

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 4247 inch LGE LED TV.

1.2 Customers product related items

Product : Power Supply Unit

Part code : EAY62171601

1.3 Product name

Product name : LGP4247-11SPL

Revision code : 1.3

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 3.5Arms . (at 100Vac & Nominal Load) Under 1.5Arms . (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 load
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 0.9 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	0.09W Under(6mA)	-	-
		2 (0.001~2) (ON condition)	± 5%	250 mVp_p
12V	11.4V ~ 12.6V	3 (0.3~3)	± 5%	350 mVp_p
24V	22.8V ~ 25.2V	4.1 (0.1~4.1)	± 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.

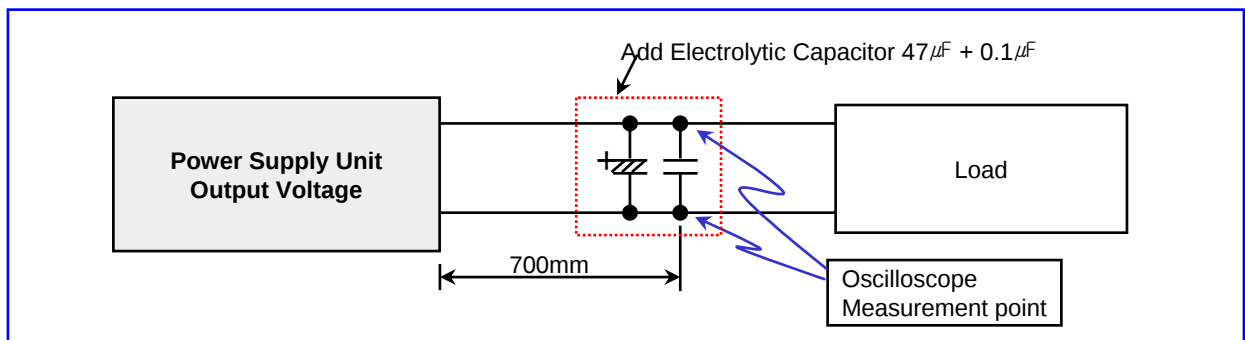
Do not turn "Power_ON" Signal on at the load condition of 3.5V output, more than 40mA.

* 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

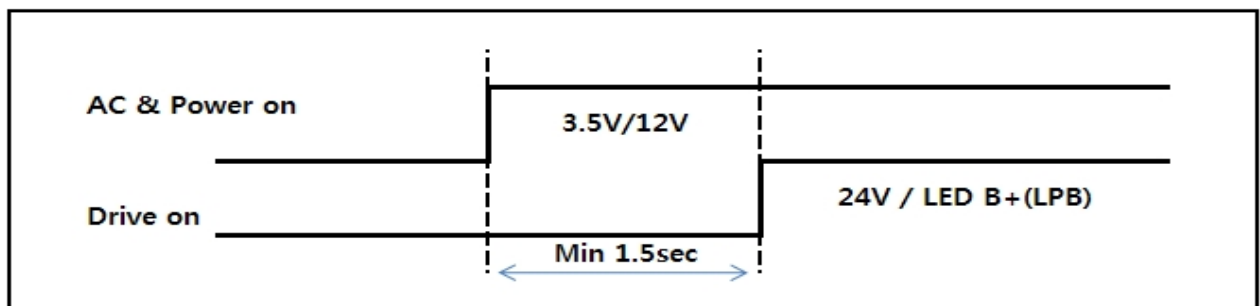


※ Ripple and noise are measured at the end of output cable which are added a 0.1uF ceramic capacitor and 47uF electrolytic capacitor. (connected parallel)

* 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]	0.006	Don't Care (Power-Off)	
Wattage [W]	Less than 0.09Under (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-DC 1.5K VAC 3 SEC 10 mA. 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 0.5 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 UL60950, IEC60950, 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 1.0kg
Unit Size	290(W) X 240(D) X 12.9(H)

