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SPECIFICATION FOR APPROVAL

• CUSTOMER : LG Electronics inc.

• ITEM : Power Supply Unit.

• P/NO

Model Name	Customer	Supplier
LGP32F-12P	EAY62770401	LGP32F-12P

• DATE : 2012. 01. 05

• Revision : 1.0

• Remark : MP (PCB REV 1.0)

Producing District : **HWASUNG,KOREA** (한국 화성)
(생산지) **QINGDAO,CHINA** (중국 청도)

★ Safety Standard Parts [안전규격부품 List]

Power Cord, Power Plug, X/Y-Capacitor, Power Switch, Fuse, SMPS Trans, Stand-By Trans, Photo coupler, Insulation(절연) Resistor, Discharge(방전) Resistor, Fusing Resistor, FBT.CPT, CPT Socket, DY, D-Coil, Line Filter, PCB Material, Front / Back-cover Material Relay(1-2차간), Varistor, Adapter

★ EMC Standard Parts [전자규격 부품 List]

Power Plug, Line Filter, X-Capacitor, Y-Capacitor, SMPS Trans, Tuner, Saw-Filter, Shield Case, Oscillator, Pattern Change

★ Green [유해물질 확인사항]

This item must meet the standards of LG Electronics for six major substances as designated by RoHS for control.

(Cd: 10ppm under, Pb/Hg/Cr+6/PBB/PBDE: 100 ppm under)

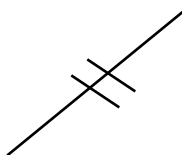


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Documentation For Approval

Model Name	Customer	Supplier
LGP32F-12P	EAY62770401	LGP32F-12P

Written	Checked		Approved
			

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Revision History

Rev No.	Contents	Date of Approval	Checked	Remark
0.1	Apply to DV (PCB REV 0.4) PCB P/No. : EAX64560501(1.3) DV 1st Edition.	11.11.15	J.H.SHIN	
0.2	Apply to PV (PCB REV 0.5) PCB P/No. : EAX64560501(1.4) PV 1st Edition.	11.12.07	J.H.SHIN	
1.0	Apply to MP (PCB REV 1.0) PCB P/No. : EAX64560501(1.6) 1. Surge Solution - Add ZD104 : 15V SOD-123 - Add C108 : 100pF 50V MP Edition.	12.01.05	J.H.SHIN	

CTQ Management

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2	2.2 Power Output Characteristics	9
3	2.2.1. Stand by Power Consumption	10

Specification

1. INTRODUCTION

1.1 Scope

This approval is the description related to every electrical and structural specifications and reliability For Power Supply Unit used on 32 inch LGE LED TV.

1.2 Customers product related items

Product : Power Supply Unit

Part code : EAY62770401

1.3 Product name

Product name : LGP32F-12P

Revision code : 1.0

2. SPECIFICATION

2.1 Input Requirements

Nominal Input Voltage	AC 100V to AC 240V
Input Voltage Variation	AC 90V to AC 264V
Input Current	Under 1.6Arms . (at 100Vac & Nominal Load) Under 0.8Arms . (at 240Vac & Nominal Load)
Nominal Frequency	50 / 60 Hz
Frequency Variation Range	47 Hz to 63 Hz
Phase	Single
Leakage Current	0.7mA_peak. (100Vac ~ 240Vac)
Surge Immunity	$\pm 4\text{kV}$ / 1000ns / 0° to 360°
Hold-up Time	More than 20ms at 100Vac and maximum output Set condition.
Lightning Surge	2kA Normal, Common Mode
Inrush Current	80A zero-peak max at cold start and any specified line, load, temperature conditions.

2.1.1 Power Factor

over than 0.4 at 90 – 264Vac & max load condition

2.2 Power Output Characteristics

Output	Voltage Variable range [V]	Rated Current (Min, Max) [Amean]	Voltage Regulation [V]	Ripple Voltage [mVp_p]
3.5V (STBY)	3.325V ~ 3.675V	0.3W Under (15mA)	-	-
		1.2A (0~1.2A) (ON condition)	± 5%	250 mVp_p (Set Condition)
12V	11.4V ~ 12.6V	0.5A (0.3~0.5A)	± 5%	350 mVp_p
24V	22.8V ~ 25.2V	2.4A (0.1~2.4A)	± 5%	500 mVp_p

* On Condition : In a moment of Power_ON Signal activated, the current of 3.5V output should be limited within 40mA(Max) at LCD TV condition for stability.

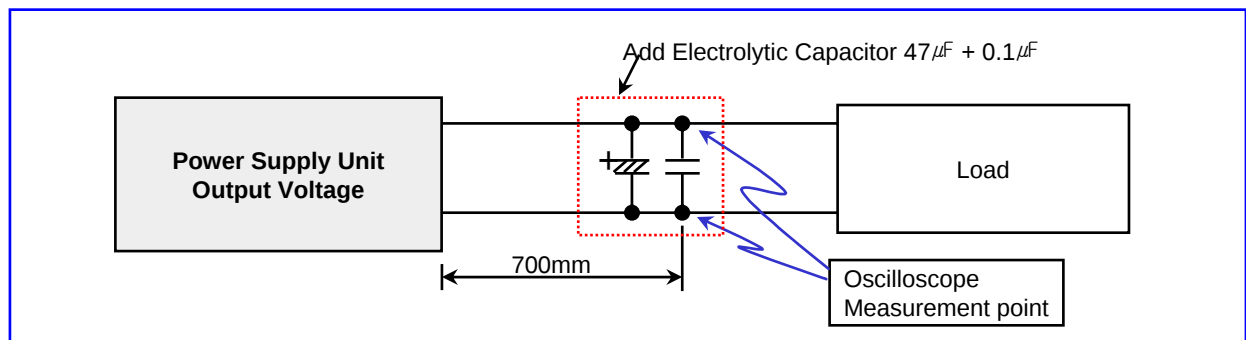
Do not turn "Power_ON" Signal on at the load condition of 3.5V output, more than 40mA.

* Total regulation for each output circuit includes the results of input voltage variation, load variation, warm-up drift and temperature change.

* The following instruments shall be used for measuring ripple noise.

1. Probe having impedance ratio of 1:1.
2. Oscilloscope having frequency characteristic of 100MHz or more.

- Test Point : power output each pin

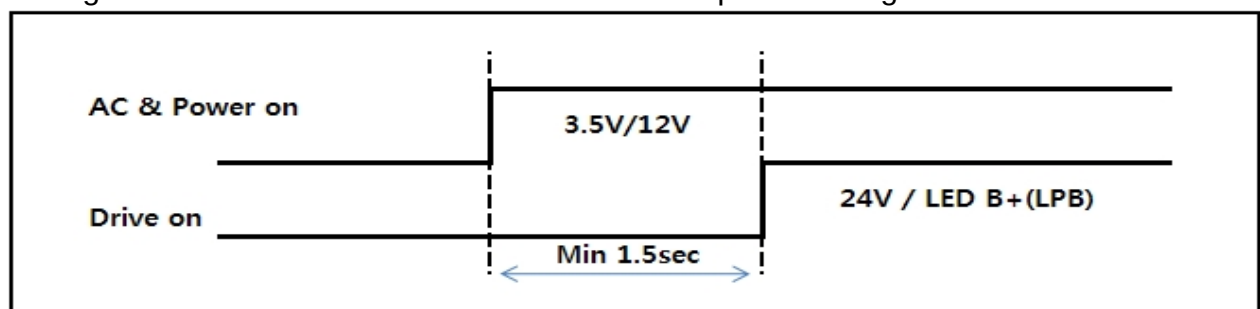


※ Ripple and noise are measured at the end of output cable which are added a 0.1uF ceramic capacitor and 47uF electrolytic capacitor. (connected parallel)

* Power turn on system (Only E/Load condition)

If Main Board is opened, that is electrical load condition,

drive on signal must be turn on after about 1.5s behind power on signal



2.2.1 Stand By Power Consumption

Output Voltage	3.5V (STBY)	12V	24V
Load [A]	0.015	Don't Care (Power-Off)	
Wattage [W]	Less than 0.3W Under (230Vac / 50Hz)		

2.3 Environment Requirement

Operating Temperature Range	-10℃ to 40℃ (60℃:No Hardware Failure, TV SET Condition)
Operating Humidity Range	30 to 85 %
Storage Temperature Range	-25 to 85 deg.
Storage humidity Range	5 to 90 %
MTBF (Mean Time Between Failure)	50,000 hour
Cooling Condition	Natural Air
Shock	98 m/s ² Shock test consists of pivoting the power supply, from one edge of it's bottom side, on a flat surface (such as wood having thickness of 10mm or more) and allowing the opposite edge to fall from a height of 50mm to this surface. The test is performed three times on each edge of the bottom side of the power supply

2.4 Dielectric Strength Voltage and Insulation Resistance



Dielectric Strength Voltage	AC 3KV or DC 4240V 1 Min 10 mA (Test SPEC) AC 3.6KV 1 Sec 10 mA (PSU Mass Production) Between Primary and All Secondary Circuits.
Insulation Resistance	Insulation resistance shall be more than 8M ohm (at DC 500V) Between Primary Live, Neutral line and Secondary.

- * Above tests are performed at room temperature in non-condensing atmospheric conditions
- * Frame grounds are connected to secondary circuits.

2.5 Burn-in

More than 2 hours at 45℃(±5℃), Normal input voltage.
AC on/off must be test 1 time after burn-in.
80% Load of specification.

2.6 Interface

Appellation	Explanation	Signal Direction	Action
POWER ON	Vcc Circuit ON/OFF	Input	Hi : Vcc ON Low : Vcc OFF

2.7 Product Safety



Safety Standards to be applied	Design to meet the requirements as follows UL60065, UL60950, IEC60065 and 60950
EMI/RFI Standards to be applied	Design to meet the requirements as follows FCC and EN55020, EN55013 Class B with 4dB minimum margin.

2.8 Construction

Weight	Less than 600g
Unit Size	155(W) X 155(L) X 26.6(H)

2.9 Function of protection

Protection	Output Circuit	Trip Point		Notes
		Min	Max	
Over Current	STBY 3.5V	2.0A	5.0A	Auto Re-start
	12V	1.0A	10.0A	Latch
	24V	3.0A	5.0A	Latch
Short Circuit	STBY 3.5V	-		Auto Re-start
	12V	-		Latch
	24V	-		Latch

- * This Power Supply has above-mentioned protections.
- * Short circuit protection between different output terminals is not considered.
- * Trip point for over voltage indicates the operating point when the output voltage slowly increases.
- * The conditions of Over Current measurement
Multi output(3.5V,12V,24V) is nominal load state except an over current measurement.

2.10 Sound Noise Characteristics.

PSU Noise Specification

22.5 dB(a) / 20.μ Pa 2.0E-5 Pa

(1/1 octave, A-weighting, to 1kHz ~ 16kHz Total overall)

Measure Location : Anechoic Room

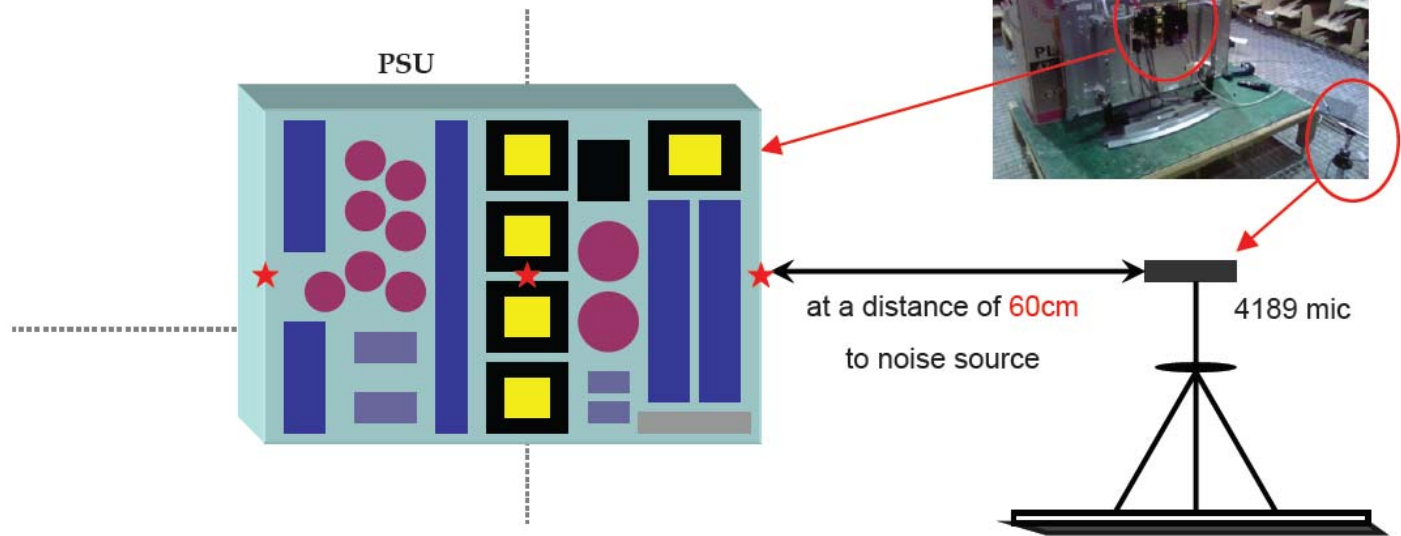
Measure Condition : At a distance of 60cm mic

Full white pattern, at AC 110V/220V

The max specification

(measure 3 points, at PSU center and left & right on the side)

