Powertron Electronics Corp.

Approval Sheet

AC/DC Adapter

Customer : TPS

Customer Part No.:

Model No.: PS1010-120HEB100

Powertron Part No.:PS1010-120HEB100 / 2K19S1966

Description: Input : 100V~240Vac

Output : DC12V / 1000mA

Output Cable: UL2468 20AWG, plug: 5.5x2.1x11mm Barrel straight

Approval No.: PS1010-120HEB100-181-VI1

Customer	**Approved**	**Checked**	
Powertron	**Approved**	**Checked**	**Issued**
	Chiu 2019.10.10 Jeff	生 技 2019.09.26 毛海濤	工 程 2019.09.26 孫 爽

Revision History

Approval No.	Description	Rev. date	Page	Rev No.
PS1010-120HEB100-181-VI1	Draft spec. released	2019/09/26	1/17~17/17	A0 (STW0151909002)

Contents

1. DESCRIPTION

This product is an 12W AC to DC plug-in, Class II, single output power device with constant voltage sources.

2. SCOPE

This specification is applied as description of electrical & mechanical characteristics for PS1010.

3. ELECTRICAL CHARACTERISTICS

3.1 Input Characteristics

3.1.1 AC input voltage
Rated input voltage: 100 ~ 240Vac
Operating input voltage range: 90~ 264Vac
3.1.2 AC input frequency
Rated Input frequency: 50/60 Hz
Operating input frequency range: 47~63 Hz
3.1.3 AC input current
Maximum: 400mA
3.1.4 AC inrush current
Inrush current will be less 20A at input 115Vac, 40A max/230VAC
cold start at input voltage 90-degrees cut angle for sine wave with full load.

3.2 Output Characteristics

3.2.1 Output voltage
Output voltage :DC 12V±5%
3.2.2 Output current
Output current: 0~1000mA

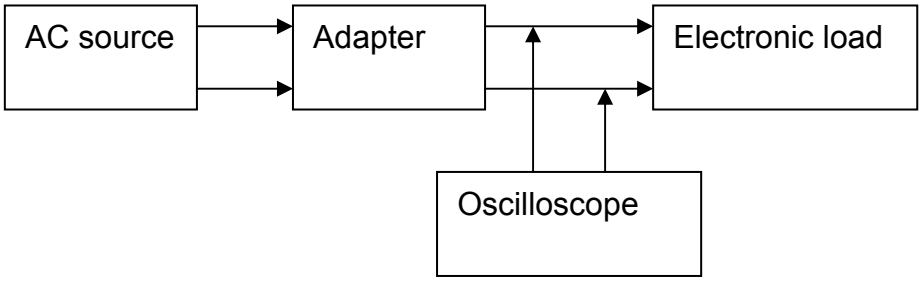
3.3 Efficiency

3.3.1The efficiency of power supply will be higher than 82.96% at input voltage range with average value.
3.3.2 Meet DOE regulation level VI.

3.4 Ripple & Noise

Ripple limit: 180mV max.
Noise limit: 180mV max.

Test condition: This is measured over bandwidth of 20MHz at the power supply output connector a 10μF electrolytic capacitor in parallel with a 0.1μF ceramic capacitor in 5 minutes after the supply starts up.



3.5 Turn on delay time & Rise time

3.5.1 Turn-on delay time

At turn on moment, From AC input turn on to output voltage rise to 90%, The time will less than 3Secs. At input voltage range with full load.

3.5.2 Rise time

At turn on moment, The output voltage from 10% to 90% rise time will be less than 100mSecs. At input voltage range with full load.

3.5.3 Over shoot will be less than 8% of normal voltage value.

3.5.4 Hold up time

At turn off moment, From AC input turn off to output voltage fall to 90%, The time will be more than 10mSecs. At input voltage range with full load.

3.6 Protection

3.6.1 Short circuit protection

When output short circuited, output voltage peak value will be less rating output voltage, AC input peak power will be less 2W at moment and with auto- recovery function

3.6.2 Over current protection

Over current protection point output current Max 200%, with auto-recovery function.

3.6.3 Over voltage protection

Over voltage protection point will be less than output voltage 120%.

