

Modelo: BSA-3750 Service Manual

Reproductor DVD-DivX

DVD- DivX Player



- DVD-Video / Audio CD / Video CD
- Photo Viewer for JPEG Photos, Kodak Picture CD
- 5.1 Channel Audio Output
- Progressive Scan Output
- Virtual Surround Sound
- Multi-language / Subtitle / Angle
- Random Play / Program Play
- DivX 3.11~5.xx
- MPEG4 AVI Files
- Mirror front
- Remote Control



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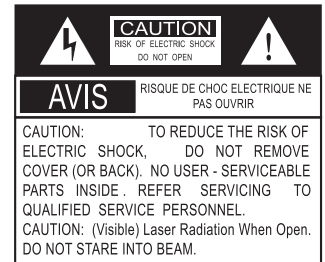
1. General Sections

Cautions and Warnings

Product Safety Notice

Parts marked with the symbol  in the schematic diagram have critical characteristics.

Use ONLY replacement parts recommended by the manufacturer. It is recommended that the unit be operated from a suitable DC supply or batteries during initial check out procedures.



Leakage Current Check/Resistance Check

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 240 K ohms, the unit is defective.

WARNING: DO NOT return the set to the customer until the problem or located is corrected.

Protection of Eyes from Laser Beam

To protect eyes from invisible laser beam during servicing
DO NOT LOOK AT THE LASER BEAM

Laser Caution

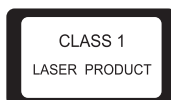
This Digital Video Disc Player employs a Laser System. To prevent direct exposure to the laser beam, do not try to open the enclosure.

Visible laser radiation emits when open and interlocks are defeated.

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. This CD Changer must be adjusted and repaired only by qualified service personnel.

DO NOT STARE INTO BEAM.

Laser symbol:



THIS IS COMPACT DISC PLAYER IS CLASSIFIED AS A CLASS 1 LASER PRODUCT.
THE LASS 1 LASER PRODUCT LABEL IS LOCATED ON THE REAR EXTERIOR.

Precautions

1. ESD Precautions in Repairing

1.1 Do not apply excessive pressure on the mechanical parts (moving parts), including the Pickup Block, as extremely high mechanical precision or required in these parts.

1.2 When soldering the microprocessor and signal processing IC's, use a ceramic soldering iron or a soldering iron whose metal part is grounded since they are not resistant to static electricity.

1.3 When removing the solder or soldering the laser shorting lands for the Pickup Block, use a ceramic soldering iron or a soldering iron whose metal part is grounded since the laser diode or not resistant to static electricity.

2. DVD Loading Unit Precautions when handling the Mechanism Block

2.1 Do not loosen any screws in the Pickup Block.

2.2 Do not adjust any screws in the Mechanism Block except for “Tilt Adjust Screws”, as they are adjusted precisely at the factory.

2.3 Replacement of the Pickup Block is impossible. Always replace the Traverse Ass’y when the Pickup Block needed to be replaced. Do not touch the lens or lens holder of the Pickup Block.

2.4 The Guide Rails of the Pickup Block are greased. Take care when handling.

2.5 When you try to slide the Pickup Block, do not press or pull it directly. Always turn the dive gears with your fingers.

2.6 Be sure that the anti-slipping rubber on the turntable or clean. If there is dust or it is greasy, clean the part with the liquid that contains 50% each of alcohol and water.

When removing the Mechanism P.C.B. Ass’y, you need to short-circuit the laser diode shorting lands beforehand.

Test Equipment / Jigs

Variable isolating transformer, Dual channel oscilloscope, Digital multimeter

Specification

1	Chassis		
	Laser concept		2 laser for DVD and VCD
2	Disc formats		
	DVD+R		Yes
	DVD-R		Yes
	DVD+RW		Yes
	DVD-RW		Yes
	CD-R		Yes
	CD-RW		Yes
3	Media formats		
	DVD-Video		Yes
	Audio CD		Yes
	Video CD		VCD 1.0,1.1,2.0
	S-Video CD		Yes
	CD-ROM		DivX,MPEG4,MP3, JPEG, Kodak Picture CD,WMA
4	Player features		
	Parental control		Yes, numerical lock
	Screen saver		Yes
	Picture mode select		Yes
	Video strobe		Yes
	Video filter		Yes
	File browser		DivX, MP3, JPEG, Kodak Picture CD,WMA
5	Player functions		
	Play/stop/pause		Yes/Yes/Yes

	Next/previous(skip)	Yes/Yes
	Fast forward/reverse	Yes/Yes (DVD,MP3,WMA : 2X / 4X / 6X / 8X , VCD,CDDA:1X / 2X / 3X / 4X, DivX: 2X / 4X / 8X / 16X)
	Zoom	DVD/VCD 2X/3X/4X,JPEG 1.5X/2X/1/2/1/4
	Slow motion forward /reverse	YES/YES(DVD,VCD:1/2,1/4,1/8)
	Perfect still picture	Yes
	Frame advance /reverse	Yes/Yes
	Repeat CD /DVD	DVD: title -chapter-A/B;VCD,CD: A/B-repeat one-repeat all
	Random play	CDDA, MP3,WMA
	Program play	CDDA,DVD,JPEG,MP3,WMA
	Last memory(resume)	Yes
6	Region Code	
	Region code	changed by request.
7	OSD	
	OSD style	standard
	OSD language	English, German, Dutch, French, Italian, Spanish, Portuguese
	Subtitle Language	English, German, Dutch, French
	Welcome Logo and OSD background	Provided by Customer
8	Audio out	
	Digital Audio decoder	Dolby digital AC-3, MPEG 2, PCM, MP3
	Digital Audio output	Dolby digital AC-3, DTS, MPEG, PCM 48/96 KHz
	Analog Audio output	Dolby Prologic II (down mix), Stereo; Dolby digital AC-3; 5.1CH
	Audio D/A converter	24 Bit/96kHz
	Virtual surround Sound	Yes
	Digital sound process	Yes
	Frequency range DVD 48/96 kHz	4 Hz-22 kHz/ 4 Hz- 44 kHz
	Frequency range CD 44.1 kHz	4 Hz-20 kHz
	Dynamic range 1 kHz	≥80 Db(weighted)
	Crosstalk	≥80 dB(weighted)
	Signal noise	≥90 dB(weighted)
9	Video out	
	Video D/A converter	10 Bit / 54 MHz
	Progressive Video out	PAL / NTSC
	PAL	Yes, 625 lines / 50Hz / 4.43 MHz

	NTSC		Yes, 525 lines / 60 Hz / 3.58 MHz
	Norm converter (PAL-NTSC, NTSC-PAL)		Yes
	Video resolution		525 lines
	Frequency response		5MHz < -3 dB
	Signal noise rate luminance		>60 dB (weighted)
	Signal noise rate chroma		>60 dB unweighted
10	Connections rear		
	Euro-AV		Yes, scart
	Cinch Video		Yes, 1× output
	Cinch Audio		Yes, 6× output
	S-Video (Y-C)		Yes, 1× output
	Digital Audio out coaxial		Yes, 1×
	Digital Audio out optical		Yes, 1×
	progressive scan out		Yes, 3xoutput
11	Power Supply		
	Power voltage		AC 110-240V 50/60 Hz
	Max. power consumption		Approx. max. 10W
	Power switch		Yes
	Power supply plug		Yes
12	Cabinet		
	Dimensions in cm (W× H ×D) net		Approx. 43.0×4.8×25.7
	Dimensions of carton in cm (W× H ×D)		Aprrox. 47.1x10.8x36.8
13	Design		
	Design		mirror-like front panel as per the sample provided by Hu- alu
	Cabinet keys		POWER ,PLAY, PAUSE, STOP, OPEN/CLOSE, PREV, NEXT
	Logo		ACCORDING TO REQUEST
	Label		Model no. label and production serial number label will be sticked at rear panel
14	Remote Control		
	Type		standard
	Batteries		Yes, 2×R03P AAA (no mercury)
	IR code		standard
15	Display		
	Type		VFD

16	Packaging		
	1 set /carton		ACCORDING TO REQUEST
	54 cartons/ slip-sheet		
17	Loadability		
	For 20' Container		1296 sets
	For 40' Container		2592 sets
	For 40 HC Container		2880 sets
18	Supplied Accessories		
	Euro-AV cable (Scart-cable)		Yes
	Power cord		Yes
	Remote control		Yes
	Batteries		Yes
	Instruction Manual		ACCORDING TO REQUEST
	Warranty info		Yes
19	Safely Conformity		changed by request with payment
	CE		CE report is available for Hualu's model no.:DVD4360

Dissassembly Instructions

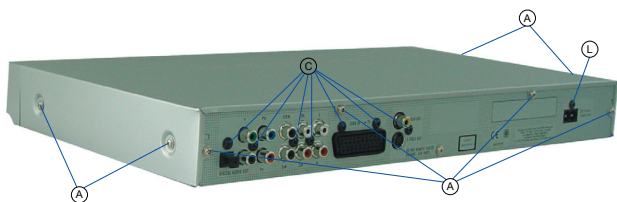


Fig. 1

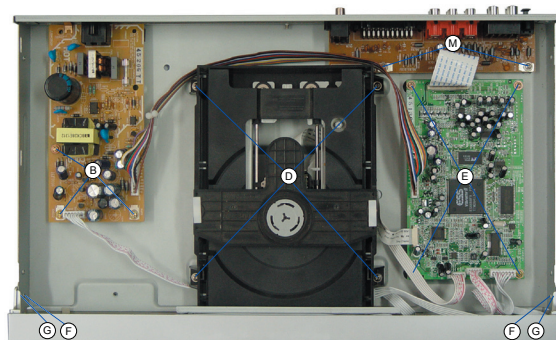


Fig. 2

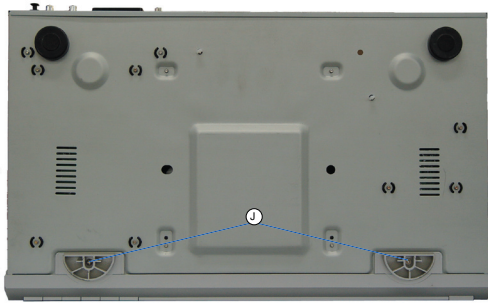


Fig.3



Fig. 4



Fig. 5

1. Cabinet Upper Part

- Undo the 8 screws A (Fig. 1)
- Bend the upper part of the cabinet from the rear side (Fig. 1) off the base plate, and then detach the cabinet upper part from the unit.

2. Front Panel

- Undo the 2 screws J (Fig. 3)
- Undo the 2 screws F (Fig. 2)
- Undo the 2 locking lugs G (Fig. 2) and then remove the front panel.
- Unplug the connectors if necessary.

3. VFD Driver and Key Control Board Units

- Remove the front panel (Point 2)
- Undo the 4 screws I (Fig. 4)
- Remove the VFD Driver and Key Control Board units.

4. Power Supply Board

- Undo the 4 screws B (Fig. 2).
- Undo the 1 screw L (Fig. 1).
- Remove the Power Supply Board from the unit.
- Unplug the connectors if necessary.

5. Main Board

- Undo the 7 screws E (Fig. 2).
- Remove the main board.
- Unplug the connectors if necessary.

6. Output Board

- Undo the 2 screws M (Fig. 2)
- Undo the 4 screws C (Fig. 1).
- Remove the output board.
- Unplug the connectors if necessary.

7. Drive Mechanism

- Undo the 4 screws D (Fig. 2)
- Lift the drive mechanism at its back part, slide it to the rear, and then remove it.
- Unplug the connectors if necessary.

8. Opening the Tray of a Defective Unit

- Turn the toothed wheel H (Fig. 5) in direction of the arrow until the tray moves then pull out the tray completely.
- Remove the DVD/CD from the defective drive unit if necessary.

2. Service and Special Functions

Software Upgrade

You can download the upgrade software "bank30.rom" from Web using an Internet browser.

- Copy the "bank30.rom" on the drive of your PC.
- Create a software upgrade CD.
 - Use only a new CD-R / CD-RW (not a erased one).
 - Give the CD name of your choice (e.g. version and unit name).
 - Burn the "bank30.rom" on the CD-R / CD-RW.
- Insert the upgrade CD, the unit will be upgraded automatically.
- After upgrade, the disc tray will opened, remove the upgrade CD.

Attention: if a failure should occur during the software upgrade, it may happen that the unit's function and a restart of the upgrade function are no longer possible. If this should be the case,

- Power off the unit with pressing ON/OFF button on the front panel (do not remove the upgrade CD).
- During pressing still the NEXT button on the front panel, press down the ON/OFF button to power on the unit, the unit will be upgraded automatically.
- After upgrade, the disc tray will opened, remove the upgrade CD.

