FILE NO. SM-CTV-O-131

COLOR TELEVISION

SERVICE MANUAL

MODEL NO. 21NF55/21PF93
CHASSIS NO. EX-1A1

Please read this manual carefully before service

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SPECIFICATIONS

Model Number		21NF55	21PF93
RF system	Color system	PAL4.43, NTSC3.58, NTSC4.43, SECAM	
	Sound system	B/G, I, M, D/K	
Video system		PAL4.43, NTSC3.58, NTSC4.43, PAL-M, PAL-N (50/60Hz)	
Receiving channel	VHF	C1～C12 (49.75-85.25MHz, 168.25-216.25MHz)	
	UHF	C13～C57 (471.25-863.25MHz)	
	CATV	Z1～Z7 (111-167MHz) Z8～Z35 (223-447MHz)	
Programs preset		236(0-235)	
Antenna input		75Ω(unbalanced)	
Picture tube (Approx.) Effective screen d imensions		406×305mm	
Audio output (THD≤7%)		3W+3W	
Power source		150-250V ~, 50/60Hz	
Weight (Approx.)		24kg	25kg
Dimensions (W×H×D) (Approx.)		585×460×480mm	577×459×480mm
Rated power consumption		69W	

Note: Designs and specifications are subject to change without notice.

INSTRUCTIONS FOR SERVICE SAFETY AND MAINTENANCE

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTION BELOW.

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.

1.1 Do not attempt to service this TV if you are not conversant with the precautions and procedures for working on high voltage equipment.

1.2 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.

1.3 The CRT, if broken, will violently expel glass fragments. Use shatterproof goggles and take extreme care while handling.

1.4 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.
9. Keep wires away from high temperature components.

PRODUCT SAFETY NOTICE

CAUTION: FOR YOU 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 bythem 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. Install the TV set on a stable and level surface. 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.

ADJUSTMENTS

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:

1. Color purity
2. Convergence
3. White balance

Notes:

① The purity/convergence magnet assembly and rubber wedges need mechanical positioning.

② For some picture tubes, purity/ convergence adjustments are not required.

1. Color Purity Adjustment

Preparation:

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

1.1 Face the TV set north or south.

1.2 Connect the power plug into the wall outlet and turn on the main power switch of the TV set.

1.3 Operate the TV for at least 15 minutes.

1.4 Degauss the TV set using a specific degaussing coil.

1.5 Set the brightness and contrast to maximum.

1.6 Counter clockwise rotate the R/B low brightness potentiometers to the end and rotate the green low brightness potentiometer to center.

1.7 Receive green raster pattern signals.

1.8 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.

1.9 Slowly move the deflection yoke assembly forward or backward until a uniform green screen is obtained.

1.10 Tighten the clamp screw of the assembly temporarily. Check purity o f the red raster and blue raster until purities of the three rasters meet the requirement.

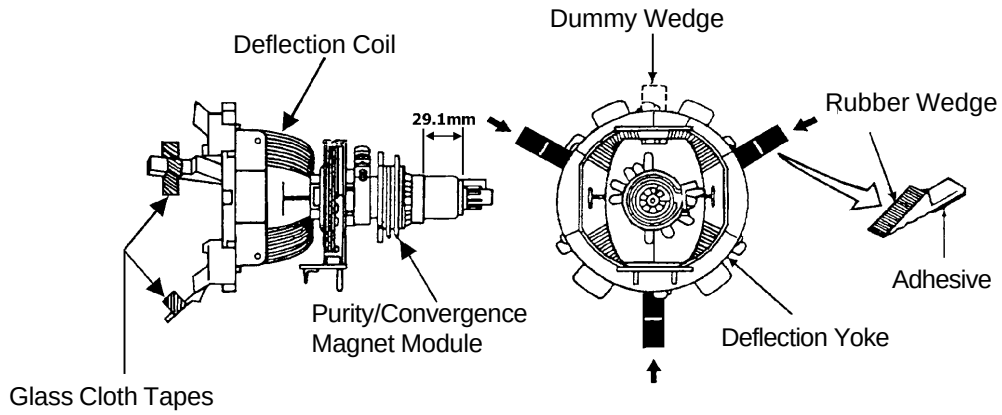


Fig. 1

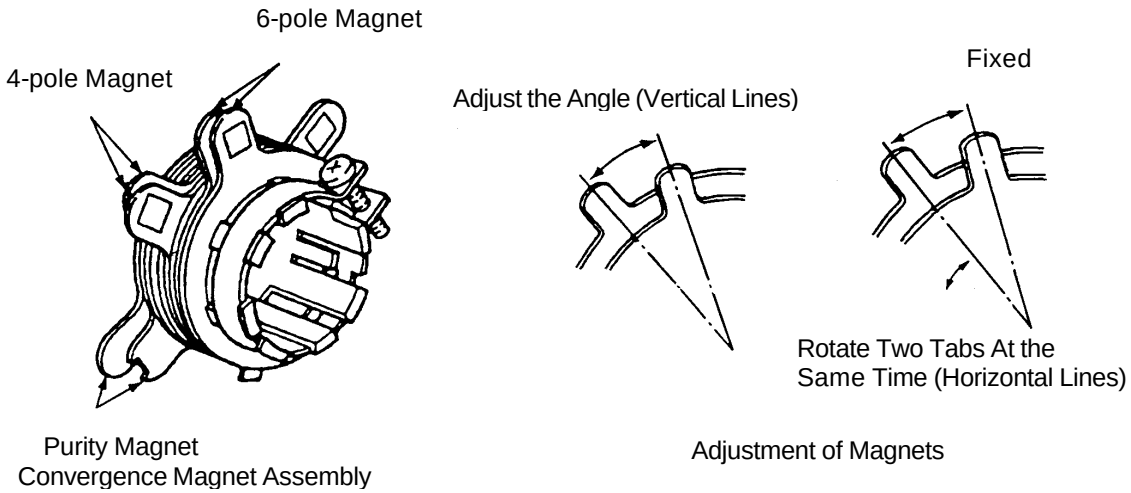


Fig. 2

2. Convergence Adjustment

Preparation:

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

2.1 Center convergence adjustment

2.1.1 Receive dot pattern.

2.1.2 Adjust the brightness/contrast controls to obtain a sharp picture.

2.1.3 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.

2.1.4 Turn both tabs at the same time keeping the angle constant to superimpose red and blue horizontal on the center of the screen.

2.1.5 Adjust two tabs of the 6-pole magnet to superimpose red/blue line and green line.

2.1.6 Remember red and blue movement. Repeat steps2.1.3-2..15 until optimal convergence is

obtained.

2.2 Circumference convergence adjustment

2.2.1 Loosen the clamp screw holding the deflection yoke assembly and allow it tilting.

2.2.2 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.

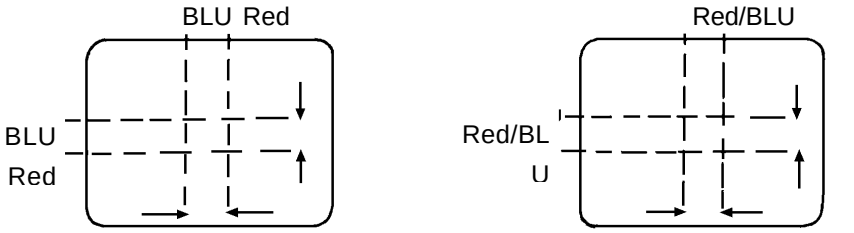
2.2.3 Put the second wedge into bottom.

2.2.4 Move front of the deflection yoke to the left or right to obtain better convergence in circumference.

2.2.5 Fix the deflection yoke position and put the third wedge in either upper space. Fasten the deflection yoke assembly on the picture tube.

2.2.6 Detach the temporarily mounted wedge and put it in either upper space. Fasten the deflection yoke assembly on the picture tube.

2.2.7 After fastening the three wedges, recheck overall convergence and ensure to get optimal convergence. Tighten the lamp screw holding the deflection yoke assembly.



4-pole Magnet Movement

6-pole Magnet Movement

Incline the Yoke up (or down)

Incline the Yoke Right(or left)

Circumference Convergence by DEF Yoke

Fig. 3

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 I^2C bus control, change the bus data to adjust white balance.

CIRCUIT ADJUSTMENT S

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 I^2C bus control, first change the bus data.

1. Degaussing

A deg aussing coil is built inside he 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.

1.1 Power on the TV set and operate it for at least 15 minutes.

1.2 Receive red full-field pattern.

1.3 Power on the specific degausser and face it to the TV screen.

1.4 Turn on the degausser. Slowly move it around the screen and slowly take it away from the TV.

1.5 Repeat the above steps until the TV is degaussed completely.

2. Supply Voltage Adjustment

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

2.1 Make sure that the supply voltage is within the range of the rated value.

2.2 Connect a digital voltmeter to the +B voltage output terminal of the TV set. Power on the TV and set the brightness and sub-brightness to minimum.

2.3 Regulate voltage adjustment components on the power PCB to make the voltmeter read 115± 1V.

3. High Voltage Inspection

Measure voltages of test point s 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 1

Test Point	Voltage Value (V)
Positive of C492	185V±5V
Filament pin of socket	$6.3V\pm^{0.3}V_{RMS}$
21" CRT anode	25.5KV±1.2KV
Anode of 21" pure flat CRT (including Samsung, BMCC and Toshiba)	27.5KV±1.5KV
Anode of other 21" pure flat CRTs	26.5KV±1.5KV

Notes:

① Measure voltage of the related isoelectronic point if it's difficult to measure a certain point in Table 1.

② Anode high voltage differs depending on CRTs used, which should be decided by engineers.

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.

4.1 After removing the back cover, look for the FBT on the main PCB. There should be a FCB on the FBT.

4.2 Power on the TV and preheat it for 15 min.

4.3 Receive a normal TV signal. Rotate knob of the FCB until you get a sharp picture.

5. Safety Inspection

5.1 Inspection for insulation and voltage-resistant

Perform safety test for all naked metal of the TV. Supply high voltage of 3000V AC, 50Hz (limit current of 10mA) between all naked metal and cold ground. Test every point for 3 min. and ensure no arcing and sparking.

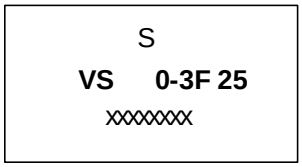
5.2 Requirements for insulation resistance

Measure resistance between naked metal of the TV and feed end of the power cord to be infinity with a DC-500 high resistance meter and insulation resistance between the naked metal and degaussing coil to be over 20MΩ.

6. DESIGN/SERVICE mode

6.1 To enter the USER SERVICE mode

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.



6.1.1 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. (In this case, the S mode cannot be stored in the EEPROM. To exit from the S mode, turn off the TV set.)

6.1.2 After entering the S mode, Red "S "is displayed on the upper center of the screen and MENU1 is default. Use the POS+/- buttons to highlight an adjustment and the VOL+/- buttons to adjust it. The adjusted data are immediately output and stored in the EEPROM

6.2 Bus data in the S mode

Table 1 Adjustment and Option Data in S mode

Item	Adjustment	Description	Remarks
CORE	03	Coring (for some CPU only)	
0-IF	20	Sound adjustment setting (for some CPU only)	
5PAR/6PAR	1F	Parallelogram correction (for large-screen only)	
5BOW/6BOW	1F	Curve correction (for large-screen only)	
5HSH/6HSH	Set to the optimal mode	Horizontal center in the TV mode for 50Hz/60Hz For 50Hz, "5HSH" is displayed; for 60Hz, "6HSH" is displayed.	*

(Continued)

5EWW/6EWW	1F	East-West correction (for large-screen only)	
5EWP/6EWP	1F	East-West parabola correction (for large-screen only)	
5UCR/6UCR	1F	Upper corner parabola correction (for large-screen only)	
5LCR/6LCR	1F	Lower corner parabola correction (for large-screen only)	
5EWT/6EWT	1F	Trapezoidal correction (for large-screen only)	
5VSL/6VSL	1F	Vertical slope (for large-screen only)	*
5VAM/6VAM	1F	Vertical amplitude; For 50Hz, "5VAM" is displayed; for 60Hz, "6VAM" is displayed.	*
5SCL/6SCL	Set to the optimal mode	S correction	*
5VSH/6VSH	Set to the optimal mode	Vertical center in the TV mode for 50Hz/60Hz. For 50Hz, "5VSH" is displayed; for 60Hz, "6VSH" is displayed.	*
5VOF/6VOF	Set to the optimal mode	OSD vertical center	*
VX	19	Vertical zoom (for large-screen only)	
	20	Red gun cutoff voltage	*
GRN	20	Green gun cutoff voltage	*
WPR	1F	Red gun drive voltage	*
WPG	1F	Green gun drive voltage	*
WPB	1F	Blue gun drive voltage	*
YDFP/YDFN	07	PAL brightness delay time/ NTSC brightness delay time	
TOP VOL	10-1F 26	UOC AGC TV audio output power can be adjusted by means of UOC audio output amplitude. Generally, UOC audio output amplitude is set to 26 for 21" models with stereo output of 3W+3W; 2C for 21" models with stereo output of 5W+5W; 24 for 14" models with mono output of 2WX2; 22 for 14" models with mono output of 1WX2.	* ***
IFFS	03（02）	PIF (02-38.9MHz, 03-38MHz)	
HDOL	04	Cathode drive level (typical: 04-07)	
AGC	03	IF ACG speed	
VG2B	3A	VG2 brightness setting(VG2B): 3A for 21" models; 2E for 14" models; Contrast Max. setting (MCON): 30 for 21" Malaysia Matsushita or BMCC CRT with ferrite mask; MCON: 30; VG2B: 30, HDOL: 04 for 21" Chunghwa CRT	
SBRI	1F	Sub brightness	
MBRI	30	Brightness Max.	

(Continued)

SCON	20	Sub contrast	
MCON	30	Contrast Max.	
SCOL	32	Sub color	
OP1	BF	Option set byte 1	***
OP2	09	Option set byte 2	***
OP3	FF	Option set byte 3	***
OP4	F6	Option set byte 4	***
OP5	76	Option set byte 5	***
OP6	3C	Option set byte 6	***
INIT		EEPROM initialization	
VG2		Adjusting screen voltage with VG2	*
VSD		Vertical output off	
STS0/1/2		System status byte	

Notes:

① The items remarked with "*", not affecting functions of the whole set, can be adjusted depending on models.

② The items remarked with "***", affecting functions of the whole set, can be adjusted depending on functions of models.

③ To write in logo, use the ↓/↑ buttons to highlight an adjustment and the ←/→ buttons to adjust.

④ The data sheet may differ dependent on different models.

⑤ The data sheet may differ dependent on different CRTs for the same model.

6.3 Option set

With remote control system software TDA935X, all options can be set in the SERVICE mode and stored in EEPROM. Data related to picture, sound and geometric adjustment are also stored in EEPROM.

Table 2 Function Option Bit Setting

	Bit	Item	Description	Data
OP1	0	OP_HOTEL	Hotel mode (1: Yes, 0: No)	1
	1	OP_236	Channels preset: 1: 236 channels 0: 100 channels	1
	2	OP_NTSC	NTSC color system options: 1: Yes, 0: No	1
	3	OP_AV2	Two sets of AV inputs: 1: Two sets of separate AV inputs 0：Two sets of parallel AV inputs or one set of AV inputs	1/0
	4	OP-SVSH	S-Video terminal: 1: Yes, 0: No	1
	5	OP-DVD	DVD component input: 1: Yes	1
	6	OP-RGB	RGB input: 1: Yes, 0: No	1
	7	OP-OSO	Switch off in vertical overscan	1
OP2	0	OP_AVL	AVL: 1: Yes	1

(Continued)

	1	OP_RFTOAV	AV RF output: 1: RF output (for models with SCART jack except EX-1A) 0: Monitor output (for models with RCA jack)	0/1
	2	OP_NOT_1	Teletext language setting (OP-NOT-3/2/1): 1XX-English/Arabic 011-English/Farsi 010-English/Russian 001-English/Ukrainian 000- English/Paneuro	0
	3	OP_NOT_2		0
	4	OP_NOT_3		0
	5	OP_USER-LOGO	User LOGO setting prior to CHANGHONG LOGO: 1: Display characters can be set by the VOL+/- buttons	0
	6	OP_ON-BLACK	Power-on auto test back selection: 1: Blue, 0: Black	0
	7	OP_FSL	Slicing level for vertical sync	0
OP3	0	OP_ENGLISH	English	1
	1	OP_FARSI	Farsi or Czech	1
	2	OP_ARABIC	Arabic or Slovakian	1
	3	OP_RUSSIAN	Russian	1
	4	OP_FRENCH	French	1
	5	OP_GERMAN	German	1
	6	OP_ITALY	Italian, Indonesian or Hungarian	1
	7	OP_SPANISH	Spanish, Malay or Croatian	1
OP4	0	OP_FMWS	Window selection of sound pll: small/large window	0
	1	OP_DIRECT_SWITCH_ON	Memory power-on (If turned off by the remote control, then the TV is turned on by the remote control; if turned off by the MAIN POWER SWITCH, then turned on by the MAIN POWER SWITCH.) 1: Yes	1
	2	OP_HCO	EHT tracking mode	1
	3	OP_LOGO	Changhong logo display：1-Displayed without signal reception；0-No	0
	4	OP_SOUND_DK	Sound system-D/K option setting	1
	5	OP_SOUND_BG	Sound system-B/G option setting	1
	6	OP_SOUND_I	Sound system-I option setting	1
	7	OP_SOUND_M	Sound system-M option setting	1
OP5	0	OP_TUNER	Tuner: 1: Philips-Tuner 0: Panasonic-Tuner	0
	1	OP_AUTO_LANG0	Outgoing language option setting: (OP-AUTO-LANG2/1/0): English (000)	0
	2	OP_AUTO_LANG1		0

(Continued)

	3	OP_AUTO_LANG2	Farsi (001) Arabic (010) Russian (011) French (100) German (101) Italian or Indonesian (110) Spanish or Malay (111)	0
	4	OP_FORF	Field frequency options (OP-FORS/FORF): 00- AUTO 60HZ, 01-KEEP LAST, 10-FORCE 60HZ, 11-AUTO 50HZ	1
	5	OP_FORS		1
	6	OP_AVON	If AV off, then AV on	1
	7	OP_ONPOSITION	With HOTEL mode preset, on position is fixed to POS1.	0
OP6	0	OP_AUTOTEST	Auto test when power-on (set to 0 typically)	0
	1	OP_PSNS	Sensitivity	0
	2	OP_BSCREEN	Black screen when changing channels: 1-Yes；0-No	1
	3	OP_SECAM	SECAM color system option: 1: Yes	1
	4	OP_DFL	Disable flash protection	1
	5	OP_SIF	External SIF amplifier: 1: Yes, 0: No	1
	6	OP_EXT_SIF0	Sound system options for external circuit (OP-EXT-SIF1/0): D/K: 00，B/G: 01，I: 10，M: 11. 1: Sets sound system of external SIF as the appropriate one and also sets sound system in the course of auto demo as the appropriate one 0: Changes sound system in the course of auto demo.	1
	7	OP_EXT_SIF1		0

Notes:

① Do not change the data marked with "_" in "Data" column.

② Check if the color/sound systems conform to the specifications of different models after setting.

