

# **Elenberg LVD-1902 SERVICE MANUAL**

## **CONTENT**

### **PART 1: Brief Introduction Of The LVD-1902**

- ◆ Schematic Diagram
- ◆ Printed Circuit

### **PART 2: Exploded View**

### **PART 3: Key Ics And Assemblies**

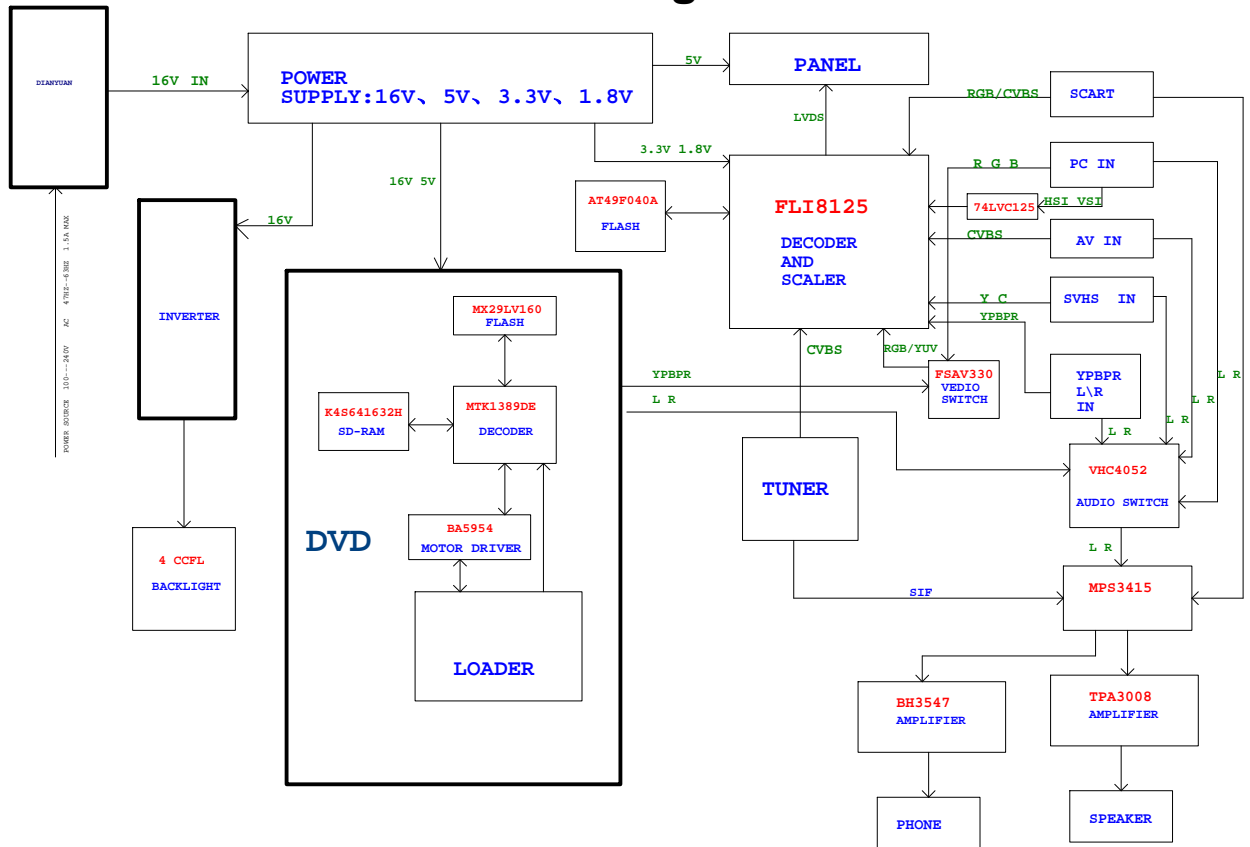
### **PART 4: Detailed Circuit**

- ◆ Main Board
- ◆ DVD Board
- ◆ HI-voltage Board

### **PART 5: Parts List**

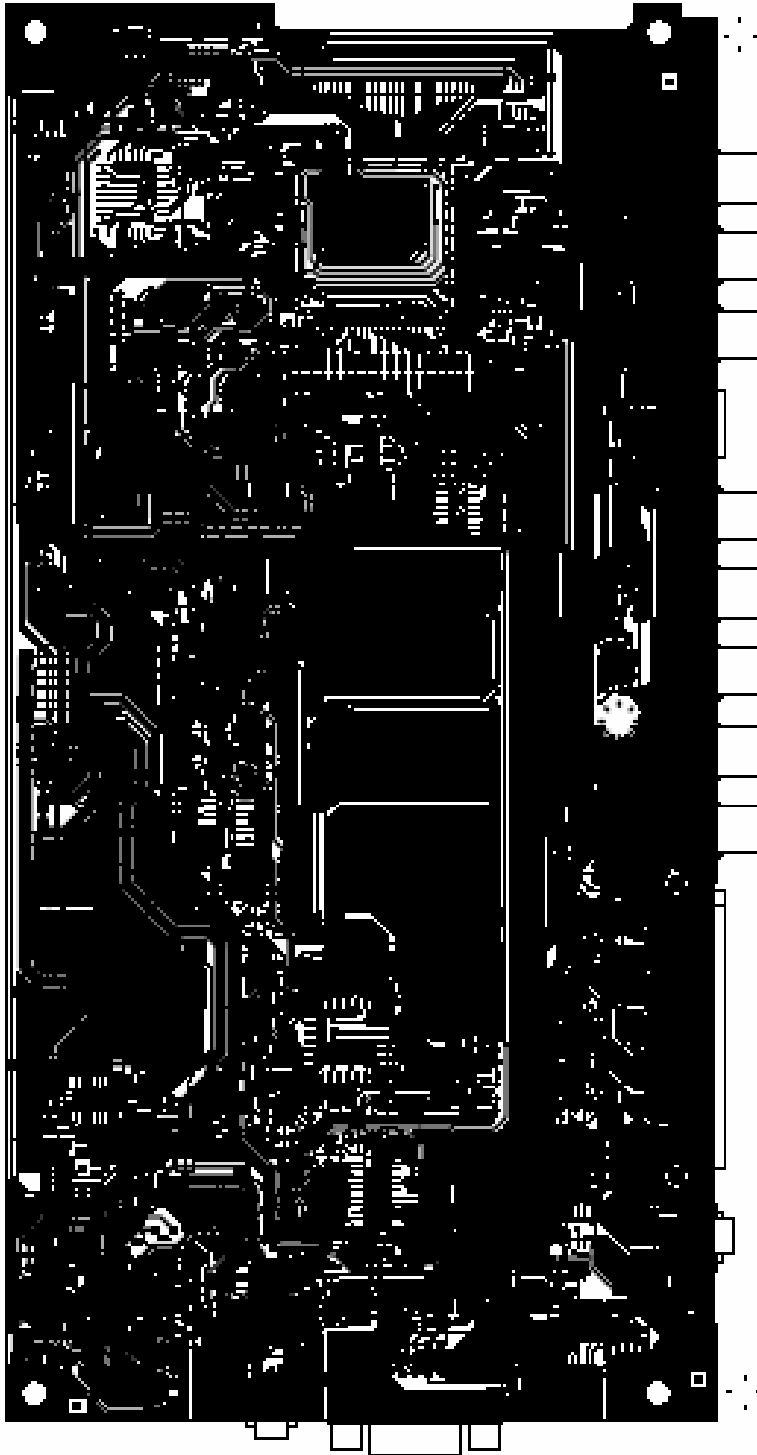
### **PART6: Debug Procedure**

# Part 1 Brief Introduction Of TheLVD-1902 Schematic Diagram

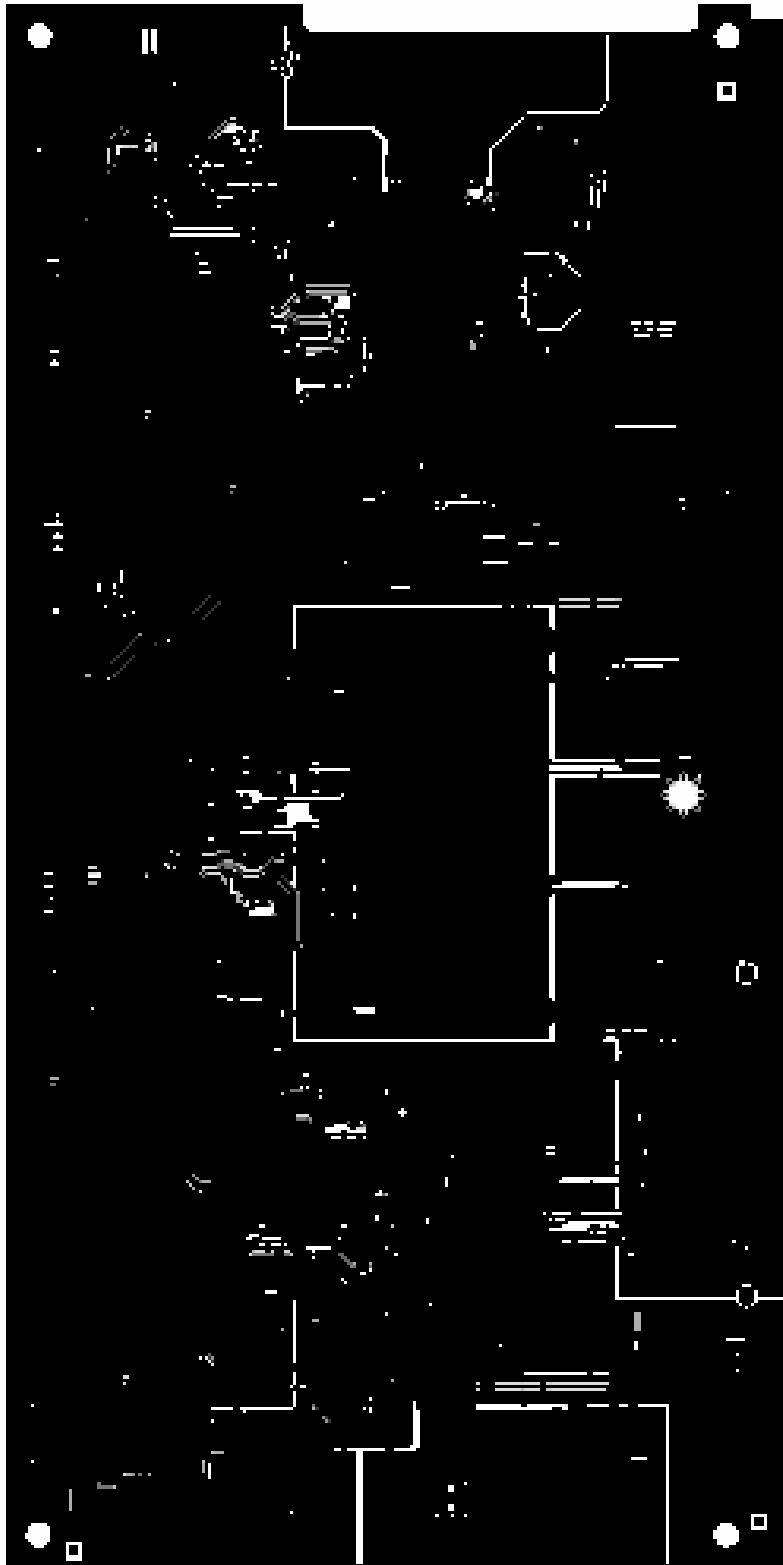


# Printed Circuit

1. Main board  
A: TOP LAYER

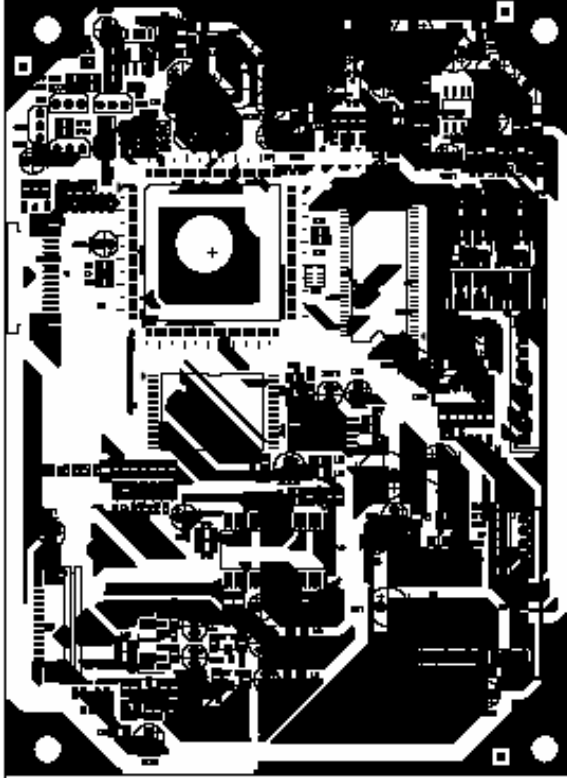


## B: BOTTOM LAYER



## 2. DVD board

### A: TOP LAYER

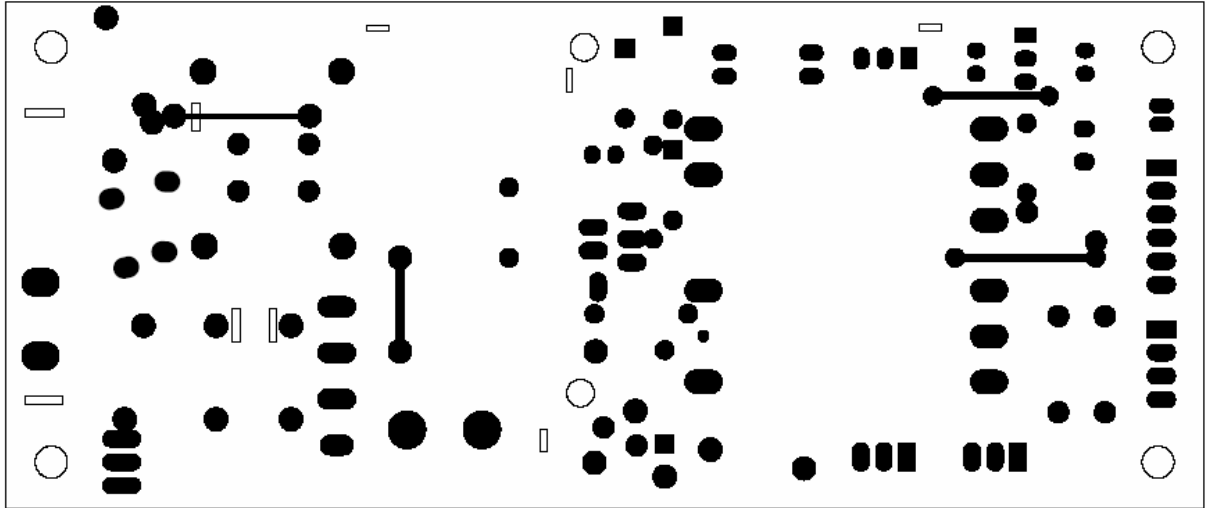


### B: BOTTOM LAYER

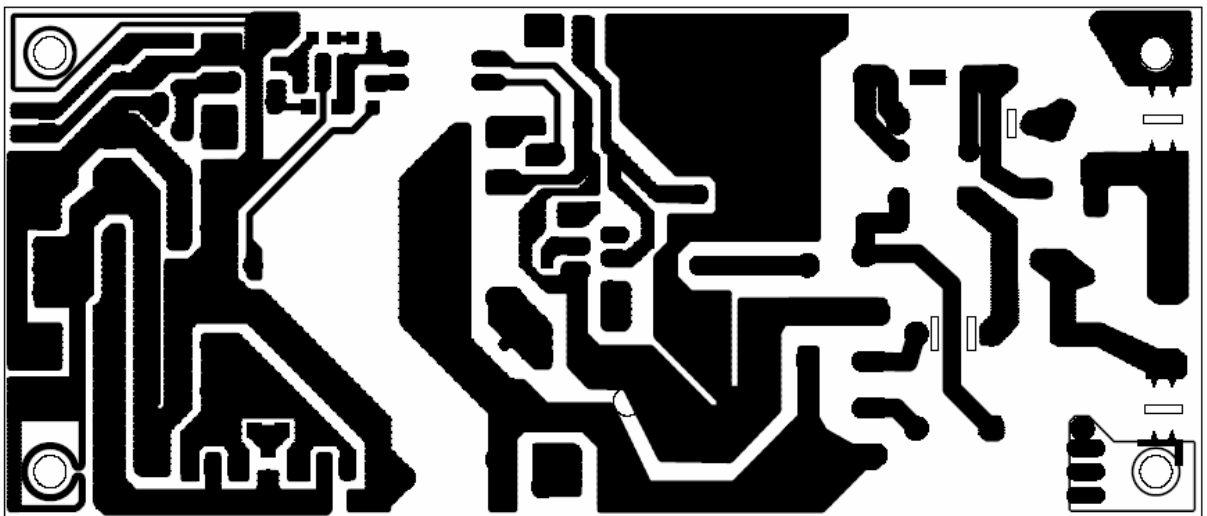


### 3. Power board

#### A: TOP LAYER

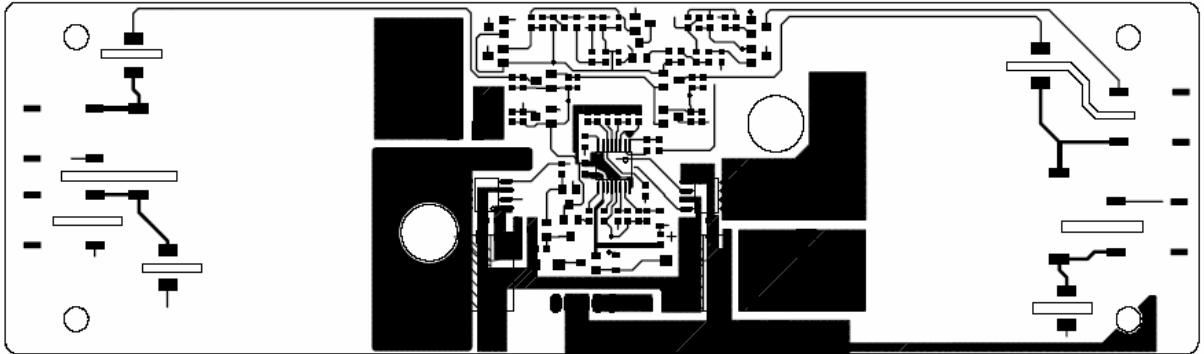


#### B: BOTTOM LAYER

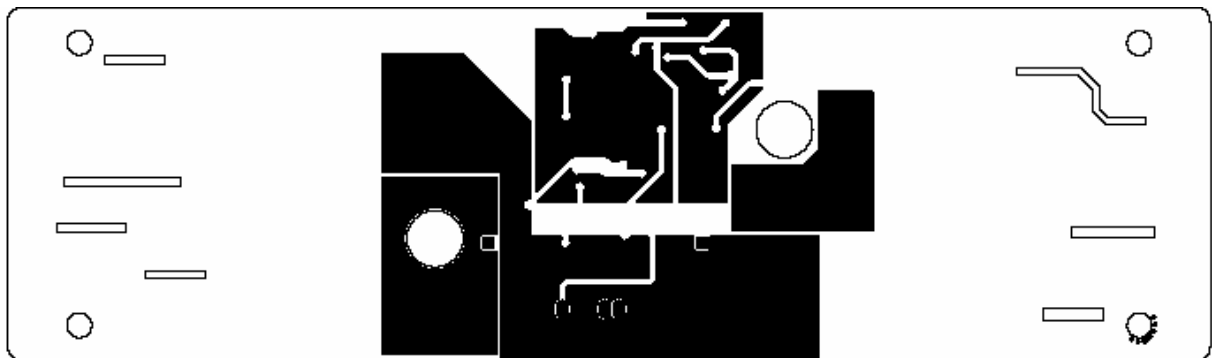


## 4. Inverter board

### A: TOP LAYER

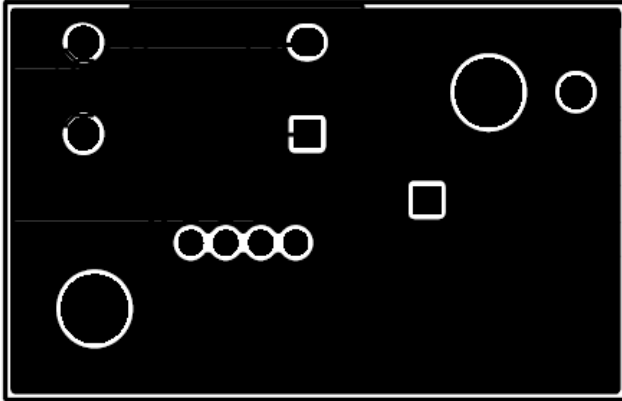


### B: BOTTOM LAYER

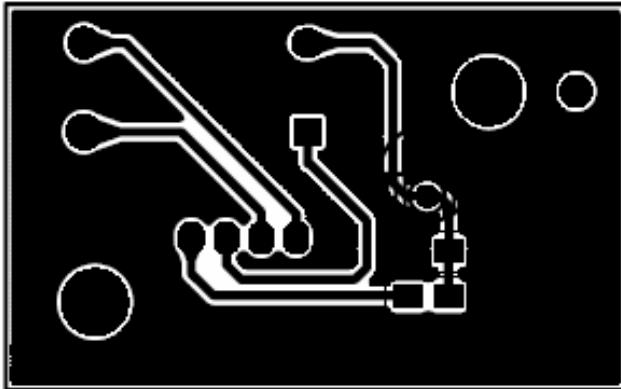


## 5. Remote Control Board

A: TOP LAYER

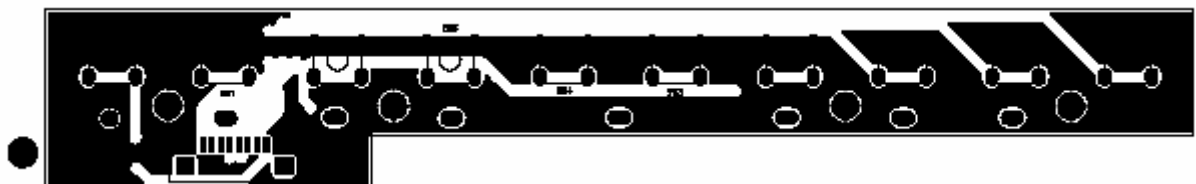


B: BOTTOM LAYER

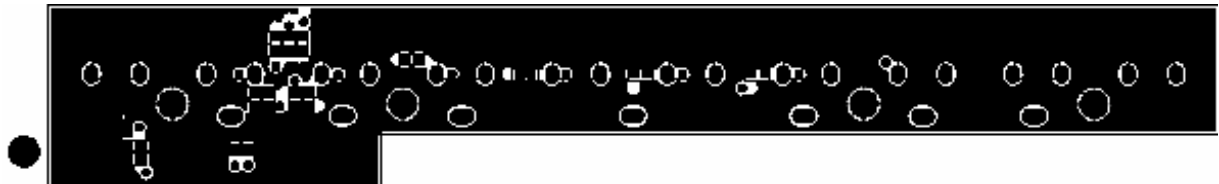


## 6. Key board

A: TOP LAYER



B: BOTTOM LAYER

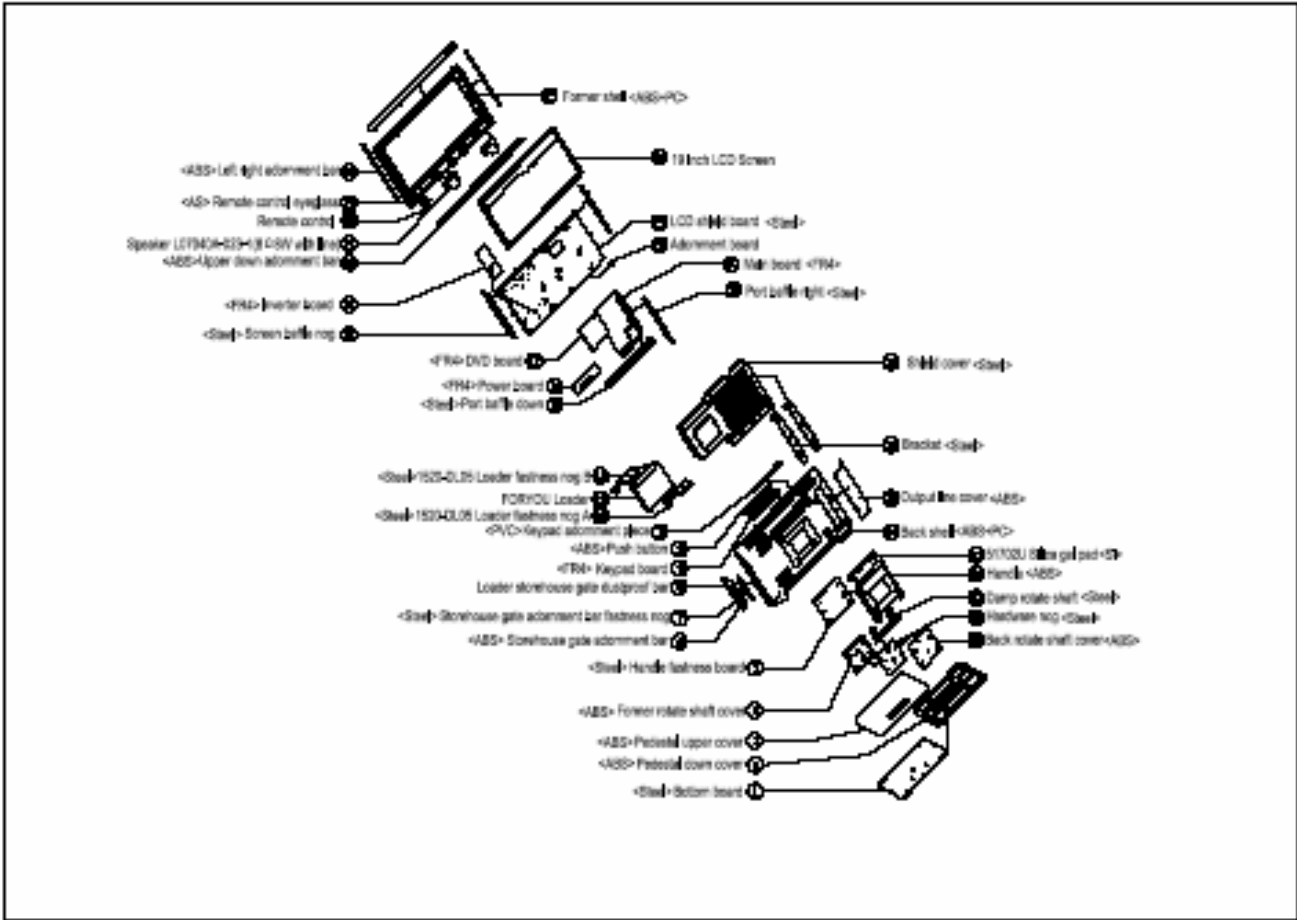




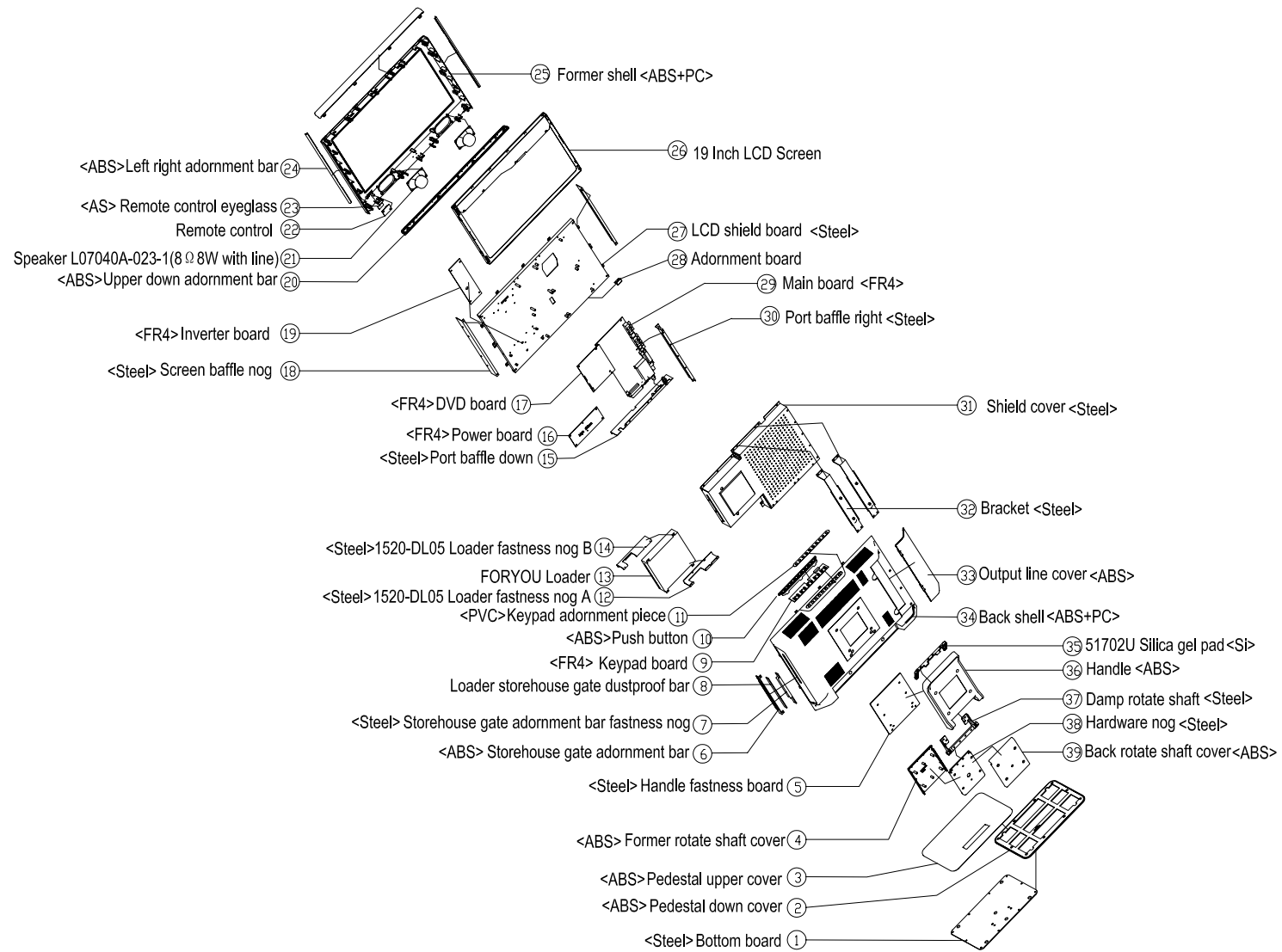
# Part 2 Exploded view

## Exploded view

LVD-1902 Exploded view



# LVD-1902 Exploded view



## Part 3 Key ICs And Assemblies

On Main Board			On DVD board		
Serial No	Position	Type	Serial no	Position	Type
1	3U7	78L09	1	U2	<u>BA033</u>
2	4U5	LM1117MPX-3.3V	2	U3	<u>AZ1117H-1.8V</u>
3	2U3 4U6	FDS9435	3	U6	<u>MT1389DE/E</u>
4	4U2	<u>AIC1084(3.3V)</u>	4	U4	<u>BA5954FP</u>
5	4U1	TL494C	5	U5	<u>BA6287</u>
6	4U3	<u>LM1117DTX-1.8V</u>	6	U8	<u>IS42S16400B-7T</u>
7	3U4	<u>CD4052</u>	7	U9	<u>MX29LV160BBTC-70</u>
8	3U1	<u>MSP3415G</u>	8	U7	<u>24C16</u>
9	1U4	AT24C32AN	9	U11	<u>NJM4558</u>
10	1U1	<u>FSAV330</u>	10	U10	<u>CS4344</u>
11	2U1	<u>AT49BV040B</u>	11	U1	<u>78L05</u>
12	2U5	FLI8125-LF			
13	3U6	<u>TPA3008D2PHP</u>			
14	1U3	24C02			
15	3U9	<u>BH3547F</u>			
16	1U7 1U6 1U8 1U9 1U11 1U12 1U13 1U15	<u>PESD5V0L5</u>			
On Power Board			On Inverter Board		
1	U5	<u>FSCM0765RGWDTU</u>	1	1C1	<u>Bit3193</u>
2	U2	<u>PC817</u>			
3	U3	<u>KA431AZ</u>			

# ICS ON MAIN BOARD

## 1. FSAV330

Low On Resistance Quad SPDT Wide Bandwidth Video Switch

### General Description

The Fairchild Video Switch FSAV330 is a quad single pole/double throw high-speed CMOS TTL-compatible video switch. The low On Resistance of the switch allows inputs to be connected to outputs without adding propagation delay or generating additional ground bounce noise.

When  $\overline{OE}$  is LOW, the select pin connects the A Port to the selected B Port output. When  $\overline{OE}$  is HIGH, the switch is OPEN and a high-impedance state exists between the two ports.

### Features

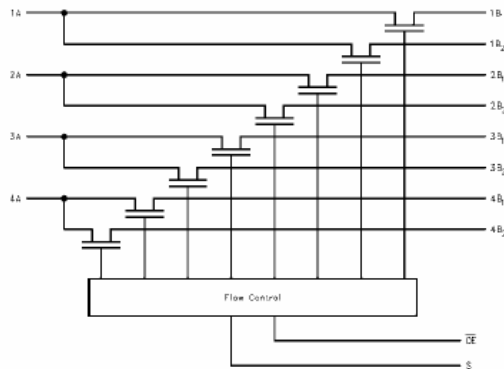
- Replacement for the P15V330
- Wide bandwidth 180 MHz
- $4\Omega$  switch connection between two ports
- Minimal propagation delay through the switch
- Low  $I_{CC}$
- Zero bounce in flow-through mode
- Control inputs compatible with TTL level

### Ordering Code:

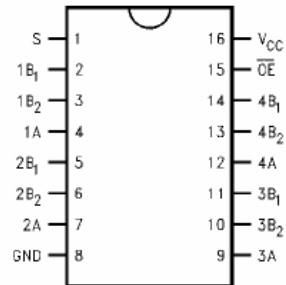
Order Number	Package Number	Package Description
FSAV330M	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
FSAV330QSC	MQA16	16-Lead Quarter Size Outline Package (QSOP), JEDEC MO-137, 0.150" Wide
<b>FSAV330MTC</b>	<b>MTC16</b>	<b>16-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide</b>

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

### Logic Diagram



### Connection Diagram



### Pin Descriptions

Pin Name	Description
$\overline{OE}$	Bus Switch Enable
S	Select Input
A	Bus A
B <sub>1</sub> -B <sub>2</sub>	Bus B

### Truth Table

S	$\overline{OE}$	Function
X	H	Disconnect
L	L	A = B <sub>1</sub>
H	L	A = B <sub>2</sub>

## 2. 74LVX125

Low Voltage Quad Buffer with 3-STATE Outputs.

### General Description

The LVX125 contains four independent non-inverting buffers with 3-STATE outputs. The inputs tolerate voltages up to 7V allowing the interface of 5V systems to 3V systems.

### Features

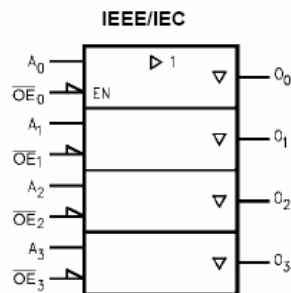
- Input voltage level translation from 5V to 3V
- Ideal for low power/low noise 3.3V applications
- Guaranteed simultaneous switching noise level and dynamic threshold performance

### Ordering Code:

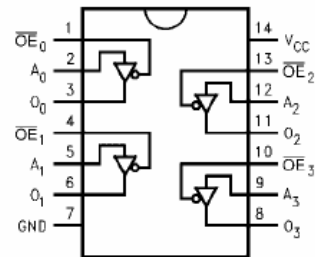
Order Number	Package Number	Package Description
74LVX125M	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150" Narrow
74LVX125SJ	M14D	14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74LVX125MTC	MTC14	14-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

Devices also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

### Logic Symbol



### Connection Diagram



### Truth Table

Inputs		Output
$\overline{OE}_n$	$A_n$	$O_n$
L	L	L
L	H	H
H	X	Z

H = HIGH Voltage Level  
L = LOW Voltage Level  
Z = High Impedance  
X = Immaterial

### Pin Descriptions

Pin Names	Description
$A_n$	Inputs
$\overline{OE}_n$	Output Enable Inputs
$O_n$	Outputs

### Capacitance

Symbol	Parameter	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C to } +85^\circ\text{C}$		Units
		Min	Typ	Max	Min	Max	
$C_{IN}$	Input Capacitance		4.0	10		10	pF
$C_{PD}$	Power Dissipation Capacitance (Note 5)		14				pF

Note 5:  $C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

$$\text{Average operating current can be obtained by the equation: } I_{CC(\text{opr.})} = \frac{C_{PD} \times V_{CC} \times f_{IN} + I_{CC}}{4 \text{ (per bit)}}$$

## 3. AT49BV040B

### Features

- **Single Supply for Read and Write: 2.7V to 5.5V**
- **Fast Read Access Time – 70 ns ( $V_{CC} = 2.7V$  to 3.6V); 55 ns ( $V_{CC} = 4.5V$  to 5.5V)**
- **Internal Program Control and Timer**
- **Flexible Sector Architecture**
  - One 16K Bytes Boot Sector with Programming Lockout
  - Two 8K Bytes Parameter Sectors
  - Eight Main Memory Sectors (One 32K Bytes, Seven 64K Bytes)
- **Fast Erase Cycle Time – 8 Seconds**
- **Byte-by-Byte Programming – 10  $\mu$ s/Byte Typical**
- **Hardware Data Protection**
- **$\overline{DATA}$  Polling or Toggle Bit for End of Program Detection**
- **Low Power Dissipation**
  - 20 mA Active Current
  - 25  $\mu$ A CMOS Standby Current for  $V_{CC} = 2.7V$  to 3.6V
  - 30  $\mu$ A CMOS Standby Current for  $V_{CC} = 4.5V$  to 5.5V
- **Minimum 100,000 Write Cycles**

### Description

The AT49BV040B is a 2.7V to 5.5V in-system reprogrammable Flash Memory. Its 4 megabits of memory is organized as 524,288 words by 8 bits. Manufactured with Atmel's advanced nonvolatile CMOS technology, the device offers an access time of 70 ns ( $V_{CC} = 2.7V$  to 3.6V) and an access time of 55 ns ( $V_{CC} = 4.5V$  to 5.5V). The power dissipation over the industrial temperature range with  $V_{CC} = 2.7V$  to 3.6V is 72 mW and is 110 mW with  $V_{CC} = 4.5V$  to 5.5V.

When the device is deselected, the CMOS standby current is less than 30  $\mu$ A. To allow for simple in-system reprogrammability, the AT49BV040B does not require high input voltages for programming. Reading data out of the device is similar to reading from an EPROM; it has standard  $\overline{CE}$ ,  $\overline{OE}$ , and  $\overline{WE}$  inputs to avoid bus contention. Reprogramming the AT49BV040B is performed by erasing a sector of data and then programming on a byte by byte basis. The byte programming time is a fast 10  $\mu$ s. The end of a program or erase cycle can be optionally detected by the  $\overline{DATA}$  polling or toggle bit feature. Once the end of a byte program cycle has been detected, a new access for a read or program can begin. The typical number of program and erase cycles is in excess of 100,000 cycles.

