

harman/kardon

AVR 1650

5 X 95W 5.1 CHANNEL A/V RECEIVER

SERVICE MANUAL



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ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge build-up or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical change sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together or your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES devices.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing.

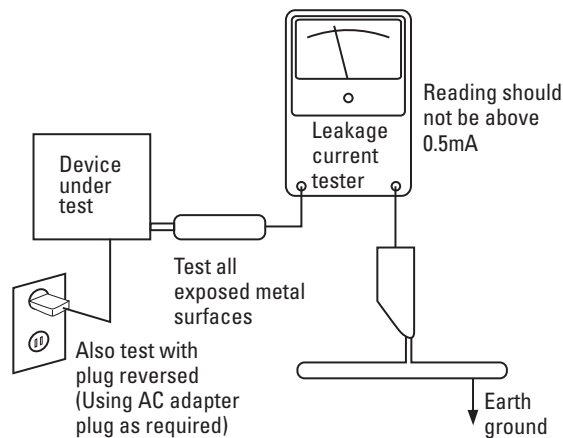
Components identified with the IEC symbol  in the parts list are of special significance to safety. When replacing a component identified with , use only the replacement parts designated, or parts with the same ratings or resistance, wattage, or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

AVR 1650/AVR 165

Specifications

Specifications

Audio Section

Stereo power:	95W per channel, two channels driven @ 8 ohms, 20Hz – 20kHz, <0.07% THD
Multichannel power:	95W per channel, two channels driven @ 8 ohms, 20Hz – 20kHz, <0.07% THD
Input sensitivity/impedance:	200mV/47k ohms
Signal-to-noise ratio (IHF-A):	100dB
Surround system adjacent-channel separation:	Dolby Pro Logic/PLII: 40dB Dolby Digital: 55dB DTS: 55dB
Frequency response:	10Hz – 130kHz (+0dB/–3dB)
High instantaneous-current capability (HCC):	±25 amps
Transient intermodulation distortion (TIM):	Unmeasurable
Slew rate:	40V/μsec

FM Tuner Section

Frequency range:	87.5 – 108.0MHz
Usable sensitivity IHF:	1.3μV/13.2dBf
Signal-to-noise ratio (mono/stereo):	70dB/68dB
Distortion (mono/stereo):	0.2%/0.3%
Stereo separation:	40dB @ 1kHz
Selectivity (±400kHz):	70dB
Image rejection:	80dB
IF rejection:	90dB

AM Tuner Section

Frequency range:	520 – 1720kHz
Signal-to-noise ratio:	45dB
Usable sensitivity (loop):	500μV
Distortion (1kHz, 50% mod):	0.8%
Selectivity (±10kHz):	30dB

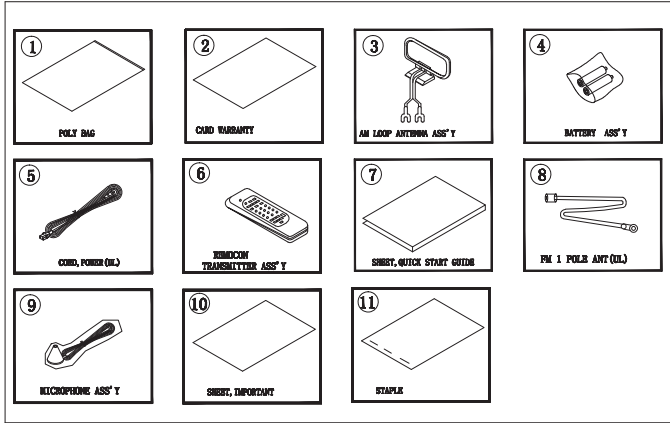
Video Section

Television format:	NTSC (AVR 1650); PAL (AVR 165)
Input level/impedance:	1Vp-p/75 ohms
Output level/impedance:	1Vp-p/75 ohms
Video frequency response (composite video):	10Hz – 8MHz (–3dB)
HDMI:	Version 1.4a with 12-bit Deep Color

General Specifications

Power requirement:	120V AC/60Hz (AVR 1650); 220V – 240V AC/50Hz – 60Hz (AVR 165)
Power consumption:	<0.5W (standby); 280W maximum
Dimensions (W x H x D):	17-5/16" x 6-1/2" x 17-1/8" (440mm x 165mm x 435mm)
Weight	20 lb (9.1kg)

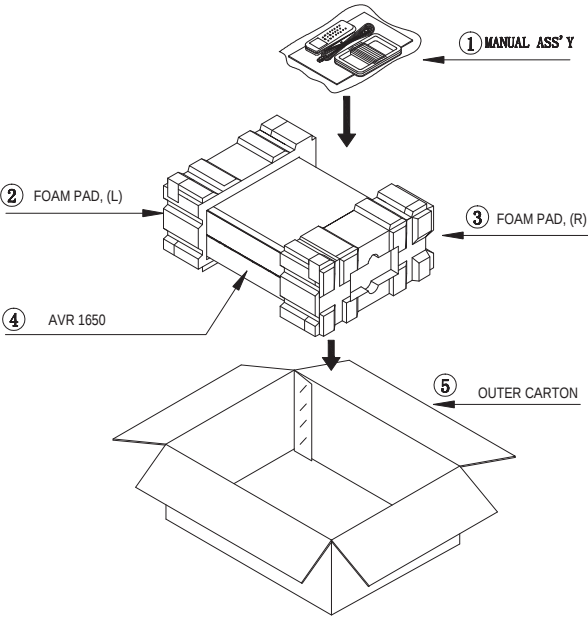
1. Instruction manual ass’y - Accessories



NO	DESCRIPTION	PARTS NO.	Qty
1	POLY BAG		1
2	CARD WARRANTY	CWEL1172X	1
3	ANT, AM LOOP	CSA1A082Z	1
4	BATTERY		3
5	CORD, POWER	CJAS070Z	1
6	REMOCON ASS'Y	CARTAVR1650-BK	1
7	SHEET, QUICK START GUIDE		1
8	FM 1 POL. ANT (UL)	CSA1A012Z	1
9	MICRO PHONE ASS'Y	CJXAVS6061CRO	1
10	SHEET, IMPORTANT		1
11	STAPLES		3

2. Package Drawing

AVR1650

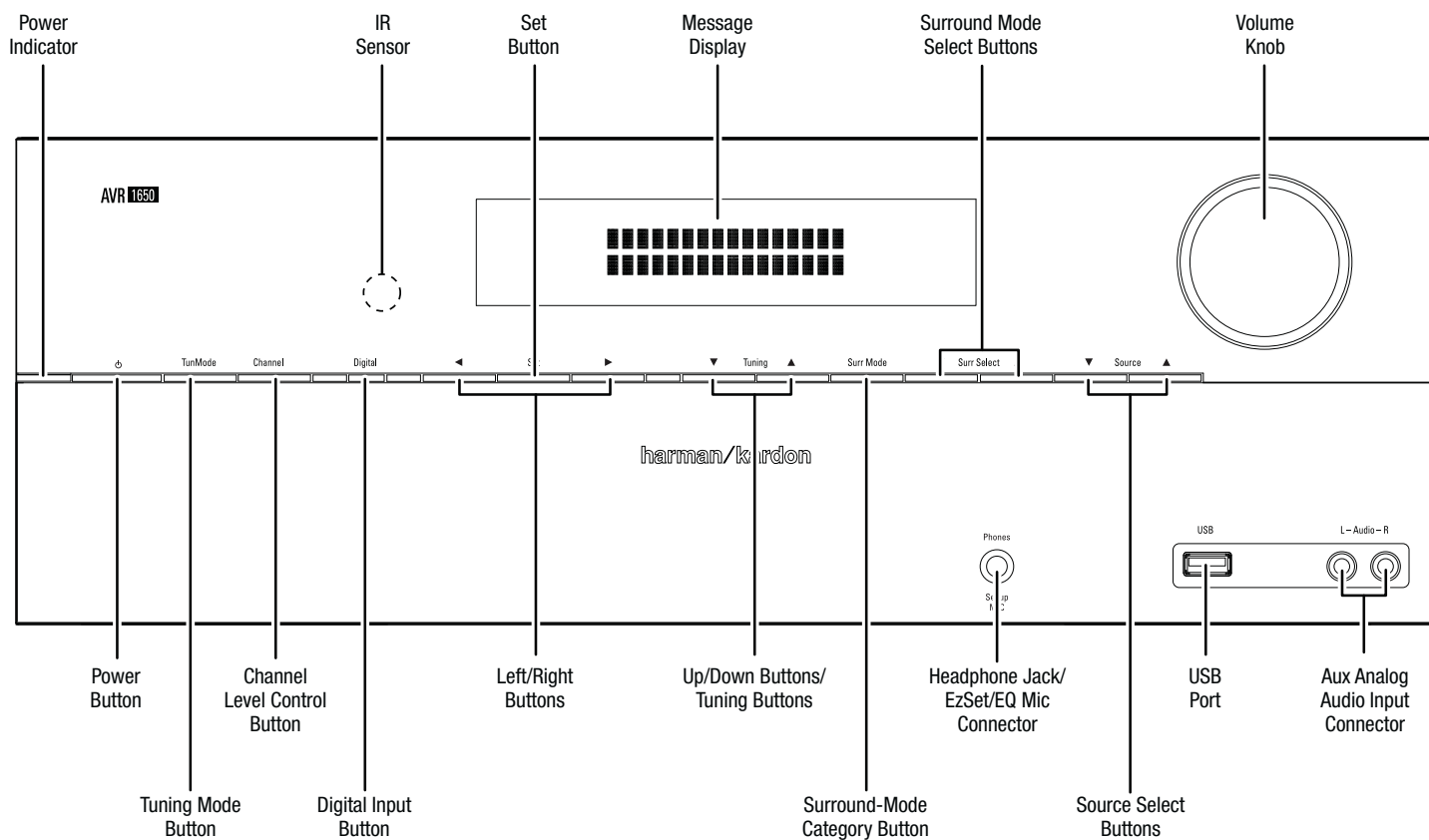


NO	DESCRIPTION	PART NO.	Qty
1	MANUAL ASS'Y		1
2	FOAM PAD, (L)	CPSSA504	1
3	FOAM PAD, (R)	CPSSA505	1
4	AVR 1650		1
5	BOX, OUT. CARTON	CP61A097X	1

AVR 1650/AVR 165

Front-Panel Controls

Front-Panel Controls



AVR 1650/AVR 165

Front-Panel Controls, continued

Front-Panel Controls, continued

Power indicator: This LED has three possible modes:

- LED is off: Indicates that the AVR is unplugged or the rear-panel Main Power switch is off.
- LED glows amber: Indicates that the AVR is in the Standby mode.
- LED glows white: Indicates that the AVR is turned on.

IMPORTANT NOTE: If the PROTECT message ever appears on the AVR's front-panel Message display, turn off the AVR and unplug it from the AC outlet. Check all speaker wires for a possible short circuit (the "+" and "-" conductors touching each other or both touching the same piece of metal). If a short circuit is not found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

IR sensor: This sensor receives infrared (IR) commands from the remote control. It is important to ensure that the sensor is not blocked.

Set button: Press this button to select the currently highlighted menu item.

Message display: Various messages appear in this two-line display in response to commands and changes in the incoming signal. In normal operation, the current source name appears on the upper line, while the surround mode is displayed on the lower line. When the on-screen display menu system (OSD) is in use, the current menu settings appear.

Surround-Mode Select buttons: After you have selected the desired surround-mode category, press these buttons to select a specific mode within the category, such as to change from Dolby® Pro Logic® II Movie mode to Logic 7® Movie mode. Surround-mode availability depends on the nature of the source input signal, i.e., digital versus analog, and the number of channels encoded within the signal.

Volume knob: Turn this knob to raise or lower the volume.

Up/Down buttons: Use these buttons to navigate the AVR's menus.

Volume knob: Turn this knob to raise or lower the volume.

Power button: Press this button to turn the AVR on or to place it in the Standby mode.

Tuning Mode button: This button toggles between manual (one frequency step at a time) and automatic (seeks frequencies with acceptable signal strength) tuning mode. It also toggles between stereo and mono modes when an FM station is tuned in.

Channel Level Control button: Press this button to activate the channel-level adjustment feature. After pressing this button, use the Up/Down buttons to select the channel for adjustment and use the Left/Right buttons to adjust the channel's level.

Digital Input button: Press this button to change the audio input for the current source. Use the Left/Right buttons to cycle through the available inputs. Although you can assign any digital audio input to any source, the analog audio inputs are all permanently dedicated to the source with which they are labeled.

Left/Right buttons: Use these buttons to navigate the AVR's menus.

Up/Down buttons/Tuning buttons: Use these buttons to navigate the AVR's menus. When the radio is the active source, use these buttons to tune stations according to the setting of the Tuning Mode button (see above).

Surround-Mode Category button: Press this button to select a surround-sound category. Each press changes the surround-mode category: Auto Select, Virtual, Stereo, Movie, Music and Video Game. To change the specific surround-sound mode within the category, use the Surround Mode Select buttons. See *Audio Processing and Surround Sound*, on page 20, for more information on surround modes.

Headphone jack/EzSet/EQ Mic connector: Connect a 1/4" stereo headphone plug to this jack for private listening. This jack is also used to connect the supplied microphone for the EzSet/EQ procedure described in *Configure the AVR for Your Speakers*, on page 17.

Source Select buttons: Press these buttons to select the active source.

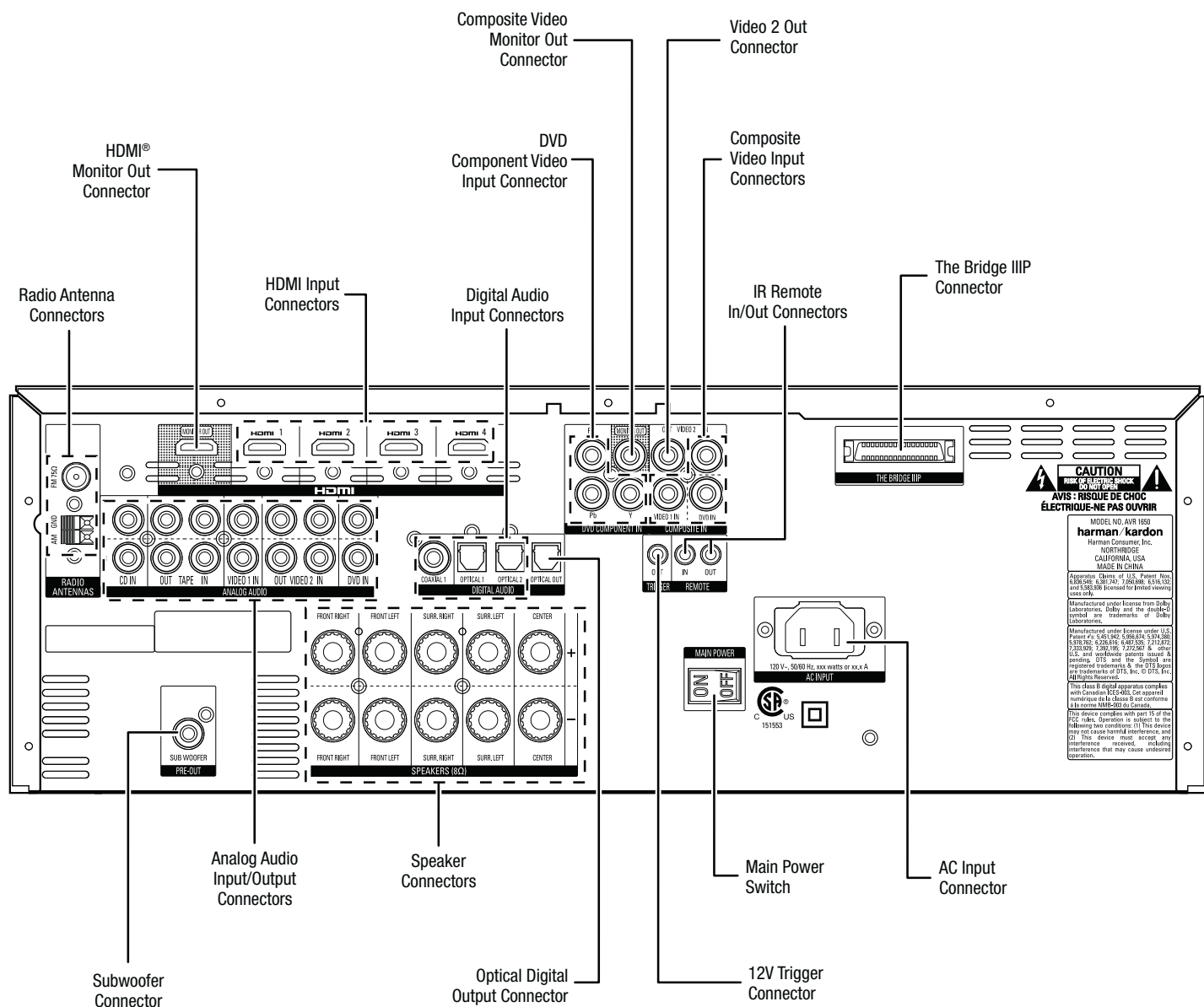
USB port: You can use this port to perform software upgrades that may be offered in the future. Do not connect a storage device, a peripheral product or a PC here, unless instructed to do so as part of an upgrade procedure.

Aux Analog Audio Input connector: Connect an auxiliary source component that will be used only temporarily, such as a camcorder, portable music player or game console, here.

AVR 1650/AVR 165

Rear-Panel Connectors

Rear-Panel Connectors



AVR 1650/AVR 165 Rear-Panel Connections (AVR 1650 shown)

AVR 1650/AVR 165

Rear-Panel Connectors, continued

Rear-Panel Connectors, continued

Radio Antenna connectors: Connect the included AM and FM antennas to their respective terminals for radio reception.

HDMI Monitor Out connector: If your TV has an HDMI connector and you have HDMI or component video source devices, use an HDMI cable (not included) to connect it to the AVR's HDMI Monitor Out connector.

Notes on using the HDMI Monitor Out connector:

- When connecting a DVI-equipped display to the HDMI Monitor Out connector, use an HDMI-to-DVI adapter and make a separate audio connection.
- Make sure the HDMI-equipped display is HDCP-compliant. If it isn't, do not connect it via HDMI; use an analog video connection instead and make a separate audio connection.

HDMI Input connectors: The HDMI (High-Definition Multimedia Interface®) feature is a connection for transmitting digital audio and video signals between devices. If your source devices have HDMI connectors, using them will provide the best possible video and audio performance quality. Since the HDMI cable carries both digital video and digital audio signals, you do not have to make any additional audio connections for devices you connect via HDMI connections. See *Connect Your Source Devices*, on page 13, for more information.

Composite Video Monitor Out connector: If your TV or video display does not have an HDMI connector, or if your TV does have an HDMI connector *but you are connecting some source devices with only composite video connectors*, use a composite video cable (not included) to connect the AVR's Composite Video Monitor Out connector to your TV's composite video input connector.

DVD Component Video Input connector: If your Blu-ray Disc™ or DVD player does not have an HDMI connector but does have a component video connector, using the component video connector will provide superior video performance. You will also need to make an audio connection from the player to the AVR.

Digital Audio Input connectors: If your non-HDMI source devices have digital outputs, connect them to the AVR's digital audio connectors. NOTE: Make only one type of digital connection (HDMI, optical or coaxial) from each device. See *Connect Your Source Devices*, on page 13, for more information.

Video 2 Out connector: Connect an analog video recorder's video input connector to the AVR's Video 2 Out connector. You can record any composite video input signal. NOTE: To record the audio and video from the source device, connect the AVR's Video 2 Out Analog Output connectors to the analog video recorder's audio inputs.

Composite Video Input connectors: Use composite video connectors for video source devices that don't have HDMI or component video connectors. You will also need to make an audio connection from the source device to the AVR. See *Connect Your Source Devices*, on page 13, for more information.

IR Remote In/Out connectors: When the IR Sensor on the front panel is blocked (such as when the AVR is installed inside a cabinet), connect an optional IR receiver to the IR Remote In connector. The IR Remote Out connector may be connected to the IR input of a compatible product to enable remote control through the AVR. See *Connect IR Equipment*, on page 15, for more information.

The Bridge IIP connector: Connect an optional Harman Kardon The Bridge IIP docking station to this connector. Insert the plug until it snaps into place in the connector. IMPORTANT: Connect The Bridge IIP only with the AVR's power turned off. See *Connect The Bridge IIP*, on page 15, for more information.

Subwoofer connector: Connect this jack to a powered subwoofer with a line-level input. See *Connect Your Subwoofer*, on page 13, for more information.

Analog Audio Input/Output connectors: Use the AVR's Analog Audio Input/Output connectors for source devices that don't have HDMI or digital audio connectors. Use the Video 2 Out and Tape Out connectors to connect to the audio inputs of a VCR and tape deck. See *Connect Your Source Devices*, on page 13, for more information.

Speaker connectors: Use two-conductor speaker wire to connect each set of terminals to the correct speaker. See *Connect Your Speakers*, on page 13, for more information.

Optical Digital Output connector: Connect a digital audio recorder's optical digital input to the AVR's Optical Digital Output connector. You can record both coaxial and optical digital PCM audio signals. (Dolby Digital and DTS® bitstreams are not available for recording.)

Main Power switch: This mechanical switch turns the AVR's power supply on or off. It is usually left on and cannot be turned on or off using the remote control.

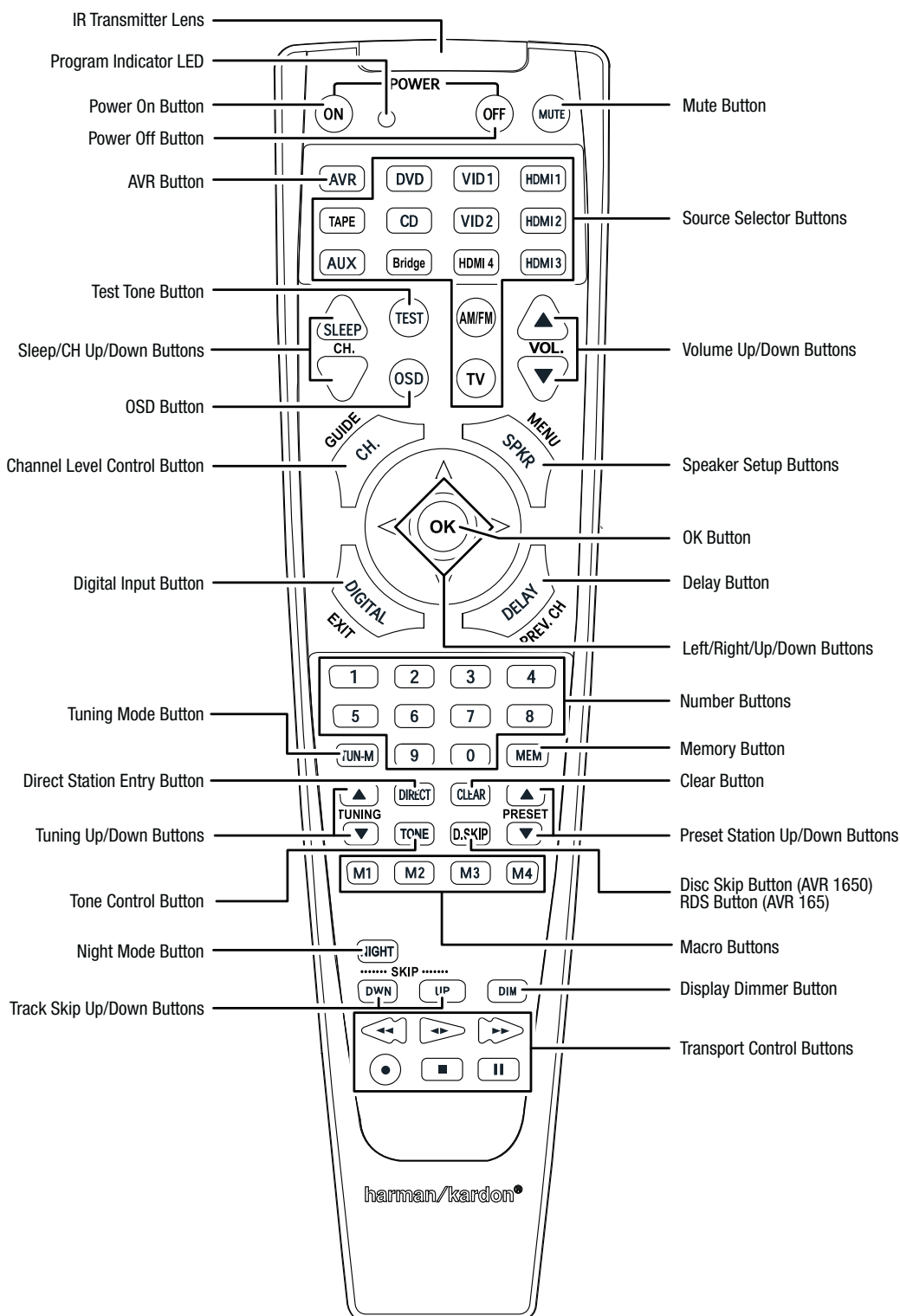
12V Trigger connector: This connector provides 12V DC whenever the AVR is on. It can be used to turn on and off other devices such as a powered subwoofer.

AC Input connector: After you have made all other connections, plug the supplied AC power cord into this receptacle and into an unswitched wall outlet.

AVR 1650/AVR 165

System Remote Control Functions

System Remote Control Functions



AVR 1650/AVR 165

System Remote Control Functions, continued

System Remote Control Functions, continued

In addition to controlling the AVR, the AVR remote is capable of controlling nine other devices, including an iPod/iPhone device docked in a The Bridge III docking station connected to the AVR. During the installation process, you may program the codes for each of your source components into the remote. (See *Program the Remote to Control Your Source Devices and TV*, on page 16, for programming information.) To operate a component, press its Source Selector button to change the remote's control mode.

A button's function depends on which component is being controlled. See Table A10 in the Appendix for listings of the functions for each type of component. Most of the buttons on the remote have dedicated functions, although the precise codes transmitted vary depending on the specific device being controlled. Due to the wide variety of functions for various source devices, we have included only a few of the most often-used functions on the remote: alphanumeric keys, transport controls, television-channel control, menu access and power on and off. To return the remote to the AVR control mode at any time, press the AVR button.

IR Transmitter lens: As buttons are pressed on the remote, infrared codes are emitted through this lens.

Program Indicator LED: This LED lights up to indicate various procedures when the remote is in the Programming mode.

Power On/Off buttons: Press these buttons to turn the AVR or the device being controlled on and off. The Main Power switch on the AVR's rear panel must be on for this button to turn the AVR on and off.

Mute button: Press this button to mute the AVR's speaker-output connectors and Headphone jack. To restore the sound, press this button or adjust the volume.

AVR button: Press this button to switch the remote's control mode to operate the AVR.

Source Selector buttons: Press one of these buttons to select a source device, e.g., DVD, AM/FM radio, etc. This action will also turn on the AVR and switch the remote's control mode to operate the selected source device. **NOTE:** The first press of the Radio Source Selector button switches the AVR to the last-used tuner band (AM or FM). Each successive press changes the band.

Test Tone button: Press this button to activate the test tone for calibrating channel volume levels by ear.

Sleep button/Channel Up/Down buttons: Press the Sleep button to activate the sleep timer, which turns off the AVR after a programmed period of time of up to 90 minutes. The Channel Up/Down buttons have no effect on the AVR but are used to change channels on TVs and some video sources.

Volume Up/Down buttons: Press these buttons to raise or lower the volume.

OSD button: Press this button to activate the on-screen display menu system.

Channel Level Control button: Press this button to activate the individual channel-level adjustment. It lets you easily change the channel balance to suit different programs or seating arrangements. See *Manual Speaker Setup*, on page 21, for more information.

Speaker Setup button: Press this button to configure which speakers are included in your system. See *Manual Speaker Setup*, on page 21, for more information.

OK button: This button is used to select items from the menu system.

Digital Input button: Press this button to select the specific digital audio input (or analog audio input) to which the current source is connected.

Delay button: Pressing this button lets you adjust two different types of delay settings (use the Up/Down buttons to cycle through the settings):

- **A/V Sync:** This setting lets you resynchronize the audio and video signals from a source to eliminate a "lip sync" problem. Lip-sync issues can occur when the video portion of a signal undergoes additional processing in either the source device or the video display. Use the Left/Right buttons to delay the audio by up to 180ms.
- **Front L/Center/Front R/Surr R/Surr L/Subwoofer:** These settings let you set the delay for each speaker to compensate for the different distances they may be from the listening position. Use the Up/Down buttons to cycle through each of the system's speakers, and use the Left/Right buttons to set the distance each speaker is from the listening position. See *Manual Speaker Setup*, on page 21, for more information.

Left/Right/Up/Down buttons: These buttons are used to navigate the menu system.

Number buttons: Use these buttons to enter numbers for radio-station frequencies or to select station presets.

Tuning Mode button: Press this button to toggle the radio between manual (one frequency step at a time) and automatic (seeks frequencies with acceptable signal strength) tuning mode. It also toggles between stereo and mono modes when an FM station is tuned in.

Memory button: To save the currently tuned radio station as a preset, press this button, then a Number button.

Direct Station Entry button: Press this button before using the Number buttons to enter a radio station frequency.

Clear button: Press this button to clear a radio station frequency you have started to enter.

Tuning Up/Down buttons: Press these buttons to tune a radio station. Depending on whether the tuning mode has been set to manual or automatic, each press will either change one tuning frequency increment at a time or seek the next higher or lower station with acceptable signal strength.

Preset Station Up/Down buttons: Press these buttons to cycle through your preset radio stations.

Tone Control button: Press this button to access the bass and treble controls. Use the OK button to select an adjustment and use the Up/Down buttons to change the settings.

Disc Skip button (AVR 1650): This button is used with some optical disc changers to skip to the next disc.

RDS button (AVR 165): When listening to an FM radio station that broadcasts RDS information, this button activates the various RDS functions.

Night Mode button: Press this button to activate Night mode with specially encoded Dolby Digital discs or broadcasts. Night mode compresses the audio so that louder passages are reduced in volume to avoid disturbing others, while dialogue remains intelligible. Each press of the button advances through the following settings:

- **Off:** No compression is applied. Loud passages in the program remain as they were recorded.
- **Mid:** Loud passages in the program are reduced moderately in volume.
- **Max:** Loud passages in the program are reduced more in volume.

Macro buttons: These buttons may be programmed to execute a series of up to 19 commands with a single button press. They are useful for programming the command to turn on or off all of your components or for accessing specialized functions for a different component from the one that you are currently operating. See *Programming Macro Commands*, on page 24, for information about programming macros.

Track Skip Up/Down buttons: These buttons have no effect on the AVR but are used with many source components to change tracks or chapters.

Display Dimmer button: Press this button to dim the AVR's front-panel display partially or fully.

Transport Control buttons: These buttons have no effect on the AVR but are used to control many source components. By default, when the remote is operating the AVR, these buttons will control a Harman Kardon Blu-ray Disc player or DVD player.

AVR 1650/AVR 165

Types of Home Theater System Connections

Types of Home Theater System Connections

There are different types of audio and video connections used to connect the AVR to your speakers, your TV or video display, and your source devices. The Consumer Electronics Association has established the CEA® color-coding standard.

Connection Color Guide Table

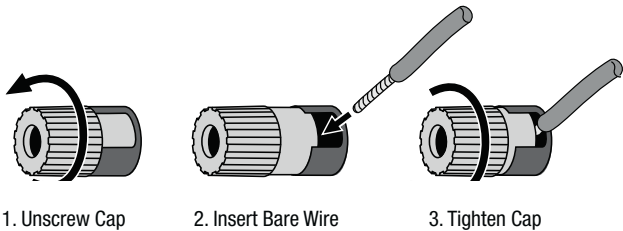
Analog Audio Connection	Color
Front Left/Right	White/Red
Center	Green
Surround Left/Right	Blue/Gray
Subwoofer	Purple
Digital Audio Connection	Color
Coaxial (input or output)	Orange
Optical Input	Black
Optical Record Output	Gray
Analog Video Connection	Color
Component Video	Red/Green/Blue
Composite Video	Yellow

Speaker Connections

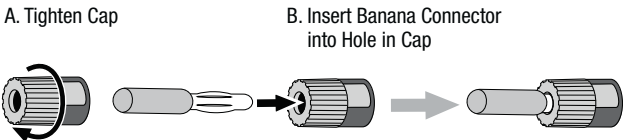
Speaker cables carry an amplified signal from the AVR's speaker terminals to each loudspeaker. Each cable contains two wire conductors, or leads, that are differentiated in some way, such as with colors or stripes.

The differentiation helps you maintain proper polarity, without which your system's low-frequency performance can suffer. Each speaker is connected to the AVR's speaker-output terminals using two wires, one positive (+) and one negative (–). Always connect the positive terminal on the speaker, which is usually colored red, to the positive terminal on the AVR, which is colored as indicated in the Connection Color Guide Table, above. The negative terminals on the speakers and the AVR are black.

Your AVR uses binding-post speaker terminals that can accept bare-wire cables or banana plugs. Bare-wire cables are installed as shown below:



Banana plugs are inserted into the hole in the middle of the terminal cap, as shown below:

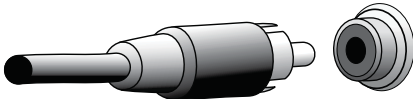


Always connect the colored (+) terminal on the AVR to the (+) terminal on the speaker (usually red), and the black (–) terminal on the AVR to the (–) terminal on the speaker (usually black).

IMPORTANT: Make sure the (+) and (–) bare wires do not touch each other or the other terminal. Touching wires can cause a short circuit that can damage your AVR or amplifier.

Subwoofer Connections

The subwoofer is a speaker dedicated to reproducing only the low (bass) frequencies, which require more power. To obtain the best results, most speaker manufacturers offer powered subwoofers that contain their own amplifiers. Use a single RCA audio cable (not included) to make a line-level (non-amplified) connection from the AVR's Subwoofer connector to a corresponding input jack on the subwoofer.



Although the AVR's purple subwoofer output looks similar to a full-range analog audio jack, it is filtered so that only the low frequencies pass through it. Don't connect this output to any device other than a subwoofer.

Source Device Connections

Audio and video signals originate in source devices (components where a playback signal originates) such as your Blu-ray Disc or DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television tuner, iPod or iPhone (docked in an optional The Bridge IIIP docking station) or MP3 player. The AVR's FM/AM tuner also counts as a source, even though no external connectors are needed other than the AVR's FM and AM antennas. Separate connectors are required for the audio and video portions of the source device's signal, except for digital HDMI connectors. The types of connectors you use will depend upon the capabilities of the source device and of your TV or video display.

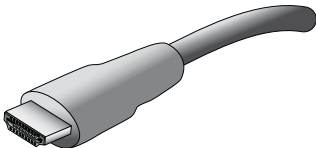
Digital Audio Connections – HDMI

There are two types of audio connections – digital and analog. Digital audio signals are required for listening to sources encoded with digital surround modes, such as Dolby Digital and DTS, or for uncompressed PCM digital audio. Your AVR has three types of digital audio connectors: HDMI, coaxial and optical. Do not use more than one type of digital audio connector for each source device. However, it's okay to make both analog and digital audio connections to the same source.

Your AVR is equipped with four rear-panel HDMI input connectors and one HDMI monitor output connector. HDMI technology enables digital audio and video information to be carried using a single cable, delivering the highest quality picture and sound. If your TV or video-display device has an HDMI input connector, make a single HDMI connection from each source device to the AVR. Usually, a separate digital audio connection is not required.

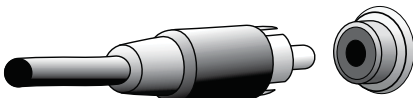
The AVR's HDMI Monitor Output connector contains an Audio Return Channel (ARC) that carries a digital audio signal from your TV or video display back to the AVR. It allows you to listen to HDMI devices that are connected directly to your TV (such as an Internet connection) without making an additional connection from the device to the AVR. The ARC signal is active when the TV source is selected. See *System Setup*, on page 23, for more information.

The HDMI connector is shaped for easy plug-in (see illustration, below), and HDMI cable runs are limited to about 10 feet (3m). If your video display has a DVI input and is HDCP-compliant, use an HDMI-to-DVI adapter (not included), and make a separate audio connection.



Digital Audio Connections – Coaxial

Coaxial digital audio jacks are usually color-coded orange. Although they look like standard RCA-type analog jacks, you should not connect coaxial digital audio outputs to analog inputs or vice versa.

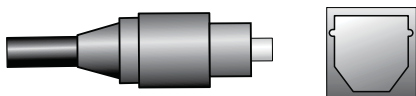


AVR 1650/AVR 165

Types of Home Theater System Connections, continued

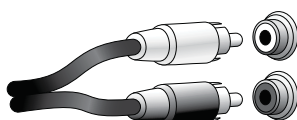
Digital Audio Connections – Optical

Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted. Optical input connectors are color-coded using a black shutter, while optical outputs use a gray shutter.



Analog Audio Connections

Two-channel analog connections require a stereo audio cable, with one connector for the left channel (white) and one for the right channel (red). These two connectors are attached to each other.

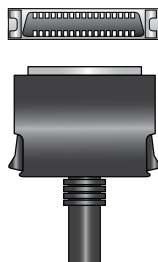


For source devices that have both digital and analog audio outputs, you may make both connections.

The analog connections also feed the Analog Record Output connectors. You may record materials from Blu-ray Disc recordings, DVDs or other copy-protected sources using only analog connections. Remember to comply with all copyright laws if you choose to make a copy for your own personal use.

The Bridge IIP Connection

Your AVR includes a proprietary, dedicated connector for a The Bridge IIP docking station (available separately) for the iPod or iPhone.



Video Connections

Many source devices output both audio and video signals (e.g., Blu-ray Disc, DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to an audio connection as described above, make a video connection for each of these source devices. Make only one type of video connection for each device.

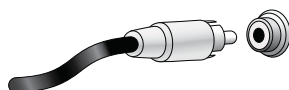
Digital Video Connections

If you have already connected a source device to one of the AVR's HDMI input connectors, you have automatically made a video connection for that device, since the HDMI cable carries both digital audio and digital video signals.

Analog Video Connections – Composite Video

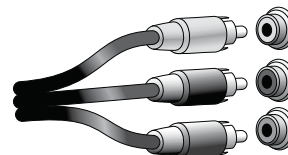
Your AVR uses two types of analog video connections: composite video and component video.

Composite video is the basic connection most commonly available. Both the chrominance (color) and the luminance (intensity) components of the video signal are transmitted using a single cable. The jack is usually color-coded yellow and looks like an analog audio jack. Do not connect a composite video jack to an analog audio or coaxial digital audio jack, or vice versa.



Analog Video Connections – Component Video

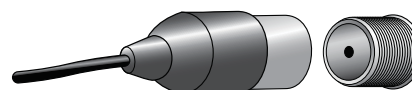
Component video separates the video signal into three components – one luminance (“Y”) and two sub-sampled color signals (“Pb” and “Pr”) – that are transmitted using three separate cables that are color-coded green (Y), blue (Pb) and red (Pr). Component video cables that join three separate green, blue and red connectors into a single cable are sold separately.



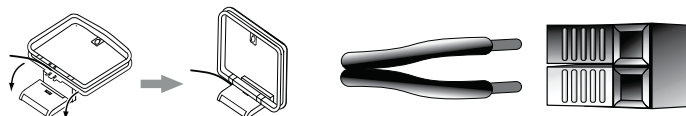
If your TV or video display has an HDMI connector, we recommend it for the best quality connection. Your AVR converts component analog video input signals to the HDMI format, upscaling them to high-definition 1080p resolution.

Radio Connections

Your AVR uses separate terminals for the included FM and AM antennas. The FM antenna uses a 75-ohm F-connector.

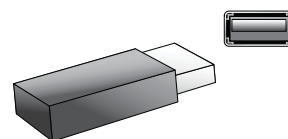


The AM antenna connector uses spring-clip terminals. After assembling the antenna as shown below, press the levers to open the connectors, insert the bare wires into the openings, and release the levers to secure the wires. The antenna wires are not polarized, so you can insert either wire into either connector.



USB Port

The USB port on your AVR is used for firmware upgrades. If an upgrade for the AVR's operating system is released in the future, you will be able to download it to the AVR using this port. Complete instructions will be provided at that time.



IMPORTANT: Do not connect a PC or other USB host/controller to the AVR's USB port, or you may damage both the AVR and the other device.

AVR 1650/AVR 165

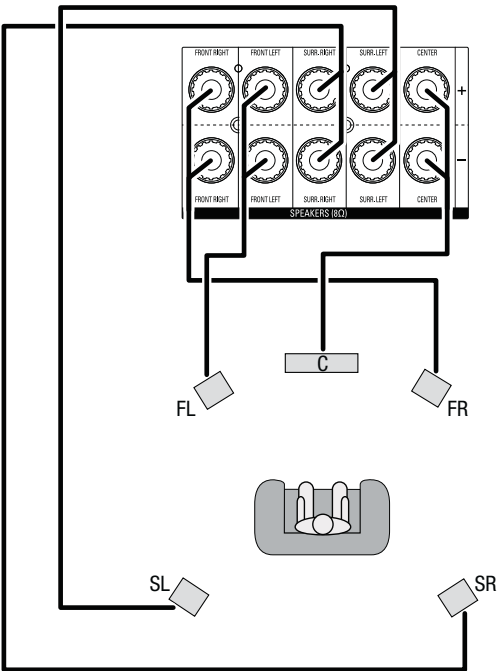
Making Connections

Making Connections

CAUTION: Before making any connections to the AVR, ensure that the AVR's AC cord is unplugged from the AVR and the AC outlet. Making connections with the AVR plugged in and turned on could damage the speakers.

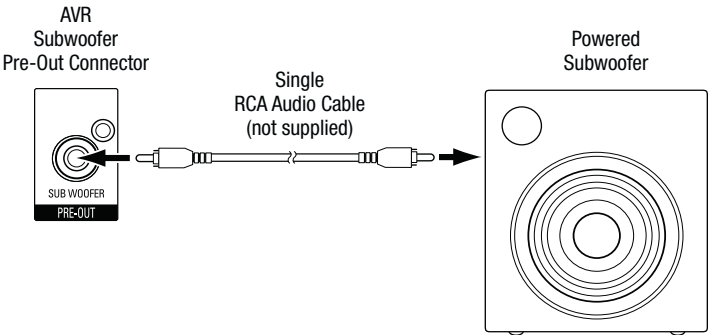
Connect Your Speakers

After you have placed your loudspeakers in the room as explained in *Place Your Speakers*, on page 10, connect each speaker to its color-coded terminal on the AVR as explained in *Speaker Connections*, on page 11. Connect the speakers as shown in the illustration.



Connect Your Subwoofer

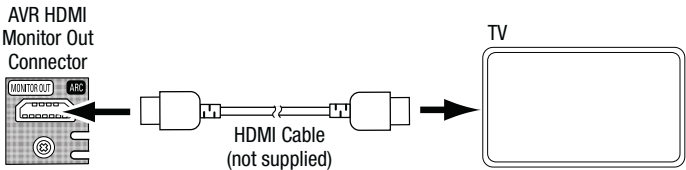
Use a single RCA audio cable to connect the AVR's Subwoofer Pre-Out connector to your subwoofer. Consult your subwoofer's user manual for specific information about making connections to it.



Connect Your TV or Video Display

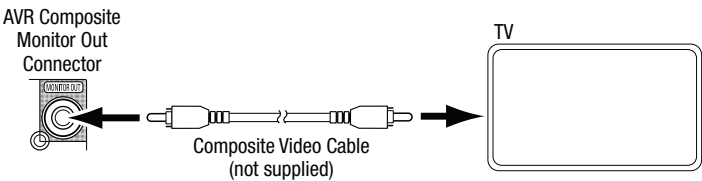
HDMI Monitor Out connector

If your TV has an HDMI connector and you have HDMI or component video source devices, use an HDMI cable (not included) to connect your TV to the AVR's HDMI Monitor Out connector. It will provide the best possible picture quality.



Composite Video Monitor Out connector

If your TV does not have an HDMI connector, or if your TV does have an HDMI connector but you are connecting some source devices with only composite video connectors, use a composite video cable (not included) to connect the AVR's Composite Monitor Out connector to your TV's composite video connector.



Connect Your Source Devices

Source devices are components where a playback signal originates, such as a Blu-ray Disc or DVD player, or a cable, satellite or HDTV tuner. Your AVR has several different types of input connectors for your audio and video source devices: HDMI, component video, composite video, optical digital audio, coaxial digital audio and analog audio. The connectors are labeled for the types of source devices you are most likely to connect.

Each of your AVR's source buttons is assigned to an HDMI connector or an analog audio input connector (listed in the "AVR Source Button/Analog Audio Connector" column of the table below). To provide you flexibility for connecting and configuring your system, we have designed the AVR so that you can assign the digital audio inputs to any of the video AVR sources.

As you connect your various source components, fill out the "Source Device Connected" column in the following table – it will make it easier for you to assign the digital audio input connectors and component video connector later in the setup process.

AVR Source Button/ Analog Audio Connector	Recommended Source Device Type	Source Device Connected	Digital Audio Input Connector Assigned
Video 1	Cable or Satellite Tuner		
Video 2	DVD Recorder or VCR		
DVD	Blu-ray Disc or DVD Player		
CD	CD Player		
Tape	Cassette Deck or Audio Recorder		
Aux	Portable Media Palyer		
The Bridge IIIP	iPod/iPhone Device		
AVR Source Button/ HDMI Connector	-----	Source Device Connected	Digital Audio Input Connector Assigned
HDMI 1	-----		
HDMI 2	-----		
HDMI 3	-----		
HDMI 4	-----		

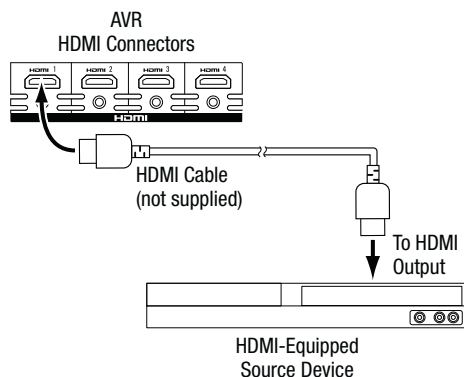
AVR 1650/AVR 165

Making Connections, continued

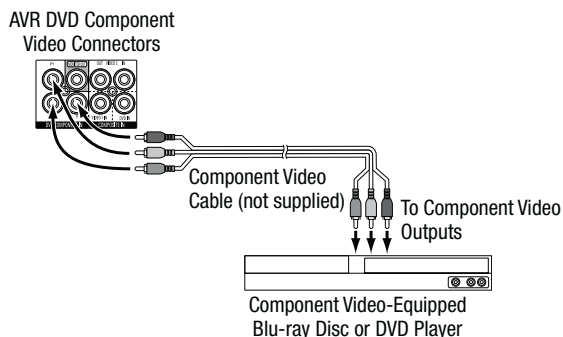
HDMI devices

If any of your source devices have HDMI connectors, using those connectors will provide the best possible video and audio performance quality. Since the HDMI cable carries both digital video and digital audio signals, you do not have to make any additional audio connections for devices you connect via HDMI cables, although you can assign one of the digital audio connectors to one of the HDMI inputs.

If you have a TV or other source device equipped with the HDMI Audio Return Channel function, you can feed its sound to the AVR via the HDMI Monitor Out connector's Audio Return Channel, and it will not require additional audio connections to the AVR.

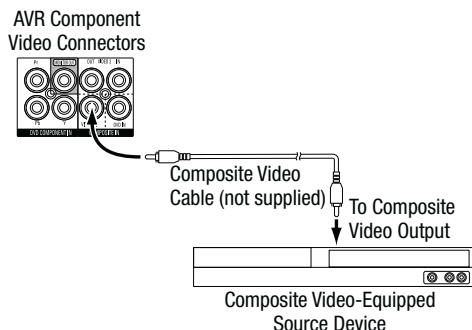
**Component video devices**

If your Blu-ray Disc or DVD player does not have an HDMI connector but does have a component video connector, using the component video connector will provide superior video performance. You will also need to make an audio connection from the player to the AVR.

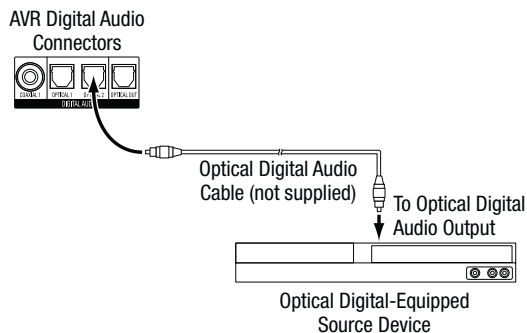
**Composite video devices**

You will need to make composite video connections from your source devices that do not have HDMI or component video connectors. You will also need to connect the source device's analog audio outputs to the AVR's corresponding analog audio connectors.

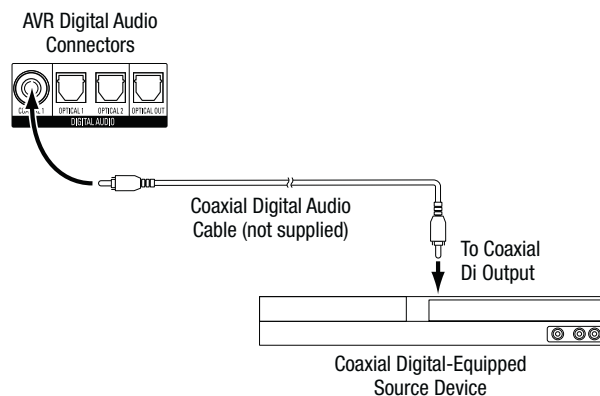
IMPORTANT: If you connected your Blu-ray Disc or DVD player to the AVR's DVD Component Video Input connectors, do not connect a source device to the AVR's DVD Composite Video Input connector.

**Optical digital audio devices**

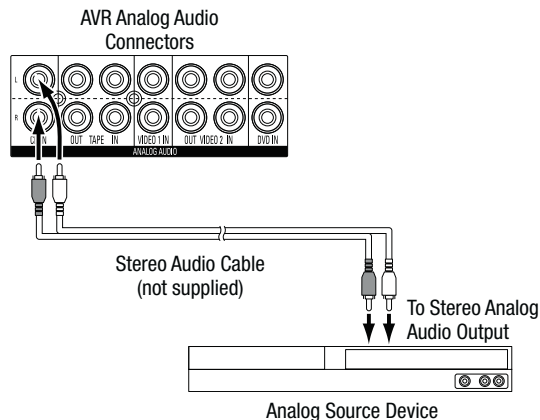
If your source devices have optical digital outputs, connect them to the AVR's Optical Digital Audio connectors. **NOTE:** Make only one type of digital connection (HDMI, optical or coaxial) from each device.

**Coaxial digital audio devices**

If your source devices have coaxial digital outputs, connect them to the AVR's Coaxial Digital Audio connectors. **NOTE:** Make only one type of digital connection (HDMI, optical or coaxial) from each device.

**Analog audio devices**

Make analog audio connections from your source devices that do not have HDMI or digital audio connectors. If you're connecting video sources to the DVD, Video 1 or Video 2 audio inputs, you must also connect the source device's composite video output to the corresponding composite video connector.

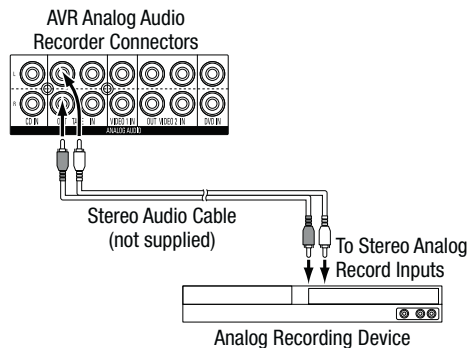


AVR 1650/AVR 165

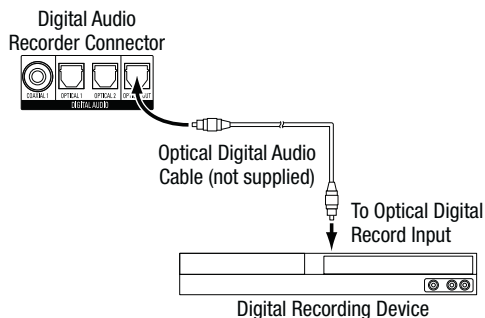
Making Connections, continued

Audio recorders

Connect an analog audio recorder's inputs to the AVR's analog audio Tape Out connectors. You can record any analog audio input signal.

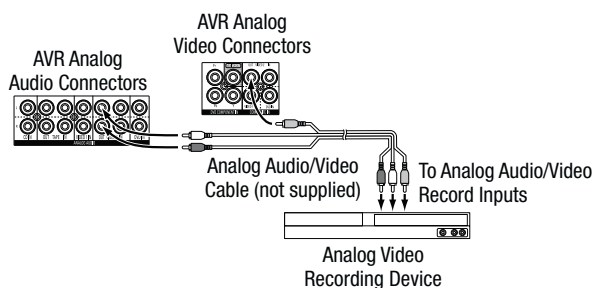


You can connect the AVR's Optical Digital Output connector to a digital audio recorder's optical digital input connector. You can record both coaxial and optical digital input signals.



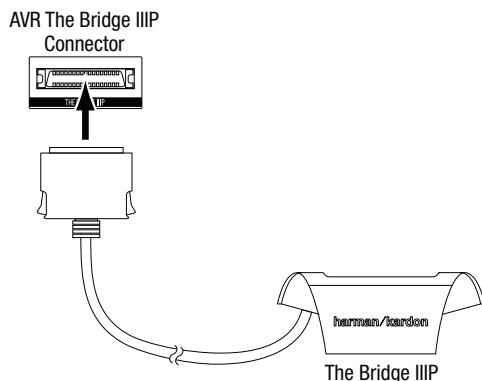
Video recorders

Connect an analog video recorder's video input connector to the AVR's Video 2 Out Composite Video connector, and its audio input connectors to the AVR's Video 2 Out Analog Audio connectors. You can record any composite video signal.



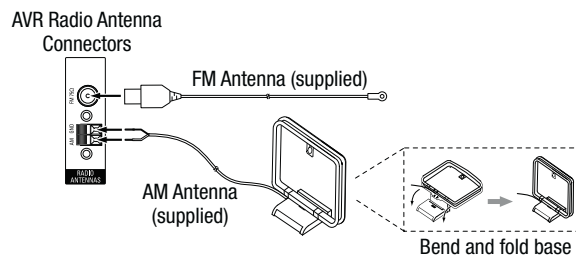
Connect The Bridge IIIP

Connect an optional The Bridge IIIP to the AVR's The Bridge IIIP connector. Insert the plug until it snaps into place in the connector. **IMPORTANT: Connect The Bridge IIIP only with the AVR's power turned OFF.**



Connect the Radio Antennas

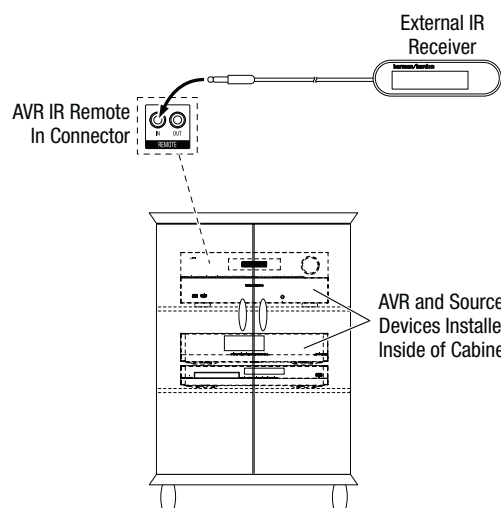
- Connect the supplied FM antenna to the AVR's FM 75Ω Radio Antenna connector. For the best reception, extend the FM antenna as far as possible.
- Bend and fold the base of the supplied AM antenna as shown and connect the antenna wires to the AVR's AM and Gnd connectors. (You can connect either wire to either connector.) Rotate the antenna as necessary to minimize background noise.



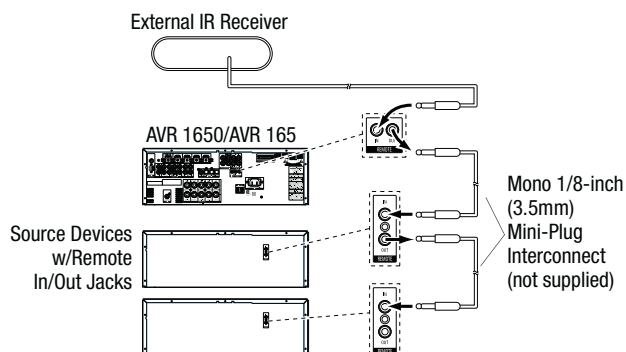
Connect IR Equipment

The AVR's Remote IR Input and Output connectors let you remotely control the AVR in a variety of situations:

- When you place the AVR inside a cabinet or facing away from the listener, connect an external IR receiver, such as the Harman Kardon HE 1000 (available separately), to the AVR's IR Remote In connector.



