

Service Manual

CHASSIS : CP-780

**MODEL : DUB-2850GB
DUB-2850
DUB-2850K**



Caution

: In this Manual, some parts can be changed for improving. their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List)in Service Information Center.

CONTENTS

1 MAIN FEATURES	3
1.1 SPECIFICATIONS	3
1.2 CHANNEL/FREQUENCY TABLE	5
2 SAFETY INSTRUCTION	7
3 ALIGNMENT INSTRUCTIONS	8
3.1 MICROCONTROLLER CONFIGURATION : SERVICE MODE	8
3.2 SERVICE MODE NAVIGATION	8
3.3 MICROCONTROLLER CONFIGURATION : OPTION BITS	8
3.4 OPTION 1	9
3.5 OPTION 2	9
3.6 NVM default setting	10
3.7 TV SET ALIGNMENT	12
3.8 OAD(Over air download)	13
4 IC DESCRIPTION	14
4.1 UOC III Series	14
4.2 TDA8946J (STEREO AUDIO AMPLIFIER)	24
4.3 TDA8358J (VERTICAL AMPLIFIER)	26
4.4 TDA6108AJF (VIDEO AMPLIFIER)	28
4.5 2WC16-16KB (EEPROM)	29
4.6 STR-W6754	30
4.7 Pnx 8314	32
4.8 UDA 1334 BTS (audio DAC)	34
4.9 CI MAX	35
4.10 M29W320ET(Flash Memory)	38
4.11 K4S281632D(SDRAM)	39
5 CIRCUIT DESCRIPTION	40
5.1 BLOCK DIAGRAM	40
5.2 FUNCTIONAL DESCRIPTION OF VIDEO PROCESSOR	41
5.3 GENERAL DESCRIPTION OF THE TV SOUND OF SOUND PROCESSOR	49
5.4 FUNCTIONAL DESCRIPTION PROCESSOR	51
6 SERVICE PARTS LIST	56
7 SCHEMATIC DIAGRAM	65
8 PRINTED CIRCUIT BOARD	70
9 EXPLODED VIEW	78

DOCUMENT HISTORY

VERSION	DATE	COMMENTS
V1.00	22/10/05	Creation of document (Author BD MIN) for project CP-780 50Hz iDTV.

1 MAIN FEATURES

1.1 SPECIFICATIONS

1.1.1 GENERAL

DVB standard		Transmission standard	Picture compression standard	Voice compression standard
		COFDM	MPEG2	MPEG Audio
TV standard		PAL - SECAM B/G D/K, PAL I/I, SECAM L/L'		
Colour system	Tuner	PAL, SECAM		
	AV	PAL, SECAM, PAL 60, NTSC M, NTSC 4.43		
Sound system		NICAM B/G, I, D/K, L, FM 2Carrier B/G, D/K		
Power consumption		95W		
Sound Output Power		7W x 2 (at 60% mod, 10%THD)		
Speaker		12W 8 ohm x2		
Teletext system		10 pages memory FASTEXT (FLOF or TOP)		
Aerial input		75 ohm unbalanced		
Channel coverage		Off-air channels, S-cable channels and hyperband		
Tuning system		frequency synthesiser tuning system		
Visual screen size		66cm		
Channel indication		On Screen Display		
Program Selection		100 programmes		
Aux. terminal		EURO-SCART 1 : Audio / Video In and Out, R/G/B In, Slow and Fast switching. EURO-SCART 2 : Audio / Video In and Out, SVHS In. SPDIF : jack on rear of cabinet(Digital channel output) AV3 : Audio-Video Jack on side of cabinet. SVHS3 (option) : Jack on side of cabinet sound input common with AV3. Headphone jack on side of cabinet		
Remote Control		R-52N20		
PCMCIA		CI slot (on rear of cabinet)		

1.1.2 EURO-SCART 1 (21 Pin)

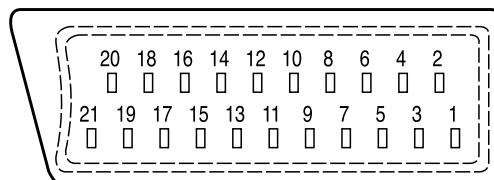
Pin	Signal Description	Matching value
1	Audio Output Right	0.5 Vrms, Impedance < 1 k Ω , (RF 54% Mod)
2	Audio Input Right	0.5 Vrms, Impedance > 10 k Ω
3	Audio Output Left	0.5 Vrms, Impedance < 1 k Ω , (RF 54% Mod)
4	Audio Earth	
5	Blue Earth	
6	Audio Input Left	0.5 Vrms, Impedance > 10 k Ω
7	Blue Input	0.7 Vpp \pm 0.1V, Impedance 75 Ω
8	Slow Switching	TV : 0 to 2V, AV 16/9:4.5 to 7V, AV 4/3 : 9.5 to 12V, Impedance > 10 k Ω

CP-780 Service Manual

9	Green Earth	
10	N.C.	
11	Green Input	0.7 Vpp ± 0.1V, Impedance 75 Ω
12	N.C.	
13	Red Earth	
14	Blanking Earth	
15	Red Input	0.7 Vpp ± 0.1V, Impedance 75 Ω
16	Fast Switching	0 to 0.4V : Logic "0", 1 to 3V : Logic "1", Impedance 75 Ω
17	Video Out Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75 Ω
20	Video Input	1 Vpp ± 3dB, Impedance 75 Ω
21	Common Earth	

1.1.3 EURO-SCART 2 (21Pin)

Pin	Signal Description	Matching value
1	Audio Output Right	0.5 Vrms, Impedance < 1 k Ω (RF 54% Mod)
2	Audio Input Right	0.5 Vrms, Impedance > 10 k Ω
3	Audio Output Left	0.5 Vrms, Impedance < 1 k Ω, (RF 54% Mod)
4	Audio Earth	
5	Earth	
6	Audio Input Left	0.5 Vrms, Impedance > 10 k Ω
7	N.C.	
8	N.C.	
9	N.C.	
10	N.C.	
11	N.C.	
12	N.C.	
13	Earth	
14	Earth	
15	Chroma Input	±3dB for a luminance signal of 1 Vpp
16	N.C.	
17	Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75 Ω (Monitor output)
20	Video Input, Y In.	1 Vpp ± 3dB, Impedance 75 Ω
21	Common Earth	



1.2 CHANNEL/FREQUENCY TABLE

CHANNEL	EUROPE CCIR	FRANCE	GB(IRELAND)	EAST OIRT
C01	46.25	-	45.75	49.75
C02	48.25	55.75 (L)	53.75	59.25
C03	55.25	60.5 (L)	61.75	77.25
C04	62.25	63.75 (L)	175.25	85.25
C05	175.25	176.00	183.25	93.25
C06	182.25	184.00	191.25	175.25
C07	189.25	192.00	199.25	183.25
C08	196.25	200.00	207.25	191.25
C09	203.25	208.00	215.25	199.25
C10	210.25	216.00	223.25	207.25
C11	217.25	189.25 (LUX)	231.25	215.25
C12	224.25	69.25 (L)	239.25	223.25
C13	53.75	76.25 (L)	247.25	-
C14	-	83.25 (L)	49.75	-
C15	82.25	90.25	57.75	-
C16	-	97.25	65.75	-
C17	183.75	-	77.75	-
C18	192.25	-	85.75	-
C19	201.25	-	-	-
C20	-	-	-	-
C21	471.25	471.25	471.25	471.25
C22	479.25	479.25	479.25	479.25
C23	487.25	487.25	487.25	487.25
C24	495.25	495.25	495.25	495.25
C25	503.25	503.25	503.25	503.25
C26	511.25	511.25	11.25	511.25
C27	519.25	519.25	519.25	519.25
C28	527.25	527.25	527.25	527.25
C29	535.25	535.25	535.25	535.25
C30	543.25	543.25	543.25	543.25
C31	551.25	551.25	551.25	551.25
C32	559.25	559.25	559.25	559.25
C33	567.25	567.25	567.25	567.25
C34	575.25	575.25	575.25	575.25
C35	583.25	583.25	583.25	583.25
C36	591.25	591.25	591.25	591.25
C37	599.25	599.25	599.25	599.25
C38	607.25	607.25	607.25	607.25
C39	615.25	615.25	615.25	615.25
C40	623.25	623.25	623.25	623.25
C41	631.25	631.25	631.25	631.25
C42	639.25	639.25	639.25	639.25
C43	647.25	647.25	647.25	647.25
C44	655.25	655.25	655.25	655.25
C45	663.25	663.25	663.25	663.25
C46	671.25	671.25	671.25	671.25
C47	679.25	679.25	679.25	679.25
C48	687.25	687.25	687.25	687.25
C49	695.25	695.25	695.25	695.25
C50	703.25	703.25	703.25	703.25
C51	711.25	711.25	711.25	711.25
C52	719.25	719.25	719.25	719.25
C53	727.25	727.25	727.25	727.25
C54	735.25	735.25	735.25	735.25
C55	743.25	743.25	743.25	743.25
C56	751.25	751.25	751.25	751.25
C57	759.25	759.25	759.25	759.25
C58	767.25	767.25	767.25	767.25

CP-780 Service Manual

CHANNEL	EUROPE CCIR	FRANCE	GB(IRELAND)	EAST OIRT
C59	775.25	775.25	775.25	775.25
C60	783.25	783.25	783.25	783.25
C61	791.25	791.25	791.25	791.25
C62	799.25	799.25	799.25	799.25
C63	807.25	807.25	807.25	807.25
C64	815.25	815.25	815.25	815.25
C65	823.25	823.25	823.25	823.25
C66	831.25	831.25	831.25	831.25
C67	839.25	839.25	839.25	839.25
C68	847.25	847.25	847.25	847.25
C69	855.25	855.25	855.25	855.25
C70	863.25	863.25	863.25	863.25
C71	69.25	-	-	-
C72	76.25	-	-	-
C73	83.25	-	-	-
C74	90.25	-	-	-
C75	97.25	-	-	-
C76	59.25	-	-	-
C77	93.25	-	-	-
S01	105.25	104.75	103.25	105.25
S02	112.25	116.75	111.25	112.25
S03	119.25	128.75	119.25	119.25
S04	126.25	140.75	127.25	126.25
S05	133.25	152.75	135.25	133.25
S06	140.25	164.75	143.25	140.25
S07	147.25	176.75	151.25	147.25
S08	154.25	188.75	159.25	154.25
S09	161.25	200.75	167.25	161.25
S10	168.25	212.75	-	168.25
S11	231.25	224.75	-	231.25
S12	238.25	236.75	-	238.25
S13	245.25	248.75	255.25	245.25
S14	252.25	260.75	263.25	252.25
S15	259.25	272.75	271.25	259.25
S16	266.25	284.75	279.25	266.25
S17	273.25	296.75	287.25	273.25
S18	280.25	136.00	295.25	280.25
S19	287.25	160.00	303.25	287.25
S20	294.25	-	-	294.25
S21	303.25	303.25	-	303.25
S22	311.25	311.25	311.25	311.25
S23	319.25	319.25	319.25	319.25
S24	327.25	327.25	327.25	327.25
S25	335.25	335.25	335.25	335.25
S26	343.25	343.25	343.25	343.25
S27	351.25	351.25	351.25	351.25
S28	359.25	359.25	359.25	359.25
S29	367.25	367.25	367.25	367.25
S30	375.25	375.25	375.25	375.25
S31	383.25	383.25	383.25	383.25
S32	391.25	391.25	391.25	391.25
S33	399.25	399.25	399.25	399.25
S34	407.25	407.25	407.25	407.25
S35	415.25	415.25	415.25	415.25
S36	423.25	423.25	423.25	423.25
S37	431.25	431.25	431.25	431.25
S38	439.25	439.25	439.25	439.25
S39	447.25	447.25	447.25	447.25
S40	455.25	455.25	455.25	455.25
S41	463.25	463.25	463.25	463.25

2 SAFETY INSTRUCTION

WARNING: Only competent service personnel may carry out work involving the testing or repair of this equipment.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not exceed the specified limit. The nominal value of the high voltage of this receiver is 28-30 KV at max beam current. The high voltage must not, under any circumstances, exceed 33 KV. Each time a receiver requires servicing, the high voltage should be checked. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY Radiation in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.

SAFETY PRECAUTION

Potentials of high voltage are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back board removed involves a shock hazard from the receiver. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment.

Discharge the high potential of the picture tube before handling the tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled.

If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement Parts List.

When replacing a high wattage resistor (metal oxide film resistor) in the circuit board, keep the resistor 10 mm away from circuit board.

Keep wires away from high voltage or high temperature components.

This receiver must operate under AC 220 - 240 volts, 50 Hz. NEVER connect to a DC supply or any other voltage or frequency.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this equipment have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are identified by designated symbol on the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitutes replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY Radiation.

3 ALIGNMENT INSTRUCTIONS

3.1 MICROCONTROLLER CONFIGURATION : SERVICE MODE

To switch the TV set into service mode please see instruction below.

- 1 - Select PR. number 91
- 2 - Adjust sharpness to minimum and exit all menus.
- 3 - Within 2 seconds press the key sequence : **RED - GREEN - menu**

The software version is displayed beside the word Service, e.g. "SERVICE V0.22".

To exit SERVICE menu press menu key or **Stand By** key.

3.2 SERVICE MODE NAVIGATION

Pr Up/Down remote keys : cycle through the service items available.

Vol +/- remote keys : Dec./Increment the values within range - Cycle trough option bits.

OK key : Toggle bits in option byte

Order	Item	Default setting
1	HOR CEN	39
2	RED GAIN	32
3	GRN GAIN	32
4	BLUE GAIN	32
5	RED BIAS	32
6	GRN BIAS	32
7	AGC LEVEL	NO ADJUSTMENT
8	G2-SCREEN	-
9	OPTION1	0001 1001
10	OPTION2	0010 1111
11	AVL	-
12	PARABOLA	20
13	HOR WIDTH	50
14	CORNER T	39
15	CORNER B	39
16	HOR. PARAL	25
17	V.LINEAR	-
18	V.SLOPE	36
19	EW TRAPEZ	25
20	S CORRECT	22
21	VERT CENT	43
22	VERT SIZE	24

3.3 MICROCONTROLLER CONFIGURATION : OPTION BITS

There are two option bytes available (16 bits in all). These option bits are available from Service mode. First find the OPTION1/OPTION2/OPTION3 control, and then use the Volume PLUS/MINUS buttons on the remote control keypad to locate the bits, and OK key to toggle them. The table below shows the two option bytes available;

3.4 OPTION1

	B7	B6	B5	B4	B3	B2	B1	B0
1	TOP Teletext OFF	FASTEXT (FLOF) OFF	TUBE 4:3	VAI bit set to 1 in SECAM L	Dolby Virtual OFF	SVHS3 disabled	TUNER OPTIONS 00=PHILIPS 01=Not used 10=Alps 11=Parstnic(DW)	
0	TOP Teletext ON	FASTEXT (FLOF) ON	TUBE 16:9	VAI bit set to 0 in SECAM L	Dolby Virtual ON	SVHS3 enabled		

3.5 OPTION2

	B7	B6	B5	B4	B3	B2	B1	B0
1	Fixed to '0'	Fixed to '0'	Nu Must be Set to 1 for Future compatibility	Fixed to '0'	5 keys local keyboard	Full ATSS	PAT& TAT Enabled	n.u. Must be set to 1 for future compatibility
0					7 keys local keyboard			

- OPTION SETTING BY MODEL

CHASSIS	MODEL	OPTION BIT[b7...b0]			DW[hex]	REMARKS
		I	II	III		
CP-780	DUB-2850GB	I	0001	1001	19	OPTION "b1,b0" - Depends on Tuner
		II	0010	1111	2F	

3.6 NVM default setting

The purpose of this message, when you change a virgin EEPROM, is to allow to modify the NVM DATA to desired values.

1 - Introduction :

The NVM default values are fixed for the user, but for flexibility in service, these data are stored in NVM and can be changed when the TV set is in a special mode call "NVM EDITOR". This mode can only be access from "FACTORY" mode.

2 - Entering into "FACTORY" mode.

To switch the TV set into FACTORY mode, use the factory remote control, and press on "SVC" key. The factory menu will appear on the screen, showing "FACTORY" , plus other relevant information like software version and date.

WARNING : When in "FACTORY" mode you should not press any key other than the keys described in the procedure below. Unwanted key stroke could misadjust the TV set.

3 - Entering into "NVM EDITOR" mode.

To switch the TV set into NVM EDITOR mode, use the user remote control, and press on "PICTURE/OK" key. The NVM EDITOR window will appear on the screen. This mode allow you to access all data stored in NVM. The current NVM address is given in column "ADDR." in both DECimal and HEXadecimal format. The column DATA gives the value contained at selected address in both DECimal and HEXadecimal format.

4 - Navigation in "NVM EDITOR" mode.

Use Program Up/Down keys to select the desired address. Use Volume Up/Down keys to change the data at selected address. You must press "PICTURE/OK" key to store value after modification.

The data can be adjusted between 0 and 63.

5 - Exit "NVM EDITOR" mode.

To switch the TV set back into FACTORY mode, use the user remote control, and press on "MENU" key.

The factory menu will appear on the screen, showing "FACTORY" .

6 - Exit "FACTORY" mode.

To exit "FACTORY" mode, use the factory remote control, and press on "SVC" key. The factory menu will disappear from the screen.

NVM DATA CHANGE LIST

No	Register Name	Address	(hex)	CP-780
			Default	DUB-2850GB
1	OCP_THRESHOLD	0x58F	0x91	<-
2	DCXO	0x590	0x4E	<-
3	AGC_PHILIPS	0x5C1	0xAB	<-
4	AGC_NC	0x5C2	0xAB	0x04
5	AGC_ALPS	0x5C3	0xB6	<-
6	AGC_PARTSNIC	0x5C4	0xB6	<-
7	AGC_PHILIPS_START	0x5C5	0x16	<-
8	AGC_NC_START	0x5C6	0x16	0x00
9	AGC_ALPS_START	0x5C7	0x16	<-
10	AGC_PARTSNIC_START	0x5C8	0x16	<-
11	AVLLEV	0x621	0x5	<-
12	Nor1_Bright	0x64A	0x23	<-
13	Nor1_contrast	0x64B	0x2E	<-
14	Nor1_Colour	0x64C	0x1C	<-
15	Nor1_Sharpness	0x64D	0x23	<-
16	Nor1_Tint	0x64E	0x20	<-
17	Nor1_JVC_Bri	0x64F	0x2D	<-
18	Nor1_JVC_Cont	0x650	0x2A	<-
19	Nor1_JVC_Colour	0x651	0x1B	<-
20	Nor1_JVC_Sharp	0x652	0x23	<-
21	Nor2_Bright	0x653	0x28	<-
22	Nor2_Contrast	0x654	0x13	<-
23	Nor2_Colour	0x655	0x19	<-
24	Nor2_Sharpness	0x656	0x1B	<-
25	Nor2_Tint	0x657	0x20	<-
26	PresetGainRGB	0x673	0x2A	<-
27	PresetGainRGB	0x674	0x2A	<-
28	PresetGainRGB	0x675	0x2A	<-
29	Cathode_Drive	0x67B	0x1	<-
30	Y_delay_PAL_BG	0x686	0x5	<-
31	Y_delay_SECAM_BG	0x687	0x8	<-
32	Y_delay_PAL_DK	0x688	0x5	<-
33	Y_delay_SCM_DK	0x689	0x5	<-
34	Y_delay_PAL_I	0x68A	0x7	<-
35	Y_delay_SECAM	0x68B	0x5	<-
36	Y_delay_SECAM-L	0x68C	0x8	<-
37	Y_delay_AV	0x68D	0xA	<-
38	G2_Bright	0x68E	0x1A	3D
39	G2_Contrast	0x68F	0x42	77

3.7 TV SET ALIGNMENT

3.7.1 G2 ALIGNMENT

- Tune a colour bar pattern.
- Find the G2 - SCREEN item in service mode.
- Adjust screen volume (on FBT) to bring the cursor to central position : green.

3.7.2 WHITE BALANCE

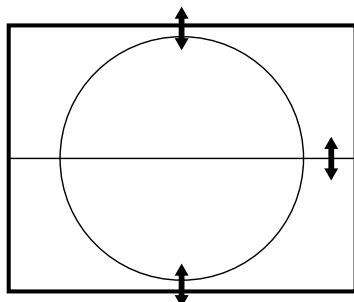
- Select a dark picture and adjust RED BIAS and GRN BIAS to the desired colour temperature.
- Select a bright picture and adjust RED, GRN and BLUE GAIN to the desired colour temperature.

3.7.3 FOCUS

Adjust the Focus volume (on FBT) to have the best resolution on screen.

3.7.4 VERTICAL GEOMETRY

Adjust V. LINEAR (linearity), S CORRECT (S. Correction), VERT SIZE (Vertical amplitude), VERT CENT (vertical centring) to compensate for vertical distortion.

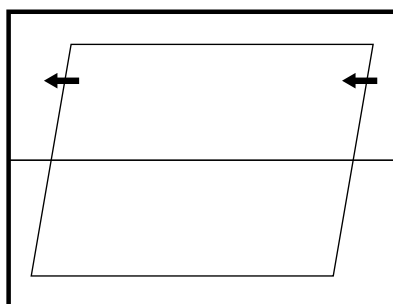


3.7.5 HORIZONTAL PICTURE CENTRING

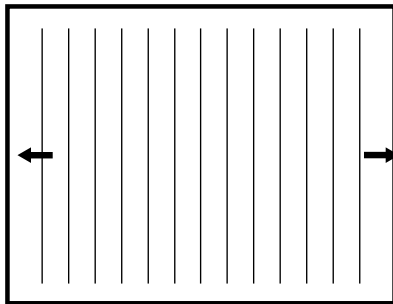
Adjust HOR CEN (Horizontal centre) to have the picture in the centre of the screen.

3.7.6 EAST / WEST CORRECTION

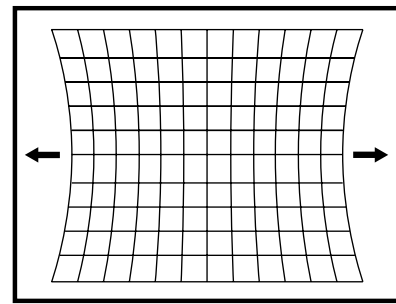
Adjust the PARABOLA, HOR WIDTH, CORNER, HOR PARAL, EW TRAPEZ, to compensate for geometrical distortion.



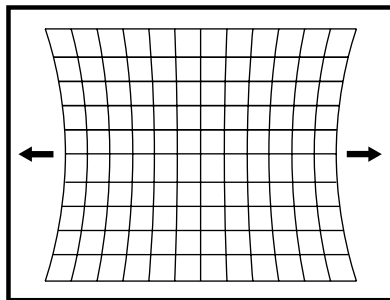
HOR PARAL



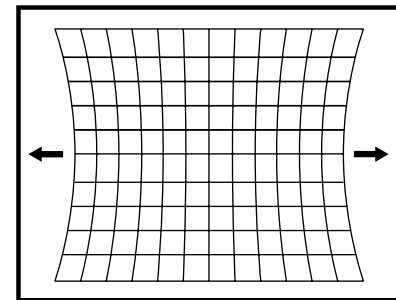
HOR WIDTH
adjust for 93% overscan.



PARABOLA



CORNER B & CORNER T



EW TRAPEZ

3.8 OAD (Over Air Download)

3.8.1 Concept of OAD

OAD is the function for updating software of IDTV(Integrated Digital TV) or DSTB (Digital Set-Top Box) from outer source.

3.8.2 Object of OAD

Sometimes IDTV or DSTB may need a newer software for technical or system problems after sale, so through OAD function, IDTV or DSTB may be updated automatically at each user's home.

3.8.3 OAD on CP-780

CP-780 performs OAD automatically when being on ST-BY mode. But CP-780 can't supply power to digital part to search s/w on ST-BY mode. To solve this, CP-780 is worked as below.

- a. power off by remote control on Analog mode : go directly to ST-BY mode. In this case, power consumption : 1.5w / AC 230V.
- b. power off by remote control on Digital mode
 - go to video mute (raster off) and stay about 3~5 minute to search S/W. In this case, power Consumption is 52W / AC 230V
 - After finishing searching s/w, TV set go to ST-BY mode. (1.5W / AC 230V) If turn off TV before TV complete searching s/w, TV set will perform it again.
 - If TV set find a new s/w to update, a update message will be shown on the screen when the user turn on TV.
 - CP-780 performs this process once a day.
 - If the user doesn't want OAD search, the user can press R/C button for 2~3 sec to go directly to ST-BY mode.

3.8.4 Algorithm of OAD

Digital stream has a date/time information. CP-780 stores a date info at NVM. UOC brings date info from digital stream and compares it with NVM data. If those two are different from each other, TV set performs OAD and store a date info at NVM. If those two are the same, go directly to ST-BY mode. Through this algorithm, CP-780 perform OAD search once a day.

4 IC DESCRIPTION

4.1 UOC^{III} Series

The UOC series combines the functions of a Video Signal Processor(VSP) together with a FLASH embedded TEXT/Control/Graphics m-Controller(TCG m-Controller) and US Closed Caption decoder. In addition the following functions can be added:

- Adaptive digital(4H/2H) PAL/NTSC combfilter
- Teletext decoder with 10page text memory
- Multi- standard stereo decoder
- BTSC stereo decoder
- Digital sound processing circuit
- Digital video processing circuit

4.1.1 IC MARKING AND VERSION

Chassis	IC marking	OSD languages	ATSS countries	Text
CP-780		ENGLISH, WELSH GEALIC	Australia,, Belgium, Switzerland, Czech Republic, Germany, Denmark, Spain, France, Finland, GB, Greece, Hungary, Italy, Ireland, Norway, Netherlands, Portugal, Poland, Sweden, Slovak Republic, Others	PAN-EUROPEAN LATIN, CYRILLIC, GREEK.

