

# Specification For Approval

Date: 2013 / 07 / 01

File No.: 130701001

Version: 1.0

Customer : 盛達電業股份有限公司

Customer P/N : AAZANDXSXAN0727101

INVAX P/N : AN0727-13B03SM

Description : Antenna

Cortec Checked By:

R@D Dept  
2013.07.01  
Jack

Customer Approved By:



**INVAX System Technology Corp.**  
4F. No. 815.Chung Hsiao East Rd.,Sec.5  
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<http://www.invaxsystem.com>



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Province, China

TEL:86-76 9-85388261 F AX:86-769-85317869  
<http://www.cortec.com.cn>

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Product Number: AN0727-13B03SM

Product Name: Antenna



## 1. Revision History

| Revision | Date       | Change Notification | Description |
|----------|------------|---------------------|-------------|
| 1.0      | 2013.07.01 |                     |             |
|          |            |                     |             |
|          |            |                     |             |
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|          |            |                     |             |

Product Number: AN0727-13B03SM

Product Name: Antenna



## 2. Specification

|                                                                                    |                                                                           |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Sample Photo                                                                       |                                                                           |
|  |                                                                           |
| A. Electrical Characteristics                                                      |                                                                           |
| Frequency                                                                          | 700 ~ 960 MHz<br>1710 ~ 2700 MHz                                          |
| S.W.R.                                                                             | $\leq 3.5$ @ 700 ~ 960 MHz<br>$\leq 4.0$ @ 1710 ~ 2700 MHz                |
| Antenna Gain                                                                       | $1.0 \pm 0.7\text{dBi}$ @ low Band<br>$1.0 \pm 0.7\text{dBi}$ @ High Band |
| Polarization                                                                       | Linear                                                                    |
| Impedance                                                                          | 50 Ohm                                                                    |
| B. Material & Mechanical Characteristics                                           |                                                                           |
| Material of Radiator                                                               | Cu                                                                        |
| Material of Plastic                                                                | TPE & ABS                                                                 |
| Cable Type                                                                         | RG-178                                                                    |
| Connector Type                                                                     | SMA Male                                                                  |
| Pull Test                                                                          | $\geq 5$ Kg                                                               |
| C. Environmental                                                                   |                                                                           |
| Operation Temperature                                                              | - 40 °C ~ + 65 °C                                                         |
| Storage Temperature                                                                | - 40 °C ~ + 80 °C                                                         |

