

Product Number: AN002
Product Name: Antenna

Specification For Approval

Date: 2019-04-29

File No.: 190429003

Version: 1.0

Customer : _____

Customer P/N : _____

P/N : : **AN002** _____

Description : Antenna

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| Checked By: |
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| Customer Approved By: |
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Product Number: AN002
Product Name: Antenna

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Product Number: AN002

Product Name: Antenna

1. Revision History

| Revision | Date | Change Notification | Description |
|----------|------------|---------------------|-------------|
| 1.0 | 2019-04-29 | 初版 | |
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Product Number: AN002

Product Name: Antenna

2. Specification

| | |
|---|---|
| Sample Photo | |
| | |
| A. Electrical Characteristics | |
| Frequency | 824 ~ 960 MHz 1710 ~ 2170 MHz |
| S.W.R. | <= 6.0 @ 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 |
| Cable Type | RG-178 |
| Connector Type | SMA Male |
| 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 |

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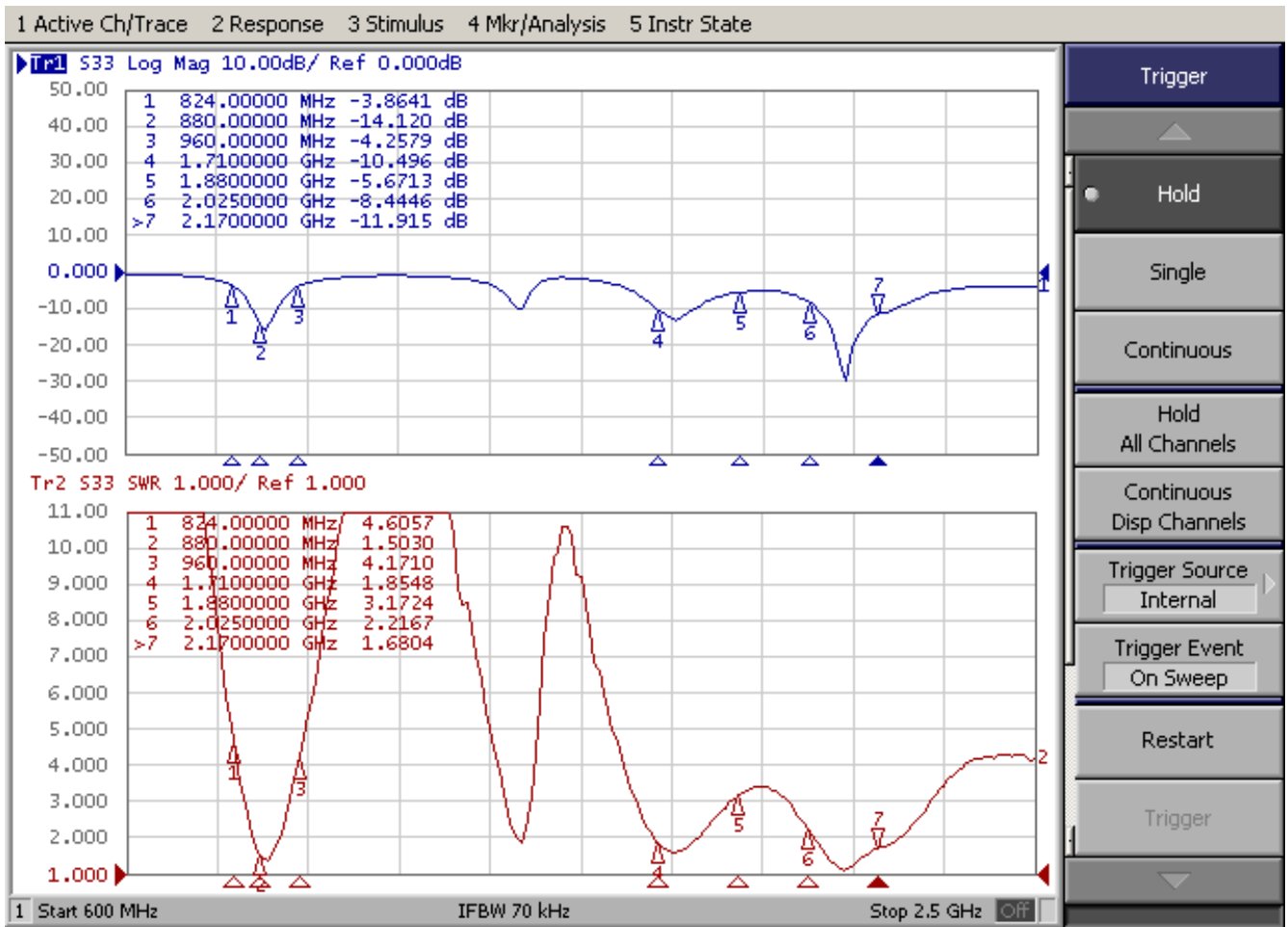
Product Name: Antenna

