Colour Television **Chassis**

Service
Service
Service

4200

Service Manual

Chassis name	Platform	Model name
4200	MSD6306	24PFH4200/96

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
•24PFH4200/96: 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

• without TV stand:
Width 561 mm - Height 345 mm - Depth 42 mm - Weight 3.6 kg
• with TV stand:
Width 561 mm - Height 373 mm - Depth 156 mm - Weight 3.8 kg

Connectivity
TV Side
• HDMI 1 in
• USB x 1
• Headphone x 1
• HDMI 2 in
Coaxial x 1

TV Rear
CVBS/Y Pb Pr : CVBS/Y Pb Pr, Audio L/R
Audio in: DVI
VGA x 1
• HDMI 2 in - MHL
• HDMI 3 in

Sound

Output Power (10% THD) RMS	4W
Speaker configuration	2W+2W
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

Power

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

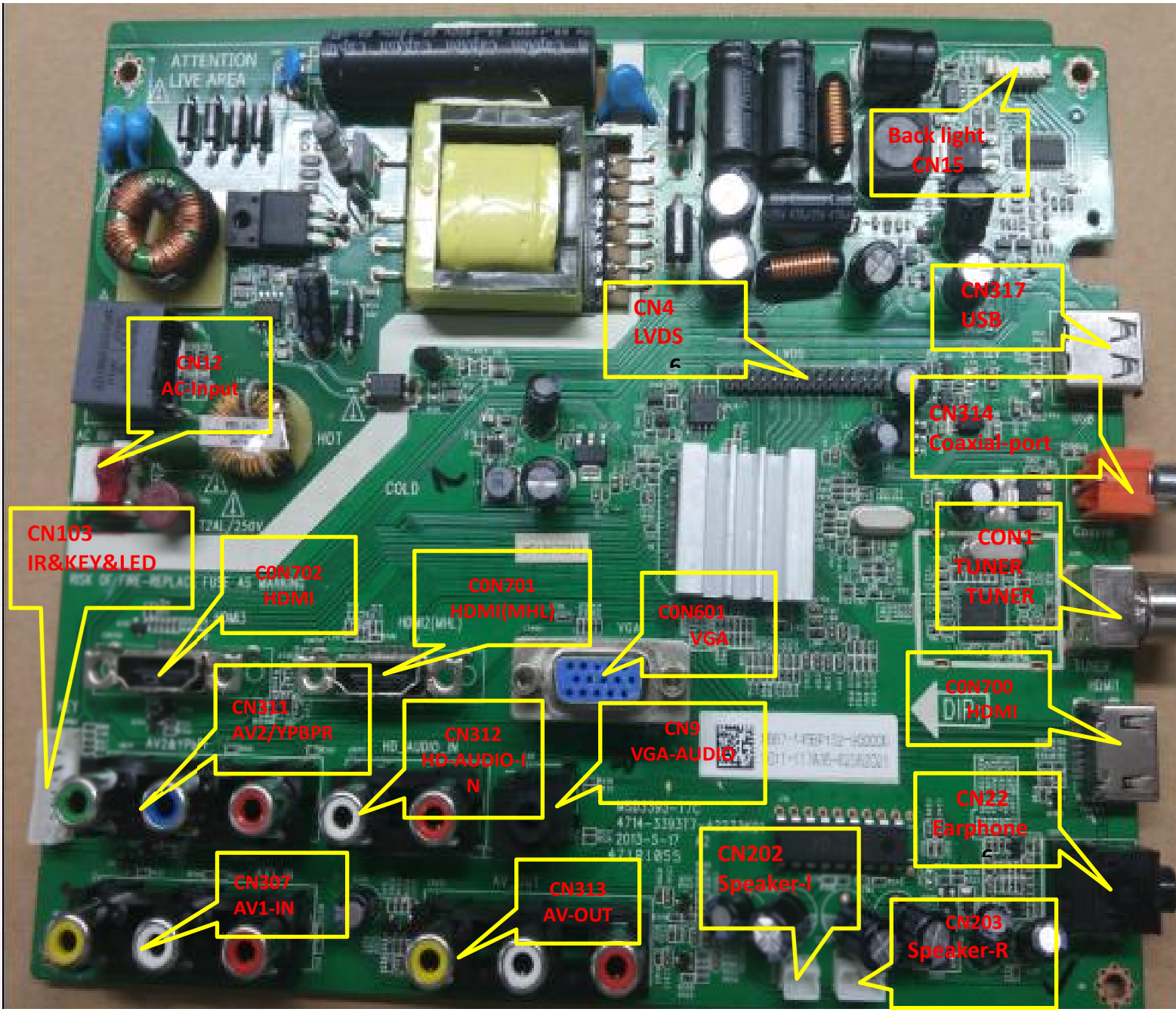
Power

• Mains power : AC 100-240V 50/60Hz

• Standby Energy Consumption:≤0.5W

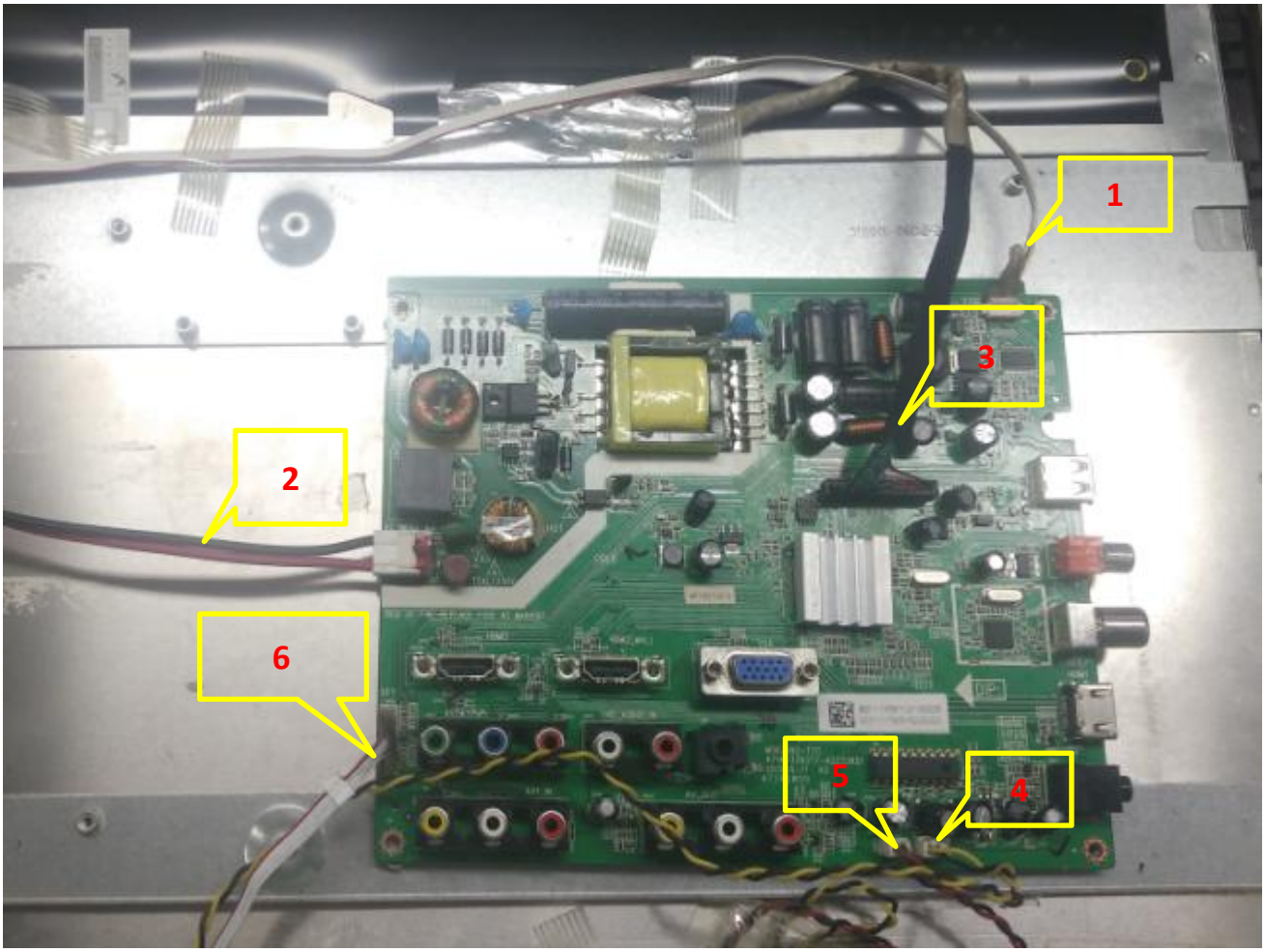
• Ambient temperature : 5°C to 40°C

2. Connections Overview



3. Mechanical Instructions

3.1 Cable dressing



Serial no	part description	function
1	Backlight wire	Connect to CN15
2	Power wire	Connect to CN12
3	LVDS wire	CN14 to T-CON board
4	Speaker wire	CON203 to speaker (yellow black wire)
5	Speaker wire	C0N202 to speaker (red black wire)
6	two-terminal wire	CN103 to IR board&LED

Cable dressing(24” 4200 series)

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 KEY board &IR&LED

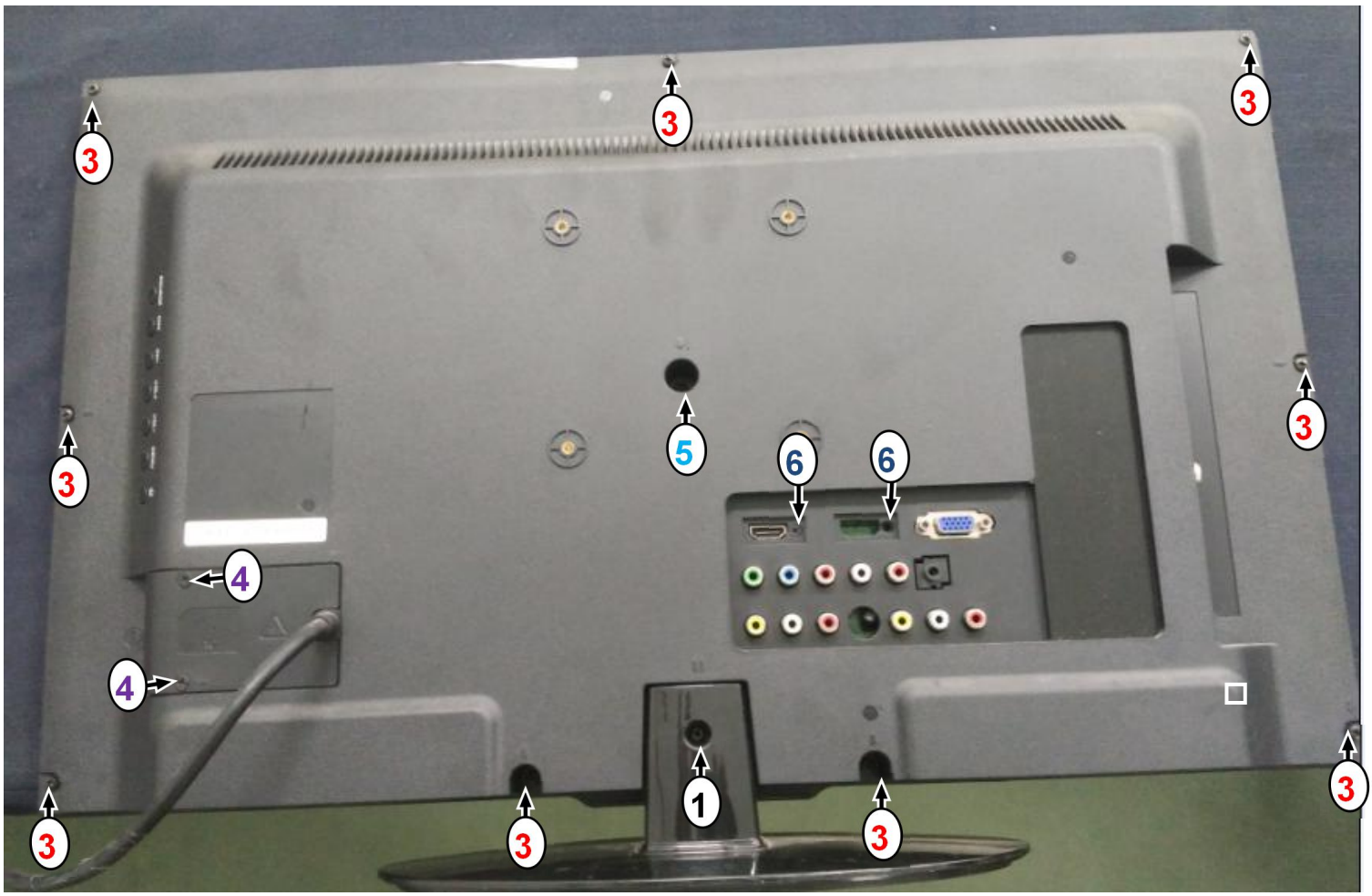
1. Unplug the connector from the SSB.
   Caution: be careful, as these are very fragile connectors!
2. Remove all the fixation screws(2)2pcs can remove the key board,then remove the same fixation screw (2)1pcs,Ir board and LED together,from the IR board control unit.
   When defective, replace the whole unit