Product Number: AN0727-13B03SM

Product Name: Antenna



### 3. Characteristics and Reliability Test

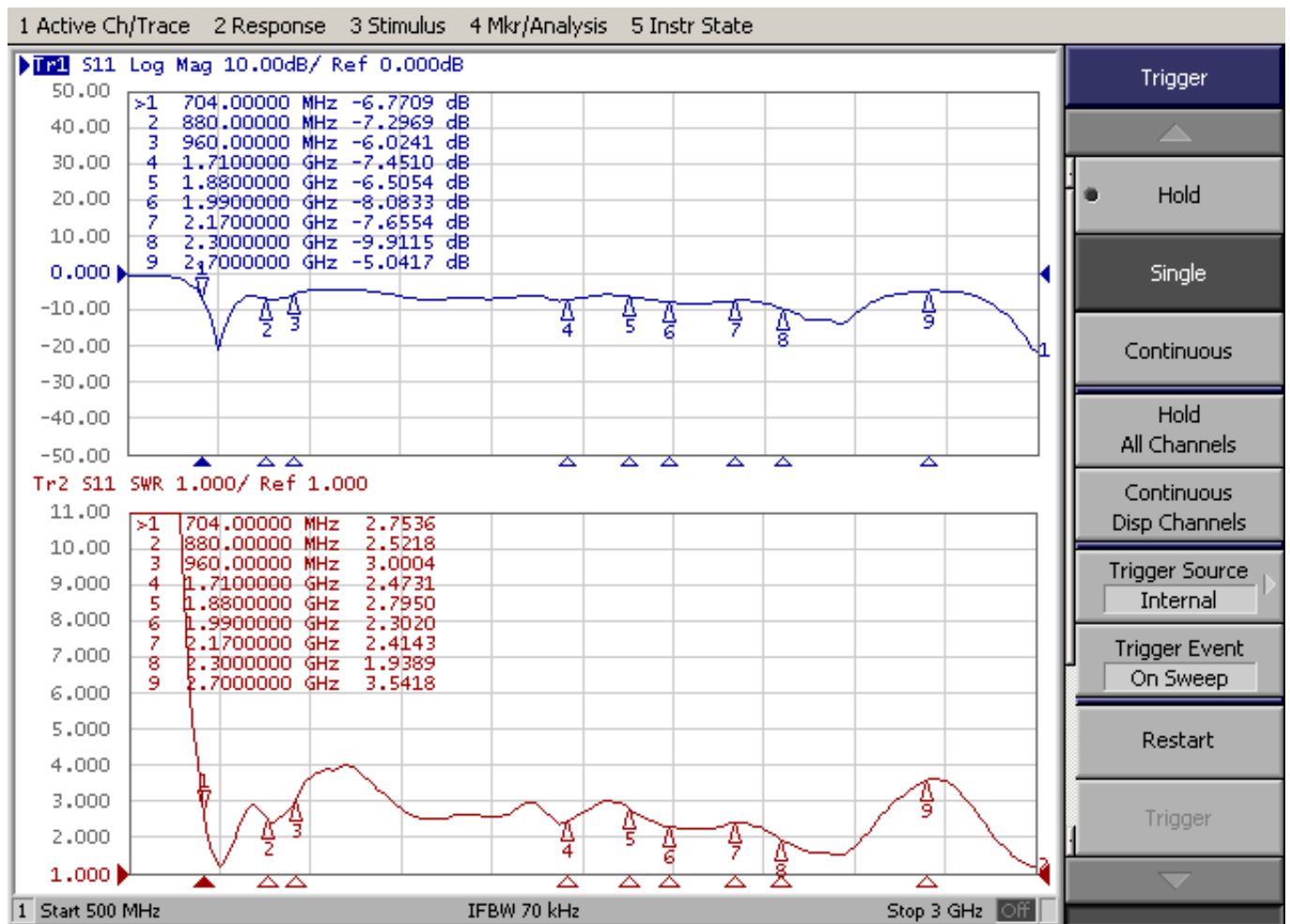
| Test Items |                      | Test Condition and Procedure                                                                                              | Requirements                                                            |
|------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| C1         | S.W.R.               | Set DUT on Network Analyzer; make individual calibration to test                                                          | Directive DUT specification                                             |
| C2         | Antenna Gain         | Set DUT on Antenna Chamber; make individual calibration to test                                                           | Directive DUT specification                                             |
| M1         | Vibration            | GB / T2423 . 48-1997<br>Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz<br>3 directions; 2 hours for each direction | 1. No Visual Damage<br>2. Frequency Tol.<= 5%                           |
| M2         | Random Drop          | GB / T2423.8-1995<br>Height: 1.0 Meter;<br>3 directions; 1 time for each direction                                        | 1. No parts separated<br>2. Frequency Tol.<= 5%                         |
| M3         | Solderability        | GB 2423 . 28- 82<br>Solder iron: 260±5°C; Duration: 5 seconds                                                             | 1. Mounted on PCB<br>2. No Visual Damage                                |
| M4         | Terminal-Pull Test   | Holding with individual specification; force applied to axis of terminal                                                  | 1. Directive DUT specification<br>2. Frequency Tol.<= 5%                |
| M5         | Terminal-Torque Test | Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal                     | 1. Directive DUT specification<br>2. Frequency Tol.<= 5%                |
| M6         | Dimension            | Inspection of dimension, color, material, package, surface process                                                        | Directive DUT specification                                             |
| E1         | Salt Spray           | GB / T 2423 . 17- 93<br>Temp: 35°C; RH: >= 95%; NaCl solution: >= 5%;<br>Time: 24 hours                                   | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol.<= 5% |
| E2         | Humidity             | GB / T 2423 . 4 - 93<br>Temp: 80°C / 12 H; -40°C / 12H RH: >= 90%;<br>Time: 24 hours                                      | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol.<= 5% |
| E3         | Thermal Shock        | GB / T 2423 . 22 - 87<br>1 Cycle: - 40°C (30 minutes) to + 80°C (30 minutes)<br>Cycles: 24                                | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol.<= 5% |
| E4         | Life (High Temp.)    | GB / T 2423 . 2 - 89<br>Temp: 80°C; Time: 24 hours                                                                        | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol.<= 5% |
| R1         | RoHS                 | With Reference to IEC 62321:2008 with flow chart                                                                          | Directive RoHS 2011/65/EU                                               |
| R2         | PFOS                 | With Reference to USA EPA 3540C:1996 by LC/MS                                                                             | Directive RoHS 2006/122/EC                                              |
| R3         | PFOA                 | With Reference to USA EPA 3540C:1996 by LC/MS                                                                             | Directive RoHS 2006/122/EC                                              |

