V1.0

TV CONTROL BOARD SPECIFICATION

MODEL: T.MSD309.B81A (Europe)

Part Number: MST-11123062

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The information in the specification is subject to change without notice.

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REVISION HISTORY

VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
V1.0	2011.12.30	T.MSD309.B81A 11496 CN.SY9C 11362	All	First issued.	Linda

1. GENERAL DESCRIPTION

T.MSD309.B81A is a digital and analog TV control board, which is suitable for Pan Europe and UK market. It can support more than 26 inch LED panels which resolution is up to 1920×1080.

T.MSD309.B81A can receive and decode both Free-To-Air DTV and CA DVB-T/C program. It can decrypt programs encrypted by Irdeto, Viaccess, Conax with built-in CI(optional).

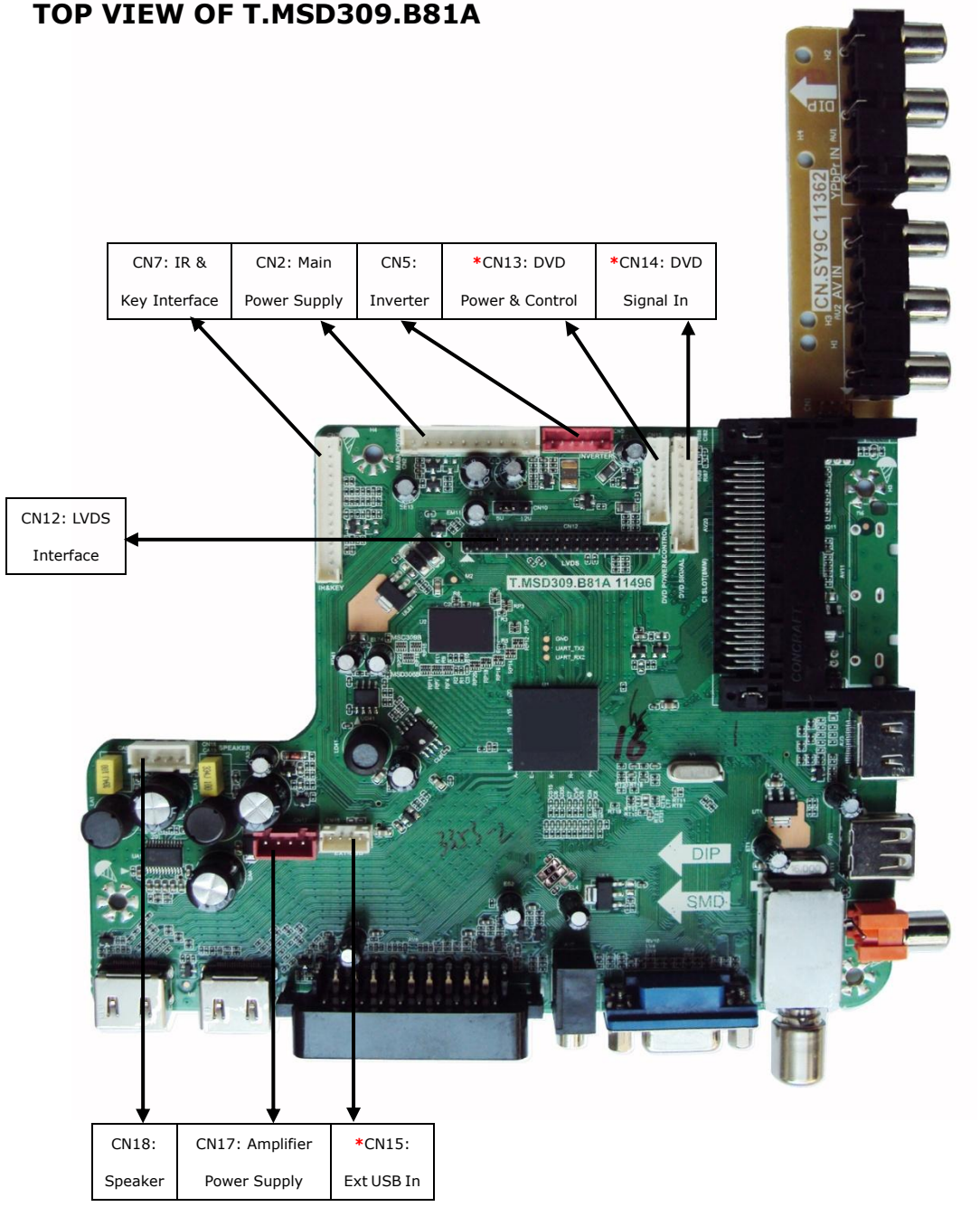
T.MSD309.B81A s USB slot can be used for Software upgrade, multimedia playback, PVR and time-shift(with 1G DDR).

2. FUNCTION LAYOUT

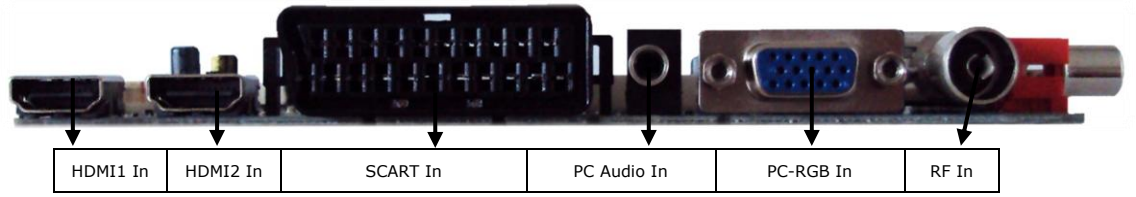
The picture is for a reference only, the actual item is the standard.

The optional connectors and terminals are marked with "*".

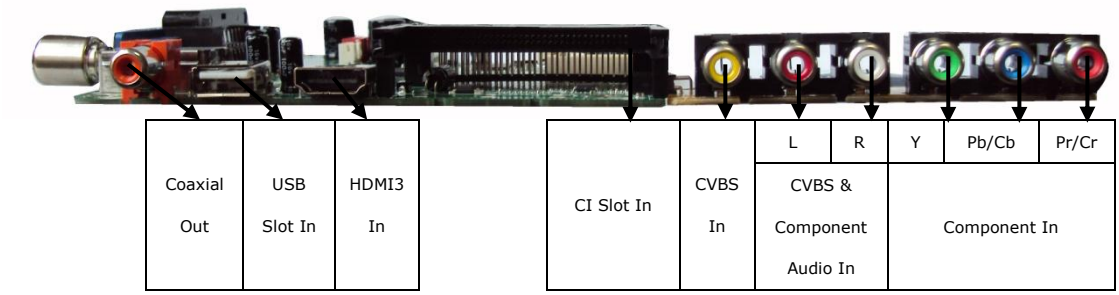
TOP VIEW OF T.MSD309.B81A



FRONT VIEW OF T.MSD309.B81A



SIDE VIEW OF T.MSD309.B81A



3. FEATURES

CHIPSET	MSD309BT-Z1/MSD308BT-Z1			
MARKET AREA	Pan Europe, UK			
OSD LANGUAGE	English, French, German, Italian, Spanish, Portuguese (optional)			
PANEL	Panel Type	LED		
	Interface	Dual/Single LVDS Interface		
	Max Resolution	1920×1080		
TV INPUT	ATV	Receiving Range		48.25MHz ~ 863.25MHz
		Input Impedance		75Ω
		Video System		PAL, SECAM
		Sound System		BG, DK, I, L/L’
				NICAM/A2
		TELETEXT		1000Pages
		Max Storage Channels		100CH
	DVB-T	Receiving Range		VHF (174MHz ~ 230MHz)
				UHF (474MHz ~ 862MHz)
		Input Impedance		75Ω
		Channel Bandwidth		7MHz/8MHz
		Modulation	DVB-T	COFDM 2K/8K QPSK,16QAM,64QAM
			DVB-C (only with MSD308BT-Z1)	16QAM, 32QAM, 64QAM, 128QAM, 256QAM
		Video System		MPEG-2 MP@ML, MPEG-2 MP@HL,H.264
		Sound System		MPEG-1 layer 1/2,MPEG-2 layer 2, DD,DD+
		Basic Functions		EPG, Subtitle, LCN,

			TELETEXT (Europe), MHEG-5(UK)
		Common Interface	Built-In
		Max Storage Channels	≥400CH(dynamic)
VIDEO INPUT	PC-RGB	Format	Up to 1920×1080@60Hz
	CVBS	Video System	PAL/NTSC/SECAM
		Video Level	1.0 V_{P-P}±5%
	Component	480i, 480p, 576i, 576p, 720p, 1080i, 1080p	
	HDMI	480i, 480p, 576i, 576p, 720p, 1080i, 1080p	
	SCART	CVBS & RGB	
AUDIO INPUT	PC Audio	Earphone Input	0.2 ~ 2.0 V_{RMS}
	CVBS/Component Audio	L/R RCA Input	0.2 ~ 2.0 V_{RMS}
AUDIO OUTPUT	Frequency Response	100Hz~15KHz @±3dB (1KHz, 0dB reference signal)	
	Max Output Power	2×9W(8Ω) THD+N<10%@1KHz (Power Supply: 24V, Audio Input: 0.5V_{RMS})	
POWER	Requirement	24V/12V/5V/5VSB	
	To Panel	5V, 12V	
	Management	Standby Power Consumption < 0.2W(Board Only)	
COMB FILTER	3D		
DEINTERLACE	3D		
USB FUNCTION	Multimedia, PVR, Software upgrade		
KEY FUNCTION	MENU, CH+, CH-, VOL+, VOL-, INPUT, POWER		
EXPANDABLE FUNCTION	DVD		
Note: Licenses involved in specifications above are supposed to be obtained by customers themselves.			

ELECTRICAL CHARACTERISTICS & REQUIREMENTS

Power Supply Mode	Symbol	Voltage Range	Max Current	Ripple Voltage@25℃	Startup Time	Rise Time
24V/12V/ 5V/5VSB (Built-In)	24V	24V±1V	1200mA	240mV_{P-P}	≤100ms	≤50ms
	12V	12V±0.6V	400mA	120mV_{P-P}	≤100ms	≤50ms
	5V	5.1V±0.05V	1500mA	50mV_{P-P}	≤100ms	≤50ms
	5VSB	5.1V±0.05V	500mA	50mV_{P-P}	--	≤50ms
Note: The current of panel, inverter and extension modules are not included in max current.						

SUBSTITUTABLE PRIMARY MATERIALS

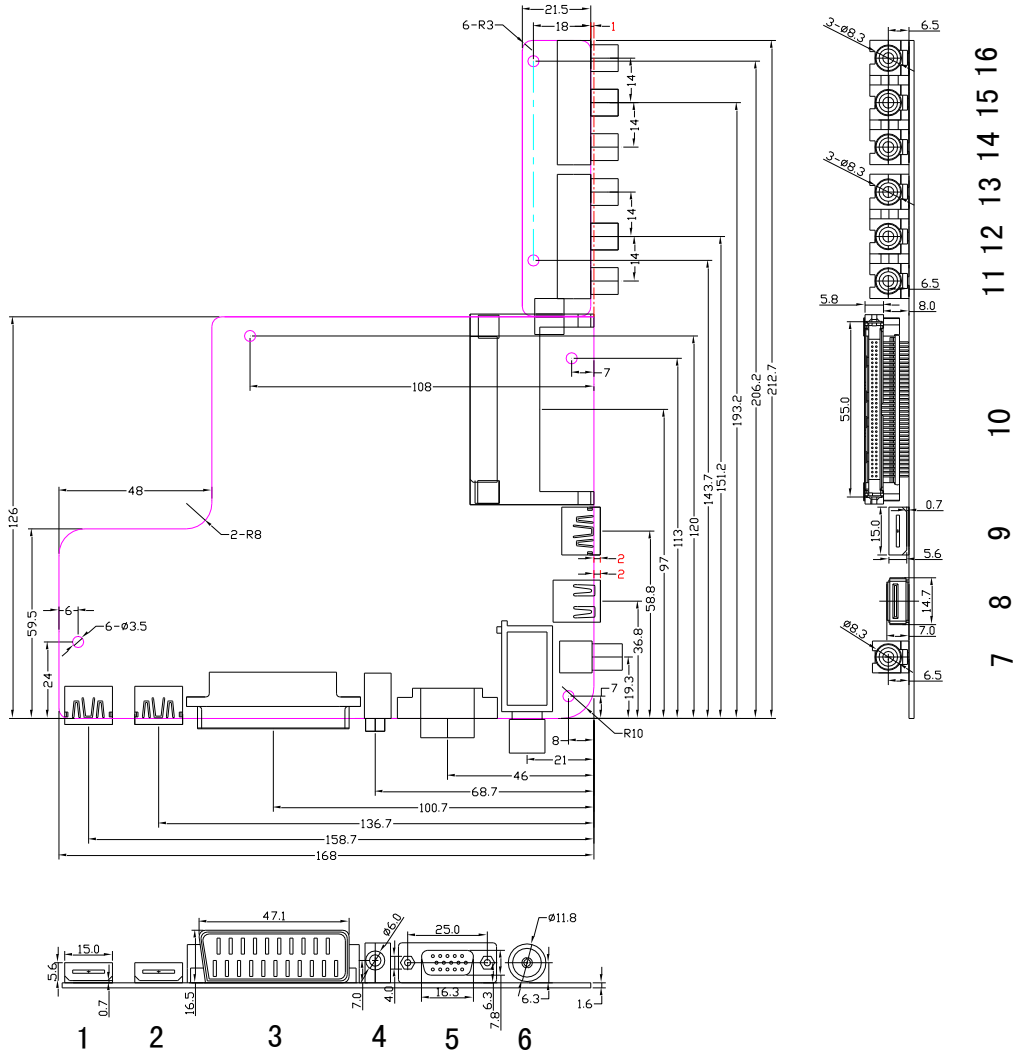
The table is for reference only, the actual item is the standard.

NAME	TYPE	BRAND	BACKUP TYPE	BACKUP BRAND
FLASH	GD25Q32SIP (32M bits)	GIGA	W25Q32BVSSIG	Winbond
			MX25L3206EM2I-12G	Macronix
			S25FL032K0XMFI011	Spansion
DDR	H5PS1G63EFR-G7C (1G bits 1066MHz)	Hynix	NT5TU64M16GG-BE	Nanya
			K4T51163QJ-BCF8	Samsung
AMPLIFIER	R2A15122FP	Renesas	——	——
TUNER	TDA18273HN	NXP	——	——

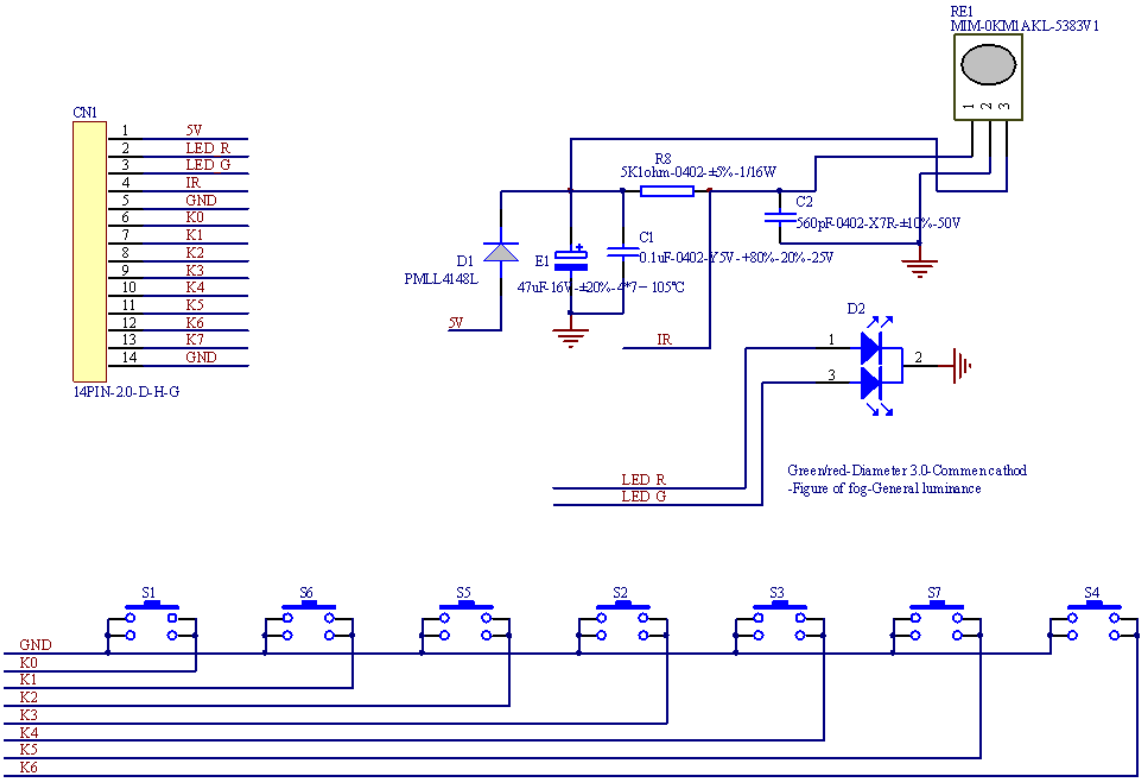
4. PCB DIMENSIONS

The size of T.MSD309.B81A is 168mm(L)*126mm(W)*22 mm(H).