Initialization of the Set

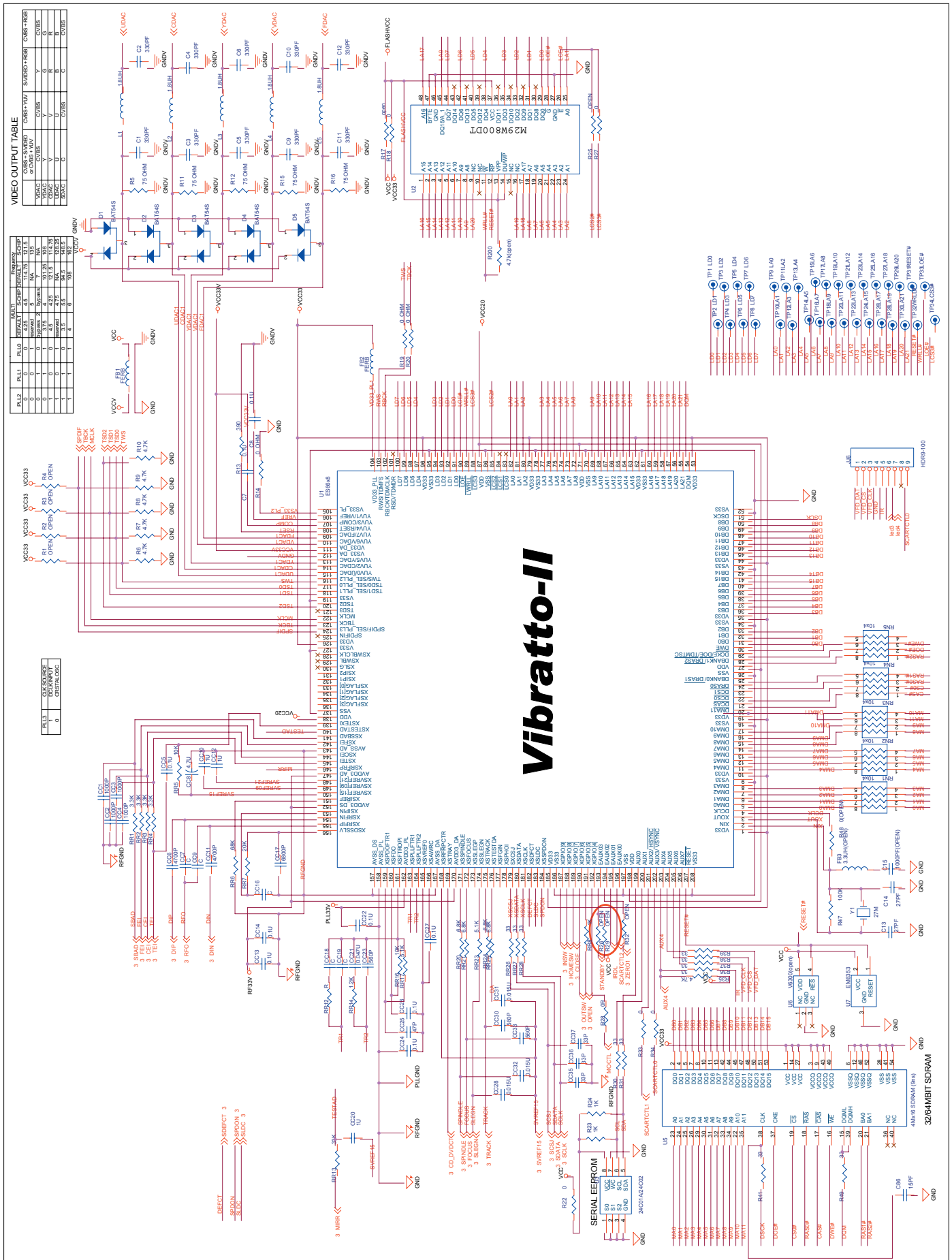
You can restore all the custom settings to the basic settings.

- Press SETUP button to open the main menu.
- Select the PREFERENCES line with ▲ or ▼ and activate with OK button.
- Select the DEFAULTS line with ▲ or ▼ and press OK button to confirm.
- Select the RESET with ► and press OK button to reset the unit to its basic settings.
- Press SETUP to exit the menu.

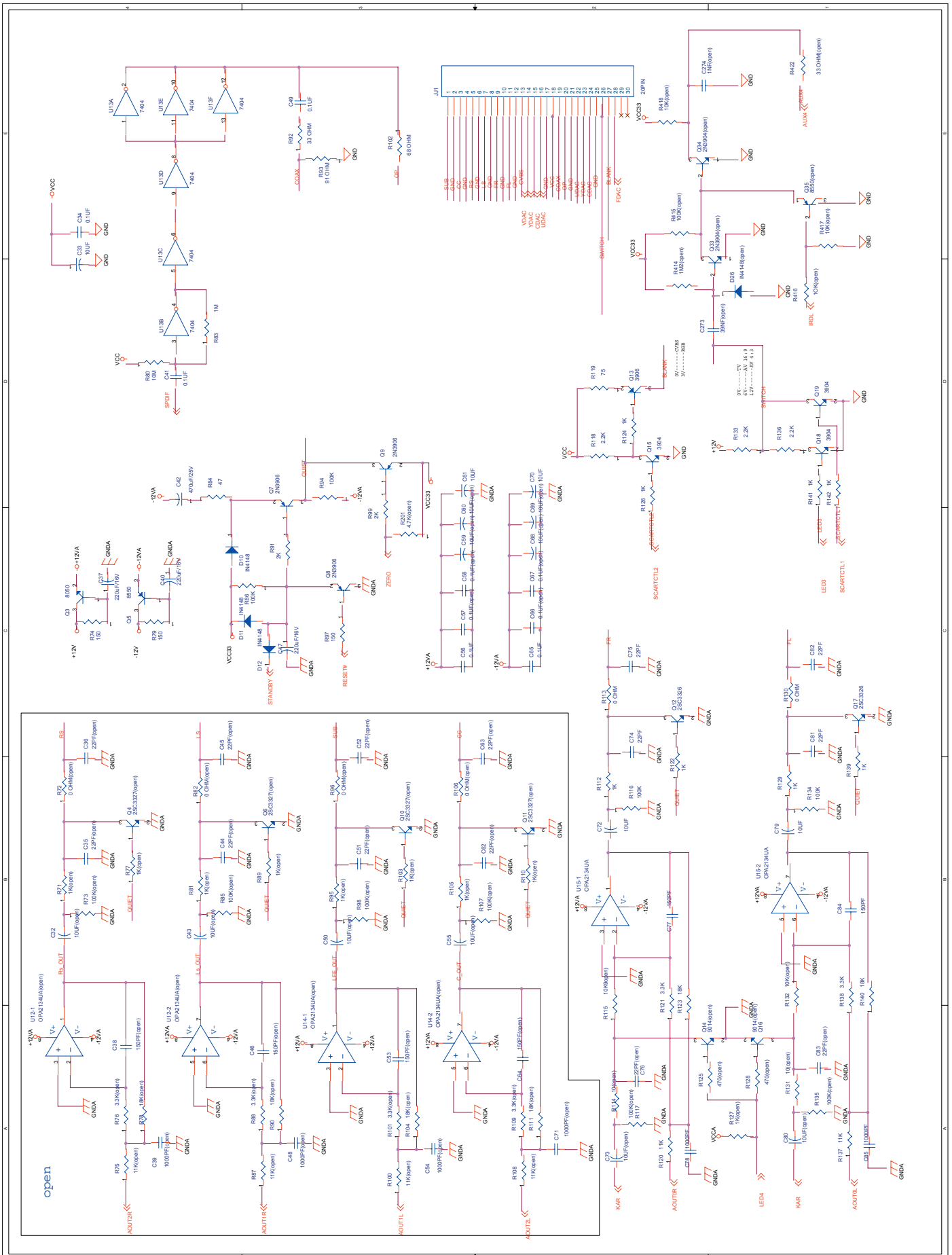
3. Layout of Circuit Diagrams and PCBs

Main Board

Main Board (M1)

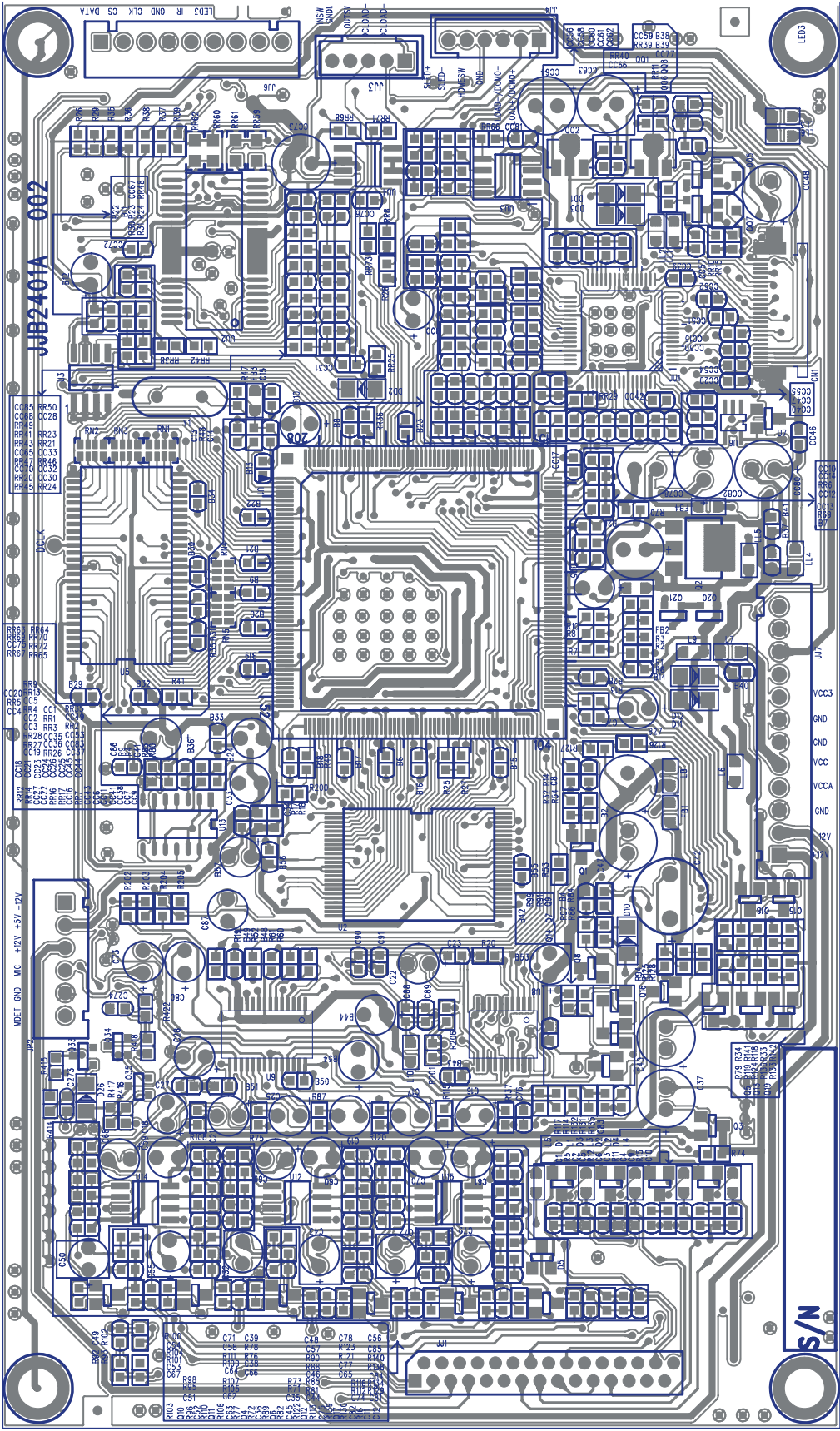


Main Board (M4)

