

# HD 990/230

## CD Player



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## Technical Specifications

### Signal Format

Sampling Frequency	32 kHz to 96 kHz
D/A Conversion	Multi-Level Delta-Sigma, Dual DAC configuration.
Oversampling	24 Bits/384 kHz Asynchronous Sample Rate Converter

### Discrete Analog Output Section

Error Correction	CIRC System
Frequency Response	20 Hz – 20 kHz +0/-0.5dB
Total Harmonic Distortion (THD)	<0.0006% @1kHz
Dynamic Range	> 120 dB
Signal-to-Noise Ratio	116 dB
Channel Separation	> 115 dB
Line-Output Level	2.0 Vrms (Unbalanced) 4.0 Vrms (Balanced)

### General

Power Requirement	100-240 V 50/60 Hz
Power Consumption	<20 Watts (On) <2 Watts (Standby)
Dimensions	
Height	63mm
Width	440mm
Depth	332mm
Weight	3.8 kg

Depth measurement includes knobs, buttons and connection jacks.  
Height measurement includes feet and chassis.  
All features and specifications are subject to change without notice.

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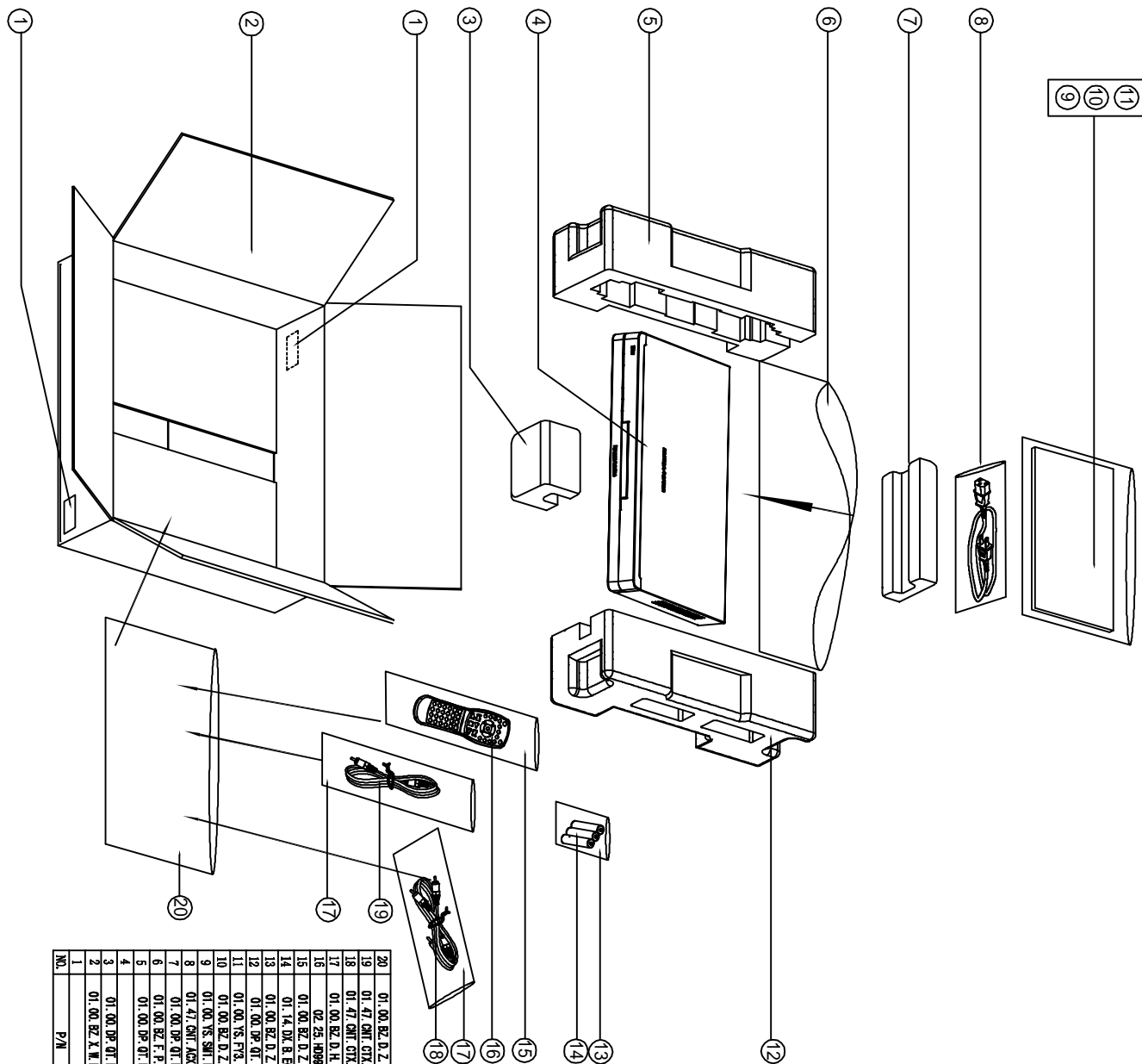
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Part 01.00.YS.SM1.E1799

## Troubleshooting Guide

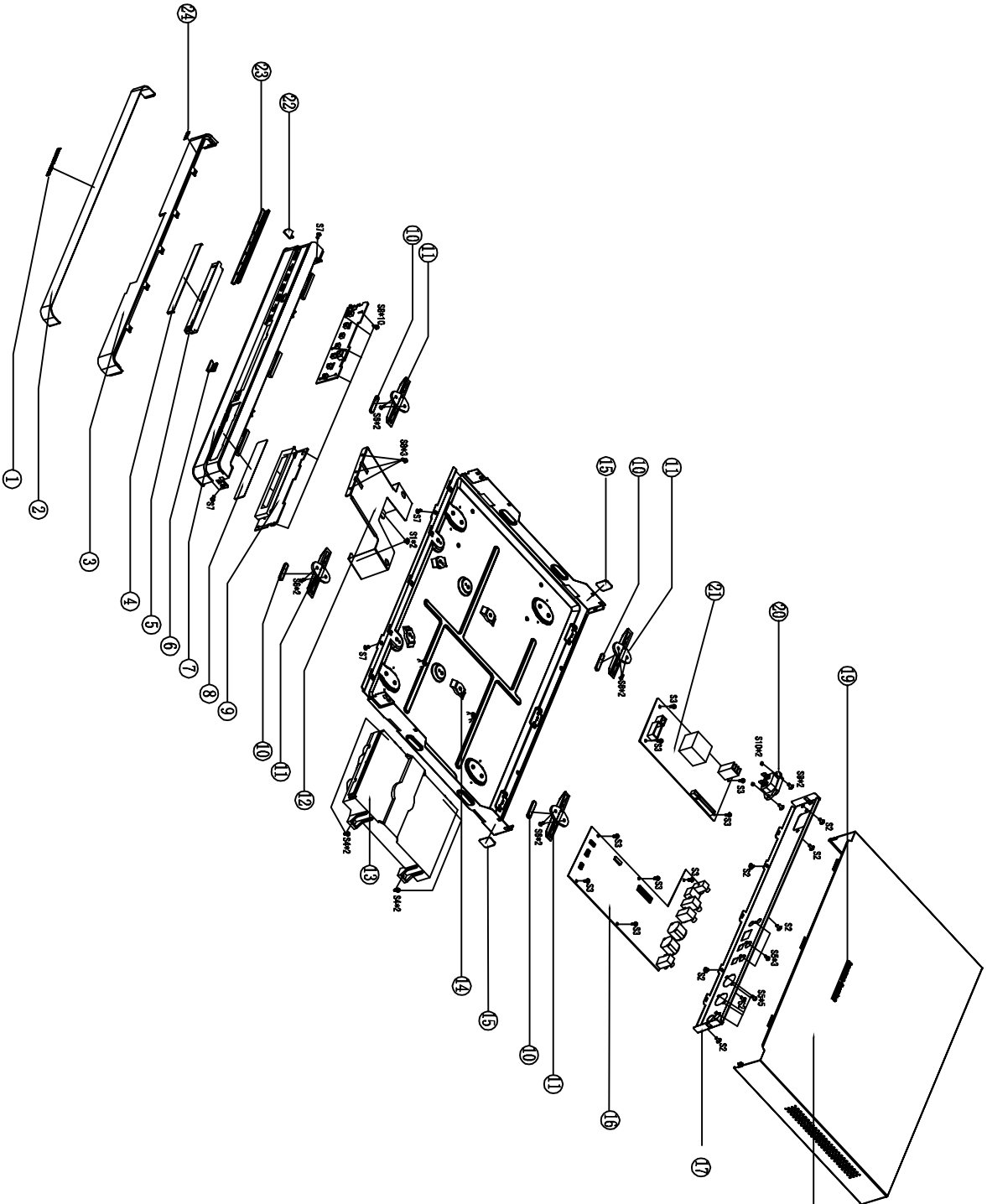
### TROUBLE SHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
No lights on Front Panel	<ul style="list-style-type: none"> <li>No AC power</li> </ul>	<ul style="list-style-type: none"> <li>Make certain AC power cord is plugged into a live outlet.</li> </ul>
Remote does not appear to operate	<ul style="list-style-type: none"> <li>Power Switch turned off</li> <li>Weak batteries</li> <li>Blocked sensor</li> </ul>	<ul style="list-style-type: none"> <li>Turn on Power Switch.</li> <li>Install fresh batteries, observing polarity indications.</li> <li>Remove obstructions from the front panel sensor or connect a remote sensor to the <b>Remote In</b> jack on the rear panel.</li> </ul>
Front panel lights, but CD does not play	<ul style="list-style-type: none"> <li>Disc upside down</li> </ul>	<ul style="list-style-type: none"> <li>Reload disc with label side facing up.</li> </ul>
Play indicator lights, but no sound is heard	<ul style="list-style-type: none"> <li>Poor connections</li> <li>Wrong source connected</li> </ul>	<ul style="list-style-type: none"> <li>Make certain connections are secure and made to the correct (e.g., <b>CD</b>) input.</li> <li>Select CD source on receiver or preamp.</li> </ul>
Sound skips or stutters during play	<ul style="list-style-type: none"> <li>Disc may be damaged</li> <li>Surface vibrations</li> </ul>	<ul style="list-style-type: none"> <li>Try another disc.</li> <li>Isolate the unit from vibration by placing it on a firm surface or move it further away from speakers.</li> </ul>
Sound is continually distorted	<ul style="list-style-type: none"> <li>Incorrect input</li> </ul>	<ul style="list-style-type: none"> <li>Make certain that the analog <b>Audio Outputs</b> ② of the CD player are connected to a line level audio input, NOT to a digital audio or phono input.</li> </ul>
<b>ERROR</b> lights up continuously in the display	<ul style="list-style-type: none"> <li>Various</li> </ul>	<ul style="list-style-type: none"> <li>Turn the unit off and on again. If the problem persists, turn the AC power to the CD player off and on.</li> </ul>



NO.	P/N	DESCRIPTION	QTY
20	01.00.BZ.D.Z.E018	Plastic bag for accessory 16, 5924, 5cm	1
19	01.47.CNT.CTX.E038	AV line	1
18	01.47.CNT.CTX.E027	Audio line	1
17	01.00.BZ.D.H.E029	Plastic bag for AV or audio line 6x23cm	2
16	02.25.10990	Remote control	1
15	01.00.BZ.D.Z.E019	Plastic bag for RC 6, 4x24cm	2
14	01.14.DX.B.E0015	5# battery	3
13	01.00.BZ.D.Z.E035	Plastic bag for battery 7, 598cm	1
12	01.00.PP.01.E445	Polyfoam - r light	1
11	01.00.YS.F13.E1781	Safety and warning instruction manual	1
10	01.00.BZ.D.Z.E020	Plastic bag for manual 25x35cm	1
9	01.00.TS.SM1.E1788	User manual	1
8	01.47.CNT.AOX.E092	AC Power Cord	1
7	01.00.BZ.F.H.E307	HD990-Accessory	1
6	01.00.BZ.F.H.E307	Plastic bag for unit 59x90cm	1
5	01.00.PP.01.E444	Polyfoam - left	1
4	01.00.PP.01.E443	Main unit	1
3	01.00.PP.01.E443	Polyfoam - front	1
2	01.00.BZ.X.W.E1699	Carson box HD990 EU version	1
1		Barcode label	2
		DESCRIPTION	

# HD 990 EU Explode view



NO.	P/N	DESCRIPTION	QTY.
1	01.00.WJ.JG.E128	Metal logo 52x5, 2mm (with single side glue)	1
2	01.00.WJ.JG.E005	Aluminum veneer	1
3	01.00.SJ.HD990.E007	Lens	1
4	01.00.WJ.T.J.HD990.E006	Aluminum ally wrap for disc tray	1
5	01.00.SJ.HD990.E009	Disc tray door	1
6	01.00.SJ.HD990.E005	Button 11	1
7	01.00.SJ.HD990.E003	Front panel	1
8	01.00.SJ.HD990.E008	VFD filter	1
9	02.15.HD00R6576301	VFD board	1
10	01.00.DP.X.J.E179	Sponge28, 7x5, 7x2, 5mm (with single side glue)	4
11	01.00.SJ.HD990.E008	Pedestal under lay	4
12	01.00.WJ.T.J.HD990.E004	Front panel bracket	1
13	01.15.JX.EV348950	DV34-850	1
14	01.00.WJ.T.J.HD990.E001	Chassis	1
15	01.00.DP.X.J.E889	Sponge15x15x2, 7mm (with single side glue) Black	2
16	02.11.HD00R65604301	Main board	1
17	01.00.WJ.T.J.HD990.E002	Rear panel	1
18	01.00.WJ.T.J.HD990.E003	Top cover	1
19	01.00.SB.E129	Metal logo 73, 8x7, 4mm (with single side glue)	1
20	01.40.CDN.DC2.E178	Power Jack (NS-044-0)	1
21	02.19.HD00R7254301	SMPS Board	1
22	01.00.SJ.HD990.E010	Power Indicator Lampshade	1
23	01.00.SJ.HD990.E004	Button 1	1
24	01.00.SB.E127	Metal Logo13, 9x4, 75mm (with single side glue)	1
S1	01.00.WJ.JG.E403	Screw 3x4(FRONT)	7
S2	01.00.WJ.JG.E795	Screw 3x4(FRONT)	9
S3	01.00.WJ.JG.E795	Screw 3x4(FRONT)	9
S4	01.00.WJ.JG.E321	Screw 3x4(FRONT)	4
S5	01.00.WJ.JG.E285	Screw 3x4(FRONT)	8
S6	01.00.WJ.JG.E321	Screw 3x4(FRONT)	8
S7	01.00.WJ.JG.E328	Screw 3x4(BTTO)	4
S8	01.00.WJ.JG.E051	Screw 2.5x4(FRONT)	13
S9	01.00.WJ.JG.E1083	NUT M3	2
S9	01.00.WJ.JG.E119	NUT M3	2

HD990  
Explodeview

<b>HD990 Components List</b>					
<b>Serial No.: WA0035-01001 to WA0035-01420</b>					
<b>P/N</b>	<b>Description</b>	<b>Specification</b>	<b>Qty</b>	<b>Location.No.</b>	<b>Note</b>
01.00.SJ.HD980E003	plastic part	HD980-Front panel	1	HD980-RE01	
01.00.SJ.HD980E004	plastic part	HD980-Button I	1	HD980-RE02	
01.00.SJ.HD980E005	plastic part	HD980-Button II	1	HD980-RE03	
01.00.SJ.HD980E006	plastic part	HD980-Pedestal underlay	4	HD980-RE04	
01.00.SJ.HD980E007	plastic part	HD980-Lens	1	HD980-RE05	
01.00.SJ.HD980E008	VFD filter	HD980-VFD filter	1	HD980-RE06	
01.00.SJ.HD980E009	plastic part	HD980-Disc tray door	1	HD980-RE07	
01.00.SJ.HD980E010	plastic part	HD980-Power indicator lampshade	1	HD980-RE08	
01.00.SJ.SK.E008	plastic part	1000A-IR receiver support 5.5mm	1		
01.00.FZ.QT.E409	PC piece	HD980-H05	1	Between Lens and Front panel	
01.00WJT.JHD990E001	Metals Part	HD990-Chassis	1	HD990-PT01	
01.00WJT.JHD990E002	Metals Part	HD990-Rear panel	1	HD990-PT02	
01.00WJT.JHD980E003	Metals Part	HD980-Top cover	1	HD980-PT03	
01.00WJT.JHD980E004	Metals Part	HD980-Front panel bracket	1	HD980-PT04	
01.00WJT.JHD980E005	Metals Part	HD980-Aluminum veneer	1	HD980-PT05	
01.00WJT.JHD980E006	Metals Part	HD980-Aluminum ally wrap for disc tray	1	HD980-PT06	
01.00.WJ.JG.E717	Screw	M3*4PWBTTNI	2	For Front panel bracket and Chassis (2)	
01.00.WJ.JG.E403	Screw	M3*6PWBTTTO	7	For Top cover and Chassis(2),Top cover and Rear panel(3),Rear panel and Chassis(2)	
01.00.WJ.JG.E795	Screw	M3*6PWHNI	9	For Main board and Chassis(5),SMPS board and Chassis(4)	
01.00.WJ.JG.E235	Screw	M3*8PWBTTNI	4	For Loader and Chassis(4)	
01.00.WJ.JG.E321	Screw	M3*8PAHO	8	For the jacks on main board and Rear panel(8)	
01.00.WJ.JG.E909	Screw	M3*6BBTTO	8	For Pedestal underlay and Chassis(8)	
01.00.WJ.JG.E328	Screw	3*6KBTTTO	4	For Front panel and Chassis(4)	
01.00.WJ.JG.E051	Screw	M2.5*8PWAHNI	13	For Key board and Front panel(6),VFD board and Front panel(6),Front panel bracket and Front panel(3)	
01.00.WJ.JG.E1083	Screw	M3*10PMHO	2	For the Power Jack(2)	
01.00.WJ.JG.E119	Nut	M3	2	For the Power Jack(2)	
01.00.FZ.TG.E025	Screw Jacket	Φ3*4mm	4		For uncovered screws drilled through the chassis
01.00.DP.XJ.E799	Sponge	29.7*5.7*2.5mm (with single side glue)	4	HD980-H01	
01.00.DP.HM.E125	Sponge	20*10*2mm (with double sides glue)	3	For VFD(2),Loader flat cable(1)	
01.00.DP.HM.E303	Sponge	20*50*2mm (with single side glue)	1	For Loader flat cable and chassis(1)	
01.00.DP.HM.E124	Sponge	20*10*3mm (with single side glue) Black	4	Sticked on Front panel bracket	
01.00.DP.JY.E615	Insulated PVC	176.5*84.4*0.5mm (with single side glue)	1	Sticked under SMPS board	
01.00.DP.JY.E153	Insulated PVC	φ6.6*φ3.6*0.3mm (with single side glue) Black	1	Sticked on Chassis under Loader	
01.00.DP.XJ.E889	Sponge	15*15*2.7mm (with single side glue) Black	2	HD980-H06, Sticked on the flank side of the Chassis	
01.13.L.H.E020	Magnetism annulus	M248	1	For the Power Connect Cable	
01.00.FZ.QT.E122	Plastic fastener	12cm	4	For Power cord (3),Loader connect cable(1)	
01.00.WJ.TJ.E569	aluminium fastener	φ3.5*40	2		
01.47.CNT.LJX7E768	Connect cable	2.54-3Y-3Y-220mm (Be different side)	1	Connect Key board and SMPS board	
01.47.CNTACXE052	AC Power Cord	WS-002E+WS-019 HO5VV-F 0.75*2C BK 2M	1		EU version
01.47.CNT.LJX3E037	Connect cable	2.0-6Y-6Y-130mm (Be different side) (UL20080 28AWG)	1	Connect Loader and Main board	
01.47.CNT.LJX3E036	Connect cable	2.0-5Y-5Y-240mm (Be same side) (LG UL20080 28AWG)	1	Connect Loader and Main board	
01.47.CNT.LJX7E612	Connect cable	2.54-2.0-13Y-240mm(Be same side)	1	Connect SMPS board and Main board	
01.47.CNT.LJX5E333	Connect cable	70mm(solder one end and grounding piece another end)	1	Connect Key board and SMPS board	
01.47.CNT.LJX5E334	Connect cable	80mm(solder one end and grounding piece another end)	1	Connect VFD board and Main board	
01.47.CNT.LJX2E110	Connect cable	1.25-6Y-6Y-180mm(Be same side)	1	Connect Key board and VFD board	
01.47.CNT.LJX7E819	Connect cable	VH-3Y-2Y-400mm(Be same side)	1	Connect SMPS board and Power Jack(solder one end)	
01.48.BPX.1.E139	flat cable	1.25*14P*80mmA	1	Connect Main board and VFD board	
01.48.BPX.1.E045	flat cable	0.5*24P*180mmA	1	Connect Loader and Main board	
01.47.CNT.CTX.E027	Remot control transmission cable	φ3.5+φ3.5(single channel), black, 1.2m	1		
01.47.CNT.LJX5E337	HRS-Link Cable	HRS-Link Cable, Black, 1.5m	1		
01.15.JX.EDV34850	Loader	DV34-850	1	SF-HD850G+DVD-M06B	
01.40.CON.DCZ.E178	Power Jack	WS-044-0	1		
01.00.SB.E162	Metal logo	HD990 13.9*4.75mm (with single side glue)	1	HD990-H01,stickd on Lens	