4. Safety & EMC requirement

Safety

Safety Refer Standards

Nationality	Safety Refer Standards	Mark
CB scheme	IEC62368-1:2014	
TUV GS	EN62368-1:2014+A11	www.tuv.com ID 1000000000

EMI (PS1010 Series models) (Environment temperature at 25 ℃)

Nationality	Refer Standard	Mark
CE (For EU ADAPTER)	EN 55032:2012/AC:2013 EN55032:2015 EN55024:2010 EN55024:2010+A1:2015 EN6100-3-3:2013 EN6100-3-2:2014	CE
FCC (For USA ADAPTER)	FCC Part 15 ,Subpart B:Oct.1,2013 ANSI C63.4:2009	FC
VCCI (For JAPAN ADAPTER)	VCCI V-3/2013.04 VCCI V-4/2012.04	VCCI
C-TICK (for AU ADAPTER)	AS/NZS CISPR 22:2009+A1:2010	

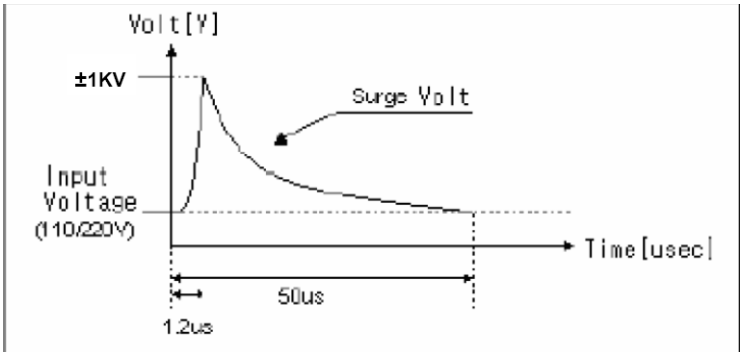
Referring Standards		Test Specification	
ESD	IEC61000-4-2	Contact	±4KV
		Air	±8KV
EFT	IEC61000-4-4	1KV on AC power line.	
SURGE	IEC61000-4-5	1KV on differential mode.	

4.1 Surge Test

There must be no damage to the adaptor and it must continue to operate and meet all specifications after surge test.

Surge voltage condition: Full Load, voltage(±1KV)

Ring wave (0.5us/100KHz), -. Impulse(1.2/50us)



4.2 Leakage Current

MAX Current: under 250uA

Y-capacitor between primary & secondary circuit is less than 3300pF.

4.3 HI-POT

Between primary to secondary: 3000Vac 50Hz for one minute,
In Production line shall be more than 2 sec

Test current will be less 10mA

Adapter is no damage after completion of the test

4.4 Insulation Resistance

Adapter will withstand 500VDC 50Mohms between input or output plug to plastic case

5.Reliability

5.1 MTBF

40,000 hour Power on at 25 ℃

5.2 Temperature Rise (Delta-T).

Temperature rise will be less than 85℃ and case temperature rise will be less than 35℃ at normal AC input / DC output full loading
Environment temperature 25 ± 1℃

5.3 Burn-in

100% Burn - in at full loading and 4 hours at 40 +/- 5℃ Environment temperature.

5.4 Drop Test

The adapter will be subjected to 3 drops from 1 M height on a hard wooden surface.

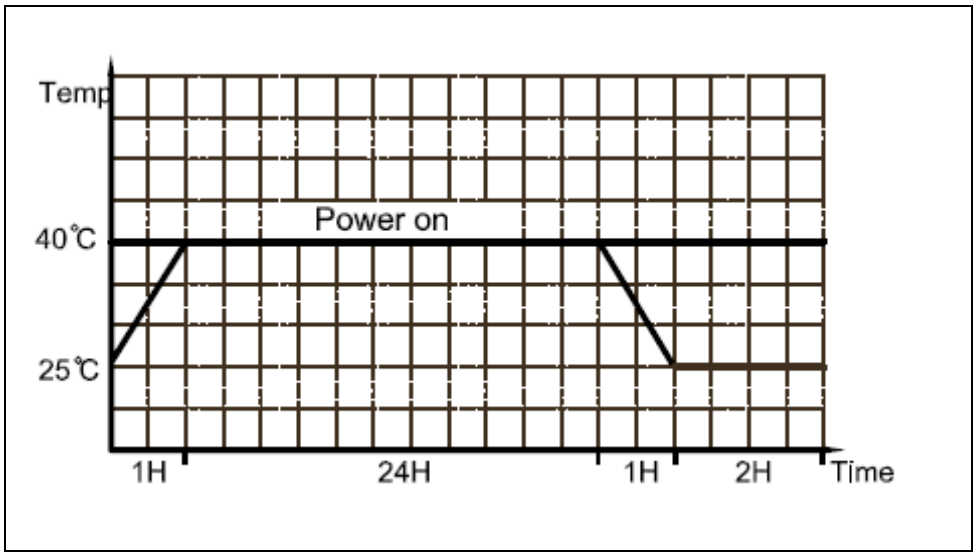
5.5 AC input ON/OFF test (Dip test)