- If any source devices are equipped with a compatible IR input connector, use a 1/8-inch (3.5mm) mini-plug interconnect cable (not included) to connect the AVR's IR Remote Out jack to the source device's IR input connector.



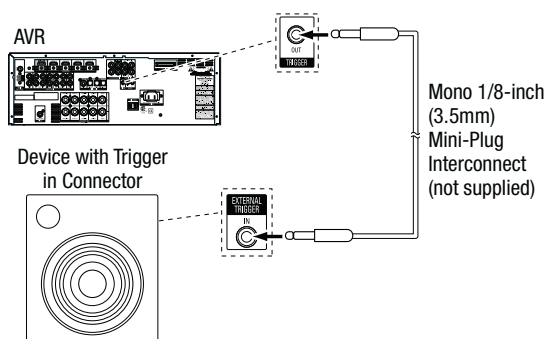
To control more than one source device through the AVR's IR Remote Out connector, connect all sources in "daisy chain" fashion, connecting each device's IR output connector to the next device's IR input connector, starting with the AVR.

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Making Connections, continued, and Set Up the Remote Control

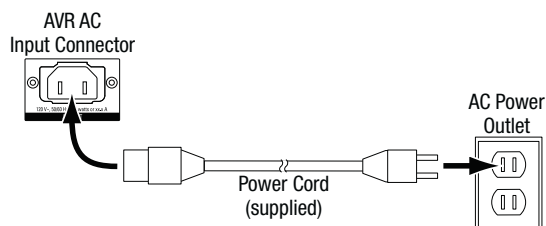
Connect the 12V Trigger Output

If your system has equipment that can be controlled by a DC trigger signal, connect it to the AVR's 12V Trigger connector with a mono 1/8-inch (3.5mm) mini-plug interconnect cable. The AVR will supply a 12V DC (100mA) trigger signal at this connection whenever it is powered on.



Connect to AC Power

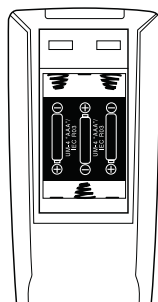
Connect the AC power cord to the AVR's AC Input connector and then to a working AC power outlet.



Set Up the Remote Control

Install the Batteries in the Remote Control

Remove the remote control's battery cover, insert the three supplied AAA batteries as shown in the illustration, and replace the battery cover.



NOTE: Remove the protective plastic from the AVR's front panel to keep it from reducing the remote control's effectiveness.

Program the Remote to Control Your Source Devices and TV

In addition to using the remote to control the AVR itself and the AM/FM radio, you can program the remote to control up to nine additional audio/video source devices plus your TV. The remote is also ready to operate your iPod or iPhone device when the device is docked in a connected The Bridge III P (not included).

Once you have programmed the remote, you can switch the remote's control mode to access the functions for a particular source device by pressing the remote's Source Selector button for that device. To control the AVR, press the remote's AVR button.

Before you begin programming the remote, review the connections you filled in on the Input Connections and Source Buttons table on page 13. The Source Selector buttons are assigned to the components that you listed in the table's "Source Device Connected" column.

1. Turn on the source device you want to program the remote to control.
2. Look up the code numbers for the device in Tables A11 – A17 in the Appendix. Write all the applicable code numbers in a convenient place.
3. Press and hold the Source Selector button for that source device until the Program Indicator LED on the remote starts to flash, then release it. (This procedure places the remote in the Programming mode.)

NOTE: If you're programming one of the four HDMI source buttons, after pressing the HDMI button you must also press the Source Selector button for the type of device that will be controlled:

- Press DVD to control a DVD player.
 - Press VID1 to control a VCR, DVR or Harman Kardon digital media center.
 - Press VID2 to control a cable or satellite set-top box.
4. Aim the remote at the source device and use the remote's Number buttons to enter a code number from Step 2, above.
 - a) If the device turns off, press the Source Selector button again to save its code. The Source Selector button will flash, and the remote will exit the Programming mode.
 - b) If the device does not turn off, enter another code number.
 - c) If you run out of code numbers for a device, you can search through all of the codes in the remote's library for devices of its type by pressing the Up or Down button repeatedly until the device turns off. When it does, press the Source Selector button to save the code.
 5. Check that other functions control the device correctly. Sometimes manufacturers use the same Power code for several models, while other function codes vary. Repeat this process until you've programmed a satisfactory code set that operates most of the device's functions.
 6. If you searched through the remote's code library to find the code, you can find out which code number you have programmed by pressing and holding the Source Selector button to re-enter the Programming Mode. Then press the remote's OK button, and the Program Indicator LED will flash in the code sequence. One flash represents "1," two flashes represent "2," and so forth. A series of quick flashes represents "0." Record the code number programmed for each device in Table A7 in the Appendix.

Repeat Steps 3 – 6 for each source device you want to control with the AVR remote.

In general, the label for each button on the remote describes the button's function when used to control the AVR. However, the button may perform a very different function when used to control another device. Refer to the *Remote Control Function List*, Table A10 in the Appendix, for each button's functions with the various product types.

You can also program the remote to perform Macros (preprogrammed code sequences that execute many code commands with a single button press) and "punch-through" programming (allowing the remote to operate a device's channel or transport controls when the remote is in another device's mode). See *Advanced Remote Control Programming*, on page 24, for instructions on these functions.

AVR 1650/AVR 165

Operating Your AVR

Operating Your AVR

Now that you have installed your components and completed a basic configuration, you are ready to begin enjoying your home theater system.

Controlling the Volume

Adjust the volume either by turning the front-panel Volume knob (clockwise to increase volume or counterclockwise to decrease volume) or by pressing the Volume Up/Down buttons on the remote. The volume is displayed as a negative number of decibels (dB) below the 0dB reference point.

0dB is the maximum recommended volume for your AVR. Although it's possible to turn the volume to a higher level, doing so may damage your hearing and your speakers. For certain more dynamic audio materials, even 0dB may be too high, allowing for damage to equipment. Use caution with regard to volume levels.

Muting the Sound

To mute all speakers and the headphones, press the Mute button on the remote. Any recording in progress will not be affected. The MUTE message will appear in the front-panel display as a reminder. To restore the sound, press the Mute button again, or adjust the volume.

Listening Through Headphones

Plug the 1/4-inch stereo plug on a pair of headphones into the front-panel Phones jack for private listening. The default Headphone Bypass mode delivers a conventional 2-channel signal to the headphones. Press the Surround Modes button on the front panel or use the remote and OSD to switch to HARMAN headphone virtual surround processing, which emulates a 5.1-channel speaker system. No other surround modes are available for the headphones.

Selecting a Source

There are two different ways to select a source:

- Press the front-panel Source Select buttons.
- Directly select any source by pressing its Source Selector button on the remote.

The AVR selects the audio and video inputs assigned to the source and any other settings you made during setup.

The source name, the audio and video inputs assigned to the source, and the surround mode will appear on the front panel.

Video Troubleshooting Tips

If there is no picture:

- Check the source selection.
- Check all connections for a loose or incorrect connection.
- Check the video-input selection on the TV/display device.

Additional Tips for Troubleshooting HDMI Connections

- Turn off all devices (including the TV, the AVR and any source components).
- Unplug the HDMI cables, starting with the cable between the AVR and the TV, and continuing with the cables between the AVR and each source device.
- Carefully reconnect the cables from the source devices to the AVR. Connect the cable from the AVR to the TV last.
- Turn on the devices in this order: TV, AVR, source devices.

NOTE: Depending upon the particular components involved, the complexity of the required communication between HDMI components may cause delays of up to a minute in the completion of some actions, such as input switching or switching between SD and HD channels.

Listening to FM and AM Radio

Select the AM/FM source. Use the Tuning Up/Down buttons to tune a station, which will be shown on the front-panel display and the TV screen.

The AVR defaults to automatic tuning, meaning each press of the Tuning Up/Down buttons scans until a station with acceptable signal strength is found. To switch to manual tuning, in which each press of a Tuning button steps through a single frequency increment, press the Tuning Mode button. Each press of the Tuning Mode button toggles between the automatic and manual tuning modes.

Once you have tuned an FM station, toggling the Tuning Mode setting also switches the radio between stereo and monaural reception. (Mono reception may improve reception of weaker stations.)

Preset Stations

A total of 30 stations (AM and FM combined) may be stored as presets. When the desired station has been tuned in, press the Memory button on the remote, and two dashes will flash on the front-panel Message display. Use the Number buttons to enter the desired preset number.

To tune a preset station, press the Preset Up/Down buttons or enter the preset number using the Number buttons.

Listening to an iPod/iPhone Device

When The Bridge IIIP is connected to its proprietary input on the AVR, and an iPod or iPhone is docked, you may play the audio materials on your iPod or iPhone through your high-quality audio/video system, operate the iPod or iPhone using the AVR remote or the AVR's front-panel controls, view navigation messages on the AVR's front panel or a connected video display, and charge the iPod or iPhone.

As of this writing, your AVR supports audio playback from the following Apple products: iPod classic, iPod nano 3G, iPod nano 4G, iPod nano 5G, iPod nano 6G, iPod touch, iPod touch 2G, iPod touch 3G, iPod touch 4G, iPhone, iPhone 3G, iPhone 3GS, iPhone 4G. For the latest compatibility information, please see our Web site: www.harmankardon.com.

After docking an iPod or iPhone device in The Bridge IIIP, select the Bridge Source Selector button on the remote. "Bridge" will appear on the front-panel Message display, and a The Bridge screen will appear on a TV connected to the AVR.

```
SONG: Previously Disenchanted
ARTIST: Jugalbandi
ALBUM: Yellow Star Mailings List
10:17 ▶ 15:33
```

The screen will show the currently playing song, artist, album, elapsed time, play mode and total track time. Use the remote's Transport Control buttons to control playback.

Navigating iPod/iPhone Device Menus

Pressing the remote's Speaker Setup (Menu) button while an iPod/iPhone device is playing in The Bridge IIIP will display the iPod/iPhone Menu screen on a connected TV:

```
Menu
Playlists
▶ Artists
Albums
Songs
Podcasts
Genres
Composers
Audiobooks
```

Use the Up/Down and OK buttons to navigate through the list and select the desired category. When the category's screen appears, use the Up/Down and OK buttons to navigate within the category and make selections. NOTE: Not all categories may appear with all iPod/iPhone devices.

- To return to a previous menu screen at any time, press the Speaker Setup (Menu) button.

AVR 1650/AVR 165

Operating Your AVR, continued, and Advanced Functions

Selecting a Surround Mode

Selecting a surround mode can be as simple or sophisticated as your individual system and tastes. Feel free to experiment, and you may find a few favorites for certain sources or program types. You can find more detailed information on surround modes in *Audio Processing and Surround Sound*, on this page.

To select a surround mode, press the OSD Button on the remote to display the Master menu:

```

**  MASTER MENU  **

▶ INPUT SETUP
  SURROUND MODE
  EzSet/EQ
  MANUAL SETUP
  SYSTEM SETUP
  
```

Use the Up/Down and OK buttons to select Surround Mode. The Surround Mode menu will appear:

```

*  MODE : MUSIC  *

DOLBY PLII MUSIC

▶ CENTER WIDTH : 3
  DIMENSION    : 0
  PANORAMA     : Off

BACK TO MASTER MENU
  
```

Use the Up/Down and OK buttons to select the desired surround-mode category.

Auto Select: For a digital program, such as a movie recorded with a Dolby Digital or DTS soundtrack, the AVR will automatically use the soundtrack's native surround format. For 2-channel analog and PCM programs, the AVR uses the Logic 7 Movie, Logic 7 Music or Logic 7 Game mode, depending on the source.

Virtual Surround: When only two main speakers are present in the system, you can use HARMAN virtual surround to create an enhanced sound field that virtualizes the missing speakers.

Stereo: When you want 2-channel playback, select the number of speakers you want to use for playback:

- "2 CH Stereo" uses two speakers.
- "5 CH Stereo" plays the left-channel signal through the front left and surround left speakers, the right-channel signal through the front right and surround right speakers, and a summed mono signal through the center speaker.

Movie: Select from the following when you want a surround mode for movie playback: Logic 7 Movie or Dolby Pro Logic II Movie.

Music: Select from the following when you want a surround mode for music playback: Logic 7 Music or Dolby Pro Logic II Music. The Dolby Pro Logic II Music mode provides some additional settings. See *Audio Processing and Surround Sound*, on page 20, for more information.

Video Game: Select from the following when you want a surround mode for game playback: Logic 7 Game or Dolby Pro Logic II Game.

After you select the surround-mode category, the Mode menu will appear:

```

*  MODE : MUSIC  *

DOLBY PLII MUSIC

▶ CENTER WIDTH : 3
  DIMENSION    : 0
  PANORAMA     : Off

BACK TO MASTER MENU
  
```

Use the Left/Right buttons to change the surround mode.

You can also select surround modes using the AVR's front-panel buttons:

1. Press the Surr Mode button. The Message display will show the surround-mode category and surround mode.
2. To change the surround mode within the surround-mode category, press the Surround Select Up/Down buttons. Each press will change to the next surround mode.
3. To change the surround-mode category, press the Surr Mode button. Each press will change to the next surround-mode category.

Advanced Functions

Much of the adjusting and configuration your AVR requires is handled automatically, with little intervention required on your part. You can also customize your AVR to suit your system and your tastes. In this section, we will describe some of the more advanced adjustments available to you.

Audio Processing and Surround Sound

Audio signals can be encoded in a variety of formats that can affect not only the quality of the sound but also the number of speaker channels and the surround mode. You may also manually select a different surround mode, when available.

Analog Audio Signals

Analog audio signals usually consist of two channels – left and right. Your AVR offers two options for analog playback:

DSP Surround Off Mode: The DSP Surround Off mode digitizes the incoming signal and applies the bass-management settings, including speaker configuration, delay times and output levels. Select this mode when your front speakers are small, limited-range satellites and you are using a subwoofer. To select this mode, use a digital audio input or turn the Tone Control setting off, then select 2 CH Stereo mode.

Analog Surround Modes: Your AVR is able to process 2-channel audio signals to produce multichannel surround sound, even when no surround sound has been encoded in the recording. Among the available modes are the Dolby Pro Logic II, HARMAN virtual speaker, Logic 7 and 5 CH Stereo modes. To select one of these modes, see *Selecting a Surround Mode*, on page 20.

Digital Audio Signals

Digital audio signals offer greater flexibility and capacity than analog signals and allow the encoding of discrete channel information directly into the signal. The result is improved sound quality and startling directionality, since each channel's information is transmitted discretely. High-resolution recordings sound extraordinarily distortion-free, especially in the high frequencies.

Surround Modes

Surround-mode selection depends upon the format of the incoming audio signal as well as your personal taste. Although there is never a time when all of the AVR's surround modes are available, there is usually a wide variety of modes available for a given input. Table A9 in the Appendix, on page 31, offers a brief description of each mode and indicates the types of incoming signals or digital bitstreams the mode may be used with. Additional information about the Dolby and DTS modes is available on the companies' Web sites: www.dolby.com and www.dtsonline.com.

When in doubt, check the jacket of your disc for more information on which surround modes are available. Usually, nonessential sections of the disc, such as trailers, extra materials or the disc menu, are available only in Dolby Digital 2.0 (2-channel) or PCM 2-channel mode. If the main title is playing and the display shows one of these surround modes, look for an audio or language setup section in the disc's menu. Also, make sure your disc player's audio output is set to the original bitstream rather than 2-channel PCM. Stop play and check the player's output setting.

The channels included in a typical 5.1-channel recording are front left, front right, center, surround left, surround right and LFE (low-frequency effects). The LFE channel is denoted as ".1" to represent the fact that it is limited to the low frequencies.

Digital formats include Dolby Digital 2.0 (two channels only), Dolby Digital 5.1, Dolby Digital EX (6.1), Dolby Digital Plus (7.1), Dolby TrueHD (7.1), DTS-HD High-Resolution

AVR 1650/AVR 165

Troubleshooting

Troubleshooting

Symptom	Cause	Solution
Unit does not function when Main Power switch is turned on	No AC power	- Ensure that the power cord is plugged into a live AC power outlet - Check if the AC outlet is switch-controlled
Front-panel Message display lights, but there's no sound or picture	- Intermittent input connection - Mute is on - Volume control is turned down	- Secure all input and speaker connections - Press Mute button - Turn up Volume control
No sound from any speaker; PROTECT message appears on Message display	- Amplifier is in protection mode due to possible short circuit - Amplifier is in protection mode due to internal problems	- Check all speaker wires at speaker and AVR connections for crossed wires - Contact your local Harman Kardon service center
No sound from center or surround speakers	- Incorrect surround mode - Program material is monophonic - Incorrect speaker configuration - Program material is stereo	- Select a surround mode other than stereo - Mono programs contain no surround information - Check the speaker configuration in the setup menu - The surround decoder may not create center- or surround-channel information from nonencoded stereo programs
Unit does not respond to remote control commands	- Weak batteries in remote - AVR not selected - Remote sensor is obscured	- Change batteries in remote - Press the Setup/AVR button - Ensure that the AVR's front-panel remote sensor is in the line of sight of the remote
Intermittent buzzing in tuner	Local interference	Move the AVR or antenna away from computers, fluorescent lights, motors or other electrical appliances
Unable to activate remote control Programming mode	Source Selector button is not held for at least 3 seconds	Be sure to hold the Source Selector button for at least 3 seconds

Additional information on troubleshooting possible problems with your AVR and installation-related issues may be found in the list of "Frequently Asked Questions," which is located in the Product Support section of our Web site: www.harmankardon.com

Resetting the Remote

To reset the remote to its factory-default condition, simultaneously press and hold any Source Selector button and the “0” Number button. When the Program Indicator LED flashes amber, enter the code “333.” When the green LED goes out, the remote control will be reset.

Processor Reset

If the AVR behaves erratically after a power surge, first turn off the rear-panel Main Power switch and unplug the AC power cord for at least 3 minutes. Plug the cord back in and turn the AVR on. If this procedure doesn’t help, reset the AVR’s processor as described below.

NOTE: A processor reset erases all user configurations, including video resolution, speaker and level settings, and tuner presets. After a reset, reenter all of these settings from your notes in the Appendix worksheets.

To reset the AVR’s processor:

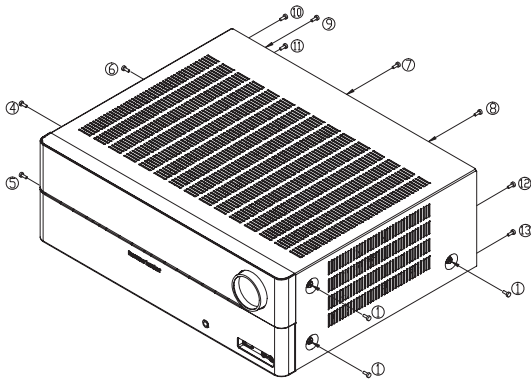
1. Press the front-panel Standby/On switch to place the unit in the Standby mode (the Power Indicator LED will turn amber).
2. Press and hold the front-panel Surround Mode button for at least 5 seconds until the RESET message appears on the front-panel Message display.

If the AVR does not function correctly after a processor reset, contact Harman/kardon at 1-800-422-8027

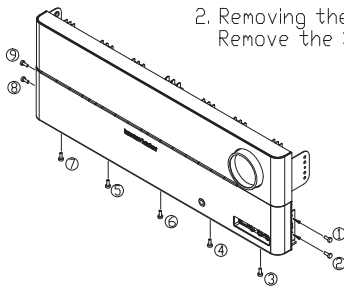
DISASSEMBLY

AVR1650

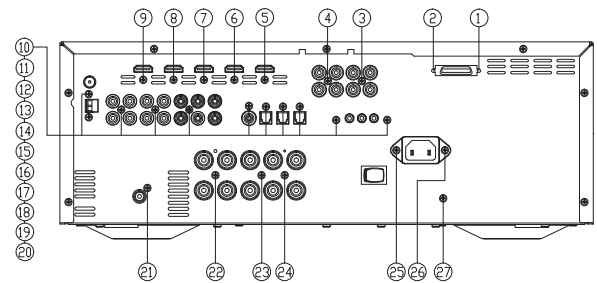
1. Removing the Top Cabinet
Remove the Screws ①-⑩



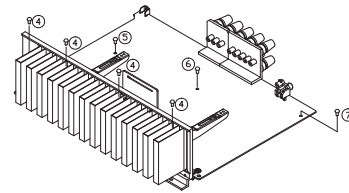
2. Removing the Front Panel
Remove the Screws ①-⑨



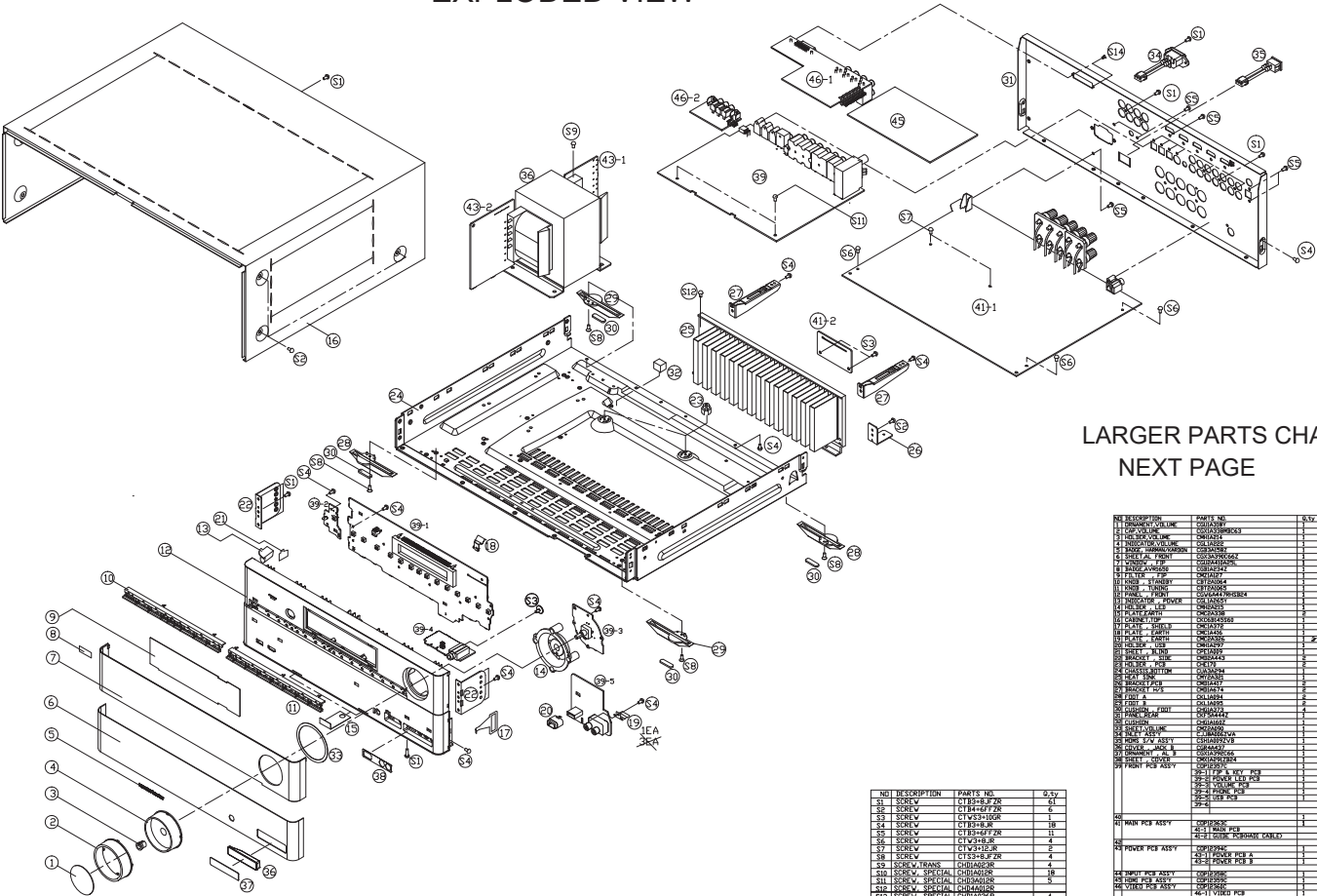
3. Removing the Rear Panel
Remove the Screws ①-⑩



4. Removing the Main PCB
Remove the Screws ①-⑦



EXPLODED VIEW



LARGER PARTS CHART
NEXT PAGE

NO	DESCRIPTION	PARTS NO.	QTY
1	SCREW	C122-6AF-28	61
2	SCREW	C122-6AF-28	6
3	SCREW	C122-6AF-28	10
4	SCREW	C122-6AF-28	11
5	SCREW	C122-6AF-28	2
6	SCREW	C122-6AF-28	2
7	SCREW	C122-6AF-28	2
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NO	DESCRIPTION	PART NO.	Qty
1	ORNAMENT,VOLUME	CGU1A318Y	1
2	CAP,VOLUME	CGX1A338MBC63	1
3	HOLDER,VOLUME	CMH1A214	1
4	INDICATOR,VOLUME	CGL1A222	1
5	BADGE, HARMAN/KARDON	CGB3A158Z	1
6	SHEET,AL FRONT	CGX3A390C66Z	1
7	WINDOW , FIP	CGU2A410A25L	1
8	BADGE,AVR1650	CGB1A234Z	1
9	FILTER , FIP	CMZ1A127	1
10	KNOB , STANDBY	CBT2A1064	1
11	KNOB , TUNING	CBT2A1065	1
12	PANEL , FRONT	CGW6A447RHSB24	1
13	INDICATOR , POWER	CGL1A265Y	1
14	HOLDER , LED	CMH2A215	1
15	PLATE,EARTH	CMC2A338	2
16	CABINET,TOP	CKC6B145S60	1
17	PLATE , SHIELD	CMC1A372	1
18	PLATE , EARTH	CMC1A416	1
19	PLATE , EARTH	CMC2A326	1
20	HOLDER , USB	CMH1A297	1
21	SHEET , BLIND	CPE1A009	1
22	BRACKET , SIDE	CMD2A443	2
23	HOLDER , PCB	CHE170	2
24	CHASSIS,BOTTOM	CUA3A294	1
25	HEAT SINK	CMY2A321	1
26	BRACKET,PCB	CMD1A417	2
27	BRACKET H/S	CMD1A674	2
28	FOOT A	CKL1A094	2
29	FOOT B	CKL1A095	2
30	CUSHION , FOOT	CHG1A373	4
31	PANEL,REAR	CKF5A444Z	1
32	CUSHION	CHG1A160Z	1
33	SHEET,VOLUME	CMZ2A090	1
34	INLET ASS'Y	CJJ8A006ZWA	1
35	MDMS S/W ASS'Y	CSH1A009ZVB	1
36	COVER , JACK B	CGR4A437	1
37	ORNAMENT , AL B	CGX1A392C66	1
38	SHEET , COVER	CMX1A291ZB24	1
39	FRONT PCB ASS'Y		1
		39-1 FIP & KEY PCB	1
		39-2 POWER LED PCB	1
		39-3 VOLUME PCB	1
		39-4 PHONE PCB	1
		39-5 USB PCB	1
		39-6	
40			1
41	MAIN PCB ASS'Y		1
		41-1 MAIN PCB	
		41-2 GUIDE PCB(CHADI CABLE)	
42			
43	POWER PCB ASS'Y		1
		43-1 POWER PCB A	1
		43-2 POWER PCB B	1
44	INPUT PCB ASS'Y		1
45	HDMI PCB ASS'Y		1
46	VIDEO PCB ASS'Y		1
		46-1 VIDEO PCB	1
		46-2 RS232 PCB	1

AMPLIFIER SECTION BIAS ADJUSTMENT

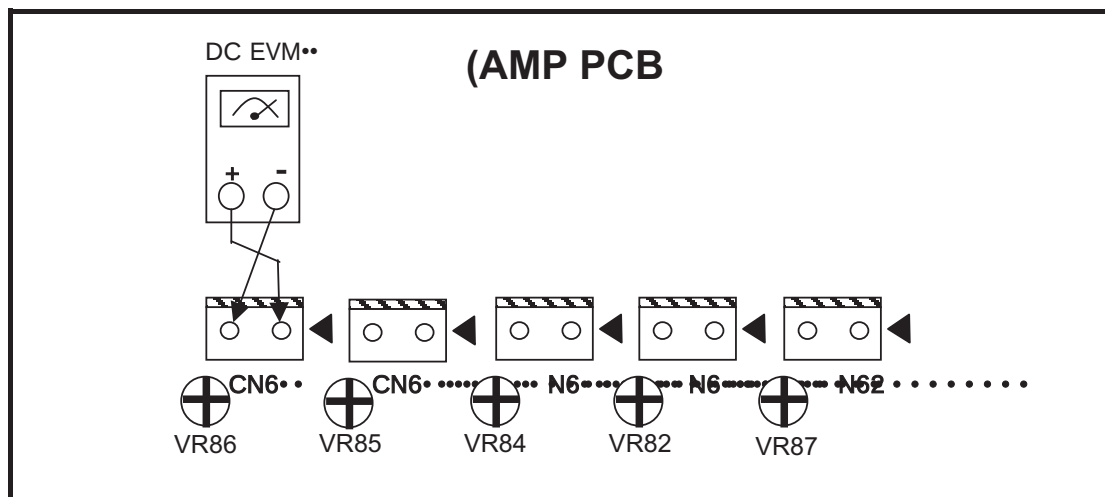
Measurement condition

.No input signal or volume position is minimum.

Standard value

.Ideal current = 48mA ($\pm 5\%$)

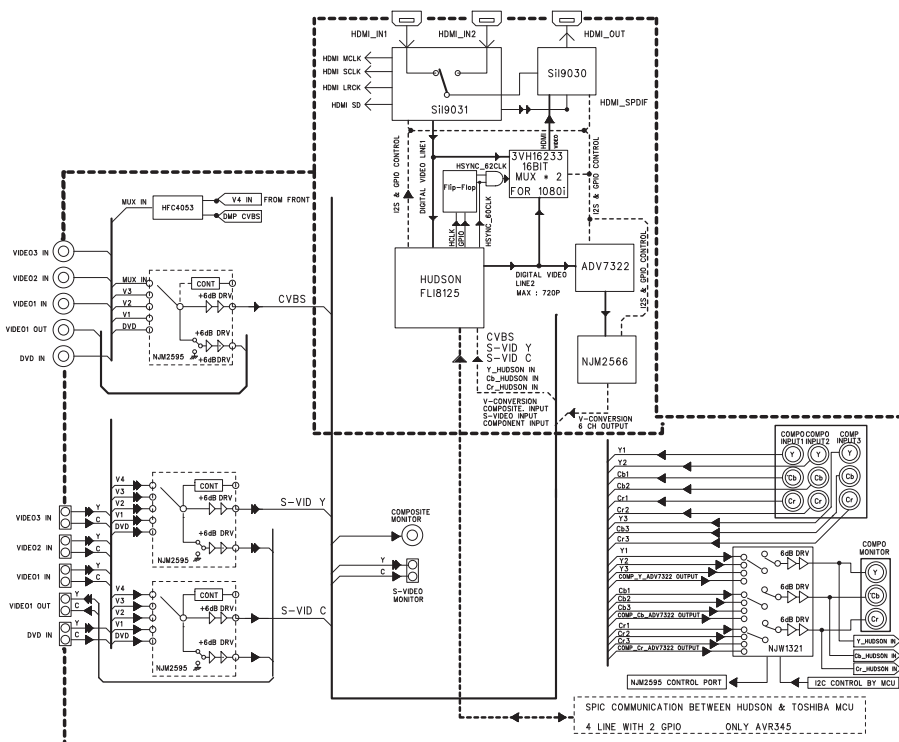
.Ideal DC Voltage = 25.92mV ($\pm 5\%$)

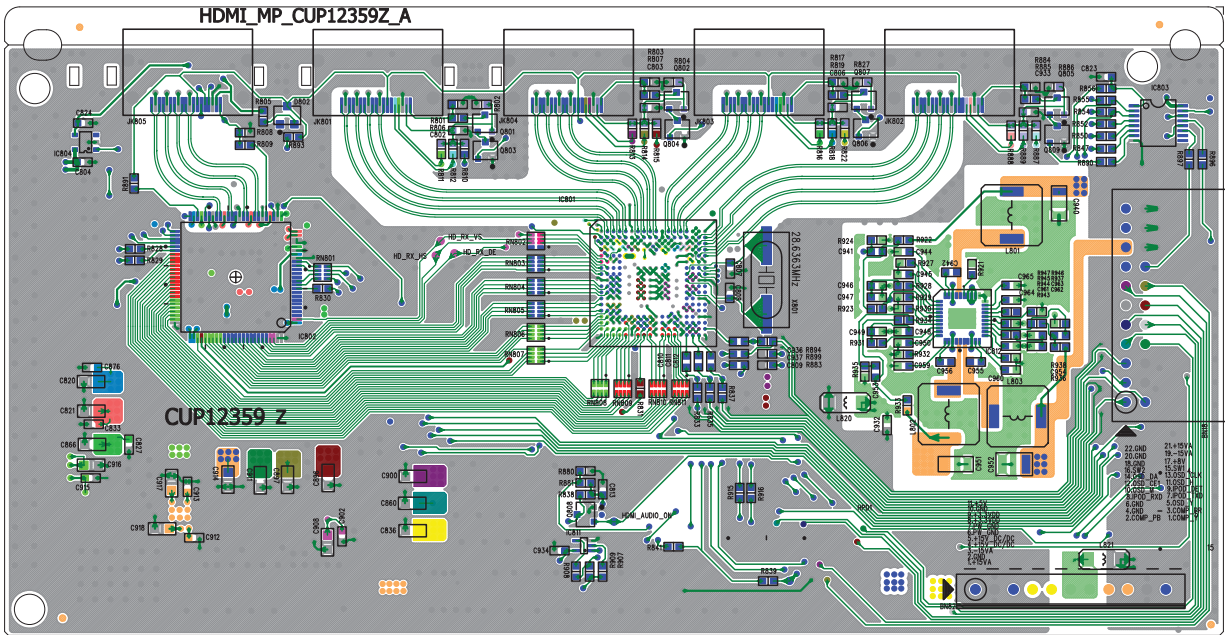


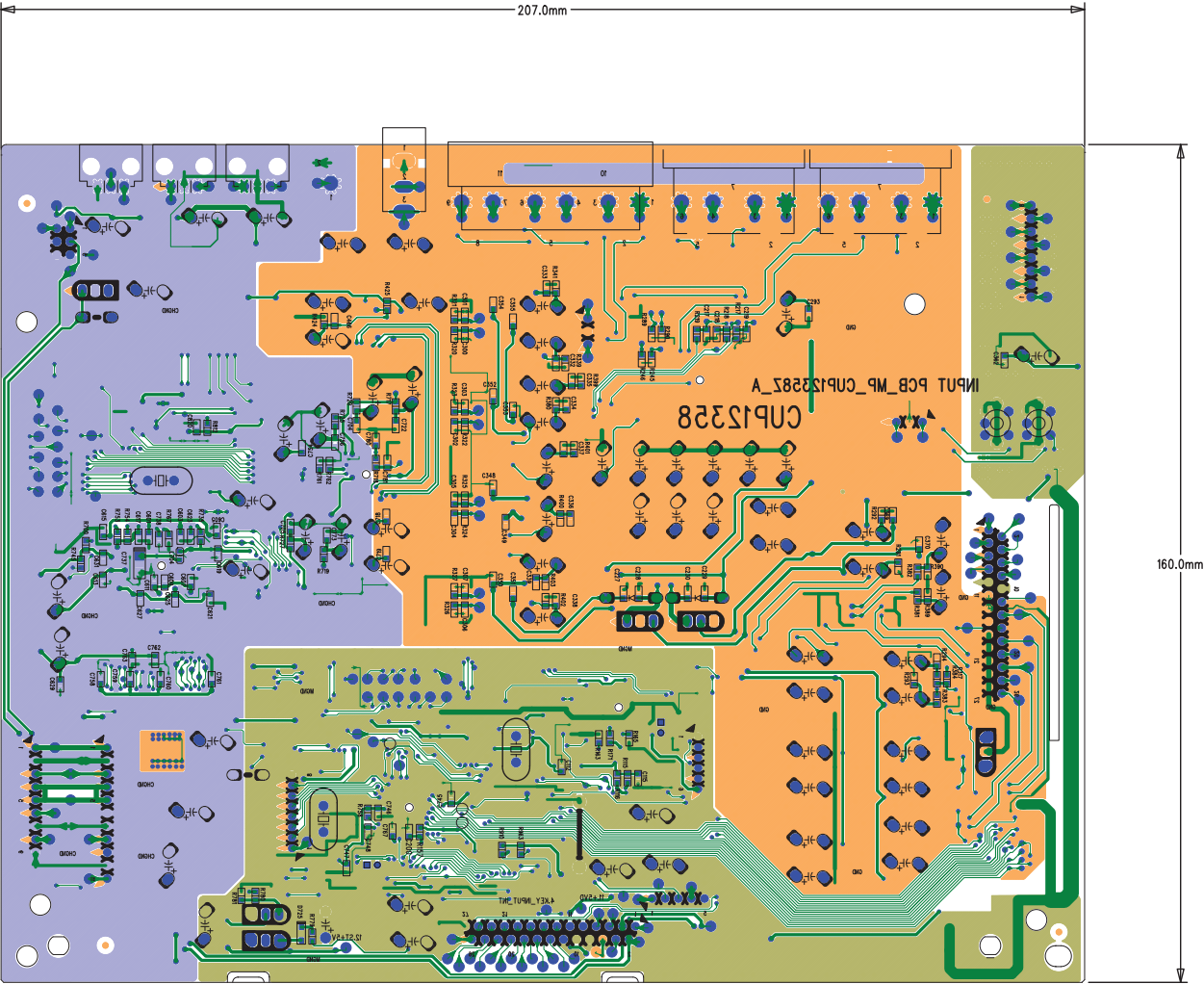
DC VOLTMETER ; Connect to

CN66(FR),CN61(CNT),CN64(SR),CN63(FL),CN62(SL)

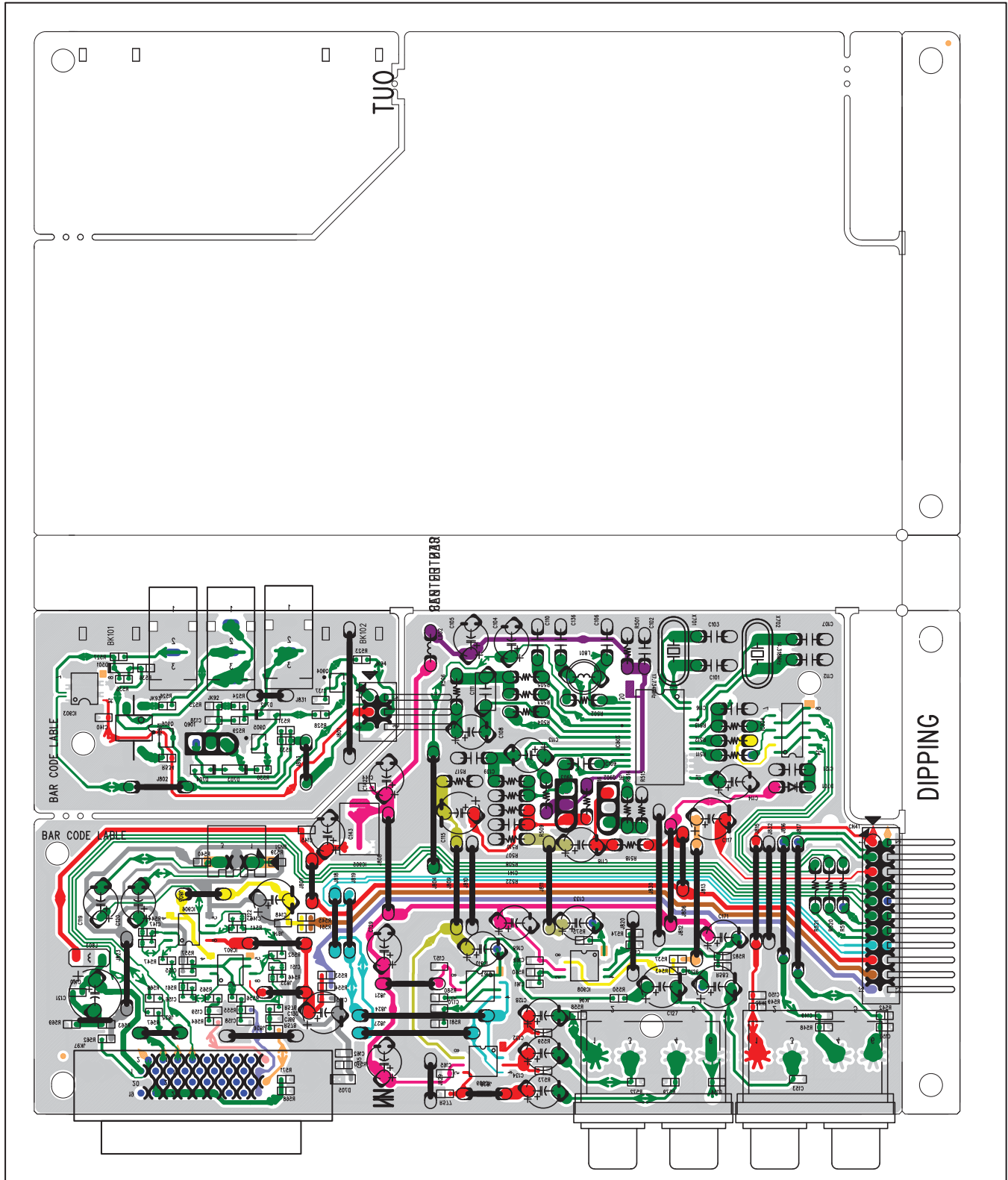
NO.	Channel	Adjust for	Adjustment
1	Front Left	25.92mV ($\pm 5\%$)	CN63
2	Front Right	25.92mV ($\pm 5\%$)	CN66
3	Center	25.92mV ($\pm 5\%$)	CN61
4	Surround Left	25.92mV ($\pm 5\%$)	CN62
5	Surround Right	25.92mV ($\pm 5\%$)	CN64

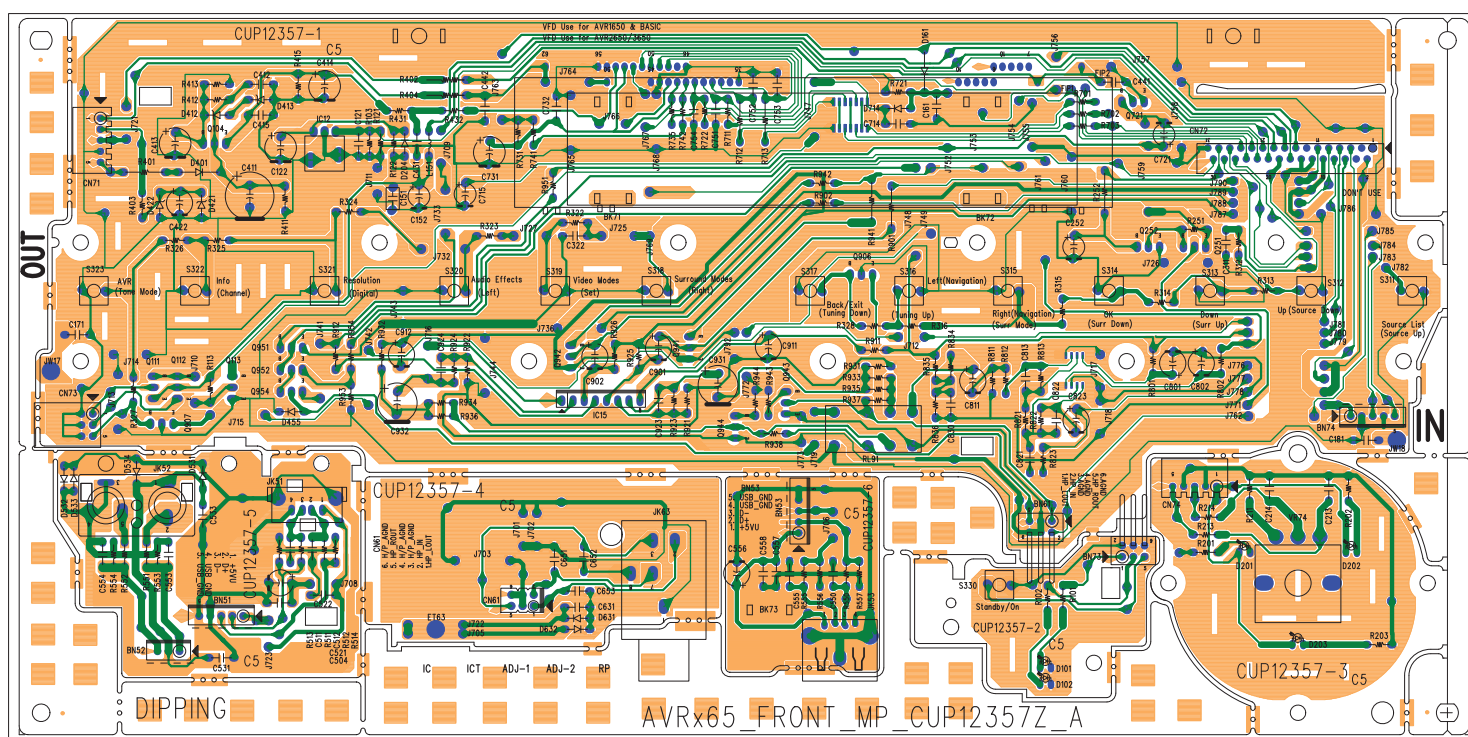




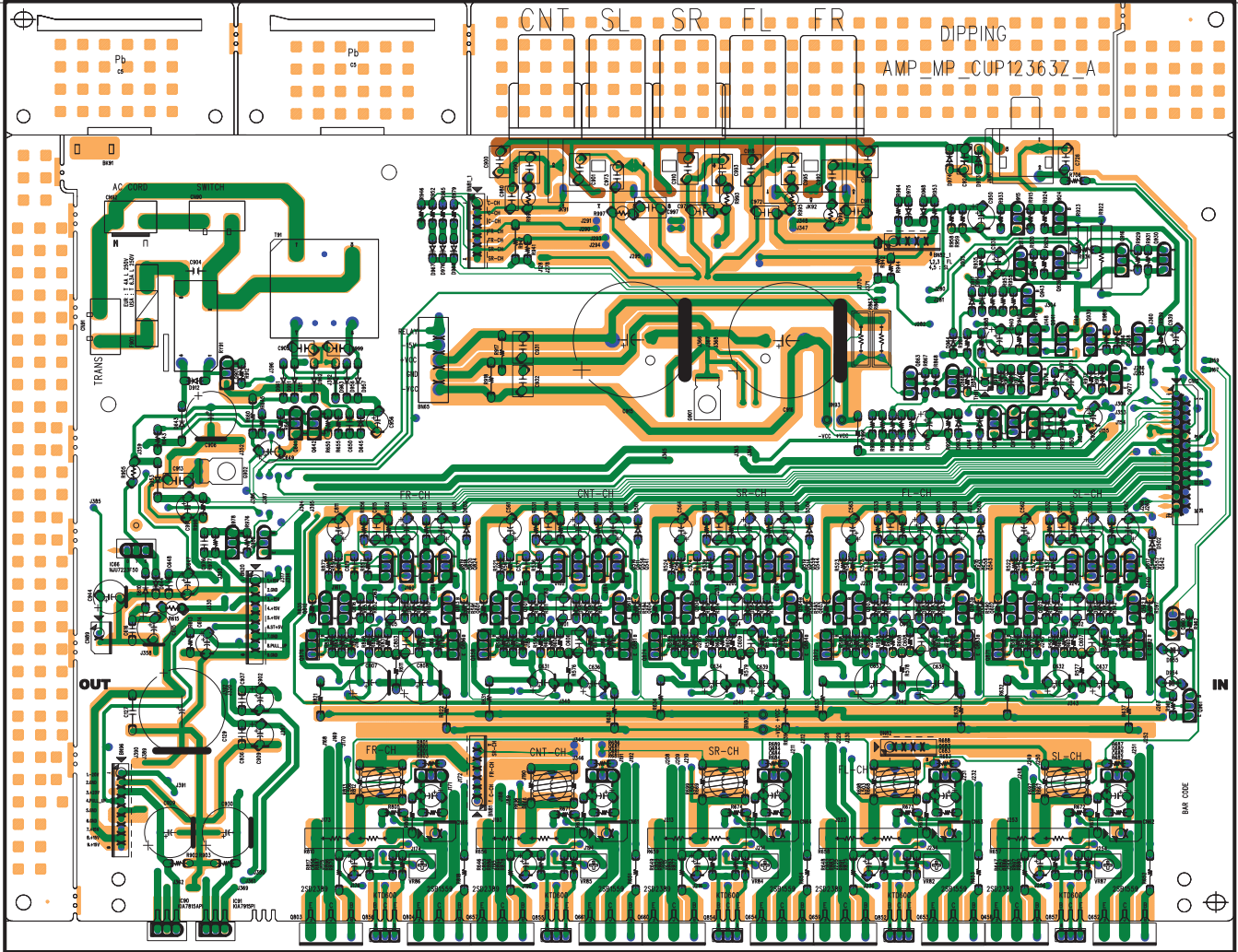


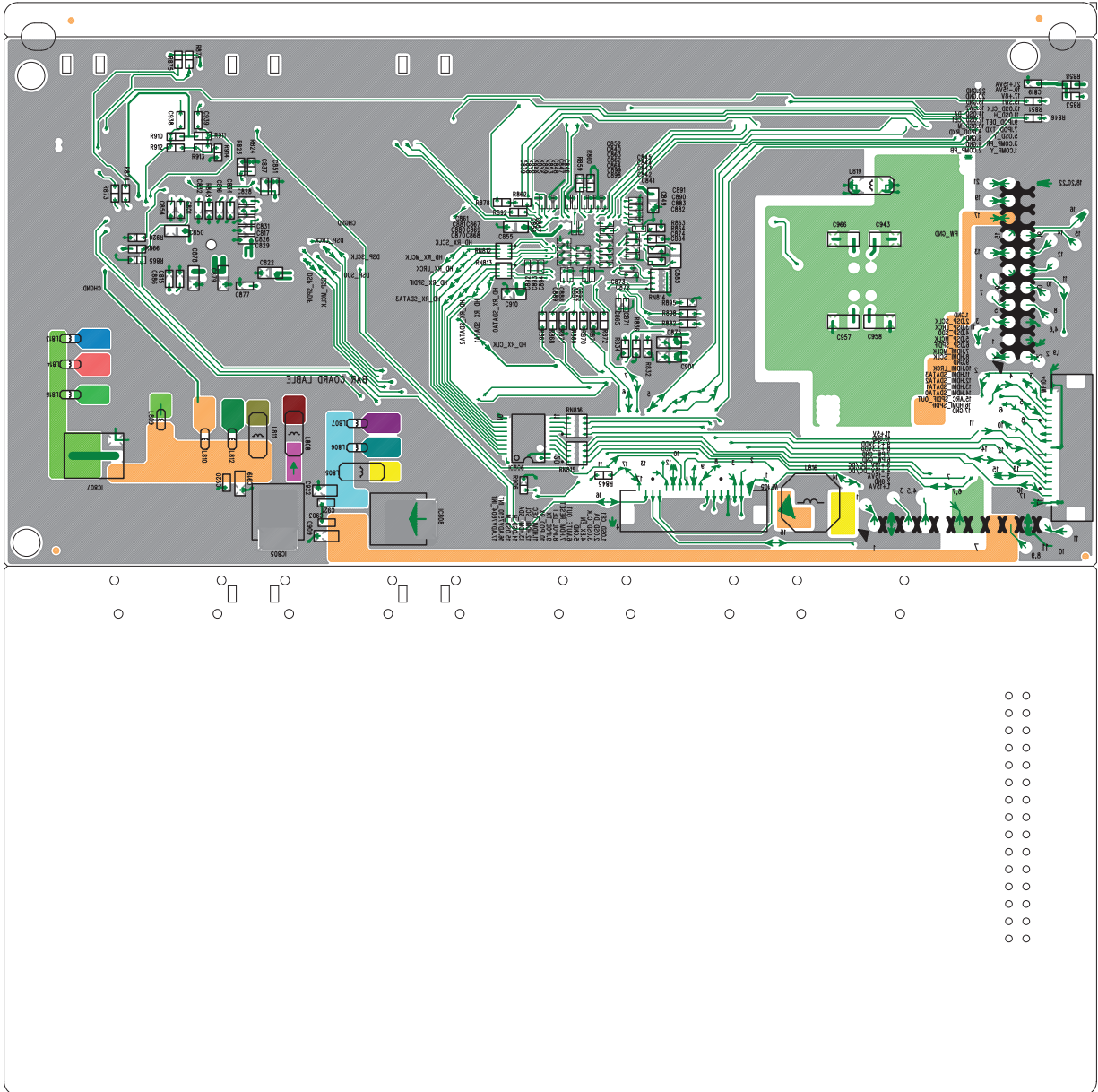


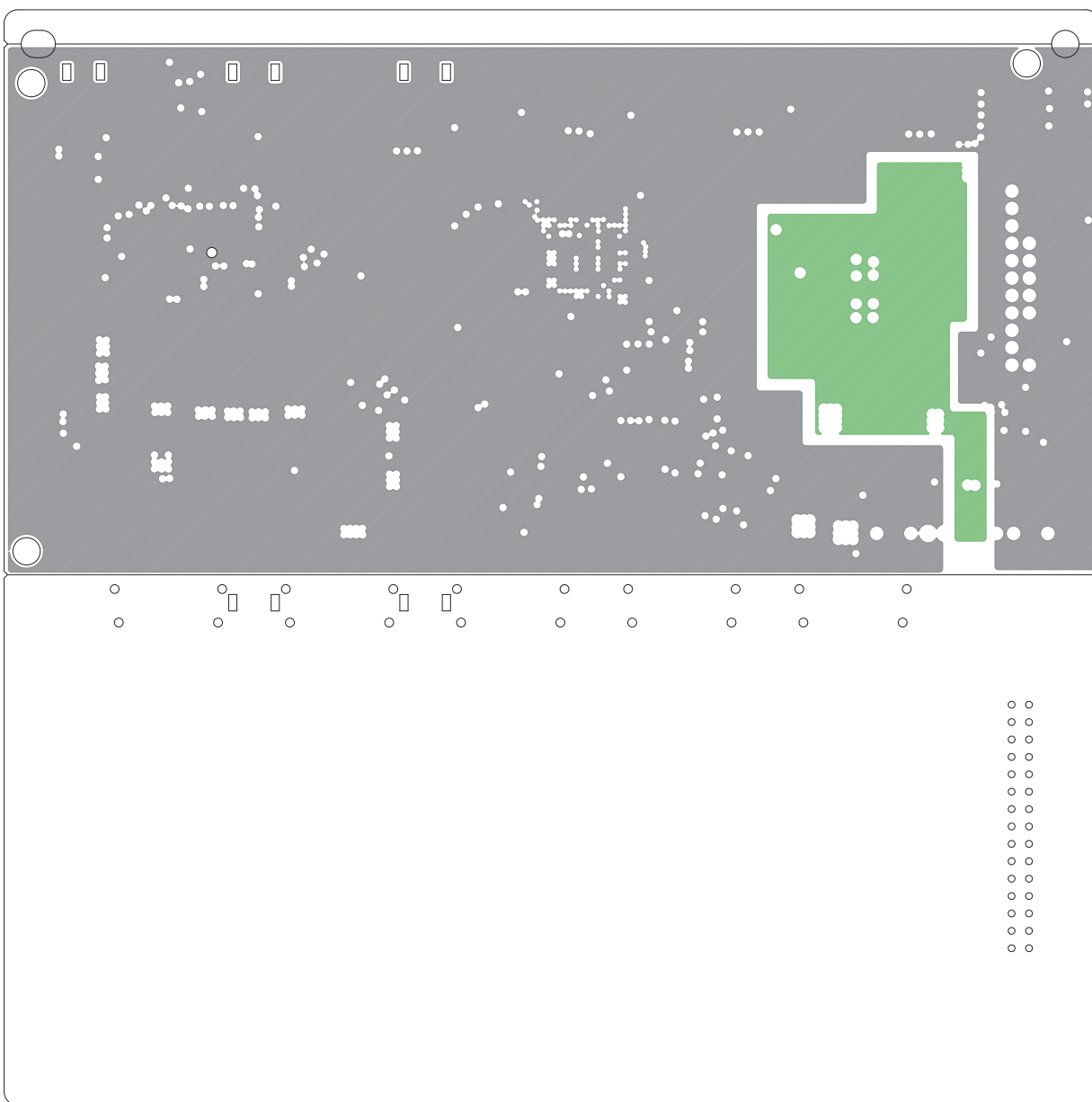


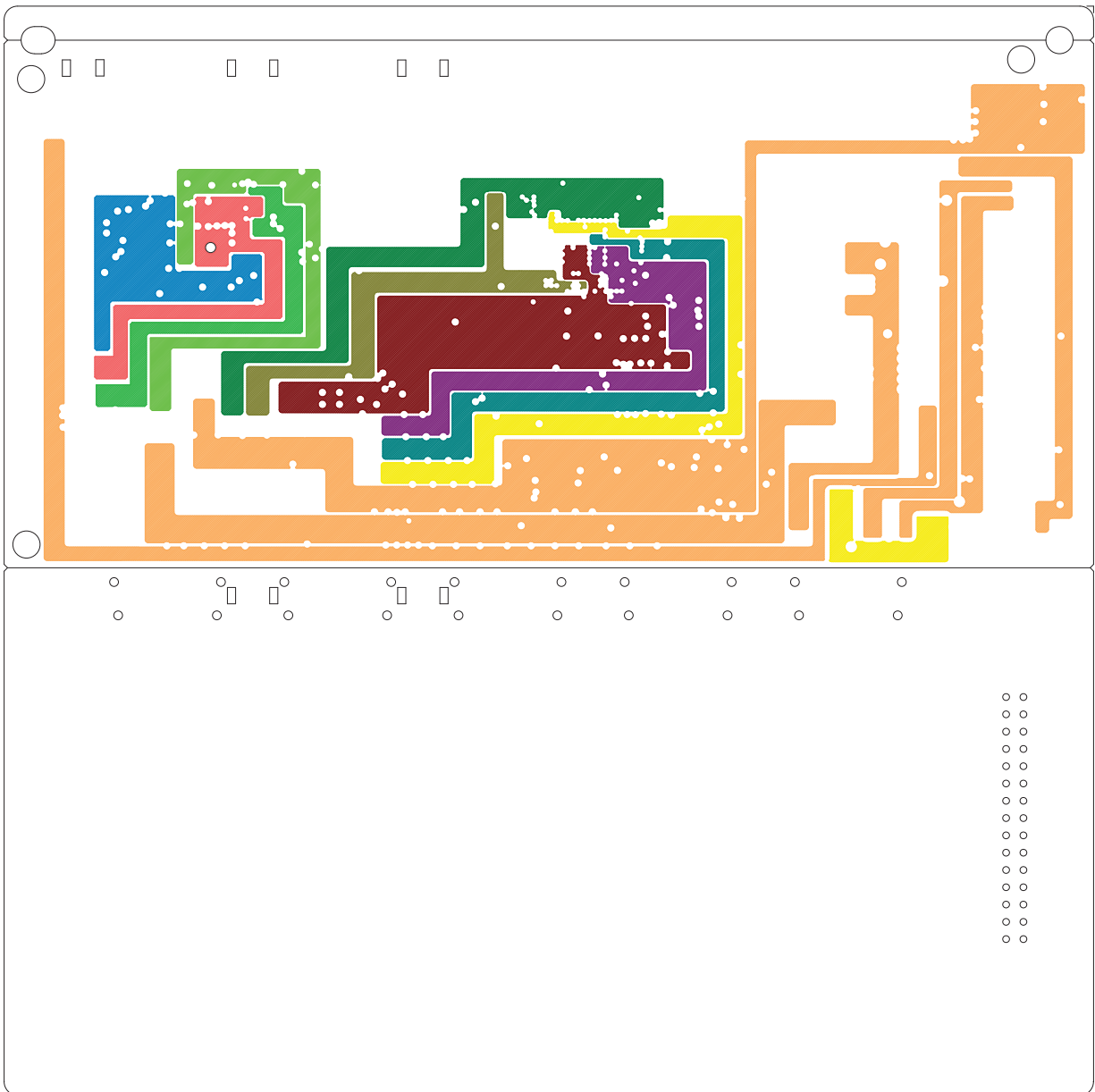












AVR 1650 ELECTRICAL PARTS LIST

Quantity of all components with a designator = 1 unless otherwise noted

Reference Designator	Part Number	Description	
FRONT PCB ASS'Y		COP12357C	
C121	CCBS1H151KBT	CAP , CERAMIC(150PF/50V)	CH UP025 B151K-A-B Z
C122	CCEA1AH331T	CAP , ELECT(10V/330uF)	KR3-10V331MB(6.3*11L)
C151	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z
C152	CCEA1CKS100T	CAP , ELECT(16V/10uF) -S	KC3-16V100MA2(4*5L)
C161	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C171	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C181	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C213	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C214	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C252	CCEA1HKS2R2T	CAP , ELECT(50V/2.2uF) -S	KC3-50V2R2MA2(4*5L)
C311	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z
C322	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z
C412	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z
C413	CCEA1JH470TS	CAP , ELECT	63V/47UF/105'C
C414	CCEA1JH470TS	CAP , ELECT	63V/47UF/105'C
C415	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z
C422	CCEA1HH4R7T	CAP , ELECT(50V/4.7uF)	KR3-50V4R7MA(5*11L)
C431	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C441	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C442	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C504	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z
C511	CCBS1H560JT	CAP , CERAMIC(56PF/50V)	CH UP025SL560J-A-B Z
C512	CCBS1H560JT	CAP , CERAMIC(56PF/50V)	CH UP025SL560J-A-B Z
C521	CCEA1AH101T	CAP , ELECT(10V/100uF)	KR3-10V101MA(5*11L)
C522	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z
C533	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C553	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z
C554	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z
C631	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C651	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C652	CCBS1H471KBT	CAP , CERAMIC(470PF/50V)	CH UP025 B471K-A-B Z
C653	CCBS1H471KBT	CAP , CERAMIC(470PF/50V)	CH UP025 B471K-A-B Z
C714	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C715	CCEA1CKS100T	CAP , ELECT(16V/10uF) -S	KC3-16V100MA2(4*5L)
C721	CCEA1HKS2R2T	CAP , ELECT(50V/2.2uF) -S	KC3-50V2R2MA2(4*5L)
C731	CCEA1AH471T	CAP , ELECT(10V/470uF)	KR3-10V471MB(6.3*11L)
C732	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C751	CCBS1C222MXT	CAP , CERAMIC(2200PF/16V)	CH EP025 B222M-A-B J
C752	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z
C753	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z
C754	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C801	CCEA1EH470T	CAP , ELECT(25V/47uF)	KR3-25V470MA(5*11L)
C802	CCEA1EH470T	CAP , ELECT(25V/47uF)	KR3-25V470MA(5*11L)
C811	CCEA1HH100T	CAP , ELECT(50V/10uF)	KR3-50V100MA(5*11L)
C813	CCBS1H470JT	CAP , CERAMIC(47PF/50V)	CH UP025SL470J-A-B Z
C821	CCBS1H471KBT	CAP , CERAMIC(470PF/50V)	CH UP025 B471K-A-B Z
C822	CCBS1H151KBT	CAP , CERAMIC(150PF/50V)	CH UP025 B151K-A-B Z
C823	CCEA1HH100T	CAP , ELECT(50V/10uF)	KR3-50V100MA(5*11L)
C830	CCBS1H473ZFT	CAP , CERAMIC(47000PF/50V)	CH UP025 F473Z-A-B J
C901	CCEA1HH100T	CAP , ELECT(50V/10uF)	KR3-50V100MA(5*11L)

