

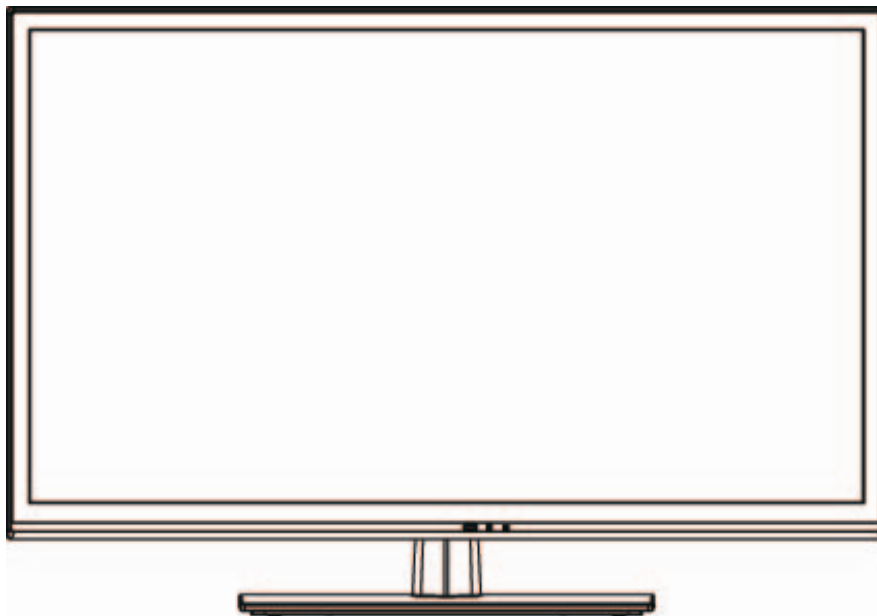
FILE NO

SERVICE MANUAL LED TV

TC-L32XM6

TC-L32XM6X

TC-L32XM6P



CONTENTS

1. Safety precautions	3
2. Alignment instructions and method of software upgrading.....	5
3. Working principle analysis of the unit	12
4. Specifications.....	13
5. Block diagram	14
6. IC block diagram	17
7. Wiring diagram	24
8. Troubleshooting guide.....	28
9. Schematic diagram	32
10. APPENDIX-A: Assembly list	
APPENDIX-B: Exploded View	
11. Disassembly and Assembly Instructions	

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 high voltage. 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 thermo tropic glue need to disengage when service, please soak the thermo tropic glue into the alcohol and then pull them out in case of damage.

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	0 ~ + 35 °C
	Scope for storage	-20 ~ + 60°C
Humidity	Scope for operation	20% ~ 80 %
	Scope for storage	10% ~ 90%

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.

2. Alignment instructions

(1) Test equipment

VG-859 (YPbPr, VGA, HDMI signal generator)
FLUKE 54200(TV signal generator)
CA310 (white balancer)

(2) Power test

Connect main board, power board and IR board according the wiring diagram, connect the power and press power key (Remote controller or Keypad) button to turn on the TV.

a) Test the pin voltage of P802/power board , the data is shown in table1:

Table1 voltage data of P802

For 32"					
P802	Pin1,2	Pin3,4	Pin5,6,7	Pin8,9	Pin10,11
Voltage	GND	11.4V~12.6V	GND	11.4V~12.6V	4.75V~5.25V

For 32"				
Pin12	Pin13	Pin 14	Pin15	Pin16
On:2.5V~5.25V Off: 0~0.5V	Normal: 2.0~5V Abnormal :0~0.5V	On:2.5V~5.25V Off: 0~0.5V	Duty 5%~100%	NC

(3) Alignment flow-chart

The alignment flow-chart is shown as fig-1

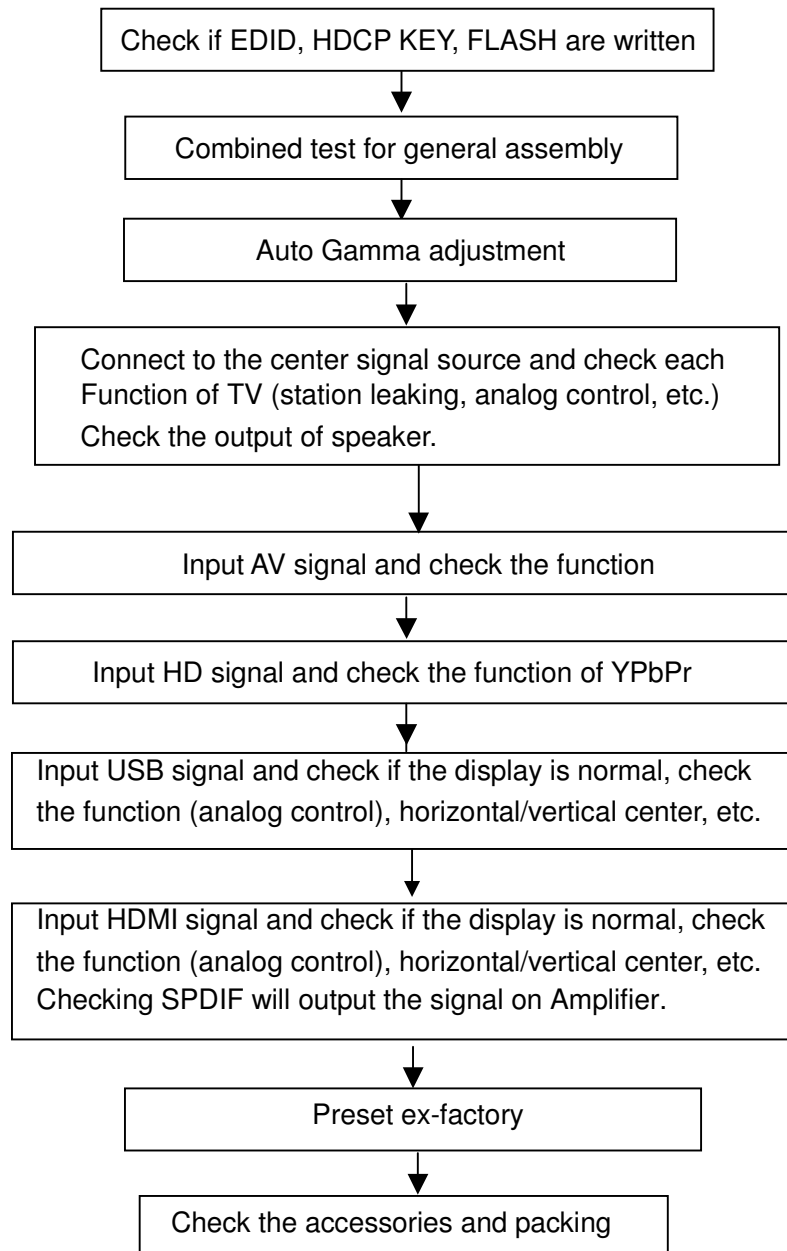


Fig-1 adjustment flow-chart

(4) Adjustment instruction

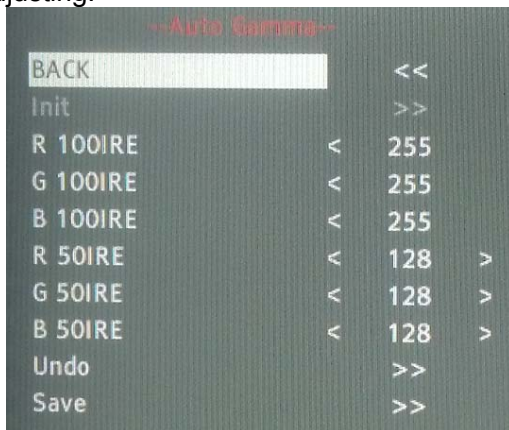
At any input source then press the “←”, “EXIT” and “OK” (using RC within 1 sec) to enter factory mode

During Factory menu, if “EXIT” key is pushed, system will exit factory mode.

4-1. Auto Gamma Adjustment & Check

4-2.1. Set into factory mode then choose Auto Gamma Adjust,

4-2.2. Press "2" "3" "2" "4" in turn within 1sec to enter the item, and push Init will self-generate gray pattern for adjusting.



4-2.3. Following the Cool spec as bellow.

Color	Cool	
x	100IRE	0.2677
	50IRE	0.2684
y	100IRE	0.2655
	50IRE	0.2671
Adjust Tolerance	±0.005	

(1) Adjust 100IRE

First, Decrease G to meet y spec(0.2655).

Second, Decrease R to meet x spec(0.2677).

(2) Adjust 50IRE

First, Decrease G to meet y spec(0.2671).

Second, Decrease R to meet x spec(0.2684).

Note: Do not adjust the B GAIN on both 100IRE and 50IRE.

When match the spec, pressing “Save” then exit the adjustment page.

(3) When match the spec, pressing right key in "Save" position then exit the adjustment page.

4-2.4. Exit Factory Mode:

After finish Gamma adjust press [EXIT] to exit factory mode.

(5) Items of Factory menu

When in any source, press the "Left -> Exit -> Enter" key of remote control can enter into factory mode.

During Factory menu, only "EXIT" key is pushed, system will exit factory mode.

Press up and down key can move high light item from Model Change -> Color Temp. Adjust -> Auto Gamma Adjust -> Timer Clear -> Preset Channel -> Full Power -> ADC Calibration -> Shipping reset -> Bypass Gamma -> UART Enable -> I2C -> Boot Loader Upgrade -> V-Com Adjust -> SG Pattern.

Push "Enter" key can enter high light item function. (Press left and right can adjust value)

Display Model version, Release Date, firmware version and released date on the bottom.



1)Model ID

Press up or down key can select high light item function

Press enter or right key to enter the item.

It's only used for FW engineer.

2)Color Temp. Adjust

Press up or down key can select high light item function

Press enter or right key to enter the item.

It's only used for PQ engineer.

3)Auto Gamma Adjust

Press up or down key can select high light item function

Press enter or right key to enter the item.

It's only used for PQ engineer.

4)Timer Clear

Reset the timer which records hours of LED panel burn in

This item will have a check dialog "yes or no" to do or not.

- Time in factory mode: Time function shall be displayed automatically. Saving the total time of system power on (LED turn on), and count the time automatically. The timer is continuous and saved (per 10 minutes) forever, unless it will be reset by doing "Timer Clear".

5)Preset channel

Load preset channel for production line.

6)Full Power

This is for power consumption testing.

To measure the maximum power consumption of TV set, we adjust the value of following items to maximum.

- Video: Contrast maximum value, Brightness maximum value, Backlight maximum value.

- Audio: Volume maximum value, Bass default value, Treble default value.

Press enter key to turn on Full Power and OSD stay display until press enter key to recover from Full Power.

7)ADC Calibration

ADC Calibration function is reserved for calibration by hand (PQ engineer only).

8)Shipping reset

Reset all settings of OSD menu to default value.

Reset settings: Channel table, Model table (H/V Position, Clock, Phase), Source dependent setting (Contrast, Brightness etc.), Common setting (Volume, Language etc.), Parental Control (Rating, Password etc), Closed Caption.

9)Bypass Gamma

For factory test value of gamma.

10)UART Enable

Enable to communicate with Auto-Alignment system.

11)I2C

Enable to communicate with Eeprom burn-in tool.

12)Boot Loader Upgrade

For firmware downgrade used.

13)V-Com Adjust

It's reserved for BMS function.

14)SG Pattern

Aging is for factory burn in and PTN ID provides each pattern for tester using.

(6) Performance check

6-1 TV function

Connect RF to the center signal source, enter Channel menu → auto tuning, check if there are channels be skipped, check if the picture and speaker are normal.

6-2 AV terminals

Input Video signal, check if the picture and sound are normal.

6-3 YPbPr terminal

Input YUV signal (VG859 signal generator), separately input the YUV signals listed in table4 and check if the display and sound are normal at any situation (power on, channel switch and format convert, etc.)

Table4 YUV signal format

MODE	FREQ	PERIOD	SYNC POLARITY	PIXEL CLOCK	Display	SYNC WIDTH	BACK PORCH
	LINE(kHz) FRAME (Hz)	LINE (pixel) FIELD (lines)	LINE FIELD	(MHz)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)
59.94Hz 720x480i	15.734	1716	Negative	27	1440	124	114
	59.94	525	Negative		480	3	15
59.94Hz 720x480P	31,469	858	Negative	27	720	62	60
	59.94	525	Negative		480	6	30
60Hz 1280x720P	45	1650	Positive	74.25	1280	40	220
	60	750	Positive		720	5	20
60Hz 1920X1080i	33.75	2200	Positive	74.25	1920	44	148
	60	1125	Positive		1080	5	15
60Hz 1920X1080P	67.5	2200	Positive	148.5	1920	44	148
	60	1125	Positive		1080	5	36

6-4 HDMI terminal

Input HDMI signal (VG859 signal generator), separately input the signals listed in table6 and check the display and sound (32 KHz, 44.1 KHz, 48 KHz) at any situation (power on, channel switch and format convert, etc.)

Table6 HDMI signal format

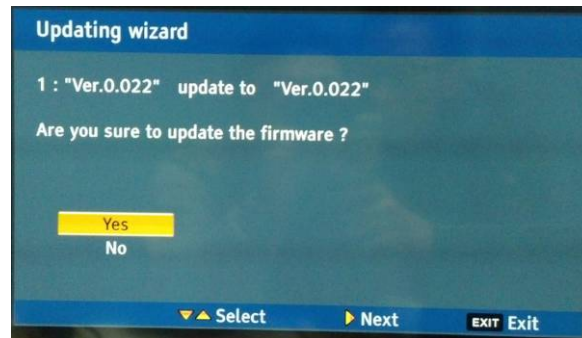
HDMI 1/2/ DVI Timing Table	FREQ	FREQ	PERIOD	SYNC POLARITY	PIXEL CLOCK	Display	SYNC WIDTH	BACK PORCH
	MODE	LINE(kHz) FRAME(Hz)	LINE (pixel) FIELD(lines)	LINE FIELD	(MHz)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)
	640x480	31.47 59.94	800 525	Negative Negative	25.175	640 480	96 2	48 33
	800x600	37.88 60.32	1056 628	Positive Positive	40	800 600	128 4	88 23
	1024x768	48.36 60	1344 806	Negative Negative	65	1024 768	136 6	160 29
	1280x768 (1280cvt)	47.4 59.99	1440 790	Positive Negative	68.25	1280 768	32 7	80 12
	1280x768	47.78 59.87	1664 798	Negative Positive	79.5	1280 768	128 7	192 20
	1280x1024	63.98 60.02	1688 1066	Positive Positive	108	1280 1024	112 3	248 38
	1360x768	47.71 60.02	1792 795	Positive Positive	85.5	1360 768	112 6	256 18
	1366x768	47.71 59.79	1792 795	Positive Positive	85.5	1366 768	112 6	256 18
	1920x1080	67.5 60	2200 1125	Positive Positive	148.5	1920 1080	44 5	148 36
	59.94Hz 1440x480i	15.73 59.94	1716 262.5	Negative Negative	27	1440 480	124 3	114 15
	59.94Hz 720x480P	31.47 59.94	858 525	Negative Negative	27	720 480	62 6	60 30
	60Hz 1280x720P	45 60	1650 750	Positive Positive	74.25	1280 720	40 5	220 20
	60Hz 1920X1080i	33.75 60	2200 562.5	Positive Positive	74.25	1920 1080	44 5	148 15
	24Hz 1920x1080P	27 24	2750 1125	Positive Positive	74.25	1920 1080	44 5	148 36
	30Hz 1920x1080P	33.75 30	2200 1125	Positive Positive	74.25	1920 1080	44 5	148 36
	60Hz 1920X1080P	67.5 60	2200 1125	Positive Positive	148.5	1920 1080	44 5	148 36

6-5 other functions check

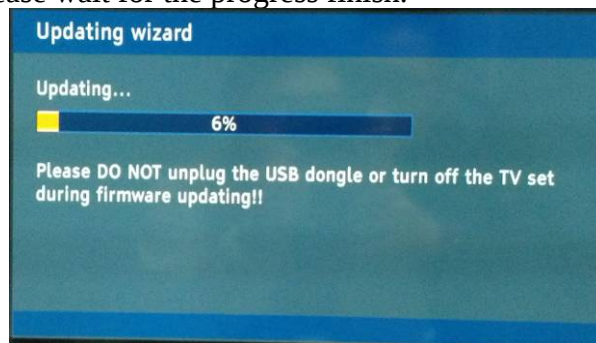
a) Check the sleep timer, picture/sound mode, OSD, stereo and analog TV Teletext, etc.

(7) Firmware update process

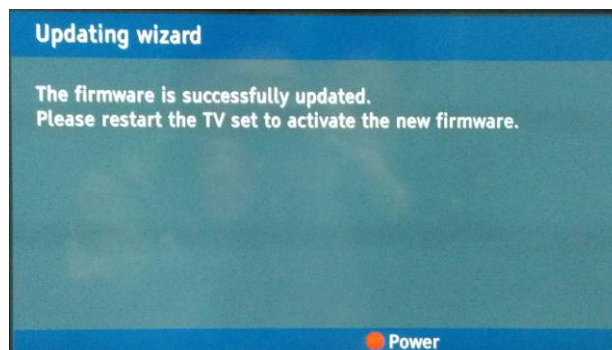
- (1) Plug the USB with the firmware file named upgrade_2013_NA_60.pkg
- (2) If system detect upgrade_2013_NA_60.pkg, USB upgrade message would appear automatically.
- (3) Press Up key to select Yes, and then press OK key to start the upgrading.



- (4) Upgrading is starting, please wait for the progress finish.



- (5) When the progress completed, please follow the instruction to remove USB and restart Power off then on.