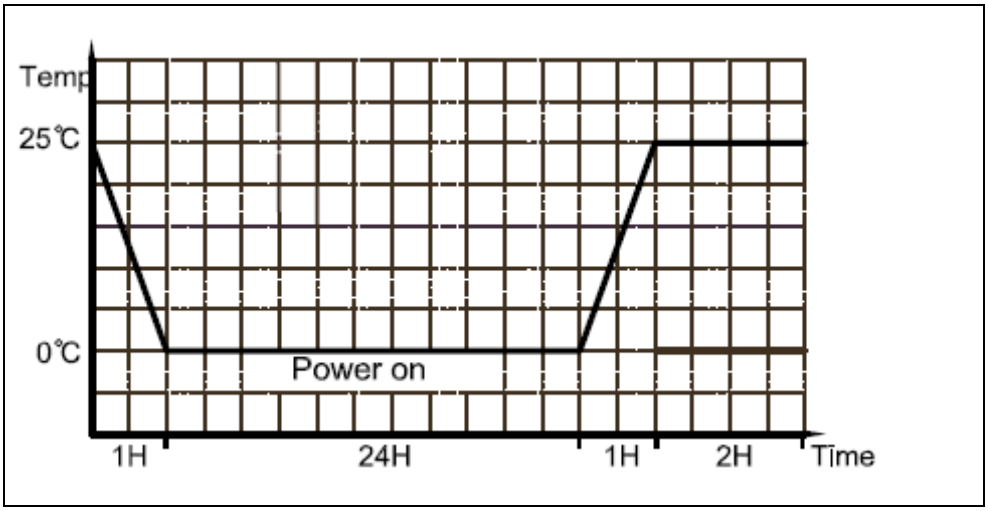
The adapter must meet all specifications after test.
AC input voltage: 115/230Vac
AC input ON/OFF cycle: min 5 sec/ 5secs
AC input voltage drop: 30%/500msecs
AC input ON/OFF times: 10,000

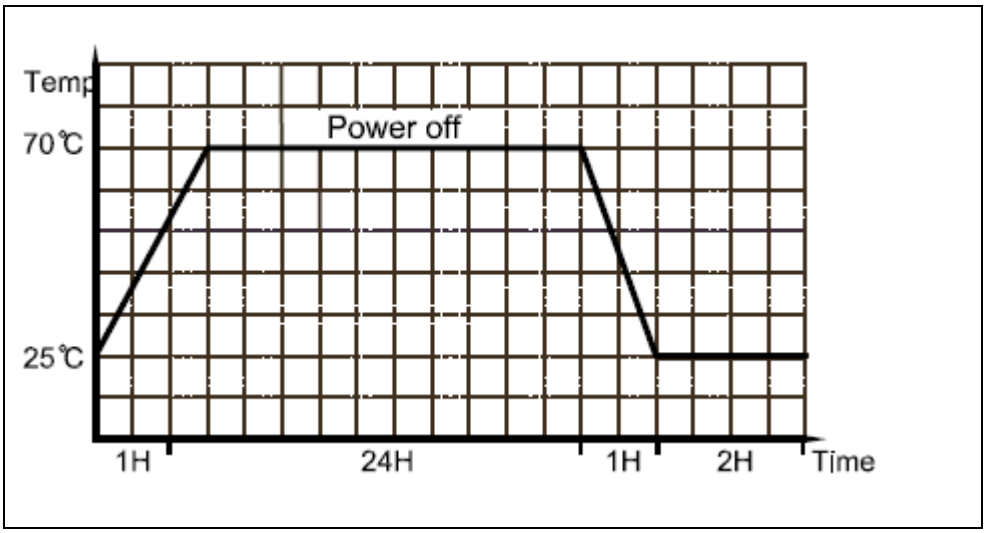
6. ENVIRONMENTAL CHARACTERISTICS.

