LED COLOUR TV

MAINTENANCE MANUAL

MODEL: HLS83D-I CHASSIS（MSD6486）

(take PCB for example:JUC7.820.00215735-2)

Please read this manual carefully before maintenance

CATALOG

Chapter1 Safety and notes

1-1 Installation notes

(1) Please don't beat or rub, scratch the surface of the LED screen heavily, don’t touch it with your hand casually.

(2) When the screen is dirty, please clean it with absorbent cotton or cotton cloth slightly.

(3) Please clean it timely when water or other viscosity pollution fall, which may make the LED face or color change.

(4) Please don’t make the LED screen shake by strong external force.

1-2 Attention points of operation and using

(1) Please unplug the power cable before moving the LED screen.

(2) Please don’t change the original setting of the main boards, if not, the brightness and white balance etc.

may not meet the specification.

(3) The radiation of a long time using in the room temperature is larger than the low temperature.

(4) Please note that the long displaying image may remain at the top when shutdown the machine.

(5) Please avoid the impact from the mobile phone to protect your TV.

1-3 Storage notes

(1)When stored for a long time, please keep the temperature between 0℃to 40℃,don't expose the TV to the strong sunlight, the humidity should be less than 85％RH.

(2)Please don't put your TV under high humidity and high temperature environment, for example, the temperature: 60℃, and the humidity: 85%RH.

(3)Please don't put your TV under low temperature environment, for example, the temperature lower than -25℃.

1-4 Dismantling notes

(1)As LED screen is easy to be damaged, while dismantle, please attention to protect.

(2)Please attention the position of each screw when dismantle, in case to beat the wrong position when install, if not, it may lead to crack or slide of the face frame.

(3) If you need to dismantle the power board or the main board, please attention the position and direction of each line, especially the direction of the screen line, in case of causing accident when install. Before dismantle, we can take some photos of the line route for the comparison of installing.

(4)After check and maintenance, please assure that there is no foreign body in the machine when install.

1-5 High-voltage warning

The high-voltage of the LED screen is generated by the power supply board, without attention to exposure to the high voltage, one may meet a serious electricity shock.

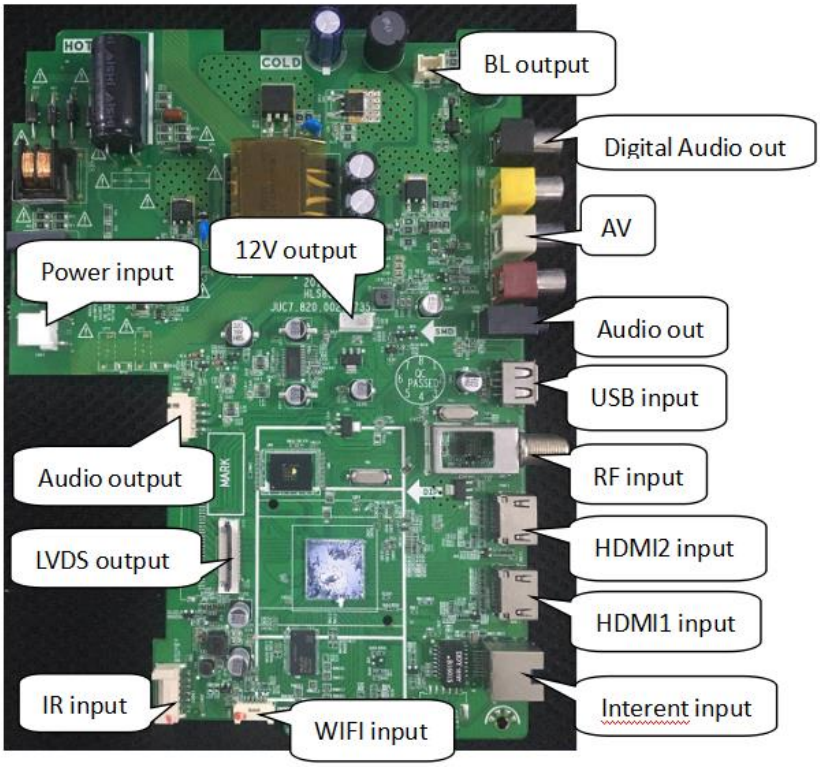
Chapter2 whole machine standard and terminal functions

2-1 Basic standard

Item		Standard	
LED Panel	Active Screen Size	31.5 inches	the parameters are for reference only, the specific should accord to the standard of the screen practicality of the batch orders
	Bezel Opening Area	697.685mm(H) *392.256 mm(V)	
	Pixel Pitch	0.51075mm*0.51075mm	
	Pixel Format	1366 horiz. by 768 vert. Pixels, RGB Vertical Stripe	
	Color Depth	16.7M(Dithered 8bit)	
	Luminance, White	200 cd/m2 (Typ.)	
	Viewing Angle (CR>10)	170(H);170(V)	
	contrast ratio	1200:1	
	Driver Element	a-Si TFT active matrix	
	Display Operation Mode	Normally black	
	Surface Treatment	Hard Coating, 3H	
TV function	sound system	M	
	color system	NTSC/PAL-M/PAL-N	
Audio and video signal input	AV	AV x1	
	Audio out	Audio out x1	
	HDMI	HDMI x2	support to1080P
	USB	USB x1	support media player
Audio output		Audio output L / R	8W inner speakers for each channel
Digital Audio out		Digital Audio out	

Internet	RJ-45 terminal	
	WIFI	
Power	power supply	AC100V~240V, 50/60Hz
	power achievement	<40W
requirement for environment	operation temperature storage temperature operation humidity	-5° ~ + 50° - 20 ° ~ + 60° 20% ~ 80%
appearance size	W x H x D	731.18mm(W)*435.04mm(H)*53.8mm(D)

2-2 Introduction of terminals(practicality photos)



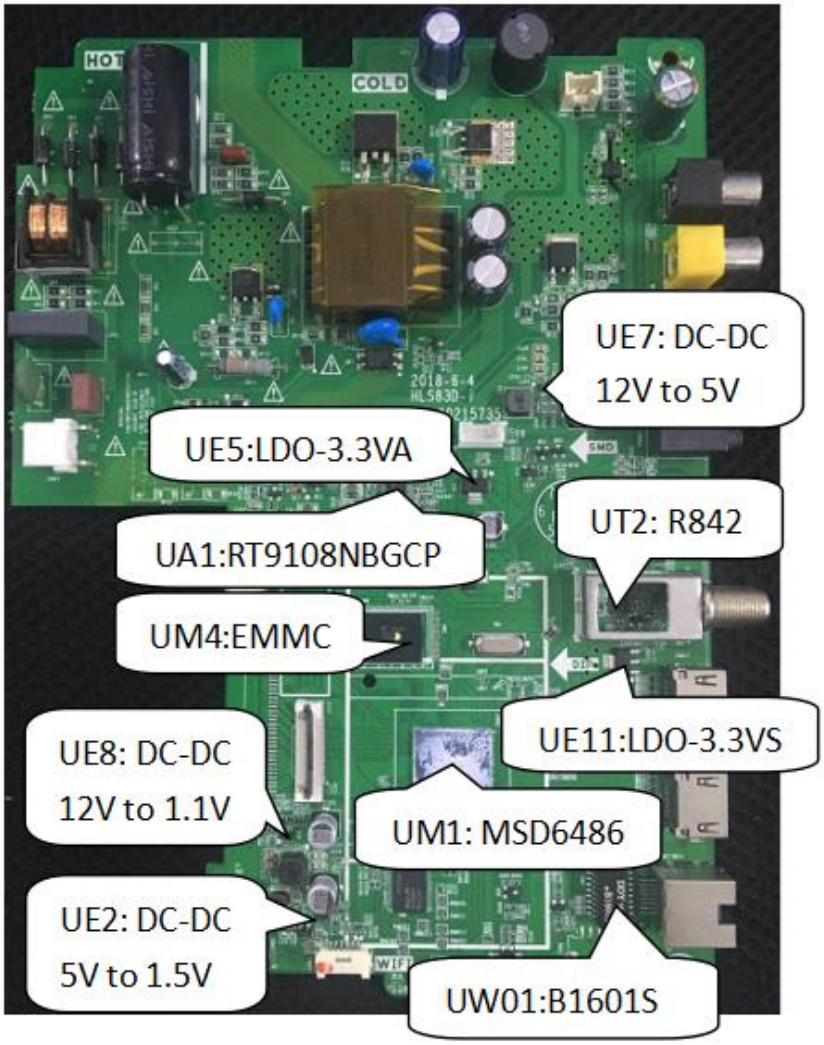
ATTENTION:

1.HDMI support to 1080P；

Chapter3 Main chip functions and the introductions of power supply

3-1 Main IC and functions of HLS83D-I

No.	Item no.	Model	Main function
1	UT2	R842	Tuner output IF signal
2	UM1	MSD6486XT-8-00EB	Video decoder, image processor, A/D and D/A conversion
3	UM4	THGBMDG5D1LBAIL	EMMC
4	UA1	RT9108	15W Stereo (BTL) Analog Input Audio Amplifier with Power Limiter and DC Detect
5	UE7	MP1658GTF-Z	12V to 5V DC-DC
6	UE2	SY8088	12V to 1.5V DC-DC/For Main Chip
7	UE5	AMS1117-3.3	5V to 3.3V LDO/Normal For Main Chip& NAND Flash
8	UE11	AMS1117-3.3	5V to 3.3V LDO/Standby For Main Chip
9	UW01	B1601S	10/100 BASE-T Single Port Surface Mount Magnetics
10	UP1	NCP1251A	Current-Mode PWMController for Off-line Power Supplies
11	UE8	MP2225GJ	12V to 1.1V DC-DC/For Main Chip
12	UB1	PF7911BG	LED Voltage BoostController
13	UM7	FM24C64D-SO-T-G	EEPROM/64Kbit


HOT
COLD
UE7: DC-DC
12V to 5V
UE5:LDO-3.3VA
UA1:RT9108NBGCP
UT2: R842
UM4:EMMC
UE11:LDO-3.3VS
UE8: DC-DC
12V to 1.1V
UM1: MSD6486
UE2: DC-DC
5V to 1.5V
UW01:B1601S

3-2 Pin function description of HLS83D-I chip and description of power supply

3-2-1 MSD6486 recommended operating power conditions

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
3.3V Supply Voltages	V_{VDD_33}	3.14		3.46	V
1.5V Supply Voltages	V_{VDD_15}	1.43		1.57	V
Core Power Voltages	V_{VDD_core}	TBD	TBD	TBD	V
Ambient Operating Temperature	T_A	0		70	°C
Junction Temperature	T_J			125	°C

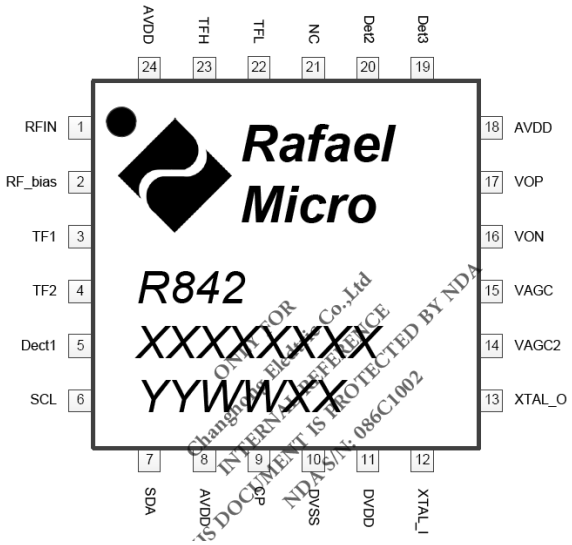
Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
3.3V Supply Voltages	V_{VDD_33}		3.6	V
1.5V Supply Voltages	V_{VDD_15}		1.65	V
Core Power Voltages	V_{VDD_core}		TBD	V
Input Voltage (5V tolerant inputs)	$V_{IN5Vtol}$		5.0	V
Input Voltage (non 5V tolerant inputs)	V_{IN}		V_{VDD_33}	V
Storage Temperature	T_{STG}	-40	150	°C

Note: Stresses above those listed in Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and does not imply functional operation of the device. Exposure to absolute maximum ratings for extended periods may affect device reliability.