Working principle analysis of the unit

1. NTSC signals flow:

Antenna signal will be send to tuner TDST-H021F, then Tuner will be demodulating and output standard video signal TV-CVBS, and sound SIF signal.

TV-CVBS will send to the master control IC MT5385 to video decode, de-interlace and scaler, then output LVDS level drive for panel display.

The sound IF (SIF) will be fed into MT5385, after demodulating, pre-amplifying, bass adjusting and volume control, the sound signal will be transform into digital I2S signal and sent to digital amplifier TAS5707.

2. Composite/Component signal flow

Composite signal and Component signal will be fed to MT5385 to perform video decode, de-interlace and scaler, then output LVDS drive level for panel display.

Audio signal from Composite/Component terminal via matched resistance is fed to MT5385 to bass adjust and volume control, the sound signal will be transform into digital I2S signal and sent to digital amplifier TAS5707.

3. HDMI signal flow

Two HDMI video signals are directly fed to the master control IC MT5385 to digital decode, image scale, then output LVDS drive level for panel display. HDMI audio signal via decoder built-in MT5385 to bass adjust and volume control, the sound signal will be transform into digital I2S signal and sent to digital amplifier TAS5707.

4. USB signal flow

USB signal via USB connector sent to MT5385 and its A/D conversion to YPbPr output for MT5385, then output R/G/B of 24 bit to back end module to Video decode, de-interlace and image scale, then send to LVDS level drive for panel display.

Sound signal of USB signal via matched resistance and sent to MT5385 to bass adjust and volume control, the sound signal will be transform into digital I2S signal and sent to digital amplifier TAS5707.

5. SPDIF signal flow

The master control IC MT5385 will transfer digital sound signal out by format Dobly Digital or PCM.

4. Specifications

Specifications

Power rating

AC 110-127 V, 60 Hz

Rated Power Consumption

32": 56 Watts

Standby condition

32": 0.3 Watts

Visible screen size (diagonal)

32" class : 31.5 inch (80cm)

Number of pixels

32" HD (1366X768)

Dimensions (W × H × D) (Including Stand)

32" : 29.2" × 20.2" × 8.2" (741 mm × 513 mm × 207 mm)

Net Weight

32" : 17.6lb. (8 kg) (Including Stand)

32" : 15.4lb. (7 kg) (TV only)

Sound System

1-way 2 bottom SP System

Channel Capability-ATSC/NTSC (Digital/Analog)

VHF/UHF: 2 - 69, CATV: 1 - 135

Sound Output

32" : 5W+5W

Maximum Visible Range

32" : 27.6" × 15.6" (701 mm x 396 mm)

Operating Conditions

Temperature: 32° F - 95° F (0°C to 35°C)

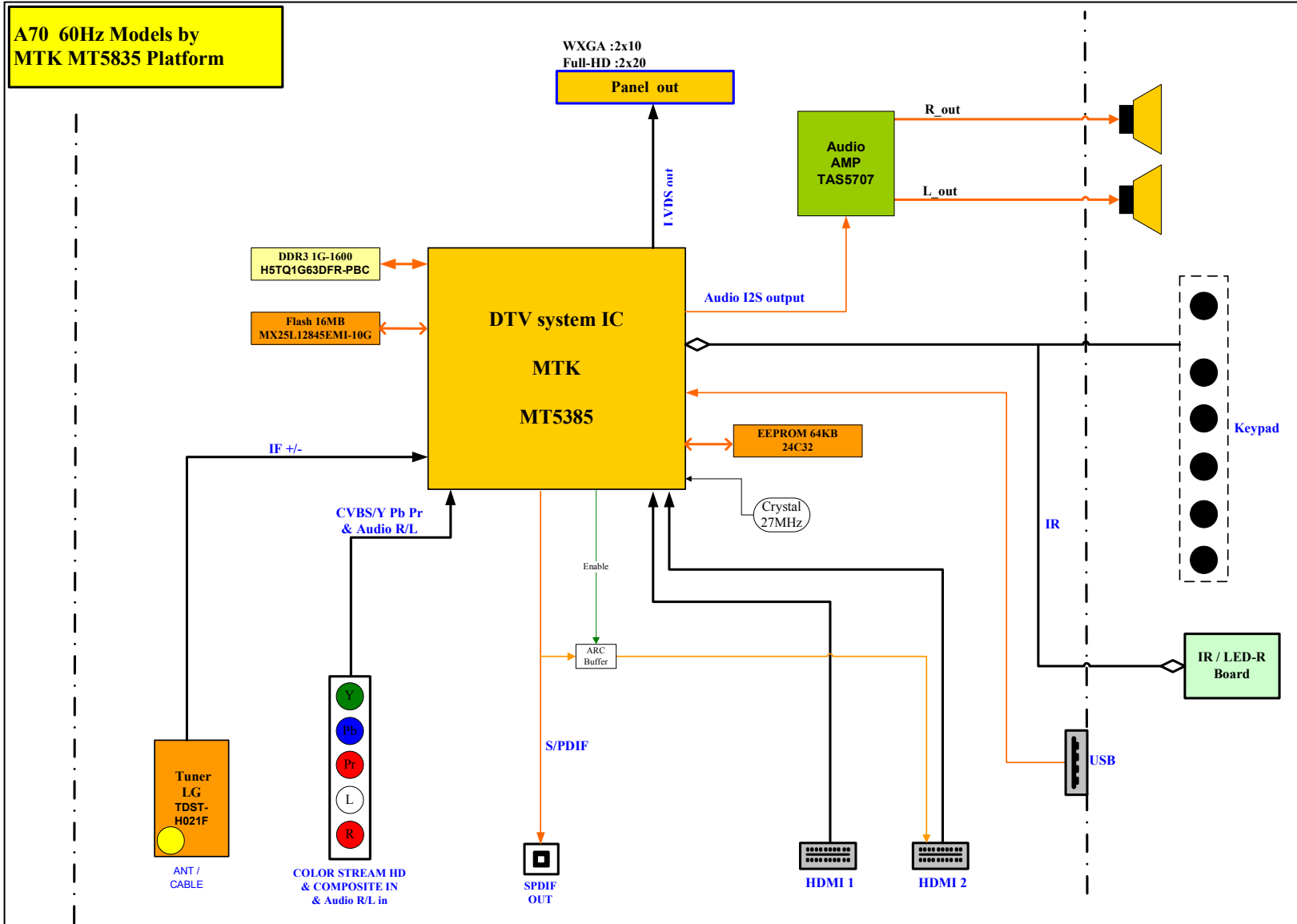
Humidity: 20 % - 80 % RH (non-condensing)

- Specifications are subject to change without notice.
- The On-Screen Menu and figures in this manual may differ slightly from the product.
- USB Flash Memory format : FAT16, FAT32 (no support exFAT or NTFS).
- Some USB devices (USB HUB or card adopter) or some USB stick may not be used with this TV.

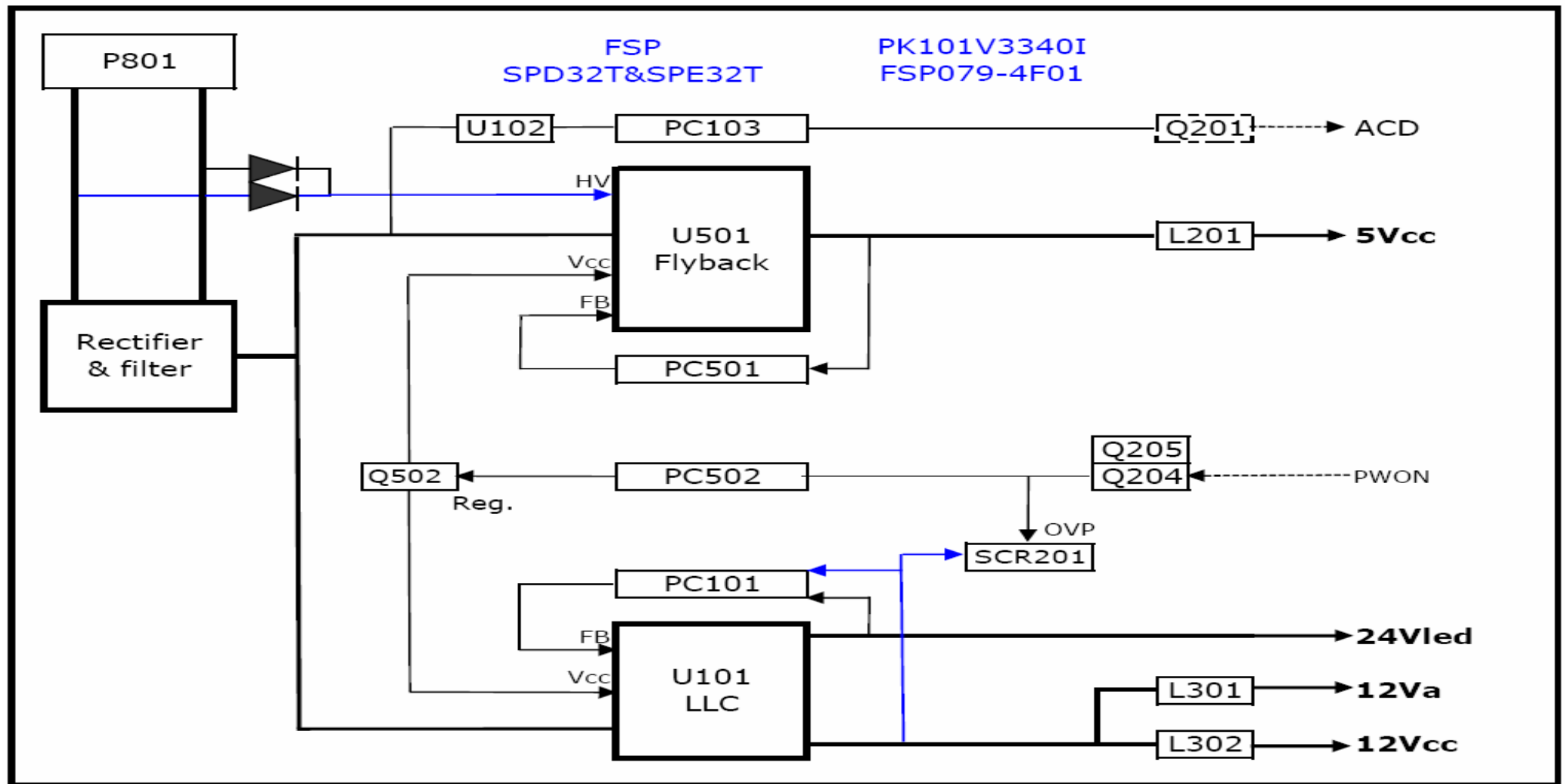
SPE32T 32" Block Diagram

5-1 Block Diagram

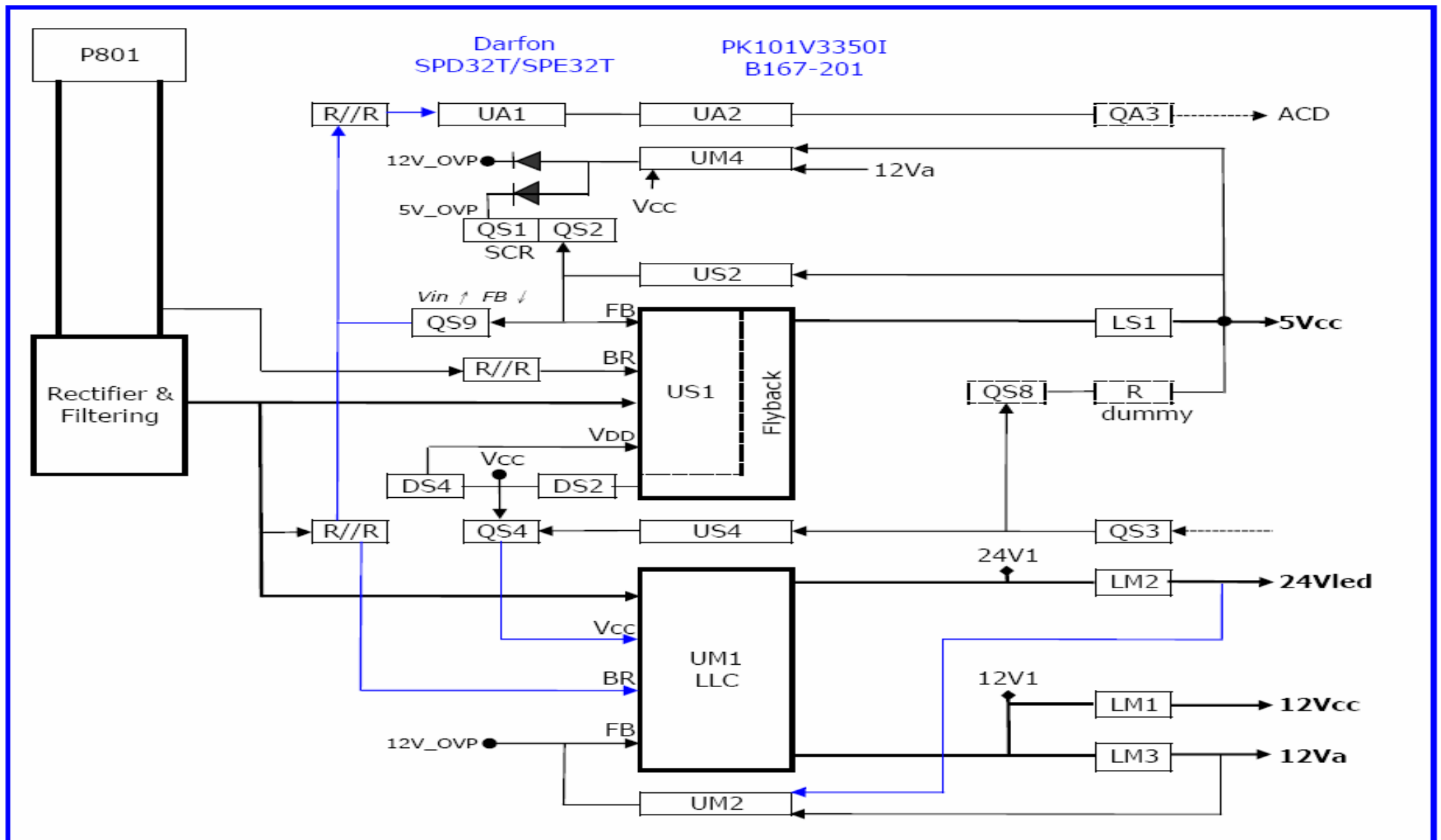
EE:



Power board:FSP



Power board:DARFON



IC block diagram

1. MT5385

GENERAL FEATURE LIST

Host CPU

- ARM11 single core 700MHz
- Floating Point Unit
- 16K I-Cache and 16K D-Cache for ARM11 core
- 128K L2 Cache
- Boot ROM
- Boot from serial flash, NAND flash
- Supports security boot
- JTAG ICE interface
- Watch Dog timers

General Copy Protection Unit

- Supports CPPM/CPRM
- Supports AES with 128/192/256 bit key
- Supports AACS
- Supports DES/3DES
- Supports SHA-1/224/256
- Supports MD5
- Supports CSS
- Supports RC4
- Random number generator

MPEG1 Decoder

MPEG2 Decoder

- MPEG MP@ML, MP@HL
- Supports de-blocking filter
- Full-HD 30P dual decoder

MPEG4 Decoder (option)

- ASP@L5
- Full-HD 30P dual decoder

H.264 (MPEG4.10 / AVC) HD Decoder (option)

- MP@L4.0, HP@L4.0, constrained BP@L3 video standard
- Full-HD 30P dual decoder

VC-1 (SMPTE421M) Decoder (option)

- MP@HL, AP@L3
- WMV9 decoder MP@HL
- Full-HD 30P dual decoder

DivX (XviD) Decoder (option)

- DIVX3 / DIVX4 / DIVX5 / DIVX6 / DIVX HD
 - Full-HD 30P dual decoder
- AVS Decoder (option)
 - Jizhun profile @Level 6.2 (supports 4:2:0 format)
 - Full-HD 30P dual decoder
- RMVB Decoder (option)
 - RealVideo8/9/10
 - Full-HD 30P dual decoder
- VP6 Decoder (option)
- VP8 Decoder (option)
 - Supports 3D side-by-side Full-HD contents
 - Full-HD 30P dual decoder

- MVC
 - H.264 stereo high profile Full-HD 60fps
- Still Image decoding
 - JPEG decoder (base-line or progressive), hardware accelerator
 - BMP/PNG/JIF decoder
- De-mosquito engine
 - For all AV inputs
- 2D Graphics
 - Supports multiple color modes
 - Point, horizontal/vertical line primitive drawings
 - Rectangle fill and gradient fill functions
 - Bitblt with transparent options
 - Alpha blending and optional pre-multiplied alpha composition Bitblt
 - Stretch Bitblt
 - YCbCr to RGB color space conversion
 - Supports index to direct mode bitblt
- Image Resizer
 - Supports 16bpp/32bpp direct color format
 - Supports 420/422 video format
 - Supports 420/422/444 JPEG format
 - Arbitrary ratio vertical/horizontal scaling of video, from 1/128X to 128X
 - Simple DMA
 - Supports MMU in OSD mode
- OSD Plane
 - Three linking list OSDs with multiple color mode and all of them have
- up-scaler
 - Supports stereo OSD

Video Plane

- Supports video freeze and over scan
- Flesh tone management
- Gamma correction
- Color Transient Improvement (CTI)
- 2D Peaking
- Saturation/hue adjustment
- Brightness and contrast adjustment
- Black and White level extender
- Adaptive Luma management
- Automatic detect video, film and mixed-mode source
- 3:2/2:2 pull down source detection
- Supports FHD motion-adaptive de-interlace
- Supports excellent low angle image processing
- Brilliant boundary shaping for moving object
- Advanced non-linear panorama scaling
- Programmable zoom viewer
- Progressive scan output
- Supports alpha blending for OSD on video plane
- Dithering processing for flat panel display
- Frame rate conversion
- Supports FHD panel and VGA dot-to-dot
- Supports PIP/POP, (dual de-interlace, one HD and one SD)