Ver.	V1.0
NO.	Description
1	HDMI1 IN
2	HDMI2 IN
3	SCART IN
4	PC AUDIO IN
5	VGA IN
6	RF IN
7	COAX OUT
8	USB IN
9	HDMI3 IN
10	CI SLOT
11	CVBS IN
12	CVBS/YPbPr RIN
13	CVBS/YPbPr LIN
14	YPbPr-Y IN
15	YPbPr-Pb IN
16	YPbPr-Pr IN



5. SCHEMATICS OF IR BOARD & KEY BOARD



6. INTERFACE DEFINITION

The optional connectors are marked with "*".

◆ CN7(14PIN/2.0): IR & KEY BOARD CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	5V	+5V DC Power Supply
2	RED	Red Indicator
3	GRN	Green Indicator
4	IR	IR Receiver
5	GND	Ground
6	K0	Key0
7	K1	Key1
8	K2	Key2
9	K3	Key3
10	K4	Key4
11	K5	Key5
12	K6	Key6
13	K7	Key7(Reserved)
14	GND	Ground

◆ CN2(10PIN/2.54): MAIN POWER SUPPLY CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	5VSB	+5V Power Supply when Standby
2	PON	Power On/Off
3	GND	Ground
4	GND	
5	P5V	+5V Power Supply for Panel
6	P5V	
7	5V	Main +5V Power Supply
8	5V	
9	GND	Ground
10	12V	+12V DC Power Supply

◆ CN5(6PIN/2.0): INVERTER CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	12V	+12V DC Power Supply
2	12V	
3	BLO	Back-Light ON/OFF Control for Panel
4	ADJ	Brightness Adjustment for Panel
5	GND	Ground
6	GND	

◆ *CN13(8PIN/2.0): DVD POWER & CONTROL CONNECTOR

NO.	SYMBOL	DESCRIPTION	MAX CURRENT
1	D5	+5V DC Power Supply for DVD	1200 mA
2	D5		
3	GND	Ground	--
4	GND		
5	D12	+12V DC Power Supply for DVD	1000 mA
6	DIR	IR Data Transfer to DVD	--
7	DAT/RX	Data Receiver/Serial Data Receiver	--
8	STB/TX	DVD Standby Control/Serial Data Transmitter	--

◆ *CN14(11PIN/2.0): DVD SIGNAL INPUT CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	NC	No Connection
2	GND	Ground
3	DRI	DVD Audio Right Channel Input
4	GND	Ground
5	DLI	DVD Audio Left Channel Input
6	DPB	DVD Component-Pb Input
7	GND	Ground
8	DPR	DVD Component-Pr Input
9	GND	Ground
10	DY	DVD Component-Y Input
11	GND	Ground

◆ CN12(2× 20PIN/2.0): LVDS INTERFACE CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	VSEL	Power Supply for Panel
2	VSEL	
3	VSEL	
4	GND	Ground
5	GND	
6	GND	
7	TXO0-	LVDS ODD 0- Signal
8	TXO0+	LVDS ODD 0+ Signal
9	TXO1-	LVDS ODD 1- Signal
10	TXO1+	LVDS ODD 1+ Signal
11	TXO2-	LVDS ODD 2- Signal
12	TXO2+	LVDS ODD 2+ Signal
13	GND	Ground
14	GND	
15	TXOC-	LVDS ODD Clock- Signal
16	TXOC+	LVDS ODD Clock+ Signal
17	TXO3-	LVDS ODD 3- Signal
18	TXO3+	LVDS ODD 3+ Signal
19	TXE0-	LVDS EVEN 0- Signal
20	TXE0+	LVDS EVEN 0+ Signal
21	TXE1-	LVDS EVEN 1- Signal
22	TXE1+	LVDS EVEN 1+ Signal
23	TXE2-	LVDS EVEN 2- Signal
24	TXE2+	LVDS EVEN 2+ Signal
25	GND	Ground
26	GND	
27	TXEC-	LVDS EVEN Clock- Signal
28	TXEC+	LVDS EVEN Clock+ Signal
29	TXE3-	LVDS EVEN 3- Signal
30	TXE3+	LVDS EVEN 3+ Signal
31	GND	Ground
32	GND	
33	3.3V	Mode Select
34	NC	No connection
35	VSEL1	Reserved Power Supply
36	VSEL2	Reserved Power Supply
37	TXO4-	LVDS ODD 4- Signal
38	TXO4+	LVDS ODD 4+ Signal
39	TXE4-	LVDS EVEN 4- Signal
40	TXE4+	LVDS EVEN 4+ Signal

◆ CN18 (4PIN/2.54): SPEAKER CONNECTOR

NO.	SYMBOL	DESCRIPTION
1	LO	Audio Left Channel Output
2	GND	Ground
3	GND	
4	RO	Audio Right Channel Output

◆ CN17 (4PIN/2.54): AMPLIFIER POWER SUPPLY CONNECTOR

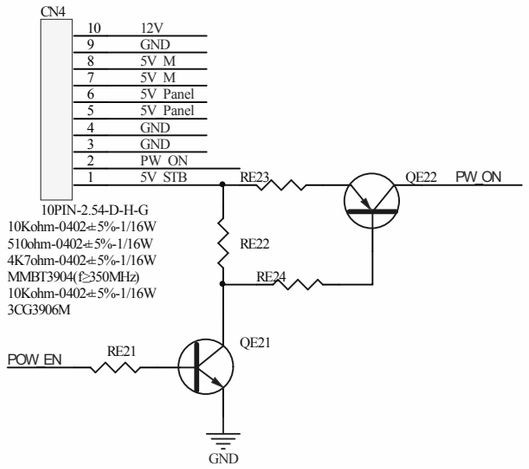
NO.	SYMBOL	DESCRIPTION
1	24V	+24V Power Supply for Amplifier
2	24V	
3	GND	Ground
4	GND	

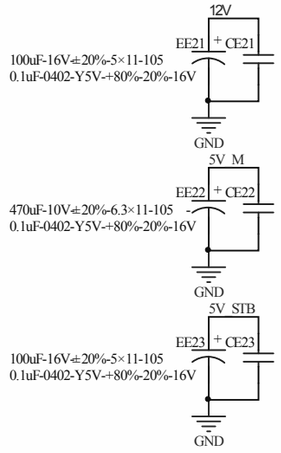
◆ *CN15(4PIN/2.0): EXTERNAL USB CONNECTOR

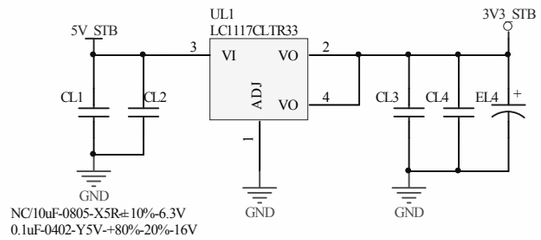
NO.	SYMBOL	DESCRIPTION
1	5V	+5V DC Power Supply for USB
2	DM	USB Data-
3	DP	USB Data+
4	GND	Ground

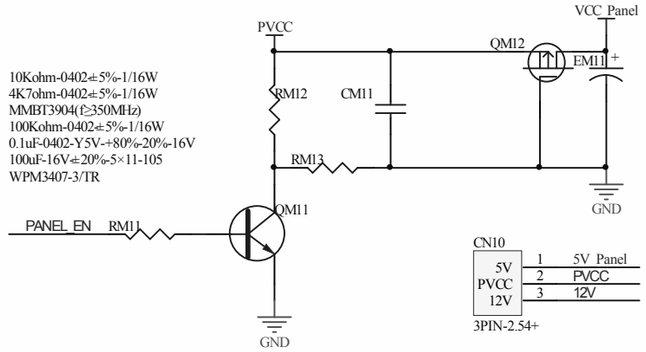
7. CONFIGURATION & GENERAL PRECAUTIONS

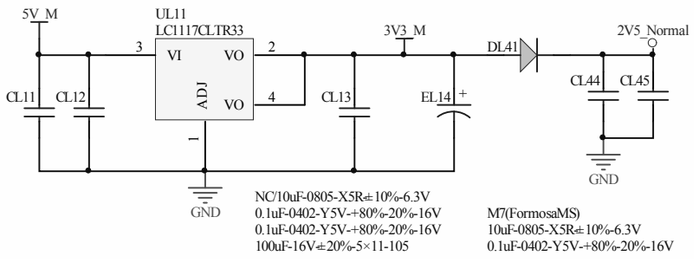
- **Relative humidity: ≤ 80%.**
- **Storage temperature: -10~60°C.**
- **Operation temperature: 0~40°C.**
- **Protect the board from static electricity in case of damage to the IC.**
- **Keep the board away from conductor when it is working.**
- **Don’t push or pull the connectors when the board is working.**
- **Don’t press , distort or disassemble the board.**
- **Clean the board with soft dry cloth when it’s dirty.**
- **Don’t wire in the board to power supply before panel is correctly connected.**

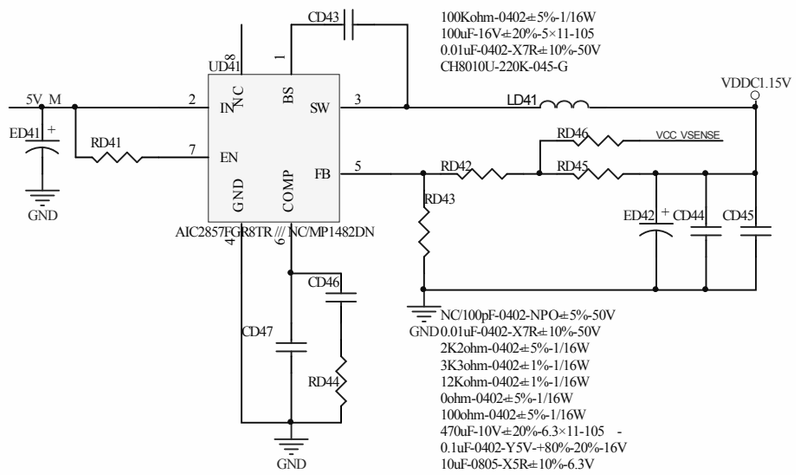

CN4
10 12V
9 GND
8 5V_M
7 5V_M
6 5V_Panel
5 5V_Panel
4 GND
3 GND
2 PW_ON
1 5V_STB
RE23
QE22
PW_ON
10PIN-2.54-D-H-G
10Kohm-0402±5%-1/16W
510ohm-0402±5%-1/16W
4K7ohm-0402±5%-1/16W
MMBT3904(f≥350MHz)
10Kohm-0402±5%-1/16W
3CG3906M
RE22
RE24
QE21
POW_EN
RE21
GND

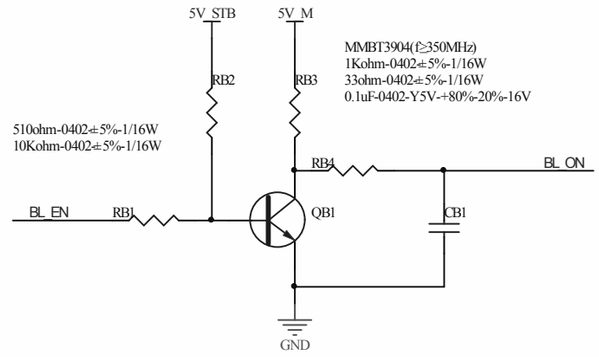

12V
EE21 CE21
100uF-16V±20%-5×11-105
0.1uF-0402-Y5V-+80%-20%-16V
GND
5V_M
EE22 CE22
470uF-10V±20%-6.3×11-105
0.1uF-0402-Y5V-+80%-20%-16V
GND
5V_STB
EE23 CE23
100uF-16V±20%-5×11-105
0.1uF-0402-Y5V-+80%-20%-16V
GND

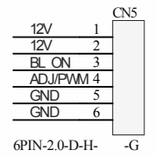

5V_STB
UL1
LC1117CLTR33
3V3_STB
VI
VO
ADJ
CL1
CL2
CL3
CL4
EL4
GND
NC/10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
NC/10uF-0805-X5R±10%-6.3V
100uF-16V±20%-5×11-105

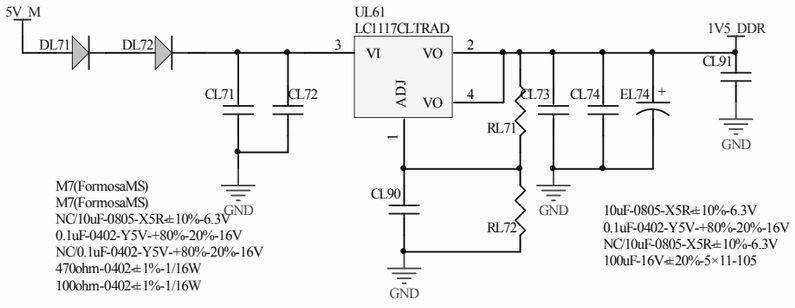

PVCC
VCC_Panel
QM12
EM11
10Kohm-0402±5%-1/16W
4K7ohm-0402±5%-1/16W
MMBT3904(f≥350MHz)
100Kohm-0402±5%-1/16W
0.1uF-0402-Y5V-+80%-20%-16V
100uF-16V±20%-5×11-105
WPM3407-3/TR
RM12
CM11
RM13
QM11
PANEL_EN
RM11
GND
CN10
5V 1 5V_Panel
PVCC 2 PVCC
12V 3 12V
3PIN-2.54+

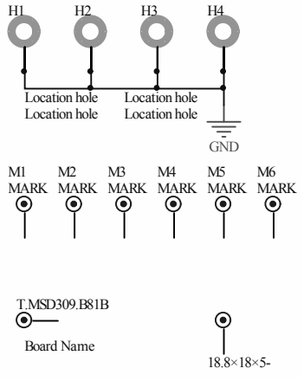

5V_M
UL11
LC1117CLTR33
3V3_M
DL41
2V5_Normal
VI
VO
ADJ
CL11
CL12
CL13
EL14
CL44
CL45
GND
NC/10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
100uF-16V±20%-5×11-105
M7(FormosaMS)
10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V

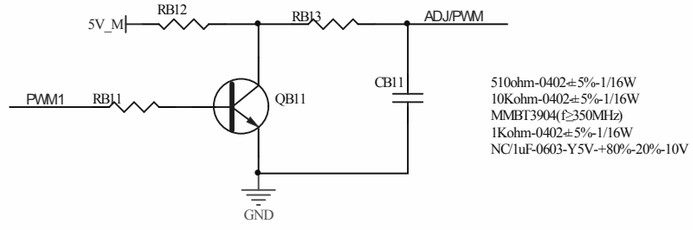

CD43
100Kohm-0402±5%-1/16W
100uF-16V±20%-5×11-105
0.01uF-0402-X7R±10%-50V
CH8010U-220K-045-G
UD41
5V_M
ED41
RD41
IN
NC
BS
SW
EN
GND
FB
COMP
AIC2857FGR8TR /// NCMP1482DN
LD41
VDDC1.15V
RD46
VCC_VSENSE
RD42
RD45
RD43
ED42
CD44
CD45
CD46
CD47
RD44
NC/100pF-0402-NPO±5%-50V
0.01uF-0402-X7R±10%-50V
2K2ohm-0402±5%-1/16W
3K3ohm-0402±1%-1/16W
12Kohm-0402±1%-1/16W
0ohm-0402±5%-1/16W
100ohm-0402±5%-1/16W
470uF-10V±20%-6.3×11-105
0.1uF-0402-Y5V-+80%-20%-16V
10uF-0805-X5R±10%-6.3V

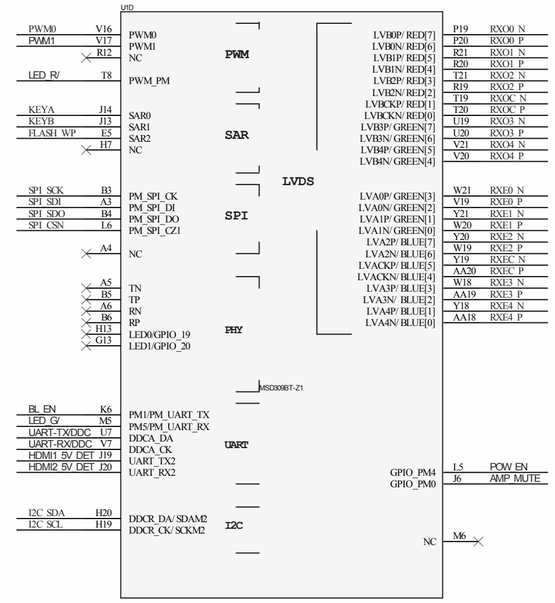

5V_STB
5V_M
MMBT3904(f≥350MHz)
1Kohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
0.1uF-0402-Y5V-+80%-20%-16V
RB2
RB3
510ohm-0402±5%-1/16W
10Kohm-0402±5%-1/16W
RB4
BL_ON
BL_EN
RB1
QB1
CB1
GND