P/N	Description	Specification	Qty	Location.No.	Note
01.00.SB.E128	Metal logo	52*5.2mm (with single side glue)	1	HD980-H03,stickd on Aluminum veneer	
01.00.SB.E129	Metal logo	73.6*7.4mm (with single side glue)	1	HD980-H04,stickd on Top cover	
02.11HCD08M5604C01	Main Board (semi-manufactured goods)	HCD08M-5604C01	1	2-layers	
02.15HCD08K5575C01	Key Board (semi-manufactured goods)	HCD08K-5575C01	1	2-layers	
02.15HCD08K5576C01	VFD Board (semi-manufactured goods)	HCD08K-5576C01	1	2-layers	
02.19HCD06P1254C01	SMPS Board (semi-manufactured goods)	HCD06P-1254C01	1	1-layer	
02.25.HD990	Remote Control(manufactured goods)	HD990	1		

**HD990 Components List for Main Board (5604C01)**

P/N	Description	Specification	Qty	Location.No.	Note
01.57.R.3.E000J	Resistor, chip	0805-0Ω ±5%	16	R149 R154 R167 (R170) R175 (R191) R194 R197 R201 R235 R236 R241 R253 R272 R273 R274	
01.57.R.3.E1R0J	Resistor, chip	0805-1Ω±5%	4	R204 R205 R206 R207	
01.57.R.3.E220J	Resistor, chip	0805-22Ω±5%	3	R148 R254 R256	
01.57.R.3.E330J	Resistor, chip	0805-33Ω±5%	5	R98 R100 R101 R141 R247	
01.57.R.3.E470J	Resistor, chip	0805-47Ω±5%	17	R90 R91 R92 R95 R97 R102 R110 R125 R126 R127 R128 R130 R131 R136 R137 R268 R275	
01.57.R.3.E750J	Resistor, chip	0805-75Ω±5%	1	R85	
01.57.R.3.E101J	Resistor, chip	0805-100Ω±5%	14	R88 R94 R96 R99 R150 R153 R162 R163 R164 R183 R184 R215 R216 R225	
01.57.R.3.E151J	Resistor, chip	0805-150Ω±5%	1	R265	
01.57.R.3.E241J	Resistor, chip	0805-240Ω±5%	5	R83 R165 R180 R181 R220	
01.57.R.3.E271F	Resistor, chip	0805-270Ω±1%	1	R109	
01.57.R.3.E391F	Resistor, chip	0805-390Ω±1%	3	R117 R166 R214	
01.57.R.3.E511F	Resistor, chip	0805-510Ω±1%	2	R219 (R224)	
01.57.R.3.E561J	Resistor, chip	0805-560Ω±5%	5	R186 R187 R210 R259 R260	
01.57.R.3.E102J	Resistor, chip	0805-1KΩ±5%	6	R115 R138 R139 R140 R208 R239	
01.57.R.3.E152J	Resistor, chip	0805-1.5KΩ±5%	2	R178 R189	
01.57.R.3.E202J	Resistor, chip	0805-2KΩ±5%	2	R246 R248	
01.57.R.3.E222J	Resistor, chip	0805-2.2KΩ±5%	4	R157 R193 R195 R199	
01.57.R.3.E272J	Resistor, chip	0805-2.7KΩ±5%	8	R84 R211 R213 R226 R263 R264 R212 (R227)	
01.57.R.3.E332J	Resistor, chip	0805-3.3KΩ±5%	1	R93	
01.57.R.3.E472J	Resistor, chip	0805-4.7KΩ±5%	8	R112 R118 R142 R179 R190 R222 R244 R267	
01.57.R.3.E512J	Resistor, chip	0805-5.1KΩ±5%	1	R202	
01.57.R.3.E622F	Resistor, chip	0805-6.2KΩ±1%	1	R249	
01.57.R.3.E822F	Resistor, chip	0805-8.2KΩ±1%	3	R200 R203 R266	
01.57.R.3.E103J	Resistor, chip	0805-10KΩ±5%	35	(R86) R87 R89 R114 R120 R122 R123 R132 R133 (R134) R135 R143 R144 R145 R146 R147 R152 R155 R156 (R161) R168 R171 R173 R176 R185 R217 R218 R221 R223 R232 R238 R242 R243 R245 R276	
01.57.R.3.E1182F	Resistor, chip	0805-11.8KΩ±1%	2	R255 R257	
01.57.R.3.E223J	Resistor, chip	0805-22KΩ±5%	2	R182 R192	
01.57.R.3.E333J	Resistor, chip	0805-33KΩ±5%	2	R250 R251	
01.57.R.3.E473J	Resistor, chip	0805-47KΩ±5%	2	R196 R198	
01.57.R.3.E104J	Resistor, chip	0805-100KΩ±5%	4	R151 R169 R172 R174	
01.57.R.3.E105J	Resistor, chip	0805-1MΩ±5%	2	R177 R188	
01.57.R.4.E560J	Resistor, chip	1206-56Ω±5%	4	R10 R31 R51 R72	
01.57.R.4.E101F	Resistor, chip	1206-100Ω±1%	4	R9 R30 R50 R71	
01.57.R.4.E331F	Resistor, chip	1206-330Ω±1%	24	R1 R2 R7 R13 R18 R19 R22 R23 R28 R34 R39 R40 R42 R43 R48 R54 R59 R60 R63	
01.57.R.4.E511F	Resistor, chip	1206-510Ω±1%	4	R12 R33 R53 R74	
01.57.R.4.E681F	Resistor, chip	1206-680Ω±1%	8	R4 R16 R25 R37 R45 R57 R66 R78	
01.57.R.4.E821F	Resistor, chip	1206-820Ω±1%	4	R5 R26 R46 R67	
01.57.R.4.E222F	Resistor, chip	1206-2.2KΩ±1%	8	R6 R15 R27 R36 R47 R56 R68 R77	
01.57.R.4.E272F	Resistor, chip	1206-2.7KΩ±1%	10	R8 R11 R21 R29 R32 R49 R52 R62 R70 R73	
01.57.R.4.E153F	Resistor, chip	1206-15KΩ±1%	7	R3 R24 R44 R65 R158 R159 R160	
01.57.R.4.E473F	Resistor, chip	1206-47KΩ±1%	12	R14 R17 R20 R35 R38 R41 R55 R58 R61	
01.57.R.4.E475J	Resistor, chip	1206-4.7MΩ±5%	1	R116	
01.57.R.8.EP3304	Resistor, thick film chip network	0603-33Ω*4 ±5%	7	RN2 RN3 RN4 RN5 RN6 RN7 RN8	
01.54.CS.3E4P7N50V	Capacitor, multilayer ceramic, chip	0805-4.7P NPO±5%/50V	1	C61	
01.54.CS.3E100N50V	Capacitor, multilayer ceramic, chip	0805-10P NPO±5%/50V	6	(C62) C63 (C75) (C76) (C77) (C79)	
01.54.CS.3E150N50V	Capacitor, multilayer ceramic, chip	0805-15P NPO±5%/50V	2	(C152) (C160)	
01.54.CS.3E470N50V	Capacitor, multilayer ceramic, chip	0805-47P NPO±5%/50V	2	C146 C187	
01.54.CS.3E101N50V	Capacitor, multilayer ceramic, chip	0805-100P NPO±5%/50V	5	C94 C96 C121 C122 C126	
01.54.CS.3E121N50V	Capacitor, multilayer ceramic, chip	0805-120P NPO±5%/50V	1	C141	
01.54.CS.3E201N50V	Capacitor, multilayer ceramic, chip	0805-200P NPO±5%/50V	1	C147	

### HD990 Components List for Main Board (5604C01)

P/N	Description	Specification	Qty	Location.No.	Note
01.54.CS.3E391N50V	Capacitor, multilayer ceramic, chip	0805-390P NPO±5%/50V	2	C89 C90	
01.54.CS.3E471N50V	Capacitor, multilayer ceramic, chip	0805-470P NPO±5%/50V	2	C92 C93	
01.54.CS.3E681N50V	Capacitor, multilayer ceramic, chip	0805-680P NPO±5%/50V	1	C98	
01.54.CS.3E102X50V	Capacitor, multilayer ceramic, chip	0805-102 X7R ±10%/50V	3	C56 C139 C149	
01.54.CS.3E332X50V	Capacitor, multilayer ceramic, chip	0805-332 X7R±10%/50V	3	C142 C143 C150	
01.54.CS.3E392X50V	Capacitor, multilayer ceramic, chip	0805-392 X7R±10%/50V	1	C148	
01.54.CS.3E472X50V	Capacitor, multilayer ceramic, chip	0805-472 X7R±10%/50V	1	(C157)	
01.54.CS.3E103X50V	Capacitor, multilayer ceramic, chip	0805-103 X7R±10%/50V	5	C70 C82 C100 C101 C140	
01.54.CS.3E223X50V	Capacitor, multilayer ceramic, chip	0805-223 X7R±10%/50V	1	C57	
01.54.CS.3E273Y50V	Capacitor, multilayer ceramic, chip	0805-273 Y5V-20+80%/50V	1	C145	
01.54.CS.3E473X50V	Capacitor, multilayer ceramic, chip	0805-473 X7R±10%/50V	1	C95	
01.54.CS.3E104Y50V	Capacitor, multilayer ceramic, chip	0805-104 Y5V+80-20%/50V	103	(C45) C46 C47 (C48) (C49) C50 C51 C52 (C53) C54 (C55) (C58) C59 C60 C68 (C72) (C73) (C74) C81 (C83) (C84) (C85) C86 (C87) C88 (C91) C97 (C99) (C103) (C104) (C105) (C106) (C107) C108 (C109) (C110) (C111) (C112) (C113) (C114) (C115) (C116) (C117) (C118) (C119) (C120) C123 C124 C125 (C127) (C128) (C129) C130 (C131) (C132) (C133) (C134) (C135) (C136) (C137) C138 C144 C151 C153 C154 (C156) C161 C164 C165 C166 C188 C189 C65 C66 C67 C71 C190 C191 C192 C193 C194 C195 C196 C197 C198 C199 C200 C201 C202 C203 C204 C205 C206 C207 C208 C209 C210 C211 C212 C213 C214 C215 C216 (C69) C80 C158 C159 C162 C163	
01.54.CS.3E105Y16V	Capacitor, multilayer ceramic, chip	0805-105 Y5V-20+80%/16V	6	C155	
01.54.CS.3E475Y16V	Capacitor, multilayer ceramic, chip	0805-475 Y5V+80-20%/16V	1	C155	
01.54.CS.4E104X50V	Capacitor, multilayer ceramic, chip	1206-104 X7R±10%/50V	24	C1 C2 C6 C8 C9 C10 C11 C13 C14 C15 C16 C21 C23 C24 C28 C30 C31 C32 C33 C35 C36 C37 C38 C43	
01.34.CL.DE10U16VC	Capacitor, AL.electrolytic	CD110-10UF/16V 5*11	1	CE53	
01.34.CL.D47U25VC1	Capacitor, AL.electrolytic	CD110-47UF/25V 5*11	20	CE1 CE2 CE3 CE4 CE5 CE6 CE7 CE8 CE9 CE10 CE11 CE12 CE13 CE14 CE15 CE16 CE17 CE18 CE48 CE50	
01.34.CL.DE47U50VCD	Capacitor, AL.electrolytic	CD110-47UF/50V 6.3*12	11	CE19 CE21 CE22 CE23 CE24 CE25 CE26 CE27 CE28 CE29 CE30 CE33 CE41 CE43 CE46 CE49 CE20 CE31 CE32 CE34 CE35 CE36 CE37 CE38 CE39 CE40 CE42 CE44 CE45 CE57 CE58 CE59 CE60 CE61 CE62 CE52	
01.34.CL.DE220U10VD	Capacitor, AL.electrolytic	CD110-220UF/10V 5*12	25	CE33 CE41 CE43 CE46 CE49 CE20 CE31 CE32 CE34 CE35 CE36 CE37 CE38 CE39 CE40 CE42 CE44 CE45 CE57 CE58 CE59 CE60 CE61 CE62 CE52	
01.34.CL.DEH470U35VG	Capacitor, AL.electrolytic	CD288H-470UF/35V 10*20	2	CE47 CE51	WB serie,samwha 105°C(M)
01.00.CDDLE33263V	Metallized Polyester Film Capacitor	332/63V	4	C183 C184 C185 C186	Faratronic NO:C241J332J2
01.00.CD.DLE10463V	Metallized Polyester Film Capacitor	104/63V	4	C167 C173 C176 C181	Faratronic NO:C241J104J2
01.00.CD.DLE68163V	Metallized Polyester Film Capacitor	681/63V	8	C168 C169 C171 C174 C178 C179 C180 C182	Faratronic NO:C241J681K2
01.00.CD.DLE22250V	Metallized Polyester Film Capacitor	222/50V	4	C170 C172 C175 C177	Faratronic NO:C241H222J2
01.13.L.L.S.E007	Inductor, multilayer ceramic, chip	0805-10UH, SMD	2	L5 L6	
01.13.L.L.S.E362	Inductor,Weifengda	WBR453232-220K-R, SMD1812	2	L2 L1	
01.13.L.L.D.E081	Inductor, Coilcraft	WB1010-1, DIP6	4	T1 T2 T3 T4	
01.13.L.L.S.E382	Inductor, TDK	1812-47UH, SMD1812	2	L4 L3	
01.13.L.Z.ESC100	Bead, chip,	1206-100Q, SMD	14	FB1 FB2 FB3 FB4 FB5 FB6 FB7 FB8 FB9 FB10 FB11 FB12 FB13 FB14	
01.00.ZJ.BHQ.E008	Relay, HongFa	HFD27/005-S(555), DIP	2	K2 K1	
01.41.D.PS.E5819	Schottky Rectifier, Rohm	5819 1A SCHOTTKY, SS14	1	D22	
01.41.D.PS.ELL4148	Diode	LL4148, DO-213AA	14	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D21	
01.41.D.PSE30BQ040	Schottky Rectifier, IR	30BQ040 3A, SMC	4	D14 D15 D16 D20	
01.41.D.FS.E019	LED, BRIGHTTEK	1SA1206V31C0CAE1(Red), SMD	3	D17 D18 D19	
01.41.D.WS.E6V2	Zener diode	6.2V 0.4W, SMD	1	DZ1	
01.42.Q.S.E123	MOSFET, DIODES	BSS123, SOT-23	1	MQ1	
01.42.Q.S.E1035	Transistor,Panasonic	2SA1035, SOT-23	17	Q1 Q2 Q4 Q6 Q9 Q10 Q12 Q14 Q17 Q18 Q20 Q22 Q25 Q26 Q28 Q30 Q33	
01.42.Q.S.E2406	Transistor,Panasonic	2SC2406, SOT-23	16	Q3 Q5 Q7 Q8 Q11 Q13 Q15 Q16 Q19 Q21 Q23 Q24 Q27 Q29 Q31 Q32	
01.42.Q.S.E1132	Transistor, ROHM	2SB1132, MPT3	2	Q43 Q44	
01.42.Q.S.E1664T	Transistor, ROHM	2SD1664T100R, MPT3	2	Q34 Q35	
01.42.Q.S.E3018	MOSFET,ROHM	2SK3018T106, MPT3	2	MQ2 MQ3	
01.42.Q.D.E8050	Transistor	KTC8050-C/P, TO-92	2	Q38 Q39	
01.42.Q.D.E8550	Transistor	KTC8550-C/P, TO-92	2	Q36 Q37	
01.42.Q.S.EBCP5616	Transistor, NXP	BCP56-16, SOT223	2	Q40 Q41	



### HD990 Components List for Main Board (5604C01)

P/N	Description	Specification	Qty	Location.No.	Note
01.42.Q.S.EBCP5316	Transistor, NXP	BCP53-16, SOT223	1	Q42	
01.00.JZ.E33868	Quartz Crystal Unit	33.8688MHZ-49S-20P	1	Y2	
01.00.JZ.E225792A	Quartz Crystal Unit	22.5792MHz-49S-10PF ±10PPM DIP	1	Y1	
01.44.IC.S.EBF532S	IC, ADI, Blackin DSP	ADSP- BF532SBSTZ400,LQFP176	1	U22	
01.46.IC.E7208G	IC, Via, Servo chip	VT7208, LQFP216	1	U36	
01.46.ICEKH29LV040	IC, KH,Flash Memory	KH29LV040CQC-70G, PLCC32	1	U23	firmware burn-in; (Can be replaced by ATEML AT49BV040B-70JU)
01.46.IC.E290011	IC, AMIC, Flash memory	AMIC A290011TL-70, PLCC32	1	U37	firmware burn-in
0146ICHY57V641620E	IC, Hynix, SDRAM	HY57V641620ETP-7,T SOP54	1	U24	
0146ICEM11B416256A	IC, EliteMT, DRAM	M11B416256A-25J,SOJ40	1	U38	
01.44.IC.S.E5888	IC, Rohm, Actuator driver	BA5888FP, HSOP-28	1	U28	
01.44.IC.S.E1955	IC,ADI, DAC	AD1955, SSOP28	2	U11 U3	
01.46.IC.E7414	IC, Philips, Hex inverting Schmitt trigger	74HCT14D,SOIC14	1	U39	
01.44.ICSE74LVC125	IC, TI, quadruple Bus Buffer Gate	SN74LVC125ADR, SOIC14	1	U12	
01.46ICESN74LV74DR	IC, TI, D-Type Trigger	SN74LV74ADR, SOIC8	1	U40	
01.46.IC.E74HCT245	IC,TI,TTL input buffer	SN74HCT245PWR,TSSOP20	1	U26	
0146ICESN74LVC244A	IC, TI, Octal Buffers/Drives	SN74LVC244APWR, TSSOP20	1	U41	
01.44.IC.D.EPC817C	IC, Sharp, Photoelectric Coupler	PC817,DIP4	1	U20	
01.44.IC.S.E1117	IC, AAC, LDO	AZ1117H-ADJ, SOT-223	2	U30 U32	
01.44.ICSEA11173V3	IC, AAC, LDO	AZ1117H-3.3, SOT-223	1	U29	
01.44.IC.SELM393	IC, ST, Comparator	LM393, SOP8	1	U27	
01.44.IC.SETL072CD	IC, TI, opamp	TL072CD, SOIC8	2	U8 U4	
0144ICSETPS73033DB	IC, TI, LDO	TPS73033DBVR, DBV5	1	U17	
01.44.IC.S.E9022	IC, NS, Vacuum Fluorescent Display Filament Driver	LM9022, SO8	1	U25	
01.44.IC.S.E3522	IC, AAT, Reset monitor	AAT3522, SOT_23	1	U31	
01.46.ICECS8416CZZ	IC, Cirrus Logic, Digital Audio Interface Receiver	CS8416-CZZ, TSSOP28	1	U10	
01.46.ICEAD8663ARZ	IC, ADI, opamp	AD8663ARZ, SOIC8	3	U33 U34 U35	
0146ICEICS83905AGT	IC, ICS, Crystal Interface-TO-LVCMOS/LVTTL Fanout Buffer	ICS83905AGT, TSSOP16	1	U14	
01.44.IC.S.E2134	IC, TI, opamp	OPA2134UA, SOIC8	2	U2 U6	
01.44.IC.S.E275	IC, ADI, opamp	OP275GS, SOIC8	2	U1 U5	
0146ICESN65LVDS2DB	IC, TI, Differential Receiver	SN65LVDS2DBVR, DBV5	1	U15	
01.40.CON.DCZ.E121	Jack, IR in/out jack	SCJ351P00XS0B00 (BLACK), In-line Package	1	JP7	
01.40.CON.DCZ.E046	Jack, Audio output jack	AV2-8.4-1G	1	JP1	Antiflaming,Down red & up white, Gold-plated jack
01.40.CON.DPH.E000	Connector	PH-2A	1	CN7	Antiflaming
01.40.CON.DPH.E024	Connector	PH-5A	1	CN3	Antiflaming
01.40.CON.DPH.E028	Connector	PH-6A	1	CN4	Antiflaming
01.40.CON.DPH.E047	Connector	PH-13A	1	CN5	Antiflaming
01.40.CON.S05.E007	FPC connector	FPC-0.5-24P with upward touch	1	CN2	SMD
0140CONS05E007	FPC connector	1.25-14P	1	CN1	Vertical Type
01.40.CON.DCZ.E808	HRS-Link Jack	PCB-109 DIP	1	JP6	
01.40CONDDZEHDY9M4	XLR Jack	HDY-9M-4 DIP	2	JP2 JP3	
01.40.CON.DCZ.E799	AV/Optical Reciver Jack	TC58-655-52G DIP	1	JP4	
01.40.CON.DCZ.E800	AV/Optical Output Jack	TC58-655-02G DIP	1	JP5	
01.37.PCB.2.E5604C	5604C	Main Board	1		

### HD990 Components List for Key Board (5575C01)

P/N	Description	Specification	Qty	Location.No.	Note
01.57.R.3.E000J	Resistor, chip	0805-0Ω ±5%	1	R414 R415	
01.57.R.3.E241J	Resistor, chip	0805-240Ω±5%	1	R412	
01.57.R.3.E471J	Resistor, chip	0805-470Ω±5%	1	R404	
01.57.R.3.E821J	Resistor, chip	0805-820Ω±5%	1	R413	
01.57.R.3.E472J	Resistor, chip	0805-4.7KΩ±5%	8	R402 R403 R406 R407 R408 R409 R410 R411	
01.57.R.3.E153J	Resistor, chip	0805-15KΩ±5%	1	R401	
01.54.CS.3E220N50V	Capacitor, multilayer ceramic, chip	0805-22P NPO±5%/50V	2	C402 C403	
01.54.CS.3E104Y50V	Capacitor, multilayer ceramic, chip	0805-104 Y5V+80-20%/50V	3	C404 C405 C406	
01.54.CS.3E225Y16V	Capacitor, multilayer ceramic, chip	0805-225 Y5V-20+80%/16V	1	C401	
01.34.CLDE100U10VA	Capacitor, AL.electrolytic	CDV-100UF/10V 5*5	2	CE401 CE402	
01.41.D.PS.ELL4148	Diode	LL4148 SMD	1	D401	
01.41.DFDE1L0392A2	LED, color is orange & white,DIP	1L0392A2W32CM002	1	LED401	
01.42.Q.S.E8050	Transistor	KTC8050 SMD	1	Q402	SOT-23
01.42.Q.S.EC8550	Transistor	KTC8550 SMD	1	Q401	SOT-23
01.00.JZ.E04000	Quartz Crystal Unit	4.000MHZ-49S-22P	1	Y401	
01.46.IC.E78P156	IC, ELAN, MCU	EM78P156ELM,SOIC18	1	U401	firmware burn-in
01.44.IC.D.E0038B	IC, IR receiver	HS0038B	1	IR401	
01.39.SW.QC.ED665A	Touch switch	6*6*5(80g)	7	K401 K402 K403 K404 K405 K406 K407	DIP
0140CONS13AY1E011	Connector	1.25-6A(Horizontal Type)	1	(CN403)	DIP

