

Service
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4100S



Service Manual

Chassis name	Platform	Model name
4100S	TSUMV59	24PHA4100S/67

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24" 24PHA4100S/67	28

1. Product information

Product information is subject to change without notice.

For detailed product information, please visit www.philips.com/support

Display

Type

Diagonal screen size

•24PHA4100S/67 24 inch

Display resolution

•1920*1080p

Input resolution

• 800 x 600p - 60 Hz

• 1024 x 768p - 60 Hz

• 1280 x 768p - 60 Hz

• 1360 x 765p - 60 Hz

• 1360 x 768p - 60 Hz

• 1280 x 1024p - 60 Hz

• 1920 x 1080p - 60 Hz23.5

Video formats

Resolution — Refresh rate

• 480i, 480p, 576i, 576p, 720p, 1080i, 1080p(24/25/30/50/60Hz)

Computer formats

Resolutions (amongst others)

• 720*400@70HZ

• 640*480@60HZ

• 800*600@60HZ

• 1024*768@60HZ

• 1360*768@60HZ

• 1280*720@60HZ

• 1280*960@60HZ

• 1280*1024@60HZ

• 1600*900@60HZ

• 1920*1080@60HZ

Dimensions and Weights

24PHA4100S/67

• without TV stand:

Width 550 mm - Height327 mm - Depth66

mm - Weight 2.3 kg

• with TV stand:

Width 550 mm - Height360 mm - Depth 156

mm - Weight 2.5 kg

Connectivity

TV Side

• HDMI 2 in

• HDMI 1 in

• USB x 1

• Headphone x 1

TV Rear

CVBS/Y Pb Pr : CVBS/Y Pb Pr, Audio L/R

Audio in: DVI

VGA x 1

Sound

Output Power (10% THD) RMS 4W

Speaker configuration 8W+8W

Speaker system	2.0
Speaker type	built-in(normal)
Auto Volume Levelier / Auto Volume Levelier +	YES
Dolby Digital DecoderType	YES

Multimedia

Connections

- USB 2.0
-

Music Playback Formats	MPEG-1,MPEG-2 (Layer I/II)
	MP3, AAC-LC, HE-AAC

Picture Playback Formats	JPEG、BMP、PNG
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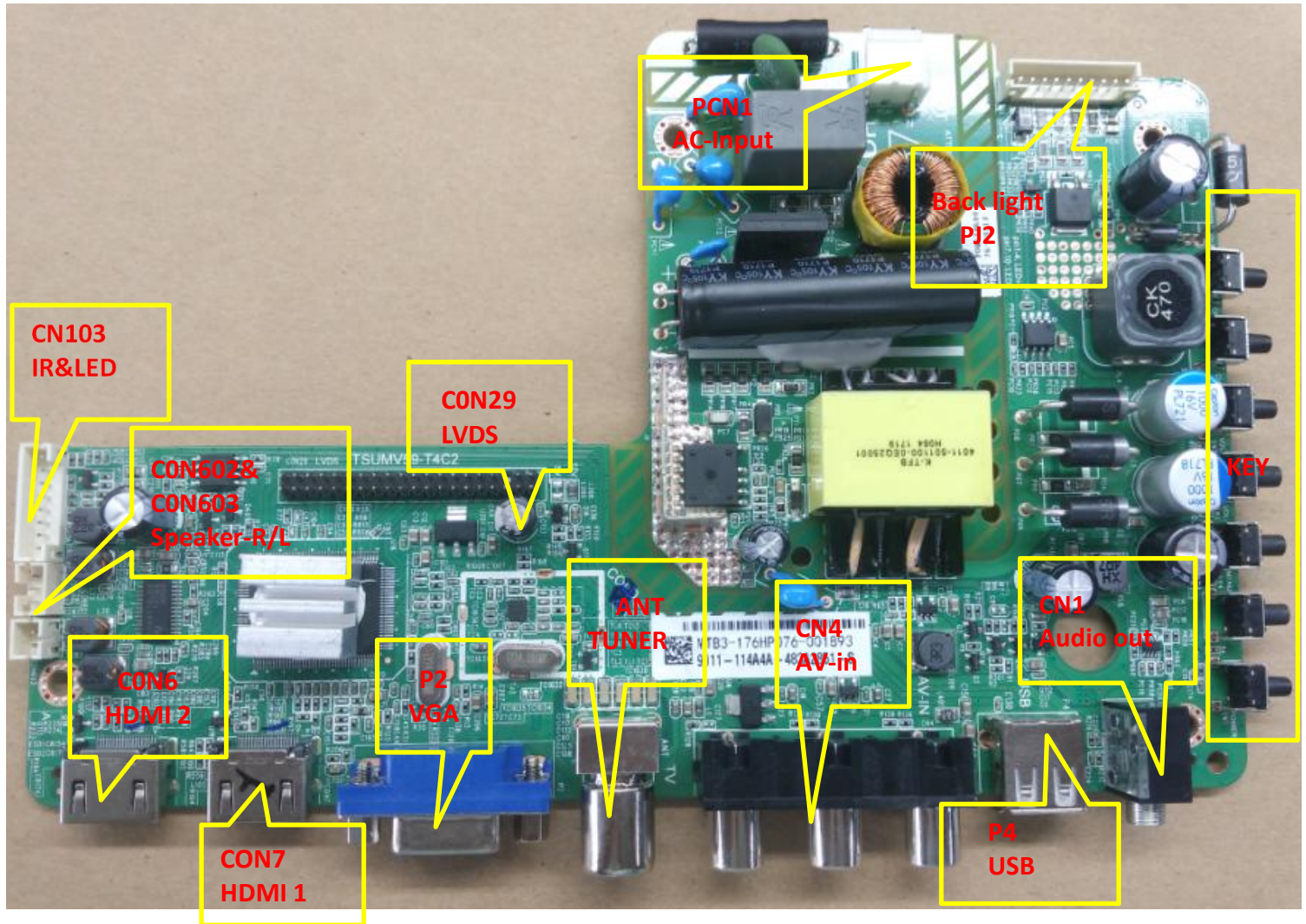
Power

Product specifications are subject to change without notice. For more specification details of this product, see www.philips.com/support

Power

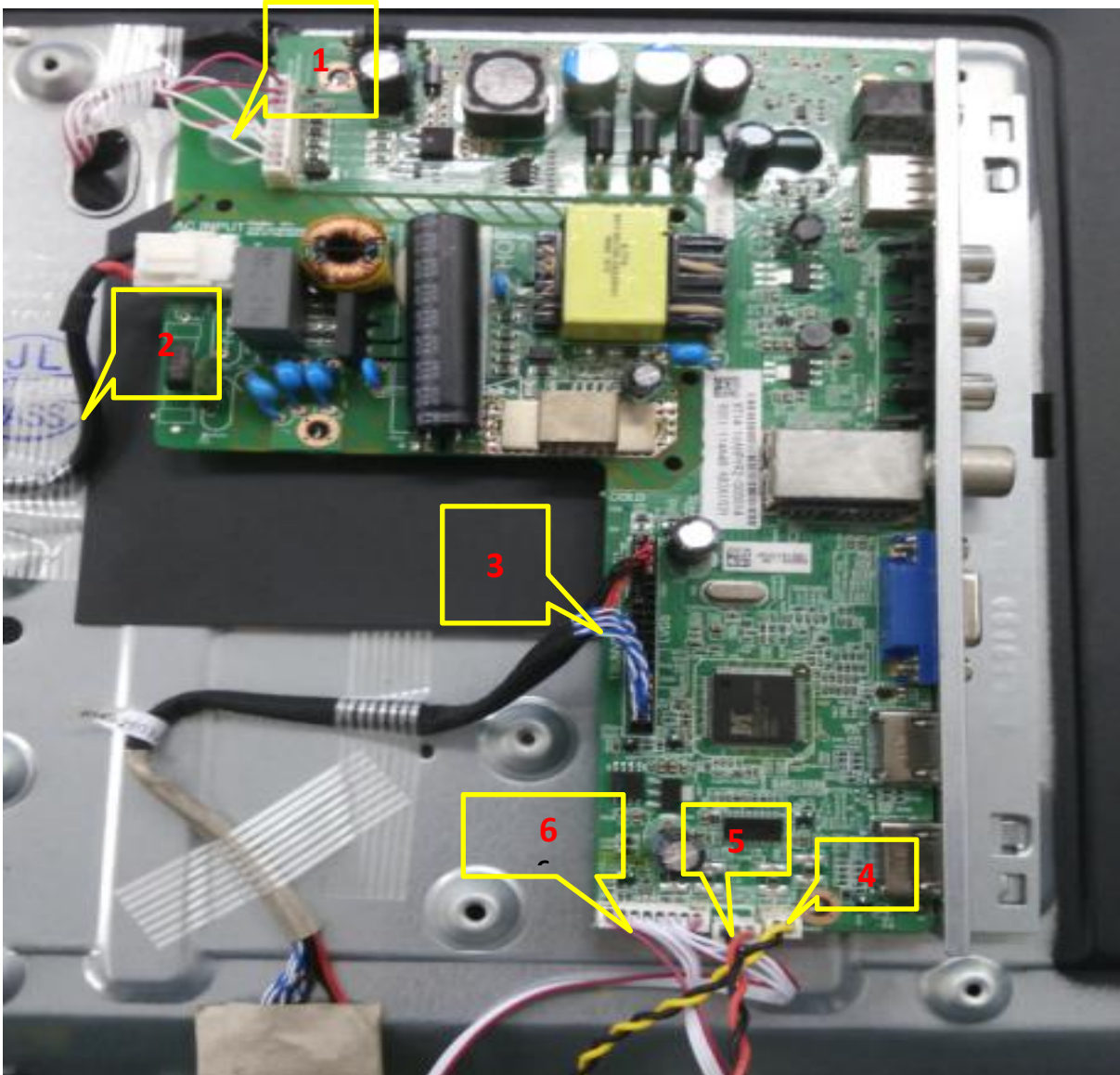
- Mains power : AC 100-240V 50/60Hz
- Standby Energy Consumption:≤0.5W
- Ambient temperature : 5°C to 40°C

