



Color TV Service Manual

Model: CT-21CQS5CPT

Chassis:ETE-2

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CIRCUIT DIAGRAM

PARTS LIST

Please read this manual carefully before service.

SERVICE SAFETY AND MAINTENANCE

WARNING:
**BEFORE EXAMINING AND SERVICING
THIS CHASSIS READ CAREFULLY THE
FOLLOWING SAFETY
INSTRUCTIONS.**

X-RAY RADIATION PRECAUTION

1. The EHT must be checked every time the TV is serviced to ensure that the CRT does not emit X-ray radiation as result of excessive EHT voltage. The maximum EHT voltage permissible in any operating circumstances must not exceed the rated value. When checking the EHT, use the High Voltage Check procedure in this manual using an accurate EHT voltmeter.
2. The only source of X-RAY radiation in this TV is the CRT. The TV minimizes X-RAY radiation, which ensures safety during normal operation. To prevent X-ray radiation, the replacement CRT must be identical to the original fitted as specified in the parts list.
3. Some components used in this TV have safety related characteristics preventing the CRT from emitting X-ray radiation. For continued safety, replacement component should be made after referring the PRODUCT SAFETY NOTICE below.
4. Service and adjustment of the TV may result in changes in the nominal EHT voltage of the CRT anode. So ensure that the maximum EHT voltage does not exceed the rated value after service and adjustment.

SAFETY PRECAUTION

WARNING:
REFER SERVICING TO
QUALIFIED SERVICE
PERSONNEL ONLY.

1. The TV has a nominal working EHT voltage. Extreme caution should be exercised when working on the TV with the back removed.
 - a. Do not attempt to service this TV if you are not conversant with the precautions and procedures for working on high voltage equipment.
 - b. When handling or working on the CRT, always discharge the anode to the TV chassis before removing the anode cap in case of electric shock.
 - c. The CRT, if broken, will violently expel glass fragments. Use shatterproof goggles and take extreme care while handling.
 - d. Do not hold the CRT by the neck as this is a very dangerous practice.
2. It is essential that to maintain the safety of the customer all power cord forms be replaced exactly as supplied from factory.
3. Voltage exists between the hot and cold ground when the TV is in operation. Install a suitable isolating transformer of beyond rated overall power when servicing or connecting any test equipment for the sake of safety.
4. When replacing ICs, use specific tools or a static-proof electric iron with small power (below 35W).
5. Do not use a magnetized screwdriver when tightening or loosing the deflection yoke assembly to avoid electronic gun magnetized and decrement in convergence of the CRT.
6. When remounting the TV chassis, ensure that all guard devices, such as nonmetal control buttons, switch, insulating sleeve, shielding cover, isolating resistors and capacitors, are installed on the original place.
7. Replace blown fuses within the TV with the fuse specified in the parts list. 8. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by the international hazard symbols on the circuit diagram and parts list, it must be the company-approved type and must be mounted as the original.
8. Keep wires away from high temperature components.

PRODUCT SAFETY NOTICE

CAUTION:
FOR YOUR PROTECTION
THE FOLLOWING PRODUCT SAFETY NOTICE
SHOULD BE READ CAREFULLY BEFORE
OPERATING AND SERVICING THIS TV SET.

1. Many electrical and mechanical components in this chassis 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 replacements rated at higher voltages or wattage, etc. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols on the circuit diagram and parts list. Before replacing any of these components read the parts list in this manual carefully. Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation.
2. Do not slap or beat the cabinet or CRT, since this may result in fire or explosion.
3. Never allow the TV sharing a plug or socket with other large-power equipment. Doing so may result in too large load, causing fire.
4. Do not allow anything to rest on or roll over the power cord. Protect the power cord from being walked on, modified, cut or pinched, particularly at plugs.
5. Do not place any objects, especially heavy objects and lightings, on top of the TV set. Do not install the TV near any heat sources such as radiators, heat registers, stove, or other apparatus that produce heat.
6. Service personnel should observe the SAFETY INSTRUCTIONS in this manual during use and servicing of this TV set. Otherwise, the resulted damage is not protected by the manufacturer.

SAFETY SYMBOL DESCRIPTION



The lightning symbol in the triangle tells you that the voltage inside this product may be strong enough to cause an electric shock. Extreme caution should be exercised when working on the TV with the back removed.



This is an international hazard symbol, telling you that the components identified by the symbol have special safety-related characteristics.



FDA

This symbol tells you that the critical components identified by the FDA marking have special safety-related characteristics.

UL

This symbol tells you that the critical components identified by the UL marking

have special safety-related characteristics.

C UL

This symbol tells you that the critical components identified by the C-UL marking have been evaluated to the UL and C-UL standards and have special safety-related characteristics.

VDE

This symbol tells you that the critical components identified by the VDE marking have special safety-related characteristics.

MAINTENANCE

1. Place the TV set on a stable stand or base that is of adequate size and strength to prevent it from being accidentally tipped over, pushed off, or pulled off. Do not place the set near or over a radiator or heat register, or where it is exposed to direct sunlight.
2. Do not install the TV set in a place exposed to rain, water, excessive dust, mechanical vibrations or impacts.
3. Allow enough space (at least 10cm) between the TV and wall or enclosures for proper ventilation.
4. Slots and openings in the cabinet should never be blocked by clothes or other objects.
5. Please power off the TV set and disconnect it from the wall immediately if any abnormal condition are met, such as bad smell, belching smoke, sparkling, abnormal sound, no picture/sound/raster. Hold the plug firmly when disconnecting the power cord.
6. Unplug the TV set from the wall outlet before cleaning or polishing it. Use a dry soft cloth for cleaning the exterior of the TV set or CRT screen. Do not use liquid cleaners or aerosol cleaners.

SPECIFICATION

RF System : Colour / Sound system : PAL/SECAM BG/DK/I, NTSC-M (4.43 & 3.58)

Programs Preset : 236 (0 ~ 235)

Antenna Input : 75Ω (unbalanced)

Power Source : 110 ~ 240V 50/60Hz

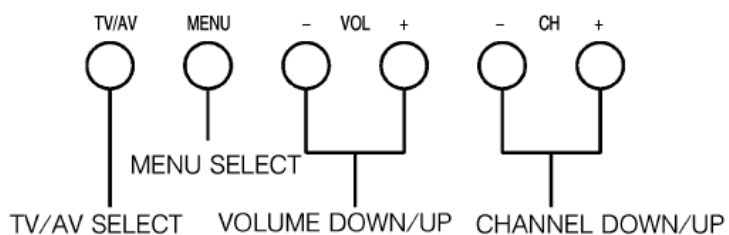
Designs and specifications are subject to change without notice.

CONTROL & FUNCTION

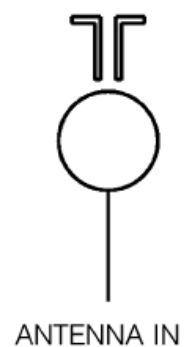
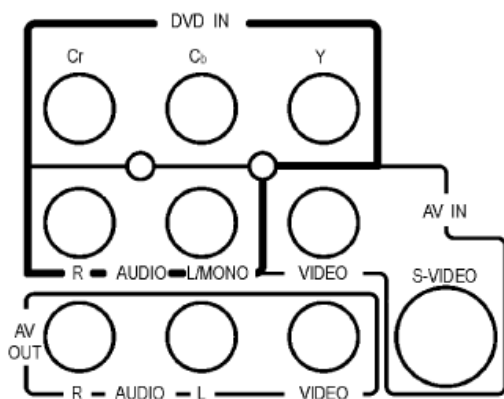
Front Panel



AV IN on the side panel



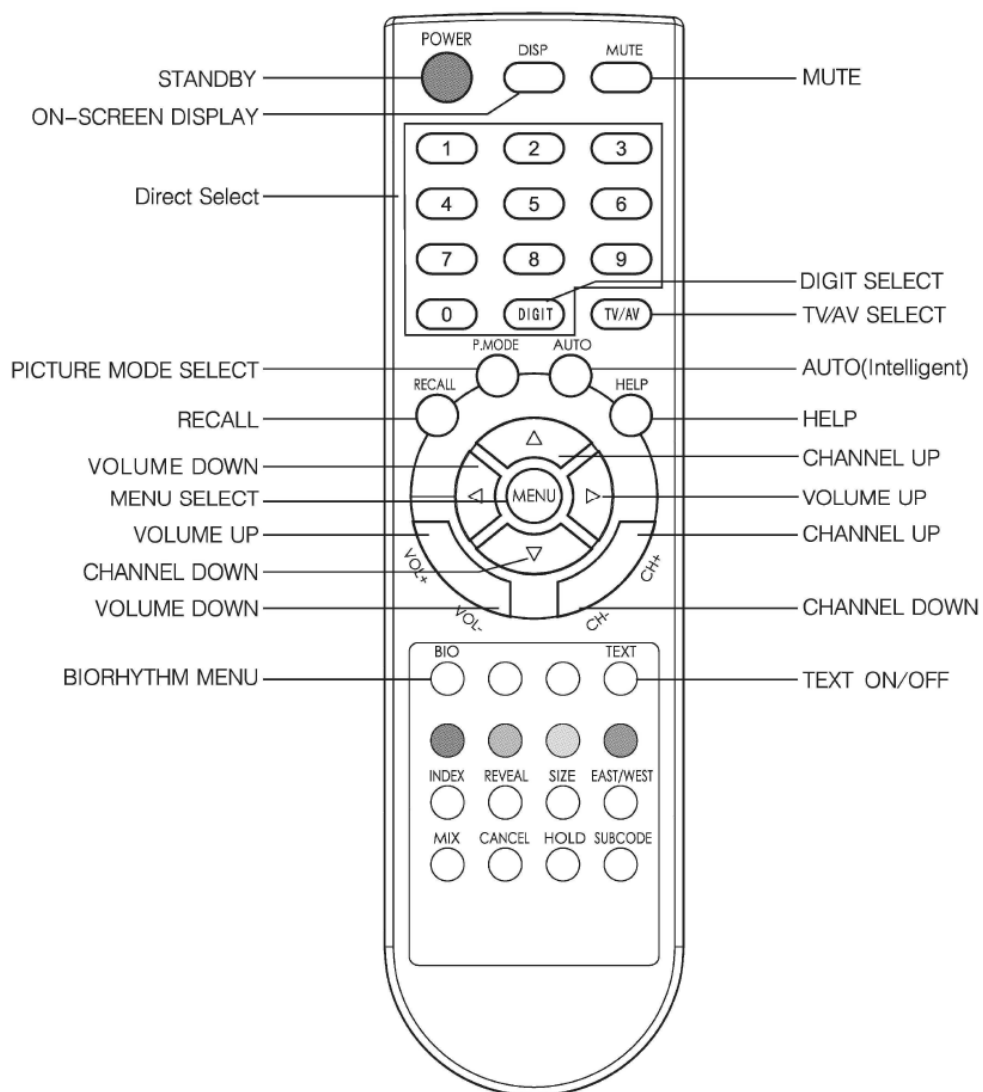
Rear Panel



* The pictures showed are for function illustration. Please refer to the TV as the standard.

Remote Control

Remote control



• The color and INDEX buttons also function as fast menu selection in the TV mode.

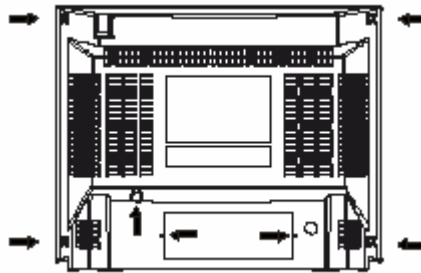
Notes:

- ① When in operation, please point your remote control directly to the infrared sensor.
- ② Do not expose the remote control to impacts, water or disassemble it.

