

Specification for Approval

Customer : **Linkman Co.,Ltd.**

Part Name : **AC ADAPTER**

Description : **12Volts / 2Amps**

Model No. : **STD-12020U (USA / Level V)**

Customer P / N :

Product P / N : **RXTD12020U415211**

Issued Date : **08 - Sep. - 2015**

Version : **A1**

Issued Stamp :

Customer's Approval Signature

ADAPTER TECHNOLOGY CO.,LTD.

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E-mail : service_tw@ adaptertech.com.tw ; service@ adaptertech.com.tw

Factory (China) : BOAYANG ELECTRONICS CO., LTD.

**Di Feng Gong Ye Qu 2 Hao,Xiasha Liuwu Village, Shipai Town, Dong Guan City,
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TEL : 86-0769-8136-9899 ; 86-0769-8136-0909 ; 86-0769-8136-9008

86-0769-8186-8338 ; 86-0769-8186-8900

FAX : 86-0769-8136-9009

24W
Switching Power Adapter
SPECIFICATION

Model No. : **STD-12020U(USA/Level V)**

Description : **12Volts / 2Amps**

Part No. : **RXTD12020U415211**

Version : **A1**

Date : **08 – Sep. – 2015**

Approved	Reviewed	Checked	Prepared	Sales

Approval Documents/Spec. Revised Records

- Customer : Linkman Co.,Ltd.
- Model No. : STD-12020U
- Original Documents Content : Spec. 10 Pages, Attachment 2 Pages

Revised Records : No.	Date	Description (Before / After)	Page(s) Revised	Revised By (Adapter/Customer)	Remark
1	Feb./26/2010	ISSUE	-	Wei	1.0
2	Jun./18/2010	LABEL Modify	P7	Wei	1.1
3	Sep./08/2015	Changed into Japanese tracking AC pin	P4~P7	Wei	A1

1. Feature :

- ◆ **Input** : **Universal 100 ~ 240 Vac / 47 ~ 63 Hz Input, without any slide switch.**
- ◆ **Output** : **+12V / 0~2 A**
- ◆ **Case Dimension** : **72 (L) * 34 (W) * 69 (H) mm ((±0.5mm))**
- ◆ **Efficiency** : **Eff (av) ≥ 82.22 % Min.**
- ◆ **Safety** : **PSE**
- ◆ **EMI** : **Class B ; Conduction & Radiation Met.**
- ◆ **Protection** : **OVP (Over Voltage Protection) 、 SCP (Short Circuit Protection) 、 OCP (Over Current Protection)**
- ◆ **High frequency design , less power consumption.**
- ◆ **Suitable for usage at Telecommunication, Computer, Industrial Controller, & OA System.**
- ◆ **Meet Energy Star V / Erp (Stage 2) / MEPS V .**

2. Input :

2.1 Voltage	Universal 100~240Vac, single phase
2.2 Frequency	47 ~ 63 Hz
2.3 Current	0.58A Max.
2.4 Inrush Current	30A Max. / 100Vac ; 45A Max. / 230Vac (Cold Start At 25 °C , Full Load)
2.5 Efficiency	Eff (av) ≥ 82.22% Min. (At 115 Vac & 230 Vac)
2.6 Power Consumption	Pi ≤ 0.3 W (At 230Vac & No Load)

$$\text{※Eff (av)} = \frac{E_1 + E_2 + E_3 + E_4}{4}$$

E1=efficiency with 25% rated load ; E2= efficiency with 50% rated load
E3=efficiency with 75% rated load ; E4= efficiency with 100% rated load

3. Output :

3.1 DC Output	Voltage	+12V ± 5%
	Current	2.0A Max.
	Regulation	11.4Vmin. ~ 12.0Vtyp. ~ 12.6Vmax.
	Ripple & Noise	100 mV Max.
	Total Power	24W Max.

Remark : For ripple & noise measurement, use a 20MHz bandwidth frequency oscilloscope, and add a 0.1μF multilayer Cap. and a Low ESR Electrolytic Cap. (10 μF) at output connector terminals. (At nominal line voltage, Full Load)

4. Protection :

4.1 Over Voltage Protection (OVP)	15V (Max.)
4.2 Short Circuit Protection (SCP)	Automatic recovery after short-circuit fault being removed
4.3 Over Current Protection(OCP)	4A (MAX)

Remark : When Short Circuit Protection is activated,the power supply will shutdown automatically.