STRUCTURE AND CHASSIS FUNCTION DESCRIPTION

1. STRUCTURE BLOCK DIAGRAM

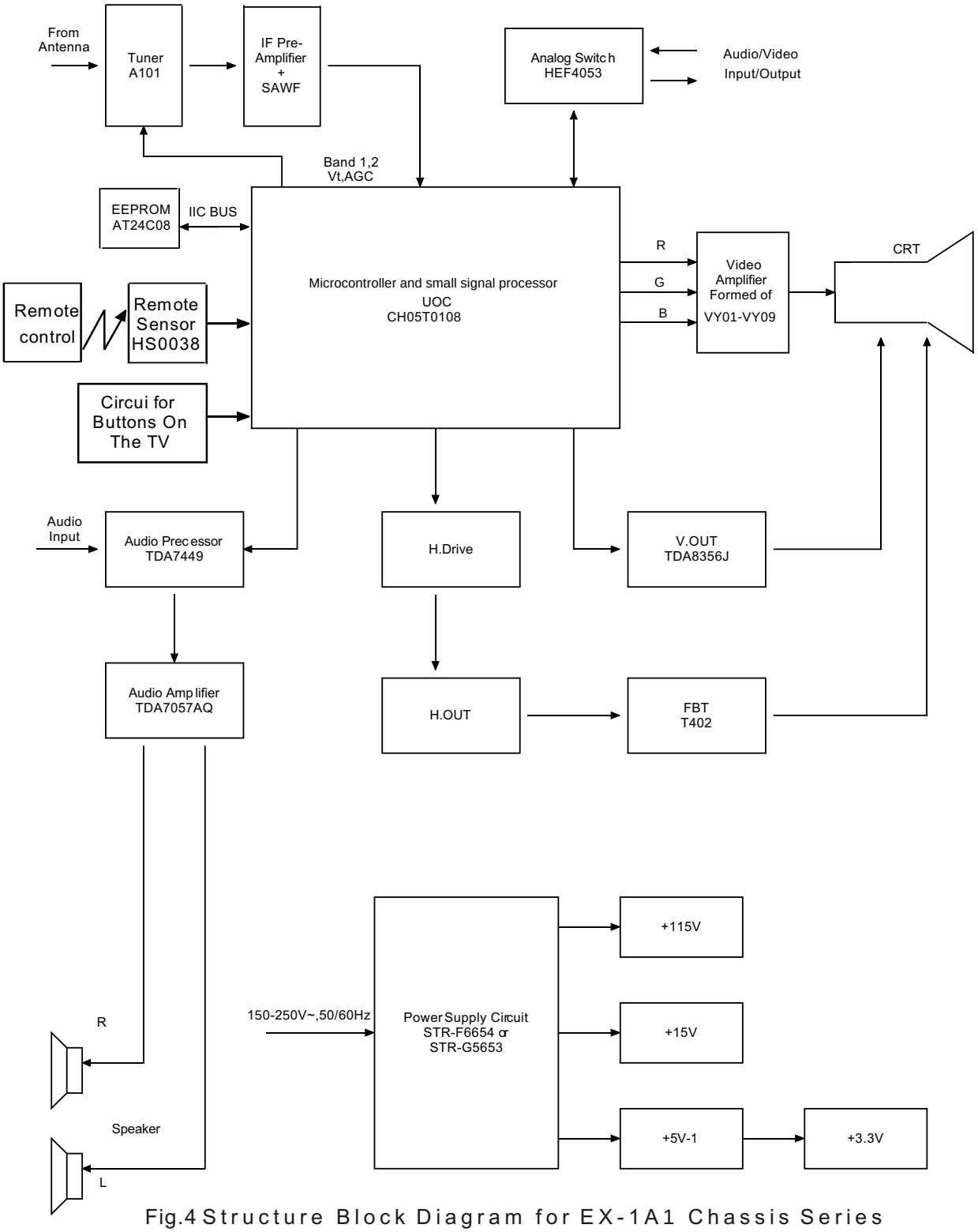


Fig.4 Structure Block Diagram for EX-1A1 Chassis Series

2. BLOCK DIAGRAM FOR SUPPLY VOLT-AGE SYSTEM

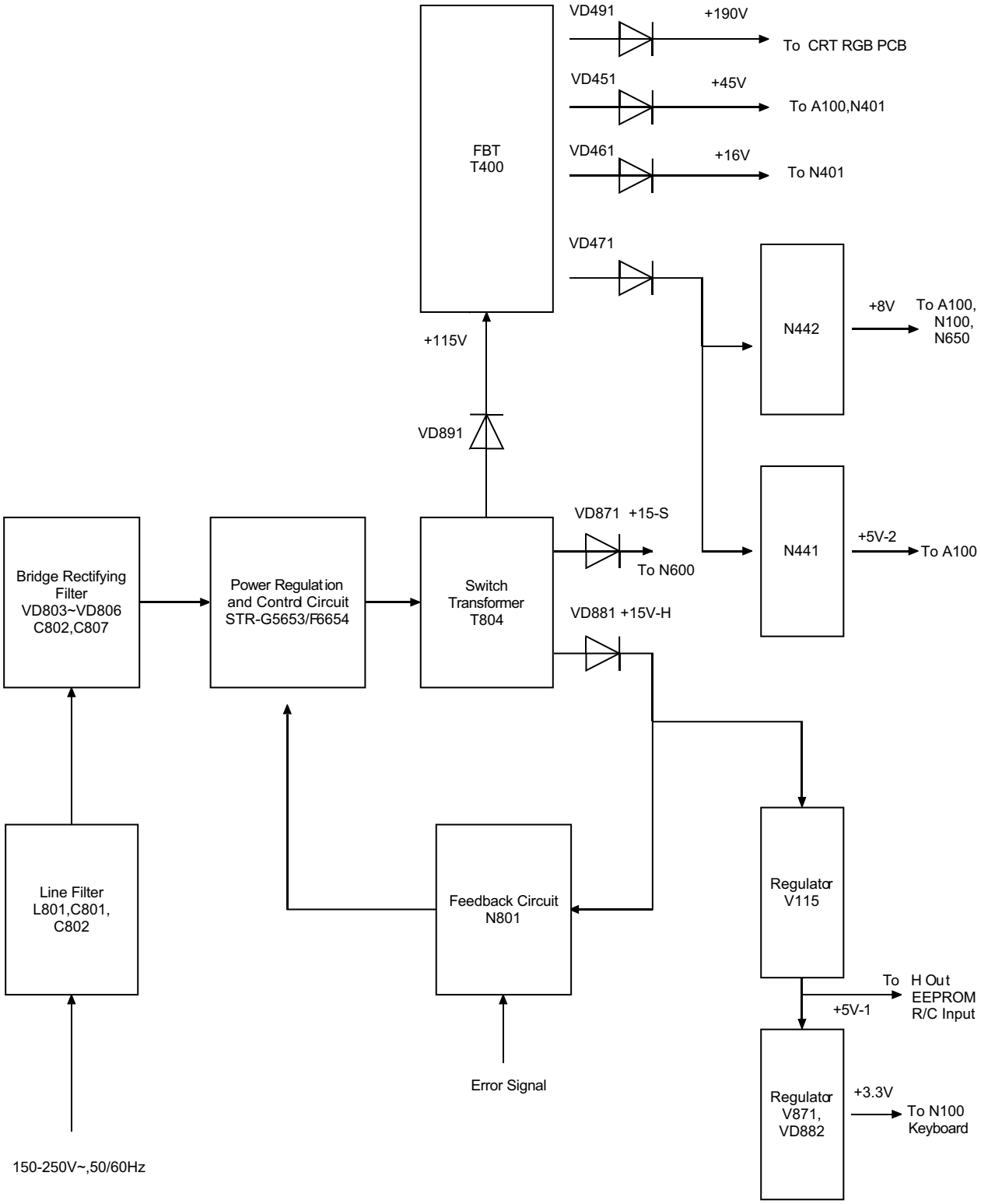


Fig.6 Block Diagram for EX-1A1 Supply Voltage System

3. CHASSIS DESCRIPTION

1). General Description

EX-1A1 chassis series are applied in 21NF55/21PF93 respectively which uses mainly Philips' advanced UOC-ultimate chip TDA935X/6X/8X and I²C-bus controlled IC. With combination of microcontroller and small signal processor, the TDA935X/6X/8X series feature high-integration, high-performance-to-price ratio and high-reliability and advanced functions with fewer external components, which provide much convenience for manufacturing and technical service.

2). The EX-1A1chassis series mainly use the following ICs and assemblies.

Table 3 Key ICs and Assemblies

Serial No.	Position	Type	Function Description
1	N100	CH05T0101 (TDA935X/6X/8X)	Microcontroller and small signal processor (UOC)
2	N200	AT24C08	EEPROM
3	N401	TDA8356/N6	Vertical scan output stage circuit
4	N402	HEF4053	Analog switch
5	N600	TDA7057AQ	Sound power amplifier
6	N650	TDA7449	Sound processor
7	N861	STR-G5653	Power supply circuit
8	A100	TDQ-5B6M	Tuner

SERVICE DATA

1. KEY ICS TECHNICAL DATA

1.1 *Microcontroller and small signal processor TDA935X/6X/8X*

The super chips TDA935X/6X/8X are good in pins compatibility. Differences among them are shown as follows.

TDA9351 (48K) PAL/NTSC/SECAM+1 PAGE TELETEST
TDA9350 (48K) PAL/NTSC+1 PAGE TELETEST
TDA9361 (64K) PAL/NTSC/SECAM+10 PAGE TELETEST
TDA9360 (64K) PAL/NTSC+10 PAGE TELETEST
TDA9380 (32K) PAL/NTSC
TDA9387 (32K) NTSC

TDA935X/6X/8X PS/N2 series TV signal processor-Teletext decoder with embedded ? -Controller

1) General Description

The various versions of theTDA935X/6X/8X PS/N2 series combine the functions of a TV signal 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 1or 10 page text. The ICs are intended to be used in economy television receivers with 90? and 110? picture tubes. The ICs have supply voltages of 8 V and 3.3 V and theyare mounted in S-DIP envelope with 64 pins.

The features are given in the following feature list. The differences between the various ICs are given in the table on page 4.

2) Features

TV-signal processor

- Multi-standard vision IF circuit with alignment-free PLL demodulator
- Internal (switchable) time-constant for the IF-AGC circuit
- A choice can be made between versions with mono intercarrier sound FM demodulator and versions with QSS IF amplifier.
- The mono intercarrier sound versions have 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.
- Source selection between 'internal' CVBS and external CVBS or Y/C signals
- Integrated chrominance trap circuit
- Integrated luminance delay line with adjustable delaytime
- Picture improvement features with peaking (with variable centre frequency and positive/negative overshoot ratio) and black stretching
- Integrated chroma band-pass filter with switchable centre frequency
- Only one reference (12 MHz) crystal required for the
- -Controller, Teletext- and the colour decoder
- PAL/NTSC or multi-standard colour decoder with automatic search system

- Internal base-band delay line
- RGB control circuit with 'Continuous Cathode Calibration', white point and black level offset adjustment so that the colour temperature of the dark and the light parts of the screen can be chosen independently.
- Linear RGB or YUV input with fast blanking for external RGB/YUV sources. The Text/OSD signals are internally supplied from the ? -Controller/Teletext decoder
- Contrast reduction possibility during mixed-mode of OSD and Text signals
- 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

TV signal processor-Teletext decoder with embedded ? -Controller TDA935X/6X/8X PS/N2 series

- **-Controller**
- 80C51 ? -controller core standard instruction set and timing
- 1 ? s machine cycle
- 16 - 128Kx8-bit late programmed ROM
- 3 - 12Kx8-bit DATA RAM (shared between Display, Acquisition and Auxiliary Ram)
- Interrupt controller for individual enable/disable with two level priority
- Two 16-bit Timer/Counter registers
- One 16 bit Timer with 8-bit Pre-scaler
- WatchDog timer
- Auxiliary RAM page pointer
- 16-bit Data pointer
- Stand-by, Idle and Power Down (PD) mode
- 14 bits PWM for Voltage Synthesis Tuning
- 8-bit A/D converter
- 4 pins which can be programmed as general I/O pin, ADC input or PWM (6-bit) output

Data Capture

- Text memory for 0, 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
- 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 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 device

Functional Difference Between The Various IC Versions

IC Version (TDA) 9350 9351 9352 9353 9360 9361 9362 9363 9364 9365 9366 9367 9380 9381 9382 9383 9384 9385 9386 9387 9388 9389

Table 4

IC VERSION(TDA)	9350	9351	9352	9353	9360	9361	9362	9363	9364	9365	9366	9367	9380	9381	9382	9383	9384	9385	9386	9387	9388	9389
TV range	90°	90°	90°	110°	90°	90°	110°	110°	110°	110°	90°	90°	90°	90°	90°	110°	110°	110°	110°	90°	110°	110°
Mono intercarrier multi-standard sound demodulator (4.5–6.5 MHz) with switchable centre frequency	√	√		√	√	√	√	√					√	√		√	√			√	√	
Audio switch	√	√			√	√	√	√					√	√		√	√			√	√	
Automatic Volume Levelling	√	√	√	√	√	√					√	√	√	√	√							
Automatic Volume Levelling or subcarrier output (for combfilter applications)							√	√	√	√						√	√	√	√	√	√	√
Qss sound IF amplifier with separate input and AGC circuit			√						√	√	√	√			√			√	√			√
AM sound demodulator without extra reference circuit										√									√			
PAL decoder	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√			
SECAM decoder		√	√	√	√	√		√		√		√		√	√		√		√			
NTSC decoder	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Horizontal geometry (E–W)				√			√	√	√	√						√	√	√	√		√	√
Horizontal and Vertical Zoom				√			√	√	√	√						√	√	√	√		√	√
ROM size	32–64K	32–64K	32–64K	32–64K	64–128K	64–128K	64–128K	64–128K	64–128K	64–128K	64–128K	64–128K	16–64K	16–64K	16–64K	16–64K	16–64K	16–64K	16–64K	16–64K	16–64K	16–64K
User RAM size	1K	1K	1K	1K	2K	2K	2K	2K	2K	2K	2K	2K	1K	1K	1K	1K	1K	1K	1K	1K	1K	1K
Teletext	1 page	1 page	1 page	1 page	10 page	10 page	10 page	10 page	10 page	10 page	10 page	10 page										
Closed captioning	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

3) Block Diagram

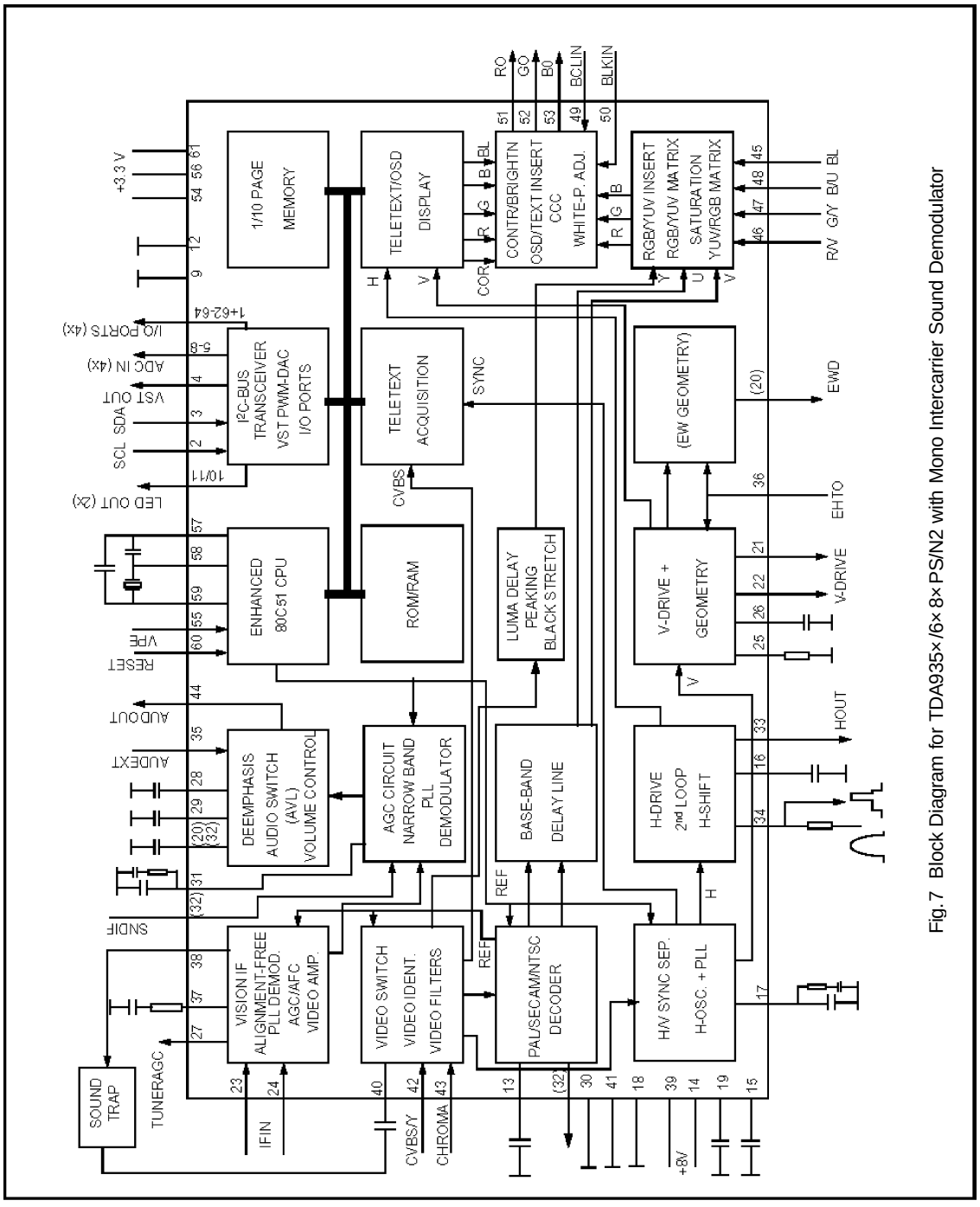


Fig.7 Block Diagram for TDA935x/6x 8x PS/N2 with Mono Intercarrier Sound Demodulator

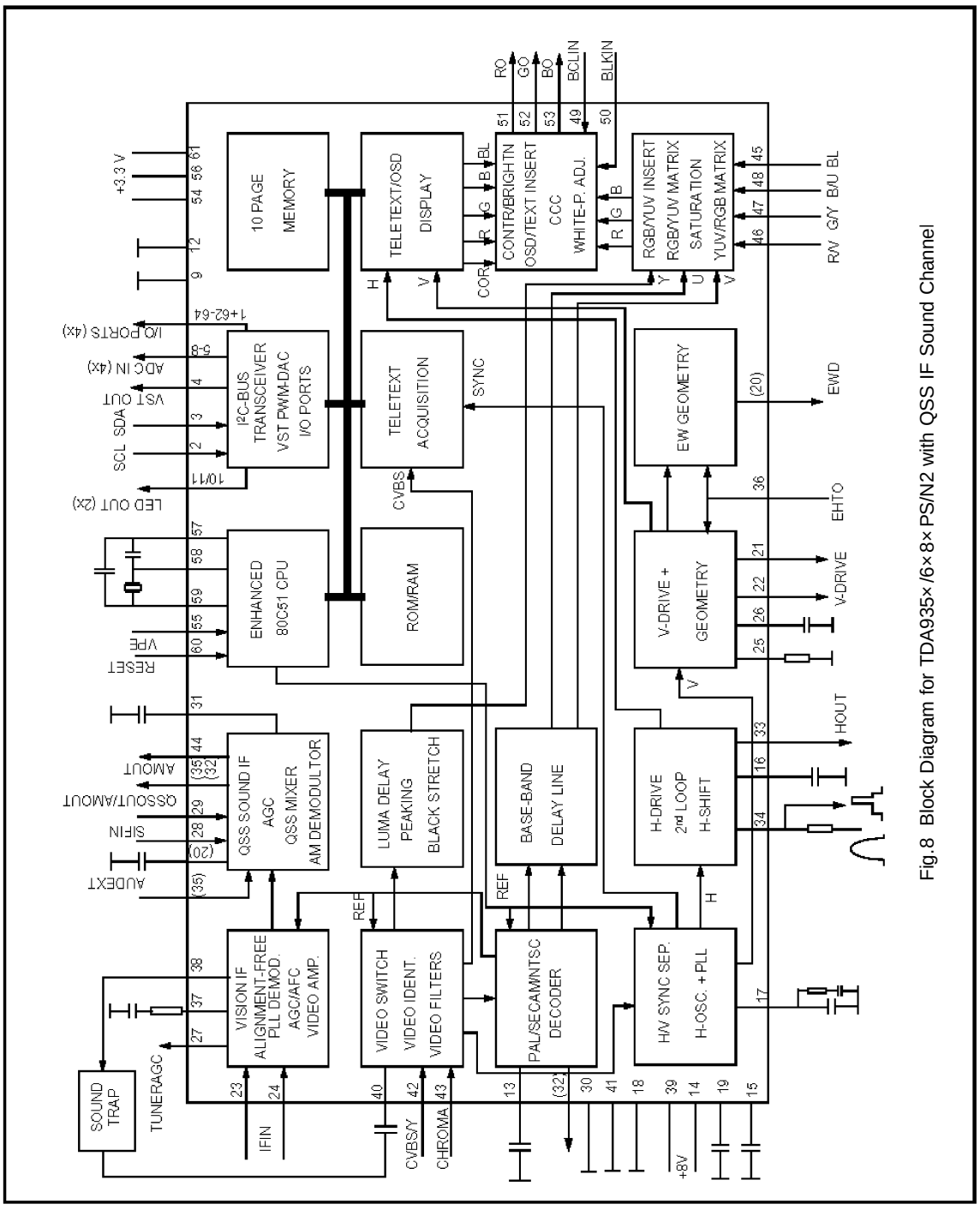


Fig.8 Block Diagram for TDA935×/6×8× PS/N2 with QSS IF Sound Channel

4) pinning

Table 5

SYMBOL	PIN	DESCRIPTION
P1.3/T1	1	port 1.3 or Counter/Timer 1 input
P1.6/SCL	2	port 1.6 or I^2C-bus clock line
P1.7/SDA	3	port 1.7 or I^2C-bus data line
P2.0/TPWM	4	port 2.0 or Tuning PWM output
P3.0/ADCO/PWMO	5	port 3.0 or ADC0 input or PWM0 output
P3.1/ADC1/PWM1	6	port 3.1 or ADC1 input or PWM1 output
P3.2/ADC1/PWM2	7	port 3.2 or ADC2 input or PWM2 output
P3.3/ADC3/PWM3 VSSC/P	8 9	port 3.3 or ADC3 input or PWM3 output digital ground for µ-Controller core and periphery
P0.5	10	port 0.5 (8mA current sinking capability for direct drive of LEDs)
P0.6	11	port 0.6 (8mA current sinking capability for direct drive of LEDs)
VSSA	12	analog ground of Teletext decoder and digital ground of TV-processor
SECPLL	13	SECAM PLL decoupling
VP2	14	2nd supply voltage TV-processor (+8V)
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/EWD(1)	20	Automatic Volume Levelling/East-West drive output
VDRB	21	vertical drive B output
VDRA IFIN1	22 23	vertical drive A output IF input 1
IFIN2	24	IF input 2
IREF	25	reference current input
VSC	26	vertical sawtooth capacitor
TUNERAGC	27	tuner AGC output
AUDEEM/SIFIN1(1)	28	audio deemphasis or SIF input 1
DECSDEM/SIFIN2(1)	29	decoupling sound demodulator or SIF input2
GND2	30	ground 2 for TV processor
SNDPLL/SIFAGC(1)	31	narrow band PLL filter/AGC sound IF
AVL/SNDIF/REFO/ AMOUT(1)	32	Automatic Volume Levelling/sound IF input/subcarrier reference output/AM output
HOUT	33	(non controlled)
FBISO	34	horizontal output
AUDEXT/ QSSO/AMOUT(1)	35	flyback input/sand castle output
EHTO	36	external audio input/QSS intercarrier out/AM audio output (non controlled)
PLLIF	37	EHT/overvoltage protection input
IFVO/SVO	38	IF-PLL loop filter
VP1	39	IF video output/selected CVBS output
CVBSINT	40	main supply voltage TV-processor (+8V)
GND1	41	internal CVBS input
CVBS/Y	42	ground 1 for TV-processor
CHROMA AUDOUT/AMOUT(1)	43 44	external CVBS/Y input chrominance input (SVHS)
INSSW2	45	2nd RGB/YUV insertion input
R2/VIN	46	2nd R input/V (R-Y) input
G2/YIN	47	2nd G input/U input

SYMBOL	PIN	DESCRIPTION
B2/UIN	48	2nd B input/U (B-Y) input
BCLIN	49	beam current limiter input/(V-guard input, note2)
BLKIN	50	black current input/(V-guard input, note2)
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 (3.3V)
VPE	55	OTP programming Voltage
VDDC	56	digital supply to core (3.3V)
OSCGND	57	oscillator ground supply
XTALIN	58	crystal oscillator input
XTALOUT RESET	59 60	crystal oscillator output reset
VDDP	61	digital supply to periphery (+3.3V)
P1.0/INT1	62	port 1.0 or external interrupt 1 input
P1.1/TO	63	port 1.1 or Counter/Timer 0 input
P1.2/INTO	64	port 1.2 or external interrupt 0 input

Notes

1)The function of pin 20, 28, 29, 31, 32, 35 and 44 is dependent on the IC version (mono intercarrier FM demodulator/QSS IF amplifier and East-West output or not) and on some software control bits. The valid combinations are given in table 5.