MECHANICA DISASSEMBLIES

CABINET BACK REMOVAL

1. Refer to Figure 1, remove 7 screws.
2. Pull off cabinet back and remove.



CHASSIS REMOVAL

1. Remove cabinet back.
2. Discharge the picture tube anode (2nd anode lead) to the dag coating (picture tube grounding lead).
3. Disconnect Degaussing coil socket (KE). Picture tube socket, Deflection yoke connector (KDY). Speaker connectors (KL and KR), and 2nd anode lead.
4. Remove chassis completely by sliding it straight back.

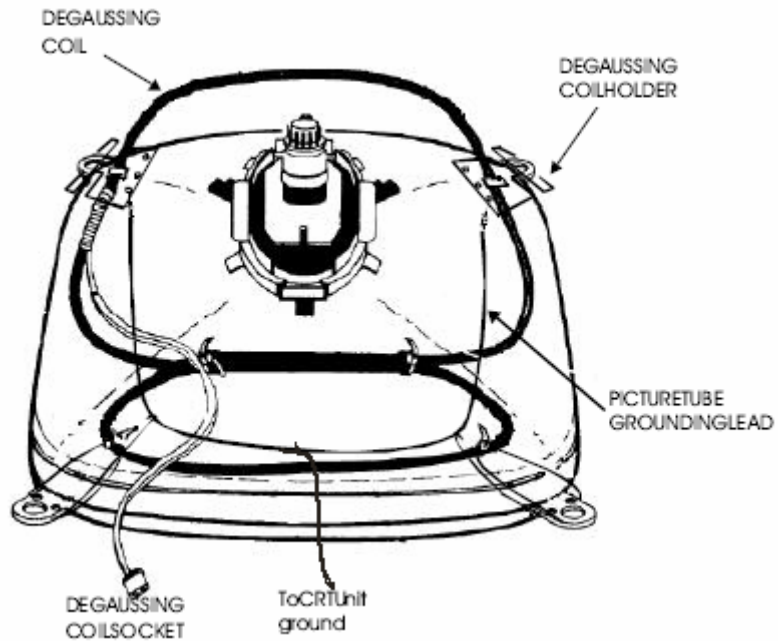
PICTURE TUBE REMOVAL

CAUTION: Do not disturb the deflection yoke or magnet assembly on the picture tube Neck.

Care must be taken to keep these assemblies intact, unless picture tube is being replaced. Discharge the picture tube to the coating before handling the Tube.

1. Remove chassis, referring to Chassis Removal instructions.
2. Place cabinet front face down on the soft surface.
3. Remove the screw one ach corner of the picture tube and GENTLY lift the picture tube out of the cabinet.
4. Install a replacement picture tube in reverse order.
5. Properly install the degaussing coil and picture tube grounding lead on the picture tube. See Figure 2.

Note: If the Picture Tube is being replaced, mount the Degaussing Coil on the picture tube. See following Figure 1. Cabinet Back Removal



ADJUSTMENTS

1 SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

Perform the adjustments in the following order:

Color purity

Convergence

White balance

Notes:

The purity/convergence magnet assembly and rubber wedges need mechanical positioning.

For some picture tubes, purity/ convergence adjustments are not required.

1.1 Color Purity Adjustment

Preparation:

Before starting this adjustment, adjust the vertical sync, horizontal sync, vertical amplitude and focus.

- Face the TV set north or south.
- Connect the power plug into the wall outlet and turn on the main power switch of the TV set.
- Operate the TV for at least 15 minutes.
- Degauss the TV set using a specific degaussing coil.
- Set the brightness and contrast to maximum.
- Counter clockwise rotate the R /B low brightness potentiometers to the end and rotate the green low brightness potentiometer to center.
- Receive green raster pattern signals.
- Loosen the clamp screw holding the deflection yoke assembly and slide it forward or backward to display a vertical green zone on the screen. Rotate and spread the tabs of the purity magnet around the neck of the CRT until the green zone is located vertically at the center of the screen.
- Slowly move the deflection yoke assembly forward or backward until a uniform green screen is obtained.
- Tighten the clamp screw of the assembly temporarily. Check purity of the red raster and blue raster until purities of the three rasters meet the requirement.

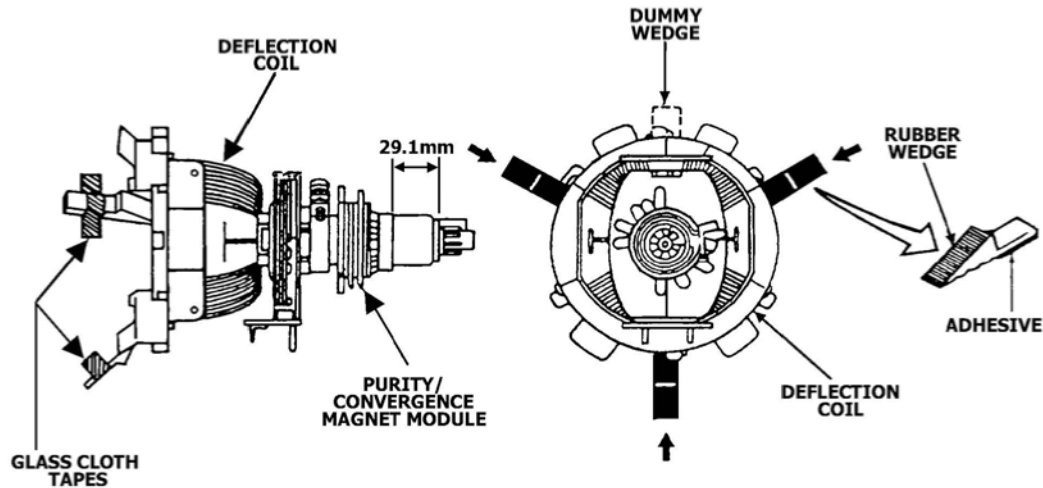


Fig. 1

1.2 Convergence Adjustment

Preparation: Before attempting any convergence adjustment, the TV should be operated for at least 15 minutes.

- Center convergence adjustment.
- Receive dot pattern.
- Adjust the brightness/contrast controls to obtain a sharp picture.
- Adjust two tabs of the 4-pole magnet to change the angle between them and red and blue vertical lines are superimposed each other on the center of the screen.
- Turn both tabs at the same time keeping the angle constant to superimpose red and blue horizontal on the center of the screen.
- Adjust two tabs of the 6-pole magnet to superimpose red/blue line and green line.
- Remember red and blue movement. Repeat steps 2.1.3 2. 1.5 until optimal convergence is obtained.
- Circumference convergence adjustment.
- Loosen the clamp screw holding the deflection yoke assembly and allow it tilting.
- Temporarily put the first wedge between the picture tube and deflection yoke assembly. Move front of the deflection yoke up or down to obtain better convergence in circumference. Push the mounted wedge in to fix the yoke temporarily.
- Put the second wedge into bottom.
- Move front of the deflection yoke to the left or right to obtain better convergence in circumference.
- Fix the deflection yoke position and put the third wedge in either upper space. Fasten the deflection yoke assembly on the picture tube.
- Detach the temporarily mounted wedge and put it in either upper space. Fasten the deflection yoke assembly on the picture tube.
- After fastening the three wedges, recheck overall convergence and ensure to get optimal convergence. Tighten the lamp screw holding the deflection yoke assembly.

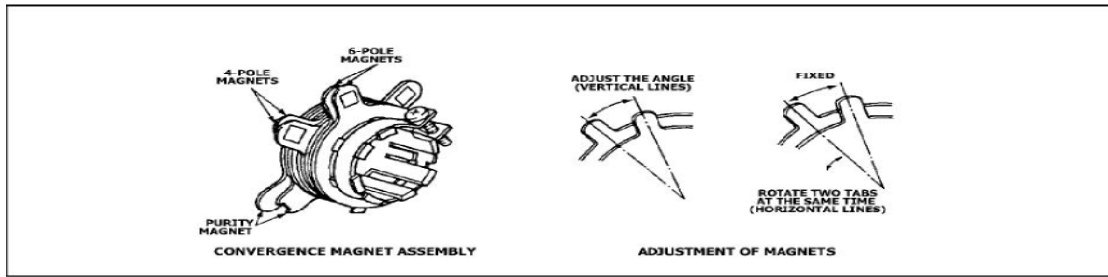


Fig. 2

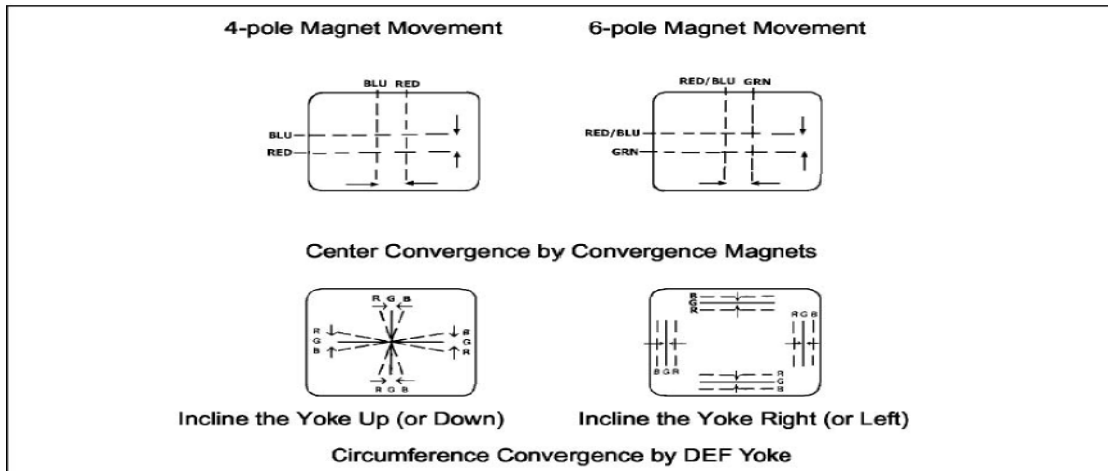


Fig.3

1.3 White Balance Adjustment

Generally, white balance adjustment is made with professional equipment. It's not practical to get good white balance only through manual adjustment. For TVs with I2C bus control, change the bus data to adjust white balance.

2 CIRCUIT ADJUSTMENTS

Preparation:

Circuit adjustments should be made only after completion of set-up adjustments.

Circuit adjustments can be performed using the adjustable components inside the TV set.

For TVs with 2 I C bus control, first change the bus data.

2.1 Degaussing

A degaussing coil is built inside the TV set. Each time the TV is powered on, the degaussing coil

will automatically degauss the TV. If the TV is magnetized by external strong magnetic field, causing color spot on the screen, use a specific degausser to demagnetize the TV in the following ways. Otherwise, color distortion will be shown on the screen.

- Power on the TV set and operate it for at least 15 minutes.
- Receive red full-field pattern.
- Power on the specific degausser and face it to the TV screen.
- Turn on the degausser. Slowly move it around the screen and slowly take it away from the TV
- Repeat the above steps until the TV is degaussed completely.

2.2 Confirmation and Adjustment for Voltage

Caution: +B voltage has close relation to high voltage. To prevent X-ray radiation, set +B voltage to the rated value

- Make sure that the supply voltage is within the range of the rated value.
- Connect a digital voltmeter to the voltage output terminal of the main PCB. Power on the TV and set the brightness and sub-brightness to minimum. Ensure that the voltage from the main PCB reads as follows.
- Regulate voltage adjustment components on the power section until the +B the voltage reaches the rated value.

