



深圳市欧凯科技有限公司

Shenzhen Okey Technology Co., Limited

SPECIFICATION FOR APPROVAL

Customer spec: Input100-240VAC,50/60HZ,12V7000mAoutput

Customer part No: _____

Okeytech part No: OK-D12-7000PFC,AC-DCpoweradpter,1.8AMaxinputcurrent

Samples No: S20130626 **Issuing date:** 2013-06-26

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Shenzhen Okey Technology Co., Limited 深圳市欧凯科技有限公司	Switching mode power supply Specification (CLASS A)	
	Okeytech P/N	Customer P/N
	OK-D12-7000	

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1 General

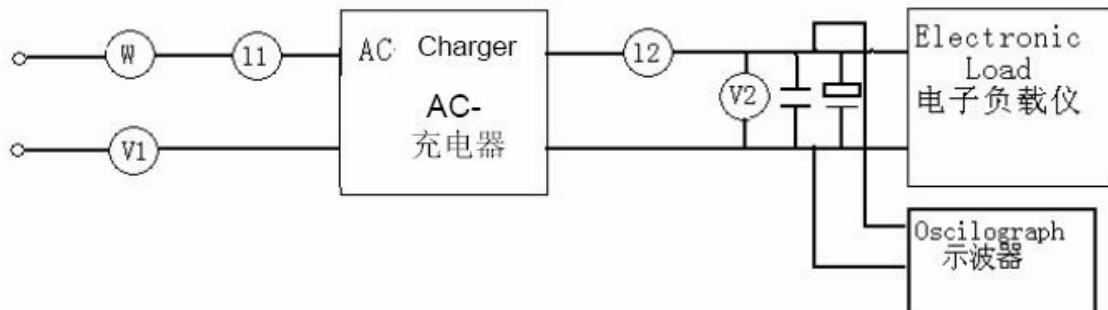
The specification defines an AC-DC switching mode power supply unit with full range AC input and single DC output, compatible with IT&AV devices. The power adapter shall be cooled with natural convection and meets safety requirements, EMC&EMI requirements.

2 Quoted criterion

CB/IEC 60065, IEC60950, UL&CUL/UL60950 /60065 CSA C22.2, GB4943/8898, EN60950/60065, J60950/60065, K60950/60065, AS/NZ60950/60065.

3 Electrical characteristics

Generally, without special directives, the power adapter will be tested according to the Testing circuit as follows



4 Input characteristics

Rated input voltage

It is from 100V AC to 240V AC input voltage.

Input voltage range

The adapter operates from 90V AC to 264V AC.

Efficiency

87% Min at input 100-240V AC /60HZ frequency, output with 12V DC full load.

Input voltage regulation

The line regulation less than $\pm 2\%$ at full load and $\pm 10\%$ input voltage.

The load regulation less than $\pm 3\%$.

Rated frequency

50/60Hz frequency range.

The adapter operates with an input frequency from 47Hz to 63Hz.

Max input current

1.8A at 100V AC input, 0.9A at 230V AC input.

Peak inrush current

With cold starting, the inrush current less than 120A at 100-240V AC input.

Harmonic standards&power factor correction

The adapter complies with IEC61000-3-2 Class D Harmonic standards&PF shall >0.9 at 240Vac, PF shall>0.95 at 100Vac for both 50/60Hz and DC output with full load.

