SANYO

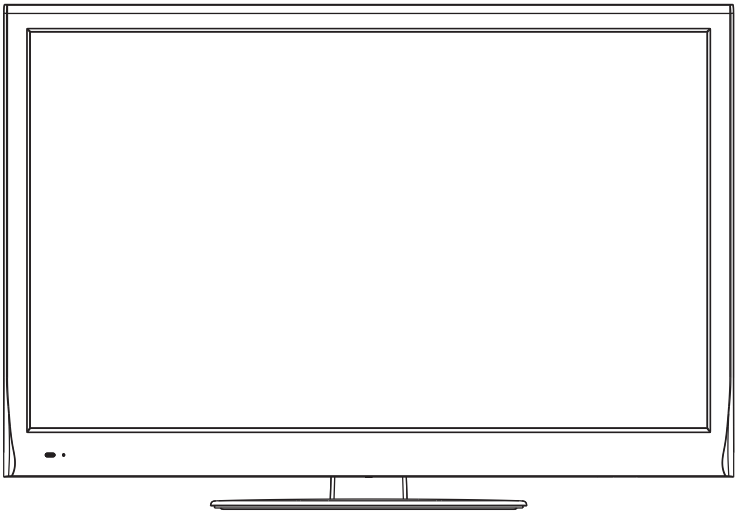
FILE NO.

SERVICE MANUAL

LED-LCD TV

LED-46XR10FH(B)

PRODUCT CODE No.
1 682 351 11: PAL-BG(TV) DTV



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Attention: This service manual is only for service personnel to take reference with. Before servicing please read the following points carefully.

Safety precautions

1. Instructions

Be sure to switch off the power supply before replacing or welding any components or inserting/plugging in connection wire Anti static measures to be taken (throughout the entire production process!):

a) Do not touch here and there by hand at will;

b) Be sure to use anti static electric iron;

c) It's a must for the welder to wear anti static gloves.

Please refer to the detailed list before replacing components that have special safety requirements. Do not change the specs and type at will.

2. Points for attention in servicing of LED

2.1 Screens are different from one model to another and therefore not interchangeable. Be sure to use the screen of the original model for replacement.

2.2 The operation voltage of LED screen is 700-825V. Be sure to take proper measures in protecting yourself and the machine when testing the system in the course of normal operation or right after the power is switched off. Please do not touch the circuit or the metal part of the module that is in operation mode. Relevant operation is possible only one minute after the power is switched off.

2.3 Do not use any adapter that is not identical with the TV set. Otherwise it will cause fire or damage to the set.

2.4 Never operate the set or do any installation work in bad environment such as wet bathroom, laundry, kitchen, or nearby fire source, heating equipment and devices or exposure to sunlight etc. Otherwise bad effect will result.

2.5 If any foreign substance such as water, liquid, metal slices or other matters happens to fall into the module, be sure to cut the power off immediately and do not move anything on the module lest it should cause fire or electric shock due to contact with the high voltage or short circuit.

2.6 Should there be smoke, abnormal smell or sound from the module, please shut the power off at once. Likewise, if the screen is not working after the power is on or in the course of operation, the power must be cut off immediately and no more operation is allowed under the same condition.

2.7 Do not pull out or plug in the connection wire when the module is in operation or just after the power is off because in this case relatively high voltage still remains in the capacitor of the driving circuit. Please wait at least one minute before the pulling out or plugging in the connection wire.

2.8 When operating or installing LED please don't subject the LED components to bending, twisting or extrusion, collision lest mishap should result.

2.9 As most of the circuitry in LED TV set is composed of CMOS integrated circuits, it's necessary to pay attention to anti statics. Before servicing LED TV make sure to take anti static measure and ensure full grounding for all the parts that have to be grounded.

2.10 There are lots of connection wires between parts behind the LED screen. When servicing or moving the set please take care not to touch or scratch them. Once they are damaged the screen

would be unable to work and no way to get it repaired.
If the connection wires, connections or components fixed by the thermotropic glue need to disengage when service, please soak the thermotropic glue into the alcohol and then pull them out in case of dagmage.
2.11 Special care must be taken in transporting or handling it. Exquisite shock vibration may lead to breakage of screen glass or damage to driving circuit. Therefore it must be packed in a strong case before the transportation or handling.
2.12 For the storage make sure to put it in a place where the environment can be controlled so as to prevent the temperature and humidity from exceeding the limits as specified in the manual. For prolonged storage, it is necessary to house it in an anti-moisture bag and put them altogether in one place. The ambient conditions are tabulated as follows:

Temperature	Scope for operation	5 ~ +35 ^{o}C
	Scope for storage	-15~ +45 ^{o}C
Humidity	Scope for operation	20% ~ 80%
	Scope for storage	<= 80%

2.13 Display of a fixed picture for a long time may result in appearance of picture residue on the screen, as commonly called “ghost shadow”. The extent of the residual picture varies with the maker of LED screen. This phenomenon doesn’t represent failure. This “ghost shadow” may remain in the picture for a period of time (several minutes). But when operating it please avoid displaying still picture in high brightness for a long time.

3. Points for attention during installation

3.1 The front panel of LED screen is of glass. When installing it please make sure to put it in place.
3.2 For service or installation it’s necessary to use specified screw lest it should damage the screen.
3.3 Be sure to take anti dust measures. Any foreign substance that happens to fall down between the screen and the glass will affect the receiving and viewing effect
3.4 When dismantling or mounting the protective partition plate that is used for anti vibration and insulation please take care to keep it in intactness so as to avoid hidden trouble.
3.5 Be sure to protect the cabinet from damage or scratch during service, dismantling or mounting.

Alignment instructions

1. Safety Instructions

Be sure to switch off the power supply before replacing or welding any components or inserting/plugging in connection wire Anti static measures to be taken (throughout the entire production process!):

a) Do not touch here and there by hand at will;

b) Be sure to use anti static electric iron;

c) It's a must for the welder to wear anti static gloves.

Please refer to the detailed list before replacing components that have special safety requirements. Do not change the specs and type at will.

2. Test equipment

VG-848 (VGA, YPbPr signal generator)

VG-849 (HDMI digital video signal generator)

CA210 (color analyzer)

3 Alignment flow

3.1 Voltage of power supply test

According to the wiring specified by Product Specification, connect power board, main/data processing board, IR/light sensor board, key board and backlight board correctly, then switch on main power and press key "⏻" to turn on the TV set.

a) Test each pin voltage of socket X401 (＜ 26" models) and 13-pin power socket X601 (≥ 26" models) in turn, please refer voltage of CCFL to Table 1, refer voltage of LED to Table 2:

Table 1 Each pin voltage of 13-pin power socket for CCFL models

Pin	1	2	3	4、5	6、7	8	9	10	11	12	13
Vol.	≥2.5 V	≥2.0 V	0	12 V±5%	0	N.C.	5 V±5%	0	5 V±5%	0	≥2.5 V

Table 2 Each pin voltage of 13-pin power socket for LED models

Pin	1	2	3	4	5	6	7、8	9、10	11	12	13
Vol/	≥2.5 V	0	5 V±5%	0	5 V±5%	N.C.	0	12 V±5%	0	≥2.0 V	≥2.5 V

b) Test each pin voltage of 5-pin power socket X606 in turn (≥ 26" models), please refer voltage to Table 3:

Table 3 Each pin voltage of 5-pin power socket

Pin	1、2	3、4、5
Vol.	24 V±5%	0

3.2 Alignment flow chart shown as Fig. 1

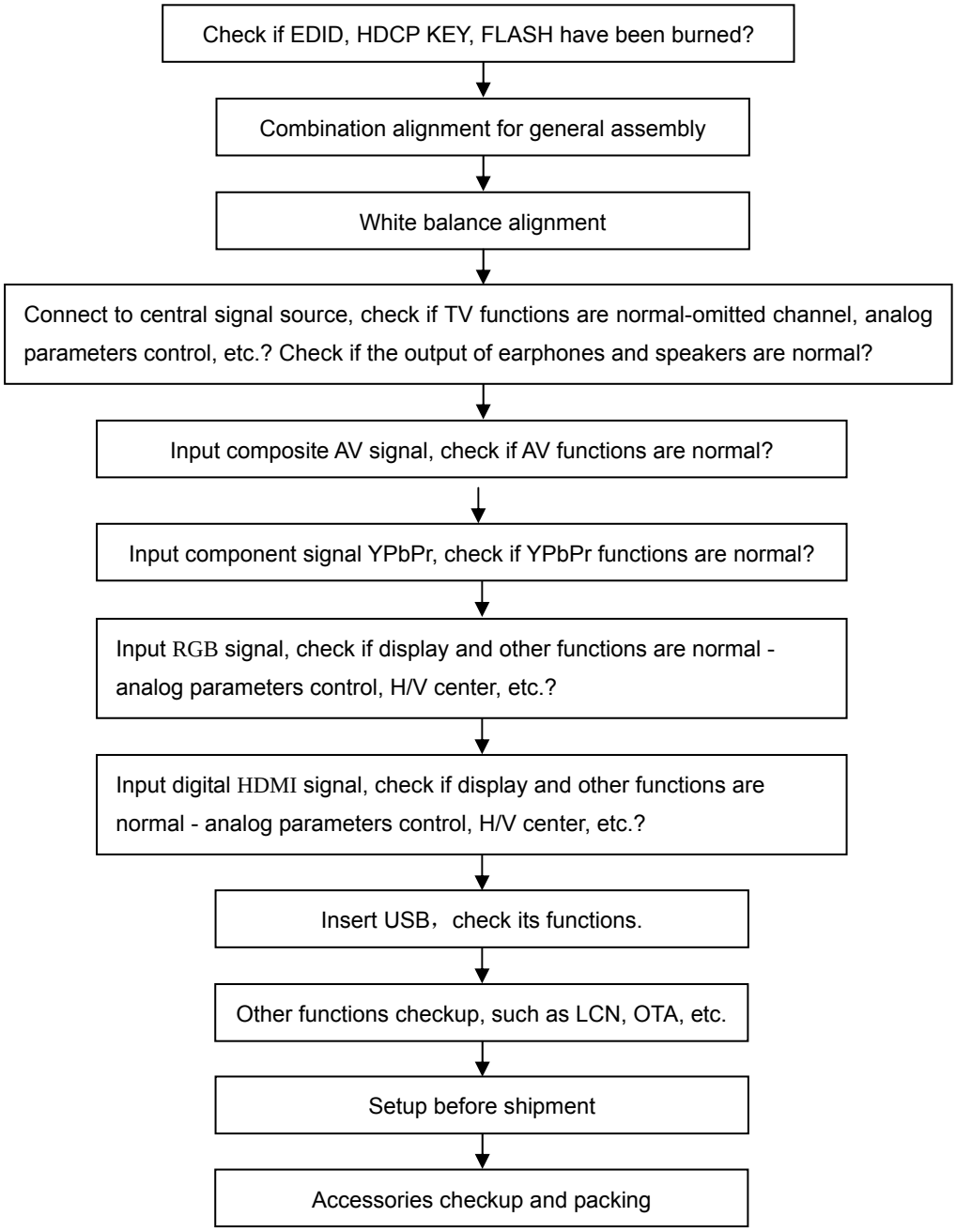


Fig. 1　Alignment flow chart

4 **Alignment instructions**

4.1 Unit adjustment

4.1.1 According to the wiring specified by Product Specification, connect power board, main/data processing board, IR/light sensor board, key board and backlight board correctly, then switch on main power and press key "⏻" to turn on the TV set, check if the display is normal.

4.1.2 Using method of factory menu

a) Press key "**SOURCE**" first, then press keys "**2**, **5**, **8**, **0**" in turn to enter into initial factory menu;

b) Press keys "▲" and "▼" to move cursor to the item of factory menu;

c) Press keys "◄" and "►" to change the value when cursor is moved onto one item;

d) Press key "**OK**" to enter into the inferior factory menu from current menu page;

e) Press key "**MENU**" to exit current menu to its superior factory menu;

f) Press key "**EXIT**" to exit factory menu in any case;

g) Factory menu item: **ADC ADJUST**, for ADC calibration of RGB and YP_BP_R;

h) Factory menu item: **W/B ADJUST**, for white balance adjustment;

i) Factory menu item: **POWER Mode**, for setting power-on mode; the default setting is "Standby" mode unless specified by customer;

Standby: TV set will be in "standby" mode after power-on;

MEM: TV set will keep states before last power-off;

ForceOn: TV set will turn on automatically; it also can be used as aging mode at factory;

j) Factory menu item: **Other Setting->ISP Mode**, the item will not be kept in memory, that is, it will be always in "OFF" mode after turning on again;

"**ON**": Upgrading unit software through D-SUB port while connecting to ISP device;

"**OFF**": Normal DDC functions of D-SUB port will recover;

k) Factory menu item: **EEPROM Init**, for factory and customer data initialization; TV set will reset and initial guiding interface will display after executing the item;

l) Factory menu item: **Fac. Channel Preset**., for factory channels presetting; it is necessary to connect to central signal source before operating the item; now digital frequency of central signal CH28（529.5 MHz）and CH33（564.5 MHz）are distributed to Australia programs DVB-T; original preset digital programs will not change along with the modification of central signal, so please operate relevant item of menu "Channel" to search programs;

m) Factory menu item: **Shipment**, all analog & digital programs for factory adjustment will be cleared out first, then customer channels will be preset according to order requirements; the item must be executed before shipment to clear out channels for factory adjustment;

n) Factory menu item: **Other Setting->MST DEBUG**, default setting is "OFF", it will not be kept in memory, that is, it will always in "OFF" mode after turning on TV set again;

"**OFF**": RS232 functions of some engineering machines can match design specifications;

"**ON**": It is convenient for design tools to debug the software;

o) Factory menu item: **Backlight**, for adjusting brightness of backlight; test voltage of 13-pin power socket while adjusting the item to make it greater than PWM voltage corresponding to mixture brightness described by panel specification; the item need not adjustment for it has been preset by software;

p) Factory menu item: **Other Setting->SSC ADJUST**, for expanded spectrum adjustment; the item need not adjustment for it has been preset by software;

q) Factory menu item: **Other Setting->AUDIO Curve Setting**, for sound curve adjustment; if without special customer requirements, the item need not adjustment commonly for it has been preset by software;

r) Factory menu item: **Software Update**, for software upgrade from USB port; at any channel, insert USB memory device, select option "**YES**", software will auto-search file "**MERGE.bin**" in USB memory device to begin upgrade; please execute item "**EEPROM Init**" before adjustment again, for old data still remain in E^2PROM after software upgrade.

4.1.3 ADC calibration of analog component YPbPr

a) Switch to analog component YPbPr channel;

b) Press key "**SOURCE**", then press keys "**2**, **5**, **8**, **0**" in turn to enter into initial factory menu;

c) Move cursor to item "**ADC ADJUST**" and press key "**OK**" to enter into inferior factory menu;

d) Input analog component Y/Pb/Pr signal（**VG848 Timing 972(1080i), Pattern 918(8 Color & 16 Grey)**）; move cursor to item "**MODE** "， press keys "▲" and "▼" to select item "**YPbPr**"， then move cursor to item "**AUTO ADC**" and press key "**OK**" to begin auto-adjustment until prompt "**Success**" displays which means successful auto-calibration;

4.1.4 ADC calibration of analog RGB

a) Switch to analog RGB channel;

b) Press key "**SOURCE**", then press keys "**2**, **5**, **8**, **0**" in turn to enter into initial factory menu;

c) Move cursor to item "**ADC ADJUST**" and press key "**OK**" to enter into inferior factory menu;

d) Input analog RGB signal（**VG848: Timing 856（1024×768/60 Hz）, Pattern 914(Color Temp.)**）; move cursor to item "**MODE** "， press keys "▲" and "▼" to select item "**RGB**"， then move cursor to item "**AUTO ADC**" and press key "**OK**" to begin auto-adjustment until prompt "**Success**" displays which means successful auto-calibration.

4.2 White balance adjustment"

Unless specified by customer:

a) ＜ 26" models:

Default color temperature "**Cool**" is **10000K** and its chromatic coordinates is (**280**, **288**); color temperature "**Normal**" is **8000K** and its chromatic coordinates is (**295**, **305**); color temperature "**Warm**" is **6500K** and its chromatic coordinates is (**323**, **329**);

b) ≥ 26" models:

Default color temperature "**Cool**" is **12000K** and its chromatic coordinates is (**272**, **278**); color temperature "**Normal**" is **9300K** and its chromatic coordinates is (**285**, **293**); color temperature "**Warm**" is **6500K** and its chromatic coordinates is (**323**, **329**);

4.3 Adjustment procedure

TV set should be working over 30 mins to be in stabler state before white balance adjustment; Use white balance apparatus CA-210 and switch to its BBY channel;

a) Switch to HDMI1channel;

b) Press key "**SOURCE**", then press keys "**2**, **5**, **8**, **0**" in turn to enter into initial factory menu;

c) Move cursor to item "**W/B ADJUST**" and press key "**OK**" to enter into inferior factory menu;

d) Input **HDMI** signal (**VG-848 Timing:856(1024×768/60 Hz)，Pattern:921(Gray 16 step(H)**); move cursor to item "**MODE**", press keys "▲" and "▼" to select item "**HDMI1**" or other HDMI channels, then move cursor to item "**Temper..**" and press keys "▲" and "▼" to select item "**Normal**";

e) Fix item "**G-GAIN**", adjust items "**R-GAIN**, **B-GAIN**" to set chromatic coordinates of **13th** scale as the value of temperature "**Normal**";

f) Fix item "**G-OFFSE**T", adjust items "**R-OFFSET, B-OFFSET**" to set chromatic coordinates of **4th** scale as the value of temperature "**Normal**";

g) During temperature "**Normal**" adjustment , make sure that chromatic coordinates errors of bright scale are (**x±10, y±15**) and chromatic coordinates errors of dark scale are (**x±10,y±25**);

h) Move cursor to item "**COPY ALL**" again to copy data of white balance to other channels;

i) Check if chromatic coordinates of "**Cool**" and "**Warm**" meet the requirements or not, if not, adjust items "**R-GAIN/B-GAIN/R-OFFSET/B-OFFSET**" to meet them:
"**Cool**": chromatic coordinates errors of bright scale are (**x±5, y±15**), chromatic coordinates errors of dark scale are (**x±8, y±30**);
"**Warm**": chromatic coordinates errors of bright & dark scales are both (**x±10, y±10**);

j) Check if chromatic coordinates of other channels meet the requirements, if not, adjust them respectively;

k) Check white balance of each channel by eye, check if the picture is normal;

l) Please refer to the adjusting rules as follows:
B Gun: coordinates of **X** and **Y** will increase when **B** gun is adjusted downwards;
coordinates of **X** and **Y** will decrease when **B** gun is adjusted upwards;
R Gun: adjusting **R** gun will effect coordinate of **X**, and value of **Lv** slightly;
coordinate of **X** will increase when **R** gun is adjusted upwards;
coordinate of **X** will decrease when **R** gun is adjusted downwards;
G Gun: adjusting **G** gun will effect coordinate of **Y**, and value of **Lv** greatly;
coordinate of **Y** will increase when **G** gun is adjusted upwards;
coordinate of **Y** will decrease when **G** gun is adjusted downwards.

