

SPECIFICATION No.	
DATE OF ISSUE	2014. 06. 30



LED Driver

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SPECIFICATION

Model : SI-EPF006660WW

CUSTOMER :	
CHECKED	APPROVED
20	20

SAMSUNG			
DRAWN	CHECKED		APPROVED
	SALES	QA	
20	20	20	20

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REVISION OF SPECIFICATION

	01	Modify the item 1.4,2,2,9		2014.06.30	SK.Choi	CH.Back
	00	The First Specification established.		2014.05.26	SK.Choi	CH.Back
SYMBOL	REV	REVISION	PAGE	DATE	TRACED	APPRO.

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1. AC Input Characteristics

1.1. Input Voltage

The PSU is capable of supplying full rated output power over the input range of 108 to 305VAC RMS. Its nominal voltages are 120 and 277VAC. The PSU is capable of start-up (power-on) at 108VAC and 47 Hz minimum

Condition	Minimum	Maximum	Units
Nominal	120	277	Vrms
Variable	108	305	Vrms

1.2. Input Frequency

The PSU operates with an input frequency range of 47 – 63Hz.

Condition	Minimum	Maximum	Units
Nominal	50	60	Hz
Variable	47	63	Hz

1.3. Input Current

Maximum steady state input current is 0.59A (Max.) @120Vac.

Input Voltage	Maximum	Units
120Vac/60Hz	0.59A	Amps(RMS)

1.4. Range Switching

The PSU can accept 120Vac to 277Vac full input range. No range switching is necessary or possible.

1.5. Inrush Current

The cold or hot start inrush current should be less than 20A and not cause the fuse open or component damaged. (The Time duration at 50% of Ipeak is 300usec.)

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1.6. Power Factor

Power factor must higher than 0.9 @ 120-277Vac with the output current greater than 57% of rated current and the total output power higher than half load conditions.

Parameter	Symbol	Condition	Specifications			Units
			min.	typ.	max.	
Power Factor	PF	Input = 120-277Vac Vout = 20-50V Iout = 0.797-1.4A Po>25W	0.9	-	1.00	

1.7. THD (Total Harmonic Distortion)

THD must lower than 20% @ 120-277Vac with the output current greater than 57% of rated current and the total output power higher than half load conditions.

Parameter	Symbol	Condition	Specifications			Units
			min.	typ.	max.	
THD	TH	Input = 120-277Vac Vout = 20-50V Iout = 0.797-1.4A Po>25W	-	-	20	%

1.8. Power Saving

The stand-by power should less than 1W. (Dimming Voltage < 1V Condition.)



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2. DC Output Characteristics

2.1. Output Voltage and Output Current

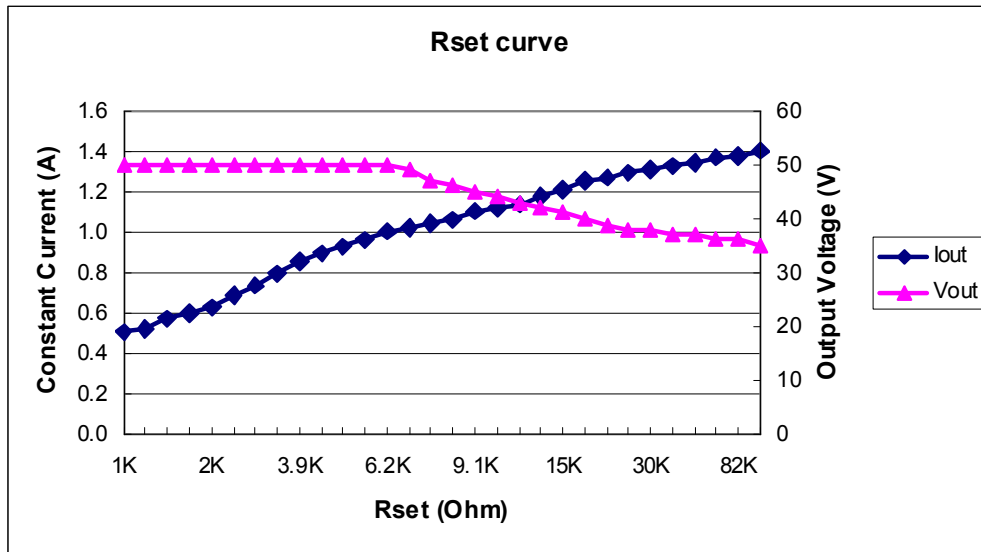
The output current can be adjusted by the Rset resistor. This item is tested under LED mode of E-load and the Rd coefficient should setting at 0.21.