Once the abnormal condition resulting in the failure being removed, the power supply will restart accordingly. When

Over Voltage Protection is activated, the power supply will shutdown.

5. Safety 、EMI and EMC Requirement :

5.1 Safety Requirement

a. Safety : PSE

b. Dielectric Strength : 10mA Max. Cut off current

(1)	Primary to Secondary	3000Vac for 1 Minute
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c. Insulation Resistance :

(1)	Primary to Secondary	10 M Ohm for 500Vdc
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5.2 EMI Requirement : Class B ; Conduction & Radiation Met.

5.3 Leakage Current : Less than 0.25mA

6. Operation and Environment Performance :

6.1 Temperature Range

Operating	+ 0°C ~ + 40°C
Storage	- 20 °C ~ + 80 °C

6.2 Humidity Range(Non-condensing)

Operating	20% ~ 80% RH
Storage	10% ~ 90% RH

6.3 Cooling : By natural air

7. M.T.B.F. : 300,000Hrs.(Calculated Hours at 25°C,By Telcordia SR-332)

8.Mechanical :

8.1 Weight : 165 g Typical

8.2 Cable Type : Black UL2468 20AWG
(Wire + Plug)

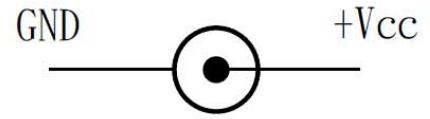
Plug : $\varnothing 5.5 * \varnothing 2.1 * 9.5\text{mm}$
(Tuning Fork & Cannelure)

8.3 Cable Length : 1500mm

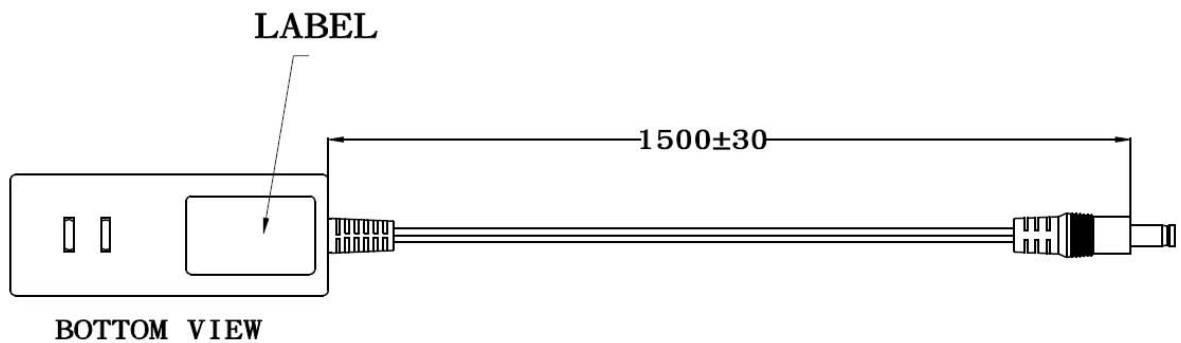
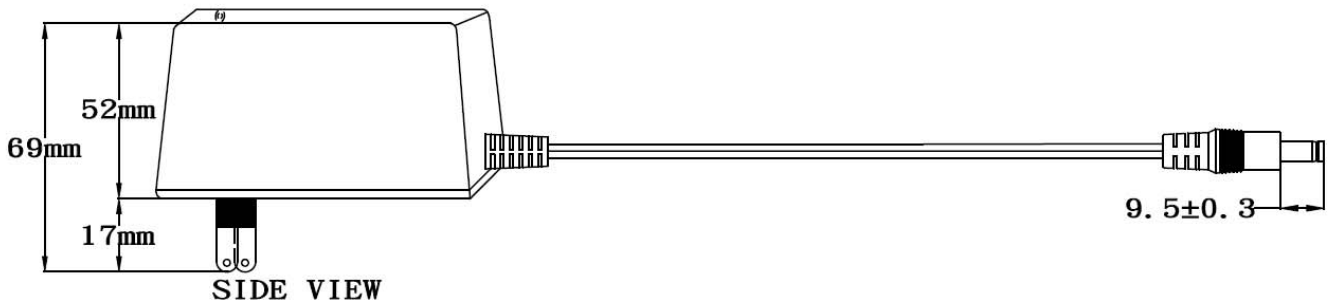
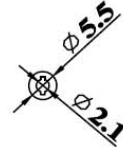
8.4 Case Dimension : 72mm(L)*34mm(W)*69mm(H) ($\pm 0.5\text{mm}$)