Table 6 Pin functions for various versions

IC version	FM-PLL Version				QSS Version					
East-West Y/N	N		Y		N			Y		
CMB1/CMBO bits	00	01/10/11	00	01/10/11	00	01/10/11		00	01/10/11	
AM bit	-	-	-	-	-	0	1	-	0	1
Pin 20	AVL		EWD		AVL			EWD		
Pin 28	AUDEEM				SIFIN1					
Pin 29	DECSDEM				SIFIN2					
Pin 31	SNDPLL				SIFAGC					
Pin 32	SNDIR[1]	REFO[2]	AVL/SNDIF[1]	REFO[2]	AMOUT	REFO[2]		AMOUT	REFO[2]	
Pin 35	AUDEXT				AUDEXT	QSSO	AMOUT	AUDEXT	QSSO	AMOUT
Pin44	AUDOUT				Controlled AM or audio out					

Notes

1)When additional(external) selectivity is required for FM-PLL system pin 32 can be used as sound IF input. This function is selected by means of SIF bit in subaddress 28H.

2)The reference output signal is only available for the CMB1/CMBO setting of 0/1. For the other setings this pin is a switch output.

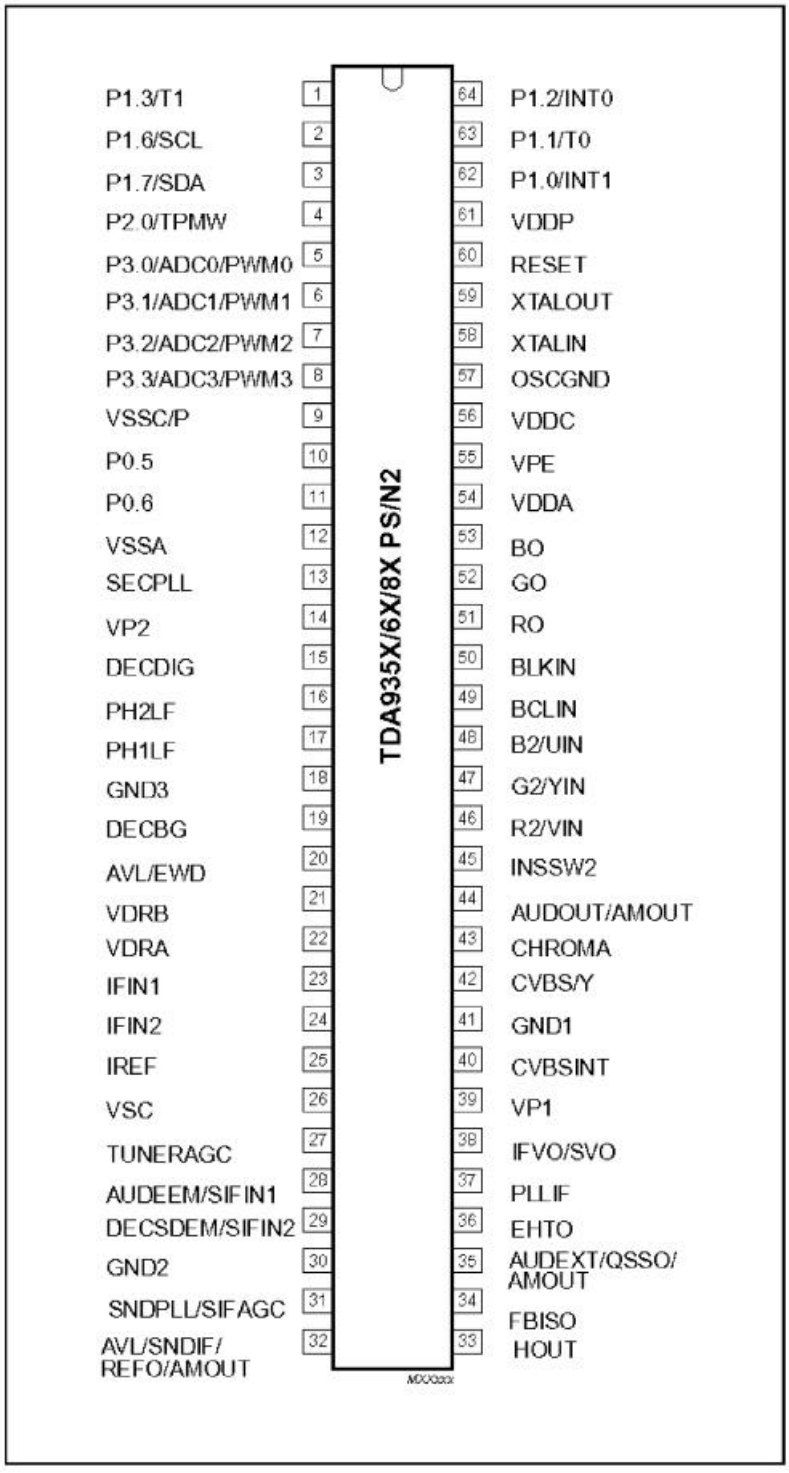


Fig.9 Pin Configuration (SDIP 64)

1.2 EEPROM AT24C08

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, I^2C-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(<10ms) for up to 16 bytes
- High reliability
  -Endurance 10^6 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: -40℃ to +85℃
  -Automotive: -40℃ to +125℃

2) Pin Configuration

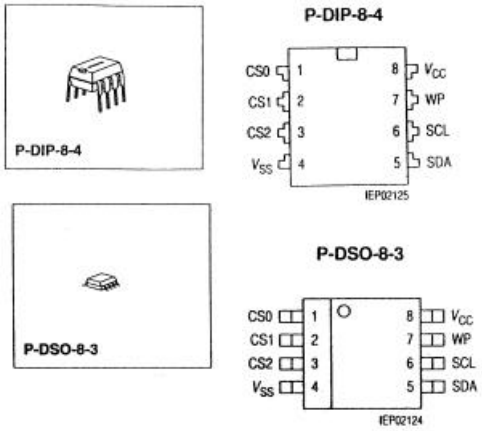


Fig. 10

3) Block Diagram

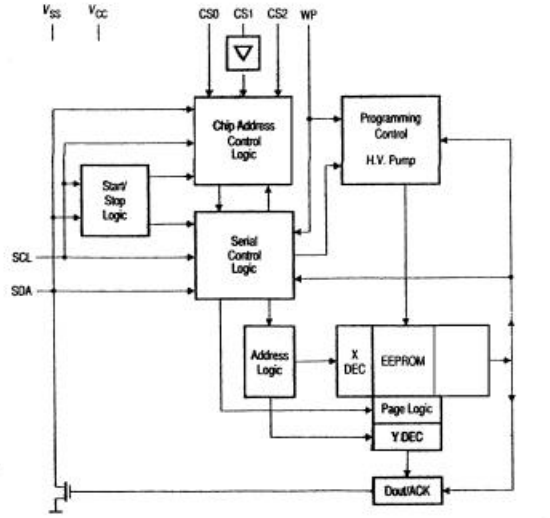


Fig. 11

1.3 Vertical scan output stage circuit TDA8356/N6

DC-coupled vertical deflection circuit TDA8356

1) Features

- Few external components
- Highly efficient fully DC-coupled vertical output bridge circuit
- Vertical flyback switch
- Guard circuit
- Protection against:

  Short-circuit of the output pins (7 and 4)

  Short-circuit of the output pins to VP.
- Temperature protection
- High EMC immunity because of common mode inputs
- A guard signal in zoom mode.

2) General Description

The TDA8356 is a power circuit for use in 90, and 110, colour deflection systems for field frequencies of 50 to 120 Hz. The circuit provides a DC driven vertical deflection output circuit, operating as a highly efficient class G system.

3) Block Diagram

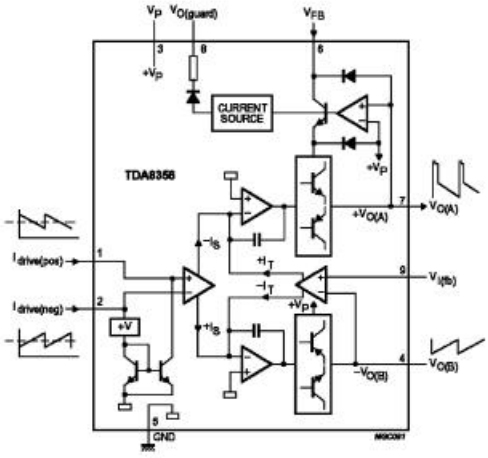


Fig.12

4) Pinning

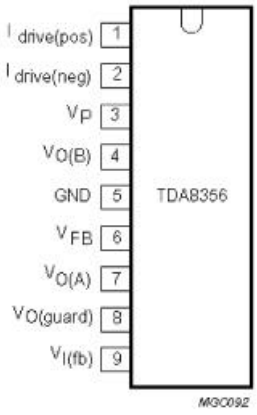


Fig.13

Table 7

Symbol	Pin	Description
Idrive(pos) Idrive(neg)	1 2	input power-stage (positive); includes II(sb) signal bias input power-stage (negative); includes II(sb) signal bias
VP	3	operating supply voltage
VO(B)	4	output voltage B
GND	5	ground
VFB	6	input flyback supply voltage
VO(A)	7	output voltage A
VO(guard)	8	guard output voltage
VI(fb)	9	input feedback voltage

1.4 Electronic switch circuit HEF4053

Triple 2-channel Analog Multiplexer/Demultiplexer

1). Description

The HEF4053 is a triple 2 -channel analog multiplexer/demultiplexer with a common enable input ($\overline{E}$). Each multiplexer/demultiplexer has two indepen-

dent inputs/outputs (Y_0 and Y_1), a common input/output (Z), and select inputs (Sn). Each also contains two-bidirectional analog switches, each with one side connected to an independent input/output (Y_0 and Y_1) and the other side connected to a common input/output (Z).

With ($\overline{E}$) LOW, one of the two switches is selected (low impedance ON-state) by Sn. With $\overline{E}$ HIGH, all switches are in the high impedance OFF-state, independent of S_A to S_C.

V_{DD} and V_{SS} are the supply voltage connections for the digital control inputs (S_A to S_C and $\overline{E}$). The V_{DD} to V_{SS} range is 3 to 15V.The analog inputs/outputs (Y_0, Y_1 and Z) can swing between V_{DD} as a positive limit and V_{EE} as a negative limit. V_{DD}-V_{EE} may not exceed 15 V.

For operation as a digital multiplexer/demultiplexer, V_{EE} is connected to V_{SS} (typically ground).

2). Block Diagram

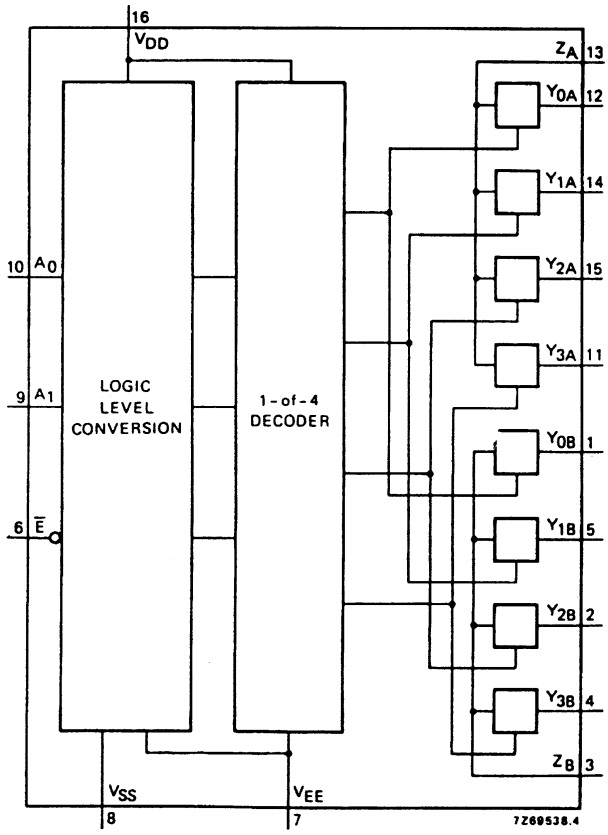


Fig.14 Functional Diagram

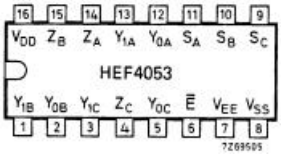


Fig. 15 Pinning Diagram

HEF4053P(N): 16-lead DIL; plastic
(SOT38-1)
HEF4053D(F): 16-lead DIL; ceramic
(cerdip)
(SOT74)
HEF4053T(D): 16-lead S0; plastic
(SOT109-1)
(): Package Designator North America

Pinning

Y_{0A} to Y_{0C}	Independent inputs/outputs
Y_{1A} to Y_{1C}	Independent inputs/outputs
S_A to S_C	Select inputs
E	Enable input (active LOW)
Z_A to Z_C	Common inputs/outputs

3. Function Table

Inputs		Channel
E	**Sn**	**On**
L	L	Y_{0n}-Z_n
L	H	Y_{1n}-Z_n
H	X	none

Notes

H=HIGH state (the more positive voltage)
L=LOW state (the less positive voltage)
X=STATE is immaterial

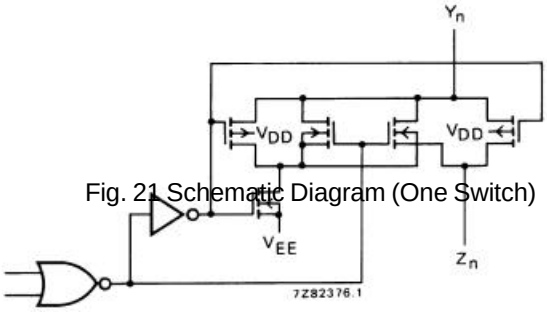


Fig. 21 Schematic Diagram (One Switch)

Fig 16

Ratings

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage (with reference to V_{DD}) V_{EE} -18 to + 0,5 V

Note

To avoid drawing V_{DD} current out of terminal Z, when switch current flows into terminals Y, the voltage drop across the bidirecctional switch must not exceed 0, 4 V. If the switch current flows into terminal Z, no V_{DD} current will flow out of terminals Y, in this case there is no limit for the voltage drop across the switch, but the voltages at Y and Z may not exceed V_{DD} or V_{EE}.

1.5 *Sound power amplifier TDA7057AQ*

2× 8W Stereo BTL Audio Output Amplifier with DC Volume Control

1). Features

- DC volume control
- Few external components
- Mute mode
- Thermal protection
- Short-circuit proof
- No switch-on and switch-off clicks
- Good overall stability
- Low power consumption
- Low HF radiation
- ESD protected on all pins.

2). General Description

The TDA7057AQ is a stereo BTL output amplifier with DC volume control. The device is designed for use in TVs and monitiors, but is also suitable for battery-fed portable recorders and radios.

Missing Current Limiter (MCL)

A MCL protection circuit is built-in. The MCL circuit is activated when the difference in current between the output terminal of each amplifier exceeds 100 mA (typical 300 Ma). This level of 100 mA allows for single-ended headphone applications.

3). Block Diagram

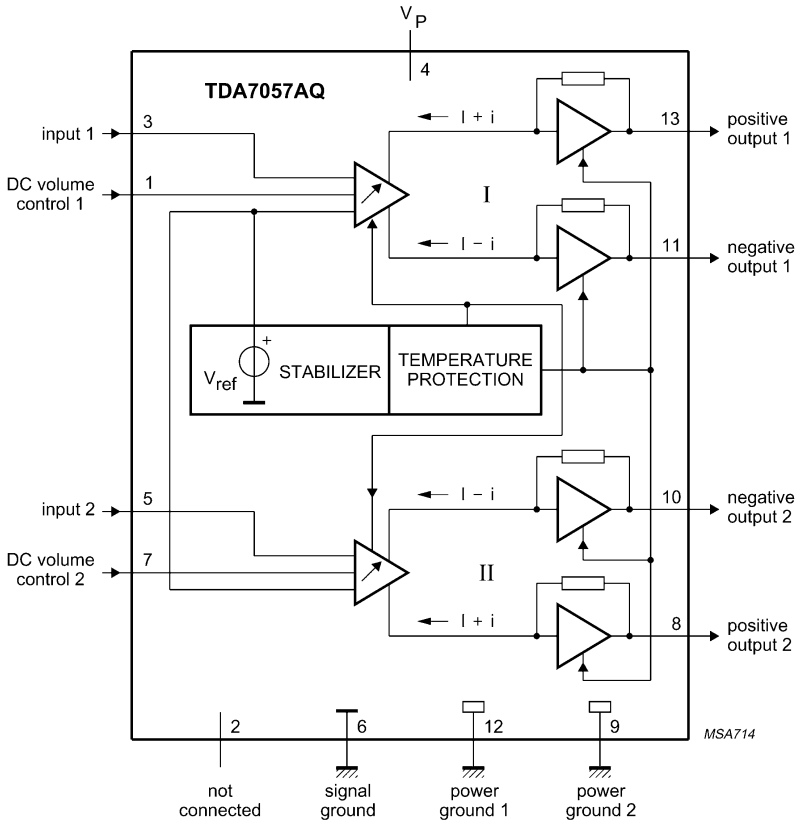


Fig.17

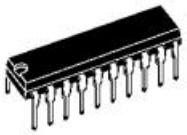
1.6 *Audio effect processor TDA7449*

TDA7449 TONE CONTROLDIGITALLY CONTROLLED

AUDIO PROCESSORINPUT MULTIPLEXER

1) Features

- 2 stereo inputs
- selectableinput gain for optimal Adaptationto different sources One stereo output Treble, and bass control in 2.0db Steps Volumecontrol in 1.0db steps Two speaker attenuators:
- two independentspeakercontrol In 1.0dbsteps for balancefacility
- independent mute function All function are programmable via Serial bus



DIP20

ORDERING NUMBER: TDA7449

2) descripion

The tda7449 is a volume tone (bass and treble) Balance (left/right) processor for quality audio Applications in TV systems.

Selectable input gain is provided. Control of all the functions is accomplished by serial bus.

The ac signal setting is obtained by resistor networks and switches combined with operational Amplifiers.

Thanks to the used bipolar/cmostechnology, Low distortion, low noise and dc stepping are Obtained.

3) Block Diagram

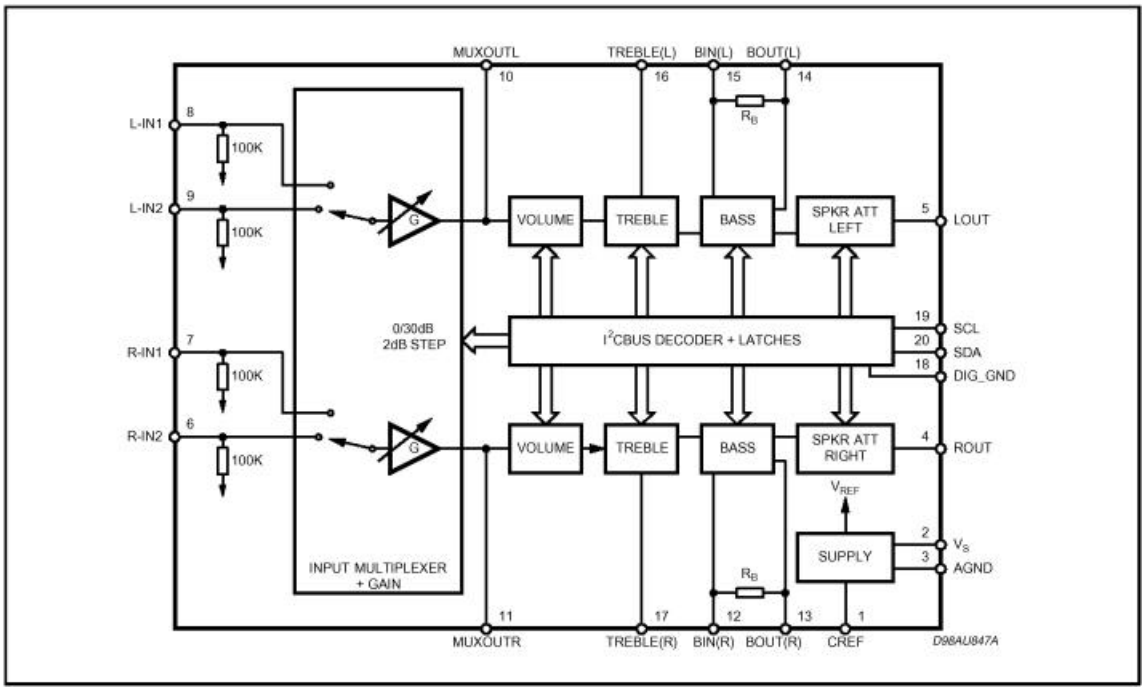


Fig.18

4) Pin Connection

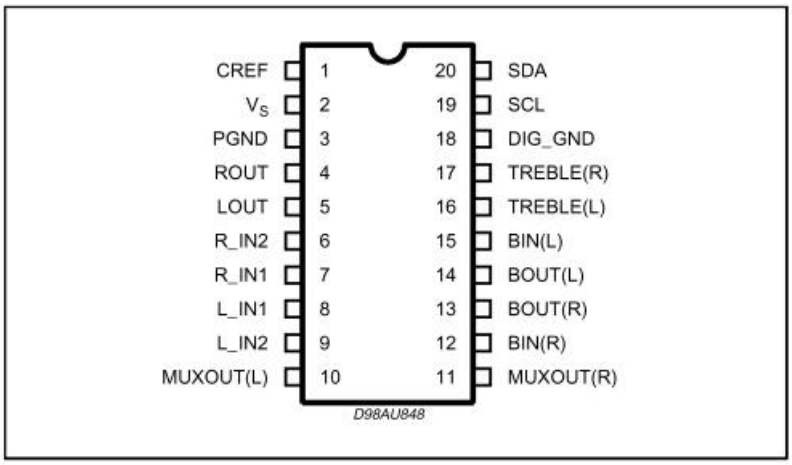


Fig.19

5) Electrical Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
AUDIO OUTPUTS						
V_{CLIP}	Clipping Level	d=0.3%	2.1	2.6		V_{RMS}
R_L	Output Load Resistance		2			KΩ
R_O	Output Impedance		10	4.0	70	Ω
V_{DC}	DC Voltage Level			3.8		V
GENERAL						
E_{NO}	Output Noise	All gains=0dB: BW=20Hz to 20KHz flat		5	15	μV
Et	Total Tracking Error	Av=0to−24dB		0	1	dB
		Av=−24to−47dB		0	2	dB
S/N	Signal to Noise Ratio	All gains 0dB; Vo=1V_{RMS};		106		dB
Sc	Channel Separation Left/Right		80	100		dB
d	Distortion	Av=0; V1=1VRMS;		0.01	0.08	%
BUS INPUT						
V_{IL}	Input Low Voltage				1	V
V_{IH}	Input High Voltage		3			V
I_{IN}	Input Current	V_{IN}=0.4V	−5		5	μV
Vo	Output Voltage SDA Acknowledge	Io=1.6mA		0.4	0.8	V