5 **Functions checkup**

5.1 Analog & digital TV functions

Input central signal to RF port, enter into menu "**CHANNEL**", then search channels automatically, check if there is any omitted channel, check if the output of speakers and the picture are normal.

5.2 Composite video of AV port

Input composite video signal to AV port, check if the picture and the sound are normal under the circumstances of power on/off, switching channel and format, etc.

5.3 Analog component YPbPr/YCbCr port

Input analog YP_BP_R signal from VG848 signal generator with YP_BP_R formats listed as Table 4 respectively, check if the picture and the sound are normal under the circumstances of power-on/off, switching channel and format, etc.

Table 4 YP_BP_R signal formats

No.	Definition	H. - fre.（kHz）	V. – fre.（Hz）	Dot pulse fre.（MHz）	Note
1	720×480	15.734/15.75	59.94/60	13.5/13.514	480i (NTSC, NTSC4.43,PAL60,PAL-M)
2	720×576	15.625	50	13.5	576i (PAL, PAL-N, SECAM)
3	720×480	31.469/31.5	59.94/60	27/27.027	480p
4	720×576	31.25	50	27	576p
5	1280×720	37.5	50	74.25	720p (50p)
6	1280×720	44.955/45	59.94/60	74.176/74.25	720p (59.94p/60p)

7	1920×1080	28.125	50	74.25	1080i (50i)
8	1920×1080	33.75	59.94/60	74.176/74.25	1080i (59.94i/60i)
9	1920×1080	26.973	23.976	74.176	1080p (23.97p)
10	1920×1080	27	24	74.25	1080p (24p)
11	1920×1080	28.125	25	74.25	1080p (25p)
12	1920×1080	33.716	29.97	74.176	1080p (29.97p)
13	1920×1080	33.75	30	74.25	1080p (30p)
14	1920×1080	56.25	50	148.5	1080p (50p)
15	1920×1080	67.432/67.5	59.94/60	148.35/148.5	1080p (59.94p/60p)

5.4 Analog R, G, B port

Input analog RGB signal from VG-848 signal generator to VGA port with VGA signal formats listed in Table 5 respectively, check if the display and the sound are normal under the circumstances of power-on/off, switching channel and format, etc. if there is any H/V offset, enter into main menu and select items "**PICTURE"->"Screen"->"Auto Ajust**" in turn to make calibration automatically;

Table 5 Analog RGB signal formats

No.	Definition	H. - fre.（kHz）	V. – fre.（Hz）	Dot pulse fre.（MHz）	Note
1	640×480	31.469	59.94	25.175	IBM
2	720×400	31.469	70.086	28.322	IBM
3	640×480	37.861	72.809	31.5	VESA
4	640×480	37.5	75	31.5	VESA
5	800×600	35.156	56.25	36	VESA
6	800×600	37.879	60.317	40	VESA
7	800×600	48.077	72.188	50	VESA
8	800×600	46.875	75	49.5	VESA
9	1024×768	48.363	60.004	65	VESA
10	1024×768	56.476	70.069	75	VESA
11	1024×768	60.023	75.029	78.75	VESA
12	1152×864	67.5	75	108	VESA
13	1280×960	60	60	108	VESA
14	1280×1024	63.98	60.02	108	VESA
15	1280×1024	80	75	135	SXGA
16	1360×768	47.7	60	85.5	WXGA
17	1440×900	55.9	60	106.5	WXGA+
18	1400×1050	65.22	60	122.61	SXGA+
19	1680×1050	65.3	60	146.25	WSXGA+
20	1920×1080	67.5	60	148.5	

5.5 Digital HDMI port

Input HDMI signal from VG849 signal generator with the formats listed in Table 6 respectively, check if the display and the sound (32 kHz, 44.1 kHz, 48 kHz) are normal under the circumstances of power-on, switching channels or formats, etc.

Table 6 Digital HDMI signal format

No.	Definition	H. - fre.（kHz）	V. – fre.（Hz）		Dot pulse fre.（MHz）	Note
1	640×480	31.469/31.5	59.94/60		25.175/25.2	640×480p@59.94/60 Hz
2	720×480	31.469/31.5	59.94/60		27/27.027	720×480p@59.94/60 Hz,4:3/16:9
3	1280×720	44.955/45	59.94/60		74.176/74.25	1280×720p@59.94/60 Hz
4	1920×1080	33.716/33.75	59.94/60		74.176/74.25	1920×1080i@59.94/60 Hz
5	720(1440)×480	15.734/15.75	59.94/60		27/27.027	720(1440)×480i@59.94/60 Hz,4:3/16:9
6	720(1440)×240	15.734/15.75	Mode1	59.826/59.886	27/27.027	720(1440)×240p@59.94/60 Hz,4:3/16:9
			Mode 2	60.054/60.115		
7	(2880)×480	15.734/15.75	59.94/60		54/54.054	(2880)×480i@59.94/60 Hz,4:3/16:9
8	(2880)×240	15.734/15.75	Mode 1	59.826/59.886	54/54.054	(2880)×240p@59.94/60 Hz,4:3/16:9
			Mode 2	60.054/60.115		
9	1440×480	31.469/31.5	59.94/60		54/54.054	1440×480p@59.94/60 Hz,4:3/16:9
10	1920×1080	67.432/67.5	59.94/60		148.352/148.5	1920×1080p@59.94/60 Hz
11	720×576	31.25	50		27	720×576p@50 Hz,4:3/16:9
12	1280×720	37.5	50		74.25	1280×720p@50 Hz
13	1920×1080	28.125	50		74.25	1920×1080i@50 Hz
14	720(1440)×576	15.625	50		27	720(1440)×576i@50 Hz,4:3/16:9
15	720(1440) ×288	15.625	Mode 1		49.761	27
16	(2880) ×576	15.625	Mode 2	49.92	(2880)×576i@50 Hz,4:3/16:9	720(1440)×288p@50 Hz,4:3/16:9
			Mode 3	50.08		
			50	54		
17	(2880) ×288	15.625	Mode 1		49.761	54
18	1440×576	31.25	Mode 2	49.92	1440×576p@50 Hz,4:3/16:9	(2880)×288p@50 Hz,4:3/16:9
			Mode 3	50.08		
			50	54		
19	1920×1080	56.25	50		148.5	1920×1080p@50 Hz
20	1920×1080	26.973/27	23.97/24		74.176/74.25	1920×1080p@23.97/24 Hz
21	1920×1080	28.125	25		74.25	1920×1080p@25 Hz
22	1920×1080	33.716/33.75	29.97/30		74.176/74.25	1920×1080p@29.97/30 Hz

5.6 USB port

5.6.1 Media playing function

Insert USB memory containing files of picture, audio and video, check if the picture, the sound and other functions are normal;

5.6.2 PVR function

Insert formatted USB memory containing recorded-program files, press key “**Rec. List**” to select and play program, check if the picture, the sound and other functions are normal;

5.7 MUSIC port

Input audio signal, check if the sound is normal;

5.8 Other functions checkup

a) Check if composite video out of AV port, digital audio port, earphone jack, etc., are normal;
b) Check if the functions of LCN, OTA are normal;

6 User menu setup before shipment

Enter into “**LOCK**” user menu, input initial password “**0000**”, select item “**Restore Factory Default**” and then press key “**OK**” to make setup before shipment;

a) Clear out information of all programs;
b) Clear out information of program-lock, favorite programs, etc.;
c) Recover default analog parameters;;
d) Set menu language as “**English**”;
e) Set power-on mode as “**Standby**”.

Method of software upgrading instructions

Factory software burned instructions listed as Table 7

Table 7 Factory software burned instructions

Model	Loc. No.	Part No.	Part Type	Software function	Burned before SMT	Burning method
<26" CCFL	N103	5272564002	EN25Q64-104HIP	Main program	Yes	Use ALL-100 with write-protect, refer to Note 1 in detail.
	N106	5272404005	CAT24C04WI-GT3	HDCP KEY	Yes	Use ALL-100, etc.
	N301 N316	5272402002 5272402003	AT24C02BN10SU-1.8 CAT24C02WI	HDMI EDID	Yes	Use ALL-100, etc.
	N305	5272402002 5272402003	AT24C02BN10SU-1.8 CAT24C02WI	VGA EDID	Yes	Use ALL-100, etc.
<26" LED	N103	5272564002	EN25Q64-104HIP	Main program	Yes	Use ALL-100 with write-protect, refer to Note 1 in detail.
	N106	5272404005	CAT24C04WI-GT3	HDCP KEY	Yes	Use ALL-100, etc.
	N301 N311	5272402002 5272402003	AT24C02BN10SU-1.8 CAT24C02WI	HDMI EDID	Yes	Use ALL-100, etc.
	N305	5272402002 5272402003	AT24C02BN10SU-1.8 CAT24C02WI	VGA EDID	Yes	Use ALL-100, etc.
≥26" LED	N103	5272564002	EN25Q64-104HIP	Main program	Yes	Use ALL-100 with write-protect, refer to Note 1 in detail.
	N106	5272404005	CAT24C04WI-GT3	HDCP KEY	Yes	Use ALL-100, etc.
	N302 N305 N316	5272402002 5272402003	AT24C02BN10SU-1.8 CAT24C02WI	HDMI EDID	Yes	Use ALL-100, etc.
	N309	5272402002 5272402003	AT24C02BN10SU-1.8 CAT24C02WI	VGA EDID	Yes	Use ALL-100, etc.

Note 1: Method of write-protect setup: enter into burning interface of ALL-100, tick option "**Config**", press item "**config Setting**", set option "**Protect**" as "**All Protect**"; make sure that option "**Config**" must be ticked before burning software and write-protect must be reset after ALL-100 burning software is opened every time.

Note 2: Method of burning and upgrading software online by using ISP burning device:

a) For main board upgrade: connect 4-pin cable of ISP burning device to Debug port of main board (<26": **X404**, ≥26": **X604**); for unit upgrade, connect both D-SUB ports of ISP burning device and main board, enter into factory menu and set item "**Other Settings**->**ISP Mode**" as "**ON**";

b) Using **Mstar** online burning program, enter into menu "**Device**", tick option "**WP Pin pull to high during ISP**" to ensure that hardware write-protect of Flash is removed and erasing process is normal, please refer to Fig. 2;

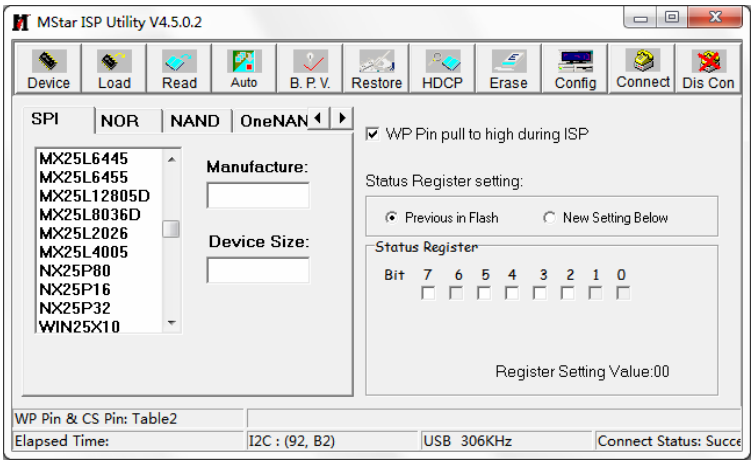


Fig. 2 Write-protect setup

c) Press menu "**Connect**", a dialog box "**Device Type is XXX** (**XXX** is corresponding type of **SPI Flash**)" will pop up, that is, connection has been successful, please refer to Fig. 3; if connection is failed, press the first menu "**Device**" to select SPI Flash type manually, then press menu "**Connect**" again;

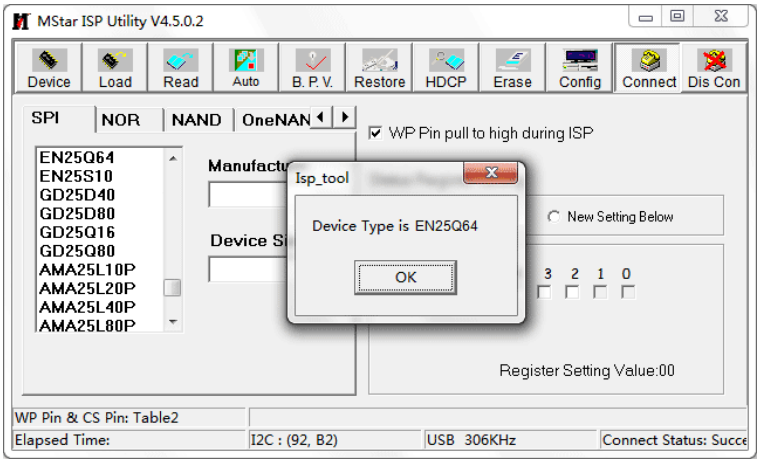


Fig. 3 Successful connection

d) Press menu "**Read**", select the burning file, such as "**MERGE.bin**", please refer to Fig. 4;

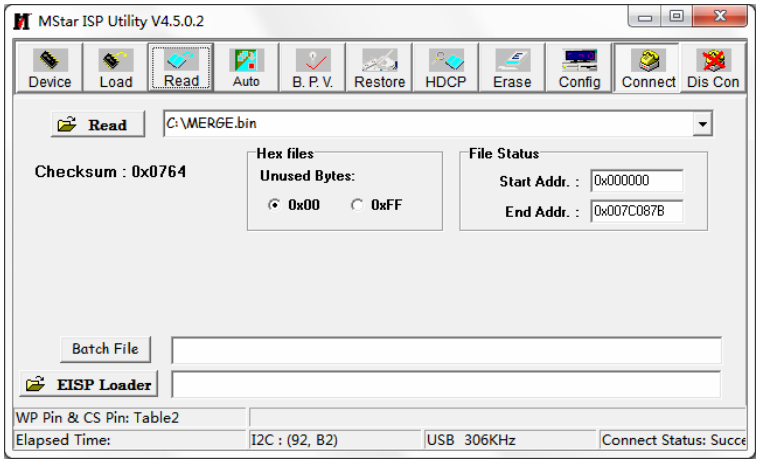


Fig. 4 Burning file

e) Press menu "**Auto**", tick options "**All chip**", "**program**" and relative option switches, please refer to Fig.5, press key "**Run**" to begin burning;

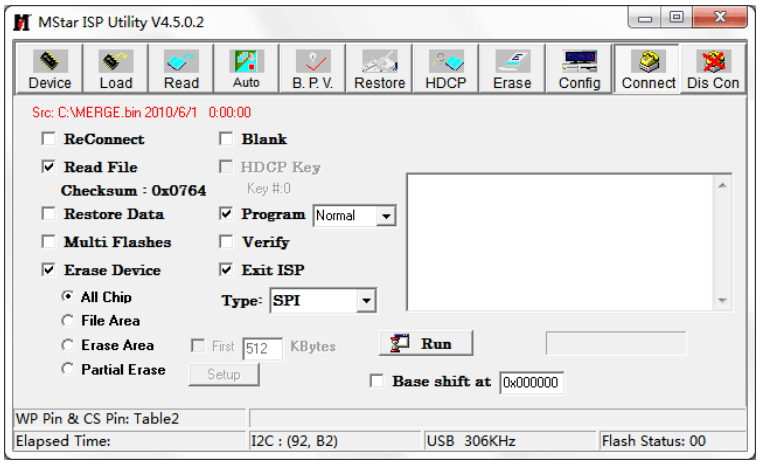


Fig. 5 Option switches

f) Burning process has two steps: **Erase** and **Program;** please refer to Fig. 6;