5 Output characteristics

Rated output voltage and current

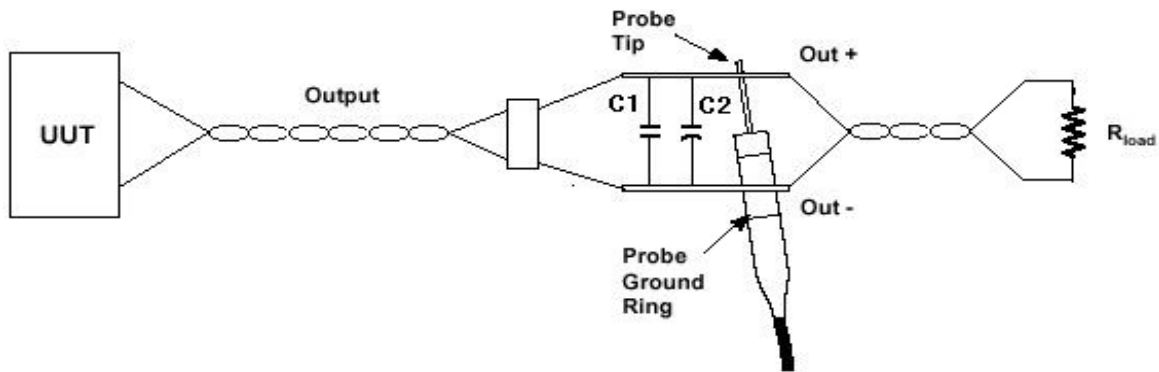
At normal conditions for rated input voltage and frequencies, the rated output voltage and current has slight fluctuation as shows

Output Voltage	Voltage Range		Current Range	
	lower limit	higher limit	min load	full rated load
+ 12V	11.4 V	12.6 V	0 A	7000mA

Rated output power

The adapter works constantly for **84W** full load.

Note: the test shall be done under the following conditions: ambient temperature 25° C, relative humidity 35~85%RH, air pressure 86~106kPa.



Output ripple & noise

The ripple and noise less than 200mVp-p at 100-240V AC input, 50-60Hz frequency, when the adapter is tested at the output terminal with a 47uF EC-capacitor and 0.1uF CC-capacitor, the electromagnetic oscillograph works at 20MHz band-width.

Normal output voltage	Ripple & noise
12V	200mV

Output over voltage protection

The adapter will be protected when its output voltage over 15.6V-18V.

Output over current protection

The adapter will be protected when its output current over 8400mA-10000mA.

Short circuit protection

The adapter will be protected when short circuit occurs, without damage, it can start again at normal conditions.

Power consumption

The unload consumption less 0.5W at 100-240V AC input.

6 Reliability items

The mean time between failure

MTBF for the adapter exceeds 50k hours when it works at full rated load but in an ambient temperature 35° C.

Hi-pot test

1500V AC, 60s between primary and secondary, leakage current less than 6mA, no Damages in the adapter.

Insulation test

500VDC, 60sec between primary and secondary circuit and chassis IR should \cong 100M Ω .

Leakage current

Less than 0.25mA at input 240V AC/50Hz frequency.

Ground test

At 25A current in the AC input terminal, between input ground and output ground, GR less than 0.1 Ω .

Temperature rise

The highest temperature measured on the housing of the adapter does not exceed 70° C when the adapter works at 25° C indoor , the highest temperature rising on the surface does not exceed 45° C When the adapter works at input 100-240V AC and output with 12V DC full load.

Surge withstanding and EFT

The adapter can withstand 2kV line transient under common mode and differentiated Mode.

Transient response

Less than 10% at output change between 50% and 100% of full load , the slew rate is 0.5A/us, frequency is 100HZ and 100kHz.

Hold Up Time

8mS (min) at 100V AC/60HZ, ambient 25°C, output full load.

Rise Time

≤50mS at 100V AC/60HZ, ambient 25°C, Output full load, 5%-95% of output voltage.

Operating direction

Green LED indicator.

On-Off life

The adapter can withstand 5k times on-off repetition of primary power, no failure or Damage at 100-240V AC input.

Burn-in

100% aging test at 80-100% full load at 35~40 °C burn-in room, prototype samples aged for 72H, pilot samples aged for 24H, massive units aged for 4H.

Strain relief test

The cord and plug can withstand 9kg pulling power for 60S, no breakage or damage On the cord and plug .