3-2-2 Pin function of R842

Pin description:



Pin Number	Symbol	I/O	Description
1	RFIN	I	RF input
2	RF_bias	-	RF circuit bias
5,19,20	Detx	-	Power detector decoupling capacitor
3,4,22,23	TFxx	-	Tracking filter pin out
6	SCL	I	I²C bus, clock input
7	SDA	I/O	I²C bus, data input/ output
8	AVDD	S	AVDD for PLL
9	CP	-	PLL Charge Pump decouple
10	DVSS	S	Digital Ground
11	DVDD	S	Digital 3.3V Supply
12	XTAL_I	I	Crystal Driver Input
13	XTAL_O	I	Crystal Driver Output
14,15	VAGC	I	IF automatic gain control input
16,17	VOP, VON	O	Differential IF output
18	AVDD	S	Analog 3.3V supply
21	NC	-	No used
24	AVDD	S	RF 3.3V Supply

Table 2-1. R842 Summary List of Pin Assignment for Hybrid version

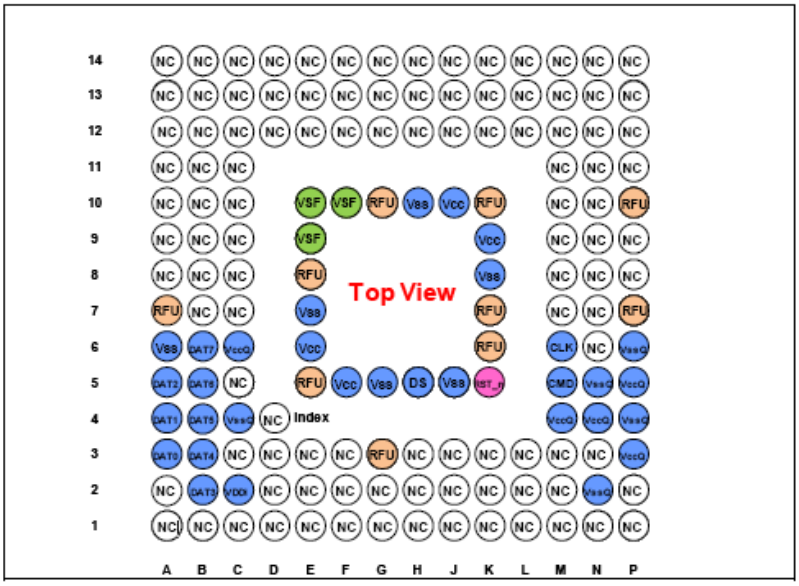
(note: E-Pad is GND)

3-2-3 THGBMDG5D1LBAIL EMMC brief introduction:

Pin introduction:

Pin Connection

P-WFBGA153-1113-0.50 (11.5mm x 13mm, H0.8mm max. package)

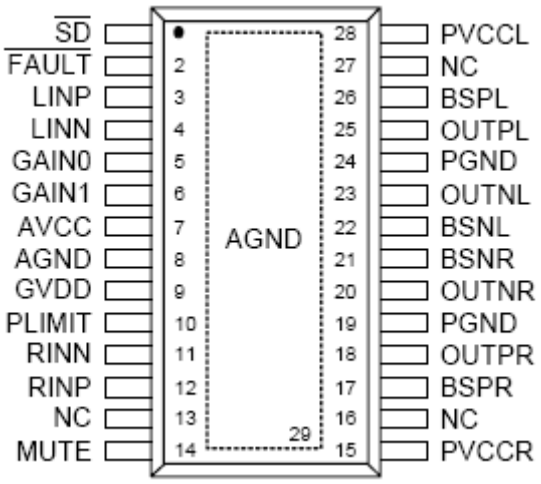


Pin Number	Name	Pin Number	Name	Pin Number	Name	Pin Number	Name
A3	DAT0	C2	VDDi	J5	Vss	N4	VccQ
A4	DAT1	C4	VssQ	J10	Vcc	N5	VssQ
A5	DAT2	C6	VccQ	K5	RST_n	P3	VccQ
A6	Vss	E6	Vcc	K8	Vss	P4	VssQ
B2	DAT3	E7	Vss	K9	Vcc	P5	VccQ
B3	DAT4	F5	Vcc	M4	VccQ	P6	VssQ
B4	DAT5	G5	Vss	M5	CMD		
B5	DAT6	H5	DS	M6	CLK		
B6	DAT7	H10	Vss	N2	VssQ		

NC: No Connect, shall be connected to ground or left floating.
RFU: Reserved for Future Use, shall be left floating for future use.
VSF: Vendor Specific Function, shall be left floating.

3-2-4 RT9108 brief introduction:

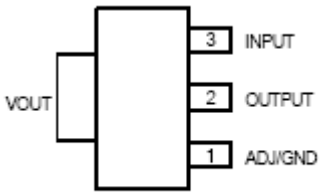
Pin introduction:



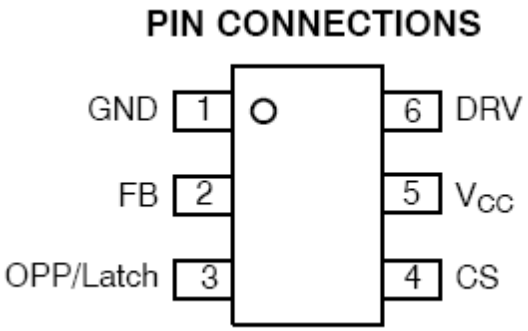
Pin No.	Pin Name	Pin Function
1	$\overline{SD}$	Shutdown Logic Input for Audio Amp (High = outputs enabled). TTL logic levels with compliance to AVCC.
2	$\overline{FAULT}$	Open-Drain Output for Short Circuit Fault Status. Short circuit faults can be set to auto recovery by connecting the $\overline{FAULT}$ pin to the $\overline{SD}$ pin.
3	LINP	Positive Audio Input for Left Channel. Biased at 2.3V.
4	LINN	Negative Audio Input for Left Channel. Biased at 2.3V.
5	GAIN0	Gain Select Least Significant Bit.
6	GAIN1	Gain Select Most Significant Bit.
7	AVCC	Analog Supply Input.
8, 29 (Exposed Pad)	AGND	Analog Ground. Connect to the thermal pad. The exposed pad must be soldered to a large PCB and connected to AGND for maximum power dissipation.
9	GVDD	High-Side FET Gate Drive Supply. Nominal voltage is 5V.
10	PLIMIT	Power Limit Level Adjustment.
11	RINN	Negative Audio Input for Right Channel. Biased at 2.3V.
12	RINP	Positive Audio Input for Right Channel. Biased at 2.3V.
13, 16, 27	NC	No Internal Connection.
14	MUTE	Mute Logic Input for Audio Amp (Low = outputs enabled).
15	PVCCR	Power Supply Input for Right Channel H-Bridge. Right channel and left channel power supply inputs are connected internally.
17	BSPR	Bootstrap I/O for Right Channel, Positive High-Side MOSFET.
18	OUTPR	Class-D H-Bridge Positive Output for Right Channel.

3-2-5 AMS1117-3.3 brief introduction:

Pin introduction:



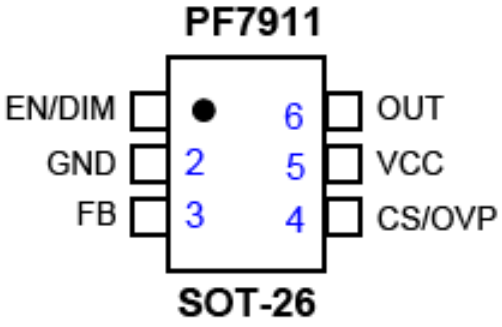
3-2-6 NCP1251A Current-Mode PWMController for Off-linePower Supplies brief introduction:



Pin N°	Pin Name	Function	Pin Description
1	GND	–	The controller ground.
2	FB	Feedback pin	Hooking an optocoupler collector to this pin will allow regulation.
3	OPP/OVP	Adjust the Over Power Protection Latches off the part	A resistive divider from the auxiliary winding to this pin sets the OPP compensation level. When brought above 3 V, the part is fully latched off.
4	CS	Current sense + ramp compensation	This pin monitors the primary peak current but also offers a means to introduce ramp compensation.
5	V_{CC}	Supplies the controller	This pin is connected to an external auxiliary voltage and supplies the controller. When the V_{CC} exceeds a certain level, the part permanently latches off.
6	DRV	Driver output	The driver's output to an external MOSFET gate.

