DAEWOO

S/M No. : TCP185C/NEF

Service Manual
Color Television

CHASSIS : CP-185N and CP-185C



Specification

Version	Pal multi system
TV Standard	PAL-SECAM B/G, D/K, H, I/I (NTSC : AV Only)
Sound system	Mono
Power consumption	* 1 Speaker 14":49W / 20":60W / 21" 68W * 2Speaker 14":57W / 20":64W / 21":74W
Speaker	3W 8 Ohm o 7.5W 8 Ohm
Teletext system	Option
Aerial Input	75 Ohm unbalanced
Channel coverage	off-air channels, S-cable channels and hyperband
Tuning system	Ferquency synthesiser tuning system
Visual screen size	14":34cm 20':48cm 21":51cm
Channel indication	On screen display
Program selection	100 Programmes
Auxiliary Outpup Terminal	RCA jack : Audio input and Vidio input ERUO SCART Jack : Audio/Video and R/G/B input. Sloe and fast swtching, SVHsin Audio - Video jack on front of cabinet in common connection with EURO-SCART Headphone jack on front of cabinet
Remote control	R-40A10 (None teletext) →AAA Battery type R-40A01(With teletext) →AAA Battery type R-44C05(With teletext) →AA Battery type

DAEWOO ELECTRONICS CO., LTD
http://svc.dwe.co.kr
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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 22-23 kV (14")or 24-26 kV (20"-21")at max beam current. The high voltage must not, under any circumstances, exceed 27.5 kV (14", 20"), 29KV (21"). 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

1. Potentials of high voltage are present when this receiver is operating. Operation of the receiver outside the cabinet or with the back cover removed involves a shock hazard from the receiver.
   1) Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment.
   2) 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.
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the Replacement Parts List.
3. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor body 10 mm away from the circuit board.
4. Keep wires away from high voltage or high temperature components.
5. This receiver must operate under AC 230 volts, 5O Hz. NEVER connect to a DC supply of any other voltage or frequency.

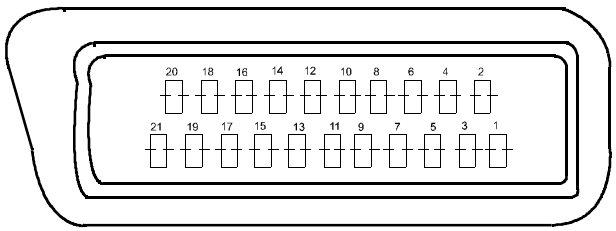
■ PRODUCT SAFETY NOTICE

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 spe- cial 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.

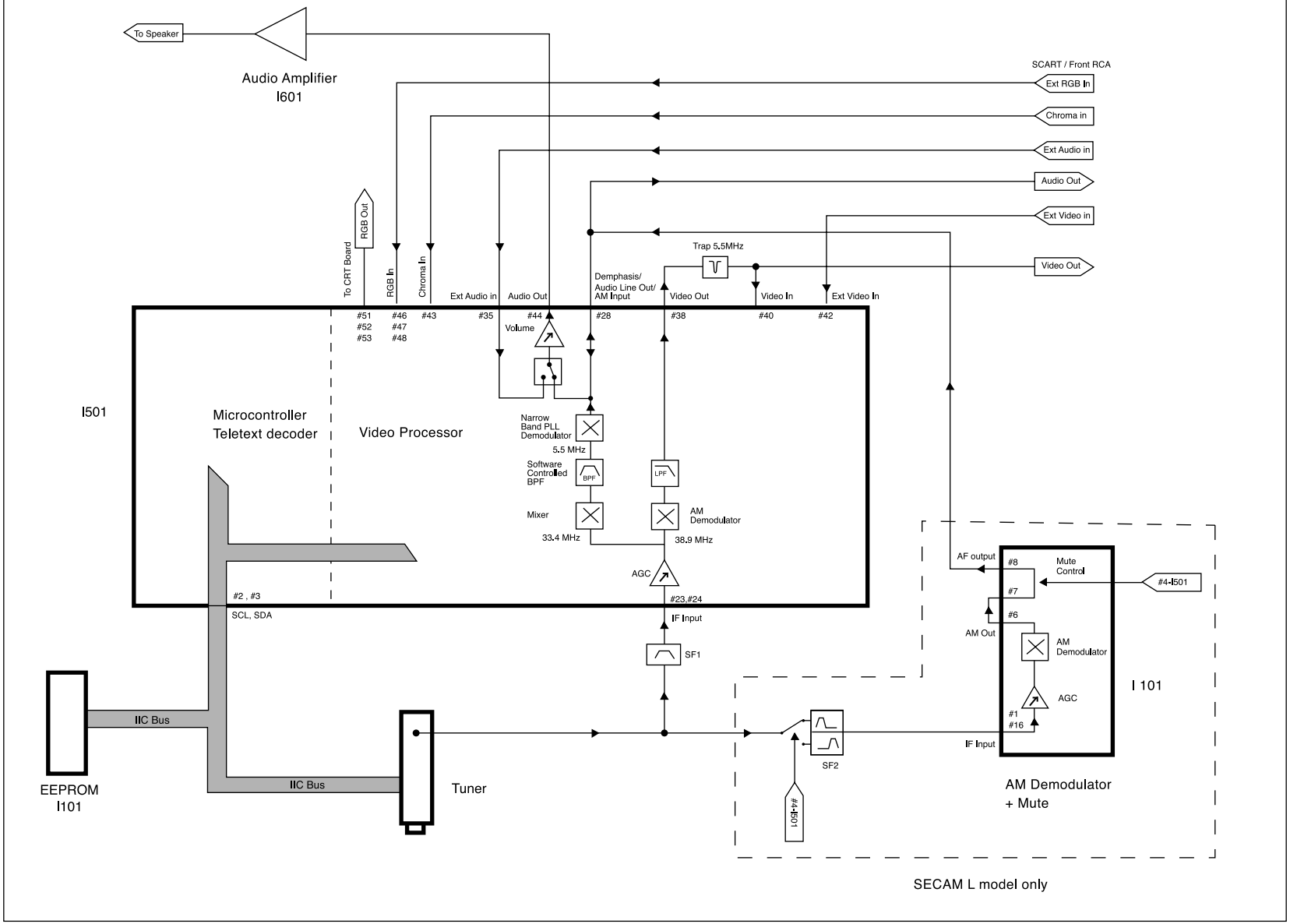
SPECIFICATIONS

21Pin EURO-SCART

PIN	SIGNAL DESCRIPTION	MATCHING VALUE
1	Audio Output Right	0.5 Vrms, Impedance < 1kΩ, (RF 54% Mod)
2	Audio Input Right	0.5Vrms, Impedance > 10kΩ
3	Audio Output Left	0.5 Vrms, Impedance < 1kΩ, (RF 54% Mod)
4	Audio Earth	
5	Blue Earth	
6	Audio Input Left	0.5Vrms, Impedance > 10kΩ
7	Blue Input	0.7Vpp + 0.1V, Inpedance 75Ω
8	Slow Switching	TV : 0 to 2V, AV : 4.5 to 12V, Impedance > 10kΩ
9	Green Earth	
10	N.C	
11	Green Input	0.7Vpp + 0.1V, Impedance 75Ω
12	N.C	
13	Red Earth	
14	Blanking Earth	
15	Red Input Chroma Input	0.7Vpp ±0.1V, Impedance 75Ω ± 3dB for a luminance signal of 1 Vpp
16	Fast Switching	0 to 0.4V : Logic :"0", 1 to 3V : Logic "1", Impedance 75Ω
17	Video Out Earth	
18	Video In Earth	
19	Video Output	1 Vpp ± 3dB, Impedance 75Ω
20	Video Input	1 Vpp ± 3dB, Impedance 75Ω
21	Common Earth	



CIRCUIT BLOCK DIAGRAM



ALIGNMENT INSTRUCTIONS

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 menu.
3 - Quickly press the key sequence : **RED - GREEN - menu**

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

In Service Mode press "**OK**" to the microcontroller i.e. the I2C bus is free and the set can be controlled by external equipment.
Press "**OK**" again to allow the microcontroller to control the set again

Microcontroller configuration :

Tuner Option

Option	Tuner maker
DW	DAEWOO / SAMSUNG
PHI	LIPS (tuner internal AGC)
PH2	PHILIPS (Video processor AGC)

TV set Alignment

1 - G2 alignment

- Set TV in NORMAL I mode
- TV in AV mode without video signal ? Black screen.
- TV preset with WP Red, WP Green and WP Blue equal to 32.
- TV preset with Black R, Black G equal to 8.
- Adjust screen volume (on FBT) such that the highest cathode cut-off voltage measured on CRT board, is Vcut-off 5V

Screen size	Vcut-off
14"	115V
20" & 21"	125V

2 - White balance

- Select a dark picture and adjust Black G and Black R to the desired colour temperature.
- Select a bright picture and adjust WP Red, WP Green, WP Blue to the desired colour temperature.

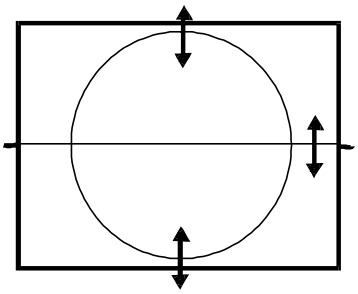
ALIGNMENT INSTRUCTIONS

3 - Focus

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

4 - Vertical geometry

- Adjust the Vertical Amplitude, Shift, S-Correction and Slope to compensate for vertical distortion



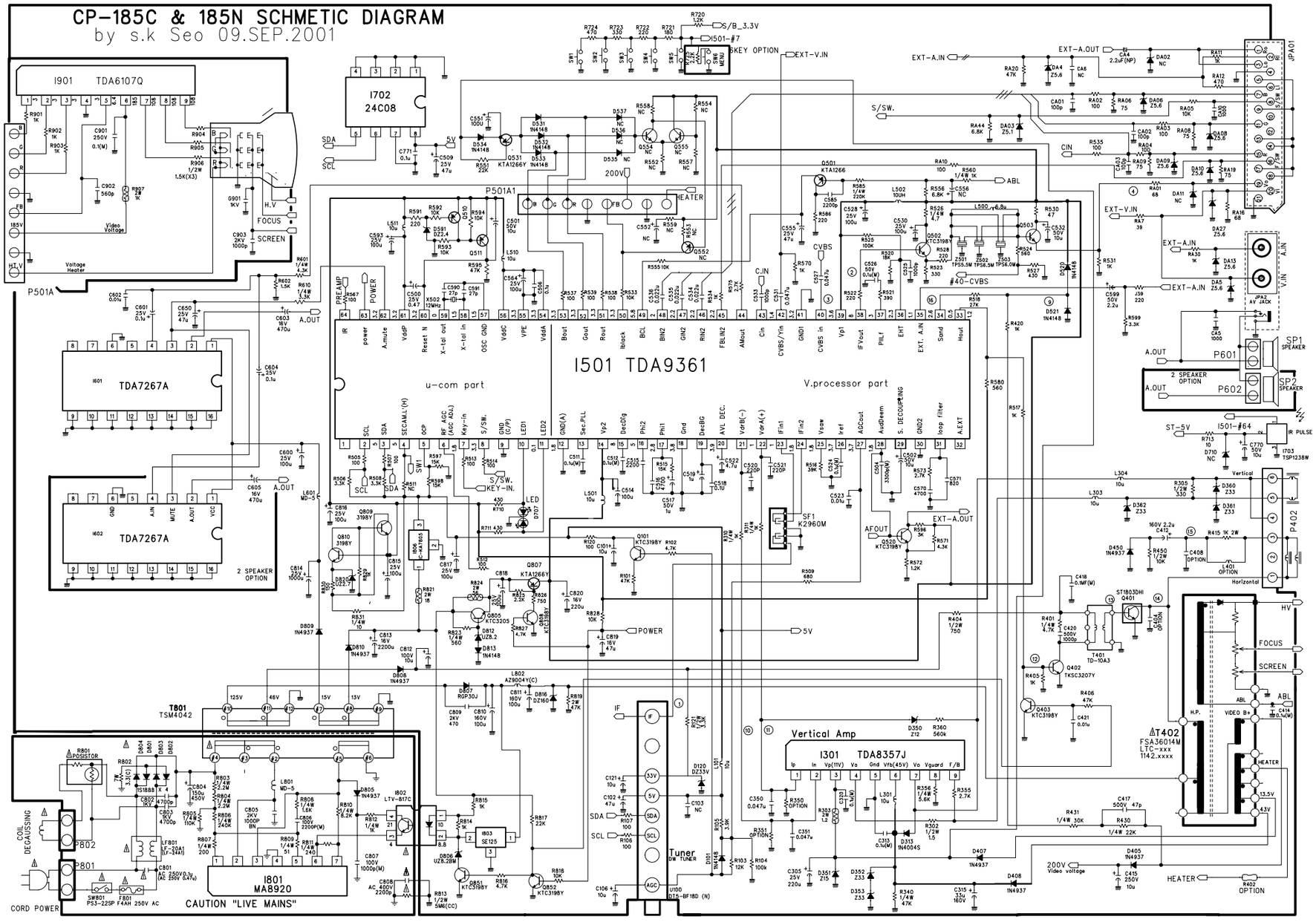
5 - Horizontal picture centering

- Adjust H Shift to have the picture in the center of the screen.

7 - AGC

- Adjust the antenna signal level to 68dBμV±2 for Daewoo tuner (63dBμV±1 for Philips tuner)
- Set RF AGC to 0.
- Increase RF AGC level and stop when the level on pin 6 of I501 goes below 2.5 Vdc

SCHEMATIC DIAGRAM



NOTE:

1. RESISTANCE IS SHOWN IN OHM. K=1000, M=1000000
2. UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITOR VALUES ARE EXPRESSED IN uF
3. VOLTAGES READ WITH "VTVM" FROM POINT INDICATED TO CHASSIS GROUND USING A COLOR BAR SIGNAL WITH ALL CONTROLS AT NORMAL LINE 230V AC VOLTAGE READINGS SHOWN ARE NORMAL VALUES AND MAY VARY +20% EXCEPT H.V
4. THIS CIRCUIT DIAGRAM IS A STANDARD ONE CIRCUIT PRINTED MAY BE SUBJECT TO CHANGE FOR PRODUCT IMPROVEMENT WITHOUT PRIOR NOTICE

WARNING:

BEFORE SERVICING THE CHASSIS, READ "X-RAY RADIATION", "SAFETY PRECAUTION", AND "PRODUCT SAFETY NOTICE" IN SERVICE MANUAL

CAUTION TO SERVICE TECHNICIANS:

BEFORE RETURNING THE RECEIVER TO CUSTOMER, LEAKAGE CURRENT QR RESISTANCE MEASUREMENTS SHOULD BE PERFORMED TO DETERMINE THAT EXPOSED PARTS ARE PROPERLY INSULATED FROM THE SUPPLY CIRCUIT.

