harman/kardon

AVR 1600

5 X 40W 7.1 CHANNEL A/V RECEIVER

SERVICE MANUAL

CONTENTS

harman/kardon, Inc.

250 Crossways Park Dr.

Released 2009 Woodbury, New York 11797 Rev0 10/2009

Discontinued XXXX

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.

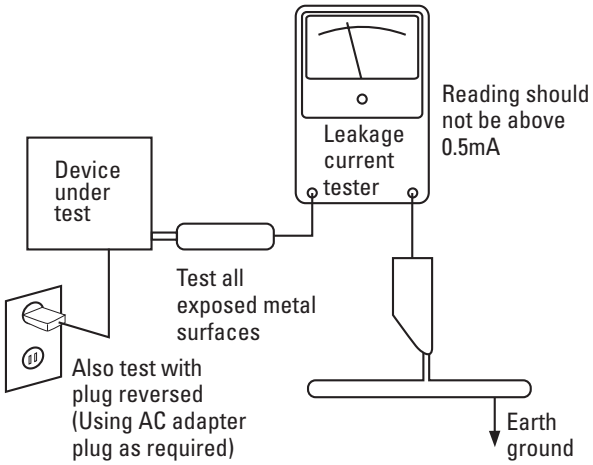
Components identified with the IEC symbol ⚠ in the parts list are special significance to safety. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings or resistance, wattage, or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before retuming 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 o.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 1600 TECHNICAL SPECIFICATIONS

Audio Section

Stereo Mode, Continuous Average Power (FTC)
40 Watts per channel, 20Hz–20kHz, @ <0.07% THD, both channels driven into 8 ohms

Seven-Channel Surround Modes
Power per Individual Channel

Front L & R channels:
40 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Center channel:
40 Watts @ <0.07% THD, 20Hz–20kHz into 8 ohms

Surround (L & R Side, L & R Back) channels:
40 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance	
Linear (High-Level)	200mV/47k ohms
Signal-to-Noise Ratio (IHF-A)	100dB
Surround System Adjacent Channel Separation	
Pro Logic® II	40dB
Dolby® Digital (AC-3)	55dB
DTS®	55dB
Frequency Response	
@ 1W (+0dB, –3dB)	10Hz – 130kHz
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 70/68dB
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	520–1710kHz
Signal-to-Noise Ratio	45dB
Usable Sensitivity	Loop 500µV
Distortion	1kHz, 50% Mod 0.8%
Selectivity	±10kHz, 30dB

Please register your AVR 1600 at www.harmankardon.com. You'll need the product's serial number. At the same time, you can choose to be notified about new products and/or special promotions.

Video Section

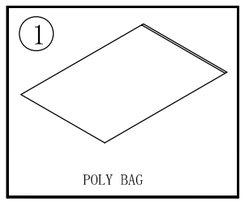
Television Format	NTSC
Input Level/Impedance	1Vp-p/75 ohms
Output Level/Impedance	1Vp-p/75 ohms
Video Frequency Response (Composite and S-Video)	10Hz–8MHz (–3dB)
Video Frequency Response (Component Video)	10Hz–100MHz (–3dB)
HDMI™	Version 1.3a with 10-bit Deep Color

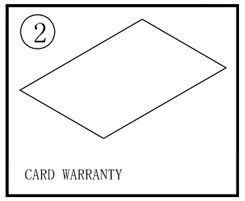
General

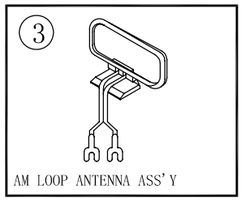
Power Requirement	AC 120V/60Hz	
Power Consumption	540W maximum (7 channels driven)	
Stand-by consumption	<1W	
Dimensions	(Product)	(Shipping)
Width	17-5/16 inches (440mm)	21-7/8 inches (555mm)
Height	6-1/2 inches (165mm)	10-1/2 inches (266mm)
Depth	15 inches (382mm)	18-5/16 inches (465mm)
	(Product)	(Shipping)
Weight	20 lb (9.1kg)	24 lb (10.9kg)

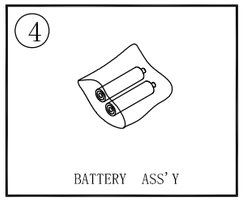
Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.
Features, specifications and appearance are subject to change without notice.

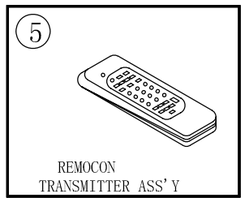
1. Instruction manual ass'y - Accessories

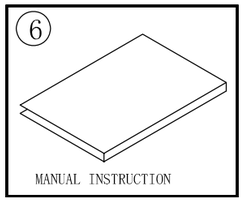


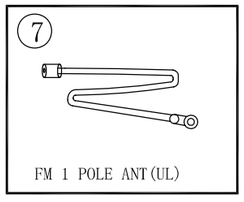


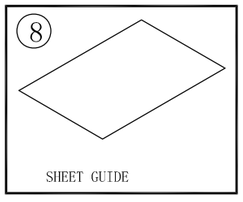


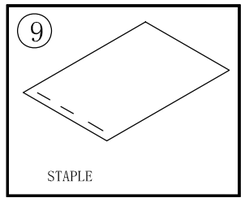


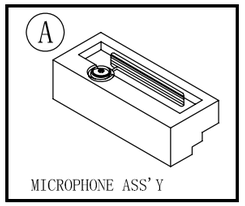










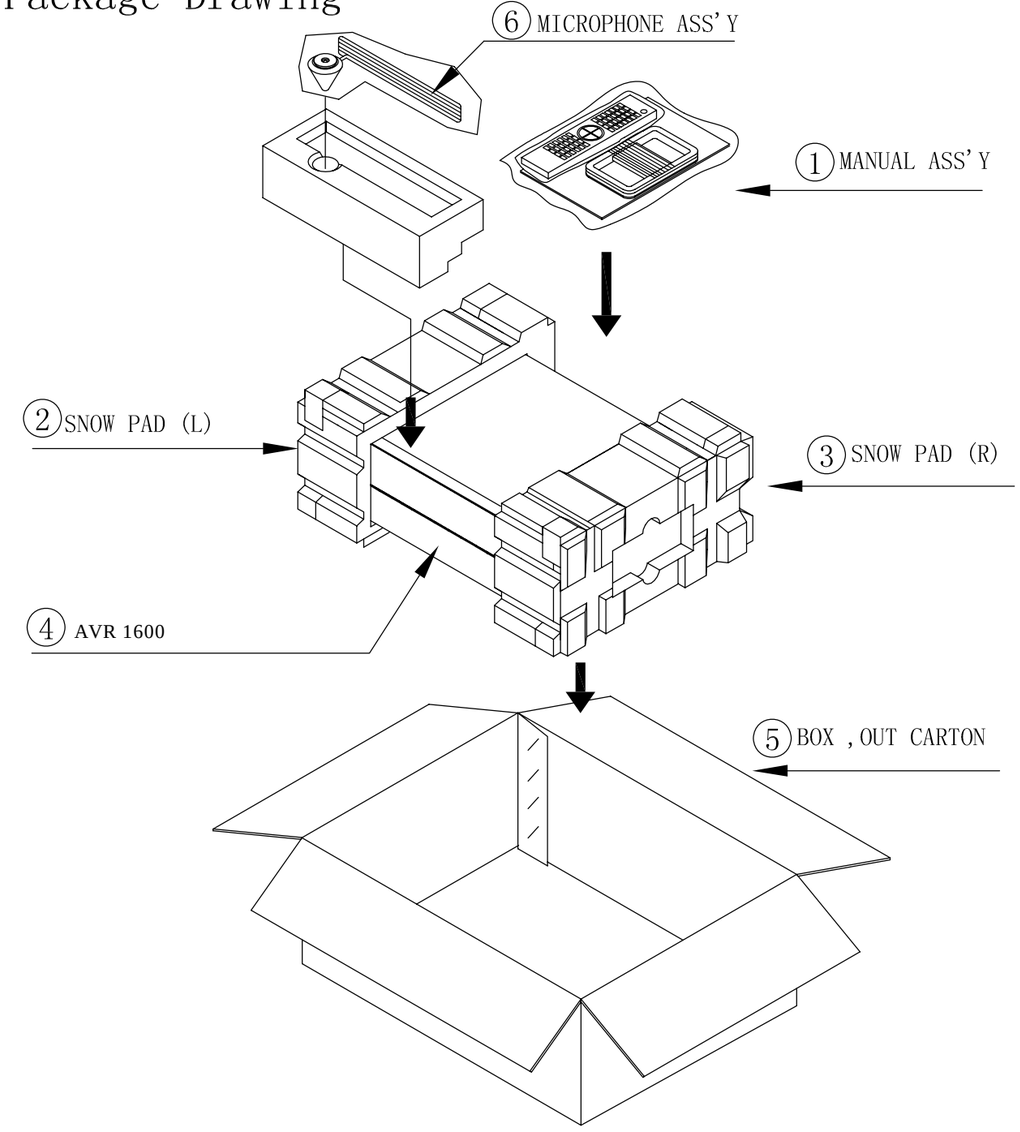


NO	DESCRIPTION	PARTS NO.	Q ty
1	POLY BAG		1
2	CARD WARRANTY	CQE1A172X	1
3	ANT, AM LOOP	CSA1A032Z	1
4	BATTERY		3
5	REMOCON ASS'Y	CARTAVR1600/120	1
6	INSTRUCTION MANUAL	visit www.harmankardon.com	1
7	FM 1 POL ANT(UL)	CSA1A019Z	1
8	SHEET,QUICK SETUP GUIDE		1
9	STAPLE		3

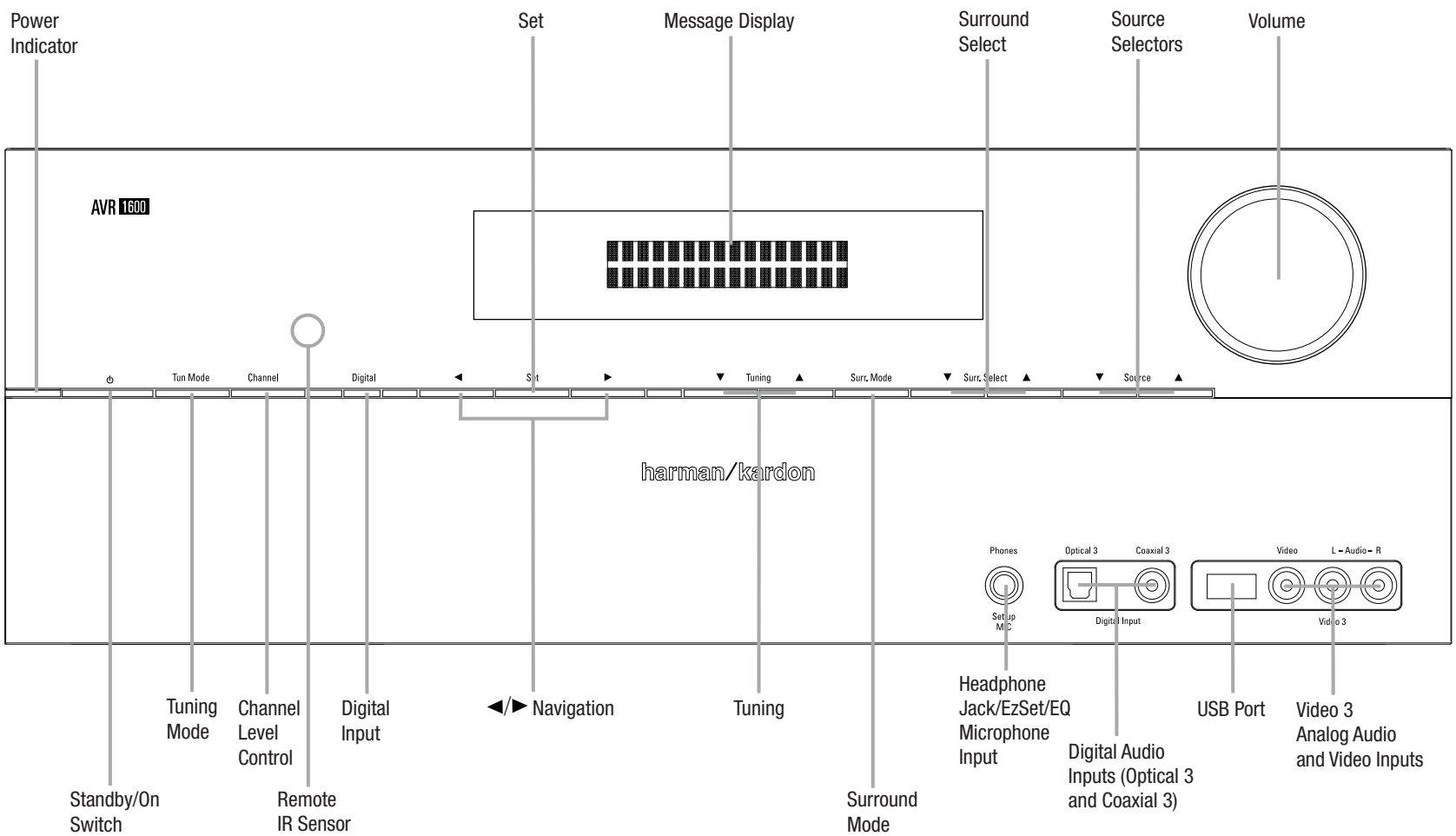
A	MICROPHONE ASS'Y	CJXAVR340MICRO	1

AVR1600

2. Package Drawing



NO	DESCRIPTION	PARTS NO.	Q,ty
1	ACCESSORYS	CQXAVR1600/120	1
2	SNOW,PAD(L)	CPS5A564	1
3	SNOW,PAD(R)	CPS5A565	1
4	AVR 1600	AVR 1600	1
5	BOX,OUT CARTON	CPG1A891Z	1
6	MICROPHONE ASS'Y	CJXAVR340MICRO	1



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

Power Indicator: This LED has three possible modes:

- **Main Power Off:** When the AVR is unplugged or the rear-panel Main Power Switch is off, this LED is off.
- **Standby:** Amber indicates that the AVR is ready to be turned on.
- **On:** When the AVR is turned on, this LED turns white.

NOTE: If the PROTECT message ever appears, turn off the AVR and unplug it. Check all speaker wires for a possible short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

Standby/On Switch: This electrical switch turns the receiver on, or places it in Standby mode for quick turn-on.

Tuning Mode: 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.

Channel Level Control: Press this button to adjust the output level for any amplifier channel. It may be necessary to raise or lower the level of a specific channel to compensate for the placement of the relevant speaker in the room in relation to the listening position; e.g., the center channel speaker is further away from the listening position than the front left and right speakers, so that the dialogue is too soft to hear clearly.

To adjust the level of a channel, press this button once. If the desired channel is not displayed on screen and in the front-panel Message Display, use the Tuning Buttons to scroll to it. When the desired channel appears, use the ◄/► Navigation Buttons to change the level.

It is recommended that you avoid changing the channel levels after you have run the EzSet/EQ setup procedure described in the Initial Setup section, which properly adjusts all channel levels. See the Advanced Functions section for more information on manual speaker setup, including level adjustment.

Remote IR Sensor: This sensor receives infrared (IR) commands from the remote control. It is important to ensure that it is not blocked. If covering the sensor is unavoidable, use an optional Harman Kardon HE 1000, or other infrared receiver, connecting it to the Remote IR Input on the AVR 1600's rear panel.

Digital Input: To change the audio input for the current source to one of the six digital audio inputs or the analog input for the source, press this button and use the ◄/► Navigation Buttons to change the input. Although any digital audio input may be assigned to any source, the analog audio inputs are all permanently dedicated to the source with which they are labeled.

◄/► Navigation: These buttons are used to navigate the AVR's menus.

Set: Press this button to select the currently highlighted 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.

Tuning: Press these buttons to tune a radio station.

Surround Mode: Press this button to select a surround sound (e.g., multichannel) mode. Each press changes the surround mode category: AUTO SELECT, VIRTUAL, STEREO, MOVIE, MUSIC, VIDEO GAME. To change the specific mode within the category, use the Surround Select Buttons. See the Advanced Functions section for more information on surround modes.

Surround Select: 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 IIx 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.

Source Selectors: Press these buttons to select a source device, which is a component where a playback signal originates, e.g., DVD.

Headphone Jack/EzSet/EQ Microphone Input: Plug a 1/4" headphone plug into this jack for private listening.

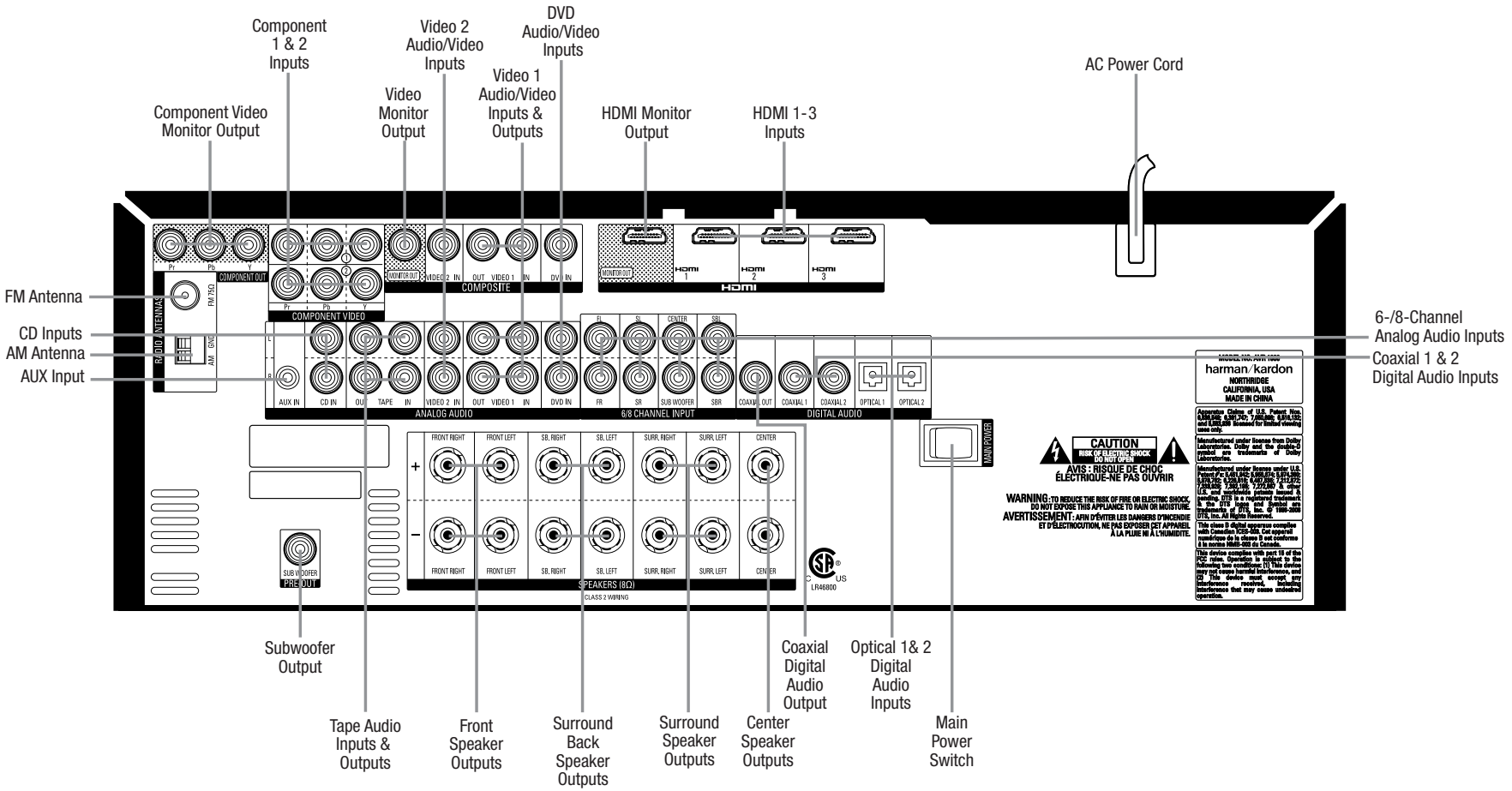
This jack is also used to connect the supplied microphone for the EzSet/EQ procedure described in the Initial Setup section.

Digital Audio Inputs (Optical 3 and Coaxial 3): Connect a source component that will only be used temporarily, such as a digital camera or game console, to these jacks. Use only one type of audio. The audio input may be assigned to any video source.

USB Port: This port may be used in case a software upgrade for the receiver is offered in the future. Do not connect a storage device, peripheral product or a PC here, unless instructed to do so as part of an upgrade procedure.

Video 3 Analog Audio and Video Inputs: Connect a source component that will only be used temporarily, such as a digital camera or game console, to these jacks. These inputs are selected as the Video 3 source, and may not be assigned to other sources.

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



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

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

Component Video Monitor Output: If you are using one of the Component Video Inputs and your television or video display is component-video-capable, connect these jacks to the video display.

NOTE: Due to copy-protection restrictions, there is no output at the Component Video Monitor Outputs for copy-protected sources.

Component Video 1/2 Inputs: If a video source has analog component video (Y/Pb/Pr) capability, and if you are not using an HDMI connection, connect the component video outputs of the source to one of the sets of component video inputs. Do not make any other video connections to that source. These inputs may be assigned to any source.

NOTE: It is not possible to have no component video input assigned to a source, as the AVR 1600 does not transcode composite video source signals to the component video format. Thus, if a signal is present at the input assigned to the source, and you have connected the source device to the composite video input, you will not see the correct picture unless you turn off the device connected to the component video input, or assign the other component video input to the source.

Video Monitor Output: If any of your sources use composite video connections, connect this monitor output to the corresponding input on your video display. Composite video source signals are only available at this output.

Video 1, Video 2 and DVD Audio/Video Inputs: These jacks may be used to connect your video-capable source components (e.g., Blu-ray Disc™ player, DVD player, cable TV box) to the receiver.

NOTE: If a source is equipped with an HDMI output, it is preferable to connect it to one of the AVR's HDMI Inputs. If the source does not have an HDMI output, use its component or composite video output, and make a separate audio connection.

Video 1 Audio/Video Outputs: These jacks may be used to connect your DVR, VCR or another recorder.

HDMI Inputs and Output: HDMI (High-Definition Multimedia Interface) is a connection for transmitting digital audio and video signals between devices. Connect up to three HDMI-equipped source devices to the HDMI inputs using a single-cable connection.

When you connect the HDMI Output to your video display, the AVR 1600 will automatically transcode component video source signals to the HDMI format, but they will be passed through at the original resolution and will not be scaled. The AVR's on-screen menus are visible when the HDMI Output is used, but only at 480i resolution. The main video source will not be visible.

NOTE: When connecting a DVI-equipped display to one of the HDMI Outputs:

- Use an HDMI-to-DVI adapter.
- Make sure the display is HDCP-compliant. If it isn't, do not connect it to an HDMI Output; use an analog video connection instead.
- Always make a separate audio connection.

AC Power Cord: After you have made all other connections, plug the AC power cord into an unswitched wall outlet.

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

Coaxial 1/2 and Optical 1/2 Digital Audio Inputs: If a source has a compatible digital audio output, and if you are not using an HDMI connection for audio for the device, connect it to one of these jacks to hear digital audio formats, such as Dolby Digital, DTS and linear PCM. Use only one type of digital audio connection for each source.

Coaxial Digital Audio Output: If a source is also an audio recorder, connect the Coaxial Digital Audio Output to the recorder's matching input for improved recording quality. Only PCM digital audio signals are available for recording. Both coaxial and optical digital audio signals are available at this Digital Audio Output.

Front, Center, Surround and Surround Back Speaker Outputs: Use two-conductor speaker wire to connect each set of terminals to the correct speaker. Remember to observe the correct polarity (positive and negative connections).

6-/8-Channel Analog Audio Inputs: Connect the multichannel analog audio outputs of a non-HDMI player (DVD-Audio, SACD™, Blu-ray Disc or HD-DVD, or any other external decoder) to these jacks. See page 25 for more information.

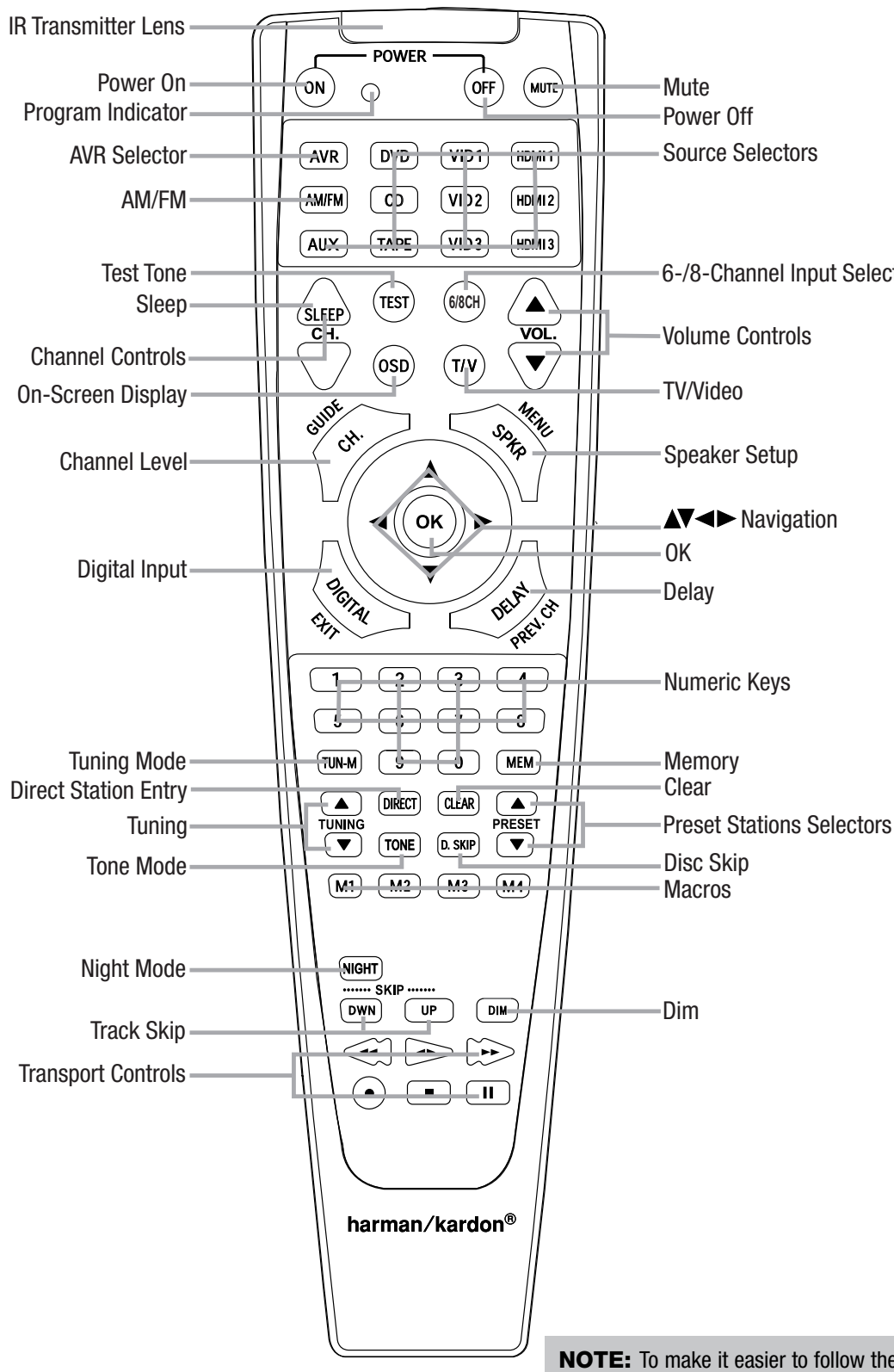
CD and Tape Audio Inputs: These jacks may be used to connect audio-only source components (e.g., CD player, tape deck). Do not connect a turntable to these jacks unless you are using it with a phono preamp.

Tape Outputs: These jacks may be used to connect a CDR or another audio-only recorder.

Subwoofer Output: If you have a powered subwoofer with a line-level input, connect it to the Subwoofer Output.

AUX Input: Enjoy audio from an iPod (not included), CD player or other portable player by connecting its headphone jack to this input using a 1/8" stereo mini-plug cable (not included). Video and still-image playback are not available at this input.

REMOTE CONTROL FUNCTIONS



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REMOTE CONTROL FUNCTIONS

The AVR 1600 remote is capable of controlling up to 11 devices, including the AVR itself and a device connected to the Auxiliary Input. During the installation process, you may program the codes for each of your source components into the remote. Each time you wish to operate any component or the AVR, first press its Selector Button to change the device mode to the appropriate codes.

Each Input Selector has been preprogrammed to control certain types of components, with only the codes specific to each brand and model changing, depending on which product code is programmed. The device types programmed into each selector, except the HDMI selectors, may not be changed.

DVD: Controls Harman Kardon Blu-ray Disc players, and many brands of DVD players and recorders.

CD: Controls CD players and recorders.

Tape: Controls cassette decks.

Video 1: Controls VCRs, TiVo® devices and DVRs, and the Harman Kardon DMC 1000 digital media center.

Video 2: Controls cable and satellite television set-top boxes.

Video 3: Controls televisions and other video displays.

HDMI 1, 2 and 3: Each code set controls a source device (VCR/PVR, DVD player or cable/satellite set-top box) connected to one of these inputs.

AUX: Controls a device connected to the Auxiliary Input.

Any given button may have different functions, depending on which component is being controlled. Some buttons are labeled with these functions. For example, the Sleep Button is labeled for use as the Channel Up Button when controlling a television or cable box. See Table A10 in the appendix for listings of the different functions for each type of component.

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

Power On Button: Press this button to turn on the AVR or another device. The Main Power Switch must first have been switched on.

Mute Button: Press to mute the AVR 1600's speaker and headphone outputs. To end the muting, press this button, adjust the volume or turn off the receiver.

Program Indicator: This LED lights up or flashes in one of three colors as the remote is programmed with codes.

Power Off Button: Press to turn off the AVR 1600 or another device.

AVR Selector: Press to switch the remote to AVR device mode.

Source Selectors: Press one of these buttons to select a source device, e.g., DVD, CD, cable TV, satellite or HDTV tuner. This will also turn on the receiver and switch the remote's device mode to operate the source.

AM/FM Button: Press this button to select the tuner as the source, or to switch between the AM and FM bands.

6-/8-Channel Input Selector: Press this button to select the 6-/8-Channel Inputs as the audio source. If a signal is present at the component video inputs assigned to this source, it will be used. If not, the receiver will use the video input and remote control codes for the last-selected analog video source.

Test Tone: Press this button to activate the test tone for manual output-level calibration.

TV/Video: This button has no effect on the receiver, but is used to switch video inputs on some video source components.

Sleep Button: Press this button to activate the sleep timer, which turns off the receiver after a programmed period of time of up to 90 minutes.

Channel Controls: These buttons have no effect on the receiver, but are used to change channels on TVs and some video sources.

Volume Controls: Press these buttons to raise or lower the volume, which will be shown in decibels (dB) in the Message Display.

On-Screen Display (OSD): Press this button to activate the on-screen menu system.

Channel Level: Press this button to adjust the output levels for any channel so that all speakers sound equally loud at the listening position.

Speaker Setup: Press this button to configure speaker sizes, that is, the low-frequency capability of each speaker.

Navigation (▲/▼◄/►) and OK Buttons: These buttons are used to make selections within the on-screen menu system, or when accessing the functions of the four buttons surrounding this area of the remote – Channel Level, Speaker Setup, Digital Input or Delay.

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

Delay: Press this button to set delay times that compensate for placing the speakers at different distances from the listening position, or to resolve a "lip sync" issue that may be caused by digital video processing.

NOTE: The Channel Level, Speaker Setup, Digital Input Select and Delay functions may also be adjusted using the OSD on-screen menus. In addition, the EzSet/EQ system may be used to adjust the Channel Level, Speaker Setup and Delay settings automatically.

Numeric Keys: Use these buttons to enter radio station frequencies or to select station presets. Press the Direct Button before entering the station frequency.

Tuning Mode: 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.

Memory: After you have tuned a particular radio station, press this button, then the Numeric Keys, to save that station as a radio preset.

Tuning: 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 frequency step at a time, or seek the next frequency with acceptable signal strength.

Direct: Press this button before using the Numeric Keys to directly enter a radio station frequency.

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

Preset Stations Selector: Press these buttons to select a preset radio station.

Tone Mode: Press this button to access the tone controls (bass and treble). Use the Navigation Buttons to make your selections.

Disc Skip: This button has no effect on the receiver, but is used with some optical disc changers to skip to the next disc.

Macros: These buttons may be programmed to execute long command sequences 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 than you are currently operating.

Night Mode: 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.

Track Skip: These buttons have no effect on the receiver, but are used with many source components to change tracks or chapters.

Dim: Press this button to partially or fully dim the front-panel display.

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

There are different types of audio and video connections used to connect the receiver, the speakers, the video display, and the source devices. The Consumer Electronics Association has established the CEA® color-coding standard. Some of these connectors are not used on the AVR 1600, although they may be found on other components in your system. See Table 1.

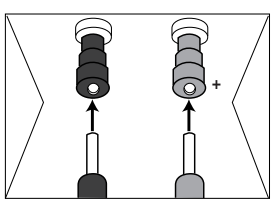
Table 1 – Connection Color Guide

Audio Connections		
	Left	Right
Front **(FL/FR)**	**White**	**Red**
Center **(C)**	**Green**	
Surround **(SL/SR)**	**Blue**	**Gray**
Surround Back **(SBL/SBR)**	**Brown**	**Tan**
Subwoofer **(SUB)**	**Purple**	
Digital Audio Connections		
Coaxial	**Orange**	
Optical	Input ■	Output ■
Video Connections		
Component	Y **Green**	Pb **Blue** Pr **Red**
Composite	**Yellow**	
S-Video	◎	
HDMI™ Connections (digital audio/video)		
HDMI	▭	

Speaker Connections

Speaker cables carry an amplified signal from the receiver's speaker terminals to each loudspeaker. They contain two wire conductors, or leads, inside plastic insulation, that are differentiated in some way, such as with colors or stripes.

The differentiation preserves polarity, without which low-frequency performance can suffer. Each speaker is connected to the receiver'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 receiver, which is colored as indicated in the Connection Color Guide (Table 1). The negative terminals are both black.



The AVR 1600 uses binding-post speaker terminals that can accept banana plugs or bare-wire cables. Banana plugs are inserted into the hole in the middle of the terminal cap. See Figure 1.

Figure 1 – Binding-Post Speaker Terminals With Banana Plugs

Bare wire cables are installed as follows (see Figure 2):

1. Unscrew the terminal cap until the pass-through hole is revealed.
2. Insert the bare end of the wire into the hole.
3. Hand-tighten the cap until the wire is held snugly.

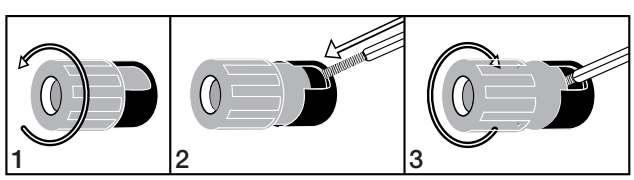


Figure 2 – Binding-Post Speaker Terminals With Bare Wires

Subwoofer

The subwoofer is dedicated to the low frequencies (bass), which require more power. To obtain the best results, most speaker manufacturers offer powered subwoofers that contain their own amplifier. Usually, a line-level (nonamplified) connection is made from the receiver's Subwoofer Output to a corresponding jack on the subwoofer, as shown in Figure 3.

Although the purple subwoofer outputs look similar to full-range analog audio jacks, they are filtered to allow only the low frequencies to pass. Don't connect these outputs to any other devices.

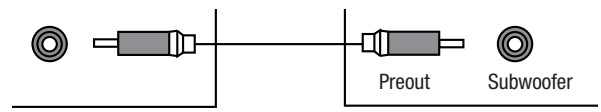


Figure 3 – Subwoofer

CONNECTING SOURCE DEVICES TO THE AVR

Audio and video signals originate in "source devices," including your Blu-ray Disc or DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television box or MP3 player. The AVR's tuner also counts as a source, even though no external connections are needed, other than the FM and AM antennas and the SIRIUS tuner module.

Separate connections are required for the audio and video portions of the signal, except for digital HDMI connections. The types of connections used depend upon the capabilities of the source device and video display.

Audio Connections

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 noncompressed PCM digital audio. There are three types of digital audio connections: HDMI, coaxial and optical. Do not use more than one type of digital audio connection for each source device. However, it's okay to make both analog and digital audio connections to the same source.

NOTE: HDMI signals may carry both audio and video. If your video display device has an HDMI input, make a single HDMI connection from each source device to the AVR. Usually, a separate digital audio connection is not required. Turn the volume on your television all the way down.

Digital Audio

The AVR 1600 is equipped with three HDMI (High-Definition Multimedia Interface) inputs, and one output. HDMI technology enables digital audio and video information to be carried using a single cable, delivering the highest quality picture and sound.

The AVR 1600 uses HDMI (V.1.3a with Deep Color) technology and is capable of processing both the audio and video components of the HDMI data, minimizing the number of cable connections in your system. The AVR 1600 implements Deep Color, which increases by an order of magnitude the shades of color that can be displayed, and the latest lossless multichannel audio formats, including Dolby TrueHD and DTS-HD Master Audio.

NOTE: Some DVD-Audio, SACD, Blu-ray Disc and HD-DVD players only output multichannel audio through their multichannel analog outputs. Make a separate analog audio connection in addition to the HDMI connection, which is still used for video and to listen to Dolby Digital, DTS or PCM materials that may be stored on the disc.

The AVR 1600 converts analog video signals to the HDMI format, including its on-screen menus, but outputs them at their native resolution.

The HDMI connector is shaped for easy plug-in (see Figure 4). If your video display has a DVI input and is HDCP-compliant, use an HDMI-to-DVI adapter (not included). A separate audio connection is required. HDMI cable runs are limited to about 10 feet.

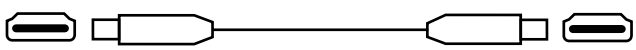


Figure 4 – HDMI Connection

If your video display or source device is not HDMI-capable, use one of the analog video connections (composite or component video) and a separate audio connection.

Coaxial digital audio jacks are usually color-coded in orange. Although they look similar to analog jacks, you should not connect coaxial digital audio outputs to analog inputs or vice versa. See Figure 5.

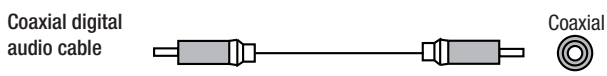


Figure 5 – Coaxial Digital Audio

Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted. Input connectors are color-coded using a black shutter, while outputs use a gray shutter. See Figure 6.

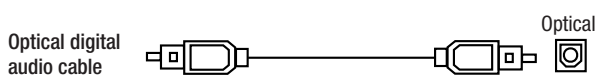


Figure 6 – Optical Digital Audio

Analog Audio

Analog connections require two cables, one for the left channel (white) and one for the right channel (red). These two cables are often attached to each other. See Figure 7.

For sources that are capable of both digital and analog audio, you may make both connections.

You may only record materials from DVDs or other copy-protected sources using analog connections. Remember to comply with all copyright laws, if you choose to make a copy for your own personal use.

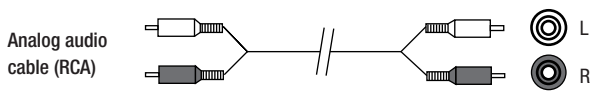


Figure 7 – Analog Audio

The 6-/8-Channel Inputs are multichannel analog connections that are used with high-definition sources that decode the copy-protected digital content, such as some DVD-Audio, SACD, Blu-ray Disc and HD-DVD players. See Figure 8. The multichannel analog audio connection is not required for players compliant with HDMI version 1.1 or better, or that output linear PCM signals via an HDMI connection. Consult the owner's guide for your disc player for more information, and see page 25.

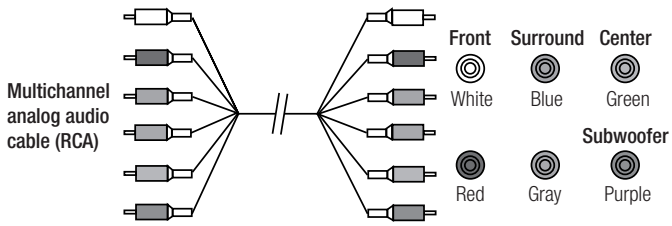


Figure 8 – Multichannel Analog Audio

The AVR 1600 has an Auxiliary Audio Input on the rear panel in the form of a stereo 1/8" mini jack. Connect the headphone output of any audio source, such as an MP3 player or portable CD player, to the Auxiliary Audio Input. See Figure 9.

Figure 9 – Auxiliary Audio Input

Video Connections

Many sources output both audio and video signals (e.g., Blu-ray Disc or DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to the audio connection, make one type of video connection for each of these sources (only one at a time for any source).

Digital Video

If you have already connected a source device to one of the HDMI inputs, you have automatically made a video connection, as the HDMI signal includes both digital audio and video components.

Analog Video

There are two types of analog video connections used on the AVR 1600: composite video and component video.

Composite video is the basic connection most commonly available. The jack is usually color-coded yellow, and looks like an analog audio jack. Do not plug a composite video cable into an analog or coaxial digital audio jack, or vice versa. Both the chrominance (color) and luminance (intensity) components of the video signal are transmitted using a single cable. See Figure 10.

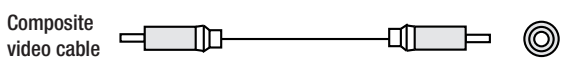


Figure 10 – Composite Video

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. See Figure 11.

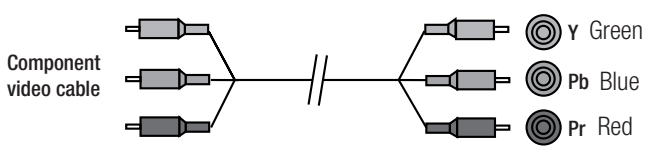


Figure 11 – Component Video

If it's available on your video display, an HDMI connection is recommended as the best quality connection, followed by component video, and then composite video.

NOTE: HDCP-copy-protected sources are not available at the Component Video Monitor Outputs.

ANTENNAS

The AVR 1600 uses separate terminals for the included FM and AM antennas.

The FM antenna uses a 75-ohm F-connector. See Figure 12.

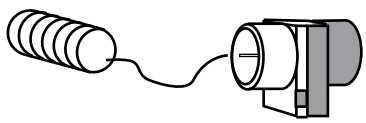


Figure 12 – FM Antenna

The AM loop antenna needs to be assembled. Connect the two leads to the spring terminals on the receiver. The AM antenna leads have no polarity, and you may connect them to either terminal. See Figure 13.

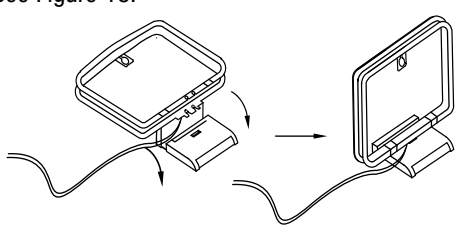


Figure 13 – AM Antenna

USB PORT

The USB Port on the AVR 1600 is used only for software upgrades. If an upgrade for the receiver's operating system is released in the future, it may be downloaded to the AVR using this port. Complete instructions will be provided at that time.

In this section, you will configure the AVR 1600 to match your actual system. A video display must be connected to one of the video monitor outputs on the receiver.

USING THE ON-SCREEN MENU SYSTEM

Although it's possible to configure the AVR using only the remote and the front-panel messages, it is easier to use the full-screen menu system.

The menu system is accessed by pressing the OSD Button on the remote.

The Master menu will appear (see Figure 18).

Figure 18 – Master Menu

The Master menu consists of five submenus: Input Setup, Surround Select, EzSet/EQ, Manual Setup and System Setup.

Use the ▼/▲◄/► Buttons on the remote to navigate the menu system, and press the OK Button to select a menu or setting line, or to enter a new setting.

The current menu, setting line or setting will appear in the Message Display, as well as on screen.

To return to the previous menu, navigate to the "BACK TO MASTER MENU" line and press the OK Button. To exit the menu system, press the OSD Button.

Most users should follow the instructions in this Initial Setup section to configure a basic home theater system. You may return to these menus at any time to make additional adjustments, such as those described in the Advanced Functions section.

Before beginning initial setup, all loudspeakers, a video display and all source devices should be connected. You should be able to turn on the receiver and view the Master menu when you press the OSD Button. If necessary, reread the Installation Section and the beginning of this section before continuing.

Configure the AVR 1600, Using EzSet/EQ Technology

One of the most important steps in setting up a home theater system is to calibrate the receiver to match the loudspeakers, optimizing sound reproduction.

Until recently, most receivers required manual calibration and configuration, a tedious process that called for a good ear or the purchase of an SPL (sound-pressure level) meter. Although you may configure the AVR 1600 manually, as described in the Advanced Functions section, it is recommended that you take advantage of the signature Harman Kardon EzSet/EQ system.

Eliminate extraneous background noise, such as noisy air conditioning. Avoid making any loud noises while running EzSet/EQ setup.

IMPORTANT SAFETY NOTE: During the EzSet/EQ procedure, a series of very loud test sweeps will be played through all of the speakers. Avoid sitting or standing close to any one speaker during the procedure. If you are particularly sensitive to loud noises, you may wish to leave the room and have someone else run the EzSet/EQ process.

STEP ONE – Place the included EzSet/EQ microphone in the listening position or in the center of the room, at about the same height as the listeners' ears. The microphone features a threaded insert on the bottom, for mounting on a camera tripod.

STEP TWO – Plug the EzSet/EQ microphone into the Headphone Jack/EzSet/EQ Microphone Input Jack on the front of the receiver, and set the level control on the subwoofer to the halfway point.

STEP THREE – Turn on the AVR 1600 and the video display. Press the OSD Button to display the Master menu. Use the ▼ Button to highlight the EZSET/EQ LINE, then press the OK Button. See Figure 19.

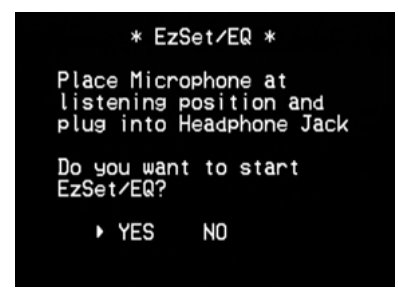


Figure 19 – EzSet/EQ Screen

Select "YES", and a warning screen, followed by the screen shown in Figure 20, will appear.

Figure 20 – EzSet/EQ Screen

To return to the SPEAKER SETUP menu without starting the EzSet/EQ process, select "Cancel". When you are ready to begin, select the number of speakers in your system. Select 5.1 if no surround back speakers are present or if the surround back channels will be used for multizone operation.

NOTE: If there are fewer than five main speakers in your system, do not use the EzSet/EQ process. Instead, proceed as described in the Advanced Functions section. If you have selected a 6.1-channel configuration with a single surround back speaker, use EzSet/EQ automatic configuration for 5.1 speakers, connect the single surround back speaker to the left Surround Back Speaker Output, then configure the surround back speaker manually, as described in the Advanced Functions section. The 6.1-channel configuration is not recommended. If the subwoofer is to be connected to the Front Speaker Outputs, do not connect the subwoofer until after running the EzSet/EQ process.

The AVR 1600 will automatically set its master volume to –25dB.

The test will begin, and a screen such as the one shown in Figure 21 will appear. Maintain silence during the EzSet/EQ configuration.

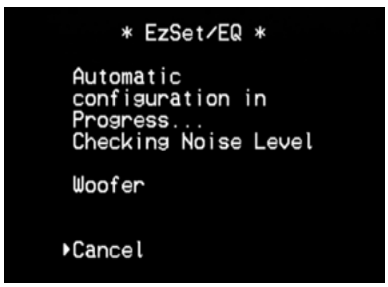


Figure 21 – EzSet/EQ in Progress

As the EzSet/EQ system tests each speaker, its position will appear on screen. If the test sweep is heard from a different speaker than the one indicated on screen, turn off the AVR and check the speaker-wire connections, then begin again.

When the test is completed, select the Continue option. The results will be displayed, along with these options:

- The Retest option repeats the EzSet/EQ process. Increase the master volume manually if some speakers were not correctly detected.
- Select Cancel to return to the Master menu.

See the Advanced Functions section for instructions on how to manually configure the speakers or manually adjust the settings established by the EzSet/EQ process.

Set Up Sources

The Input Setup menu is used to assign the correct physical audio and component video connections to each source.

The AUDIO IN setting must be adjusted now, and if a component video input was used for the source, the COMPONENT IN setting must also be adjusted. Otherwise, there will be no sound or picture when the source is playing. The other settings may be adjusted later.

To display the Input Setup menu, press the OSD Button. Select the INPUT SETUP LINE and press the OK Button. A screen similar to the one shown in Figure 22 will appear.

Figure 22 – Input Setup Menu

Source: Indicates the currently selected source. Use the ◄/► Buttons to select a source: DVD, CD, TUNER (Radio), Tape, 8 CH DIRECT, AUX, VIDEO 1, VIDEO 2, VIDEO 3, HDMI 1, HDMI 2, HDMI 3.

Title: You may change the display name for any source (except the tuner). This may help you to select the correct source device even when you have forgotten which physical connections you used. Move the cursor to the TITLE line and press the OK Button. A block cursor will blink. Use the ▲/▼ Buttons to scroll through the alphabet in upper and lower case, the numbers and many punctuation marks. When you have selected the desired character, press the ► Button to move to the next space. Press the ► Button to leave a blank space. Press the OK Button when you have finished.

Component In: If you connected the source to one of the two component video inputs, press the ► Button to adjust the setting if needed.

NOTE: If the source is connected to a composite video input but a signal is present at the selected component video input, the AVR will display the component video signal. To avoid this, turn off the component video source device, or adjust this setting to select a component video input that is not in use. When no component video signal is present, the AVR will automatically select the composite video input associated with the source.

Audio In: If you used a digital audio connection for a source, change this setting to assign the correct digital audio input, even if you also connected its analog audio outputs to the receiver. Move the cursor to this line, and press the ◄/► Buttons until the correct digital input appears. If an analog audio connection was used, change this setting to ANALOG.

Auto Poll: The Auto Poll feature is used when both an analog audio and digital audio connection have been made for one source device. If no digital signal is available, the AVR 1600 will switch to the analog input for the source. This situation can occur with some cable or satellite television broadcasts, where some channels are broadcast with digital audio and others with analog audio, or when a DVD player is paused or stopped.

For some sources, the Auto Poll feature is unnecessary and may be undesirable, such as for a DVD player. Move the cursor to this line, and press the ◄/► Buttons until OFF appears, disabling the Auto Poll feature. With Auto Poll turned off, the receiver will only check for a signal at the audio input assigned to the source.