2.9 Function of protection

Protection	Output Circuit	Trip point		Notes
		Min	Max	
Over Current	STBY 3.5V	3.0A	6.0A	Auto Re-start
	12V	8.0A	28.4A	Latch
	24V	5.0A	14.2A	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

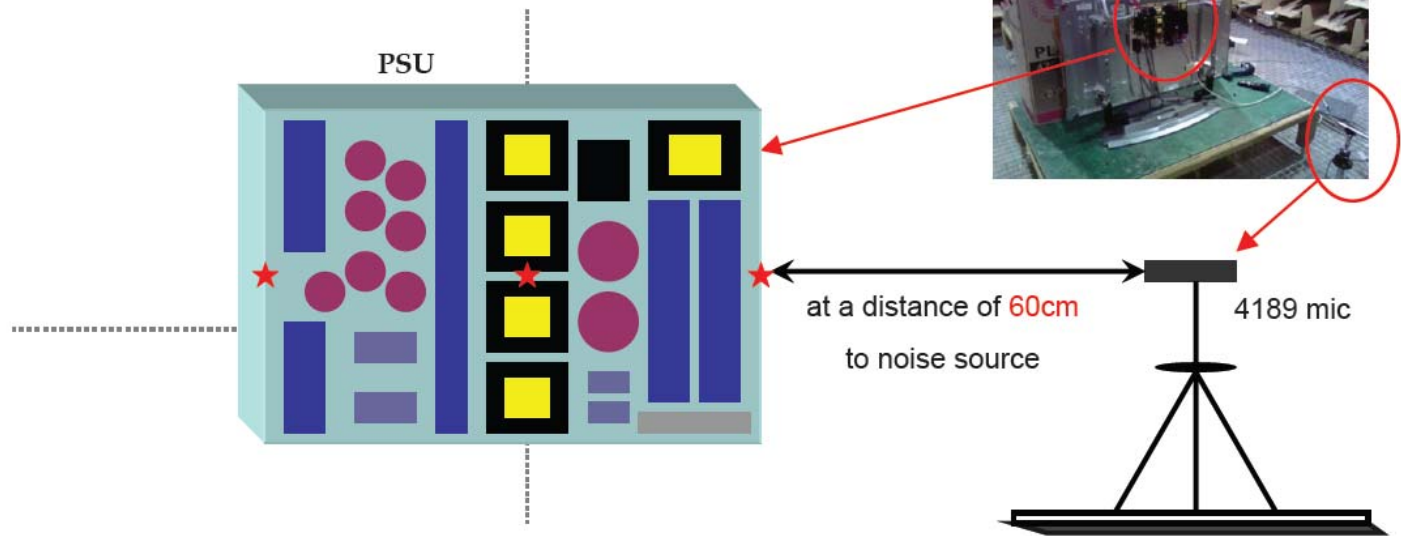
Measure Condition : At a distance of 60cm mic

