DATE OF ISSUE : 2010.07.12

SAMSUNG LED

LED Tube PSU

REV.NO.
00

SPECIFICATION

MODEL : STILPWA00242100AAA

CUSTOMER :	
CHECKED	APPROVED
2010. . .	2010. . .

SAMSUNG LED			
DRAWN	CHECKED		APPROVED
	SALES	QA	
2010. . .	2010. . .	2010. . .	2010. . .

SAMSUNG LED CO,.LTD.

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DATE OF ISSUE : 2010.07.12

SAMSUNG LED

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REV.NO. 00

PRODUCT REVISION HISTORY

Rev' NO	ITEM	PAGE	DATE	TRACED	APPROVED
00	The First Specification Established	13	2010.07.12	H.B.CHANG	K.S.PARK

LED Lighting
CONTENTS OF SPECIFICATION FOR LED Tube PSU

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1. APPLICATION

- This specification defines the general specification and performance of the AC-DC Converter for supplying DC power to LED Tube product manufactured by SAMSUNG LED.

2. FUNDAMENTAL SPECIFICATIONS

No.	ARTICLE	SPECIFICATIONS
2-1	Appearance and Structure	

ARTICLE		MIN	TYP	MAX	UNIT	REMARK
Size		195±0.3㎜x40±0.3㎜x28±0.3㎜			mm	Wire length : 200±20㎜ (Input/Output)
Case Material		Steel			-	-
Weight		220±20			g	-
Wire	Input	White / Black				color
	Output	Red / Black				

2-2 Safety and EMI

(1) Safety

- This PSU designed by PSE LED Power standards(J61347-1 / J61347- 2-13)
- This PSU designed by K61347-1, K61347-2-2, K61047 standard that specify safety and performance requirement items about DC/AC converter for LED LAMP.

(2) EMI & EMC

- This PSU must satisfy FCC Part 18, CISPR and PUB.22 CLASS(B) standards.
- The PSE LED Power standard(J55001) is applied to This PSU.
- This Power must satisfy standards about examination of radiated emission(30M ~ 1GHs) / conduction / magnetic radiation(9K ~ 30MHz) / noise power test.

(3) Environment Standard

- This PSU must observe ROHS / Lead free standard.

No.	ARTICLE	SPECIFICATIONS

2-3 Electric Specification

	CATEGORY	SPECIFICATION	REMARK
Input	Rated Input Voltage	100 - 240 V	
	Allowed Input Range	90 - 264 Vac	
	Power Consumption	24W Typ.	27W MAX.
	Rated Input Current	0.1 - 0.3 A	
	Input Frequency	50 / 60 Hz	
	Allowed Freq. Range	47 - 63 Hz	
	Inrush Current	50 A MAX.	AC 220V
	Power Factor	90% MIN.	Rated Input Voltage 100 - 240V MAX Load
	Standby Power	3W MAX.	No Load
Output	Output Voltage	16 - 20.5 Vdc	
	Rated Output Current	1.1 A ± 5%	
	Short Protection	There must not be damage when PSU act again	After shortcircuiting PSU Output during 1 minute
	Peak Current	1.1 A * 2 MAX.	
	Current Ripple	1.1 A MAX.	
	Efficiency	78% MIN.	
	Thermal Drift(Io)	± 10%	
	Io by Input voltage	± 10%	
	Turn-on Delay	1 sec. MAX.	

No.	ARTICLE	SPECIFICATIONS

2-4 PSU Reliability Specification

CATEGORY	SPECIFICATION	REMARK
Operating Temperature	-20 - 50 ℃	
Operating Humidity	10 - 90 %	
Storage Temperature	-20 - 60 ℃	
Storage Humidity	10 - 95 %	
Insulation resistance	100 Mohm MIN.	DC 500V Between LIVE/NEUTRAL and GND
Hi-pot	Withstanding 3.75KVAC(50/60Hz) Cut off Current 10mA	Between Input and Output
Acoustic Noise	Under 40dB	1m away from the six direction (top, bottom, left, right, front and back)
Leakage Current	Under 0.25mA when measuring Live-Output and Neutral Output	The input impedance of 1K ohm on the condition of the rated voltage and load
Conducted Emission	CE CLASS (B) -3dB	EMI
Radiated Emission	CE CLASS (B) -3dB	
Vibration Resistance	Operating normally without damage after vibration test	1) Frequency : 5Hz → 60Hz → 5Hz 2) Acceleration : 0.5 G 3) Axis : X, Y, Z Axis 4) Duration of Test : 3 minutes
On / Off Test	More than 5000 times	On the condition of Minimum and Maximum Input with Regular load
Surge	Be satisfied to run the tests 3 times on 8us maximum rising time and 20us minimum falling time.	The voltage(L-N) between rated input voltage and 50% load condition : 4KV and 1000A
ESD	Be satisfied when inputing the Capacity noise of ⓐ~ⓓ condition by the condenser radiation method	ⓐ Input voltage : 15KV ⓑ Input noise : 10 times ⓒ Capacitance : 150pF ⓓ Radiation resistance : 330Ω
M.T.B.F	50,000 Hrs MIN.	