PSU NOISE MEASURE POINT



2.11 Connector Specification

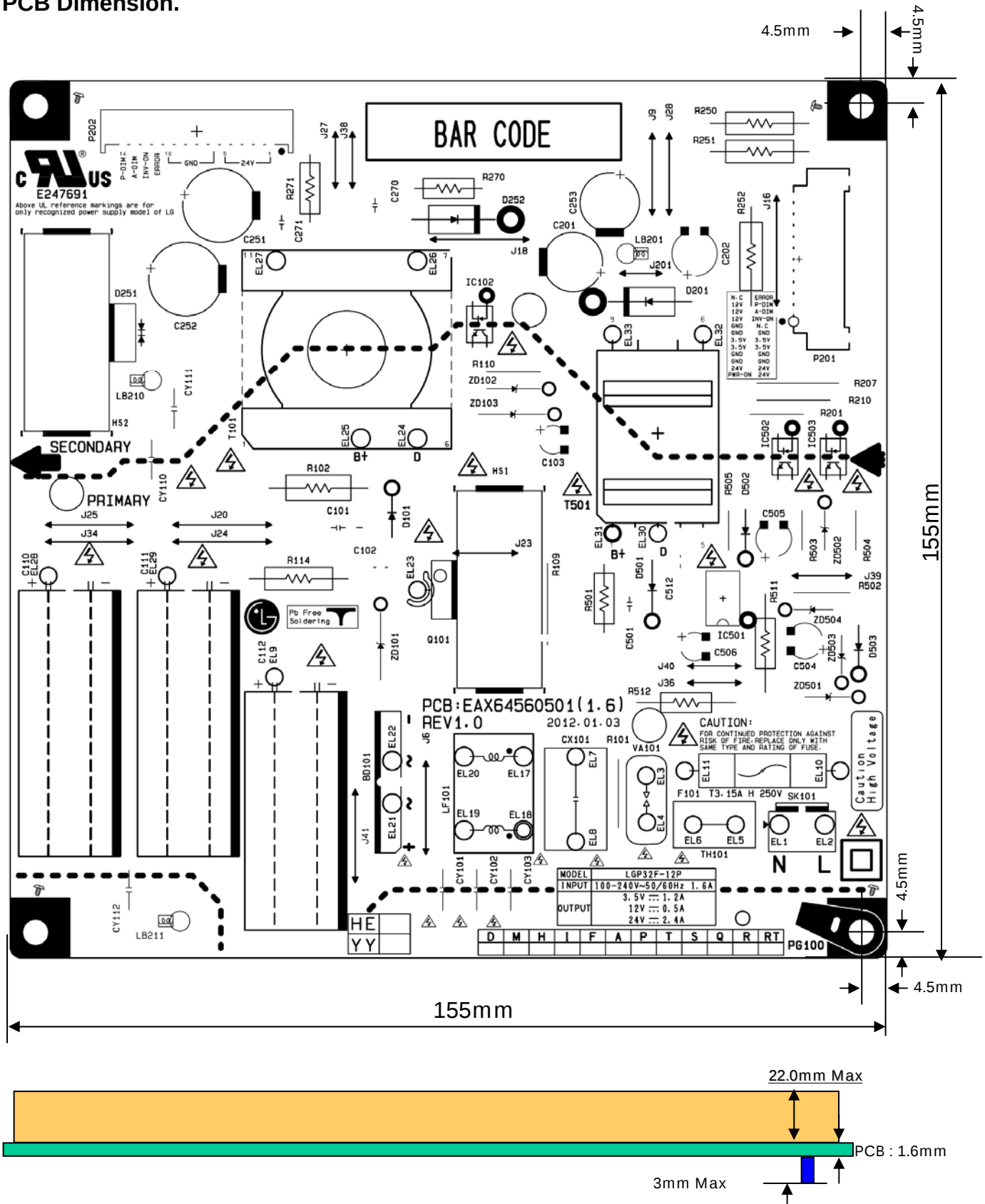
2.11.1 Connectors Usage

SK101	
Type : YW396-03AV Maker : YEON-HO	
Pin No.	Signal
1	NEUTRAL
2	LIVE

P202	
Type : 20022WR-14BD(H14BD2) Maker : YEON-HO	
Pin No.	Signal
1	24V
2	24V
3	24V
4	24V
5	24V
6	GND
7	GND
8	GND
9	GND
10	GND
11	ERROR
12	INV-ON
13	A-DIM
14	P-DIM

P201			
Type : SMAW200-H24S2 Maker : YEON-HO			
Pin No.	Signal	Pin No.	Signal
1	POWER-ON	2	24V
3	24V	4	24V
5	GND	6	GND
7	GND	8	GND
9	3.5V	10	3.5V
11	3.5V	12	3.5V
13	GND	14	GND
15	GND	16	N.C
17	12V	18	INV-ON
19	12V	20	A-DIM
21	12V	22	P-DIM
23	N.C	24	ERROR

2.12 PCB Dimension.

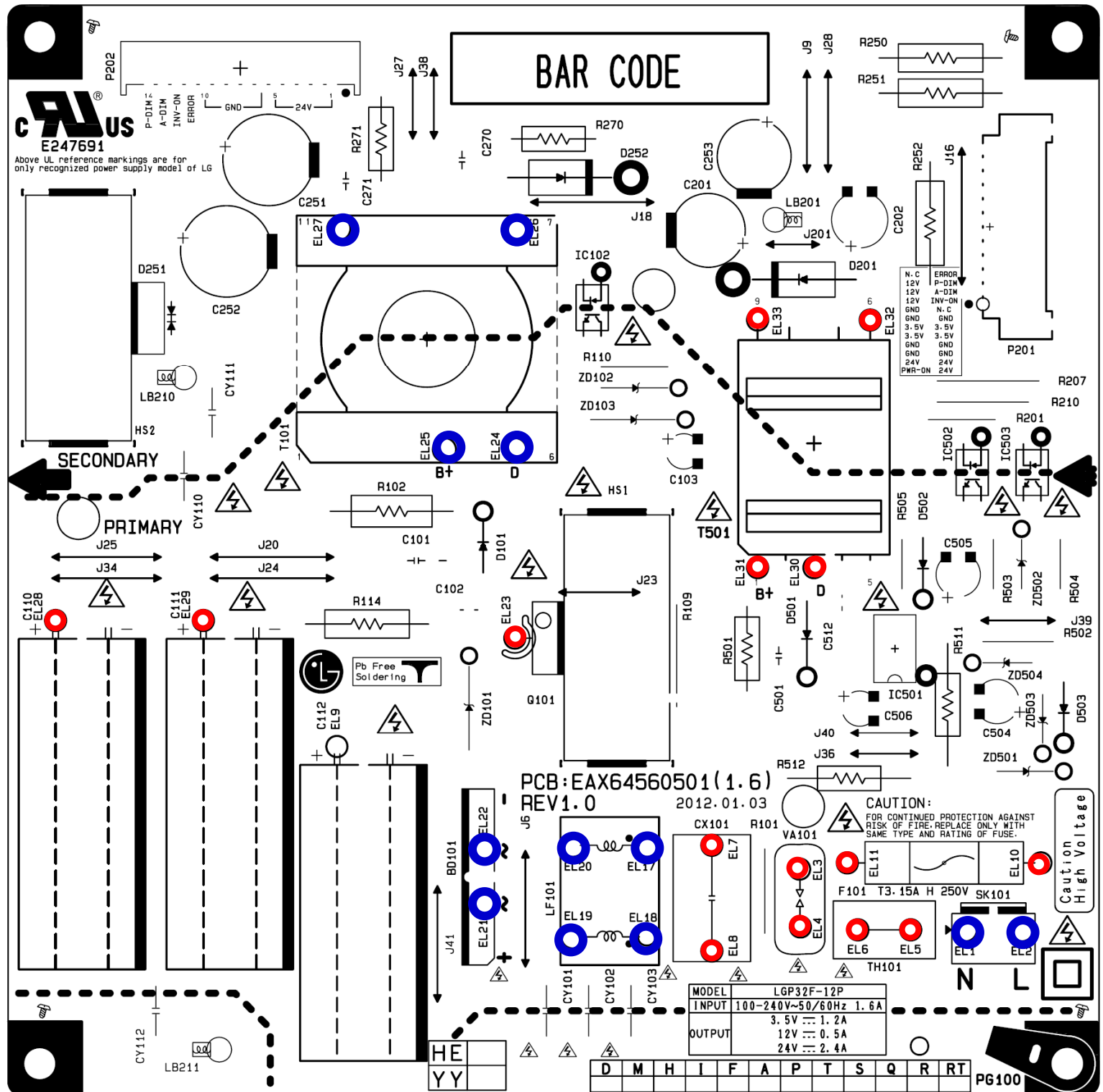


- 1) Power board PCB : 155mm X 155mm X 1.6(T)mm
- 2) Component Height : Max 22.0mm
- 3) Lead Cutting : Max 3mm
- 4) PCB Material : FR-1,KB,DS,L,CTI-600

2.13 Apply to the Eyelet point. (LGP32F-12P)

Apply to the Eyelet point 2.0Φ : EL1,EL2,EL17,EL18,EL19,EL20,EL21,EL22,EL24,EL25,EL26,EL27 (12EA)

Apply to the small Eyelet point 1.6Φ : EL3,EL4,EL5,EL6,EL7,EL8,EL10,EL11,EL23,EL28,EL29 , EL30,EL31,EL32,EL33 (15EA)



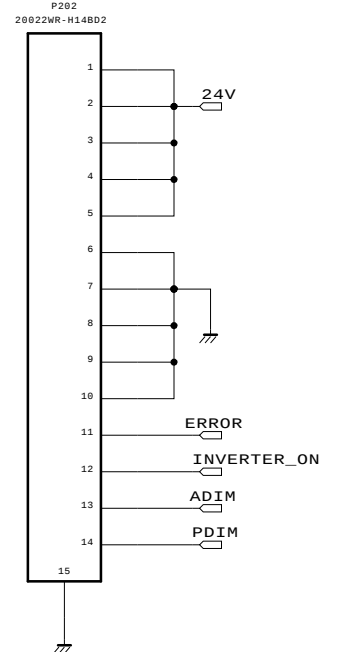
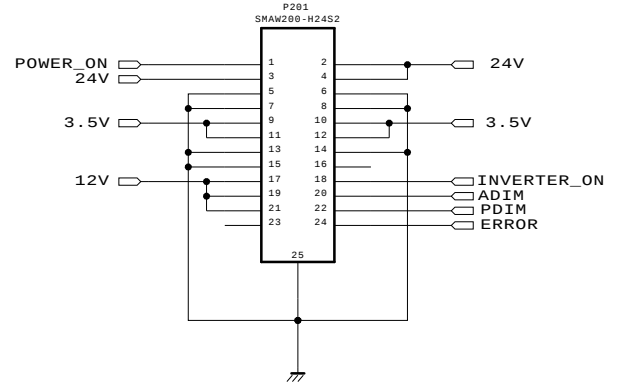
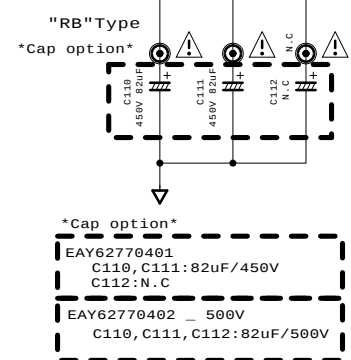
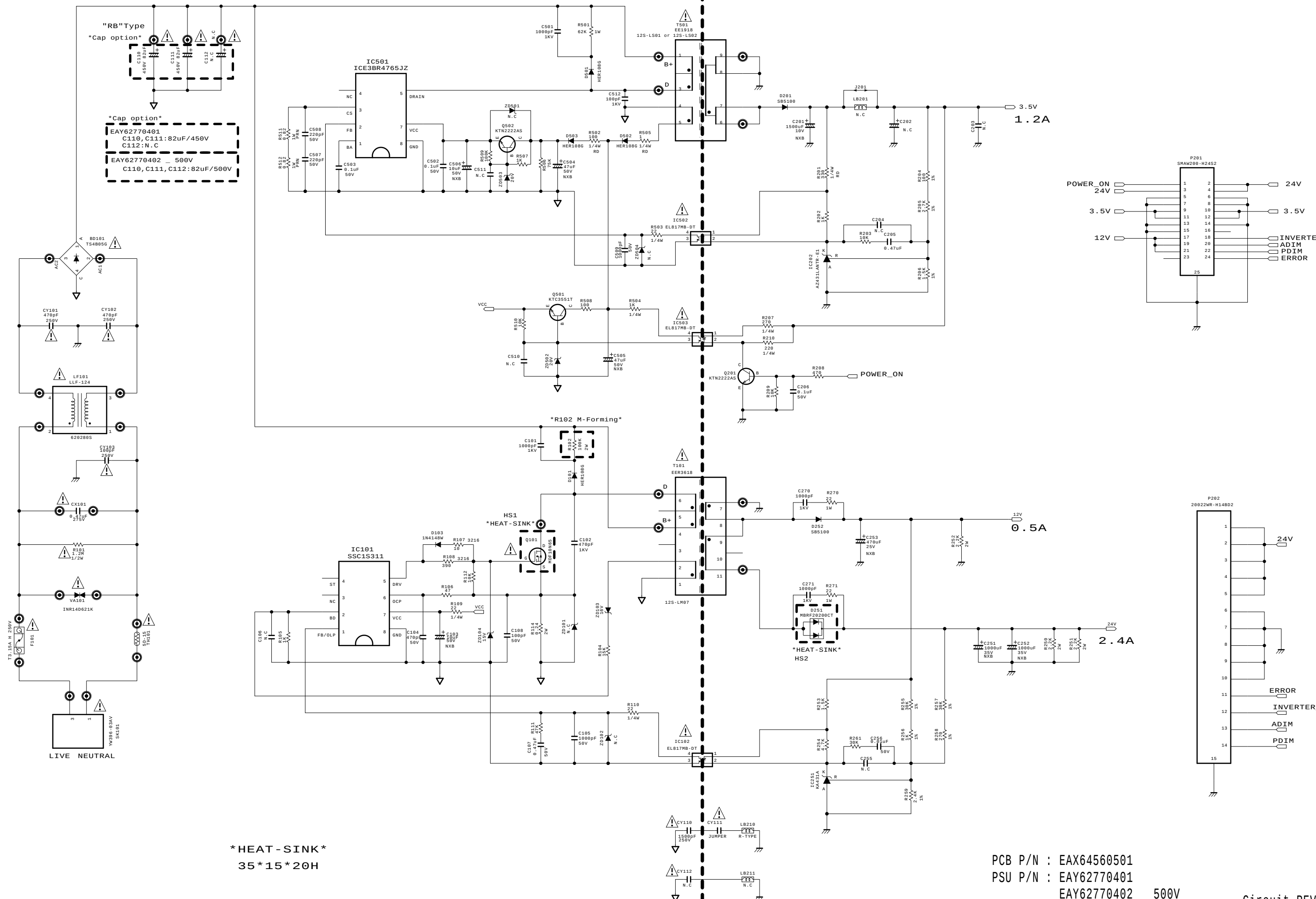
2.14 Electrical Characteristics

No.	Test Item	Test method																		
1	Intermittent Operation stability Test	The switching regulator shall ON/OFF for 20,000 time at an Interval of 10 sec at maximum load, after that electrical Characteristics shall be satisfied.																		
2	Low temperature operation	The switching regulator is left at the operating guarantee Minimum temperature for 2 hours without applying electricity. After that power shall be turned on, and then the electrical Characteristics shall be satisfied.																		
3	Low temperature Storage test Leave At low temperature	The switching regulator is left at minimum storage Temperature for 96 hours or more. Then the switching regulator is left at a room temperature and humidity for 1 hour or more, after that electrical characteristics shall be satisfied.																		
4	Heat cycle storage test	The switching regulator is 10 consecutive temperature cycle that shown below is performed and then leave them at room temperature and humidity for 1 hour or more. After that, electrical characteristics shall be satisfied. <table><tr><th>Time</th><th>Temperature</th></tr><tr><td>30 minutes</td><td>25℃</td></tr><tr><td>30 minutes</td><td>25℃ -> -20℃</td></tr><tr><td>60 minutes</td><td>Minimum storage temperature (-20℃)</td></tr><tr><td>30 minutes</td><td>-20℃ -> 25℃</td></tr><tr><td>30 minutes</td><td>25℃</td></tr><tr><td>30 minutes</td><td>25℃ -> 70℃</td></tr><tr><td>60 minutes</td><td>Maximum storage temperature (70℃)</td></tr><tr><td>30 minutes</td><td>70℃ -> 25℃</td></tr></table>	Time	Temperature	30 minutes	25℃	30 minutes	25℃ -> -20℃	60 minutes	Minimum storage temperature (-20℃)	30 minutes	-20℃ -> 25℃	30 minutes	25℃	30 minutes	25℃ -> 70℃	60 minutes	Maximum storage temperature (70℃)	30 minutes	70℃ -> 25℃
Time	Temperature																			
30 minutes	25℃																			
30 minutes	25℃ -> -20℃																			
60 minutes	Minimum storage temperature (-20℃)																			
30 minutes	-20℃ -> 25℃																			
30 minutes	25℃																			
30 minutes	25℃ -> 70℃																			
60 minutes	Maximum storage temperature (70℃)																			
30 minutes	70℃ -> 25℃																			
5	Heat shock test	Heat shock test performed under following conditions without applying electricity and then leave them at room temperature and humidity for 1 hour or more. After that, electrical characteristics shall be satisfied. Condition : -45℃ (30minutes), 120℃ (30minutes), Switching time : Less than 5 minutes, 200 cycles.																		