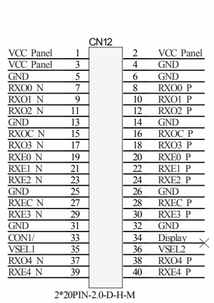

CN5
12V 1
12V 2
BL_ON 3
ADJ/PWM 4
GND 5
GND 6
6PIN-2.0-D-H- -G

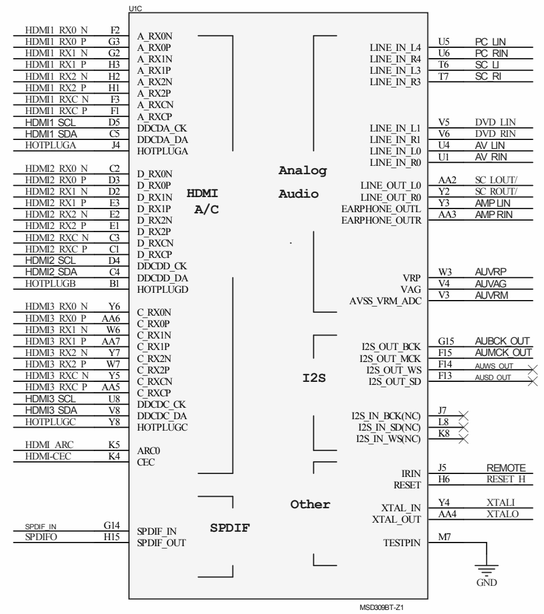

5V_M
UL61
LC1117CLTRAD
1V5_DDR
DL71
DL72
VI
VO
ADJ
CL71
CL72
CL73
CL74
EL74
CL91
RL71
RL72
CL90
GND
M7(FormosaMS)
M7(FormosaMS)
NC/10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
NC/0.1uF-0402-Y5V-+80%-20%-16V
470ohm-0402±1%-1/16W
100ohm-0402±1%-1/16W
10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
NC/10uF-0805-X5R±10%-6.3V
100uF-16V±20%-5×11-105

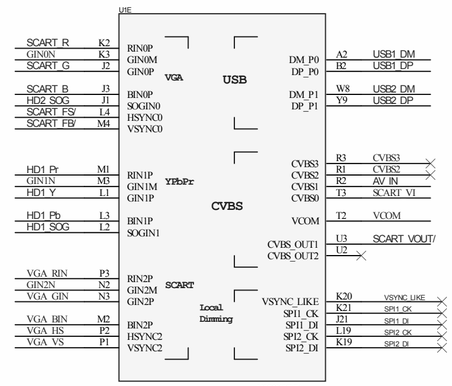

H1 H2 H3 H4
Location hole
Location hole
Location hole
Location hole
GND
M1 MARK
M2 MARK
M3 MARK
M4 MARK
M5 MARK
M6 MARK
T.MSD309.B81B
Board Name
18.8×18×5-

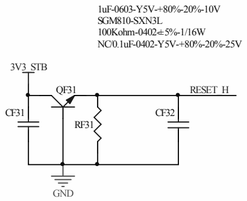

5V_M
RB12
RB13
ADJ/PWM
PWM1
RB11
QB11
CB11
GND
510ohm-0402±5%-1/16W
10Kohm-0402±5%-1/16W
MMBT3904(f≥350MHz)
1Kohm-0402±5%-1/16W
NC/1uF-0603-Y5V-+80%-20%-10V

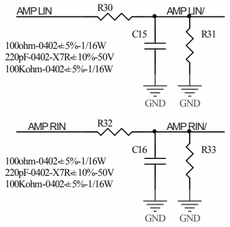

U1D
LVDS
PWM
SAR
SPI
PHY
UART
I2C
MSD3098T-Z1
PWM0 V16
PWM1 V17
NC R12
LED_R/ T8
PWM_PM
KEYA J14
KEYB J13
FLASH_WP E5
NC H7
SAR0
SAR1
SAR2
SPI_SCK B3
SPI_SDI A3
SPI_SDO B4
SPI_CSN L6
PM_SPI_CK
PM_SPI_DI
PM_SPI_DO
PM_SPI_CZ1
A4
NC
A5
B5
A6
B6
H13
G13
TN
TP
RN
RP
LED0/GPIO_19
LED1/GPIO_20
BL_EN K6
LED_G/ M5
UART-TX/DDC_ U7
UART-RX/DDC_ V7
HDMI1_5V_DET J19
HDMI2_5V_DET J20
PM1/PM_UART_TX
PM5/PM_UART_RX
DDCA_DA
DDCA_CK
UART_TX2
UART_RX2
I2C_SDA H20
I2C_SCL H19
DDCR_DA/ SDAM2
DDCR_CK/ SCKM2
LVB0P/ RED[7] P19 RXO0_N
LVB0N/ RED[6] P20 RXO0_N
LVB1P/ RED[5] R21 RXO1_N
LVB1N/ RED[4] R20 RXO1_P
LVB2P/ RED[3] T21 RXO2_N
LVB2N/ RED[2] R19 RXO2_P
LVBCKP/ RED[1] T19 RXOC_N
LVBCKN/ RED[0] T20 RXOC_P
LVB3P/ GREEN[7] U19 RXO3_N
LVB3N/ GREEN[6] U20 RXO3_P
LVB4P/ GREEN[5] V21 RXO4_N
LVB4N/ GREEN[4] V20 RXO4_P
LVA0P/ GREEN[3] W21 RXE0_N
LVA0N/ GREEN[2] V19 RXE0_P
LVA1P/ GREEN[1] Y21 RXE1_N
LVA1N/ GREEN[0] W20 RXE1_P
LVA2P/ BLUE[7] Y20 RXE2_N
LVA2N/ BLUE[6] W19 RXE2_P
LVACKP/ BLUE[5] Y19 RXEC_N
LVACKN/ BLUE[4] AA20 RXEC_P
LVA3P/ BLUE[3] W18 RXE3_N
LVA3N/ BLUE[2] AA19 RXE3_P
LVA4P/ BLUE[1] Y18 RXE4_N
LVA4N/ BLUE[0] AA18 RXE4_P
GPIO_PM4 L5 POW_EN
GPIO_PM0 J6 AMP_MUTE
NC M6

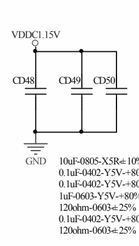

CN12
2*20PIN-2.0-D-H-M
VCC_Panel 1 2 VCC_Panel
VCC_Panel 3 4 GND
GND 5 6 GND
RXO0_N 7 8 RXO0_P
RXO1_N 9 10 RXO1_P
RXO2_N 11 12 RXO2_P
GND 13 14 GND
RXOC_N 15 16 RXOC_P
RXO3_N 17 18 RXO3_P
RXE0_N 19 20 RXE0_P
RXE1_N 21 22 RXE1_P
RXE2_N 23 24 RXE2_P
GND 25 26 GND
RXEC_N 27 28 RXEC_P
RXE3_N 29 30 RXE3_P
GND 31 32 GND
CON1/ 33 34 Display
VSEL1 35 36 VSEL2
RXO4_N 37 38 RXO4_P
RXE4_N 39 40 RXE4_P

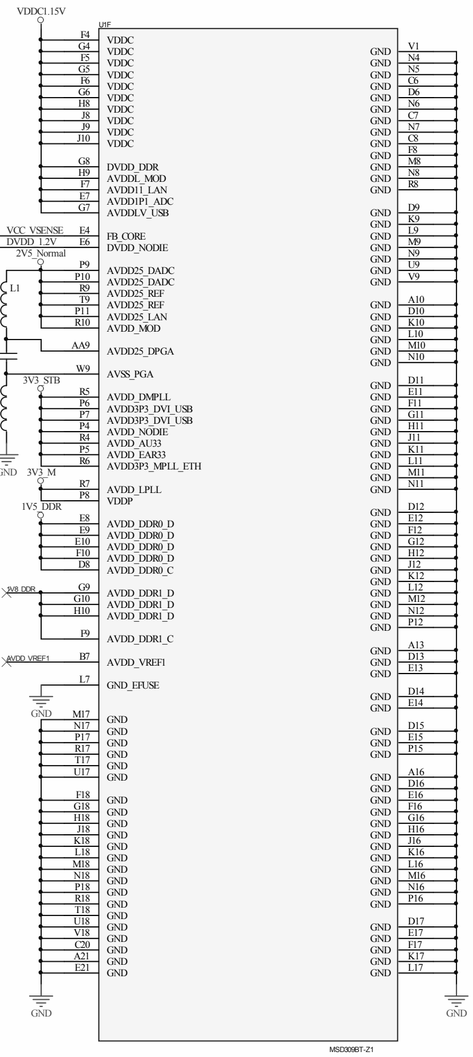

U1C
HDMI
A/C
Analog
Audio
I2S
Other
SPDIF
MSD3098T-Z1
HDMI1_RX0_N E2
HDMI1_RX0_P G3
HDMI1_RX1_N G2
HDMI1_RX1_P H3
HDMI1_RX2_N H2
HDMI1_RX2_P H1
HDMI1_RXC_N F3
HDMI1_RXC_P F1
HDMI1_SCL D5
HDMI1_SDA C5
HOTPLUGA J4
HDMI2_RX0_N C2
HDMI2_RX0_P D3
HDMI2_RX1_N D2
HDMI2_RX1_P E3
HDMI2_RX2_N E2
HDMI2_RX2_P E1
HDMI2_RXC_N C3
HDMI2_RXC_P C1
HDMI2_SCL D4
HDMI2_SDA C4
HOTPLUGB B1
HDMI3_RX0_N Y6
HDMI3_RX0_P AA6
HDMI3_RX1_N W6
HDMI3_RX1_P AA7
HDMI3_RX2_N Y7
HDMI3_RX2_P W7
HDMI3_RXC_N Y5
HDMI3_RXC_P AA5
HDMI3_SCL U8
HDMI3_SDA V8
HOTPLUGC Y8
HDMI_ARC K5
HDMI-CEC K4
SPDIF_IN G14
SPDIFO H15
A_RX0N
A_RX0P
A_RX1N
A_RX1P
A_RX2N
A_RX2P
A_RXCN
A_RXCP
DDCDA_CK
DDCDA_DA
HOTPLUGA
D_RX0N
D_RX0P
D_RX1N
D_RX1P
D_RX2N
D_RX2P
D_RXCN
D_RXCP
DDCDD_CK
DDCDD_DA
HOTPLUGD
C_RX0N
C_RX0P
C_RX1N
C_RX1P
C_RX2N
C_RX2P
C_RXCN
C_RXCP
DDCDC_CK
DDCDC_DA
HOTPLUGC
ARC0
CEC
SPDIF_IN
SPDIF_OUT
LINE_IN_L4 U5 PC_LIN
LINE_IN_R4 U6 PC_RIN
LINE_IN_L3 T6 SC_LI
LINE_IN_R3 T7 SC_RI
LINE_IN_L1 V5 DVD_LIN
LINE_IN_R1 V6 DVD_RIN
LINE_IN_L0 U4 AV_LIN
LINE_IN_R0 U1 AV_RIN
LINE_OUT_L0 AA2 SC_LOUT/
LINE_OUT_R0 Y2 SC_ROUT/
EARPHONE_OUTL Y3 AMP_LIN
EARPHONE_OUTR AA3 AMP_RIN
VRP W3 AUVRP
VAG V4 AUVAG
AVSS_VRM_ADC V3 AUVRM
I2S_OUT_BCK G15 AUBCK_OUT
I2S_OUT_MCK F15 AUMCK_OUT
I2S_OUT_WS F14 AUWS_OUT
I2S_OUT_SD F13 AUSD_OUT
I2S_IN_BCK(NC) J7
I2S_IN_SD(NC) L8
I2S_IN_WS(NC) K8
IRIN J5 REMOTE
RESET H6 RESET_H
XTAL_IN Y4 XTALI
XTAL_OUT AA4 XTALO
TESTPIN M7
GND

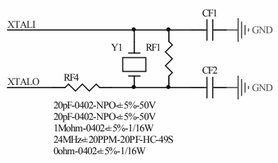

U1E
USB
VGA
YPbPr
CVBS
SCART
Local Dimming
MSD3098T-Z1
SCART_R K2
GIN0N K3
SCART_G J2
SCART_B J3
HD2_SOG J1
SCART_FS/ L4
SCART_FB/ M4
HD1_Pr M1
GIN1N M3
HD1_Y L1
HD1_Pb L3
HD1_SOG L2
VGA_RIN P3
GIN2N N2
VGA_GIN N3
VGA_BIN M2
VGA_HS P2
VGA_VS P1
RIN0P
GIN0M
GIN0P
BIN0P
SOGIN0
HSYNC0
VSYNC0
RIN1P
GIN1M
GIN1P
BIN1P
SOGIN1
RIN2P
GIN2M
GIN2P
BIN2P
HSYNC2
VSYNC2
DM_P0 A2 USB1_DM
DP_P0 B2 USB1_DP
DM_P1 W8 USB2_DM
DP_P1 Y9 USB2_DP
CVBS3 R3
CVBS2 R1
CVBS1 R2 AV_IN
CVBS0 T3 SCART_VI
VCOM T2
CVBS_OUT1 U3 SCART_VOUT/
CVBS_OUT2 U2
VSYNC_LIKE K20 VSYNC_LIKE
SPI1_CK K21 SPI1_CK
SPI1_DI J21 SPI1_DI
SPI2_CK L19 SPI2_CK
SPI2_DI K19 SPI2_DI

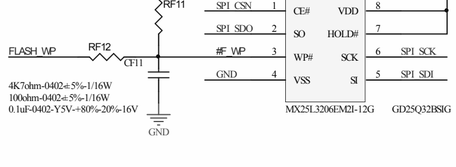

1uF-0603-Y5V-+80%-20%-10V
SGM810-SXN3L
100Kohm-0402-±5%-1/16W
NC/0.1uF-0402-Y5V-+80%-20%-25V
3V3_STB
QF31
RESET_H
CF31
RF31
CF32
GND

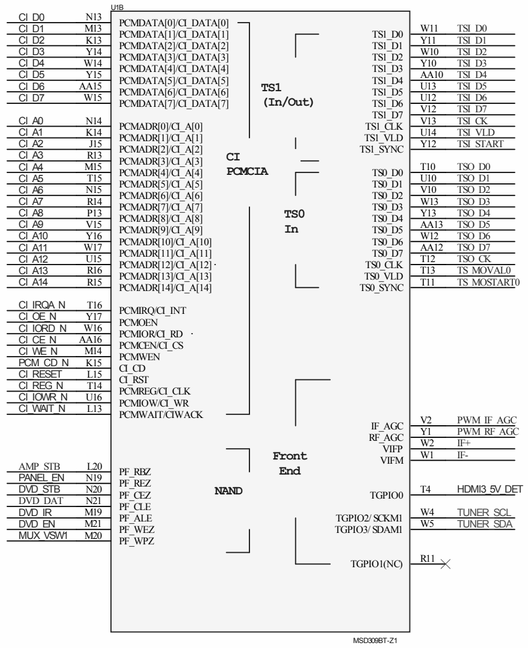

AMP_LIN
R30
AMP_LIN/
C15
R31
100ohm-0402-±5%-1/16W
220pF-0402-X7R-±10%-50V
100Kohm-0402-±5%-1/16W
GND
AMP_RIN
R32
AMP_RIN/
C16
R33
100ohm-0402-±5%-1/16W
220pF-0402-X7R-±10%-50V
100Kohm-0402-±5%-1/16W

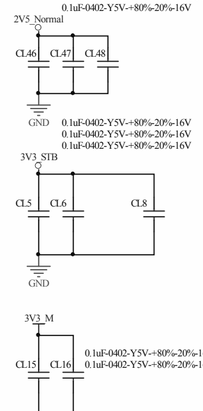

VDDC1.15V
CD48
CD49
CD50
GND
10uF-0805-X5R-±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
1uF-0603-Y5V-+80%-20%-10V
120ohm-0603-±25%
0.1uF-0402-Y5V-+80%-20%-16V
120ohm-0603-±25%
0.1uF-0402-Y5V-+80%-20%-16V
NC/0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V