.

3.2.3 Rear Cover

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

1. Remove fixation screws [3] [4] [5] and [6] 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 [3] [4] [5] and [6] that secure the back cover.unplug connectors （for 24**"24PFH4200/96**）



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/Sotf/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
Spectial 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

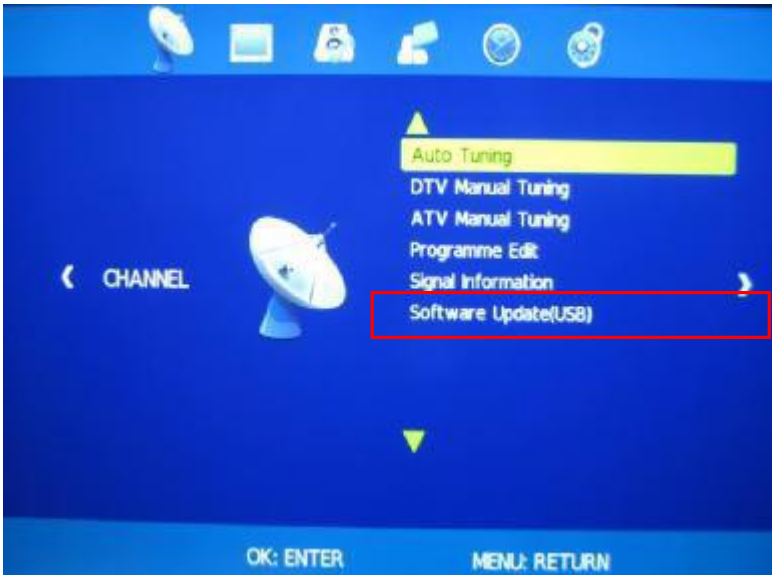
5.1 Software Upgrading

Operations and procedure of software upgrading:

1). Changed the file name to "MERGE.bin", then stored 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: Select AIR or DTV signal source, press Menu key to pop up the main menu, then choose.

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 extinguish and turn into lighting after about a minute, means that the upgrade is completed.

5.1.4 Notice：

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 U disk or damage the machine.

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
24PFH4200/96	K236WL3-MA200-1	7422-236CMK-28000061-F

6. Circuit Descriptions

6.1 Introduction

The 4200 is covered by MSD6306 platform. The major deltas versus its predecessor support DVB-T, with also WIFI/multi-media, Video out

The MSD6306 chassis comes with the following stylings:

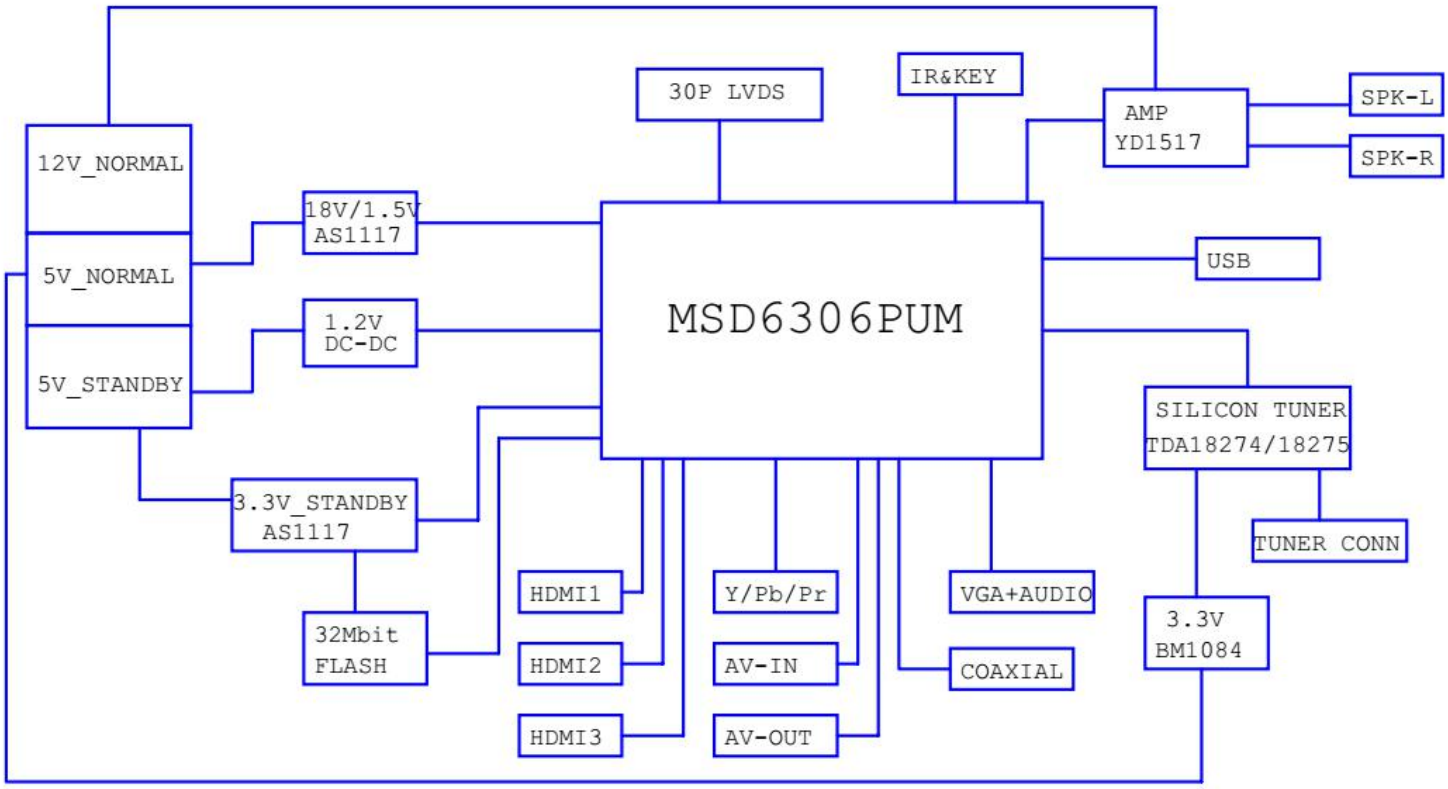
- Series 4200 24PFH4200/96

6.1.1 Implementation

Key components of this chassis are:

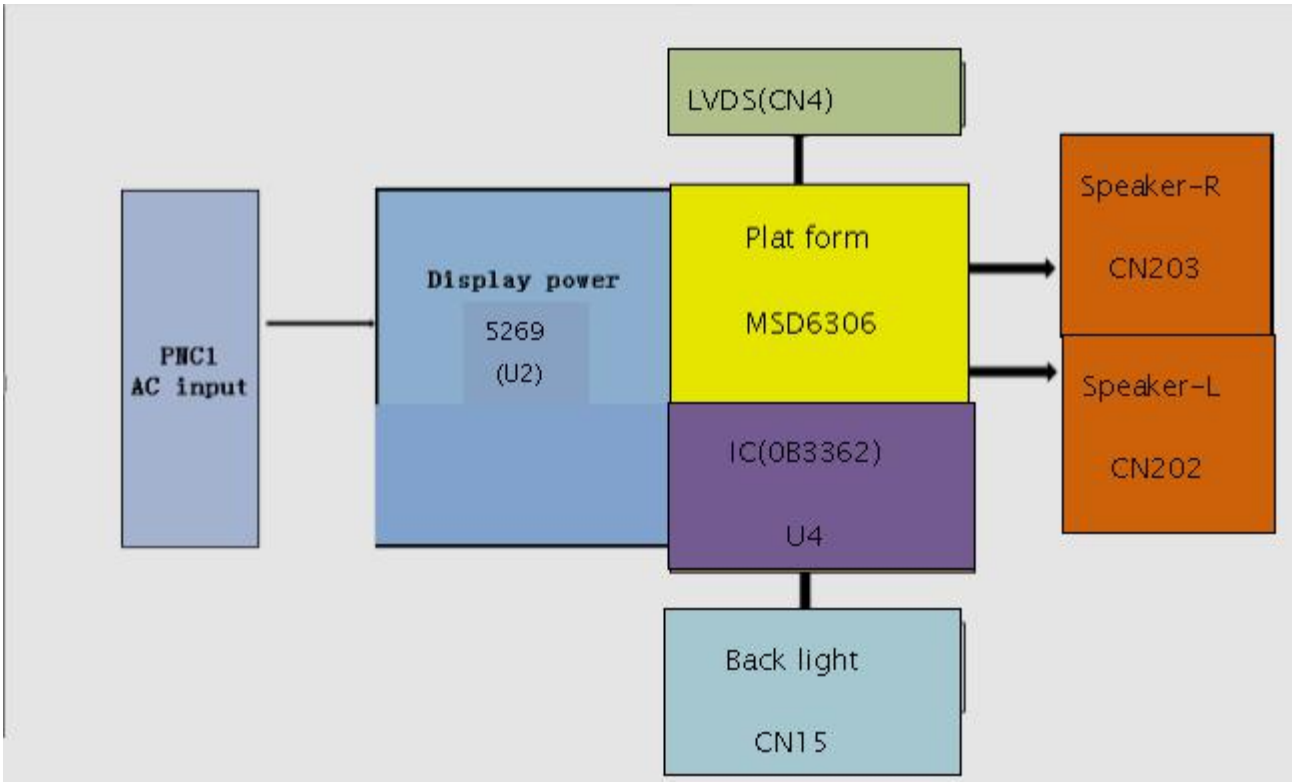
- TUNER POWER AS1117-33
- VDDC POWER
- MSD6306-T7
- 3.3V STANDBY AS1117 -33
- 64 Mbit SPI FLASH
- HDMI1 ARC
- HDMI2 MHL
- HDMI3 PORT

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).