Vibration test

The test is done referred to IEC publ. 68-2-6 criteria as shows

Testing conditions		Acceptance criteria
Frequency	10-55Hz	No effects on electrical performance, no damage on the adapter
Sweep	2hours, for each axis (X,Y,Z)	
Acceleration	0.6G 1.5 (5-50Hz, peak-peak)	
Displacement	0.35 mm(5-50Hz)	

Bending test

Fix the adapter and its plug, with a load of 300g to the other end, turn around the cable by $\pm 60^\circ$, repetitions over 2k times, at a frequency of 20 times per minute, no damages in mechanical and electrical characteristics and defect rate within 10% after The testing.

Dropping test

Drop the adapter at 100cm height to 20mm thick hardwood floor, hit the adapter for 6 times, no mechanical damages or other failures, no electrical defects and other Failures.

Appearance inspection

With visual inspection about the housing, no visual abnormality, no scratches and Other mechanical damages, outer metals have no rust, loosening, shaking, etc.


7 Mechanical characteristics

Physical size: (L)140mm*(W)60mm*(H)34mm

Resin Materials: Flame resistance applies to UL94-V1

Net weight: 390g+/-5g

AC Socket: IEC320-C14

DC output plug: (OD)5.5*(ID)2.1* (L)10 mm (tuning fork) 

Output cable: AWG#16/1C+1 UL1185 *1000mm (min) BLACK

8 Environmental performances

Operating at low temperature

At $0 \pm 2^\circ \text{C}$, with the rated voltage 100-240V AC input to the primary, unload and full load to the secondary, no abnormality in electric and mechanical characteristics after 4H testing.

Operating at high temperature

At $40 \pm 2^\circ \text{C}$, with the rated voltage 100-240V AC input to the primary, unload and full load to the secondary, no abnormality in electric and mechanical characteristics after 4H testing.

Storage at low temperature

At $-20 \pm 2^\circ \text{C}$, non-operated testing, after 4H recovery, at ambient temperature 25°C , No abnormality in electric and mechanical Characteristics.

Storage at high temperature

At $70 \pm 2^{\circ}\text{C}$, non-operated testing, after 4H recovery, at ambient temperature 25°C , No abnormality in electric and mechanical Characteristics.

Storage at high temperature and high humidity with the adapter operated

At 40°C , 90~95%RH, operating at 100-240V AC input, unload and full load to the secondary, no abnormality in electric and mechanical characteristics after 4H testing.

Salty&foggy test for metal parts

Testing condition, salty water thickness: 5%, equipment temperature: $35\text{-}40^{\circ}\text{C}$, put the adapter (un-packaged) into the testing cabinet for 24h, after the testing, at 25°C , No rusty and eroded defects on the sockets and plugs.

9 List of testing equipment

Items	Equipment	Manufacturer	Model No
1	AC variable-frequency power source	艾诺	AN97001HSS
2	oscilloscope	TEK	TDS1012B
3	Electronic load tester	Chroma	63103
4	multimeter	Fluke	Fluke 187
5	power meter	威博	PF1200
6	Temperature Meter	CENTER	304
7	Electromagnetic interference machine	Italy	PM7000
8	constant temperature and humidity machine	爱斯佩克	EL-04KA
9	vibration measurement instrument	重力	NY2001D
10	data acquisition unit	Agilent	34970A
11	Plug and wire bending machine	奥斯达	CM-817
12	Thruster	ALGOL	20KGF 200N
13	digital caliper	上工	200mm