8.5 Material Flammability : UL 94V-0

8.6 External Apperance : As drawing below (Scale \rightarrow mm)

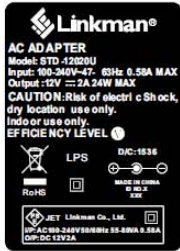


Output Cable Plug Pin Assignment

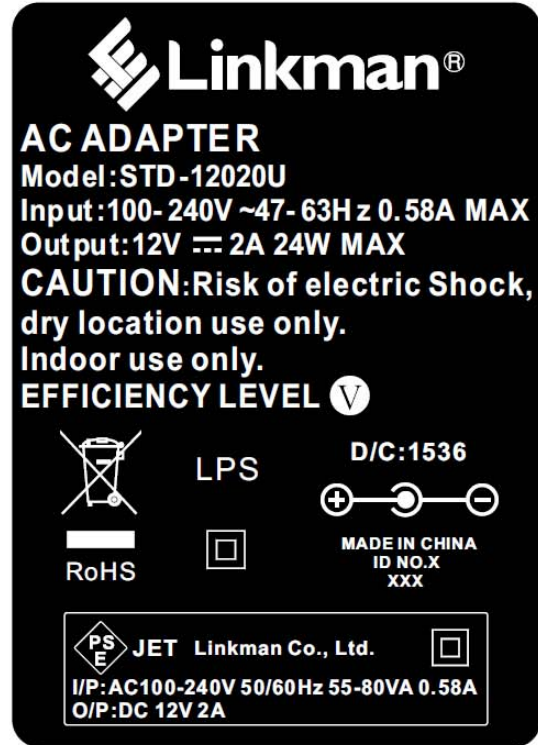


8.7 Spec. Label Materials : Metalized Polyester Label (Silver Gloss)
 Color : Black Background with Silver Printing
 Label Dimension : 34.5mm(L)*24.5mm(W)+/-0.1mm
 Label Thickness : #75

100%



300%



"XXX"
 Label supplier's code.
 It is accurate that the number of words depends on the real finished product.

ID NO."X"
 Manufacturer's code.
 It is accurate that the number of words depends on the real finished product.

Label Part No. :9443019382

A. Line Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90Vac / 50 % Load	11.4~12.6 V	11.949 V	11.948 V	11.950 V
115Vac / 50 % Load	11.4~12.6 V	11.950 V	11.949 V	11.951 V
132Vac / 50 % Load	11.4~12.6 V	11.950 V	11.949 V	11.951 V
180Vac / 50 % Load	11.4~12.6 V	11.950 V	11.947 V	11.950 V
230Vac / 50 % Load	11.4~12.6 V	11.950 V	11.949 V	11.949 V
264Vac / 50 % Load	11.4~12.6 V	11.950 V	11.949 V	11.950 V

B. Efficiency Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac	82.22 % Min..	83.25 %	83.11 %	82.98 %
230Vac	82.22 % Min..	82.44 %	82.43 %	82.33 %

$$\text{Eff (av)} = \frac{E1 + E2 + E3 + E4}{4}$$

E1=efficiency with 25% rated load ; E2= efficiency with 50% rated load
E3=efficiency with 75% rated load ; E4= efficiency with 100% rated load

C. Load Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 0 % Load	11.4~12.6 V	12.075 V	12.073 V	12.074 V
115Vac / 50 % Load	11.4~12.6 V	11.950 V	11.948 V	11.949 V
115Vac / 100 % Load	11.4~12.6 V	11.824 V	11.825 V	11.822 V
230Vac / 0 % Load	11.4~12.6 V	12.075 V	12.077V	12.073 V
230Vac / 50 % Load	11.4~12.6 V	11.950 V	11.952V	11.948 V
230Vac / 100 % Load	11.4~12.6 V	11.824 V	11.822 V	11.822 V

D. Ripple & Noise Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	100mVpp Max	56.7mVpp	55.4mVpp	55.1mVpp
230Vac / 100 % Load	100mVpp Max	57.5mVpp	58.8mVpp	56.7mVpp

E. Inrush Current

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	30A Max.	27.8 A	27.9A	27.5A
230Vac / 100 % Load	45A Max	42.6 A	43.2A	43.3A

F. Over Current Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	4A Max.	2.688 A	2.658 A	2.701A
230Vac / 100 % Load	4A Max.	3.011 A	2.912 A	3.001A

