

Product Number: AN176GSMR

Product Name: Antenna

# Specification For Approval

Date: 2021.06.02

File No.: 210602001

Version: 1.0

Customer : \_\_\_\_\_

Customer P/N :  /

P/N : **ST-ANGSM-5RSS**

Description : Antenna

Checked By :

Customer Approved By:



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## 2. Specification

Sample Photo	
	
A. Electrical Characteristics	
Frequency	824 ~ 960 MHz 1710 ~ 2170 MHz
S.W.R.	<= 4.5 @ 824 ~ 960 MHz <= 4.0 @ 1710 ~ 2170 MHz Tested at 290mm Square Ground Plane
Antenna Average Gain	- 12 ~ - 9 dBi @ 824 ~ 960 MHz - 7 ~ -5 dBi @ 1710 ~ 2170 MHz Tested at 290mm Square Ground Plane
Polarization	Linear
Impedance	50 Ohm
B. Material & Mechanical Characteristics	
Material of Radiator	Cu
Material of Plastic	Body: TPEE Hinge: ABS Holder: POM
Cable Type	RG-178
Connector Type	SMA Male Reverse
C. Environmental	
Operation Temperature	- 40 °C ~ + 65 °C
Storage Temperature	- 40 °C ~ + 80 °C
Antenna Color Storage life	< 2 year

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### 3. Characteristics and Reliability Test

Test Items 測試項目		Test Condition and Procedure 測試方法	Requirements 要求	Result 結果
C1	V.S.W.R. 電壓駐波比	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	PASS
C2	Insertion Loss 插入損失	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	N/A
C3	Antenna Gain 天線增益	Set DUT on Antenna Chamber; make individual calibration to test 設置天線暗室參數進行測試	Directive DUT specification 符合待測物規範	PASS
C4	Voltage Breakdown 耐電壓	Test voltage should be applied between insulated portions, or between ground as specified. 在絕緣部分測試電壓,或指定接地面之間	Max Voltage $\geq$ 500 V or directive material specification 最大電壓 $\geq$ 500V 或符合材料規範	N/A
C5	Insulation Resistance 絕緣阻抗	Set Voltage: 500 $\pm$ 50V; between the insulated portions, or between ground as specified. 設置電壓 500 $\pm$ 50V,在絕緣部份測試或指定接地面之間	Resistance $\geq$ 500 M ohm or directive material specification 阻抗 $\geq$ 500M ohm 或符合材料規範	N/A
C6	Contact Resistance 接觸阻抗	Air Temp: 26°C; measured with test equipment 室溫 26°C, 指定量測設備	Directive material specification 符合材料規範	N/A
M1	Vibration 震動	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction 振幅 1.5mm ; 頻率 20~80~20Hz ; 3 個方向各 2H	1. No Visual Damage 2. Frequency Tol. $\leq$ 5% 無明顯外觀不良; 頻率偏移 $\leq$ 5%	PASS
M2	Random Drop 跌落	GB / T2423.8-1995 Single : Height: 1.0 Meter; 3 directions; 1 time for each direction 單支天線, 高 1m ; 3 個方向各 1 次	1. No parts separated 、 fracture 2. Frequency Tol. $\leq$ 5% 產品無脫落、斷裂; 頻率偏移 $\leq$ 5%	PASS
		Packing : Height: 0.76 Meter; 1 corner, 3 edges, 6 surface 包裝 : 高 0.76m , 一角、三棱、六面各一次		PASS
		Antenna+Machine: Height: 0.76 Meter; 1 corner, 3 edges, 6 surface. 整機 : 高 0.76m , 一角、三棱、六面各一次	N/A	
M3	Solderability	GB / T2423.28-2005	Tin evenly on full	N/A