Product Number: AN0727-13B03SM

Product Name: Antenna



#### 4. Antenna - S Parameter Test Data



Product Number: AN0727-13B03SM

Product Name: Antenna



## 5. Antenna - Radiation Pattern Test Data

### Testing Equipment Specification:

Antenna Anechoic Chamber Dimension: 8 x 4 x 4 m

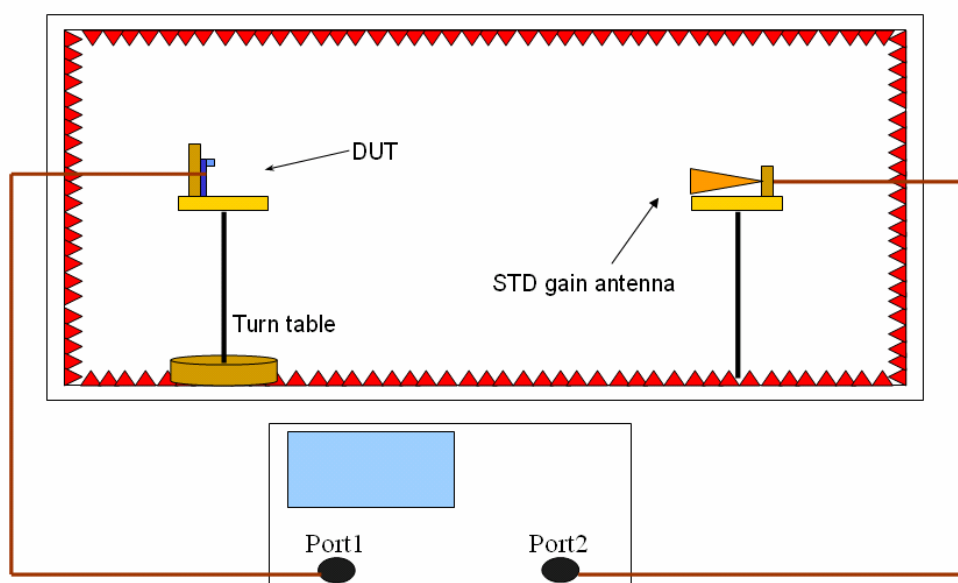
Quiet Zone: 600mm @1 GHz

Isolation: >100dB @ 1 MHz ~ 10 GHz

Testing Equipment: Agilent 5071B

Received Antenna: 0.7 ~ 6.0 GHz for Gain Calibration

Double Ridged Horn Antenna



## 6. Mechanical Drawing

See attached files

## 7. Material Description and RoHS Test Report

See attached files