OD (option)

- Supports 60Hz Full-HD and WXGA panel over drive

TCON (option)

- Flexible timing control with programmable timing
- Horizontal timing control
- Vertical timing control
- Multi-line timing control
- Multi-frame timing control
- Supports gate power modulation timing
- Supports command-based timing
- Supports POL inversion every 30 seconds
- Supports 1/2/4/8 frame inversion, 1-line inversion, 2-line inversion,

and could up to 255-line dot inversion

Local Dimming

- Block division: up to 800 total blocks, up to 100 horizontal blocks
- Supports 50K ~ 50M SPI clock rate

LVDS

- Supports 6/8/10-bit one-link, 6/8/10-bit dual-link LVDS transmitter
- Built-in spread spectrum for EMI performance
- Programmable panel timing output

Mini-LVDS

- Dual port 8-bit 6 pairs mini-LVDS output

CVBS In

- On-chip 54 MHz 10-bit video ADC
- Supports PAL (B,G,D,H,M,N,I,Nc), NTSC, NTSC-4.43, SECAM
- NTSC/PAL supports 3D/2D comb filter
- Built-in motion-adaptive 3D Noise Reduction
- VBI data slicer for CC/TT decoding
- Supports 1 S-Video
- Supports 2 1-channel CVBS
- Supports SCART connector

VGA In

- Supports VGA input up to UXGA 162 MHz
- Supports full VESA standards

Component Video In

- Supports 2 component video inputs
- Supports 480i / 480p / 576i / 576p / 720p / 1080i / 1080p

Audio ADC

- Supports 3 pair L/R input

Audio digital input

- Supports 1 bit (2 channel) I

2

S audio input

HDMI Receiver

- Two channel HDMI1.4a
- Maximum data rate can be up to 3.3 GHz
- Audio return channel
- EIA/CEA-861B
- CEC

Video bypass

- ATV bypass
- CVBS Monitor (any AV or S-video input)

TV audio demodulator

- Supports BTSC / EIA-J / A2 / NICAM / PAL FM / SECAM world-wide

formats

- Standard automatic detection

Stereo demodulation, SAP demodulation

Mode selection (Main/SAP/Stereo)

Audio DAC

Supports 2-pair audio DACs

DRAM Controller

16-bit DDR2/DDR3 interface

Supports DDR2 1066Mhz, DDR3 1333Mhz

Supports 512Mb or 1Gb or 2Gb DDR2 and DDR3 DRAM device

Supports DDR2-1066/DDR3-1333/DDR3-1600 device

Audio DSP

Supports AC-3 (Dolby Digital) decoding (ATSC) and E-AC3 (Dolby

Digital Plus) decoding (option)

MPEG-1 layer I/II decoding

Supports WMA / HE-AAC (option)

Support Dolby DDCO, and MS10 (option)

Dolby Prologic II (option)

Audio output: 5.1ch + 2ch (down mix) + 2ch(bypass)

Pink noise and white noise generator

Equalizer

Bass management

3D surround processing with virtual surround

Audio and video lip synchronization

Supports bass/treble

Automatic volume control

Supports 5-bit (10-channel) main audio I

2

S output interface, each of these channels is up to 24-bit resolution

S/PDIF interface

Supports SPDIF in bypass

SPDIF out

Analog TV IF Demodulator

Supports world-wide analog TV standard

Accept direct IF and low IF

Full digital AGC control and carrier recovery

Embedded SAW filter and IF Amplifier. Cost effective TV front-end

structure and no more cost on:

External analog SAW filters (Video/Audio)

External analog IF demodulator

External peripheral circuit on CVBS signal data path

External SAW filter and IF VGA on tuner

Digital TV (ATSC / Open-Cable) Demodulator

- Compliant with ATSC digital television standard

- Supports SCTE DVS-031 and ITU J.83 Annex B digital CATV standard

- Accept direct IF (44 MHz or 43.75 MHz) and low IF (5.38 MHz)

- NTSC interference rejection capability

- Meet all ATSC/A74 requirements

- Excellent adjacent and co-channel rejection capability

- Dual digital AGC controls for IF and RF, respectively

- Full-digital frequency offset recovery with wide acquisition range 500KHz for ATSC and 250 kHz for CATV reception

- EIA/CEA-909 antenna interface, both mode A and mode B are supported

- Embedded SAW filter and IF Amplifier. Cost effective TV front-end structure and no more cost on:

 - External analog IF demodulator

 - External SAW filter and IF VGA on tuner

Peripherals

- Seven basic serial interfaces: one is for the tuner, three are the masters for general purpose and two of them can be active in standby mode, one is the slave for VGA DDC, the other two extra slave serial interfaces used for HDMI EDID data

 - Five PWMs, two of them can be active in standby mode

 - IR receiver

 - Real-time clock and watchdog controller

 - Built-in 2-link USB2.0/1.1, both of them support external hub with 16 endpoints.

 - Built-in uP for standby mode

 - Supports SDIO interface

 - Supports smart card interface

 - Supports two serial flash or one serial and one NAND flash

 - Supports 2-input low-speed ADC

 - Supports boundary scan (JTAG)

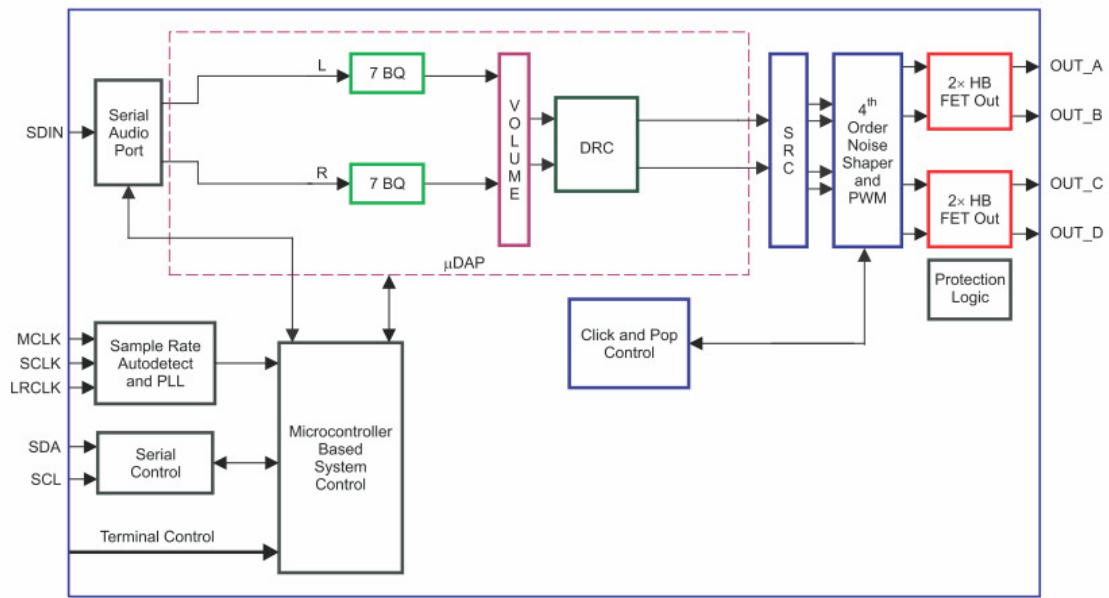
IC Outline

- LQFP Package 216 pins with E-pad

- 3.3V/1.2V and 1.8V for DDR2 or 1.5V for DDR3

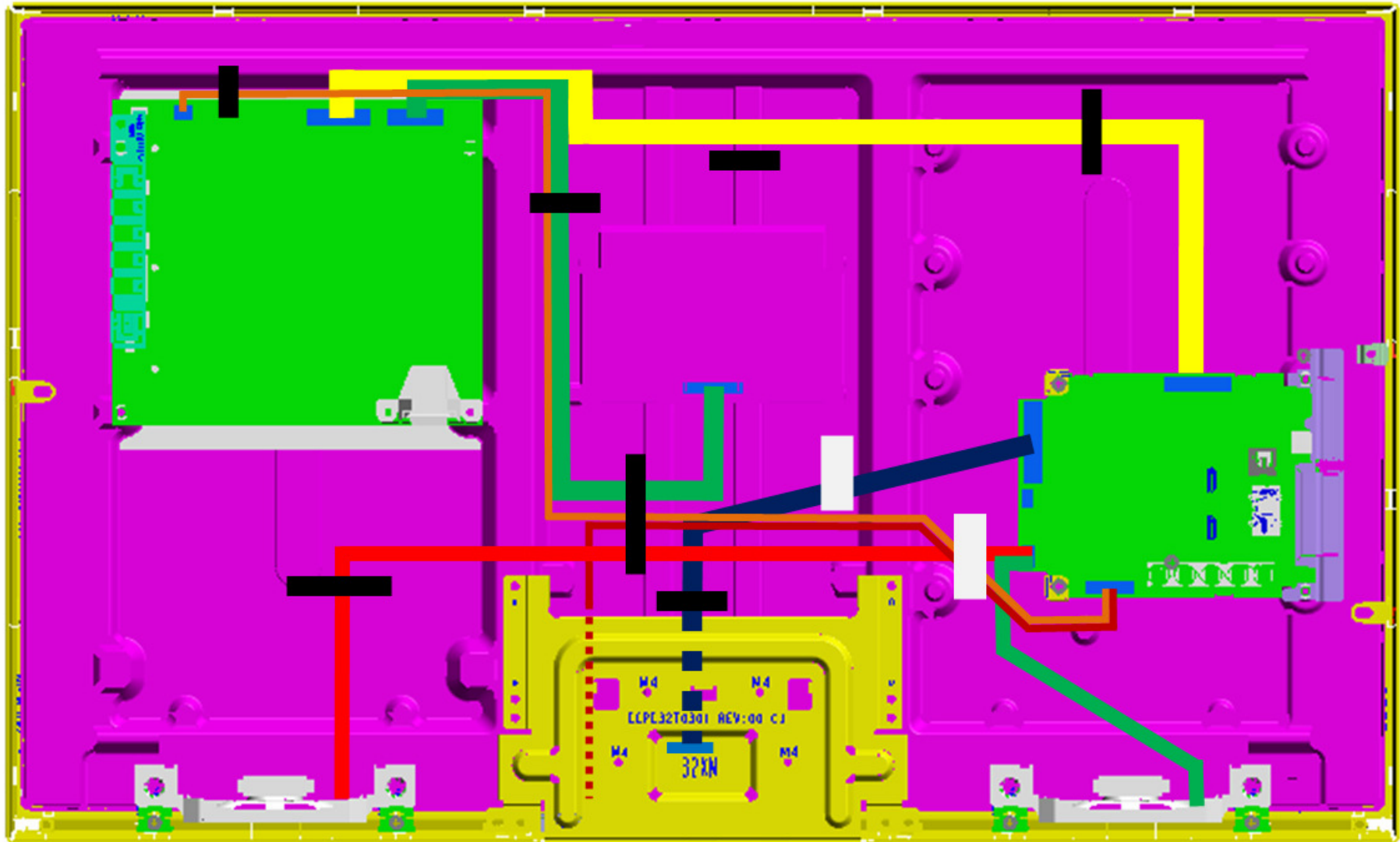
2. TI TAS5707

20-W STEREO DIGITAL AUDIO POWER AMPLIFIER WITH EQ AND DRC



SPE32T 32-inch Wiring Diagram

7-1 BLOCK



7-2 Wiring Connection

CMI panel

Main board to Panel			
SPE32T DC02L00700I 280 mm			
Panel side		Main board CN1	
P-TWO 187053-30091		LVDS cable	JWT A2006WR0-2X10P
1	VCC	Red	1 LVDS_PWR
2	VCC	Red	2 LVDS_PWR
3	VCC	NC	
4	VCC	NC	
5	GND	NC	
6	GND	NC	
7	GND	NC	
8	GND	NC	
9	SELLVDS	Yellow	8 LVVDS_SEL
10	NC	NC	
11	GND	NC	
12	RX0-	Yellow	20 LVDS_D0O_N
13	RX0+	White	19 LVDS_D0O_P
14	GND	NC	
15	RX1-	Red	18 LVDS_D1O_N

Main board to Speaker			
SPE32T DC02A00130I L:280 & R:480 mm			
Main board CN4			Speaker
JWT A2001WR2-4P		Color	Right
1	SPK_OUTL+	Red	P3 Speaker +
2	SPK_OUTL-	Black	P2 Speaker -
			Left
3	SPK_OUTR-	Green	P5 Speaker -
4	SPK_OUTR+	White	P4 Speaker +

Main board to IR board/ Key			
SPE32T DC02V04140I IR:450 mm & Key:750mm			
IR board CN1			Main board CN3
JWT A2001WR2-11P		Color	JWT A2001WR2-5P
1	VCC3V3_STB	Red	1 VCC5_0_STB
2	IRR	White	2 IRR

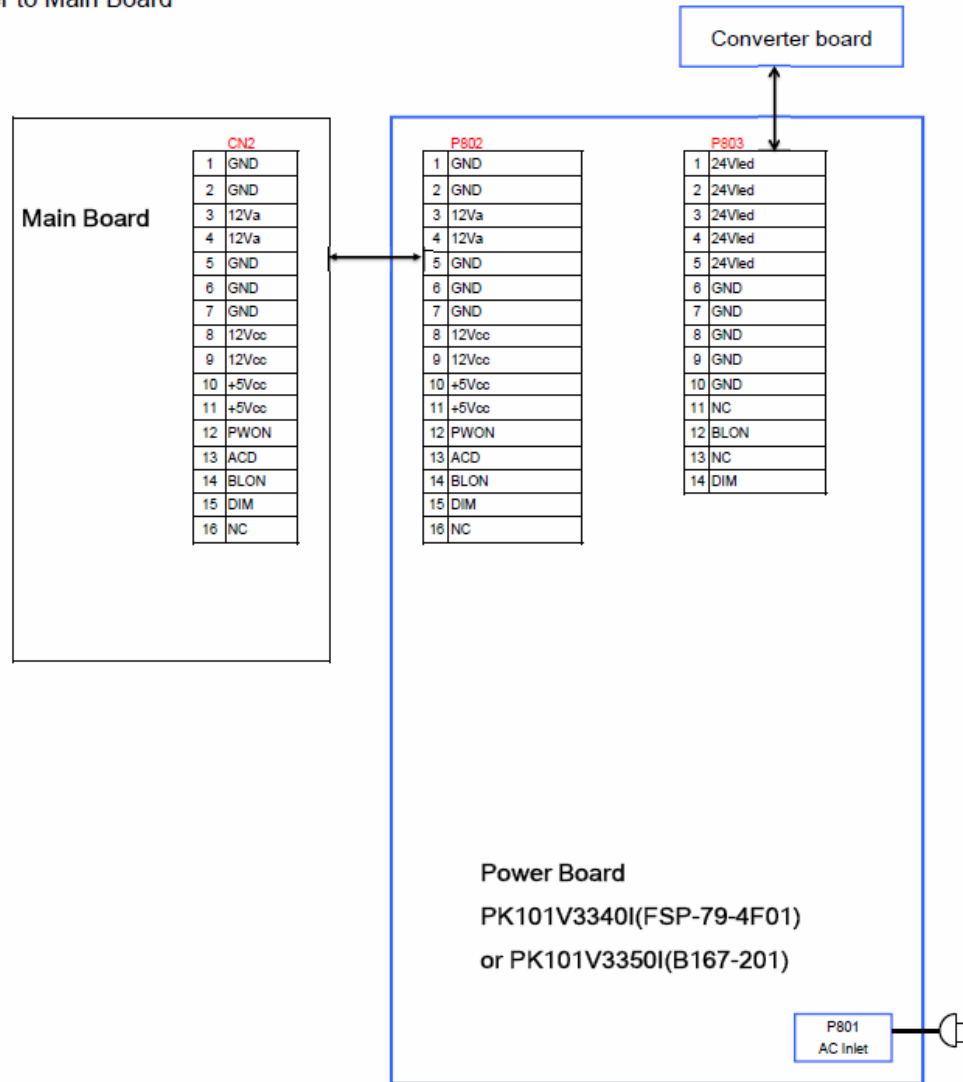
16	RX1+	White	17	LVDS_D1O_P
17	GND	Black	5	GND
18	RX2-	Orange	16	LVDS_D2O_N
19	RX2+	White	15	LVDS_D2O_P
20	GND	Black	6	GND
21	RXCLK-	Brown	14	LVDS_CO_N
22	RXCLK+	White	13	LVDS_CO_P
23	GND	Black	7	GND
24	RX3-	Black	12	LVDS_D03_N
25	RX3+	White	11	LVDS_D03_P
26	GND	NC		
27	NC	NC		
28	NC	NC		
29	NC	NC		
30	GND	NC		

3	GND	Black	3	GND
4	LED_G	Orange	4	LEDG
		NC	5	LEDR
		NC	6	Light_S_C
		NC	7	Light_S_D
1	GND	Black	8	GND
2	Power	Red	9	Power Key
3	SAR0	Orange	10	SAR0
4	SAR1	Yellow	11	SAR1

Main board to Power board:

SPE32T&SPD32T Interconnect

Power to Main Board



8. Trouble shooting

1. Fault clearance

Before calling your dealer or service center for assistance, check the matters below once again.