3-2-7 PF7911 High Voltage BoostController brief introduction:

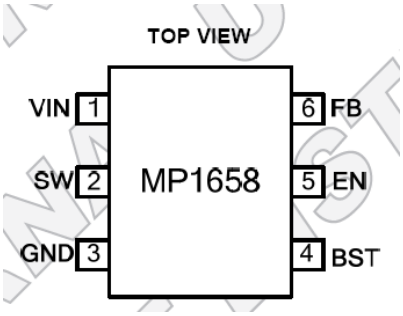
Pin introduction:



NAME	PIN No.	DESCRIPTION
EN/DIM	1	Dual Function Pin for Both Dimming Input Signal and Enable Input
GND	2	Ground
FB	3	Feedback Input, Connecting to the LED Current Sensing Resistor
CS/OVP	4	Dual Function Pin for Both Over Voltage Protection of Boost Output and & Current Sensing of Boost Switch.
VCC	5	Supply Voltage
OUT	6	Output to Drive Boost MOSFET

3-2-8 MP1658GTF-Z brief introduction:

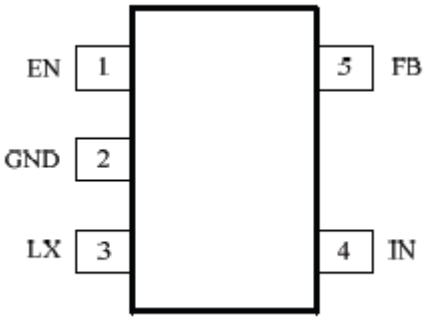
Pin introduction:



PIN FUNCTIONS

Package Pin #	Name	Description
1	VIN	Supply Voltage. The MP1658 operates from a 4.5V-to-16V input rail. Requires C1 to decouple the input rail. Connect using a wide PCB trace.
2	SW	Switch Output. Connect using a wide PCB trace.
3	GND	System Ground. Reference ground of the regulated output voltage: requires extra care during PCB layout. Connect to GND with copper traces and vias.
4	BST	Bootstrap. Connect a capacitor and a resistor between SW and BST pins to form a floating supply across the high-side switch driver. Use a 1μF BST capacitor.
5	EN	EN=HIGH to enable the MP1658. For automatic start-up, connect EN to VIN through 100k pull-up resistor.
6	FB	Feedback. Connect to the tap of an external resistor divider from the output to GND to set the output voltage. The frequency fold-back comparator lowers the oscillator frequency when the FB voltage drops below 600mV to prevent current-limit runaway during a short circuit fault.

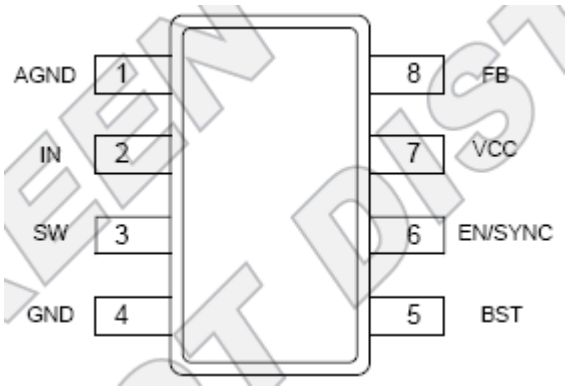
3-2-9 SY8088 brief introduction:



(SOT23-5)

Pin Name	Pin Number	Pin Description
EN	1	Enable control. Pull high to turn on. Do not float.
GND	2	Ground pin.
LX	3	Inductor pin. Connect this pin to the switching node of the inductor.
IN	4	Input pin. Decouple this pin to the GND pin with at least 4.7uF ceramic capacitor.
FB	5	Output Feedback Pin. Connect this pin to the center point of the output resistor divider (as shown in Figure 1) to program the output voltage: $V_{OUT}=0.6*(1+R_1/R_2)$.Add optional C_1 (10pF~47pF) to speed up the transient response.

3-2-10 MP2225GJ brief introduction:



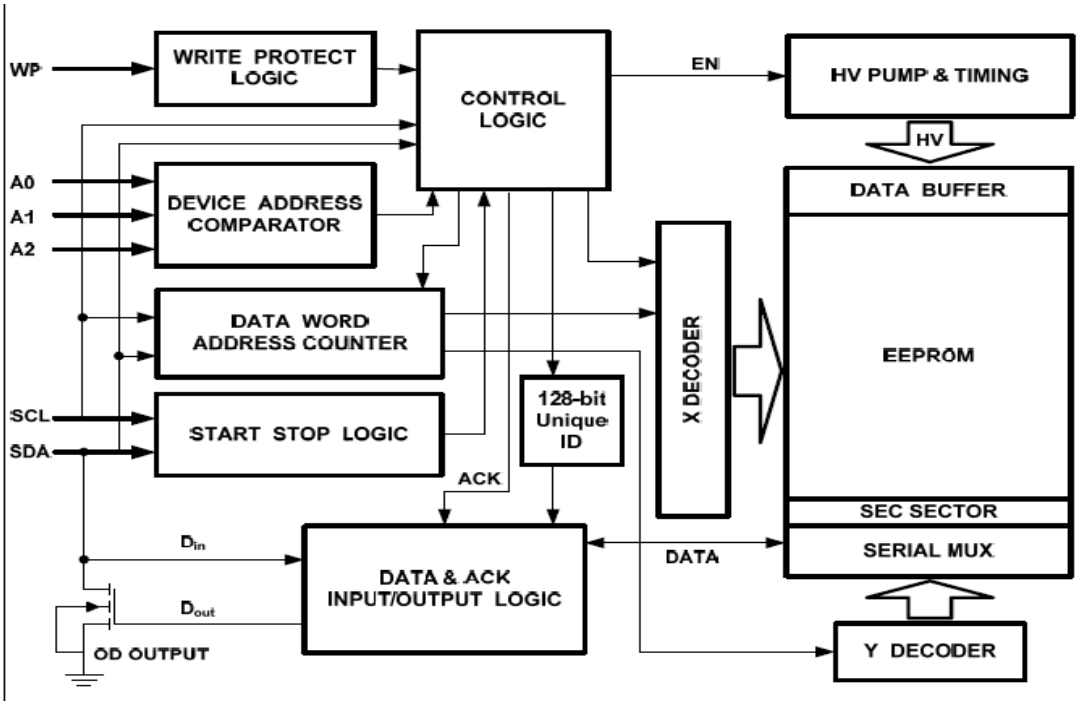
Pin #	Name	Description
1	AGND	Analog Ground. Connect it to GND.
2	IN	Supply Voltage. The MP2225 operates from a 4.5V-to-18V input rail. Requires C1 to decouple the input rail. Connect using a wide PCB trace.
3	SW	Switch Output. Connect using a wide PCB trace.
4	GND	Power Ground. Requires special consideration during PCB layout. Connect to GND with copper traces and vias.
5	BST	Bootstrap. Requires a capacitor between SW and BST pins to form a floating supply across the high-side switch driver.
6	EN/SYNC	EN high to enable the MP2225. Can apply an external clock to the EN pin to change the switching frequency.
7	VCC	Bias Supply. Decouple with a 0.1μF-to-0.22μF capacitor.
8	FB	Feedback. Connect to the tap of an external resistor divider from the output to GND to set the output voltage. The frequency fold-back comparator lowers the oscillator frequency when the FB voltage is below 480mV to prevent current-limit run-away during a short-circuit fault condition.

3-2-11 FM24C64D-SO-T-G brief introduction:

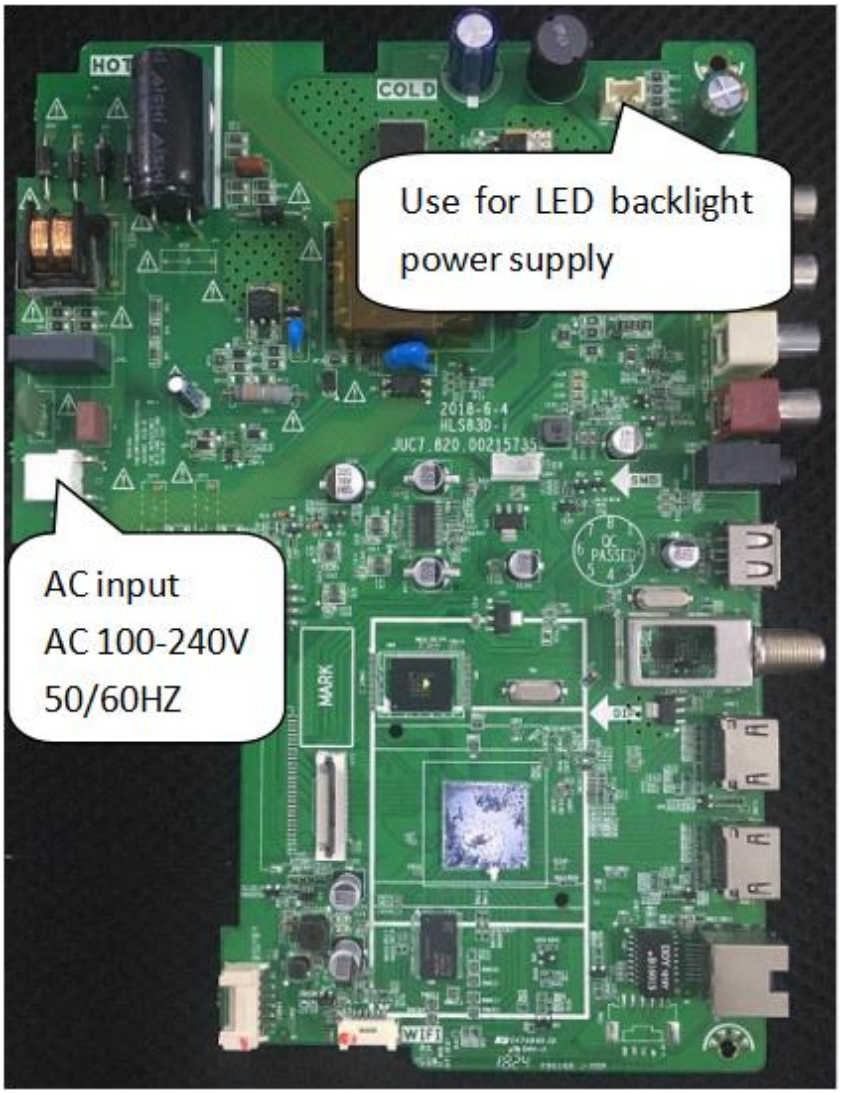
Pin introduction:

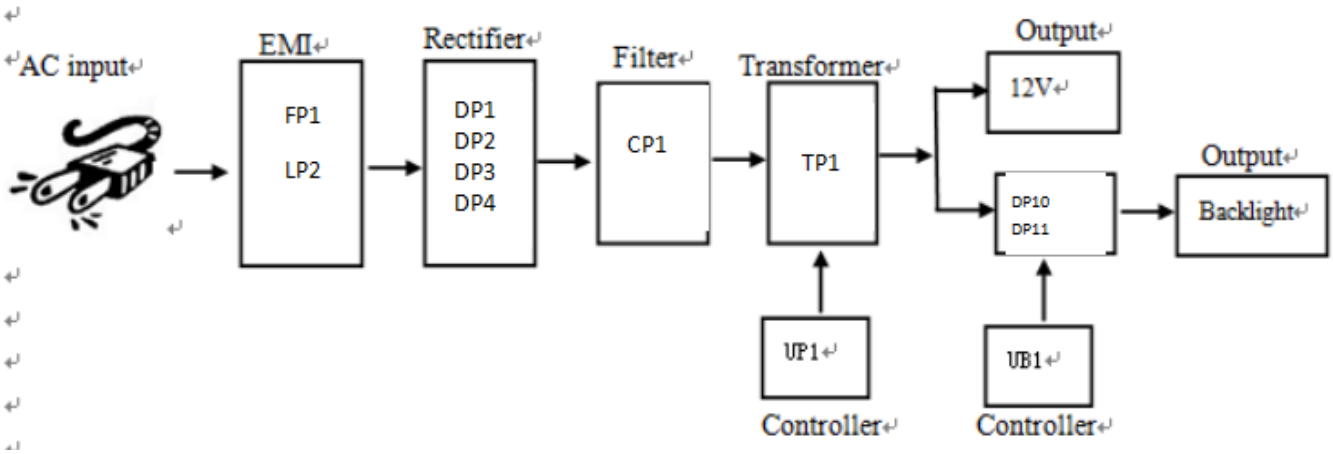
Pin Name	Function
A0~A2	Device Address Inputs
SDA	Serial Data Input/Output
SCL	Serial Clock Input
WP	Write Protect
V_{CC}	Power Supply
GND	Ground
NC	Not Connect

Block diagram


WP
WRITE PROTECT LOGIC
CONTROL LOGIC
EN
HV PUMP & TIMING
HV
A0
A1
A2
DEVICE ADDRESS COMPARATOR
DATA BUFFER
DATA WORD ADDRESS COUNTER
X DECODER
EEPROM
SCL
SDA
START STOP LOGIC
128-bit Unique ID
ACK
SEC SECTOR
SERIAL MUX
Din
DATA & ACK INPUT/OUTPUT LOGIC
DATA
Dout
OD OUTPUT
Y DECODER

3-3 Brief introduction of power supply

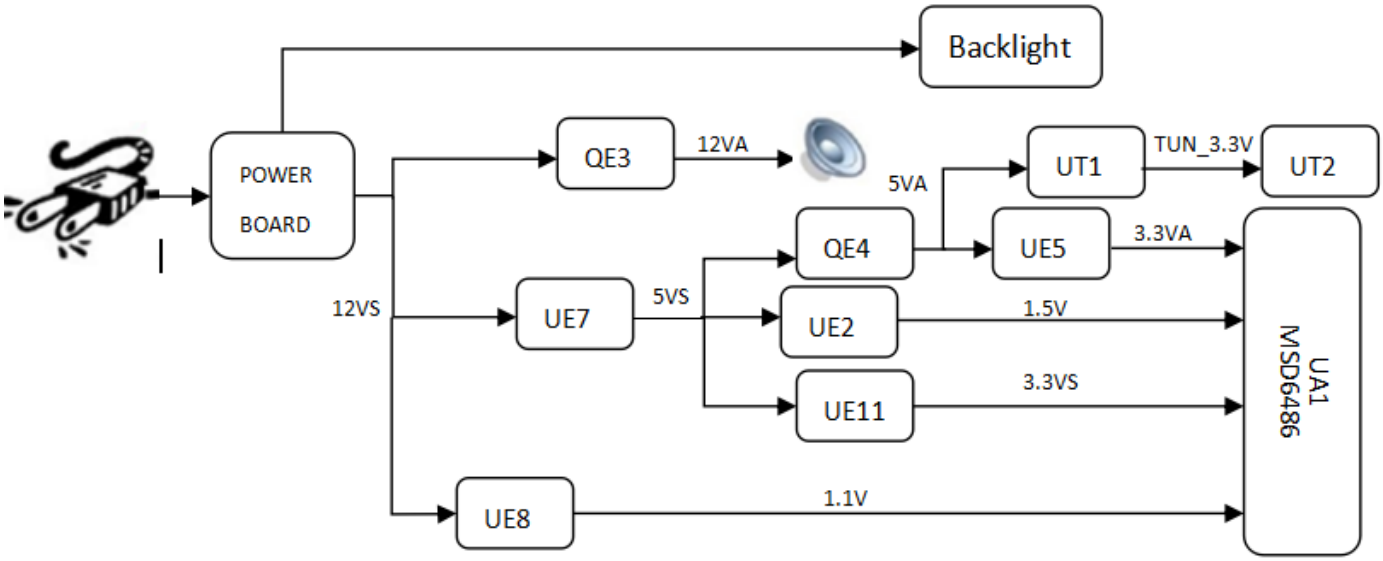




Chapter4 MSD6486 Power Block Diagram, main board power supply systems, main board interface definition and the waveform of key points

This chapter mainly introduce the chassis frame diagram, power supply system, interface definition and each key point's wave shape.

4-1 MSD6486 Power Block Diagram

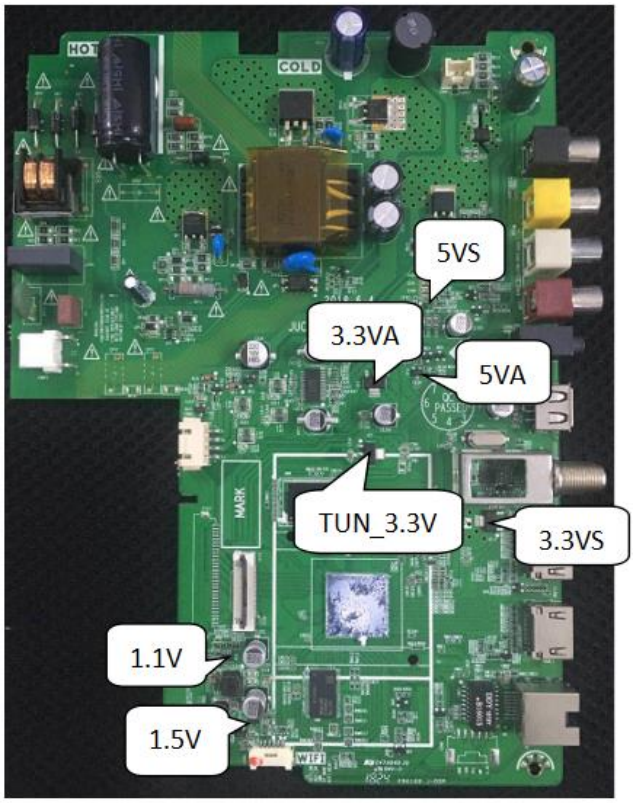


4-2 Power supply system

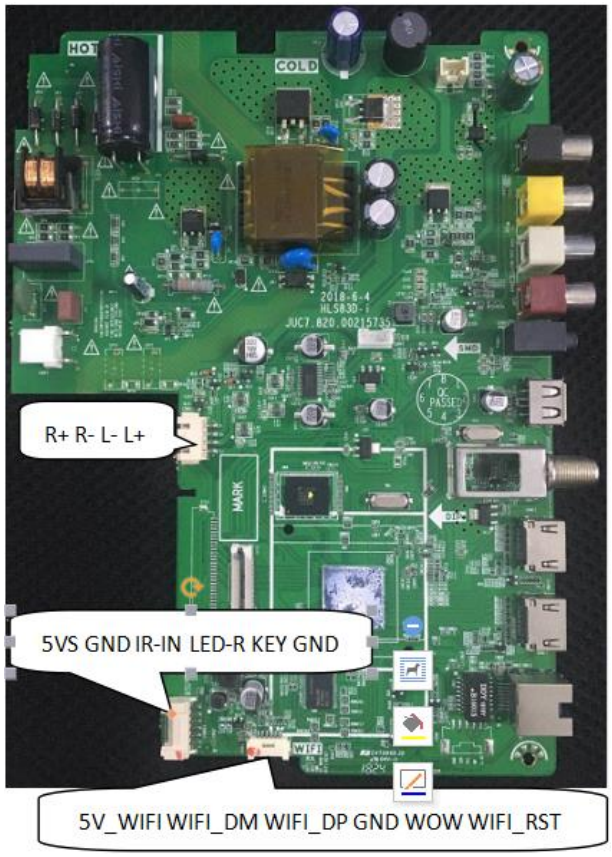
Power board has one kind of output voltage: +12VSTB.

4-2-1 Pin voltage of the voltage adjuster on the main board

item No.	UE7	QE4	UT1	UE5	UE11	UE2	UE8
output voltage	5VS	5VA	TUN_3.3V	3.3VA	3.3VS	1.5V	1.1V



4-2-2 Interface definition



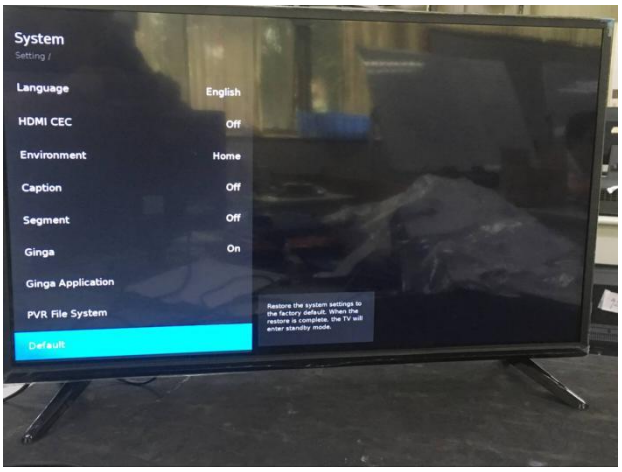
Chapter5 Software upgrade instructions

Software upgrade method：Use a U disk including the upgrade program directly upgrade

1)Download the bin file:To the root directory of your USB device (Change the filename to "MstarUpgrade.bin",which can be found in factory mode - SW information - SW name.);Then insert the USB device to USB interface of TV set.

2)Press the " Setting - Support -software Upgrade (USB)" button on key board, it will upgrade directly as follow.

3). When update finished, TV will automatically shut down and then boot. Then Set default the TV: Setting--->System-->Default.



Chapter6: Classical accident maintenance procedures and examples

6-1 The thinking of don’t boot

The power is not connected.