ELECTRICAL CHARACTERISTICS (refer to the test circuit Tamb = 25℃, VS = 9V,RL= 10KΩ, RG = 600 Ω, all controls flat (G = 0dB), unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
SUPPLY						
VS	Supply Voltage		6	9	10.2	V
IS	Supply Current			7		mA
SVR	Ripple Rejection		60	90		dB
INPUT STAGE						
RIN	Input Resistance			100		KΩ
VCL	Clipping Level	THD = 0.3%	2	2.5		Vrms
SIN	Input Separation	The selected input is grounded through a 2.2m capacitor	80	100		dB
Ginmin	Minimum Input Gain		−1	0	1	dB
Ginman	Maximum Input Gain			30		dB
Gstep	Step Resolution			2		dB
VOLUME CONTROL						
CRANGE	Control Range		45	47	49	dB
AVMAX	Max. Attenuation		45	47	49	dB
ASTEP	Step Resolution		0.5	1	1.5	dB
EA	Attenuation Set Error	AV = 0 to −24dB	−1.0	0	1.0	dB
		AV = −24 to −47dB	−1.5	0	1.5	dB
ET	Tracking Error	AV = 0 to −24dB		0	1	dB
		AV = −24 to −47dB		0	2	dB
VDC	DC Step	adjacent attenuation steps from 0dB to AV max		0 0.5	3	mv mv
Amute	Mute Attenuation		80	100		dB
BASS CONTROL (1)						
Gb	Control Range	Max. Boost/cut	±12.0	±14.0	±16.0	dB
BSTEP	Step Resolution		1	2	3	dB
RB	Internal Feedback Resistance		18.75	25	31.25	KΩ
TREBLE CONTROL (1)						
Gt	Control Range	Max. Boost/cut	±13.0	±14.0	±15.0	dB
TSTEP	Step Resolution		1	2	3	dB
SPEAKER ATTENUATORS						
CRANGE	Control Range			76		dB
SSTEP	Step Resolution		0.5	1	1.5	dB
EA	Attenuation Set Error	AV = 0 to −20dB	−1.5	0	1.5	dB
		AV = −20 to −56dB	−2	0	2	dB
VDC	DC Step	adjacent attenuation steps		0	3	mv
Amute	Mute Attenuation		80	100		dB

NOTE1:

1) The device is functionally good at Vs = 5V. a step down, on Vs, to 4V does't reset the device.

2) BASS and TREBLE response: The center frequency and the response quality can be chosen by the external circuitry.

1.7 Power module STR-G5653/6454R

Switch-mode Power Supply STR- G5653/F6654

The Series STR-G5653/F6654 is specifically designed to satisfy the requirements for increased integration and reliability in off-line quasi-resonant flyback converters. The series incorporates a high-precise error amplifying control and drive circuit with discrete avalanche-rated power MOSFET, featuring fewer external components, small-size and standard power supply.

Covering the power range from below 25 watts up to 300 watts for 100/115/230 VAC inputs, and up to 150 watts for 85 to 265 VAC universal input, these devices can be used in a range of applications, from battery chargers and set top boxes, to televisions, monitors, and industrial power supply units.

Cycle-by-cycle current limiting, under-voltage lockout with hysteresis, over-voltage protection, and thermal shutdown protects the power supply during the normal overload and fault conditions.

Low-current startup and a low-power standby mode selecte d from the secondary circuit completes a comprehensive suite of features. The series is provided in a five-pin overmolded SIP style package, affording dielectric isolation without compromising thermal characteristics.

1) Features

- Flyback Operation with Quasi-Resonant Soft Switching for Low Power Dissipation and EMI
- Rugged Avalanche-Rated MOSFET
- Soft drive circuit MOSFET
- Adjustable MOSFET switching speed
- Choice of MOSFET Voltage and rDS(on)
- Full Over-Current Protection (no blanking)
- Under-Voltage Lockout with Hysteresis
- Over-Voltage Protection
- Direct Voltage Feedback
- Low Start-up Current (100 µA max)
- Low-Frequency, Low-Power Standby Operation
- Overmolded 5-Pin Package

2). Circuit Block Diagram

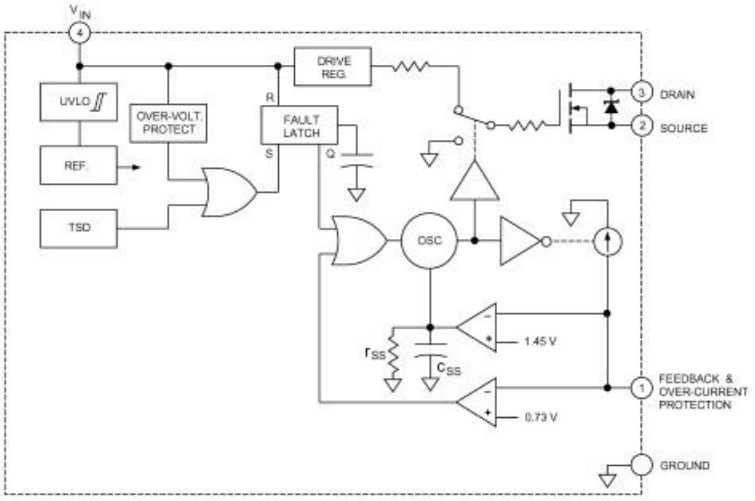


Fig.20

3). Pin Configuration and Functions

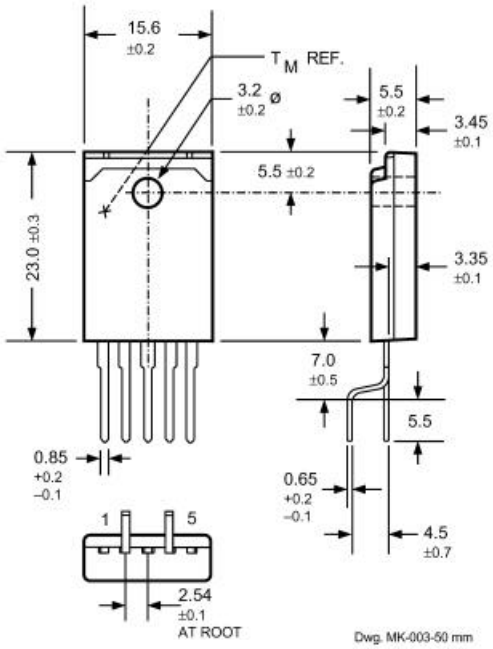


Fig.21

Table 8 Pin function for STR-G5653

Pin No.	Symbol	Function Description
1	D	MOSFET drain
2	S	MOSFET source
3	GND	Ground
4	V_{IN}	Supply voltage input for control circuit
5	OCP/FB	Over-current protection detection signal/ voltage-limiting signal input

Table 9 Pin function for STR-F6654

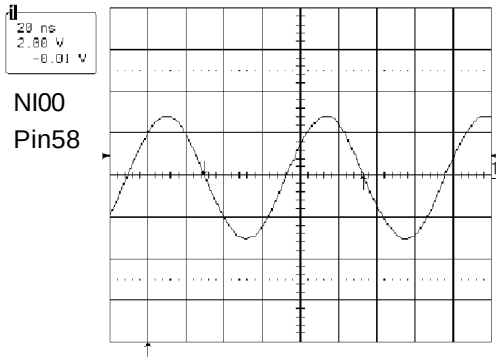
Pin No.	Symbol	Function Description
1	OCP/FB	Over-current protection detection signal/ voltage-limiting signal input
2	S	MOSFET source
3	D	MOSFET drain
4	V_{IN}	Supply voltage input for control circuit
5	GND	Ground

4). Difference between STR-G5653 and STR-F6654

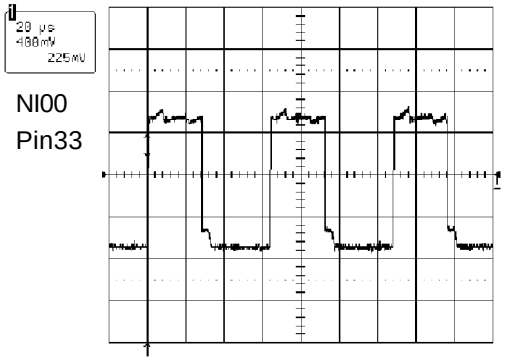
a. Different size: STR- F6654 is larger
b. Different pin functions
c. Different electric characteristics: Larger power output, switching current, avalanche-rated and internal allowable power consumption for STR-F6654
d. internal allowable power consumption for STR-F6654

2. WAVEFORMS OF KEY POINTS

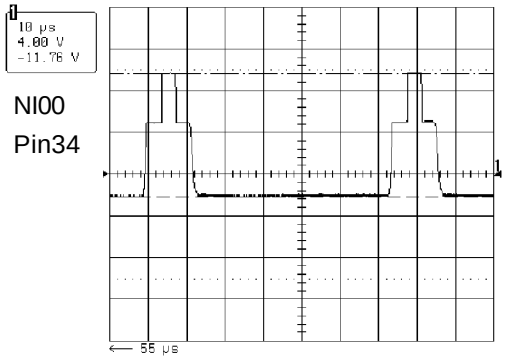
NI00
Pin58



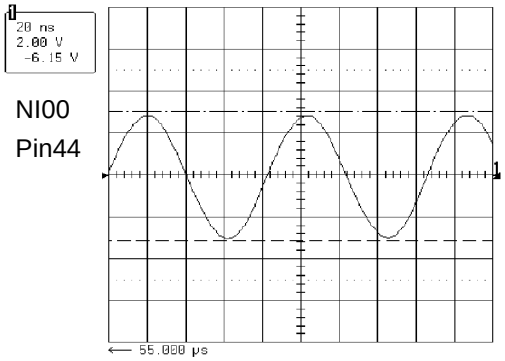
NI00
Pin33



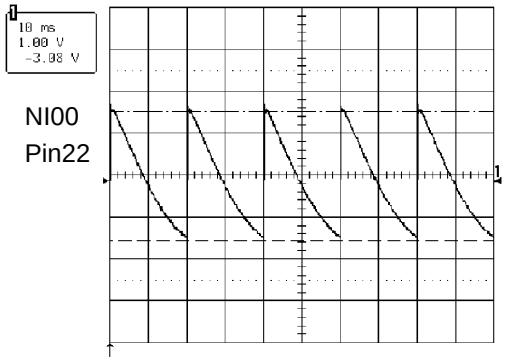
NI00
Pin34



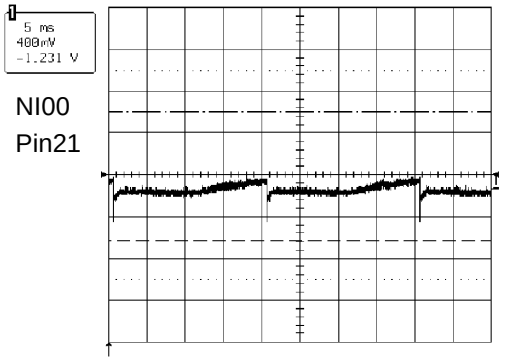
NI00
Pin44



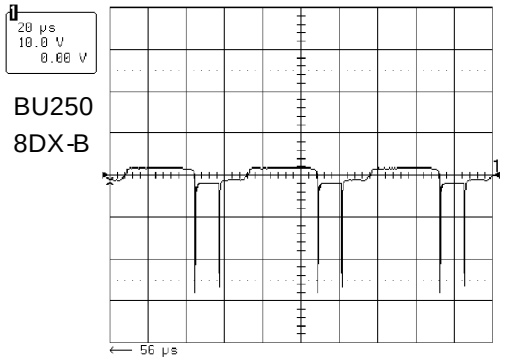
NI00
Pin22



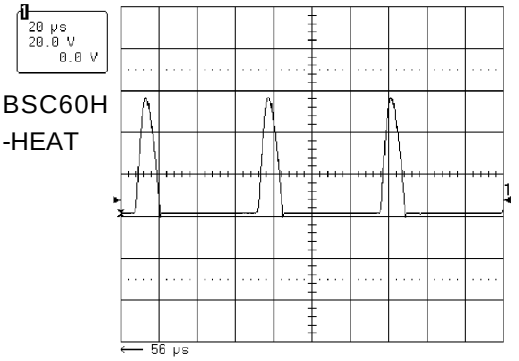
NI00
Pin21



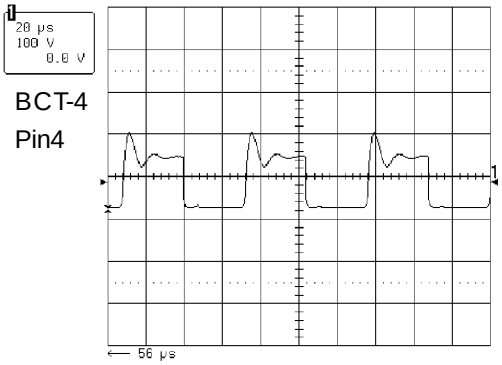
BU250
8DX-B



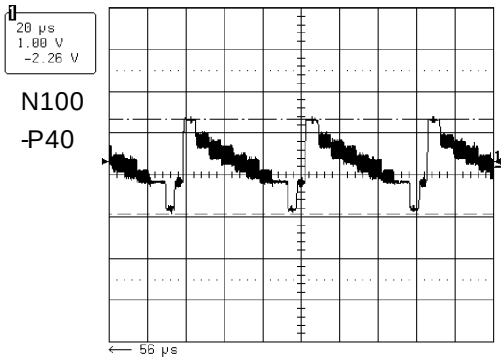
BSC60H
-HEAT



BCT-4
Pin4



N100
-P40



Notes:

① The waveforms are only for reference.

② The waveforms may d iffer dependent on different models.

3. KEY ICS SERVICE DATA

Table 10 Function and Service Data of TDA9351PS/N2/3I(N100)'s Pins

Pin No.	Symbol	Digital Multimeter : Victor DT890D		
		Reference Voltage (V)	Positive Resistance (KΩ)	Nerative Resistance (KΩ)
1	P1.3/T1	3.8	9.5	9.5
2	P1.6/SCL	3.4	6.8	6.8
3	P1.7/SDA	3.0	6.8	6.8
4	P2.0/TPWM	1.8	36.2	17.9
5	P3.0/ADC0/PWM0	0.1	11.8	12.3
6	P3.1/ADC1/PWM1	0.1	5.0	5.0
7	P3.2/ADC2/PWM2	0.02	13.5	13.5
8	P3.3/ADC3/PWM3	0.7	10.7	9.3
9	VSSC/P	0	0	0
10	P0.5	0.01	13.3	13.3
11	P0.6	4.2	11.6	11.0
12	VSSA	0	0	0
13	SECPLL	2.3	27.6	21.7
14	VP2	8.0	1.8	1.8
15	DECDIG	5.0	23.1	16.1
16	PH2LF	3.2	27.5	`21.0
17	PH1LF	3.9	27.9	21.2
18	GND3	0	0	0
19	DECBG	4.0	24.4	18.7
20	AVL/EWD (1)	0.01	27.6	21.2
21	VDRA	2.4	27.6	20.4
22	IFIN1	2.4	27.6	20.3
23	IFIN2	1.8	24.7	19.8
24	IREF	1.8	24.7	19.9
25	TUNERAGC	3.8	25.3	20.5
26	AUDEEM/SIFIN1(1)	3.8	27.7	21.5
27	DECSDEM/SIFIN2(1)	1.6	8.4	8.4
28	GND2	3.2	27.1	20.7
29	VSSA	2.3	27.8	21.6
30	SECPLL	0	0	0
31	SNDPLL/SIFAGC(1)	2.3	27.8	21.8
32	AVL/SNDIF/REF0/AMOUT(1)	0.2	27.2	20.4
33	HOUT	0.4	5.3	5.3
34	FBISO	0.5	24.0	18.8

(continued)

35	AUDEXT/QSSO/AMOUT(1)	3.7	27.8	21.5
36	AUDEXT/	1.6	18.7	16.0
37	QSSO/AMOUT(1)	2.4	27.8	21.5
38	AUDEXT/	3.3	24.0	21.1
39	QSSO/AMOUT(1)	7.7	1.8	1.8
40	AUDEXT/	3.8	27.5	21.2
41	GND1	0	0	0
42	CVBS/Y	3.3	27.5	21.2
43	CHROMA	1.4	26.8	20.9
44	AUDOUT /AMOUT(1)	3.3	27.5	21.5
45	INSSW2	1.6	1.0	1.0
46	R2/VIN	2.6	28.0	21.7
47	G2/YIN	2.6	28.0	21.7
48	B2/UIN	2.6	28.0	21.7
49	BCLIN	2.5	27.6	20.8
50	BLKIN	6.0	27.9	21.3
51	RO	2.6	1.1	1.1
52	GO	2.5	1.1	1.1
53	BO	2.4	1.1	1.1
54	VDDA	3.2	11.0	11.3
55	VPE	0	0	0
56	VDDC	3.2	11.0	11.3
57	OSCGND	0.02	-	-
58	XTALIN	-	-	-
59	XTALOUT	-	-	-
60	RESET	0	0	0
61	VDDP	3.2	11.0	11.3
62	P1.0/INT1	0	-	-
63	P1.1/T0	1.5	3.3	3.3
64	P1.2/INT0	5.0	18.2	17.5

Table 11 Functions and Service Data of AT24C08(N200)'s Pins

Pin No.	Function Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	Address input	0.00	0.00	0.00
2	Address input	0.00	0.00	0.00
3	Address input	0.00	0.00	0.00
4	Common ground	0.00	0.00	0.00
5	Clock line	4.94	6.85	4.83
6	Data line	4.94	6.89	5.15
7	PW write protect	4.94	9.58	6.31
8	Supply voltage	4.94	3.5	3.25

Table 12 Function and Service Data of TDA8356 (N401)'s Pins

Pin No.	Symbol	Digital Multimeter : Victor DT890D		
		Reference Voltage (V)	Positive Resistance (KΩ)	Nerative Resistance (KΩ)
1	Idrive (pos)	2.4	27.7	20.3
2	Idrive (neg)	2.4	27.7	20.4.
3	VP	15.4	26.3	13.5
4	VO (B)	7.7	6.1	6.1
5	GND	0	0	0
6	VFB	45.0	113.3	13.7
7	VO (A)	7.5	6.1	6.1
8	VO(guard)	0.2	10.0	9.7.
9	VI(fb)	7.7	6.1	6.1

Table 13 Function and Service Data of HEF4053BP (N402)'s Pins

Pin No.	Functiondescription	Digital Multimeter : Victor DT890D		
		Reference Voltage (V)	Positive Resistance (KΩ)	Nerative Resistance (KΩ)
1	Signal input	3.0	22.2	47.0
2	Signal input	3.9	22.2	47.0.
3	Signal input	1.3	21.2	40.0
4	Signal output	2.5	0	0
5	Signal input	2.4	-	-
6	Ground	0	0	0
7	Ground	0	0	0
8	Ground	0	0	0.
9	Control signal input	0.03	13.5	13.1
10	Control signal input	0.03	13.5	13.1
11	Control signal input	0.03	13.5	13.1
12	Signal input	3.9	22.2	47.0
13	Signal output	0.7	22.2	47.0
14	Signal input	3.9	21.9	26.0
15	Audio output	3.9	21.9	26.0
16	Supply voltage	7.8	0	0

Table 14 Functions and Service Data of TDA7057AQ (N600)'s Pins

Pin No.	Function Description	Digital Multimeter		
		Reference Voltage (V)	Positive Resistance (20KΩ)	Negative Resistance (20KΩ)
1	Volume control input	0.95	6.85	6.15
2	Not connected	0.00	∞	∞
3	Audio R signal input	2.38	12.59	6.51
4	Supply voltage	17.48	0.47	0.47
5	Audio L signal input	2.37	12.5	6.51
6	Ground	0.00	0.00	0.00
7	Volume control input	0.95	6.85	0.15
8	Left channel in-phase signal output	8016	6.46	5.59
9	Ground	0.00	0.00	0.00
10	Left channel inverting signal output	8.25	6.46	5.59
11	Right channel inverting signal output	8.24	6.46	5.59
12	Ground	0.00	0.00	0.00
13	Right channel in-phase signal output	8.13	6.46	5.59

Table 15 Function and Service Data of TDA7449 (N650)'s Pins

Pin No.	Symbol	Digital Multimeter: Victor DT890D		
		Reference Voltage (V)	Positive Resistance (KΩ)	Negative Resistance (KΩ)
1	CREF	4.0	28.2	21.9
2	VS	8.0	1.8	1.8
3	PGND	0	0	0
4	ROUT	3.3	9.4	9.3
5	LOUT	3.3	9.4	9.3
6	R_IN1	4.0	21.9	26.0
7	R_IN2	4.0	26.7	24.3.
8	L_IN1	4.0	26.7	24.3
9	L_IN2	4.0	21.9	26.1
10	MUXOUT(L)	4.0	24.5	22.5
11	MUXOUT(R)	4.0	24.5	22.5
12	BIN(R)	4.0	28.0	26.1
13	BOUT(R)	4.0	28.0	21.0
14	BOUT(L)	4.0	28.0	20.8
15	TREBLE(L)	4.0	28.0	26.1
16	BIN(L)	4.0	30.5	28.0
17	TREBLE(R)	4.0	30.5	28.0
18	DIG_GND	0	0	0
19	SCL	3.4	6.8	6.7
20	SDA	3.1	6.8	6.7

Notes:

③ The data are only for reference.