**HD990 Components List for Key Board (5575C01)**

P/N	Description	Specification	Qty	Location.No.	Note
01.40.CON.DTJ.E024	Connector	TJC3-3A	1	(CN404)	Antiflaming
01.37.PCB.2.E5575C	5575C	Key board	1		2-layers

**HD990 Components List for VFD Board (5576C01)**

P/N	Description	Specification	Qty	Location.No.	Note
01.57.R.3.E103J	Resistor, chip	0805-10K $\Omega$ $\pm$ 5%	1	(R415)	
01.57.R.3.E203J	Resistor, chip	0805-20K $\Omega$ $\pm$ 5%	1	(R414)	
01.54.CS.3E300N50V	Capacitor, multilayer ceramic, chip	0805-30P NPO $\pm$ 5%/50V	1	(C411)	
01.54.CS.3E473X50V	Capacitor, multilayer ceramic, chip	0805-473 X7R $\pm$ 10%/50V	2	(C407) ( C415)	
01.54.CS.3E104Y50V	Capacitor, multilayer ceramic, chip	0805-104 Y5V+80-20%/50V	2	(C408 ) (C409)	
01.54.CS.3E225Y16V	Capacitor, multilayer ceramic, chip	0805-225 Y5V-20+80%/16V	1	(C410)	
01.34.CL.DE47U16VB	Capacitor, AL.electrolytic	CD11X-47UF/16V 5*7	1	(CE403)	
01.41.D.PS.ELL4148	Diode	LL4148 SMD	1	(D402)	
01.44.IC.S.E75711	IC, SANYO, VFD Driver	LC75711NE,QFP64E	1	(U402)	
01.16.E1302FA	VFD	VFD22-1302FA	1	VFD401	
01.39.SW.QC.ED665A	Touch switch	6*6*5(80g)	1	K408	DIP
01.40CONS13AY1E011	Connector	1.25-6A(Horizontal Type)	1	(CN403)	DIP
0140CONS13FPC2E002	FPC connector	1.25-14P(Vertical Type and Single Contact)	1	(CN401)	
01.37.PCB.2.E5576C	5576C	VFD board	1		2-layers

**HD990 Components List for SMPS Board (1254C01)**

P/N	Description	Specification	Qty	Location.No.	Note
01.57.R.C.ED100	FIXED CARBON FILM	RT1/4W-10 $\Omega$	2	R4,R6	
01.57.R.C.ED470	FIXED CARBON FILM	RT1/4W-47 $\Omega$	1	R21	
01.57.R.C.ED101	FIXED CARBON FILM	RT1/4W-100 $\Omega$	1	R16	
01.57.R.C.ED221	FIXED CARBON FILM	RT1/4W-220 $\Omega$	3	R13,R19,R20	
01.57.R.C.ED681	FIXED CARBON FILM	RT1/4W-680 $\Omega$	1	R14	
01.57.R.C.ED102	FIXED CARBON FILM	RT1/4W-1K $\Omega$	1	R26	
01.57.R.C.ED222	FIXED CARBON FILM	RT1/4W-2.2K $\Omega$	3	R17,R18,R22	
01.57.R.C.ED512	FIXED CARBON FILM	RT1/4W-5.1K $\Omega$	3	R23,R24,R25	
01.57.R.C.ED103	FIXED CARBON FILM	RT1/4W-10K $\Omega$	1	R15	
01.57.R.C.ED473	FIXED CARBON FILM	RT1/4W-47K $\Omega$	1	R5	
01.57.R.C.EF683	FIXED CARBON FILM	RT1W-68K $\Omega$ 5%	1	R2	
01.57.R.C.EF364	FIXED CARBON FILM	RT1W-360K $\Omega$	1	R3	
01.57.R.C.ED105	FIXED CARBON FILM	RT1/4W-1M $\Omega$	1	R1	
01.57.R.R.E5D9	Thermistor	NTC-5D-9	1	NTC	
01.57.R.Y.E10K	Varistor	10K.471	1	RV1	
01.00.CDGYE104275V	High-voltage metallized polyester film	104/275V X2(lead pitch: 15mm)	1	CX1	
01.00.CDGYE471400V	High-voltage metallized polyester film	471/400V Y1(lead pitch:10mm)	2	CY1,CY2	
01.00.CDGYE102400V	High-voltage metallized polyester film	102/400V Y1(lead pitch:10mm)	1	CY3	
01.00.CD.CPE1031KV	High-voltage metallized polyester film	103/1KV(lead pitch:7.5mm)	1	C1	
01.00.CDDSE473/50V	RADIAL LEADS MLCC	473/50V X7R $\pm$ 10% (lead pitch:5.08mm)	2	C2,C13	
01.00.CD.DS.E683	RADIAL LEADS MLCC	683/50V X7R $\pm$ 10% (lead pitch:5.08mm)	1	C3	
01.00.CD.DSE10450V	RADIAL LEADS MLCC	104/50V X7R $\pm$ 10% (lead pitch:5.08mm)	6	C10 C11 C12 C14 C15 C16	
01.34.CLDE4U7160VD	CAPACITOR,AL.ELECTROLYTIC	CD288H-4.7UF/160V 8*12	1	EC3	CAPXON KF4R7M160F115A
01.34.CLDEH2U250VC	CAPACITOR,AL.ELECTROLYTIC	CD288H-2.2UF/50V 5*11	1	EC22	CAPXON GF2R2M050C110A
01.34.CLDEH47U25VD	CAPACITOR,AL.ELECTROLYTIC	KM470M025C110AP	2	EC17,EC18	CAPXON GF470M025C110A
01.34.CLDEH47U50VD	CAPACITOR,AL.ELECTROLYTIC	GF470M050E110A	1	EC2	CAPXON GF470M050E110A
01.34.CLDE47U400VG	CAPACITOR,AL.ELECTROLYTIC	CD288H-47UF/400V 18*20	1	EC1	CAPXON KM470M400K210A
0134CLDE288100U25V	CAPACITOR,AL.ELECTROLYTIC	GF101M025E110A	2	EC11,EC12	CAPXON GF101M025E110A
0134CLDE288220U16V	CAPACITOR,AL.ELECTROLYTIC	CD288H-220UF/16V 6.3*12	4	EC5,EC6,EC16,EC21	CAPXON GF221M016E110A
0134CLDE288220U25V	CAPACITOR,AL.ELECTROLYTIC	CD288H-220UF/25V 8*12	4	EC9,EC10,EC14,EC15	CAPXON GF221M025F115A
01.34CLDEH470U16VD	CAPACITOR,AL.ELECTROLYTIC	GF471M016F115A	1	EC4	CAPXON GF471M016F115A
01.34CLDE1000U16VG	CAPACITOR,AL.ELECTROLYTIC	CD288H-1000UF/16V 10*20	2	EC19,EC20	CAPXON GF102M015G160A
01.13.L.L.D.E090	Pulse transformer,Coilcraft	L520-10UH	1	L7	
01.13.L.L.D.E005	Bead, leaded fixed	LH0810-20UH	1	L6	
01.13.L.L.D.E051	Bead, leaded fixed	LH0608-22UH	4	L3,L4,L5,L8	
01.13.L.L.D.E086	Common Mode Choke	LCL- ET20-010(50MH)	1	LF1	FLY, FuZhou
01.41.D.PD.EIN4001	Diode	IN4001,SOD81	1	D17	
01.41.D.PD.EIN4007	Diode	IN4007,SOD81	4	D1,D2,D3,D4	
01.41.D.PD.EFR104	Diode	FR104, In-line Package	5	D6,D8,D10,D11,D13	
01.41.D.PD.EFR107	Diode	FR107, In-line Package	1	D7	
01.41.D.PD.EIN4148	Diode	IN4148,DO-35	3	D14,D16,D18	
01.41.D.PD.E21DQ10	Diode	21DQ10, In-line Package	1	D12	
01.41.D.PD.E31DQ06	Diode	31DQ06, In-line Package	1	D15	
01.41.D.PD.E1U08	Diode	1U08, In-line Package	1	D5	

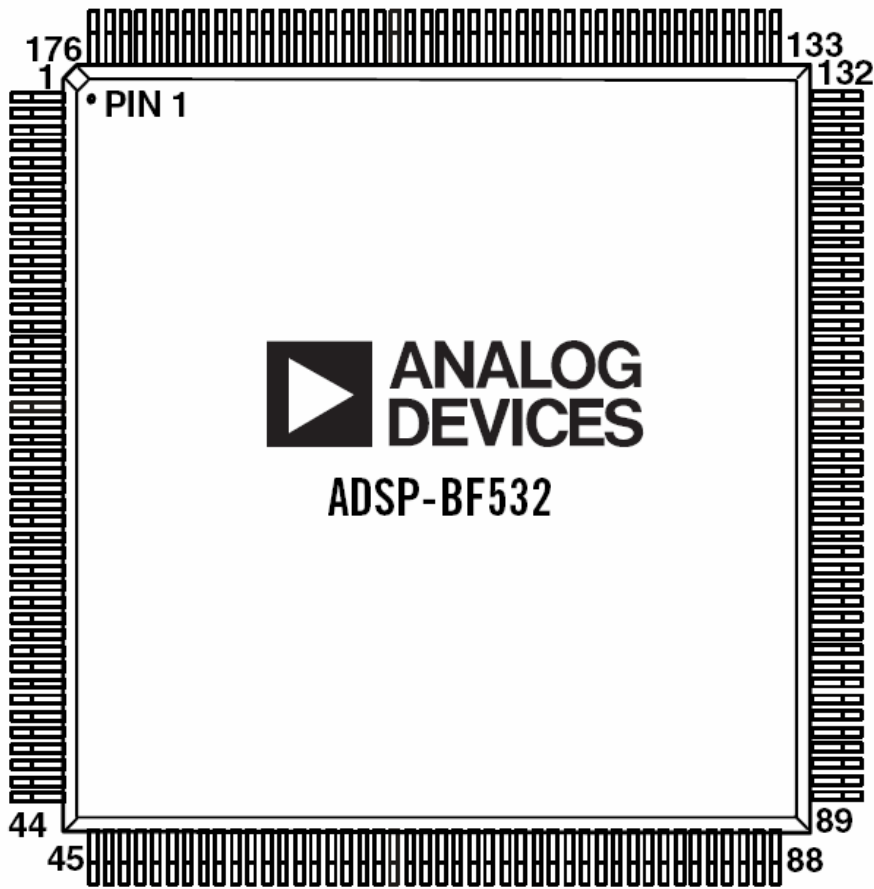
**HD990 Components List for SMPS Board (1254C01)**

P/N	Description	Specification	Qty	Location.No.	Note
01.41.D.WD.E16V	Zener Diode	16V, In-line Package	1	ZD1	
01.41.D.WD.E18V	Zener Diode	18V, In-line Package	1	ZD2	
01.42.Q.D.E5551	Transistor	2N5551, TO-92	1	Q1	
01.42.Q.D.E8550	Transistor	KTC8550-C/P, TO-92	1	Q3	
01.42.Q.D.E9014	Transistor	C9014, TO-92	1	Q2	
01.44.IC.D.EMCR100	Silicon Controlled Rectifiers	MCR100-6, TO-92	1	SC1	
01.44.IC.D.E2659R	IC, FAIRCHILD, FPS	KA5M02659R, DIP8	1	IC1	
01.44.IC.DEAZ431AZ	IC, AAC, Adjustable Shunt Regulator	AZ431AZ-AE1TR, TO-92	1	IC2	
01.44.IC.D.EBA33	IC, ROHM, Dropout Voltage Regulator	BA33BCO, TO-220	1	IC6	
01.44.IC.D.ELM317T	IC, NS, Positive Adjustable Regulator	LM317T, TO-220	1	IC5	
01.44.IC.D.EL7805	IC, ST, Voltage Regulator	L7805, TO-220	1	IC3	
01.44.IC.D.EPC817C	IC, Sharp, Photoelectric Coupler	PC817, DIP4	1	PH1	
01.40.CON.DCZ.E131	Fuse Holder	BLX-2A	1	FU1	Antiflaming
01.38.FUSEDE1A250V	Fuse	T1A/250V	1	FU1	
01.13.L.R.E059	Switching Power Transformer	BCK-EC2802	1	TR1	FLY, FuZhou
01.40.CON.DCZ.E129	Connector	Vertical VH three holes two pins(white)	2	JP1	Antiflaming
01.40.CON.DTJ.E024	Connector	TJC3-3A	1	CN1	Antiflaming
01.40.CON.DTJ.E002	Connector	TJC3-13A	1	CN2	Antiflaming
01.00.WJ.TJ.E496	Radiator	12*16*23mm	1	for IC3	Antiflaming
01.00.WJ.QT.E041	3pins grounding piece	M4	4	G1,G2,G3,G4	
01.00.FZ.ZZ.E009	Jumper	5mm	2	JP3,JP5	
01.00.FZ.ZZ.E002	Jumper	7.5mm	2	JP7,JP8,JP2	
01.00.FZ.ZZ.E003	Jumper	10mm	1	JP4	
01.00.FZ.ZZ.E010	Jumper	15mm	1	JP6	
01.37.PCB.1.E1254C	1254C	SMPS board	1		1-layer

**HD990 Components List for Remote Control Include Circuits Board(1782C)**

P/N	Description	Specification	Qty	Location.No.	Note
01.00.WJ.TH.E183	Anode Spring		1	same as DVD25	
01.00.WJ.TH.E184	Cathode Spring		1	same as DVD25	
01.00.WJ.TH.E185	Double role spring		1	same as DVD25	
01.00.SJ.HD990E001	Remote Control Top Case		1	HD990 (tooling same as HD970)	
01.00.SJ.HD980E001	Remote Control Bottom Case		1	HD980 (tooling same as HD970)	
01.00.SJ.HD980E002	Cover for battery case		1	HD980 (tooling same as HD970)	
01.00.BP.QT.E1186	RC indication plate (upper)		1	HD990	
01.00.BP.QT.E1075	RC indication plate (nether)		1	HD980	
01.00.DD.QT.E012	RC conductive rubber (upper)		1	same as HD970	
01.00.DD.QT.E117	RC conductive rubber (nether)		1	same as HD970	
01.57.R.4.E010J	Resistor, chip	1206-1Ω±5%	1	R1	
01.57.R.3.E221J	Resistor, chip	0805-220Ω±5%	1	R2	
01.54.CS.3.E101N	Capacitor, multilayer ceramic, chip	0805-100P NPO±5%/50V	2	C3 C4	
01.54.CS.3.E104Y	Capacitor, multilayer ceramic, chip	0805-104 Y5V+80-20%/50V	1	C2	
01.34.CLDE100U10VB	Capacitor,AL.electrolytic	CD11X-100UF/10V 5*7	1	C1	5*7
01.44.IC.S.E970	IC, Princeton Technology Corp., IR encoder	HD970, SMD	1	U1	
01.41.D.PS.ELL4148	Diode	LL4148, DO213AA	8	D1 D2 D3 D4 D5 D6 D7 D8	
01.42.Q.S.E8050	Transistor,CHIP	KTC8050, SOT-23	1	Q1	
01.41.D.FD.EHIR305	Transmitting diode	HIR305CAP, 2P, In-line Package	1	LED	
01.00.ZJ.TXQ.E009	Ceramic Resonator	Z455E, 2P, In-line Package	1	X1	
02.25.HD9701782C	1782C		1	Remote control board(same as HD970)	

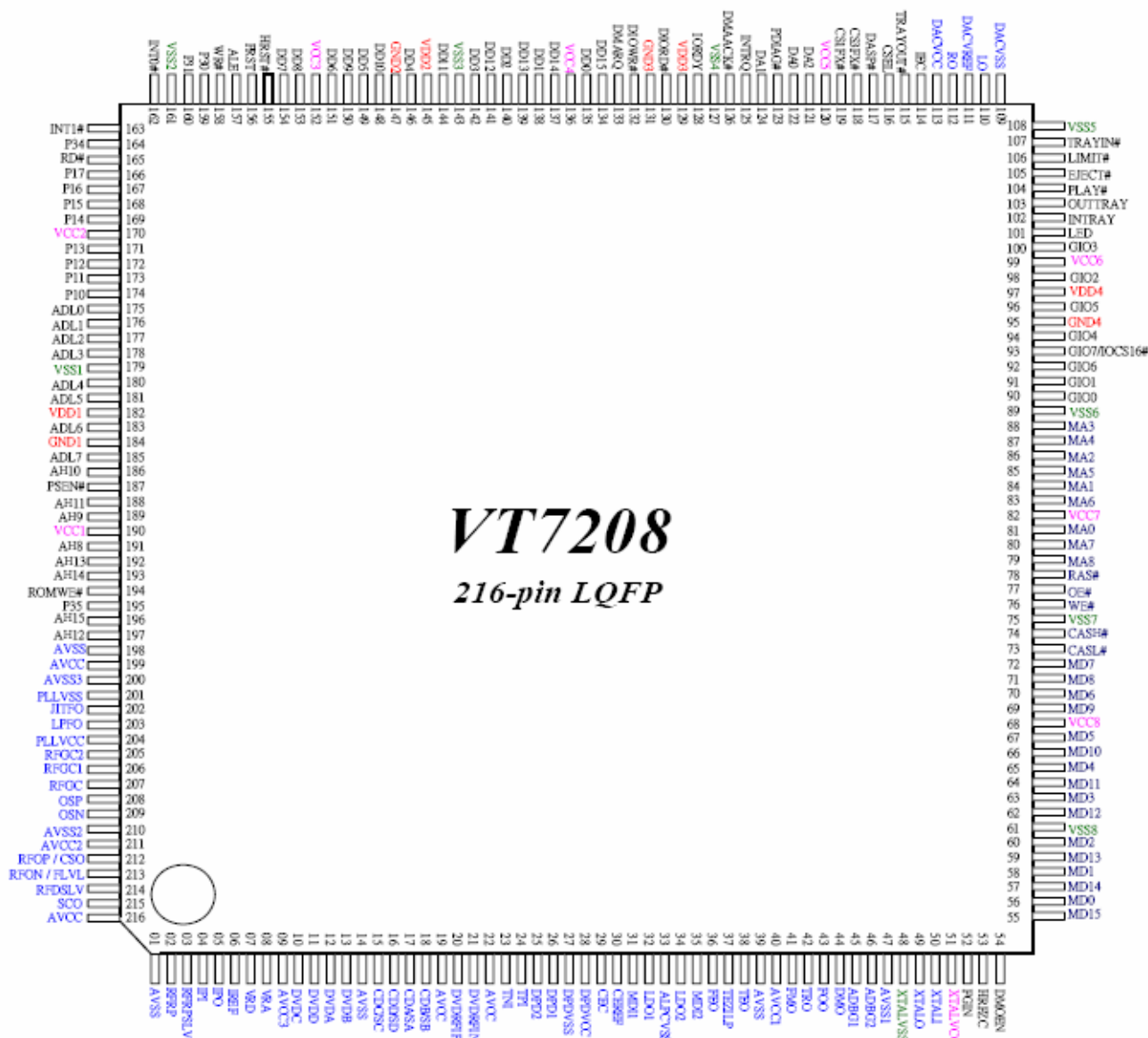
# ADSP-BF532SBSTZ400 LQFP176



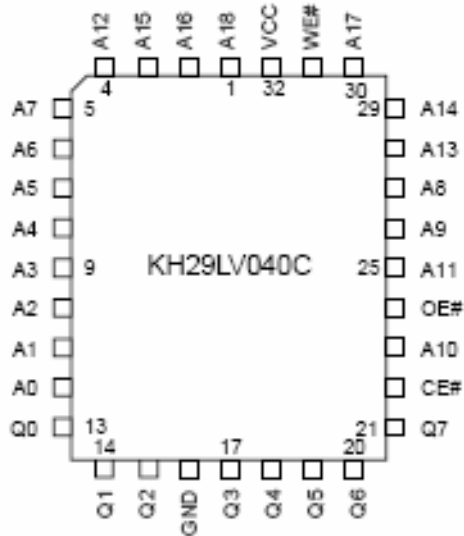
176-Lead LQFP Pin Assignment (Numerically by Lead Number)