6-2 Common problems for your reference

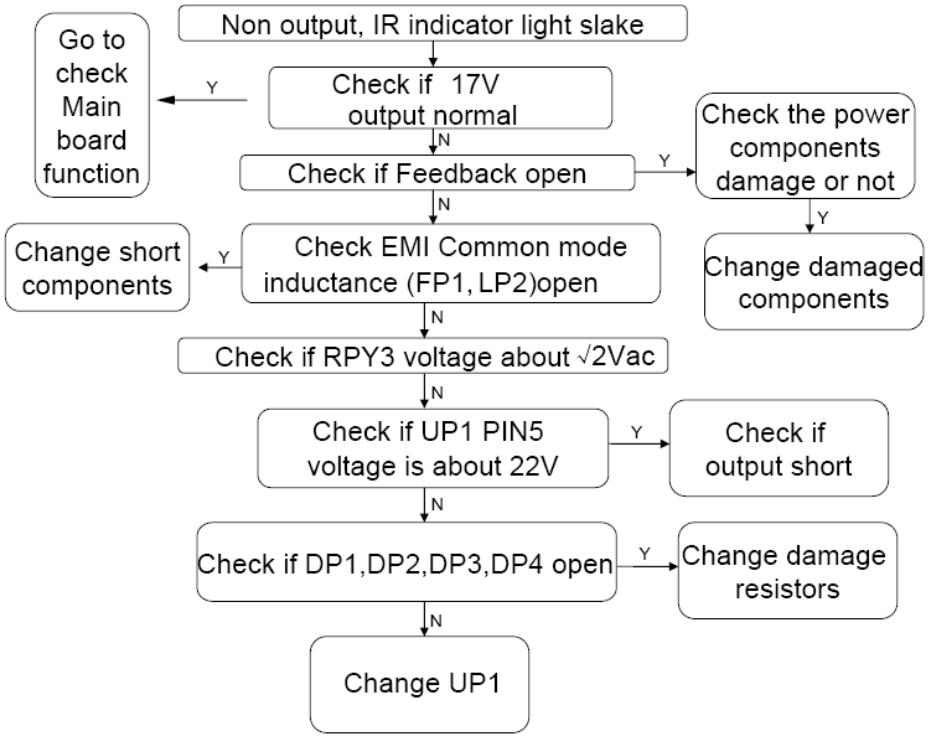
To speed you to diagnose and solve problems, the following common problems are offered for your reference.

Symptoms	Possible Reason	Solutions
No picture, no sound, and no indicator light on	1.The power cord is not plugged in 2.The power is off	1.Plug in the power cord 2.Turn the power on
Abnormity Picture and sound with	1.Contrast, sharpness, and color are set improperly 2.Color system is improperly 3.Sound system is improperly	1.Adjust the numerical value of Contrast, sharpness, and color 2.Set the Color system to the country broadcasting standard 3.Set the Sound system to meet the country’s broadcasting standard
Picture is spotted or with snow	Signal source is low-grade or the signal cord is in a lower quality	Use the qualified signal cord
No picture, no sound and indicator light is green	Contrast, brightness, color and volume are all in the minimum value or TV is in mute mode.	Adjust the value of contrast, brightness, color and volume
	The signal cable is not correctly connected.	Connect the signal cable correctly
Blue screen, AV or SVIDEO is displayed	There is no signal input or the video cable is not connected or incorrectly connected	Connect the video cable correctly
No sound	There is no audio signal input or audio cable is not connected correctly	Connect the audio cable correctly
VGA picture display with improper color	The color temp is adjusted incorrectly by user	Readjust the color temp, or select the original color setting
HDMI source, with snow pixel of full screen	The signal source is not normal	Plug the HDMI cable again
The remote control does not work	Batteries are improperly installed or exhausted	1. Make sure the positive and the negative polarities are correct. 2.Check if there is a loose contact

		between the batteries and the springs 3.Replace the batteries

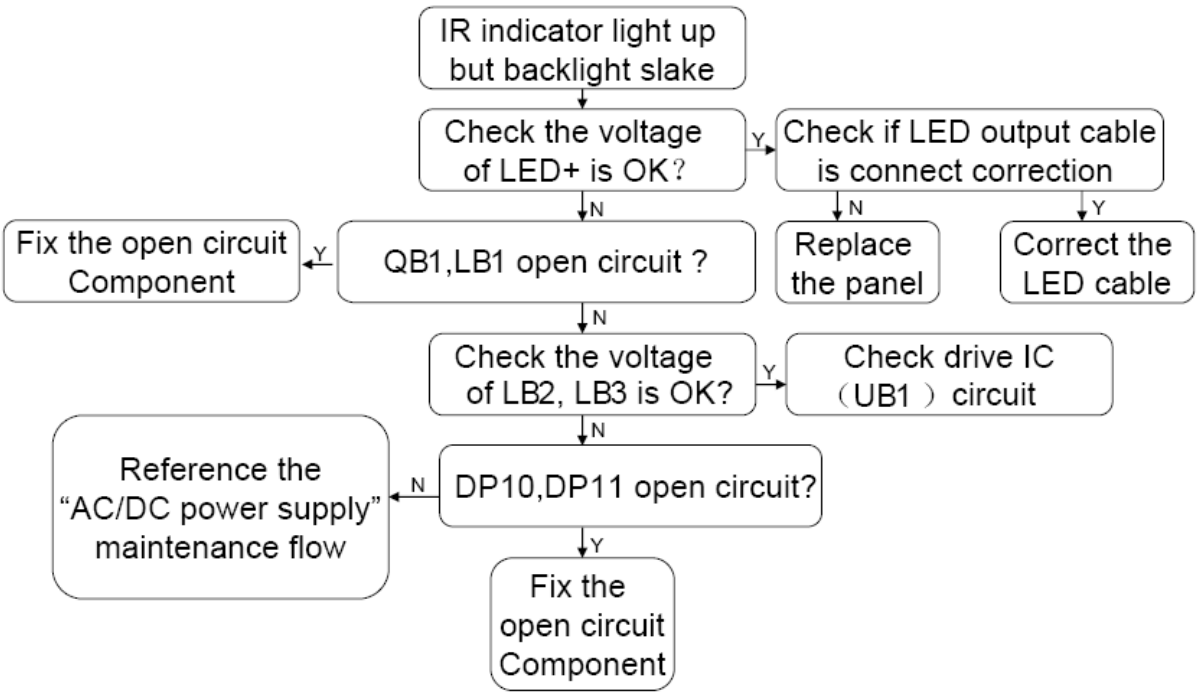
6-3 Trouble shooting

1、AC/DC power supply

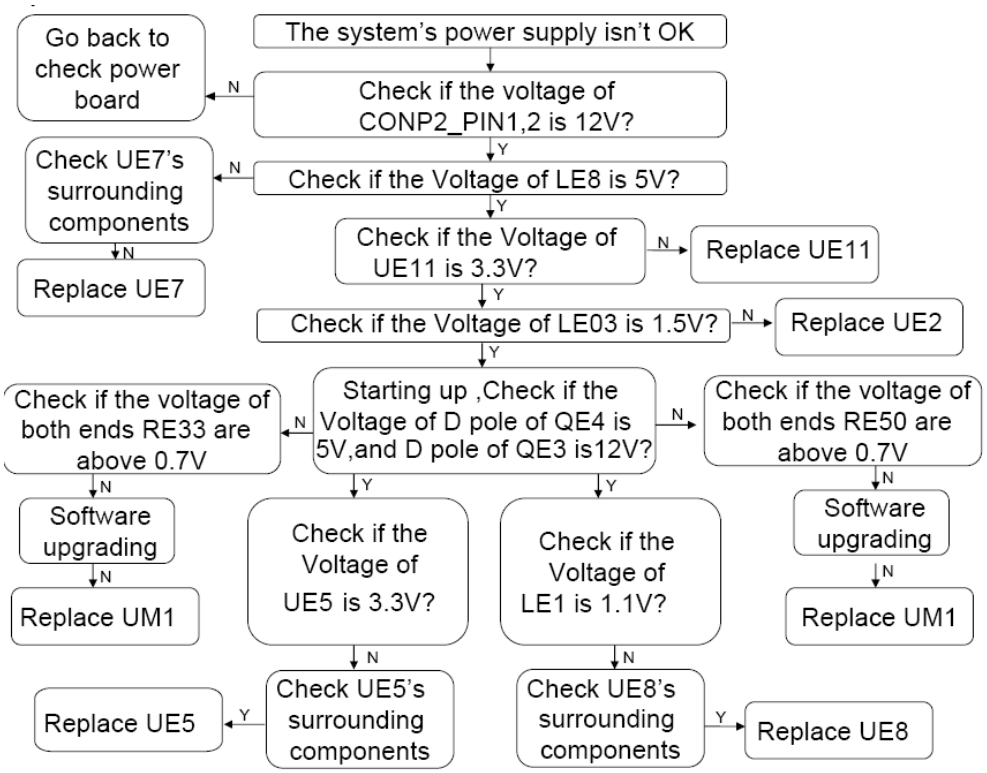


WARNING: For safety, please using isolation transformer for power supply when checking circuit of power. And keep GND connection normal.

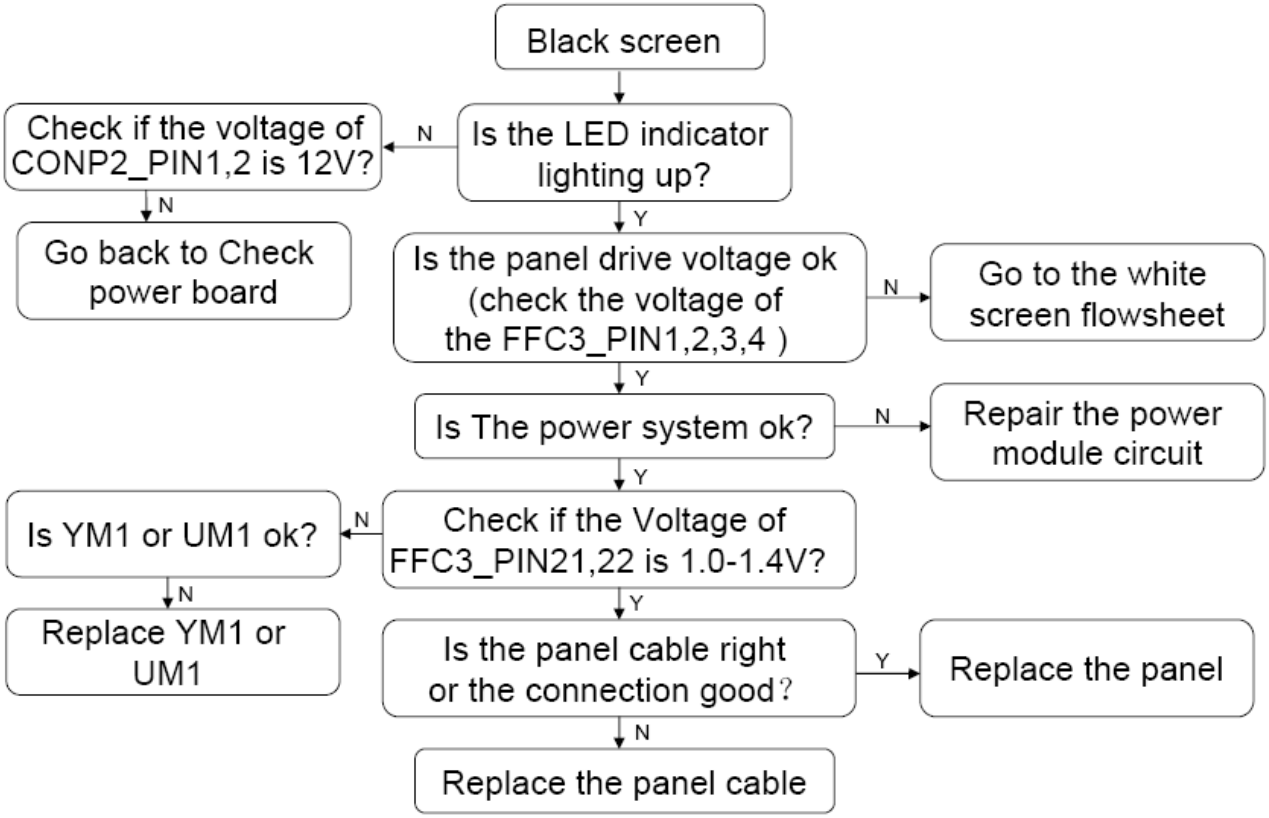
2、LED driver power supply


IR indicator light up but backlight slake
Check the voltage of LED+ is OK?
Y
Check if LED output cable is connect correction
N
N
Y
Fix the open circuit Component
Y
QB1,LB1 open circuit ?
Replace the panel
Correct the LED cable
N
Check the voltage of LB2, LB3 is OK?
Y
Check drive IC （UB1 ） circuit
N
Reference the “AC/DC power supply” maintenance flow
N
DP10,DP11 open circuit?
Y
Fix the open circuit Component