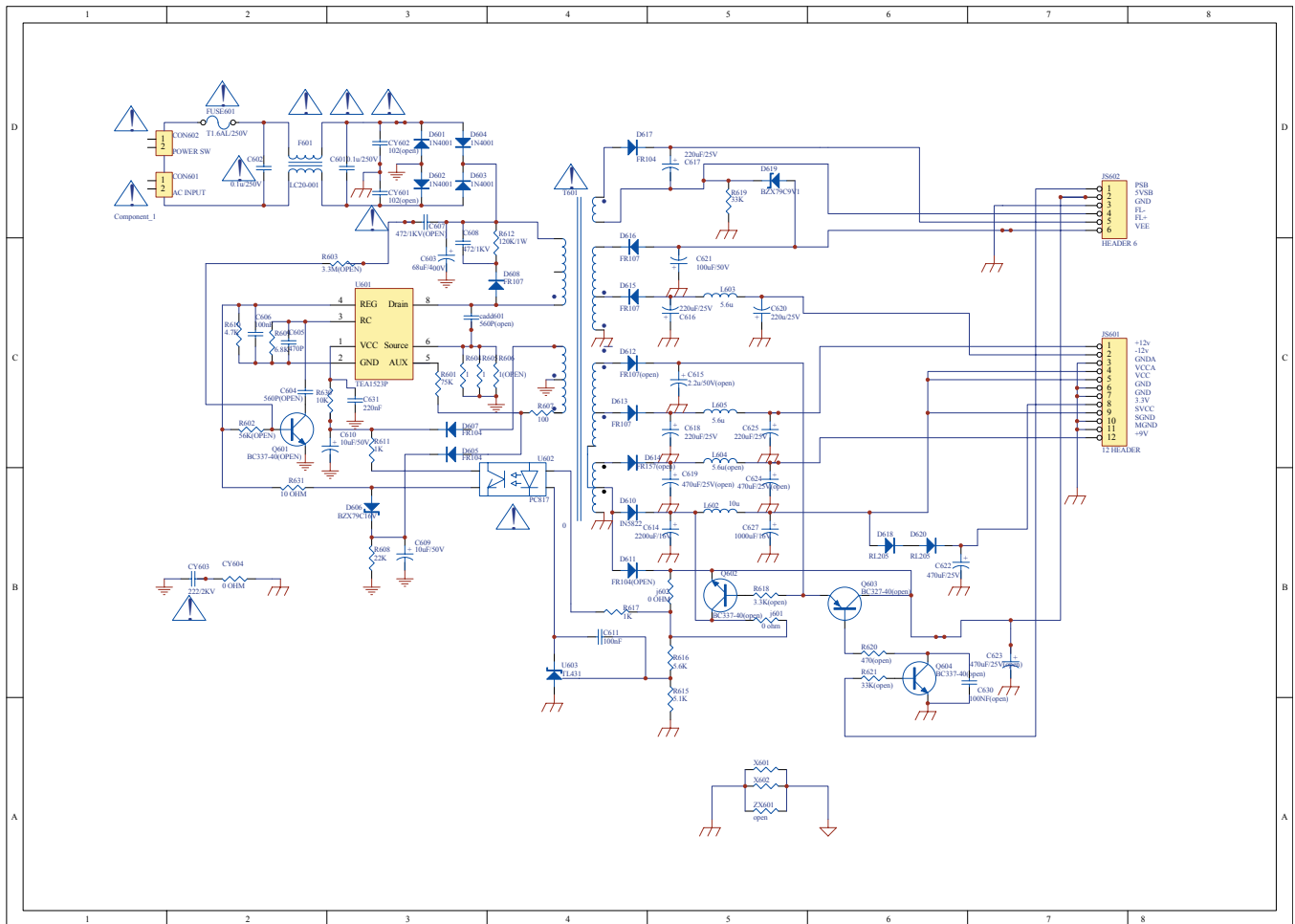


Main Board

View of Component Side

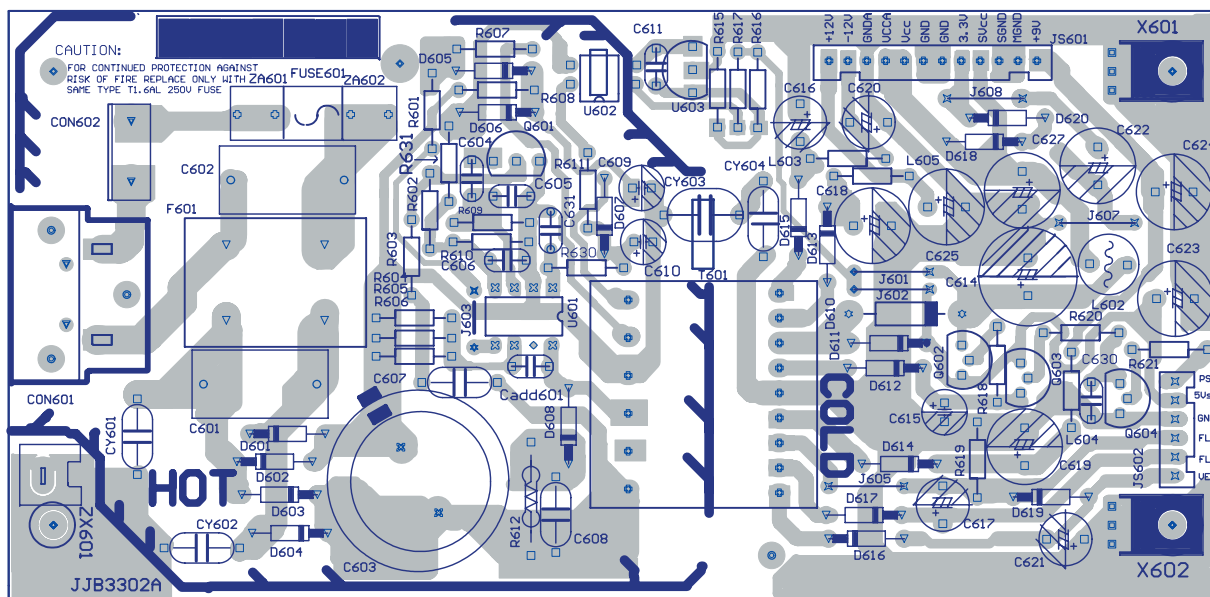


Power Supply Board

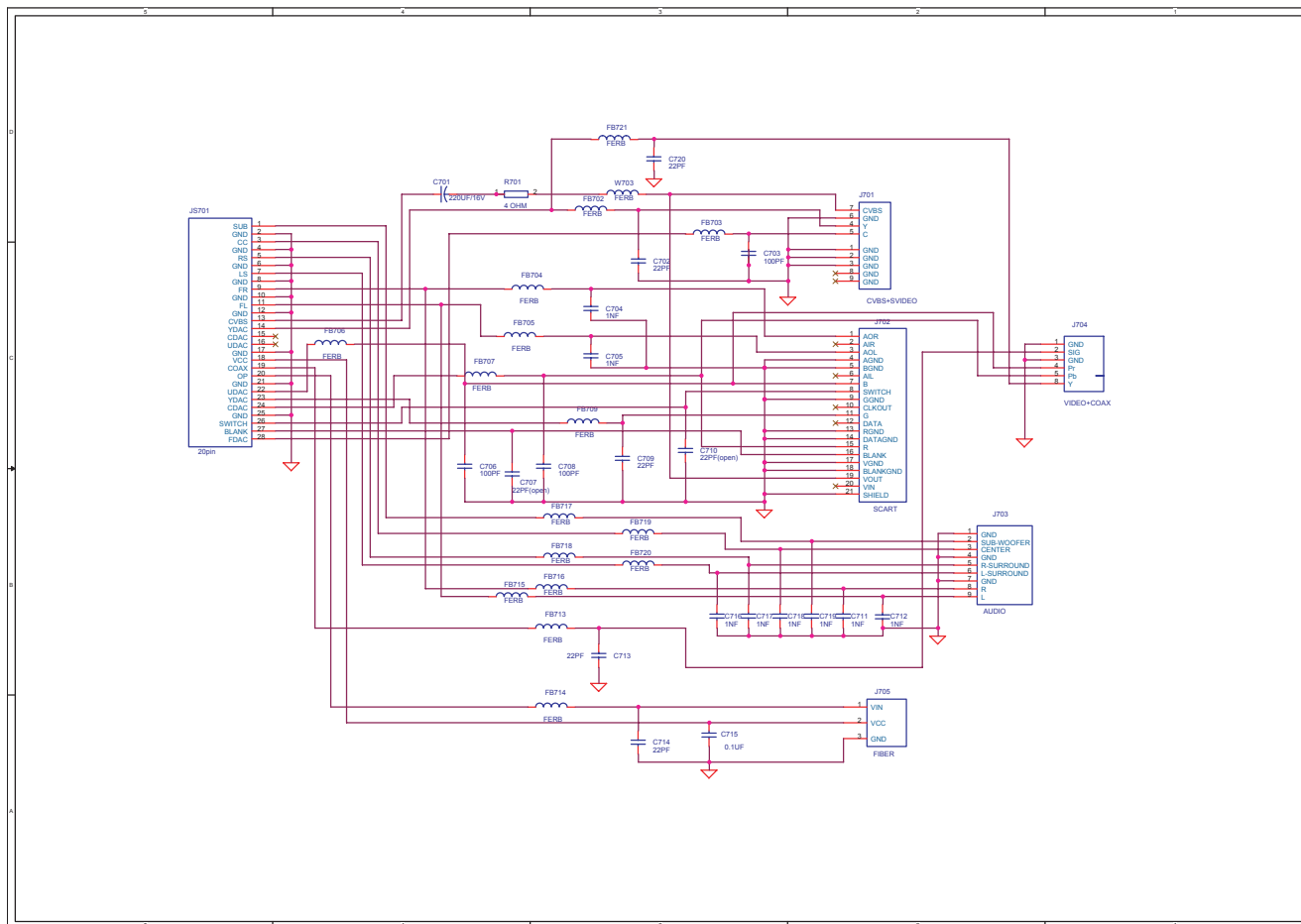


Power Supply Board

View of component Side

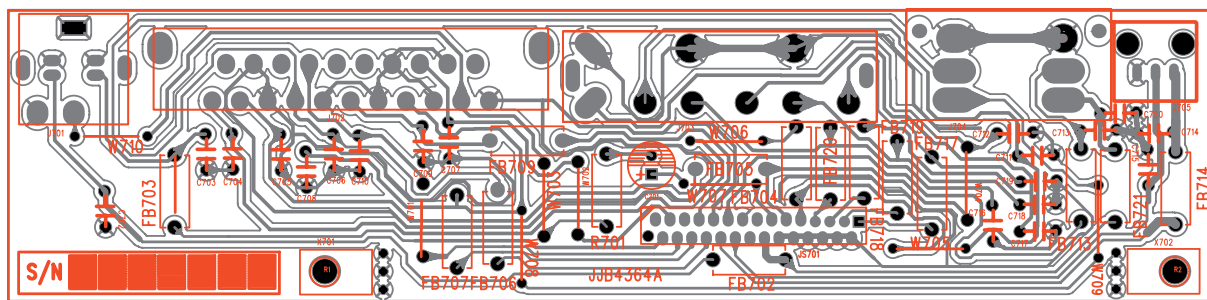


Output Board

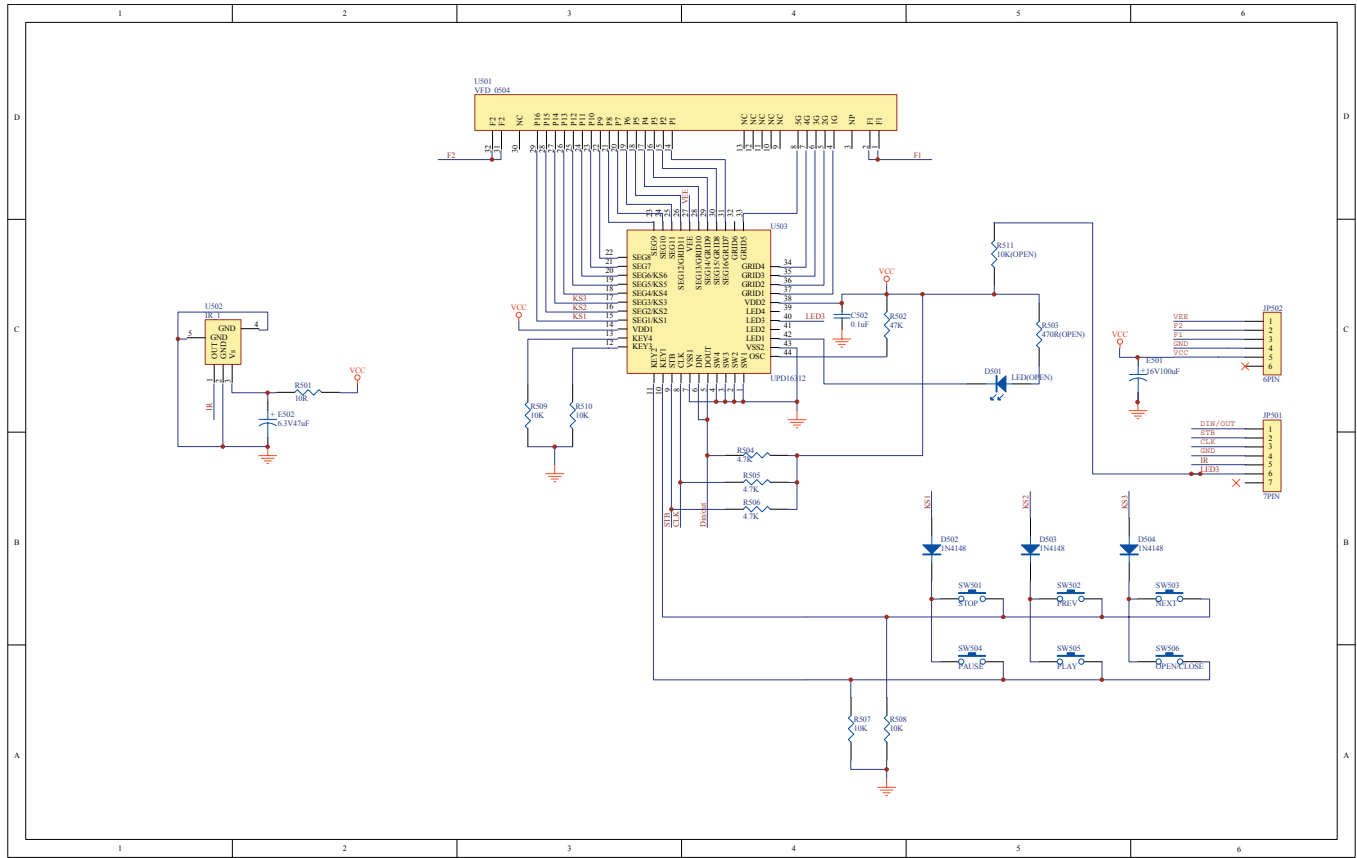


Output Board

View of Component Side

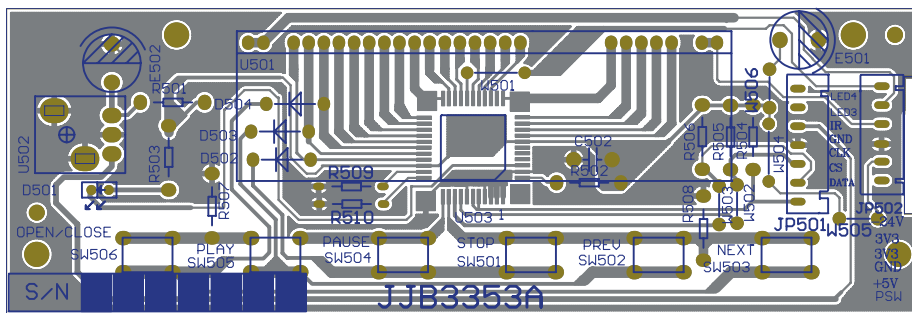


Key Control and VFD Driver Board



Key Control and VFD Driver Board

View of Component Side

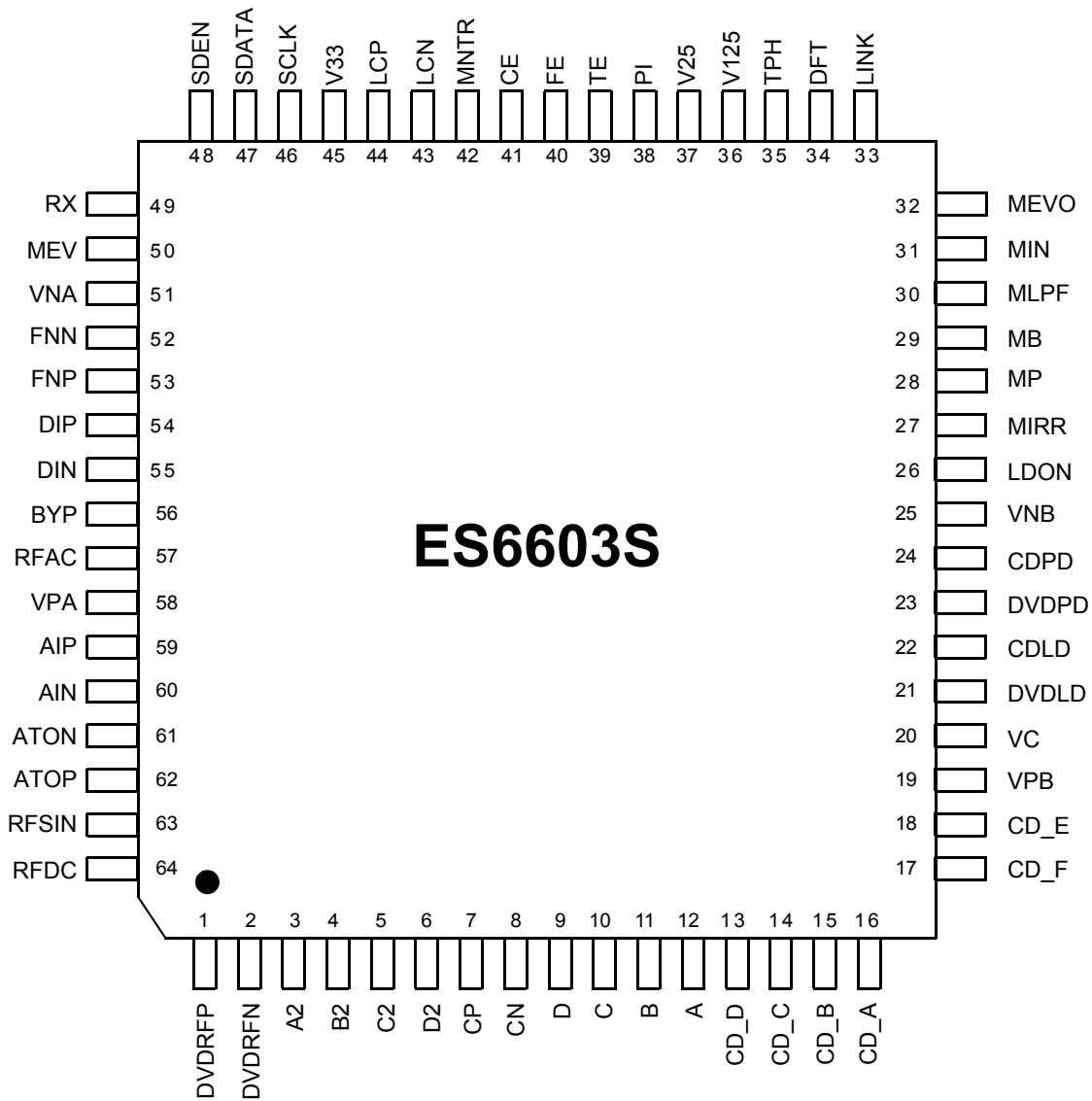


4. IC Block Diagrams

ES6603

ES6603 PINOUT

The figure below depicts the ES6603 device pinout. The pound symbol(#) indicates an active-low signal.