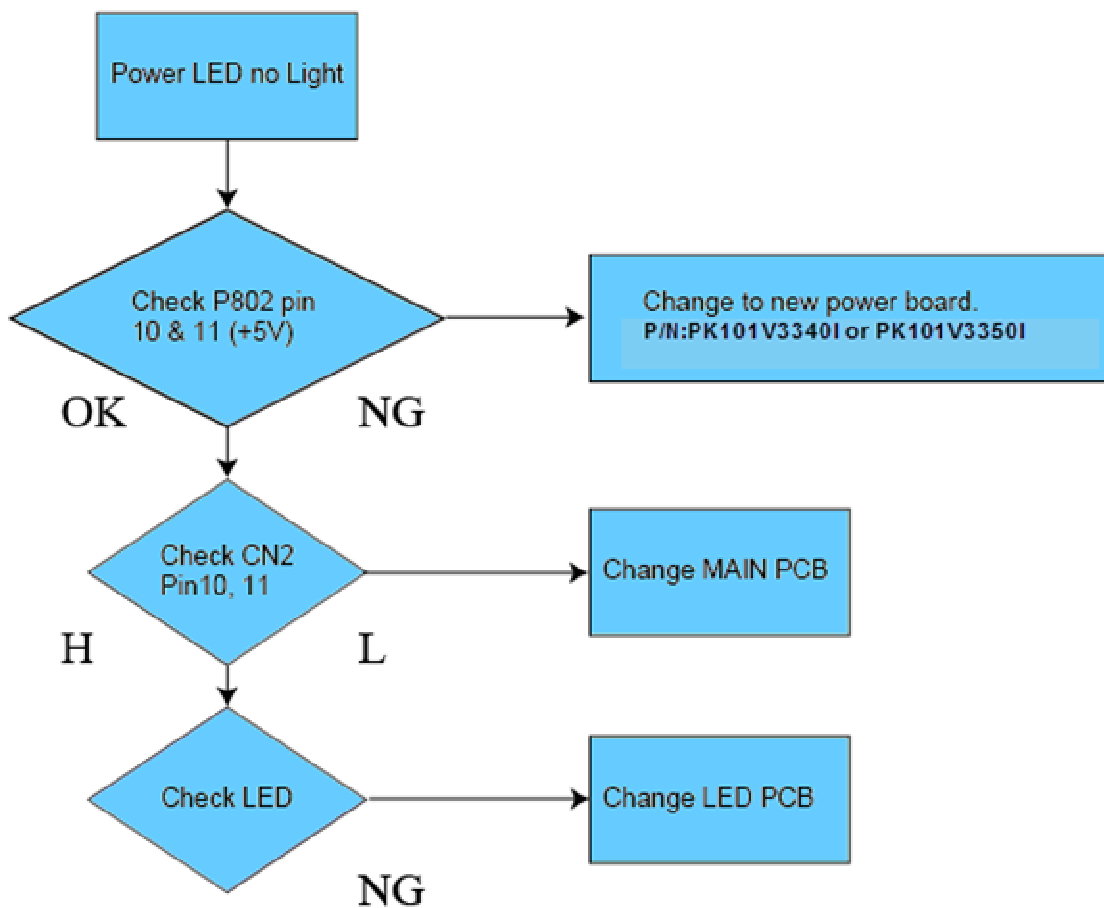
- (1) Make sure you have connected LED TV to your equipment as described in the section "CONNECTING LED TV".
- (2) Check cable connection. Verify that all external equipment and power cord are properly connected.
- (3) Verify that all power is switched on.
- (4) If LED TV still does not produce an image, re-start the external equipment.
- (5) If the image still does not appear, unplug LED TV from the external equipment and check the external equipment. The problem may be with your graphics controller rather than with LED TV. (When you reconnect LED TV, remember to turn the external equipment and TV off before you power up LED TV. Power the equipment back on in order of LED TV and external equipment.)
- (6) If the problem still exists, check the following chart.

Problem	Try these Solutions
NO POWER	• Plug this LED TV into the AC outlet. • Press POWER button on side control or on Remote Control to turn on LED TV. • Check POWER Indicator. If this indicator blank, this TV has getting trouble.
Remote Control does not work	• Check the batteries. • Make sure nothing is between the Remote Receiver and the Remote Control. • Make sure you are not too far from LED TV when using Remote Control. • Maximum operating range is 5m. • Is direct sunlight or strong artificial light shining on LED TV's Infrared Remote Receiver? Eliminate the light by closing curtains, pointing the light in a different direction, etc.
No image	• Check the connection between the external equipment and LED TV. • When turning LED TV on, it takes within 7 seconds (ATV mode) to display the image. • Check the system that you select is corresponding with the external equipment or the video equipment. • Make sure the temperature is not out of the Operating Temperature (0°C ~ 40°C). • Turn off power, then turn on again, re-start LED TV.
No sound	• Check Audio cable connection from Audio input source. • Adjust the Sound System. • Press VOLUME (+) button. • Press MUTE button.
There are tiny black points and/or bright point on the TV	• Dark or bright points of light (red, green, or blue) may appear on the screen. This is a characteristic of the LED panel, not a malfunction of the LED TV. • LED panel is produced with very high accuracy technology. There is 99.99% or more dot pixel, but there is also 0.01 % or less of dot pixel lack or dot pixel that is constantly lighted. This is not defect. • Regarding LED panel characteristic, it may occur picture remain (look like a mirror) when the screen is changed if it displays same screen for a long time. Changing the picture or turn-off the power supply may recover. • Stripe pattern (more, interference stripes) may show up on the screen depends on the reflected picture.
Abnormal color of image	• Adjust the value of color. • Select different color system.

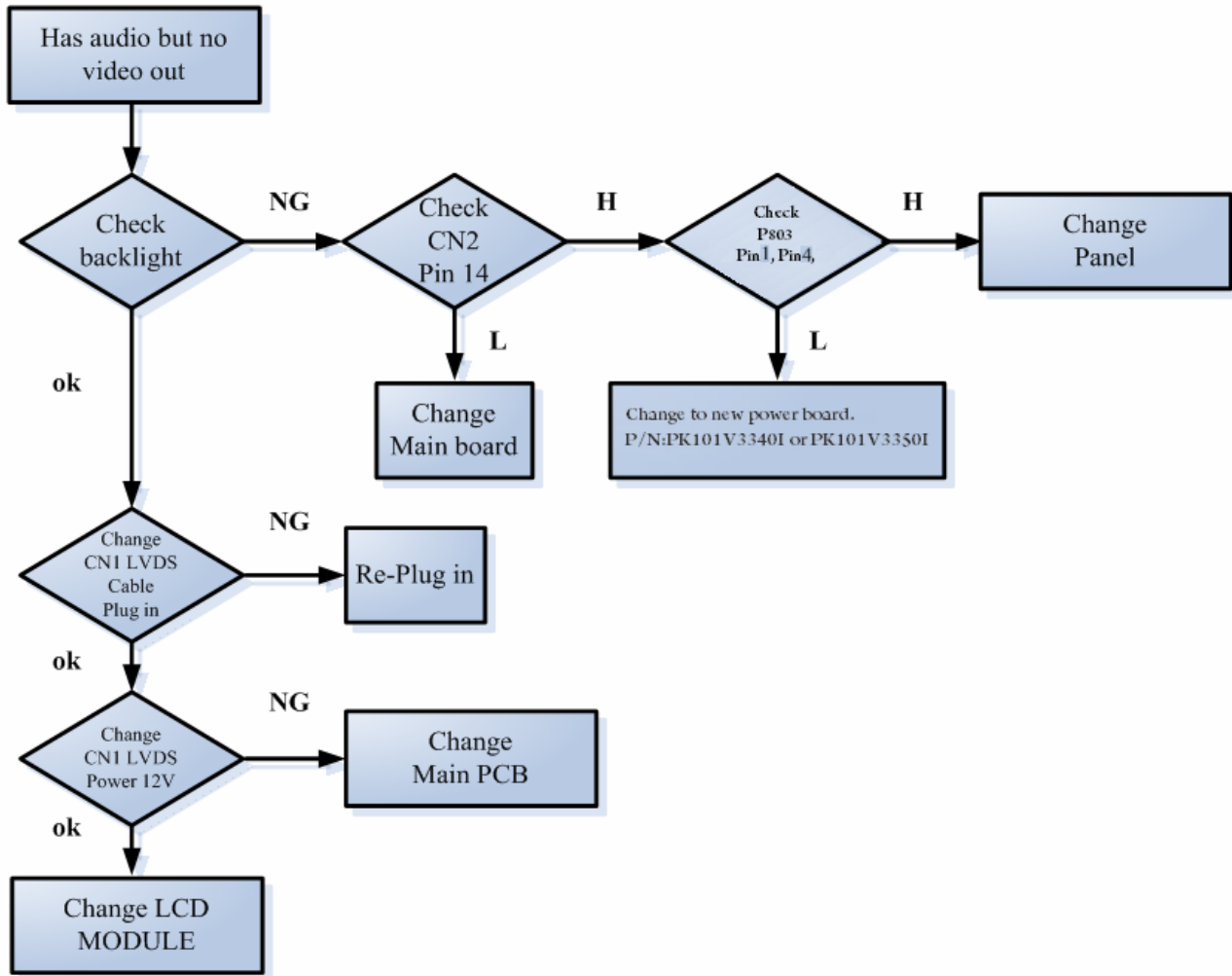
2. Troubleshooting guide

The flow chart shown below will help you to troubleshoot your Television set with it doesn't display normally. Each procedure offers a simple way to check for system errors. Before starting, ensure that there is a signal in and that the Television is turned on.

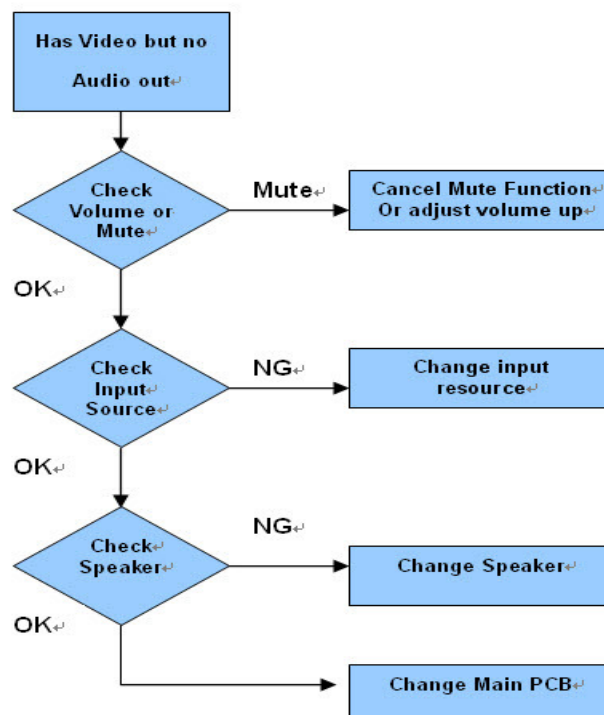
2-1 Power LED no light



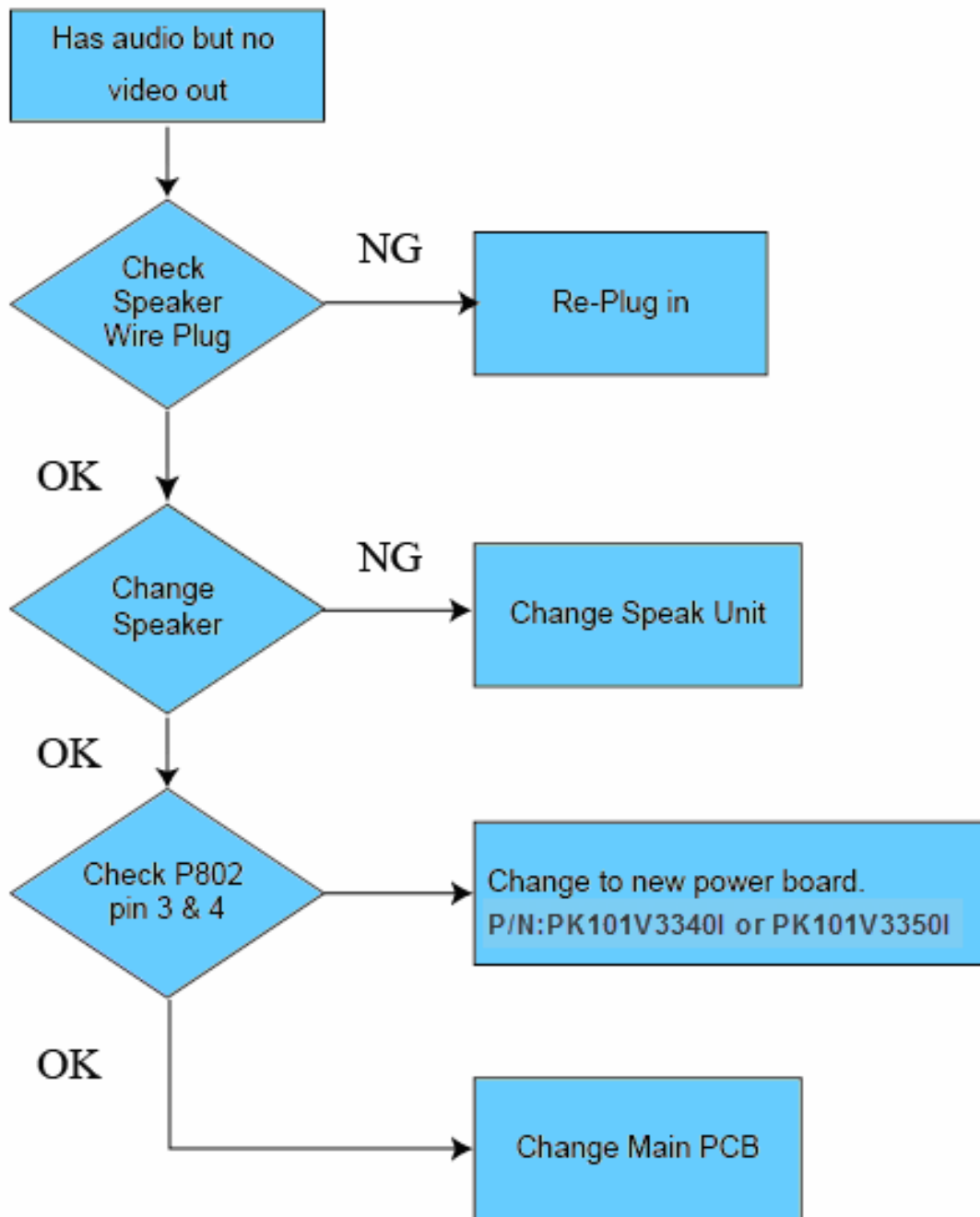
2-2 Has audio but no video out



2-3 Has video but no audio out step 1



2-4 Has video but no audio out step 2



9. SCHEMATIC DIAGRAM --ELECTRON

E1



AMP_VCC
For AMP

+12V

5V_SW

FB20

Q15
LMBT3904LT1G
SOT-23B
(LVDS_PWR_EN)

U14
DMG4435SSS
SOP8

FB21

LVDS_PWR
For Page1

(NC) (Option)

+5V_VSB

FB1

U1
AX0518ESA
SOP8-T5
POWER_EN

FB2

(1.2V)
VCC

(About 3.2A)

FB3

U2
AX1007E33A
SOT-223

FB4

(3.3V)
3V3SB

R39

AVDD33_XTAL

R41

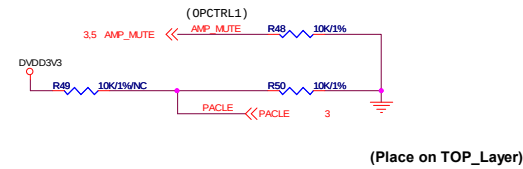
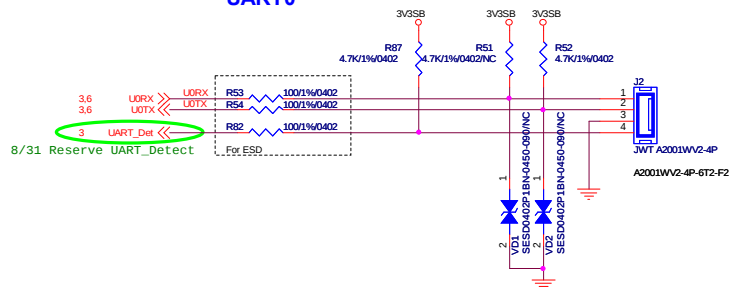
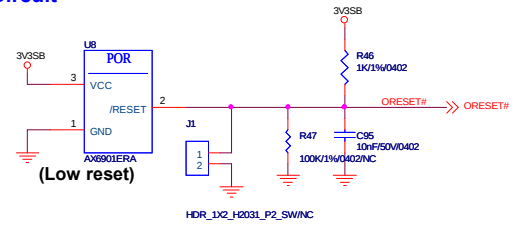
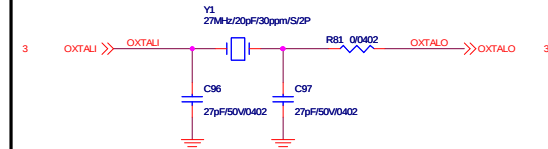
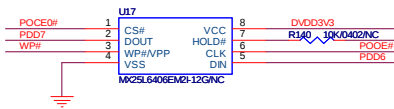
AVDD33_REG