Table 1

Test Point	Voltage	Test Point	Voltage
TP-115V	117V±1.5V	TP-18V	23V±2V
TP-15V	15.5V±1V	TP-5V	5V±0.5V
TP-3.3V	3.3V±0.3V	TP-8V	8V±1V
TP-12V	13V±2V	TP--12V	-13V±2V
TP-195V	196V±2V		

Note: It's impossible to check the power part separately from the main chassis board as the part is mounted on the main chassis board. The power components, etc. should be checked for burnout when power-on. If burned out, do not power on the TV again until the cause is found out.

2.3 High Voltage Inspection

Measure voltages of test points on the main PCB with the digital voltmeter. Measure the CRT high voltage with the high-voltage testing equipment and heater voltage with the high-frequency effective voltmeter. The rated values are shown as below.

Table 2

Test Point	Voltage	Test Point	Voltage
Negative of VD49 1	1 96±2V	14"GS_CRT_anode	22±1.5KV
21 "FS_CRT_anode	26±1.5KV	21 "PF-CRT-anode	27±1.5KV
Heater	6.3±0.3Vrms		

2.4 Focus Adjustment

Caution: Dangerously high voltages are present inside the TV. Extreme caution should be exercised when working on the TV with the back removed.

- After removing the back cover, look for the FBT on the main PCB. There should be a FCB (FOCUS) on the FBT.
- Power on the TV and preheat it for 15 min.
- Receive a normal TV signal. Rotate knob of the FCB until you get a sharp picture

2.5 SERVICE mode

To enter the SERVICE mode

Set the volume to 0. Then press and hold the MUTE button on the remote control, and press the MENU button on the TV to enter the SERVICE mode. To exit from the SERVICE mode, turn off the TV set by the POWER button on the remote control.

Caution: The user service mode adjustment can be changed only when service personnel

adjust the whole set data during servicing. As the control data have dramatic effects on functions

and performance of the TV, service personnel should not tell user how to enter the SERVICE mode to avoid improper data settings.

Adjustments and bus data

Table 3

SERVICE Mode	Adjust	Description	Note
STS0/1/2/3/4		UOC system surveillance display	
IFP1	00	IF PRESET VALUE 1	#
IFP2	00	IF PRESET VALUE2	#
TINT	20	BASE BAND TINT CONTROL	#
TWBK	88	TIME OF "WIDE BLANKING"	#
PWL	15	Peak white limited	#
OIF	20	Off-set if demodulatour	#
5HP/6HP	adjustable	HOR PARALLELOGRAM CORRECTION	*
5HB/6HB	adjustable	HOR BOW CORRECTION	*
5HSH/6HSH	adjustable	HORIZONTAL SHIFT	*
5HZD/6HZD	0A	DVD HORIZONTAL SHIFT	***
5EWW/6EWW	adjustable	E-W WIDTH	*
5EWP/6EWP	adjustable	E-W PARABOLA WIDTH	*
5UCR/6UCR	adjustable	E-W UPPER CORNER PARABOLA	*
5LCR/6LCR	adjustable	E-W BOTTOM CORNER PARABOLA	*
5TC/6TC	adjustable	E-W TRAPEZIUM	*
5VSL/6VSL	adjustable	VERTICAL SLOPE	*
5VAM/6VAM	adjustable	VERTICAL AMPLITUDE	*
5SCL/6SCL	adjustable	VERTICAL S CORRECTION	*
5VSH/6VSH	adjustable	VERTICAL SHIFT	*
5VZD/6VZD	00	DVD VERTICAL SHIFT	***
5VOF/6VOF	26	OSDVERTICAL SHIFT	**
RED	20	BLACK LEVEL OFFSET:R	**
GRN	20	BLACK LEVEL OFFSET:G	**
WPR	1F	WHITE POINT R	**
WPG	1F	WHITE POINT G	**
WPB	1F	WHITE POINT B	**
DRED	00	DVD BLACK LEVEL OFFSET:R	**
DGRN	50	DVD BLACK LEVEL OFFSET:R	**
DWPR	00	DVD WHITE POINT R	**

DWPG	00	DVD WHITE POINT G	**
DWPB	00	DVD WHITE POINT B	**
YDFP/YDFN/ YDFS/YDAV	07	LUMINANCE DELAY TIME	#
TOP	adjustable	AGC TAKE OVER	*
VOL	2A	Volume control	***
VOLA	20	Dummy AVL level	#
CORE	03	Core noise reduction	#
HLOG	02	the horizontal position LOGO	***
VLG 1	0A	The first line vertical position of LOGO	**
VLG2	0E	The second line vertical position of LOGO	**
COL1	04	The color of first line LOGO	**
COL2	04	The color of second line LOGO	**
TIME	0F	The time of No signal auto off	#
IFFS	02	IF 38MHZ(03)/38.9MHZ(02)/45.75MHZ(01)	
HDOL	0A	Cathode drive level	
AGC	03	AGC time	#
VG2B	1A	VG2 bright set	***
SBRI	24	Sub bright	***
MBRI	30	Max bright	***
SCON	20	Sub contrast	***
MCON	39	Max contrast	***
SCOL	32	Sub color	
OP1		Optional 1	***
OP2		Optional 2	***
OP3		Optional 3	***
OP4		Optional 4	***
OP5		Optional 5	***
OP6		Optional 6	***
OP7		Optional 7	***
OP8		Optional 8	***
OP9		Optional 9	***
OP10		Optional 10	***
INIT		EEPROM init	
VG2		Screen Voltage : Rotate knob of the SCREEN on the FBT	*
VSD			

Table 4

	BIT	Name	Decription	Data
OP1	0	OP_HOTEL	HOTEL model, 1:yes;0:no	1
	1	OP_236	CHANNEL number setup(1:236,0:100)	1
	2	OP_NTSC	NTSC (1:yes,0:no)	1
	3	OP_AV2	2 AV input(1:AV2,0:no AV2)	1
OP2	4	OP_S VSH	S-VIDEO input(1:yes;0:no)	0
	5	OP_DVD	DVD input(1:yes,0:no)	0
	6	OP_SCART	SCART(1:yes;0:no)	1
	7	OP_OSO	Switch off in vertical overscan	1
	0	OP_AVL	AVL (: 1yes;0:no AVL (SLIM CRT))	1
	1	OP_AUTO_SOUND	AUTO_SOUND	1
	2	OP_NOT_1	Text language setup OP_NOT_3/2/1 , text 1XX-English/ Arabic 01 1-English /Farsi 010-English /Russian 00 1-English /Ukrainian 000-English / Paneuro	0
3	OP_NOT_2	0		
4	OP_NOT_3	0		
OP3	5	OP_USER_LOGO	USER'S LOGO SETUP	0
	6	OP_ON_BLACK	1:blue back;0:black back	0
	7	OP_FSL		0
	0	OP_ENGLISH	OSD language: 1,ENGLISH	1
	1	OP_CZECH	OSD language: 1, CZECH	1
	2	OP_SLOVAK	OSD language: 1, SLOVAK	1
	3	OP_RUSSIAN	OSD language: 1, RUSSIAN	1
OP4	4	OP_FRENCH	OSD language: 1, FRENCH	1
	5	OP_GERMAN	OSD language: 1, GERMAN	1
	6	OP_ITALY	OSD language: 1, ITALY	1
	7	OP_SPANISH	OSD language: 1, SPANISH	1
	0	OP_PORTUGUESE	OSD language: 1, PORTUGUESE	1
	1	OP_SERBIAN	OSD language: 1, SERBIAN	1
	2	OP_TURKISH	OSD language: 1, TURKISH	1
OP5	3	OP_POLISH	OSD language: 1, POLISH	1
	4	OP_BULGARIAN	OSD language: 1, BULGARIAN	1
	5	OP_ROMANIAN	OSD language: 1, ROMANIAN	1
	6	OP_CROATIAN	OSD language: 1, CROATIAN	1
	7	OP_HUNGARIAN	OSD language: 1, HUNGARIAN	1
	0	OP_UKRAIN	OSD language: 1, Ukrainian	1
	1	OP_ARABIC	OSD language: 1, ARABIC	1
2	OP_FARSI	OSD language: 1, FARSI	1	

	3	OP_BLANK	BLANK	0
	4	OP_BLANK	BLANK	0
	5	OP_RFTOAV	1 : S C A R T 0 : RCA	1
	6	OP_TDA1517	1:TDA1517;0:TFA9842AJ	0
	7	OP_FAKE_AVL	1:FAKE A V L ; 0 : A V L	0
OP6	0	OP_AV_ON	1:AV shutdown,AV r e s t a r t ; 0 : T V r e s t a r t	1
	1	OP_DIRECT_SWITCH	1:memory-restart;0:power-on and standby	1
	2	OP_HCO	EHT tracking mode	0
	3	OP_CHH_LOGO	1:CHANGHONG l o g o	0
	4	OP_SOUND_DK	1:D/K	1
	5	OP_SOUND_BG	1:B/G	1
	6	OP_SOUND_I	1:I	1
	7	OP_SOUND_M	1:M	1
OP7	0	OP_AUTO_LANGO	AUTO_Language 4/3/2/1/0: ENGLISH:00000 CZECH:00001 SLOVAK:00010 ...	0
	1	OP_AUTO_LANG 1		0
	2	OP_AUTO_LANG2		0
	3	OP_AUTO_LANG3		0
	4	OP_AUTO_LANG4	0	
	5	OP_FORF	OP_FORF/FORF: 00-AUTO 60HZ,01-KEEP LAST, 10-FORCE 60HZ,11-AUTO 50HZ	1
	6	OP_FORF	OP_FORF/FORF: 00-AUTO 60HZ,01-KEEP LAST, 10-FORCE 60HZ,11-AUTO 50HZ	1
	7	OP_HOTEL_ON_PROG	1 :Startup on channel 1 hotel model available0	
OP8	0	OP_AUTO_TEST	Power-on self-test , 1 :yes,0,no	0
	1	OP_PSNS	sensibility	0
	2	OP_B SCREEN	Black screen1 Yes;0:No	0
	3	OP_SECAM	1:SECAM	1
	4	OP_DFL	Disable flash protection	1
	5	OP_SIF		<u>0</u>
	6	OP_EXT_SIF0	D/K:00,B/G:01,I:10,M:11.	1
	7	OP_EXT_SIF1		0
OP9	0	OP-TUNER	0:TAF5-E4I22 1:TAF5-C4I21/ TAF5-C4I23	0
	1	OP_TINT	1 :PAL TINT Adjust	1
	2	OP_FMWS	WINDOW OF SOUND PLL:+/-200KHZ	1
	3	OP_FMWS1	WINDOW OF SOUND PLL:+/-600KHZ	<u>0</u>
	4	OP_OSVE		<u>0</u>
	5	OP-FFI		<u>0</u>
	6	OP-SPEED 1	Program quickly, 1:yes,0no	0
	7	OP-SPEED0	Program slowly, 1:yes,0no	0
OP10	0	OP_AKIRA_LOGO	LOGO:AKIRA	0
	1	OP_HBL		<u>0</u>
	2	OP_NTSC_TUNER	1:TAF5-U2F22	<u>0</u>
	3	OP_CHILD_LOCK	1 :CHILD LOCK	0