The output condition is as following curve. The tolerance of output voltage should be within $\pm 2\%$ of setting value and output current should be within $\pm 5\%$ of rated current. The full load condition are 35V/1.4A(max current) and 50V/1A(max voltage).

The output current adjusted method is following below:

1. Disconnected Rset resistor to set full load at 35V/1.4A condition.
2. Connected the Rset resistor value to adjust the output current*. The Rset resistor connected to 6.2KOhm, the output is setting to full load at 50V/1A condition.

* The Rset value is referring to Appendix A.



The output Voltage range is referring from following form :

Parameter	Condition	Minimum	Normal	Maximum	Units
Output Voltage	$I_o = 0.5 \sim 1.4A$	20	-	50	Volts
MAX Power	$I_o = 0.5 \sim 1.4A$ $V_o = 20 \sim 50V$	10	-	50	Watts

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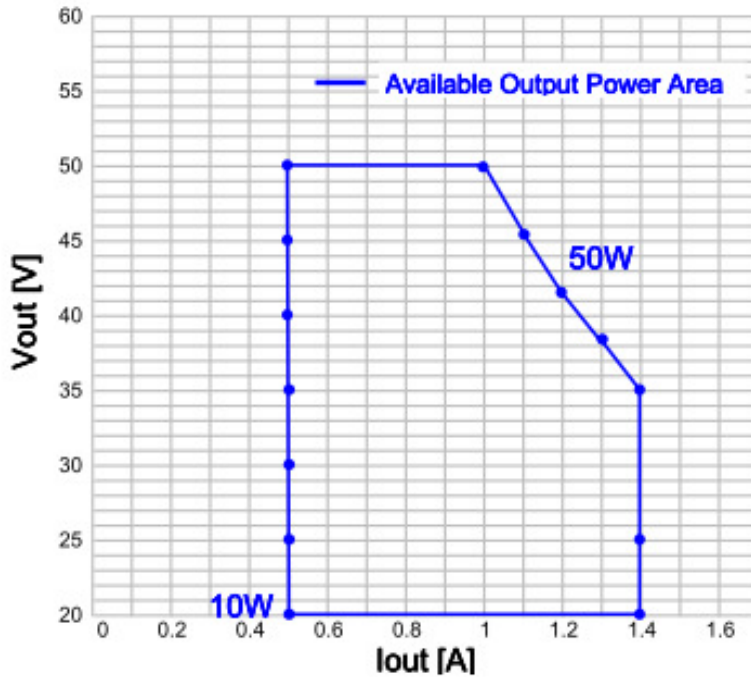


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* The output voltage is limited by max output power. The output current is 1.4A, the output voltage is 35V MAX. When the output current is down to 1A in using Rset to set, the output voltage is up to 50V MAX. The detail value is referring from Appendix A.

The Output Watt coverage is referring from following:



2.2. Turn-On Delay Time

DC output turn-on delay time should less than 1 second at 108Vac input at typical load condition (35V/1.4A)

The turn-on delay time is measured from “AC turn on” to “output reach 95% of rated current”.

2.3. Efficiency

The efficiency should greater than 83% at output condition 35V/1.4A and 50V/1A under 120V/60Hz.