THE DIFFERENT PARTS FOR CRT

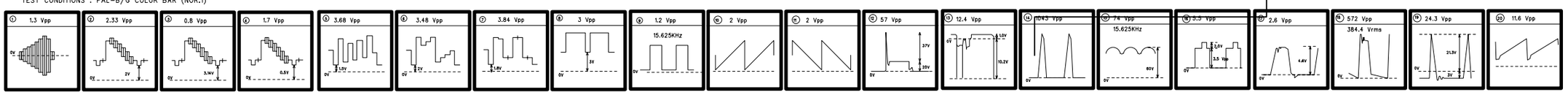
Loc.	14 INCH(CPT)	20 INCH(CPT)	21 INCH(PHILIPS)				
C404	1.6KV 6200PF	1.6KV 9100PF	1.6KV 7500PF				
C408	200V 0.36UF	200V 0.47UF	200V 0.68UF				
L401	NONE	NONE	L-76				
R801	140M290	7ROM290	7ROM290				
SCT1	PCS633A	PCS629-03C	PCS629-03C				
J007	WIRE COPPER	WIRE COPPER	NONE				
R350	1/4W 1K	1/4W 1.2K	1/4W 1.5K				
R351	1/4W 1K	1/4W 1.2K	1/4W 1.5K				
R556	1/6W 7.5K	1/6W 6.8K	1/6W 5.6K				
R810	1/4W 6.8K	1/4W 7.5K	1/4W 7.5K				
R402	1W 2 OHM	1W 2.4 OHM	1W 1.2 OHM				
V001	ODY-M1401	CDY-S2017	W/ITC				
V901	A34JLL90X	A48AGY13X	A51EFK155X01				
ZZ131	1401S-1015-1P	2001S-1015-1P	2101S-1015-1P				
ZZ131	DC-1450	DC-20SF	DC-21SF				

PRODUCT SAFETY NOTE :

THE 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 PART LIST. DON'T DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING.

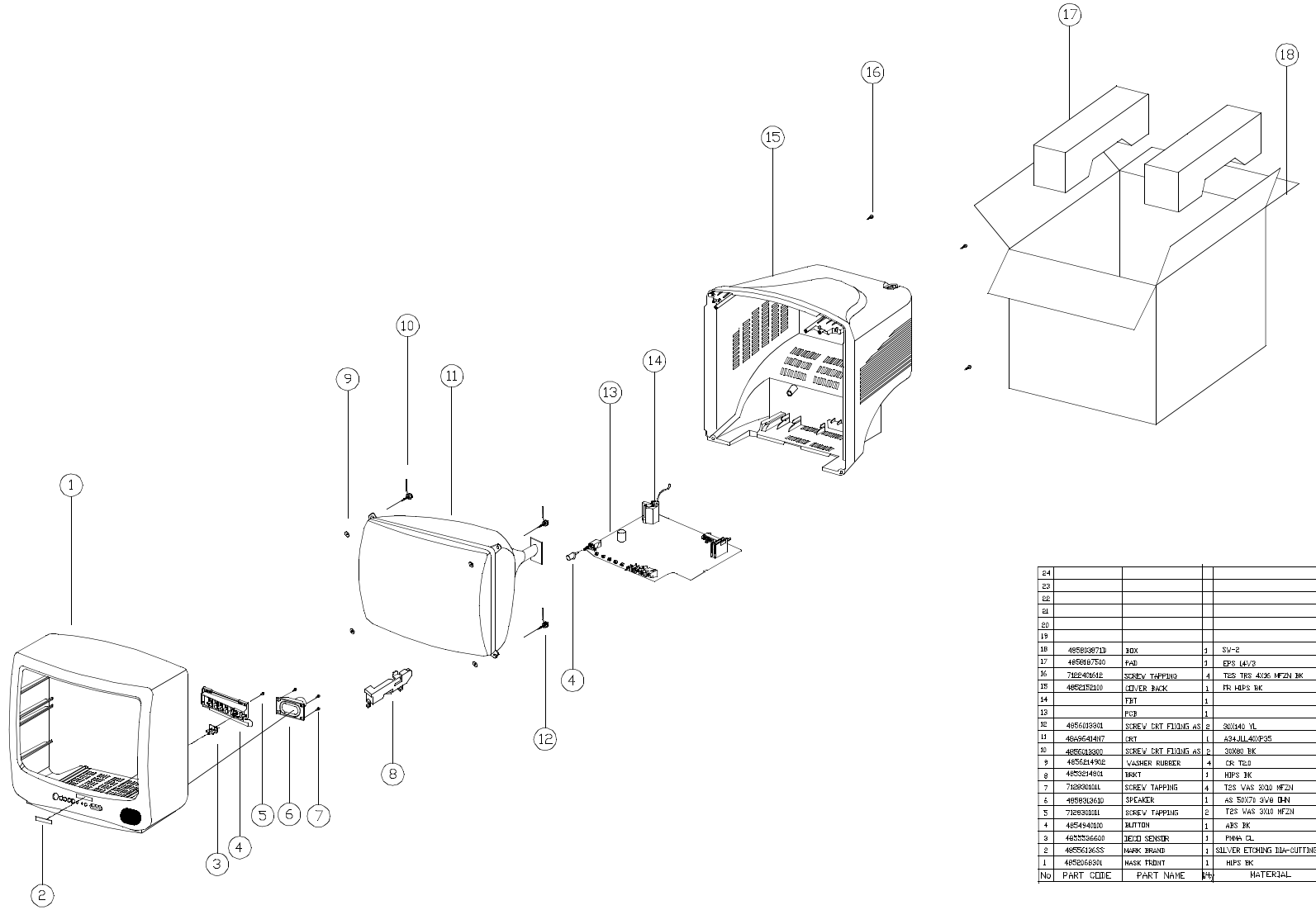
* WAVEFORMS

TEST CONDITIONS : PAL-B/G COLOR BAR (NOR.1)



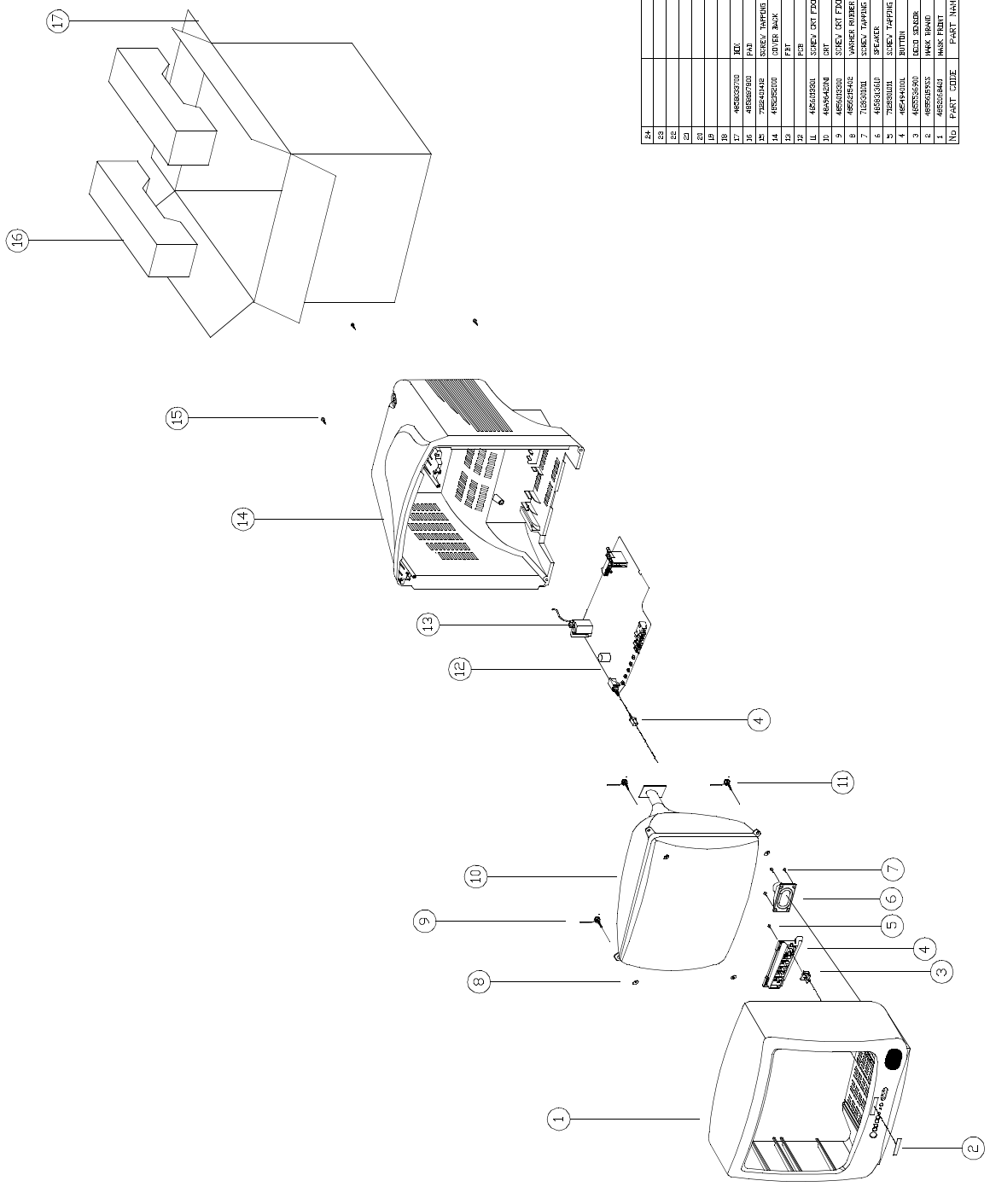
EXPLODED VIEW

1. 14V3



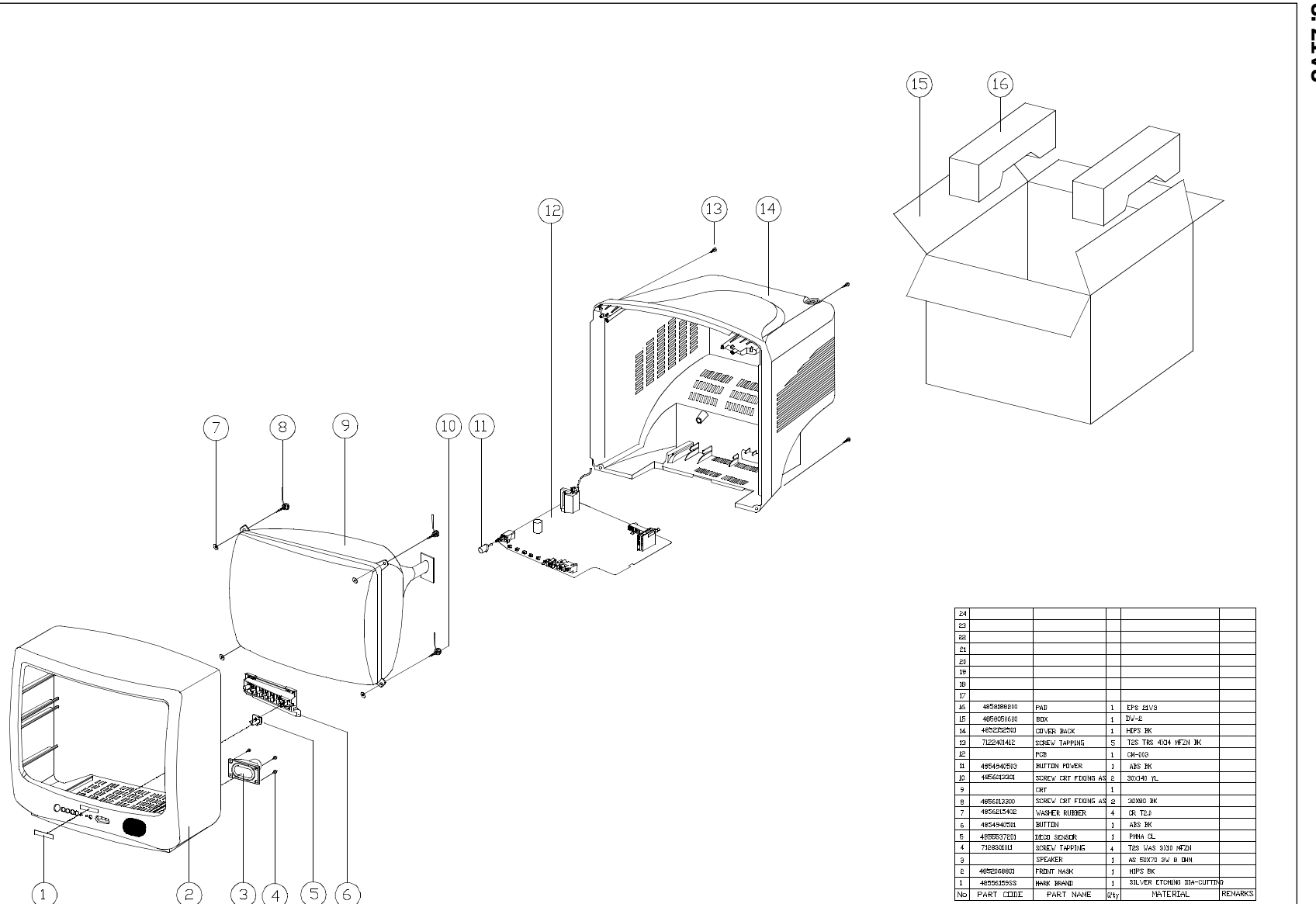
No	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS
24					
23					
22					
21					
20					
19					
18	485B138710	BOX	1	SW-2	
17	485B187530	PAD	1	EPS 14V3	
16	7129400612	SCREW TAPPING	4	TES TRS 4X16 MFZN BK	
15	485B218100	COVER BACK	1	PA HIPS BK	
14		FBT	1		
13		PCB	1		
12	485B603301	SCREW CRT FIXING AS	2	300X140 YL	
11	48A95414M7	CRT	1	A34JLL40XP35	
10	485B613300	SCREW CRT FIXING AS	2	30X80 BK	
9	485B614902	WASHER RUBBER	4	CR T2.0	
8	485B214801	BRKT	1	HIPS BK	
7	7129300101	SCREW TAPPING	4	TES WAS 3X10 MFZN	
6	485B913610	SPEAKER	1	AS 50X70 3V8 OHN	
5	7129300101	SCREW TAPPING	2	TES WAS 3X10 MFZN	
4	485B940100	BUTTON	1	ABS BK	
3	4855536600	DECO SENSOR	1	PMMA CL	
2	4855G13655	MARK BRAND	1	SILVER ETCHING DIA-CUTTING	
1	485B06830L	MASK FRONT	1	HIPS BK	