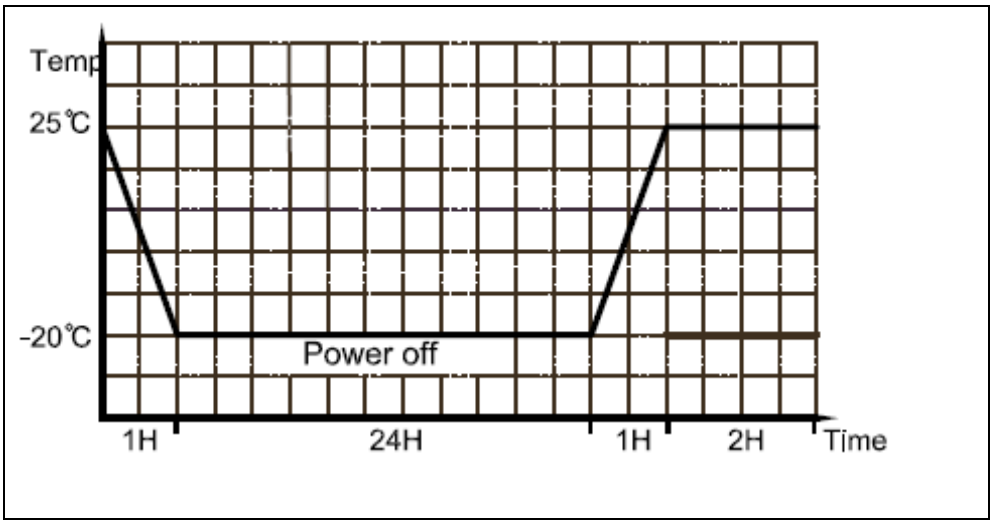
6.1 Temperature

The adapter must meet all specifications after test.
Unit operating temperature range: 0 to 40℃ For AC input and DC output
Storage temperature range: -20 to 70℃




Temp
25℃
0℃
Power on
1H
24H
1H
2H
Time


Temp
70℃
Power off
25℃
1H
24H
1H
2H
Time


Temp
25℃
-20℃
Power off
1H
24H
1H
2H
Time

6.2 Max Temperature

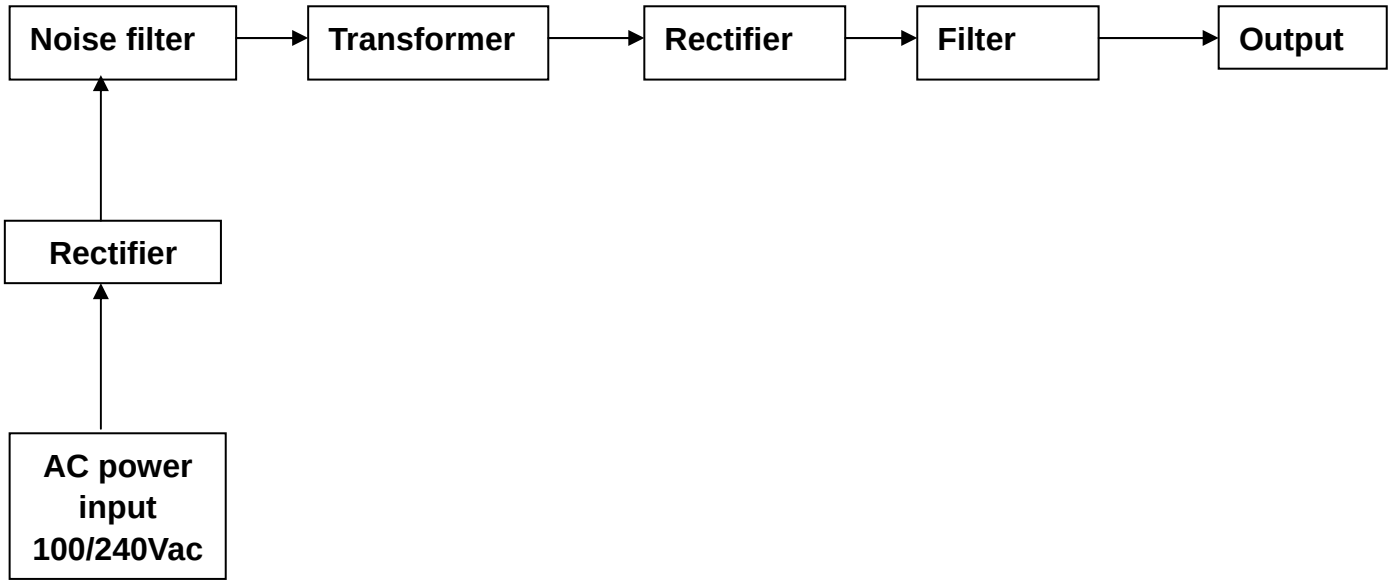
The adaptor must meet all specifications after test.
Condition:
Measure the temperature continuously for more than 3 hours with max load.