ES6603 Device Pinout

ES6603 PIN DESCRIPTION

The table below lists the pin descriptions for the ES6603. The poundsymbol (#) indicates an active-low signal.

ES6603 Pin Descriptions List

Name	Pin Numbers	I/O	Definition
DVDRFP, DVDRFN	1, 2	I	Differential RF signal attenuator inputs.
A2, B2, C2, D2	3:6	I	AC coupled photo detector interface inputs for the differential phase detector (DPD) from the main beam photo matrix.
CP, CN	7, 8	ó	Differential phase tracking low-pass filter pins. Connect CP to CN via capacitors.
D, C, B, A	9:12	I	Photo detector interface inputs from the main beam photo matrix.
CD_D, CD_C, CD_B, CD_A	13:16	I	CD photo detector interface inputs from the main beam photo matrix.
CD_F, CD_E	17, 18	I	CD photo detector interface inputs from the CD side beam photo detector; used for CD tracking detection.
VPB	19	P	Servo block power supply.
VC	20	O	Reference voltage out (VPB/2). Output impedance is less than 50 .
DVDLD	21	O	DVD APC output; controls laser power for DVD.
CDLD	22	O	CD APC output; controls laser power for CD.
DVDPD	23	I	DVD APC input.
CDPD	24	I	CD APC input.
VNB	25	G	Servo block ground.
LDON	26	I	APC On/Off control. A high level activates LD output. (open is low)
MIRR	27	O	Mirror detect output.
MP, MB	28, 29	I	Mirror top and bottom hold pins. Connected to VPB pin 19 via capacitors.
MLPF	30	I	Mirror low-pass filter pins. Connected to VPB pin 19 via a capacitor.
MIN	31	I	RF input signal for mirror. AC coupled inputs for the mirror detection circuit from MEVO pin 32.
MEVO	32	O	RFDC bottom envelope out. Pull-In or bottom clamped RF envelope signal output for mirror detection.
LINK	33	I,O	Linking Signal In/Mirror Monitor Out. In the linking area, the mirror and tracking error outputs are disabled when this pin goes high. When the monitor output signal is selected by the Control H register, mirror-related signals can be observed.
DFT	34	O	Defect output. When the Pull-In signal level is below the detection level, or when the RF signal level is below the detection level, the DFT output goes high. The defect output is selected by the serial port.
TPH	35	I	Pull-In top hold. Connected to VPB pin 19 via a capacitor.
V125	36	O	1.25V servo block reference voltage output.
V25	37	P	2.5V servo output reference power supply.
PI	38	O	Pull-In signal out. The summing signal output of A, B, C, D, or CD_A, CD_B, CD_C, or CD_D. Reference to V25/3.
TE	39	O	Tracking error output reference to V125 pin 36.
FE	40	O	Focusing error output reference to V125 pin 36.

ES6603 PIN DESCRIPTION

ES6603 Pin Descriptions List (Continued)

Name	Pin Numbers	I/O	Definition
CE	41	O	Center error output reference to V125 pin 36.
MNTR	42	O	Monitor out signal. Output is selectable by register settings.
LCN, LCP	43, 44	I	Lens shift offset cancellation low-pass filter pins. Connect LCN to LCP via a capacitor.
V33	45	P	3.3V output buffers power supply.
SCLK	46	I	Serial clock from ES66x8.
SDATA	47	I/O	Serial data I/O.
SDEN	48	I	Serial data enable. Enabled by an active-high signal.
RX	49	I	Reference resistor. Connected to ground via a 12.0k , 1% resistor..
MEV	50	I	RFDC bottom envelope. Connected to VPA pin 58 via a capacitor.
VNA	51	G	RF block and serial port ground.
FNN, FNP	52, 53	O	Differential outputs of equalizer/filter.
DIP, DIN	54, 55	I	Differential analog inputs to the RF single-end output buffer and full wave rectifier.
BYP	56	I	AGC amplifier gain bypass. Tied to VPA via a capacitor.
RFAC	57	O	Single-ended RF output.
VPA	58	P	RF block and serial port power supply.
AIP, AIN	59, 60	I	Differential AGC amplifier inputs.
ATON, ATOP	61, 62	O	Differential attenuator outputs.
RFSIN	63	I	Single-ended RF signal attenuator input.
RFDC	64	O	Single-ended RF summing output.

ES6603 DEVICE INTERFACES

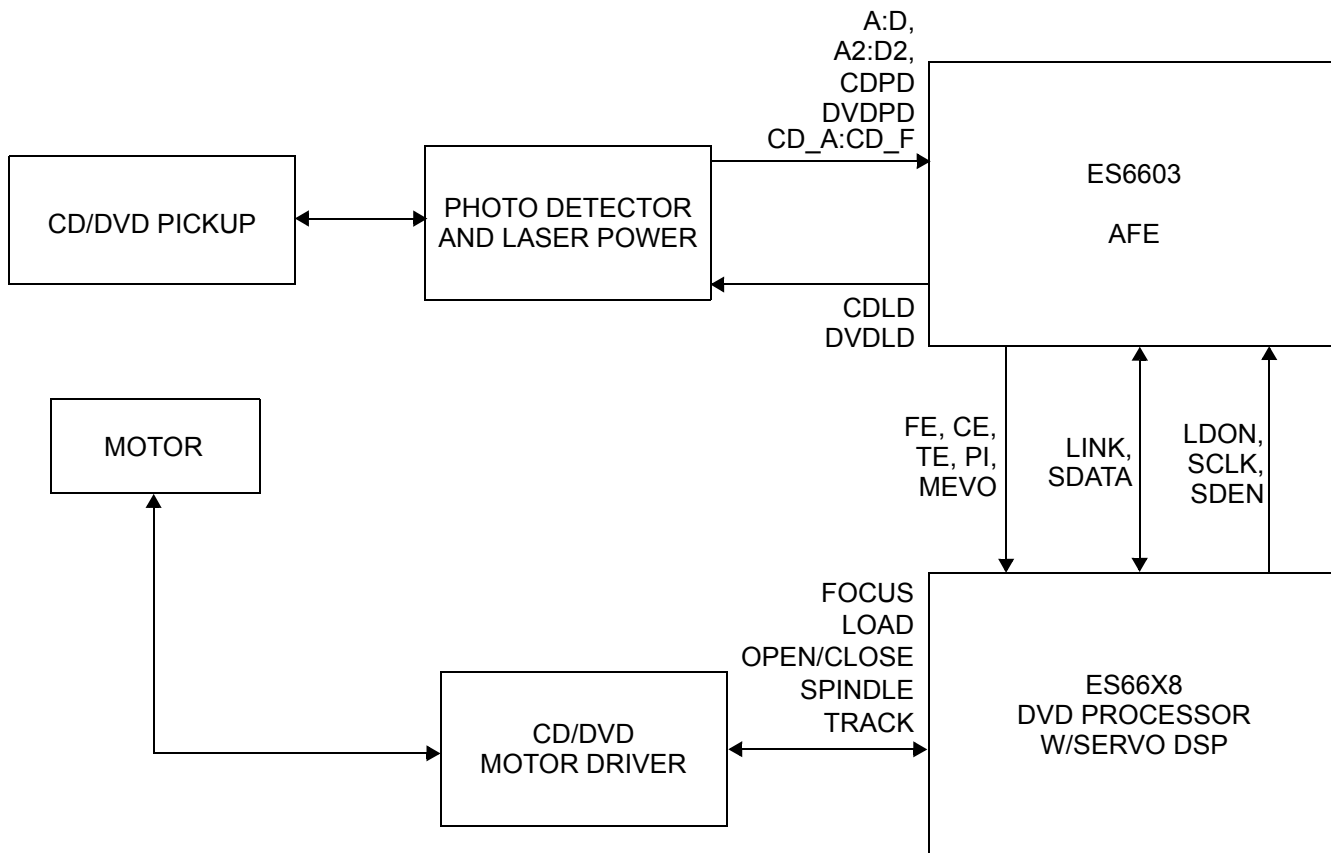
The table below lists the device interfaces for the ES6603.

ES6603 Device Interfaces

Name	Pin Numbers	I/O	Definition
AGC Interface	59, 60	I	Differential AGC amplifier inputs [AIP] and [AIN].
Automatic Laser Power Control (APC) Interface	21	O	APC laser power control for DVD [DVDLD].
	22	O	APC laser power control for CD [CDLD].
	23	I	APC photo diode in for DVD [DVDPD].
	24	I	APC photo diode in for CD [CDPD].
	26	I	APC input on/off control [LDON].
CD/DVD Photo Detector Interface	3:6		DVD differential phase detector matrix inputs [A2], [B2], [C2], and [D2].
	9:12	I	DVD single-ended phase detector matrix inputs [A], [B], [C], and [D].
	13:16	I	CD photo detector interface inputs [CD_A], [CD_B], [CD_C] and [CD_D].
	17, 18	I	CD side beam photo detector tracking outputs [CD_E] and [CD_F].
Embedded Servo DSP Interface	26	I	APC input on/off control [LDON] from embedded servo DSP.
	33	I/O	Linking signal and mirror monitor control I/O [LINK].
	34	O	Defect output [DFT] to embedded servo DSP.
	38	O	Pull-In signal [PI] to embedded servo DSP.
	39	O	Tracking error [TE] to embedded servo DSP.
	40	O	Focusing error [FE] to embedded servo DSP.
	41	O	Center error [CE] to embedded servo DSP..
	46	I	Serial clock [SCLK] from embedded servo DSP.
	47	I/O	Serial data I/O [SDATA] for embedded servo DSP.
48	I	Serial data enable [SDEN] from embedded servo DSP.	
Filtering and Reference Voltage	7, 8	I	Differential phase tracking low-pass filters [CP] and [CN].
	20	O	DC bias reference voltage [VC].
	30	I	Mirror low-pass filter [MLPF].
	36	O	Servo block reference voltage [V125].
	43, 44	I	Lens shift offset cancellation low-pass filters [LCP] and [LCN].
	64	O	Single-ended RF summing output reference [RFDC].
Power and Ground	19	P	Servo block port power supply [VPB].
	25	G	Servo block ground [VNB].
	37	P	2.5V reference voltage servo output power supply [V25].
	45	P	3.3V output buffers power supply [V33].
	51	G	RF block and serial port ground [VNA].
	58	P	RF block and serial port power supply [VPA].
AGC and Filter Interface	1,2	I	Differential RF signal attenuator inputs [DVDRFP] and [DVDRFN].
	52, 53	O	Differential normal filter outputs [FNP] and [FNN].
	54, 55	I	Differential analog RF buffer inputs [DIP] and [DIN].
	57	O	Single-ended RF output [RFAC].
	63	I	Single-ended RF signal attenuator input [RFSIN].
	61, 62	O	Differential attenuator outputs [ATOP] and [ATON].
Serial Port Interface	46	I	Serial clock from ES66x8 [SCLK].
	47	I/O	Serial data I/O [SDATA].
	48	I	Serial data enable [SDEN].