Antenna LTE Antenna/bm  
Remark: H-Plane/V-Pol  
Tested by : Antenna 3D Lab

Location: **Chamber**

Date: **2012/8/23**

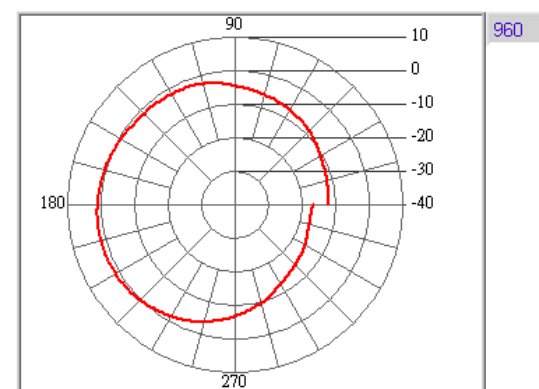
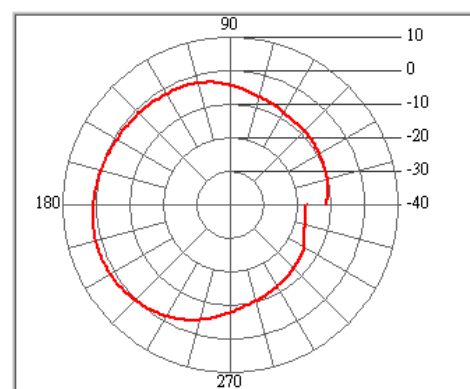
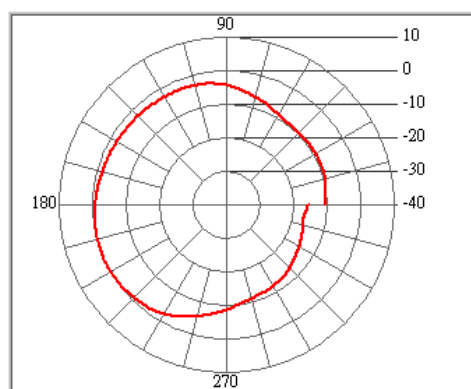
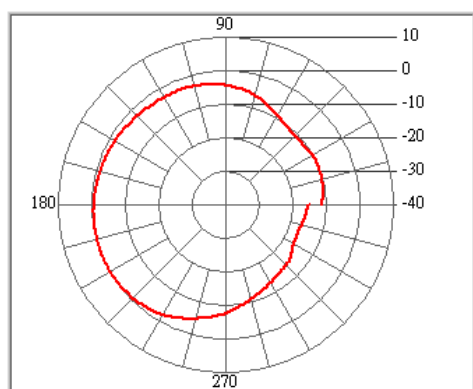
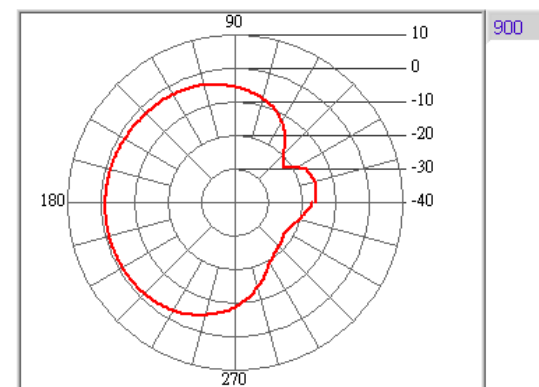
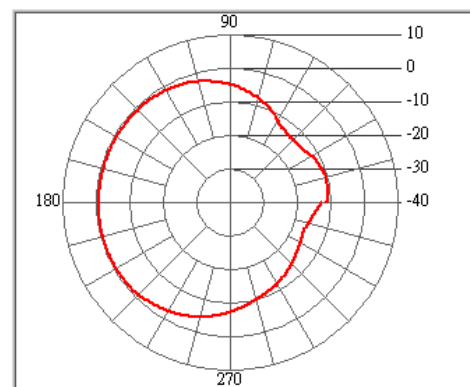
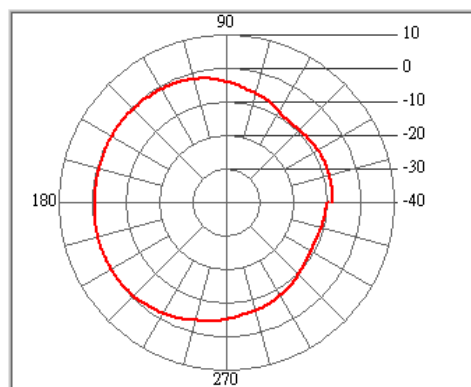
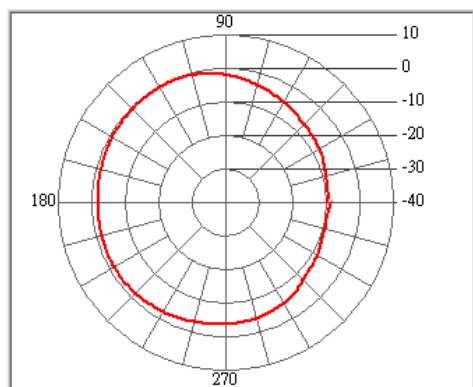
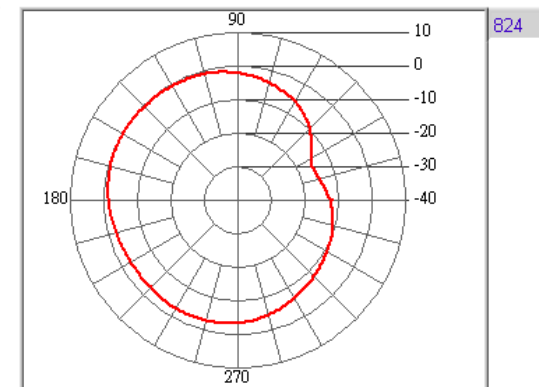
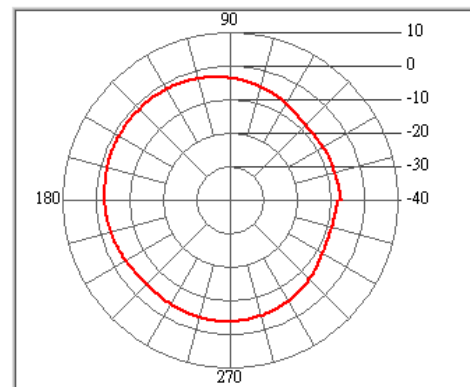
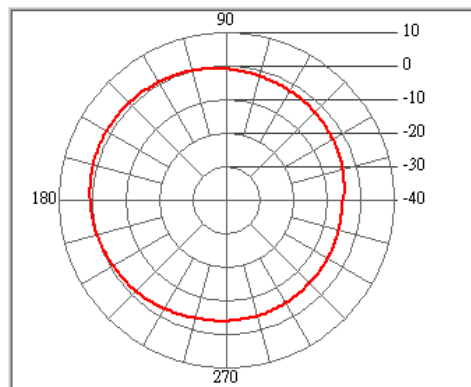
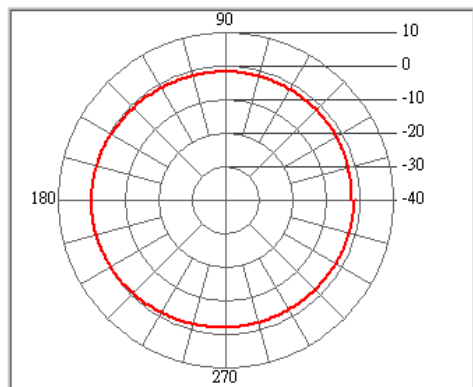
Time: **下午 04:59:48**