Q2
LMBT3904LT1G
SOT-23B
VCC

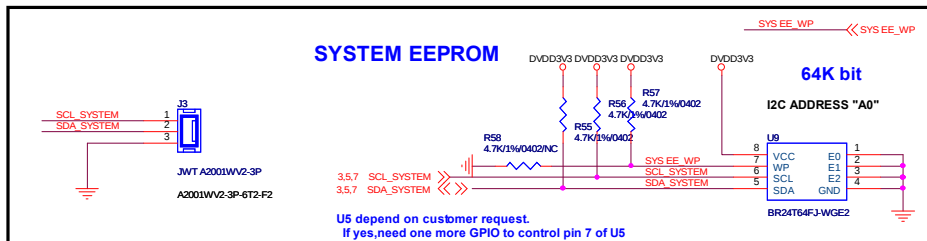
Q1
DMP2160U
SOT-23GDS

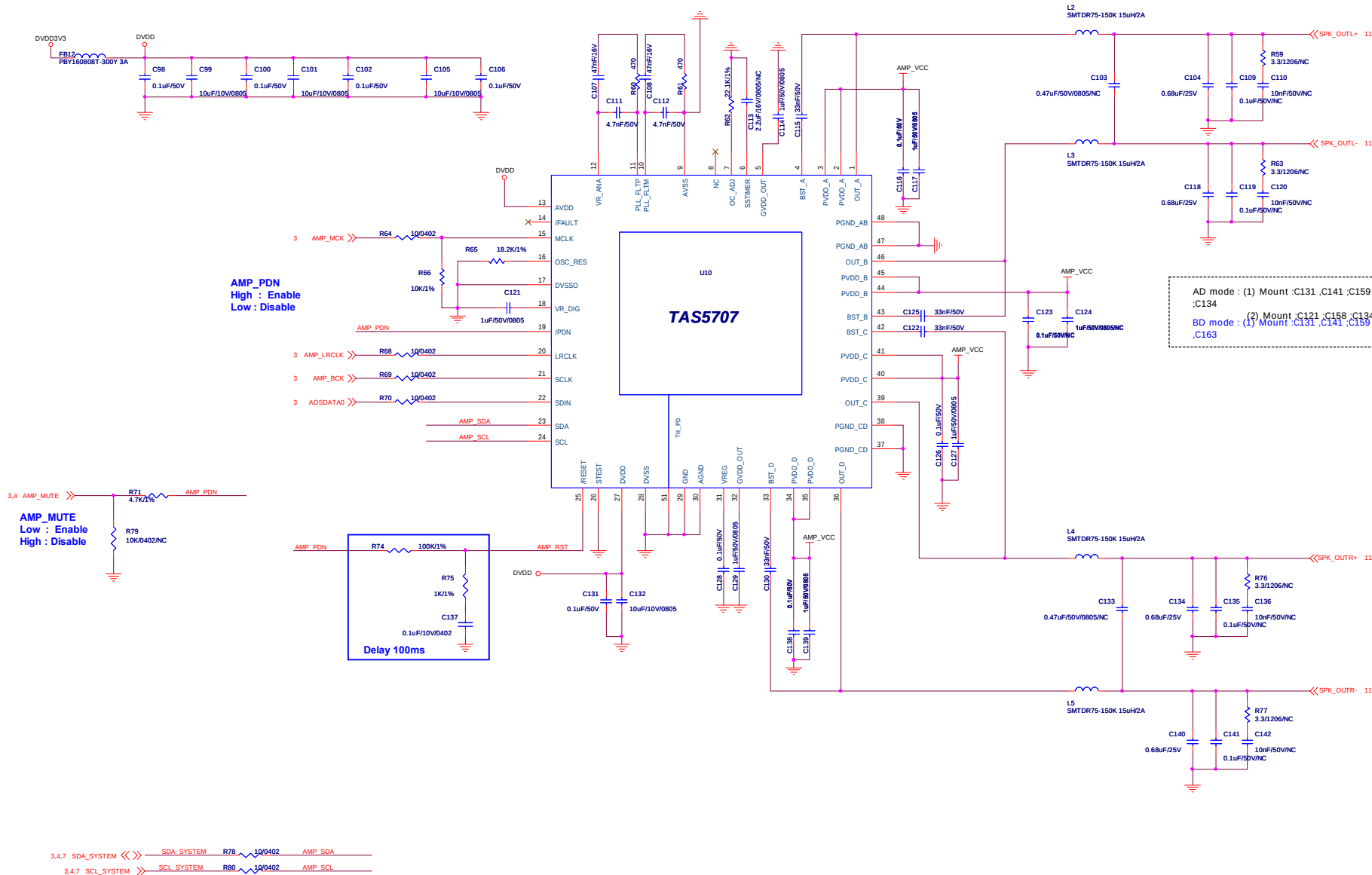
FB5

(5V)
5V_SW



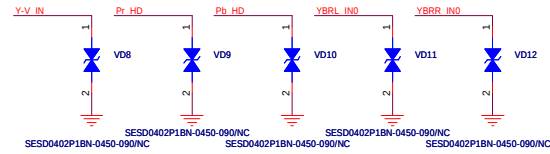
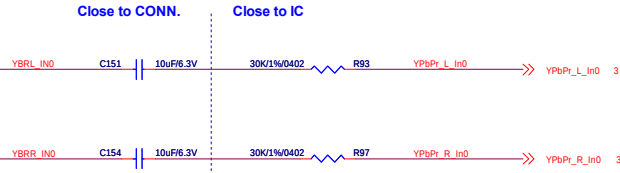
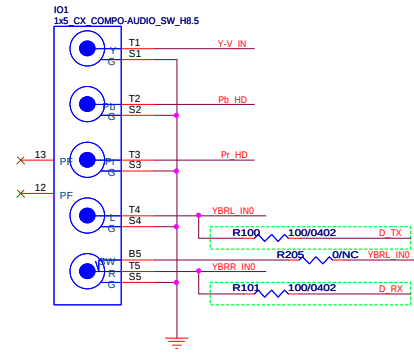
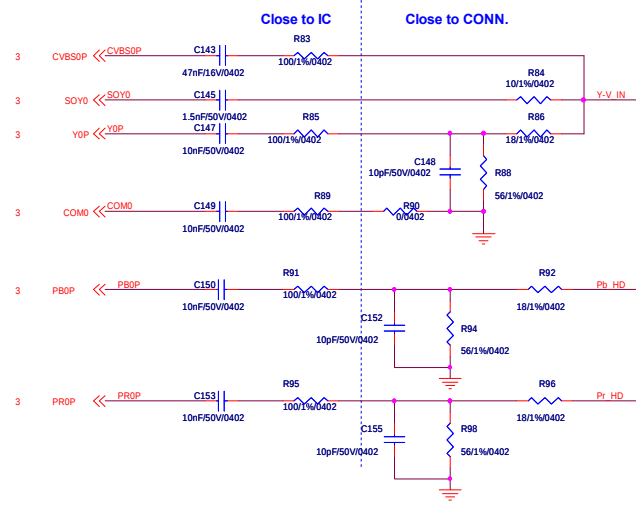
LQFP Strapping	OPWRSTB	OPCTRL1	PACLE
ICE mode + 27M + serial boot	0	0	0
ICE mode + 27M + ROM to Nand boot	0	0	1



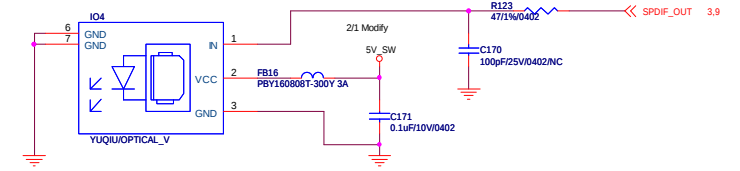


Component input

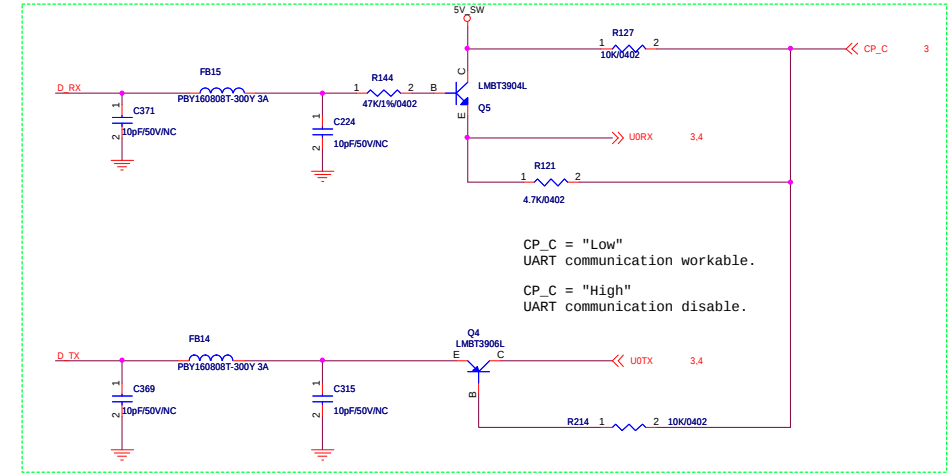
A/V input



OPT SPDIF out



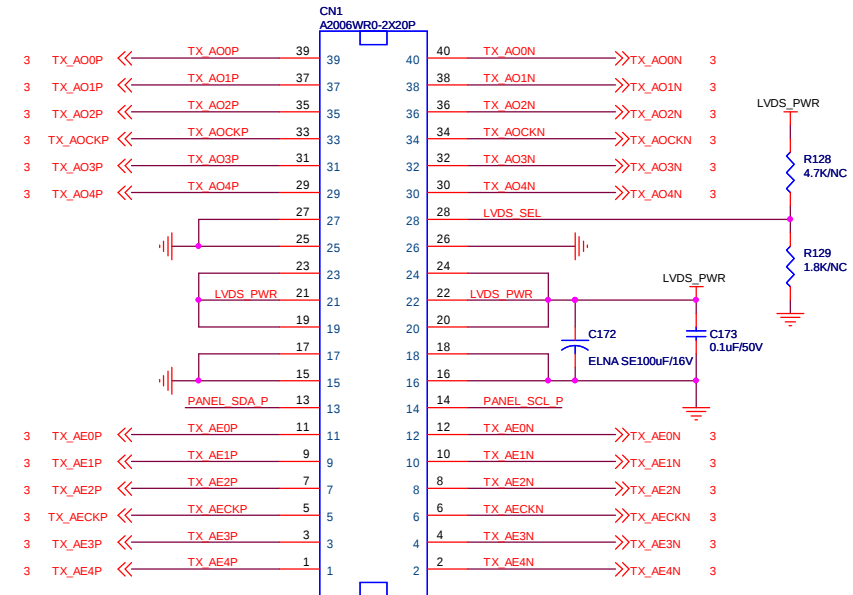
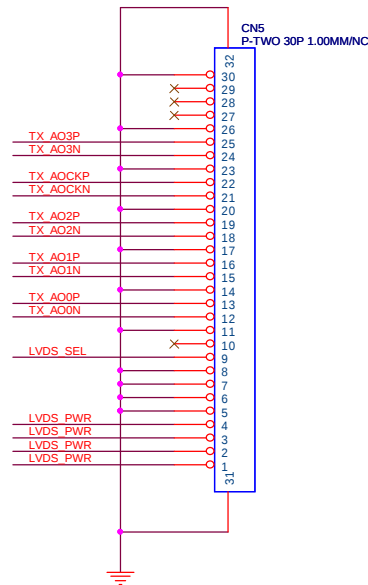
Modify form last version



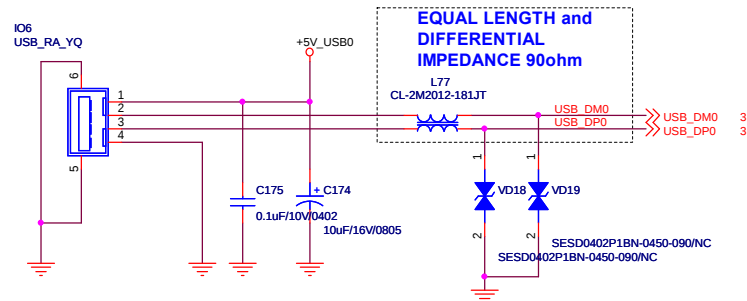
COMPAL OPTOELECTRONICS CO., LTD		
SCHEMATIC, M/B VTV-L32616		
Size	Document Number	Rev
	XXXXXX	1
Date: Tuesday, November 27, 2012		
Sheet 6 of 11		

WXGA A2006WV0-2X10P
FHD A2006WV0-2X20P

(PIN21~PIN40)
(PIN1~PIN40)



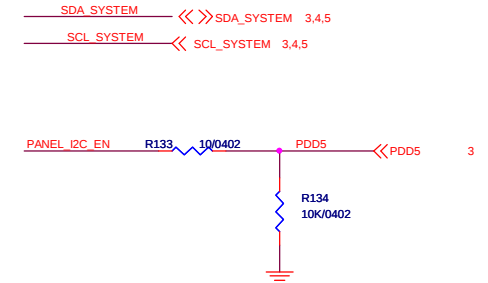
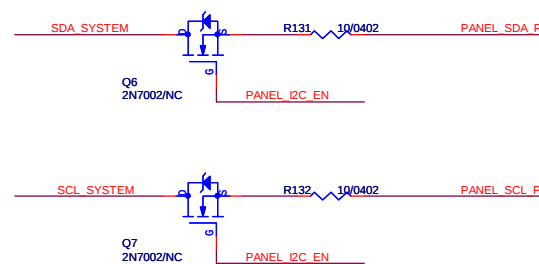
USB



USB Power Control



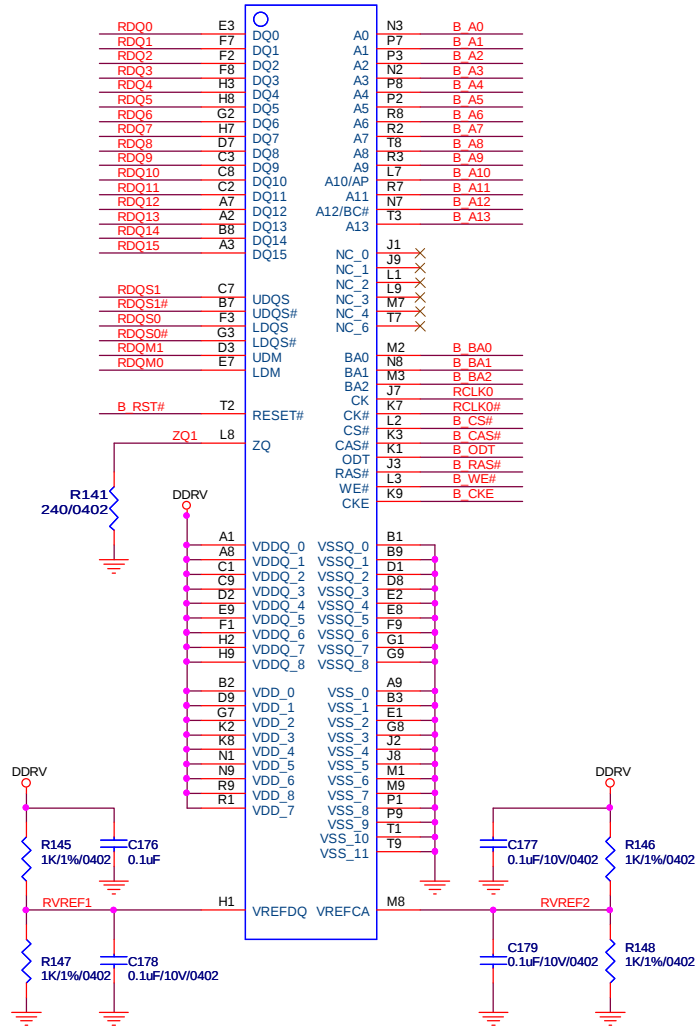
3 PANEL SLET >> PANEL SLET R130 100/0402/NC LVDS_SEL



DDR3#1

1Gb DDR3-1600 for H5TQ1G63DFR-PBC

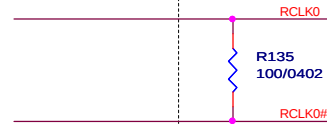
U11
H5TQ1G63DFR-PBC_MTK



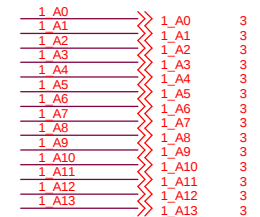
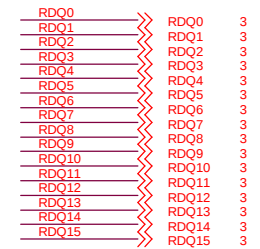
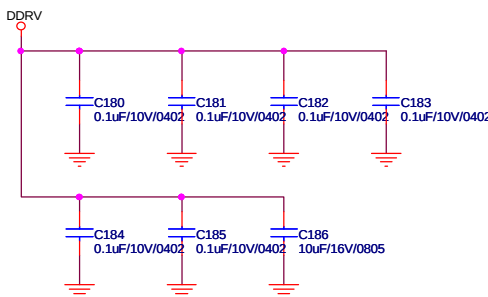
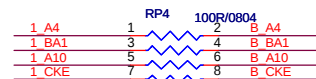
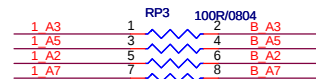
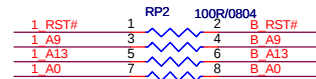
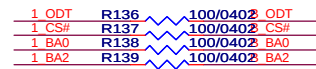
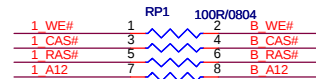
Damping and Termination for CLK

