Approval Sheet 承認書

Customer:	Razer
Customer P/N:	
TUE P/N:	KS050774
Product:	AC ADAPTER
Description:	Model Name : KSASB0241200167D5 Input : 100-240Vac/50-60Hz Output : 12V/1.67A Case : Black Cable : 3.6m Efficiency Level : DoE 6
Revision:	B
Cross Reference:	

Customer		Top-Unum Electronics Co., Ltd.	
Approval Signature / 客戶承認簽章		Edited by / 製作	Dickey
		Checked by / 審核	Chuck
		Approved by / 核准	Robert
Date / 日期		Date / 日期	2016-02-26

Project Modify List

Item	Content	Rev.	Date	Designed By	Checked By
1	First REV.	A	2016.01.18	Chenxian	Wenzhanxin
2	Update label	B	2016.02.26	Chenxian	Wenzhanxin
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1 GENERAL

1.1 Description

This specification defines the performance characteristics for a class Ⅱ adapter, single-phase 20.04 watts. Single output level power supply.

- Simple design philosophy.
- Reliability level of 50K hours MTBF @ 25° C(rated input voltage, and using the BELLCORE SR-332 method).
- DC output voltage must be Safe Extra Low Voltage (SELV) & Limited Power as defined by IEC60950-1

The maximum room ambient temperature (T_{mra}), as mentioned in clause 1.4.12 of IEC60950-1, for the external power supply is 40°C.

• Cooling: natural convection.

2 INPUT REQUIREMENTS

2.1 Input Conditions

The Supply shall operate over the voltage ranges as follows:

Rated input voltage	100-240Vac
Operating range	90-264Vac
Rated input frequency	50/60Hz +/- 3Hz
Rated input current	0.6A max.
Maximum input power	24.53W
Input current (no loading)	≤25mA
Power consumption (no loading)	Max. 0.075W
Primary current protection	An adequate internal fuse on the AC input line is provide.
Configuration	2 Conductor

2.2 AC Inrush Current

Peak inrush current shall be limited to 100A for a cold start. Under both cold & warm start conditions, there shall be no immediate damage or long term impact on the reliability of the Supply. The conformance test for this requirement shall be performed at +12.5% of the rated input voltage. Voltage and current waveforms will be observed on an oscilloscope following closure of the external power switch. Switch closure will be repeated until the waveforms show closure coincident with a voltage peak. The current measured during this occurrence will be defined as the peak inrush current.

3 OUTPUT REQUIREMENTS

3.1	Nominal dc output voltage	+12.0V
3.2	Minimum load current	0.0A
3.3	Rating load current	1.67A
3.4	Peak load current	/
3.5	Rating output power	20.04W
3.6	Line regulation	The line regulation is less than ±5% while measuring at rated load and +/-10% of input voltage changing.
3.7	Load regulation	The load regulation for +12.0V is less than +/-5%, at measured output load from 10% to 100% rated load .
3.8	Peak load regulation	The peak load regulation for +12.0V is less than / , at measured output load from 30% to 100% rated load.
3.9	Ripple and noise	150 mVp-p
		Add 0.1uF/50V ceramic capacitor and 10uF/50V aluminum electrolytic capacitor across the output terminal. Measured with 20MHz Bandwidth Oscilloscope.
3.10	Switching efficiency	85.98% minimum (output current from 100%, 75%, 50%, 25%.) 75.98% minimum(10% load)
		115V/60Hz and 230V/50Hz, output current from 100%, 75%, 50%, 25%.
3.11	Turn on delay time	3000 Ms At Rated input AC voltage and full load
3.12	Rise time	The Supply shall have a start-up rise time of less than 30Ms to rise to within regulation limits for all DC outputs.
3.13	Hold up time	When power off, DC output +12V must be maintain 7ms in regulation limit at 230Vac and full load.
3.14	Output over-shoot	Less than 7% of nominal voltage value
3.15	Temperature coefficient	Output voltage temperature coefficient ±0.05%/℃
3.16	LED indication function	/
3.17	Protection function	
	Over-voltage protection	The output voltage shall be clamped by internal protection zener.
	Short-circuit protection	The adapter shall not be damaged by short the DC output to Ground.The adapter shall resume normal operation when a short circuited fault condition is removed.
	Over current protection	The power supply will be protection when output power at 110-200% of all rated dc output

4 MECHANICAL

4.1 Enclosure And Layout

Plastic case: UL94V-1

Weight : 144 g (Max.)
Dimensions: 88.5x43.3x40 mm
Colour : BLACK

4.2 Input and Output Configuration

Input pin: International Pin
Output connector : dc plug type: 4.0*1.2*11mm(Fork and Groove)
Polarity: Center:"+"
Cable: 3.6M VW-1 80℃ 300V 1185 18AWG 3.5Q BLACK (PAHS+6P+NP+REACH+RoHS)

5 REGULATORY COMPLIANCE

5.1 EMC Specifications

The external power supply must meet all specification in this section. It is recommended that the external power supply be tested with the customer's equipment in order to get the best EMC solution.

5.1.1 Radiated and Conducted Emission

The power supply shall comply to:
FCC part 15: Class B for radiated and conducted emissions.
EN55022:2010+A1:2007, Class B for radiated and conducted emissions.
GB9254-2008, GB17625.1-2012

5.2 Immunity

5.2.1 Electrostatic Discharge Immunity

EN 55024:2010, EN 61000-4-2

- Air Discharge: ±8kV
- Contact Discharge: ±4kV
- Performance Criteria B

Electrostatic-discharge test by contract or air should be conducted with Static-discharge tester, energy storage capacitance of 150pF, and discharge resistance of 330Ω, 8KV air discharge, 4KV contact discharge.