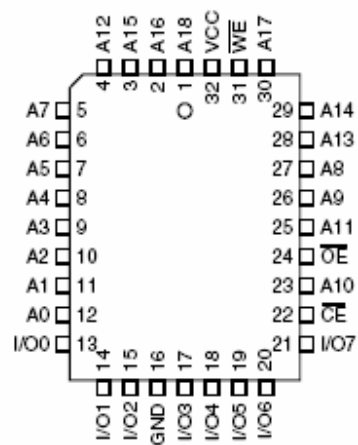
The device is erased by executing a chip erase or a sector erase command sequence; the device internally controls the erase operations. The memory array of the AT49BV040B is organized into two 8K byte parameter sectors, eight main memory sectors, and one boot sector.

The device has the capability to protect the data in the boot sector; this feature is enabled by a command sequence. The 16K-byte boot sector includes a reprogramming lock out feature to provide data integrity. The boot sector is designed to contain user secure code, and when the feature is enabled, the boot sector is permanently protected from being reprogrammed.

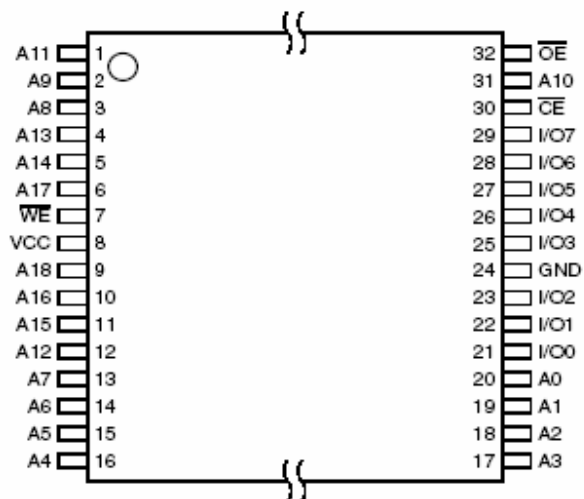
## Pin Configurations

Pin Name	Function
A0 - A18	Addresses
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
WE	Write Enable
I/O0 - I/O7	Data Inputs/Outputs

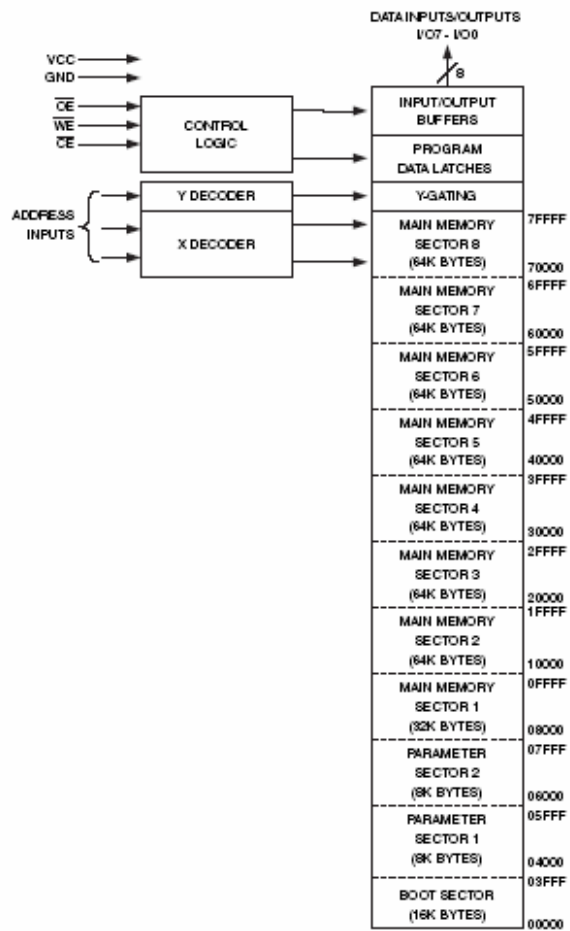
### 32-lead PLCC Top View



### 32-lead VSOP or 32-lead TSOP Top View – Type 1



## Block Diagram





## 4. LM1117

### FEATURES

- Output Current up to 1 A
- Low Dropout Voltage ( 700mV at 1A Output Current )
- Three Terminal Adjustable or Fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V
- 2.85V Device for SCSI-II Active Terminator
- 0.04% Line Regulation, 0.1% Load Regulation
- Very Low Quiescent Current
- Internal Current and Terminal Limit
- Logic-Controlled Electronics Shutdown
- Surface Mount Package SOT-223 & TO-263 (D2-Pack)
- 100% Thermal Limit Burn-In

### APPLICATION

- Active SCSI Terminators
- Portable/Plan Top/Notebook Computers
- High Efficiency Linear Regulators
- SMPS Post Regulators
- Mother B/D Clock Supplies
- Disk Drives
- Battery Chargers

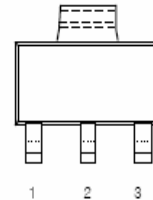
### DESCRIPTION

The LM1117 is a low power positive-voltage regulator designed to meet 1A output current and comply with SCSI-II specifications with a fixed output voltage of 2.85V. This device is an excellent choice for use in battery-powered applications, as active terminators for the SCSI bus, and portable computers.

The LM1117 features very low quiescent current and very low dropout voltage of 700mV at a full load and lower as output current decreases. LM1117 is available as an adjustable or fixed 1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, and 5.0V output voltages.

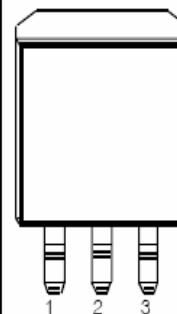
The LM1117 is offered in a 3-pin surface mount package SOT-223 & TO-263. The output capacitor of 10 $\mu$ F or larger is needed for output stability of LM1117 as required by most of the other regulator circuits.

SOT-223 PKG (FRONT VIEW)



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

TO-263 (D2 PKG, FRONT VIEW)



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

### ORDERING INFORMATION

Device (Marking)	Package
LM1117S	SOT-223
LM1117S-XX	
LM1117T	TO-263 (D2)
LM1117T-XX	

(X=Output Voltage=1.5V, 1.8V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V, Adjustable=AD)

## 5. FDS9435A

### Single P-Channel Enhancement Mode Field Effect Transistor

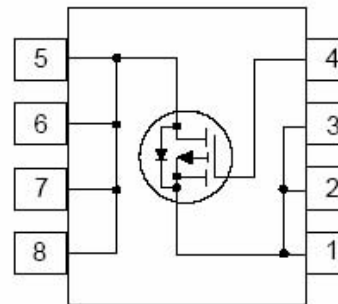
SO-8 P-Channel enhancement mode power field effect transistors are produced using Fairchild's proprietary, high cell density, DMOS technology. This very high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where fast switching, low in-line power loss, and resistance to transients are needed.

#### • Features

-5.3 A, -30 V,  $R_{DS(ON)} = 0.045 \Omega @ V_{GS} = -10 \text{ V}$ ,  
 $R_{DS(ON)} = 0.075 \Omega @ V_{GS} = -4.5 \text{ V}$ .

High density cell design for extremely low RDS(ON).

High power and current handling capability in a widely used surface mount package.



Absolute Maximum Ratings		$T_A = 25^\circ\text{C}$ unless otherwise noted		
Symbol	Parameter	FDS9435A	Units	
$V_{DS}$	Drain-Source Voltage	-30	V	
$V_{GS}$	Gate-Source Voltage	-20	V	
$I_D$	Drain Current - Continuous (Note 1a)	-5.3	A	
	- Pulsed	-50		
$P_D$	Maximum Power Dissipation (Note 1a)	2.5	W	
		(Note 1b)		1.2
		(Note 1c)		1
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
<b>THERMAL CHARACTERISTICS</b>				
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	50	$^\circ\text{C/W}$	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	25	$^\circ\text{C/W}$	

## 6. FLI8125

The FLI8125 is a cost-effective, highly-integrated, mixed signal solution for TV and Digital Video applications. It incorporates a multi-standard video decoder, high-speed triple 8-bit Analog-to-Digital Converter(ADC),and front end switching. An integrated VBI Slicer adds Closed Captioning(CC) and Teletext service support, and the built-in microprocessor enables full system control without external devices.

### Features

<b>INTEGRATED TRIPLE ADC</b>	<b>FAROUDJA DCDI – EDGE™</b>
<ul style="list-style-type: none"> <li>▪ RGB / YPbPr support up to 135MHz</li> <li>▪ SCART – RGB + Fast Blank support</li> <li>▪ Interlaced and progressive scan</li> <li>▪ External OSD support</li> </ul>	<ul style="list-style-type: none"> <li>▪ Edge Correction               <ul style="list-style-type: none"> <li>– Eliminates objectionable stair-casing</li> <li>– Enhances clarity and realism</li> </ul> </li> <li>▪ Horizontal Enhancement</li> <li>▪ Adaptive Contrast and Color (ACC)</li> <li>▪ Active Color Management - II (ACM-II)</li> </ul>
<b>DIGITAL INPUT PORT</b>	<b>DIGITAL OUTPUT</b>
<ul style="list-style-type: none"> <li>▪ 24-bit re-configurable input port</li> </ul>	<ul style="list-style-type: none"> <li>▪ 18/24-bit 85Mhz TTL output</li> <li>▪ Dual LVDS up to SXGA</li> <li>▪ Energy Spectrum Management for reducing EMI</li> <li>▪ Programmable CLUT for gamma correction</li> </ul>
<b>INTEGRATED 2D VIDEO DECODER</b>	<b>OSD CONTROLLER</b>
<ul style="list-style-type: none"> <li>▪ Worldwide NTSC/PAL/SECAM support</li> <li>▪ Macrovision / VCR trick mode support</li> </ul>	<ul style="list-style-type: none"> <li>▪ Up to 4 windows: 1, 2 or 4-bits per pixel color</li> <li>▪ Programmable Font scalar to meet Teletext requirements</li> </ul>
<b>EMBEDDED MICROPROCESSOR</b>	<b>VBI SLICER</b>
<ul style="list-style-type: none"> <li>▪ Turbo 186 core</li> <li>▪ Internal RAM / ROM</li> <li>▪ Serial Flash / Parallel ROM support</li> <li>▪ 2-wire slave controller, UART support</li> <li>▪ Internal RESET Controller</li> <li>▪ GPIOs , Low Bandwidth ADC – 6 input</li> <li>▪ Infra-red Interface</li> </ul>	<ul style="list-style-type: none"> <li>▪ V-Chip, Closed Captioning, XDS, CGMS, WSS decode</li> <li>▪ Teletext 1.5 support</li> </ul>
<b>SCALING ENGINE</b>	<b>JTAG SUPPORT</b>
<ul style="list-style-type: none"> <li>▪ Independent H &amp; V scaling factors</li> <li>▪ 4:2:2 YPbPr or 4:4:4 RGB scaling</li> <li>▪ Anamorphic scaling (non-linear)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Boundary Scan support</li> </ul>

• Pin Input



• Pin List

I/O Legend: A = Analog, I = Input, O = Output, P = Power, G= Ground

**Table 1: Analog Input Port**

Pin Name	No.	I/O	Description
VDD18_A B	158	AP	Analog Power (1.8V) for A & B Channels. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
NC	159		No Connection. Leave this pin open for normal operation.
GND18_C	160	AG	Analog Ground (1.8V Return) for C channel. Must be directly connected to the analog system ground plane on board.
VDD18_C	161	AP	Analog Power (1.8V) for C Channel. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
ADC_TES T	162	O	Analog Front End Test O/P. Leave this Pin open. Used for factory testing purpose only.
AVDD_AD C	163	AP	Analog Power (3.3V) for ADC. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
AGND	164	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
AGND	165	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
SV1P	166	AI	Positive analog sync input for channel 1. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	167	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.