2. 20V3



NO	PART CODE	PART NAME	QTY	MATERIAL	REMARKS
1	485G00440	MASK FRONT	1	ABS BK	
2	485G00435	MASK BRAND	1	GLUES ETCHING 104-SUTTUG	
3	4857556900	LOGO SPEAKER	1	PMMA CL	
4	485H40100	BUTTON	1	ABS BK	
5	7128501001	SCREW TAPPING	2	TCB VAS 3X10 NFZN	
6	485G03G40	SPEAKER	1	AS 50W7I 5X8 8HH	
7	7128501001	SCREW TAPPING	4	TCB VAS 3X10 NFZN	
8	485G01540	WASHER RUBBER	4	CR TCB	
9	485G03300	SCREW CRT FIXING	2	30100 BK	
10	48A5642CN	CRT	1	A48ULL49XJAPAN	
11	485G03G01	SCREW CRT FIXING	2	30100 YL	
12		PCB	1		
13		FBT	1		
14	485G05100	COVER BACK	1	PR MAPS BK	
15	7128401412	SCREW TAPPING	4	TCB TRS 4X14 NFZN BK	
16	485G07800	PAD	1	EPS 20V3	
17	485G06700	JEDI	1	JU-2	
18					
19					
20					
21					
22					
23					
24					

3. 21V3



24					
23					
22					
21					
20					
19					
18					
17					
16	4858188200	PAD	1	EPS 21V3	
15	4858050600	BOX	1	DV-2	
14	4852152500	COVER BACK	1	HIPS BK	
13	7122401412	SCREW TAPPING	5	T2S TRS 4X14 MFZN BK	
12		PCB	1	CM-003	
11	4854940593	BUTTON POWER	1	ABS BK	
10	4856013301	SCREW CRT FIXING AS	2	30X140 YL	
9		CRT	1		
8	4856013300	SCREW CRT FIXING AS	2	30X90 BK	
7	4856215402	WASHER RUBBER	4	CR T2.8	
6	4854940591	BUTTON	1	ABS BK	
5	4855837201	DECO SENSOR	1	PMMA CL	
4	7128930101	SCREW TAPPING	4	T2S WAS 3X10 MFZN	
3		SPEAKER	1	AS 50X70 8W 8 OHM	
2	4852866801	FRONT MASK	1	HIPS BK	
1	4855615955	MARK BRAND	1	SILVER ETCHING DIA-CUTTING	
No	PART CODE	PART NAME	Q'ty	MATERIAL	REMARKS

ELECTRICAL PARTS LIST

CAUTION

"⚠" is safety part, so it must be used the same part.

"Ⓡ" is a recommendable part for essential stock.

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
ZZ100	48B3740A10	TRANSMITTER REMOCON	R-40A10	Ⓡ
ZZ110	PTACPWD434	ACCESSORY AS	DTA-20V1MZ	
00100	4850Q00910	BATTERY	R03/NN	
00200	48586002E2	MANUAL INSTRUCTION	ENGLISH,ARABIC	
M821	4858213800	BAG INSTRUCTION	L.D.P.E T0.05X250X400	
ZZ120	PTBCSHD435	COVER BACK AS	DTA-21V1MZ	
M211	4852151601	COVER BACK	HIPS BK	
M541	4855415800	SPEC PLATE	150ART P/E FILM (C/TV)	
M781	4857820300	CLOTH BLACK	T0.5 L=150	
ZZ130	PTPKCPD435	PACKING AS	DTA-21V1MZ	
10	6520010100	STAPLE PIN	AUTO W65	
M801	485805063B	BOX CARTON	DW-3A	
M811	4858186800	PAD	EPS 21V1	
M821	4858211800	BAG P.E	L.D.P.E T0.03X1300X1100	
ZZ131	48519A5310	CRT GROUND NET	2101S-1015-1P	
ZZ132	58G0000147	COIL DEGAUSSING	DC-21SF	⚠
ZZ140	PTCACAD435	CABINET AS	DTA-21V1MZ	
M201A	4856013300	SCREW CRT FIXING	30X80 BK	
M201B	4856215402	WASHER RUBBER	CR T2.0	
M201C	4856013302	SCREW CRT FIXING	30X190 BK	
M211A	7172401412	SCREW TAPPTITE	TT2 TRS 4X14 MFZN BK	
M211D	7172401412	SCREW TAPPTITE	TT2 TRS 4X14 MFZN BK	
M492	4854939403	BUTTON POWER	ABS BK	
M591	4855930900	DECO TERM	PVC CL T0.2	
SP01A	7178301011	SCREW TAPPTITE	TT2 WAS 3X10 MFZN	
V901	4859625560	CRT	A51EFK155X01	Ⓡ ⚠
ZZ200	PTFMSJD435	MASK FRONT AS	DTA-21V1MZ	
M191	4851932302	BUTTON CTRL	4939402+5536301	
M201	4852067601	MASK FRONT	HIPS BK	
M561	48556159SS	MARK BRAND	SILVER ETCHING DIA-CUTTIN	
ZZ210	PTSPPWA652	SPEAKER AS	DTA-14C4TFF	
P601A	4850703S50	CONNECTOR	YH025-03+35098+ULW=200	
SP01	4858314010	SPEAKER	SP-5070F01 3W 8 OHM	Ⓡ
ZZ290	PTMPMSD435	PCB MAIN MANUAL AS	DTA-21V1MZ	
10	2193102005	SOLDER BAR	SN:PB=63:47 S63S-1320	
30	2291050616	FLUX SOLDER	JS-64T3	
40	2291050301	FLUX SOLVENT	IM-1000	
C404	CMYH3C752J	C MYLAR	1.6KV BUP 7500PF J	
C408	CMYE2D474J	C MYLAR	200V PU 0.47MF J	
C801	CL1UC3104M	C LINE ACROSS	WORLD AC250V 0.1UF M R.47	
C804	CEYN2W151P	C ELECTRO	450V LHS 150MF (25X40)	Ⓡ

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C808	CH1AFE222M	C CERA AC	4KV 2200PF M KX DE1210	Ⓡ ⚠
D707	DSML1216W-	LED	SML1216W	
D807	DRGP30J—-	DIODE	RGP30J	
F801	5FSGB4022L	FUSE GLASS TUBE	SEMKO TL 4A 250V MF51	Ⓡ ⚠
G901	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV)	
G902	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV)	
G903	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV)	
G904	4SG0DX0001	SPARK GAP	SSG-102-A1(1.0KV)	
I301	PTA2SW5405	HEAT SINK ASS`Y	1TDA8357J- + 7174301011	
00001	1TDA8357J-	IC VERTICAL	TDA8357J	Ⓡ
0000A	4857025405	HEAT SINK	A1050P-H24 T=2	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
I501	1DW3812EB1	IC MICOM	DW9381/N1/2S-2B1	Ⓡ
I601	1TDA7267A-	IC AMP	TDA7267A	Ⓡ
I702	1AT24C08PC	IC	AT24C08-10PC	Ⓡ
I703	1SRV21M—-	IC PREAMP	SRV-21M	
I801	PTA2SW7919	HEAT SINK ASS`Y	1MA8920—- + 7174301211	
00001	1MA8920—-	IC POWER	MA8920	Ⓡ
0000A	4857027919	HEAT SINK	AL EX	
0000B	7174301211	SCREW TAPPTITE	TT2 RND 3X12 MFZN	
0000C	4853938501	BRKT TR	SBHG1-A T1.5	
I802	1LTV817C—	IC PHOTO COUPLER	LTV-817C	Ⓡ ⚠
I803	1DP123——	IC ERROR AMP	DP123	Ⓡ
I805	1KA7805—-	IC REGULATOR	KA7805	Ⓡ
I901	PTC3SW1100	HEAT SINK ASS`Y	1TDA6107Q- + 7174300811	
00001	1TDA6107Q-	IC VIDEO	TDA6107Q	Ⓡ
0000A	4857031100	HEAT SINK	A1050P-H24 T2.0	
0000B	7174300811	SCREW TAPPTITE	TT2 RND 3X8 MFZN	
JPA01	4859200401	SOCKET RGB	YRS21-R1	
JPA02	4859109950	JACK PIN BOARD	PH-JB-9710A	
L401	58H0000020	COIL H-LINEARITY	L-76(76.5UH)	
LF801	5PLF20A1—	FILTER LINE	LF-20A1	Ⓡ ⚠
M561	4853533600	HOLDER LED	P.P BK	
P401	4859240120	CONN WAFER	YFW500-06	
P501	4850708N08	CONNECTOR	BIC-08T-25T+C-20T+ULW=400	
PWC1	4859908110	CORD POWER AS	1-L0+H03VVH2-F+HOU=2200	
Q401	PTJ2SW7200	HEAT SINK ASS`Y	TST1803DH- + 7174301011	
00001	TST1803DH-	TR	ST1803DHI	
0000A	4857027200	HEAT SINK	AL T1.0	
0000B	7174301011	SCREW TAPPTITE	TT2 RND 3X10 MFZN	
R801	DDC7R0M290	POSISTOR	ECPCD7R0M290	
R802	RX07B339JP	R CEMENT	7W 3.3 OHM J BEN 15MM 4P	
SCT1	4859303530	SOCKET CRT	PCS629-03C	
SF01	5PK7252M—	FILTER SAW	K7252M	
SW801	5S40101146	SW POWER PUSH	SS-160-7-B	

ELECTRICAL PARTS LIST

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
T401	50D10A3—-	TRANS DRIVE	TD-10A3	
T402	50H0000211	FBT	1142.5109	Ⓡ ⚠
T802	50M4042A7-	TRANS SMPS	TSM-4042A7	Ⓡ ⚠
U100	4859721530	TUNER VARACTOR	DT5-BF18D N	Ⓡ
X502	5XE12R000E	CRYSTAL QUARTZ	HC-49/U 12.00000MHZ 30PPM	
Z501	5PYXT5R5MB	FILTER CERA	XT 5.5MB	
Z502	5PYXT6R5MB	FILTER CERA	XT 6.5MB	
Z503	5PYXT6R0MB	FILTER CERA	XT 6.0MB	
ZZ200	PTMPJ0D435	PCB MAIN (RHU) AS	DTA-21V1MZ	
C315	CEXF2C330V	C ELECTRO	160V RSS 33MF (13X20) TP	
C415	CEXF2E100V	C ELECTRO	250V RSS 10MF (10X20) TP	
C805	CBXB3D102K	C CERA SEMI	2KV BL(N) 1000PF K (T)	
C810	CEXF2C101V	C ELECTRO	160V RSS 100MF (16X25) TP	
C811	CEXF2C101V	C ELECTRO	160V RSS 100MF (16X25) TP	
C813	CEXF1C222V	C ELECTRO	16V RSS 2200MF (13X25) TP	
C814	CEXF1E102V	C ELECTRO	25V RSS 1000MF (13X20) TP	
C903	CCXB3D102K	C CERA	2KV B 1000PF K (TAPPING)	
ZZ200	PTMPJBD435	PCB MAIN M-10 AS	DTA-21V1MZ	
10	2TM18006BE	TAPE MASKING	6.2X500	
E001	4856310300	EYE LET	BSR T0.2 (R1.6)	
E002	4856310300	EYE LET	BSR T0.2 (R1.6)	
E003	4856310300	EYE LET	BSR T0.2 (R1.6)	
E004	4856310300	EYE LET	BSR T0.2 (R1.6)	
E005	4856310300	EYE LET	BSR T0.2 (R1.6)	
E006	4856310300	EYE LET	BSR T0.2 (R1.6)	
E007	4856310300	EYE LET	BSR T0.2 (R1.6)	
E008	4856310300	EYE LET	BSR T0.2 (R1.6)	
E009	4856310300	EYE LET	BSR T0.2 (R1.6)	
E010	4856310300	EYE LET	BSR T0.2 (R1.6)	
E011	4856310300	EYE LET	BSR T0.2 (R1.6)	
E012	4856310300	EYE LET	BSR T0.2 (R1.6)	
E013	4856310300	EYE LET	BSR T0.2 (R1.6)	
E014	4856310300	EYE LET	BSR T0.2 (R1.6)	
E015	4856310300	EYE LET	BSR T0.2 (R1.6)	
E016	4856310300	EYE LET	BSR T0.2 (R1.6)	
E017	4856310300	EYE LET	BSR T0.2 (R1.6)	
E018	4856310300	EYE LET	BSR T0.2 (R1.6)	
E019	4856310300	EYE LET	BSR T0.2 (R1.6)	
E020	4856310300	EYE LET	BSR T0.2 (R1.6)	
E021	4856310300	EYE LET	BSR T0.2 (R1.6)	
E022	4856310300	EYE LET	BSR T0.2 (R1.6)	
E023	4856310300	EYE LET	BSR T0.2 (R1.6)	
E024	4856310300	EYE LET	BSR T0.2 (R1.6)	
E100	4856310600	EYE LET	BSR T0.2 (R2.3)	
E101	4856310600	EYE LET	BSR T0.2 (R2.3)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
E102	4856310600	EYE LET	BSR T0.2 (R2.3)	
E103	4856310600	EYE LET	BSR T0.2 (R2.3)	
E104	4856310600	EYE LET	BSR T0.2 (R2.3)	
E105	4856310600	EYE LET	BSR T0.2 (R2.3)	
E106	4856310600	EYE LET	BSR T0.2 (R2.3)	
E107	4856310600	EYE LET	BSR T0.2 (R2.3)	
E108	4856310600	EYE LET	BSR T0.2 (R2.3)	
E109	4856310600	EYE LET	BSR T0.2 (R2.3)	
E110	4856310600	EYE LET	BSR T0.2 (R2.3)	
E111	4856310600	EYE LET	BSR T0.2 (R2.3)	
E112	4856310600	EYE LET	BSR T0.2 (R2.3)	
E113	4856310600	EYE LET	BSR T0.2 (R2.3)	
E114	4856310600	EYE LET	BSR T0.2 (R2.3)	
E115	4856310600	EYE LET	BSR T0.2 (R2.3)	
E116	4856310600	EYE LET	BSR T0.2 (R2.3)	
E117	4856310600	EYE LET	BSR T0.2 (R2.3)	
E118	4856310600	EYE LET	BSR T0.2 (R2.3)	
E119	4856310600	EYE LET	BSR T0.2 (R2.3)	
N001	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
N002	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
N003	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
N004	4857417500	TERM PIN	DA-IB0214(D2.3/DY PIN)	
P601	485923162S	CONN WAFER	YW025-03 (STICK)	
R303	RS02Z129JS	R M-OXIDE FILM	2W 1.2 OHM J SMALL	
R402	RS01Z279J-	R M-OXIDE FILM	1W 2.7 OHM J (TAPPING)	
R415	RS02Z102JS	R M-OXIDE FILM	2W 1K OHM J SMALL	
R819	RS02Z473JS	R M-OXIDE FILM	2W 47K OHM J SMALL	
R821	RS02Z180JS	R M-OXIDE FILM	2W 18 OHM J SMALL	
R822	RS02Z101JS	R M-OXIDE FILM	2W 100 OHM J SMALL	
R824	RS02Z560JS	R M-OXIDE FILM	2W 56 OHM J SMALL	
ZZ200	PTMPJRD435	PCB MAIN RADIAL AS	DTA-21V1MZ	
C101	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C102	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C106	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C121	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C305	CEXF1E221V	C ELECTRO	25V RSS 220MF (8X11.5) TP	
C313	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C314	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C412	CEXF2C229V	C ELECTRO	160V RSS 2.2MF (8X11.5)TP	
C414	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C417	CXSL2H470J	C CERA	500V SL 47PF J (TAPPING)	
C418	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C420	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
C500	CEXF1H478V	C ELECTRO	50V RSS 0.47MF (5X11) TP	
C501	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	