6.3 Humidity

The adapter must meet all specifications after test.
Operating humidity: Max 75%RH
Storage humidity: Max 95% RH

7 Block Diagram & Schematic Drawing

7.1 Block Diagram



8 Mechanical

8.1 Plastic Case material: “PC+ABS”.
8.2 Physical Size: 67mm(L) X 27mm(W) X60.1mm(H).
8.3 Output Cable: UL2468, 20AWG, L=1500mm Plug: 5.5x2.1x11mm Barrel straight

8.4 AC input with 2 pins plug-in type.

9.SAMPLE TEST REPORT

9.1 Burn - In Test

Test Purpose: To check reliability of the products.
Test Condition: Ambient Temperature: 40 +/- 5℃ 1. Vin = 115V/60Hz Full load 4hours 2. Vin = 230V/50Hz Full load 4hours
Criteria: There should not be any abnormal found after the testing.
Test result: ■ Pass □ Fail

Test Data	No.	1	2	3	4	5
	1	---	---	---	---	---
	2	---	---	---	---	---

9.2 COMBINE REGULATION TEST

Test Purpose: To check if the Total regulation and ripple noise meet the specification.
Test Condition: Ambient Temperature: 25℃ 1. Vin = 90V/60Hz Full load 2. Vin =110V/60Hz Half load 3. Vin = 132V/60Hz No load 4. Vin = 180V/50Hz Full load 5. Vin = 230V/50Hz Half load 6. Vin = 264V/50Hz No load
Criteria: 1. Output Voltage Range: 11.4V ~12.6V 2. Ripple & Noise Range: 180mV Max
Test result: ■ Pass □ Fail

	Output Voltage (V)						Ripple & Noise (mV)					
Test Data	No.	1	2	3	4	5	No.	1	2	3	4	5
	1	---	---	---	---	---	1	---	---	---	---	---
	2	---	---	---	---	---	2	---	---	---	---	---
	3	---	---	---	---	---	3	---	---	---	---	---
	4	---	---	---	---	---	4	---	---	---	---	---
	5	---	---	---	---	---	5	---	---	---	---	---
	6	---	---	---	---	---	6	---	---	---	---	---

9.3 Efficiency Test

Test Purpose:

To check if the power supply efficiency meets the specification.

Test Condition:

Ambient Temperature: 25℃

1. Vin =115V/60Hz Average active efficiency
2. Vin = 230V/50Hz Average active efficiency
3. Vin =115V/60Hz N0 load Input Power
4. Vin =230V/50Hz N0 load Input Power

Criteria:

Efficiency Range: 82.96% Min Input Power(NO LOAD):0.1W Max

Test result: ■ Pass □ Fail

	No(SAMPLE).	1	2	3	4	5
Test Data	1(%)115V	---	---	---	---	---
	2(%)230V	---	---	---	---	---
	3(w)115V	---	---	---	---	---
	4(w)230V	---	---	---	---	---

9.4 OCP Test

Test Purpose:

To check max. over current meets the specification.