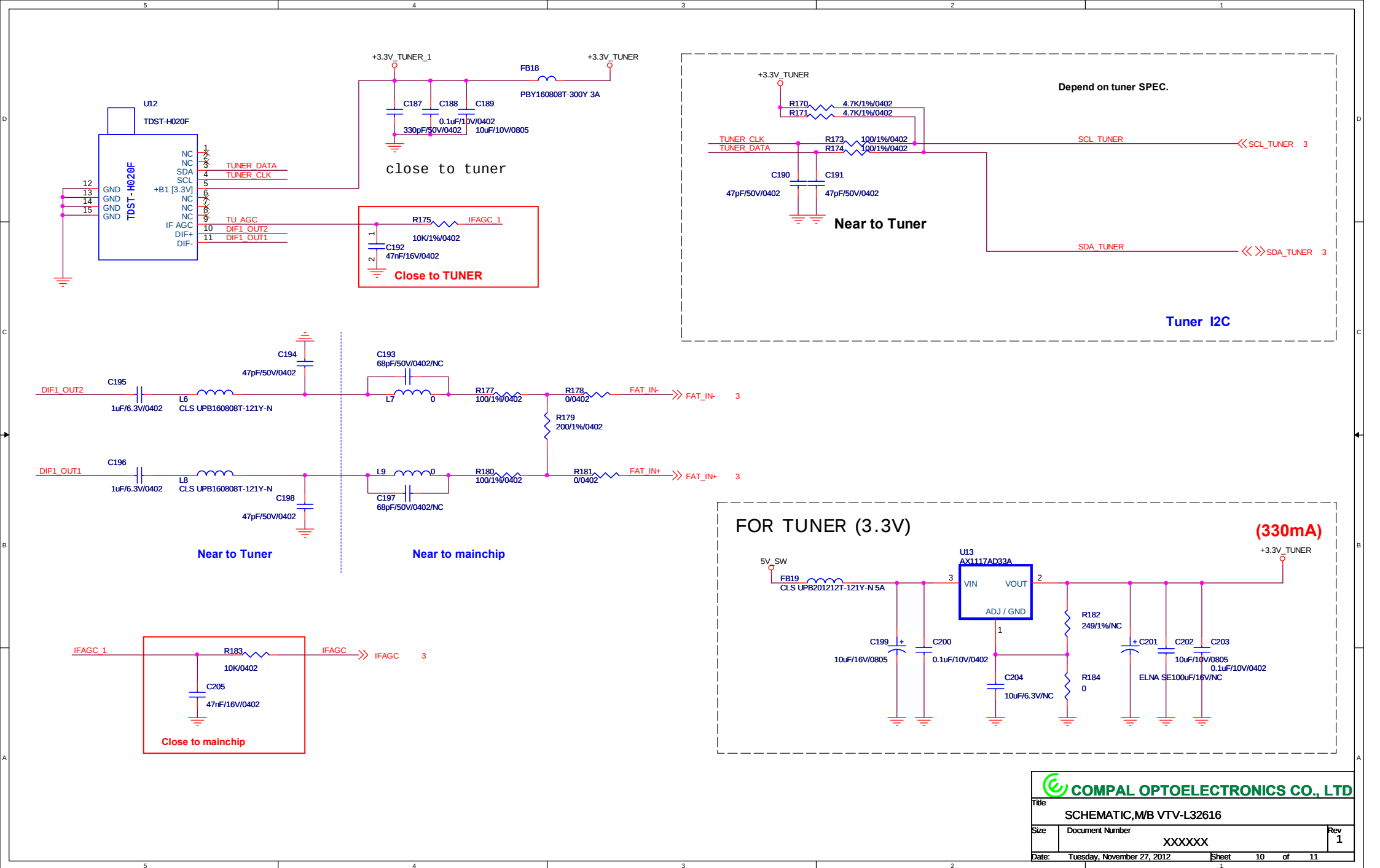
Close to Mainchip

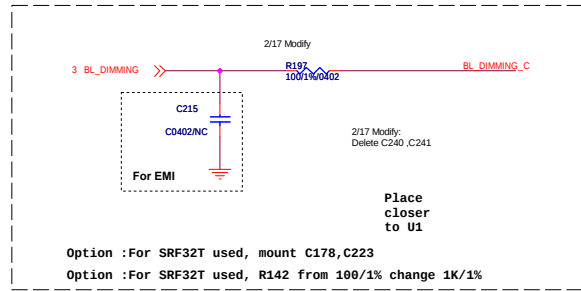
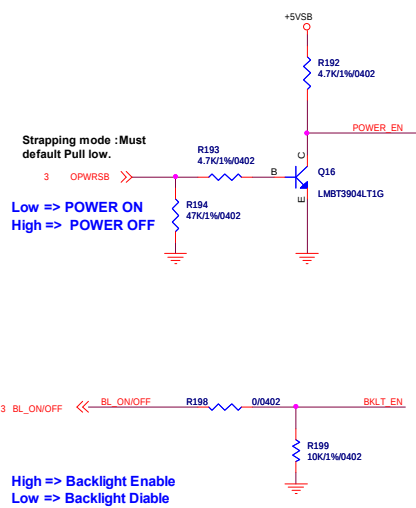
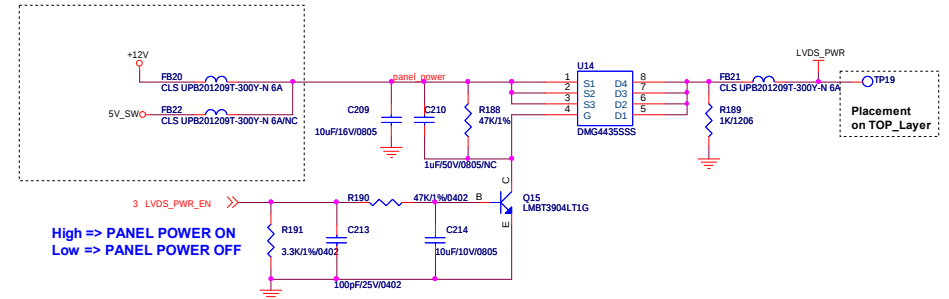
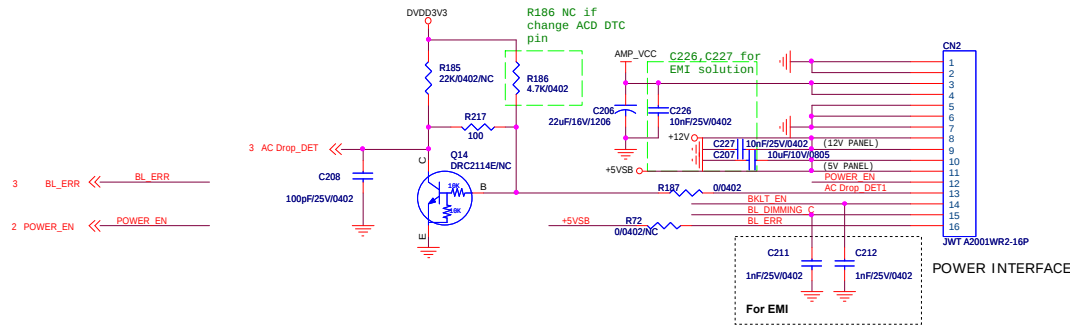
Close to DRAM



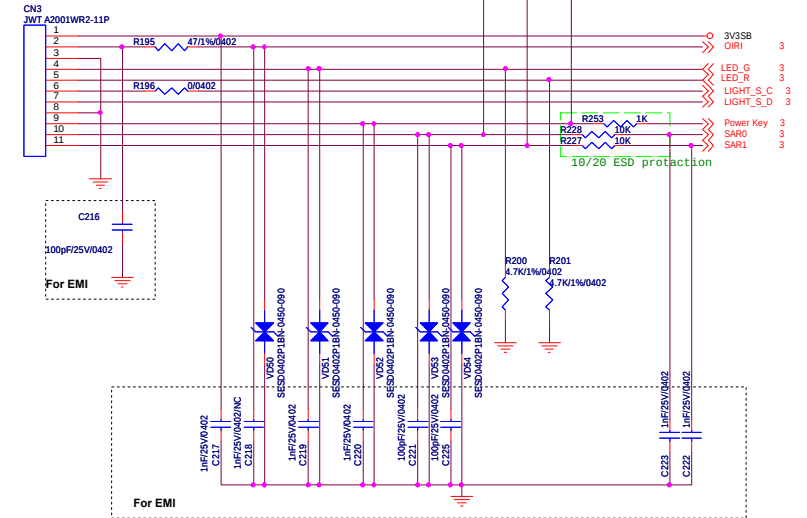
Damping for DDR ADDR/CMD



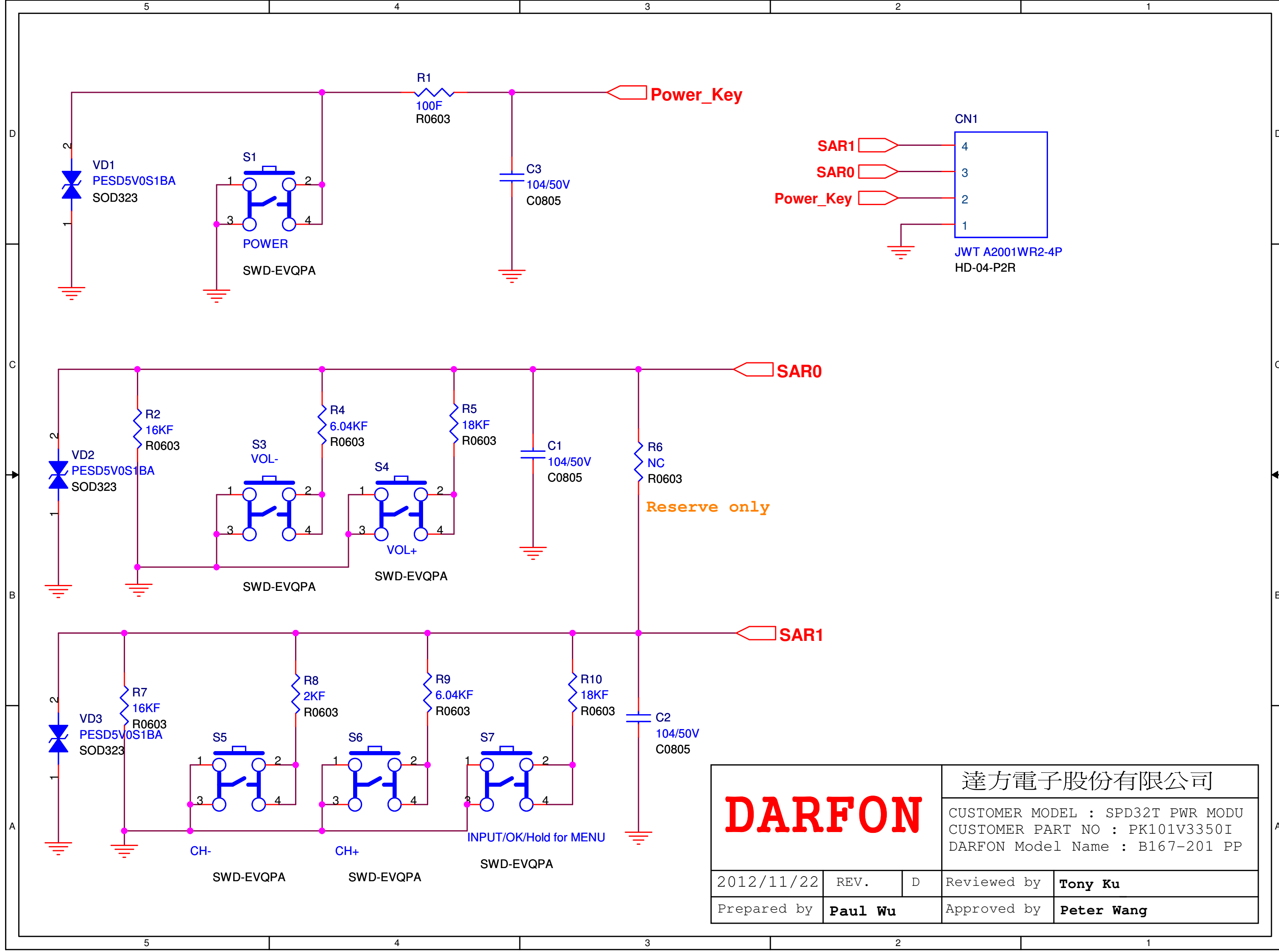




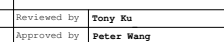
FRONT PANEL CONNECTOR



SCHEMATIC DIAGRAM POWER



DARFON			達方電子股份有限公司	
			CUSTOMER MODEL : SPD32T PWR MODU CUSTOMER PART NO : PK101V3350I DARFON Model Name : B167-201 PP	
2012/11/22	REV.	D	Reviewed by	Tony Ku
Prepared by	Paul Wu		Approved by	Peter Wang

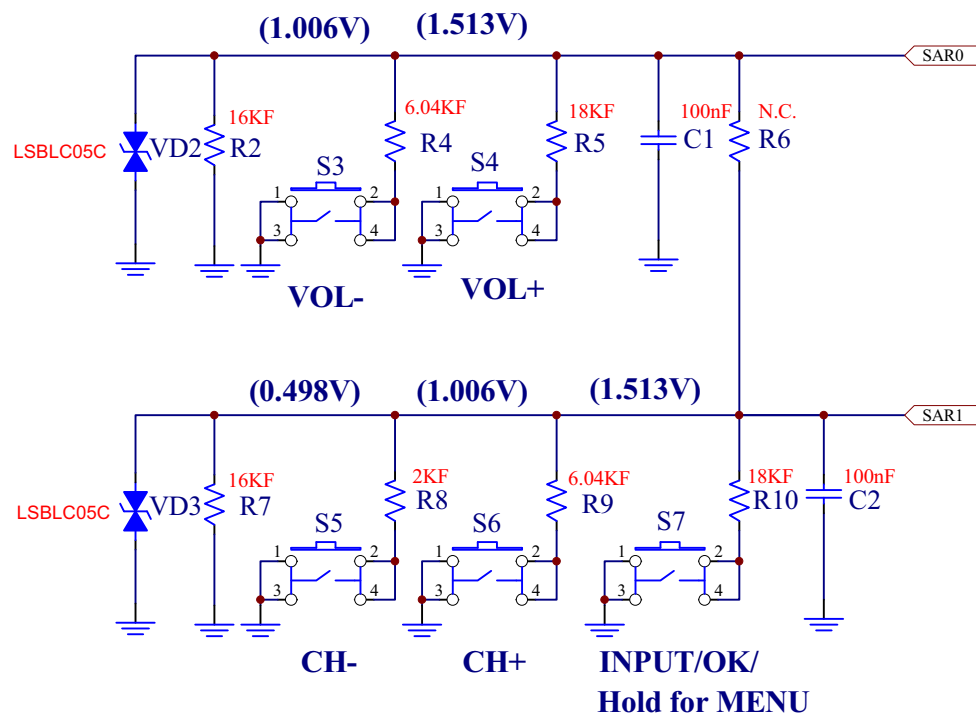
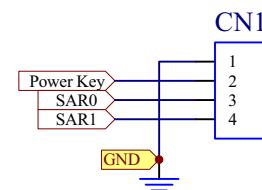
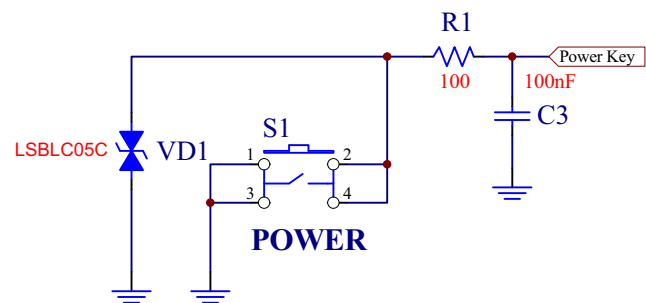


1

2

3

4



FSP GROUP

全漢企業股份有限公司

FSP Technology Inc.