2. Connections Overview



3. Mechanical Instructions

3.1 Cable dressing



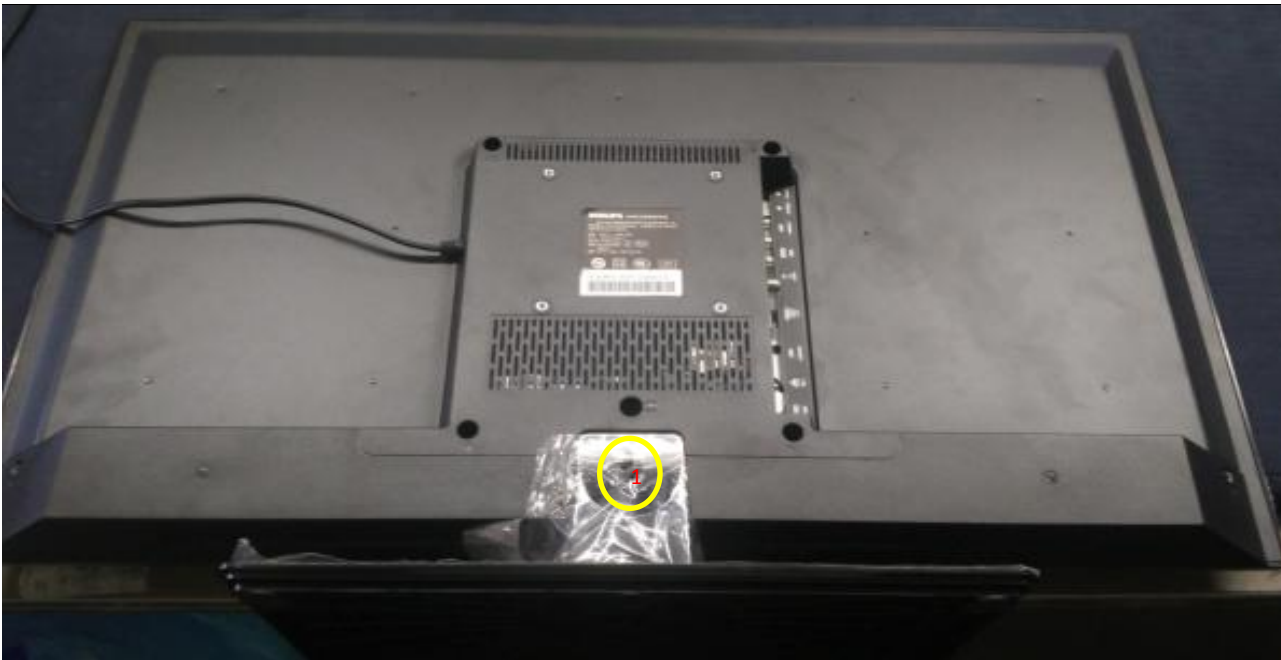
Serial no	part description	function
1	Backlight wire	Connect to PJ2
2	Power wire	Connect to PCN1
3	LVDS wire	C0N29 to T-CON board
4	Speaker wire	C0N602 to speaker (yellow black wire)
5	Speaker wire	C0N603 to speaker (red black wire)
6	two-terminal wire	CN103 to IR board&LED

Cable dressing(For24" 24PHA4100S/67)

3.2 Assembly/Panel Removal

3.2.1 Stand removal

1. Remove the fixation screws [1] 1pcs ,that secure the stand
2. Take the stand bracket out from the set.

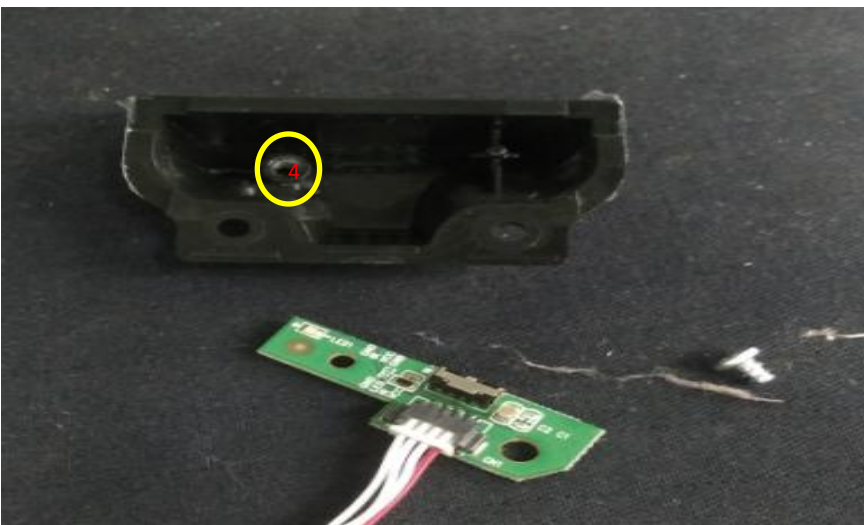
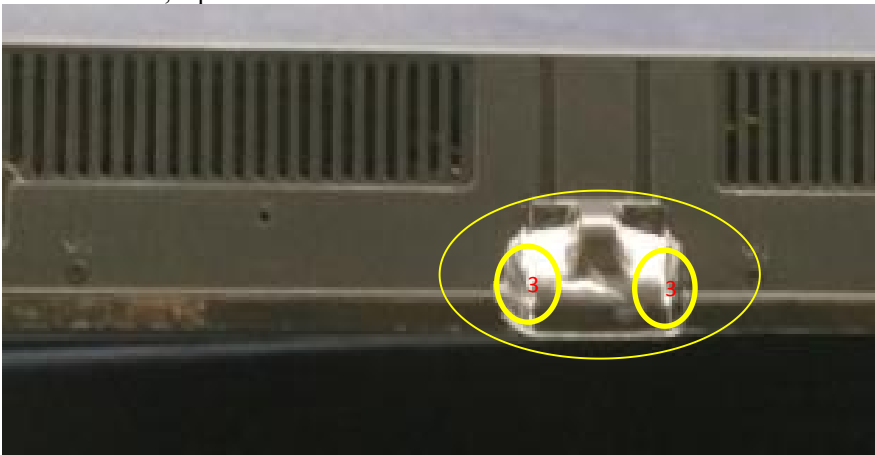


3.2.2 IR board

1. Unplug the connector from the SSB.

Caution: be careful, as these are very fragile connectors!

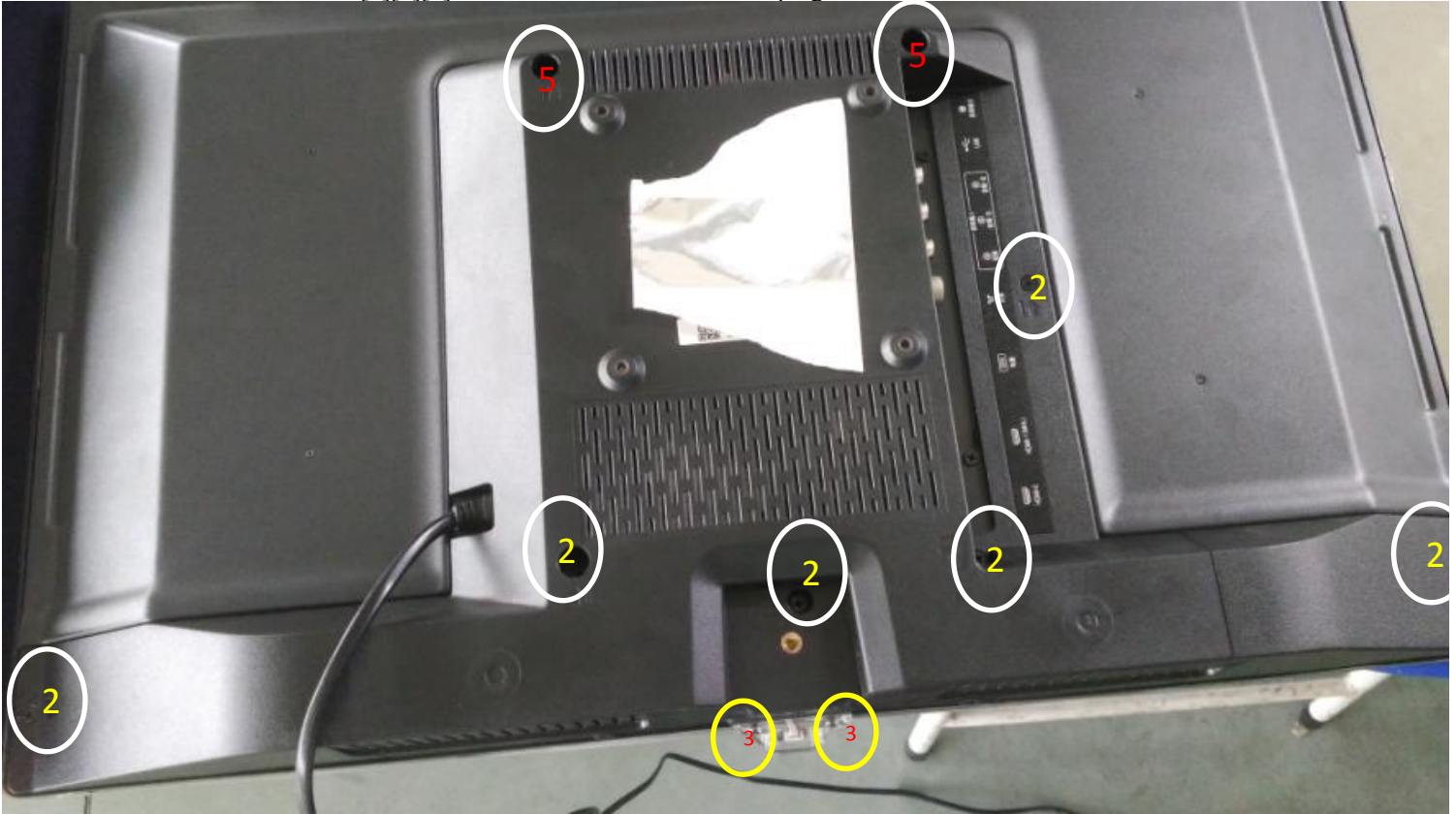
2. Remove all the fixation screws(3), then Remove the fixation screws(4) Ir board and LED together, from the IR board control unit. When defective, replace the whole unit



3.2.3 Rear Cover

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [2][3][5] that secure the back cover..
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.
3. Remove fixation screws[2][3][5] that secure the back cover.unplug connectors



3.2.5 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
1. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

3.2.7 Speakers

1. Gently release the tapes that secure the speaker cables.
 2. Unplug the speaker connector from the SSB.
 3. Take the speakers out.
- When defective, replace the both units.

3.2.9 LCD Panel

3. Remove the SSB as described earlier.
 2. Remove the PSU as described earlier.
 3. Remove the keyboard control panel as described earlier.
 4. Remove the stand bracket as described earlier.
 5. Remove the IR/LED as described earlier.
 6. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
 7. Remove all other metal parts not belonging to the panel.
 8. Lift the LCD Panel from the bezel.
- When defective, replace the whole unit.

4. Service Modes

Factory Mode

Purpose

- To perform extended alignments.