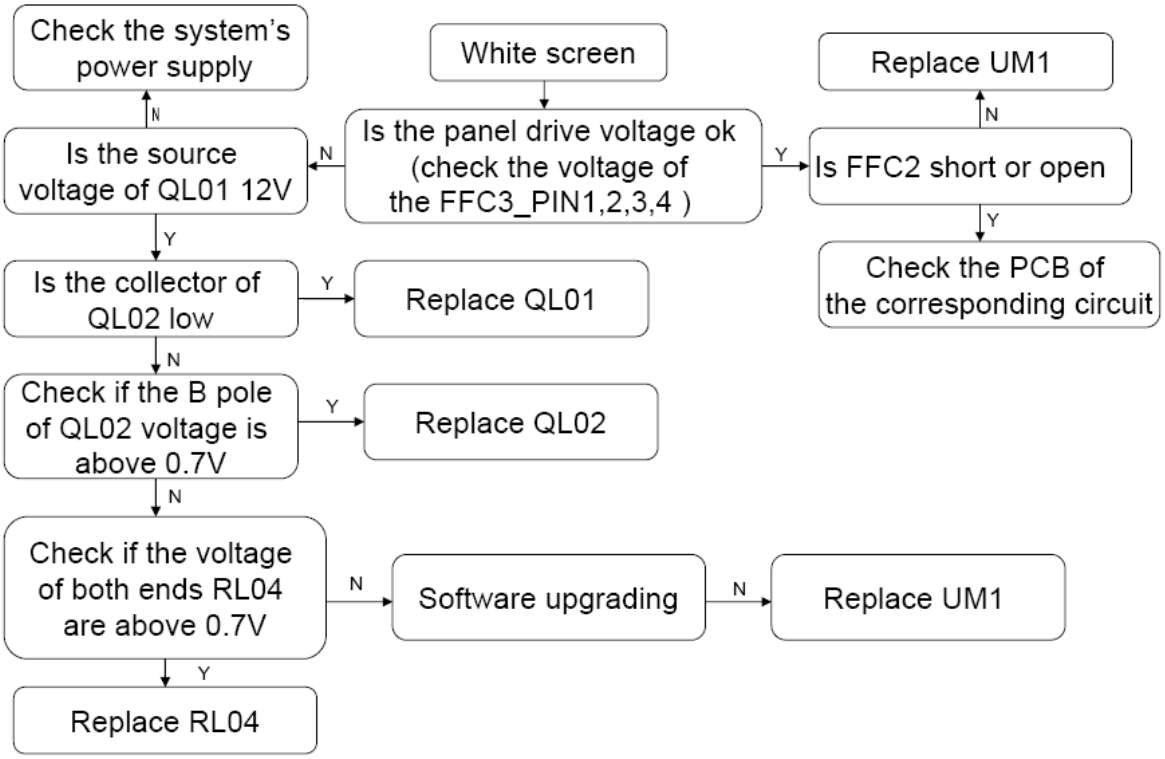
3、Power part


The system’s power supply isn’t OK
Go back to check power board
N
Check if the voltage of CONP2_PIN1,2 is 12V?
Y
Check UE7’s surrounding components
N
Check if the Voltage of LE8 is 5V?
Y
N
Replace UE7
Check if the Voltage of UE11 is 3.3V?
N
Replace UE11
Y
Check if the Voltage of LE03 is 1.5V?
N
Replace UE2
Y
Check if the voltage of both ends RE33 are above 0.7V
N
Starting up ,Check if the Voltage of D pole of QE4 is 5V,and D pole of QE3 is12V?
N
Check if the voltage of both ends RE50 are above 0.7V
N
Y
Y
N
Software upgrading
Check if the Voltage of UE5 is 3.3V?
Check if the Voltage of LE1 is 1.1V?
Software upgrading
N
N
N
Replace UM1
Replace UM1
N
N
Replace UE5
Y
Check UE5’s surrounding components
Check UE8’s surrounding components
Y
Replace UE8