TITLE: FSP079-4F01

P/N: 3BS0334712GP

size: A4 rev: 2.4

APPROVED:

Gerry

CHECKED:

Joey

DESIGNER:

Feimin

Date: 2012/12/4

PCB File: FSP079-4F01-R2

Sheet 2 of 2

File: E:\AD6\70W\FSP079-4F01-R2-1(Panasonic-A70-32)\FSP079-4F01-WITH VALUE\FSP079-4F01-20121204.dwg

線路圖 表單編號:7000P-0106

1

2

3

4

APPENDIX-A: Main assembly
SPE32 (TC-L32XM6)
Version:02

REF. No	Description	Part Number		Q'ty	Remarks
		Chassis no: SPE32T			
		Product no SPE32TMA010	Product no SPE32TMA101 SKD-ADI		
1	PCBA IR/B	454C4070L01	454C4070L01	1	
2	FIRMWARE M/B	461C6270L31	461C6270L31	1	
3	LCD MODU	AC6VM3205R1	NA	1	
4	SPK SET(90d)(PIN90d)	CG100513G0I	CG100513G0I	2	
5	H-CON SET	DC02A00130I	DC02A00130I	1	
6	H-CON SET	DC02L00700I	DC02L00700I	1	
7	H-CON SET	DC02P02010I	DC02P02010I	1	
8	H-CON SET	DC02P02030I	DC02P02030I	1	
9	H-CON SET	DC02V04140I	DC02V04140I	1	
10	MYLAR AL TAPE	LCTC324010I	LCTC324010I	2	
11	PWR MODU(SPD32T)	PK101V3340I or PK101V3350I	PK101V3340I or PK101V3350I	1	
12	CABINET ASSY	APPE32T010I	APPE32T010I	1	
13	BACK COVER ASSY	APPE32T020I	APPE32T020I	1	
14	KEY BUTTON BRAKT (32	FBPE32T010I	FBPE32T010I	1	
15	LCD MTG SIDE(32B6)	ECPD32T050I	ECPD32T050I	1	
16	METAL BRACKET BOTTOM	ECPE32T030I	ECPE32T030I	1	
17	LCD MTG SIDE(32XM6)	ECPE32T040I	ECPE32T040I	2	
18	GROUND_SPRING (32XM6	EEPE32T010I	EEPE32T010I	2	

19	BARRIER P-PCB LCD	ELPE32T010I	ELPE32T010I	1	
20	SIDE AV BRACKET(32B6	FAPD32T050I	FAPD32T050I	1	
21	SPEAKER BRACKET(32XM	FAPE32T050I	FAPE32T050I	4	
22	CH MOUNT BOSS(32XM6)	FAPE32T060I	FAPE32T060I	2	
23	LOCKING CABLE TIE	KA000600ZZI	KA000600ZZI	1	
24	SUPPORT(32XM6)	LCPE32T020I	LCPE32T020I	1	
25	SCREW+LOCK WASHER(8)	MAA8002040I	MAA8002040I	6	
26	SCREW	MAAI30004ZI	MAAI30004ZI	8	
27	SCREW	MAAT40001ZI	MAAT40001ZI	4	
28	TAPPING SCREW	MAB300001ZI	MAB300001ZI	8	
29	TAPPING SCREW	MABT40140ZI	MABT40140ZI	8	
30	RATING NP-TC-L32XM6	EJ4PE32000I	EJ4PE32000I	1	
31	CARTON-TC-L32XM6	HB4PE32011I	NA	1	
32	MANUAL KITS-32XM6	PK28PE3201I	PK28PE3201I	1	Change from PK28PE3200I to PK28PE3201I
33	ENERGY GUIDE-TC-L32XM6	HGPE320000I	HGPE320000I	1	
34	ZIPPERED BAG	HK3OL77801I	HK3OL77801I	1	
35	PE BAG FOR TV	HK3PD32001I	HK3PD32001I	1	
36	SCRW-SEMS-W	MAA7000130I	MAA7000130I	4	Type B screw
37	SCREW	MAAF50001ZI	MAAF50001ZI	4	Type A screw
38	PWR CORD(S)	GA05009160I	GA05009160I	1	Change from GA05009080I to GA05009160I
39	REMO CTRL AA	PK11V01870I	PK11V01870I	1	
40	PEDESTAL ASSY (32XM6)	APPE32T041I	APPE32T041I	1	Change from APPE32T040I to APPE32T041I

41	STAND METAL (32XM6)	ECPE32T020I	ECPE32T020I	1	
42	EPS TR (32XM6)	FJPE32T050I	NA	1	
43	EPS TL (32XM6)	FJPE32T060I	NA	1	
44	EPS BR (32XM6)	FJPE32T070I	NA	1	
45	EPS BL (32XM6)	FJPE32T080I	NA	1	

APPENDIX-A: Main assembly
SPE32 (TC-L32XM6X)
Version:02

REF. No	Description	Part Number		Q'ty	Remarks
		Chassis no: SPE32T			
		Product no SPE32TMX010	Product no SPE32TMX101 SKD-PANAMEX/PAVCA		
1	PCBA IR/B	454C4070L01	454C4070L01	1	
2	FIRMWARE M/B	461C6270L32	461C6270L32	1	
3	LCD MODU	AC6VM3205R1	NA	1	
4	SPK SET(90d)(PIN90d)	CG100513G0I	CG100513G0I	2	
5	H-CON SET	DC02A00130I	DC02A00130I	1	
6	H-CON SET	DC02L00700I	DC02L00700I	1	
7	H-CON SET	DC02P02010I	DC02P02010I	1	
8	H-CON SET	DC02P02030I	DC02P02030I	1	
9	H-CON SET	DC02V04140I	DC02V04140I	1	
10	MYLAR AL TAPE	LCTC324010I	LCTC324010I	2	
11	PWR MODU(SPD32T)	PK101V3340I or PK101V3350I	PK101V3340I or PK101V3350I	1	
12	CABINET ASSY	APPE32T010I	APPE32T011I	1	
13	BACK COVER ASSY	APPE32T020I	APPE32T021I	1	
14	KEY BUTTON BRAKT (32	FBPE32T010I	FBPE32T010I	1	
15	LCD MTG SIDE(32B6)	ECPD32T050I	ECPD32T050I	1	
16	METAL BRACKET BOTTOM	ECPE32T030I	ECPE32T030I	1	
17	LCD MTG SIDE(32XM6)	ECPE32T040I	ECPE32T040I	2	
18	GROUND_SPRING (32XM6	EEPE32T010I	EEPE32T010I	2	

19	BARRIER P-PCB LCD	ELPE32T010I	ELPE32T010I	1	
20	SIDE AV BRACKET(32B6	FAPD32T050I	FAPD32T050I	1	
21	SPEAKER BRACKET(32XM	FAPE32T050I	FAPE32T050I	4	
22	CH MOUNT BOSS(32XM6)	FAPE32T060I	FAPE32T060I	2	
23	LOCKING CABLE TIE	KA000600ZZI	KA000600ZZI	1	
24	SUPPORT(32XM6)	LCPE32T020I	LCPE32T020I	1	
25	SCREW+LOCK WASHER(8)	MAA8002040I	MAA8002040I	6	
26	SCREW	MAAI30004ZI	MAAI30004ZI	8	
27	SCREW	MAAT40001ZI	MAAT40001ZI	4	
28	TAPPING SCREW	MAB300001ZI	MAB300001ZI	8	
29	TAPPING SCREW	MABT40140ZI	MABT40140ZI	8	
30	RATING NP-TC-L32B6X	EJ4PD32050I	EJ4PD32050I	1	
31	CARTON-TC-L32XM6X	HB4PE32021I	NA	1	
32	MANUAL KITS-32XM/39EM6X	PK28PE3211I	PK28PE3211I	1	Change from PK28PE3210I to PK28PE3211I
33	NA	NA	NA	NA	
34	ZIPPERED BAG	HK3OL77801I	HK3OL77801I	1	
35	PE BAG FOR TV	HK3PD32001I	HK3PD32001I	1	
36	SCRW-SEMS-W	MAA7000130I	MAA7000130I	4	Type B screw
37	SCREW	MAAF50001ZI	MAAF50001ZI	4	Type A screw
38	PWR CORD(S)	GA18000030I	GA18000030I	1	Change from GA18000020I to GA18000030I
39	REMO CTRL AA	PK11V01870I	PK11V01870I	1	
40	PEDESTAL ASSY (32XM6)	APPE32T041I	APPE32T041I	1	Change from APPE32T040I to APPE32T041I

41	STAND METAL (32XM6)	ECPE32T020I	ECPE32T020I	1	
42	EPS TR (32XM6)	FJPE32T050I	NA	1	
43	EPS TL (32XM6)	FJPE32T060I	NA	1	
44	EPS BR (32XM6)	FJPE32T070I	NA	1	
45	EPS BL (32XM6)	FJPE32T080I	NA	1	

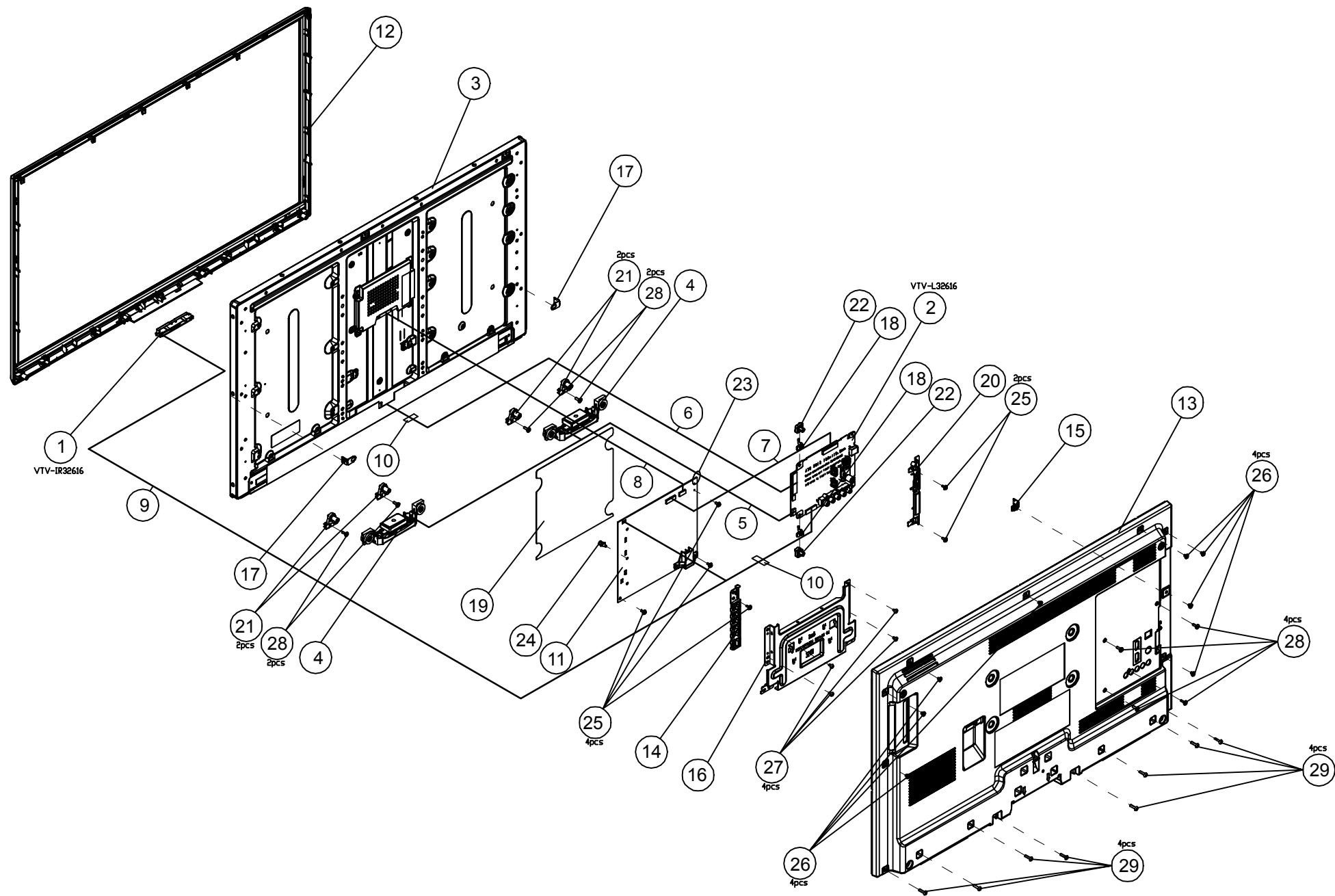
APPENDIX-A: Main assembly
SPE32 (TC-L32XM6P)
Version:02

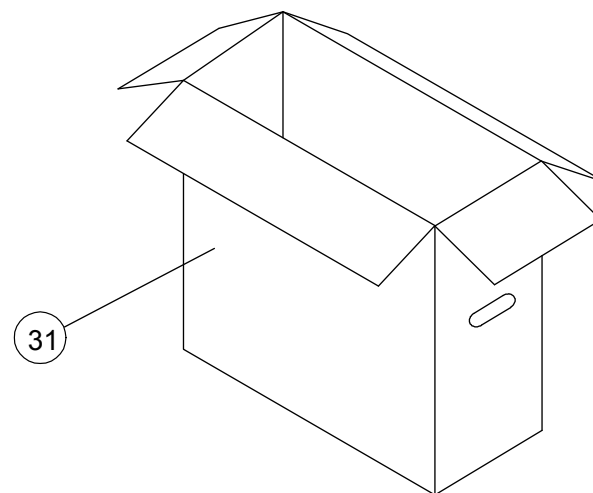
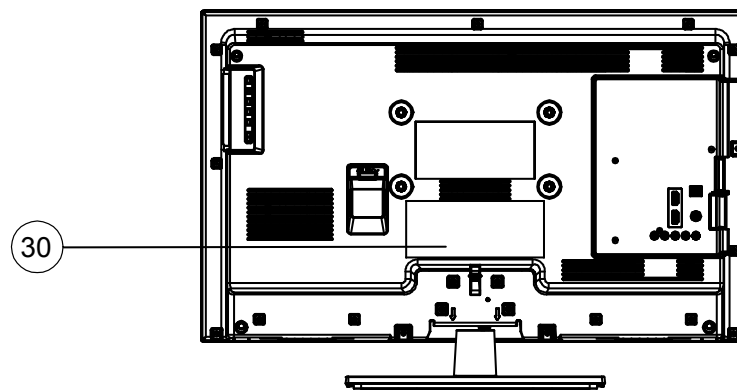
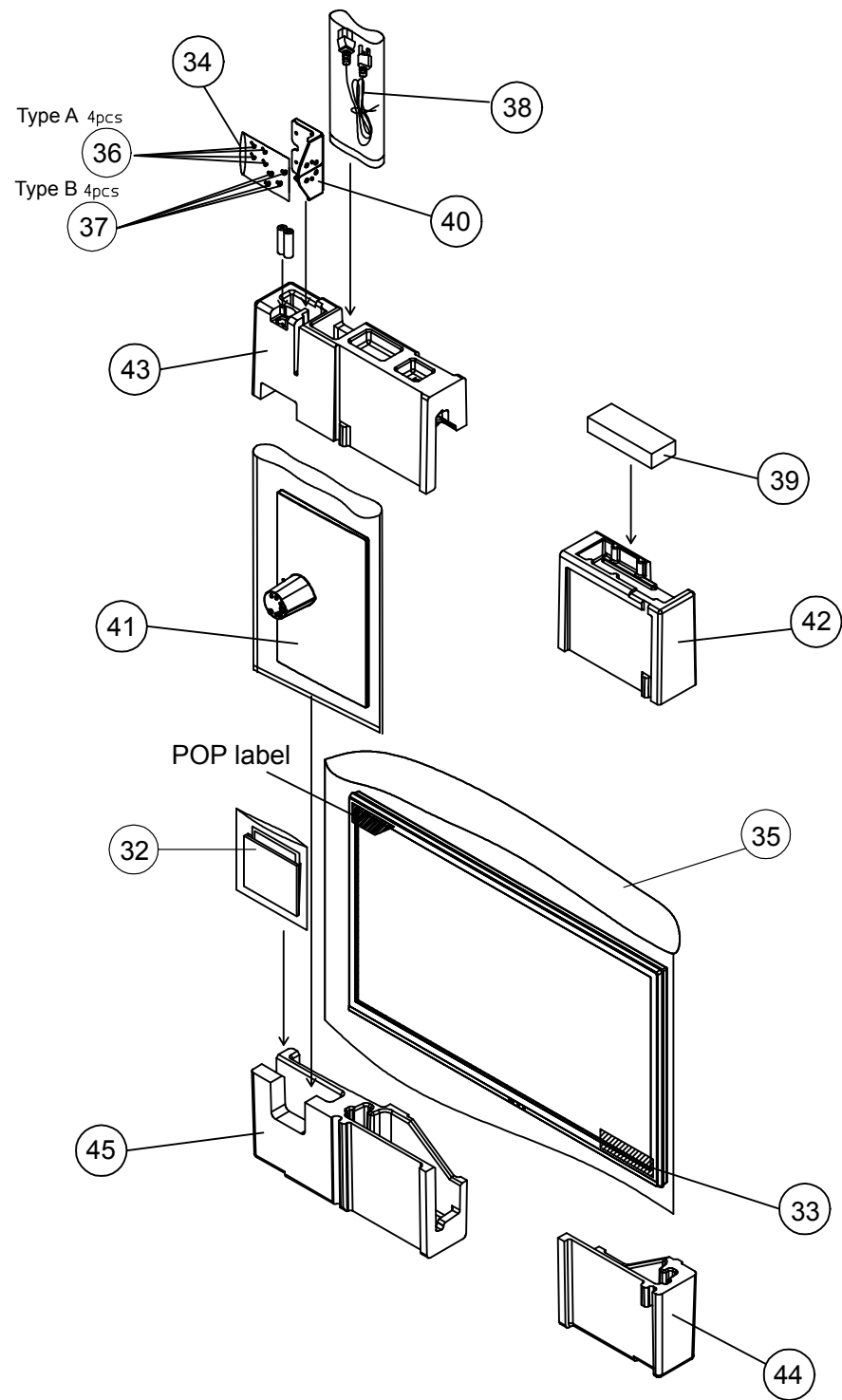
REF. No	Description	Part Number		Q'ty	Remarks
		Chassis no: SPE32T			
		Product no SPE32TMP010	Product no SPE32TMP101 SKD-ADI		
1	PCBA IR/B	454C4070L01	454C4070L01	1	
2	FIRMWARE M/B	461C6270L32	461C6270L32	1	
3	LCD MODU	AC6VM3205R1	NA	1	
4	SPK SET(90d)(PIN90d)	CG100513G0I	CG100513G0I	2	
5	H-CON SET	DC02A00130I	DC02A00130I	1	
6	H-CON SET	DC02L00700I	DC02L00700I	1	
7	H-CON SET	DC02P02010I	DC02P02010I	1	
8	H-CON SET	DC02P02030I	DC02P02030I	1	
9	H-CON SET	DC02V04140I	DC02V04140I	1	
10	MYLAR AL TAPE	LCTC324010I	LCTC324010I	2	
11	PWR MODU(SPD32T)	PK101V3340I or PK101V3350I	PK101V3340I or PK101V3350I	1	
12	CABINET ASSY	APPE32T010I	APPE32T010I	1	
13	BACK COVER ASSY	APPE32T020I	APPE32T020I	1	
14	KEY BUTTON BRAKT (32)	FBPE32T010I	FBPE32T010I	1	
15	LCD MTG SIDE(32B6)	ECPD32T050I	ECPD32T050I	1	
16	METAL BRACKET BOTTOM	ECPE32T030I	ECPE32T030I	1	
17	LCD MTG SIDE(32XM6)	ECPE32T040I	ECPE32T040I	2	
18	GROUND_SPRING (32XM6	EEPE32T010I	EEPE32T010I	2	

