

AKAI

SERVICE MANUAL

Model:

LCT2785TA

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This manual is the latest at the time of printing, and does not include the modification which may be made after the printing, by the constant improvement of product.

1.Do not power on .

1.1 Please check AC cable if connect to AC plug.

Is true the connector don't connect to AC plug. Please connect it.

2.2 Please check AC cable if connect to AC power.

Is true the AC cable don't connect to AC power. Please connect it.

3.3 Please check power board of fuse if broken.

If the F1 fuse is broken, Please pull out the AC cable from AC power. Please check AC L power and AC N ground by multimeter, The read number is infinite, the fuse is broke. then look up power board if not burn out place. Is true it. Please change power board or be changed power board.

2. The power on switch of green extinguish.

2.1 The power of led(indicator light) is red light, To touch power on key when indicator light wink.

Is true that the power DC output have somewhere short circuit.

Please check connector J39,J31 .If not connector direction is wrong.

Or the mainboard somewhere of power short circuit.

3.The power is normal work ,but don't backlight.

3.1 The indicator light work normal (green light).

Please check Main board of transistor Q1&collect if not has +5v voltage.

Is true Q18 collect hasn't +5v ,To check Q18 if fail. Or to check Q18 of base if not low.

(Low is working, high don't work).

Please refer to attached sheet A circuit diagram.

3.2 Please check backlight of connector if not it direction is wrong or the connector of wire compositordirection is wrong.

3.3 To check connector panel of voltage is +24v. It's true .Then to check of the first pin if it have +5V voltage, It's true , than to check power board of +24v voltage ,It's true. The panel of backlight board is fail. The change panel of backlight board.

Please refer to attached sheet B Panel of datasheet.

4.The screen don't have picture But have backlight.

4.1 To check to panel of voltage ,To check main board of bead L69 and L57 connect if not OK.Then check the L69 and L57 of voltage is +12v(27 inch panel voltage is +5v, To check L68 and L56) . Next to check fuse F1 and connector J10 if not is +12v(27 inch panel voltage is +5v). If isn't please check power board of connector CON5 if has +12v(27 inch panel voltage is +5v).

4.2To check to main board +12 V voltage. To check to main board IC U35 of the first pin if

+5v voltage ,It's fail. It's low (close 0 v) working.

The circuit diagram follow down:

Please refer to attached sheet A circuit diagram.

5.The remote control don't be control.

6.1 The check batteries of remote control if it run out of .

6.2 To check main board of connector J21 of wire connect fastness and the connector of wire open.

Please refer to attached sheet A circuit diagram.

6.The sound don't output.

7.1 To check main board +24v voltage of connector J8 ,It's true not +24v voltage. Then to check power main +24v fail .

Please refer to attached sheet A circuit diagram.

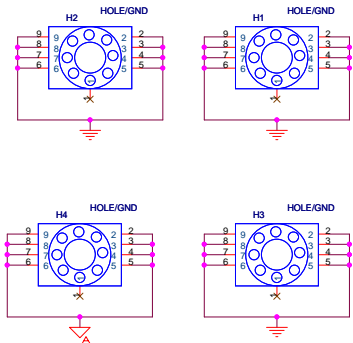
7.The DTV don't detect .

7.1 To check mainboard of connector J24 and DTV mainboard of connector HA1 of FCC wire if no connect fastness.

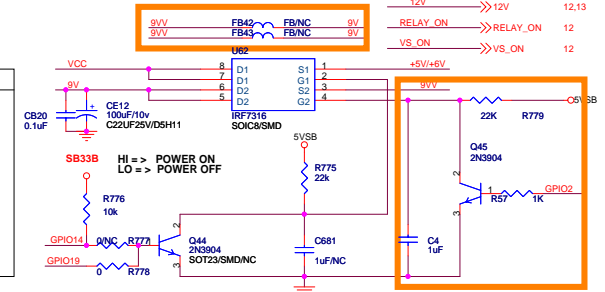
Please refer to attached sheet C of DTV circuit diagram.

MT8202E (PBGA388) LCDTV BOARD 4 LAYERS FOR AKAI

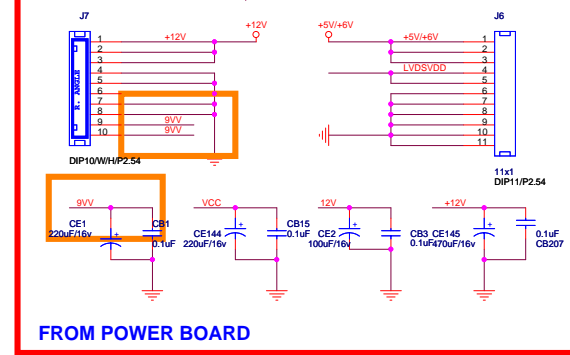
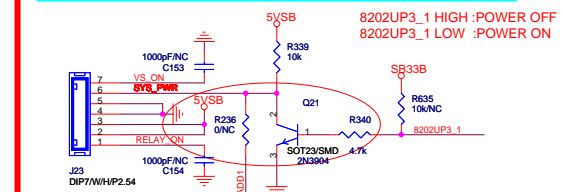
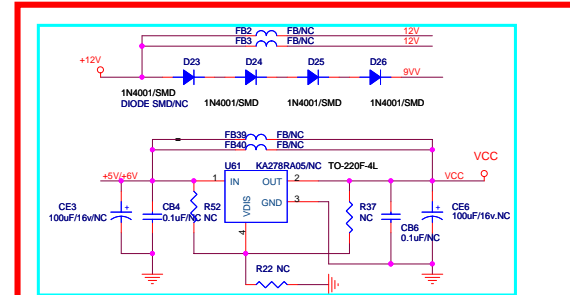
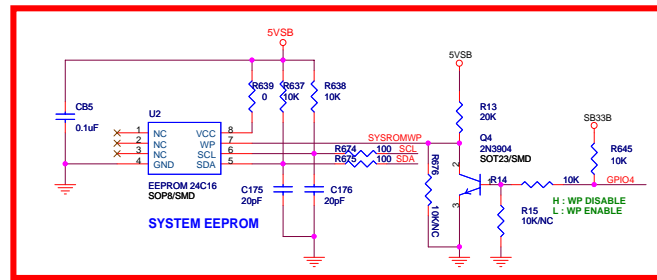
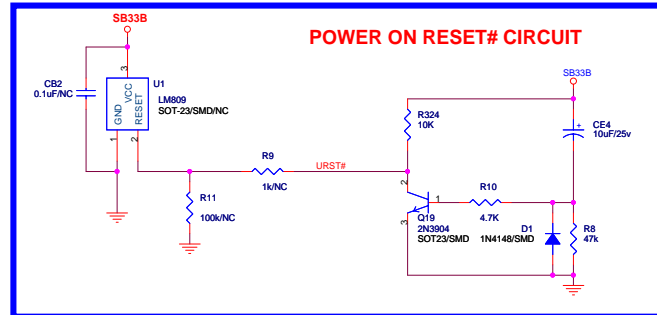
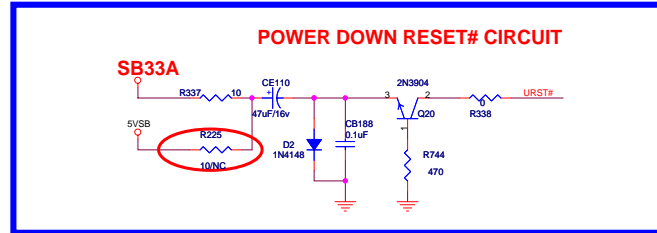
1. INDEX / POWER / RESET / EEPROM
2. LDO
3. MT8202E PBGA388
4. MT8202 DECOUPLING
5. DDR MEMORY & FLASH
6. MT5351 INTERFACE
7. HDMI MT8293
8. DAUGHTER BOARD IN
9. WM8776 & VIDEO BYPASS
10. AUDIO / VIDEO IN CIRCUIT
11. VGA & PC AUDIO IN
12. LVDS OUT
13. BACK LIGHT / KEYPAD
14. TUNER IN
15. AV IN
16. AUDIO IN
17. AUDIO Amplifier



Rev	History	P#	Date
AKAI_MT8202_27US_LVDS_V0.0	New		2005/11/22
AKAI_MT8202_27US_HDMI_LVDS_V0.0	ADD HDMI / VIDEO /AUDIO CONNECTOR INPUT IN		

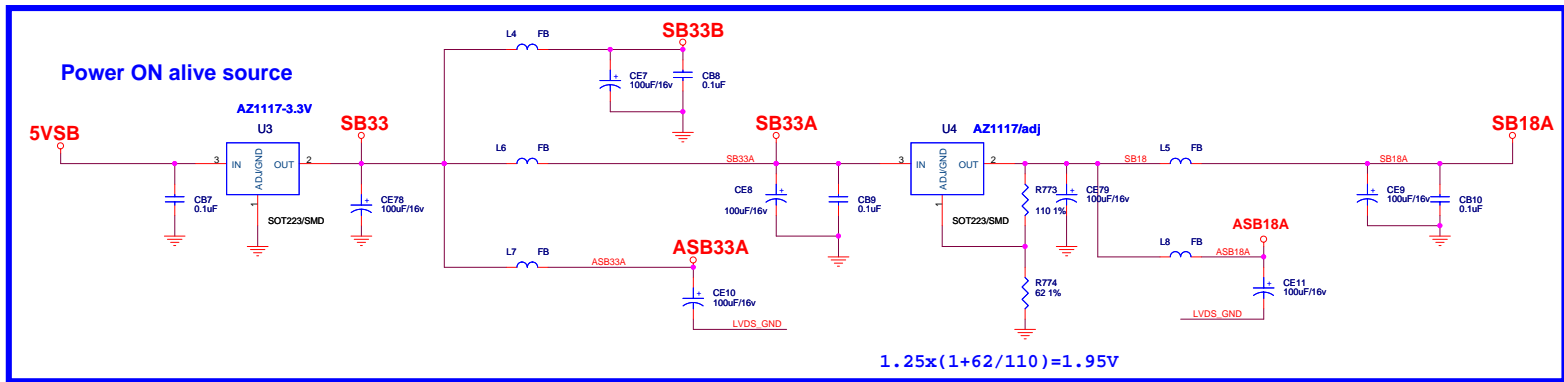


- LVDSVDD >> LVDSGND 2,3,4
- SCL >> SCL 9,14
- SDA >> SDA 9,14
- URST# >> URST# 3
- 8202UP3_1 >> 8202UP3_1 3
- GPIO2 >> GPIO2 3,12
- GPIO4 >> GPIO4 3
- GPIO14 >> GPIO14 3,13
- GPIO19 >> GPIO19 3,13
- 9V >> 9V 7,9,14
- 12V >> 12V 12,13
- RELAY_ON >> RELAY_ON 12
- VS_ON >> VS_ON 12

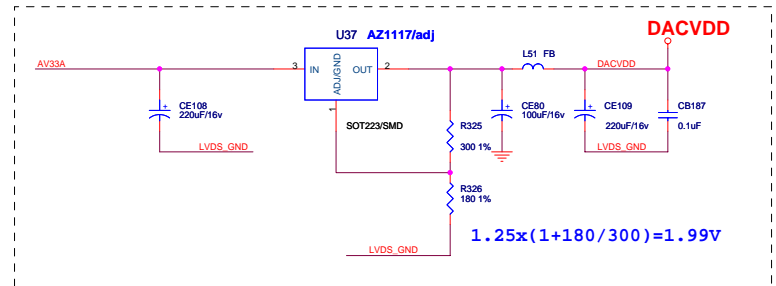
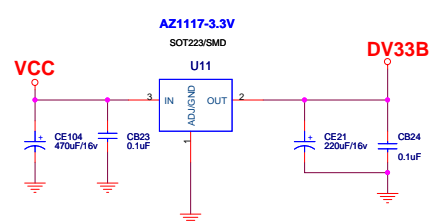
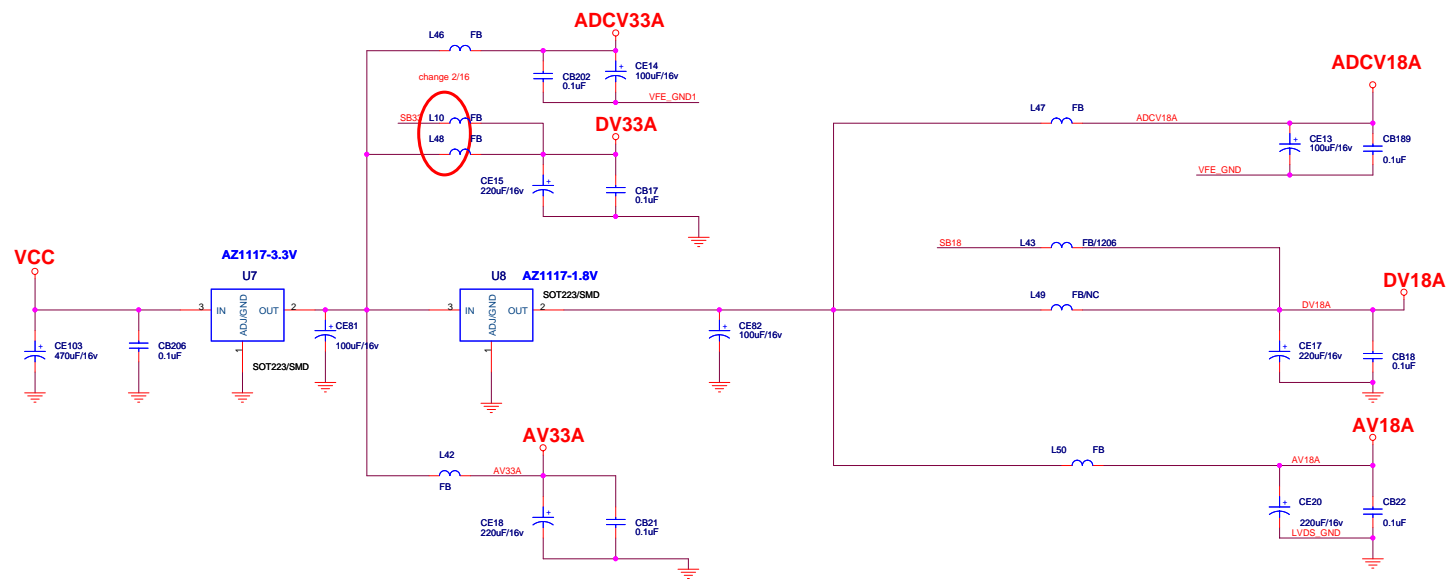


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INDEX / POWER / RESET / EEPROM			
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Size	C	Checked: <Checker>	Sheet 1 of 17
Date:	Thursday, April 13, 2006		

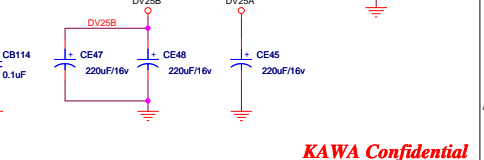
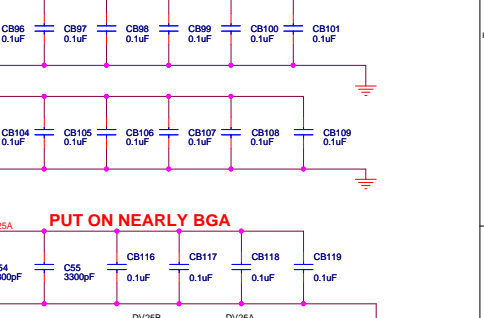
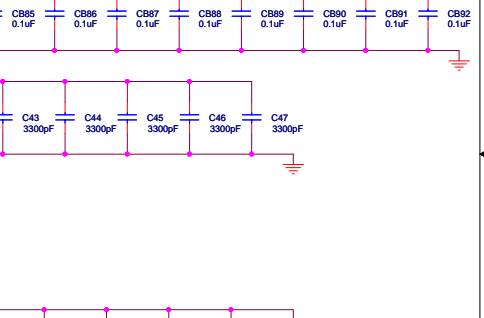
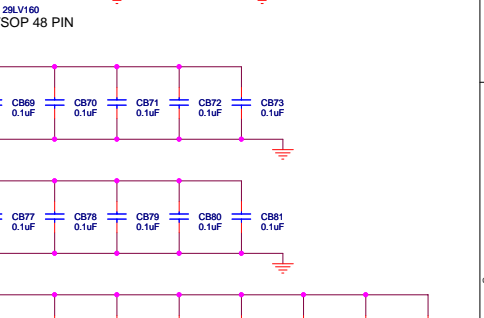
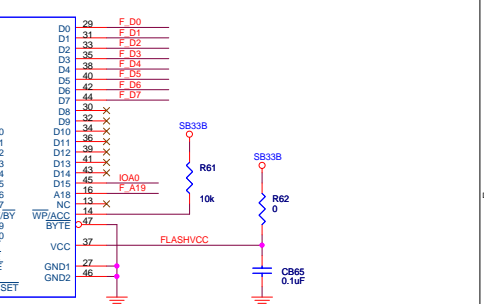
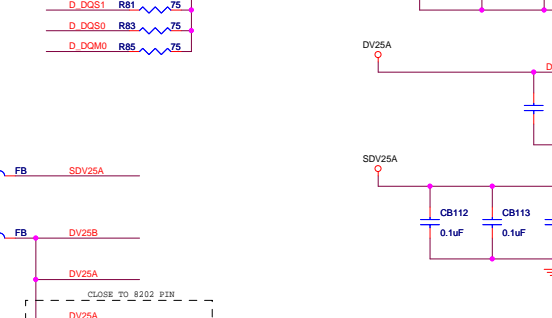
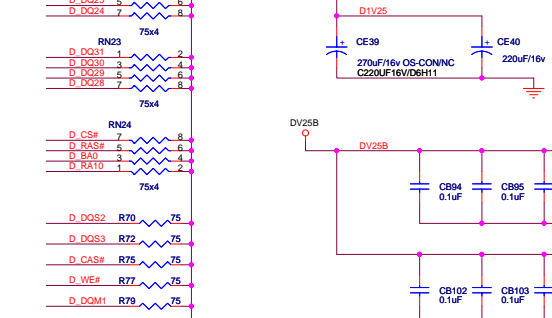
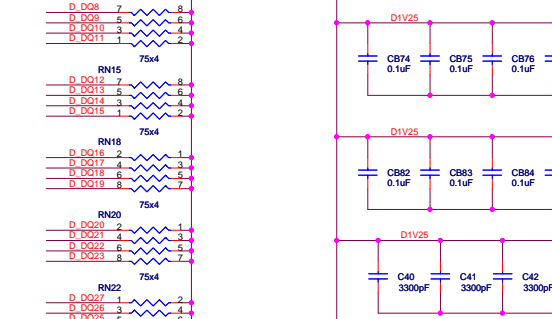
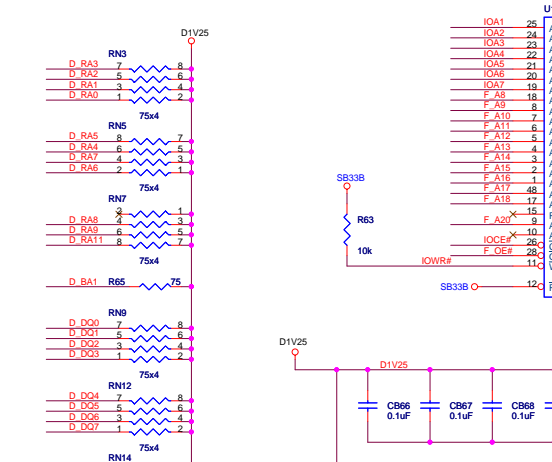
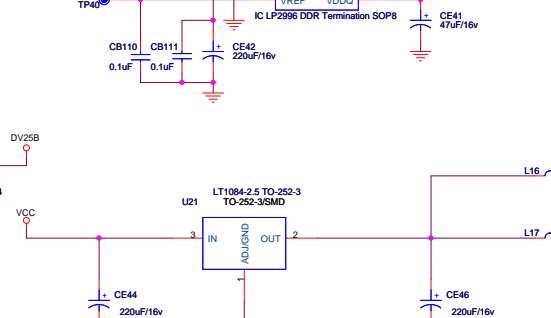
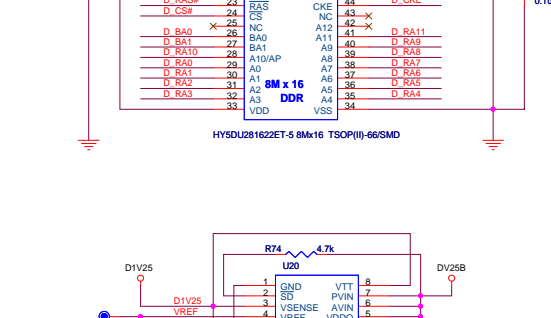
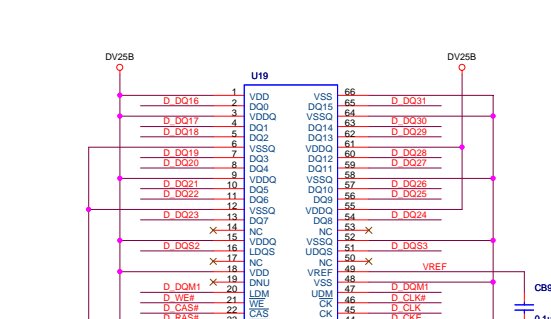
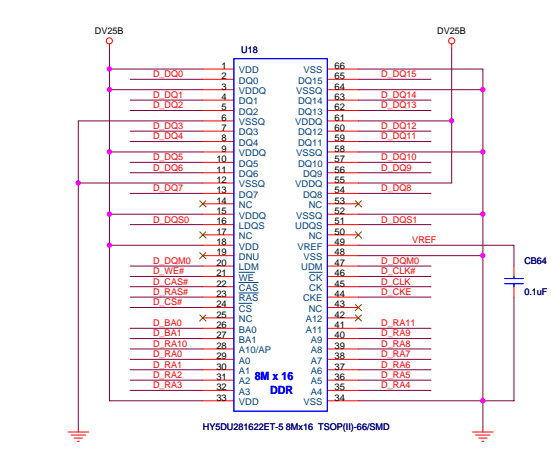
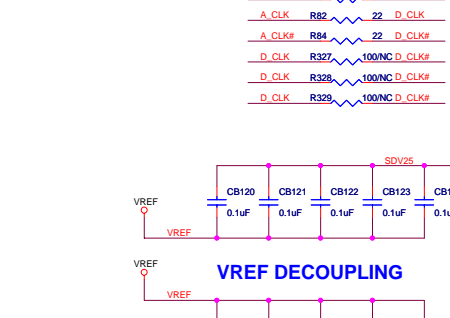
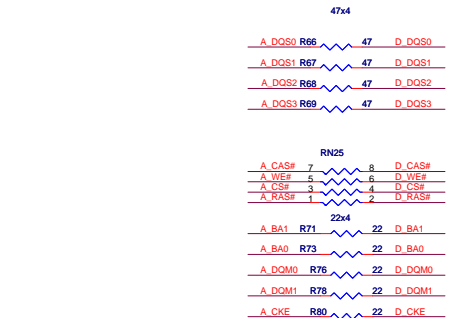
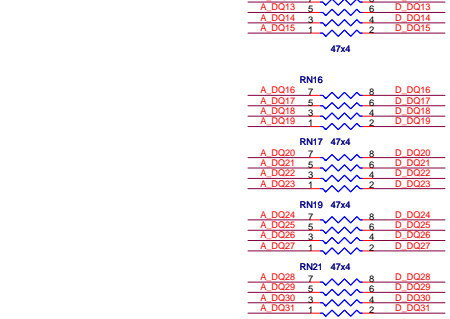
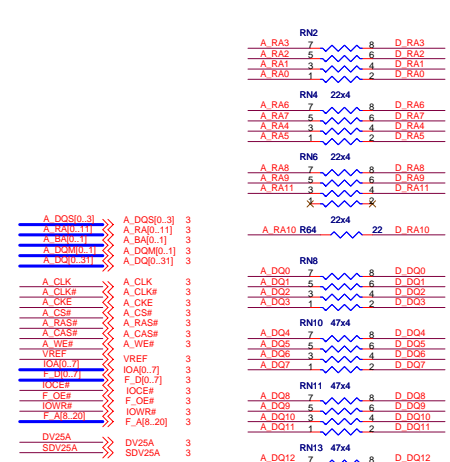


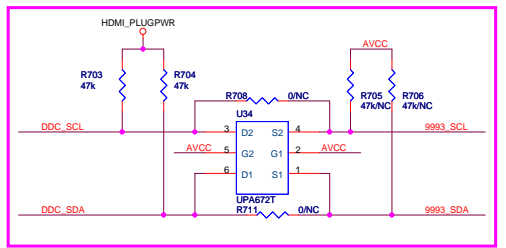
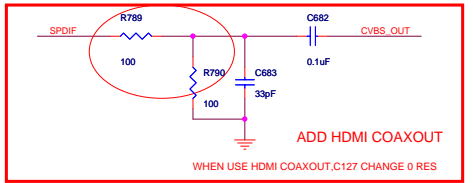
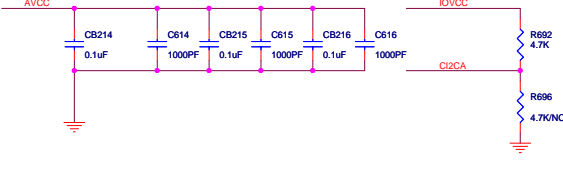
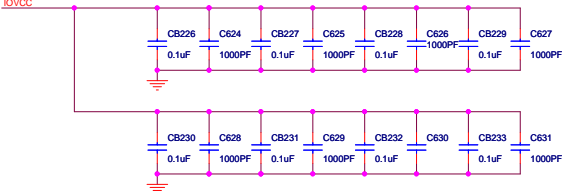
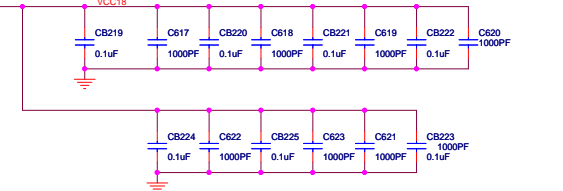
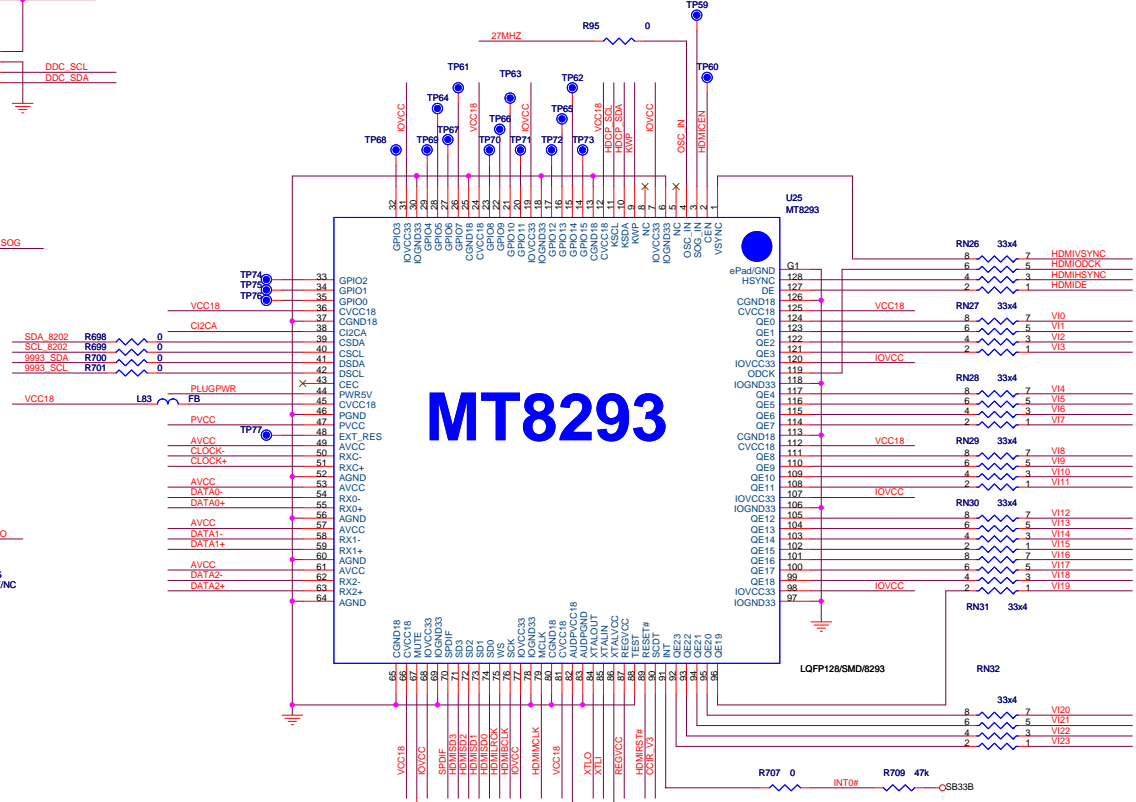
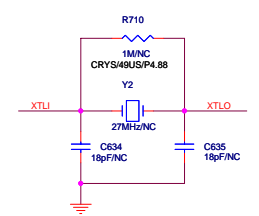
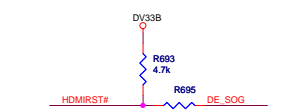
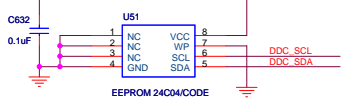
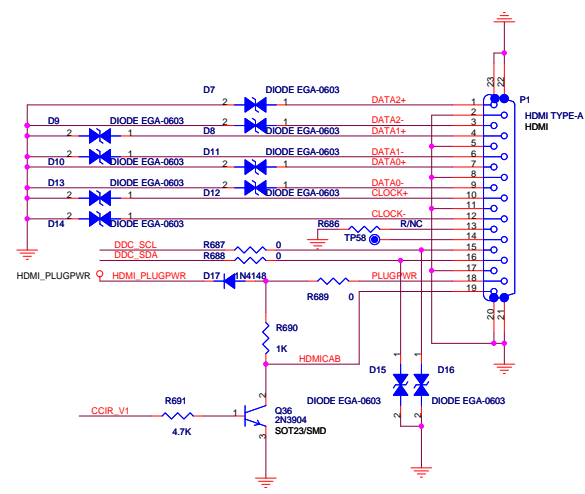
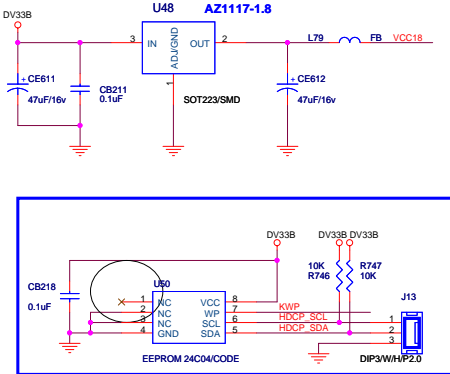
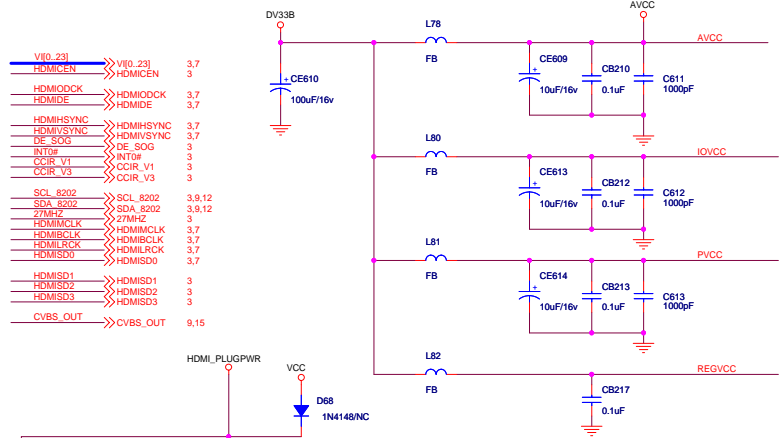
- LVDS_GND >>> LVDS_GND 3.4,12
- VFE_GND >>> VFE_GND 3.4,8,11
- VFE_GND1 >>> VFE_GND1 3.4,8,11