The remaining lines in the Input Setup menu adjust the audio performance, and may be skipped at this time. Leaving these settings at their factory defaults is recommended for most listening, in order

to enjoy the sound mix created by your favorite movie and music artists.

BXR: Enhances bass performance when playing MP3 tracks. Select ON, or leave at the default OFF setting for non-MP3 audio.

Tone: Determines whether the treble and bass controls are active. When it's off, the tone controls are "flat", with no changes. When it's on, the bass and treble frequencies are boosted or cut, depending upon the tone-control settings. When an analog audio source is in use and the 2-Channel Stereo surround mode is selected, setting the TONE to OFF places the unit in analog bypass mode.

Bass and Treble: Boost or cut the low or high frequencies by up to 10dB by using the ◄/► Buttons to change the setting by 2dB at a time.

6-/8-Channel Inputs

The 6-/8-Channel Analog Audio Inputs are used when playing certain multichannel discs (DVD-Audio, Blu-ray Disc, SACD and HD-DVD) on a player that decodes the audio and outputs it via its multichannel analog audio outputs but not via its HDMI output.

HDMI-Equipped Multichannel Disc Player:

- Connect the player's HDMI output to one of the AVR's HDMI Inputs. No other connections are necessary.
- Make sure the HDMI input is selected as the source and the Audio Input in the Input Setup menu.

HDMI-Equipped Multichannel Disc Player That Does Not Output Multichannel Audio via an HDMI Connection:

- Connect the player's HDMI output and its multichannel analog audio outputs to one of the AVR's HDMI Inputs and to the AVR's 6-/8-Channel Analog Audio Inputs. In addition, connect the player's component video outputs to one of the AVR's Component Video Inputs.
- When listening to DVD-Video discs, CDs or other materials outputting standard-definition digital audio, select the HDMI Input as the source and as the Audio Input.
- To listen to high-resolution multichannel discs, select the 6-/8-Channel Analog Audio Inputs as the source, and select the component video input the player was connected to. It is not possible to view HDMI video while listening to multichannel analog audio.

Multichannel Disc Player Without HDMI Output, or When Video Display Has No HDMI Input:

- Connect the player's component video outputs to one set of Component Video Inputs on the AVR. Depending on the capabilities of the player and your video display, you may need to use the DVD composite video connection instead.
- Connect the player's digital audio output to a digital audio input on the AVR.
- Connect the player's multichannel audio outputs to the AVR's 6-/8-Channel Analog Audio Inputs.
- When listening to DVD-Video discs, CDs or other materials outputting standard-definition digital audio, select the DVD source, and make sure the digital audio input the player is connected to is selected as the audio input in the Input Setup menu. If a component video connection was made, select the correct input at the COMPONENT IN line of the Input Setup menu. If the DVD Video input was used, it will automatically be selected.
- To listen to high-resolution multichannel discs, select the "8 CH DIRECT" source.

NOTE: The 6-/8-Channel Inputs pass the incoming signals directly to the volume control, without digitizing or processing them. It is not possible to change the surround mode or adjust any of the tone controls when using the 6-/8-Channel Inputs. Configure the bass management settings (i.e., speaker size, delay and output level) on your source device to match the settings programmed using the EzSet/EQ procedure, which may be viewed using the Speaker Setup menu (see Advanced Functions section). Consult the owner's guide for your multichannel player for more information.

System Settings

The AVR 1600 offers system settings that make the receiver easier to use. Access these settings by pressing the OSD Button and navigating to the SYSTEM SETUP line of the Master menu. Press the OK Button to display the submenu. See Figure 23.

Figure 23 – System Setup Menu Screen

VFD Fade Time Out: Some people find the brightness of the AVR's front-panel display distracting during movies or listening sessions. It's possible to dim the front-panel display completely using the Dim function (see below). This sets the display to remain dark most of the time, lighting up only when a button is pressed or a remote command is received, and going dark again 5 seconds after the last command. The VFD FADE TIME OUT feature also causes the display to light up only when a button is pressed or a change in the incoming signal is detected, but the display immediately begins to fade to dark. This setting allows you to program the length of the fade time. Select a time-out period of between 3 and 10 seconds, or select OFF if you prefer to leave the displays on at all times or to use the Dim function.

Volume Default and Default Volume Set: These two settings are used together to program the AVR's volume level at turn-on. This feature avoids discomfort for listeners in case the last user turned the volume very high. Press the OSD Button to remove the display from the screen so that you may adjust the volume to a desired level while a source is playing. Make a note of the number that appears in the display, and return to the System Setup menu. At the DEFAULT VOL SET line, select the desired volume setting, and activate the feature by setting VOLUME DEFAULT to ON.

HDMI Audio to TV: Determines whether HDMI audio signals are passed through the HDMI Output to the video display. In normal operation, leave this setting OFF, as audio will be played through the AVR. To use the TV by itself, without the home theater system, turn this setting ON. Mute the TV's speakers when using the AVR for audio.

Semi-OSD Time Out: Program the amount of time (2 to 5 seconds) the two-line semi-OSD status messages remain on screen, or deactivate the semi-OSD display altogether if you find it distracting. These messages will continue to appear on the front panel of the receiver.

Full-OSD Time Out: Program the amount of time (20, 30, 40 or 50 seconds) the full-OSD menus remain visible on screen. The full-OSD system may not be deactivated.

NOTE: It isn't possible to view video sources while the full-OSD menus are displayed.

Dim Function

To dim the Message Display, press the Dim Button on the remote. Each button press will cycle through the three settings of:

- **VFD Full:** Normal brightness
- **VFD Half:** Display is dimmed but still visible; the light inside the volume knob goes dark
- **VFD Off:** Display goes completely dark except for Power Indicator, to remind you that the receiver is turned on.

When you have finished, press the OSD Button to clear the menus from view.

You are now ready to begin enjoying your new receiver!

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

TURNING ON THE AVR 1600

Flip the rear-panel Main Power Switch to the "On" position. The Power Indicator on the front panel will turn amber, indicating that the AVR is in Standby mode and is ready to be turned on. The Main Power Switch is normally left on.

There are several ways to turn on the AVR 1600:

a) Press the Standby/On Switch on the front panel.

b) Using the remote, press the Power On Button or any of the Source Selectors.

To turn the receiver off, press either the Standby/On Switch on the front panel or the Power Off Button on the remote control. Unless the receiver will not be used for an extended period of time, leave the Main Power Switch on. When the Main Power Switch is turned off, any settings you have programmed will be preserved for up to four weeks.

IMPORTANT NOTE: If the PROTECT message ever appears in the Message Display, turn off the AVR and unplug it. Check all speaker wires for a short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

VOLUME CONTROL

Adjust the volume either by turning the knob on the front panel (clockwise to increase volume or counterclockwise to decrease volume), or by pressing the Volume Control 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 the AVR 1600. 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.

MUTE FUNCTION

To temporarily 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 display as a reminder. To restore normal audio, press the Mute Button again, or adjust the volume. Turning off the AVR will also end muting.

SLEEP TIMER

The sleep timer sets the AVR to play for up to 90 minutes and then turn off automatically.

Press the Sleep Settings Button on the remote, and the time until turn-off will be displayed. Each additional press of the Sleep Button decreases the play time by 10 minutes. The SLEEP OFF setting disables the sleep timer.

If you press the Sleep Button after the timer has been set, the remaining play time will be displayed. Press the Sleep Button again to change the play time.

TONE CONTROLS

You may boost or cut either the treble or the bass frequencies by up to 10dB.

Press the Tone Mode Button once. This will indicate whether the tone controls are in or out of the circuitry. With the TONE IN message displayed, press the Tone Mode Button repeatedly to access TREBLE MODE and BASS MODE. Use the ▲/▼ Buttons to change the treble or bass settings.

To return the tone controls to 0, or "flat" response, press the Tone Mode Button, and then use the ▲/▼ Buttons to display the TONE OUT message, which preserves any changes you have made to the bass or treble settings for later use. To reactivate your changes, the tone control must be set to TONE IN.

The display will return to normal a few seconds after your last command.

You may also adjust the tone controls using the full-OSD menu system. Press the OSD Button on the remote to view the Master menu. With the cursor pointing to the INPUT SETUP line, press the OK Button to display the Input Setup menu and view the current tone settings. To make changes to the TONE, BASS or TREBLE settings, use the ▲/▼ Buttons to move the cursor to the setting, and use the ◄/► Buttons to adjust it. It isn't necessary to press the OK Button to enter the new setting.

When you have finished, either wait until the display times-out and disappears, press the OSD Button to clear the display, or move the cursor to the BACK TO MASTER MENU line and select it to make other changes using the menu system.

NOTE: The AVR 1600 does not have a conventional balance control. The speaker output level calibration process compensates for any characteristics of your room or loudspeakers, and it is recommended that you leave the settings as they are after you have completed Initial Setup. However, you may manually adjust the levels of the left and right channels – decreasing one and increasing the other by the same amount – using the Channel Adjust submenu, as described in the Advanced Functions section. This achieves the same effect as a balance control.

HEADPHONES

Plug the 1/4" plug on a pair of headphones into the front-panel 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 the remote, 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.

SOURCE SELECTION

- Use the front-panel ▲/▼ Source Buttons to scroll through the sources.
- Using the on-screen menus, press the OSD Button, highlight "INPUT SETUP" and press the OK Button. Use the ◄/► Buttons to select a source.

• For direct access to any source, press its Source Selector on the remote.

The AVR selects the audio and video inputs assigned to the source, and any other settings 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. The source name and surround mode will also appear on screen.

VIDEO TROUBLESHOOTING TIPS:
If there is no picture:

- Check the source selection and video input assignment.
- Check the wires for a loose or incorrect connection.
- Check the video input selection on the display device (TV).

Additional Tips for HDMI Connections:

- Turn off all devices (including the TV, AVR and any source components).
- Unplug the HDMI cables, starting with the cable between the TV and AVR, 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.

USING THE RADIO

To select the AVR 1600's built-in radio:

1. Use the front-panel ▲/▼ Source Buttons to scroll to the desired band.
2. Press the AM/FM Source Selector on the remote. Press it again to switch bands.

Use the ▲/▼ Tuning Buttons to tune a station, as displayed on the front panel and on screen.

The AVR defaults to automatic tuning, meaning each press of the ▲/▼ Tuning Buttons scans through all frequencies until a station with acceptable signal strength is found. To switch to manual tuning, in which each press of the ▲/▼ Tuning Buttons steps through a single frequency increment (0.1MHz for FM, or 10kHz for AM), press the Tuning Mode Button on the remote. Each press of the Tuning Mode Button toggles between automatic and manual tuning modes.

When an FM station has been tuned, toggling the tuning mode also switches between stereo and monaural play, which may improve reception of weaker stations.

A total of 30 stations (AM and FM together) may be stored as presets. When the desired station has been tuned, press the Memory Button on the remote, and two dashes will flash. Use the Numeric Keys to enter the desired preset number.

To tune a preset station: Press the Preset ▲/▼ Buttons or enter the preset number using the Numeric Keys.

RECORDING

Two-channel analog and digital audio signals, as well as composite video signals, are normally available at the appropriate recording outputs. To make a recording, connect your audio or video recorder to the appropriate output jacks, as described in the Installation section, insert blank media and make sure the recorder is turned on and recording while the source is playing.

NOTES:

1. Analog and digital audio signals are not converted to the other format.
2. Only PCM digital audio signals are available for recording. Proprietary formats such as Dolby Digital and DTS may not be recorded using the digital audio connections. Use the analog audio connections to make an analog recording.
3. HDMI and component video sources that are HDCP-copy-protected are not available for recording.
4. Please make certain that you are aware of any copyright restrictions on any material you record. Unauthorized duplication of copyrighted materials is prohibited by federal law.

AUX INPUT

Enjoy the full power and resolution of your Harman Kardon system, including a variety of analog surround modes, while listening to content stored on your portable device.

The Auxiliary Audio Input mini jack is provided on the AVR's rear panel for convenient connection of portable players, such as CD players and the iPod (iPod and cable not included). Purchase a stereo cable with a 1/8" plug on at least one end for connection to the Auxiliary Audio Input. Plug the other end of the cable into the portable device's headphone output, and operate the device using its own controls. You may also use a cable with separate left and right audio plugs at one end for connection to any component equipped with analog audio outputs.

No video connection is available with the AUX input. However, the AVR will use the last-selected analog video input when the AUX source is selected.

SELECTING A SURROUND MODE

Surround mode selection 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. More detailed information on surround modes may be found in the Advanced Functions section.

To select a surround mode, press the OSD Button on the remote to display the Master menu. Use the ▲/▼ Buttons to move the cursor to the SURROUND SELECT line and press the OK Button. The Surround Modes menu will appear (see Figure 24). Use the ▲/▼ Buttons repeatedly until the desired surround mode category appears: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Press the OK Button to change the surround mode for the category.

Figure 24 – Surround Modes Menu

Auto Select: For digital programs, such as movies recorded with a Dolby Digital soundtrack, the AVR will automatically use the native surround format. For 2-channel analog and PCM programs, the AVR uses Logic 7 Movie mode.

Virtual Surround: When only two main speakers are present in the system, Harman Virtual Surround may be used to create an enhanced sound field that virtualizes the missing speakers.

Stereo: When 2-channel playback is desired, select the number of speakers used for playback:

- 2 CH STEREO uses only two speakers. As described on page 30, you may select Analog Bypass mode for a pure analog signal when analog audio inputs are in use. Turn off the TONE setting, and the AVR does the rest.
- 5 CH STEREO plays the left-channel signal through the front and surround left speakers, the right-channel signal through the right speakers and a summed mono signal through the center speaker.
- 7 CH STEREO follows the same scheme as 5 CH STEREO, but adds the surround back speakers. This mode is only available when the surround back speakers are present.

Movie: Use when a surround mode is desired for movie playback: Logic 7 Movie, DTS Neo:6 Cinema or Dolby Pro Logic II (IIx when seven main speakers are present).

Music: Use when a surround mode is desired for music playback: Logic 7 Music, DTS Neo:6 Music or Dolby Pro Logic II (IIx when seven main speakers are present). The Dolby Pro Logic II/IIx Music mode allows access to a submenu with some additional settings. See the Advanced Functions section for more information.

Video Game: Use to select a surround mode for game playback: Logic 7 Game, or Dolby Pro Logic II (IIx when seven main speakers are present) Game.

After you have made your selection, use the ▲/▼ Buttons to move the cursor to the BACK TO SURROUND SELECT line and press the OK Button, then select the BACK TO MASTER MENU line and press the OK Button to make additional adjustments. When you are finished using the menu system, press the OSD Button to clear the full-OSD menus from view (the semi-OSD display will appear).

See the Advanced Functions section for more information on surround modes.

TROUBLESHOOTING GUIDE

Symptom	Cause	Solution
Unit does not function when Main Power Switch is turned on	• No AC Power	• Make certain AC power cord is plugged into a live outlet • Check whether outlet is switch-controlled
Display lights, but no sound or picture	• Intermittent input connections • Mute is on • Volume control is down	• Secure all input and speaker connections • Press Mute Button • Turn up volume control
No sound from any speaker; PROTECT message appears on front panel	• Amplifier is in protection mode due to possible short • Amplifier is in protection mode due to internal problems	• Check speaker wires for shorts at receiver and speaker ends • Contact your local Harman Kardon service center
No sound from surround or center speakers	• Incorrect surround mode • Input is monaural • Incorrect configuration • Stereo or Mono program material	• Select a mode other than Stereo • There is no surround information from mono sources • Check speaker configuration • The surround decoder may not create center- or rear-channel information from nonencoded programs
Unit does not respond to remote commands	• Weak batteries in remote • Wrong device selected • Remote sensor is obscured	• Change remote batteries • Press the AVR Button • Make certain front-panel sensor is in line of sight of remote or connect an optional remote sensor
Intermittent buzzing in tuner	• Local interference	• Move unit or antenna away from computers, fluorescent lights, motors or other electrical appliances

Additional information on troubleshooting possible problems with your AVR 1600, or installation-related issues, may be found in the list of "Frequently Asked Questions", which is located in the Product Support section at www.harmankardon.com.

Resetting the Remote

- To reset the remote to its factory defaults, simultaneously press and hold any Input Selector and the "0" Numeric Key. When the Program LED flashes in amber, enter the code "333". When the green LED goes out, the remote will have been fully reset.

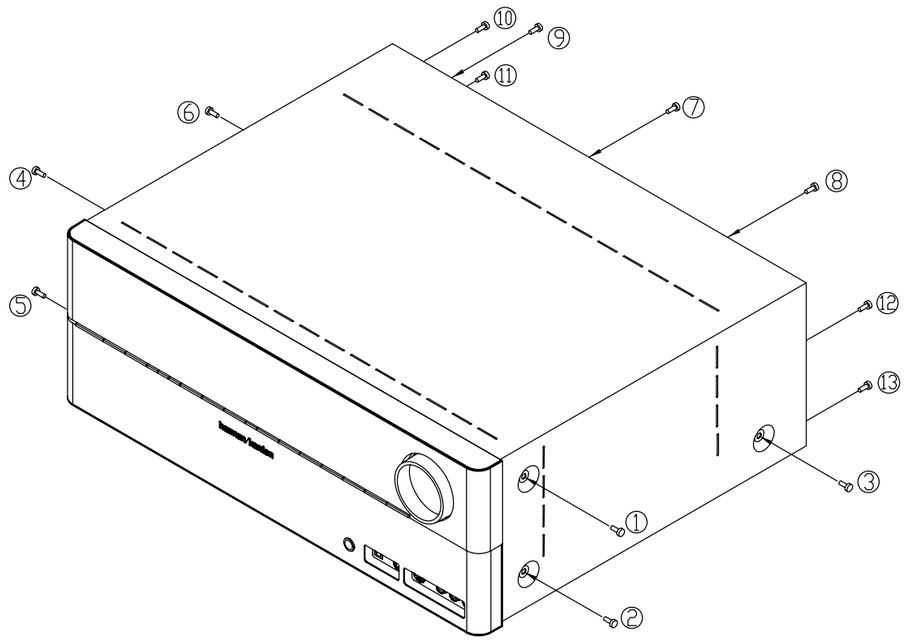
PROCESSOR RESET

- To reset the AVR 1600, place it in Standby mode (press the front panel Standby/On Switch so that the Power Indicator turns amber).
- Then press and hold the front-panel Surround Mode Button for at least 5 seconds until the RESET message appears.

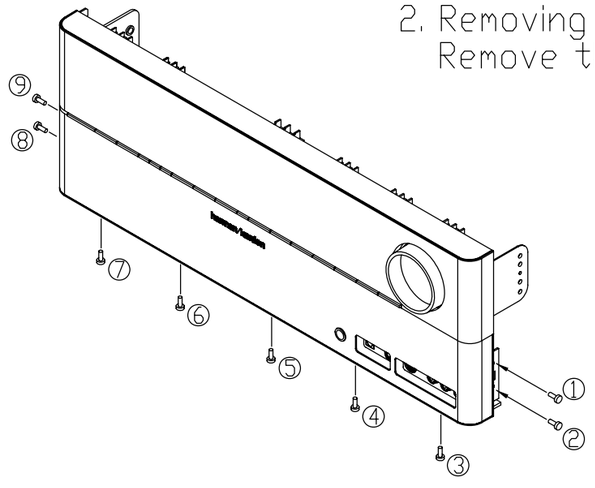
DISASSEMBLY

AVR1600

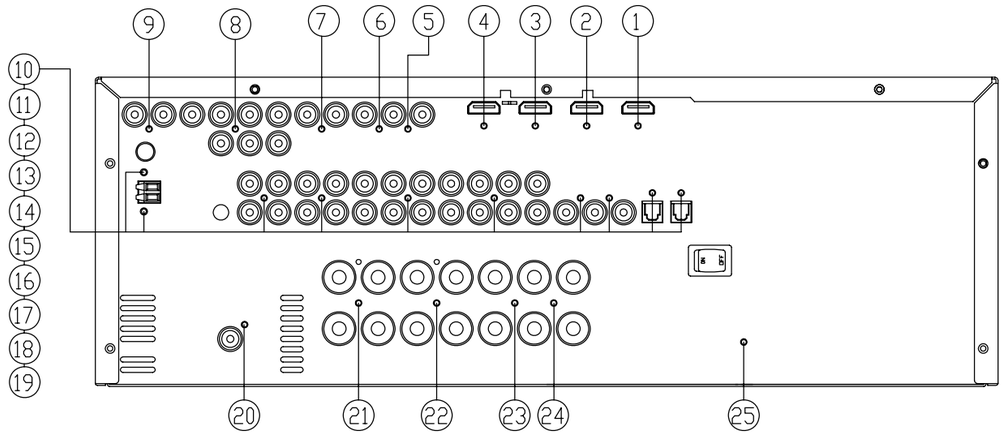
1. Removing the Top Cabinet
Remove the Screws ①~⑬



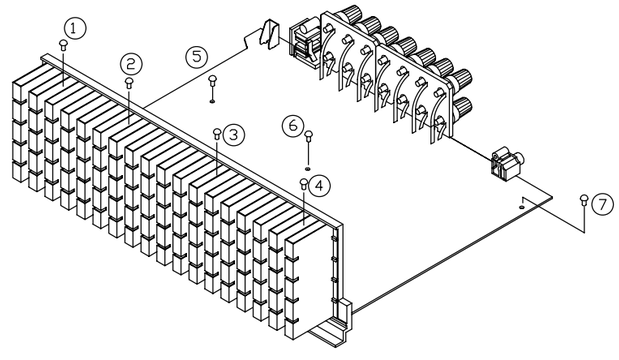
2. Removing the Front Panel
Remove the Screws ①~⑨



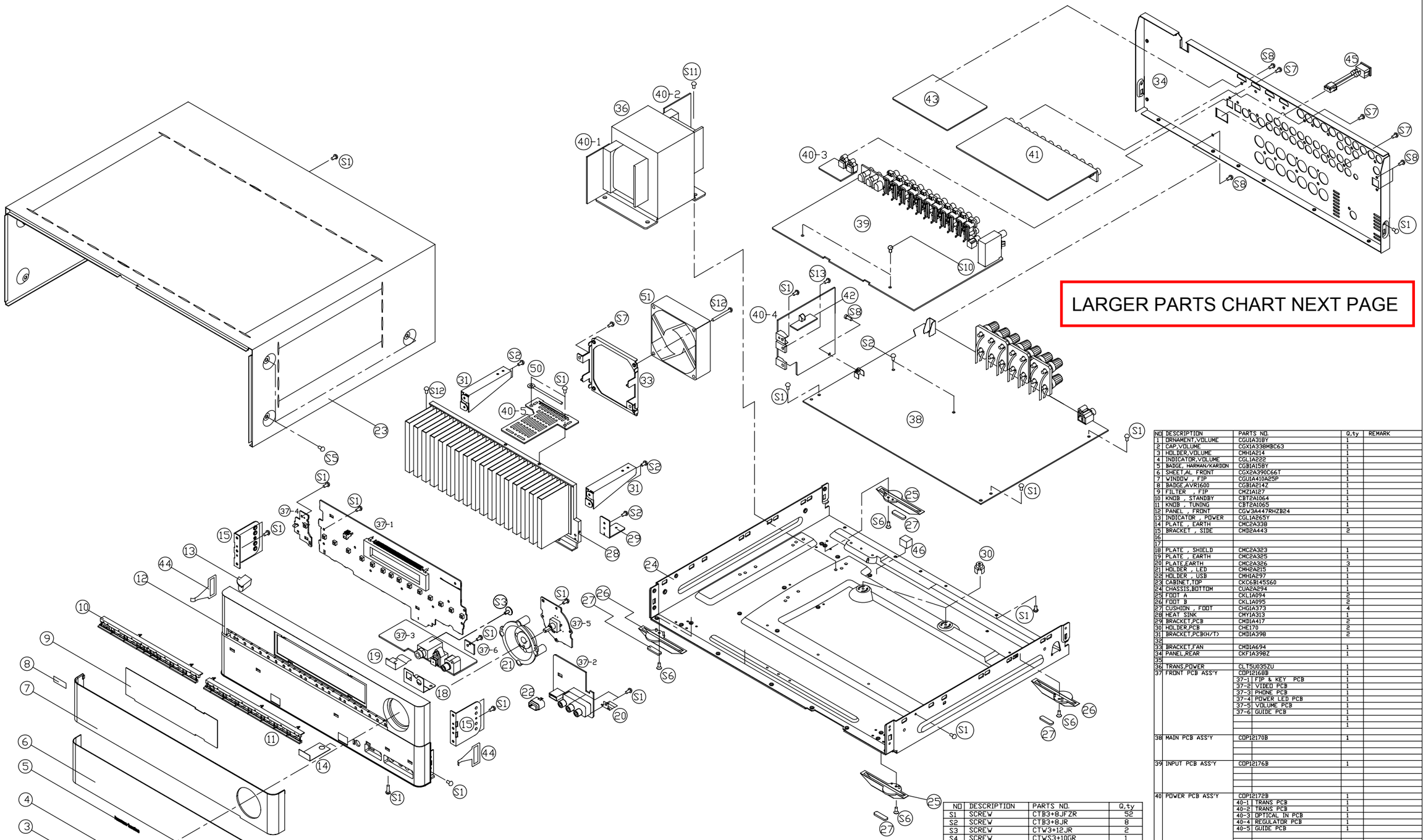
3. Removing the Rear Panel
Remove the Screws ①~㉕



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



AVR 1600 EXPLODED VIEW



NO	DESCRIPTION	PARTS NO.	Q,ty
S1	SCREW	CTB3+8JFZR	52
S2	SCREW	CTB3+8JR	8
S3	SCREW	CTW3+12JR	2
S4	SCREW	CTWS3+10GR	1
S5	SCREW	CTB4+6FFZR	6
S6	SCREW	CTS3+8JFZR	4
S7	SCREW	CTB3+10JFZR	18
S8	SCREW	CTB3+6FFZR	8
S9	SCREW, SPECIAL	CHD1A012R	14
S10	SCREW, SPECIAL	CHD1A012ZR	2
S11	SCREW,TRANS	CHD1A023R	4
S12	SCREW, SPECIAL	CHD4A012R	5
S13	SCREW, SPECIAL	CHD3A012R	11
S14	SCREW, SPECIAL	CHD1A036R	4
S15			
S16			

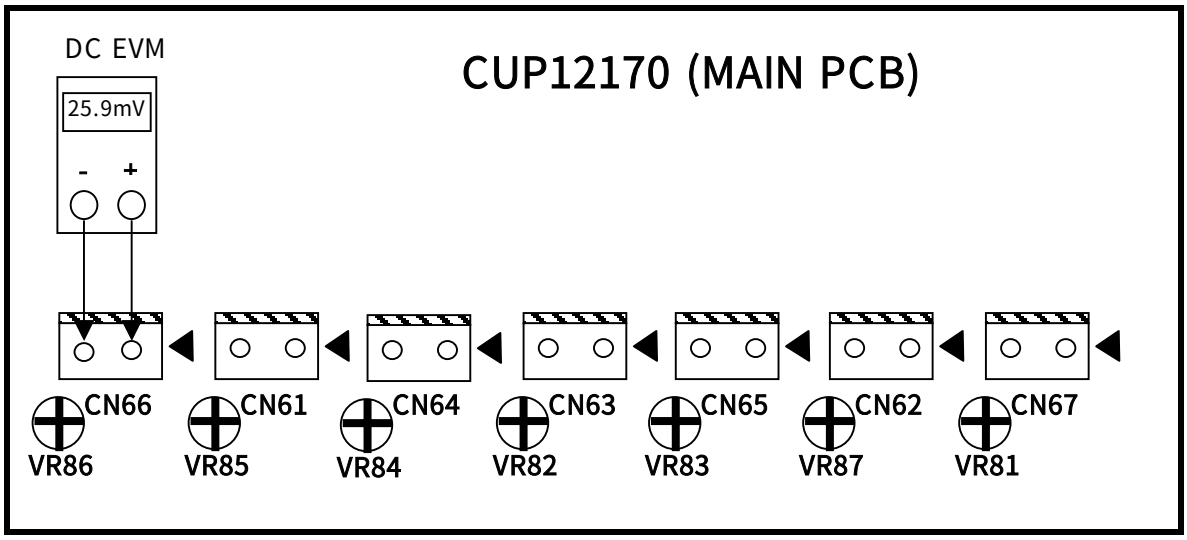
NO	DESCRIPTION	PARTS NO.	Q,ty	REMARK
1	ORNAMENT,VOLUME	CGUIA318Y	1	
2	CAP,VOLUME	CGXIA338MBC63	1	
3	HOLDER,VOLUME	CMHIA214	1	
4	INDICATOR,VOLUME	CGL1A222	1	
5	BADGE, HARMAN/KARDON	CGBIA158Y	1	
6	SHEET,AL FRONT	CGX2A390C66T	1	
7	WINDOW , FIP	CGUIA410A25P	1	
8	BADGE,AVR1600	CGBIA214Z	1	
9	FILTER , FIP	CMZIA127	1	
10	KNOB , STANDBY	CBT2A1064	1	
11	KNOB , TUNING	CBT2A1065	1	
12	PANEL , FRONT	CGW3A447RHZB24	1	
13	INDICATOR , POWER	CGL1A265Y	1	
14	PLATE , EARTH	CMC2A338	1	
15	BRACKET , SIDE	CMD2A443	2	
16				
17				
18	PLATE , SHIELD	CMC2A323	1	
19	PLATE , EARTH	CMC2A325	1	
20	PLATE,EARTH	CMC2A326	3	
21	HOLDER , LED	CMH2A215	1	
22	HOLDER , USB	CMHIA297	1	
23	CABINET,TOP	CKC6B145S60	1	
24	CHASSIS,BOTTOM	CUA2A294	1	
25	FOOT A	CKL1A094	2	
26	FOOT B	CKL1A095	2	
27	CUSHION , FOOT	CHG1A373	4	
28	HEAT SINK	CMY1A313	1	
29	BRACKET,PCB	CMD1A417	2	
30	HOLDER,PCB	CHE170	2	
31	BRACKET,PCB(H/T)	CMD1A398	2	
32				
33	BRACKET,FAN	CMD1A694	1	
34	PANEL,REAR	CKF1A398Z	1	
35				
36	TRANS,POWER	CLT5U035ZU	1	
37	FRONT PCB ASS'Y	CDP12168B	1	
	37-1	FIP & KEY PCB	1	
	37-2	VIDEO PCB	1	
	37-3	PHONE PCB	1	
	37-4	POWER LED PCB	1	
	37-5	VOLUME PCB	1	
	37-6	GUIDE PCB	1	
			1	
			1	
38	MAIN PCB ASS'Y	CDP12170B	1	
39	INPUT PCB ASS'Y	CDP12176B	1	
40	POWER PCB ASS'Y	CDP12172B	1	
	40-1	TRANS PCB	1	
	40-2	TRANS PCB	1	
	40-3	OPTICAL IN PCB	1	
	40-4	REGULATOR PCB	1	
	40-5	GUIDE PCB	1	
41	VIDEO PCB ASS'Y	CDP12174B	1	
42	DCDC PCB ASS'Y	CDP12167B	1	
43	HDMI PCB ASS'Y	CDP12178B	1	
44	PLATE , SHIELD	CMC1A372	2	
45	MDMS S/W ASS'Y	CSHIA009ZVB	1	
46	CUSHION	CHG1A160Z	1	
47	COVER , JACK A	CGR3A436	1	
48	COVER , JACK B	CGR3A437	1	
49	ORNAMENT , AL A	CGXIA391C66	1	
50	ORNAMENT , AL B	CGXIA392C66	1	
51	FAN , MOTOR	CFNCF12B25HSN	1	
52				
53				

NO	DESCRIPTION	PARTS 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	CGB1A158Y		1
6	SHEET,AL FRONT	CGX2A390C66T		1
7	WINDOW , FIP	CGU1A410A25P		1
8	BADGE,AVR1600	CGB1A214Z		1
9	FILTER , FIP	CMZ1A127		1
10	KNOB , STANDBY	CBT2A1064		1
11	KNOB , TUNING	CBT2A1065		1
12	PANEL , FRONT	CGW3A447RHZB24		1
13	INDICATOR , POWER	CGL1A265Y		
14	PLATE , EARTH	CMC2A338		1
15	BRACKET , SIDE	CMD2A443		2
16				
17				
18	PLATE , SHIELD	CMC2A323		1
19	PLATE , EARTH	CMC2A325		1
20	PLATE,EARTH	CMC2A326		3
21	HOLDER , LED	CMH2A215		1
22	HOLDER , USB	CMH1A297		1
23	CABINET,TOP	CKC6B145S60		1
24	CHASSIS,BOTTOM	CUA2A294		1
25	FOOT A	CKL1A094		2
26	FOOT B	CKL1A095		2
27	CUSHION , FOOT	CHG1A373		4
28	HEAT SINK	CMY1A313		1
29	BRACKET,PCB	CMD1A417		2
30	HOLDER,PCB	CHE170		2
31	BRACKET,PCB(H/T)	CMD1A398		2
32				
33	BRACKET,FAN	CMD1A694		1
34	PANEL,REAR	CKF1A398Z		1
35				
36	TRANS,POWER	CLT5U035ZU		1
37	FRONT PCB ASS'Y			1
		37-1	FIP & KEY PCB	1
		37-2	VIDEO PCB	1
		37-3	PHONE PCB	1
		37-4	POWER LED PCB	1
		37-5	VOLUME PCB	1
		37-6	GUIDE PCB	1
				1
				1
38	MAIN PCB ASS'Y			1
39	INPUT PCB ASS'Y			1
40	POWER PCB ASS'Y			1
		40-1	TRANS PCB	1
		40-2	TRANS PCB	1
		40-3	OPTICAL IN PCB	1
		40-4	REGULATOR PCB	1
		40-5	GUIDE PCB	1
41	VIDEO PCB ASS'Y			1
42	DCDC PCB ASS'Y			1
43	HDMI PCB ASS'Y			1
44	PLATE , SHIELD	CMC1A372		2
45	MOMS S/W ASS'Y	CSH1A009ZVB		1
46	CUSHION	CHG1A160Z		1
47	COVER , JACK A	CGR3A436		1
48	COVER , JACK B	CGR3A437		1
49	ORNAMENT , AL A	CGX1A391C66		1
50	ORNAMENT , AL B	CGX1A392C66		1
51	FAN , MOTOR	CFNCF12825HSN		1

AMPLIFIER SECTION BIAS ADJUSTMENT

Measurement condition
; No input signal or volume position is minimum.

Standard value
; Ideal current = 48mA (± 5%)
; Ideal DC Voltage = 25.92mV (± 5%)



DC VOLTMETER ; Connect to
CN66(SL),CN61(CEN),CN64(SR),CN63(FL),CN65(SBL),CN62(FR),CN67(SBR)

NO.	Channel	Adjust for	Adjustment
1	Front Left	25.92mV (± 5%)	CN63
2	Front Right	25.92mV (± 5%)	CN62
3	Center	25.92mV (± 5%)	CN61
4	Surround Left	25.92mV (± 5%)	CN66
5	Surround Right	25.92mV (± 5%)	CN64
6	Surround Back Left	25.92mV (± 5%)	CN65
7	Surround Back Right	25.92mV (± 5%)	CN67

AVR1600 & AVR160/230 BLOCK DIAGRAM

All Models have Tuner Module.

TUNER MODULE — TUNER L/R, TUNER MUTE, TUNER CONT., SCL, SDA, CE, RST & TUNED

* OPTION * AVR3600 & AVR460 — VOL.IC & Multi VoLIC CONT.

A-BUS OUT — RJ45 JACK — MULTI_OUT

NJW1159M — 8dB AMP — 2CH VOL — MULTI & A-BUS MUTE

TO CODEC IC — AD-LT, AD+LT, AD-RT, AD+RT

8-CHANNEL ELECTRONIC VOLUME WITH INPUT SELECTOR

NJW1197CF (AVR1600 & AVR160)

NJW1298FU1 (AVR2600, AVR3600, AVR360 & AVR460))

8 CHANNEL INPUT — FL/R, SL/R, SBL/R, CEN/SUB

ATT — TONE — PRE AMP

8CH PRE-OUT (AVR3600 & AVR460)

FRONT L, FRONT R, SURR L, SURR R, CEN, SUBWOOFER (All Models), SBL/MULTI L, SBR/MULTI R

FUNC. MUTE

DATA CLOCK

* OPTION * (Or ~) (AVR1600 & AVR160)

ANALOG5 IN Or DVD IN
ANALOG4 IN Or VIDEO1 IN
ANALOG4 OUT Or VIDEO1 OUT
ANALOG3 IN Or VIDEO2 IN
ANALOG2 IN Or TAPE IN
ANALOG2 OUT Or TAPE OUT
ANALOG 1 IN Or CD IN
ANALOG FRONT IN Or VIDEO3 IN
TUNER IN
ONLY USA VER. * OPTION AVR2600 & AVR3600 — Sirius IN
* OPTION AVR1600 & AVR160 — STEREO IN
* OPTION AVR2600 & AVR360 AVR3600 & AVR460 — IPod IN
MIC IN

MAIN AMP

FRONT L, FRONT R, SBL/MULTI L, SBR/MULTI R, SURR L, SURR R, CEN — P-AMP +29dB

+8dB — HP_AMP — MIC_AMP — MIC SIG. — +40dB — HP_IN — +12V

H_PHONE OUT or MIC_INPUT

Temp. Sensor — POWER MUTE — DC/OVER CURRENT SENS — TEMP I/F — HEAT2 — PROTECT

FL, FR, SBL/ZONE2 LEFT, SBR/ZONE2 RIGHT, SL, SR, CEN

* OPTION * (AVR2600 & AVR360) (AVR3600 & AVR460)

---

* OPTION (AVR2600, AVR3600, AVR360 & AVR460)

TO USB IPOD PART +8V — TO HDMI PART +1.8V, +3.3V — +5V — REGULATOR IC (+5V) — +8V — DC DC CIRCUITS

* OPTION(AVR1600 & AVR160) — TO HDMI PART(DC DC CIRCUITS) TO VIDEO PART

TO INPUT PART +5VD — REGULATOR IC (+5V)

TO INPUT PART PULL UP FOR MUTE

TO HDMI, VIDEO & USB IPOD PART -5VD — REGULATOR IC (-5V)

-15V — REGULATOR IC (±5V)

TO INPUT & USB iPod PART +15V

TO INPUT PART +9V — REGULATOR IC (+9V) — TO HDMI PART

POWER FAIL — +VCC(DC) -VCC(DC) — UNBAL DETECT

34V(DC) — REGULATOR CIRCUITS — 4.9V(AC)

DRIVER SUPPLY VOLTAGE — FILMENT VOLTAGE

* OPTION (AVR3600 & AVR460) — TO A-BUS PART +24V — DC POWER — AC IN

* OPTIONAL ACCESSORY *

TO INPUT PART ST+5V — REGULATOR IC (+5V)

POWER DOWN — RESET IC (+2.6V)

+6V — SUB TRANS — POWER S/W — POWER HIGH — Fuse 2A RED — Fuse 2A — AC OUTLET — BLACK OR BROWN — LIVE — NEUTRAL — WHITE OR BLUE — AC IN

* OPTION (AVR2600 & AVR360) (AVR3600 & AVR460)

I2S/SPDIF

HDMI OUT — ADV7510 (HDMI TX) — MCLK/I²C_SyncDE — 3Bit TTL Data — I2C — HDMI EX_EN — HDM & VIDEO SW IC CONT.

HDMI_IN3, HDMI_IN2, HDMI_IN1 — ADV7604 — VIDEO Processor — HDMI RX — 28.6363MHz — HDMI I2S Data — 74VCX541

UART RX/TX — MCU Up-date & CONT. — USB D+/D- — TMP92FD28FG 32bit u-COM(USB HOST) INT.RAM:32-K & ROM:512-K — XOUT XIN XOUT XIN — 9MHz — 32.768KHZ

POWER HIGH, MCU RST, MCU BOOT, VOL LED CONT., USB POWER ON, USB IDLE

* OPTION * (Or ~) (AVR1600 & AVR160) — COAX.&OPT. FRONT — Or COAX.3 & OPT.3 — OPT.1, OPT.2, *OPTION* AVR3600 & AVR460 OPT.3

D_FL, D_FR, D_SL, D_SR, D_CNT, D_SW, D_SBL, D_SBR

ADUITA1+, ADUITA1-, ADUITB1+, ADUITB1-, ADUITA2+, ADUITA2-, ADUITB2+, ADUITB2-, ADUITA3+, ADUITA3-, ADUITB3+, ADUITB3-, ADUITA4+, ADUITA4-, ADUITB4+, ADUITB4-

CS42528 — 114dB, 192 kHz 8-CH CODEC WITH S/PDIF RECEIVER — A IN L+/- — AD IN R+/- — DIN — DOUT — RM CLK — OMCK — S4I_SCLK — S4I_LRCK — S4I_SDOUT — SDIN1 SDIN2 SDIN3 SDIN4 CX_SCLK(DSP2_SCLK) CX_LRCK(DSP2_LRCK)

FROM VOLUME IC — LT — RT — COAX.1 — COAX.2 — COAX OUT

HDMI MCLK — RM CLK — DSP XTAL OUT — OMCK — HDMI SW2 — 2CH MUX 74VHC157 — QUAD 2-CH MUX — 74VCX541 — HDMI SW1 I2S/DSP_SPDIF — OPTAL BUFFER

CODEC CONT. (CODEC_CE,CODEC_D OUT,CLK,DSP DATA) — CODEC RST.

DAOMCLK — (CS1,IJRQ1,BSY,SDA,CLK,DSP DATA) — DAOMCLK — I2S — 24.576MHz

DSP CS497024 — 32-bit High Definition Audio Decoder DSP Family with Dual DSP Engine Technology — DSP XTAL OUT — DA2I2SRCK — DA2I2SCK — DA2I2SDATA — XIN — XOUT — FL-FR — CEN-SUB — SL-SR — SBL-SBR — AUDATA0 — AUDATA1 — AUDATA2 — AUDATA3 — SCLK0 — LRCLK0

DSP CONT. — DSP RST. — ADDRESS&DATA

M12L16161A 16M SDRAM — SPI Serial Flash 8 Mbit

REMOTE SENSOR — FL DISPLAY — ROTARY ENCODER (MASTER VR) — STANDBY AMBER/WHITE — MOMS SWITCH — KEY1~2 — KEY MATRIX — (WHITE) VOLUME Indicator

* OPTION * (Or ~) (AVR1600 & AVR160) — COAX.FRONT Or COAX.3 — OPT.FRONT Or OPT.3 — USB PORT FOR UPDATING NEW F/W — COMPOSITE F.FRONT Or VIDEO IN — ANALOG FRONT Or VIDEO IN

VIDEO3 IN, VIDEO2 IN, VIDEO1 IN, VIDEO1 OUT, DVD IN — 5MP CVBS — V3, V2, V1, DVD — CONT — +6dB DRV — CVBS IN — NJM2595MTE1

OSD IC LC74763M — CVBS IN OSD IN — CVBS OUT OSD OUT — OSD IC CONT.

USA VER.:14.318MHz EUR VER.:17.734MHz — * Option (EUR VER.) 14.318MHz

COMP INPUT1, COMP INPUT2 — Y1, Y2, Cb1, Cb2, Cr1, Cr2 — 6dB DRV — Y3(CVBS) — Y, Cb, Cr — MONITOR COMPONENT

NJW1321FP1 — NJM2595 CONTROL PORT — I2C — HDM & VIDEO SW IC CONT.

COMPOSITE(CVBS) MONITOR — CVBS OUT

** EEP_ROM ** FOR BACK-UP MEMORY.

T5CN5 32bit u-COM — 10MHz — XIN XOUT — I2C — EEPROM (32 Kbit)

TUNER CONT., VFD CONT., VOL LED CONT., VOL EN, KEY, IRP, IN, MIC IN, IR(REMOTE) IN

VOL.IC & Multi VoLIC CONT., CODEC CONT., DSP CONT., HDMI EX_EN, HDMI & VIDEO SW IC CONT., MCU Update & UART CONT., OSD IC CONT., ADV7510 INT'L, ADV7604 INT'L

MCU RST., MCU BOOT, PROTECT IN, POWER FAIL IN, POWER DOWN, POWER HIGH, CODEC RST., DSP RST., HDMI RST.