5.2.2 Radiated Field Immunity

EN 55024:2010, EN 61000-4-3

Frequency Range: 80-1000MHz

Field Strength: 3 V/m with 80% amplitude modulation of 1kHz
Performance Criteria A

Radio-frequency electromagnetic field susceptibility test, RS 80-1000MHz, 3V/m, 80%AM(1KHz).

5.2.3 Fast Transient Immunity

EN 55024:2010, EN 61000-4-4

- Power line: 1kV
- Signal line: 0.5kV
- Performance Criteria B

5.2.4 Surge Immunity

EN 55024:2010, EN 61000-4-5

- 1.2/50 usec Open Circuit voltage
- 8/20 usec Short Circuit current
- Power line: 1kV
- Line to Earth: 2kV

Lightning Surge Voltage shall be applied in differential and common mode to AC input lines and cross primary ac input and secondary GND.

5.3 Safety Requirements and Certification

5.3.1 Regulatory Standard

The power supply shall comply with the following international regulatory standards

for short	Country	Certified Status	Standard/标准
UL	USA/美国	MEET	UL 60950-1
TUV	Europe/欧洲	MEET	TUV/VDE-EN60950-1
CE	Europe/欧洲	MEET	Declared& CE Mark
UK	Britain/英国	MEET	BS EN60950-1
TCA	Australia/澳洲	MEET	AS/NZS60950.1
KC	Korea/韩国	MEET	K 60950-1
BSMI	Taiwan/台湾	MEET	CNS14336
PSE	Japan/日本	MEET	J 60950-1

5.3.2 Additional Safety Requirements

◎ Dielectric Withstand Voltage, Primary(input AC short)-to-Secondary(output DC short): 3000Vac, 5m A, 1 minute.
◎ Insulation Resistance, Input to output: 20MΩ(MIN.) at 500VDC.
◎ Reinforced insulation system, Primary-to-Ground and Primary-to-Secondary.
◎ The leakage current shall not exceed 0.25mA.

6 ENVIRONMENTAL REQUIREMENTS

6.1 Temperature

◎ Operating: 0 °C +40 °C

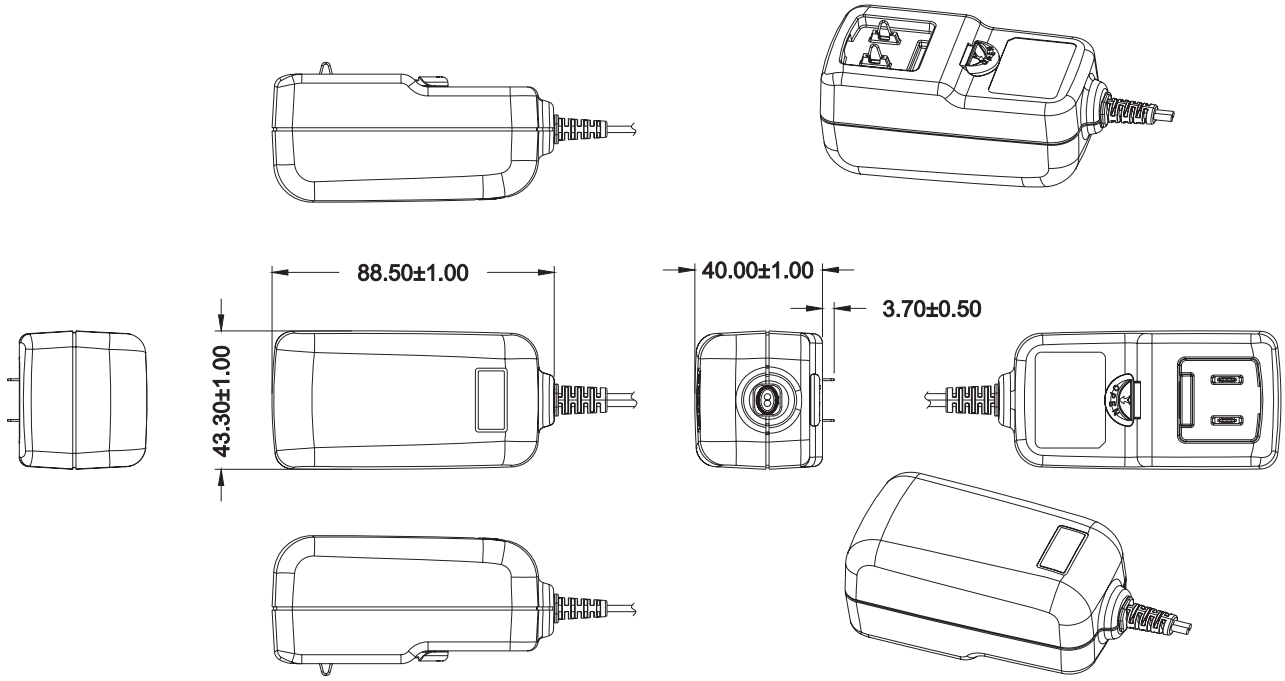
◎ Non-Operating: -20 °C +80 °C

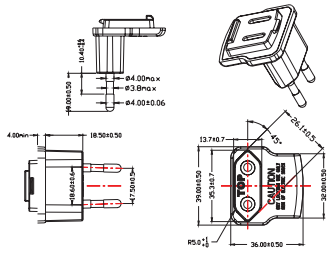
6.2 Humidity

◎ Operating: 10%~90% (Non Condensing)

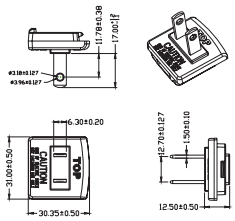
◎ Non-Operating: 10%~90% (Non Condensing)