Temperatuer (°C): **25.00**

Humidity (%): **65.00**

Approved by:

| Freq. (MHz)     | 704   | 750   | 800   | 824   | 850   | 870   | 880   | 900   | 920   | 930   | 950   | 960   |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Peak Gain (dBi) | 0.06  | 1.37  | -1.49 | -0.33 | -0.28 | -0.25 | -0.59 | -1.14 | -0.21 | -0.02 | 1.49  | 1.38  |
| Peak Degree     | 193   | 151   | 131   | 151   | 120   | 204   | 204   | 193   | 204   | 204   | 204   | 203   |
| AV Gain (dBi)   | -1.38 | -1.62 | -4.26 | -3.58 | -3.22 | -3.38 | -4.15 | -5.11 | -4.32 | -4.37 | -3.26 | -3.22 |





Cortec Technology Inc.

广东省东莞市长安镇振安路沙头段咸西工业区

Antenna LTE Antenna/bm  
Remark: H-Plane/V-Pol  
Tested by : Antenna 3D Lab

Location: **Chamber**

Date: **2012/8/23**

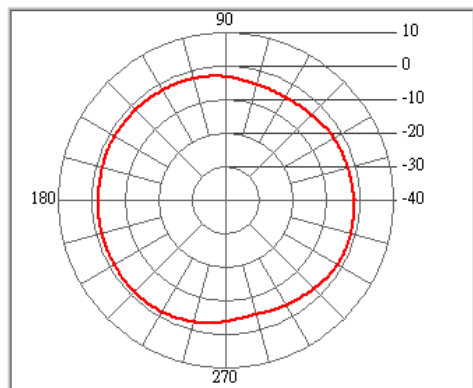
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Temperatuer (°C): **25.00**

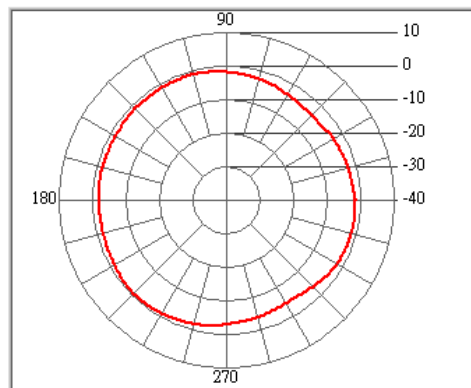
Humidity (%): **65.00**

Approved by:

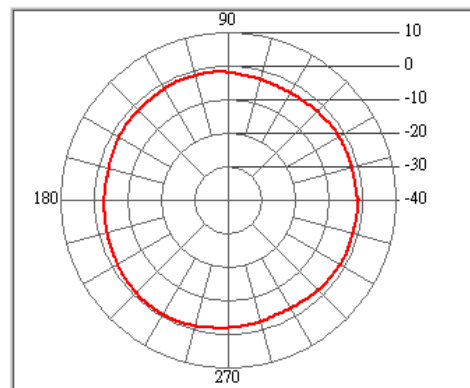
| Freq. (MHz)     | 1710  | 1750  | 1790  | 1820  | 1860  | 1880  | 1920  | 1950  | 1990  | 2050  | 2100 | 2170 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Peak Gain (dBi) | -1.29 | -0.66 | -0.75 | -1.08 | -1.51 | -2.09 | -1.14 | -1.51 | -1.16 | -0.21 | 1.32 | 1.05 |
| Peak Degree     | 345   | 230   | 241   | 241   | 0     | 93    | 262   | 251   | 93    | 93    | 360  | 360  |
| AV Gain (dBi)   | -2.44 | -2.13 | -1.99 | -2.24 | -2.38 | -3    | -2.16 | -2.29 | -1.8  | -0.65 | 0.57 | 0.28 |