④ The data sheet may differ dependent on different models.

4. REPLACEMENT OF PARTS

4.1 *Description*

Many electrical and mechanical components in this chassis have special safety-related characteristics. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols or UL, FCC, FDA or VDE marking on the circuit diagram and parts list. When replacing any of these components, substitute the one which has the same safety characteristics as specified in the manual.

Note:

Models and specifications of components in this table may be somewhat different with your unit.

In this case, please rely on the actual unit.

4.2 Parts List for 21NF55

Position	Name	Attribute	Type
	1. Parts on Main PCB		
	1) Basic Parts		
R051	Carbon film resistor		RT13-0.166W-10ΩJ
R399	Carbon film resistor		RT13-0.166W-10ΩJ
R136B	Carbon film resistor		RT13-0.166W-10ΩJ
R042	Carbon film resistor		RT13-0.166W-47ΩJ
R242	Carbon film resistor		RT13-0.166W-47ΩJ
R064	Carbon film resistor		RT13-0.166W-47ΩJ
R048	Carbon film resistor		RT13-0.166W-68ΩJ
R302	Carbon film resistor		RT13-0.166W-75ΩJ
RAV1A	Carbon film resistor		RT13-0.166W-75ΩJ
RAV1	Carbon film resistor		RT13-0.166W-75ΩJ
R392	Carbon film resistor		RT13-0.166W-75ΩJ
R015	Carbon film resistor		RT13-0.166W-100ΩJ
R041	Carbon film resistor		RT13-0.166W-100ΩJ
R131	Carbon film resistor		RT13-0.166W-100ΩJ
R133	Carbon film resistor		RT13-0.166W-100ΩJ
R191	Carbon film resistor		RT13-0.166W-100ΩJ
R192	Carbon film resistor		RT13-0.166W-100ΩJ
R193	Carbon film resistor		RT13-0.166W-100ΩJ
R249	Carbon film resistor		RT13-0.166W-100ΩJ
R251	Carbon film resistor		RT13-0.166W-100ΩJ
R251A	Carbon film resistor		RT13-0.166W-100ΩJ
R430A	Carbon film resistor		RT13-0.166W-100ΩJ
RCLM	Carbon film resistor		RT13-0.166W-100ΩJ
RDAM	Carbon film resistor		RT13-0.166W-100ΩJ
R116	Carbon film resistor		RT13-0.166W-100ΩJ
R890	Carbon film resistor		RT13-0.166W-100ΩJ
R245A	Carbon film resistor		RT13-0.166W-100ΩJ
R243A	Carbon film resistor		RT13-0.166W-150ΩJ
W010A	Carbon film resistor		RT13-0.166W-220ΩJ
R391	Carbon film resistor		RT13-0.166W-330ΩJ
R231	Carbon film resistor		RT13-0.166W-390ΩJ
R012	Carbon film resistor		RT13-0.166W-470ΩJ
R879	Carbon film resistor		RT13-0.166W-470ΩJ
R049	Carbon film resistor		RT13-0.166W-1kΩJ
R101A	Carbon film resistor		RT13-0.166W-1kΩJ
R241	Carbon film resistor		RT13-0.166W-1kΩJ
R606	Carbon film resistor		RT13-0.166W-1kΩJ
R878	Carbon film resistor		RT13-0.166W-1kΩJ
R895	Carbon film resistor		RT13-0.166W-1kΩJ
R896	Carbon film resistor		RT13-0.166W-1kΩJ
R047	Carbon film resistor		RT13-0.166W-1.2KΩJ
R137	Carbon film resistor		RT13-0.166W-1.5KΩJ
R046	Carbon film resistor		RT13-0.166W-1.8KΩJ

Position	Name	Attribute	Type
R430	Carbon film resistor		RT13-0.166W-1.8KΩJ
R621	Carbon film resistor		RT13-0.166W-2KΩJ
R062	Carbon film resistor		RT13-0.166W-2.2KΩJ
R065	Carbon film resistor		RT13-0.166W-2.2KΩJ
R248	Carbon film resistor		RT13-0.166W-2.2KΩJ
R371	Carbon film resistor		RT13-0.166W-2.2KΩJ
R138A	Carbon film resistor		RT13-0.166W-2.2KΩJ
R132A	Carbon film resistor		RT13-0.166W-3.3KΩJ
R133A	Carbon film resistor		RT13-0.166W-3.3KΩJ
R171	Carbon film resistor		RT13-0.166W-3.9KΩJ
R045	Carbon film resistor		RT13-0.166W-4.7KΩJ
R891	Carbon film resistor		RT13-0.166W-4.7KΩJ
R899	Carbon film resistor		RT13-0.166W-4.7KΩJ
R063	Carbon film resistor		RT13-0.166W-5.6KΩJ
R005	Carbon film resistor		RT13-0.166W-10KΩJ
R007	Carbon film resistor		RT13-0.166W-10KΩJ
R008	Carbon film resistor		RT13-0.166W-10KΩJ
R009	Carbon film resistor		RT13-0.166W-10KΩJ
R137A	Carbon film resistor		RT13-0.166W-10KΩJ
R137B	Carbon film resistor		RT13-0.166W-10KΩJ
R139A	Carbon film resistor		RT13-0.166W-10KΩJ
R140A	Carbon film resistor		RT13-0.166W-10KΩJ
R141A	Carbon film resistor		RT13-0.166W-10KΩJ
R141B	Carbon film resistor		RT13-0.166W-10KΩJ
R195	Carbon film resistor		RT13-0.166W-10KΩJ
R302A	Carbon film resistor		RT13-0.166W-10KΩJ
R897	Carbon film resistor		RT13-0.166W-10KΩJ
R410	Carbon film resistor		RT13-0.166W-10KΩJ
R218A	Carbon film resistor		RT13-0.166W-10KΩJ
R622	Carbon film resistor		RT13-0.166W-10KΩJ
R002	Carbon film resistor		RT13-0.166W-12KΩJ
R158	Carbon film resistor		RT13-0.166W-15KΩJ
R011	Carbon film resistor		RT13-0.166W-15KΩJ
R013	Carbon film resistor		RT13-0.166W-15KΩJ
VD893B	Carbon film resistor		RT13-0.166W-22KΩJ
R396	Carbon film resistor		RT13-0.166W-22KΩJ
R233	Carbon film resistor		RT13-0.166W-27KΩJ
R235	Carbon film resistor		RT13-0.166W-27KΩJ
R894A	Carbon film resistor		RT13-0.166W-33KΩJ
R115	Carbon film resistor		RT13-0.166W-33KΩJ
R893A	Carbon film resistor		RT13-0.166W-39KΩJ
R372	Carbon film resistor		RT13-0.166W-47KΩJ
R373	Carbon film resistor		RT13-0.166W-47KΩJ
R605	Carbon film resistor		RT13-0.166W-47KΩJ
R003	Carbon film resistor		RT13-0.166W-100KΩJ

Position	Name	Attribute	Type
R006	Carbon film resistor		RT13-0.166W-100KΩJ
R232	Carbon film resistor		RT13-0.166W-100KΩJ
R395	Carbon film resistor		RT13-0.166W-100KΩJ
R485	Carbon film resistor		RT13-0.166W-120KΩJ
R488	Carbon film resistor		RT13-0.166W-560KΩJ
R242A	Carbon film resistor		RT14-0.25W-10ΩJ
R165	Carbon film resistor		RT14-0.25W-100ΩJ
R166	Carbon film resistor		RT14-0.25W-100ΩJ
R892	Carbon film resistor		RT14-0.25W-680ΩJ
R024	Carbon film resistor		RT14-0.25W-1KΩJ
R025	Carbon film resistor		RT14-0.25W-1kΩJ
R001	Carbon film resistor		RT14-0.25W-2.2KΩJ
R887	Carbon film resistor		RT14-0.25W-2.2KΩJ
R883	Carbon film resistor		RT14-0.25W-4.7KΩJ
R872	Carbon film resistor		RT14-0.25W-5.1KΩJ
R872A	Carbon film resistor		RT14-0.25W-5.1KΩJ
R894	Carbon film resistor		RT14-0.25W-270KΩJ
R403	Metal film resistor		RJ14-0.25W-3KΩJ
R167	Metal film resistor		RJ14-0.25W-39KΩG
R888A	Metal oxide film resistor		RY21-0.5W-3.3ΩJ
R416	Metal oxide film resistor		RY21-0.5W-22ΩJ
R505	Metal oxide film resistor		RY21-0.5W-1KΩJ
R463	Metal oxide film resistor		RY21-0.5W-3.3KΩJ
R418	Metal oxide film resistor		RY21-1W-330ΩJ
R881	Metal oxide film resistor		RY21-2W-0.2ΩJ
R890A	Metal oxide film resistor		RY21-2W-22KΩJ
R893	Metal oxide film resistor		RY21-2W-330KΩJ
R504	Metal oxide film resistor		RY21-3W-12KΩJ
R504A	Metal oxide film resistor		RY21-3W-12KΩJ
R893B	Glass glazed resistor		RI40-0.5W-1MΩJ
R452	Fuse resistor		RF10-0.5W-0.27ΩJ
L871	Fuse resistor		RF10-0.5W-0.27ΩJ
R461	Fuse resistor		RF10-0.5W-1ΩJ
R491	Fuse resistor		RF10-0.5W-1ΩJ
R405	Fuse resistor		RF10-0.5W-1ΩJ
R451	Fuse resistor		RF10-1W-0.27ΩJ
R666	Fuse resistor		RF10-2W-1ΩJ
R506	Wirewound resistor		RXG4-6W-3.9ΩK
RT800	Wirewound resistor		RXG6-H2-10W-2.2ΩJ
RT802B	Thermistor	CE	BC96709-7ΩJ
RT802B	Thermistor	CE	PTDCA1BF7R0Q200
C200	Ceramic capacitor		CC1-63V-06a-SL-33PFJ
C200A	Ceramic capacitor		CC1-63V-06a-SL-33PFJ
C188E	Ceramic capacitor		CC1-63V-08a-C-100PFJ
C371A	Ceramic capacitor		CC1-63V-08a-C-100PFJ

Position	Name	Attribute	Type
C003	Ceramic capacitor		CC1-63V-08a-SL-220PFJ
C171A	Ceramic capacitor		CT1-63V-06a-2B4-330PFK
C882	Ceramic capacitor		CT1-63V-06a-2B4-470PFK
C194	Ceramic capacitor		CT1-63V-06a-2B4-560PFK
C884	Ceramic capacitor		CT1-63V-06a-2B4-820PFK
C165	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C166	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C186A	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C233	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C401	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C430	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C302A	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C188D	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C171	Ceramic capacitor		CT1-63V-06a-2B4-1200PFK
C157	Ceramic capacitor		CT1-63V-08a-2B4-2200PFK
C047	Ceramic capacitor		CT1-63V-08a-2B4-3300PFK
C048	Ceramic capacitor		CT1-63V-08a-2B4-3300PFK
C168	Ceramic capacitor		CT1-63V-10a-2B4-3900PFK
C042	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C061	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C159	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C621	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C015	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C025	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C026	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C603	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C064	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C666	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C893	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C487	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C052	Ceramic capacitor		CT1-63V-12a-2F4-0.022μFZ
C170	Ceramic capacitor		CT1-63V-12a-2F4-0.022μFZ
C491	Ceramic capacitor		CT1-500V-06a-2B4-220PFK
C503	Ceramic capacitor		CT1-500V-08a-2B4-820PFK
C828A	Ceramic capacitor	CE	CT81-400VAC-2E4-1000PFM-Y1
C828A	Ceramic capacitor	CE	CD85-E2GA102MYHS
C829A	Ceramic capacitor	CE	CT81-400VAC-2E4-1000PFM-Y1
C829A	Ceramic capacitor	CE	CD85-E2GA102MYHS
C820B	Ceramic capacitor	CE	CT81-400VAC-2E4-2200PFM-Y1
C820B	Ceramic capacitor	CE	CD12-E2GA222MYHS
C808	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C809	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C810	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C811	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C886	Ceramic capacitor		CT81-2KV-08c-2B4-220PFK

Position	Name	Attribute	Type
C871	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK
C881	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK
C891A	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK
C163	Polyester film capacitor		CL21X-50V-0.022μFJ
C007	Polyester film capacitor		CL21X-50V-0.1μFJ
C008	Polyester film capacitor		CL21X-50V-0.1μFJ
C032	Polyester film capacitor		CL21X-50V-0.1μFJ
C155	Polyester film capacitor		CL21X-50V-0.1μFJ
C181	Polyester film capacitor		CL21X-50V-0.1μFJ
C187	Polyester film capacitor		CL21X-50V-0.1μFJ
C189	Polyester film capacitor		CL21X-50V-0.1μFJ
C251A	Polyester film capacitor		CL21X-50V-0.1μFJ
C218	Polyester film capacitor		CL21X-50V-0.1μFJ
C231	Polyester film capacitor		CL21X-50V-0.1μFJ
C410	Polyester film capacitor		CL21X-50V-0.1μFJ
C125A	Polyester film capacitor		CL21X-50V-0.1μFJ
C396B	Polyester film capacitor		CL21X-50V-0.1μFJ
C167	Polyester film capacitor		222236676104
C167	Polyester film capacitor		ECQV1104JMW
C151	Polyester film capacitor		CL21X-50V-0.22μFJ
C156	Polyester film capacitor		CL21X-50V-0.22μFJ
C623	Polyester film capacitor		CL21X-50V-0.22μFJ
C009	Polyester film capacitor		CL21X-50V-0.47μFJ
CBY10	Polyester film capacitor		CL21X-50V-0.47μFJ
C411	Polyester film capacitor		CL21X-100V-0.1μFJ
C425	Polyester film capacitor		CL21X-100V-0.1μFJ
C493	Polyester film capacitor		CL21X-100V-0.1μFJ
C481	Polyester film capacitor		CL21X-250V-0.1μFJ
C801	Polypropylene capacitor	CE	CBB62-250VAC-0.1μFK
C801	Polypropylene capacitor	CE	222233550104
C801	Polypropylene capacitor	CE	222233825104
C801	Polypropylene capacitor	CE	ECQU2A104KLA
C801	Polypropylene capacitor	CE	ECQU2A104MLA
C802	Polypropylene capacitor	CE	CBB62-250VAC-0.1μFK
C802	Polypropylene capacitor	CE	222233550104
C802	Polypropylene capacitor	CE	222233825104
C802	Polypropylene capacitor	CE	ECQU2A104KLA
C802	Polypropylene capacitor	CE	ECQU2A104MLA
C013	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C137A	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C169	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C302	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CAV1	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C371	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C391	Aluminum electrolytic capacitor		CD110X-16V-10μFM

Position	Name	Attribute	Type
C399	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C051	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C004	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C125	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C242	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C399A	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C892	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C318B	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C031	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C031A	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C187A	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C188	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C217	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C475	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C392A	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C153	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C115	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C476	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C477	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C453	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C116	Aluminum electrolytic capacitor		CD110X-16V-470μFM
C414	Aluminum electrolytic capacitor		CD110X-25V-220μFM
C462	Aluminum electrolytic capacitor		CD110X-25V-470μFM
C666A	Aluminum electrolytic capacitor		CD110X-25V-1000μFM
C872	Aluminum electrolytic capacitor		CD110X-25V-1000μFM
C882A	Aluminum electrolytic capacitor		CD110-35V-470μFM
C161	Aluminum electrolytic capacitor		CD110X-50V-0.47μFM
C158	Aluminum electrolytic capacitor		CD110X-50V-1μFM
C162	Aluminum electrolytic capacitor		CD110X-50V-2.2μFM
C486	Aluminum electrolytic capacitor		CD110X-50V-4.7μFM
C001	Aluminum electrolytic capacitor		CD110X-50V-47μFM
C883	Aluminum electrolytic capacitor		CD110X-50V-47μFM
C452	Aluminum electrolytic capacitor		CD110X-63V-100μFM
C411B	Aluminum electrolytic capacitor		CD110X-100V-22μFM
C524	Aluminum electrolytic capacitor		CD110X-160V-4.7μFM
C502	Aluminum electrolytic capacitor		CD110X-160V-4.7μFM
C891	Aluminum electrolytic capacitor		CD288-160V-220μFM
C890	Aluminum electrolytic capacitor		CD110X-250V-3.3μFM
C492	Aluminum electrolytic capacitor		CD288-250V-10μFM
C506	Aluminum electrolytic capacitor		CD288-250V-10μFM
C807	Aluminum electrolytic capacitor		CD293-400V-220μFM
L049	Fixed inductor		LGB0606-0.33μHK
W013	Fixed inductor		LGA0307-0.68μHK
L241	Fixed inductor		LGB0606-6.8μHJ
L371	Fixed inductor		LGB0606-10μHJ

Position	Name	Attribute	Type
L381	Fixed inductor		LGB0606-10μHJ
L302	Fixed inductor		LGB0606-10μHJ
W010	Fixed inductor		LGB0606-10μHJ
L188C	Fixed inductor		LGB0606-10μHJ
L181	Fixed inductor		LGB0606-22μHJ
L187	Fixed inductor		LGB0606-22μHJ
L152	Fixed inductor		LGB0606-22μHJ
L051	Fixed inductor		LGB0606-22μHJ
L031	Fixed inductor		LGB0606-56μHK
L350	Fixed inductor		LGB0606-56μHK
L221	Fixed inductor		LGA0307-22μHK
L881	Feed-through inductor		TEM2000
L891	Feed-through inductor		TEM2000
L421	Feed-through inductor		TEM2011
L422	Feed-through inductor		TEM2011
L502	Feed-through inductor		ZZ008
VD882	Diode		W05Z2.7A
D895	Diode		W05Z4.7B
D895	Diode		GDZJ4.7B
VD448A	Diode		W05Z8.2A
VD448A	Diode		GDZJ8.2A
D886	Diode		W05Z15C
D886	Diode		GDZJ15C
VD890	Diode		2CK75D
VD890	Diode		1N4148
VD892	Diode		2CK75D
VD892	Diode		1N4148
VD065	Diode		2CK75D
VD065	Diode		1N4148
V485	Diode		2CK75D
V485	Diode		1N4148
VD401	Diode		BAV21
VD402	Diode		BAV21
VD896	Diode		BAV21
VD131	Diode		BAV21
VD133	Diode		BAV21
VD451	Diode		2CZRU2
VD471	Diode		2CZRU2
VD461	Diode		2CZRU2
VD491	Diode		2CZRU2
VD881	Diode		2CZRU2
VD871	Diode		2CZRU4Z
VD891	Diode		RG2
VD803	Diode		BY254
VD803	Diode		1N5408

Position	Name	Attribute	Type
VD804	Diode		BY254
VD804	Diode		1N5408
VD805	Diode		BY254
VD805	Diode		1N5408
VD806	Diode		BY254
VD806	Diode		1N5408
D524	Diode		RM11C
D881	Diode		AK03
D884	Diode		AU01Z
D885	Diode		AU01Z
D888	Diode		AU01Z
V890	Triode		2SA1015-Y
V890	Triode		3CG1015-Y
V890	Triode		2PA1015Y
V890	Triode		KTA1266-Y
V251	Triode		2SA1015-Y
V251	Triode		3CG1015-Y
V251	Triode		2PA1015Y
V251	Triode		KTA1266-Y
V241	Triode		3DG1815-Y
V241	Triode		2SC1815-Y
V241	Triode		2PC1815Y
V241	Triode		KTC3198-Y
V201A	Triode		3DG1815-Y
V201A	Triode		2SC1815-Y
V201A	Triode		2PC1815Y
V201A	Triode		KTC3198-Y
V371	Triode		3DG1815-Y
V371	Triode		2SC1815-Y
V371	Triode		2PC1815Y
V371	Triode		KTC3198-Y
V391	Triode		3DG1815-Y
V391	Triode		2SC1815-Y
V391	Triode		2PC1815Y
V391	Triode		KTC3198-Y
V605	Triode		3DG1815-Y
V605	Triode		2SC1815-Y
V605	Triode		2PC1815Y
V605	Triode		KTC3198-Y
V871	Triode		3DG1815-Y
V871	Triode		2SC1815-Y
V871	Triode		2PC1815Y
V871	Triode		KTC3198-Y
V888	Triode		3DG1815-Y
V888	Triode		2SC1815-Y

Position	Name	Attribute	Type
V888	Triode		2PC1815Y
V888	Triode		KTC3198-Y
V872	Triode		BC548C
V872	Triode		BC547C
V501	Triode		2SC2688-L
V501	Triode		3DA2688-L
V501	Triode		3DA2688
V501	Triode		3DA2688-F
V102	Triode		PH2369
V047	Triode		2SC388ATM
V047	Triode		KSC388C-Y
V047	Triode		3DG388ATM
N200	IC		AT24C08
N200	IC		AT24C08A-10PI2.7
N200	IC		M24C08-BN6
N100	IC		CH05T0101/TDA9381PS/N2/2I
VD001	IC		μPC574J
VD001	IC		CW574CS
N441	IC		L7805CV
N441	IC		KA7805TU
N441	IC		MC7805CT
N861	IC		STR-G5653
V502	IC		BU2508DX
N600	IC		TDA7057AQ
N401	IC		TDA8356/N6
V115	IC		L7805CV
N442	IC		L7808CV
N801	Photo coupler	CE	HS817
N801	Photo coupler	CE	HPC922
N801	Photo coupler	CE	HS817C
N801	Photo coupler	CE	SFH615A-3
N801	IC	CE	LTV-816
G200	Crystal oscillator		JA18A-12.000MHZ
G200	Crystal oscillator		9922-520-00169-12MHz
A100	Electronic tuner		TDQ-5B6-M(JUB2.891.001-1)
Z240	Ceramic trap		TPS6.5MB
Z240	Ceramic trap		XT6.5MB
Z241	Ceramic trap		TPS6.0MB
Z241	Ceramic trap		XT6.0MB
Z242	Ceramic trap		TPS5.5MB
Z242	Ceramic trap		XT5.5MB
Z102	Surface acoustic wave filter		K6283K
L501	Line drive transformer		BCT-4(JU4.739.029)
L801	Filtering inductor	CE	LCL-F15(JUB4.757.001)
L802	Filtering inductor	CE	LCL-F16(JUB4.757.002)