7 APPEARANCE DRAWING: (Unit: mm)

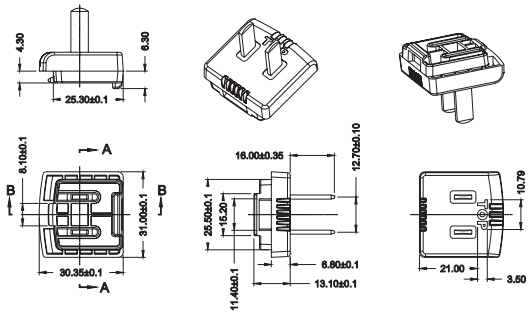




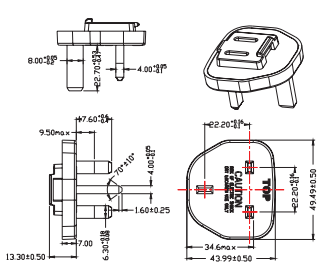
EU PLUG



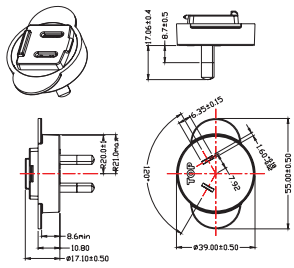
UL PLUG



CCC PLUG



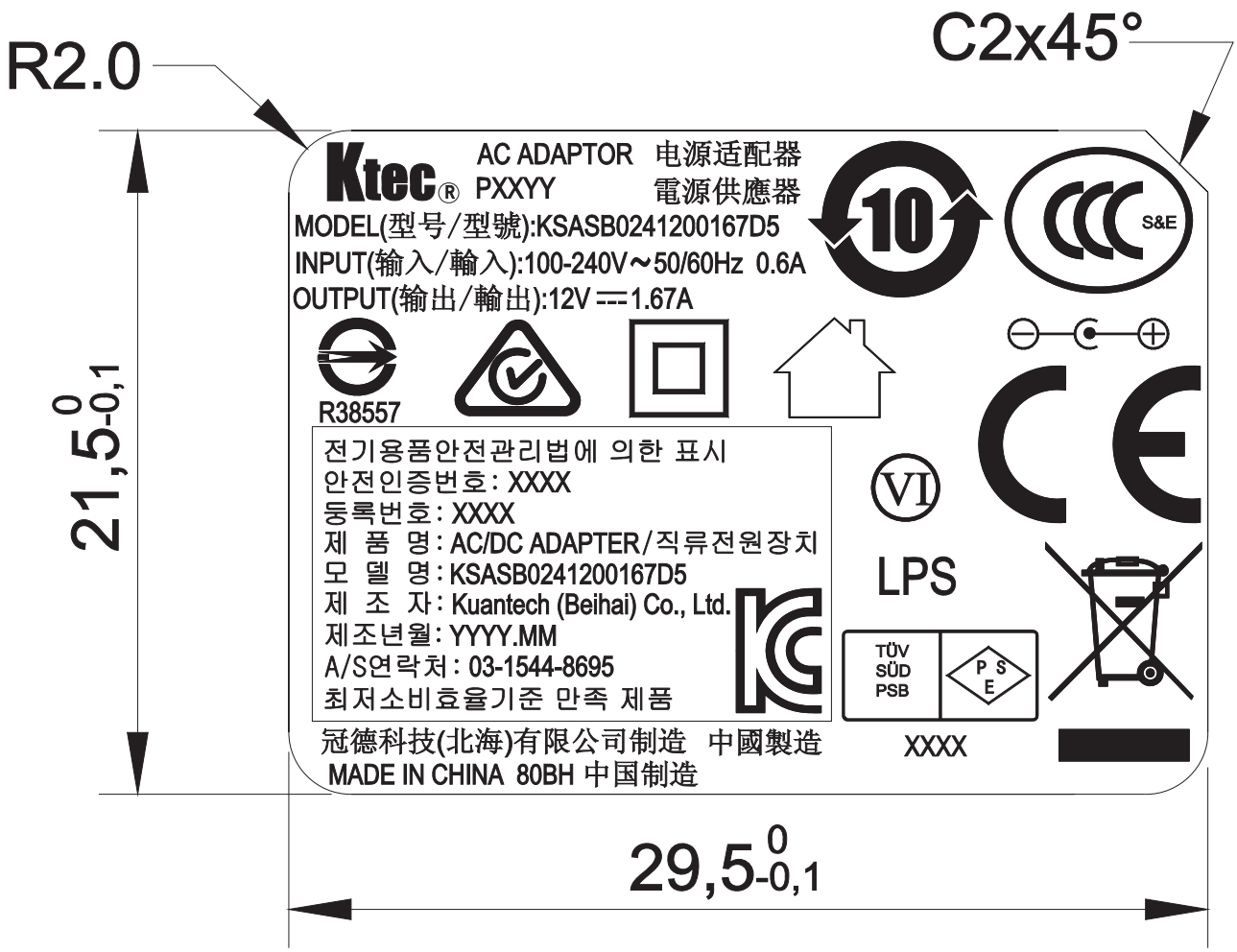
UK PLUG



SAA PLUG

NOTE: 1. Case cover & chassis material:
SE-1/PC BLACK (NO KTEC)
2. AC PIN MATERIAL: BRASS (NI PLATED)
3. PAHS+6P+NP+REACH+RoHS