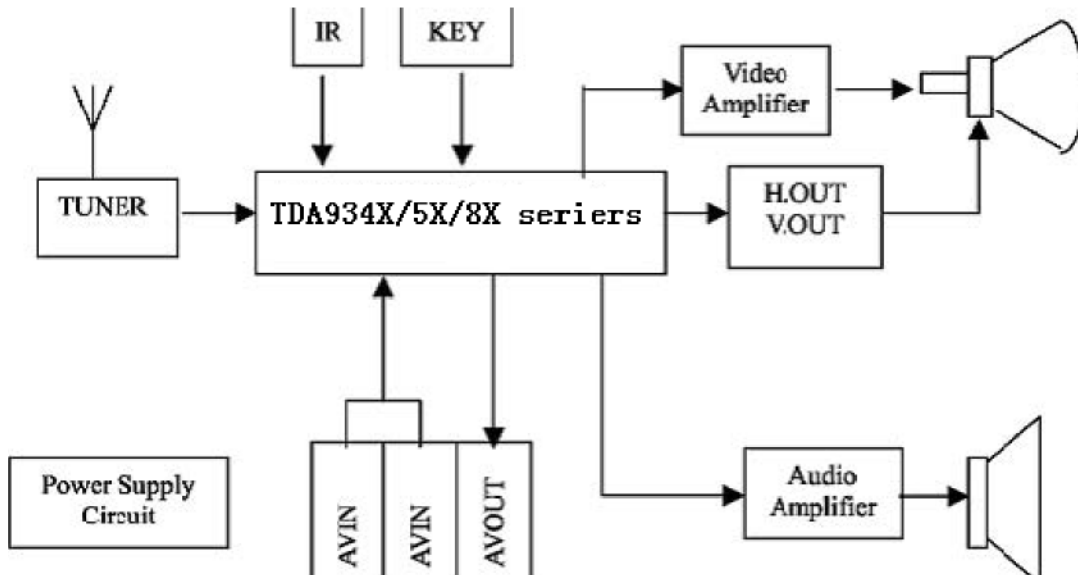
4	OP_BLANK	BLANK	0
5	OP_BLANK	BLANK	0
6	OP_BLANK	BLANK	0
7	OP_TEXT_KEY	1: (remote-control unit)TEXT key available	1

Notes: The data sheet may differ dependent on different models.

The data sheet may differ dependent on different CRTs for the same model.

STRUCTURE AND CHASSIS FUNCTION DESCRIPTION

1. STRUCTUE BLOCK DIAGRAM



2 CHASSIS DESCRIPTION

2.1 General Description

ETE-2 chassis is applied in PF21GB300 series. By use of philips UOC for TV small signal processing and bus control, the chassis enables TV tuning, adjustment, control and picture correction, featuring high-integration, high-performance-to-price ratio and high-reliability and compact circuit with fewer external components. The chassis, widely used in small and medium TVs, provides much more convenience for manufacturing and technical service. It includes:

UOC TDA9384PS/N3/3 for PAL/NTSC /SECAM small signal processing and bus control
EEPROM AT24C08 for data memory
TDA4863AJ for vertical output power amplifying
TFA9842AJ for audio power amplifying
Thick-film IC STR-G5653 for power circuit adjustment and control.

2.2 The following features are available in the

chassis: Color systems: PAL, NTSC

Sound systems: D/K, B/G, I, M

236 programs preset

AV stereo

IIC bus control Electronic

Hotel

Biorhythm

2.3 The chassis mainly uses the following ICs and assemblies.

	Position	Type	Description
1	N200	AT24C08	EERPOM
2	N100	TDA9384PS/N3/3	(slim CRT no (Small signal processor + micro control unit (MCU)) TEXT) page TEXT) (slim CRT 1
		TDA9353PS/N3/3	
		TDA938 1PS/N3/3(noTEXT)	
		TDA9345PS/N3/3 (1 page TEXT)	
3	N601	TFA9842AJ	Audio power amplifier
4	N300	TDA4863AJ	slim CRT Vertical scan output stage circuit
		TDA4864AJ	
5	N801	STR-G5653	Switch-mode power supply control
6	A001	TAF5-C4I21/ TAF5-C4I23	IF 38MHz tuner
		TAF5-E4I22	IF 38.9MHz tuner
		TAF5-U2F22	IF 45.75MHz tuner

SERVICE DATA

1 TV signal processor TDA935X/8X PS-N3 series

1.1 GENERAL DESCRIPTION

The various versions of the TDA935X/8X/ PS-N3 series combine the functions of a video processor together with a -Controller and US Closed Caption decoder. Most versions have a Teletext decoder on board. The Teletext decoder has an internal RAM memory for 1 or 10 page text. The ICs are intended to be used in economy television receivers with 90 and 10 picture tubes. The ICs have supply voltages of 8 V and 3.3 V and they are mounted in an SDIP-64 envelope.

The features are given in the following feature list.

1.2 FEATURES TV processor

Available in TDA935X/6X/8X PS versions

- Multi-standard vision IF circuit with alignment-free PLL demodulator
 - Internal (switchable) time-constant for the IF-AGC 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.
 - The FM-PLL demodulator can be set to centre frequencies of 4.74/5.74 MHz so that a second sound channel can be demodulated. In such an application it is necessary that an external band pass filter is inserted.
 - Integrated chrominance trap circuit
 - Integrated luminance delay line with adjustable delay time
 - Picture improvement features with peaking (with switchable centre frequency, depeaking, variable positive/negative overshoot ratio and video dependent coring) and blue- and black stretching. All features are available for CVBS, Y/C and YPBPR signals.
 - Tint control for external RGB/YPBPR signals
 - Integrated chroma band-pass filter with switchable centre frequency
 - Only one reference (12 MHz) crystal required for the -Controller, Teletext- and the colour decoder
 - Multi-standard colour decoder with automatic search system
 - Internal base-band delay line
 - Indication of the Signal-to-Noise ratio of the incoming CVBS signal
 - A linear RGB/YUV/YPBPR input with fast blanking for external RGB/YUV sources. The synchronisation circuit can be connected to the incoming Y signal. The Text/OSD signals are internally supplied from the -Controller/Teletext decoder.
 - 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 light parts of the screen can be chosen independently.
- 2 levels of contrast reduction of main picture possible during OSD/Text insertion ('halftone')**
- OSD/Text gain reduction control
 - 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

- Horizontal and vertical zoom function for 16: 9 applications
- Horizontal parallelogram and bow correction for large screen picture tubes
- Low-power start-up of the horizontal drive circuit
- Macrovision keying possibility for horizontal synchronisation.

Available in TDA935X/6X/8X PS versions

- A choice can be made between versions with mono intercarrier sound FM demodulator and versions with QSS IF amplifier.
- Source selection between the 'internal' CVBS and an external CVBS or Y/C signal

Controller

- 80C5 1 -controller core standard instruction set and timing
- 1 s machine cycle
- 32 - 128Kx8-bit late programmed ROM
- 3 - 12Kx8-bit Auxiliary RAM (shared with Display)
- Interrupt controller for individual enable/disable with two level priority
- Two 16-bit Timer/Counter registers
- One 16-bit Timer with 8-bit P re-scaler
- WatchDog timer
- Auxiliary RAM page pointer
- 16-bit Data pointer
- Stand-by, Idle and Power Down modes
- 14 bits PWM for Voltage Synthesis Tuning
- 8-bit A/D converter
- 4 multiplexed inputs for the A/D converter and 5 PWM (6-bits) outputs for control of TV analogue signals (TDA95XX series)
- 4 pins which can be programmed as general I/O pin, ADC input or PWM (6-bit) output (TDA93XX series)

Data Capture

- Text memory for 1 or 10 pages
- In the 10 page versions 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 processor throughput

- 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

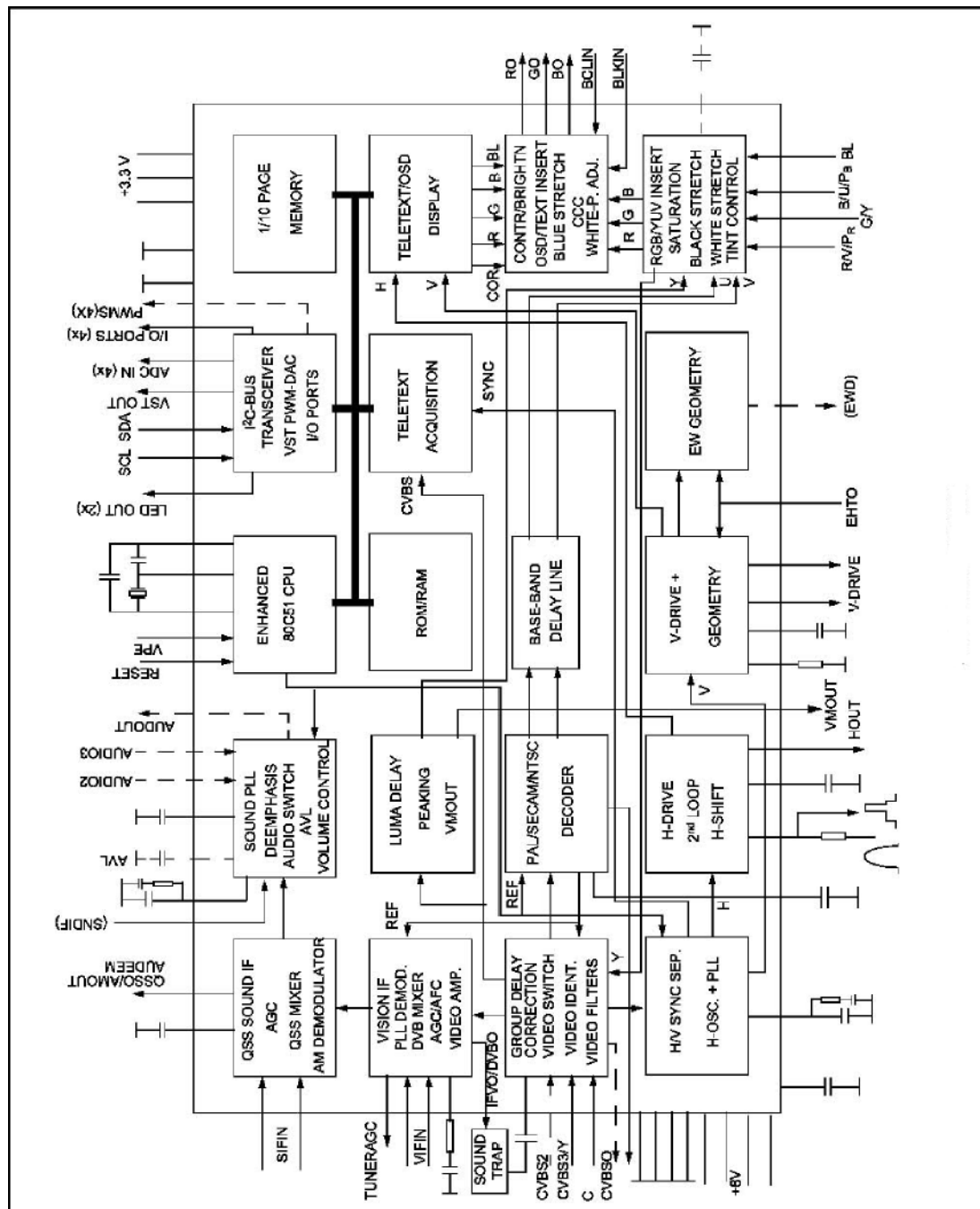
- Teletext and Enhanced OSD modes
- Features of level 1.5 WST and US Close Caption
- Serial and Parallel Display Attributes
- Single/Double/Quadruple Width and Height for characters
- Scrolling of display region
- Variable flash rate controlled by software
- Enhanced display features including overlining, 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, 12x13, 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 (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