G. Short Circuit Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	Auto Recovery	OK	OK	OK
230Vac / 100 % Load	Auto Recovery	OK	OK	OK

H. Input Power Consumption(No Load)

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230Vac / 0 % Load	≤ 0.3 W	0.27W	0.26W	0.27W

Efficiency Test Report

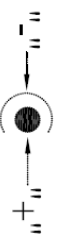
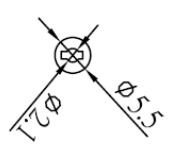
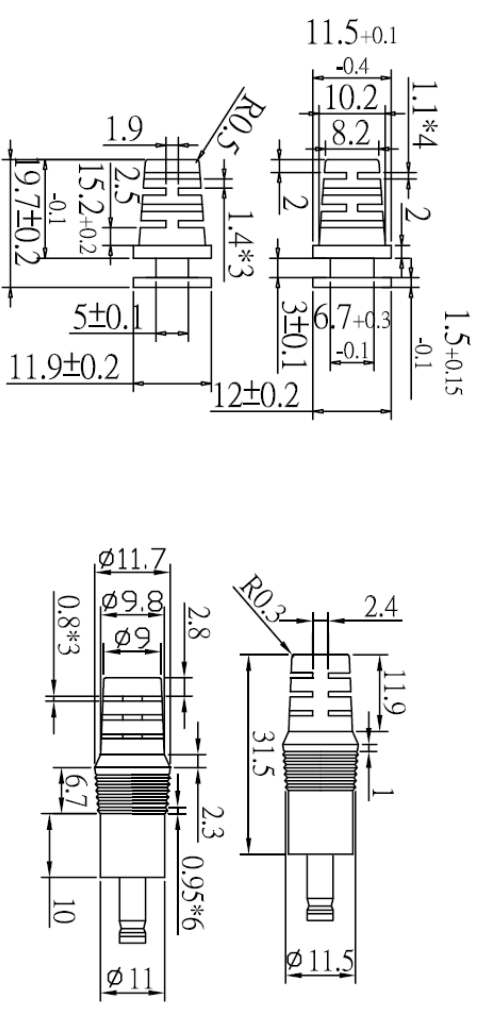
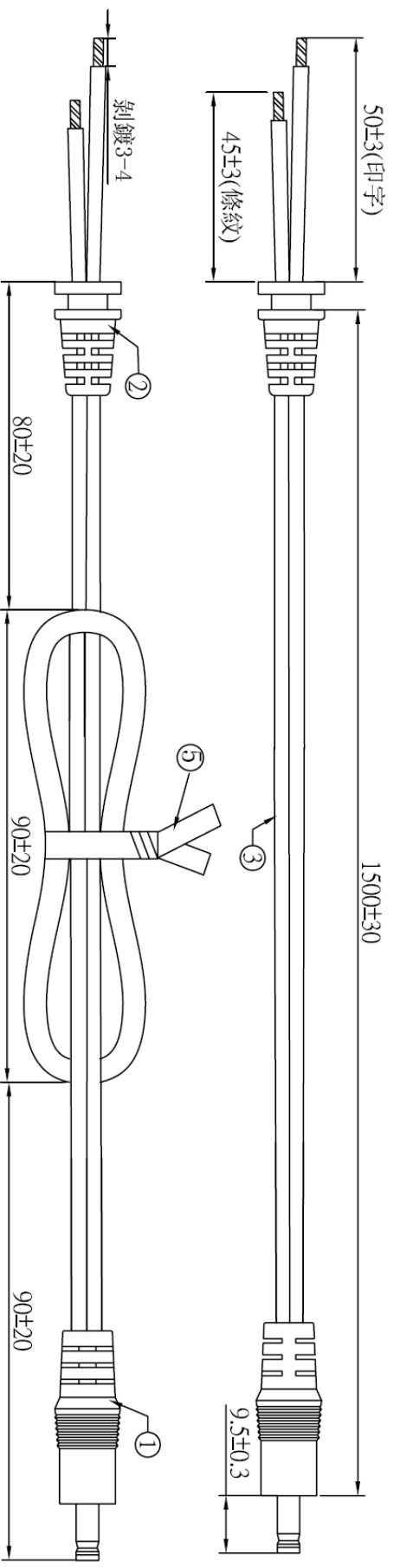
- A. Model Number : STD-12020Z (Z=A,B,C,E,K,T,U,V) (12V / 2A / 24W)
- B. DC Power Cord : UL2468 , 20AWG , 1.8M
- C. Average Efficiency :
- Energy Star V $(0.0626 \cdot \ln(\text{Nameplate Output}) + 0.622) = 82.09\% \text{ Min.}$
- Erp (Stage 2) $(0.063 \cdot \ln(\text{Nameplate Output}) + 0.622) = 82.22\% \text{ Min.}$
- MEPS V $(0.0626 \cdot \ln(\text{Nameplate Output}) + 0.622) = 82.09\% \text{ Min.}$
- D. NO Load Power Consumption :
- Energy Star V 0.3W Max.
- Erp (Stage 2) 0.3W Max.
- MEPS V 0.3W Max.
- E. Testing Dequpment :
- a. AC Power Source : " Zentech " 2700M-10
- b. Electronic Load : " PRODIGIT " 3311C
- c. Power Meter : " Zentech " 2100
- d. Digital Meter : " FLUKE " 45
- F. AC Input Voltage : 115Vac/60Hz