SYSTEM BLOCK DIAGRAM

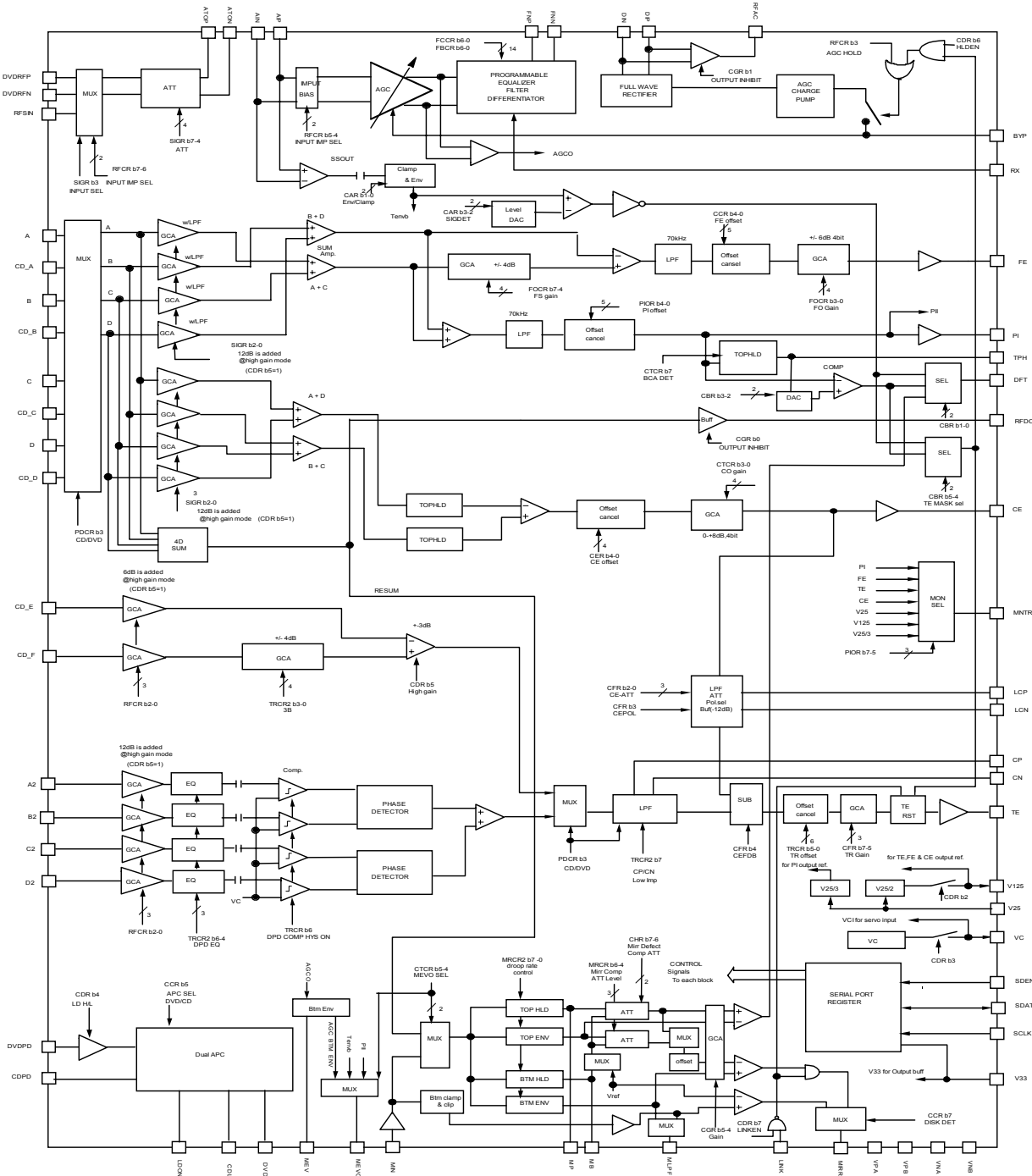
A sample system block diagram featuring the ES6603 and the ES66x8 Vibratto-II DVD processor with embedded servo DSP is depicted in the figure below.



ES6603/ES66x8 Block Diagram

BLOCK DIAGRAM

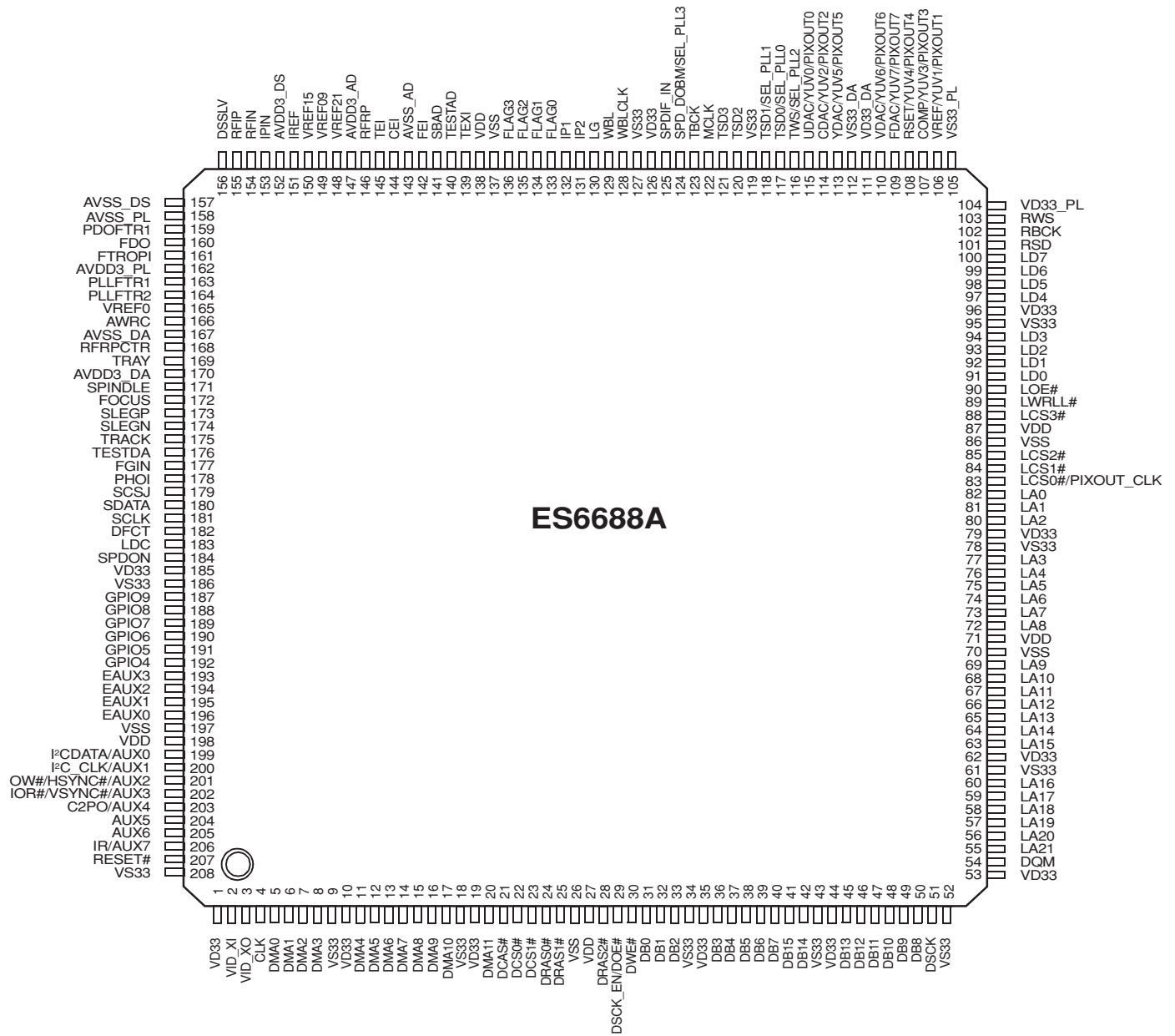
The major subsystem of the ES6603 are shown in the figure below.



ES6603 Block Diagram

ES6688/6698

The figure below depicts the ES6688/98 device pinout.



ES6688/98 DEVICE INTERFACES

The table below lists the device interfaces for the ES6688/98.

ES6688A Pin Description

Names	Pin Numbers	I/O	Definitions
VD33	1, 10, 19, 35, 44, 53, 62, 79, 96, 126, 185	P	I/O power supply.
VID_XI	2	I	Crystal input.
VID_XO	3	O	Crystal output.
CLK	4	I	System clock.
DMA[11:0]	5:8 11:17, 20	O	DRAM address bus.
VS33	9, 18, 34, 43, 52, 61, 78, 95, 119, 127, 186, 208	G	Ground for I/O power supply.
DCAS#	21	O	DRAM column address strobe (active-low).
DCS[1:0]#	22, 23	O	DRAM chip select (active-low).
DRAS[2:0]#	24, 25, 28	O	DRAM row address strobe (active-low).
VSS	26, 70, 86, 137, 197	G	Ground for core power supply.
VDD	27, 71, 87, 138, 198	P	Core power supply.
DSCK_EN	29	O	DRAM clock enable output.
DOE#		O	DRAM output enable (active-low).
DWE#	30	O	DRAM write enable (active-low).
DB[15:0]	31:33, 36:42, 45:50	I/O	DRAM data bus.
DSCK	51	O	Output clock to DRAM.
DQM	54	O	Data input/output mask.
LA[21:0]	55:60, 63:69, 72:77, 80:82	O	RISC port address bus.
LCS0#	83	O	RISC port chip select (active-low).
PIXOUT_CLK		O	CCIR656 output pixel clock.
LCS[3:1]#	84, 85, 88	O	RISC port chip select (active-low).
LWRLL#	89	O	RISC port low-byte write enable (active-low).
LOE#	90	O	RISC port output enable (active-low).
LD[7:0]	91:94, 97:100	I/O	RISC port data bus; (5V tolerant input).
RSD	101	I	Audio receive serial data; (5V tolerant input).
RBCK	102	I	Audio receive bit clock; (5V tolerant input).
RWS	103	I	Audio receive frame sync; (5V tolerant input).
VD33_PL	104	P	Power for PLL blocks.
VS33_PL	105	G	Ground for PLL blocks.

ES6688A Pin Description (Continued)

Names	Pin Numbers	I/O	Definitions
VREF	106	I	Internal voltage reference to video DAC.
YUV1		O	YUV pixel 1 output data.
PIXOUT1		O	CCIR656 output pixel 1.
COMP	107	I	Compensation input.
YUV3		O	YUV pixel 3 output data.
PIXOUT3		O	CCIR656 output pixel 3.
RSET	108	I	DAC current adjustment resistor input.
YUV4		O	YUV pixel 4 output data.
PIXOUT4		O	CCIR656 output pixel 4.
FDAC	109	O	Video DAC output. Refer to description and matrix for UDAC pin 115.
YUV7		O	YUV pixel 7 output data.
PIXOUT7		O	CCIR656 output pixel 7.
VDAC	110	O	Video DAC output. Refer to description and matrix for UDAC pin 115.
YUV6		O	YUV pixel 6 output data.
PIXOUT6		O	CCIR656 output pixel 6.
VD33_DA	111	P	Power for I/O power supply for VDAC.
VS33_DA	112	G	Ground for I/O power supply for VDAC.
YDAC	113	O	Video DAC output. Refer to description and matrix for UDAC pin 115.
YUV5		O	YUV pixel 5 output data.
PIXOUT5		O	CCIR656 output pixel 5.
CDAC	114	O	Video DAC output. Refer to description and matrix for UDAC pin 115.
YUV2		O	YUV pixel 2 output data.
PIXOUT2		O	CCIR656 output pixel 2.

ES6688A Pin Description (Continued)

Names	Pin Numbers	I/O	Definitions																																																																																																
UDAC	115	O	<p>Video DAC output.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>F DAC (pin 109)</th> <th>V DAC (pin 110)</th> <th>Y DAC (pin 1130)</th> <th>C DAC (pin 114)</th> <th>U DAC (pin 115)</th> </tr> </thead> <tbody> <tr><td>0</td><td>CVBS/Chroma</td><td>CVBS1</td><td>Y</td><td>C</td><td>N/A</td></tr> <tr><td>1</td><td>CVBS/Chroma</td><td>CVBS1</td><td>Y</td><td>C</td><td>CVBS2</td></tr> <tr><td>2</td><td>CVBS/Chroma</td><td>N/A</td><td>Y</td><td>C</td><td>N/A</td></tr> <tr><td>3</td><td>CVBS/Chroma</td><td>CVBS1</td><td>N/A</td><td>N/A</td><td>CVBS2</td></tr> <tr><td>4</td><td>CVBS/Chroma</td><td>CVBS1</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr><td>5</td><td>CVBS/Chroma</td><td>CVBS1</td><td>Y</td><td>Pb</td><td>Pr</td></tr> <tr><td>6</td><td>CVBS/Chroma</td><td>N/A</td><td>Y</td><td>Pb</td><td>Pr</td></tr> <tr><td>7</td><td>N/A</td><td>SYNC</td><td>G</td><td>B</td><td>R</td></tr> <tr><td>8</td><td>CVBS/Chroma</td><td>Chroma</td><td>Y</td><td>Pb</td><td>Pr</td></tr> <tr><td>9</td><td>CVBS</td><td>CVBS1</td><td>G</td><td>B</td><td>R</td></tr> <tr><td>10</td><td>CVBS</td><td>CVBS1</td><td>G</td><td>R</td><td>B</td></tr> <tr><td>11</td><td>N/A</td><td>SYNC</td><td>G</td><td>R</td><td>B</td></tr> <tr><td>12</td><td>CVBS/Chroma</td><td>N/A</td><td>Y</td><td>Pr</td><td>Pb</td></tr> <tr><td>13</td><td>CVBS/Chroma</td><td>CVBS1</td><td>Y</td><td>Pr</td><td>Pb</td></tr> <tr><td>14</td><td>Chroma</td><td>Y</td><td>G</td><td>R</td><td>B</td></tr> </tbody> </table> <p>F: CVBS/chroma signal for simultaneous mode. Y: Luma component for YUV and Y/C processing. C: Chrominance signal for Y/C processing. U: Chrominance component signal for YUV mode. V: Chrominance component signal for YUV mode.</p>	Value	F DAC (pin 109)	V DAC (pin 110)	Y DAC (pin 1130)	C DAC (pin 114)	U DAC (pin 115)	0	CVBS/Chroma	CVBS1	Y	C	N/A	1	CVBS/Chroma	CVBS1	Y	C	CVBS2	2	CVBS/Chroma	N/A	Y	C	N/A	3	CVBS/Chroma	CVBS1	N/A	N/A	CVBS2	4	CVBS/Chroma	CVBS1	N/A	N/A	N/A	5	CVBS/Chroma	CVBS1	Y	Pb	Pr	6	CVBS/Chroma	N/A	Y	Pb	Pr	7	N/A	SYNC	G	B	R	8	CVBS/Chroma	Chroma	Y	Pb	Pr	9	CVBS	CVBS1	G	B	R	10	CVBS	CVBS1	G	R	B	11	N/A	SYNC	G	R	B	12	CVBS/Chroma	N/A	Y	Pr	Pb	13	CVBS/Chroma	CVBS1	Y	Pr	Pb	14	Chroma	Y	G	R	B
Value		F DAC (pin 109)	V DAC (pin 110)	Y DAC (pin 1130)	C DAC (pin 114)	U DAC (pin 115)																																																																																													
0		CVBS/Chroma	CVBS1	Y	C	N/A																																																																																													
1		CVBS/Chroma	CVBS1	Y	C	CVBS2																																																																																													
2		CVBS/Chroma	N/A	Y	C	N/A																																																																																													
3		CVBS/Chroma	CVBS1	N/A	N/A	CVBS2																																																																																													
4		CVBS/Chroma	CVBS1	N/A	N/A	N/A																																																																																													
5		CVBS/Chroma	CVBS1	Y	Pb	Pr																																																																																													
6		CVBS/Chroma	N/A	Y	Pb	Pr																																																																																													
7		N/A	SYNC	G	B	R																																																																																													
8		CVBS/Chroma	Chroma	Y	Pb	Pr																																																																																													
9		CVBS	CVBS1	G	B	R																																																																																													
10		CVBS	CVBS1	G	R	B																																																																																													
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14	Chroma	Y	G	R	B																																																																																														
YUV0		O	YUV pixel 0 output data.																																																																																																
PIXOUT0		O	CCIR656 output pixel 0.																																																																																																
TWS		O	Audio transmit frame sync output.																																																																																																
SEL_PLL2	116	I	<p>System and DSCK output clock frequency selection is made at the rising edge of RESET#. The matrix below lists the available clock frequencies and their respective PLL bit settings. Strapped to VCC or ground via 4.7-kΩ resistor; read-only during reset.</p> <table border="1"> <thead> <tr> <th>SEL_PLL2</th> <th>SEL_PLL1</th> <th>SEL_PLL0</th> <th>Clock Type (MHz)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td><td>CLK · 4.5</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>CLK · 5.0</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>Bypass</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>CLK · 4.0</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>CLK · 4.25</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>CLK · 4.75</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>CLK · 5.5</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>CLK · 6.0</td></tr> </tbody> </table>	SEL_PLL2	SEL_PLL1	SEL_PLL0	Clock Type (MHz)	0	0	0	CLK · 4.5	0	0	1	CLK · 5.0	0	1	0	Bypass	0	1	1	CLK · 4.0	1	0	0	CLK · 4.25	1	0	1	CLK · 4.75	1	1	0	CLK · 5.5	1	1	1	CLK · 6.0																																																												
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ES6688A Pin Description (Continued)