A1P	168	AI	Positive analog input 'A' for channel 1. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	169	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
B1P	170	AI	Positive analog input 'B' for channel 1. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	171	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
C1P	172	AI	Positive analog input 'C' for channel 1. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
AVDD_A	173	AP	Analog Power (3.3V) for ADC of Channel-A. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
AN	174	AI	Negative analog input 'A' for channels 1 through 4. This acts as the return Path for the Sources connected to Channel-A Inputs. This has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network to Analog Ground Plane on board.
AGND	175	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
SV2P	176	AI	Positive analog sync input for channel 2. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	177	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
A2P	178	AI	Positive analog input 'A' for channel 2. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	179	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
B2P	180	AI	Positive analog input 'B' for channel 2. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	181	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
C2P	182	AI	Positive analog input 'C' for channel 2. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
AVDD_B	183	AP	Analog Power (3.3V) for ADC of Channel-B. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
BN	184	AI	Negative analog input 'B' for channels 1 through 4. This acts as the return Path for the Sources connected to Channel-B Inputs. This has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network to Analog Ground Plane on board.
AGND	185	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
SV3P	186	AI	Positive analog sync input for channel 3. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
VDD18_AB	158	AP	Analog Power (1.8V) for A & B Channels. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
GNDS	187	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
A3P	188	AI	Positive analog input 'A' for channel 3. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	189	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
B3P	190	AI	Positive analog input 'B' for channel 3. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	191	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
C3P	192	AI	Positive analog input 'C' for channel 3. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
AVDD_C	193	AP	Analog Power (3.3V) for ADC of Channel-C. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
CN	194	AI	Negative analog input 'C' for channels 1 through 4. This acts as the return Path for the Sources connected to Channel-C Inputs. This has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network to Analog Ground Plane on board.
AGND	195	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
SV4P	196	AI	Positive analog sync input for channel 4. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	197	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
A4P	198	AI	Positive analog input 'A' for channel 4. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	199	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
B4P	200	AI	Positive analog input 'B' for channel 4. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
GNDS	201	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
C4P	202	AI	Positive analog input 'C' for channel 4. The input has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network.
AVDD_SC	203	AP	Analog Power (3.3V) for ADC of SYNC Channel. Must be bypassed with 0.1uF capacitor to the analog system ground plane.

SVN	204	AI	Negative analog sync input for channels 1 through 4. This acts as the Return Path for the Sources connected to SV Channel Inputs. This has to be AC coupled using a series 20 Ohm resistor and 0.1uF Capacitor network to Analog Ground Plane on board.
VO_GND	205	AG	Analog Ground. Must be directly connected to the analog system ground plane on board.
VOOUT2	206	AO	Analog VOUT signal This is the Analog Video Output from the Decoder in the Composite Video format. This can be amplified and be fed to any video display device.
VDD18_SC	207	AP	Analog Power (1.8V) for SYNC Channel. Must be bypassed with 0.1uF capacitor to the analog system ground plane.
GND18_SC	208	AG	Analog Ground (1.8V Return) for SYNC channel. Must be directly connected to the analog system ground plane on board.

**Table 2: Low Bandwidth ADC Input Port**

Pin Name	No	I/O	Description
VDDA33_LBADC	1	AP	Analog Power (3.3V) for Low Bandwidth ADC Block. Must be bypassed with 0.1uF capacitor.
LBADC_IN1	2	AI	Low Bandwidth Analog Input-1. The Input signal connected to this Pin, must be bypassed with a 0.1uF capacitor and could be in the range of 0V to 3.3V (peak to peak).
LBADC_IN2	3	AI	Low Bandwidth Analog Input-2. The Input signal connected to this Pin, must be bypassed with a 0.1uF capacitor and could be in the range of 0V to 3.3V (peak to peak).
LBADC_IN3	4	AI	Low Bandwidth Analog Input-3. The Input signal connected to this Pin, must be bypassed with a 0.1uF capacitor and could be in the range of 0V to 3.3V (peak to peak).
LBADC_IN4	5	AI	Low Bandwidth Analog Input-4. The Input signal connected to this Pin, must be bypassed with a 0.1uF capacitor and could be in the range of 0V to 3.3V (peak to peak).
LBADC_IN5	6	AI	Low Bandwidth Analog Input-5. The Input signal connected to this Pin, must be bypassed with a 0.1uF capacitor and could be in the range of 0V to 3.3V (peak to peak).
LBADC_IN6	7	AI	Low Bandwidth Analog Input-6. The Input signal connected to this Pin, must be bypassed with
LBADC_RTN	8	AG	This Pin provides the Return Path for LBADC inputs. Must be directly connected to the analog system ground plane on board.
VSSA33_LBADC	9	AG	Analog Ground for Low Bandwidth ADC Block. Must be directly connected to the analog system ground plane on board.

**Table 3: RCLK PLL Pins**

Pin Name	No	I/O	Description
GND_RPLL	11	DG	Digital GND for ADC clocking circuit. Must be directly connected to the digital system ground plane.
VDD_RPLL_18	12	DP	Digital power (1.8V) for ADC digital logic. Must be bypassed with capacitor to Ground Plane.
VBUFC_RPLL	13	O	Test Output. Leave this Pin Open. This is reserved for Factory Testing Purpose.
AGND_RPLL	14	AG	Analog ground for the Reference DDS PLL. Must be directly connected to the analog system ground plane.
XTAL	15	AO	Crystal oscillator output.
TCLK	16	AI	Reference clock (TCLK) from the 14.3MHz crystal oscillator.
AVDD_RPLL_33	17	AP	Analog Power (3.3V) for RCLK PLL. Must be bypassed with 0.1uF capacitor.

**Table 4: Digital Video Input Port**

Pin Name	No	I/O	Description
VID_CLK_1	153	I	Video port data clock input meant for Video Input – 1. Up to 75Mhz [Input, 5V-tolerant]
VIDIN_HS	122	I	When Video Input – 1 is in BT656 Mode, this Pin acts as Horizontal Sync Input for Video Input – 2. OR when Video Input – 1 is in 16 Bit Mode this Pin acts as Horizontal Sync Input for Video Input – 1. OR this Pin acts as Horizontal Sync Input for 24 Bit Video Input
VIDIN_VS	121	I	When Video Input – 1 is in BT656 Mode, this Pin acts as Vertical Sync Input for Video Input – 2. OR when Video Input – 1 is in 16 Bit Mode this Pin acts as Vertical Sync Input for Video Input – 1. OR this Pin acts as Vertical Sync Input for 24 Bit Video Input
VID_DATA_IN_0	135	IO	Input YUV data in 8-bit BT656 of Video Input – 1 [Bi-Directional, 5V-tolerant] OR Input Y Data in case of 16 Bit Video Input (CCIR601) of Video Input – 1 OR Input Red Data in case of 24 Bit Video Input
VID_DATA_IN_1	136		
VID_DATA_IN_2	137		
VID_DATA_IN_3	138		
VID_DATA_IN_4	139		
VID_DATA_IN_5	140		
VID_DATA_IN_6	141		
VID_DATA_IN_7	142		
Pin Name	No	I/O	Description

VID_DATA_IN_8	145	IO	Input Pr / Pb Data in case of 16 Bit Video Input (CCIR601) of Video Input – 1 OR Input Green Data in case of 24 Bit Video Input
VID_DATA_IN_9	146		
VID_DATA_IN_10	147		
VID_DATA_IN_11	148		
VID_DATA_IN_12	149		
VID_DATA_IN_13	150		
VID_DATA_IN_14	151		
VID_DATA_IN_15	152		
VID_DATA_IN_16	123	IO	Input Blue Data in case of 24 Bit Video Input OR Video Input – 2 in 8-bit with Embedded Sync / Separate Sync Sync in which case VID_DATA_IN_16 acts as the LSB of the 8-bit Video input and VID_DATA_IN_23 acts as the MSB of the 8-bit Video input.
VID_DATA_IN_17	124		
VID_DATA_IN_18	125		
VID_DATA_IN_19	128		
VID_DATA_IN_20	129		
VID_DATA_IN_21	130		
VID_DATA_IN_22	131		
VID_DATA_IN_23	132		
VID_CLK2	118	I	Video port data clock input meant for Video Input – 2. Up to 75Mhz [Input, 5V-tolerant]
VID_DE/FLD	115	I	Video Active Signal Input or the Field Signal Input from external Digital Video Source.

Note: In case of Multiple Digital Video Input Sources, only one source could be in 8-Bit with embedded Sync (BT656 mode) format.

**Table 5: System Interface**

Pin Name	No	I/O	Description
RESETn	10	I	Hardware Reset (active low) [Schmitt trigger, 5v-tolerant] Connect to ground with 0.01uF (or larger) capacitor.
TEST	20	I	For normal mode of operation connect this Pin to Ground.
GPIO15	21	IO	This pin is available as a general-purpose input/output port. Also it is optionally programmable to give out the external chip select signal meant for external SRAM. Refer to note below.
HSYNC2	22	I	Horizontal Sync signal Input-2. Used when Analog RGB component signal carries separate HSYNC signal.
VSYNC2	23	I	Vertical Sync signal Input-2. Used when Analog RGB component signal carries separate VSYNC signal.
HOST_SCLK	24	IO	Host input clock or 186 UART Data In or JTAG clock signal. [Input, Schmitt trigger, 5V-tolerant]
HOST_SDATA	25	IO	Host input data or 186 UART Data Out or JTAG mode signal. [Bi-directional, Schmitt trigger, slew rate limited, 5V-tolerant]
DDC_SCLK	26	IO	DDC2Bi clock for VGA Port [internal 10K $\Omega$ pull-up resistor]
DDC_SDATA	27	IO	DDC2Bi data for VGA Port [internal 10K $\Omega$ pull-up resistor]
MSTR_SCLK	30	O	Clock signal from Master Serial 2 Wire Interface Controller
MSTR_SDATA	31	IO	Data signal meant for Master Serial 2 Wire interface Controller
TCK	34	IO	This Pin accepts the Input Clock signal in case of Boundary Scan Mode.
TDI	35	IO	This Pin accepts the Input Data signal in case of Boundary Scan Mode.
TMS	36	IO	This Pin accepts the Input Test Mode Select signal in case of Boundary Scan Mode.
TRST	37	IO	This Pin accepts the Boundary Scan Reset signal in case of Boundary Scan Mode.
GPIO6/IRin	38	IO	Input from Infra Red Decoder can be connected to this Pin. When not used, this pin is available as General Purpose Input/output Port.
GPIO7/IRQin	41	IO	Input Interrupt Request signal can be connected to this Pin. When not used, this pin is available as General Purpose Input/output Port.
GPIO8/IRQout	42	IO	This Pin will give out the Interrupt Signal to interrupt external Micro. When not used, this pin is available as General Purpose Input/output Port.
GPIO9/SIPC_SCLK	43	IO	This Pin accepts the Clock signal from External Serial 2 Wire interface Bus if FL18125 is programmed to be in Slave mode. When not used, this pin is available as General Purpose Input/output Port.
GPIO10/SIPC_SDATA/ A18	44	IO	This Pin acts as the Data I/O signal when used with External Serial 2 Wire interface Bus if FL18125 is programmed to be in Slave mode. Or this Pin is programmable to give out Address # 18 from the Internal Micro when used with 512K External Memory. When not used, this pin is available as General Purpose Input/output Port.
GPIO11/PWM0	47	IO	This Pin can be programmed to give out Pulse Width Modulated Output Pulses for external use. When not used, this pin is available as General Purpose Input/output Port.
GPIO12/PWM1	48	IO	This Pin can be programmed to give out Pulse Width Modulated Output Pulses for external use. When not used, this pin is available as General Purpose Input/output Port.
GPIO13/PWM2	51	IO	This Pin can be programmed to give out Pulse Width Modulated Output Pulses for external use. When not used, this pin is available as General Purpose Input/output Port.
<b>Pin Name</b>	<b>No</b>	<b>I/O</b>	<b>Description</b>

GPIO14/PWM3/ SCART16	52	IO	This Pin can be programmed to give out Pulse Width Modulated Output Pulses for external use. Or it can be programmed to sense the Fast Blank Input signal from a SCART I/P source. When not used, this pin is available as General Purpose Input/output Port.
TDO	55	O	This Pin provides the Output Data in case of Boundary Scan Mode.
HSYNC1	156	I	Horizontal Sync signal Input-1. Used when Analog RGB component signal carries separate HSYNC signal.
VSYNC1	157	I	Vertical Sync signal Input-1. Used when Analog RGB component signal carries separate VSYNC signal.
101		O	Clock Output meant for External OSD Controller
102		O	Horizontal Sync Output meant for External OSD Controller
XOSD_CLK	103	O	Vertical Sync Output meant for External OSD Controller
XOSD_HS	104	O	Field Signal Output meant for External OSD Controller
PD20/B4/GPIO0	86	IO	These Pins provide the Panel Data as shown in the TTL Display Interface Table below. These are available as General Purpose Input / Output Pins when not used as Panel Data.
PD21/B5/GPIO1	87		
PD22/B6/GPIO2	88		
PD23/B7/GPIO3	89		

**Table 6: LVDS Display Interface**

Pin Name	No	I/O	Description
PBIAS	53	O	Panel Bias Control (backlight enable) [Tri-state output, 5V- tolerant]
PPWR	54	O	Panel Power Control [Tri-state output, 5V- tolerant]
AVDD_LV_33	56	DP	Digital Power for LVDS Block. Connect to digital 3.3V supply.
VCO_LV	57	O	Reserved. Output for Testing Purpose only at Factory.
AVSS_LV	58	G	Ground for LVDS outputs.
AVDD_OUT_LV_33	59	DP	Digital Power for LVDS outputs. Connect to digital 3.3V supply.
CH3P_LV_E	60	O	These form the Differential Data Output for Channel – 3 (Even).
CH3N_LV_E	61		
CLKP_LV_E	62	O	These form the Differential Clock Output Even Channel.
CLKN_LV_E	63		
CH2P_LV_E	64	O	These form the Differential Data Output for Channel – 2 (Even).
CH2N_LV_E	65		
CH1P_LV_E	66	O	These form the Differential Data Output for Channel – 1 (Even).
CH1N_LV_E	67		
CH0P_LV_E	68	O	These form the Differential Data Output for Channel – 0 (Even).
CH0N_LV_E	69		
AVSS_OUT_LV	70	G	Ground for LVDS outputs.
AVDD_OUT_LV_33	71	DP	Digital Power for LVDS outputs. Connect to digital 3.3V supply.
CH3P_LV_O	72	O	These form the Differential Data Output for Channel – 3 (Odd).
CH3N_LV_O	73		
CLKP_LV_O	74	O	These form the Differential Clock Output Odd Channel.
CLKN_LV_O	75		
CH2P_LV_O	76	O	These form the Differential Data Output for Channel – 2 (Odd).
CH2N_LV_O	77		
CH1P_LV_O	78	O	These form the Differential Data Output for Channel – 1 (Odd).
CH1N_LV_O	79		
CH0P_LV_O	80	O	These form the Differential Data Output for Channel – 0 (Odd).
CH0N_LV_O	81		
AVSS_OUT_LV	82	G	Ground for LVDS outputs.
AVDD_OUT_LV_33	83	DP	Digital Power for LVDS outputs. Connect to digital 3.3V supply.



**Table 7: TTL Display Interface**

Pin Name	No	I/O	Description For 8-bit panels	For 6-bit panels
PBIAS	53	O	Panel Bias Control (backlight enable) [Tri-state output, 5V- tolerant]	
PPWR	54	O	Panel Power Control [Tri-state output, 5V- tolerant]	
AVDD_LV_33	56	DP	Digital Power for TTL Block. Connect to digital 3.3V supply.	
VCO_LV	57	O	Reserved. Output for Testing Purpose only at Factory.	
AVSS_LV	58	G	Ground for TTL outputs.	
AVDD_OUT_LV_33	59	DP	Digital Power for TTL outputs. Connect to digital 3.3V supply.	
R0	60	O	Red channel bit 0 (Even)	Not used.
R1	61	O	Red channel bit 1 (Even)	Not used.
R2	62	O	Red channel bit 2 (Even)	Red channel bit 0 (Even)
R3	63	O	Red channel bit 3 (Even)	Red channel bit 1 (Even)
R4	64	O	Red channel bit 4 (Even)	Red channel bit 2 (Even)
R5	65	O	Red channel bit 5 (Even)	Red channel bit 3 (Even)
R6	66	O	Red channel bit 6 (Even)	Red channel bit 4 (Even)
R7	67	O	Red channel bit 7 (Even)	Red channel bit 5 (Even)
G0	68	O	Green channel bit 0 (Even)	Not used.
G1	69	O	Green channel bit 1 (Even)	Not used.
AVSS_OUT_LV	70	G	Ground for TTL outputs.	
AVDD_OUT_LV_33	71	DP	Digital Power for TTL outputs. Connect to digital 3.3V supply.	
G2	72	O	Green channel bit 2 (Even)	Green channel bit 0 (Even)
G3	73	O	Green channel bit 3 (Even)	Green channel bit 1 (Even)
G4	74	O	Green channel bit 4 (Even)	Green channel bit 2 (Even)
G5	75	O	Green channel bit 5 (Even)	Green channel bit 3 (Even)
G6	76	O	Green channel bit 6 (Even)	Green channel bit 4 (Even)
G7	77	O	Green channel bit 7 (Even)	Green channel bit 5 (Even)
B0	78	O	Blue channel bit 0 (Even)	Not used.
B1	79	O	Blue channel bit 1 (Even)	Not used.
B2	80	O	Blue channel bit 2 (Even)	Blue channel bit 0 (Even)
B3	81	O	Blue channel bit 3 (Even)	Blue channel bit 1 (Even)
AVSS_OUT_LV	82	G	Ground for TTL outputs.	
AVDD_OUT_LV_33	83	DP	Digital Power for TTL outputs. Connect to digital 3.3V supply.	
PD20/B4	86	O	Blue channel bit 4 (Even)	Blue channel bit 2 (Even)
PD21/B5	87	O	Blue channel bit 5 (Even)	Blue channel bit 3 (Even)
PD22/B6	88	O	Blue channel bit 6 (Even)	Blue channel bit 4 (Even)
PD23/B7	89	O	Blue channel bit 7 (Even)	Blue channel bit 5 (Even)
DEN	90	O	Display Data Enable	
DHS	91	O	Display Horizontal Sync.	
DVS	92	O	Display Vertical Sync.	
DCLK	93	O	Display Pixel Clock	
PD24	115	O	Red channel bit 0 (Odd)	Not used.
Pin Name	No	I/O	Description For 8-bit panels	For 6-bit panels
PD25	114	O	Red channel bit 1 (Odd)	Not used.
PD26	113	O	Red channel bit 2 (Odd)	Red channel bit 0 (Odd)
PD27	112	O	Red channel bit 3 (Odd)	Red channel bit 1 (Odd)
PD28	111	O	Red channel bit 4 (Odd)	Red channel bit 2 (Odd)
PD29	110	O	Red channel bit 5 (Odd)	Red channel bit 3 (Odd)
PD30	109	O	Red channel bit 6 (Odd)	Red channel bit 4 (Odd)
PD31	108	O	Red channel bit 7 (Odd)	Red channel bit 5 (Odd)
PD32	107	O	Green channel bit 0 (Odd)	Not used.
PD33	106	O	Green channel bit 1 (Odd)	Not used.
PD34	105	O	Green channel bit 2 (Odd)	Green channel bit 0 (Odd)
PD35	104	O	Green channel bit 3 (Odd)	Green channel bit 1 (Odd)
PD36	103	O	Green channel bit 4 (Odd)	Green channel bit 2 (Odd)
PD37	102	O	Green channel bit 5 (Odd)	Green channel bit 3 (Odd)
PD38	101	O	Green channel bit 6 (Odd)	Green channel bit 4 (Odd)
PD39	123	O	Green channel bit 7 (Odd)	Green channel bit 5 (Odd)
PD40	124	O	Blue channel bit 0 (Odd)	Not used.
PD41	125	O	Blue channel bit 1 (Odd)	Not used.
PD42	128	O	Blue channel bit 2 (Odd)	Blue channel bit 0 (Odd)
PD43	129	O	Blue channel bit 3 (Odd)	Blue channel bit 1 (Odd)
PD44	130	O	Blue channel bit 4 (Odd)	Blue channel bit 2 (Odd)
PD45	131	O	Blue channel bit 5 (Odd)	Blue channel bit 3 (Odd)

PD46	132	O	Blue channel bit 6 (Odd)	Blue channel bit 4 (Odd)
PD47	118	O	Blue channel bit 7 (Odd)	Blue channel bit 5 (Odd)

Note: In case of 24 Bit TTL Panels the RGB Odd Channel Outputs will not be used. In that case they can be made available for other purposes as Address & Data from On-Chip Micro or Digital Video Input Data.

**Table 8: Parallel/Serial ROM Interface**

Pin Name	No	I/O	Description
A17	95	O	256K x8 PROM Address. These pins also have bootstrap functionality. For serial SPI ROM interface: - ROM_ADDR17 will be Serial Clock (ROM_SCLK) - ROM_ADDR16 will be Serial Data Output (ROM_SDO) For 512K X 8 PROM, Address Signal A18 is available thru Pin # 44 which is GPIO10.
A16	96		
A15	100		
A14	101		
A13	102		
A12	103		
A11	104		
A10	105		
A9	106		
A8	107		
A7	108		
A6	109		
A5	110		
A4	111		
A3	112		
A2	113		
A1	114		
A0	115		
D7	132	IO	External PROM data input.
D6	131		
D5	130		
D4	129		
D3	128		
D2	125		
D1	124		
D0	123		
ROM_OEN	118	O	External PROM data Output Enable.
ROM_SDI/ ROM_WEN	97	O	External PROM data Write Enable (for In-System-Programming of FLASH) or Serial Data Input (SDI) for SPI ROM interface.
ROM_SCSN/ ROM_CSN	94	O	External PROM data Chip Select or Serial PROM Chip Select (ROM_SCSN) for SPI ROM interface.

**Table 9: Digital Power and Ground**

Pin Name	No	I/O	Description
RVDD_3.3	32 49 98 116 154	P	Ring VDD. Connect to digital 3.3V.
CVDD_1.8	18 28 39 45 84 119 126 133 143	P	Core VDD. Connect to digital 1.8V.
CRVSS	19 29 33 40 46 50 85 99 117 120 127 134 144 155	G	Chip ground for core and ring.

**Table 10: JTAG Boundary Scan**

Pin Name	No	I/O	Description
TCK	34	I	JTAG Boundary Scan TCK signal
TDO	55	O	JTAG Boundary Scan TDO signal
TDI	35	I	JTAG Boundary Scan TDI signal. Pad has internal 50K pull-up resistor.
TMS	36	I	JTAG Boundary Scan RST signal. Pad has internal 50K pull-up resistor.
TRST	37	I	JTAG Boundary Scan TMS signal. Pad has internal 50K pull-up resistor.

## 7. CD4052B

The CD4052B is a differential 4-Channel multiplexer having two binary control inputs, A and B, and an inhibit input. The two binary signals select 1 of 4 pairs of channels to be turned on and connect the analog inputs to the outputs.

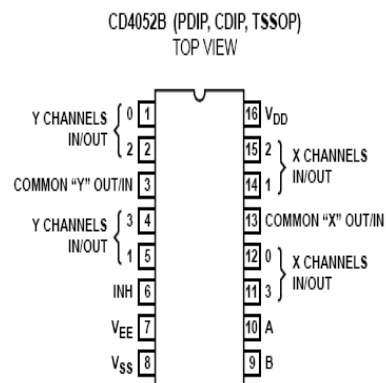
### Features

- Wide Range of Digital and Analog Signal Levels
  - Digital ..... 3V to 20V
  - Analog .....  $\leq 20V_{P-P}$
- Low ON Resistance, 125 $\Omega$  (Typ) Over 15V $_{P-P}$  Signal Input Range for  $V_{DD}-V_{EE} = 18V$
- High OFF Resistance, Channel Leakage of  $\pm 100pA$  (Typ) at  $V_{DD}-V_{EE} = 18V$
- Logic-Level Conversion for Digital Addressing Signals of 3V to 20V ( $V_{DD}-V_{SS} = 3V$  to 20V) to Switch Analog Signals to 20V $_{P-P}$  ( $V_{DD}-V_{EE} = 20V$ )
- Matched Switch Characteristics,  $r_{ON} = 5\Omega$  (Typ) for  $V_{DD}-V_{EE} = 15V$
- Very Low Quiescent Power Dissipation Under All Digital-Control Input and Supply Conditions, 0.2 $\mu W$  (Typ) at  $V_{DD}-V_{SS} = V_{DD}-V_{EE} = 10V$
- Binary Address Decoding on Chip
- 5V, 10V and 15V Parametric Ratings
- 10% Tested for Quiescent Current at 20V
- Maximum Input Current of 1 $\mu A$  at 18V Over Full Package Temperature Range, 100nA at 18V and 25 $^{\circ}C$
- Break-Before-Make Switching Eliminates Channel Overlap

### Applications

- Analog and Digital Multiplexing and Demultiplexing
- A/D and D/A Conversion
- Signal Gating

### • Pinouts



## 8. AT24C32AN

2-Wire Serial EEPROM 32K (4096 x 8)

### Features

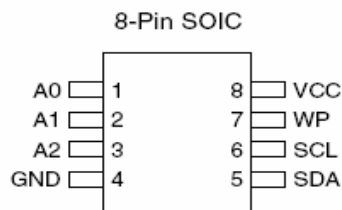
- **Low-Voltage and Standard-Voltage Operation**
  - 2.7 ( $V_{CC} = 2.7V$  to 5.5V)
  - 1.8 ( $V_{CC} = 1.8V$  to 5.5V)
- **Low-Power Devices ( $I_{SB} = 2 \mu A$  @ 5.5V) Available**
- **Internally Organized 4096 x 8, 8192 x 8**
- **2-Wire Serial Interface**
- **Schmitt Trigger, Filtered Inputs for Noise Suppression**
- **Bidirectional Data Transfer Protocol**
- **100 kHz (1.8V) and 400 kHz (2.5V) Clock Rate for AT24C32A**
- **400 kHz (1.8V) Clock Rate for AT24C64A**
- **Write Protect Pin for Hardware Data Protection**
- **32-Byte Page Write Mode (Partial Page Writes Allowed)**
- **Self-Timed Write Cycle (10 ms max)**
- **High Reliability**
  - **Endurance: 1 Million Write Cycles**
  - **Data Retention: 100 Years**
- **Automotive Grade and Extended Temperature Devices Available**
- **8-Pin JEDEC PDIP and 8-Pin JEDEC SOIC Packages**

### Description

The AT24C32A/64A provides 32,768/65,536 bits of serial electrically erasable and programmable read only memory (EEPROM) organized as 4096/8192 words of 8 bits each. The device's cascadable feature allows up to 8 devices to share a common 2-wire bus. The device is optimized for use in many industrial and commercial applications where low power and low voltage operation are essential. The AT24C32A/64A is available in space saving 8-pin JEDEC PDIP and 8-pin JEDEC SOIC packages and is accessed via a 2-wire serial interface. In addition, the entire family is available in 2.7V (2.7V to 5.5V) and 1.8V (1.8V to 5.5V) versions.