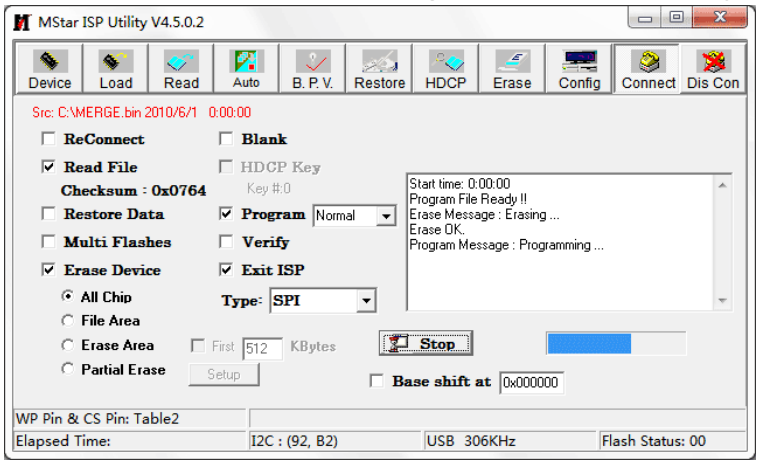


Fig. 6 Option switches

1) First, the step "**Erasing…**" will last for some time, or it is failed if it is passed by quickly, please confirm procedure 2）and begin burning process again;
2) Then the following step is "**Programming…;**
3) A prompt "**Pass**" will display at last;

g) A prompt "**Pass**" will display if burning process is successful, please refer to Fig. 7;

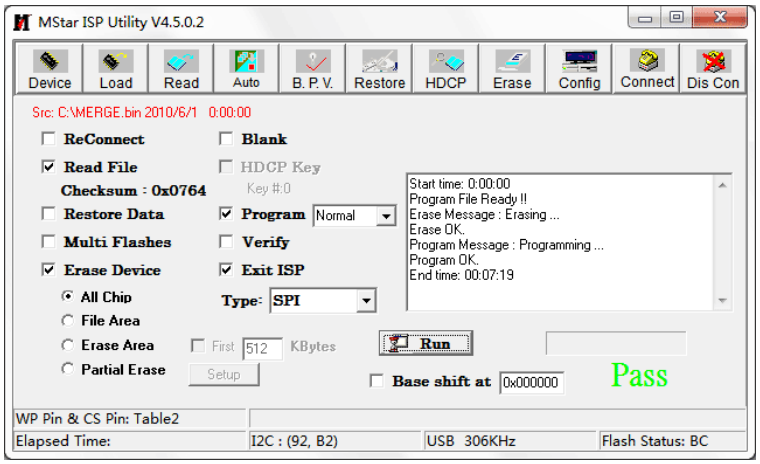


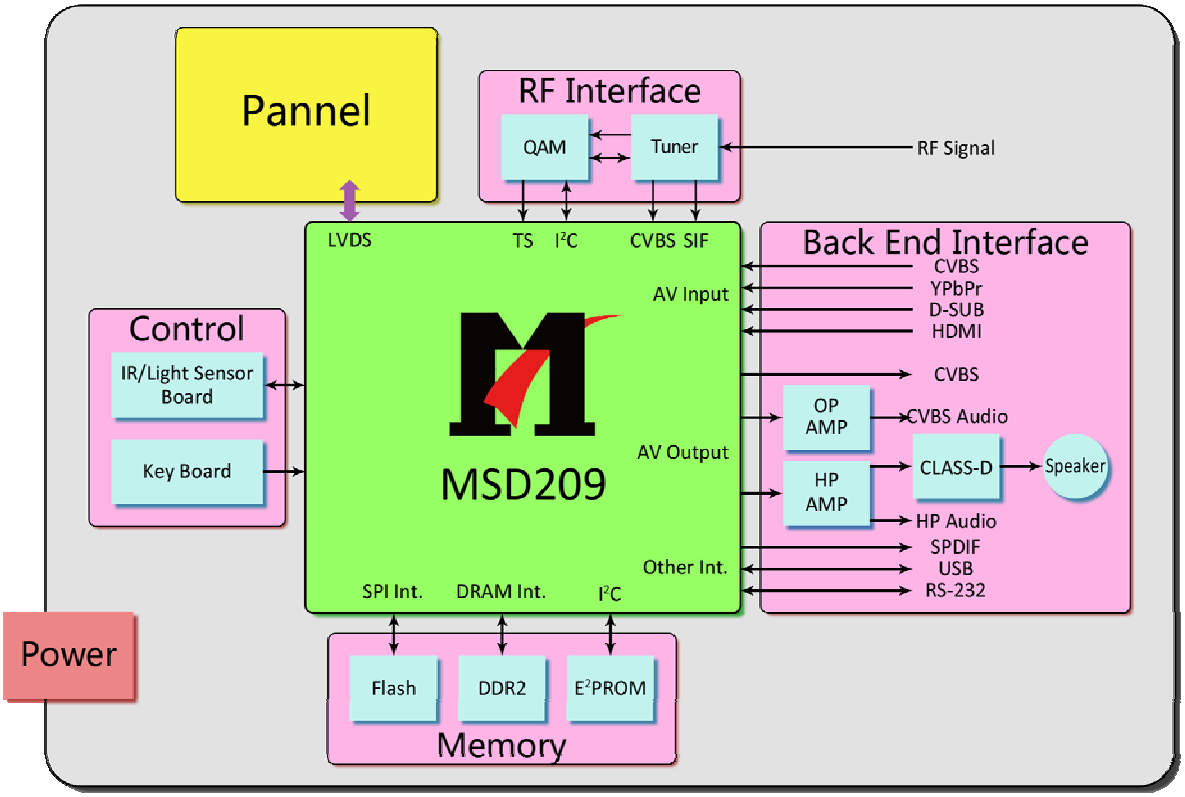
Fig. 7 Successful burning process

h) If there are other machines to be burned, remain **ISP** burning interface and repeat procedures **c**）to **e**）only;

Note 3: Method of online burning and upgrade through **USB**:

a) Make sure that U disk is formatted as "**FAT32**";
b) Copy firmware to U disk with name of "**Merge.bin**";
c) Turn on the TV set, press key "**SOURCE**" first, then press keys "**2**, **5**, **8**, **0**" in turn to enter into initial factory menu at any channel;
d) Enter into factory menu, select item "**Software Update**", press key "**OK**", a prompt "**Are you sure?**" will display, select option "**Yes**", then software will auto-search file "**MERGE.bin**" in the USB memory to begin upgrade, detailed upgrading processes are below:
    1) Read data from USB memory, a prompt "**Unknown image type**" will display if upgrading file is wrong;
    2) If upgrading file is right, a prompt "**Software upgrading...**" and percent of upgrading progress will display, while indicated light is twinkling at the same time;
    3) The unit will restart after upgrading processes has completed;
e) Restart the unit, enter into factory menu, confirm software parameters - version and time, then execute "**EEPROM Init**" to complete the whole upgrading processes;
f) USB burning method could not be sure to all kinds of U disks, so please try another U disk if one is inapplicable.

Working principle analysis of the unit



Signal Flow

1、 **PAL/SECAM signal flow**

Send PAL/SECAM analog RF signal received from antenna to TUNER **FT21XX** which is controlled by main chip **MSD209GL** through **I²C** BUS; CVBS video signal and SIF audio differential signal will be outputted after demodulation;

CVBS video signal is sent into main chip **MSD209GL** to be processed by modules of video decoding, deinterlacing, video processing and zoom, then LVDS signal will be outputted to drive display panel;

SIF audio differential signal is sent into main chip **MSD209GL** to be demodulated to analog audio signal, then it is sent to earphone amplifier **BH3547F** to be amplified after the processes of preamplification, acoustic effect processing and volume control, and then it is divided into two, one is sent to earphone jack, the other is sent to audio power amplifier **R2A15112FP** (D class) to be amplified and then drive speakers.

2、 **DVB-T signal flow**

Send DVB-T digital RF signal received from antenna to TUNER **FT21XX** which is controlled by main chip **MSD209GL** through **I²C** BUS; after down frequency conversion, differential IF signal will be inputted into demodulator IC **MSB1210** to be demodulated; then it will be sent to main chip **MSD209GL** with the standard format of serial or parallel TS stream for demultiplexing and decoding;

Video route: digital video signal is sent into main chip **MSD209GL** for decoding and video processing after demultiplexing, then LVDS signal will be outputted to drive display panel;

Audio route: digital audio signal will be sent into main chip **MSD209GL** for decoding and audio processing after demultiplexing, then dual-sound-track analog audio signal (stereo) is sent to earphone amplifier **BH3547F** to be amplified after the processes of preamplification, acoustic effect processing and volume control by main chip **MSD209GL**, then one is sent to earphone jack, the other is sent to audio power amplifier **R2A15112FP** (D class) to be amplified and then drive speakers.

3、 **AV input signal flow**

AV video signal is sent into main chip **MSD209GL** to be processed by modules of video decoding, deinterlacing, video processing and zoom, then LVDS signal will be outputted to drive display panel;

AV audio signal is sent into main chip **MSD209GL** for acoustic effect processing and volume control after the processing of voltage division, impendence matching and AC coupling, then it is sent to earphone amplifier **BH3547F** to be amplified, one is sent to earphone jack, the other is sent to audio power amplifier **TDA7266SA** (AB class) to be amplified and then drive speakers.

4、 **D-SUB/YPbPr input signal flow**

D-SUB/YPbPr video signal is sent into main chip **MSD209GL** to be processed by modules of A/D conversion, video decoding, deinterlacing, video processing and zoom, then LVDS signal will be outputted to drive display panel;

D-SUB/YPbPr audio signal is sent into main chip **MSD209GL** for acoustic effect processing and volume control after the processing of voltage division, impendence matching and AC coupling, then it is sent to earphone amplifier **BH3547F** to be amplified, one is sent to earphone jack, the other is sent to audio power amplifier **R2A15112FP** (D class) to be amplified and then drive speakers.

5、 **HDMI input signal flow**

HDMI video signal is sent into main chip **MSD209GL** to be processed by modules of video decoding, video processing and zoom, then LVDS signal will be outputted to drive display panel;

HDMI audio signal is sent into main chip **MSD209GL** for audio processing, preamplification, acoustic effect processing and volume control, then it is sent to earphone amplifier **BH3547F** to be amplified, one is sent to earphone jack, the other is sent to audio power amplifier **R2A15112FP** (D class) to be amplified and then drive speakers.

6、 **AV input signal flow**

Current active AV video signal is sent into main chip **MSD209GL** for video coding, then it is amplified by peripheral video amplified circuits and then outputted;

Current active AV audio signal is sent into main chip **MSD209GL** for preamplification, acoustic effect processing and volume control, then it is sent to operation amplifier to be amplified and then outputted.

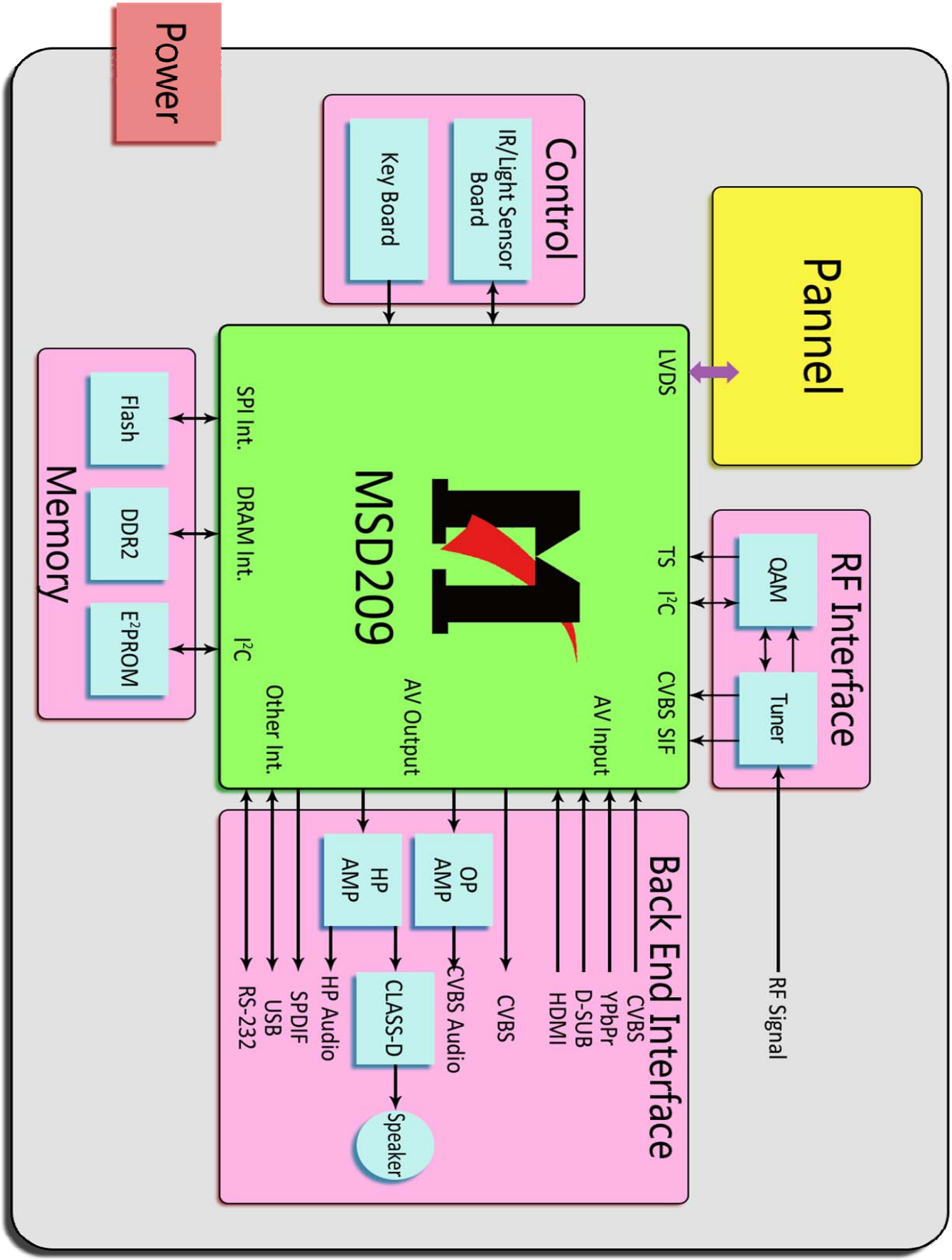
7、 **SPDIF input signal flow**

Current active AV audio signal is sent into main chip **MSD209GL** for acoustic effect processing, volume control and digital audio coding, then it is outputted.

8、 **MEMC input signal flow**

Current active AV video signal is sent into main chip **MSD209GL** for video coding, then LVDS signal is outputted to **MEMC** chip **6M20S** for frame insertion processing, and then frequency multiplication LVDS signal is outputted to drive display panel.

Block diagram



IC Block Diagram and Instruction

1、 MSD209GL-LF

GENERAL DESCRIPTION

The MSD209GL is a highly integrated controller IC for LCD/PDP DTV applications with resolutions up to full-HD(1920 x 1080). It is configured with an integrated triple-ADC/PLL, a multi-standard TV video and audio decoder, a motion adaptive video de-interlacer, a scaling engine, the MStarACE-3 color engine, an advanced 2D graphics engine, a transport processor, a high-definition (HD) MPEG video decoder, a high-definition (HD) H.264 video decoder, a RealVideo decoder, a JPEG video decoder, a MPEG-4 decoder, and a 24-bit DSP for MPEG audio decoding, a DVI/HDCP/HDMI receiver, and a peripheral control unit providing a variety of HDTV control functions.

For digital TV application, the MSD209GL comprises an MPEG-2 transport processor with advanced section filtering capability, an MPEG-2 (MP@HL profile) video decoder, a MPEG-4 decoder, a H.264 video decoder, and an audio DSP decoder for MPEG audio streams, MPEG layer I and II digital audio decoder with analog audio outputs that are designed to support existing and future DVB-T programs while handling conditional access. Furthermore,it is also possible to decode JPEG, RealVideo streams, and MP3 formats from external sources such as USB interface.

For analog TV, the MSD209GL includes NTSC/PAL/SECAM multi-standard video decoder comprising a 3D motion adaptive comb filter and time-based correction, and a NICAM/A2 audio decoder to support worldwide television standards. The MSD209GL is also configured with a VBI processor to decode digital information such as Close Caption/V-chip/teletext/WSS/CGMS-A/VPS. In addition, the MStar advanced LCD TV processor enhances video quality, motion adaptive de-interlacer, picture quality adjustment units, and MStarACE-3 color engine.

With USB 2.0 host controllers, UART, IR, SPI, I2C, and PWM, the MSD209GL fulfills all requirements in advanced DTV sets. To reduce system costs, the MSD209GL also integrates intelligent power management control capability for green-mode requirements and spread-spectrum support for EMI management.