Position	Name	Attribute	Type
F801	Delay fuse		RT1-20-2.5A-250V
F801	Delay fuse	CE	R/S/V/I50TT2.5AL250V(61802.5)
F801	Delay fuse	CE	61802.5
	2) Parts for Side AV		
RA2	Carbon film resistor		RT13-0.166W-75ΩJ
RB1	Carbon film resistor		RT13-0.166W-75ΩJ
RAV2	Carbon film resistor		RT13-0.166W-75ΩJ
RAV2A	Carbon film resistor		RT13-0.166W-75ΩJ
RA1	Carbon film resistor		RT13-0.166W-10KΩJ
RB2	Carbon film resistor		RT13-0.166W-10KΩJ
CA3	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CB3	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CAV2	Aluminum electrolytic capacitor		CD110X-16V-10μFM
N402	IC		HEF4053BP
N402	IC		HCF4053BEY
N402	IC		MC14053BCP
	3) Parts for S-VIDEO terminal		
R313	Carbon film resistor		RT13-0.166W-75ΩJ
R315	Carbon film resistor		RT13-0.166W-75ΩJ
R301S	Carbon film resistor		RT13-0.166W-4.7KΩJ
R300S	Carbon film resistor		RT13-0.166W-10KΩJ
C300S	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C313	Polyester film capacitor		CL21X-50V-0.022μFJ
V300S	Triode		3DG1815-Y
V300S	Triode		2SC1815-Y
V300S	Triode		2PC1815Y
V300S	Triode		KTC3198-Y
XS301	S-VIDEO terminal		PH-S
	4) Parts for AV Stereo		
R303	Carbon film resistor		RT13-0.166W-75ΩJ
RCLS	Carbon film resistor		RT13-0.166W-100ΩJ
RDAS	Carbon film resistor		RT13-0.166W-100ΩJ
RBY1	Carbon film resistor		RT13-0.166W-2KΩJ
RBY2	Carbon film resistor		RT13-0.166W-2KΩJ
R631	Carbon film resistor		RT13-0.166W-2KΩJ
R381	Carbon film resistor		RT13-0.166W-2.2KΩJ
R303A	Carbon film resistor		RT13-0.166W-10KΩJ
R632	Carbon film resistor		RT13-0.166W-10KΩJ
R383	Carbon film resistor		RT13-0.166W-47KΩJ
R382	Carbon film resistor		RT13-0.166W-47KΩJ
C381A	Ceramic capacitor		CC1-63V-08a-C-100PFJ
C303A	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C631	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
CBY8	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
CBY6A	Polyester film capacitor		CL21X-50V-5600PFJ

Position	Name	Attribute	Type
CBY7A	Polyester film capacitor		CL21X-50V-5600PFJ
CBY7	Polyester film capacitor		CL21X-50V-0.15μFJ
CBY2	Polyester film capacitor		CL21X-50V-0.15μFJ
C372	Polyester film capacitor		CL21X-50V-0.22μFJ
C382	Polyester film capacitor		CL21X-50V-0.22μFJ
C633	Polyester film capacitor		CL21X-50V-0.22μFJ
CBY6	Polyester film capacitor		CL21X-50V-0.33μFJ
CBY3	Polyester film capacitor		CL21X-50V-0.33μFJ
CBY11	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C381	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C303	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CBY9	Aluminum electrolytic capacitor		CD110X-16V-100μFM
L303	Fixed inductor		LGB0606-10μHJ
V381	Triode		3DG1815-Y
V381	Triode		2SC1815-Y
V381	Triode		2PC1815Y
V381	Triode		KTC3198-Y
N650	IC		TDA7449
XS801	AV terminals		AVLP-33-9R1-YUV
	5) Parts for DVD COMPONENT IN		
R305A	Carbon film resistor		RT13-0.166W-100ΩJ
R306	Carbon film resistor		RT13-0.166W-100ΩJ
R364	Carbon film resistor		RT13-0.166W-100ΩJ
R358	Carbon film resistor		RT13-0.166W-180ΩJ
R354	Carbon film resistor		RT13-0.166W-220ΩJ
R362	Carbon film resistor		RT13-0.166W-220ΩJ
R353	Carbon film resistor		RT13-0.166W-430ΩJ
R350	Carbon film resistor		RT13-0.166W-470ΩJ
R357	Carbon film resistor		RT13-0.166W-470ΩJ
R361	Carbon film resistor		RT13-0.166W-470ΩJ
R351	Carbon film resistor		RT13-0.166W-3.3KΩJ
R356	Carbon film resistor		RT13-0.166W-3.3KΩJ
R360	Carbon film resistor		RT13-0.166W-3.3KΩJ
R352	Carbon film resistor		RT13-0.166W-10KΩJ
R355	Carbon film resistor		RT13-0.166W-10KΩJ
R359	Carbon film resistor		RT13-0.166W-10KΩJ
R135	Carbon film resistor		RT13-0.166W-47KΩJ
R135B	Carbon film resistor		RT13-0.166W-47KΩJ
C370	Polyester film capacitor		CT1-63V-12a-2F4-0.022μFZ
C373	Polyester film capacitor		CT1-63V-12a-2F4-0.022μFZ
C374	Polyester film capacitor		CT1-63V-12a-2F4-0.022μFZ
C305	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C306	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C311	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C350	Aluminum electrolytic capacitor		CD110X-16V-100μFM

Position	Name	Attribute	Type
V353	Triode		2SA1015-Y
V353	Triode		3CG1015-Y
V353	Triode		2PA1015Y
V353	Triode		KTA1266-Y
V351	Triode		3DG1815-Y
V351	Triode		2SC1815-Y
V351	Triode		2PC1815Y
V351	Triode		KTC3198-Y
V356	Triode		3DG1815-Y
V356	Triode		2SC1815-Y
V356	Triode		2PC1815Y
V356	Triode		KTC3198-Y
V361	Triode		3DG1815-Y
V361	Triode		2SC1815-Y
V361	Triode		2PC1815Y
V361	Triode		KTC3198-Y
	6) Parts for NTSC-M Decoding		
R246	Carbon film resistor		RT13-0.166W-2KΩJ
R247	Carbon film resistor		RT13-0.166W-2KΩJ
V246	Triode		2SA1015-Y
V246	Triode		3CG1015-Y
V246	Triode		2PA1015Y
V246	Triode		KTA1266-Y
V247	Triode		2SA1015-Y
V247	Triode		3CG1015-Y
V247	Triode		2PA1015Y
V247	Triode		KTA1266-Y
V047A	Triode		RN1204
Z243	Ceramic trap		TPS4.5MB2
Z243	Ceramic trap		XT4.5MB
	7) Parts for SIF		
R262A	Carbon film resistor		RT13-0.166W-68ΩJ
R264A	Carbon film resistor		RT13-0.166W-100ΩJ
R263	Carbon film resistor		RT13-0.166W-220ΩJ
R263A	Carbon film resistor		RT13-0.166W-820ΩJ
R264	Carbon film resistor		RT13-0.166W-820ΩJ
R261A	Carbon film resistor		RT13-0.166W-1kΩJ
R265	Carbon film resistor		RT13-0.166W-2.2KΩJ
R262	Carbon film resistor		RT13-0.166W-10KΩJ
R260	Carbon film resistor		RT13-0.166W-22KΩJ
C260	Ceramic capacitor		CC1-63V-06a-SL-47PFJ
C261	Ceramic capacitor		CC1-63V-06a-SL-47PFJ
C262	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C261A	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
L260	Fixed inductor		LGB0606-8.2μHJ

Position	Name	Attribute	Type
V260	Triode		3DG1815-Y
V260	Triode		2SC1815-Y
V260	Triode		2PC1815Y
V260	Triode		KTC3198-Y
V261	Triode		3DG1815-Y
V261	Triode		2SC1815-Y
V261	Triode		2PC1815Y
V261	Triode		KTC3198-Y
Z260	Ceramic filter		LT6.5MH
	8) Data Related to CRT		
	a) Mount the following parts when using a Changsha-LG CRT A51QAE320X02.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.7ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-680PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.36μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	b) Mount the following parts when using a Seg Hitachi CRT A51JSY63X13(C).		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.7ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-680PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.36μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	c) Mount the following parts when using a BMCC CRT		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ

Position	Name	Attribute	Type
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-14c-2C1-1200PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.36μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	d) Mount the following parts when using a Samsung CRT A51KQK99X01.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.7ΩJ
R518	Metal oxide film resistor		RY21-3W-4.7KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-14c-2C1-1200PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.36μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		TLN0028A(JUB4.756.009)
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	e) Mount the following parts when using a Huafei CRT		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.7ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.36μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	f) Mount the following parts when using a Chunghwa CRT A51AEZ90X02.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ

Position	Name	Attribute	Type
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.7ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-4.7KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.33μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HF60A(JU4.756.037)
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	g) Mount the following parts when using a Thai CRT		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-14c-2C1-1200PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.36μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60H(JUB4.799.044-1)
	2. Parts on CRT RGB PCB		
	1) Basic Parts		
RY05	Carbon film resistor		RT13-0.166W-47ΩJ
RY06	Carbon film resistor		RT13-0.166W-47ΩJ
RY08	Carbon film resistor		RT13-0.166W-47ΩJ
RY04	Carbon film resistor		RT13-0.166W-270ΩJ
RY07	Carbon film resistor		RT13-0.166W-270ΩJ
RY09	Carbon film resistor		RT13-0.166W-270ΩJ
RY01	Carbon film resistor		RT13-0.166W-1KΩJ
RY02	Carbon film resistor		RT13-0.166W-1KΩJ
RY03	Carbon film resistor		RT13-0.166W-1KΩJ
RY14	Carbon film resistor		RT14-0.25W-220ΩJ
RY15	Carbon film resistor		RT14-0.25W-220ΩJ
RY16	Carbon film resistor		RT14-0.25W-220ΩJ
RY17	Carbon film resistor		RT14-0.25W-330ΩJ
RY18	Carbon film resistor		RT14-0.25W-330ΩJ
RY19	Carbon film resistor		RT14-0.25W-330ΩJ
RY40A	Carbon film resistor		RT14-0.25W-330KΩJ

Position	Name	Attribute	Type
RY11	Metal oxide film resistor		RY21-2W-15KΩJ
RY12	Metal oxide film resistor		RY21-2W-15KΩJ
RY13	Metal oxide film resistor		RY21-2W-15KΩJ
RY21	Glass glazed resistor		RI40-0.5W-1KΩK
RY22	Glass glazed resistor		RI40-0.5W-1KΩK
RY23	Glass glazed resistor		RI40-0.5W-1KΩK
CY01	Ceramic capacitor		CC1-63V-10a-SL-330PFJ
CY02	Ceramic capacitor		CC1-63V-10a-SL-330PFJ
CY03	Ceramic capacitor		CC1-63V-10a-SL-330PFJ
CY04	Ceramic capacitor		CT81-2KV-20C-2R4-3300PFK
CY05	Polyester film capacitor		CL21X-250V-0.1μFJ
CY06	Aluminum electrolytic capacitor		CD110X-250V-10μFM
VDY01	Diode		2CK75D
VDY01	Diode		1N4148
VDY02	Diode		2CK75D
VDY02	Diode		1N4148
VDY03	Diode		2CK75D
VDY03	Diode		1N4148
VDY04	Diode		BAV21
VDY04A	Diode		BAV21
VDY05	Diode		BAV21
VDY05A	Diode		BAV21
VDY06	Diode		BAV21
VDY06A	Diode		BAV21
VDY07	Diode		W05Z8.2A
VDY07	Diode		GDZJ8.2A
VY01	Triode		3DG2482
VY01	Triode		2SC2688-L
VY01	Triode		3DA2688-L
VY01	Triode		3DA2688
VY01	Triode		3DA2688-F
VY02	Triode		3DG2482
VY02	Triode		2SC2688-L
VY02	Triode		3DA2688-L
VY02	Triode		3DA2688
VY02	Triode		3DA2688-F
VY03	Triode		3DG2482
VY03	Triode		2SC2688-L
VY03	Triode		3DA2688-L
VY03	Triode		3DA2688
VY03	Triode		3DA2688-F
VY04	Triode		BF422
VY04	Triode		3DG422
VY06	Triode		BF422
VY06	Triode		3DG422

Position	Name	Attribute	Type
VY08	Triode		BF422
VY08	Triode		3DG422
VY05	Triode		BF423
VY05	Triode		3CG423
VY07	Triode		BF423
VY07	Triode		3CG423
VY09	Triode		BF423
VY09	Triode		3CG423
SY01	CRT socket (Model: GZS series)	CE	GZS10-2-108
SY01	CRT socket (Model: GZS series)	CE	GZS10-2-AC2
	2) Data Related to CRT		
	a) Mount the following parts when using a Changsha-LG CRT A51QAE320X02.		
RY20	Fuse resistor		RF10-2W-1.5ΩJ
RY20	Fuse resistor		RF11-2W-1.5ΩJ
	b) Mount the following parts when using a Seg Hitachi CRT A51JSY63X13(C).		
RY20	Fuse resistor		RF10-2W-1.5ΩJ
RY20	Fuse resistor		RF11-2W-1.5ΩJ
	c) Mount the following parts when using a BMCC CRT		
RY20	Fuse resistor		RF10-2W-1.5ΩJ
RY20	Fuse resistor		RF11-2W-1.5ΩJ
	d) Mount the following parts when using a Samsung CRT A51KQK99X01.		
RY20	Fuse resistor		RF10-2W-1.5ΩJ
RY20	Fuse resistor		RF11-2W-1.5ΩJ
	e) Mount the following parts when using a Huafei CRT		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	f) Mount the following parts when using a Chunghwa CRT A51AEZ90X02.		
RY20	Fuse resistor		RF10-2W-1.5ΩJ
RY20	Fuse resistor		RF11-2W-1.5ΩJ
	g) Mount the following parts when using a Thai CRT		
RY20	Fuse resistor		RF10-2W-1.5ΩJ
RY20	Fuse resistor		RF11-2W-1.5ΩJ
	3. Parts on Side AV PCB		
XK01	AV terminals		AVW-13-3R-8.5-TV
	4. Parts on Soft Switch PCB		
RK99	Carbon film resistor		RT13-0.166W-120ΩJ

Position	Name	Attribute	Type
RK91	Carbon film resistor		RT13-0.166W-150ΩJ
RK92	Carbon film resistor		RT13-0.166W-200ΩJ
RK94	Carbon film resistor		RT13-0.166W-270ΩJ
RK95	Carbon film resistor		RT13-0.166W-390ΩJ
RK96	Carbon film resistor		RT13-0.166W-820ΩJ
	5. Parts on Power Switch PCB		
RP12	Carbon film resistor		RT13-0.166W-1KΩJ
RP12A	Carbon film resistor		RT13-0.166W-1KΩJ
RP12B	Carbon film resistor		RT13-0.166W-1KΩJ
VDP11A-1	Light emitting diode		HFBA032MP-90S3
VDP11B-1	Light emitting diode		HFBA032MP-90S3
VDP11C-1	Light emitting diode		HFBA032MP-90S3
NP11A	IC		HS0038A2
CP11	Aluminum electrolytic capacitor		CD110X-16V-47μFM
	6. Others		
	Power switch		KDC-A04-MU171
	Power Cord		RVVZ-CH4-2000-ZH1
	Electric speaker		YDT513-A3-10W-8Ω
	Degaussing coil		XC-2118

4.3 Parts List for 21PF93

Position	Name	Attribute	Type
	1. Parts on Main PCB		
	1) Basic Parts		
R051	Carbon film resistor		RT13-0.166W-10ΩJ
R399	Carbon film resistor		RT13-0.166W-10ΩJ
R136B	Carbon film resistor		RT13-0.166W-10ΩJ
R042	Carbon film resistor		RT13-0.166W-47ΩJ
R242	Carbon film resistor		RT13-0.166W-47ΩJ
R064	Carbon film resistor		RT13-0.166W-47ΩJ
R048	Carbon film resistor		RT13-0.166W-68ΩJ
R302	Carbon film resistor		RT13-0.166W-75ΩJ
RAV1A	Carbon film resistor		RT13-0.166W-75ΩJ
RAV1	Carbon film resistor		RT13-0.166W-75ΩJ
R392	Carbon film resistor		RT13-0.166W-75ΩJ
R015	Carbon film resistor		RT13-0.166W-100ΩJ
R041	Carbon film resistor		RT13-0.166W-100ΩJ
R131	Carbon film resistor		RT13-0.166W-100ΩJ
R133	Carbon film resistor		RT13-0.166W-100ΩJ
R191	Carbon film resistor		RT13-0.166W-100ΩJ
R192	Carbon film resistor		RT13-0.166W-100ΩJ
R193	Carbon film resistor		RT13-0.166W-100ΩJ
R249	Carbon film resistor		RT13-0.166W-100ΩJ
R251	Carbon film resistor		RT13-0.166W-100ΩJ
R251A	Carbon film resistor		RT13-0.166W-100ΩJ
R430A	Carbon film resistor		RT13-0.166W-100ΩJ
RCLM	Carbon film resistor		RT13-0.166W-100ΩJ
RDAM	Carbon film resistor		RT13-0.166W-100ΩJ
R116	Carbon film resistor		RT13-0.166W-100ΩJ
R890	Carbon film resistor		RT13-0.166W-100ΩJ
R245A	Carbon film resistor		RT13-0.166W-100ΩJ
R243A	Carbon film resistor		RT13-0.166W-150ΩJ
W010A	Carbon film resistor		RT13-0.166W-220ΩJ
R391	Carbon film resistor		RT13-0.166W-330ΩJ
R231	Carbon film resistor		RT13-0.166W-390ΩJ
R012	Carbon film resistor		RT13-0.166W-470ΩJ
R879	Carbon film resistor		RT13-0.166W-470ΩJ
R049	Carbon film resistor		RT13-0.166W-1kΩJ
R101A	Carbon film resistor		RT13-0.166W-1kΩJ
R241	Carbon film resistor		RT13-0.166W-1kΩJ
R606	Carbon film resistor		RT13-0.166W-1kΩJ
R878	Carbon film resistor		RT13-0.166W-1kΩJ
R895	Carbon film resistor		RT13-0.166W-1kΩJ
R896	Carbon film resistor		RT13-0.166W-1kΩJ
R047	Carbon film resistor		RT13-0.166W-1.2KΩJ
R137	Carbon film resistor		RT13-0.166W-1.5KΩJ
R046	Carbon film resistor		RT13-0.166W-1.8KΩJ

R430	Carbon film resistor		RT13-0.166W-1.8KΩJ
R621	Carbon film resistor		RT13-0.166W-2KΩJ
R062	Carbon film resistor		RT13-0.166W-2.2KΩJ
R065	Carbon film resistor		RT13-0.166W-2.2KΩJ
R248	Carbon film resistor		RT13-0.166W-2.2KΩJ
R371	Carbon film resistor		RT13-0.166W-2.2KΩJ
R138A	Carbon film resistor		RT13-0.166W-2.2KΩJ
R132A	Carbon film resistor		RT13-0.166W-3.3KΩJ
R133A	Carbon film resistor		RT13-0.166W-3.3KΩJ
R171	Carbon film resistor		RT13-0.166W-3.9KΩJ
R045	Carbon film resistor		RT13-0.166W-4.7KΩJ
R891	Carbon film resistor		RT13-0.166W-4.7KΩJ
R899	Carbon film resistor		RT13-0.166W-4.7KΩJ
R063	Carbon film resistor		RT13-0.166W-5.6KΩJ
R005	Carbon film resistor		RT13-0.166W-10KΩJ
R007	Carbon film resistor		RT13-0.166W-10KΩJ
R008	Carbon film resistor		RT13-0.166W-10KΩJ
R009	Carbon film resistor		RT13-0.166W-10KΩJ
R137A	Carbon film resistor		RT13-0.166W-10KΩJ
R137B	Carbon film resistor		RT13-0.166W-10KΩJ
R139A	Carbon film resistor		RT13-0.166W-10KΩJ
R140A	Carbon film resistor		RT13-0.166W-10KΩJ
R141A	Carbon film resistor		RT13-0.166W-10KΩJ
R141B	Carbon film resistor		RT13-0.166W-10KΩJ
R195	Carbon film resistor		RT13-0.166W-10KΩJ
R302A	Carbon film resistor		RT13-0.166W-10KΩJ
R897	Carbon film resistor		RT13-0.166W-10KΩJ
R410	Carbon film resistor		RT13-0.166W-10KΩJ
R218A	Carbon film resistor		RT13-0.166W-10KΩJ
R622	Carbon film resistor		RT13-0.166W-10KΩJ
R002	Carbon film resistor		RT13-0.166W-12KΩJ
R158	Carbon film resistor		RT13-0.166W-15KΩJ
R011	Carbon film resistor		RT13-0.166W-15KΩJ
R013	Carbon film resistor		RT13-0.166W-15KΩJ
VD893B	Carbon film resistor		RT13-0.166W-22KΩJ
R396	Carbon film resistor		RT13-0.166W-22KΩJ
R233	Carbon film resistor		RT13-0.166W-27KΩJ
R235	Carbon film resistor		RT13-0.166W-27KΩJ
R894A	Carbon film resistor		RT13-0.166W-33KΩJ
R115	Carbon film resistor		RT13-0.166W-33KΩJ
R893A	Carbon film resistor		RT13-0.166W-39KΩJ
R372	Carbon film resistor		RT13-0.166W-47KΩJ
R373	Carbon film resistor		RT13-0.166W-47KΩJ
R605	Carbon film resistor		RT13-0.166W-47KΩJ
R003	Carbon film resistor		RT13-0.166W-100KΩJ
R006	Carbon film resistor		RT13-0.166W-100KΩJ