3. OPERATING MANUAL

3-1 Input Rectification Part

AC (from INPUT FILTER and INPUT RECTIFICATION CIRCUIT) →

FUSE → VARISTOR → FILTER (C1, LF1) → BRIDGE DIODE (BD1)

3-2 Switching Part

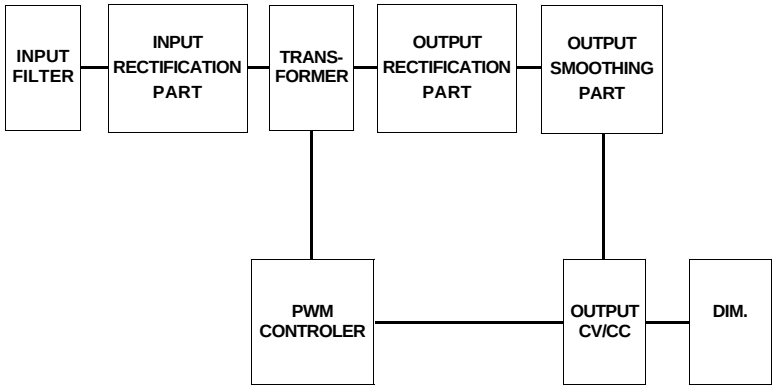
DC is being Swiched by Inside CONTROLLER of U1.

U1 has PWM CONTROLLER which can switch TRANSFORMER by doing FET PWM CONTROL.

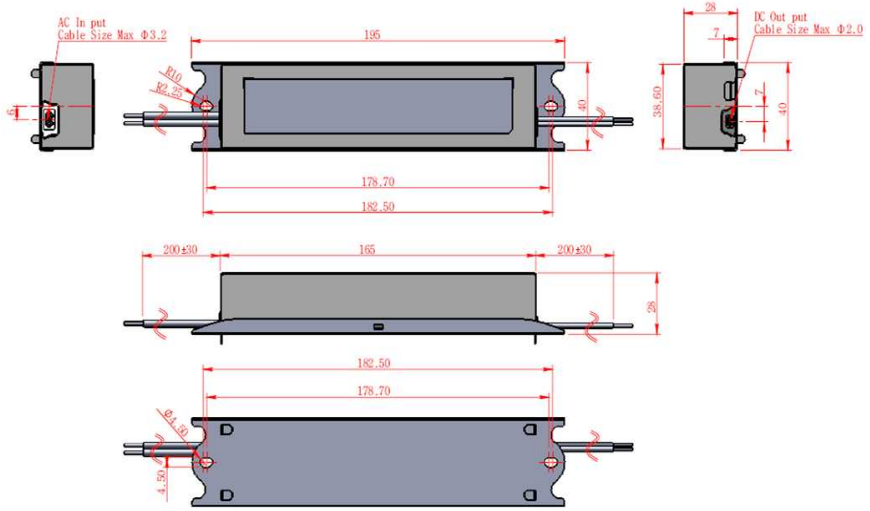
3-3 Output Rectification·Smoothing Circuit and Feedback Circuit

It is a circuit that make stable constant voltage and constant current (CV/CC) after rectify & smooth the second voltage of voltage converting parts (T1). Current change by DIM. of voltage. By sensing Output voltage and Current, It is controlling the flowing Current that flows to U3 linked by U4 and giving the feedback to U1.