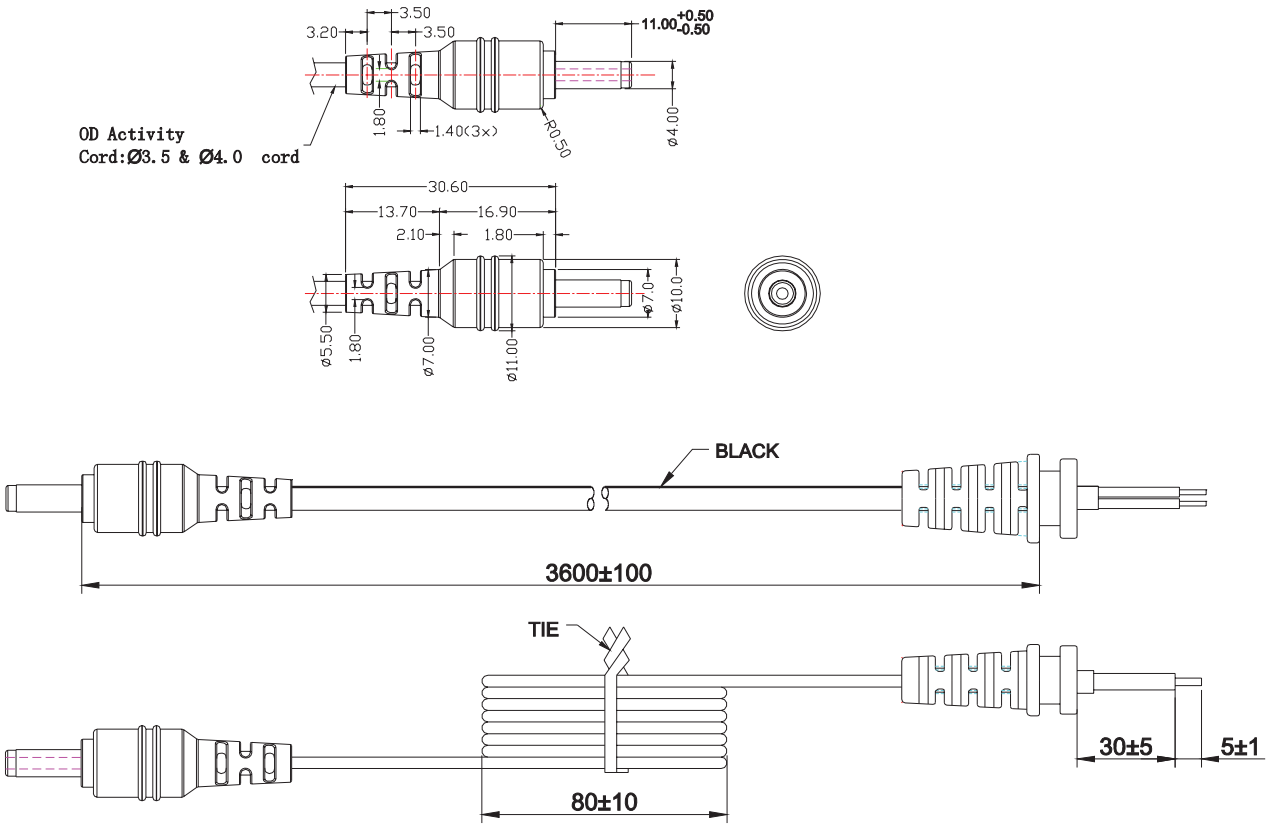
8 NAME PLATE:



Note: ☐ 1. MATERIAL: POLYESTER+PVC; COATING: 0.25+-0.05mm
White characters, Black background
PAHS+6P+NP+REACH+RoHS