HDMI SW1, HDMI SW2, VOL IC MUTE, TUNER MUTE, FUNC MUTE, SBL MUTE, POWER MUTE, HP MUTE, HDMI MUTE

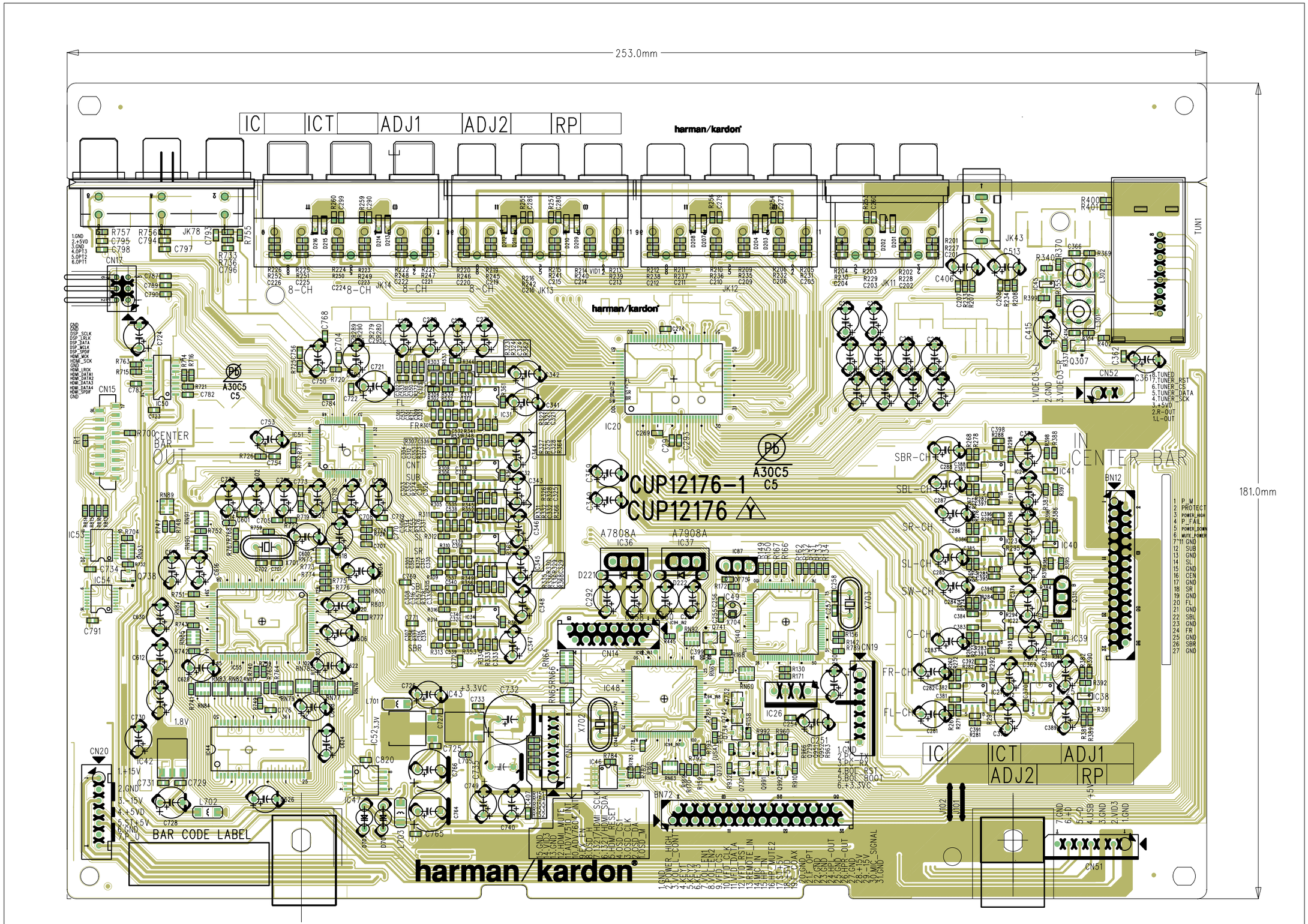
M/P

ISSUE 2009.07.27

REVISION							
1		2		3		4	
		5		6		7	

SCHEMATIC DIAGRAM — SHEET 1/1

MODEL	AVR1600 & AVR160/230		
DESIGN	CHECK	APPROVE	DRAWING NO
J.H.Lee	W.Y.Yang	G.S.Wey	BLOCK DIAGRAM 2171BLDZ 1/1
09.07.27	09.07.27	09.07.27	



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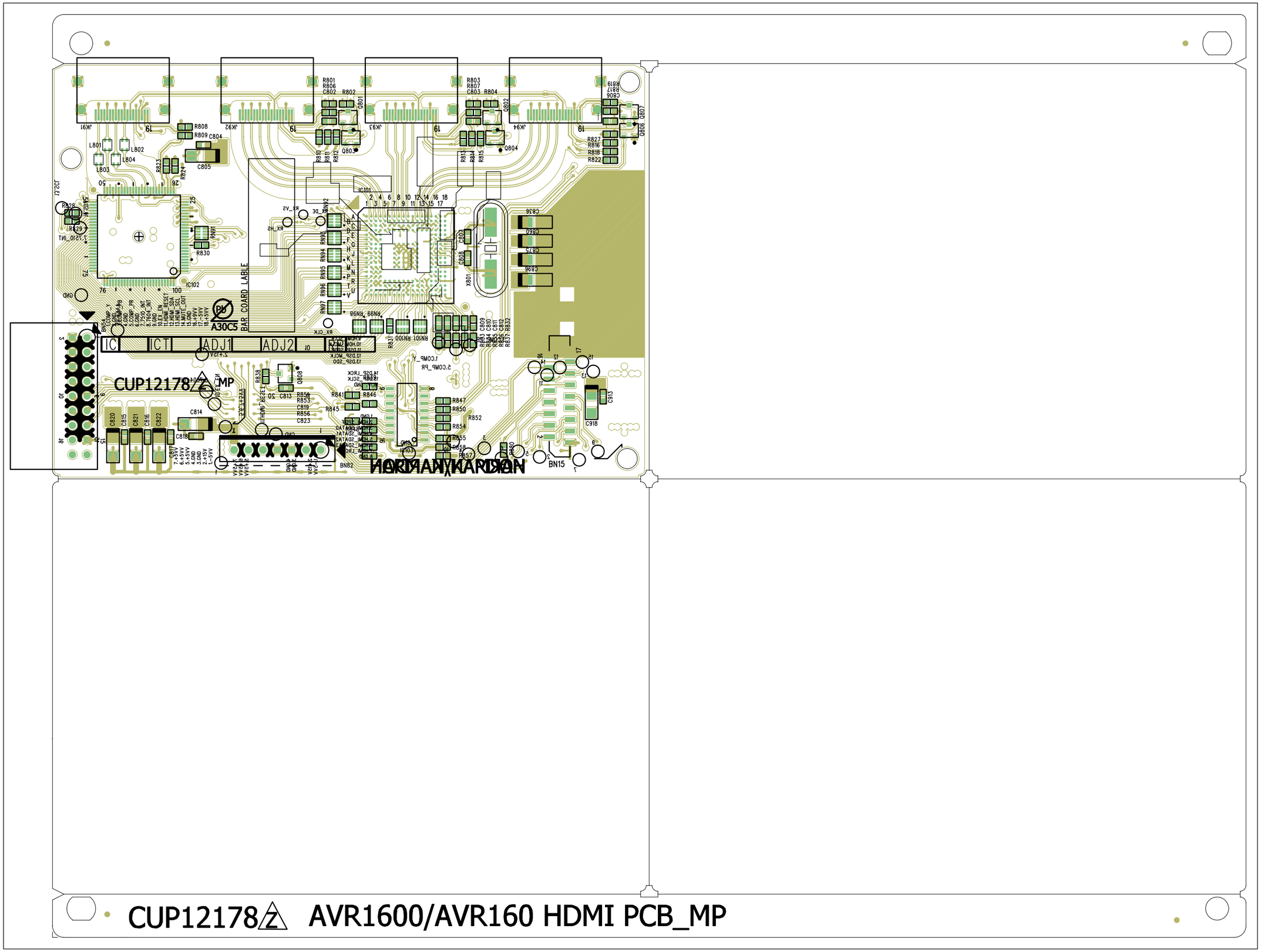
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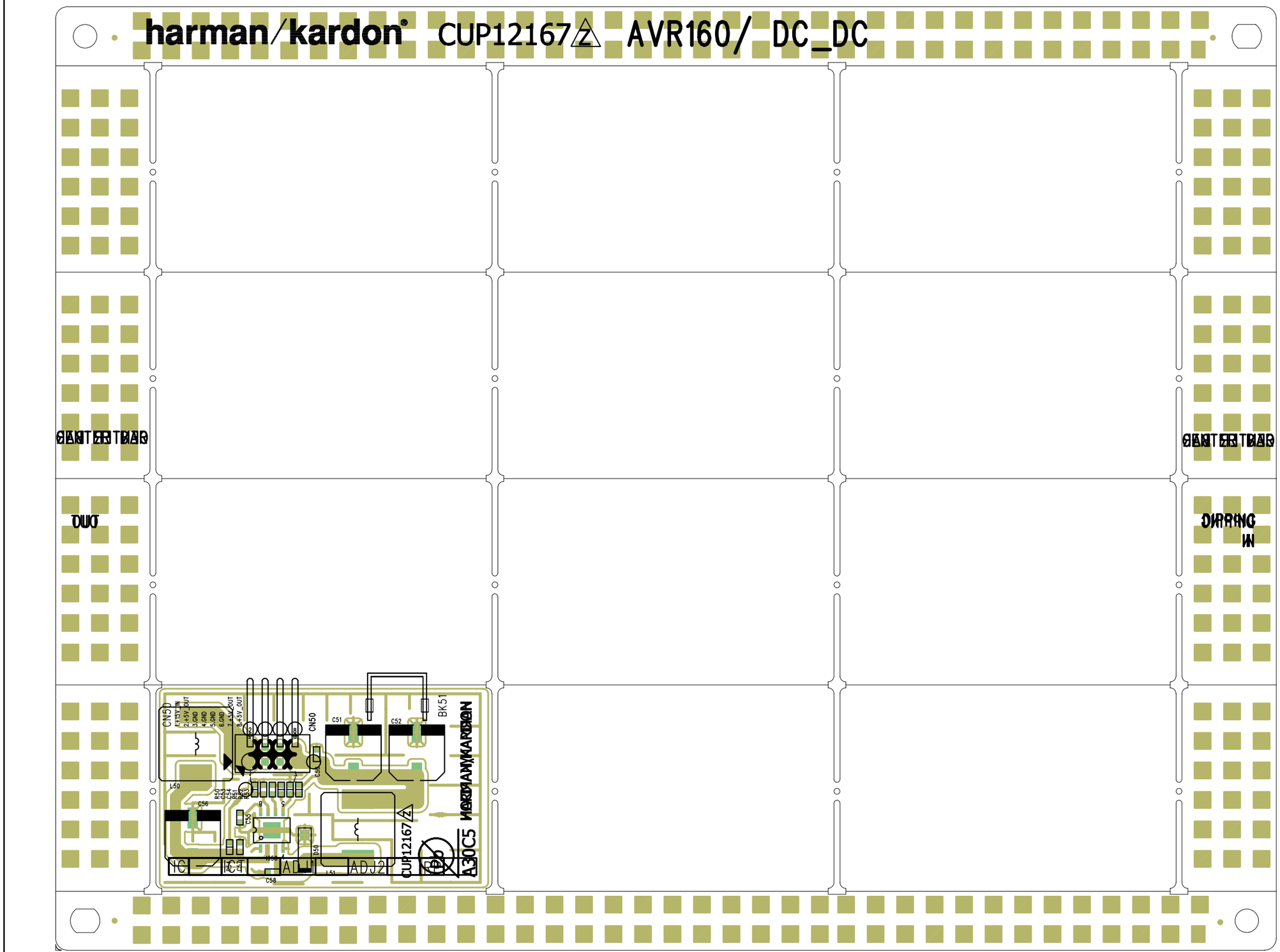
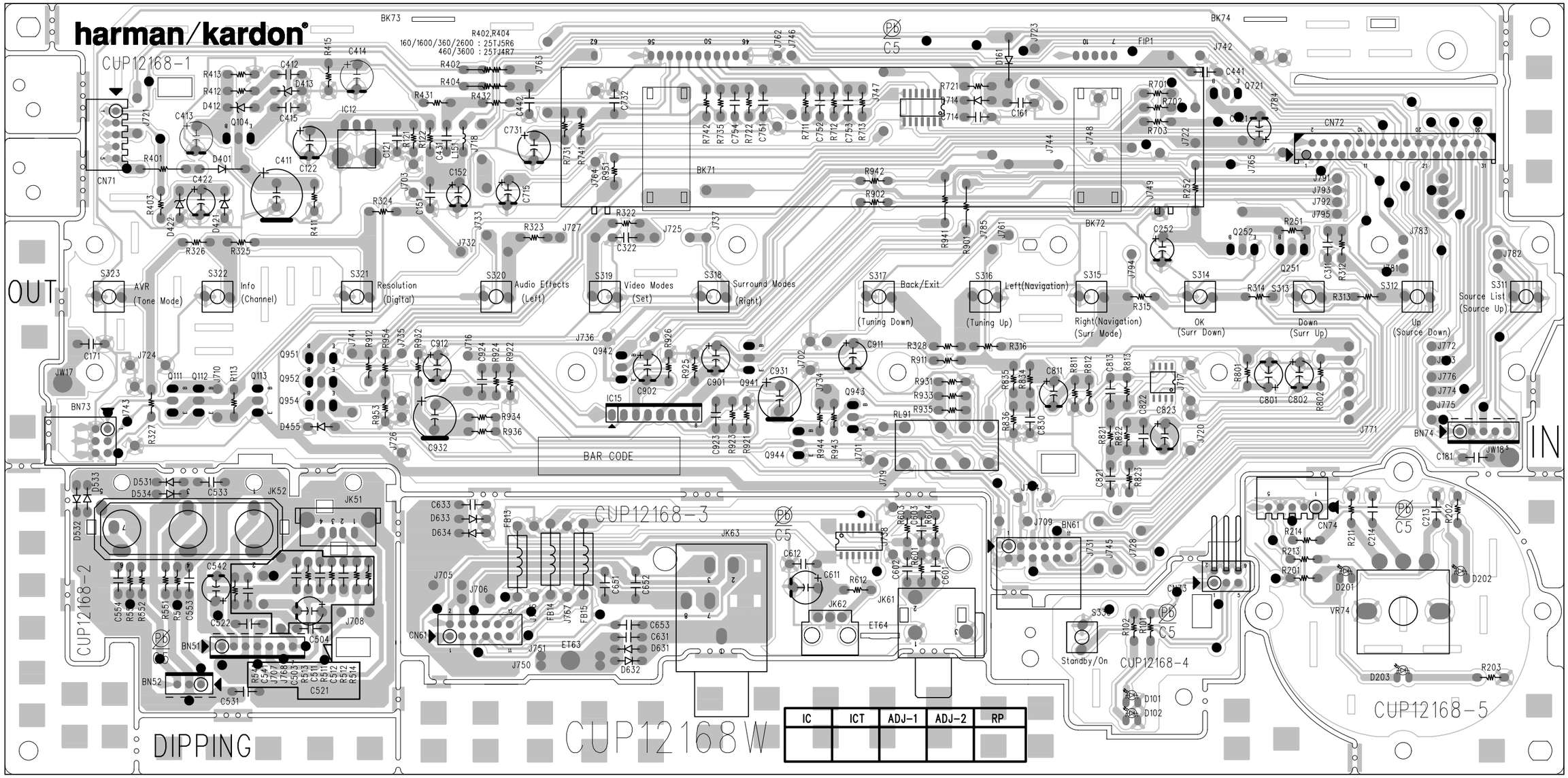
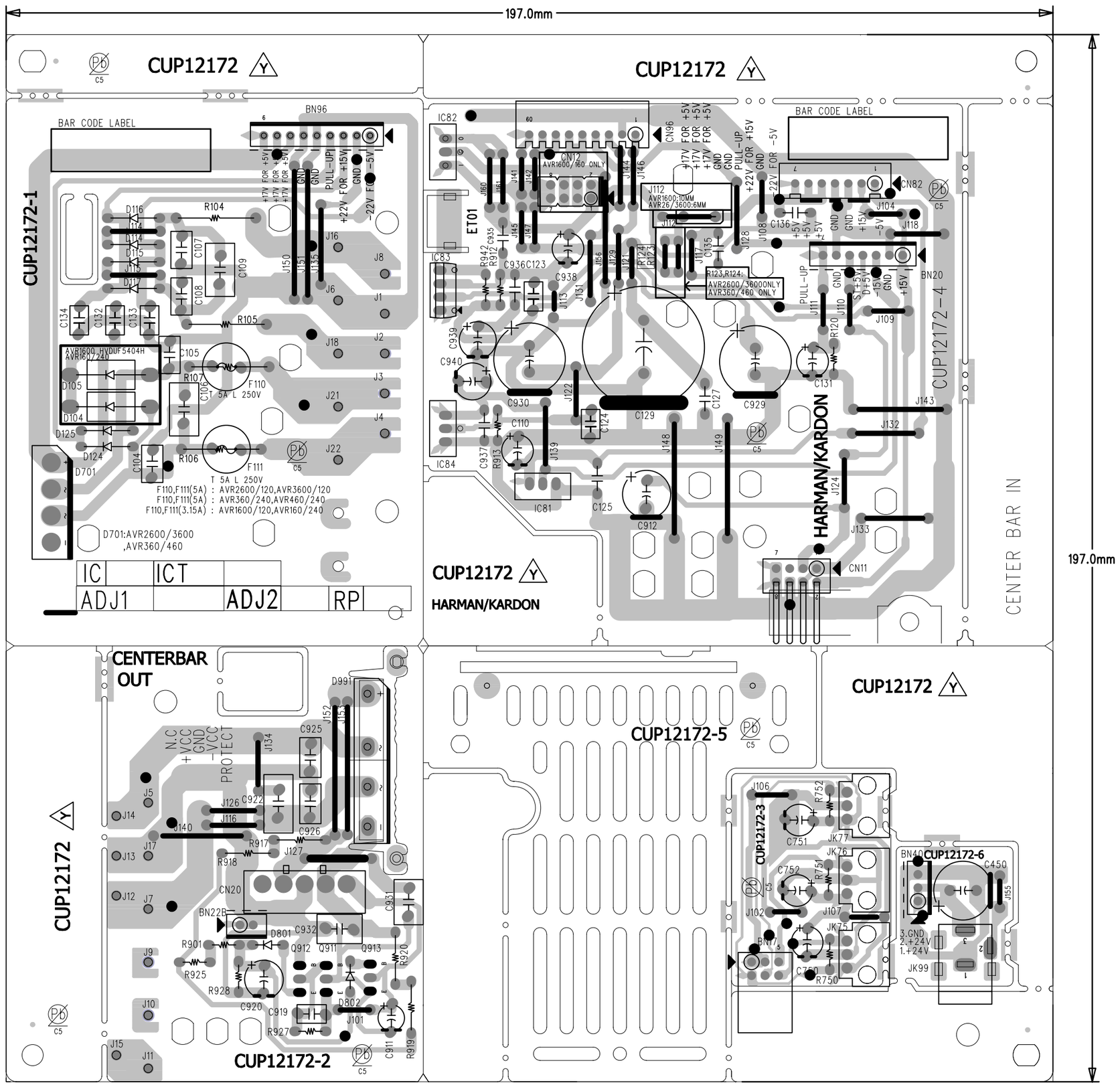
A30C5
BAR COARD LABLE
IC
ICT
ADJ1
ADJ2
IC101
IC102
BN82
BN15
CUP12178Z AVR1600/AVR160 HDMI PCB_MP


harman/kardon®
CUP12167Z AVR160/ DC_DC
DUT
CN50
C51
C52
BK51
L50
C56
C55
C58
D50
IC1
ADJ1
ADJ2
CUP12167Z
A30C5


harman/kardon
CUP12168-1
CUP12168-2
CUP12168-3
CUP12168-4
CUP12168-5
CUP12168W
BAR CODE
DIPPING
OUT
IN
S323 AVR (Tone Mode)
S322 Info (Channel)
S321 Resolution (Digital)
S320 Audio Effects (Left)
S319 Video Modes (Set)
S318 Surround Modes (Right)
S317 Back/Exit (Tuning Down)
S316 Left(Navigation) (Tuning Up)
S315 Right(Navigation) (Surr Mode)
S314 OK (Surr Down)
S313 Down (Surr Up)
S312 Up (Source Down)
S311 Source List (Source Up)
S330 Standby/On
IC
ICT
ADJ-1
ADJ-2
RP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CUP12172
CUP12172-1
BAR CODE LABEL
BN96
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ICT
ADJ1
ADJ2
RP
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F110,F111(5A) : AVR360/240,AVR460/240
F110,F111(3.15A) : AVR1600/120,AVR160/240
D701:AVR2600/3600
,AVR360/460
CUP12172
HARMAN/KARDON
CUP12172-4
CENTER BAR IN
CENTERBAR
OUT
CUP12172-2
CUP12172-5
CUP12172-3
CUP12172-6
CN12
AVR1600/160 ONLY
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CN82
CN20
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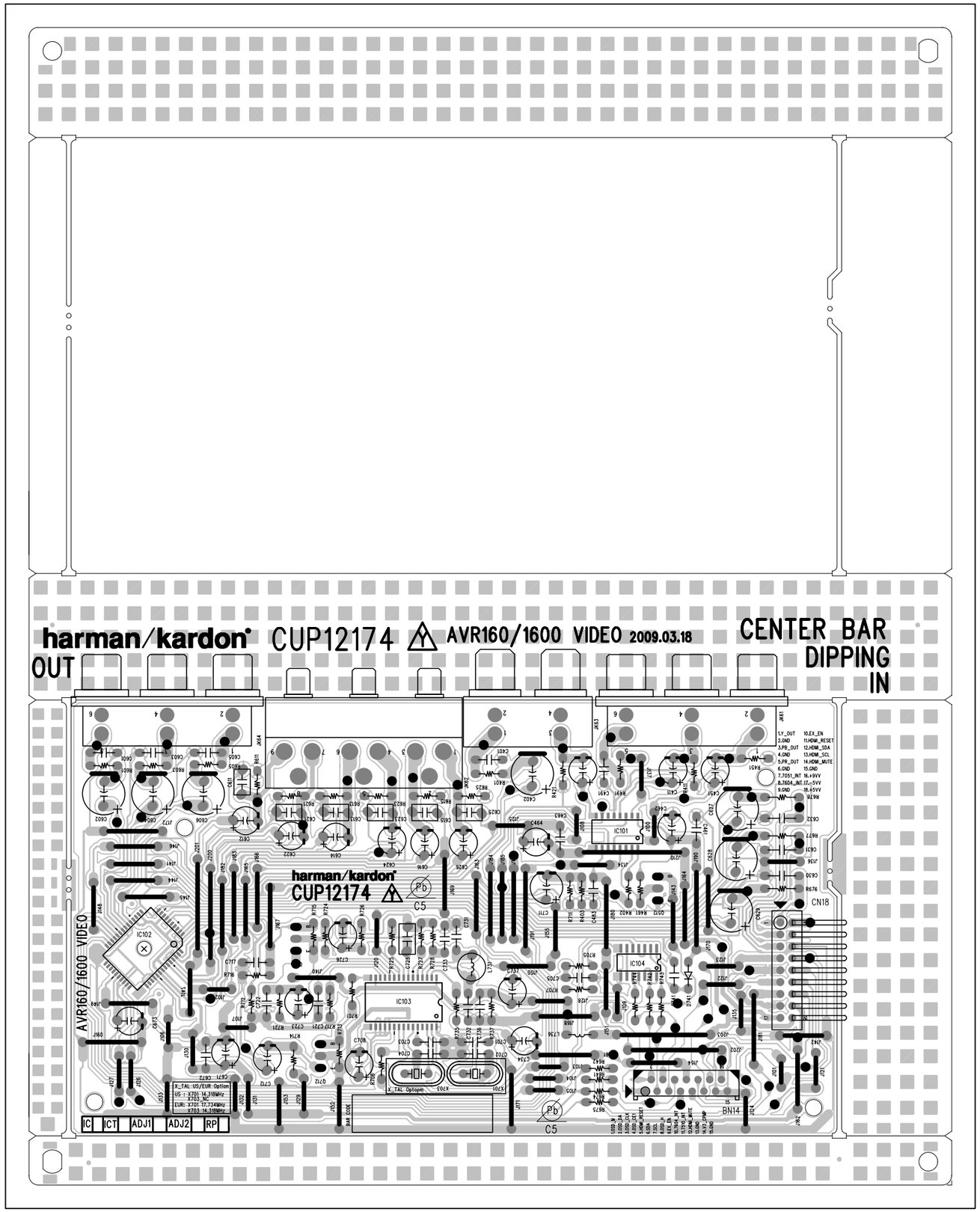
BN40
BN75
JK99
IC81
IC82
IC83
IC84
ET01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OUT
CENTER BAR DIPPING IN
harman/kardon
CUP12174
AVR160/1600 VIDEO
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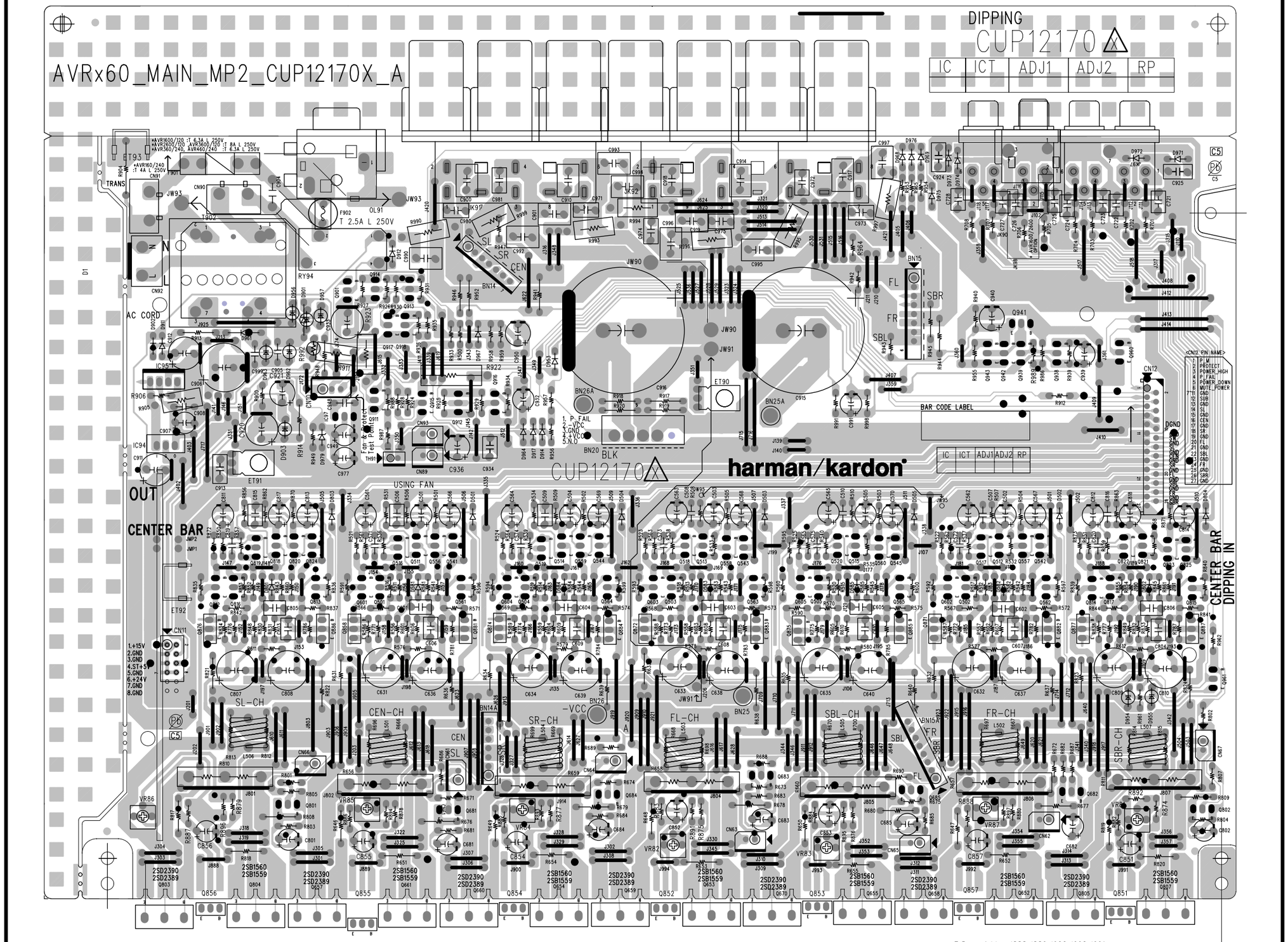
IC103
IC104
IC101
CN18
BN14
C5
IC
ICT
ADJ1
ADJ2
RP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CUP12170
IC | ICT | ADJ1 | ADJ2 | RP
TRANS
AC CORD
OUT
CENTER BAR
USING FAN
BAR CODE LABEL
harman/kardon
SL-CH
CEN-CH
SR-CH
FL-CH
SBL-CH
FR-CH
SBR-CH
CEN
SL
SR
FL
FR
SBL
SBR
-VCC
CENTER BAR
DIPPING IN
7.5mm Add : J888,J889,J900,J992,J991
6.0mm Add : J994,J993
10.0mm Add : J145

AVR1600 Electrical Parts List					
Ref. Designator	Part Number	Description		Qty	
FRONT/VOLUME/STANDBY PCB/VOLUME/STANDBY PCB COP12168C					
Capacitors					
C121	CCBS1H151KBT	CAP , CERAMIC(150PF/50V)	CH UP025 B151K-A-B Z	1	EA
C122	CCEA1AH331T	CAP , ELECT	330UF 10V	1	EA
C151	CCBS1H473ZFT	CAP , CERAMIC(47000PF/50V)	CH UP025 F473Z-A-B J	1	EA
C152	CCEA1CKS100T	CAP , ELECT	10UF 16V	1	EA
C161	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C213	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C214	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C252	CCEA1HKS2R2T	CAP , ELECT	2.2UF 50V SMALL SIZE	1	EA
C311	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z	1	EA
C322	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z	1	EA
C412	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z	1	EA
C413	CCEA1JH470TS	CAP , ELECT	63V/47UF/105'C	1	EA
C414	CCEA1JH470TS	CAP , ELECT	63V/47UF/105'C	1	EA
C415	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z	1	EA
C422	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C431	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C441	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C442	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C503	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C504	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z	1	EA
C511	CCBS1H560JT	CAP , CERAMIC(56PF/50V)	CH UP025SL560J-A-B Z	1	EA
C512	CCBS1H560JT	CAP , CERAMIC(56PF/50V)	CH UP025SL560J-A-B Z	1	EA
C521	CCEA1AH101T	CAP , ELECT	100UF 10V	1	EA
C522	CCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z	1	EA
C531	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C533	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C541	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z	1	EA
C542	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C553	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z	1	EA
C554	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z	1	EA
C601	CCBS1H181KBT	CAP , CERAMIC(180PF/50V)	CH UP025 B181K-A-B Z	1	EA
C602	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C603	CCBS1H100JCT	CAP , CERAMIC(10PF/50V)	CH UP025CH100J-A-B Z	1	EA
C611	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C612	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C631	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C633	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C651	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C652	CCBS1H471KBT	CAP , CERAMIC(470PF/50V)	CH UP025 B471K-A-B Z	1	EA
C653	CCBS1H471KBT	CAP , CERAMIC(470PF/50V)	CH UP025 B471K-A-B Z	1	EA
C714	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C715	CCEA1CKS100T	CAP , ELECT	10UF 16V	1	EA
C721	CCEA1HKS2R2T	CAP , ELECT	2.2UF 50V SMALL SIZE	1	EA
C731	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C732	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C751	CCBS1C222MXT	CAP , CERAMIC(2200PF/16V)	CH EP025 B222M-A-B J	1	EA
C752	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z	1	EA
C753	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z	1	EA
C754	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C801	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C802	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C811	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C813	CCBS1H470JT	CAP , CERAMIC(47PF/50V)	CH UP025SL470J-A-B Z	1	EA
C821	CCBS1H471KBT	CAP , CERAMIC(470PF/50V)	CH UP025 B471K-A-B Z	1	EA
C822	CCBS1H151KBT	CAP , CERAMIC(150PF/50V)	CH UP025 B151K-A-B Z	1	EA
C823	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C830	CCBS1H473ZFT	CAP , CERAMIC(47000PF/50V)	CH UP025 F473Z-A-B J	1	EA
C901	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C902	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C911	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT/VOLUME/STANDBY PCB/VOLUME/STANDBY PCB COP12168C					
C912	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C923	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C924	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C931	CCEA1CH331T	CAP , ELECT	330UF 16V	1	EA
C932	CCEA1CH331T	CAP , ELECT	330UF 16V	1	EA
C411	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
Semiconductors					
D161	HVD1N5819T	DIODE , SCHOTTKY	1N5819	1	EA
D401	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D412	HVDMTZJ6.8BT	DIODE , ZENER	MTZJ6.8B 1/2W	1	EA
D413	HVDMTZJ27BT	DIODE , ZENER	MTZJ27B 1/2W	1	EA
D421	HVDMTZJ6.8BT	DIODE , ZENER	MTZJ6.8B 1/2W	1	EA
D422	HVDMTZJ6.8BT	DIODE , ZENER	MTZJ6.8B 1/2W	1	EA
D455	CVD1SS133MT	DIODE	1SS133	1	EA
D531	CVD1SS133MT	DIODE	1SS133	1	EA
D534	CVD1SS133MT	DIODE	1SS133	1	EA
D631	CVD1SS133MT	DIODE	1SS133	1	EA
D632	CVD1SS133MT	DIODE	1SS133	1	EA
D633	CVD1SS133MT	DIODE	1SS133	1	EA
D634	CVD1SS133MT	DIODE	1SS133	1	EA
D714	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
Q104	CVTKTC1027YT	TRANSISTOR NPN	KTC1027Y	1	EA
Q111	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q112	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q113	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q251	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q252	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q721	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q941	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q942	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q943	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q944	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q951	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q952	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q954	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
D101	CVD1L0345W31BOCT20	L.E.D , WHITE	CVD1L0345W31BOCT201	1	EA
D102	CVD30ASOGCAA-S7	L.E.D , ORANGE	T0L-30ASOGCAA-S7	1	EA
D201	CVD1L0345W31BOCT20	L.E.D , WHITE	CVD1L0345W31BOCT201	1	EA
D202	CVD1L0345W31BOCT20	L.E.D , WHITE	CVD1L0345W31BOCT201	1	EA
D203	CVD1L0345W31BOCT20	L.E.D , WHITE	CVD1L0345W31BOCT201	1	EA
IC11	HVI74HCU04AFNG	I.C , INVERTER (TOSHIBA)	TC74HCU04AFNG(TOSHIBA)	1	EA
IC12	HRVNJL34H380A	SENSOR , REMOCON (JRC)	NJL34H380A	1	EA
IC13	HVI74ACT04MTR	I.C , HEX (ST) INVERTER	74ACT04MTR	1	EA
IC14	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC15	HVINJM4556AL	I.C , HEADPHONE (JRC) DUAL OP AMP	NJM4556AL	1	EA
Resistors					
R101	CRD20TF2200T	RES , CARBON(220 OHM, 1%)	(220 OHM, 1%)	1	EA
R102	CRD20TF6800T	RES , CARBON(680 OHM, 1%)	(680 OHM, 1%)	1	EA
R113	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R121	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R122	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R201	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R202	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R203	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R211	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R213	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1	EA
R214	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1	EA
R251	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R252	CRD25TJ393T	RES , CARBON (39K OHM)	(39K OHM)	1	EA
R312	CRD20TF1001T	RES , CARBON	1K /1/5W /F	1	EA
R313	CRD20TF1501T	RES , CARBON	1.5K /1/5W /F	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT/VOLUME/STANDBY PCB/VOLUME/STANDBY PCB COP12168C					
R314	CRD20TF1801T	RES , CARBON	1.8K /1/5W /F	1	EA
R315	CRD20TF2701T	RES , CARBON	2.7K /1/5W/F	1	EA
R316	CRD20TF3301T	RES , CARBON	3.3K /1/5W/F	1	EA
R322	CRD20TF1001T	RES , CARBON	1K /1/5W /F	1	EA
R323	CRD20TF1501T	RES , CARBON	1.5K /1/5W /F	1	EA
R324	CRD20TF1801T	RES , CARBON	1.8K /1/5W /F	1	EA
R325	CRD20TF2701T	RES , CARBON	2.7K /1/5W/F	1	EA
R326	CRD20TF3301T	RES , CARBON	3.3K /1/5W/F	1	EA
R327	CRD20TF5601T	RES , CARBON(5.6K/F)	(5.6K/F)	1	EA
R328	CRD20TF5601T	RES , CARBON(5.6K/F)	(5.6K/F)	1	EA
R401	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R402	CRD25TJ5R6T	RES , CARBON (5.6 OHM)	(5.6 OHM)	1	EA
R403	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R404	CRD25TJ5R6T	RES , CARBON (5.6 OHM)	(5.6 OHM)	1	EA
R411	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R412	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R413	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R415	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R431	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R432	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R511	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R512	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R513	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R514	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R541	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R551	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R552	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R553	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R554	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R601	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R603	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R604	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R612	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R701	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R702	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R703	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R711	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R712	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R713	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R721	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R722	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R731	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R735	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R741	CRD20TJ123T	RES , CARBON	12K OHM 1/5W J	1	EA
R742	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R801	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R802	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R811	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R812	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R813	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R821	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R822	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R823	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R834	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R835	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R836	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R901	CRD25TJ101T	RES , CARBON (100 OHM)	(100 OHM)	1	EA
R902	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R911	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R912	CRD20TJ101T	RES , CARBON(1/5W,100,5%)	100 OHM 1/5W J	1	EA
R921	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R922	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R923	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R924	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R925	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT/VOLUME/STANDBY PCB/VOLUME/STANDBY PCB COP12168C					
R926	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R931	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R932	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R933	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R934	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R935	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R936	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R941	CRD25TJ432T	RES , CARBON(1/4W, 4.3K)	(1/4W, 4.3K)	1	EA
R942	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R943	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R944	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R951	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R953	CRD20TJ362T	RES , CARBON	3.6K OHM 1/5W J	1	EA
R954	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
VR74	CSR2A037Z	ENCODER		1	EA
Miscellaneous					
S311	CST1A024ZT	SW , TACT		1	EA
S312	CST1A024ZT	SW , TACT		1	EA
S313	CST1A024ZT	SW , TACT		1	EA
S314	CST1A024ZT	SW , TACT		1	EA
S315	CST1A024ZT	SW , TACT		1	EA
S316	CST1A024ZT	SW , TACT		1	EA
S317	CST1A024ZT	SW , TACT		1	EA
S318	CST1A024ZT	SW , TACT		1	EA
S319	CST1A024ZT	SW , TACT		1	EA
S320	CST1A024ZT	SW , TACT		1	EA
S321	CST1A024ZT	SW , TACT		1	EA
S322	CST1A024ZT	SW , TACT		1	EA
S323	CST1A024ZT	SW , TACT		1	EA
S330	CST1A024ZT	SW , TACT		1	EA
L151	HLQ02C100KT	COIL , AXAIL (10UH)		1	EA
BK71	CMD1A572	BRACKET , FIP		1	EA
BK72	CMD1A572	BRACKET , FIP		1	EA
BN51	CWB1C907250BM001	SHIELD WIRE ASS'Y (2.5mm, 250mm, 7pin)		1	EA
BN52	CWB1C903400BM001	SHIELD WIRE ASS'Y (2.5mm, 400mm, 3pin)		1	EA
BN61	CJP12GB143ZB	PIN HEADER , DIP SOCKET(12PIN, 2.54mm, ANGLE)		1	EA
BN73	CJP06GB143ZB	FEMALE HEADER(6P, 2.54mm)		1	EA
BN74	CWB1C905120BM	WIRE ASS'Y		1	EA
CN61	CJP12GA239ZB	PIN HEADER(12P, 2.54mm), STRAIGHT TYPE		1	EA
CN71	CJP05GB03ZY	WAFER , ANGLE (2.5mm)		1	EA
CN72	CJP31GA41ZM	WAFER (1.25MM, CARD CABLE, STRAIGHT 31P)	MOLEX 52045-**45	1	EA
CN73	CJP06GB142ZB	PIN HEADER(6P, 2.54mm)		1	EA
CN74	CJP05GB03ZY	WAFER , ANGLE (2.5mm)		1	EA
ET63	CMC2A325	PLATE , EARTH AVR155		1	EA
ET64	CMC4A111	PLATE , EARTH		1	EA
FB13	KLZ9H001Z	BEAD , CORE		1	EA
FB14	KLZ9H001Z	BEAD , CORE		1	EA
FB15	KLZ9H001Z	BEAD , CORE		1	EA
F1	CFL162BD01GINK	V.F.D	162-BD-01GINK	1	EA
JK51	CJJ9X006Z	JACK , USB STRAIGHT(BLACK)	U250FD004BY	1	EA
JK52	CJJ4S028Y	JACK , BOARD (3P SILVER)		1	EA
JK61	CJJ4M041Y	JACK , BOARD (COAX)		1	EA
JK62	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
JK63	CJJ2E026Z	JACK , HEADPHONE(SILVER PLATE)		1	EA
RL91	CSL4A016ZU	RELAY , 12V 2C2P	BC3-12H	1	EA
	CBT2A1064	KNOB , STANDBY		1	EA
	CBT2A1065	KNOB , BACK		1	EA
	CGB1A158Y	BADGE , FRONT HARMAN/KARDON		1	EA
	CGL1A265Y	INDICATOR , POWER		1	EA
	CGW3A447RHZB24	PANEL , FRONT		1	EA
	CHR301	CLAMPER		6	EA
	CMC1A372	PLATE , SHIELD		2	EA
	CMC2A323	PLATE , SHIELD		1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT/VOLUME/STANDBY PCB/VOLUME/STANDBY PCB COP12168C					
	CMC2A326	PLATE , EARTH AVR1600		3	EA
	CMC2A338	PLATE , EARTH AVR1600		2	EA
	CMD2A443	BRACKET , SIDE		2	EA
	CMH1A297	HOLDER , USB		1	EA
	CMH2A215	HOLDER , LED AVR1600		1	EA
	CMZ1A127	FILTER , FIP		1	EA
	CPE1A009	SHEET , BLIND		1	EA
	CTB3+8JFZR	SCREW		28	EA
	CTWS3+10GR	SCREW		1	EA
CB72	CWC4C4A31B250B08	CARD , CABLE (31p,1.25mm,250mm,08mm)		1	EA
MAIN PCB ASS'Y		**COP12170B**			
Capacitors					
C501	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C502	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C503	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C504	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C505	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C506	CCKT1H331KB	CAP , CERAMIC	330PF 50V K	1	EA
C507	CCBS1H331KBT	CAP , CERAMIC(330PF/50V)	CH UP025 B331K-A-B Z	1	EA
C508	CCBS1H331KBT	CAP , CERAMIC(330PF/50V)	CH UP025 B331K-A-B Z	1	EA
C509	CCKT1H331KB	CAP , CERAMIC	330PF 50V K	1	EA
C510	CCBS1H331KBT	CAP , CERAMIC(330PF/50V)	CH UP025 B331K-A-B Z	1	EA
C561	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C562	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C563	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C564	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C565	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C566	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C567	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C568	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C569	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C570	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C571	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C572	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C573	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C574	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C575	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C601	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C602	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C603	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C604	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C605	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C606	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C607	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C608	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C609	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C610	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C681	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C682	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C683	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C684	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C685	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C726	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C801	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C802	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C803	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C804	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C805	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C806	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C811	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C812	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C813	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
C814	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C815	CCKT1H331KB	CAP , CERAMIC	330PF 50V K	1	EA
C816	CCBS1H331KBT	CAP , CERAMIC(330PF/50V)	CH UP025 B331K-A-B Z	1	EA
C817	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C818	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C819	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C820	CCBS1H681KBT	CAP , CERAMIC(680PF/50V)	CH UP025 B681K-A-B Z	1	EA
C851	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C852	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C853	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C854	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C855	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C856	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C857	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C900	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C901	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C905	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C907	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C908	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C910	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C911	CCEA1CH471T	CAP , ELECT	470UF 16V	1	EA
C912	CCEA1CH221T	CAP , ELECT	220UF 16V	1	EA
C913	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C914	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C917	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C918	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C919	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C924	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C932	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C933	CCEA1EH221T	CAP , ELECT	220UF 25V	1	EA
C934	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1	EA
C936	CCEA1EH221T	CAP , ELECT	220UF 25V	1	EA
C939	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C940	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C948	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C950	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C971	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C972	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C973	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C974	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C975	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C977	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C980	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C981	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C990	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C991	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1	EA
C992	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C993	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C994	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C995	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C996	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C997	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C999	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C631	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C632	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C633	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C634	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C635	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C636	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C637	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C638	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C639	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C640	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C807	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C808	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
C809	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C810	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C904	KCKDKS472ME	CAP , CERAMIC(X1/Y2/SC)	0.0047UF/2.5KV	1	EA
C906	CCEA1EH102E	CAP , ELECT	1000UF 25V	1	EA
C915	CCET50VKL4103NK	CAP , ELECT	10000UF/50V	1	EA
C916	CCET50VKL4103NK	CAP , ELECT	10000UF/50V	1	EA
Semiconductors					
D501	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D502	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D503	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D504	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D505	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D581	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D582	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D583	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D584	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D585	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D801	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D802	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D803	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D804	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D901	HVD1N5819T	DIODE , SCHOTTKY	1N5819	1	EA
D902	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D911	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D912	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D914	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
D917	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D953	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D954	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D955	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D956	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D957	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D961	HVD1N5819T	DIODE , SCHOTTKY	1N5819	1	EA
D962	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D963	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D964	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D967	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D968	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D969	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D973	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D974	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D975	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D976	HVD1SS133MT	DIODE	1SS133T-77	1	EA
D979	HVDMTZJ5.1BT	DIODE , ZENER	MTZJ5.1B 1/2W	1	EA
IC97	HVIRE5VT28CATZ	I.C , RESET (RICOH)	RE5VT28CATZ	1	EA
Q501	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q502	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q503	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q504	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q505	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q511	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q512	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q513	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q514	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q515	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q516	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q517	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q518	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q519	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q520	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q541	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q542	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q543	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
Q544	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q545	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q556	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q557	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q558	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q559	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q560	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q561	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q562	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q563	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q564	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q565	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q601	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q602	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q603	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q604	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q605	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q681	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q682	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q683	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q684	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q685	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q801	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q802	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q812	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q813	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q814	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q815	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q816	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q817	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q818	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q819	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q820	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q821	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q822	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q823	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q824	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q825	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q901	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q911	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q912	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q913	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q914	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q915	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q916	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q917	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q918	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q938	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q939	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q941	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q942	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q943	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Q960	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q961	HVTKTA1024YT	TRANSISTOR PNP	KTA1024Y	1	EA
Q652	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q653	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q654	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q655	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q657	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA
Q658	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA
Q659	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA
Q660	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA
Q661	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q670	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA
Q803	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
Q804	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q805	CVT2SD2389P43M	TR , POWER (DARLINGTON TYPE) NPN	2SD2389 (NPNMT-100PWR MICA 4	1	EA
Q807	CVT2SB1559P43M	TR , POWER (DARLINGTON TYPE) PNP	2SB1559 (PNPMT-100PWR MICA 4	1	EA
Q851	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q852	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q853	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q854	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q855	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q856	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q857	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
IC95	HVIKIA78R05PI	REGULATOR (5V OUTPUT LOW DROP)	KIA78R05PI	1	EA
Q858	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q871	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q872	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q874	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q875	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q876	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q877	HVTKTA1360Y	TRANSISTOR , PRE DRIVE PNP	KTA1360Y	1	EA
Q881	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Q882	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Q883	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Q884	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Q885	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Q886	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Q887	HVTKTC3423Y	TRANSISTOR , PRE DRIVE NPN	KTC3423Y	1	EA
Resistors					
R500	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R501	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R502	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R503	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R504	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R505	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R506	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R507	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R508	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R509	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R510	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R511	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R512	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R513	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R514	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R515	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R516	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R517	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R518	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R519	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R520	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R521	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R522	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R523	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R524	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R525	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R531	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R532	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R533	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R534	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R535	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R536	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R537	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R538	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R539	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R540	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R541	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
R542	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R543	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R544	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R545	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R556	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R557	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R558	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R559	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R560	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R561	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R562	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R563	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R564	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R565	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R566	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R567	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R568	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R569	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R570	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R571	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R572	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R573	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R574	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R575	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R576	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R577	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R578	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R579	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R580	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R581	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R582	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R583	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R584	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R585	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R586	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R587	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R588	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R589	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R590	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R591	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R592	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R593	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R594	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R595	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R596	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R597	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R598	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R599	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R600	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R601	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R602	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R603	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R604	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R605	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R606	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R607	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R608	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R609	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R610	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R611	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R612	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R631	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R632	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R633	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R634	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
R635	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R636	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R637	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R638	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R639	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R640	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R646	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R647	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R648	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R649	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R650	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R651	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R652	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R653	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R654	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R655	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R666	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R667	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R668	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R669	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R670	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R671	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R672	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R673	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R674	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R675	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R676	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R677	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R678	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R679	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R680	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R681	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R682	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R683	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R684	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R685	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R686	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R687	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R688	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R689	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R690	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R696	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R697	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R698	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R699	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R700	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R706	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
R771	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R772	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R773	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R774	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R775	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R776	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R777	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R781	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R782	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R783	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R784	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R785	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R786	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R787	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R801	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R802	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R803	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R804	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
R805	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R807	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R808	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R809	CRD25TJ182T	RES , CARBON (1.8K OHM)	(1.8K OHM)	1	EA
R812	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R813	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R814	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R815	CRD25TJ470T	RES , CARBON (47 OHM)	(47 OHM)	1	EA
R817	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R818	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R819	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R820	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R821	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R822	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R823	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R824	CRD25FJ180T	RES , CARBON (18 OHM) NONFLAMMABLE	(18 OHM) NONFLAMMABLE	1	EA
R830	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R831	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R832	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R833	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R834	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R835	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R836	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R837	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R838	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R839	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R840	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R841	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R842	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R843	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R844	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R845	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R848	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R849	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R850	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R851	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R852	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R853	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R854	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R855	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R856	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R857	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R858	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R859	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R860	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R861	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R862	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R863	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R870	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R871	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R872	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R873	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R874	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R875	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R876	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R877	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R878	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R879	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R880	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R882	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R883	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R884	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R885	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R886	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R887	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
R888	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R891	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R892	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R893	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R894	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R895	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R896	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R897	CRD20TJ391T	RES , CARBON (390 OHM)	(390 OHM)	1	EA
R900	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R906	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R912	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1	EA
R913	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
R917	CRD25TJ393T	RES , CARBON (39K OHM)	(39K OHM)	1	EA
R918	CRD25TJ393T	RES , CARBON (39K OHM)	(39K OHM)	1	EA
R919	CRD25TJ393T	RES , CARBON (39K OHM)	(39K OHM)	1	EA
R920	CRD25TJ393T	RES , CARBON (39K OHM)	(39K OHM)	1	EA
R924	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R925	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R926	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R927	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R928	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R929	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R930	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R931	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R933	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R934	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R935	CRD20TJ154T	RES , CARBON (150K OHM)	(150K OHM)	1	EA
R936	CRD20TJ334T	RES , CARBON (330K OHM)	(330K OHM)	1	EA
R939	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R940	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R941	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R942	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R943	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R944	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R945	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R946	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R947	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R948	CRD25TJ392T	RES , CARBON	3.9K 1/4W J	1	EA
R949	CRD20TJ334T	RES , CARBON (330K OHM)	(330K OHM)	1	EA
R952	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R953	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R954	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R955	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R956	CRD20TJ224T	RES , CARBON	220 KOHM 1/5W J	1	EA
R957	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R958	CRD20TJ563T	RES , CARBON	56K OHM 1/5W J	1	EA
R959	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R961	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R962	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R964	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R965	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R986	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R987	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R988	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R989	CRD20TJ302T	RES , CARBON (3K OHM)	(3K OHM)	1	EA
R991	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1	EA
R992	KRG1SANJ271RT	RES , METAL OXIDE FILM (270 OHM)	(270 OHM)	1	EA
R998	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
VR81	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR82	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR83	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR84	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR85	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR86	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR87	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
R656	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R657	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R658	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R659	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R660	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R810	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R811	CRF5EKR27HX2K	RES , CEMENT (0.27 OHM)	(0.27 OHM)	1	EA
R905	CRG1ANJ1R0H	RES , METAL OXIDE FILM	1 OHM 1W J	1	EA
R922	CRG2ANJ470H	RES , METAL OXIDE FILM	47 OHM 2W J	1	EA
R923	CRG1ANJ220H	RES , METAL OXIDE FILM	22 OHM 1W J	1	EA
R990	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R993	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R994	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R995	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R996	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R997	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R999	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
Miscellaneous					
	CMYAVR1600/120	HEAT SINK ASS'Y		1	EA
	CFNCF12825HSN	FAN , MOTOR		1	EA
	CHD1A012R	SCREW , SPECIAL		14	EA
	CHD1A036R	SCREW , SPECIAL		4	EA
	CHD3A012R	SCREW , SPECIAL		11	EA
	CMD1A398	BRACKET , PCB	AG-D9320	2	EA
	CMD1A417	BRACKET , PCB	AG-D8900	2	EA
	CMD1A694	BRACKET , FAN		1	EA
	CMY1A313	HEAT SINK		1	EA
	CTB3+8JR	SCREW		8	EA
	CTB3+8JR	SCREW		4	EA
ET90	HJT1A025	PLATE , EARTH	MET37-0002	1	EA
ET91	HJT1A025	PLATE , EARTH	MET37-0002	1	EA
F901	KJCFC5S	HOLDER , FUSE		2	EA
BN14	CWB1D00718088	WIRE ASS'Y (2.5MM, 180MM, 7PIN, DUAL-DIPP TYPE)		1	EA
BN15	CWB1D00915088	WIRE ASS'Y (2.5mm, 150mm, 9pin, Dual-dipping type)		1	EA
BN20	CWB3F905300UZ	WIRE ASS'Y (3.96mm, 300mm, 5pin)		1	EA
BN25	CWE8112120VV	WIRE ASS'Y (1PIN,120mm,LUG,#18,RED)		1	EA
BN26	CWE8112120VV	WIRE ASS'Y (1PIN,120mm,LUG,#18,RED)		1	EA
CN10	CJP03GA01ZY	WAFER		1	EA
CN11	CJP08GA221ZB	FEMALE HEADER (08P,2.54mm) , STRAIGHT TYPE		1	EA
CN12	CJP27GA41ZM	WAFER (1.25MM, CARD CABLE, STRAIGHT 27P)	MOLEX 52045-**45	1	EA
CN61	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN62	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN63	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN64	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN65	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN66	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN67	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN89	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN		1	EA
CN90	CJP02GA89ZY	WAFER		1	EA
CN91	CJP02GA89ZY	WAFER		1	EA
CN92	CJP02KA060ZY	WAFER		1	EA
ET92	CMD1A387	BRACKET , PCB		1	EA
ET93	CMD1A387	BRACKET , PCB		1	EA
JK90	CJJ4M040Z	JACK , BOARD (SW)		1	EA
JK91	CJJ5R006Z	TERMINAL , SPEAKER		1	EA
JK92	CJJ5Q012Z	TERMINAL , SPEAKER		1	EA
JW91	CWE8112120VV	WIRE ASS'Y (1PIN,120mm,LUG,#18,RED)		1	EA
L501	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L502	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L503	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L504	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L505	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L506	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB ASS'Y		**COP12170B**			
L507	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
RY94	CSL1E002ZE	RELAY , POWER	G5PA-1 (DC 6V)	1	EA
TH91	KRTP42T7D330B	THERMAL SENSOR , POSISTOR	P42T7D330BW20	1	EA
T902	CLT5I005ZU	TRANSFORMER, SUB		1	EA
POWER PCB/DIGITAL IN/PROTECT PCB ASS'Y CUP12172C					
Capacitors					
C104	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C105	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C106	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	1	EA
C107	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C108	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C109	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	1	EA
C110	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C123	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C124	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C125	CCBS1H473ZFT	CAP , CERAMIC(47000PF/50V)	CH UP025 F473Z-A-B J	1	EA
C127	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C131	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C132	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C133	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C134	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C135	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C136	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C750	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C752	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C911	CCEA1HKS2R2T	CAP , ELECT	2.2UF 50V SMALL SIZE	1	EA
C912	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C919	CCKT1H102KB	CAP , CERAMIC	1000PF 50V K	1	EA
C920	CCEA1HH470T	CAP , ELECT	47UF 50V	1	EA
C922	KCME2E104JP04T	CAP , METALLIZED FILM (0.1UF/250V)	(0.1UF/250V)	1	EA
C925	CCME2A103JXT	CAP , METALLIZED FILM (0.01UF/100V)	(0.01UF/100V)	1	EA
C926	CCME2A103JXT	CAP , METALLIZED FILM (0.01UF/100V)	(0.01UF/100V)	1	EA
C931	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C932	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C935	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C936	CCBS1H473ZFT	CAP , CERAMIC(47000PF/50V)	CH UP025 F473Z-A-B J	1	EA
C937	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C938	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C939	CCEA1EH101T	CAP , ELECT	100UF 25V	1	EA
C940	CCEA1EH101T	CAP , ELECT	100UF 25V	1	EA
C129	CCEA1EH103E	CAP , ELECT (10000uF/25V,22x30,KR3)	KR3-025V103MM300	1	EA
C929	CCEA1VH222EZ	CAP , ELECT (2200UF/35V, 12.5X31)	KR3-35V222MH1-L/C4.0	1	EA
C930	CCEA1VH222EZ	CAP , ELECT (2200UF/35V, 12.5X31)	KR3-35V222MH1-L/C4.0	1	EA
Semiconductors					
D114	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D115	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D116	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D117	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D124	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D125	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D801	CVD1SS133MT	DIODE	1SS133	1	EA
D802	CVD1SS133MT	DIODE	1SS133	1	EA
D104	HVDUF5404H	DIODE , ULTRAFAST (DELTA)	UF5404H	1	EA
D105	HVDUF5404H	DIODE , ULTRAFAST (DELTA)	UF5404H	1	EA
D991	CVDGBJ1006BIA	DIODE HEAT SINK ASS'Y (CMY2A138)	(CMY2A138)	1	EA
Q911	HVTKTA1267YT	TRANSISTOR PNP	KTA1267Y	1	EA
Q912	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q913	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
IC81	CVIKIA7905PI	I.C , REGULATOR(-5V)	KIA7905PI	1	EA
IC83	CVIKIA278R15PI	I.C , REGULATOR(15V OUTPUT LOW DROP)	KIA278R15PI	1	EA