Names	Pin Numbers	I/O	Definitions					
TSD0	117	O	Audio transmit serial data port 0.					
SEL_PLL0		I	Refer to the description and matrix for SEL_PLL2, pin 116.					
TSD1	118	O	Audio transmit serial data port 1.					
SEL_PLL1		I	Refer to the description and matrix for SEL_PLL2, pin 116.					
TSD2, 3	120, 121	O	Audio transmit serial data ports 2 and 3.					
MCLK	122	I/O	Audio master clock for audio DAC.					
TBCK	123	O	Audio transmit bit clock.					
SPD_DOBM	124	O	S/PDIF output.					
SEL_PLL3		I	Clock source select. Strapped to VCC or ground via 4.7-kΩ resistor; read only during reset. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>SEL_PLL3</th> <th>Clock Source</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Crystal oscillator</td> </tr> <tr> <td>1</td> <td>CLK input</td> </tr> </tbody> </table>	SEL_PLL3	Clock Source	0	Crystal oscillator	1
SEL_PLL3	Clock Source							
0	Crystal oscillator							
1	CLK input							
SPDIF_IN	125	I	S/PDIF input; (5V tolerant input).					
WBLCLK	128	O	DVD-RAM wobble detector circuit clock source to preamp.					
WBL	129	O	DVD-RAM wobble output.					
LG	130	O	DVD-RAM land/groove flag.					
IP2	131	I	DVD-RAM header position index 2.					
IP1	132	I	DVD-RAM header position index 1.					
FLAG[3:0]	133:136	O	To monitor servo status.					
TEXI	139	I	High-speed tracking error input.					
TESTAD	140	I	Test AD input.					
SBAD	141	I	Sub-beam addition input signal.					
FEI	142	I	Focus input error signal.					
AVSS_AD	143	G	Analog ground for ADC block.					
CEI	144	I	Center error input signal.					
TEI	145	I	Tracking error input signal.					
RFRP	146	I	RF ripple/envelope input signal.					
AVDD3_AD	147	P	Analog power supply for ADC block.					
VREF21	148	O	2.1V reference voltage.					
VREF09	149	O	0.9V reference voltage.					
VREF15	150	O	1.5V reference voltage.					
IREF	151	I	Servo data PLL interface reference current generator. Connect a resistor between this pin and ground to set reference current.					
AVDD3_DS	152	P	Analog power supply for data slicer block.					

ES6688A Pin Description (Continued)

Names	Pin Numbers	I/O	Definitions
IPIN	153	I	Inverting input of data slicer.
RFIN	154	I	Analog RF signal input after passing through equalizer (minus).
RFIP	155	I	Analog RF signal input after passing through equalizer (plus).
DSSLV	156	O	Data slicer level output.
AVSS_DS	157	G	Analog ground for data slicer block.
AVSS_PL	158	G	Analog ground for data PLL block.
PDOFTR1	159	O	Servo data PLL phase detector filter pin number 1.
FDO	160	O	Servo data PLL output node of frequency detector charge pump.
FTROPI	161	I	Servo data PLL input node of loop filter OP circuit.
AVDD3_PL	162	P	Analog power supply for data PLL block.
PLLFTR1	163	I	Servo data PLL loop filter pin number 1.
PLLFTR2	164	I	Servo data PLL loop filter pin number 2.
VREF0	165	O	Servo data PLL reference voltage output.
AWRC	166	I/O	Auto wide range control VCO signal from/to AWRC DAC.
AVSS_DA	167	G	Analog ground for DAC part.
RFRPCTR	168	I/O	Central level of RFRP.
TRAY	169	O	Output voltage level for tray buffer IC.
AVDD3_DA	170	P	Analog power supply for DAC part.
SPINDLE	171	O	Output voltage level for spindle buffer IC.
FOCUS	172	O	Output voltage level for focus buffer IC.
SLEGP	173	O	Output voltage level for Sledge buffer IC (plus).
SLEGN	174	O	Output voltage level for Sledge buffer IC (minus).
TRACK	175	O	Output voltage level for tracking buffer IC.
TESTDA	176	O	Test DA output.
FGIN	177	I	Spindle hall sensor input.
PHOI	178	I	Sledge photo interrupt signal input.
SCSJ	179	O	Chip selection signal to RF chip (serial data enable).
SDATA	180	I/O	Data signal from/to RF chip.
SCLK	181	O	Serial clock source to RF chip.
DFCT	182	I	Defect flag input signal.
LDC	183	O	Laser diode on/off control output.
SPDON	184	O	Spindle power driver on/off control output.
GPIO9-7, 5	187-189, 191	O	General-purpose open-collector output used for servo control; Pull up to VCC via a 4.7-k Ω resistor.
GPIO6, 4	190, 192	I/O	General-purpose input/output used for servo control; (5V tolerant input).

ES6688A Pin Description (Continued)

Names	Pin Numbers	I/O	Definitions
EAUX3	193	O	Extended auxilliary port with open-collector output used for servo control; Pull up to VCC via a 4.7-kΩ resistor.
EAUX2-0	194-196	I/O	Extended auxilliary ports; (5V tolerant input).
I ² C DATA	199	I/O	I ² C data I/O; (5V tolerant input).
AUX0		I/O	Auxiliary port (open collector); (5V tolerant input).
I ² C_CLK	200	I/O	I ² C clock I/O; (5V tolerant input).
AUX1		I/O	Auxiliary port (open collector); (5V tolerant input).
IOW#	201	O	I/O Write strobe (LCS1) (active-low).
HSYNC#		I/O	Horizontal sync (active-low); (5V tolerant input).
AUX2		I/O	Auxiliary port; (5V tolerant input).
IOR#	202	O	I/O Read strobe (LCS1) (active-low).
VSYNC#		I/O	Vertical sync (active-low); (5V tolerant input).
AUX3		I/O	Auxiliary port; (5V tolerant input).
C2PO	203	I	Error correction flag from CD; (5V tolerant input).
AUX4		I/O	Auxiliary port; (5V tolerant input).
AUX5, 6	204, 205	I/O	Auxiliary ports; (5V tolerant input).
IR	206	I	Infrared remote control input; (5V tolerant input).
AUX7		I/O	Auxiliary port; (5V tolerant input).
RESET#	207	I	Reset input (active-low); (5V tolerant input).

ES6688A Device Interfaces

Name	Pin Numbers	I/O	Definition
Audio Port Interface	101	I	Audio receive serial data input (RSD); (5V tolerant input).
	102	I	Audio receive bit clock input (RBCK); (5V tolerant input).
	103	I	Audio receive frame sync input (RWS); (5V tolerant input).
	116	O	Audio transmit frame sync output (TWS).
	117, 118, 120, 121	O	Audio transmit serial data outputs (TSD[3:0]).
	122	I/O	Audio DAC master clock (MCLK).
	123	O	Audio transmit bit clock output (TBCK).
	124	O	Sony/Philips Digital Interface audio output (SPD_DOBM).
	125	I	Sony/Philips Digital Interface audio input (SPDIF_IN); (5V tolerant input).
Auxiliary Port Interface	193	O	Extended auxilliary ports (EAUX3).
	194-196	I/O	Extended auxilliary ports (EAUX2-0); (5V tolerant input).
	199, 200	I/O	Open collector auxilliary ports (AUX1, 0); (5V tolerant input).
	201-206	I/O	Primary auxiliary port I/Os (AUX7-2); (5V tolerant input).
Clock Interface and Reset	2	I	27-MHz crystal clock input (VID_XI).
	3	O	27-MHz crystal clock output (VID_XO).
	4	I	System clock (CLK).
	29	O	DRAM clock enable output (DSCK_EN).
	51	O	Output clock (DSCK) to video memory (DRAM).
	116:118	I	Clock frequency select PLL outputs (SEL_PLL[2:0]).
	207	I	Reset input (active-low) (RESET#); (5V tolerant input).
Display Interface	106:110, 113:115	O	Pixel data outputs (YUV[7:0]).
	201	I/O	Horizontal sync (HSYNC#); (5V tolerant input).
	202	I/O	Vertical sync (VSYNC#); (5V tolerant input).
CCIR656 Output Port Interface	106:110, 113:115	O	CCIR656 output pixels [7:0]; [PIXOUT[7:0]].
	83	O	CCIR656 output pixel clock [PIXOUT_CLK].
EPROM/Flash ROM and RISC Port Interface	55:60, 63:69, 72:77, 80:82	O	RISC port address bus (LA[21:0]) to EPROM or Flash memory.
	83:85	O	RISC port chip select outputs (LCS[2:0]#) to EPROM or Flash memory.
	89	O	RISC port low-byte write enable output (LWRL#) to EPROM or Flash memory.
	90	O	RISC port output enable (LOE#) to EPROM and Flash memory.
	91:94, 97:100	I/O	RISC port data bus (LD[7:0]) to EPROM or Flash memory; (5V tolerant input).

ES6688A Device Interfaces (Continued)

Name	Pin Numbers	I/O	Definition
Filter and Reference Voltage Interface	106	I	Video DAC reference voltage input (VREF).
	107	I	Compensation input (COMP).
Front Panel Display Interface	206	I	Infrared remote control input (IR); (5V tolerant input).
General-Purpose	187-189, 191	O	General-purpose open collector output (GPIO9-7, 5); Pull up to VCC using a 4.7-kΩ resistor.
	190, 192	I/O	General-purpose I/O (GPIO6, 4); (5V tolerant input).
I ² C Bus Interface	199	I/O	I ² C data I/O (I2C_DATA); (5V tolerant input).
	200	I/O	I ² C clock I/O (I2C_CLK); (5V tolerant input).
Power and Ground	1, 10, 19, 35, 44, 53, 62, 79, 96, 126, 185	P	I/O power supply (VD33).
	9, 18, 34, 43, 52, 61, 78, 95, 119, 127, 186, 208	G	I/O ground (VS33).
	26, 70, 86, 137, 197	G	Ground for core power (VSS).
	27, 71, 87, 138, 198	P	Core power supply (VDD).
	104	P	Power supply for PLL block (VD33_PL).
	105	G	Ground for PLL block (VS33_PL).
	111	P	Power supply for video DAC (VD33_DA).
	112	G	Ground for video DAC (VS33_DA).
	143	G	Analog ground for ADC (AVSS_AD).
	147	P	Analog power supply for ADC (AVDD3_AD).
	152	P	Analog power supply for data slicer (AVDD3_DS).
	157	G	Analog ground for data slicer (AVSS_DS).
	158	G	Analog ground for data PLL (AVSS_PL).
	162	P	Analog power supply for data PLL (AVDD3_PL).
	167	G	Analog ground for DAC (AVSS_DA).
170	P	Analog power supply for DAC (AVDD3_DA).	
Serial Port Interface	203	I	C2PO error correction flag from CD (C2PO); (5V tolerant input).
Servo Data Slicer Interface	153	I	Inverting input of data slicer (IPIN).
	154	I	Analog RF signal input after passing through equalizer (minus) (RFIN).
	155	I	Analog RF signal input after passing through equalizer (plus) (RFIP).
	156	O	Data slicer level output (DSSLV).

ES6688A Device Interfaces (Continued)

Name	Pin Numbers	I/O	Definition
Servo DAC Interface	166	I/O	Auto wide range control VCO signal from/to AWRC DAC (AWRC).
	168	I/O	Central level of RFRP (RFRPCTR).
	169	O	Output voltage level for tray buffer IC (TRAY).
	171	O	Output voltage level for spindle buffer IC (SPINDLE).
	172	O	Output voltage level for focus buffer IC (FOCUS).
	173	O	Output voltage level for Sledge buffer IC (plus) (SLEGP).
	174	O	Output voltage level for Sledge buffer IC (minus) (SLEGN).
	175	O	Output voltage level for tracking buffer IC (TRACK).
	176	O	Test DA output (TESTDA).
Servo Comparator Interface	139	I	High-speed tracking error input (TEXI).
Servo ADC Interface	140	I	Test AD input (TESTAD).
	141	I	Sub-beam addition input signal (SBAD).
	142	I	Focus input error signal (FEI).
	144	I	Center error input signal (CEI).
	145	I	Tracking error input signal (TEI).
	146	I	RF ripple/envelope input signal (RFRP).
	148	O	2.1V reference voltage (VREF21).
	149	O	0.9V reference voltage (VREF09).
	150	I	1.5V reference voltage (VREF15).
Servo PLL Interface	151	I	Servo data PLL interface reference current generator. Connect a resistor between this pin and ground to set reference current (IREF).
	159	O	Servo data PLL phase detector filter pin number 1 (PDOFTR1).
	160	O	Servo data PLL output node of frequency detector charge pump (FDO).
	161	I	Servo data PLL input node of loop filter OP circuit (FTROPI).
	163	I	Servo data PLL loop filter pin number 1 (PLLFTR1).
	164	I	Servo data PLL loop filter pin number 2 (PLLFTR2).
	165	O	Servo data PLL reference voltage output (VREF0).