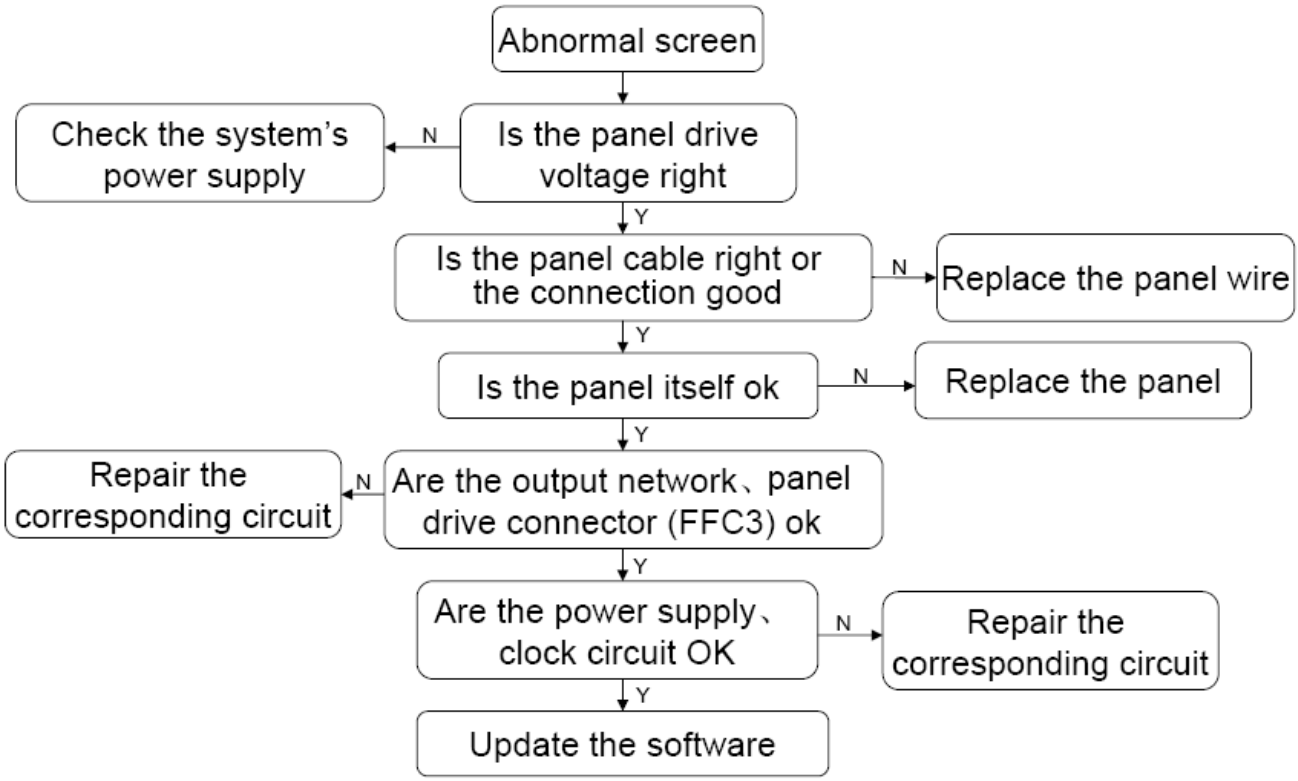
4、Black Screen



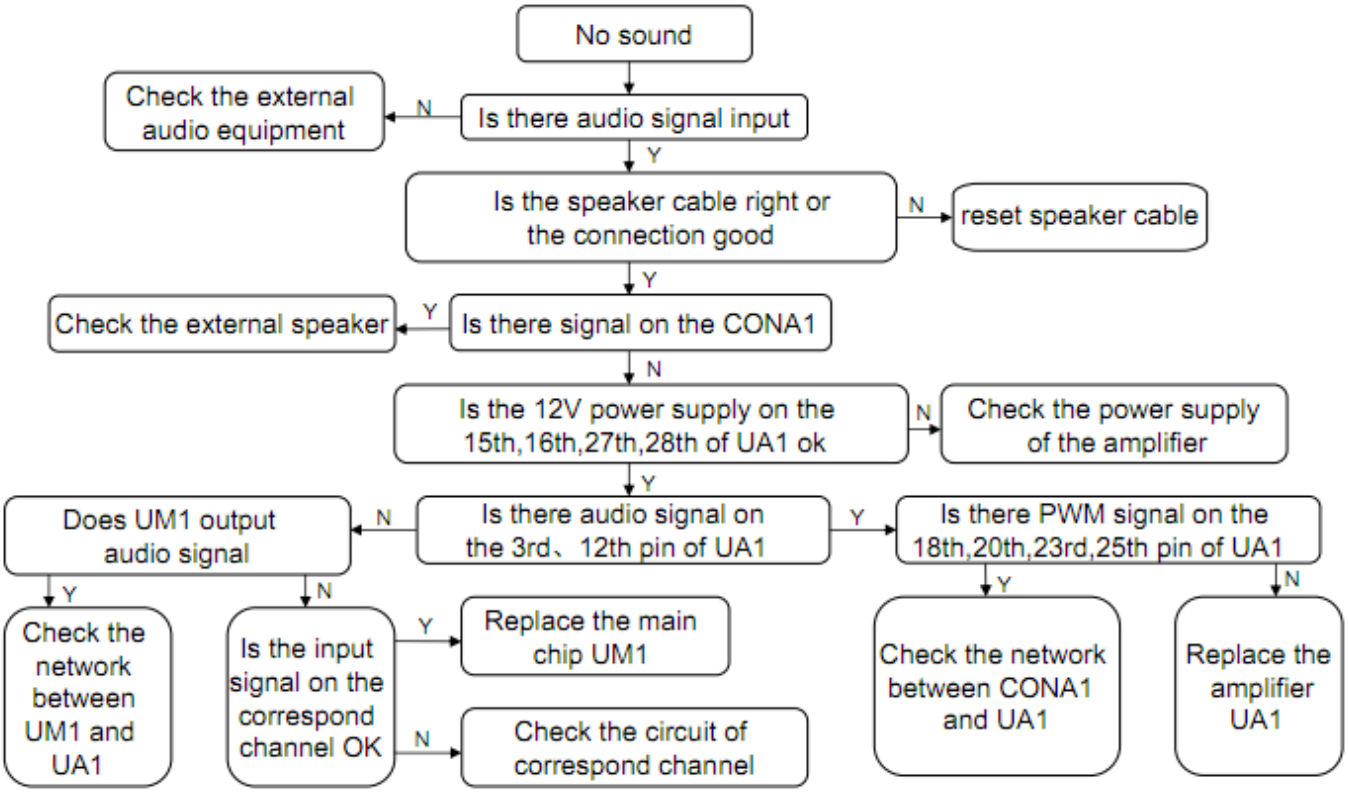
5、white screen or AGP



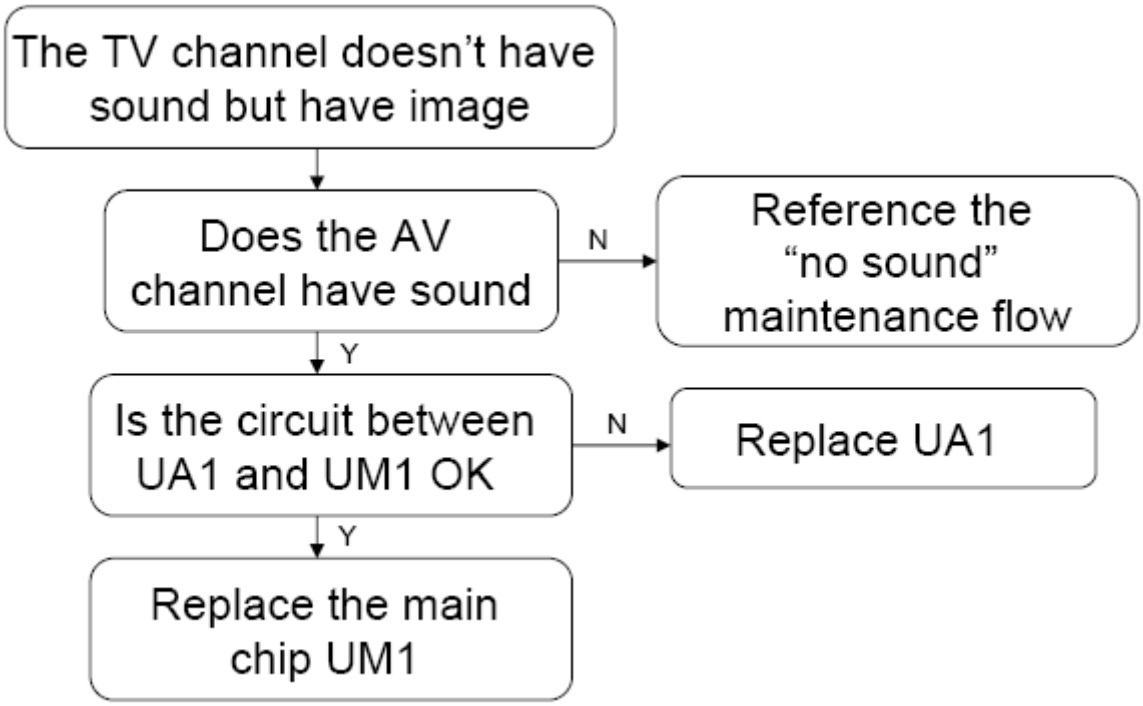
6、Abnormal screen



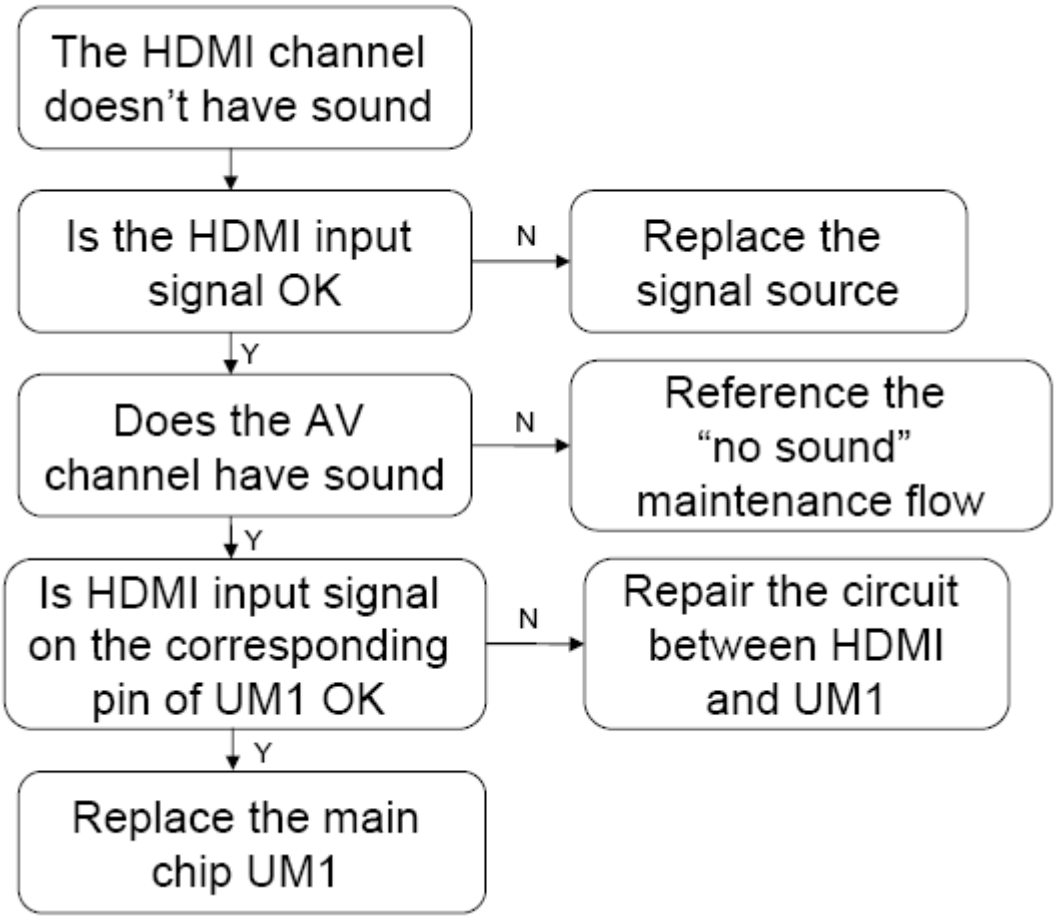
7、No sound



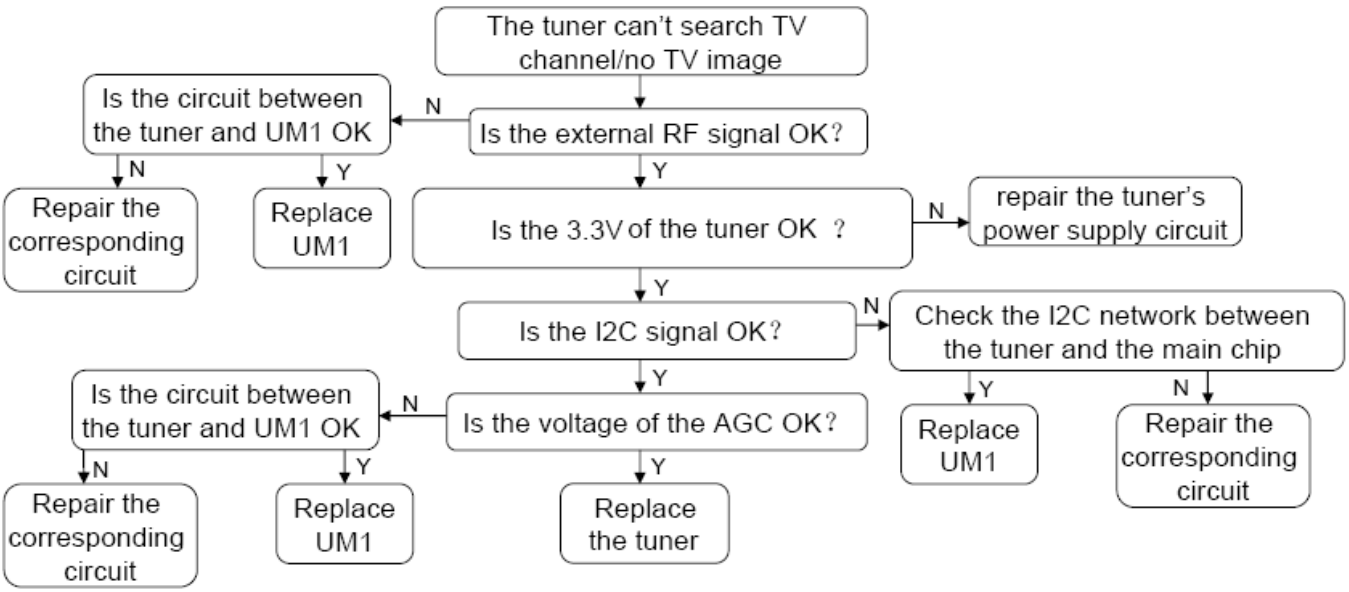
8、TV channel don’t have sound



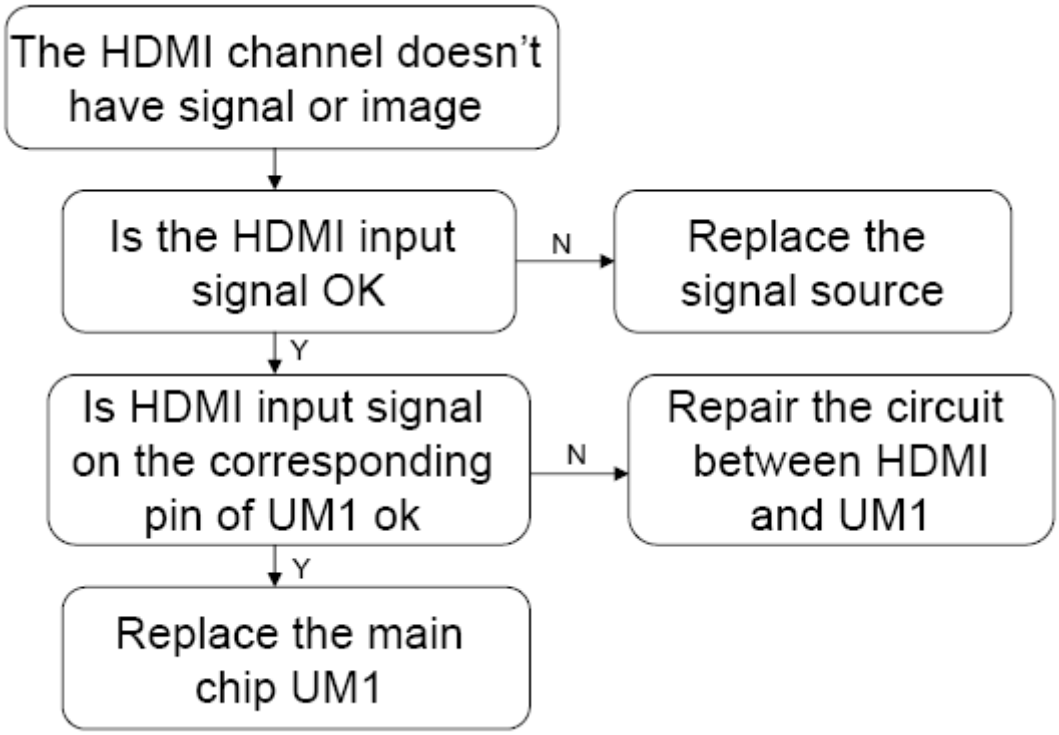
9、HDMI channel doesn't have sound



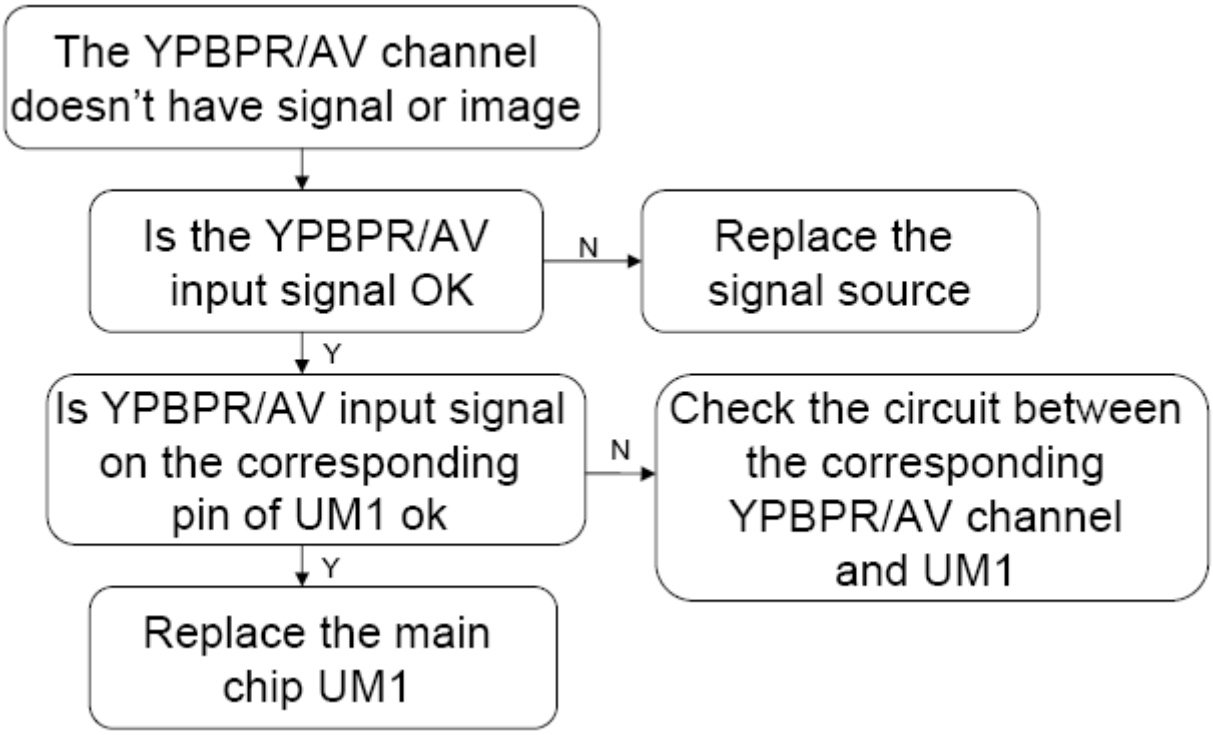
10、Function Part (TV failure)



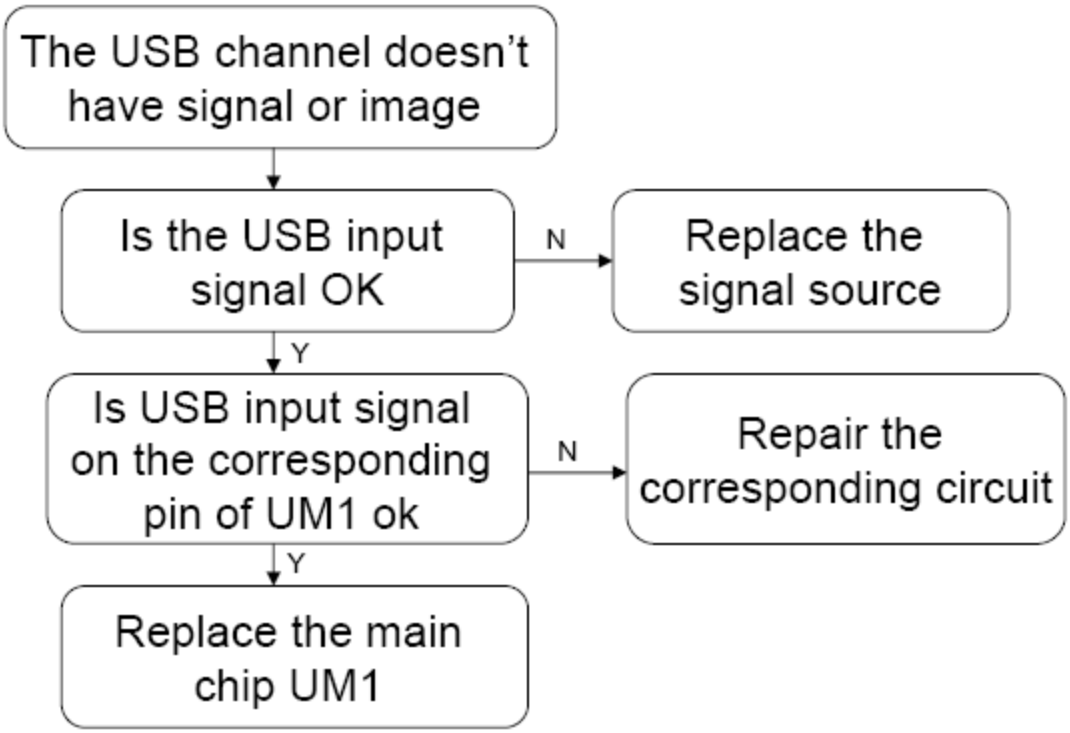
11、Function Part (the HDMI channel doesn’t have image)



12、Function Part (the YPBPR and AV channel doesn’t have signal)



13、Function Part (The USB channel doesn't have signal)



Chapter7 Factory mode parameter setting instructions and notes

7-1 Enter into the factory mode

Switch on TV set, and make it works normally:

Press【SETTING】key on the remote control.

Press number keys “3”、“1”、“3、“8” on remote control to enter password. Finish entering the factory mode.

If you want to quit the factory mode, Please. press【EXIT】key to exit source.

7-2 The list of factory mode as follow：(only for reference)

First-class navigation	Second-class navigation	Parameter values	Third-class navigation	Parameter values
Factory Setting				
ADC Adjust				
	Mode	PC-RGB		
	R-GAIN	1509		
	G-GAIN	1509		
	B-GAIN	1509		
	R-OFFSET	0		
	G-OFFSET	0		
	B-OFFSET	0		
	AUTO ADC	FAIL		
Customer setting				
	Gamma Table	0		
	Panel Setting			
	Uart Enable	On		
	Aging Mode	Off		
	Ginga	On		
	Power On Mode	Secondary		

	White Pattern	Off		
	WDT	On		
	PVR-RecordAll	Off		