(The PSU should warm up under full load condition at least 30 minutes).

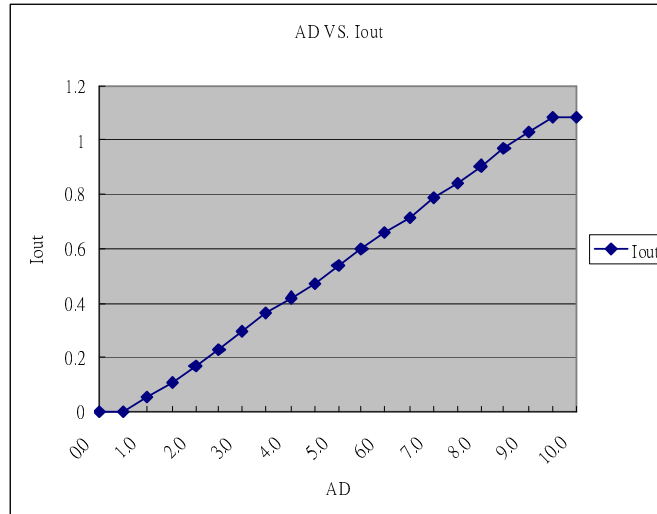


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2.4. Dimming

The PSU has AD dimming function. It must be used with DC 0~10V. Dimming Curve is as below:

(The current of LED module is $1.043A \pm 5%$ at full load condition.)



3. Protection Requirements

1.1. Short Circuit Protection

The PSU should be protected when the output short and do not result in a fire hazard, shock hazard, or damage to the PSU. The protection is auto-recovery mode. The test procedure is setup at LED mode and short V+ to GND, after the fault condition removed, the PSU should be auto-recovery and works normally.

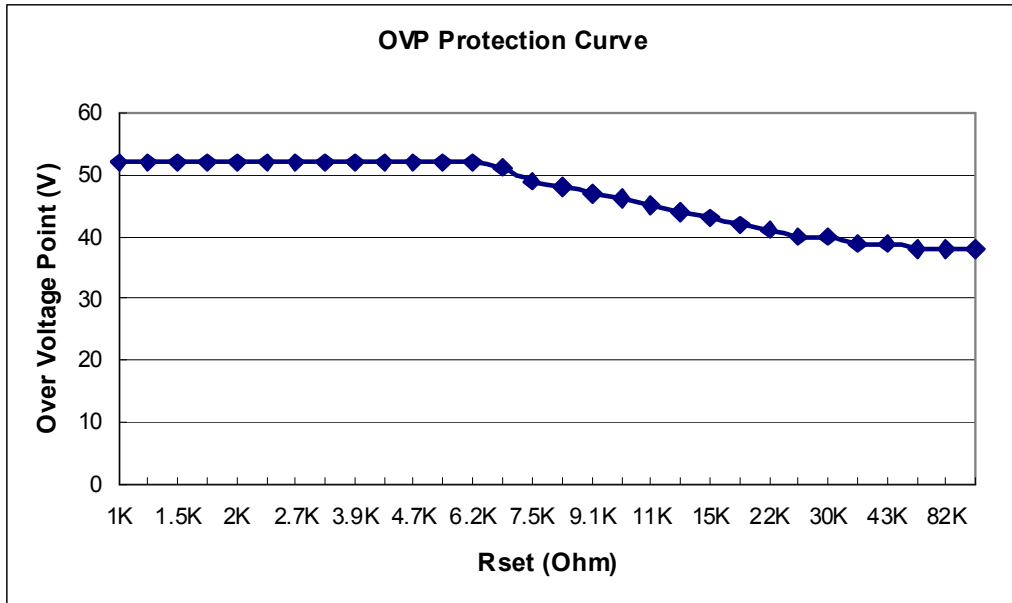
1.2. OVP Protection

When No Load Condition occurs, the PSU should Clamp output voltage at the OVP Voltage and not to damage the PSU. The OVP Voltage can adjust by Rset. After the Load is switch on, the PSU should be works normally. The OVP Voltage can adjust by Rset. OVP Voltage is referring from following curve.