ES6688A Device Interfaces (Continued)

Name	Pin Numbers	I/O	Definition
Servo Control and Data Interface	133:136	O	To monitor servo status (FLAG[3:0]).
	177	I	Spindle hall sensor input (FGIN).
	178	I	Sledge photo interrupt signal input (PHOI).
	179	O	Chip selection signal to RF chip (serial data enable) (SCSJ).
	180	I/O	Data signal from/to RF chip (SDATA).
	181	O	Serial clock source to RF chip (SCLK).
	182	I	Defect flag input signal (DFCT).
	183	O	Laser diode on/off control output (LDC).
	184	O	Spindle power driver on/off control output (SPDON).
	187-189, 191	O	General-purpose open collector output used for servo control (GPIO9-7, 5); Pull up to VCC using a 4.7-kΩ resistor.
	190, 192	I/O	General-purpose input/output used for servo control (GPIO6, 4); (5V tolerant input).
Servo DVD-RAM Interface	128	O	DVD-RAM wobble detector circuit clock source to preamp (WBLCLK).
	129	O	DVD-RAM wobble output (WBL).
	130	O	DVD-RAM land/groove flag (LG).
	131	I	DVD-RAM header position index 2 (IP2).
	132	I	DVD-RAM header position index 1 (IP1).
System Memory Interface	5:8, 11:17, 20	O	DRAM address bus (DMA[11:0]).
	21	O	Memory column address strobe output (DCAS#).
	22, 23	O	DRAM chip select outputs (DCS[1:0]#).
	24, 25, 28	O	Memory row address strobe output (DRAS[2:0]#).
	29	O	Memory output enable (DOE#).
	30	O	Memory write enable output (DWE#).
	31:33, 36:42, 45:50	I/O	Memory data bus (DB[15:0]).
	51	O	Output clock to DRAM (DSCK).
	54	O	Memory data I/O mask output (DQM).
Video DAC Interface	109	O	CVBS/chroma signal (FDAC) for simultaneous mode.
	110	O	Composite component signal (VDAC) for YUV mode.
	113	O	Luma component signal (YDAC) for YUV mode and Y/C processing.
	114	O	Chrominance component signal (CDAC) for Y/C processing.
	115	O	Chrominance component signal (UDAC) for YUV mode.

SYSTEM BLOCK DIAGRAM

A sample system block diagram for the ES66x8 Vibratto-II DVD player board design is shown in the figure below.

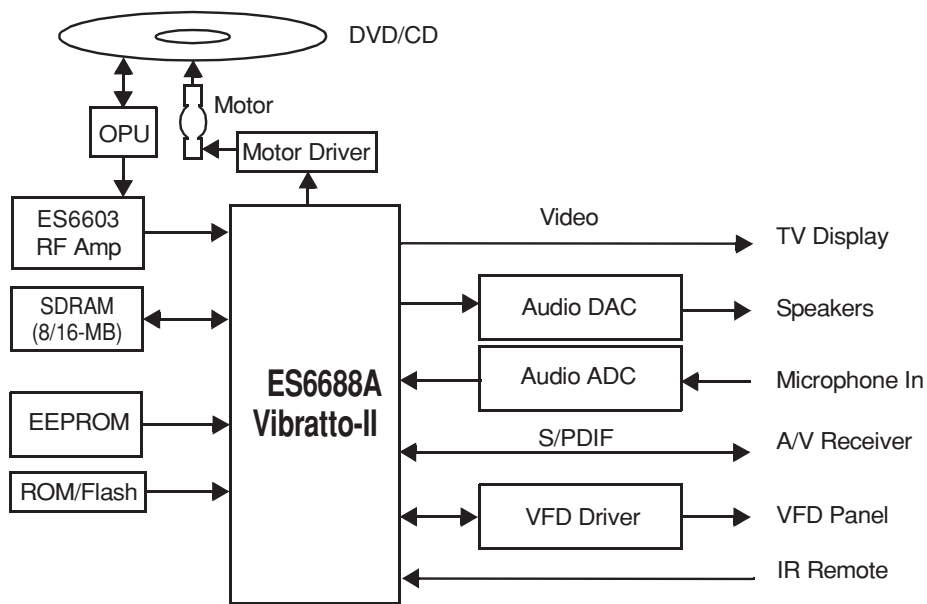
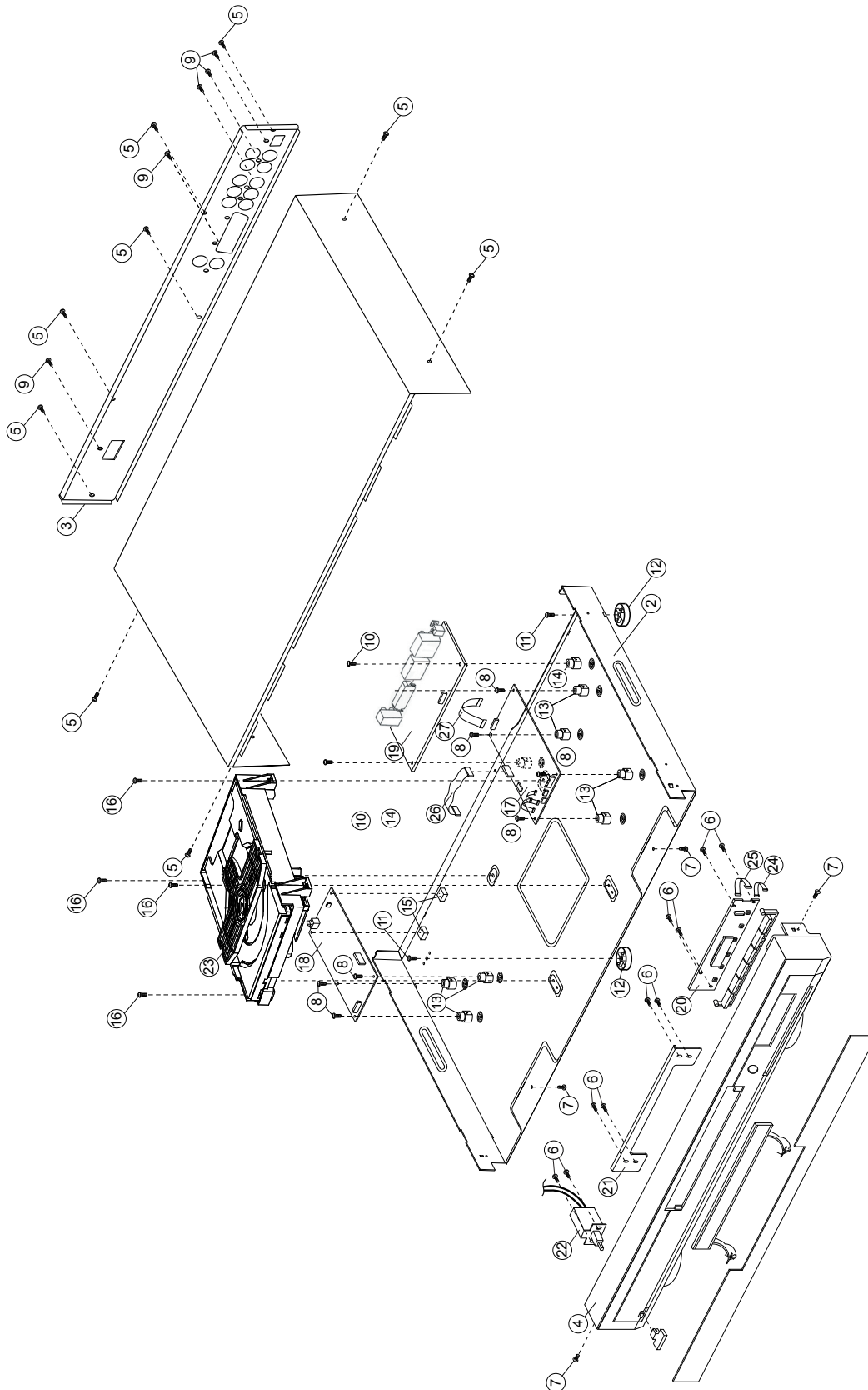


Figure 2 ES6688A Vibratto-II System Block Diagram

5. Exploded View and Spare Parts Lists

Exploded View





Spare Parts Lists

Structure Parts List

Note: 1. When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.
2. Important safety notice: Components identified by “ ! “ mark have special characteristics important for safety.

Ref. No.	PART NUMBER	Part Name & Description	Pcs	Remarks
1	JKM3350-1	Top Cover	1	
2	JMZ0001A	Thermoplastic tube	2	
3	JMZ0001B	Thermoplastic tube	1	
4	JSB0002	POWER Switch	1	
5	JWV0005	Power wire (2P)	1	
6	JGR4360	Rear side panel	1	
7	JMK4350-2	Chassis	1	
8	JKA2302	Foot	2	
9	JMN0002	Clip	3	
10	JMN2301	Stanchion	7	
11	JMN2302	Stanchion	2	
12	JGM2301	Power board Rubber	2	
13	JWV12P2.5A	Connecting wire (12pin)	1	
14	JWJ30P1.0T80	Flexible flat cable(30P)	1	
15	JYP3350P-2	Front Panel	1	
16	JGK4350-BSA	Logo nameplate	1	
17	JMN3350	Bracket	1	
18	JWV7P2.5A	Connecting wire (7pin)	1	
19	JWV6P2.5B	Connecting wire (6pin)	1	
20	JMG3350	Foot rubber mat	2	
21	JQL0011D	adhesive tape (double side)	1	
22	DV34	Optical pickup unit	1	
23	KZG-D01	Holder of mechanism	1	
24	JWJ24P0.5T190	Flexible flat cable(24P)	1	
25	JWV6P2.0Y160	Connecting wire (6 pin, pitch=2.0mm, L=160mm)	1	
26	JWV5P2.0T140	Connecting wire (5 pin, pitch=2.0mm, L=140mm)	1	
27	JMG1313	Board Rubber	2	
28	JMR0002	Mechanism mat	2	
29	BA2.6×8	Screw	2	
30	FM3×6	Screw	4	
31	PA3×8	Screw	10	
32	PWB3×8	Screw	2	
33	PWB3×8-B	Screw	8	
34	PWM3×6	Screw	9	
35	PWM3×8	Screw	4	
36	PWM3×11	Screw	2	
37	PWM3×15	Screw	7	

Electric Parts List

Note:

1. When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.
2. Important safety notice: Components identified by “!” mark have special characteristics important for safety.
3. This product uses a laser diode. Refer to caution statements.
4. Capacity valuse are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF), F=Farads (F); Resistance vallues are in ohms, unless specified otherwise, 1K=1,000(OHM), 1M=1,000K(OHM).

POS.	NO	PART NUMBER	DESCRIPTION	Pcs	Remarks
		JEP4364A	Output Board Module	1	
		JEP3353A	Operate Board Module	1	
		JEP4360P	Power Board Module	1	⚠
		JEP4361A	Decode Board Module	1	
		JEP4364A	Output Board Module	1	
		JJB4364A-1	PCB	1	
C701		ECA1CHG221	Aluminum electrolytic capacitor 220uF	1	
C702,C709,C714,C713,C720		HLT1HC220K05F3D	Capacitor,ceramic 22pF	5	
C703,C706,C708		HLT1HS101K05F3D	Capacitor,ceramic 100pF	3	
C715		HLS1HF104Z07F3D	Capacitor,ceramic 100nF	1	
C711,C712,C704,C705,C716,C717,C718,C719		HLK1HB102K05F3D	Capacitor,ceramic 1000pF	8	
FB702,FB703,FB704,FB705,FB706,FB707,FB709,FB713,FB714,FB721,W703,W704,W705,FB717,FB718,FB719,FB720		EN9589	Ferrite bead	17	
JS701		JJS30P1.0S	Connector 30P 1.0mm	1	
X701,X702		VJR0978	Earthing strip	2	
J701		ASW-03	Terminal (CVBS+S-VIDEO)	1	
J702		CS-106	Terminal (SCART)	1	
J703		AV6-8.4-13/PB	Terminal (5.1 channel Audio)	1	
J704		AV4-8403A	Terminal (Coaxial + YPbPr)	1	
J705		TPK-TX178A	Terminal (Optical)	1	
W701,W702,W706,W707,W708,W709,W710		Z-W6NL-H10	Jumper 10mm	7	
R701		ERD25TJ3R9B	Resistor 1/4W 3.9 Ω \pm 5%	1	
		JEP3353A	Operate Board Module	1	
		JJB3353A	PCB	1	
E501,E502		ECEA1AKA101-H5	Aluminum electrolytic capacitor 100uF	2	
C502		HLS1HF104Z07F3D	Capacitor,ceramic 100nF	1	
JP502		JJU6P2.5A	Connector 6P 2.5mm	1	
JP501		JJU7P2.5A	Connector 7P 2.5mm	1	
D502,D503,D504		1N4148	Diode	3	
U502		AT136BT-12DW	36KHz IR Receiver	1	
R501		ERD25TJ100D	Resistor 10 Ω \pm 5%	1	