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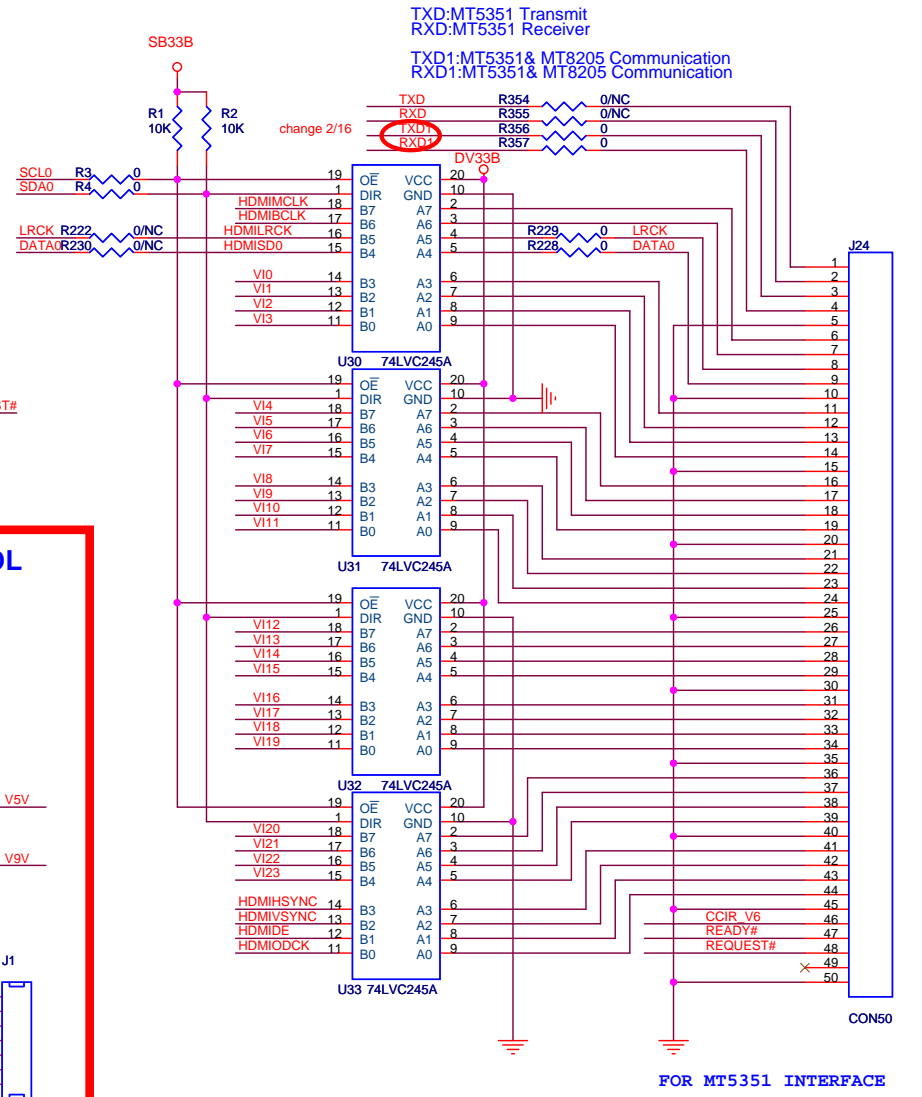
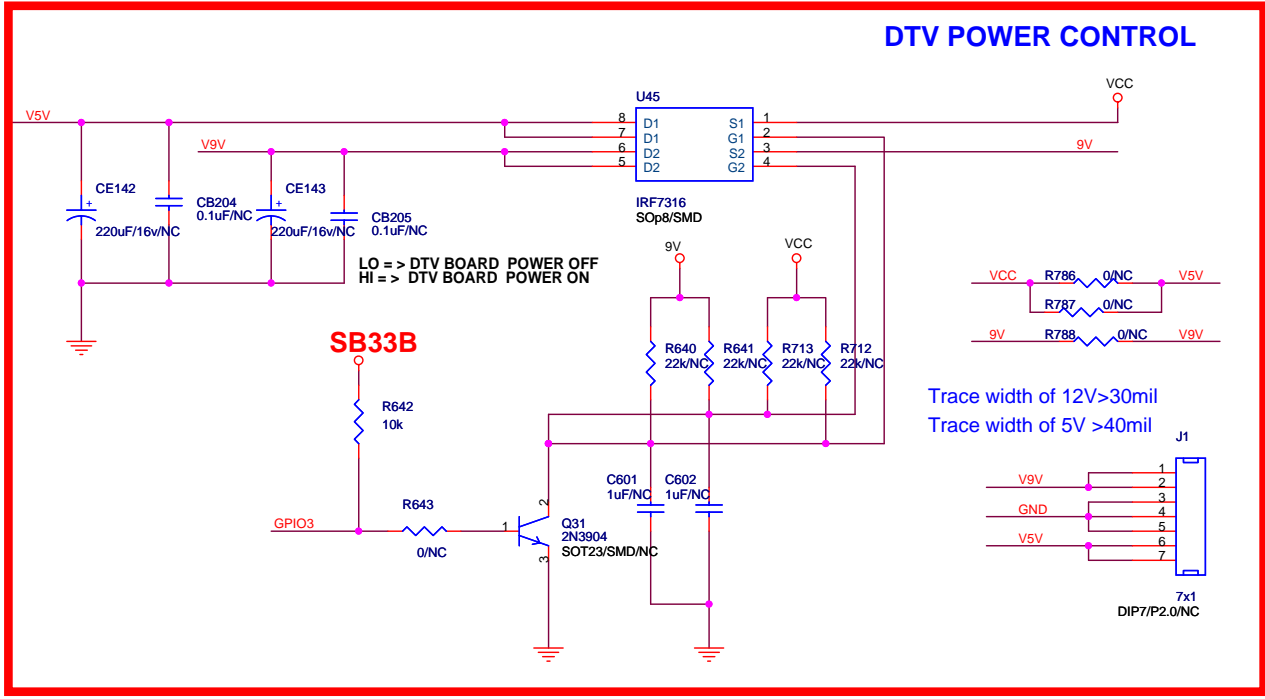
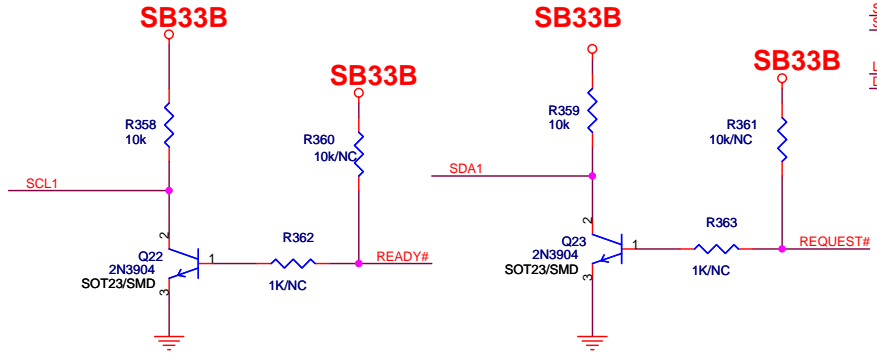
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Date:	Thursday, April 13, 2006	Sheet	2 / 17





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Date:	Thursday, April 20, 2006	Sheet	17

HDMIMCLK	>>	HDMIMCLK	3,6
HDMIBCLK	>>	HDMIBCLK	3,6
HDMILRCK	>>	HDMILRCK	3,6
HDMISD0	>>	HDMISD0	3,6
HDMIDE	>>	HDMIDE	3,6
HDMIODCK	>>	HDMIODCK	3,6
HDMIHSYNC	>>	HDMIHSYNC	3,6
HDMIVSYNC	>>	HDMIVSYNC	3,6
VI[0..23]	>>	VI[0..23]	3,6
TXD	>>	TXD	3,11
RXD	>>	RXD	3,11
TXD1	>>	TXD1	3
RXD1	>>	RXD1	3
SCL1	>>	SCL1	3
SDA1	>>	SDA1	3
GPIO3	>>	GPIO3	3
CCIR_V6	>>	CCIR_V6	3
SCL0	>>	SCL0	3
SDA0	>>	SDA0	3
9V	>>	9V	1,9,14



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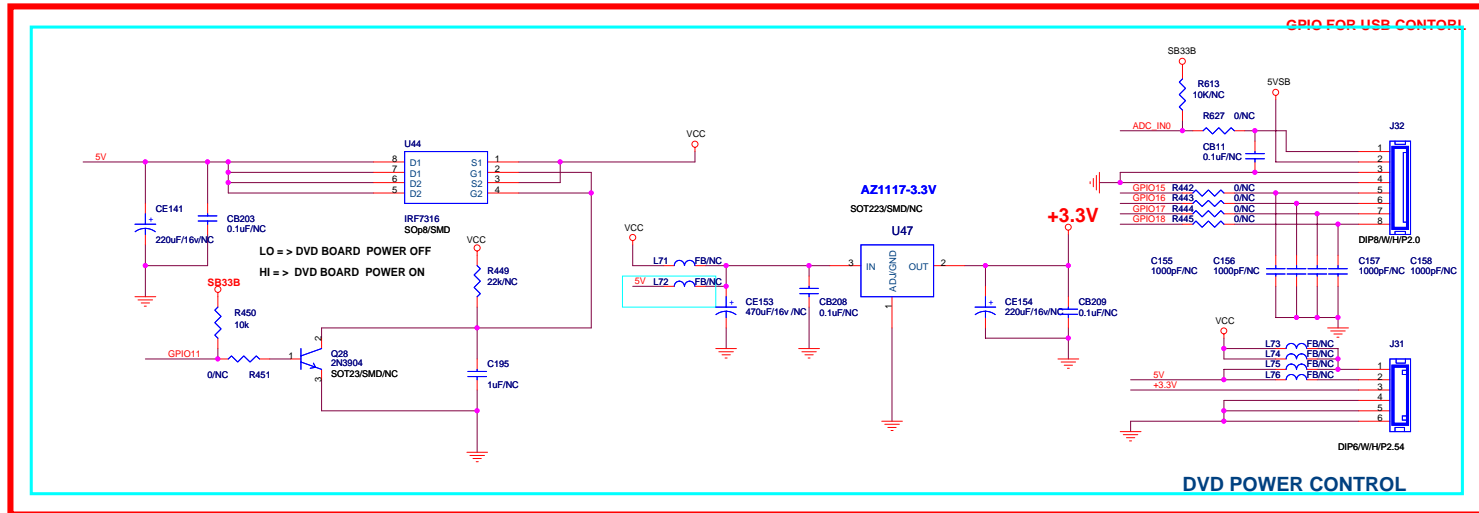
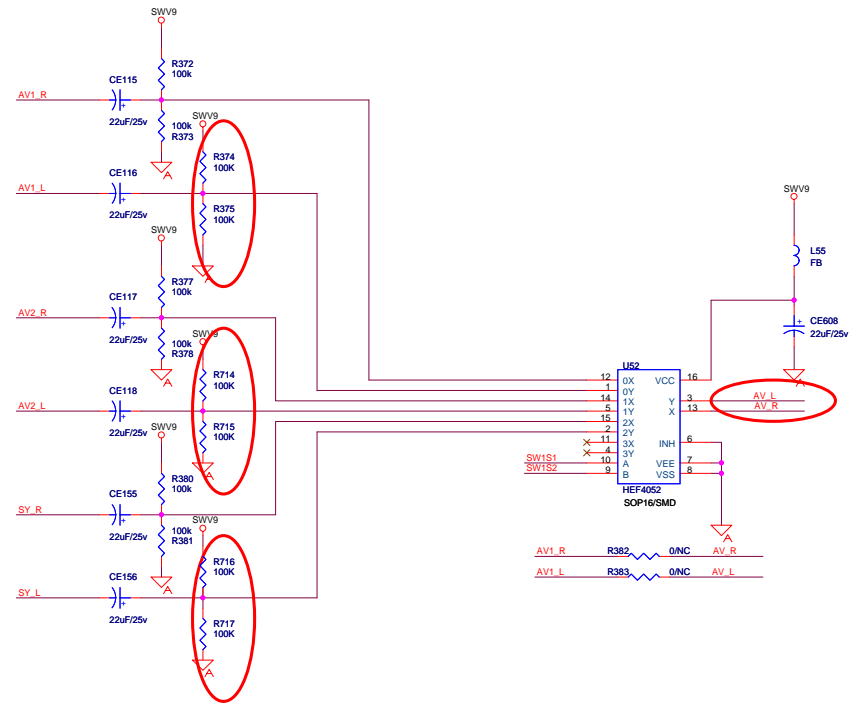
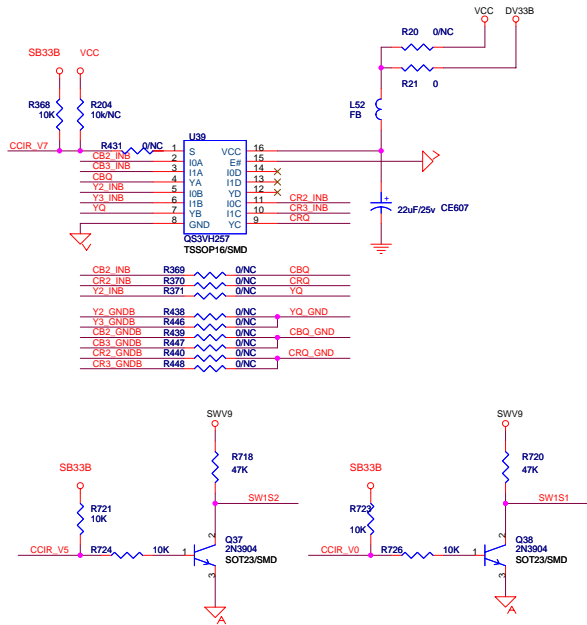
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INPUT

ADC_IN0	ADC_IN0	3
CCIR_V0	CCIR_V0	3
CCIR_V5	CCIR_V5	3
CCIR_V7	CCIR_V7	3
GPIO11	GPIO11	3
GPIO15	GPIO15	3
GPIO16	GPIO16	3
GPIO17	GPIO17	3
GPIO18	GPIO18	3
VFE_GND	VFE_GND	2,3,4,11
AADC_VSS	AADC_VSS	3,4,10
AUT_R	AV1_R	15
AV1_L	AV1_L	15
AV2_R	AV2_R	15
AV2_L	AV2_L	15
SV_R	AV2_L	15
SV_L	SV_R	15
YZ_INB	YZ_INB	15
YZ_GNDB	YZ_INB	15
CB2_INB	YZ_GNDB	10,15
CB2_GNDB	CB2_INB	15
CR2_INB	CB2_GNDB	10,15
CR2_GNDB	CR2_INB	10,15
Y3_INB	CR2_GNDB	10,15
Y3_GNDB	Y3_INB	15
CB3_INB	Y3_GNDB	15
CB3_GNDB	CB3_INB	15
CR3_INB	CB3_GNDB	15
CR3_GNDB	CR3_INB	15
SV	SV	1,7,9,14

OUTPUT

AV_R	AV_R	9
AV_L	AV_L	9
YQ	YQ	10
CBQ	CBQ	10
CRQ	CRQ	10
YQ_GND	YQ_GND	10
CBQ_GND	CBQ_GND	10
CRQ_GND	CRQ_GND	10



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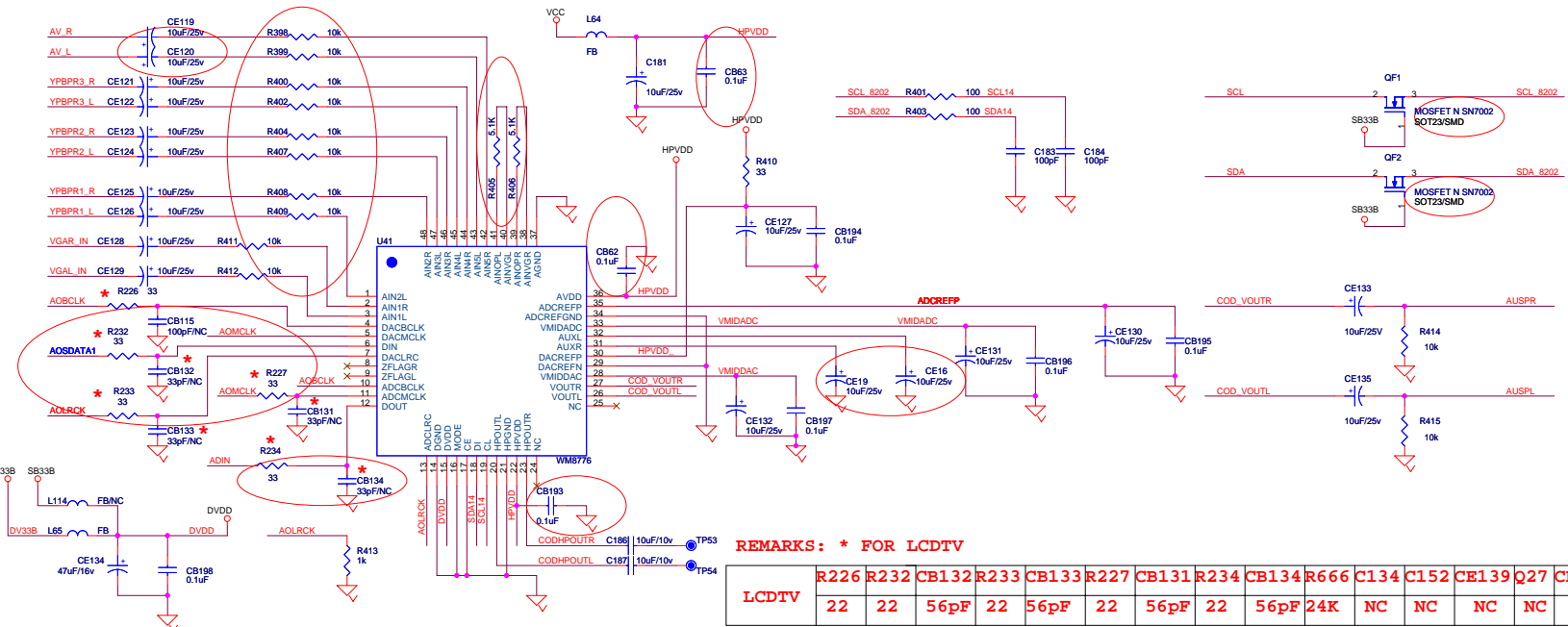
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DAUGHTER BOARD IN			
Size	Document Number	Designers	Rev
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Date:	Thursday, April 13, 2006	Sheet	8 17

INPUT

GPIO7	GPIO7	3
SCL	SCL	1,14
SDA	SDA	1,14
SDA_8202	SDA_8202	3,6,12
SCL_8202	SCL_8202	3,6,12
AOSDATA1	AOSDATA1	3
AOMCLK	AOMCLK	3,16
AOBCLK	AOBCLK	3,16
AOLRCK	AOLRCK	3,16
ADIN	ADIN	3,16
AIZ	AIZ	3
AV_L	AV_R	8
YPBPR1_L	YPBPR1_L	15
YPBPR1_R	YPBPR1_R	15
YPBPR2_R	YPBPR2_R	15
YPBPR2_L	YPBPR2_L	15
YPBPR3_R	YPBPR3_R	15
YPBPR3_L	YPBPR3_L	15
VGAR_IN	VGAR_IN	11
VGAL_IN	VGAL_IN	11
TESTP2	TESTP2	3
AR	AR	3
MU	MU	16
A_MUTE	A_MUTE	17
9V	9V	1,7,14

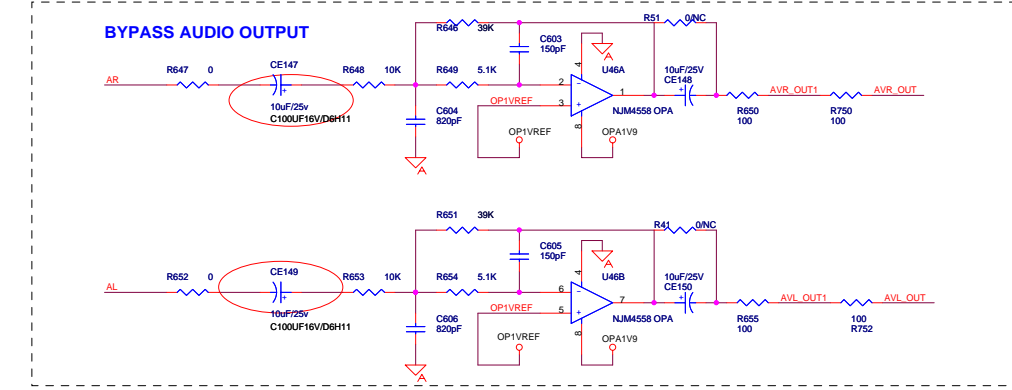
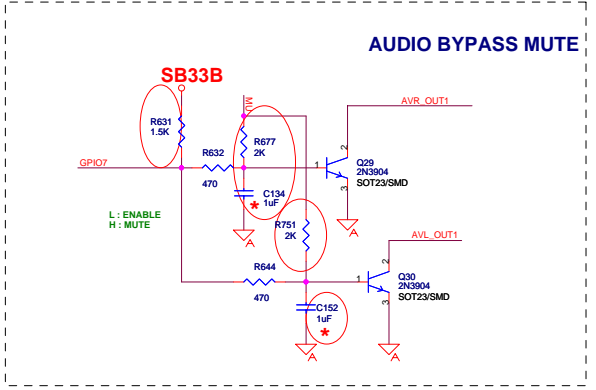
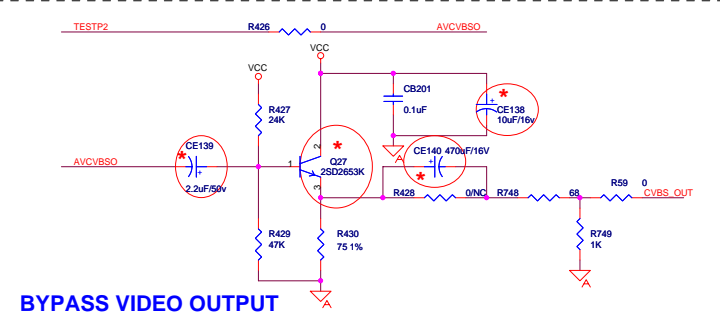
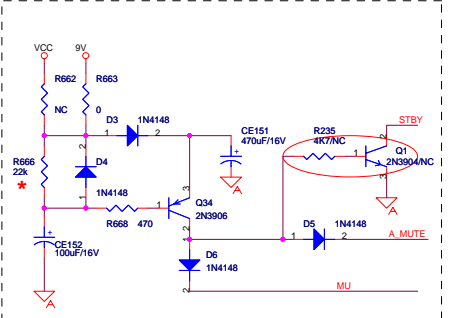
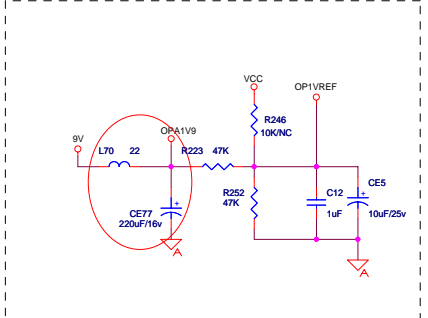
OUTPUT

AUSPR	AUSPR	16
AUSPL	AUSPL	16
AVL_OUT	AVR_OUT	15
AVL_OUT	AVL_OUT	15
CVBS_OUT	CVBS_OUT	6,15



REMARKS: * FOR LCDTV

LCDTV	R226	R232	CB132	R233	CB133	R227	CB131	R234	CB134	R666	C134	C152	CE139	Q27	CE140	CE138
	22	22	56pF	22	56pF	22	56pF	22	56pF	24K	NC	NC	NC	NC	NC	NC



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Title			
M8776 & VIDEO BYPASS			
Size	Document Number	AKAI_MIT8202_27US_LVDS_V0.0	Rev 1
C	Checked:	<Designer>	Sheet 9
Date:	Saturday, April 22, 2006	Checked:	17