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|----|--|---|---|------|
| | 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.检查尺寸,颜色,材料,包装,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 恆溫恆濕 | 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 分為一個週期;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% | PASS |
| 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 |

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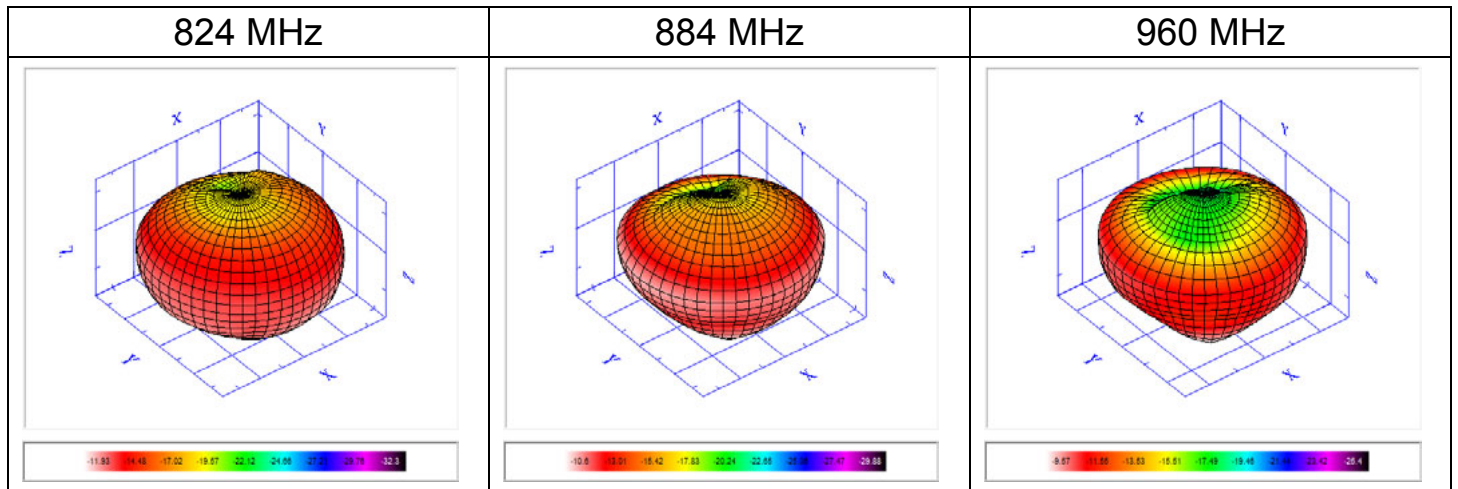
4. Antenna - S Parameter Test Data