### Pin Configurations

Pin Name	Function
A0 - A2	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect



## Pin Description

**SERIAL CLOCK (SCL):** The SCL input is used to positive edge clock data into each EEPROM device and negative edge clock data out of each device.

**SERIAL DATA (SDA):** The SDA pin is bidirectional for serial data transfer. This pin is open-drain driven and may be wire-ORed with any number of other open-drain or open collector devices.

**DEVICE/PAGE ADDRESSES (A2, A1, A0):** The A2, A1 and A0 pins are device address inputs that are hard wired or left not connected for hardware compatibility with AT24C16. When the pins are hardwired, as many as eight 32K/64K devices may be addressed on a single bus system (device addressing is discussed in detail under the Device Addressing section). When the pins are not hardwired, the default A<sub>2</sub>, A<sub>1</sub>, and A<sub>0</sub> are zero.

**WRITE PROTECT (WP):** The write protect input, when tied to GND, allows normal write operations. When WP is tied high to V<sub>CC</sub>, all write operations to the memory are inhibited. If left unconnected, WP is internally pulled down to GND. Switching WP to V<sub>CC</sub> prior to a write operation creates a software write protect function.

## 9. TPA3008D2

10-W STEREO CLASS-D AUDIO POWER AMPLIFIER.

### FEATURES

- 10-W/Channel Into an 16- $\Omega$  Load From a 17-V Supply
- Up to 92% Efficient, Class-D Operation Eliminates Need For Heatsinks
- 8.5-V to 18-V Single-Supply Operation
- Four Selectable, Fixed Gain Settings
- Differential Inputs Minimizes Common-Mode Noise
- Space-Saving, Thermally Enhanced PowerPAD™ Packaging
- Thermal and Short-Circuit Protection With Auto Recovery Option
- Pinout Similar to TPA3000D Family

### DESCRIPTION

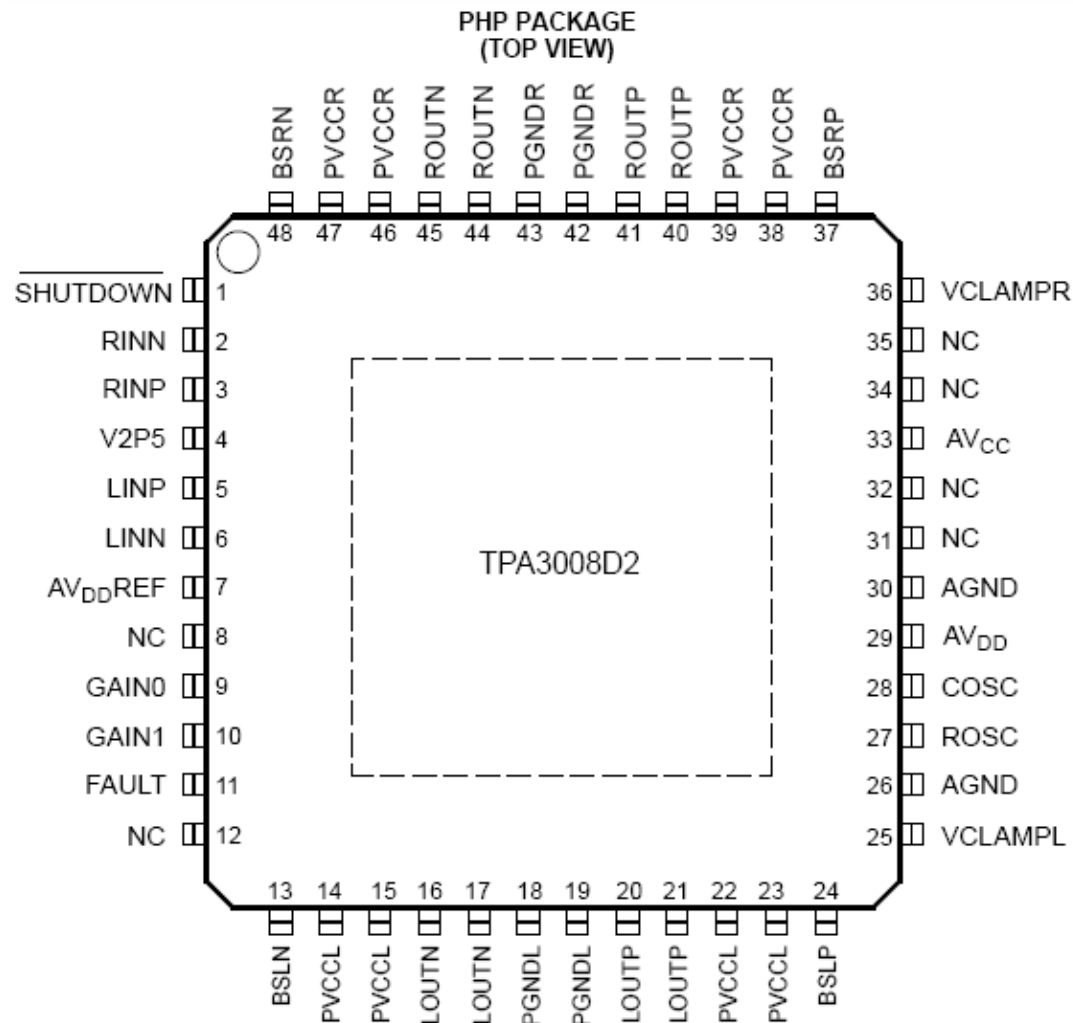
The TPA3008D2 is a 10-W (per channel) efficient, class-D audio amplifier for driving bridged-tied stereo speakers. The TPA3008D2 can drive stereo speakers as low as 8  $\Omega$ . The high efficiency of the TPA3008D2 eliminates the need for external heatsinks when playing music.

The gain of the amplifier is controlled by two gain select pins. The gain selections are 15.3, 21.2, 27.2, and 31.8 dB.

The outputs are fully protected against shorts to GND, VCC, and output-to-output shorts. A fault terminal allows short-circuit fault reporting and automatic recovery. Thermal protection ensures that the maximum junction temperature is not exceeded.

### APPLICATIONS

- LCD Monitors and TVs
- All-In-One PCs



• Pin Description

TERMINAL FUNCTIONS

PIN NAME	PIN NUMBER	I/O	DESCRIPTION
AGND	26, 30	-	Analog ground for digital/analog cells in core
AV <sub>CC</sub>	33	-	High-voltage analog power supply, not connected internally to PVCCR or PVCLL
AV <sub>DD</sub>	29	O	5-V Regulated output for use by internal cells and GAIN0, GAIN1 pins only. Not specified for driving other external circuitry.
AV <sub>DD</sub> REF	7	O	5-V Reference output—connect to gain setting resistor or directly to GAIN0, GAIN1.
BSLN	13	-	Bootstrap I/O for left channel, negative high-side FET
BSLP	24	-	Bootstrap I/O for left channel, positive high-side FET
BSRN	48	-	Bootstrap I/O for right channel, negative high-side FET
BSRP	37	-	Bootstrap I/O for right channel, positive high-side FET
COSC	28	I/O	I/O for charge/discharging currents onto capacitor for ramp generator.
FAULT	11	O	Short-circuit detect fault output. FAULT = high, short-circuit detected. FAULT = low, normal operation. Status is reset when power is cycled or SHUTDOWN is cycled.
GAIN0	9	I	Gain select least significant bit. TTL logic levels with compliance to AV <sub>DD</sub> .
GAIN1	10	I	Gain select most significant bit. TTL logic levels with compliance to AV <sub>DD</sub> .
LINN	6	I	Negative audio input for left channel
LINP	5	I	Positive audio input for left channel
LOUTN	16, 17	O	Class-D 1/2-H-bridge negative output for left channel
LOUTP	20, 21	O	Class-D 1/2-H-bridge positive output for left channel
NC	8, 12, 31, 32, 34, 35	-	No internal connection
PGNDL	18, 19	-	Power ground for left channel H-bridge
PGNDR	42, 43	-	Power ground for right channel H-bridge
PVCLL	14, 15	-	Power supply for left channel H-bridge (internally connected to pins 22 and 23), not connected to PVCCR or AV <sub>CC</sub> .
PVCLL	22, 23	-	Power supply for left channel H-bridge (internally connected to pins 14 and 15), not connected to PVCCR or AV <sub>CC</sub> .
PVCCR	38, 39	-	Power supply for right channel H-bridge (internally connected to pins 46 and 47), not connected to PVCLL or AV <sub>CC</sub> .
PVCCR	46, 47	-	Power supply for right channel H-bridge (internally connected to pins 38 and 39), not connected to PVCLL or AV <sub>CC</sub> .
RINP	3	I	Positive audio input for right channel
RINN	2	I	Negative audio input for right channel
ROSC	27	I/O	I/O current setting resistor for ramp generator.
ROUTN	44, 45	O	Class-D 1/2-H-bridge negative output for right channel
ROUTP	40, 41	O	Class-D 1/2-H-bridge positive output for right channel
SHUTDOWN	1	I	Shutdown signal for IC (low = shutdown, high = operational). TTL logic levels with compliance to V <sub>CC</sub> .
VCLAMPL	25	-	Internally generated voltage supply for left channel bootstrap capacitors.
VCLAMPR	36	-	Internally generated voltage supply for right channel bootstrap capacitors.
V2P5	4	O	2.5-V Reference for analog cells.
Thermal Pad	-	-	Connect to AGND and PGND—should be the center point for both grounds. Internal resistive connection to AGND.

## 10. TL494

### PULSE-WIDTH-MODULATION CONTROL CIRCUITS

- Complete PWM Power Control Circuitry
- Uncommitted Outputs for 200-mA Sink or Source Current
- Output Control Selects Single-Ended or Push-Pull Operation
- Internal Circuitry Prohibits Double Pulse at Either Output
- Variable Dead Time Provides Control Over Total Range
- Internal Regulator Provides a Stable 5-V Reference Supply With 5% Tolerance
- Circuit Architecture Allows Easy Synchronization

#### description

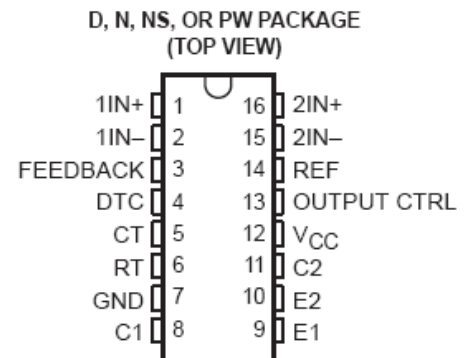
The TL494 incorporates all the functions required in the construction of a pulse-width-modulation (PWM) control circuit on a single chip. Designed primarily for power-supply control, this device offers the flexibility to tailor the power-supply control circuitry to a specific application.

The TL494 contains two error amplifiers, an on-chip adjustable oscillator, a dead-time control (DTC) comparator, a pulse-steering control flip-flop, a 5-V, 5%-precision regulator, and output-control circuits.

The error amplifiers exhibit a common-mode voltage range from  $-0.3\text{ V}$  to  $V_{CC} - 2\text{ V}$ . The dead-time control comparator has a fixed offset that provides approximately 5% dead time. The on-chip oscillator can be bypassed by terminating RT to the reference output and providing a sawtooth input to CT, or it can drive the common circuits in synchronous multiple-rail power supplies.

The uncommitted output transistors provide either common-emitter or emitter-follower output capability. The TL494 provides for push-pull or single-ended output operation, which can be selected through the output-control function. The architecture of this device prohibits the possibility of either output being pulsed twice during push-pull operation.

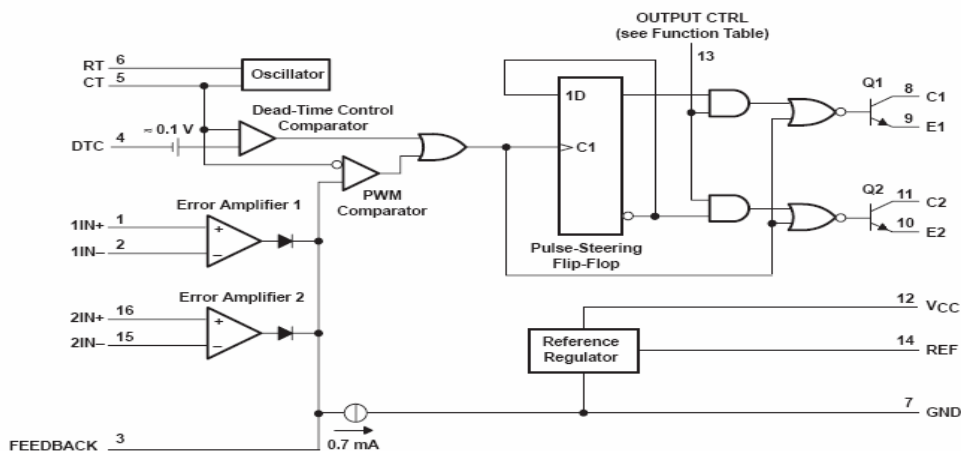
The TL494C is characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ . The TL494I is characterized for operation from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .



FUNCTION TABLE

INPUT TO OUTPUT CTRL	OUTPUT FUNCTION
$V_I = \text{GND}$	Single-ended or parallel output
$V_I = V_{\text{ref}}$	Normal push-pull operation

#### functional block diagram





# ICS ON DVD BOARD

## 1. BA5954

The AM5954 is a four-channel BTL driver IC for driving the motors and actuators such as used in CD-ROM drives. Two of the channels use current feedback to minimize the current phase shift caused by the influence of loading inductance.

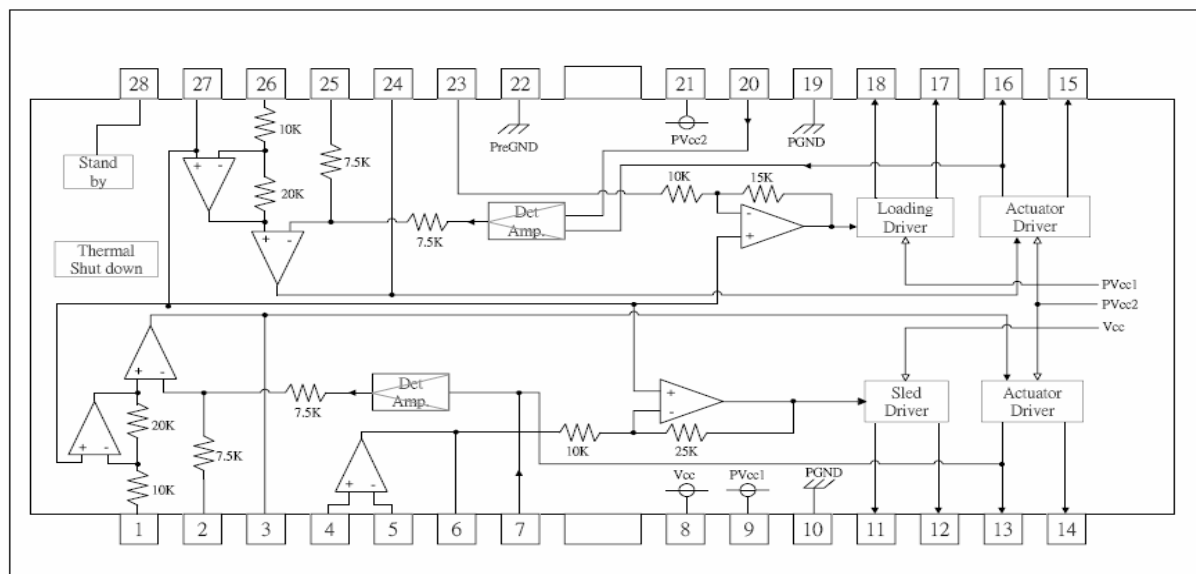
- **Applications**

BTL driver for CD, CD-ROM and DVD.

- **Features**

- 1) Two channels are current-type BTL drivers for actuators for tracking and focus, two channels are voltage-type BTL driver for sled and loading motors.
- 2) Wide dynamic range [9.0V(*typ*) when  $V_{cc}=PV_{cc}=12V$ , at  $R_L=8\Omega$  load].
- 3) Separating power of  $V_{cc}$  and  $PV_{cc}$  to improve power efficiency by a low supply voltage for tracking and focus.
- 4) Level shift circuit built-in.
- 5) Thermal shut down circuit built-in.
- 6) Standby mode built-in.
- 7) **Dual actuator drivers:**  
The drivers use current feedback to minimize the current phase shift caused by the influence of the load inductance. The output structure are two power OPAMPS in bridge configuration.
- 8) **Sled motor driver:**  
A general purpose input OP provides differential input for signal addition. The output structure are two power OPAMPS in bridge configuration.
- 9) **Loading driver:**  
Single input linear BTL driver. The output structure are two power OPAMPS in bridge configuration.

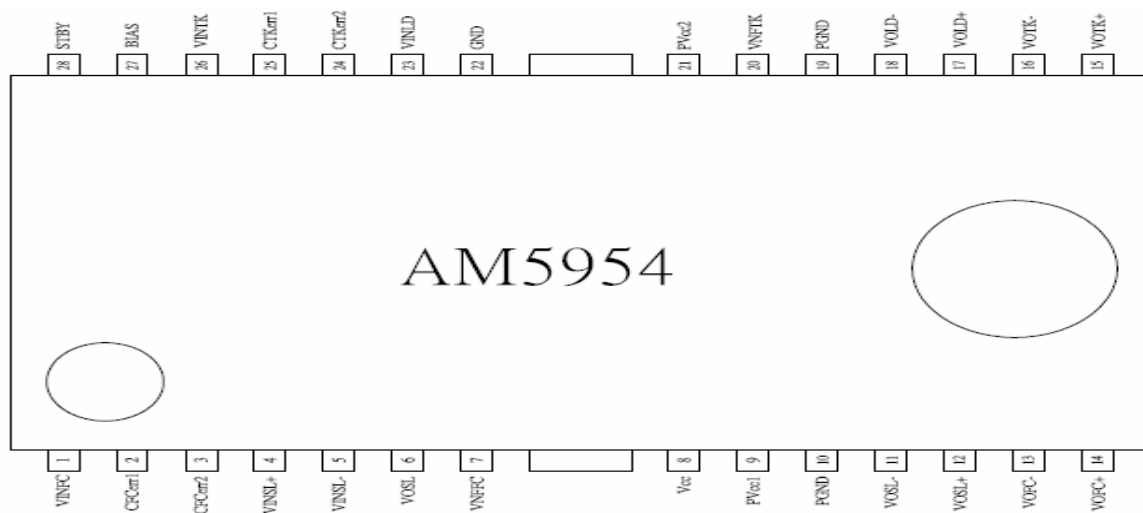
- **Block diagram**



● **Pin description**

PIN No	Pin Name	Function
1	VINFC	Input for focus driver
2	CFCerr1	Connection of capacitor for the error amp filter
3	CFCerr2	Connection of capacitor for the error amp filter
4	VINSL+	OPAMP input (+) for the sled driver
5	VINSL-	OPAMP input (-) for the sled driver
6	VOSL	OPAMP output for the sled driver
7	VNFFC	Focus driver feedback pin
8	Vcc	Vcc for pre-drive block and power block of sled
9	PVcc1	Vcc for power block of loading
10	PGND	GND for power block
11	VOSL-	Sled driver output (-)
12	VOSL+	Sled driver output (+)
13	VOFC-	Focus driver output (-)
14	VOFC+	Focus driver output (+)
15	VOTK+	Tracking driver output (+)
16	VOTK-	Tracking driver output (-)
17	VOLD+	Loading driver output (+)
18	VOLD-	Loading driver output (-)
19	PGND	GND for power block
20	VNFTK	Feedback for tracking driver
21	PVcc2	Vcc for power block of tracking and focus
22	GND	GND for pre-drive block
23	VINLD	Input for loading driver
24	CTKerr2	Connection of capacitor for the error amp filter
25	CTKerr1	Connection of capacitor for the error amp filter
26	VINTK	Input for tracking driver
27	BIAS	Input for reference voltage
28	STBY	Input for standby control

● **Pin configuration**



## 2. MT1389HD

Abbr. :

SR : Slew Rate

PU : Pull Up

PD : Pull Down

SMT : Schmitt Trigger

2MA~16MA : Output buffer driving strength.

Pin	Main	Alt.	Type	Description
<b>RF Interface ( 26 )</b>				
231	RFGND18		Ground	Analog ground
232	RFVDD18		Power	Analog power 1.8V
252	OSP		Analog output	RF Offset cancellation capacitor connecting
253	OSN		Analog output	RF Offset cancellation capacitor connecting
254	RFGC		Analog output	RF AGC loop capacitor connecting for DVD-ROM
255	IREF		Analog Input	Current reference input. It generates reference current for RF path. Connect an external 15K resistor to this pin and AVSS.
256	AVDD3		Power	Analog power 3.3V
1	AGND		Ground	Analog ground
2	DVDA		Analog Input	AC coupled input path A
3	DVDB		Analog Input	AC coupled input path B
4	DVDC		Analog Input	AC coupled input path C
5	DVDD		Analog Input	AC coupled input path D
6	DVDRFIP		Analog Input	AC coupled DVD RF signal input RFIP
7	DVDRFIN		Analog Input	AC coupled DVD RF signal input RFIN
8	MA		Analog Input	DC coupled main-beam RF signal input A
9	MB		Analog Input	DC coupled main-beam RF signal input B
10	MC		Analog Input	DC coupled main-beam RF signal input C
11	MD		Analog Input	DC coupled main-beam RF signal input D
12	SA		Analog Input	DC coupled sub-beam RF signal input A
13	SB		Analog Input	DC coupled sub-beam RF signal input B
14	SC		Analog Input	DC coupled sub-beam RF signal input C
15	SD		Analog Input	DC coupled sub-beam RF signal input D
16	CDFON		Analog Input	CD focusing error negative input
17	CDFOP		Analog Input	CD focusing error positive input
18	TNI		Analog Input	3 beam satellite PD signal negative input
19	TPI		Analog Input	3 beam satellite PD signal positive input

<b>ALPC ( 4 )</b>				
Pin	Main	Alt.	Type	Description
20	MDI1		Analog Input	Laser power monitor input
21	MDI2		Analog Input	Laser power monitor input
22	LDO2		Analog Output	Laser driver output
23	LDO1		Analog Output	Laser driver output

<b>ADC Power ( 2 )</b>				
244	ADCVDD3		Power	Analog 3.3V Power for ADC
245	ADCVSS		Ground	Analog ground for ADC
<b>VPLL ( 3 )</b>				
43	VPLLVSS		Ground	Analog ground for VPLL
44	CAPPAD		Analog Input	VPLL External Capacitance connection
45	VPLLVDD3		Power	Analog 3.3V Power for VPLL
<b>Reference Voltage ( 3 )</b>				
28	V2REFO		Analog output	Reference voltage 2.8V
29	V20		Analog output	Reference voltage 2.0V
30	VREFO		Analog output	Reference voltage 1.4V
<b>Analog Monitor Output ( 7 )</b>				
24	SVDD3		Power	Analog power 3.3V
25	CSO	RFOP	Analog output	1) 2) Central servo Positive main beam summing output
26	RFLVL	RFON	Analog output	1) 2) RFRP low pass, or Negative main beam summing output
27	SGND		Ground	Analog ground
31	FEO		Analog output	Focus error monitor output
32	TEO		Analog output	Tracking error monitor output
33	TEZISLV		Analog output	TE Slicing Level
<b>Analog Servo Interface ( 6 )</b>				
246	RFVDD3		Power	Analog Power
247	RFRPDC		Analog output	RF ripple detect output
248	RFRPAC		Analog Input	RF ripple detect input(through AC-coupling)
249	HRFZC		Analog Input	High frequency RF ripple zero crossing
250	CRTPLP		Analog output	Defect level filter capacitor connecting
251	RFGND		Ground	Analog Power

<b>RF Data PLL Interface ( 9 )</b>				
<b>Pin</b>	<b>Main</b>	<b>Alt.</b>	<b>Type</b>	<b>Description</b>
235	JITFO		Analog output	The output terminal of RF jitter meter.
236	JITFN		Analog Input	The input terminal of RF jitter meter.
237	PLLVSS		Ground	Ground pin for data PLL and related analog circuitry.
238	IDACEXLP		Analog output	Data PLL DAC Low-pass filter
239	PLLVDD3		Power	Power pin for data PLL and related analog circuitry.
240	LPFON		Analog Output	The negative output of loop filter amplifier
241	LPFIP		Analog Input	The positive input terminal of loop filter amplifier.
242	LPFIN		Analog Input	The negative input terminal of loop filter amplifier.
243	LPFOP		Analog Output	The positive output of loop filter amplifier
<b>Motor and Actuator Driver Interface ( 10 )</b>				
34	OP_OUT		Analog output	Op amp output.
35	OP_INN		Analog input	Op amp negative input
36	OP_INP		Analog input	Op amp positive input
37	DMO		Analog Output	Disk motor control output. PWM output.
38	FMO		Analog Output	Feed motor control. PWM output.
39	TROPENP W M		Analog Output	Tray PWM output / Tray open output.
40	PWMOUT 1	V_ADIN9	Analog Output	1) 1st General PWM output, or 2) Version AD input 9
41	TRO		Analog Output	Tracking servo output. PDM output of tracking servo compensator.
42	FOO		Analog Output	Focus servo output. PDM output of focus servo compensator
50	FG (Digital pin)	V_ADIN8	LVTTL 3.3V Input, Schmitt Input, pull up , with analog input path for V_ADIN8	1) Motor Hall sensor input, or 2) Version AD input 8
<b>General Power/Ground ( 18 )</b>				
55,93, 142,160, 174, 213	DVDD18		Power	1.8V power pin for internal digital circuitry
81,178	DVSS		Ground	1.8V Ground pin for internal digital circuitry
65,96,11 8, 131,145, 156, 170, 208	DVDD3		Power	3.3V power pin for internal digital circuitry
90, 148	DVSS		Ground	3.3V Ground pin for internal digital circuitry
<b>Micro Controller and Flash Interface (48)</b>				
<b>Pin</b>	<b>Main</b>	<b>Alt.</b>	<b>Type</b>	<b>Description</b>