CVBS0 >>> CVBS0 3
 CVBS1 >>> CVBS1 3
 CVBS2 >>> CVBS2 3

SY0 >>> SY0 3
 SC0 >>> SC0 3

SY1 >>> SY1 3
 SC1 >>> SC1 3

Y0+ >>> Y0+ 3
 Y0- >>> Y0- 3
 PB0+ >>> PB0+ 3
 PB0- >>> PB0- 3
 PR0+ >>> PR0+ 3
 PR0- >>> PR0- 3
 SOY0 >>> SOY0 3

Y1+ >>> Y1+ 3
 Y1- >>> Y1- 3
 PB1+ >>> PB1+ 3
 PB1- >>> PB1- 3
 PR1+ >>> PR1+ 3
 PR1- >>> PR1- 3
 SOY1 >>> SOY1 3

MPX1 >>> MPX1 3
 MPX2 >>> MPX2 3

TO MT8202

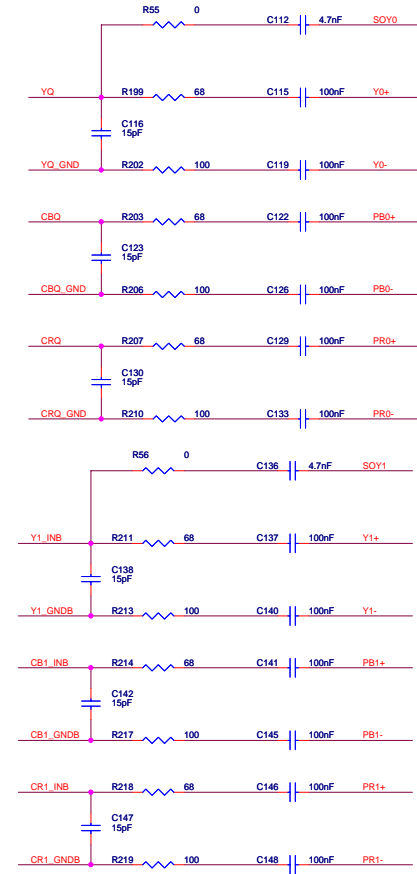
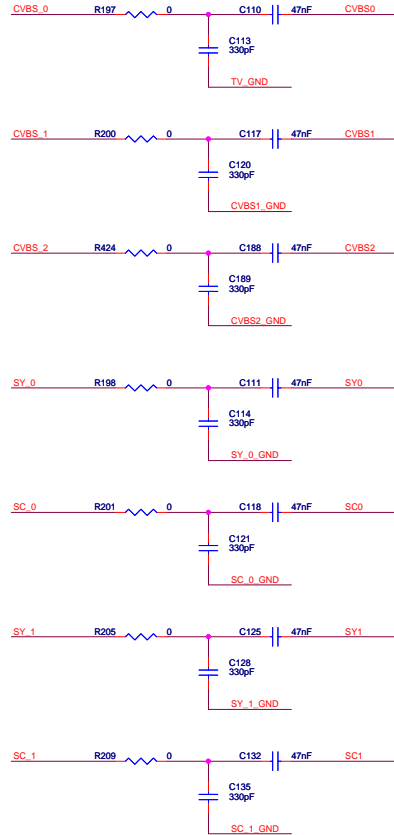
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 CVBS_0 >>> CVBS_0 14
 SIF >>> SIF 14
 AF >>> AF 14
 CVBS_1 >>> CVBS_1 15
 CVBS1_GND >>> CVBS1_GND 15
 CVBS_2 >>> CVBS_2 15
 CVBS2_GND >>> CVBS2_GND 15
 SY_1 >>> SY_1 15
 SY_1_GND >>> SY_1_GND 15
 SC_1 >>> SC_1 15
 SC_1_GND >>> SC_1_GND 15
 SY_0 >>> SY_0 15
 SY_0_GND >>> SY_0_GND 15
 SC_0 >>> SC_0 15
 SC_0_GND >>> SC_0_GND 15

SOY1 >>> SOY1 3
 SOY0 >>> SOY0 3
 Y1_INB >>> Y1_INB 15
 Y1_GNDB >>> Y1_GNDB 8,15
 CR1_INB >>> CR1_INB 15
 CR1_GNDB >>> CR1_GNDB 8,15
 CB1_INB >>> CB1_INB 15
 CB1_GNDB >>> CB1_GNDB 8,15
 CRO >>> CRO 8
 YQ >>> YQ 8
 YQ_GND >>> YQ_GND 8
 CRO_GND >>> CRO_GND 8
 CRQ_GND >>> CRQ_GND 8

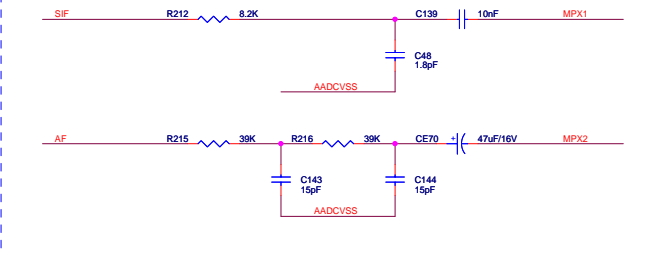
FROM AV BOARD

AADCSS >>> AADCSS 3,4

THIS PAGE NEARLY IC



FROM Tuner

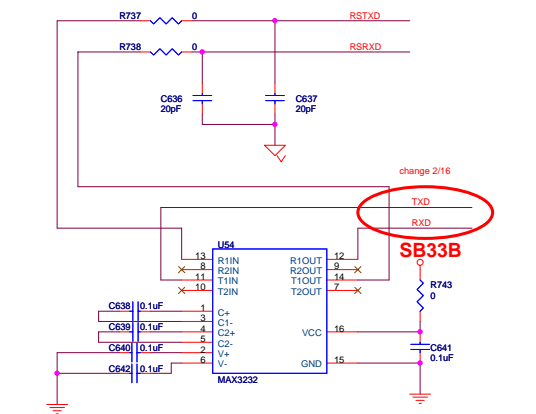
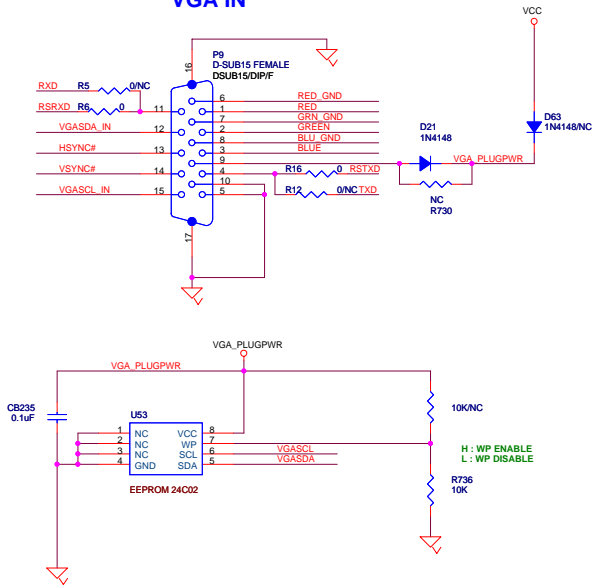


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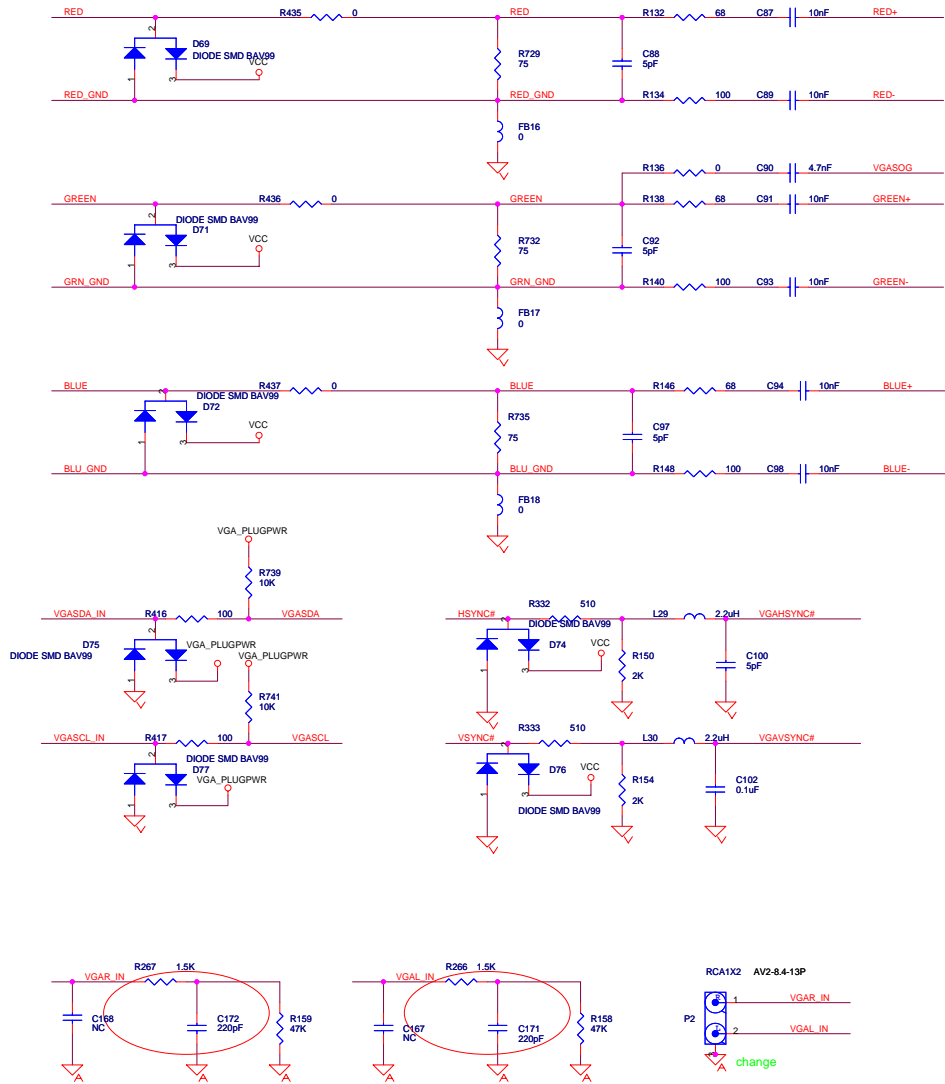
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AUDIO / VIDEO IN CIRCUIT			
Size	Document Number	<Designer>	Rev
C	AKAI_MT8202_27US_LVDS_V0.0	<Checker>	1
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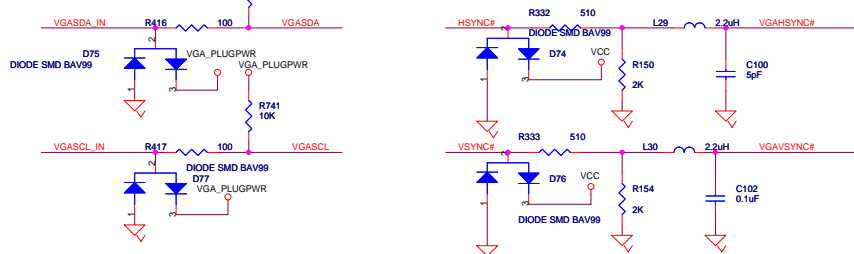
VGA IN



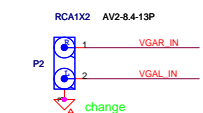
NEARLY VGA CON



NEARLY 8202



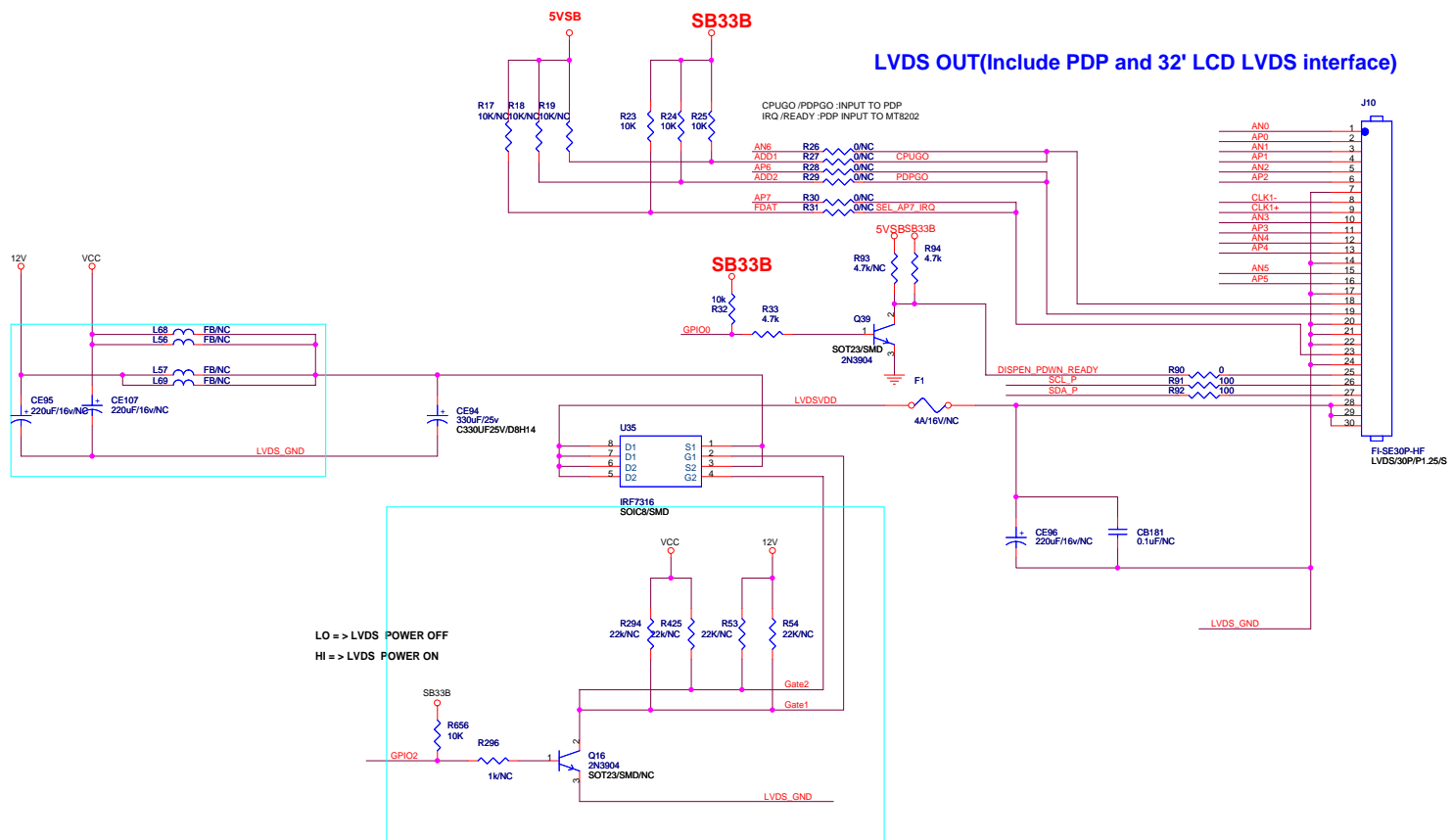
VGA/DVI AUDIO INPUT



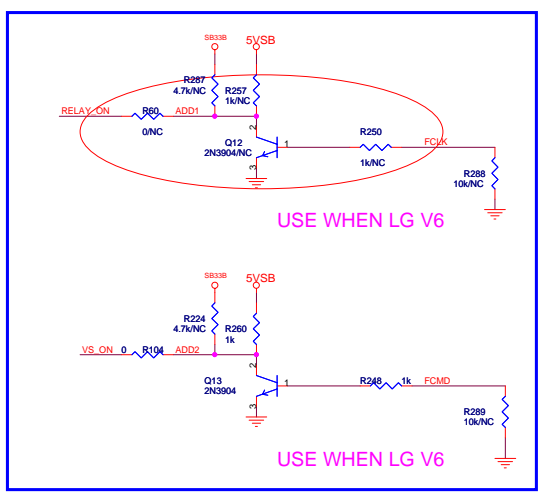
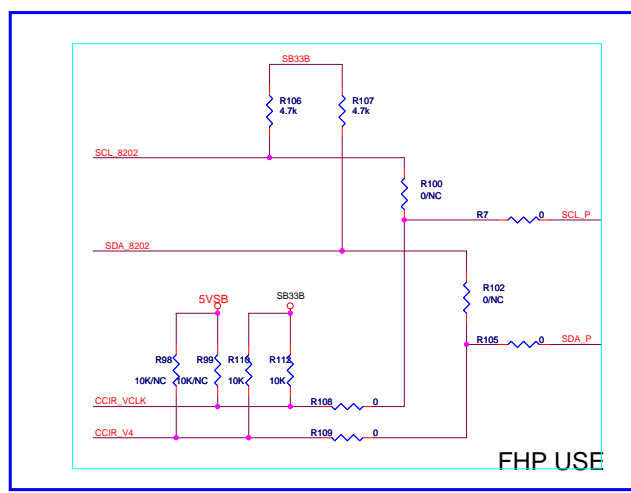
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Title			
VGA IN & PC AUDIO IN			
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GPIO0	>>	GPIO2	3
CLK1+	>>	CLK1+	3
CLK1-	>>	CLK1-	3
AP0_7	>>	AP0_7	3
AP0_6	>>	AP0_6	3
LVDS_GND	>>	LVDS_GND	2,3,4
LVDSVDD	>>	LVDSVDD	2,3,4
CCIR_VCLK	>>	CCIR_VCLK	3
CCIR_V4	>>	CCIR_V4	3
FCLK	>>	FCLK	3
FCMD	>>	FCMD	3
FDAT	>>	FDAT	3
SCL_8202	>>	SCL_8202	3,6,9
SDA_8202	>>	SDA_8202	3,6,9
RELAY_ON	>>	RELAY_ON	1
VS_ON	>>	VS_ON	1
12V	>>	12V	1,13



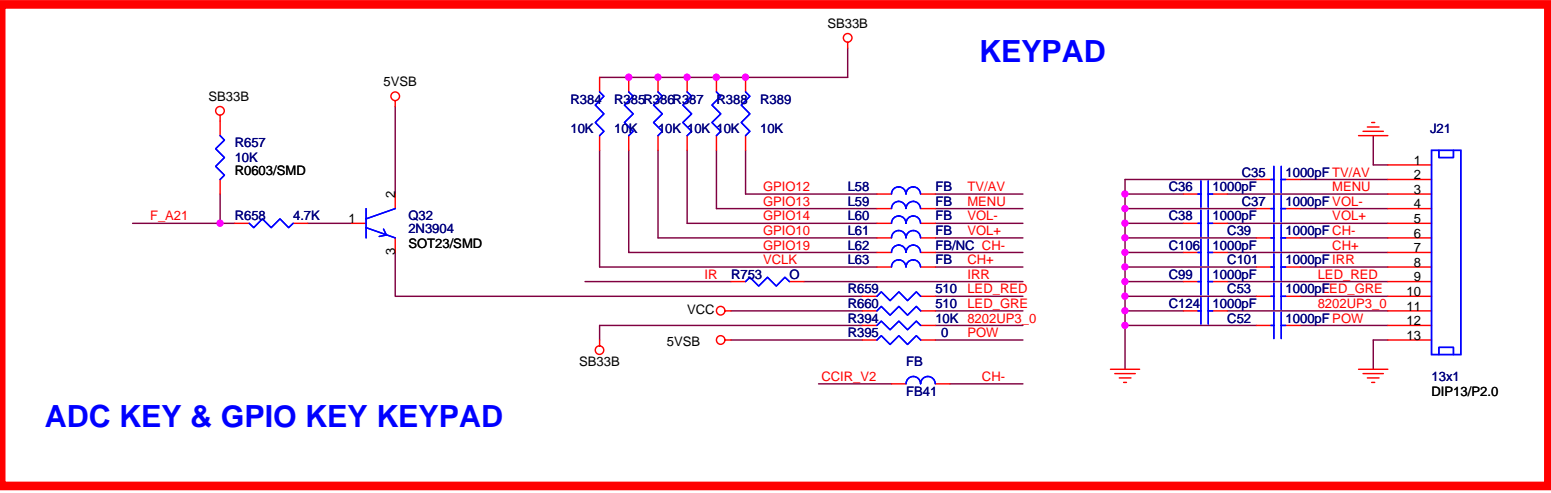
LO => LVDS POWER OFF
 HI => LVDS POWER ON



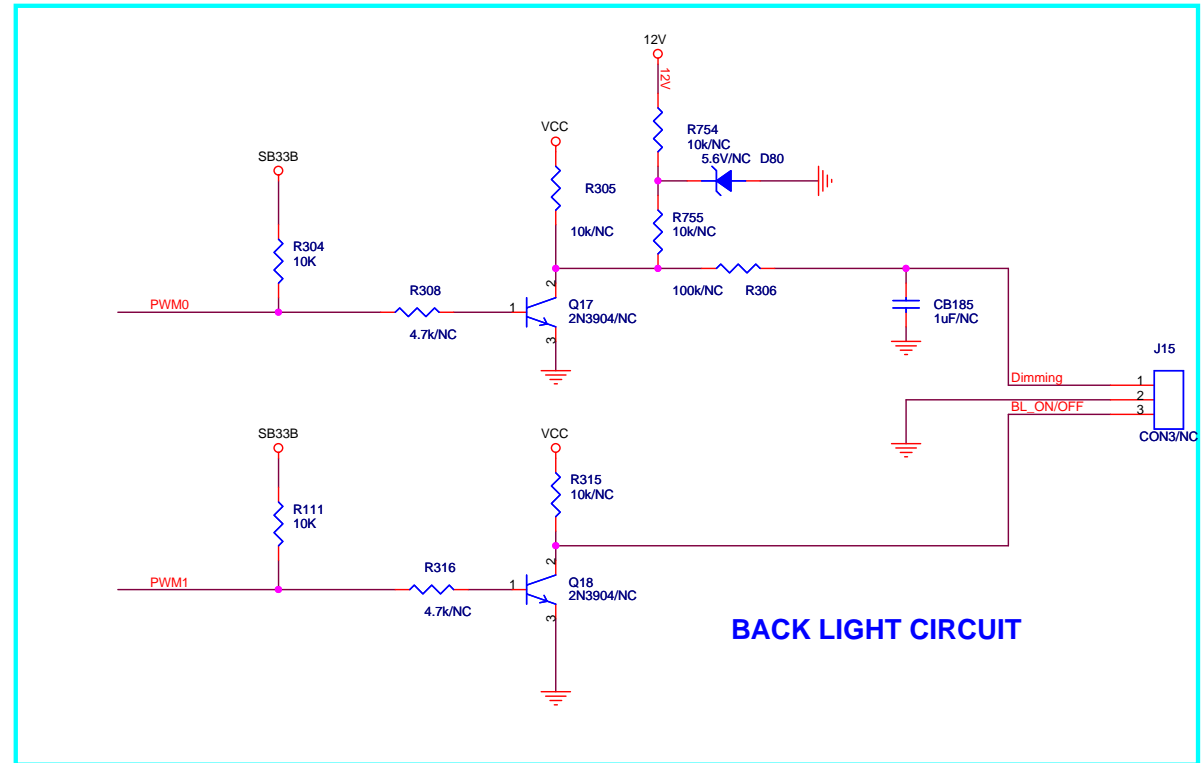
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Title			
LVDS OUT			
Size	Document Number	Designer	Rev
C	AKAI_MTB202_27US_LVDS_V0.0	<Designer>	1
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IR	>>>IR	3,15
GPIO10	>>>GPIO10	3
GPIO12	>>>GPIO12	3
GPIO13	>>>GPIO13	3
GPIO14	>>>GPIO14	1,3
PWM0	>>>PWM0	3
PWM1	>>>PWM1	3
8202UP3_0	>>>8202UP3_0	3
GPIO14	>>>GPIO14	1,3
GPIO19	>>>GPIO19	1,3
VCLK	>>>VCLK	3
F_A21	>>>F_A21	3
CCIR_V2	>>>CCIR_V2	3
12V	>>>12V	1,12



ADC KEY & GPIO KEY KEYPAD

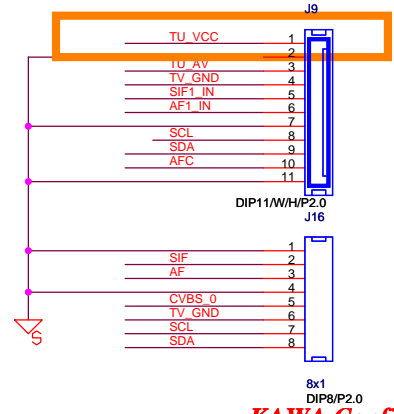
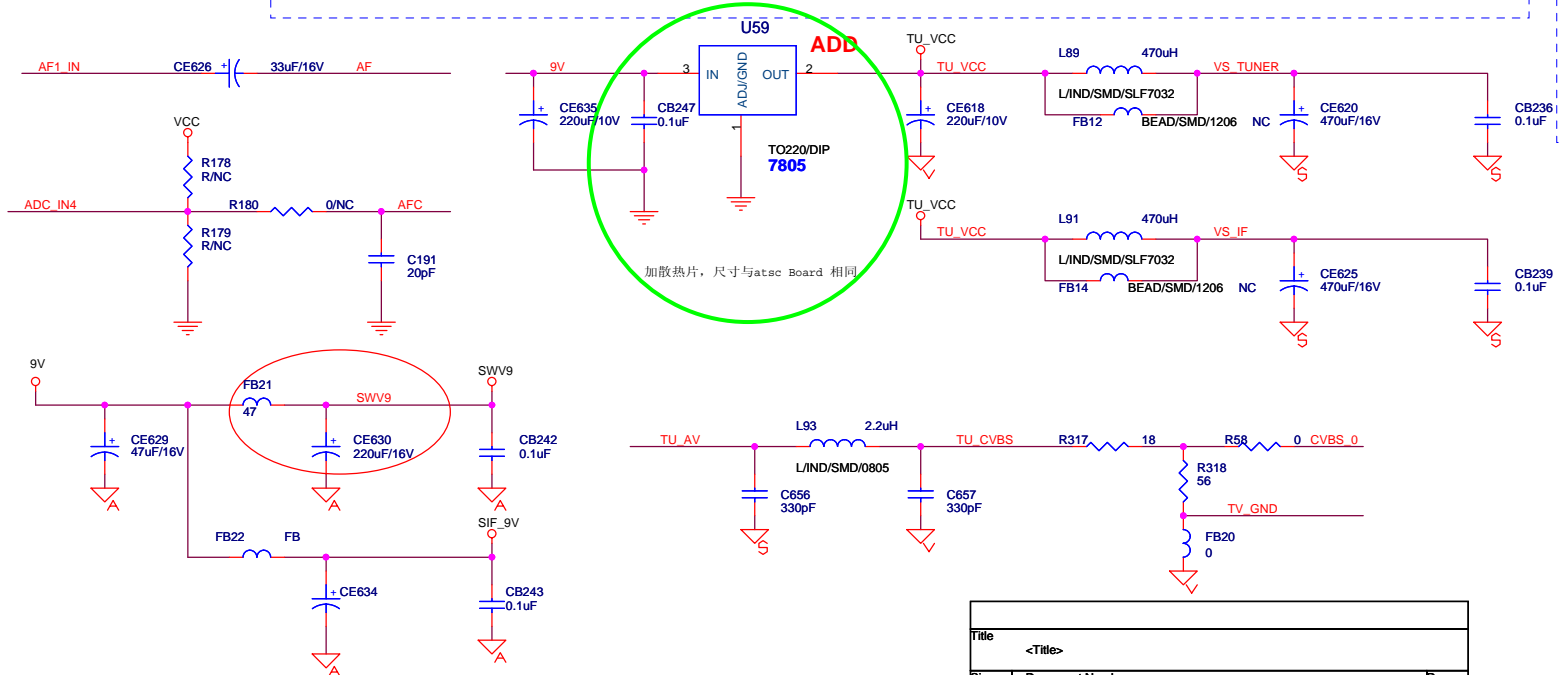
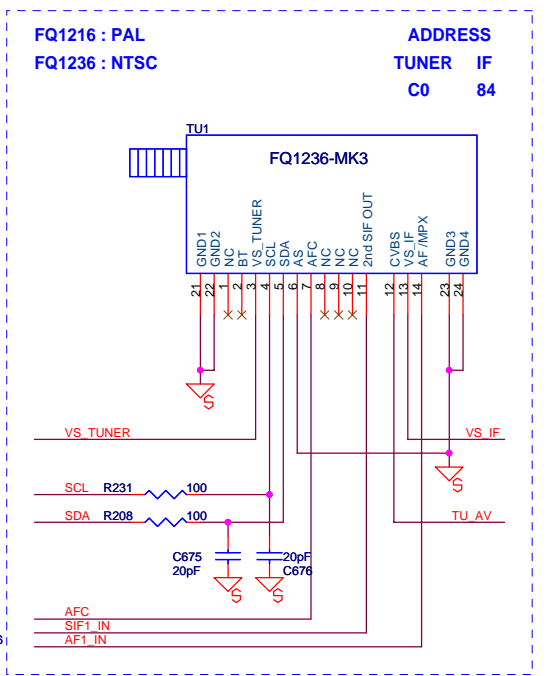
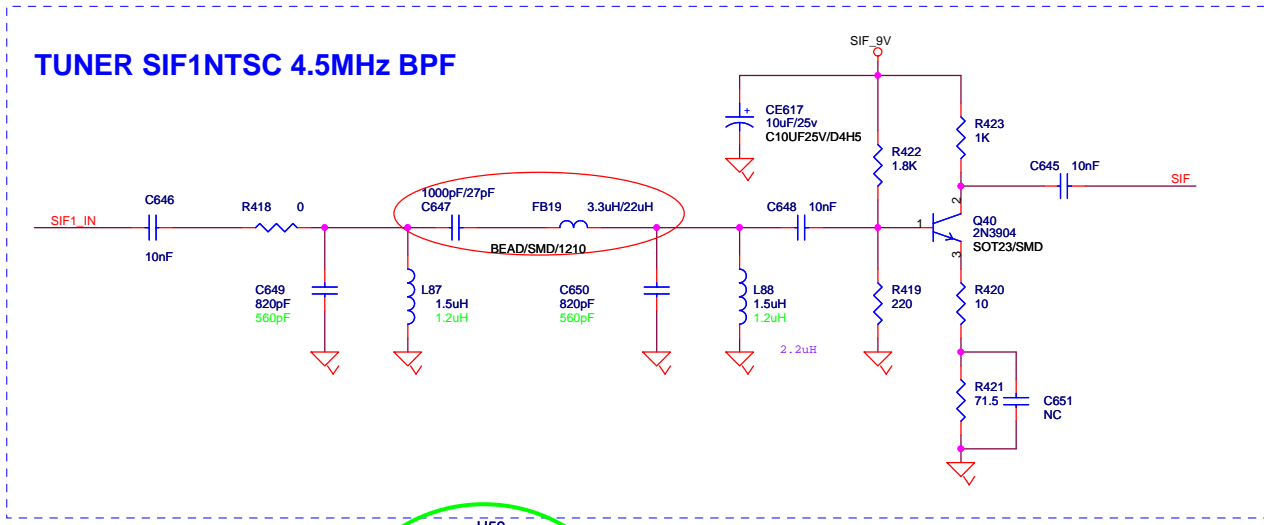