Load Conditions Reported Quantity	100% * I ₀	75% * I ₀	50% * I ₀	25% * I ₀	0% * I ₀
Rms Output Current(mA)	2000mA	1500mA	1000mA	500mA	0mA
Rms Output Voltage(V)	11.846V	11.923V	12.001V	12.091V	12.156V
Active Output Power(W)	23.69W	17.88W	12.00W	6.05W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V
Rms Input Current(A)	0.465A	0.360A	0.259A	0.152A	0.011A
Rms Input Power(W)	29.00W	21.60W	14.30W	7.28W	0.16W
T.H.D. (Voltage)	0.27	0.25	0.21	0.13	0.11
True Power Factor	0.540	0.512	0.468	0.047	0.185
Power Consumed by UUT(W)	5.31W	3.72W	2.30W	1.23W	0.16W
Efficiency	81.70%	82.80%	83.92%	83.04%	*
Average Efficiency	82.87%				*

- G. AC Input Voltage : 230Vac/50Hz

Load Conditions Reported Quantity	100% * I ₀	75% * I ₀	50% * I ₀	25% * I ₀	0% * I ₀
Rms Output Current(mA)	2000mA	1500mA	1000mA	500mA	0mA
Rms Output Voltage(V)	11.845V	11.922V	12.000V	12.078V	12.156V
Active Output Power(W)	23.69W	17.88W	12.00W	6.04W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V
Rms Input Current(A)	0.313A	0.245A	0.170A	0.097A	0.013A
Rms Input Power(W)	28.70W	21.60W	14.60W	7.41W	0.25W
T.H.D. (Voltage)	0.23	0.18	0.16	0.12	0.11
True Power Factor	0.391	0.378	0.360	0.330	0.078
Power Consumed by UUT(W)	5.01W	3.72W	2.60W	1.37W	0.25W
Efficiency	82.54%	82.79%	82.19%	81.50%	*
Average Efficiency	82.26%				*

Tester : Wei



" "	" "
" + "	" "
條紋	印字

注意:此圖面所需材料符合"ROHS"標準

- ① 5.5*2.1*23音叉車溝黑色半邊(YY-PD-00186),外模P-184號模(二次成型),用料外PVC60P黑色(YY-PV-00009)
- ② SR-101號模,用料PVC60P黑色(YY-PV-00009),吊重:1米/20磅/60秒
- ③ UL 2468 20AWG(0.16*26) BK OD:1.9*3.8(YY-DC-00164) 裁線長度:1560+10/-0
- ④ PE有鐵芯帶 10CM黑色(YY-ES-00001)
- ⑤ 絕緣阻抗:20Ω,導通阻抗:1.5Ωmax
- ⑥ 單位:MM

料號			制圖	劉鋒
客戶	阿達特	初審		
版次	02	審核		
頁數	01	批准		
圖號	ADT-0949	日期	2009/06/04	
版次	02	內容	SR尺寸	

8.7 Spec. Label Materials : Metalized Polyester Label (Silver Gloss)
 Color : Black Background with Silver Printing
 Label Dimension : 34.5mm(L)*24.5mm(W)+/-0.1mm
 Label Thickness : #75