62	HIGHA0		Input 2~16MA, SR PU	Microcontroller address 8
74	HIGHA1		Input 2~16MA, SR PU	Microcontroller address 9
73	HIGHA2		Input 2~16MA, SR PU	Microcontroller address 10
72	HIGHA3		Input 2~16MA, SR PU	Microcontroller address 11
71	HIGHA4		Input 2~16MA, SR PU	Microcontroller address 12
70	HIGHA5		Input 2~16MA, SR PU	Microcontroller address 13
69	HIGHA6		Input 2~16MA, SR PU	Microcontroller address 14
68	HIGHA7		Input 2~16MA, SR PU	Microcontroller address 15
89	AD7		Input 2~16MA, SR	Microcontroller address/data 7
86	AD6		Input 2~16MA, SR	Microcontroller address/data 6
85	AD5		Input 2~16MA, SR	Microcontroller address/data 5
84	AD4		Input 2~16MA, SR	Microcontroller address/data 4
83	AD3		Input 2~16MA, SR	Microcontroller address/data 3
82	AD2		Input 2~16MA, SR	Microcontroller address/data 2
80	AD1		Input 2~16MA, SR	Microcontroller address/data 1
79	AD0		Input 2~16MA, SR	Microcontroller address/data 0
92	IOA0		Input 2~16MA, SR PU	Microcontroller address 0 / IO

Pin	Main	Alt.	Type	Description
77	IOA1		Input 2~16MA, SR PU	Microcontroller address 1 / IO
56	IOA2		Input 2~16MA, SR PU	Microcontroller address 2 / IO
57	IOA3		Input 2~16MA, SR PU	Microcontroller address 3 / IO
58	IOA4		Input 2~16MA, SR PU	Microcontroller address 4 / IO
59	IOA5		Input 2~16MA, SR PU	Microcontroller address 5 / IO
60	IOA6		Input 2~16MA, SR PU	Microcontroller address 6 / IO
61	IOA7		Input 2~16MA, SR PU	Microcontroller address 7 / IO
67	A16		Output 2~16MA, SR	Flash address 16
91	A17		Output 2~16MA, SR	Flash address 17
63	IOA18		Input 2~16MA, SR SMT	Flash address 18 / IO
64	IOA19		Input 2~16MA, SR SMT	Flash address 19 / IO
75	IOA20		Input 2~16MA, SR SMT	Flash address 20 / IO
87	IOA21		Input 2~16MA, SR SMT	1) Flash address 21 / IO 2) While External FLASH size <= 2MB: I) GPIO

88	ALE		Input 2~16MA, SR PU, SMT	Microcontroller address latch enable
----	-----	--	--------------------------------	--------------------------------------

Pin	Main	Alt.	Type	Description
78	IIOE#		Input 2~16MA, SR SMT	Flash output enable, active low / IO
66	IOWR#		Input 2~16MA, SR SMT	Flash write enable, active low / IO
76	IOCS#		Input 2~16MA, SR PU, SMT	Flash chip select, active low / IO
94	UWR#		Input 2~16MA, SR PU, SMT	Microcontroller write strobe, active low
95	URD#		Input 2~16MA, SR PU, SMT	Microcontroller read strobe, active low
97	UP1_2		Input 4MA, SR PU, SMT	Microcontroller port 1-2
98	UP1_3		Input 4MA, SR PU, SMT	Microcontroller port 1-3
99	UP1_4		Input 4MA, SR PU, SMT	Microcontroller port 1-4
100	UP1_5		Input 4MA, SR PU, SMT	Microcontroller port 1-5
101	UP1_6	SCL	Input 4MA, SR PU, SMT	1) Microcontroller port 1-6 2) I <sup>2</sup> C clock pin
102	UP1_7	SDA	Input 4MA, SR PU, SMT	1) Microcontroller port 1-7 2) I <sup>2</sup> C data pin
103	UP3_0	RXD	Input 4MA, SR PU, SMT	1) Microcontroller port 3-0 2) 8032 RS232 RXD
104	UP3_1	TXD	Input 4MA, SR PU, SMT	1) Microcontroller port 3-1 2) 8032 RS232 TXD



105	UP3_4	RXD SCL	Input 4MA, SR PU, SMT	1) Microcontroller port 3-4 2) Hardwired RD232 RXD 3) I <sup>2</sup> C clock pin
106	UP3_5	TXD SDA	Input 4MA, SR PU, SMT	1) Microcontroller port 3-5 2) Hardwired RD232 TXD 3) I <sup>2</sup> C data pin
109	IR		Input SMT	IR control signal input
110	INTO#		Input 4MA, SR PU, SMT	Microcontroller external interrupt 0, active low

<b>Audio interface ( 28 )</b>				
<b>Pin</b>	<b>Main</b>	<b>Alt.</b>	<b>Type</b>	<b>Description</b>
204	SPMCLK	SCLK0	Input Non-pull	1) Audio DAC master clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 clock pin II) GPIO
205	SPDATA	SDIN0	Input Non-pull	1) Audio data of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-in II) GPIO
206	SPLRCK	SDO0	Input Non-pull	1) Audio left/right channel clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 data-out II) GPIO
207	SPBCK	SDCS0 ASDATA5	Input Non-pull	1) Audio bit clock of SPDIF input 2) While SPDIF input is not used: I) Serial interface port 0 chip select II) Audio serial data 5 part I : DSD data sub-woofer channel or Microphone output III) GPIO
209	ALRCK		Input 4MA, PD, SMT	1) Audio left/right channel clock Trap value in power-on reset: I) 1 : use external 373 II) 0: use internal 373
210	ABCK	Fs64	Output 4MA Non-pull	1) Audio bit clock 2) Phase de-modulation
211	ACLK		Input 4MA	Audio DAC master clock

			Non-pull	
197	ASDATA0		Input 4MA PD SMT	1) Audio serial data 0 (Front-Left/Front-Right) 2) DSD data left channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While using external channels: I) GPO_2
202	ASDATA1		Input 4MA PD SMT	1) Audio serial data 1 (Left-Surround/Right-Surround) 2) DSD data right channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While using external channels: I) GPO_1
203	ASDATA2		Input 4MA PD SMT	1) Audio serial data 2 (Center/LFE) DSD data left surround channel Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation While using external channels: I) GPO_0
212	ASDATA3		Input 4MA PD SMT	1) Audio serial data 3 (Center-back/ Center-left-back/Center-right-back, in 6.1 or 7.1 mode) 2) DSD data right surround channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) GPO_0
214	ASDATA4	INT1#	Input 4MA PD SMT	1) Audio serial data 4 (Down-mixed Left/Right) 2) DSD data center channel 3) Trap value in power-on reset : I) 1 : manufactory test mode II) 0 : normal operation 4) While only 2 channels output: I) Microcontroller external interrupt 1 II) GPO_0
215	MC_DATA	INT2#	Input PD SMT	1) Microphone serial input 2) While not support Microphone: I) Microcontroller external interrupt 2 II) GPO_0
216	SPDIF		Output 2~16MA, SR : ON/OFF Non-pull	SPDIF output

217	APLLVDD3		Power	3.3V Power pin for audio clock circuitry
218	APLLCAP		Analog Input	APLL External Capacitance connection

219	APLLVSS		Ground	Ground pin for audio clock circuitry
220	ADACVSS2		Ground	Ground pin for AUDIO DAC circuitry
221	ADACVSS1		Ground	Ground pin for AUDIO DAC circuitry
222	ARF	GPIO	Output	1) AUDIO DAC Sub-woofer channel output While internal 2) AUDIO DAC not used: GPIO
223	ARS	GPIO	Output	1) AUDIO DAC Right Surround channel output 2) While internal AUDIO DAC not used: a. SDATA3 b. GPIO
224	AR	GPIO	Output	1) AUDIO DAC Right channel output 2) While internal AUDIO DAC not used: a. SDATA1 b. GPIO
225	AVCM		Analog	AUDIO DAC reference voltage
226	AL	GPIO	Output	1) AUDIO DAC Left Surround channel output 2) While internal AUDIO DAC not used: a. SDATA2 b. GPIO
227	ALS	GPIO	Output	1) AUDIO DAC Left Surround channel output 2) While internal AUDIO DAC not used: a. SDATA0 b. GPIO
228	ALF	GPIO	Output	1) AUDIO DAC Center channel output 2) While internal AUDIO DAC not used:GPIO
229	ADACVDD1		Power	3.3V power pin for AUDIO DAC circuitry
230	ADACVDD2		Power	3.3V power pin for AUDIO DAC circuitry

#### Video Interface ( 18 )

196	DACVDDC		Power	3.3V power pin for VIDEO DAC circuitry
195	VREF		Analog	Bandgap reference voltage
194	FS		Analog	Full scale adjustment
193	YUV0	CIN	Output 4MA, SR	1) Video data output bit 0 2) Compensation capacitor
192	DACVSSC		Ground	Ground pin for VIDEO DAC circuitry
191	YUV1	Y	Output 4MA, SR	1) Video data output bit 1 2) Analog Y output
190	DACVDDB		Power	3.3V power pin for VIDEO DAC circuitry
189	YUV2	C	Output 4MA, SR	1) Video data output bit 2 2) Analog chroma output
188	DACVSSB		Ground	Ground pin for VIDEO DAC circuitry
187	YUV3	CVBS	Output 4MA, SR	1) Video data output bit 3 2) Analog composite output

186	DACVDDA		Power	3.3V power pin for VIDEO DAC circuitry
185	YUV4	Y/G	Output 4MA, SR	1) Video data output bit 4 2) Green or Y
184	DACVSSA		Ground	Ground pin for VIDEO DAC circuitry
183	YUV5	B/Cb/Pb	Output 4MA, SR	1) Video data output bit 5 2) Blue or CB

182	YUV6	R/Cr/Pr	Output 4MA, SR	1) Video data output bit 6 2) Red or CR
181	VSYN	V_ADIN1	Input 4MA, SR SMT Non-pull	1) Vertical sync input/output 2) While no External TV-encoder: I) Vertical sync for video-input II) Version AD input port 1 III) GPIO
180	YUV7	INT3# ASDATA5	Input 4MA, SR SMT Non-pull	1) Video data output bit 7 2) While no External TV-encoder: I) Microcontroller external interrupt 3 II) Audio serial data 5 part II : DSD data sub-woofer channel or Microphone output III) GPIO
179	HSYN	INT4# V_ADIN2	Input 4MA, SR SMT Non-pull	1) Horizontal sync input/output 2) While no External TV-encoder: I) Horizontal sync for video-input II) Microcontroller external interrupt 4 III) Version AD input port 2 IV) GPIO
<b>MISC ( 12 )</b>				
46	USB_VSS		USB Ground	USB ground pin
47	USBP		Analog Input	USB port DPLUS analog pin
48	USBM		Analog Input	USB port DMINUS analog pin
49	USB_VDD3		USB Power	USB Power pin 3.3V
108	PRST#		Input PU, SMT	Power on reset input, active low
107	ICE		Input PD, SMT	Microcontroller ICE mode enable
233	XTALO		Output	27M crystal out
234	XTALI		Input	27M crystal in
201	GPIO_3		Input Pull-Down	GPIO
200	GPIO_4		Input Pull-Down	GPIO
199	RCLKB	GPIO_5	Input Pull-Up	GPIO
198	RVREF	GPIO_6	Input Pull-Up	GPIO

<b>Dram Interface ( 58 ) ( Sorted by position )</b>				
176	C_0	IO_0 (RD16)	Input Non-pull	1) Digital Video output C bit 0 2) GPIO
175	C_1	IO_1 (RD17)	Input Non-pull	1) Digital Video output C bit 1 2) GPIO
173	C_2	IO_2 (RD18)	Input Non-pull	1) Digital Video output C bit 2 2) GPIO
172	C_3	IO_3 (RD19)	Input Non-pull	1) Digital Video output C bit 3 2) GPIO
171	C_4	IO_4 (RD20)	Input Non-pull	1) Digital Video output C bit 4 2) GPIO

169	C_5	IO_5 (RD21)	Input Non-pull	1) Digital Video output C bit 5 2) GPIO
168	C_6	IO_6 (RD22)	Input Non-pull	1) Digital Video output C bit 6 2) GPIO
167	C_7	IO_7 (RD23)	Input Non-pull	1) Digital Video output C bit 7 2) GPIO

177	IO_17	(DQM2)	Input Non-pull	GPIO
166	YUVCLK	IO_8 (DQM3)	Input Non-pull	1) Digital Video output Clock 2) GPIO
165	Y_0	IO_9 (RD24)	Input Non-pull	1) Digital Video output Y bit 0 2) GPIO
164	Y_1	IO_10 (RD25)	Input Non-pull	1) Digital Video output Y bit 1 2) GPIO
163	Y_2	IO_11 (RD26)	Input Non-pull	1) Digital Video output Y bit 2 2) GPIO
162	Y_3	IO_12 (RD27)	Input Non-pull	1) Digital Video output Y bit 3 2) GPIO
161	Y_4	IO_13 (RD28)	Input Non-pull	1) Digital Video output Y bit 4 2) GPIO
159	Y_5	IO_14 (RD29)	Input Non-pull	1) Digital Video output Y bit 5 2) GPIO
158	Y_6	IO_15 (RD30)	Input Non-pull	1) Digital Video output Y bit 6 2) GPIO
157	Y_7	IO_16 (RD31)	Input Non-pull	1) Digital Video output Y bit 7 2) GPIO

155	RA4		Input	DRAM address 4
154	RA5		Input	DRAM address 5
153	RA6		Input	DRAM address 6
152	RA7		Input	DRAM address 7

151	RA8		Input	DRAM address 8
150	RA9		Input	DRAM address 9
149	RA11		Input Pull-Down	DRAM address bit 11
147	CKE		output	DRAM clock enable
146	RCLK		Input	Dram clock
144	RA3		Input	DRAM address 3
143	RA2		Input	DRAM address 2
141	RA1		Input	DRAM address 1
140	RA0		Input	DRAM address 0
139	RA10		Input	DRAM address 10
138	BA1		Input	DRAM bank address 1
137	BA0		Input	DRAM bank address 0
136	RCS#		output	DRAM chip select, active low
135	RAS#		output	DRAM row address strobe, active low

134	CAS#		output	DRAM column address strobe, active low
133	RWE#		output	DRAM Write enable, active low
132	DQM1		Input	Data mask 1
130	IO_18	(DQS1)	Input Non-pull	GPIO
129	RD8		Input	DRAM data 8
128	RD9		Input	DRAM data 9

127	RD10		Input	DRAM data 10
126	RD11		Input	DRAM data 11
125	RD12		Input	DRAM data 12
124	RD13		Input	DRAM data 13
123	RD14		Input	DRAM data 14
122	RD15		Input	DRAM data 15
121	RD0		Input	DRAM data 0
120	RD1		Input	DRAM data 1
119	RD2		Input	DRAM data 2
117	RD3		Input	DRAM data 3
116	RD4		Input	DRAM data 4
115	RD5		Input	DRAM data 5
114	RD6		Input	DRAM data 6
113	RD7		Input	DRAM data 7
112	IO_19	(DQS0)	Input Non-pull	GPIO
111	DQM0		Input	Data mask 0

JTAG Interface( 4 )					
51	TDI	V_ADIN4	Input Non-pull	1) 2) 3)	Serial interface port 3 data-out Version AD input port 4 GPIO
52	TMS	V_ADIN5	Input Non-pull	1) 2) 3)	Serial interface port 3 data-in Version AD input port 5 GPIO
53	TCK	V_ADIN6	Input Non-pull	1) 2) 3)	Serial interface port 3 clock pin Version AD input port 6 GPIO
54	TDO	V_ADIN7	Input Non-pull	1) 2) 3)	Serial interface port 3 chip-select Version AD input port 7 GPO

Note:

1. The Main column is the main function, Alt. Means alternative function.
2. The multi-function GPIO pins are set to green characters.
3. The video input port and external TV encoder mode can not both use CCIR-601 mode, at least one of them should be in CCIR-656 mode.
4. Following is a summary of modified pins.
  - (a) Pin 48, 49, 50, 51 are no longer for JTAG functions.
  - (b) V\_ADIN0 and V\_ADIN3 is not available.

## 3.24C16

### 2-Wire Serial CMOS E<sup>2</sup>PROM 16k (2048 x 8)

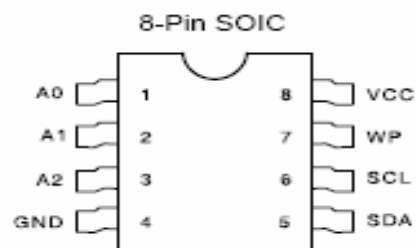
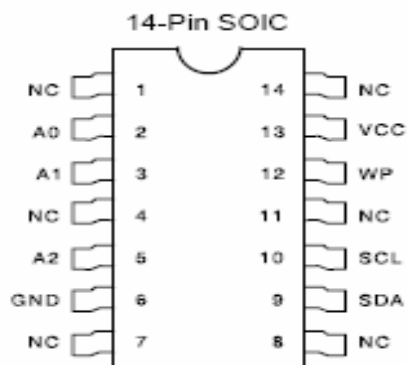
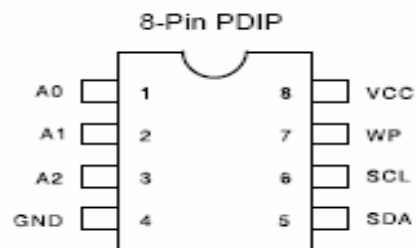
The AT24C16 provides 16384 bits of serial electrically erasable and programmable read only memory (EEPROM) organized as 2048 words of 8 bits each. The device is optimized for use in many industrial and commercial applications where low power and low voltage operation are essential. The AT24C16 is available in space saving 8-pin PDIP, 8-pin and 14-pin SOIC packages and is accessed via a 2-wire serial interface. In addition, the entire family is available in 5.0V(4.5V to 5.5V), 2.7V(2.7V to 5.5V) and 1.8V(1.8V to 5.5V) versions.

### Features

- Low Voltage and Standard Voltage Operation
  - 5.0 (V<sub>CC</sub> = 4.5V to 5.5V)
  - 2.7 (V<sub>CC</sub> = 2.7V to 5.5V)
  - 2.5 (V<sub>CC</sub> = 2.5V to 5.5V)
  - 1.8 (V<sub>CC</sub> = 1.8V to 5.5V)
- Internally Organized 128 x 8 (1K), 256 x 8 (2K), 512 x 8 (4K), 1024 x 8 (8K) or 2048 x 8 (16K)
- 2-Wire Serial Interface
- Bidirectional Data Transfer Protocol
- 100 kHz (1.8V, 2.5V, 2.7V) and 400 kHz (5V) Compatibility
- Write Protect Pin for Hardware Data Protection
- 8-Byte Page (1K, 2K), 16-Byte Page (4K, 8K, 16K) Write Modes
- Partial Page Writes Are Allowed
- Self-Timed Write Cycle (10 ms max)
- High Reliability
  - Endurance: 1 Million Cycles
  - Data Retention: 100 Years
- Automotive Grade and Extended Temperature Devices Available
- 8-Pin and 14-Pin JEDEC SOIC and 8-Pin PDIP Packages

### Pin Configurations

Pin Name	Function
A <sub>0</sub> to A <sub>2</sub>	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect
NC	No Connect



## Pin Capacitance <sup>(1)</sup>

Applicable over recommended operating range from  $T_A = 25^\circ\text{C}$ ,  $f = 1.0\text{ MHz}$ ,  $V_{CC} = +1.8\text{V}$ .

Symbol	Test Condition	Max	Units	Conditions
$C_{I/O}$	Input/Output Capacitance (SDA)	8	pF	$V_{I/O} = 0\text{V}$
$C_{IN}$	Input Capacitance (A0, A1, A2, SCL)	6	pF	$V_{IN} = 0\text{V}$

Note: 1. This parameter is characterized and is not 100% tested.

## DC Characteristics

Applicable over recommended operating range from:  $T_A = -40^\circ\text{C}$  to  $+85^\circ\text{C}$ ,  $V_{CC} = +1.8\text{V}$  to  $+5.5\text{V}$ ,  $T_{AC} = 0^\circ\text{C}$  to  $+70^\circ\text{C}$ ,  $V_{CC} = +1.8\text{V}$  to  $+5.5\text{V}$  (unless otherwise noted).

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
$V_{CC1}$	Supply Voltage		1.8		5.5	V
$V_{CC2}$	Supply Voltage		2.5		5.5	V
$V_{CC3}$	Supply Voltage		2.7		5.5	V
$V_{CC4}$	Supply Voltage		4.5		5.5	V
$I_{CC}$	Supply Current $V_{CC} = 5.0\text{V}$	READ at 100 kHz		0.4	1.0	mA
$I_{CC}$	Supply Current $V_{CC} = 5.0\text{V}$	WRITE at 100 kHz		2.0	3.0	mA
$I_{SB1}$	Standby Current $V_{CC} = 1.8\text{V}$	$V_{IN} = V_{CC}$ or $V_{SS}$		0.6	3.0	$\mu\text{A}$
$I_{SB2}$	Standby Current $V_{CC} = 2.5\text{V}$	$V_{IN} = V_{CC}$ or $V_{SS}$		1.4	4.0	$\mu\text{A}$
$I_{SB3}$	Standby Current $V_{CC} = 2.7\text{V}$	$V_{IN} = V_{CC}$ or $V_{SS}$		1.6	4.0	$\mu\text{A}$
$I_{SB4}$	Standby Current $V_{CC} = 5.0\text{V}$	$V_{IN} = V_{CC}$ or $V_{SS}$		8.0	18.0	$\mu\text{A}$
$I_{LI}$	Input Leakage Current	$V_{IN} = V_{CC}$ or $V_{SS}$		0.10	3.0	$\mu\text{A}$
$I_{LO}$	Output Leakage Current	$V_{OUT} = V_{CC}$ or $V_{SS}$		0.05	3.0	$\mu\text{A}$
$V_{IL}$	Input Low Level <sup>(1)</sup>		-1.0		$V_{CC} \times 0.3$	V
$V_{IH}$	Input High Level <sup>(1)</sup>		$V_{CC} \times 0.7$		$V_{CC} + 0.5$	V
$V_{OL2}$	Output Low Level $V_{CC} = 3.0\text{V}$	$I_{OL} = 2.1\text{ mA}$			0.4	V
$V_{OL1}$	Output Low Level $V_{CC} = 1.8\text{V}$	$I_{OL} = 0.15\text{ mA}$			0.2	V

Note: 1.  $V_{IL}$  min and  $V_{IH}$  max are reference only and are not tested.



## AC Characteristics

Applicable over recommended operating range from  $T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ,  $V_{CC} = +1.8\text{V}$  to  $+5.5\text{V}$ ,  $CL = 1$  TTL Gate and  $100\text{ pF}$  (unless otherwise noted).

Symbol	Parameter	2.7-, 2.5-, 1.8-volt		5.0-volt		Units
		Min	Max	Min	Max	
fSCL	Clock Frequency, SCL		100		400	kHz
tLOW	Clock Pulse Width Low	4.7		1.2		$\mu\text{s}$
tHIGH	Clock Pulse Width High	4.0		0.6		$\mu\text{s}$
tI	Noise Suppression Time <sup>(1)</sup>		100		50	ns
tAA	Clock Low to Data Out Valid	0.1	4.5	0.1	0.9	$\mu\text{s}$
tBUF	Time the bus must be free before a new transmission can start <sup>(1)</sup>	4.7		1.2		$\mu\text{s}$
tHD.STA	Start Hold Time	4.0		0.6		$\mu\text{s}$
tSU.STA	Start Set-up Time	4.7		0.6		$\mu\text{s}$
tHD.DAT	Data In Hold Time	0		0		$\mu\text{s}$
tSU.DAT	Data In Set-up Time	200		100		ns
tR	Inputs Rise Time <sup>(1)</sup>		1.0		0.3	$\mu\text{s}$
tF	Inputs Fall Time <sup>(1)</sup>		300		300	ns
tSU.STO	Stop Set-up Time	4.7		0.6		$\mu\text{s}$
tDH	Data Out Hold Time	100		50		ns
tWR	Write Cycle Time		10		10	ms

Note: 1. This parameter is characterized and is not 100% tested.

## 4. NJM4558

### DUAL OPERATIONAL AMPLIFIER

#### ■ GENERAL DESCRIPTION

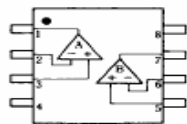
The NJM4558/4559 integrated circuit is a dual high-gain operational amplifier internally compensated and constructed on a single silicon chip using an advanced epitaxial process.

Combining the features of the NJM741 with the close parameter matching and tracking of a dual device on a monolithic chip results in unique performance characteristics. Excellent channel separation allow the use of the dual device in single NJM741 operational amplifier applications providing density. It is especially well suited for applications in differential-in, differential-out as well as in potentiometric amplifiers and where gain and phase matched channels are mandatory.

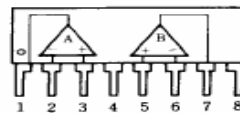
#### ■ FEATURES

- Operating Voltage (  $\pm 4V \sim \pm 18V$  )
- High Voltage Gain ( 100dB typ. )
- High Input Resistance (  $5M\Omega$  typ. )
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

#### ■ PIN CONFIGURATION



NJM4558D, NJM4558M, NJM4558V  
NJM4559D, NJM4559M, NJM4559V



NJM4558L  
NJM4559L

#### PIN FUNCTION

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

#### ■ PACKAGE OUTLINE



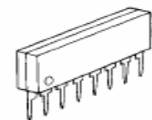
NJM4558D  
NJM4559D



NJM4558M  
NJM4559M



NJM4558V  
NJM4559V



NJM4558L  
NJM4559L

● Electrical characteristics (unless otherwise noted,  $T_a = 25^\circ C$  and  $V_{CC} = 9V$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output current	$I_o$	200	—	—	mA	
Output saturation voltage	$V_{CE}$	—	—	1.6	V	$I_o = 100mA$
Input high level voltage	$V_{IH}$	2.0	—	—	V	
Input low level voltage	$V_{IL}$	—	—	0.8	V	
Standby supply current	$I_{ST}$	—	—	0.4	mA	When inputs A and B are both LOW level
Input high level current	$I_{IH}$	—	—	400	$\mu A$	$V_{IH} = 4.5V$

A diode that absorbs at least 500 mA is built in to give protection against surge currents with a pulse width of 10 ms and a duty ratio of 10% or less.