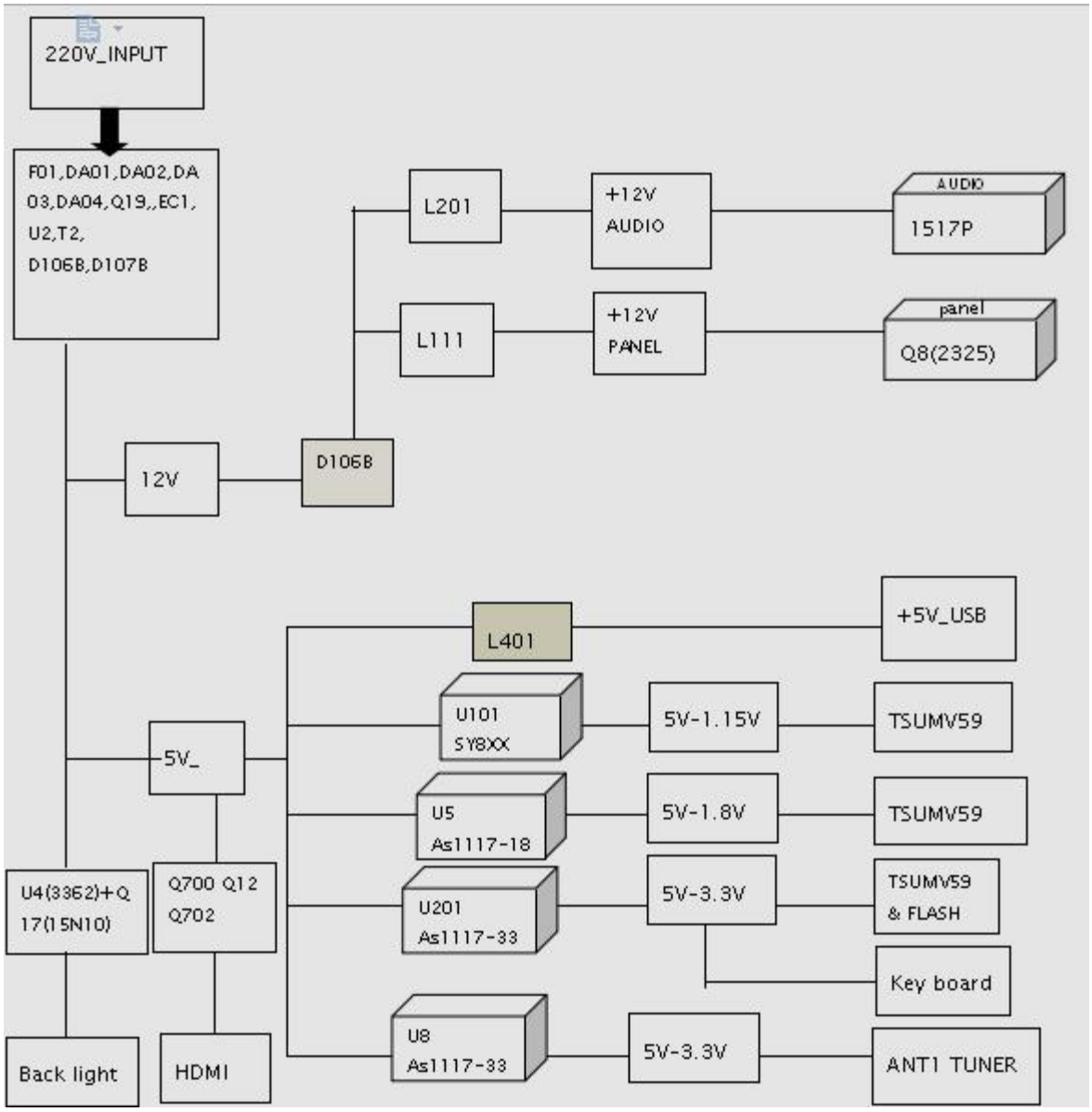
PSDL stands for a **P**ower **S**upply for **D**irect-view **L**ED backlight with 2D-dimming.

6.3 DC/DC Converters

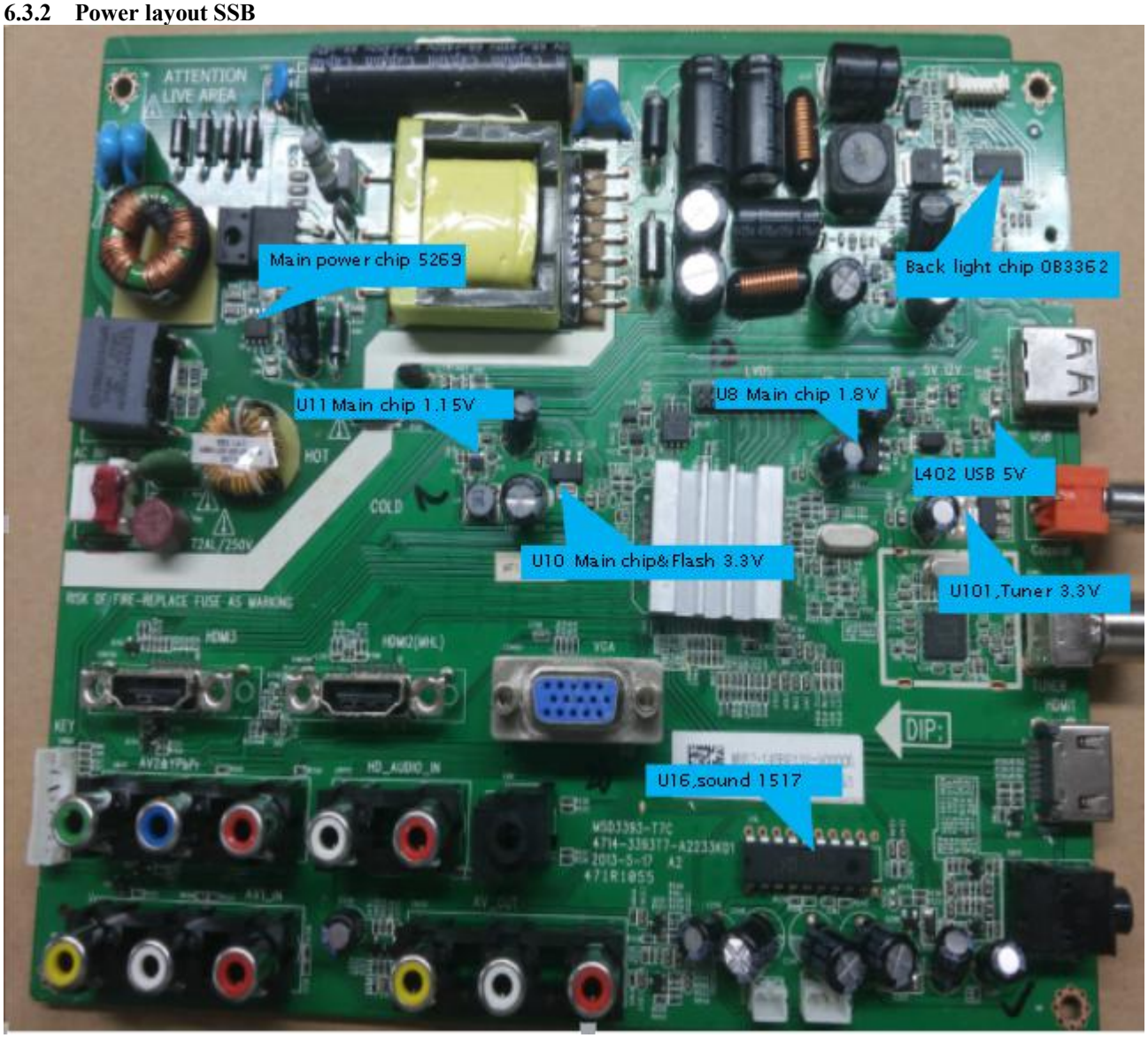
The on-board DC/DC converters deliver the following voltages(depending on set execution):

• +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

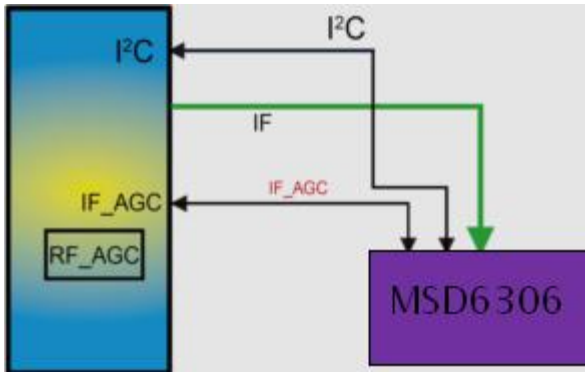
The Front-End for analogue tuner consist of the following key components:

• TUNER 18275

• SCALER MSD6306

Below find a block diagram of the front-end application for DVB-C part.18275+MSD6306

18275



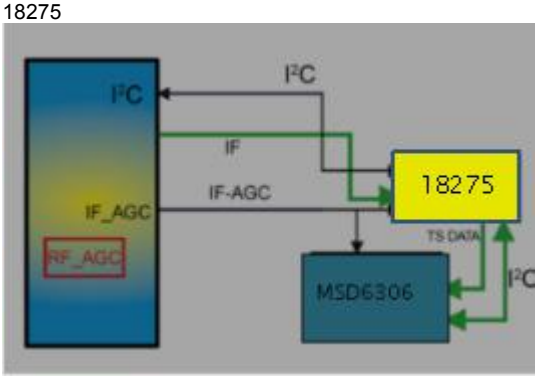
6.4.2 DTB-T2 part

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

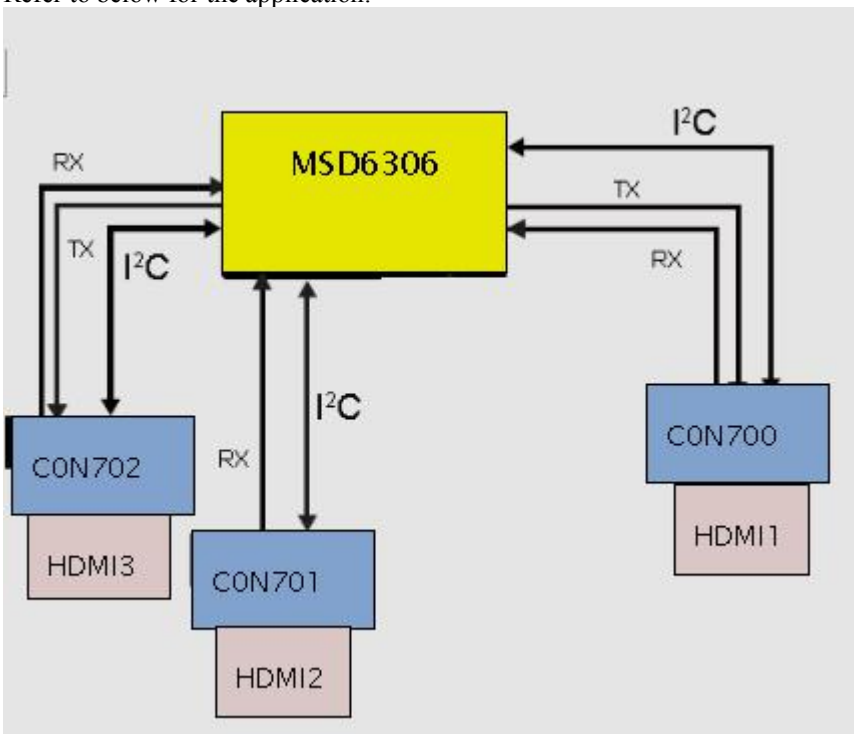
• TUNER EUROPE 18275

• SCALER MSD6306
Below find a block diagram of the front-end application for DTV part.