ELECTRICAL PARTS LIST

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C502	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C504	CMXM2A332J	C MYLAR	100V 3300PF J (TP)	
C509	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C511	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C512	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C514	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C517	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C519	CEXF1H109V	C ELECTRO	50V RSS 1MF (5X11) TP	
C522	CEXF1H479V	C ELECTRO	50V RSS 4.7MF (5X11) TP	
C524	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C526	CMXM2A104J	C MYLAR	100V 0.1MF J (TP)	
C528	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C530	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C532	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C551	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C555	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C564	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C593	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C599	CEXF1H229V	C ELECTRO	50V RSS 2.2MF (5X11) TP	
C600	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C601	CEXF1H108V	C ELECTRO	50V RSS 0.1MF (5X11) TP	
C603	CEXF1C101V	C ELECTRO	16V RSS 100MF (6.3X11) TP	
C650	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C770	CEXF1H100V	C ELECTRO	50V RSS 10MF (5X11) TP	
C802	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C803	CCXF3A472Z	C CERA	1KV F 4700PF Z (T)	
C806	CMXM2A222J	C MYLAR	100V 2200PF J (TP)	
C807	CMXM2A102J	C MYLAR	100V 1000PF J (TP)	
C809	CCXB3A471K	C CERA	1KV B 470PF K (T)	
C812	CEXF2A100V	C ELECTRO	100V RSS 10MF (6.3X11) TP	
C815	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C816	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C817	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C818	CEXF1E101V	C ELECTRO	25V RSS 100MF (6.3X11) TP	
C819	CEXF1E470V	C ELECTRO	25V RSS 47MF (5X11) TP	
C820	CEXF1C221V	C ELECTRO	16V RSS 220MF (8X11.5) TP	
C901	CMXL2E104K	C MYLAR	250V MEU 0.1MF K	
C902	CCXB1H561K	C CERA	50V B 560PF K (TAPPING)	
CA04	CEXD1H229F	C ELECTRO	50V RND 2.2MF (5X11) TP	
CA05	CCXB1H102K	C CERA	50V B 1000PF K (TAPPING)	
F801A	4857415001	CLIP FUSE	PFC5000-0702	
F801B	4857415001	CLIP FUSE	PFC5000-0702	
L802	58C9430599	COIL CHOKE	AZ-9004Y(94MH)	
Q101	TKTC3198Y-	TR	KTC3198Y	
Q402	TKTC3207—	TR	KTC3207 (TP)	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
Q403	TKTC3198Y-	TR	KTC3198Y	
Q501	TKTA1266Y-	TR	KTA1266Y (TP)	
Q502	TKTC3198Y-	TR	KTC3198Y	
Q503	TKTC3198Y-	TR	KTC3198Y	
Q510	TKTA1266Y-	TR	KTA1266Y (TP)	
Q511	TKTA1266Y-	TR	KTA1266Y (TP)	
Q520	TKTC3198Y-	TR	KTC3198Y	
Q531	TKTA1266Y-	TR	KTA1266Y (TP)	
Q805	TKTC3205Y-	TR	KTC3205Y (TP)	
Q807	TKTA1266Y-	TR	KTA1266Y (TP)	
Q808	TKTC3198Y-	TR	KTC3198Y	
Q809	TKTC3198Y-	TR	KTC3198Y	
Q810	TKTC3198Y-	TR	KTC3198Y	
Q851	TKTC3198Y-	TR	KTC3198Y	
Q852	TKTC3198Y-	TR	KTC3198Y	
SW700	5S50101090	SW TACT	THVH472GCA	
SW701	5S50101090	SW TACT	THVH472GCA	
SW702	5S50101090	SW TACT	THVH472GCA	
SW703	5S50101090	SW TACT	THVH472GCA	
SW704	5S50101090	SW TACT	THVH472GCA	
ZZ200	PTMPJAD435	PCB MAIN AXIAL AS	DTA-21V1MZ	
10	2TM14006LB	TAPE MASKING	3M #232 6.0X2000M	
20	2TM10006LB	TAPE MASKING	3M #232-MAP-C 6.2X2000M	
A001	4859805293	PCB MAIN	246X246 S1B	
C350	CCZF1H473Z	C CERA	50V F 0.047MF Z	
C351	CCZB1H222K	C CERA	50V B 2200PF K AXIAL	
C421	CCZF1H103Z	C CERA	50V F 0.01MF Z	
C506	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
C515	CBZR1C222M	C CERA	16V Y5R 2200PF M (AXIAL)	
C516	CBZR1C472M	C CERA	16V Y5R 4700PF M (AXIAL)	
C518	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
C520	CCZB1H221K	C CERA	50V B 220PF K (AXIAL)	
C521	CCZB1H221K	C CERA	50V B 220PF K (AXIAL)	
C523	CCZF1H103Z	C CERA	50V F 0.01MF Z	
C525	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C527	CCZF1H473Z	C CERA	50V F 0.047MF Z	
C531	CCZF1H473Z	C CERA	50V F 0.047MF Z	
C533	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
C534	CCZF1H223Z	C CERA	50V F 0.022MF Z	
C535	CCZF1H223Z	C CERA	50V F 0.022MF Z	
C536	CCZF1H223Z	C CERA	50V F 0.022MF Z	
C570	CBZR1C472M	C CERA	16V Y5R 4700PF M (AXIAL)	
C571	CCZB1H821K	C CERA	50V B 820PF K AXIAL	
C585	CBZR1C222M	C CERA	16V Y5R 2200PF M (AXIAL)	
C590	CZCH1H270J	C CERA	CH 50V 27PF J AXL 52MM	

ELECTRICAL PARTS LIST

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
C591	CZCH1H270J	C CERA	CH 50V 27PF J AXL 52MM	
C602	CCZF1H103Z	C CERA	50V F 0.01MF Z	
C771	CBZF1H104Z	C CERA SEMI	50V F 0.1MF Z	
CA01	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA02	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA03	CCZB1H101K	C CERA	50V B 100PF K (AXIAL)	
CA10	CCZB1H102K	C CERA	50V B 1000PF K (AXIAL)	
D101	D1N4148—-	DIODE	1N4148 (TAPPING)	
D120	DUZ33B——	DIODE ZENER	UZ-33B	
D313	D1N4004S—	DIODE	1N4004S	
D350	DUZ12BM—-	DIODE ZENER	UZ-12BM (UNIZON)	
D351	DUZ15BM—-	DIODE ZENER	UZ-15BM	
D352	DUZ33B——	DIODE ZENER	UZ-33B	
D353	DUZ33B——	DIODE ZENER	UZ-33B	
D360	DUZ33B——	DIODE ZENER	UZ-33B	
D361	DUZ33B——	DIODE ZENER	UZ-33B	
D362	DUZ33B——	DIODE ZENER	UZ-33B	
D405	D1N4937G—	DIODE	1N4937G (TAPPING)	
D407	D1N4937G—	DIODE	1N4937G (TAPPING)	
D408	D1N4937G—	DIODE	1N4937G (TAPPING)	
D450	D1N4937G—	DIODE	1N4937G (TAPPING)	
D520	D1N4148—-	DIODE	1N4148 (TAPPING)	
D521	D1N4148—-	DIODE	1N4148 (TAPPING)	
D531	D1N4148—-	DIODE	1N4148 (TAPPING)	
D532	D1N4148—-	DIODE	1N4148 (TAPPING)	
D533	D1N4148—-	DIODE	1N4148 (TAPPING)	
D534	D1N4148—-	DIODE	1N4148 (TAPPING)	
D591	DUZ2R4B—-	DIODE ZENER	UZ-2.4B	
D710	DMTZJ5R1A-	DIODE ZENER	MTZJ 5.1A	
D801	DLT2A05G—	DIODE	LT2A05G (TP)	
D802	DLT2A05G—	DIODE	LT2A05G (TP)	
D803	DLT2A05G—	DIODE	LT2A05G (TP)	
D804	DLT2A05G—	DIODE	LT2A05G (TP)	
D805	D1N4937G—	DIODE	1N4937G (TAPPING)	
D806	DUZ8R2BM—	DIODE ZENER	UZ-8.2B	
D808	D1N4937G—	DIODE	1N4937G (TAPPING)	
D810	D1N4937G—	DIODE	1N4937G (TAPPING)	
D812	DUZ8R2BM—	DIODE ZENER	UZ-8.2B	
D813	D1N4148—-	DIODE	1N4148 (TAPPING)	
D816	DZY160——	DIODE ZENER	ZY160	
D820	DUZ2R7B—-	DIODE ZENER	UZ-2.7B	
D821	DRGP15J—-	DIODE	RGP15J	
DA03	DUZ5R1B—-	DIODE ZENER	UZ-5.1B	
DA04	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA05	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
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	
DA13	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
DA27	DUZ5R6BM—	DIODE ZENER	UZ-5.6BM	
J001	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J002	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J003	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J004	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J005	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J006	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J008	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J010	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J012	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J013	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J014	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J016	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J017	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J018	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J019	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J020	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J021	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J022	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J024	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J026	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J027	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J028	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J029	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J030	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J031	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J032	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J034	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J035	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J036	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J037	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J038	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J039	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
J040	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J041	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J042	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J043	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J044	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J045	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J046	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	

ELECTRICAL PARTS LIST

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
J047	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J048	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J049	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J050	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J051	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J052	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J053	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J054	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J055	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J056	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J061	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J062	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J063	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J064	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
J065	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
L101	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L301	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L303	85801065GY	WIRE COPPER	AWG22 1/0.65 TIN COATING	
L304	5CPZ100K04	COIL PEAKING	10UH 10.5MM K (LAL04TB)	
L500	5CPZ829K02	COIL PEAKING	8.2UH K (AXIAL 3.5MM)	
L501	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L502	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L510	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L511	5CPZ100K02	COIL PEAKING	10UH K (AXIAL 3.5MM)	
L601	5MC0000100	COIL BEAD	HC-3550	
L801	5MC0000100	COIL BEAD	HC-3550	
R101	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R102	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R103	RD-AZ123J-	R CARBON FILM	1/6 12K OHM J	
R104	RD-AZ104J-	R CARBON FILM	1/6 100K OHM J	
R105	RD-AZ392J-	R CARBON FILM	1/6 3.9K OHM J	
R106	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R107	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R120	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R121	RD-2Z332J-	R CARBON FILM	1/2 3.3K OHM J	
R302	RD-2Z109J-	R CARBON FILM	1/2 1 OHM J	
R305	RD-2Z331J-	R CARBON FILM	1/2 330 OHM J	
R306	RD-4Z564J-	R CARBON FILM	1/4 560K OHM J	
R310	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R311	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R340	RD-4Z473J-	R CARBON FILM	1/4 47K OHM J	
R350	RN-4Z1501F	R METAL FILM	1/4 1.50K OHM F	
R351	RN-4Z1501F	R METAL FILM	1/4 1.50K OHM F	
R355	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R356	RD-4Z562J-	R CARBON FILM	1/4 5.6K OHM J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R401	RD-4Z472J-	R CARBON FILM	1/4 4.7K OHM J	
R404	RD-2Z751J-	R CARBON FILM	1/2 750 OHM J	
R405	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R406	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R420	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R430	RD-4Z223J-	R CARBON FILM	1/4 22K OHM J	
R431	RD-4Z303J-	R CARBON FILM	1/4 30K OHM J	
R450	RD-2Z103J-	R CARBON FILM	1/2 10K OHM J	
R505	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R506	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R507	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R508	RD-AZ332J-	R CARBON FILM	1/6 3.3K OHM J	
R509	RD-AZ681J-	R CARBON FILM	1/6 680 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-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R516	RD-AZ393J-	R CARBON FILM	1/6 39K OHM J	
R517	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R518	RD-AZ273J-	R CARBON FILM	1/6 27K OHM J	
R520	RD-AZ183J-	R CARBON FILM	1/6 18K OHM J	
R521	RD-AZ391J-	R CARBON FILM	1/6 390 OHM J	
R522	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R523	RD-AZ331J-	R CARBON FILM	1/6 330 OHM J	
R524	RD-AZ561J-	R CARBON FILM	1/6 560 OHM J	
R525	RD-AZ104J-	R CARBON FILM	1/6 100K OHM J	
R526	RD-4Z479J-	R CARBON FILM	1/4 4.7 OHM J	
R527	RD-AZ431J-	R CARBON FILM	1/6 430 OHM J	
R528	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R530	RD-AZ470J-	R CARBON FILM	1/6 47 OHM J	
R531	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R533	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R534	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R535	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R537	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R538	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R539	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R551	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R555	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R556	RD-AZ562J-	R CARBON FILM	1/6 5.6K OHM J	
R560	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R567	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
R571	RD-AZ432J-	R CARBON FILM	1/6 4.3K OHM J	
R572	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R573	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	