R502	ERD25TJ473D	Resistor 47K ±5%	1	
R504,R505,R506,R507,R508, R509,R510	ERD25TJ103D	Resistor 10K ±5%	7	
SW501,SW502,SW503, SW504,SW505,SW506	EVQPAE05R	Light Touch Button	6	
U501	HNV05SS32	VFD	1	
	JMG2302	VFD rubber mat	2	
W502,W503,W505,W506	Z-W6NL-H5	Jumper 5mm	4	
W501,W504	Z-W6NL-H7.5	Jumper 7.5mm	2	
U503	D16312	IC	1	
	JEP4360P	Power Board Module	1	⚠
	JJB3302A	PCB	1	⚠
C609 C610	ECA1HHG100	Aluminum electrolytic capacitor 10uF	2	
C627	ECA1CHG102	Aluminum electrolytic capacitor 1000uF	1	
C614	ECA1CHG222	Aluminum electrolytic capacitor 2200uF	1	
C616 C618 C620 C625 C617	ECA1EHG221	Aluminum electrolytic capacitor 220uF	5	
C622	ECA1EHG471	Aluminum electrolytic capacitor 470uF	1	
C621	ECA1HHG101	Aluminum electrolytic capacitor 100uF	1	
C603	HPW680M2GN30	Aluminum electrolytic capacitor 68uF	1	
C601 C602	AC275V-104K	Capacitor, 275V104	2	⚠
C605	HLK1HB471K05F3D	Capacitor,ceramic 470pF	1	
C606	HLS1HF104Z07F3D	Capacitor,ceramic 100nF	1	
C631 C611	HCM08051HY5V224ZB3	Capacitor,ceramic 220nF	2	
C608	ECKA3A472MBP	Capacitor,ceramic 4.7nF	1	
CY603	HJE222M12H3	Capacitor,ceramic 2.2nF	1	⚠
CON602	JJS0002	AC Connector 2P pitch=7.92mm	1	⚠
CON601	K2AA2B000004	AC inlet	1	⚠
D601 D602 D603 D604	1N4007-H02-1	Diode	4	
D605 D607 D617	FR104-H02-1	Diode	3	
D606	BZX55C16V	Zener diode	1	
D608 D613 D615 D616	FR107-H02-1	Diode	4	
D610	1N5822-M26	Diode	1	
D618 D620	RL205-H14	Diode	2	
D619	BZX55C9V1	Zener diode	1	
F601	JLF0001	Choke	1	⚠
J603	Z-W6NL-H7.5	Jumper 7.5mm	1	
J601 J602 J605 J607 J608, CY604	Z-W6NL-H10	Jumper 10mm	6	
JS601	JJU12P2.5A	Connector 12P 2.5mm	1	
JS602	JJU6P2.5A	Connector 6P 2.5mm	1	
L602	ELC10D100E	Inductor 10uH	1	
L603 L605	ELEAA5R6JA	Inductor 5.6uH	2	
R601	ERD25TJ753B	Resistor 75K ±5%	1	
R604 R605	ERD25TF1R0B	Resistor 1Ω±5%	2	

R607	ERD25TJ101B	Resistor 100Ω±5%	1	
R608	ERD25TJ223B	Resistor 22K ±5%	1	
R609	ERD25TJ682B	Resistor 6.8K ±5%	1	
R631	ERD25TJ100B	Resistor 10Ω±5%	1	
R610	ERD25TJ472B	Resistor 4.7K ±5%	1	
R615	ERD25TF512B	Resistor 5.1K ±1%	1	
R616	ERD25TF532B	Resistor 5.3K ±1%	1	
R611 R617	ERD25TJ102B	Resistor 1K ±5%	2	
R612	ERX2SJ563H	Resistor 56K ±5%	1	
R619	ERD25TJ333B	Resistor 33K ±5% 0.25W	1	
R630	ERD25TJ103B	Resistor 10K ±5% 0.25W	1	
T601	JTP2301	Transformer	1	⚠
U601	TEA1523P	IC	1	
U602	H11A817C300	IC	1	⚠
U603	AZ431BZ-A	IC	1	
X601 X602	VJR0978	Earthing Strip	2	
ZA601 ZA602	EYF52BC	Fuse socket	2	
FUSE601	JSF0002	Fuse	1	⚠
CY601,CY602	HJE102M09H3	Capacitor, 1nF/400V	2	⚠
ZX601	RMCC001-1	Earthing Strip	1	
	JEP4361A	Decode Board Module		
U3	24C01	IC	1	
QQ2,QQ1	2SB1115-T	SMT transistor	2	
UU2	BA5954	IC	1	
UU4	BA6287F	IC	1	
D1,D2,D3,D4,D5	BAT54RSLT1	SMT diode	5	
B2,B26,CC73	ECA1AM101	Aluminum electrolytic capacitor 100uF	3	
B27	ECA1AM470	Aluminum electrolytic capacitor 47uF	1	
CC48,CC63,CC64,CC78,CC80	ECA1CM101	Aluminum electrolytic capacitor 47uF	5	
C37,C40,C47	ECA1CM221	Aluminum electrolytic capacitor 220uF	3	
B10,B12,C16,C17,B24,B25, C33,B36,B57,C61,C70,C72, C79,C18,C19,C21,C25,C28, B44,B54,C59,C60,C68,C69, C32,C43,C50,C55	ECA1EM100	Aluminum electrolytic capacitor 10uF	28	
CC82	ECA1EM101	Aluminum electrolytic capacitor 100uF	1	
C42	ECA1EM471	Aluminum electrolytic capacitor 470uF	1	
CC8	ECA1EM4R7	Aluminum electrolytic capacitor 4.7uF	1	
CC55,CC65,CC67	ECJ1VB1C101K	SMT capacitor 100pF	3	
CC45,CC62	ECJ1VB1C103K	SMT capacitor 0.01uF	2	
CC10,CC12,CC20,CC81,CC83	ECJ1VB1C105Z	SMT capacitor 1uF	5	
C86	ECJ1VB1C150Z	SMT capacitor 15pF	1	
C77,C84,C38,C46,C53,C64	ECJ1VB1C151Z	SMT capacitor 150pF	6	

CC28,CC31,CC32	ECJ1VB1C153K	SMT capacitor 0.015uF	3	
CC60	ECJ1VB1C161K	SMT capacitor 160pF	1	
CC58	ECJ1VB1C224K	SMT capacitor 0.022uF	1	
C1,C2,C3,C4,C5,C6,C9,C10, C11,C12,	ECJ1VB1C331Z	SMT capacitor 330pF	10	
CC61	ECJ1VB1C333K	SMT capacitor 0.033uF	1	
CC6,CC11,CC15,CC68	ECJ1VB1C472K	SMT capacitor 470pF	4	
CC53,CC21	ECJ1VB1C473K	SMT capacitor 0.047uF	2	
CC17	ECJ1VB1C682K	SMT capacitor 680pF	1	
CC47	ECJ1VB1C821Z	SMT capacitor 820pF	1	
CC41,CC43	ECJ1VB1H471K	SMT capacitor 470pF	2	
CC23,CC30,CC33	ECJ1VB1H561K	SMT capacitor 560pF	3	
CC50,CC51,CC52,CC54	ECJ1VB1H681K	SMT capacitor 680pF	4	
C74,C75,C81,C82,C36,C35,C 44,C45,C52,C51,C62,C63	ECJ1VC1H220J	SMT capacitor 22pF	12	
C14,C13	ECJ1VC1H240G	SMT capacitor 24pF	2	
CC35,CC36,CC37	ECJ1VC1H330J	SMT capacitor 33pF	3	
CC25	ECJ1VC1H470J	SMT capacitor 47pF	1	
B4,B6,B7,B8,B9,B11,B13,B1 4,B15,B16,B17,B18,B19,B20 ,B21,B22,B23,B28,CC29,B29 ,B30,B31,B32,B33,C34,B34, B35,B37,B38,B39,B40,C41 ,B41,C49,B55,C56,B56,C65, CC5,C7,C8,CC13,CC14,CC 22,CC24,CC26,CC27,CC38, CC39,CC40,CC42,CC44,CC46, CC49,CC56,CC57,CC70,CC72, CC75,CC77,CC85,c27,B48,B49 ,B50,B51,C57,C58,C66,C67	ECJ1VF1C104Z	SMT capacitor 0.1uF	70	
CC1,CC2,CC3,CC4,CC59,C C66,C78,C85,C39,C48,C54, C71	ECUV1H102JCV	SMT capacitor 1000pF	12	
L1,L2,L3,L4,L5	ELJEA1R8KF	SMT inductor 1.8uH	5	
U7	EM6353BX1SP3B- 4.4	IC	1	
RR29,RR47	ERJ3EKF1202V	SMT resistor 12K 0.1W ±1%	2	
,R123,R140,R78,R90,R104, R111	ERJ3EKF1802V	SMT resistor 18K 0.1W ±1%	6	
R121,R138,R76,R88,R101,R 109	ERJ3EKF3301V	SMT resistor 3.3K 0.1W ±1%	6	
R137,R120,R75,R87,R100,R 108	ERJ3EKF9101V	SMT resistor 9.1K 0.1W ±1%	6	
R22,R27,R34,RR35,RR73,R1 4,R19,R20,R28,R130,R113,R 72,R82,R96,R106	ERJ3GEY0R00V	SMT resistor 0Ω 0.1W	15	
RR40,RR39,R18	ERJ3GEYJ100V	SMT resistor 10Ω 0.1W ±5%	3	


RR8,R23,R24,RR36,RR50,R112,R122,R124,R126,R129,R139,R141,R142,R71,R77,R81,R89,R103,R95,R105,R110	ERJ3GEYJ102V	SMT resistor 1K 0.1W ±5%	21	
RR5,RR9,RR10,RR16,RR42,RR63,RR69, R54	ERJ3GEYJ103V	SMT resistor 10K 0.1W ±5%	8	
RR11,R47,R86,R94,R116,R134,R73,R85,R98,R107	ERJ3GEYJ104V	SMT resistor 100K 0.1W ±5%	10	
R83,RR65	ERJ3GEYJ105V	SMT resistor 1MΩ 0.1W ±5%	2	
R80	ERJ3GEYJ106V	SMT resistor 10MΩ 0.1W ±5%	1	
RR14	ERJ3GEYJ122V	SMT resistor 1.2K 0.1W ±5%	1	
R74,R79,R97	ERJ3GEYJ151V	SMT resistor 150Ω 0.1W ±5%	3	
RR70,RR64	ERJ3GEYJ152V	SMT resistor 1.5K 0.1W ±5%	2	
RR15	ERJ3GEYJ183V	SMT resistor 18K 0.1W ±5%	1	
R91,R99	ERJ3GEYJ202V	SMT resistor 2K 0.1W ±5%	2	
RR7	ERJ3GEYJ203V	SMT resistor 20K 0.1W ±5%	1	
R118,R133,R136	ERJ3GEYJ222V	SMT resistor 2.2K 0.1W ±5%	3	
RR72,RR66,RR41,RR45	ERJ3GEYJ223V	SMT resistor 22K 0.1W ±5%	4	
RR26,RR27,RR28,R30,R31,R36,R37,R38,R39,R41,RR46,R49,R52,R53,R92,R60,R61	ERJ3GEYJ330V	SMT resistor 33Ω 0.1W ±5%	17	
RR1,RR2,RR3,RR4,RR49,	ERJ3GEYJ332V	SMT resistor 3.3K 0.1W ±5%	5	
RR13	ERJ3GEYJ333V	SMT resistor 33K 0.1W ±5%	1	
R13	ERJ3GEYJ391V	SMT resistor 390Ω 0.1W ±5%	1	
R84	ERJ3GEYJ470V	SMT resistor 47Ω 0.1W ±5%	1	
R6,R7,R8,R9,R10,R35,RR67	ERJ3GEYJ472V	SMT resistor 4.7K 0.1W ±5%	7	
RR43,RR48	ERJ3GEYJ473V	SMT resistor 47K 0.1W ±5%	2	
RR17,RR23	ERJ3GEYJ512V	SMT resistor 5.1K 0.1W ±5%	2	
R102	ERJ3GEYJ680V	SMT resistor 68Ω 0.1W ±5%	1	
RR20,RR21,RR24,RR25	ERJ3GEYJ682V	SMT resistor 6.8K 0.1W ±5%	4	
RR6	ERJ3GEYJ683V	SMT resistor 68K 0.1W ±5%	1	
R5,R11,R12,R15,R16,R119	ERJ3GEYJ750V	SMT resistor 75Ω 0.1W ±5%	6	
R93	ERJ3GEYJ910V	SMT resistor 91Ω 0.1W ±5%	1	
RR59,RR60,RR61,RR62	ERJ6GEYJ1R0V	SMT resistor 1Ω 0.125W ±5%	4	
UU1	ES6603S	IC	1	
U1	ES6688FA	IC	1	
RN1,RN2,RN3,RN4,RN5	EXB38V100JV	SMT Resistor Array 10Ω ×4	5	
Y1	HC49S27.000M	Crystal Oscillator	1	
U5	IS42S16400A-7T	SDRAM	1	
	JJB2401A-003	PCB	1	
CN1	JJS24P0.5AL	Connector 24P 0.5mm	1	
JJ1	JJS30P1.0S	Connector 30P 1.0mm	1	
JJ7	JJU12P2.5A	Connector 12P 2.5mm	1	
JJ3	JJU5P2.0A	Connector 5P 2.0mm	1	

JJ4	JJU6P2.0A	Connector 6P 2.0mm	1	
JJ6	JJU7P2.5A	Connector 7P 2.5mm	1	
FB1,FB2,FB4,LL1,LL2,L9,LL3,LL4,LL5,LL6,L6,L7,L8	JLB0004	SMT ferrite bead	13	
QQ6,QQ8,Q15,Q18,Q19	KST3904-MTF	SMT transistor	5	
DD1,DD2,DD3,D10,D11,D12	LL4148-13	SMT transistor	6	
U2	M29W800DT-70N1	FLASH	1	
U15,U12,U14	OPA 4558	IC	3	
U13	PC74HCTO4T	IC	1	
Q7,Q8,Q9,Q13	SMD-2N3906	SMT transistor	4	
Q17,Q12,Q1,Q4,Q6,Q10,Q11	SMD-2SC3326	SMT transistor	7	
QQ7,QQ5	SMD-2SK3018	SMT transistor	2	
Q3,Q20,Q21	SMD-8050	SMT transistor	3	
Q5	SMD-8550	SMT transistor	1	
UU3	TL3472	IC	1	
U9	WM8746	IC	1	

ACCESSORY PARTS LIST

Note:

1. When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.
2. Important safety notice: Components identified by “ ! “ mark have special characteristics important for safety.

Ref. No.	PART NUMBER	Part Name & Description	Pcs	Remarks
1	R03P-AAA	Battery	2	
2	JAK4360-BSA-1	Remote control	1	
3	JFX0003	Scart cable	1	
4	RJA0055-1K	Power cable	1	
5	JPF0001	Accessory bag	1	
6	JQC4360-BSA	Guarantee	1	
7	JQT4360-BSA-1	User Manual	1	
8	JQL0010P	Adhesive Tape	0.15	
9	CZT1002-J	Adhesive Tape	1.4	
10	JPF0002-1	Set bag	1	
11	JPG4360B-BSA	Packing case	1/3	
12	JPN3350A	Cushion (left)	1	
13	JPN3350B	Cushion (right)	1	
14	PRNC0020	Cushion (front)	1	