2.15 Mechanical Characteristics

No.	Test Item	Test method
1	Appearance	There shall be no contaminant or dirt on the switching regulator which has adverse effect on electrical characteristics. There shall be no excessive unevenness or scratches on the plated or painted surface.
2	Vibration	While applying electricity : Vibration frequency : 5 ~ 100Hz Acceleration : 4.9 m/s^2 Vibration in X,Y,Z direction for 30 minutes While applying electricity : Vibration frequency : 5 ~ 100Hz Acceleration : 14.7 m/s^2 Vibration in X,Y,Z direction for 30 minutes After that electrical characteristics shall be satisfied. There shall be no damage to appearance and construction.
3	Shock	Shock : 98 m/s^2 On the oak more than 10mm thickness with the flat face, raise the one side for 50mm, and it carries out each side free fall for three sides. There shall be no damage to appearance and construction.

Schematic Diagram



HEAT - SINK
35*15*20H

PCB P/N : EAX64560501
PSU P/N : EAY62770401
EAY62770402 - 500V

Circuit REV 0.6
PCB REV 1.0

THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

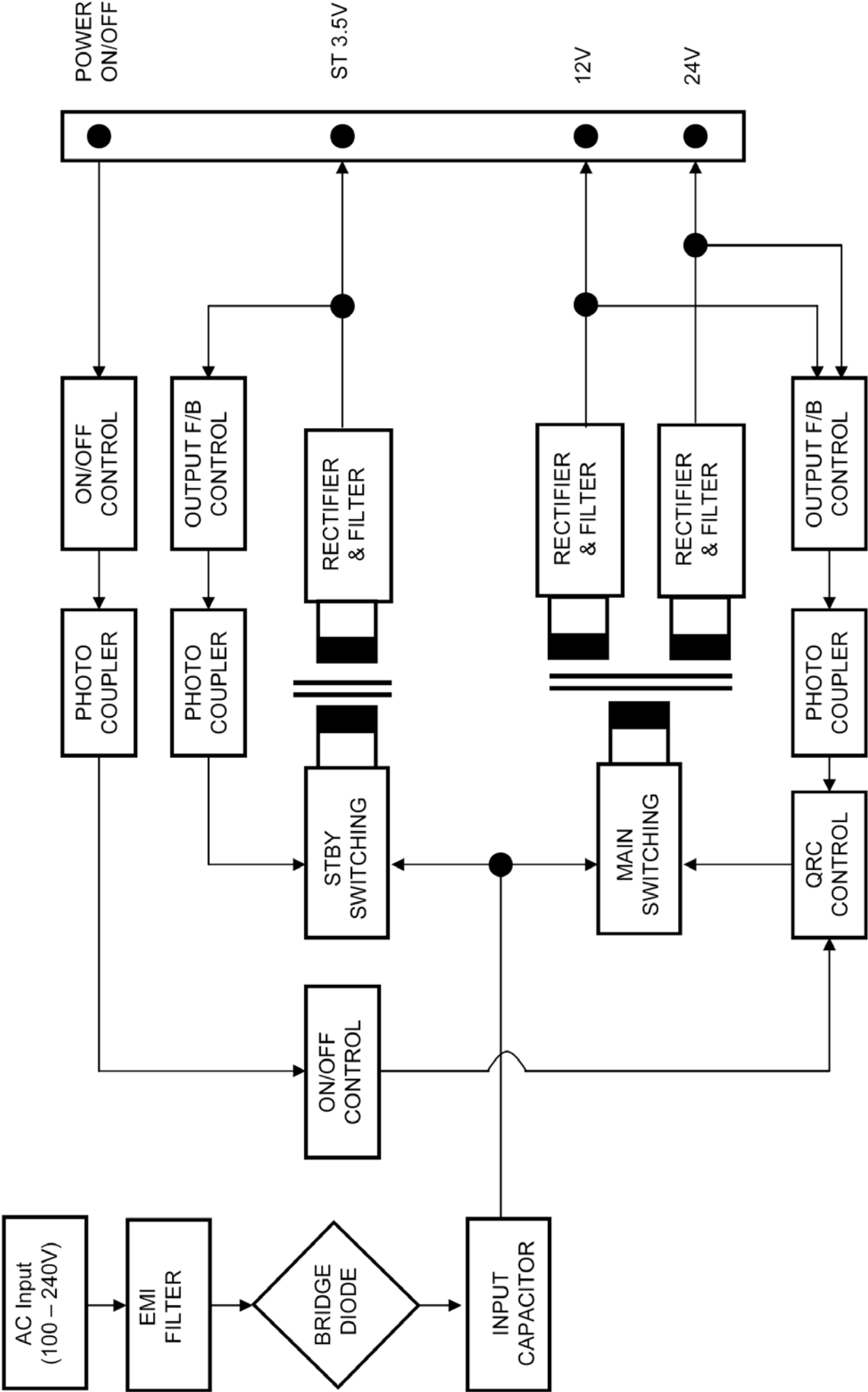
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MODEL	LGP32F-12P	DATE	'12.01.03
BLOCK	STBY\MULTI	SHEET	1 / 1

Block Diagram

LGP32F-12P BLOCK DIAGRAM



Parts List

LGP32F-12P (EAY62770401)

NO.	L/V	Q'ty	UNIT	LOCATION	SPECIFICATION	DESCRIPTION	MAKER
	MI			HS1	MULTI FET ASS'Y	HEAT SINK ASS'Y	
1	MI	1	EA	HS1	LGP32F-12P (35*15*20)	HEAT SINK	YUWON NRT HUAGUANG INNO D&C
2	MI	1	EA	Q101	TK7A65D TO-220FP MDF10N65B TO-220FP PFF10N65 TO-220FP	FET	TOSHIBA MAGNACHIP POWER DEVICE
3	MI	1	EA	FOR Q101	M/S S/W + $\Phi 3.0$ 7L SILVER PLATE HEAD	SCREW	JUNGWOO SEOUL METAL ASEA BOLT TANJIN METAL
4	MI	0.01	GR	FOR Q101	HC300 OKC-5500 G746 YG6111 DS-323	SILICON GREASE	CHANG AMLS OKONG SHINETSU MOMENTIVE DONGYANG SILICON
	MI			HS2	MULTI DIODE ASS'Y	HEAT SINK ASS'Y	
5	MI	1	EA	HS2	LGP32F-12P (35*15*20)	HEAT SINK	YUWON NRT HUAGUANG INNO D&C
6	MI	1	EA	D251	MBRF20200CT, 20A, 200V TO-220FP MBRF20U200CT/CTA, 20A, 200V TO-220FP FMXA-2202S, 20A, 200V TO-220FP	DIODE	SENSITRON KEC SANKEN
7	MI	1	EA	FOR D251	M/S S/W + $\Phi 3.0$ 7L SILVER PLATE HEAD	SCREW	JUNGWOO SEOUL METAL ASEA BOLT TANJIN METAL
8	MI	0.01	GR	FOR D251	HC300 OKC-5500 G746 YG6111 DS-323	SILICON GREASE	CHANG AMLS OKONG SHINETSU MOMENTIVE DONGYANG SILICON
	MI				LGP32F-12P MI COMPONENTS	MI ASS'Y	
9	MI	1	EA	BD101	TS4B05G-26 600V 4A KBJ406G 600V 4A D4SB60L 600V 4A TS4B05G 600V 4A	DIODE	TSC LITEON SHINDENGEN DACHANG
10	MI	2	EA	C110,C111	KMF 82uF 450V M RB P7.5 $\Phi 18 \times 31.5$ SK 82uF 450V M RB P7.5 $\Phi 18 \times 30$	CAPACITOR, ALUMINUM	SAMYOUNG SUSCON
11	MI	1	EA	CY103	NK 100pF 250V K P10 ,Y1 CD 100pF 250V K P10 ,Y1 CT81 100pF 250V K P10 ,Y1 SD 100pF 250V K P10 ,Y1 DA 100pF 250V K P10 ,Y1	CAPACITOR, CERAMIC	APEX INTEC TDK YINANDON SAMWHA DONGIL ELEC.
12	MI	2	EA	CY101,CY102	NK 470pF 250V K P10 ,Y1 CD 470pF 250V K P10 ,Y1 CT81 470pF 250V K P10 ,Y1 SD 470pF 250V K P10 ,Y1 DA 470pF 250V K P10 ,Y1	CAPACITOR, CERAMIC	APEX INTEC TDK YINANDON SAMWHA DONGIL ELEC.
13	MI	1	EA	CY110	NK 1500pF 250V M P10, Y1 CD 1500pF 250V M P10, Y1 CT81 1500pF 250V M P10, Y1 SD 1500pF 250V M P10, Y1 DA 1500pF 250V M P10, Y1	CAPACITOR, CERAMIC	APEX INTEC TDK YINANDON SAMWHA DONGIL ELEC.
14	MI	1	EA	CX101	PCX2 337 0.47uF 275V P15 MPX 0.47uF 275V P15	CAPACITOR, FILM	PILKOR EUROPTRONIC
15	MI	2	EA	D201,D252	SB5100 100V 5A P20 SB5100 100V 5A P20 SR510-24 100V 5A P20	DIODE	SENSITRON LITEON TSC
16	MI	1	EA	F101	T3.15A H 250V 215 VIOLET(1-LINE) T3.15A H 250V 50CT VIOLET(1-LINE) T3.15A H 250V TSC VIOLET(1-LINE)	FUSE, TIME LAG	LITTELFUSE Dainfuse WALTER
17	MI	1	EA	R102	MORS 100K Ω 2W J SMALL P20 M-Forming RSD02 100K Ω 2W J SMALL P20 M-Forming PRO2 100K Ω 2W J SMALL P20 M-Forming	RESISTOR, METAL OXIDE FILM	ABCO SMART PILKOR
18	MI	1	EA	PG100	JS-12-75-04 SPCC 0.4T GND PIN	GND REINFORCE	SAMSUNG JS
19	MI	3	EA	IC102,IC502,IC503	EL817MB(DT) LTV817M-BN	IC	EVERLIGHT LITEON
20	MI	1	EA	IC501	ICE3BR4765JZ	IC	INFINEON
21	MI	1	EA	LF101	CV620280SH LLF-124 LLF-124 LLF-124	LINE FILTER	TNC SOOJUNG FEELUX DONG YANG TELECOM
22	MI	1	EA	TH101	DSC5D15 5 Ω 6A $\Phi 15$ MF72-5D15 5 Ω 6A $\Phi 15$ WTR15D5 5 Ω 6A $\Phi 15$ ICL-5W 5R00MSMT	THERMISTOR NTC	DSC NSE Xiamen Wanming SMART
23	MI	1	EA	T101	12S-LM07(EER3618 360uH)	TRANSFORMER	JIANGSU CHANNELON DONG YANG TELECOM SOOJUNG CLOVER HITECH FEELUX
24	MI	1	EA	T501	12S-LS01(EE1918 1.1mH) 12S-LS02(EE1924 1.1mH)	TRANSFORMER	BUJEON JIANGSU CHANNELON FEELUX DONG YANG TELECOM SOOJUNG TDK CLOVER HITECH
25	MI	1	EA	VA101	INR14D621K-CAP 620V $\Phi 14$ TUBE WMR14D621K 620V $\Phi 14$ TUBE SVC621D-14ABW7 620V $\Phi 14$ TUBE	VARISTOR	AMOTECH Xiamen Wanming SAMWHA
26	MI	1	EA	P202	20022WR-14BD 20022WR-H14BD2	WAFER	YEONHO YEONHO
27	MI	1	EA	SK101	YW396-03AV	WAFER	YEONHO
28	MI	1	EA	P201	SMAW200-H24S2 24PIN WHITE	WAFER	YEONHO

LGP32F-12P (EAY62770401)

	SMT				LGP32F-12P SMT COMPONENTS	SMT ASSEMBLY	
29	SMT	1	EA	C108	100pF 50V J 1608 NPO	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
30	SMT	2	EA	C507,C508	220pF 50V J 1608 NPO	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
31	SMT	1	EA	C104	470pF 50V J 1608 NPO	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
32	SMT	2	EA	C105,C509	1000pF 50V K 1608 X7R	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
33	SMT	1	EA	C256	0.01uF 50V K 1608 X7R	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
34	SMT	3	EA	C206,C502,C503	0.1uF 50V K 1608 X7R	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
35	SMT	2	EA	C107,C205	0.47uF 16V K 1608 X7R	CAPACITOR, CHIP	PILKOR SAMWHA YAGEO HEC
36	SMT	1	EA	ZD104	BZT52C15 15V SOD-123 MMSZ5245BT1G 15V SOD-123 MMSZ5245B 15V SOD-123	DIODE, ZENER	DIODES ONSEMI RECTRON
37	SMT	1	EA	D103	SDS4148G 100V 150mA SOD-123 1N4148W 100V 150mA SOD-123 1N4148W 100V 150mA SOD-123 MMSD4148T1G 100V 200mA SOD-123	DIODE	AUK DIODES RECTRON ONSEMI
38	SMT	1	EA	IC101	SSC1S311, SO-8	IC	SANKEN
39	SMT	1	EA	IC202	TLV431BSN1T1G 1.24V ±0.5% SOT-23 SJ432BS 1.24V ±0.5% SOT-23 AZ431LANTR-E1 1.24V ±0.5% SOT-23	IC	ONSEMI AUK BCD
40	SMT	1	EA	IC251	SNF431BS 2.5V ±0.5% SOT-23 AS431ANTR-E1 2.5V ±0.5% SOT-23 KIA431BM 2.5V ±0.5% SOT-23	IC	AUK BCD KEC
41	SMT	1	EA	R106	47Ω J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
42	SMT	1	EA	R508	100Ω J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
43	SMT	1	EA	R208	470Ω J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
44	SMT	3	EA	R105,R202,R507	1KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
45	SMT	1	EA	R253	1.5KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
46	SMT	1	EA	R254	4.7KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
47	SMT	4	EA	R112,R203,R209,R510	10KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
48	SMT	1	EA	R104	15KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
49	SMT	1	EA	R261	30KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
50	SMT	1	EA	R111	47KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
51	SMT	1	EA	R506	75KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
52	SMT	1	EA	R509	100KΩ J 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
53	SMT	1	EA	R204	100Ω F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
54	SMT	1	EA	R258	270Ω F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
55	SMT	1	EA	R256	1KΩ F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
56	SMT	1	EA	R206	1.5KΩ F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
57	SMT	1	EA	R259	2.4KΩ F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
58	SMT	1	EA	R205	2.7KΩ F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
59	SMT	2	EA	R255,R257	30KΩ F 1608	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
60	SMT	1	EA	R107	10Ω J 3216	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO

LGP32F-12P (EAY62770401)

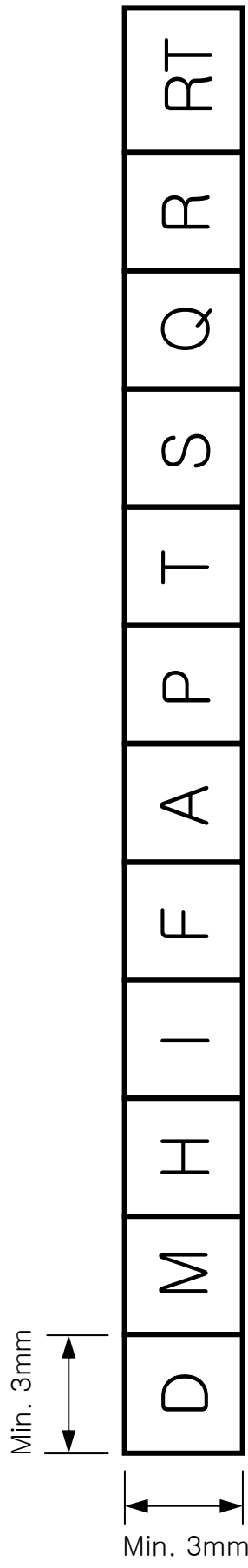
61	SMT	1	EA	R108	390Ω J 3216	RESISTOR, CHIP	PILKOR SAMSUNG YAGEO
62	SMT	1	EA	Q501	BCW66GLT SOT-23 NPN KTC3551T 80V 1A TSM NPN 2SC5865 SOT-23 NPN	TRANSISTOR	ONSEMI KEC ROHM
63	SMT	2	EA	Q201,Q502	KTN2222AS 40V 600mA SOT-23 NPN MMBT2222ALT 40V 600mA SOT-23 NPN PMBT2222A 40V 600mA SOT-23 NPN SBT2222A 40V 600mA SOT-23 NPN	TRANSISTOR	KEC ONSEMI NXP AUK
64	SMT	0.05	GR		HT-130A-106 HT-130D-7 LOCTITE 3609	BOND	HITECH KOREA HITECH KOREA LOCTITE
	AI				LGP32F-12P A/I COMPONENTS	AI ASSEMBLY	
65	AI	1	EA	C201	NXB 1500uF 10V M P5 Φ10X20 SG 1500uF 10V M P5 Φ10X20	CAPACITOR, ALUMINUM	SAMYOUNG SUSCON
66	AI	2	EA	C251,C252	NXB 1000uF 35V M P5 Φ12.5X20 SG 1000uF 35V M P5 Φ13X21	CAPACITOR, ALUMINUM	SAMYOUNG SUSCON
67	AI	1	EA	C253	NXB 470uF 25V M P5 Φ10X16 SG 470uF 25V M P5 Φ10X16	CAPACITOR, ALUMINUM	SAMYOUNG SUSCON
68	AI	2	EA	C103,C506	NXB 10uF 50V M P5 Φ5X11 SG 10uF 50V M P5 Φ5X11	CAPACITOR, ALUMINUM	SAMYOUNG SUSCON
69	AI	2	EA	C504,C505	NXB 47uF 50V M P5 Φ6.3X11 SG 47uF 50V M P5 Φ6.3X11	CAPACITOR, ALUMINUM	SAMYOUNG SUSCON
70	AI	1	EA	C512	DG 100pF 1KV K P5 125℃ CK 100pF 1KV K P5 125℃ CK45 100pF 1KV K P5 125℃ EKR 100pF 1KV K P5 125℃ CT81 100pF 1KV K P5 125℃	CAPACITOR, CERAMIC	APEX INTEC DONGIL ELEC TDK SAMWHA YINANDON
71	AI	1	EA	C102	DG 470pF 1KV K P5 125℃ CK 470pF 1KV K P5 125℃ CK45 470pF 1KV K P5 125℃ EKR 470pF 1KV K P5 125℃ CT81 470pF 1KV K P5 125℃	CAPACITOR, CERAMIC	APEX INTEC DONGIL ELEC TDK SAMWHA YINANDON
72	AI	4	EA	C101,C270,C271,C501	DG 1000pF 1KV K P5 125℃ CK 1000pF 1KV K P5 125℃ CK45 1000pF 1KV K P5 125℃ EKR 1000pF 1KV K P5 125℃ CT81 1000pF 1KV K P5 125℃	CAPACITOR, CERAMIC	APEX INTEC DONGIL ELEC TDK SAMWHA YINANDON
73	AI	1	EA	LB210	BFS3550R2F SINGLE RADIAL HBR S 3550 PT SINGLE RADIAL SER3550050BA SINGLE RADIAL	INDUCTOR, BEAD FILTER LEAD	SAMWHA HANBACK SCC
74	AI	15	EA	EL3,EL4,EL5,EL6,EL7, EL8,EL10,EL11,EL23,EL28, EL29,EL30,EL31,EL32,EL33	1.6X3.0	EYELET	SAMSUNG JS DOSUNG DAERIN
75	AI	12	EA	EL1,EL2,EL17,EL18,EL19, EL20,EL21,EL22,EL24,EL25, EL26,EL27	2.0X3.0	EYELET	SAMSUNG JS DOSUNG DAERIN
76	AI	17	EA	J6,J9,J16,J18,J20, J23,J24,J25,J27,J28, J34,J36,J38,J39,J40, J201,CY111	Φ0.6	JUMPER WIRE	DIELEC DAEAEAD TPI
77	AI	4	EA	D101,D501,D502,D503	UF1007 1KV 1A DO-41 UF4007 1KV 1A DO-41 HER108G 1KV 1A DO-41 UF4007 1KV 1A DO-41	DIODE	DIODES DACHANG RECTRON TSC
78	AI	1	EA	ZD103	1N5246B 16V DO-35 1N5246B 16V DO-35 MTZJ16B 16V DO-34	DIODE, ZENER	RECTRON VISHAY ROHM
79	AI	2	EA	ZD502,ZD503	1N5250B 20V DO-35 1N5250B 20V DO-35 MTZJ20B 20V DO-34	DIODE, ZENER	RECTRON VISHAY ROHM
80	AI	1	EA	R101	MSR37 1.2MΩ 1/2W J SURGE PRC92 1.2MΩ 1/2W J SURGE	RESISTOR, FIXED CARBON COMPOSITION	PILKOR SMART
81	AI	1	EA	R505	CRS 1Ω 1/4W J SMALL RDM94 1Ω 1/4W J SMALL SFR25 1Ω 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
82	AI	3	EA	R109,R110,R503	CRS 22Ω 1/4W J SMALL RDM94 22Ω 1/4W J SMALL SFR25 22Ω 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
83	AI	1	EA	R502	CRS 100Ω 1/4W J SMALL RDM94 100Ω 1/4W J SMALL SFR25 100Ω 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
84	AI	1	EA	R210	CRS 220Ω 1/4W J SMALL RDM94 220Ω 1/4W J SMALL SFR25 220Ω 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
85	AI	1	EA	R207	CRS 270Ω 1/4W J SMALL RDM94 270Ω 1/4W J SMALL SFR25 270Ω 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
86	AI	1	EA	R201	CRS 330Ω 1/4W J SMALL RDM94 330Ω 1/4W J SMALL SFR25 330Ω 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
87	AI	1	EA	R504	CRS 1KΩ 1/4W J SMALL RDM94 1KΩ 1/4W J SMALL SFR25 1KΩ 1/4W J SMALL	RESISTOR, CARBON FILM	ABCO SMART PILKOR
88	AI	2	EA	R270,R271	MORS 22Ω 1W J SMALL RSD01 22Ω 1W J SMALL PR01 22Ω 1W J SMALL	RESISTOR, METAL OXIDE FILM	ABCO SMART PILKOR
89	AI	3	EA	R250,R251,R252	MORS 2.2KΩ 2W J SMALL RSD02 2.2KΩ 2W J SMALL PR02 2.2KΩ 2W J SMALL	RESISTOR, METAL OXIDE FILM	ABCO SMART PILKOR
90	AI	1	EA	R501	MORS 62KΩ 1W J SMALL RSD01 62KΩ 1W J SMALL PR01 62KΩ 1W J SMALL	RESISTOR, METAL OXIDE FILM	ABCO SMART PILKOR
91	AI	1	EA	R114	WNPS 0.24Ω 2W J SMALL PRN02 0.24Ω 2W J SMALL	RESISTOR, WIRE WOUND	ABCO SMART
92	AI	2	EA	R511,R512	WNPS 0.82Ω 1W J SMALL PRN01 0.82Ω 1W J SMALL	RESISTOR, WIRE WOUND	ABCO SMART
93	AI	1	EA	PCB	LGP32F-12P (155*155*1.6T) FR-1,KB,DS,L,CTI-600	PCB	DUCK SUNG HT CIRCUIT(QINGDAO) DONGMYUNG CIR TIAN FENG TIS KOREA

LGP32F-12P (EAY62770401)

	ETC				LGP32F-12P SUBSIDIARY MATERIALS		
94	ETC	0.0333	EA	LGP32F-12P	580*450 *173* 8T	BOX CARTON	NEWEA IND DAESAN. HANYOUNG JAEIL QXBW
95	ETC	0.3667	EA	LGP32F-12P	575*159*8T (Cross board A)	BOX PARTITION	NEWEA IND DAESAN. HANYOUNG JAEIL QXBW
96	ETC	0.2000	EA	LGP32F-12P	450*159*8T (Cross board B)	BOX PARTITION	NEWEA IND DAESAN. HANYOUNG JAEIL QXBW
97	ETC	0.0667	EA	LGP32F-12P	575*445*8T	BOX PAD	NEWEA IND DAESAN. HANYOUNG JAEIL QXBW
98	ETC	1.00	EA		440 * 220	BUBBLE SHEET	DUCKJIN S&P JAEIL QXBW
99	ETC	1	EA		40 X 8 NY WHITE 93CODE 19DIGIT	BAR CODE	SHUN JIN HANA.
100	ETC	30	GR		EF-9301(g) ILF-714(kg)	FLUX	ALPHA ION ELEC
101	ETC	0.01	Kg		S-1000 K8418	DILUENT	KOKI DYFENCO
102	ETC	0.012	Kg		HSE-11 B20 BAR (SN:99%,AG:0.3%,CU:0.7%) SN:99%, AG:0.3%, CU:0.7%	SOLDER BAR	HEESUNG METAL SEOUL ALLOYMETAL
103	ETC	0.002	Kg		HSE-11 B20 WIRE (SN:99%,AG:0.3%,CU:0.7%) SN:99%, AG:0.3%, CU:0.7%	SOLDER WIRE	HEESUNG METAL SEOUL ALLOYMETAL
104	ETC	3	GR		H-828W OKE-410 QS9112 RTV TSE3854DS-W KE402RTV DS818	BOND (RTV)	OKONG OKONG KCC MOMENTIVE SHINETSU 동양실리콘

Process Marking

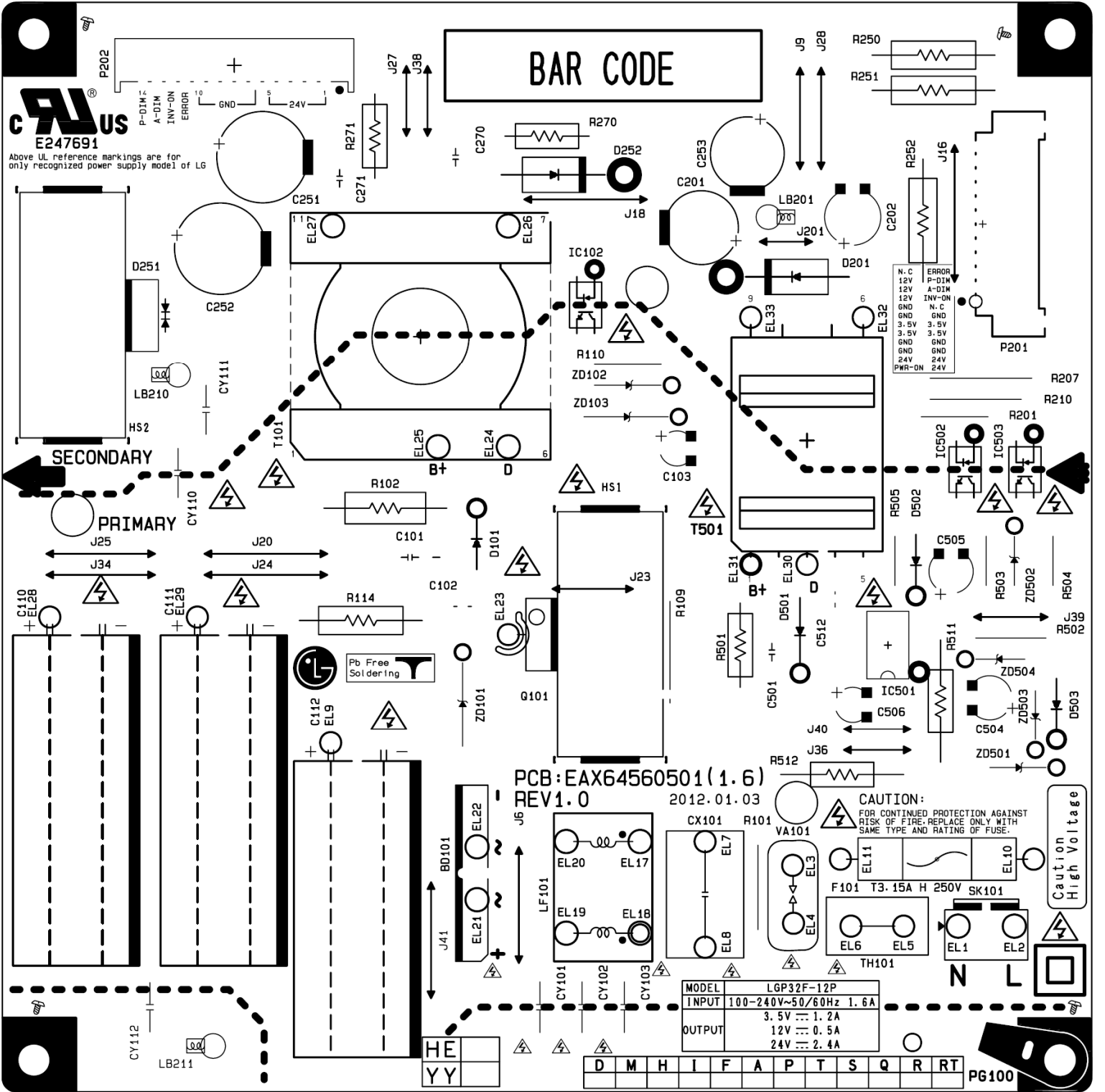
공정표시 MARK (PCB SILK)