ELECTRICAL PARTS LIST

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R575	RD-AZ272J-	R CARBON FILM	1/6 2.7K OHM J	
R580	RD-AZ561J-	R CARBON FILM	1/6 560 OHM J	
R585	RD-4Z224J-	R CARBON FILM	1/4 220K OHM J	
R586	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R591	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R592	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R593	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R594	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R595	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
R596	RD-AZ302J-	R CARBON FILM	1/6 3K OHM J	
R597	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R598	RD-AZ153J-	R CARBON FILM	1/6 15K OHM J	
R599	RD-AZ392J-	R CARBON FILM	1/6 3.9K OHM J	
R601	RD-4Z332J-	R CARBON FILM	1/4 3.3K OHM J	
R602	RD-AZ152J-	R CARBON FILM	1/6 1.5K OHM J	
R610	RD-4Z332J-	R CARBON FILM	1/4 3.3K OHM J	
R710	RD-AZ431J-	R CARBON FILM	1/6 430 OHM J	
R711	RD-AZ431J-	R CARBON FILM	1/6 430 OHM J	
R713	RD-AZ100J-	R CARBON FILM	1/6 10 OHM J	
R720	RD-AZ122J-	R CARBON FILM	1/6 1.2K OHM J	
R721	RD-AZ181J-	R CARBON FILM	1/6 180 OHM J	
R722	RD-AZ221J-	R CARBON FILM	1/6 220 OHM J	
R723	RD-AZ331J-	R CARBON FILM	1/6 330 OHM J	
R724	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
R803	RD-4Z185J-	R CARBON FILM	1/4 1.8M OHM J	
R804	RD-4Z185J-	R CARBON FILM	1/4 1.8M OHM J	
R805	RD-4Z114J-	R CARBON FILM	1/4 110K OHM J	
R806	RD-4Z244J-	R CARBON FILM	1/4 240K OHM J	
R807	RD-4Z201J-	R CARBON FILM	1/4 200 OHM J	
R808	RD-4Z162J-	R CARBON FILM	1/4 1.6K OHM J	
R809	RD-4Z510J-	R CARBON FILM	1/4 51 OHM J	
R810	RD-4Z752J-	R CARBON FILM	1/4 7.5K OHM J	
R811	RD-4Z241J-	R CARBON FILM	1/4 240 OHM J	
R812	RD-4Z102J-	R CARBON FILM	1/4 1K OHM J	
R813	RC-2Z565KP	R CARBON COMP	1/2 5.6M OHM K	
R814	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R815	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R816	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R817	RD-AZ223J-	R CARBON FILM	1/6 22K OHM J	
R818	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
R823	RD-4Z561J-	R CARBON FILM	1/4 560 OHM J	
R825	RD-AZ222J-	R CARBON FILM	1/6 2.2K OHM J	
R826	RD-AZ751J-	R CARBON FILM	1/6 750 OHM J	
R827	RD-AZ472J-	R CARBON FILM	1/6 4.7K OHM J	
R828	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	

LOC	PART CODE	PART NAME	DESCRIPTION	REMARK
R829	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R830	RD-AZ151J-	R CARBON FILM	1/6 150 OHM J	
R831	RD-4Z100J-	R CARBON FILM	1/4 10 OHM J	
R901	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R902	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R903	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
R904	RD-2Z152J-	R CARBON FILM	1/2 1.5K OHM J	
R905	RD-2Z152J-	R CARBON FILM	1/2 1.5K OHM J	
R906	RD-2Z152J-	R CARBON FILM	1/2 1.5K OHM J	
R954	RD-AZ103J-	R CARBON FILM	1/6 10K OHM J	
RA01	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA02	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA03	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA04	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA06	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA07	RD-AZ390J-	R CARBON FILM	1/6 39 OHM J	
RA08	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA09	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA10	RD-AZ101J-	R CARBON FILM	1/6 100 OHM J	
RA11	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
RA12	RD-AZ471J-	R CARBON FILM	1/6 470 OHM J	
RA16	RD-AZ680J-	R CARBON FILM	1/6 68 OHM J	
RA19	RD-AZ750J-	R CARBON FILM	1/6 75 OHM J	
RA20	RD-AZ473J-	R CARBON FILM	1/6 47K OHM J	
RA30	RD-AZ102J-	R CARBON FILM	1/6 1K OHM J	
RA44	RD-AZ682J-	R CARBON FILM	1/6 6.8K OHM J	

DIFFERENT PART LIST

LOC	PART NAME	14 INCH	20 INCH CPT CRT	20 INCH ORING CRT	21 INCH
C404	C MYLAR	1.6KV 7500PF	1.6 KV 9100PF	1.6KV 8200PF	1.6KV 7500PF
C408	C MYLAR	200V 0.62µF	200V 0.47µF	200V 0.43µF	200V 0.47µF
1803	IC ERROR AMP	DP123	DP123	DP133	DP123
L401	COIL H-LIN	NONE	NONE	NONE	L-76
R801	POSISTOR	ECPCC140M290	ECPCD7R0M290	ECPCD7RM290	ECPCD7R0M290
SCT1	SOCKET CRT	PCS633A	PCS629-03C	PCS633A	PCS629-03C
P401	CONN WAFER	YFW500-05	YFW500-05	YFW500-05	YFW500-06
J007	WIRE COPPER	AWG22 1/0.65	AWG22 1/0.65	AWG22 1/0.65	NONE
R350	R METAL FILM	1/4W 1K OHM	1/4 1.2K OHM	1/4W 1.2K OHM	1/4W 1.5K OHM
R351	R METAL FILM	1/4W 1K OHM	1/4 1.2K OHM	1/4W 1.2K OHM	1/4W 1.5K OHM
R556	R METAL FILM	1/6W 7.5K OHM	1/6 6.8K OHM	1/6 6.8K OHM	1/6 5.6K OHM
R810	R METAL FILM	1/4W 6.8K OHM	1/4 7.5K OHM	1/4W 7.5K OHM	1/4W 7.5K OHM
R402	R METAL OXIDE	1W 0.82 OHM	1W 0.68 OHM	1W 3.0 OHM	1W 2.7 OHM
V01	COIL DY	ODY-M1401	CDY-S2017	ODY-M2050	ITC CRT
V03	MAGNET CP	NY-225	NY-88DTA	NY-225	ITC CRT
V901	CRT	A34JLL90X	A48AGY13X	A48JLL92X	A51EFK155X01
ZZ131	CRT GND NET	1401S-1015-1P	2001S-1015-1P	2001S-1015-1P	2101S-1015-1P
ZZ132	COIL DEG.	DC-1450	DC-20SF	DC-20SF	DC-21SF

APPENDIX

FUNCTIONAL DESCRIPTION For CP-185C/N

FUNCTIONAL DESCRIPTION OF VIDEO PROCESSOR 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 µ-Controller/Teletext decoder as a reference. The setting of the various frequencies is made by the controlling software in subaddress 27H (33.9 MHz for system L-and 38.9 MHz for all other systems) Because of the internal VCO, the IF circuit has a high immunity to EMC interference.

1. IF demodulator and audio amplifier

The FM demodulator is realised as a narrow band PLL with external loop filter, which provides the necessary selectivity without using an extra band pass filter. To obtain 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. The nominal frequency of the demodulator is set via a gain controlled amplifier and AGC circuit. The nominal frequency of the demodulator is tuned to the required frequency (5.5 / 6.0 / 6.5 MHz) by means of a calibration circuit which uses the clock frequency of the microcontroller as a reference. Selection of the required frequency is done by the controlling software.

Video switches

The video switch has one input for an external CVBS or Y/C signal. The selected CVBS signal can be supplied to pin 38, the IF video output. The selection between both signals is realised by the controlling software in subaddress 22H.

The video ident circuit is connected to the selected signal. This ident circuit is independent of the synchronisation.

Synchronisation circuit

The IC contains separator circuits for the horizontal and vertical sync pulses and a data-slicing circuit which extracts the digital teletext data from the analogue signal.

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 a 12 MHz signal coming from the reference oscillator of the µ-Controller/Teletext decoder.

The horizontal drive is switched on and off via the soft start/stop procedure. This function is realised by means of variation of the TON of the horizontal drive pulses.

The vertical synchronisation is realised by means of a divider circuit. The vertical ramp generator needs an external resistor and capacitor. For the vertical drive a differential output current is available. The outputs are DC coupled to the vertical output stage.

The following geometry parameters can be adjusted:

- Horizontal shift
- Vertical amplitude
- Vertical slope
- S-correction
- Vertical shift

Chroma and luminance processing

The chroma band-pass and trap circuits (including the SECAM cloche filter) are realised by means of gyrators and are tuned to the right frequency by comparing the tuning frequency with the reference frequency of the colour decoder. The luminance delay line and the delay cells for the peaking circuit are also realised with gyrators. The circuit contains a black stretcher functi on which corrects the black level for incoming signals which have a difference between the black level and the blanking level.

Colour decoder

The ICs can 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 12 MHz clock signal from the referenc oscillator of the µ-Controller/Teletext decoder.

The Automatic Colour Limiting (ACL) circuit (switchable via the ACL bit in subaddress 2OH) prevents oversaturation occurring 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.

SOFTWARE CONTROL

The CPU communicates with the peripheral functions using Special function Registers (SFRS) which are addressed as RAM locations. The registers for the Teletext decoder appear as normal SFRs in the µ-Controller memory map and are written to these functions by using a serial bus. This bus is controlled by dedicated hardware which uses a simple handshake system for software synchronisation.

For compatibility reasons and possible re-use of software blocks, the TV processor is controlled by I2C bus. The TV processor control registers cannot be read. Only the status registers can be read (Read address 8A).

The SECAM decoder contains an auto-calibrating PLL demodulator which has two references, via the divided 12 MHz reference frequency (obtained from the µ-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 base-band delay line (TDA 4665 function) is integrated. This delay line is also active during NTSC reception, to obtain a good suppression of cross colour effects. The demodulated colour difference signals are internally supplied to the delay line.

RGB output circuit and black-current stabilization

In the RGB control circuit the signal is controlled on contrast, brightness and saturation. The ICs have a linear input for external RGB signals. The signals for OSD and text are internally supplied to the control circuit. The output signal has an amplitude of about 2 Volts 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. A black level off set can be made with respect to the level which is generated by the black current stabilisation system. In this way different colour temperatures can be obtained for the bright and the dark part of the picture.
The black current stabilisation system checks the output level of the 3 channels and indicates whether the black level of the highest output is in a certain window or below or above this window. This indication is read from the status byte 01 and is used for automatic adjustment of the Vg2d voltage during the production of the TV receiver.

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 is placed in an overscan position so that the discharge is not visible on the screen.

2. IF

The TDA9361/TDA9381 has an alignment free IF PLL demodulator. The fully integrated oscillator is automatically calibrated, using the 12 MHz crystal as a frequency reference. The IF frequency is simply set in TV-Processor by I2C bus. The AFC information is available via I2C bus from the TV-Processor status bytes. The controlling software uses this information for tuner frequency tracking (automatic following). The AFC window is typically 125Khz wide. The minimum frequency step of the tuner is 62.5 kHz.
This AFC function is disabled when a program is tuned using the direct frequency entry or after fine tuning adjustment. Therefore it is recommended to tune a channel with the TV search function (manual or ATSS) or by using the direct channel entry to enable the Automatic Frequency Control.

For SECAM L and L' the TDA9361/TDA9381 is switched to positive modulation via I2C bus. SECAM L' transmission only occur in VHF band I and have their picture and sound carrier interchanged, compared to SECAM L and PAL B/G channels. For SECAM'L the picture carrier is situated at 33.9 MHz and the AM sound carrier at 40.40 MHz. The IF PLL reference is tuned from 38.9 to 33.9 MHz, this is done via I2C Bus and the SIF filter is switched from channel 2 to channel 1;this is done by pin 4 of TDA 9361.

The tuner AGC time constant is slower for positive than for negative modulation, because the TDA9361 reduces its AGC current. To make the AGC time constant even slower an extra series resistor R103 is added. To prevent IF overload when jumping from a very strong transmitter to a weak transmitter a diode D101 has been added

The SAW filter (SF1) has a double Nyquist slope at 38.9 MHz and 33.9 MHz needed for this multistandard application. The disadvantage of this choice is that a 5.5 MHz trap filter (Z501) is needed to suppress the residual sound carrier in the video for B/G signals.

3. Source switching

Video :

The TDA9361/TDA9381 has only one external video input. The SCART video in pin (#20) is connected to the front RCA video input.

The controlling software via I2C bus selects the signal source :

- Video signal from tuner (Pin 40).
- External video.
- External SVHS from SCART.

The sound source switching is done in the video processor part and in the AM demodulator by the µ-Controller via I2C bus.

The video processor pin 28 has multiple functions and provides in this applicationbus.