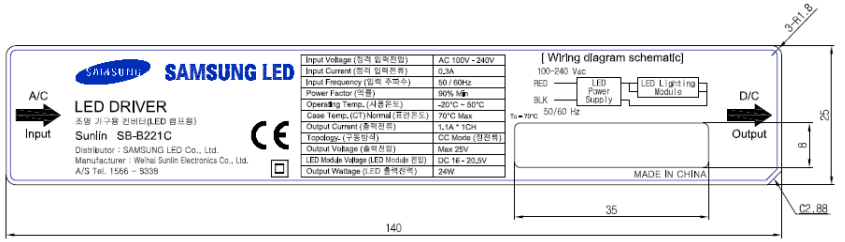
3-4 Block Diagram



4. APPEARANCE AND STRUCTURE



4-1 Main Label

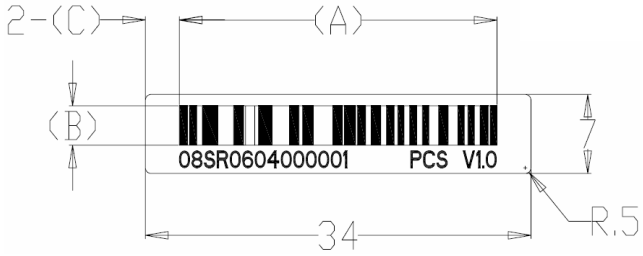


(1) Color

- Background : Silver
- Logo/Outside Frame : Pantone Blue 072C
- Text : PMS Black

(2) Material : Silver Tetron Paper 0.1t (OPP LAMINATING 0.02t)

4-2 Bar Code



(1) Color

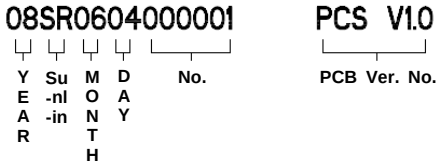
- Background : White
- Text / Logo / Outside Frame : Black (Text Type : Arial Bold 0.6mm)

(2) Material : Artpaper (OPP LAMINATING)

(3) Size : 34 x 7mm

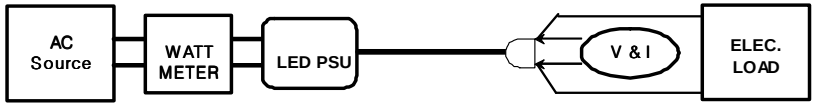
(4) Printing

- A : 30mm MIN
- B : 2mm MIN
- C : 1mm MIN



5. TEST METHOD

Test Circuit



5-1 Output Voltage

1) Setting the AC Source to 220V
2) Inputing 100mA Load to Output terminal - CC mode
3) Checking the Output voltage which fits in 16V~30V

5-2 CV, CC Output

(1) Out Current

1) Setting the AC Source to 220V
2) Setting the ELEC. LOAD to 19V(CV Mode)
3) Checking the Output current which fits in 1.1A ± 5%

(2) Short Protection

1) Setting the AC Source to 220V
2) Shortcircuiting compulsorily Output VO+ and VO−
3) Checking for working normally after 1 minute maintaining shortcircuit

(3) Efficiency & Power Factor

1) Setting the AC Source to 220V
2) Setting the ELEC. LOAD to 19V(CV Mode)
3) Checking the Input/Output efficiency(more than 78%)
4) Checking the Power factor.(More than 90% when Input voltage is 220V)

5-3 Insulation Resistance

(1) Binding each Input AC Lines and Output Lines
(2) Connecting both sides to measuring instrument of Insulation Resistance
(3) Checking the Insulation resistance value (DC 500V , 10MΩ)

5-4 Hi-pot

(1) Binding each Input AC Lines and Output Lines
(2) Connecting both sides to measuring instrument of Insulation Withstand Voltage
(3) Checking for working normally after inputing AC 3.75KV between input and output (60 Sec, Cut Off Current 10mA)

6. SET RELIABILITY STANDARDS (PSU + LED Tube)

1) The reliability specifications is specified by the difference from the initial value.

2) The test condition of reliability shall be made in the standard testing condition same as the performance tests.

3) Unless otherwise specified, reliability tests shall be made according to these standards.

4) If there is unspecified matters, the user and the supplier shall decide by mutual discussion. (Unspecified matters in the followings must be no problem in the usage.)