BACK LIGHT CIRCUIT

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Title			
BACK LIGHT / KEYPAD			
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B	AKAL_MIT8202_27US_LVDS_V0.0	Checked: <Checker>	1
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SCL	SCL	1,9
SDA	SDA	1,9
CVBS_0	CVBS_0	10
TV_GND	TV_GND	10
AF	AF	10
SIF	SIF	10
ADC_IN4	ADC_IN4	3
9V	9V	1,7,9

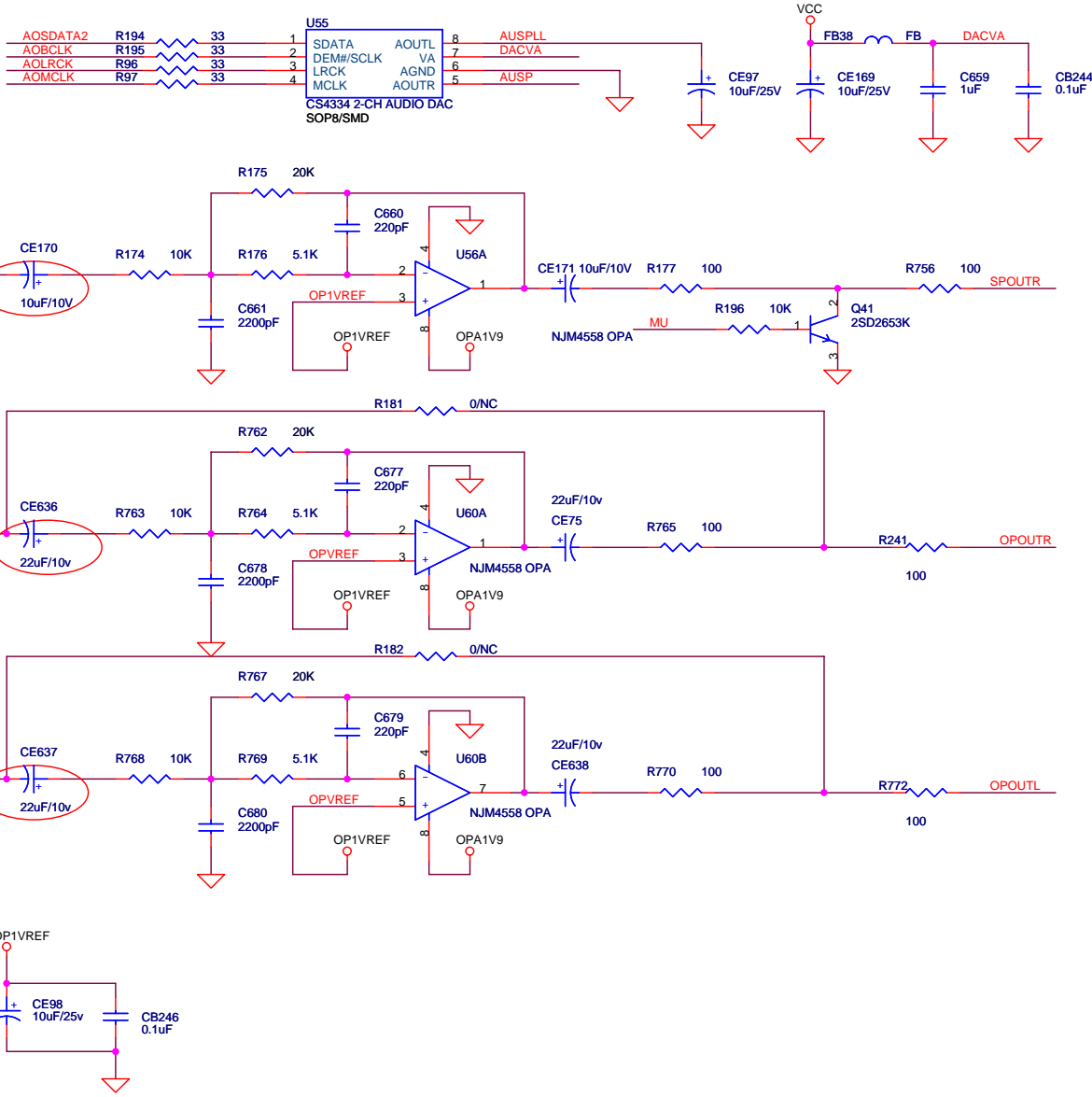


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Size	Document Number	Rev
Custom-Doc		<Rev Code>
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TUNER IN			
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AOSDATA2 >>> AOSDATA2 3
 AOMCLK >>> AOMCLK 3,9
 AOBCLK >>> AOBCLK 3,9
 AOLRCK >>> AOLRCK 3,9
 MU >>> MU 9
 SPOUTR >>> SPOUTR 15
 AUSPR >>> AUSPR 9
 AUSPL >>> AUSPL 9
 OPOUTL >>> OPOUTL 17
 OPOUTR >>> OPOUTR 17
 A_MUTE >>> A_MUTE 9,17



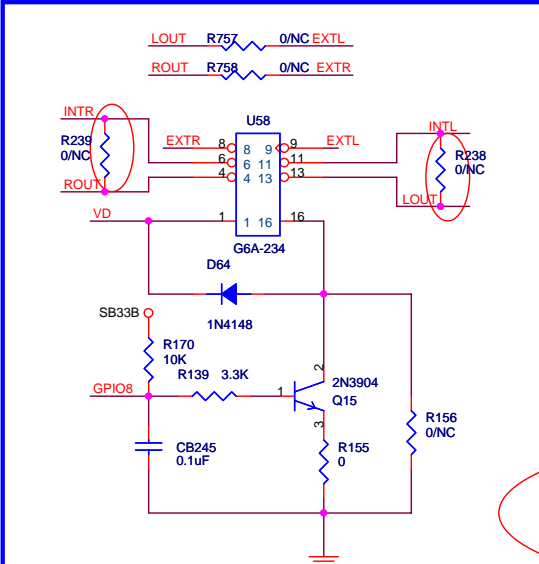
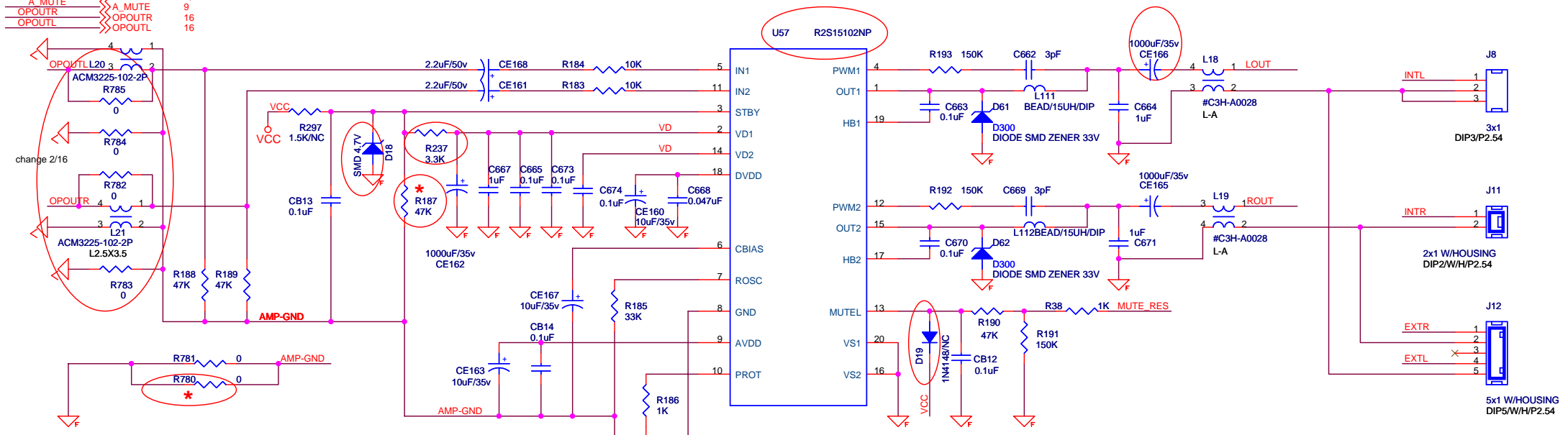
GPIO DECRPTION

- UP3_4 : SW SCL
- UP3_5 : SW SDA
- ERO0/UP3_0 :KEYPAD POWER
- ERO1/UP3_1 : MAIN POWER SWITCH
- VCLK : KEPAD CH+
- GPIO19 : KEPAD CH-
- DE/GPIO : DVD IR
- CCIR_CLK : PDP USE
- CCIR_V4 : PDP USE
- GPIO0 : PDP USE
- GPIO1 : NO USE
- GPIO2 : LVDS POWER SW
- GPIO3 : DTV POWER CONTROL
- GPIO4 : EEPROM WRITE PROTECT
- GPIO5/TXD : 2nd UART FOR MT5351
- GPIO6/RXD : 2nd UART FOR MT5351
- GPIO7 : AUDIO BYPASS MUTE CONTROL
- GPIO8 : SPEAKER SWITCH
- GPIO9 : AUDIO MUTE
- GPIO10 : Indicates active video at HDMI port
- GPIO11 : DVD POWER CONTROL
- GPIO12 : AV SWITCH
- GPIO13 : HDMI Hot Plug Detect
- GPIO14 : NO USE
- GPIO[15..18] : FOR DVD CONTROL
- GPIO/PWM0 : DIMMING
- GPIO/PWM1 : BACKLIGHT ON/OFF
- OUT_27Mhz/GPIO : HDMI CRYSTAL
- SDA1 : TO MT5351 I/F REQUEST
- SCL1 : TO MT5351 I/F READY
- F_A21 : KEYPAD(LED RED)
- ADCIN0 : KEYPAD
- ADCIN3:PDP 5VD DETECT
- ADCIN4:FOR TUNER AFC
- CCIR_V[0-3] : KEYPAD
- CCIR_V5 : AUDIO SWITCH
- CCIR_V6 : RESET DTV
- CCIR_V7 : YBPBR VIDEO SWITCH

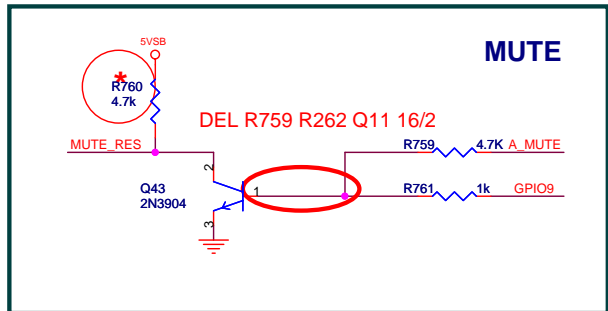
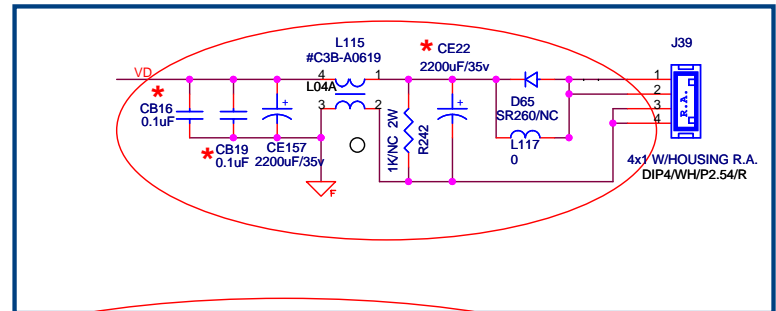
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Sub Woofer			
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GPIO8	GPIO8	3
GPIO9	GPIO9	3
AUSPR	AUSPR	9,16
AUSPL	AUSPL	9,16
A_MUTE	A_MUTE	9
OPOUTR	OPOUTR	16
OPOUTL	OPOUTL	16



GPIO8: SPEAKER SWITCH (INTERNAL OR EXTERNAL)



REMARKS: * FOR LCDTV

LCDTV	R780	R187	R760	CB16	CB19	CE22
	NC	51K	2.2K	NC	NC	NC

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Title			
AUDIO Amplifier			
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B	AKAL_MT8202_27US_LVDS_V0.0	Checked: <Checker>	1
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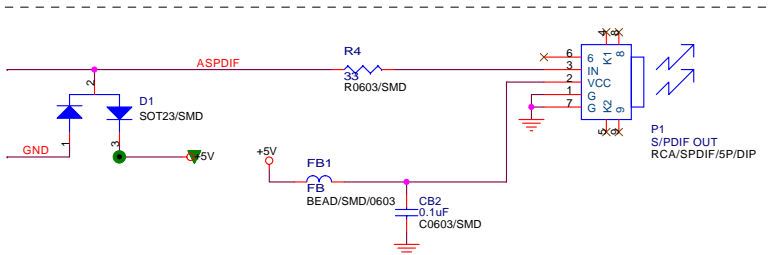
MT5111 / MT5351 REFERENCE DESIGN - 4 LAYERS

Rev	History	P#	DATE
RA-V1	INITIAL VERSION		2005/06/15
RA-V2	ADDED AUDIO SWITCH / REFINE POWER CIRCUIT		2005/07/14

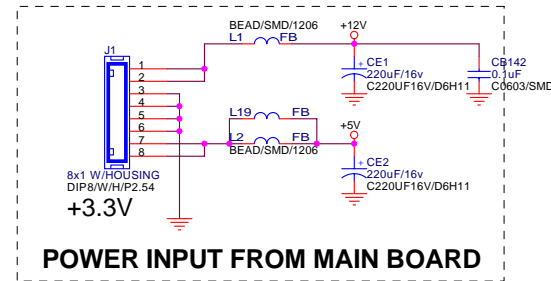
- 01. INDEX AND INTERFACE
- 02. POWER
- 03. TUNER
- 04. MT5111 ASIC
- 05. MT5351 ASIC
- 06. MT5351 PERIPHERAL
- 07. DDR MEMORY
- 08. NOR FLASH / JTAG / UART

NS : NON-STUFF

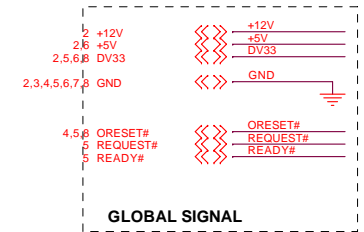
NAME	TYPE	DEVICE
+12V	POWER +12V	POWER SUPPLY
+5V	POWER +5V	POWER SUPPLY
+5V_tuner	POWER +5V	TUNER POWER
DV33_DM	POWER +3V3	MT5111 POWER
DV18	POWER +1V8	MT5111 POWER
DV33	POWER +3V3	MT5351 POWER
AV33	POWER +3V3	MT5351 ANALOG POWER
DV25	POWER +2V5	MT5351 DDR POWER
DV12	POWER +1V2	MT5351 POWER
GND	GROUND	GROUND



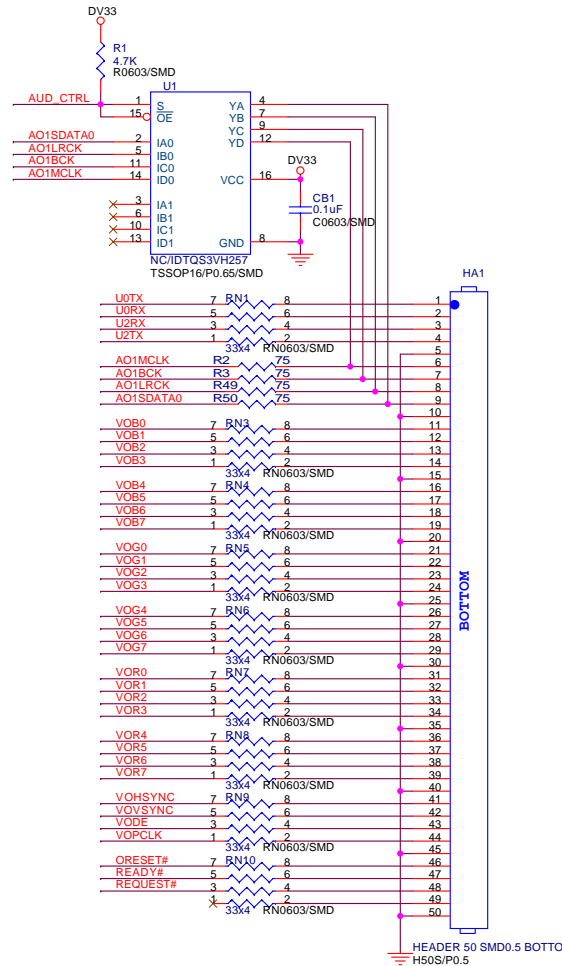
SPDIF CIRCUIT



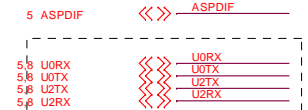
POWER INPUT FROM MAIN BOARD



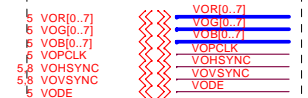
GLOBAL SIGNAL



DIGITAL OUTPUT



UART (RS232)



DIGITAL VIDEO OUTPUT



DIGITAL AUDIO INTERFACE

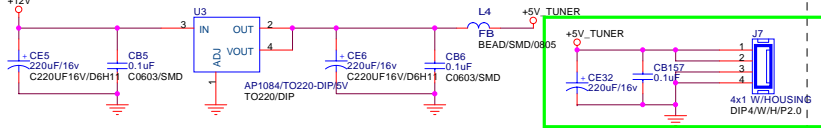


AUD_CTRL

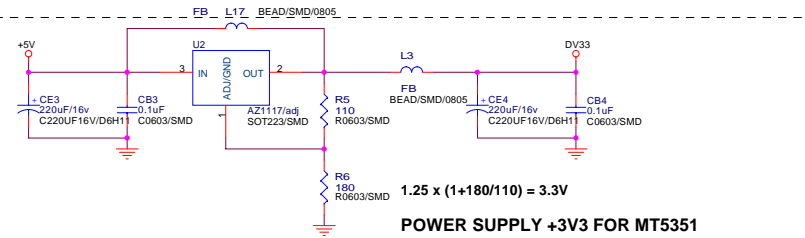
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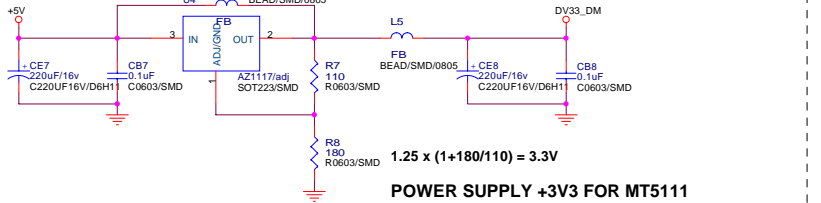
9V



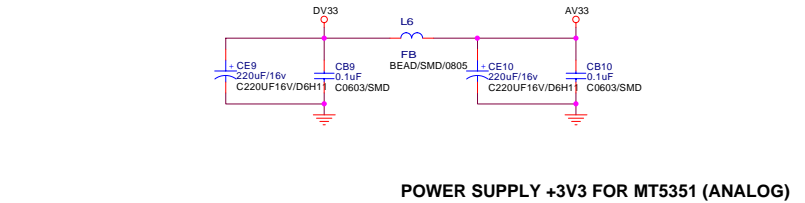
POWER SUPPLY +5V FOR TUNER



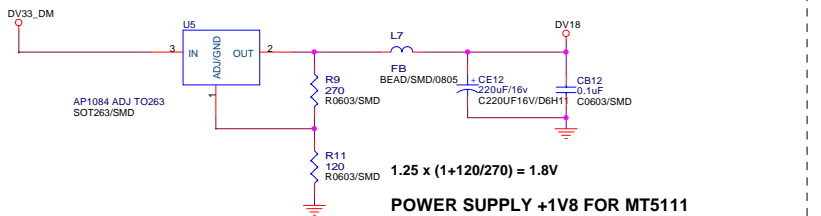
1.25 x (1+180/110) = 3.3V
POWER SUPPLY +3V3 FOR MT5351



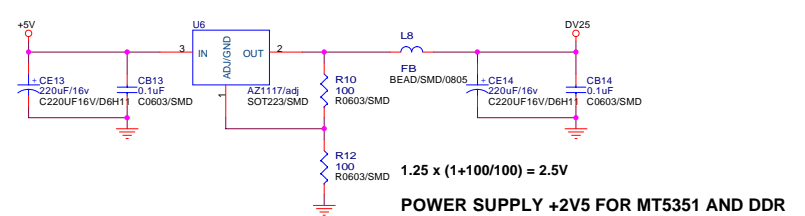
1.25 x (1+180/110) = 3.3V
POWER SUPPLY +3V3 FOR MT5111



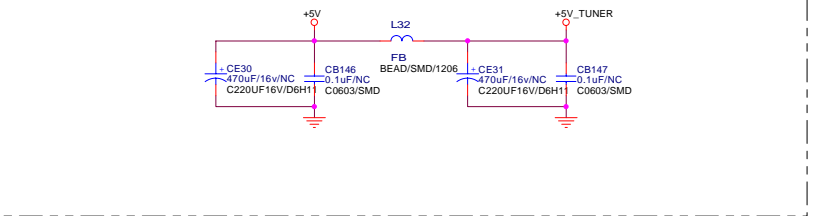
POWER SUPPLY +3V3 FOR MT5351 (ANALOG)



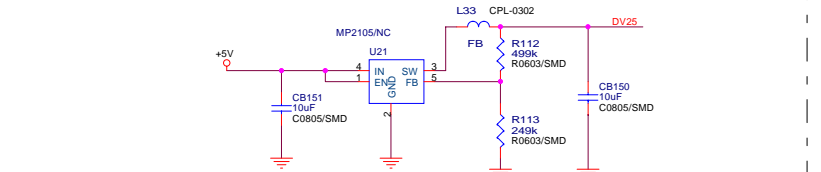
1.25 x (1+120/270) = 1.8V
POWER SUPPLY +1V8 FOR MT5111



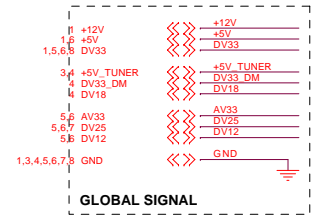
1.25 x (1+100/100) = 2.5V
POWER SUPPLY +2V5 FOR MT5351 AND DDR



1.25 x (1+0/100) = 1.25V
POWER SUPPLY +1V2 FOR MT5351



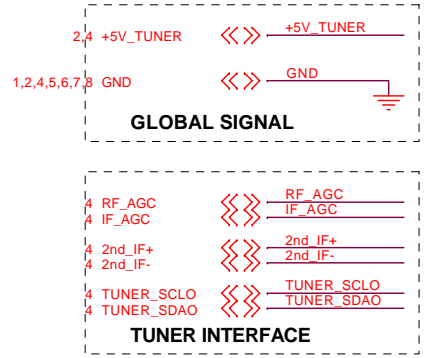
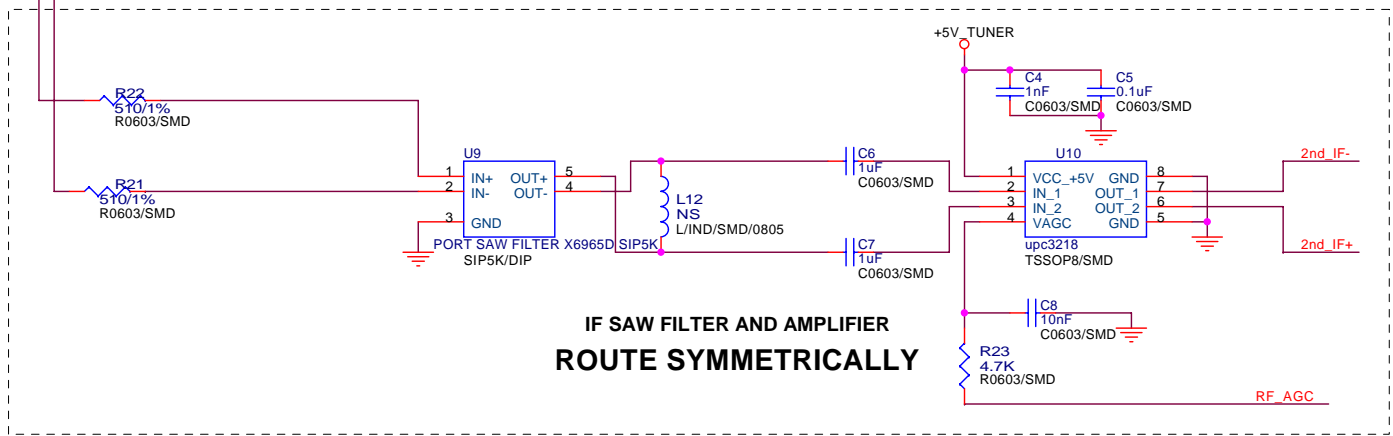
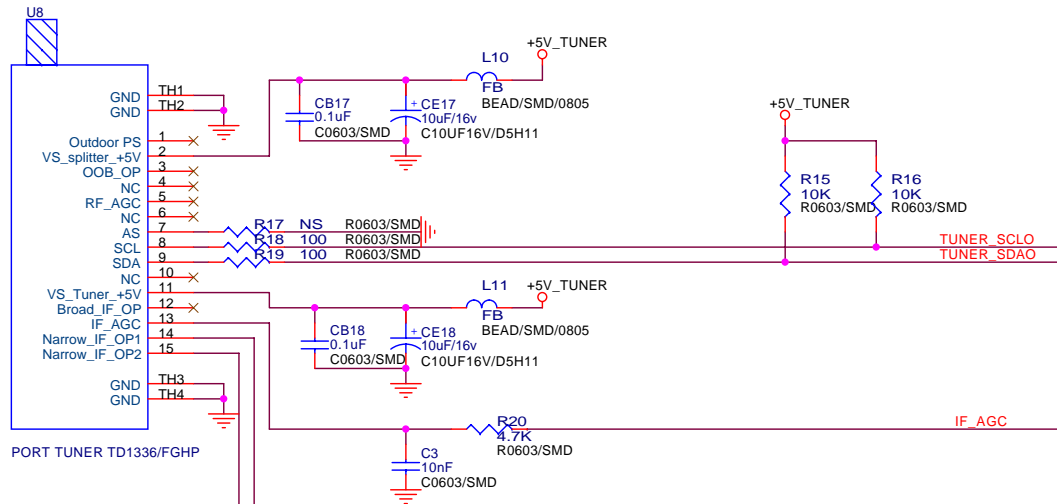
Compatible With U6