- Deemphasis time constant
- Audio monitor output
- External AM input
- Deemphasis time constant : The time constant is given by the capacitor C504,needer to obtain the 54µs time time constant for standarad PAL signal.
- Audio monitor output : the nominal output signal is 500 mVrms, for all standards. The signal is also internally connected through to the audio switch. This signal is not controlled by the volume setting and can be used for SCART audio output.

The signal is buffered to avoid influencing the deemphasis time constant and to adjust the output level.

- External AM input : By software the deemphasis pin can be converted into an input pin. External AM signal for SECAM L/L' is directly connected to this pin. In this configuration the FM sound is internally muted, DC level remains at 3Vdc.

An external sound signal of 500mVrms is applied to pin 35 via a coupling capacitor. The input impedance of this pin is 25kΩ typical. Switching between internal FM, external AM or external audio from SCART is controlled internally by software.

Fast R, G, B insertion : The external R, G, B insertion needs a fast switching and cannot be controlled by the software (instruction cycle of 1µ sec). The fast switching pin 16 of SCART is directly connected to the TV processor pin 45 (Fast blanking input). The display is synchronised with the selected video source, i.e. to get stable R, G, B signal insertion they must be synchronised with the selected video source.

4. µ-Controller I/O pin configuration and function

The I/O pins of the µ-Controller can be configured in many ways. All port functions can be individually programmed by the controlling software.
Each I/O port pin can be individually programmed in these configurations :

Open drain

In this mode, the port can function as input and output. It requires an external pull-up resistor. The maximum allowable supply voltage for this pull up resistor is +5V.
So in this mode it is possible to interface a 5 Volt environment like I2C while the µ-Controller has a 3.3 Volt supply.

Push-Pull

The push pull mode can be used for output only. Both sinking and sourcing is active, which leads to steep slopes. The levels are 0 and Vddp, the supply voltage 3.3Volts.

High impedance

This mode can be used for input only operation of the port.

Special port for LED

Pin 10 and 11 have the same functionality as the general I/O pins but in addition, their current source and sink capacity is 8 mA instead of 4 mA. These pins are used for driving LED's via a series current limiting resistor.

µ-Controller I/O pin configuration and function table

pin	name	configuration		description
		Stand by	TV on	
1	n.u.	High impedance	High impedance	not used
2	SCL	Open Drain	Open Drain	Serial clock line
3	SDA	Open Drain	Open Drain	Serial data line
4	SECAM L'	High impedance	Push Pull / High impedance	SIF filter switching + AM/FM switching
5	OCP	High impedance	High impedance	Over Current Protection (Switch the set OFF if the voltage on this pin is <2.3V)
6	RF AGC in	High impedance	High impedance	Used during ATSS to measure 7RF signal level.
7	Key in	High impedance	High impedance	Local keyboard input
8	S/SW	High impedance	High impedance	external video switch
10	Red LED	High impedance	Open Drain	
11	Green LED	Open Drain	High impedance	
62	Audio mute	Push Pull	High impedance	

5. SECAM L/L' sound switching circuit.

The microcontroller pin 4 is a three levels output. The voltage and configuration of this port is described below :

Sound mode	Port configuration	Voltage
FM	Push Pull	Internally shorted to ground
AM L	Push Pull	Pull up to 3.3V
AM L'	High Impedance	Fixed by R511, R156, R157

In FM mode the microcontroller is internally grounded to pin 4. The TDA9830 output is muted

6. Sound amplification

The device TDA7267A is a mono audio amplifier in powerDIP package specially designed for TV application. Thanks to the fully complementary output configuration the device delivers a rail to rail voltage swing without need of bootstrap capacitors. No external heat sink is needed as the Cu ground plane of the PCB is used as heat dissipation.

7. Vertical deflection

The vertical driver circuit is a bridge configuration. The deflection coil is connected between the output amplifiers, which are driven in phase opposition. The differential input circuit is voltage driven. The input circuit is especially intended for direc connection to driver circuits which deliver symmetrical current signals, but is also suitable for asymmetrical currents. The output current of these devices is converted to voltages at the input pins via resistors R350 and R351. The differential input voltage is compared with the output current through the deflection coils measured as voltage across R302, which provides internal feed-back information. The voltage across R302 is proportional to the output current.

Flyback voltage

The flyback voltage is determined by an additional supply voltage V_{fb}. The principle of operation with two supply voltages (class G) makes it possible to fix the supply voltage Vp optimum for the scan voltage and the second supply voltage V_{fb} optimum for the flyback voltage. Using this method, very high efficiency is achieved. The supply voltage V_{fb} is almost totally available as fly-back voltage across the coil, this being possible due to the absence of a coupling capacitor.

Protection

The output circuit has protection circuits for :

- Too high die temperature
- overvoltage of output stage A

Guard circuit

The guard signal is not used by the TDA9361/ TDA9381 to blank the screen in case of a fault condition.

Damping resistor

For HF loop stability a damping resistor (R305) is connected across the deflection coil.

IC DESCRIPTION

1. TDA9361 : TV signal processor - Teletext decoder with embedded µ-Controller.
TDA9381 : TV signal processor - with embedded µ-Controller.

TV-signal Processor

- Multi-standard vision IF circuit with alignment-free PLL demodulator
- Internal (switchable) time-constant for the IF-AGC circuit
- Mono intercarrier with a selective FM-PLL demodulator which can be switched to the different FM sound frequencies (5.5 / 6.0 / 6.5 MHz)
- Source selection between 'Internal' CVBS and external CVBS or Y/C signals
- Integrated chrominance trap circuit
- Integrated luminance delay line with adjustable delay time
- Asymmetrical'delay line type' peaking in the luminance channel
- Black stretching for non-standard luminance signals
- Integrated chroma band-pass filter with switchable centre frequency
- Only one reference (12 MHz) crystal required for the µ-Controller, Teletext and the colour decoder
- PAL / NTSC or multistandard colour decoder with automatic search system
- Internal base-band delay line
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level off set adjustment so that the colour temperature of the dark and the bright parts of the screen can be chosen independently.
- Linear RGB or YUV input with fast blanking for external RGB/YUV sources. The Text/OSD signals are internally supplied from the µ-Controller/Teletext decode
- Contrast reduction possibility during mixed-mode of OSD and Text signals
- Horizontal synchronisation with two control loops and alignment-free horizontal oscillator
- Vertical count-down circuit
- Vertical driver optimised for DC-coupled vertical output stages
- Horizontal and vertical geometry processing

µ-Controller

- 80C51 µ-controller core standard instruction set and timing
- 1µs machine cycle
- 64Kx8-bit programmed ROM
- 3 - 12Kx8-bit Auxiliary RAM (shared with Display and Acquisition)
- Interrupt controller for individual enable/disable with two level priority
- Two 16-bit Timer/Counter registers
- watchdog timer
- Auxiliary RAM page pointer
- 16-bit Data pointer
- IDLE and Power Down (PD) mode
- 8-bit A/D converter
- 4 pins which can be programmed as general I/0 pin or ADC input.

Data Capture

- Text memory 10 pages
- Inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and Subtitle Page Table (SPT)
- 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 optimised µ-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
- Full Field and Vertical Blanking Interval (VBI) data capture of WST data

Display

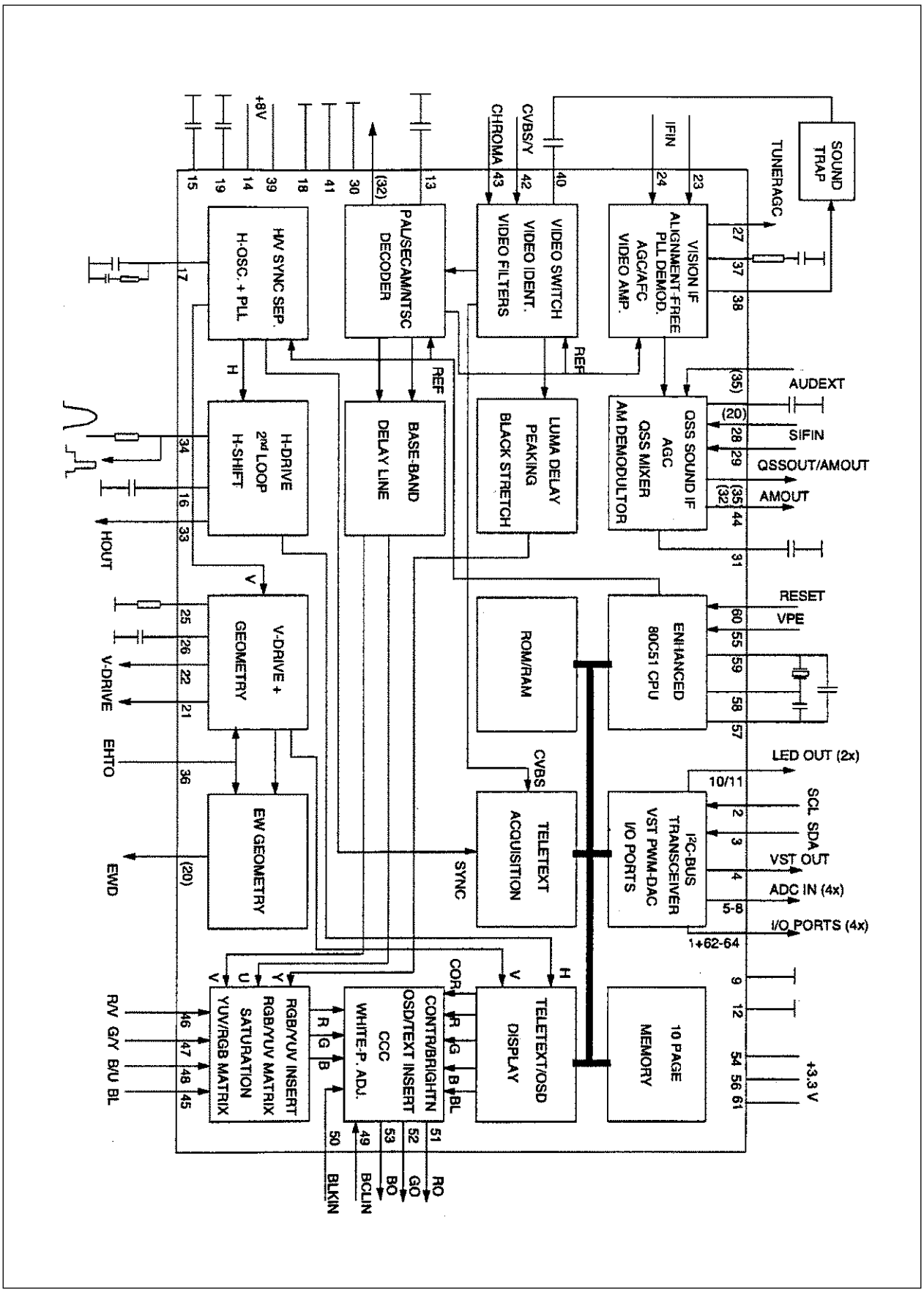
- Teletext and Enhanced OSD modes
- Features of lever 1.5 WST.
- Serial and Parallel Display Attributes
- Single/Double/Quadruple Width and Height for characters
- Scrolling of display region
- Variable flash rate controlled by software
- Enhanced display features including overlining, underlining and italics
- Soft colours using CLUT with 4096 colour palette
- Globally selectable scan lines per row (9/10/13/16) and character matrix [12x10, 12xl3, 12x16 (VxH)]
- Fringing (Shadow) selectable from N-S-E-W direction
- Fringe colour selectable
- Meshing of defined area
- Contrast reduction of defined area
- Cursor
- Special Graphics Characters with two planes, allowing four colours per character
- 32 software redefinable On-Screen display characters
- 4 WST Character sets (GO/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

Data Capture

The Data Capture section takes in the analogue Composite Video and Blanking Signal (CVBS), and from this extracts the required data, which is then decoded and stored in memory.
The extraction of the data is performed in the digital domain. The first stage is to convert the analogue CVBS signal into a digital form. This is done using an ADC sampling at 12MHz. The data and clock recovery is then performed by a Multi-Rate Video Input Processor (MuIVIP). From the recovered data and clock the following data types are extracted WST Teletext (625/525), Closed Caption, VPS, WSS. The extracted data is stored in either memory (DRAM) via the Memory Interface or in SFR locations.

Data Capture Features

- Video Signal Quality detector
- Data Capture for 625 line WST
- Data Capture for 525 line WST
- Data Capture for US Closed Caption
- Data Capture for VPS data (PDC system A)
- Data Capture for Wide Screen Signalling (WSS) bit decoding
- Automatic selection between 525 WST/625WST
- Automatic selection between 625WST/VPS on line 16 of VBI
- Real-time capture and decoding for WST Teletext in Hardware, to enable optimised microprocessor throughput
- 10 pages stored On-Chip
- Inventory of transmitted Teletext pages stored in the Transmitted Page Table (TPT) and Subtitle Page Table (SPT)
- Automatic detection of FASTEXT transmission
- Real-time packet 26 engine in Hardware for processing accented, G2 and G3 characters
- Signal quality detector for WST/VPS data types
- Comprehensive Teletext language coverage
- Full Field and Vertical Blanking Interval (VBI) data capture of WST data


SOUND TRAP
TUNERAGC
IFIN
CVBS/Y
CHROMA
+8V
VISION IF ALIGNMENT-FREE PLL DEMOD. AGC/AFC VIDEO AMP.
VIDEO SWITCH VIDEO IDENT. VIDEO FILTERS
PAL/SECAM/NTSC DECODER
H/V SYNC SEP. H-OSC. + PLL
QSS SOUND IF AGC QSS MIXER AM DEMODULTOR
AUDEXT
SIFIN
QSSOUT/AMOUT
AMOUT
LUMA DELAY PEAKING BLACK STRETCH
BASE-BAND DELAY LINE
H-DRIVE 2nd LOOP H-SHIFT
HOUT
ENHANCED 80C51 CPU
RESET
VPE
ROM/RAM
V-DRIVE + GEOMETRY
V-DRIVE
EHTO
LED OUT (2x)
SCL SDA
VST OUT
ADC IN (4x)
I/O PORTS (4x)
I²C-BUS TRANSCEIVER VST PWM-DAC I/O PORTS
TELETEXT ACQUISITION
CVBS
SYNC
EW GEOMETRY
EWD
TELETEXT/OSD DISPLAY
10 PAGE MEMORY
+3.3 V
RGB/YUV INSERT RGB/YUV MATRIX SATURATION YUV/RGB MATRIX
CONTR/BRIGHTN OSD/TEXT INSERT CCC WHITE-P. ADJ.
R/V G/Y B/U BL
RO GO BO BCLIN BLKIN