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
Supply					
Vp	supply voltages		8.0/3.3		V
Ip	supply current (VP = 8 V)		135		mA
Ip	supply current (VP = 3.3 V)		60		mA
Input voltages					
ViVIF(rms)	video IF amplifier sensitivity (RMS value)		75		V
ViSIF(rms)	QSS sound IF amplifier sensitivity (RMS value)		45		d B V
ViAUDIO(rms)	external audio input (RMS value)		500		mV
ViCVBS(p-p)	external CVBS/Y input (peak-to-peak value)		1.0		V
ViCHROMA(p-p)	external chroma input voltage (burst amplitude)		0.3		V

	(peak-to-peak value)				
ViRGB(p-p)	RGB inputs (peak-to-peak value)		0.7		V
ViY(p-p)	luminance input signal (peak-to-peak value)		1.4 / 1.0		V
ViU(p-p) / ViPB(p-p)	U / PB input signal (peak-to-peak value)		1.33 / +0.7		V
ViV(p-p) / ViPR(p-p)	V / PR input signal (peak-to-peak value)		1.05 / +0.7		V
Output signals					
V _o (IFVO)(p-p)	Demodulated CVBS output (peak-to-peak value)		2.0		V
V _o (QSSO)(rms)	sound IF intercarrier output in QSS versions (RMS value)		100		Mv
V _o (AMOUT)(rms)	demodulated AM sound output in QSS versions (RMS value)		500		mV
V _o (CVBSO)(p-p)	selected CVBS output (peak-to-peak value)		2.0		V
I _o (AGCOUT)	tuner AGC output current range	0		5	mA
V _o RGB(p-p)	RGB output signal amplitudes (peak-to-peak value)		2.0		V
I _o HOUT	horizontal output current	10			mA
I _o VERT	vertical output current (peak-to-peak value)	1			mA

BLOCK DIAGRAM



Pinning

SYMBOL	PIN	DESCRIPTION
P3.1/ADC1/PWM1	6	port 3.1 or ADC1 input or PWM1 output
P3.2/ADC2/PWM2	7	port 3.2 or ADC2 input or PWM2 output
P3.3/ADC3/PWM3	8	port 3.3 or ADC3 input or PWM3 output
VSSC/P	9	digital ground for -Controller core and periphery
P0.5	10	port 0.5 (8 mA current sinking capability for direct drive of LEDs)
P0.6/C VBSTD	11	port 0.6 (8 mA current sinking capability for direct drive of LEDs) or Composite video input. A positive-going 1 V(peak-to-peak) input is required
VSSA	12	digital ground of TV-processor
SECPLL	13	SE CAM PLL decoupling
VP2	14	2nd supply voltage TV-processor (+8V)
DECDIG	15	supply voltage decoupling of digital circuit 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/EWD (1)	20	Automatic Volume Levelling (90versions)/ E-W drive output (110versions)
VDRB	21	vertical drive B output
VDRA	22	vertical drive A output
IFIN1	23	IF input 1
IFIN2	24	IF input 2
IREF	25	reference current input
VSC	26	vertical sawtooth capacitor
AGCOUT	27	tuner AGC output
SIFIN1/A UDEEM (2)	28	SIF input 1 / audio deemphasis
SIFIN2/DECSDEM (2)	29	SIF input 2 / decoupling sound demodulator
GND2	30	ground 2 for TV processor
SNDPLL/SIFA GC (2)	31	narrow band PLL / AGC sound IF
AVL/REF0/SNDIF/AMOUT (2)	32	Automatic Volume Levelling / subcarrier reference output / sound IF input / AM output
HOUT	33	horizontal output
FBISO	34	flyback input/sandcastle output
QSSO/AMOUT/	35	QSS intercarrier output / AM output / external audio input

<i>A UDEXT⁽²⁾</i>		
<i>EHTO</i>	36	<i>EHT/overvoltage protection input</i>
<i>PLLIF</i>	37	<i>IF-PLL loop filter</i>
<i>IFVO/SVO/DVBO (2)</i>	38	<i>IF video output / selected CVBS output / DVB output (QFP-80)</i>
<i>VPI</i>	39	<i>main supply voltage TV processor</i>
CVBS1	40	internal CVBS input
GND	41	ground for TV processor
CVBS3/Y	42	CVBS3/Y input
C	43	chroma input
AUDOUT / AMOUT (2)	44	audio output / AM audio output (volume controlled)
INSSW2	45	2nd RGB / YUV insertion input
R2/V/PR-IN	46	2nd R input / V (R-Y) input / PR input
G2/Y-IN	47	2nd G input / Y input
B2/U/PB -IN	48	2nd B input / U (B-Y) input / PB input
BCLIN	49	beam current limiter input
BLKIN	50	black current input / V-guard input
RO	51	Red output
GO	52	Green output
BO	53	Blue output
VDDA	54	analog supply of Teletext decoder and digital supply of TV-processor (3.3 V)
VPE	55	OTP Programming Voltage
VDDC	56	digital supply to core (3.3 V)
OSCGND	57	oscillator ground supply
XTALIN	58	crystal oscillator input
XTALOUT	59	crystal oscillator output
RESET	60	reset
VDDP	61	digital supply to periphery (+3.3 V)
P1.0/INT1	62	port 1.0 or external interrupt 1 input
P1.1/T0	63	port 1.1 or Counter/Timer 0 input
P1.2/INT0	64	port 1.2 or external interrupt 0 input
P1.3/T1	1	port 1.3 or Counter/Timer 1 input
P1.6/SCL	2	port 1.6 or I ² C-bus clock line
P1.7/SDA	3	port 1.7 or I ² C-bus data line
P2.0/TPWM	4	port 2.0 or Tuning PWM output
P3.0/ADC0/PWM0	5	port 3.0 or ADC0 input or PWM0 output

2 TFA9842AJ

2-channel audio amplifier with volume control (SE: 1 W to 7.5 W)

2.1 General description

The TFA9842AJ contains two identical audio power amplifiers. The TFA9842AJ can be used as two Single-Ended (SE) channels with a volume control. The maximum gain is 26 dB. The TFA9842AJ comes in a 9-pin DIL-bent-SIL (DBS9P) power package. The TFA9842AJ contains a unique protection circuit that is solely based on multiple temperature measurements inside the chip. This gives maximum output power for all supply voltages and load conditions with no unnecessary audio holes. Almost any supply voltage and load impedance combination can be made as long as thermal boundary conditions (number of channels used, external heatsink and ambient temperature) allow it.

2.2 Features

2 Channel SE: 1 W to 7.5 W operation possibility

Soft clipping

Input clamps

Volume control

Standby and mute mode

No on/off switching plops

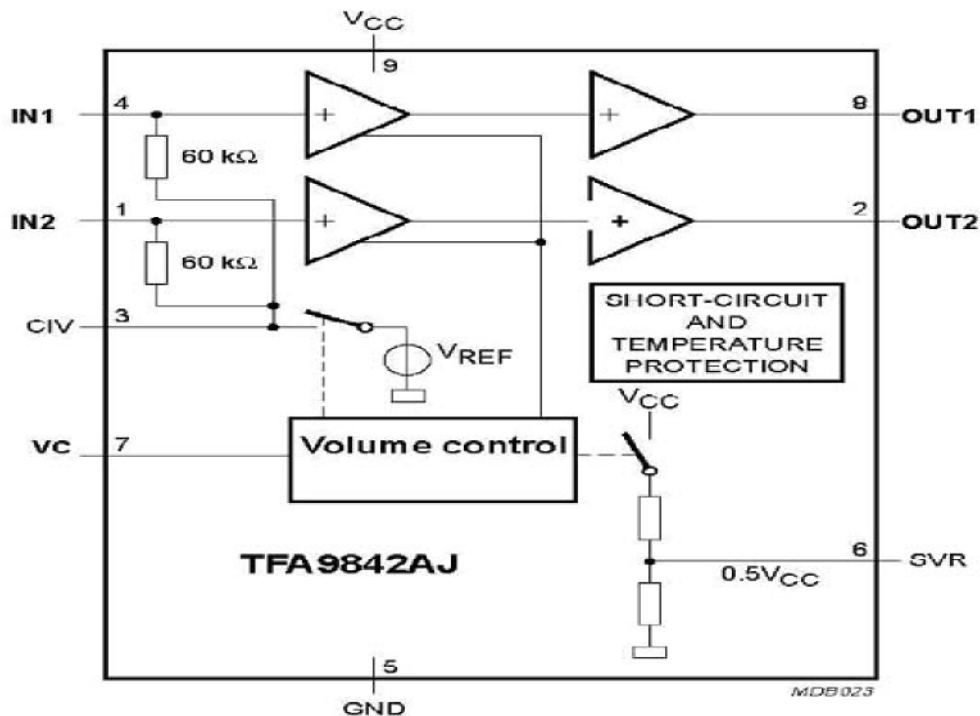
Low standby current

High supply voltage ripple rejection

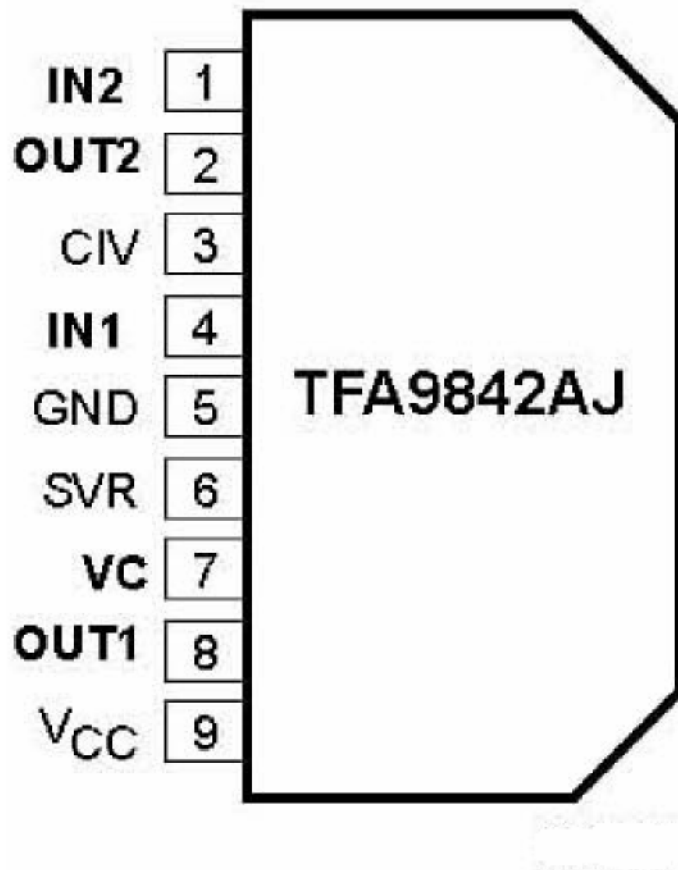
Outputs short-circuit protected to ground, supply and across the load

Thermally protected

2.3 Block diagram of TFA9842AJ



4.2.4 Pinning



4.2.5 Pin description

Symbol	Pin	Description
IN2	1	input 2
OUT2	2	loudspeaker terminal 2
CIV	3	common input voltage decoupling
IN1	4	input 1
GND	5	ground
SVR	6	half supply voltage decoupling (ripple rejection)
VC	7	volume control input (standby, mute and volume control)
OUT1	8	loudspeaker terminal 1
V _{cc}	9	supply voltage

3 VERTICAL SCAN OUTPUT STAGE CIRCUIT

TDA4863AJ/TDA4864AJ

4.3.1 FEATURES

TDA4863AJ: Output current up to 3 A (p-p)