- D : 자삽
- M : SMD
- H : 수삽 최종
- I : ICT
- F : 1차 성능
- A : AGING
- P : HI-POT
- T : 최종 검사 (ATE)
- S : SET 검사
- Q : QC 검사
- R : 불량 수리
- RT : 양산 보증 시험

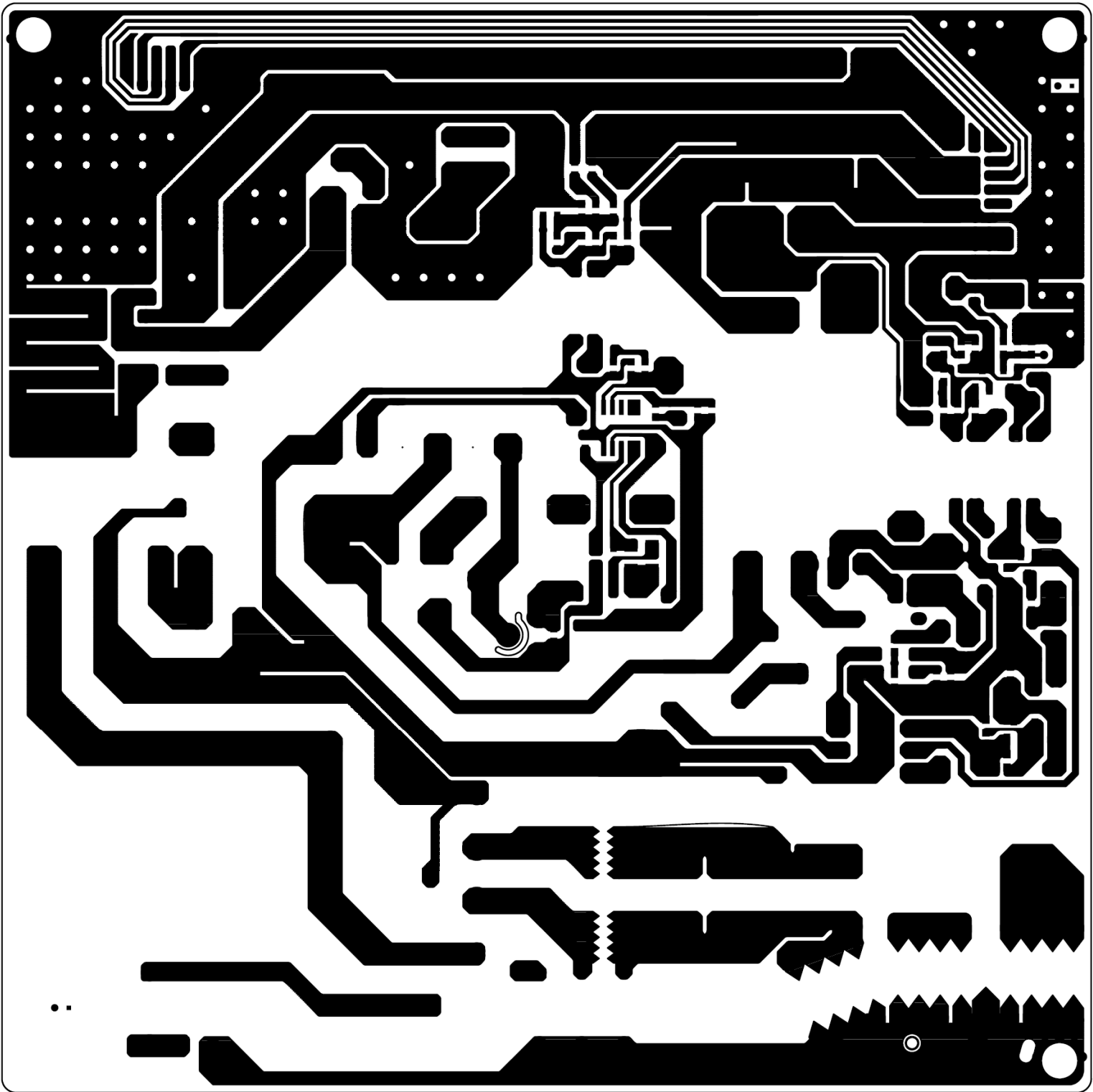
PCB Layout

Top Silk

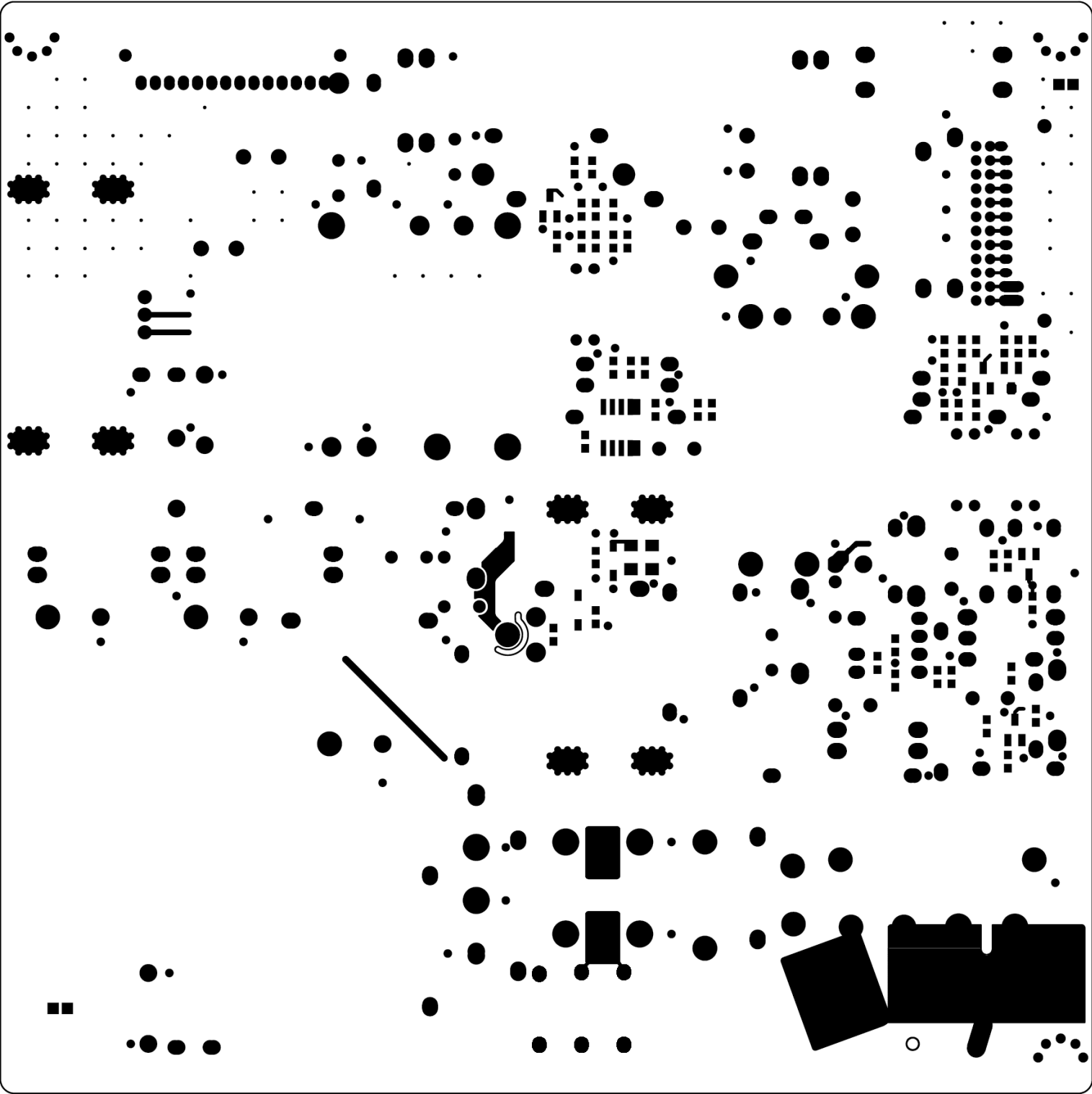


[illegible]

Bottom Pattern



Bottom Solder mask



Safety Parts

Object/part No.	Manufacturer / Trademark	Type / Model	Value / Rating	Parts Marking (實物)	standard	mark(s) of conformity1)	
AC input connector, (SK101)	YEON HO	YW396 Series	250V / 7.5A		UL498	UL	
Fuse, (F101)	Littelfuse Inc.	215 Series	T3.15A H / 250V	LF.T3.15AH250VP	IEC 60127-1		
	WALTER FUSE	TSC		TSC3.15A250V(P)	IEC 60127		
	BUSSMANN	S505		T3.15AH250V	IEC 60127		
	Dainfuse	50CT		T3.15AH250V	IEC 60127		
Line Filter, (LF101)	TNC	CV620280SH	Rated 130℃	620280 S3	IEC 60065	Test in appliance	
	DONG YANG TELECOM CO., LTD	LLF-124		LLF-124			
	FEELUX						
	SOOJUNG						
Varistor, (VA101)	Samwha	SVC621D-14	Min. 620V	SVC621-14	IEC61051-2		
	Amotech Co., Ltd.	INR 14D621		INR 14D621			
	Xiamen Wanming Electronics Co.,Ltd	WMR14D621K		WMR 14D621K			
Bridge Diode, (BD101)	Lite-on	KBJ406G	Min. 600V / Min. 4A	KBJ406G		Test in appliance	
	DACHANG	TS4B05G		TS4B05G			
	GULF	GSIB460		GSIB460			
	TSC	TS4B05G-26		TS4B05G			E96005
	SHINDENGEN	D4SB60L		D4SB60L			E142422
X-cap. (CX101)	Pilkor	PCX2 337	275V (CX101= Max 0.47uF)	PCX2 337	IEC 60384-14 UL1414		
	SUNGHO	CMPP		CMPP	IEC 60384-14 UL1414/UL1283		
	Okaya	LE		LE	IEC 60384-14 UL1414		
	EUROPTRONIC	MPX		MPX	E199061/ E311052 IEC 60384-14-2'nd edition		
	CHENG TUNG	CTX		CTX	IEC 60384-14 UL1414		
Thermistor. (TH101)	DSC	DSC 5D-15	5ohm at 25 ° C	DSC 5D-15	IEC 60065		
	Xiamen Wanming Electronics Co.,Ltd	WTR 15D050		WTR 15D050			
	JIANGSU XINGSHUN ELECTRONICS CO., LTD	5D2-15		5D2-15			
	Smart	ICL-5W		ICL-05 5ROOMSMT			
	NANJING SHIHENG ELECTRONICS CO., LTD	MF72 5D15		MF72 5D15			
Elec.Cap., (C110,C111) Optinal (C112)	SAMYOUNG	NZE	500V/Min 82uF/105℃	NZE500V82uF	IEC 60950-1	Test in appliance	
	SAMYOUNG	KMF	450V / Min 82uF / 105℃	KMF450V82uF	IEC 60950-1	Test in appliance	
	SUSCON	SK		SK450V82uF			
	SAMWHA	WL		LT450V82uF			
	LELON	RGA		RGA450V82uF			
Flyback IC, (IC501)	INFINEON	ICE3BR4765JZ	Min. 650 V / Min 1.67A	3BR4765JZ	IEC 60950-1	Test in appliance	
Switching TR, (Q101)	TOSHIBA	TK7A65D	Min. 650V / Min 4.5A	TK7A65D			
	MAGNACHIP	MDF10N65B		MDF10N65B			
	POWER DEVICE	PFF10N65		PFF10N65			
Y Cap., (CY101,CY102)	ANSHAN KEI FAT	Y1 / CT7	Min 250V / Max 470pF	CT7 471K	IEC 60384-14		
	Kunshan Wansheng	Y1 / CT7		CT7 471K			
	Apex intec	Y1 / NK		NK471K			
	DONG IL	Y1 / DA		DA471K			
	YINANDON	Y1 / CT81		CT81 471K			
	SAMWHA	Y1 / SD		SD471K			
	JYA-NAY	Y1 / JN		JN471K			
	GUANGDONG SOUTH HONGMING	Y1 / F		F471K			
Y Cap., (CY103)	TDK	Y1 / CD	Min 250V / Max 100pF	CD471K	IEC 60384-14		
	ANSHAN KEI FAT	Y1 / CT7		CT7 101K			
	Kunshan Wansheng	Y1 / CT7		CT7 101K			
	Apex intec	Y1 / NK		NK101K			
	DONG IL	Y1 / DA		DA101K			
	YINANDON	Y1 / CT81		CT81 101K			
	SAMWHA	Y1 / SD		SD101K			
	JYA-NAY	Y1 / JN		JN101K			
GUANGDONG SOUTH HONGMING	Y1 / F	F101K					
TDK	Y1 / CD	CD101K					