Lead No.	Signal	Lead No.	Signal	Lead No.	Signal	Lead No.	Signal	Lead No.	Signal
1	GND	41	GND	81	TX	121	ADDR19	161	AMS0
2	GND	42	GND	82	RX	122	ADDR18	162	ARDY
3	GND	43	GND	83	EMO	123	ADDR17	163	BR
4	VROUT1	44	GND	84	TRST	124	ADDR16	164	SA10
5	VROUT0	45	VDDEXT	85	TMS	125	ADDR15	165	SWE
6	VDDEXT	46	PF5	86	TDI	126	ADDR14	166	SCAS
7	GND	47	PF4	87	TDO	127	ADDR13	167	SRAS
8	GND	48	PF3	88	GND	128	GND	168	VDDINT
9	GND	49	PF2	89	GND	129	GND	169	CLKOUT
10	CLKIN	50	PF1	90	GND	130	GND	170	GND
11	XTAL	51	PF0	91	GND	131	GND	171	VDDEXT
12	VDDEXT	52	VDDINT	92	GND	132	GND	172	SMS
13	RESET	53	SCK	93	VDDEXT	133	GND	173	SCKE
14	NMI	54	MISO	94	TCK	134	VDDEXT	174	GND
15	GND	55	MOSI	95	BMODE1	135	ADDR12	175	GND
16	RTX0	56	GND	96	BMODE0	136	ADDR11	176	GND
17	RTX1	57	VDDEXT	97	GND	137	ADDR10		
18	VDDRTIC	58	DT1SEC	98	DATA15	138	ADDR9		
19	GND	59	DT1PRI	99	DATA14	139	ADDR8		
20	VDDEXT	60	TF51	100	DATA13	140	ADDR7		
21	PPL_CLK	61	TSCLK1	101	DATA12	141	ADDR6		
22	PP10	62	DR1SEC	102	DATA11	142	ADDR5		
23	PP11	63	DR1PRI	103	DATA10	143	VDDINT		
24	PP12	64	RFS1	104	DATA9	144	GND		
25	VDDINT	65	RSCLK1	105	DATA8	145	VDDEXT		
26	PP13	66	VDDINT	106	GND	146	ADDR4		
27	PF15	67	DT0SEC	107	VDDEXT	147	ADDR3		
28	PF14	68	DT0PRI	108	DATA7	148	ADDR2		
29	PF13	69	TF50	109	DATA6	149	ADDR1		
30	GND	70	GND	110	DATA5	150	ABET		
31	VDDEXT	71	VDDEXT	111	VDDINT	151	ABE0		
32	PF12	72	TSCLK0	112	DATA4	152	AWE		
33	PF11	73	DR0SEC	113	DATA3	153	ARE		
34	PF10	74	DR0PRI	114	DATA2	154	AOE		
35	PF9	75	RFS0	115	DATA1	155	GND		
36	PF8	76	RSCLK0	116	DATA0	156	VDDEXT		
37	PF7	77	TMR2	117	GND	157	VDDINT		
38	PF6	78	TMR1	118	VDDEXT	158	AMS3		
39	GND	79	TMR0	119	BG	159	AMS2		
40	GND	80	VDDINT	120	BGF	160	AMST		

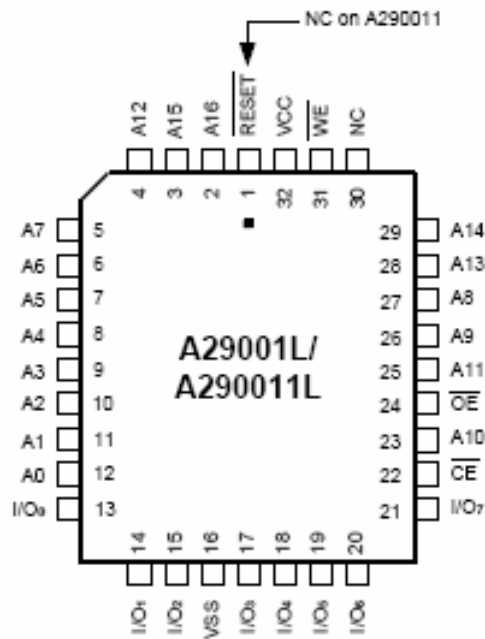
# VT7208 LQFP 216



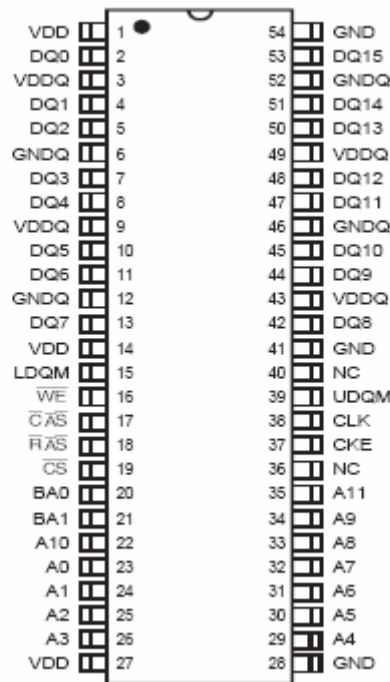
# KH29LV040CQC-70G PLCC-32



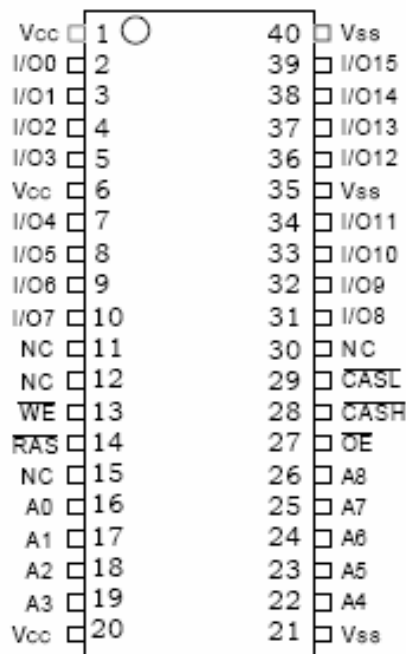
# A290011TL-70 PLCC-32



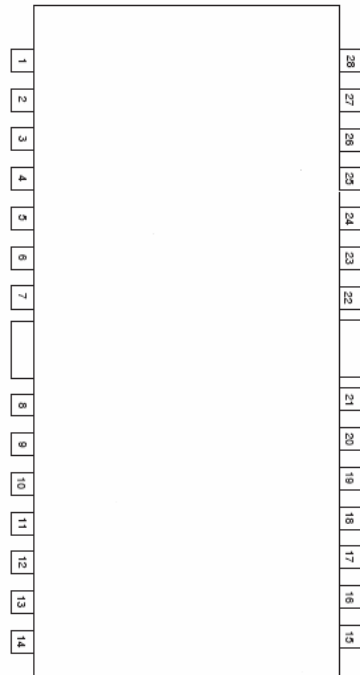
# HY57V641620ETP-7 TSSOP-54



# M11B416256A SOJ-40

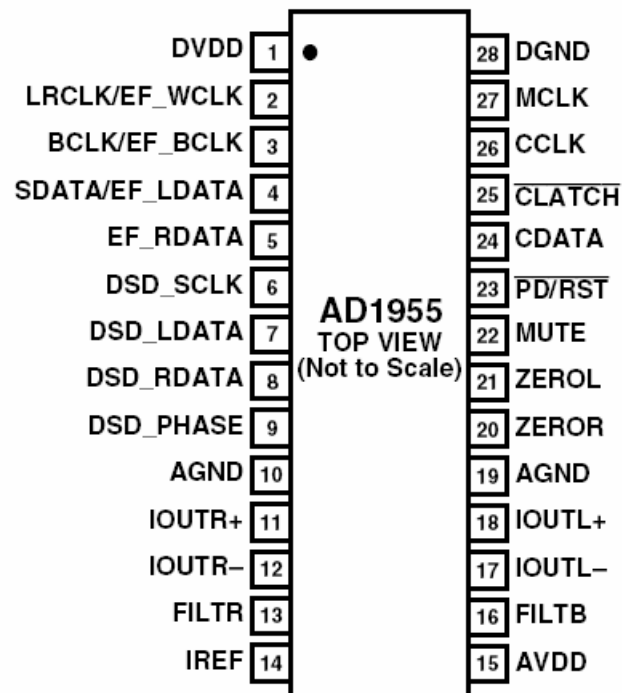


# BA5888FP HSOP-28



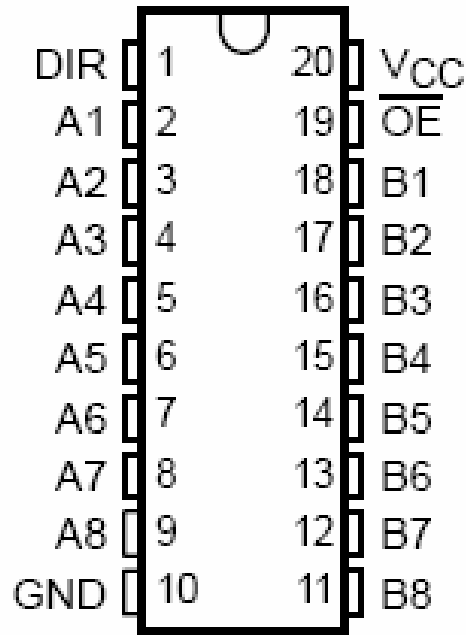
No	Symbol	No	Symbol
1	VINFC	15	VOTK+
2	CFCerr1	16	VOTK-
3	CFCerr2	17	VOLD+
4	VINSL+	18	VOLD-
5	VINSL-	19	PGND
6	VOSL	20	VNFJK
7	VNFJC	21	PVcc2
8	Vcc	22	PreGND
9	PVcc1	23	VINLD
10	PGND	24	CTKerr2
11	VOSL-	25	CTKerr1
12	VOSL+	26	VINTK
13	VOFC-	27	BIAS
14	VOFC+	28	STBY