Reference Designator	Part Number	Description	
FRONT PCB ASS'Y		COP12357C	
C902	CCEA1HH100T	CAP , ELECT(50V/10uF)	KR3-50V100MA(5*11L)
C911	CCEA1EH470T	CAP , ELECT(25V/47uF)	KR3-25V470MA(5*11L)
C912	CCEA1EH470T	CAP , ELECT(25V/47uF)	KR3-25V470MA(5*11L)
C923	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z
C924	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z
C931	CCEA1CH331T	CAP , ELECT(16V/330uF)	KR3-16V331MC(8*11.5L)
C932	CCEA1CH331T	CAP , ELECT(16V/330uF)	KR3-16V331MC(8*11.5L)
D161	HVD1N5819T	DIODE , SCHOTTKY	1N5819
D401	CVD1N4003ST	DIODE , RECT	1N4003
D412	CVDZJ8.2BT	DIODE , ZENER 8.2V	ZJ8.2B 1/2W
D413	HVDMTZJ27BT	DIODE , ZENER	MTZJ27B 1/2W
D421	CVDZJ6.8BT	DIODE , ZENER 6.8V	ZJ6.8B 1/2W
D422	CVDZJ6.8BT	DIODE , ZENER 6.8V	ZJ6.8B 1/2W
D455	HVD1SS133MT	DIODE	1SS133T-77
D531	HVD1SS133MT	DIODE	1SS133T-77
D532	HVD1SS133MT	DIODE	1SS133T-77
D533	HVD1SS133MT	DIODE	1SS133T-77
D534	HVD1SS133MT	DIODE	1SS133T-77
D631	HVD1SS133MT	DIODE	1SS133T-77
D632	HVD1SS133MT	DIODE	1SS133T-77
D714	C3A206	WIRE , COPPER	SN95/PB5 , 0.6
L151	HLQ02C100KT	COIL , AXAIL (10UH)	
Q104	CVTKTC1027YT	TRANSISTOR , KTC1027Y	KTC1027Y/T0-92L/KEC
Q111	HVTKRA107MT	TRANSISTOR , TO-92M	KRA107M
Q112	HVTKRC107MT	TRANSISTOR , TO-92M	KRC107M
Q113	HVTKRC107MT	TRANSISTOR , TO-92M	KRC107M
Q251	HVTKTA1271YT	TRANSISTOR	KTA1271Y
Q252	HVTKRC107MT	TRANSISTOR , TO-92M	KRC107M
Q721	HVTKRC107MT	TRANSISTOR , TO-92M	KRC107M
Q906	HVTKRA107MT	TRANSISTOR , TO-92M	KRA107M
Q907	HVTKRA107MT	TRANSISTOR , TO-92M	KRA107M
Q941	HVTKTC2874BT	TRANSISTOR , MUTE	KTC2874B
Q942	HVTKTC2874BT	TRANSISTOR , MUTE	KTC2874B
Q943	HVTKTC2874BT	TRANSISTOR , MUTE	KTC2874B
Q944	HVTKTC2874BT	TRANSISTOR , MUTE	KTC2874B
Q951	HVTKRC107MT	TRANSISTOR , TO-92M	KRC107M
Q952	HVTKRA107MT	TRANSISTOR , TO-92M	KRA107M
Q954	HVTKRC107MT	TRANSISTOR , TO-92M	KRC107M
R101	CRD20TF2200T	RES , CARBON(220 OHM, 1%)	
R102	CRD20TF6800T	RES , CARBON(680 OHM, 1%)	
R113	CRD20TJ102T	RES, CARBON(1/5W,1Kohm,J)	
R122	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)	
R201	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
R202	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
R203	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
R211	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)	
R213	CRD20TJ272T	RES, CARBON(1/5W,2.7Kohm,J)	
R214	CRD20TJ272T	RES, CARBON(1/5W,2.7Kohm,J)	
R251	CRD20TJ222T	RES, CARBON(1/5W,2.2Kohm,J)	
R252	CRD25TJ393T	RES, CARBON(1/4W,39Kohm,J)	
R312	CRD20TF1001T	RES , CARBON 1K /1/5W /F	
R313	CRD20TF1501T	RES , CARBON 1.5K /1/5W /F	
R314	CRD20TF1801T	RES , CARBON 1.8K /1/5W /F	

Reference Designator	Part Number	Description
FRONT PCB ASS'Y COP12357C		
R315	CRD20TF2701T	RES , CARBON 2.7K /1/5W/F
R316	CRD20TF3301T	RES , CARBON 3.3K /1/5W/F
R322	CRD20TF1001T	RES , CARBON 1K /1/5W /F
R323	CRD20TF1501T	RES , CARBON 1.5K /1/5W /F
R324	CRD20TF1801T	RES , CARBON 1.8K /1/5W /F
R325	CRD20TF2701T	RES , CARBON 2.7K /1/5W/F
R326	CRD20TF3301T	RES , CARBON 3.3K /1/5W/F
R327	CRD20TF5601T	RES , CARBON(5.6K/F)
R328	CRD20TF5601T	RES , CARBON(5.6K/F)
R401	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R402	CRD25TJ5R6T	RES, CARBON(1/4W, 5.6ohm, J)
R403	CRD20TJ100T	RES, CARBON(1/5W, 10ohm, J)
R404	CRD25TJ5R6T	RES, CARBON(1/4W, 5.6ohm, J)
R411	CRD20TJ104T	RES, CARBON(1/5W, 100Kohm, J)
R412	CRD20TJ122T	RES, CARBON(1/5W, 1.2Kohm, J)
R413	CRD20TJ104T	RES, CARBON(1/5W, 100Kohm, J)
R415	CRD20TJ473T	RES, CARBON(1/5W, 47Kohm, J)
R431	CRD20TJ100T	RES, CARBON(1/5W, 10ohm, J)
R432	CRD20TJ100T	RES, CARBON(1/5W, 10ohm, J)
R511	CRD20TJ100T	RES, CARBON(1/5W, 10ohm, J)
R512	CRD20TJ100T	RES, CARBON(1/5W, 10ohm, J)
R513	CRD20TJ153T	RES, CARBON(1/5W, 15Kohm, J)
R514	CRD20TJ153T	RES, CARBON(1/5W, 15Kohm, J)
R551	CRD20TJ471T	RES, CARBON(1/5W, 470ohm, J)
R552	CRD20TJ471T	RES, CARBON(1/5W, 470ohm, J)
R553	CRD20TJ104T	RES, CARBON(1/5W, 100Kohm, J)
R554	CRD20TJ104T	RES, CARBON(1/5W, 100Kohm, J)
R701	CRD20TJ102T	RES, CARBON(1/5W, 1Kohm, J)
R702	CRD20TJ102T	RES, CARBON(1/5W, 1Kohm, J)
R703	CRD20TJ102T	RES, CARBON(1/5W, 1Kohm, J)
R711	CRD20TJ470T	RES, CARBON(1/5W, 47ohm, J)
R712	CRD20TJ470T	RES, CARBON(1/5W, 47ohm, J)
R713	CRD20TJ470T	RES, CARBON(1/5W, 47ohm, J)
R721	CRD20TJ103T	RES, CARBON(1/5W, 10Kohm, J)
R722	CRD20TJ101T	RES, CARBON(1/5W, 100ohm, J)
R731	CRD20TJ100T	RES, CARBON(1/5W, 10ohm, J)
R735	CRD20TJ152T	RES, CARBON(1/5W, 1.5Kohm, J)
R741	CRD20TJ123T	RES, CARBON(1/5W, 12Kohm, J)
R742	CRD20TJ102T	RES, CARBON(1/5W, 1Kohm, J)
R801	CRD20TJ101T	RES, CARBON(1/5W, 100ohm, J)
R802	CRD20TJ101T	RES, CARBON(1/5W, 100ohm, J)
R811	CRD20TJ104T	RES, CARBON(1/5W, 100Kohm, J)
R812	CRD20TJ102T	RES, CARBON(1/5W, 1Kohm, J)
R813	CRD20TJ103T	RES, CARBON(1/5W, 10Kohm, J)
R821	CRD20TJ102T	RES, CARBON(1/5W, 1Kohm, J)
R822	CRD20TJ103T	RES, CARBON(1/5W, 10Kohm, J)
R823	CRD20TJ104T	RES, CARBON(1/5W, 100Kohm, J)
R834	CRD20TJ222T	RES, CARBON(1/5W, 2.2Kohm, J)
R835	CRD20TJ103T	RES, CARBON(1/5W, 10Kohm, J)
R836	CRD20TJ152T	RES, CARBON(1/5W, 1.5Kohm, J)
R901	CRD25TJ101T	RES, CARBON(1/4W, 100ohm, J)
R902	CRD20TJ101T	RES, CARBON(1/5W, 100ohm, J)
R911	CRD20TJ101T	RES, CARBON(1/5W, 100ohm, J)

Reference Designator	Part Number	Description
FRONT PCB ASS'Y		COP12357C
R912	CRD20TJ101T	RES, CARBON(1/5W,100ohm,J)
R921	CRD20TJ102T	RES, CARBON(1/5W,1Kohm,J)
R922	CRD20TJ102T	RES, CARBON(1/5W,1Kohm,J)
R923	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R924	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R925	CRD20TJ104T	RES, CARBON(1/5W,100Kohm,J)
R926	CRD20TJ104T	RES, CARBON(1/5W,100Kohm,J)
R931	CRD20TJ104T	RES, CARBON(1/5W,100Kohm,J)
R932	CRD20TJ104T	RES, CARBON(1/5W,100Kohm,J)
R933	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R934	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R935	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R936	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R941	CRD25TJ432T	RES, CARBON(1/4W,4.3Kohm,J)
R942	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R943	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R944	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R951	CRD20TJ102T	RES, CARBON(1/5W,1Kohm,J)
R953	CRD20TJ362T	RES, CARBON(1/5W,3.6Kohm,J)
R954	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
S311	CST1A024ZT	SW , TACT
S312	CST1A024ZT	SW , TACT
S313	CST1A024ZT	SW , TACT
S314	CST1A024ZT	SW , TACT
S315	CST1A024ZT	SW , TACT
S316	CST1A024ZT	SW , TACT
S317	CST1A024ZT	SW , TACT
S318	CST1A024ZT	SW , TACT
S319	CST1A024ZT	SW , TACT
S320	CST1A024ZT	SW , TACT
S321	CST1A024ZT	SW , TACT
S322	CST1A024ZT	SW , TACT
S323	CST1A024ZT	SW , TACT
S330	CST1A024ZT	SW , TACT
BK71	CMD1A572	BRACKET , FIP
BK72	CMD1A572	BRACKET , FIP
BN51	CWB1C005350BM00	Shield Wire ass'y
BN52	CWB1C903400BM00	SHIELD WIRE ASS'Y (2.5mm, 400mm, 3pin)
BN61	CJP06GB142ZB	PIN HEADER(6P, 2.54mm)
BN73	CJP06GB142ZB	PIN HEADER(6P, 2.54mm)
BN74	CWB1C005100BM	WIRE ASS'Y(5P, 100MM)
CN61	CJP06GA221ZB	FEMALE HEADER (6P,2.54mm) STRAIGHT TYPE FAS2851
CN71	CJP05GB03ZY	WAFER,YMAW025(2.5mm,ANGLE)
CN72	CJP27GA285ZN	WAFER,FPC 1.25mm, stright 1.25-2-NP
CN73	CJP06GB143ZB	FEMALE HEADER(6P, 2.54mm)
CN74	CJP05GB03ZY	WAFER,YMAW025(2.5mm,ANGLE)
C411	CCEA1JH101E	CAP , ELECT 100UF 63V
D101	CVD1L0345W31BOCT201V	L.E.D , WHITE CVD1L0345W31BOCT201
D102	CVD30ASOGCAA-S7	L.E.D , ORANGE T0L-30ASOGCAA-S7
D201	CVD1L0345W31BOCT201V	L.E.D , WHITE CVD1L0345W31BOCT201
D202	CVD1L0345W31BOCT201V	L.E.D , WHITE CVD1L0345W31BOCT201
D203	CVD1L0345W31BOCT201V	L.E.D , WHITE CVD1L0345W31BOCT201
FIP1	CFL162SD19GINK	V.F.D , (FUTABA, 162-SD-19GINK)162-SD-19GINK

Reference Designator	Part Number	Description
FRONT PCB ASS'Y		COP12357C
IC12	CRVKSM603TE5B	SENSOR , REMOCON
IC13	CVISN74ACT04DR	I.C, HEX INVERTERS(SOIC/D-14P)SN74ACT04DR/TEXAS
IC14	HVINJM2068MDTE1	I.C, OP AMP (JRC) NJM2068MD-TE1
IC15	HVINJM4556AL	I.C, HEADPHONE (JRC) NJM4556AL
JK51	CJJ9X006Z	JACK , USB STRAIGHT(BLACK) U250FD004BY/YUQIU
JK52	CJJ4N094Z	JACK , RCA(2P, WH/RD, NO SHIELD)RCA-251H-00A-01
JK63	CJJ2E026Z	JACK, PHONES(6.35mm,SILVER) PJ-612A-51/YUQIU
RL91	CSL4A016ZU	RELAY,BC3-12H,DC12V,2C2P BC3-12H/HANDOUK
VR74	CSR2A037Z	ENCODER
	CPE1A009	SHEET , BLIND
	CTB3+10JR	SCREW 28.000000
	CTWS3+10GR	SCREW
CN72	CWC4C4A27B250B08	CARD , CABLE (27P/1.25mm,/250mm)
	CGX1A338MBC63	CAP , VOLUME
	CGX1A392C66	ORNAMENT , AL B
	CGX3A390C66Z	SHEET , AL FRONT AVR1650
	CKC6B145S60	CABINET , TOP
	CMH1A214	HOLDER , VOLUME
	CMZ2A090	SHEET , VOLUME
	CTB3+8JFZR	SCREW 17.000000
	CTB4+6FFZR	SCREW 6.000000
	CUAAVR1650	BOTTOM CHASSIS ASS'Y
	CHD1A012ZR	SCREW , SPECIAL 2.000000
	CHD1A023R	SCREW , SPECIAL 4.000000
	CHD1A065R	SCREW , FLAT(2.6X4) 2.000000
	CHD4A012R	SCREW , SPECIAL 4.000000
	CHE170	HOLDER , PCB 2.000000
	CHG1A113	RUBBER 3.000000
	CHG1A160Z	CUSHION , RUBBER
	CHG1A373	CUSHION , FOOT AVR350 4.000000
	CHR301	CLAMPER 3.000000
	CKF5A444Z	PANEL , REAR AVR1650
	CKL1A094	FOOT , A AVR350 2.000000
	CKL1A095	FOOT , B AVR350 2.000000

INPUT PCB ASS'Y **COP12358C**

C112	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C115	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C200	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C217	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)
C218	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)
C219	CCUS1H101JA	CAP, CHIP(1608, 50V/100pF)
C227	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C228	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C229	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C230	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C293	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C300	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C301	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C302	CCUS1H683KC	CAP, CHIP(1608, 50V/0.068uF)
C303	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C304	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
C305	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C332	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C333	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C334	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C335	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C336	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C337	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C348	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C349	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C350	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C351	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C352	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C353	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C362	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)
C369	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)
C370	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)
C466	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C601	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C603	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C605	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C607	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C609	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C611	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C613	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C615	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C617	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C619	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C621	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C623	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C625	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C627	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C629	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C631	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C704	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C705	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C718	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C719	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C722	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C737	CCSNA0J220B	CAP, CHIP TANTAL(22uF/6.3V, NingXia XingRi)
C738	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C745	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C746	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C747	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C748	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C754	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C756	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C758	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C759	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C760	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C761	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C762	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C763	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C767	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
C773	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C780	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)
C781	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)
C820	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
D725	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
L704	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
R115	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)
R116	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)
R157	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R163	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R165	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R171	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R217	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R218	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R219	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R245	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R246	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R289	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R290	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R291	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R292	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R293	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R294	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R317	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)
R320	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R321	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R322	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R323	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R324	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R325	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R339	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R341	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R380	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R381	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)
R382	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)
R383	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)
R384	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)
R389	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R390	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R399	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R400	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R401	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R424	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)
R425	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)
R700	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R717	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R718	CRJ10DF1371T	RES, CHIP(1608/1%/1.37Kohm)
R719	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R720	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R725	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R727	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R735	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R745	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
R753	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R754	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R761	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)
R762	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)
R767	CRJ10DF5101T	RES, CHIP(1608/1%/5.1Kohm)
R779	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R780	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R781	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R812	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R910	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R963	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
C111	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C113	CCUS1H180JA	CAP, CHIP(1608, 50V/18pF)
C114	CCUS1H180JA	CAP, CHIP(1608, 50V/18pF)
C116	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C117	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C118	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C121	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C123	CRJ10DJ183T	RES, CHIP(1608/5%/18Kohm)
C127	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C201	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C202	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C203	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C204	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C205	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C206	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C207	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C208	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C209	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C210	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C211	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C212	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C213	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C214	CCUS1H221JA	CAP, CHIP(1608, 50V/220pF)
C236	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C237	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C260	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C277	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C278	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C279	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C291	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C308	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C309	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C310	CCUS1H822KC	CAP, CHIP(1608, 50V/8200pF)
C311	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C312	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C313	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C316	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C317	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C318	CCUS1H683KC	CAP, CHIP(1608, 50V/0.068uF)
C319	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C320	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)
C321	CCUS1H272KC	CAP, CHIP(1608, 50V/2700pF)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
C324	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C325	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C326	CCUS1H822KC	CAP, CHIP(1608, 50V/8200pF)
C327	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C328	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C329	CCUS1H391JA	CAP, CHIP(1608, 50V/390pF)
C358	CCUS1H392KC	CAP, CHIP(1608, 50V/3900pF)
C359	CCUS1H822KC	CAP, CHIP(1608, 50V/8200pF)
C363	CCUI1E103KC	CAP, CHIP(1005, 25V/0.01uF)
C364	CCUS1H392KC	CAP, CHIP(1608, 50V/3900pF)
C365	CCUS1H822KC	CAP, CHIP(1608, 50V/8200pF)
C383	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)
C384	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)
C394	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)
C455	CCUI1H101JA	CAP, CHIP(1005, 50V/100pF)
C456	CCUI1H151JA	CAP, CHIP(1005, 50V/150pF)
C457	CCUI1H101JA	CAP, CHIP(1005, 50V/100pF)
C458	CCUI1H151JA	CAP, CHIP(1005, 50V/150pF)
C459	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C460	CCUI1H272KC	CAP, CHIP(1005, 50V/2700pF)
C461	CCUI1H272KC	CAP, CHIP(1005, 50V/2700pF)
C462	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C701	CCUS1H150JA	CAP, CHIP(1608, 50V/15pF)
C702	CCUS1H150JA	CAP, CHIP(1608, 50V/15pF)
C707	CCUI1H102KC	CAP, CHIP(1005, 50V/1000pF)
C708	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C716	CCUS1H151JA	CAP, CHIP(1608, 50V/150pF)
C729	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C731	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C733	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C734	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C741	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C742	CCUS1H270JA	CAP, CHIP(1608, 50V/27pF)
C743	CCUI1C104KC	CAP, CHIP(1005, 16V/0.1uF)
C744	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)
C751	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C768	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C769	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C770	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C772	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C778	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C783	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C784	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C789	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C790	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C791	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C794	CCUS1H181JA	CAP, CHIP(1608, 50V/180pF)
C797	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C801	CCUS1H180JA	CAP, CHIP(1608, 50V/18pF)
C802	CCUS1H180JA	CAP, CHIP(1608, 50V/18pF)
C866	CCUS1H330JA	CAP, CHIP(1608, 50V/33pF)
C867	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
D201	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323

Reference Designator	Part Number	Description
INPUT PCB ASS'Y COP12358C		
D202	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D203	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D204	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D205	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D206	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D207	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D208	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D301	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D302	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
D726	HVDRB160L60TE25	DIODE, SCHOTTKY BARRIER RB160L-60TE25
D727	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
IC101	CVIR2A15218FP	I.C, INPUT WITH 8CH VOLUME(100P QFP) R2A15218FP
IC104	HVINJM2115MDTE1	IC, OP AMP NJM2115
IC105	HVINJM2115MDTE1	IC, OP AMP NJM2115
IC106	CVIANAM1615AV	I.C, DSP (CVIST25VF080B504CS2F)
IC106	CVIST25VF080B504CS2F	I.C, 8 Mbit SPI Serial Flash SST25VF080B-50-4C-S2AF
IC111	CVIAZ4580MTR-E1	I.C, OPAMP(DUAL LOW NOISE) AZ4580MTR-E1/SOIC8/BCD
IC112	CVIAZ4580MTR-E1	I.C, OPAMP(DUAL LOW NOISE) AZ4580MTR-E1/SOIC8/BCD
IC113	CVIAZ4580MTR-E1	I.C, OPAMP(DUAL LOW NOISE) AZ4580MTR-E1/SOIC8/BCD
IC122	CVIAZ4580MTR-E1	I.C, OPAMP(DUAL LOW NOISE) AZ4580MTR-E1/SOIC8/BCD
IC125	CVIAZ4580MTR-E1	I.C, OPAMP(DUAL LOW NOISE) AZ4580MTR-E1/SOIC8/BCD
IC141	CVICS497024CVZ	I.C, DSP (CIRRUS LOGIC) CS497024CVZ
IC143	HVICS42528-CQ	I.C, CODEC + DIR (CIRRUS LOGIC) CS42528-CQ
IC144	CVIM12L16161A5TG	I.C, 16MB SDRAM (ESMT)
IC145	HVITC74VHC157FT	I.C, 2-CHANNEL MUX (TOSHIBA) TC74VHC157FT
IC146	CVITC74VCX541FT	I.C, OCTAL BUS BUFFER (TOSHIBA) TC74VCX541FT
IC150	HVILM1117S-1V8	I.C, REGULATOR (1.8V) LM1117-1V8
IC151	CVIANAM1613AV	I.C, U-COM(CVIT5CN5, AVR165/BASIC)
IC151	CVIT5CN5	I.C, U-COM (512KB/32KB, LQFP100P) TOSHA
IC152	CVIM24C32WMN6TP	I.C, EEPROM (32 Kbit) ST M24C32WMN6TP
IC155	CVTUPA672T	F.E.T (NEC) UPA672
IC156	CVIKIC3201S-33	I.C, REGULATOR (3V3) KIC3201S-33(SOT-89)
IC162	CVIANAM1614AV	IC, USB U-COM(CVITMP92FD28FG, AVR165/BASIC)
IC162	CVITMP92FD28FG	I.C, USB DECODER FLASH(100PIN, QFP)TOSH TMP92FD28DFG
IC164	CVIML61C282PR	I.C, RESET (2.8V, SOT-89) ML61C282PRG
L601	CLZ9R001Z	FERRITE, CHIP BEAD(60ohm, 2012)HCB2012KF-600T40
L602	CLZ9R001Z	FERRITE, CHIP BEAD(60ohm, 2012)HCB2012KF-600T40
L702	CLZ9Z014Z	FERRITE, CHIP BEAD(60ohm, 4516)HCB4516KF-600T60/COILMASTER
L705	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
Q102	HVTKRA107S	TRANSISTOR, CHIP, SOT-23 KRA107S
Q103	HVTKRA107S	TRANSISTOR, CHIP, SOT-23 KRA107S
Q105	HVTKRA107S	TRANSISTOR, CHIP, SOT-23 KRA107S
Q301	HVTKTC812TB	TRANSISTOR, CHIP(TS6) KTC812T-B-RTK
Q303	HVTKTC812TB	TRANSISTOR, CHIP(TS6) KTC812T-B-RTK
Q304	HVTKTC812TB	TRANSISTOR, CHIP(TS6) KTC812T-B-RTK
Q306	HVTKTC812TB	TRANSISTOR, CHIP(TS6) KTC812T-B-RTK
Q307	HVTKRA107S	TRANSISTOR, CHIP, SOT-23 KRA107S
Q308	HVTKRC102S	TRANSISTOR, CHIP, SOT-23 KRC102S
Q312	HVTKRA107S	TRANSISTOR, CHIP, SOT-23 KRA107S
Q729	HVTKRC107S	TRANSISTOR, CHIP, SOT-23 KRC107S
Q730	HVTKRC107S	TRANSISTOR, CHIP, SOT-23 KRC107S

Reference Designator	Part Number	Description
INPUT PCB ASS'Y COP12358C		
Q738	CVTKRC103S	TRANSISTOR , CHIP , SOT-23 KRC103S
Q741	HVTKRC107S	TRANSISTOR , CHIP , SOT-23 KRC107S
Q742	HVTKRA107S	TRANSISTOR , CHIP , SOT-23 KRA107S
Q951	HVTKRC107S	TRANSISTOR , CHIP , SOT-23 KRC107S
Q952	HVTKRA107S	TRANSISTOR , CHIP , SOT-23 KRA107S
Q991	HVTKRC107S	TRANSISTOR , CHIP , SOT-23 KRC107S
Q992	HVTKRA107S	TRANSISTOR , CHIP , SOT-23 KRA107S
RN60	CRJ064IJ102T	RES, CHIP(1005/5%/1Kohm*2)
RN61	CRJ104DJ103T	RES , CHIP , 10K OHM, 5% , 1608 X 4
RN63	CRJ104DJ103T	RES , CHIP , 10K OHM, 5% , 1608 X 4
RN64	CRJ064IJ101T	RES, CHIP(1005/5%/100ohm*4)
RN65	CRJ064IJ101T	RES, CHIP(1005/5%/100ohm*4)
RN66	CRJ064IJ101T	RES, CHIP(1005/5%/100ohm*4)
RN67	CRJ064IJ101T	RES, CHIP(1005/5%/100ohm*4)
RN68	CRJ104DJ103T	RES , CHIP , 10K OHM, 5% , 1608 X 4
RN71	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN76	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN77	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN78	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN79	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN81	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN82	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN83	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN84	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN85	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN87	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN90	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN91	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN93	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
R110	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R111	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R113	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)
R117	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)
R118	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R120	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R131	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R132	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R141	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R142	CRJ06IJ0R0T	RES, CHIP(1005/5%/0ohm)
R149	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R150	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R151	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R152	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R156	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R158	CRJ06IJ102T	RES, CHIP(1005/5%/1Kohm)
R161	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R162	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)
R166	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R167	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R172	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R173	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R174	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R192	CRJ10DJ222T	RES, CHIP(1608/5%/2.2Kohm)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
R193	CRJ10DJ474T	RES, CHIP(1608/5%/470Kohm)
R201	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R202	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R203	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R204	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R205	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R206	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R207	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R208	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R209	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R210	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R211	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R212	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R213	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R214	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R227	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R228	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R229	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R230	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R231	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R232	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R233	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R234	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R235	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R236	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R237	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R238	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R239	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R240	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R241	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R242	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R247	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R248	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R251	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R252	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R257	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R258	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R259	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R260	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R263	CRJ10DJ184T	RES, CHIP(1608/5%/180Kohm)
R264	CRJ10DJ184T	RES, CHIP(1608/5%/180Kohm)
R269	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R270	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R274	CRJ10DJ222T	RES, CHIP(1608/5%/2.2Kohm)
R281	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R282	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R283	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R284	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R285	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R286	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R295	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R296	CRJ10DJ563T	RES, CHIP(1608/5%/56Kohm)
R300	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
R301	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R302	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R303	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R304	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R305	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R306	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R307	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R308	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R309	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R310	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R311	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R312	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R319	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R328	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R329	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R330	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R331	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R332	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R333	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R336	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R337	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R338	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)
R340	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R344	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R345	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R346	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R347	CRJ10DJ682T	RES, CHIP(1608/5%/6.8Kohm)
R350	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)
R351	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)
R352	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R353	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R354	CRJ10DJ301T	RES, CHIP(1608/5%/300ohm)
R355	CRJ10DJ273T	RES, CHIP(1608/5%/27Kohm)
R356	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R357	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R358	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R359	CRJ10DJ152T	RES, CHIP(1608/5%/1.5Kohm)
R362	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R363	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R364	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R365	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R366	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R367	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R369	CRJ10DJ301T	RES, CHIP(1608/5%/300ohm)
R370	CRJ10DJ273T	RES, CHIP(1608/5%/27Kohm)
R372	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R373	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R374	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R375	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R376	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R377	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R385	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)
R386	CRJ10DJ561T	RES, CHIP(1608/5%/560ohm)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y		COP12358C
R391	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)
R392	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)
R393	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)
R395	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)
R396	CRJ10DJ392T	RES, CHIP(1608/5%/3.9Kohm)
R408	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R410	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R411	CRJ06IJ272T	RES, CHIP(1005/5%/2.7Kohm)
R412	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R413	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)
R414	CRJ06IJ472T	RES, CHIP(1005/5%/4.7Kohm)
R415	CRJ06IJ472T	RES, CHIP(1005/5%/4.7Kohm)
R416	CRJ06IJ272T	RES, CHIP(1005/5%/2.7Kohm)
R417	CRJ06IJ472T	RES, CHIP(1005/5%/4.7Kohm)
R418	CRJ06IJ472T	RES, CHIP(1005/5%/4.7Kohm)
R419	CRJ06IJ272T	RES, CHIP(1005/5%/2.7Kohm)
R420	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)
R421	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)
R422	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)
R423	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)
R701	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R702	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R709	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R710	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R711	CRJ06IJ560T	RES, CHIP(1005/5%/56ohm)
R712	CRJ06IJ820T	RES, CHIP(1005/5%/82ohm)
R713	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R714	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R715	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R722	CRJ06IJ0R0T	RES, CHIP(1005/5%/0ohm)
R723	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R724	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)
R726	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)
R728	CRJ06IJ102T	RES, CHIP(1005/5%/1Kohm)
R729	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R730	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R732	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R734	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R736	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R737	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R738	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R739	CRJ06IJ820T	RES, CHIP(1005/5%/82ohm)
R741	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R742	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R743	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R746	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R751	CRJ06IJ820T	RES, CHIP(1005/5%/82ohm)
R752	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R755	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R756	CRJ10DJ750T	RES, CHIP(1608/5%/75ohm)
R760	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R764	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R765	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)

Reference Designator	Part Number	Description
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INPUT PCB ASS'Y COP12358C

R768	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R769	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R770	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)
R771	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R772	CRJ10DJ183T	RES, CHIP(1608/5%/18Kohm)
R773	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R774	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R775	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R776	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R777	CRJ06IJ101T	RES, CHIP(1005/5%/100ohm)
R778	CRJ06IJ221T	RES, CHIP(1005/5%/220ohm)
R782	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)
R783	CRJ10DJ272T	RES, CHIP(1608/5%/2.7Kohm)
R784	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)
R785	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
R786	CRJ10DJ471T	RES, CHIP(1608/5%/470ohm)
R787	CRJ06IJ0R0T	RES, CHIP(1005/5%/0ohm)
R789	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R790	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R791	CRJ10DJ273T	RES, CHIP(1608/5%/27Kohm)
R793	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R795	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R798	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R799	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R800	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R801	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R810	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R811	CRJ06IJ103T	RES, CHIP(1005/5%/10Kohm)
R815	CRJ06IJ330T	RES, CHIP(1005/5%/33ohm)
R816	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)
R855	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R861	CRJ10DJ100T	RES, CHIP(1608/5%/10ohm)
R932	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R960	CRJ10DJ332T	RES, CHIP(1608/5%/3.3Kohm)
R966	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)
R992	CRJ10DJ562T	RES, CHIP(1608/5%/5.6Kohm)
WF104	CJP17GA193ZY	WAFER, CARD CABLE (SMD)
WF105	CJP17GA193ZY	WAFER, CARD CABLE (SMD)
C126	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C231	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C232	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C233	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C234	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C235	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C281	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C282	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C283	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C284	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C285	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C286	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C292	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C294	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C295	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y COP12358C		
C296	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C297	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C298	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C340	CCEA1HH220T	CAP , ELECT(50V/22uF) KR3-50V220MA(5*11L)
C341	CCEA1HH220T	CAP , ELECT(50V/22uF) KR3-50V220MA(5*11L)
C342	CCEA1HH220T	CAP , ELECT(50V/22uF) KR3-50V220MA(5*11L)
C343	CCEA1HH220T	CAP , ELECT(50V/22uF) KR3-50V220MA(5*11L)
C344	CCEA1HH220T	CAP , ELECT(50V/22uF) KR3-50V220MA(5*11L)
C345	CCEA1HH220T	CAP , ELECT(50V/22uF) KR3-50V220MA(5*11L)
C361	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C371	C3A206	WIRE , COPPER SN95/PB5 , 0.6
C372	C3A206	WIRE , COPPER SN95/PB5 , 0.6
C373	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C374	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C389	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C390	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C463	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C464	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C465	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C612	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C614	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C628	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C630	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C703	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C706	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C715	CCEA1HH4R7T	CAP , ELECT(50V/4.7uF) KR3-50V4R7MA(5*11L)
C717	CCEA1HH4R7T	CAP , ELECT(50V/4.7uF) KR3-50V4R7MA(5*11L)
C720	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C721	CCEA1AH471T	CAP , ELECT(10V/470uF) KR3-10V471MB(6.3*11L)
C728	CCEA1AH471T	CAP , ELECT(10V/470uF) KR3-10V471MB(6.3*11L)
C730	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C740	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C749	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C750	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C752	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C753	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C786	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C787	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C862	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C863	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C868	CCEA1EH470T	CAP , ELECT(25V/47uF) KR3-25V470MA(5*11L)
D221	CVD1N4003ST	DIODE , RECT 1N4003
D222	CVD1N4003ST	DIODE , RECT 1N4003
J104	C3A206	WIRE , COPPER SN95/PB5 , 0.6
J105	C3A206	WIRE , COPPER SN95/PB5 , 0.6
Q311	HVTKTC2874BT	TRANSISTOR , MUTE KTC2874B
Q731	HVTKTA1267YT	TRANSISTOR KTA1267Y
Q733	HVTKTC3199YT	TRANSISTOR , KTC3199Y T0-92M
BN50	CWB1B00325058	WIRE ASS'Y (3PIN, 2.5mm, 250mm, STRAIGHT)
CN19	CJP06GA19ZY	WAFER, 20017WS(2mm, STRAIGHT)
CN20	CJP09GI237ZW	LOCK-WAFER/STRAIGHT/2.5mm
CN30	CJP08GA19ZY	WAFER, 20017WS(2mm, STRAIGHT)
CN51	CJP05GA01ZY	WAFER, YMW025(2.5mm, STRAIGHT)

Reference Designator	Part Number	Description
INPUT PCB ASS'Y COP12358C		
CN53	CJP03GA01ZY	WAFER, YMW025(2.5mm, STRAIGHT)
CN71	CJP06GB143ZB	FEMALE HEADER(6P, 2.54mm)
CN82	CJP11GI237ZW	LOCK-WAFER/STRAIGHT/2.5mm
C732	CCEA0JKR3222E	CAP , ELECT(2200uF/6.3V) JWT A2512WV0-NP
IC102	HVIKIA7808API	I.C, REGULATOR(+8V, T0220IS) KIA7808API (KEC)
IC103	CVIKIA7908PI	I.C, REGULATOR(-8V, T0220IS) KIA7908PI (KEC)
IC115	HVIKIA7812API	I.C, REGULATOR(+12V, T0220IS) KIA78XXAPI
JK11	CJJ4P019W	JACK , RCA
JK12	CJJ4P019W	JACK , RCA
JK13	CJJ4R020W	JACK , BOARD
JK74	CJJ4M044Z	JACK , BOARD GOLD PLATE
JK75	HJSTORX177L	MODULE , OPTICAL(RX) TORX177L
JK76	HJSTORX177L	MODULE , OPTICAL(RX) TORX177L
JK79	HJSTOTX177AL	MODULE , OPTICAL(TX)
L301	CLM4B001Z	COIL , MPX(FM 19KHz FILTER)
L302	CLM4B001Z	COIL , MPX(FM 19KHz FILTER)
TUN1	CNVMW004MV1S63SA	TUNER(USA) FM(SCREW : F TYPE), M(S/LAB)KST-MW004MV1-S63SA
WF101	CJP27GA285ZN	WAFER, FPC 1.25mm, stright 1.25-2-NP
WF103	CJP27GA285ZN	WAFER, FPC 1.25mm, stright 1.25-2-NP
X701	H0X24576E150TF	CRYSTAL, 24.576MHz, HC-49/S, 15pF, 30PPM 24.576MHZ
X702	H0X10000E220TF	CRYSTAL, 10.000MHz, HC-49/S, 22pF, 30PPM CL-22P
X703	C0X09000E150C	CRYSTAL, 09.000MHz, HC-49/S, 15pF, 30PPM
X708	H0X00032K120I	CRYSTAL, 32.768KHz, TUNING FORK, 12pF, 20PPM

HDMI PCB ASS'Y COP12359C

C801	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C815	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C816	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C817	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C819	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C822	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C826	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C828	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C829	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C831	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C832	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C834	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C835	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C837	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C838	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C839	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C840	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C841	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C842	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C843	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C844	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C845	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C846	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C847	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C848	CCUI1C104KC	CAP , CHIP (1005, 16V/0.1uF)
C849	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)

Reference Designator	Part Number	Description
HDMI PCB ASS'Y COP12359C		
C850	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C851	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C852	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C853	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C854	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C855	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C856	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C857	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C858	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C859	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C861	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C862	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C863	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C864	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C865	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C867	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C868	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C869	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C870	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C871	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C872	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C873	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C874	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C875	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C877	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C878	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C879	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C880	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C881	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C882	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C883	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C884	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C885	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C886	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C887	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C888	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C889	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C890	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C891	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C892	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C893	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C894	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C895	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C898	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C899	CCUI1C104KC	CAP, CHIP (1005, 16V/0.1uF)
C901	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C903	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C909	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C910	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C919	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C920	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C921	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C922	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)

Reference Designator	Part Number	Description
HDMI PCB ASS'Y COP12359C		
C938	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)
C939	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)
C943	CCUSSP1E106KC	CAP, CHIP (3216, 25V/10uF) CL31A106KAHNNNE
C957	CCUSSP1E106KC	CAP, CHIP (3216, 25V/10uF) CL31A106KAHNNNE
C958	CCUSSP1E106KC	CAP, CHIP (3216, 25V/10uF) CL31A106KAHNNNE
C966	CCUSSP1E106KC	CAP, CHIP (3216, 25V/10uF) CL31A106KAHNNNE
IC805	CVINJM2845DL118	I.C,REGULATOR(1.8V/TO-252)NJM2845DL1-18(TE1)JRC
IC806	CVITC74VCX541FT	I,C , OCTAL BUS BUFFER (TOSHIBA) TC74VCX541FT
IC807	CVIKIA1117BS18	I.C , REGULATOR(SOT-223) KIA1117
IC808	CVINJM2845DL118	I.C, REGULATOR(1.8V/TO-252)NJM2845DL1-18(TE1)JRC
L805	CLZ9Z014Z	FERRITE,CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
L806	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L807	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L808	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
L809	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L810	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L811	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
L812	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L813	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L814	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L815	CLZ9R005Z	FERRITE CHIP BEAD(1608/60ohm)HCB1608KF-600T30/COILMASTER
L816	CLQ12E100MRZ	COIL , SMD POWER (10UH/3A)CMI-SPC9H45F-SERIES
L819	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
L821	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
RN812	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN813	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN814	CRJ104DJ103T	RES , CHIP , 10K OHM, 5% , 1608 X 4
RN815	CRJ104DJ220T	RES , CHIP , 22 OHM, 5% , 1608 X 4
RN816	CRJ104DJ220T	RES , CHIP , 22 OHM, 5% , 1608 X 4
R823	CRJ10DF8201T	RES, CHIP(1608/1%/8.2Kohm)
R824	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)
R832	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)
R834	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)
R836	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)
R846	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R848	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R851	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)
R853	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R858	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R859	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)
R860	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)
R862	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R863	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R864	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R867	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R868	CRJ10DJ750T	RES, CHIP(1608/5%/75ohm)
R869	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R870	CRJ10DJ750T	RES, CHIP(1608/5%/75ohm)
R871	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R872	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R873	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R874	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R875	CRJ10DJ202T	RES, CHIP(1608/5%/2Kohm)

Reference Designator	Part Number	Description
HDMI PCB ASS'Y COP12359C		
R876	CRJ10DJ202T	RES, CHIP(1608/5%/2Kohm)
R877	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R878	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R882	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R895	CRJ10DJ510T	RES, CHIP(1608/5%/51ohm)
R898	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R910	CRJ10DF49R9T	RES, CHIP(1608/1%/49.9ohm)
R911	CRJ10DF49R9T	RES, CHIP(1608/1%/49.9ohm)
R912	CRJ10DF49R9T	RES, CHIP(1608/1%/49.9ohm)
R913	CRJ10DF49R9T	RES, CHIP(1608/1%/49.9ohm)
R914	CRJ10DF4R99T	RES, CHIP(1608/1%/4.99ohm)
R920	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
WF104	CJP17GB210ZY	WAFER, (CARD CABLE,ANGLE, SMT, 1MM,10008HR-17L(P) 10008HR-17L
WF105	CJP17GB210ZY	WAFER, (CARD CABLE,ANGLE, SMT, 1MM,10008HR-17L(P) 10008HR-17L
C802	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C803	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C804	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C806	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C807	CCUS1H510JA	CAP, CHIP(1608, 50V/51pF)
C808	CCUS1H510JA	CAP, CHIP(1608, 50V/51pF)
C809	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)
C810	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C811	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C812	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C813	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C820	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C821	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C823	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)
C824	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C827	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C833	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C836	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C860	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C866	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C876	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C896	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C897	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C900	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C902	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C908	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C911	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C912	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C913	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C914	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C915	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C916	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C917	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C918	CCUC0J106KC	CAP, CHIP(2012, 6.3V/10uF)
C932	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)
C933	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C936	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)
C937	CCUS1H102KC	CAP, CHIP(1608, 50V/1000pF)
C940	CCUYAP0J226KC	CAP, CHIP (3216, 6.3V/22uF)

Reference Designator	Part Number	Description
HDMI PCB ASS'Y COP12359C		
C941	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C942	CCUS1H473KC	CAP, CHIP(1608, 50V/0.047uF)
C944	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C945	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C947	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C948	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C950	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C951	CCUYAP0J226KC	CAP, CHIP (3216, 6.3V/22uF)
C952	CCUYAR1C226KC	CAP, CHIP (3225, 16V/22uF)
C953	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C954	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C955	CCUS1H473KC	CAP, CHIP(1608, 50V/0.047uF)
C956	CCUS1H473KC	CAP, CHIP(1608, 50V/0.047uF)
C959	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C960	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C961	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C963	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)
C964	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)
C965	CCUS1A105KC	CAP, CHIP(1608, 10V/1uF)
IC801	CVIADV7604	I.C, HDMI RX (BALL, BGA-260P)ANALOG DEVICE ADV7604
IC802	CVIADV7511KSTZ	I.C, HDMI TX (LQFP-100P) ADV7511
IC803	HVICD4094BPWR	I.C, SHIFT REGISTER CD4094BPWR(SMD)
IC804	CVINJU7754F05TE1	I.C, REGULATOR(SOT-23-5) NJU7754F05-TE1
IC812	CVITPS65251RHAR	I.C, PMU WITH 3 DC/DC CONVERTER(QFN RHA40) TPS65251RHAR
JK801	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)H050FS019G643BY
JK802	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)H050FS019G643BY
JK803	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)H050FS019G643BY
JK804	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)H050FS019G643BY
JK805	CJJ9H008Y	JACK, HDMI(TYPE-A, SMT-19P)H050FS019G643BY
L801	CLQ14E4R7MRZ	COIL, SMD POWER (4.7UH/4A)
L802	CLQ14E4R7MRZ	COIL, SMD POWER (4.7UH/4A)
L803	CLQ14E4R7MRZ	COIL, SMD POWER (4.7UH/4A)
L820	CLZ9Z014Z	FERRITE, CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
Q801	HVTKRA102S	TRANSISTOR, CHIP, SOT-23 KRA102S
Q802	HVTKRA102S	TRANSISTOR, CHIP, SOT-23 KRA102S
Q803	CVTKRC103S	TRANSISTOR, CHIP, SOT-23 KRC103S
Q804	CVTKRC103S	TRANSISTOR, CHIP, SOT-23 KRC103S
Q805	HVTKRA102S	TRANSISTOR, CHIP, SOT-23 KRA102S
Q806	CVTKRC103S	TRANSISTOR, CHIP, SOT-23 KRC103S
Q807	HVTKRA102S	TRANSISTOR, CHIP, SOT-23 KRA102S
Q808	CVTKRC103S	TRANSISTOR, CHIP, SOT-23 KRC103S
Q809	CVTKRC103S	TRANSISTOR, CHIP, SOT-23 KRC103S
RN801	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN802	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN803	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN804	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN805	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN806	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN807	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN808	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN809	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN810	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)
RN811	CRJ064IJ330T	RES, CHIP(1005/5%/33ohm*4)

Reference Designator	Part Number	Description	
HDMI PCB ASS'Y		COP12359C	
R801	CRJ10DJ223T	RES, CHIP(1608/5%/22Kohm)	
R802	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R803	CRJ10DJ223T	RES, CHIP(1608/5%/22Kohm)	
R804	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R806	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	
R807	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	
R808	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R809	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R810	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R812	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R814	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R815	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R817	CRJ10DJ223T	RES, CHIP(1608/5%/22Kohm)	
R818	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R819	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	
R822	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R827	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R828	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R829	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R830	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	
R831	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	
R833	CRJ10DJ240T	RES, CHIP(1608/5%/24ohm)	
R835	CRJ10DJ240T	RES, CHIP(1608/5%/24ohm)	
R837	CRJ10DJ240T	RES, CHIP(1608/5%/24ohm)	
R838	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	
R839	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R847	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R850	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R852	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R854	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	
R855	CRJ10DJ472T	RES, CHIP(1608/5%/4.7Kohm)	
R856	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R880	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	
R883	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	
R884	CRJ10DJ223T	RES, CHIP(1608/5%/22Kohm)	
R885	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)	
R886	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R887	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R889	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)	
R890	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R893	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R894	CRJ10DJ240T	RES, CHIP(1608/5%/24ohm)	
R896	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R897	CRJ10DJ101T	RES, CHIP(1608/5%/100ohm)	
R899	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)	
R909	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R915	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	
R916	CRJ10DJ330T	RES, CHIP(1608/5%/33ohm)	
R921	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R922	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R923	CRJ10DF4022T	RES, CHIP(1608/1%/40.2Kohm)	41101021
R924	CRJ10DF7501T	RES, CHIP(1608/1%/7.5Kohm)	
R927	CRJ10DJ154T	RES, CHIP(1608/5%/150Kohm)	

Reference Designator	Part Number	Description	
HDMI PCB ASS'Y COP12359C			
R928	CRJ10DJ203T	RES, CHIP(1608/5%/20Kohm)	1608
R929	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R930	CRJ10DF3833T	RES, CHIP(1608/1%/383Kohm)	41101021
R931	CRJ10DJ203T	RES, CHIP(1608/5%/20Kohm)	1608
R932	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)	
R933	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R934	CRJ10DF4022T	RES, CHIP(1608/1%/40.2Kohm)	
R935	CRJ10DF1272T	RES, CHIP(1608/1%/12.7Kohm)	
R936	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
R937	CRJ10DF4022T	RES, CHIP(1608/1%/40.2Kohm)	
R938	CRJ10DF4301T	RES, CHIP(1608/1%/4.3Kohm)	
R943	CRJ10DJ154T	RES, CHIP(1608/5%/150Kohm)	
R944	CRJ10DJ203T	RES, CHIP(1608/5%/20Kohm)	
R945	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)	
R946	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)	
X801	C0X28636E330S	CRYSTAL, 28.636MHz, HC-49/SMD, 33pF, 30PPM	
	CMD1A628	BRACKET, PCB	
BN18	CJP22GB143ZB	DIP, SOCKET(22PIN, 2.54mm,ANGLE)	71100171
BN82	CWB1D01110058	WIRE ASS'Y	

VIDEO PCB ASS'Y COP12360C

C137	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	
C138	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	
C144	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C145	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C146	CCUS1H330JA	CAP, CHIP(1608, 50V/33pF)	
C147	CCUS1H330JA	CAP, CHIP(1608, 50V/33pF)	
C148	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
C149	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
C150	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
C151	CCUS1H330JA	CAP, CHIP(1608, 50V/33pF)	
C152	CCUS1H220JA	CAP, CHIP(1608, 50V/22pF)	
C153	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
C154	CCUS1H680JA	CAP, CHIP(1608, 50V/68pF)	
C155	CCUS1H330JA	CAP, CHIP(1608, 50V/33pF)	
C156	CCUS1H330JA	CAP, CHIP(1608, 50V/33pF)	
C157	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C158	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)	
C159	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)	
C160	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C161	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	
C162	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C163	CCUS1H223KC	CAP, CHIP(1608, 50V/0.022uF)	
C164	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	
C165	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C166	CCUS1H472KC	CAP, CHIP(1608, 50V/4700pF)	
C169	CCUS1H104KC	CAP, CHIP(1608, 50V/0.1uF)	
C170	CCUS1H103KC	CAP, CHIP(1608, 50V/0.01uF)	
D501	CVD1SS355T	DIODE, SMD, SWITCHING	1SS355/SOD-323
D702	CVD1SS355T	DIODE, SMD, SWITCHING	1SS355/SOD-323
D703	CVD1SS355T	DIODE, SMD, SWITCHING	1SS355/SOD-323
D704	CVD1SS355T	DIODE, SMD, SWITCHING	1SS355/SOD-323