MSD209GL Features：

Twin-turbo 8051 Micro-controller

- Twin-turbo 8051 MCU
- Interrupt controller
- Supports ISP
- Two full duplex UARTs
- DMA engine to speed up large data movement

Transport Stream De-multiplexer

- One external TS input and one internal TS data path
- Supports serial TS interface, with or without sync signal
- Maximum TS data rate is 104 Mb/sec
- 32 general purpose PID filters and section filters for each transport stream de-multiplexer
- One video PES and one audio PES channel
- Supports DVB subtitle and digital teletext

- Supports additional audio/video/PCR filters
- Supports TS DMA channel for time-shift
- Supports AES encryption/decryption

MPEG-2 A/V Decoder

- ISO/IEC 13818-2 MPEG-2 video MP@HL
- Automatic frame rate conversion
- Supports resolution in HDTV (1080i, 720p) and SDTV
- Supports MPEG-1, MPEG-2 (Layer I/II), Dolby Digital (AC-3), and AAC audio decoding
- Optionally Supports Dolby Digital Plus (E-AC-3) decoding, and Dolby Digital Compatible Output (DDCO) for HE-AAC to DD transcoding

MPEG-4 Video Decoder

- ISO/IEC 14496-2 MPEG-4 ASP video decoding
- Supports resolution in HDTV (1080p@30fps)
- Supports DivX^3 Home Theater or HD profile

H.264 Decoder

- ITU-T H.264, ISO/IEC 14496-10 (main and high
- profile up to level 4.0) video decoding
- Supports resolutions for all DVB, ATSC, HDTV,DVD and VCD
- Supports resolution up to 1080p@30fps
- Supports CABAC and CAVLC stream types
- Processing of ES and PES streams, extractions and provision of time stamps

RealMedia Decoder

- Supports maximum resolution up to 720p@30fps
- Supports RV8, RV9, RV10, RA8-LBR and HE-AAC decoders
- Supports file formats with RM and RMVB
- Supports Picture Re-sampling
- Supports in-loop de-block for B-frame

Hardware JPEG

- Supports sequential mode, single scan
- Supports both color and grayscale picture
- Operates in scan unit; hardware decoder will handle the bit stream after scan header
- Supports programmable region of interest (ROI)
- Supports format: 422/411/420/444/422T
- Decoded picture will be stored in DRAM with UYVY format
- Supports scaling down ratio: 1/2, 1/4, 1/8,applied to height and width simultaneously
- Supports picture rotation

NTSC/PAL/SECAM Video Decoder

- Supports NTSC-M, NTSC-J, NTSC-4.43, PAL (B,D, G, H, M, N, I, Nc), and SECAM
- Automatic TV standard detection
- Motion adaptive 3D comb filter for NTSC/PAL
- Seven configurable CVBS & Y/C S-video inputs
- Supports Teletext level-1.5, Closed Caption(analog CC 608/ analog CC 708/digital CC 608/digital CC 708), V-chip and SCTE
- Two CVBS video outputs

Multi-Standard TV Sound Processor

- Supports BTSC/A2/EIA-J demodulation in NTSC and A2/NICAM/FM/AM demodulation in PAL
- Supports MTS Mode Mono/Stereo/SAP in BTSC/EIA-J and Mono/Stereo/Dual in A2/NICAM
- L/R audio line-in x5 and SIF audio input
- L/R speaker and 2 additional L/R audio line-out
- Built-in audio sampling rate conversion (SRC)
- Built-in audio ADC
- Built-in audio DAC's
- Audio processing for loudspeaker channel,including volume, balance, mute, tone, EQ,virtual stereo/surround, and treble/bass
- Advanced sound**Optional** available (Dolby, SRS,BBE… etc)
- Supports digital audio format decoding:
  - MPEG-1, MPEG-2 (Layer I/II), MP3, AC-3 (Dolby Digital), AAC-LC, WMA
  - E-AC-3 (Dolby Digital Plus) decoding and E-AC-3 to AC-3 conversion at the same time

Digital Audio Interface

- I^2S digital audio input & output
- S/PDIF digital audio input & output
- HDMI audio channel processing capability
- Programmable delay for audio/video synchronization

Analog RGB Compliant Input Ports

- Three analog ports support up to 1080P
- Supports PC RGB input up to SXGA@75Hz
- Supports HDTV RGB/YPbPr/YCbCr
- Supports Composite Sync and SOG (Sync-on-Green) separator
- Automatic color calibration

Auto-Configuration/Auto-Detection

- Auto input signal format and mode detection
- Auto-tuning function including phasing,positioning, offset, gain, and jitter detection
- Sync Detection for H/V Sync

DVI/HDCP/HDMI Compliant Input Port

- Three DVI/HDCP/HDMI input ports support up to 225MHz @ 1080P 60Hz with 12-bit deep-color resolution
- Single link on-chip DVI 1.0 compliant receiver
- High-bandwidth Digital Content Protection
- (HDCP) 1.1 compliant receiver
- High Definition Multimedia Interface (HDMI) 1.3 compliant receiver with CEC (Consumer Electronics Control) support
- Long-cable tolerant robust receiving

MACE-4, MStar Advanced Color Engine year 2009 Edition, provides superb visual quality for wider gamut FHD panels

- Fully programmable shrink/zoom capabilities
- Panorama and various scaling supports
- 3D motion adaptive video de-interlacers with de-flickering and edge smoothing functions
- Automatic 3:2 pull-down & 2:2 pull-down detection and recovery

- Automatic picture enhancement:
  - Dynamic brilliant and fresh color
  - Dynamic *Blue Stretch*
  - Intensified contrast and details
  - Dynamic *Vivid Skin*
  - Dynamic sharpened Luma/Chroma edges
  - Enhanced depth of field perception
  - Accurate and independent color control
- Supports sRGB and xvYCC color processing
- Supports HDMI 1.3 deep color format
- Supports linear/nonlinear color mapping for wider gamut panels
- 10-bit internal data processing
- Programmable 12-bit RGB gamma CLUT
- 3D video noise reduction
- MPEG artifact removal including de-blocking and mosquito noise reduction
- Frame rate conversion

Output Interface

- Supports up to 10-bit dual LVDS full-HD (1920 x 1080) panel interface
- Supports 2 data output formats: Thine & TI data mappings
- Compatible with TIA/EIA
- With 6/8 bits optional dithered output
- Spread spectrum output frequency for EMI suppression

CVBS Video Output

- Supports CVBS bypass output
- Built-in video encoder for encoding digital video into CVBS output

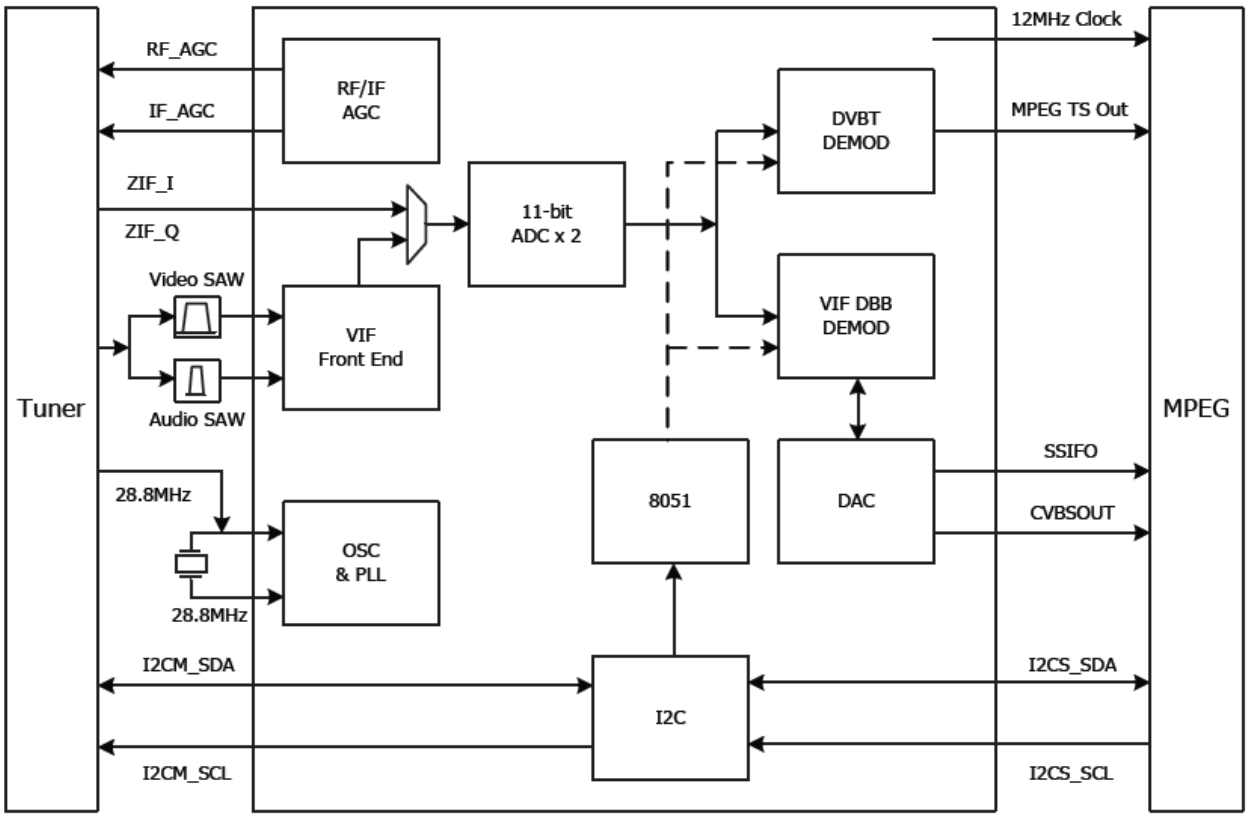
2D Graphics Engine

- Point draw, line draw, rectangle draw/fill and text draw
- BitBlt and stretch BitBlt
- Raster Operation (ROP)

Miscellaneous

- DRAM controller to support 16-bit DDR2 interface
- SPI serial interface for external SPI flash
- High efficiency power control module
- Two ports of USB 2.0 host controller with the flexibility for connecting external storage devices
- 256-pin LQFP package
- Operating at 1.26V (core), 1.8V (DDR2), and 3.3V (I/O and analog)

2、 MSB1210-LF



Integrated DVBT receiver

- Compliant with DVBT(ETSI ET 300 744)
- Supports 2K, 4K, 8K and 1/4, 1/8, 1/16, 1/32 guard interval (GI) and hierarchical,non-hierarchical modes
- Nordig Unified 1.0.3, D-Book, E-Book,IEC62002 (MBRAI) compliant
- Dual 11-bit ADCs: accept IF, low IF, zero-IF inputs in 5, 6, 7, 8MHz channel bandwidths
- All digital demodulation and timing recovery loops
- CCI and ACI rejection capability
- Independent ADC controls (for IF and RF)
- Configurable parallel/serial MPEG-2 transport stream interface
- Impulse-Noise suppression
- Advanced performance for SFN networks
- Supports single or dual AGC control
- Direct 36MHz, 44MHz IF sampling scheme from tuner
- Full-digital frequency offset recovery with wide acquisition range (+/-500kHz)
- IQ imbalance compensation for ZIF

Integrated VIF receiver

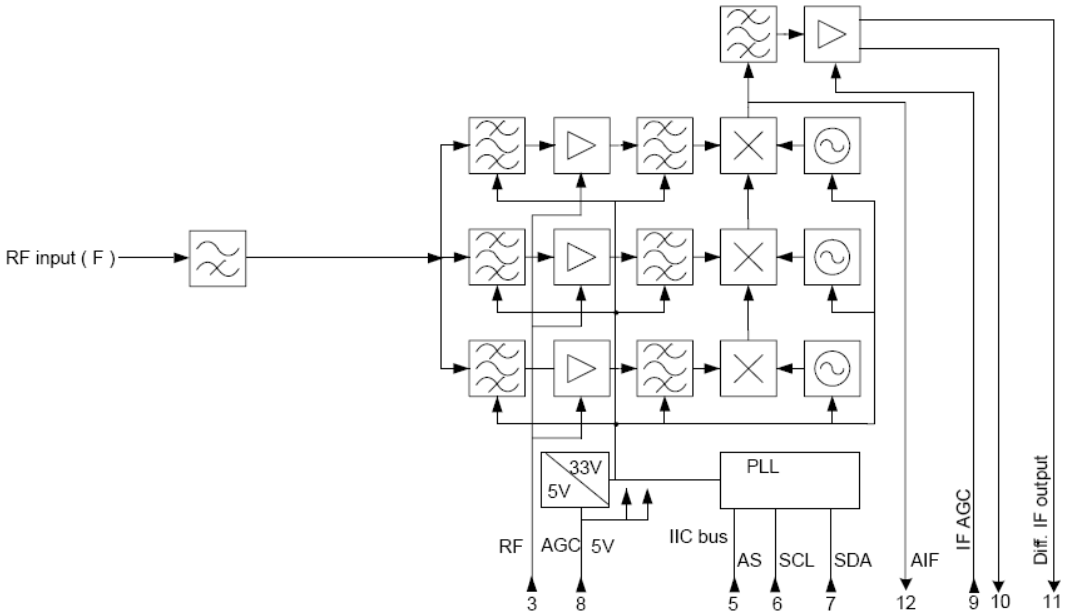
- Multi-standard analog TV receiver applications
- Digital low IF architecture
- Maximum IF gain of 48dB
- Programmable TOP to accommodate different tuner gain to optimize noise and linearity performance

Miscellaneous

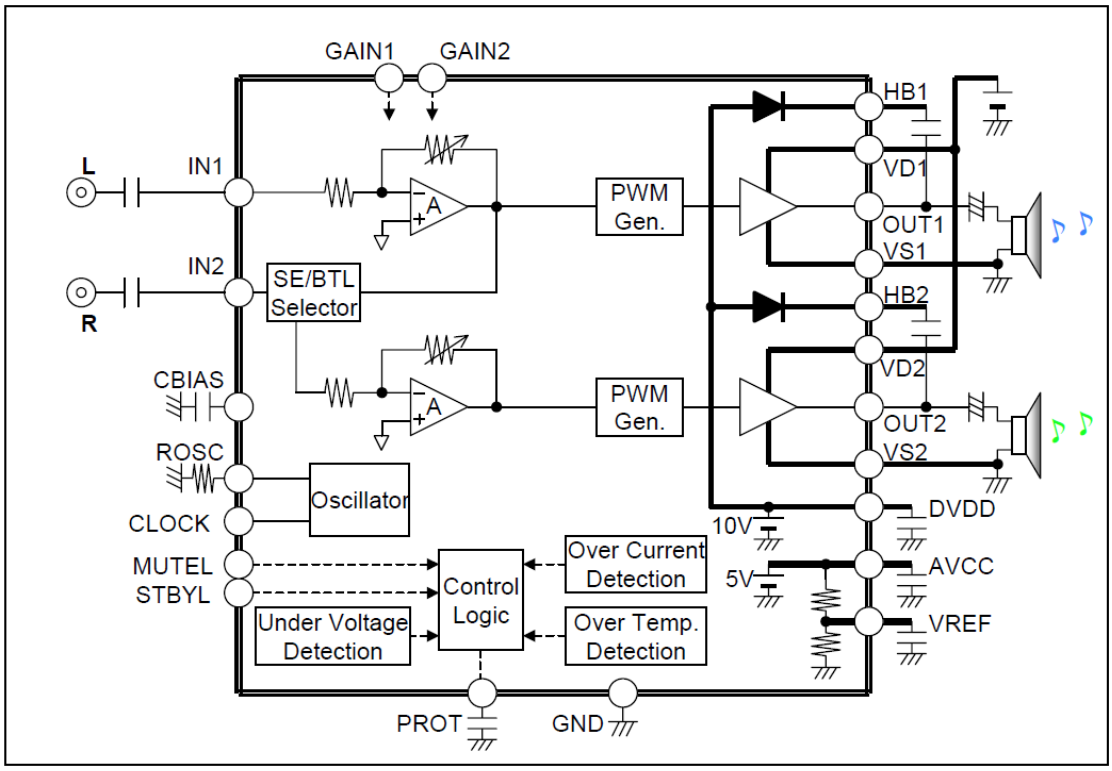
- Embedded 8-bit MCU
- Clock generation from a single 20.48/ 28.8MHz crystal
- Supports I2C interface with bypass mode
- Operating voltage: 3.3V and 1.2V
- 48-pin LQFP package

3、FT21XX

FT 21XX are newly developed low-cost Half-NIM modules designed for both digital (DVB-T/C) and analog TV reception in compliance with the European ATV standards for analogue, as well as with the terrestrial standard ETS 300 744 and cable standard ETS 300429 for digital. It consists of a 3-band RF tuner, which receives RF signal and down-converts it to an IF frequency of 36MHz for digital and 38.9MHz for analog IF. The analogue IF output can directly drive a SAW filter. A digital IF Stage, which consists of one SAW filter & gaincontrollable IF that offers a sufficient output level to be connected directly to an A/D converter.



4、 R2A15112FP



R2A15112FP is a Digital Power Amplifier IC developed for TV.

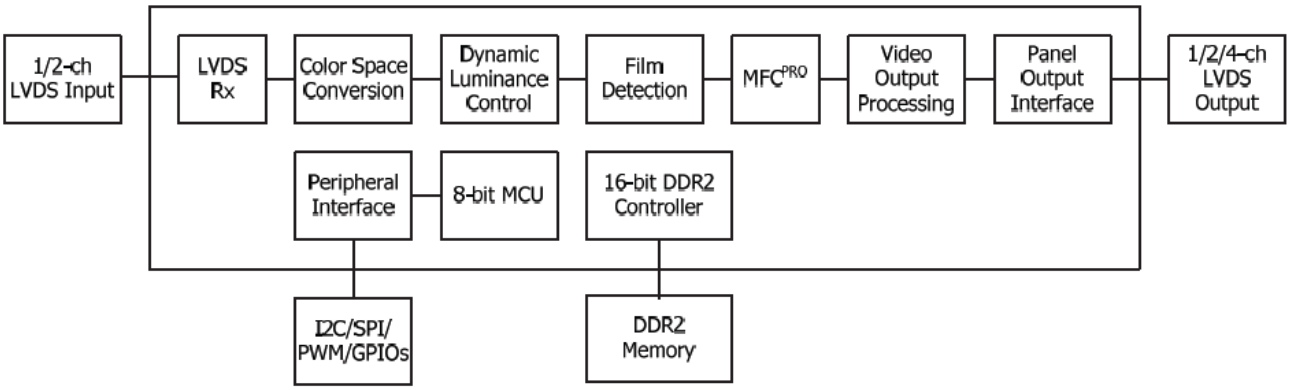
R2A15112FP has a maximum power of 15W(typ) × 2ch.(VD = 24V,THD = 1%, SE) at a 4 Ω load.

It is possible to replace a conventional analog amplifier with a digital amplifier easily.

Feature

- Maximum power out put (No external heat sink)
  (note) These apply when the thermal pad is soldered to the printed-circuit board directly.
  Recommended Power Condition
  SE operation mode :15Wx2ch(VD=24V,4Ω load,THD+N:1%）
  BTL operation mode:30Wx1ch(VD=21V,8Ω load,THD+N:10%）
- Highly efficient, low noise, and low distortion
- Popless
- Built-in protection - Overcurrent, overheat, and undervoltage
- Built-in Mute and Standby function
- The gain can be changed to four settings by two terminals.