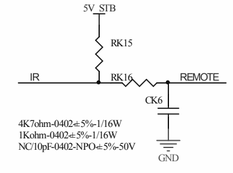

VDDC1.15V
U1F
MSD3098T-Z1
VDDC E4
VDDC G4
VDDC F5
VDDC G5
VDDC F6
VDDC G6
VDDC H8
VDDC J8
VDDC J9
VDDC J10
VDDC
DVDD_DDR G8
AVDDL_MOD H9
AVDD11_LAN F7
AVDD1P1_ADC E7
AVDDLV_USB G7
FB_CORE
DVDD_NODIE E4
DVDD_1.2V E6
2V5_Normal
AVDDS25_DADC P9
AVDDS25_DADC P10
AVDDS25_REF R9
AVDDS25_REF T9
AVDDS25_LAN P11
AVDD_MOD R10
AVDDS25_DPGA AA9
AVSS_PGA W9
AVDD_DMPLL R5
AVDD3P3_DVI_USB P6
AVDD3P3_DVI_USB P7
AVDD_NODIE P4
AVDD_AU33 R4
AVDD_EAR33 P5
AVDD3P3_MPLL_ETH R6
AVDD_LPLL R7
VDDP P8
AVDD_DDR0_D E8
AVDD_DDR0_D E9
AVDD_DDR0_D F10
AVDD_DDR0_D D8
AVDD_DDR0_C
AVDD_DDR1_D G9
AVDD_DDR1_D G10
AVDD_DDR1_D H10
AVDD_DDR1_C P9
AVDD_VREF1 B7
GND_EFUSE L7
GND M17
GND N17
GND P17
GND R17
GND T17
GND U17
GND F18
GND G18
GND H18
GND J18
GND K18
GND L18
GND M18
GND N18
GND P18
GND R18
GND T18
GND U18
GND V18
GND C20
GND A21
GND E21
GND V1
GND N4
GND N5
GND C6
GND D6
GND N6
GND C7
GND N7
GND C8
GND F8
GND M8
GND N8
GND R8
GND D9
GND K9
GND L9
GND M9
GND N9
GND U9
GND V9
GND A10
GND D10
GND K10
GND L10
GND M10
GND N10
GND D11
GND E11
GND F11
GND G11
GND H11
GND J11
GND K11
GND L11
GND M11
GND N11
GND D12
GND E12
GND F12
GND G12
GND H12
GND J12
GND K12
GND L12
GND M12
GND N12
GND P12
GND A13
GND D13
GND E13
GND D14
GND E14
GND D15
GND E15
GND P15
GND A16
GND D16
GND E16
GND F16
GND G16
GND H16
GND J16
GND K16
GND L16
GND M16
GND N16
GND P16
GND D17
GND E17
GND F17
GND K17
GND L17
C14 VCC_VSENSE
GND
2V5_Normal
L1
C4
L2
3V3_STB
3V3_M
1V5_DDR
2V8_DDR
AVDD_VREF1

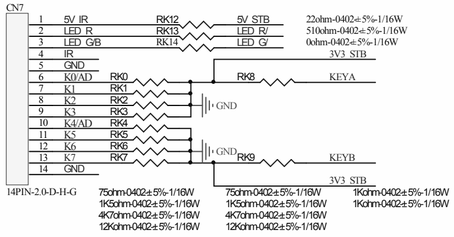

XTALI
XTALO
Y1
RF1
CF1
CF2
RF4
GND
20pF-0402-NPO-±5%-50V
20pF-0402-NPO-±5%-50V
1Mohm-0402-±5%-1/16W
24MHz-±-20PPM-20PF-HC-49S
0ohm-0402-±5%-1/16W

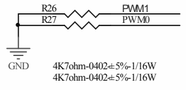

3V3_STB
RF11
FLASH_WP
RF12
CF11
GND
4K7ohm-0402-±5%-1/16W
100ohm-0402-±5%-1/16W
0.1uF-0402-Y5V-+80%-20%-16V
UF11
SPI_CSN 1
SPI_SDO 2
#F_WP 3
GND 4
CE# VDD 8
SO HOLD# 7
WP# SCK 6
VSS SI 5
SPI_SCK
SPI_SDI
MX25L3206EM2I-12G
GD25Q32BSIG

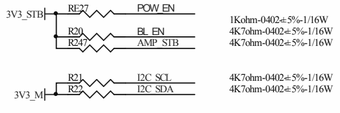

U1B
CI
PCMCIA
TS1
(In/Out)
TS0
In
NAND
Front
End
MSD3098T-Z1
CI_D0 N13
CI_D1 M13
CI_D2 K13
CI_D3 Y14
CI_D4 W14
CI_D5 Y15
CI_D6 AA15
CI_D7 W15
CI_A0 N14
CI_A1 K14
CI_A2 J15
CI_A3 R13
CI_A4 M15
CI_A5 T15
CI_A6 N15
CI_A7 R14
CI_A8 P13
CI_A9 V15
CI_A10 Y16
CI_A11 W17
CI_A12 U15
CI_A13 R16
CI_A14 R15
CI_IRQA_N T16
CI_OE_N Y17
CI_IORD_N W16
CI_CE_N AA16
CI_WE_N M14
PCM_CD_N K15
CI_RESET L15
CI_REG_N T14
CI_IOWR_N U16
CI_WAIT_N L13
AMP_STB L20
PANEL_EN N19
DVD_STB N20
DVD_DAT N21
DVD_IR M19
DVD_EN M21
MUX_VSW1 M20
PCMDATA[0]/CI_DATA[0]
PCMDATA[1]/CI_DATA[1]
PCMDATA[2]/CI_DATA[2]
PCMDATA[3]/CI_DATA[3]
PCMDATA[4]/CI_DATA[4]
PCMDATA[5]/CI_DATA[5]
PCMDATA[6]/CI_DATA[6]
PCMDATA[7]/CI_DATA[7]
PCMADR[0]/CI_A[0]
PCMADR[1]/CI_A[1]
PCMADR[2]/CI_A[2]
PCMADR[3]/CI_A[3]
PCMADR[4]/CI_A[4]
PCMADR[5]/CI_A[5]
PCMADR[6]/CI_A[6]
PCMADR[7]/CI_A[7]
PCMADR[8]/CI_A[8]
PCMADR[9]/CI_A[9]
PCMADR[10]/CI_A[10]
PCMADR[11]/CI_A[11]
PCMADR[12]/CI_A[12]
PCMADR[13]/CI_A[13]
PCMADR[14]/CI_A[14]
PCMIRQ/CI_INT
PCMOEN
PCMIOR/CI_RD
PCMCEN/CI_CS
PCMWEN
CI_CD
CI_RST
PCMREG/CI_CLK
PCMIOW/CI_WR
PCMWAIT/CIWACK
PF_RBZ
PF_REZ
PF_CEZ
PF_CLE
PF_ALE
PF_WEZ
PF_WPZ
TSI_D0 W11 TSI_D0
TSI_D1 Y11 TSI_D1
TSI_D2 W10 TSI_D2
TSI_D3 Y10 TSI_D3
TSI_D4 AA10 TSI_D4
TSI_D5 U13 TSI_D5
TSI_D6 U12 TSI_D6
TSI_D7 V12 TSI_D7
TSI_CLK V13 TSI_CK
TSI_VLD U14 TSI_VLD
TSI_SYNC Y12 TSI_START
TSO_D0 T10
TSO_D1 U10
TSO_D2 V10
TSO_D3 W13
TSO_D4 Y13
TSO_D5 AA13
TSO_D6 W12
TSO_D7 AA12
TSO_CK T12
TSO_VLD T13 TS_MOVAL0
TSO_SYNC T11 TS_MOSTART0
IF_AGC V2 PWM_IF_AGC
RF_AGC Y1 PWM_RF_AGC
VIFP W2 IF+
VIFM W1 IF-
TGPIO0 T4 HDMI3_5V_DET
TGPIO2/ SCKM1 W4 TUNER_SCL
TGPIO3/ SDAM1 W5 TUNER_SDA
TGPIO1(NC) R11

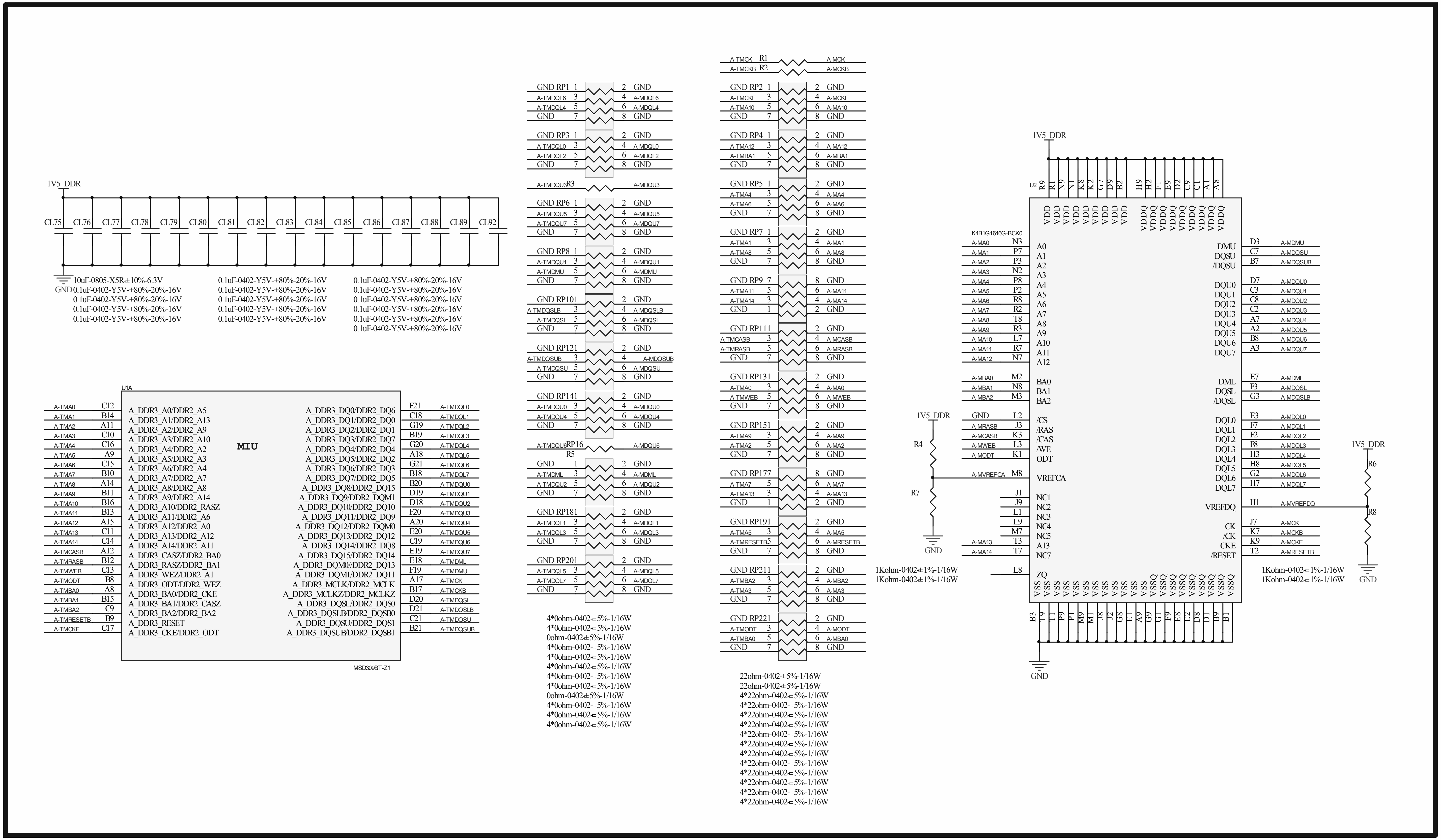

2V5_Normal
CL46
CL47
CL48
GND
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
3V3_STB
CL5
CL6
CL8
3V3_M
CL15
CL16
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
1V5_DDR
CL93
CL94
CL95
CL96
CL97
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V