GLOBAL SIGNAL

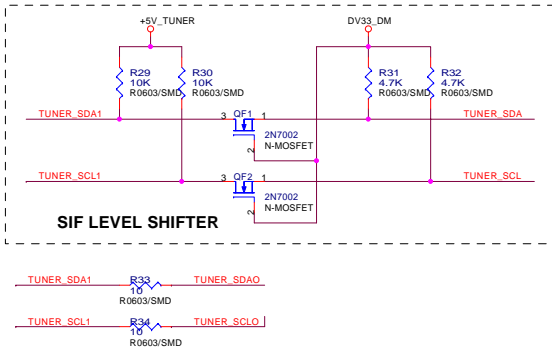
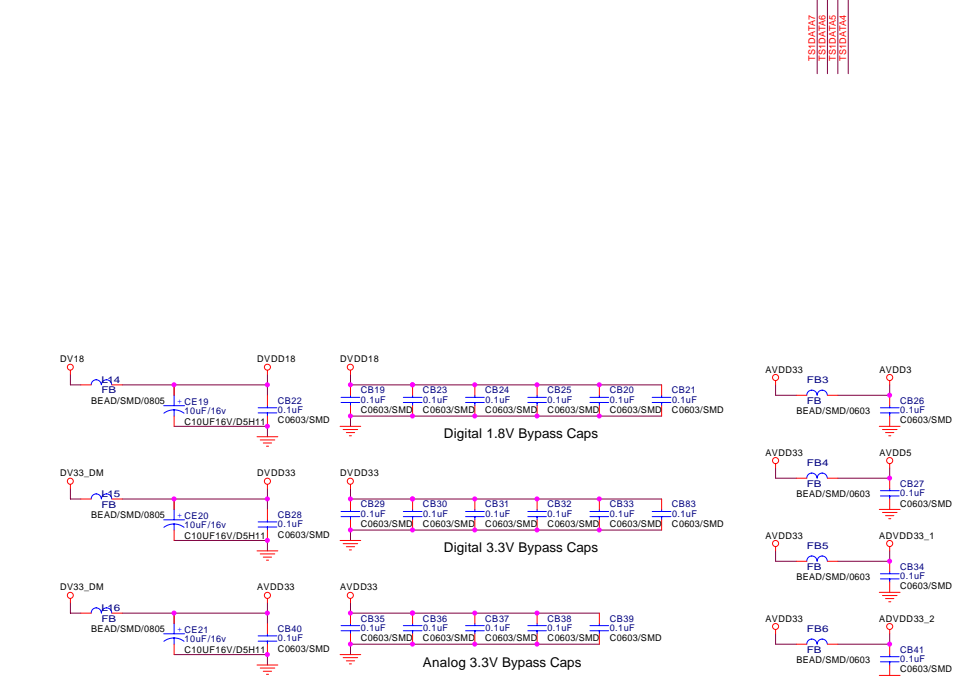
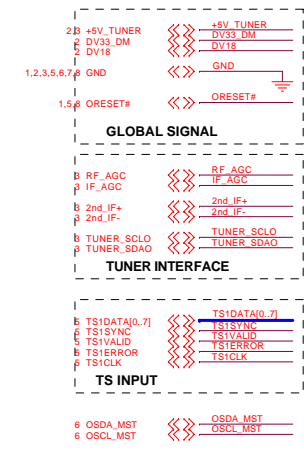
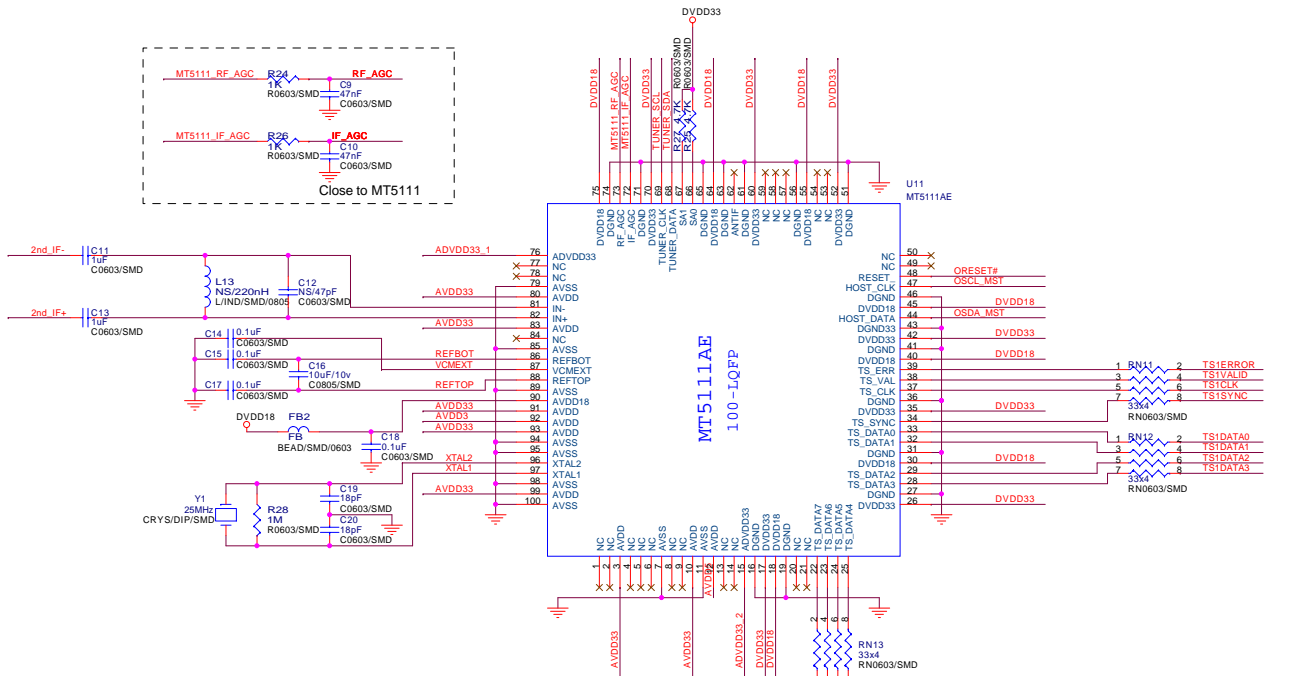
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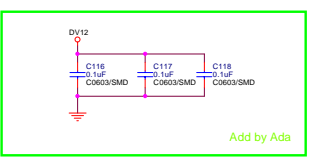
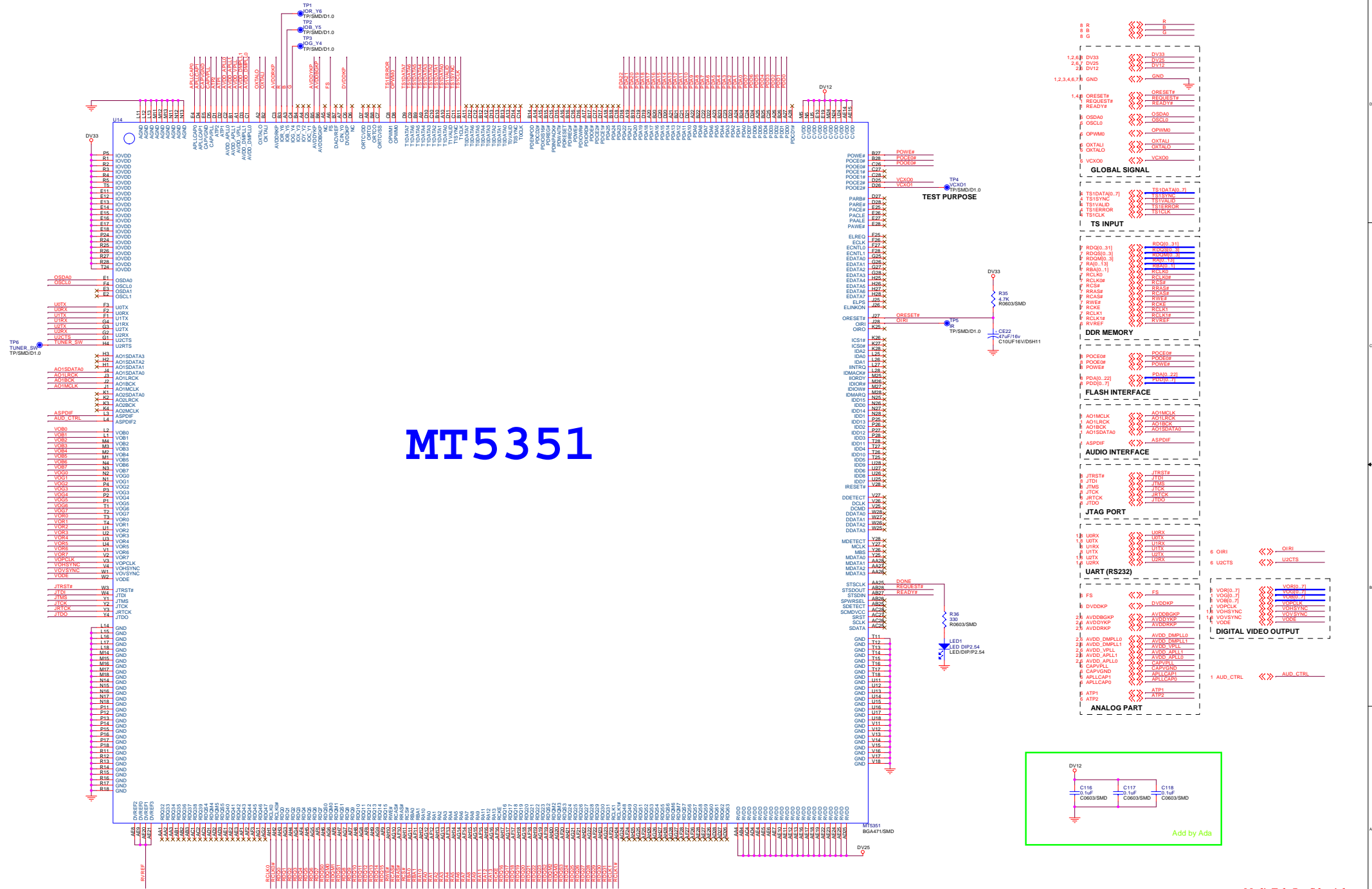
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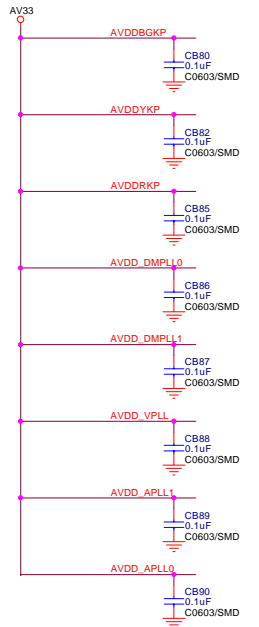
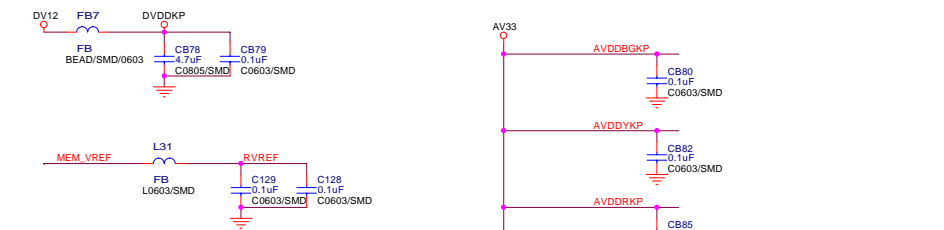
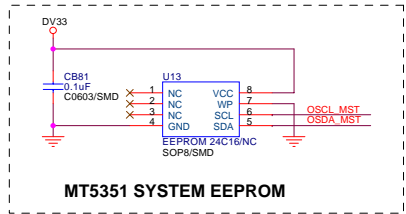
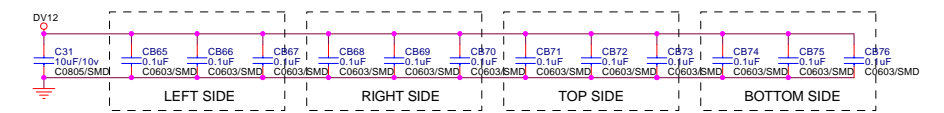
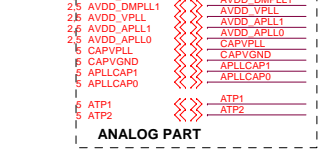
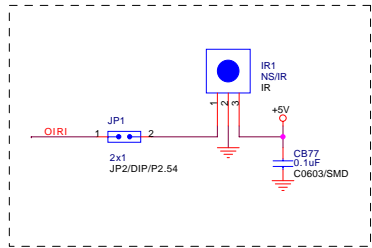
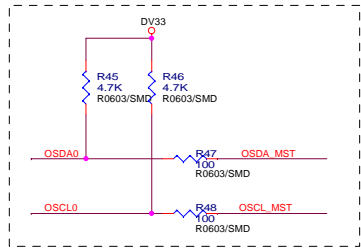
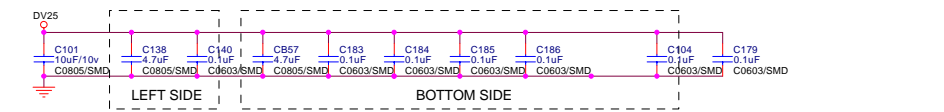
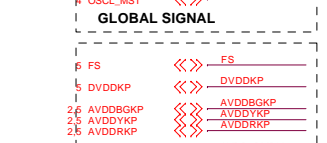
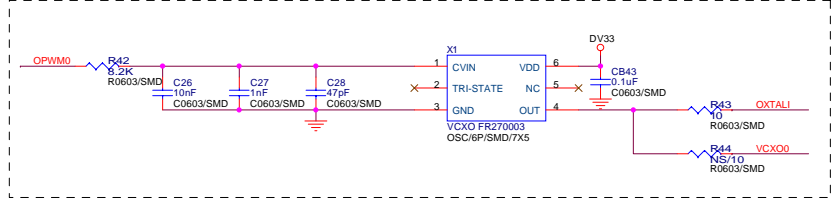
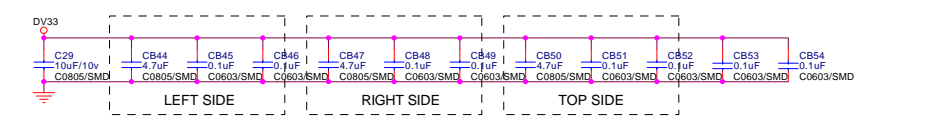
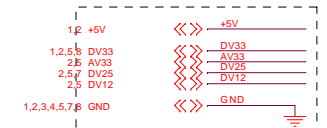
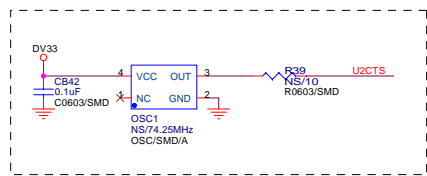
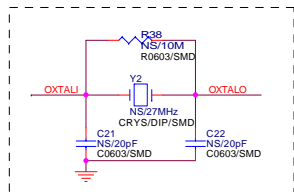
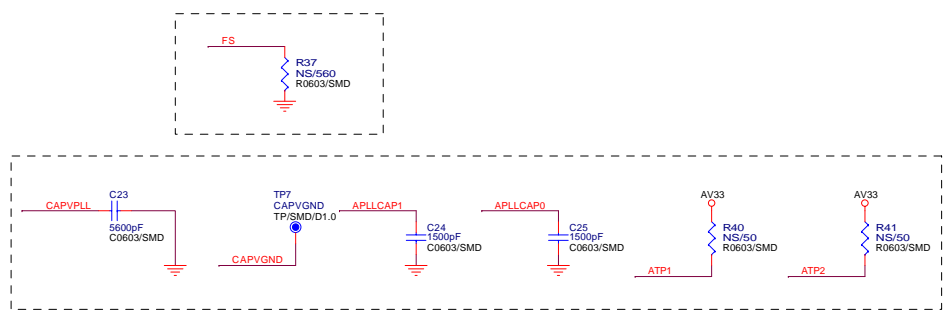
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MT5111 ASIC			
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MT5351



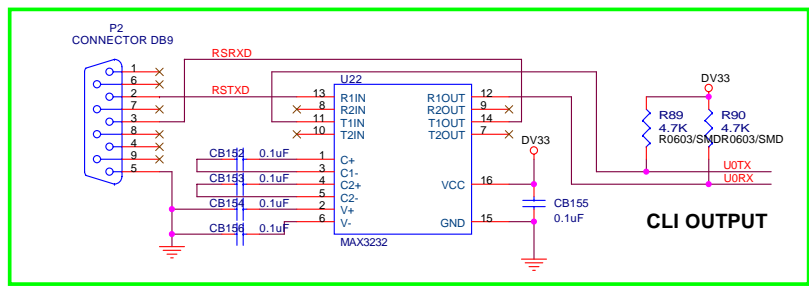
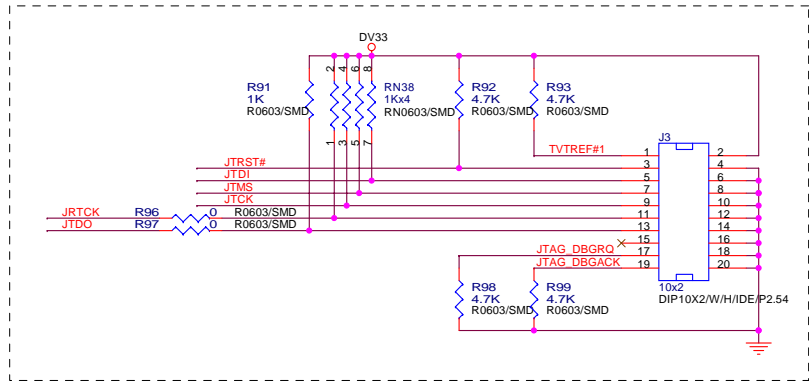
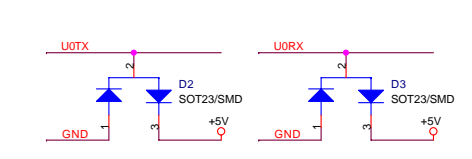
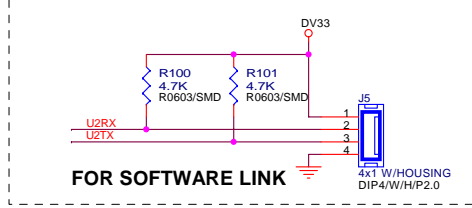
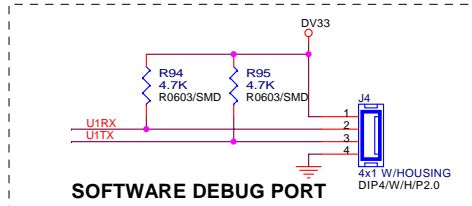
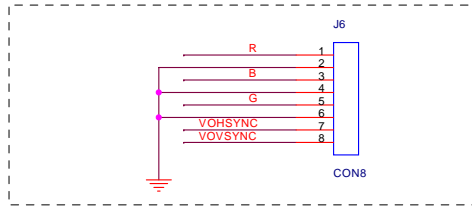
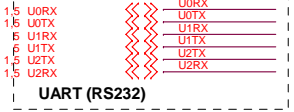
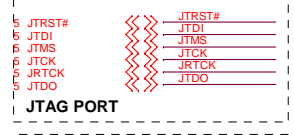
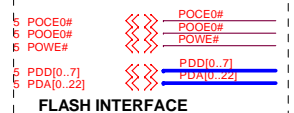
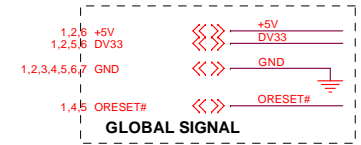
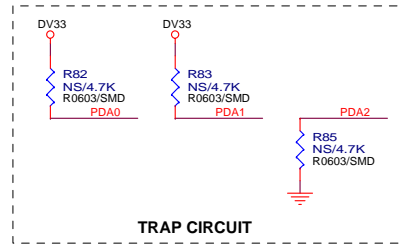
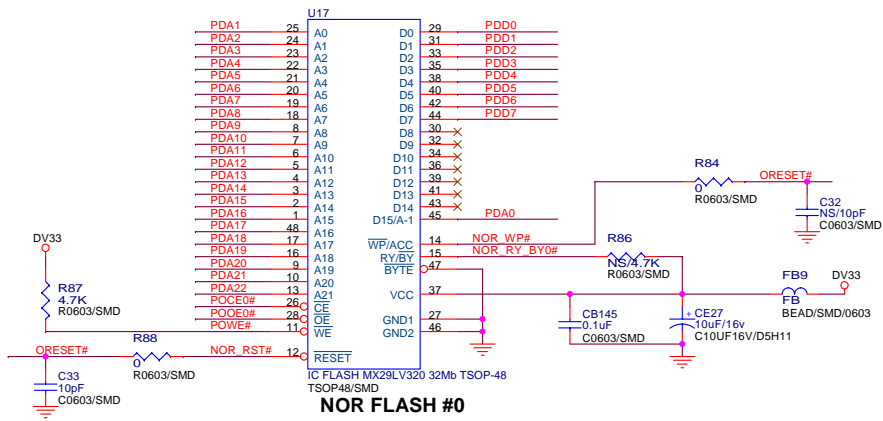
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Date	Monday, February 20, 2006	Sheet	1 of 8



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Main IC Specifications

- M13S128168A (ESMT)
2M x 16 Bit x 4 Banks Double Data Rate SDRAM
- MT5111CE
Single-Chip HDTV/CATV Demodulator
- MT5351
MT5351 is a DTV Backend Decoder SOC which support flexible transport demux, HD MPEG-2 video decoder, MPEG1,2, MP3, AC3 audio decoder, HDTV encoder. MT5351 is powered by ARM 926EJ with 16K I-Cache and 16K D-Cache. It can support 64Mb to 1Gb DDR DRAM devices with configurable 32/64 bit data bus interface.
- MT8202
MT8202G is a highly integrated Single-Chip for LCD TV supporting video input and output format up to HDTV. It includes 3D comb filter TV decoder to retrieve the best image from popular composite signals.
- MT8293
HDMI PanelLink Cinema Receiver
- R2S15102NP
Digital Power Amplifier R2S15102NP
- WM8776
24-bit, 192kHz Stereo CODEC with 5 Channel I/P Multiplexer

TFT LCD Preliminary Specification

MODEL NO.: V270B1 - L01

LCD TV Head Division	
AVP	郭振隆

QRA Dept.	TVHD / PDD		
	DDIII	DDII	DDI
Approval	Approval	Approval	Approval
陳永一	李汪洋	藍文錦	林文聰

LCD TV Marketing and Product Management Division	
Product Manager	陳立宜 謝芳宜

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 1.0	Jun. 15,'05	All	All	Preliminary Specification was first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

V270B1- L01 is a TFT Liquid Crystal Display module with 14-CCFL Backlight unit and 1ch-LVDS interface. The display diagonal is 27". This module supports 1366 x 768 WXGA format and can display true 16.7M colors(8-bits colors). The inverter module for backlight is built-in.

1.2 FEATURES

- Excellent brightness (550 nits)
- Ultra high contrast ratio (1000:1)
- Fast response time (8ms)
- High color saturation NTSC 75%
- WXGA (1366 x 768 pixels) resolution
- DE (Data Enable) only mode
- LVDS (Low Voltage Differential Signaling) interface
- Optimized response time for both 50/60 Hz frame rate
- Ultra wide viewing angle: 176(H)/176(V) (CR>20) Super MVA technology
- 180 degree rotation display option
- Low color shift function option
- Color reproduction (Nature color)

1.3 APPLICATION

- TFT LCD TVs
- High brightness, multi-media displays

1.4 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	596.259 (H) x 335.232 (V) (27" diagonal)	mm	(1)
Bezel Opening Area	603.22 (H) x 341.98 (V)	mm	
Driver Element	a-si TFT active matrix	-	
Pixel Number	1366 x R.G.B. x 768	pixel	
Pixel Pitch (Sub Pixel)	0.1460 (H) x 0.4365 (V)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Colors	16.7M	color	
Display Operation Mode	Transmissive mode / Normally black	-	
Surface Treatment	Hardness : 3H, Haze : 40% Anti-reflective coating < 2% reflection	-	

1.5 MECHANICAL SPECIFICATIONS

Item	Min.	Typ.	Max.	Unit	Note	
Module Size	Horizontal(H)	636.85	637.55	638.25	mm	
	Vertical(V)	379.1	379.8	380.5	mm	
	Depth(D)	33.9	35.4	36.9	mm	To PCB cover
	Depth(D)	39.2	40.7	42.2	mm	To inverter cover
Weight	3700	4000	4300	g		

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-20	+60	°C	(1)
Operating Ambient Temperature	T _{OP}	0	+50	°C	(1), (2)
Shock (Non-Operating)	S _{NOF}	-	50	G	(3), (5)
Vibration (Non-Operating)	V _{NOF}	-	1.0	G	(4), (5)

Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. (Ta ≤ 40 °C).

(b) Wet-bulb temperature should be 39 °C Max. (Ta > 40 °C).

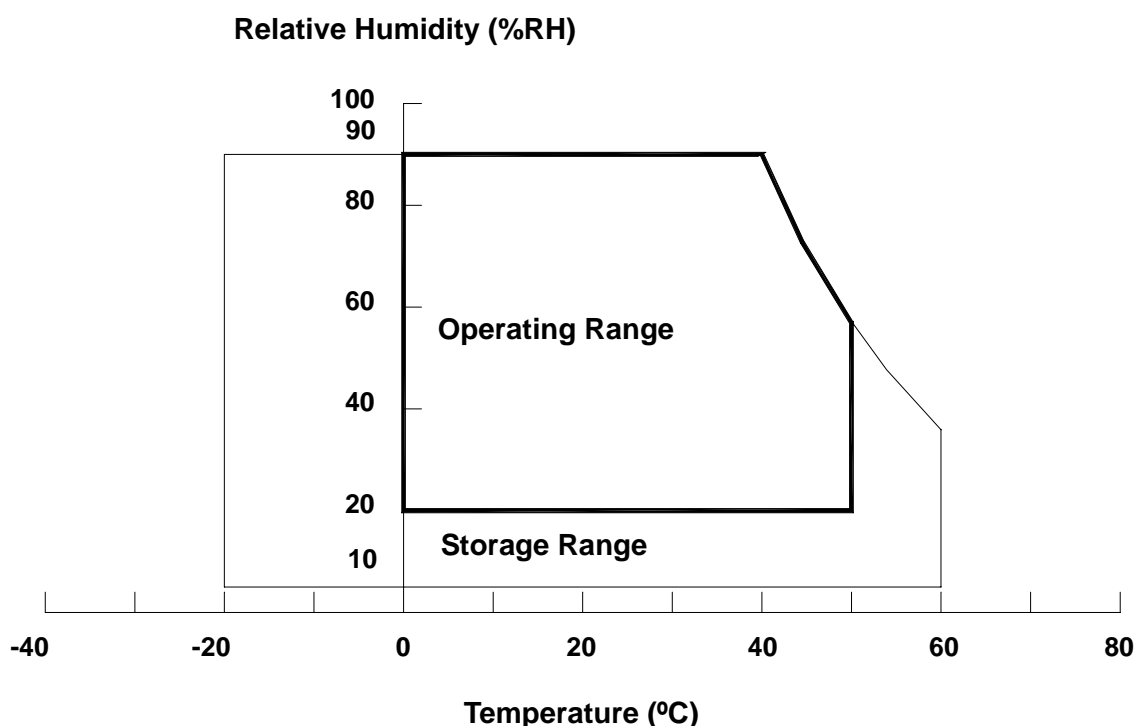
(c) No condensation.

Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 60 °C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 60 °C. The range of operating temperature may degrade in case of improper thermal management in final product design.

Note (3) 11 ms, half sine wave, 1 time for ± X, ± Y, ± Z.

Note (4) 10 ~ 500 Hz, 10 min, 1 time each X, Y, Z.

Note (5) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.



2.2 ELECTRICAL ABSOLUTE RATINGS

2.2.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	V _{CC}	-0.3	6.0	V	(1)
Input Signal Voltage	V _{IN}	-0.3	3.6	V	

2.2.2 BACKLIGHT UNIT

Item	Symbol	Test Condition	Min.	Type	Max.	Unit	Note
Lamp Voltage	V _W	T _a = 25	-	-	3000	V _{RMS}	
Power Supply Voltage	V _{BL}	-	0	-	30	V	(1)
Control Signal Level	-	-	-0.3	-	7	V	(1), (3)

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Functional operation should be restricted to the conditions described under normal operating conditions.

Note (2) No moisture condensation or freezing.

Note (3) The control signals includes Backlight On/Off Control, Internal PWM Control, External PWM Control and Internal/External PWM Selection.