☑ 2. Laser 镭射
Date code(PXXYY: P=PAHS, XX=WEEK, YY=YEAR)
按实际生产日期

9 DIMENSION OF OUTPUT PLUG & DC CORD (Unit: mm)

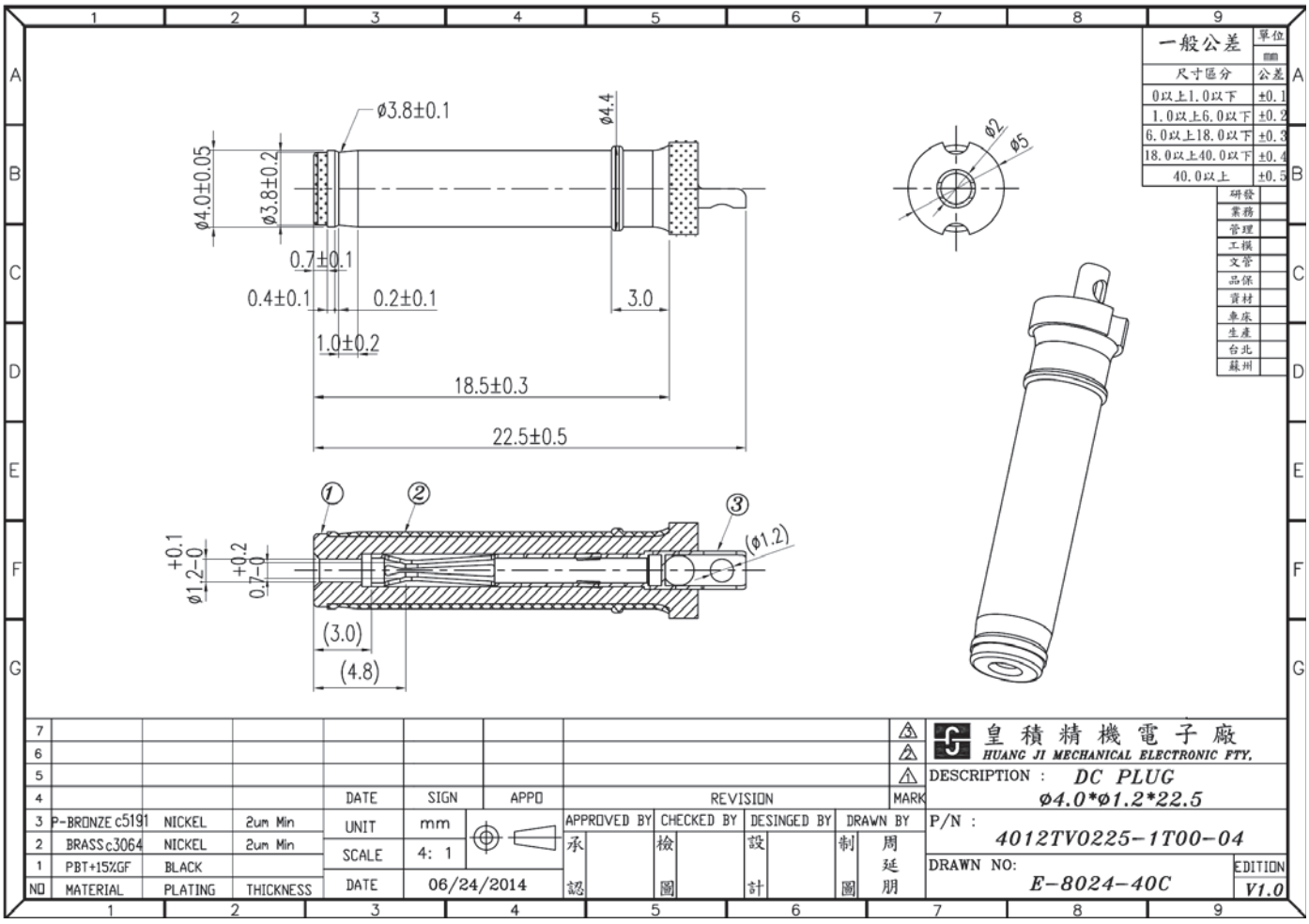


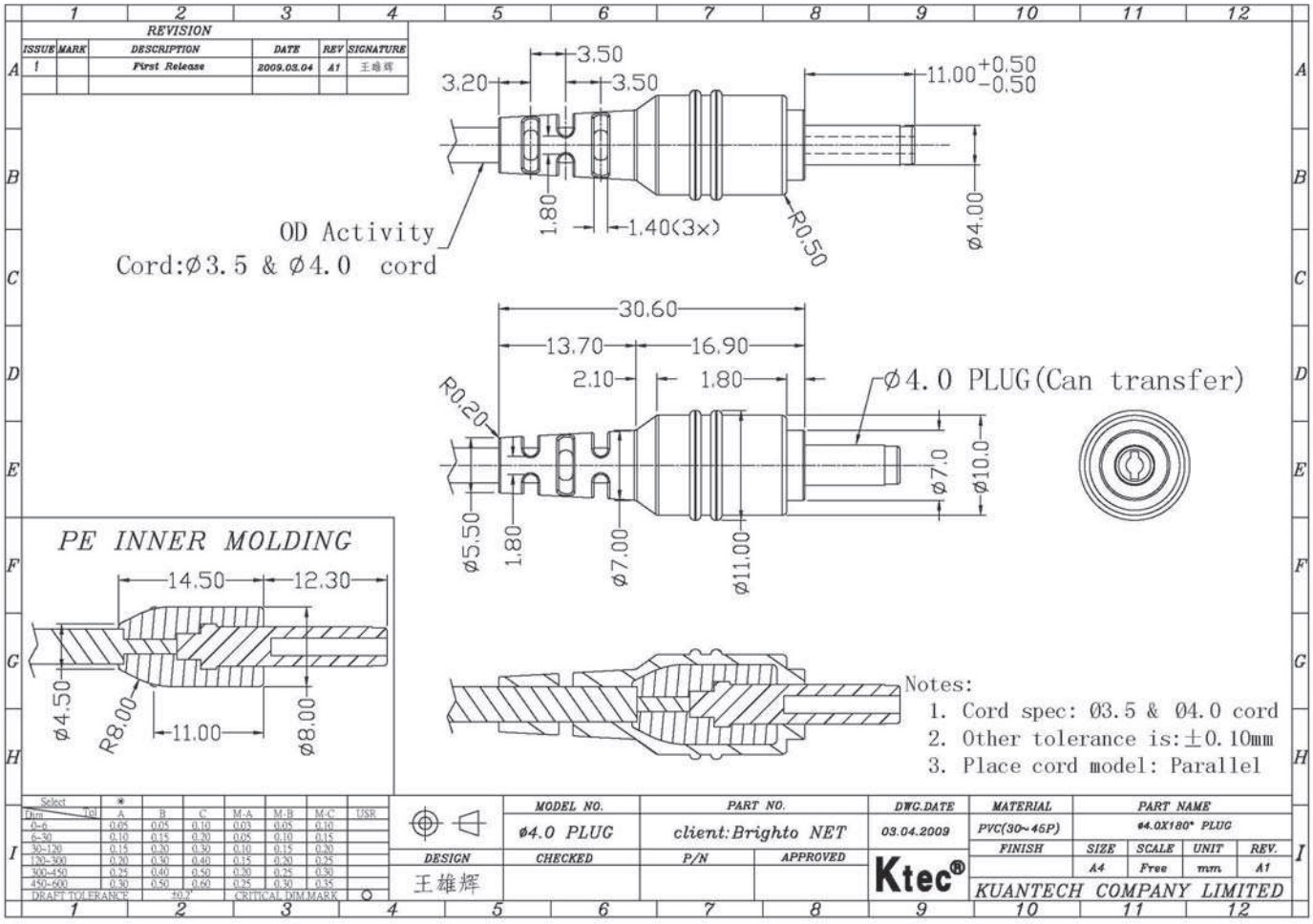
NOTE: (unit:mm)

1).WIRE TYPE: VW-1 80°C 300V L=3600mm 1185 18AWG Ø3.5 BLACK

2).THE POLARITY: ⊖—◉—⊕

3).PAHS+6P+NP+REACH+RoHS


ø3.8±0.1
ø4.4
ø4.0±0.05
ø3.8±0.2
0.7±0.1
0.4±0.1
0.2±0.1
3.0
1.0±0.2
18.5±0.3
22.5±0.5
ø2
ø5
(ø1.2)
(3.0)
(4.8)
一般公差
單位
尺寸區分
公差
0以上1.0以下 ±0.1
1.0以上6.0以下 ±0.2
6.0以上18.0以下 ±0.3
18.0以上40.0以下 ±0.4
40.0以上 ±0.5
皇積精機電子廠
HUANG JI MECHANICAL ELECTRONIC FTY.
DESCRIPTION : DC PLUG
ø4.0*ø1.2*22.5
P/N : 4012TV0225-1T00-04
DRAWN NO: E-8024-40C
EDITION V1.0
DATE 06/24/2014
SCALE 4: 1
UNIT mm
APPROVED BY
CHECKED BY
DESINGED BY
DRAWN BY
REVISION
MARK
NO MATERIAL PLATING THICKNESS
1 PBT+15%GF BLACK
2 BRASS c3064 NICKEL 2um Min
3 P-BRONZE c5191 NICKEL 2um Min