Product Number: AN176GSMR

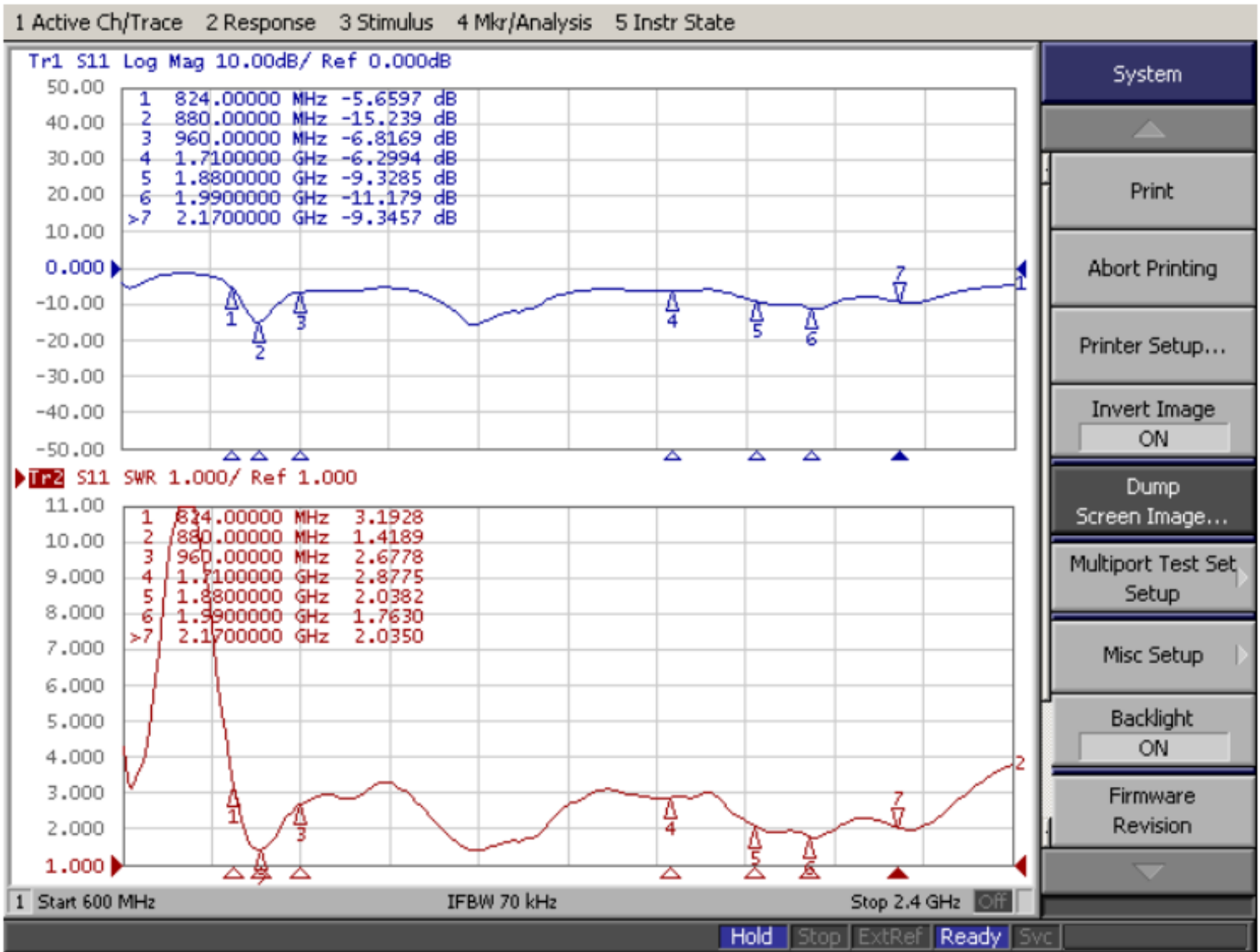
Product Name: Antenna

	可焊性	Temp: 260±5° C;Duration: 5 seconds 溫度 260±5° C;持續 5 秒	上錫均勻飽滿	
M4	Pull Test 拉力	Holding with individual specification; force applied to axis of terminal .單獨定義產品端子拉力	1. Directive DUT specification 2. Frequency Tol.≤5% 符合待測物規範;頻率偏移≤5%	PASS
M5	Torque Test 扭力	Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal 單獨定義產品端子之順時針及逆時針扭力	1. Directive DUT specification 2. Frequency Tol.≤ 5% 符合待測物規範;頻率偏移≤5%	PASS
M6	Dimension 尺寸	Inspection of dimension, color, material, package, surface process.檢查尺寸,顏色,材料,包裝,表面處理	Directive DUT specification 符合待測物規範	PASS
E1	Waterproof 防水	With Reference to IEC 60529 // IP Code Definition 參考 IEC60529 IP 定義	Directive DUT specification 符合待測物規範	N/A
E2	Salt Spray 鹽霧	GB / T 2423.17-2008 Temp: 35°C; RH: ≥ 95%; NaCl solution: ≥ 5%;Time: 24H 溫度 35°C ; 濕度≥95%;鹽水濃度≥5% ; 測試 24H	1. No Visual Damage 2. Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	PASS