* The Rset value is referring to Appendix A.



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4. Environmental (Temperature and Humidity)

4.1. Operating

Temperature	The PSU shall operate from -20°C to 50°C.
Relative Humidity	10% to 90% relative humidity.
Altitude	2,000 feet above sea level or 10,000 feet above sea level with a 32°C maximum ambient air temperature.

4.2. Shipping / Storage

Temperature	The PSU can be storage from ambient -25°C to 80°C.
RelativeHumidity	20% to 90% relative humidity.
Altitude	20,000 feet above sea level.

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5. Isolation (High Potential Testing)

5.1. Dielectric Strength (HI-POT)

One hundred percent (100%) of PSU shall comply with the minimum production line Hi-Pot (High Potential) test as noted below. The test shall be applied between the L/N (AC Line and Neutral) to Output Terminal (Vout and RTN). (HIPOT Tester should turn off the “ARC FAIL” Condition.)

Parameters	Setting
Voltage	3750 Vac minimum
Trip Current Sensitivity	10 milli-amperes maximum
Voltage Ramp Time	500 V/Second ramp minimum
Dwell Time	60 seconds for safety apply, 3 seconds for mass production(4000 Vac)
Breakdown Arc Detection	10 microseconds maximum

One hundred percent (100%) of PSU shall comply with the minimum production line Hi-Pot (High Potential) test as noted below. The test shall be applied between the L/N (AC Line and Neutral) to PE (Chassis/Input receptacle ground terminal). (HIPOT Tester should turn off the “ARC FAIL” Condition.)

Parameters	Setting
Voltage	1500 Vac minimum
Trip Current Sensitivity	10 milli-amperes maximum
Voltage Ramp Time	500 V/Second ramp minimum
Dwell Time	60 seconds for safety apply, 3 seconds for mass production(1800 Vac)
Breakdown Arc Detection	10 microseconds maximum

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5.2. Insulation Resistance

One hundred percent (100%) of PSU shall comply with the minimum production line Insulation Resistance test as noted below. The test shall be applied between the L/N (AC Line and Neutral) to Output Terminal (Vout and RTN).

Parameters	Setting
Voltage	500Vdc minimum
Dwell Time	60 seconds for safety apply, 3 seconds for mass production
Insulation Resistance	4 M ohms

One hundred percent (100%) of PSU shall comply with the minimum production line Insulation Resistance test as noted below. The test shall be applied between the L/N (AC Line and Neutral) to PE (Chassis/Input receptacle ground terminal).

Parameters	Setting
Voltage	500Vdc minimum
Dwell Time	60 seconds for safety apply, 3 seconds for mass production
Insulation Resistance	2 M ohms

5.3. Leakage current

The maximum leakage current is < 0.7mA at 277Vac 60Hz with resistive load.

(Please refer to IEC 60950).

Parameters	Setting
Input Voltage	277Vac/60Hz
Leakage Current	700 micro-amperes maximum

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5.4. Earth continuity (IEC61347)

One hundred percent (100%) of PSU shall comply with the minimum production line Insulation Resistance test as noted below. The test shall be applied between the PE (Input receptacle ground terminal) to PE (Chassis).

Maximum resistance: 0.50 Ω , Measured by passing a minimum current of 10 A with a no-load voltage not exceeding 12 V for at least 1 s.

Parameters	Setting
Voltage	12V maximum
Current	10A minimum
Dwell Time	60 seconds for safety apply 3 seconds for mass production
Maximum Resistance	0.5 ohms

6. Safety & Requirements

6.1. Safety

The PSU should meet following requirements:

Standard	UL/cUL	UL60950 + UL8750
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6.2. EMI

The PSU should meet following requirements. The test voltage has tested under 120Vac/60Hz at full load. The margin limit is under 3dB.