18275



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 IMHL input (TV digital interface support)
• HDMI 3: HDMI input (TV digital interface support HDCP)
• +5V detection mechanism
• Stable clock detection mechanism
• HPD control
• Sync detection
• TMDS output control
• CEC control
• ARC control
• MHL control

6.6 Video and Audio Processing - MSD6306
The MSD6306 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 muti-standard video decoder
8. Rich format audio codec

10. HDMI1.3receiver
11. MHL input
12. 2D converter
14. PWM dimming (LED backlight)
15. Two-link LVDS,

1 OVERVIEW

The World-Leading Audio/Video Technology: The The MSD6306 supports Full MPEG2/4/H.264 video decoder standards, and JPEG. The MSD6306 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 MSD6306 enables consumer electronics manufacturers to build high quality, low cost and feature-rich DTV. The MSD6306 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 MSD6306 family has built-in high resolution and high-quality audio codec.

Rich Features for High Value Products:The MSD6306 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 MSD6306 family provides consumers with FHD 60Hz direct drive.

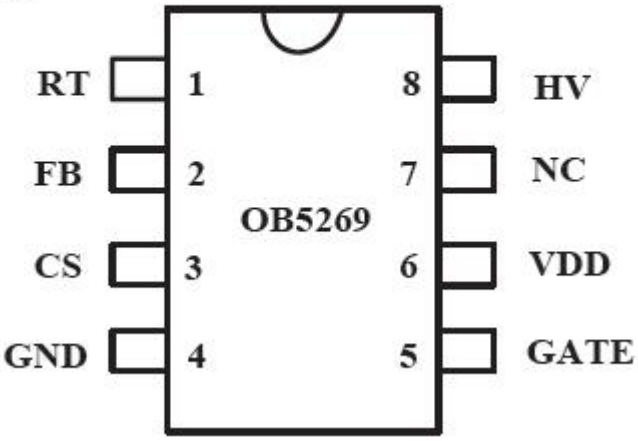
WW Common Platform Capability: The MSD6306 family supports ATSC, DVB-T, DVB-C, and ISDB-T demodulation functions. It reserves transport stream inputs for external demodulators for other countries or areas. TV maker can easily port the same UI to worldwide TV models. First-class adjacent and co-channel rejection capability grants excellent reception.Professional error-concealment provides stable, smooth and mosaic-free video quality.

7. IC Data Sheets

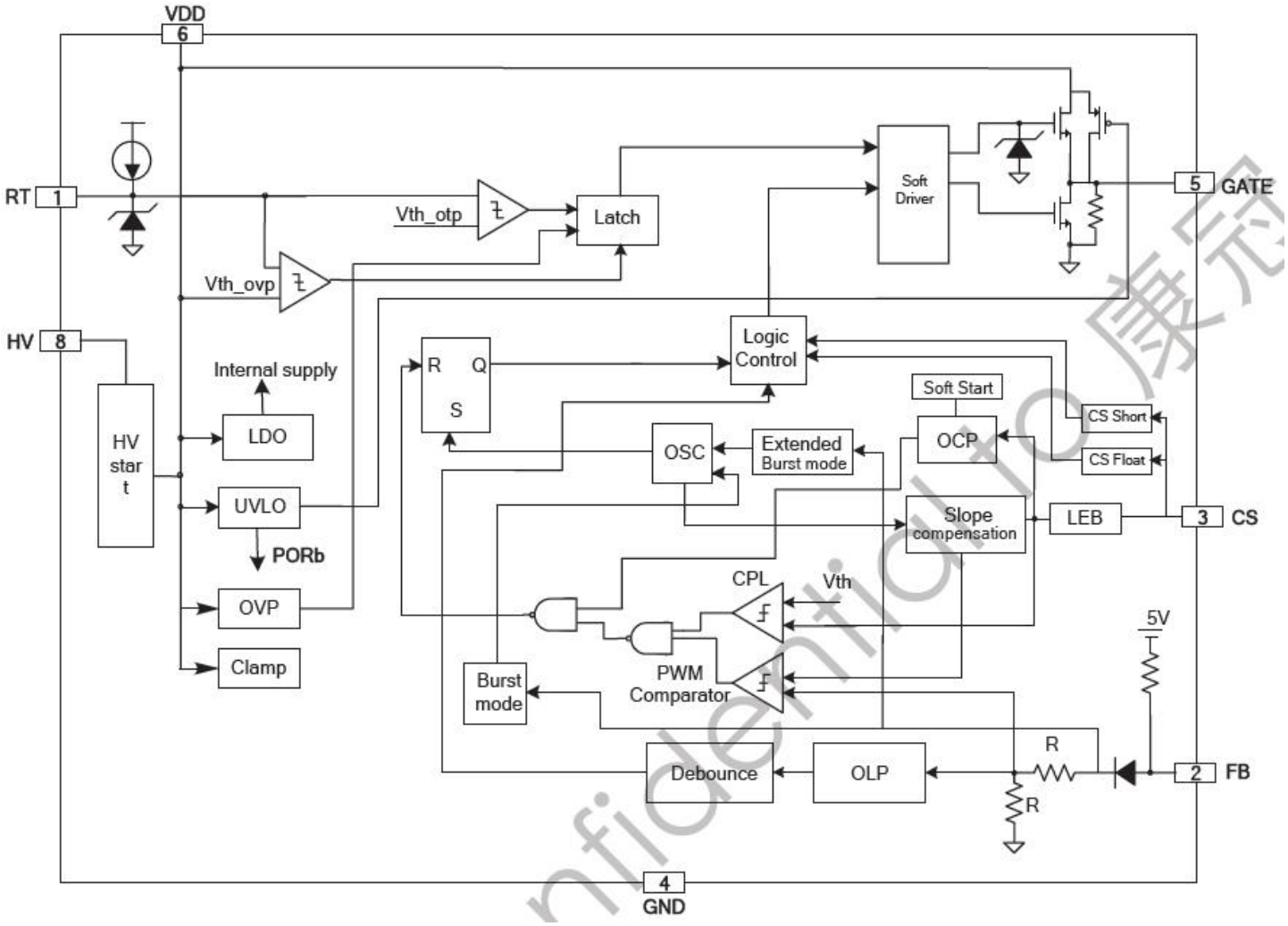
7.1 0B5269

Pin Configuration

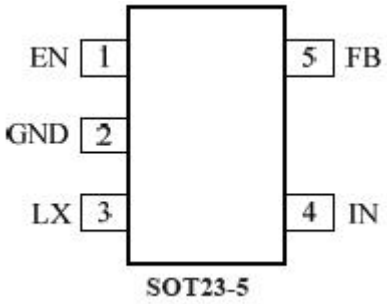
The OB5269 is offered in SOP8 package, shown as below.