Ref. Designator	Part Number	Description		Qty	
POWER PCB/DIGITAL IN/PROTECT PCB ASS'Y CUP12172C					
IC84	CVIKIA7915PI	I.C , REGULATOR(15V, TO-220AB)	KIA7915PI	1	EA
D991	HVDGBJ1006	DIODE , BRIDGE		1	EA
Resistors					
R120	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R750	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R751	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R901	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1	EA
R912	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R913	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R917	CRD25TJ153T	RES , CARBON (15K OHM)	(15K OHM)	1	EA
R918	CRD25TJ153T	RES , CARBON (15K OHM)	(15K OHM)	1	EA
R919	CRD25TJ153T	RES , CARBON (15K OHM)	(15K OHM)	1	EA
R920	CRD25TJ153T	RES , CARBON (15K OHM)	(15K OHM)	1	EA
R925	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R927	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R928	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R942	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R104	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1	EA
R105	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1	EA
Miscellaneous					
F110	KBA2D3150A2EYT	FUSE(382 Series, 250V, 3.15A)	382 250V/3.15	1	EA
F111	KBA2D3150A2EYT	FUSE(382 Series, 250V, 3.15A)	382 250V/3.15	1	EA
BN17	CJP06GB143ZB	FEMALE HEADER(6P, 2.54mm)		1	EA
BN20	CWB1D00708058	WIRE ASS'Y (LOCKING TYPE, 2.5MM, 7PIN, 80MM)		1	EA
BN96	CWB1D00912058	WIRE ASS'Y (LOCKING TYPE, 2.5MM, 9PIN, 120MM)		1	EA
CN11	CJP08GB142ZB	PIN HEADER (08P, 2.54mm) , ANGLE TYPE		1	EA
CN12	CJP08GA221ZB	FEMALE HEADER (08P,2.54mm) , STRAIGHT TYPE		1	EA
CN20	CJP05GA90ZY	WAFER , 5P(DIP, 3.96PITCH)		1	EA
CN82	CJP07GI237ZW	LOCKING TYPE , STRAIGHT WAFER, 2.5MM		1	EA
CN96	CJP09GJ243ZW	WAFER (9P LOCK ANGLE 2.5MM)		1	EA
	CMY2A138	HEAT SINK		1	EA
	CTB3+12JR	SCREW		1	EA
ET01	CMD1A387	BRACKET , PCB		1	EA
JK75	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
JK76	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
VIDEO IN/OUT PCB ASS'Y		**CUP12174C**			
Capacitors					
C401	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z	1	EA
C402	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C411	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C421	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C451	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C461	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C462	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C463	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C464	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C483	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z	1	EA
C491	CCBS1H101KBT	CAP , CERAMIC(100PF/50V)	CH UP025 B101K-A-B Z	1	EA
C601	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C602	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C603	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C604	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C605	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C606	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C611	CCCT1H030CC	CAP , CERAMIC	3PF 50V C	1	EA
C612	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C613	CCCT1H030CC	CAP , CERAMIC	3PF 50V C	1	EA
C614	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA

Ref. Designator	Part Number	Description		Qty	
VIDEO IN/OUT PCB ASS'Y		**CUP12174C**			
C615	CCCT1H030CC	CAP , CERAMIC	3PF 50V C	1	EA
C616	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C621	CCCT1H030CC	CAP , CERAMIC	3PF 50V C	1	EA
C622	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C623	CCCT1H030CC	CAP , CERAMIC	3PF 50V C	1	EA
C624	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C625	CCCT1H030CC	CAP , CERAMIC	3PF 50V C	1	EA
C626	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C627	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C628	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C629	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C630	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C631	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C632	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C671	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C672	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C673	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C701	CCBS1H270JT	CAP , CERAMIC(27PF/50V)	CH UP025SL270J-A-B Z	1	EA
C702	CCBS1H270JT	CAP , CERAMIC(27PF/50V)	CH UP025SL270J-A-B Z	1	EA
C705	CCBS1H181KBT	CAP , CERAMIC(180PF/50V)	CH UP025 B181K-A-B Z	1	EA
C708	CCEA1HHR47T	CAP , ELECT	0.47UF 50V	1	EA
C711	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C712	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C717	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C721	CCBS1H560JT	CAP , CERAMIC(56PF/50V)	CH UP025SL560J-A-B Z	1	EA
C722	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C723	CCEA1HH0R1T	CAP , ELECT	0.1UF 50V	1	EA
C725	HCQI1H682JZT	CAP , MYLAR	6800PF 50V J	1	EA
C726	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1	EA
C731	CCBS1H220JCT	CAP , CERAMIC(22PF/50V)	CH UP025CH220J-A-B Z	1	EA
C732	CCBS1H330JT	CAP , CERAMIC(33PF/50V)	CH UP025SL330J-A-B Z	1	EA
C733	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C734	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1	EA
C736	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
C737	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C741	CCBS1H223ZFT	CAP , CERAMIC(22000PF/50V)	CH UP025 F223Z-A-B J	1	EA
Semiconductors					
IC101	CVINJM2595MTE1	I.C , VIDEO S/W (JRC)	NJM2595MTE1	1	EA
IC102	CVINJW1321FP1	I.C , VIDEO S/W (JRC)	NJW1321FP1	1	EA
IC103	HVILC74763M	I.C , OSD	LC74763M	1	EA
IC104	HVI74ACT04M	I.C , HEX (ST) INVERTER	74ACT04M	1	EA
D741	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
Q512	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q712	HVTKTA1267YT	TRANSISTOR PNP	KTA1267Y	1	EA
Q716	HVTKTC3199YT	TRANSISTOR NPN	KTC3199Y	1	EA
Resistors					
R401	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R402	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
R411	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R421	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R451	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R461	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R491	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R601	CRD20TJ560T	RES , CARBON	56 OHM 1/5W J	1	EA
R603	CRD20TJ360T	RES , CARBON (36 OHM)	(36 OHM)	1	EA
R605	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R611	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R613	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R615	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R621	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R623	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
VIDEO IN/OUT PCB ASS'Y		**CUP12174C**			
R625	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R641	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
R642	C3A206	WIRE , COPPER	SN95/PB5 , 0.6	0.02	M
R674	CRD20TJ330T	RES , CARBON	33 OHM 1/5W J	1	EA
R675	CRD20TJ330T	RES , CARBON	33 OHM 1/5W J	1	EA
R676	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R677	CRD20TJ360T	RES , CARBON (36 OHM)	(36 OHM)	1	EA
R678	CRD20TJ560T	RES , CARBON	56 OHM 1/5W J	1	EA
R701	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R705	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R706	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R707	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R711	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R713	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R714	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R715	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1	EA
R716	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R717	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R721	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R724	CRD20TJ393T	RES , CARBON (39K OHM)	(39K OHM)	1	EA
R725	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R726	CRD20TJ682T	RES , CARBON	6.8K OHM 1/5W J	1	EA
R727	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R728	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R735	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R737	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R742	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R743	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R744	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
Miscellaneous					
L731	KLQ5R6J405T	COIL, PEAKING(RADIAL)	5.6UH J 4X5	1	EA
L736	HLQ02C101JT	COIL , AXAIL	100UH,J	1	EA
BN14	CJP15GA115ZY	WAFER , CARD CABLE		1	EA
CN18	CJP18GB142ZB	PIN HEADER (18P, 2.54mm) , ANGLE TYPE		1	EA
JK61	CJJ4S010Z	JACK , BOARD		1	EA
JK62	CJJ4R045Z	JACK , BOARD		1	EA
JK63	CJJ4N043Z	JACK , BOARD		1	EA
JK64	CJJ4S030Z	JACK , BOARD	3P,G/B/R,SILVER	1	EA
X701	HOX14318E220C	CRYSTAL (14.318MHz)		1	EA
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
Capacitors					
C200	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C201	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C202	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C203	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C204	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C205	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C206	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C207	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C208	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C209	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C210	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C211	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C212	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C213	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C214	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C215	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C216	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C219	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C220	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
C221	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C222	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C223	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C224	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C225	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C226	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C254	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C255	CCUS1H150JA	CAP , CHIP(15PF/50V)	15PF 50V J	1	EA
C256	CCUS1H150JA	CAP , CHIP(15PF/50V)	15PF 50V J	1	EA
C257	CCUS1H200JA	CAP , CHIP (20PF)		1	EA
C258	CCUS1H220JA	CAP , CHIP	22PF 50V J	1	EA
C259	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C260	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C269	CCUS1A105KC	CAP , CHIP	1UF 10V K	1	EA
C274	CCUS1A105KC	CAP , CHIP	1UF 10V K	1	EA
C277	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C279	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C280	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C289	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C290	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C291	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C293	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C295	CCUS1H272KC	CAP , CHIP	2700PF 50V K	1	EA
C296	CCUS1H272KC	CAP , CHIP	2700PF 50V K	1	EA
C299	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C301	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C302	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C303	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C304	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C305	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C306	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C307	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C308	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C309	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C310	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C311	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C312	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C313	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C314	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C315	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C316	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C317	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C318	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C319	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C320	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C321	CCUS1H271JA	CAP , CHIP	270PF 50V J	1	EA
C322	CCUS1H271JA	CAP , CHIP	270PF 50V J	1	EA
C323	CCUS1H271JA	CAP , CHIP	270PF 50V J	1	EA
C324	CCUS1H271JA	CAP , CHIP	270PF 50V J	1	EA
C325	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C326	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C327	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C328	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C329	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C330	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C331	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C332	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C333	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C334	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C335	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C336	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C337	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C338	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C339	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C340	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
C350	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C351	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C352	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C353	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C354	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C355	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C356	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C357	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C362	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C363	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C364	CCUS1H392KC	CAP , CHIP CERAMIC(1608, 3900p)	3900PF 50V K	1	EA
C365	CCUS1H822KC	CAP , CHIP(8200pF/50V,1608 SIZE)	0603B822K101B	1	EA
C369	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C370	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C381	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C382	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C383	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C384	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C385	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C386	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C387	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C388	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C391	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C392	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C393	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C394	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C395	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C396	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C397	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C398	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C399	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C407	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C408	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C409	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C410	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C411	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C412	CCUS1H392KC	CAP , CHIP CERAMIC(1608, 3900p)	3900PF 50V K	1	EA
C413	CCUS1H822KC	CAP , CHIP(8200pF/50V,1608 SIZE)	0603B822K101B	1	EA
C415	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C532	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C534	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C535	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C536	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C537	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C538	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C539	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C540	CCUS1H182KC	CAP , CHIP(1800PF/50V/1608/X7R)	1800PF 50V K	1	EA
C601	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C603	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C605	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C607	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C609	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C611	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C613	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C615	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C617	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C619	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C621	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C623	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C625	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C627	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C629	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C631	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C701	CCUS1H200JA	CAP , CHIP (20PF)	(20PF)	1	EA
C702	CCUS1H200JA	CAP , CHIP (20PF)	(20PF)	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
C704	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C705	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C707	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C708	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C718	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C719	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C722	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C723	CCUS1H473KC	CAP , CHIP	0.047UF 50V K	1	EA
C725	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C727	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C729	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C731	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C733	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C734	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C738	CCUS1A105KC	CAP , CHIP	1UF 10V K	1	EA
C739	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C741	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C742	CCUS1H330JA	CAP , CHIP	33PF 50V J	1	EA
C743	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C744	CCUS1H330JA	CAP , CHIP	33PF 50V J	1	EA
C745	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C746	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C747	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C748	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C754	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C756	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C758	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C759	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C760	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C761	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C762	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C763	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C765	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C768	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C769	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C770	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C771	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C772	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C773	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C775	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C778	CCUS1A105KC	CAP , CHIP	1UF 10V K	1	EA
C780	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C781	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C782	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C783	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C784	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C785	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C787	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C789	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C790	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C791	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C793	CCUS1H101JA	CAP , CHIP	100PF 50V J	1	EA
C794	CCUS1H181JA	CAP , CHIP	180PF 50V J	1	EA
C795	CCUS1H181JA	CAP , CHIP	180PF 50V J	1	EA
C796	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C797	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C798	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C820	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C250	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C251	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C261	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C262	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C263	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C264	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C265	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
C266	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C267	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C268	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C270	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C271	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C272	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C273	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C275	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C276	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C281	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C282	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C283	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C284	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C285	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C286	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C287	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C288	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C292	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C294	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C341	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C342	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C343	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C344	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C345	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C346	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C347	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C348	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C349	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C358	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C359	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C360	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C361	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C371	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C372	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C373	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C374	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C375	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C376	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C377	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C378	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C389	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C390	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C406	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1	EA
C513	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1	EA
C600	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C602	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C604	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C606	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C608	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C610	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C612	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C614	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C616	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C618	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C620	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C622	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C624	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C626	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C628	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C630	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C703	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C706	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C717	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C720	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C721	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
C724	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C726	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C728	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C730	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C735	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C737	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C740	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C749	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C750	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C752	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C753	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C764	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C766	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C732	CCEA0JKR3222E	CAP , ELECT		1	EA
Semiconductors					
D201	HVD1SS355T	DIODE , CHIP		1	EA
D202	HVD1SS355T	DIODE , CHIP		1	EA
D203	HVD1SS355T	DIODE , CHIP		1	EA
D204	HVD1SS355T	DIODE , CHIP		1	EA
D207	HVD1SS355T	DIODE , CHIP		1	EA
D208	HVD1SS355T	DIODE , CHIP		1	EA
D209	HVD1SS355T	DIODE , CHIP		1	EA
D210	HVD1SS355T	DIODE , CHIP		1	EA
D211	HVD1SS355T	DIODE , CHIP		1	EA
D212	HVD1SS355T	DIODE , CHIP		1	EA
D213	HVD1SS355T	DIODE , CHIP		1	EA
D214	HVD1SS355T	DIODE , CHIP		1	EA
D215	HVD1SS355T	DIODE , CHIP		1	EA
D216	HVD1SS355T	DIODE , CHIP		1	EA
IC20	CVINJW1197CFC2	I.C , VOL WITH INPUT SELECTOR	NJW1197CFC2	1	EA
IC21	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC22	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC23	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC24	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC25	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC31	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC32	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC33	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC34	HVINJM2068MTE1	I.C , DUAL OP AMP (JRC)	NJM2068M-TE1	1	EA
IC38	HVTKTC812TB	TRANSISTOR , CHIP(TS6)	KTC812T-B-RTK	1	EA
IC39	HVTKTC812TB	TRANSISTOR , CHIP(TS6)	KTC812T-B-RTK	1	EA
IC40	HVTKTC812TB	TRANSISTOR , CHIP(TS6)	KTC812T-B-RTK	1	EA
IC41	HVTKTC812TB	TRANSISTOR , CHIP(TS6)	KTC812T-B-RTK	1	EA
IC42	CVIKIA1117S18	I.C , REGULATOR(SOT-223)	KIA1117S/F18, SOT-223	1	EA
IC43	CVIKIA1117S33	I.C , REGULATOR(SOT-223)	KIA1117S/F33, SOT-223	1	EA
IC44	CVIM12L16161A5TG	I.C, 16MB SDRAM (ESMT)	M12L16161A5TG	1	EA
IC45	HVTKTC812TB	TRANSISTOR , CHIP(TS6)	KTC812T-B-RTK	1	EA
IC46	CVIM24C32WMN6TP	I.C , EEPROM (32 Kbit) ST	M24C32WMN6TP	1	EA
IC47	CVIF25L008A50PAG	I.C , 8Mbit SPI Serial FLASH (50MHz/8lead SOIC)	F25L008A-50PAG	1	EA
IC48	CVIANAM1458AT	I.C , U-COM (AVR1600)	ANAM1458AT	1	EA
	CVIT5CN5	I.C , U-COM (512KB/32KB, LQFP100P) TOSHIBA	BLANK DO NOT USE	1	EA
IC49	CVITMP92FD28FG	I.C , USB DECODER FLASH(100PIN, QFP) TOSHIBA	TMP92FD28DFG, FLASH	1	EA
IC50	HVITC74HCU04AFN	IC , INVERTER	TC74HCU04AFN	1	EA
IC51	HVICS42528-CQ	I.C , CODEC + DIR (CIRRUS LOGIC)	CS42528-CQ	1	EA
IC52	HVINJM2391DL133	I.C , CHIP REGULATOR (+3.3V) JRC	CS42528-CQ	1	EA
IC53	CVITC74VCX541FT	I,C , OCTAL BUS BUFFER (TOSHIBA)	NJM2391DL133	1	EA
IC54	HVITC74VHC157FT	I.C , 2-CHANNEL MUX (TOSHIBA)	TC74VHC157FT	1	EA
IC55	CVICS497024CVZ	I.C , DSP (CIRRUS LOGIC)	CS497024CVZ	1	EA
Q307	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA
Q729	HVTKRC107S	TRANSISTOR , CHIP	KRC107S	1	EA
Q730	HVTKRC107S	TRANSISTOR , CHIP	KRC107S	1	EA
Q731	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA
Q732	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
Q734	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA
Q738	CVTKRC103S	TRANSISTOR , CHIP	KRC103S	1	EA
Q741	HVTKRC107S	TRANSISTOR , CHIP	KRC107S	1	EA
Q742	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA
Q951	HVTKRC107S	TRANSISTOR , CHIP	KRC107S	1	EA
Q952	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA
Q991	HVTKRC107S	TRANSISTOR , CHIP	KRC107S	1	EA
Q992	HVTKRA107S	TRANSISTOR, CHIP	KRA107S	1	EA
D221	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D222	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D703	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D704	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
IC87	HVIRE5VT28CATZ	I.C , RESET (RICOH)	RE5VT28CATZ	1	EA
Q311	HVTKTC2874BT	TRANSISTOR , MUTE, NPN	KTC2874B	1	EA
IC26	HVIKIA78R05PI	REGULATOR (5V OUTPUT LOW DROP)	KIA78R05PI	1	EA
IC36	HVIKIA7808API	I.C , REGULATOR +8V	KIA7808 (KEC)	1	EA
IC37	CVIKIA7908PI	I.C , REGULATOR(TO-220IS)	KIA7908PI TO-220IS	1	EA
Resistors					
RN60	CRJ104DJ102T	RES , 4 ARRAY CHIP(1K, 1608X4)		1	EA
RN61	CRJ104DJ103T	RES, ARRAY, 10K (1608)	10K(1608)	1	EA
RN63	CRJ104DJ103T	RES, ARRAY, 10K (1608)	10K(1608)	1	EA
RN64	CRJ104DJ101T	RES , CHIP NETWORK(1/16W, 100ohm, 1608X4)	100R (1608)	1	EA
RN65	CRJ104DJ101T	RES , CHIP NETWORK(1/16W, 100ohm, 1608X4)	100R (1608)	1	EA
RN66	CRJ104DJ101T	RES , CHIP NETWORK(1/16W, 100ohm, 1608X4)	100R (1608)	1	EA
RN73	CRJ104DJ103T	RES, ARRAY, 10K (1608)	10K(1608)	1	EA
RN76	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN77	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN78	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN79	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN81	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN82	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN83	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN84	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN85	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN87	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN88	CRJ104DJ103T	RES, ARRAY, 10K (1608)	10K(1608)	1	EA
RN89	CRJ104DJ103T	RES, ARRAY, 10K (1608)	10K(1608)	1	EA
RN90	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN91	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
RN92	CRJ104DJ101T	RES , CHIP NETWORK(1/16W, 100ohm, 1608X4)	100R (1608)	1	EA
RN93	CRJ104DJ330T	RES , 4ARRAY (1608*4)	33 OHM/1608*4	1	EA
R130	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R131	CRJ10DJ220T	RES , CHIP (22 OHM)	1608 SIZE	1	EA
R132	CRJ10DJ220T	RES , CHIP (22 OHM)	1608 SIZE	1	EA
R133	CRJ10DJ153T	RES , CHIP (15K OHM)		1	EA
R134	CRJ10DJ153T	RES , CHIP (15K OHM)		1	EA
R135	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R136	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R137	CRJ10DJ202T	RES , CHIP (2K OHM)		1	EA
R138	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R139	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R140	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R141	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R142	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R149	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R150	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R151	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R152	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R153	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R154	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R155	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R156	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R157	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
R158	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R159	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R160	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R161	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R162	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R163	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R164	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R165	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R166	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R167	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R168	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R169	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R170	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R172	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R201	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R202	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R203	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R204	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R205	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R206	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R207	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R208	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R209	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R210	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R211	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R212	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R213	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R214	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R215	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R216	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R219	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R220	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R221	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R222	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R223	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R224	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R225	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R226	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R227	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R228	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R229	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R230	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R231	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R232	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R233	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R234	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R235	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R236	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R237	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R238	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R239	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R240	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R241	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R242	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R245	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R246	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R247	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R248	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R249	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R250	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R251	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R252	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R253	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA
R254	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA
R255	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
R256	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA
R257	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA
R259	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA
R260	CRJ10DJ4R7T	RES , CHIP (4.7 OHM)	1608 SIZE	1	EA
R261	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R262	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R263	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R264	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R265	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R266	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R267	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R268	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R271	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R272	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R273	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R274	CRJ10DJ222T	RES , CHIP (2.2K OHM)	1608 SIZE	1	EA
R275	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R276	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R277	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R278	CRJ10DJ242T	RES , CHIP (2.4K OHM)	1608 SIZE	1	EA
R279	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R280	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R281	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R282	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R283	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R284	CRJ10DJ912T	RES , CHIP	9.1K OHM/1608	1	EA
R285	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R286	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R287	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R288	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R289	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R290	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R291	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R292	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R293	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R294	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R295	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R296	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R297	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R298	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R301	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R302	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R303	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R304	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R305	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R306	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R307	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R308	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R309	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R310	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R311	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R312	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R313	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R314	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R315	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R316	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R317	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R318	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R321	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R322	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R323	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R324	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R325	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R326	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R327	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
R328	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R329	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R330	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R331	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R332	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R333	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R334	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R335	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R336	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R337	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R338	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R340	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R341	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R344	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R345	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R348	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R349	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R352	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R353	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R354	CRJ10DJ301T	RES , CHIP	300 OHM J 1608	1	EA
R355	CRJ10DJ273T	RES , CHIP (27K OHM)	(27K OHM)	1	EA
R356	CRJ10DJ122T	RES , CHIP (1.2K OHM)	1608 SIZE	1	EA
R361	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R362	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R363	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R364	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R365	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R366	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R367	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R368	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R369	CRJ10DJ301T	RES , CHIP	300 OHM J 1608	1	EA
R370	CRJ10DJ273T	RES , CHIP (27K OHM)	(27K OHM)	1	EA
R371	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R372	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R373	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R374	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R375	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R376	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R377	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R378	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R381	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R382	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R383	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R384	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R385	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R386	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R387	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R388	CRJ10DJ561T	RES , CHIP	560 OHM	1	EA
R389	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R390	CRJ10DJ184T	RES , CHIP (180K OHM)	1608 SIZE	1	EA
R391	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R392	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R393	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R394	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R395	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R396	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R397	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R398	CRJ10DJ392T	RES . CHIP (3.9K OHM)	(3.9K OHM)	1	EA
R399	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R400	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R401	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R402	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R445	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R531	CRJ10DJ152T	RES , CHIP (1.5K OHM)	1608 SIZE	1	EA
R532	CRJ10DJ152T	RES , CHIP (1.5K OHM)	1608 SIZE	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
R533	CRJ10DJ152T	RES , CHIP (1.5K OHM)	1608 SIZE	1	EA
R534	CRJ10DJ152T	RES , CHIP (1.5K OHM)	1608 SIZE	1	EA
R704	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R711	CRJ10DJ560T	RES , CHIP (56 OHM)	1608 SIZE	1	EA
R712	CRJ10DJ820T	RES , CHIP (82 OHM)	1608 SIZE	1	EA
R714	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R715	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R716	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R717	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R718	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R719	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R720	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R721	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R724	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R725	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R726	CRJ10DJ100T	RES , CHIP (10 OHM)	1608 SIZE	1	EA
R727	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R728	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R732	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R733	CRJ10DJ100T	RES , CHIP (10 OHM)	1608 SIZE	1	EA
R736	CRJ10DJ241T	RES , CHIP (240 OHM)	(240 OHM)	1	EA
R737	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R739	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R740	CRJ10DJ121T	RES , CHIP (120 OHM)	1608 SIZE	1	EA
R741	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R742	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R743	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R747	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R748	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R751	CRJ10DJ820T	RES , CHIP (82 OHM)	1608 SIZE	1	EA
R752	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R753	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R754	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R755	CRJ10DJ750T	RES , CHIP (75 OHM)	1608 SIZE	1	EA
R756	CRJ10DJ750T	RES , CHIP (75 OHM)	1608 SIZE	1	EA
R757	CRJ10DJ750T	RES , CHIP (75 OHM)	1608 SIZE	1	EA
R759	CRJ10DJ331T	RES , CHIP (330 OHM)	(330 OHM)	1	EA
R760	CRJ10DJ105T	RES , CHIP (1M OHM)	1608 SIZE	1	EA
R761	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R762	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R763	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R764	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R765	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R767	CRJ10DF5101T	RES. CHIP (5.1K 1%)	1608 SIZE	1	EA
R768	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R773	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R774	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R775	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R776	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R777	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R782	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R783	CRJ10DJ272T	RES , CHIP (2.7K OHM)	1608 SIZE	1	EA
R784	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R785	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R786	CRJ10DJ105T	RES , CHIP (1M OHM)	1608 SIZE	1	EA
R788	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R789	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R793	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R800	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R801	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R810	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R811	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R812	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R813	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R814	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA

Ref. Designator	Part Number	Description		Qty	
INPUT (DSP) PCB ASS'Y		**CUP12176C**			
R815	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R816	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R910	CRJ10DJ105T	RES , CHIP (1M OHM)	1608 SIZE	1	EA
R932	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R960	CRJ10DJ332T	RES , CHIP (3.3K OHM)	1608 SIZE	1	EA
R963	CRJ10DJ105T	RES , CHIP (1M OHM)	1608 SIZE	1	EA
R966	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R992	CRJ10DJ562T	RES , CHIP (5.6K OHM)	1608 SIZE	1	EA
Miscellaneous					
CN15	CJP17GA193ZY	WAFER, CARD CABLE (SMD)		1	EA
L701	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L702	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L703	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L704	CLZ9R005Z	FERRITE , CHIP BEAD(60ohm, 1608)	HCB1608KF-600T30	1	EA
L705	CLZ9R005Z	FERRITE , CHIP BEAD(60ohm, 1608)	HCB1608KF-600T30	1	EA
BN12	CJP27GA41ZM	WAFER (1.25MM, CARD CABLE, STRAIGHT 27P)	MOLEX 52045-**45	1	EA
BN72	CJP31GA41ZM	WAFER (1.25MM, CARD CABLE, STRAIGHT 31P)	MOLEX 52045-**45	1	EA
CN14	CJP15GA115ZY	WAFER , CARD CABLE		1	EA
CN17	CJP06GB142ZB	PIN HEADER(6P, 2.54mm)		1	EA
CN19	CJP07GA01ZY	WAFER , STRAIGHT(7PIN)		1	EA
CN20	CJP07GI237ZW	LOCKING TYPE , STRAIGHT WAFER, 2.5MM		1	EA
CN51	CJP07GA01ZY	WAFER , STRAIGHT(7PIN)		1	EA
CN52	CJP03GA01ZY	WAFER		1	EA
JK11	CJJ4P014W	JACK , IN/OUT		1	EA
JK12	CJJ4R019W	TERMINAL , IN/OUT		1	EA
JK13	CJJ4R019W	TERMINAL , IN/OUT		1	EA
JK14	CJJ4R037W	JACK , BOARD		1	EA
JK43	CJJ2D008Z	JACK , STEREO		1	EA
JK78	CJJ4S022Z	JACK , BOARD		1	EA
L301	CLM4B001Z	COIL , MPX (FM 19KHz FILTER)		1	EA
L302	CLM4B001Z	COIL , MPX (FM 19KHz FILTER)		1	EA
X701	COX24576E180TF	CRYSTAL , 24.576MHz	CRYSTAL_HC-49/S_18PF	1	EA
X702	HOX10000E220TF	CRYSTAL(HC-49/S,ATS) 10MHz	CL-22P	1	EA
X703	COX09000E150C	CRYSTAL(9MHZ)		1	EA
X704	HOX00032K120I	CRYSTAL , 32.768KHZ	TUNING FORK	1	EA
HDMI PCB ASS'Y		**CUP12178C**			
Capacitors					
	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C801	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C802	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C803	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C804	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C805	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C806	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C807	CCUS1H510JA	CAP , CHIP (51PF)	(51PF)	1	EA
C808	CCUS1H510JA	CAP , CHIP (51PF)	(51PF)	1	EA
C809	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C810	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C811	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C812	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C813	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C814	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C815	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C816	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C817	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C818	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C819	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C820	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C821	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C822	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA

Ref. Designator	Part Number	Description		Qty	
HDMI PCB ASS'Y		**CUP12178C**			
C823	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C824	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C825	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C826	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C827	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C828	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C829	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C831	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C832	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C833	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C834	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C835	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C836	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C837	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C838	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C839	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C840	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C841	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C842	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C843	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C844	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C845	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C846	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C847	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C848	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C849	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C850	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C851	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C852	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C853	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C854	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C855	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C856	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C857	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C858	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C859	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C860	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C861	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C862	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C863	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C864	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C865	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C866	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C867	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C868	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C869	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C870	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C871	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C872	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C873	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C874	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C875	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C876	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C877	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C878	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C879	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C880	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C881	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C882	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C883	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C884	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C885	CCUC0J106KC	CAP , CHIP (10UF/6.3V K X5R 2012)	10UF/6.3V	1	EA
C886	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C887	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C888	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA

Ref. Designator	Part Number	Description		Qty	
HDMI PCB ASS'Y		**CUP12178C**			
C889	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C890	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C891	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C892	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C893	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C894	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C895	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C896	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C897	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C898	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C899	CCUI1C104KC	CAP , CHIP(1005, 16V/0.1UF)	16V/0.1UF	1	EA
C900	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C901	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C902	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C903	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C904	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C905	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C907	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C908	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C909	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C910	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C911	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C912	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C913	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C914	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C915	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C916	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C917	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C918	CCSNA1C100B	CAP , CHIP TANTAL(10uF/16V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C919	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
C920	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C921	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C922	CCSNA0J220B	CAP , CHIP TANTAL(22uF/6.3V, NingXia XingRi)	XRCA45 XXX M XXX AT	1	EA
Semiconductors					
D901	HVD1SR159-200	DIODE , RECTIFIER		1	EA
D902	HVD1SR159-200	DIODE , RECTIFIER		1	EA
D903	HVD1SR159-200	DIODE , RECTIFIER		1	EA
D904	HVD1SR159-200	DIODE , RECTIFIER		1	EA
IC101	CVIADV7604	IC , HDMI RX (BALL, BGA-260P) ANALOG DEVICE	ADV7604	1	EA
IC102	CVIADV7510	I.C , HDMI 1.3 TX(100P LPFQ) ANALOG DEVICE	ADV7510	1	EA
IC103	HVITC74HC4094FN	I.C 8-BIT SHIFT AND STORE REGISTER (3-STATE)	TC74HC4094AFN	1	EA
IC104	CVIKIA1117S50	I.C , REGULATOR(SOT-223)	KIA1117S50-RTK/P	1	EA
IC105	HVIKIA7809AF	I.C , REGULATOR	KIA7809AF	1	EA
IC106	CVINJM2845DL118	IC, JRC LOW DROPOUT VOLTAGE REGULATOR	NJM2845	1	EA
IC107	CVITC74VCX541FT	I,C , OCTAL BUS BUFFER (TOSHIBA)	TC74VCX541FT	1	EA
IC108	CVIKIA1117S33	I.C , REGULATOR(SOT-223)	KIA1117S/F33, SOT-223	1	EA
IC109	CVIKIA1117S18	I.C , REGULATOR(SOT-223)	KIA1117S/F18, SOT-223	1	EA
IC110	CVINJM2845DL118	IC, JRC LOW DROPOUT VOLTAGE REGULATOR	NJM2845	1	EA
Q801	HVTKRA102S	TRANSISTOR , CHIP	KRA102S	1	EA
Q802	HVTKRA102S	TRANSISTOR , CHIP	KRA102S	1	EA
Q803	CVTKRC103S	TRANSISTOR , CHIP	KRC103S	1	EA
Q804	CVTKRC103S	TRANSISTOR , CHIP	KRC103S	1	EA
Q806	CVTKRC103S	TRANSISTOR , CHIP	KRC103S	1	EA
Q807	HVTKRA102S	TRANSISTOR , CHIP	KRA102S	1	EA
Q808	CVTKRC103S	TRANSISTOR , CHIP	KRC103S	1	EA
Resistors					
RN100	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN101	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN102	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN103	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN104	CRJ104DJ103T	RES, ARRAY, 10K (1608)	10K(1608)	1	EA

Ref. Designator	Part Number	Description		Qty	
HDMI PCB ASS'Y		**CUP12178C**			
RN105	CRJ104DJ220T	RES,4ARRAY (22 OHM)	22X4/2012	1	EA
RN106	CRJ104DJ220T	RES,4ARRAY (22 OHM)	22X4/2012	1	EA
RN91	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN92	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN93	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN94	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN95	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN96	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN97	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN98	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
RN99	CRJ064IJ330T	RES , CHIP NETWORK(1/16W, 33ohm, 1005X4)	MNR04M0APJ330	1	EA
R801	CRJ10DJ223T	RES , CHIP (22K OHM)	1608 SIZE	1	EA
R802	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R803	CRJ10DJ223T	RES , CHIP (22K OHM)	1608 SIZE	1	EA
R804	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R806	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R807	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R808	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R809	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R810	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R812	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R814	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R815	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R817	CRJ10DJ223T	RES , CHIP (22K OHM)	1608 SIZE	1	EA
R818	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R819	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R822	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R823	CRJ10DF8201T	RES , CHIP (8.2K/1%)	(8.2K/1%)	1	EA
R824	CRJ10DF1001T	RES , CHIP 1%	1K/1/10W/F	1	EA
R827	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R828	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R829	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R831	CRJ10DJ330T	RES , CHIP (33 OHM)	1608 SIZE	1	EA
R832	CRJ10DJ510T	RES , CHIP (51 OHM)	1608 SIZE	1	EA
R833	CRJ10DJ240T	RES , CHIP (24 OHM)	(24 OHM)	1	EA
R834	CRJ10DJ510T	RES , CHIP (51 OHM)	1608 SIZE	1	EA
R835	CRJ10DJ240T	RES , CHIP (24 OHM)	(24 OHM)	1	EA
R836	CRJ10DJ510T	RES , CHIP (51 OHM)	1608 SIZE	1	EA
R837	CRJ10DJ240T	RES , CHIP (24 OHM)	(24 OHM)	1	EA
R838	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R839	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R844	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R846	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R847	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R848	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R850	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R852	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R853	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R854	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R855	CRJ10DJ472T	RES , CHIP (4.7K OHM)	1608 SIZE	1	EA
R856	CRJ10DJ101T	RES , CHIP (100 OHM)	1608 SIZE	1	EA
R858	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R859	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R860	CRJ10DJ102T	RES , CHIP (1K OHM)	1608 SIZE	1	EA
R861	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R862	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R863	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R864	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R867	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R868	CRJ10DJ750T	RES , CHIP (75 OHM)	1608 SIZE	1	EA
R869	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R870	CRJ10DJ750T	RES , CHIP (75 OHM)	1608 SIZE	1	EA
R871	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R873	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA
R874	CRJ10DJ0R0T	RES , CHIP (O OHM)	1608 SIZE	1	EA

Ref. Designator	Part Number	Description		Qty	
HDMI PCB ASS'Y		**CUP12178C**			
R875	CRJ10DJ202T	RES , CHIP (2K OHM)	(2K OHM)	1	EA
R876	CRJ10DJ202T	RES , CHIP (2K OHM)	(2K OHM)	1	EA
R877	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R878	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R879	CRJ10DJ103T	RES , CHIP (10K OHM)	1608 SIZE	1	EA
R880	CRJ10DJ104T	RES , CHIP (100K OHM)	1608 SIZE	1	EA
R882	CRJ10DJ105T	RES , CHIP (1M OHM)	1608 SIZE	1	EA
R883	CRJ10DJ105T	RES , CHIP (1M OHM)	1608 SIZE	1	EA
Miscellaneous					
X801	COX28636E330S	CRYSTAL (28.63636MHz HC-49/SMD, 33PF)		1	EA
	CHG1A306	CUSHION		0.5	EA
BN15	CJP17GA193ZY	WAFER, CARD CABLE (SMD)		1	EA
JK91	CJJ9H008Z	JACK , HDMI (TYPE-A,SMT-19P)	H050FS019G600BY	1	EA
JK92	CJJ9H008Z	JACK , HDMI (TYPE-A,SMT-19P)	H050FS019G600BY	1	EA
JK93	CJJ9H008Z	JACK , HDMI (TYPE-A,SMT-19P)	H050FS019G600BY	1	EA
JK94	CJJ9H008Z	JACK , HDMI (TYPE-A,SMT-19P)	H050FS019G600BY	1	EA
L801	CLZ9R009Z	CHOKE COIL, CHIP (FOR HDMI)		1	EA
L802	CLZ9R009Z	CHOKE COIL, CHIP (FOR HDMI)		1	EA
L803	CLZ9R009Z	CHOKE COIL, CHIP (FOR HDMI)		1	EA
L804	CLZ9R009Z	CHOKE COIL, CHIP (FOR HDMI)		1	EA
L805	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L806	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L807	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L808	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L809	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L810	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L811	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L812	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L813	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L814	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
L815	CLZ9Z014Z	FERRITE , CHIP BEAD(60ohm, 4516)	HCB4516KF-600T60	1	EA
BN54	CJP18GB143ZB	FEMALE HEADER (18P, 2.54mm) , ANGLE TYPE		1	EA
BN82	CWB1D00715058	WIRE ASS'Y (LOCKING TYPE, 2.5MM, 7PIN, 150MM)		1	EA
DC DC PCB ASS'Y		**COP12167B**			
C50	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C51	CCEC1ACEEX151TY	CAP , ELEC SMD (150uF/10V, 8X10.5, SANYO)	10CE150EX	1	EA
C52	CCEC1CRV471T	CAP , SMD ELECT(MANLEX RV, 16V/470, 10X10)	16V/470	1	EA
C53	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C54	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C55	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
C56	CCEC1EHVH151TY	CAP , ELEC SMD (150uF/25V, 8X10.5, SANYO)	25HVH150M	1	EA
C57	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C58	CCUS1H103KC	CAP , CHIP	0.01UF 50V K	1	EA
D50	CVDSS34SR	DIODE , SCHOTTKY (40V,3A, DO-214AC) DELTA	SS34SR	1	EA
IC50	CVISI8005QTL	IC , DCDC Converter (3.5A, SOP8) SANKEN	SI8005QTL	1	EA
R50	CRJ10DJ223T	RES , CHIP (22K OHM)	1608 SIZE	1	EA
R51	CRJ10DJ623T	RES , CHIP 1608 SIZE (62K OHM)	(62K OHM)	1	EA
R52	CRJ10DJ512T	RES , CHIP (5.1K OHM)	1608 SIZE	1	EA
R53	CRJ10DJ473T	RES , CHIP (47K OHM)	1608 SIZE	1	EA
R54	CRJ10DJ683T	RES , CHIP (68K OHM)	1608 SIZE	1	EA
L50	CLQ13E470MRZ	COIL , SMD POWER (47UH/3A)	CMI-SSP12L80F-SERIES	1	EA
L51	CLQ13E220MRZ	COIL , SMD POWER (22UH/3A)	CMI-SSP12L80F-SERIES	1	EA
BK51	CMD1A569	BRACKET , PCB		1	EA
CN50	CJP08GB142ZB	PIN HEADER (08P, 2.54mm) , ANGLE TYPE		1	EA
BOTTOM CHASSIS ASS'Y					
	CHD1A012ZR	SCREW , SPECIAL		2	EA
	CHD1A023R	SCREW , SPECIAL		4	EA
	CHD4A012R	SCREW , SPECIAL		5	EA

Ref. Designator	Part Number	Description		Qty	
BOTTOM CHASSIS ASS'Y					
CB12	CWC4C4A27B100B10	CARD , CABLE (27p,1.25mm Pitch,100mm Length,Protec		1	EA
CB14	CWC4C4A15B080B10	CABLE , CARD (15P,1.25MM,80MM,B,10MM)		1	EA
CB15	CWC4F2A17A100B10	CARD , CABLE (17P,1.0mm Pitch,100mm Length,Protect		1	EA
F901	KBA2C6300TLEY	FUSE(218 Series, 250V, 6.3A)		1	EA
T901	CLT5U035ZU	TRANS , POWER		1	EA
	CHE170	HOLDER , PCB		2	EA
	CHE36-3	CLAMPER , WIRE		1	EA
	CHG1A113	RUBBER		3	EA
	CHG1A160Z	CUSHION , RUBBER		1	EA
	CHG1A373	CUSHION , FOOT AVR1600		4	EA
	CJA523FBXA	CORD , POWER CRX-E320/U(1.8M, FERRITE)	NISPT-2 18AWG/2C 105C BK	1	EA
	CJA523FBYA	CORD , POWER		1	EA
	CKF1A398Y	PANEL , REAR		1	EA
	CKF1A398Z	PANEL , REAR		1	EA
	CKL1A094	FOOT , A AVR1600		2	EA
	CKL1A095	FOOT , B AVR1600		2	EA
	CTB3+10JFZR	SCREW		18	EA
	CTB3+6FFZR	SCREW		8	EA
	CTB3+8JFZR	SCREW		10	EA
	CTS3+8JFZR	SCREW		4	EA
	CTW3+12JR	SCREW		2	EA
	CUA2A294	CHASSIS , BOTTOM		1	EA
	KHR1A028	BUSHING , AC CORD		1	EA
BN90	CSH1A009ZVB	SWITCH , MOMS WIRE ASS'Y (2P, 80MM, RED)		1	EA
	CSH1A009ZV	SWITCH , MOMS		1	EA
	CWB4F202080UK	WIRE ASS'Y (3.96MM, 80MM, 2P, RED)		1	EA
TUN1	**CNVMW004MV1S63SA**	**TUNER(USA) FM(SCREW : F TYPE), AM(S/LAB)**	**KST-MW004MV1-S63SA**	**1**	**EA**

TOSHIBA TC74HCU04AP/AF/AFN

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74HCU04AP, TC74HCU04AF, TC74HCU04AFN

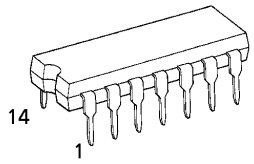
HEX INVERTER

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

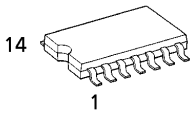
The TC74HCU04A is a high speed CMOS INVERTER fabricated with silicon gate C²MOS technology.
It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.
Since the internal circit is composed of a single stage inverter, it can be used in analog applications such as crystal oscllators.
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

FEATURES:

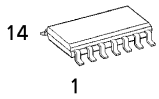
- High Speed ····· t_{pd} = 4ns(typ.) at V_{CC} = 5V
- Low Power Dissipation ····· I_{CC} = 1μA(Max.) at Ta = 25°C
- High Noise Immunity ····· $V_{NIH} = V_{NIH}$ = 10% V_{CC} (Min.)
- Output Drive Capability ····· 10 LSTTL Loads
- Symmetrical Output Impedance ··· $|I_{OH}| = I_{OL}$ = 4mA(Min.)
- Balanced Propagation Delays ····· $t_{pLH} \simeq t_{pHL}$
- Wide Operating Voltage Range ·· V_{CC}(opr.) = 2V ~ 6V
- Pin and Function Compatible with 74LS04



P (DIP14-P-300-2.54)
Weight : 0.96g (Typ.)

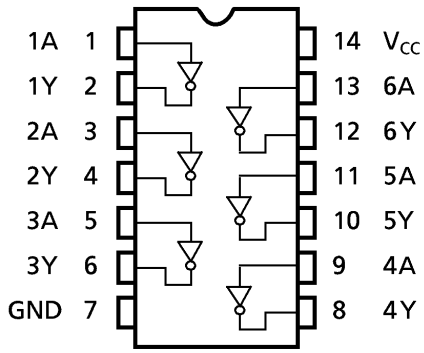


F (SOP14-P-300-1.27)
Weight : 0.18g (Typ.)



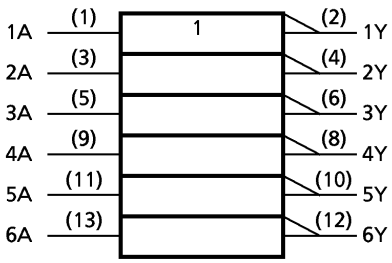
FN (SOL14-P-150-1.27)
Weight : 0.12g (Typ.)

PIN ASSIGNMENT



(TOP VIEW)

IEC LOGIC SYMBOL



TRUTH TABLE

A	Y
L	H
H	L

961001EBA2

Ordering number : ※EN5039

CMOS IC

SANYO 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.