5、 MST6M20S



Input Interface

- Single/dual channel 8/10 bit LVDS input
- Each input LVDS channel frequency supports up to 100 MHz
- One channel input supports up to WXGA(1366x768)
- Two channel inputs support up to Full HD(1920x1080)
- Input mode supports JEIDA / VESA mode
- Image capturing window is defined by DE signal
- Supports flexible aging mode

Output Interface

- Single/dual/quad link 8/10 bit LVDS output
- Each output LVDS channel frequency supports up to 90 MHz
- Supports two channel LVDS up to WXGA (1366x768) @ 120Hz
- Supports four channel LVDS up to Full HD (1920x1080) @ 120Hz
- Supports 2/4 phase output
- Supports left-right screen partition
- Supports TH/TI format
- Supports dithering options
- Spread spectrum output frequency for EMI suppression

Video Processing

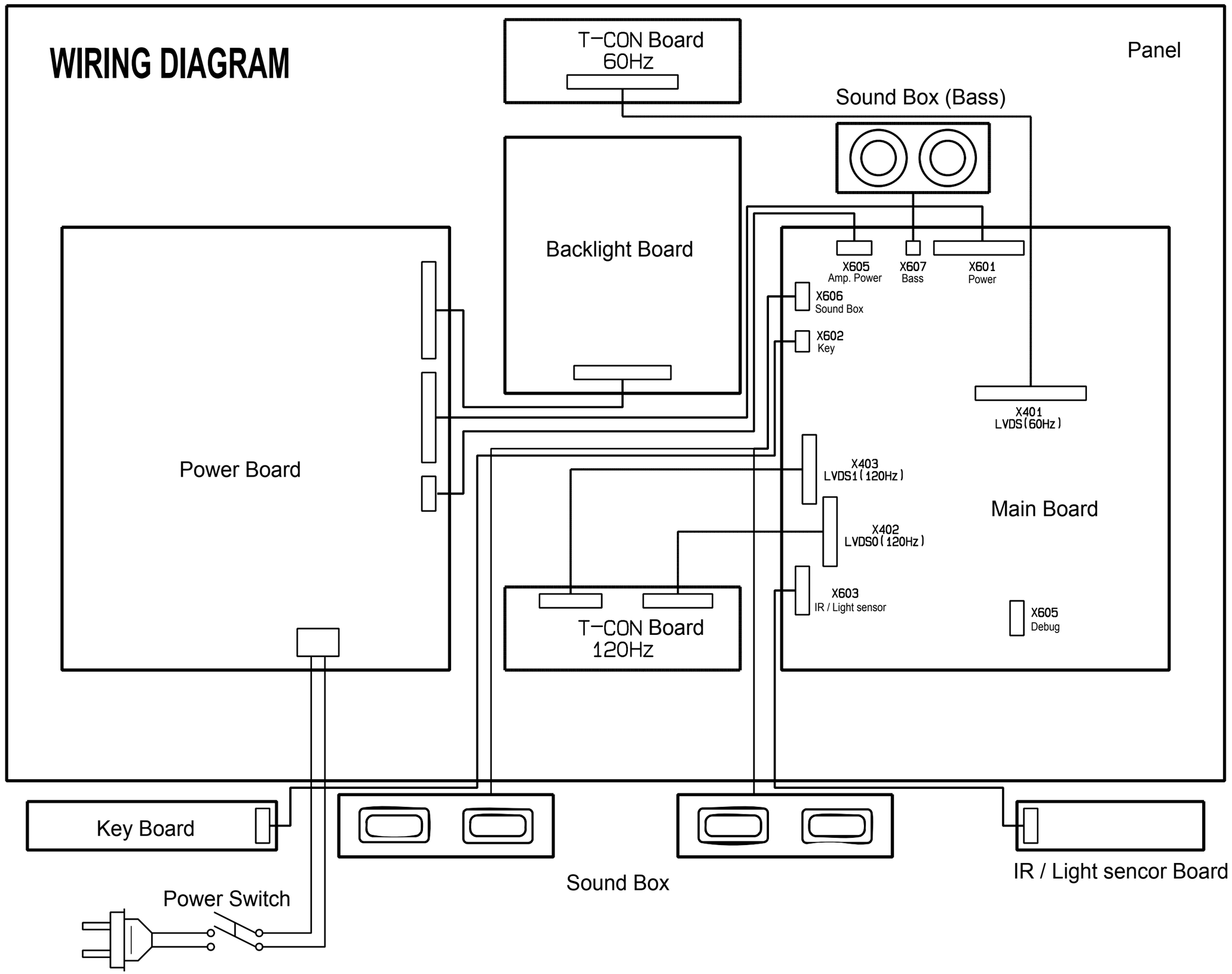
- MFCPRO (Motion Frame Conversion Professional) supports:
- Wider searching range
- Refined judder-free motion video and film
- Motion blur elimination to improve MPRT
- Advanced halo and artifact elimination
- Output frame rate 50/60/100/120 f/sec
- Supports MFCPRO under Full-HD resolution
- Automatic 2:2 / 3:2 film mode detection
- Supports 2:2 / 3:2 pull-down reverse processing
- Support 1080p 24fps 5:5 pull-down
- Supports 10-bit 4:4:4 processing
- Brightness contrast saturation adjustment
- White balance adjustment
- Supports Gamma correction per bit and FRC function for 16.7M color selection

- Supports black insertion
- Supports OSD area handling
- Splits screen demo for motion frame conversion

Miscellaneous

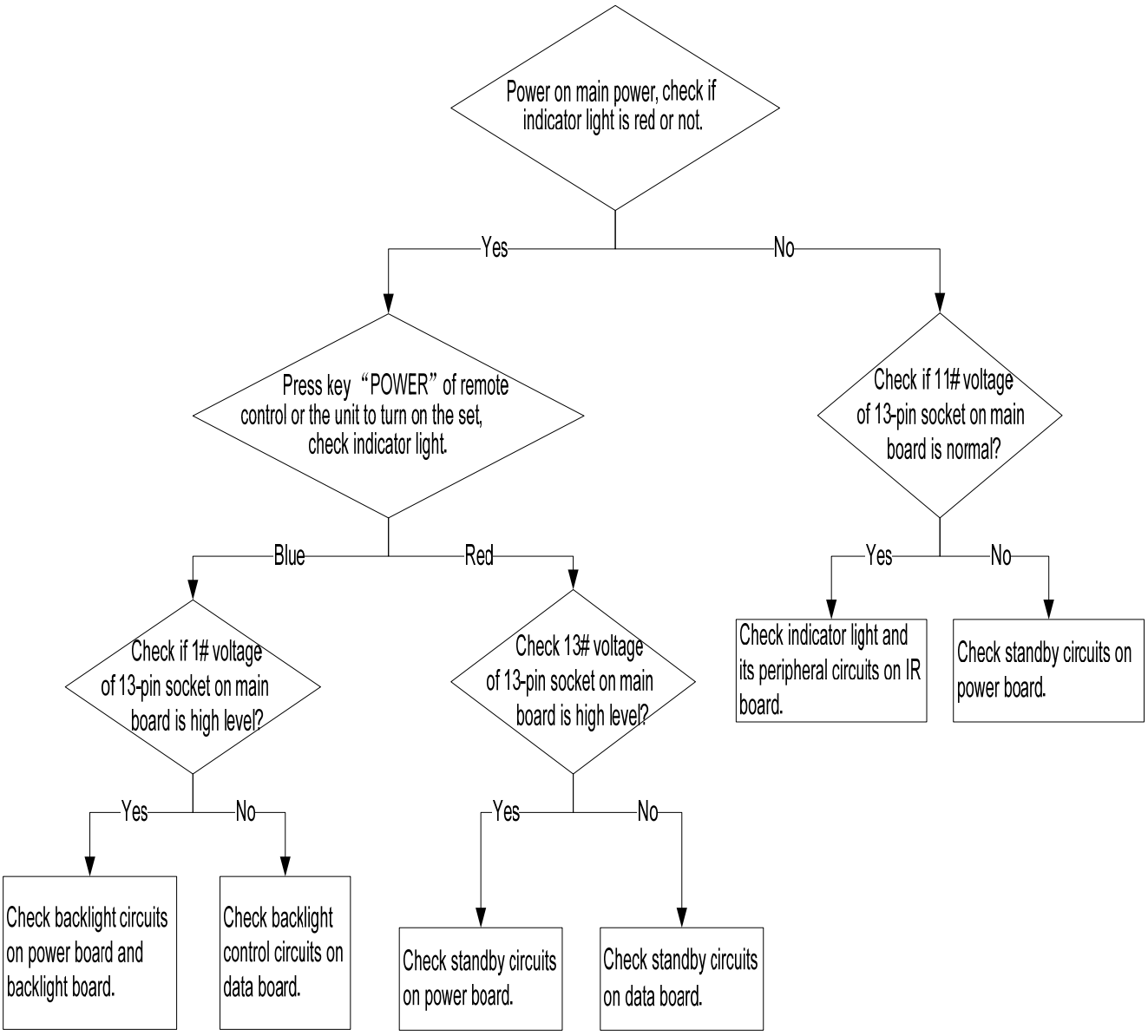
- Embedded 8-bit Microcontroller
- Supports 16-bit DDR2 interface
- Supports I2C, SPI, PWM, and GPIOs
- Supports booting from internal SRAM, external EEPROM, and SPI flash
- 216-pin LQFP package

WIRING DIAGRAM

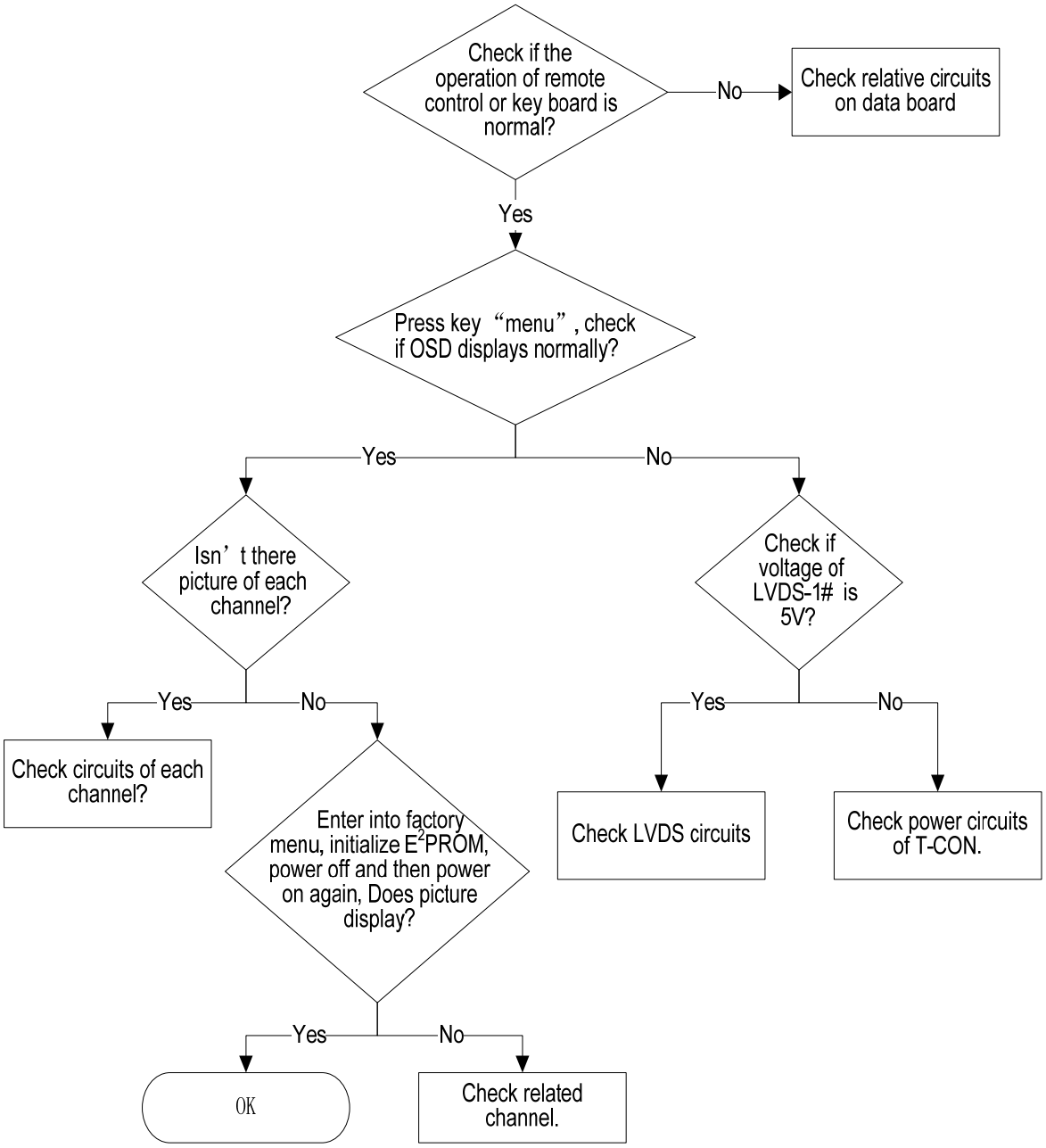


Troubleshooting guide LED-46XR10FH(B)