## 5. BA033

### Low saturation voltage type 3-pin regulator

The BA00T and BA00FP series are fixed positive output low drop-out type, 3-pin voltage regulators with positive output. These regulators are used to provide a stabilized output voltage from a fluctuating DC input voltage. There are 10 fixed output voltages, as follows: 3V, 3.3V, 5V, 6V\*, 7V, 8V, 9V, 10V, 12V and 15V. The maximum current capacity is 1A for each of the above voltages. (Items marked with an asterisk are under development.)

#### ●Application

Constant voltage power supply

#### ●Features

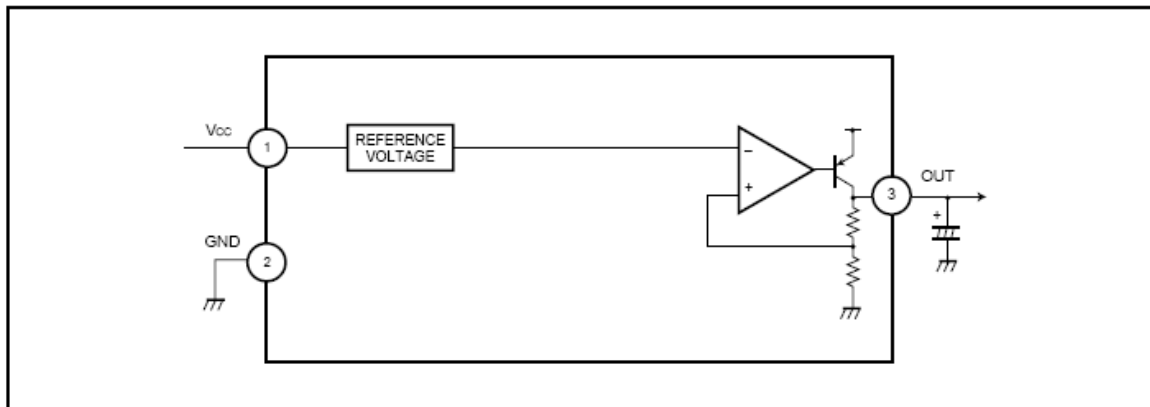
- 1) Built-in overvoltage protection circuit, overcurrent protection circuit and thermal shutdown circuit.
- 2) TO220FP and TO252-3 packages are available to cover a wide range of applications.
- 3) Compatible with the BA17800 series.
- 4) Richly diverse lineup.
- 5) Low minimum I / O voltage differential.

#### ●Product codes

Output voltage (V)	Product No.	Output voltage (V)	Product No.
3.0	BA03T / FP	8.0	BA08T / FP
3.3	BA033T / FP	9.0	BA09T / FP
5.0	BA05T / FP	10.0	BA10T / FP
6.0	BA06T* / FP*	12.0	BA12T / FP
7.0	BA07T / FP	15.0	BA15T / FP

\* : Under development.

#### ●Block diagram



# ICS ON HI-VOLTAGE BOARD

## 1. BIT3193

### High Performance PWM Controller

BIT3193 integrated circuit provides the essential features for general purpose PWM controller in a small low cost 16-pin package. BIT3193 has built-in a low frequency PWM generator for any specified application. BIT3193 includes latched off protection feature may make the system more reliable while compare to other similar products.

#### • Features

- 4.5V ~ 8V operation
- Fixed High Frequency, Voltage Mode PWM Control
- Latched Off Protection
- Build-In Low Frequency PWM Generator
- Build-in UVLO
- Low Power CMOS Process
- Totem Pole Output
- 16 Pin Package

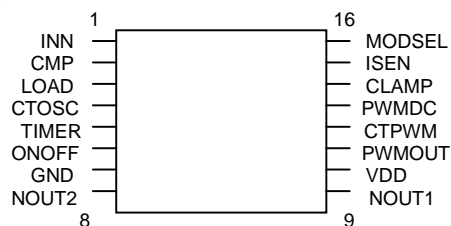
#### • Applications

- DC/DC Converters
- LCD TV
- LCD Monitor
- Notebook Computer
- Tablet PC
- Personal Digital Assistants
- Navigation Phone/ Door Phone
- Portable consumer product

#### • Recommended Operating Condition:

Supply Voltage	4.5~8V
Operating Ambient Temperature	0~70 ° C
Operating Frequency	50K~400K Hz

#### • Pin Layout:



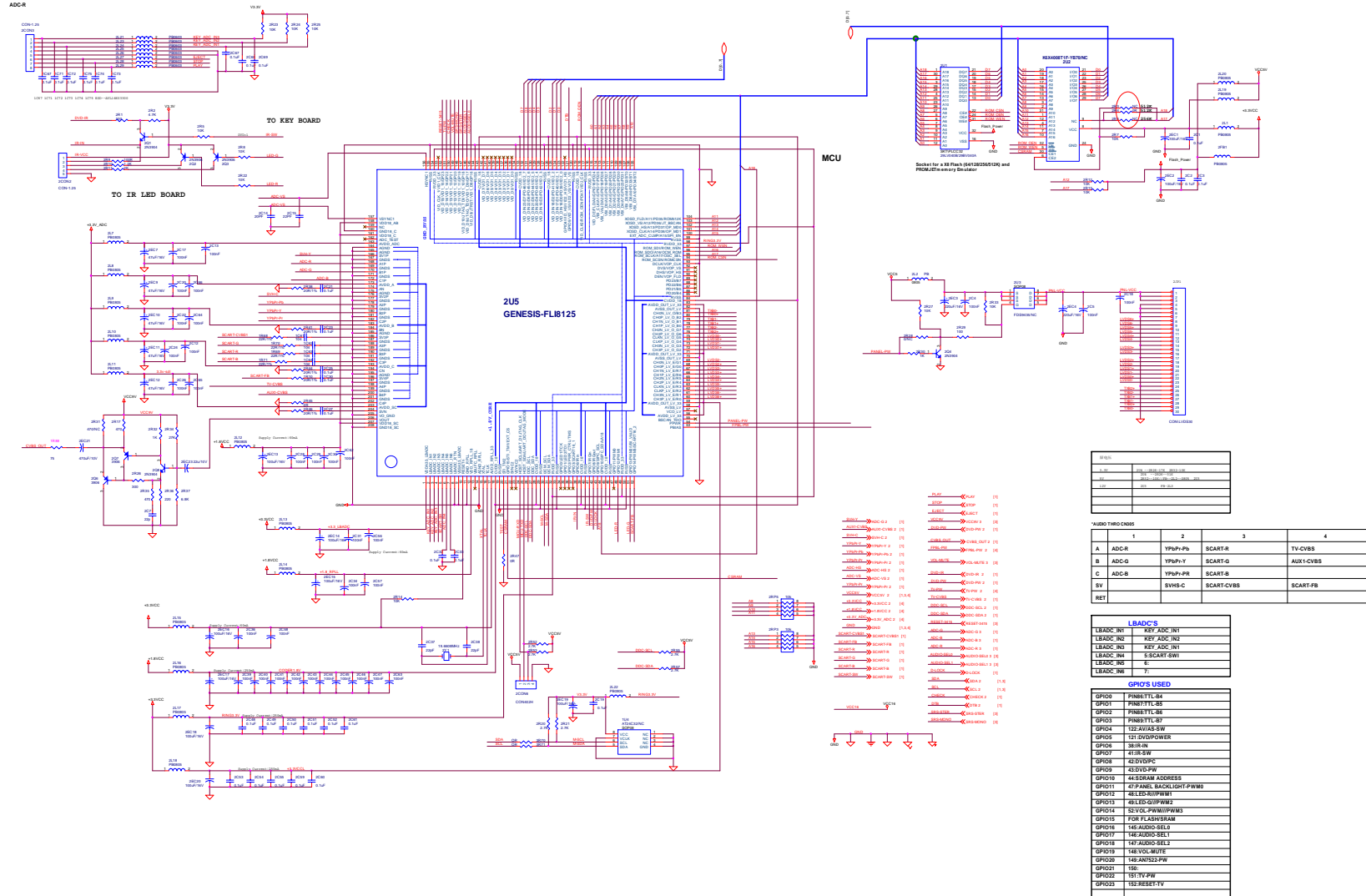
• Pin Description

Pin No.	Symbol	I/O	Descriptions
1	INN	I/O	The inverting input of the error amplifier.
2	CMP	O	Output of the error amplifier.
3	LOAD	I/O	A switch that connected to the high frequency triangle wave generator. This switch is open while ISEN pin <1.3V. An external resistor connected here may change the operation frequency of CTOSC in open load situation.
4	CTOSC	I/O	An external capacitor connected here can set the frequency of high frequency PWM controller.
5	TIMER	I/O	With internal reference current and an external capacitor connected here can set the required period of starting and the timing of initialization. The controller is forced to reset mode while TIMER<0.3V. During reset mode, a~60uA current will flow into the INN pin to reduce the output level of the error amplifier CMP to turn off the controller. The latched off protection function will be enable after this node is charged to>2.5V. System is latched off if any abnormal operation is detected if pin TIMER>2.5V. The output current of this pin is 20uA when TIMER<0.3V. The output current becomes to 1uA when TIMER>0.3V.
6	ONOFF	I	The control pin of turning on or off the IC.1V threshold with an internal 80K $\pm$ 15% ohm pull-low resistor.
7	GND	I/O	The ground pin of the device.
8	NOUT2	O	The number 2 output driver for driving the NMOSFET switch.
9	NOUT1	O	The number 1 output driver for driving the NMOSFET switch.
10	VDD	I	The power supplies pin of the device.
11	PWMOUT	O	The output pin of low frequency PWM generator. A 2.5V or floating two state output is provided through this pin. The internal circuit limits the max. Duty-cycle to ~92%.
12	CTPWM	I/O	With the internal reference current and an external capacitor connected here can set the operation frequency of low frequency PWM generator with 1.0V~2.5V triangle wave output.
13	PWMDC	I	Low frequency PWM controlling input. A PWM output comes out by comparing this DC input and the 1.0~2.5V triangle wave that is generated by CTPWM.
14	CLAMP	I	Over voltage clamping. If a>2.0V voltage is detected. A~60uA current will flow into the INN pin to reduce the output of the error amplifier pin CMP to regulate the output voltage.
15	ISEN	I	Load current detection pin, the open load situation is detected if a less than 1.3V input is sensed.
16	MODSEL	O	To set the output polarity of the low frequency PWM controller.



## 2. Hudson

ADCR

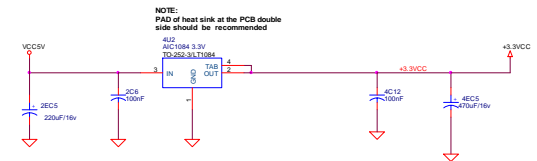
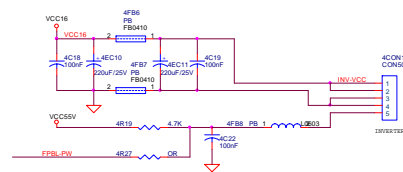
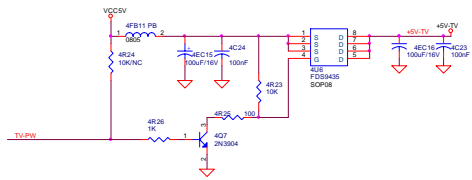
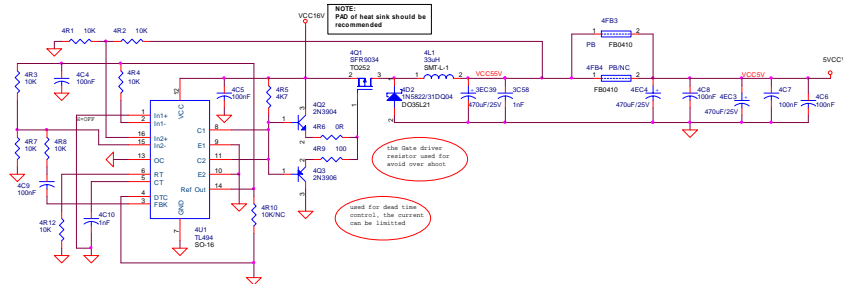
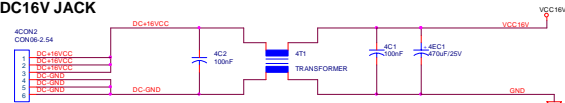




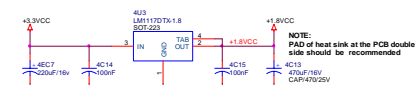


# 4. Power

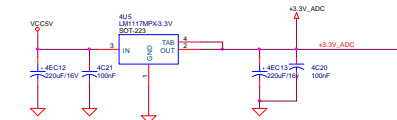
## DC16V JACK



LT1084 CAN OUTPUT 1.5A CURRENT



LM1117 CAN OUTPUT 0.8A CURRENT



- VCC5V >>> VCC5V 2 [1,2,3]
- +5V\_TV >>> +5V\_TV 4 [1]
- VCC16V >>> VCC16V 4 [3]
- VCC55V >>> VCC55V 4 [3]
- +3.3VCC >>> +3.3VCC 2 [2]
- +1.8VCC >>> +1.8VCC 2 [2]
- +3.3V\_ADC >>> +3.3V\_ADC 2 [2]
- GND >>> GND [1,2,3]
- VCC5V >>> VCC5V 3 [2,3]
- FBBL\_PW >>> FBBL\_PW 2 [2]
- TV\_PW >>> TV\_PW 2 [2]

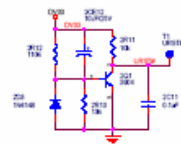
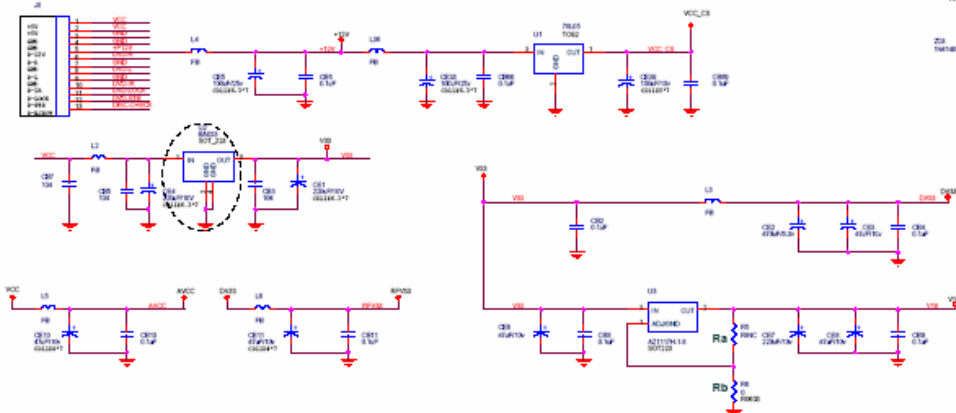
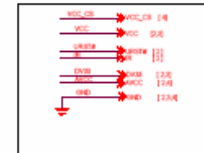
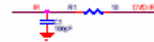


# DVD BOARD

## 1. Index

- |   |                      |
|---|----------------------|
| 1 | INDEX & POWER, RESET |
| 2 | MT1389E              |
| 3 | SDRAM & FLASH        |
| 4 | VIDEO OUT & AV-CON   |
| 5 | AUDIO OUT - CS4344   |

NAME	TYPE	DEVICE
VCC	Digital 5V	SUPPLY
DV33	Digital 3.3V	MT1389E
RPV33	Servo 3.3V	MT1389E
AV33	Laser Diode 3.3V	MT1389E
V1.8	Digital 1.8V	MT1389E
SD33	Digital 3.3V	SDRAM
+12V	Audio +12V	OP AMP.
-12V	Audio -12V	OP AMP.
AVDD5	Audio 5V	Audio DAC
DVDD3	Audio 3.3V	Audio DAC

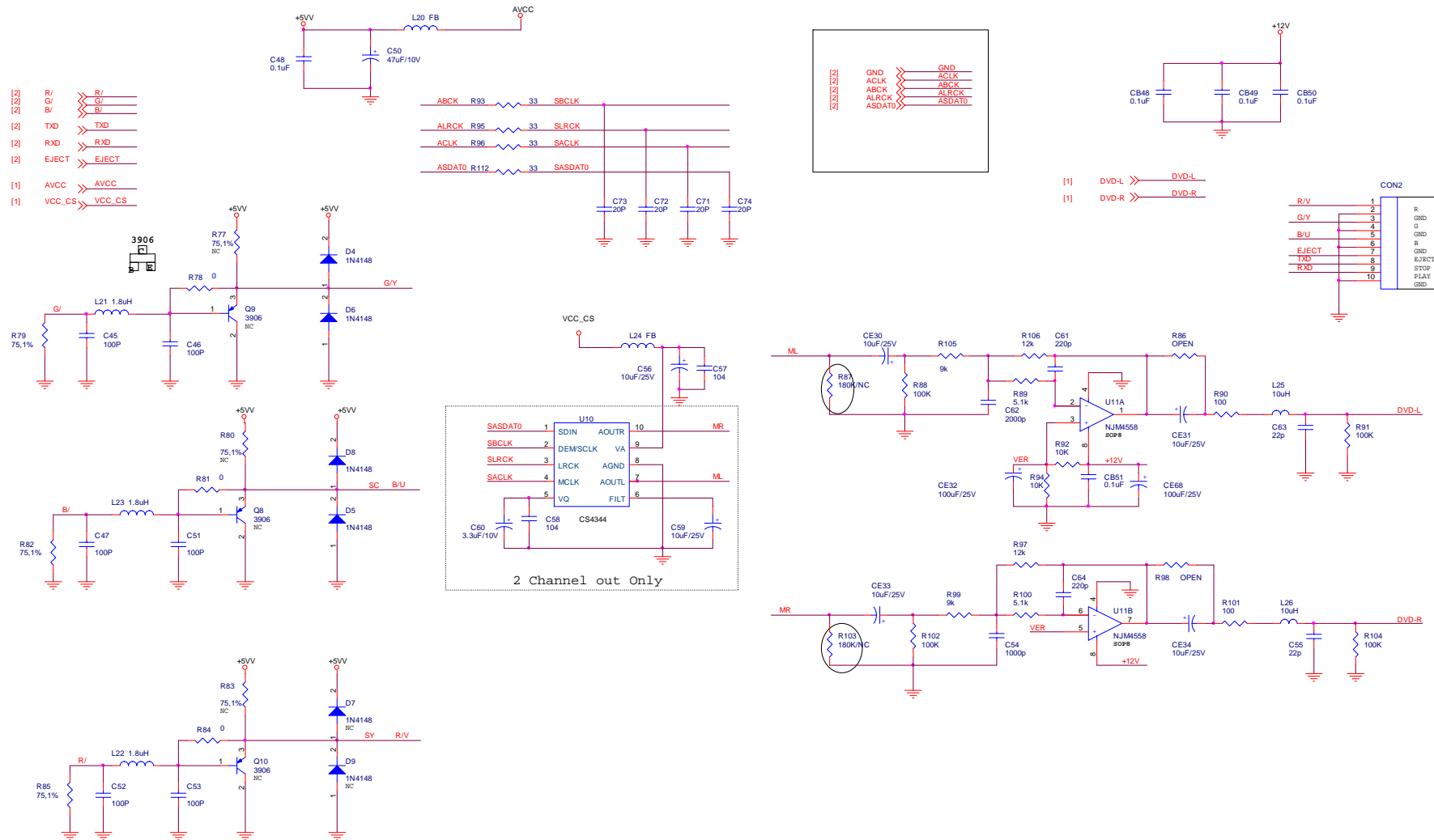


AZ1117	Rb	Ra
Fix regulator	0 ohm	OFF
Adj regulator	300 Ω	600 Ω

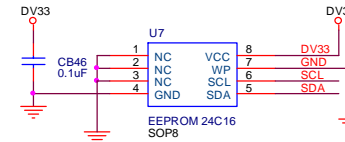
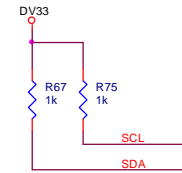
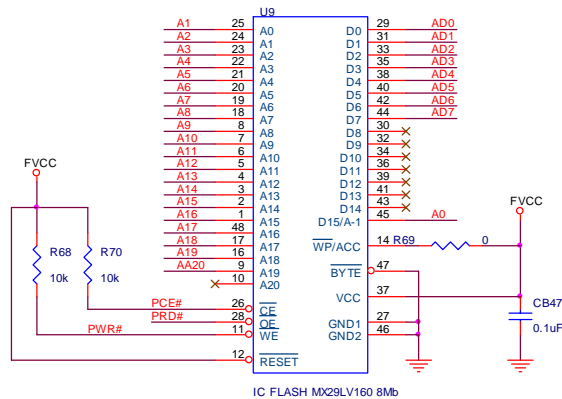
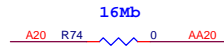
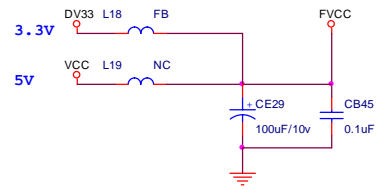
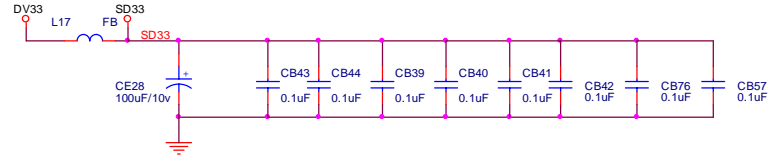
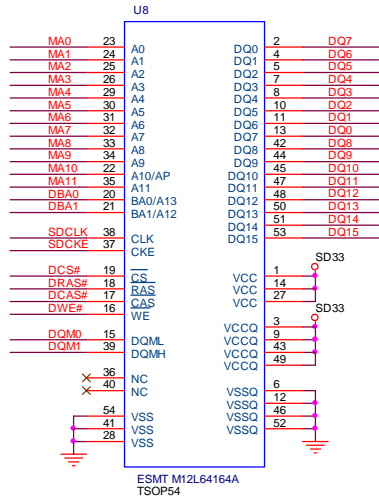
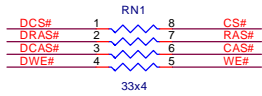
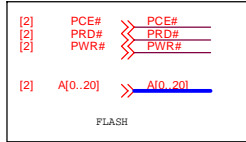
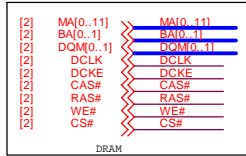
$1.25 \times (1 + Rb/Ra)$   
**Note for Fix or Adj Regulator**  
 Ra = 680 FOR 1.8V  
 Ra = 560 FOR 1.92V