Standard	FCC	FCC Part 15 Class B
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6.3 Surge

The PSU Should meet floolwing requirements :

Standard	IEC / EN	IEC/EN61547
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Characteristics	Test Level			
	Equipment			
	Semi-luminaire	Independent driver		
		Input Power Level		
		≤25W	> 25W	
Waveform	-	-	1.2/50 μs	
Test Level	L-N	-	-	± 1 kV
	L/N - GND	-	-	± 2 KV

Note: L-N Use Low impedance (2 ohm) five times for each phase.

Note: L/N - GND Use High impedance (12 ohm) five times for each phase

6.4. ESD(Electrostatic Discharges) (EN 61547) (CLASS B)

The PSU with lighting fixture should meet following requirements:

ESD can not be tested with PSU stand alone must test with lighting fixture.

Standard		Test Specification
ESD	IEC 61000-4-2	Contact Discharge ±4KV
		Air Discharge ±8KV

7. Reliability

Item	Descriptions	Specification
Electrolytic Capacitor Life	Input Vac :120~277Vac Ambient: 50°C Output Loading: 100% of full load	≥ 50,000 hours
CMTBF	Input Vac 230Vac Ambient: 25°C Output Loading: Full load	≥ 100,000 hours
Burn-in (MP stage)	AC 120V/60Hz 100% Burn-in with 100% load (ORT random test) AC 277V/60Hz 100% Burn-in with 100% load (100% MP stage) 35~45°C Environment temperature Burn-in 2 hours	No function error No damage

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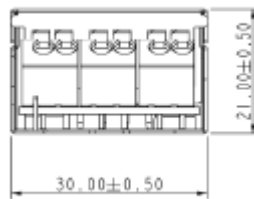
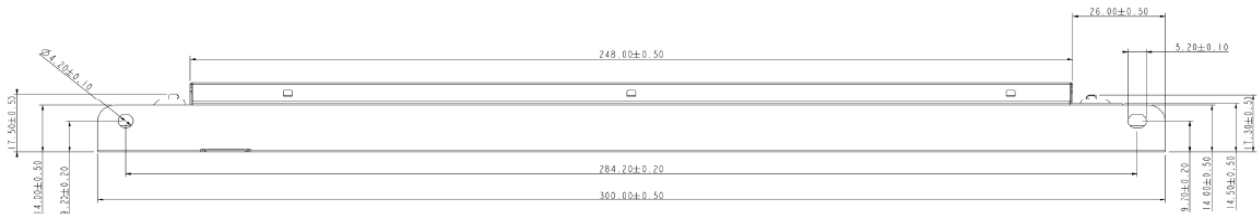
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8. Outline Dimensions: 300 x 30 x 21mm



[TOP]



[Side]



[Bottom]

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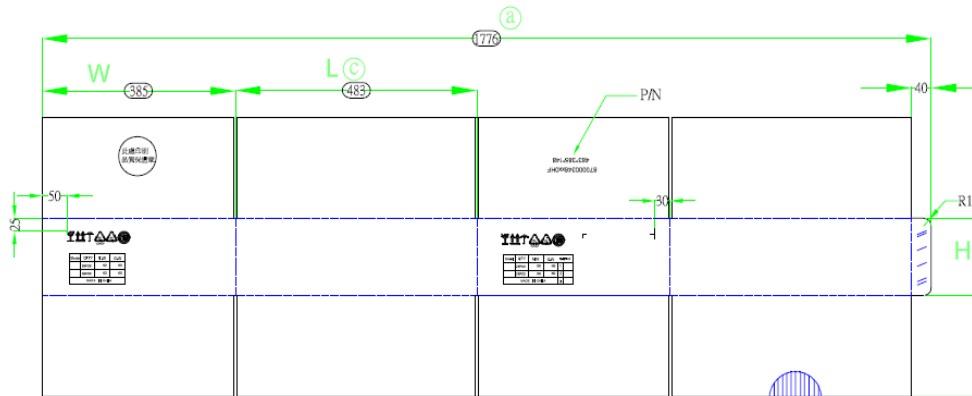
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9. Label Drawing:

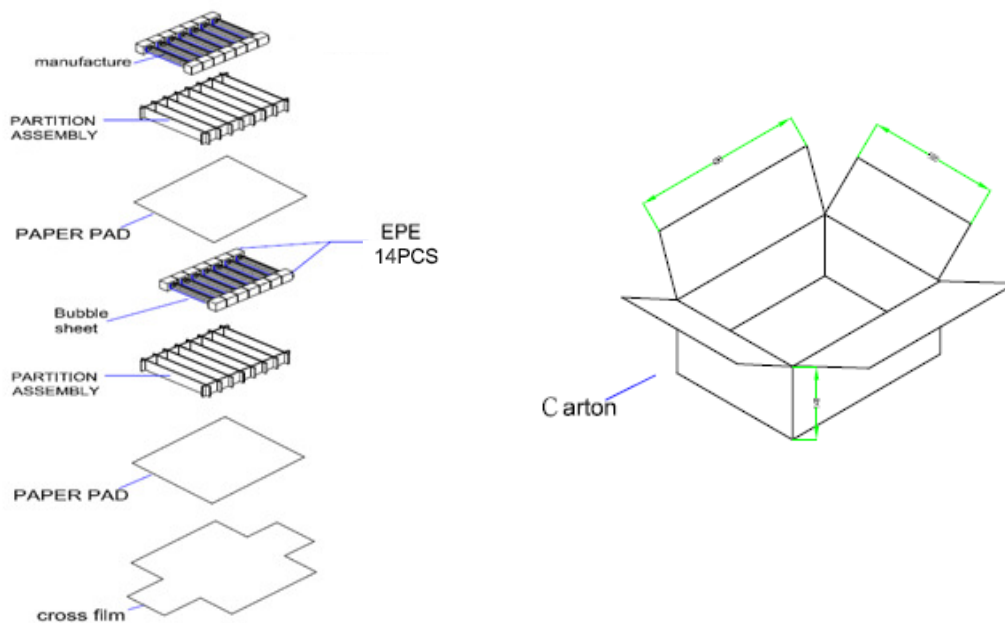


10. PACKING SPECIFICATION

10.1. Outbox : 483(L) * 385(W) * 148(H)



10.2. Stock pattern





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11. Appendix A

The Output Current and Output Voltage set-up Table is as below

Rset (ohm)	Output Current (A)	Output Voltage (V)	MAX Output Voltage (V)	OVP Voltage (V)
1K	0.507	20~50	50	52
1.3K	0.522	20~50	50	52
1.5K	0.574	20~50	50	52
1.6K	0.596	20~50	50	52
2K	0.633	20~50	50	52
2.4K	0.691	20~50	50	52
2.7K	0.738	20~50	50	52
3.3K	0.797	20~50	50	52
3.9K	0.858	20~50	50	52
4.3K	0.895	20~50	50	52
4.7K	0.932	20~50	50	52
5.6K	0.965	20~50	50	52
6.2K	1.000	20~50	50	52
6.8K	1.020	20~49	49	51
7.5K	1.043	20~47	47	49
8.2K	1.065	20~46	46	48
9.1K	1.102	20~45	45	47
10K	1.116	20~44	44	46
11K	1.138	20~43	43	45
13K	1.175	20~42	42	44
15K	1.211	20~41	41	43
20K	1.248	20~40	40	42
22K	1.270	20~39	39	41
24K	1.292	20~38	38	40
30K	1.307	20~38	38	40
33K	1.329	20~37	37	39
43K	1.344	20~37	37	39
51K	1.365	20~36	36	38
82K	1.380	20~36	36	38
110K	1.404	20~35	35	38