E3	Temperature and Humidity Chamber 恒溫恒濕	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: ≥ 90%; Time: 24H 溫度 80°C 測試 12H 轉-40°C 測試 12H; 濕度≥ 90% ; 時間 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	PASS
E4	Thermal Shock 冷熱衝擊	GB / T 2423.22 - 2008 - 40°C (30 minutes) to + 80°C (30 minutes) ; Cycles: 24 - 40°C 測試 30 分轉 80°C 測試 30 分爲一個週期; 共 24 週期	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	N/A
E5	Aging test 老化	GB / T 2423.2 - 2008 Temp: 80°C; Time: 24 hours 溫度 80°C , 測試 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	PASS
E6	High Temp. 高溫	Temp. 270±10°C ; Times : 120 seconds 溫度 270±10°C , 測試時間 120 秒	No Visual Damage 無明顯外觀不良	N/A
R1	RoHS	With Reference to IEC 62321:2008 with flow chart 參考 IEC 62321 測試流程	Directive RoHS 2011/65/EU 符合 RoHS 2011/65/EU 標準	PASS
R2	PFOS	With Reference to USA EPA 3550C:1996 by LC/MS 參考 USA EPA 3550C 測試流程	Directive RoHS 2006/122/EC 符合 RoHS 2011/65/EU 標準	PASS