Primary menu	Secondary menu	Value,remark
ADC ADJUST	MDOE	VGA, YPBPR, Selection
	R-GAIN	Front-end gain adjustment
	G-GAIN	
	B-GAIN	
	R-OFFSET	Clamp level adjustment
	G-OFFSET	
	B-OFFSET	
	AUTO ADC	ADC automatically adjust
PICTURE MODE	Input Source	Source Selection
	MODE	Dynamic/Standard/Soft/User
	BRIGHTNESS	BRIGHTNESS
	CONTRAST	CONTRAST
	COLOR	COLOR
	SHARPNESS	SHARPNESS
	TINT	TINT
	Copy all	No function
W/B ADJUST	inputsource	Source Selection
	TEMPERATURE	Cool, Standard, Warm
	R-GAIN	White level adjustment
	G-GAIN	
	B-GAIN	
	R-OFFSET	Black level adjustment
	G-OFFSET	
	B-OFFSET	
	Copy all	No function
SSC SETTING	MIU Enable	DDR spectrum enable
	MIU0 Span	Exhibition frequently wide
	MIU Step	Spread spectrum step
	LVDS enable	LVDS spectrum enable
	LVDS Span	Exhibition frequently wide
	LVDS Step	Spread spectrum step
	LVDS swing	LVDS swing
Spectral set	2HOUR OFF	2hours power off enable
	WDT	Watch dog on/off
	White pattern	White pattern selection
	Restore user default	Factory reset
	PVR_RECORDALL	PVR Record on/off
	Power	Power mode selection
	Mirror	Mirror function selection
	Ageing mode	Ageing mode enable
VIF	Vif 1	Vif set
	Vif 2	Vif set
	Vif 3	Vif set
Qmap adjsut	PQ setting	
PEQ	PEQsetting	
OverScan	Overscan resolution	Reselution select
	Overscan hsize	Adjust overscan H size
	Overscan hposition	Adjust overscan H position
	Overscan vsize	Adjust overscan V size
	Overscan vposition	Adjust overscal V position
other	Test pattern	
	UART DEBUG	DEBUG ON/OFF
	HDMI CEC/ARC	CEC/ARC ON/OFF

	Backlight	Adjust backlight
CI+ key usb upgrade	CI+ key usb upgrade	
SW information	SW information	
Non-linear	MODE	Feature Selection
	OSD 0	Curve adjustment
	OSD 25	
	OSD 50	
	OSD 75	
	OSD 100	
Channel table1	KTC factory Frequecy table set	
CI factory setting	No function	
Channel table2	KTC factory Frequecy table set	
Channel dvbt	KTC factory Frequecy table set	

5. Software Upgrading and Panel Code

5.1 Software Upgrading

5.1.1 Software upgrade tools and materials

- * Personal computer (WINDOWS XP or WINDOW7 32 bit operating system,USB2.0)
- * AC100~240V power supply and power cord
- * ISP burning board
- * ISP burning board driver
- * ISP Tool V4.5.2.8.SZ.exe
- * VGA wire
- * USB flash disk (2.0 version, Capacity not more than 8G)
- * Mainboard software

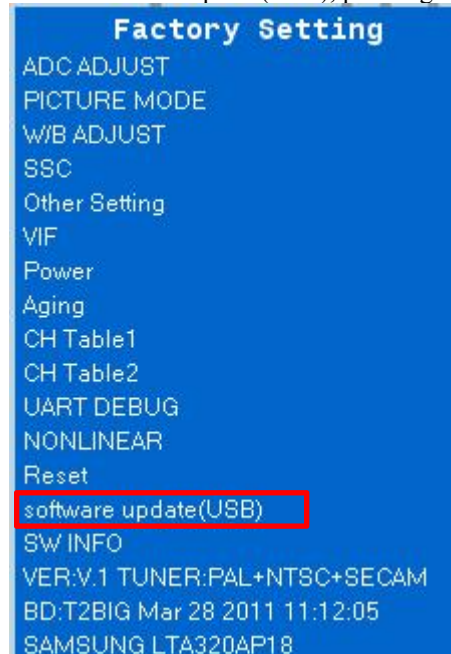
5.1.2 Operations and procedure of software upgrading:

- (1). Changed the file name to "MERGE.bin", then store software in the FAT32 format blank U disk.
- (2). Insert USB flash disk into the USB upgrade port, upgrade the software according to the following the operating instructions::

Method 1 (Method 1 will not erase the original EDID and HDCP KEY on mainboard. Easy operation, you only need one U disk to upgrade. So we require customer use this way to upgrade.) :

- ①. Start the machine and wait the normal picture display, press the MENU button on the remote control, will be popping up the main menu, press the 8202 number keys and enter the Factory Setting menu.
- ②. Press up/down keys to move the cursor to "software update(USB)" function menu, then press right key to select "YES", to implement USB upgrade command:
 - a. After prompt "File system init error", means that the machine have found USB device, but did not find the needing Record the R/G/B-GAIN and R/B/G-OFFSET value under the YPbPr(SD) and YPbPr(HD) mode, to be replaced the recorded value after the machine software upgrade
 - upgrade software, please check the software name is correct or format the U disk again and then copy software.
 - b. After prompt "USB Connect Detect fail", means that the machine does not find USB device, check if the USB device has been inserted into, or change another U disk and try again.
- ③. Display percentage progress prompts and about 10 seconds later, the machine black screen and restart automatically, means that the machine complete the upgrade process, turn off the machine first, then pull out the U disk.

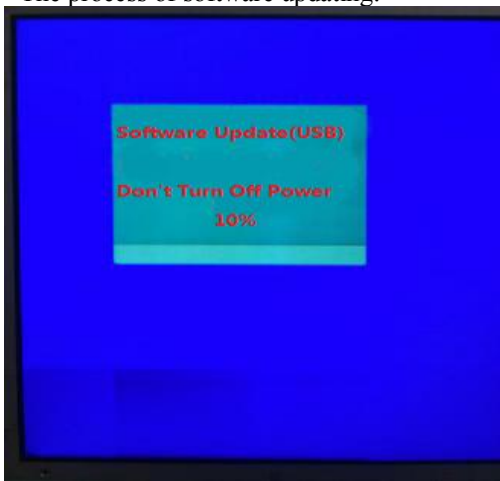
Select Software Update(USB), press right key or OK key to enter.



Software update menu will pop up when press confirm key, then select “Yes” to confirm:



The process of software updating:



Method 2: Keep pressing VOL+ and CH+ keys on the machine panel, power on the machine, the standby light flashes quickly after about 5 seconds, standby light goes out and turn into lighting after about a minute, means that upgrade is Completed.

(3). Notices:

- ①. When the machine Upgrading (U disk light flash), do not remove U disk or switch off the power, otherwise it will destroy the software and lead can not upgrade.
- ②. The machine must be power off when inserted or pulled out U disk, to avoid damaging U disk or machine.
- ③. Because of compatibility between machine and U disk, some machines will not flicker during upgrading. Please change U disk (The capacity of U disk is not more than 2G) or use method 1 to upgrade.
- ④. If the display screen can't display menu normally, it cannot use "method 1" to upgrade, you can use Mstar ISP Tools to upgrade except method 1 and method 2.

5.2 Panel Code

Press the following key sequence on a standard RC transmitter: “1999” directly followed by MENU, can see the panel type information from factory menu, see the Panel PN from the configuration table

CTN ALT BOM#	Panel Type	Panel PN
24PHA4100S/67	K236WD8-MH200A1	7422-236CMK-335A8271-F

6. Circuit Descriptions

6.1 Introduction

The 4100S is covered by TSUMV59 platform. The major deltas versus its predecessor support DVB-T, with multi-media, Video out. The TSUMV59 chassis comes with the following stylings:

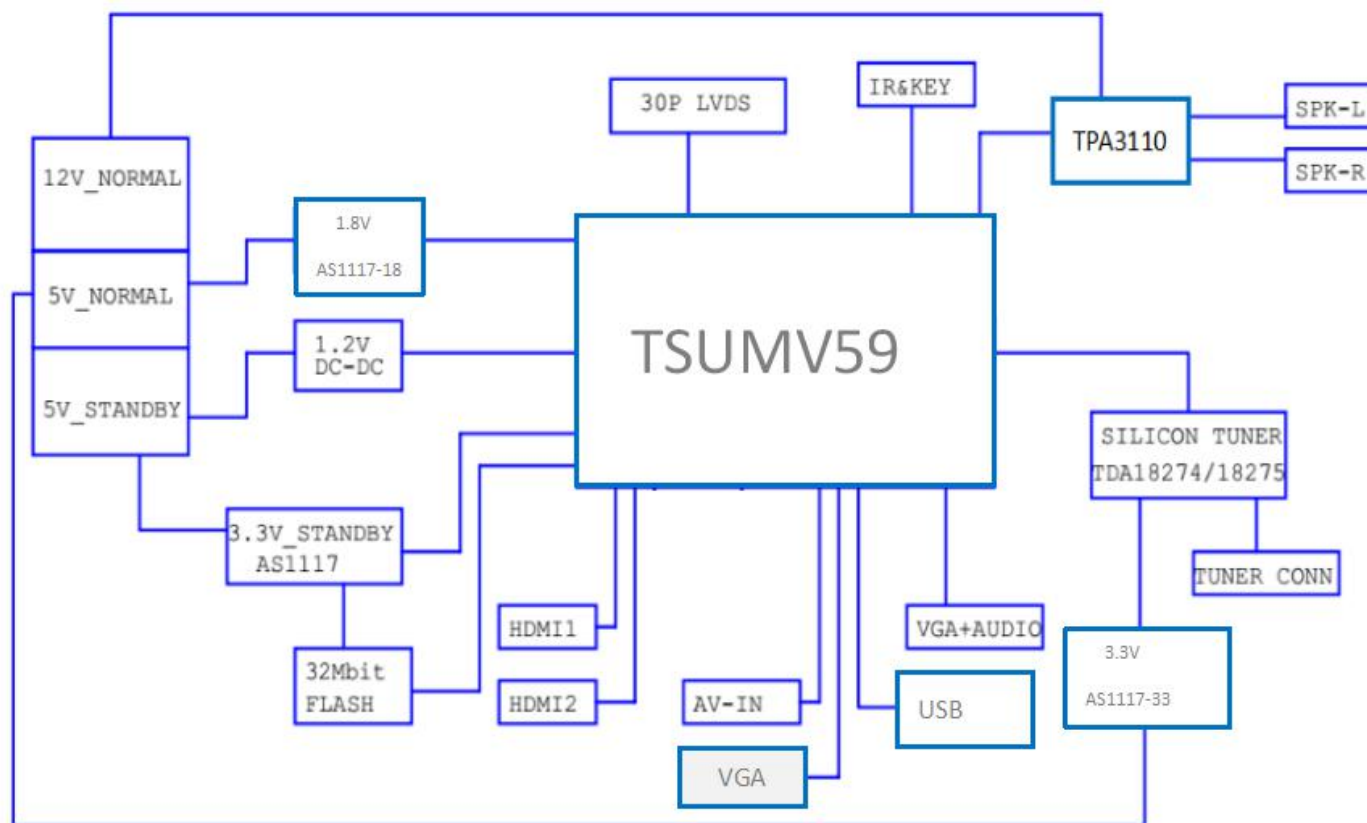
- Series 4100S 24PHA4100S/67

6.1.1 Implementation

Key components of this chassis are:

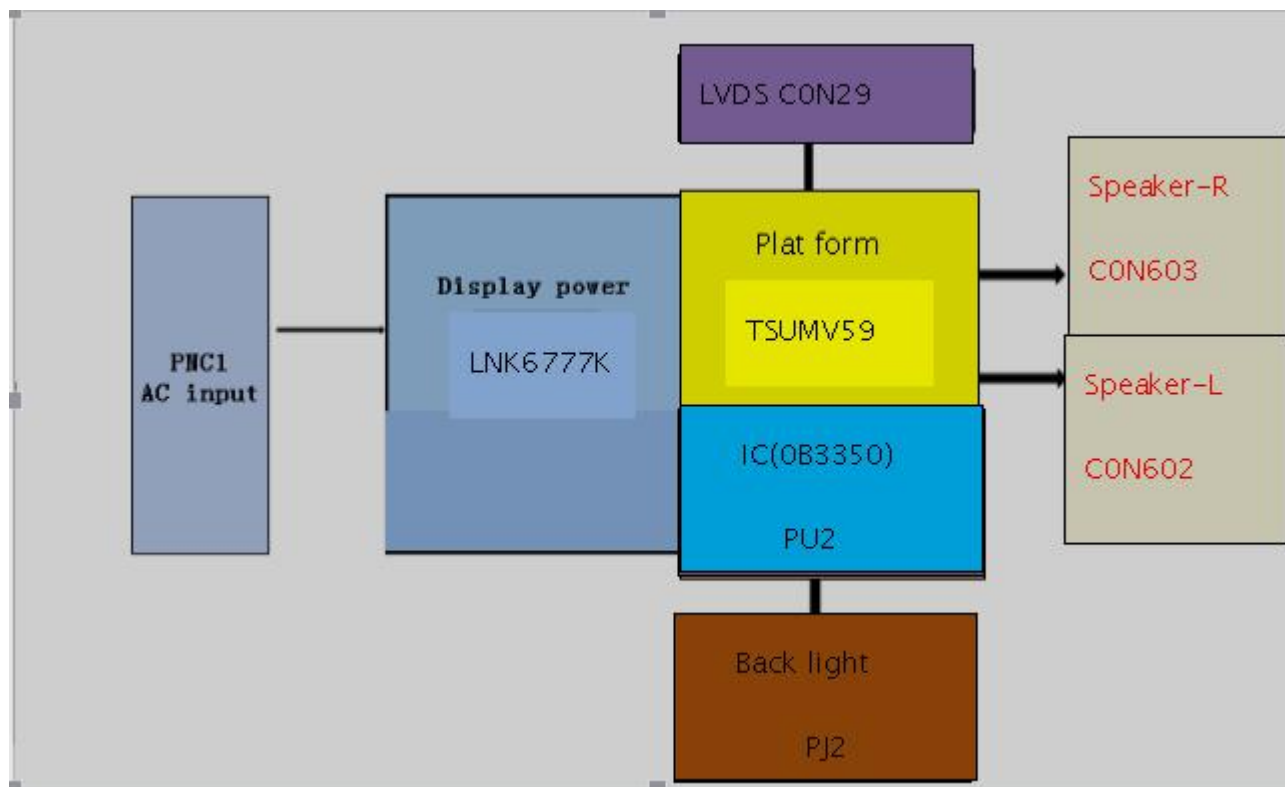
- TUNER POWER AS1117-33
- VDDC POWER
- TSUMV59-T4C2
- 3.3V STANDBY AS1117 -33
- 64 Mbit SPI FLASH
- HDMI1 ARC
- HDMI2 PORT

6.1.2 Block diagram



6.2 Power Supply

Power architecture of this platform



6.2.1 Power Supply Unit

All power supplies are a black box for Service. When defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market.

Consult the Philips Service web portal for the order codes of the boards.

Important delta's with the platform are:

- New power architecture for LED backlight
- “Boost”-signal is now a PWM-signal + continuous variable

The control signals are:

- PS-ON
- Lamp “on/off”
- DIM (PWM) (not for PSDL)

In this manual, no detailed information is available because of design protection issues.

- +12 output (on-mode)
- +12V_audio (audio AMP power)
- Output to the display; in case of
 - IPB: High voltage to the LCD panel
 - PSL and PSLS (LED-driver outputs)
 - PSDL (high frequent) AC-current.

6.2.2 Diversity

The diversity in power supply units is mainly determined by the diversity in displays.

The following displays can be distinguished:

- CCFL/EEFL backlight: power panel is conventional IPB
- LED backlight:
 - side-view LED without scanning: PSL power panel
 - side-view LED with scanning: PSLS power panel
 - direct-view LED without 2D-dimming: PSL power panel
 - direct-view LED with 2D-dimming: PSDL power panel.

PSL stands for **P**ower **S**upply with integrated **L**ED-drivers.

PSLS stands for a **P**ower **S**upply with integrated **L**ED-drivers with added **S**canning functionality (added microcontroller).

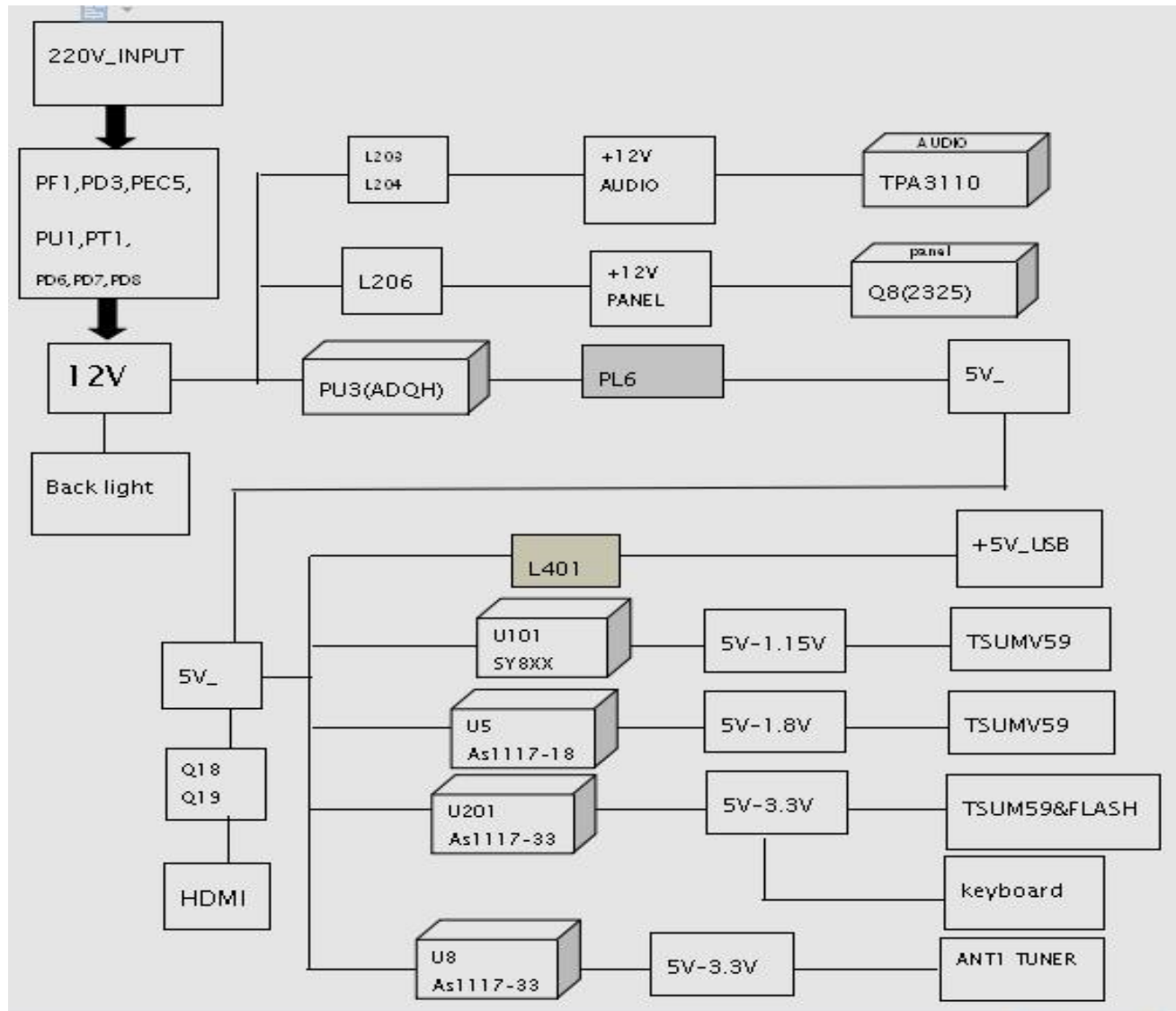
PSDL stands for a **P**ower **S**upply for **D**irect-view **L**ED backlight with 2D-dimming.