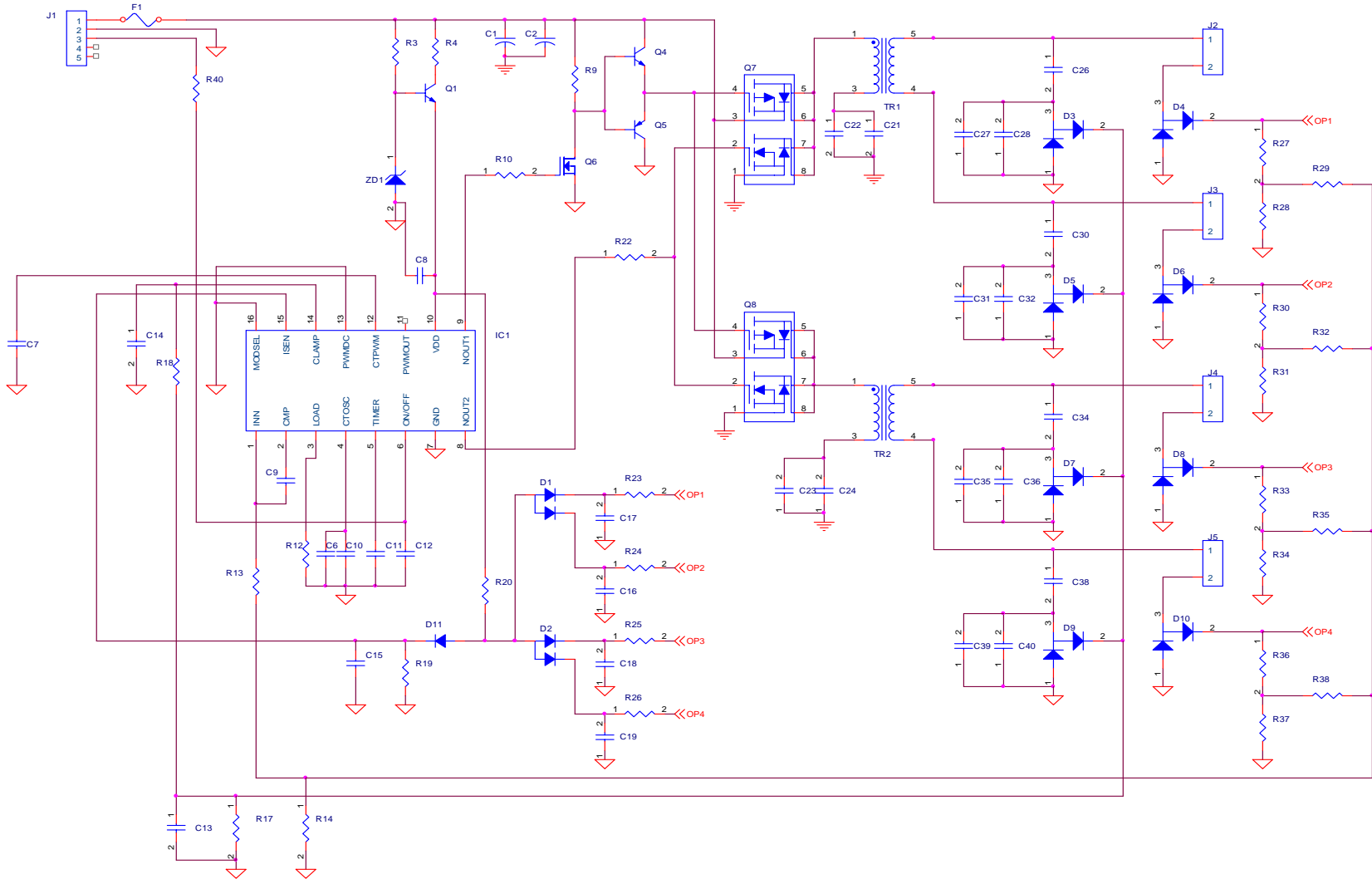
### 3. Video out and AV connector



# 4. SDRAM and FLASH



# HI-VOLTAGE BOAD



## Part 5 Part list of LVD-1902

Bom No	Part No	Part Name	QTY	
LTD-51702-2541C	02.03.116.2541 C	Remote control board	1	
Part No	Name	Specification	QTY	LOCA NO
01.54.CS.3.E105Y	SMD capacitor	0805-105 Y5V-20+80%/16V	1	C2
01.57.R.3.E101J	SMD resistor	0805-100Ω±5%	1	R1
01.41.D.FD.E3RB	Radiation diode	φ3	1	D1
01.44.IC.D384B1	IC	ERM384B1S11000 DIP	1	U1
01.40.CON.S13.AY.E00 9	SMD jack	1.25-5A(lie paste)	1	CON1
01.37.PCB.2.E2541C3	Circuit board	Remote control board2541C-V3.0	1	
Bom No	Part No	Part Name	QTY	
LTD-51702-2540C	02.03.116.2540 C	Key board	1	
Part No	Name	Specification	QTY	LOCA NO
01.57.R.2.E471J	SMD resistor	0603-470Ω±5%	1	KR1
01.57.R.2.E102J	SMD resistor	0603-1KΩ±5%	1	KR3
01.57.R.2.E202J	SMD resistor	0603-2KΩ±5%	1	KR2
01.57.R.2.E332J	SMD resistor	0603-3.3KΩ±5%	1	KR4
01.57.R.2.E622J	SMD resistor	0603-6.2KΩ±5%	1	KR6
01.57.R.2.E103J	SMD resistor	0603-10KΩ±5%	1	KR5
01.57.R.2.E223J	SMD resistor	0603-22KΩ±5%	1	KR7
01.13.L.Z.ESA600	SMD magnetism	0603-600Ω	8	L1 L2 L3 L4 L5 L6 L7 L8
01.40.CON.S13.AY.E00 8	SMD jack	1.25-8A(lie paste)	1	CN1
01.39.SW.QC.ED665	Touch switch	6*6*5(DIP 300g)	11	SW1 SW2 SW3 SW4 SW6 SW5 SW7 SW6 SW8 SW9 SW10
01.47.CNT.LJX.5.E190	Two pins connecting line	L=75MM	1	
01.37.PCB.2.E2540C	Circuit board	Key board2540C	1	
Bom No	Part No	Part Name	QTY	
LTD06V-3707C01	02.23.LTD06V3 707C01	DVD board	1	

Part No	Name	Specification	QTY	LOCA NO
01.57.R.2.E000J	SMD resistor	0603-0Ω ±5%	20	R2 R6 R10 R12 R14 R21 R22 R28 R29 R30 R39 R50 R69 R74 R78 R81 R84 R117 R118 R119
01.57.R.3.E1R0J	SMD resistor	0805-1Ω±5%	5	R23 R42 R43 R44 R45
01.57.R.2.E4R7J	SMD resistor	0603-4.7Ω±5%	2	R40 R41
01.57.R.2.E6R8J	SMD resistor	0603-6.8Ω±5%	1	R19
01.57.R.2.E100J	SMD resistor	0603-10Ω±5%	3	R1 R36 R37
01.57.R.2.E330J	SMD resistor	0603-33Ω±5%	11	R71 R72 R73 R76 R93 R95 R96 R112 R7 R8 R107
01.57.R.2.E101J	SMD resistor	0603-100Ω±5%	2	R90 R101
01.57.R.2.E750F	SMD resistor	0603-75Ω±1%	3	R79 R82 R85
01.57.R.2.E102J	SMD resistor	0603-1KΩ±5%	3	(R34) R67 R75
01.57.R.2.E561F	SMD resistor	0603-560Ω±1%	1	(R26)
01.57.R.2.E472J	SMD resistor	0603-4.7KΩ±5%	1	(R25)
01.57.R.2.E512J	SMD resistor	0603-5.1KΩ±5%	2	R100 R89
01.57.R.2.E912J	SMD resistor	0603-9.1KΩ±5%	2	R99 R105
01.57.R.2.E103J	SMD resistor	0603-10KΩ±5%	25	R3 R24 R32 R33 R49 R52 R56 R58 R59 R60 R61 R62 R63 R64 R65 R66 R68 R70 R92 R108 R109 R110 2R11 2R13 R94
01.57.R.2.E123J	SMD resistor	0603-12KΩ±5%	2	R97 R106
01.57.R.2.E153J	SMD resistor	0603-15KΩ±5%	2	R18 R48
01.57.R.2.E183J	SMD resistor	0603-18KΩ±5%	1	R47
01.57.R.2.E203J	SMD resistor	0603-20KΩ±5%	4	R46 R51 R53 R55
01.57.R.2.E104J	SMD resistor	0603-100KΩ±5%	8	R13 R31 R35 R88 R91 R102 R104 R27
01.57.R.2.E114J	SMD resistor	0603-110KΩ±5%	1	2R12
01.57.R.2.E154J	SMD resistor	0603-150KΩ±5%	2	R16 R15
01.57.R.2.E684J	SMD resistor	0603-680KΩ±5%	2	R17 R11
01.57.R.2.E754J	SMD resistor	0603-750KΩ±5%	1	(R9)
01.57.R.8.EP3304	SMD row resistor	33Ω*4 ±5%	1	RN1
01.54.CS.2.E200N	SMD capacitor	0603-20P NPO±5%/50V	5	C10 C71 C72 C73 C74



01.54.CS.2.E220N	SMD capacitor	0603-22P NPO±5%/50V	2	C63 C55
01.54.CS.2.E330N	SMD capacitor	0603-33P NPO±5%/50V	2	(C18) (C19)
01.54.CS.2.E101N	SMD capacitor	0603-100P NPO±5%/50V	7	C1 C45 C46 C47 C51 C52 C53
01.54.CS.2.E151N	SMD capacitor	0603-150P NPO±5%/50V	2	C43 C44
01.54.CS.2.E221N	SMD capacitor	0603-220P NPO±5%/50V	2	C64 C61
01.54.CS.2.E331X	SMD capacitor	0603-330P X7R±10%/50V	2	C40 C39
01.54.CS.2.E391N	SMD capacitor	0603-390P NPO±5%/50V	1	(C3)
01.54.CS.2.E102X	SMD capacitor	0603-102 X7R±10%/50V	2	C17 C54
01.54.CS.2.E222X	SMD capacitor	0603-222 X7R±10%/50V	3	C4 (C8) C16
01.54.CS.2.E152X	SMD capacitor	0603-152 X7R±10%/50V	1	(C13)
01.54.CS.2.E202X	SMD capacitor	0603-202 X7R±10%/50V	1	C62
01.54.CS.2.E682X	SMD capacitor	0603-682 X7R±10%/50V	2	(C21) (C28)
01.54.CS.2.E103Y	SMD capacitor	0603-103 Y5V-20+80%/50V	1	(C7)
01.54.CS.2.E153Y	SMD capacitor	0603-153 Y5V-20+80%/50V	1	C42
01.54.CS.2.E333X	SMD capacitor	0603-333 X7R±10%/50V	1	(C23)
01.54.CS.2.E473Y	SMD capacitor	0603-473 Y5V-20+80%/50V	1	C24 C25
01.54.CS.2.E104Y	SMD capacitor	0603-104 Y5V-20+80%/50V	69	CB2 C2 CB4 CB6 C6 CB8 CB9 C9 CB10 CB11 CB12 CB13 CB14 CB15 CB16 CB17 CB18 CB19 CB20 C20 CB21 CB22 C22 CB23 CB24 CB25 CB26 C26 CB27 C27 CB28 CB29 CB30 CB31 CB32 CB33 CB34 C34 CB35 CB36 C36 CB37 CB38 C38 CB39 CB40 CB41 C41 CB42 CB43 CB44 CB45 CB46 CB47 CB48 C48 C57 CB49 CB50 CB51 CB66 CB69 CB76 2C11 CB3

				CB5 CB7 C58 CB57
01.54.CS.2.E105Y16V	SMD capacitor	0603-105 Y5V-20+80%/16V	5	C29 C30 C31 C32 C33
01.34.CL.D.E3U350VB	Electrolyse capacitor	CD11X-3.3UF/50V 4*7	1	C60
01.34.CL.D.E10U25VB	Electrolyse capacitor	CD11X-10UF/25V 4*7	10	C11 C12 C14 CE30 CE31 CE33 CE34 C56 C59 2CE12
01.34.CL.D.E47U10V2B	Electrolyse capacitor	CD11X-47UF/10V 4*7	14	CE3 CE6 CE8 CE10 CE11 CE13 CE16 CE17 CE18 CE21 CE22 CE24 CE27 C50
01.34.CL.D.E100U10VB	Electrolyse capacitor	CD11X-100UF/10V 5*7	6	CE14 CE20 CE23 CE28 CE29 CE39
01.34.CL.D.E100U25VB	Electrolyse capacitor	CD11X-100UF/25V 6.3*7	4	CE5 CE32 CE36 CE68
01.34.CL.D.E220U10VB	Electrolyse capacitor	CD11X-220UF/10V 6.3*7	4	CE1 CE4 CE7 CE15
01.34.CL.D.E470U6V3B	Electrolyse capacitor	CD11X-470UF/6.3V 8*7	2	CE2 CE19
01.13.L.Z.ESB50P	SMD magnetism	0805-50Ω PB	14	L3 L4 L5 L6 L7 L9 L12 L13 L16 L17 L18 L20 L24 L36
01.13.L.Z.ESC50P	SMD magnetism	1206-50Ω PB	1	L2
01.13.L.L.S.E002	SMD inductor	0603-10UH	1	L37
01.13.L.L.S.E020	SMD inductor	1206-22UH	1	L10
01.13.L.L.S.E006	SMD inductor	0805-1.8UH	3	L21 L22 L23
01.13.L.L.S.E011	SMD inductor	0805-3.3UH	1	L8
01.13.L.L.S.E007	SMD inductor	0805-10UH	5	L11 L14 L15 L25 L26
01.41.D.PS.ELL4148	Diode	LL4148 SMD	7	2D3 D4 D5 D6 D7 D8 D9
01.42.Q.S.E2N3904	Audion	2N3904 SMD	2	Q1 2Q1
01.42.Q.S.E1132	Audion	2SB1132 SMD	2	Q5 Q4
01.00.JZ.E27000	DIP oscillator	27.000MHZ-49S-20 P	1	Y1
01.42.Q.S.E3018	Transistor	2SK3018T106 SMD	2	Q2 Q3
01.44.IC.S.EBA033	IC	BA033 SMD	1	U2
01.44.IC.S.EA11171V8	IC	AZ1117H-1.8 SMD	1	U3
01.46.IC.EMT1389DEE	IC	MT1389DE/E SMD	1	U6
01.44.IC.S.E5954	IC	BA5954 SMD	1	U4
01.44.IC.S.E6287	IC	BA6287 SMD	1	U5

01.46.IC.E24C16	IC	24C16 SMD	1	U7
01.46.IC.HY57V641620 ETP7	IC	HY57V641620ETP-7 SMD	1	U8
01.44.IC.S.E29LV160C BTC	IC	KH29LV160CBTC-7 0G SMD	1	U9
01.44.IC.D.E78L05	IC	78L05 DIP	1	U1
01.44.IC.S.E4558	IC	NJM4558 SMD	1	U11
01.44.IC.S.E4344	IC	CS4344 SMD	1	U10
01.40.CON.DPH.E047	Jack	PH-13A	1	J8
01.40.CON.DPH.E002	Jack	PH-10A	1	CON2
01.40.CON.S05.E007	SMD jack	FPC-0.5-24P	1	HA1
01.40.CON.S10.FPC1.E016	SMD jack	FPC-1.0-12P	1	J1
01.37.PCB.2.E3707C	Circuit board	DVD board3707C	1	
Bom No	Part No	Part Name	QTY	
LTD06M-3302C01	02.11.LTD06M3302C01	Main board	1	
Part No	Name	Specification	QTY	LOCA NO
01.57.R.2.E000J	SMD resistor	0603-0Ω ±5%	21	1R29 1R30 1R65 2R4 3R22 3R23 3R20 3R21 2R45 2R47 3R70 3R71 3R109 1R28 4R6 4R27 3R94 3R96 3R24 1R10 3R104
01.57.R.2.E220J	SMD resistor	0603-22Ω±5%	13	1R2 1R5 1R14 1R18 1R21 1R34 1R36 1R37 1R41 1R66 2R38 2R41 2R44
01.57.R.2.E470J	SMD resistor	0603-47Ω±5%	1	2R31
01.57.R.2.E750F	SMD resistor	0603-75Ω±1%	21	1R3 1R6 1R13 1R15 1R19 1R24 1R25 1R26 1R27 1R40 1R43 1R47 1R67 1R72 1R71 1R77 1R73 1R88 1C30 1R44 1R82
01.57.R.2.E101J	SMD resistor	0603-100Ω±5%	27	2R9 1R50 1R53 1R57 1R58 3R16 3R17 3R67 3R69 2R1 4R9 1R31 1R33 1R45 1R46 1R48 1R49 1R56 2R29 4R25 2R16 2R18 2R46

				1R70 1R69 1R68 2R39
01.57.R.2.E221J	SMD resistor	0603-220Ω±5%	1	2R36
01.57.R.2.E301J	SMD resistor	0603-300Ω±5%	7	3R18 3R19 2R26 3R116 3R117 3R100 3R112
01.57.R.2.E471J	SMD resistor	0603-470Ω±5%	3	2R35 2R17 3R98
01.57.R.2.E122J	SMD resistor	0603-1.2KΩ±5%	1	2R11
01.57.R.2.E102J	SMD resistor	0603-1KΩ±5%	12	1R59 2R30 3R50 3R52 3R55 3R60 4R26 2R32 3R3 3R107 3R118 3R119
01.57.R.2.E152J	SMD resistor	0603-1.5KΩ±5%	1	3R36
01.57.R.2.E202J	SMD resistor	0603-2KΩ±5%	2	3R27 2R10
01.57.R.2.E272J	SMD resistor	0603-2.7KΩ±5%	6	2R20 2R21 2R52 2R53 2R55 2R57
01.57.R.2.E222J	SMD resistor	0603-2.2KΩ±5%	4	1R32 1R35 1R54 1R55
01.57.R.2.E302J	SMD resistor	0603-3KΩ±5%	1	3R33
01.57.R.2.E472J	SMD resistor	0603-4.7KΩ±5%	6	2R2 3R97 4R19 4R5 3R91 3R83
01.57.R.2.E392J	SMD resistor	0603-3.9KΩ±5%	1	3R28
01.57.R.2.E682J	SMD resistor	0603-6.8KΩ±5%	1	2R37
01.57.R.2.E103J	SMD resistor	0603-10KΩ±5%	33	2R5 2R7 2R8 3R1 4R1 4R2 4R3 4R4 4R7 4R8 1R51 1R52 2R12 2R13 2R14 2R22 2R23 2R24 2R25 2R27 2R33 3R43 3R44 3R48 3R64 3R90 3R92 4R12 4R23 3R86 1R81 3R102 3R120
01.57.R.2.E273J	SMD resistor	0603-27KΩ±5%	1	2R34
01.57.R.2.E333J	SMD resistor	0603-33KΩ±5%	1	1R80
01.57.R.2.E473J	SMD resistor	0603-47KΩ±5%	14	3R31 3R38 3R42 3R45 3R49 3R56 3R62 3R65 1R78 1R83 1R84 1R79 1R86 1R87
01.57.R.2.E104J	SMD resistor	0603-100KΩ±5%	10	3R14 3R51 3R53 3R54 3R57 3R58 3R59 3R61 3R63 3R101
01.57.R.2.E124J	SMD resistor	0603-120KΩ±5%	5	3R75 3R78 3R66 3R114 3R99

01.57.R.Y.E330	Press agile resistor	AVL14K03300	6	1C67 1C71 1C73 1C74 1C75 1C72
01.57.R.8.EP1034	SMD row resistor	10KΩ*4 ±5%	2	2RP3 2RP5
01.54.CS.2.E5P0N	SMD capacitor	0603-5P NPO±0.25PF/50V	2	1C56 1C57
01.54.CS.2.E100N	SMD capacitor	0603-10P NPO±5%/50V	2	(3C14) (3C13)
01.54.CS.2.E6P0N	SMD capacitor	0603-6P NPO±0.25%/50V	2	(3C27) (3C26)
01.54.CS.2.E220N	SMD capacitor	0603-22P NPO±5%/50V	20	1C45 1C53 1C34 1C49 1C47 1C48 1C54 1C55 1C58 1C59 1C65 1C66 2C37 2C38 1C39 1C15 1C37 2C71 2C14 2C15
01.54.CS.2.E560N	SMD capacitor	0603-56P NPO±5%/50V	2	3C24 (3C25)
01.54.CS.2.E104X	SMD capacitor	0603-104 X7R±10%/50V	115	1C1 1C6 2C1 2C2 2C13 2C3 1C12 1C35 1C51 1C70 1C40 1C52 2C6 2C12 1C16 2C19 2C21 2C23 2C25 2C27 2C32 2C33 2C48 2C49 2C51 2C52 2C53 2C54 2C55 2C57 2C59 2C60 2C61 2C50 2C64 2C67 2C68 2C69 3C46 3C49 3C51 3C60 3C65 3C66 3C35 3C38 3C41 3C44 3C47 3C50 3C52 3C54 3C58 2C4 2C5 4C1 4C2 4C4 4C5 4C7 4C9 1C60 2C17 2C18 2C20 2C22 2C24 2C26 2C28 2C29 2C30 2C31 2C34 2C36 2C39 2C40 2C41 2C42 2C43 2C44 2C45 2C46 2C47 2C56 2C58 2C62 2C63 2C65 2C66 3C20 3C21 3C31 3C34 4C12 3C83 3C88 4C14 4C15 4C18 4C19 4C20 4C21 4C8 4C22 4C23 4C24 3C90 3C84 1C41 1C44 1C46 1C64 1C32 3C87 3C36
01.54.CS.2.E221N	SMD capacitor	0603-220P NPO±5%/50V	2	3C63 (3C17)
01.54.CS.2.E471X	SMD capacitor	0603-470P X7R±10%/50V	5	3C16 3C19 3C23 3C43 3C48

01.54.CS.2.E473Y	SMD capacitor	0603-473 Y5V-20+80%/50V	6	1C20 1C25 1C31 1C63 1C62 1C61
01.54.CS.2.E102X	SMD capacitor	0603-102 X7R±10%/50V	3	4C6 3C70 4C10
01.54.CS.2.E152X	SMD capacitor	0603-152 X7R±10%/50V	3	3C15 3C18 3C22
01.54.CS.2.E103Y	SMD capacitor	0603-103 Y5V-20+80%/50V	3	3C45 3C69 (1C42)
01.54.CS.2.E823X	SMD capacitor	0603-823 X7R±10%/50V	2	3C28 3C29
01.54.CS.2.E223X	SMD capacitor	0603-223 X7R±10%/50V	1	3C32
01.54.CS.2.E472X	SMD capacitor	0603-472 X7R±10%/50V	1	3C42
01.54.CS.2.E474Y	SMD capacitor	0603-474 Y5V+80-20%/50V	5	3C55 3C56 3C57 3C59 3C61
01.54.CS.2.E824Y	SMD capacitor	0603-824 Y5V-20+80%/50V	1	3C67
01.54.CS.2.E105Y16V	SMD capacitor	0603-105 Y5V-20+80%/16V	10	3C53 3C62 3C64 3C71 3C81 3C82 3C77 3C78 3C79 3C80
01.54.CS.2.E224Y	SMD capacitor	0603-224 Y5V-20+80%/16V	5	3C72 3C73 3C74 3C75 3C68
01.34.CL.D.E1U50VC	Electrolyse capacitor	CD110-1UF/50V 5*11	5	3EC44 3EC45 3EC59 3EC57 3EC58
01.34.CL.D.E10U25VC	Electrolyse capacitor	CD110-10UF/25V 5*11	17	1EC8 3EC4 3EC5 3EC6 3EC16 3EC17 3EC20 3EC23 3EC26 3EC29 3EC34 3EC35 3EC36 3EC40 3EC41 1EC10 2EC23
01.34.CL.D.E22U16VC	Electrolyse capacitor	CD110-22UF/16V 5*11	4	3EC50 3EC51 3EC52 3EC62
01.34.CL.D.E100U16VC	Electrolyse capacitor	CD110-100UF/16V 5*11	18	1EC7 2EC1 2EC2 3EC2 3EC3 3EC7 2EC13 2EC14 2EC15 2EC16 2EC17 2EC18 2EC19 2EC20 3EC15 4EC15 4EC16 3EC47
01.34.CL.D.E47U25VC1	Electrolyse capacitor	CD110-47UF/25V 5*11	10	2EC7 2EC9 2EC10 2EC11 2EC12 3EC53 3EC54 3EC55 3EC49 3EC8
01.34.CL.D.E330U25VE	Electrolyse capacitor	CD110-330UF/25V 8*14	2	3EC56 3EC48

01.34.CL.D.E220U16VD	Electrolyse capacitor	CD110-220UF/16V 6.3*12	8	1EC2 1EC3 2EC3 2EC4 4EC12 4EC7 4EC13 3EC9
01.34.CL.D.E220U25VD	Electrolyse capacitor	CD110-220UF/25V 8*12	2	4EC10 4EC11
01.34.CL.D.E470U10VD	Electrolyse capacitor	CD110-470UF/10V 6.3*12	1	2EC21
01.34.CL.D.E470U16VD	Electrolyse capacitor	CD110-470UF/16V 8*12	2	4C13 4EC5
01.34.CL.D.E288470U2 5VE	Electrolyse capacitor	CD288H-470UF/25V 8*14	6	4EC1 4EC3 2EC5 3EC39 4EC4 3EC11
01.13.L.Z.ESA50P	SMD magnetism	0603-50Ω PB	35	2L7 2L8 2L9 2L10 2L11 2L12 2L13 2L14 2L15 2L16 2L17 2L18 1FB1 1FB9 1FB10 1FB11 1FB5 1FB6 1FB7 3FB7 3FB8 3FB9 4FB8 1L12 1FB13 1L14 1L16 1L17 1L18 1L19 3FB10 3FB11 3FB12 3FB13 3FB14
01.13.L.Z.ESB50P	SMD magnetism	0805-50Ω PB	22	3FB30 3FB31 3FB32 3FB33 2L2 2L22 4FB11 3FB4 3FB2 3FB3 3FB29 3FB35 3FB36 3FB27 3FB22 3FB23 3FB38 3FB37 3FB39 2FB1 3FB40
01.13.L.Z.ESA600	SMD magnetism	0603-600Ω	8	2L21 2L23 2L24 2L25 2L26 2L27 2L28 2L29
01.13.L.Z.ED50A	DIP magnetism bead	50Ω (3.5*6.0*0.8)	10	4FB3 3FB1 3FB19 3FB5 4FB6 4FB7 4FB4 4FB5 1FB27 1FB28
01.13.L.L.S.E085	SMD jar install inductor	SLF12575T-470M2 R7	1	4L1
01.13.L.L.D.E150	DIP inductor	LH0608-33UH	4	3L10 3L9 3L7 3L8
01.13.L.L.D.E056	DIP inductor	LCL-11201HA	1	4T1
01.13.L.L.S.E022	SMD inductor	1206-47UH	2	3FB17 3FB6
01.41.D.PS.ELL4148	Diode	LL4148 SMD	3	1D15 3D6 3D5
01.41.D.PD.E31DQ04	Diode	31DQ04 DIP	1	4D2
01.42.Q.S.E2N3904	Audion	2N3904 SMD	13	1Q5 2Q1 2Q4 3Q7 3Q8 3Q9 4Q2 4Q7 3Q13 3Q6 2Q8 3Q15 3Q16
01.42.Q.S.E2N3906	Audion	2N3906 SMD	6	2Q2 2Q3 4Q3 3Q11 2Q6 2Q7

01.00.JZ.E196608A	DIP oscillator	19.6608MHZ-49S-20P	1	2Y1
01.00.JZ.E18432A	DIP oscillator	18.432MHZ-49S-12P	1	3Y1
01.40.CON.DDZ.ES-081-9	S end seed	S-081-9	1	1CN2
01.40.CON.DCZ.E089	Same core jack	AV3-8.4-14G	1	1CN3
01.40.CON.DCZ.E164	Same core jack	AV3-8.4-14G	1	1CN1
01.40.CON.DCZ.E450	Same core jack	AV2-8.4-14/PB	1	2CON4
01.40.CON.DCZ.E007	VGA jack	EV-015FC/15 pin DIP	1	1CN4
01.40.CON.DCZ.E102	Perch earphone jack	CKX-3.5-02(without switch) DIP	2	3CN3 3CN5
01.31.GPT.E063	Tuner	MPE05-1-E DIP	1	1TU1
01.40.CON.DTJ.E004	Jack	TJC3-2A	2	1CN12 1CN13
01.40.CON.S13.AY.E008	SMD jack	1.25-8A(lie paste)	1	2CON3
01.40.CON.DTJ.E012	Jack	TJC3-6A	1	4CON2
01.40.CON.DPH.E002	Jack	PH-10A	1	1CON4
01.40.CON.DPH.E020	Jack	PH-4A	1	2CON6
01.40.CON.DPH.E024	Jack	PH-5A	1	4CON1
01.40.CON.DPH.E047	Jack	PH-13A	1	1CON1
01.40.CON.S13.AY.E004	SMD jack	1.25-30A(lie paste)	1	2JP1
01.40.CON.S13.AY.E009	SMD jack	1.25-5A(lie paste)	1	2CON2
01.40.CON.DCZ.E331	SCART jack	CS112 DIP	1	2CON8
01.44.IC.D.E78L09	IC	78L09 DIP	1	3U7
01.44.IC.S.E11173V3	IC	LM1117MPX-3.3V SMD	1	4U5
01.44.IC.S.ES9435	IC	FDS9435 SMD	2	2U3 4U6
01.44.IC.S.EAIC108433V	IC	AIC1084(3.3V) SMD	1	4U2
01.44.IC.S.E494	IC	TL494C SMD	1	4U1
01.44.IC.S.ELM1117DTX18V	IC	LM1117DTX-1.8V SMD	1	4U3