TDA4864AJ: Output current up to 2.5A (p-p)

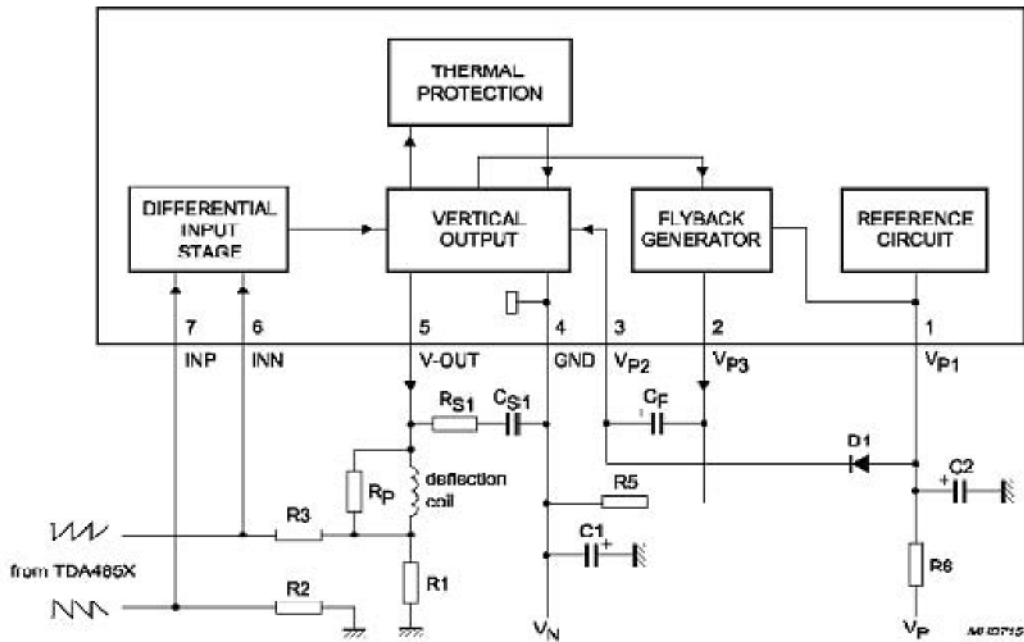
3.2 GENERAL DESCRIPTION

The TDA4863AJ and TDA4864AJ are deflection boosters for use in vertical deflection systems for frame frequencies up to 200 Hz.

The TDA4863AJ or TDA4864AJ needs a separate flyback supply voltage, so the supply voltages are independently adjustable to optimize power consumption and flyback time.

For the TDA4863AJ or TA4864AJ the flyback supply voltage will be generated internally by doubling the supply voltage and therefore a separate flyback supply voltage is not needed.

3.3 Block diagram of TDA4863AJ and TDA4864AJ



4.3.4 pinning

PIN	SYMBOL	DESCRIPTION
1	VP1	positive supply voltage 1
2	VP3	flyback generator output
3	VP2	supply voltage 2 for vertical output
4	GND	ground or negative supply voltage
5	V-OUT	vertical output
6	INN	inverted input of differential input stage
7	INP	non-inverted input of differential input stage

4 EEPROM AT24C08

4.1 Features

Data EEPROM internally organized as 1024/2048 bytes and 64/128 pages×16 bytes

Page protection mode, flexible page-by-page hardware write protection -Additional protection EEPROM of 64/128 bits, bit per data page 1-Protection setting for each data page by writing its protection bit -Protection management without switching WP pin

Low power CMOS

Vcc=2.7 to 5.5V operation

Two wire serial interface bus, IIC-Bus compatible

Filtered inputs for noise suppression with Schmitt trigger

Clock frequency up to 400 kHz

High programming flexibility

- Internal programming voltage
- Self timed programming cycle including erase
- Byte-write and page-write programming, between 1 and 16 bytes
- Typical programming time 6ms(< 1 0ms) for up to 16 bytes

High reliability

- Endurance 10⁶ cycles 1)
- Data retention 40 years 1)
- ESD protection 4000 V on all pins

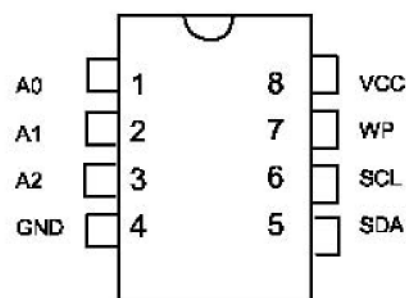
8 pin DIP/DSO packages

Available for extended temperature ranges

- Industrial: -40to +85
- Automotive: -40to +125

4.2 Pin Configuration

Pin Name	Function
A0-A2	Address Inputs
SDA	Serial Data
SCL	Serial Clock Input
WP	Write Protect
NC	No Connect



4.3 Pin Description

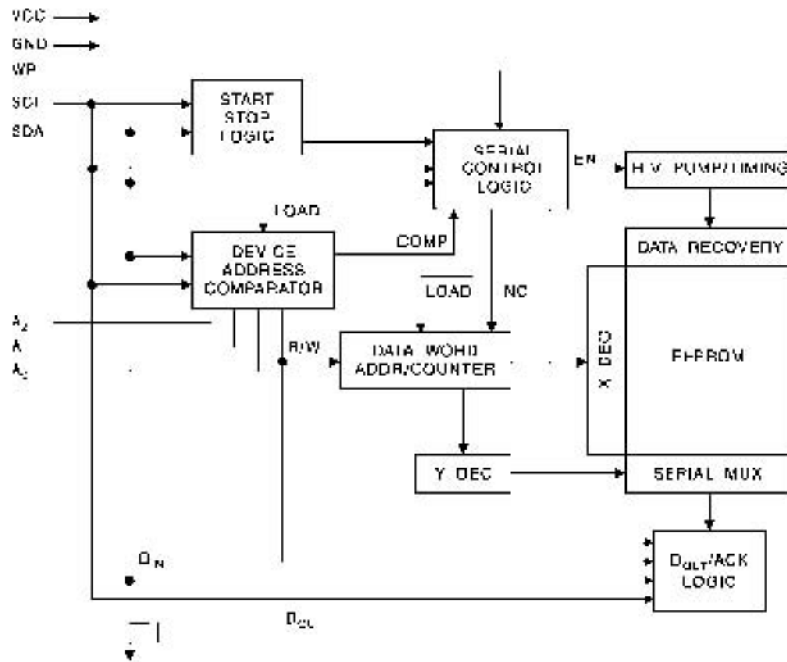
SERIAL CLOCK (SCL): The SCL input is used to positive edge clock data into each EEPROM device and negative edge clock data out of each device.

SERIAL DATA (SDA): The SDA pin is bi-directional for serial data transfer. This pin is open-drain driven and may be wire-ORed with any number of other open-drain or open-collector devices. The AT24C08 only uses the A2 input for hardware addressing and a total of two 8K devices may be addressed on a single bus system. The A0 and A1 pins are no connects.

4.4 Memory Organization

AT24C08, 8K SERIAL EEPROM: Internally organized with 64 pages of 16 bytes each, the 8K requires a 10-bit data word address for random word addressing.

4.4.5 Block Diagram

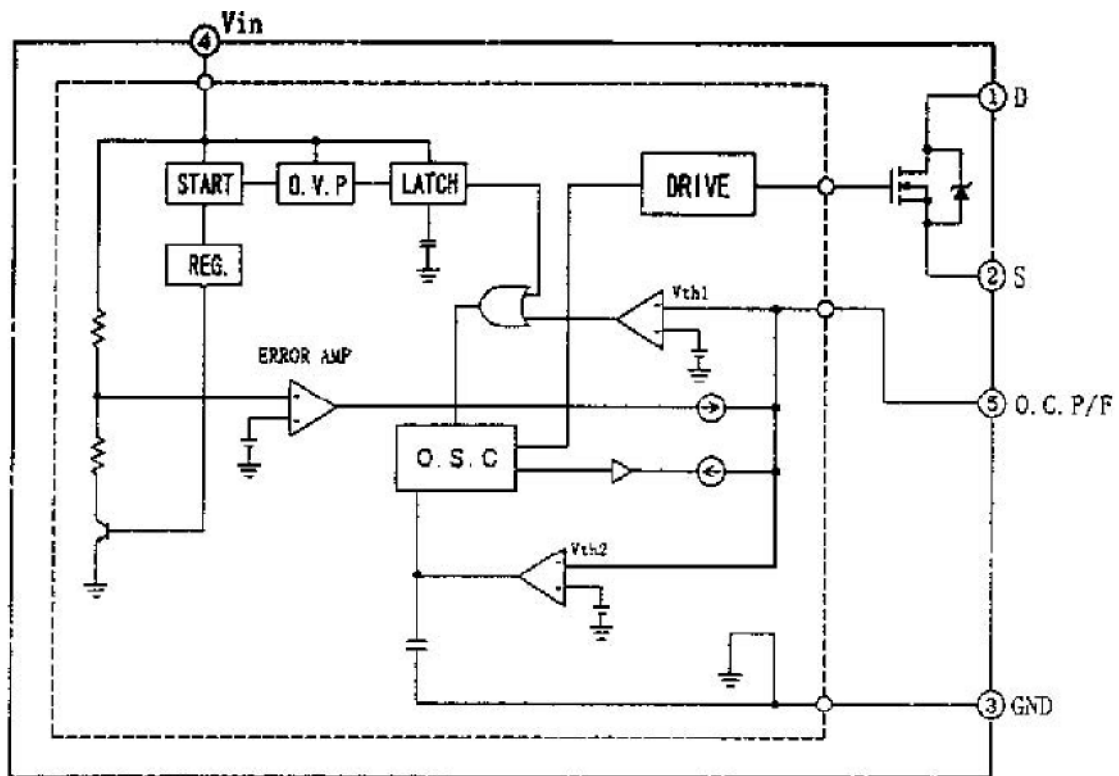


5 SWITCH-MODE POWER SUPPLY IC STRG5653

5.1 General Description

The STRG5653 is part of the STRG5600 series thick-film ICs for switch-mode power supply incorporating power MOSFET with a high-precise error amplifier. The ICs feature fewer external components, small-size and standard power supply.