6.3 DC/DC Converters

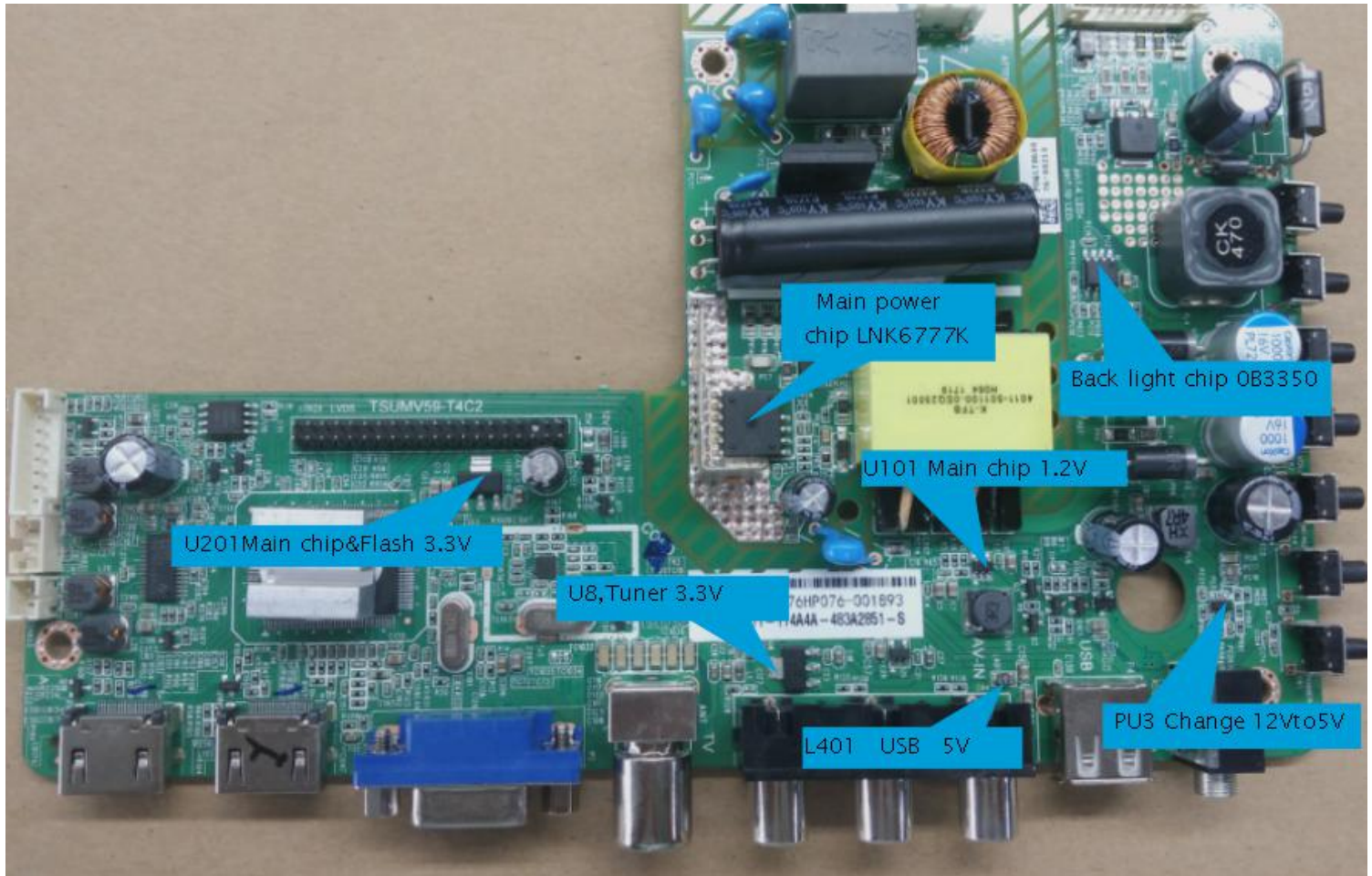
The on-board DC/DC converters deliver the following voltages(depending on set execution):

- +3V5-SB, permanent voltage for the Stand-by Power system
- +3V3-STANDBY, voltage for IR/Key board
- +12V, input from the power supply for the panel common(active mode)
- +12V, input from the power supply for LNB supply
- +3V3-FLASH, voltage for FLASH when TV on
- +3.3VA_T2, +1.2V_T2 voltage for Demodulator IC channel decoder
- TUNER_3V3, supply voltage for tuner
- +5V-SW, input intermediate supply voltage for USB Power
- +12V-AUDIO1 for the AUDIO AMP
- +1.8V-Main chip

6.3.1 Power tree



6.3.2 Power layout SSB



6.4 Front-End Analogue and DVB-C, DVB-T; reception

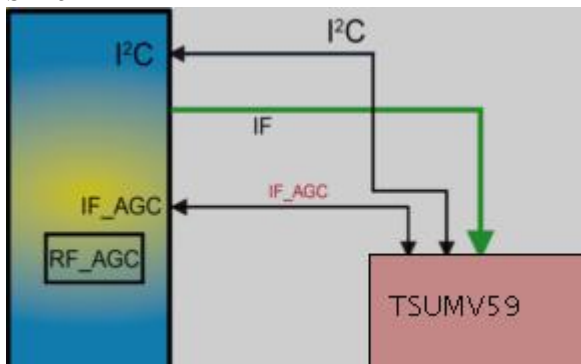
6.4.1 DVB-C part

The Front-End for analogue tuner consist of the following key components:

- TUNER SI2151
- SCALER TSUMV59

Below find a block diagram of the front-end application for DVB-C part.

SI2151



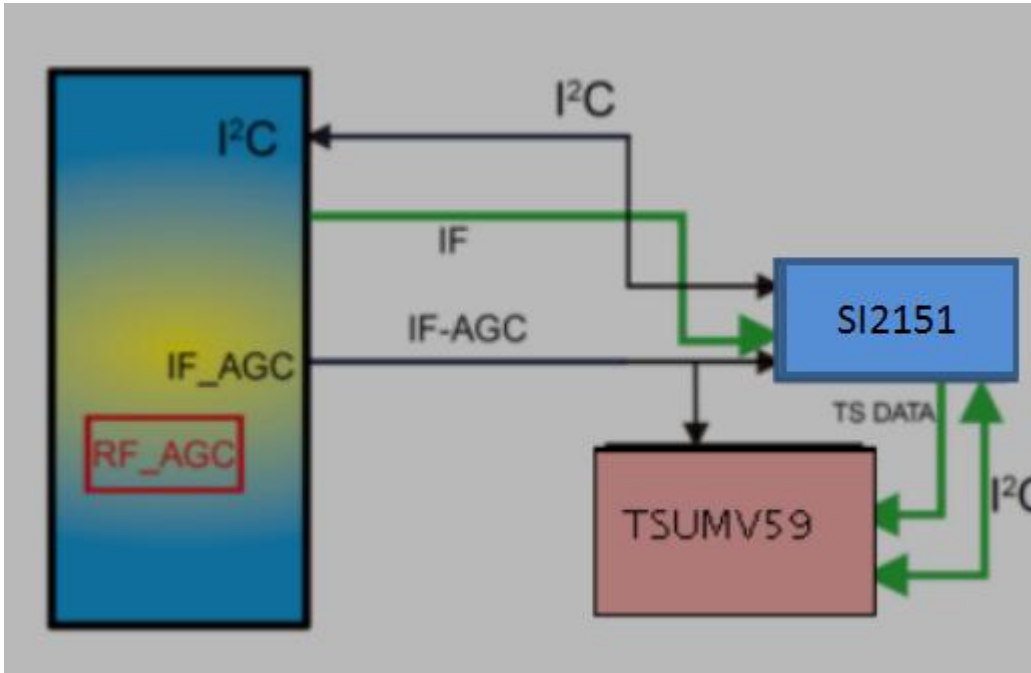
6.4.2 DTB-T2 part

The Front-End for DVT part consist of the following key components:

- TUNER EUROPE SI2151
- SCALER TSUMV59 Processor

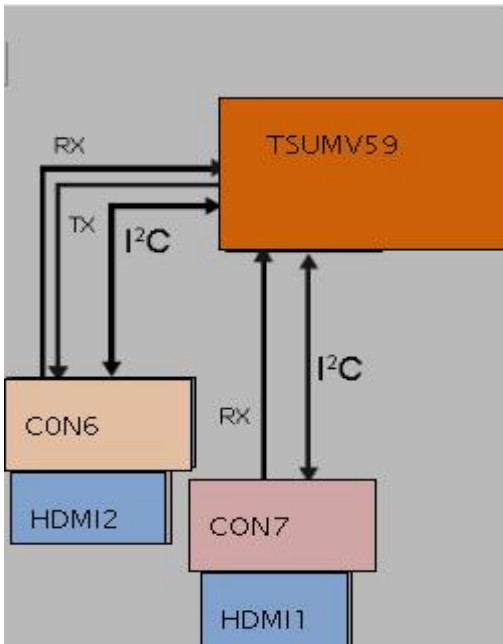
Below find a block diagram of the front-end application for DTB-T2 part.

SI2151



6.5 HDMI

Refer to below for the application.



The following HDMI connector can be used:

- HDMI 1: HDMI input (TV digital interface support HDCP)
- HDMI 2: HDM I input (TV digital interface support)
- +5V detection mechanism
- Stable clock detection mechanism

-
- HPD control
 - Sync detection
 - TMDS output control
 - CEC control
 - ARC control

6.6 Video and Audio Processing -TSUMV59

The TSUMV59 is the main audio and video processor (or System-on-Chip) for this platform. It has the following features:

1. Worldwide multi-standard analog TV demodulator
2. PAL/SECAM/DVB-T/DVB-T2 /DVB-C demodulators
3. 1920*1080@60Hz direct drive
4. Powerful CPU core
5. A transport de-multiplexer
7. A multi-standard video decoder
8. Rich format audio codec
10. HDMI1.2 receiver
11. 2D converter
12. PWM dimming (LED backlight)
13. Two-link LVDS,