19	BARRIER P-PCB LCD	ELPE32T010I	ELPE32T010I	1	
20	SIDE AV BRACKET(32B6	FAPD32T050I	FAPD32T050I	1	
21	SPEAKER BRACKET(32XM	FAPE32T050I	FAPE32T050I	4	
22	CH MOUNT BOSS(32XM6)	FAPE32T060I	FAPE32T060I	2	
23	LOCKING CABLE TIE	KA000600ZZI	KA000600ZZI	1	
24	SUPPORT(32XM6)	LCPE32T020I	LCPE32T020I	1	
25	SCREW+LOCK WASHER(8)	MAA8002040I	MAA8002040I	6	
26	SCREW	MAAI30004ZI	MAAI30004ZI	8	
27	SCREW	MAAT40001ZI	MAAT40001ZI	4	
28	TAPPING SCREW	MAB300001ZI	MAB300001ZI	8	
29	TAPPING SCREW	MABT40140ZI	MABT40140ZI	8	
30	RATING-TC-L32XM6P	EJ4PE32040I	EJ4PE32040I	1	
31	CARTON-TC-L32XM6P	HB4PE32031I	NA	1	
32	MANUAL KITS-32XM/39E	PK28PE3221I	PK28PE3221I	1	Change from PK28PE3220I to PK28PE3221I
33	NA	NA	NA	NA	
34	ZIPPERED BAG	HK3OL77801I	HK3OL77801I	1	
35	PE BAG FOR TV	HK3PD32001I	HK3PD32001I	1	
36	SCRW-SEMS-W	MAA7000130I	MAA7000130I	4	Type B screw
37	SCREW	MAAF50001ZI	MAAF50001ZI	4	Type A screw
38	PWR CORD(S)	GA18000030I	GA18000030I	1	Change from GA18000020I to GA18000030I
39	REMO CTRL AA	PK11V01870I	PK11V01870I	1	
40	PEDESTAL ASSY (32XM6	APPE32T041I	APPE32T041I	1	Change from APPE32T040I to APPE32T041I

41	STAND METAL (32XM6)	ECPE32T020I	ECPE32T020I	1	
42	EPS TR (32XM6)	FJPE32T050I	NA	1	
43	EPS TL (32XM6)	FJPE32T060I	NA	1	
44	EPS BR (32XM6)	FJPE32T070I	NA	1	
45	EPS BL (32XM6)	FJPE32T080I	NA	1	

APPENDIX-B: SPE32 Exploded View

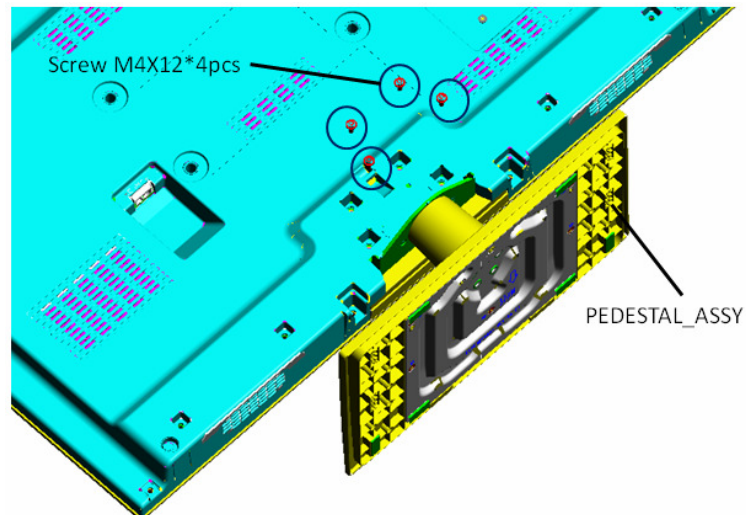




11 Disassembly and Assembly Instructions

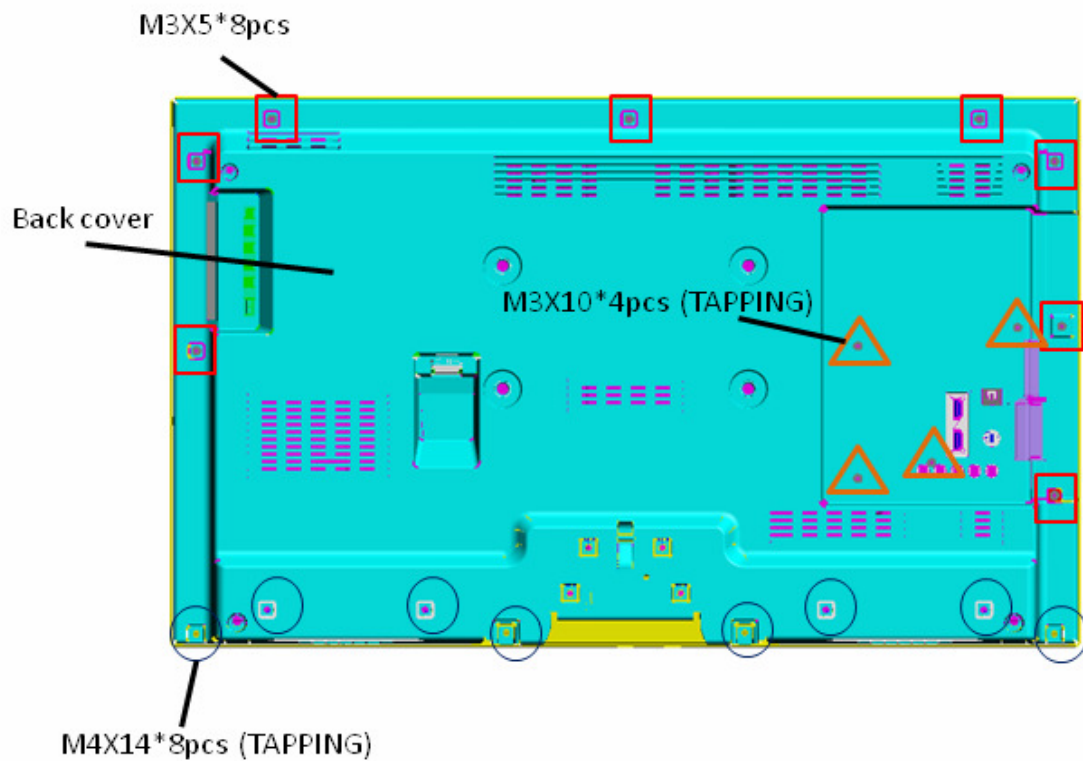
11.1. PEDESTAL

1. Lay down the unit so that the rear cover faces upward.
2. Remove the 4 screws.
3. Remove the Pedestal_assy



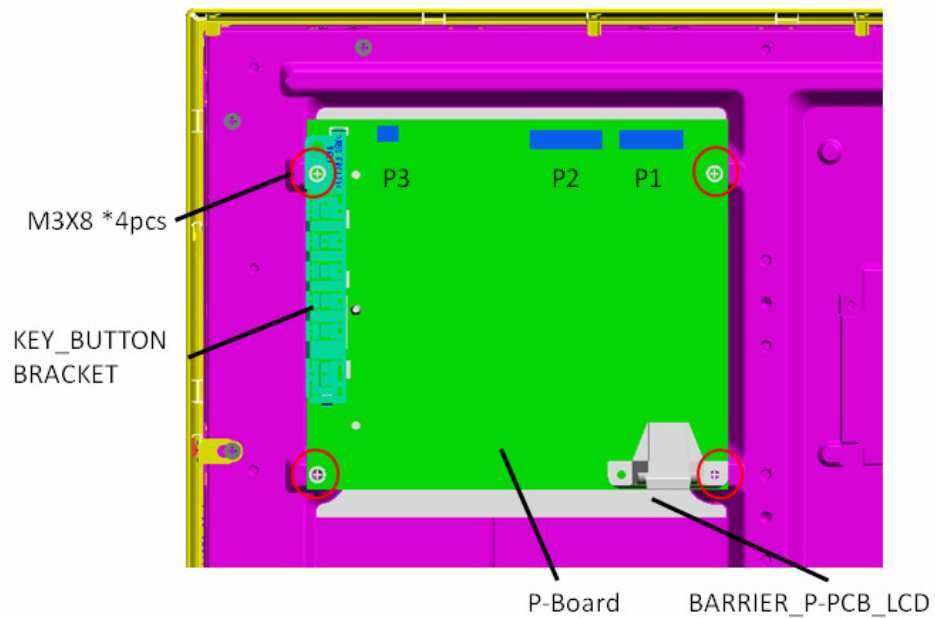
11.2. Back cover

1. Remove the 20 screws.
2. Remove the Back cover.



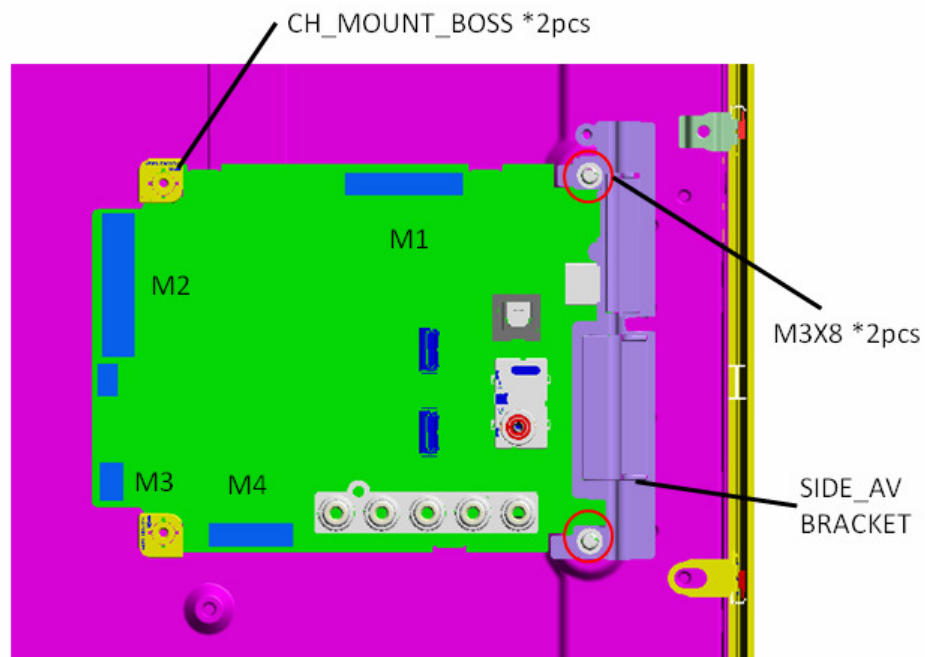
11.3. P-Board

1. Remove the 4 screws.
2. Disconnect the connectors (P1, P2, P3)
3. Remove the P-Board.



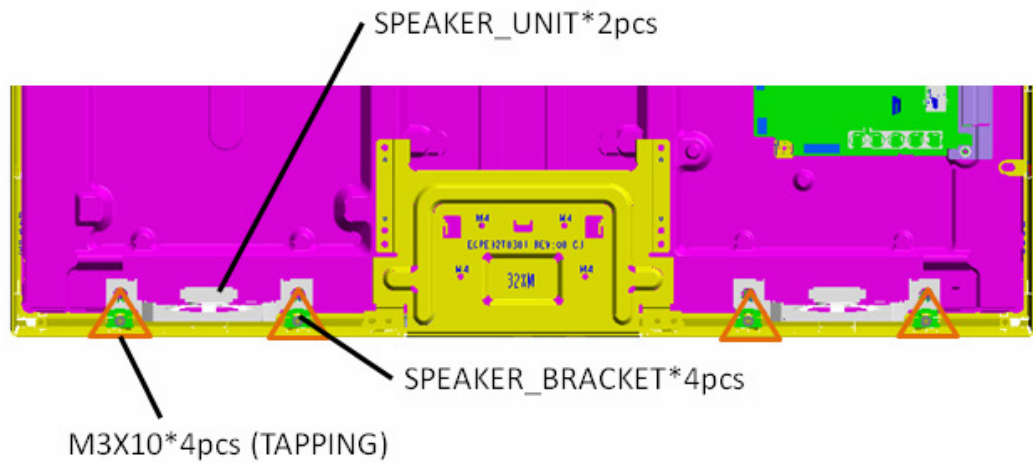
11.4. M-Board

1. Remove the 2 screws.
2. Disconnect the connectors (M1, M2, M3, M4).
3. Remove the M-Board.



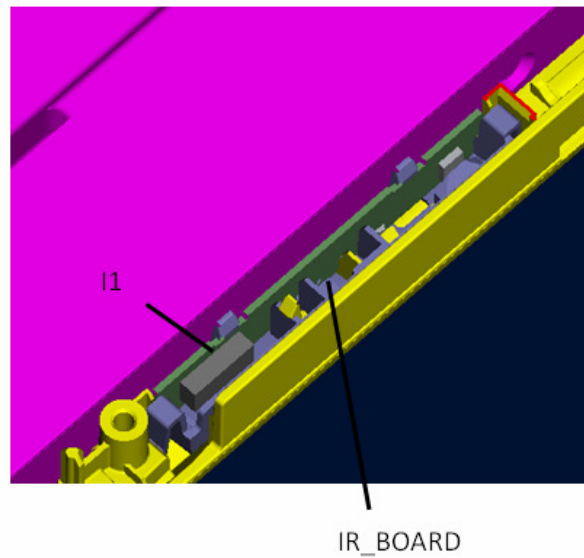
11.5. Speaker unit

1. Remove the 4 screws.
2. Remove the speaker units.



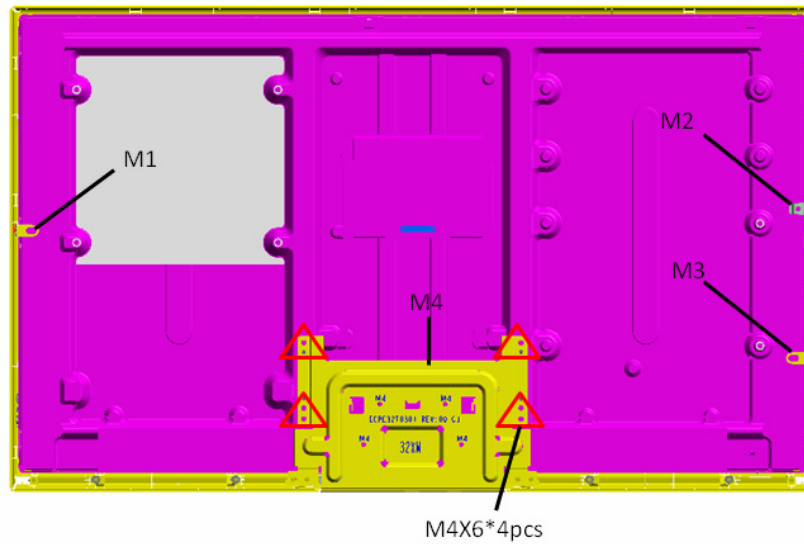
11.6. IR-Board

1. Disconnect the connectors (I1).
2. Remove the IR-Board.



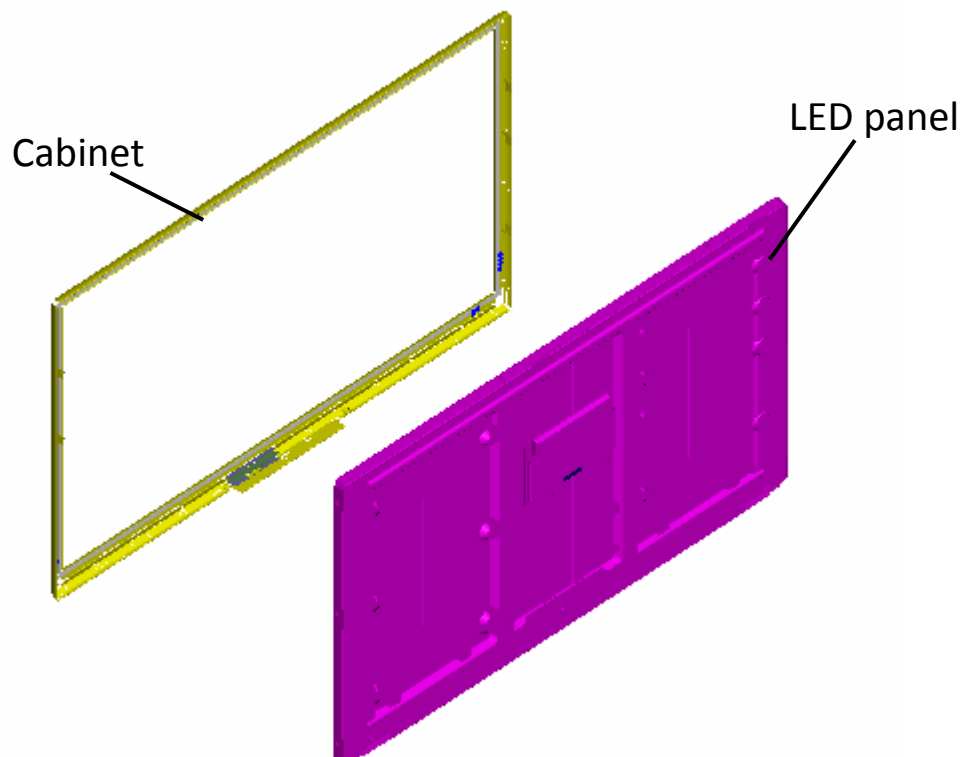
11.7. Metal parts

1. Remove the 4 screws.
2. Remove the metal parts (M1,M2, M3,M4).



11.8. LED Panel

1. Remove the LED panel.



PE32T SERVICE MANUAL CHANGE LIST

[illegible]