# AD1955 SSOP-28

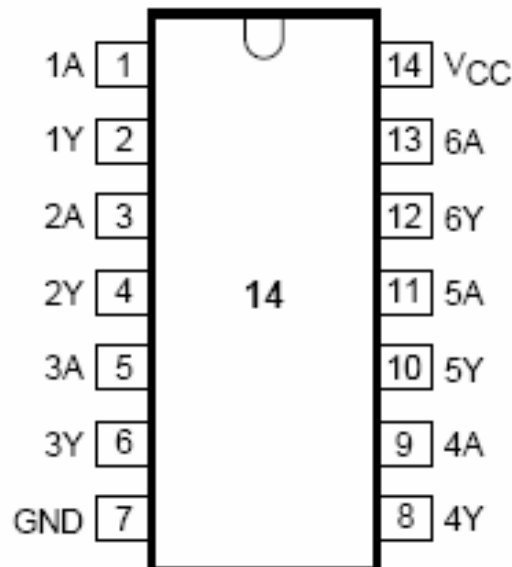




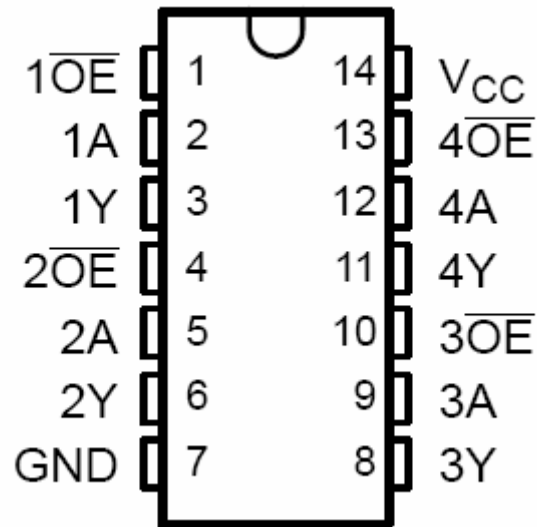
# SN74HCT245PWR TSSOP-20



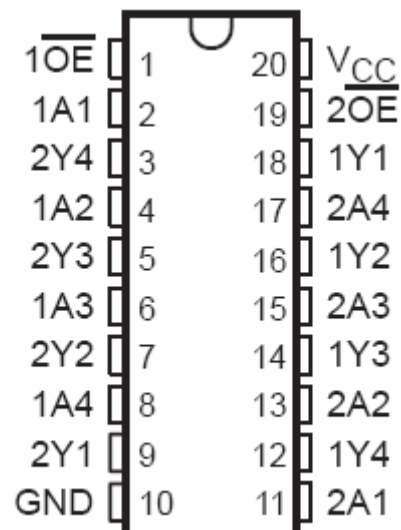
# 74HCT14D SOIC14



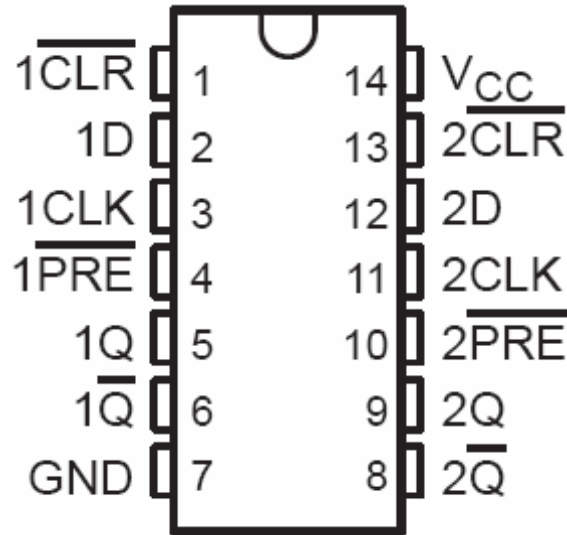
## SN74LVC125ADR SOIC8



## SN74LVC244APWR TSSOP20

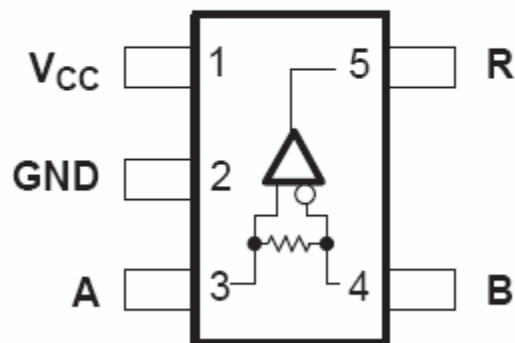


### SN74LV74ADR SOIC14



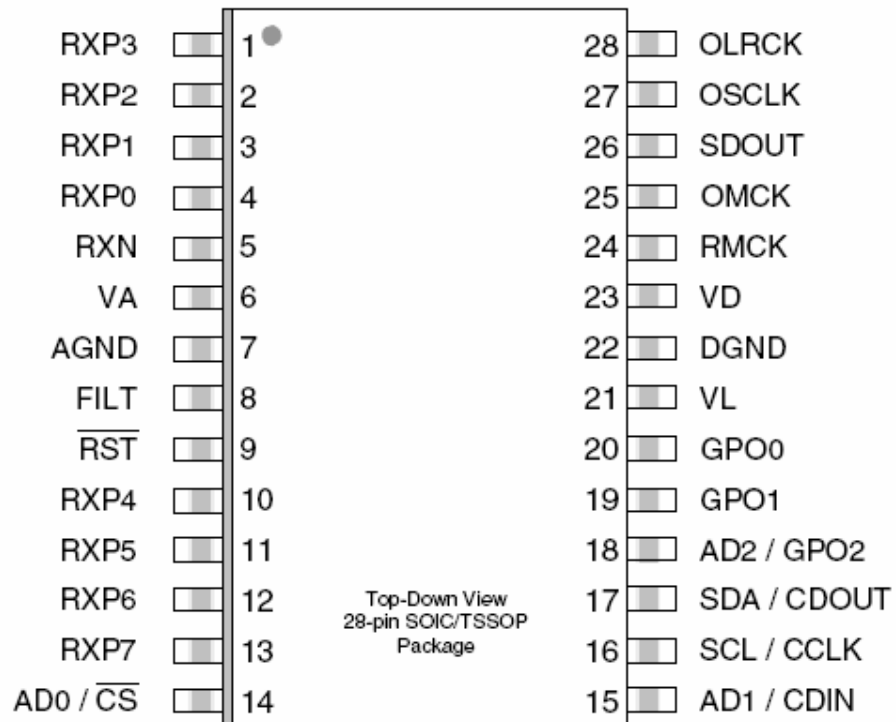
### SN65LVDS2DBVR DBV5

**SN65LVDS2 and SN65LVDT2  
DBV Package  
(TOP VIEW)**

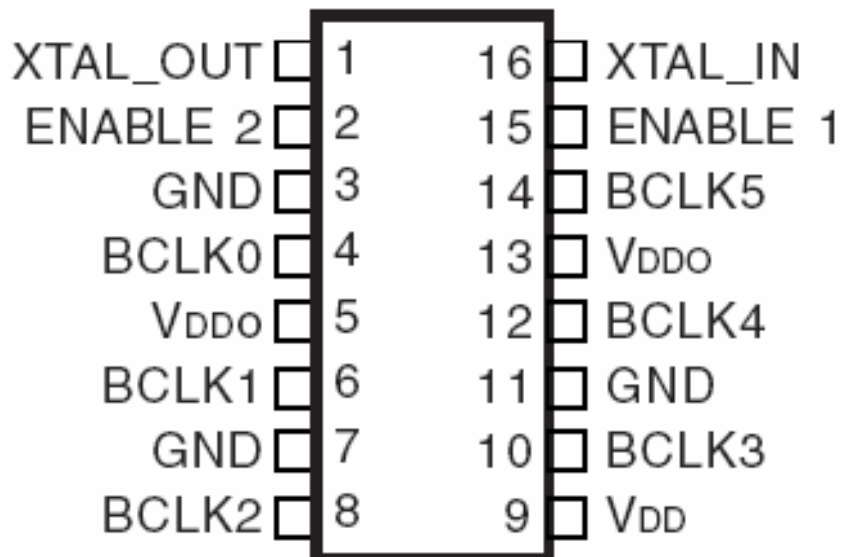


**110-Ω Resistor for LVDT Only**

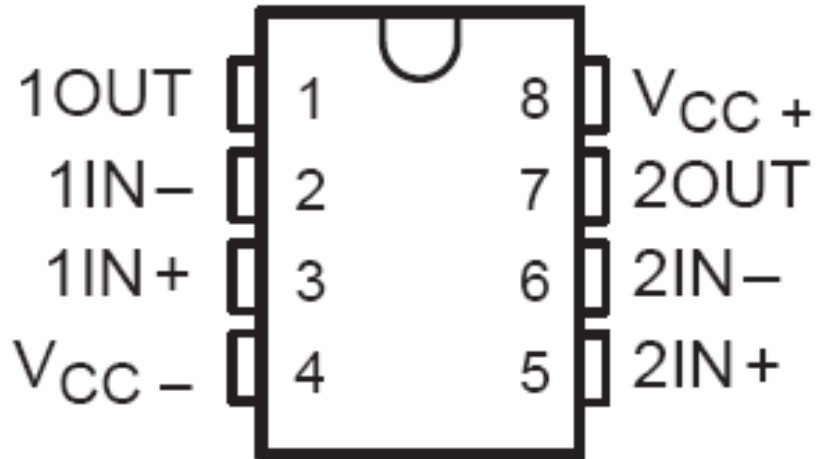
### CS8416-CZZ TSSOP28



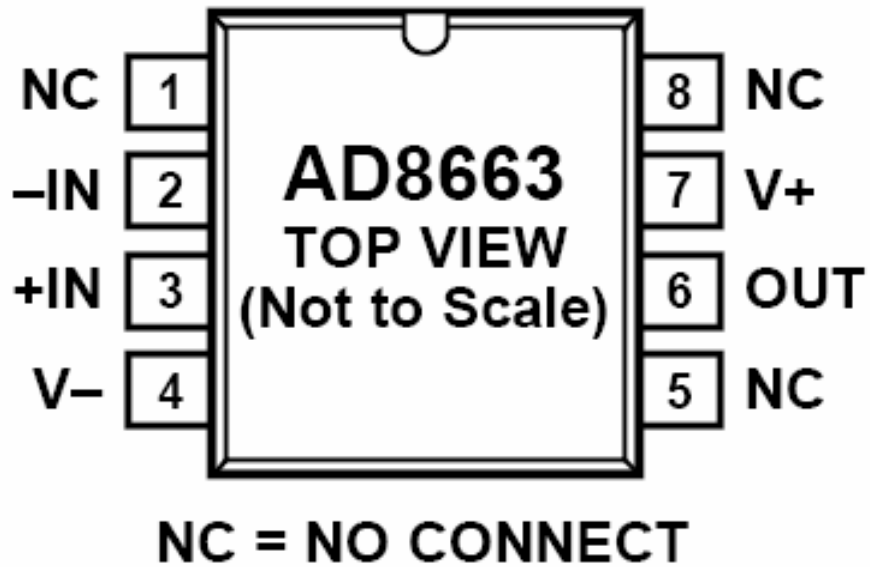
### ICS83905AGT TSSOP16



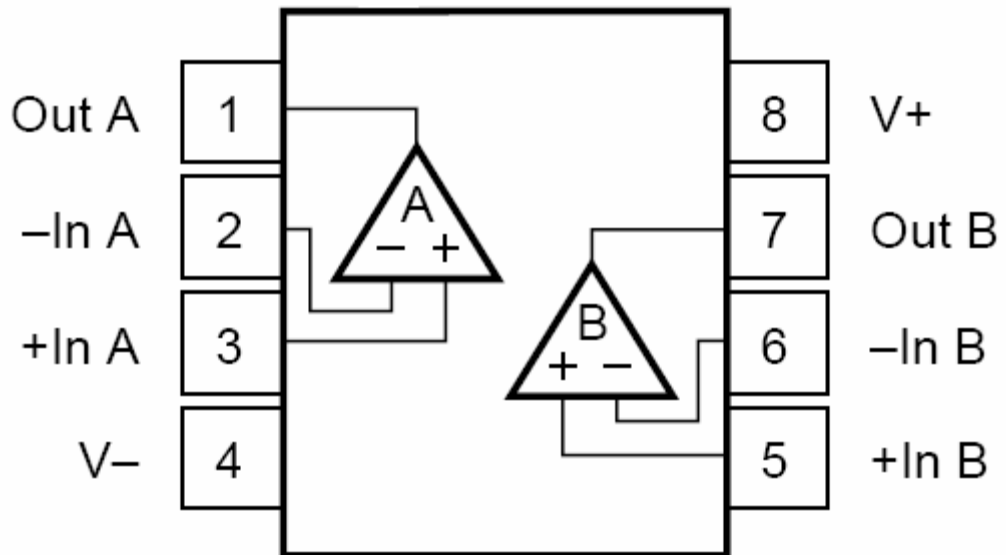
TL072CD SO8



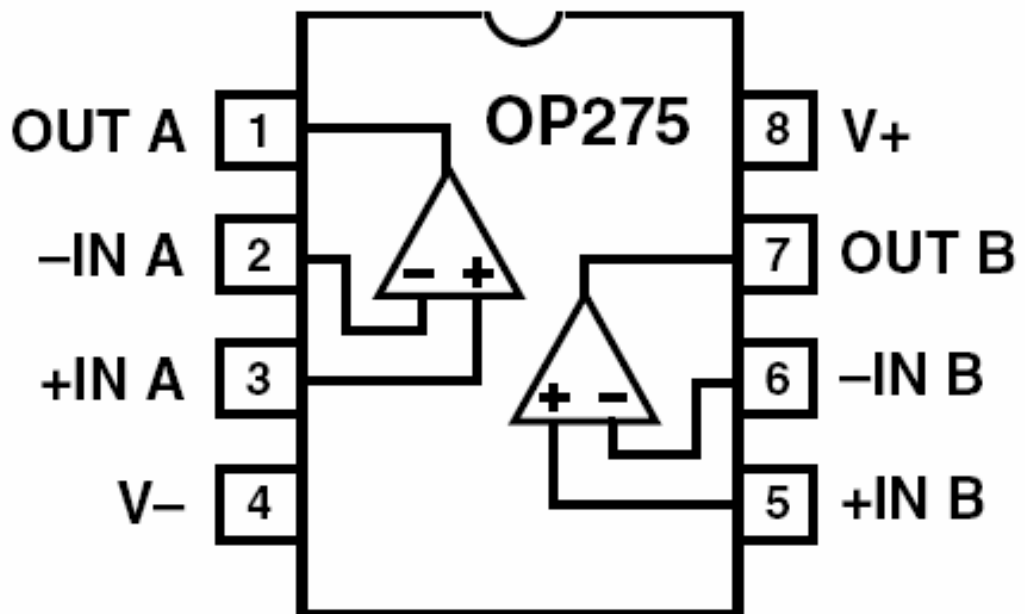
AD8663ARZ SOIC8



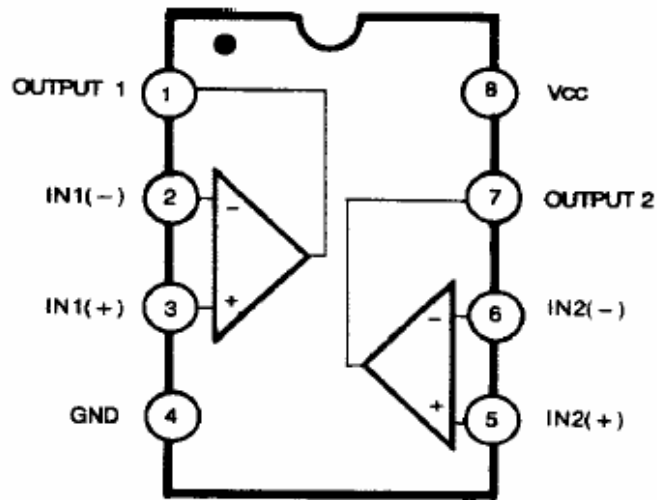
OPA2134UA SOIC8



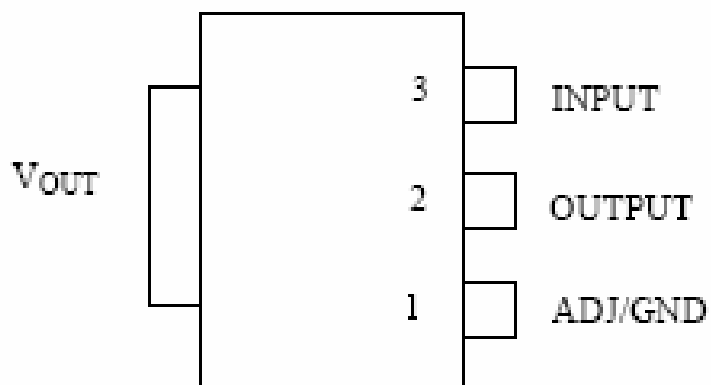
OP275GS SO8



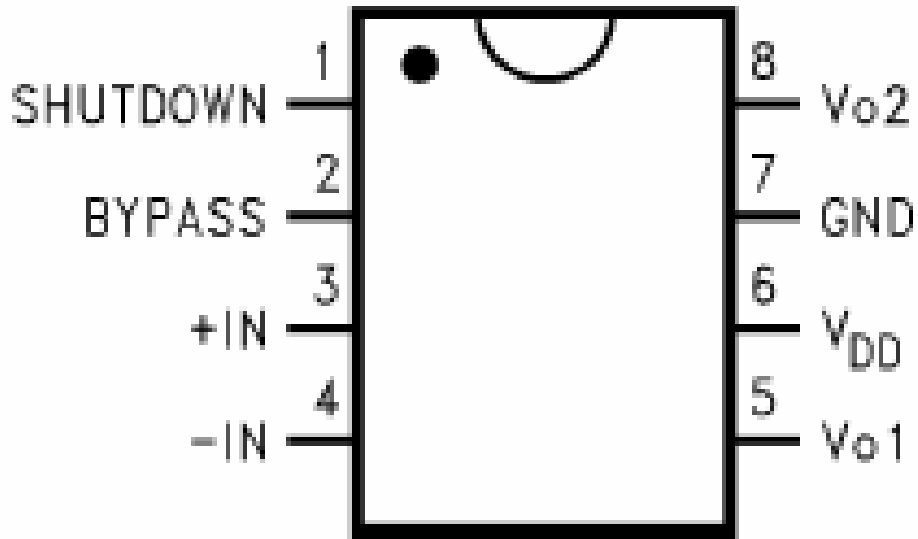
# LM393 SOP8



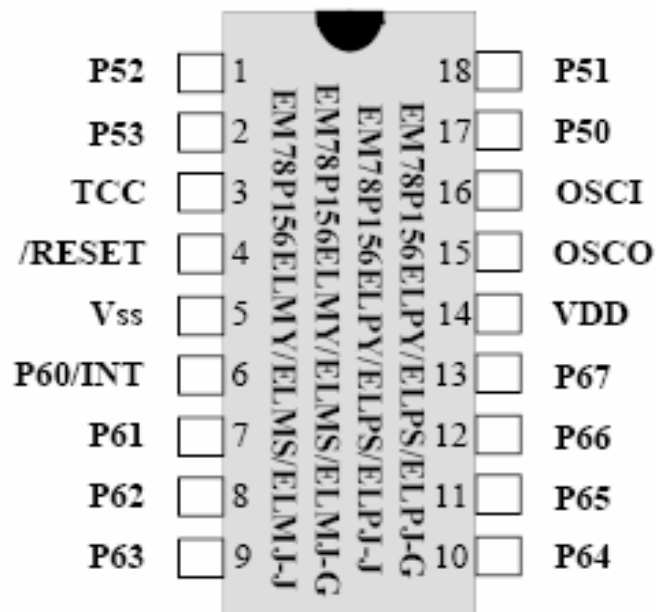
# AZ1117-ADJ/3.3V/5V SOT-223



### LM9022 SOP8

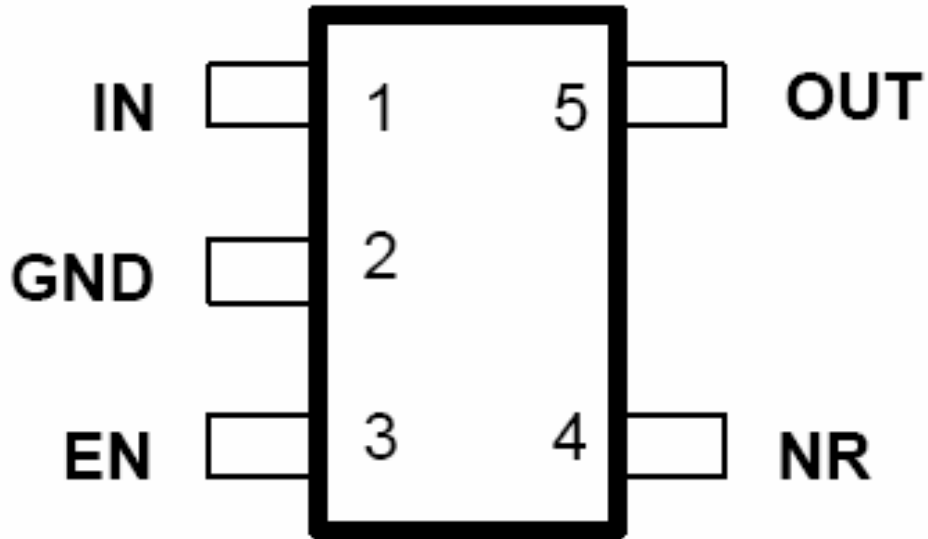


### EM78P156ELM-G SOIC18

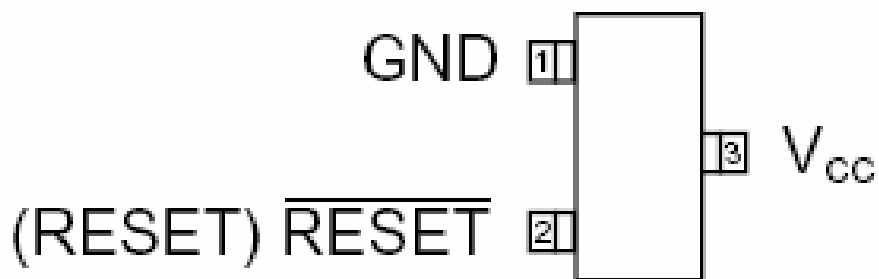




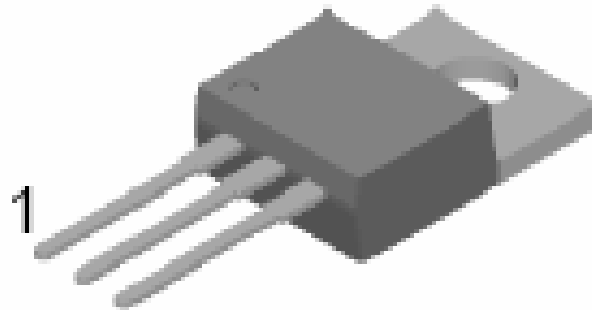
TPS73033DBVR DVB5



AAT3522 SOT-23

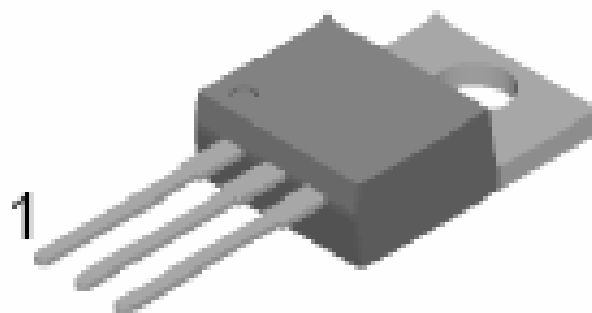


## L7805/L7812 TO-220



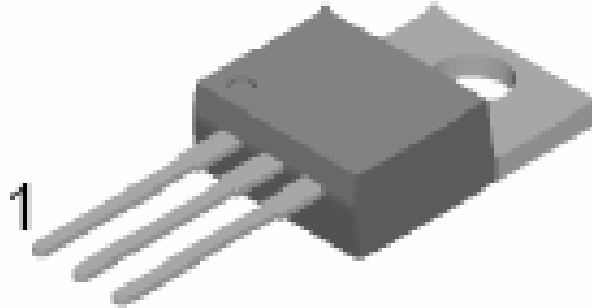
1. Input 2. GND 3. Output

## L7912 TO-220



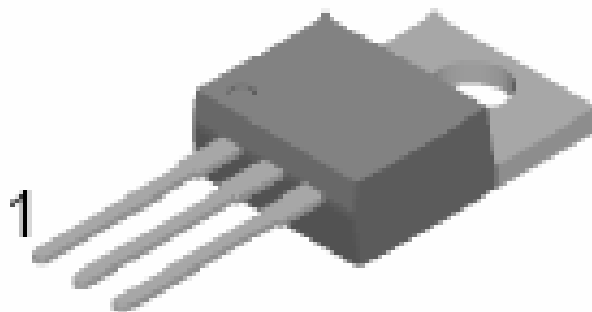
1. GND 2. Input 3. Output

BA33BCO TO-220



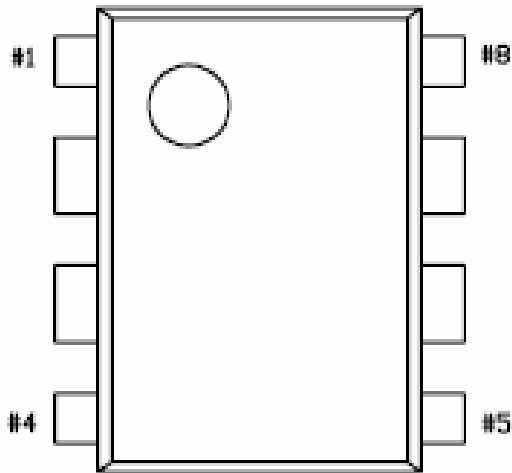
1. Vcc 2. GND 3. Output

LM317T TO-220



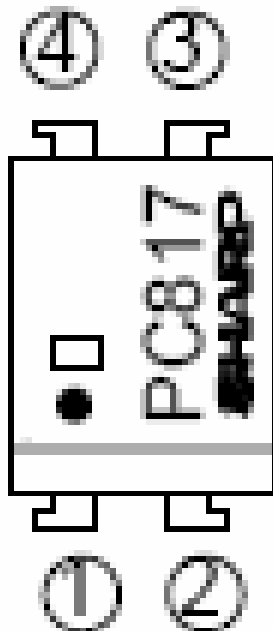
1. Adj 2. Output 3. Input

KA5M02659R DIP8



- 1.6.7.8. Drain
- 2. GND
- 3. Vcc
- 4. FB
- 5. NC

PC817 DIP4

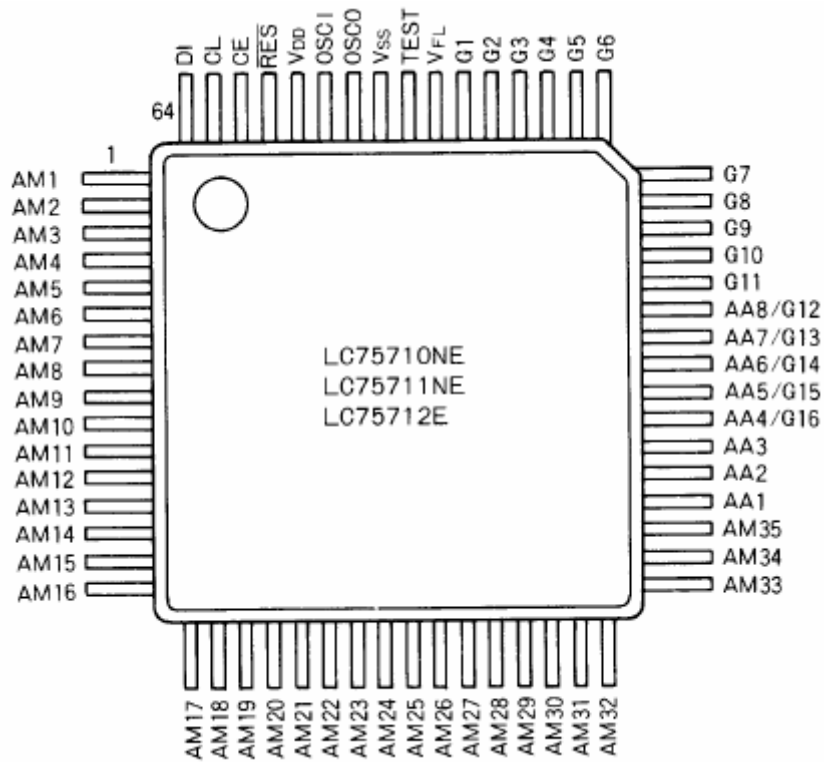


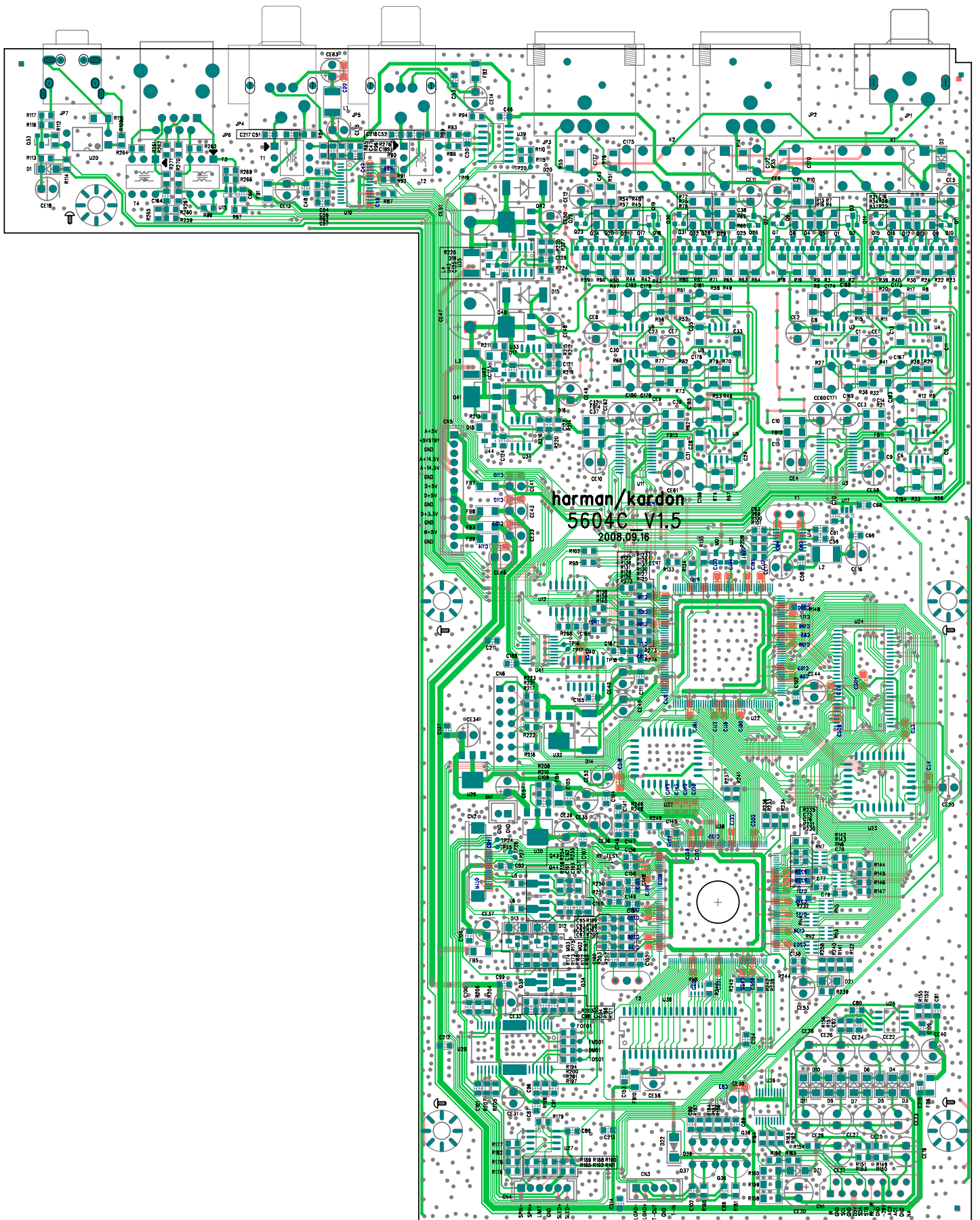
- ① Anode
- ② Cathode
- ③ Emitter
- ④ Collector