IC DESCRIPTION

IC marking and version

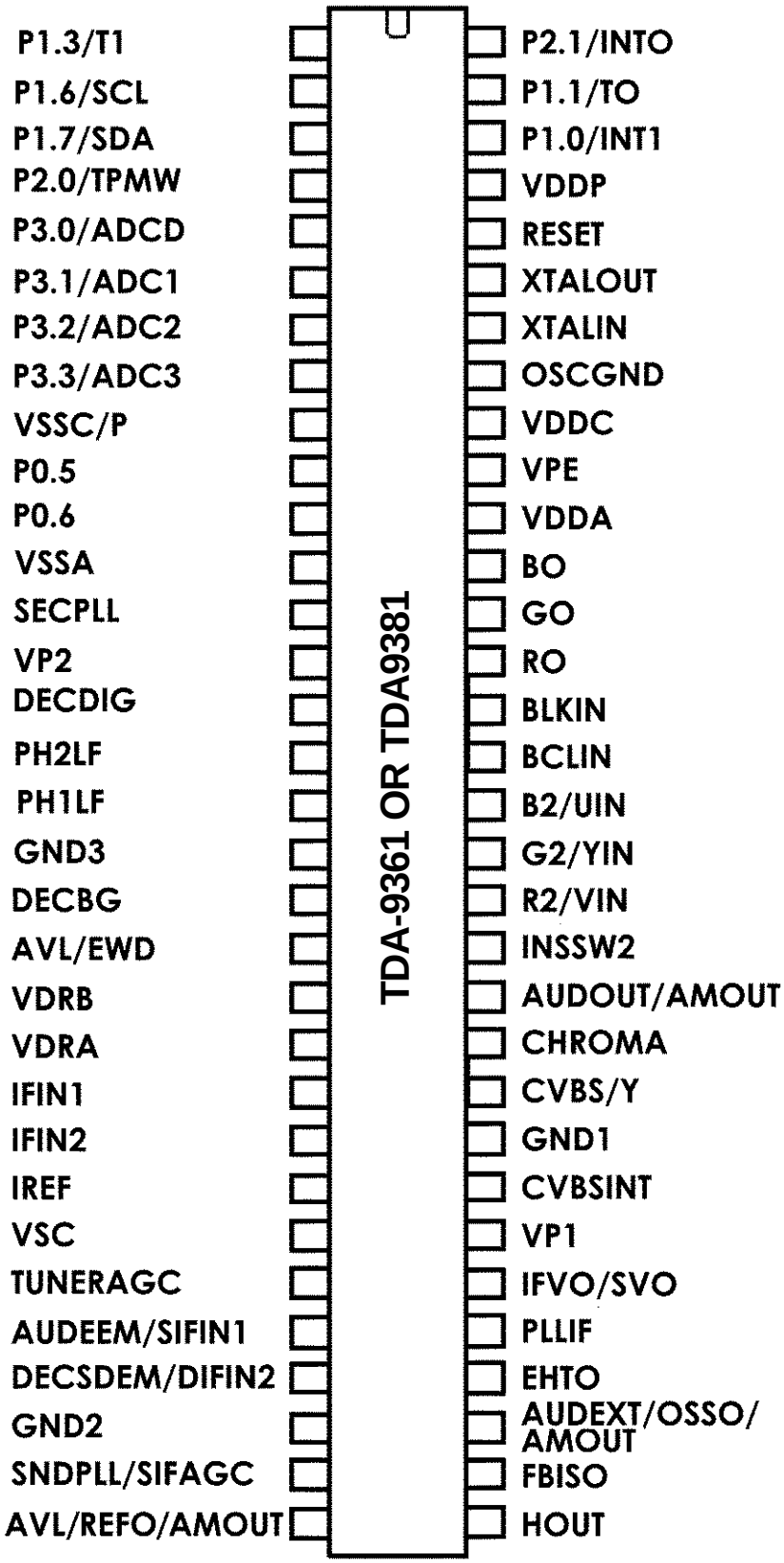
Chassis	IC marking (line 3)	OSD languages	Text
CP 185	DW9361/N1/3-DE1 (note : x is the software version)	English, Russian Arabic, Melayu	English, Russian Arabic, Melayu
CP 185N/C	DW9381/N3-DE1 (note : x is the software version)	English, Russian, Arabic Melayu, Thailand, HIND	

PINNING

SYMBOL	PIN	DESCRIPTION
n.u.	1	Port 1.3 Not used.
SCL	2	I2C bus clock line
SDA	3	I2C Data line
SECAM L' out	4	Port 2.0 : FM sound : PushPull Low AM SECAM L'PushPull High AM SECAM L : High Impedance
OCP	5	Port 3.0 : Over Current Protection
RF AGC in	6	ADC 1 : For program sorting in ATSS (High Impedance)
Key-in	7	ADC 2 : local key input (High impedance)
S/SW	8	ADC 3 : Scart Slow switching input
VssC/P	9	digital ground for µ-controller core and peripheral
LED 1	10	port 0.5 (8mA current sinking capability)
LED 2	11	port 0.6 (8mA current sinking capability)
VSSA	12	analog ground of teletext decoder and digital ground of TV processor
SEC PLL	13	SECAM PLL decoupling
VP2	14	2nd supply voltage TV-processor
DECDIG	15	decoupling digital supply of TV-processor
PH2LF	16	phase-2 filter
PH1LF	17	phase-1 filter
GND3	18	ground 3 for TV-processor
DECBG	19	bandgap decoupling
AVL	20	n.u.
VDRB	21	vertical drive B output
VDRA	22	vertical drive A output

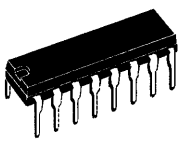
IC DESCRIPTION

SYMBOL	PIN	DESCRIPTION
IFIN1	23	IF input 1
IFIN2	24	IF input 2
IREF	25	Reference current input
VSC	26	vertical sawtooth capacitor
TUNERAGC	27	tuner AGC output
AUDEEM	28	audio deemphasis
DECSDEM	29	decoupling sound demodulator
GND2	30	ground 2 for TV processor
SNDPLL	31	narrow band PLL filter
SNDIF	32	n.u.
HOUT	33	horizontal output
FBISO	34	flyback input / sandcastle output
AUDEXT	35	external audio input
EHT0	36	EHT/Overvoltage protection
PLLIF	37	IF PLL loop filter
IFVO	38	IF video output
VP1	39	main supply voltage TV-processor
CVBSINT	40	internal CVBS input
GND1	41	ground 1 for TV-processor
CVBS/Y	42	external CVBS/Y input
CHROMA	43	chrominance input (SVHS)
AUDOUT	44	audio out
INSSW2	45	2nd RGB insertion input
R2IN	46	2nd R input
G2IN	47	2nd G input
B2IN	48	2nd B input
BCLIN	49	beam current limiter input
BLKIN	50	black current input
R0	51	RED Output
G0	52	GREEN Output
B0	53	BLUE Output
VDDA	54	analog supply of Teletext decoder and digital supply of TV-Processor (3.3V)
VPE	55	OTP programming supply
VDDC	56	digital supply to core (3.3V)
OSCGND	57	oscillator ground supply
XTALIN	58	crystal oscillator input
XTALOUT	59	crystal oscillator output
RESET	60	reset
VDDP	61	digital supply to periphery (3.3V)
Audio Mute	62	Port 1.0 : Audio mute output (PushPull)
Power	63	Port 1.1 : Power output (PushPull)
IR in	64	Interrupt input 0 : R/C Infrared input


P1.3/T1
P1.6/SCL
P1.7/SDA
P2.0/TPMW
P3.0/ADCD
P3.1/ADC1
P3.2/ADC2
P3.3/ADC3
VSSC/P
P0.5
P0.6
VSSA
SECPLL
VP2
DECDIG
PH2LF
PH1LF
GND3
DECBG
AVL/EWD
VDRB
VDRA
IFIN1
IFIN2
IREF
VSC
TUNERAGC
AUDEEM/SIFIN1
DECSDEM/DIFIN2
GND2
SNDPLL/SIFAGC
AVL/REFO/AMOUT
TDA-9361 OR TDA9381
P2.1/INTO
P1.1/TO
P1.0/INT1
VDDP
RESET
XTALOUT
XTALIN
OSCGND
VDDC
VPE
VDDA
BO
GO
RO
BLKIN
BCLIN
B2/UIN
G2/YIN
R2/VIN
INSSW2
AUDOUT/AMOUT
CHROMA
CVBS/Y
GND1
CVBSINT
VP1
IFVO/SVO
PLLIF
EHTO
AUDEXT/OSSO/
AMOUT
FBISO
HOUT

2. TDA-7267A

- Can deliver 3w the 10% 14.5V/8Ω
- Internal fixed gain 32dB
- No feedback capacitor
- No boucherot cell
- Thermal protection
- Ac short circuit trotection
- Svr capacitor for better ripple Rejection
- Low turn-on/off pop
- Stand-by mode



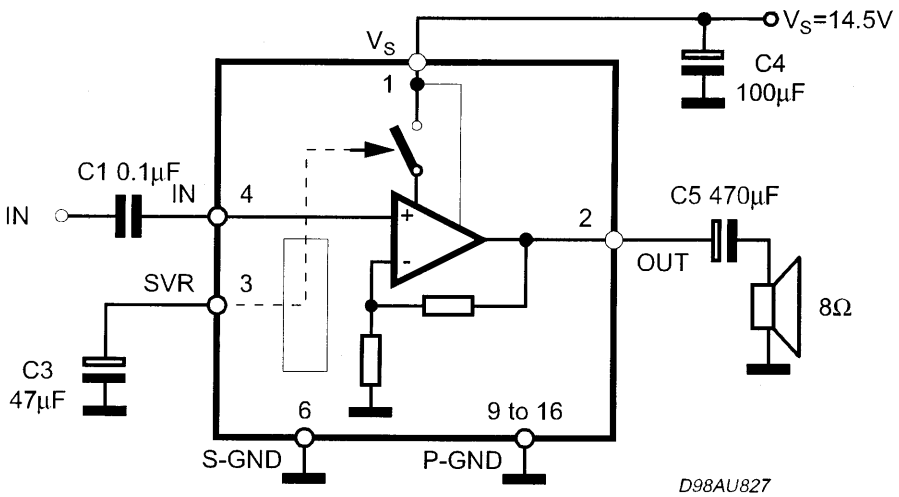
PowerDIP 8+8

ORDERING NUMBER : TDA7267A

Decription

The device TDA7267A is a new technology Mono Audio Amplifier in Power DIP package specifically designed for TV application.
Thanks to the fully complementary output configuration the device delivers a rail to rail voltage swing without need of boostrap capacitors.

Black Diagram



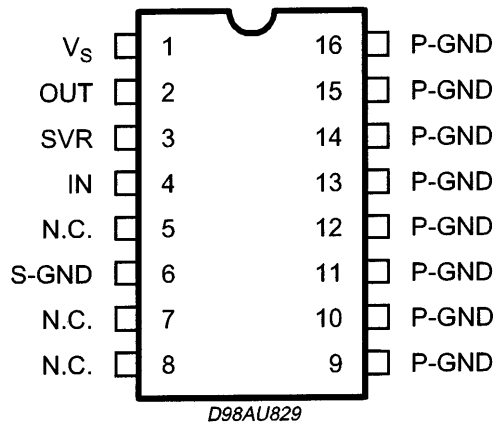
IC DESCRIPTION

APPENDIX

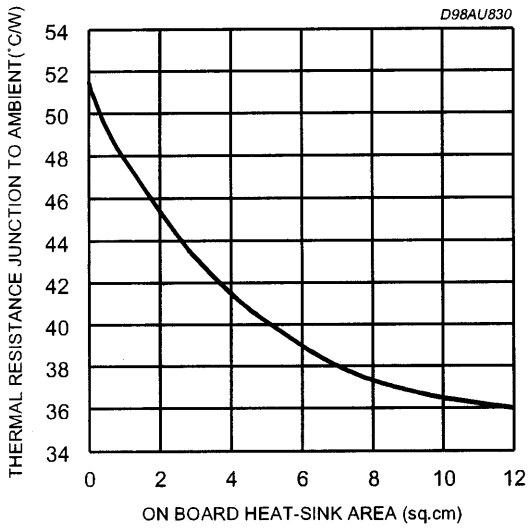
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	unit
V_S	Operating Supply Voltage	18	V
I_O	Output Put Peak Current	1.5	A
T_{op}	Operating Temperature Range	0 to 70	ºC
T_i	Junction Temperature	150	ºC
T_{stg}	Storage Temperature Range	-40 to 125	ºC

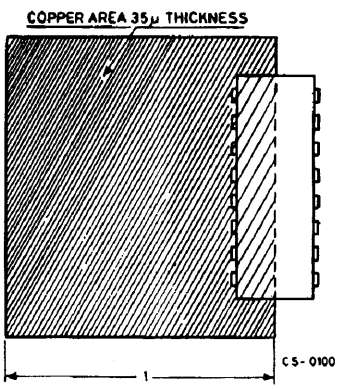
PIN CONNECTION (Top View)



Rth with "on Board" Square heat Sink vs. Copper Area



Example of heatsink using PC board copper



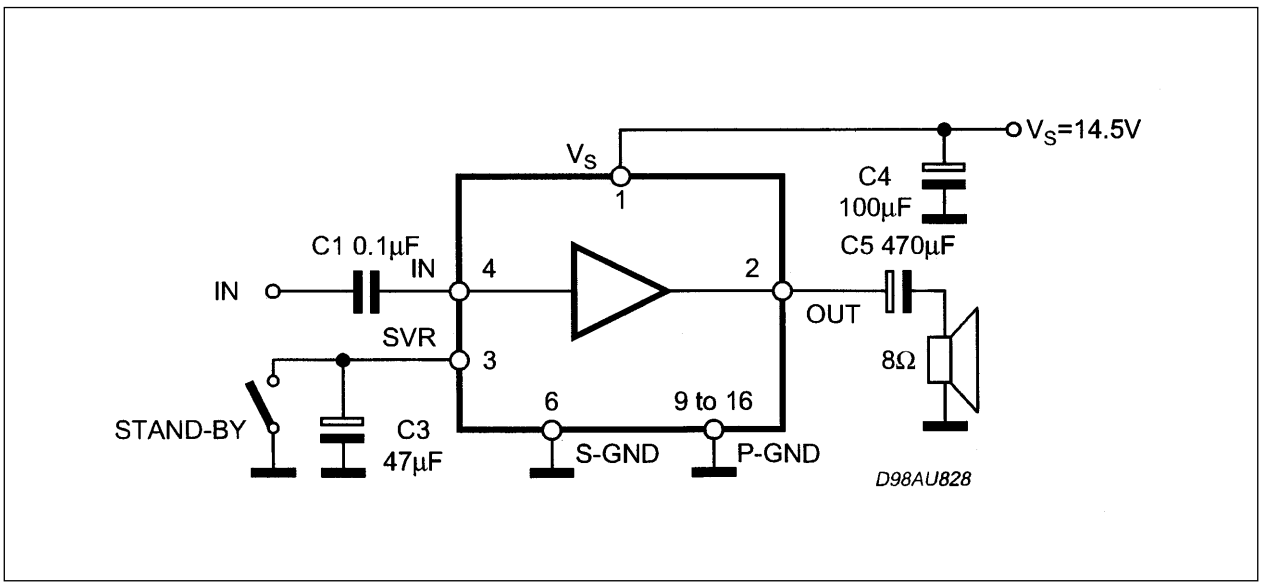
THERAML DATA

Symbol	Parameter	Value	unit
$R_{th\ j\text{-}amb}$	Thermal Rasistance junction to ambient	70	ºC/W
$R_{th\ j\text{-}case}$	Thermal Resistance Junction to case	15	ºC/W

ELECTRICAL CHARACTERISTICS (Tamb = 25ºC; Vs = 14.5V; RL=8Ω; f=1KHz; nuless otherwise specified.)