10 Safety and EMC

Safety

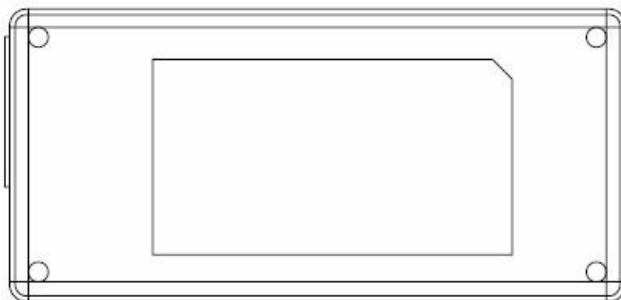
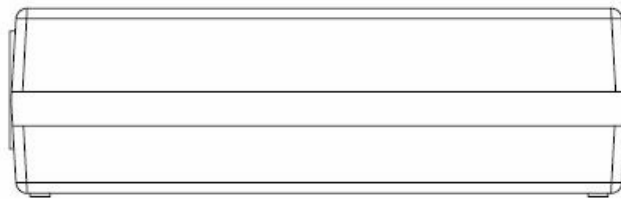
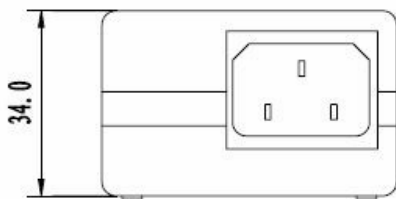
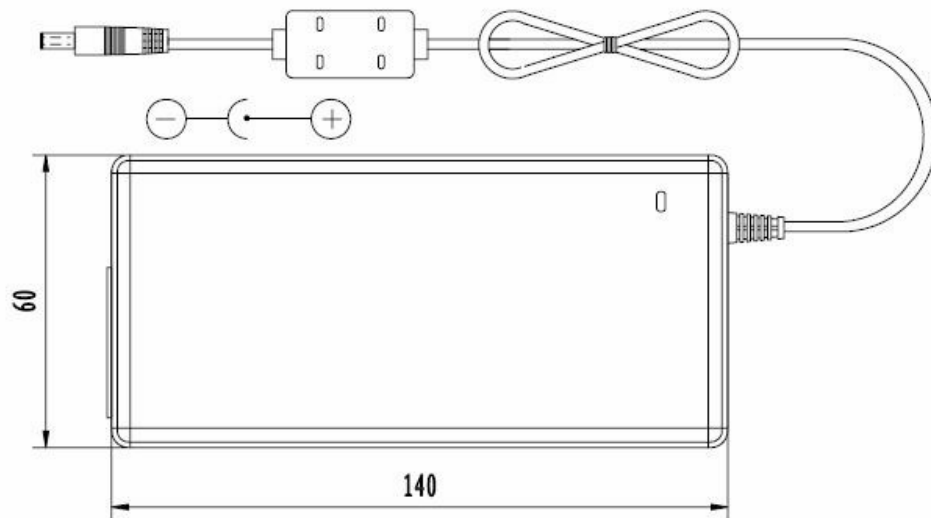
Certificate	Standards	Status
UL/CUL	UL60950-1 & UL60065	meet
GS	EN60950 & EN60065	meet
CE	IEC60950 & IEC60065	meet
CB	IEC60950 & IEC60065	meet
CCC	GB4943&GB8898	meet
PSE	J60950/J55022/J60065	meet
Australia	AS/NZS60950/AS/NZS60065	meet
Korea	K60950-1 &K60065	meet