Reference Designator	Part Number	Description
VIDEO PCB ASS'Y COP12360C		
D705	CVD1SS355T	DIODE, SMD, SWITCHING 1SS355/SOD-323
IC902	HVILC74763M	I.C , OSD LC74763M
IC904	CVISN74ACT04DR	I.C , HEX INVERTERS(SOIC/D-14P) SN74ACT04DR/TEXAS
IC905	CVIKIA1117BS50	I.C , REGULATOR(SOT-223) KIA1117BS50
IC906	CVIAZ4580MTR-E1	I.C , OPAMP(DUAL LOW NOISE)AZ4580MTR-E1/SOIC8/BCD
IC907	CVITL072CDR	I.C , OP AMP/SOP/8P (TI) TL072CDR
IC908	HVINJM2244MTE1	I.C , VIDEO SWITCH NJM2244 QRW-6500
IC909	HVINJM2244MTE1	I.C , VIDEO SWITCH NJM2244 QRW-6500
IC910	HVINJM2244MTE1	I.C , VIDEO SWITCH NJM2244 QRW-6500
L803	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm,4516)HCB4516KF-600T60/COILMASTER
Q904	HVTKRA102S	TRANSISTOR , CHIP , SOT-23 KRA102S
Q905	HVTKRC102S	TRANSISTOR , CHIP , SOT-23 KRC102S
Q906	HVTKRA107S	TRANSISTOR , CHIP , SOT-23 KRA107S
R523	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R524	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R525	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R526	CRJ10DJ221T	RES, CHIP(1608/5%/220ohm)
R527	CRJ10DJ470T	RES, CHIP(1608/5%/47ohm)
R528	CRJ10DJ102T	RES, CHIP(1608/5%/1Kohm)
R529	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R530	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R531	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R533	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R534	CRJ10DJ103T	RES, CHIP(1608/5%/10Kohm)
R536	CRJ10DJ473T	RES, CHIP(1608/5%/47Kohm)
R537	CRJ10DJ680T	RES, CHIP(1608/5%/68ohm)
R539	CRJ10DJ474T	RES, CHIP(1608/5%/470Kohm)
R540	CRJ10DJ474T	RES, CHIP(1608/5%/470Kohm)
R541	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm) 10K /1/10W/F
R543	CRJ10DJ680T	RES, CHIP(1608/5%/68ohm)
R544	CRJ10DF1002T	RES, CHIP(1608/1%/10Kohm) 10K /1/10W/F
R545	CRJ10DJ220T	RES, CHIP(1608/5%/22ohm)
R546	CRJ10DF4992T	RES, CHIP(1608/1%/49.9Kohm)
R547	CRJ10DF5101T	RES, CHIP(1608/1%/5.1Kohm)
R550	CRJ10DJ680T	RES, CHIP(1608/5%/68ohm)
R551	CRJ10DJ220T	RES, CHIP(1608/5%/22ohm)
R552	CRJ10DF5101T	RES, CHIP(1608/1%/5.1Kohm)
R553	CRJ10DJ220T	RES, CHIP(1608/5%/22ohm)
R554	CRJ10DJ220T	RES, CHIP(1608/5%/22ohm)
R555	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)
R556	CRJ10DF4992T	RES, CHIP(1608/1%/49.9Kohm)
R557	CRJ10DF4992T	RES, CHIP(1608/1%/49.9Kohm)
R559	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R560	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R561	CRJ10DF4992T	RES, CHIP(1608/1%/49.9Kohm)
R562	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R563	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R564	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)
R565	CRJ10DF4992T	RES, CHIP(1608/1%/49.9Kohm)
R566	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)
R567	CRJ10DJ271T	RES, CHIP(1608/5%/270ohm)
R568	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R569	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)

Reference Designator	Part Number	Description
VIDEO PCB ASS'Y COP12360C		
R570	CRJ10DJ4R7T	RES, CHIP(1608/5%/4.7ohm)
R571	CRJ10DJ0R0T	RES, CHIP(1608/5%/0ohm)
R573	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R574	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R575	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R576	CRJ10DF4992T	RES, CHIP(1608/1%/49.9Kohm)
R577	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R578	CRJ10DF1001T	RES, CHIP(1608/1%/1Kohm)
R580	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R581	CRJ10DJ105T	RES, CHIP(1608/5%/1Mohm)
R582	CRJ10DJ104T	RES, CHIP(1608/5%/100Kohm)
C101	CCBS1H270JT	CAP, CERAMIC(27PF/50V) CH UP025SL270J-A-B Z
C102	CCBS1H223ZFT	CAP, CERAMIC(22000PF/50V)CH UP025 F223Z-A-B J
C103	CCBS1H270JT	CAP, CERAMIC(27PF/50V) CH UP025SL270J-A-B Z
C104	CCEA1HH1R0T	CAP, ELECT(50V/1uF) KR3-50V010MA(5*11L)
C105	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C106	CCBS1H330JT	CAP, CERAMIC(33PF/50V) CH UP025SL330J-A-B Z
C108	CCEA1HH1R0T	CAP, ELECT(50V/1uF) KR3-50V010MA(5*11L)
C109	CCBS1H560JT	CAP, CERAMIC(56PF/50V) CH UP025SL560J-A-B Z
C110	CCBS1H223ZFT	CAP, CERAMIC(22000PF/50V)CH UP025 F223Z-A-B J
C111	HCQI1H682JZT	CAP, MYLAR 6800PF 50V J
C113	CCEA1HH0R1T	CAP, ELECT(50V/0.1uF) KR3-50VR10MA(5*11L)
C114	CCEA1HHR47T	CAP, ELECT(50V/0.47uF) KR3-50VR47MA(5*11L)
C115	CCEA1AH471T	CAP, ELECT(10V/470uF) KR3-10V471MB(6.3*11L)
C116	CCBS1H181KBT	CAP, CERAMIC(180PF/50V) CH UP025 B181K-A-B Z
C117	CCEA1AH471T	CAP, ELECT(10V/470uF) KR3-10V471MB(6.3*11L)
C118	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C119	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C120	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C121	CCBS1H223ZFT	CAP, CERAMIC(22000PF/50V) CH UP025 F223Z-A-B J
C122	CCEA1CH221T	CAP, ELECT(16V/220uF) KR3-16V221MB(6.3*11L)
C126	CCEA1AH471T	CAP, ELECT(10V/470uF) KR3-10V471MB(6.3*11L)
C127	CCEA1AH471T	CAP, ELECT(10V/470uF) KR3-10V471MB(6.3*11L)
C128	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C129	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C130	CCEA1EH221T	CAP, ELECT(25V/220uF) KR3-25V221MC(8*11.5L)
C131	CCEA1CH471T	CAP, ELECT(16V/470uF) KR3-16V471MC(8*11.5L)
C132	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C133	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C134	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C135	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C136	CCBS1H220JCT	CAP, CERAMIC(22PF/50V) CH UP025CH220J-A-B Z
C139	CCBS1H220JCT	CAP, CERAMIC(22PF/50V) CH UP025CH220J-A-B Z
C141	CCBS1H151KBT	CAP, CERAMIC(150PF/50V) CH UP025 B151K-A-B Z
C142	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C143	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C167	CCEA1HH100T	CAP, ELECT(50V/10uF) KR3-50V100MA(5*11L)
C168	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
C171	CCEA1CH101T	CAP, ELECT(16V/100uF) KR3-16V101MA(5*11L)
D701	CVD1SS133MT	DIODE, SWITCHING 1SS133
L801	CLQ03D5R6KT	COIL, PEAKING(RADIAL) AL35RD5R6K
L802	HLQ02C101JT	COIL, AXIAL 100UH, J
Q901	HVTKTA1266YT	TRANSISTOR KTA1266YT

Reference Designator	Part Number	Description
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VIDEO PCB ASS'Y COP12360C

Q902	HVTKTA1267YT	TRANSISTOR KTA1267Y
Q903	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
R501	CRD20TJ104T	RES, CARBON(1/5W,100Kohm, J)
R502	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R503	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R504	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm, J)
R505	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R506	CRD20TJ682T	RES, CARBON(1/5W,6.8Kohm, J)
R507	CRD20TJ271T	RES, CARBON(1/5W,270ohm, J)
R508	CRD20TJ103T	RES, CARBON(1/5W,10Kohm, J)
R509	CRD20TJ393T	RES, CARBON(1/5W,39Kohm, J)
R510	CRD20TJ222T	RES, CARBON(1/5W,2.2Kohm, J)
R511	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R512	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R513	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R514	C3A206	WIRE , COPPER
R515	CRD20TJ223T	RES, CARBON(1/5W,22Kohm, J)
R516	CRD20TJ822T	RES, CARBON(1/5W,8.2Kohm, J)
R517	CRD20TJ104T	RES, CARBON(1/5W,100Kohm, J)
R518	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm, J)
R519	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R520	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R521	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
	CMD1A569	BRACKET , PCB 2.000000
BN51	CJP03GJ243ZW	LOCK-WAFER/ANGLE/2.5mm A2512WR0-3P
CN41	CJP22GB142ZB	PIN HEADER (22P,2.54mm) , ANGLE TYPE
IC901	BVIKP1010B	IC, PHOTO COUPLER (COSMO) KP1010B
JK91	CJJ2D008Z	JACK, STEREO (BLK MOLD) PJ-308-02/YUQIU
JK92	CJJ2D008Z	JACK, STEREO (BLK MOLD) PJ-308-02/YUQIU
JK93	CJJ2D008Z	JACK, STEREO (BLK MOLD) PJ-308-02/YUQIU
JK94	CJP06GB142ZB	PIN HEADER(6P, 2.54mm)
JK95	CJJ4P064Z	JACK , 4P GOLD(GN/YL, BD/BD, SHIELD PLATE) RCA-401DAG-34
JK96	CJJ4P074Z	JACK , RCA(4P, GOLD PLATE (Y/Y/Y/Y)41100861
JK97	CJJ9L016Z	JACK , IPOD CONNECTOR (36PIN) SCSI36P
X701	HOX14318E220C	CRYSTAL (14.318MHZ)

MAIN PCB ASS'Y COP12363C

C127	CCBS1H104ZFT	CAP , CERAMIC 0.1UF 50V Z
C501	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C502	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C503	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C504	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C506	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)
C507	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)
C508	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)
C509	CCKT1H331KB	CAP, CERAMIC(50V/330pF/K)
C561	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C562	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C563	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C564	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C566	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)

Reference Designator	Part Number	Description
MAIN PCB ASS'Y		COP12363C
C567	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C568	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C569	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C571	CCBS1H681KBT	CAP , CERAMIC(680PF/50V) CH UP025 B681K-A-B Z
C572	CCBS1H681KBT	CAP , CERAMIC(680PF/50V) CH UP025 B681K-A-B Z
C573	CCBS1H681KBT	CAP , CERAMIC(680PF/50V) CH UP025 B681K-A-B Z
C574	CCBS1H681KBT	CAP , CERAMIC(680PF/50V) CH UP025 B681K-A-B Z
C601	CCCT1H120JC	CAP , CERAMIC 12PF 50V J
C602	CCCT1H120JC	CAP , CERAMIC 12PF 50V J
C603	CCCT1H120JC	CAP , CERAMIC 12PF 50V J
C604	CCCT1H120JC	CAP , CERAMIC 12PF 50V J
C606	CCCT1H330JC	CAP , CERAMIC 33PF 50V J
C607	CCCT1H330JC	CAP , CERAMIC 33PF 50V J
C608	CCCT1H330JC	CAP , CERAMIC 33PF 50V J
C609	CCCT1H330JC	CAP , CERAMIC 33PF 50V J
C614	CCEA1HH4R7T	CAP , ELECT(50V/4.7uF) KR3-50V4R7MA(5*11L)
C615	CCEA1EH331T	CAP , ELECT(25V/330uF) KR3-25V331MC(8*11.5L)
C616	CCBS1H104ZFT	CAP , CERAMIC 0.1UF 50V Z
C631	CCEA1JH470TS	CAP , ELECT 63V/47UF/105'C
C632	CCEA1JH470TS	CAP , ELECT 63V/47UF/105'C
C634	CCEA1JH470TS	CAP , ELECT 63V/47UF/105'C
C636	CCEA1JH470TS	CAP , ELECT 63V/47UF/105'C
C637	CCEA1JH470TS	CAP , ELECT 63V/47UF/105'C
C639	CCEA1JH470TS	CAP , ELECT 63V/47UF/105'C
C647	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C648	CCBS1H104ZFT	CAP , CERAMIC 0.1UF 50V Z
C649	CCEA1HHR15T	CAP , ELECT(50V/0.15uF) 0.15UF 50V
C650	CCBS1H104ZFT	CAP , CERAMIC 0.1UF 50V Z
C681	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C682	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C683	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C684	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C726	CCKT1H221KB	CAP , CERAMIC(50V/220pF/K)
C801	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C803	CCCT1H330JC	CAP , CERAMIC 33PF 50V J
C805	CCCT1H120JC	CAP , CERAMIC 12PF 50V J
C811	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C813	CCEA1CH101T	CAP , ELECT(16V/100uF) KR3-16V101MA(5*11L)
C815	CCKT1H331KB	CAP , CERAMIC(50V/330pF/K)
C817	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C819	CCBS1H681KBT	CAP , CERAMIC(680PF/50V) CH UP025 B681K-A-B Z
C852	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C854	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C855	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C856	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C857	CCEA1HH100T	CAP , ELECT(50V/10uF) KR3-50V100MA(5*11L)
C900	HCQI1H473JZT	CAP , MYLAR 0.047UF 50V J
C901	HCQI1H473JZT	CAP , MYLAR 0.047UF 50V J
C902	CCEA1EH101T	CAP , ELECT(25V/100uF) KR3-25V101MB(6.3*11L)
C905	CCFT1H223ZF	CAP , CERAMIC 0.022UF 50V Z
C909	CCEA1EH101T	CAP , ELECT(25V/100uF) KR3-25V101MB(6.3*11L)
C910	HCQI1H473JZT	CAP , MYLAR 0.047UF 50V J
C913	CCFT1H104ZF	CAP , SEMICONDUCTOR 0.1UF 50V Z

Reference Designator	Part Number	Description	
MAIN PCB ASS'Y		COP12363C	
C917	CCEA1HH470T	CAP , ELECT(50V/47uF)	KR3-50V470MB(6.3*11L)
C918	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C919	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C924	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z
C925	CCEA1HKS2R2T	CAP , ELECT(50V/2.2uF)-S	KC3-50V2R2MA2(4*5L)
C927	CCKT1H102KB	CAP , CERAMIC(50V/1000pF/K)	
C931	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C932	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C936	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C937	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J
C939	CCEA1HH4R7T	CAP , ELECT(50V/4.7uF)	KR3-50V4R7MA(5*11L)
C940	CCEA1AH471T	CAP , ELECT(10V/470uF)	KR3-10V471MB(6.3*11L)
C956	CCEA1HH2R2T	CAP , ELECT(50V/2.2uF)	KR3-50V2R2MA(5*11L)
C971	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J
C972	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J
C973	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J
C975	CCEA1CH220T	CAP , ELECT(16V/22uF)	KR3-16V220MA(5*11L)
C976	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z
C980	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J
C981	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J
C990	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C991	CCEA1HH1R0T	CAP , ELECT(50V/1uF)	KR3-50V010MA(5*11L)
C992	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C993	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C995	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C997	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J
C999	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z
D501	CVD1SS133MT	DIODE , SWITCHING	1SS133
D502	CVD1SS133MT	DIODE , SWITCHING	1SS133
D503	CVD1SS133MT	DIODE , SWITCHING	1SS133
D504	CVD1SS133MT	DIODE , SWITCHING	1SS133
D581	CVD1SS133MT	DIODE , SWITCHING	1SS133
D582	CVD1SS133MT	DIODE , SWITCHING	1SS133
D583	CVD1SS133MT	DIODE , SWITCHING	1SS133
D584	CVD1SS133MT	DIODE , SWITCHING	1SS133
D610	CVD1N4003ST	DIODE , RECT	1N4003
D643	CVD1SS133MT	DIODE , SWITCHING	1SS133
D644	CVD1SS133MT	DIODE , SWITCHING	1SS133
D645	CVDZJ4.3BT	DIODE , ZENER 4.3V	ZJ4.3B 1/2W
D801	CVD1SS133MT	DIODE , SWITCHING	1SS133
D802	CVD1SS133MT	DIODE , SWITCHING	1SS133
D803	CVD1SS133MT	DIODE , SWITCHING	1SS133
D901	HVD1N5819T	DIODE , SCHOTTKY	1N5819
D903	CVD1SS133MT	DIODE , SWITCHING	1SS133
D912	CVD1SS133MT	DIODE , SWITCHING	1SS133
D914	C3A206	WIRE , COPPER	SN95/PB5 , 0.6
D917	CVD1SS133MT	DIODE , SWITCHING	1SS133
D953	CVD1SS133MT	DIODE , SWITCHING	1SS133
D954	CVD1N4003SRT	DIODE , RECT	1N4003
D955	CVD1N4003SRT	DIODE , RECT	1N4003
D956	CVD1N4003ST	DIODE , RECT	1N4003
D957	CVD1N4003ST	DIODE , RECT	1N4003
D961	HVD1N5819T	DIODE , SCHOTTKY	1N5819

Reference Designator	Part Number	Description
MAIN PCB ASS'Y COP12363C		
D962	CVD1N4003ST	DIODE , RECT 1N4003
D963	CVD1N4003ST	DIODE , RECT 1N4003
D973	CVD1SS133MT	DIODE , SWITCHING 1SS133
D974	CVD1SS133MT	DIODE , SWITCHING 1SS133
D977	C3A206	WIRE , COPPER SN95/PB5 , 0.6
F901	KJCF5S	HOLDER , FUSE
G901	HJT1A025	PLATE , EARTH MET37-0002
G902	HJT1A025	PLATE , EARTH MET37-0002
Q501	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q502	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q503	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q504	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q511	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q512	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q513	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q514	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q516	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q517	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q518	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q519	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q541	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q542	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q543	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q544	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q556	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q557	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q558	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q559	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q561	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q562	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q563	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q564	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q601	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q602	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q603	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q604	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q641	HVTKRC102MT	TRANSISTOR , TO-92M KRC102M
Q642	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
Q681	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
Q682	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
Q683	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
Q684	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
Q801	HVTKTC3199YT	TRANSISTOR , KTC3199Y TO-92M
Q812	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q813	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q816	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q818	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q819	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q820	CVT2SC2240BL	TRANSISTOR , 2SC2240BL (NPN, TO-92, LOW NOISE, TOSH
Q824	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q863	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q868	HVTKTA1268GRT	TRANSISTOR KTA1268GR
Q901	HVTKTC3199YT	TRANSISTOR , KTC3199Y

Reference Designator	Part Number	Description
MAIN PCB ASS'Y		COP12363C
Q911	HVTKTA1267YT	TRANSISTOR KTA1267Y
Q912	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q913	HVTKTC3198YT	TRANSISTOR KTC3198Y
Q938	HVTKRA107MT	TRANSISTOR , TO-92M KRA107M
Q939	HVTKRA107MT	TRANSISTOR , TO-92M KRA107M
Q941	HVTKTC3199YT	TRANSISTOR , KTC3199Y/TO-92M
Q942	HVTKTC3199YT	TRANSISTOR , KTC3199Y/TO-92M
Q943	HVTKTC3199YT	TRANSISTOR , KTC3199Y/TO-92M
Q960	HVTKRC107MT	TRANSISTOR , TO-92M KRC107M
Q961	HVTKTA1024YT	TRANSISTOR , KTA1024Y/TO-92L
Q976	HVTKTC3199YT	TRANSISTOR , KTC3199Y/TO-92M
Q977	HVTKTC3199YT	TRANSISTOR , KTC3199Y/TO-92M
Q978	HVTKTA1267YT	TRANSISTOR KTA1267Y
Q988	HVTKRC107MT	TRANSISTOR , TO-92M KRC107M
R501	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)
R502	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)
R504	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)
R505	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)
R506	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R507	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R508	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R509	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R511	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R512	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R513	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R514	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R516	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R517	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R518	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R519	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R521	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)
R522	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)
R523	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)
R524	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)
R531	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R532	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R533	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R534	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R536	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R537	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R538	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R539	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R541	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)
R542	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)
R543	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)
R544	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)
R556	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R557	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R558	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R559	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R561	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R562	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R563	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)

Reference Designator	Part Number	Description
MAIN PCB ASS'Y		COP12363C
R564	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R566	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R567	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R568	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R569	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R571	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R572	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R573	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R574	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R576	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)
R577	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)
R578	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)
R579	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)
R581	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R582	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R583	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R584	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R586	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R587	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R588	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R589	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R591	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R592	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R593	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R594	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R596	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R597	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R598	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R599	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R601	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R602	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R603	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R604	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R606	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R607	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R608	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R609	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R611	CRD20TJ100T	RES, CARBON(1/5W,10ohm,J)
R613	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R615	CRG2SANJ121RT	RES, M-OXIDE FILM(2W/120ohm)
R631	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R632	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R633	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R634	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R636	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R637	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R638	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R639	CRD25FJ180T	RES, CARBON (18 OHM) NONFLAMMABLE
R643	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R644	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R645	CRD20TJ102T	RES, CARBON(1/5W,1Kohm,J)
R646	CRD25FJ3R3T	RES, CARBON 3.3 OHM 1/4W J
R647	CRD25FJ3R3T	RES, CARBON 3.3 OHM 1/4W J

Reference Designator	Part Number	Description
MAIN PCB ASS'Y		COP12363C
R648	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R649	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R650	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R651	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R652	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R653	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R654	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R655	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R660	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R666	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R667	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R668	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R669	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R671	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R672	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R673	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R674	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R676	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)
R677	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)
R678	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)
R679	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)
R681	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)
R682	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)
R683	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)
R684	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)
R686	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R687	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R688	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R689	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R696	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R697	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R698	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R699	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R706	C3A206	WIRE , COPPER
R771	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R772	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R773	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R774	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R776	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R781	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R782	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R783	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R784	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R786	CRD20TJ750T	RES, CARBON(1/5W,75ohm,J)
R801	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R803	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm,J)
R805	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R808	CRD25TJ182T	RES, CARBON(1/4W,1.8Kohm,J)
R812	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R813	CRD25TJ470T	RES, CARBON(1/4W,47ohm,J)
R817	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R818	CRD25FJ3R3T	RES , CARBON 3.3 OHM 1/4W J
R821	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE

Reference Designator	Part Number	Description
MAIN PCB ASS'Y		COP12363C
R822	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE
R830	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R831	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)
R834	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R835	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R836	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R837	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R842	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R843	CRD20TJ561T	RES, CARBON(1/5W,560ohm,J)
R848	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R850	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R852	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R853	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R856	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R857	CRD20TJ221T	RES, CARBON(1/5W,220ohm,J)
R860	CRD20TJ271T	RES, CARBON(1/5W,270ohm,J)
R862	CRD20TJ273T	RES, CARBON(1/5W,27Kohm,J)
R866	C3A206	WIRE , COPPER
R867	CRD20TJ1R0T	RES, CARBON(1/5W,1ohm,J)
R868	CRD20TJ162T	RES, CARBON(1/5W,1.6Kohm,J)
R870	CRD20TJ433T	RES, CARBON(1/5W,43Kohm,J)
R872	CRD20TJ471T	RES, CARBON(1/5W,470ohm,J)
R875	CRD20TJ331T	RES, CARBON(1/5W,330ohm,J)
R877	CRD20TJ331T	RES, CARBON(1/5W,330ohm,J)
R878	CRD20TJ331T	RES, CARBON(1/5W,330ohm,J)
R879	CRD20TJ331T	RES, CARBON(1/5W,330ohm,J)
R880	CRD20TJ331T	RES, CARBON(1/5W,330ohm,J)
R882	CRD20TJ564T	RES, CARBON(1/5W,560Kohm,J)
R883	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)
R885	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)
R886	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)
R887	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)
R888	CRD20TJ122T	RES, CARBON(1/5W,1.2Kohm,J)
R891	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)
R893	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)
R894	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)
R896	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)
R897	CRD20TJ391T	RES, CARBON(1/5W,390ohm,J)
R901	CRD20TJ272T	RES, CARBON(1/5W,2.7Kohm,J)
R902	CRD20TJ153T	RES, CARBON(1/5W,15Kohm,J)
R903	CRD20TJ153T	RES, CARBON(1/5W,15Kohm,J)
R905	CRG1SANJ1R0RT	RES, M-OXIDE FILM(1W/1ohm)
R908	CRD20TJ153T	RES, CARBON(1/5W,15Kohm,J)
R909	CRD20TJ153T	RES, CARBON(1/5W,15Kohm,J)
R912	CRD20TJ332T	RES, CARBON(1/5W,3.3Kohm,J)
R917	CRD25TJ393T	RES, CARBON(1/4W,39Kohm,J)
R918	CRD25TJ393T	RES, CARBON(1/4W,39Kohm,J)
R925	CRD20TJ103T	RES, CARBON(1/5W,10Kohm,J)
R927	CRD20TJ104T	RES, CARBON(1/5W,100Kohm,J)
R928	CRD20TJ333T	RES, CARBON(1/5W,33Kohm,J)
R939	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm,J)
R940	CRD20TJ152T	RES, CARBON(1/5W,1.5Kohm,J)
R941	CRD20TJ223T	RES, CARBON(1/5W,22Kohm,J)

Reference Designator	Part Number	Description
MAIN PCB ASS'Y COP12363C		
R942	CRD25TJ223T	RES, CARBON(1/4W,22Kohm, J)
R944	CRD20TJ223T	RES, CARBON(1/5W,22Kohm, J)
R946	CRD20TJ223T	RES, CARBON(1/5W,22Kohm, J)
R947	CRD20TJ223T	RES, CARBON(1/5W,22Kohm, J)
R955	CRD20TJ223T	RES, CARBON(1/5W,22Kohm, J)
R956	CRD20TJ274T	RES, CARBON(1/5W,270Kohm, J)
R957	CRD20TJ153T	RES, CARBON(1/5W,15Kohm, J)
R961	CRD20TJ331T	RES, CARBON(1/5W,330ohm, J)
R962	CRD20TJ273T	RES, CARBON(1/5W,27Kohm, J)
R971	C3A206	WIRE , COPPER
R972	CRD20TJ153T	RES, CARBON(1/5W,15Kohm, J)
R973	CRD20TJ392T	RES, CARBON(1/5W,3.9Kohm, J)
R974	CRD20TJ473T	RES, CARBON(1/5W,47Kohm, J)
R975	CRD20TJ563T	RES, CARBON(1/5W,56Kohm, J)
R976	CRD20TJ103T	RES, CARBON(1/5W,10Kohm, J)
R977	CRD20TJ472T	RES, CARBON(1/5W,4.7Kohm, J)
R986	CRD20TJ102T	RES, CARBON(1/5W,1Kohm, J)
R987	CRD20TJ561T	RES, CARBON(1/5W,560ohm, J)
R988	CRD20TJ562T	RES, CARBON(1/5W,5.6Kohm, J)
R989	CRD20TJ302T	RES, CARBON(1/5W,3Kohm, J)
R990	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)
R991	CRD20TJ822T	RES, CARBON(1/5W,8.2Kohm, J)
R993	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)
R995	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)
R997	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)
R998	CRD20TJ103T	RES, CARBON(1/5W,10Kohm, J)
R999	CRG1SANJ100RT	RES, M-OXIDE FILM(1W/10ohm)
VR82	CVN12A221B03T	RES , SEMI FIXED (220 OHM) NVZ6TLTAB221/HOKURIKU
VR84	CVN12A221B03T	RES , SEMI FIXED (220 OHM) NVZ6TLTAB221/HOKURIKU
VR85	CVN12A221B03T	RES , SEMI FIXED (220 OHM) NVZ6TLTAB221/HOKURIKU
VR86	CVN12A221B03T	RES , SEMI FIXED (220 OHM) NVZ6TLTAB221/HOKURIKU
VR87	CVN12A221B03T	RES , SEMI FIXED (220 OHM) NVZ6TLTAB221/HOKURIKU
	CMYAVR1650	HEAT SINK ASS'Y
	CHD1A012R	SCREW , SPECIAL
	CHD4A012R	SCREW , SPECIAL
	CMD1A417	BRACKET , PCB AG-D8900
	CMD1A674	BRACKET , H/S
	CMY2A321	HEAT SINK AVR1650
	CTB3+8JR	SCREW
	CTW3+8JR	SCREW CF1 S 2.000000
IC90	CVIKIA7815APIUPF	I.C,VOL-REG(15V TO-220IS-4)KIA7815API-U/PF KEC
IC91	CVIKIA7915PI	I.C , REGULATOR(15V, TO-220AB) KIA7915PI
Q652	CVT2SB1559P43M	TRANSISTOR Power, 2SB1559, MT-100(T03P) w MICA M43
Q653	CVT2SB1559P43M	TRANSISTOR Power, 2SB1559, MT-100(T03P) w MICA M43
Q654	CVT2SB1559P43M	TRANSISTOR Power, 2SB1559, MT-100(T03P) w MICA M43
Q657	CVT2SD2389P43M	TRANSISTOR Power, 2SD2389, MT-100(T03P) w MICA M43
Q658	CVT2SD2389P43M	TRANSISTOR Power, 2SD2389, MT-100(T03P) w MICA M43
Q659	CVT2SD2389P43M	TRANSISTOR Power, 2SD2389, MT-100(T03P) w MICA M43
Q660	CVT2SD2389P43M	TRANSISTOR Power, 2SD2389, MT-100(T03P) w MICA M43
Q661	CVT2SB1559P43M	TRANSISTOR Power, 2SB1559, MT-100(T03P) w MICA M43
Q803	CVT2SD2389P43M	TRANSISTOR Power, 2SD2389, MT-100(T03P) w MICA M43
Q804	CVT2SB1559P43M	TRANSISTOR Power, 2SB1559, MT-100(T03P) w MICA M43
Q852	HVTKTD600KGR	TRANSISTOR , BIAS KTD600KGR

Reference Designator	Part Number	Description
MAIN PCB ASS'Y		COP12363C
Q854	HVTKTD600KGR	TRANSISTOR , BIAS KTD600KGR
Q855	HVTKTD600KGR	TRANSISTOR , BIAS KTD600KGR
Q856	HVTKTD600KGR	TRANSISTOR , BIAS KTD600KGR
Q857	HVTKTD600KGR	TRANSISTOR , BIAS KTD600KGR
BK91	CMD1A387	BRACKET , PCB
BN20	CWB1D00912058	WIRE ASS'Y (LOCKING TYPE, 2.5MM,9PIN, 120MM)
BN65	CWB3F005220UZ	WIRE ASS'Y (3.96mm, 5P, 220mm) 3.96MM,5P,220MM
BN81	CWB1D00718088	WIRE ASS'Y (2.5MM, 180MM, 7PIN, DUAL-DIPPING TYPE)
BN82	CWB1D00518088	WIRE ASS'Y (2.5MM,180MM,5PIN,DUAL-DIPPING TYPE)
BN91	CWB1F002120ZZ	WIRE ASS'Y(#18,2P,120mm, 3.96mm Dual-dipping type)
BN96	CWB1D00915058	WIRE ASS'Y (LOCKING TYPE, 2.5MM, 9PIN, 150MM)
CN12	CJP27GA285ZN	WAFER,FPC 1.25mm,stright 1.25-2-NP
CN61	CJP02GA01ZY	WAFER,YMW025(2.5mm,STRAIGHT)
CN62	CJP02GA01ZY	WAFER,YMW025(2.5mm,STRAIGHT)
CN63	CJP02GA01ZY	WAFER,YMW025(2.5mm,STRAIGHT)
CN64	CJP02GA01ZY	WAFER,YMW025(2.5mm,STRAIGHT)
CN66	CJP02GA01ZY	WAFER,YMW025(2.5mm,STRAIGHT)
CN90	CJP02GA89ZY	WAFER, YW396-NNAB(7.92mm)
CN91	CJP02GA89ZY	WAFER, YW396-NNAB(7.92mm)
CN92	CJP02KA060ZY	WAFER
C129	CCEA1EH103E	CAP, ELECT(25V/10000uF)22x30 KR3-025V103MM300
C633	CCEA1JH221E	CAP , ELECT 220UF 63V
C638	CCEA1JH221E	CAP , ELECT 220UF 63V
C807	CCEA1JH221E	CAP , ELECT 220UF 63V
C808	CCEA1JH221E	CAP , ELECT 220UF 63V
C904	KCKDKS472ME	CAP , CERAMIC(X1/Y2/SC) 0.0047UF/2.5KV
C906	CCEA1VH102E	CAP , ELECT(35V/1000uF) KR3-35V102MG(12.5*20L)
C915	CCET63VKL5822NK	CAP , ELECT 8200/63V (30*50)
C916	CCET63VKL5822NK	CAP , ELECT 8200/63V (30*50)
C929	CCEA1VH222EZ	CAP, ELECT (2200UF/35V,12.5X31)KR3-35V222MH1-L/C4.0
C930	CCEA1VH222EZ	CAP, ELECT (2200UF/35V,12.5X31)KR3-35V222MH1-L/C4.0
IC66	CVINJU7223F50	I.C , REGULATOR(5V, TO-220F) NJU7223F50
JK90	CJJ4M070Z	JACK , 1P(PURPLE) , GOLD PLATE RCA-107BAG-01
JK91	CJJ5R006Z	TERMINAL , SPEAKER
JK92	CJJ5P020Z	TERMINAL , SPEAKER
L501	CLEY0R5KAK	COIL , SPEAKER(0.5uH) SPRING COIL 8TS/KSE
L502	CLEY0R5KAK	COIL , SPEAKER(0.5uH) SPRING COIL 8TS/KSE
L503	CLEY0R5KAK	COIL , SPEAKER(0.5uH) SPRING COIL 8TS/KSE
L504	CLEY0R5KAK	COIL , SPEAKER(0.5uH) SPRING COIL 8TS/KSE
L506	CLEY0R5KAK	COIL , SPEAKER(0.5uH) SPRING COIL 8TS/KSE
Q858	HVTKTA1360Y	TRANSISTOR , PRE DRIVE KTA1360Y
Q871	HVTKTA1360Y	TRANSISTOR , PRE DRIVE KTA1360Y
Q872	HVTKTA1360Y	TRANSISTOR , PRE DRIVE KTA1360Y
Q874	HVTKTA1360Y	TRANSISTOR , PRE DRIVE KTA1360Y
Q876	HVTKTA1360Y	TRANSISTOR , PRE DRIVE KTA1360Y
Q881	HVTKTC3423Y	TRANSISTOR , PRE DRIVE KTC3423Y
Q882	HVTKTC3423Y	TRANSISTOR , PRE DRIVE KTC3423Y
Q883	HVTKTC3423Y	TRANSISTOR , PRE DRIVE KTC3423Y
Q884	HVTKTC3423Y	TRANSISTOR , PRE DRIVE KTC3423Y
Q886	HVTKTC3423Y	TRANSISTOR , PRE DRIVE KTC3423Y
RY91	CSL1C005ZE	RELAY (DC 5V, 1C1P) HL3-1A-5SH
R656	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)
R657	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)

Reference Designator	Part Number	Description
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MAIN PCB ASS'Y COP12363C

R658	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)
R659	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)
R810	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)
R863	CRF5EKR10HS	RES , CEMENT (SMALL SIZE)
R864	CRF5EKR10HS	RES , CEMENT (SMALL SIZE)
TH91	KRTP42T7D330B	THERMAL SENSOR , POSISTOR P42T7D330BW20
T91	CLT5I025ZU	TRANS, SUB (AVR156X/1650/2650/3650)

POWER PCB ASS'Y COP12394C

C104	HCQI1H103JZT	CAP , MYLAR	0.01UF	50V	J
C105	HCQI1H103JZT	CAP , MYLAR	0.01UF	50V	J
C106	HCQI1H104JZT	CAP , MYLAR	0.1UF	50V	J
C107	HCQI1H103JZT	CAP , MYLAR	0.01UF	50V	J
C108	HCQI1H103JZT	CAP , MYLAR	0.01UF	50V	J
C109	HCQI1H104JZT	CAP , MYLAR	0.1UF	50V	J
C132	CCFT1H473ZF	CAP , CERAMIC	0.047UF	50V	Z
C133	CCFT1H473ZF	CAP , CERAMIC	0.047UF	50V	Z
C134	CCFT1H473ZF	CAP , CERAMIC	0.047UF	50V	Z
C921	KCME2E104JP04T	CAP , M-FILM(250V/0.1uF)			
C922	CCME2A104JXT	CAP,METAL-FILM(100V/0.1uF)			HMFS104J2AP050T
C923	CCME2A104JXT	CAP,METAL-FILM(100V/0.1uF)			HMFS104J2AP050T
C924	HCQI1H473JZT	CAP , MYLAR	0.047UF	50V	J
C925	HCQI1H473JZT	CAP , MYLAR	0.047UF	50V	J
D114	CVD1N4003ST	DIODE , RECT	1N4003		
D115	CVD1N4003ST	DIODE , RECT	1N4003		
D116	CVD1N4003ST	DIODE , RECT	1N4003		
D117	CVD1N4003ST	DIODE , RECT	1N4003		
D124	CVD1N4003ST	DIODE , RECT	1N4003		
D125	CVD1N4003ST	DIODE , RECT	1N4003		
D921	CVD1N4003ST	DIODE , RECT	1N4003		
F110	KBA2D3150A2EYT	FUSE(382 Series, 250V, 3.15A)	382	250V/3.15	
F111	KBA2D3150A2EYT	FUSE(382 Series, 250V, 3.15A)	382	250V/3.15	
R902	CRD25TJ680T	RES, CARBON(1/4W,68ohm,J)			
R904	C3A206	WIRE , COPPER			
CN20	CJP05GA90ZY	WAFER , 5P(DIP, 3.96PITCH)			
CN96	CJP09GI237ZW	LOCK-WAFER/STRAIGHT/2.5mm			
C135	CCEA1EH472E	CAP , ELECT(25V/4700uF)	KR3-25V472MR	(16*31.5L)	
D104	HVDUF5404H	DIODE , ULTRA FAST (DELTA)			
D105	HVDUF5404H	DIODE , ULTRA FAST (DELTA)			
D991	CVDGBJ1006BIA	DIODE HEAT SINK ASS'Y (CMY2A138)			
	CMY2A138	HEAT SINK			
	CTB3+8JR	SCREW			
D991	HVDGBJ1006	DIODE , BRIDGE(10A/600V)			
RY22	CSL4A018ZE	RELAY	HL1-2C-12H	12V	2C2P
R104	CRQ1AJR47H	RES , FUSE			
R105	CRQ1AJR47H	RES , FUSE			
	CTB3+6FFZR	SCREW	CF1 S	10.000000	
	CTB3+8JFZR	SCREW	CF1 S	24.000000	
	CTS3+8JFZR	SCREW	CF1 S	4.000000	
	CTW3+12JR	SCREW	CF1 S	2.000000	
	CTW3+8JR	SCREW			
	CUA3A294	CHASSIS , BOTTOM			SECC 1.0T

Reference Designator	Part Number	Description
POWER PCB ASS'Y COP12394C		
BN90	CSH1A015ZA	SWITCH , MOMS WIRE ASS'Y (2P, 80MM, RED)
	CSH1A015Z	SWITCH , MOMS(OR-L-11G-BB) OR-L-11G-BB
	CWB4F202080UK	WIRE ASS'Y (3.96MM, 80MM, 2P, RED)
CN92	CWZPM5003TW91A	2P WIRE ASS'Y(100MM)
RT01	CJJ8A006ZW	RECEPTACLE , AC(15A/250V,R-301,B21) R-301(B21)
TW91	CWZPM5003TW91	2P WIRE ASS'Y(100MM)
F901	KBA2C6300TLEY	FUSE(218 Series, 250V, 6.3A)
T901	CLT5U047ZU	TRANS , POWER(AVR1650)
WF103	CWC4C4A27B100B10	CARD,CABLE (27p,1.25mm Pitch,100mm Length,Protec
WF104	CWC4F2A17A080A10	CARD,CABLE (17P/1.00mm/80mm , A TYPE)
WF105	CWC4F2A17A080A10	CARD , CABLE (17P/1.00mm/80mm , A TYPE)
	CHE154	CLAMPER , ARM

MISCELLANEOUS/MECHANICAL

CGB1A234Z	BADGE , AVR1650	
CGL1A222	INDICATOR , VOLUME	
CGR5A437	COVER , JACK B	
CGU1A318Y	ORNAMENT , VOLUME AVR255	
CGU2A410A25L	WINDOW , FIP	
CGWAVR1650	FRONT PANEL ASS'Y	
CBT2A1064	KNOB , STANDBY	
CBT2A1065	KNOB , BACK	
CGB3A158Z	BADGE , HARMAN/KARDON (FRONT)	
CGL1A265Y	INDICATOR , POWER	
CGW6A447RHSB24	PANEL , FRONT AVR1650	
CMC1A372	PLATE , SHIELD	
CMC1A416	PLATE , EARTH TOP	
CMC2A326	PLATE , EARTH AVR350	
CMC3A338	PLATE , EARTH	2.000000
CMD2A443	BRACKET , SIDE	2.000000
CMH1A297	HOLDER , USB	
CMH2A215	HOLDER , LED	
CMX1A291ZB24	SHEET , COVER	
CMZ1A127	FILTER , FIP 55	

TOSHIBATMP92CD28

CMOS 32-Bit Microcontrollers
TMP92CD28FG / TMP92CD28DFG

1. Outline and Device Characteristics

The TMP92CD28 is a high-speed advanced 32-bit Microcontroller developed for controlling equipment which processes mass data.

The TMP92CD28 has a high-performance CPU (900/H1 CPU) and various built-in I/Os.

The TMP92CD28FG and TMP92CD28DFG are housed in a 100-pin flat package.

Device characteristics are as follows:

- (1) CPU: 32-bit CPU (900/H1 CPU)
 - Compatible with 900/L1 instruction code
 - 16 Mbytes of linear address space
 - General-purpose register and register banks
 - Micro DMA: 8 channels (250 ns/4 bytes at $f_{SYS} = 20$ MHz, best case)
- (2) Minimum instruction execution time: 50 ns (at $f_{SYS} = 20$ MHz)
- (3) Internal memory
 - Internal RAM: 32-Kbytes
 - Internal ROM: 512-Kbytes

TOSHIBA**TMP92CD28**

- (4) External memory expansion
 - Expandable up to 16 Mbytes (Shared program/data area)
 - Can simultaneously support 8- or 16-bit width external data bus
 - Dynamic data bus sizing
 - Separate bus system
- (5) Memory controller
 - Chip select output: 3 channels
- (6) 8-bit timers: 6 channels
- (7) 16-bit timers: 2 channels
- (8) General-purpose serial interface: 2 channels
 - UART/synchronous mode: 2 channels (channel 0 , and 1)
 - IrDA ver.1.0 (115 kbps) mode selectable: 2 channels (channel 0 and 1)
- (9) Serial bus interface: 2 channels
 - I²C bus mode
 - Clock synchronous mode (only channel 1)
- (10) SPI controller : 1 channel
 - Supported up to SPI mode of SD card and MMC card
 - Built-in FIFO buffer of 32 bytes to each Input/Output
- (11) High Speed serial interface : 1 channel
 - Built-in FIFO buffer of 32 bytes to each Input/Output
- (12) USB Host Controller : 1channel
 - Universal Serial Bus Specification Rev2.0
 - Open HCI for USB Release 1.0a
 - 12Mbps – Full speed support. (Isochronous Transfer is not supported.)
- (13) Watchdog timer
- (14) Timer for real-time clock (RTC)
- (15) Key-on wake up (only for HALT release):4 channels
- (16) Program patch logic: 8 banks
- (17) Interrupts: 47interrupts
 - 9 CPU interrupts: Software interrupt instruction and illegal instruction
 - 34 internal interrupts: Seven selectable priority levels
 - 4 external interrupts (INT0 to INT3): Seven selectable priority levels
(INT0 to INT3 selectable edge or level interrupt)
- (18) Input/output ports: 70pins
- (19) Standby function
 - Three HALT modes: IDLE2 (Programmable), IDLE1, STOP
 - Power cut mode (Built-in power supply management circuits (PMC) for leak current provision.)
- (20) Clock controller
 - Built-in two blocks of clock doubler (PLL). PLL supplies 48 MHz for USB and 36 MHz for CPU from 9MHz
 - Clock gear function: Select high-frequency clock f_c to $f_c/16$
 - Special timer for CLOCK ($f_s = 32.768$ kHz)

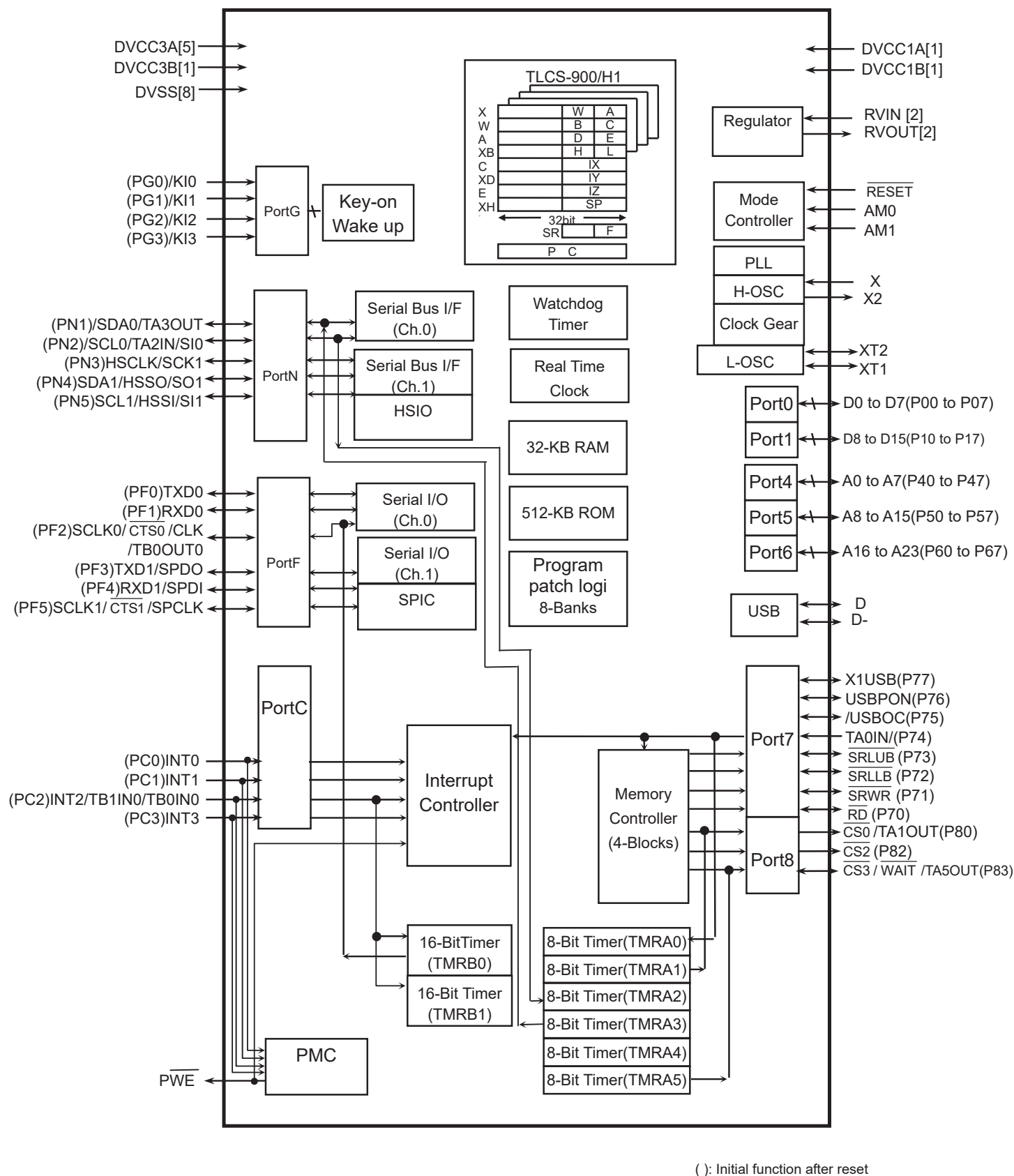
TOSHIBA**TMP92CD28**

Figure 1.1 TMP92CD28 Block Diagram

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TMP92CD28

2. Pin Assignment and Functions

The assignment of input/output pins for the TMP92CD28, their names and functions are as follows:

2.1 Pin Assignment Diagram

Figure 2.1.1 shows the pin assignment of the TMP92CD28FG.

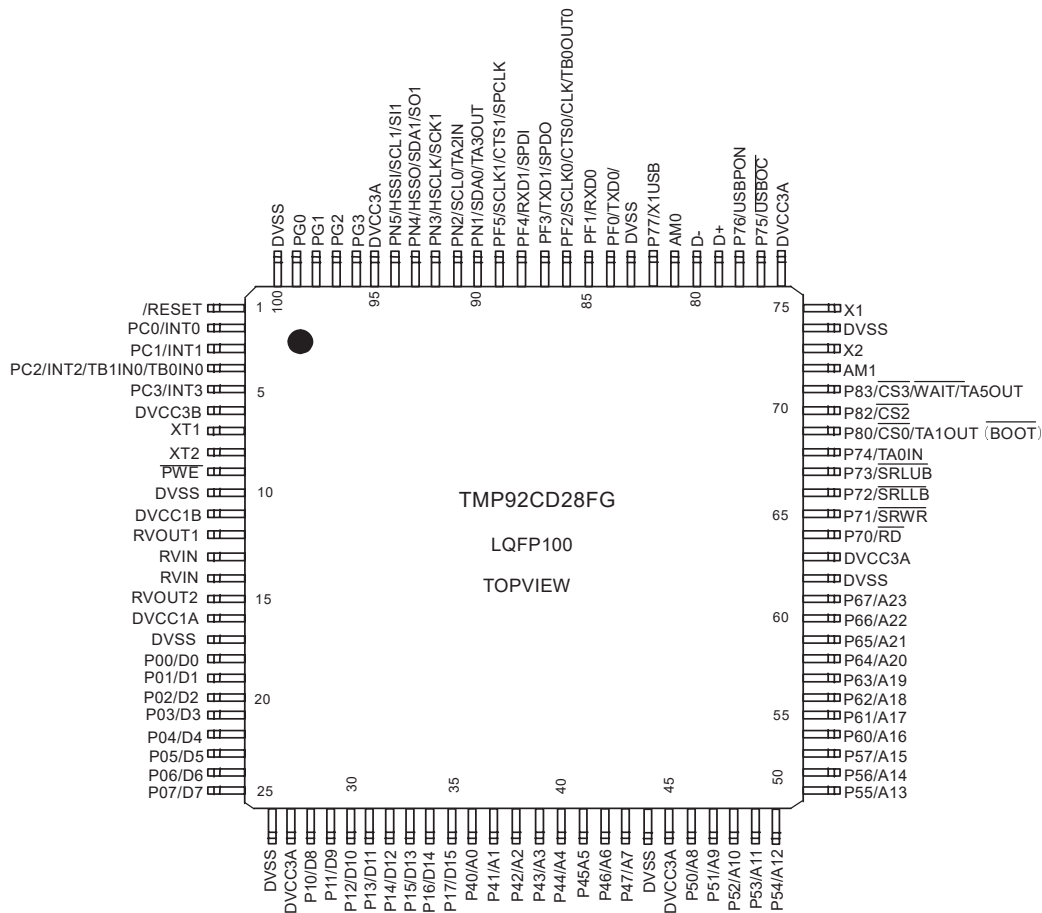


Figure 2.1.1 Pin Assignment Diagram (100-pin LQFP)

TOSHIBA**TMP92CD28**

Figure 2.1.2 shows the pin assignment of the TMP92CD28DFG.

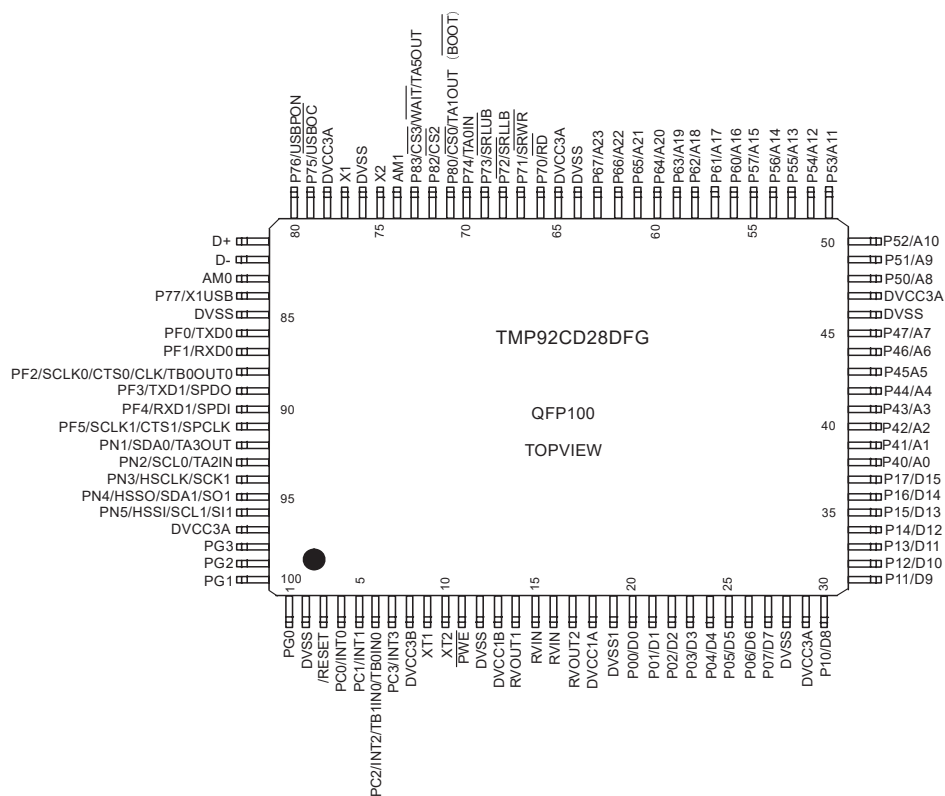


Figure 2.1.2 Pin Assignment Diagram (100-pin QFP)

TOSHIBA**TMP92CD28****2.2 Pin Names and Functions**

The following table shows the names and functions of the input/output pins

Table 2.2.1 Pin Names and Functions (1/3)

Pin name	Number of Pin	I/O	Function
P00 to P07 D0 to D7	8	I/O I/O	Port 0: I/O port Input or output specifiable in units of bits Data: Data bus 0 to 7
P10 to P17 D8 to D15	8	I/O I/O	Port 1: I/O port Input or output specifiable in units of bits Data: Data bus 8 to 15
P40 to P47 A0 to A7	8	I/O Output	Port 4: I/O port Input or output specifiable in units of bits Address: Address bus 0 to 7
P50 to P57 A8 to A15	8	I/O Output	Port 5: I/O port Input or output specifiable in units of bits Address: Address bus 8 to 15
P60 to P67 A16 to A23	8	I/O Output	Port 6: I/O port Input or output specifiable in units of bits Address: Address bus 16 to 23
P70 RD	1	I/O Output	Port 70: I/O port (Schmitt input, with pull-up register) Read: Outputs strobe signal for read external memory.
P71 SRWR	1	I/O Output	Port 71: I/O port (Schmitt input, with pull-up register) Write enable for SRAM: Strobe signal for writing data.
P72 SRLLB	1	I/O Output	Port 72: I/O port (Schmitt input, with pull-up register) Data enable for SRAM on pins D0 to D7
P73 SRLUB	1	I/O Output	Port 73: I/O port (Schmitt input, with pull-up register) Data enable for SRAM on pins D8 to D15
P74 TA0IN	1	Input Input	Port 74: Input port (Schmitt input) 8-bit timer 0 input: Input pin of 8-bit timer TMRA0
P75 USBOC	1	I/O Input	Port 75: I/O port (Schmitt input) USBOC Input
P76 USBPON	1	I/O Output	Port 76: I/O port (Schmitt input) USBPON Output
P77 X1USB	1	I/O Input	Port 77: I/O port 48MHz Clock Input for USB Host Controller
P80 CS0 TA1OUT (BOOT Note)	1	Output Output Output Input	Port 80: Output port Chip select 0: Outputs "Low" when address is within specified address area 8-bit timer 1 Output: Output pin of 8-bit timer TMRA0 or TMRA1 This pin sets single boot mode (only during reset). (Note) The function of TMP92FD28
P82 CS2	1	Output Output	Port 82: Output port Chip select 2: Outputs "Low" when address is within specified address area
P83 CS3 TA5OUT WAIT	1	I/O Output Output Input	Port 83: I/O port Chip select 3: Outputs "Low" when address is within specified address area 8-bit timer 5 Output: Output pin of 8-bit timer TMRA4 or TMRA5 Wait: Signal used to request CPU bus wait
PC0 INT0	1	Input Input	Port C0: Input port (Schmitt input) Interrupt request pin0 : Interrupt request pin with programmable level/rising/falling edge
PC1 INT1	1	Input Input	Port C1: Input port (Schmitt input) Interrupt request pin 1 : Interrupt request pin with programmable level/rising/falling edge
PC2 INT2 TB0IN0 TB1IN0	1	Input Input Input Input	Port C2: Input port (Schmitt input) Interrupt request pin 2 : Interrupt request pin with programmable level/rising/falling edge 16-bit timer 0 input 0: Input of count/capture trigger in 16-bit timer TMRB0 16-bit timer 1 input 0: Input of count/capture trigger in 16-bit timer TMRB1
PC3 INT3	1	Input Input	Port C3: Input port (Schmitt input) Interrupt request pin 3 : Interrupt request pin with programmable level/rising/falling edge

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TMP92CD28

Table 2.2.2 Pin Names and Functions (2/3)

Pin name	Number of Pin	I/O	Function
PF0 TXD0	1	I/O Output	Port F0: I/O port (Schmitt input) Serial 0 send data: Open drain output programmable
PF1 RXD0	1	I/O Input	Port F1: I/O port (Schmitt input) Serial 0 receive data
PF2 SCLK0 CTS0 CLK TB0OUT0	1	I/O I/O Input Output Output	Port F2: I/O port (Schmitt input) Serial 0 clock I/O Serial 0 data send enable (Clear to send) Clock: System Clock output 16-bit timer 0 output 0: Output pin of 16-bit timer TMRB0
PF3 TXD1 SPDO	1	I/O Output Output	Port F3: I/O port (Schmitt input) Serial 1 send data: Open drain output programmable SPI Data output
PF4 RXD1 SPDI	1	I/O Input Input	Port F4: I/O port (Schmitt input) Serial 1 receive data SPI Data input
PF5 SCLK1 CTS1 SPCLK	1	I/O I/O Input Output	Port F5: I/O port (Schmitt input) Serial 1 clock I/O Serial 1 data send enable (Clear to send) SPI Clock output
PG0 to PG3 KI0 to KI3	4	Input	Port G: Input port (Schmitt input) Key input 0 to 7: Pin used of key-on wakeup 0 to 7

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Table 2.2.3 Pin Names and Functions (3/3)

Pin name	Number of Pin	I/O	Function
PN1 SDA0 TA3OUT	1	I/O I/O Output	Port N1: I/O port (Schmitt input, Open drain output) Serial bus interface 0 send/receive data at I ² C mode 8-bit timer 3 Output: Output pin of 8-bit timer TMRA2 or TMRA3
PN2 SCL0 TA2IN	1	I/O I/O Input	Port N2: I/O port (Schmitt input, Open drain output) Serial bus interface 0 clock I/O data at I ² C mode 8-bit timer 2 input: Input pin of 8-bit timer TMRA2
PN3 SCK1 HSCLK	1	I/O I/O Output	Port N3: I/O port (Schmitt input) Serial bus interface 1 clock I/O data at SIO mode HSIO Clock output
PN4 SO1 SDA1 HSSO	1	I/O Output I/O Output	Port N4: I/O port (Schmitt input, Open drain output) Serial bus interface 1 send data at SIO mode Serial bus interface 1 send/receive data at I ² C mode HSIO Data output
PN5 SI1 SCL1 HSSI	1	I/O Input I/O Input	Port N5: I/O port (Schmitt input, Open drain output) Serial bus interface 1 receive data at SIO mode Serial bus interface 1 clock I/O data at I ² C mode HSIO Data input
AM0, AM1	2	Input	Operation mode: Fixed to AM1 = "1" and AM0 = "1"
X1 / X2	2	I/O	High-frequency oscillator connection I/O pins
XT1/XT2	2	I/O	Low-frequency oscillator circuit connection pin.
RESET	1	Input	Reset: Initializes TMP92CD28 (Schmitt input, with pull-up register)
PWE	1	Output	External power supply control output: Pin to control ON/OFF of external power supply. In stand-by mode, outputs "L" level. In other than stand-by mode, outputs "H" level.
D+, D-	2	I/O	Data pin connected to USB. In case USB is not used, connect both pins to pull-up(DVCC3A) or pull-down resistor for protect current flows it.
RVIN	2	Input	Power supply pin for Internal Regulator
RVOUT1, RVOUT2	2	Output	1.5V output from Internal Regulator (Only Mask ROM Version)
DVCC3A	5	—	Power supply pin for peripheral I/O-A (Connect all DVCC3A pins to power supply pin.)
DVCC3B	1	—	Power supply pin for peripheral I/O-B (Connect all DVCC3B pins to power supply pin.)
DVCC1A	1	—	Power supply pin for internal logic-A.
DVCC1B	1	—	Power supply pin for internal logic-B.
DVSS	8	—	GND pins (0 V) (All DVSS pins should be connected with GND(0V))

32-bit RISC Microcontroller – TX03 Series T5CN5

1. Overview and Features

The TX03 series is a 32-bit RISC microcontroller series with an ARM Cortex™-M3 microcontroller core.