Test Condition:

Ambient Temperature: 25℃

1. Vin =115V/60Hz
2. Vin = 230V/50Hz

Criteria:

1. Over Current Range: MAX 2.0A
2. Power supply shall shutdown for over current test, and it shall recover automatically when the protection removes.

Test result: ■ Pass □ Fail

	No.	1	2	3	4	5
Test Data	1	---	---	---	---	---
	2	---	---	---	---	---

9.5 Short Circuit Test

Test Purpose:

To verify that no damage, fire or safety problem will result from a short circuit.

Criteria:

1. Power supply shall recover automatically.
2. The maximum output energy will lower than 2VA is when it is in output short-circuit.

Test Condition:

Ambient Temperature: 25℃

1. Vin =115V/60Hz
2. Vin = 230V/50Hz

Test result: ■ Pass □ Fail

	No.	1	2	3	4	5
Test Data	1	---	---	---	---	---
	2	---	---	---	---	---

9.6 Hi-Pot Test

Test Purpose:

To check if Hi-Pot characteristic meet specification requirement.

Test Condition:

Ambient Temperature: 25℃

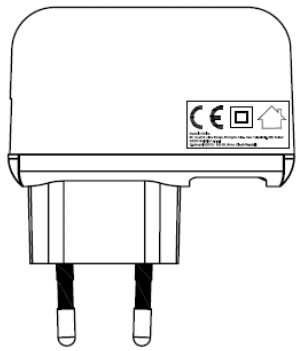
1. H/P TEST: 3000VAC 10.0mA(Max) 3Seconds
2. I-R TEST: 500VDC 50MΩ(Min) 3Seconds
3. R-Ω TEST: 100mΩ(max) 25A

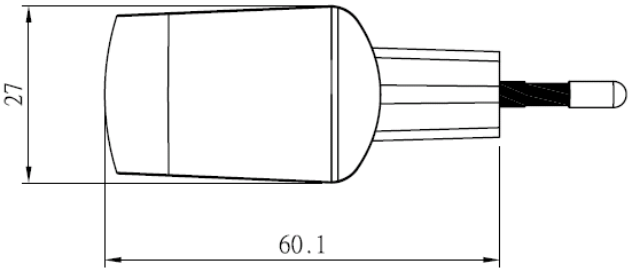
Criteria:

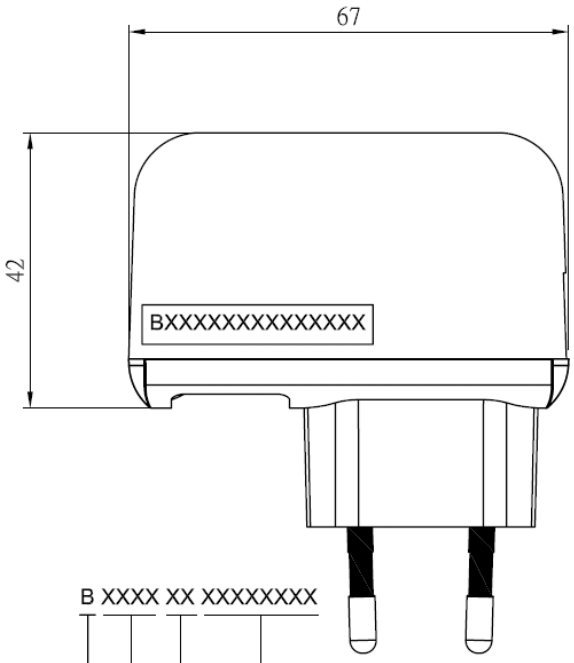
Power supply should experience no damage.