1 OVERVIEW

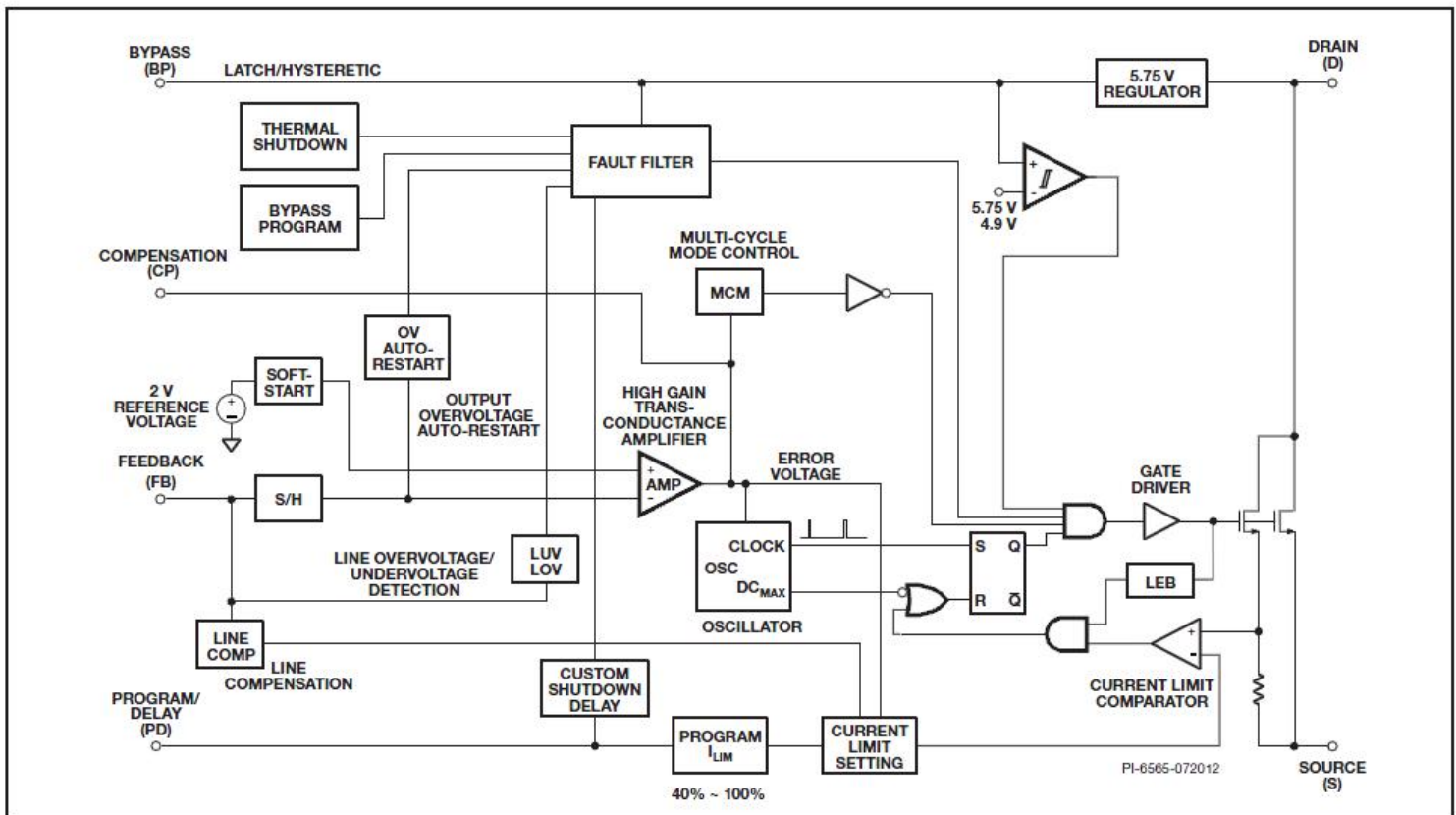
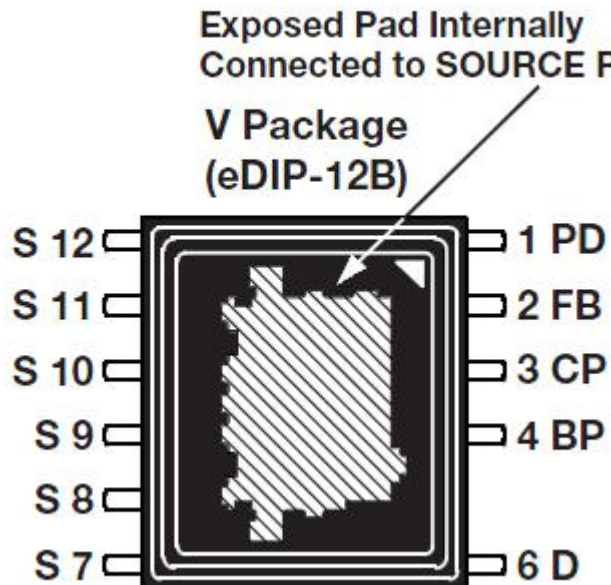
The World-Leading Audio/Video Technology: The TSUMV59 supports Full MPEG2/4/H.264 video decoder standards, and JPEG. The TSUMV59 family consists of a DTV front-end demodulator, a backend decoder and a TV controller and offers high integration for advanced applications. It integrates a transport de-multiplexer, a high definition video decoder, an audio decoder, a -link LVDS transmitter, and a NTSC/PAL/SECAM TV decoder. The TSUMV59 enables consumer electronics manufacturers to build high quality, low cost and feature-rich DTV. The TSUMV59 also supports MediaTek MDDiTM de-interlace solution which can reach very smooth picture quality for motions. The special color processing technology provides a natural, deep colors and true studio quality video. Moreover, . The TSUMV59 family has built-in high resolution and high-quality audio codec.

Rich Features for High Value Products: The TSUMV59 family enables true single-chip experience. It integrates high-quality HDMI1.4, high speed VGA ADC, a-link LVDS, USB2.0 receiver, and ATSC/DVB-T/DVBC/DTMB/ISDB-T demodulators.

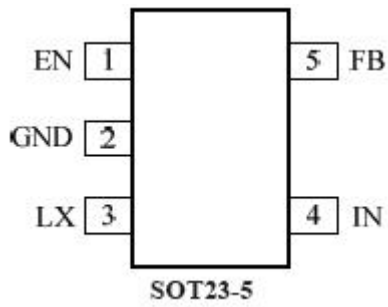
All New FHD@60Hz Experience: The TSUMV59 family provides consumers with FHD 60Hz direct drive.

WW Common Platform Capability: The TSUMV59 family supports ATSC, DVB-T, DVB-C, and ISDB-T demodulation functions. It reserves transport stream inputs for external demodulators for other countries or areas. TV maker can easily port the same UI to worldwide TV models. First-class adjacent and co-channel rejection capability grants excellent reception. Professional error-concealment provides stable, smooth and mosaic-free video quality.