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

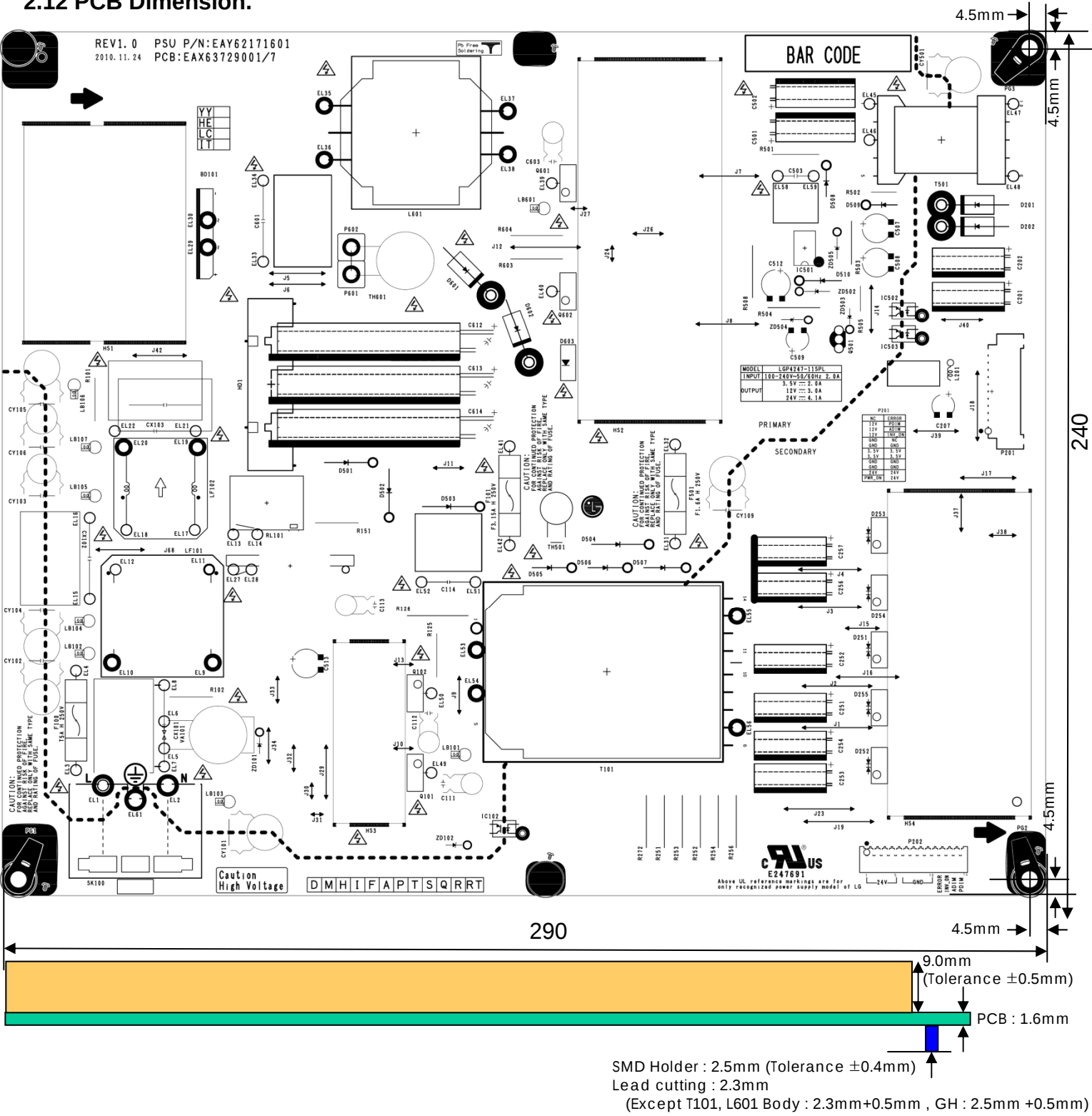
2.11.1 Connectors Usage

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/OFF
19	12V	20	A-DIM
21	12V	22	P-DIM
23	N.C	24	ERROR