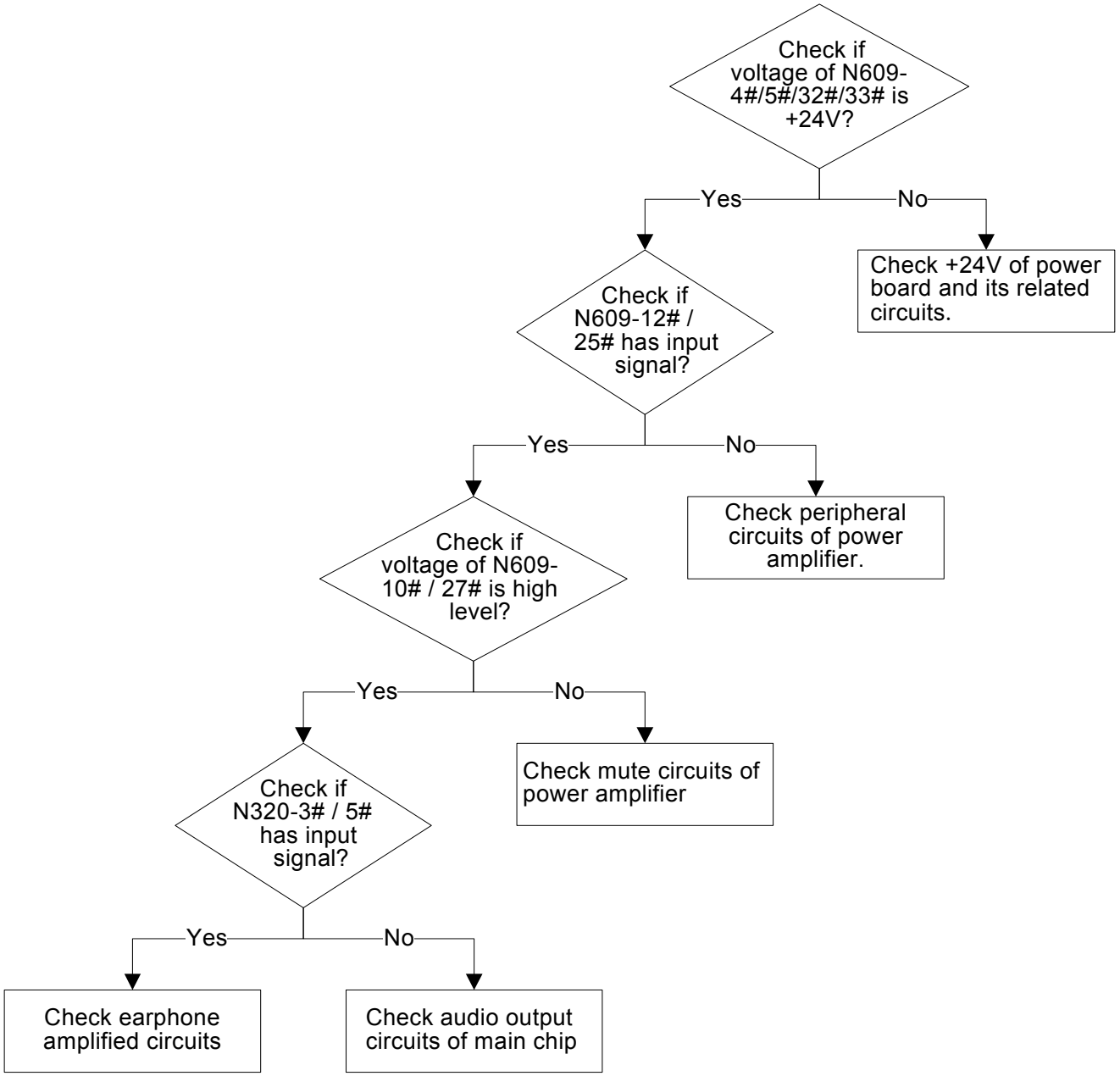
1、 No Backlight

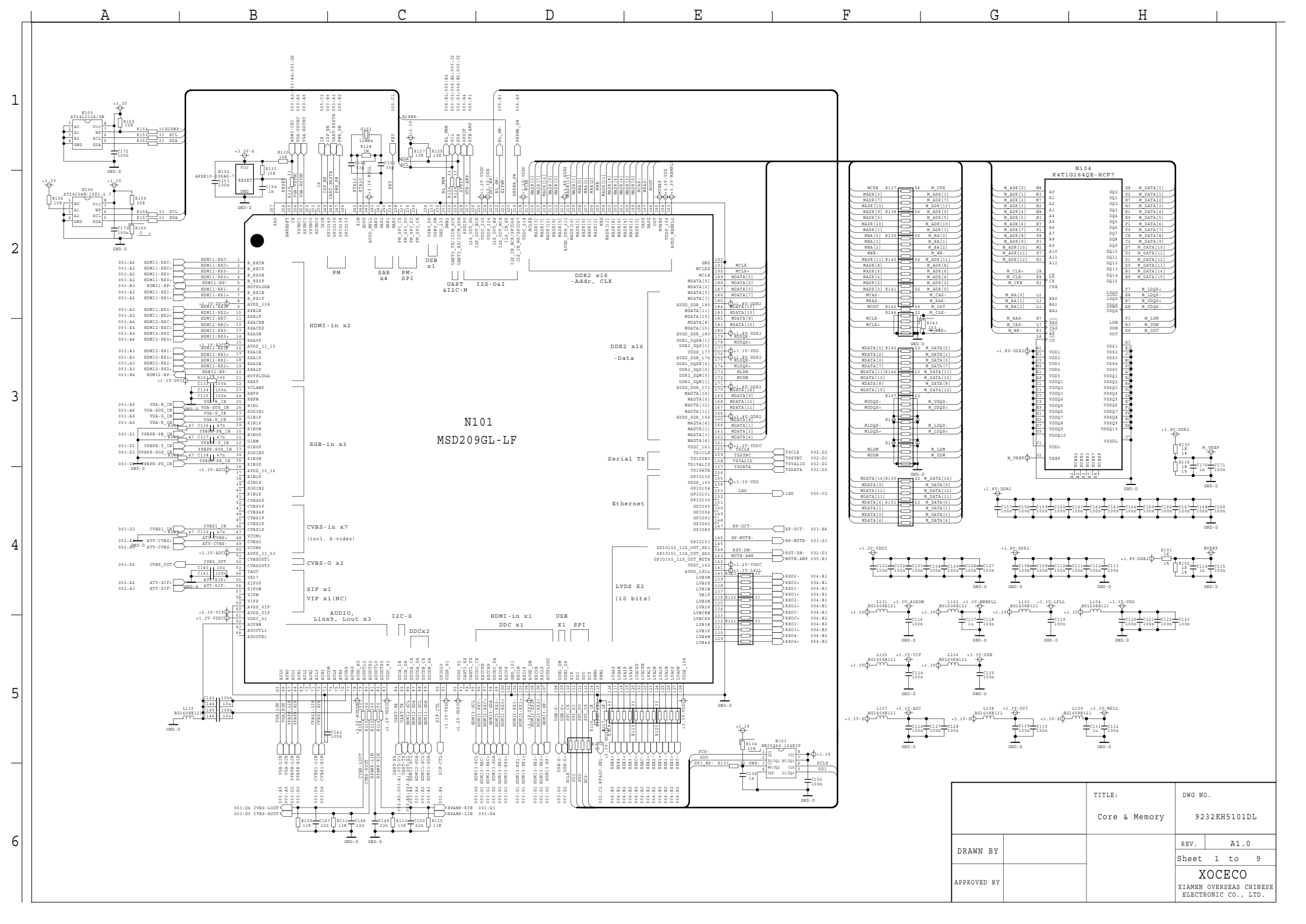


2、 No Picture, but backlight is normal.



3、 No sound, but picture is normal.





		TITLE: Core & Memory	DWG NO. 9232KH5101DL
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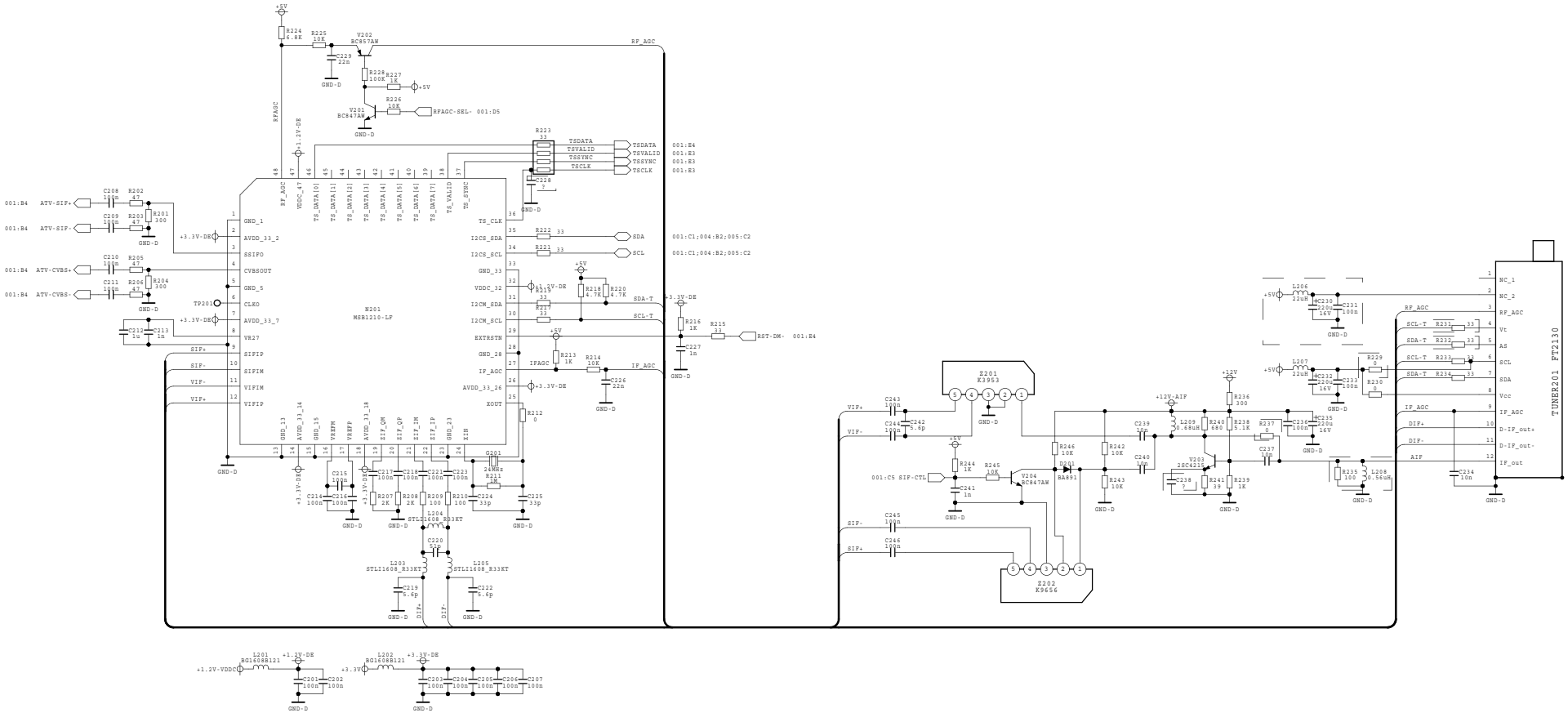
APPROVED BY			Sheet 1 to 9
			XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.



		TITLE: RF Demodulation	DWG NO. 9232KH5101DL
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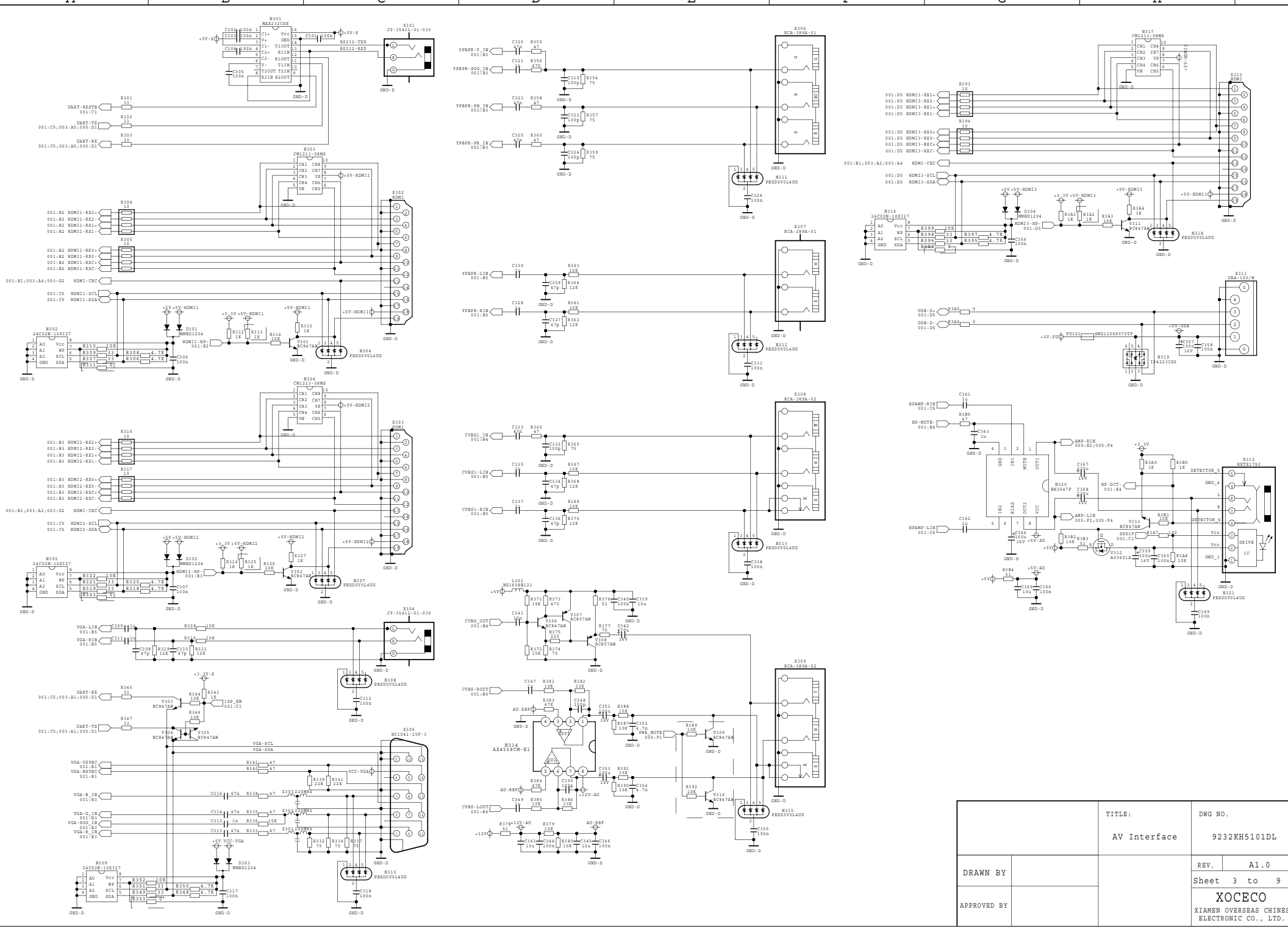
APPROVED BY			Sheet 2 to 9
			XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.



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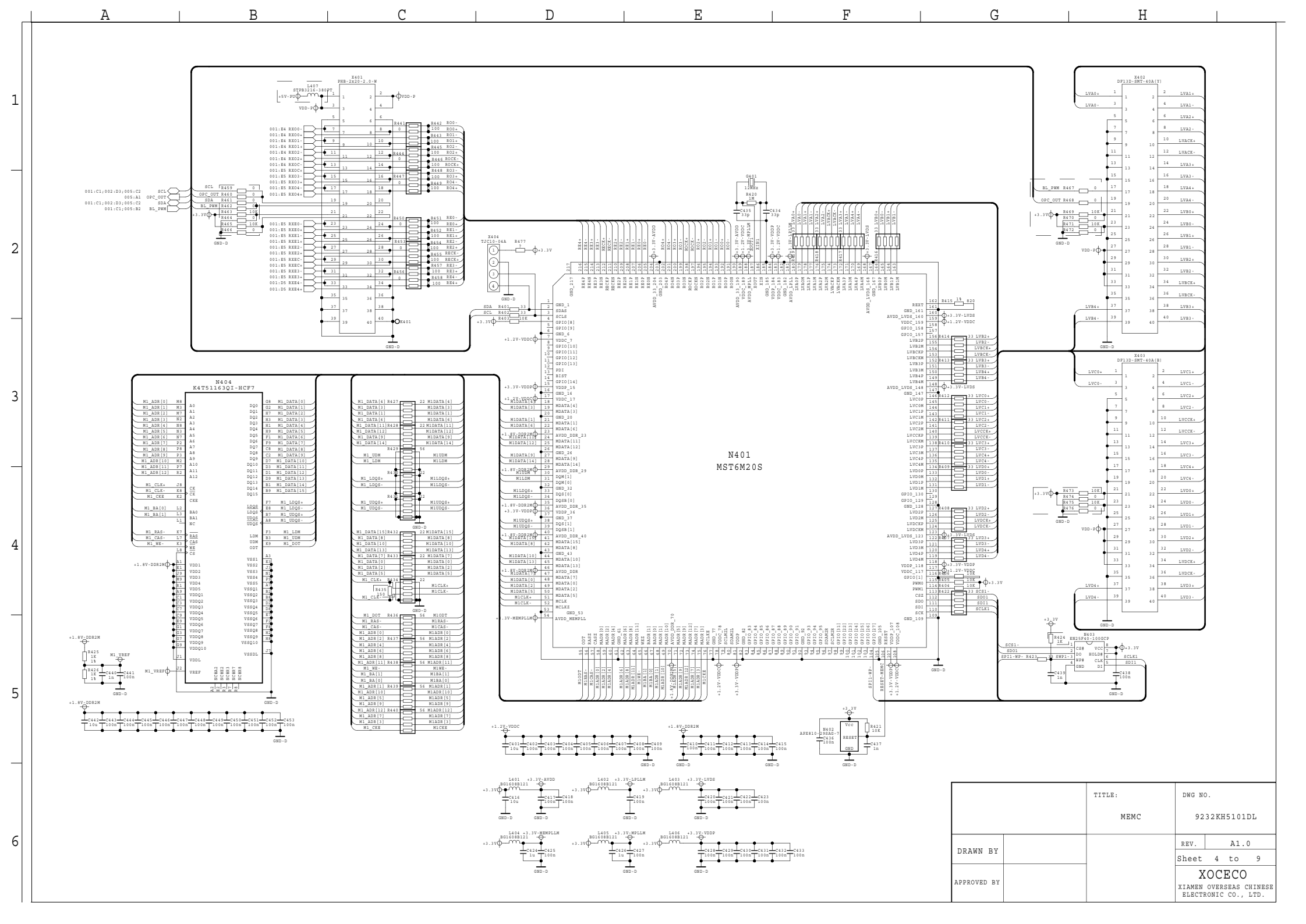
APPROVED BY		Sheet 3 to 9	
		XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.	


N401
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N404
K4T51163QI-HCF7
X401
PHB-2x20-2.0-W
X402
DF13D-SMT-40A(Y)
X403
DF13D-SMT-40A(S)
X404
TJC10-04A
L407
STPB3216-380PT
G401
12MHz
N402
APX810-29SAD-7
N403
EN25F40-100QCP
TITLE:
MEMC
DWG NO.
9232KH5101DL
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APPROVED BY
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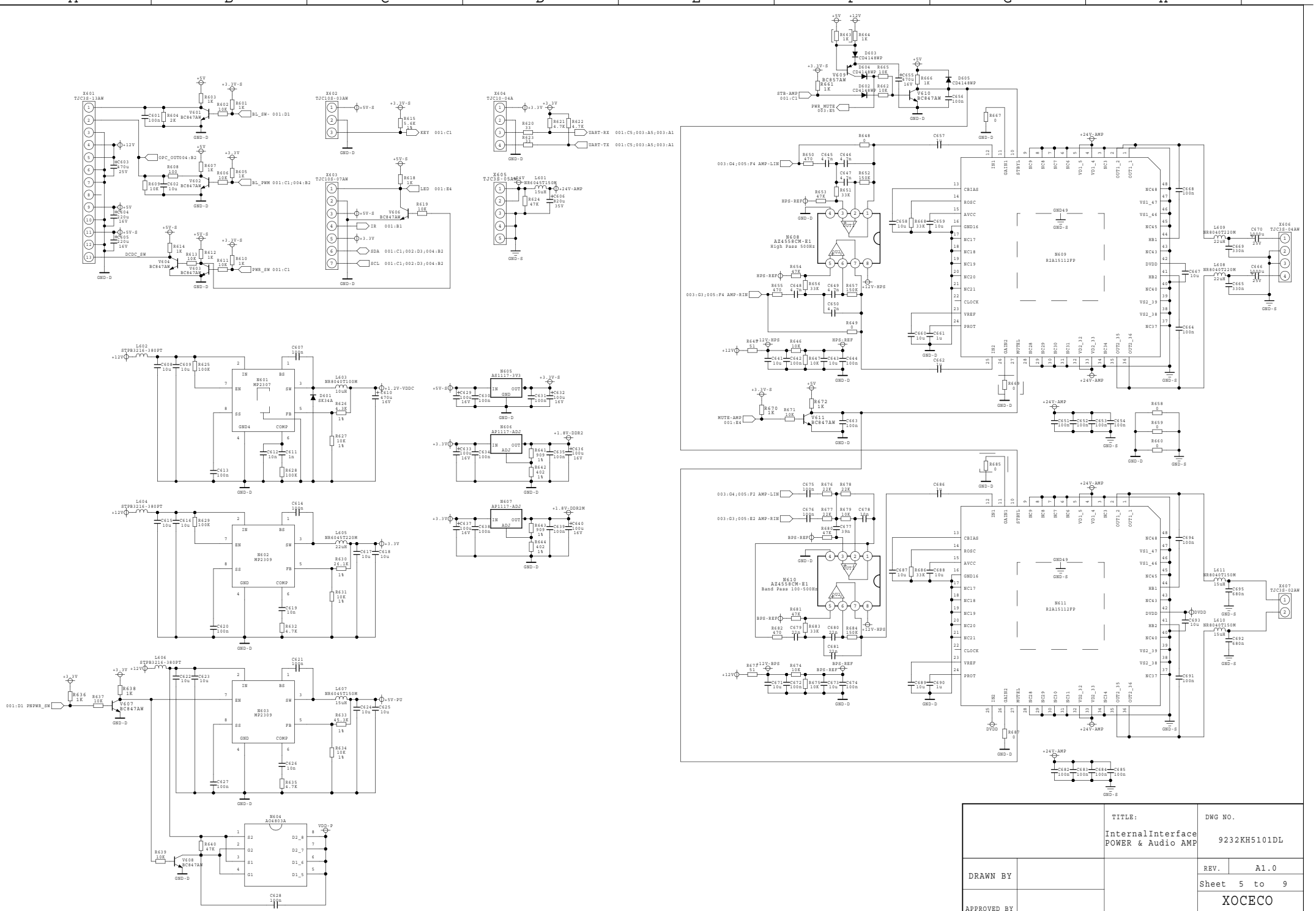
A1.0
Sheet 4 to 9
XOCECO
XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.