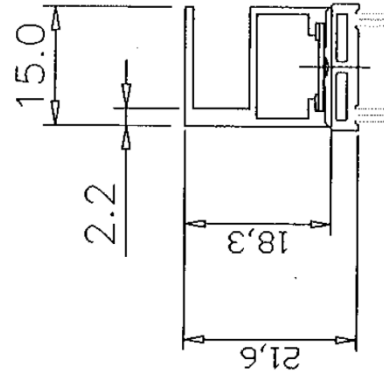
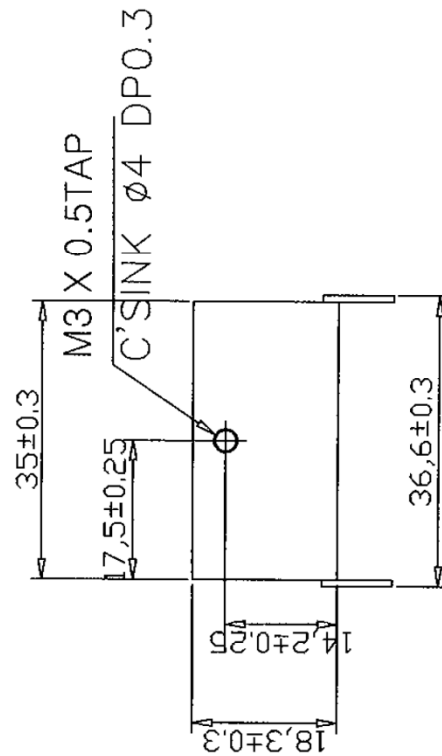
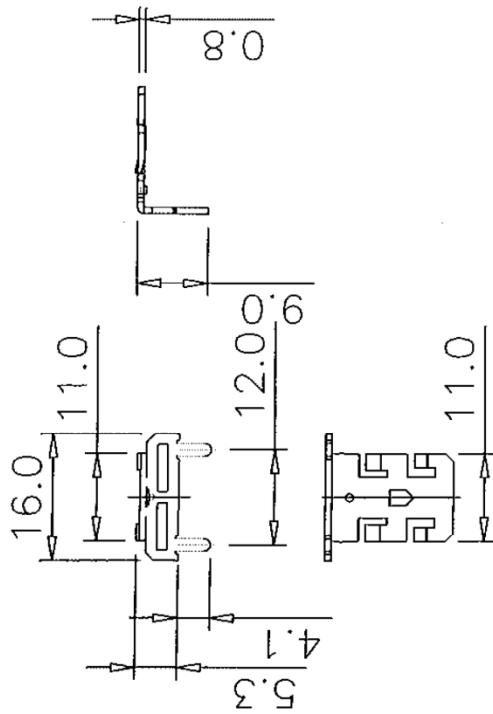
Bridging Cap., (CY110)	ANSHAN KEI FAT	Y1 / CT7	Min 250V / Max 1500pF	CT7 152M	IEC 60384-14	
	Kunshan Wansheng	Y1 / CT7		CT7 152M		
	Apex intec	Y1 / NK		NK152M		
	DONG IL	Y1 / DA		DA152M		
	YINANDON	Y1 / CT81		CT81 152M		
	SAMWHA	Y1 / SD		SD152M		
	JYA-NAY	Y1 / JN		JN152M		
	GUANGDONG SOUTH HONGMING	Y1 / F		F152M		
	TDK	Y1 / CD		CD152M		
Switching Transformer, (T101)	SOOJUNG	12S-LM07	Class B	12S-LM07	IEC 60950-1	Test in appliance
	DONG YANG TELECOM CO., LTD					
	JIANGSU CHANNELON ELECTRONIC GROUP					
	FEELUX					
	Clover hi-tech Co., Ltd.					
Switching Transformer, (T501)	SOOJUNG	12S-LS01	Class B	12S-LS01	IEC 60065	Test in appliance
	BUJEON					
	DONG YANG TELECOM CO., LTD					
	JIANGSU CHANNELON ELECTRONIC GROUP					
	TDK					
	FEELUX	12S-LS02	Class B	12S-LS02	IEC 60065	Test in appliance
	Clover hi-tech Co., Ltd.					
	SOOJUNG					
	DONG YANG TELECOM CO., LTD					
Opto-coupler, (IC102, IC502, IC503)	Everlight	EL817	>0.4mm / Rated 6000Vac	EL817	IEC 60065 UL 1577	
	Lite-on	LTV817...		817BN		
Discharge Resistor, (R101)	Smart	PRC	1/2W, 1.2Mohm, 5%		IEC 60065	
	UNIROYAL ELECTRONICS INDUSTRY CO., LTD	MGR0W2J****A10			IEC 60065	
	Pilkor	SR37, MSR37			IEC 60065	
FR-1	DONGMYUNG CIR.	DM5-V-0	94V-0			
	HT CIRCUIT(QINGDAO)	1994V0	94V-0			
	TIAN FENG	TU-1	94V-0			
	Duck sung	DS8-V-0	94V-0			
	TIS KOREA	TIS-3	94V-0			
1) an asterisk indicates a mark which assures the agreed level of surveillance Remarks: *) Large volume capacitors exceeding volume 1750mm³						

Mechanical Drawing

NOTE

1. MATERIAL : ALUMINUM A6063S -T5
2. BURR 방향에 주의하고 높이는 0.05이하 일 것.
3. BENDING부 갈라짐이 없고 각도 공차는 $\pm 1^\circ$ 이하 일 것.
4. 소자 결합부위의 평탄도는 0.05mm 이내일 것.
5. 절삭유 등 기타 이물질이 없도록 완전 탈지할 것.
6. 표면에 얼룩, 이물, 불황등 유해한 결함이 없을 것.
7. SOLDER PIN 의 압입은 물리적이여야하며 흔들림없이 고정되어있을 것.
8. 무지정 공차는 ± 0.30 이하일 것.
9. 기타 의문사항은 반드시 설계자와 협의 할 것.

후가공명		선택
아노다이징 (Anodizing)	단면부 포함	
	단면부 제외	○
착색	WHITE	○
	BLACK	



NO	THE NAME OF AN ARTICLE	DWG-NO	MATERIAL	Q'TY	REMARK
1	HEAT SINK - A		AL 6063 (합지처리)	1	YP-325
2	PIN-TERMINAL		SCPT, SPEC t=0.8, 주석도금	2	YP-L-013

REVISION	NO.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Packing Drawing

5					4		3		2		1	
NO		CHANGE ADDITION		REVISED		APPROVED		DATE				
Q'TY : 36Box x 30set = 1080 SETS												
1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6												

1934 Max

590

460

1201

125

1070

1100

460

590

적재 : MAX 9단

GUIDE : 50 x 50 x (1400~2000) x 5t 4EA

PALLET : 1100 x 1070 x 125T (합판)

※ 박스지수는 내측치수임

NO	DESCRIPTION	MATERIAL	Q'TY	REMARK
1	CARTON BOX(내측)	SK.3S.K(D/W t8) (580x450x173x18)	1/30	9단 - 173
2	PAD	SK.3S.K(D/W t8) (575x445x18)	2/30	8T PAD
3	PARTITION - A	SK.3S.K(D/W t8) (575x159x18)	11/30	LGP32F-12P
4	PARTITION - B	SK.3S.K(D/W t8) (450x159x18)	6/30	LGP32F-12P
5	BUBBLE SHEET	ANTI (440x220mm)	30/30	LGP32F-12P
6	POWER SUPPLY	LGP32F-12P 개월(155x155x28)	30/30	LGP32F-12P

가운데에는 PARTITION-B를 각각 2EA씩 끼운다

1

2

3

4

5

6

THIRD ANGLE PROJECT	TOLERANCE	DRAWING C.S YTM	SCALE N/S	R&D CENTER
MATERIAL	TREATMENT	CHECKED	UNIT mm	DATE 2011.10.19
		APPROVED	SIZE A3	DRAWING NO. YY-111019-1

5

4

3

2

1

Y 유양디엔유

주소 : 경기도 용인시 팔림면 용암리 489-1
TEL : (내선) 081-850-7400
FAX : 081-852-8857

Y YUYANG DNU

489-1, YULSAM-RI, PALJAM-MYEON, KYOONGGI-DO, KOREA
TEL : (Ref.) +82-31-850-7400
FAX : +82-31-852-8857

BOX 의 외측사이즈를 기재함.

Description of goods		QTY
Item		
Model		
Part No		P03
DATE	201	

* 내측지수 (외측지수)

NOTE

1. 인쇄 COLOR
- 1) 문자 COLOR : BLACK
- 2) 취급주의 MARKING : RED
- 3) RoHS MARKING 및 외각선 : RED
2. SAMPLE제시 승인후 양산할 것

3. 박스 제작시 내측 지수를 기준으로 제작할 것

* 지수 : 내측지수(외측지수)

THIRD ANGLE PROJECT	DRAWING C.S YTM	SCALE N/S	R&D CENTER	NO	PART NAME	EA	SPECIFICATION	REMARK
TREATMENT	CHECKED	UNIT mm	DATE 2011.10.19					
MATERIAL SK.3S.K(D/W t8)	APPROVED	SIZE A 3	DRAWING NO. YY-111019-2					
				Y YUYANG DNU				

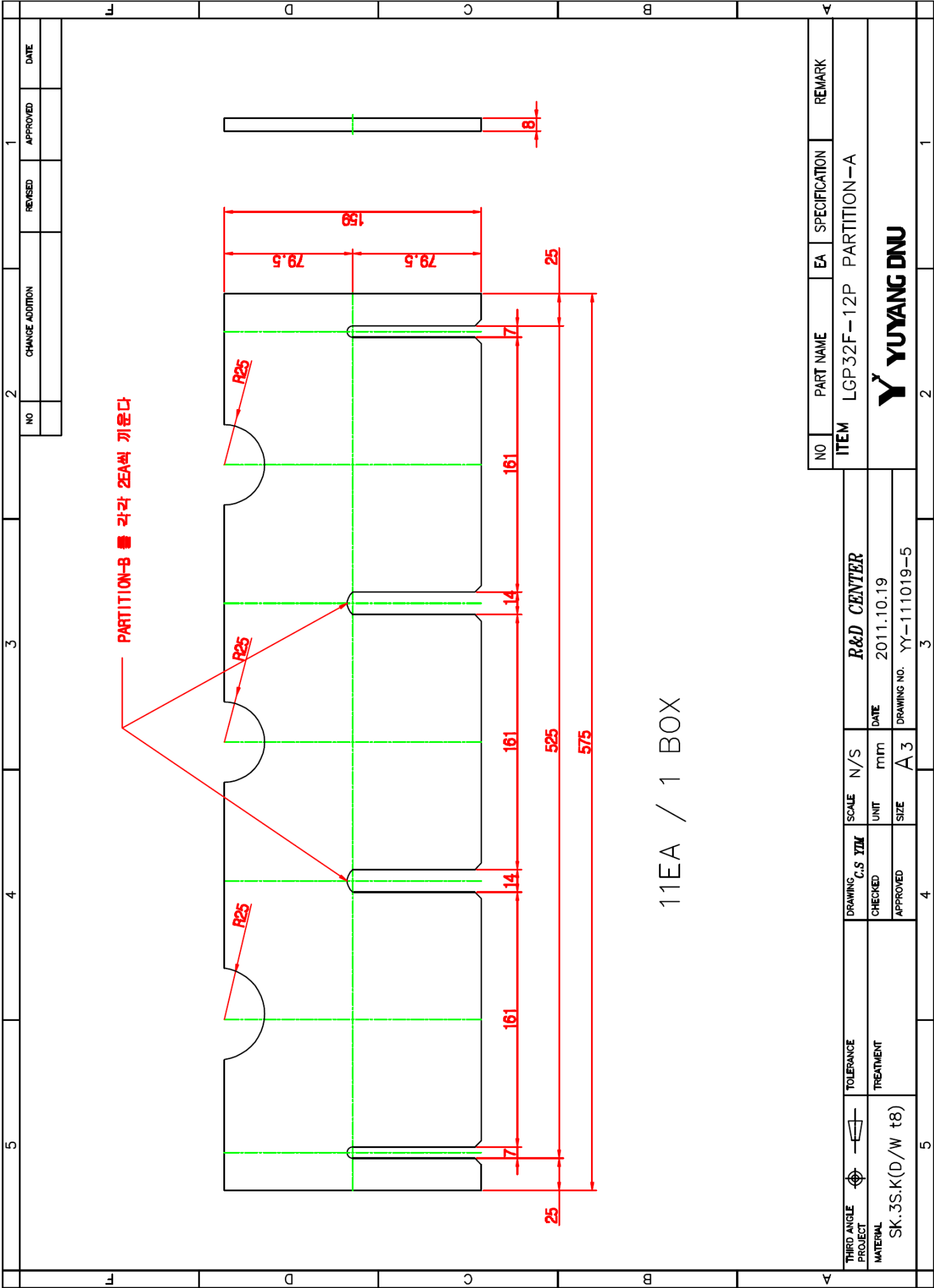
Y^y YUYANG DNU Date: 2012. 01. 05

	5	4	3	2	1	
				NO	CHANGE ADDITION	REVISD
						APPROVED
						DATE

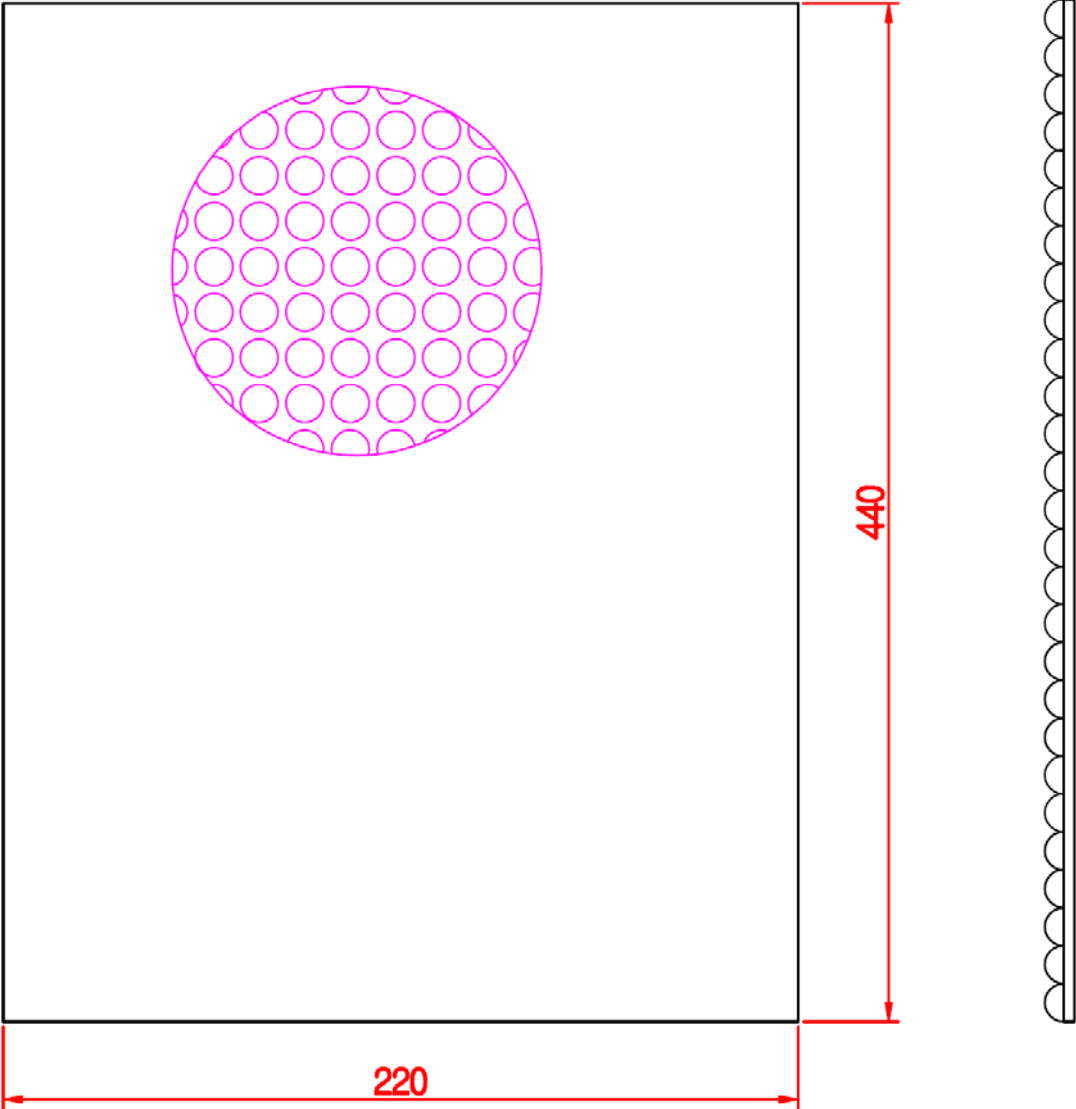
6EA / 1 BOX

THIRD ANGLE PROJECT	TOLERANCE	DRAWING C.S YTM	SCALE N/S	R&D CENTER	ITEM	PART NAME	EA	SPECIFICATION	REMARK
MATERIAL SK.3S.K(D/W t8)	TREATMENT	CHECKED	UNIT mm	DATE 2011.10.19	LGP32F-12P	PARTITION-B			
		APPROVED	SIZE A 3	DRAWING NO. YY-111019-4					