W/B Adjust				
	Mode	DTV		
	TEMPERATURE	Medium		
	R-GAIN	1024		
	G-GAIN	1005		
	B-GAIN	1006		
	R-OFFSET	1024		
	G-OFFSET	1024		
	B-OFFSET	1024		
	Default			
RESET ALL				
RESET SHOP				
Non-linear				
	MODE	Contrast		
	OSD0	50		
	OSD25	70		
	OSD50	89		
	OSD75	109		
	OSD100	128		
OverScan				
	Input Source	DTV		
	Left Crop	16		
	Right Crop	17		
	Up Crop	13		
	Down Crop	12		

SSC Setting				
	SSC MIU	Off		
	MIU0 Span(0.1KHz)	20		
	MIU0 Step(0.01%)	1		
	MIU1 Span(0.1KHz)	20		
	MIU1 Step(0.01%)	1		
	SSC LVDS	Off		
	LVDS Span	350		
	LVDS Step	200		
	LVDS Swing	350		
USB Logo Update				
Others				
	UART BUS	OFF		
	White Balance ADJ	Off		
	DTV Log	Off		
	Key Upgrade Auto	Off		
	Key Upgrade Force	Off		
	PQ File...update	off		
	Sound Setting			
	AVD PARAMETER			
	Overwrite USB Upgrade			
Picture Mode				
	INPUT SOURCE	DTV		
	MODE	Standard		
	BRIGHTNESS	50		
	CONTRAST	100		
	COLOR	50		

	SHARPNESS	50		
	TINT	50		
SW INFORMATION				
	CLVERSION:	360821		
	Backup Database			
	Restore Database			
Key info.				
	HDCP1key is OK!			
	HDCP2key is OK!			
	ETH MAC:00:6c:fd:ea:7e:5d			
	WIFI MAC:00:7e:56:7d:cc:f8			
	ESN is OK!			
	WideVine is OK!			
	Playready is OK!			
	USB ---			
	IP is Error!			
RAM Log				

Chapter8 Instructions of HLS83D-I module Circuit Schematic Diagram

8-1 Clear EMMC, and set the parameters after upgrading according to the upgrade instructions.

8-2 Check each channel/source to see if the image and sound are normal.

8-3 Circuit Schematic Diagram is Available separately as an attachment.

Appendix：Circuit Schematic Diagram

c00215735-2.pdf