EMI: Meet FCC part 15 Class B/CISPR part 22,Class B/CE/3C

EMS

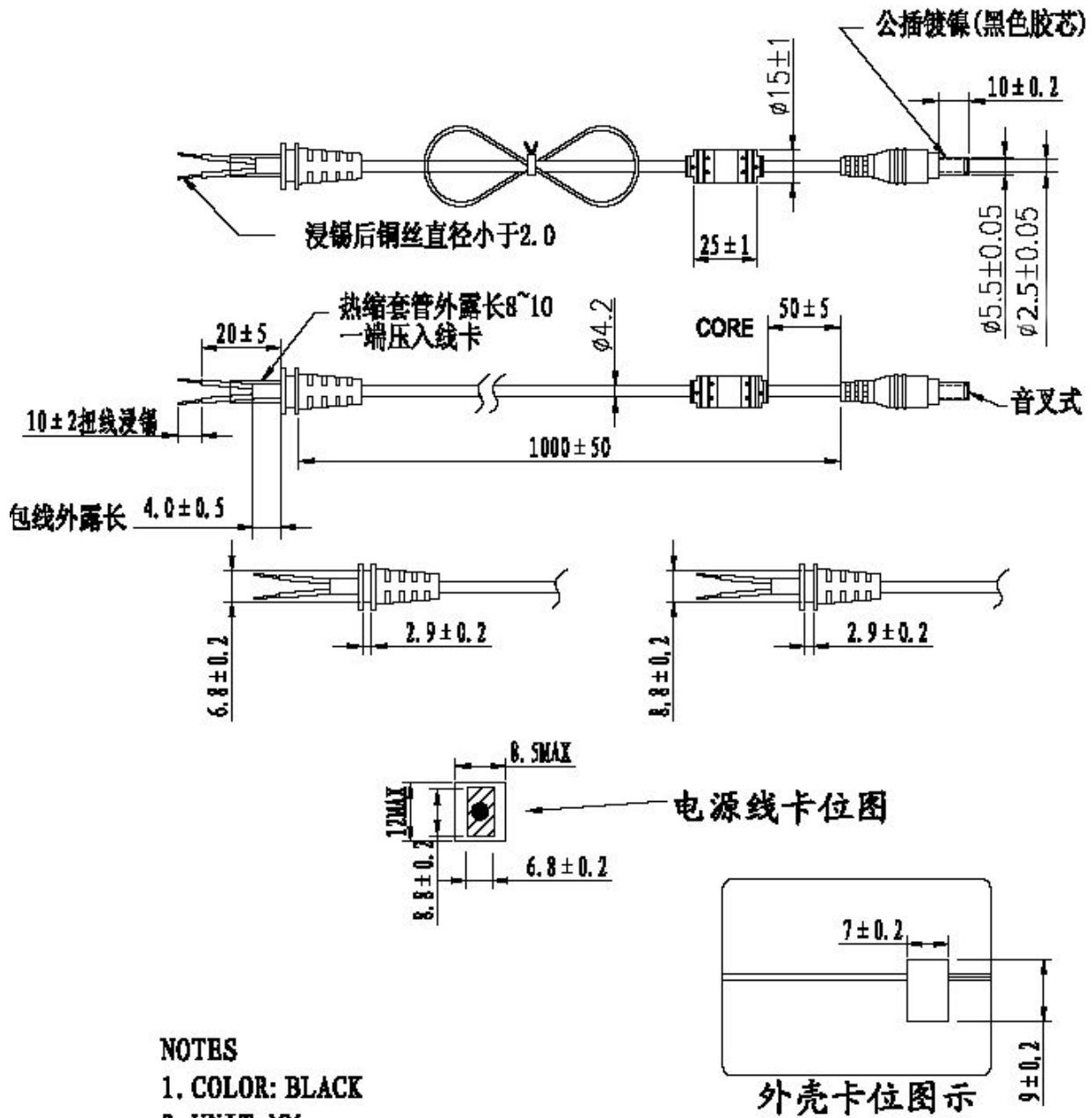
Test Item	Test specification	IEC standards
ESD	contact: 4kV/ air: 8kV	IEC61000-4-2
RF	FR: 26mhz-1.0ghz, field strength: 3V/m	IEC61000-4-3
EFT	2kV on AC power line	IEC61000-4-4
SURGE	1kV(l-n) & 2kV(l-pe, n-pe)	IEC61000-4-5
CS	3V/m	IEC61000-4-6
DIPS	0% 250 cycle, 40% 5 cycle, 70% 5 cycle	IEC61000-4-11

11 Mechanical drawing



- notes:
1. unit: mm.
2. material: PC+ABS
3. color: black
4. tolerance: $\pm 1.0\text{mm}$