4.1.2 BLOCK DIAGRAM

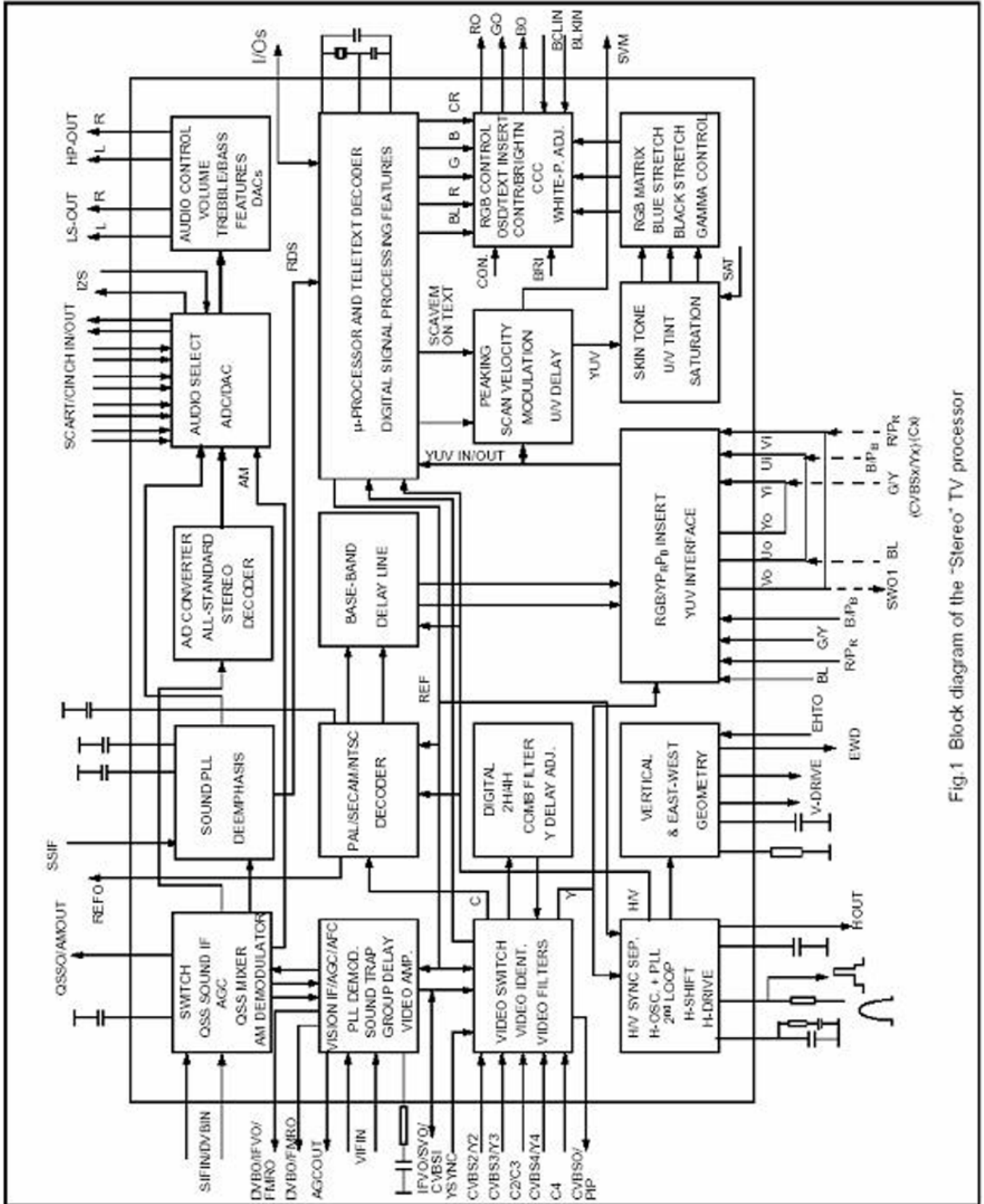


Fig.1 Block diagram of the "Stereo" TV processor

CP-780 Service Manual

4.1.3. PINNING

QFP 128pin	Symbol	Short Description
1	VSSP2	Ground
2	VSSC4	Ground
3	VDDC4	digital supply to SDACs (1.8V)
4	VDDA3(3.3V)	supply (3.3 V)
5	VREF_POS_LSL	positive reference voltage SDAC (3.3 V)
6	VREF_NEG_LSL+HPL	negative reference voltage SDAC (0 V)
7	VREF_POS_LSR+HPR	positive reference voltage SDAC (3.3 V)
8	VREF_NEG_HPL+HPR	negative reference voltage SDAC (0 V)
9	VREF_POS_HPR	positive reference voltage SDAC (3.3 V)
10	XTALIN	crystal oscillator input
11	XTALOUT	crystal oscillator output
12	VSSA1	Ground
13	VGUARD/SWIO	V-guard input / I/O switch (e.g. 4 mA current sinking capability for direct drive of LEDs)
14	DECDIG	decoupling digital supply
15	VP1	1st supply voltage TV-processor (+5 V)
16	PH2LF	phase-2 filter
17	PH1LF	phase-1 filter
18	GND1	ground 1 for TV-processor
19	SECPLL	SECAM PLL decoupling
20	DECBG	bandgap decoupling
21	EWD/AVL (1)	East-West drive output or AVL capacitor
22	VDRB	vertical drive B output
23	VDRA	vertical drive A output
24	VIFIN1	IF input 1
25	VIFIN2	IF input 2
26	VSC	vertical sawtooth capacitor
27	IREF	reference current input
28	GNDIF	ground connection for IF amplifier
29	SIFIN1/DVBIN1 (2)	SIF input 1 / DVB input 1
30	SIFIN2/DVBIN2 (2)	SIF input 2 / DVB input 2
31	AGCOUT	tuner AGC output
32	EHTO	EHT/overvoltage protection input
33	AVL/SWO/SSIF/ REFO/REFIN (2)	Automatic Volume Levelling / switch output / sound IF input / subcarrier reference output / external reference signal input for I signal mixer for DVB operation
34	AUDIOIN5L	audio-5 input (left signal)
35	AUDIOIN5R	audio-5 input (right signal)
36	AUDOUTSL	audio output for SCART/CINCH (left signal)
37	AUDOUTSR	audio output for SCART/CINCH (right signal)
38	DECSDEM	decoupling sound demodulator

QFP 128pin	Symbol	Short Description
39	QSSO/AMOUT/AUDEEM (2)	QSS intercarrier output / AM output / deemphasis (front-end audio out)
40	GND2	ground 2 for TV processor
41	PLLIF	IF-PLL loop filter
42	SIFAGC/DVBAGC (2)	AGC sound IF / internal-external AGC for DVB applications
43	DVBO/IFVO/FMRO (2)	Digital Video Broadcast output / IF video output / FM radio output
44	DVBO/FMRO (2)	Digital Video Broadcast output / FM radio output
45	VCC8V	8 Volt supply for audio switches
46	AGC2SIF	AGC capacitor second sound IF
47	VP2	2nd supply voltage TV processor (+5 V)
48	IFVO/SVO/CVBSI (2)	IF video output / selected CVBS output / CVBS input
49	AUDIOIN4L	audio-4 input (left signal)
50	AUDIOIN4R	audio-4 input (right signal)
51	CVBS4/Y4	CVBS4/Y4 input
52	C4	chroma-4 input
53	AUDIOIN2L	audio 2 input (left signal)
54	AUDIOIN2R	audio 2 input (right signal)
55	CVBS2/Y2	CVBS2/Y2 input
56	AUDIOIN3L	audio 3 input (left signal)
57	AUDIOIN3R	audio 3 input (right signal)
58	CVBS3/Y3	CVBS3/Y3 input
59	C2/C3	chroma-2/3 input
60	AUDOUTLSL	audio output for audio power amplifier (left signal)
61	AUDOUTLSR	audio output for audio power amplifier (right signal)
62	AUDOUTHPL	audio output for headphone channel (left signal)
63	AUDOUTHPR	audio output for headphone channel (right signal)
64	CVBSO/PIP	CVBS / PIP output
65	SVM	scan velocity modulation output
66	FBISO/CSY	flyback input/sandcastle output or composite H/V timing output
67	HOUT	horizontal output
68	VSScomb	ground connection for comb filter
69	VDDcomb	supply voltage for comb filter (5 V)
70	VIN (R/PRIN2/CX)	V-input for YUV interface (2nd R input / PR input or CX input)
71	UIN (B/PBIN2)	U-input for YUV interface (2nd B input / PB input)
72	YIN (G/YIN2/CVBS-Yx)	Y-input for YUV interface (2nd G input / Y input or CVBS/YX input)

CP-780 Service Manual

QFP 128pin	Symbol	Short Description
73	YSYNC	Y-input for sync separator
74	YOUT	Y-output (for YUV interface)
75	UOUT(INSSW2)	U-output for YUV interface (2nd RGB / YPBPR insertion input)
76	VOUT(SWO1)	V-output for YUV interface (general purpose switch output)
77	INSSW3	3rd RGB / YPBPR insertion input
78	R/PRIN3	3rd R input / PR input
79	G/YIN3	3rd G input / Y input
80	B/PBIN3	3rd B input / PB input
81	GND3	ground 3 for TV-processor
82	VP3	3rd supply for TV processor
83	BCLIN	beam current limiter input
84	BLKIN	black current input
85	RO	Red output
86	GO	Green output
87	BO	Blue output
88	VDDA1	analog supply for TCG m-Controller and digital supply for TV-processor (+3.3 V)
89	VREFAD_NEG	negative reference voltage (0 V)
90	VREFAD_POS	positive reference voltage (3.3 V)
91	VREFAD	reference voltage for audio ADCs (3.3/2 V)
92	GND A	Ground
93	VDDA(1.8)	analogue supply for audio ADCs (1.8 V)
94	VDDA2(3.3)	supply voltage SDAC (3.3 V)
95	VSSadc	ground for on-chip temperature sensor
96	VDDadc(1.8)	supply voltage video ADC
97	INT0/P0.5	external interrupt 0 or port 0.5 (4 mA current sinking capability for direct drive of LEDs)
98	P1.0/INT1	port 1.0 or external interrupt 1
99	P1.1/T0	port 1.1 or Counter/Timer 0 input
100	VDDC2	digital supply to core (1.8 V)
101	VSSC2	Ground
102	P0.4/I2SWS	port 0.4 or I2S word select
103	P0.3/I2SCLK	port 0.3 or I2S clock
104	P0.2/I2SDO2	port 0.2 or I2S digital output 2
105	P0.1/I2SDO1	port 0.1 or I2S digital output 1
106	P0.0/I2SDI1/O	port 0.0 or I2S digital input 1 or I2S digital output
107	P1.3/T1	port 1.3 or Counter/Timer 1 input
108	P1.6/SCL	port 1.6 or I2C-bus clock line
109	P1.7/SDA	port 1.7 or I2C-bus data line
110	VDDP(3.3V)	supply to periphery and on-chip voltage regulator (3.3 V)
111	P2.0/TPWM	port 2.0 or Tuning PWM output
112	P2.1/PWM0	port 2.1 or PWM0 output
113	P2.2/PWM1	port 2.2 or PWM1 output
114	P2.3/PWM2	port 2.3 or PWM2 output

QFP 128pin	Symbol	Short Description
115	P3.0/ADC0	port 3.0 or ADC0 input
116	P3.1/ADC1	port 3.1 or ADC1 input
117	VDDC1	digital supply to core (+1.8 V)
118	DECV1V8	decoupling 1.8 V supply
119	P3.2/ADC2	port 3.2 or ADC2 input
120	P3.3/ADC3	port 3.3 or ADC3 input
121	VSSC/P	digital ground for m-Controller core and periphery
122	P2.4/PWM3	port 2.4 or PWM3 output
123	P2.5/PWM4	port 2.5 or PWM4 output
124	VDDC3	digital supply to core (1.8V)
125	VSSC3	Ground
126	P1.2/INT2	port 1.2 or external interrupt 2
127	P1.4/RX	port 1.4 or UART bus
128	P1.5/TX	Port 1.5 or UART bus

4.1.4 FEATURES

Analogue Video Processing (all versions)

- Multi-standard vision IF circuit with alignment-free PLL demodulator
- Internal (switchable) time-constant for the IF-AGC circuit
- Switchable group delay correction and sound trap (with switchable centre frequency) for the demodulated CVBS signal
- DVB/VSF IF circuit for preprocessing of digital TV signals.
- Video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed.
- Automatic Y/C signal detector
- Adaptive digital (4H/2H) PAL/NTSC comb filter for optimum separation of the luminance and the chrominance signal.
- Integrated luminance delay line with adjustable delay time
- Picture improvement features with peaking (with switchable centre frequency, depeaking, variable positive/negative peak ratio, variable pre-/overshoot ratio and video dependent coring), dynamic skin tone control, gamma control and blue- and black stretching. All features are available for CVBS, Y/C and RGB/YPBPR signals.
- Switchable DC transfer ratio for the luminance signal
- Only one reference (24.576 MHz) crystal required for the TCG m-Controller, digital sound processor, Teletext and the colour decoder
- Multi-standard colour decoder with automatic search system and various “forced mode” possibilities
- Internal base-band delay line
- Indication of the Signal-to-Noise ratio of the incoming CVBS signal
- Linear RGB/YPBPR input with fast insertion.
- YUV interface. When this feature is not required some pins can be used as additional RGB/YPBPR input. It is also possible to use these pins for additional CVBS (or Y/C) input (CVBS/YX and CX).

- Tint control for external RGB/YPBPR signals
- Scan Velocity Modulation output. The SVM circuit is active for all the incoming CVBS, Y/C and RGB/YPBPR signals. The SVM function can also be used during the display of teletext pages.
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level offset adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Contrast reduction possibility during mixed-mode of OSD and Text signals
- Adjustable 'wide blanking' of the RGB outputs
- Horizontal synchronization with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimized for DC-coupled vertical output stages
- Horizontal and vertical geometry processing with horizontal parallelogram and bow correction and horizontal and vertical zoom
- Low-power start-up of the horizontal drive circuit

Analogue video processing (stereo versions)

- The low-pass filtered 'mixed down' I signal is available via a single ended or balanced output stage.

Analogue video processing (mono versions)

- The low-pass filtered 'mixed down' I signal is available via a single ended output stage

Digital Video Processing (some versions)

- Double Window mode applications. It is possible to display a video and a text window or 2 text windows in parallel.
- Linear and non-linear horizontal scaling of the video signal to be displayed.

Sound Demodulation (all versions)

- Separate SIF (Sound IF) input for single reference QSS (Quasi Split Sound) demodulation.
- AM demodulator without extra reference circuit
- The mono intercarrier sound circuit has a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (4.5/5.5/6.0/6.5 MHz). The quality of this system is such that the external band-pass filters can be omitted. In the stereo versions of UOCIII the use of this demodulator is optional for special applications. Normally the FM demodulators of the stereo demodulator/decoder part are used (see below).
- The FM-PLL demodulator can be set to centre frequencies of 4.72/5.74 MHz so that a second sound channel can be demodulated. In such an application it is necessary that an external bandpass filter is inserted.
- The vision IF and mono intercarrier sound circuit can be used for the demodulation of FM radio signals. With an external FM tuner also signals with an IF frequency of 10.7 MHz can be demodulated.
- Switch to select between 2nd SIF from QSS demodulation or external FM (SSIF)

Audio Interfaces and switching (stereo versions with Audio DSP)

- Audio switch circuit with 4 stereo inputs, a stereo output for SCART/CINCH, 1 stereo output for HEADPHONE. The headphone channel has an analogue volume control circuit for the L and R channel. Finally 1 stereo SPEAKER output with digital controls.
- AVL (Automatic Volume Levelling) circuit for the headphone channel.
- Digital input crossbar switch for all digital signal sources and destinations

- Digital output crossbar for exchange of channel processing functionality
- Digital audio input interface (stereo I2S input interface)
- Digital audio output interface (stereo I2S output interface)

Audio interfaces and switching (AV stereo versions without Audio DSP)

- Audio switch circuit with 4 stereo inputs, a stereo output for SCART/CINCH and a stereo SPEAKER output with analogue volume control.
- Analogue mono AVL circuit at left audio channel

Audio interfaces and switching (mono versions)

- Audio switch circuit with 4 external audio (mono) inputs and a volume controlled output
- AVL circuit

Stereo Demodulator and Decoder (full stereo versions)

- Demodulator and Decoder Easy Programming (DDEP)
- Auto standard detection (ASD)
- Static Standard Selection (SSS)
- DQPSK demodulation for different standards, simultaneously with 1-channel FM demodulation
- NICAM decoding (B/G, I, D/K and L standard)
- Two-carrier multistandard FM demodulation (B/G, D/K and M standard)
- Decoding for three analog multi-channel systems (A2, A2+ and A2*) and satellite sound
- Adaptive de-emphasis for satellite FM
- Optional AM demodulation for system L, simultaneously with NICAM
- Identification A2 systems (B/G, D/K and M standard) with different identification time constants
- FM pilot carrier present detector
- Monitor selection for FM/AM DC values and signals, with peak and quasi peak detection option
- BTSC MPX decoder
- SAP decoder
- dbx[®] noise reduction (4)
- Japan (EIAJ) decoder
- FM radio decoder
- Soft-mute for DEMDEC outputs DEC, MONO and SAP
- FM overmodulation adaptation option to avoid clipping and distortion

Audio Multi Channel Decoder (stereo versions with Audio DSP)

- Dolby[®] Pro Logic[®] (DPL) (1)
- Five channel processing for Main Left and Right, Subwoofer, Centre and Surround. To exploit this feature an external DAC is required.

Volume and tone control for loudspeakers (stereo versions with Audio DSP)

- Automatic Volume Level (AVL) control
- Smooth volume control
- Master volume control
- Soft-mute
- Loudness
- Bass, Treble
- Dynamic Bass Boost (DBB) (2)

- Dynamic Virtual Bass (DVB) (3)
- BBE® Sound processing (4)
- Graphic equalizer
- Processed or non processed subwoofer
- Programmable beeper

Reflection and delay for loudspeaker channels (stereo versions with Audio DSP)

- (Option) Dolby® Pro Logic® Delay (1).0
- Pseudo hall/matrix function

Psycho acoustic spatial algorithms, downmix and split in loudspeaker channels (stereo versions with Audio DSP)

- Extended Pseudo Stereo (EPS) (5)
- Extended Spatial Stereo (ESS) (6)
- Virtual Dolby® Surround (VDS 422,423) (1)
- SRS 3D and SRS TruSurround® (4)

RDS/RBDS

- Demodulation of the European Radio Data system (RDS) or the USA Radio Broadcast Data System (RBDS) signal
- RDS and RBDS block detection
- Error detection and correction
- Fast block synchronisation
- Synchronisation control (flywheel)
- Mode control for RDS/RBDS processing
- Different RDS/RBDS block information output modes

m-Controller

- 80C51 m-controller core standard instruction set and timing
- 0.4883 ms machine cycle
- maximum of 256k x 8-bit flash programmable ROM
- maximum of 8k x 8-bit Auxiliary RAM
- 12-level Interrupt controller for individual enable/disable with two level priority
- Two 16-bit Timer/Counter registers
- One 24-bit Timer (16-bit timer with 8-bit Pre-scaler)
- WatchDog timer
- Auxiliary RAM page pointer
- 16-bit Data pointer
- Stand-by, Idle and Power Down modes
- 24 general I/O
- 14 bits PWM for Voltage Synthesis Tuning
- 8-bit A/D converter with 4 multiplexed inputs
- 5 PWM (6-bits) outputs for analogue control functions
- Remote Control Pre-processor (RCP)
- Universal Asynchronous Receiver Transmitter (UART)

Data Capture

- Text memory up to 10 pages
- Inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and

Subtitle Page Table (SPT)

- Data Capture for US Closed Caption
- Data Capture for 525/625 line WST, VPS (PDC system A) and Wide Screen Signalling (WSS) bit decoding
- Automatic selection between 525 WST/625 WST
- Automatic selection between 625 WST/VPS on line 16 of VBI
- Real-time capture and decoding for WST Teletext in Hardware, to enable optimized m-processor throughput
- Automatic detection of FASTEXT transmission
- Real-time packet 26 engine in Hardware for processing accented, G2 and G3 characters
- Signal quality detector for video and WST/VPS data types
- Comprehensive teletext language coverage
- Vertical Blanking Interval (VBI) data capture of WST data

Display

- Teletext and Enhanced OSD modes
- Features of level 1.5 WST and US Close Caption
- 50Hz/60Hz display timing modes
- Two page operation for 16:9 screens
- Serial and Parallel Display Attributes
- Single/Double/Quadruple Width and Height for characters
- Smoothing capability of both Double Size, Double Width & Double Height characters
- Scrolling of display region
- Variable flash rate controlled by software
- Soft colours using CLUT with 4096 colour palette
- Globally selectable scan lines per row (9/10/13/16/) and character matrix [12x9, 12x10, 12x13, 12x16, 16x18, (VxH)]
- Fringing (Shadow) selectable from N-S-E-W direction
- Fringe colour selectable
- Contrast reduction of defined area
- Cursor
- Special Graphics Characters with two planes, allowing four colours per character
- 64 software redefinable On-Screen display characters
- 4 WST Character sets (G0/G2) in single device (e.g. Latin, Cyrillic, Greek, Arabic)
- G1 Mosaic graphics, Limited G3 Line drawing characters
- WST Character sets and Closed Caption Character set in single device
- SVM for Text

4.2 TDA8946J STEREO AUDIO AMPLIFIER

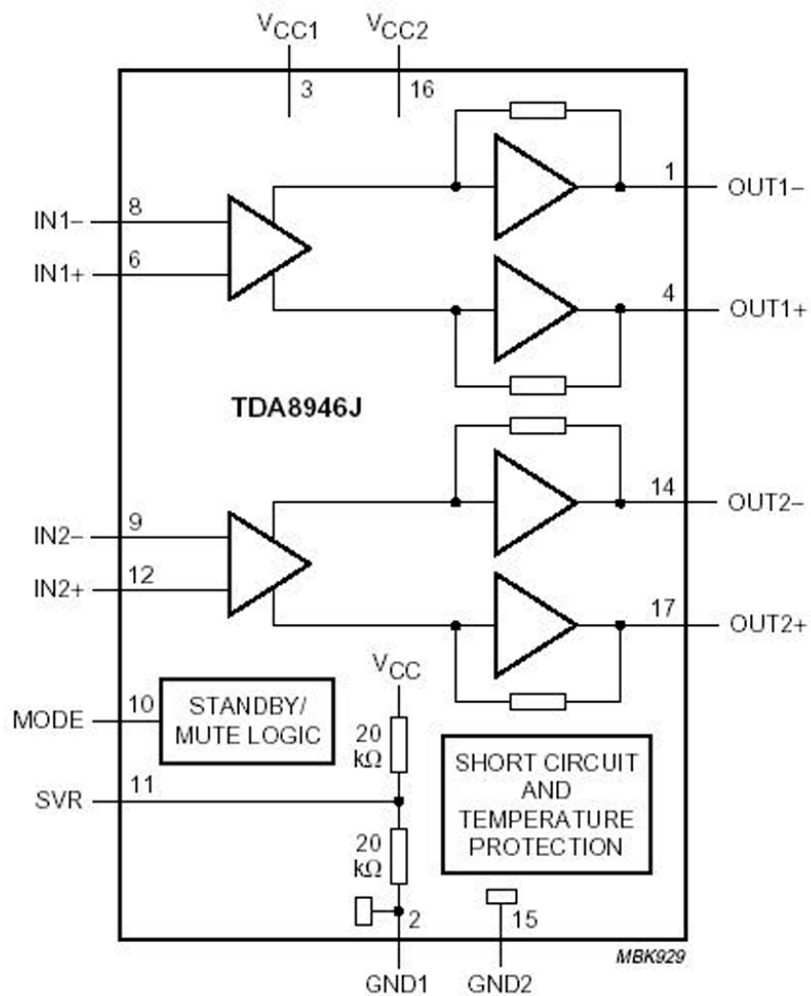
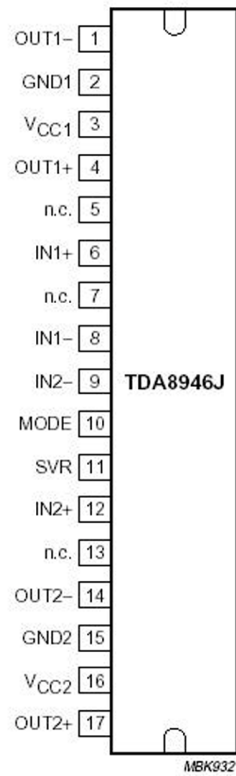
The TDA8946J is a dual-channel audio power amplifier with an output power of 2x15W at an 8 Ω load and a 18V supply. The circuit contains two Bridges Tied Load(BTL) amplifiers with an all-NPN output stage and standby/mute logic. The TDA8946J comes in a 17-pin DIL-bent-SIL(DBS) power package.

4.2.1 FEATURES

- * Few external components
- * Fixed gain
- * Standby and mute mode
- * No on/off switching plops
- * Low standby current
- * High supply voltage ripple rejection
- * Outputs short-circuit protected to ground, supply and across the load
- * Thermally protected

Pin description

Pin	Symbol	Description
1	OUT1-	negative loudspeaker terminal 1
2	GND1	ground channel 1
3	Vcc1	supply voltage channel 1
4	OUT1+	positive loudspeaker terminal 1
5	n.c.	not connected
6	IN1+	positive input1
7	n.c.	not connected
8	IN1-	negative input1
9	IN2-	negative input2
10	MODE	mode selection input
11	SVR	half supply voltage decoupling (ripple rejection)
12	IN2+	positive input2



Block diagram TDA8946J

4.3 TDA8358J VERTICAL AMPLIFIER

The TDA8358J are power circuit for use in 90° and 110° colour deflection systems for field frequencies of 25 to 200Hz field frequencies, and for 4:3 and 16/9 picture tubes. The IC contains a vertical deflection output circuit, operating as a high efficiency class G system. The full bridge output circuit allows DC coupling of the deflection coil in combination with single positive supply voltages.

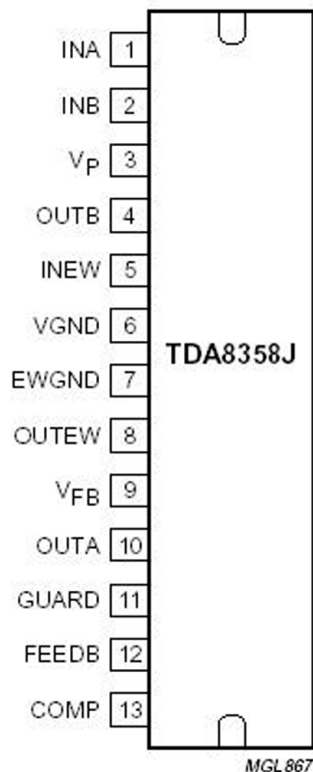
The east-west output stage is able to supply the sink current for a diode modulator circuit.

The IC is constructed in a Low Voltage DMOS(LVDMOS) process that combines bipolar, CMOS and DMOS devices. DMOS transistors are used in the output stage because of the absence of second breakdown.

4.3.1 TDA8358J

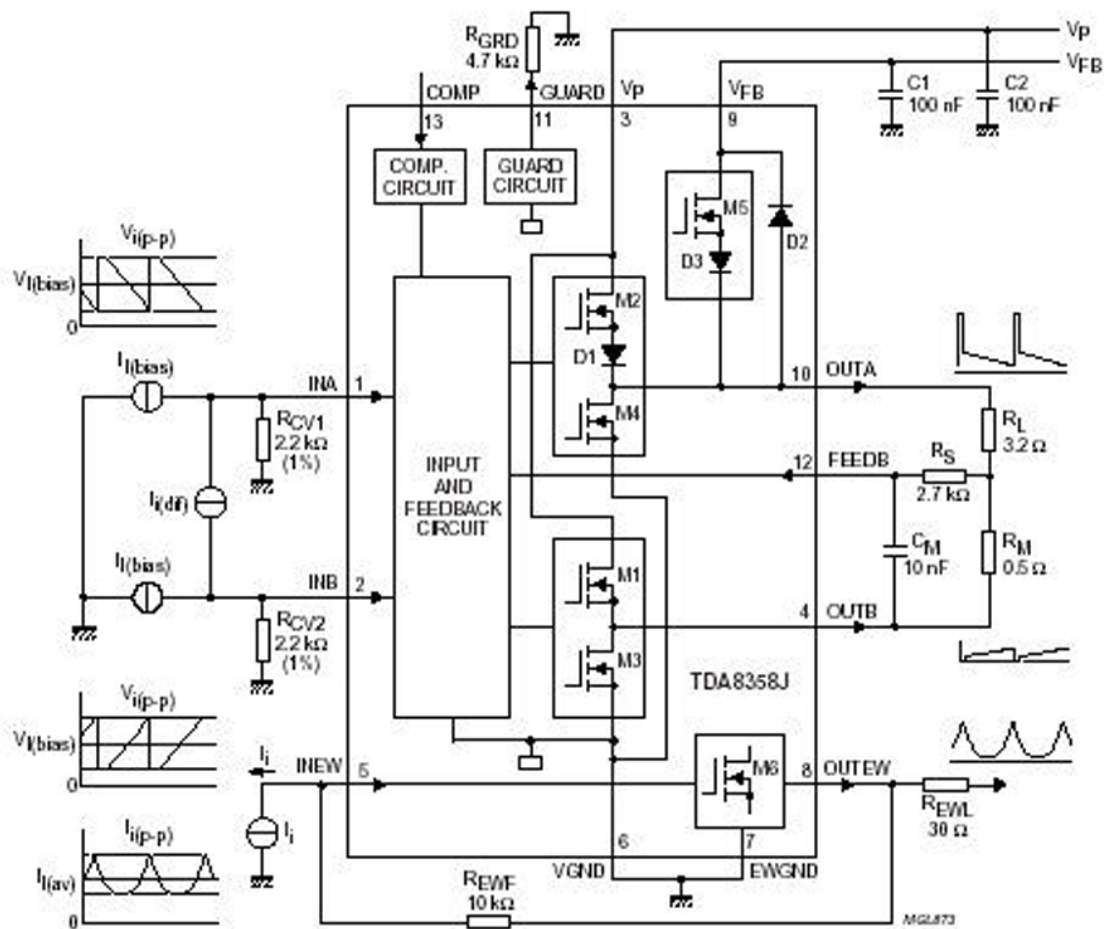
Features :

- * Few external components
- * Highly efficient fully DC-coupled vertical bridge output circuit
- * Vertical flyback switch with short rise and fal times
- * Built-in guard circuit
- * Thermal protection circuit
- * Improved EMC performance due to differential inputs
- * East-west output stage



Pinning

Pin	Symbol	Description
1	INA	Positive vertical input
2	INB	Negative vertical input
3	VP	Supply voltage
4	OUTB	Vertical output voltage B
5	INEW	East-west input voltage
6	VGND	Vertical ground
7	EWGND	East-west ground
8	OUTEW	East-west output voltage
9	VFB	Flyback supply voltage
10	OUTA	Vertical output voltage A
11	GUARD	Guard output voltage
12	FEEDB	Input measuring resistor
13	COMP	Input compensation current



Block diagram TDA8358J

4.4 TDA6108AJF

4.4.1 Features

- Typical bandwidth of 9.0MHz for an output signal of 60V (p-p)
- High slew rate of 1310V/us up and -1850V/us down
- No external components required
- Very simple application
- Single supply voltage of 200V
- Internal reference voltage of 2.5V
- Fixed gain of 81
- Black-Current Stabilization (BCS) circuit with voltage window from 1.5 to 6V and current window from 100Ua to -10Ma
- Thermal protection

4.4.2 Pin description

Pin	Symbol	Description
1	Vi(1)	inverting input1
2	Vi(2)	inverting input2
3	Vi(3)	inverting input3
4	GND	ground(fin)
5	Iom	black current measurement output
6	VDD	supply voltage
7	Voc(3)	Cathode output3
8	Voc(2)	cathode output2
9	Voc(1)	cathode output1

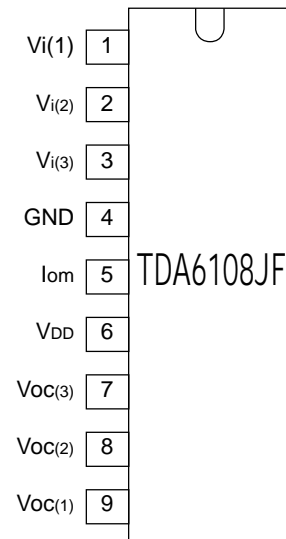


Fig.2 Pin configuration

4.5 24WC16 - 16 KB EEPROM

Features :

- * 16 Kbit serial I2C bus EEPROM
- * 400KHz I2C Bus Compatible
- * supply voltage : 1.8 V to 6.0 V
- * Low Power CMOS Technology
- * 1 Million Erase/Write cycles (minimum)
- * 100 year data retention (minimum)

Pin description

Pin No.	Name	Description
1, 2, 3	A0, A1, A2	Device address - not used
5	SDA	Serial Data/Address Input/Output
6	SCL	Serial clock
7	WP	Write control
8	Vcc	Supply voltage
4	Vss	Ground

The memory device is compatible with the I2C memory standard. This is a two wire serial interface that uses a bi-directional data bus and serial clock. The memory carries a built-in 4-bit unique device type identifier code (1010) in accordance with the I2C bus definition.