5.2 Block Diagram



4.5.3 Function of Terminal

Terminal No.	Symbols	Description	Functions
1	D	Drain Terminal	MOS FET drain
2	S	Source Terminal	MOS FET source
3	GND	Ground Terminal	Ground
4	VIN	Power supply Terminal	Input of power supply for control
5	O.C.P/F.B	Over current/Feedback	Input of over current detection signal

APPENDIX

REPLACEMENT PARTS LIST

PART CODE	DESCRIPTION	SPECIFICATION	QTY	LOCATION					
54111A04180	POWER SWITCH	KDC-A04-MU171	1						
54111A04180	POWER SWITCH	KDC-A04(30)							
54111A04180	POWER SWITCH	PS5E-A-T1							
56231310080	SPEAKER	YDT313-A3-10W-8Ω	2						
8475901360B	DEGAUSSING COIL	XC-14E9	1						
681C14C1BM2	14" CRT	A34JQQ90X94	1						
	FRONT PANEL		1						
883370040G007	POWER KNOB	JUC8.337.040-G007	1						
883370139G007	FUNCTION KEY	JUC8.337.139-G007	1						
886400710C	LENS	JUC8.640.071	1						
50990011560	REMOTE CONTROLLER	GK22B1-C11	1						
8782000110G	MAIN PCB	JUG7.820.011	1						
50820012670	CHIP RES.	RC-05K000JT	6	RM607A	J002	J003	J005	RS503	
				RS101					
50820012680	CHIP RES.	RC-05K100JT	2		R051				
51905470JW5	CHIP RES.	RC-05K470JT	1	R042					
50820014550	CHIP RES.	RC-05K560JT	1	R048					
50820012970	CHIP RES.	RC-05K750JT	8	R507	R508	R509	R517	R592	
				R521	R522	R041			
50820012690	CHIP RES.	RC-05K101JT	9	R015	R191	R192	R193	R245A	
				R249	R251	R251A	R430A		
50820012750	CHIP RES.	RC-05K151JT	1	R243A					
50820012860	CHIP RES.	RC-05K331JT	1	R591					
50820012890	CHIP RES.	RC-05K391JT	1	R231					
50820012910	CHIP RES.	RC-05K471JT	2	R010	R049				
50820012700	CHIP RES.	RC-05K102JT	2	R241A	RK08				
50820012650	CHIP RES.	RC-05K122JT	2	R047	R248				
50820012790	CHIP RES.	RC-05K182JT	1	R046					
50820012810	CHIP RES.	RC-05K222JT	2	R062	R065				
50820012840	CHIP RES.	RC-05K272JT	1	R171					
50820012920	CHIP RES.	RC-05K472JT	15	R011	R045	R203	R204	R205	
				R220	R891	R582	R583	R584	
				R587	R588	R589	R581	R586	
50820014560	CHIP RES.	RC-05K682JT	1	R063					
51905103JW5	CHIP RES.	RC-05K103JT	2	R195	R606				
50820012770	CHIP RES.	RC-05K153JT	1	R158					
50820012850	CHIP RES.	RC-05K273JT	2	R233	R235				
51905104JW5	CHIP RES.	RC-05K104JT	5	R232	R519	R520	R595	RS100	
50810012400	CHIP CAP.	0805CG330J500NT	2	C200	C200A				
50810012410	CHIP CAP.	0805CG470J500NT	2	C582	C585				
50810012430	CHIP CAP.	0805CG561J500NT	1	C215A					
52A72680J04	CHIP CAP.	0805CG681J500NT	1	C240					
50810012440	CHIP CAP.	0805CG821J500NT	1	C171A					
50810013650	CHIP CAP.	0805CG102J500NT	7	C165					
50810012330	CHIP CAP.	0805B102K500NT		C166	C186A	C233	C430	C508	
				C509					
50810012340	C	0805B222K500NT	1	C157					
50810012550	CHIP RES.	0805B332K500NT	2	C047	C168	C061	C159		
50810012370	CHIP RES.	0805B472K500NT	3	C042					
50810012220	CHIP RES.	0805B103K500NT	5	C007	C034	C125A	C190	C127	
52A71392K06	CHIP RES.	0805B392K500NT	1	C171					
50810012350	CHIP RES.	0805B223K500NT	7	C052	C156	C161	C170	C374	
				C570	C573				
50810012490	CHIP CAP.	0805B104K500NT	3	C032	C189	C218			
617100850W7	CHIP DIODE	RLS4148TE-11	12	VD065	VD191	VD192	VD193	VD194	
				VD195	VD201	VD202	VD221A	VD604	
				VD890	VD892				
50680010410	CHIP TRANSISTOR	MMBT3906LT1G	2	V251	V890				
50680010480	CHIP TRANSISTOR	MMBT3904LT1G	5	V241	V581	V591	V601	V582	
51113100JU0	CARBON RES.	RT13-0.166W-10ΩJ	2	R242	R596A				
51113101JU0	CARBON RES.	RT13-0.166W-100ΩJ	5	R024	R025	R186A	R205A	R206	
50620072170	CARBON RES.	RT13-0.166W-200ΩJ	1	R865					
51113471JU0	CARBON RES.	RT13-0.166W-470ΩJ	1	R012					
51113102JU0	CARBON RES.	RT13-0.166W-1kΩJ	2	R813	R814				
51113182JU0	CARBON RES.	RT13-0.166W-1.8kΩJ	1	R430					
51113472JU0	CARBON RES.	RT13-0.166W-4.7kΩJ	2	R207	R214				
51113333JU0	CARBON RES.	RT13-0.166W-33kΩJ	1	R894					
50620071780	CARBON RES.	RT13-0.166W-39kΩJ	2	R810	R892				
50620071470	CARBON RES.	RT13-0.166W-120kΩJ	1	R485					
51113105JU0	CARBON RES.	RT13-0.166W-1MΩJ	1	R481A					
50620071220	CARBON RES.	RT14-0.25W-100ΩJ	2	R165	R166				
50620071370	CARBON RES.	RT14-0.25W-680ΩJ	1	R804					
50620071250	CARBON RES.	RT14-0.25W-1kΩJ	1	R807					
50620071260	CARBON RES.	RT14-0.25W-2.2kΩJ	3	R301	R302	R812			
51124302JT0	CARBON RES.	RT14-0.25W-3kΩJ	1	R866					
50620072640	CARBON RES.	RT14-0.25W-150kΩJ	1	R893					
50620030800	M. OXIDE FILM RES.	RJ14-0.25W-39kΩG	1	R167					
50620101360	OXIDE FILM RES.	RY21-0.5W-2.2ΩJ	1	R307					

PART CODE	DESCRIPTION	SPECIFICATION	QTY	LOCATION					
50620101430	OXIDE FILM RES.	RY21-0.5W-3.3ΩJ	1	R811					
51315331JK0	OXIDE FILM RES.	RY21-0.5W-330ΩJ	1	R309					
50620101310	OXIDE FILM RES.	RY21-0.5W-1KΩJ	1	R405					
50620100960	OXIDE FILM RES.	RY21-0.5W-270KΩJ	1	R896					
50620102430	OXIDE FILM RES.	RY21-0.5W-820KΩJ	1	R808					
50620102690	OXIDE FILM RES.	RY21-2W-0.22ΩJ	1	R803					
50620103280	OXIDE FILM RES.	RY21-2W-240ΩJ	1	R310					
50620101930	OXIDE FILM RES.	RY21-2W-3.3KΩJ	1	R463					
50620101770	OXIDE FILM RES.	RY21-2W-15KΩJ	1	R004C					
50620101040	OXIDE FILM RES.	RY21-2W-300KΩJ	1	R806					
51318123JF0	OXIDE FILM RES.	RY21-3W-12KΩJ	2	R402	R403				
51515P27J70	FUSE RES.	RF10-0.5W-0.27ΩJ	4	R605	R451	R461	R471		
51515010J70	FUSE RES.	RF10-0.5W-1ΩJ	1	R333					
50620050310	FUSE RES.	RF10-0.5W-1ΩJ	1	R491					
51224111493	FUSE RES.	RF10-2W-1.5ΩJ	1	R490					
50620080290	WIRE RES.	RXG6-H2-10W-2.2ΩJ	1	R801					
50620040030	THERMAL RES	MZ73-9RM	1	RT801A					
50620040120	THERMAL RES	PTDCA1BF7R0Q200							
52532471K10	CERAMIC CAP.	CT1-63V-06C-2B4-470PFK	1	C811					
52532821K10	CERAMIC CAP.	CT1-63V-06C-2B4-820PFK	1	C814					
52532102K10	CERAMIC CAP.	CT1-63V-06C-2B4-1000PFK	3	C301	C302	C472A			
5253F103Z10	CERAMIC CAP.	CT1-63V-08C-2F4-10NFZ	2	C866A	C891				
52542471KV0	CERAMIC CAP.	CT1-500V-06A-2B4-470PFK	3	C491	C816	C825A			
52542821KV0	CERAMIC CAP.	CT1-500V-08a-2B4-820PFK	1	C403					
5254F102M10	CERAMIC CAP.	CT81-250VAC-2E4-1000PFM-Y1	4	C815					
5254F102M10	CERAMIC CAP.	CD85-E2GA102MYHS		C815A					
50640024110	CERAMIC CAP.	CT7-250VAC-2E4-1000PFM-Y1		C802	C803				
50640023150	CERAMIC CAP.	CT81-1KV-16C-2E4-4700PFZ	4	C805	C806	C807	C808		
52592681K30	CERAMIC CAP.	CT81-2KV-12C-2B4-680PFK	1	C810					
52592471K30	CERAMIC CAP.	CT81-2KV-10C-2B4-470PFK	1	C818					
52368104J10	MYLAR RES.	CL21X-63V-0.1μFJ	4	C231	C309	C311	C608		
50640013360	MYLAR RES.	2222 366 76104	1	C167					
52369104J10	MYLAR RES.	ECQV1104JMW							
52367224J10	MYLAR RES.	CL21X-50V-0.22μFJ	5	C154	C155	C214	C216	C333	
5236C104J10	MYLAR RES.	CL21X-250V-0.1μFJ	1	C481					
5246Q104KB0	POLYPROPYLENE CAP.	CBB62-250VAC-0.1μFK	2	C801	C804				
526134P7M11	ELECTROLYTIC CAP.	CD110X-16V-4.7μFM	1	C486					
52623010060	ELECTROLYTIC CAP.	CD110X-16V-10μFM	10	C169	C501	C502	C507	C572	
				C581	C595	C584	C583	C586	
52613470M11	ELECTROLYTIC CAP.	CD110X-16V-47μFM	3	C242	C051	C125			
52613101M11	ELECTROLYTIC CAP.	CD110X-16V-100μFM	8	C013	C033	C188	C190A	C217	
				C592A	C827	C866			
52613102M11	ELECTROLYTIC CAP.	CD110X-16V-1000μFM	1	C153					
52613222M11	ELECTROLYTIC CAP.	CD110X-16V-2200μFM	1	C473					
52614471M11	ELECTROLYTIC CAP.	CD110X-25V-470μFM	3	C452	C462	C825			
50640062160	ELECTROLYTIC CAP.	CD110X-25V-1000μFM	1	C472					
52616471M11	ELECTROLYTIC CAP.	CD110X-35V-470μFM	1	C607					
52616102M11	ELECTROLYTIC CAP.	CD110X-35V-1000μFM	1	C817					
52617010MV0	ELECTROLYTIC CAP.	CD110X-50V-1μFM	1	C158					
50640062270	ELECTROLYTIC CAP.	CD110X-50V-2.2μFM	1	C162					
52617470M11	ELECTROLYTIC CAP.	CD110X-50V-47μFM	4	C001	C303	C812	C882A		
50640062010	ELECTROLYTIC CAP.	CD110X-160V-4.7μFM	2	C402	C890				
50640062140	ELECTROLYTIC CAP.	CD110X-250V-22μFM	1	C492					
50640063270	ELECTROLYTIC CAP.	CD288-160V-47μFM	1	C490					
50640062370	ELECTROLYTIC CAP.	CD288-160V-220μFM	1	C820					
50640062440	ELECTROLYTIC CAP.	CD293-450V-330μFM	1	C809					
50630061100	INDUCTOR	LGB0606-1μHK	1	L049					
50630061210	INDUCTOR	LGB0606-6.8μHJ	1	L241					
50630061070	INDUCTOR	LGB0606-10μHJ	6	L005	L100	L101	L102	L152	
50630061520	INDUCTOR	LGA0307-10μHJ	4	L501	L502	L581	L582		
50630010150	INDUCTOR	TEM2011	5	L301	L302	L807	L808	L809	
555756106A6	INDUCTOR	ZZ008	1	L401					
61212039BT5	DIODE	W05Z3.9B	1	VD861					
61212051BT5	DIODE	W05Z5.1B	1	VD816					
61212056BT5	DIODE	W05Z5.6B	1	VD003					
61212062AT5	DIODE	W05Z6.2A	2	VD186	VD221				
61212068BT5	DIODE	W05Z6.8B	1	VD812					
61212082BT5	DIODE	W05Z8.2B	2	VD448A	VD892A				
61212150CT5	DIODE	W05Z15C	1	VD815					
61118010158	DIODE	W05Z33C	1	VD001A					
61411075DT0	DIODE	1N4148	1	VD485					
61411075DT0	DIODE	2CK75D							
617100210T0	DIODE	BAV21	1	VD896					
611120RU210	DIODE	2CZRU2	4	VD302	VD491	VD811	VD471		
61112RU4ZN0	DIODE	2CZRU4Z	3	VD809	VD451	VD461			
50660091240	DIODE	RG4A	1	VD810					
50660091200	DIODE	MUR460RLG							
614145408N0	DIODE	BY254	4	VD801					
61414540810	DIODE	1N5408		VD802	VD804	VD805			
611001030V0	DIODE	AK03	1	VD806					
611001110T0	DIODE	AU01Z	3	VD807	VD808	VD814			
62118150Y16	AUDION	3DG1815-Y	2	V402					
50650030770	AUDION	2PC1815Y		V803					