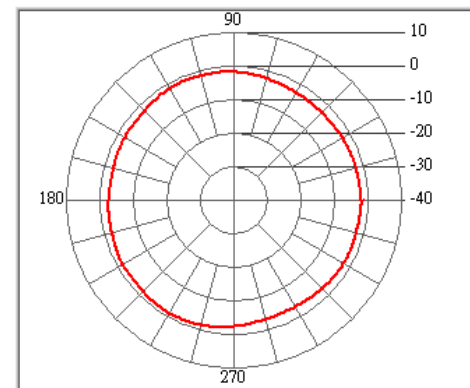
1710



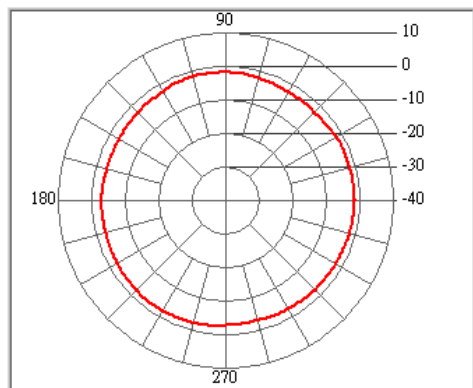
1750



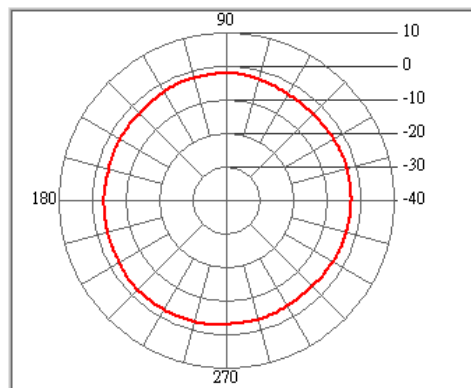
1790



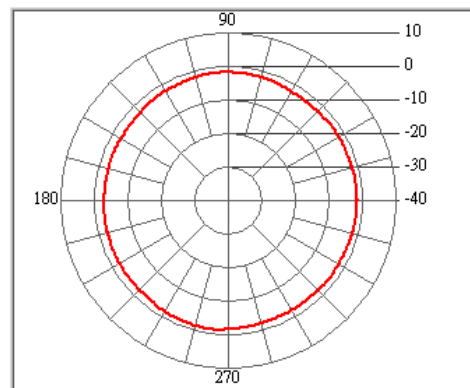
1820



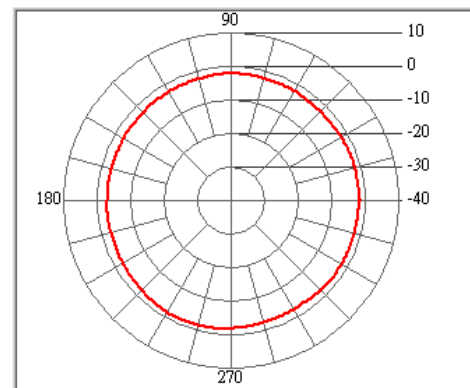
1860



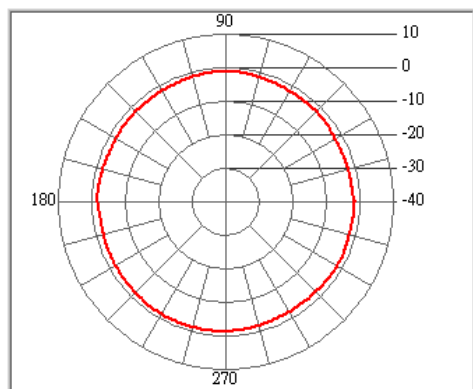
1880



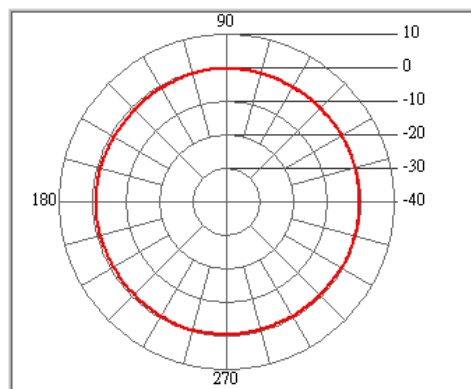
1920



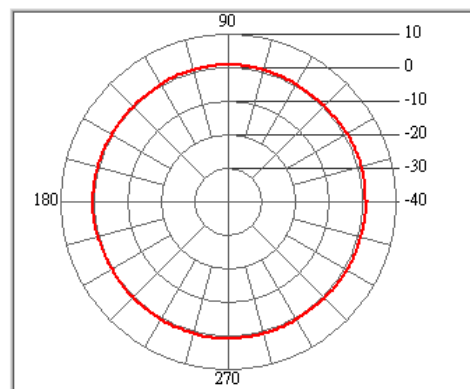
1950



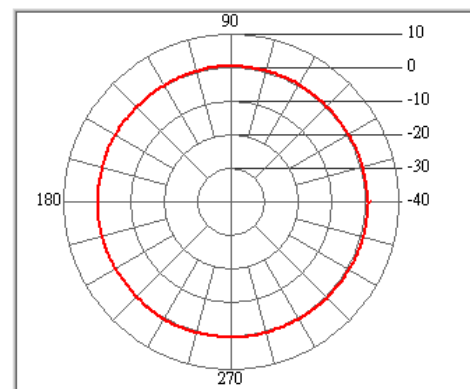
1990



2050



2100



2170



Cortec Technology Inc.

广东省东莞市长安镇振安路沙头段咸西工业区

Antenna LTE Antenna/bm  
Remark: H-Plane/V-Pol  
Tested by : Antenna 3D Lab

Location: **Chamber**

Date: **2012/8/23**

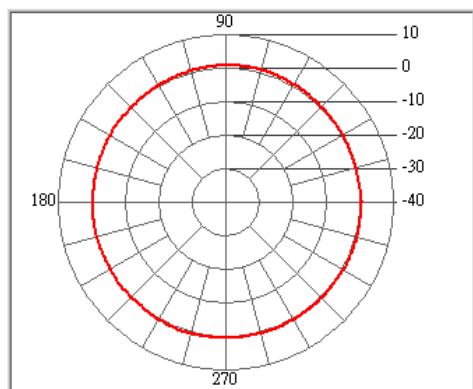