R232	Carbon film resistor		RT13-0.166W-100KΩJ
R395	Carbon film resistor		RT13-0.166W-100KΩJ
R485	Carbon film resistor		RT13-0.166W-120KΩJ
R488	Carbon film resistor		RT13-0.166W-560KΩJ
R242A	Carbon film resistor		RT14-0.25W-10ΩJ
R165	Carbon film resistor		RT14-0.25W-100ΩJ
R166	Carbon film resistor		RT14-0.25W-100ΩJ
R892	Carbon film resistor		RT14-0.25W-680ΩJ
R024	Carbon film resistor		RT14-0.25W-1KΩJ
R025	Carbon film resistor		RT14-0.25W-1kΩJ
R001	Carbon film resistor		RT14-0.25W-2.2KΩJ
R887	Carbon film resistor		RT14-0.25W-2.2KΩJ
R883	Carbon film resistor		RT14-0.25W-4.7KΩJ
R872	Carbon film resistor		RT14-0.25W-5.1KΩJ
R872A	Carbon film resistor		RT14-0.25W-5.1KΩJ
R894	Carbon film resistor		RT14-0.25W-270KΩJ
R403	Metal film resistor		RJ14-0.25W-3KΩJ
R167	Metal film resistor		RJ14-0.25W-39KΩG
R888A	Metal oxide film resistor		RY21-0.5W-3.3ΩJ
R416	Metal oxide film resistor		RY21-0.5W-22ΩJ
R505	Metal oxide film resistor		RY21-0.5W-1KΩJ
R463	Metal oxide film resistor		RY21-0.5W-3.3KΩJ
R418	Metal oxide film resistor		RY21-1W-330ΩJ
R881	Metal oxide film resistor		RY21-2W-0.2ΩJ
R890A	Metal oxide film resistor		RY21-2W-22KΩJ
R893	Metal oxide film resistor		RY21-2W-330KΩJ
R504	Metal oxide film resistor		RY21-3W-12KΩJ
R504A	Metal oxide film resistor		RY21-3W-12KΩJ
R893B	Glass glazed resistor		RI40-0.5W-1MΩJ
R452	Fuse resistor		RF10-0.5W-0.27ΩJ
L871	Fuse resistor		RF10-0.5W-0.27ΩJ
R461	Fuse resistor		RF10-0.5W-1ΩJ
R491	Fuse resistor		RF10-0.5W-1ΩJ
R405	Fuse resistor		RF10-0.5W-1ΩJ
R451	Fuse resistor		RF10-1W-0.27ΩJ
R666	Fuse resistor		RF10-2W-1ΩJ
R506	Wirewound resistor		RXG4-6W-3.9ΩK
RT800	Wirewound resistor		RXG6-H2-10W-2.2ΩJ
RT802B	Thermistor	CE	BC96709-7ΩJ
RT802B	Thermistor	CE	PTDCA1BF7R0Q200
C200	Ceramic capacitor		CC1-63V-06a-SL-33PFJ
C200A	Ceramic capacitor		CC1-63V-06a-SL-33PFJ
C188E	Ceramic capacitor		CC1-63V-08a-C-100PFJ
C371A	Ceramic capacitor		CC1-63V-08a-C-100PFJ
C003	Ceramic capacitor		CC1-63V-08a-SL-220PFJ
C171A	Ceramic capacitor		CT1-63V-06a-2B4-330PFK

C882	Ceramic capacitor		CT1-63V-06a-2B4-470PFK
C194	Ceramic capacitor		CT1-63V-06a-2B4-560PFK
C884	Ceramic capacitor		CT1-63V-06a-2B4-820PFK
C165	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C166	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C186A	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C233	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C401	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C430	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C302A	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C188D	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C171	Ceramic capacitor		CT1-63V-06a-2B4-1200PFK
C157	Ceramic capacitor		CT1-63V-08a-2B4-2200PFK
C047	Ceramic capacitor		CT1-63V-08a-2B4-3300PFK
C048	Ceramic capacitor		CT1-63V-08a-2B4-3300PFK
C168	Ceramic capacitor		CT1-63V-10a-2B4-3900PFK
C042	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C061	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C159	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C621	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
C015	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C025	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C026	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C603	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C064	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C666	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C893	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C487	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C052	Ceramic capacitor		CT1-63V-12a-2F4-0.022μFZ
C170	Ceramic capacitor		CT1-63V-12a-2F4-0.022μFZ
C491	Ceramic capacitor		CT1-500V-06a-2B4-220PFK
C503	Ceramic capacitor		CT1-500V-08a-2B4-820PFK
C828A	Ceramic capacitor	CE	CT81-400VAC-2E4-1000PFM-Y1
C828A	Ceramic capacitor	CE	CD85-E2GA102MYHS
C829A	Ceramic capacitor	CE	CT81-400VAC-2E4-1000PFM-Y1
C829A	Ceramic capacitor	CE	CD85-E2GA102MYHS
C820B	Ceramic capacitor	CE	CT81-400VAC-2E4-2200PFM-Y1
C820B	Ceramic capacitor	CE	CD12-E2GA222MYHS
C808	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C809	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C810	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C811	Ceramic capacitor		CT81-1KV-10C-2B4-1000PFM
C886	Ceramic capacitor		CT81-2KV-08c-2B4-220PFK
C871	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK
C881	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK
C891A	Ceramic capacitor		CT81-2KV-10c-2B4-470PFK

C163	Polyester film capacitor		CL21X-50V-0.022μFJ
C007	Polyester film capacitor		CL21X-50V-0.1μFJ
C008	Polyester film capacitor		CL21X-50V-0.1μFJ
C032	Polyester film capacitor		CL21X-50V-0.1μFJ
C155	Polyester film capacitor		CL21X-50V-0.1μFJ
C181	Polyester film capacitor		CL21X-50V-0.1μFJ
C187	Polyester film capacitor		CL21X-50V-0.1μFJ
C189	Polyester film capacitor		CL21X-50V-0.1μFJ
C251A	Polyester film capacitor		CL21X-50V-0.1μFJ
C218	Polyester film capacitor		CL21X-50V-0.1μFJ
C231	Polyester film capacitor		CL21X-50V-0.1μFJ
C410	Polyester film capacitor		CL21X-50V-0.1μFJ
C125A	Polyester film capacitor		CL21X-50V-0.1μFJ
C396B	Polyester film capacitor		CL21X-50V-0.1μFJ
C167	Polyester film capacitor		222236676104
C167	Polyester film capacitor		ECQV1104JMW
C151	Polyester film capacitor		CL21X-50V-0.22μFJ
C156	Polyester film capacitor		CL21X-50V-0.22μFJ
C623	Polyester film capacitor		CL21X-50V-0.22μFJ
C009	Polyester film capacitor		CL21X-50V-0.47μFJ
CBY10	Polyester film capacitor		CL21X-50V-0.47μFJ
C411	Polyester film capacitor		CL21X-100V-0.1μFJ
C425	Polyester film capacitor		CL21X-100V-0.1μFJ
C493	Polyester film capacitor		CL21X-100V-0.1μFJ
C481	Polyester film capacitor		CL21X-250V-0.1μFJ
C801	Polypropylene capacitor	CE	CBB62-250VAC-0.1μFK
C801	Polypropylene capacitor	CE	222233550104
C801	Polypropylene capacitor	CE	222233825104
C801	Polypropylene capacitor	CE	ECQU2A104KLA
C801	Polypropylene capacitor	CE	ECQU2A104MLA
C802	Polypropylene capacitor	CE	CBB62-250VAC-0.1μFK
C802	Polypropylene capacitor	CE	222233550104
C802	Polypropylene capacitor	CE	222233825104
C802	Polypropylene capacitor	CE	ECQU2A104KLA
C802	Polypropylene capacitor	CE	ECQU2A104MLA
C013	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C137A	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C169	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C302	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CAV1	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C371	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C391	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C399	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C051	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C004	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C125	Aluminum electrolytic capacitor		CD110X-16V-47μFM

C242	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C399A	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C892	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C318B	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C031	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C031A	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C187A	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C188	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C217	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C475	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C392A	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C153	Aluminum electrolytic capacitor		CD110X-16V-100μFM
C115	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C476	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C477	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C453	Aluminum electrolytic capacitor		CD110X-16V-220μFM
C116	Aluminum electrolytic capacitor		CD110X-16V-470μFM
C414	Aluminum electrolytic capacitor		CD110X-25V-220μFM
C462	Aluminum electrolytic capacitor		CD110X-25V-470μFM
C666A	Aluminum electrolytic capacitor		CD110X-25V-1000μFM
C872	Aluminum electrolytic capacitor		CD110X-25V-1000μFM
C882A	Aluminum electrolytic capacitor		CD110-35V-470μFM
C161	Aluminum electrolytic capacitor		CD110X-50V-0.47μFM
C158	Aluminum electrolytic capacitor		CD110X-50V-1μFM
C162	Aluminum electrolytic capacitor		CD110X-50V-2.2μFM
C486	Aluminum electrolytic capacitor		CD110X-50V-4.7μFM
C001	Aluminum electrolytic capacitor		CD110X-50V-47μFM
C883	Aluminum electrolytic capacitor		CD110X-50V-47μFM
C452	Aluminum electrolytic capacitor		CD110X-63V-100μFM
C411B	Aluminum electrolytic capacitor		CD110X-100V-22μFM
C524	Aluminum electrolytic capacitor		CD110X-160V-4.7μFM
C502	Aluminum electrolytic capacitor		CD110X-160V-4.7μFM
C891	Aluminum electrolytic capacitor		CD288-160V-220μFM
C890	Aluminum electrolytic capacitor		CD110X-250V-3.3μFM
C492	Aluminum electrolytic capacitor		CD288-250V-10μFM
C506	Aluminum electrolytic capacitor		CD288-250V-10μFM
C807	Aluminum electrolytic capacitor		CD293-400V-220μFM
L049	Fixed inductor		LGB0606-0.33μHK
W013	Fixed inductor		LGA0307-0.68μHK
L241	Fixed inductor		LGB0606-6.8μHJ
L371	Fixed inductor		LGB0606-10μHJ
L381	Fixed inductor		LGB0606-10μHJ
L302	Fixed inductor		LGB0606-10μHJ
W010	Fixed inductor		LGB0606-10μHJ
L188C	Fixed inductor		LGB0606-10μHJ
L181	Fixed inductor		LGB0606-22μHJ

L187	Fixed inductor		LGB0606-22μHJ
L152	Fixed inductor		LGB0606-22μHJ
L051	Fixed inductor		LGB0606-22μHJ
L031	Fixed inductor		LGB0606-56μHK
L350	Fixed inductor		LGB0606-56μHK
L221	Fixed inductor		LGA0307-22μHK
L881	Feed-through inductor		TEM2000
L891	Feed-through inductor		TEM2000
L421	Feed-through inductor		TEM2011
L422	Feed-through inductor		TEM2011
L502	Feed-through inductor		ZZ008
VD882	Diode		W05Z2.7A
D895	Diode		W05Z4.7B
D895	Diode		GDZJ4.7B
VD448A	Diode		W05Z8.2A
VD448A	Diode		GDZJ8.2A
D886	Diode		W05Z15C
D886	Diode		GDZJ15C
VD890	Diode		2CK75D
VD890	Diode		1N4148
VD892	Diode		2CK75D
VD892	Diode		1N4148
VD065	Diode		2CK75D
VD065	Diode		1N4148
V485	Diode		2CK75D
V485	Diode		1N4148
VD401	Diode		BAV21
VD402	Diode		BAV21
VD896	Diode		BAV21
VD131	Diode		BAV21
VD133	Diode		BAV21
VD451	Diode		2CZRU2
VD471	Diode		2CZRU2
VD461	Diode		2CZRU2
VD491	Diode		2CZRU2
VD881	Diode		2CZRU2
VD871	Diode		2CZRU4Z
VD891	Diode		RG2
VD803	Diode		BY254
VD803	Diode		1N5408
VD804	Diode		BY254
VD804	Diode		1N5408
VD805	Diode		BY254
VD805	Diode		1N5408
VD806	Diode		BY254
VD806	Diode		1N5408

D524	Diode		RM11C
D881	Diode		AK03
D884	Diode		AU01Z
D885	Diode		AU01Z
D888	Diode		AU01Z
V890	Triode		2SA1015-Y
V890	Triode		3CG1015-Y
V890	Triode		2PA1015Y
V890	Triode		KTA1266-Y
V251	Triode		2SA1015-Y
V251	Triode		3CG1015-Y
V251	Triode		2PA1015Y
V251	Triode		KTA1266-Y
V241	Triode		3DG1815-Y
V241	Triode		2SC1815-Y
V241	Triode		2PC1815Y
V241	Triode		KTC3198-Y
V201A	Triode		3DG1815-Y
V201A	Triode		2SC1815-Y
V201A	Triode		2PC1815Y
V201A	Triode		KTC3198-Y
V371	Triode		3DG1815-Y
V371	Triode		2SC1815-Y
V371	Triode		2PC1815Y
V371	Triode		KTC3198-Y
V391	Triode		3DG1815-Y
V391	Triode		2SC1815-Y
V391	Triode		2PC1815Y
V391	Triode		KTC3198-Y
V605	Triode		3DG1815-Y
V605	Triode		2SC1815-Y
V605	Triode		2PC1815Y
V605	Triode		KTC3198-Y
V871	Triode		3DG1815-Y
V871	Triode		2SC1815-Y
V871	Triode		2PC1815Y
V871	Triode		KTC3198-Y
V888	Triode		3DG1815-Y
V888	Triode		2SC1815-Y
V888	Triode		2PC1815Y
V888	Triode		KTC3198-Y
V872	Triode		BC548C
V872	Triode		BC547C
V501	Triode		2SC2688-L
V501	Triode		3DA2688-L
V501	Triode		3DA2688

V501	Triode		3DA2688-F
V102	Triode		PH2369
V047	Triode		2SC388ATM
V047	Triode		KSC388C-Y
V047	Triode		3DG388ATM
N200	IC		AT24C08
N200	IC		AT24C08A-10PI2.7
N200	IC		M24C08-BN6
N100	IC		CH05T0101/TDA9381PS/N2/2I
VD001	IC		μPC574J
VD001	IC		CW574CS
N441	IC		L7805CV
N441	IC		KA7805TU
N441	IC		MC7805CT
N861	IC		STR-G5653
V502	IC		BU2508DX
N600	IC		TDA7057AQ
N401	IC		TDA8356/N6
V115	IC		L7805CV
N442	IC		L7808CV
N801	Photo coupler	CE	HS817
N801	Photo coupler	CE	HPC922
N801	Photo coupler	CE	HS817C
N801	Photo coupler	CE	SFH615A-3
N801	IC	CE	LTV-816
G200	Crystal oscillator		JA18A-12.000MHZ
G200	Crystal oscillator		9922-520-00169-12MHz
A100	Electronic tuner		TDQ-5B6-M(JUB2.891.001-1)
Z240	Ceramic trap		TPS6.5MB
Z240	Ceramic trap		XT6.5MB
Z241	Ceramic trap		TPS6.0MB
Z241	Ceramic trap		XT6.0MB
Z242	Ceramic trap		TPS5.5MB
Z242	Ceramic trap		XT5.5MB
Z102	Surface acoustic wave filter		K6283K
L501	Line drive transformer		BCT-4(JU4.739.029)
L801	Filtering inductor	CE	LCL-F15(JUB4.757.001)
L802	Filtering inductor	CE	LCL-F16(JUB4.757.002)
F801	Delay fuse		RT1-20-2.5A-250V
F801	Delay fuse	CE	R/S/V/I50TT2.5AL250V(61802.5)
F801	Delay fuse	CE	61802.5
	2) Parts for Side AV		
RA2	Carbon film resistor		RT13-0.166W-75ΩJ
RB1	Carbon film resistor		RT13-0.166W-75ΩJ
RAV2	Carbon film resistor		RT13-0.166W-75ΩJ
RAV2A	Carbon film resistor		RT13-0.166W-75ΩJ

RA1	Carbon film resistor		RT13-0.166W-10KΩJ
RB2	Carbon film resistor		RT13-0.166W-10KΩJ
CA3	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CB3	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CAV2	Aluminum electrolytic capacitor		CD110X-16V-10μFM
N402	IC		HEF4053BP
N402	IC		HCF4053BEY
N402	IC		MC14053BCP
	3) Parts for S-VIDEO terminal		
R313	Carbon film resistor		RT13-0.166W-75ΩJ
R315	Carbon film resistor		RT13-0.166W-75ΩJ
R301S	Carbon film resistor		RT13-0.166W-4.7KΩJ
R300S	Carbon film resistor		RT13-0.166W-10KΩJ
C300S	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C313	Polyester film capacitor		CL21X-50V-0.022μFJ
V300S	Triode		3DG1815-Y
V300S	Triode		2SC1815-Y
V300S	Triode		2PC1815Y
V300S	Triode		KTC3198-Y
XS301	S-VIDEO terminal		PH-S
	4) Parts for AV Stereo		
R303	Carbon film resistor		RT13-0.166W-75ΩJ
RCLS	Carbon film resistor		RT13-0.166W-100ΩJ
RDAS	Carbon film resistor		RT13-0.166W-100ΩJ
RBY1	Carbon film resistor		RT13-0.166W-2KΩJ
RBY2	Carbon film resistor		RT13-0.166W-2KΩJ
R631	Carbon film resistor		RT13-0.166W-2KΩJ
R381	Carbon film resistor		RT13-0.166W-2.2KΩJ
R303A	Carbon film resistor		RT13-0.166W-10KΩJ
R632	Carbon film resistor		RT13-0.166W-10KΩJ
R383	Carbon film resistor		RT13-0.166W-47KΩJ
R382	Carbon film resistor		RT13-0.166W-47KΩJ
C381A	Ceramic capacitor		CC1-63V-08a-C-100PFJ
C303A	Ceramic capacitor		CT1-63V-06a-2B4-1000PFK
C631	Ceramic capacitor		CT1-63V-10a-2B4-4700PFK
CBY8	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
CBY6A	Polyester film capacitor		CL21X-50V-5600PFJ
CBY7A	Polyester film capacitor		CL21X-50V-5600PFJ
CBY7	Polyester film capacitor		CL21X-50V-0.15μFJ
CBY2	Polyester film capacitor		CL21X-50V-0.15μFJ
C372	Polyester film capacitor		CL21X-50V-0.22μFJ
C382	Polyester film capacitor		CL21X-50V-0.22μFJ
C633	Polyester film capacitor		CL21X-50V-0.22μFJ
CBY6	Polyester film capacitor		CL21X-50V-0.33μFJ
CBY3	Polyester film capacitor		CL21X-50V-0.33μFJ
CBY11	Aluminum electrolytic capacitor		CD110X-16V-10μFM

C381	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C303	Aluminum electrolytic capacitor		CD110X-16V-10μFM
CBY9	Aluminum electrolytic capacitor		CD110X-16V-100μFM
L303	Fixed inductor		LGB0606-10μHJ
V381	Triode		3DG1815-Y
V381	Triode		2SC1815-Y
V381	Triode		2PC1815Y
V381	Triode		KTC3198-Y
N650	IC		TDA7449
XS801	AV terminals		AVLP-33-9R1-YUV
	5) Parts for DVD COMPONENT IN		
R305A	Carbon film resistor		RT13-0.166W-100ΩJ
R306	Carbon film resistor		RT13-0.166W-100ΩJ
R364	Carbon film resistor		RT13-0.166W-100ΩJ
R358	Carbon film resistor		RT13-0.166W-180ΩJ
R354	Carbon film resistor		RT13-0.166W-220ΩJ
R362	Carbon film resistor		RT13-0.166W-220ΩJ
R353	Carbon film resistor		RT13-0.166W-430ΩJ
R350	Carbon film resistor		RT13-0.166W-470ΩJ
R357	Carbon film resistor		RT13-0.166W-470ΩJ
R361	Carbon film resistor		RT13-0.166W-470ΩJ
R351	Carbon film resistor		RT13-0.166W-3.3KΩJ
R356	Carbon film resistor		RT13-0.166W-3.3KΩJ
R360	Carbon film resistor		RT13-0.166W-3.3KΩJ
R352	Carbon film resistor		RT13-0.166W-10KΩJ
R355	Carbon film resistor		RT13-0.166W-10KΩJ
R359	Carbon film resistor		RT13-0.166W-10KΩJ
R135	Carbon film resistor		RT13-0.166W-47KΩJ
R135B	Carbon film resistor		RT13-0.166W-47KΩJ
C370	Polyester film capacitor		CT1-63V-12a-2F4-0.022μFZ
C373	Polyester film capacitor		CT1-63V-12a-2F4-0.022μFZ
C374	Polyester film capacitor		CT1-63V-12a-2F4-0.022μFZ
C305	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C306	Aluminum electrolytic capacitor		CD110X-16V-10μFM
C311	Aluminum electrolytic capacitor		CD110X-16V-47μFM
C350	Aluminum electrolytic capacitor		CD110X-16V-100μFM
V353	Triode		2SA1015-Y
V353	Triode		3CG1015-Y
V353	Triode		2PA1015Y
V353	Triode		KTA1266-Y
V351	Triode		3DG1815-Y
V351	Triode		2SC1815-Y
V351	Triode		2PC1815Y
V351	Triode		KTC3198-Y
V356	Triode		3DG1815-Y
V356	Triode		2SC1815-Y