Test result: ■ Pass □ Fail

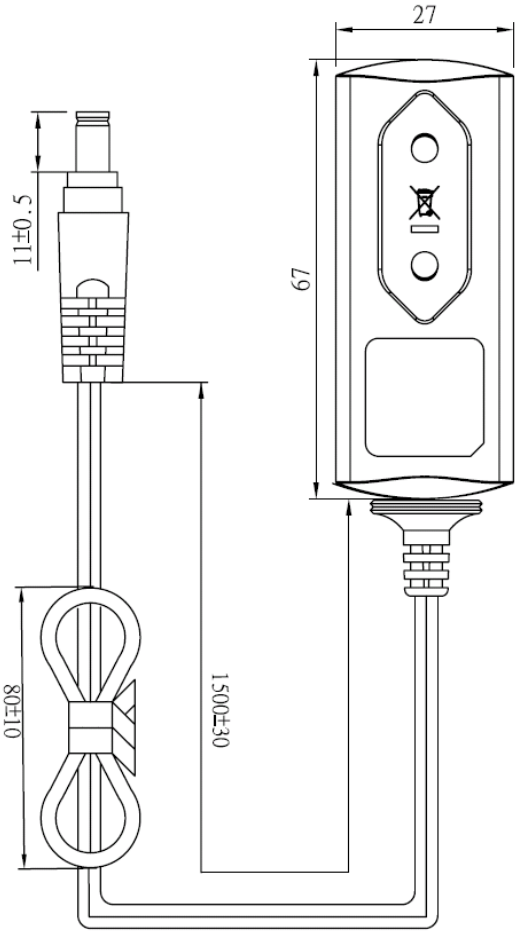
	No.	1	2	3	4	5
Test Data	1	---	---	---	---	---
	2	---	---	---	---	---
	3	---	---	---	---	---







NOTE:
1. Serial numerical digits: 15
2. Dimension: L=28mm * W=8mm
3. Black word on white base



NOTE:

1.CASE: L67 X W27 X H60.1mm(Black)

2.AC INLET with 2 pins plug-in type

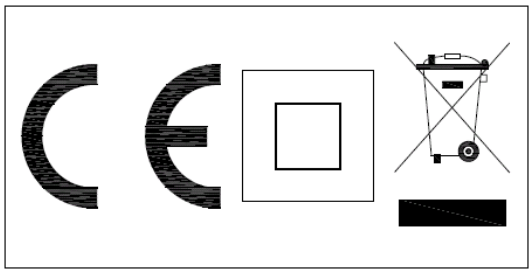
3.DC CABLE:UL2468 20AWG L=1500mm.

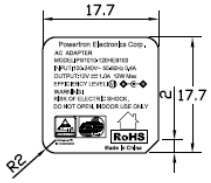
4.DC PLUG:5.5x2.1x11mm Barrel straight Spring loaded Center locking female barrel. center is positive.

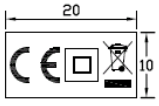
Tolerance table		
0	3	± 0.8
3	10	± 1.0
10	18	± 1.2
18	50	± 1.5
50	80	± 2.0
80	120	± 2.5
120	180	± 3.5

Rev No	Date	Revision Description	Approval
01	2017.06.22	First Issue	ChenZhanhong

Customer		Name	Aspect Drawing	Part No	
Unit	mm	Rev No	01	Date	2017.06.22
Approval	ChenZhanhong	Checked	ChenZhanhong	Drawing	KELLY





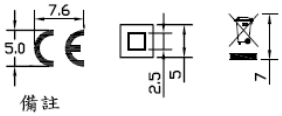


NOTE:

1.Silver background with black solid characters.