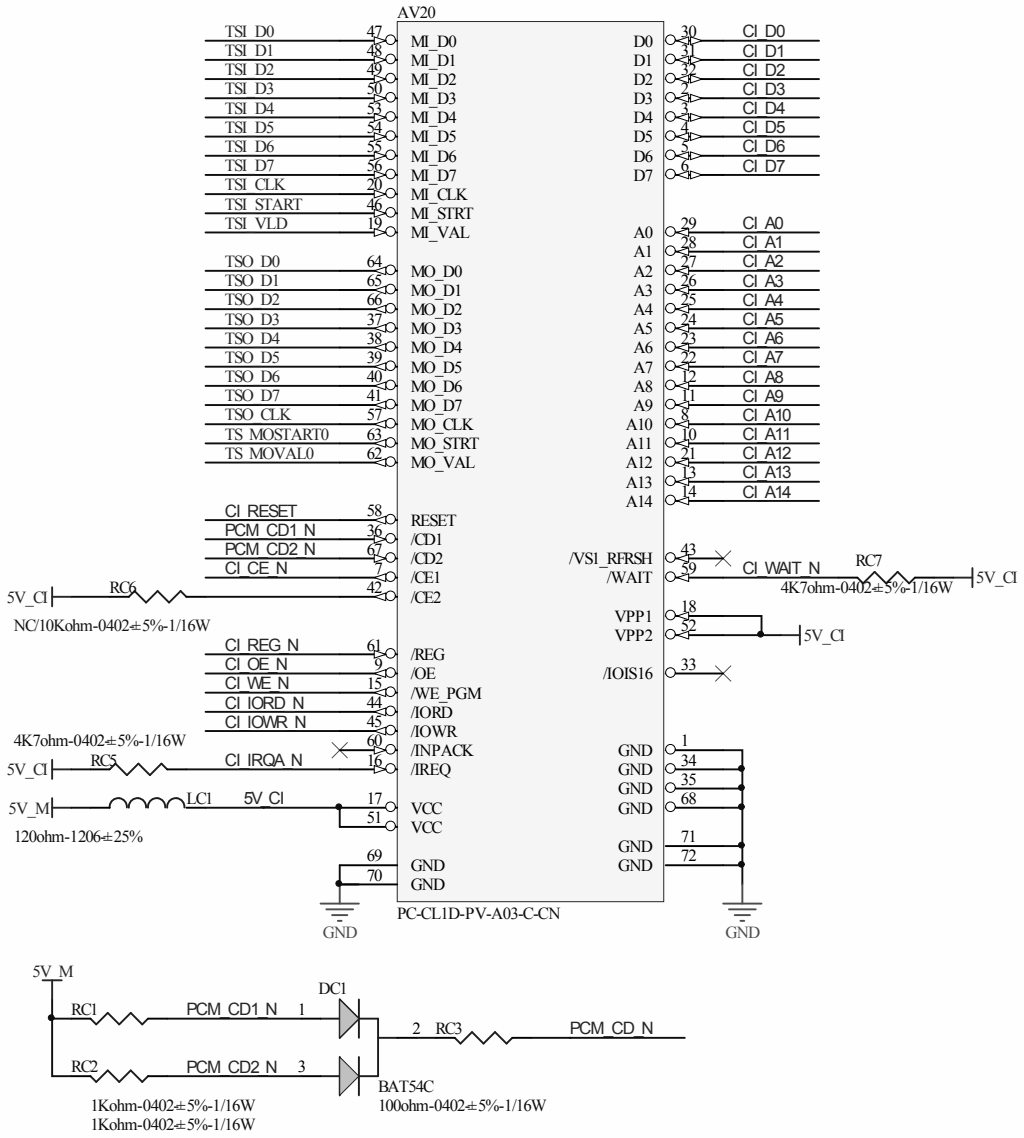

5V_STB
RK15
IR
RK16
REMOTE
CK6
GND
4K7ohm-0402-±5%-1/16W
1Kohm-0402-±5%-1/16W
NC/10pF-0402-NPO-±5%-50V

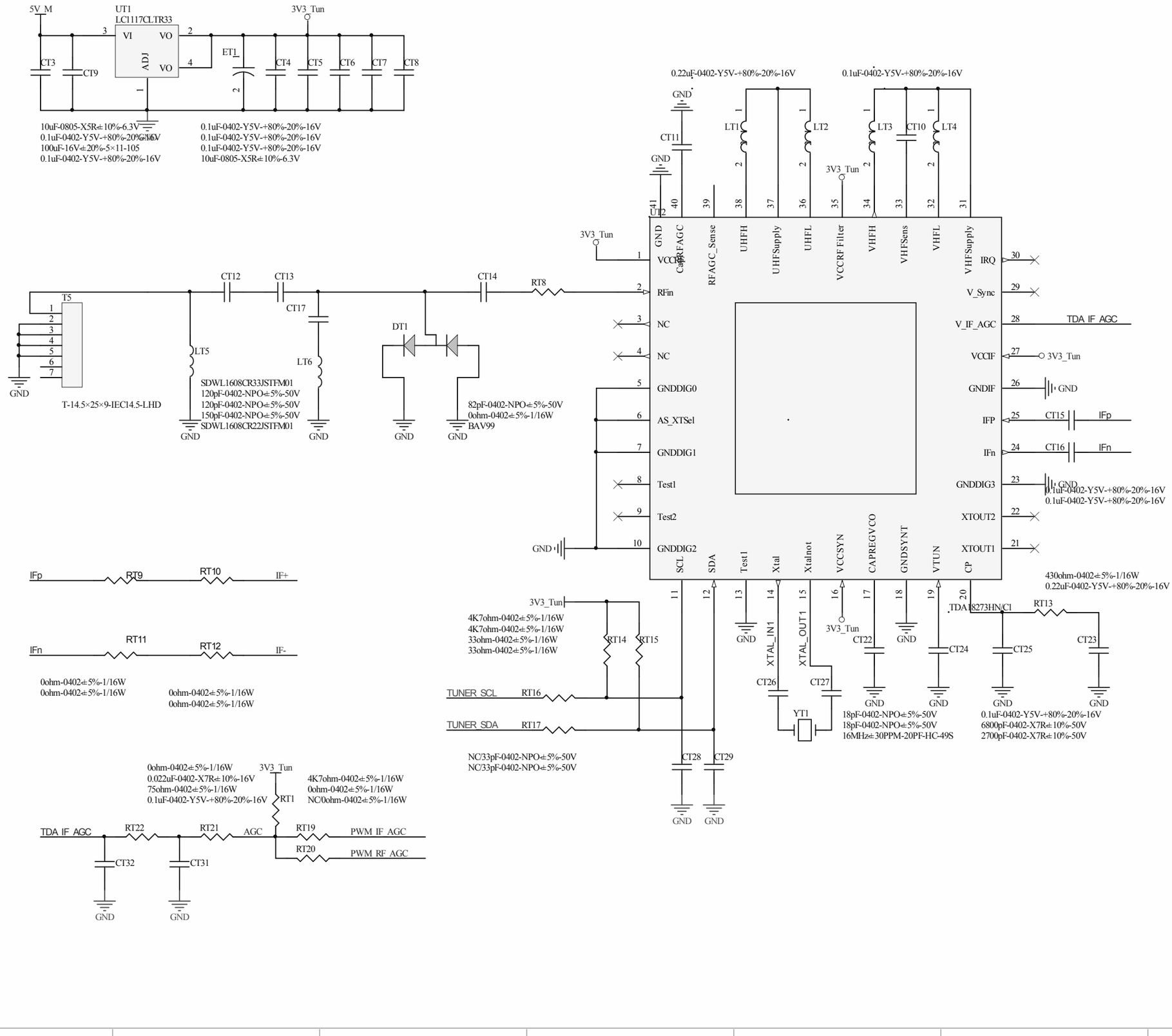

CN7
14PIN-2.0-D-H-G
5V_IR
LED_R
LED_G/B
IR
GND
K0/AD
K1
K2
K3
K4/AD
K5
K6
K7
GND
RK0
RK1
RK2
RK3
RK4
RK5
RK6
RK7
RK8
RK9
KEYA
KEYB
5V_STB
LED_R/
LED_G/
3V3_STB
GND
22ohm-0402-±5%-1/16W
510ohm-0402-±5%-1/16W
0ohm-0402-±5%-1/16W
75ohm-0402-±5%-1/16W
1K5ohm-0402-±5%-1/16W
4K7ohm-0402-±5%-1/16W
12Kohm-0402-±5%-1/16W
1Kohm-0402-±5%-1/16W

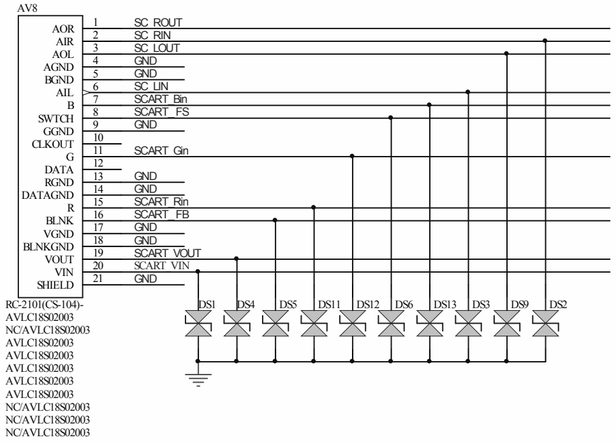

R26
R27
PWM1
PWM0
GND
4K7ohm-0402-±5%-1/16W
4K7ohm-0402-±5%-1/16W


3V3_STB
RE27
POW_EN
R29
BL_EN
R247
AMP_STB
3V3_M
R21
I2C_SCL
R22
I2C_SDA
1Kohm-0402-±5%-1/16W
4K7ohm-0402-±5%-1/16W
4K7ohm-0402-±5%-1/16W
4K7ohm-0402-±5%-1/16W
4K7ohm-0402-±5%-1/16W


1V5_DDR
CL75 CL76 CL77 CL78 CL79 CL80 CL81 CL82 CL83 CL84 CL85 CL86 CL87 CL88 CL89 CL92
GND
10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
U1A
MIU
MSD309BT-Z1
A-TMA0 C12 A_DDR3_A0/DDR2_A5
A-TMA1 B14 A_DDR3_A1/DDR2_A13
A-TMA2 A11 A_DDR3_A2/DDR2_A9
A-TMA3 C10 A_DDR3_A3/DDR2_A10
A-TMA4 C16 A_DDR3_A4/DDR2_A2
A-TMA5 A9 A_DDR3_A5/DDR2_A3
A-TMA6 C15 A_DDR3_A6/DDR2_A4
A-TMA7 B10 A_DDR3_A7/DDR2_A7
A-TMA8 A14 A_DDR3_A8/DDR2_A8
A-TMA9 B11 A_DDR3_A9/DDR2_A14
A-TMA10 B16 A_DDR3_A10/DDR2_RASZ
A-TMA11 B13 A_DDR3_A11/DDR2_A6
A-TMA12 A15 A_DDR3_A12/DDR2_A0
A-TMA13 C11 A_DDR3_A13/DDR2_A12
A-TMA14 C14 A_DDR3_A14/DDR2_A11
A-TMCASB A12 A_DDR3_CASZ/DDR2_BA0
A-TMRASB B12 A_DDR3_RASZ/DDR2_BA1
A-TMWEB C13 A_DDR3_WEZ/DDR2_A1
A-TMODT B8 A_DDR3_ODT/DDR2_WEZ
A-TMBA0 A8 A_DDR3_BA0/DDR2_CKE
A-TMBA1 B15 A_DDR3_BA1/DDR2_CASZ
A-TMBA2 C9 A_DDR3_BA2/DDR2_BA2
A-TMRESETB B9 A_DDR3_RESET
A-TMCKE C17 A_DDR3_CKE/DDR2_ODT
A_DDR3_DQ0/DDR2_DQ6 F21 A-TMDQL0
A_DDR3_DQ1/DDR2_DQ0 C18 A-TMDQL1
A_DDR3_DQ2/DDR2_DQ1 G19 A-TMDQL2
A_DDR3_DQ3/DDR2_DQ7 B19 A-TMDQL3
A_DDR3_DQ4/DDR2_DQ4 G20 A-TMDQL4
A_DDR3_DQ5/DDR2_DQ2 A18 A-TMDQL5
A_DDR3_DQ6/DDR2_DQ3 G21 A-TMDQL6
A_DDR3_DQ7/DDR2_DQ5 B18 A-TMDQL7
A_DDR3_DQ8/DDR2_DQ15 B20 A-TMDQU0
A_DDR3_DQ9/DDR2_DQM1 D19 A-TMDQU1
A_DDR3_DQ10/DDR2_DQ10 D18 A-TMDQU2
A_DDR3_DQ11/DDR2_DQ9 F20 A-TMDQU3
A_DDR3_DQ12/DDR2_DQM0 A20 A-TMDQU4
A_DDR3_DQ13/DDR2_DQ12 E20 A-TMDQU5
A_DDR3_DQ14/DDR2_DQ8 C19 A-TMDQU6
A_DDR3_DQ15/DDR2_DQ14 E19 A-TMDQU7
A_DDR3_DQM0//DDR2_DQ13 E18 A-TMDML
A_DDR3_DQM1/DDR2_DQ11 F19 A-TMDMU
A_DDR3_MCLK/DDR2_MCLK A17 A-TMCK
A_DDR3_MCLKZ/DDR2_MCLKZ B17 A-TMCKB
A_DDR3_DQSL/DDR2_DQS0 D20 A-TMDQSL
A_DDR3_DQSLB/DDR2_DQSB0 D21 A-TMDQSLB
A_DDR3_DQSU/DDR2_DQS1 C21 A-TMDQSU
A_DDR3_DQSUB/DDR2_DQSB1 B21 A-TMDQSUB
RP1: GND 1-2 GND; A-TMDQL6 3-4 A-MDQL6; A-TMDQL4 5-6 A-MDQL4; GND 7-8 GND
RP3: GND 1-2 GND; A-TMDQL0 3-4 A-MDQL0; A-TMDQL2 5-6 A-MDQL2; GND 7-8 GND
R3: A-TMDQU3 - A-MDQU3
RP6: GND 1-2 GND; A-TMDQU5 3-4 A-MDQU5; A-TMDQU7 5-6 A-MDQU7; GND 7-8 GND
RP8: GND 1-2 GND; A-TMDQU1 3-4 A-MDQU1; A-TMDMU 5-6 A-MDMU; GND 7-8 GND
RP101: GND 2 GND; A-TMDQSLB 3-4 A-MDQSLB; A-TMDQSL 5-6 A-MDQSL; GND 7-8 GND
RP121: GND 2 GND; A-TMDQSUB 3-4 A-MDQSUB; A-TMDQSU 5-6 A-MDQSU; GND 7-8 GND
RP141: GND 2 GND; A-TMDQU0 3-4 A-MDQU0; A-TMDQU4 5-6 A-MDQU4; GND 7-8 GND
RP16: A-TMDQU6 - A-MDQU6
R5: GND 1-2 GND; A-TMDML 3-4 A-MDML; A-TMDQU2 5-6 A-MDQU2; GND 7-8 GND
RP181: GND 2 GND; A-TMDQL1 3-4 A-MDQL1; A-TMDQL3 5-6 A-MDQL3; GND 7-8 GND
RP201: GND 2 GND; A-TMDQL5 3-4 A-MDQL5; A-TMDQL7 5-6 A-MDQL7; GND 7-8 GND
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
4*0ohm-0402±5%-1/16W
R1: A-TMCK - A-MCK
R2: A-TMCKB - A-MCKB
RP2: GND 1-2 GND; A-TMCKE 3-4 A-MCKE; A-TMA10 5-6 A-MA10; GND 7-8 GND
RP4: GND 1-2 GND; A-TMA12 3-4 A-MA12; A-TMBA1 5-6 A-MBA1; GND 7-8 GND
RP5: GND 1-2 GND; A-TMA4 3-4 A-MA4; A-TMA6 5-6 A-MA6; GND 7-8 GND
RP7: GND 1-2 GND; A-TMA1 3-4 A-MA1; A-TMA8 5-6 A-MA8; GND 7-8 GND
RP9: GND 7-8 GND; A-TMA11 5-6 A-MA11; A-TMA14 3-4 A-MA14; GND 1-2 GND
RP111: GND 2 GND; A-TMCASB 3-4 A-MCASB; A-TMRASB 5-6 A-MRASB; GND 7-8 GND
RP131: GND 2 GND; A-TMA0 3-4 A-MA0; A-TMWEB 5-6 A-MWEB; GND 7-8 GND
RP151: GND 2 GND; A-TMA9 3-4 A-MA9; A-TMA2 5-6 A-MA2; GND 7-8 GND
RP177: GND 8 GND; A-TMA7 5-6 A-MA7; A-TMA13 3-4 A-MA13; GND 1-2 GND
RP191: GND 2 GND; A-TMA5 3-4 A-MA5; A-TMRESETB 5-6 A-MRESETB; GND 7-8 GND
RP211: GND 2 GND; A-TMBA2 3-4 A-MBA2; A-TMA3 5-6 A-MA3; GND 7-8 GND
RP221: GND 2 GND; A-TMODT 3-4 A-MODT; A-TMBA0 5-6 A-MBA0; GND 7-8 GND
22ohm-0402±5%-1/16W
22ohm-0402±5%-1/16W
4*22ohm-0402±5%-1/16W (×13)
1V5_DDR
R4
R7
A-MVREFCA
1Kohm-0402±1%-1/16W
1Kohm-0402±1%-1/16W
U2
K4B1G1646G-BCK0
R9 R1 N9 N1 K8 K2 G7 D9 B2 VDD
H9 H2 F1 E9 D2 C9 C1 A1 A8 VDDQ
A-MA0 N3 A0; A-MA1 P7 A1; A-MA2 P3 A2; A-MA3 N2 A3; A-MA4 P8 A4; A-MA5 P2 A5; A-MA6 R8 A6; A-MA7 R2 A7; A-MA8 T8 A8; A-MA9 R3 A9; A-MA10 L7 A10; A-MA11 R7 A11; A-MA12 N7 A12
A-MBA0 M2 BA0; A-MBA1 N8 BA1; A-MBA2 M3 BA2
GND L2 /CS; A-MRASB J3 /RAS; A-MCASB K3 /CAS; A-MWEB L3 /WE; A-MODT K1 ODT
A-MVREFCA M8 VREFCA
J1 NC1; J9 NC2; L1 NC3; L9 NC4; M7 NC5; A-MA13 T3 A13; A-MA14 T7 NC7
L8 ZQ
DMU D3 A-MDMU; DQSU C7 A-MDQSU; /DQSU B7 A-MDQSUB
DQU0 D7 A-MDQU0; DQU1 C3 A-MDQU1; DQU2 C8 A-MDQU2; DQU3 C2 A-MDQU3; DQU4 A7 A-MDQU4; DQU5 A2 A-MDQU5; DQU6 B8 A-MDQU6; DQU7 A3 A-MDQU7
DML E7 A-MDML; DQSL F3 A-MDQSL; /DQSL G3 A-MDQSLB
DQL0 E3 A-MDQL0; DQL1 F7 A-MDQL1; DQL2 F2 A-MDQL2; DQL3 F8 A-MDQL3; DQL4 H3 A-MDQL4; DQL5 H8 A-MDQL5; DQL6 G2 A-MDQL6; DQL7 H7 A-MDQL7
VREFDQ H1 A-MVREFDQ
CK J7 A-MCK; /CK K7 A-MCKB; CKE K9 A-MCKE; /RESET T2 A-MRESETB
VSS VSSQ
B3 T9 T1 P9 P1 M9 M1 J8 J2 G8 E1 A9 G9 G1 F9 E8 E2 D8 D1 B9 B1
GND
1V5_DDR
R6
R8
1Kohm-0402±1%-1/16W
1Kohm-0402±1%-1/16W
GND


AV20
TSI_D0 47
TSI_D1 48
TSI_D2 49
TSI_D3 50
TSI_D4 53
TSI_D5 54
TSI_D6 55
TSI_D7 56
TSI_CLK 20
TSI_START 46
TSI_VLD 19
MI_D0
MI_D1
MI_D2
MI_D3
MI_D4
MI_D5
MI_D6
MI_D7
MI_CLK
MI_STRT
MI_VAL
TSO_D0 64
TSO_D1 65
TSO_D2 66
TSO_D3 37
TSO_D4 38
TSO_D5 39
TSO_D6 40
TSO_D7 41
TSO_CLK 57
TS_MOSTART0 63
TS_MOVAL0 62
MO_D0
MO_D1
MO_D2
MO_D3
MO_D4
MO_D5
MO_D6
MO_D7
MO_CLK
MO_STRT
MO_VAL
CI_RESET 58
PCM_CD1_N 36
PCM_CD2_N 67
CI_CE_N 7
42
RESET
/CD1
/CD2
/CE1
/CE2
5V_CI
RC6
NC/10Kohm-0402±5%-1/16W
CI_REG_N 61
CI_OE_N 9
CI_WE_N 15
CI_IORD_N 44
CI_IOWR_N 45
/REG
/OE
/WE_PGM
/IORD
/IOWR
4K7ohm-0402±5%-1/16W
5V_CI
RC5
CI_IRQA_N 60 16
/INPACK
/IREQ
5V_M
LC1
5V_CI 17
120ohm-1206±25%
VCC
51
VCC
69
70
GND
GND
GND
PC-CL1D-PV-A03-C-CN
D0 30 CI_D0
D1 31 CI_D1
D2 32 CI_D2
D3 2 CI_D3
D4 3 CI_D4
D5 4 CI_D5
D6 5 CI_D6
D7 6 CI_D7
A0 29 CI_A0
A1 28 CI_A1
A2 27 CI_A2
A3 26 CI_A3
A4 25 CI_A4
A5 24 CI_A5
A6 23 CI_A6
A7 22 CI_A7
A8 12 CI_A8
A9 11 CI_A9
A10 8 CI_A10
A11 10 CI_A11
A12 21 CI_A12
A13 13 CI_A13
A14 14 CI_A14
/VS1_RFRSH 43
/WAIT 59
CI_WAIT_N
RC7
4K7ohm-0402±5%-1/16W
5V_CI
VPP1 18
VPP2 52
5V_CI
/IOIS16 33
GND 1
GND 34
GND 35
GND 68
GND 71
GND 72
GND
5V_M
DC1
RC1
PCM_CD1_N 1
2 RC3
PCM_CD_N
RC2
PCM_CD2_N 3
BAT54C
1Kohm-0402±5%-1/16W
1Kohm-0402±5%-1/16W
100ohm-0402±5%-1/16W