Features of the T5CN5 is as follows:

1.1 Features

(1) ARM Cortex-M3 microcontroller core

1) Improved code efficiency has been realized through the use of Thumb2 instruction

- New 16-bit Thumb instructions for improved program flow
- New 32-bit Thumb instructions for improved performance
- Auto-switching between 32-bit instruction and 16-bit instruction is executed by compiler.

2) Both high performance and low power consumption have been achieved.

-High performance

- A 32-bit multiplication ($32 \times 32 = 32$ bit) can be executed with one clock.
- Division takes between 2 and 12 cycles depending on dividend and divisor

-Low power consumption

- Optimized design using a low power consumption library
- Standby function that stops the operation of the microcontroller core

3) High-speed interrupt response suitable for real-time control

- An interruptible long instruction.
- Stack push automatically handled by hardware.

(2) On Chip program memory and data memory

Product name	On chip Flash ROM	On chip RAM
T5CN5	512Kbyte	32Kbyte

(3) 16-bit timer : 10 channels

- 16-bit interval timer mode
- 16-bit event counter mode
- 16-bit PPG output
- Input capture function

(4) Real time clock (RTC) : 1 channel

- Clock (hour, minute and second)
- Calendar (Month, week, date and leap year)
- Time correction + or – 30 seconds (by software)
- Alarm (Alarm output)
- Alarm interrupt

(5) Watchdog timer : 1 channel

- 26 cycles of binary counter
- Watchdog timer out

(6) General-purpose serial interface : 3 channels

- Either UART mode or synchronous mode can be selected (4byte FIFO equipped)

(7) Serial bus interface : 3 channels

- Either I²C bus mode or synchronous mode can be selected.

(8) CEC : 1 channel

- Transmission and reception per 1 byte.

(9) Remote control signal preprocessor : 2 channels

- Can receive up to 72bit data at a time

(10) 10-bit A/D converter : 12 channels

- Start by an internal or external timer trigger
- Fixed channel/scan mode
- Single/repeat mode
- AD monitoring 2ch
- Conversion speed 1.15usec(@fsys = 40MHz)

(11) Interrupt source

- Internal: 42 factors...The order of precedence can be set over 7 levels (except the watchdog timer interrupt).
- External: 8 factors...The order of precedence can be set over 7 levels.

(12) Input/ output ports

- 79 pins

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T5CN5

- (13) Standby mode
 - Standby modes :IDLE, SLOW, SLEEP, STOP
 - Sub clock operation(32.768kHz) :SLOW, SLEEP
- (14) Clock generator
 - On-chip PLL (quadrupled)
 - Clock gear function: The high-speed clock can be divided into 1/1, 1/2, 1/4 or 1/8.
- (15) Endian
 - Little endian
- (16) Maximum operating frequency
 - 40MHz
- (17) Operating voltage range
 - 2.7V~3.6V (with on-chip regulator)
- (18) Temperature range
 - -20~85 degrees (except during Flash writing/ erasing)
 - 0~70 degrees (during Flash writing/ erasing)
- (19) Package
 - LQFP100-P-1414-0.5H (14mm × 14mm, 0.5mm pitch)

1.2 Block Diagram

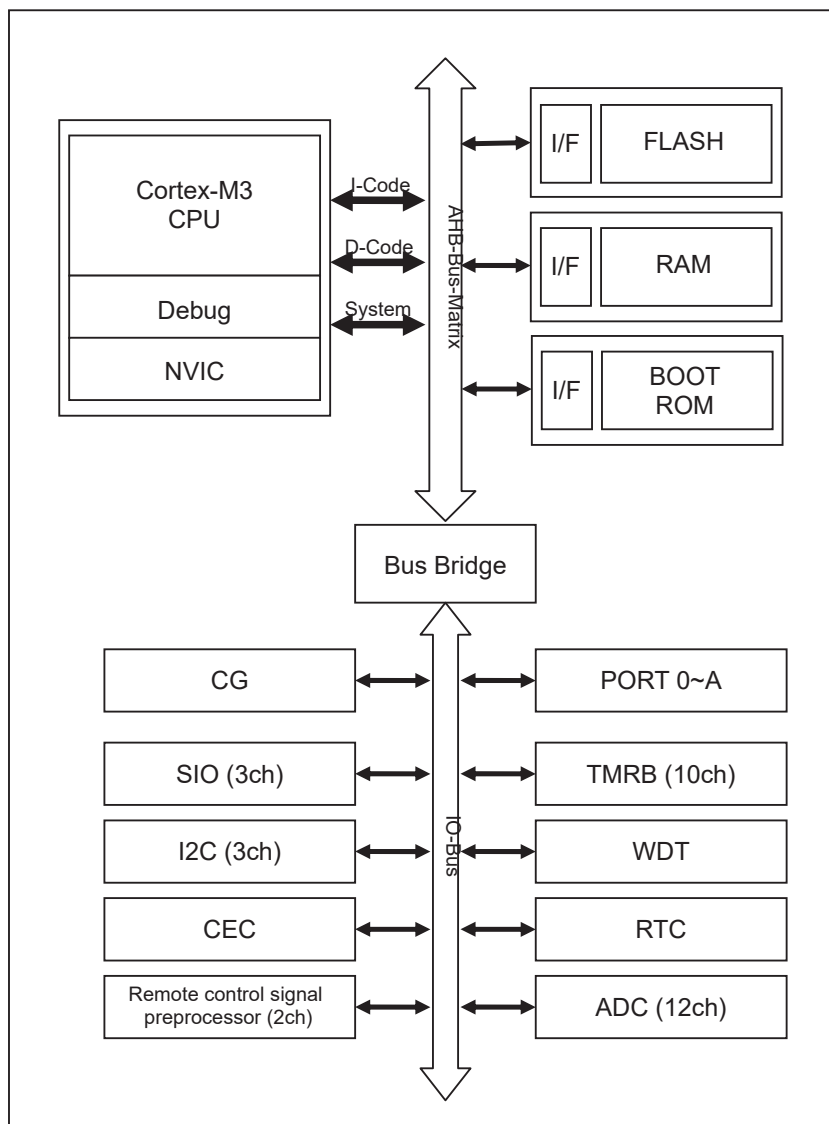


Fig. 1.1 T5CN5 Block Diagram

2. Pin Layout and Pin Functions

This chapter describes the pin layout, pin names and pin functions of T5CN5.

2.1 Pin Layout (Top view)

Fig. 2-1 shows the pin layout of T5CN5.

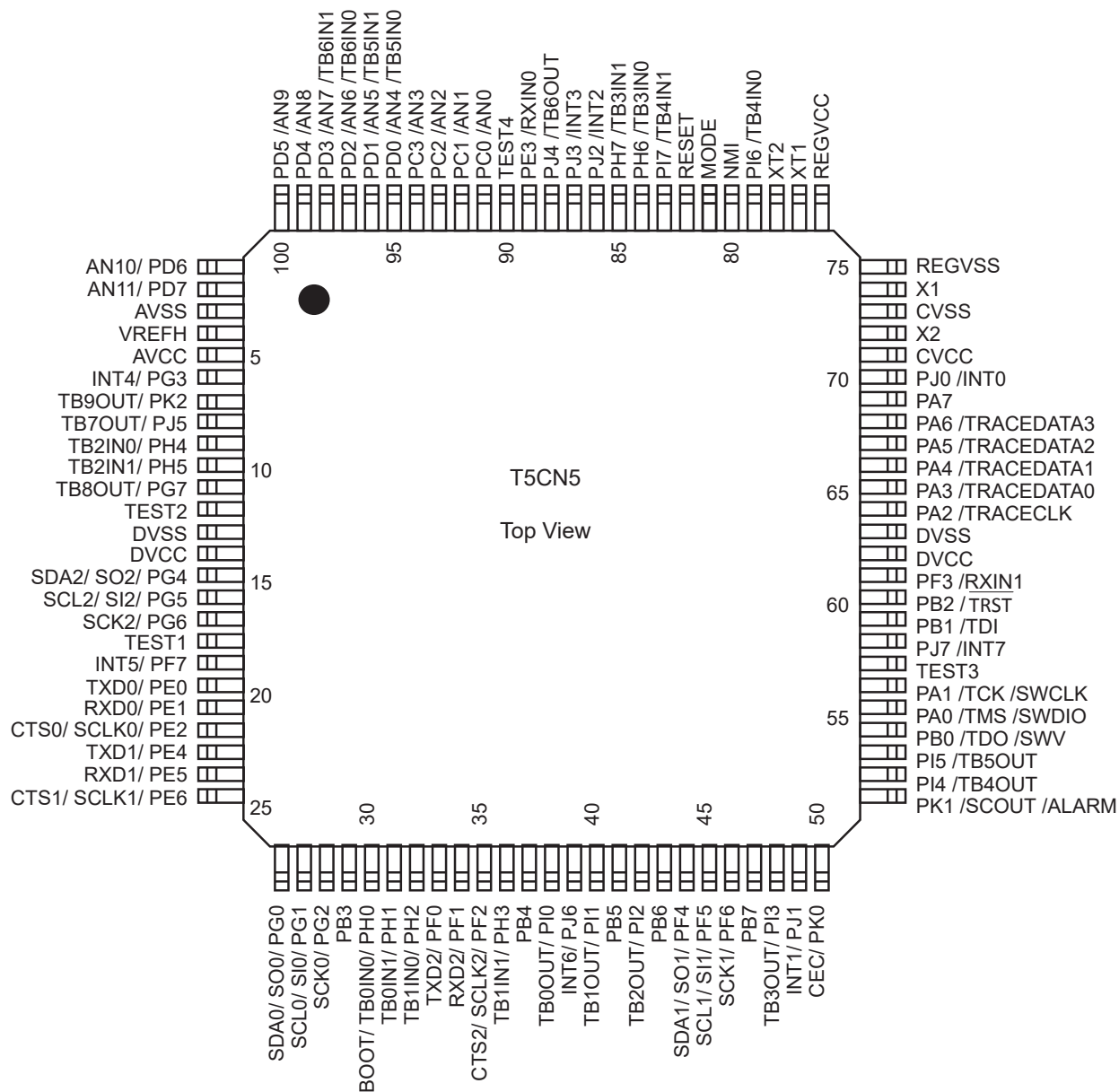


Fig. 2.1 Pin Layout (LQFP100)

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T5CN5

Table 2.1 Pin Numbers and Names (1/2)

Pin No.	Pin name	Pin No.	Pin name
1	PD6, AN10	26	PG0, SO0, SDA0
2	PD7, AN11	27	PG1, SI0, SCL0
3	AVSS	28	PG2, SCK0
4	VREFH	29	PB3
5	AVCC	30	PH0, TB0IN0, $\overline{\text{BOOT}}$
6	PG3, INT4	31	PH1, TB0IN1
7	PK2, TB9OUT	32	PH2, TB1IN0
8	PJ5, TB7OUT	33	PF0, TXD2
9	PH4, TB2IN0	34	PF1, RXD2
10	PH5, TB2IN1	35	PF2, SCLK2, CTS2
11	PG7, TB8OUT	36	PH3, TB1IN1
12	TEST2	37	PB4
13	DVSS	38	PI0, TB0OUT
14	DVCC	39	PJ6, INT6
15	PG4, SO2, SDA2	40	PI1, TB1OUT
16	PG5, SI2, SCL2	41	PB5
17	PG6, SCK2	42	PI2, TB2OUT
18	TEST1	43	PB6
19	PF7, INT5	44	PF4, SO1, SDA1
20	PE0, TXD0	45	PF5, SI1, SCL1
21	PE1, RXD0	46	PF6, SCK1
22	PE2, SCLK0, CTS0	47	PB7
23	PE4, TXD1	48	PI3, TB3OUT
24	PE5, RXD1	49	PJ1, INT1
25	PE6, SCLK1, CTS1	50	PK0, CEC

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T5CN5

Table 2.1 Pin Numbers and Names (2/2)

Pin No.	Pin name	Pin No.	Pin name
51	PK1, SCOUT, $\overline{\text{ALARM}}$	76	REGVCC
52	PI4, TB4OUT	77	XT1
53	PI5, TB5OUT	78	XT2
54	PB0, TDO, SWV	79	PI6, TB4IN0
55	PA0, TMS, SWDIO	80	$\overline{\text{NMI}}$
56	PA1, TCK, SWCLK	81	MODE
57	TEST3	82	$\overline{\text{RESET}}$
58	PJ7, INT7	83	PI7, TB4IN1
59	PB1, TDI	84	PH6, TB3IN0
60	PB2, $\overline{\text{TRST}}$	85	PH7, TB3IN1
61	PF3, RXIN1	86	PJ2, INT2
62	DVCC	87	PJ3, INT3
63	DVSS	88	PJ4, TB6OUT
64	PA2, TRACECLK	89	PE3, RXIN0
65	PA3, TRACEDATA0	90	TEST4
66	PA4, TRACEDATA1	91	PC0, AN0
67	PA5, TRACEDATA2	92	PC1, AN1
68	PA6, TRACEDATA3	93	PC2, AN2
69	PA7	94	PC3, AN3
70	PJ0, INT0	95	PD0, AN4, TB5IN0
71	CVCC	96	PD1, AN5, TB5IN1
72	X2	97	PD2, AN6, TB6IN0
73	CVSS	98	PD3, AN7, TB6IN1
74	X1	99	PD4, AN8
75	REGVSS	100	PD5, AN9

TOSHIBA**T5CN5****2.2 Pin names and Functions**

Table 2.2 and Table 2.3 sort the input and output pins of the T5CN5 by pin or port. Each table includes alternate pin names and functions for multi-function pins.

3.1.1 Sorted by Pin

Table 2.2 Pin Names and Functions Sorted by Pin (1/5)

Type	# of Pins	Pin Name	Input/Output	Function	Programmable Pull up/ Pull down	Schmitt trigger	Programmable Open Drain Output
Function	1	PD6 AN10	I I	Input port Analog input	Pull up	-	-
	2	PD7 AN11	I I	Input port Analog input	Pull up	-	-
PS	3	AVSS	I	A/D converter: GND pin (0V) Tie AVSS to power supply even if the A/D converter is not used.	-	-	-
	4	VREFH	I	Supplying the A/D converter with a reference power supply. Tie VREFH to power supply even if the A/D converter is not used.	-	-	-
	5	AVCC	I	Supplying the A/D converter with a power supply. Tie AVCC to power supply even if the A/D converter is not used.	-	-	-
Function	6	PG3 INT4	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○
	7	PK2 TB9OUT	I/O O	I/O port Timer B output	Pull up	-	-
	8	PJ5 TB7OUT	I/O I	I/O port Timer B output	Pull up	-	-
	9	PH4 TB2IN0	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	10	PH5 TB2IN1	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	11	PG7 TB8OUT	I/O O	I/O port Timer B output	Pull up	-	○
Test	12	TEST2	-	TEST pin: Not connected.	-	-	-
PS	13	DVSS	-	GND pin	-	-	-
	14	DVCC	-	Power supply pin	-	-	-
Function	15	PG4 SDA2/ SO2	I/O I/O O	I/O port If the serial bus interface operates -in the I2C mode : data pin -in the SIO mode: data pin	Pull up	○	○
	16	PG5 SCL2/ SI2	I/O I/O I	I/O port If the serial bus interface operates -in the I2C mode : clock pin -in the SIO mode: data pin	Pull up	○	○
	17	PG6 SCK2	I/O I/O	I/O port Inputting and outputting a clock if the serial bus interface operates in the SIO mode.	Pull up	○	○
Test	18	TEST1	-	TEST pin: Not connected.	-	-	-
Function	19	PF7 INT5	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○

TOSHIBA**T5CN5**

Table 2.2 Pin Names and Functions Sorted by Pin (2/5)

Type	# of Pins	Pin Name	Input/ Output	Function	Programmable Pull-up/ Pull down	Schmitt trigger	Programmable Open Drain Output
Function	20	PE0 TXD0	I/O O	I/O port Sending serial data	Pull up	-	○
	21	PE1 RXD0	I/O I	I/O port Receiving serial data	Pull up	○	○
	22	PE2 SCLK0 CTS0	I/O I I	I/O port Serial clock input/ output Handshake input pin	Pull up	○	○
	23	PE4 TXD1	I/O O	I/O port Sending serial data	Pull up	-	○
	24	PE5 RXD1	I/O I	I/O port Receiving serial data	Pull up	○	○
	25	PE6 SCLK1 CTS1	I/O I I	I/O port Serial clock input/ output Handshake input pin	Pull up	○	○
	26	PG0 SDA0/ SO0	I/O I/O O	I/O port If the serial bus interface operates -in the I2C mode : data pin -in the SIO mode: data pin	Pull up	○	○
	27	PG1 SCL0/ SIO	I/O I/O I	I/O port If the serial bus interface operates -in the I2C mode : clock pin -in the SIO mode: data pin	Pull up	○	○
	28	PG2 SCK0	I/O I/O	I/O port Inputting and outputting a clock if the serial bus interface operates in the SIO mode.	Pull up	○	○
	29	PB3	I/O	I/O port	Pull up	-	-
Function/ Control	30	PH0 TB0IN0 <u>BOOT</u>	I/O I I	I/O port Inputting the timer B capture trigger Setting a single boot mode: This pin goes into single boot mode by sampling "L" at the rise of a reset signal.	Pull up	○	-
Function	31	PH1 TB0IN1	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	32	PH2 TB1IN0	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	33	PF0 TXD2	I/O O	I/O port Sending serial data	Pull up	-	○
	34	PF1 RXD2	I/O I	I/O port Receiving serial data	Pull up	○	○
	35	PF2 SCLK2 CTS2	I/O I I	I/O port Serial clock input/ output Handshake input pin	Pull up	○	○
	36	PH3 TB1IN1	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	37	PB4	I/O	I/O port	Pull up	-	-
	38	PI0 TB0OUT	I/O O	I/O port Timer B output	Pull up	-	-
	39	PJ6 INT6	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○

TOSHIBA**T5CN5**

Table 2.2 Pin Names and Functions Sorted by Pin (3/5)

Type	# of Pins	Pin Name	Input/Output	Function	Programmable Pull-up/Pull down	Schmitt trigger	Programmable Open Drain Output
Function	40	PI1 TB1OUT	I/O O	I/O port Timer B output	Pull up	-	-
	41	PB5	I/O	I/O port	Pull up	-	-
	42	PI2 TB2OUT	I/O O	I/O port Timer B output	Pull up	-	-
	43	PB6	I/O	I/O port	Pull up	-	-
	44	PF4 SDA1/ SO1	I/O I/O O	I/O port If the serial bus interface operates -in the I2C mode : data pin -in the SIO mode: data pin	Pull up	○	○
	45	PF5 SCL1/ SI1	I/O I/O I	I/O port If the serial bus interface operates -in the I2C mode : clock pin -in the SIO mode: data pin	Pull up	○	○
	46	PF6 SCK1	I/O I/O	I/O port Inputting and outputting a clock if the serial bus interface operates in the SIO mode.	Pull up	○	○
	47	PB7	I/O	I/O port	Pull up	-	-
	48	PI3 TB3OUT	I/O O	I/O port Timer B output	Pull up	-	-
	49	PJ1 INT1	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○
	50	PK0 CEC	I/O I/O	I/O port CEC pin	-	○	● (Note 4)
	51	PK1 SCOUT ALARM	I/O O O	I/O port System clock output Alarm output	Pull up	-	-
	52	PI4 TB4OUT	I/O O	I/O port Timer B output	Pull up	-	-
	53	PI5 TB5OUT	I/O O	I/O port Timer B output	Pull up	-	-
Function/ Debug	54	PB0 TDO/SWV	I/O O	I/O port Debug pin	Pull up	-	-
	55	PA0 TMS/SWDIO	I/O I/O	I/O port Debug pin	Pull up	○	-
	56	PA1 TCK/ SWCLK	I/O I	I/O port Debug pin	Pull up	-	-
Test	57	TEST3	-	TEST pin: Not connected.	-	-	-
Function	58	PJ7 INT7	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○
Function/ Debug	59	PB1 TDI	I/O I	I/O port Debug pin	Pull up	-	-
	60	PB2 TRST	I/O I	I/O port Debug pin	Pull up	○	-
Function	61	PF3 RXIN1	I/O I	I/O port Inputting signal to remote controller	Pull up	○	○
PS	62	DVCC	-	Power supply pin	-	-	-
	63	DVSS	-	GND pin	-	-	-

TOSHIBA

T5CN5

Table 2.2 Pin Names and Functions Sorted by Pin (4/5)

Type	# of Pins	Pin Name	Input/Output	Function	Programmable Pull-up/Pull down	Schmitt trigger	Programmable Open Drain Output
Function/Debug	64	PA2 TRACECLK	I/O O	I/O port Debug pin	Pull up	-	-
	65	PA3 TRACEDATA0	I/O O	I/O port Debug pin	Pull up	-	-
	66	PA4 TRACEDATA1	I/O O	I/O port Debug pin	Pull up	-	-
	67	PA5 TRACEDATA2	I/O O	I/O port Debug pin	Pull up	-	-
	68	PA6 TRACEDATA3	I/O O	I/O port Debug pin	Pull up	-	-
Function	69	PA7	I/O	I/O port	Pull up		
	70	PJ0 INT0	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○
PS	71	CVCC	-	Power supply pin	-	-	-
Clock	72	X2	O	Connected to a high-speed oscillator.	-	-	-
PS	73	CVSS	-	GND pin	-	-	-
Clock	74	X1	I	Connected to a high-speed oscillator.	-	○	-
PS	75	REGVSS	-	GND pin	-	-	-
	76	REGVCC	-	Power supply pin	-	-	-
Clock	77	XT1	I	Connected to a low-speed oscillator.	-	○	-
	78	XT2	O	Connected to a low-speed oscillator.	-	-	-
Function	79	PI6 TB4IN0	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	80	NMI	I	Non-maskable interrupt	-	○ w/ noise filter	-
Control	81	MODE	I	Mode pin: Tied to GND pin	-	○	-
Function	82	RESET	I	Reset input pin	Tied to Pull up	○ w/ noise filter	-
	83	PI7 TB4IN0	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	84	PH6 TB3IN0	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	85	PH7 TB3IN1	I/O I	I/O port Inputting the timer B capture trigger	Pull up	○	-
	86	PJ2 INT2	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○
	87	PJ3 INT3	I/O I	I/O port Interrupt request pin	Pull up	○ w/ noise filter	○
	88	PJ4 TB6OUT	I/O O	I/O port Timer B output	Pull up	-	-
	89	PE3 RXIN0	I/O I	I/O port Inputting signal to remote controller	Pull up	○	○
Test	90	TEST4	-	TEST pin: Not connected.	-	-	-

TOSHIBA**T5CN5**

Table 2.2 Pin Names and Functions Sorted by Pin (5/5)

Type	# of Pins	Pin Name	Input/Output	Function	Programmable Pull-up/ Pull down	Schmitt trigger	Programmable Open Drain Output
Function	91	PC0 AN0	I I	Input port Analog input	Pull up	-	-
	92	PC1 AN1	I I	Input port Analog input	Pull up	-	-
	93	PC2 AN2	I I	Input port Analog input	Pull up	-	-
	94	PC3 AN3	I I	Input port Analog input	Pull up	-	-
	95	PD0 AN4 TB5IN0	I I I	Input port Analog input Inputting the timer B capture trigger	Pull up	-	-
	96	PD1 AN5 TB5IN1	I I I	Input port Analog input Inputting the timer B capture trigger	Pull up	-	-
	97	PD2 AN6 TB6IN0	I I I	Input port Analog input Inputting the timer B capture trigger	Pull up	-	-
	98	PD3 AN7 TB6IN1	I I I	Input port Analog input Inputting the timer B capture trigger of	Pull up	-	-
	99	PD4 AN8	I I	Input port Analog input	Pull up	-	-
	100	PD5 AN9	I I	Input port Analog input	Pull up	-	-

(Note 1) TEST1 through 4 must be left unconnected.**(Note 2)** Be sure to tie MODE to GND.**(Note 3)** Tie VREFH/ AVCC to power supply and AVSS to GND even if the A/D converter is not used.**(Note 4)** Nch open drain port.

2.3 Pin Names and Power Supply Pins

Table 2.4 Pin Names and Power Supplies

Pin name	Power supply
PA	DVCC
PB	DVCC
PC	AVCC
PD	AVCC
PE	DVCC
PF	DVCC
PG	DVCC
PH	DVCC
PI	DVCC
PJ	DVCC
PK	DVCC
X1, X2	CVCC
XT1, XT2	DVCC
$\overline{\text{RESET}}$	DVCC
$\overline{\text{NMI}}$	DVCC
MODE	DVCC

2.4 Pin Numbers and Power Supply Pins

Table 2.5 Pin Numbers and Power Supplies

Power supply	Pin number	Voltage range
DVCC	14, 62	2.7V~3.6V
AVCC	5	
REGVCC	76	
CVCC	71	

ESMT

M12L16161A

SDRAM

512K x 16Bit x 2Banks Synchronous DRAM

FEATURES

- JEDEC standard 3.3V power supply
- LVTTTL compatible with multiplexed address
- Dual banks operation
- MRS cycle with address key programs
 - CAS Latency (2 & 3)
 - Burst Length (1, 2, 4, 8 & full page)
 - Burst Type (Sequential & Interleave)
- All inputs are sampled at the positive going edge of the system clock
- Burst Read Single-bit Write operation
- DQM for masking
- Auto & self refresh
- 32ms refresh period (2K cycle)

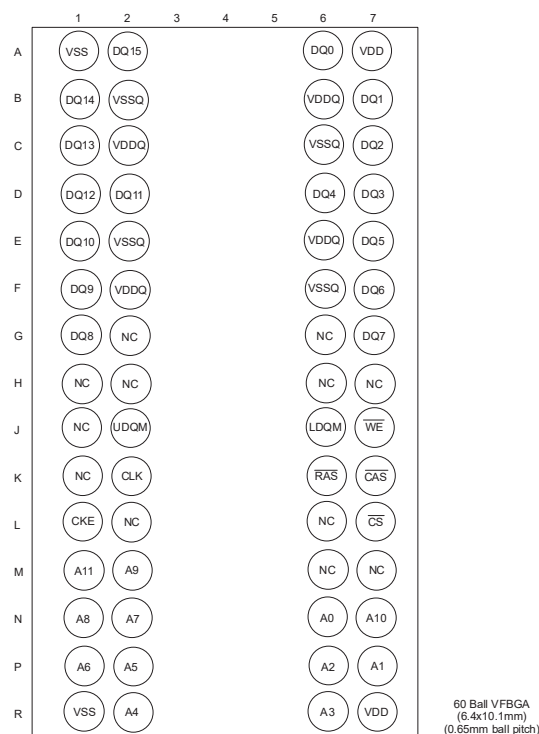
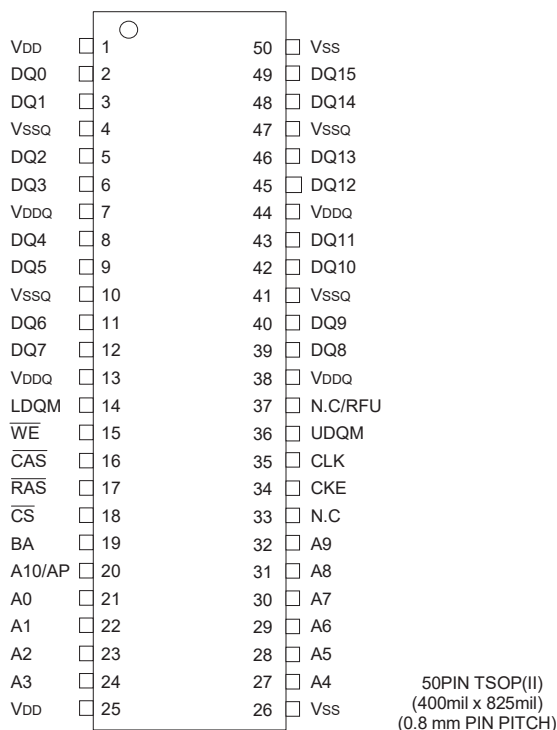
GENERAL DESCRIPTION

The M12L16161A is 16,777,216 bits synchronous high data rate Dynamic RAM organized as 2 x 524,288 words by 16 bits, fabricated with high performance CMOS technology. Synchronous design allows precise cycle control with the use of system clock I/O transactions are possible on every clock cycle. Range of operating frequencies, programmable burst length and programmable latencies allow the same device to be useful for a variety of high bandwidth, high performance memory system applications.

ORDERING INFORMATION

Part NO.	MAX Freq.	PACKAGE	COMMENTS
M12L16161A-5TG	200MHz	TSOP(II)	Pb-free
M12L16161A-7TG	143MHz	TSOP(II)	Pb-free
M12L16161A-7BG	143MHz	VFBGA	Pb-free

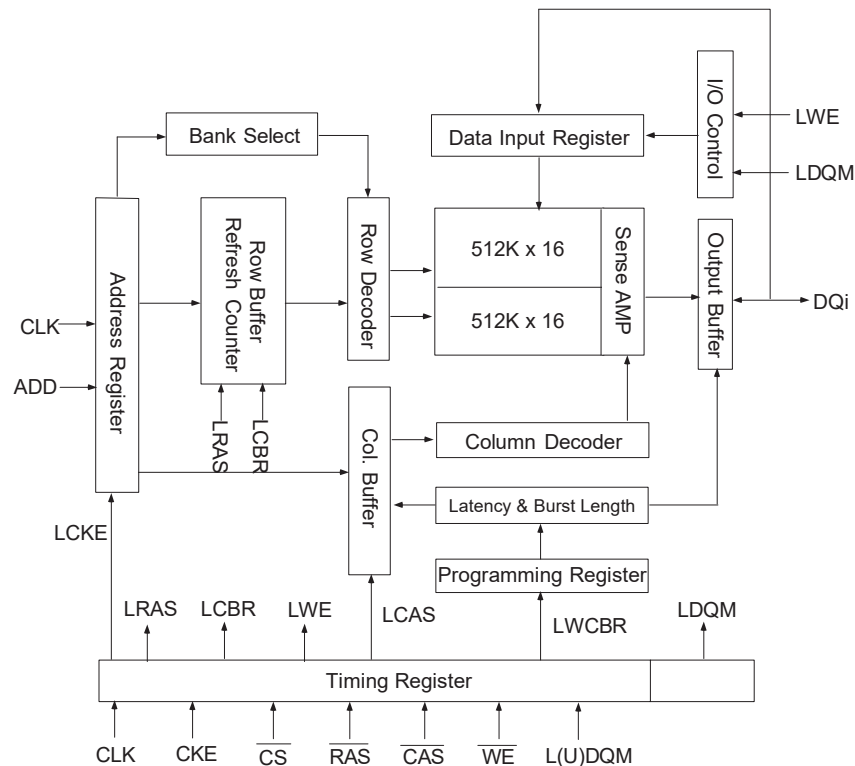
PIN CONFIGURATION (TOP VIEW)



ESMT

M12L16161A

FUNCTIONAL BLOCK DIAGRAM



PIN FUNCTION DESCRIPTION

Pin	Name	Input Function
CLK	System Clock	Active on the positive going edge to sample all inputs.
$\overline{\text{CS}}$	Chip Select	Disables or enables device operation by masking or enabling all inputs except CLK, CKE and L(U)DQM.
CKE	Clock Enable	Masks system clock to freeze operation from the next clock cycle. CKE should be enabled at least one cycle prior to new command. Disable input buffers for power down in standby.
A0 ~ A10/AP	Address	Row / column addresses are multiplexed on the same pins. Row address : RA0 ~ RA10, column address : CA0 ~ CA7
BA	Bank Select Address	Selects bank to be activated during row address latch time. Selects bank for read/write during column address latch time.
$\overline{\text{RAS}}$	Row Address Strobe	Latches row addresses on the positive going edge of the CLK with $\overline{\text{RAS}}$ low. Enables row access & precharge.
$\overline{\text{CAS}}$	Column Address Strobe	Latches column addresses on the positive going edge of the CLK with $\overline{\text{CAS}}$ low. Enables column access.
$\overline{\text{WE}}$	Write Enable	Enables write operation and row precharge. Latches data in starting from $\overline{\text{CAS}}$, $\overline{\text{WE}}$ active.
L(U)DQM	Data Input / Output Mask	Makes data output Hi-Z, tSHZ after the clock and masks the output. Blocks data input when L(U)DQM active.



M24128 M24C64 M24C32

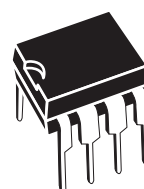
128 Kbit, 64 Kbit and 32 Kbit serial I²C bus EEPROM

Features

- Two-wire I²C serial interface supports 400 kHz protocol
- Single supply voltages (see [Table 1](#) for root part numbers):
 - 2.5 V to 5.5 V
 - 1.8 V to 5.5 V
 - 1.7 V to 5.5 V
- Write Control input
- Byte and Page Write
- Random and Sequential Read modes
- Self-timed programming cycle
- Automatic address incrementing
- Enhanced ESD/latch-up protection
- More than 1 Million write cycles
- More than 40-year data retention
- Packages
 - ECOPACK[®] (RoHS compliant)

Table 1. Device summary

Reference	Part number	Supply voltage
M24128	M24128-BW	2.5 V to 5.5V
	M24128-BR	1.8 V to 5.5V
	M24128-BF	1.7 V to 5.5V
M24C64	M24C64-W	2.5 V to 5.5V
	M24C64-R	1.8 V to 5.5V
	M24C64-F	1.7 V to 5.5V
M24C32	M24C32-W	2.5 V to 5.5V
	M24C32-R	1.8 V to 5.5V
	M24C32-F	1.7 V to 5.5V



PDIP8 (BN)



SO8 (MN)
150 mil width



TSSOP8 (DW)
169 mil width



UFDFPN8 (MB)
2 × 3 mm (MLP)



WLCSP (CS)

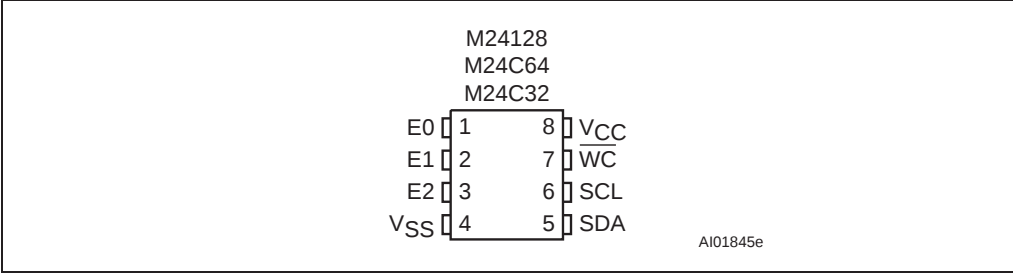
M24128, M24C64, M24C32

Description

Table 2. Signal names

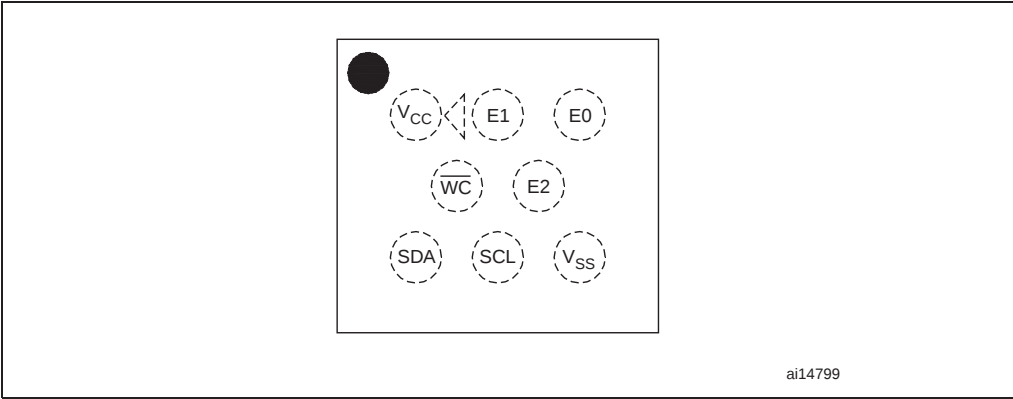
Signal name	Function	Direction
E0, E1, E2	Chip Enable	Input
SDA	Serial Data	I/O
SCL	Serial Clock	Input
WC	Write Control	Input
V _{CC}	Supply voltage	
V _{SS}	Ground	

Figure 2. DIP, SO, TSSOP and UFDFPN connections



1. See [Package mechanical data](#) section for package dimensions, and how to identify pin-1.

Figure 3. M24128 WLCSP connections (top view, marking side, with balls on the underside)



ML61 Series Positive Voltage Detector

❖ Application

- ◆ Memory Battery Back-up Circuits
- ◆ Microprocessor Reset Circuitry
- ◆ Power Failure Detection
- ◆ Power-on Reset Circuit
- ◆ System Battery Life and Charge Voltage Monitor

❖ Features

- CMOS Low Power Consumption : Typical 1.0uA at $V_{in}=2.0V$
- Selectable Detect Voltage : 1.1V to 6.0V in 0.1V increments
- Highly Accurate : Detect Voltage 1.1V to 1.9V $\pm 3\%$
Detect Voltage 2.0V to 6.0V $\pm 2\%$
- Operating Voltage : 0.8V to 10.0V
- Package Available : SOT23 (150mW), SOT89 (500mW) & TO92 (300mW)

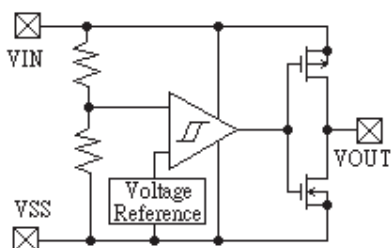
❖ General Description

The ML61 is a group of high-precision and low-power voltage detectors.

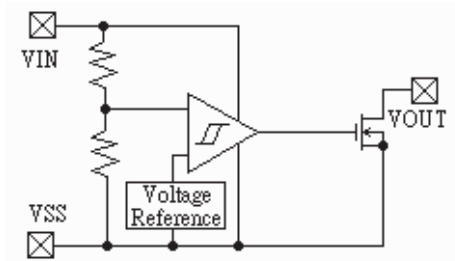
The ML61 consists of a highly-accurate and low-power reference voltage source, a comparator, a hysteresis circuit, and an output driver. Detect voltage is very accurate and stable with N-channel open drain and CMOS, are available.

❖ Block Diagram

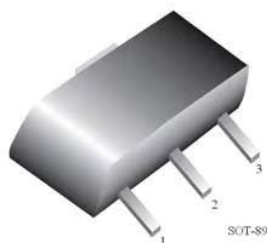
(1) CMOS Output



(2) N-Channel Open Drain Output



SOT-89



❖ Pin Configuration

Pin Number	Pin Name	Description
1	VOUT	Supply Voltage Output
2	VIN	Supply Voltage Input
3	VSS	Ground



NJM2068

LOW-NOISE DUAL OPERATIONAL AMPLIFIER

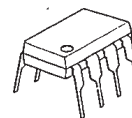
■ GENERAL DESCRIPTION

The NJM2068 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate which far exceeds that of the 4558 type amplifier. The specially designed low noise input transistors allow the NJM2068 to be used in very low noise signal processing applications such as audio preamplifiers and servo error amplifier.

■ FEATURES

- Operating Voltage $(\pm 4V \sim \pm 18V)$
- Low Total Harmonic Distortion $(0.001\% \text{ typ.})$
- Low Noise Voltage $(\text{FLAT} + \text{JISA}, 0.56 \mu V \text{ typ.})$
- High Slew Rate $(6V/\mu s \text{ typ.})$
- Unity Gain Bandwidth $(27\text{MHz @ } f=10\text{kHz})$
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

■ PACKAGE OUTLINE



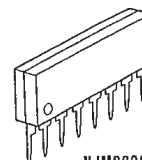
NJM2068D



NJM2068M



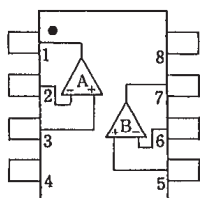
NJM2068V



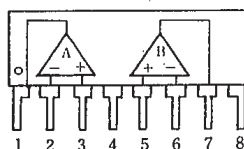
NJM2068L

4

■ PIN CONFIGURATION



NJM2068D
NJM2068M
NJM2068V

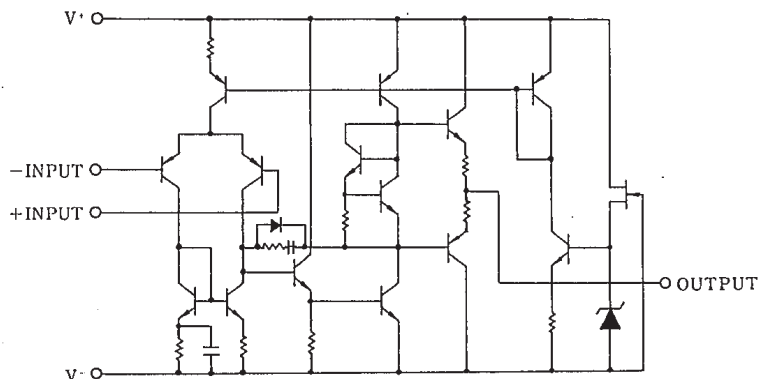


NJM2068L

PIN FUNCTION

1. A+ OUTPUT
2. A- INPUT
3. A+ INPUT
4. V-
5. B+ INPUT
6. B- INPUT
7. B OUTPUT
8. V+

■ EQUIVALENT CIRCUIT (1/2 Shown)





NJM2115

DUAL OPERATIONAL AMPLIFIER

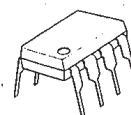
■ GENERAL DESCRIPTION

NJM 2115 is a low operating Voltage (± 1.0 V min.) and low saturation output voltage (± 2.0 V p-p at supply voltage ± 2.5 V) operational amplifier. It is applicable to HANDY TYPE CD, RADIO CASSETTE CD, and PORTABLE DAT, that are digital audio apparatus which require the 5V single supply operation and high output voltage. The NJM2115 is improved version of the NJM2100 about BIAS-CIRCUIT. So, NJM2115 is low saturation compared to the NJM2100 under the condition of low supply voltage ($< \pm 2.5$ V). The NJM2115 is stable about the oscillation compared to the NJM2100 under the condition of $V^+/V^- > 2.5$ V.

■ FEATURES

- Operating Voltage (± 1 V $\sim \pm 7$ V)
- Low Saturation Output Voltage (± 2.0 V p.p. @ $V^+ = \pm 2.5$ V)
- Slew Rate (4 V/ μ s typ.)
- Unity Gain Bandwidth (12 MHz typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

■ PACKAGE OUTLINE



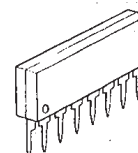
NJM2115D



NJM2115M

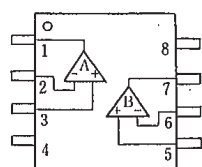
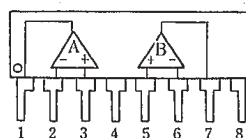


NJM2115V



NJM2115L

■ PIN CONFIGURATION

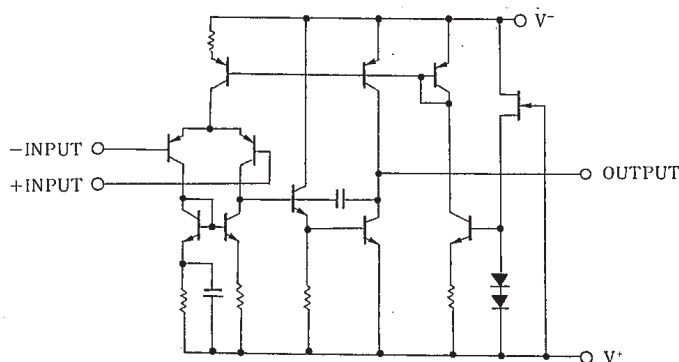
NJM2115D
NJM2115M
NJM2115V

NJM2115L

PIN FUNCTION

1. A OUTPUT
2. A -INPUT
3. A +INPUT
4. V^-
5. B +INPUT
6. B -INPUT
7. B OUTPUT
8. V^+

■ EQUIVALENT CIRCUIT (1/2 Shown)



3-INPUT VIDEO SWITCH WITH 75 Ω DRIVER

■ GENERAL DESCRIPTION

The NJM2244 is a three input integrated video switch which selects one video or audio signal from three input signals.

It contains driver circuit for 75 Ω load and is able to connect to TV monitor.

Its operating supply voltage range is 5 to 12V and bandwidth is 10MHz. Crosstalk is 70dB (at 4.43MHz).

NJM2244 contains clamp function and it can be operated while setting DC level fixed in position of the video signal.

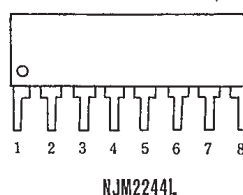
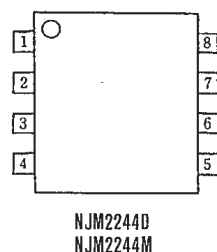
■ FEATURES

- Operating Voltage 4.75~13V
- 3 Input-1 Output
- Internal Driver Circuit for 75 Ω Impedance
- Muting Function available
- Internal Clamp Function
- Low power Dissipation 16.5mA
- Cross-talk 70dB(at 4.43MHz)
- Wide Frequency Range 10MHz(2V_{P-P} Input)
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

■ APPLICATION

- VCR Video Camera AV-TV Video Disc Player

■ PIN CONFIGURATION

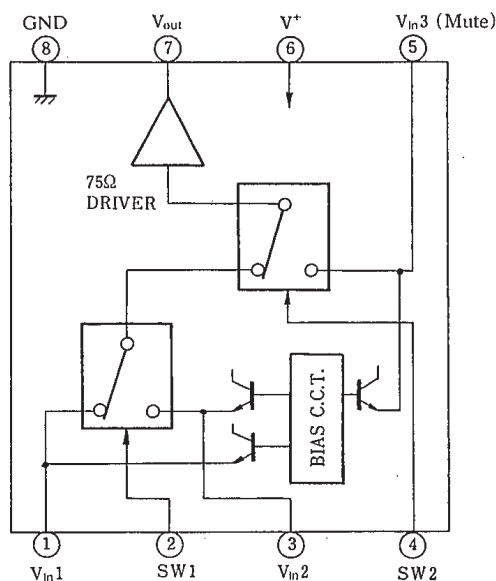


PIN FUNCTION

1. V_{in1}
2. SW1
3. V_{in2}
4. SW2
5. V_{in3}
6. V⁺
7. V_{out}
8. GND

■ BLOCK DIAGRAM

Pin Connection



■ INPUT CONTROL SIGNAL-OUTPUT SIGNAL

SW 1	SW 2	OUTPUT SIGNAL
L	L	V _{in1}
H	L	V _{in2}
L/H	H	V _{in3}

note): Input clamp voltage is about 2/5 of supply voltage.



NJM2845/46

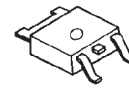
LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

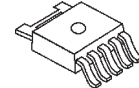
The NJM2845 is low dropout voltage regulator. Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

NJM2845 is 3 terminal type and NJM2846 is ON/OFF control built in type. These product can be selected according to the applications.

■ PACKAGE OUTLINE



NJM2845DL1

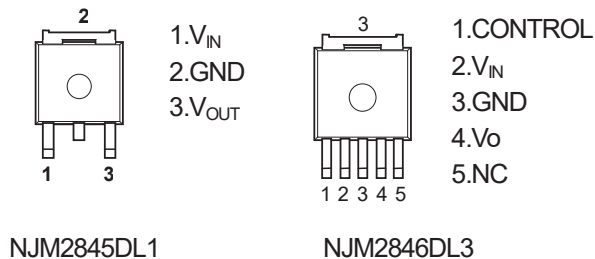


NJM2846DL3

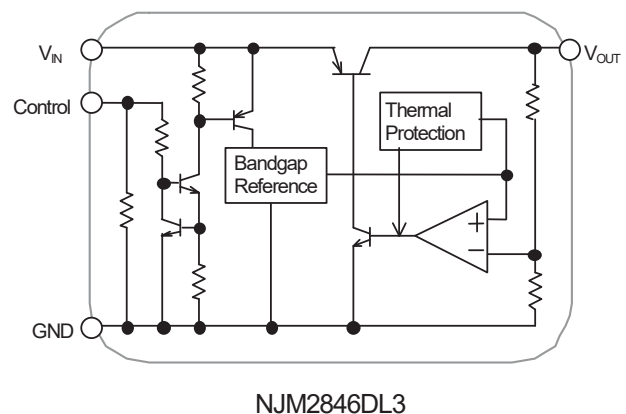
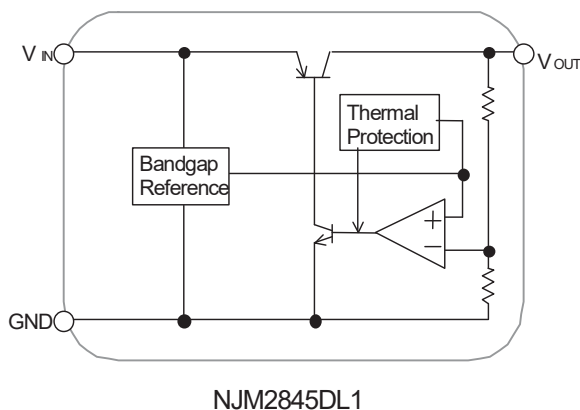
■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz, 3V Version)
- Output Noise Voltage $V_{no}=45\mu V_{rms}$ typ. ($V_o=3V$ Version)
- Output capacitor with 2.2 μF ceramic capacitor ($V_o \geq 2.6V$)
- Output Current $I_o(max.)=800mA$
- High Precision Output $V_o \pm 1.0\%$
- Low Dropout Voltage 0.18V typ. ($I_o=500mA$)
- ON/OFF Control (NJM2846)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-3 (NJM2845DL1), TO-252-5 (NJM2846DL3)

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT





NJM4556A

DUAL HIGH CURRENT OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

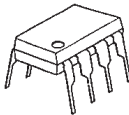
The NJM4556A integrated circuit is a high-gain, high output current dual operational amplifier capable of driving $\pm 70\text{mA}$ into $150\ \Omega$ loads ($\pm 10.5\text{V}$ output voltage), and operating low supply voltage ($V^+/V^-=\pm 2\text{V}\sim$).

The NJM4556A combines many of the fetures of the popular NJM4558 as well as having the capability of driving $150\ \Omega$ loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556A make it ideal for many audio, telecommu- nications and instrumentation applications.