Product Number: AN176GSMR

Product Name: Antenna

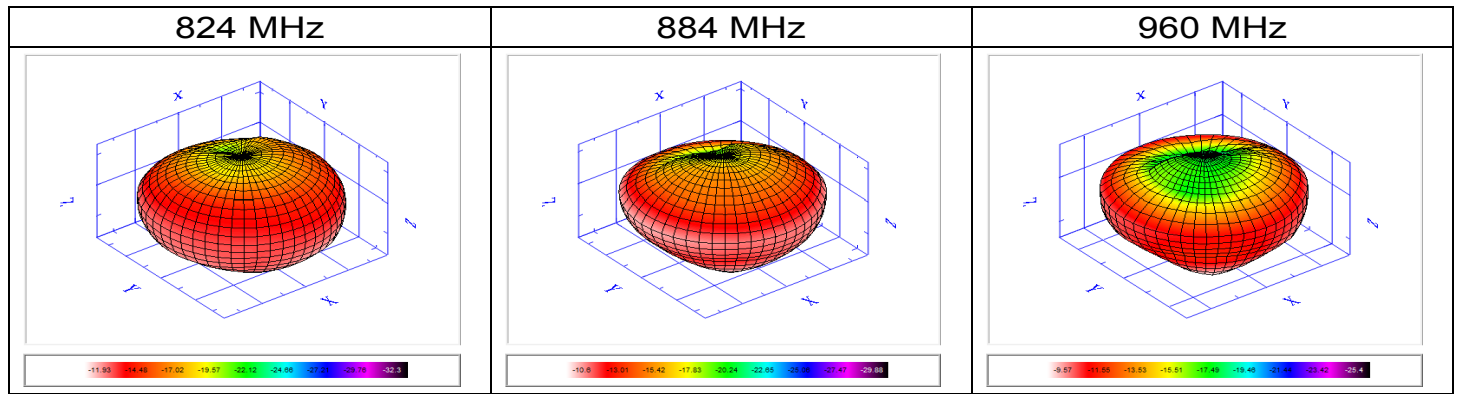
### 4. Antenna - S Parameter Test Data



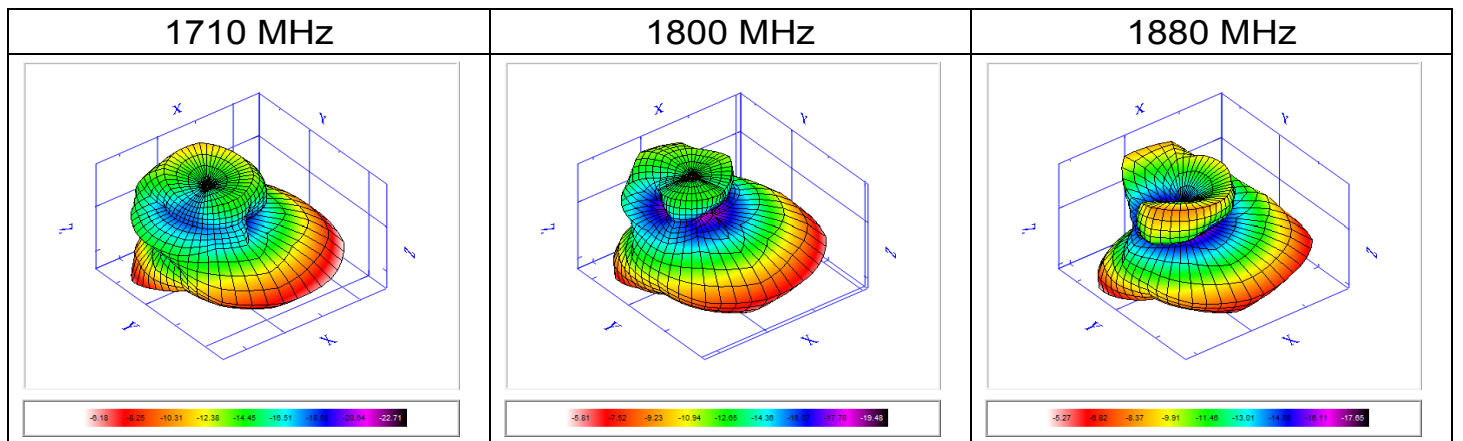
Product Number: AN176GSMR

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### 5. Antenna - Radiation Pattern Test Data