YUYANG DNU



REVISION				
NO	CHANGE ADDITION	REVISED	APPROVED	DATE

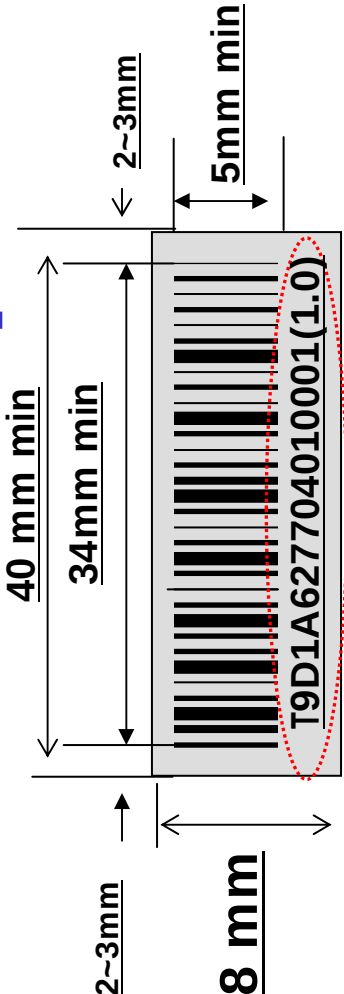


MATERIAL PE t0.03 PINK	<i>R&D CENTER</i>	DRAWING <i>C.S YIM</i>	ITEM LGP32F-12P BUBBLE SHEET
TOLERANCE + 5 - 0	DATE 2011.10.19	CHECKED	DRAWING NO. YY-111019-6
TREATMENT	SCALE N/S	SIZE A4	APPROVED Y YUYANG DNU

Bar-Code **Label Drawing**

※ Bar Code Size는 그림의 size가 최소size이며,
업체 기준 및 PCB공간에 따라 변경 할 수
있으나, 그림의 size보다 줄일 수는 없음.

PSU Bar Code Label Spec



일자표기 방법

Method of marking	Date	Method of marking	Date	Method of marking	Date
1	1	B	11	M	21
2	2	C	12	N	22
3	3	D	13	P	23
4	4	E	14	Q	24
5	5	F	15	R	25
6	6	G	16	S	26
7	7	H	17	T	27
8	8	J	18	U	28
9	9	K	19	V	29
A	10	L	20	W	30
				X	31

T 9 D 1 A 62770401 0001 (1.0)

Approval Revision History

(Bar code should not be read during scanning work.)

Serial No. (10 Digit No. or 34 Digit No)

Part No of LGE (EAY62770401)

Manufacturing Line (A, B, C)

Manufacturing Date [1,2,3,4,5,6,7,8,9,A,B,C,D,E...X]

Manufacturing Month (1, 2, 3, ... Oct.: O, Nov.: N, Dec.: D)

Manufacturing Year(9:2009 / A :2010 / B :2011 ...)

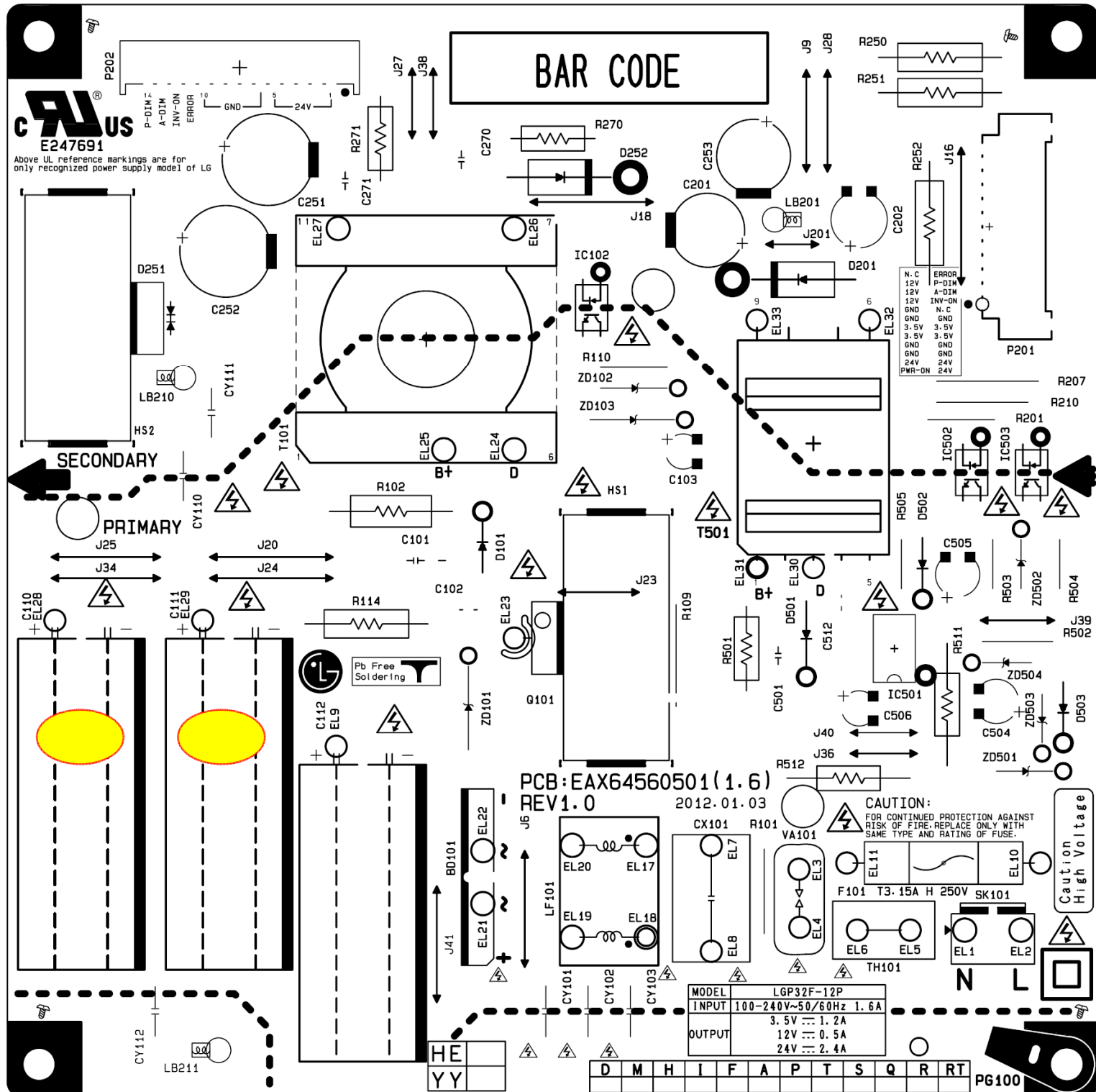
Supplier Code (L : LGIT / B : H&E / T : YY..)

Labeling Point



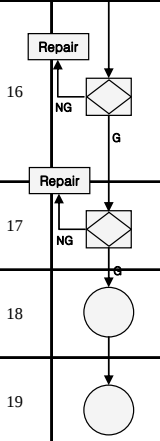
Workmanship Point

Silicone Bonding Point (PCB Bottom ●)



Manufacturing Process

공정번호	공정 흐름도	중요도	공정명	작업내용	4M			
					Man(사람)	Machine(장비)	Material(재료)	Method(방법)
1			수입 검사	샘플 수입 검사 진행		D/Calipers (Mitutoyo) M/Meter (Mitutoyo) PIN Gauge (Eisen) L.C.R Meter (HP) 내압기 (Exttech) 전자 현미경 (ICALSCOPE) DCR Meter (GW Instek) 석정반 (성진이앤지)		수입검사 기준서
2			AI	자삭		Equence Axial (Dynapert) Radial (Panaset) Eyelet (은성) Jumper전용기	승인원 대치	Axial / Radial 리드 각도 : 15 ~ 25도 리드 길이 : 1.5 ~ 2mm
3			SMT	Chip자삭		AIS-K411-R2SS (TSM) VIP-98 (N BTU Eng co.) 1810 (Exl Heller) HDP-2C (Panasonic) YV-64D (Yamaha) HSD-X (Yamaha) HSD-XG (Yamaha) YV-100XS (Yamaha) YV-100XS (Yamaha) YVL88II (Yamaha) YVL88XF (Yamaha) YV-100XF (Yamaha) YV-100XF (Yamaha) YV-100X (Yamaha) YV-10	승인원 대치	1. 미삽, 오삽, 역삽 없을 것 2. Chip 틀어짐 PCB PAD 에서 1/3 이상 벗어 났을 경우 NG 3. 점착 강도 1608 : 1kgf 이상 2012 : 1.3kgf 이상 3216 : 1.5kgf 이상
4			H/S 준비 작업	H/S 준비 작업			승인원 대치	1. 치수에 맞게 작업 할 것
5			수삽	부품 삽입			승인원 대치	오삽,미삽,역삽,불삽 없을 것
6			수삽 외관 검사	수삽 부품 확인 (미삽/오삽역삽)				
7		CTQ	Wave Soldering	납땜	홍호선사원	SAP-700 (신명기전) SAS-680LTP (신명기전) SAS-680TP (신명기전) SAS-680 (신명기전)	HSE-11 B20 WIRE(희성) SN:99%, AG:0.3%, CU:0.7%	공정 관리 기준 Au : 0.2wt% 이하 Cu : 1.2wt% 이하 Zn : 0.0005wt% 이하 Bi : 0.025wt% 이하 Fe : 0.02wt% 이하 Cd : N.D Pb : 0.1% 이하 - 0.08 over 시 교체
8			중간 검사	수삽 부품 확인 (미삽/오삽역삽)				
9			Soldering면 납을 수정	납땜 상태 확인 수정			HSE-HGF10(희성금속)	
10			반면 검사	납땜 상태 확인 검사				
11			ICT	ICT검사		CMS-9000 FX (우리회사) CMS-9000 FX (우리회사) CMS-9000 FV (우리회사)		1. 오삽,미삽,역삽,open,short 검출 2. PASS, FAIL 판정 확인
12			동작검사	동작 출력치 확인		ATS1000(1),ATS500, ATS1000(2) (비오버엔터프라이즈)		1. TEST JIG 및 CONVEYOR 에 제품 장착상태 확인 2. PASS, FAIL 판정 확인 (FAIL시 경광등 울림)
13		Safety CTQ	내압Test	내압 검사		7142 (Exttech)		1. TEST JIG 및 CONVEYOR 에 제품 장착상태 확인 2. PASS, FAIL 판정 확인 (FAIL시 경광등 울림)
14			실리콘 도포	실리콘 도포			QS9112(KCC) OKE-410(OKONG)	
15		CTQ	Aging	Aging진행		Aging System (아진전자)		1. CABLE 연결상태 확인 2. 출력전압 확인용 LED 상태 확인 3. 부품 BURNT 유/무 확인

	CTQ	특성 검사	제품 출력치 확인	김재규 대리, 이용순 반장 정경택 대리, 문경덕 사원	ATS1700(1),ATS1700(2) ATS1200,ATS1600, ATS1000(3),ATS1500 (비오비엔터프라이즈)		1. 자재의 오상, 설상, 미상 상태 확인 2. 냉납, SHORT, 납불등 SOLDERING 상태 확인 3. READ 길이 확인 (MAX 2.5mm) 4. 실리콘 BONDING 상태 확인
		외관 검사	제품 외관 검사진행				
		실장/포장	실장 검사 포장진행			SK SK A골 1종, SK SSKK DW 2 종, SK SK B골 1종, 수K수 수출용 2종(제일포장산업)	
		출하 검사	제품 품질 보정, 출하 검사 진행		ATS3000 (비오비엔터프라이즈)		출하 검사 기준서

Appendix List

No.	Contents
1	PCB Check list
2	Warranty letter

Appendix 1.

PCB CHECK LIST

Revision History		Rev	DATE	REMARK
1	기존 PCB Check Sheet Ver1.9 에서 신규 Power Check Sheet Ver1.0 으로 개정 함	1.0	2011.06.02	

Details Check Item		RESULT		REMARK
▶ 부품 LOCATION NO.		OK	NG	
1	Power 1차측 회로 Location No.가 100번대 일 것(Multi 1차측 포함)	OK		JUMPER는 제외됨.
2	Power 2차측 회로 Location No.가 200번대 일 것(Stand by 2차측, Multi 2차 포함)	OK		JUMPER는 제외됨.
3	Inverter 1차측 회로 Location No.가 300번대 일 것	OK		Inverter 회로 없음.
4	Inverter 2차측 회로(F/B, OVP회로부 포함) Location No.가 400번대 일 것	OK		Inverter 회로 없음.
5	Stand by 1차측은 Location No.가 500번대 일 것	OK		JUMPER는 제외됨.
6	PFC단은 Location No.가 600번대 일 것	OK		JUMPER는 제외됨.
7	MICOM 주위는 Location No.가 700번대 일 것	OK		해당사항 없음
8	LCD : LED Driver 단은 Location No.가 800번대 일 것	OK		LCD 에만 적용함
9	PDP : STBY 1,2차단은 Location No.가 300번대 일 것	OK		PDP 에만 적용함
10	PDP : Va 2차단은 Location No.가 500번대 일 것	OK		PDP 에만 적용함
11	PDP : Vs 2차단은 Location No.가 900번대 일 것	OK		PDP 에만 적용함
12	PDP : Vs, Va 1차단은 Location No.가 800번대 일 것	OK		PDP 에만 적용함
13	CTV : Power Block은 Location No. 800번대 일 것	OK		CTV 에만 적용함
14	Resistor의 회로Location No.는 R***로 시작할 것	OK		
15	Capacitor의 회로Location No.는 C***로 시작할 것	OK		
16	Diode의 회로Location No.는 D***로 시작할 것	OK		
17	Zener Diode의 회로Location No는 ZD***로 시작할 것	OK		
18	Coil의 회로Location No.는 L***로 시작할 것 (PFC 포함)	OK		
19	Transformer의 회로Location No.는 T***로 시작할 것 (Drive Trans 포함)	OK		
20	Bead의 회로Location No.는 LB***로 시작할 것	OK		
21	Fuse의 회로Location No.는 F***로 시작할 것	OK		
22	TR/FET/Thyristor의 회로Location No.는 Q***로 시작할 것	OK		
23	Varistor의 회로Location No.는 VA***로 시작할 것	OK		
24	Volume Resistor의 회로Location No.는 VR***로 시작할 것	OK		해당사항 없음
25	Jumper의 회로Location No.는 J***로 시작할 것	OK		
26	H/S의 회로Location No.는 HS***로 시작할 것	OK		
27	IC의 회로Location No.는 IC***로 시작할 것	OK		2007.04.16 DDC 표준