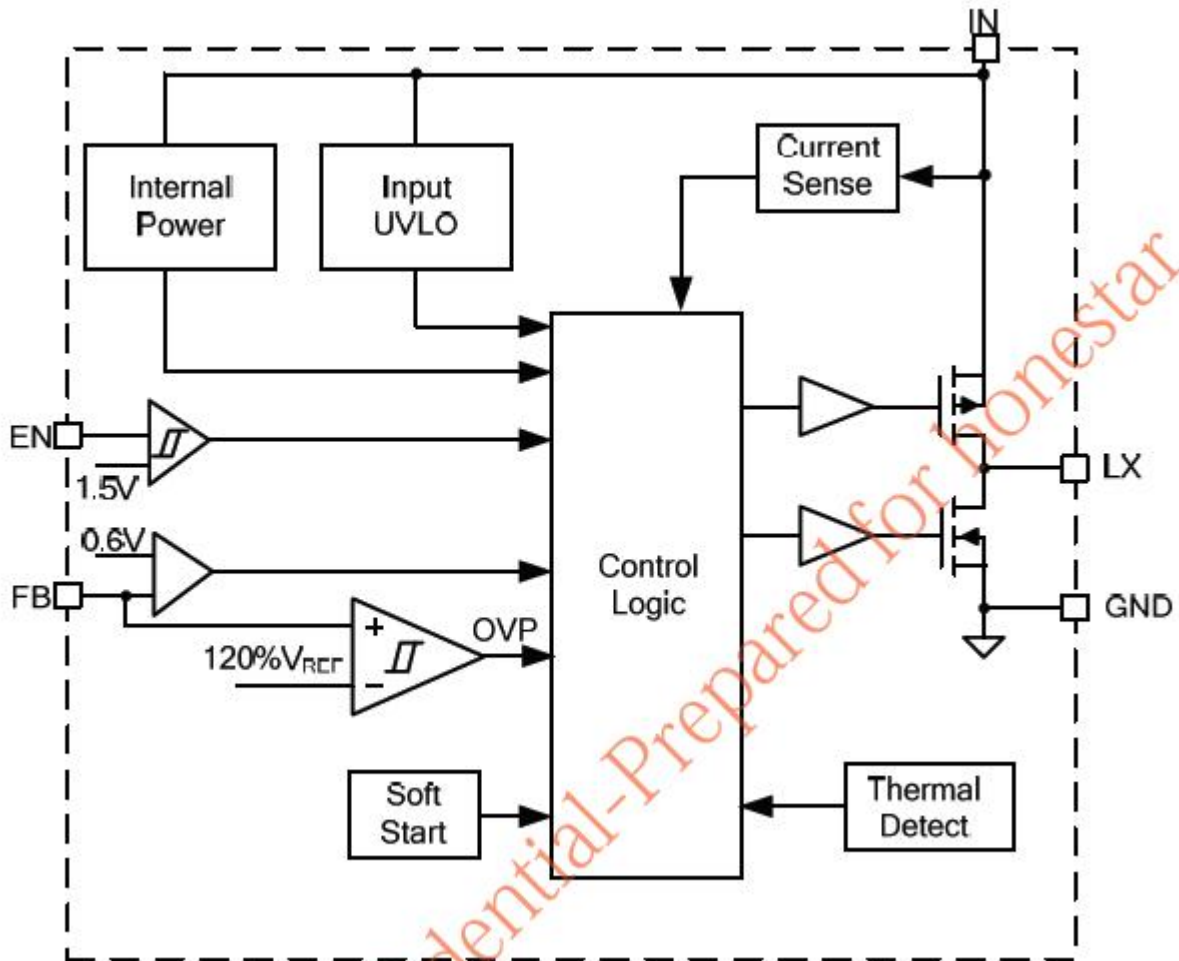
7.1 LNK6777K



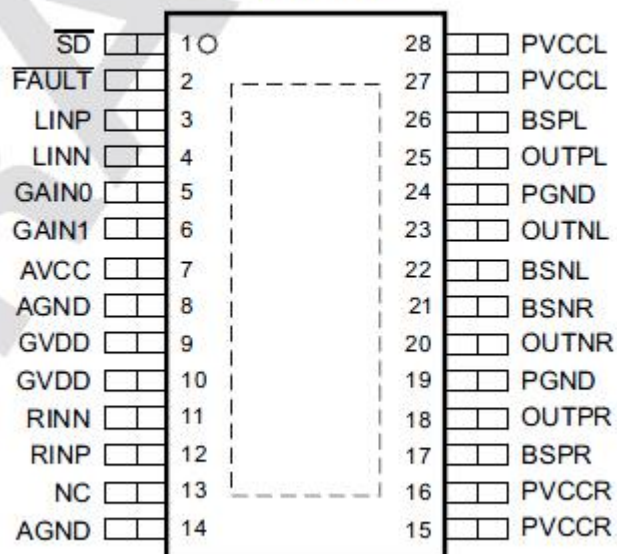
7.3 SY800XX



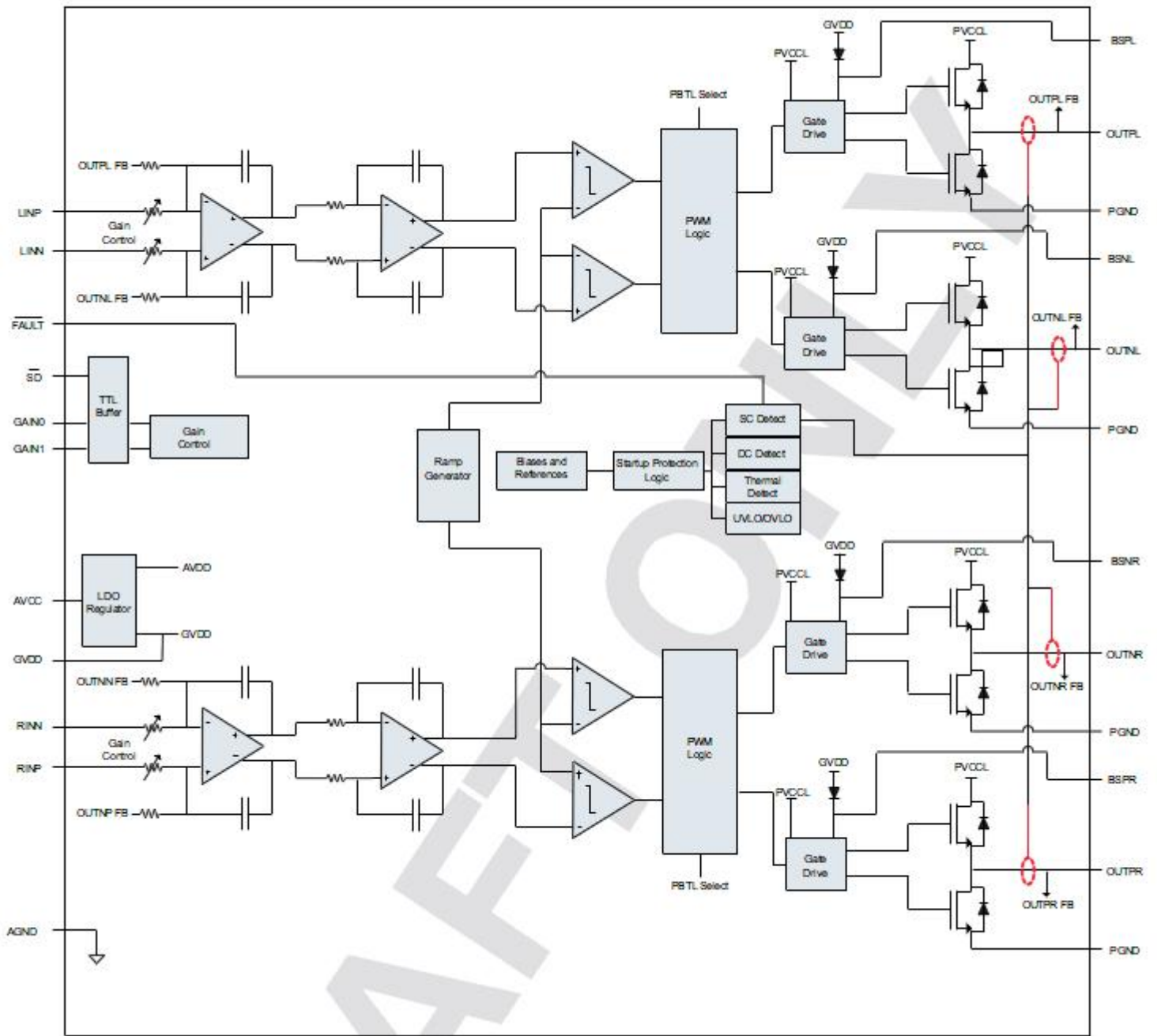
Block Diagram



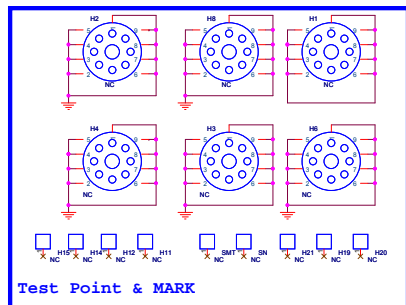
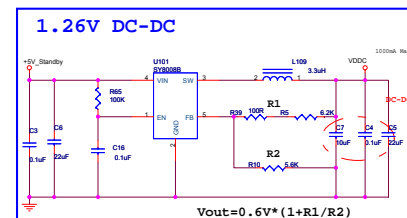
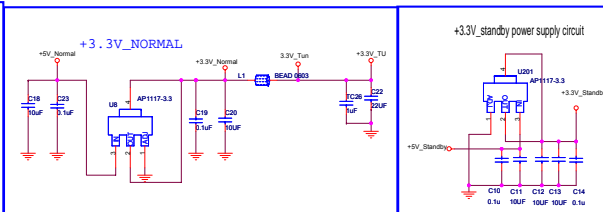
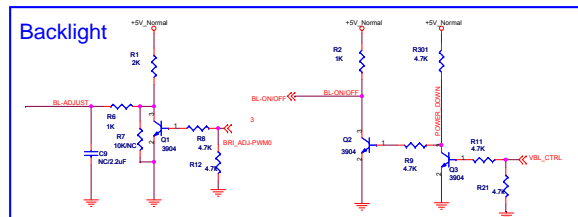
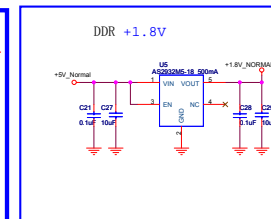
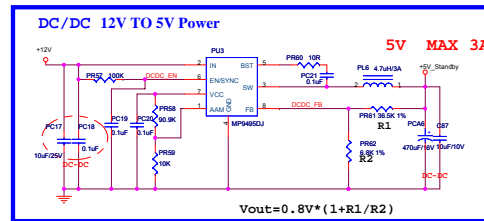
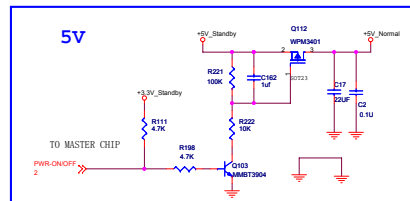
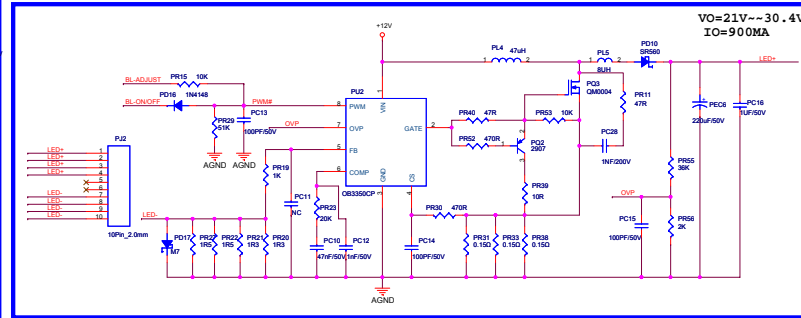
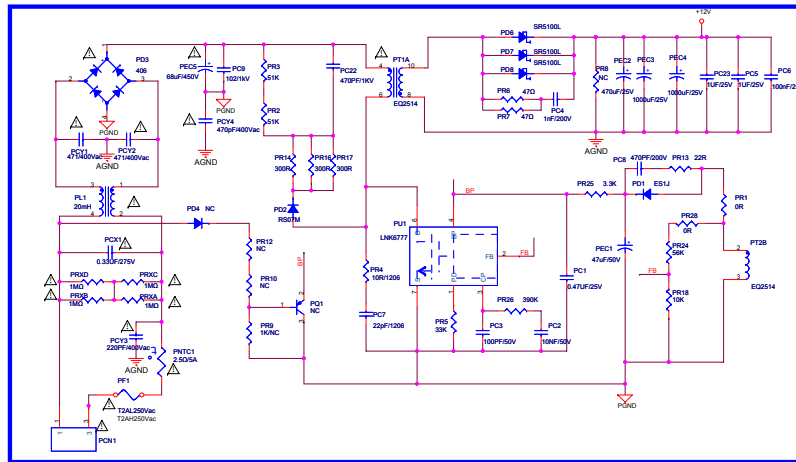
PWP (TSSOP) PACKAGE
(TOP VIEW)



FUNCTIONAL BLOCK DIAGRAM

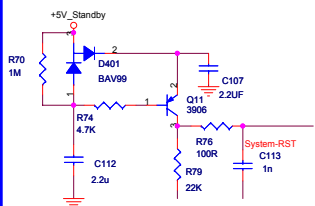


8. Circuit Diagrams

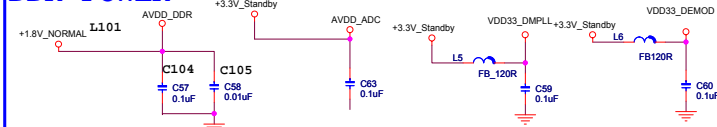
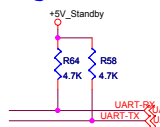


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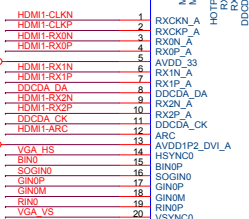
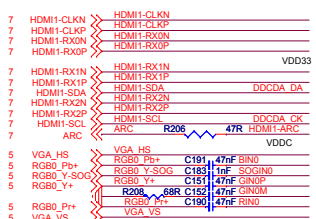
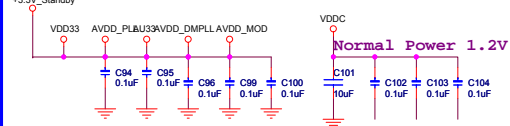
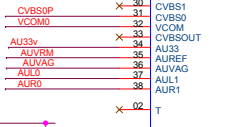
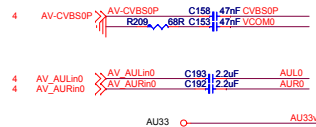
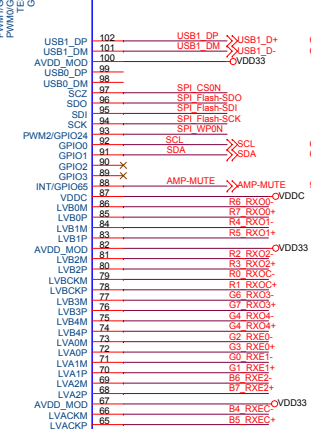
RESET



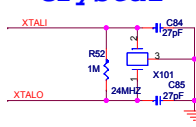
Debug Port



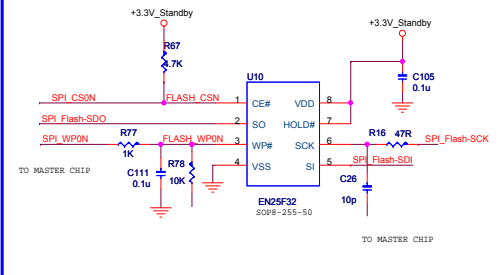
NORMAL 3.3V 1.2V

**TSUMV59XES-SJ**

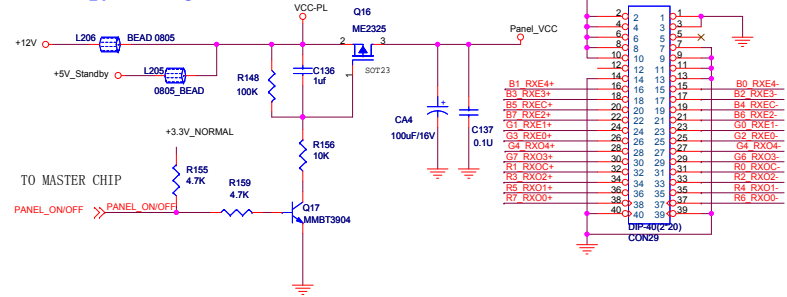
Crystal



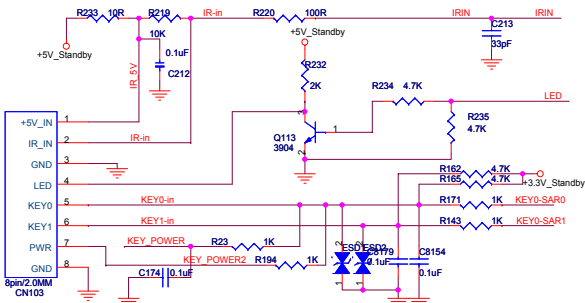
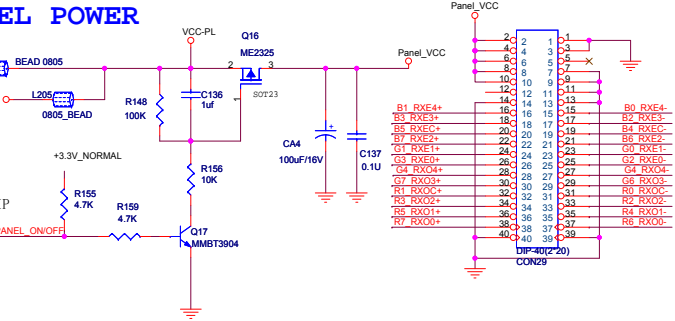
FLASH