6-1 Test Items and Conditions

No.	STRESS TEST	STRESS CONDITIONS	DURATION	SAMPLE SIZE
1	HTOL	60 ℃, Operation	120 hrs	3
2	WHTOL	50 ℃, 95 %RH, Operation	120 hrs	3
3	Box Vibration	10 ~ 300 Hz, 1.5 G, 5minSR, Y Axis/1h	1 cycle	3
4	Box Drop	Under 9.2 Kg : 76 cm, Above 9.2 Kg : 46 cm, Free Falling	3 Times	3
5	Power On/Off	25℃, ON/OFF each 30sec	13500 cycle	3
6	Thermal shock	[-30℃,70℃,]each 30min, Duration of changing temperature : less than 5min	50 cycle	3
7	ESD (HBM)	Air ±8kV, Contact ±4kV	10 Times	3
8	Hi-pot	AC 3.0kV, Ramp Time:0.2sec, Dwell Time:60sec, 5time, 60Hz	5 Times	3
9	EMI	Conducted Test, Radiated Test	1 Time	1
10	Surge	Ring Wave : 2kV, Bi Wave : 1kV	6 Times	3
11	Insulation resistance	10MΩ MIN at DC 500V, 60sec, 1times	6 Times	3

6-2 Criteria for Judging the Damage (Used by LED Module Load)

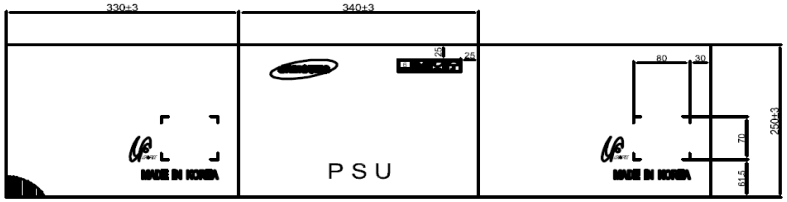
No.	TEST	CONDITIONS	CRITERIA	
			MIN	MAX
1	Intensity of illumination(lx)	Standard test conditions of LED Tube	Initial characteristic x 0.75 (lx)	Initial characteristic x 1.25 (lx)
2	Color Temperature(K)	Standard test conditions of LED Tube	Initial characteristic - 500K	Initial characteristic + 500K

* During the test, there must be no dew in surface of the product.
If measurement are performed with diffuser, diffuser must be cleaned.

7. PACKING SPECIFICATION

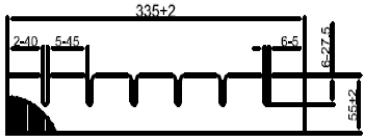
MODEL	OUT BOX	
	SIZE	Q'ty.
STILPWA00242100AAA	340×330×250㎜	20 EA / 1 BOX

7-1 OUT BOX (0201 TYPE)

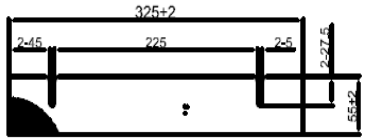


7-2 CROSS PAD

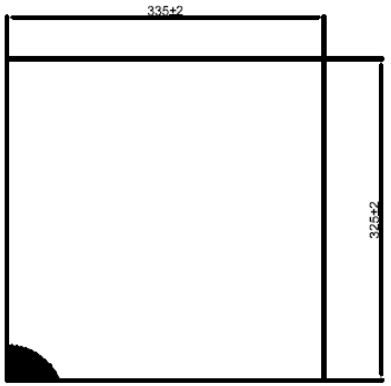
(2EA / OUT BOX)



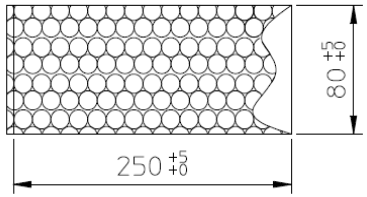
(6EA / OUT BOX)



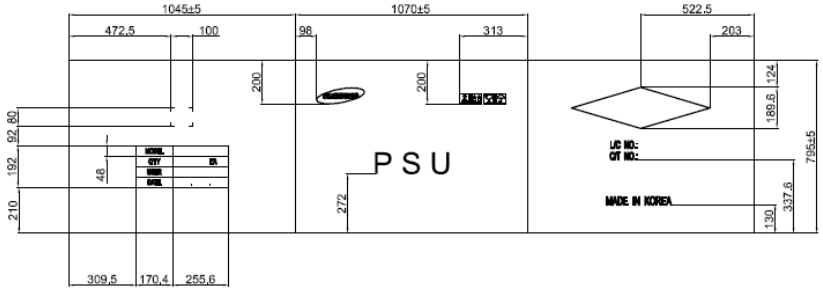
7-3 NIL PAD (5EA / OUT BOX)