V_S	Supply Voltage Range		5		18	V
I_S	Quiescent Current			23	35	mA
I_{sb}	Stand-By Current	Pin 3 shorted to GND			0.3	mA
V_O	Quiescent Output Voltage			7.5		V
A_V	voltage Gain		31		33	dB
R_{IN}	Input Impedance		50	100		KΩ
P_O	Output Power	THD = 10%	2.7	3		W
THD	Distortion	Po = 1W		0.1	0.3	%
SVR	Supply Voltage Rejection	V_{ripple} = 150mVrms; F_{ripple} = 1KHz		50		dB
E_I	Input Noise Voltage	Rg = 10KΩ; BW = 20Hz to 20KHz		5	10	µV
V_{sb}	Stand-By Enable Voltage				1	V

Figure1. Application Circuit



APPLICATION HINTS :

For 14.5V supply and 8Ω speaker application, its maximum power dissipation is about 1.8W.

Assumming that max ambient temperature is 70ºC, the required thermal resistance of the device mounted on the PCB with a dissipating area must be equal to : (150-70)/1.8 = 44.4ºC/W.

Junction to pin thermal resistance of the package is about 15ºC/W. That means external heat sink of about 30ºC C/W is required.

Cu ground plane of PCB can be used as heat dissipating means.

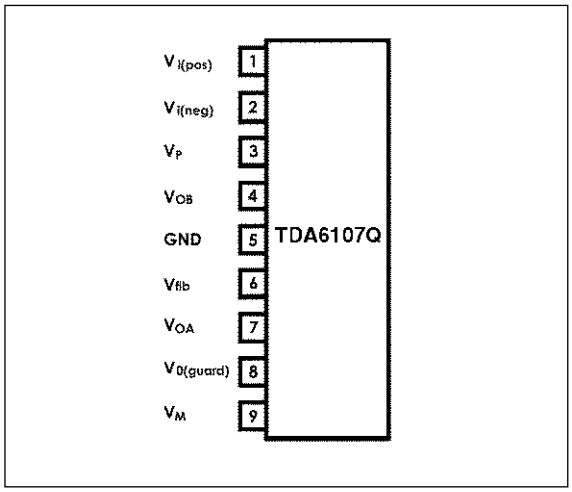
3. TDA8357J Vertical Amplifier

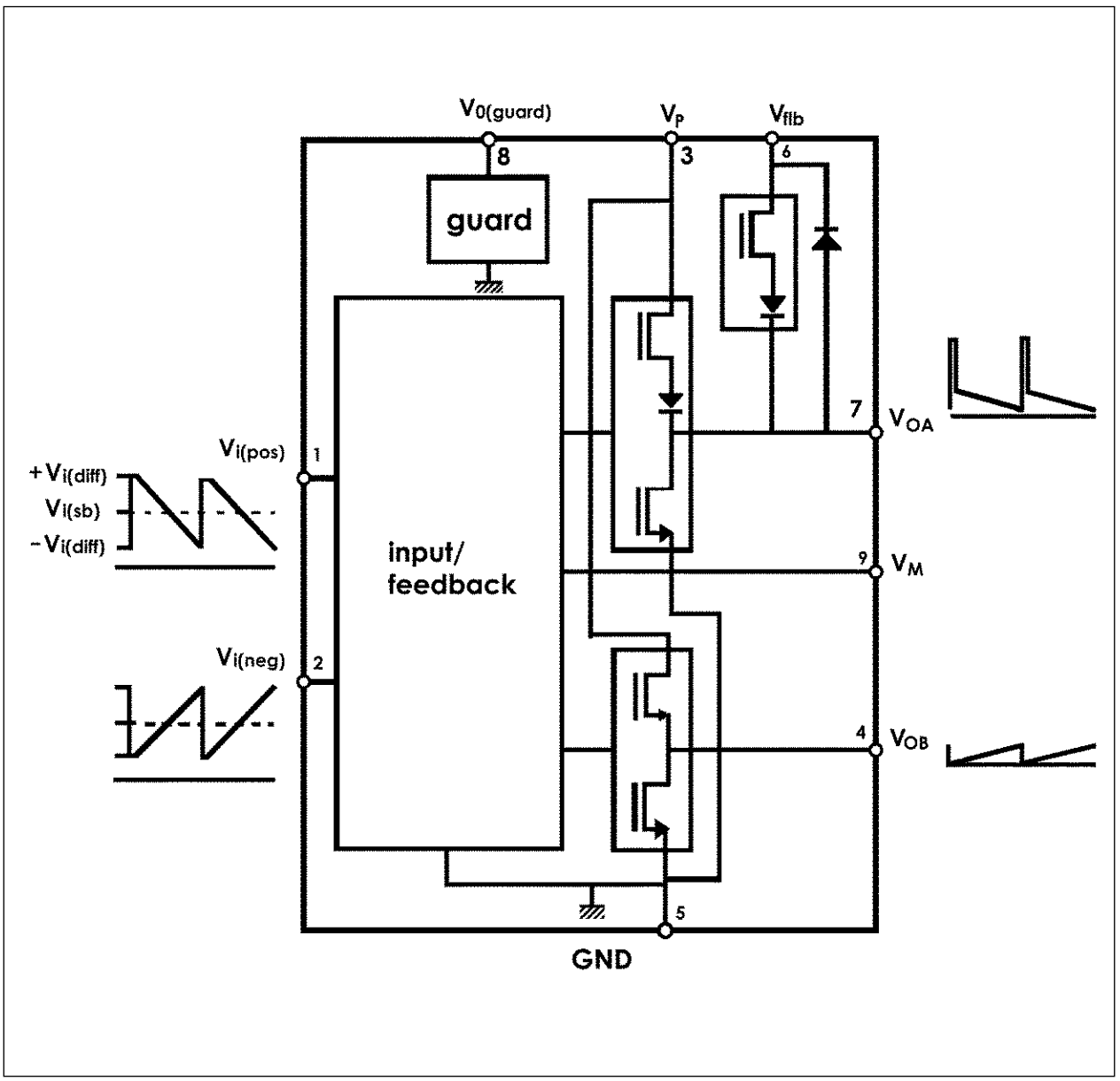
The TDA8357J is a power circuit for use in 90º TV systems for field frequencies of 25 to 200Hz and 16/9 picture tubes. The cir-cuit provides a DC driven vertical deflection output circuit, operating as a highly efficient class G system. Due to the full bridge output circuit the deflection coils can be DC coupled. The IC is constructed in a Low Voltage DMOS process that combines Bipolar, CMOS and DMOS devices. MOS transistors are used in the output stage because of the absence of second breakdown.

Features :
- Few external components
- Highly efficient fully DC-coupled vertical output bridge circuit
- Short rise and fall time of the vertical flyback switch
- Guard circuit
- Temperature (thermal) protection
- High EMC because of common mode inputs

Pinning

Pin	Symbol	Description
1	$V_{i(pos)}$	input voltage (positive)
2	$V_{i(neg)}$	input voltage (negative)
3	V_P	supply voltage
4	V_{OB}	output voltage B
5	GND	ground
6	V_{flb}	flyback supply voltage
7	V_{OA}	output voltage A
8	$V_{O(guard)}$	guard output voltage
9	V_M	input measuring resistor





4. TDA6107Q

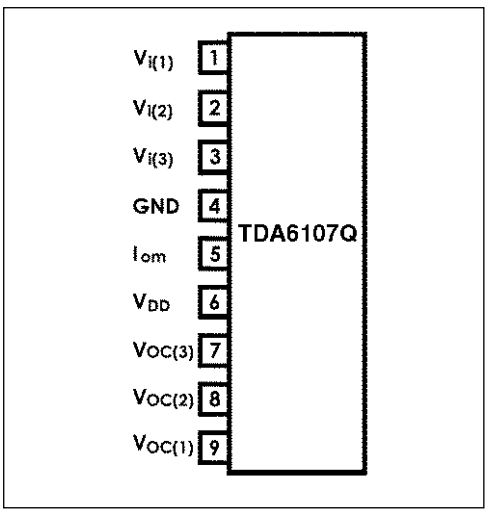
The TDA6107Q includes three video output amplifiers in one plastic DIL-Bent-SIL 9-pin medium power package, using high voltage DMOS technology, and is intended to drive the three cathodes of a colour CRT directly. To obtain maximum performance, the amplifier should be used with black-current control.

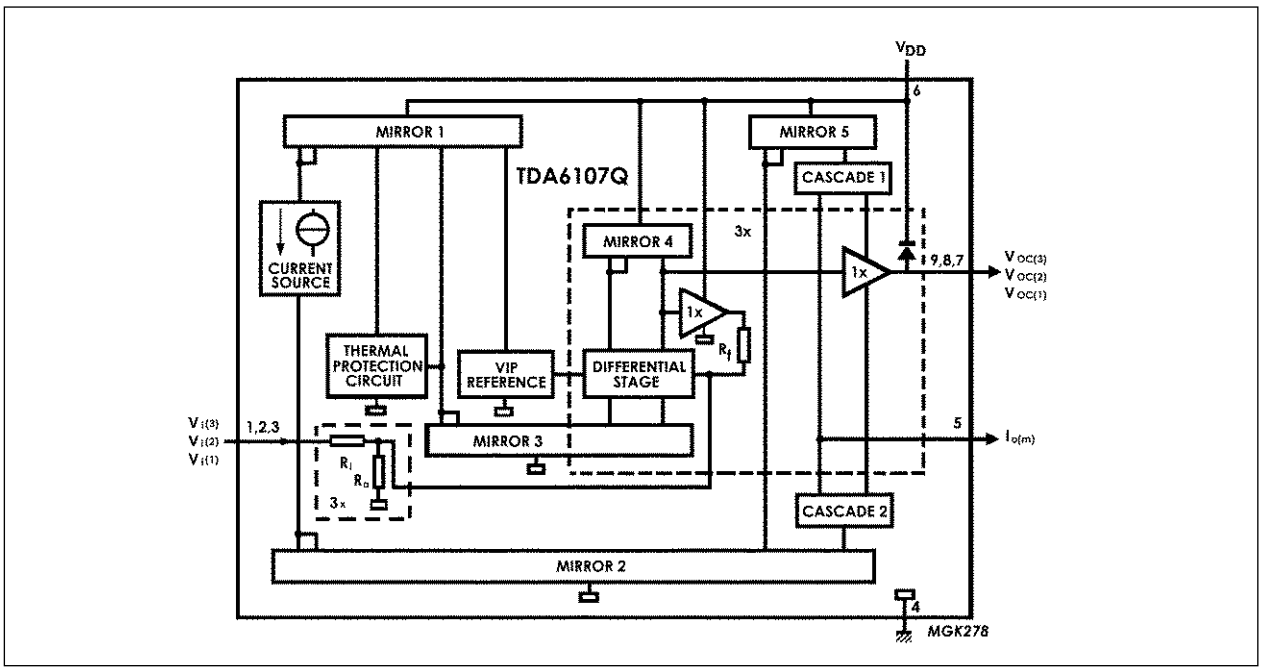
Features

- Typical bandwidth of 5.5 MHz for an output signal of 60 Vpp
- High slew rate of 900V/µs
- No external components requireds
- Very simple application
- Single supply voltage of 200V
- Internal reference voltage of 2.5 V
- Fixed gain of 50.
- Black-current stabilisation (BCS) circuit
- Thermal protection

Pin description

Pin	Symbol	Description
1	$V_{i(1)}$	inverting input 1
2	$V_{i(2)}$	inverting input 2
3	$V_{i(3)}$	inverting input 3
4	GND	ground (fim)
5	I_{om}	black current measurement output
6	V_{DD}	supply voltage
7	$V_{OC(3)}$	cathode output 3
8	$V_{OC(2)}$	cathode output 2
9	$V_{OC(1)}$	cathode output 1





5. 24C08 8 Kbit EEPROM

features :
- 8 Kbit serial I2C bus EEPROM
- Single supply voltage : 4.5 V to 5.5 V
- 1 Million Erase/Write cycles (minimum)
- 40 year data retention (minimum)

Pin description

Pin No.	Name	Description
1, 2, 3	E0, E1, E2	Device address
5	SDA	Serial Data/Address Input/Output
6	SCL	Serial clock
7	WC	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

DAEWOO

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