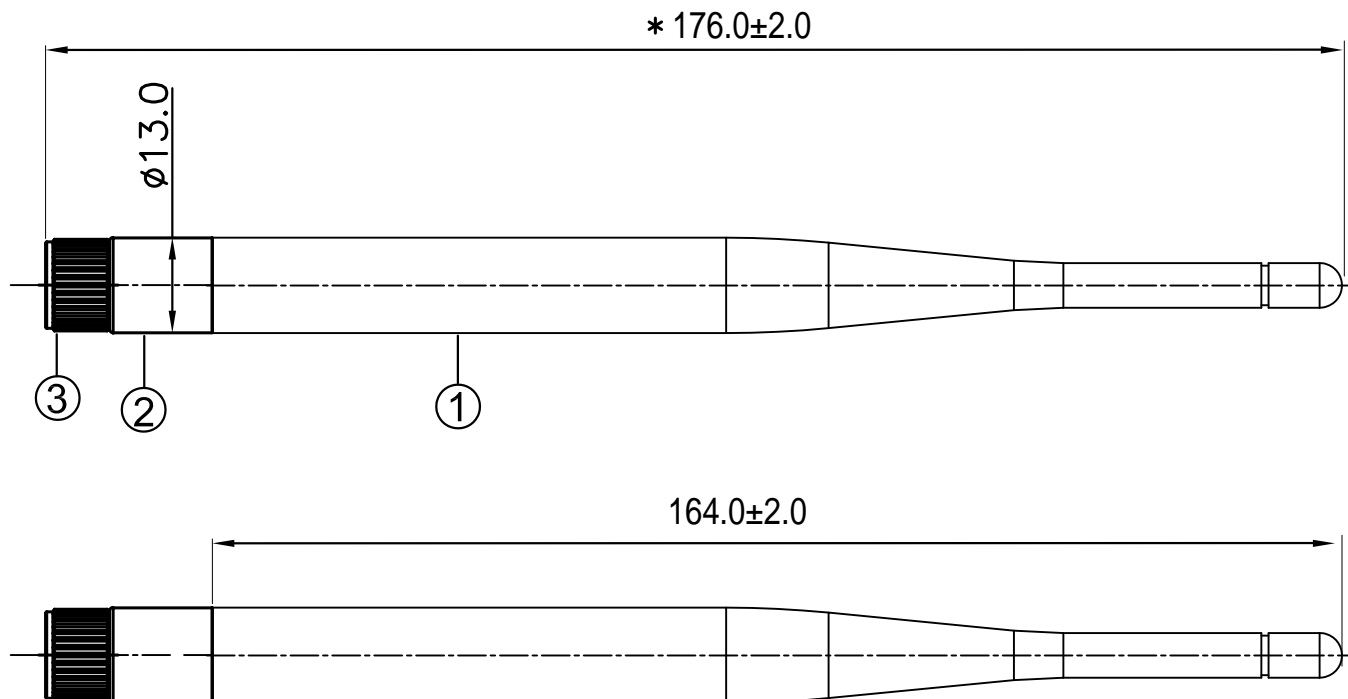
Frequency	824	839	854	869	884	899	914	929	944	959	960
TRP (dBm)	-14.84	-14.67	-14.38	-13.69	-13.5	-13.57	-13.63	-13.46	-13.5	-12.92	-12.88
Peak EIRP (dBm)	-11.93	-12.05	-11.77	-10.86	-10.6	-10.81	-10.72	-10.51	-10.42	-9.62	-9.57
NHPRP +/- 45 (degree)	-14.9	-14.72	-14.42	-13.73	-13.52	-13.58	-13.63	-13.44	-13.45	-12.82	-12.78
NHPRP +/- 30 (degree)	-15.6	-15.45	-15.19	-14.52	-14.33	-14.4	-14.44	-14.27	-14.33	-13.75	-13.71
E-Theta Peak Gain (dBi)	-17.35	-17.01	-16.55	-16.35	-16.35	-16.53	-16.01	-15.34	-15.35	-14.65	-14.6
E-Phi Peak Gain (dBi)	-12.55	-12.23	-11.9	-11.05	-10.79	-10.99	-11.25	-10.91	-10.68	-9.88	-9.83
E-Total Peak Gain (dBi)	-11.93	-12.05	-11.77	-10.86	-10.6	-10.81	-10.72	-10.51	-10.42	-9.62	-9.57
Directivity (dBi)	2.91	2.62	2.61	2.83	2.9	2.76	2.92	2.95	3.08	3.29	3.3
Efficiency (%)	3.28	3.41	3.65	4.28	4.47	4.4	4.33	4.5	4.47	5.11	5.16



Frequency	1710	1760	1800	1850	1880
TRP (dBm)	-12.14	-11.51	-11.56	-11.52	-10.59
Peak EIRP (dBm)	-6.18	-6.15	-5.81	-6.32	-5.27
NHPRP +/- 45 (degree)	-11.89	-11.25	-11.38	-11.49	-10.69
NHPRP +/- 30 (degree)	-14.46	-13.79	-13.88	-13.76	-12.96
E-Theta Peak Gain (dBi)	-13.8	-13.49	-13.7	-14.31	-14.32
E-Phi Peak Gain (dBi)	-6.6	-6.31	-5.83	-6.45	-5.36
E-Total Peak Gain (dBi)	-6.18	-6.15	-5.81	-6.32	-5.27
Directivity (dBi)	5.96	5.36	5.75	5.2	5.32
Efficiency (%)	6.1	7.06	6.98	7.04	8.73

# RoHS

## Compatible



SIGN	DATE	DESCRIPTION	APPROVER
△			
△			
△			

No.	Part Number	Description	Material	Finished	Q'ty
3	SMA-MC-920N-A	SMA公頭母針	CU	黑色	1
2	AN0304-T01B	連接頭	ABS	黑色	1
1	AN9201-04B	天線塑膠外套	TPE	黑色	1