Serial Clock (SCL)

The SCL input is used to strobe all data in and out of the memory.

Serial Data (SDA)

The SDA pin is bi-directional, and is used to transfer data in or out of the memory.

CP-780 Service Manual

4.6 STR - W6754

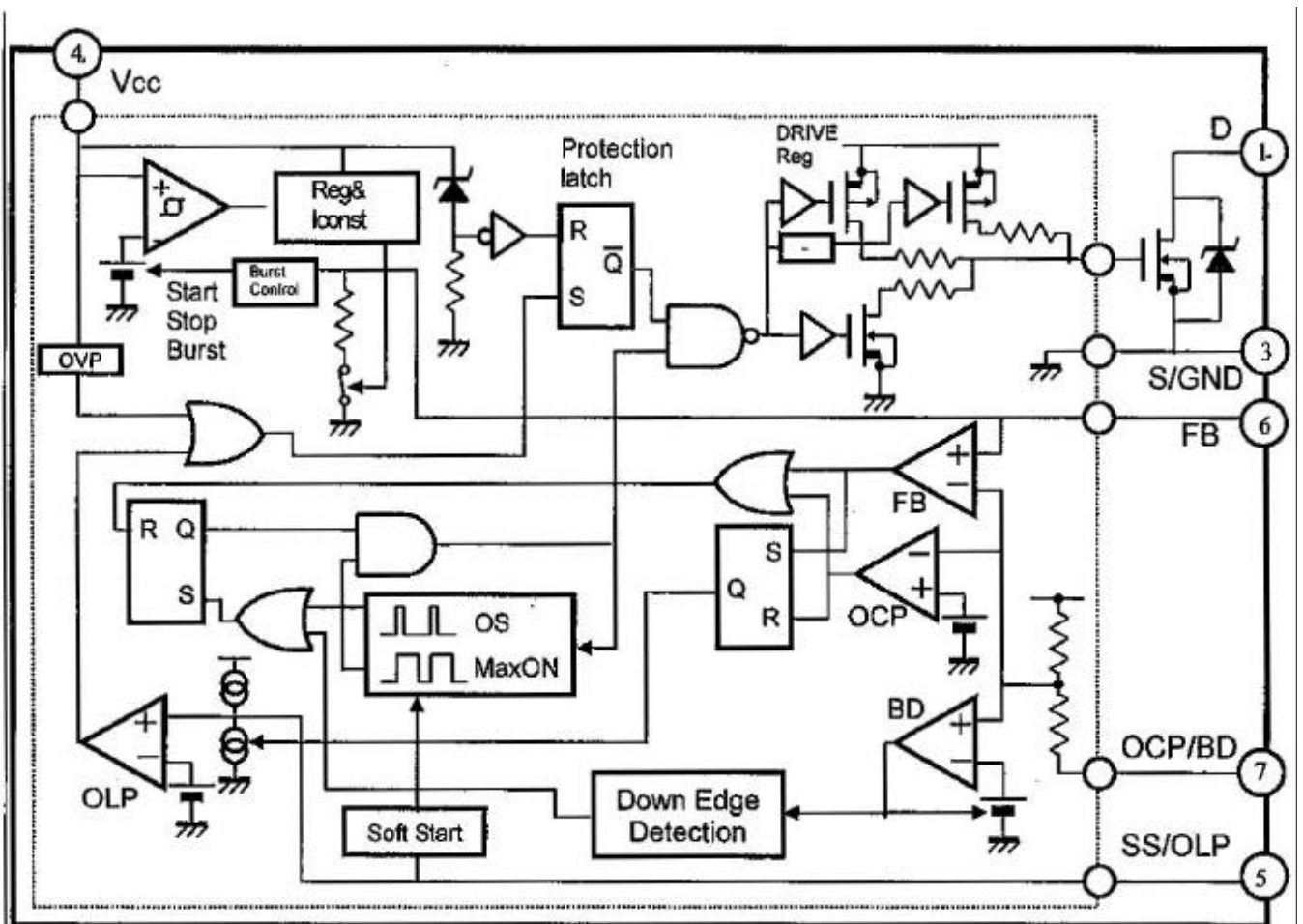
4.6.1 GENERAL DESCRIPTION

The STR-W6754 is an hybrid IC with a build-in MOSFET and control IC, designed for flyback converter type switch mode power supply applications.

4.6.2 FEATURES

- * Small SIP fully isolated moulded 6 pins package
- * Many protection functions :
 - * Pulse-by-pulse overcurrent protection (OCP)
 - * Overvoltage protection with latch mode (OVP)
 - * Overload protection with latch mode (OLP)

4.6.3 BLOCK DIAGRAM



4.6.4 PIN DESCRIPTION

Terminal No.	SYMBOL	DESCRIPTION
1	D	Drain terminal
3	S/GND	Source/ Ground terminal
4	VCC	Power supply terminal
5	SS/OLP	Delay at Overload/ Soft start set up terminal
6	FB	Feedback terminal
7	OCP/BD	Overcurrent Protection Input/ Bottom Detection terminal

4.6.5 CONTROL PART - ELECTRICAL CHARACTERISTICS

DESCRIPTION	TERMINAL	SYMBOL	RATING			UNIT
			MIN.	TYPE	MAX	
Operation start voltage	4-3	V _{CC} (on)	16.3	18.2	19.9	V
Operation stop voltage	4-3	V _{CC} (off)	8.8	9.7	10.6	V
Circuit current in operation	4-3	I _{CC} (on)	-	-	6	mA
Circ. current in non-operation	4-3	I _{CC} (off)	-	-	100	μA
Maximum on time	1-3	T _{ON} (max)	27.5	32.5	39.0	μS
Minimum on time	1-3	T _{ON} (min)	0.4	0.8	1.2	μS
O.C.P./B.D. terminal threshold voltage 1	7-3	V _{OCPBD} (TH1)	0.28	0.40	0.52	V
O.C.P./B.D. terminal threshold voltage 2	7-3	V _{OCPBD} (TH2)	0.67	0.80	0.93	V
O.C.P./F.B. terminal outflow current	7-3	I _{OCPBD}	-250	-100	-40	μA
OVP operation voltage	4-3	V _{CC} (OVP)	25.5	27.7	29.9	V
Latch circuit holding current	4-3	I _{CC} (H)	-	45	140	μA
Latch circuit release voltage	4-3	V _{CC} (Loff)	6.0	7.2	8.5	V

4.6.6 MOSFET ELECTRICAL CHARACTERISTICS

DESCRIPTION	TERMINAL	SYMBOL	RATING			UNIT
			MIN.	TYPE	MAX	
Drain-to-source break down voltage	1-3	V _{DSS}	650	-	-	V
Drain leakage current	1-3	I _{DSS}	-	-	300	μA
On-resistance	1-3	R _{DS} (on)	-	-	0.96	Ω
Switching time	1-3	t _f	-	-	400	ns
Thermal resistance	-	θ _{ch-F}	-	-	1.6	°C/W

CP-780 Service Manual

4.7 pnx831x

4.7.1 pin list by numbers

#	NAME	#	NAME	#	NAME	#	NAME
1	TMS	53	MIU_DATA[7]	105	MIU_ADDR[24]	157	AVDD_PLL
2	TRST	54	MIU_DATA[14]	106	MIU_MASK[0]	158	XTAL_IN
3	TCK	55	MIU_DATA[6]	107	MIU_MASK[1]	159	XTAL_OUT
4	RESETN	56	MIU_DATA[13]	108	MIU_WEN	160	AVSS_PLL
5	SYS_RESETN	57	MIU_DATA[5]	109	MIU_RDY	161	VDDP
6	SCL0	58	MIU_DATA[12]	110	MIU_RDY	162	VSSP
7	SDA0	59	MIU_DATA[4]	111	VDDP	163	B
8	SCL1	60	VDDP	112	VSSP	164	AVDD_2
9	SDA1	61	VSSP	113	SDRAM_DATA[0]	165	G/Y
10	VDDP	62	MIU_DATA[11]	114	SDRAM_DATA[1]	166	IDUMP_2
11	VSSP	63	MIU_DATA[3]	115	SDRAM_DATA[2]	167	R/C
12	PIO11/CTS0	64	MIU_DATA[10]	116	SDRAM_DATA[3]	168	CVBS/Y
13	PIO12/RTS0	65	MIU_DATA[2]	117	SDRAM_DATA[4]	169	AVDD_1
14	PIO13/RX0	66	MIU_DATA[9]	118	SDRAM_DATA[5]	170	Y/CVBS
15	PIO14/TX0	67	MIU_DATA[1]	119	VDDC	171	IDUMP_1
16	PIO15/DCD0 PLL_OUT	68	MIU_DATA[8]	120	VSSC	172	C/CVBS
17	PIO16/DTR0/ VCXO_CLOCK	69	MIU_DATA[0]	121	SDRAM_DATA[6]	173	VREF
18	PIO17/RX1	70	MIU_OE_N	122	SDRAM_DATA[7]	174	RSET
19	PIO18/TX1	71	MIU_CS_N[3]	123	SDRAM_DATA[15]	175	AVDD_0
20	TS_DATA[0]	72	MIU_CS_N[2]	124	SDRAM_DATA[14]	176	PIO19/ITU_OUT[0]/ BOOT[0]
21	TS_DATA[1]	73	MIU_CS_N[1]	125	SDRAM_DATA[13]	177	PIO20/ITU_OUT[1]/ BOOT[1]
22	TS_DATA[2]	74	MIU_CS_N[0]	126	SDRAM_DATA[12]	178	PIO21/ITU_OUT[2]/ BOOT[2]
23	TS_DATA[3]	75	MIU_ADDR[0]	127	SDRAM_DATA[11]	179	PIO22/ITU_OUT[3]/ BOOT[3]
24	TS_DATA[4]	76	VDDP	128	SDRAM_DATA[10]	180	PIO23/ITU_OUT[4]
25	TS_DATA[5]	77	VSSP	129	SDRAM_DATA[9]	181	PIO24/ITU_OUT[5]
26	TS_DATA[6]	78	VDDC	130	VDDP	182	PIO25/ITU_OUT[6]
27	TS_DATA[7]	79	VSSC	131	VSSP	183	PIO26/ITU_OUT[7]
28	TS_VAL	80	MIU_ADDR[1]	132	SDRAM_DATA[8]	184	PIO27/ITU_CLOCKZ
29	TS_STROBE	81	MIU_ADDR[2]	133	DQM[1]	185	PIO2/OWM/VS
30	TS_SYNC	82	MIU_ADDR[3]	134	VDDC	186	DSU_CLK
31	PIO0/IR_IN	83	MIU_ADDR[4]	135	VSSC	187	DSU_TPC1
32	PIO1/IR_OUT	84	MIU_ADDR[5]	136	HCKB	188	PCST0[2]
33	PIO3/VPP	85	MIU_ADDR[6]	137	CKE	189	PCST0[1]
34	PIO4/C4	86	MIU_ADDR[7]	138	DQM[0]	190	VDDP
35	PIO5/C8	87	MIU_ADDR[8]	139	WE	191	VDDC
36	SC0_DA	88	MIU_ADDR[9]	140	CAS	192	VSSC
37	SC0_CMDVCC	89	MIU_ADDR[10]	141	RAS	193	VSSP
38	SC0_RST	90	MIU_ADDR[11]	142	SDRAM_ADDR[12]	194	PCST0[0]
39	SC0_OFF	91	MIU_ADDR[12]	143	SDRAM_ADDR[11]	195	PCST1[2]
40	SCO_CCK	92	MIU_ADDR[13]	144	SDRAM_ADDR[9]	196	PCST1[1]
41	VDDC	93	MIU_ADDR[14]	145	SDRAM_ADDR[8]	197	PCST1[0]
42	VSSC	94	VDDP	146	SDRAM_ADDR[7]	198	USB_OVRCUR
43	VDDP	95	VSSP	147	SDRAM_ADDR[6]	199	USB_PWR
44	VSSP	96	MIU_ADDR[15]	148	SDRAM_ADDR[5]	200	USB_DP
45	PIO6/SC1_DA	97	MIU_ADDR[16]	149	SDRAM_ADDR[4]	201	USB_DM
46	PIO7/SC1_CMDVCC	98	MIU_ADDR[17]	150	SDRAM_ADDR[13]	202	SD_OUT
47	PIO8/SC1_RST	99	MIU_ADDR[18]	151	SDRAM_ADDR[14]	203	SCK_OUT
48	PIO9/SC1_CCK	100	MIU_ADDR[19]	152	SDRAM_ADDR[10]	204	WS_OUT
49	PIO10/SC1_CCK	101	MIU_ADDR[20]	153	SDRAM_ADDR[0]	205	FSCLK
50	MIU_BAA	102	MIU_ADDR[21]	154	SDRAM_ADDR[1]	206	SPDIF
51	MIU_CLK	103	MIU_ADDR[22]	155	SDRAM_ADDR[2]	207	TDO/DSU_TPC0
52	MIU_DATA[15]	104	MIU_ADDR[23]	156	SDRAM_ADDR[3]	208	TDI

4.7.2 Features

General features

- Targeted to provide a low cost solution for Set Top Box technology
- Comprehensive driver software and development tool support
- 3.3 V and 1.2V power supplies
- Philips CMOS 0.12m process technology
- SQFP208 package

CPU related features

The pnx831x includes an embedded 32-bit MIPS RISC-based CPU which have the following main features:

- 32-bit PR1910 core operating at 120 MHz.
- MIPS-II ISA and MIPS16 instruction set
- Unified 8K Byte Instruction/Data cache
- 4K Byte deeply embedded memory.
- Two 32-bit timers with compare and enable
- One 32-bit watchdog timer with compare and a watchdog interrupt
- Copy-back store policy, write on allocate
- Debug Support Unit (DSU) with Enhanced JTAG interface version 2.0

DMA features

The pnx831x has an integrated 4-channel high performance DMAC ontroller engine that can Be used to perform a variety of tasks in the system.

- supports 4 DMA channels allowing transfer from any memory location or peripherals to any memory location. The arbitration mechanism between the 4 channels is round-robin.
- Buffered mode DMA with a 16-byte data buffer.
- Transfer type programmable for source and target buffer (Byte, Half-word, Word, 4-Word burst).
- Support for IO (non-incrementing addresses) source and/or destination.
- Configurable throttle support with throttle sizes ranging from 16 to 112 bytes.
- Integrated CRC Engine to perform CRC of MPEG section data as a post-process after the section data has been collected into a memory queue. The CRC polynomial is fixed and is based on the 32-bit CRC decoder model described in the Annex B of ISO/IEC 13818-1 specification.

Memory and bus interfaces

The pnx831x has two external buses:

- 16-bit SDRAM memory interface which supports a scalable frequency up to 133 MHz. (64 Mbit, 128 Mbit, 256 Mbit)
- 16-bit memory and peripheral interface to connect ROM, NOR Flash and various peripherals.

Peripheral interfaces

The pnx831x has many embedded peripheral units which have the following physical interfaces:

- Two UART (RS-232) data ports: one with six wires for modem support and one with two wires
- Two I2C master / slave transceivers, supporting the standard (100 Kbit/s) and fast (400 Kbit/s)

I2C bus modes.

- Two smart-card reader interfaces sharing the same UART ISO-7816 compatible.
- One Integrated Conditional Access Module interface (ICAM compliant) shared with a standard smart-card interface.
- Infrared receive and transmit interfaces (IR-capture & IR-blaster)
- A general purpose port of up to 28bits available when the associated peripheral function is not used in the application
- One USB1.1 host controller

Interrupt interface

- Sixteen external interrupt inputs shared with PIO lines.

4.8 UDA1334BTS audio DAC

4.8.1 PINNING

SYMBOL	PIN	PAD TYPE	DESCRIPTION
BCK	1	5V tolerant digital input pad : note 1	bit clock input
WS	2	5V tolerant digital input pad : note 1	word select input
DATA1	3	5V tolerant digital input pad : note 1	serial data input
V _{DDD}	4	digital supply pad	digital supply voltage
V _{88D}	5	digital ground pad	digital ground
SYSCLK	6	5V tolerant digital input pad : note 1	system clock input
SFOR1	7	5V tolerant digital input pad : note 1	serial format select 1
MUTE	8	5V tolerant digital input pad : note 1	mute control
DEEM	9	5V tolerant digital input pad : note 1	de-emphasis control
PCS	10	3-level input pad : note 2	power control and sampling freq. select
SFOR0	11	digital input pad : note 2	serial format select 0
V _{ref(DAC)}	12	analog pad	DAC reference voltage
V _{DDA}	13	analog supply pad	DAC analog supply voltage
VOU _{TL}	14	analog output pad	DAC output left
V _{88A}	15	analog ground pad	DAC analog ground
VOU _{TR}	16	analog output pad	DAC output right

Notes

1. 5V tolerant is only supported if the power supply voltage is between 2.7 and 3.6V. For lower Power supply voltages this is maximum 3.3V tolerant.
2. Because of test issues these pads are not 5V tolerant and they should be at power supply Voltage level or at a maximum of 0.5V that level.

4.8.2 Features

General

- 1.8 to 3.6V power supply voltage
- Integrated digital filter plus DAC
- Automatic system clock versus sample rate detection
- Low power consumption
- Supports sample frequencies from 8 to 100kHz
- No analog post filtering required for DAC
- Slave mode only applications
- Easy application
- SSOP16 package.

Multiple format data interface

- I2S-bus and LSB-justified format compatible
- 1fs input data rate.

DAC digital features

- Digital de-emphasis for 44.1kHz sampling frequency
- Mute function.

Advanced audio configuration

- High linearity, wide dynamic range and low distortion.
- Standby or sleep mode in which the DAC is powered down.

PLL system clock generation

- Integrated low jitter PLL for use in applications in which there is digital audio data present but the system cannot provide an audio related system clock. This mode is called audio mode
- The PLL can generate 25648kHz and 38448kHz from a 27MHz input clock. This mode is called video mode

4.9 CI MAX

4.9.1 Features

Module Interface

- 2 full independent module capability
- Common Interface Standard compliant
 - DVB_CI (CENELEC EN-50221)
 - NRSS-B (SCTE IS-679 Part B)
 - DAVIC v1.2 (CA0 interface)
- Memory PCMCIA compliance (R2)
 - 8-bit data access
 - 26-bit address Memory card
- Attribute Memory access (CIS, Tuple)

CP-780 Service Manual

- High speed capability
 - Up to 20Mbits/s on command interface
 - Up to 100Mbits/s on Transport Stream
- Polling and interrupt modes
- Hot insertion (Automatic and Reset VCC handling)
- 3.3V or 5V I/O buffers

PQFP 128package

- Universal Control Signal Generator (UCSG)
 - PC Card control signals generation
 - Supports powerPC, ARM, ST20, 68xxx, TMS, LSI 64008, TC81220F, IDTR3041 host microprocessors
- 12C port
 - CIMAX™ Set-up
 - Slot selection
 - Cascade mode management (up to 4 CIMAX™)
- Chip Select bank and interrupt facilities
- 3.3V or 5V I/O buffers

Digital Video Stream Interface

- MPEG II Transport Stream compliant
- 3.3V or 5V I/O buffer for direct interface with FEC and DEMUX ICs

4.9.2 Pinning

Name	Pin Number
MDOA0	1
MDOB1	2
MDOA1	3
MDOB2	4
MDOA2	5
CD2B#	6
CD2A#	7
GND_DVB1	8
GND_PROC	9
NC	10
NC	11
EXTINT	12
EXTCS	13
INT	14
WAIT/ACK	15
WR/STR	16
RD/DIR	17
CS	18
A15	19
A16	20
A17	21
A18	22
A19	23
A20	24
A21	25
A22	26
A23	27
A24	28
A25	29
SDA	30
SCL	31
SA0	32
SA1	33
RESET	34
CLK	35
VCC_CORE	36
GND_CORE	37
VCC_PROC	38
GND_TSI	39
MDI0	40
MDI1	41
MDI2	42
MDI3	43
MDI4	44
MDI5	45

Name	Pin Number
MDI6	46
MDI7	47
MIVAL	48
MISTRT	49
MICLK	50
VCC_TSI	51
GND_TSO	52
MDO0	53
MDO1	54
MDO2	55
MDO3	56
MDO4	57
MDO5	58
MDO6	59
MDO7	60
MOVAL	61
MOSTRT	62
MOCLK	63
VCC_TSO	64
VCC_DVB2	65
ADLE	66
ADOE#	67
DATDIR	68
DATOE#	69
VCCEN	70
CD1B#	71
CD1A#	72
MDOB3	73
MDOA3	74
MDOB4	75
MDOA4	76
MDOB5	77
MDOA5	78
MDOB6	79
MDOA6	80
CE1B#	81
CE1A#	82
MDOB7	83
MDOA7	84
CE2B#	85
GND_DVB2	86
CE2A#	87
OE#	88
IORD#	89
IOWR#	90

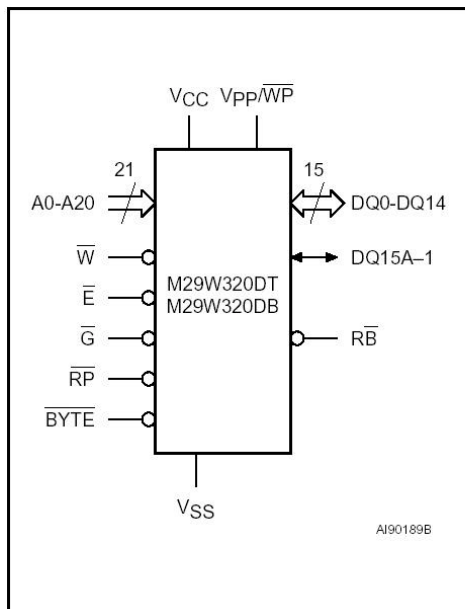
Name	Pin Number
MISTRTB	91
MISTRTA	92
MDIB0	93
MDIA0	94
MDIB1	95
MDIA1	96
WE#	97
MDIB2	98
MDIA2	99
RDY/IRQB#	100
RDY/IRQA#	101
MDIB3	102
MDIA3	103
MIVALB	104
MIVALA	105
MDIB4	106
MDIA4	107
MICLKB	108
VCC_DVB1	109
MICLKA	110
MDIB5	111
MDIA5	112
MDIB6	113
MDIA6	114
MDIB7	115
MDIA7	116
MOCLKB	117
MOCLKA	118
RSTB	119
RSTA	120
WAITB#	121
WAITA#	122
REG#	123
MOVALB	124
MOVALA	125
MOSTRTB	126
MOSTRTA	127
MDOB0	128

4.10 M29W320ET (Flash Memory)

4.10.1 Features

- SUPPLY VOLTAGE
 $V_{cc} = 2.7V$ to $3.6V$ for Program, Erase and Read
 $V_{pp} = 12V$ for Fast Program (optional)
- ACCESS TIME: 70, 90ns
- PROGRAMMING TIME
 $10\mu s$ per Byte/Word typical
- 67 MEMORY BLOCKS
 1 Boot Block (Top or Bottom Location)
 2 Parameter and 64 Main Blocks
- PROGRAM/ERASE CONTROLLER
 Embedded Byte/Word Program algorithms
- ERASE SUSPEND and RESUME MODES
 Read and Program another Block during Erase Suspend
- UNLOCK BYPASS PROGRAM COMMAND
 Faster Production/Batch Programming
- V_{pp}/WP PIN for FAST PROGRAM and WRITE PROTECT
- TEMPORARY BLOCK UNPROTECTION MODE
- COMMON FLASH INTERFACE
 64bit Security Code
- LOW POWER CONSUMPTION
 Standby and Automatic Standby
- 100,000 Program/Erase Cycles per Block
- Electronic Signature
 Manufacturer Code : 0020h
 Top Device Code M29W320ET : 22Cah

4.10.2 Logic diagram and signal name



A0-A20	Address Inputs
DQ0-DQ7	Data Inputs/Outputs
DQ8-DQ14	Data Inputs/Outputs
DQ15A-1	Data Input/Output or Address Input
\bar{E}	Chip Enable
\bar{G}	Output Enable
\bar{W}	Write Enable
\bar{RP}	Reset/Block Temporary Unprotect
\bar{RB}	Ready/Busy Output
\bar{BYTE}	Byte/Word Organization Select
V_{CC}	Supply Voltage
V_{PP}/\bar{WP}	V_{pp} /Write Protect
V_{SS}	Ground
NC	Not Connected Internally

4.11 K4S281632D (SDRAM)

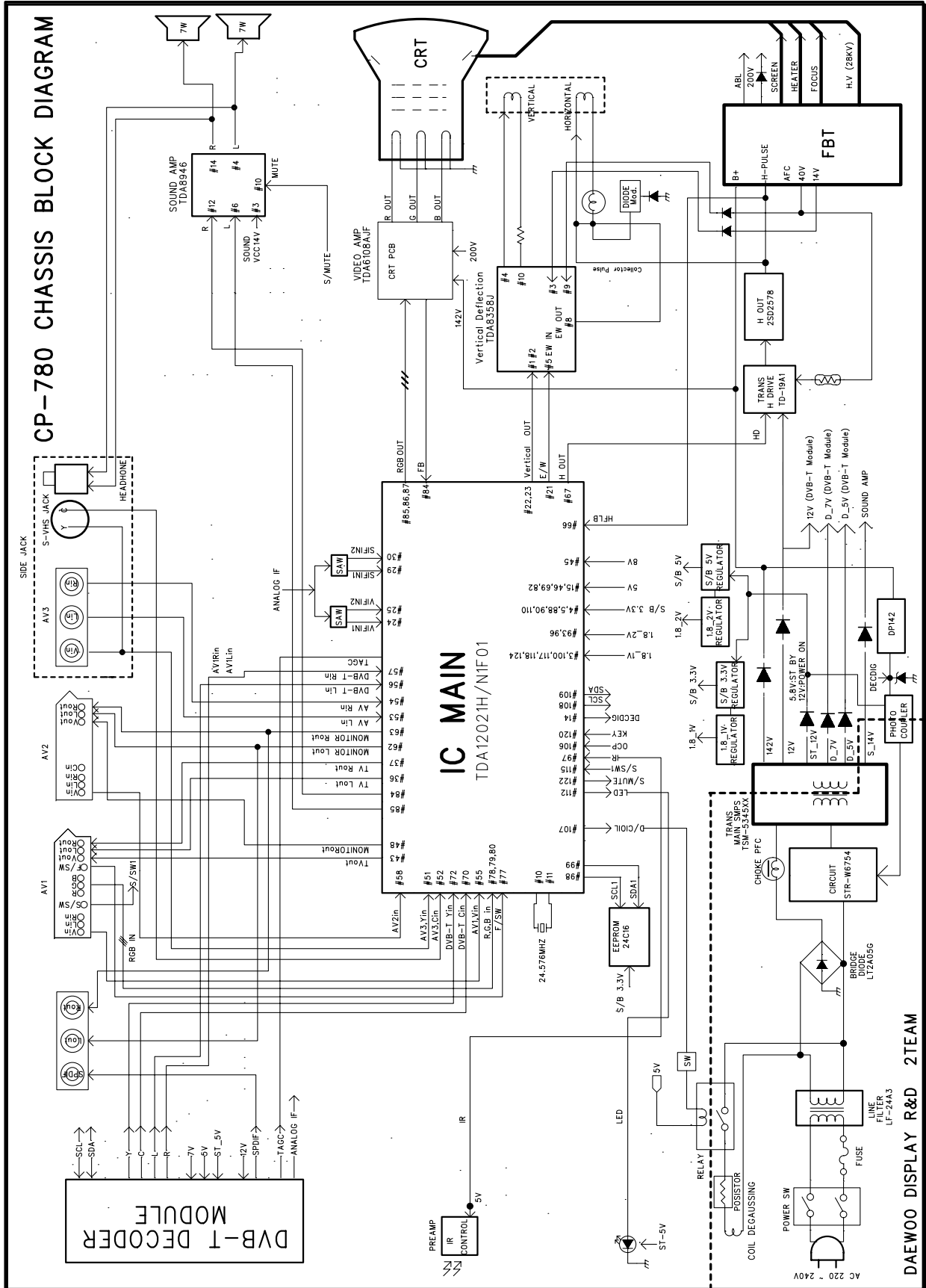
4.11.1 Features

- JEDEC standard 3.3V power supply
- LVTTL compatible with multiplexed address
- Four banks operation
- MRS cycle with address key programs
 - CAS latency (2 & 3)
 - Burst length (1, 2, 4, 8 & Full page)
 - Burst type (Sequential & Interleave)
- All inputs are sampled at the positive going edge of the system clock.
- Burst read single-bit write operation
- DQM for masking
- Auto & self refresh
- 64ms refresh period (4K cycle)

4.11.2 Pin function

Pin	Name	Input Function
CLK	<i>System clock</i>	Active on the positive going edge to sample all inputs.
$\overline{\text{CS}}$	<i>Chip select</i>	Disables or enables device operation by masking or enabling all inputs except CLK, CKE and DQM
CKE	<i>Clock enable</i>	Masks system clock to freeze operation from the next clock cycle. CKE should be enabled at least one cycle prior to new command. Disable input buffers for power down in standby.
A ₀ ~ A ₁₁	<i>Address</i>	Row/column addresses are multiplexed on the same pins. Row address : RA ₀ ~ RA ₁₁ , Column address : CA ₀ ~ CA ₈
BA ₀ ~ BA ₁	<i>Bank select address</i>	Selects bank to be activated during row address latch time. Selects bank for read/write during column address latch time.
$\overline{\text{RAS}}$	<i>Row address strobe</i>	Latches row addresses on the positive going edge of the CLK with $\overline{\text{RAS}}$ low. Enables row access & precharge.
$\overline{\text{CAS}}$	<i>Column address strobe</i>	Latches column addresses on the positive going edge of the CLK with $\overline{\text{CAS}}$ low. Enables column access.
$\overline{\text{WE}}$	<i>Write enable</i>	Enables write operation and <u>row precharge</u> . Latches data in starting from CAS, WE active.
L(U)DQM	<i>Data input/output mask</i>	Makes data output Hi-Z, tSHZ after the clock and masks the output. Blocks data input when L(U)DQM active.
DQ ₀ ~ 15	<i>Data input/output</i>	Data inputs/outputs are multiplexed on the same pins.
VDD/VSS	<i>Power supply/ground</i>	Power and ground for the input buffers and the core logic.
VDDQ/VSSQ	<i>Data output power/ground</i>	Isolated power supply and ground for the output buffers to provide improved noise immunity.
N.C./RFU	<i>No connection /reserved for future use</i>	This pin is recommended to be left No Connection on the device.