Details Check Item		RESULT		REMARK
▶ 부품 LOCATION NO.		OK	NG	
28	Connector wafer / Ass'y (Board in type)의 회로 Location No.는 P***로 시작할 것	OK		
29	Eyelet의 회로Location No.는 EL***로 시작할 것	OK		
30	Gripper의 회로Location No.는 G***로 시작할 것	OK		해당사항 없음
31	Holder의 회로Location No.는 HD***로 시작할 것	OK		
32	Thermistor의 회로Location No는 TH***로 시작할 것	OK		
33	Metal Ground의 회로Location No.는 PG***로 시작할 것	OK		해당사항 없음
34	Line Filter의 회로Location No.는 LF***로 시작할 것	OK		
35	AC Socket(Inlet)의 회로 Location No.는 SK***로 시작할 것 (AC전원 Docking용 Wafer 포함)	OK		2007.04.16 DDC 표준
36	Photo Coupler의 회로Location No는 IC***로 시작할 것	OK		2007.04.16 DDC 표준
37	Relay의 회로 Location No.는 RL***로 시작할 것	OK		해당사항 없음
38	Y-Capacitor의 회로Location No는 CY***로 시작할 것	OK		
39	X-Capacitor의 회로Location No는 CX***로 시작할 것	OK		
40	Fuseble Resistor의 회로Location No는 R***로 시작할 것	OK		해당사항 없음
▶ PCB Pattern 간격		OK	NG	
1	Primary ⇔ Secondary(GND,Y-Cap,Photo Coupler) 간격이 Creepage 기준을 만족할 것.(규격Gr. 안전규격 Check List 참조.Note 0) (단, Working Voltage가 350V이상일 때 규격 요청 거리에 따른다.)	OK		첨부화일 참조. (Creepage) NOTE 0  Creepage
2	Primary(L,N) ⇔ Safety GND 간격이 3mm이상일 것 (단, 2심일 경우 6mm 이상 일 것)	OK		
3	Live ⇔ Neutral 간격이 3mm 이상일 것	OK		
4	Primary ⇔ Secondary 부품간 공간 거리는 6mm이상일 것 (6mm 이하일 경우에는 insulation sheet 추가)	OK		
5	1차측 Main Current loop는 Pattern 두께 3mm 이상일 것 (BD ⇔ 1차 평활 Cap까지 중점 Check)	OK		
6	PFC Coil 밑으로 소신호 Line이 지나가지 말 것. DC는 문제 없음	OK		
7	주 GND(AC 평활 Cap. GND) 에서 IC GND 연결 시 Pattern Impedance 를 고려하여 pattern을 분리 할 것.	OK		
8	DIP Type St-By IC 일 경우 고압Pin과 근접Pin 간의 이격거리 확보 할 것. - Drain pin과 인접된 pin은 N.A나 공 pin 일 것.	OK		

Details Check Item		RESULT		REMARK
▶ Component		OK	NG	
1	Surge Test 시 1~2차간 간격이 6.0mm 이상일 것(safety GND와 2차 GND의 구별 주의 (절연 Y-Cap사용) 공간확보 주의, 절연Sheet)	OK		(주) 3심:3.0mm 이상 (내압 test 必) 2심:6.0mm 이상 (Y-cap 포함)
2	전해 Cap(전수) 부품 주위 발열 부품 과 3mm 이상 이격 시킬 것 (공간거리)	OK		
3	1차 평활 전해 Cap 부품 upper 영역은 1mm이상 Bottom 영역은 5mm 이상 이격 시킬 것 (Vertical type Capacitor에 한함) (Note 1)	OK		PSU가 수직 장착 모델에 한함.
4	1차 평활 Cap 3mm 영역 내 아래로 Pattern이 지나가지는 않을 것 (양면 PCB 상측 Pattern에 한함)	OK		
5	높이가 낮은 코어를 사용할 경우 절연 tape를 사용할 것 (PCB와의 이격거리 확보)	OK		1,2차 절연형 Trans 에 한함
6	Trans의 경우 300V 기준으로 Barrier 8mm 이상 사용하고 있을 것 (Note 0) (Barrier를 줄이기 위해 Wire에 Tube 사용가능, 규격 GR. 필 확인 사항)	OK		첨부화일 참조. (Creepage) T501 : 3중 절연 Wire 사용. T101 : Bobbin 형상으로 절연 거리 유지됨.
7	AC Inlet의 경우 Yellow - Green wire의 Screw 3.5Φ 이상 일 것. * Y/G wire를 사용하지 않을 경우, PCB Pattern으로만 대응 시엔 200A Test통과할 것 * Safety GND는 독립적으로 GND역할만 하도록 할 것. UL Test의뢰 * Pattern 대응 시엔 반드시 규격 확인을 할 것	OK		
8	부품에 힘을 가했을 때 1~2차 부품간 6mm 공간 거리 확보할 것. Core에 절대로 부품이 접촉되면 안됨	OK		
9	Box type Capacitor 사용 시 Forming type이 적용할 것. RTV Bond가 되어 있을 것 (X-capacitor 포함.) 단, PDP Sony 모델에 한함	OK		관계 없음.
10	CORE(Trans류 All 포함) 주위에는 2mm 이상 전 부품을 이격 시킨다. * 유기전압 1kV (peak to peak) 이상 시엔 4mm 이상 (1000:1 Probe 기준)	OK		
11	Inverter Trans와 Metal Frame(shield)과 4mm 이상 이격을 시킨다. (적용이 어려울 경우, 반드시 Insulation sheet 추가한다.)	OK		Inverter 회로 미적용.
12	2차 측 출력 Wafer 는 고정 PIN 추가 TYPE 적용 할 것 (단, LPB 일 경우 Micom Deberging 용 Wafer 는 제외)	OK		

NOTE 0



Creepage

NOTE 1



CAPACITOR

Details Check Item		RESULT		REMARK
▶ 필수 Marking 사항		OK	NG	
1	AC Socket, AC입력용 Wafer에 L/N표시는 되어 있을 것. (Docking Type도 L/N 표시(QA 요청), 상,하측 모두 표시) 특히, Socket B/D-in type의 경우, AC socket 자체에 L/N 표기가 되어 있으므로, 반드시 PCB L/N 마킹과 동일한지 확인한다. (Note 3-2)	OK		Fuse 는 Live 단에 위치 할 것
2	Safety GND는 Chassis로 부터 분리될 때 작업자가 확인 가능한 위치일 것. (Note 2) * 추후, PCB 상,하면에 모두 표기, 상세한 내용은 하단의 유첨 파일 참조 요망, 그리고, 반드시 규격에 최종 확인 받을 것.	OK		2심은 제외함
3	Fuse rating(전압,T,전류,H), caution(규격 문구), UL Mark는 입력되어 있을 것 Ex) T5A H 250V 형식으로 표시함 * caution: UL에 등록되어있는 문구가 그대로 입력되어야 함 (For ~ , Replace ~)	OK		
4	Fuse가 보이는 곳에 위치할 것 (Fuse Marking도 보이는 곳에.)	OK		
5	High Voltage warning mark가 입력되어 있을 것. - Inverter 출력부 : LIPS에 한함 Inverter 출력부 영역 표시하고 Warning mark 추가. - Primary측 Metal.(H/Sink), High Voltage가 open된 곳. (Fuse) : 공통	OK		
6	입력/출력 전압, 전류 Spec표기는 되어 있을 것 (Note 3)	OK		
7	1차측과 2차측 구분하는 Marking 표시할 것. (상측면 / 하측면)	OK		
8	각 부품의 회로No.가 부품에 가려지지 않을 것	OK		
9	Solder pattern에 하측 회로No./부품 형상 등 겹쳐지지 말 것	OK		
10	기구 Dead Space가 고려되어 PCB Marking할 것. PCB 고정용 Metal 영역 표시할 것.	OK		
11	PCB 사양서에 CTI Spec 이 있는지 확인하고, PCB 에 마킹 되었는지 확인 할 것. - 표기 값 : 600V 이상 (CTI 600)	OK		
12	Critical Component List 기준으로 회로도에 Caution 마크 넣을 것 	OK		
13	PCB 에 Screw 마크 넣을 것 	OK		

NOTE 2



Safety GND 규정

NOTE 3



Input/Output

NOTE 3-2



B/D-in socket

Details Check Item		RESULT		REMARK
▶ EMI		OK	NG	
1	Lightning Surge가 L/N Test 시 Varistor를 14Φ 620V 이상 사용할 것	OK		
2	Lightning Surge가 L/G, G/N간 : 3KV이상 시 Y-Cap. Y1급 사용할 것	OK		
3	Lightning Surge 로 인해 Fuse Dead시만 OK. (대책 : arcing을 방지, Varistor는 Fuse와 가까운 곳에 위치할 것)	OK		
4	GND Arcing pattern Slit은 1.2mm일 것 Arcing Pattern 양단 거리는 safety규정은 최소 3.0mm 이상 일 것 (L/N 사이)	OK		
5	Conducted Emission 측정조건 : 110Vac/220Vac & 50Hz/60Hz TV Model : GND 有/無, Vivid/Standard, HDMI/Antenna	OK		
▶ INVERTER (LIPS에 한함)		OK	NG	
1	Ballaster capacitor 사용할 것	OK		
2	Inverter Trans로 부터 주변 4mm 이내에 소신호 AC pattern이 지나갈 시에는 OVP/OLP 등 Worst 상태를 반드시 확인하여 이상이 없을 것 (Feed Back Line 포함) [AC입력으로 부터 Inverter에 간섭 되는 noise 를 줄이기 위해 POWER FET의 Heat Sink 를 형상 변경하여 AC 입력부와 Inverter Trans 간 Shield로 사용. (CE 규제사항) - Design 상 고려되어야 함.]	OK		해당사항 없음
3	Inverter 출력부에 적용한 고압 Capacitor의 Lead는 인위적 힘을 가하여도 주변 부품과 Touch 되지 않도록 절연 거리 확보 or Bodning 적용할 것. (특히, 다른 고압 Capacitor의 body와 touch 되지 않도록 할 것)	OK		해당사항 없음
4	Inverter Trans Gripper 및 Eyelet 부위 Size 확인할 것. - Pin 동박 Size : 5.5mm - Pattern Size 확대 : 6mm (단, 32인치 이상 LIPS 에만 적용함)	OK		해당사항 없음
5	고압 Inverter wafer 는 수평 Type 일 것.	OK		해당사항 없음

Details Check Item		RESULT		REMARK
▶ 기타		OK	NG	
1	Fuse 깡통(CAN)Type 을 사용하지 말 것.	OK		
2	Main Board/Power Board(LIPS 포함) 연결 Connector의 Housing과 Wafer의 Maker가 일치할 것. *일치가 안될 경우, Spec. 확인 및 QA 인증 시험이 요구됨.(특히, Board in connector는 Terminal도 확인)	OK		
3	Litz Wire 사용하지 말 것.	OK		USTC
4	PFC Bypass Diode가 적용되어 있을 것. (Note 4)	OK		첨부화일 참조(Bypass)
5	Inrush 제어용 Relay 적용 모델인 경우, Fusing Resistor 적용 확인할 것.(Note 5) (단, Fusing Resistor 미적용 시 Relay Open Test 확인 하여, PL 조건 만족할 것)	OK		첨부화일 참조(Relay) Relay 사용 안 함.
6	1차 Control IC의 IC Vcc 정류Cap.은 High Ripple, Low Impedance Cap. 사용할 것.	OK		
7	RN Type (Metal Film Type) Resistor는 100kohm이상 사용하지 말 것.	OK		08년 6월 26" MNT ND 분 양산 문제 발생. (여러 차례 재발됨)
8	TO-220, TO-3P type FET, Diode, IC 적용 시, Forming type 을 적용했을 때 forming 후 cutting을 하기 때문에 길이가 짧아진다. 따라서 반드시 Heatsink 와 PDM 등록 승인원, 부품 현물을 3자 확인 후 lead 길이, pitch 확인할 것. (LGEAZ, LGEND 관련하여 사전 협의 필요 LGEND 에서는 forming type 을 전수 원함)	OK		08년 3월 LGEAZ CKD 분 PQ 이전 문제 발생하여 지급 조치 한 이력 있음.
9	PCB하측 lead 길이 special 관리 모델의 경우 (예를 들어 2.0mm 관리 품) H/Sink, wafer, 각종 부품 도면 받아서 lead 길이 check 할 것	OK		
10	Critical Component List 의 부품인 경우 실물에서 형명 마킹 제대로 되어 있는지 확인 할 것	OK		
11	일본향 모델에 사용되는 방전저항은 규격 인증된 Dip Type 저항만 사용 할 것. (단, 일본향 모델에 한 함)	OK		

NOTE 4



Bypass-Diode

NOTE 5



Relay

Details Check Item		RESULT		REMARK
▶ Attachment		OK	NG	
1	PL check List  LGP32F-12P_PL Safety Check List			

※ APPENDIX 2

WARRANTY LETTER **(ROHS)**

Non-use certificate

Description	For approval / For mass production	Submitting date	20012 . 01. 05
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Cooperating suppliers

Company name	YUYANG DNU CO.,LTD.	Approval	Person in charge	Head of department
Contact	Tel.:82-31-350-7406	Name	KIM SANG OK	CEO
e-Mail	sokim@yuyang.co.kr	Signature	 D:WTV & MFTW Pb FreeWROHSWarranty €	 PRESIDENT SANG OK KIM
LGE Part No.	EAY62770401	Part production date	filling the sheet in case of mass production	
Maker Part No.	LGP32F-12P	Production plant	HWASUNG in KOREA QINGDAO in CHINA	
Part name	LGP32F-12P			

This is to certify that materials used and contained in the products and components that we supply to your company, meet the standards of the checked items listed below.

_____ below _____

We meet the standards of LG Electronics for six major substances (Pb, Cd, Cr⁶⁺, Hg, PBBs, PBDEs) as designated by RoHS for control.

* Records are requested if they are parts to be actually installed on the PCB (Printed Circuit Board)

Soldering Type: ☒ Flow ☐ Reflow (Requirement : 250℃ / 10sec)

1. Maximum heat-resisting temperature : 260℃

2. Time within actual Peak time : 10

☒ Pb-Free Soldering (all solder cream, Bar, Wires included) is available to apply.

Note.

1. All the contents written on these documents must be created on the basis of facts, and cooperating suppliers must submit the data immediately whenever LG Electronics requests.
2. In the case that these documents are used for approval purposes, cooperating suppliers must submit the sample on the request. For the purpose of mass production, it must be submitted at the time of delivering the first product.