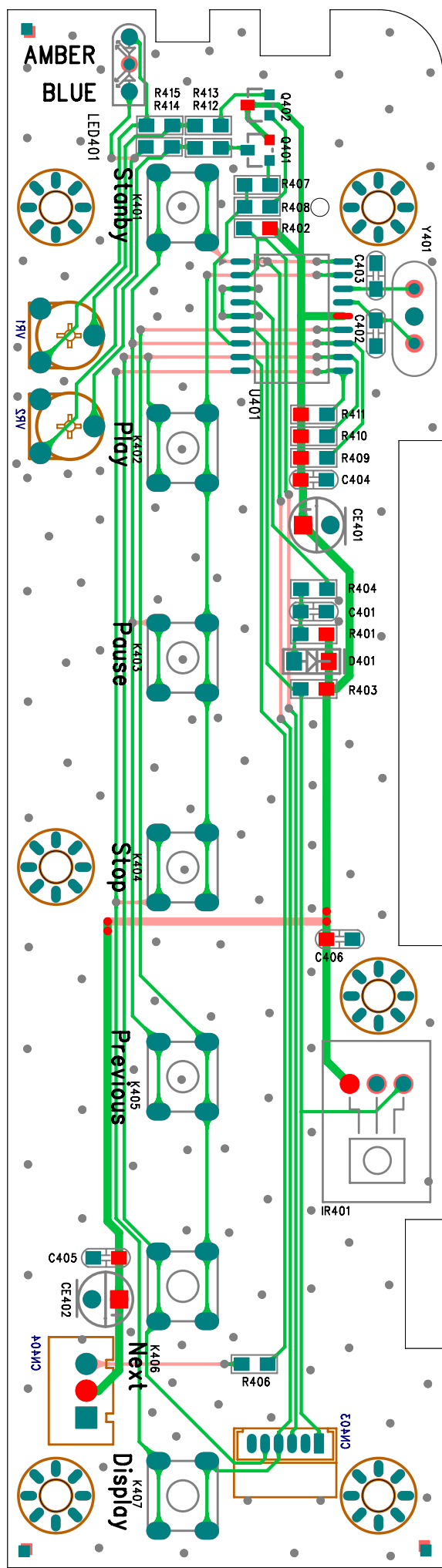
# AZ431AZ-ATRE1 TO-92

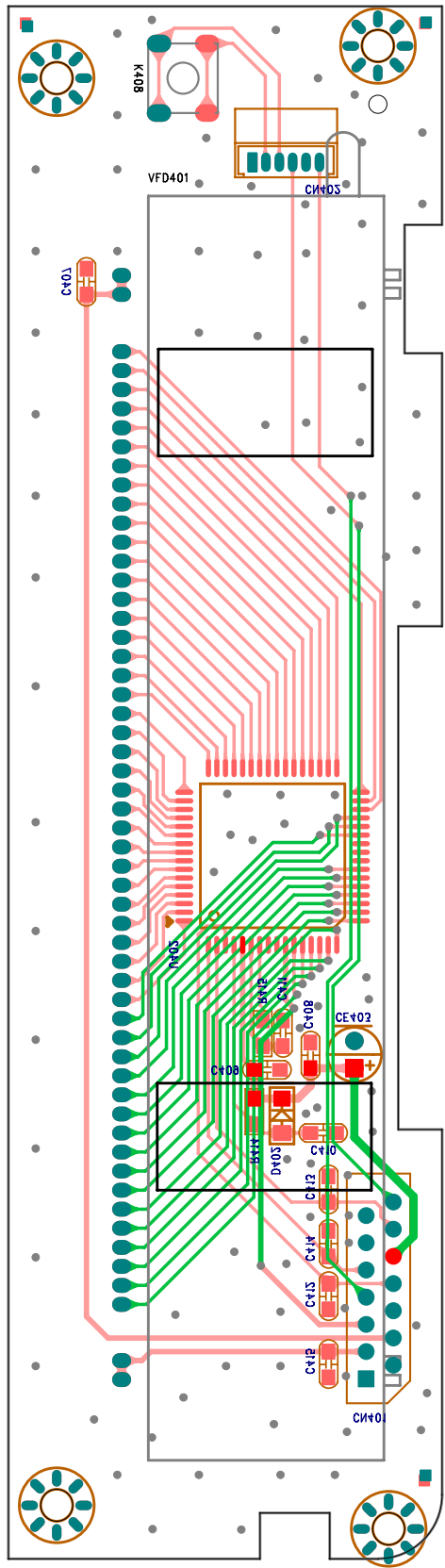


# LC75711NE QFP64E

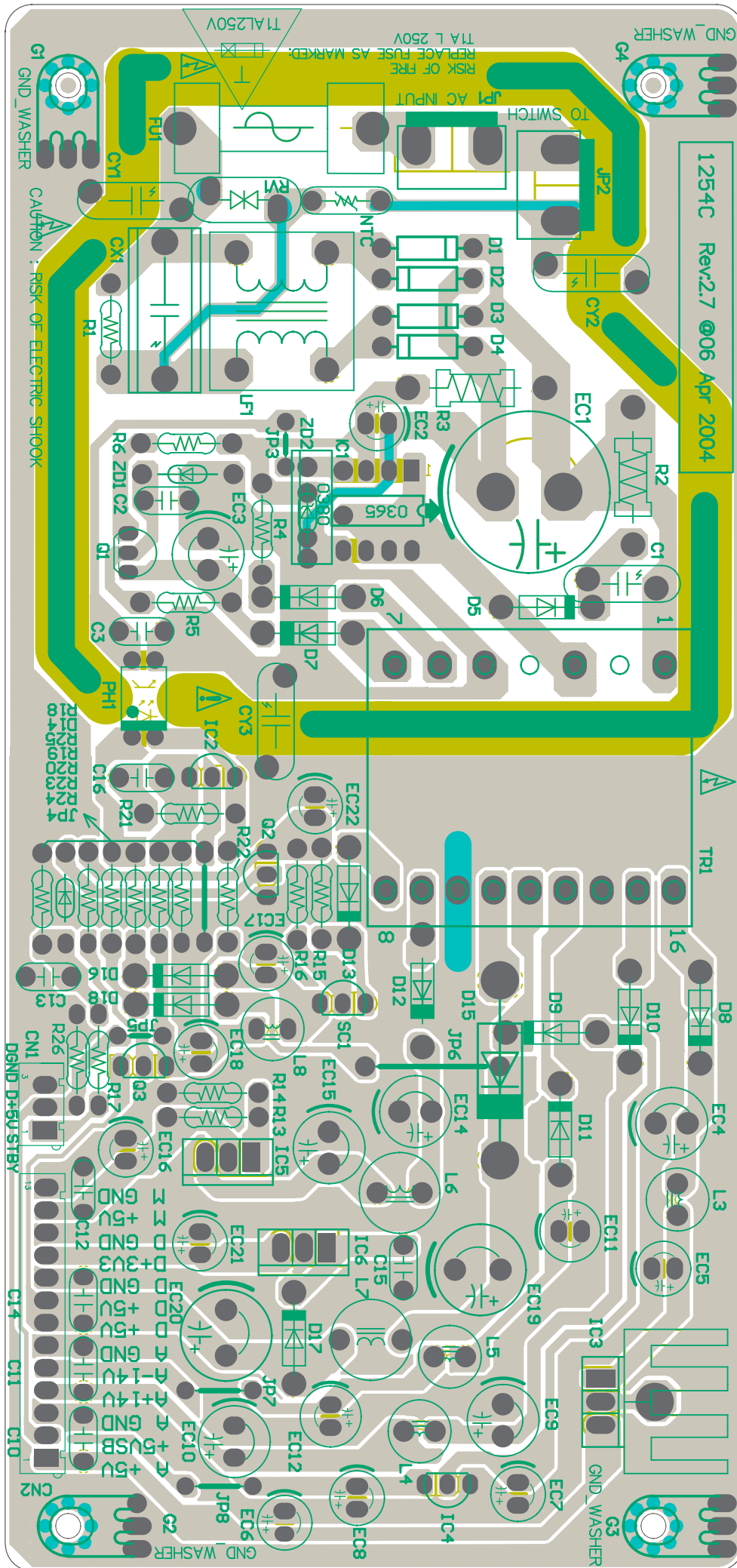












**History**

**REV 1.0:**

- 1.Make Pin1 of Y3 hang up.
- 2.Add R258 and C102, and both be valued "NA".
- 3.Add net name "ATA\_CS1#", "ATA\_CS0#", "ATA\_RDY#", "ATA\_RST#", "VFD\_STB", "DATA/SDA", "CLOCK/SCL", "IR", "D[0..15]" and "A[1..19]".
- 4.Renamed net "CS\_75710" as "CS\_75711".
- 5.Renamed net "CS\_1955\_1#" in which Pin25 of U11 is connected as "CS\_1955\_2#".
- 6.Delete the Capacitors that connected Pin4,5,6 of JP5 and JP7.
- 7.Add FB11, FB12, FB13, FB14, CE20, CE42, CE51, CE52, CE54, CE55, CE56, CE57, CE58, CE59, CE60, CE61 and CE62.
- 8.Change the Y1's PCB Footprint into "DIP" Footprint.
- 9.Delete Y2, C83 and RN1 in the original schematics.

**REV 1.1:**

- 1.Add C165-C186, and all valued "NA";
- 2.Add U39, U40, T3, T4;
- 3.Add R259, R260, R265, R264, R261(NA), R262(NA), R263, R266, R267, R268, C164, C181, C182;
- 4.Delete U9, U16, U18, U19, U21;
- 5.Delete C65, C104, C61, C71, R105, R119, R124, R129, R107, R108, R110, R111;
- 6.Change R99 to 100R;
- 7.Replaced U21D with U12D;
- 8.Renamed net "DAC\_SDATA\_R1" as "DAC\_SDATA\_L"; and Renamed net "DAC\_SDATA\_R2" as "DAC\_SDATA\_R".

**REV 1.2:**

- 1.Change R5, R26, R46, R67 to 820R;
- 2.Add R272, R273, R274 valued 0R;
- 3.Add C187/0805-47pF and C188/0805-100nF;
- 4.Add U41/SN74LVC244;
- 5.Change R90, R91, R92 to 47R;
- 6.Change some connections between U40A and U12C
- 7.Add a 47R resistance between U40 PIN5 and U12C PIN12.
- 8.Change 3.3V supply of JP4 to 5V.

**REV 1.3:**

- 1.Add C198,R276.

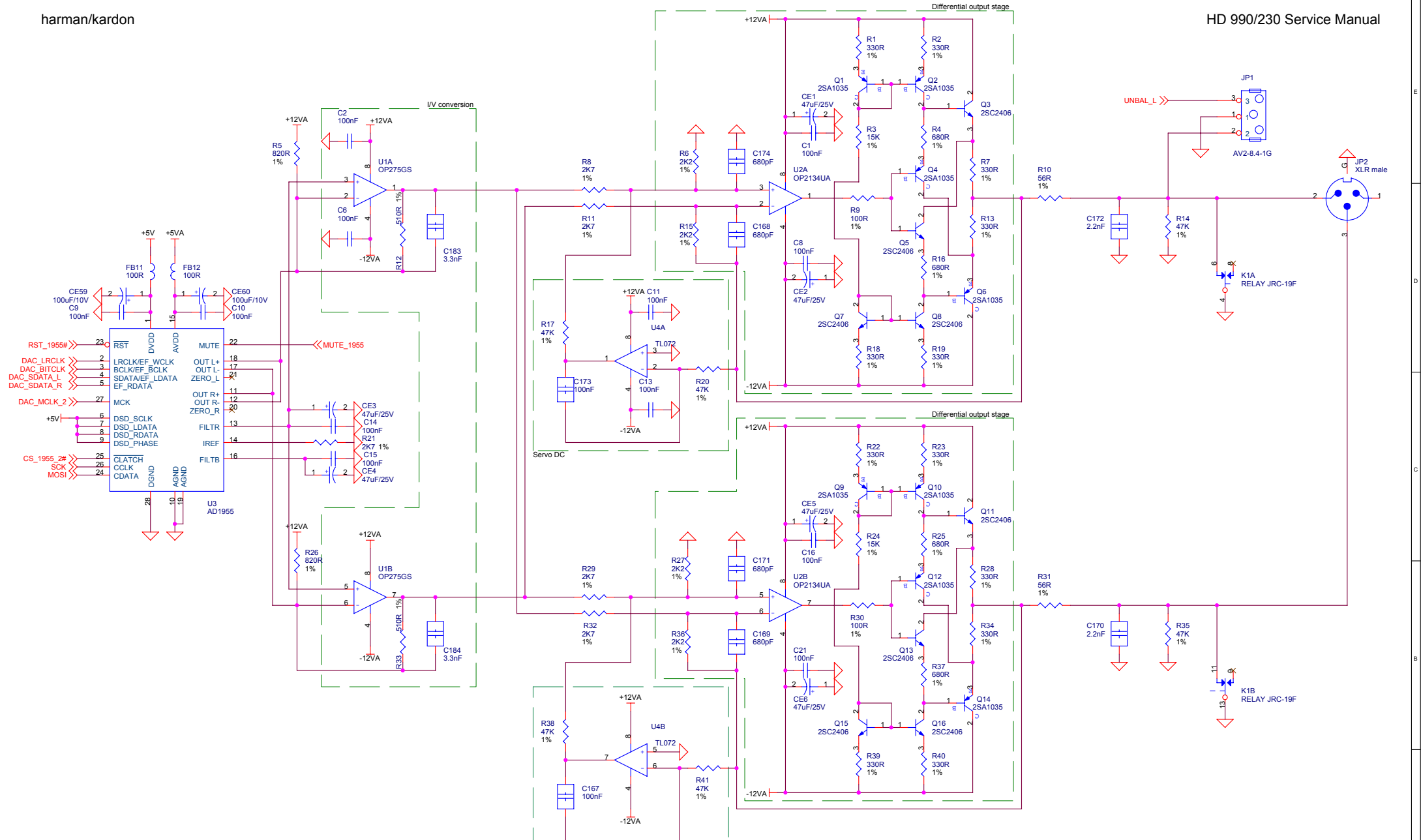
**REV 1.4:**

- 1.Exchange L/R channel.
- 2.change R12, R33, R53 and R74 to 510R 1%.
- 3.Add D22;
- 4.Change U2 and U6 from OP275GS to OPA2134UA;
- 5.Delete C3, C7, C17, C20, C25, C29, C39, C42, C12, C22, C34, C44, C4, C18, C26, C40, C5, C19, C27 & C41 and change them to C174, C168, C171, C169, C182, C178, C180, C179, C173, C167, C181, C176, C183, C184, C185, C186, C172, C170, C177 & C175 MKP type caps one to one.
- 6.Add C85, C66, C71, C67 & C190-C216.
- 7.Add C217 & C218 be valued NA.
- 8.Add CE52.

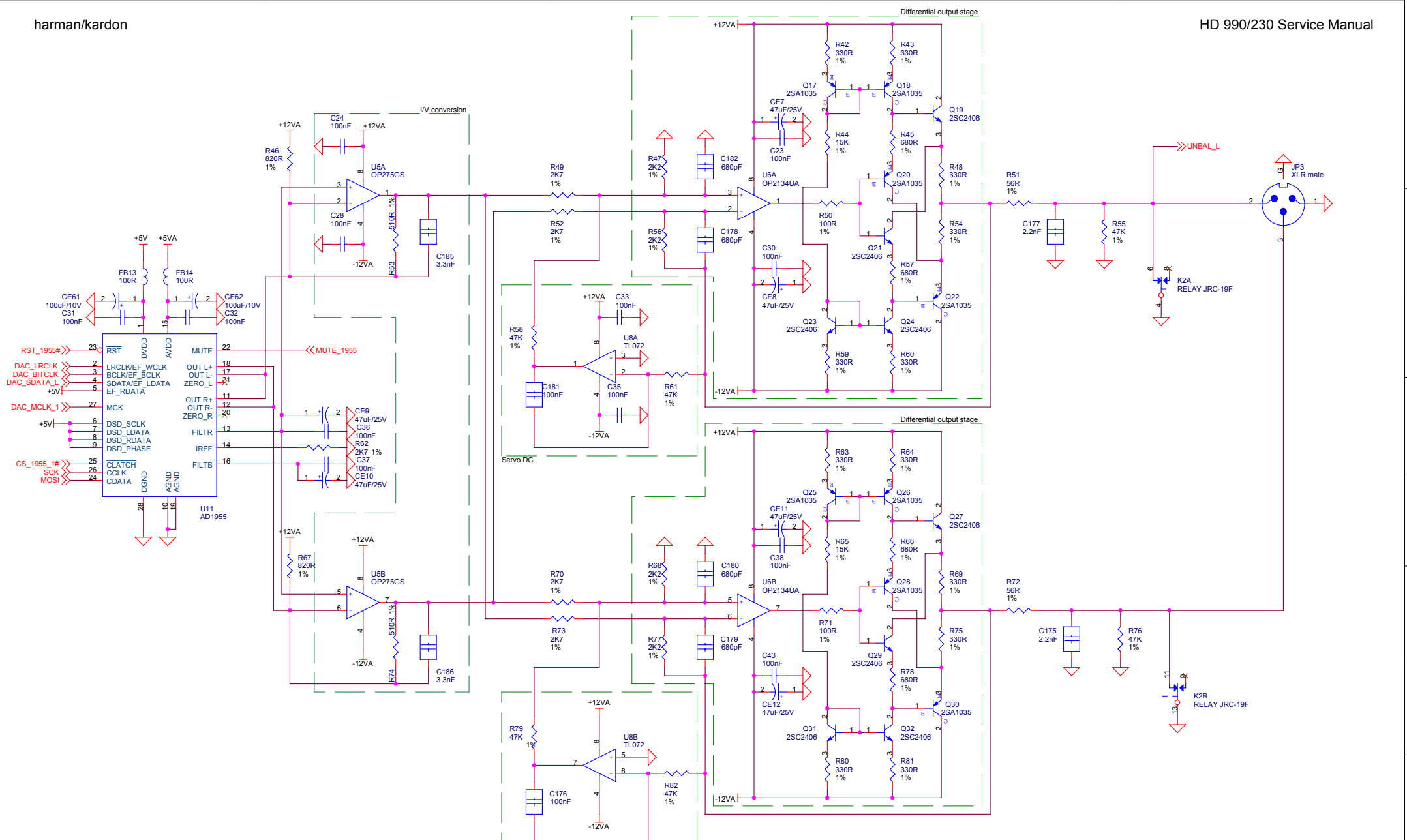
**REV 1.5:**

- 1.Add CON7; Add CE63; Add RF Test Point.

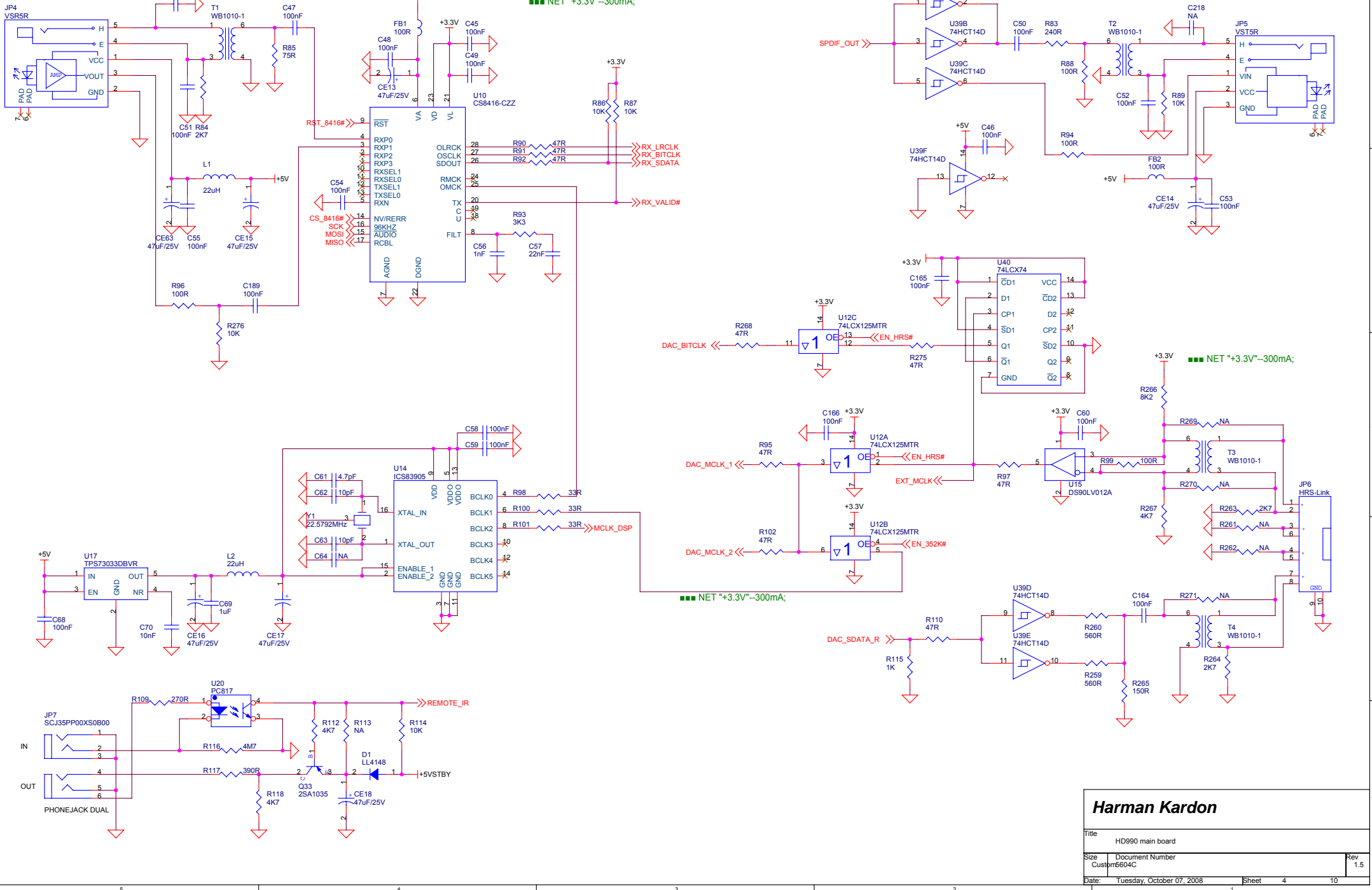
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Size: Custom	Document Number: 013_CS_100 MAN	Rev:
Date: Saturday, September 13, 2008	Sheet: 1	10