5 CIRCUIT DESCRIPTION 5.1 BLOCK DIAGRAM



5.2 FUNCTIONAL DESCRIPTION OF VIDEO PROCESSOR

5.2.1 Vision IF amplifier

The vision IF amplifier can demodulate signals with positive and negative modulation. The PLL demodulator is completely alignment-free.

The VCO of the PLL circuit is internal and the frequency is fixed to the required value by using the clock frequency of the TCG u-Controller as a reference. The setting of the various frequencies (e.g. 38, 38.9, 45.75 and 58.75MHz) can be made via the control bits IFA-IFC in subaddress 2FH. Because of the internal VCO the IF circuit has a high immunity to EMC interferences.

The output of the AFC detector can be read from output byte 04H and has a resolution of 7bit(25kHz per step). By means of this information a fast tuning algorithm can be designed.

The IC contains a group delay correction circuit which can be switched between the BG and a uncompensated group delay response characteristic. This has the advantage that in multi-standard receivers no compromise has to be made for the choice of the SAW filter. This group delay correction is realised for the demodulated CVBS output signal. The IC contains in addition a sound trap circuit with a switchable centre frequency.

5.2.2 QSS sound circuit

The sound IF amplifier is similar to the vision IF amplifier and has an external AGC decoupling capacitor.

The single reference QSS mixer is realised by a multiplier. In this multiplier the SIF signal is converted to the intercarrier frequency by mixing it with the regenerated picture carrier from the VCO. The mixer output signal is supplied to the output via a high-pass filter for attenuation of the residual video signals. With this system a high performance hi-fi stereo sound processing can be achieved.

The AM sound demodulator is realised by a multiplier. The modulated sound IF signal is multiplied in phase with the limited SIF signal. The demodulator output signal is supplied to the output via a low-pass filter for attenuation of the carrier harmonics.

Switching between the QSS output and AM output is made by means of the AM bit in subaddress 33H.

5.2.3 FM demodulator

The FM demodulator is realised as narrow-band PLL with internal loop filter, which provides the necessary selectivity without using an external band-pass filter. To obtain a good selectivity a linear phase detector and a constant input signal amplitude are required. For this reason the intercarrier signal is internally supplied to the demodulator via a gain controlled amplifier and AGC circuit. To improve the selectivity an internal bandpass filter is connected in front of the PLL circuit.

The nominal frequency of the demodulator is tuned to the required frequency (4.5/5.5/6.0/6.5 MHz) by means of a calibration circuit which uses the clock frequency of the TCG(1)-Controller as a reference. It is also possible to frequencies of 4.72 and 5.74Mhz so that a second sound channel can be demodulated. In the latter application an external bandpass filter has to be applied to obtain sufficient selectivity (the sound input can be activated by means of the setting of CMB2-CMB0 bits in subaddress 4AH). The setting to the wanted frequency is realised by means of the control bits FMA, FMB and FMC in the control bit 33H.

From the output status bytes it can be read whether the PLL frequency is inside or outside the window and whether the PLL is in lock or not. With this information it is possible to make an automatic search system for the incoming sound frequency. This can be realised by means of a software loop which switches the demodulator to the various frequencies and then select the frequency on which a lock condition has been found.

The amplitude deemphasis output signal changed with 6dB by means of the AGN bit. In this way output signal differences between the 4.5 MHz standard (frequency deviation 25 kHz) and the other standards (frequency deviation 50 kHz) can be compensated.

5.2.4 Audio input selector and volume control

5.2.4.1 STEREO AND AV STEREO VERSIONS

The audio input selector circuit has 4 external stereo inputs, a stereo output for SCART/CINCH and stereo outputs for headphone and audio power amplifiers. The selection is made with the bits SAS2/0, SO2/0 and HPO2/0. AV stereo versions without Audio DSP have no headphone output. The input signal selection for the volume controlled audio outputs is realised by the HPO2/0 bits.

The gain from an external audio input to each of the (non-controlled) analogue output is 0 or +6dB (controlled by the DSG bit). A supply voltage of 5V allows input and output amplitude of 1VRMS full scale, as required to comply with the SCART specification, the audio supply voltage must be 8V. In that case the gain of the audio amplifier must be doubled. This can be realised with the DSG bit in subaddress 32H.

The circuit contains an analogue stereo volume control circuit with a control range of about 70dB. This volume control circuit is used for the headphone channel (stereo versions with Audio DSP) or for the main channel (AV stereo versions without Audio DSP). The analogue control circuit also contains an Automatic Volume Levelling (AVL) function. When this function is activated it stabilises the audio output signal to a certain level so that big fluctuations of the output power are prevented.

5.2.4.2 MONO VERSIONS

The audio input selector circuit has 4 inputs for mono signals. The selection is made with the HPO2/0 bits.

The circuit contains an analogue volume control circuit with a control range of about 70dB and an AVL circuit.

5.2.5 CVBS and Y/C input signal selection

5.2.5.1 ALL VERSIONS

The ICs have 3 inputs for external CVBS signals. All CVBS inputs can be used as Y input for the insertion of Y/C signals. However, the CVBS(Y)2 input has to be combined with the C3 input. It is possible to add an extra CVBS(Y/C) input via the pins which are intended to be used for YUV interface (or RGB/YPrPb input). The selection of this additional CVBS(Y/C) input is made via the YC bit.

The function of the IFVO/SVO/CVBSI pin is determined by the SVO1/SVO0 bits. When used as output a selection can be made between the IF video output signal or the selected CVBS signal (monitor out). This pin can also be used as additional CVBS input. This signal is inserted in front of the group delay / sound trap circuit. It is also possible to use the group delay and sound trap circuit for the CVBS2 signal (via the CV2 bit).

For the CVBS(Y/C) inputs the circuit can detect whether a CVBS or Y/C signal is present on the input. The result can be read from the status register (YCD bit in subaddress 03H) and this information can be used to put the input switch in the right position (by means of the INA-IND bits in subaddress 38H). The Y/C detector is only active for the CVBS(Y)3/C3, CVBS(Y)4/C4 and CVBS(Y)x/Cx inputs. It is not active for the CVBS(Y)2/C3 input.

The video ident circuit can be connected to all video input signals. This ident circuit is independent of the synchronisation and can be used to switch the synchronisation and can be used to switch the presence of a video signal (via the VID bit). In this way a very stable OSD can be realised. The result of the video ident circuit can be read from the output bit SID (subaddress 00).

5.2.6 Synchronisation circuit

The IC contains separator circuits for the horizontal and vertical sync pulses. To obtain an accurate timing of the displayed picture the input signal of the sync separator is not derived from the various CVBS/Y or RGB/YPrPb inputs but from the YOUT pin. For this reason the YOUT pin must be capacitively coupled to the YSYNC pin. The delay between the various inputs and the YOUT signal can have rather large differences (e.g. comb filter active or not). By choosing the YOUT signal as input signal for the sync separator these delays have no effect on the picture position. Only for RGB signals without sync on green the input of the sync separator has to be connected to one of the CVBS inputs. This selection is made by means of the SYS bit.

The horizontal drive signal is obtained from an internal VCO which is running at a frequency of 25 MHz. This oscillator is stabilised to this frequency by using the clock signal coming from the reference oscillator of the TCG -Controller.

To obtain a stable On-Screen-Display (OSD) under all conditions it is important that the first control loop is switched off or set to low gain when no signal is available at the input. The input signal condition is detected by the video identification circuit. The video identification circuit can automatically switch first control loop to a low gain when no input signal is available. This mode

is obtained when the VID bit is set to "0". When the VID bit is "1" the mode of the first control loop can be switched by means of the FOA/FOB or POC bits.

For a good performance during normal TV reception (display of the front-end signal) various connections are active between the vision IF amplifier and the synchronisation circuit (e.g. gating pulses for the AGC detector and noise gating of the sync separator). These connections are not allowed when external video signals are displayed. The switching of these connections can be coupled to the input signal selection bits (INA-IND). This mode is obtained when the VDXEN bit is "0". Due to the input signal selector configuration it is possible that the internal CVBS signal is available on one of the other CVBS inputs. In this condition the connections between the vision IF amplifier and the synchronisation circuit can be switched on and off by means of the VDX bit. The VDXEN bit must be set to "1" for this mode.

The vertical synchronisation is realised by means of a divider circuit.

5.2.7 Horizontal and vertical drive

The horizontal drive is switched on and off via the soft start/stop procedure. The soft start function is realised by means of variation of the TON of the horizontal drive pulses. During the soft-stop period the horizontal output frequency is doubled resulting in a reduction of the EHT so that the picture tube capacitance can easily be discharged. In addition the horizontal drive circuit has a 'low-power start-up' function.

The vertical ramp generator needs an external resistor and capacitor. For the vertical drive a differential output current is available. The outputs must be DC coupled to the vertical output stage.

The IC has the following geometry control functions:

- * Vertical amplitude
- * Vertical slope
- * S-correction
- * Vertical shift
- * Vertical zoom
- * Vertical scroll
- * Vertical linearity correction. When required the linearity setting for the upper and lower part of the screen can have a different setting.
- * Horizontal shift
- * EW width
- * EW parabola width
- * EW upper and lower corner parabola correction
- * EW trapezium correction
- * Horizontal parallelogram and bow correction.

When the East-West geometry function is not required (e.g. for 90 picture tubes) the EW output pin can be used for the connection of the AVL capacitor. This function is chosen by means of the AVLE bit.

5.2.8 Chroma, luminance and feature processing

Some versions contain a 4H/2H(2D) adaptive PAL/NTSC comb filter. The comb filter is automatically activated when standard CVBS signals are received. A signal is considered as "standard signal" when a PAL or NTSC signal is identified and when the vertical divider is in the modes 'standard narrow window' or 'standard TV norm'. For non-standard signals and for SECAM signals the comb filter is bypassed and the signal is filtered by means of bandpass and trap filters.

The chroma band-pass and trap circuits (including the SECAM cloche filter) are realised by means of internal filters and are tuned to the right frequency by comparing the tuning frequency with the reference frequency of the colour decoder.

The circuit contains the following picture improvement features:

* Peaking control circuit. The peaking function can be activated for all incoming CVBS, Y/C and RGB/YPrPb signals. Various parameters of the peaking circuit can be adapted by means of the I2C-bus. The main parameters are:

- Peaking centre frequency (via the PF1/PF0 bits in subaddress 19H).
- Ratio of positive and negative peaks (via the RPO1/RPO0 bits in subaddress 47H). The peaks in the direction "white" are the positive peaks.
- Ratio of pre- and after shoots (via the RPA1/RPA0 bits in subaddress 47H).
- * Video dependent coring in the peaking circuit. The coring can be activated only in the low-light parts of the screen. This effectively reduces noise while having maximum peaking in the bright parts of the picture.
- * Black stretch. This function corrects the black level for incoming signals which have a difference between the black level and the blanking level. The amount of stretching (A-A in Fig. 72) and the minimum required back ground to activate the stretching can be set by means of the I2C-bus (BSD/AAS in subaddress 45H).
- * Gamma control. When this function is active the transfer characteristic of the luminance amplifier is made non-linear. The control curve can be adapted by means of I2C-bus settings (see Fig. 74). It is possible to make the gamma control function dependent on the picture content (Average Picture Level, APL). The effect is illustrated in Fig. 75. Previously this function was mentioned under the name "white stretch function".
- * Blue-stretch. This circuit is intended to shift colour near 'white' with sufficient contrast values towards more blue to obtain a brighter impression of the picture.
- * Dynamic skin tone (flesh) control. This function is realised in the YUV domain by detecting the colours near to the skin tone.
- * Scan-Velocity modulation output. Also the SVM function can be activated for all incoming CVBS, Y/C and RGB/YPrPb signals. The delay between the RGB output signals and the SVM output signal can be adjusted (by means of the SVM2-SVM0 bits in subaddress 48H) so that an optimum picture performance can be obtained. Furthermore a coring function can be activated. It is possible to generate Scan Velocity Modulation drive signals during the display of 'full screen' teletext (not in mixed mode). Another feature is that the SVM output signal can be made dependent on the horizontal position on the screen (parabola on the SVM output).

5.2.9 Colour decoder

The ICs decode PAL, NTSC and SECAM signals. The PAL/NTSC decoder does not need external reference crystals but has an internal clock generator which is stabilised to the required frequency by using the clock signal from the reference oscillator of the TCG u -Controller.

Under bad-signal conditions (e.g. VCR-playback n feature mode), it may occur that the colour killer is activated although the colour PLL is still in lock. When this killing action is not wanted it is possible to overrule the colour killer by forcing the colour decoder to the required standard and to activate the FCO-bit (Forced Colour On) in subaddress 3CH. The sensitivity of the colour decoder for PAL and NTSC can be increased by means of the setting of the CHSE1/CHSE0 bits in subaddress 3CH.

The Automatic Colour Limiting (ACL) circuit (switchable via the ACL bit in subaddress 3BH) prevents that oversaturation occurs when signals with a high chroma-to-burst ratio are received. The ACL circuit is designed such that it only reduces the chroma signal and not the burst signal. This has the advantage that the colour sensitivity is not affected by this function.

The SECAM decoder contains an auto-calibrating PLL demodulator which has two references, viz: the divided reference frequency (obtained from the-Controller) which is used to tune the PLL to the desired free-running frequency and the bandgap reference to obtain the correct absolute value of the output signal. The VCO of the PLL is calibrated during each vertical blanking period, when the IC is in search or SECAM mode. The frequency offset of the B-Y demodulator can be reduced by means of the SBO1/SBO0 bits in subaddress 3CH.

The base-band delay line is integrated. In devices without CVBS comb filter this delay line is also active during NTSC to obtain a good suppression of cross colour effects. The demodulated colour difference signals are internally supplied to the delay line. The baseband comb filter can be switched off by means of the BPS bit (subaddress 3CH).

The subcarrier output is combined with a 3-level output switch (0 V, 2.1 V and 4.5 V). The output level and the availability of the subcarrier signal is controlled by the CMB2-CMB0 bits.

5.2.10 RGB output circuit

In the RGB control circuit the signal is controlled on contrast, brightness and saturation. The IC has a YUV interface so that additional picture improvement ICs can be applied. To compensate signal delays in the external YUV path the clamp pulse in the control circuit can be shifted by means of the CLD bit in subaddress 44H. When the YUV interface is not required some of the pins can be used for the insertion of RGB/YPrPb signals or as additional CVBS(Y)/C input. When the YUV interface is not used one of the pins (VOUT) is transferred to general purpose output switch (SWO1). The IC has also a YUV interface to the digital die. Via this loop digital features like "double window" are added.

A tint control is available for the base-band U/V signals. For this reason this tint control can be activated for all colour standards. The signals for OSD and text are internally supplied to the control circuit. The output signal has an amplitude of about 1.2V black-to-white at nominal input

signals and nominal settings of the various controls.

To obtain an accurate biasing of the picture tube the 'Continuous Cathode Calibration' system has been included in these ICs. The system is slightly adapted compared with the previous circuits. In the new configuration the cut-off level of the picture tube is controlled with a continuous loop whereas the correction of the amplitude of the output signals is realised by means of a digital loop. As a consequence the current measurement can be controlled from the-Processor. The value of the "highcurrent" in the CCC loop can be chosen via the SLG0 and SLG1 bits (subaddresses 42H and 46H). The gain control in the 3 RGB channels is realised by means of 7-bit DACs. The total gain control range is 6 dB. The change in amplitude at the cathodes of the picture tube for one LSB is about 1.1 Vp-p. The setting of the control DAC is determined by the following registers:

- * The white point setting of the R, G and B channel in subaddress 20H to 22H. This register has a resolution of 6 bits and the control range in output signal amplitude is +/-3 dB.
- * The cathode drive setting (CL3-CL0 in subaddress 42H). This setting is valid for all channels, there solution is 4 bits and the control range is +/-3 dB.
- * The gain setting of the R, G and B channel. During switch on this register is loaded with the preset gain setting of subaddress 23H to 25H and when necessary it will be adapted by the CCC control loop. These registers have a resolution of 7 bits. The control of the gain setting is illustrated in table below.

WPR(GB)	'0'	B5	B4	B3	B2	B1	B0	Max 64
CL	'0'	B3	B2	B1	B0	'0'	'0'	Max 60
CCC-gain	B6	B5	B4	B3	B2	B1	B0	Max 126
R(GB)-gain	B6	B5	B4	B3	B2	B1	B0	Max 126

The setting of the gain registers of the 3 channels can be stored during switch off and can be loaded again during switch-on so that the drive conditions are maintained.

When required the operation of the CCC system can be changed into a one-point black current system. The switching between the 2 possibilities is realised by means of the EGL bit (EGL = 0) in subaddress 42H. When used as one-point control loop the system will control the black level of the RGB output signals to the 'low' reference current and not on the cut off point of the cathode. In this way spreads in the picture tube characteristics will not be taken into account. In this condition the settings of the "white point control registers" (subaddress 20H-22H) and the "cathode drive level bits" (CL3 - CL0 in subaddress 42H) are added to the settings of the RGB preset gain registers (subaddress 23H - 25H).

A black level off-set can be made with respect to the level which is generated by the black current stabilization system. In this way different colour temperatures can be obtained for the bright and the dark part of the picture. The black level control is active on the Red and the Green output signal. It is also possible to control the black level of the Blue and the Green output signal (OFB bit = 1).

In the Vg2 adjustment mode (AVG=1) the black current stabilization system checks the output level of the 3 channels and indicates whether the black level of the highest output is in a certain

window(WBC-bit) or below or above this window (HBC-bit). This indication can be read from the status byte 01 and can be used for automatic adjustment of the Vg2 voltage during the production of the TV receiver. During this test the vertical scan remains active so that the indication of the 2 bits can be made visible on the TV screen.

The control circuit contains a beam current limiting circuit and a peak white limiting circuit. The control is realised by means of a reduction of the contrast and brightness control settings. The way of control (first contrast and then brightness or contrast and brightness in parallel) can be chosen by means of the CBS bit (subaddress 44H). The peak white level is adjustable via the I2C-bus.

To prevent that the peak white limiting circuit reacts on the high frequency content of the video signal a low-pass filter is inserted in front of the peak detector. The circuit also contains a soft-clipper which prevents that the high frequency peaks in the output signal become too high. The difference between the peak white limiting level and the soft clipping level is adjustable via the I2C-bus in a few steps.

During switch-off of the TV receiver a fixed beam current is generated by the black current control circuit. This current ensures that the picture tube capacitance is discharged. During the switch-off period the vertical deflection can be placed in an overscan position so that the discharge is not visible on the screen.

A wide blanking pulse can be activated in the RGB outputs by means of the HBL bit in subaddress 43H. The timing of this blanking can be adjusted by means of the bits WBF/R bits in subaddress 26H.

5.2.11 I2C-BUS USER INTERFACE DESCRIPTION

The UOC III series is fully controlled via the I2C-bus. Control is exercised by writing data to one or more internal registers. Status information can be read from a set of info registers to enable the controlling microcontroller determine whether any action is required. The device has an I2C-bus slave transceiver, in accordance with the fast-mode specification, with a maximum speed of 400 kbits/s. Information concerning the I2C-bus can be found in brochure "I2C-bus and how to use it" (order number 939839340011). To avoid conflicts in a real application with other ICs providing similar or complementary functions, there are two possible slave addresses available which can be selected by the SVM pin(pin 65).

Possible slave address

SVM PIN	SLAVE ADDRESS A6 TO A0
Scavem application	1 0 0 0 1 0 1
Tied 5 volts	1 0 0 0 1 1 1

The device will not respond to a 'generalcall' on the I2C-bus, i.e. when a slave address of 0000000 is sent by a master.

Write registers

Each address of the address space (see below) can only be written.

Correct operation is not guaranteed if registers in the range \$FB to \$FF will be addressed!

Read registers

The output registers of the TV processor are only available via auto-increment mode, no address can be used and all registers must be read.

5.3 GENERAL DESCRIPTION OF THE TV SOUND OF SOUND PROCESSOR

The TV Sound Processor is a digital TV sound processor for analogue multi-channel sound systems in TV sets. It is based on a 24 bit DSP and designed to support several applications.

A new easy-to-use control concept was implemented for easiest configuration programming of the very complex functionality of the TV Sound Processor. Pre-defined setups are available for all implemented sound processing modes. Aloud speaker switching concept allows it to adapt the pre-defined setups to the specific loudspeaker application. The built-in intelligence for pre-defined standards and Auto Standard Detection (ASD) allows an easy setup of the demodulator and decoder part.

The control concept for the audio processor is based on the following new features:

- * Pre-defined setups for the sound processing modes like Dolby(r) Pro Logic(r) and Virtual Dolby(r) Surround (422, 423)
- * Flexible configuration of audio outputs to the loudspeaker configuration with an additional output crossbar
- * Master volume function

The control concept for the demodulator and decoder (DEMDEC) is based on the following new features:

- * Easy demodulator setup for all implemented standards with Demodulator and Decoder Easy Programming (DDEP) for a pre-selected standard or combined with Auto Standard Detection (ASD) for automatic detection of a transmitted standard
- * Automatic decoder configuration and signal routing depending on the selected or detected standard
- * FM overmodulation adaptation option to avoid clipping and distortion

5.3.1 Supported standards

The multistandard capability of the TV Sound Processor covers all terrestrial TV sound standards, FM Radio and satellite FM.

The AM sound of L/L' standard is normally demodulated in the 1st sound IF. The resulting AF signal has to be entered into the mono audio input of the TV Sound Processor. A second possibility is to use the AM demodulator in the DEMDEC part, however this may result in limited performance.

Korea has a stereo sound system similar to Europe. It is supported by the TV Sound Processor. Differences include deviation, modulation contents and identification. It is based on M standard.

Other features of the DEMDEC are:

CP-780 Service Manual

- * M/BTSC and N standards supported
- * M/Japan (EIAJ) supported
- * FM Radio stereo decoding
- * Alignment-free, fully digital system
- * For BTSC full dbx(r) performance
- * SAP demodulation (without dbx(r)) simultaneously with stereo decoding, or mono plus SAP with dbx(r)
- * Line/pilot frequency selectable from 15.734 kHz and 15.625 kHz (or automatic detection / auto search)
- * High selectivity for pilot detection, high robustness against high-frequent audio components
- * Pilot lock indicator
- * SAP detector
- * Separate noise detectors for stereo and SAP with adjustable threshold levels, hysteresis, and automute function

An overview of the supported standards and sound systems and their key parameters is given in the following tables.

The analogue multi-channel sound systems (A2, A2+ and A2*) are sometimes also named 2CS (2 carrier systems).

ANALOG 2-CARRIER SYSTEMS

[Table] Frequency modulation

STANDARD	SOUND SYSTEM	CARRIER FREQUENCY (MHz)	FM DEVIATION(kHz) NOM./MAX./OVER	MODULATION		BANDWIDTH/ DE-EMPHASIS (kHz/us)
				SC1	SC2	
M	Mono	4.5	15/25/50	Mono	-	15/75
M	A2+	4.5/4.724	15/25/50	1/2(L+R)	1/2(L+R)	15/75(Korea)
B/G	A2	5.5/5.742	27/50/80	1/2(L+R)	R	15/50
I	Mono	6.0	27/50/80	mono	-	15/50
D/K(1)	A2*	6.5/6.258	27/50/80	1/2(L+R)	R	15/50
D/K(2)	A2*	6.5/6.742	27/50/80	1/2(L+R)	R	15/50
D/K(3)	A2*	6.5/5.742	27/50/80	1/2(L+R)	R	15/50

[Table] Identification for A2 systems

PARAMETER	A2/A2*	A2+ (KOREA)
Pilot frequency	54.6875kHz = 3.5 x line freq.	55.0699 kHz = 3.5 x line freq.
Stereo identification frequency	117.5 Hz = line freq / 133	149.9 Hz = line freq / 105
Dual identification frequency	274.1 Hz = line freq / 57	276.0 Hz = line freq / 57
AM modulation depth	50%	50%

2-CARRIER SYSTEMS WITH NICAM

[Table] NICAM standards

STANDARD	SC1				SC2 (MHz) NICAM	DE- EMPAHSIS	ROLL- OFF (%)	NICAM CODING
	FREQUENCY (MHz)	TYPE	MODULATION					
			INDEX(%) NOM./MAX.	DEVIATION (kHz) NAM./MAX. /OVER				
B/G	5.5	FM	-	27/50/80	5.85	J17	40	Note1
I	6.0	FM	-	27/50/80	6.552	J17	100	Note1
D/K	6.5	FM	-	27/50/80	5.85	J17	40	Note1
L	6.5	AM	54/100	-	5.85	J17	40	Note1

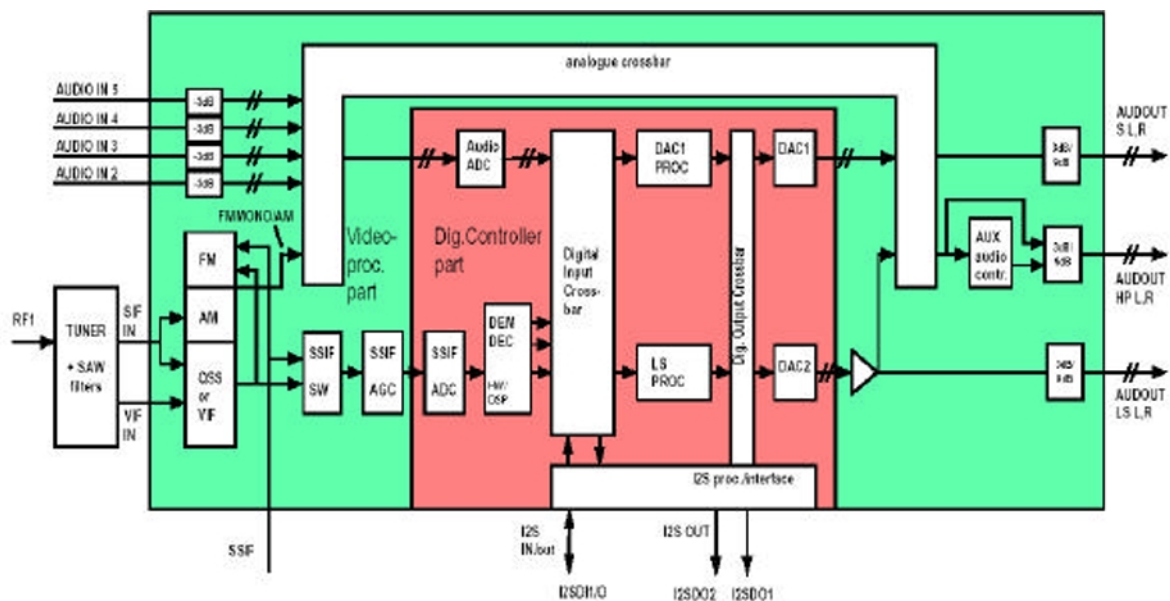
Note 1. See 'EBU specification' or equivalent specification.

5.4 FUNCTIONAL DESCRIPTION SOUND PROCESSOR

5.4.1 The UOC III TV Sound Concept

The UOCIII sound concept is implemented over the video processor and TCG-microcontroller.

Only relevant blocks, functions and signal flows for sound are given.



(only relevant blocks, functions and signal flow for sound are shown)

The tuner receives a RF signal and converts it to IF. Via appropriate SAW filters the SIF signal is delivered to the QSS stage of the video processor and if channels according to standard L/L' are received also to the AM demodulator. The Quasi Split Sound demodulation generates the SSIF or intercarrier signal. By the SSIF switch it is possible to choose between the internally derived intercarrier and an external second SIF(2NDSIFEXT), e.g. an intercarrier coming from a PIP frontend. In other applications a 10.7MHz radio IF or satellite FM may be connected to this input. The selected SSIF passes some anti alias filtering, is amplified in an AGC amplifier (SSIF AGC) and is then converted from analogue to digital (SSIF ADC).