5V_M
UT1
LC1117CLTR33
VI
VO
ADJ
3V3_Tun
CT3
CT9
ET1
CT4
CT5
CT6
CT7
CT8
10uF-0805-X5R±10%-6.3V
0.1uF-0402-Y5V-+80%-20%-16V
100uF-16V±20%-5×11-105
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
10uF-0805-X5R±10%-6.3V
0.22uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
GND
CT11
LT1
LT2
LT3
CT10
LT4
3V3_Tun
UT2
GND
RFAGC Cap
RFAGC_Sense
UHFH
UHFSupply
UHFL
VCCRF Filter
VHFH
VHFSens
VHFL
VHFSupply
3V3_Tun
VCCIF
RFin
NC
NC
GNDDIG0
AS_XTSel
GNDDIG1
Test1
Test2
GND
GNDDIG2
IRQ
V_Sync
V_IF_AGC
TDA IF AGC
VCCIF
3V3_Tun
GNDIF
GND
IFP
CT15
IFp
IFn
CT16
IFn
GNDDIG3
GND
0.1uF-0402-Y5V-+80%-20%-16V
0.1uF-0402-Y5V-+80%-20%-16V
XTOUT2
XTOUT1
SCL
SDA
Test1
Xtal
Xtalnot
VCCSYN
CAPREGVCO
GNDSYNT
VTUN
CP
430ohm-0402±5%-1/16W
0.22uF-0402-Y5V-+80%-20%-16V
TDA18273HN/C1
RT13
CT12
CT13
CT14
RT8
CT17
T5
T-14.5×25×9-IEC14.5-LHD
LT5
SDWL1608CR33JSTFM01
120pF-0402-NPO±5%-50V
120pF-0402-NPO±5%-50V
150pF-0402-NPO±5%-50V
SDWL1608CR22JSTFM01
LT6
DT1
82pF-0402-NPO±5%-50V
0ohm-0402±5%-1/16W
BAV99
3V3_Tun
4K7ohm-0402±5%-1/16W
4K7ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
RT14
RT15
TUNER_SCL
RT16
TUNER_SDA
RT17
NC/33pF-0402-NPO±5%-50V
NC/33pF-0402-NPO±5%-50V
CT28
CT29
XTAL_IN1
XTAL_OUT1
CT26
CT27
YT1
18pF-0402-NPO±5%-50V
18pF-0402-NPO±5%-50V
16MHz±30PPM-20PF-HC-49S
CT22
CT24
CT25
CT23
0.1uF-0402-Y5V-+80%-20%-16V
6800pF-0402-X7R±10%-50V
2700pF-0402-X7R±10%-50V
IFp
RT9
RT10
IF+
IFn
RT11
RT12
IF-
0ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
0.022uF-0402-X7R±10%-16V
75ohm-0402±5%-1/16W
0.1uF-0402-Y5V-+80%-20%-16V
3V3_Tun
RT1
4K7ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
NC/0ohm-0402±5%-1/16W
TDA IF AGC
RT22
RT21
AGC
RT19
PWM IF AGC
RT20
PWM RF AGC
CT32
CT31


AV8
AOR
AIR
AOL
AGND
BGND
AIL
B
SWTCH
GGND
CLKOUT
G
DATA
RGND
DATAGND
R
BLNK
VGND
BLNKGND
VOUT
VIN
SHIELD
1 SC_ROUT
2 SC_RIN
3 SC_LOUT
4 GND
5 GND
6 SC_LIN
7 SCART_Bin
8 SCART_FS
9 GND
10
11 SCART_Gin
12
13 GND
14 GND
15 SCART_Rin
16 SCART_FB
17 GND
18 GND
19 SCART_VOUT
20 SCART_VIN
21 GND
DS1 DS4 DS5 DS11 DS12 DS6 DS13 DS3 DS9 DS2
RC-2101(CS-104)-
AVLC18S02003
NC/AVLC18S02003
AVLC18S02003
AVLC18S02003
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AVLC18S02003
AVLC18S02003
NC/AVLC18S02003
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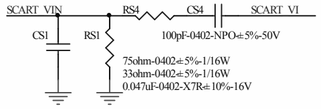
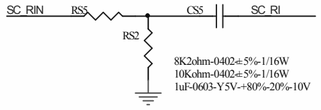
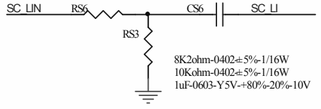
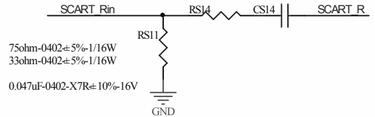
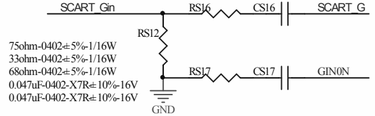
NC/AVLC18S02003

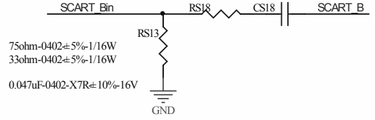

SCART_VIN
RS4
CS4
SCART_VI
CS1
RS1
100pF-0402-NPO±5%-50V
75ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
0.047uF-0402-X7R±10%-16V
GND

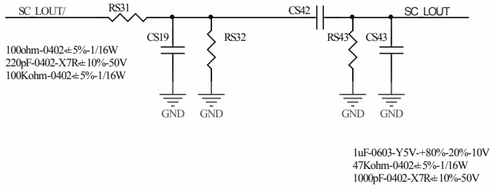

SC_RIN
RS5
CS5
SC_RI
RS2
8K2ohm-0402±5%-1/16W
10Kohm-0402±5%-1/16W
1uF-0603-Y5V-+80%-20%-10V
GND

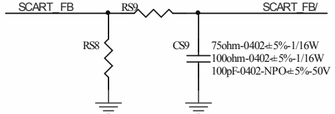

SC_LIN
RS6
CS6
SC_LI
RS3
8K2ohm-0402±5%-1/16W
10Kohm-0402±5%-1/16W
1uF-0603-Y5V-+80%-20%-10V
GND


SCART_Rin
RS14
CS14
SCART_R
RS11
75ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
0.047uF-0402-X7R±10%-16V
GND


SCART_Gin
RS16
CS16
SCART_G
RS12
75ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
68ohm-0402±5%-1/16W
0.047uF-0402-X7R±10%-16V
0.047uF-0402-X7R±10%-16V
RS17
CS17
GIN0N
GND


SCART_Bin
RS18
CS18
SCART_B
RS13
75ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
0.047uF-0402-X7R±10%-16V
GND


SC_LOUT/
RS31
CS42
SC_LOUT
100ohm-0402±5%-1/16W
220pF-0402-X7R±10%-50V
100Kohm-0402±5%-1/16W
CS19
RS32
RS43
CS43
GND GND GND GND
1uF-0603-Y5V-+80%-20%-10V
47Kohm-0402±5%-1/16W
1000pF-0402-X7R±10%-50V


SCART_FB
RS9
SCART_FB/
RS8
CS9
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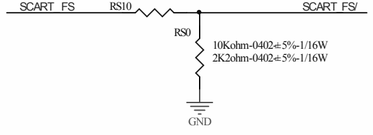
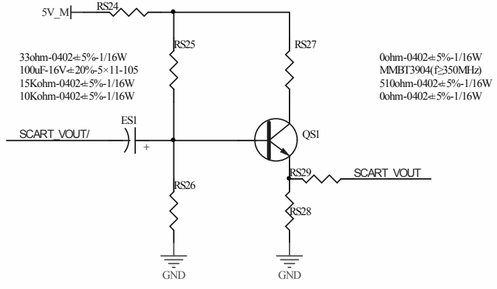
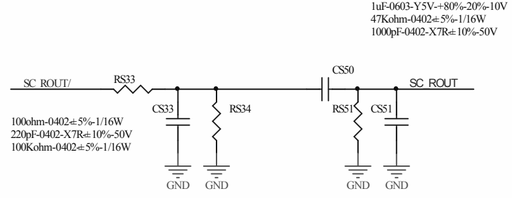
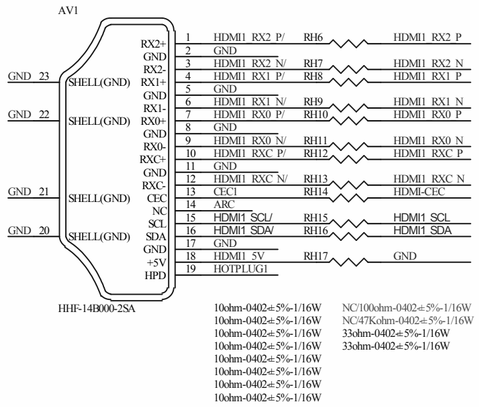
100ohm-0402±5%-1/16W
100pF-0402-NPO±5%-50V
GND GND

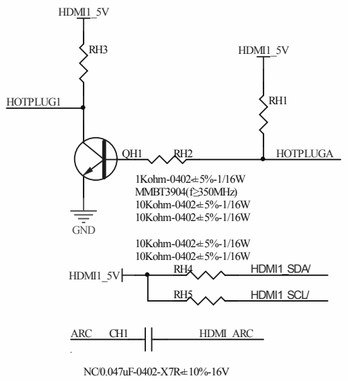

SCART_FS
RS10
SCART_FS/
RS0
10Kohm-0402±5%-1/16W
2K2ohm-0402±5%-1/16W
GND

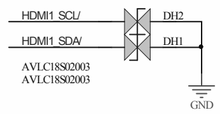

5V_M
RS24
RS25
RS27
33ohm-0402±5%-1/16W
100uF-16V±20%-5×11-105
15Kohm-0402±5%-1/16W
10Kohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
MMBT3904(f≥350MHz)
510ohm-0402±5%-1/16W
0ohm-0402±5%-1/16W
SCART_VOUT/
ES1
+
QS1
RS29
SCART_VOUT
RS26
RS28
GND GND

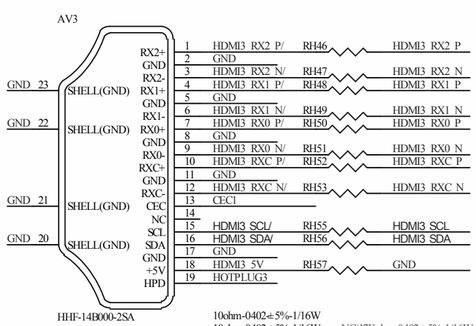

1uF-0603-Y5V-+80%-20%-10V
47Kohm-0402±5%-1/16W
1000pF-0402-X7R±10%-50V
SC_ROUT/
RS33
CS50
SC_ROUT
100ohm-0402±5%-1/16W
220pF-0402-X7R±10%-50V
100Kohm-0402±5%-1/16W
CS33
RS34
RS51
CS51
GND GND GND GND



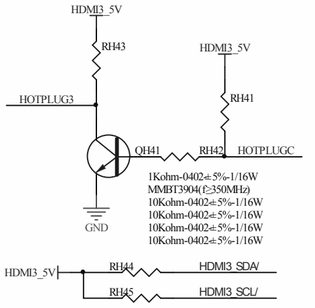
10ohm-0402±5%-1/16W ×8
NC/100ohm-0402±5%-1/16W
NC/47Kohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W

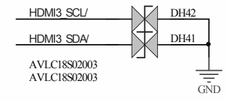


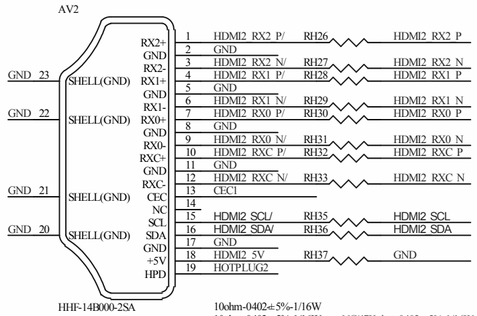




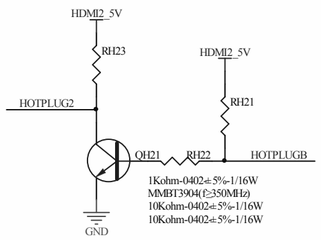
10ohm-0402±5%-1/16W ×8
NC/47Kohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W

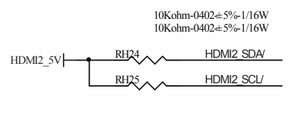


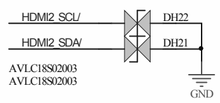


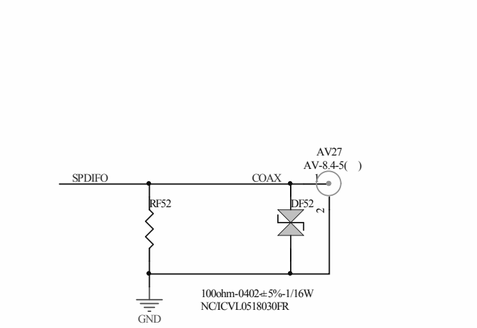


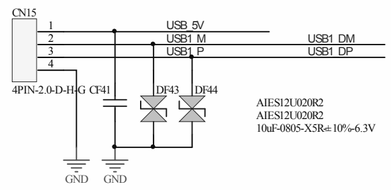
10ohm-0402±5%-1/16W ×8
NC/47Kohm-0402±5%-1/16W
33ohm-0402±5%-1/16W
33ohm-0402±5%-1/16W