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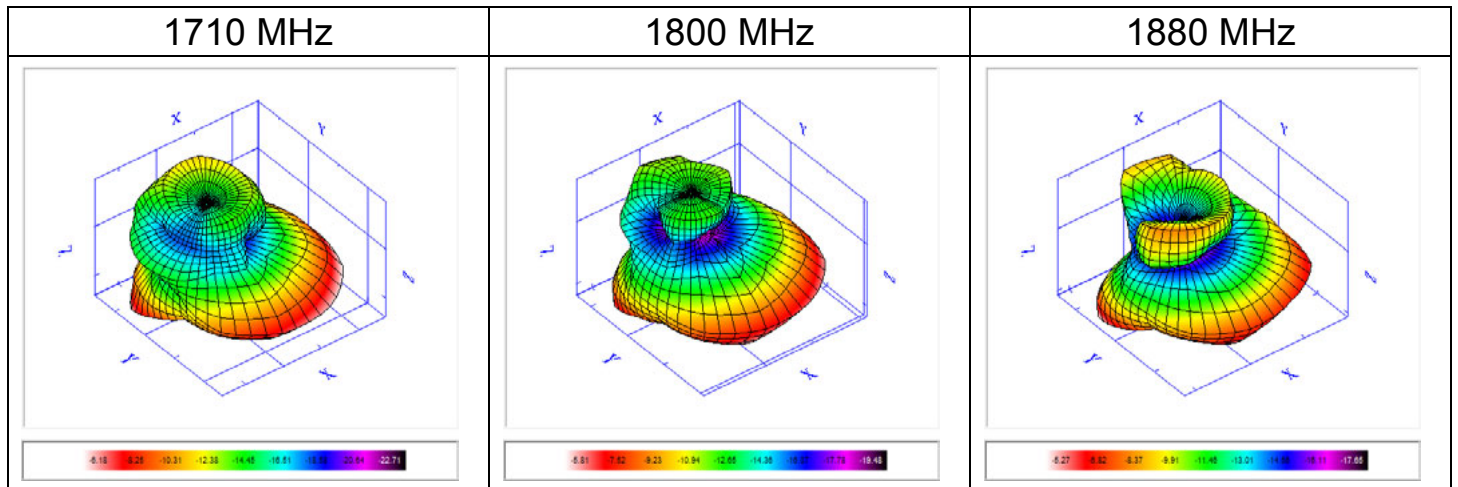
Product Name: Antenna

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 |

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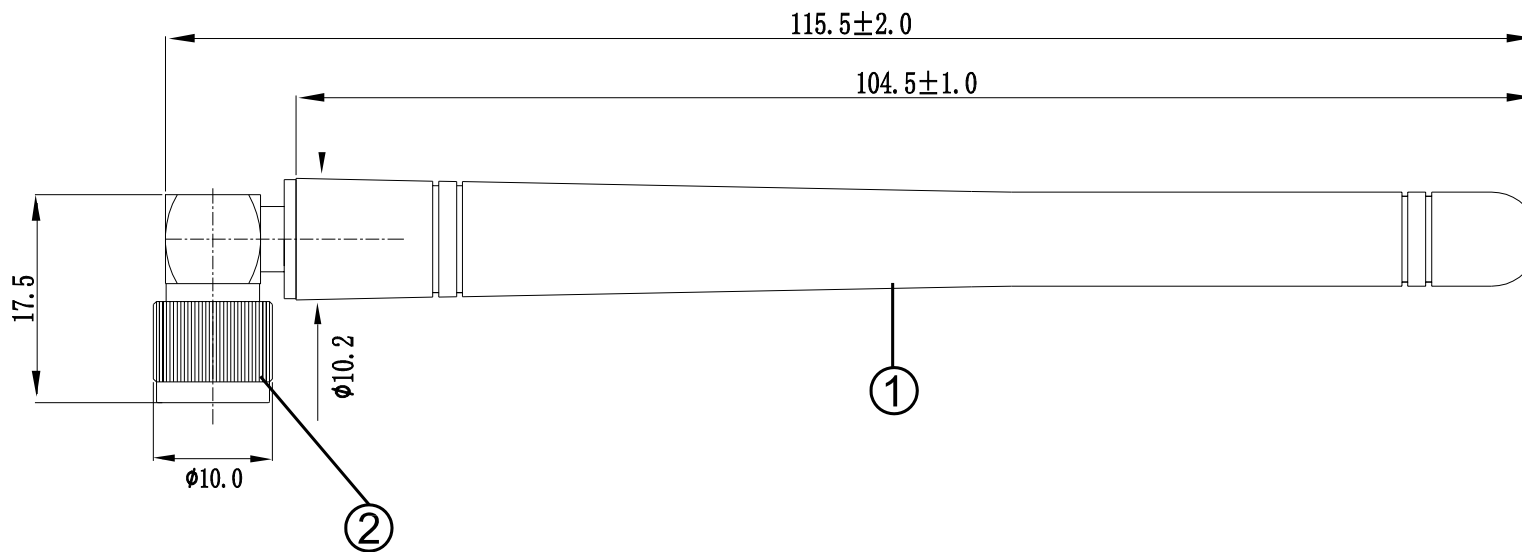
| | | | | | |
|-------------------------|--------|--------|--------|--------|--------|
| Frequency | 1710 | 1760 | 1800 | 1850 | 1880 |
| TRP (dBm) | -12.14 | -11.51 | -11.56 | -11.52 | -10.59 |
| Peak EIRP (dBm) | -6.18 | -6.15 | -5.81 | -6.32 | -5.27 |
| NHPRP +/- 45 (degree) | -11.89 | -11.25 | -11.38 | -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 |
|------|------|-------------|----------|
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| △ | | | |
| △ | | | |