12 DC cord & plug specs



NOTES

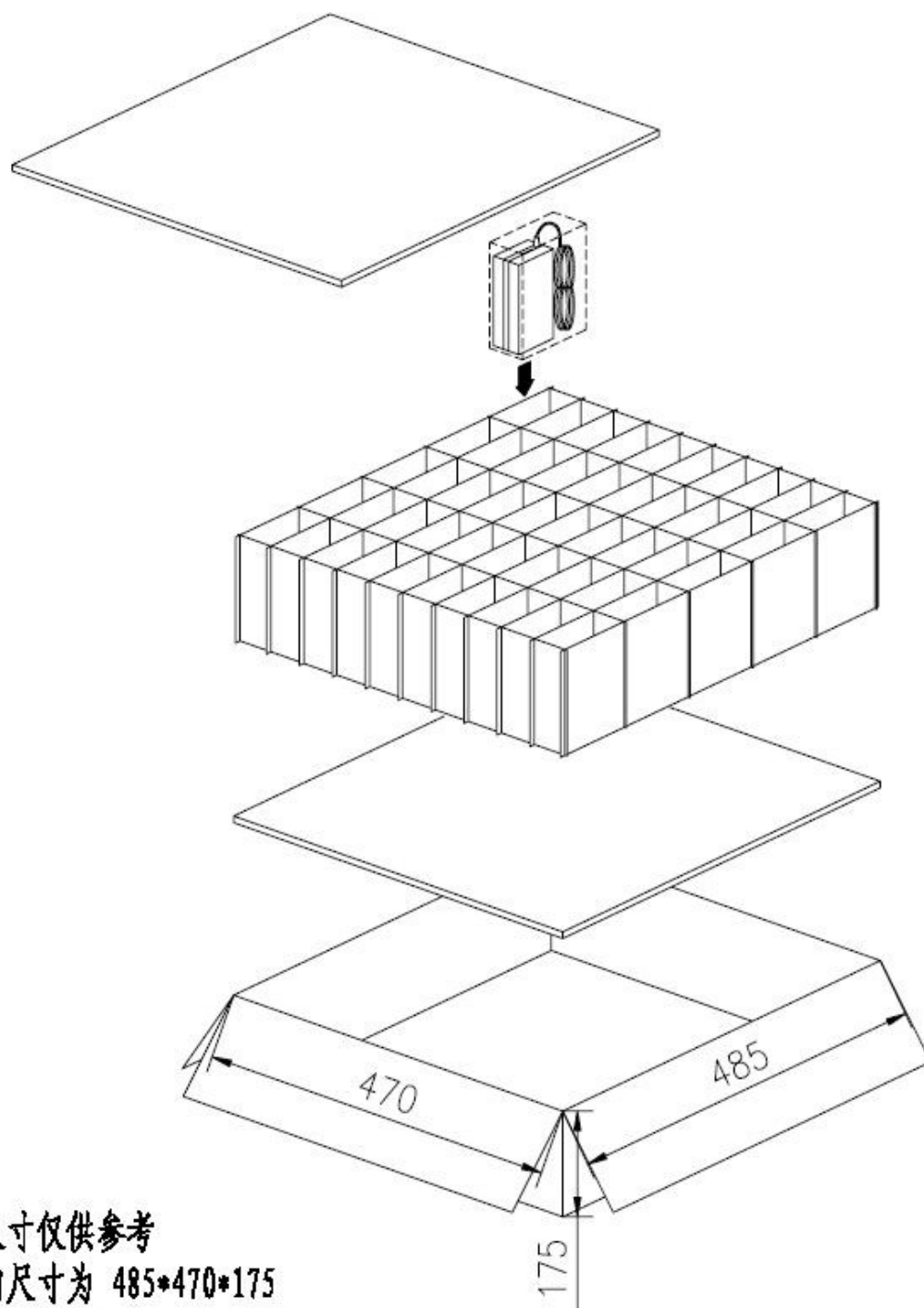
1. COLOR: BLACK
2. UNIT: MM
3. 白芯线导电电阻55毫欧以下，屏蔽线导电电阻65毫欧以下，80° 300V(线条上有标识: AWM STYLE 1185 16AWG 80° 300V VW-1)

13 Name plate



14 Packaging

50 pcs/carton



要求:

- (1). 图示尺寸仅供参考
- (2). 纸箱内尺寸为 $485 \times 470 \times 175$
- (3). 单位mm. 无比例
- (4). 材质为A=B双瓦楞纸
- (5). 每箱装50PCS