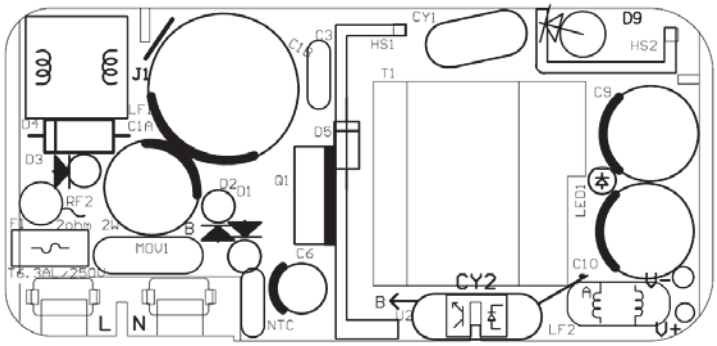

REVISION
ISSUE 1 | MARK | DESCRIPTION: First Release | DATE: 2009.03.04 | REV: A1 | SIGNATURE: 王雄辉
3.50
3.20
3.50
11.00 +0.50 -0.50
OD Activity
Cord:Ø3.5 & Ø4.0 cord
1.80
1.40(3x)
R0.50
Ø4.00
30.60
13.70
16.90
2.10
1.80
Ø4.0 PLUG(Can transfer)
R0.20
Ø7.0
Ø10.0
Ø5.50
1.80
Ø7.00
Ø11.00
PE INNER MOLDING
14.50
12.30
Ø4.50
R8.00
11.00
Ø8.00
Notes:
1. Cord spec: Ø3.5 & Ø4.0 cord
2. Other tolerance is:±0.10mm
3. Place cord model: Parallel
MODEL NO. Ø4.0 PLUG
PART NO. client:Brighto NET
DWG.DATE 03.04.2009
MATERIAL PVC(30~45P)
PART NAME Ø4.0X180* PLUG
DESIGN 王雄辉
CHECKED
P/N
APPROVED
FINISH
SIZE A4
SCALE Free
UNIT mm
REV. A1
Ktec®
KUANTECH COMPANY LIMITED

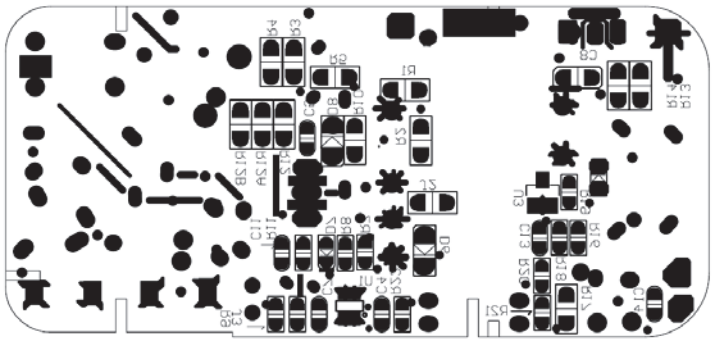
10 BOM:

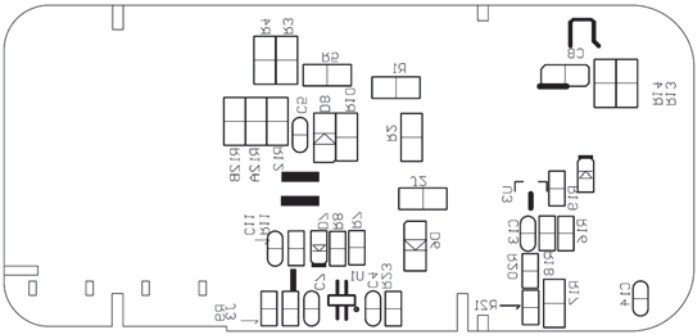
Item	Description	Unit	QTY	Position
Inductor	COMMON CHOKE EE10"φ0.25*2*64TS"10mH min"GP	EA	1	LF1
Inductor	COMMON CHORE T9*5*3 0.7*7Ts 180uH min(zhi)"GP	EA	1	LF2
TRANSFORMER	TRANSFORMER EE22 加宽(立式)KSASB024 系列变压器"GP	EA	1	T1
PHOTOCOUPLER	PHOTOCOUPLER;LTV-817;DIP-4"LITE-ON"GP	EA	1	U2
MOS-FET	MOSFET 4N60 4A 600V TO-220F GP	EA	1	Q1
SCHOTTKY	DIODE/SCHOTTKY; 30A/100V TO-220AB GP	EA	1	D9
Ceramic Cap	C/Y1;1000pF;250V 20% Y5U SE102M GP	EA	1	CY1
E-CAP	E/CAP;33uF 400V;-10% +20%;105'C;KM GP	EA	1	C1B
FUSE Resistor	RES/FR 2ohm 5% 2W GP	EA	1	RF2
Chip capacitor	CHIP/CAP X7R 100PF 50V 10% 0805"GP	EA	2	C5.C11
Chip capacitor	CHIP CAP 1000pF 500V X7R 10% 1206"GP	EA	1	C8
Chip capacitor	CHIP/CAP;X7R;100nF;50v;10%;0805"GP	EA	2	C7.C14
Chip capacitor	CHIP/CAP;X7R;47nF;50v;10%;0805"GP	EA	1	C13
Chip capacitor	CHIP/CAP;X7R;2200pF;50v;10%;0805"GP	EA	1	C4
Chip Res	CHIP RES 0ohm 0.25W 1% 1206"GP	EA	1	J2
Chip Res	CHIP RES 0ohm 0.125W 1% 0805"GP	EA	1	R23
Chip Res	CHIP RES 0ohm 0.125W 1% 0805"GP	EA	1	J3
Chip Res	CHIP/RES;100Kohm;0.125W;1%;0805"GP	EA	1	R8
Chip Res	CHIP/RES;18Kohm;0.125W;1%;0805"GP	EA	1	R18
Chip Res	CHIP/RES;180Kohm;0.25W;1%;1206"GP	EA	2	R3.R4
Chip Res	CHIP/RES;2.4Kohm;0.125W;1%;0805"GP	EA	1	R21
Chip Res	CHIP/RES;2.0ohm;0.25W;1%;1206"GP	EA	2	R12A.R12B
Chip Res	CHIP/RES;2.4ohm;0.25W;1%;1206"GP	EA	1	R12
Chip Res	CHIP/RES;4.64Kohm;0.125W;1%;0805"GP	EA	1	R19
Chip Res	CHIP/RES;1Kohm;0.125W;1%;0805"GP	EA	1	R11
Chip Res	CHIP/RES;68ohm;0.25W;1%;1206"GP	EA	2	R5.R10
Chip Res	CHIP/RES 10Kohm 0.125W 5% 0805"GP	EA	1	R20
Chip Res	CHIP/RES;2Mohm;0.25W;5% 1206"GP	EA	2	R1 R2
Chip Res	CHIP/RES;33ohm;0.25W;5%;1206"GP	EA	2	R13.R14
Chip Res	CHIP/RES;3.3ohm;0.125W;5%;0805"GP	EA	1	R7
Chip Res	CHIP/RES;470ohm;0.25W;5%;1206"GP	EA	1	R17
IC	IC;40V;0.4%;SOT-23-3;125'C;431"GP	EA	1	U3
Chip Diode	SMD DIODE 1A 1KV SOD-123 GP	EA	1	D6
Chip Fast Diode	DIODE SOD323 0.2A 200V GP	EA	1	D7