■ FEATURES

- Operating Voltage ($\pm 2\text{V}\sim\pm 18\text{V}$)
- High Output Current ($I_o=70\text{mA}$)
- Slew Rate ($3\text{V}/\mu\text{s typ.}$)
- Gain Band Width Product (8MHz typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

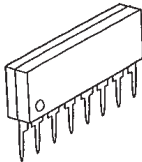
■ PACKAGE OUTLINE



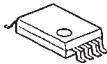
NJM4556AD



NJM4556AM

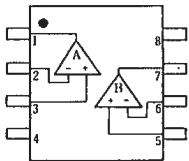


NJM4556AL

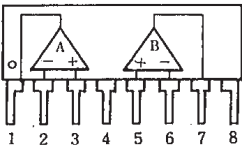


NJM4556AV

■ PIN CONFIGURATION



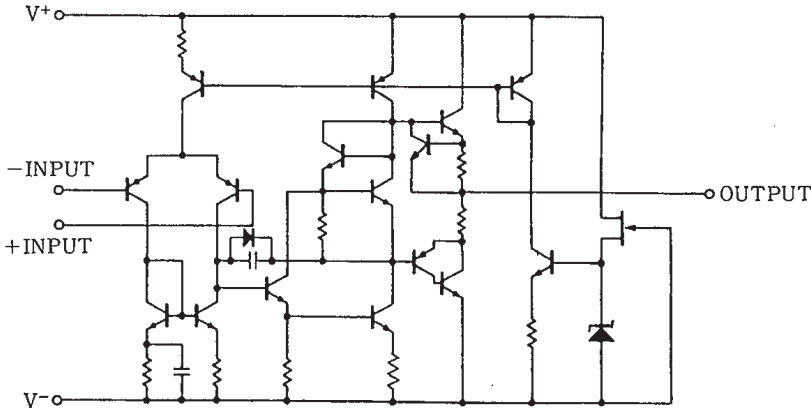
NJM4556AD.
NJM4556AM
NJM4556AV



NJM4556AL

- PIN FUNCTION
- 1. A OUTPUT
 - 2. A-INPUT
 - 3. A+INPUT
 - 4. V^-
 - 5. B+INPUT
 - 6. B-INPUT
 - 7. B OUTPUT
 - 8. V^+

■ EQUIVALENT CIRCUIT (1/2 Shown)





NJU7223

500mA Low Dropout Voltage Regulator

GENERAL DESCRIPTION

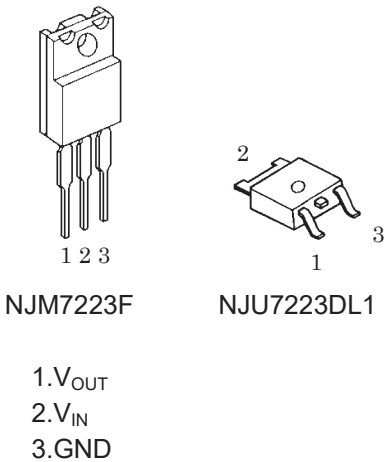
The NJU7223 series is a high precision output voltage, low drop output, low current consumption and high output current 3-terminal positive voltage regulator with a over current protection and a thermal shutdown.

Low dropout voltage is realized at high current output.

FEATURES

- High Precision Output Voltage $\pm 2\%$
- High Output Current $I_o(\text{max.})=500\text{mA}$
- Low Current Consumption $30\mu\text{A}$
- Low Dropout Voltage $\Delta V_{IO}=0.4\text{V typ. } (I_o=0.5\text{A}, V_o=5\text{V})$
- Internal Over Current Protection
- Internal Thermal Shutdown Protection
- Package Outline TO-220F, TO-252
- C-MOS Technology

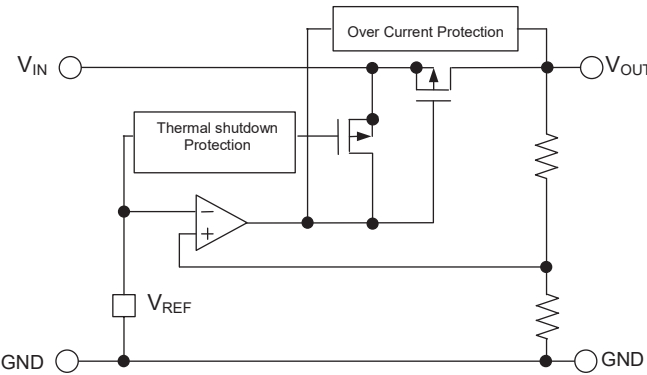
PACKAGE OUTLINE



OUTPUT VOLTAGE LINE-UP

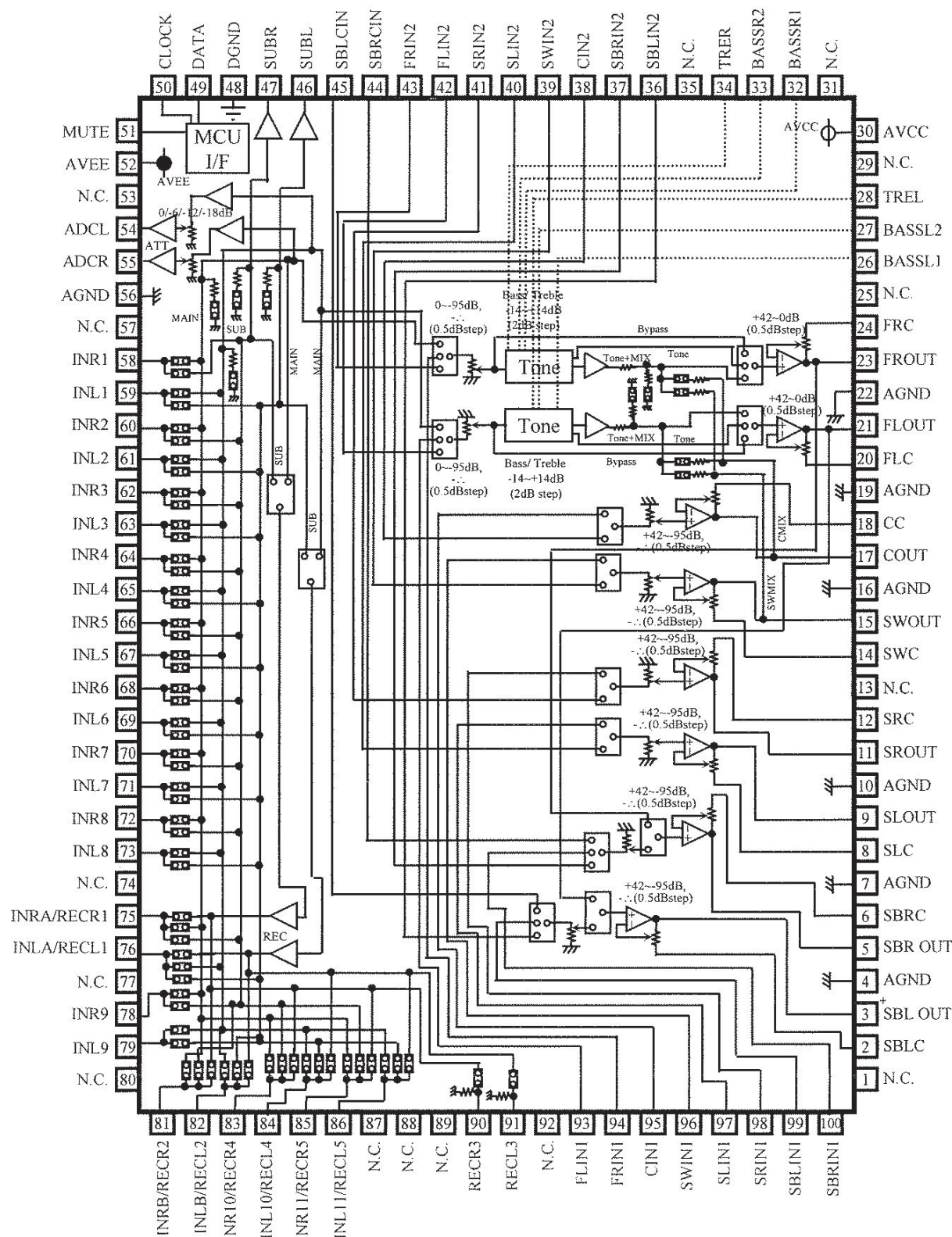
V _{OUT}	TO-220F	TO-252
+1.8V	NJU7223F18	NJU7223DL1-18
+2.5V	NJU7223F25	NJU7223DL1-25
+3.0V	NJU7223F30	NJU7223DL1-30
+3.3V	NJU7223F33	NJU7223DL1-33
+5.0V	NJU7223F50	NJU7223DL1-50

EQUIVALENT CIRCUIT



C.S	Integrated Circuit (R2A15218FP)
-----	---------------------------------

Fig 1. BLOCKDIAGRAM AND PIN CONFIGURATION(TOP VIEW)



C.S	Integrated Circuit (R2A15218FP)
-----	---------------------------------

Fig 2. PIN DESCRIPTION

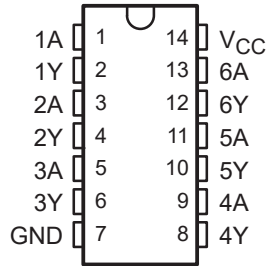
PIN No.	Name	Function
23,21, 17,15, 11,9, 5,3	FROUT,FLOUT, COUT,SWOUT, SROUT,SLOUT, SBROUT,SBLOUT	Output pin of FL/FR/C/SW/SL/SR/SBL/SBR channel
24,20, 18,14, 12,8, 6,2	FRC,FLC, CC,SWC, SRC,SLC, SBRC,SBLC	Connects capacitor for reducing click noise of L/R/C/SW/SL/SR/SBL/SBR channel volume
4,7,10,16, 19,22,56	AGND	Analog ground of internal circuit
28,34	TREL, TRER	Frequency characteristic setting pin of L/R channel tone control (Treble)
26,27, 32,33	BASSL1,BASSL2 BASSR1,BASSR2	Frequency characteristic setting pin of L/R channel tone control (Bass)
30	AVCC	Positive power supply to internal circuit
43,42, 41,40, 39,38, 37,36	FRIN2, FLIN2, SRN2,SLIN2, SWIN2,CIN2, SBRIN2,SBLIN2	Input pin of L/R/C/SW/SL/SR/SBL/SBR channel (Multi IN 1/2)
93,94, 95,96, 97,98, 99,100	FLIN1, FRIN1, CIN1,SWIN1, SLIN1,SRIN1, SBLIN1,SBRIN1	
48	DGND	Digital ground of internal circuit
49	DATA	Input pin of control data
50	CLOCK	Input pin of control clock
52	AVEE	Negative power supply to internal circuit
59,61,63, 65,67,69, 71,73,79	INL1,INL2, INL3, INL4,INL5,INL6, INL7,INL8,INL9	Input pin of L/R channel (Input Selector)
58,60,62, 64,66,68, 70,72,78	INR1,INR2, INR3, INR4,INR5,INR6, INR7,INR8,INR9	
51	MUTE	Outside Mute Control PIN
44,45	SBRCIN,SBLCIN	Input pin for SBL/SBR channel Volume
46,47	SUBL,SUBR	Output pin for L/R channel SUB Output
54,55	ADCL, ADCR	Output pin for L/R channel ADC
90,91	RECR3,RECL3	Output pin for L/R channel REC Output
75,76, 81,82, 83,84, 85,86	INRA/RECR1,INLA/RECL1, INRB/RECR2,INLB/RECL2, INR10/RECR4,INL10/RECL4, INR11/RECR5,INL11/RECL5	Input pin of L/R channel (Input Selector)/ Output pin for L/R channel REC Output
1,13,25,29,31, 35,53, 57,74,77,80, 87,88,89,92	N.C.	No Connected PIN

SN54ACT04, SN74ACT04
HEX INVERTERS

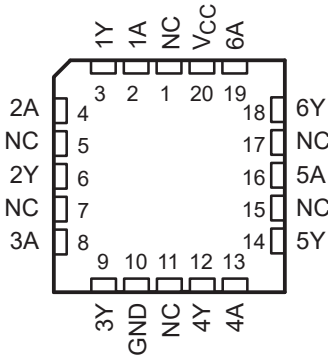
SCAS518C – JULY 1995 – REVISED OCTOBER 2003

- 4.5-V to 5.5-V V_{CC} Operation
 - Inputs Accept Voltages to 5.5 V
- Max t_{pd} of 8.5 ns at 5 V
 - Inputs Are TTL-Voltage Compatible

SN54ACT04 . . . J OR W PACKAGE
SN74ACT04 . . . D, DB, N, NS, OR PW PACKAGE
(TOP VIEW)



SN54ACT04 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

description/ordering information

The ‘ACT04 devices contain six independent inverters. The devices perform the Boolean function $Y = \overline{A}$.

ORDERING INFORMATION

T _A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	PDIP – N	Tube	SN74ACT04N	SN74ACT0N
	SOIC – D	Tube	SN74ACT04D	ACT04
		Tape and reel	SN74ACT04DR	
	SOP – NS	Tape and reel	SN74ACT04NSR	ACT04
	SSOP – DB	Tape and reel	SN74ACT04DBR	AD04
	TSSOP – PW	Tube	SN74ACT04PW	AD04
Tape and reel		SN74ACT04PWR		
–55°C to 125°C	CDIP – J	Tube	SNJ54ACT04J	SNJ54ACT04J
	CFP – W	Tube	SNJ54ACT04W	SNJ54ACT04W
	LCCC – FK	Tube	SNJ54ACT04FK	SNJ54ACT04FK

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE
(each inverter)

INPUT A	OUTPUT Y
H	L
L	H

8 Mbit SPI Serial Flash
SST25VF080B



Data Sheet

PIN DESCRIPTION

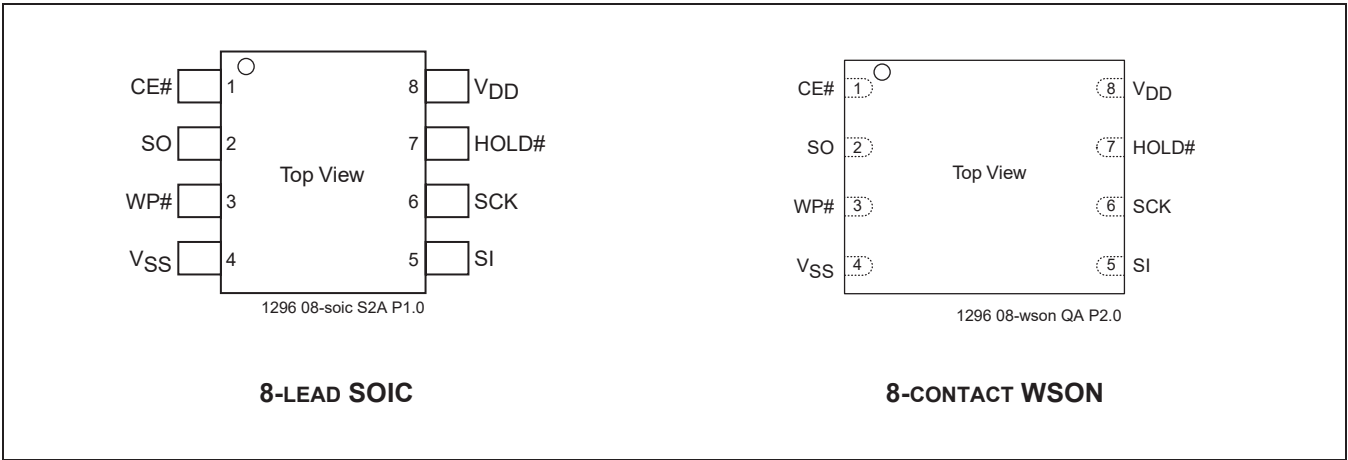


FIGURE 1: PIN ASSIGNMENTS

TABLE 1: PIN DESCRIPTION

Symbol	Pin Name	Functions
SCK	Serial Clock	To provide the timing of the serial interface. Commands, addresses, or input data are latched on the rising edge of the clock input, while output data is shifted out on the falling edge of the clock input.
SI	Serial Data Input	To transfer commands, addresses, or data serially into the device. Inputs are latched on the rising edge of the serial clock.
SO	Serial Data Output	To transfer data serially out of the device. Data is shifted out on the falling edge of the serial clock. Outputs Flash busy status during AAI Programming when reconfigured as RY/BY# pin. See “Hardware End-of-Write Detection” on page 12 for details.
CE#	Chip Enable	The device is enabled by a high to low transition on CE#. CE# must remain low for the duration of any command sequence.
WP#	Write Protect	The Write Protect (WP#) pin is used to enable/disable BPL bit in the status register.
HOLD#	Hold	To temporarily stop serial communication with SPI flash memory without resetting the device.
V _{DD}	Power Supply	To provide power supply voltage: 2.7-3.6V for SST25VF080B
V _{SS}	Ground	

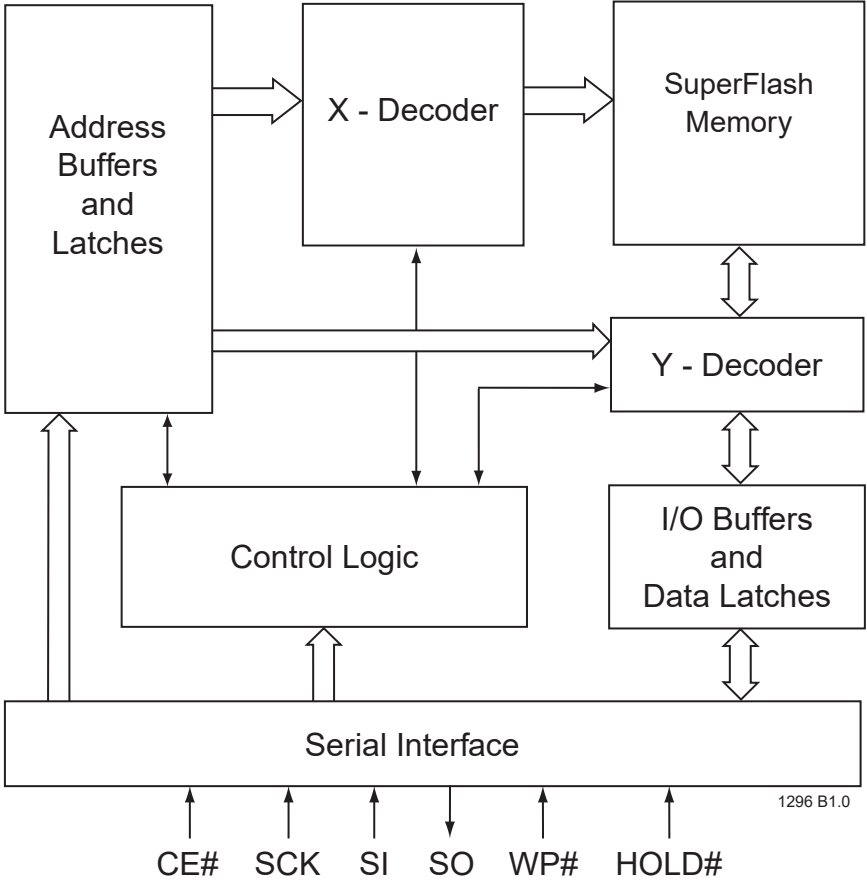
T1.0 1296



8 Mbit SPI Serial Flash
SST25VF080B

Data Sheet

FUNCTIONAL BLOCK DIAGRAM



TOSHIBA**TC74VCX541FT/FK/FTG**

TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

TC74VCX541FT, TC74VCX541FK, TC74VCX541FTG**Low-Voltage Octal Bus Buffer with 3.6 V Tolerant Inputs and Outputs**

The TC74VCX541 is a high performance CMOS octal bus buffer which is guaranteed to operate from 1.2-V to 3.6-V. Designed for use in 1.5V, 1.8 V, 2.5 V or 3.3 V systems, it achieves high speed operation while maintaining the CMOS low power dissipation.

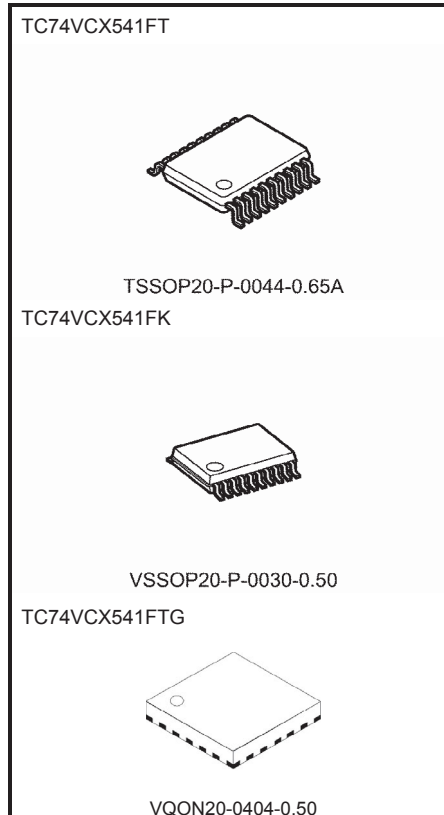
It is also designed with over voltage tolerant inputs and outputs up to 3.6 V.

The device is a non-inverting 3-state buffer having two active-low output enables. When either $\overline{OE}1$ or $\overline{OE}2$ are high, the terminal outputs are in the high-impedance state. This device is designed to be used with 3-state memory address drivers, etc.

All inputs are equipped with protection circuits against static discharge.

Features (Note 1)

- Low voltage operation: $V_{CC} = 1.2\sim 3.6\text{ V}$
- High speed operation: $t_{pd} = 3.5\text{ ns (max)}$ ($V_{CC} = 3.0\sim 3.6\text{ V}$)
 $t_{pd} = 4.2\text{ ns (max)}$ ($V_{CC} = 2.3\sim 2.7\text{ V}$)
 $t_{pd} = 8.4\text{ ns (max)}$ ($V_{CC} = 1.65\sim 1.95\text{ V}$)
 $t_{pd} = 16.8\text{ ns (max)}$ ($V_{CC} = 1.4\sim 1.6\text{ V}$)
 $t_{pd} = 42.0\text{ ns (max)}$ ($V_{CC} = 1.2\text{ V}$)
- 3.6 V tolerant inputs and outputs.
- Output current: $I_{OH}/I_{OL} = \pm 24\text{ mA (min)}$ ($V_{CC} = 3.0\text{ V}$)
 $I_{OH}/I_{OL} = \pm 18\text{ mA (min)}$ ($V_{CC} = 2.3\text{ V}$)
 $I_{OH}/I_{OL} = \pm 6\text{ mA (min)}$ ($V_{CC} = 1.65\text{ V}$)
 $I_{OH}/I_{OL} = \pm 2\text{ mA (min)}$ ($V_{CC} = 1.4\text{ V}$)
- Latch-up performance: -300 mA
- ESD performance: Machine model $\geq \pm 200\text{ V}$
Human body model $\geq \pm 2000\text{ V}$
- Package: TSSOP
VSSOP (US)
VQON
- Power down protection is provided on all inputs and outputs.



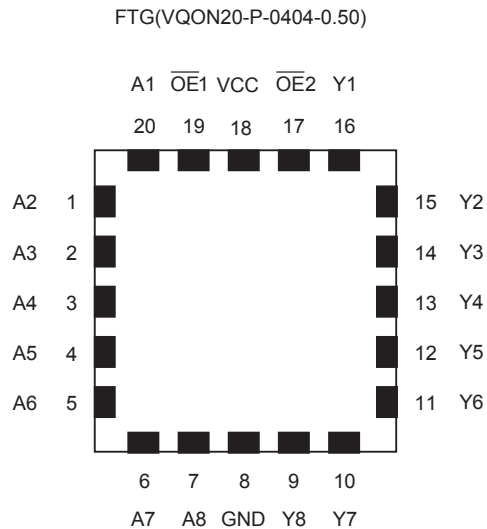
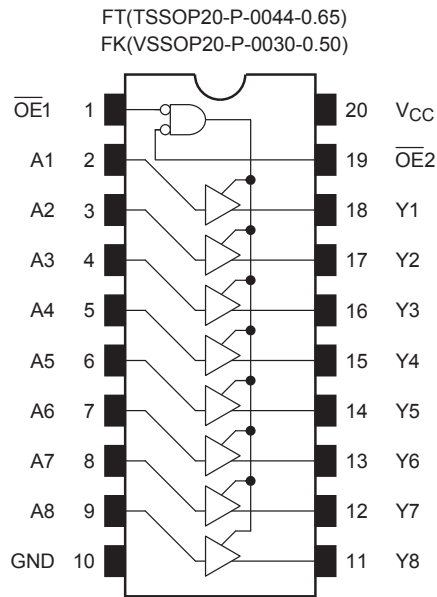
Weight	
TSSOP20-P-0044-0.65A	: 0.08 g (typ.)
VSSOP20-P-0030-0.50	: 0.03 g (typ.)
VQON20-P-0404-0.50	: 0.0145g (typ.)

Note 1: When mounting VQON package, the type of recommended flux is RA or RMA.

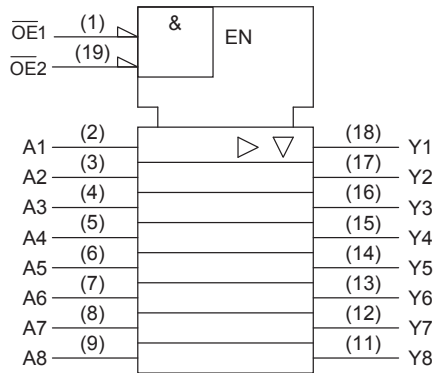
TOSHIBA

TC74VCX541FT/FK/FTG

Pin Assignment (top view)



IEC Logic Level



Truth Table

Inputs			Outputs
OE1	OE2	A _n	
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L

X: Don't care

Z: High impedance

TOSHIBA**TC74VHC157F/FN/FT**

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74VHC157F, TC74VHC157FN, TC74VHC157FT**QUAD 2-CHANNEL MULTIPLEXER**

The TC74VHC157 is an advanced high speed CMOS QUAD 2-CHANNEL MULTIPLEXER fabricated with silicon gate C²MOS technology.

It achieves the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation.

It consists of four 2-input digital multiplexers with common select and strobe inputs.

When the **STROBE** input is held "H" level, selection of data is inhibited and all the outputs become "L" level.

The **SELECT** decoding determines whether the A or B inputs get routed to their corresponding Y outputs.

An Input protection circuit ensures that 0 to 5.5V can be applied to the input pins without regard to the supply voltage. This device can be used to interface 5V to 3V systems and on two supply systems such as battery back up. This circuit prevents device destruction due to mismatched supply and input voltages.

FEATURES :

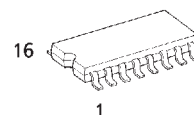
- High Speed..... $t_{pd} = 4.1\text{ns}(\text{typ.})$ at $V_{CC} = 5\text{V}$
- Low Power Dissipation..... $I_{CC} = 4\mu\text{A}(\text{Max.})$ at $T_a = 25^\circ\text{C}$
- High Noise Immunity..... $V_{NIH} = V_{NIL} = 28\% V_{CC} (\text{Min.})$
- Power Down Protection is provided on all inputs.
- Balanced Propagation Delays..... $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range..... $V_{CC} (\text{opr}) = 2\text{V} \sim 5.5\text{V}$
- Low Noise $V_{OLP} = 0.8\text{V} (\text{Max.})$
- Pin and Function Compatible with 74ALS157

TRUTH TABLE

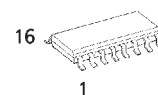
INPUTS				OUTPUT
$\overline{\text{ST}}$	SELECT	A	B	
H	X	X	X	L
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

X : Don't Care

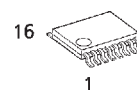
(Note) The JEDEC SOP (FN) is not available in Japan.



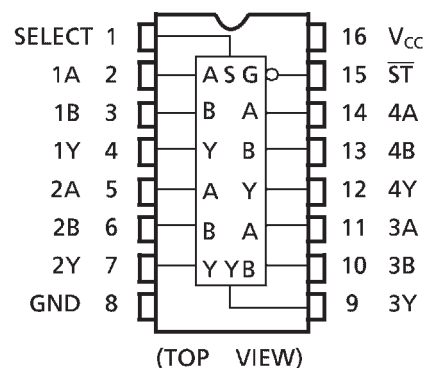
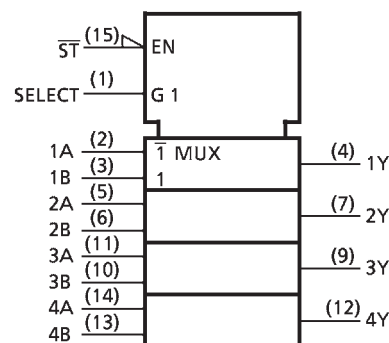
F (SOP16-P-300-1.27)
Weight : 0.18g (Typ.)



FN (SOL16-P-150-1.27)
Weight : 0.13g (Typ.)



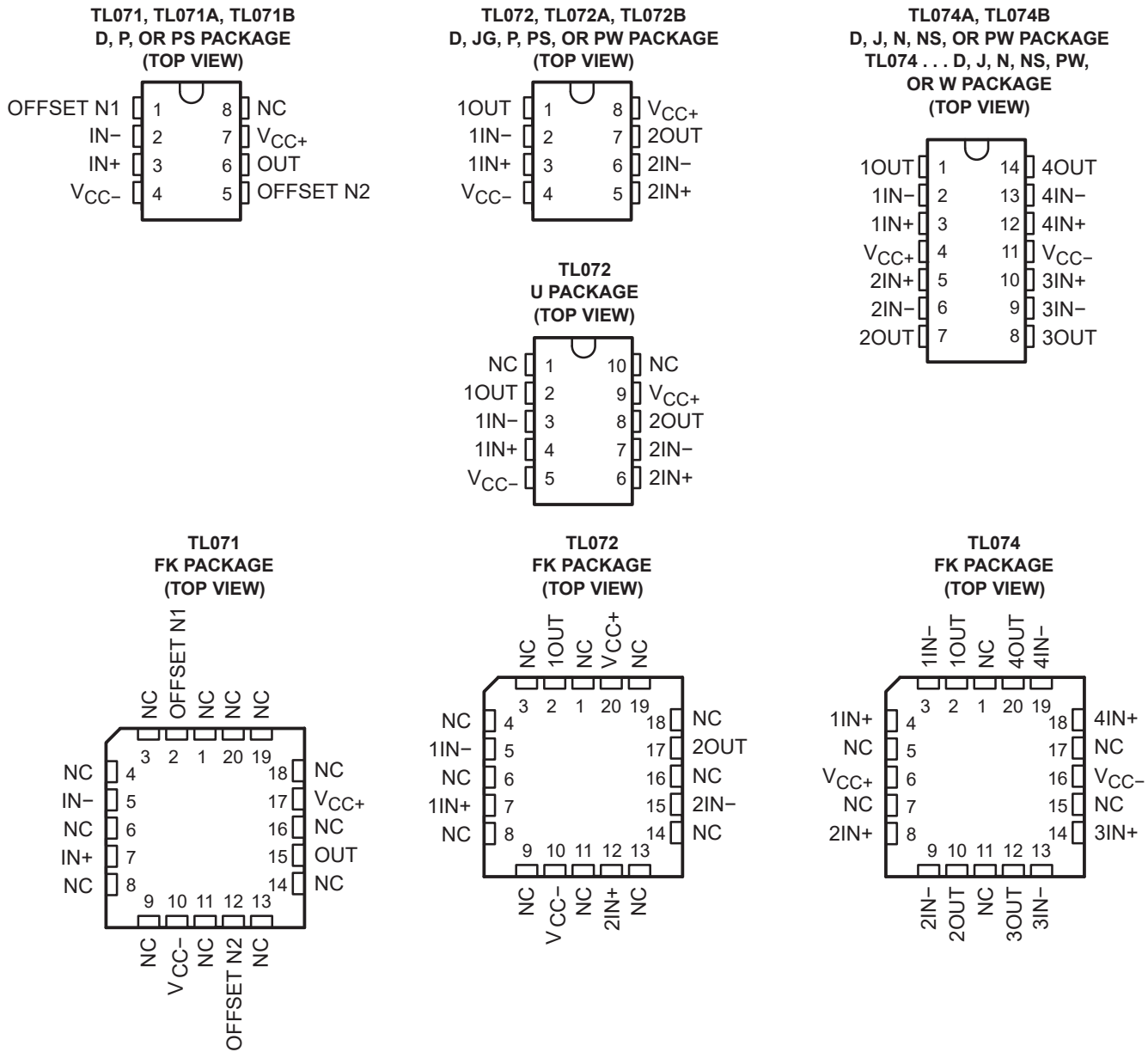
FT (TSSOP16-P-0044-0.65)
Weight : 0.06g (Typ.)

PIN ASSIGNMENT**IEC LOGIC SYMBOL**

980910EBA2

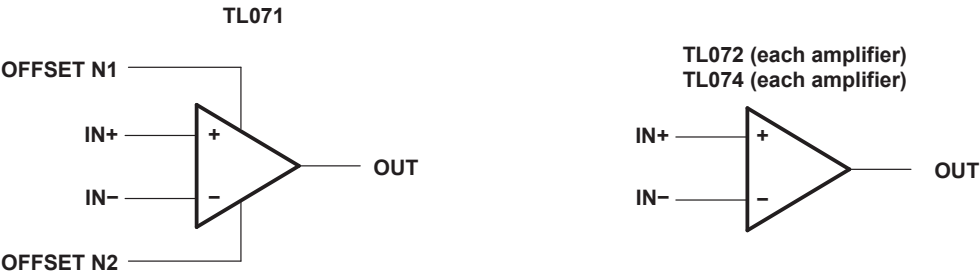
TL071, TL071A, TL071B, TL072
TL072A, TL072B, TL074, TL074A, TL074B
LOW-NOISE JFET-INPUT OPERATIONAL AMPLIFIERS

SLOS080J – SEPTEMBER 1978 – REVISED MARCH 2005



NC – No internal connection

symbols





TPS65251

www.ti.com

SLVSAA4B – JUNE 2010 – REVISED JANUARY 2011

4.5-V TO 18-V INPUT, HIGH CURRENT, SYNCHRONOUS STEP DOWN THREE BUCK SWITCHER WITH INTEGRATED FET

Check for Samples: [TPS65251](#)

FEATURES

- Wide Input Supply Voltage Range (4.5 V - 18 V)
- 0.8 V, 1% Accuracy Reference
- Continuous Loading: 3 A (Buck 1), 2 A (Buck 2 and 3)
- Maximum Current: 3.5 A (Buck 1), 2.5 A (Buck 2 and 3)
- Adjustable Switching Frequency 300 kHz - 2.2 MHz Set By External Resistor
- Dedicated Enable for Each Buck
- External Synchronization Pin for Oscillator
- External Enable/Sequencing and Soft Start Pins
- Adjustable Current Limit Set By External Resistor

- Soft Start Pins
- Current-Mode Control With Simple Compensation Circuit
- Power Good
- Optional Low Power Mode Operation for Light Loads
- QFN Package, 40-Pin 6 mm x 6 mm RHA

APPLICATIONS

- Set Top Boxes
- Blu-ray DVD
- DVR
- DTV
- Car Audio/Video
- Security Camera

DESCRIPTION/ORDERING INFORMATION

The TPS65251 features three synchronous wide input range high efficiency buck converters. The converters are designed to simplify its application while giving the designer the option to optimize their usage according to the target application.

The converters can operate in 5-, 9-, 12- or 15-V systems and have integrated power transistors. The output voltage can be set externally using a resistor divider to any value between 0.8 V and close to the input supply. Each converter features enable pin that allows a delayed start-up for sequencing purposes, soft start pin that allows adjustable soft-start time by choosing the soft-start capacitor, and a current limit (RLIMx) pin that enables designer to adjust current limit by selecting an external resistor and optimize the choice of inductor. The current mode control allows a simple RC compensation.

The switching frequency of the converters can either be set with an external resistor connected to ROSC pin or can be synchronized to an external clock connected to SYNC pin if needed. The switching regulators are designed to operate from 300 kHz to 2.2 MHz. 180° out of phase operation between Buck 1 and Buck 2, 3 (Buck 2 and 3 run in phase) minimizes the input filter requirements.

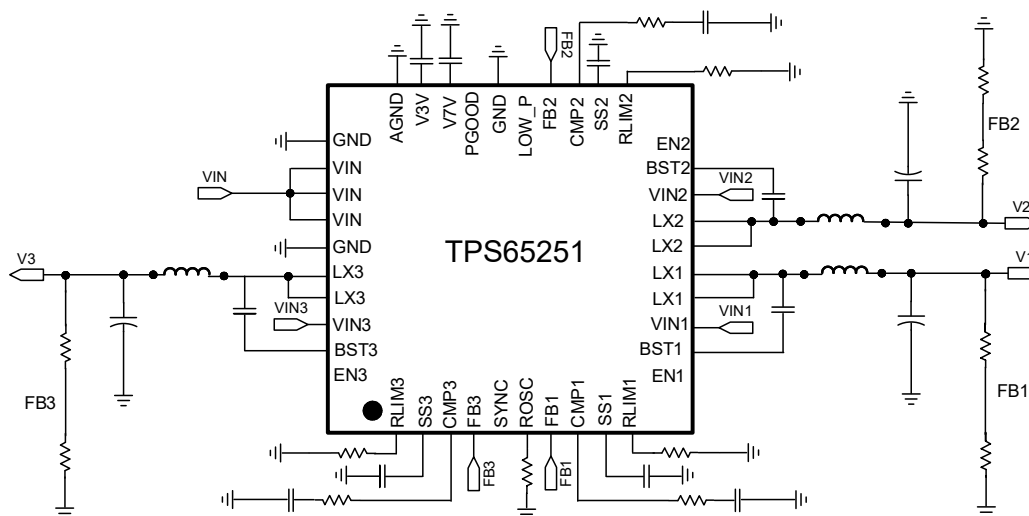
TPS65251 features a supervisor circuit that monitors each converter output. The PGOOD pin is asserted once sequencing is done, all PG signals are reported and a selectable end of reset time lapses. The polarity of the PGOOD signal is active high.

TPS65251 also features a light load pulse skipping mode (PSM) by allowing the LOW_P pin tied to V3V. The PSM mode allows for a reduction on the input power supplied to the system when the host processor is in stand-by (low activity) mode.

TPS65251

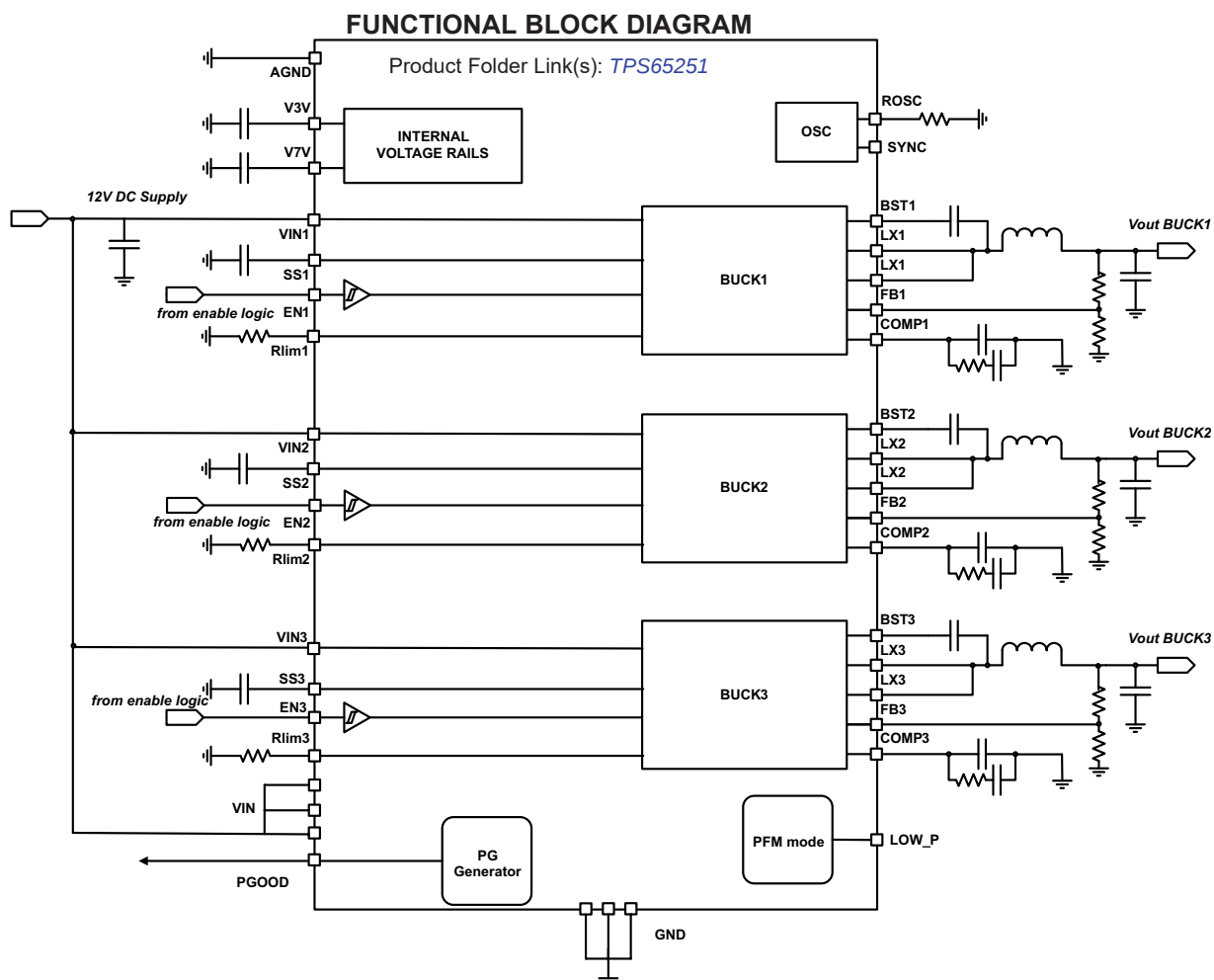
SLVSAA4B –JUNE 2010–REVISED JANUARY 2011

www.ti.com



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.



TPS65251

www.ti.com

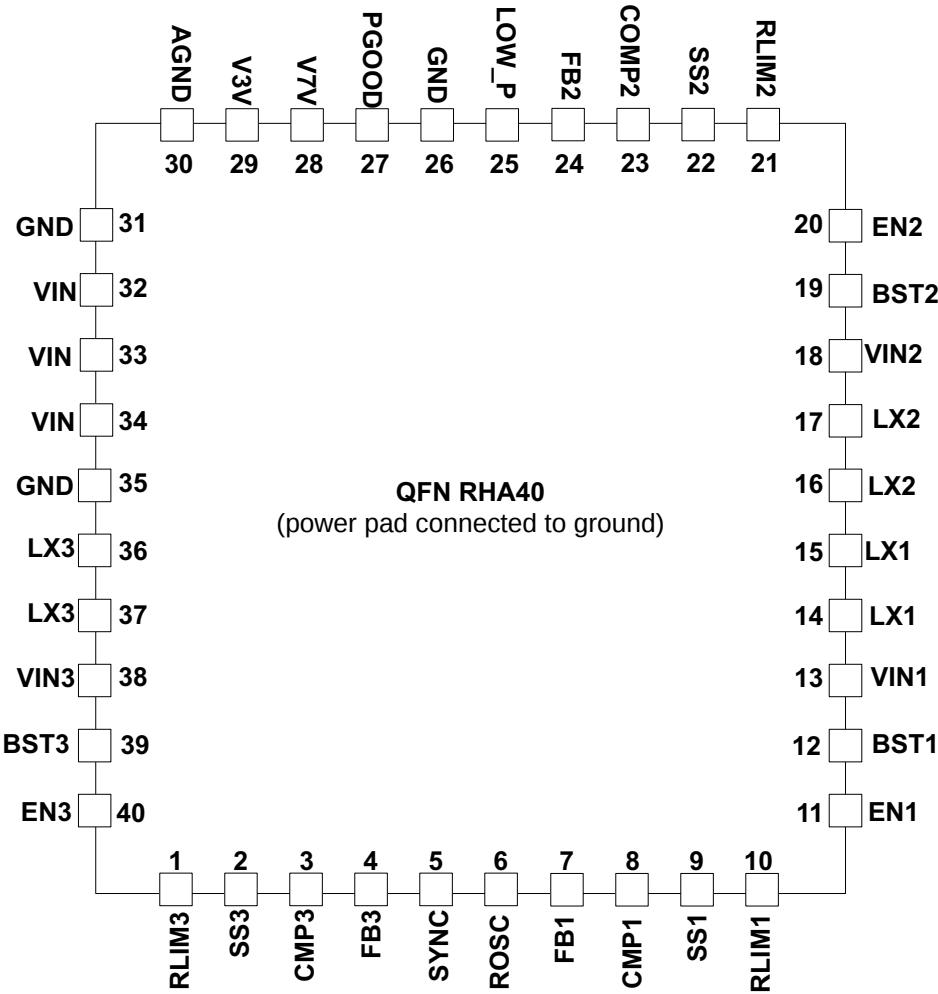
SLVSAA4B –JUNE 2010–REVISED JANUARY 2011

ORDERING INFORMATION⁽¹⁾

T _A	PACKAGE ⁽²⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 125°C	40-pin (QFN) - RHA	Reel of 2500	TPS65251RHAR	TPS65251
		Reel of 250	TPS65251RHAT	

- (1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.
- (2) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

PIN OUT



TPS65251

SLVSAA4B –JUNE 2010–REVISED JANUARY 2011

www.ti.com

TERMINAL FUNCTIONS (DCA)

NAME	NO.	I/O	DESCRIPTION
RLIM3	1	I	Current limit setting for Buck 3. Fit a resistor from this pin to ground to set the peak current limit on the output inductor.
SS3	2	I	Soft start pin for Buck 3. Fit a small ceramic capacitor to this pin to set the converter soft start time.
COMP3	3	O	Compensation for Buck 3. Fit a series RC circuit to this pin to complete the compensation circuit of this converter.
FB3	4	I	Feedback input for Buck 3. Connect a divider set to 0.8V from the output of the converter to ground.
SYNC	5	I	Synchronous clock input. If there is a sync clock in the system, connect to the pin. When not used connect to GND.
ROSC	6	I	Oscillator set. This resistor sets the frequency of internal autonomous clock. If external synchronization is used resistor should be fitted and set to ~70% of external clock frequency.
FB1	7	I	Feedback pin for Buck 1. Connect a divider set to 0.8 V from the output of the converter to ground.
COMP1	8	O	Compensation pin for Buck 1. Fit a series RC circuit to this pin to complete the compensation circuit of this converter.
SS1	9	I	Soft start pin for Buck 1. Fit a small ceramic capacitor to this pin to set the converter soft start time.
RLIM1	10	I	Current limit setting pin for Buck 1. Fit a resistor from this pin to ground to set the peak current limit on the output inductor.
EN1	11	I	Enable pin for Buck 1. A low level signal on this pin disables it. If pin is left open a weak internal pull-up to V3V will allow for automatic enable. For a delayed start-up add a small ceramic capacitor from this pin to ground.
BST1	12	I	Bootstrap capacitor for Buck 1. Fit a 47-nF ceramic capacitor from this pin to the switching node.
VIN1	13	I	Input supply for Buck 1. Fit a 10-μF ceramic capacitor close to this pin.
LX1	14, 15	O	Switching node for Buck 1
LX2	16, 17	O	Switching node for Buck 2
VIN2	18	I	Input supply for Buck 2. Fit a 10-μF ceramic capacitor close to this pin.
BST2	19	I	Bootstrap capacitor for Buck 2. Fit a 47-nF ceramic capacitor from this pin to the switching node.
EN2	20	I	Enable pin for Buck 2. A low level signal on this pin disables it. If pin is left open a weak internal pull-up to V3V will allow for automatic enable. For a delayed start-up add a small ceramic capacitor from this pin to ground.
RLIM2	21	I	Current limit setting for Buck 2. Fit a resistor from this pin to ground to set the peak current limit on the output inductor.
SS2	22	I	Soft start pin for Buck 2. Fit a small ceramic capacitor to this pin to set the converter soft start time.
COMP2	23	O	Compensation pin for Buck 2. Fit a series RC circuit to this pin to complete the compensation circuit of this converter
FB2	24	I	Feedback input for Buck 2. Connect a divider set to 0.8 V from the output of the converter to ground.
LOW_P	25	I	Low power operation mode(active high) input for TPS65251
GND	26		Ground pin
PGOOD	27	O	Power good. Open drain output asserted after all converters are sequenced and within regulation. Polarity is factory selectable (active high default).
V7V	28	O	Internal supply. Connect a 10-μF ceramic capacitor from this pin to ground.
V3V	29	O	Internal supply. Connect a 10-μF ceramic capacitor from this pin to ground.
AGND	30		Analog ground. Connect all GND pins and the power pad together.
GND	31		Ground pin

TPS65251

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TERMINAL FUNCTIONS (DCA) (continued)

NAME	NO.	I/O	DESCRIPTION
VIN	32	I	Input supply
VIN	33	I	Input supply
VIN	34	I	Input supply
GND	35		Ground pin
LX3	36, 37	O	Switching node for Buck 3
VIN3	38		Input supply for Buck 3. Fit a 10- μ F ceramic capacitor close to this pin.
BST3	39	I	Bootstrap capacitor for Buck 3. Fit a 47-nF ceramic capacitor from this pin to the switching node.
EN3	40	I	Enable pin for Buck 3. A low level signal on this pin disables it. If pin is left open a weak internal pull-up to V3V will allow for automatic enable. For a delayed start-up add a small ceramic capacitor from this pin to ground.
PAD			Power pad. Connect to ground.

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

over operating free-air temperature range (unless otherwise noted)

	Voltage range at VIN1, VIN2, VIN3, LX1, LX2, LX3	–0.3 to 18	V
	Voltage range at LX1, LX2, LX3 (maximum withstand voltage transient < 10 ns)	–1 to 18	V
	Voltage at BST1, BST2, BST3, referenced to Lx pin	–0.3 to 7	V
	Voltage at V7V, COMP1, COMP2, COMP3	–0.3 to 7	V
	Voltage at V3V, RLIM1, RLIM2, RLIM3, EN1, EN2, EN3, SS1, SS2, SS3, FB1, FB2, FB3, PGOOD, SYNC, ROSC, LOW_P	–0.3 to 3.6	V
	Voltage at AGND, GND	–0.3 to 0.3	V
T _J	Operating virtual junction temperature range	–40 to 125	°C
T _{STG}	Storage temperature range	–55 to 150	°C

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

over operating free-air temperature range (unless otherwise noted)

	MIN	NOM	MAX	UNIT
VIN Input operating voltage	4.5		18	V
T _J Junction temperature	–40		125	°C

ELECTROSTATIC DISCHARGE (ESD) PROTECTION

	MIN	MAX	UNIT
Human body model (HBM)	2000		V
Charge device model (CDM)	500		V

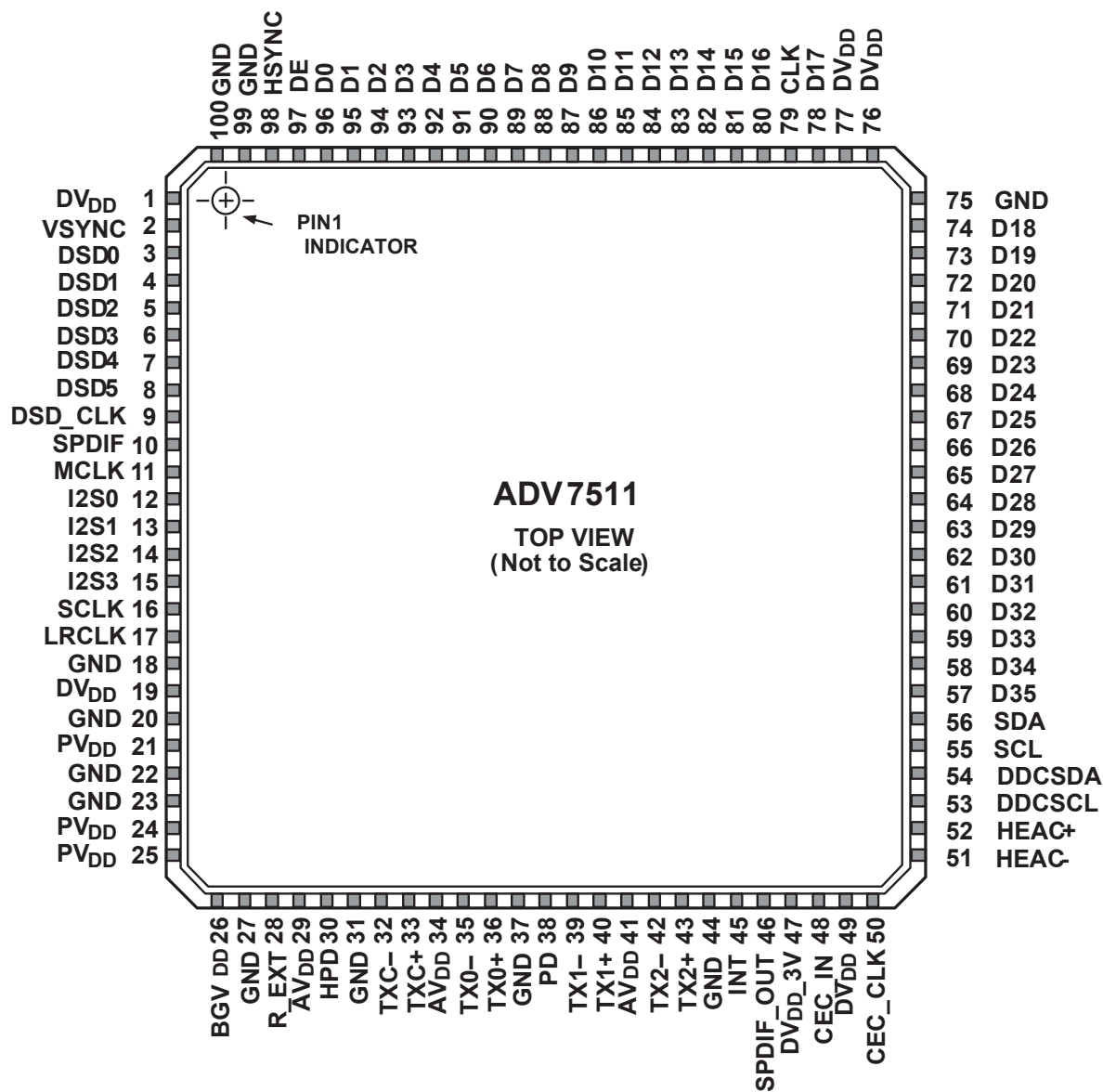
ADV7511 ADI Confidential

Rev. PrB

SECTION 5: PIN AND PACKAGE INFORMATION

This section shows the pinout of the ADV7511 100-lead LQFP package. This section also contains a brief description of the different pins as well as the mechanical drawings

Figure 6 100-lead LQFP configuration (top view - not to scale)



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Rev. PrB

Table 3 Complete Pinout List ADV7511

Pin No.	Mnemonic	Type ¹	Description
57-74, 78, 80-96	D[35:0]	I	Video Data Input. Digital input in RGB or YCbCr format. Supports typical CMOS logic levels from 1.8V up to 3.3V. See ►Figure 2 for timing details.
79	CLK	I	Video Clock Input. Supports typical CMOS logic levels from 1.8V up to 3.3V.
97	DE	I	Data Enable signal input for Digital Video. Supports typical CMOS logic levels from 1.8V up to 3.3V.
98	HSYNC	I	Horizontal Sync Input. Supports typical CMOS logic levels from 1.8V up to 3.3V.
2	VSYNC	I	Vertical Sync Input. Supports typical CMOS logic levels from 1.8V up to 3.3V.
28	R_EXT	I	Sets internal reference currents. Place 887 Ω resistor (1% tolerance) between this pin and ground.
51	HEAC-	I	HEAC- is one of a pair of differential lines for the ARC (Audio Return Channel)
52	HEAC+	I	HEAC+ is one of a pair of differential lines for the ARC (Audio Return Channel)
30	HPD	I	Hot Plug Detect signal input. This indicates to the interface whether the sink is connected. 1.8V to 5.0 V CMOS logic level.
10	S/PDIF	I	S/PDIF (Sony/Philips Digital Interface) Audio Input. This pin is typically used as the audio input from a Sony/Philips digital interface. Supports typical CMOS logic levels from 1.8V up to 3.3V. See ►Figure 4 for timing details.
46	S/PDIF_OUT	O	S/PDIF Audio Output from ARC receiver.
11	MCLK	I	Audio Reference Clock input. $128 \times N \times f_s$ with $N = 1, 2, 3$, or 4 . Set to $128 \times$ sampling frequency (f_s), $256 \times f_s$, $384 \times f_s$, or $512 \times f_s$. Supports typical CMOS logic levels from 1.8V up to 3.3V.
15-12	I ² S[3:0]	I	I ² S Audio Data Inputs. These represent the eight channels of audio (two per input) available through I ² S. Supports typical CMOS logic levels from 1.8V up to 3.3V. See Figure 3 for timing details.
16	SCLK	I	I ² S Audio Clock input. Supports typical CMOS logic levels from 1.8V up to 3.3V.
17	LRCLK	I	Left/Right Channel signal input. Supports typical CMOS logic levels from 1.8V up to 3.3V.
8-3	DSD[5:0]	I	DSD audio data inputs. See ►Figure 5 for timing details.
9	DSD_CLK	I	DSD Clock input. This is a 2.8224MHz clock for the DSD audio inputs.
38	PD/AD	I	Power-Down Control and I ² C Address Selection. The I ² C address and the PD polarity are set by the PD/AD pin state when the supplies are applied to the ADV7511. Supports typical CMOS logic levels from 1.8V up to 3.3V.
32, 33	TxC-/TxC+	O	Differential TMDS Clock Output. Differential clock output at pixel clock rate; TMDS logic level.
42, 43	Tx2-/Tx2+	O	Differential TMDS Output Channel 2. Differential output of the red data at $10 \times$ the pixel clock rate; TMDS logic level.
39, 40	Tx1-/Tx1+	O	Differential TMDS Output Channel 1. Differential output of the green data at $10 \times$ the pixel clock rate; TMDS logic level.
35, 36	Tx0-/Tx0+	O	Differential TMDS Output Channel 0. Differential output of the blue data at $10 \times$ the pixel clock rate; TMDS logic level.
45	INT	O	Interrupt signal output. CMOS logic level. A 2 k Ω pull-up resistor (10%) to interrupt the microcontroller IO supply is recommended.
29, 34, 41	AVDD	P	1.8V Power Supply for TMDS Outputs.
1, 19, 49, 76, 77	DVDD	P	1.8V Power Supply for Digital and I/O Power Supply. These pins supply power to the digital logic and I/Os. They should be filtered and as quiet as possible.
24, 25	PVDD	P	1.8V PLL Power Supply. These pins provide power to the digital portion of the clock PLL. The designer should provide quiet, noise-free power to these pins.
21	PLVDD	P	1.8V PLL Power Supply. The most sensitive portion of the ADV7511 is the clock generation circuitry. These pins provide power to the analog portion of the clock PLL (VCO). The designer should provide quiet, noise-free power to these pins.
26	BGVDD	P	Band Gap Vdd.