3. ELECTRICAL CHARACTERISTICS

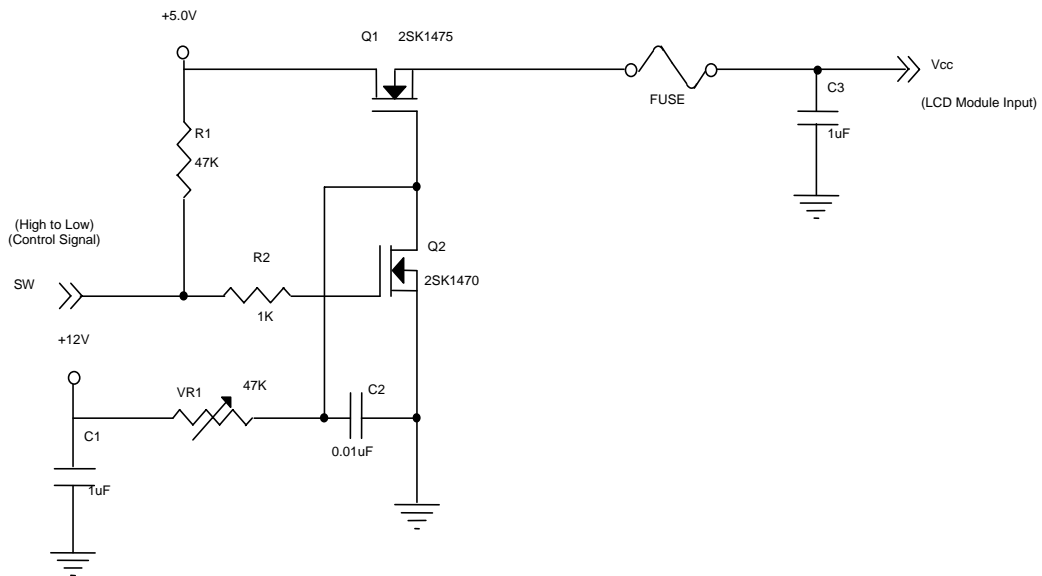
3.1 TFT LCD MODULE

Ta = 25 ± 2 °C

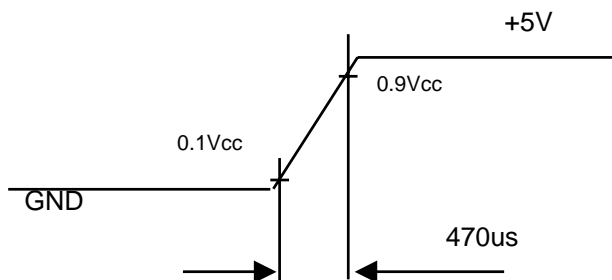
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V _{CC}	4.5	5.0	5.5	V	(1)
Power Supply Ripple Voltage		V _{RP}	-	-	150	mV	
Rush Current		I _{RUSH}	-	-	3.0	A	(2)
Power Supply Current	White	I _{CC}	-	1.8	-	A	(3)
	Black		-	1.2	-	A	
	Vertical Stripe		-	1.65	-	A	
LVDS Interface	Differential Input High Threshold Voltage	V _{LVTH}	-	-	+100	mV	
	Differential Input Low Threshold Voltage	V _{LVTL}	-100	-	-	mV	
	Common Input Voltage	V _{LVC}	1.125	1.25	1.375	V	
	Terminating Resistor	R _T		100		ohm	
CMOS interface	Input High Threshold Voltage	V _{IH}	2.7	-	3.3	V	
	Input Low Threshold Voltage	V _{IL}	0	-	0.7	V	

Note (1) The module should be always operated within above ranges.

Note (2) Measurement Conditions:

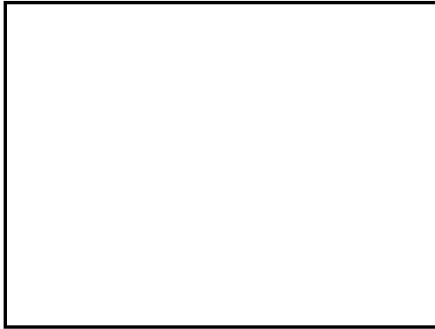


Vcc rising time is 470us



Note (3) The specified power supply current is under the conditions at $V_{cc} = 5\text{ V}$, $T_a = 25 \pm 2\text{ }^\circ\text{C}$, $f_v = 60\text{ Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern



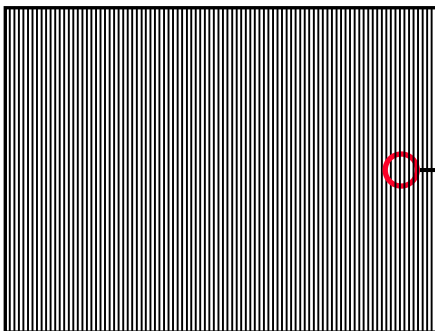
Active Area

b. Black Pattern

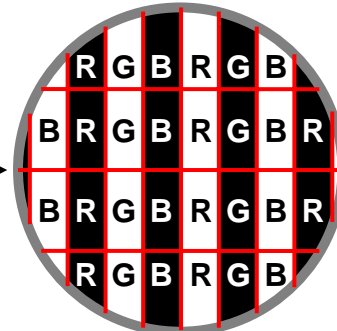


Active Area

c. Vertical Stripe Pattern



Active Area



3.2 BACKLIGHT INVERTER UNIT

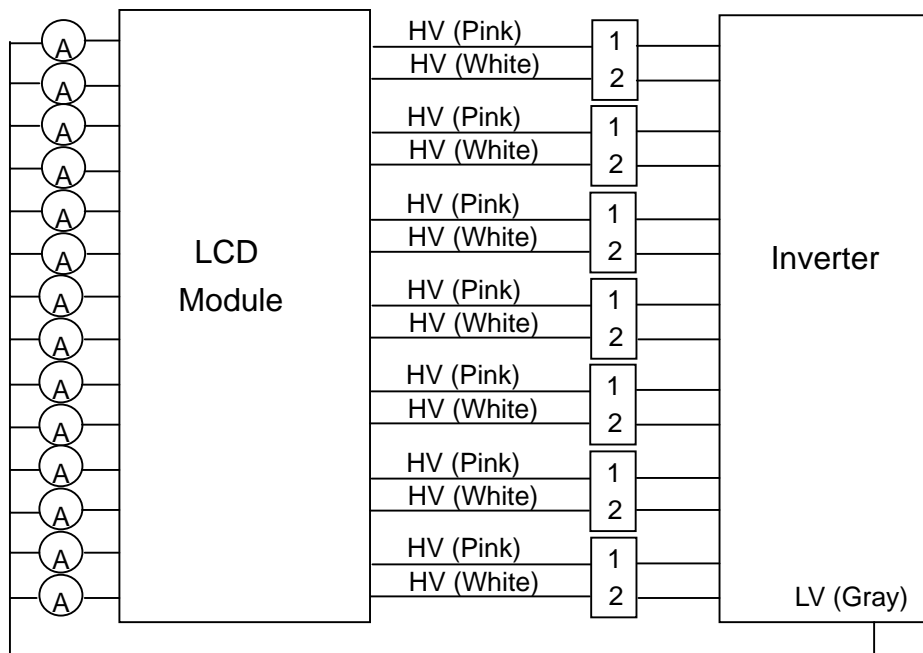
3.2.1 CCFL (Cold Cathode Fluorescent Lamp) CHARACTERISTICS ($T_a = 25 \pm 2\text{ }^\circ\text{C}$)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Voltage	V_w	-	1120	-	V_{RMS}	$I_L = 4.7\text{mA}$
Lamp Current	I_L	4.2	4.7	5.2	mA_{RMS}	(1)
Lamp Starting Voltage	V_s	-	-	1650	V_{RMS}	(2), $T_a = 0\text{ }^\circ\text{C}$
		-	-	1500	V_{RMS}	(2), $T_a = 25\text{ }^\circ\text{C}$
Operating Frequency	F_o	50	-	70	KHz	(3)
Lamp Life Time	L_{BL}	50,000	60,000	-	Hrs	(4)

3.2.2 INVERTER CHARACTERISTICS (Ta = 25 ± 2 °C)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Consumption	P _{BL}	-	92	-	W	(5), I _L = 4.7mA
Power Supply Voltage	V _{BL}	22.8	24	25.2	V _{DC}	
Power Supply Current	I _{BL}	-	3.8	-	A	Non Dimming
Input Ripple Noise	-	-	-	500	mV _{P-P}	V _{BL} = 22.8V
Backlight Turn on Voltage	V _{BS}	1790	-	-	V _{RMS}	Ta = 0 °C
		1200	-	-	V _{RMS}	Ta = 25 °C
Oscillating Frequency	F _W	53	56	59	kHz	
Dimming Frequency	F _B	150	160	170	Hz	
Minimum Duty Ratio	D _{MIN}	-	10	-	%	

Note (1) Lamp current is measured by utilizing high frequency current meters as shown below:



Note (2) The lamp starting voltage V_s should be applied to the lamp for more than 1 second under starting up duration. Otherwise the lamp could not be lighted on completed.

Note (3) The lamp frequency may produce interference with horizontal synchronous frequency from the display, and this may cause line flow on the display. In order to avoid interference, the lamp frequency should be detached from the horizontal synchronous frequency and its harmonics as far as possible.

Note (4) The life time of a lamp is defined as when the brightness is larger than 50% of its original value and the effective discharge length is longer than 80% of its original length (Effective discharge length is defined as an area that has equal to or more than 70% brightness compared to the brightness at the center point.) as the time in which it continues to operate under the condition $T_a = 25 \pm 2$ and $I_L = 4.2 \sim 5.2 \text{ mA}_{\text{RMS}}$.

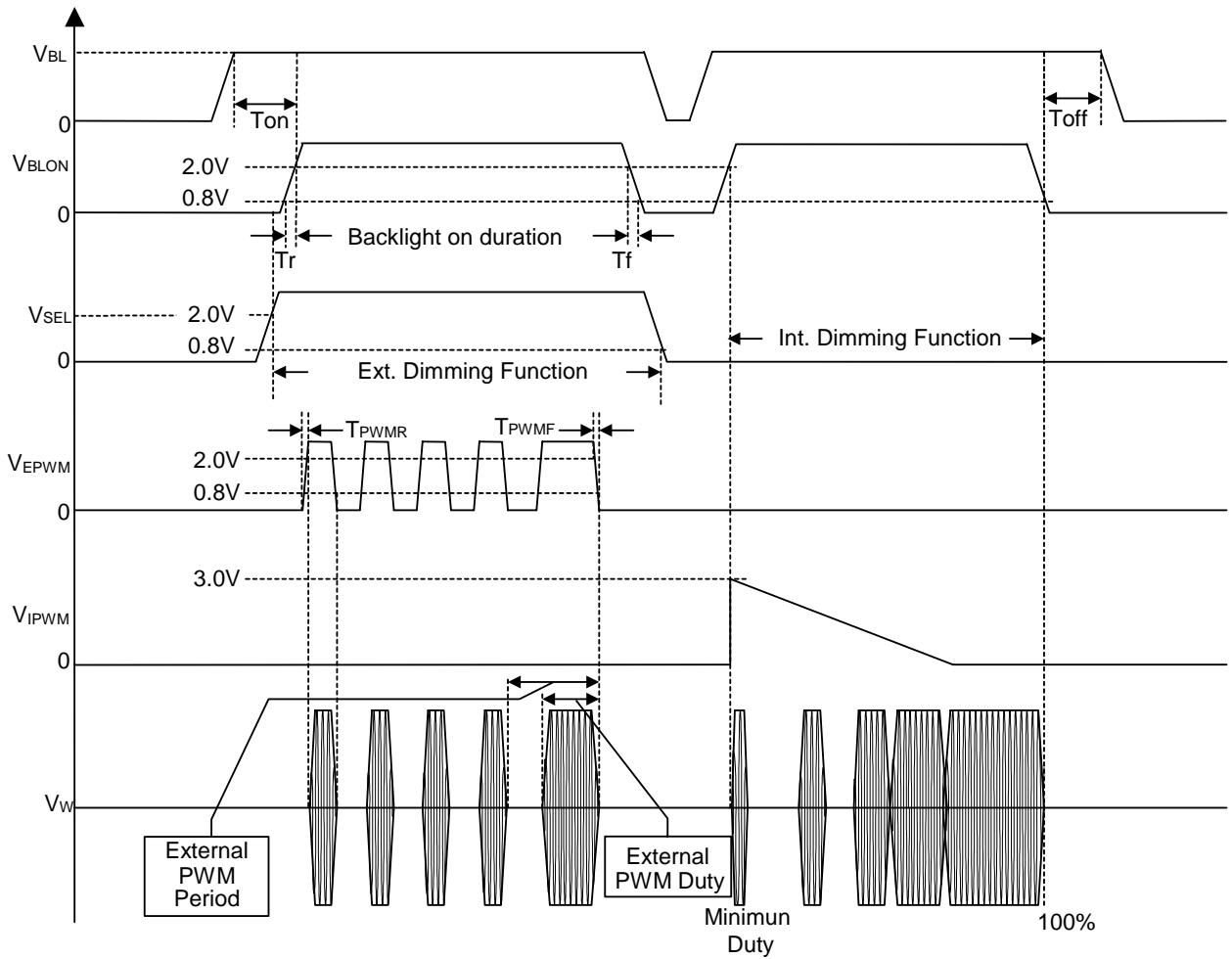
Note (5) The power supply capacity should be higher than the total inverter power consumption P_{BL} . Since the pulse width modulation (PWM) mode was applied for backlight dimming, the driving current changed as PWM duty on and off. The transient response of power supply should be considered for the changing loading when inverter dimming.

3.2.3 INVERTER INTERFACE CHARACTERISTICS

Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit	Note	
On/Off Control Voltage	ON	V_{BLON}	-	2.0	-	5.0	V	
	OFF		-	0	-	0.8	V	
Internal/External PWM Select Voltage	HI	V_{SEL}	-	2.0	-	5.0	V	
	LO		-	0	-	0.8	V	
Internal PWM Control Voltage	MAX	V_{IPWM}	$V_{\text{SEL}} = \text{L}$	-	-	3.0	V	minimum duty ratio
	MIN			-	0	-	V	maximum duty ratio
External PWM Control Voltage	HI	V_{EPWM}	$V_{\text{SEL}} = \text{H}$	2.0	-	5.0	V	duty on
	LO			0	-	0.8	V	duty off
Control Signal Rising Time	T_r	-	-	-	100	ms		
Control Signal Falling Time	T_f	-	-	-	100	ms		
PWM Signal Rising Time	T_{PWMR}	-	-	-	50	us		
PWM Signal Falling Time	T_{PWMF}	-	-	-	50	us		
Input impedance	R_{IN}	-	1	-	-	M		
BLON Delay Time	T_{on}	-	1	-	-	ms		
BLON Off Time	T_{off}	-	1	-	-	ms		

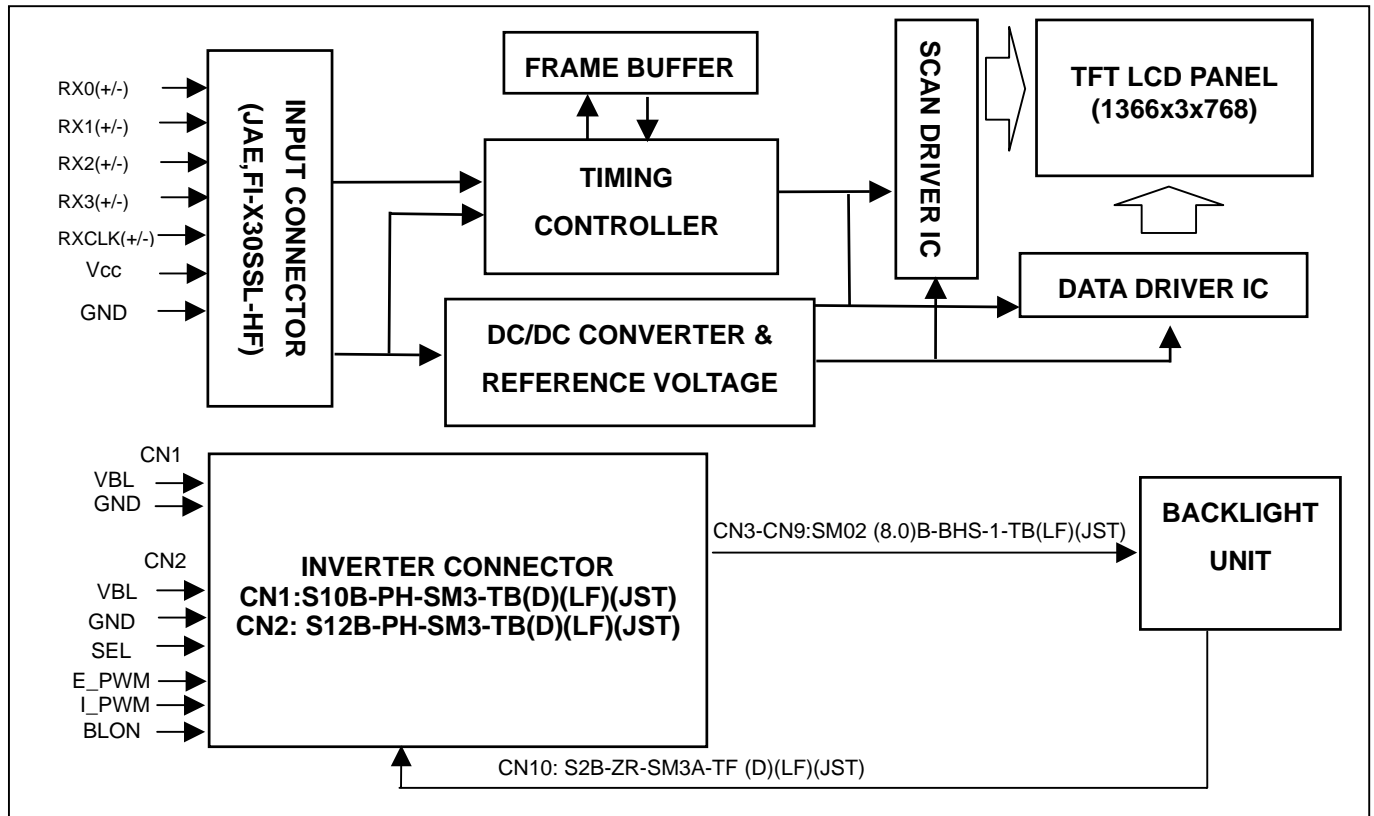
Note (1) The SEL signal should be valid before backlight turns on by BLON signal. It is inhibited to change the internal/external PWM selection (SEL) during backlight turn on period.

Note (2) The power sequence and control signal timing are shown as the following figure.



4. BLOCK DIAGRAM

4.1 TFT LCD MODULE



5. INTERFACE PIN CONNECTION

5.1 TFT LCD MODULE

CNF1 Connector Pin Assignment

Pin No.	Symbol	Description	Note
1	GND	Ground	
2	RPF	Display Rotation	(3)
3	SELLVDS	Select LVDS data format	(5)
4	NC	No Connection	(2)
5	NC	No Connection	
6	ODSEL	Overdrive Lookup Table Selection	(4)
7	EN LCS	Low Color Shift	(6)
8	GND	Ground	
9	RX0-	Negative transmission data of pixel 0	
10	RX0+	Positive transmission data of pixel 0	
11	RX1-	Negative transmission data of pixel 1	
12	RX1+	Positive transmission data of pixel 1	
13	RX2-	Negative transmission data of pixel 2	
14	RX2+	Positive transmission data of pixel 2	
15	RXCLK-	Negative of clock	
16	RXCLK+	Positive of clock	
17	RX3-	Negative transmission data of pixel 3	
18	RX3+	Positive transmission data of pixel 3	
19	GND	Ground	
20	GND	Ground	
21	GND	Ground	
22	GND	Ground	
23	GND	Ground	
24	GND	Ground	
25	GND	Ground	
26	VCC	Power supply: +5V	
27	VCC	Power supply: +5V	
28	VCC	Power supply: +5V	
29	VCC	Power supply: +5V	
30	VCC	Power supply: +5V	

Note (1) Connector Part No.: FI-X30SSL-HF(JAE) or compatible

Note (2) Reserved for internal use. Left it open.

Note (3) Low : normal display (default), High : display with 180 degree rotation

Note (4) Overdrive lookup table selection. The Overdrive lookup table should be selected in accordance to the frame rate to optimize image quality.

ODSEL	Note
L	Lookup table was optimized for 60 Hz frame rate.
H	Lookup table was optimized for 50 Hz frame rate.

Note (5) Please refer to 5.5 LVDS INTERFACE (Page 17)

Note (6) Enable Low color shift function.

EN LCS	Note
L	Low color shift off
H	Low color shift on

5.2 BACKLIGHT UNIT

The pin configuration for the housing and leader wire is shown in the table below.

CN3-CN9 (Housing): BHR-03VS-1 (JST)

Pin No.	Symbol	Description	Wire Color
1	HV	High Voltage	Pink
2	HV	High Voltage	White

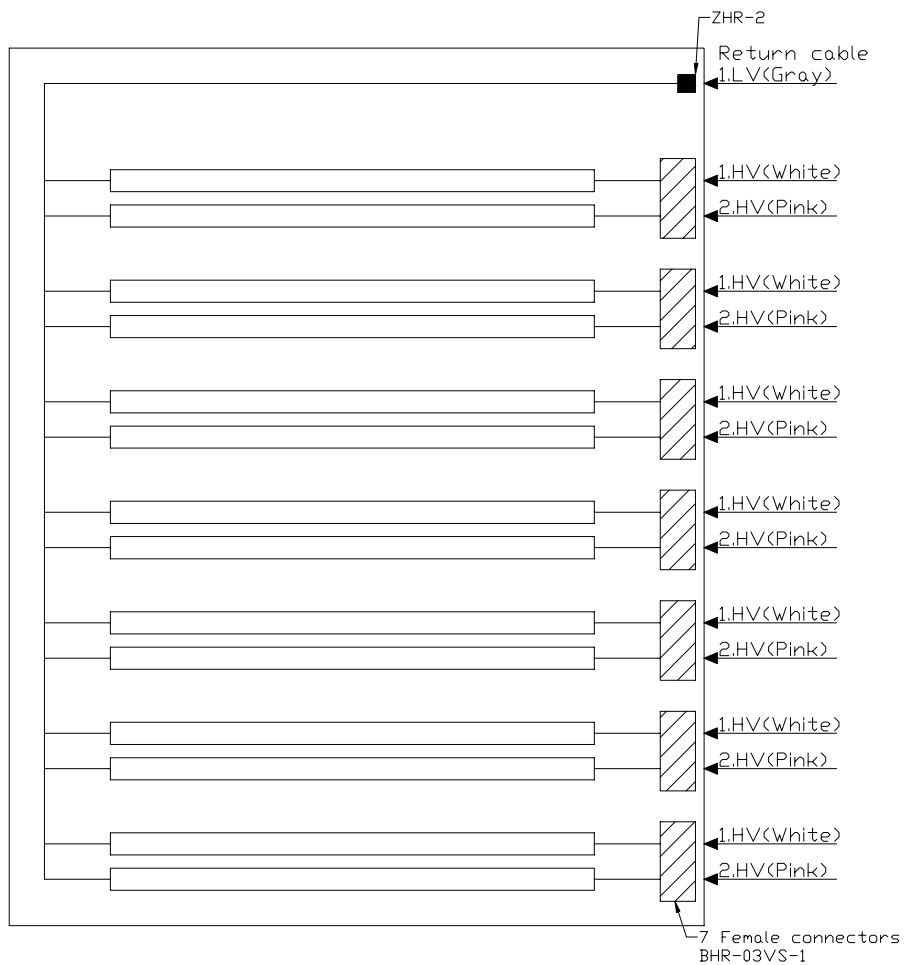
Note (1) The backlight interface housing for high voltage side is a model BHR-03VS-1, manufactured by JST.

The mating header on inverter part number is SM02(8.0)B-BHS-1-TB(LF) or equivalent.

CN10 (Housing): ZHR-2 (JST) or equivalent

Pin No.	Symbol	Description	Wire Color
1	LV	Low Voltage (+)	Gray
2	NC	No Connection	-

Note (2) The backlight interface housing and return cable for low voltage side is a model ZHR-2 , manufactured by JST or equivalent. The mating header on inverter part number is S2B-ZR-SM3A-TF(D)(LF) or equivalent.



5.3 INVERTER UNIT

CN1(Header):S10B-PH-SM3-TB(D)(LF)(JST) or equivalent.

Pin	Name	Description
1	VBL	+24V Power input
2		
3		
4		
5		
6	GND	Ground
7		
8		
9		
10		

CN2(Header): S12B-PH-SM3-TB(D)(LF)(JST) or equivalent.

Pin	Name	Description
1	VBL	+24V Power input
2		
3		
4		
5		
6	GND	Ground
7		
8		
9	SEL	Internal/external PWM selection High : external dimming Low : internal dimming
10	E_PWM	External PWM control signal E_PWM should be connected to low when internal PWM was selected (SEL = low).
11	I_PWM	Internal PWM control signal I_PWM should be connected to ground when external PWM was selected (SEL = high).
12	BLON	Backlight on/off control

CN3-CN9(Header): SM02(8.0)B-BHS-1-TB(LF)(JST) or equivalent

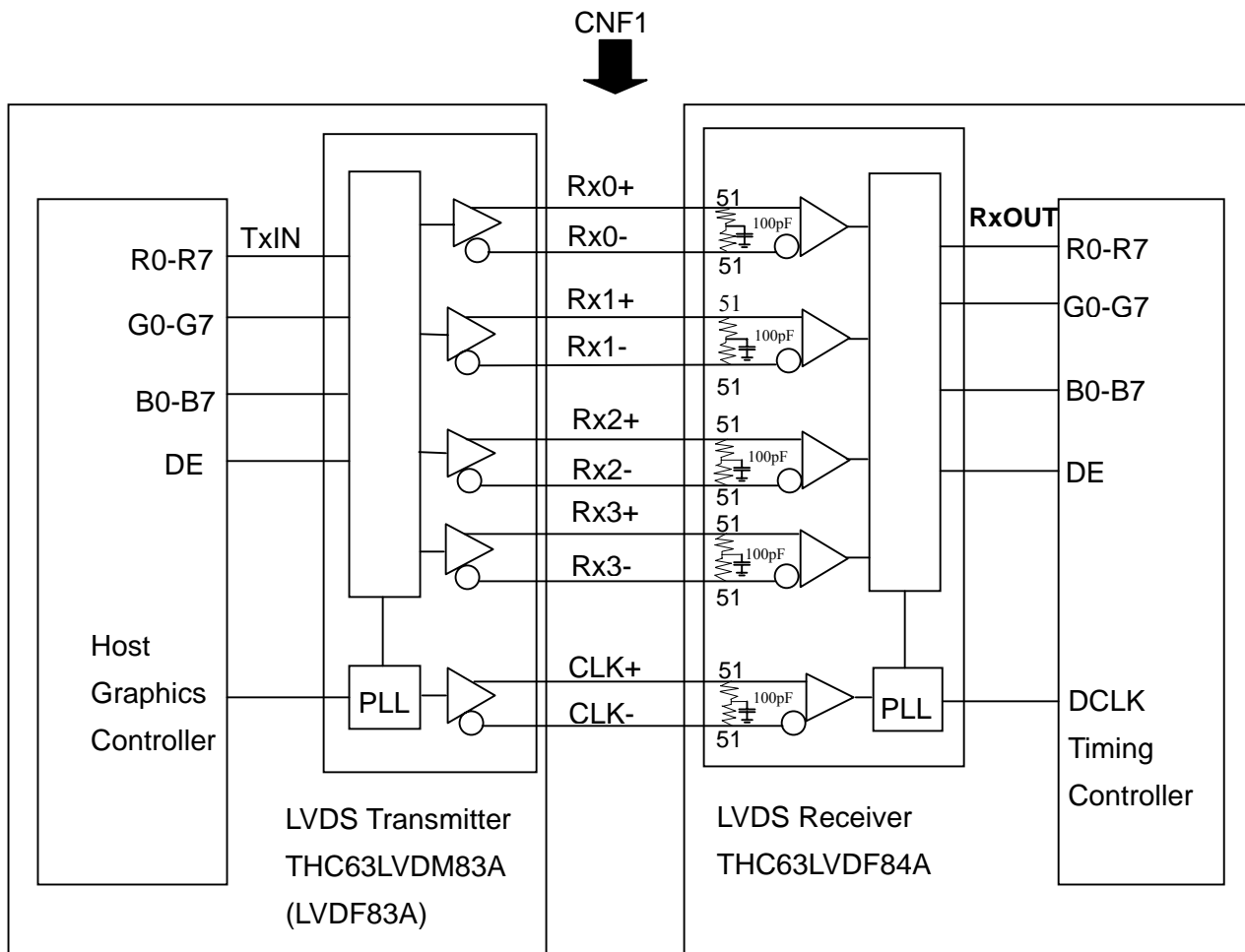
Pin	Name	Description
1	CCFL HOT	CCFL high voltage
2	CCFL HOT	CCFL high voltage

CN10(Header): S2B-ZR-SM3A-TF(D)(LF)(JST) or equivalent

Pin	Name	Description
1	CCFL COLD	CCFL low voltage
2	NC	-

Note (1) Floating of any control signal is not allowed.