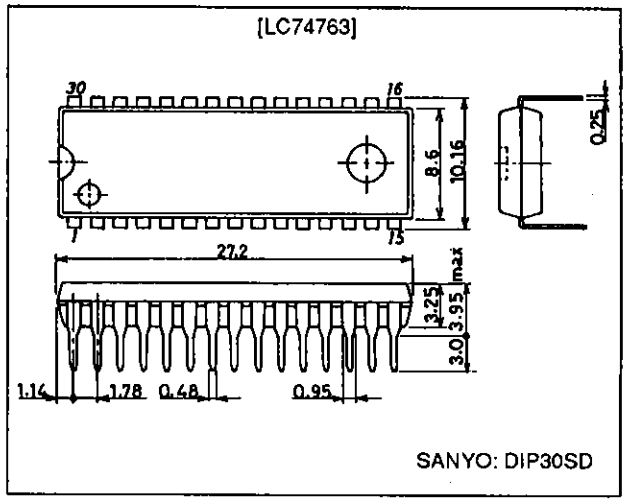
Features

- 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

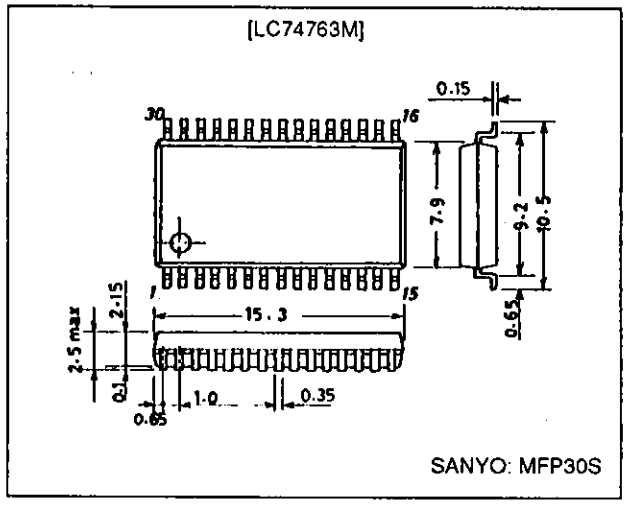
Package Dimensions

unit: mm

3196-DIP30SD



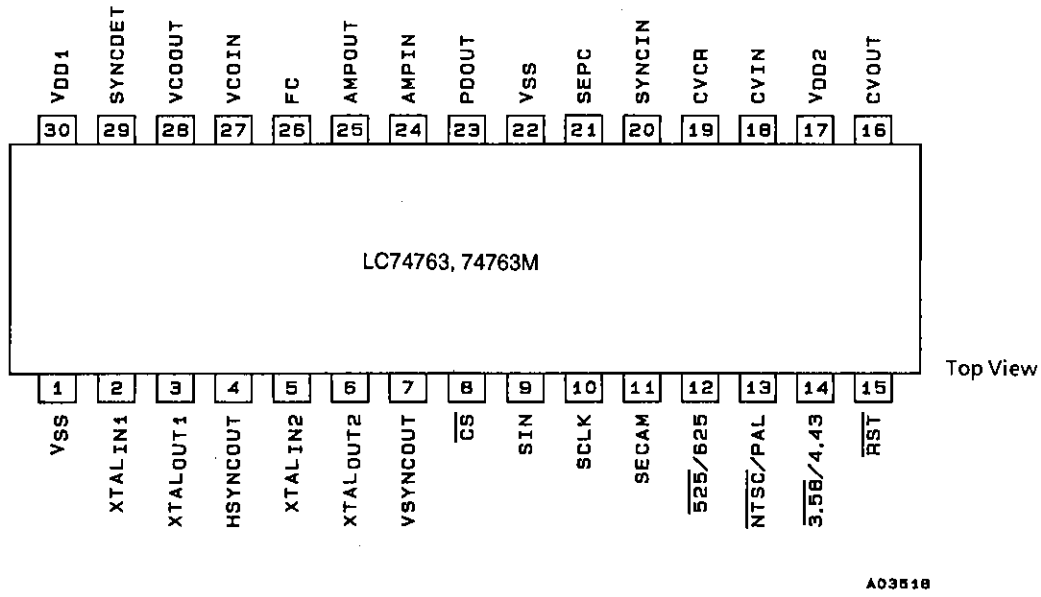
3216A-MFP30S



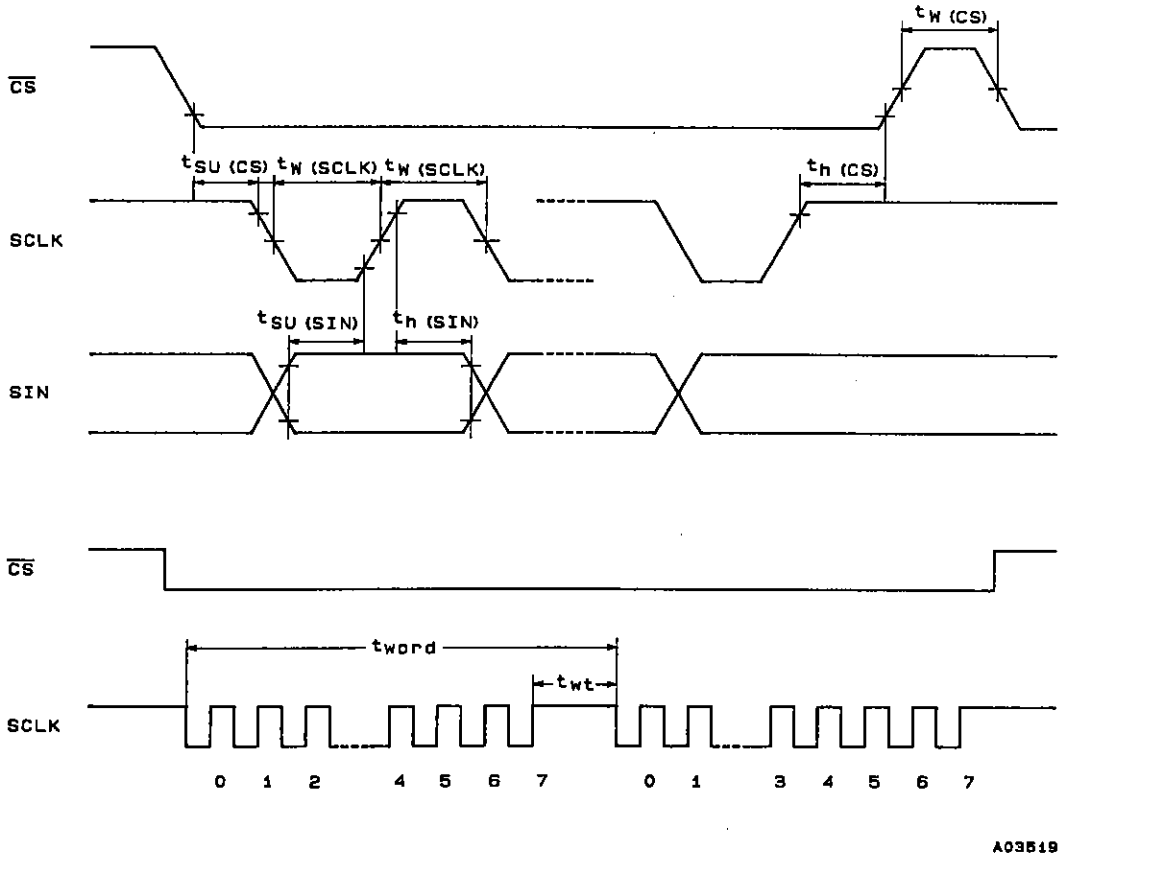
Pin Functions

Pin No.	Symbol	Function	Description
1	V_{SS}	Ground	Ground connection
2	$Xtal_{IN1}$	Crystal oscillator connection	Connection for the crystal and capacitor used to form the crystal oscillator that generates the internal synchronization signal. The oscillator can be selected with a command switch.
3	$Xtal_{OUT1}$		
4	$HSYNC_{OUT}$	Horizontal synchronization output	Outputs the horizontal synchronization signal (AFC). The output polarity can be selected (metal option). Also functions as general output port (command switch).
5	$Xtal_{IN2}$	Crystal oscillator connection	Connection for the crystal and capacitor used to form the crystal oscillator that generates the internal synchronization signal.
6	$Xtal_{OUT2}$		
7	$VSYNC_{OUT}$	Vertical synchronization output	Outputs the vertical synchronization signal. The output polarity can be selected (metal option). Also functions as general output port (command switch).
8	$\overline{CS}$	Enable input	Enables/disables serial data input. Serial data is enabled when this pin is low (hysteresis input). Pull-up resistor built in (metal option).
9	SIN	Data input	Serial data input (hysteresis input). Pull-up resistor built in (metal option).
10	SCLK	Clock input	Clock input for serial data input (hysteresis input). Pull-up resistor built in (metal option).
11	SECAM	SECAM mode switch input/ output (command switch)	During input, switches between SECAM and other modes. During output, functions as general output port or internal V output (command switch). Low = other modes, high = SECAM mode
12	$\overline{525}$/625	525/625 switch input/output (command switch)	During input, switches between 525 scan lines and 625 scan lines. During output, functions as general output port or character data output (command switch). Low = 525 lines, high = 625 lines
13	$\overline{NTSC}$/PAL	NTSC/PAL switch input/output (command switch)	Switches the color mode between NTSC and PAL. During output, functions as general output port or frame data output (command switch). Low = NTSC, high = PAL
14	$\overline{3.58}$/4.43	3.58/4.43 switch input/output (command switch)	Switch FSC between 3.58 MHz and 4.43 MHz. During output, functions as general output port or halftone output (command switch). Low = 3.58, high = 4.43
15	$\overline{RST}$	Reset input	System reset input pin, low is active (hysteresis input). Pull-up resistor built in (metal option).
16	CV_{OUT}	Video signal output	Composite video output
17	V_{DD2}	Power supply connection	Power supply connection for composite video signal level generation
18	CV_{IN}	Video signal input	Composite video input
19	CV_{CR}	Video signal input	SECAM chroma signal input
20	$SYNC_{IN}$	Sync separator circuit input	Built-in sync separator circuit video signal input
21	SEP_C	Sync separator circuit	Built-in sync separator circuit
22	V_{SS}	Ground	Ground connection
23	PD_{OUT}	Control voltage output	AFC control voltage output
24	AMP_{IN}	AFC filter connection	Filter connection
25	AMP_{OUT}		
26	FC	Control voltage input	AFC control voltage input
27	VCO_{IN}	LC oscillator connection	VCO LC oscillator circuit coil and capacitor connection
28	VCO_{OUT}		
29	$SYNC_{DET}$	External synchronization signal detection output	Outputs the exclusive NOR of the horizontal synchronization signal (AFC) and CSYNC (sync separator). The output polarity can be selected (metal option). Also functions as general output port (command switch).
30	V_{DD1}	Power supply connection	Power supply connection (+5 V: digital system power supply)

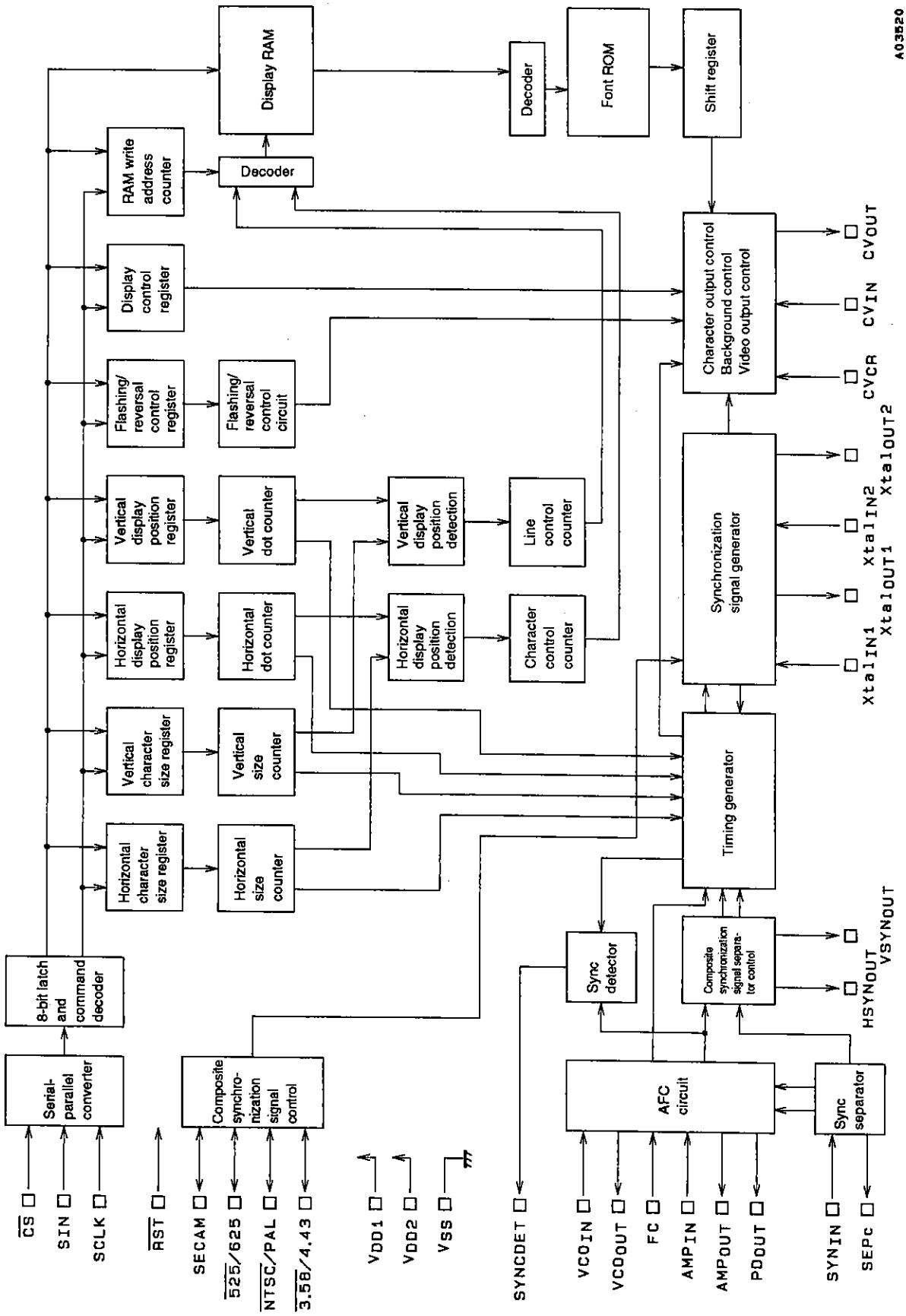
Pin Assignment



Serial Data Input Timing



System Block Diagram



TOSHIBA TC74HC4094AP/AF/AFN

TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

TC74HC4094AP,TC74HC4094AF,TC74HC4094AFN

8-Bit Shift and Store Register (3-state)

Note: xxxFN (JEDEC SOP) is not available in Japan.

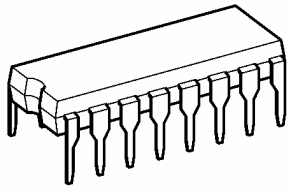
The TC74HC4094A is a high speed CMOS 8-BIT SHIFT AND STROBE REGISTER fabricated with silicon gate C^2MOS technology.

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

It consists of an 8-bit shift register and an 8-bit latch with 3-state output buffers. Data is shifted serially though the shift register on the positive going transition of the CK input. The output of the last stage (Qs) can be used to cascade several devices. Data on the Qs output is transferred to a second output (Q's) on the following negative transition of the CK input. The data in each stage of the shift register is provided to a corresponding latch, on the negative going transition of the STROBE input. When STROBE is held high, data propagates through the latch to a 3-state output buffer. This buffer is enabled when OUTPUT ENABLE input is set high.

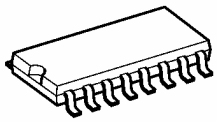
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

TC74HC4094AP



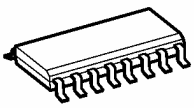
DIP16-P-300-2.54A

TC74HC4094AF



SOP16-P-300-1.27A

TC74HC4094AFN



SOL16-P-150-1.27

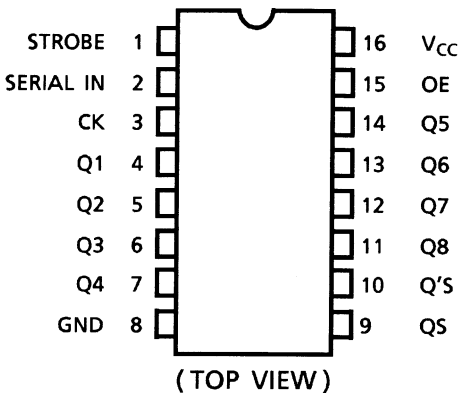
Weight

DIP16-P-300-2.54A	: 1.00 g (typ.)
SOP16-P-300-1.27A	: 0.18 g (typ.)
SOL16-P-150-1.27	: 0.13 g (typ.)

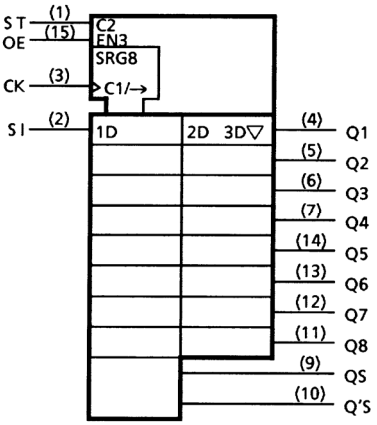
Features

- High speed: f_{max} = 73 MHz (typ.) at V_{CC} = 5 V
- Low power dissipation: I_{CC} = 4 μA (max) at Ta = 25°C
- High noise immunity: $V_{NIH} = V_{NIL}$ = 28% V_{CC} (min)
- Output drive capability: 10 LSTTL loads
- Symmetrical output impedance: $|I_{OH}| = I_{OL}$ = 4 mA (min)
- Balanced propagation delays: $t_{pLH} \simeq t_{pHL}$
- Wide operating voltage range: V_{CC} (opr) = 2 to 6 V
- Pin and function compatible with 4094B

Pin Assignment



IEC Logic Symbol



Truth Table

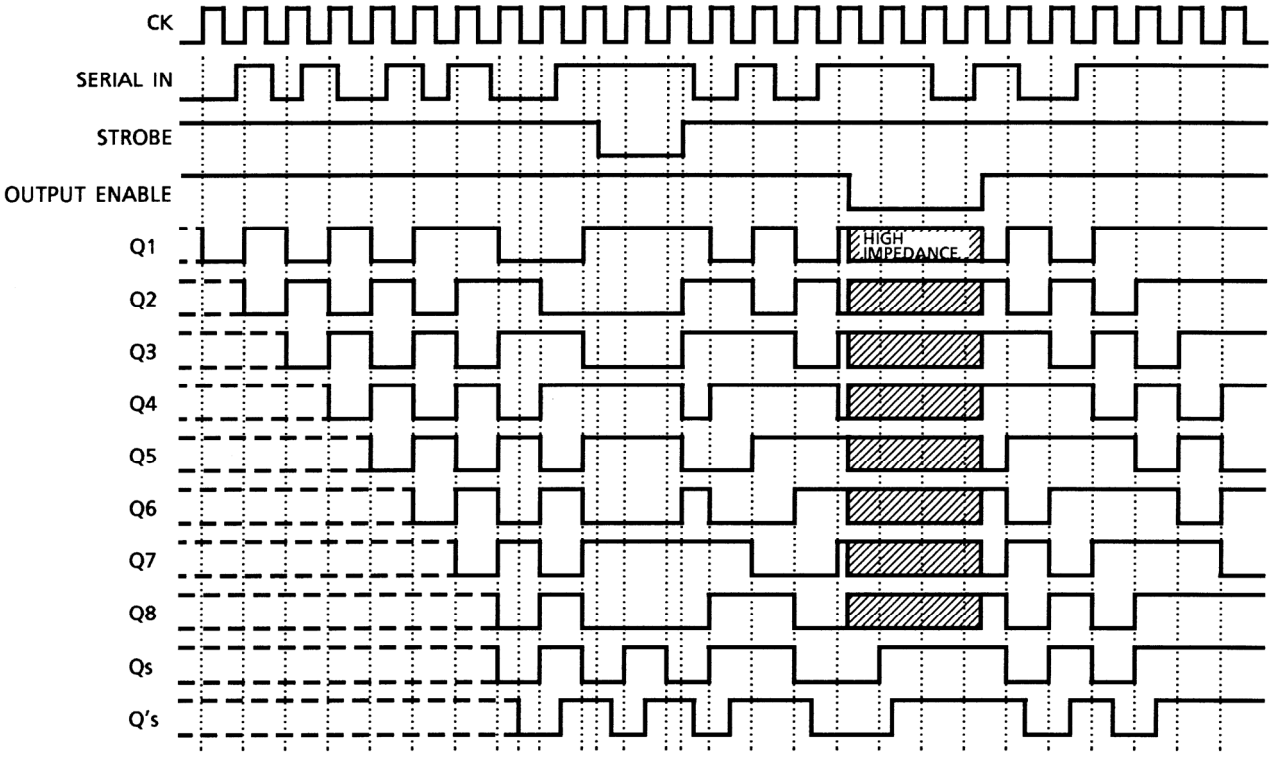
CK	OE	ST	SI	Para. Out		Seri. Out	
				Q1	Qn	Qs	Q's
↑	H	H	L	L	Qn – 1	Q7	NC
↑	H	H	H	H	Qn – 1	Q7	NC
↑	H	L	*	NC	NC	Q7	NC
↑	L	*	*	Z	Z	Q7	NC
↓	H	*	*	NC	NC	NC	Qs
↓	L	*	*	Z	Z	NC	Qs

X: Don't care

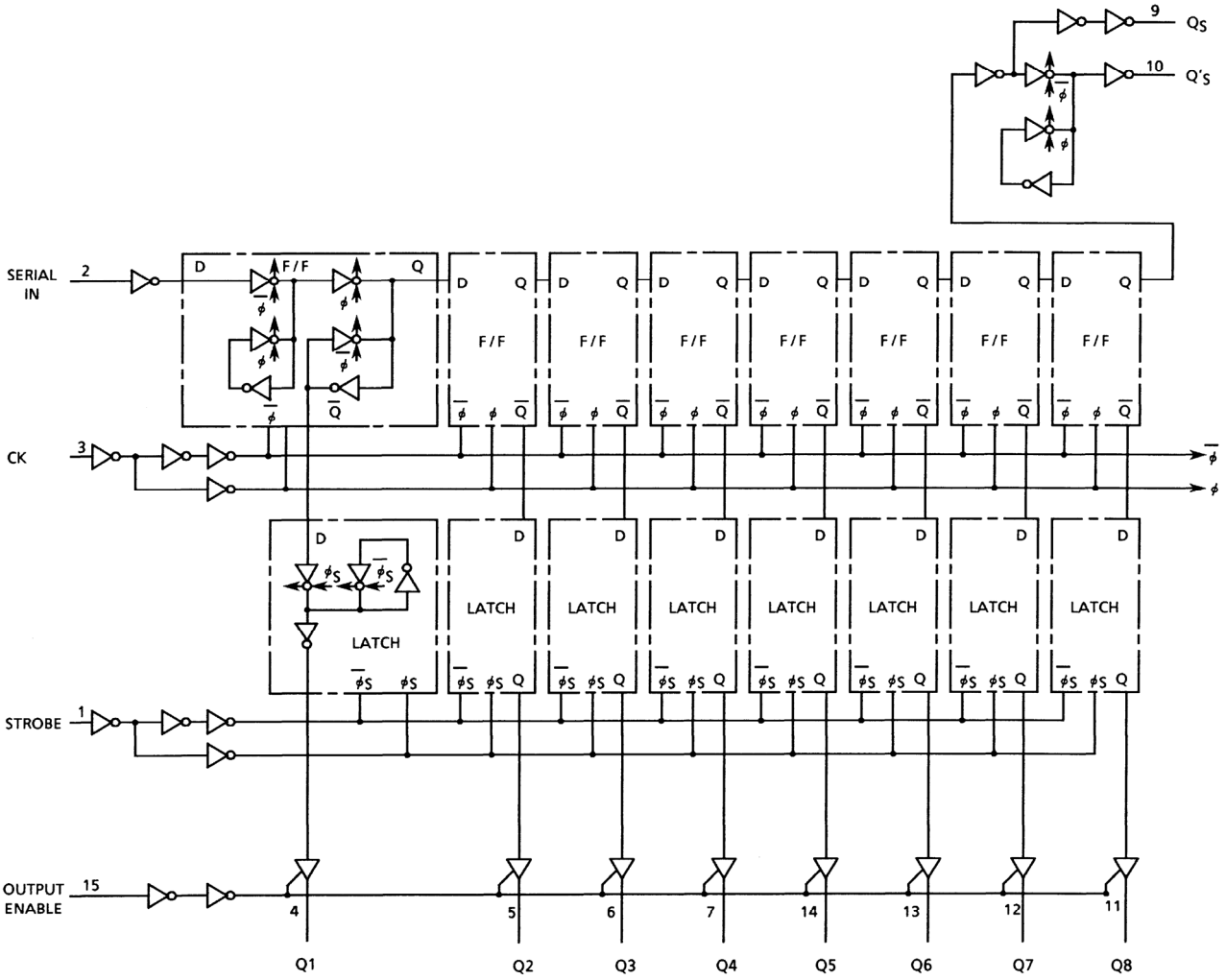
NC: No change

Z: High impedance

Timing Chart



System Diagram



Absolute Maximum Ratings (Note 1)

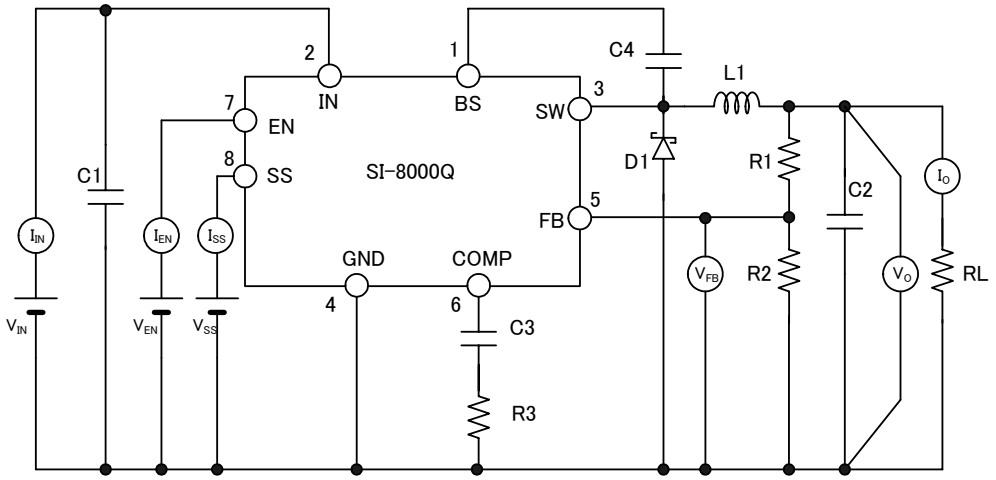
Characteristics	Symbol	Rating	Unit
Supply voltage range	V_{CC}	−0.5 to 7	V
DC input voltage	V_{IN}	−0.5 to V_{CC} + 0.5	V
DC output voltage	V_{OUT}	−0.5 to V_{CC} + 0.5	V
Input diode current	I_{IK}	±20	mA
Output diode current	I_{OK}	±20	mA
DC output current	I_{OUT}	±25	mA
DC V_{CC}/ground current	I_{CC}	±50	mA
Power dissipation	P_D	500 (DIP) (Note 2)/180 (SOP)	mW
Storage temperature	T_{stg}	−65 to 150	°C

Note 1: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.
Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 2: 500 mW in the range of Ta = −40 to 65°C. From Ta = 65 to 85°C a derating factor of −10 mW/°C shall be applied until 300 mW.

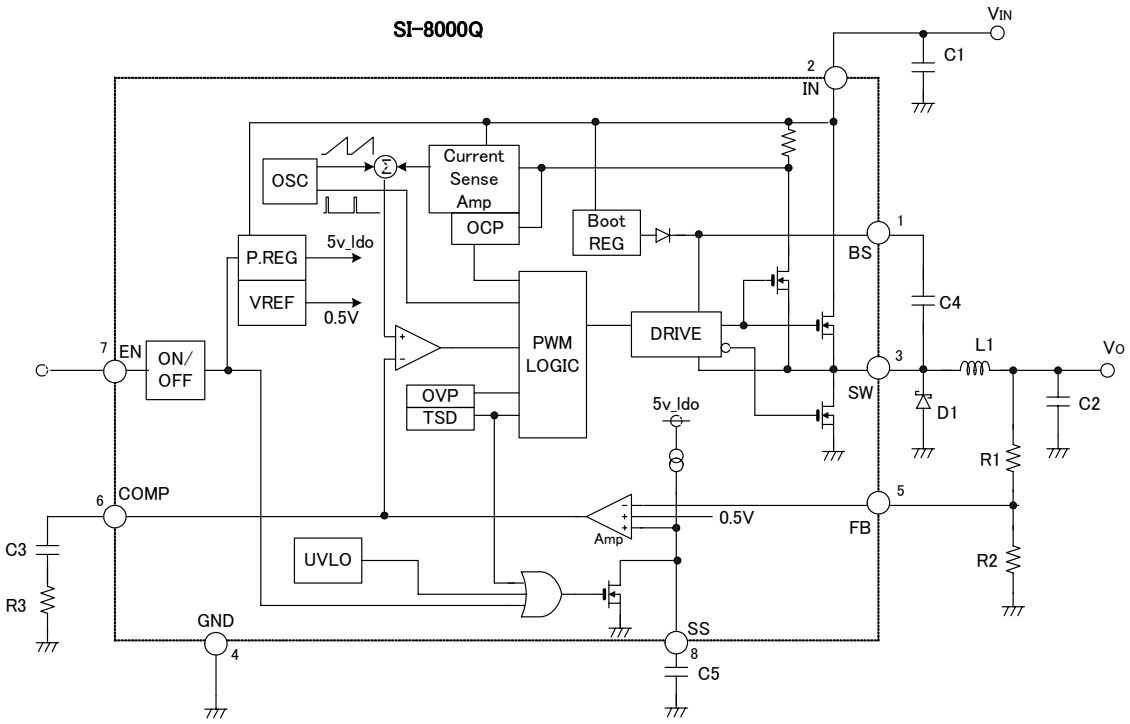
4-3測定回路図

Measurement circuit diagram



4-4 ブロックダイアグラム

Block diagram



WIDE BAND VIDEO SWITCH WITH I²C BUS

■ GENERAL DESCRIPTION

The NJW1321 is a Wide Band Video Switch with I²C BUS.

The NJW1321 includes switch of 4-input 2-output and 6dB amplifier. It is suitable for RGB or Y, Pb, and Pr signal because frequency range is 100MHz.

The NJW1321 includes external logic control terminals and external logic discernment terminals.

The NJW1321 is suitable for PTV, DTV, PDP and other high quality AV systems.

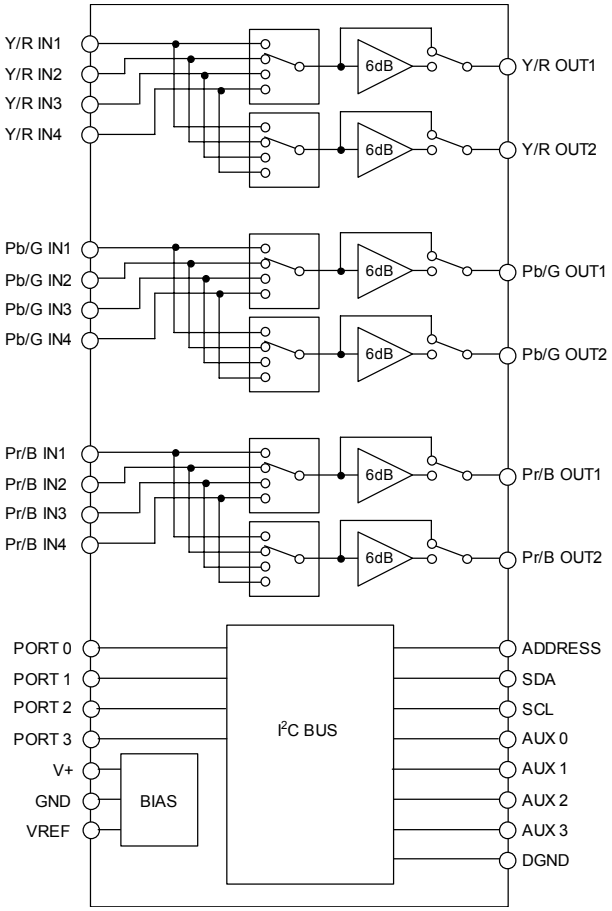
■ PACKAGE OUTLINE

NJW1321FP1

■ FEATURES

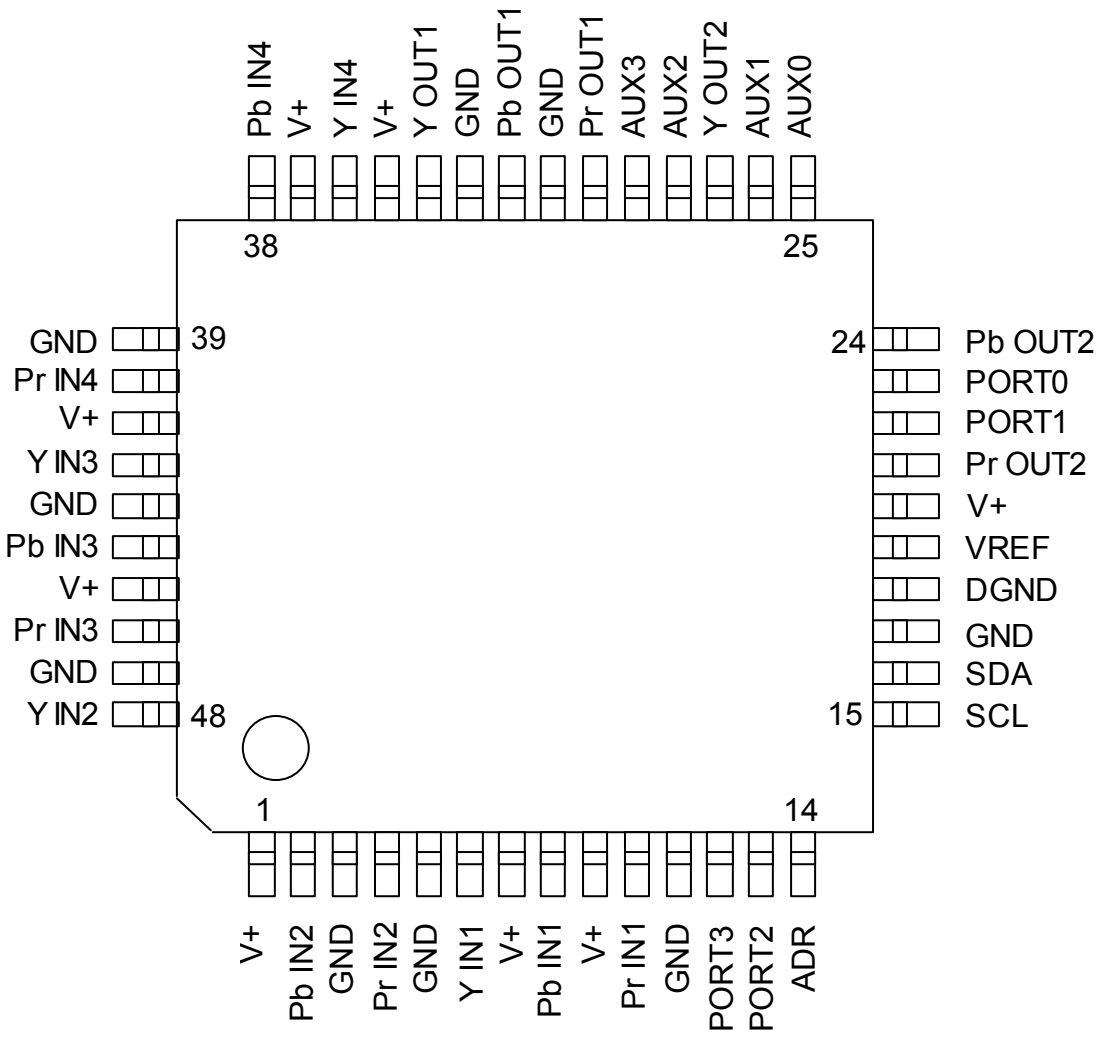
- Operating Voltage +9.0V
- I²C BUS Interface
- 4-input 2-output 3-Circuits
- Wide frequency range 0dB at 100MHz typ.
  -3dB at 300MHz typ.
- Internal 6dB amplifier (Selectable Bypass or 6dB)
- External logic discernment terminal
- External logic control terminal
- Selectable slave address
- Power Save Circuit
- Bi-CMOS Technology
- Package Outline QFP48

■ BLOCK DIAGRAM



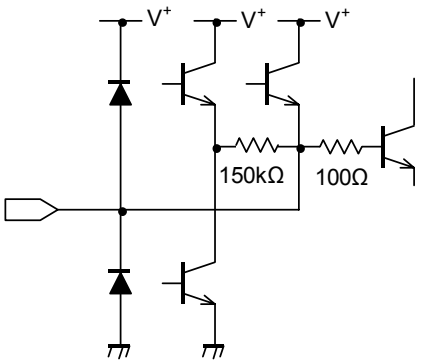
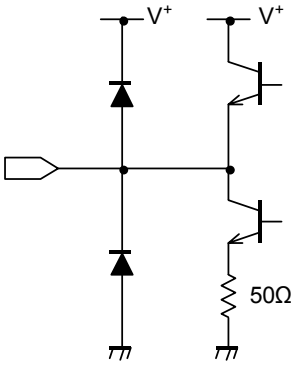
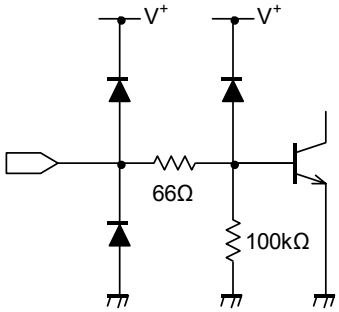
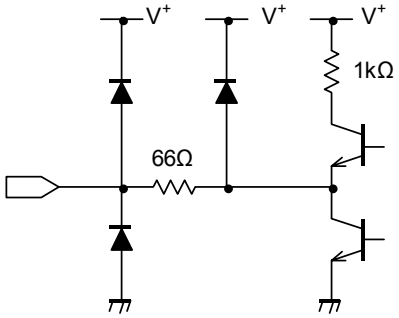
NJW1321

■PIN CONFIGURATION

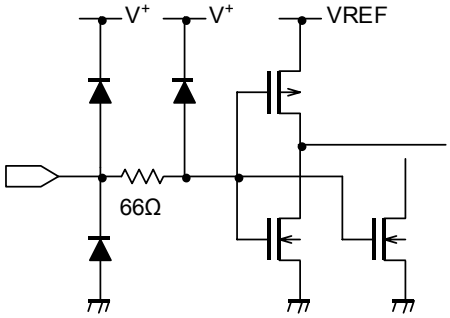
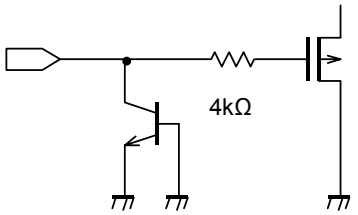
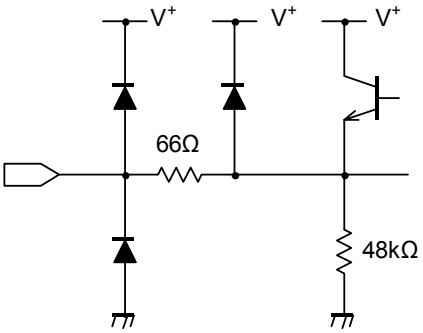


1. V+	13. PORT2	25. AUX0	37. V+
2. Pb IN2	14. ADR	26. AUX1	38. Pb IN4
3. GND	15. SCL	27. Y OUT2	39. GND
4. Pr IN2	16. SDA	28. AUX2	40. Pr IN4
5. GND	17. GND	29. AUX3	41. V+
6. Y IN1	18. DGND	30. Pr OUT1	42. Y IN3
7. V+	19. VREG	31. GND	43. GND
8. Pb IN1	20. V+	32. Pb OUT1	44. Pb IN3
9. V+	21. Pr OUT2	33. GND	45. V+
10. Pr IN1	22. PORT1	34. Y OUT1	46. Pr IN3
11. GND	23. PORT 0	35. V+	47. GND
12. PORT3	24. Pb OUT2	36. Y IN4	48. Y IN2

■**EQUIVALENT CIRCUIT**

PIN No.	NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT	VOLTAGE
6 8 10 48 2 4 42 44 46 36 38 40	Y IN1 Pb IN1 Pr IN1 Y IN2 Pb IN2 Pr IN2 Y IN3 Pb IN3 Pr IN3 Y IN4 Pb IN4 Pr IN4	Y,Pb,Pr Input RGB Input		4.4V
34 32 30 27 24 21	Y OUT1 Pb OUT1 Pr OUT1 Y OUT2 Pb OUT2 Pr OUT2	Y,Pb,Pr Output RGB Output		3.0V
23 22 13 12	PORT0 PORT1 PORT2 PORT3	Logic input terminal		-
25 26 28 29	AUX0 AUX1 AUX2 AUX3	Auxiliary 3 values voltage output terminal		0V 1.9V 5.0V

NJW1321

PIN No.	NAME	FUNCTION	INSIDE EQUIVALENT CIRCUIT	VOLTAGE
14	ADR	Slave address setting terminal		-
15 16	SCL SDA	I^2C clock terminal I^2C data terminal		-
19	VREF	Reference voltage terminal		4.8V
1 7 9 20 35 37 41 45	V+	Supply voltage terminal		-
3 5 11 17 31 33 39 43 47	GND	Ground terminal		-
18	DGND	Ground terminal		-

JRC **NJW1197C**

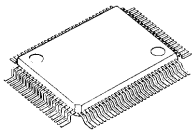
8-CHANNEL ELECTRONIC VOLUME WITH INPUT SELECTOR

■ GENERAL DESCRIPTION

NJW1197C is an 8-channel electronic volume IC. It includes Input selector, tone control, volume, mute, input selector gain control, volume output gain control and 5 REC outputs. Each mode and conditions are set by the 3-wired serial control data.

NJW1197C improves low Residual Output Noise Voltage compared with **NJW1197**.

■ PACKAGE OUTLINE

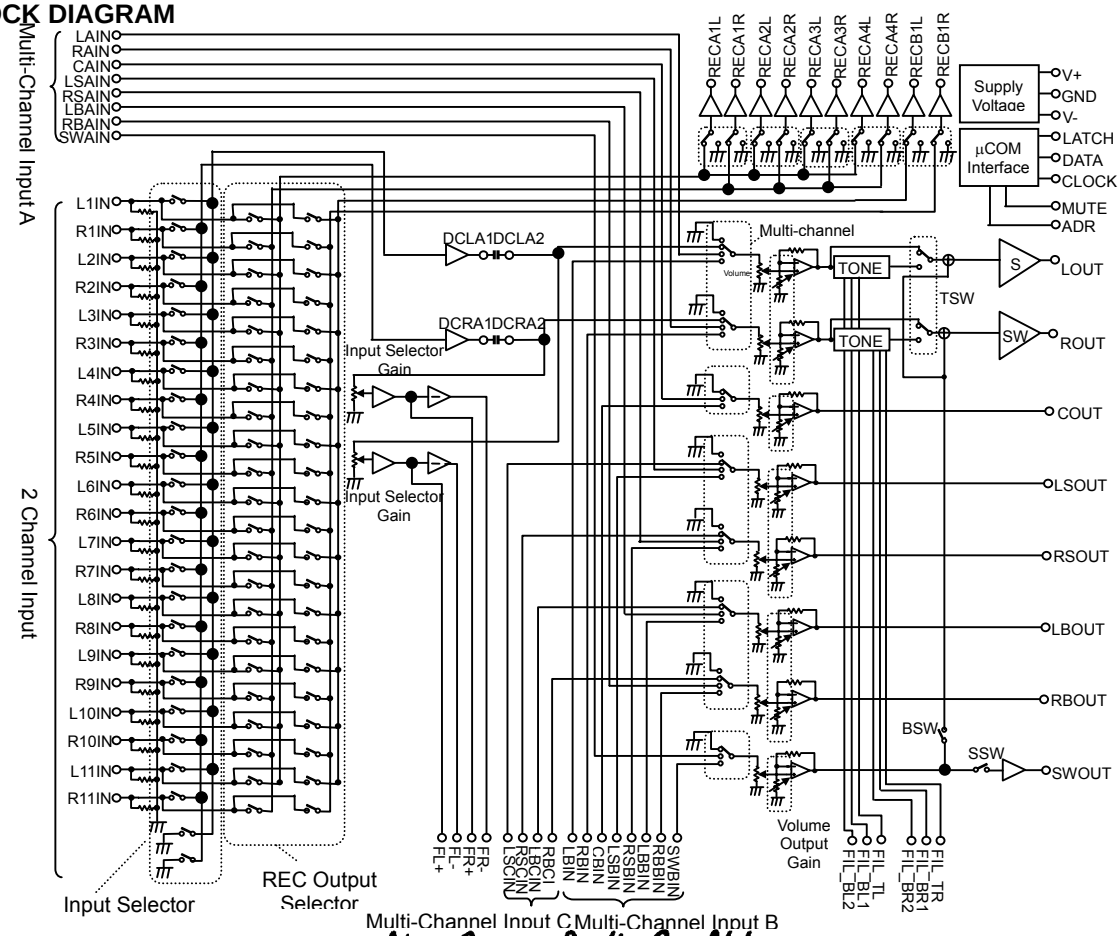


NJW1197CFC2

■ FEATURES

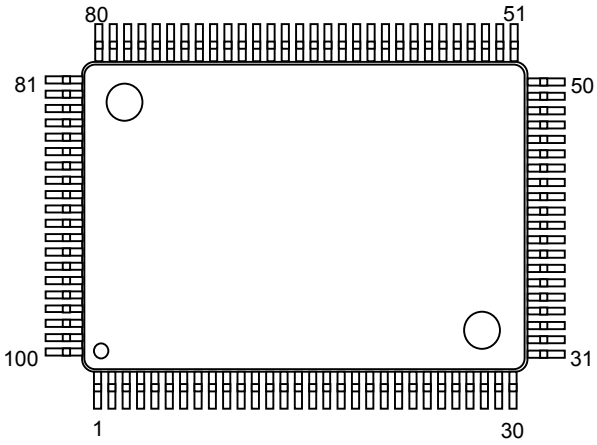
● Operating Voltage	±4.5 to ±7.5V
● 3-Wired Serial Control	Chip Address Select Function
● Input Selector (x 11)	
● REC Output (x 5)	Independent Mute function
● Input Selector Gain Control	Gain : 0/-3/-6/-9/-12dB
● Volume Output Gain Control	Gain : 0/+1/+2/+3/+4/+5/+6/+7dB (L,R,C,LS,RS,LB,RBch) Gain : 0/+1/+2/+3/+4/+5/+6/+10dB (SWch) Independent Control: L,Rch / Cch / LS,RSch / LB,RBch / SWch
● Volume	0 to -100dB/0.5dBstep, MUTE
● Residual Output Noise Voltage	-114dBV typ. @Volume=-95dB (Output Noise 3)
● Tone Control	0 to ±10dB/1dBstep
● Subwoofer output addition to L, R channel output	
● Subwoofer output ON/OFF control	
● Bi-CMOS Technology	
● Package Outline	QFP100-C2

■ BLOCK DIAGRAM



NJW1197C

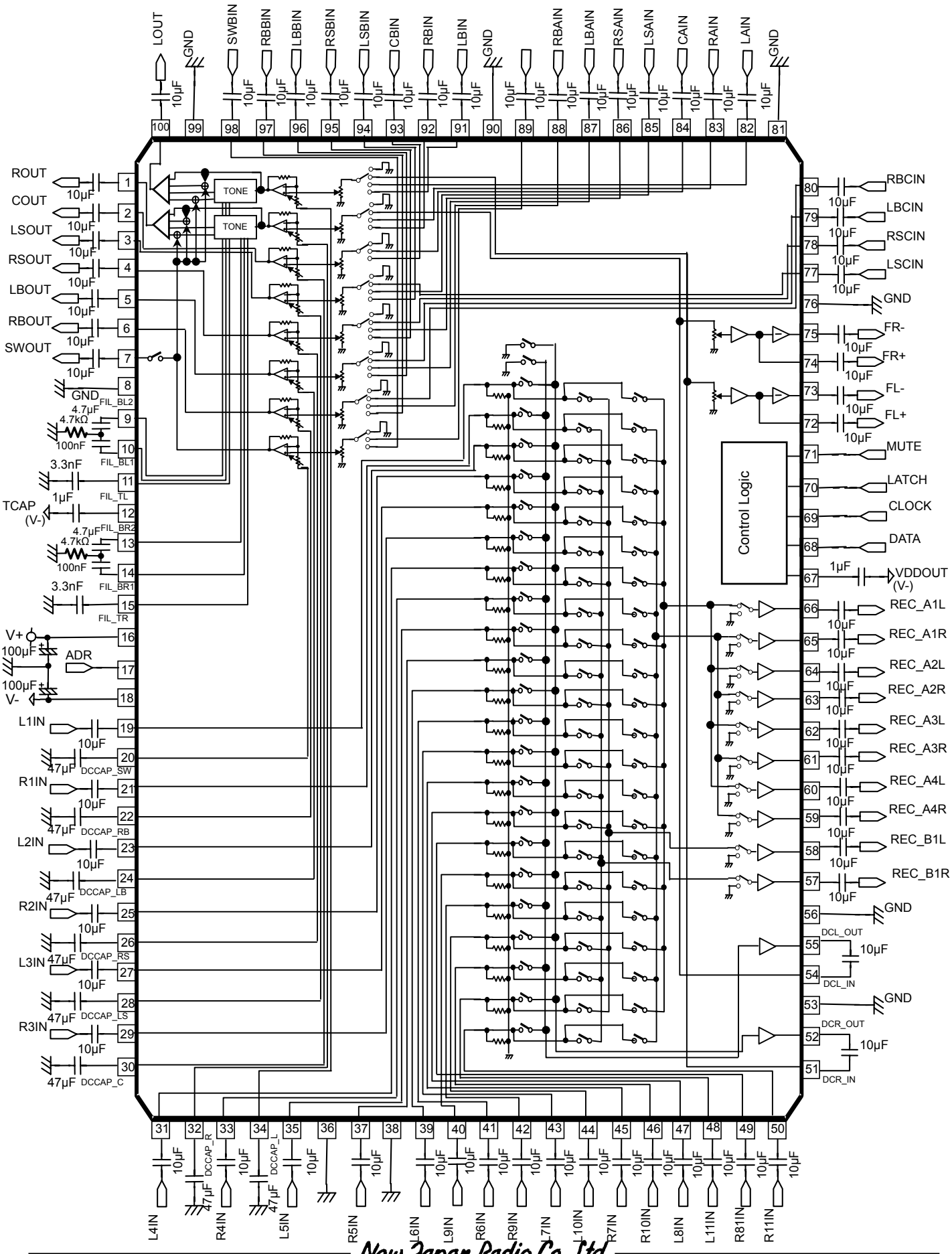
■ PIN FUNCTION



No.	SYMBOL	FUNCTION	No.	SYMBOL	FUNCTION
1	ROUT	Rch output	51	DCR_IN	“Multi-channel selector” Rch input
2	COUT	Cch output	52	DCR_OUT	“Input selector” Rch output
3	LSOUT	LSch output	53	GND	Ground
4	RSOUT	RSch output	54	DCL_IN	“Multi-channel selector” Lch input
5	LBOUT	LBch output	55	DCL_OUT	“Input selector” Lch output
6	RBOUT	RBch output	56	GND	Ground
7	SWOUT	SWch output	57	REC_B1R	“Input selector” Rch REC output B1
8	GND	Ground	58	REC_B1L	“Input selector” Lch REC output B1
9	FIL_BL2	Lch Bass filter terminal 2	59	REC_A4R	“Input selector” Rch REC output A4
10	FIL_BL1	Lch Bass filter terminal 1	60	REC_A4L	“Input selector” Lch REC output A4
11	FIL_TL	Lch Treble filter terminal	61	REC_A3R	“Input selector” Rch REC output A3
12	TCAP	Switching noise rejection capacitor	62	REC_A3L	“Input selector” Lch REC output A3
13	FIL_BR2	Rch Bass filter terminal 2	63	REC_A2R	“Input selector” Rch REC output A2
14	FIL_BR1	Rch Bass filter terminal 1	64	REC_A2L	“Input selector” Lch REC output A2
15	FIL_TR	Rch Treble filter terminal	65	REC_A1R	“Input selector” Rch REC output A1
16	V+	+ Power supply voltage input	66	REC_A1L	“Input selector” Lch REC output A1
17	ADR	Chip address select input	67	VDDOUT	Internal Digital +Power Supply Output
18	V-	- Power supply voltage input	68	DATA	Control data signal input
19	L1IN	“Input selector” Lch input 1	69	CLOCK	Clock signal input
20	DCCAP_SW	Switching noise rejection capacitor	70	LATCH	Latch signal input
21	R1IN	“Input selector” Rch input 1	71	MUTE	External mute control
22	DCCAP_RB	Switching noise rejection capacitor	72	FL+	“Input selector gain control” Lch no-inverted output
23	L2IN	“Input selector” Lch input 2	73	FL-	“Input selector gain control” Lch inverted output
24	DCCAP_LB	Switching noise rejection capacitor	74	FR+	“Input selector gain control” Rch no-inverted output
25	R2IN	“Input selector” Rch input 2	75	FR-	“Input selector gain control” Rch inverted output
26	DCCAP_RS	Switching noise rejection capacitor	76	GND	Ground
27	L3IN	“Input selector” Lch input 3	77	LSCIN	Multi-channel LSch input C
28	DCCAP_LS	Switching noise rejection capacitor	78	RSCIN	Multi-channel RSch input C
29	R3IN	“Input selector” Rch input 3	79	LBCIN	Multi-channel LBch input C
30	DCCAP_C	Switching noise rejection capacitor	80	RBCIN	Multi-channel RBch input C
31	L4IN	“Input selector” Lch input 4	81	GND	Ground
32	DCCAP_R	Switching noise rejection capacitor	82	LAIN	Multi-channel Lch input A
33	R4IN	“Input selector” Rch input 4	83	RAIN	Multi-channel Rch input A
34	DCCAP_L	Switching noise rejection capacitor	84	CAIN	Multi-channel Cch input A
35	L5IN	“Input selector” Lch input 5	85	LSAIN	Multi-channel LSch input A
36	GND	Ground	86	RSAIN	Multi-channel RSch input A
37	R5IN	“Input selector” Rch input 5	87	LBAIN	Multi-channel LBch input A
38	GND	Ground	88	RBAIN	Multi-channel RBch input A
39	L6IN	“Input selector” Lch input 6	89	SWAIN	Multi-channel SWch input A
40	L9IN	“Input selector” Lch input 9	90	GND	Ground
41	R6IN	“Input selector” Rch input 6	91	LBIN	Multi-channel Lch input B
42	R9IN	“Input selector” Rch input 9	92	RBIN	Multi-channel Rch input B
43	L7IN	“Input selector” Lch input 7	93	CBIN	Multi-channel Cch input B
44	L10IN	“Input selector” Lch input 10	94	LSBIN	Multi-channel LSch input B
45	R7IN	“Input selector” Rch input 7	95	RSBIN	Multi-channel RSch input B
46	R10IN	“Input selector” Rch input 10	96	LBBIN	Multi-channel LBch input B
47	L8IN	“Input selector” Lch input 8	97	RBBIN	Multi-channel RBch input B
48	L11IN	“Input selector” Lch input 11	98	SWBIN	Multi-channel SWch input B
49	R8IN	“Input selector” Rch input 8	99	GND	Ground
50	R11IN	“Input selector” Rch input 11	100	LOUT	Lch output

NJW1197C

■ APPLICATION CIRCUIT



M24C64
M24C32

64Kbit and 32Kbit Serial I²C Bus EEPROM

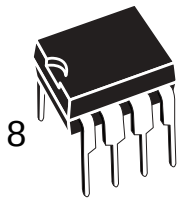
FEATURES SUMMARY

- Two-Wire I^2C Serial Interface
  Supports 400kHz Protocol
- Single Supply Voltage:
  - 4.5 to 5.5V for M24Cxx
  - 2.5 to 5.5V for M24Cxx-W
  - 1.8 to 5.5V for M24Cxx-R
- Write Control Input
- BYTE and PAGE WRITE (up to 32 Bytes)
- RANDOM and SEQUENTIAL READ Modes
- Self-Timed Programming Cycle
- Automatic Address Incrementing
- Enhanced ESD/Latch-Up Protection
- More than 1 Million Erase/Write Cycles
- More than 40-Year Data Retention

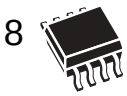
Table 1. Product List

Reference	Part Number
M24C64	M24C64
	M24C64-W
	M24C64-R
M24C32	M24C32
	M24C32-W
	M24C32-R

Figure 1. Packages



PDIP8 (BN)



SO8 (MN)
150 mil width

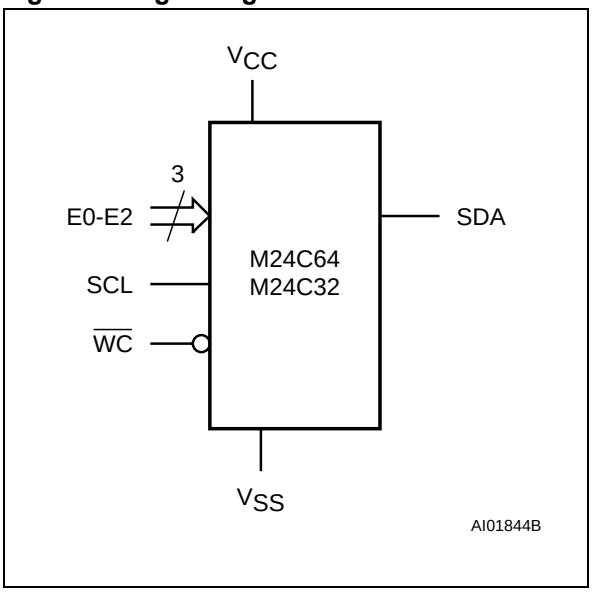
TSSOP8 (DW)
169 mil width

UFDFPN8 (MB)
2x3mm² (MLP)

SUMMARY DESCRIPTION

These I^2C-compatible electrically erasable programmable memory (EEPROM) devices are organized as 8192 x 8 bits (M24C64) and 4096 x 8 bits (M24C32).