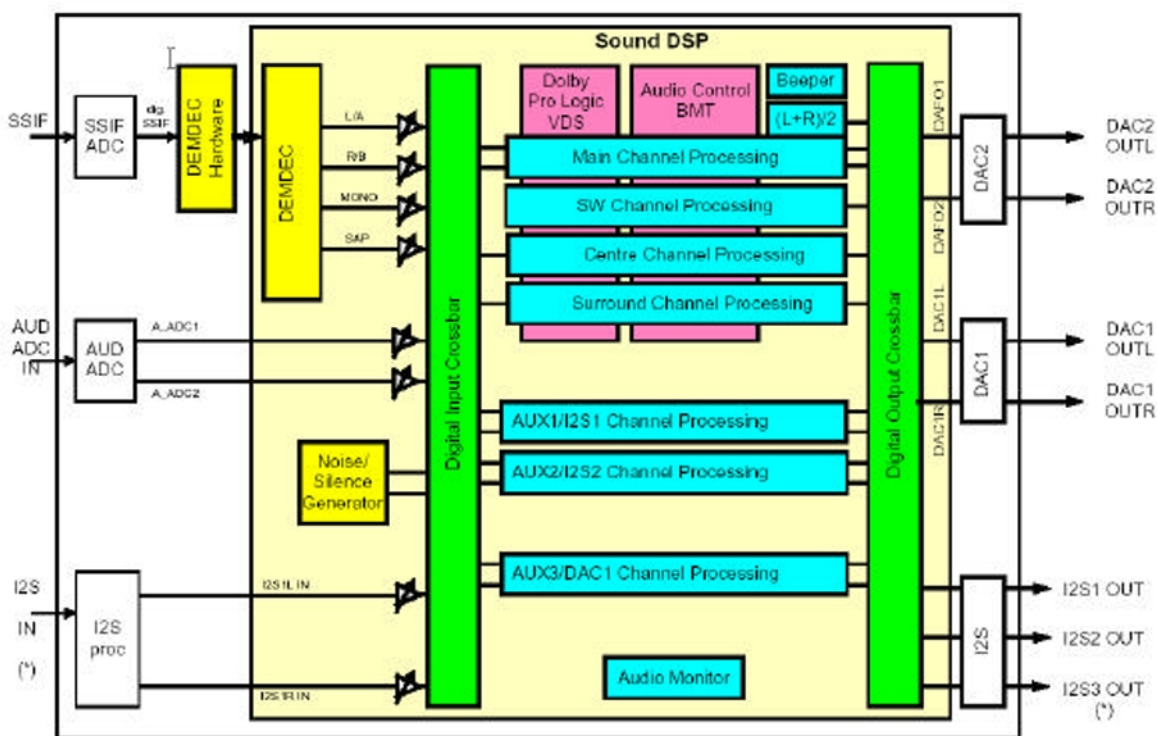
The audio signal out of the AM demodulator is connected to the analogue crossbar at the video processor. All other inputs to this multiplexer/audio switch come from external, either from a PIP frontend or SCART/CINCH(AUDINx) or the DAC output signals from the digital controller. The audio AD converters are digitising the audio signals foreseen for further digital processing. One stereo output (AUDOUTS) is available for connections to SCART/CINCH sockets.

The sound part on the digital controller consists of the demodulator/decoder(DEMDEC), a digital input crossbar, the digital audio processing for the loudspeaker and DAC channels, the I2S processing and interfacing, a digital output crossbar as well as the DA conversion.

An auxiliary audio control (volume control, AUX audio contr.) is available on the video processor. Here it is applied to the headphone channel.

The part of the concept located in the digital controller will be described in the next chapters.

5.4.2 Functional Overview Of the digital controller sound part



(*) : connected to one pin that can be used alternatively as I2S IN or I2S3 OUT

The digital controller sound part consists of the SSIFADC, audio ADCs, DEMDEC HW, the sound DSP core, audio DACs and I2S interface hardware as shown in fig below. The DEMDEC part of the Sound DSP is used for the decoder and partly demodulator tasks. The AUDIO part provides the sound features, from the level adjust unit up to the output crossbar. Audio DACs and I2S hardware are converting the processed signals to analogue or digital audio.

The SSIF signal is applied to the SSIF ADC for conversion and is then fed to the DEMDEC hardware processing mainly for demodulation but also some decoding tasks. Remaining decoding is done in the DEMDEC block of the Sound DSP. The DEMDEC processing will be described in the next chapter.

The audio signals (AUD ADC IN) from the analogue crossbar pass the audio ADC and are fed directly into the AUDIO part of the Sound DSP like the I2S signals, which is coming from I2S processing hardware. After level adjust all signals from the DEMDEC and the I2S input are available at the digital input crossbar. A special input is provided for the Noise/Silence Generator needed for Dolby(r) Pro Logic(r) processing.

In standard TV applications the main channel signal(L,R) will be connected to the DAC2 for reproduction at the speakers. With multichannel signals centre, surround or subwoofer channels may be passed to the I2S outputs where external DACs may be applied. By this it is possible to build Dolby Normal/Wide, Dolby Phantom Centre or Dolby 3 Stereo set-ups and also a VDS423 application.

5.4.3 Demodulator and decoder

INTRODUCTION

The TV sound processor provides an easy-to-use programming interface and built-in intelligence for the demodulator and decoder part.

The sound demodulator is able to search for sound carriers and react to transmission mode changes autonomously, without interaction of the micro controller software.

It is possible for a typical terrestrial TV application to setup the entire demodulator with transmission of few control words.

The control interface still allows access to every detail, called demodulator expert mode, for special applications such as satellite TV, more elaborated search algorithms etc.

The new TV Sound Processor Demodulator and Decoder Easy Programming(DDEP) interface provides three possible approaches to setup the demodulator and decoder parts:

- * Auto Standard Detection (ASD)
- * Static Standard Selection (SSS)
- * Demodulator and Decoder Expert Mode (DDXM)

MIXER

The digitized 2nd SIF input signal is fed to the mixers, which mix one or both input sound carriers down to zero IF. The mixer frequency is derived by the standard setting (Easy Programming) or in the Demodulator and Decoder Expert Mode (DDXM) by a 24-bit control word for each carrier. For NICAM demodulation, a feedback signal is added to the control word of the second carrier mixer to establish a carrier-frequency loop.

FM AND AM DEMODULATION

An FM or AM input signal is fed via a band-limiting filter to a one of two demodulators that can be used for either FM or AM demodulation. Four filters with different bandwidth are available. The output signal of the first demodulator can be used for further demodulation of multiplex signals used in the BTSC, EIAJ and FM Radio standards.

FM IDENTIFICATION

The identification of the FM sound mode is performed by AM synchronous demodulation of the pilot signal and narrow-band detection of the identification frequencies. The result is available via the control bus interface. A selection can be made for three different modes that represent different trade-offs between speed and reliability of identification. The mode is set by DDEP (for FM two-carrier standards) or via expert mode. DDEP also performs automatic FM de-matrix control in dependence on the identification.

FM/AM DECODING

A high-pass filter suppresses DC offsets from the FM/AM demodulators due to carrier frequency offsets and supplies the monitor/peak function with DC values and an un-filtered signal, e.g. for the purpose of carrier detection.

The audio bandwidth is approx. 15 kHz.

The de-emphasis function offers fixed settings for the supported standards (50s, 60s, 75s and J17).

A matrix performs the de-matrixing of the A2 stereo, dual and mono signals to obtain the left (L) and right (R) or language A and B signals.

FM PILOT CARRIER PRESENT DETECTOR

The TV Sound Processor provides FM A2 standard pilot carrier detection.

NICAM DEMODULATION

The NICAM signal is transmitted via DQPSK modulation at a bit rate of 728kBit/s. The NICAM demodulator performs DQPSK demodulation and feeds the resulting bit stream and clock signal to the NICAM decoder.

A timing loop controls the sample rate conversion circuitry to lock the sampling rate to the symbol timing of the NICAM data.

NICAM DECODER

The NICAM decoder performs all decoding functions in accordance with the EBU NICAM 728 specification. After locking to the frame alignment word, the data is de-scrambled by applying the defined pseudo-random binary sequence; the NICAM decoder will then synchronize to the periodic frame flag bit C0.

The status of the NICAM decoder can be read out from the NICAM status register by the user (see the control-bus register description). The OSB bit indicates that the decoder has locked to the NICAM data. The VDSP bit indicates that the decoder has locked to the NICAM data and that the data is valid sound data. The C4 bit indicates that the sound conveyed by the FM mono channel is identical to the sound conveyed by the NICAM channel. The error byte contains the number of sound sample errors, resulting from parity checking, that occurred in the past 128ms period. The Bit Error Rate (BER) can be calculated using the following equation;

During NICAM mode a switchable J17 de-emphasis is supplied.

NICAM AUTO-MUTE

If the Auto Standard Detection (ASD) or the Static Standard Detection (SSS) feature is activated the following auto mute function is in effect.

If NICAM B/G, I, D/K is received, the auto-mute is enabled and the signal quality becomes poor, the built-in control automatically switches the output signal (DEC output) to FM channel 1. The automatic switching depends on the NICAM bit error rate. The auto-mute function can be disabled via the control bus.

This function is enabled by setting bit NIC_AMUTE to 0. Upper and lower error limits may be defined by writing appropriate values to the corresponding control bits (NICLOERRLIM and NICUPERRLIM). When the number of errors in a 128 ms period exceeds the upper error limit the auto-mute function will switch the output sound from NICAM to whatever sound is on the first sound carrier (FM or AM). When the error count is smaller than the lower error limit the NICAM sound is restored.

The auto-mute function can be disabled by setting bit NIC_AMUTE to 1. In this condition clicks become audible when the error count increases; the user will hear a signal of degrading quality. For NICAM L applications, it is recommended to demodulate AM sound in the first sound IF. The demodulated AM is provided by the internal IF processor. For applications with external IF processing the external demodulated AM signal can be connected to the SCART/Mono input of the TV Sound Processor. By setting the EXTAM bit, the auto-mute function will switch to the audio ADC input signal named EXTAM instead of switching to the first sound carrier. The ADC source selector should be set to internal AM mono signal or to the external SCART/mono input, where the AM sound signal should be connected.