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Temperatuer (°C): **25.00**

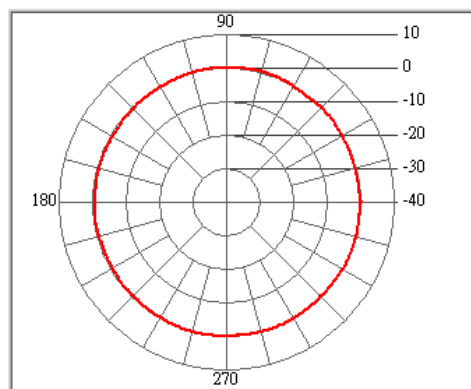
Humidity (%): **65.00**

Approved by:

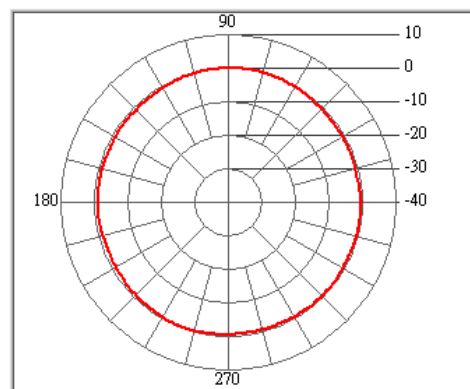
| Freq. (MHz)     | 2200 | 2250  | 2300  | 2350  | 2400  | 2450  | 2500 | 2550  | 2600  | 2650  | 2680  | 2700  |
|-----------------|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| Peak Gain (dBi) | 0.91 | 0.4   | 0.09  | 0.03  | -0.3  | 0.85  | 0.68 | 0.26  | 0.41  | 1.74  | 2.33  | 2.46  |
| Peak Degree     | 74   | 74    | 84    | 105   | 74    | 64    | 189  | 22    | 168   | 1     | 2     | 0     |
| AV Gain (dBi)   | 0.28 | -0.22 | -0.63 | -0.67 | -1.55 | -0.96 | -0.3 | -0.91 | -1.19 | -0.78 | -0.38 | -0.48 |