Figure 2. Logic Diagram



I^2C uses a two-wire serial interface, comprising a bi-directional data line and a clock line. The devices carry a built-in 4-bit Device Type Identifier code (1010) in accordance with the I^2C bus definition.

The device behaves as a slave in the I^2C protocol, with all memory operations synchronized by the serial clock. Read and Write operations are initiated by a Start condition, generated by the bus master. The Start condition is followed by a Device Select Code and Read/Write bit (RW) (as described in Table 3.), terminated by an acknowledge bit.

When writing data to the memory, the device inserts an acknowledge bit during the 9th bit time, following the bus master's 8-bit transmission. When data is read by the bus master, the bus master acknowledges the receipt of the data byte in the same way. Data transfers are terminated by a Stop condition after an Ack for Write, and after a NoAck for Read.

Table 2. Signal Names

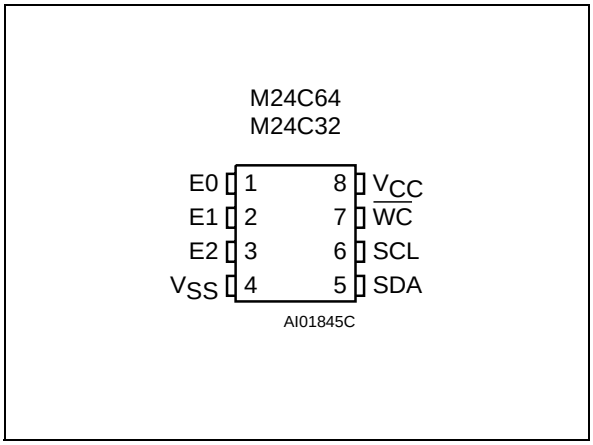
E0, E1, E2	Chip Enable
SDA	Serial Data
SCL	Serial Clock
$\overline{WC}$	Write Control
V_{CC}	Supply Voltage
V_{SS}	Ground

Power On Reset: V_{CC} Lock-Out Write Protect

In order to prevent data corruption and inadvertent Write operations during Power-up, a Power On Reset (POR) circuit is included. At Power-up, the internal reset is held active until V_{CC} has reached the Power On Reset (POR) threshold voltage, and all operations are disabled – the device will not respond to any command. In the same way, when V_{CC} drops from the operating voltage, below the Power On Reset (POR) threshold voltage, all operations are disabled and the device will not respond to any command.

A stable and valid V_{CC} (as defined in Table 9. and Table 10.) must be applied before applying any logic signal.

Figure 3. DIP, SO, TSSOP and UFDFPN Connections



Note: See PACKAGE MECHANICAL section for package dimensions, and how to identify pin-1.

225 MHz High Performance HDMI™(v1.3) Transmitter with CEC

Preliminary

ADV7510

FEATURES

General
- HDMI v1.3 fully compliant
- 225MHz supports 12-bit deep color operation in all video formats up to 1080p
- Supports xvYCC color space, Gamut Metadata Packet transmission.
- Integrated CEC buffer / controller
- Compatible with HDMI v1.3, DVI v1.0, and HDCP 1.3
- Video/audio inputs accept logic level s from 1.8V to 3.3V

Digital video
- Programmable two-way color space converter
- Supports RGB, YCbCr, DDR
- Supports ITU656 based embedded syncs
- Auto input video format timing detection (CEA-861D)

Digital audio
- Supports standard S/PDIF for stereo LPCM or compressed audio up to 192 kHz
- 8-channel uncompressed LPCM I²S audio up to 192 kHz

Special features for easy system design
- On-chip MPU with I²C® master to perform HDCP operations and EDID reading operations
- 5 V tolerant I²C and HPD I/Os, no extra device needed
- No audio master clock needed for supporting S/PDIF and I²S
- On-chip MPU reports HDMI events through interrupts and registers

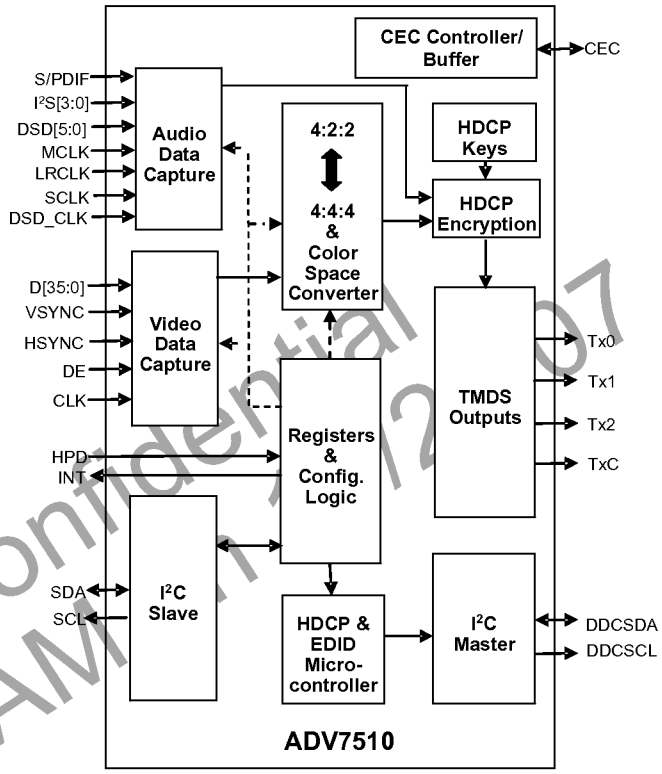


Figure 1. Functional Block Diagram

GENERAL DESCRIPTION

The ADV7510 is a 225MHz High Definition Multimedia Interface (HDMI™) transmitter which his perfect for home entertainment products including DVD players/recorders, digital set top boxes, A/V receivers, gaming consoles and PCs.

The digital video interface contains an HDMI™ v1.3 and DVI v1.0 compatible transmitter and supports all HDTV formats (including 1080p with 12-bit deep color). The ADV7510 also supports the xvYCC color space, high bitrate audio, digital theater sound (DTS) and programmable AVI Infoframes features.

With the inclusion of HDCP, the ADV7510 allows the secure transmission of protected content as specified by the HDCP v1.3 protocol.

The ADV7510 supports both SPDIF and 8-channel I²S audio. Its high fidelity 8-channel I²S can transmit either stereo or 7.1 surround audio up to 768kHz. The SPDIF can carry compressed audio including Dolby® Digital, DTS®, and THX®.

Fabricated in an advanced CMOS process, the ADV7510 is provided in a 100-lead LQFP surface-mount plastic package and is specified over the –25°C to +85°C temperature range.

Rev.0

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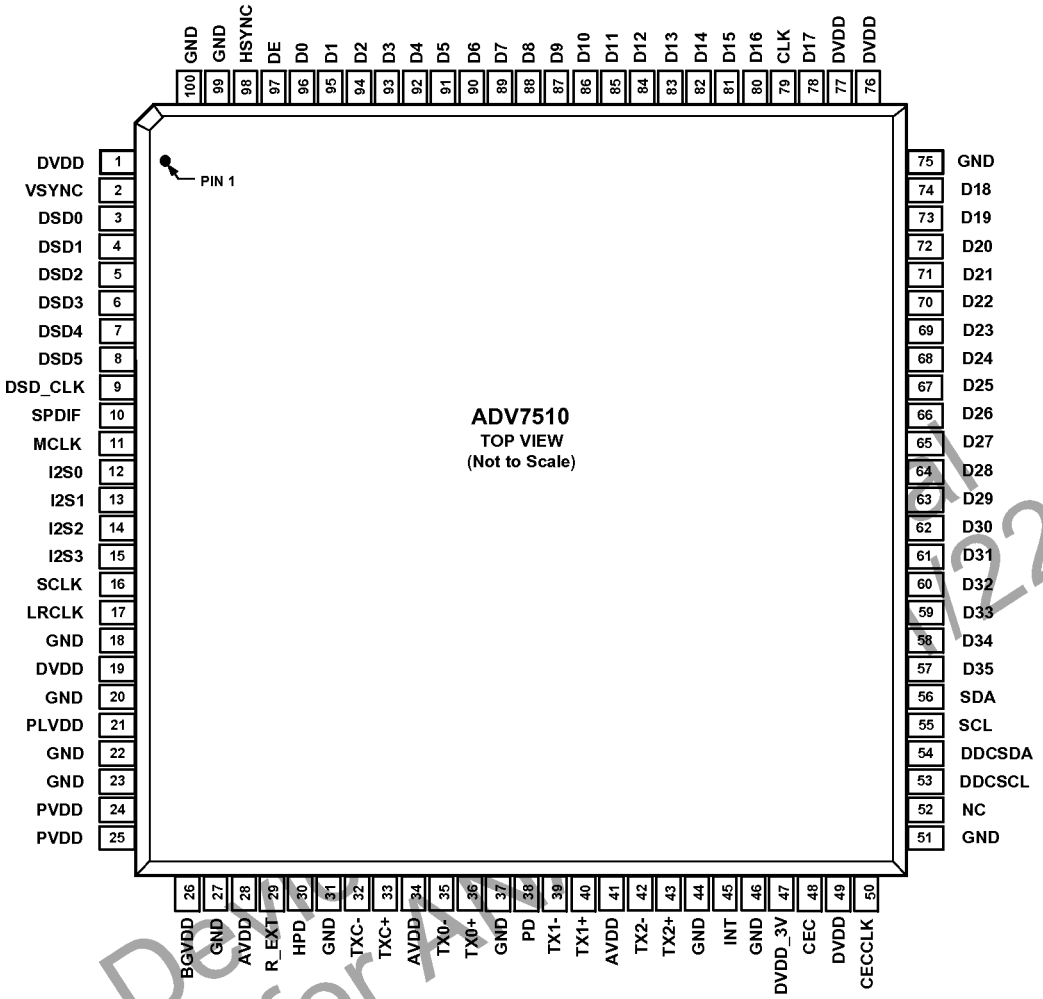

Figure 2. ADV7510 Pinout

ANALOG DEVICES

12-Bit 170 MHz Video and Graphics Digitizer with Quad HDMI 1.3 Receiver

Preliminary Information

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
Quad HDMI Rx
- **4:1 multiplexed HDMI receiver**
- **HDMI 1.3, DVI 1.0**
- **225 MHz HDMI receiver**
- **Repeater support**
- **High-bandwidth Digital Content Protection (HDCP 1.3)**
- **36-/30-/24-bit deep color support**
- **HDMI 1.3-compatible audio interface**
- **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), which 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 1.3 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 15mm x 15mm BGA surface-mount, Pb-free package and is specified over the −40°C to +85°C temperature range.

Advantiv™ Advanced Television Solutions by Analog Devices | NSV® Precision Video by Analog Devices

Pr. 0

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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_2-	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_SDA	DDCD_SCL	DDCC_SDA	DDCC_SCL	CVDD	DGND	RTERM	CVDD	DDCB_SDA	DDCB_SCL	DDCA_SCL	DDCA_SDA	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			DGND	DGND	DGND	DGND	PVDD	PVDD					TEST1	TEST2	G
H	P3	P2	RAW_VSYNC	RAW_SYNC			DGND	DGND	DGND	DGND	AGND	AGND			XTALP	AVDD	REFN	REFP	H
J	DGND	DGND	MCLKOUT	SPDIF			DVDD	DGND	DGND	DGND	AGND	AGND			XTALN	AVDD	AGND	AGND	J
K	P4	P5	LRCLK	SCLK			DVDD	DVDD	DGND	DGND	AGND	AVDD			AVDD	AVDD	AIN11	AIN12	K
L	P6	P7	I2S3	I2S2			DVDD	DVDD	DGND	DGND	AGND	AVDD			TRI8/VS_IN2	TRI7/HS_IN2	SYNC4	AIN10	L
M	P8	DGND	DGND	DGND			DVDD	DVDD	DGND	DGND	AGND	AVDD			TRI5	TR6	AGND	AGND	M
N	P9	DVDDIO	DVDDIO	DVDDIO											TRI3	TRI4	AIN8	AIN9	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	TRI2	AGND	AGND	R
T	P14	P15	DGND	DGND	P25	DVDDIO	SDA	SYNC_OUT/INT2	DVDDIO	DGND	RESETB	AVLINK	VS_IN1	AGND	TRI1	SYNC2	AIN5	AIN6	T
U	P16	P17	P19	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	

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	I^2S Audio (Channel 7 and Channel 8).
3M	DGND	Ground	Ground
3N	DVDDIO	Power	Digital I/O supply voltage (3.3V)

3P	I2S0	Misc Digital	I²S 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	I²S Audio (Channel 5 and Channel 6).
4M	DGND	Ground	Ground
4N	DVDDIO	Power	Digital I/O supply voltage (3.3V)
4P	I2S1	Misc Digital	I²S 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	I²C 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	I²C 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

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 TRI8 (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

			connector. Result available via I²C. 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 5 V tolerant.
15M	TRI5	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. This signal can be buffered and output to the FBOUT pin.
15N	TRI3	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. This signal can be buffered and output to the FBOUT pin.
15P	AVDD	Power	Analog supply voltage (1.8V)
15R	Y_MUX_OUT	Misc Analog	Buffered output of the Y channel.
15T	TRI1	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. This signal can be buffered and output to the FBOUT pin.
15U	SYNC1	Misc Analog	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
15V	AIN1	Analog Video Input	Analog video input channel
16A	TVDD	Power	Terminator supply voltage (3.3V)
16B	TVDD	Power	Terminator supply voltage (3.3V)
16C	DGND	Ground	Ground
16D	TVDD	Power	Terminator supply voltage (3.3V)
16E	DGND	Ground	Ground
16F	CVDD	Power	Comparator supply voltage (1.8V)
16H	AVDD	Power	Analog 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	Dual purpose pin. Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. 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 5 V tolerant.
16M	TRI6	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. This signal can be buffered and output to the FBOUT pin.
16N	TRI4	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. This signal can be buffered and output to the FBOUT pin.
16P	AVDD	Power	Analog supply voltage (1.8V)
16R	TRI2	Misc Analog	Trilevel/bilevel input on the SCART or D-terminal connector. Result available via I²C. This signal can be buffered and output to the FBOUT pin.
16T	SYNC2	Misc Analog	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
16U	AVDD	Power	Analog supply voltage (1.8V)
16V	AIN2	Analog Video Input	Analog video input channel
17A	TVDD	Power	Terminator supply voltage (3.3V)
17B	RXA_2+	HDMI Input	Digital Input Channel 2 complement of Port A in the HDMI interface.
17C	RXA_1+	HDMI Input	Digital Input Channel 1 complement of Port A in the HDMI interface.
17D	RXA_0+	HDMI Input	Digital Input Channel 0 complement of Port A in the HDMI interface.
17E	RXA_C+	HDMI Input	Digital input clock complement of Port A in the HDMI interface.
17F	TVDD	Power	Terminator supply voltage (3.3V)
17G	TEST1	Test	Do not connect
17H	REFN	Misc Analog	Internal voltage reference output.
17J	AGND	Ground	Ground
17K	AIN11	Analog Video Input	Analog video input channel
17L	SYNC4	Misc Analog	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
17M	AGND	Ground	Ground
17N	AIN8	Analog Video Input	Analog video input channel
17P	SYNC3	Misc Analog	This is a synchronization on green or luma input (SOG/SOY) used in embedded synchronization mode. User configurable.
17R	AGND	Ground	Ground
17T	AIN5	Analog Video Input	Analog video input channel
17U	AVDD	Power	Analog supply voltage (1.8V)

17V	AIN3	Analog Video Input	Analog video input channel
18A	DGND	Ground	Ground
18B	RXA_2-	HDMI Input	Digital Input Channel 2 true of Port A in the HDMI interface.
18C	RXA_1-	HDMI Input	Digital Input Channel 1 true of Port A in the HDMI interface.
18D	RXA_0-	HDMI Input	Digital Input Channel 0 true of Port A in the HDMI interface.
18E	RXA_C-	HDMI Input	Digital input clock true of Port A in the HDMI interface.
18F	DGND	Ground	Ground
18G	TEST2	Test	Do not connect
18H	REFP	Misc Analog	Internal voltage reference output.
18J	AGND	Ground	Ground
18K	AIN12	Analog Video Input	Analog video input channel
18L	AIN10	Analog Video Input	Analog video input channel
18M	AGND	Ground	Ground
18N	AIN9	Analog Video Input	Analog video input channel
18P	AIN7	Analog Video Input	Analog video input channel
18R	AGND	Ground	Ground
18T	AIN6	Analog Video Input	Analog video input channel
18U	AIN4	Analog Video Input	Analog video input channel
18V	AGND	Ground	Ground

CMOS 32-Bit Microcontrollers

TMP92FD28FG / ~~TMP92FD28DFG~~

1. Outline and Device Characteristics

The TMP92FD28 is a high-speed advanced 32-bit Microcontroller developed for controlling equipment which processes mass data.

The TMP92FD28 has a high-performance CPU (900/H1 CPU) and various built-in I/Os.

The TMP92FD28FG and TMP92FD28DFG 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)

아남품번	CUITMP92FD28FG
적용모델	CRX-E32φ

RoHS 確認

이 書類를 作...
西紀 2007 年 5 月 18 日
...電子(株)附設 멀티미 연구소
멀 티 미 디 어 연 구 실

(3) Internal memory
- Internal RAM: 32-Kbytes
- Internal ROM: 512-Kbytes

(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
- I^2C 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 : 1chanel
- 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 fc to fc/16
- Special timer for CLOCK (fs = 32.768 kHz)

(21) Operating voltage

- External I/O Vcc = 3.0 to 3.6 V
- Internal V_{CC} = 1.4 V to 1.6 V (fc max = 40 MHz)

(22) Package

- 100-pin QFP: P-LQFP100-1414-0.50F (TMP92FD28FG)
  P-QFP100-1420-0.65A (TMP92FD28DFG)

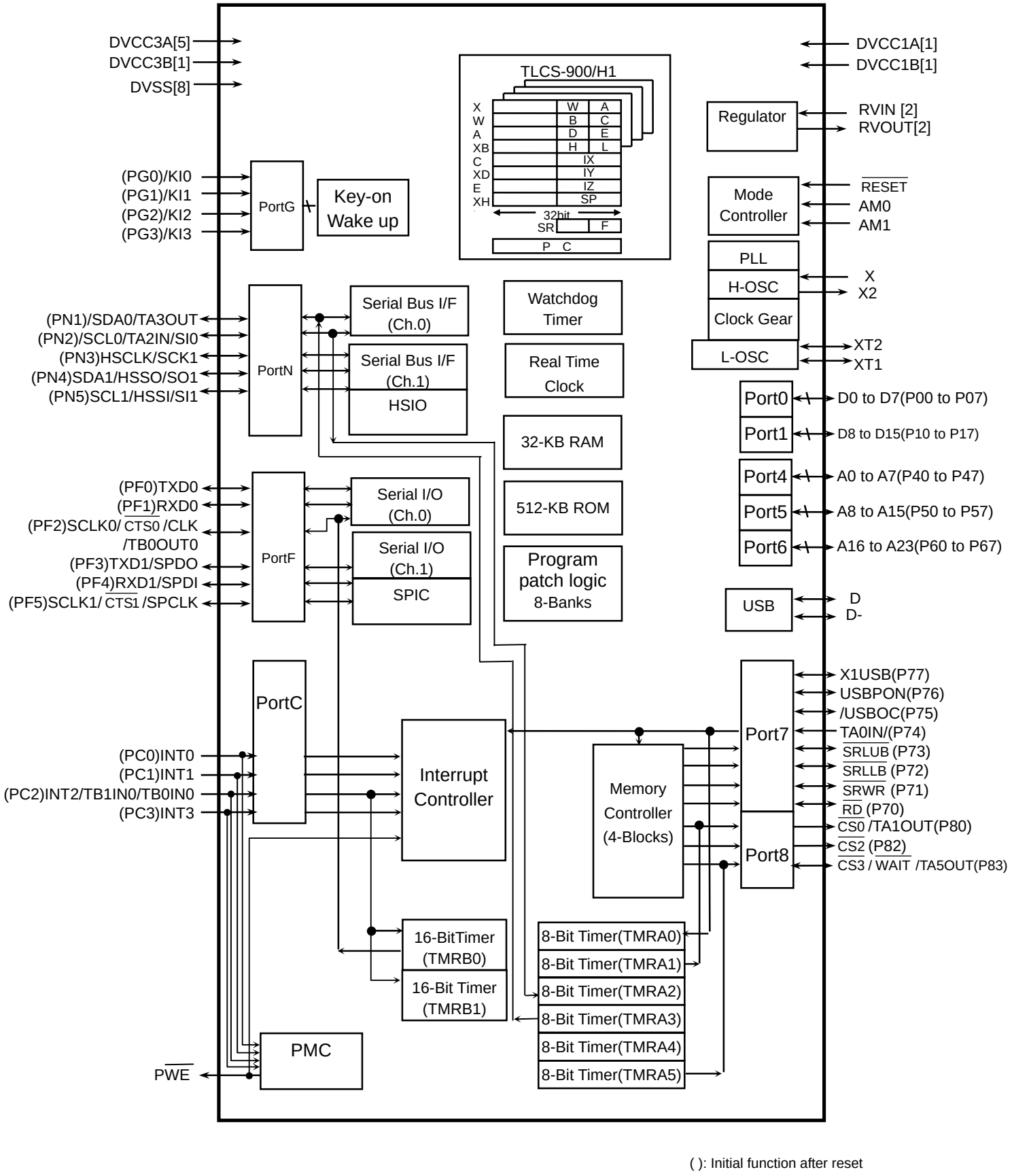


Figure 1.1 TMP92FD28 Block Diagram

2. Pin Assignment and Functions

The assignment of input/output pins for the TMP92FD28, their names and functions are as follows:

2.1 Pin Assignment Diagram

Figure 2.1.1 shows the pin assignment of the TMP92FD28FG.

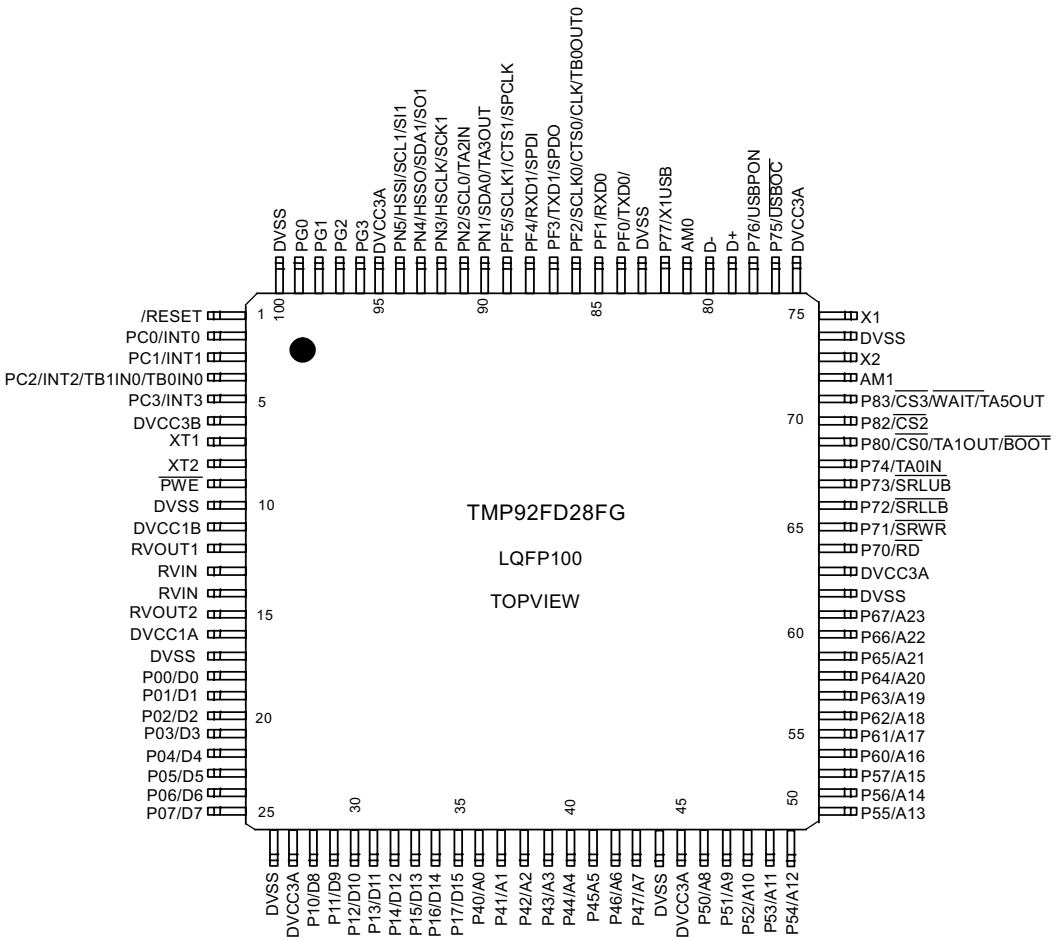


Figure 2.1.1 Pin Assignment Diagram (100-pin LQFP)

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 $\overline{RD}$	1	I/O Output	Port 70: I/O port (Schmitt input, with pull-up register) Read: Outputs strobe signal for read external memory.
P71 $\overline{SRWR}$	1	I/O Output	Port 71: I/O port (Schmitt input, with pull-up register) Write enable for SRAM: Strobe signal for wiritng data.
P72 $\overline{SRLLB}$	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 $\overline{SRLUB}$	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	I/O Input	Port 74: Input port (Schmitt input) 8-bit timer 0 input: Input pin of 8-bit timer TMRA0
P75 $\overline{USBOC}$	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 $\overline{CS0}$ TA1OUT BOOT	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).
P82 $\overline{CS2}$	1	Output Output	Port 82: Output port Chip select 2: Outputs “Low” when address is within specified address area
P83 $\overline{CS3}$ TA5OUT $\overline{WAIT}$	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

Table 2.2.1 Pin Names and Functions (2/3)

Pin name	Number of Pin	I/O	Function
PF0	1	I/O	Port F0: I/O port (Schmitt input)
TXD0		Output	Serial 0 send data: Open drain output programmable
PF1	1	I/O	Port F1: I/O port (Schmitt input)
RXD0		Input	Serial 0 receive data
PF2	1	I/O	Port F2: I/O port (Schmitt input)
SCLK0		I/O	Serial 0 clock I/O
$\overline{\text{CTS0}}$		Input	Serial 0 data send enable (Clear to send)
CLK		Output	Clock: System Clock output
TB0OUT0		Output	16-bit timer 0 output 0: Output pin of 16-bit timer TMRB0
PF3	1	I/O	Port F3: I/O port (Schmitt input)
TXD1		Output	Serial 1 send data: Open drain output programmable
SPDO		Output	SPI Data output
PF4	1	I/O	Port F4: I/O port (Schmitt input)
RXD1		Input	Serial 1 receive data
SPDI		Input	SPI Data input
PF5	1	I/O	Port F5: I/O port (Schmitt input)
SCLK1		I/O	Serial 1 clock I/O
$\overline{\text{CTS1}}$		Input	Serial 1 data send enable (Clear to send)
SPCLK		Output	SPI Clock output
PG0 to PG3	4	Input	Port G: Input port (Schmitt input)
KI0 to KI3		Input	Key input 0 to 3: Pin used of key-on wakeup 0 to 3
PN1	1	I/O	Port N1: I/O port (Schmitt input, Open drain output)
SDA0		I/O	Serial bus interface 0 send/receive data at I^2C mode
TA3OUT		Output	8-bit timer 3 Output: Output pin of 8-bit timer TMRA2 or TMRA3
PN2	1	I/O	Port N2: I/O port (Schmitt input, Open drain output)
SCL0		I/O	Serial bus interface 0 clock I/O data at I^2C mode
TA2IN		Input	8-bit timer 2 input: Input pin of 8-bit timer TMRA2
PN3	1	I/O	Port N3: I/O port (Schmitt input)
SCK1		I/O	Serial bus interface 1 clock I/O data at SIO mode
HSCLK		Output	HSIO Clock output
PN4	1	I/O	Port N4: I/O port (Schmitt input, Open drain output)
SDA1		I/O	Serial bus interface 1 send/receive data at I^2C mode
SO1		Output	Serial bus interface 1 send data at SIO mode
HSSO		Output	HSIO Data output
PN5	1	I/O	Port N5: I/O port (Schmitt input, Open drain output)
SCL1		I/O	Serial bus interface 1 clock I/O data at I^2C mode
SI1		Input	Serial bus interface 1 receive data at SIO mode
HSSI		Input	HSIO Data input

Table 2.2.1 Pin Names and Functions (3/3)

Pin name	Number of Pin	I/O	Function
X1 / X2	2	I/O	High-frequency oscillator connection I/O pins
XT1 / XT2	2	I/O	Low-frequency oscillator circuit connection pin.
AM0, AM1	2	Input	Operation mode: Fixed to AM1 = "1" and AM0 = "1"
$\overline{\text{RESET}}$	1	Input	Reset: Intializes TMP92FD28 (Schmitt input, with pull-up register)
$\overline{\text{PWE}}$	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. (Only Mask ROM Version)
DVCC1B	1	−	Power supply pin for internal logic-B. (Only Mask ROM Version)
DVSS	8	−	GND pins (0 V) (All DVSS pins shold be connected with GND(0V))

Note1) In Flash version, the regulator does not built. But supply voltage as DVCC3 power because RVIN pins are used power supply pins.

Note2) In Flash version, voltage does not output from RVOUT1 and RVOUT2.

Note3) When using MASK version in combination with Flash version, connect RVOUT1 and DVCC1B, RVOUT2 and DVCC1A.

When using only Flash version, connect DVCC1A and DVCC1B, RVOUT1 and RVOUT2 to VDD3

ESMT F25L008A

8Mbit (1Mx8)

3V Only Serial Flash Memory

■ FEATURES

- Single supply voltage 2.7~3.6V
- Speed
  - Read max frequency : 33MHz
  - Fast Read max frequency : 50MHz; 100MHz
- Low power consumption
  - typical active current
  - 15 μA typical standby current
- Reliability
  - 100,000 typical program/erase cycles
  - 20 years Data Retention
- Program
  - Byte program time 7 μs(typical)
- Erase
  - Chip erase time 8s(typical)
    block erase time 1sec (typical)
  - Sector erase time 60ms (typical),
- Auto Address Increment (AAI) WORD Programming
  - Decrease total chip programming time over Byte-Program operations
- SPI Serial Interface
  - SPI Compatible : Mode 0 and Mode3
- End of program or erase detection
- Write Protect ($\overline{WP}$)
- Hold Pin ($\overline{HOLD}$)
- Package available
  - 8-pin SOIC 200-mil

ORDERING INFORMATION

Part No.	Speed	Package		COMMENTS
F25L008A-50PAG	50MHz	8 lead SOIC	200mil	Pb-free
F25L008A-100PAG	100MHz	8 lead SOIC	200mil	Pb-free
F25L008A-50DG	50MHz	8 lead PDIP	300mil	Pb-free
F25L008A-100DG	100MHz	8 lead PDIP	300mil	Pb-free

GENERAL DESCRIPTION

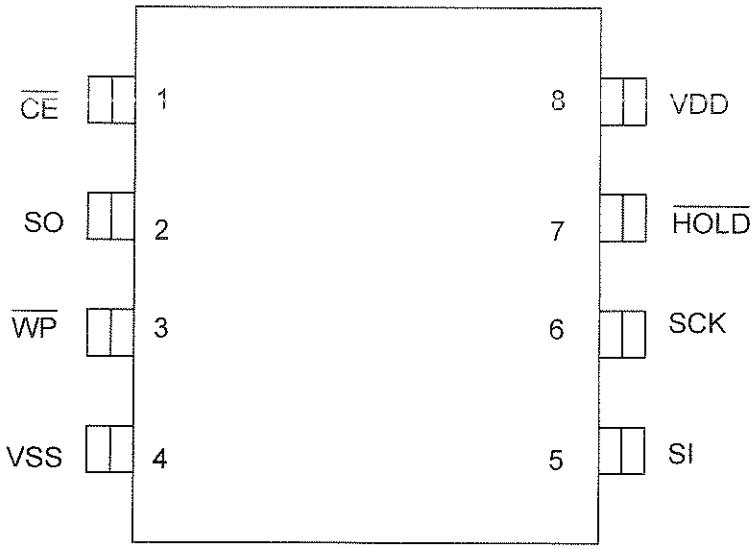
The F25L008A is a 8Megabit, 3V only CMOS Serial Flash memory device organized as 1M bytes of 8 bits. This device is packaged in 8-lead SOIC 200mil. ESMT's memory devices reliably store memory data even after 100,000 program and erase cycles.

The F25L008A features a sector erase architecture. The device memory array is divided into 256 uniform sectors with 4K byte each ; 16 uniform blocks with 64K byte each. Sectors can be erased individually without affecting the data in other sectors. Blocks can be erased individually without affecting the data in other blocks. Whole chip erase capabilities provide the flexibility to revise the data in the device.

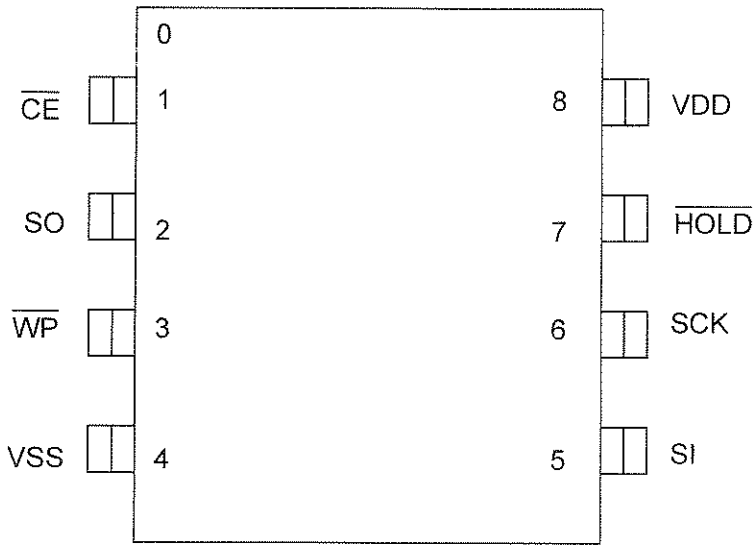
The sector protect/unprotect feature disables both program and erase operations in any combination of the sectors of the memory.

PIN CONFIGURATIONS

8-PIN SOIC



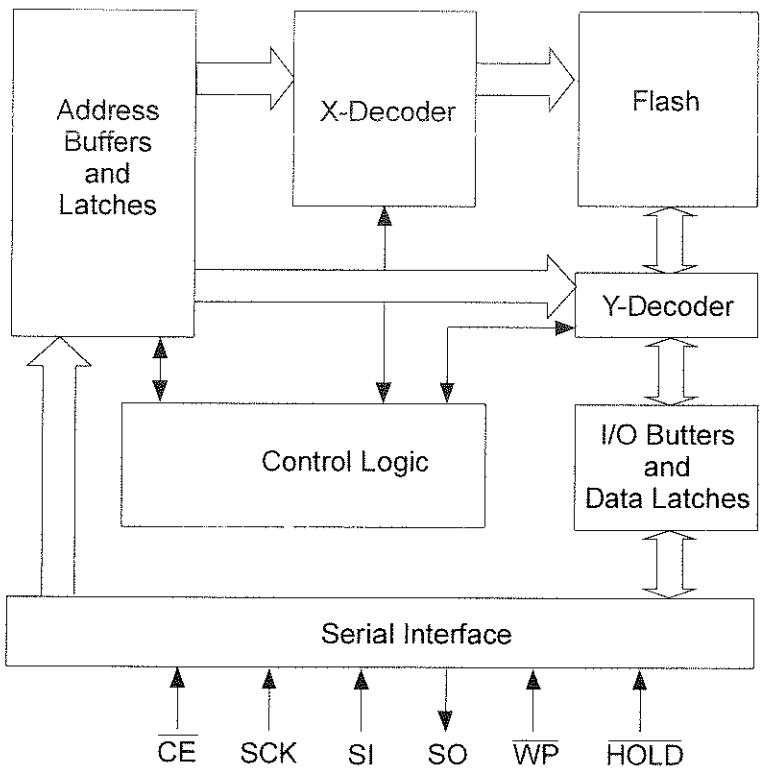
8-PIN PDIP



PIN Description

Symbol	Pin Name	Functions
SCK	Serial Clock	To provide the timing for serial input and output operations
SI	Serial Data Input	To transfer commands, addresses or data serially into the device. Data is latched on the rising edge of SCK.
SO	Serial Data Output	To transfer data serially out of the device. Data is shifted out on the falling edge of SCK.
$\overline{CE}$	Chip Enable	To activate the device when $\overline{CE}$ is low.
$\overline{WP}$	Write Protect	The Write Protect ($\overline{WP}$) pin is used to enable/disable BPL bit in the status register.
$\overline{HOLD}$	Hold	To temporality stop serial communication with SPI flash memory without resetting the device.
VDD	Power Supply	To provide power.
VSS	Ground	

FUNTIONAL BLOCK DIAGRAM



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 (32×32=32 bit) can be executed with one clock.
- Division takes between 2 and 12 cycles depending on dividend and devisor

-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 I^2C 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

(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

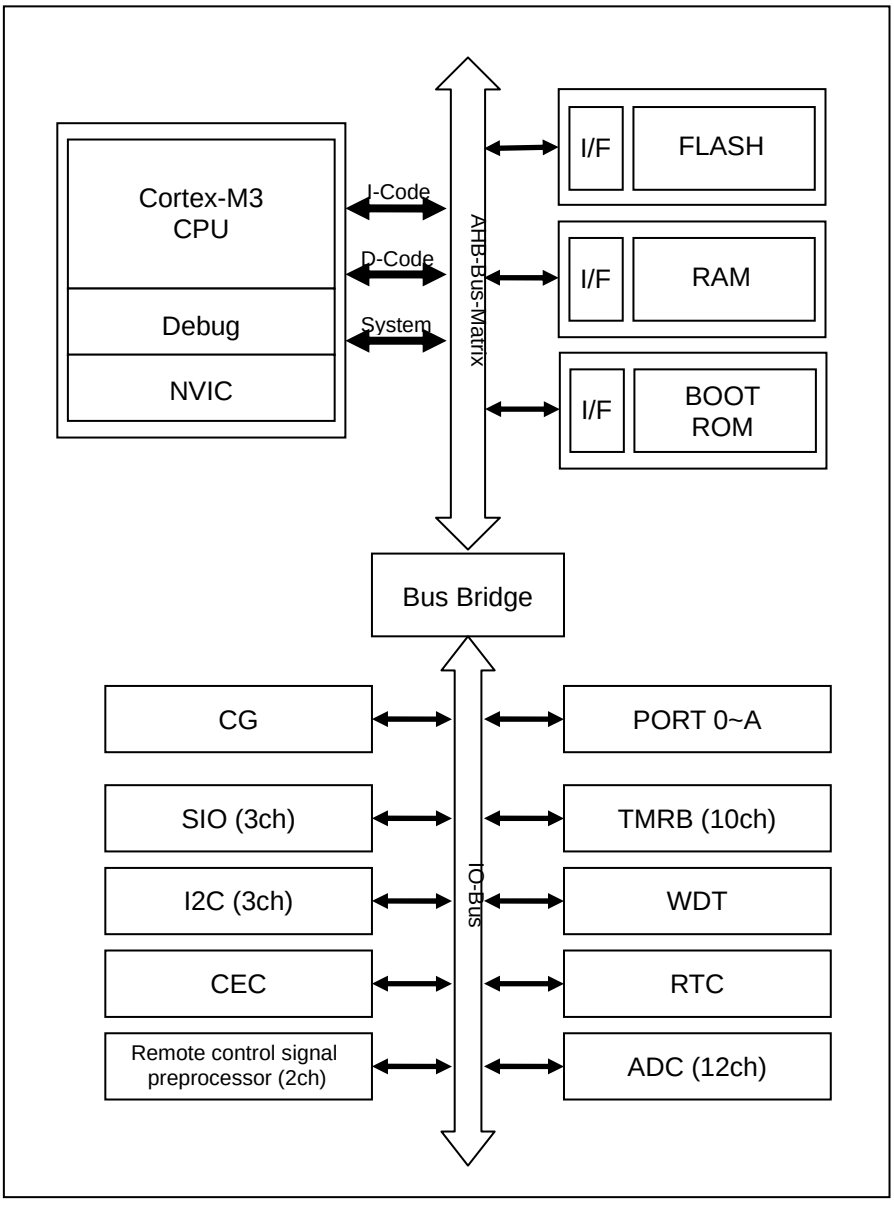


Fig. 1.1 T5CN5 Block Diagram

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.

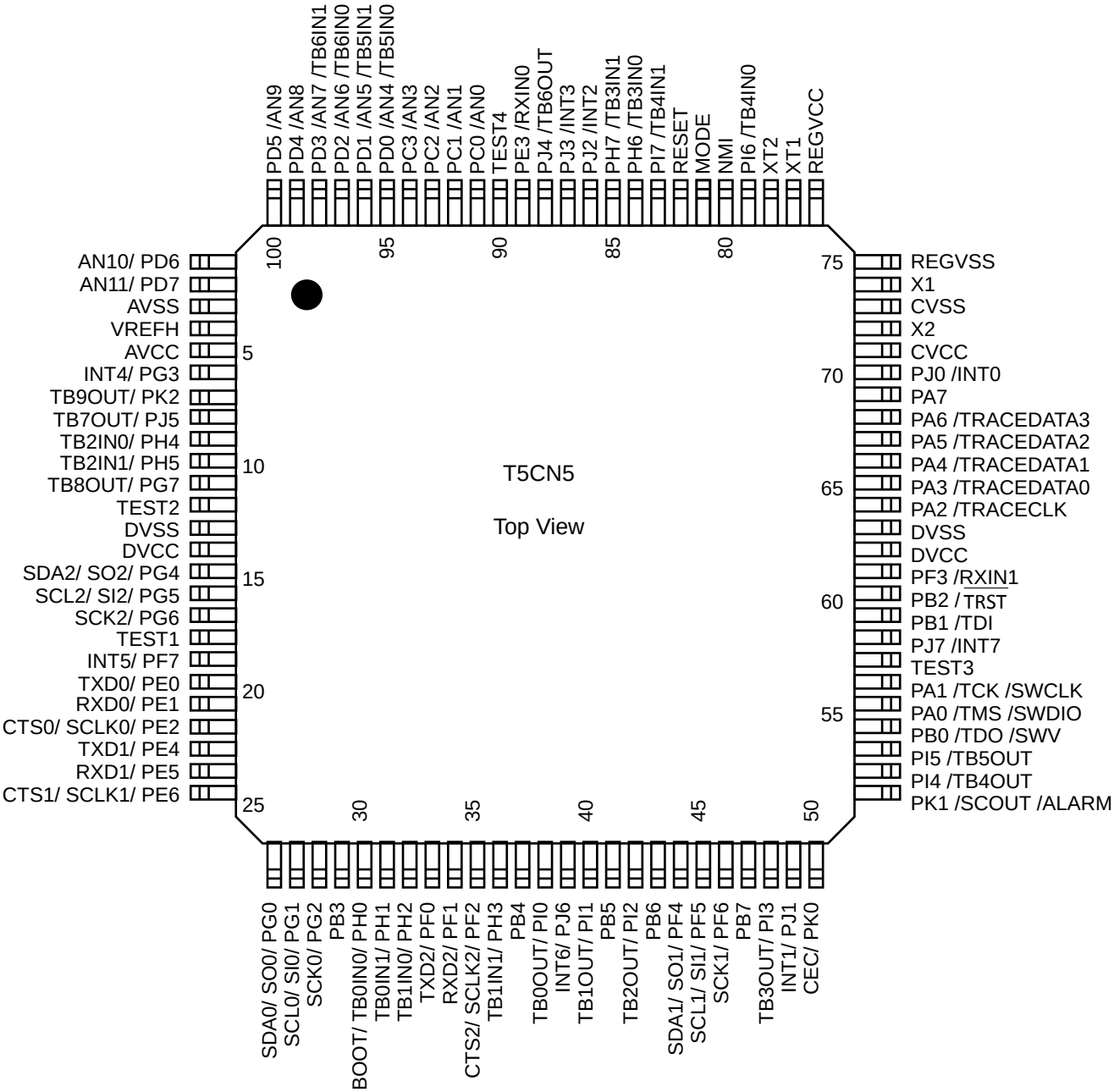


Fig. 2.1 Pin Layout (LQFP100)

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

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

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	○

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/ SI0	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 $\overline{\text{BOOT}}$	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	○

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 $\overline{\text{ALARM}}$	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 $\overline{\text{TRST}}$	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	-	-	-

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	$\overline{\text{NMI}}$	I	Non-maskable interrupt	-	○ w/ noise filter	-
Control	81	MODE	I	Mode pin: Tied to GND pin	-	○	-
Function	82	$\overline{\text{RESET}}$	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.	-	-	-

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
- LVTTL 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)

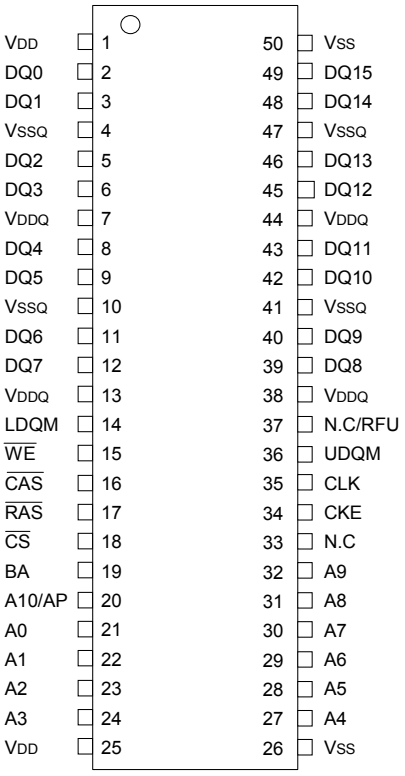
GENERAL DESCRIPTION

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.