PART CODE	DESCRIPTION	SPECIFICATION	QTY	LOCATION
62118150Y16	AUDION	KTC3198-Y		
62118150Y16	AUDION	2SC1815-Y		
62703370045	AUDION	BC337-40	2	V003 V805
621038820T0	AUDION	2SC388ATM	1	V047
62118111296	AUDION	KSC388C-Y		
621038820T0	AUDION	3DG388ATM		
50650030570	AUDION	3DA2688	1	V401
62126880010	AUDION	2SC2688-L		
50390020150	PHOTO COUPLE	HPC922	1	V802
67109P62116	PHOTO COUPLE	HS817		
67109S81700	PHOTO COUPLE	HS817C		
66115615306	I.C	SFH615A-3		
66110816005	I.C	LTV-816		
67109P62116	PHOTO COUPLE	TCET1106		
67109S81700	PHOTO COUPLE	TCET1103		
50950010440	CRYSTAL OSCILLATOR	JA18A-12.000MHZ	1	G200
5741465MB05	CERAMIC TRAP FILTER	TPS6.5MB	1	Z241
50570050120	CERAMIC TRAP FILTER	XT6.5MB		
5741460MB05	CERAMIC TRAP FILTER	TPS6.0MB	1	Z242
50570050110	CERAMIC TRAP FILTER	XT6.0MB		
5741455MB05	CERAMIC TRAP FILTER	TPS5.5MB	1	Z243
50570050080	CERAMIC TRAP FILTER	XT5.5MB		
84739002900	H. - DRIVER	BCT-4(JU4.739.029)	1	T401
8475701940B	LINE FILTER	LCL-F8B(JUB4.757.194)	2	L801 L802
59818033250	FUSE	R/S/V/I 50TT2.5AL250V	1	F801
59818033250	FUSE	61802.5		
6721224C085	I.C	AT24C08	1	N200
6721224C185	I.C	AT24C08A-10PI2.7		
67169240815	I.C	M24C08-BN6		
67107140537	I.C	HEF4053BP	1	N501
67107140537	I.C	HCF4053BP		
67107140539	I.C	HCF4053BEY		
50390068040	I.C	TDA9345PS/N3/3(OTP)	1	N100
8289100020E	TUNER	TAF5-C4I21	1	A001
57111388310	SAW FILTER	LBN38-83G	1	Z101
50820012670	CHIP RES.	RC-05K000JT	1	J004
50820012970	CHIP RES.	RC-05K750JT	1	R518
50820014540	CHIP RES.	RC-05K271JT	1	R608
50820014210	CHIP RES.	RC-05K162JT	1	R221
50820012920	CHIP RES.	RC-05K472JT	1	R210
51113103JU0	CARBON RES.	RT13-0.166W-10KΩJ	2	R601 RS602
51113104JU0	CARBON RES.	RT13-0.166W-100KΩJ	2	R603 RS604
50620071310	CARBON RES.	RT14-0.25W-4.7KΩJ	2	R649 R650
52532472K11	CERAMIC RES.	CT1-63V-10C-2B4-4700PFK	2	C601 CS602
52367224J10	MYLAR RES.	CL21X-50V-0.22μFJ	2	C603 CS604
52623010060	ELECTROLYTIC CAP.	CD110X-16V-10μFM	3	C125B C611 C512
52613220M11	ELECTROLYTIC CAP.	CD110X-16V-22μFM	1	C605
52613221M11	ELECTROLYTIC CAP.	CD110X-16V-220μFM	1	C606
52616102M11	ELECTROLYTIC CAP.	CD110X-35V-1000μFM	2	C609 C610
67107140527	I.C	HEF4052BP	1	N502
67107140529	I.C	HCF4052BEY		
8472604910B	SW TRANS.	BCK-24024L(JUB4.726.491)	1	T801
50820012800	CHIP RES.	RC-05K202JT	2	R246 R247
50820012920	CHIP RES.	RC-05K472JT	1	R208
50680010410	CHIP AUDIO	MMBT3906LT1G	2	V252 V253
50680010480	CHIP AUDIO	MMBT3904LT1G	1	V047A
51113473JU0	CARBON RES.	RT13-0.166W-47KΩJ	1	R064
5741445MB25	CERAMIC TRAP FILTER	TPS4.5MB2	1	Z244
50570050070	CERAMIC TRAP FILTER	XT4.5MB		
52623010060	ELECTROLYTIC CAP.	CD110X-16V-10μFM	2	C503
51113103J40	CARBON RES.	RT13-1/6W-10KΩJ	1	R481
51113103J20	CARBON RES.	RT13-1/6W-10KΩJ	1	R482
513165P6J10	OXIDE FILM RES.	RY21-1W-5.6ΩJ	2	R303 R305
50620103140	OXIDE FILM RES.	RY21-3W-4.7KΩJ	1	R431
50620102050	OXIDE FILM RES.	RY21-3W-5.6KΩJ	1	R432
52591122K30	CERAMIC RES.	CT81-2KV-14C-2C1-1200PFK	1	C431
52500010018	POLYPROPYLENE CAP.	CBB81-1.6KV-6800PFJ	1	C433
5241D334J70	POLYPROPYLENE CAP.	CBB13-400V-0.33μFJ	1	C438
52617P47M11	ELECTROLYTIC CAP.	CD110X-50V-0.47μFM	1	C163
50640062010	ELECTROLYTIC CAP.	CD110X-160V-4.7μFM	1	C439
611120RU210	DIODE	2CZRU2	1	VD434
84756002300	COIL INDUCTANCE	HXT65	1	L433
8475600090B		TLN0028A	1	L432
84799028201B	FLY BACK	BSC59C(B)	1	T400 L431
50390061810	I.C	TFA9842AJ/N1	1	N601
50390071520	I.C	L7805CV	1	N802
50390070710	I.C	KA7805TU		
50390070710	I.C	MC7805CT		
50390070710	I.C	CW7805CS		
67241780806	I.C	L7808CV	1	N401
67241780806	I.C	KA7808TU		
67241780806	I.C	MC7808CT		
50390071640	I.C	CW7808CS		

PART CODE	DESCRIPTION	SPECIFICATION	QTY	LOCATION					
62622214000	AUDION	TT2140LS-YB11	1	V431					
50390069720	I.C	TDA4864AJ/V1	1	N300					
67138565305	I.C	STR-G5653	1	N801					
8782000020G	CRT PCB	JUG7.820.002	1						
51113470JU0	CARBON RES.	RT13-0.166W-47ΩJ	3	R902	R912	R922			
50620072160	CARBON RES.	RT13-0.166W-270ΩJ	3	R903	R913	R923			
51113222JU0	CARBON RES.	RT13-0.166W-2.2KΩJ	3	R901	R911	R921			
50620071270	CARBON RES.	RT14-0.25W-220ΩJ	3	R906	R916	R926			
50620071300	CARBON RES.	RT14-0.25W-330ΩJ	3	R905	R915	R925			
50620071050	CARBON RES.	RT14-0.25W-330KΩJ	1	R933					
50620103270	M. OXIDE FILM RES.	RY21-2W-15KΩJ	3	R904	R914	R924			
51615222J10	GLASS GLAZED RES.	RI40-0.5W-2.2KΩJ	3	R907	R917	R927			
50640022990	CERAMIC RES.	CC1-63V-10C-SL-330PFJ	3	C901	C911	C921			
50640022880	CERAMIC RES.	CT1-500V-06A-2B4-1000PFK	1	C932A					
50640012180	POLYPROPYLENE CAP.	CBB81-1.6KV-3300PFJ	1	C933					
5236C104J20	MYLAR RES.	CL21X-250V-0.1μFJ	1	C932					
50640062120	ELECTROLYTIC CAP.	CD110X-250V-10μFM	1	C931					
50630010150	COIL INDUCTANCE	TEM2011	2	L933					
61411075DT0	DIODE	2CK75D	3	D901					
61411075DT0	DIODE	1N4148		D911	D921				
617100210T0	DIODE	BAV21	6	D902	D903	D912	D913	D922	D923
61212082AT5	DIODE	W05Z8.2A	1	D931					
62126880010	AUDION	2SC2688-L	3	V901					
62126880010	AUDION	3DA2688-L		V911					
50650030570	AUDION	3DA2688		V921					
50650030520	AUDION	3DA2688-F							
637080422W5	AUDION	BF422	3	V902					
637080422W5	AUDION	3DG422		V912	V922				
637080423W5	AUDION	BF423	3	V903					
637080423W5	AUDION	3CG423		V913	V923				
50910010000	GZS CRT SOCKET	GZS8-6-AC	1	GZ01					
5360861F000	GZS CRT SOCKET	GZS8-6-1F							
515172P7J90	FUSE RES.	RF10-2W-2.7ΩJ	1	R931					
50620050600	FUSE RES.	RF11-2W-2.7ΩJ							
50630061080	INDUCTOR	LGB0606-10μHK	2	LK01	LK02				
8782012540C	FUCNTION KEY PCB	JUC7.820.1254	1						
59822050305	CARBON RES.	RT13-0.166W-120ΩJ	1	RK99					
51113151JU0	CARBON RES.	RT13-0.166W-150ΩJ	1	RK91					
50620072170	CARBON RES.	RT13-0.166W-200ΩJ	1	RK92					
50620072160	CARBON RES.	RT13-0.166W-270ΩJ	1	RK94					
51113391JU0	CARBON RES.	RT13-0.166W-390ΩJ	1	RK95					
51113821JU0	CARBON RES.	RT13-0.166W-820ΩJ	1	RK96					
54167605410	TOUCH SWITCH	KA1W6×5-41	6	S901	S902	S903	S904	S905	
87820002001G	IR RECEIVER PCB	JUG7.820.020	1						
51113470JU0	CARBON RES.	RT13-0.166W-47ΩJ	1	RP11					
51113472JU0	CARBON RES.	RT13-0.166W-4.7KΩJ	1	RP12					
51113333JU0	CARBON RES.	RT13-0.166W-33KΩJ	1	RP13					
5253F103Z10	CERAMIC RES.	CT1-63V-08C-2F4-10NFZ	1	CP12					
52623010060	ELECTROLYTIC CAP.	CD110X-16V-10μFM	1	CP11					
61512050R15	L.E.D	FG5RD-1	1	VDP11A					
67109138025	IR RECEIVER	HRM380017	1	NP11A					
67109138025	IR RECEIVER	AT138A							
67109138045	IR RECEIVER	HS0038A2			RP15A				