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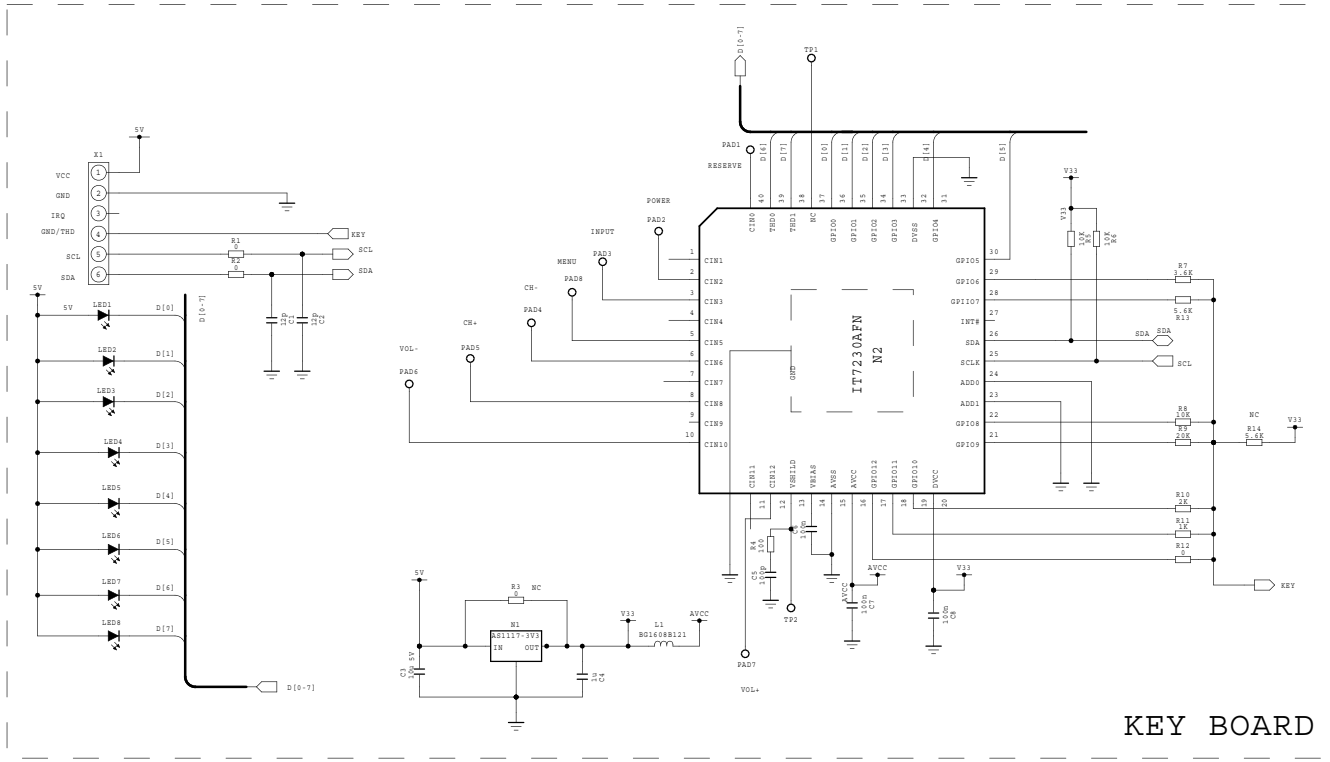
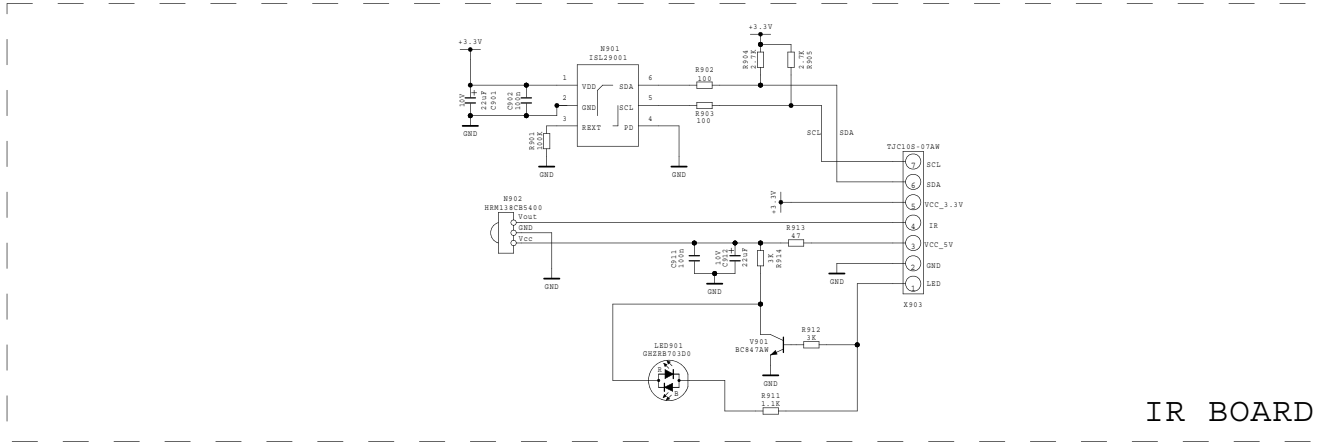
APPROVED BY		Sheet 5 to 9
		XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.





		TITLE: KEY BOARD IR BOARD	DWG NO. 9232KH5101DL
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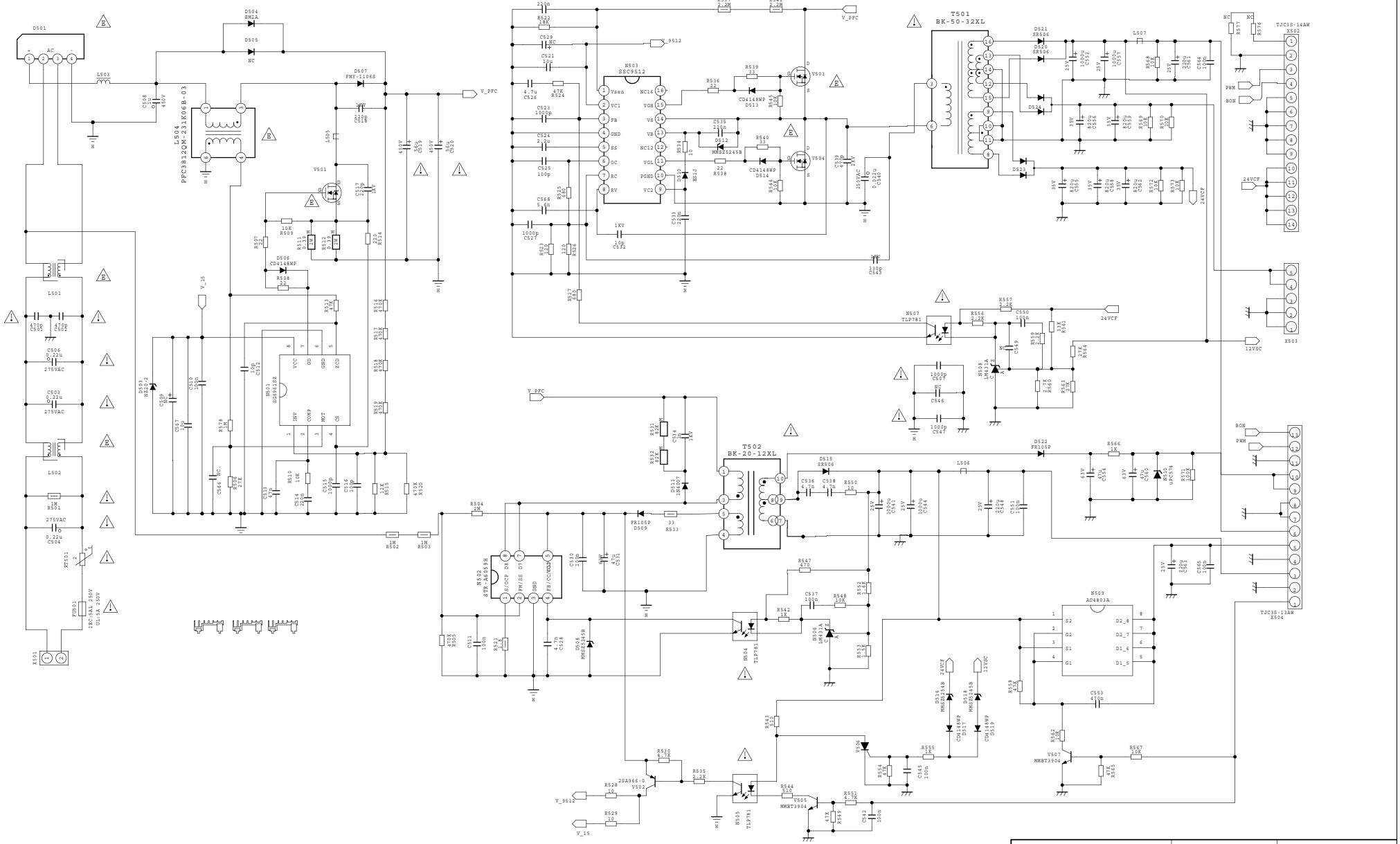
APPROVED BY			Sheet 6 to 9
			XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.



		TITLE: 32" Power Board	DWG NO. 9232KH5101DL
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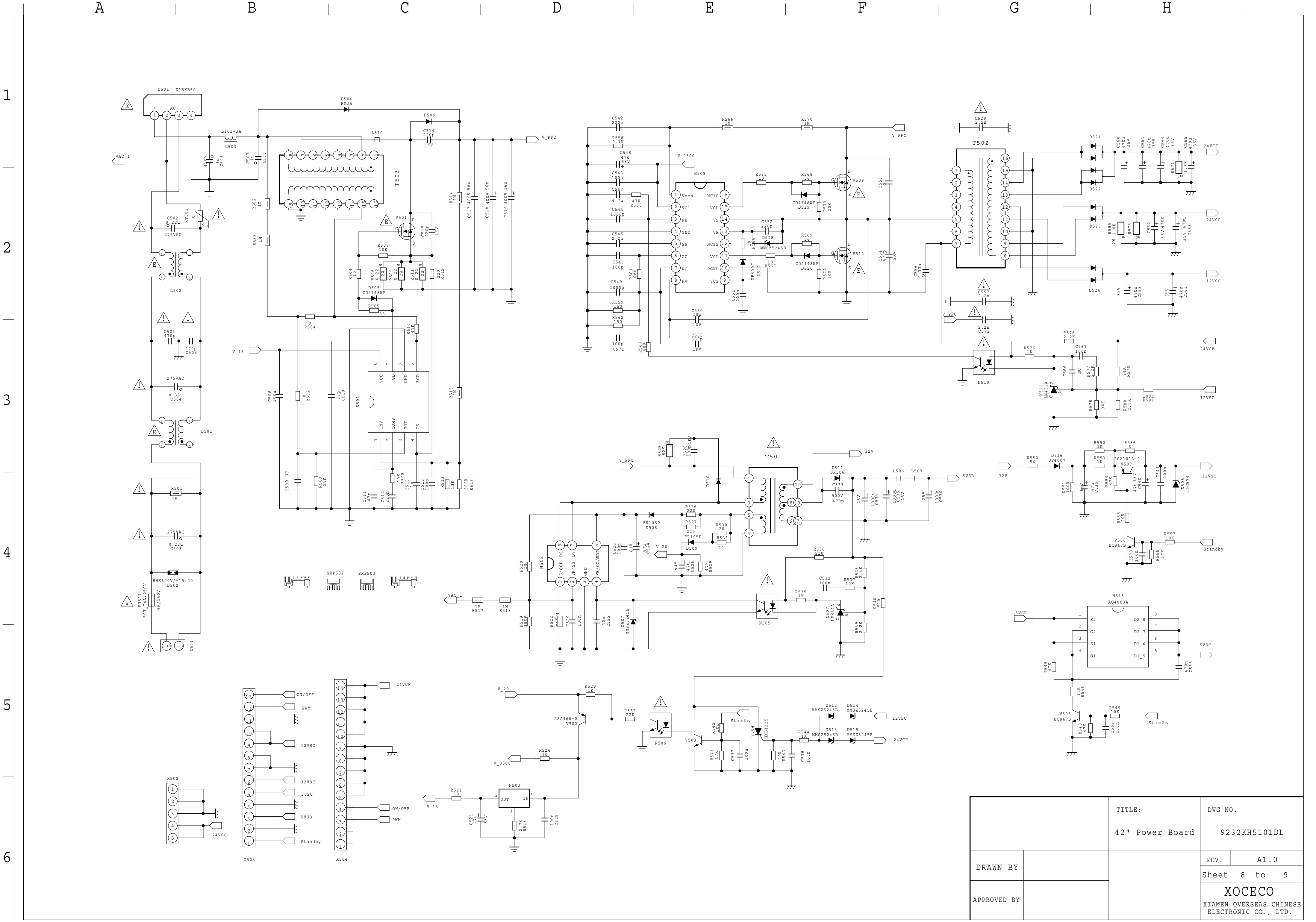
APPROVED BY			Sheet 7 to 9
			XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.



TITLE: 42" Power Board

DWG NO. 9232KH5101DL

REV. A1.0

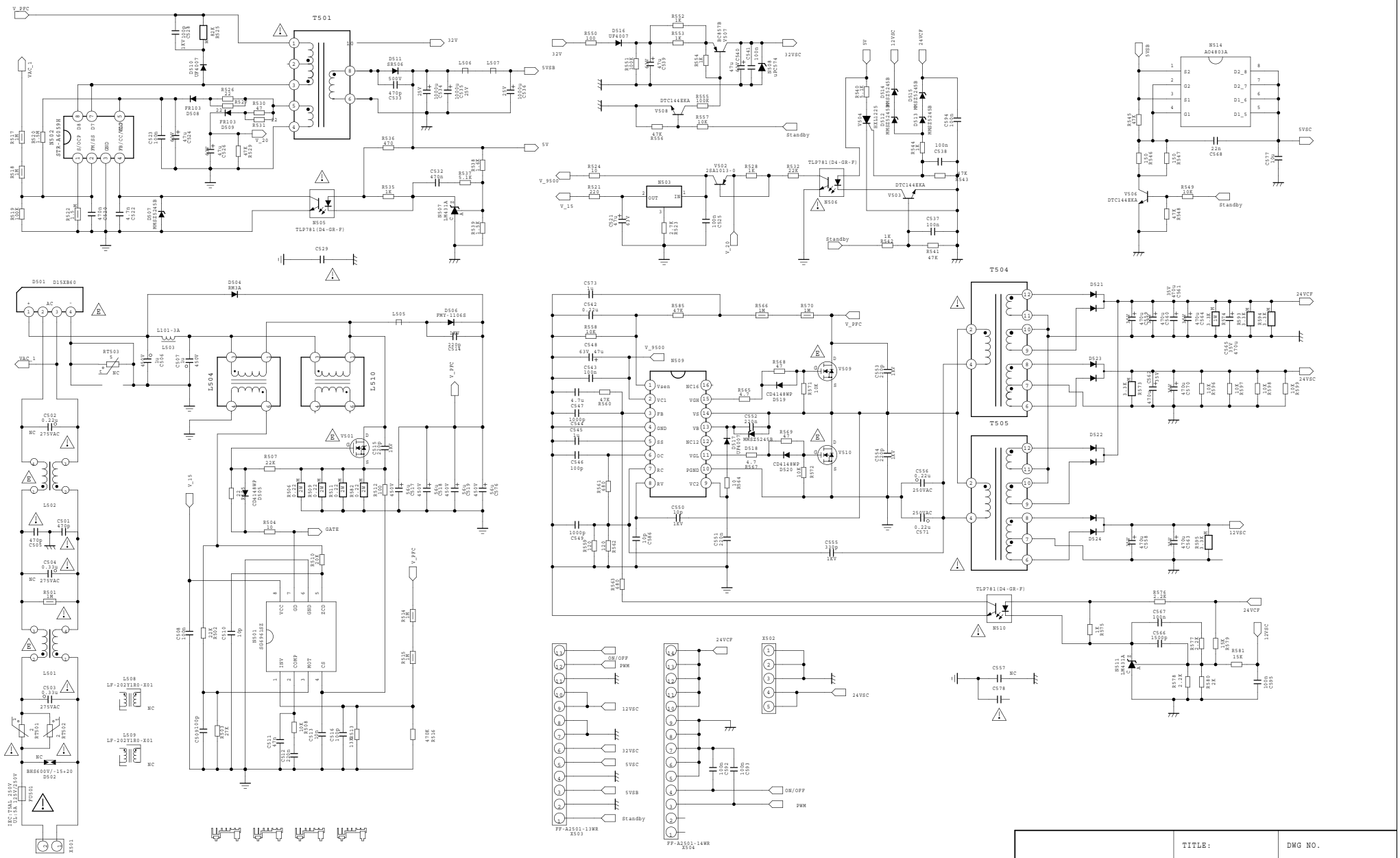
Sheet 8 to 9

DRAWN BY

APPROVED BY

XOCECO

XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.