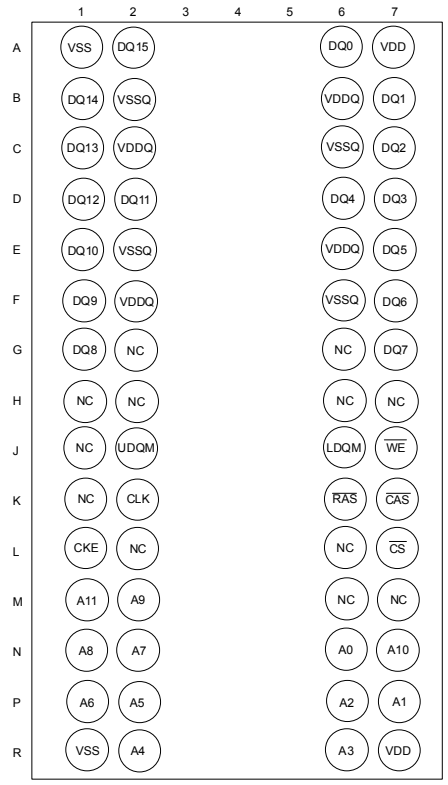
ORDERING INFORMATION

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)

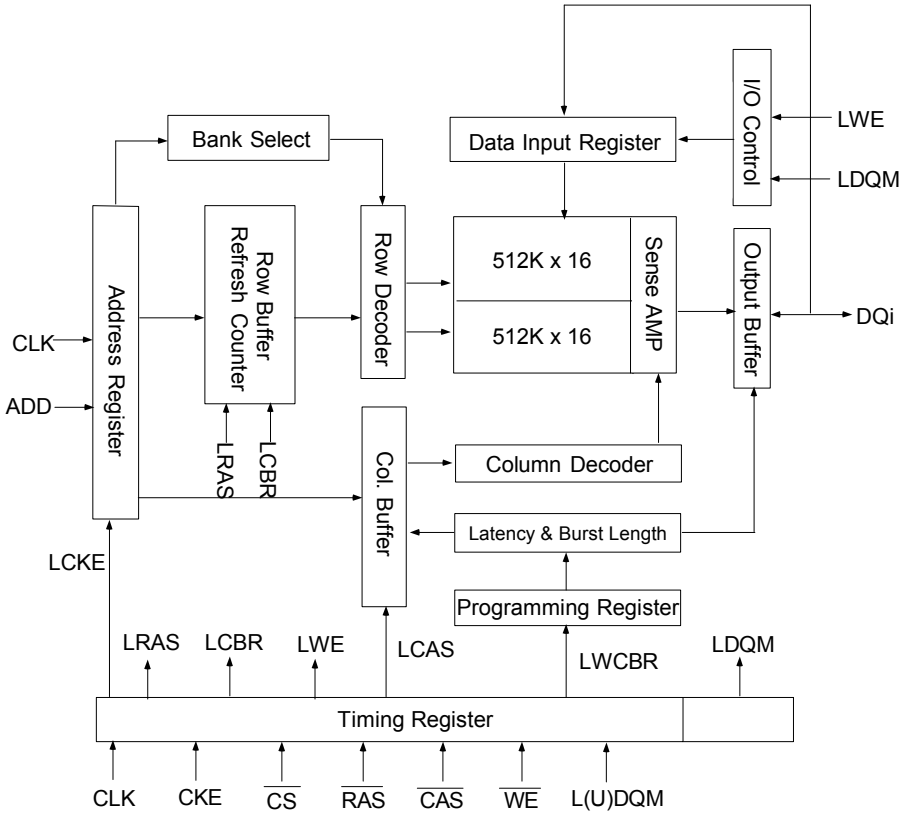


50PIN TSOP(II)
(400mil x 825mil)
(0.8 mm PIN PITCH)



60 Ball VFBGA
(6.4x10.1mm)
(0.65mm ball pitch)

FUNCTIONAL BLOCK DIAGRAM



PIN FUNCTION DESCRIPTION

Pin	Name	Input Function
CLK	*System Clock*	Active on the positive going edge to sample all inputs.
$\overline{CS}$	*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.
$\overline{RAS}$	*Row Address Strobe*	Latches row addresses on the positive going edge of the CLK with $\overline{RAS}$ low. Enables row access & precharge.
$\overline{CAS}$	*Column Address Strobe*	Latches column addresses on the positive going edge of the CLK with $\overline{CAS}$ low. Enables column access.
$\overline{WE}$	*Write Enable*	Enables write operation and row precharge. Latches data in starting from $\overline{CAS}$, $\overline{WE}$ 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.

DQ0 ~ 15	*Data Input / Output*	Data inputs/outputs are multiplexed on the same pins.
VDD/VSS	*Power Supply/Ground*	Power and ground for the input buffers and the core logic.
VDDQ/VSSQ	*Data Output Power/Ground*	Isolated power supply and ground for the output buffers to provide improved noise immunity.
N.C/RFU	*No Connection/ Reserved for Future Use*	This pin is recommended to be left No Connection on the device.

CIRRUS LOGIC

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
  - DSD®
- Additional Applications Library
  - Dolby Digital® EX, Dolby® Pro Logic® IIx, Dolby Headphone®, Dolby® Virtual Speaker®
  - DTS-ES 96/24™, DTS-ES™ Discrete 6.1, DTS-ES™ Matrix 6.1
  - AAC™ Multichannel 5.1
  - SRS® CS2® and TSXT®
  - THX® Ultra2™, THX® ReEQ™
  - Crossbar Mixer, Signal Generator
  - Advanced Post-Processor including: 7.1 Bass Manager, Tone Control, 11- Band Parametric EQ, Delay, 1:2 Upsampler
  - Microsoft® HDCD®
  - Thomson MP3 Surround, DTS:Neo6™, DSD-to-PCM Conversion, Neural Surround, Cirrus Original Multi-Channel Surround 2 (COMS2), and more. Please contact your local FAE for more information on available applications.
- Up to 12 Channels of 32-bit Serial Audio Input

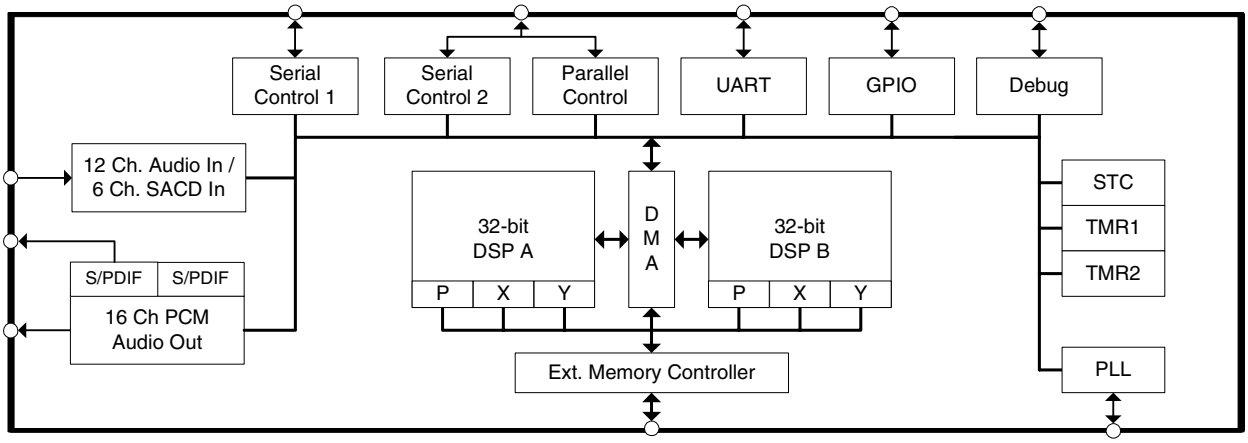
32-bit High Definition Audio Decoder DSP Family with Dual DSP Engine Technology

- Customer Software Security Keys
- 6 Channel DSD® Input
- 16 Ch x 32-bit PCM Out with Dual 192 kHz SPDIF Tx
- Two SPI™/I²C®, One Parallel and One UART Port
- 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 will support the most demanding audio post processing requirements. It is also designed as an easy upgrade path to systems currently using the CS495xx or CS4953x device with minor hardware and software changes.

Ordering Information

See page 30 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

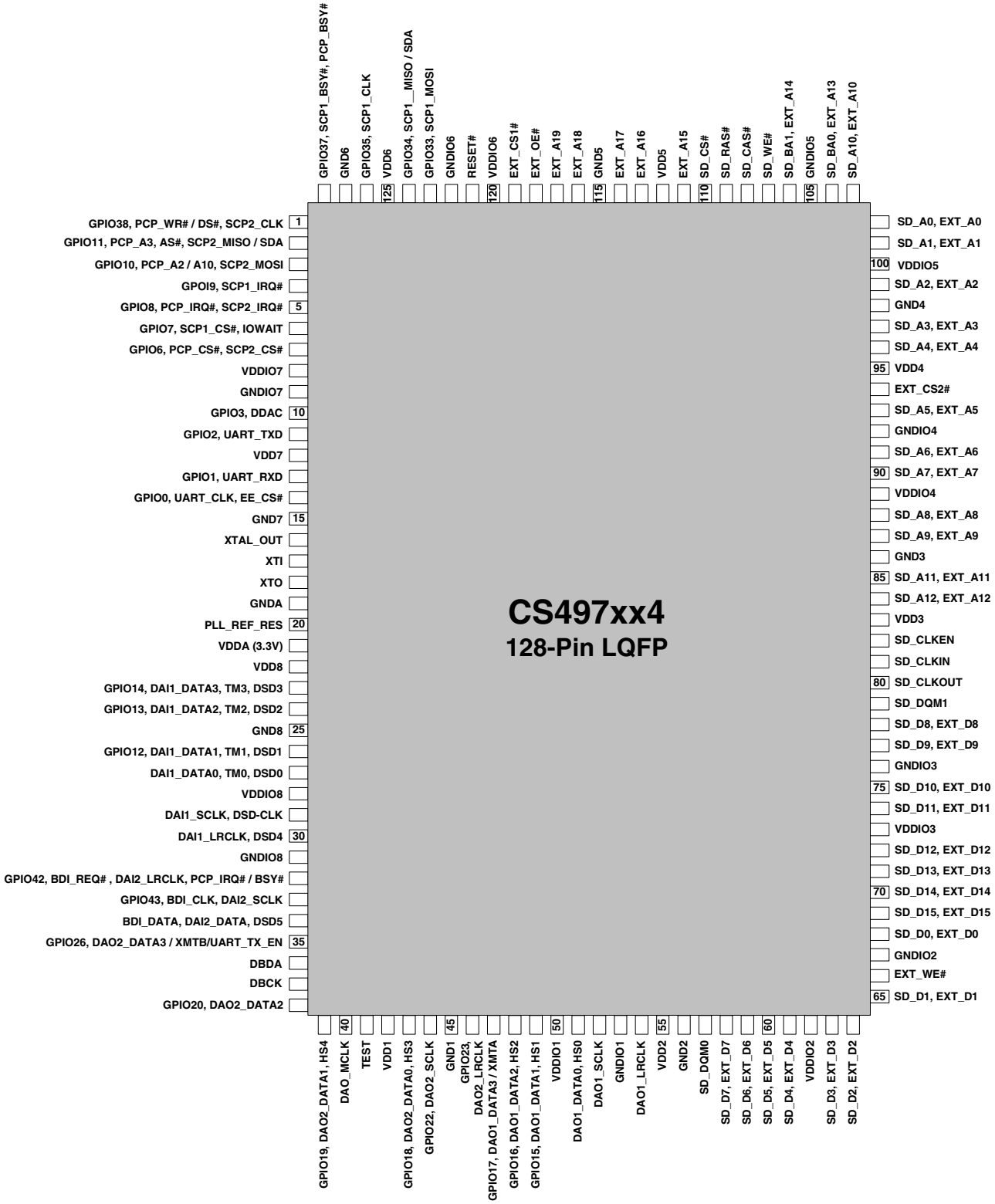


Figure 20. 128-Pin LQFP Pin-Out Diagram

8.2 144-Pin LQFP Pin-Out Diagram

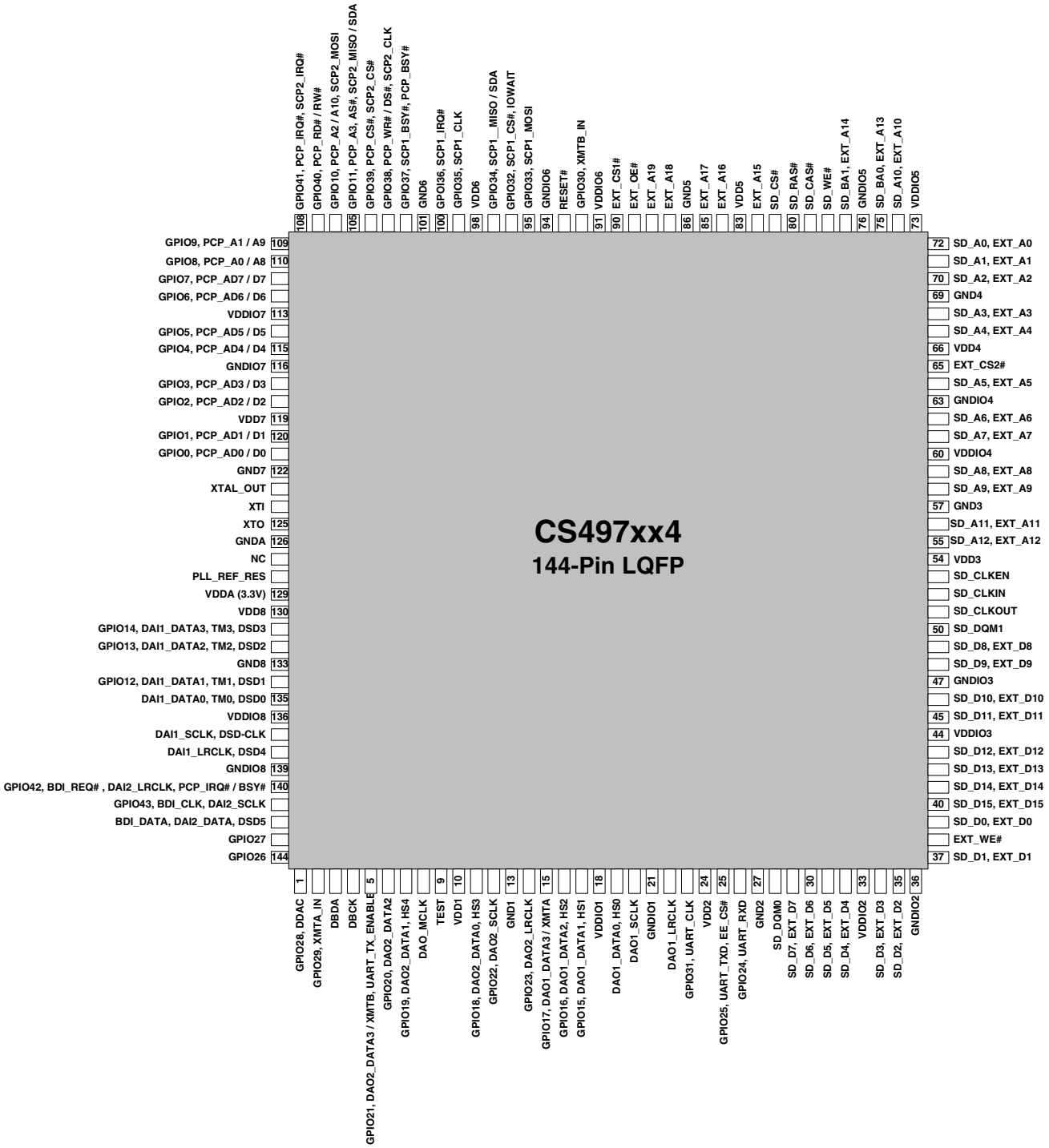


Figure 21. 144-Pin LQFP Pin-Out Diagram

JRC **NJM2845/46**

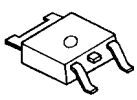
LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

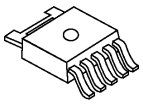
The NJM2845 is low dropout voltage regulator. Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

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

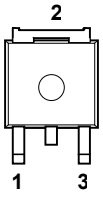


NJM2846DL3

■ FEATURES

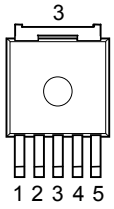
- High Ripple Rejection 75dB typ. (f=1kHz,3V Version)
- Output Noise Voltage Vno=45μVrms typ. (Vo=3V Version)
- Output capacitor with 2.2μF ceramic capacitor (Vo≥2.6V)
- Output Current Io(max.)=800mA
- High Precision Output Vo ±1.0%
- Low Dropout Voltage 0.18V typ. (Io=500mA)
- ON/OFF Control (NJM2846)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-3 (NJM2845DL1), TO-252-5 (NJM2846DL3)

■ PIN CONFIGURATION



1.V_{IN}
2.GND
3.V_{OUT}

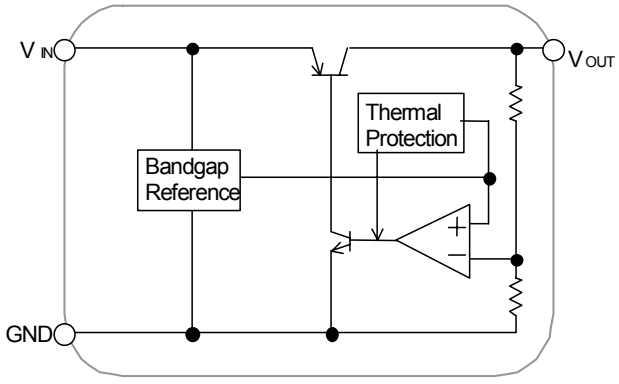
NJM2845DL1



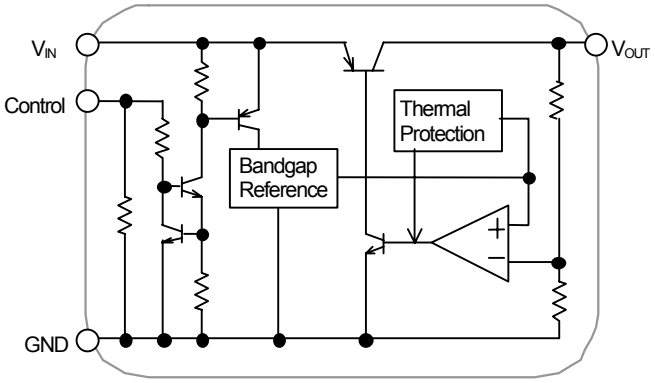
1.CONTROL
2.V_{IN}
3.GND
4.Vo
5.NC

NJM2846DL3

■ EQUIVALENT CIRCUIT



NJM2845DL1



NJM2846DL3

TOSHIBA TC74VHC157F/FN/FT

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TC74VHC157F, TC74VHC157FN, TC74VHC157FT

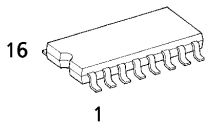
QUAD 2 - CHANNEL MULTIPLEXER

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

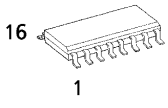
The TC74VHC157 is an advanced high speed CMOS QUAD 2 - CHANNEL MULTIPLEXER fabricated with silicon gate C^2MOS technology.
It achieves the high speed operation similar to equivalent Bipolar Schottky TTL while maintaining the CMOS low power dissipation.
It consists of four 2 - input digital multiplexers with common select and strobe inputs.
When the $\overline{STROBE}$ 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 :

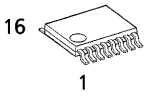
- High Speed ····· t_{pd} = 4.1ns(typ.) at V_{CC} = 5V
- Low Power Dissipation ····· I_{CC} = 4μA(Max.) at Ta = 25°C
- High Noise Immunity ····· $V_{NIH} = V_{NIL}$ = 28% V_{CC} (Min.)
- Power Down Protection is provided on all inputs.
- Balanced Propagation Delays ····· $t_{pLH} \simeq t_{pHL}$
- Wide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



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

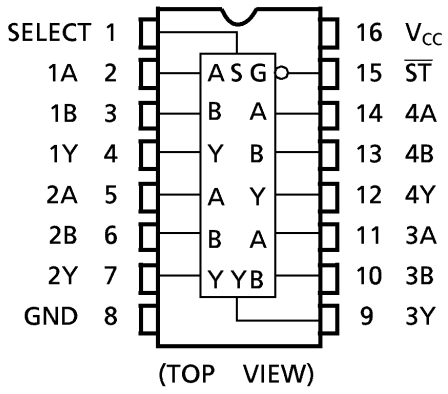


FN (SOL16-P-150-1.27)
Weight : 0.13g (Typ.)



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

PIN ASSIGNMENT



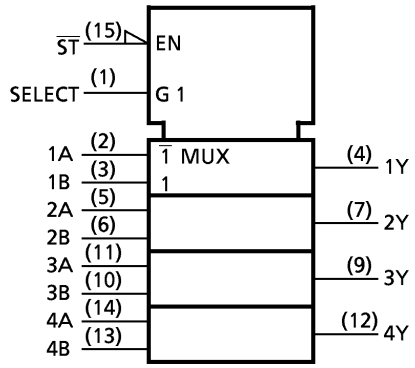
(TOP VIEW)

TRUTH TABLE

INPUTS				OUTPUT
$\overline{ST}$	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

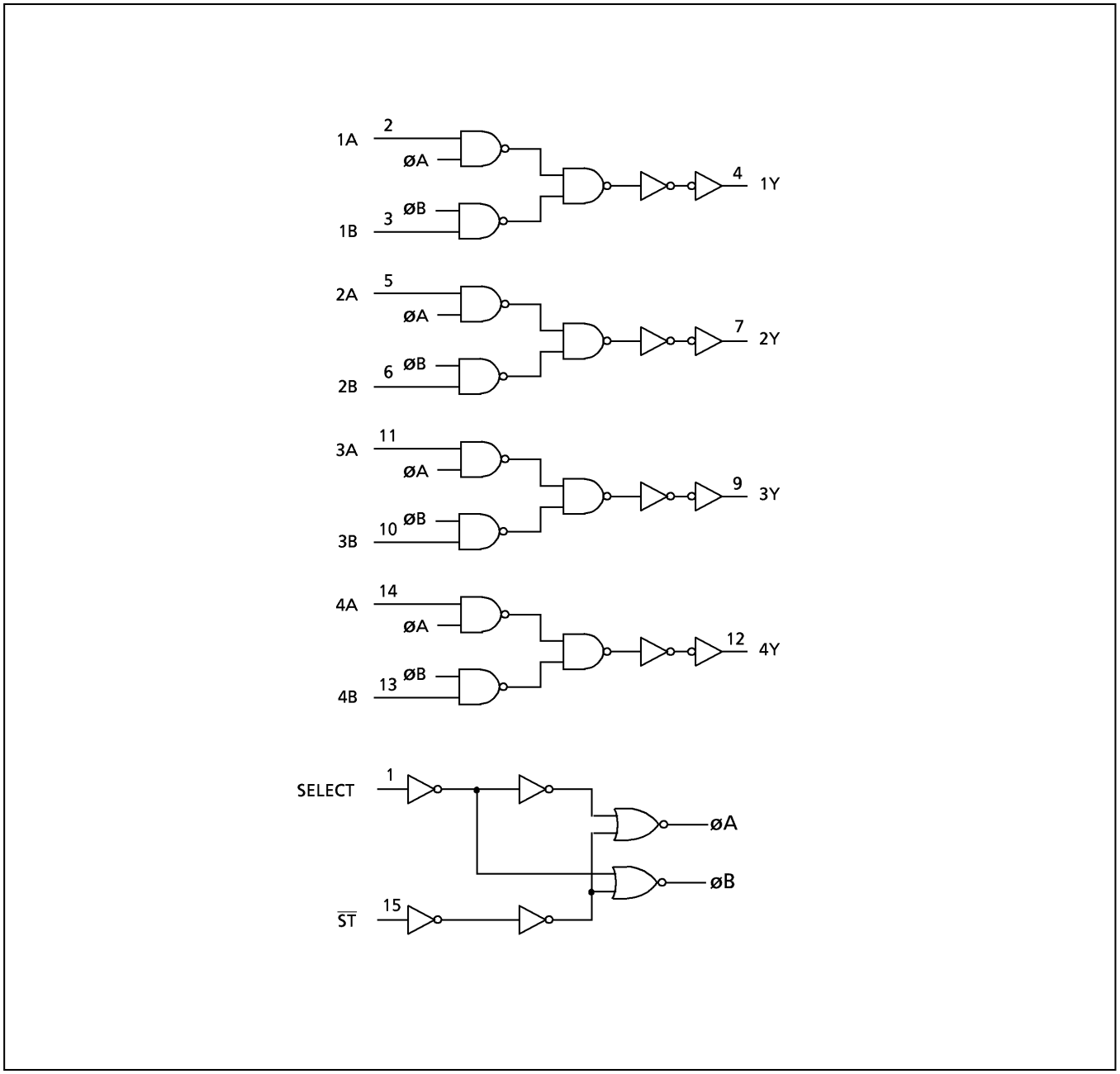
X : Don't Care

IEC LOGIC SYMBOL



980910EBA2

SYSTEM DIAGRAM



TOSHIBA TC74LCX541F/FW/FT

TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

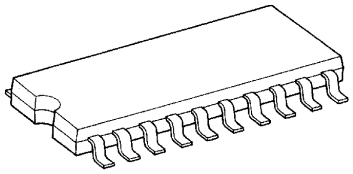
TC74LCX541F, TC74LCX541FW, TC74LCX541FT

LOW VOLTAGE OCTAL BUS BUFFER WITH 5V TOLERANT INPUTS AND OUTPUTS

The TC74LCX541 is a high performance CMOS OCTAL BUS BUFFER. Designed for use in 3.3 Volt systems, it achieves high speed operation while maintaining the CMOS low power dissipation.
The device is designed for low-voltage (3.3V) V_{CC} applications, but it could be used to interface to 5V supply environment for both inputs and outputs.
The 74LCX541 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.

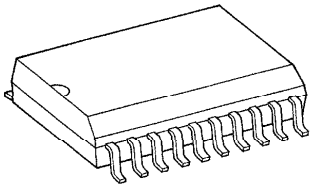
(Note) The JEDEC SOP (FW) is not available in Japan.

TC74LCX541F



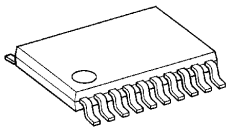
SOP20-P-300-1.27

TC74LCX541FW



SOL20-P-300-1.27

TC74LCX541FT



TSSOP20-P-0044-0.65

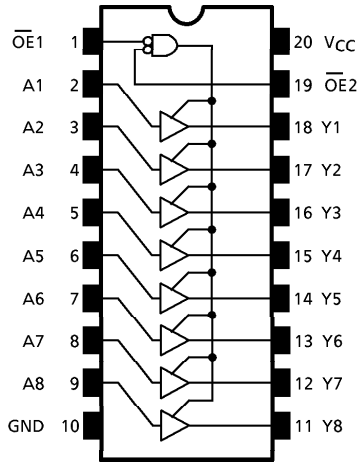
Weight
SOP20-P-300-1.27 : 0.22g (Typ.)
SOL20-P-300-1.27 : 0.46g (Typ.)
TSSOP20-P-0044-0.65 : 0.08g (Typ.)

FEATURES

- Low voltage operation : $V_{CC} = 2.0 \sim 3.6V$
- High speed operation : t_{pd} = 6.5ns (Max.) ($V_{CC} = 3.0 \sim 3.6V$)
- Output current : $|I_{OH}| / I_{OL}$ = 24mA (Min.) ($V_{CC} = 3.0V$)
- Latch-up performance : ±500mA
- Available in JEDEC SOP, EIAJ SOP and TSSOP
- Power down protection is provided on all inputs and outputs.
- Pin and function compatible with the 74 series (74AC / VHC / HC / F / ALS / LS etc.) 541 type.

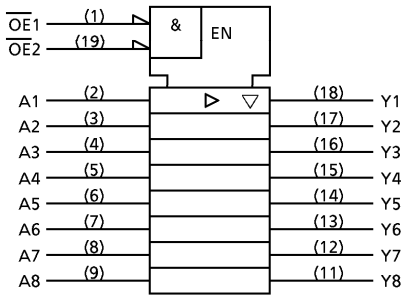
961001EBA2

PIN ASSIGNMENT



(TOP VIEW)

IEC LOGIC SYMBOL



TRUTH TABLE

INPUTS			OUTPUTS
$\overline{OE}1$	$\overline{OE}2$	An	
H	X	X	Z
X	H	X	Z
L	L	H	H
L	L	L	L

X : Don't Care
Z : High Impedance

MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage Range	V_{CC}	−0.5~7.0	V
DC Input Voltage	V_{IN}	−0.5~7.0	V
DC Output Voltage	V_{OUT}	−0.5~7.0 (Note 1)	V
		−0.5~V_{CC}+0.5 (Note 2)	
Input Diode Current	I_{IK}	−50	mA
Output Diode Current	I_{OK}	±50 (Note 3)	mA
DC Output Current	I_{OUT}	±50	mA
Power Dissipation	P_D	180	mW
DC V_{CC}/Ground Current	I_{CC} / I_{GND}	±100	mA
Storage Temperature	T_{stg}	−65~150	°C

(Note 1) Output in Off-State
(Note 2) High or Low State. I_{OUT} absolute maximum rating must be observed.
(Note 3) V_{OUT}<GND, V_{OUT}>V_{CC}

961001EBA2'

JRC **NJM2595**

5-INPUT 3-OUTPUT VIDEO SWITCH

■ GENERAL DESCRIPTION

The **NJM2595** is a 5-input 3-output video switch. Its switches select one from five signals received from VTR,TV,DVD, TV-GAME and others.

The NJM2595 is designed for audio items, such as AV amplifier and others.

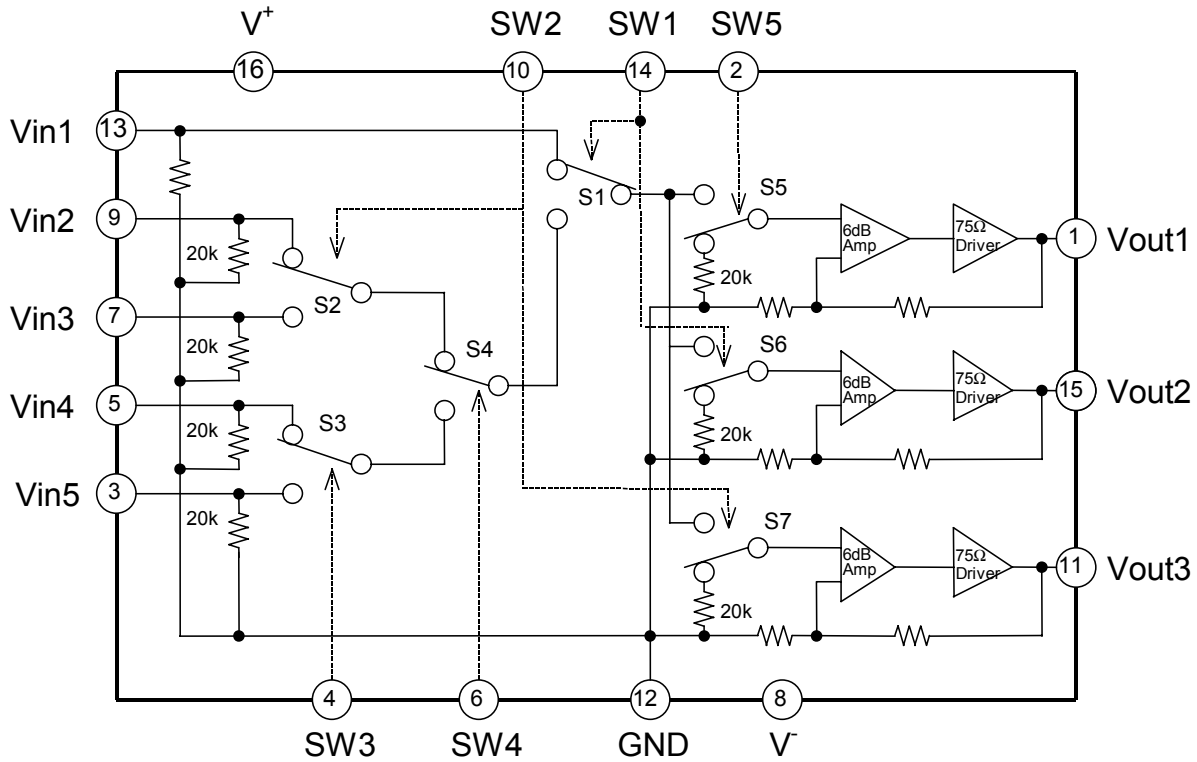
■ PACKAGE OUTLINE

NJM2595D **NJM2595M**

■ FEATURES

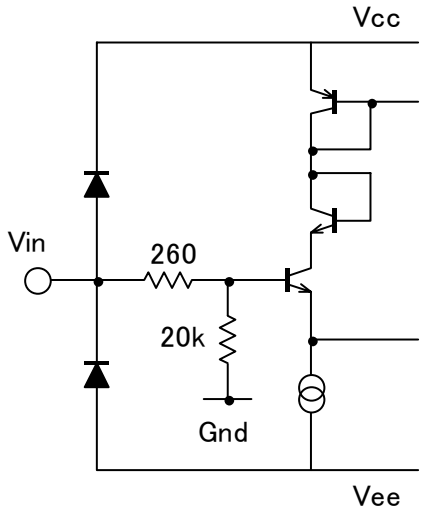
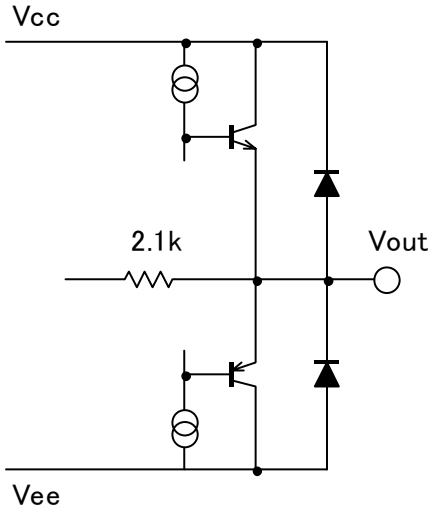
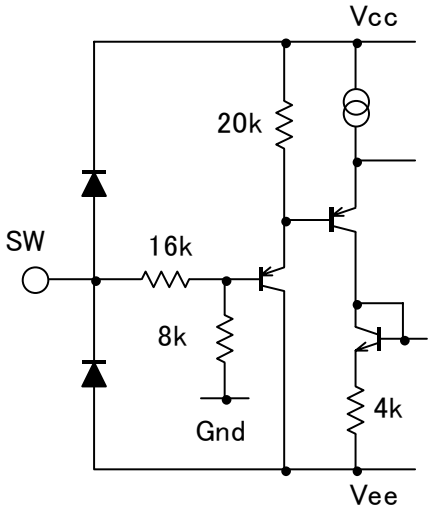
- 5-input 3-output
- Operating Voltage ±4.0 to ±6.5V
- Operating current ±15mAtyp. at Vcc=±5V
- Crosstalk -65dBtyp.
- Internal 6dB Amplifier
- Internal 75Ω Driver
- Bipolar Technology
- Package Outline DIP16,DMP16

■ PIN CONFIGURATION and BLOCK DIAGRAM



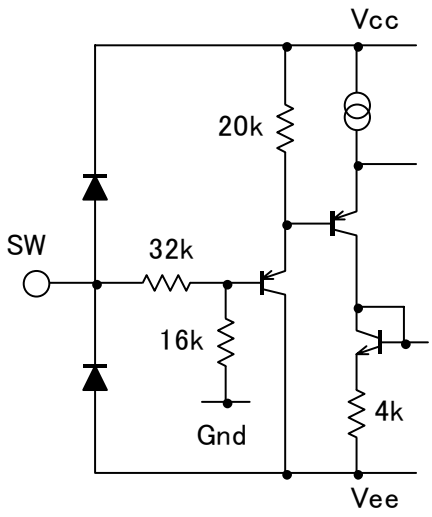
NJM2595

■ EQUIVALENT CIRCUIT

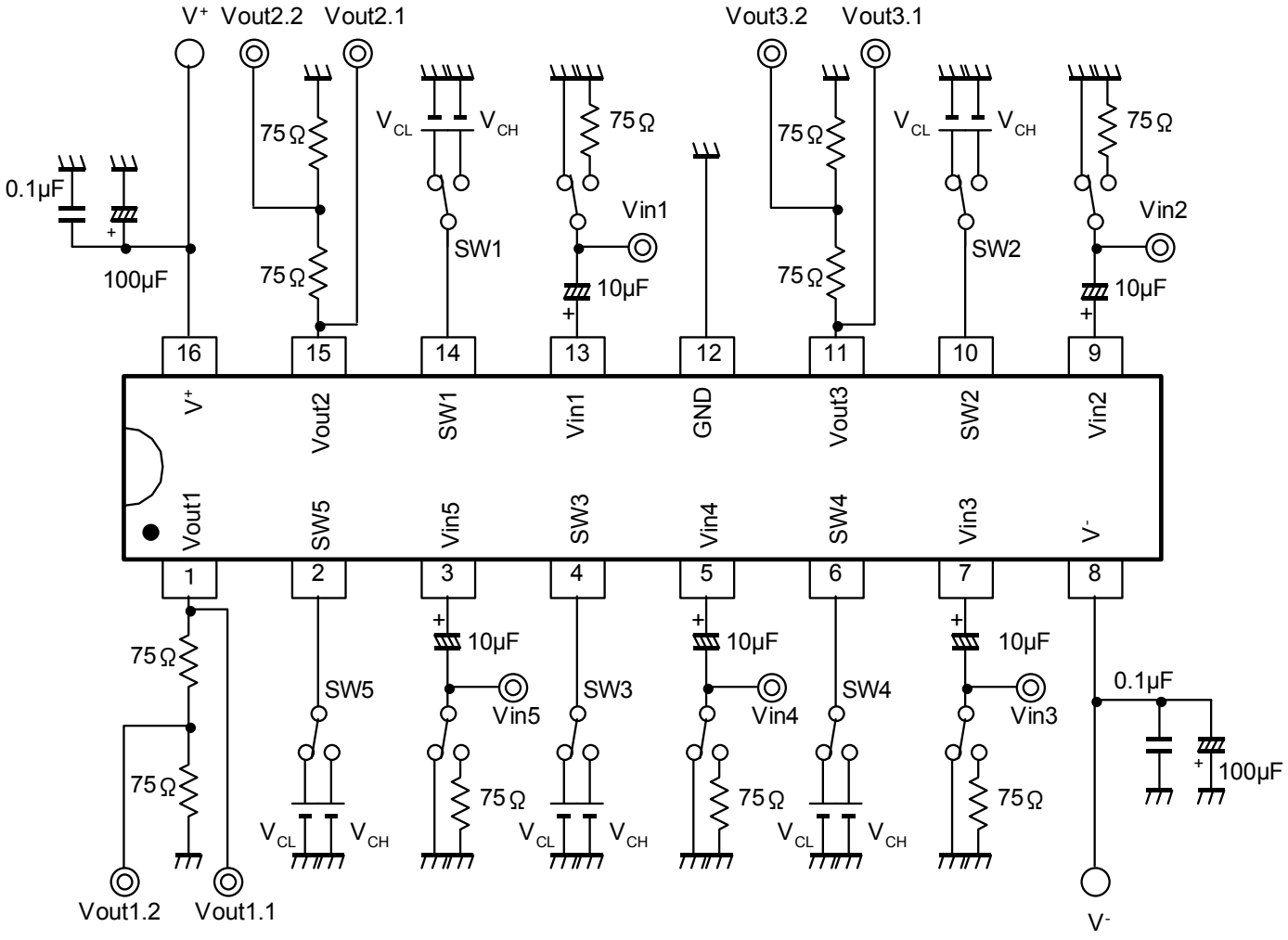
PIN No.	PIN NAME	INSIDE EQUIVALENT CIRCUIT	VOLTAGE
16	V^+		5V
8	V^-		-5V
12	GND		-
13 9 7 5 3	Vin1 Vin2 Vin3 Vin4 Vin5		0V
1 15 11	Vout1 Vout2 Vout3		0V
4 6 2	SW3 SW4 SW5		-

NJM2595

■ EQUIVALENT CIRCUIT

PIN No.	PIN NAME	INSIDE EQUIVALENT CIRCUIT	VOLTAGE
14 10	SW1 SW2		-

■ TEST CIRCUIT



NJM2068M (OP - AMP)

JRC

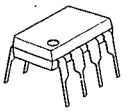
NJM2068

LOW-NOISE DUAL OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

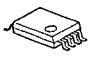
The NJM2068 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate 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.

■ PACKAGE OUTLINE

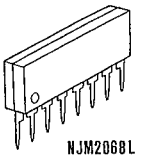


NJM2068D

NJM2068M



NJM2068V



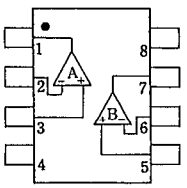
NJM2068L

■ FEATURES

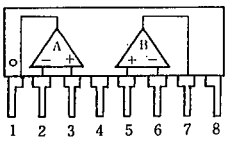
- Operating Voltage (±4V～±18V)
- Low Total Harmonic Distortion (0.001% typ.)
- Low Noise Voltage (FLAT+JISA, 0.56 μV typ.)
- High Slew Rate (6V/μs typ.)
- Unity Gain Bandwidth (27MHz @f=10kHz)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

4

■ PIN CONFIGURATION



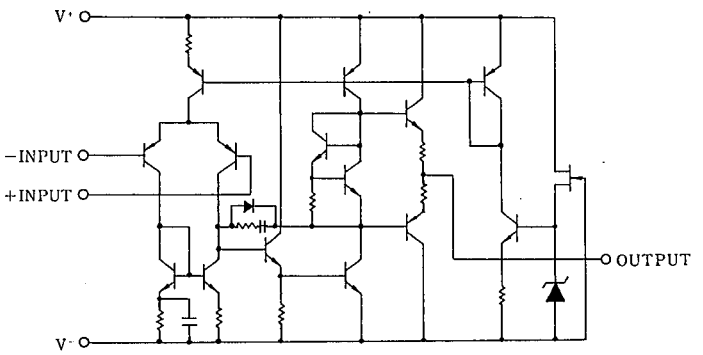
NJM2068D
NJM2068M
NJM2068V



NJM2068L

PIN FUNCITON
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)



JRC

NJM4556A

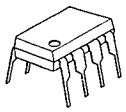
DUAL HIGH CURRENT OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM4556A integrated circuit is a high-gain, high output current dual operational amplifier capable of driving ±70mA into 150 Ω loads (±10.5V output voltage), and operating low supply voltage (V^+/V^-=±2V~).

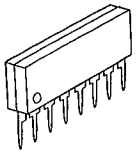
The NJM4556A combines many of the fetures of the popular NJM4558 as well as having the capability of driving 150Ω loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556A make it ideal for many audio, telecommunications and instrumentation applications.

■ PACKAGE OUTLINE

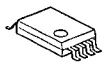


NJM4556AD

NJM4556AM



NJM4556AL

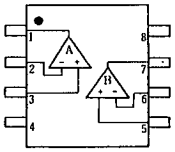


NJM4556AV

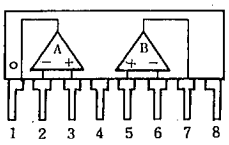
■ FEATURES

- Operating Voltage (±2V~±18V)
- High Output Current (Io=70mA)
- Slew Rate (3V/μs typ.)
- Gain Band Width Product (8MHz typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

■ PIN CONFIGURATION



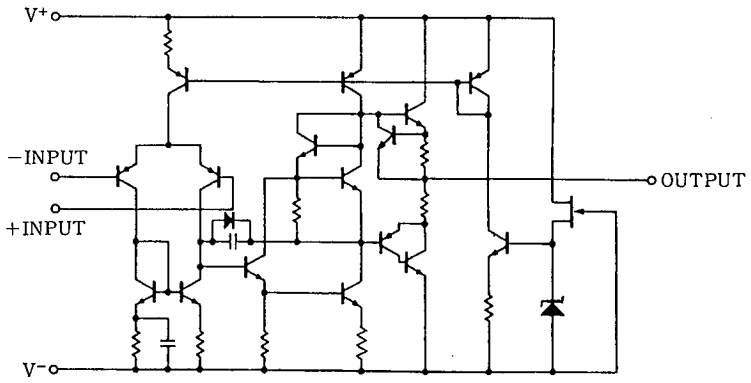
NJM4556AD
NJM4556AM
NJM4556AV



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)

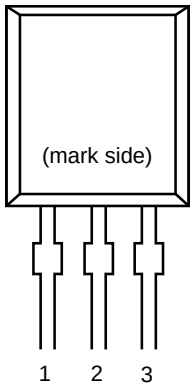


PIN CONFIGURATION

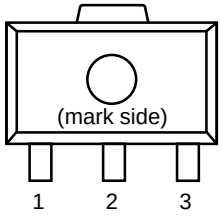
RE5VT28CATZ

RH5VT28C

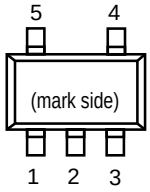
• **TO-92**



• **SOT-89**



• **SOT-23-5**



PIN DESCRIPTION

• **TO-92**

Pin No.	Symbol
1	OUT
2	V_{DD}
3	GND

• **SOT-89**

Pin No.	Symbol
1	OUT
2	V_{DD}
3	GND

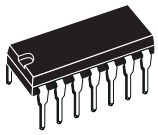
• **SOT-23-5**

Pin No.	Symbol
1	OUT
2	V_{DD}
3	GND
4	NC
5	NC

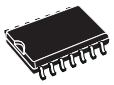
74ACT04

HEX INVERTER

- HIGH SPEED: t_{PD} = 5.0ns (TYP.) at V_{CC} = 5V
- LOW POWER DISSIPATION: I_{CC} = 2µA(MAX.) at T_A=25°C
- COMPATIBLE WITH TTL OUTPUTS V_{IH} = 2V (MIN.), V_{IL} = 0.8V (MAX.)
- 50Ω TRANSMISSION LINE DRIVING CAPABILITY
- SYMMETRICAL OUTPUT IMPEDANCE: $|I_{OH}| = I_{OL}$ = 24mA (MIN)
- BALANCED PROPAGATION DELAYS: $t_{PLH} \cong t_{PHL}$
- OPERATING VOLTAGE RANGE: V_{CC} (OPR) = 4.5V to 5.5V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 04
- IMPROVED LATCH-UP IMMUNITY



DIP



SOP

TSSOP

ORDER CODES

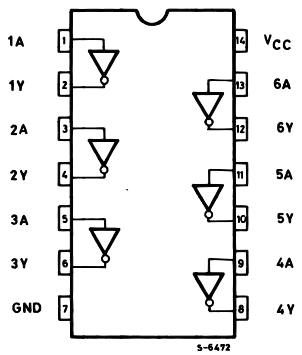
PACKAGE	TUBE	T & R
DIP	74ACT04B	
SOP	74ACT04M	74ACT04MTR
TSSOP		74ACT04TTR

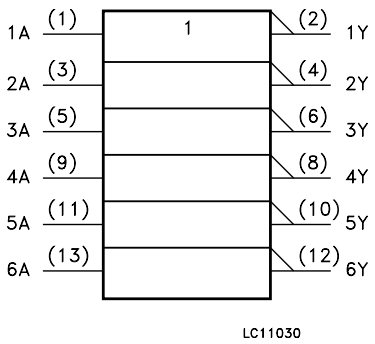
DESCRIPTION

The 74ACT04 is an advanced high-speed CMOS HEX INVERTER fabricated with sub-micron silicon gate and double-layer metal wiring C^2MOS technology.
The internal circuit is composed of 3 stages including buffer output, which enables high noise immunity and stable output.

The device is designed to interface directly High Speed CMOS systems with TTL, NMOS and CMOS output voltage levels.
All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

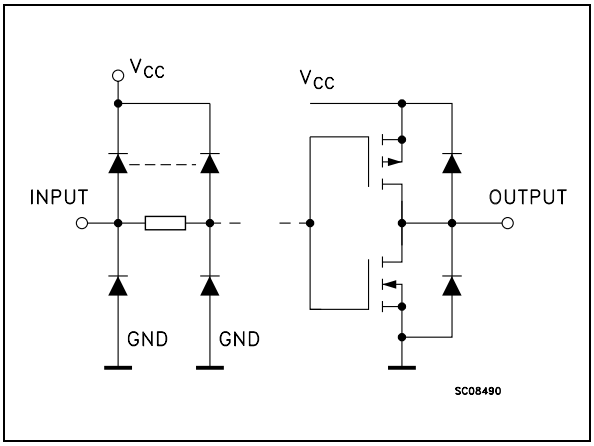
PIN CONNECTION AND IEC LOGIC SYMBOLS





74ACT04

INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1, 3, 5, 9, 11, 13	1A to 6A	Data Inputs
2, 4, 6, 8, 10, 12	1Y to 6Y	Data Outputs
7	GND	Ground (0V)
14	V_{CC}	Positive Supply Voltage

TRUTH TABLE

A	Y
L	H
H	L

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.5 to +7	V
V_I	DC Input Voltage	-0.5 to V_{CC} + 0.5	V
V_O	DC Output Voltage	-0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current	± 20	mA
I_{OK}	DC Output Diode Current	± 20	mA
I_O	DC Output Current	± 50	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 200	mA
T_{stg}	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	4.5 to 5.5	V
V_I	Input Voltage	0 to V_{CC}	V
V_O	Output Voltage	0 to V_{CC}	V
T_{op}	Operating Temperature	-55 to 125	°C
dt/dv	Input Rise and Fall Time V_{CC} = 4.5 to 5.5V (note 1)	8	ns/V

1) V_{IN} from 0.8V to 2.0V

CIRRUS LOGIC
Leading the Digital Entertainment Revolution™

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

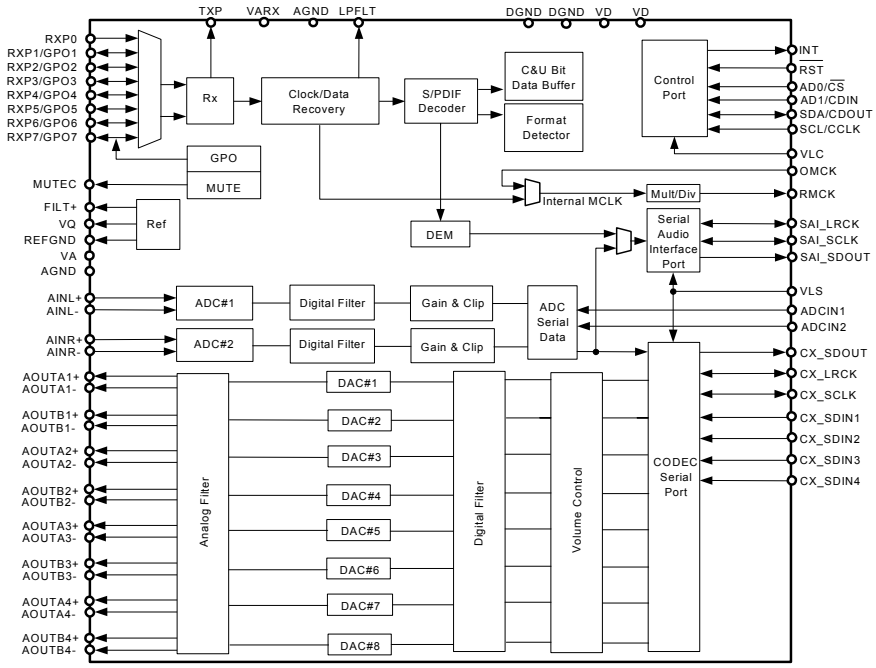
The CS42528 codec provides two analog-to-digital and eight digital-to-analog delta-sigma converters, as well as an integrated S/PDIF receiver, in a 64-pin LQFP package.