TITLE: GSM Antenna				
PART NO.: AN176GSMR			CUSTOMER P/N: /	
APP BY	CHK BY	RF BY	DES BY	Tolerance X.X ±0.3 X.XX ±0.2 X° ±1
LQ	DJC			
2021.06.02	2021.06.02			UNITS: mm SCALE: 1/1 REVISION: A

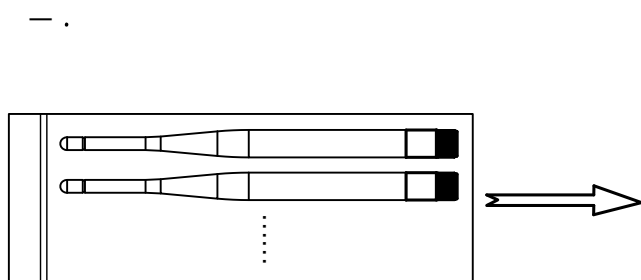


# PACKING CRITERION

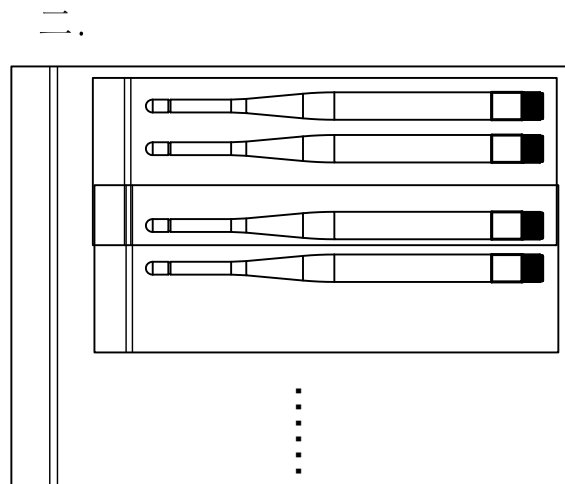
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Page: 1 of 1

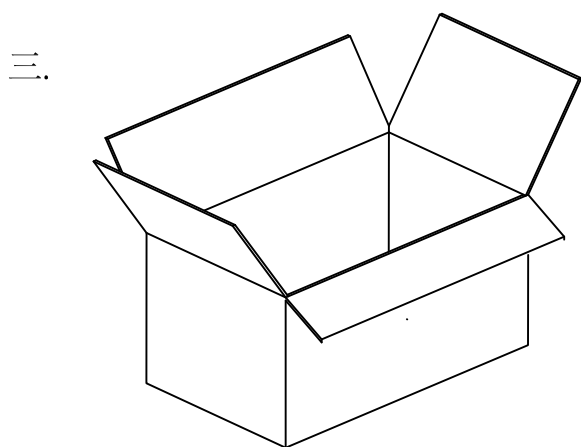
Part Number : AN176GSMR	Revision : A
Name: GSM Antenna	Customer : ALL



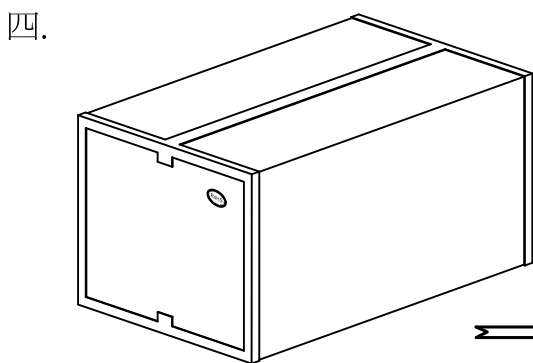
R-PE-BAG-29590006 10PCS/BAG



R-PE-BAG-300245006 50PCS /BAG

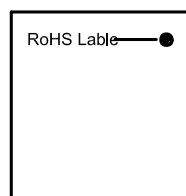


规格 : 29\*23\*32.5CM 500pcs/箱



SIDE

FRONT



APPROVED BY :   LQ  

CHECKED BY :           

DESIGNED BY :   D