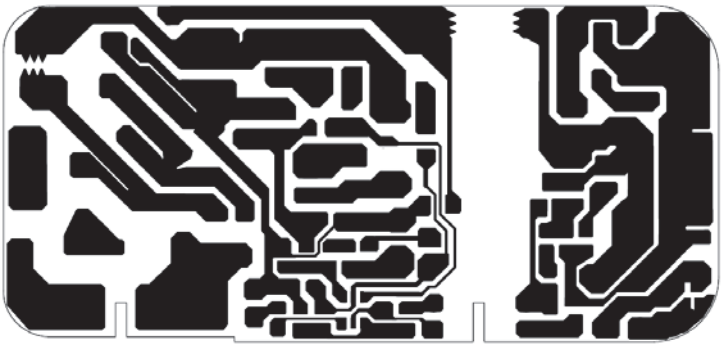
IC	SMD IC PWM LD7538RGL SOT23-6 GP	EA	1	U1
Fast Diode	DIODE FAST FR107 1A 1000V DO-41 GP	EA	5	D1-D5
Ceramic Cap	C/CAP;1000pF;1000V;20%;Y5P;P:5mm"GP	EA	1	C3
E-CAP	E/CAP 6.8UF 50V 20% 105'C SH GP	EA	1	C6
E-CAP	E/CAP 10UF 400V 20% 105'C KM GP	EA	1	C1A
E-CAP	E/CAP;1000uF 16V;20%;105'C;GF GP	EA	2	C9.C10
PCB	PCB 77.4*36.7*1.6mm"94V-0"GP	EA	1	