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47	MVDD	P	3.3V Power Supply.
18, 20, 22, 23, 27, 31, 37, 44, 46, 51, 75, 99, 100	GND	P	Ground. The ground return for all circuitry on-chip. It is recommended that the ADV7511 be assembled on a single, solid ground plane with careful attention given to ground current paths.
56	SDA	C	Serial Port Data I/O. This pin serves as the serial port data I/O slave for register access. Supports CMOS logic levels from 1.8V to 3.3V.
55	SCL	C	Serial Port Data Clock input. This pin serves as the serial port data clock slave for register access. Supports CMOS logic levels from 1.8V to 3.3V.
54	DDCSDA	C	Serial Port Data I/O to Sink. This pin serves as the master to the DDC bus. Tolerant of 5 V CMOS logic levels.
53	DDCSCL	C	Serial Port Data Clock to Sink. This pin serves as the master clock for the DDC bus. Tolerant of 5 V CMOS logic levels.
50	CEC_CLK	I	CEC clock. From 1MHz to 100Mhz. Supports CMOS logic levels from 1.8V to 5V.
48	CEC_IO	I/O	CEC data signal. Supports CMOS logic levels from 1.8V to 5V.

1. I = input, O = output, P = power supply, C = control



12-Bit, 170 MHz, Video and Graphics Digitizer with Quad HDMI Receiver

ADV7604

FEATURES

Three 12-bit ADCs

- ADC sampling rates up to 170 MHz
- 12-channel analog input mux
- 525i/625i component analog input
- 525p/625p component progressive scan support
- 720p/1080i/1080p/1250i component HDTV support
- Digitizes RGB graphics up to 1600 × 1200 at 60 Hz (UXGA)

VBI data slicer (including teletext)

Simultaneous HDMI and analog video sync processing

Ultralow jitter digital PLL

4:1 multiplexed HDMI receiver

HDMI 1.3a support

- 36-/30-/24-bit deep color support
- Flexible audio interface (DSD, DST, Dolby® TrueHD, DTS®-HD master audio, and DTS-HD high resolution audio)

225 MHz HDMI receiver

Repeater support

High-bandwidth digital content protection (HDCP 1.3)

Programmable/adaptive equalizer for cable lengths up to 30 meters

Internal EDID RAM

EDID with HDMI cable power support

CEC support

General

- S/PDIF (IEC90658-compatible) digital audio output
- Highly flexible output interface
- 12-bit 4:4:4/8-bit 4:2:2 DDR pixel output interface
- Dual STDI function support standard identification
- 2 any-to-any 3 × 3 color space conversion matrixes
- 2 programmable interrupt request output pins
- Advanced sync processing for robust sync extraction of poor video sources
- AV.Link support

APPLICATIONS

Advanced TV

- PDP HDTVs
- LCD TVs (HDTV ready)
- LCD/DLP® rear projection HDTVs
- CRT HDTVs
- LCoS™ HDTVs

AVR video receivers

LCD/DLP front projectors

HDTV STBs with PVR

CRT HDTVs

DVD recorders with progressive scan input support

GENERAL DESCRIPTION

The ADV7604 is a high quality, single chip, multiformat video decoder, graphics digitizer with an integrated 4:1 multiplexed High-Definition Multimedia Interface (HDMI®) receiver.

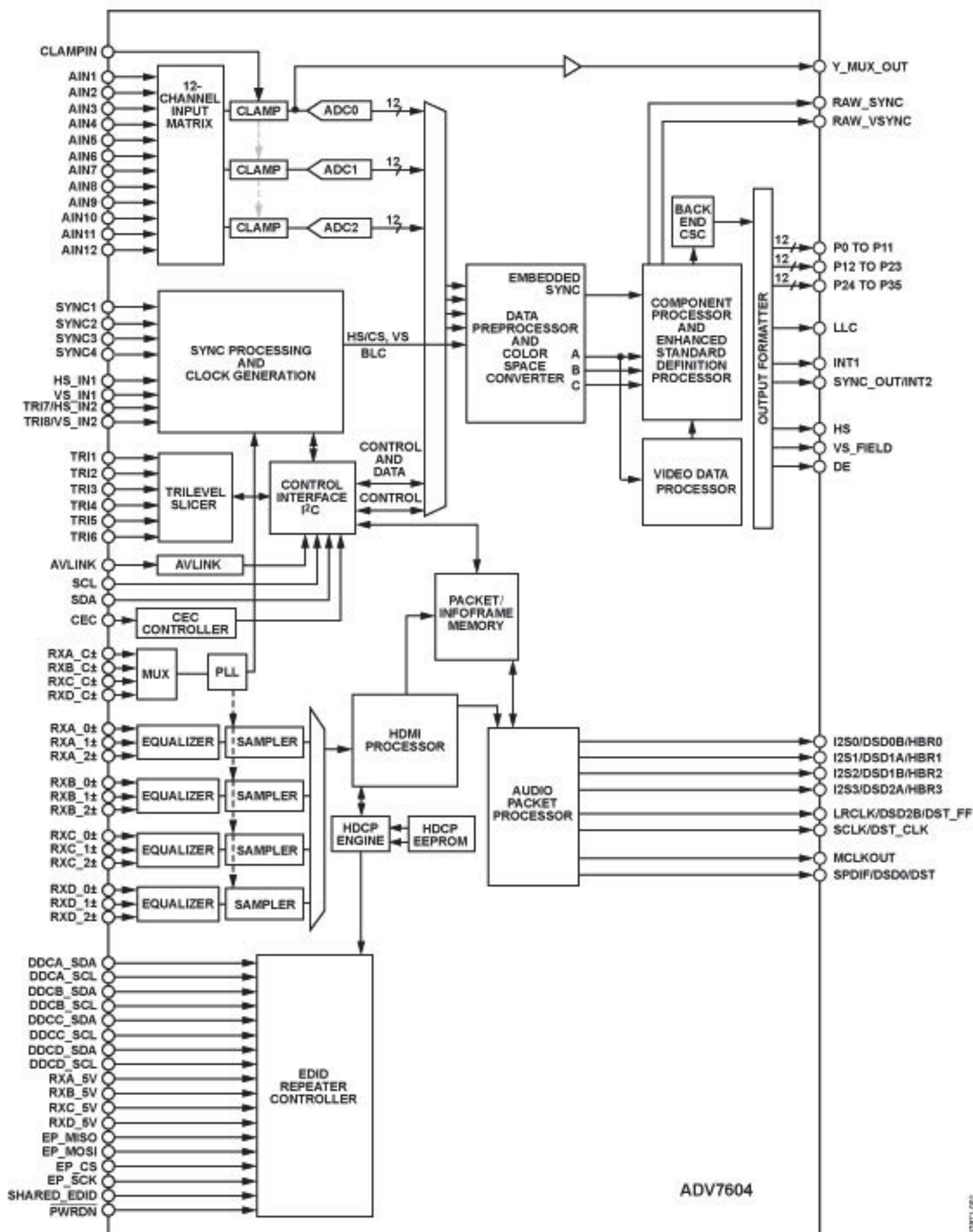
The ADV7604 contains one main component processor (CP) that processes YPrPb and RGB component formats, including RGB graphics. The CP also processes the video signals from the HDMI receiver. The ADV7604 can operate in quad HDMI and analog input mode, thus providing simultaneous HDMI and analog video sync processing. This allows for fast switching between HDMI and the ADCs.

The ADV7604 supports the decoding of a component RGB/YPrPb video signal into a digital YCrCb or RGB pixel output stream. The support for component video includes 525i, 625i, 525p, 625p, 720p, 1080i, 1080p, and 1250i standards as well as many other HD and SMPTE standards.

Graphics digitization is also supported by the ADV7604. The ADV7604 is capable of digitizing RGB graphics signals from VGA to UXGA rates and converting them into a digital RGB or YCrCb pixel output stream.

The ADV7604 incorporates a quad input HDMI-compatible receiver that supports all HDTV formats up to 1080p and display resolutions up to UXGA (1600 × 1200 at 60 Hz). The reception of encrypted video is possible with the inclusion of HDCP. The HDMI receiver also includes programmable/adaptive equalization that ensures robust operation of the interface with cable lengths up to 30 meters. The HDMI receiver has advanced audio functionality, such as a mute controller that prevents audible extraneous noise in the audio output.

Fabricated in an advanced CMOS process, the ADV7604 is provided in a space-saving, 260-ball 15 mm × 15 mm BGA surface-mount, RoHS-compliant package and is specified over the -40°C to +70°C temperature range.



ADV7604

Preliminary Information

BGA BALLOUT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
A	DGND	RXD_2-	RXD_1-	RXD_0-	RXD_C-	DGND	RXC_2-	RXC_1-	RXC_0-	RXC_C-	TVDD	RXB_2-	RXB_1-	RXB_0-	RXB_C-	TVDD	TVDD	DGND	A	
B	RXD_5V	RXD_2+	RXD_1+	RXD_0+	RXD_C+	TVDD	RXC_2+	RXC_1+	RXC_0+	RXC_C+	TVDD	RXB_2+	RXB_1+	RXB_0+	RXB_C+	TVDD	RXA_2+	RXA_1+	B	
C	PWRDNB	TVDD	TVDD	CVDD	DGND	TVDD	TVDD	DGND	DGND	DGND	TVDD	TVDD	DGND	DGND	DGND	DGND	RXA_1+	RXA_1-	C	
D	RXC_5V	RXB_5V	RXA_5V	DDCD_SD_A	DDCD_SCL	DDCC_SD_A	DDCC_SCL	CVDD	DGND	RTERM	CVDD	DDCB_SD_A	DDCB_SCL	DDCA_SCL	DDCA_SD_A	TVDD	RXA_0+	RXA_0-	D	
E	DE	CEC														DGND	DGND	RXA_C+	RXA_C-	E
F	HS	VS_FIELD	EP_MISO	EP_MOSI												DGND	CVDD	TVDD	DGND	F
G	P1	P0	EP_CS	EP_SCK														TEST1	TEST2	G
H	P3	P2	RAW_VSYN_C	RAW_VSYN_C												XTALP	AVDD	REFN	REFP	H
J	DGND	DGND	MCLKOUT	SPDIF												XTALN	AVDD	AGND	AGND	J
K	P4	P5	LRCLK	SCLK												AVDD	AVDD	AIN11	AIN12	K
L	P6	P7	I2S3	I2S2												TR16VBS_N2	TR17HS_N2	SYNC4	AIN10	L
M	P8	DGND	DGND	DGND												TR16	TR18	AGND	AGND	M
N	P9	DVDDIO	DVDDIO	DVDDIO												TR13	TR14	AIN9	AIN8	N
P	P10	P11	I2S0	I2S1												AVDD	AVDD	SYNC3	AIN7	P
R	P12	P13	DGND	DGND	SCL	DVDDIO	INT1	CLAMPIN	DVDDIO	DGND	FB_OUT	SHARED_EDID	HS_IN1	AGND	Y_Mux_out	TR12	AGND	AGND	R	
T	P14	P15	DGND	DGND	P25	DVDDIO	SDA	SYNC_CU_TANT2	DVDDIO	DGND	RESETB	AVLINK	VS_IN1	AGND	TR11	SYNC2	AIN5	AIN6	T	
U	P16	P17	P16	P21	P23	DGND	P26	DCLKIN	P28	DGND	P31	P33	P35	AGND	SYNC1	AVDD	AVDD	AIN4	U	
V	DGND	P18	P20	P22	P24	DGND	P27	LLC	P29	DGND	P30	P32	P34	AGND	AIN1	AIN2	AIN3	AGND	V	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		

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ADV7604

PIN DESCRIPTION

Pin	Mnemonic	Type	Function
1A	DGND	Ground	Ground
1B	RXD_5V	HDMI Input	5V detect pin for Port D in the HDMI interface.
1C	PWRDNB	Input	Active low system power detect. If low, EDID can be powered from +5V signal of HDMI port when connected to active equipment.
1D	RXC_5V	HDMI Input	5V detect pin for Port C in the HDMI interface.
1E	DE	Digital Video Output	DE (data enable) is a signal that indicates active pixel data.
1F	HS	Digital Video Output	HS is a horizontal synchronization output signal in the CP and HDMI processor.
1G	P1	Digital Video Output	Video pixel output port
1H	P3	Digital Video Output	Video pixel output port
1J	DGND	Ground	Ground
1K	P4	Digital Video Output	Video pixel output port
1L	P6	Digital Video Output	Video pixel output port
1M	P8	Digital Video Output	Video pixel output port
1N	P9	Digital Video Output	Video pixel output port
1P	P10	Digital Video Output	Video pixel output port
1R	P12	Digital Video Output	Video pixel output port
1T	P14	Digital Video Output	Video pixel output port
1U	P16	Digital Video Output	Video pixel output port
1V	DGND	Ground	Ground
2A	RXD_2-	HDMI Input	Digital Input Channel 2 complement of Port D in the HDMI interface.
2B	RXD_2+	HDMI Input	Digital Input Channel 2 true of Port D in the HDMI interface.
2C	TVDD	Power	Terminator supply voltage (3.3V)
2D	RXB_5V	HDMI Input	5V detect pin for Port B in the HDMI interface.
2E	CEC	Digital I/O	Consumer electronic control channel
2F	VS_FIELD	Digital Video Output	VS is a vertical synchronization output signal in the CP and HDMI processor. FIELD is a field synchronization output signal in all interlaced video modes. VS or FIELD can be configured for this pin.
2G	P0	Digital Video Output	Video pixel output port
2H	P2	Digital Video Output	Video pixel output port
2J	DGND	Ground	Ground
2K	P5	Digital Video Output	Video pixel output port
2L	P7	Digital Video Output	Video pixel output port
2M	DGND	Ground	Ground
2N	DVDDIO	Power	Digital I/O supply voltage (3.3V)
2P	P11	Digital Video Output	Video pixel output port
2R	P13	Digital Video Output	Video pixel output port
2T	P15	Digital Video Output	Video pixel output port
2U	P17	Digital Video Output	Video pixel output port
2V	P18	Digital Video Output	Video pixel output port
3A	RXD_1-	HDMI Input	Digital Input Channel 1 complement of Port D in the HDMI interface.
3B	RXD_1+	HDMI Input	Digital Input Channel 1 true of Port D in the HDMI interface.
3C	TVDD	Power	Terminator supply voltage (3.3V)
3D	RXA_5V	HDMI Input	5V detect pin for Port A in the HDMI interface.
3F	EP_MISO	Digital Input	SPI Master In/Slave Out for External EDID Interface
3G	EP_CS	Digital Output	SPI Chip Select for External EDID Interface
3H	RAW_VSYNC	Analog Output	This pin outputs the raw-sliced, embedded CSync or raw digital HS/CS.
3J	MCLKOUT	Misc Digital	Audio master clock output.
3K	LRCLK	Misc Digital	Data output clock for left and right audio channels.
3L	I2S3	Misc Digital	I2S Audio (Channel 7 and Channel 8).
3M	DGND	Ground	Ground
3N	DVDDIO	Power	Digital I/O supply voltage (3.3V)

ADV7604

Preliminary Information

3P	I2S0	Misc Digital	I ² S Audio (Channel 1 and Channel 2).
3R	DGND	Ground	Ground
3T	DGND	Ground	Ground
3U	P19	Digital Video Output	Video pixel output port
3V	P20	Digital Video Output	Video pixel output port
4A	RXD_0-	HDMI Input	Digital Input Channel 0 complement of Port D in the HDMI interface.
4B	RXD_0+	HDMI Input	Digital Input Channel 0 true of Port D in the HDMI interface.
4C	CVDD	Power	Comparator supply voltage (1.8V)
4D	DDCD_SDA	HDMI Input	HDCP slave serial clock Port D. DDCD_SDA is a 3.3 V input that is 5 V tolerant.
4F	EP_MOSI	Digital Input	SPI Master Out/SLAVE OUT for External EDID Interface
4G	EP_SCK	Digital Output	SPI Clock for External EDID Interface
4H	RAW_SYNC	Analog Output	This pin outputs the raw-sliced, embedded CSync or raw digital HS/CS.
4J	SPDIF	Misc Digital	S/PDIF digital audio output.
4K	SCLK	Misc Digital	Audio serial clock output.
4L	I2S2	Misc Digital	I ² S Audio (Channel 5 and Channel 6).
4M	DGND	Ground	Ground
4N	DVDDIO	Power	Digital I/O supply voltage (3.3V)
4P	I2S1	Misc Digital	I ² S Audio (Channel 3 and Channel 4).
4R	DGND	Ground	Ground
4T	DGND	Ground	Ground
4U	P21	Digital Video Output	Video pixel output port
4V	P22	Digital Video Output	Video pixel output port
5A	RXD_C-	HDMI Input	Digital input clock complement of Port D in the HDMI interface.
5B	RXD_C+	HDMI Input	Digital input clock true of Port D in the HDMI interface.
5C	DGND	Ground	Ground
5D	DDCD_SCL	HDMI Input	HDCP slave serial clock Port D. DDCD_SCL is a 3.3 V input that is 5 V tolerant.
5R	SCL	Misc Digital	I ² C port serial clock input (maximum clock rate of 400 kHz). SCL is the clock line for the control port.
5T	P25	Digital Video Output	Video pixel output port
5U	P23	Digital Video Output	Video pixel output port
5V	P24	Digital Video Output	Video pixel output port
6A	DGND	Ground	Ground
6B	TVDD	Power	Terminator supply voltage (3.3V)
6C	TVDD	Power	Terminator supply voltage (3.3V)
6D	DDCC_SDA	HDMI Input	HDCP slave serial clock Port C. DDCC_SDA is a 3.3 V input that is 5 V tolerant.
6R	DVDDIO	Power	Digital I/O supply voltage (3.3V)
6T	DVDDIO	Power	Digital I/O supply voltage (3.3V)
6U	DGND	Ground	Ground
6V	DGND	Ground	Ground
7A	RXC_2-	HDMI Input	Digital Input Channel 2 complement of Port C in the HDMI interface.
7B	RXC_2+	HDMI Input	Digital Input Channel 2 true of Port C in the HDMI interface.
7C	TVDD	Power	Terminator supply voltage (3.3V)
7D	DDCC_SCL	HDMI Input	HDCP slave serial clock Port C. DDCC_SCL is a 3.3 V input that is 5 V tolerant.
7G	DGND	Ground	Ground
7H	DGND	Ground	Ground
7J	DVDD	Power	Digital supply voltage (1.8 V).
7K	DVDD	Power	Digital supply voltage (1.8 V).
7L	DVDD	Power	Digital supply voltage (1.8 V).
7M	DVDD	Power	Digital supply voltage (1.8 V).
7R	INT1	Misc Digital	Interrupt pin 1, can be active low or active high. When status bits change, this pin is triggered. The events that trigger an interrupt are under user control.
7T	SDA	Misc Digital	I ² C port serial data input/output pin. SDA is the data line for the control port.
7U	P26	Digital Video Output	Video pixel output port
7V	P27	Digital Video Output	Video pixel output port

Preliminary Information

ADV7604

8A	RXC_1-	HDMI Input	Digital Input Channel 1 complement of Port C in the HDMI interface.
8B	RXC_1+	HDMI Input	Digital Input Channel 1 true of Port C in the HDMI interface.
8C	DGND	Ground	Ground
8D	CVDD	Power	Comparator supply voltage (1.8V)
8G	DGND	Ground	Ground
8H	DGND	Ground	Ground
8J	DGND	Ground	Ground
8K	DVDD	Power	Digital supply voltage (1.8 V).
8L	DVDD	Power	Digital supply voltage (1.8 V).
8M	DVDD	Power	Digital supply voltage (1.8 V).
8R	CLAMPIN	External Clamp	External clamp signal. This is an optional mode of operation for the ADV7604.
8T	SYNC_OUT/INT2	Misc Digital	Interrupt pin 2, can be active low or active high. When status bits change, this pin is triggered. The events that trigger an interrupt are under user control.
8U	DCLKIN	External Clock and Clamp	External clock for ADC sampling. This is an optional mode of operation for the ADV7604.
8V	LLC	Digital Video Output	Line locked output clock for the pixel data (range is 13.5 MHz to 170 MHz).
9A	RXC_0-	HDMI Input	Digital Input Channel 0 complement of Port C in the HDMI interface.
9B	RXC_0+	HDMI Input	Digital Input Channel 0 true of Port C in the HDMI interface.
9C	DGND	Ground	Ground
9D	DGND	Ground	Ground
9G	DGND	Ground	Ground
9H	DGND	Ground	Ground
9J	DGND	Ground	Ground
9K	DGND	Ground	Ground
9L	DGND	Ground	Ground
9M	DGND	Ground	Ground
9R	DVDDIO	Power	Digital I/O supply voltage (3.3V)
9T	DVDDIO	Power	Digital I/O supply voltage (3.3V)
9U	P28	Digital Video Output	Video pixel output port
9V	P29	Digital Video Output	Video pixel output port
10A	RXC_C-	HDMI Input	Digital input clock complement of Port C in the HDMI interface.
10B	RXC_C+	HDMI Input	Digital input clock true of Port C in the HDMI interface.
10C	DGND	Ground	Ground
10D	RTERM	Misc Analog	Sets internal termination resistance. A 500 Ω resistor between this pin and GND should be used.
10G	DGND	Ground	Ground
10H	DGND	Ground	Ground
10J	DGND	Ground	Ground
10K	DGND	Ground	Ground
10L	DGND	Ground	Ground
10M	DGND	Ground	Ground
10R	DGND	Ground	Ground
10T	DGND	Ground	Ground
10U	DGND	Ground	Ground
10V	DGND	Ground	Ground
11A	TVDD	Power	Terminator supply voltage (3.3V)
11B	TVDD	Power	Terminator supply voltage (3.3V)
11C	TVDD	Power	Terminator supply voltage (3.3V)
11D	CVDD	Power	Comparator supply voltage (1.8V)
11G	PVDD	Power	PLL supply voltage (1.8 V).
11H	AGND	Ground	Ground
11J	AGND	Ground	Ground
11K	AGND	Ground	Ground
11L	AGND	Ground	Ground

ADV7604

Preliminary Information

11M	AGND	Ground	Ground
11R	FB_OUT	Misc Digital	FB output; this is the muxed fast blank output from TRI1 to TRIB (programmable).
11T	RESETB	Misc Digital	Chip Reset. Active low. Minimum low time for a reset to take place is 5 ms.
11U	P31	Digital Video Output	Video pixel output port
11V	P30	Digital Video Output	Video pixel output port
12A	RXB_2-	HDMI Input	Digital Input Channel 2 complement of Port B in the HDMI interface.
12B	RXB_2+	HDMI Input	Digital Input Channel 2 true of Port B in the HDMI interface.
12C	TVDD	Power	Terminator supply voltage (3.3V)
12D	DDCB_SDA	HDMI Input	HDCP slave serial clock Port B. DDCB_SDA is a 3.3 V input that is 5 V tolerant.
12G	PVDD	Power	PLL supply voltage (1.8 V).
12H	AGND	Ground	Ground
12J	AGND	Ground	Ground
12K	AVDD	Power	Analog supply voltage (1.8V)
12L	AVDD	Power	Analog supply voltage (1.8V)
12M	AVDD	Power	Analog supply voltage (1.8V)
12R	SHARED_EDID	Input	EDID flag. When high, all four HDMI ports share common EDID. When low, Port D does not share common EDID – Port D operates with a separate EDID.
12T	AVLINK	Digital I/O	Digital SCART control channel
12U	P33	Digital Video Output	Video pixel output port
12V	P32	Digital Video Output	Video pixel output port
13A	RXB_1-	HDMI Input	Digital Input Channel 1 complement of Port D in the HDMI interface.
13B	RXD_1+	HDMI Input	Digital Input Channel 1 true of Port D in the HDMI interface.
13C	DGND	Ground	Ground
13D	DDCB_SCL	HDMI Input	HDCP slave serial clock Port B. DDCB_SCL is a 3.3 V input that is 5 V tolerant.
13R	HS_IN1	Misc Analog	HS on Graphics Port 1. HS input signal is used in CP mode for 5-wire timing mode. HS_IN1 is a 3.3 V input that is 5 V tolerant.
13T	VS_IN1	Misc Analog	VS on Graphics Port 1. The VS input signal is used in CP mode for 5-wire timing mode. VS_IN1 is a 3.3 V input that is 5 V tolerant.
13U	P35	Digital Video Output	Video pixel output port
13V	P34	Digital Video Output	Video pixel output port
14A	RXB_0-	HDMI Input	Digital Input Channel 0 complement of Port B in the HDMI interface.
14B	RXB_0+	HDMI Input	Digital Input Channel 0 true of Port B in the HDMI interface.
14C	DGND	Ground	Ground
14D	DDCA_SCL	HDMI Input	HDCP slave serial clock Port A. DDCA_SCL is a 3.3 V input that is 5 V tolerant.
14R	AGND	Ground	Ground
14T	AGND	Ground	Ground
14U	AGND	Ground	Ground
14V	AGND	Ground	Ground
15A	RXB_C-	HDMI Input	Digital input clock complement of Port B in the HDMI interface.
15B	RXB_C+	HDMI Input	Digital input clock true of Port B in the HDMI interface.
15C	DGND	Ground	Ground
15D	DDCA_SDA	HDMI Input	HDCP slave serial clock Port A. DDCA_SDA is a 3.3 V input that is 5 V tolerant.
15E	DGND	Ground	Ground
15F	DGND	Ground	Ground
15H	XTALP	Misc Analog	Input pin for 28.63636 MHz crystal or can be overdriven by an external 1.8 V 28.63636 MHz clock oscillator source to clock the ADV7604. The following crystal frequencies are also supported: 24.576 MHz and 27.00 MHz.
15J	XTALN	Misc Analog	This pin should be connected to the 28.63636 MHz crystal or left as a no connect if an external 1.8 V 28.63636 MHz clock oscillator source is used to clock the ADV7604. In crystal mode, the crystal must be a fundamental crystal. The following crystal frequencies are also supported: 24.576 MHz and 27.00 MHz.
15K	AVDD	Power	Analog supply voltage (1.8V)
15L	VS_IN2	Misc Analog	Dual purpose pin. Trilevel/bilevel input on the SCART or D-terminal

Preliminary Information

ADV7604

15M	TRI5	Misc Analog	connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin. VS on Graphics Port 2. The VS input signal is used in CP mode for 5-wire timing mode. VS_IN2 is a 3.3 V input that is 5V tolerant.
15N	TRI3	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin.
15P	AVDD	Power	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin.
15R	Y_MUX_OUT	Misc Analog	Analog supply voltage (1.8V)
15T	TRI1	Misc Analog	Buffered output of the Y channel.
15U	SYNC1	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin.
15V	AIN1	Analog Video Input	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
16A	TVDD	Power	Analog video input channel
16B	TVDD	Power	Terminator supply voltage (3.3V)
16C	DGND	Ground	Terminator supply voltage (3.3V)
16D	TVDD	Power	Ground
16E	DGND	Ground	Terminator supply voltage (3.3V)
16F	CVDD	Power	Ground
16H	AVDD	Power	Comparator supply voltage (1.8V)
16J	AVDD	Power	Analog supply voltage (1.8V)
16K	AVDD	Power	Analog supply voltage (1.8V)
16L	TRI7/HS_IN2	Misc Analog	Analog supply voltage (1.8V)
16M	TRI6	Misc Analog	Dual purpose pin. Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin. HS on Graphics Port 2. The HS input signal is used in CP mode for 5-wire timing mode. HS_IN2 is a 3.3 V input that is 5V tolerant.
16N	TRI4	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin.
16P	AVDD	Power	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin.
16R	TRI2	Misc Analog	Analog supply voltage (1.8V)
16T	SYNC2	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I ² C. This signal can be buffered and output to the FBOUT pin.
16U	AVDD	Power	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
16V	AIN2	Analog Video Input	Analog supply voltage (1.8V)
17A	TVDD	Power	Analog video input channel
17B	RXA_2+	HDMI Input	Terminator supply voltage (3.3V)
17C	RXA_1+	HDMI Input	Digital Input Channel 2 complement of Port A in the HDMI interface.
17D	RXA_0+	HDMI Input	Digital Input Channel 1 complement of Port A in the HDMI interface.
17E	RXA_C+	HDMI Input	Digital Input Channel 0 complement of Port A in the HDMI interface.
17F	TVDD	Power	Digital input clock complement of Port A in the HDMI interface.
17G	TEST1	Test	Terminator supply voltage (3.3V)
17H	REFN	Misc Analog	Do not connect
17J	AGND	Ground	Internal voltage reference output.
17K	AIN11	Analog Video Input	Ground
17L	SYNC4	Misc Analog	Analog video input channel
17M	AGND	Ground	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
17N	AIN8	Analog Video Input	Ground
17P	SYNC3	Misc Analog	Analog video input channel
17R	AGND	Ground	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
17T	AIN5	Analog Video Input	Ground
17U	AVDD	Power	Analog video input channel
			Analog supply voltage (1.8V)



Advanced Analog Circuits

Data Sheet

DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Pin Configuration

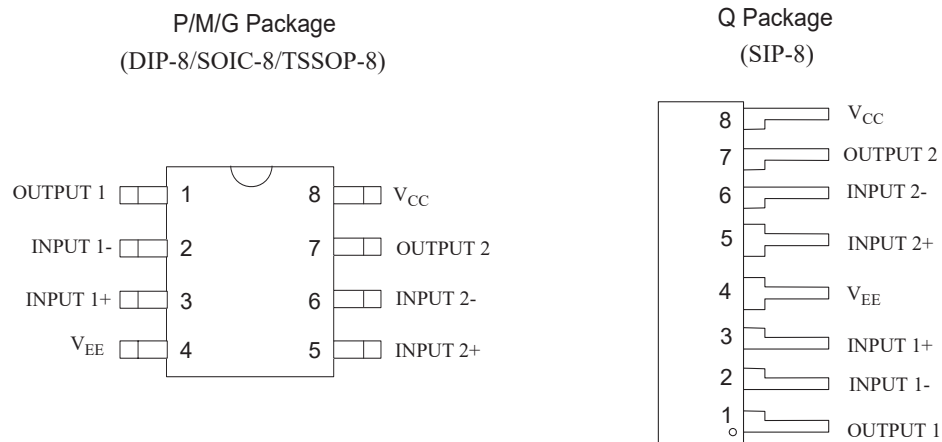


Figure 2. Pin Configuration of AZ4580 (Top View)

Pin Description

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	OUTPUT 1	2	INPUT 1-	3	INPUT 1+	4	VEE
5	INPUT 2+	6	INPUT 2-	7	OUTPUT 2	8	VCC



Data sheet acquired from Harris Semiconductor
SCHS063B – Revised July 2003

CMOS 8-Stage Shift-and-Store Bus Register

High-Voltage Types (20-Volt Rating)

■ CD4094B is an 8-stage serial shift register having a storage latch associated with each stage for strobing data from the serial input to parallel buffered 3-state outputs. The parallel outputs may be connected directly to common bus lines. Data is shifted on positive clock transitions. The data in each shift register stage is transferred to the storage register when the STROBE input is high. Data in the storage register appears at the outputs whenever the OUTPUT-ENABLE signal is high.

Two serial outputs are available for cascading a number of CD4094B devices. Data is available at the Q_S serial output terminal on positive clock edges to allow for high-speed operation in cascaded systems in which the

The CD4094B types are supplied in 16-lead hermetic dual-in-line ceramic packages (F3A suffix), 16-lead dual-in-line plastic packages (E suffix), 16-lead small-outline packages (NSR suffix), and 16-lead thin shrink small-outline packages (PW and PWR suffixes).

package (E suffix), and in chip form (H suffix).

Features:

- 3-state parallel outputs for connection to common bus
- Separate serial outputs synchronous to both positive and negative clock edges for cascading
- Medium speed operation – 5 MHz at 10 V (typ.)
- Standardized, symmetrical output characteristics
- 100% tested for quiescent current at 20 V
- Maximum input current of 1 μ A at 18 V over full package-temperature range; 100 nA at 18 V and 25°C
- Noise margin (full package temperature range):
1 V at V_{DD} = 5 V 2 V at V_{DD} = 10 V
2.5 V at V_{DD} = 15 V
- 5-V, 10-V, and 15-V parametric ratings
- Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of 'B' Series CMOS Devices"

Applications:

- Serial-to-parallel data conversion
- Remote control holding register
- Dual-rank shift, hold, and bus applications

CD4094B Types

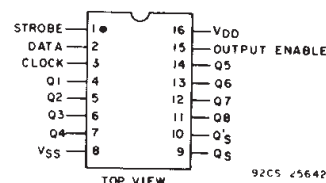
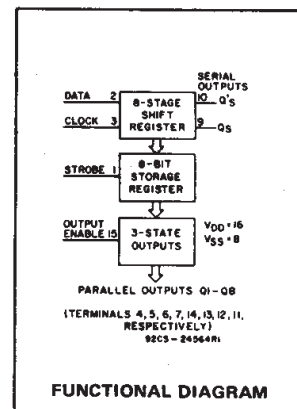


Fig. 1 – Terminal assignment.

MAXIMUM RATINGS, Absolute-Maximum Values:

DC SUPPLY-VOLTAGE RANGE, (V_{DD})

Voltages referenced to V_{SS} Terminal) -0.5V to +20V

INPUT VOLTAGE RANGE, ALL INPUTS -0.5V to V_{DD} +0.5V

DC INPUT CURRENT, ANY ONE INPUT ± 10 mA

POWER DISSIPATION PER PACKAGE (P_D):

For T_A = -55°C to +100°C 500mW

For T_A = +100°C to +125°C Derate Linearly at 12mW/°C to 200mW

DEVICE DISSIPATION PER OUTPUT TRANSISTOR

FOR T_A = FULL PACKAGE-TEMPERATURE RANGE (All Package Types) 100mW

OPERATING-TEMPERATURE RANGE (T_A) -55°C to +125°C

STORAGE TEMPERATURE RANGE (T_{stg}) -65°C to +150°C

LEAD TEMPERATURE (DURING SOLDERING):

At distance 1/16 $\pm$ 1/32 inch (1.59 $\pm$ 0.79mm) from case for 10s max +265°C

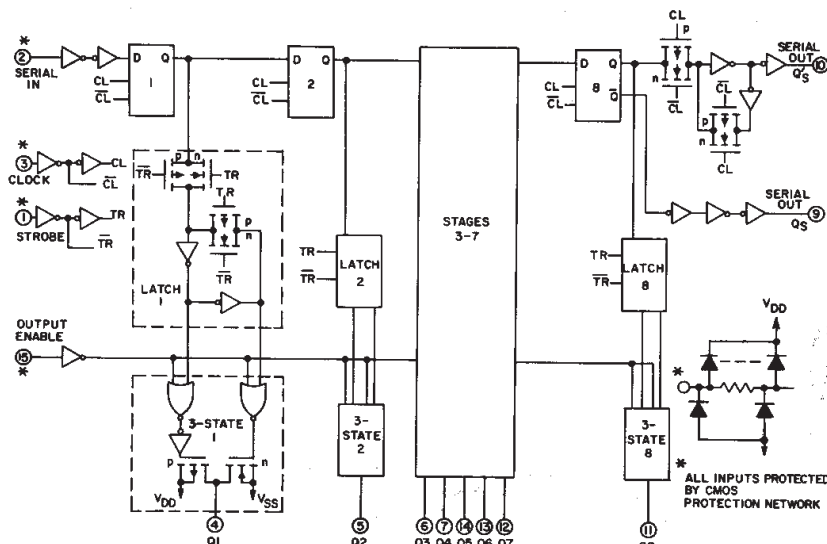


Fig. 2 – CD4094B Logic diagram.

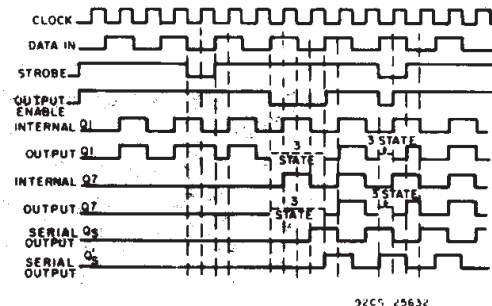


Fig. 3 – Timing diagram.

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CS42528

114 dB, 192 kHz 8-Ch Codec with S/PDIF Receiver

Features

- Eight 24-bit D/A, two 24-bit A/D Converters
- 114 dB DAC / 114 dB ADC Dynamic Range
- -100 dB THD+N
- System Sampling Rates up to 192 kHz
- S/PDIF Receiver Compatible with EIAJ CP1201 and IEC-60958
- Recovered S/PDIF Clock or System Clock Selection
- 8:2 S/PDIF Input MUX
- ADC High-pass Filter for DC Offset Calibration
- Expandable ADC Channels and One-line Mode Support
- Digital Output Volume Control with Soft Ramp
- Digital +/-15dB Input Gain Adjust for ADC
- Differential Analog Architecture
- Supports logic levels between 5 V and 1.8 V.

General Description

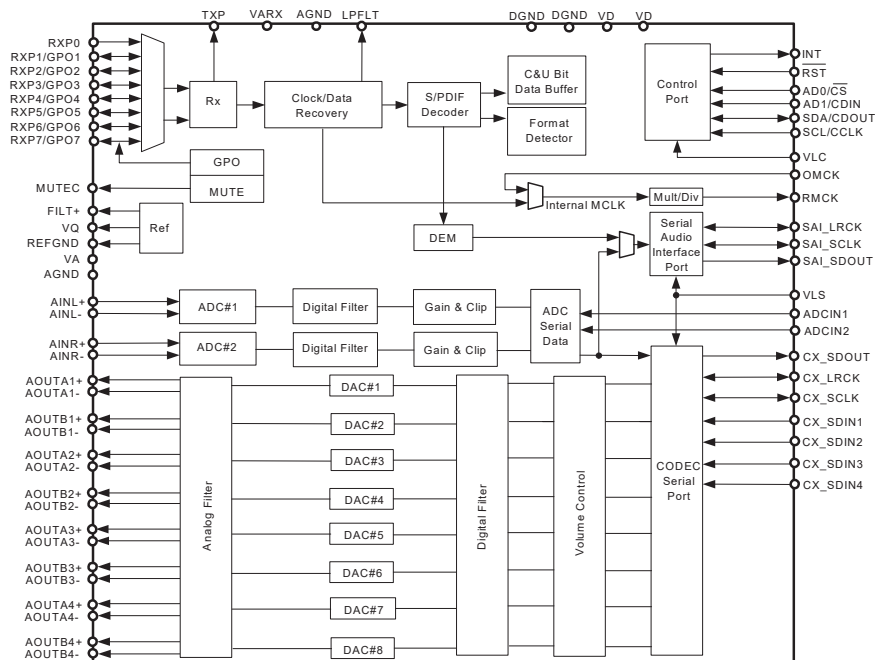
The CS42528 codec provides two analog-to-digital and eight digital-to-analog delta-sigma converters, as well as an integrated S/PDIF receiver, in a 64-pin LQFP package.

The CS42528 integrated S/PDIF receiver supports up to eight inputs, clock recovery circuitry and format auto-detection. The internal stereo ADC is capable of independent channel gain control for single-ended or differential analog inputs. All eight channels of DAC provide digital volume control and differential analog outputs. The general purpose outputs may be driven high or low, or mapped to a variety of DAC mute controls or ADC overflow indicators.

The CS42528 is ideal for audio systems requiring wide dynamic range, negligible distortion and low noise, such as A/V receivers, DVD receivers, digital speaker and automotive audio systems.

ORDERING INFORMATION

CS42528-CQZ	-10° to 70° C	64-pin LQFP	Lead Free
CS42528-DQZ	-40° to 85° C	64-pin LQFP	Lead Free
CDB42528	Evaluation Board		



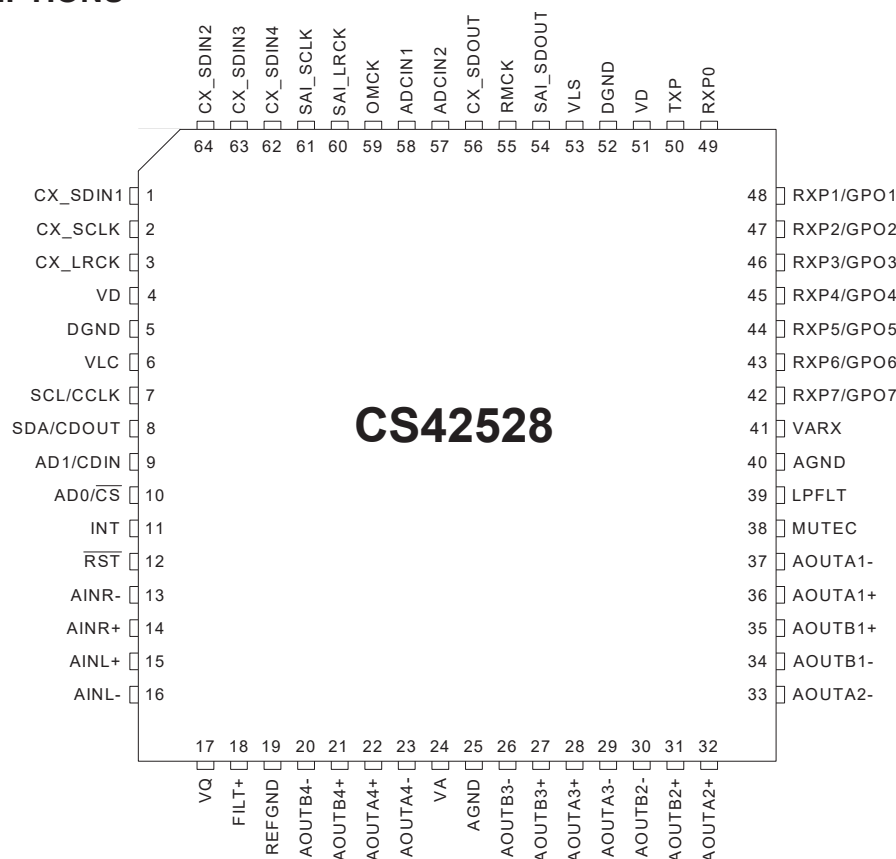
Preliminary Product Information

Cirrus Logic, Inc.
<http://www.cirrus.com>



CS42528

2. PIN DESCRIPTIONS



Pin Name	#	Pin Description
CX_SDIN1	1	Codec Serial Audio Data Input (Input) - Input for two's complement serial audio data.
CX_SDIN2	64	
CX_SDIN3	63	
CX_SDIN4	62	
CX_SCLK	2	CODEC Serial Clock (Input/Output) - Serial clock for the CODEC serial audio interface.
CX_LRCK	3	CODEC Left Right Clock (Input/Output) - Determines which channel, Left or Right, is currently active on the CODEC serial audio data line.
VD	4 51	Digital Power (Input) - Positive power supply for the digital section.
DGND	5 52	Digital Ground (Input) - Ground reference. Should be connected to digital ground.
VLC	6	Control Port Power (Input) - Determines the required signal level for the control port.
SCL/CCLK	7	Serial Control Port Clock (Input) - Serial clock for the serial control port. Requires an external pull-up resistor to the logic interface voltage in I ² C mode as shown in the Typical Connection Diagram.
SDA/CDOUT	8	Serial Control Data (Input/Output) - SDA is a data I/O line in I ² C mode and requires an external pull-up resistor to the logic interface voltage, as shown in the Typical Connection Diagram. CDOUT is the output data line for the control port interface in SPI mode.
AD1/CDIN	9	Address Bit 1 (I²C)/Serial Control Data (SPI) (Input) - AD1 is a chip address pin in I ² C mode; CDIN is the input data line for the control port interface in SPI mode.



CS42528

AD0/$\overline{\text{CS}}$	10	Address Bit 0 (I²C)/Control Port Chip Select (SPI) (Input) - AD0 is a chip address pin in I ² C mode; $\overline{\text{CS}}$ is the chip select signal in SPI mode.
INT	11	Interrupt (Output) - The CS42528 will generate an interrupt condition as per the Interrupt Mask register. See "Interrupts" on page 40 for more details.
RST	12	Reset (Input) - The device enters a low power mode and all internal registers are reset to their default settings when low.
AINR- AINR+	13 14	Differential Right Channel Analog Input (Input) - Signals are presented differentially to the delta-sigma modulators via the AINR+/- pins.
AINL+ AINL-	15 16	Differential Left Channel Analog Input (Input) - Signals are presented differentially to the delta-sigma modulators via the AINL+/- pins.
VQ	17	Quiescent Voltage (Output) - Filter connection for internal quiescent reference voltage.
FILT+	18	Positive Voltage Reference (Output) - Positive reference voltage for the internal sampling circuits.
REFGND	19	Reference Ground (Input) - Ground reference for the internal sampling circuits.
AOUTA1 +,- AOUTB1 +,- AOUTA2 +,- AOUTB2 +,- AOUTA3 +,- AOUTB3 +,- AOUTA4 +,- AOUTB4 +,-	36,37 35,34 32,33 31,30 28,29 27,26 22,23 21,20	Differential Analog Output (Output) - The full-scale differential analog output level is specified in the Analog Characteristics specification table.
VA VARX	24 41	Analog Power (Input) - Positive power supply for the analog section.
AGND	25 40	Analog Ground (Input) - Ground reference. Should be connected to analog ground.
MUTEC	38	Mute Control (Output) - The Mute Control pin outputs high impedance following an initial power-on condition or whenever the PDN bit is set to a '1', forcing the codec into power-down mode. The signal will remain in a high impedance state as long as the part is in power-down mode. The Mute Control pin goes to the selected "active" state during reset, muting, or if the master clock to left/right clock frequency ratio is incorrect. This pin is intended to be used as a control for external mute circuits to prevent the clicks and pops that can occur in any single supply system. The use of external mute circuits are not mandatory but may be desired for designs requiring the absolute minimum in extraneous clicks and pops.
LPFLT	39	PLL Loop Filter (Output) - An RC network should be connected between this pin and ground.
RXP7/GPO7 RXP6/GPO6 RXP5/GPO5 RXP4/GPO4 RXP3/GPO3 RXP2/GPO2 RXP1/GPO1	42 43 44 45 46 47 48	S/PDIF Receiver Input/ General Purpose Output (Input/Output) - Receiver inputs for S/PDIF encoded data. The CS42528 has an internal 8:2 multiplexer to select the active receiver port, according to the Receiver Mode Control 2 register. These pins can also be configured as general purpose output pins, ADC Overflow indicators or Mute Control outputs according to the RXP/General Purpose Pin Control registers.
RXP0	49	S/PDIF Receiver Input (Input) - Dedicated receiver input for S/PDIF encoded data.
TXP	50	S/PDIF Transmitter Output (Output) - S/PDIF encoded data output, mapped directly from one of the receiver inputs as indicated by the Receiver Mode Control 2 register.
VLS	53	Serial Port Interface Power (Input) - Determines the required signal level for the serial port interfaces.
SAI_SDOUT	54	Serial Audio Interface Serial Data Output (Output) - Output for two's complement serial audio PCM data from the S/PDIF incoming stream. This pin can also be configured to transmit the output of the internal and external ADCs.
RMCK	55	Recovered Master Clock (Output) - Recovered master clock output from the External Clock Reference (OMCK, pin 59) or the PLL which is locked to the incoming S/PDIF stream or CX_LRCK.



CS42528

CX_SDOOUT	56	CODEC Serial Data Output (<i>Output</i>) - Output for two's complement serial audio data from the internal and external ADCs.
ADCIN1	58	External ADC Serial Input (<i>Input</i>) - The CS42528 provides for up to two external stereo analog to digital converter inputs to provide a maximum of six channels on one serial data output line when the CS42528 is placed in One Line mode.
ADCIN2	57	
OMCK	59	External Reference Clock (<i>Input</i>) - External clock reference that must be within the ranges specified in the register "OMCK Frequency (OMCK Freqx)" on page 54.
SAI_LRCK	60	Serial Audio Interface Left/Right Clock (<i>Input/Output</i>) - Determines which channel, Left or Right, is currently active on the serial audio data line.
SAI_SCLK	61	Serial Audio Interface Serial Clock (<i>Input/Output</i>) - Serial clock for the Serial Audio Interface.



CS4970x4 Data Sheet

FEATURES

- ❑ Multi-standard 32-bit High Definition Audio Decoding plus Post-Processing
- ❑ Supports high-definition audio formats including:
 - Dolby Digital® Plus
 - Dolby® TrueHD
 - DTS-HD® High Resolution Audio
 - DTS-HD® Master Audio
 - DTS Express™
- ❑ Additional Applications Library
 - Dolby Digital® EX, Dolby® Pro Logic® IIz, Dolby Headphone 2®, Dolby® Virtual Speaker 2®, Audistry®
 - DTS-ES 96/24™ Discrete 7.1, DTS-ES™ Discrete 7.1, DTS-ES™ Matrix 6.1, DTS Neo:6®, DTS Neural Surround™
 - DSD®
 - MPEG-2 AAC™ LC 5.1
 - SRS® CS2®, SRS TruVolume™, SRS® TruSurround HD4™, WOW HD™,
 - THX® Ultra2™, THX® ReEQ™
 - Thomson MP3 Surround
 - Audyssey 2EQ™ Module
- ❑ Cirrus Logic's Applications Library
 - Cirrus Original Multi-Channel Surround 2 (COMS2), Cirrus Band Xpander™, Cirrus Virtualization Technology, Cirrus Intelligent Room Calibration 2 (IRC2)
 - Crossbar Mixer, Signal Generator
 - Advanced Post-Processors including: 7.1 Bass Manager, Tone Control, 11-Band Parametric EQ, Delay, 2:1/4:1 Decimator, 1:2/1:4 Upsampler

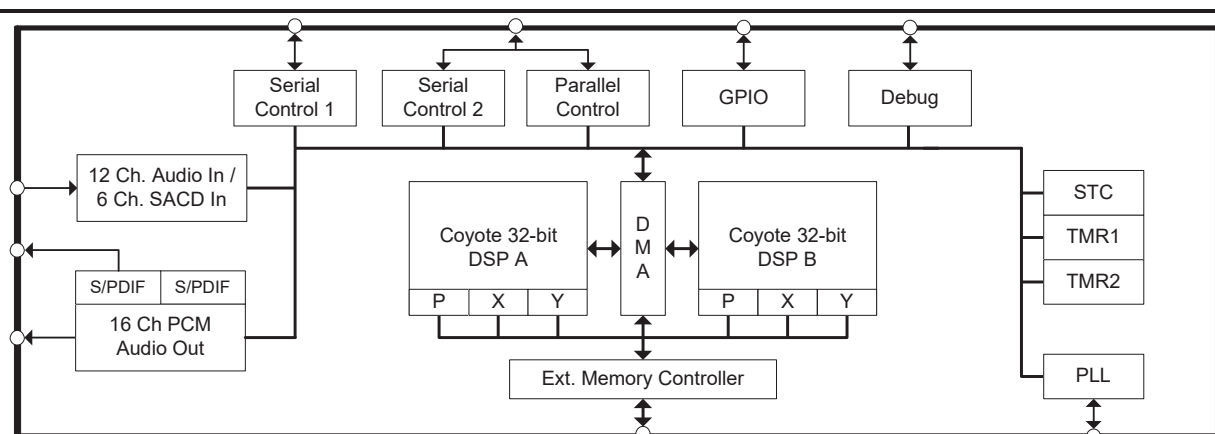
High Definition Audio Decoder DSP Family with Dual 32-bit DSP Engine Technology

- ❑ Up to 12 Channels of 32-bit Serial Audio Input
- ❑ Customer Software Security Keys
- ❑ 16 Ch x 32-bit PCM Out with Dual 192 kHz SPDIF Tx
- ❑ Two SPI™/I²C™ ports
- ❑ One Parallel Port (144-pin LQFP package only)
- ❑ Large On-chip X, Y, and Program RAM & ROM
- ❑ SDRAM and Serial Flash Memory Support

The CS4970x4 DSP family is an enhanced version of the CS4953x DSP family with higher overall performance. In addition to all the mainstream audio processing codes in on-chip ROM that the CS4953x DSP offers, the CS4970x4 device family also supports the decoding of major high-definition audio formats. Additionally, the CS4970x4, a dual-core device, performs the high-definition audio decoding on the first core, leaving the second core available for audio post-processing and audio enhancement. The CS4970x4 device supports the most demanding audio post processing requirements. It provides an easy upgrade path to systems currently using the CS495xx or CS4953x device with minor hardware and software changes.

Ordering Information

See [page 28](#) for ordering information.



Preliminary Product Information

This document contains information for a new product.
Cirrus Logic reserves the right to modify this product without notice.