5.4 BLOCK DIAGRAM OF INTERFACE



R0-R7 : Pixel R Data ,
 G0-G7 : Pixel G Data ,
 B0-B7 : Pixel B Data ,
 DE : Data enable signal

Note (1) The system must have the transmitter to drive the module.

Note (2) LVDS cable impedance shall be 50 ohms per signal line or about 100 ohms per twist-pair line when it is used differentially.

5.5 LVDS INTERFACE

	SIGNAL		TRANSMITTER THC63LVDM83A		INTERFACE CONNECTOR		RECEIVER THC63LVDF84A		TFT CONTROL INPUT			
	SELLVDS =L	SELLVDS =H	PIN	INPUT	Host	TFT-LCD	PIN	OUTPUT	SELLVDS =L	SELLVDS =H		
24 bit	R0	R2	51	TxIN0	TA OUT0+	Rx 0+	27	Rx OUT0	R0	R2		
	R1	R3	52	TxIN1			29	Rx OUT1	R1	R3		
	R2	R4	54	TxIN2			30	Rx OUT2	R2	R4		
	R3	R5	55	TxIN3			32	Rx OUT3	R3	R5		
	R4	R6	56	TxIN4			33	Rx OUT4	R4	R6		
	R5	R7	3	TxIN6			TA OUT0-	Rx 0-	35	Rx OUT6	R5	R7
	G0	G2	4	TxIN7			TA OUT1+	Rx 1+	37	Rx OUT7	G0	G2
	G1	G3	6	TxIN8	38	Rx OUT8			G1	G3		
	G2	G4	7	TxIN9	39	Rx OUT9			G2	G4		
	G3	G5	11	TxIN12	43	Rx OUT12			G3	G5		
	G4	G6	12	TxIN13	45	Rx OUT13			G4	G6		
	G5	G7	14	TxIN14	46	Rx OUT14			G5	G7		
	B0	B2	15	TxIN15	TA OUT1-	Rx 1-			47	Rx OUT15	B0	B2
	B1	B3	19	TxIN18	TA OUT2+	Rx 2+	51	Rx OUT18	B1	B3		
	B2	B4	20	TxIN19			53	Rx OUT19	B2	B4		
	B3	B5	22	TxIN20			54	Rx OUT20	B3	B5		
	B4	B6	23	TxIN21			55	Rx OUT21	B4	B6		
	B5	B7	24	TxIN22			1	Rx OUT22	B5	B7		
	DE	DE	30	TxIN26			TA OUT2-	Rx 2-	6	Rx OUT26	DE	DE
	R6	R0	50	TxIN27					7	Rx OUT27	R6	R0
	R7	R1	2	TxIN5	34	Rx OUT5			R7	R1		
	G6	G0	8	TxIN10	41	Rx OUT10			G6	G0		
	G7	G1	10	TxIN11	42	Rx OUT11			G7	G1		
	B6	B0	16	TxIN16	TA OUT3+	Rx 3+			49	Rx OUT16	B6	B0
	B7	B1	18	TxIN17	TA OUT3-	Rx 3-			50	Rx OUT17	B7	B1
RSVD 1	RSVD 1	25	TxIN23	2			Rx OUT23	NC	NC			
RSVD 2	RSVD 2	27	TxIN24	3			Rx OUT24	NC	NC			
RSVD 3	RSVD 3	28	TxIN25	5			Rx OUT25	NC	NC			
	DCLK	31	TxCLK IN	TxCLK OUT+			RxCLK IN+	26	RxCLK OUT	DCLK		
				TxCLK OUT-			RxCLK IN-					

R0~R7: Pixel R Data (7; MSB, 0; LSB)

G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE: Data enable signal

Notes(1) RSVD(reserved)pins on the transmitter shall be "H" or "L".

5.6 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																						
		Red								Green								Blue						
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale Of Green	Green(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	
Gray Scale Of Blue	Blue(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	

Note (1) 0: Low Level Voltage, 1: High Level Voltage

6. INTERFACE TIMING

6.1 INPUT SIGNAL TIMING SPECIFICATIONS

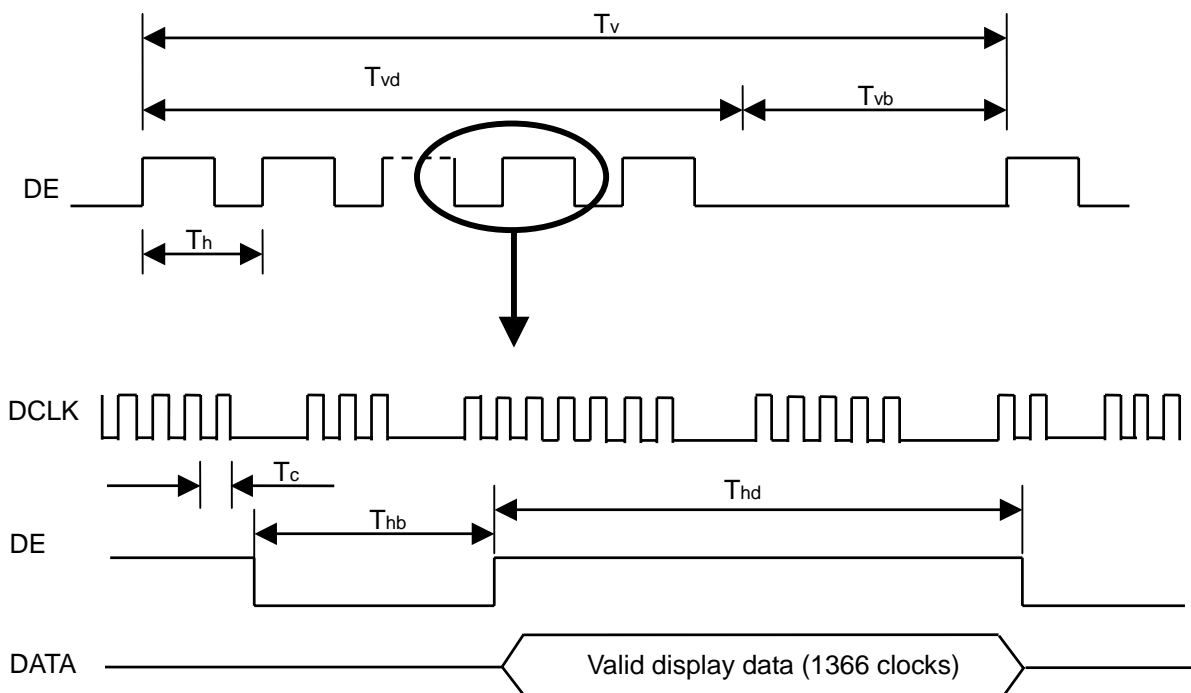
The input signal timing specifications are shown as the following table and timing diagram.

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Receiver Clock	Frequency	1/Tc	60	86	88	MHz	
	Input cycle to cycle jitter	Trcl	-	-	200	ps	
LVDS Receiver Data	Setup Time	Tlvsu	600	-	-	ps	
	Hold Time	Tlvhd	600	-	-	ps	
Vertical Active Display Term	Frame Rate	Fr5	47	50	53	Hz	(2)
		Fr6	57	60	63	Hz	
	Total	Tv	770	795	888	Th	Tv=Tvd+Tvb
	Display	Tvd	768	768	768	Th	-
	Blank	Tvb	2	27	120	Th	-
Horizontal Active Display Term	Total	Th	1436	1798	1936	Tc	Th=Thd+Thb
	Display	Thd	1366	1366	1366	Tc	-
	Blank	Thb	70	432	570	Tc	-

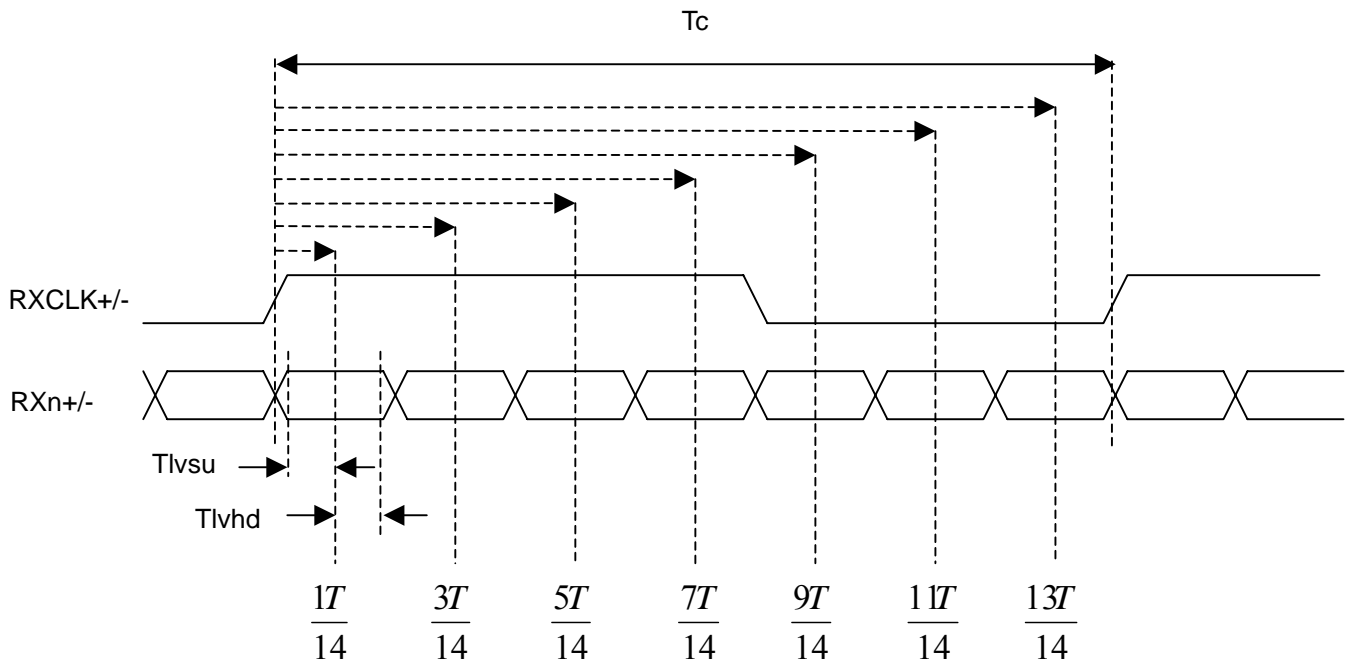
Note (1) Since this module is operated in DE only mode, Hsync and Vsync input signals should be set to low logic level. Otherwise, this module would operate abnormally.

(2) Please refer to 5.1 for detail information.

INPUT SIGNAL TIMING DIAGRAM

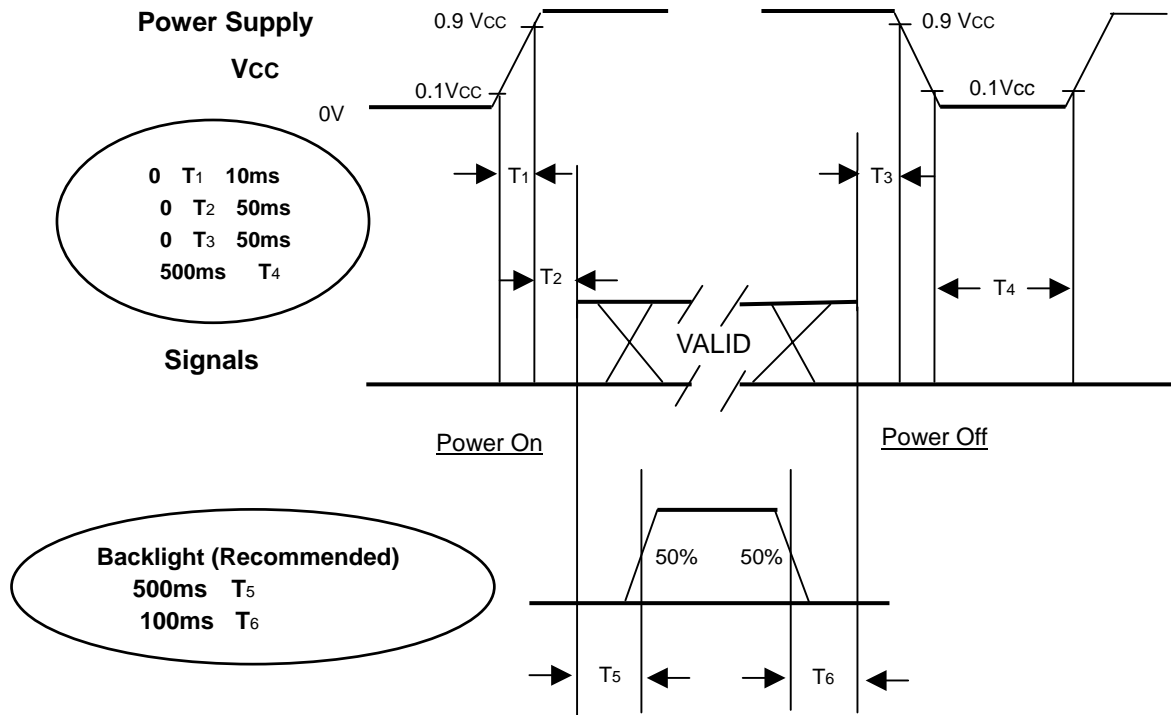


LVDS RECEIVER INTERFACE TIMING DIAGRAM



6.2 POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should be as the diagram below.



Power ON/OFF Sequence

- Note (1) The supply voltage of the external system for the module input should follow the definition of Vcc.
- Note (2) Apply the lamp voltage within the LCD operation range. When the backlight turns on before the LCD operation or the LCD turns off before the backlight turns off, the display may momentarily become abnormal screen.
- Note (3) In case of Vcc is in off level, please keep the level of input signals on the low or high impedance.
- Note (4) T4 should be measured after the module has been fully discharged between power off and on period.
- Note (5) Interface signal shall not be kept at high impedance when the power is on.

7. OPTICAL CHARACTERISTICS

7.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V _{CC}	5.0	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
Lamp Current	I _L	4.7 ± 0.5	mA
Oscillating Frequency (Inverter)	F _W	56 ± 3	KHz

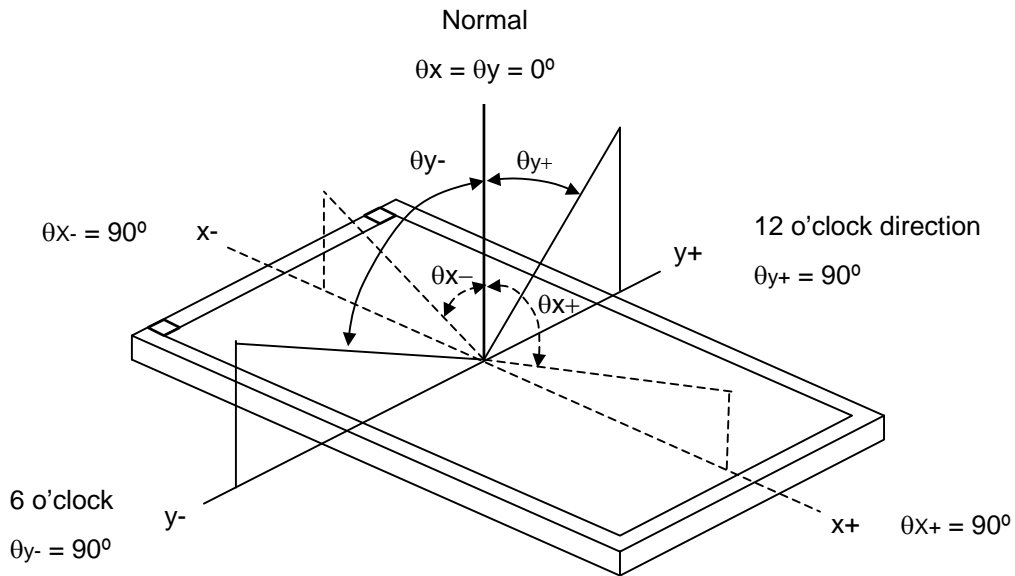
7.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown in 7.2. The following items should be measured under the test conditions described in 7.1 and stable environment shown in Note (6).

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	Viewing Normal Angle $\theta_x=0^\circ, \theta_y=0^\circ$		(1000)		-	(2)
Response Time		Gray to gray average			(8)		ms	(3)
Center Luminance of White		L _C			(550)		cd/m ²	(4)
White Variation		δW				(1.3)	-	(7)
Cross Talk		CT				(4)	%	(5)
Color Chromaticity	Red	R _x			(0.652)		-	(6)
		R _y			(0.331)		-	
	Green	G _x			(0.275)		-	
		G _y			(0.597)		-	
	Blue	B _x			(0.143)		-	
		B _y		(0.063)		-		
	White	W _x		(0.285)		Target		
	W _y		(0.293)					
Color Gamut		CG		(75)		%	NTSC	
Viewing Angle	Horizontal	θ _{x+}	CR≥20		(88)		Deg.	(1)
		θ _{x-}			(88)			
	Vertical	θ _{y+}			(88)			
		θ _{y-}			(88)			

Note (1) Definition of Viewing Angle (θ_x, θ_y):

Viewing angles are measured by EZ-Contrast 160R (Eldim)



Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

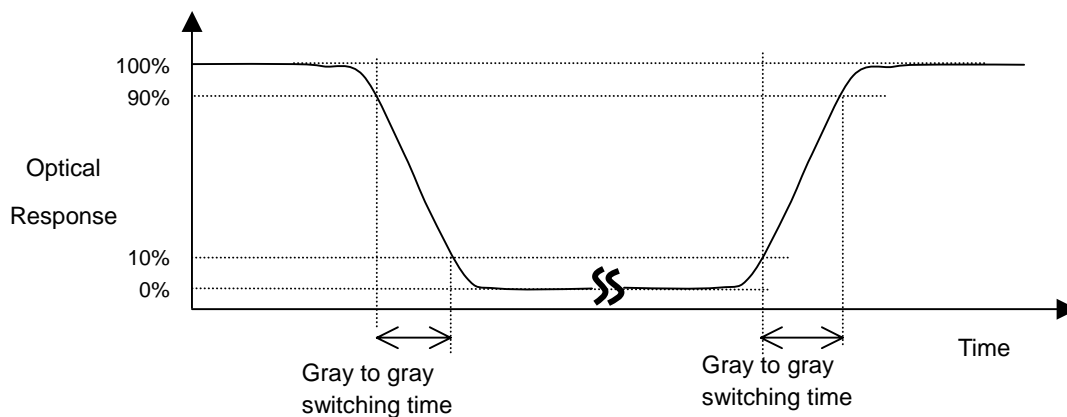
L255: Luminance of gray level 255

L 0: Luminance of gray level 0

$$\text{CR} = \text{CR} (5)$$

CR (X) is corresponding to the Contrast Ratio of the point X at the figure in Note (7).

Note (3) Definition of Gray to Gray Switching Time :



The driving signal means the signal of gray level 0, 63, 127, 191, 255.

Gray to gray average time means the average switching time of gray level 0 ,63,127,191,255 to each other .

Note (4) Definition of Luminance of White (L_C, L_{AVE}):

Measure the luminance of gray level 255 at center point and 5 points

$$L_C = L(5)$$

$$L_{AVE} = [L(1) + L(2) + L(3) + L(4) + L(5)] / 5$$

$L(x)$ is corresponding to the luminance of the point X at the figure in Note (7).

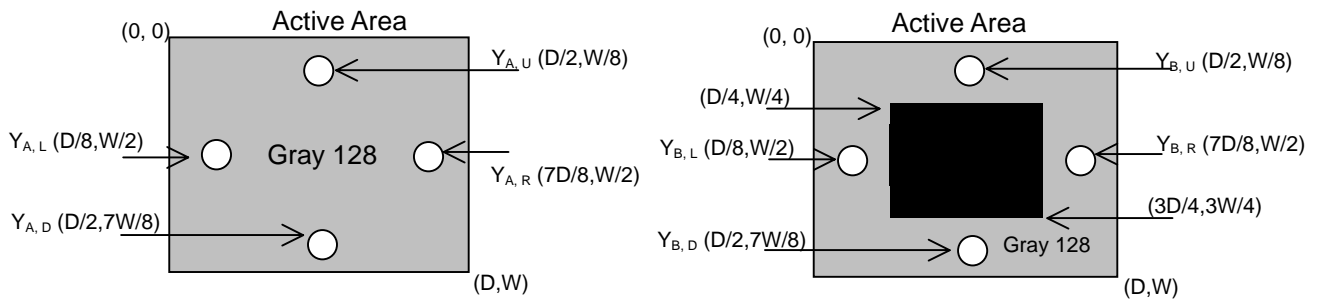
Note (5) Definition of Cross Talk (CT):

$$CT = |Y_B - Y_A| / Y_A \times 100 (\%)$$

Where:

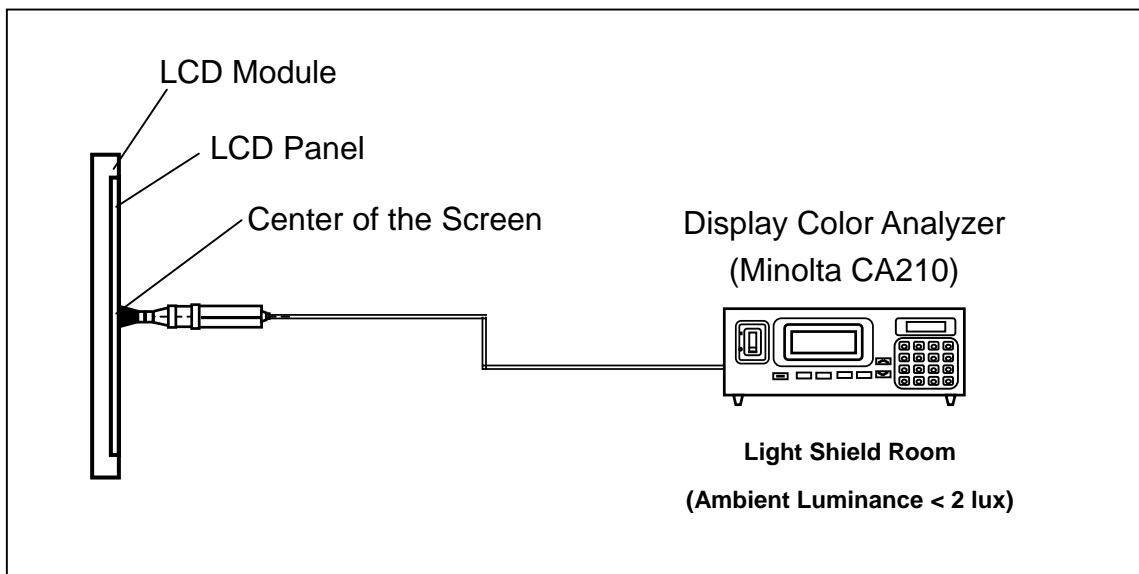
Y_A = Luminance of measured location without gray level 0 pattern (cd/m^2)

Y_B = Luminance of measured location with gray level 0 pattern (cd/m^2)



Note (6) Measurement Setup:

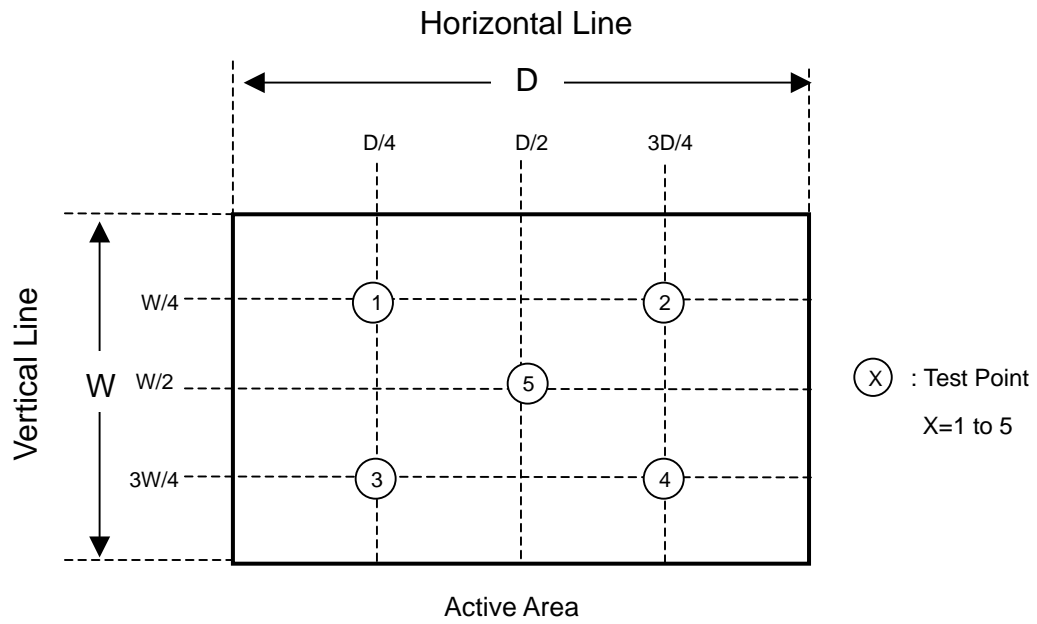
The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 1 hour in a windless room.



Note (7) Definition of White Variation (δW):

Measure the luminance of gray level 255 at 5 points

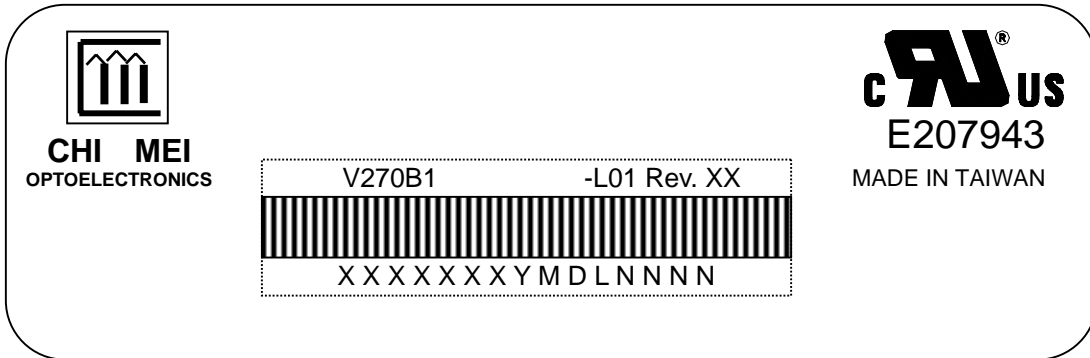
$$\delta W = \text{Maximum} [L(1), L(2), L(3), L(4), L(5)] / \text{Minimum} [L(1), L(2), L(3), L(4), L(5)]$$



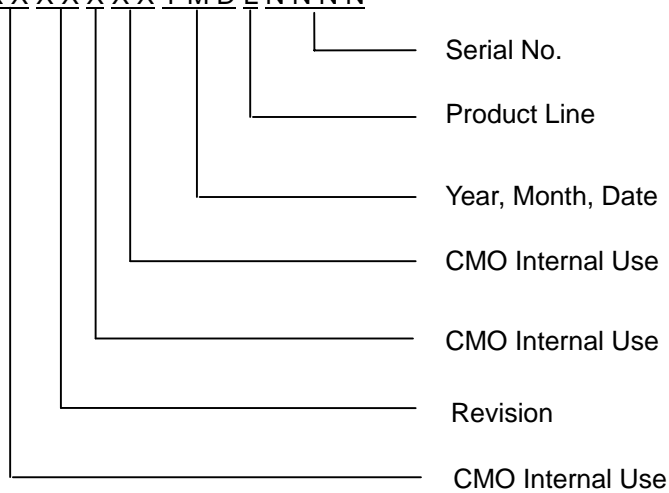
8. DEFINITION OF LABELS

8.1 CMO MODULE LABEL

The barcode nameplate is pasted on each module as illustration, and its definitions are as following explanation.



- (a) Model Name: V270B1-L01
- (b) Revision: Rev. XX, for example: A0, A1... B1, B2... or C1, C2...etc.
- (c) Serial ID: XXXXXXXXYMDLNNNN



Serial ID includes the information as below:

- (a) Manufactured Date: Year: 1~9, for 2001~2009
 Month: 1~9, A~C, for Jan. ~ Dec.
 Day: 1~9, A~Y, for 1st to 31st, exclude I ,O, and U.
- (b) Revision Code: Cover all the change
- (c) Serial No.: Manufacturing sequence of product
- (d) Product Line: 1 -> Line1, 2 -> Line 2, ...etc.