100%



300%



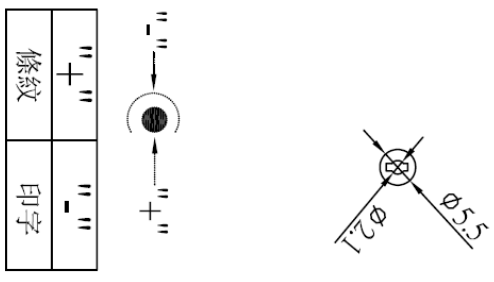
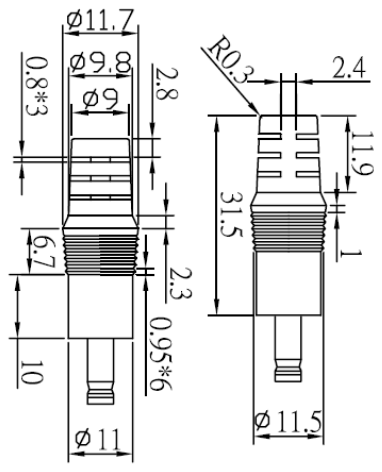
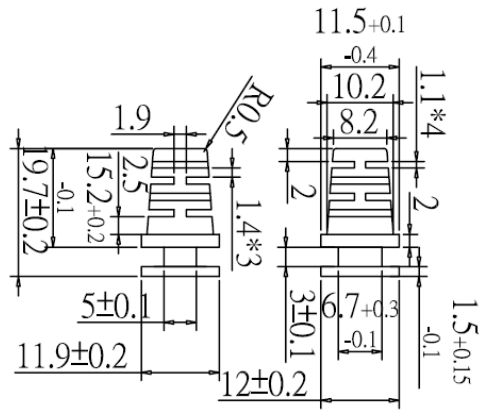
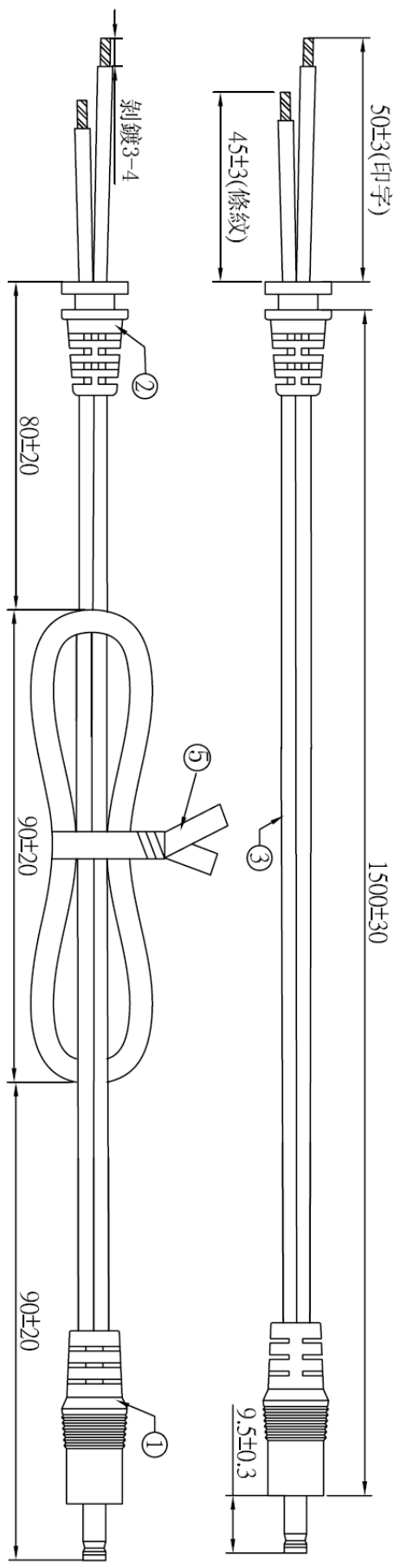
"XXX"

Label supplier's code.
 It is accurate that the number of words depends on the real finished product.

ID NO."X"

Manufacturer's code.
 It is accurate that the number of words depends on the real finished product.

Label Part No. :9443019382



注意:此圖面所需材料符合"ROHS"標準

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- ④ PE有鐵芯帶 10CM黑色(YY-ES-00001)
- ⑤ 絕緣阻抗:20Ω,導通阻抗:1.5Ωmax
- ⑥ 單位:MM

料號				
客戶	阿達特	制圖	劉鋒	
版次	02	初審		
頁數	01	審核		
		批准		
圖號	ADT-0949	日期	2009/06/04	
版次	02	內容	SR尺寸	