01.44.IC.S.E9034	Transistor	SFR9034 SMD	1	4Q1
01.44.IC.S.E4052	IC	CD4052 SMD	1	3U4
01.44.IC.S.E3415	IC	MSP3415G SMD	1	3U1
01.44.IC.S.E24C32	IC	AT24C32AN SMD	1	1U4
01.44.IC.S.EV330	IC	FSAV330 SMD	1	1U1
01.46.IC.EAT49BV	IC	AT49BV040B SMD	1	2U1
01.44.IC.S.E8125	IC	FLI8125-LF SMD	1	2U5
01.44.IC.S.E3008D	IC	TPA3008D2PHP SMD	1	3U6
01.46.IC.E24C02	IC	24C02 SMD	1	1U3
01.44.IC.S.E3547	IC	BH3547F SMD	1	3U9
01.44.IC.S.EPESD5V0L5	IC	PESD5V0L5 SMD	8	1U7 1U6 1U8 1U9 1U11 1U12 1U13 1U15
01.37.PCB.2.E3302C3	Circuit board	Main board3302C-V3.0	1	
Bom No	Part No	Part Name	QTY	
LTD06P-2956C01	02.19.LTD06P2956C01	Power supply board	1	
Part No	Name	Specification	QTY	LOCA NO
01.57.R.3.E681J	SMD resistor	0805-680Ω±5%	1	R9
01.57.R.3.E472J	SMD resistor	0805-4.7KΩ±5%	1	R13
01.57.R.3.E222J	SMD resistor	0805-2.2KΩ±5%	1	R12
01.57.R.3.E123J	SMD resistor	0805-12KΩ±5%	2	R3 R11
01.57.R.4.E4R7J	SMD resistor	1206-4.7Ω±5%	1	R6
01.57.R.4.E390J	SMD resistor	1206-39Ω±5%	2	R7 R8
01.57.R.4.E222J	SMD resistor	1206-2.2KΩ±5%	1	R10
01.57.R.4.E514J	SMD resistor	1206-510KΩ±5%	2	R1 R2
01.57.R.4.E392J	SMD resistor	1206-3.9KΩ±5%	1	R15
01.57.R.C.EC105	Carbon film resistor	RT1/6W-1MΩ	1	R4

01.57.R.C.EG563	Carbon film resistor	RT2W-56K $\Omega$	1	R5
01.57.R.R.E5D11	Hot agile resistor	NTC-5D-11	1	TH1
01.57.R.Y.E10K	Press agile resistor	10K.471	1	VR1
01.54.CS.3.E104X	SMD capacitor	0805-104 X7R $\pm$ 10%/50V	2	C13 C10
01.54.CS.3.E473X	SMD capacitor	0805-473 X7R $\pm$ 10%/50V	1	C5
01.54.CS.4.E102X200V	SMD capacitor	1206-102 X7R $\pm$ 10%/200V	1	C6
01.34.CL.D.E150U400V	Electrolyse capacitor	150uF/400V 18*36 $\pm$ 20% 105 $^{\circ}$ C Low ESR	1	C1
01.34.CL.D.E1000U25V	Electrolyse capacitor	1000uF/25V 10*20 $\pm$ 20% 105 $^{\circ}$ C Low ESR	2	C7 C8
01.34.CL.D.E470U25V	Electrolyse capacitor	470uF/25V 8*20 $\pm$ 20% 105 $^{\circ}$ C Low ESR	1	C9
01.00.CD.CP.E1031KV	Ceramic capacitor	103/1KV	1	C2
01.00.CD.CP.E2221KV A	Ceramic capacitor	222/1KV	1	C3
01.00.CD.GY.E104275V	Hi-voltage capacitor	104/275V X2	1	CX2
01.00.CD.GY.E224275V	Hi-voltage capacitor	224/275V X2	1	CX1
01.00.CD.GY.E471400V	Hi-voltage capacitor	471/400V Y1	2	CY1 CY2
01.00.CD.GY.E222400V	Hi-voltage capacitor	222/400V Y1	1	CY3
01.34.CL.D.E22U35VB	Electrolyse capacitor	CD11X-22UF/35V 5*7(105 $^{\circ}$ C)	1	C4
01.13.L.L.D.E155	Filter	LCL-401	1	Lc1
01.13.L.L.D.E180	Filter	LCL-203B DIP	1	Lc2
01.13.L.L.D.E181	Inductor	L620-3uH DIP	1	L1
01.13.L.Z.ED50B	DIP magnetism bead	50 $\Omega$ (3.5*4.7*0.8)	1	L2
01.41.D.PD.E1U08	Diode	1U08 DIP	1	D1
01.41.D.PD.EFR107	Diode	FR107 DIP	1	D1
01.41.D.PD.EFR104	Diode	FR104 DIP	1	D2

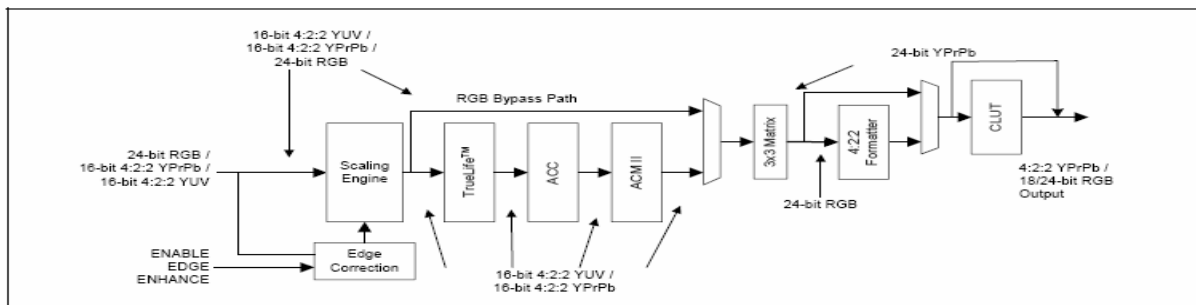
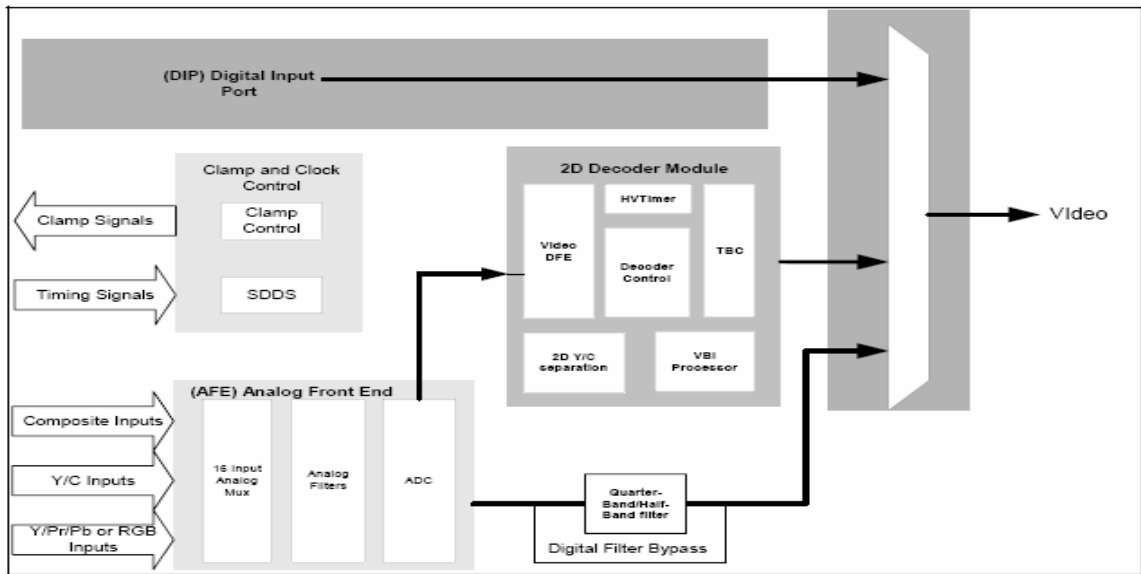
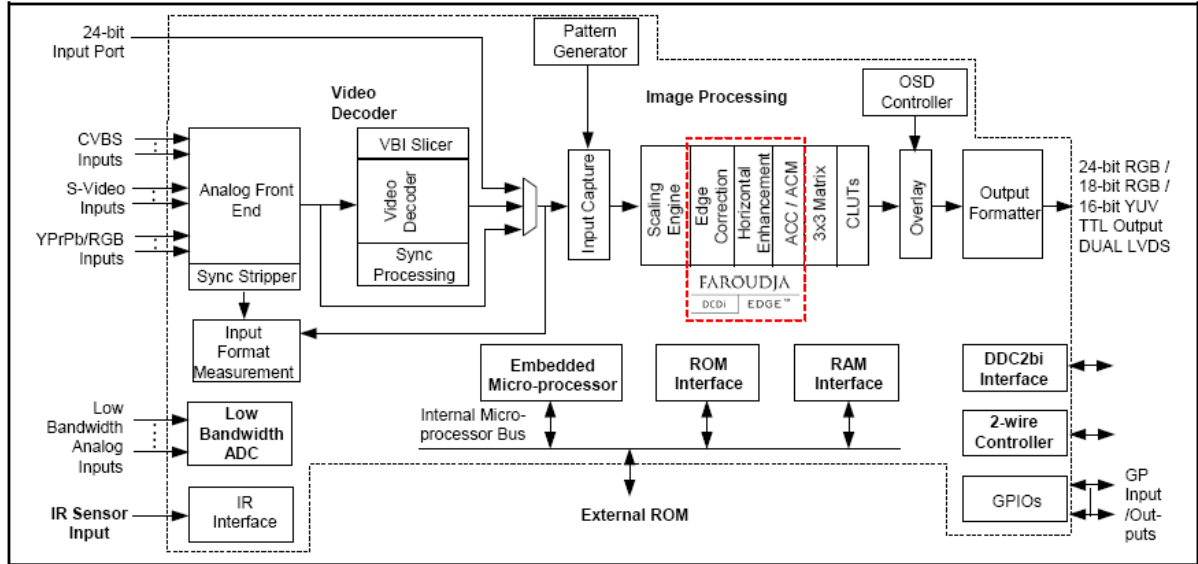
01.41.D.PD.ESF20NC15	Diode	SF20NC15M DIP	2	D3 D4
01.41.D.PD.E2015CT	Diode	MBRF20150CT DIP	2	D3 D4
01.41.D.WD.E10V	DIP zener diode	10V	1	ZD1
01.41.D.WD.E20V	DIP zener diode	20V	1	ZD2
01.44.IC.D.EM0765	IC	FSCM0765RGWDT U DIP	1	U5
01.44.IC.D.EPC817	IC	PC817 DIP	1	U2
01.44.IC.D.EKA431A	IC	KA431AZ DIP	1	U3
01.41.D.PD.EUS4K80	Diode	US4K 80R DIP	1	BD1
01.41.D.PD.EGBU406	Diode	GBU406 DIP	1	BD1
01.41.D.PD.EGBU408	Diode	GBU408 DIP	1	BD1
01.41.D.PD.EPQ322001	Transformer	BCK-PQ3220-01 DIP	1	TR1
01.40.CON.DCZ.E129	Connection	VH	1	CN1
01.40.CON.DTJ.E008	Jack	TJC3-4A	1	CN3
01.40.CON.DTJ.E012	Jack	TJC3-6A	1	CN4
01.38.FUSE.D.E3K315	Fuse	3K 3.15A 250V DIP	1	F1
01.38.FUSE.D.E32S315	Fuse	32S 3.15A 250V DIP	1	F1
01.38.FUSE.D.E315A250V	Fuse	ICP 3.15A250V	1	F1
01.00.FZ.ZZ.E010	J line	15mm	2	J1 J5
01.00.FZ.ZZ.E003	J line	10mm	2	J2 J3
01.00.FZ.ZZ.E007	J line	12.5mm	1	J4
01.37.PCB.1.E2956C2	Circuit board	Power supply board2956C-V2.0	1	
Bom No	Part No	Part Name	QTY	
MINV19-05QM1B02	02.07.MINV1905 QM1B02	Inverter	1	
Part No	Name	Specification	QTY	LOCA NO
01.57.R.2.E2R2J	SMD resistor	0603-2.2Ω±5%	1	R21
01.57.R.2.E100J	SMD resistor	0603-10Ω±5%	2	R10 R22

01.57.R.2.E681J	SMD resistor	0603-680Ω±5%	4	R27 R30 R33 R36
01.57.R.2.E681F	SMD resistor	0603-680Ω 1%	4	R28 R31 R34 R37
01.57.R.2.E202J	SMD resistor	0603-2KΩ±5%	1	R9
01.57.R.2.E103J	SMD resistor	0603-10KΩ±5%	3	R41 R17 R40
01.57.R.2.E153J	SMD resistor	0603-15KΩ±5%	4	R23 R24 R25 R26
01.57.R.2.E203J	SMD resistor	0603-20KΩ±5%	1	R14
01.57.R.2.E223J	SMD resistor	0603-22KΩ±5%	4	R29 R32 R35 R38
01.57.R.2.E683J	SMD resistor	0603-68KΩ±5%	2	R13 R18
01.57.R.2.E104J	SMD resistor	0603-100KΩ±5%	1	R20
01.57.R.2.E474J	SMD resistor	0603-470KΩ±5%	1	R19
01.57.R.4.E561J	SMD resistor	1206-560Ω±5%	1	R4
01.57.R.4.E102J	SMD resistor	1206-1KΩ±5%	1	R3
01.54.CS.2.E101N	SMD capacitor	0603-100P NPO±5%/50V	2	C13 C14
01.54.CS.2.E820N	SMD capacitor	0603-82P NPO±5%/50V	1	C6
01.54.CS.2.E821N	SMD capacitor	0603-820P NPO±5%/50V	1	C10
01.54.CS.2.E222X	SMD capacitor	0603-222 X7R±10%/50V	4	C16 C17 C18 C19
01.54.CS.2.E472X	SMD capacitor	0603-472 X7R±10%/50V	4	C27 C31 C35 C39
01.54.CS.2.E103X	SMD capacitor	0603-103 X7R±10%/50V	5	C9 C28 C32 C36 C40
01.54.CS.2.E223X	SMD capacitor	0603-223 X7R±10%/50V	1	C7
01.54.CS.2.E104Y	SMD capacitor	0603-104 Y5V-20+80%/50V	1	C12
01.54.CS.2.E474Y	SMD capacitor	0603-474 Y5V+80-20%/50V	1	C15
01.54.CS.2.E105Y16V	SMD capacitor	0603-105 Y5V-20+80%/16V	4	C3 C4 C8 C11
01.35.CC.E121010U25V X	SMD ceramic capacitor	C3225X5R1E106KT	4	C21 C23 C22 C24
01.54.CS.6.E100	SMD capacitor	1808-10P/3KV NPO±5%	4	C26 C30 C34 C38
01.34.CL.D.E220U25VD 1	Electrolyse capacitor	220UF/25V 8*12 (±20%,105°C, LOW ESR)	2	C1 C2

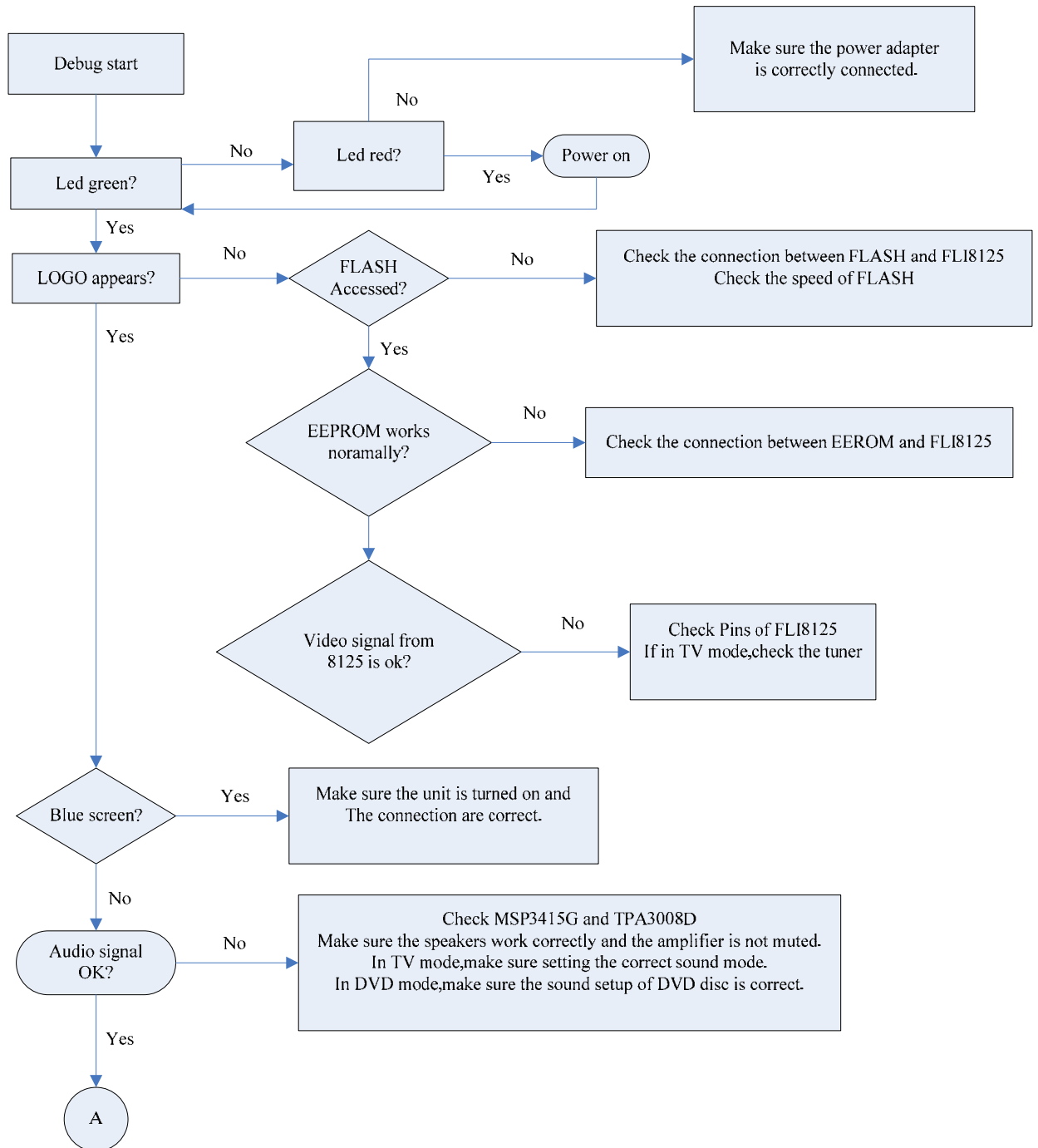
01.41.D.PS.EBAW56	Diode	BAW56 SMD	2	D1 D2
01.41.D.PS.EBAV99	Diode	BAV99LT1 SMD	8	D3 D04 D05 D06 D07 D08 D09 D10
01.41.D.PS.E1SS355	Diode	1SS355 SMD	1	D11
01.41.D.WS.EUDZ7V5B	Diode	UDZ7V5B(7.5V)	1	ZD1
01.42.Q.S.E2N3904	Audion	2N3904 SMD	2	Q1 Q4
01.42.Q.S.E2N3906	Audion	2N3906 SMD	1	Q5
01.42.Q.S.E2N7002	Transistor	2N7002 SMD	1	Q6
01.44.IC.S.E4511	Transistor	AP4511 SMD	2	Q7 Q8
01.44.IC.S.E3193	IC	Bit3193 SMD	1	IC1
01.38.FUSE.S.EF1206H I3000	Fuse	F1206HI-3000 SMD	1	F1
01.38.FUSE.S.E66002	Fuse	0466002.NR	1	F1
01.13.L.R.E115	Transformer	NIA19LES019	2	TR1 TR2
01.00.YS.TZ.T.E747	Transformer label	Label001	2	
01.40.CON.DPH.E063	Jack	PH-5A	1	J1
01.40.CON.S35.E001	SMD hi-voltage jack	3.5-2P	4	J02 J03 J04 J05
01.37.PCB.2.E3678C	Circuit board	Inverter board3678C	1	

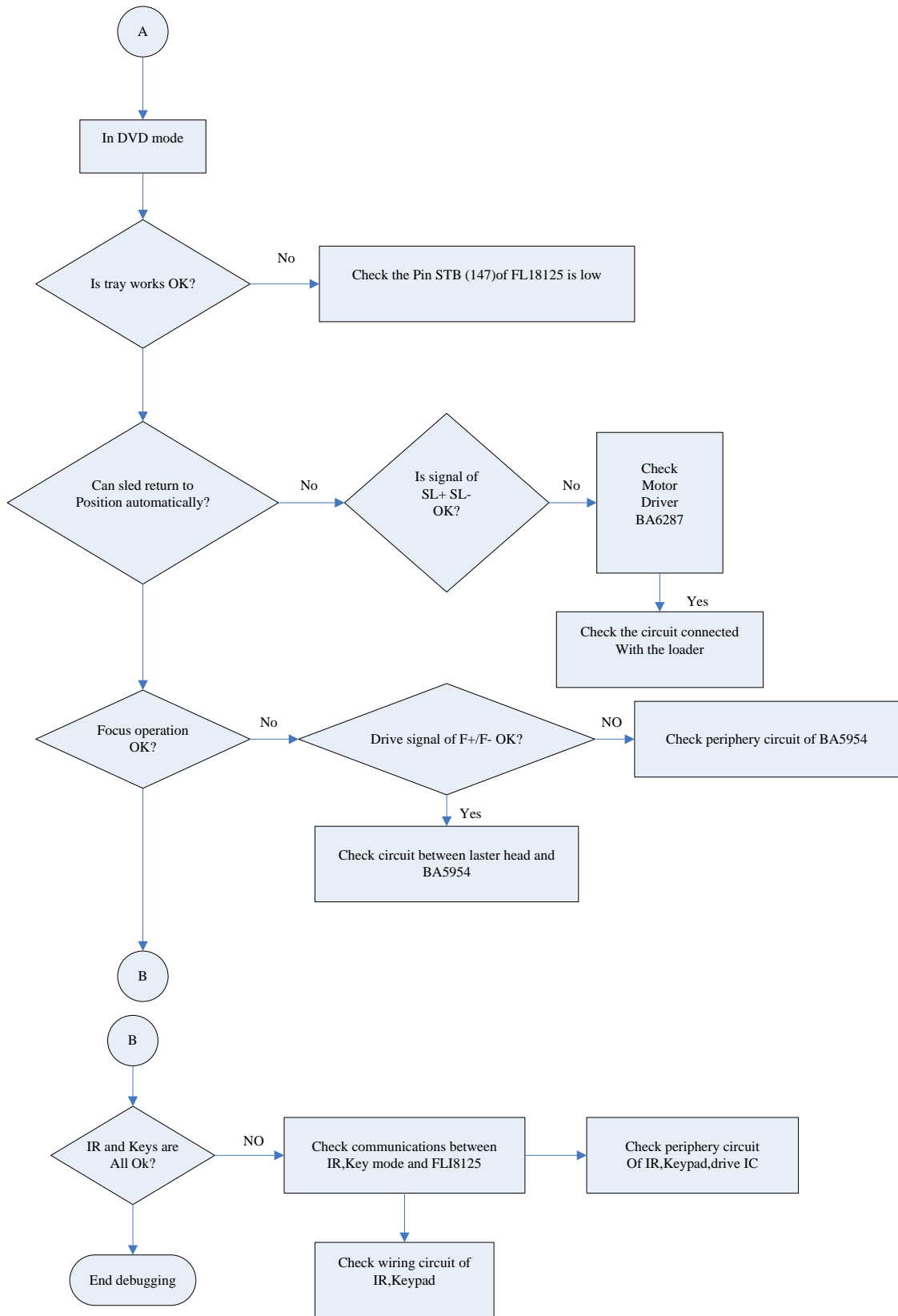
# Part6 Debugging Procedures

## 1. Signal process diagram



## 2. Debugging Strategy







### **3. Tips Of Some Typical Troubleshooting**

#### **White screen**

First check voltage in HI-voltage Board; otherwise check the voltage of MAIN board , if abnormal , the problem occurs in 4U1. If the voltage is OK, check the LVDS. At last the connection between the main board and drive board may be the target for troubleshooting.

#### **Black screen**

This problem often arise from the voltage input to the screen, so the first step is to check the voltage of invert circuit. Otherwise check if the status is standby. If in TV mode, check the power for tuner is correct.

#### **No color**

Check if the connection with the external device is correct. Otherwise make sure the saturation is not zero. At last the problem may arise from the FLI8125.

#### **Abnormal picture**

Check if the range of the signal input to FLI8125 is correct. If no, the problem may be in the AFE(Analog Front End). Otherwise make sure the color system is correct. Then check the LVDS and the LCD Screen.

#### **Pictures with no sound**

Firstly, make sure the speakers works well. If so, the trouble mostly occurred in TPA3008 in 3U6 in main board, then MSP3425G in 3U1.

#### **Sounds with no picture**

Check if any signal inputs to FLI8125, if yes, the problem may be in the AFE. Otherwise check the LVDS.