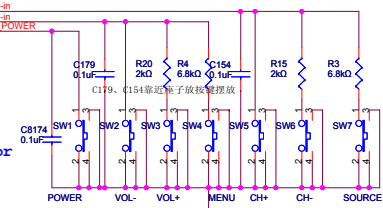
PANEL POWER

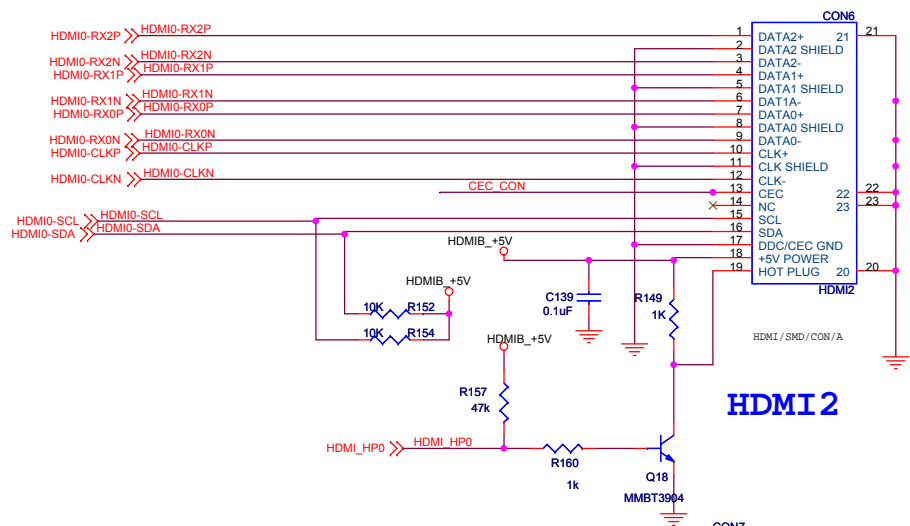


LVDS CONNECTOR

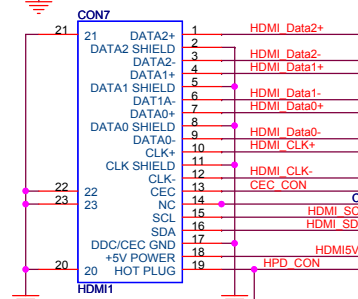


IR&KEY Connector

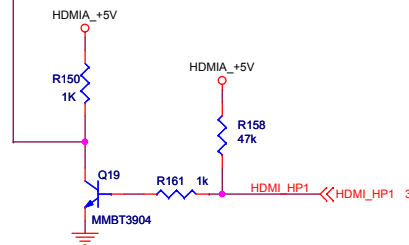
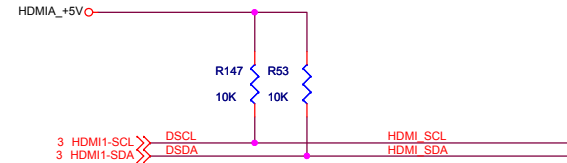
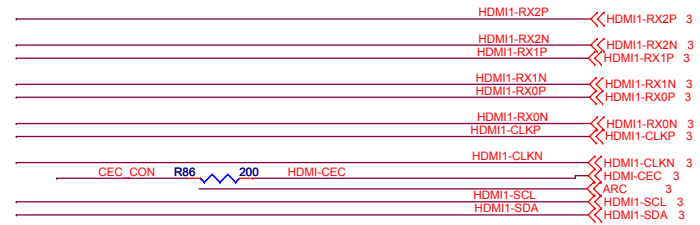




HDMI 2



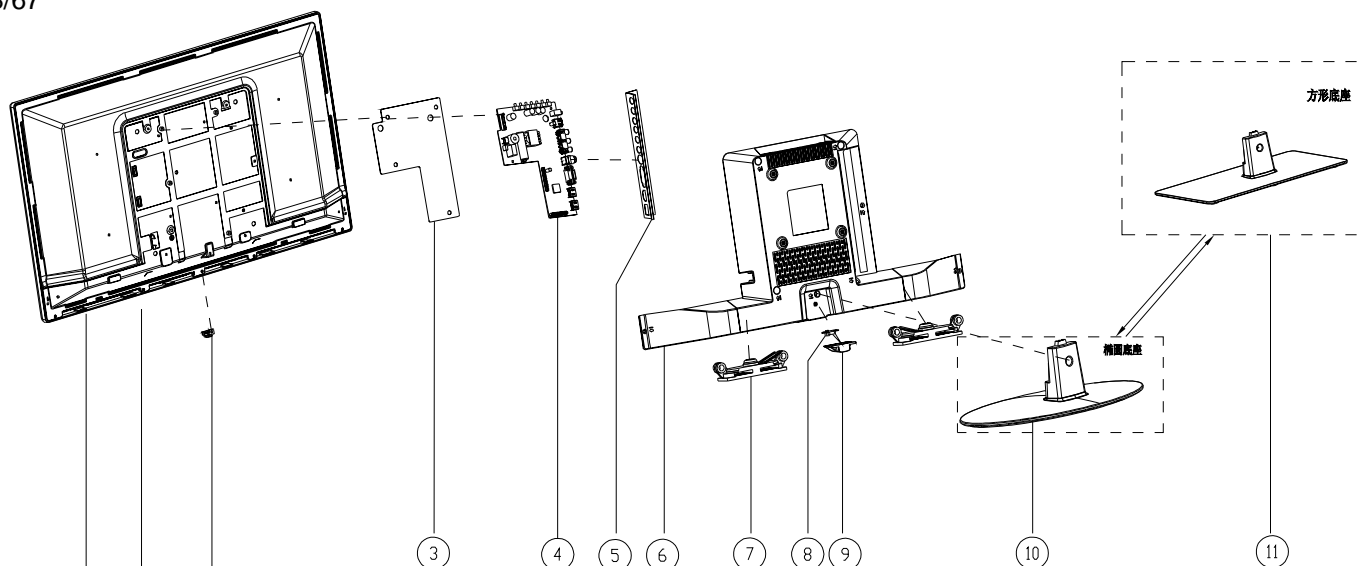
HDMI 1



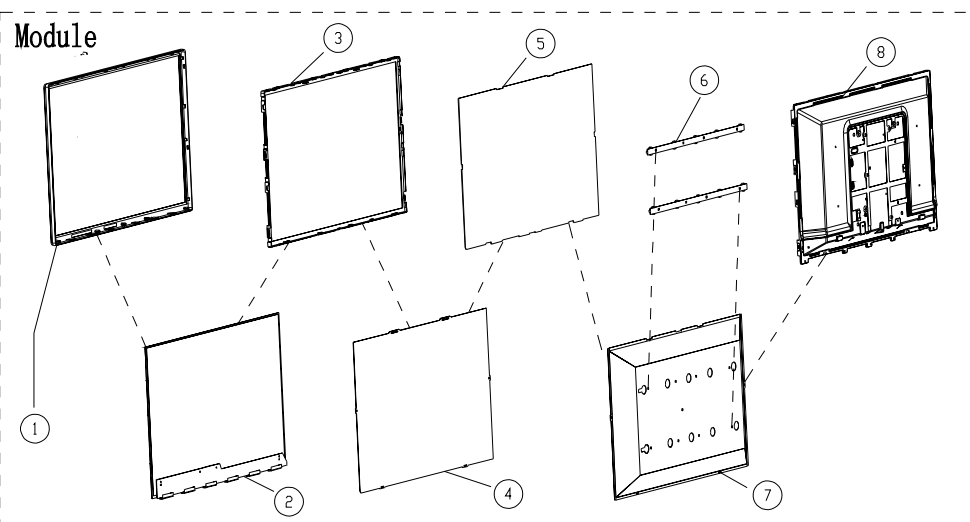
9. Styling Sheet

24" 24PHA4100S/67

REV.	ECN.	NO.	APPD.	DATE



Module



No.	Name	Vendor code	Qty
11	Black base	9000-00000-00000001	1
10	Black base	9000-00000-00000001	1
9	Black control remote display	9000-00000-00000001	1
8	Black control remote display	9000-00000-00000001	1
7	Black control remote display	9000-00000-00000001	1
6	Black control remote display	9000-00000-00000001	1
5	Black control remote display	9000-00000-00000001	1
4	Black control remote display	9000-00000-00000001	1
3	Black control remote display	9000-00000-00000001	1
2	Black control remote display	9000-00000-00000001	1
1	Black control remote display	9000-00000-00000001	1

Detail for whole structure

No.	Name	Vendor code	Qty
11	Black base	9000-00000-00000001	1
10	Black base	9000-00000-00000001	1
9	Black control remote display	9000-00000-00000001	1
8	Black control remote display	9000-00000-00000001	1
7	Black control remote display	9000-00000-00000001	1
6	Black control remote display	9000-00000-00000001	1
5	Black control remote display	9000-00000-00000001	1
4	Black control remote display	9000-00000-00000001	1
3	Black control remote display	9000-00000-00000001	1
2	Black control remote display	9000-00000-00000001	1
1	Black control remote display	9000-00000-00000001	1

Detail for module

X± .200	X*± 0.050
X± .100	X*± 0.010
.XX± .01	.XX*± 0.005
.XX± .005	.XX*± 0.002

24L81F Explosive View

KTC®

SHENZHEN KTC TECHNOLOGY CO., Ltd

2015-11-27

QTY	UNIT	SCALE	SHEET	REV.
	MM	1:1	1/1	A