CP-780 Service Manual

6. SERVICE PART LIST

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
ZZ100	48B552N20	TRANSMITTER REMOCON	R-52N20 (AAA)	
ZZ110	PTACPWG100	ACCESSORY AS	DUB-2850DT	
00010	4850Q00910	BATTERY	R03NN	
M821	4858213803	BAG INSTRUCTION	L.D.P.E TO.05X250X400(+20)	
ZZ120	PTBCSHG100	COVER BACK AS	DUB-2850DT	
M211	4852174411	COVER BACK	HIPS GY	
M211D	4857817630	CLOTH BLACK	FELT 400X20X0.7	
M211E	4857817612	CLOTH BLACK	FELT 250X20X0.7	
ZZ130	PTPKCPG100	PACKING AS	DUB-2850DT	
10	6520010100	STAPLE PIN	AUTO W65	
M801	4858058900	BOX CARTON	DW-3	
M811	485819C400	PAD	EPS 2850	
M822	4858215601	BAG P.E	PE FOAM 10.5x1600x1270	
ZZ131	58G0000159	COIL DEGAUSSING	DC-28FV2	
ZZ132	48519A5510	CRT GROUND NET	2801H-1015-2P	
ZZ140	PTCACAG100	CABINET AS	DUB-2850DT	
M211A	7172401612	SCREW TAPPTITE	TT2 TRS 4X16 MFZN BK	
M211B	7172401612	SCREW TAPPTITE	TT2 TRS 4X16 MFZN BK	
M211C	7172401612	SCREW TAPPTITE	TT2 TRS 4X16 MFZN BK	
M211D	7178301012	SCREW TAPPTITE	TT2 WAS 3X10 MFZN BK	
M361	4853634911	TERMINAL ANT	HIPS GY	
M361A	7172401612	SCREW TAPPTITE	TT2 TRS 4X16 MFZN BK	
M541	4855415800	SPEC PLATE	150ART P/E FILM (C/TV)	
M561	48556174SD	MARK BRAND	SILVER DIA-CUTTING	
M681	4856812001	TIE CABLE	NYLON66 DA100	
M682	4856816300	CLAMP WIRE	NYLON 6 (V0)	
P402A	4850706N24	CONNECTOR	YFSH500-06+YH396V+JULW=500	
PA601	4850704S30	CONNECTOR	YH025-04+YRT205+JULW700600	
SP01	48A8308300	SPEAKER SYSTEM	SS-58126F04	
SP01A	4856013600	SCREW SPKR FIX	SWRM+SECC	
V901	4859644760	CRT	W66ERF112X013	
V901A	4856215402	WASHER RUBBER	CR T2.0	
V901B	4856017351	SCREW CRT FIX	6X32 L120 RD	
ZZ200	PTFMSJG100	MASK FRONT AS	DUB-2850DT	
M201	4852091911	MASK FRONT	HIPS GY	
M481	4854870811	BUTTON POWER	HIPS GY	
M481A	4856717900	SPRING	SWPA T0.5	
M551	4855555400	DECO SENSOR	GPPS MILKY	
M781	4857818703	CLOTH BLACK	FELT 300X15X11.0	
ZZ220	PTPWMSG100	PCB POWER MANUAL AS	DUB-2850DT	
C402	CMYH3C602H	C MYLAR	1.6KV BUP 6000PF H	
C404	CMYH3C722H	C MYLAR	1.6KV BUP 7200PF H	
C408	CMYE2G274J	C MYLAR	400V PU 0.27MF J	
C430	CCXR3D681K	C CERA	2KV R 680PF K 125C	
C440	CMXE2G243J	C MYLAR	400V PU 0.024MF J (TP)	
C499	CEYD1H689W	C ELECTRO	50V RHD 6.8MF (16X35.5)	
C801	CL1UC3474M	C LINE ACROSS	0.47MF 1J(UCVSND/FSV)+Q/O	
C802	CL1UC3474M	C LINE ACROSS	0.47MF 1J(UCVSND/FSV)+Q/O	
C805	CEYD2G221D	C ELECTRO	400V FHS 220MF (25X40)	
C806	CCXR3A102K	C CERA	HIKR 1KV 1000PF K 125C	
C808	CMYF2J154J	C MYLAR	630V MPP 0.15MF J	
C812	CH1BFE332M	C CERA AC	4.0KV 3300PF M SD AC250V	
C813	CEXF2E101V	C ELECTRO	250V RSS 100MF 18X35.5	
C814	CEXF2E101V	C ELECTRO	250V RSS 100MF 18X35.5	
D403	DDGP30L—	DIODE	DGP30L	
D404	DRGP30J—	DIODE	RG30J DO-201AD 600V 3A	
D707	4858900002	HOLDER LED ASSY	LH-3P	
D809	DRL4A015—	DIODE	RL4A-015-308	
D810	DRL4A015—	DIODE	RL4A-015-308	
D820	DRGP30J—	DIODE	RG30J DO-201AD 600V 3A	
D832	DRGP30J—	DIODE	RG30J DO-201AD 600V 3A	
D833	DRGP30J—	DIODE	RG30J DO-201AD 600V 3A	
D860	PTEASW6900	HEAT SINK AS	DFMLG12S— + 7174300811	
00001	DFMLG12S—	DIODE	FML-G12S	
0000A	4857026900	HEAT SINK	AL EX	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
F801	5FSCB4022R	FUSE CERA	SEMKO F4AH 4A 250V MF51	
I301	PTB2SW8215	HEAT SINK ASS'Y	1TDA8358J- + 7174301011	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
00001	1TDA8358J-	IC VERTICAL	TDA8358J	
0000A	4857028215	HEAT SINK	AL EX	
0000B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I602	PTA2SW8233	HEAT SINK ASS'Y	1TDA8946J- + 7174301011	
00001	1TDA8946J-	IC AUDIO AMP	TDA8946J	
0000A	4857028233	HEAT SINK	AL EX BK	
0000B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I703	1TSOP1238W	IC PREAMP	TSOP1238W1	
I801	PTB2SW7923	HEAT SINK ASS'Y	1STRW6754- + 7174301011	
00001	1STRW6754-	IC POWER	STR-W6754	
0000A	4857027923	HEAT SINK	AL EX	
0000B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
I804	1LTV817C—	IC PHOTO COUPLER	LTV-817C	
I806	1DP142—	IC ERROR AMP	DP142	
I820	1LD1117V50	IC REGULATOR	LD1117AV50 5.0V 2% TO-220	
I822	PTB5W6900	HEAT SINK AS	1K78R08— + 7174300811	
00001	1K78R08—	IC REGULATOR	KIA78R08AP1	
0000A	4857026900	HEAT SINK	AL EX	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I823	PTUASW6900	HEAT SINK ASS'Y	1LD1117V33 + 7174300811	
00001	1LD1117V33	IC REGULATOR	LD1117AV33 3.3V 2% TO-220	
0000A	4857026900	HEAT SINK	AL EX	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I824	PTNBSW6900	HEAT SINK AS	1LD1117V50 + 7174300811	
00001	1LD1117V50	IC REGULATOR	LD1117AV50 5.0V 2% TO-220	
0000A	4857026900	HEAT SINK	AL EX	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
JP801	4850K01200	CORE FERRITE	BNF-27	
L401	58H0000071	COIL H-LINEARITY	TRL-350D	
L402	58C07070085	COIL CHOKE	TLN-3062A	
LF801	5PLF24A3—	FILTER LINE	LF-24A3	
LF802	58C0000155	COIL CHOKE PFC	CPC-311A	
P402	4859240120	CONN WAFER	YFW500-06	
P501	4859235820	CONN WAFER	YW025-15	
P502	4859235520	CONN WAFER	YW025-12	
P801	4859905110	CORD POWER AS	CW3222/240V 5A+H0US=2200	
PA503	4850705S03	CONNECTOR	YH025-05+YBNH250+JULW=300	
PA506	4850703S17	CONNECTOR	YH025-03+YBNH250+JULW=100	
Q401	PTN2SW4500	HEAT SINK ASS'Y	T2SD2578— + 7174300811	
00001	T2SD2578—	TR HORI	2SD2578	
0000A	4857024500	HEAT SINK	AL EX BK	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
R801	DDC7ROM290	POSISTOR	ECPCD7ROM290	
R803	RX10T333JS	R CEMENT	10W 3.3 OHM J TRIPOD SMALL	
R845	RS02Z120JS	R M-OXIDE FILM	2W 12 OHM J SMALL	
SW801	5S40101143	SW POWER PUSH	PS3-22SP (P.C.B)	
T401	50D19A1—	TRANS DRIVE	TD-19A1	
T402	50H0000299	FBT	BSC29-0177B	
T801	50M5345C8-	TRANS SMPS	TSM-5345C8	
Y801	5SC0101003	SW RELAY	DG12D1-0(M)-II 1C-1P	
ZZ200	PTPWJOG100	PCB POWER ODDS-SHAPE (RH) AS	DUB-2850DT	
C315	CEXF2A470V	C ELECTRO	100V RSS 47MF (10X16) TP	
C412	CEXF2C339V	C ELECTRO	160V RSS 3.3MF (8X16) TP	
C415	CEXF2E330V	C ELECTRO	250V RSS 33MF (13X25) TP	
C604	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C823	CEXF1E471V	C ELECTRO	25V 470MF 10X12.5	
C824	CEXF1C332V	C ELECTRO	16V RSS 3300MF (16X25) TP	
C825	CEXF1C332V	C ELECTRO	16V RSS 3300MF (16X25) TP	
C840	CEXF1C222V	C ELECTRO	16V RSS 2200MF (13X25) TP	
C861	CEXF1E102C	C ELECTRO	25V RUS 1000MF (13X20) TP	
ZZ200	PTPWJBG100	PCB POWER M-10 AS	DUB-2850DT	
E01	4856310300	EYE LET	BSR T0.2 (R1.6)	
E02	4856310300	EYE LET	BSR T0.2 (R1.6)	
E03	4856310300	EYE LET	BSR T0.2 (R1.6)	
E04	4856310300	EYE LET	BSR T0.2 (R1.6)	
E05	4856310300	EYE LET	BSR T0.2 (R1.6)	
E06	4856310300	EYE LET	BSR T0.2 (R1.6)	
E07	4856310300	EYE LET	BSR T0.2 (R1.6)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
E08	4856310300	EYE LET	BSR T0.2 (R1.6)	
E09	4856310300	EYE LET	BSR T0.2 (R1.6)	
E10	4856310300	EYE LET	BSR T0.2 (R1.6)	
E11	4856310300	EYE LET	BSR T0.2 (R1.6)	
E12	4856310300	EYE LET	BSR T0.2 (R1.6)	
E13	4856310300	EYE LET	BSR T0.2 (R1.6)	
E14	4856310300	EYE LET	BSR T0.2 (R1.6)	
E15	4856310300	EYE LET	BSR T0.2 (R1.6)	
E16	4856310300	EYE LET	BSR T0.2 (R1.6)	
E17	4856310300	EYE LET	BSR T0.2 (R1.6)	
E18	4856310300	EYE LET	BSR T0.2 (R1.6)	
E19	4856310300	EYE LET	BSR T0.2 (R1.6)	
E20	4856310300	EYE LET	BSR T0.2 (R1.6)	
E21	4856310300	EYE LET	BSR T0.2 (R1.6)	
E22	4856310300	EYE LET	BSR T0.2 (R1.6)	
E23	4856310300	EYE LET	BSR T0.2 (R1.6)	
E24	4856310300	EYE LET	BSR T0.2 (R1.6)	
E25	4856310300	EYE LET	BSR T0.2 (R1.6)	
E26	4856310300	EYE LET	BSR T0.2 (R1.6)	
E27	4856310300	EYE LET	BSR T0.2 (R1.6)	
E28	4856310300	EYE LET	BSR T0.2 (R1.6)	
E29	4856310300	EYE LET	BSR T0.2 (R1.6)	
E30	4856310600	EYE LET	BSR T0.2 (R2.3)	
E31	4856310600	EYE LET	BSR T0.2 (R2.3)	
E32	4856310600	EYE LET	BSR T0.2 (R2.3)	
E33	4856310600	EYE LET	BSR T0.2 (R2.3)	
E34	4856310600	EYE LET	BSR T0.2 (R2.3)	
E35	4856310600	EYE LET	BSR T0.2 (R2.3)	
E36	4856310600	EYE LET	BSR T0.2 (R2.3)	
E37	4856310600	EYE LET	BSR T0.2 (R2.3)	
E38	4856310600	EYE LET	BSR T0.2 (R2.3)	
E41	4856310600	EYE LET	BSR T0.2 (R2.3)	
E42	4856310600	EYE LET	BSR T0.2 (R2.3)	
E43	4856310600	EYE LET	BSR T0.2 (R2.3)	
E44	4856310600	EYE LET	BSR T0.2 (R2.3)	
E45	4856310600	EYE LET	BSR T0.2 (R2.3)	
E46	4856310600	EYE LET	BSR T0.2 (R2.3)	
E47	4856310600	EYE LET	BSR T0.2 (R2.3)	
E48	4856310600	EYE LET	BSR T0.2 (R2.3)	
E49	4856310600	EYE LET	BSR T0.2 (R2.3)	
E50	4856310600	EYE LET	BSR T0.2 (R2.3)	
E51	4856310600	EYE LET	BSR T0.2 (R2.3)	
E52	4856310600	EYE LET	BSR T0.2 (R2.3)	
E53	4856310600	EYE LET	BSR T0.2 (R2.3)	
E54	4856310600	EYE LET	BSR T0.2 (R2.3)	
E55	4856310600	EYE LET	BSR T0.2 (R2.3)	
E56	4856310600	EYE LET	BSR T0.2 (R2.3)	
E57	4856310600	EYE LET	BSR T0.2 (R2.3)	
E58	4856310600	EYE LET	BSR T0.2 (R2.3)	
E70	4856310300	EYE LET	BSR T0.2 (R1.6)	
P601	485923172S	CONN WAFER	YW025-04 (STICK)	
P602	485923202S	CONN WAFER	YW025-07 (STICK)	
P801A	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
P801B	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
P803A	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
P803B	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
P902	485923182S	CONN WAFER	YW025-05 (STICK)	
R398	RS02Z129JS	R M-OXIDE FILM	2W 1.2 OHM J SMALL	
R399	RS02Z120JS	R M-OXIDE FILM	2W 12 OHM J SMALL	
R406	RS02Z471JS	R M-OXIDE FILM	2W 470 OHM J SMALL	
R806	RS02Z228JS	R M-OXIDE FILM	2W 0.22 OHM J SMALL	
R819	RS02Z568JS	R M-OXIDE FILM	2W 0.56 OHM J SMALL	
Z2200	PTPWJRG100	PCB POWER RADIAL AS	DUB-2850DT	
C305	CEXF1E221V	C ELECTRO	25V RSS 220MF (8X11.5) TP	
C313	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C320	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C350	CMXM2A473J	C MYLAR	100V 0.047MF J (TP)	
C351	CMXM2A473J	C MYLAR	100V 0.047MF J (TP)	
C370	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)	
C401	CEXF1H101V	C ELECTRO	50V RSS 100MF (8X11.5) TP	
C414	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C418	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C420	CCXB2H222K	C CERA	500V B 2200PF K (TAPPING)	
C421	CCXF1H473Z	C CERA	50V F 0.047MF Z (TAPPING)	
C431	CMXB2G472J	C MYLAR	400V EU 4700PF J (TP)	
C602	CEXF1E470V	C ELECTRO	RSS 25V 47MF 5X11 P5.0 TA	
C603	CEXF1H228V	C ELECTRO	50V RSS 0.22MF (5X11) TP	
C625	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C660	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C661	CMXM2A224J	C MYLAR	100V 0.22MF J	
C662	CMXM2A224J	C MYLAR	100V 0.22MF J	
C665	CCXB1H472K	C CERA	50V B 4700PF K (TAPPING)	
C666	CBXF1H104Z	C CERA SEMI	50V F 0.1MF Z (TAPPING)	
C667	CCXB1H472K	C CERA	50V B 4700PF K (TAPPING)	
C668	CMXM2A224J	C MYLAR	100V 0.22MF J	
C669	CMXM2A224J	C MYLAR	100V 0.22MF J	
C701	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C804	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C807	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C810	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C811	CMXM2A473J	C MYLAR	100V 0.047MF J (TP)	
C820	CCXR3A471K	C CERA	1KV R 470PF K 125C	
C821	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C822	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C830	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C831	CEXF1H330V	C ELECTRO	50V RSS 33MF (6.3X11) TP	
C833	CCXB1H821K	C CERA	50V B 820PF K (TAPPING)	
C834	CCXF1H103Z	C CERA	50V F 0.01MF Z (TAPPING)	
C835	CEXF1E470V	C ELECTRO	RSS 25V 47MF 5X11 P5.0 TA	
C844	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C862	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C863	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C864	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C866	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C888	CEXF1H470V	C ELECTRO	50V RSS 47MF (6.3X11) TP	
F801A	4857415001	CLIP FUSE	PFC5000-0702	
F801B	4857415001	CLIP FUSE	PFC5000-0702	
L802	58C0000142	COIL CHOKE	ELC 0809 940K	
Q402	T2SD1207T	TR	2SD1207-T (TAPPING)	
Q601	T2SC5343Y	TR	2SC5343Y	
Q602	T2SA1980Y	TR	2SA1980Y	
Q701	T2SC5343Y	TR	2SC5343Y	
Q702	T2SA1980Y	TR	2SA1980Y	
Q807	TKSA1013Y	TR	KSA1013Y (TP)	
Q809	T2SC5343Y	TR	2SC5343Y	
Q810	T2SC5343Y	TR	2SC5343Y	
Q812	TKTC3203Y	TR	KTC3203-Y	
R415	RN02B102JS	R METAL FILM	2W 1K OHM J SMALL	
R450	RN02B473JS	R METAL FILM	2W 47K OHM J SMALL	
R451	RN02B473JS	R METAL FILM	2W 47K OHM J SMALL	
R822	RN02B360JS	R METAL FILM	2W 36 OHM J SMALL	
R824	RN02B360JS	R METAL FILM	2W 36 OHM J SMALL	
Z2200	PTPWJAG100	PCB POWER AXIAL AS	DUB-2850DT	
A001	4859816311	PCB POWER	330X246 G1B	
C809	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
D313	D1N4937G—	DIODE	1N4937G (TAPPING)	
D405	D1N4937G—	DIODE	1N4937G (TAPPING)	
D407	DRGP15J—	DIODE	RG15J DO-204AC 600V 1.5A	
D408	DRGP15J—	DIODE	RG15J DO-204AC 600V 1.5A	
D410	D1N4004S—	DIODE	1N4004S	
D411	D1N4004S—	DIODE	1N4004S	
D414	D1N4004S—	DIODE	1N4004S	
D450	D1N4937G—	DIODE	1N4937G (TAPPING)	
D520	D1N4148—	DIODE	1N4148 (TAPPING)	
D521	D1N4148—	DIODE	1N4148 (TAPPING)	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
D601	D1N4148—	DIODE	1N4148 (TAPPING)	
D602	D1N4148—	DIODE	1N4148 (TAPPING)	
D603	D1N4148—	DIODE	1N4148 (TAPPING)	
D701	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
D801	DLT2A05G—	DIODE	LT2A05G (TP)	
D802	DLT2A05G—	DIODE	LT2A05G (TP)	
D803	DLT2A05G—	DIODE	LT2A05G (TP)	
D804	DLT2A05G—	DIODE	LT2A05G (TP)	
D805	D1N4148—	DIODE	1N4148 (TAPPING)	
D806	D1N4937G—	DIODE	1N4937G (TAPPING)	
D807	D1N4937G—	DIODE	1N4937G (TAPPING)	
D808	DUZ6R8BM—	DIODE ZENER	UZ-6.8BM	
D811	DUZ5R1BM—	DIODE ZENER	UZ-5.1BM	
D824	DUZ5R1BM—	DIODE ZENER	UZ-5.1BM	
D825	D1N4148—	DIODE	1N4148 (TAPPING)	
D826	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
D830	D1N4937G—	DIODE	1N4937G (TAPPING)	
D831	D1N4937G—	DIODE	1N4937G (TAPPING)	
J003	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J004	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J005	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J006	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J007	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J008	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J009	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J010	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J011	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J012	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J013	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J014	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J015	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J016	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J017	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J018	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J019	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J020	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J021	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J022	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J023	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J024	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J025	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J026	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J027	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J028	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J029	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J030	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J031	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J032	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J033	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J034	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J035	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J036	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J037	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J038	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J039	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J040	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J041	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J042	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J043	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J044	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J045	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J046	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J047	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J048	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J049	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J050	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J051	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J052	85801060GY	WIRE COPPER	1/0.6 TIN COATING	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
J055	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J056	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J058	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J059	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J060	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J061	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J062	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J063	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J064	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J065	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J066	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J067	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J068	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J069	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J070	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J071	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J072	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J073	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J074	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J076	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J077	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J078	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
J079	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
L350	5CPZ109M04	COIL PEAKING	1UH 10.5MM M (LAL04TB)	
L351	5CPZ109M04	COIL PEAKING	1UH 10.5MM M (LAL04TB)	
L650	5MC0000100	COIL BEAD	HC-3550	
L701	5CPZ560K02	COIL PEAKING	56UH K (AXIAL 3.5MM)	
L801	5MC0000100	COIL BEAD	HC-3550	
L803	5MC0000100	COIL BEAD	HC-3550	
R310	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R311	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R331	RD-2Z201J-	R CARBON FILM	1/2 200 OHM J	
R340	RD-4Z473J-	R CARBON FILM	1/4 47K OHM J	
R350	RN-AZ2201F	R METAL FILM	1/6 2.2K OHM F	
R351	RN-AZ2201F	R METAL FILM	1/6 2.2K OHM F	
R370	RD-4Z159J-	R CARBON FILM	1/4 1.5 OHM J	
R394	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R395	RD-4Z394J-	R CARBON FILM	1/4 390K OHM J	
R396	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R397	RD-AZ823J-	R CARBON FILM	1/6 82K OHM J	
R400	RD-4Z204J-	R CARBON FILM	1/4 200K OHM J	
R401	RD-4Z272J-	R CARBON FILM	1/4 2.7K OHM J	
R402	RD-4Z220J-	R CARBON FILM	1/4 22 OHM J	
R403	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R404	RD-4Z399J-	R CARBON FILM	1/4 3.9 OHM J	
R405	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R407	RD-4Z182J-	R CARBON FILM	1/4 1.8K OHM J	
R420	RD-4Z103J-	R CARBON FILM	1/4 10K OHM J	
R422	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R423	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R601	RD-AZ152J-	R CARBON FILM	1/6 1.5K OHM J	
R602	RD-AZ104J-	R CARBON FILM	1/6 100K OHM J	
R610	RD-AZ432J-	R CARBON FILM	1/6 4.3K OHM J	
R611	RD-AZ563J-	R CARBON FILM	1/6 56K OHM J	
R612	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R650	RD-AZ363J-	R CARBON FILM	1/6 36K OHM J	
R660	RD-AZ363J-	R CARBON FILM	1/6 36K OHM J	
R661	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R662	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	
R701	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R702	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
R703	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R704	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R705	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R802	RC-2Z824KP	R CARBON COMP	1/2 820K OHM K	
R804	RD-2Z100J-	R CARBON FILM	1/2 10 OHM J	
R805	RD-2Z104J-	R CARBON FILM	1/2 100K OHM J	
R807	RD-4Z221J-	R CARBON FILM	1/4 220 OHM J	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R808	RD-4Z182J-	R CARBON FILM	1/4 1.8K OHM J	
R809	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R810	RD-4Z220J-	R CARBON FILM	1/4 22 OHM J	
R811	RC-2Z565KP	R CARBON COMP	1/2 5.6M OHM K	
R817	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R820	RD-4Z363J-	R CARBON FILM	1/4 36K OHM J	
R821	RD-AZ563J-	R CARBON FILM	1/6 56K OHM J	
R823	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R827	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R828	RD-4Z153J-	R CARBON FILM	1/4 15K OHM J	
R829	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R830	RD-AZ101J-	R CARBON FILM	1/6 10 OHM J	
R831	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R832	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R833	RD-2Z105J-	R CARBON FILM	1/2 1M OHM J	
R834	RD-4Z470J-	R CARBON FILM	1/4 47 OHM J	
R840	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R841	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R843	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R850	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R870	RD-2Z181J-	R CARBON FILM	1/2 180 OHM J	
ZZ230	PTPNPWG100	PANEL AS	DUB-2850DT	
M231	4852332311	PANEL AV	HIPS GY	
M231A	7172401612	SCREW TAPPTITE	TT2 TRS 4X16 MFZN BK	
M491	4854962911	BUTTON CH	HIPS GY	
M491A	7178301211	SCREW TAPTITE	TT2 WAS 3X12 MFZN	
ZZ240	PTUNMSG100	PCB UNION MANUAL AS	DUB-2850DT	
JPA01	4859105240	JACK PHONE	LGT1516-0100	
JPA03	4859105450	JACK PIN BOARD	YSC03P-4120-9S	
JPA07	4859105340	JACK S-VHS	DSW-10 (STRAIGHT)	
PA505	4850710S24	CONNECTOR	YH025-10+YBNH250-10+ULW=600	
PA603	4850707S03	CONNECTOR	YH025-07+YST025+ULW=600	
ZZ200	PTUNJOG100	PCB UNION RHU AS	DUB-2850DT	
ZZ200	PTUNJBG100	PCB UNION M-10 AS	DUB-2850DT	
ZZ200	PTUNJRG100	PCB UNION RADIAL AS	DUB-2850DT	
CH01	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
CH04	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
RH05	RN01B300JS	R METAL FILM	1W 30 OHM J SMALL	
RH07	RD-2Z300J	C CARBON FILM	1/2 30 OHM J	
SW705	5S50101Z90	SW TACT	THVV502GDA	
SW706	5S50101Z90	SW TACT	THVV502GDA	
SW707	5S50101Z90	SW TACT	THVV502GDA	
SW708	5S50101Z90	SW TACT	THVV502GDA	
SW709	5S50101Z90	SW TACT	THVV502GDA	
Z601	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z602	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z603	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z604	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZZ200	PTUNJAG100	PCB UNION AXIAL AS	DUB-2850DT	
A001	4859833514	PCB CONTROL	246X246 G1B	
DC01	DUZ5R6BM-	DIODE ZENER	UZ-5.6BM	
DC02	DUZ5R6BM-	DIODE ZENER	UZ-5.6BM	
DC03	DUZ5R6BM-	DIODE ZENER	UZ-5.6BM	
DC04	DUZ5R6BM-	DIODE ZENER	UZ-5.6BM	
DC05	DUZ5R6BM-	DIODE ZENER	UZ-5.6BM	
R730	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R731	RD-AZ331J-	R CARBON FILM	1/6 330 OHM J	
R732	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R733	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
RC13	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
ZZ250	PTCPMSG100	PCB CRT MANUAL AS	DUB-2850DT	
C903	CMXME104K	C MYLAR	250V 0.1MF K	
C925	CCYB3D102K	C CERA	2KV B 1000PF K	
I901	PTFSW1100	HEAT SINK ASSY	1DA6108AJF + 7174300811	
00001	1DA6108AJF	IC VIDEO AMP	TDA6108AJF	
0000A	4857031100	HEAT SINK	A1050P-H24 T2.0	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
P903	4859238620	CONN WAFER	YPW500-02	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
PA901	4850706S02	CONNECTOR	YH025-06+YBNH025-06+ULW=400	
PA902	4850705S04	CONNECTOR	YH025-05+YBNH250+ULW=400	
SCT1	4859303530	SOCKET CRT	PCS629-03C	
ZZ200	PTCPJOG100	PCB CRT ODD SHAPE AS	DUB-2850DT	
C904	CEXF2E479V	C ELECTRO	250V RSS 4.7MF (10X16)TP	
C905	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
ZZ200	PTCPJBG100	PCB CRT M-10 AS	DUB-2850DT	
R919	RS02Z209JS	R M-OXIDE FILM	2W 2 OHM J SMALL	
R920	RS02Z189JS	R M-OXIDE FILM	2W 1.8 OHM J SMALL	
ZZ200	PTCPJRG100	PCB CRT RADIAL AS	DUB-2850DT	
C951	CCXB1H561K	C CERA	50V B 560PF K (TAPPING)	
G921	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV) TAP	
G922	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV) TAP	
G923	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV) TAP	
G924	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV) TAP	
G925	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV) TAP	
ZZ200	PTCPJAG100	PCB CRT AXIAL AS	DUB-2850DT	
A001	4859830913	PCB CRT	246X246 G1B	
D905	D1N4004S-	DIODE	1N4004S	
D906	D1N4004S-	DIODE	1N4004S	
D907	D1N4004S-	DIODE	1N4004S	
D908	DLT2A05G-	DIODE	LT2A05G (TP)	
D909	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
D910	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
D911	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
JW1	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R901	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R902	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R903	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R905	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R906	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R907	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R909	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
R910	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
R911	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
R912	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
R913	RD-2Z105J-	R CARBON FILM	1/2 1M OHM J	
R914	RD-2Z102J-	R CARBON FILM	1/2 1K OHM J	
R921	RD-2Z100J-	R CARBON FILM	1/2 10 OHM J	
R951	RD-AZ561J-	R CARBON FILM	1/6 560 OHM J	
ZZ290	PTMPMSG100	PCB MAIN MANUAL AS	DUB-2850DT	
I502	124LC16B1B	IC MEMORY	24LC16B1B	
ICD07	14C64WBN6-	IC EEPROM	M24C64-WBN6	
ICD16	PTU2SW6902	HEAT SINK ASSY	1K1A78R33A + 7174300811	
00001	1K1A78R33A	IC REGULATOR	K1A78R33AP1 3.3V 1.0A TO-220	
0000A	4857026902	HEAT SINK	AL EX BK	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
ICD17	1K78R018P1	IC REGULATOR	K1A78R018P1	
ICD18	PTX2SW6902	HEAT SINK ASSY	1K1A317P1- + 7174300811	
00001	1K1A317P1-	IC REGULATOR	K1A317P1	
0000A	4857026902	HEAT SINK	AL EX BK	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
ICD19	PTM2SW6902	HEAT SINK ASSY	1K78R05- + 7174300811	
00001	1K78R05-	IC REGULATOR	K1A78R05API	
0000A	4857026902	HEAT SINK	AL EX BK	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
ICD20	1K78R05-	IC REGULATOR	K1A78R05API	
JP03	4859111450	JACK PIN BOARD	YSC03P-5120-L	
JPA01	4859101480	JACK SCART	DSAM-0020	
LD202	58C0000120	COIL CHOKE	CH-100Q	
LD211	58C0000120	COIL CHOKE	CH-100Q	
LD216	58C0000120	COIL CHOKE	CH-100Q	
LD217	58C0000120	COIL CHOKE	CH-100Q	
P505	4859235320	CONN WAFER	YW025-10	
PA501	4850715N09	CONNECTOR	YH025-15+YBNH250-15+ULW=100	
PA502	4950712005	CONNECTOR	YH025-12+YST250+ULW=100	
PD107	4859201260	CONN D-SUB	A02-DB9F-NS	
PI01	4859200440	CONN PCMCIA	PC68PRA5513XZ	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
SW100	5S50101Z90	SW TACT	THV502GDA	
UD001	4859700550	TUNER DIGITAL	TD1316S/VP (VERT/DIN)	
X501	5XJ24R576E	CRYSTAL QUARTZ	HC-49/S 24.576MHZ 30PPM	
Z101	5PK3953M-	FILTER SAW	K3953M	
Z102	5PK9650M-	FILTER SAW	K9650M	
Z200	PTMPJ2G100	PCB MAIN CHIP MOUNT B.AS	DUB-2850DT	
CC503	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC504	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC511	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC512	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC514	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC518	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC521	HCBK222KBA	C CHIP CERA	50V X7R 2200PF K 1608	
CC522	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC523	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC528	HCBK222KBA	C CHIP CERA	50V X7R 0.022MF K 1608	
CC532	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC533	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC541	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC544	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC546	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC555	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC556	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC558	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC559	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC568	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC575	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC578	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC579	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC589	HCBK472KBA	C CHIP CERA	50V X7R 4700PF K 1608	
CC590	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCA02	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCA04	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCA05	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCA06	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCD01	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD02	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD03	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD04	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD05	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD06	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD07	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD08	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD09	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD10	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD11	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD12	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD13	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD14	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD18	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD19	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD20	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD22	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD23	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD24	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD25	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD26	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD27	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD28	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD54	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD55	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD58	HCQK100JBA	C CHIP CERA	50V CH 10PF J 1608	
CCD61	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD62	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD63	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD65	HCQK330JBA	C CHIP CERA	50V CH 33PF J 1608	
CCD66	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD67	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
CCD68	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD69	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD70	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD76	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD77	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE06	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE07	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE08	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE09	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE10	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CCE15	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE17	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE28	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE29	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE30	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
QC501	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QC502	T2SA1037KB	TR CHIP	2SA1037AKT146-R	
QC503	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QC504	T2SA1037KB	TR CHIP	2SA1037AKT146-R	
RC501	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RC502	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RC503	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RC517	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC518	HRFT101JBA	R CHIP	1/10 10K OHM J 1608	
RC560	HRFT222JBA	R CHIP	1/10 2.2K OHM J 1608	
RC568	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC569	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC574	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC575	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC582	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC583	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC584	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC585	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC586	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC587	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC588	HRFT102FBA	R CHIP	1/10 1K OHM F 1608	
RCA07	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RCA12	HRFT102FBA	R CHIP	1/10 1K OHM F 1608	
RCA13	HRFT222JBA	R CHIP	1/10 2.2K OHM J 1608	
RCA14	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCA15	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA18	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RCA23	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCA24	HRFT222JBA	R CHIP	1/10 2.2K OHM J 1608	
RCA25	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RCD15	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD17	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD22	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD28	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD31	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD46	HRFT102FBA	R CHIP	1/10 1K OHM F 1608	
RCD48	HRFT122JBA	R CHIP	1/10 1.2K OHM J 1608	
RCD49	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD65	HRFT471JBA	R CHIP	1/10 470 OHM J 1608	
RCD66	HRFT103FBA	R CHIP	1/10 10K OHM F 1608	
RCD88	HRFT104JBA	R CHIP	1/10 100K OHM J 1608	
RCD92	HRFT104JBA	R CHIP	1/10 100K OHM J 1608	
RCE03	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE56	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE59	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE60	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE61	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE62	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE63	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE64	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE67	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE71	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE72	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
RCE73	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE74	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE76	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE78	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE79	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE80	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE83	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE84	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE85	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE86	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE87	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE88	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE89	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE90	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE91	HRFT470JBA	R CHIP	1/10 47 OHM J 1608	
RCE96	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE97	HRFT472JBA	R CHIP	1/10 4.7K OHM J 1608	
RCE99	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCX12	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCX13	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCX47	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCX59	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX62	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
ZZ200	PTMPJ0G100	PCB MAIN (RHU) AS	DUB-2850DT	
CD211	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
CD214	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
CD216	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
CD217	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
CD218	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
ZZ200	PTMPJBG100	PCB MAIN M-10 AS	DUB-2850DT	
P503	485923182S	CONN WAFER	YW025-05 (STICK)	
P506	485923162S	CONN WAFER	YW025-03 (STICK)	
P701	485923172S	CONN WAFER	YW025-04 (STICK)	
P901	485923192S	CONN WAFER	YW025-06 (STICK)	
RCX14	RS02Z100JS	R M-OXIDE FILM	2W 10 OHM J SMALL	
RCX15	RS02Z399JS	R M-OXIDE FILM	2W 3.9 OHM J SMALL	
RCX16	RS02Z479JS	R M-OXIDE FILM	2W 4.7 OHM J SMALL	
RCX17	RS02Z689JS	R M-OXIDE FILM	2W 6.8 OHM J SMALL	
RCX21	RS02Z479JS	R M-OXIDE FILM	2W 4.7 OHM J SMALL	
RCX22	RS02Z479JS	R M-OXIDE FILM	2W 4.7 OHM J SMALL	
ZZ200	PTMPJRG100	PCB MAIN RADIAL AS	DUB-2850DT	
C102	CEXF1E470V	C ELECTRO	RSS 25V 47MF 5X11 P5.0 TA	
C106	CEXF1H470V	C ELECTRO	50V RSS 47MF (6.3X11) TP	
C122	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C501	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
C502	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
C505	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C507	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C508	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
C509	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C510	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C513	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C515	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C516	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C517	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C519	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C520	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C524	CMXM2A682J	C MYLAR	100V 6800PF J (TP)	
C525	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C526	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C527	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C529	CMXL1J154J	C MYLAR	63V MEU 0.15MF J	
C534	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C535	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C536	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C537	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C538	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C539	CMXM2A332J	C MYLAR	100V 3300PF J (TP)	
C540	CMXE2A473J	C MYLAR	100V PU 0.047MF J	
C542	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C543	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C545	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C547	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C548	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C549	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C552	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C553	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C554	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C560	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C561	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C563	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C567	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C569	CEXF1E470V	C ELECTRO	RSS 25V 47MF 5X11 P5.0 TA	
C574	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C576	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C577	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C581	CMXL1J224J	C MYLAR	63V MEU 0.22MF J (TP)	
C593	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C594	CMXL1J474J	C MYLAR	63V MEU 0.47MF J	
C595	CMXL1J105J	C MYLAR	63V MEU 1MF J	
CD101	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD102	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD103	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD104	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD105	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD106	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD107	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD108	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD110	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD111	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD200	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
CD201	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
CD202	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
CD203	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
CD204	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
CD205	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
CD206	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
CD207	CEXF1C470V	C ELECTRO	16V RSS 47MF (5X11) TP	
CD208	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
CD209	CEXF1C471V	C ELECTRO	16V RSS 470MF (8X12)TP	
CD210	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
CD212	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
CD213	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
CD215	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
CD301	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD302	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD303	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
CD304	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
ICD06	1K1A7029AP	IC RESET	KIA7029AP	
Q513	T2SA1980Y-	TR	2SA1980Y	
Q514	TH2N7000-	FET	H2N7000	
Q515	TH2N7000-	FET	H2N7000	
Q813	T2SA1980Y-	TR	2SA1980Y	
Q814	T2SC5343Y-	TR	2SC5343Y	
Q815	T2SA1980Y-	TR	2SA1980Y	
Q816	T2SC5343Y-	TR	2SC5343Y	
Z605	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z606	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z607	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z608	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z609	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z610	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z611	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z612	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
Z614	5PXF1B471M	FILTER EMI	CFI 06 B 1H 470PF	
ZZ200	PTMPJAG100	PCB MAIN AXIAL AS	DUB-2850DT	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C564	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
C565	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
C566	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
C580	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
C583	CCZB1H103K	C CERA	HIKB 50V 0.01MF K AXIAL	
D101	D1N4148—	DIODE	1N4148 (TAPPING)	
D102	DBA282—	DIODE	BA282	
D501	D1N4148—	DIODE	1N4148 (TAPPING)	
D503	DUZ3R9B—	DIODE ZENER	UZ-3.9B	
D504	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
D522	DUZ3R9B—	DIODE ZENER	UZ-3.9B	
D523	DUZ3R9B—	DIODE ZENER	UZ-3.9B	
DA01	D1N4148—	DIODE	1N4148 (TAPPING)	
DA02	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA03	D1N4148—	DIODE	1N4148 (TAPPING)	
DA04	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA06	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA08	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA09	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA10	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA11	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA13	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA14	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA15	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA20	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DD101	DUZ5R1BM—	DIODE ZENER	UZ-5.1BM	
L101	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L505	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L506	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L507	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L508	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L509	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L510	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L512	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L513	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L514	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L515	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L516	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L517	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L518	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L519	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
L523	5CPZ479K02	COIL PEAKING	4.7UH K (AXIAL 3.5MM)	
LA02	5MC0000100	COIL BEAD	HC-3550	
LD101	5MC0000100	COIL BEAD	HC-3550	
LD102	5MC0000100	COIL BEAD	HC-3550	
LD103	5MC0000100	COIL BEAD	HC-3550	
LD104	5MC0000100	COIL BEAD	HC-3550	
LD105	5MC0000100	COIL BEAD	HC-3550	
LD106	5MC0000100	COIL BEAD	HC-3550	
LD108	5MC0000100	COIL BEAD	HC-3550	
LD110	5MC0000100	COIL BEAD	HC-3550	
LD204	5MC0000100	COIL BEAD	HC-3550	
LD205	5MC0000100	COIL BEAD	HC-3550	
LD206	5CPZ229M02	COIL PEAKING	2.2UH M (AXIAL 3.5MM)	
LD208	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
LD209	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
LD212	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
LD213	85801060GY	WIRE COPPER	1/0.6 TIN COATING	
LD214	5MC0000100	COIL BEAD	HC-3550	
LD215	5MC0000100	COIL BEAD	HC-3550	
LD301	5MC0000100	COIL BEAD	HC-3550	
LD302	5MC0000100	COIL BEAD	HC-3550	
LD303	5MC0000100	COIL BEAD	HC-3550	
LD304	5MC0000100	COIL BEAD	HC-3550	
LD305	5MC0000100	COIL BEAD	HC-3550	
R500	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R504	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R505	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R506	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R507	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R508	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R510	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R511	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R512	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R513	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R514	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R515	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R516	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R519	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R527	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R528	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R529	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R538	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R539	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R540	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R541	RN-AZ3902F	R METAL FILM	1/6 39K OHM F	
R551	RD-AZ823J-	R CARBON FILM	1/6 82K OHM J	
R579	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R580	RD-AZ123J-	R CARBON FILM	1/6 12K OHM J	
R581	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R589	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R590	RD-AZ334J-	R CARBON FILM	1/6 330K OHM J	
R594	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R595	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R598	RD-AZ182J-	R CARBON FILM	1/6 1.8K OHM J	
R599	RD-AZ224J-	R CARBON FILM	1/6 220K OHM J	
R720	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R812	RD-AZ473J-	R CARBON FILM	1/4 47K OHM J	
R813	RD-AZ473J-	R CARBON FILM	1/4 47K OHM J	
R814	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R815	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
RA05	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
RA16	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA17	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
RA29	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
ZZ200	PTMP J1G100	PCB MAIN CHIP MOUNT A AS	DUB-2850DT	
A001	4859811693	PCB MAIN	246X263.5 G2V	
CC103	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC104	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC123	HCFK103ZBA	C CHIP CERA	50V Y5V 0.01MF Z 1608	
CC530	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CC531	HCFK103ZBA	C CHIP CERA	50V Y5V 0.01MF Z 1608	
CC550	HCFK103ZBA	C CHIP CERA	50V Y5V 0.01MF Z 1608	
CC551	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC557	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC587	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CC591	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CC592	HCFK103ZBA	C CHIP CERA	50V Y5V 0.01MF Z 1608	
CCA01	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCA03	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCA10	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CCA28	HCBK102KBA	C CHIP CERA	50V X7R 1000PF K 1608	
CCD16	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD17	HCBK332KBA	C CHIP CERA	50V X7R 3300PF K 1608	
CCD21	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD32	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD33	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD34	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD38	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD39	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD40	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD41	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD42	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD49	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD50	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD53	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
CCD56	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD57	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD60	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD64	HCQK330JBA	C CHIP CERA	50V CH 33PF J 1608	
CCD71	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD72	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD73	HCQK391JBA	C CHIP CERA	50V CH 390PF J 1608	
CCD86	HCFK105ZBA	C CHIP CERA	50V Y5V 1MF Z 1608	
CCD87	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCD88	HCBK472KBA	C CHIP CERA	50V X7R 4700PF K 1608	
CCD89	HCFK105ZBA	C CHIP CERA	50V Y5V 1MF Z 1608	
CCD90	HCFK105ZBA	C CHIP CERA	50V Y5V 1MF Z 1608	
CCD91	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCD92	HCBK472KBA	C CHIP CERA	50V X7R 4700PF K 1608	
CCD93	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCD94	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE03	HCQK220JBA	C CHIP CERA	50V CH 22PF J 1608	
CCE04	HCQK220JBA	C CHIP CERA	50V CH 22PF J 1608	
CCE05	HCFK105ZBA	C CHIP CERA	50V Y5V 1MF Z 1608	
CCE11	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE12	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE13	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE14	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCE16	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE18	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE19	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE20	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE21	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE22	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE23	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE24	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE25	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE26	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
CCE27	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCE40	HCQK220JBA	C CHIP CERA	50V CH 22PF J 1608	
CCE41	HCQK101JBA	C CHIP CERA	50V CH 100PF J 1608	
CCE77	HCFK104ZBA	C CHIP CERA	50V Y5V 0.1MF Z 1608	
I501	121HN1F01Q	IC CHIP MICOM FLASH	TDA12021H/NIF01	
ICD01	1NX8314HSQ	IC CHIP MEDIA PROCESOR	PNX8314HS	
ICD02	1S281632DD	IC CHIP SDRAM	K4S281632F-UC75	
ICD04	1320ET70NQ	IC CHIP FLASH MEMORY	M29W320ET70N6E	
ICD05	1ST232CD-Q	IC CHIP DRIVE	ST232CD	
ICD10	1HEF4053BD	IC CHIP	HEF4053B	
ICD11	1C1GU04GWD	IC CHIP INVERTER	74AHC1GU04GW	
ICD12	1C1GU04GWD	IC CHIP INVERTER	74AHC1GU04GW	
ICD13	110046AHTD	IC CHIP CHANNEL DECODER	TDA10046AHT	
ICD15	1A1334BTS	IC CHIP AUDIO DAC	UDA1334BTS	
ICD30	1C1MAXSP20Q	IC CHIP	CIMAX-SP2	
ICD31	1ST890BDR	IC CHIP CURRENT SWITCH	ST890BDR	
ICD32	1VC573ADB	IC CHIP LATCH	74LVC573ADB	
ICD33	1VC573ADB	IC CHIP LATCH	74LVC573ADB	
ICD34	1C245APW-D	IC CHIP TRANSCEIVER	74LVC245APW	
QC120	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QC508	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QD102	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QD200	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QD201	T2SA1037KB	TR CHIP	2SA1037AKT146-R	
QD202	T2SC2412KB	TR CHIP	2SC2412K-T146-BR	
QD203	T2SA1037KB	TR CHIP	2SA1037AKT146-R	
RC103	HRFT123JBA	R CHIP	1/10 12K OHM J 1608	
RC104	HRFT683JBA	R CHIP	1/10 68K OHM J 1608	
RC105	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC114	HRFT473JBA	R CHIP	1/10 47K OHM J 1608	
RC115	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC120	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC131	HRFT472JBA	R CHIP	1/10 4.7K OHM J 1608	
RC537	HRFT183JBA	R CHIP	1/10 18K OHM J 1608	
RC542	HRFT682JBA	R CHIP	1/10 6.8K OHM J 1608	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
RC543	HRFT222JBA	R CHIP	1/10 2.2K OHM J 1608	
RC544	HRFT222JBA	R CHIP	1/10 2.2K OHM J 1608	
RC545	HRFT473JBA	R CHIP	1/10 47K OHM J 1608	
RC546	HRFT681JBA	R CHIP	1/10 680 OHM J 1608	
RC547	HRFT563JBA	R CHIP	1/10 56K OHM J 1608	
RC552	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC553	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC554	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC555	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC556	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC557	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC558	HRFT152JBA	R CHIP	1/10 1.5K OHM J 1608	
RC559	HRFT222JBA	R CHIP	1/10 2.2K OHM J 1608	
RC561	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC562	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC563	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC564	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RC565	HRFT154JBA	R CHIP	1/10 150K OHM J 1608	
RC566	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC567	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC571	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RC572	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC573	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC592	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RC593	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCA02	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCA03	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCA04	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCA06	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA08	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA09	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA10	HRFT680JBA	R CHIP	1/10 68 OHM J 1608	
RCA11	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA16	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA19	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCA32	HRFT680JBA	R CHIP	1/10 68 OHM J 1608	
RCA35	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCD02	HRFT103JBA	R CHIP	1/10 100 OHM J 1608	
RCD03	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD05	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD06	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD07	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD08	HRFT102FBA	R CHIP	1/10 1K OHM J 1608	
RCD09	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD10	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD11	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD12	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD13	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD14	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD20	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD21	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD23	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCD24	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCD25	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCD26	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCD27	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD29	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD30	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD32	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCD33	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCD34	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCD35	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCD45	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RCD50	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD51	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RCD52	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD53	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD59	HRFT102FBA	R CHIP	1/10 1K OHM J 1608	