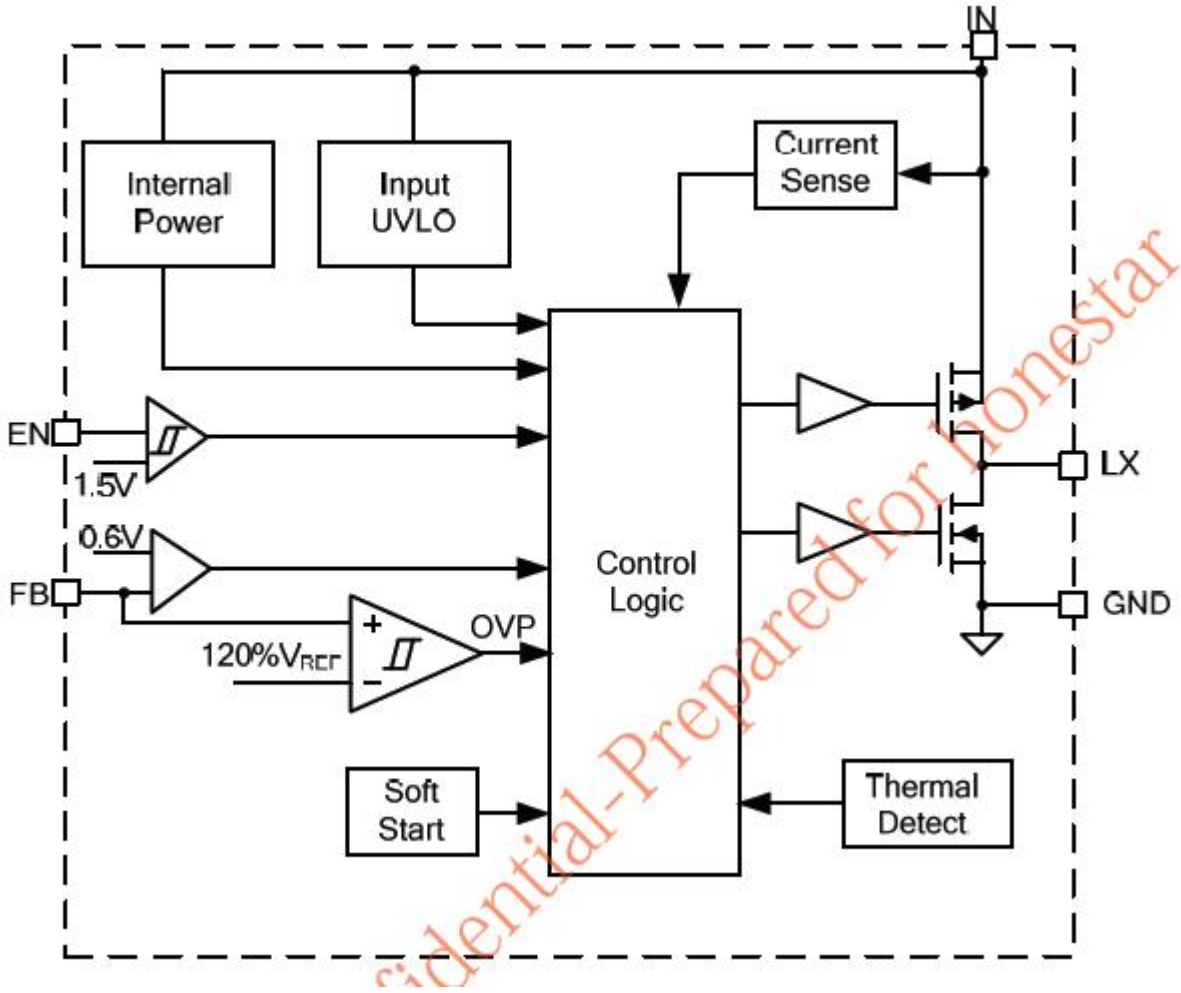
BLOCK DIAGRAM



7.2 SY800XX



Block Diagram



8. Circuit Diagrams

MSD3393(ATSC)/MSD6306PUM(DVB-T)--T7C三合一板原理图

History Rev

DATE	Rev	Description	Author
06/20/2014	Ver:A1.0	First Version Release	ZHQING

KTC ISO9001.ISO14001体系文件			
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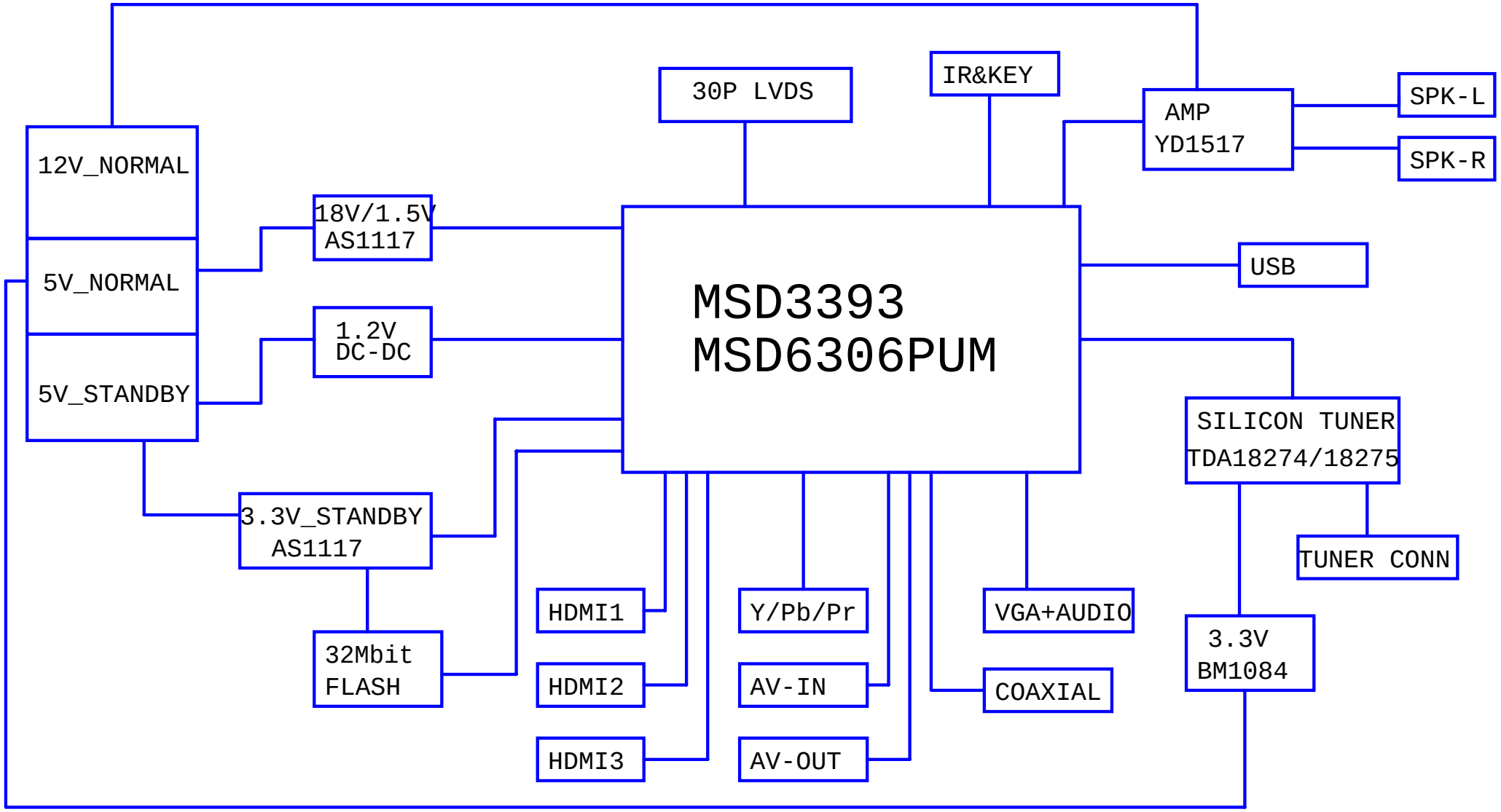
文件编号：	T4243	版本：3.0	页数： 1 of 9
设计:	张志清	审核:	批准:
发行部门：	研发处	生效日期：	Monday, June 23, 2014



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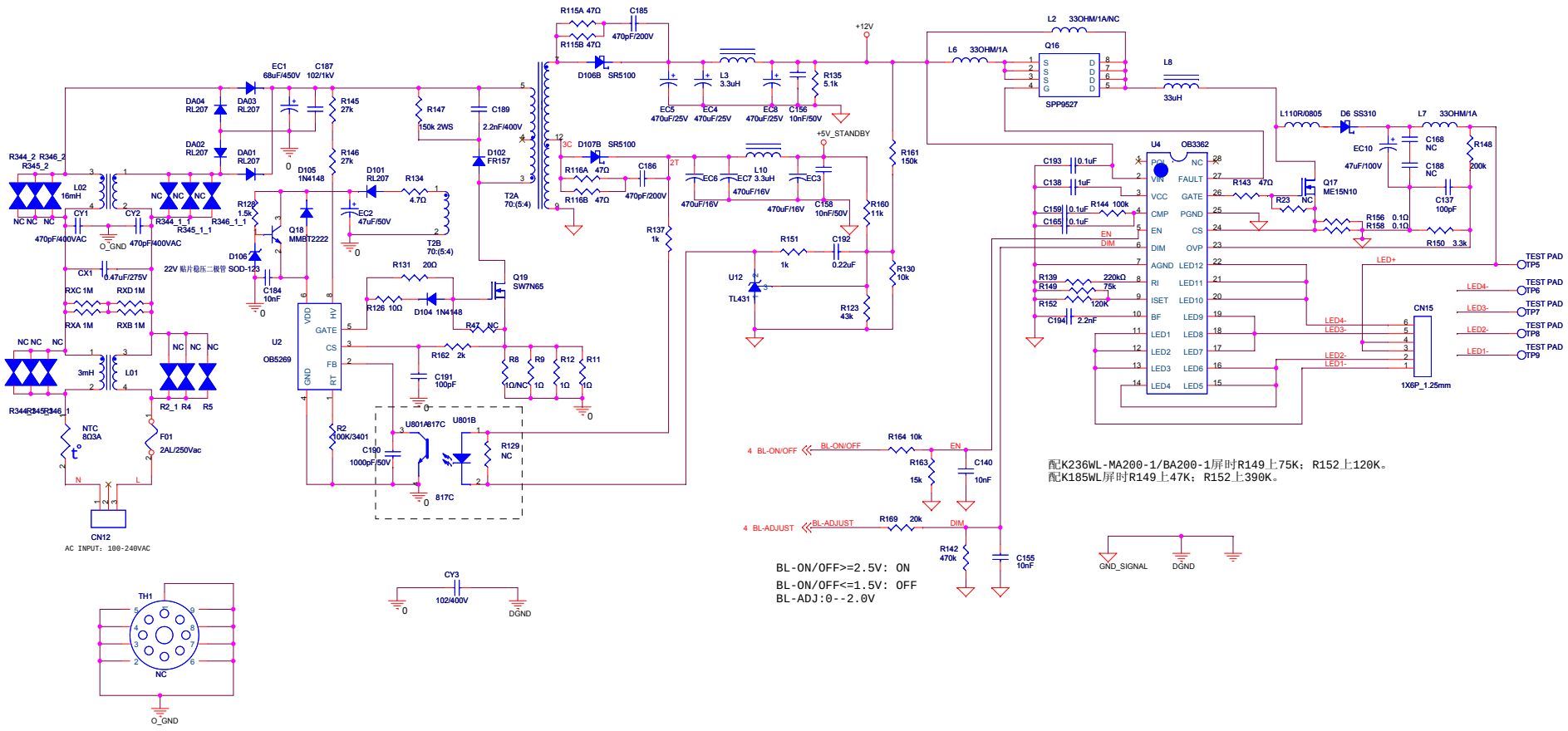

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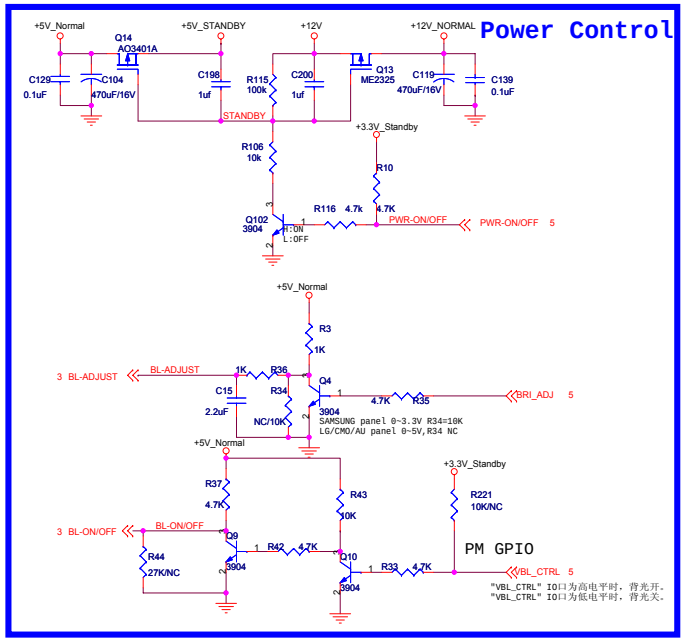
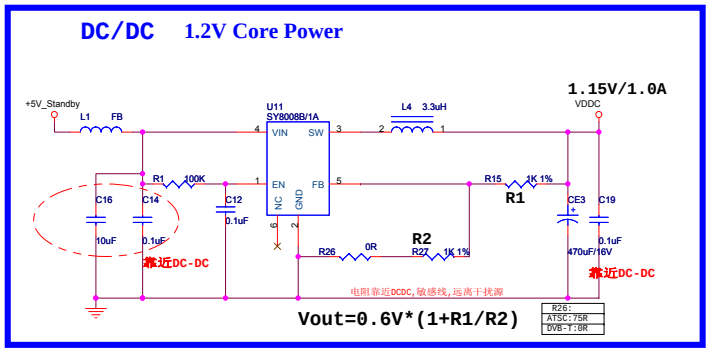
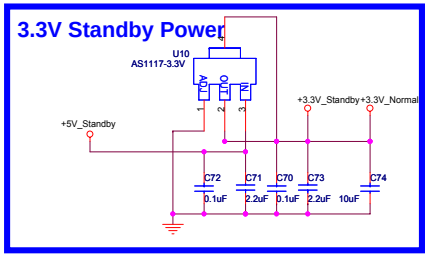
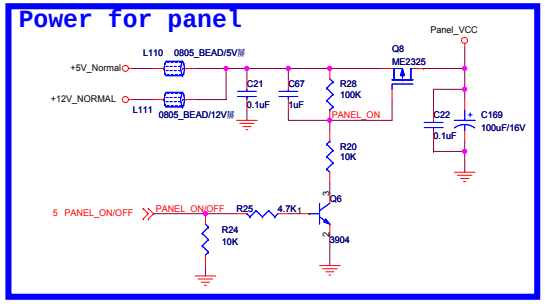
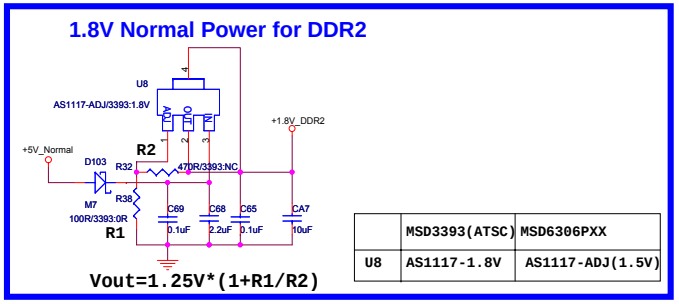