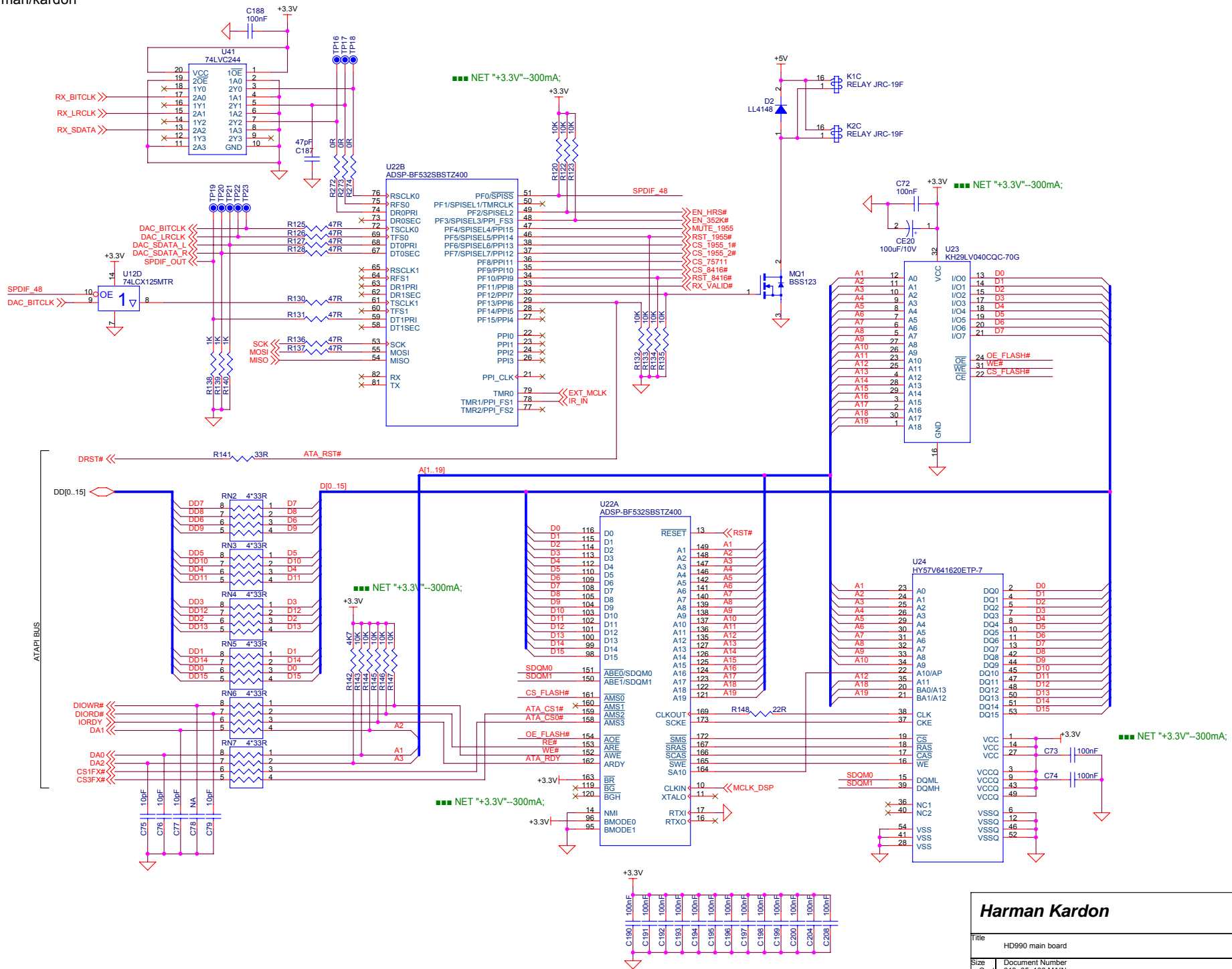
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Title HD 990 Main board		
Size	Document Number	Rev
Custpm6604C		1.5
Date:	Tuesday, October 07, 2008	Sheet 2 of 10



<b>Harman/Kardon</b>		
Title HD 990 Main board		
Size Cuspm6604C	Document Number	Rev 1.5
Date: Tuesday, October 07, 2008	Sheet 3	10



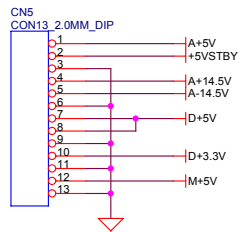
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Size	Document Number	Rev
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Date:	Tuesday, October 07, 2008	Sheet 4 of 10



**Harman Kardon**

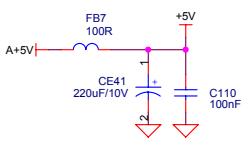
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Date:	Tuesday, October 07, 2008	Sheet 1 of 10

harman/kardon

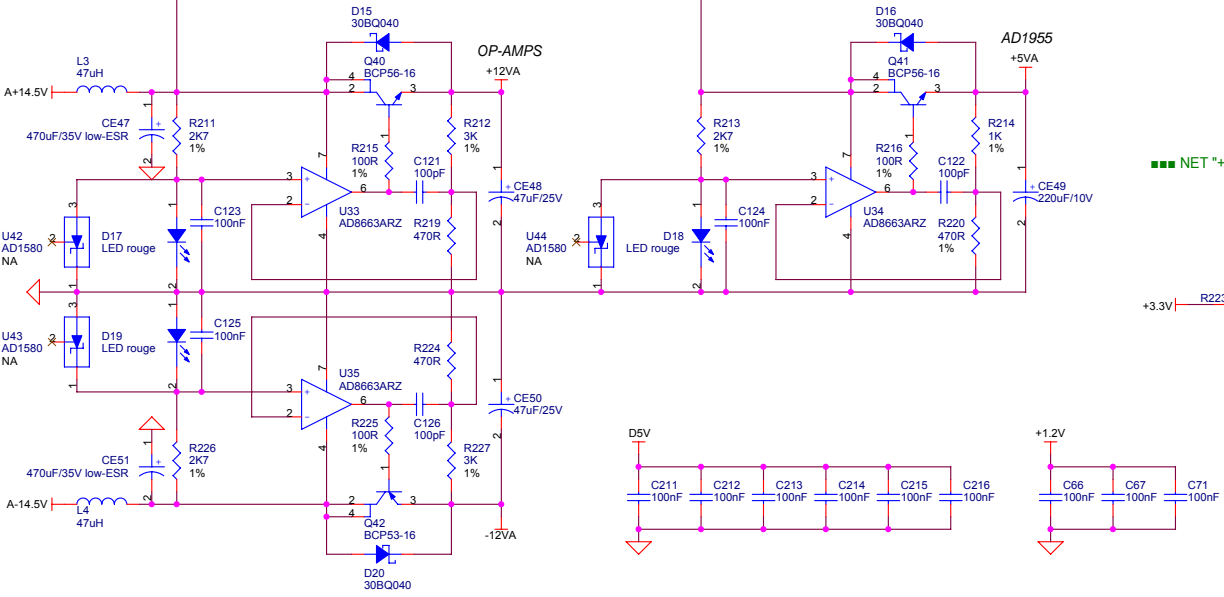
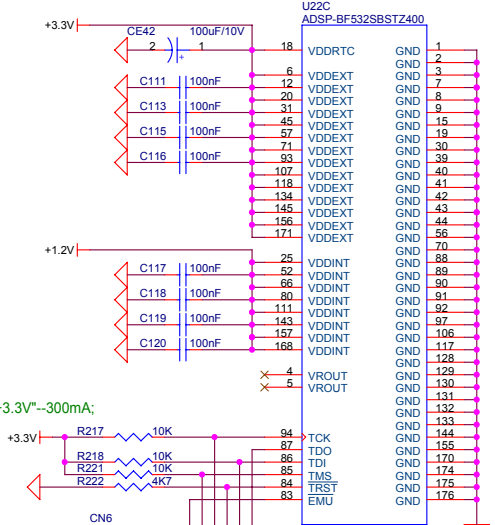
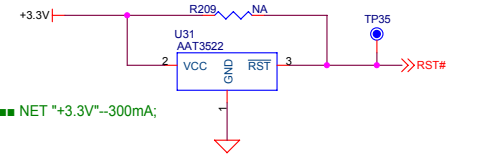
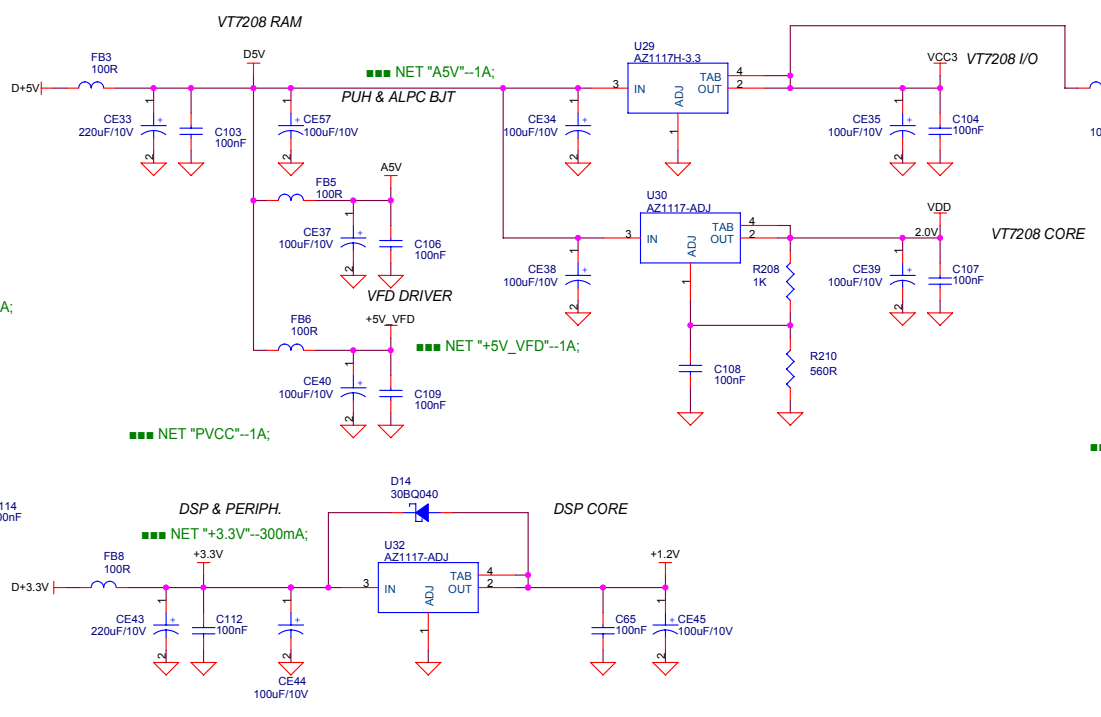
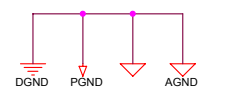
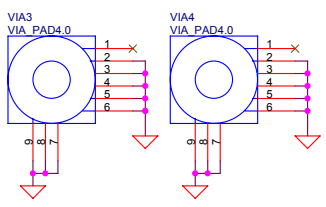
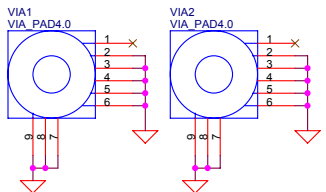
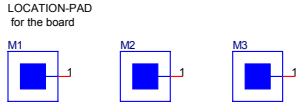
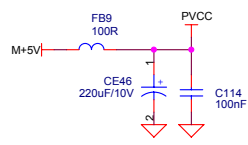


- NET "A+5V"--100mA;
- NET "+5VSTBY"--100mA;
- NET "A+14.5V"--100mA;
- NET "A-14.5V"--100mA;
- NET "D+5V"--1A;
- NET "M+5V"--1A;
- NET "D+3.3V"--200~300mA;

MASTER CLOCK & DAC

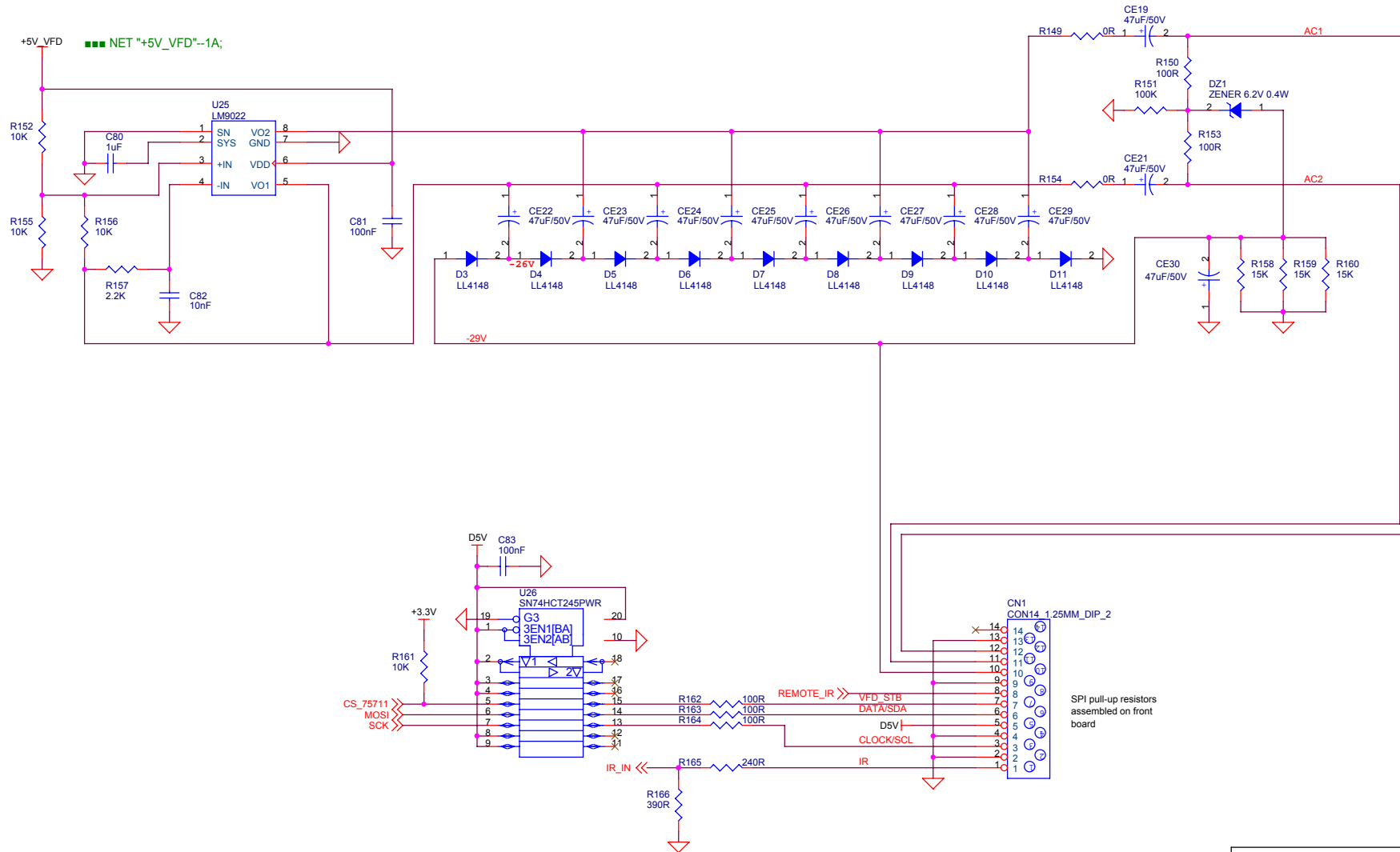


MOTOR CONTROL



Harman Kardon

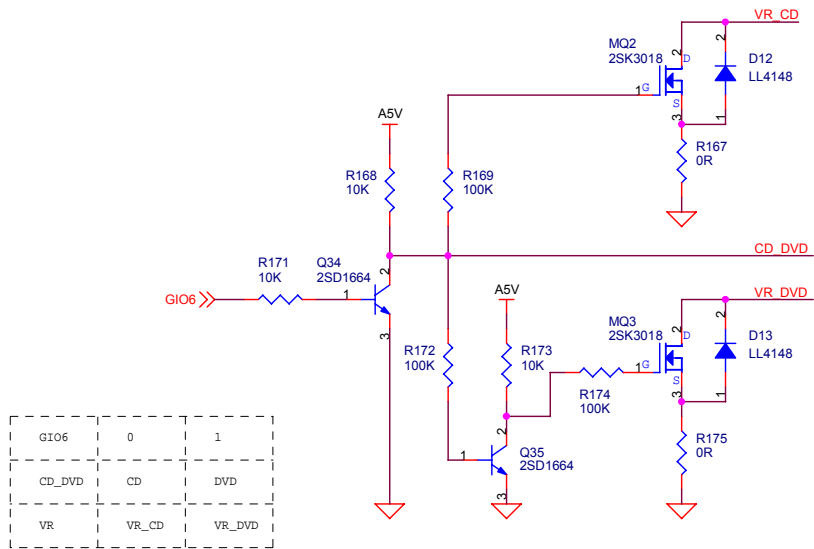
Title	HD990 main board	
Size	Document Number	Rev
Custom	013_05_100 MAIN	1.5
Date:	Tuesday, October 07, 2008	Sheet 1 of 10



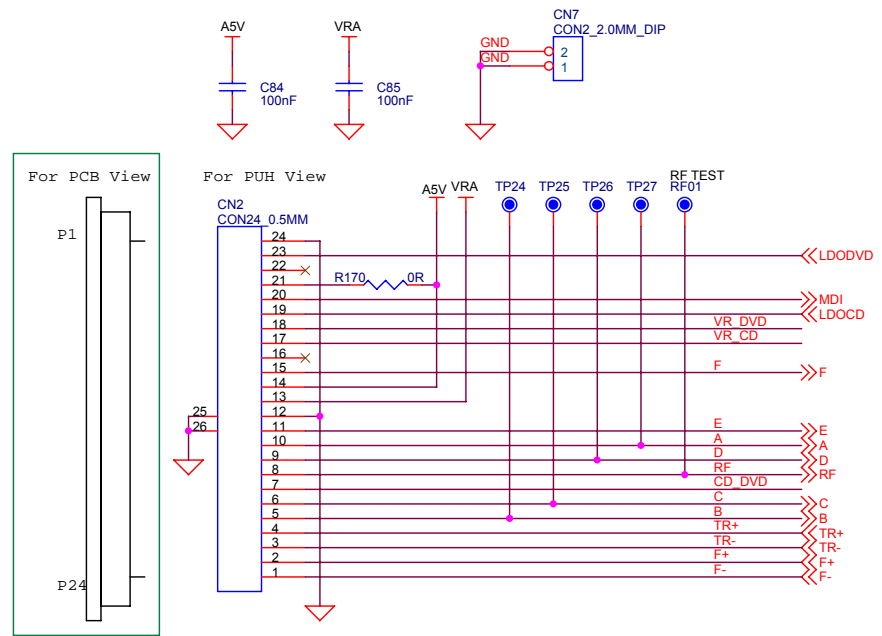
SPI pull-up resistors assembled on front board

<b>Harman Kardon</b>		
Title: HD990 main board		
Size: A3	Document Number: 5604C	Rev: 1.5
Date: Tuesday, October 07, 2008		
Sheet: 5		of 9



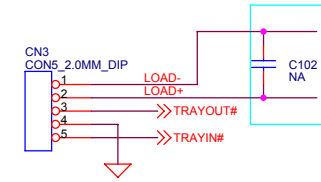
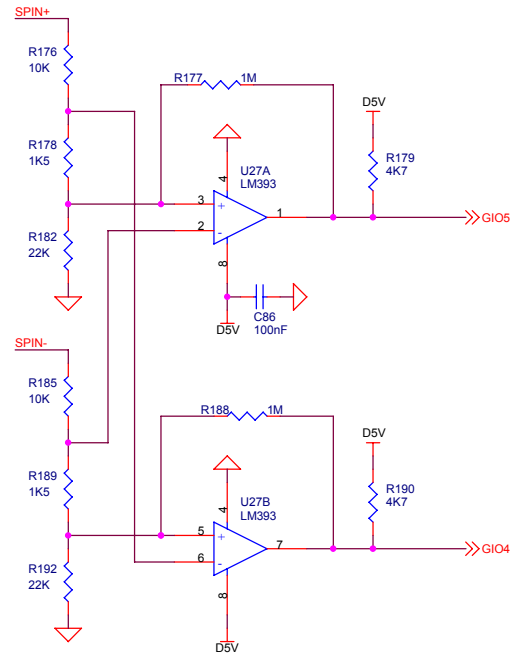
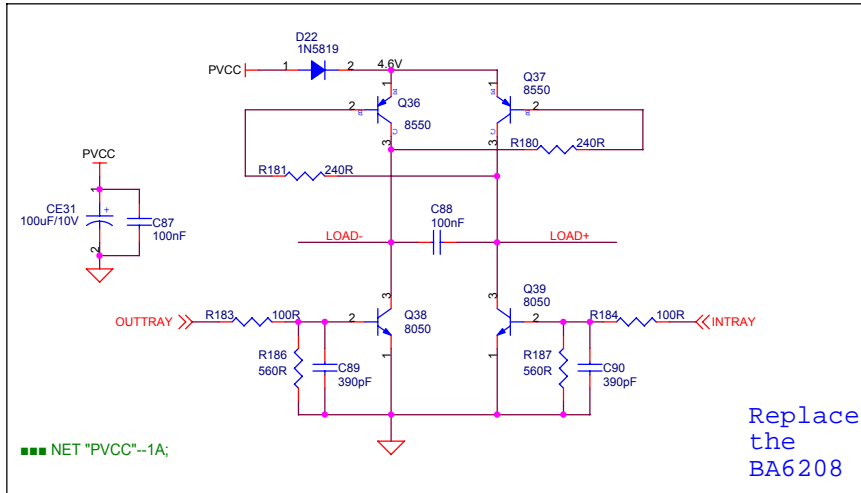