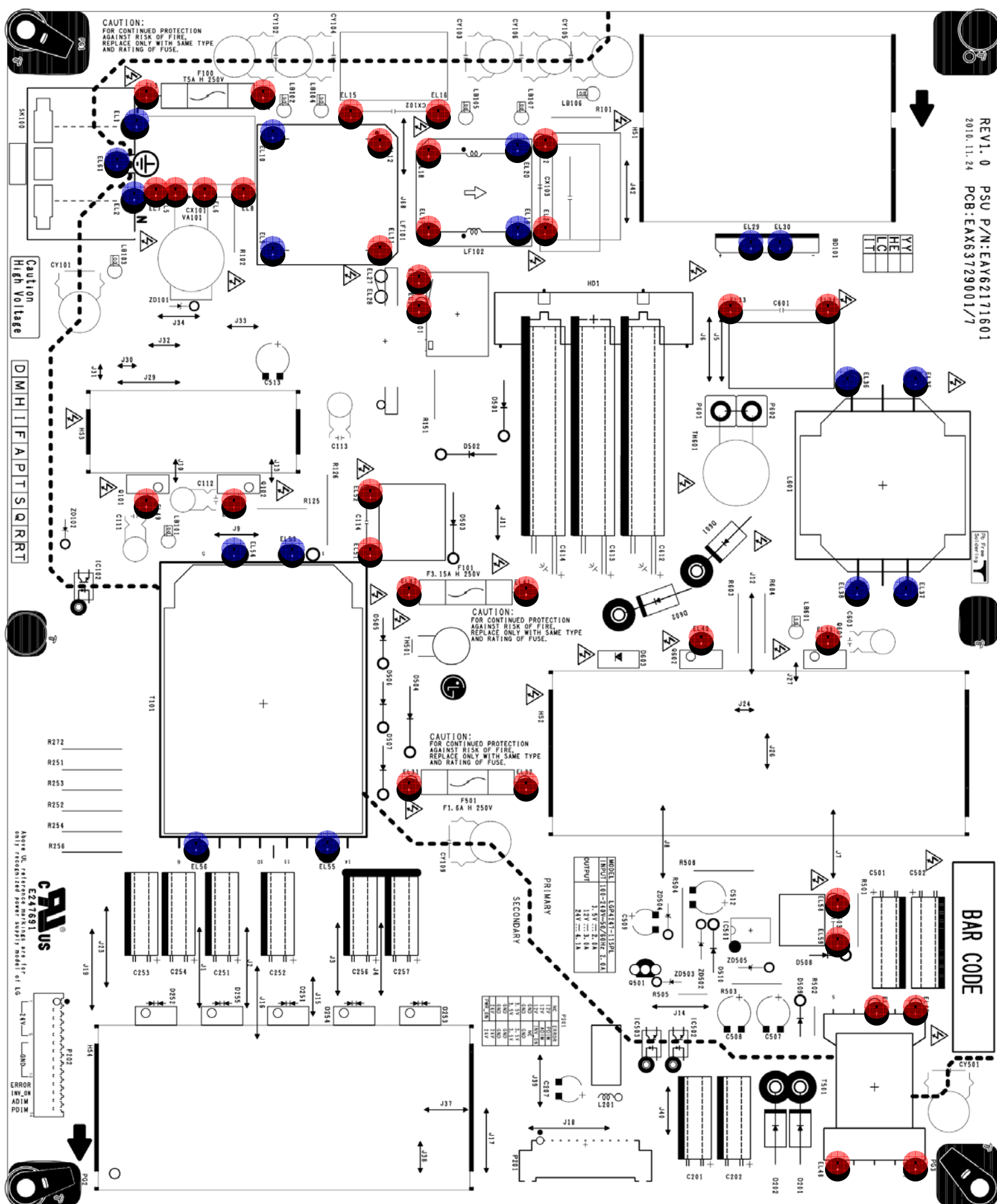
P202	
Type : 20010WR-H14B/C Maker : YEON-HO	
Pin No.	Signal
1	24V
2	24V
3	24V
4	24V
5	24V
6	GND
7	GND
8	GND
9	GND
10	GND
11	ERROR
12	INV ON/OFF
13	A-DIM
14	P-DIM

SK100	
Type : 90011WR-H03D Maker : YEON-HO	
Pin No.	Signal
1	LIVE
2	F.G
3	NEUTRAL

2.12 PCB Dimension.



Apply to the Eyelet point 2.0Φ : EL1,EL2,EL9,EL10,EL19,EL20,EL29,EL30,EL35,EL36,EL37,EL38,EL53,EL54,EL55,EL56,EL61 (17EA)
Apply to the small Eyelet point 1.6Φ : EL3,EL4,EL5,EL6,EL7,EL8,EL11,EL12,EL15,EL16,EL17,EL18,EL21,EL22,EL31,EL32,EL33,EL34,EL39,EL40,EL41,EL42,EL45,EL46,EL47,EL48,EL49,EL50,EL51,EL52,EL58,EL59 (32EA)



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℃
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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.