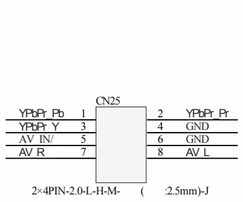


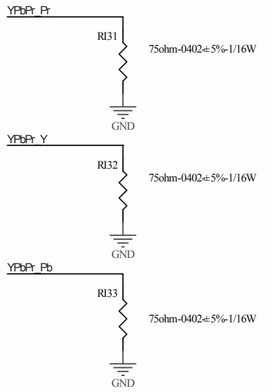


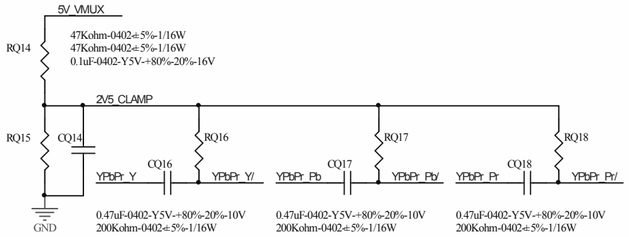


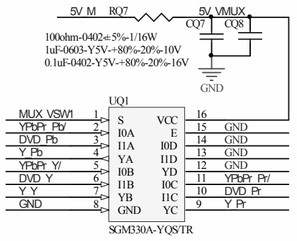


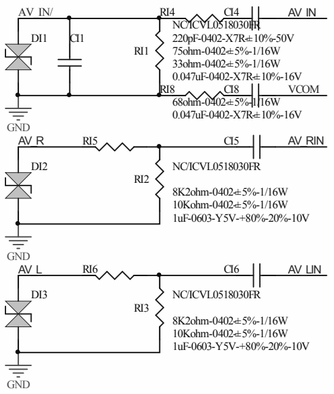


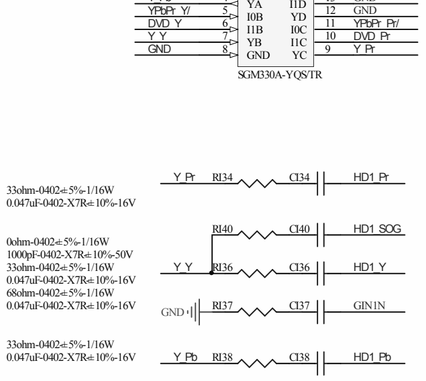


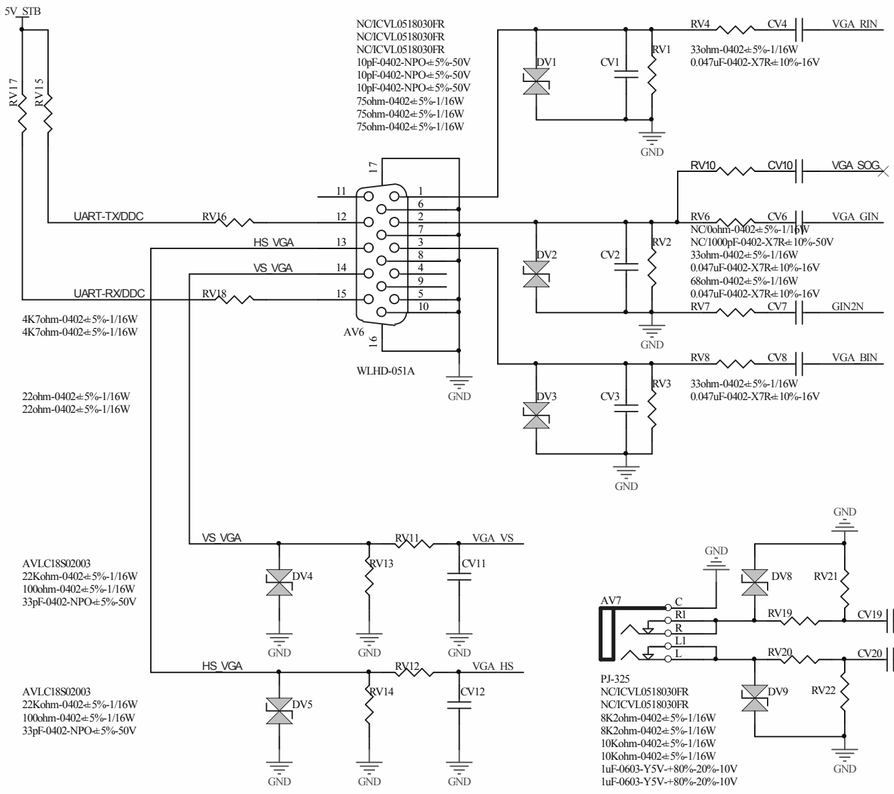


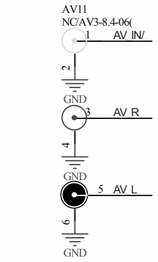


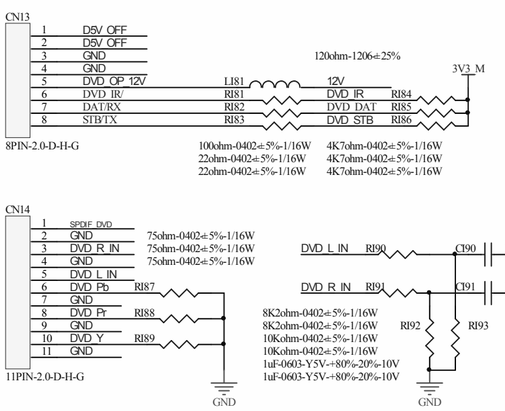


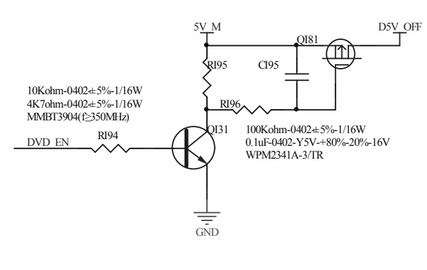


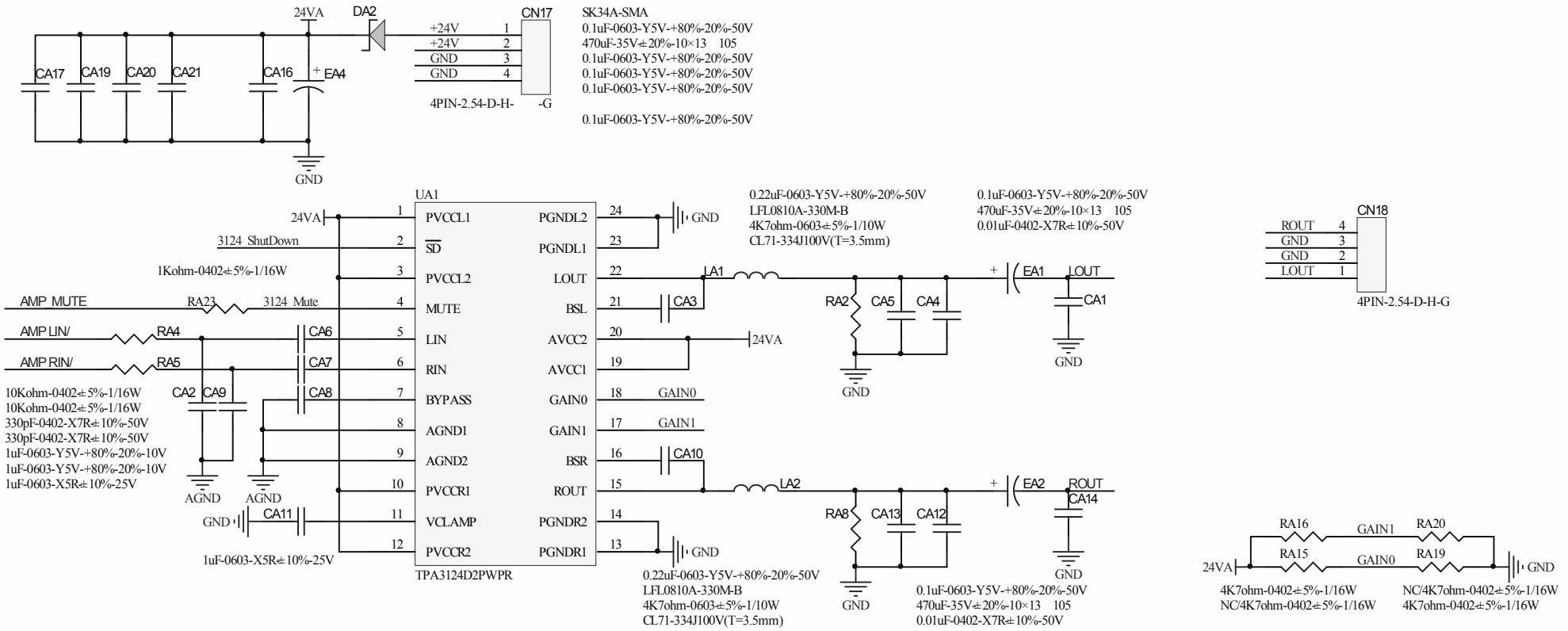


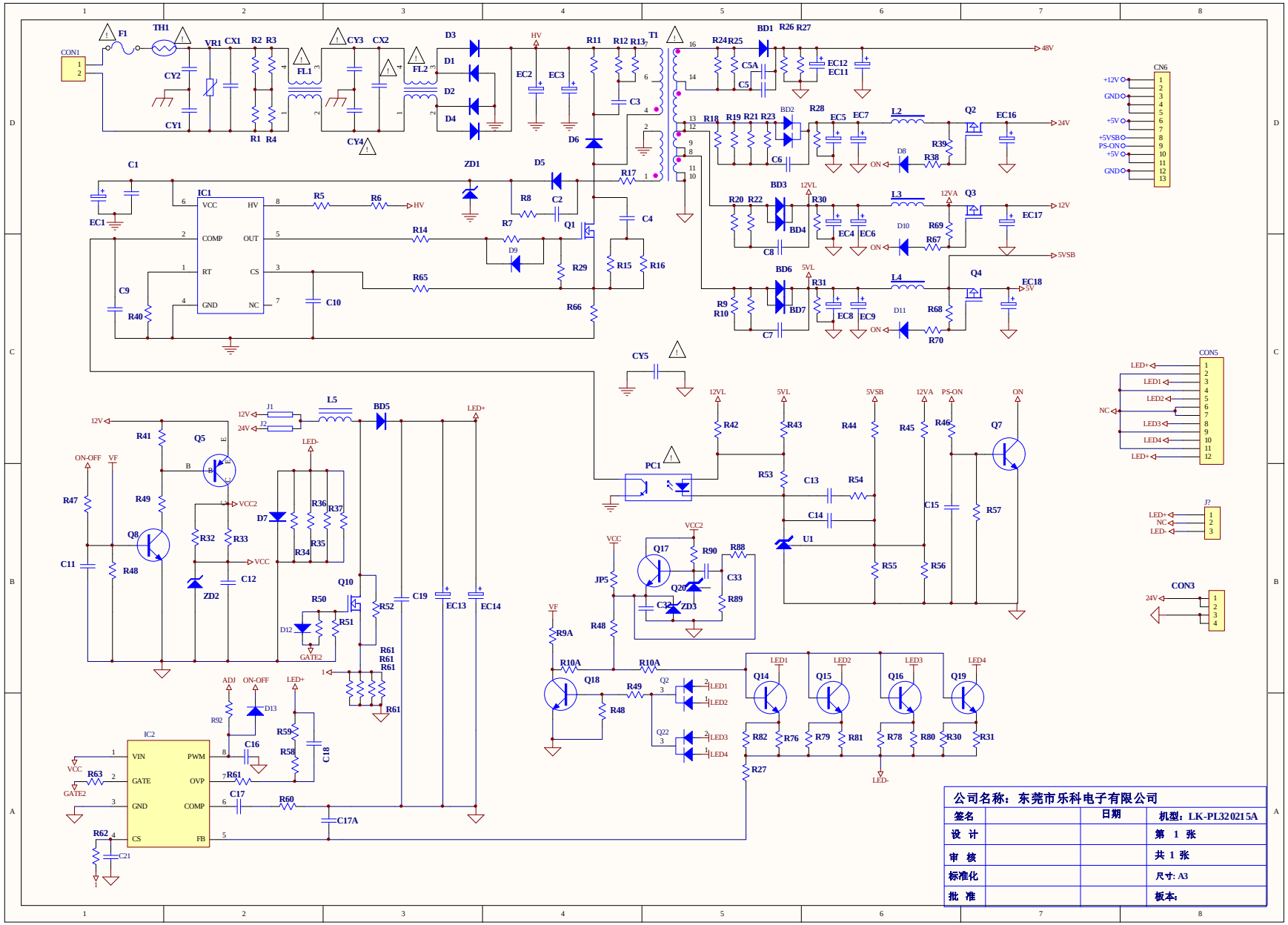









24VA
DA2
CN17
+24V 1
+24V 2
GND 3
GND 4
4PIN-2.54-D-H- -G
SK34A-SMA
0.1uF-0603-Y5V-+80%-20%-50V
470uF-35V±20%-10×13 105
0.1uF-0603-Y5V-+80%-20%-50V
0.1uF-0603-Y5V-+80%-20%-50V
0.1uF-0603-Y5V-+80%-20%-50V
0.1uF-0603-Y5V-+80%-20%-50V
CA17 CA19 CA20 CA21 CA16 EA4
GND
UA1
PVCCL1 1
SD 2
PVCCL2 3
MUTE 4
LIN 5
RIN 6
BYPASS 7
AGND1 8
AGND2 9
PVCCR1 10
VCLAMP 11
PVCCR2 12
PGNDL2 24
PGNDL1 23
LOUT 22
BSL 21
AVCC2 20
AVCC1 19
GAIN0 18
GAIN1 17
BSR 16
ROUT 15
PGNDR2 14
PGNDR1 13
TPA3124D2PWPR
3124_ShutDown
1Kohm-0402±5%-1/16W
AMP_MUTE
RA23
3124_Mute
AMP LIN/
RA4
AMP RIN/
RA5
CA6
CA7
CA8
CA2 CA9
10Kohm-0402±5%-1/16W
10Kohm-0402±5%-1/16W
330pF-0402-X7R±10%-50V
330pF-0402-X7R±10%-50V
1uF-0603-Y5V-+80%-20%-10V
1uF-0603-Y5V-+80%-20%-10V
1uF-0603-X5R±10%-25V
AGND
AGND
GND
CA11
1uF-0603-X5R±10%-25V
0.22uF-0603-Y5V-+80%-20%-50V
LFL0810A-330M-B
4K7ohm-0603±5%-1/10W
CL71-334J100V(T=3.5mm)
0.1uF-0603-Y5V-+80%-20%-50V
470uF-35V±20%-10×13 105
0.01uF-0402-X7R±10%-50V
LA1
CA3
24VA
RA2 CA5 CA4
EA1
LOUT
CA1
GND
GAIN0
GAIN1
CA10
LA2
RA8 CA13 CA12
EA2
ROUT
CA14
GND
0.22uF-0603-Y5V-+80%-20%-50V
LFL0810A-330M-B
4K7ohm-0603±5%-1/10W
CL71-334J100V(T=3.5mm)
0.1uF-0603-Y5V-+80%-20%-50V
470uF-35V±20%-10×13 105
0.01uF-0402-X7R±10%-50V
CN18
ROUT 4
GND 3
GND 2
LOUT 1
4PIN-2.54-D-H-G
RA16 GAIN1 RA20
RA15 GAIN0 RA19
24VA
GND
4K7ohm-0402±5%-1/16W
NC/4K7ohm-0402±5%-1/16W
NC/4K7ohm-0402±5%-1/16W
4K7ohm-0402±5%-1/16W



公司名称：东莞市乐科电子有限公司			
签名		日期	机型：LK-PI320215A
设 计			第 1 张
审 核			共 1 张
标准化			尺寸: A3
批 准			板本:

LEKE® 东莞市乐科电子有限公司
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POWER & LED DRIVER SPECIFICATION

二合一(电源&恒流驱动板)规格书

机 种 名 称(M/N): LK-PL320215C

描述(Description): For 31.5 ″ LED PANEL

客 户(Customer):

客户物料号 (P/N):

版 本(Version): V1.0

发行单位(Iss Dept): 电子事业部研发中心

发行日期(Iss Date): 2012-5-04

文件编号(Doc. No.):

Prepared By（拟制）	Checked By（审核）	Approved By（批准）

单　位 Units	部门 Dept	拟制 Described	检查 Check	审核 Checked	批准 Approved
■研发 R&D	■二合一项目组 R&D				
□工程部 Eng Dept					
□品质部 Qua Dept					
□检测验证部 DQA Dept					
□技术支持部 Technical Support Dept					
□销售部 Sales					

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Date	Modify Item	Modify Reason
12-5-4		初版发行

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1. Power Supply Overview 电性能指标：

1.1 Table 1 Input Electrical Characteristics Overview (输入特性）

Input voltage range 输入电压范围	90Vac-264Vac
Normal voltage range 标准输入	100Vac-240Vac
Frequency range 频率范围	50Hz/60Hz
Max input AC current 满载输入电流	3Amax at full load condition
Inrush current (cold start)浪涌电流(冷机）	50Atyp peak, 120Vac; 100Atyp peak, 220Vac
Efficiency (full load) 效率	78%min at 100Vac
PFC 功率因素(输出带额定负载）	
Leakage Current 泄漏电流	Less Than 0.75mA, 230Vac input
No-load Power Loss 空载功耗	≦0.5W 240Vac input at 5Vsb Output current≤30mA
Input Fuse 输入保险额定值	T3.15AL/250Vac

1.2 Output Eletrical Characteristics Overview (输出特性）

1.2.1 Table 2 Output Voltage, Current & Regulation. (输出调整率）

Output Voltage 输出电压	Regulation 调整率	Min current 最小电流	Rated current 额定电流	Peak current 峰值电流
+24V	¡1 0%	0A	0-1.8A	≤45W
+12V	¡1 0%	0.3A	0.3-1.5A	≤30W
+5.2V	¡5%	0.1A	0.1-1.5A	
+5.2VSB	¡5%	0.02A	0.02-0.5A	

1.2.2 Table 3 DC Output Ripple & Noise. (输出波纹和噪声）

Output Voltage	Ripple & Noise(Max)
+24V	400mVp-p@25℃(VAC=100~264V)
+12V	300mVp-p@25℃(VAC=100~264V)
+5.2V、 +5.2VSB	150mVp-p@25℃(VAC=100~264V)

Note: 1)Measurements shall be made with an oscilloscopewith 20Mhz bandwidth .

示波器设置在20MHz带宽

2）Output shall be bypassed at the connector with a 0.1 uF ceramic capacitor and a47uF electrolytic simulate system loading .