CP-780 Service Manual

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
RCD60	HRFT102FBA	R CHIP	1/10 1K OHM F 1608	
RCD61	HRFT102FBA	R CHIP	1/10 1K OHM F 1608	
RCD62	HRFT181JBA	R CHIP	1/10 180 OHM J 1608	
RCD63	HRFT680JBA	R CHIP	1/10 68 OHM J 1608	
RCD67	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCD68	HRFT332JBA	R CHIP	1/10 3.3K OHM J 1608	
RCD74	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD80	HRFT472JBA	R CHIP	1/10 4.7K OHM J 1608	
RCD82	HRFT684JBA	R CHIP	1/10 680K OHM J 1608	
RCD83	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCD84	HRFT220JBA	R CHIP	1/10 22 OHM J 1608	
RCD85	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RCD86	HRFT472JBA	R CHIP	1/10 4.7K OHM J 1608	
RCD87	HRFT224JBA	R CHIP	1/10 220K OHM J 1608	
RCD89	HRFT472JBA	R CHIP	1/10 4.7K OHM J 1608	
RCD90	HRFT104JBA	R CHIP	1/10 100K OHM J 1608	
RCD93	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD94	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD95	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD96	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCD97	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCD98	HRFT272JBA	R CHIP	1/10 2.7K OHM J 1608	
RCD99	HRFT272JBA	R CHIP	1/10 2.7K OHM J 1608	
RCE01	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCE02	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCE06	HRFT331JBA	R CHIP	1/10 330 OHM J 1608	
RCE07	HRFT391JBA	R CHIP	1/10 390 OHM J 1608	
RCE08	HRFT684JBA	R CHIP	1/10 680K OHM J 1608	
RCE09	HRFT224JBA	R CHIP	1/10 220K OHM J 1608	
RCE10	HRFT331JBA	R CHIP	1/10 330 OHM J 1608	
RCE11	HRFT331JBA	R CHIP	1/10 330 OHM J 1608	
RCE12	HRFT221JBA	R CHIP	1/10 220 OHM J 1608	
RCE13	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCE14	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCE15	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCE16	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCE17	HRFT360JBA	R CHIP	1/10 36 OHM J 1608	
RCE19	HRFT360JBA	R CHIP	1/10 36 OHM J 1608	
RCE20	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RCE21	HRFT683JBA	R CHIP	1/10 68K OHM J 1608	
RCE22	HRFT821JBA	R CHIP	1/10 820 OHM J 1608	
RCE23	HRFT152JBA	R CHIP	1/10 1.5K OHM J 1608	
RCE24	HRFT333JBA	R CHIP	1/10 33K OHM J 1608	
RCE25	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RCE26	HRFT683JBA	R CHIP	1/10 68K OHM J 1608	
RCE27	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RCE28	HRFT821JBA	R CHIP	1/10 820 OHM J 1608	
RCE29	HRFT333JBA	R CHIP	1/10 33K OHM J 1608	
RCE30	HRFT821JBA	R CHIP	1/10 820 OHM J 1608	
RCE31	HRFT102JBA	R CHIP	1/10 1K OHM J 1608	
RCE32	HRFT152JBA	R CHIP	1/10 1.5K OHM J 1608	
RCE33	HRFT229JBA	R CHIP	1/10 2.2 OHM J 1608	
RCE34	HRFT229JBA	R CHIP	1/10 2.2 OHM J 1608	
RCE50	HRFT821JBA	R CHIP	1/10 820 OHM J 1608	
RCE51	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCE52	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCE57	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE58	HRFT202JBA	R CHIP	1/10 2K OHM J 1608	
RCE65	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCE66	HRFT101JBA	R CHIP	1/10 100 OHM J 1608	
RCE68	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCE69	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCE70	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCE77	HRTS8E470J	R CHIP ARRAY	1/16 8P 47 OHM J 3216	
RCE81	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE82	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE92	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	
RCE93	HRFT103JBA	R CHIP	1/10 10K OHM J 1608	


LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
RCE94	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCE95	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCE98	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCX10	HRTS8E330J	R CHIP ARRAY	1/16 8P 33 OHM J 3216	
RCX11	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCX19	HRFT750JBA	R CHIP	1/10 75 OHM J 1608	
RCX20	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX30	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX32	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX33	HRFT330JBA	R CHIP	1/10 33 OHM J 1608	
RCX34	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX35	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX42	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX43	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX46	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX60	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX65	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
RCX67	HRFT000-BA	R CHIP	1/10 0 OHM 1608	
XD104	5Z27R000TF	CRYSTAL OSCILLATOR	4P 27.000MHZ 50PPM (BMS-873R)	

7. SCHEMATIC DIAGRAM

SAFETY CAUTION :

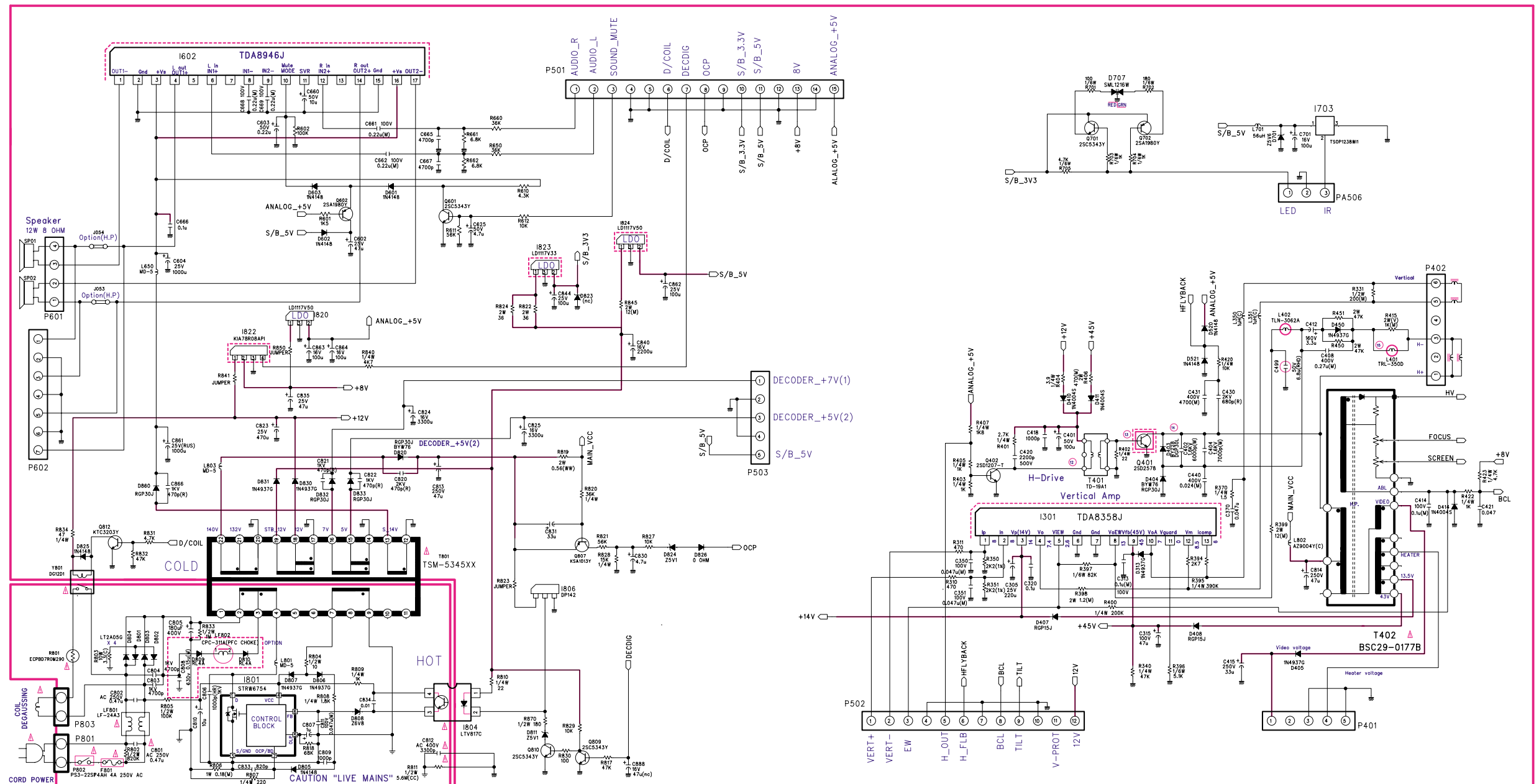
BEFORE SERVICING THIS CHASSIS IT IS IMPORTANT THAT THE SERVICE TECHNICIAN READ AND FOLLOW THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTIONS" AND "PRODUCT SAFETY NOTICE" IN THE SERVICE MANUAL.

PRODUCT SAFETY NOTE :

COMPONENTS MARKED WITH  ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET AND SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL OR SPECIFIED ONE IN THE PARTS LIST. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

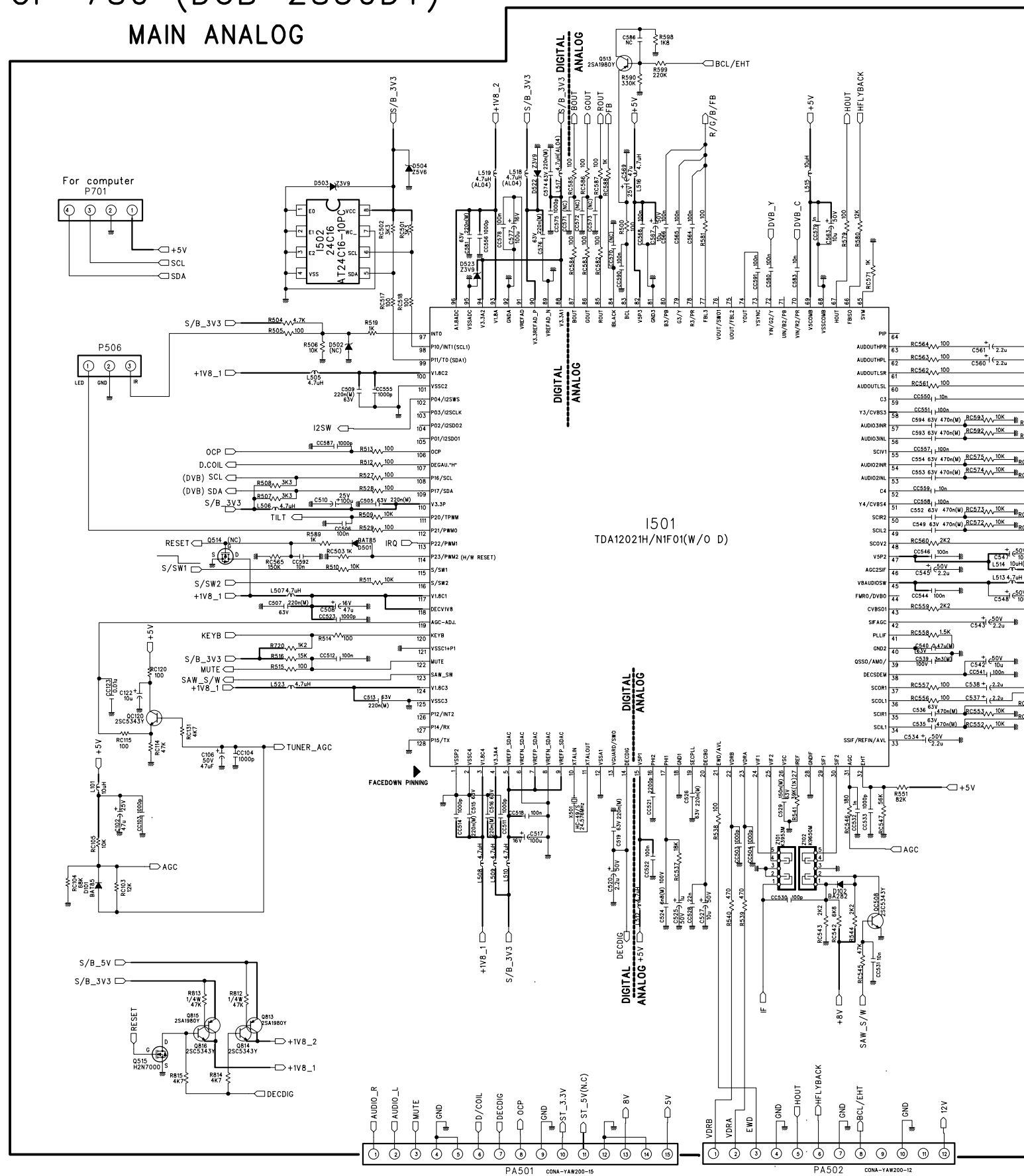
SCHEMATIC DIAGRAM CP-780(DUB-2850DT) POWER PARTS

17/OCTOBER/2005

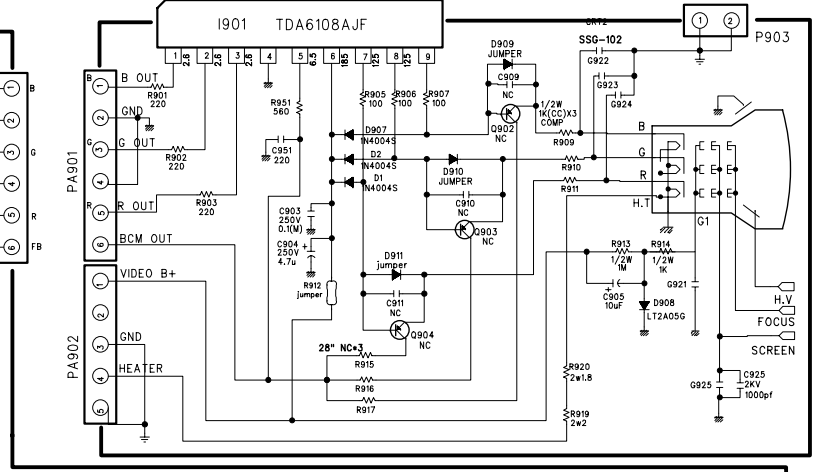


SCHEMATIC DIAGRAM

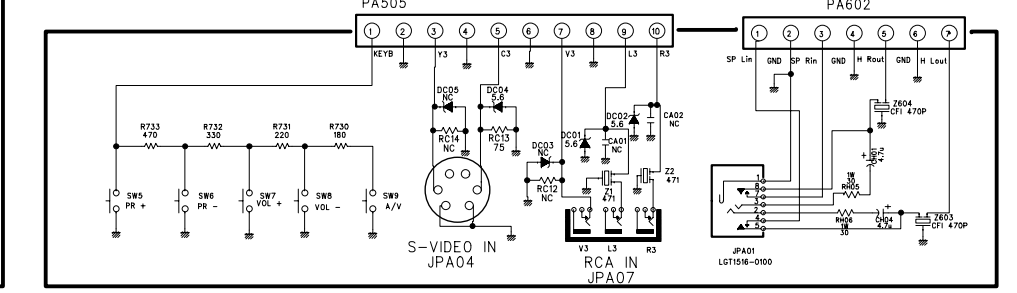
CP-780 (DUB-2850DT) MAIN ANALOG



PCB CRT



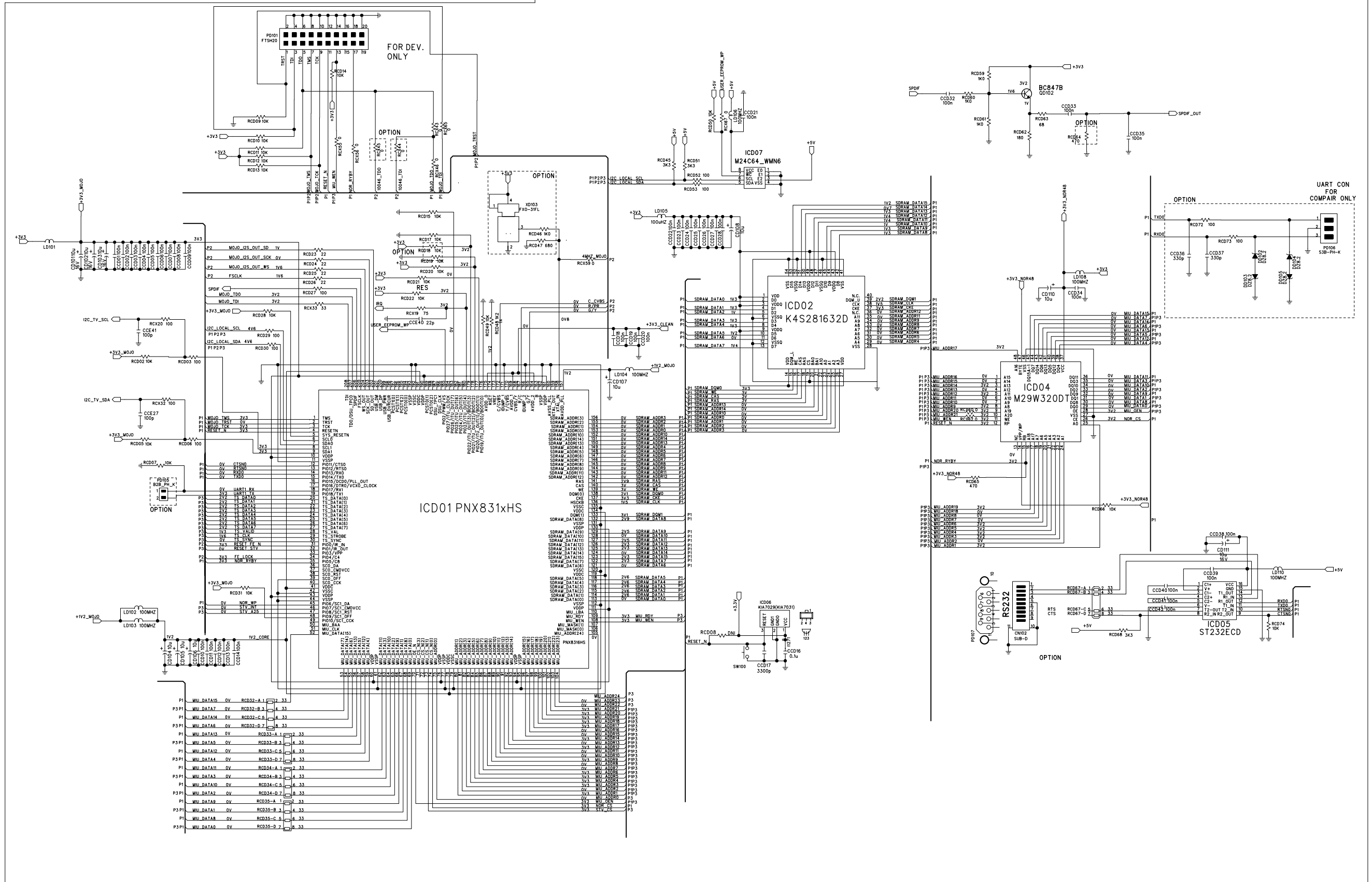
PCB CONTROL & AV



SCHEMATIC DIAGRAM

CP-780 (DUB-2850DT) MAIN DIGITAL

P1



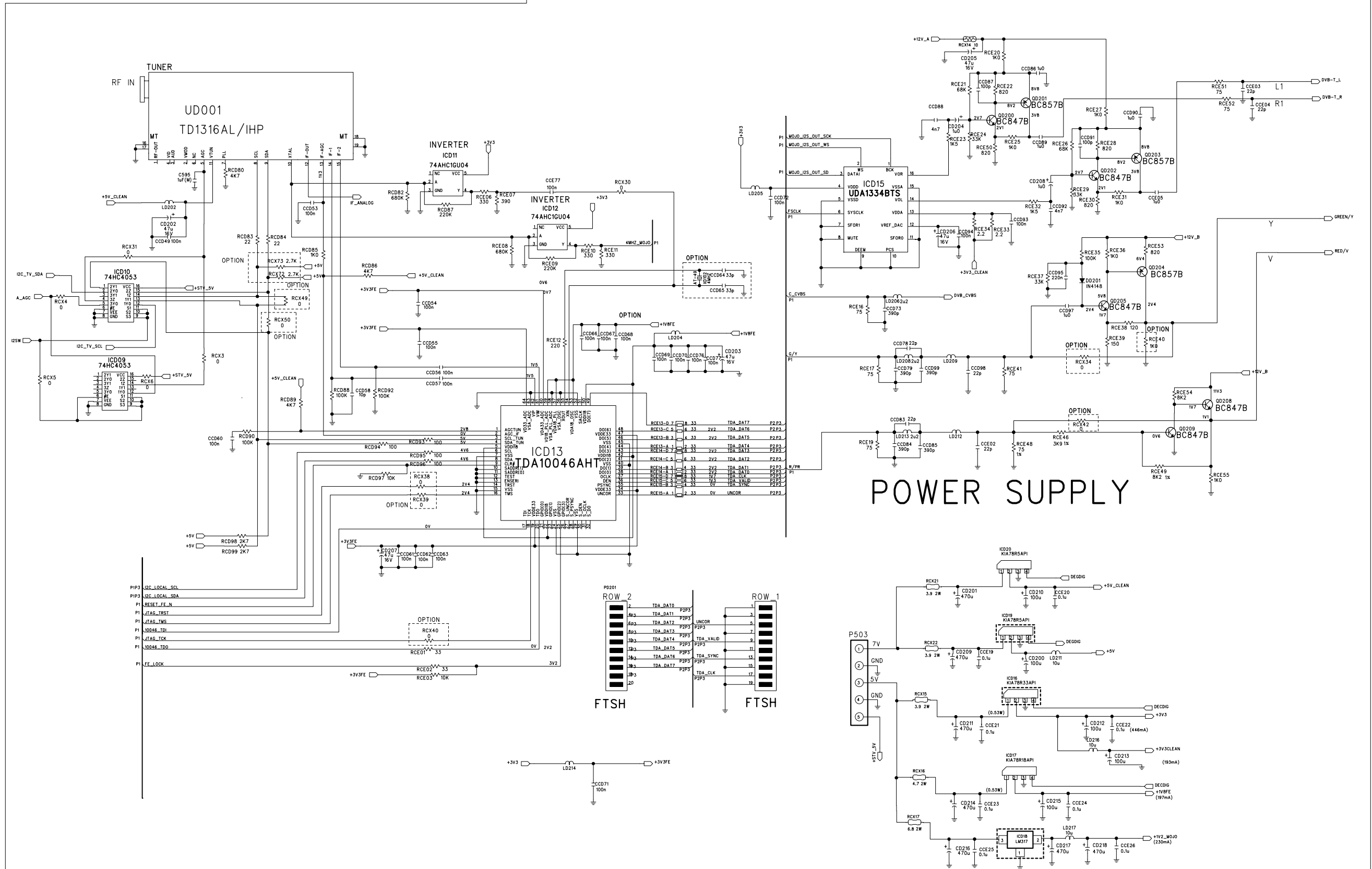
SCHEMATIC DIAGRAM

CP-780 (DUB-2850DT)

FRONT END

ANALOG BACK END

P2

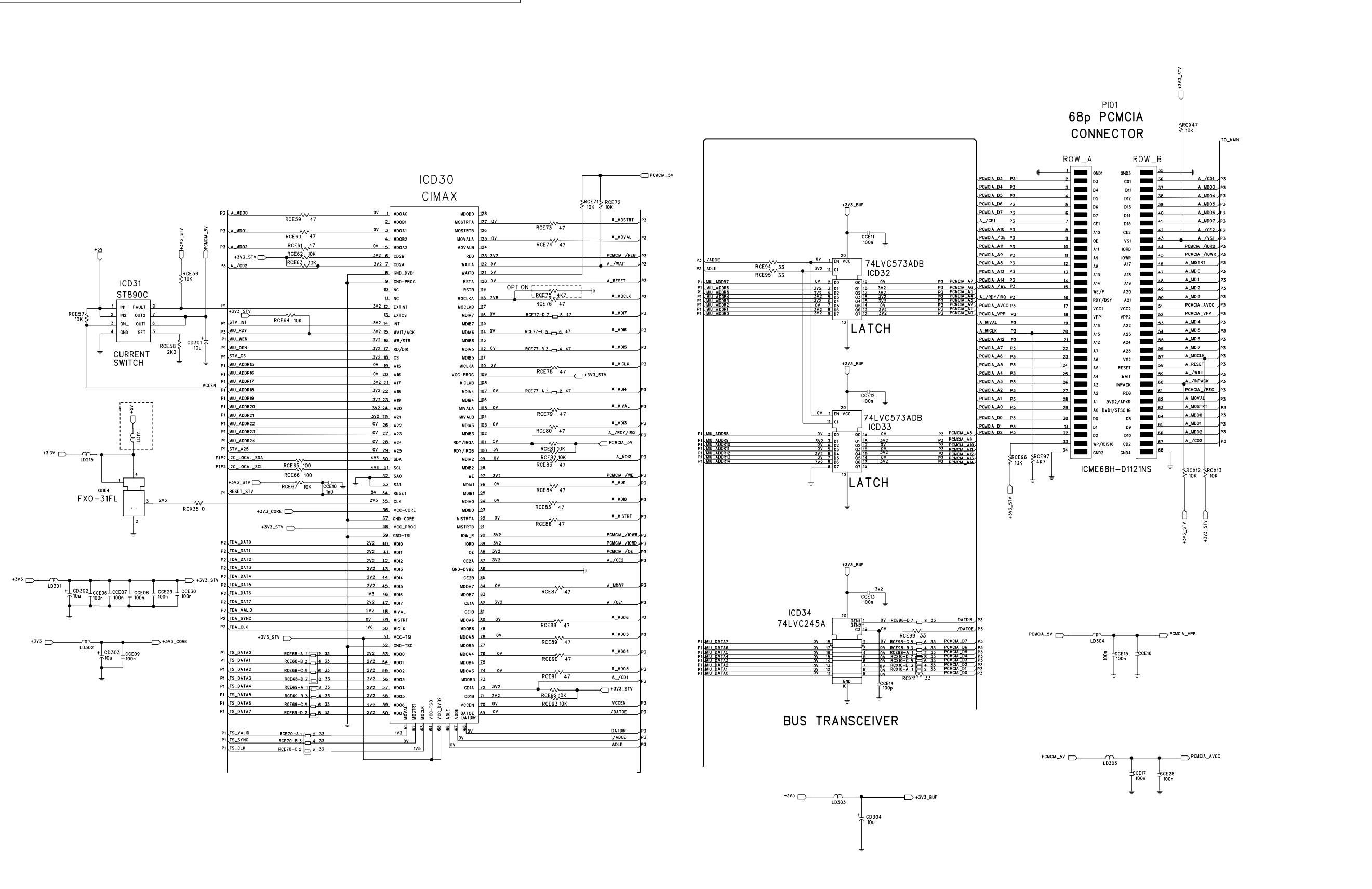


SCHEMATIC DIAGRAM

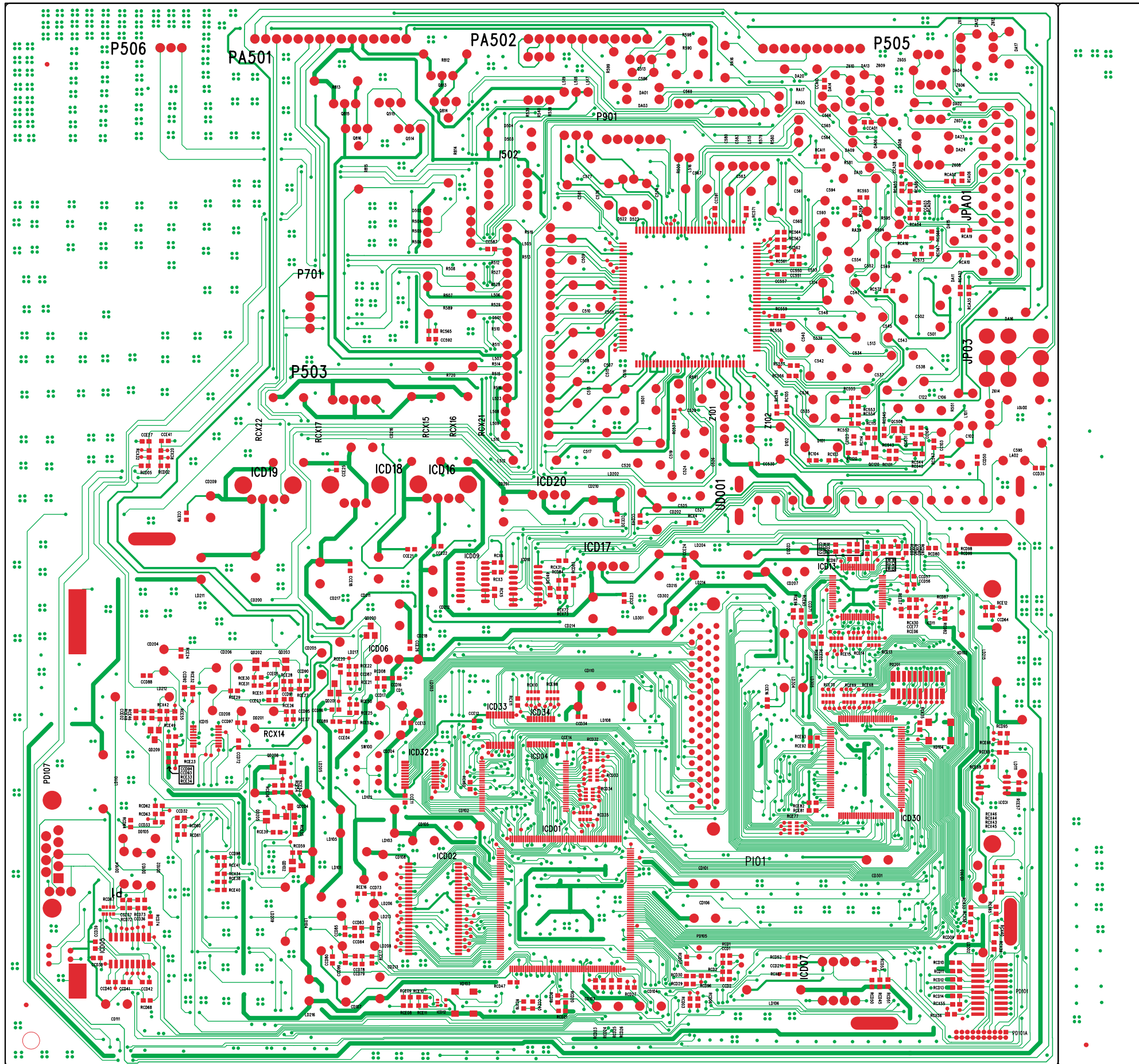
CP-780 (DUB-2850DT)