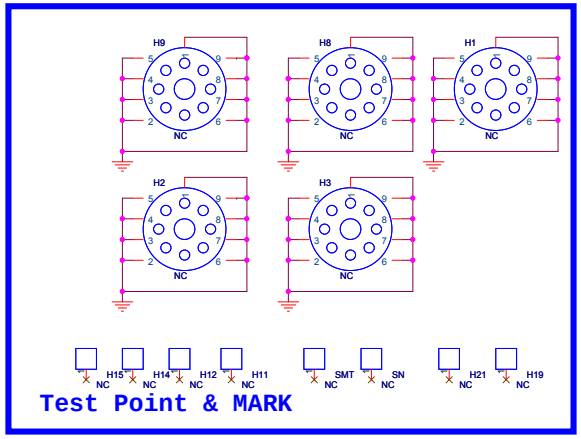


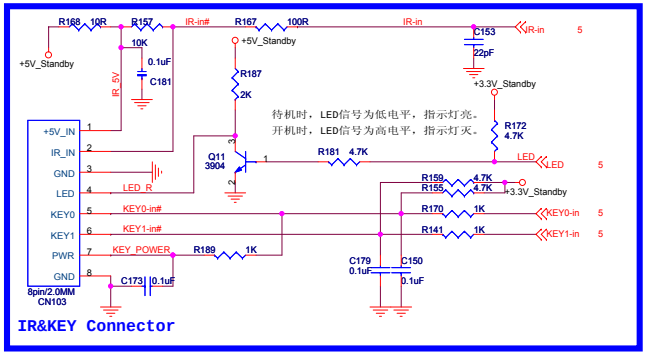






	MSD3393(ATSC)	MSD6306PXX
U8	AS1117-1.8V	AS1117-ADJ(1.5V)

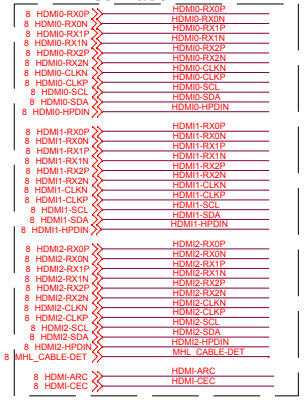




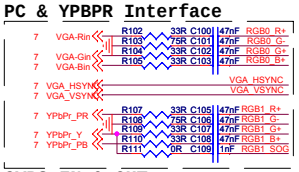
所用IO口	KEY0				KEY1		
按键功能	CH+	CH-	SOURCE	POWER	VOL-	VOL+	MENU
电阻值	0欧	2K	6.8K	1K	0欧	2K	6.8K
电压值	0V	0.98V	1.95V	0.58V	0V	0.98V	1.95V

KTC ISO9001.ISO14001体系文件			
文件名称：MSD6306PUM(台湾DVB-T)T7C三合一板原理图			
文件编号：	T4243	版本：3.0	页数： 4 of 9
设计：	张志清	审核：	批准：
发行部门：	研发处	生效日期：	Monday, June 23, 2014

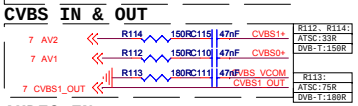
HDMI Interface



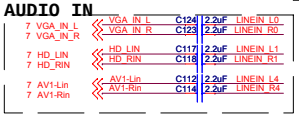
PC & YPBPR Interface



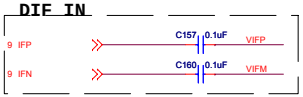
CVBS IN & OUT



AUDIO IN

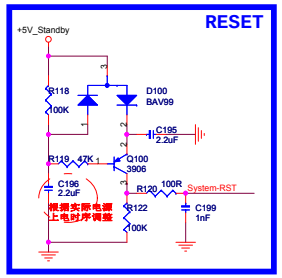


DIF IN

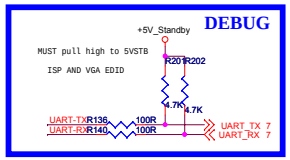


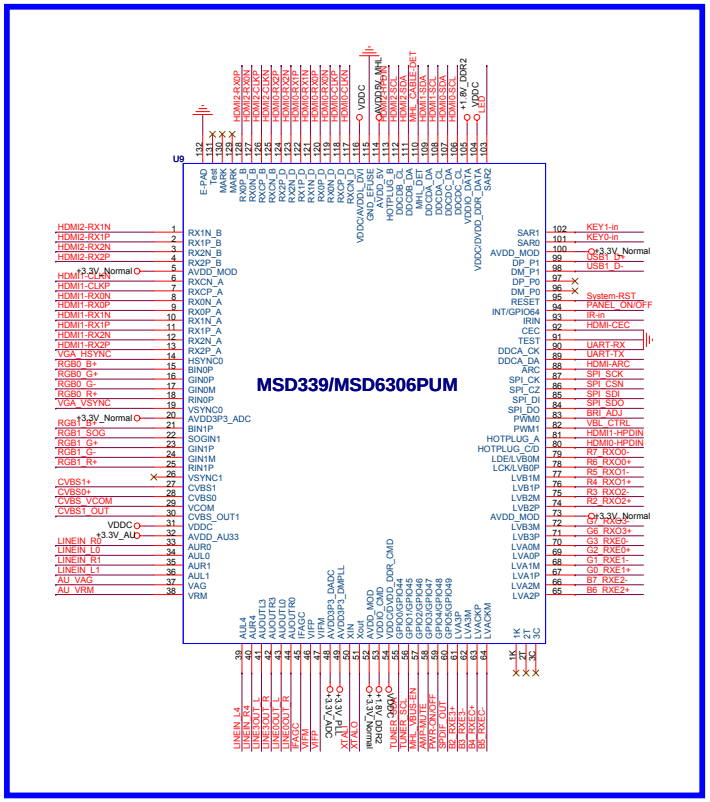
USB & SPDIF_OUT

RESET

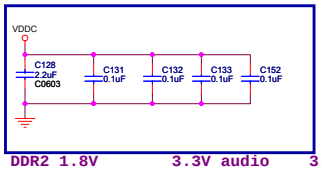


DEBUG

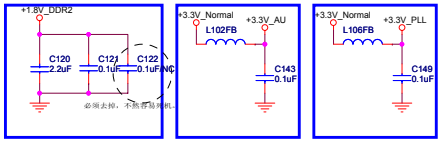




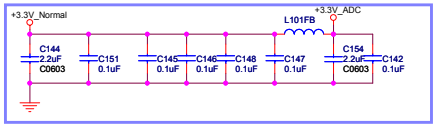
VDDC 1.15V



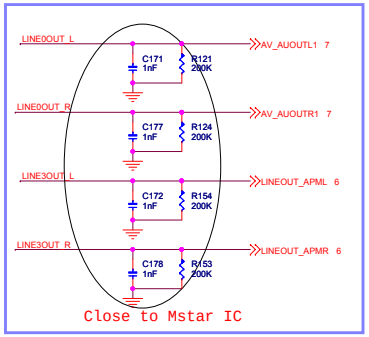
DDR2 1.8V　3.3V audio　3.3V MPLL

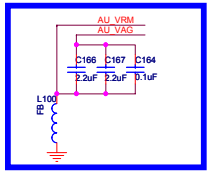


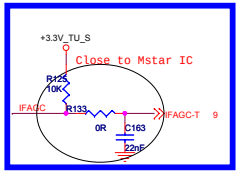
3.3V



Audio Line Out

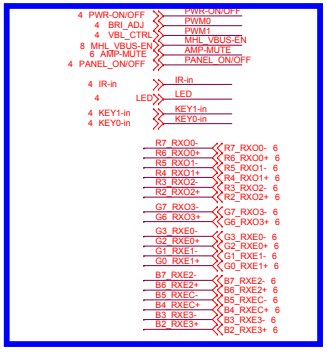




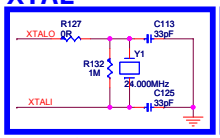


不同的芯片，支持不同的电视制式。

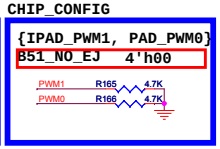
	ATSC	DVB-T
U9	MSD3393	MSD6306PUM



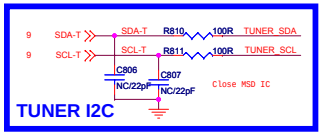
XTAL



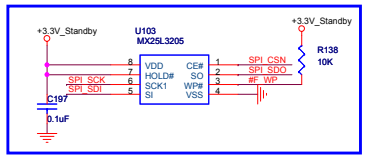
CHIP_CONFIG



TUNER I2C



FLASH



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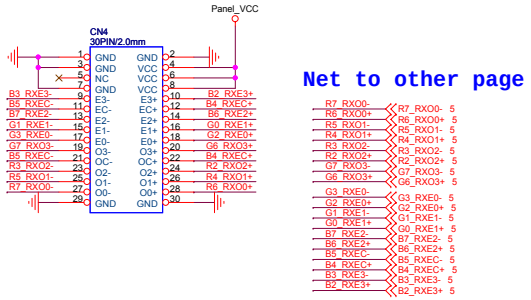
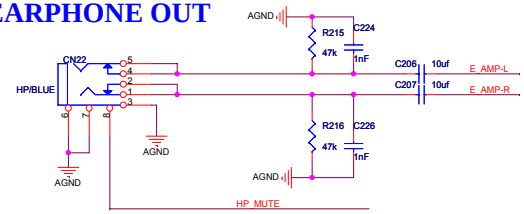
设计：	张志清	审核：	批准：
发行部门：	研发处	生效日期：	Monday, June 23, 2014