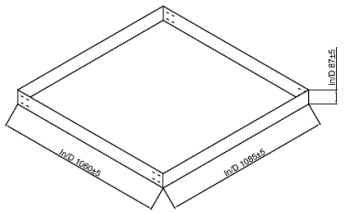
7-4 VINYL BAG



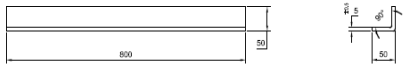
7-5 SLEEVE (1EA / PALLET)



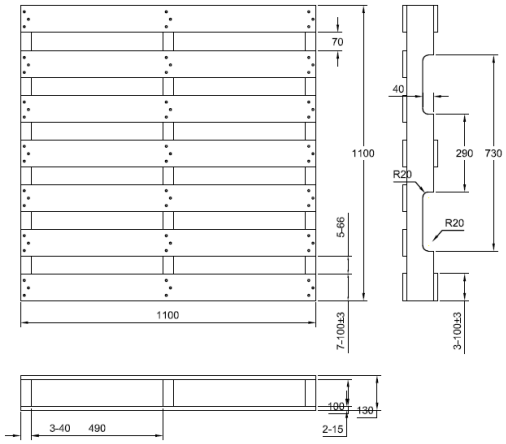
7-6 SLEEVE COVER (2EA / PALLET)



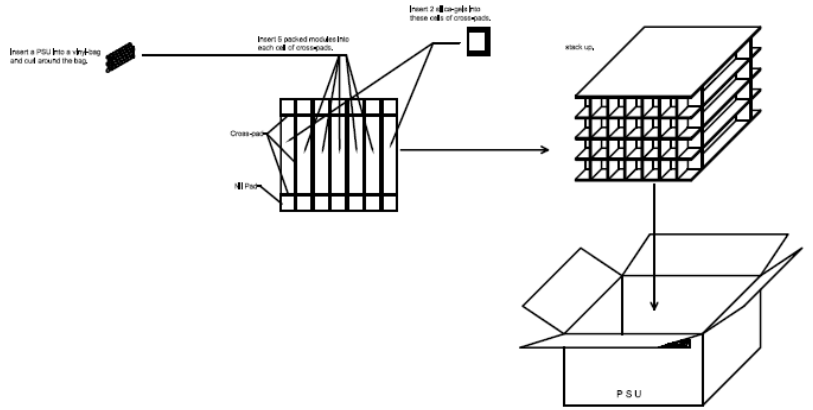
7-7 PAPER ANGLE (2EA / PALLET)



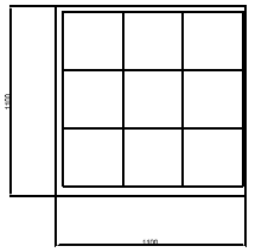
7-8 PALLET



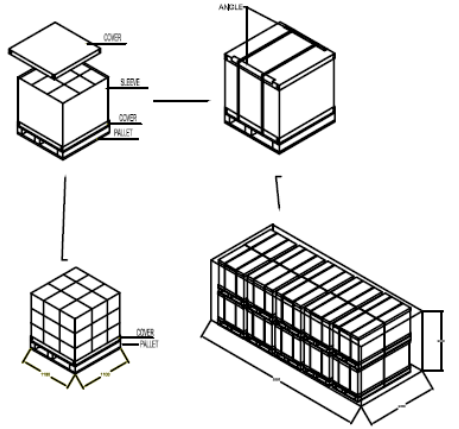
7-9 CASE PACKING



Pallet pattern



1. Spread one of sleeve covers on a pallet.
2. Load Boxes on the sleeve cover.
The pattern ; 9Box/Layer * 3Layers = 27Box/Pallet.
3. Put a sleeve between loaded boxes and the sleeve cover.
4. Put the other sleeve cover on the sleeve.



Fill the the container's empty space with airbags.

8. PRECAUTIONS IN HANDLING

1) Handling

a. Don't drop the unit and don't give the unit any shocks.

b. Don't storage the PSU in a dusty place or room.

c. Don't take the unit to pieces.

2) Cleaning

a. This PSU should not be used in any type of fluid such as oil, organic solvent, etc.

b. It is recommended that IPA(Isopropyl Alcohol) be used as a solvent for cleaning the PSU.

c. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the PSU because of worldwide regulations.

d. Before cleaning, a pre-test should be done to confirm whether any damage to the PSU will occur.

3) Static Electricity

a. Static electricity or surge voltage damages the PSU.

4) Others

a. If over voltage which exceeds the absolute maximum rating is applied to PSU, it will cause damage Circuits and result in destruction.