8. Device Pin-Out Diagram

8.1 128-Pin LQFP Pin-Out Diagram

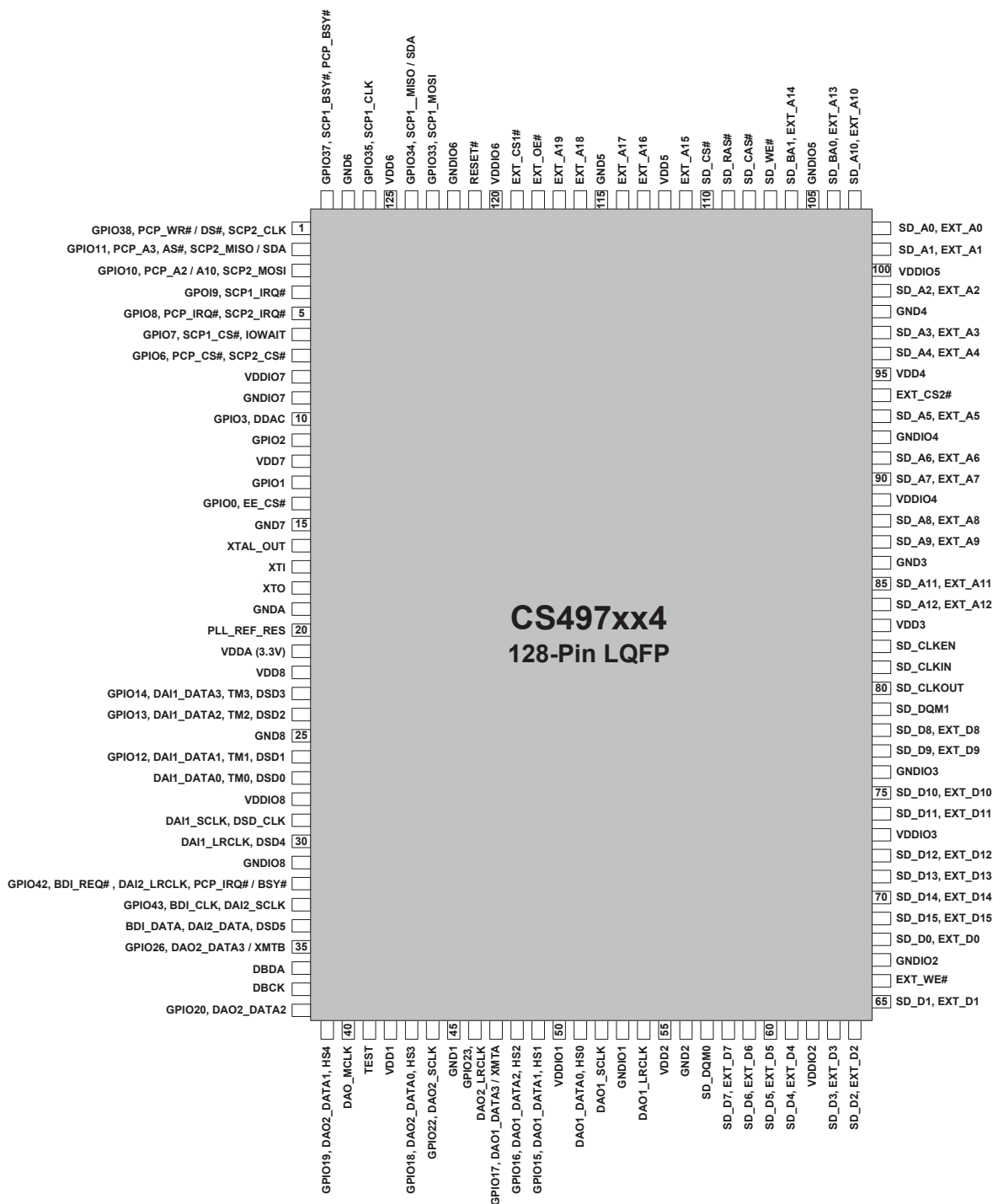


Figure 19. 128-Pin LQFP Pin-Out Diagram

KEC

SEMICONDUCTOR

TECHNICAL DATA

KIA1117BS/BF00~ KIA1117BS/BF50

BIPOLAR LINEAR INTEGRATED CIRCUIT

LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATOR

The KIA1117BS/BF × × Series are a Low Drop Voltage Regulator able to provide up to 1A of output current, available even in adjustable version ($V_{ref}=1.25V$)

FEATURES

- Low Dropout Voltage : 1.1V/Typ. ($I_{out}=1.0A$)
- Very Low Quiescent Current : 2.5 mA/Typ.
- Output Current up to 1A
- Fixed Output Voltage of 1.2V, 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5.0V
- Adjustable Version Availability : $V_{ref}=1.25V$
- Internal Current and Thermal Limit
- A Minimum of 10 μF for stability
- Suitable for MLCC, Tantalum and Low ESR Electrolytic Capacitors
- ESR Range for stability : 1m Ω ~200 Ω
- Available in $\pm 2\%$ (at 25 °C)
- High Ripple Rejection : 80dB/Typ
- Temperature Range : -40 °C ~150 °C

LINE UP

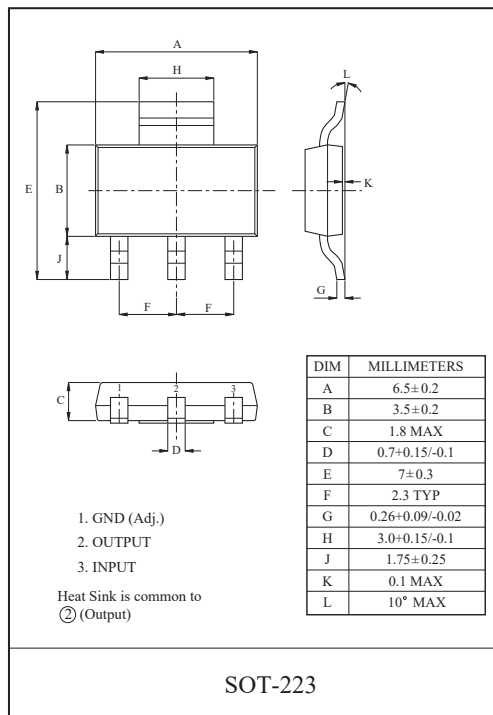
ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA1117BS/BF00	Adjustable (1.25~8V)	S : SOT-223 F : DPAK
KIA1117BS/BF12	1.2	
KIA1117BS/BF15	1.5	
KIA1117BS/BF18	1.8	
KIA1117BS/BF25	2.5	
KIA1117BS/BF28	2.85	
KIA1117BS/BF33	3.3	
KIA1117BS/BF50	5.0	

MAXIMUM RATINGS ($T_a=25\text{ }^{\circ}\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	10	V
Output Current	I_{OUT}	1.0	A
Power Dissipation 1 (No Heatsink)	S (Note)	P_{D1}	W
	F		
Power Dissipation 2 (Infinite Heatsink)	S	P_{D2}	W
	F		
Maximum Junction Temperature	$T_{j(max)}$	150	$^{\circ}\text{C}$
Operating Junction Temperature	T_{opr}	-40 ~ 150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55 ~ 150	$^{\circ}\text{C}$

Note) Package Mounted on FR-4 PCB 36 × 18 × 1.5 mm

cm²



KEC**SEMICONDUCTOR
TECHNICAL DATA****KIC3201S/T-12 ~
KIC3201S/T-60**
CMOS Linear Integrated Circuit**Large Current Positive Voltage Regulator**

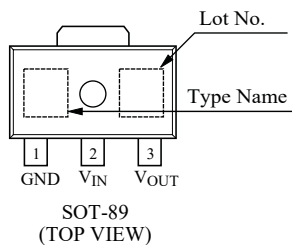
The KIC3201S/T series are highly precise, low power consumption, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The KIC3201S/T consists of a driver transistor, a precision reference voltage and an error amplifier. Output voltage is selectable in 0.05V steps between a voltage of 1.2V and 6.0V.

Features

- Maximum Output Current : 400mA
- Dropout Voltage : 150mV @100mA, 300mV @200mA for $V_{OUT}=3.0V$
- Maximum Operating Voltage : 10V
- Output Voltage Range :
1.2V ~ 6.0V (selectable in 0.05V steps)
- Highly Accurate : $\pm 2\%$
- Low Power Consumption : Typ. 8.0uA
- Operational Temperature Range : $-40^{\circ}C \sim 85^{\circ}C$
- Low ESR Capacitor : Ceramic compatible or Tantalum

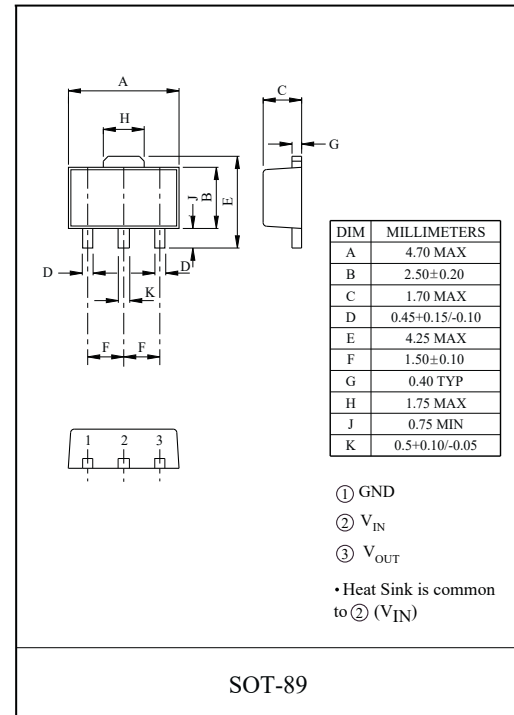
Applications

- Battery Powered Equipment
- Reference Voltage Sources
- Digital Cameras, Camcoders
- Palmtop Computers
- Portable Audio Video Equipment

Pin Configuration**KIC3201S-XX**

No.	Symbol	Description
1	GND	Ground
2	V_{IN}	Power input
3	V_{OUT}	Output

• Heat Sink is common to ② (V_{IN})



Ordering number : ※ EN5039

CMOS IC

	No. ※ 5039	LC74763, 74763M
		On-Screen Display LSI

Preliminary

Overview

The LC74763 and LC74763M are on-screen display CMOS LSIs that superimpose text and low-level graphics onto a TV screen (video signal) under the control of a microcontroller. The display characters have a 12 by 18 dots structure, and 128 characters are provided.

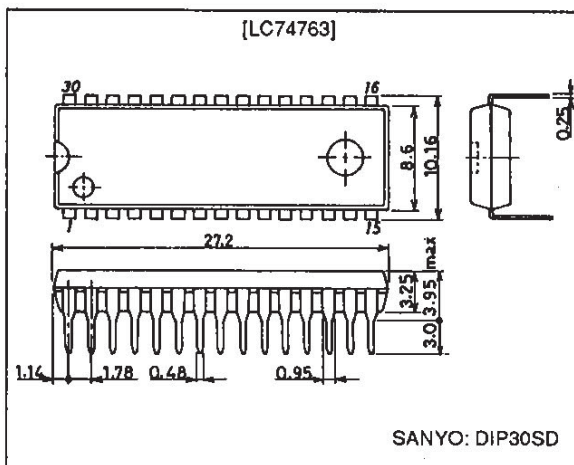
Features

- Display structure: 12 lines by 24 characters (up to 288 characters)
- Maximum character display: Up to 288 characters
- Character configuration: 12 (W) by 18 (H) dots structure
- Number of characters: 128 characters (128 plus space 2 fonts)
- Character sizes: Three sizes (normal, double, and triple sizes)
- Display starting positions: 64 horizontal and 64 vertical locations
- Reverse video function: Characters can be inverted on a per character basis.
- Flashing types: Two types with periods of 0.5 and 1.0 second on a per character basis (duty fixed at 50%)
- Background color: One of eight colors (when internal synchronization used)
- External control input: Serial data input in 8-bit units
- Built-in horizontal/vertical sync separation circuit, AFC circuit, and synchronization detector
- Video output: Composite video signal output in NTSC, PAL, PAL-M, PAL-N, PAL60, NTSC4.43, or SECAM format

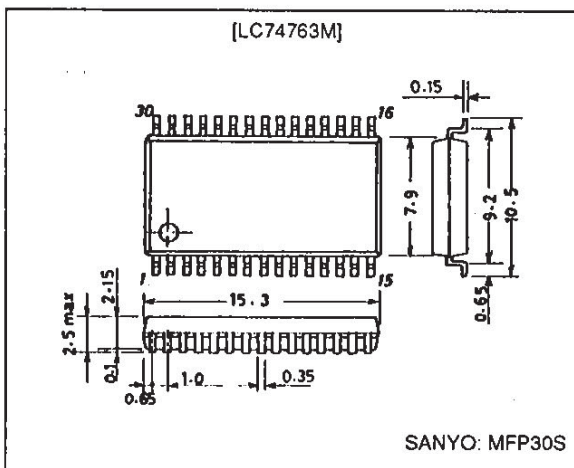
Package Dimensions

unit: mm

3196-DIP30SD

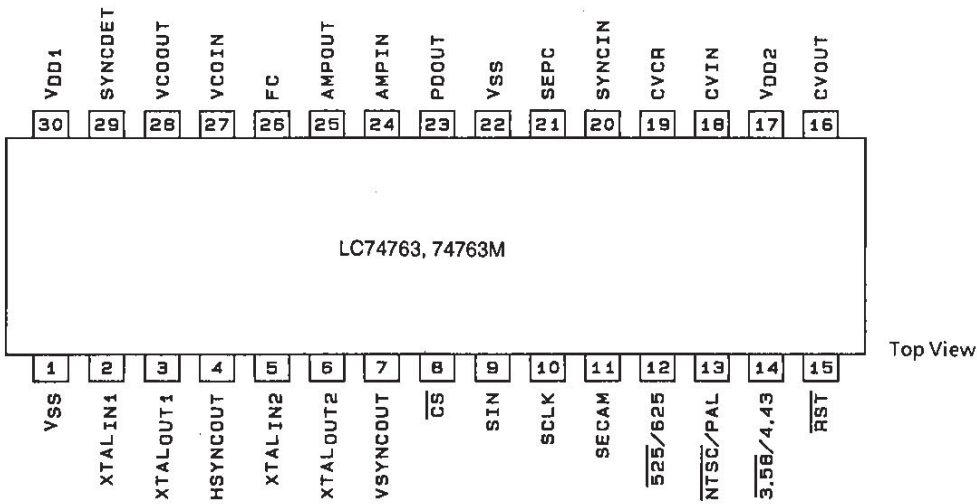


3216A-MFP30S



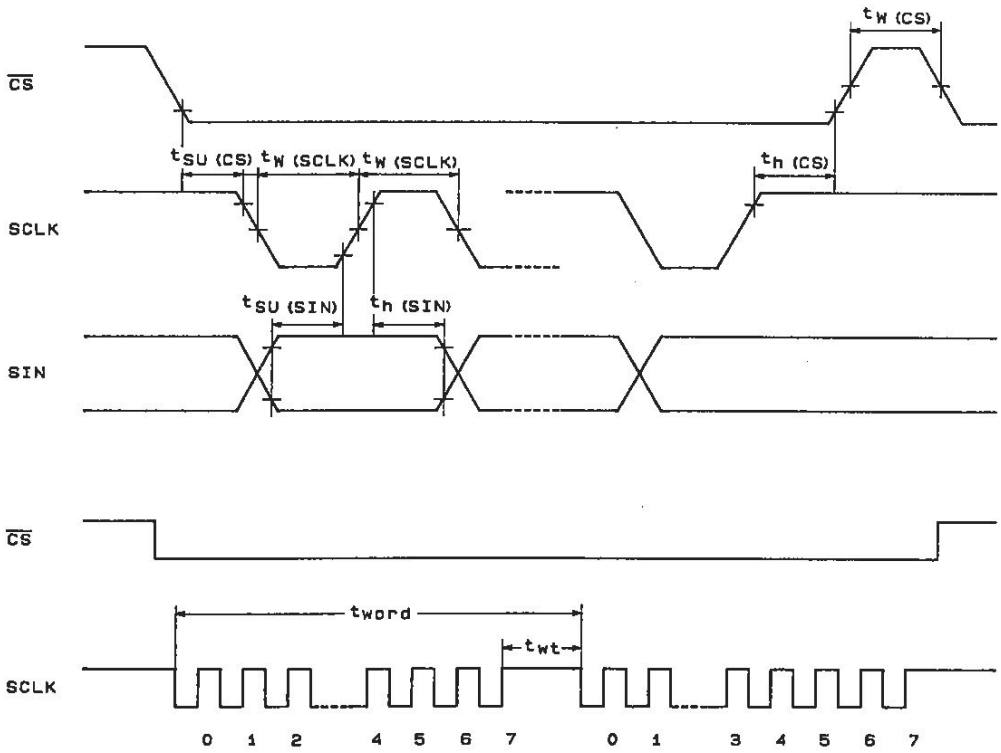
LC74763, 74763M

Pin Assignment



A03518

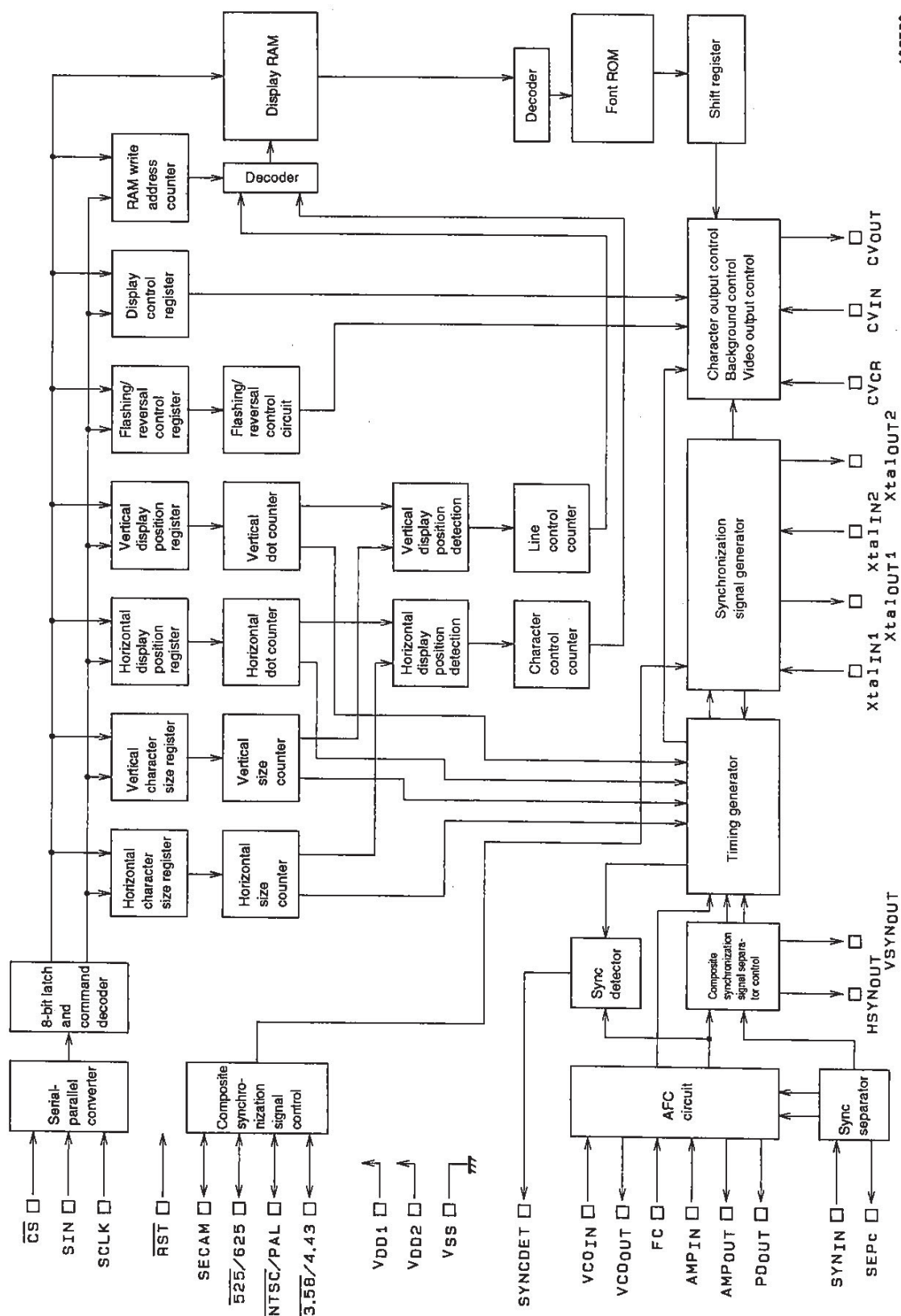
Serial Data Input Timing



A03519

LC74763, 74763M

System Block Diagram



A03B20

KEC SEMICONDUCTOR TECHNICAL DATA

KTC812T EPITAXIAL PLANAR NPN TRANSISTOR

FOR MUTING AND SWITCHING APPLICATION.

FEATURES

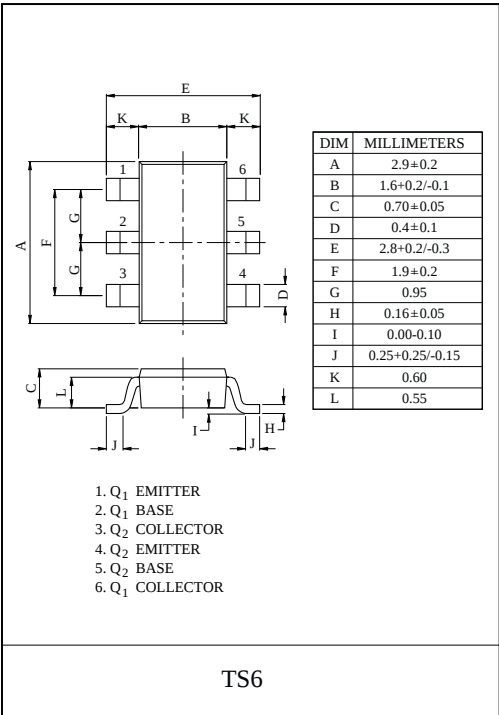
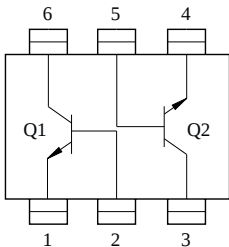
- High Emitter-Base Voltage : $V_{EBO}=25V(\text{Min.})$
- High Reverse h_{FE}
: Reverse $h_{FE}=150(\text{Typ.})$ ($V_{CE}=-2V$, $I_C=-4mA$)
- Low on Resistance : $R_{ON}=1\Omega(\text{Typ.})$, ($I_B=5mA$)

MAXIMUM RATING ($T_a=25^\circ C$)

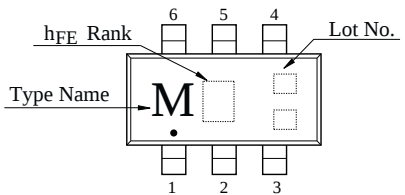
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	25	V
Collector Current	I_C	300	mA
Base Current	I_B	60	mA
Collector Power Dissipation	P_C^*	0.9	mW
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55 ~ 150	$^\circ C$

* Package mounted on a ceramic board ($600mm^2 \times 0.8mm$)

EQUIVALENT CIRCUIT (TOP VIEW)



Marking



ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB}=50V$, $I_E=0$	-	-	0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB}=25V$, $I_C=0$	-	-	0.1	μA
DC Current Gain	h_{FE}	$V_{CE}=2V$, $I_C=4mA$	350	-	1200	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=30mA$, $I_B=3mA$	-	0.042	0.3	V
Base-Emitter Voltage	V_{BE}	$V_{CE}=2V$, $I_C=4mA$	-	0.61	-	V
Transition Frequency	f_T	$V_{CE}=6V$, $I_C=4mA$	-	30	-	MHz
Collector Output Capacitance	C_{ob}	$V_{CB}=10V$, $I_E=0$, $f=1MHz$	-	4.8	7	pF
Switching Time	Turn-on Time	t_{on}	-	160	-	nS
	Storage Time	t_{stg}	-	500	-	
	Fall Time	t_f	-	130	-	

Note : h_{FE} Classification B: 350 ~ 1200



NJU7751/54

LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DISCRIPTION

NJU7751/54 is a low dropout voltage regulator with ON/OFF control and Output shunt switch.

Advanced CMOS technology achieves high ripple rejection and ultra low quiescent current.

It is suitable for reset small micro controller and other logic chips.

■ PACKAGE OUTLINE

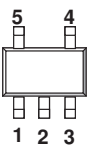


NJU7751/54F

■ FEATURES

- Ultra Low quiescent Current $I_q=20\mu A$ typ. ($I_o=0mA$)
- Output capacitor with 1.0uF ceramic capacitor
- Output Current $I_o(max.)=100mA$
- High Precision Output $V_o\pm1.0\%$
- Low Dropout Voltage 0.15V typ. ($I_o=60mA$, $V_o=3V$)
- With ON/OFF Control (Active High)
- With Output Shunt Switch
- Internal Short Circuit Current Limit
- CMOS Technology
- Package Outline SOT-23-5

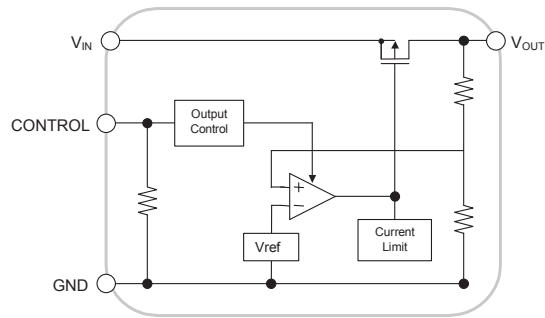
■ PIN CONFIGURATION



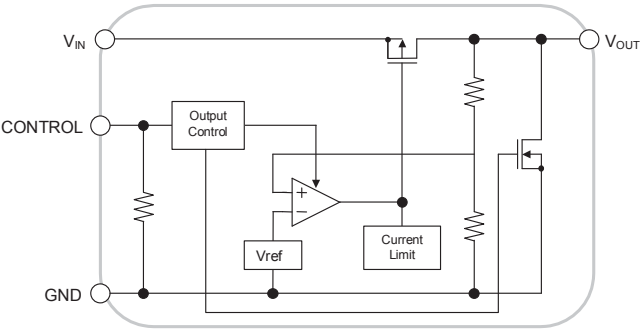
NJU7751/54F

- PIN FUNCTION
- 1.CONTROL
 - 2.GND
 - 3.N.C.
 - 4. V_{OUT}
 - 5. V_{IN}

■ EQUIVALENT CIRCUIT



NJU7751



NJU7754

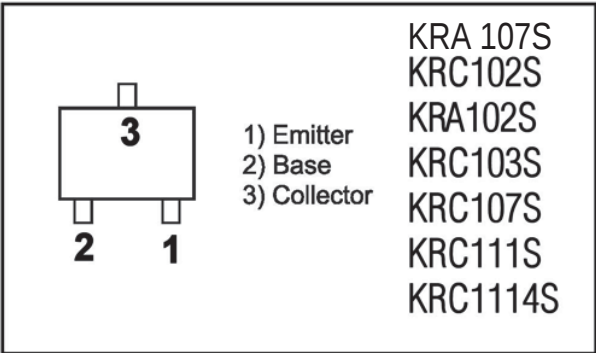
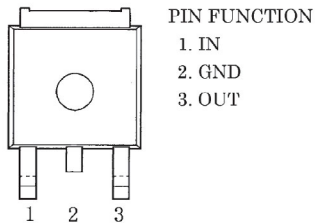
■ OUTPUT VOLTAGE RANK LIST

DEVICE NAME	V_{OUT}
NJU775*F21	2.1V
NJU775*F25	2.5V
NJU775*F03	3.0V
NJU775*F33	3.3V
NJU775*F05	5.0V

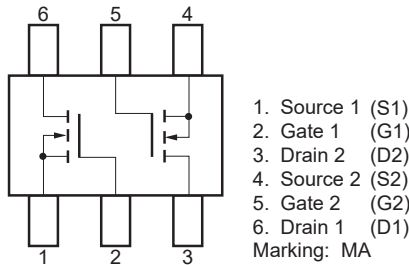
TRANSISTOR, REGULATOR IC BLOCK DIAGRAM

TO-92M  1. Emitter 2. Collector 3. Base 123 KTC2874B KSC2785Y KRA107M KRC107M KRA104MT KRC104M KTA1267 KTC 1027	TO-92  1. Emitter 2. Collector 3. Base 123 KTD1302T KTA1268GR KTC3200GR KTC3198Y KTA1271Y KSA1175YT KTC 3199 KTA1266YT 2SC2240BL KRC102M	TO-220  1. GND 2. INPUT 3. OUTPUT 123 MCNJM7905 MC7915C NJM7908 L7905 KIA 7908 L7915 KIA7915	TO-92L  1. Emitter 2. Collector 3. Base 123 KTA1024Y KSC2316Y
TO-126  1. Emitter 2. Collector 3. Base 123 KTD600KG KTA 1360 KTC 3423	TO-92  1. Emitter 2. Base 3. Collector 123 KSA733CYT	TO-220  1. INPUT 2. GND 3. OUTPUT 123 KIA7815 MC7815C MC7805C MC7809 L7805 NJM7824 L7815 L7812 KIA 7808 L7808 KIA7812	TO-3P  1. Base 2. Collector 3. Emitter 1 2 3 2SB1560 2SC3423O 2SD2390 2SB1559 2SA1360 2SD2389 2SB1647 2SD2560

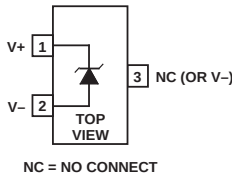
NJM2391DL1-25 NJM2391DL1-33
LOW DROPOUT VOLTAGE REGULATOR



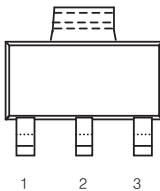
N-CHANNEL MOS FET ARRAY
μPA672T



PIN CONFIGURATION
SOT-23 Package
AD1580



SOT-223 PKG (FRONT VIEW)

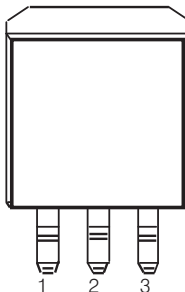


LM1117
REGULATOR

PIN FUNCTION

1. Adj/Gnd
2. Vout
3. Vin

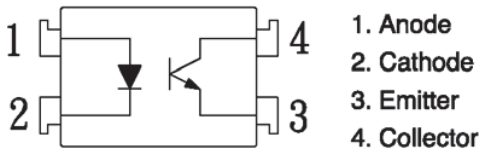
TO-263 (D2 PKG, FRONT VIEW)

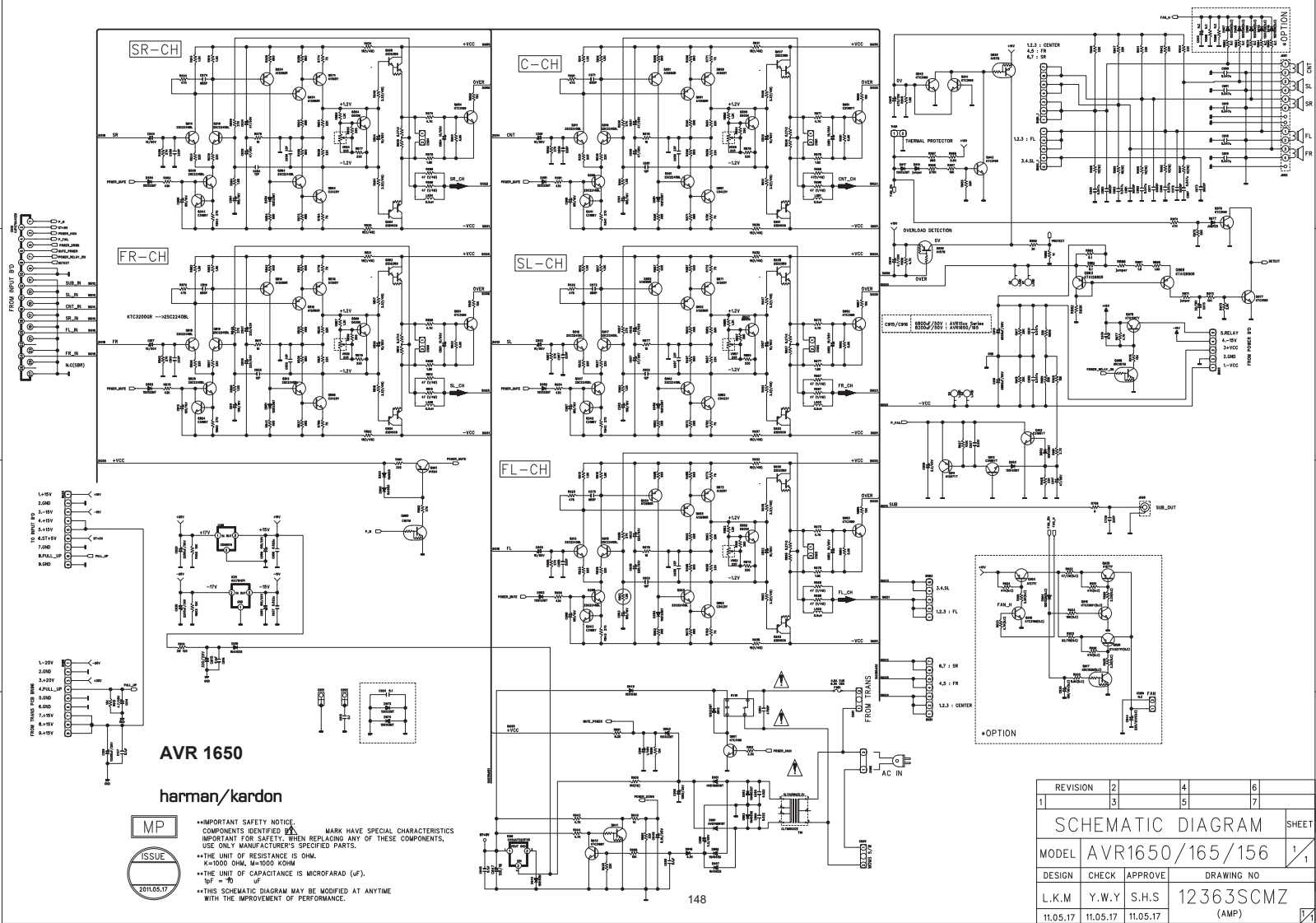


PIN FUNCTION

1. Adj/Gnd
2. Vout
3. Vin

KP1010 photocoupler





AVR 1650

harman/kardon

MP

ISSUE

201.05.17

***IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY A MARK HAVE SPECIAL CHARACTERISTICS
IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY MANUFACTURER'S SPECIFIED PARTS.
**THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM, M=1000 KOHM
**THE UNIT OF CAPACITANCE IS MICROFARAD (UF).
10P = 10 PF
**THIS SCHEMATIC DIAGRAM MAY BE MODIFIED AT ANYTIME
WITH THE IMPROVEMENT OF PERFORMANCE.

REVISION		2	4	6
1		3	5	7
SCHEMATIC DIAGRAM				SHEET
MODEL	AVR1650/165/156			1 1
DESIGN	CHECK	APPROVE	DRAWING NO	
L.K.M	Y.W.Y	S.H.S	12363SCMZ	
11.05.17	11.05.17	11.05.17	(AMP)	

6

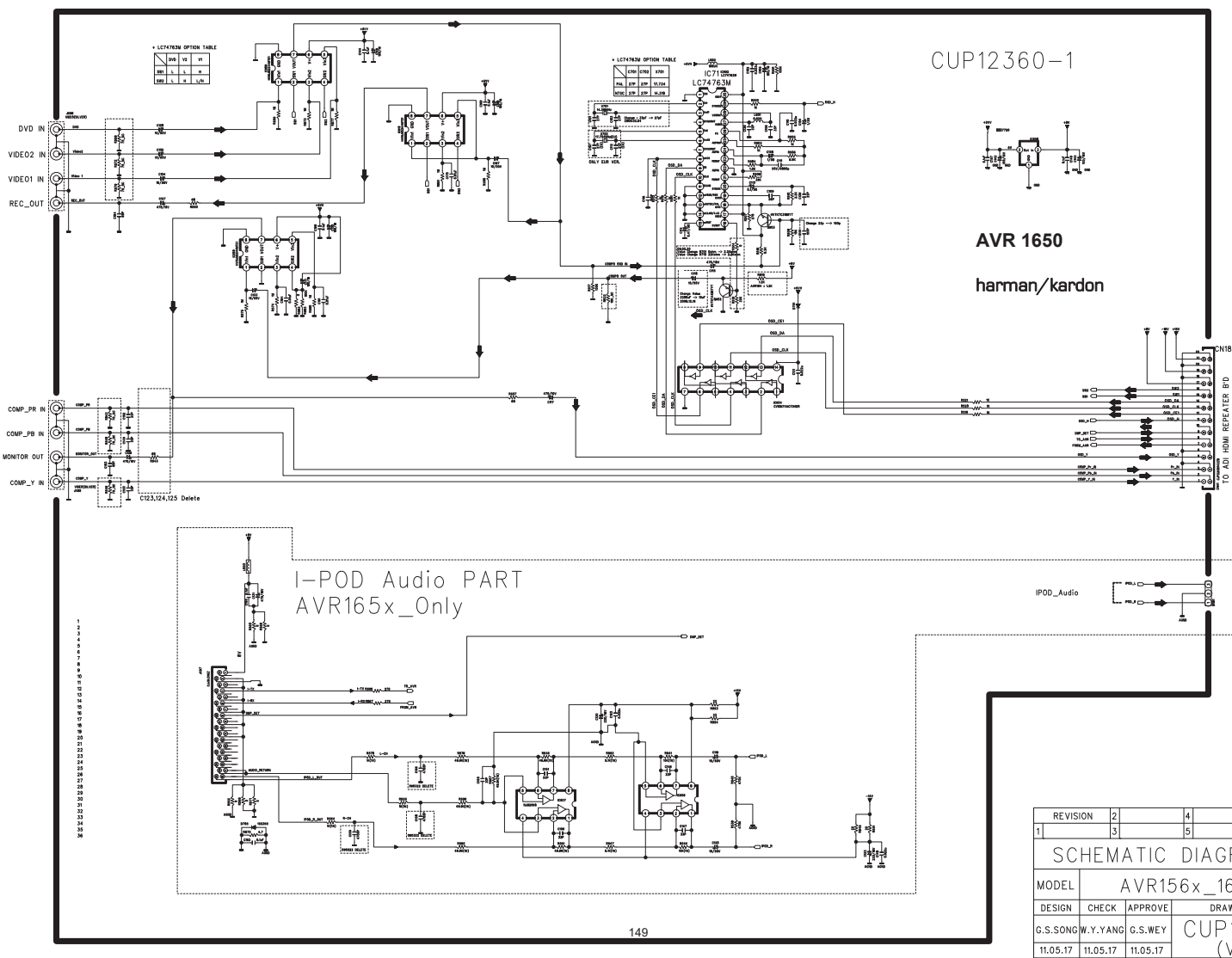
5

4

3

2

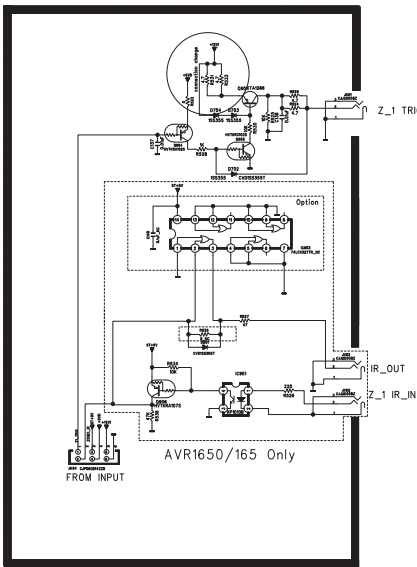
1



REVISION		2	4	6
1	3	5	7	
SCHEMATIC DIAGRAM				
MODEL	AVR156x_165x			
DESIGN	CHECK	APPROVE	DRAWING NO.	
G.S.SONG	W.Y.YANG	G.S.WEY	CUP12360Z	
11.05.17	11.05.17	11.05.17	(VIDEO)	



CUP12360-2

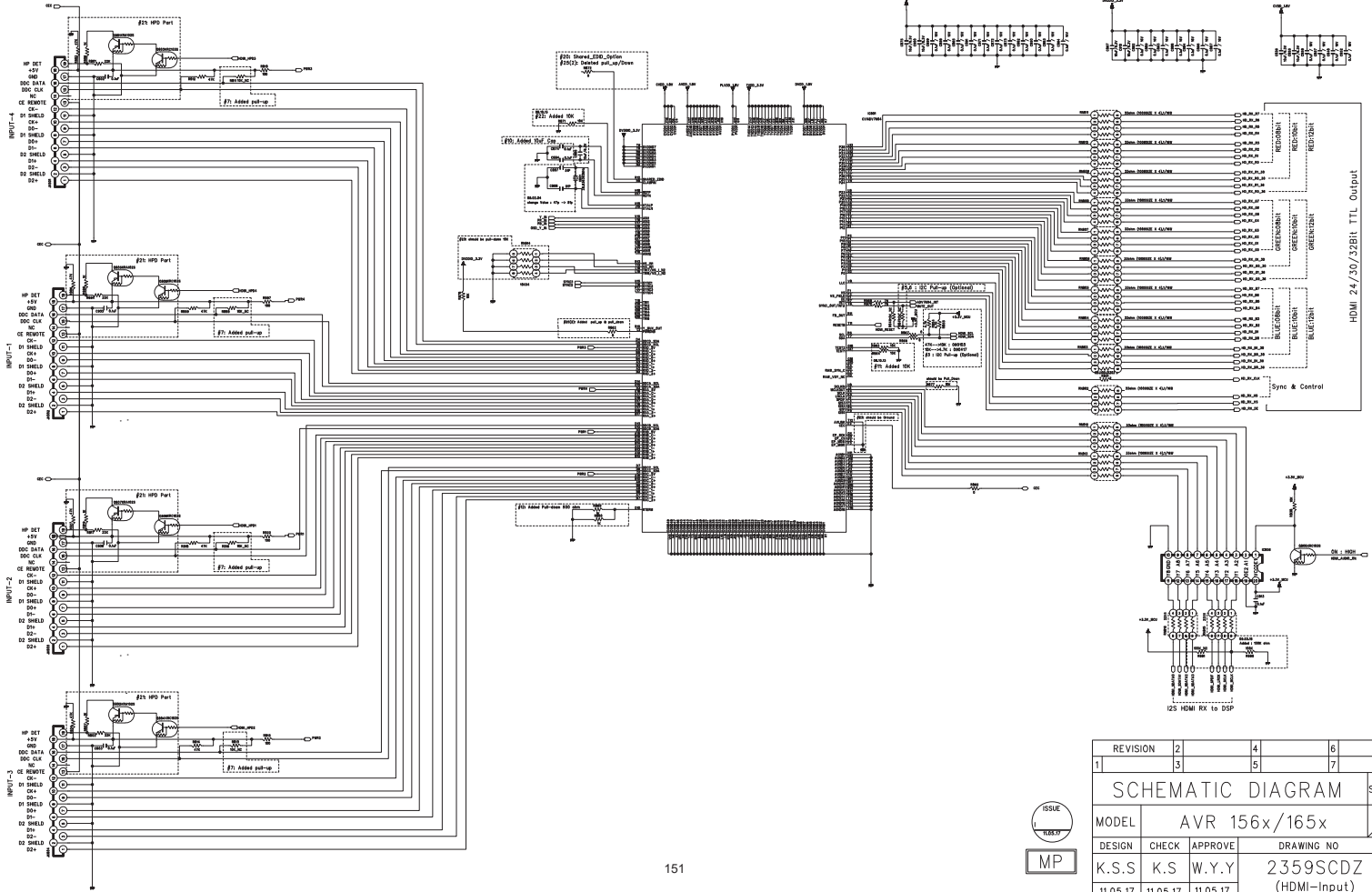


REVISION		2	4	6
1	3	5	7	
SCHEMATIC DIAGRAM				
MODEL	AVR156x_165x			SHEET
				2
DESIGN	CHECK	APPROVE	DRAWING NO	
G.S.SONG	W.Y.YANG	G.S.WEY	CUP12360Z	
11.05.17	11.05.17	11.05.17	(REMOTE)	

AVR 1650

herman/kardon

CUP12359Z

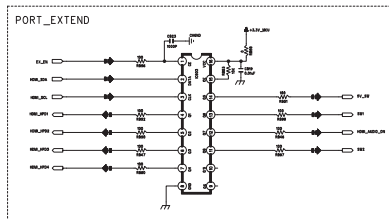
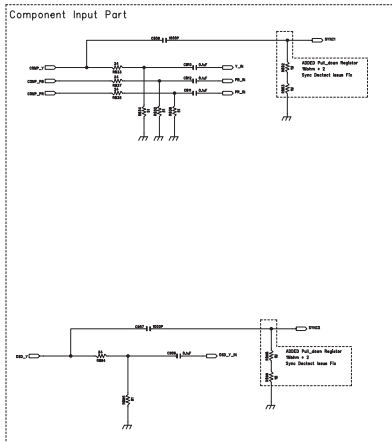
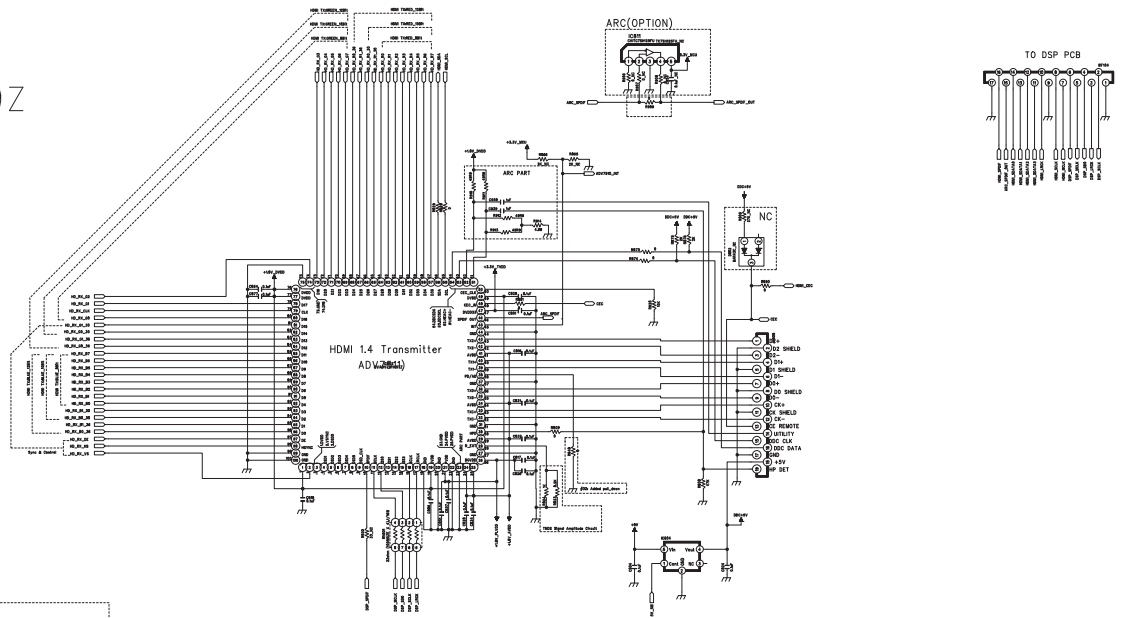


REVISION		2	4	6
1	3	5	7	
SCHEMATIC DIAGRAM				
MODEL	AVR 156x/165x			
DESIGN	K.S.S	CHECK	K.S	APPROVE
11.05.17	11.05.17	11.05.17	DRAWING NO	
				2359SCDZ
				(HDMI-Input)

CUP12359Z

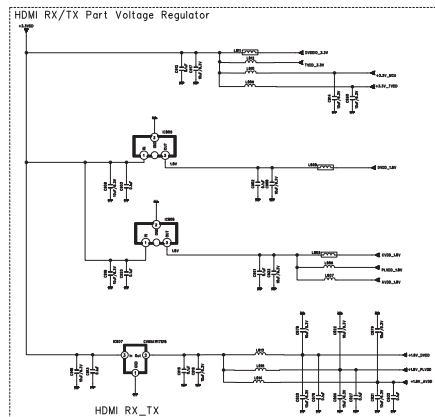
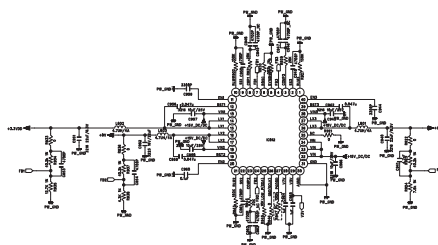
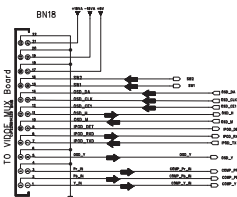
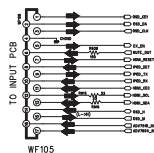
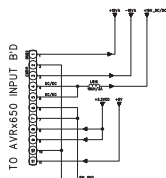
AVR 1650

harman/kardon



REVISION		2	4	6
1	3	5	7	
SCHEMATIC DIAGRAM				
MODEL	AVR 156x/165x			
DESIGN	K.S.S	CHECK	K.S	APPROVE
W.Y.Y	11.05.17	11.05.17	11.05.17	
DRAWING NO				2359SCDZ
				(HDMI-Output)

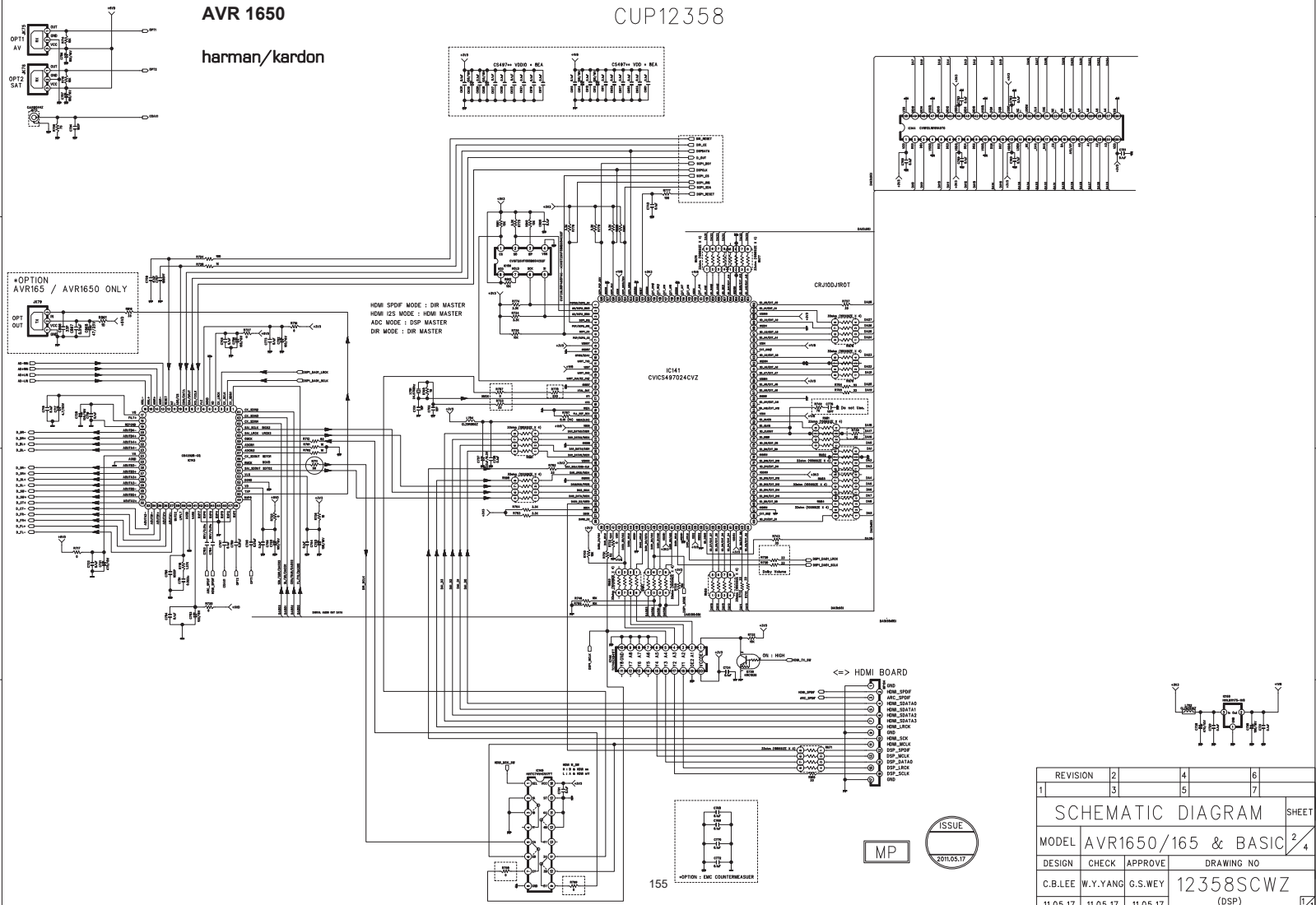
CUP12359Z



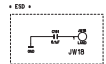
REVISION		2	4	6
1	3	5	7	
SCHEMATIC DIAGRAM				
MODEL	AVR 156x/165x			SHEET
				3
DESIGN	CHECK	APPROVE	DRAWING NO	
K.S.S	K.S	W.Y.Y	2359SCDZ	
11.05.17	11.05.17	11.05.17	(Power)	

AVR 1650
harman/kardon

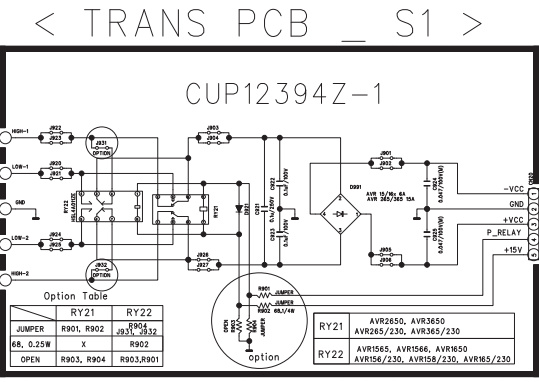
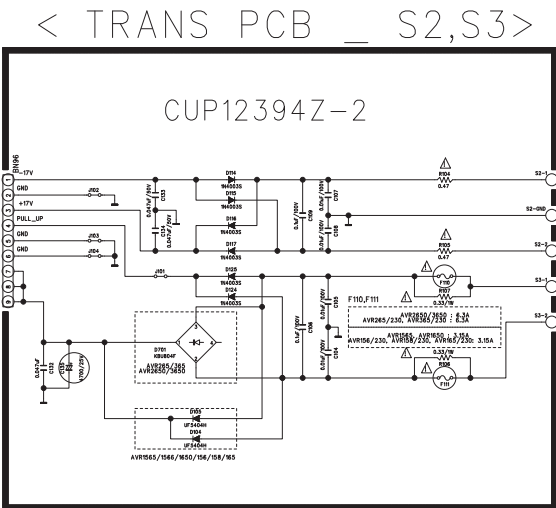
CUP12358



harman/kardon



REVISION		2	4	6
1		3	5	7
SCHEMATIC DIAGRAM				SHEET
MODEL		AVR65 SERIES		1 / 7
DESIGN	CHECK	APPROVED	DRAWING NO	
J.I.H	K.M.S	Y.Y.W	2357SCMZ	
11.05.17	11.05.17	11.05.17	(FRONT)	

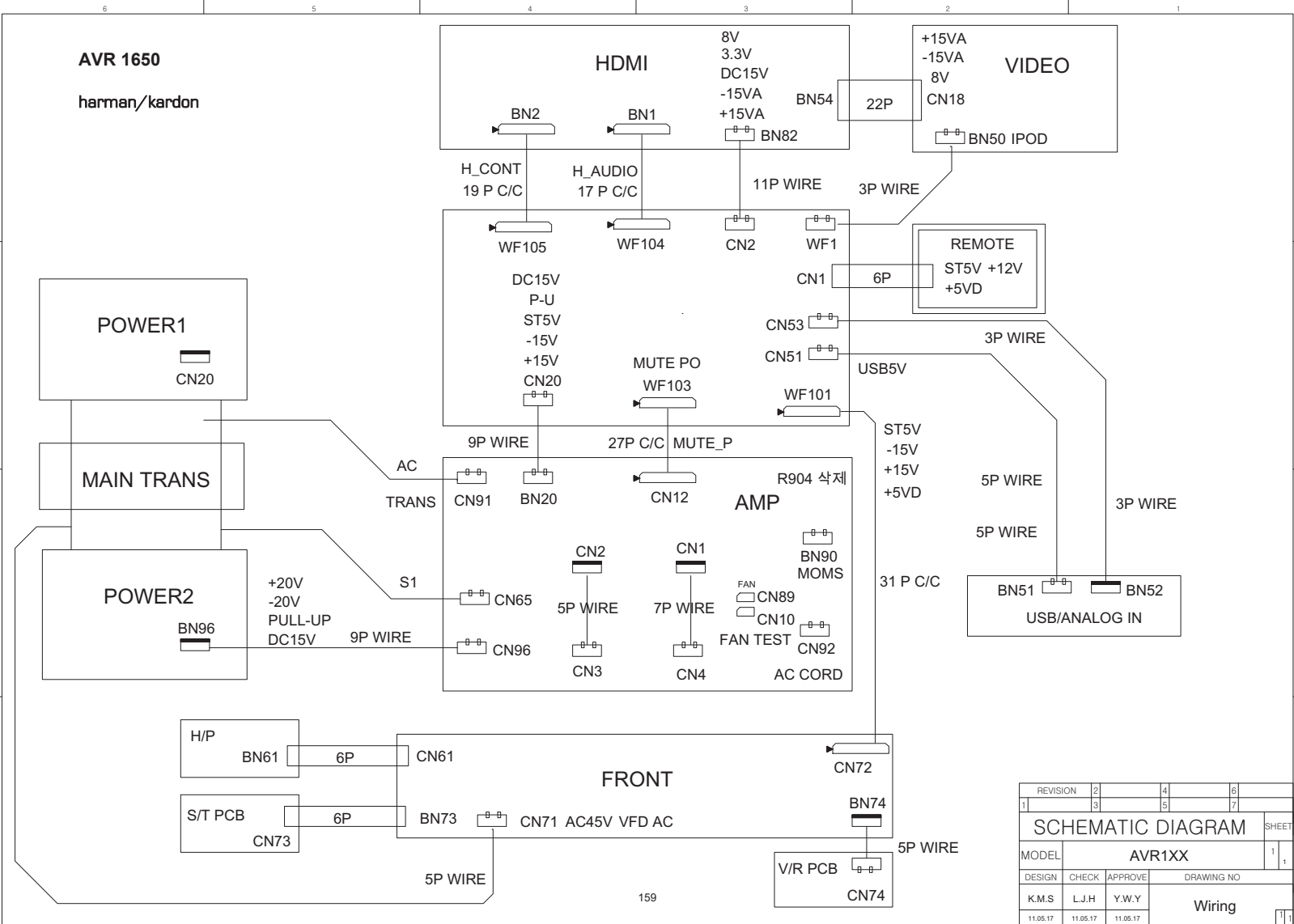


< Transformer >

MP

ISSUE
2011.05.17

REVISION		2	4	6	
1	3	5	7		
SCHEMATIC DIAGRAM					SHEET
MODEL	AVR 165/265/365				1/3
DESIGN	CHECK	APPROVE		DRAWING NO	
K.B.C	K.M.S	Y.K.Y		CUP12394Z	
11.05.17	11.05.17	11.05.17		(POWER)	



REVISION		2	4	6	
1		3	5	7	
SCHEMATIC DIAGRAM					SHEET
MODEL	AVR1XX				1 1
DESIGN	CHECK	APPROVE	DRAWING NO		
K.M.S	L.J.H	Y.W.Y	Wiring		
11.05.17	11.05.17	11.05.17			
			1 1		