9. PACKAGING

9.1 PACKING SPECIFICATIONS

- (1) 4 LCD TV modules / 1 Box
- (2) Box dimensions : 742(L) X 327 (W) X 510 (H)
- (3) Weight : approximately 19Kg (4 modules per box)

9.2 PACKING METHOD

Figures 9-1 and 9-2 are the packing method

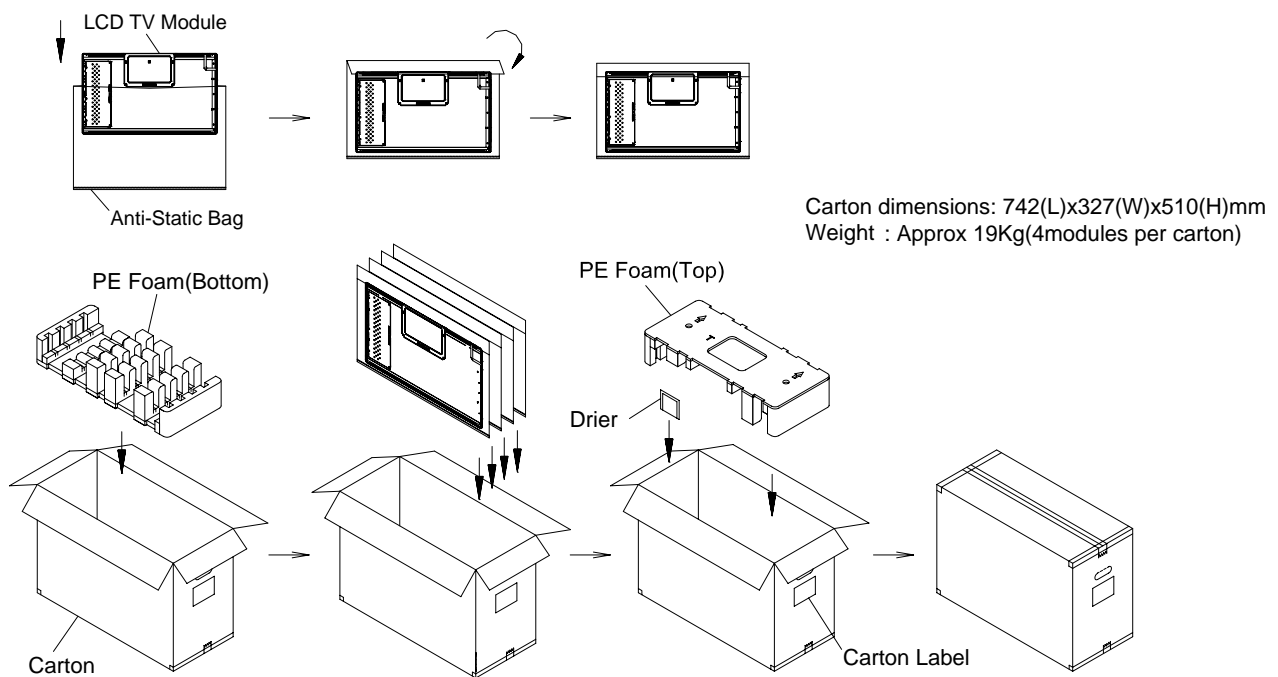


Figure.9-1 packing method

Corner Protector:L1020*50mm*50mm
Pallet:L1100*W1100*H135mm
Corrugated Fiberboard:L1100*W1100mm
Pallet Stack:L1100*W1100*H1160mm
Gross:168kg

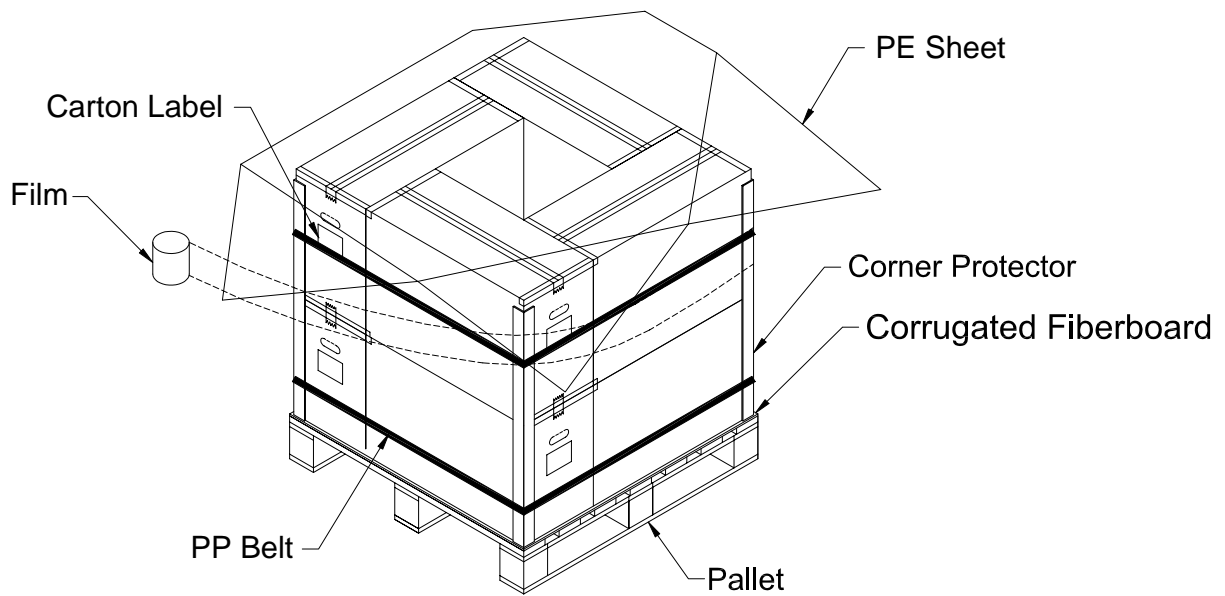


Figure. 9-2 packing method

10. PRECAUTIONS

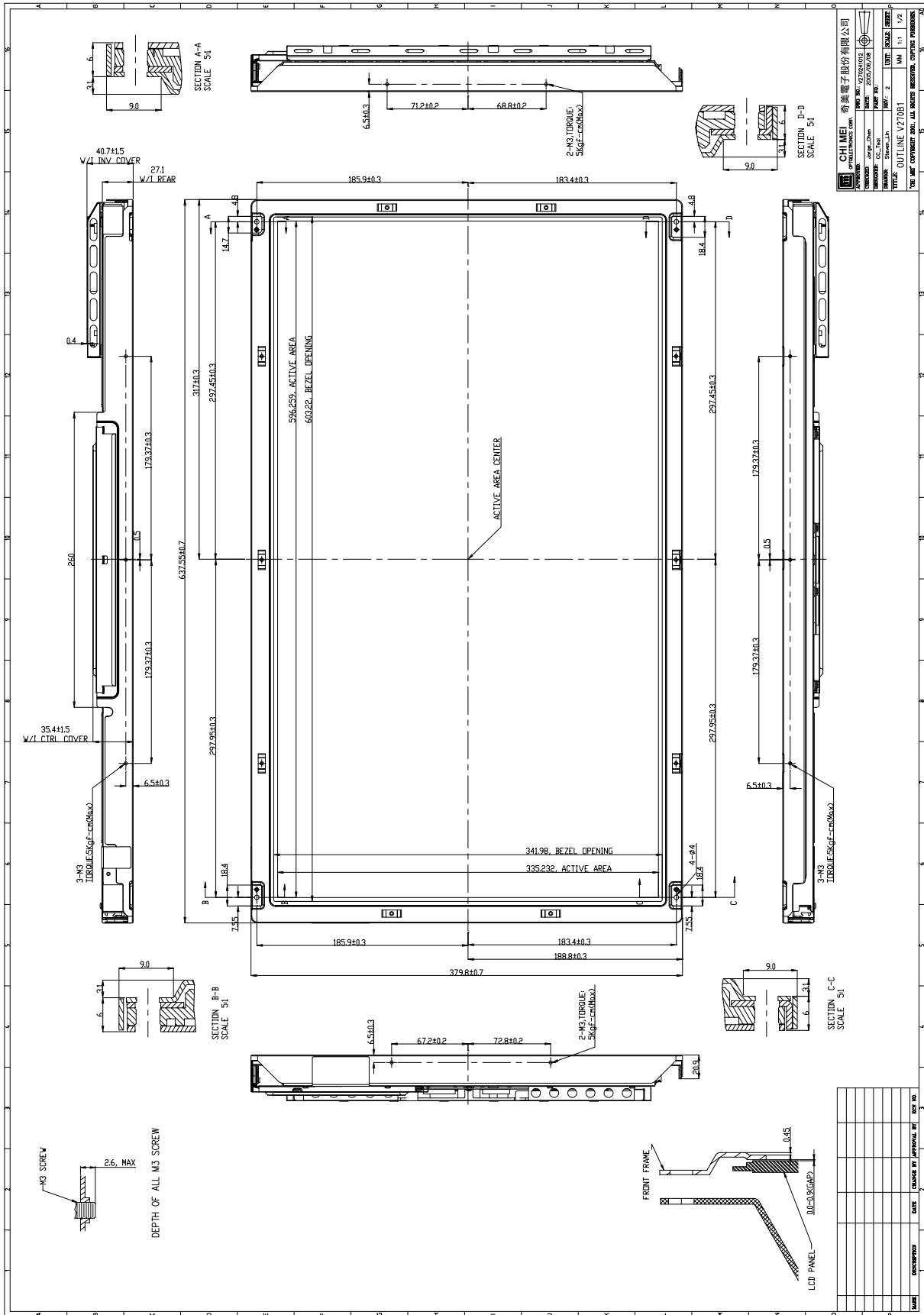
10.1 ASSEMBLY AND HANDLING PRECAUTIONS

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) It is recommended to assemble or to install a module into the user's system in clean working areas.
The dust and oil may cause electrical short or worsen the polarizer.
- (3) Do not apply pressure or impulse to the module to prevent the damage of LCD panel and backlight.
- (4) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.
- (5) Do not plug in or pull out the I/F connector while the module is in operation.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (9) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD modules in the specified storage conditions.
- (10) When ambient temperature is lower than 10°C, the display quality might be reduced. For example, the response time will become slow, and the starting voltage of CCFL will be higher than that of room temperature.

10.2 SAFETY PRECAUTIONS

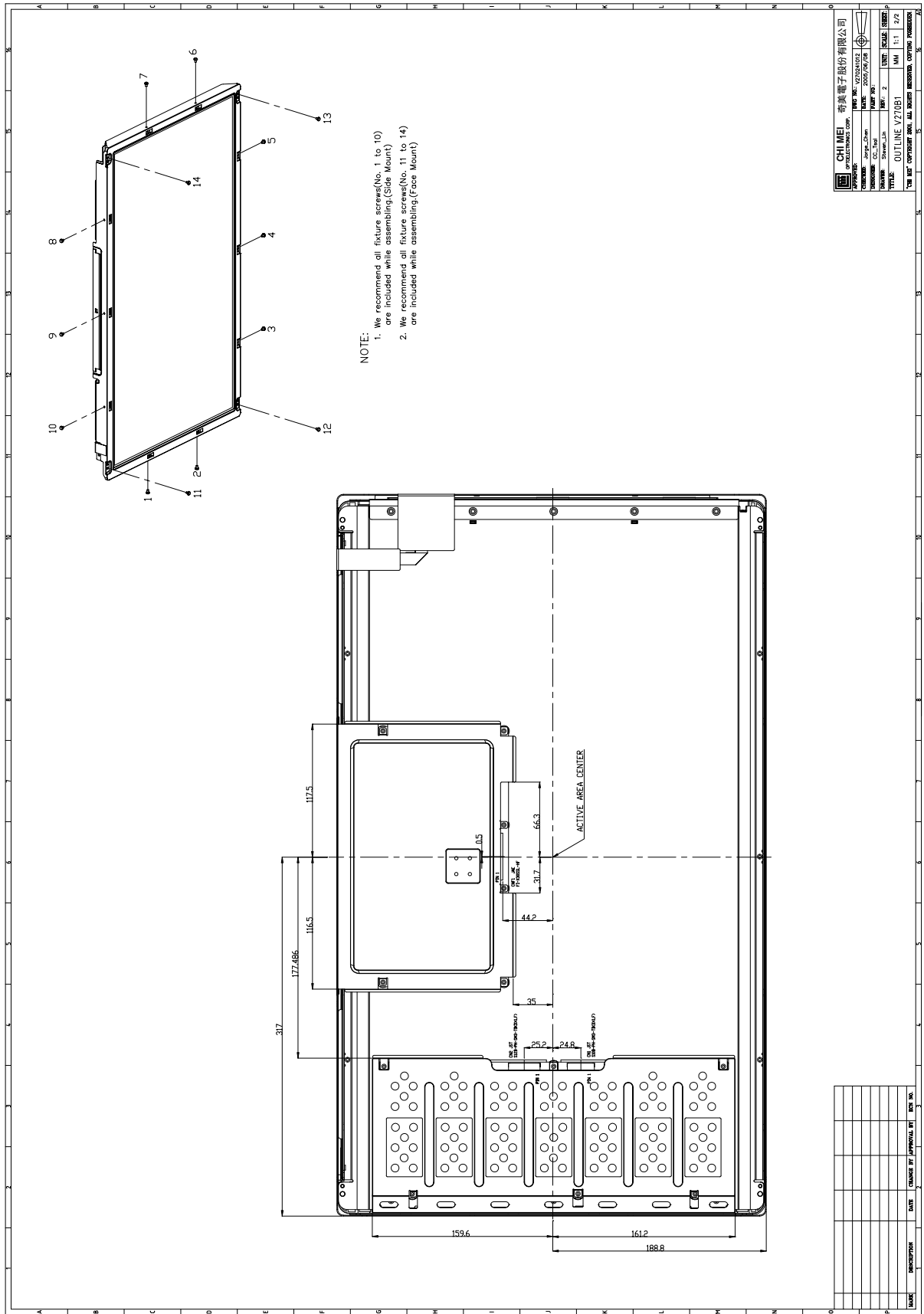
- (1) The startup voltage of a backlight is over 1000 Volts. It may cause an electrical shock while assembling with the inverter. Do not disassemble the module or insert anything into the backlight unit.
- (2) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (3) After the module's end of life, it is not harmful in case of normal operation and storage.

11. MECHANICAL CHARACTERISTICS



CHIMEI 奇美電子股份有限公司	
PROJECT: 01000000000000000000	DATE: 2008/07/08
DESIGNER: JYH	DATE: 2008/07/08
CHECKER: JYH	DATE: 2008/07/08
DATE: 2008/07/08	SCALE: 1:1
TITLE: OUTLINE V27081	NO. 1/1
YOU ARE COMPETING BY THE BEST INNOVATION. YOU PIONEER!	

NO.	DESCRIPTION	DATE	CHANGED BY	APPROVAL BY	REVISION



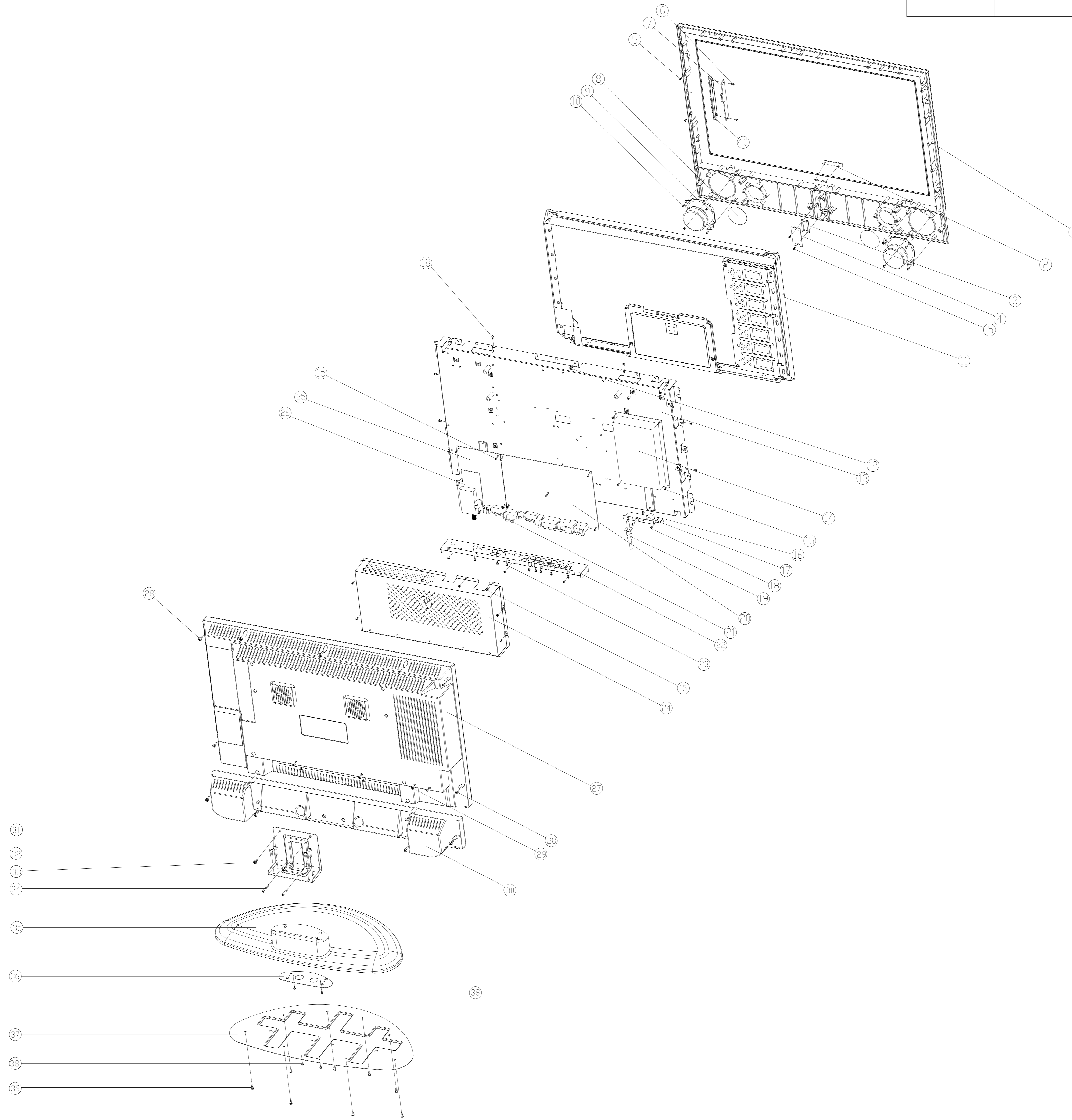
CHI MEI 奇美电子股份有限公司	
MODEL NO. 15.5" V27091	DATE: 2007/09/20
DESIGNER: Jerry Chen	DATE: 2007/09/20
APPROVER: CC, Jial	UNIT: 2
DATE: Steven_Lin	UNIT: 2
TYPE: OUTLINE V27091	UNIT: 1:1
	UNIT: 2:2

THE USER ASSUMES ALL RISKS ASSOCIATED WITH THIS DOCUMENT.

MARKS	DESCRIPTION	DATE	REVISION BY	DATE BY

NOTE : THIS RELEASED DRAWING WAS PRODUCED BY COMPUTER,DO NOT UPDATE MASTER MANUALLY.

DWG.Rev.	ZONE	DESCRIPTION	DATE	REVISOR
0		RELEASE	19-Apr-06	tzl



BOM NO: LCT27ADNIAICS-A01

ITEM	PART No.	DESCRIPTION	QTY
40	277-L32AD11-01S	FUNCTION KEY LCT32AD SILVER	1
39	614-400412-10	S-TAP. SCREW BID 4X12	8
38	614-300108-10	S-TAP. SCREW BID 3X8	4
37	449-27LA01-01	METAL PLATE FOR STAND BASE	1
36	423-27LA08-01	MIDDLE PLATE	1
35	230-26LA11-02RV	STAND COVER	1
34	614-400440-00	S-TAP. SCREW BID 4X40	2
33	604-407010-00	MACH. SCREW BID M4X10	2
32	604-508022-00	MACH. SCREW BID M5X22	4
31	423-27LA04-01	STAND SUPPORT PLATE	1
30	206-L27AD11-01RV	SPEAKER BACK CABINET	1
29	601-300508-00	MACH. SCREW CTS M3X8	6
28	614-400416-00	S-TAP. SCREW BID 4X16	12
27	202-L27AD22-01AV	BACK CABINET	1
26	771L37AD01-01	NTSC TUNER PCB ASSY	1
25	771S42D02-01	ATSC TUNER PCB ASSY	1
24	483-L27AD01-01S	SHIELD COVER -MAIN PCB	1
23	610-300210-10	S-TAP. SCREW BID 3X10	8
22	436-L27AD06-01S	TERMINAL SHEET	1
21	649-42A02-01	CONNECTION BOSS FOR MT802	2
20	771EL27AD04-02	MAIN PCB ASSY	1
19	E3404-157009	POWER CABLE	1
18	602-305004-10	MACH. SCREW BID M3X4	8
17	E4101-027001	POWER SWITCH	1
16	426-L27AD02-01S	POWER CABLE BRACKET	1
15	604-305005-10	MACH. SCREW BID M3X5	25
14	E7801-P02001	PCB ASSY PSU BOARD MEGMEET	1
13	428-27LA09-01S	PANEL BRACKET	1
12	614-400412-10	S-TAP. SCREW BID 4X12	11
11	E6203-27CDR2	LCB PANEL DMD	1
10	614-300210-10	S-TAP. SCREW BID 3X10	8
9	E4801-124001	SPEAKER	2
8	389-L32AB01-01	PVC PLATE	2
7	771KL37AD01-01	KEY PCB ASSY	1
6	614-220206-10	S-TAP. SCREW BID 22X6	2
5	614-260208-10	S-TAP. SCREW BID 26X8	4
4	771BL37AD01-01	IR RECEIVE PCB ASSY	1
3	269-42SD01-01L	REMOTE RECEIVE LENS	1
2	486-M32111-01	NAME PLATE	1
1	200-L27AD11-STD01AV	FRONT CABINET	1

DRAWN		TOLERANCE UNLESS OTHERWISE SPECIFIED	KAWA ELECTRONIC R & D CENTRE	TITLE EXPLODE VIEW
CHECKED		0 - 30 ± 0.10	MATL	MODEL NO. LCT2785TA
APPRD.		>30-100 ± 0.20	FINISH	PART NO. EXP-L27AD03-01
		>100 ± 0.30		DWG. NO. L27AD03P3
		ANGLE ± 0.3°		SCALE 1:1
		UNIT : mm		SHEET 1 OF 1

Spare Part List for LCT2785TA

Item	Part Number	Part Description	Usage / unit	Unit	Key/Spare
	LCT27ADNIA1CS-A01	AKAI LCD27" (LCT2785TA) S-MT8202 + CMO AC120/60HZ USA SILVER			
1>	510-L27AD03-01AKA	CARTON BOX AKAI LCT2785TA (MTK-8202+CMO PANEL)	1	Piece	K
2>	580-L27ADHS-TU03L	IB E FOR AKAI LCT27AD USA CMO(V270B1-L01) S-MTK8202	1	Piece	K
3>	E7501-056102	REMOTE CONTROL K001 "AKAI" 44KEYS MT8202 LCD32"/27" (W/O DVD) USA SILVER/BLACK	1	SET	K
4>	771EL27AD04-02	PCB ASSY MAIN S-MT8202 FOR 27LCD CMO	1	SET	K
5>	771L37AD01-01	NTSC TUNER PCB ASSY FOR LCD37	1	SET	K
6>	771S42D102-01	ATSC TUNER PCB ASSY	1	SET	K
7>	200-L27AD11-STD01AV	CABINET FRONT SILVER/BLACK AKAI LCT2701TD MT8205 A	1	Piece	S
8>	202-L27AD22-01AV	BACK CABINET W/O DVD W/O CARD READER LCT27AD	1	Piece	S
9>	206-L27AD11-01RV	SPEAKER CABINET AKAI LCT2701TD(MT8205) R	1	Piece	S
10>	269-42SD01-01L	REMOTE RECEIVE LENS	1	Piece	S
11>	277-L32AD11-01S	FUNCTION KEY SIL(MATERIAL:BLACK) LCT32SD	1	Piece	S
12>	300-L27AD05-02C	POLYFOAM BOTTOM	1	Piece	S
13>	300-L27AD06-02C	POLYFOAM TOP	1	Piece	S
14>	310-111404-07V	POLYBAG 11"X14"X0.04 FV	1	Piece	S
15>	310-383550-07V	POLYBAG LAMIFILM 38"X35"X0.5MM	1	Piece	S
16>	389-L32AB01-01	PVC SHEET L32AB	2	Piece	S
17>	426-L27AD02-01S	POWER CABLE CLIP L27AD S	1	Piece	S
18>	436-L27AD06-01S	TERMINAL SHEET MT8202 W/O DVD LCT27AD	1	Piece	S
19>	483-L27AD01-01S	SHIELD COVER-MAIN PCB	1	Piece	S
20>	486-M32111-01	NAME PLATE M AKAI	1	Piece	S
21>	522-421D01-01	MASKING PAPER	1	Piece	S
22>	563-119-	SERIAL NO. LABEL	1	Piece	S
23>	568-P46T02-02	WARNING LB ENG 42SF NIL	1	Piece	S
24>	579-42D102-09	SERIAL NO/BAR CODE LABEL 42D1	1	Piece	S
25>	579-42D105-01	PROTECTIVE EARTH LABEL FOR ESA 42TD1	1	Piece	S
26>	579-L27AD02-01APA	UPC LABEL OF C/B AKAI LCT2785TA	2	Piece	S
27>	579-L27AD09-01	CAUTION LABEL ENG AKAI	1	Piece	S
28>	590-L27AD01-04	WARRANTY CARD AKAI LCT2785TA	1	Piece	S
29>	593-L27AD01-03	INSERTION CARD AKAI LCT2785TA/LCT3285TA	1	Piece	S
30>	E3404-157009	AC CORD UL 1.88M FOR LCD32 MT8202	1	Piece	S
31>	E3421-925127	WIRE ASSY TJC3-2Y L860 SPK-R MT8202	1	Piece	S
32>	E3421-925129	WIRE ASSY 10P/2.5 FOR MT8202 27" POWER 9V/12V	1	Piece	S

Spare Part List for LCT2785TA

Item	Part Number	Part Description	Usage / unit	Unit	Key/Spare
33>	E3421-925130	WIRE ASSY 1H3.96-2KN6 20 L180 2P FOR LCD32"/27"	2	Piece	S
34>	E3421-925133	WIRE ASSY TJC3-3Y L650 SPK-L MT8202	1	Piece	S
35>	E3421-926119	WIRE ASSY P2.0 8P L=215 TV/SIF	1	Piece	S
36>	E3421-926125	WIRE ASSY P2.5 4P/4P L400MM AMP24V EMI MT8202	1	Piece	S
37>	E3461-064036	WIRE ASSY INVERTER 12P2.0+8P2.5+3P2.0 L450MM L650MM MT8202	1	Piece	S
38>	E3461-064038	WIRE ASSY P2.5 7P/7P L400MM 5V STANBY POWER MT8202 FOR 27"/32" LCD	1	Piece	S
39>	E3471-000044	WIRE WS SHIELD WIRE FOR 32LCD COMBO MICO KEY 13P/8P+5P	1	Piece	S
40>	E3471-000057	WIRE WS SHIELD WIRE 27" L300MM MICO CMO MT8202 LVDS NEW	1	Piece	S
41>	E4101-027001	SWITCH POW MR-22-N2BB-F2 ROCKET	1	Piece	S
42>	E4801-124001	SPEAKER 8 OHM 10W D3" YD78-1	2	Piece	S
43>	E6203-27CD02	DISPLAY LCD 27" CMO V270B1-L01 1366X768 1000:1 HIGH CONTRAST	1	Piece	S
44>	E7301-010002	BATTERY AAA R03P1.5V <2>	2	Piece	S
45>	E7801-P02001	PCB ASSY PSU BOARD MEGMEET MT168 FOR 27LCD AC110-240V OUTPUT 12V/8V/24V 200W	1	SET	S
46>	734-L27AD03-01	ELLIPSE PLASTIC BASE ASSY W/O LOGO W/O PACKING SILVER	1	SET	S
47>	771BL37AD01-01	IR RECEIVE PCB ASSY FOR LCT37AD	1	SET	S
48>	771KL37AD01-01	KEY PCB ASSY FOR LCT37AD	1	SET	S