2.UL Recognized

3.MATERIAL PET, 75#

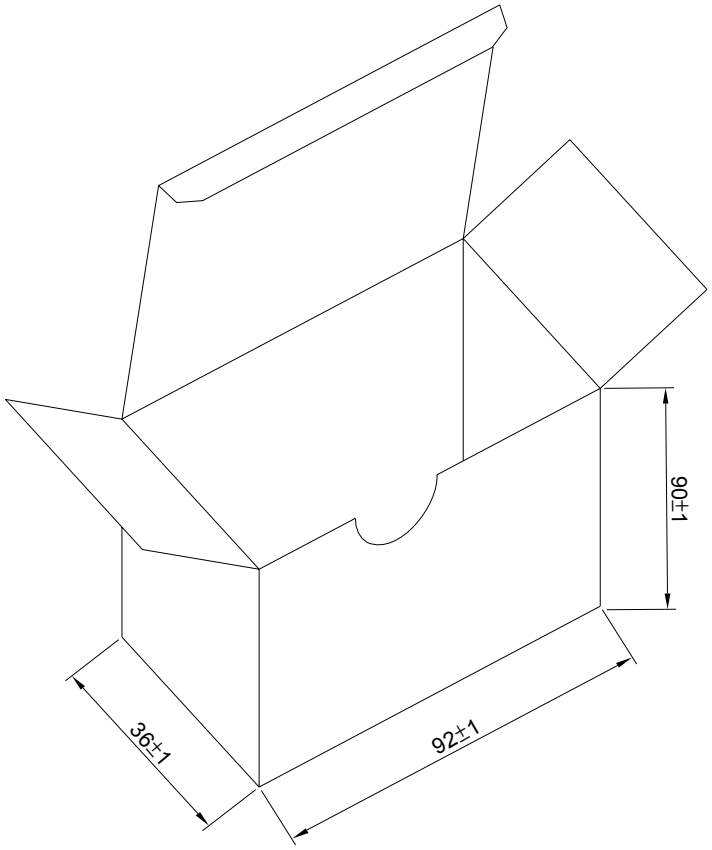


備註

1. CE標示長為7.6mm, 高度為5.0mm
2. 回型標示外筐是內筐的2倍. 內筐
2. 5mm外筐不能小於5mm.
3. 垃圾桶標示高度不能小於7mm.

Rev No	Date	Revision Description	Approval
01	2017.8.21	First issue	chenzhanhong

Customer		Name	Label	Part No	
Unit	mm	Rev No	01	Date	2017.8.21
Approval	chenzhanhong	Checked	chenzhanhong	Drawing	kelly



NOTE:

1.Material:Hard card paper(color: outside is white,inner is gray),T:350G.

2.These measurements are exterior measured.

Rev No	Date	Revision Description	Approval
01	2017.03.22	First Issue	ChenZhanhong

Customer		Name	Whitebox Drawing	Part No	
Unit	mm	Rev No	01	Date	2017.03.22
Approval	ChenZhanhong	Checked	ChenZhanhong	Drawing	gongyong jun

Front Mark (Black)

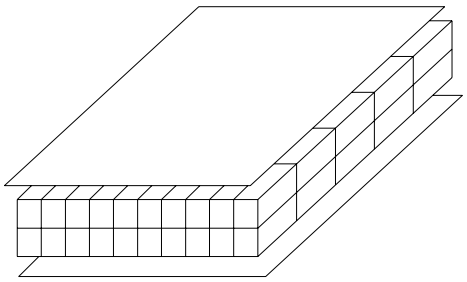
PEC

C/NO.:

MADE IN CHINA

Side Mark (Black)

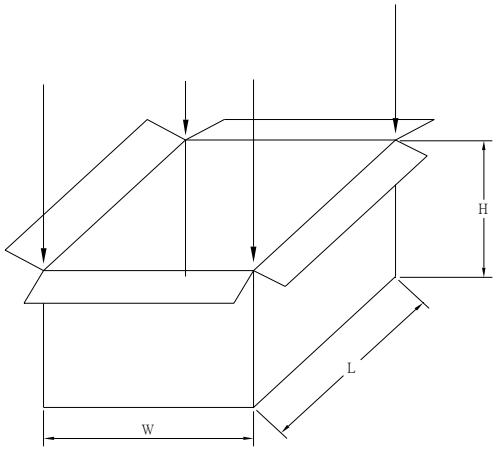
PO :
P/N:
MODEL NO.:
Q'TY: PCS
N.W.: KGS
G.W.: KGS
MEAS:480X380X225MM



L=480mm

W=380mm

H=225mm



NOTE:

1.Material: Five-Layer corrugated A=B paper material and is conformed to the CNG standard. The strength of laceration is +15Kgs.

2.These measurements are the parameter of cartons.

3.The partitions are the corrugated paper,original colors.

4.Two layers in each outer carton,Each layer contents 50pcs and three partition. 100pcs per carton.

Rev	Date	Revision Description	Approval
01	2017.03.22	First Issue	ChenZhanhong

Customer		Name	Carton drawing	Part No.	
Unit	mm	Rev No	01	Date	2017.03.22
Approval	ChenZhanhong	Checked	ChenZhanhong	Drawing	gongyongjun