11 PCB

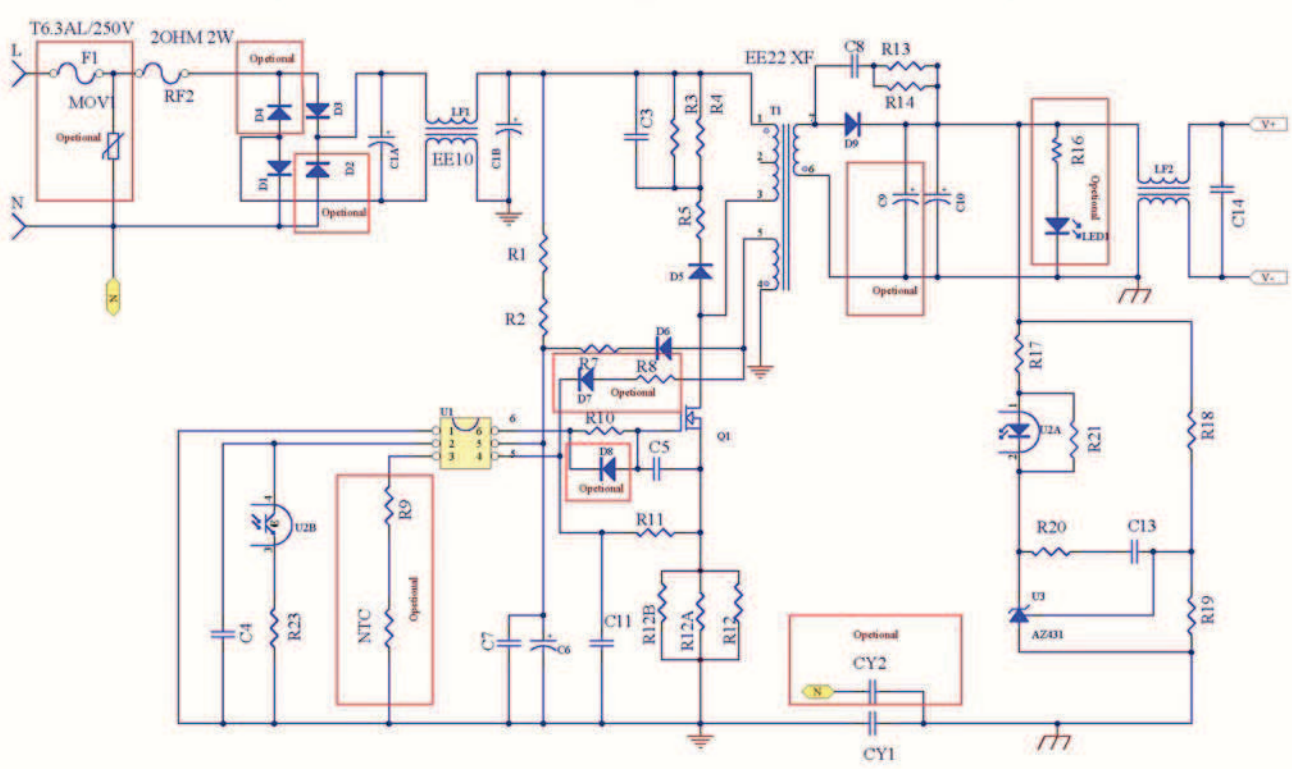




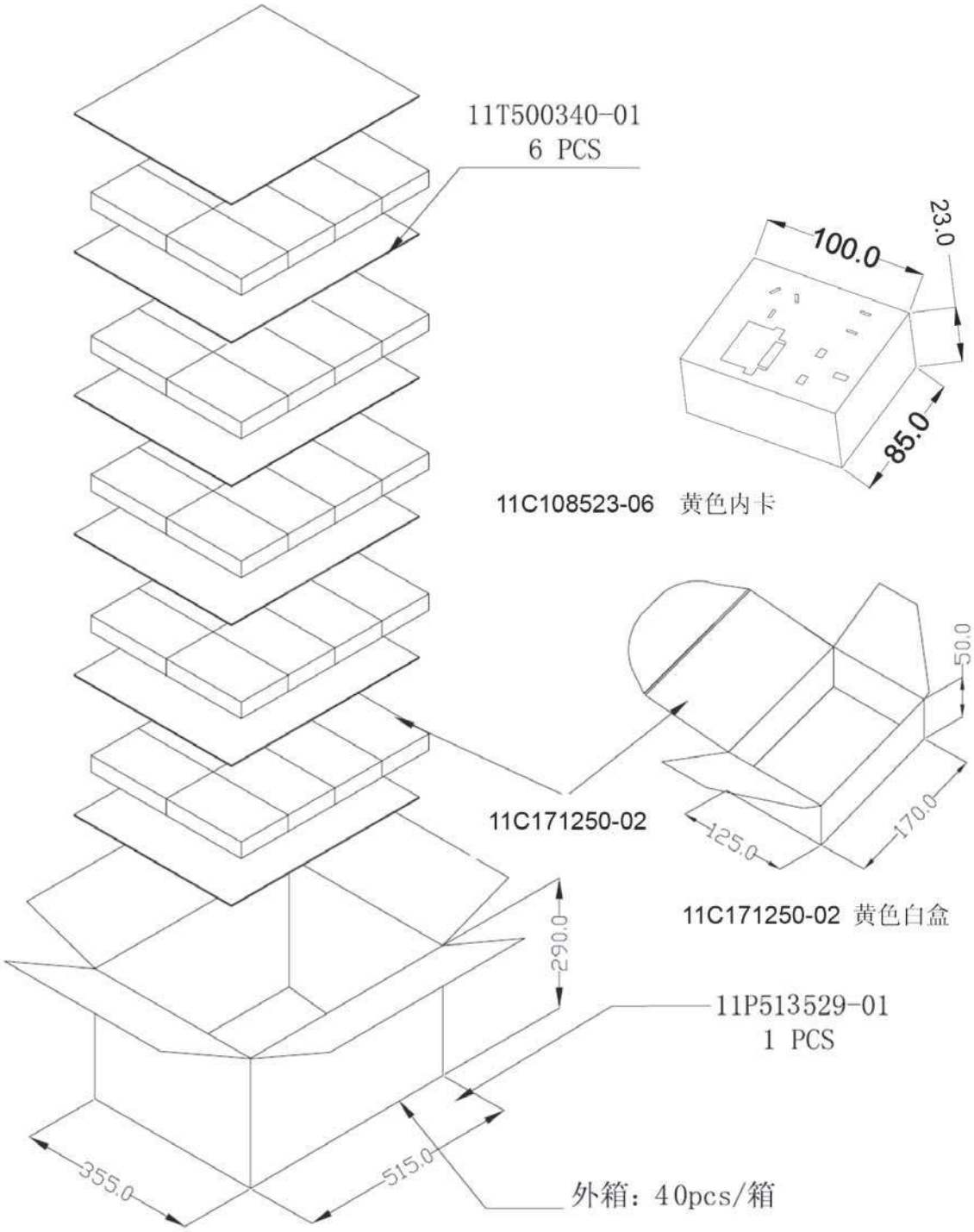




12 SCH


T6.3AL/250V
2OHM 2W
L
N
F1
MOV
RF2
Optional
D1
D2
D3
D4
C1A
LF1
EE10
C1B
EE22 XF
C8
R13
R14
D9
C3
R3
R4
T1
R5
D5
R1
R2
D6
R7
R8
D7
R10
C5
D8
Q1
R11
U1
U2B
R9
NTC
C4
R23
C7
C6
C11
R12B
R12A
R12
CY2
CY1
C9
C10
R16
LED1
LF2
C14
V+
V-
R17
U2A
R21
R18
R20
C13
U3
AZ431
R19

13 PACKING (Unit: mm)



Note: 包装盒要求用黄皮卡纸