Note:

- 1.Take " * "is the important dimension.
- 2.Tolerance:Unmarked tolerance refer to the standard tolerance please.

| 2 | SMA805-CBT5A56-E | SMA Male | CU | 镀镍 | 1 |
|-----|------------------|----------|----------|--------|------|
| 1 | BODY-AN57-01B | Body1 | TPEE | 黑色 | 1 |
| No. | Part Number | Name | Material | Finish | Q'ty |

| | | | | | |
|------------------------|--------|-------|-----------------|--|--------------------------------|
| TITLE: Antenna GSM | | | | | |
| PART NO.: AN002 | | | CUSTOMER P/N: / | | |
| APP BY | CHK BY | RF BY | DES BY | UNITS: mm SCALE: 1/1 REVISION: A | Tolerance |
| LQ | | | DJC | | X.X ±0.5 X.XX ±0.2 X° ±1 |
| 2018/10/20 | | | 2018/10/20 | | |

產品包裝規範

PACKING CRITERION

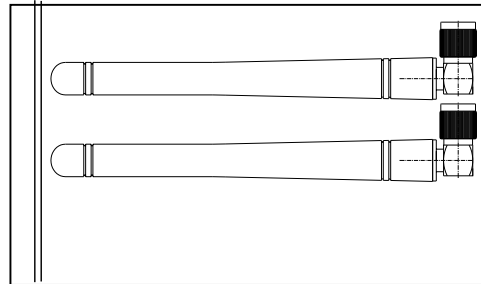


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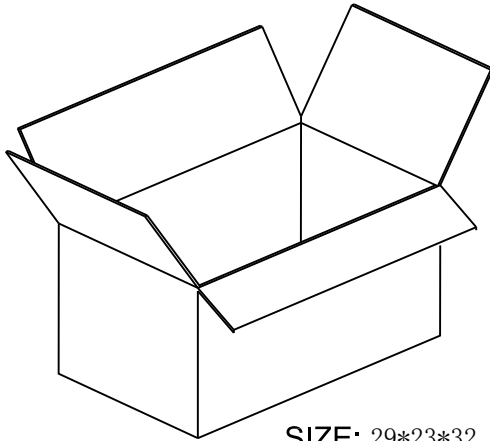
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|----------------------------|----------------|
| Part Number : AN002 | Revision : A |
| Name: Antenna | Customer : ALL |

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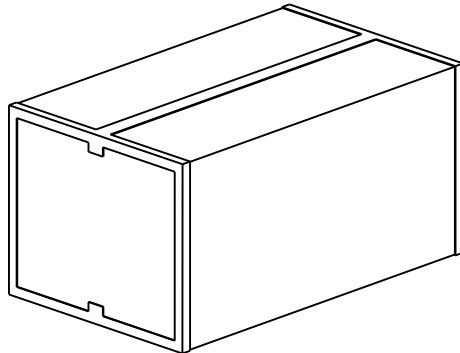
R-PE-BAG-220150006 50PCS/BAG

2.



SIZE: 29*23*32.5CM
1200 PCS/BOX

3.



APPROVED BY : LQ

CHECKED BY : DJC

DESIGNED BY :