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

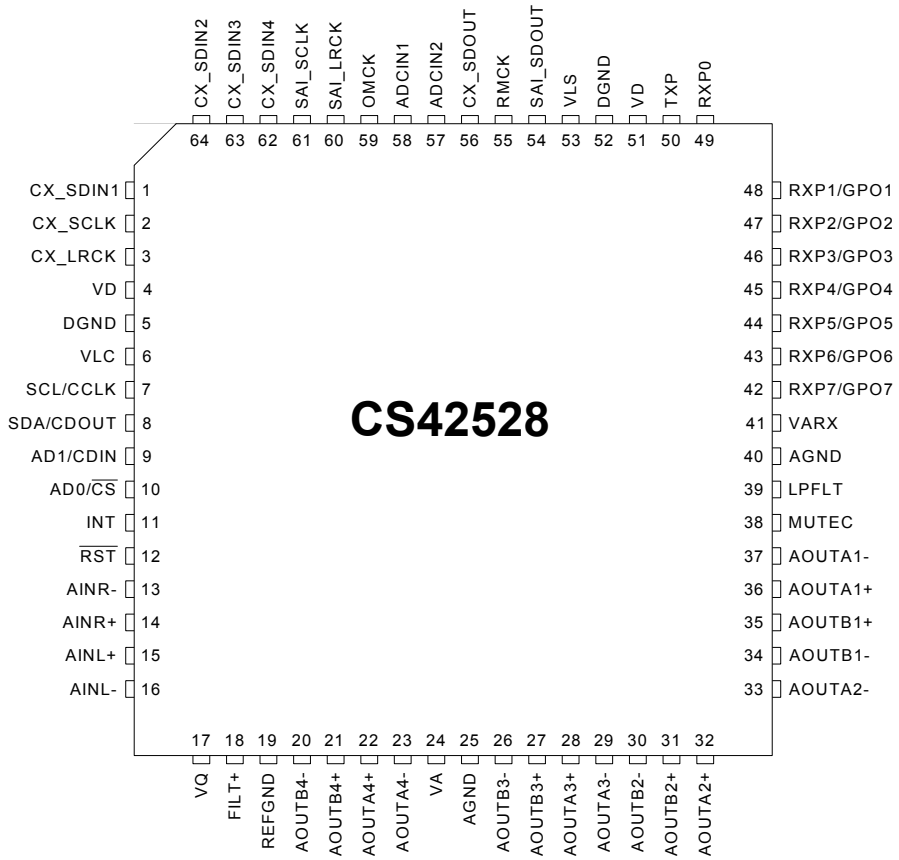
CS42528-CQZ	-10° to 70° C	64-pin LQFP	Lead Free
CS42528-DQZ	-40° to 85° C	64-pin LQFP	Lead Free
CDB42528	Evaluation Board		



Preliminary Product Information

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

2. PIN DESCRIPTIONS



Pin Name	#	Pin Description
CX_SDIN1 **CX_SDIN2** **CX_SDIN3** **CX_SDIN4**	1 64 63 62	**Codec Serial Audio Data Input** (*Input*) - Input for two's complement serial audio data.
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^2C 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^2C 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 (I^2C)/Serial Control Data (SPI)** (*Input*) - AD1 is a chip address pin in I^2C mode; CDIN is the input data line for the control port interface in SPI mode.

AD0/$\overline{CS}$	10	**Address Bit 0 (I^2C)/Control Port Chip Select (SPI)** *(Input)* **-** AD0 is a chip address pin in I^2C mode; $\overline{CS}$ 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.
$\overline{RST}$	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.

CX_SDOUT	56	**CODEC Serial Data Output** (*Output*) - Output for two's complement serial audio data from the internal and external ADCs.
ADCIN1 **ADCIN2**	58 57	**External ADC Serial Input** (*Input*) - 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.
OMCK	59	**External Reference Clock** (*Input*) - 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** (*Input*/*Output*) - Determines which channel, Left or Right, is currently active on the serial audio data line.
SAI_SCLK	61	**Serial Audio Interface Serial Clock** *(Input/Output)* - Serial clock for the Serial Audio Interface.

KOREA ELECTRONICS CO.,LTD.

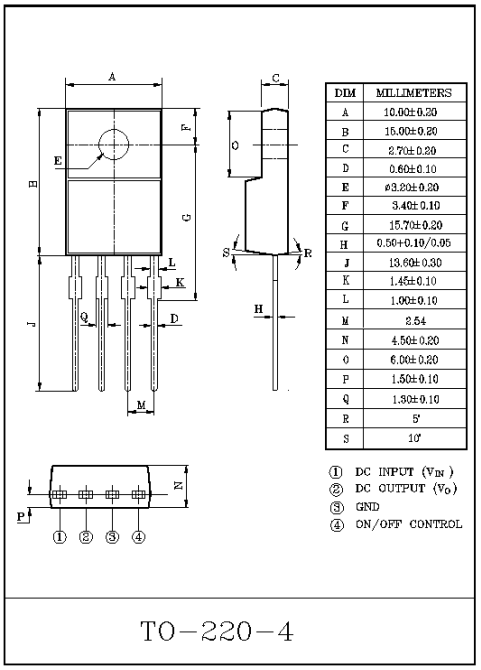
SEMICONDUCTOR
TECHNICAL DATA

KIA78R05PI~ KIA78R15PI
BIPOLAR LINEAR INTEGRATED CIRCUIT

4 TERMINAL LOW DROP VOLTAGE REGULATOR

The KIA78R×× Series are Low Drop Voltage Regulator suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 terminal lead full molded PKG.
The Regulator has multi function such as over current protection, overheat protection and ON/OFF control.

FEATURES
- 1.0A Output Low Drop Voltage Regulator.
- Built in ON/OFF Control Terminal.
- Built in Over Current Protection, Over Heat Protection Function.



DIM	MILLIMETERS
A	10.00±0.20
B	15.00±0.20
C	2.70±0.20
D	0.60±0.10
E	ø3.20±0.20
F	3.40±0.10
G	15.70±0.20
H	0.50+0.10/0.05
J	13.60±0.30
K	1.45±0.10
L	1.00±0.10
M	2.54
N	4.50±0.20
O	6.00±0.20
P	1.50±0.10
Q	1.30±0.10
R	5°
S	10°

TO-220-4

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT	Remark
Input Voltage	V_{IN}	35	V	-
ON/OFF Control Voltage	V_C	35	V	-
Output Current	I_O	1	A	-
Power Dissipation 1	P_{d1}	1.5	W	No heatsink
Power Dissipation 2	P_{d2}	15	W	with heatsink
Junction Temperature	T_j	125	℃	-
Operating Temperature	T_{opr}	-20~80	℃	-
Storage Temperature	T_{stg}	-30~125	℃	-
Soldering Temperature (10sec)	T_{sol}	260	℃	-

KEC

SEMICONDUCTOR
TECHNICAL DATA

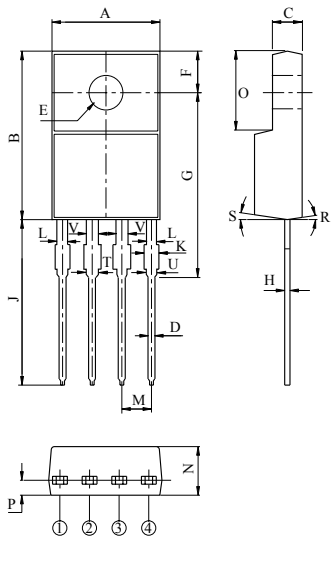
KIA278R05PI~KIA278R15PI
BIPOLAR LINEAR INTEGRATED CIRCUIT

4 TERMINAL 2A OUTPUT LOW DROP
VOLTAGE REGULATOR

The KIA278R×× Series are Low Drop Voltage Regulator suitable for various electronic equipments.
It provides constant voltage power source with TO-220 4 terminal lead full molded PKG. The Regulator has multi function such as over current protection, overheat protection and ON/OFF control.

FEATURES

- 2.0A Output Low Drop Voltage Regulator.
- Built in ON/OFF Control Terminal.
- Built in Over Current Protection, Over Heat Protection Function.



DIM	MILLIMETERS
A	10.00±0.20
B	15.00±0.20
C	2.70±0.20
D	0.60±0.10
E	Φ3.20±0.20
F	3.50±0.10
G	15.70±0.20
H	0.40±0.10
J	14.3+0.2/-0.1
K	1.45±0.10
L	1.00±0.10
M	2.54
N	4.50±0.20
O	7.5± 0.1
P	1.50±0.10
R	5°
S	8°
T	1.30±0.1
U	3-1.00±0.1
V	1.30±0.1

TO-220IS-4

LINE UP

ITEM	OUTPUT VOLTAGE (Typ.)	UNIT
KIA278R05PI	5	V
KIA278R06PI	6	
KIA278R08PI	8	
KIA278R09PI	9	
KIA278R10PI	10	
KIA278R12PI	12	
* KIA278R15PI	15	

* Note) * : Under Development.

MAXIMUM RATING (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT	Remark
Input Voltage	V_{IN}	35	V	-
ON/OFF Control Voltage	V_C	35	V	-
Output Current	I_O	2	A	-
Power Dissipation 1	P_{d1}	1.5	W	No heatsink
Power Dissipation 2	P_{d2}	15	W	with heatsink
Junction Temperature	T_j	125	℃	-
Operating Temperature	T_{opr}	-20～80	℃	-
Storage Temperature	T_{stg}	-30～125	℃	-
Soldering Temperature (10sec)	T_{sol}	260	℃	-

KEC

SEMICONDUCTOR
TECHNICAL DATA

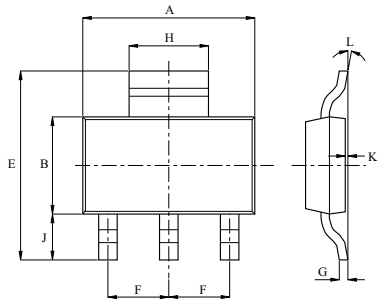
KIA1117S/F00~ KIA1117S/F50
BIPOLAR LINEAR INTEGRATED CIRCUIT

LOW DROP FIXED AND ADJUSTABLE
POSITIVE VOLTAGE REGULATOR

The KIA1117S/F × × is a Low Drop Voltage Regulator able to provide up to 1A of output current, available even in adjustable version (Vref=1.25V)

FEATURES

· Low Dropout Voltage : 1.1V/Typ. (Iout=1.0A)
· Very Low Quiescent Current : 4.2㎃/Typ.
· Output Current up to 1A
· Fixed Output Voltage of 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5.0V
· Adjustable Version Availability : Vref=1.25V
· Internal Current and Thermal Limit
· Only 10㎌ for stability
· Available in ±2%(at 25℃) and 4% in full Temperature range
· High Ripple Rejection : 80dB/Typ
· Temperature Range : 0℃~125℃



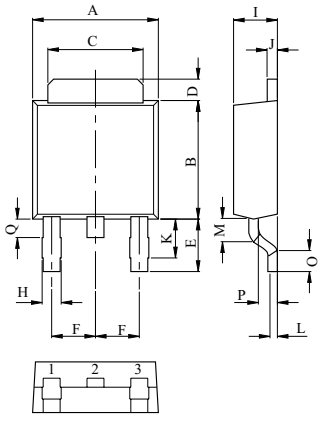
DIM	MILLIMETERS
A	6.5±0.2
B	3.5±0.2
C	1.8 MAX
D	0.7+0.15/-0.1
E	7±0.3
F	2.3 TYP
G	0.26+0.09/-0.02
H	3.0+0.15/-0.1
J	1.75±0.25
K	0.1 MAX
L	10° MAX

1. COMMOIN (ADJ.)
2. OUTPUT
3. INPUT

SOT-223

LINE UP

ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA1117S/F00	Adjustable (1.25~10V)	S : SOT-223 F : DPAK
KIA1117S/F15	1.5	
KIA1117S/F18	1.8	
KIA1117S/F25	2.5	
KIA1117S/F28	2.85	
KIA1117S/F33	3.3	
KIA1117S/F50	5.0	



DIM	MILLIMETERS
A	6.60±0.2
B	6.10±0.2
C	5.0±0.2
D	1.10±0.2
E	2.70±0.2
F	2.30±0.1
H	1.00 MAX
I	2.30±0.2
J	0.5±0.1
K	2.00±0.20
L	0.50±0.10
M	0.91±0.10
O	0.90±0.1
P	1.00±0.10
Q	0.95 MAX

1. COMMOIN (ADJ.)
2. OUTPUT
3. INPUT

DPAK

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage		V_{IN}	10	V
Output Current	S/F	I_{OUT}	1.0	A
Power Dissipation 1 (No heatsink)	S (Note)	P_{D1}	1.0	W
	F		1.3	
Power Dissipation 2 (Without heatsink)	S	P_{D2}	8.3	W
	F		13	
Operating Temperature		T_{opr}	0~125	℃
Storage Temperature		T_{stg}	-55~150	℃

Note) Package Mounted on FR-4 PCB 36 ×18 ×1.5㎜.
: mounting pad for the GND Lead min. 6㎠

KEC

SEMICONDUCTOR
TECHNICAL DATA

KTC812T
EPITAXIAL PLANAR NPN TRANSISTOR

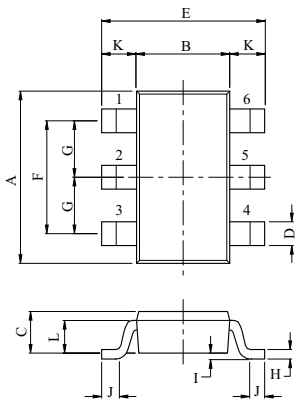
FOR MUTING AND SWITCHING APPLICATION.

FEATURES

· High Emitter-Base Voltage : V_{EBO}=25V(Min.)

· High reverse h_{FE}
  : Reverse h_{FE}=150(Typ.) (V_{CE}=-2V, I_C=-4mA)

· Low on Resistance : R_{ON}=1Ω(Typ.), (I_B=5mA)



DIM	MILLIMETERS
A	2.9±0.2
B	1.6+0.2/-0.1
C	0.70±0.05
D	0.4±0.1
E	2.8+0.2/-0.3
F	1.9±0.2
G	0.95
H	0.16±0.05
I	0.00-0.10
J	0.25+0.25/-0.15
K	0.60
L	0.55

1. Q_1 EMITTER
2. Q_1 BASE
3. Q_2 COLLECTOR
4. Q_2 EMITTER
5. Q_2 BASE
6. Q_1 COLLECTOR

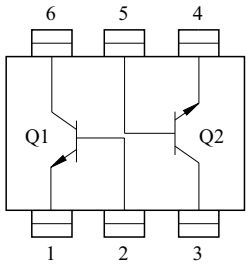
TS6

MAXIMUM RATING (Ta=25℃)

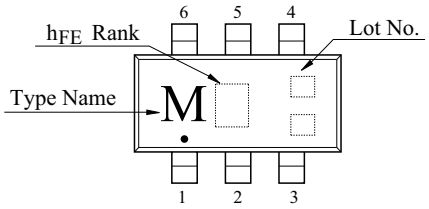
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	25	V
Collector Current	I_C	300	mA
Base Current	I_B	60	mA
Collector Power Dissipation	P_C *	0.9	mW
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}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

* Package mounted on a ceramic board (600㎟ × 0.8㎜)

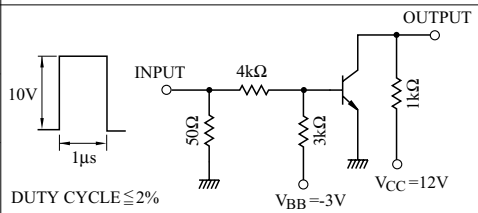
EQUIVALENT CIRCUIT (TOP VIEW)



Marking

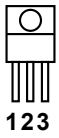
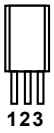
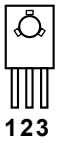
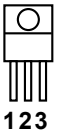
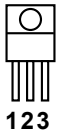
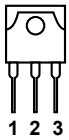


ELECTRICAL CHARACTERISTICS (Ta=25℃)

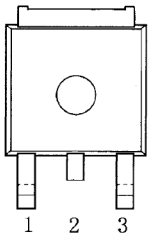
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB}=50V, I_E=0	-	-	0.1	μA
Emitter Cut-off Current		I_{EBO}	V_{EB}=25V, I_C=0	-	-	0.1	μA
DC Current Gain		h_{FE}	V_{CE}=2V, I_C=4mA	350	-	1200	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=30mA, 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

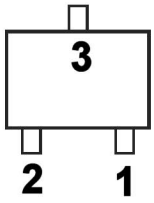
TRANSISTOR, REGULATOR IC BLOCK DIAGRAM

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

NJM2391DL1-25 NJM2391DL1-33
LOW DROPOUT VOLTAGE REGULATOR



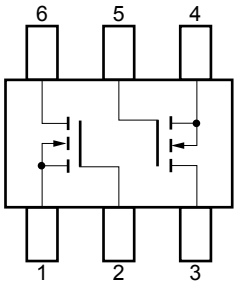
PIN FUNCTION
1. IN
2. GND
3. OUT



1) Emitter
2) Base
3) Collector

KRA 107S
KRC102S
KRA102S
KRC103S
KRC107S
KRC111S
KRC1114S

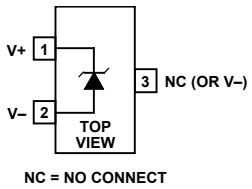
N-CHANNEL MOS FET ARRAY
μPA672T



1. Source 1 (S1)
2. Gate 1 (G1)
3. Drain 2 (D2)
4. Source 2 (S2)
5. Gate 2 (G2)
6. Drain 1 (D1)

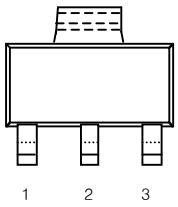
Marking: MA

PIN CONFIGURATION
SOT-23 Package
AD1580



NC = NO CONNECT

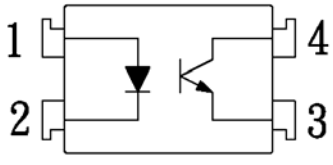
SOT–223 PKG (FRONT VIEW)



LM1117
REGULATOR

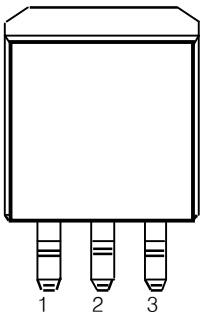
PIN FUNCTION
1. Adj/Gnd
2. Vout
3. Vin

KP1010 photocoupler



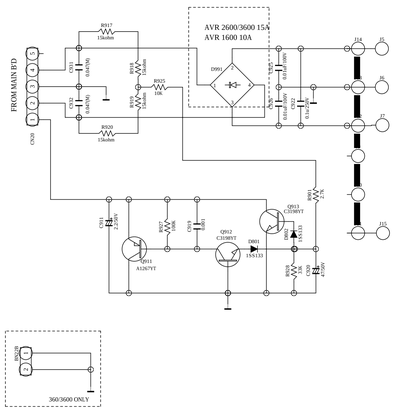
1. Anode
2. Cathode
3. Emitter
4. Collector

TO–263 (D2 PKG, FRONT VIEW)

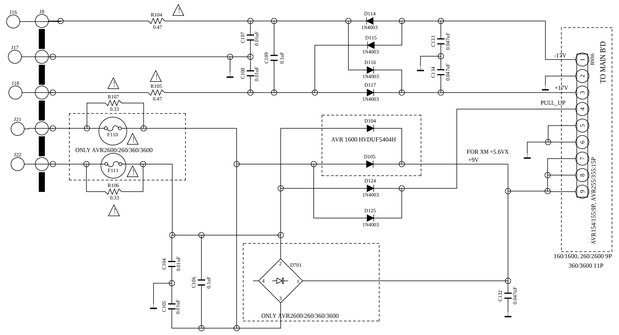


PIN FUNCTION
1. Adj/Gnd
2. Vout
3. Vin

< TRANS PCB 1 >



< TRANS PCB 2 >



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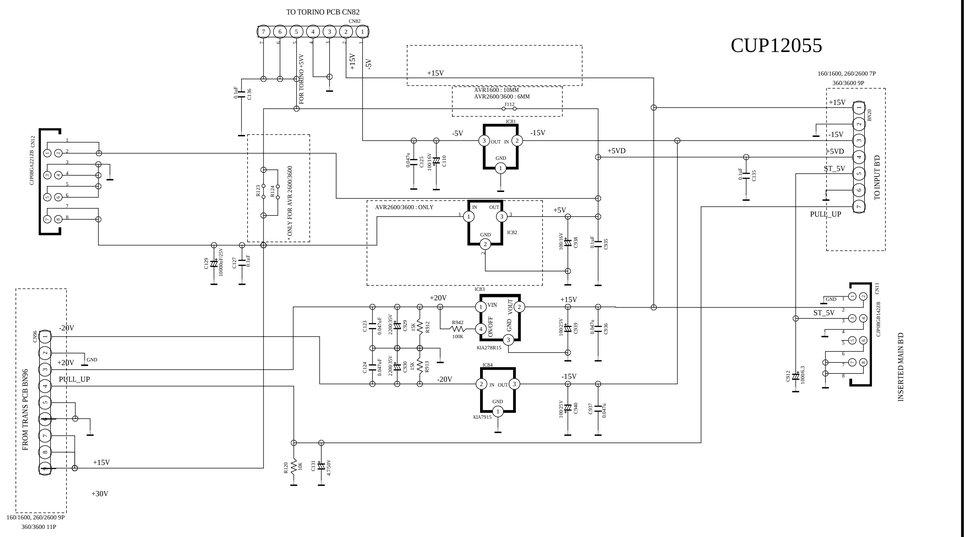
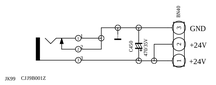


CUP12027-5

CUP12027-3



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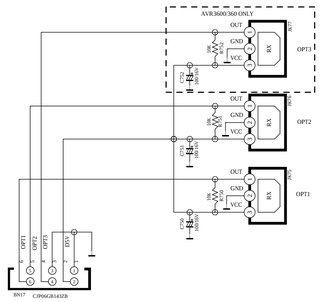

LPP

ISSUE
2008.11.01

REVISION	2		4		6	
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SCHEMATIC DIAGRAM			SHEET
MODEL	AVR x600/x60		1/1
DESIGN	CHECK	APPROVE	DRAWING NO
J.T.B	Y.Y.W	K.S.W	CUP12xxxY
08.02.11			(POWER) 1/1

CUP12174Y

*NJM2595M OPTION
==>V_MUTE "LOW" ACTIVE

FUNC.	SW1	SW2	SW3	SW4	SW5
VIDEO1	L	H	X	X	H
VIDEO2	H	L	X	L	H
VIDEO3	H	H	H	H	H
V4,IPOD	H	H	X	L	H
DVD	H	H	L	H	H

09.02.26
+Value Change R403 75ohm -> 0ohm
-Value Change R4037Sohm -> K.C

IC41 IC101
NJM2595M
CVBS

MONITOR OUT
VIDEO2 IN
VIDEO OUT
VIDEO1 IN
DVD IN

Change : 62ohm -> 47ohm
2009.02.04

EUR Ver. ONLY

COMPONENT IN1
& COMPONENT IN2

22P-->2P

COMPONENT OUT

Pr_OUT
Pb_OUT
Y_OUT

IC61 IC102
NJW1321

SW4 SW3 SW2 SW1

Pr_OUT2
Pb_OUT2
AUX1
AUX2
Y_OUT2
VIDEO
HDMI
+8V
+5V
VREF
DGND
GND
SDA
SCL
1321_SDA
1321_SCL

* LC74763M OPTION TABLE

	C701	C702	X701
PAL	27P	27P	17.734
NTSC	27P	27P	14.318

IC71 IC103
LC74763M

X701 14.318MHz
Change : 33pF -> 27pF
2009.02.04

X702 17.734475MHz

ONLY EUR VER.

OSD_CLK
OSD_DA
OSD_CE1
OSD_M
OSD_H

09.02.26
+Value Change R701 0ohm -> 2.2Kohm
+Value Change R713 220ohm -> 2.2Kohm

COMPO OSD IN
COMPO OUT

Change Value
2200uF -> 10uF
2008.12.16

AVR154 : 1.2K

IC72
74ACT04MTR

FROM MCU B'D

V3 COMP

CN45

TO ADI HDMI REPEATER B'D

22P-->2P

Change : 68ohm -> 56ohm
2009.02.04

Change : 56ohm -> 36ohm
2009.02.04

Change : 82ohm -> 47ohm
2009.02.04

* DEFINITION OF I2C REGISTER (NJW1321)

I2C BUS FORMAT

MSB		LSB	MSB		LSB	MSB		LSB	
S(1BIT)	SLAVE ADDRESS(8BIT)		A(1BIT)	DATA(8BIT)		A(1BIT)	DATA(8BIT)		A(1BIT) P(1BIT)

SLAVE ADDRESS

MSB			Slave Address(8BIT)					MSB	Hex
1	0	0	0	0	0	ADR(1BIT)	R/NOT W(1BIT)		-

CONTROL REGISTER TABLE
<WRITE MODE>

NO.	BIT							
	D7	D6	D5	D4	D3	D2	D1	D0
DATA 1	PS1	PS2	OUT1				OUT2	
DATA 2	AUX0		AUX1		AUX2		AUX3	

<READ MODE>

NO.	BIT							
	D7	D6	D5	D4	D3	D2	D1	D0
DATA	PORT0		PORT1		PORT2		PORT3	

S : Starting Term
A : Acknowledge Bit
P : Ending Term

R/NOT W : Set the Write Mode or Read Mode.
ADR : Set the Slave Address by " ADR" terminal.
R/NOT W = 0 : WRITE MODE, ADR = 0 I ; ADR=0 Hex:94(h), ADR=1 Hex:96(h)
R/NOT W = 0 : READ MODE, ADR = 0 I ; ADR=0 Hex:95(h), ADR=1 Hex:97(h)

PS : POWER SAVE
=> PS = 1 ; POWER SAVE ON (MUTE), PS = 0 ; POWER SAVE OFF (OUT ON)
OUT : OUTPUT
AUX : AUXILIARY (CONTROL SIGNAL OUTPUT)

PORT : INPUT

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SCHEMATIC DIAGRAM

SHEET 1/1

MODEL	AVR1600	
DESIGN	CHECK	APPROVE	DRAWING NO
S.K	W.Y.Y	K.S.W	CUP12174 (VIDEO) 1/1
09.02.04	09.02.04	09.02.04	

LPP

ISSUE 2009.02.04

R201 ~ R216 : 470ohm --> 100ohm
R219 ~ R223 : 470ohm --> 100ohm
R225 ~ R226 : 470ohm --> 100ohm

STEREO JACK
CD
R/O
TAPE
P/B
VIDEO2
R/O
VIDEO1
P/B
DVD
8CH Lch
8CH Rch
8CH SLch
8CH SRch
8CH Cch
8CH SUB
8CH SBL
8CH SBR

JK43 C31D0060Z (K43)
JK12 C31HP01-HW
JK13 C31HP01-HW
JK14 C31HB03796

MIC_SIGNAL
VIDEO44-R
VIDEO44-L
C3PP03-0107Y Fiber Mic(K43,K47)

IC20 CVHW1197CFC2

IC36 HVBA3780S4Y
IC37 CVBA3795SFI

C321,322,323,324 :560P-->270P

IC31 IC32 IC33 IC34 IC24 IC25 IC22 IC23 IC21

DAC-R DAC-L DAC-SW DAC-C DAC-SR DAC-SL DAC-BR DAC-BL DAC-SUB DAC-SBR DAC-SBL DAC-SBR

VOL01 VOL-L
VOL02 VOL-R
VOL03 VOL-C
VOL08 VOL-SW
VOL04 VOL-SL
VOL05 VOL-SR
VOL06 VOL-BL
VOL07 VOL-BR

HPL-OUT
HPR-OUT
L-OUT
R-OUT
C-OUT
SW-OUT
SL-OUT
SR-OUT
SBL-OUT
SBR-OUT
FUNC_MUTE2

TUNER-L
TUNER-R
TUNER_MUTE
Q307 A1037S
Q306 HVTKRA1037S
TUNER_SCK
TUNER_DATA
TUNER_CS
TUNER_RESET
TUNED
/SEN
/RST
GPIO2
TUNER MODULE
TUNER_CONNECTOR

HP_MUTE1
FUNC_MUTE1
Q720 HVTKRC1107S
Q729 HVTKRC1107S
HP_MUTE
FUNC_MUTE
HP_MUTE2
FUNC_MUTE2
Q952 HVTKRA1107S
Q951 HVTKRC1107S
CHGND

POWER_MUTE
PROTECT_IN
POWER_HIGH
P_FAIL
POWER_DOWN
CN701 CUP12176SCEZ
FROM MAIN B'D

SW-OUT
SL-OUT
C-OUT
SR-OUT
L-OUT
SBL-OUT
R-OUT
SBR-OUT
CN201
ARRAY WIRE Ass'y
FROM POWER B'D

** IMPORTANT SAFETY NOTICS.
COMPONENTS IDENTIFIED BY ⚠ 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)
pF=10 ㎌
** THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WITH THE
IMPROVEMENT OF PERFORMANCE.

MP

ISSUE
2008.10.18

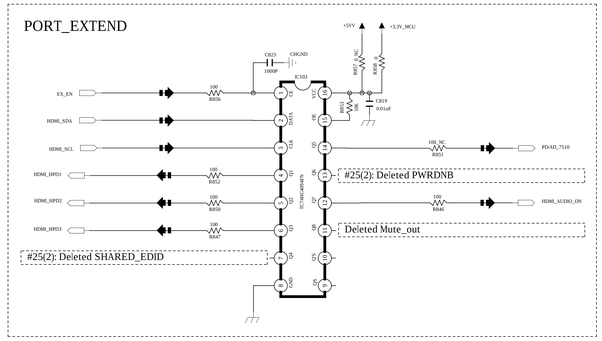
REVISION	2		4		6	
1		3		5		7	

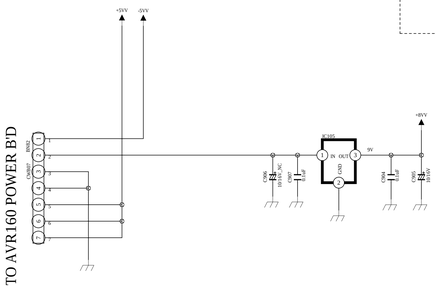
SCHEMATIC DIAGRAM

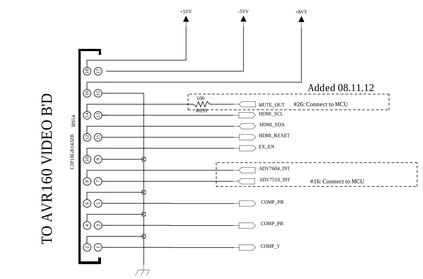
SHEET 1/3

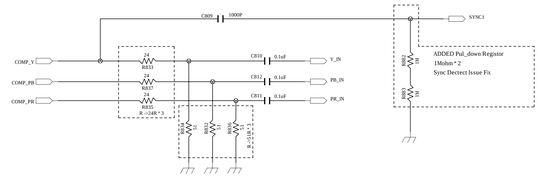
MODEL	AVR 1600/160	
DESIGN	CHECK	APPROVE	DRAWING NO
C.B.LEE	W.Y.YANG	G.S.WEY	CUP12176SCEZ
08.10.18			(INPUT) 1/1

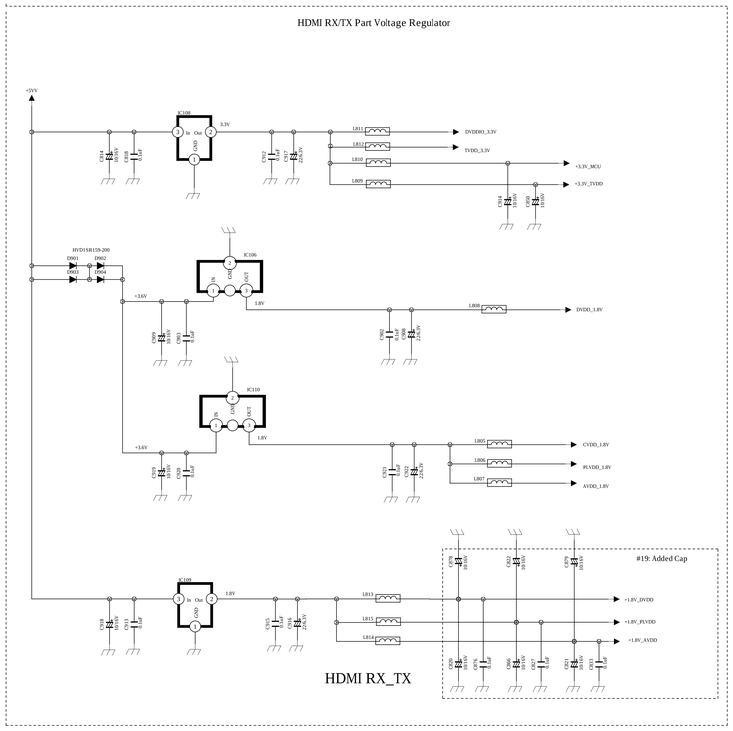
CUP12178

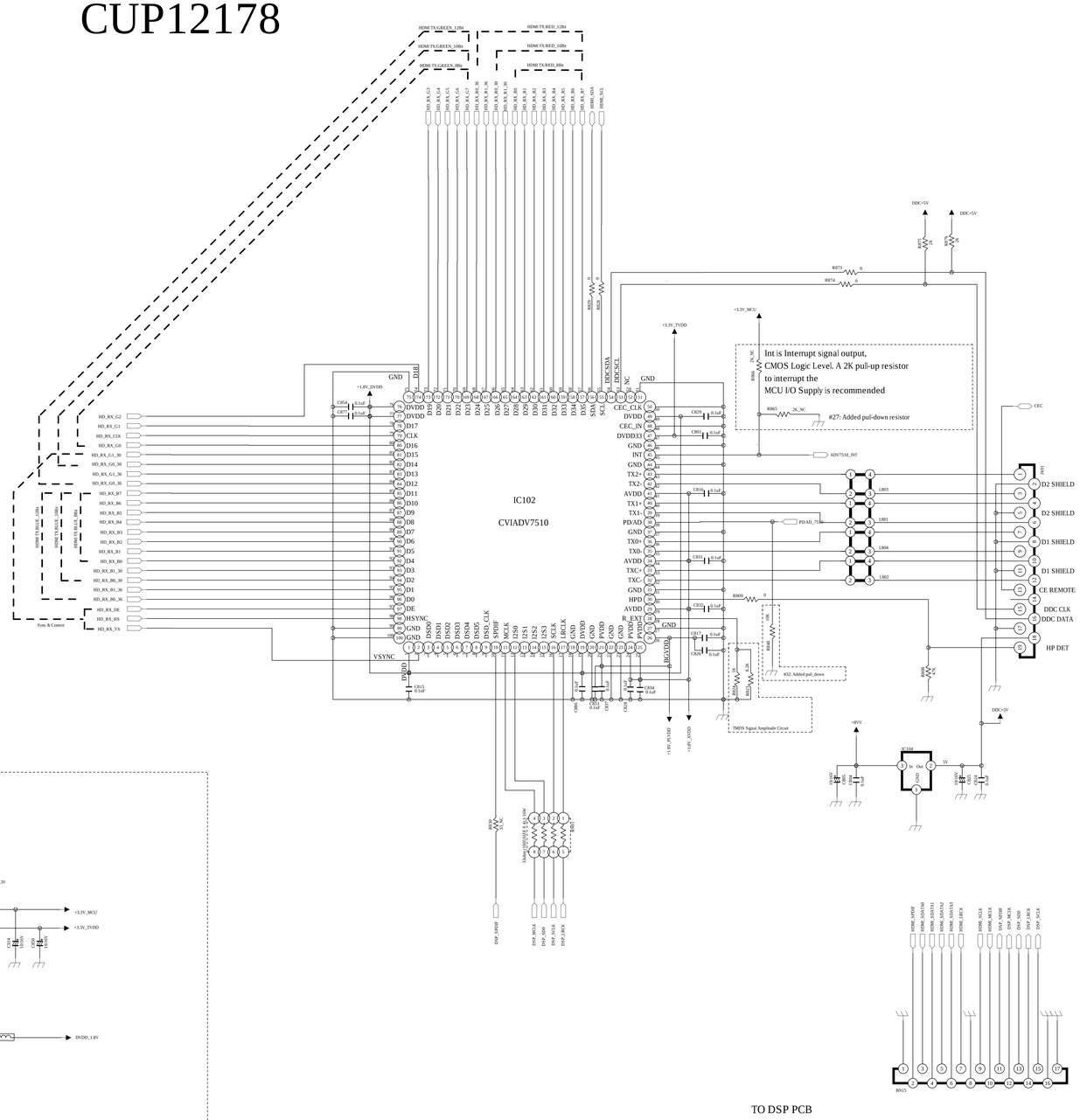












REVISION	2		4		6	
1	3		5		7	

SCHEMATIC DIAGRAM

SHEET 2/2

MODEL	AVR160_HDMI_TX

DESIGN	CHECK	APPROVE	DRAWING NO
S.K	W.Y.Y	K.S.W	CUP12178 (HDMI-Output) 1/1
09.02.04	09.02.04	09.02.04	

ISSUE 09.02.04

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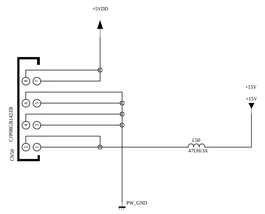
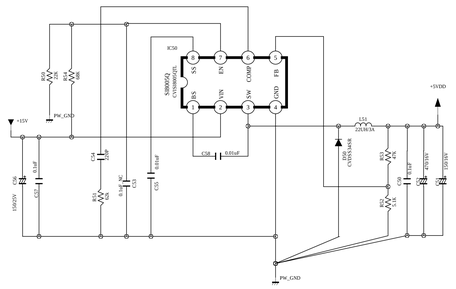
CUP12167Z





DC/DC REGUALTOR

LPP

ISSUE
09.02.04

REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR1600		5/5
DESIGN	CHECK	APPROVE	DRAWING NO
S. KIM	W.Y YANG	G.S WEY	CUP12167Z
09.02.04	09.02.04	09.02.04	DC/DC REGUALTOR 1/1

CUP12168*

CUP12168-1 FIP PCB

CUP12168-2 [STAND BY PCB]

CUP12168-3 [VOLUME PCB]

CUP12168-4 HEAD PHONE&INPUT(DIGITAL) JACK PCB

CUP12168-5 USB & INPUT(A/V ANALOG) JACK PCB

FIP1 CFL1628D05GJNK

IC12 REMOCON SENSOR

IC13 74ACT04MTR (HEX INVERTER)

IC15 NJM4556AL

IC14 NJM2068M

IC11 74HCU04AFN (CMOS INVERTER)

* OPTION * JW17

* ESD * JW18

REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR1600,AVR2600,AVR3600		1/7
DESIGN	CHECK	APPROVED	DRAWING NO
J.H.L	W.Y.Y	G.S.W	2168SCLZ
09.02.18	09.02.18	09.02.18	(FRONT) 1/1

LPP

ISSUE 2009.02.18

CUP12178

INPUT-3

#21: HPD Part

HP DET
+5V
GND
DDC DATA
DDC CLK
NC
CE REMOTE
CK-
D1 SHIELD
CK+
D0-
D1 SHIELD
D0+
D1-
D2 SHIELD
D1+
D2-
D2 SHIELD
D2+

Q801 KRA102S
Q803 KRC103S
HDMI_HPD3
PWR3
#7: Added pull-up

INPUT-1

#21: HPD Part

Q807 KRA102S
Q806 KRC103S
HDMI_HPD1
PWR1
#7: Added pull-up

INPUT-2

#21: HPD Part

Q802 KRA102S
Q804 KRC103S
HDMI_HPD2
PWR2
#7: Added pull-up

CEC

#20: Shared_EDID_Option
#25(2): Deleted pull_up/Down

08.10.13
#22: Added 10K

#10: Added 10uF Cap

09.02.04
change Value : 47p -> 51p

* #23: should be pull-down 10K

#25(2): Added pull_up & pull_down

#8: Added Pull-down

#12: Added Pull-down 500 ohm

IC101
CVIADV7604

#5,6 : I2C Pull-up (Optional)

ADV7604_INT
I²MUTE_OUT
+3.3V_MCU
HDMI_RESET
HDMI_SCL
HDMI_SDA

47K-->10K : 090103
10K-->4.7K : 090417
#3 : I2C Pull-up (Optional)

08.10.13
#11: Added 10K

should be Pul_Down

* #23: should be Ground

RN101 RN100 RN99 RN98 RN97 RN96 RN95 RN94 RN93 RN92 RN91 RN102 RN103
33ohm (1005SIZE X 4),1/16W

HD_RX_R7 HD_RX_R6 HD_RX_R5 HD_RX_R4
HD_RX_R3 HD_RX_R2 HD_RX_R1 HD_RX_R0
HD_RX_R1_30 HD_RX_R0_30 HD_RX_R1_36 HD_RX_R0_36
HD_RX_G7 HD_RX_G6 HD_RX_G5 HD_RX_G4
HD_RX_G3 HD_RX_G2 HD_RX_G1 HD_RX_G0
HD_RX_G1_30 HD_RX_G0_30 HD_RX_G1_36 HD_RX_G0_36
HD_RX_B7 HD_RX_B6 HD_RX_B5 HD_RX_B4
HD_RX_B3 HD_RX_B2 HD_RX_B1 HD_RX_B0
HD_RX_B1_30 HD_RX_B0_30 HD_RX_B1_36 HD_RX_B0_36
HD_RX_CLK
HD_RX_HS HD_RX_VS HD_RX_DE

RED:0/8bit RED:10bit RED:12bit
GREEN:0/8bit GREEN:10bit GREEN:12bit
BLUE:0/8bit BLUE:10bit BLUE:12bit

HDMI 24/30/32Bit TTL Output

Sync & Control

+3.3V_MCU
IC107 SN74AVC8T245PWR
Q808 KRC103S
ON : HIGH
HDMI_AUDIO_ON

I2S HDMI RX to DSP

REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM				SHEET
MODEL	AVR160_HDMI_RX			1/2
DESIGN	CHECK	APPROVE	DRAWING NO	
S.K	W.Y.Y	K.S.W	CUP12178 (HDMI-Output)	1/1
09.02.04	09.02.04	09.02.04		

ISSUE 09.02.04

LPP

CUP12176Z

HDMI SPDIF MODE : DIR MASTER
HDMI I2S MODE : HDMI MASTER
ADC MODE : DSP MASTER
DIR MODE : DIR MASTER

*OPTION : EMC COUNTERMEASUER

DATA	CS49700	SDRAM
EXT_D15/SD_D7	29	12
EXT_D14/SD_D6	30	11
EXT_D13/SD_D5	31	9
EXT_D12/SD_D4	32	8
EXT_D11/SD_D3	34	6
EXT_D10/SD_D2	35	5
EXT_D9/SD_D1	37	3
EXT_D8/SD_D0	39	2
EXT_D7/SD_D15	40	49
EXT_D6/SD_D14	41	48
EXT_D5/SD_D13	42	46
EXT_D4/SD_D12	43	45
EXT_D3/SD_D11	45	43
EXT_D2/SD_D10	46	42
EXT_D1/SD_D9	48	40
EXT_D0/SD_D8	49	39

Address	CS49700	SDRAM
EXT_A19	88	
EXT_A18	87	
EXT_A17	85	
EXT_A16	84	
EXT_A15	82	
EXT_A14/SD_A13	77	
EXT_A13/SD_A14	75	19
EXT_A12/SD_A10	74	20
EXT_A11/SD_A12	55	
EXT_A10/SD_A11	56	
EXT_A9/SD_A9	58	32
EXT_A8/SD_A8	59	31
EXT_A7/SD_A7	61	30
EXT_A6/SD_A6	62	29
EXT_A5/SD_A5	64	28
EXT_A4/SD_A4	67	27
EXT_A3/SD_A3	68	24
EXT_A2/SD_A2	70	23
EXT_A1/SD_A1	71	22
EXT_A0/SD_A0	72	21

REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM

SHEET 2/3

MODEL	AVR 1600/160	
DESIGN	CHECK	APPROVE	DRAWING NO
C.B.LEE	W.Y.YANG	G.S.WEY	CUP12176SCEZ (DSP) 1/1
07.10.18			

ISSUE 2007.10.18

MP

CUP12170Z

SR-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

2SD2389P:AVR154
2SD2390:AVR155/254/255
2SD2560:AVR354/355

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

2SB1559P:AVR154
2SB1560:AVR155/254/255
2SB1647:AVR354/355

BL-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

SL-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

BR-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

C-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

FR-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

FL-CH

AVR160,1600 : 2SD2389
AVR260,360,2600,3600:2SD2390

AVR160,1600 : 2SB1559
AVR260,360,2600,3600:2SB1560

GAIN	R561, R562, R563, R564, R565, R850 R851
AVR1600	1.8K
AVR26/3600	1.6K

DC PROTECTOR

THERMAL PROTECTOR

OVERLOAD DETECTION

FAN,PROTECT TEST (SHORT)

ONLY FAN USING

JK91: CENTER, SL, SR
JK92: SBL, SBR, FL, FR

FOR USING FAN

EXCEPT AVR1600/2600

ONLY AVR1600/2600

ONLY AVR1600 AVR2600

FROM TRANS

AC IN

C14321FBYA (USA) : AVR1600 / 2600
C1A28043ZA (EUR) : AVR1602/230 , 260/230
AVR354,355,354/230,355/230 :
C1A21675DZ (USA) : AVR3600
C1A28054E (EUR) : AVR3602/230

JW90,JW91 : ALL MODELS
*OPTION

JW93, OL91, F902 : EXCEPT AVR1600

USA ONLY

FAN

FROM INPUT B'D

FROM INPUT B'D

P_M
PROTECT
POWER_HIGH
P_FAIL
POWER_DOWN
MUTE_POWER

SUB SIG12
SL SIG13
C SIG14
SR SIG15
FL SIG16
SBL SIG17
FR SIG18
SBR SIG19

+15V
ST+5V
+24V

+VCC
GND
-VCC
P_FAIL

** IMPORTNAT SAFETY NOTICE.
IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY MANUFACTURE'S SPECIFIED PARTS.
** THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM, M=1000 KOHM.
** THE UNIT OF CAPACITANCE IS MICROFARAD (uF)
pF = 10 ^ uF
** THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WIHE THE IMPROVEMENT OF PERFORMANCE

REVISION	1		2		3	
SCHEMATIC DIAGRAM						SHEET
MODEL	AVR1600/2600/3600/160/260/360					2 / 7
DESIGN	CHECK	APPROVE	DRAWING NO			
C.B.LEE	W.Y.YANG	G.S.WEY	2170SCLZ (MAIN)			1 / 1
07.08.23						

MP

ISSUE 2007.09.10

FROM H/P & FRONT INPUT B'd

TO FRONT PCB

TO VIDEO PCB

V3 COMP

HDMI_MUTE (ADD:2008.11.17)

* MODEL OPTION *

MODEL	OP_A(PIN94)
AVR1600(USA)	LOW(R793):RDS OFF
AVR160(EUR)	HIGH(R792):RDS ON

*OP_A
EUR
R792 : RDS ON
R793 :RDS OFF
R792 10K
R793 10K
USA

POWER_DOWM <-->REMOTE_IN
2009.01.13

2009.01.19
Pull-Up Add

Update: LOW

FOR UPDATE(Bolero)

USE ONLY DEBUG

: PULL_UP
GPIO : Input/Out Port(without pull_up resistor)

U-COM	AVR255	AVR355	AVR155
PIN 97	HDMI_MUTE_IN	HDMI_MUTE_IN	N.A
PIN 86	TORINO_RESET	TORINO_RESET	N.C
PIN 21	UART_TX(TORINO&PC)	UART_TX(TORINO&PC)	UART_TX(PC)
PIN 22	UART_RX(TORINO&PC)	UART_RX(TORINO&PC)	UART_RX(PC)
PIN 81	VIDEO_SW1	VIDEO_SW1	N.A
PIN 82	VIDEO_SW2	VIDEO_SW2	OSD_CS1
PIN 83	VIDEO_SW3	VIDEO_SW3	OSD_CLK
PIN 84	VIDEO_SW4	VIDEO_SW4	OSD_DA
PIN 85	VIDEO_SW5	VIDEO_SW5	OSD_M
PIN 80		CLOCK	HDMI MUX_SDA
PIN 79		DATA_OUT	HDMI MUX_SCLK
PIN 77		DATA_IN	OSD_H
PIN 76		CLK-REQ	

MP

ISSUE
2007.10.18

REVISION	2		4		6	
1	3		5		7	

SCHEMATIC DIAGRAM — SHEET 3/3

MODEL	AVR 1600/160	
DESIGN	CHECK	APPROVE	DRAWING NO
C.B.LEE	W.Y.YANG	G.S.WEY	CUP12176SCEZ
07.10.18			(CPU) 1/1

7 P Wire Ass'y
BN82
HDMI PCB
(CUP12178)
Video PCB
(CUP12174)
CN18
BN54
18P Board to Board
BN14
BN15
CN14
CN15
15P Card Cable
17P Card Cable
CN51
7P Shield Wire Ass'y
CN52
3P Shield Wire Ass'y
CN19 (DEBUG FOR MCU F/W UPDATE)
CN5 (DEBUG FOR USB F/W UPDATE)
Digital in PCB
(CUP12172-3)
BN17
CN17
6P Board to Board
Input (DSP) PCB
(CUP12176)
27P Card Cable
BN12
AC IN
Plug
MONS SWITCH
7P Wire Ass'y
CN20
BN72
31P Card Cable
BN22
Power1 PCB
(CUP12172-2)
CN20
5P
CN90
5P Wire Ass'y
BN20
Main PCB
(CUP12170)
TH91
2P 2P 2P
CN93
CN89 FAN
BN14
BN26A
JW91_
BN25A
BN15
CN12
27P Card Cable
CN91
2P Wire Ass'y
CN92
AC POWER CORD
BN14A
BN26
JW91
BN25
BN15A
8P Board to Board
CN11
7P Wire Ass'y
Power2 PCB
(CUP12172-1)
BN96
BN23
CN82
CN96
9P Wire Ass'y
BN20
7P Wire Ass'y
CN11
THERMAL SENSOR
DC-FAN
Main Heat Sink
3P Shield Wire Ass'y
7P Shield Wire Ass'y
BN52
BN51
Front in PCB
(CUP12168-2)
PROTECT PCB
(CUP12172-5)
H/P PCB
(CUP12168-3)
12P Board to Board
BN61
CN61
BN74
CN74
Regulator PCB
(CUP12172-4)
5P Wire Ass'y
BN71
Front PCB
(CUP12168-1)
CN72
31P Card Cable
5P Wire Ass'y
Volume PCB
(CUP12168-5)
STAND BY PCB
(CUP12168-4)
BN73
6P Board to Board
CN73

M/P
ISSUE
2009.07.01

REVISION	2	4	6	
1	3	5	7	

WIRING DIAGRAM — SHEET 1 1

MODEL	AVR1600 & AVR160/230		
DESIGN	CHECK	APPROVE	DRAWING NO
J.H.Lee	W.Y.Yang	K.S.Wey	2171WRDZ
09.07.01	09.07.01	09.07.01	(WIRING DIAGRAM) 1 1