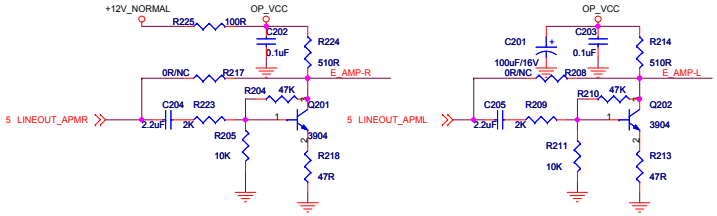
LVDS



Net to other page

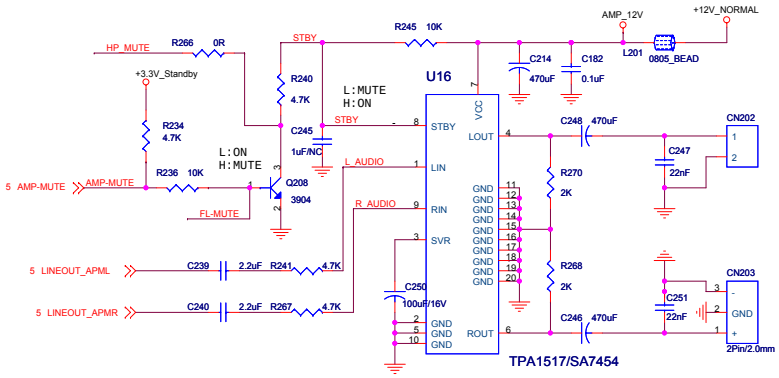
EARPHONE OUT





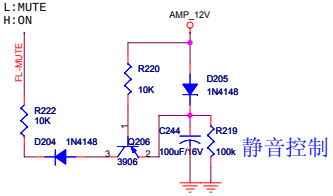
AUDIO OP

AUDIO Amplifier



TDA1517:2W

第8脚STBY：0--2V 待机
3.3--6.4V 静音
高于8.5V 正常工作



静音控制

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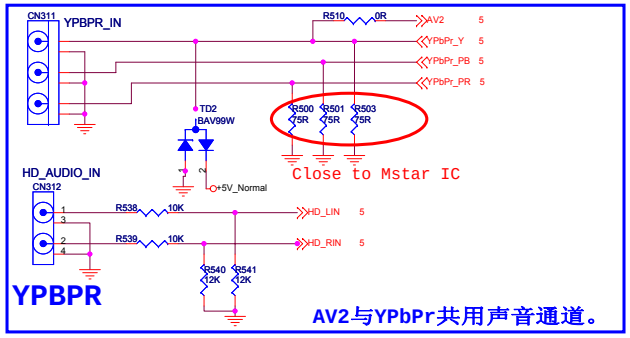
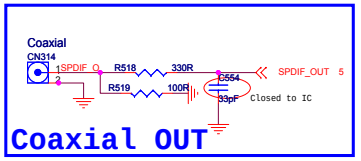
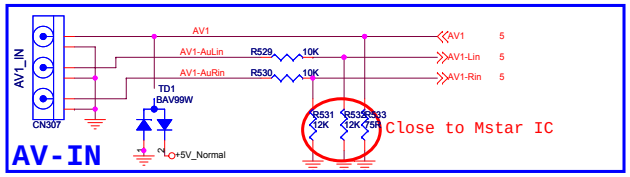
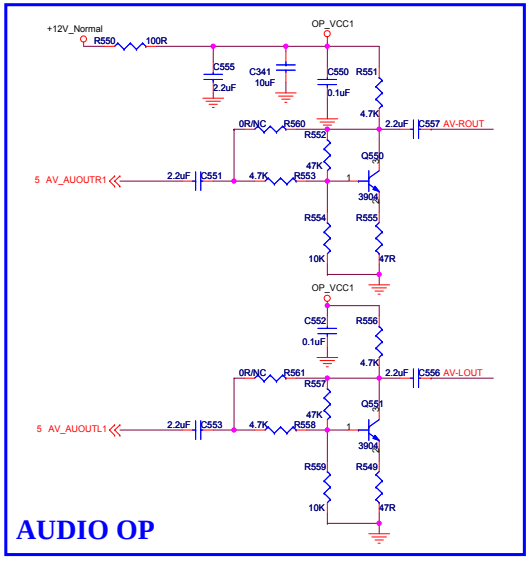
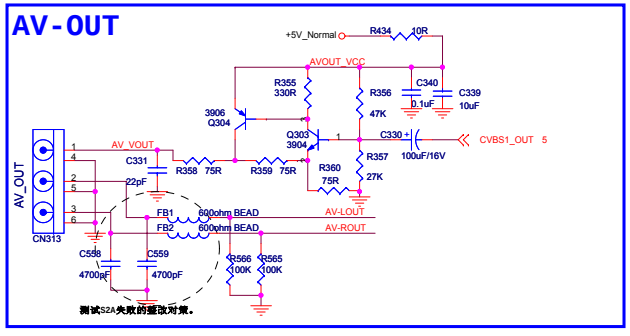
文件名称：MSD6306PUM(台湾DVB-T)T7C三合一板原理图			
文件编号：	T4243	版本：3.0	页数： 6 of 9
设计：	张志清	审核：	批准：
发行部门：	研发处	生效日期：	Monday, June 23, 2014

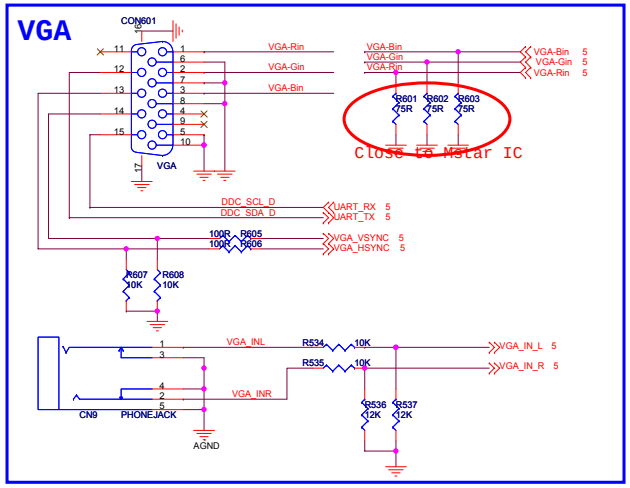


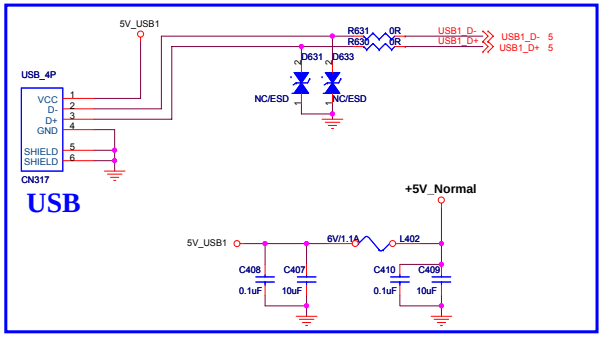












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文件名称：MSD6306PUM(台湾DVB-T)T7C三合一板原理图			
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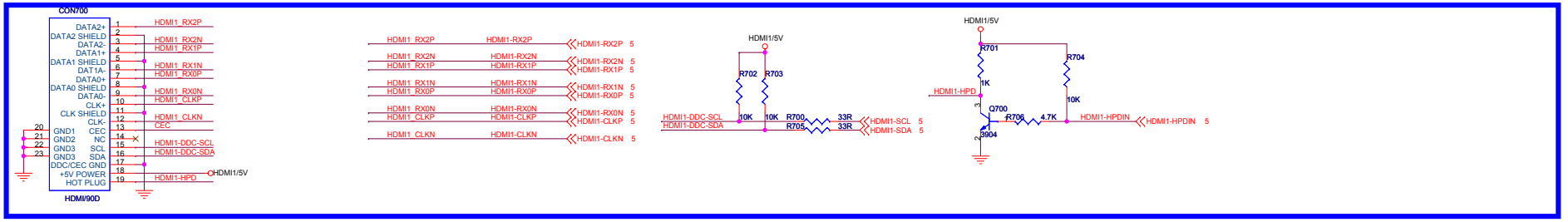
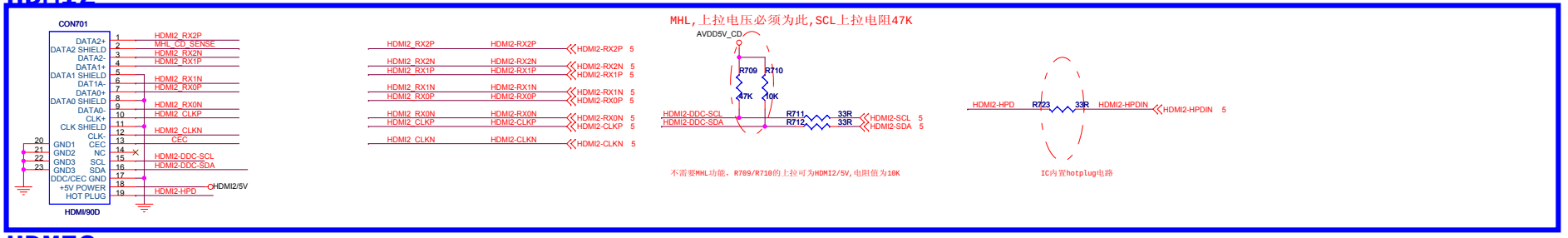
设计：	张志清	审核：	批准：
发行部门：	研发处	生效日期：	Monday, June 23, 2014

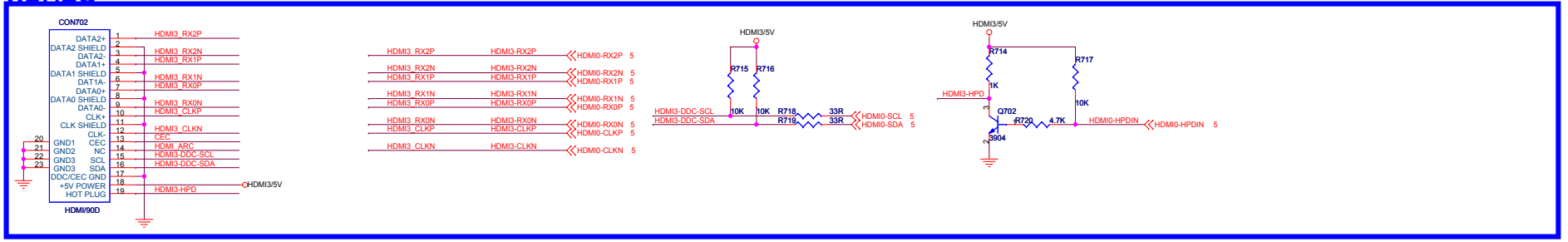
HDMI1



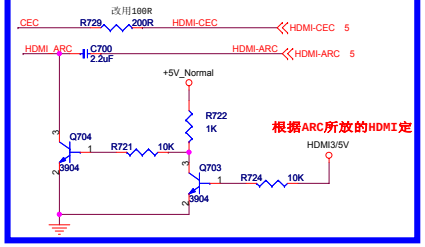
HDMI2



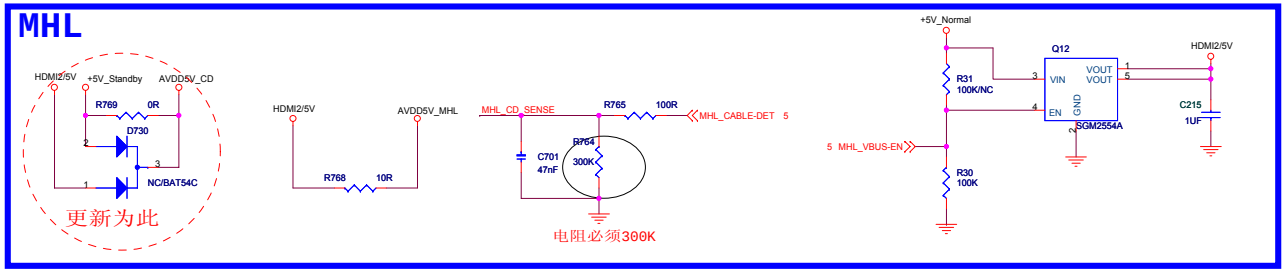
HDMI3



CEC & ARC



MHL



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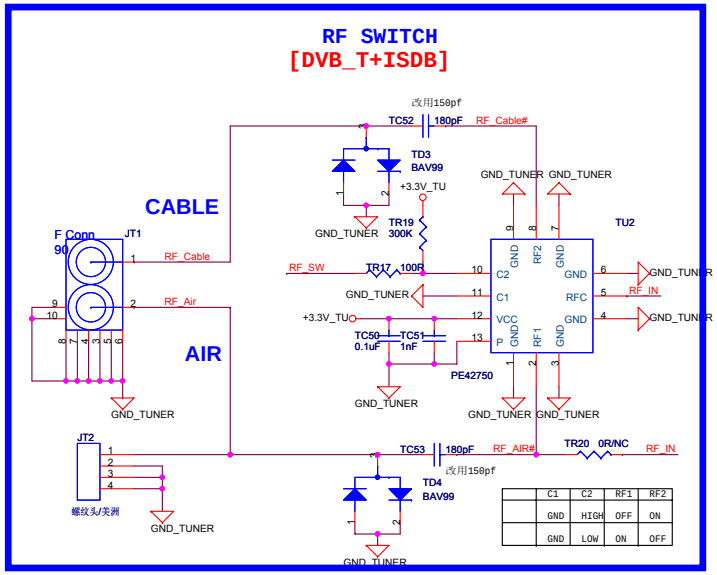