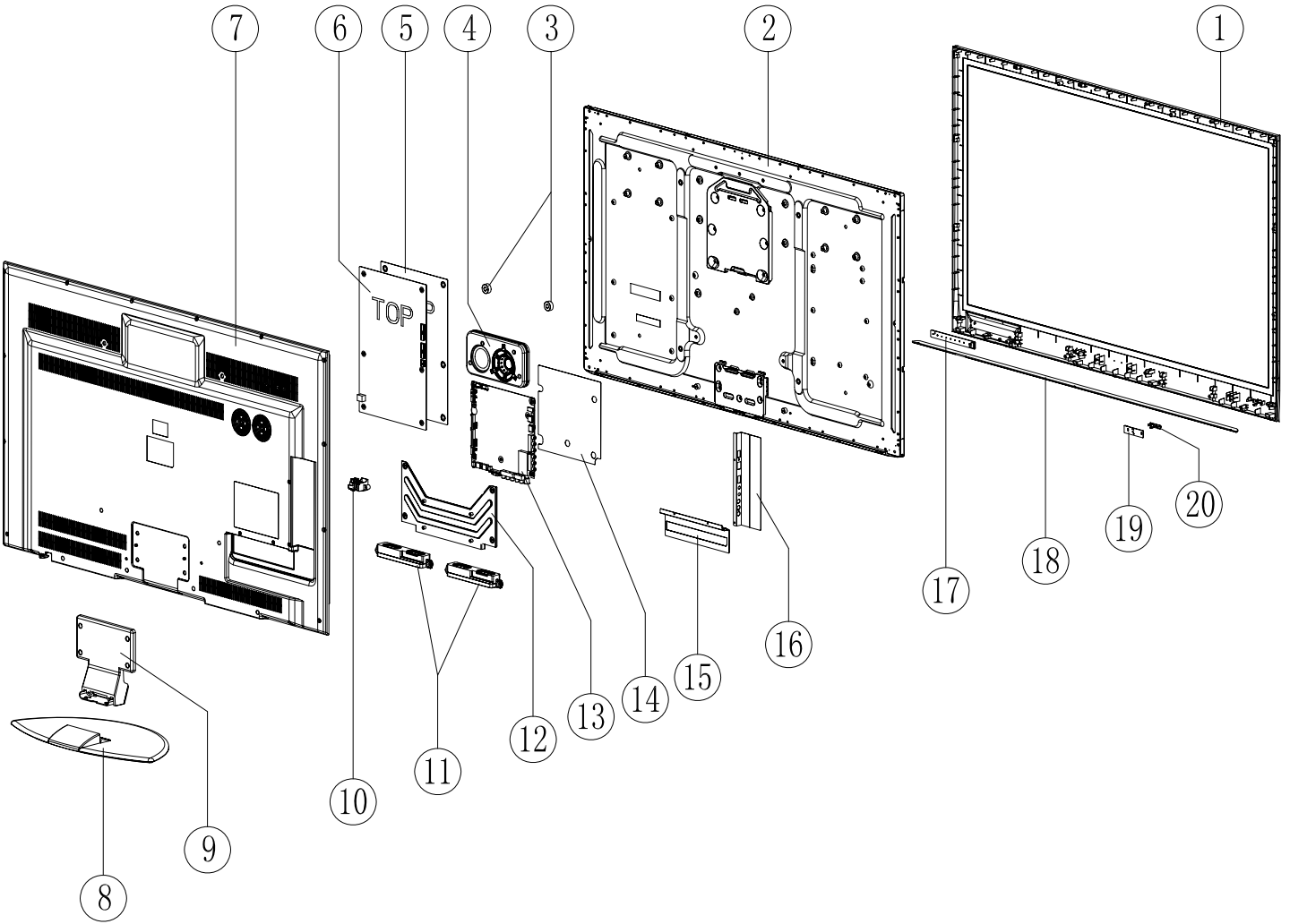


		TITLE: 46" Power Board	DWG NO. 9232KH5101DL
DRAWN BY			REV. A1.0
APPROVED BY			Sheet 9 to 9
			XOCECO XIAMEN OVERSEAS CHINESE ELECTRONIC CO., LTD.

APPENDIX-A: Main assembly 9246KH5113 LED-46XR10FH(B)

NAME	NO.	MAIN COMPONENT AND IT'S NO.	
Main board	XI6KH01801B0	N101 N104 N401 N201 N609 N103 TUNER201	MSD209GL-LF (5270209002) K4T1G164QE-HCF7 (5270164002) MST6M20S (5270620001) MSB1210-LF (5271210001) R2A15112FP (5271511201) EN25Q64-104HIP (5272564002) FT2130 (5524050027)
IR board	XI635KH00905		
Key board	XI635KH02103		
Power board	XI6KH0182010		
Remote control	XI6010900502	RC-905-0A	
Panel	XI5203468503	CMI V460H1-LE3	

APPENDIX-B: Exploded view (LED-46XR10FH(B))



PART LIST OF EXPLODED VIEW

REF.No.	DESCRIPION
1	Front cabinet
2	Display panel
3	Washer for wall mounting
4	Speaker assembly (bass)
5	Insulating slice for power board
6	Power board assembly
7	Back cover
8	Pedestal assembly
9	Standing pole
10	Power cord assembly
11	Sound box assembly
12	Standing pole bracket
13	Main board assembly
14	Insulating slice for main board
15	Interface baffle (down)
16	Interface baffle (side)
17	Touching key assembly
18	Decorative board for front cabinet
19	IR assembly
20	Light gudied pole

Note: design and specification are subject to change without notice.

PART LIST

LED-46XR10FH(B) ver.1.0

REF.No.	PARTS No.	DESCRIPION	Q'TY	REMARK
1	XI6646510110	Front cabinet	1	
2	XI5203468503	Display panel	1	LB_V460H1-LE3
3	XI5931A17810	Washer for wall mounting	1	
4	XI6170870010	Speaker assembly (bass)	1	
5	XI5880528000	Insulating slice for power board	1	
6	XI6KH0182010	Power board assembly	1	
7	XI674651H140	Back cover	1	
8	XI6151218000	Pedestal assembly	1	
9	XI6156106000	Standing pole	1	
10	XI635KH02100	Power cord assembly	1	
11	XI6170859000	Sound box assembly	1	
12	XI58A0087100	Standing pole bracket	1	
13	XI6KH01801B0	Main board assembly	1	
14	XI5880527000	Insulating slice for main board	1	
15	XI5810075120	Interface baffle (down)	1	
16	XI5810A7521A	Interface baffle (side)	1	
17	XI635KH02103	Touching key assembly	1	
18	XI5850448010	Decorative board for front cabinet	1	
19	XI635KH00905	IR assembly	1	
20	XI570031901D	Light gudied pole	1	
21	XI6010900502	Remote control	1	
22	XI594403754A	User manual	1	
23	XI60Z0000734	CMO Backlight board	1	
24	XI60Z0000735	CMO Logical board	1	

- Only the parts in above list are used for repairing.
- Other parts except the above parts can't be supplied.

Appendix: Installing the Stand or wall-mount bracket

If the stand is provided, please read these instructions thoroughly before attempting this installation.
You must install your TV into the stand in order for it to stand upright on a cabinet or other flat surface. If you intend to mount your TV on a wall or other vertical surface, you must remove the stand column.

Cautions:

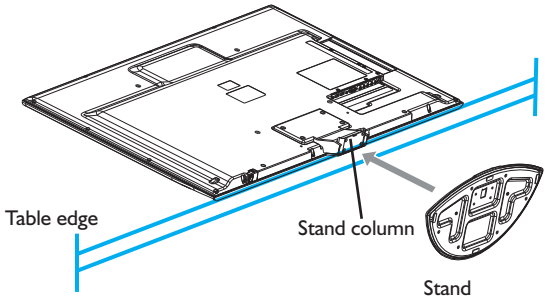
Make sure that you handle your TV very carefully when attempting assembly or removal of the stand. If you are not sure of your ability to do this, or of your ability to use the tools necessary to complete this job, refer to a professional installer or service personnel. The manufacturer is not responsible for any damages or injuries that occur due to mishandling or improper assembly.

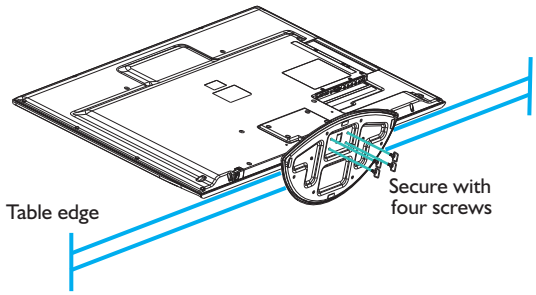
When using a table or bench as an aid to assembly, make sure that you put down a soft cushion or covering to prevent accidental scratching or damage to your TV's finish.

The speaker is not intended to support the weight of your TV. Do not move or handle your TV by the speaker. This can cause damage to your TV that is not covered by the manufacturer's warranty.

Before attempting assembly or removal of the stand, unplug the AC power cord.

Installing the stand





To install the stand:

1. Remove the stand from the box and place it on a table or bench.

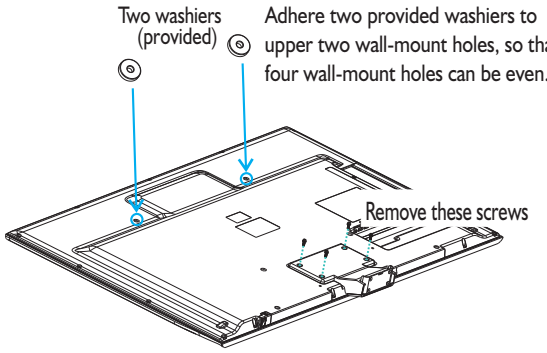
   You must pay attention to the direction of the stand. The wide portion of the stand should go towards the front of the TV.

2. Lay your TV flat (screen down) on the edge of a table or bench. Make sure that you put down a soft cushion or cloth so that your TV is not scratched.

3. Put the stand close to the TV back, align the stand with the stand column by moving the stand steadily, and align the screw holes on the stand column with the holes in the stand, then secure the stand to the TV with provided screws .

   To remove the stand from the TV, perform these steps in reverse order.

Installing a wall-mount bracket (not provided)



To attach your TV to a wall-mount bracket (not provided)

1. Carefully place your TV screen face-down on a cushioned, clean surface to protect the screen from damages and scratches.
2. Remove the four screws holding the TV to its stand column.
3. Remove the stand column.
4. Secure the wall-mount bracket to the back of your TV using the four screws provided with the bracket.

Note: There are two washiers provided for wall-mount. If you want to wall mount the TV, please adhere these two washiers to upper two wall-mount holes so that four wall-mount holes can be even, thus to ensure wall-mount reliability.

If you use pedestal stand for TV installation, please retain these two washiers for future possible wall-mount use.

NOTE:

The appearance of this product in these illustrations may differ from your actual product, and is for comparative purposes only.

WALL MOUNTING INSTRUCTIONS

Safety Precautions:

1. Be sure to ask an authorized service personnel to carry out setup.
2. Thoroughly read this instruction before setup and follow the steps below precisely.
3. The wall to be mounted should be made from solid materials. Only use accessories supplied by the manufacturer.
4. Very carefully handle the unit during setup. We are not liable for any damage or injury caused by mishandling or improper installation.
5. Be sure to place the unit on a stable and soft platform which is strong enough to support the unit.
6. Do not uplift the speaker when moving the display. The appearance of the unit may different from the actual ones.
7. Design and specifications are subject to change without notice.
8. Retain these instructions for future reference.

Note: All the wall mounting parts are optional and may be unavailable in your model.

Below we will show you how to mount the Display on the wall using our company's wall mounting components.

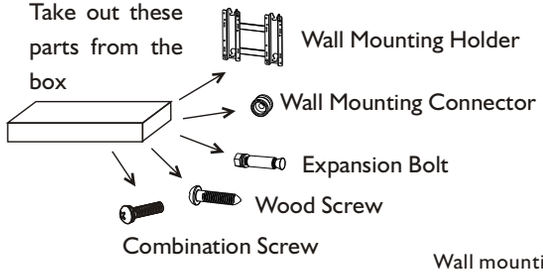


Fig.1

1. There are three options of wall mounting holder with different specifications :200200,200400,200600. Please check your wall mounting holder for its specification.

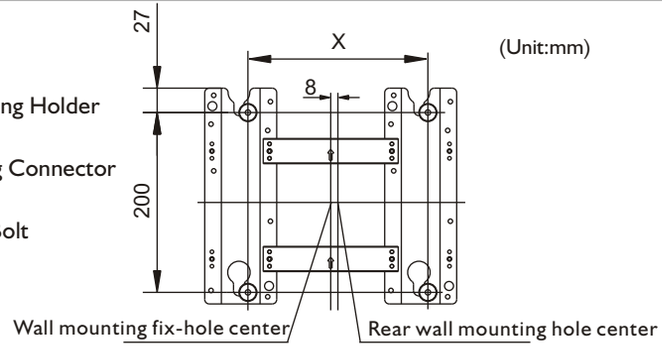


Fig.2

2. Due to the wall mounting fix-groove leaning to the right side, the whole unit will lean to right side after installation, please carefully measure the position of the holes you want to drill, refer to the parameters on Fig.2 when drilling the holes.

Note: The "X" in Fig.2 represents a data. It may be 200mm or 400mm or 600mm.

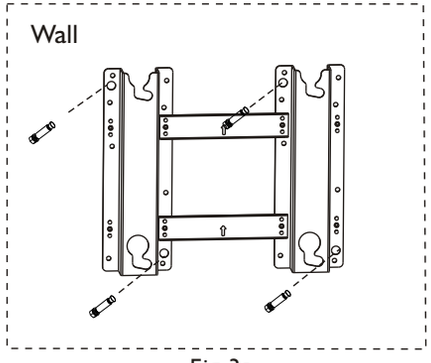


Fig.3a

3a. Screw 4pcs expansion bolts to fix the wall mounting holder on the wall.

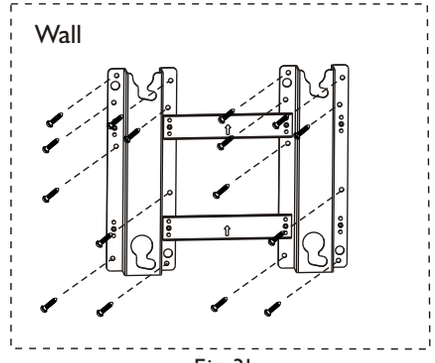


Fig.3b

3b. If your wall is a wooden structure, please fix the wall mounting holder on the wall with 16pcs wood screws.

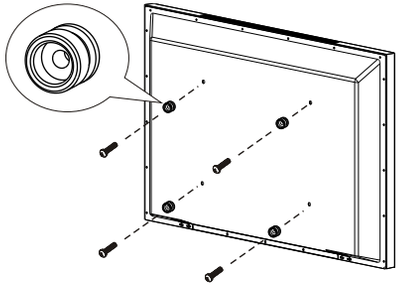


Fig.4

4. Use the 4pcs combination screws to fix the wall mounting connector to the rear of the display unit.(Caution:the direction of the connectors should be strictly confirm to the diagram illustrated above).

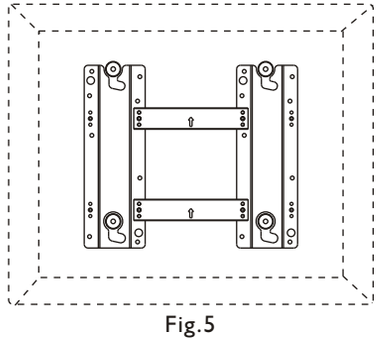


Fig.5

5. Put the back of the display unit close to the wall mounting holder, insert the four wall mounting connectors into the four calabash-shaped holes on the wall mounting holder. (Fig.5)

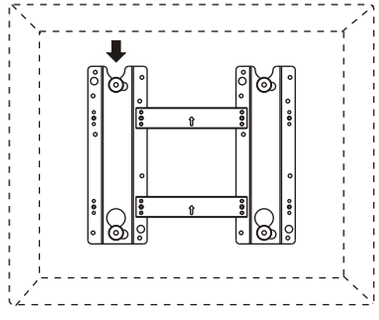


Fig.6

6. Let the display unit slowly slide down to the end of the calabash-shaped hole. (Fig.6)

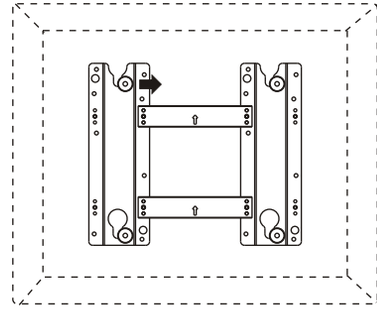


Fig.7

7. Push rightwards carefully until the wall mounting connectors fully slide into the right fix-grooves and be sure the mounting is secure.

8. If you want to dismount the unit do the above steps in reverse order.

Apr. /2011

SANYO Electric Co., Ltd.