GI06	0	1
CD_DVD	CD	DVD
VR	VR_CD	VR_DVD

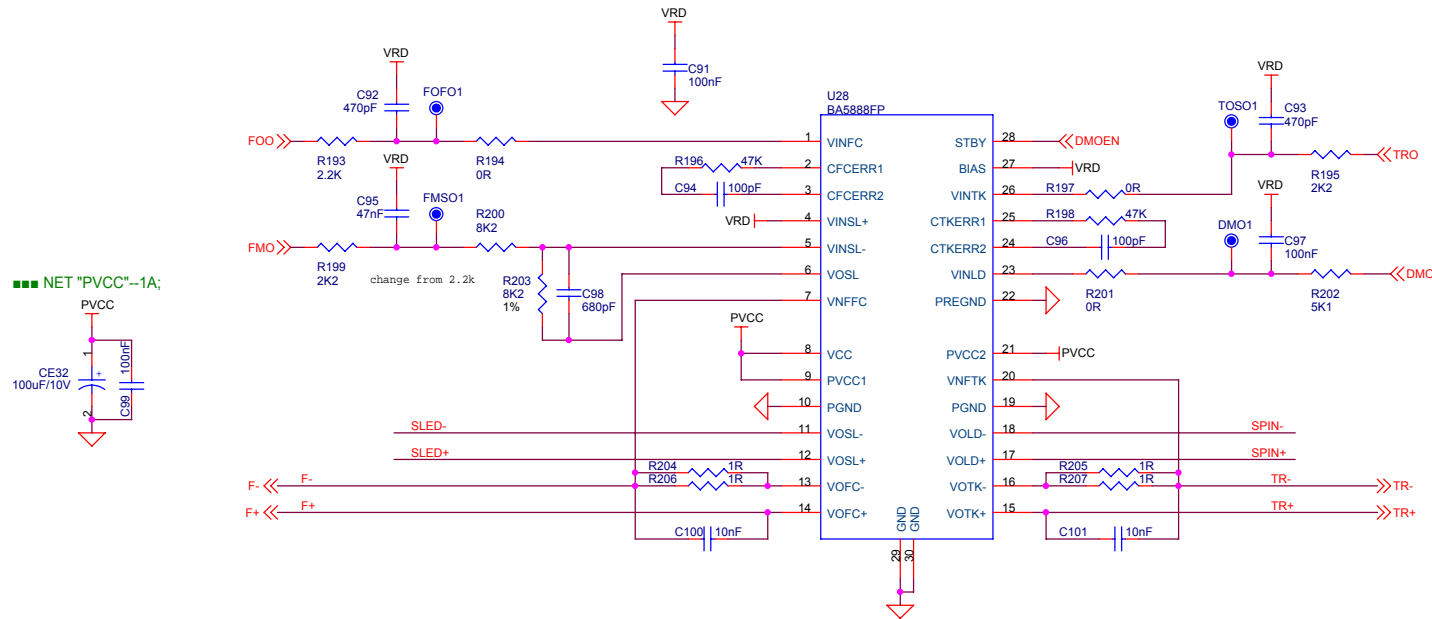
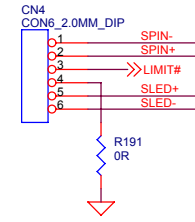


This connector support SF-HD850G

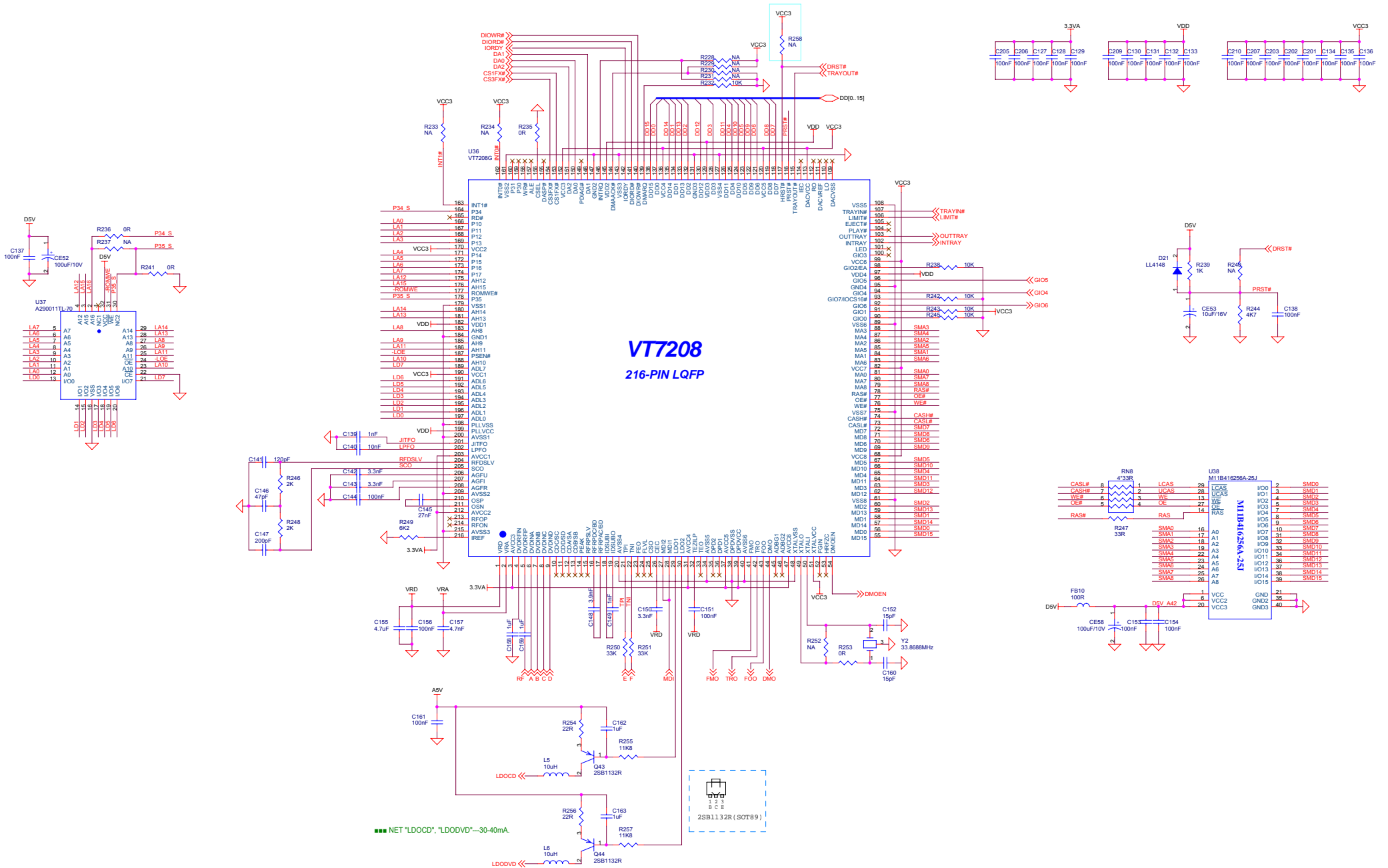
<b>Harman Kardon</b>		
Title: HD990 main board		
Size: B	Document Number: 5604C	Rev: 1.5
Date: Tuesday, October 07, 2008	Sheet: 6	of 9



This connector support SF-HD850



<b>Harman Kardon</b>		
Title: HD990 main board		
Size: A3	Document Number: 5604C	Rev: 1.5
Date: Tuesday, October 07, 2008	Sheet: 7	of 9

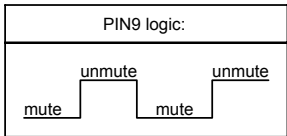
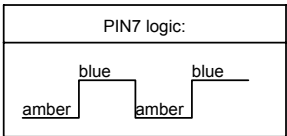
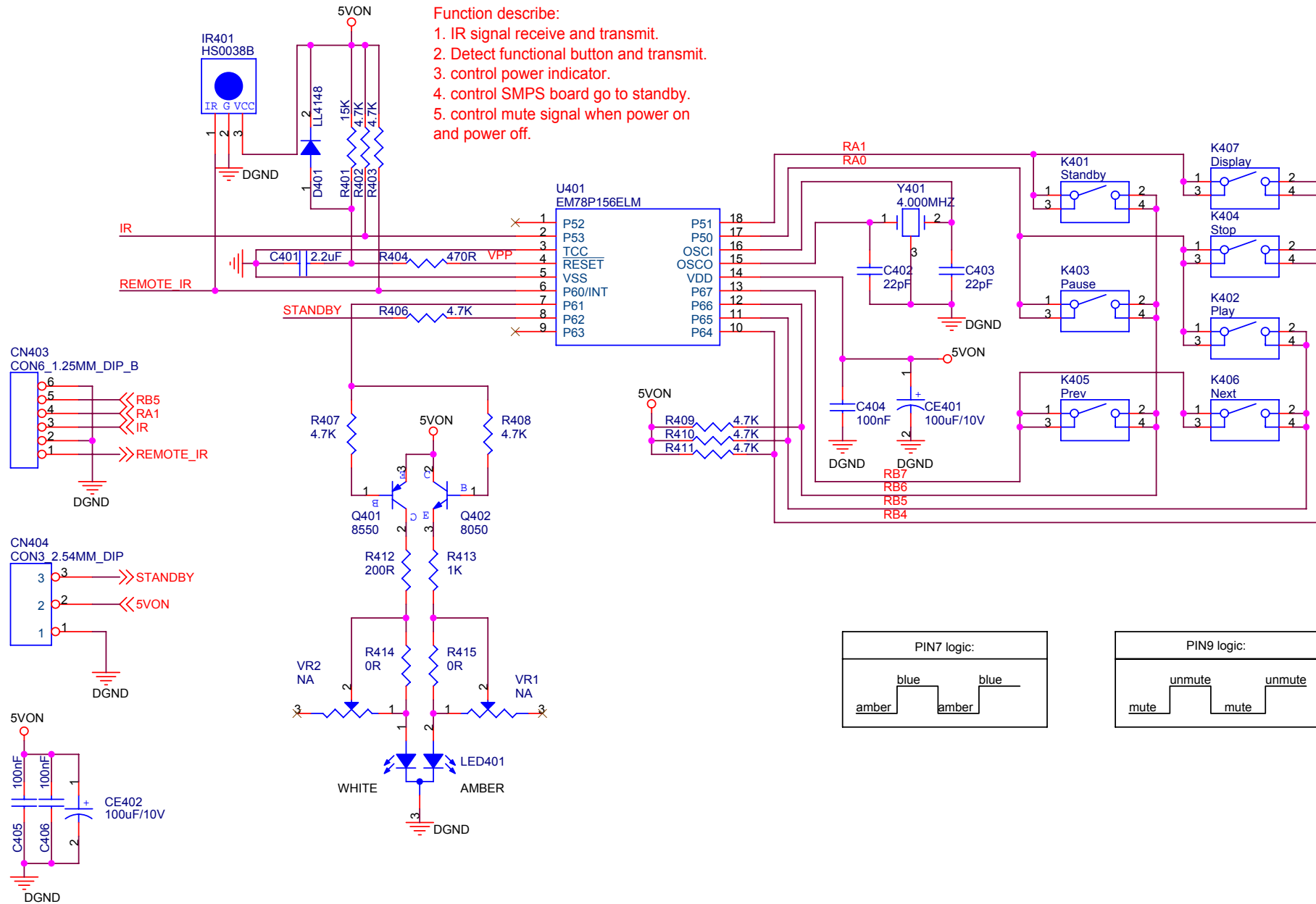


**VT7208**  
216-PIN LQFP

NET "LDOCD", "LDOVDV" --30.40mA.

<b>Harman Kardon</b>	
file	HD990 main board
Size	Document Number 5504C
Date	Tuesday, October 07, 2008
Sheet	9 of 9

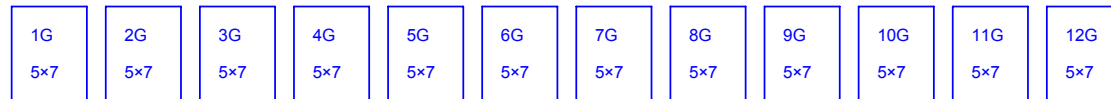
- Function describe:
1. IR signal receive and transmit.
  2. Detect functional button and transmit.
  3. control power indicator.
  4. control SMPS board go to standby.
  5. control mute signal when power on and power off.



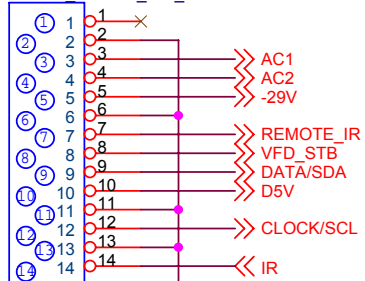
Title			
HD980 FRONT PANEL: Button board			
Size	Document Number	Rev	
A4	5575C	1.2	
Date:	Friday, August 01, 2008	Sheet	1 of 2

VFD401  
VFD22-1302FA

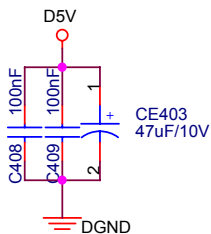
### VFD 12COLUMNS x 1LINE 5x7 DOT MATRIX



CN401  
CON14\_1.25MM\_DIP\_2



DGND



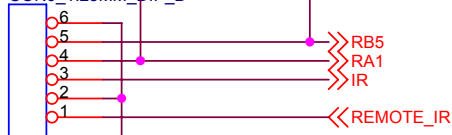
C407  
47nF

DGND

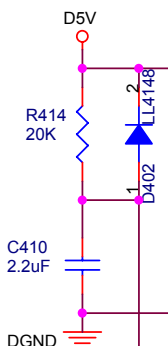
C415  
47nF

DGND

CN402  
CON6\_1.25MM\_DIP\_B



DGND

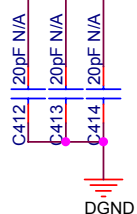


C410  
2.2uF

DGND

VFD\_STB  
CLOCK/SCL  
DATA/SDA

VFD\_STB  
CLOCK/SCL  
DATA/SDA



DGND

C411  
30pF

DGND

DGND

DGND

DGND

DGND

DGND

DGND

DGND

DGND

DGND

DGND

DGND

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DGND

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DGND

DGND

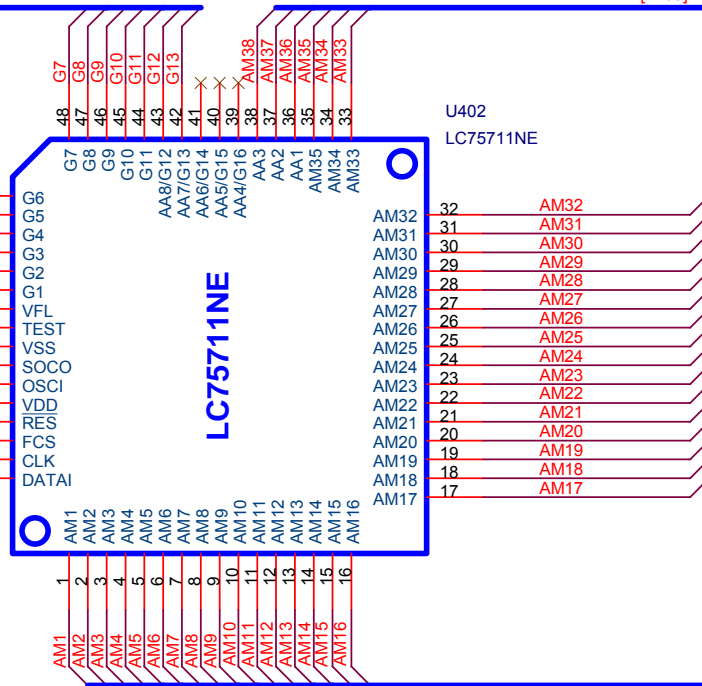
DGND

DGND

DGND

DGND

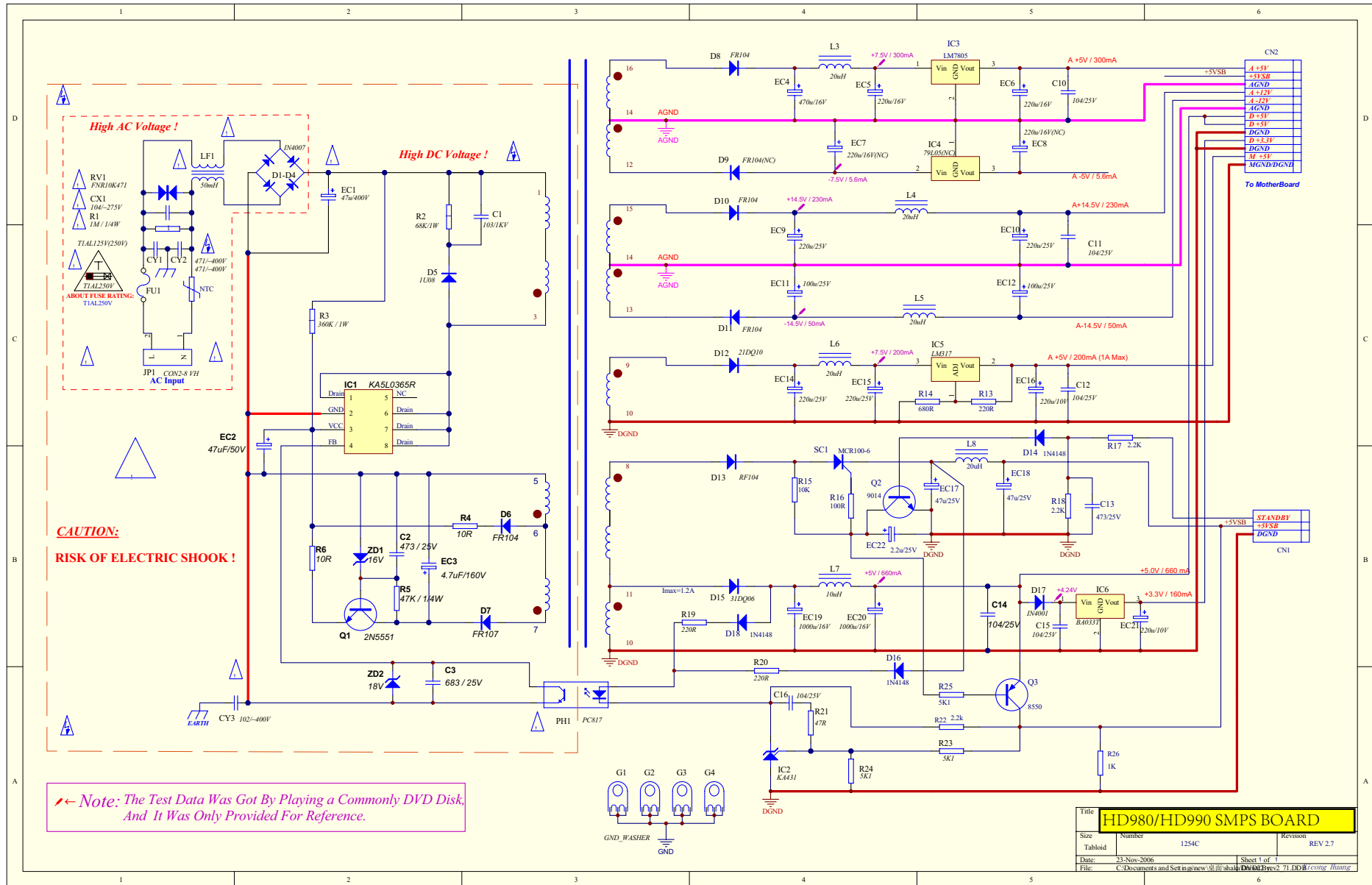
DGND



LC75711NE

U402  
LC75711NE

Title		
HD980 FRONT PANEL: VFD BOARD		
Size	Document Number	Rev
A4	5576C	1.1
Date:	Wednesday, December 19, 2007	Sheet 2 of 2



Service bulletin # HK2012-002

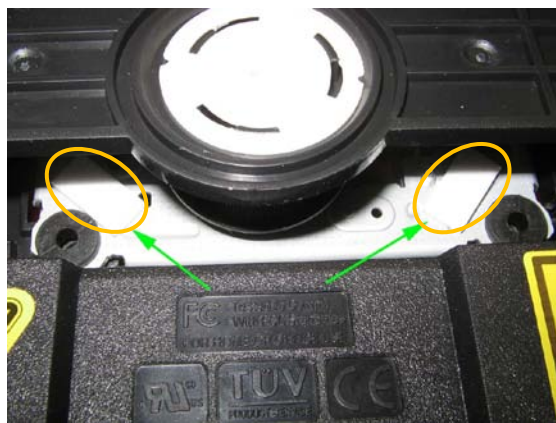
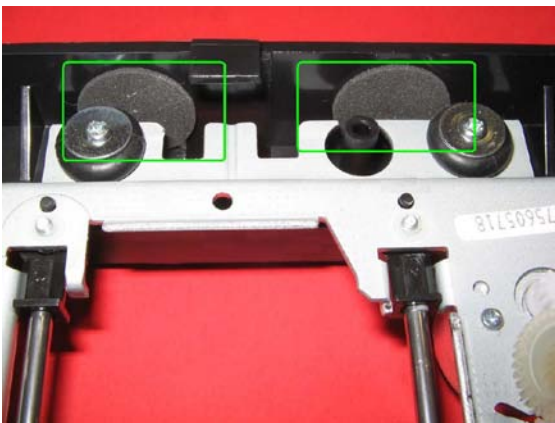
To: All Harman Kardon Service Centers  
Models: HD 980/990  
Subject: Rattle noise

In the event you receive a unit with the complaint “*Periodic mechanical noise from the CD player*”.

Perform the following repair: Add damping pads to prevent rattling.  
Rattling noise is related to the spinning disc not being completely balanced or centric.  
Parts: Pads – Part number: EDV3485ORATTLE (5 sets of 4 pads).

**Procedure:**

Please mount 2x2 damping-pads as shown in the pictures.



Note: There should be no marks in the surface or stickers on the disc, causing imbalance when the disc is spinning. Even original discs may not be fully centric.

Model	Serial number	Status	Action	PN used
HD 980/990	All	Rattle noise	Add damping pads	EDV3485ORATTLE