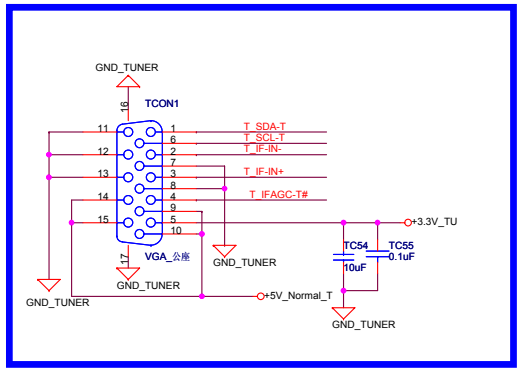

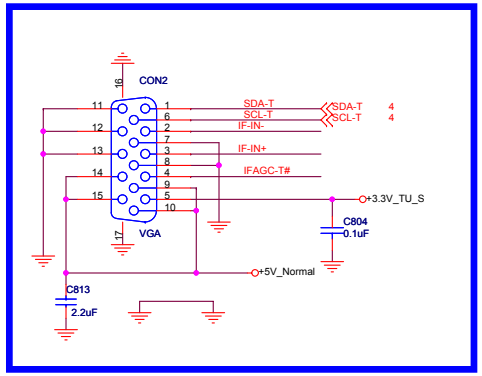

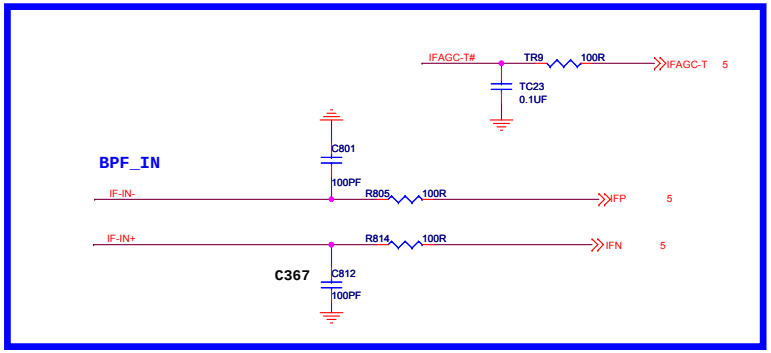

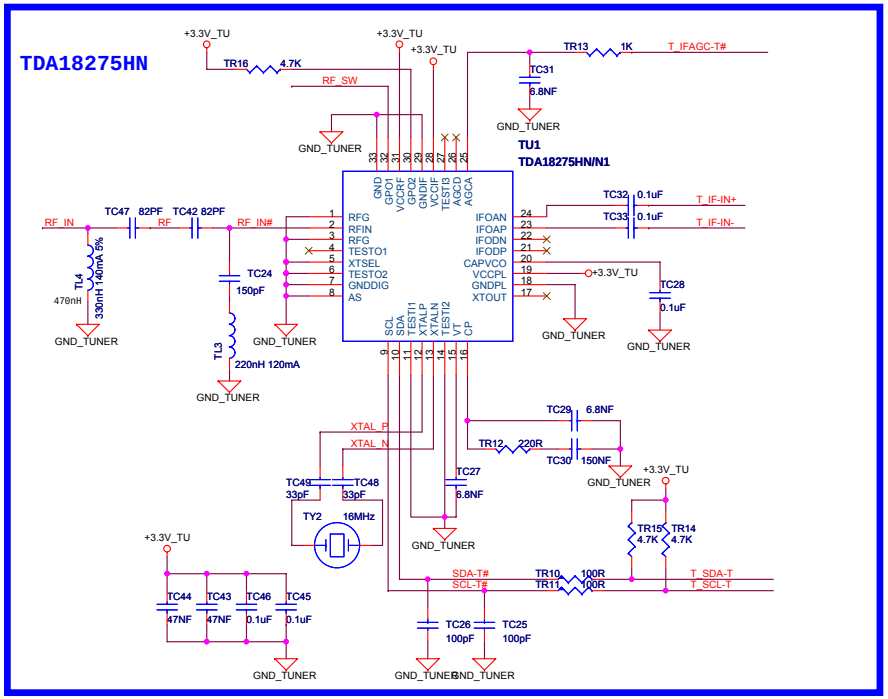

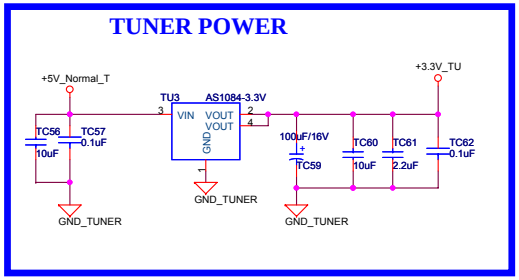

TUNER转接小板电路

KTC ISO9001.ISO14001体系文件			
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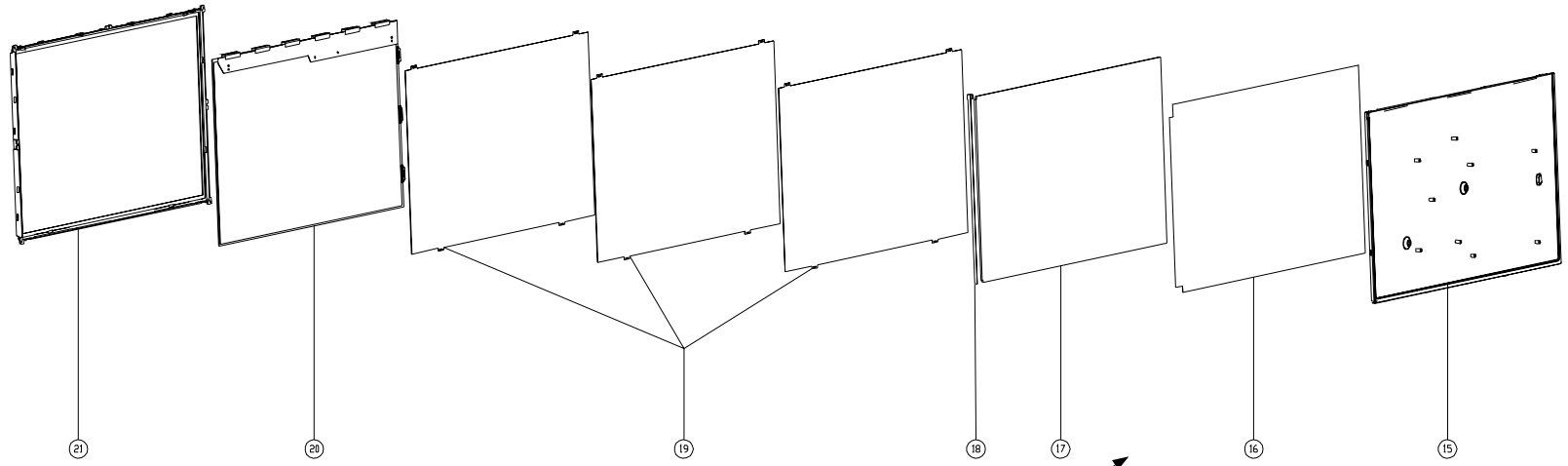
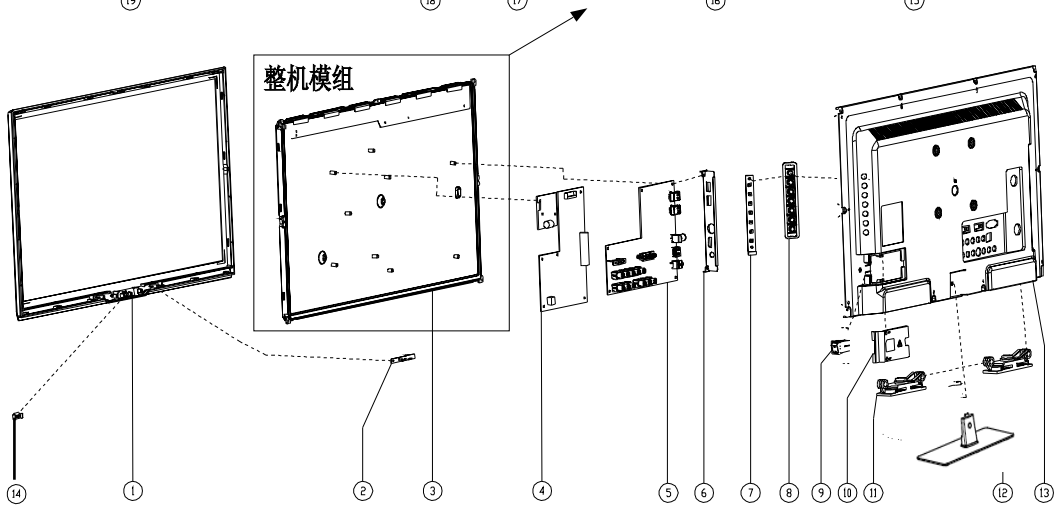
9. Styling Sheet

4200 series 24"

REV.	ECN. NO.	APPD.	DATE





21	模组中框	Mid frame	70Z1-24L31F-1144M011	1
20	玻璃基板	Glassboard	7432-236CM4-2800M011-F	1
19	扩散片	Diffuser	7823-K236WL-0120Z013	3
18	灯条	LCM Light	9044-114P12-23601011	1
17	导光板	LCM light board	7811-K236WL-00300083	1
16	反射膜	Reflector plate	7821-K236WL-0225Z023	1
15	背板	Back plate	71Z2-24L31F-11060061	1
		Detail for Module		
14	/	/	/	
13	后壳	Back cover	7002-24L31F-14600001	1
12	底座	Base	7003-24L31F-2U700003	1
11	喇叭	Speaker	7711-288285-02000011	2
10	电源线盖	Cover plate for wire	7057-24L31F-44B01111	1
9	开关	Switch	6264-250008-13210001	1
8	排钮	Button array	7030-420L31-4U711101	1
7	按键板组件	Key board	9014-112L31-00001011	1
6	侧IO挡板	Hardware baffle plate-Side	7111-24L31F-41120K01	1
5	主板	Mainboard	9011-117B35-62261011	1
4	电源板	Powerboard	With in mainboard	1
3	背光屏	Panel	7422-236CMK-28000061-F	1
2	遥控接收板组件	Remote control receive board	9015-112L31-61034091	1
1	前框	Surface frame	7001-24L33F-04B00103	1
		Detail for whole structure		
No.	Name		Vendor PN	QTY

X.± .200	X.*± 0.050	24L33F爆炸图 24L33F Explosive View	KTC® 深圳市康冠技术有限公司 SHENZHEN KTC TECHNOLOGY CO., Ltd
.X± .100	.X*± 0.010	料号	
.XX± .01	.XX*± 0.005	批准	材质
.XXX± .005	.XXX*± 0.002	审核	日期 2014.03.25
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