V356	Triode		2PC1815Y
V356	Triode		KTC3198-Y
V361	Triode		3DG1815-Y
V361	Triode		2SC1815-Y
V361	Triode		2PC1815Y
V361	Triode		KTC3198-Y
	6) Parts for NTSC-M Decoding		
R246	Carbon film resistor		RT13-0.166W-2KΩJ
R247	Carbon film resistor		RT13-0.166W-2KΩJ
V246	Triode		2SA1015-Y
V246	Triode		3CG1015-Y
V246	Triode		2PA1015Y
V246	Triode		KTA1266-Y
V247	Triode		2SA1015-Y
V247	Triode		3CG1015-Y
V247	Triode		2PA1015Y
V247	Triode		KTA1266-Y
V047A	Triode		RN1204
Z243	Ceramic trap		TPS4.5MB2
Z243	Ceramic trap		XT4.5MB
	7) Parts for SIF		
R262A	Carbon film resistor		RT13-0.166W-68ΩJ
R264A	Carbon film resistor		RT13-0.166W-100ΩJ
R263	Carbon film resistor		RT13-0.166W-220ΩJ
R263A	Carbon film resistor		RT13-0.166W-820ΩJ
R264	Carbon film resistor		RT13-0.166W-820ΩJ
R261A	Carbon film resistor		RT13-0.166W-1kΩJ
R265	Carbon film resistor		RT13-0.166W-2.2KΩJ
R262	Carbon film resistor		RT13-0.166W-10KΩJ
R260	Carbon film resistor		RT13-0.166W-22KΩJ
C260	Ceramic capacitor		CC1-63V-06a-SL-47PFJ
C261	Ceramic capacitor		CC1-63V-06a-SL-47PFJ
C262	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
C261A	Ceramic capacitor		CT1-63V-08a-2F4-10nFZ
L260	Fixed inductor		LGB0606-8.2μHJ
V260	Triode		3DG1815-Y
V260	Triode		2SC1815-Y
V260	Triode		2PC1815Y
V260	Triode		KTC3198-Y
V261	Triode		3DG1815-Y
V261	Triode		2SC1815-Y
V261	Triode		2PC1815Y
V261	Triode		KTC3198-Y
Z260	Ceramic filter		LT6.5MH
	8) Data Related to CRT		

	a) Mount the following parts when using a BMCC pure flat CRT A51LXR195X91J.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-8.2KΩJ
R411	Metal oxide film resistor		RY21-0.5W-1.8ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.3μFJ
L506	Horizontal linear inductor		HXT49(JU4.756.016)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	b) Mount the following Samsung parts when using a pure flat CRT A51QDX992X001.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-6.2KΩJ
R411	Metal oxide film resistor		RY21-0.5W-1.8ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.3μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	c) Mount the following parts when using a LG pure flat CRT A51QDJ279X31.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-3W-4.7KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2C1-1500PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.33μFJ
L506	Horizontal linear inductor		HXT49(JU4.756.016)
L505	Horizontal amplitude coil		TLN0028A(JUB4.756.009)
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)

T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	d) Mount the following parts when using a Orion pure flat CRT A51QDK090X011.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-3W-4.7KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2C1-1500PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.33μFJ
L506	Horizontal linear inductor		HXT49(JU4.756.016)
L505	Horizontal amplitude coil		TLN0028A(JUB4.756.009)
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	e) Mount the following parts when using a Toshiba pure flat CRT A51LVV896X09.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-6.2KΩJ
R411	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.3μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HF60A(JU4.756.037)
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	f) Mount the following parts when using a Thai pure flat CRT A51LYJ10X42.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-7.5KΩJ
R411	Metal oxide film resistor		RY21-0.5W-1.8ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.3μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270

T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	g) Mount the following parts when using a Huafei pure flat CRT A51ERF135X90.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-10KΩJ
R411	Metal oxide film resistor		RY21-0.5W-1.8ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-3W-4.7KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-16c-2B4-1800PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.33μFJ
L506	Horizontal linear inductor		HXT39(JU4.756.032)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	h) Mount the following parts when using a BMCC pure flat CRT A51LYZ095X91J.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-12KΩJ
R411	Metal oxide film resistor		RY21-0.5W-1.8ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.3μFJ
L506	Horizontal linear inductor		HXT49(JU4.756.016)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	i) Mount the following parts when using a Malaysia-based Matsushita pure flat CRT A51LYZ095X90.		
R481	Carbon film resistor		RT13-0.166W-10KΩJ
R482	Carbon film resistor		RT13-0.166W-12KΩJ
R411	Metal oxide film resistor		RY21-0.5W-1.8ΩJ
R412	Metal oxide film resistor		RY21-0.5W-2.2ΩJ
R518	Metal oxide film resistor		RY21-2W-1KΩJ
R519	Metal oxide film resistor		RY21-3W-5.6KΩJ
C504	Ceramic capacitor		CT81-2KV-12c-2B4-820PFK
C505	Polypropylene capacitor		CBB81-1.6KV-9100PFJ
C512	Polypropylene capacitor		CBB13-400V-0.3μFJ

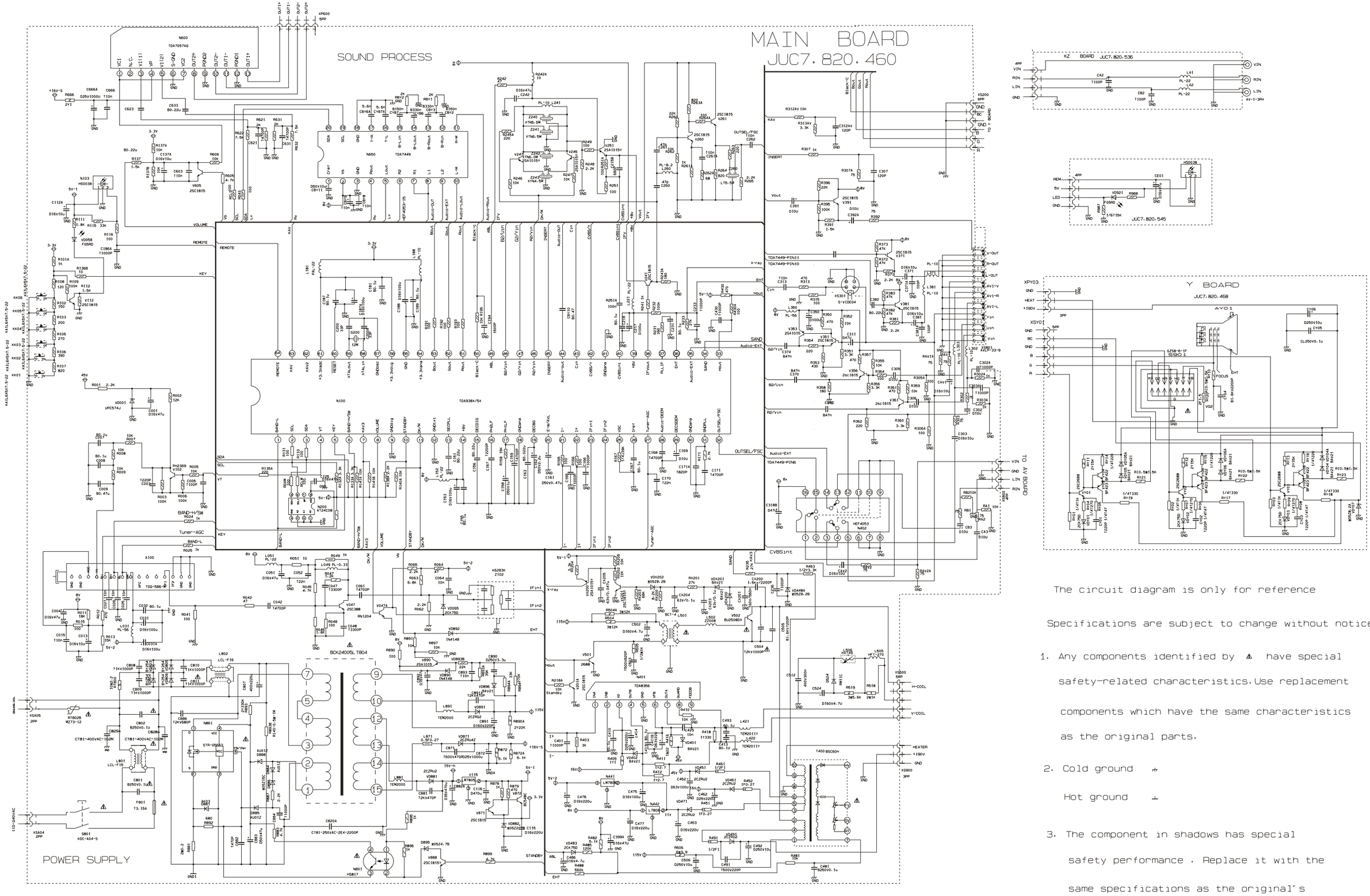
L506	Horizontal linear inductor		HXT49(JU4.756.016)
L505	Horizontal amplitude coil		HFT-270
T804	Switch transformer	CE	BCK-24005L(JUB4.726.083)
T401	Flyback transformer	CE	BSC60K(JUB4.799.044)
	2. Parts on CRT RGB PCB		
	1) Basic Parts		
RY05	Carbon film resistor		RT13-0.166W-47ΩJ
RY06	Carbon film resistor		RT13-0.166W-47ΩJ
RY08	Carbon film resistor		RT13-0.166W-47ΩJ
RY04	Carbon film resistor		RT13-0.166W-270ΩJ
RY07	Carbon film resistor		RT13-0.166W-270ΩJ
RY09	Carbon film resistor		RT13-0.166W-270ΩJ
RY01	Carbon film resistor		RT13-0.166W-1KΩJ
RY02	Carbon film resistor		RT13-0.166W-1KΩJ
RY03	Carbon film resistor		RT13-0.166W-1KΩJ
RY14	Carbon film resistor		RT14-0.25W-220ΩJ
RY15	Carbon film resistor		RT14-0.25W-220ΩJ
RY16	Carbon film resistor		RT14-0.25W-220ΩJ
RY17	Carbon film resistor		RT14-0.25W-330ΩJ
RY18	Carbon film resistor		RT14-0.25W-330ΩJ
RY19	Carbon film resistor		RT14-0.25W-330ΩJ
RY40A	Carbon film resistor		RT14-0.25W-330KΩJ
RY11	Metal oxide film resistor		RY21-2W-15KΩJ
RY12	Metal oxide film resistor		RY21-2W-15KΩJ
RY13	Metal oxide film resistor		RY21-2W-15KΩJ
RY21	Glass glazed resistor		RI40-0.5W-1KΩK
RY22	Glass glazed resistor		RI40-0.5W-1KΩK
RY23	Glass glazed resistor		RI40-0.5W-1KΩK
CY01	Ceramic capacitor		CC1-63V-10a-SL-330PFJ
CY02	Ceramic capacitor		CC1-63V-10a-SL-330PFJ
CY03	Ceramic capacitor		CC1-63V-10a-SL-330PFJ
CY04	Ceramic capacitor		CT81-2KV-20C-2R4-3300PFK
CY05	Polyester film capacitor		CL21X-250V-0.1μFJ
CY06	Aluminum electrolytic capacitor		CD110X-250V-10μFM
VDY01	Diode		2CK75D
VDY01	Diode		1N4148
VDY02	Diode		2CK75D
VDY02	Diode		1N4148
VDY03	Diode		2CK75D
VDY03	Diode		1N4148
VDY04	Diode		BAV21
VDY04A	Diode		BAV21
VDY05	Diode		BAV21
VDY05A	Diode		BAV21
VDY06	Diode		BAV21
VDY06A	Diode		BAV21

VDY07	Diode		W05Z8.2A
VDY07	Diode		GDZJ8.2A
VY01	Triode		3DG2482
VY01	Triode		2SC2688-L
VY01	Triode		3DA2688-L
VY01	Triode		3DA2688
VY01	Triode		3DA2688-F
VY02	Triode		3DG2482
VY02	Triode		2SC2688-L
VY02	Triode		3DA2688-L
VY02	Triode		3DA2688
VY02	Triode		3DA2688-F
VY03	Triode		3DG2482
VY03	Triode		2SC2688-L
VY03	Triode		3DA2688-L
VY03	Triode		3DA2688
VY03	Triode		3DA2688-F
VY04	Triode		BF422
VY04	Triode		3DG422
VY06	Triode		BF422
VY06	Triode		3DG422
VY08	Triode		BF422
VY08	Triode		3DG422
VY05	Triode		BF423
VY05	Triode		3CG423
VY07	Triode		BF423
VY07	Triode		3CG423
VY09	Triode		BF423
VY09	Triode		3CG423
SY01	CRT socket (Model: GZS series)	CE	GZS10-2-108
SY01	CRT socket (Model: GZS series)	CE	GZS10-2-AC2
	2) Data Related to CRT		
	a) Mount the following parts when using a BMCC pure flat CRT A51LXR195X91J.		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	b) Mount the following Samsung parts when using a pure flat CRT A51QDX992X001.		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	c) Mount the following parts when using a LG pure flat CRT A51QDJ279X31.		
RY20	Fuse resistor		RF10-2W-3ΩJ
RY20	Fuse resistor		RF11-2W-3ΩJ

	d) Mount the following parts when using a Orion pure flat CRT A51QDK090X011.		
RY20	Fuse resistor		RF10-2W-3ΩJ
RY20	Fuse resistor		RF11-2W-3ΩJ
	e) Mount the following parts when using a Toshiba pure flat CRT A51LVV896X09.		
RY20	Fuse resistor		RF10-2W-4.3ΩJ
RY20	Fuse resistor		RF11-2W-4.3ΩJ
	f) Mount the following parts when using a Thai pure flat CRT A51LYJ10X42.		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	g) Mount the following parts when using a Huafei pure flat CRT A51ERF135X90.		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	h) Mount the following parts when using a BMCC pure flat CRT A51LYZ095X91J.		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	i) Mount the following parts when using a Malaysia-based Matsushita pure flat CRT A51LYZ095X90.		
RY20	Fuse resistor		RF10-2W-3.3ΩJ
RY20	Fuse resistor		RF11-2W-3.3ΩJ
	3. Parts on Side AV PCB		
XK01	AV terminals		AVW-13-3R-8.5-TV
	4. Parts on Soft Switch PCB		
RK99	Carbon film resistor		RT13-0.166W-120ΩJ
RK91	Carbon film resistor		RT13-0.166W-150ΩJ
RK92	Carbon film resistor		RT13-0.166W-200ΩJ
RK94	Carbon film resistor		RT13-0.166W-270ΩJ
RK95	Carbon film resistor		RT13-0.166W-390ΩJ
RK96	Carbon film resistor		RT13-0.166W-820ΩJ
S901	Soft switch		KA1W6×5-41
S902	Soft switch		KA1W6×5-41
S903	Soft switch		KA1W6×5-41
S904	Soft switch		KA1W6×5-41
S905	Soft switch		KA1W6×5-41
S906	Soft switch		KA1W6×5-41
	5. Parts on Remote Sensor PCB		
RP12	Carbon film resistor		RT13-0.166W-390ΩJ

NP11A	IC		HS0038A2
CP11	Aluminum electrolytic capacitor		CD110X-16V-47μFM
	6. Parts on Power Switch PCB		
VDP11A	Light emitting diode		HFBA052MP(7.0)
	7. Others		
	Power switch		KDC-A04-MU171
	Power Cord		RVVZ-CH4-2000-ZH1
	Electric speaker		YD78-B1-10W-8Ω
	Degaussing coil		XC-2118

Circuit Diagram for 21NF55/21PF93



The circuit diagram is only for reference

Specifications are subject to change without notice

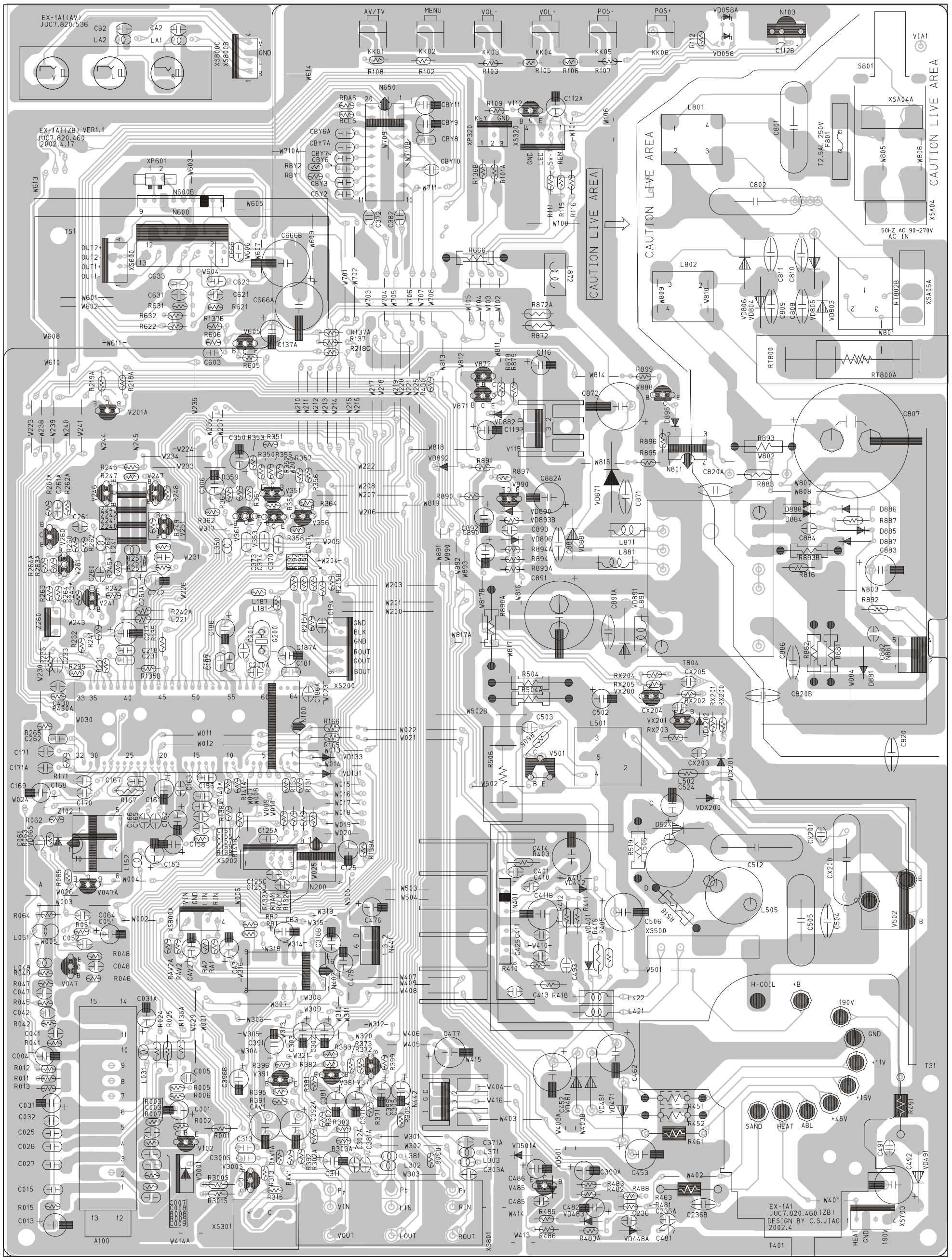
1. Any components identified by ⚠ have special safety-related characteristics. Use replacement components which have the same characteristics as the original parts.

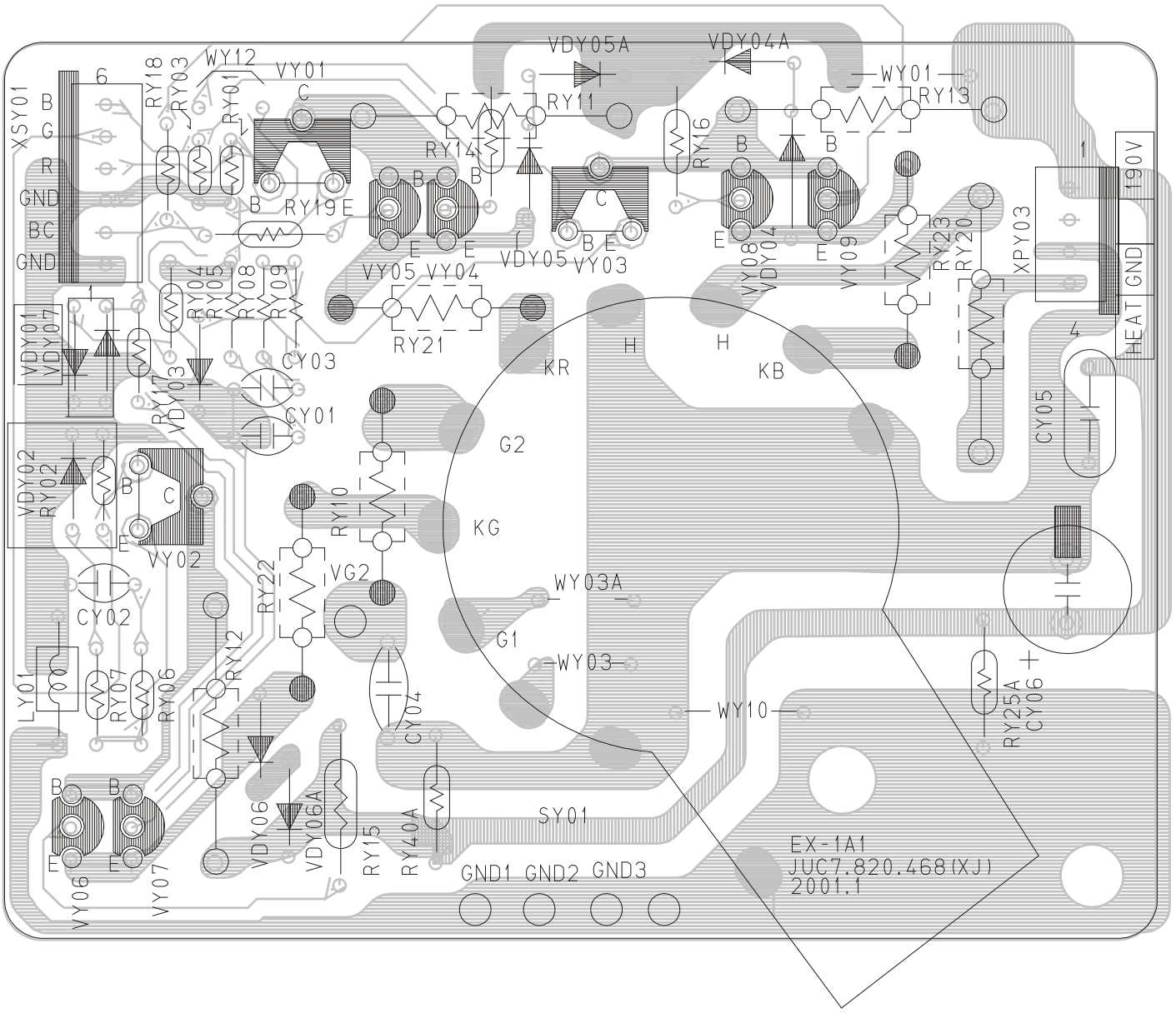
2. Cold ground ⏚

   Hot ground ⊥

3. The component in shadows has special safety performance . Replace it with the same specifications as the original's

MAIN PCB FOR 21NF55/21PF93





CRT RGB PCB FOR 21NF55/21PF93