COMMON INTERFACE

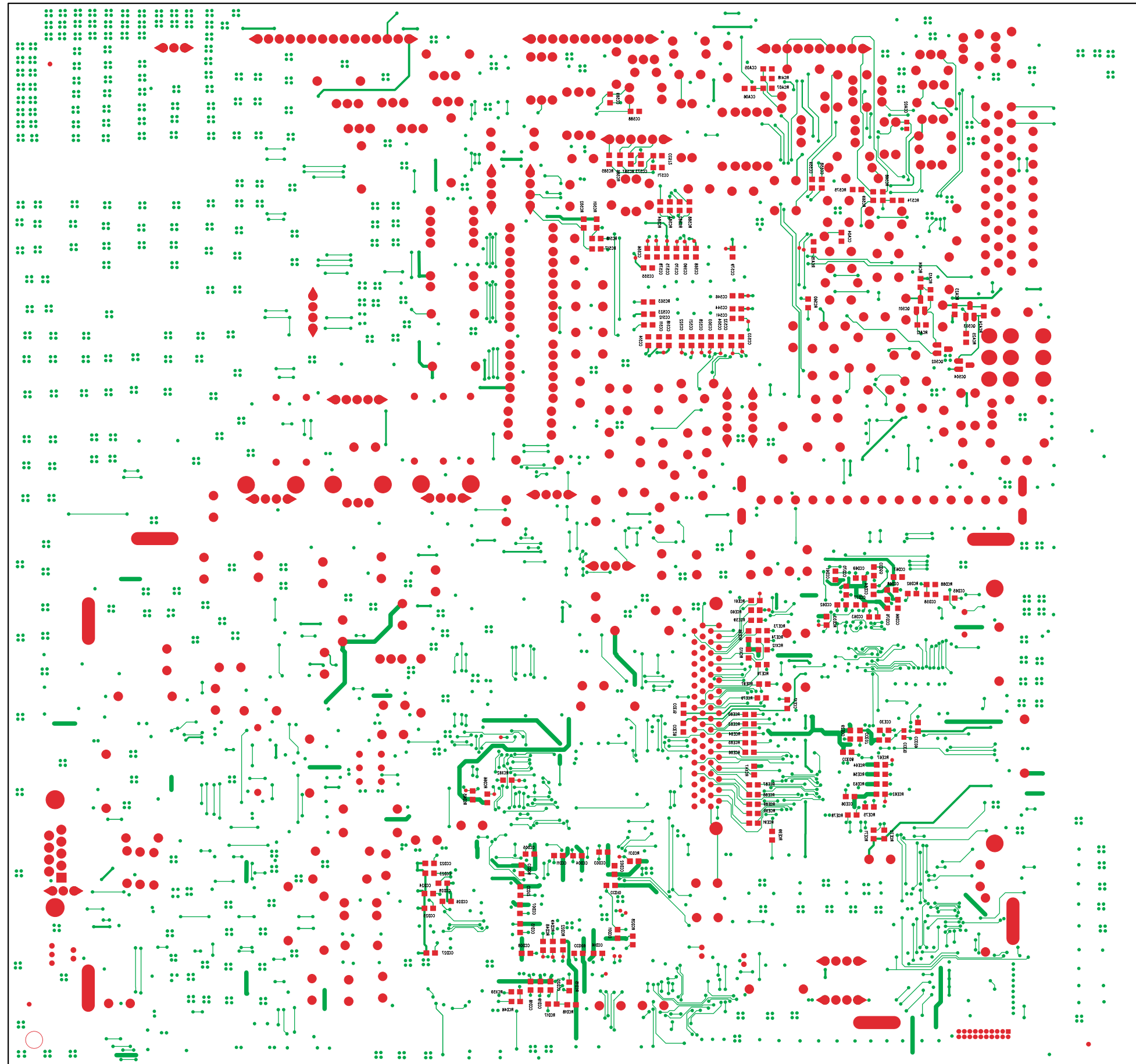
P3



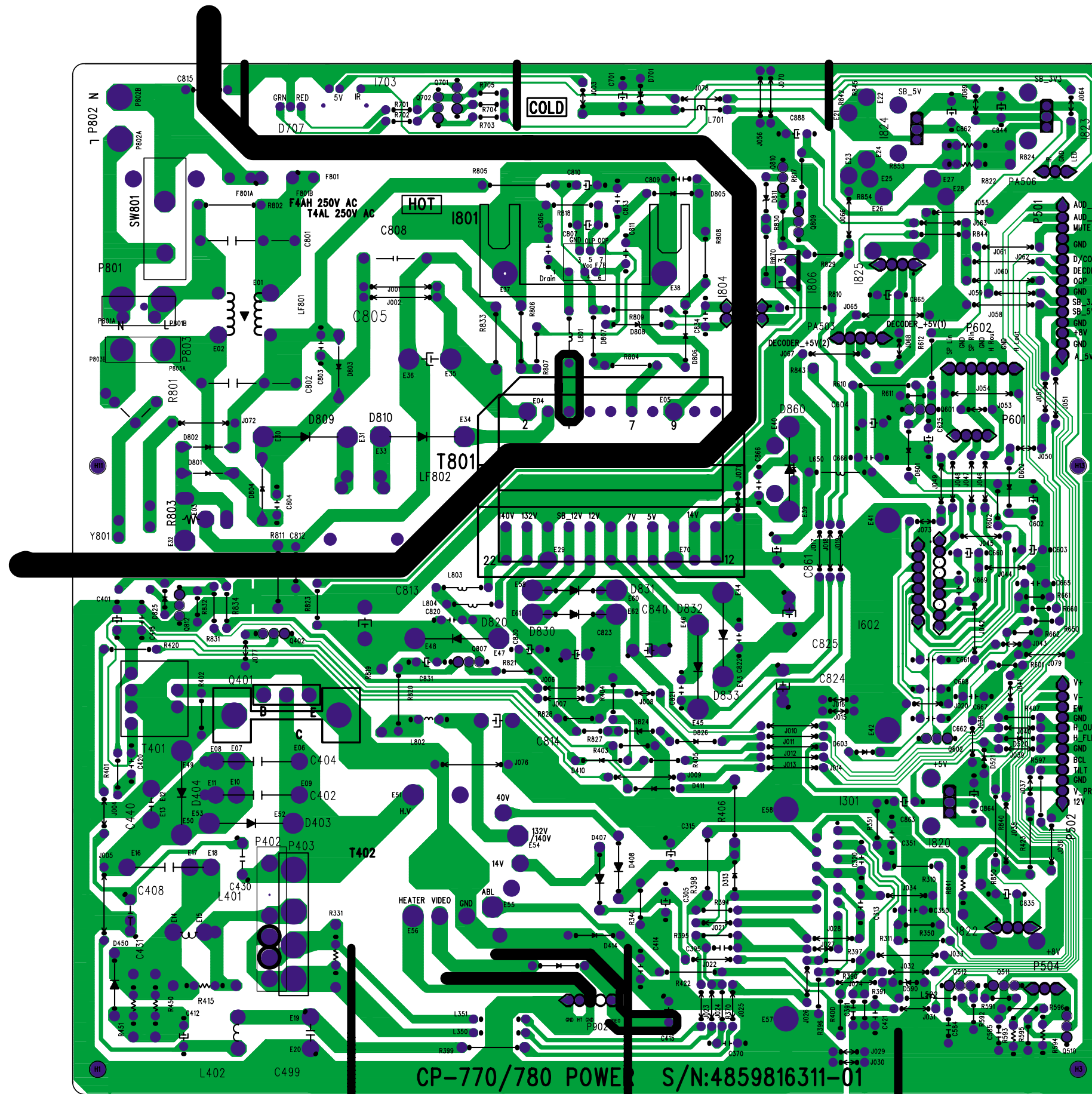
8. PRINTED CIRCUIT BOARD



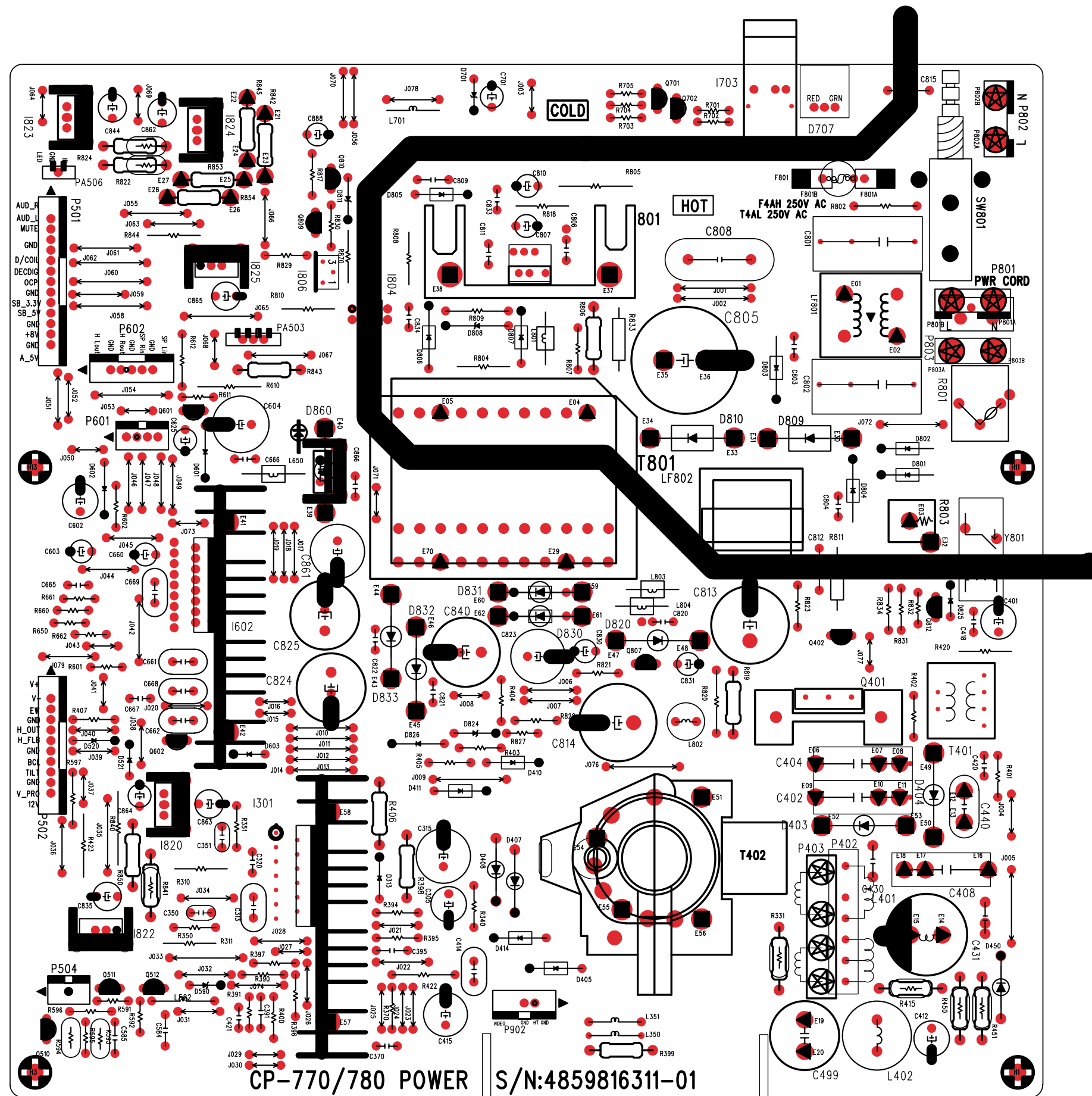
PRINTED CIRCUIT BOARD



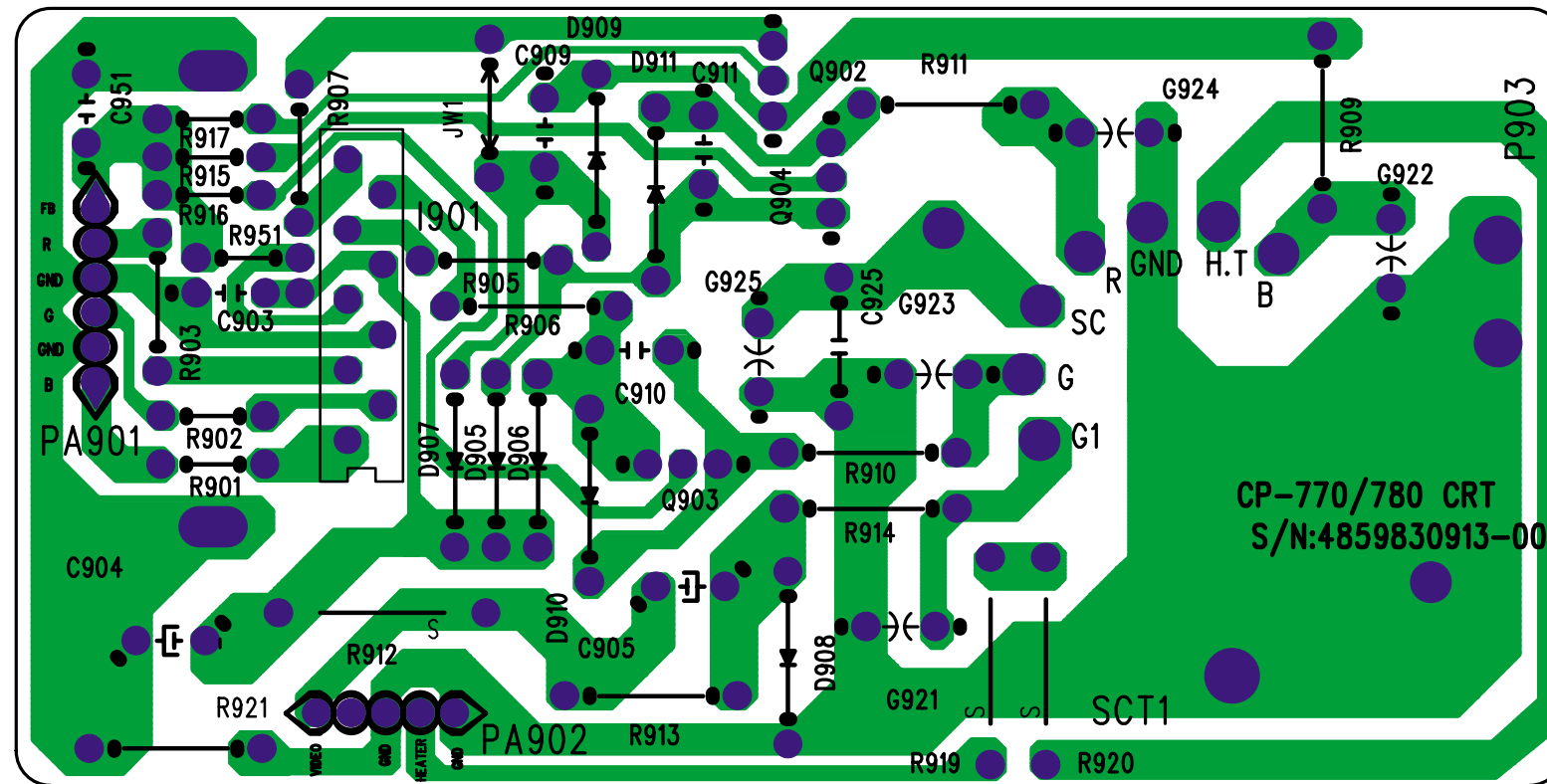
PRINTED CIRCUIT BOARD



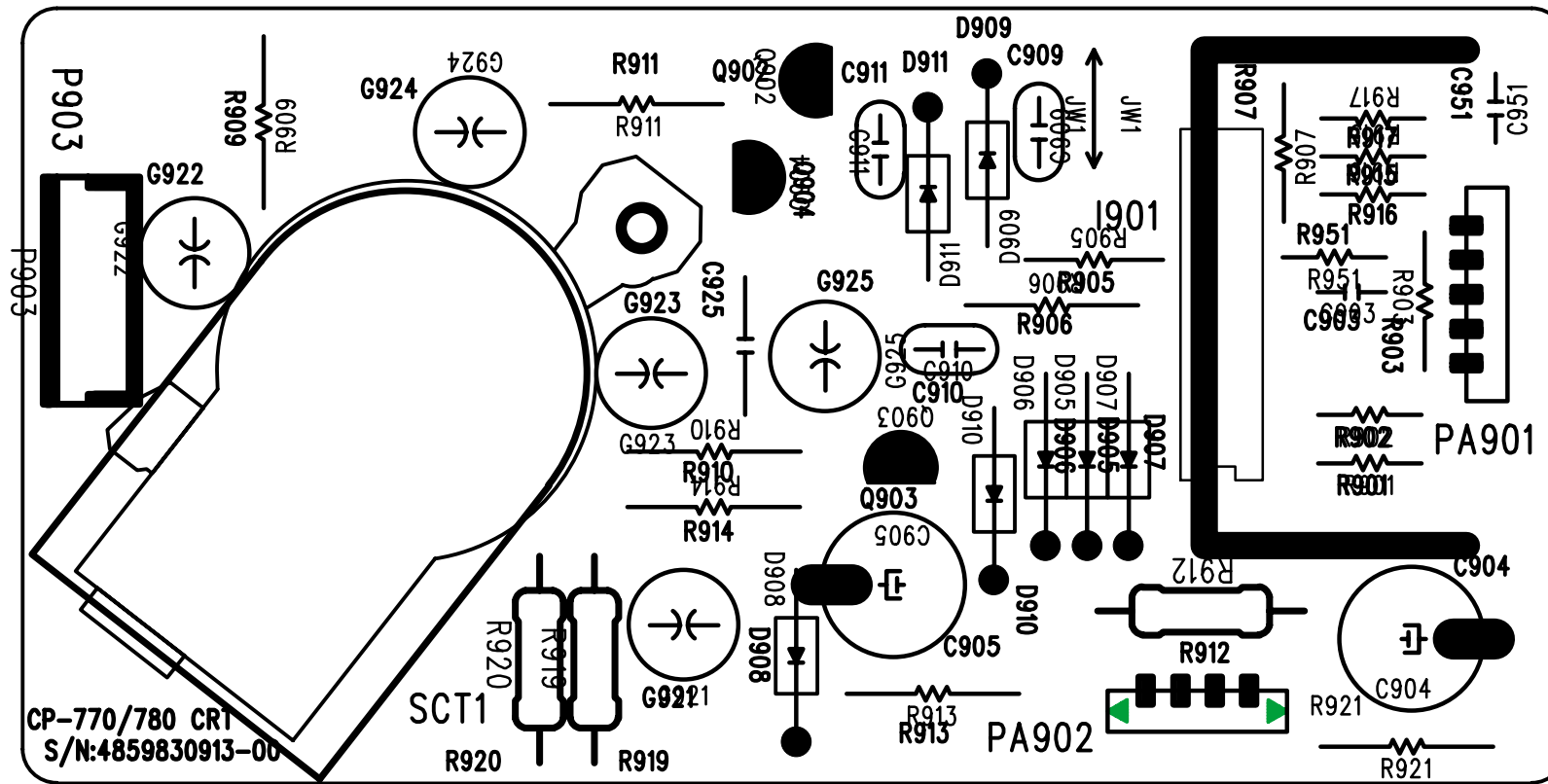
PRINTED CIRCUIT BOARD



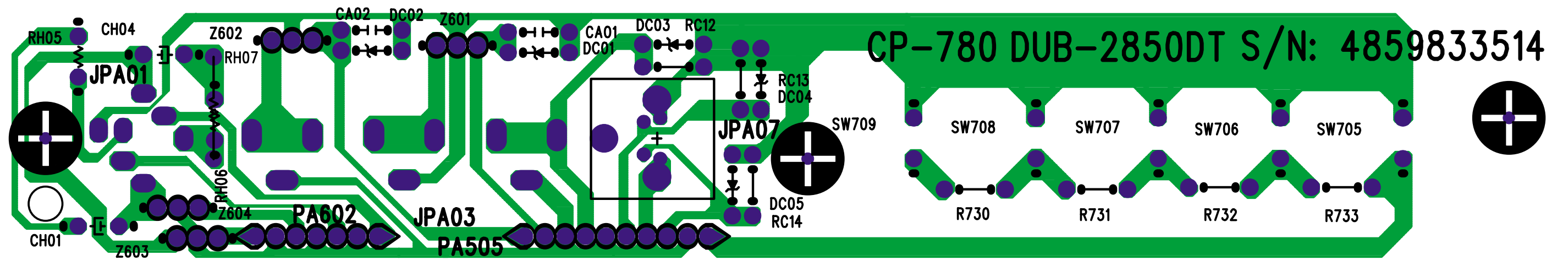
PRINTED CIRCUIT BOARD



PRINTED CIRCUIT BOARD

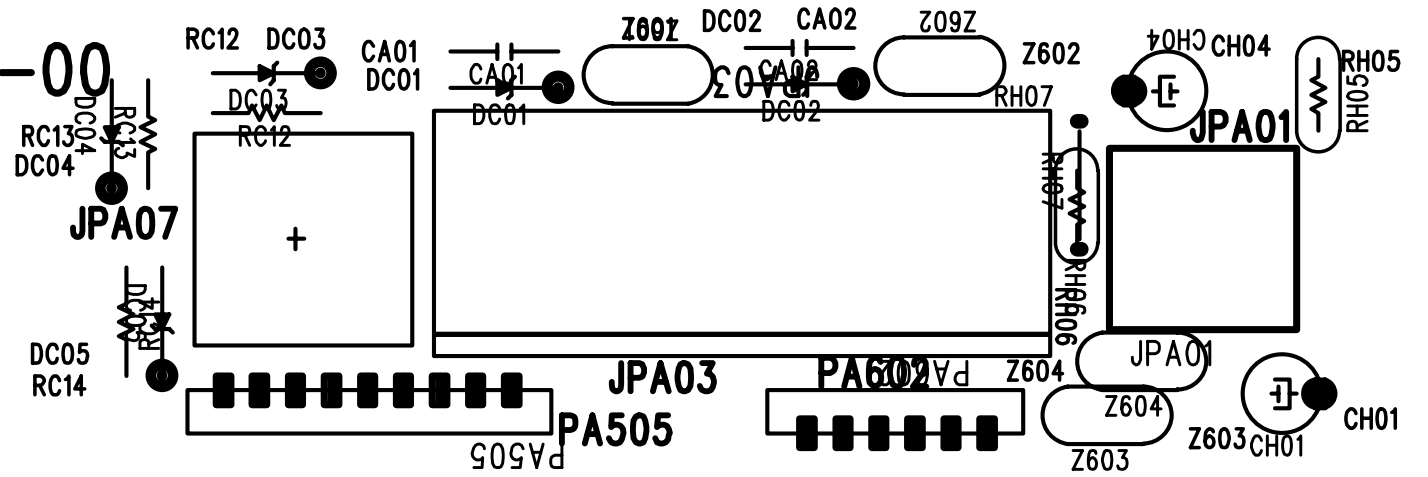
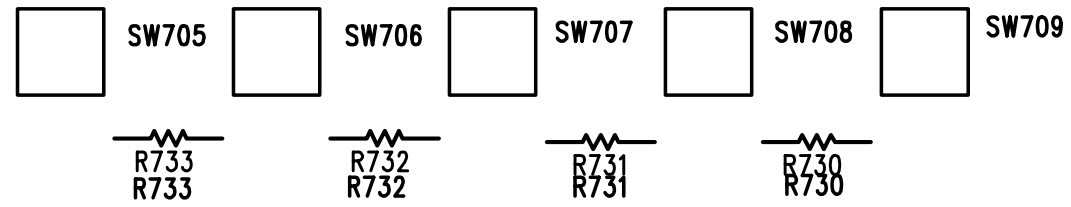


PRINTED CIRCUIT BOARD

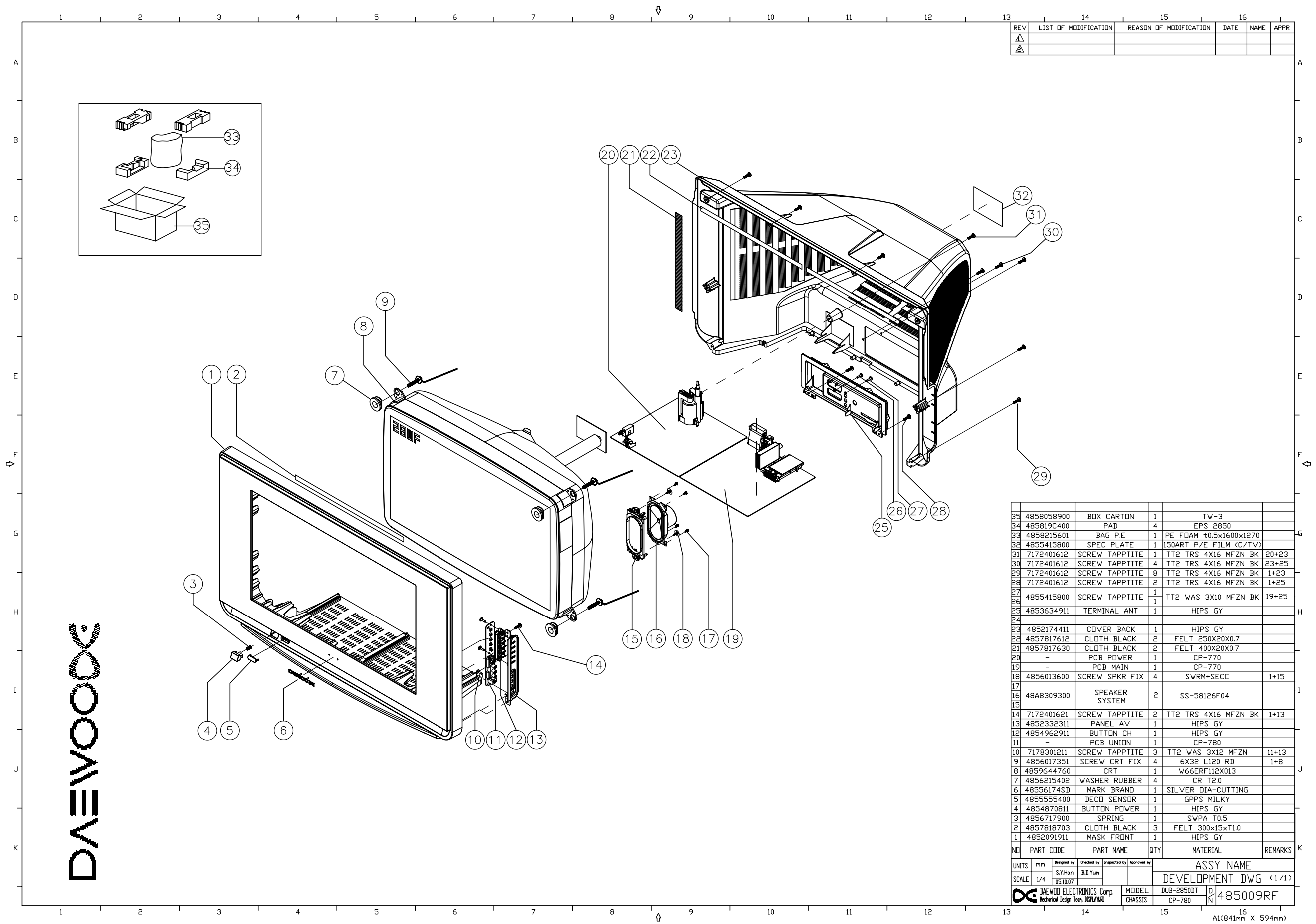


PRINTED CIRCUIT BOARD

CF-780 DUB-2850DT S/N : 4859833514-00



9. EXPLODED VIEW



DAEWOO

REV	LIST OF MODIFICATION	REASON OF MODIFICATION	DATE	NAME	APPR
Δ					
Δ					

35	4858058900	BOX CARTON	1	TW-3	
34	485819C400	PAD	4	EPS 2850	
33	4858215601	BAG P.E	1	PE FOAM t:0.5x1600x1270	
32	4855415800	SPEC PLATE	1	ISOART P/E FILM (C/TV)	
31	7172401612	SCREW TAPPTITE	1	TT2 TRS 4X16 MFZN BK	20+23
30	7172401612	SCREW TAPPTITE	4	TT2 TRS 4X16 MFZN BK	23+25
29	7172401612	SCREW TAPPTITE	8	TT2 TRS 4X16 MFZN BK	1+23
28	7172401612	SCREW TAPPTITE	2	TT2 TRS 4X16 MFZN BK	1+25
27	4855415800	SCREW TAPPTITE	1	TT2 WAS 3X10 MFZN BK	19+25
26	4853634911	TERMINAL ANT	1	HIPS GY	
24	4852174411	COVER BACK	1	HIPS GY	
23	4857817612	CLOTH BLACK	2	FELT 250X20X0.7	
21	4857817630	CLOTH BLACK	2	FELT 400X20X0.7	
20	-	PCB POWER	1	CP-770	
19	-	PCB MAIN	1	CP-770	
18	4856013600	SCREW SPKR FIX	4	SWRM+SECC	1+15
17	48A8309300	SPEAKER SYSTEM	2	SS-58126F04	
15	7172401621	SCREW TAPPTITE	2	TT2 TRS 4X16 MFZN BK	1+13
13	4852332311	PANEL AV	1	HIPS GY	
12	4854962911	BUTTON CH	1	HIPS GY	
11	-	PCB UNION	1	CP-780	
10	7178301211	SCREW TAPPTITE	3	TT2 WAS 3X12 MFZN	11+13
9	4856017351	SCREW CRT FIX	4	6X32 L120 RD	1+8
8	4859644760	CRT	1	W66ERF112X013	
7	4856215402	WASHER RUBBER	4	CR T2.0	
6	48556174SD	MARK BRAND	1	SILVER DIA-CUTTING	
5	4855555400	DECD SENSDR	1	GPPS MILKY	
4	4854870811	BUTTON POWER	1	HIPS GY	
3	4856717900	SPRING	1	SWPA T0.5	
2	4857818703	CLOTH BLACK	3	FELT 300x15xT1.0	
1	4852091911	MASK FRONT	1	HIPS GY	
NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS
				UNITS mm	
SCALE 1/4		Designed by S.Y.Hon	Checked by B.D.Yun	INSPECTED BY	
				APPROVED BY	
				ASSY NAME	
				DEVELOPMENT DWG (1/1)	
DAEWOO ELECTRONICS Corp.		MODEL DUB-2850DT	CHASSIS CP-780	D/A 485009RF	



DAEWOO ELECTRONICS CORP.

686, AHYEON-DONG, MAPO-GU,
SEOUL, KOREA.

C.P.O. BOX 8003 SEOUL KOREA

PRINTED DATE : NOV. 2005