输出并联0.1uF的陶瓷电容和47uF的电解电容。

1.2.3 Output Transient Response. （输出动态响应）

Table 4. Test condition.测试条件

Voltage Tolerance Limit	Slew Rate	Load Change
+24V/¡10%;+12V/¡10% ;5.2V/5.2VSB¡5%	0.2A/uS	Min. to 50% load and 50% to Max load
All output¡ 10%	0.2A/uS	Min. load to Max load

Note: Transient response measurements shall be made with a load changing repetition rate of 50Hz to 10kHz. 以50~10KHz的频率跳变负载来测试。

1.2.4 Table 5 DC Output Hold-Up Time.（输出保持时间）

Output Voltage	120Vac input	220Vac input
+24V	≥5 mS	≥10 mS
+12V	≥5 mS	≥10 mS
+5.2V 、+5.2VSB	≥5 mS	≥10 mS

Note: All of dc output at full load. 所有输出带满载

1.2.5 Table 6 DC Output Overshoot At Turn On & Turn Off.（输出超调）

Output Channel	Output(V)	Over shoot voltage(V)超调电压	
		Turn on开机	Turn off关机
+24V	+24V	10%	10%
+12V	+12V	10%	10%
+5.2V 、+5.2VSB	+5.2V	10%	10%

Note: All of dc output current from Min. to Max. 测试时负载范围：最小到最大

1.2.6 Table 7 DC output voltage rise time（输出上升时间）

Output Voltage	120Vac input	220Vac input
+24V	≤100 ms	≤100 ms
+12V	≤100 ms	≤100 ms
+5.2V 、+5.2VSB	≤100 ms	≤100 ms

Note: The output voltages shall rise from10% to 90% of their output voltage.输出从10%上升到90%的时间

1.3 On/Off Control (ON/OFF控制）

The power supply DC outputs shall be enable with an active-high TTL(≥ 2.5V/2.0mA)-compatible signal(Ps-on). The 5.0Vsb is on whenever the AC power is present.

除5.0Vsb外，其余输出受控于一个TTL电平兼容的信号（Ps-on≥2.5V/2.0mA) 5.0Vsb上电就存在。

* When Ps-on is pulled to TTL high, the DC outputs are to be enabled. Ps-on 高电平，打开输出

* When Ps-on is pulled to TTL low or open circuit, the DC outputs are to be disabled. Ps-on 低电平，关闭输出

Table 8.

Ps-on Signal	Comments	Outputs
Ps-on- high	≥2.5V&2.0mA （ source)	Output
Ps-on- low	≤0.5 V	X
Ps-on-open	——	X

1.4 Protection:(保护功能）

1.4.1 Table9 DC Over Voltage Protection. (输出过压保护）

The power supply have the over voltage protection. When the main feedback control circuit fault occur .

The power supply shall be over voltage protection to protect the whole system.

该开关电源具有过压保护功能，当主反馈回路出现故障时，电源过压保护，从而保护整个系统安全）

1.4.2 Table 10 DC Output Over current Protection. (输出过流保护）

Output Voltage	Over Current	Comments
+24V	≥2.0A	Hiccup尝试重复启动
+12V	≥2.5A	Hiccup尝试重复启动
+5.0V	≥3.0A	Hiccup尝试重复启动
+5.2VSB	≥3.0A	Hiccup尝试重复启动

1.4.3 Table 11 DC Output Short Circuit Protection. (输出短路保护）

Output Voltage	Comments
+24V	Hiccup尝试重复启动
+12V	Hiccup尝试重复启动
+5.2VSB	Hiccup尝试重复启动

Note:* The Short Circuit protection should be test at other of dc output at min load 短路保护测试是在其它最小负载时测试.

1.4.4 Reset After Shutdown.（保护功能复位）

Recycle the ps-on signal, the power supply will restart after the fault removed.

故障去除后，关掉Ps-on信号再打开，电源即可恢复。

1.5 LED General Requirements （LED 电气性能）

1.5.1 Table 1 Input Electrical Characteristics Overview (输入特性）

PARA METER 参 数	SYMBOL 符 号	MIN 最小值	TYPICAL 典 型 值	MAX 最大值	UNIT 单 位	REMARK 备 注
INPUT VOLTAGE 输入电压	Vin	21.6	24	26.4	V	
NPUT CURRENT 输入电流	Iin	-	1.4	1.5	A	Vin=24V,Von/off=5V RL=panel
INPUT POWER 输入功率	Pin	-	32.6	36	W	Vin=24V,Von/off=5V RL= panel
INPUT VOLTAGE 开关电压	Von/off	-	0	0.5	V	Off State
		2.5	5	5. 5		On State
INPUT VOLTAGE 亮度调整电压	Vadj	20	-	80	%	PWM 200HZ
EFFICIENCY 效 率	Eff	80	-	-	%	Vin=24V,Von/off=5V RL= panel

1.5.2 Output Characteristics (输出特性)

PARAMETER 参 数	SYMBOL 符 号	MIN 最小值	TYPICAL 典 型 值	MAX 最大值	UNIT 单 位	REMARK 备 注
LAMP CURRENT 灯管电流(亮)	IL	400	480	550	mA	Vin=24V,Von/off=5.0 V,Vadj=5V RL= panel
LAMP VOLTAGE 灯管工作电压	VL	-	68	-	Vrms	Vin=24V,Von/off=5V, Vadj=5V RL= panel
OUTPUT OPEN 开 路 保 护	VL	LATCH				Vin=24V,Von/off=5V RL=∞KΩ

2.Pin Connection(连接器脚位定义)

Power supply connectors（电源输入/输出端子）AC INPUT(交流输入)

Location（位置）: CON1

Connector type（端子型号）: 3.96mm-3Pin

Pin assignments: Table.

Pin No (引脚号)	Symbol (符号)	Description (描述)
1	L	
2	NC	
3	N	

Table 13 Pin-CN6 Connection And Function TYPE : 13PIN-2.5mm

NO.	Pin Connection	Function
1	GND	+5VSB&+5V DC GROUND
2	GND	+5VSB&+5V DC GROUND
3	+5V	+5VDC OUTPUT
4	+5V	+5VDC OUTPUT
5	PS_ON	POWER ON/OFF CONTROL (ON = HIGH LEVEL)
6	+5VSB	STANDBY OUTPUT
7	+5V	+5V DC OUTPUT
8	+5V	+5V DC OUTPUT
9	GND	+12V DC GROUND
10	GND	+12V DC GROUND
11	GND	+12V DC GROUND
12	12V	+12V DC OUTPUT
13	12V	+12V DC OUTPUT

Table 14 Pin-CN5 Connection And Function TYPE : 4PIN-2.5mm

NO.	Pin Connection	Function
1,2	+24V	+24V DC OUTPUT
3,4	GND	GROUND

Table 15 Pin-CN7 Connection And Function TYPE : 2PIN-2.0mm

NO.	Pin Connection	Function
1	ON/OFF	LED CONTROL(ON = HIGH LEVEL)
2	ADJ	PWM调光控制输入信号

Location（位置）: CON8,CON9

Connector type（端子型号）: 卧式/PH2.0mm/2Pin or equivalent

Pin No(引脚号)	Symbol(符号)	Description(描述)
2	LED-	LED-
1	LED+	LED+

3. Isolation (绝缘性能）

3.1 Table 16 (绝缘性能）

Input To Output	DC500V 50MΩ Min (at room temperature)

Note:

3.2 Table 17 (绝缘耐压）

Input To Output	AC 3.0KV/1 minute 10mA Max

Note:

4. Safety (安全规格）

The power supply shall compliance with the following Criterion:

电源安全性满足下列标准

1）IEC60950、UL60950、IEC60065、GB4943-2001

5. EMC (电磁兼容性）

5.1 EMI（电磁干扰）

The power supply shall compliance with the following Criterion:

电源电磁干扰满足下列规则:

1）Conduction Emission:(传导干扰度）

EN55022， CLASS B

GB9254,CLASS B

FCC PART15 CLASS B

2) Radiate Emission:(辐射干扰度）

EN55022， CLASS B

GB9254,CLASS B

FCC PART15 CLASS B

5.2 EMS（电磁干扰）

The power supply shall compliance with the following Criterion:

电源电磁抗干扰满足下列规则:

1）ESD (静电抗扰度）

*GB17626.2-1998/IEC61000-4-2

2) EFT (脉冲群抗扰度）

*GB17626.4-1998/IEC61000-4-4 3KV¡ 1kV （瞬时测试），¡ 2kV（AC line noise）

3) Surge (雷击浪涌）

*GB17626.5-1998/IEC61000-4-5 ¡1KV

6. Environmental Requirement (工作环境）

6.1 Temperature (环境温度）

Operating : 0℃ to +40℃

Store: -10℃ to +70℃

6.2 Humidity (环境温度）

Operating : From10% to 90% relative humidity (non-condensing).

Store: From 5 to 95% relative humidity (non-condensing).

6.3 Altitude (海拔高度）

Operating: To10,000ft.

Store: To20,000ft.

6.4 Cooling Method (冷却方式）

Ventilation cooling .

6.5 Vibration (振动耐受）

* 10-55Hz 29.4m/s2(3G),3minutes period, 60minutes each along X, Y and Z axis.

6.6 Impact (冲击耐受）

*196.1m/s2(20G), 11mS, once each X , Y and Z axis.

7.Dimension(物理尺寸）

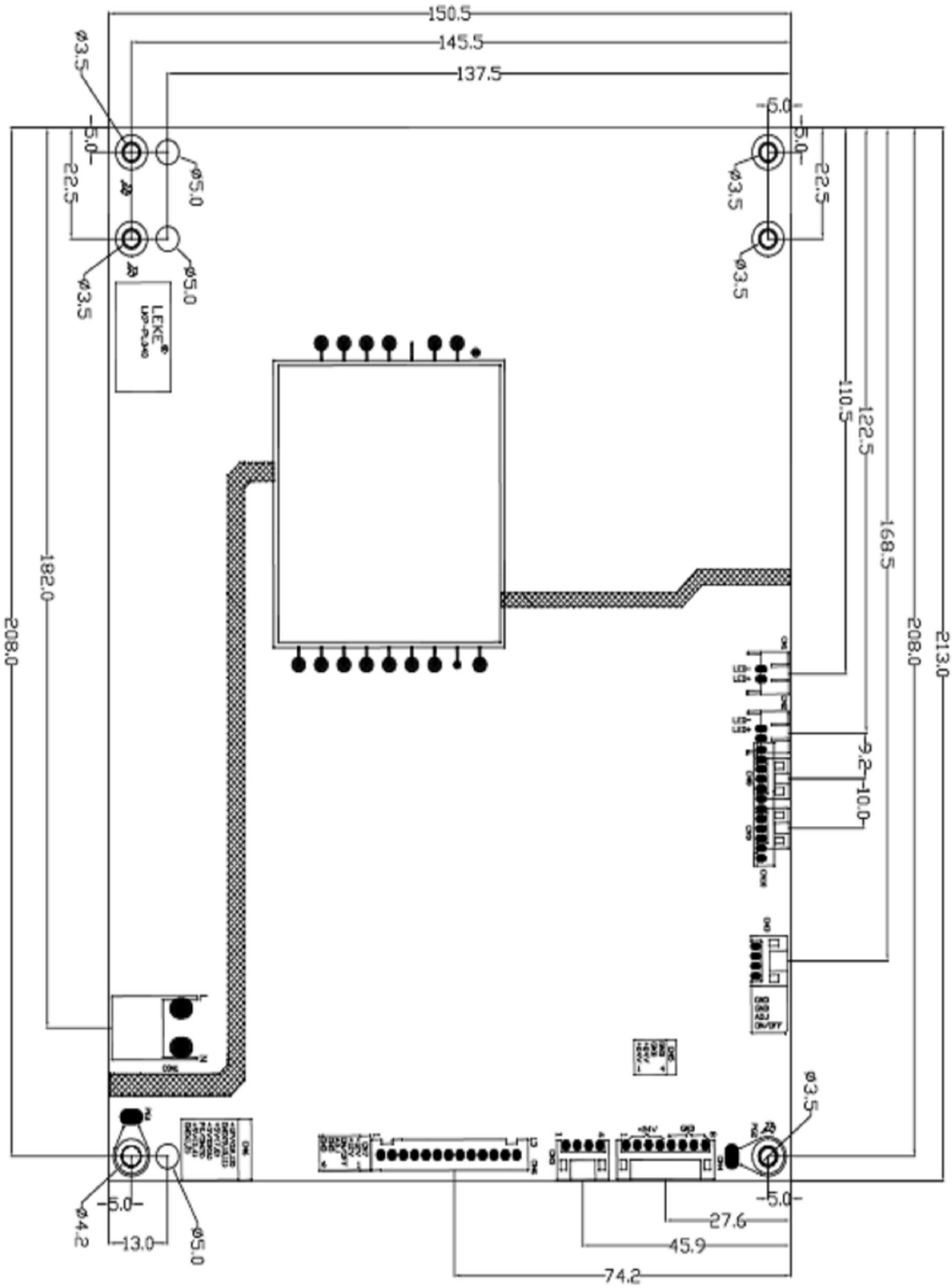
* 213mm X 150.5mm X 13mm (长L *宽W * 高H).*高是指PCB上的高度

8.Weight (重量）

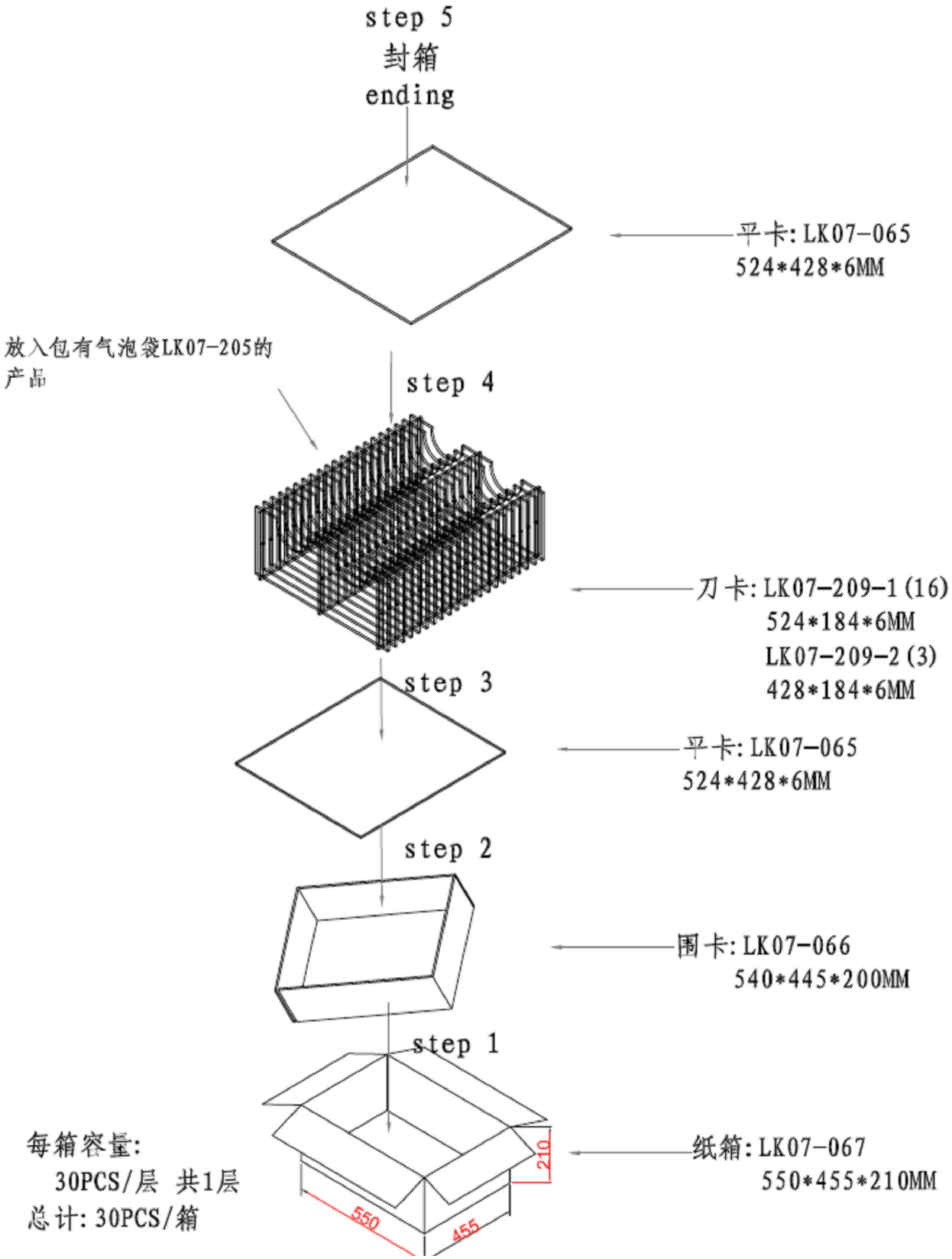
* 500克

备注:带"*"的为参考项.

9. Housing ASSEMBLY DRAWING （结构尺寸）



备注：单位(mm)

1. 图中外形误差 ±0.5，其余未注为：±0.2
2. 产品元件面最高器件限高13.0mm，板厚1.6mm，脚下限长2.5mm

10. Package(包装）