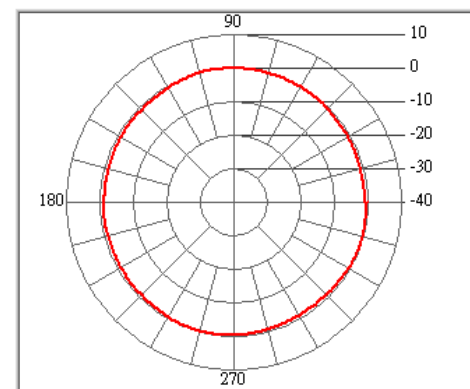
2200



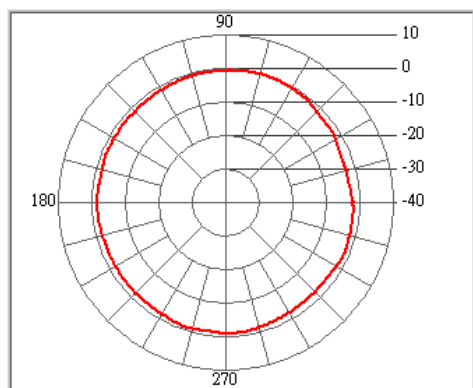
2250



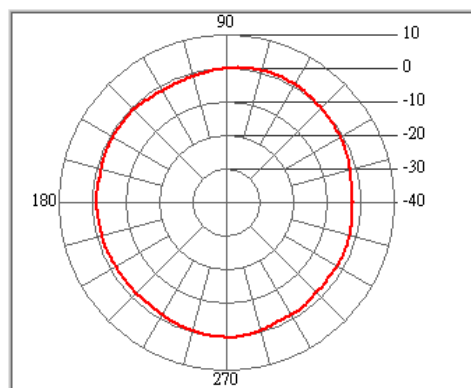
2300



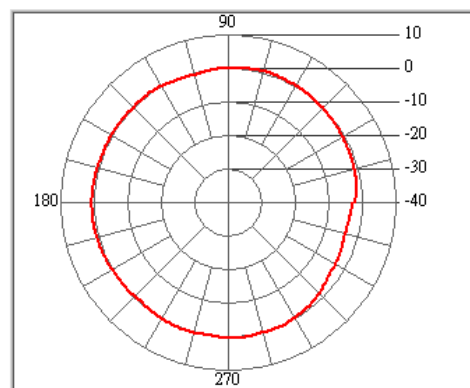
2350



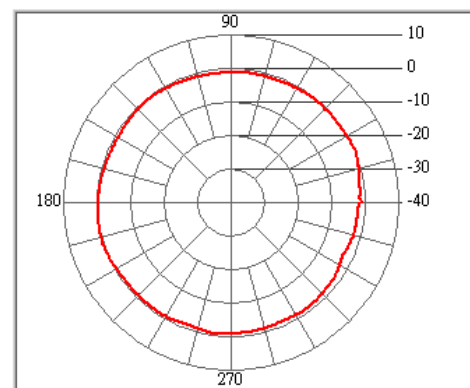
2400



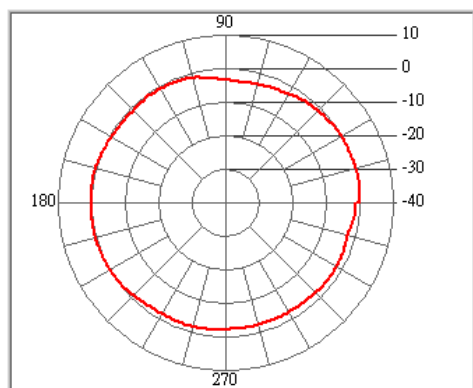
2450



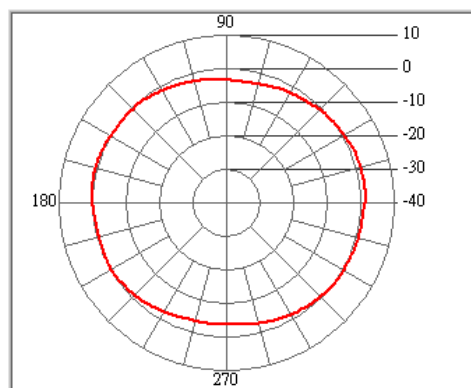
2500



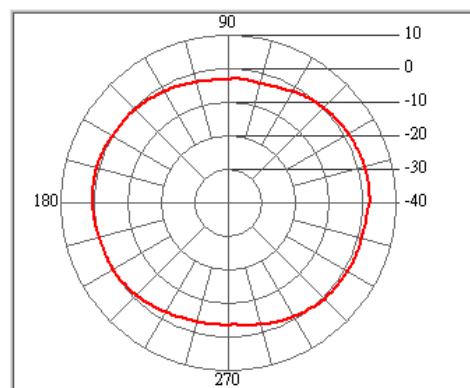
2550



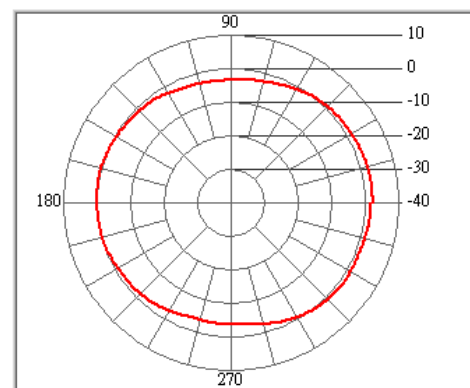
2600



2650



2680



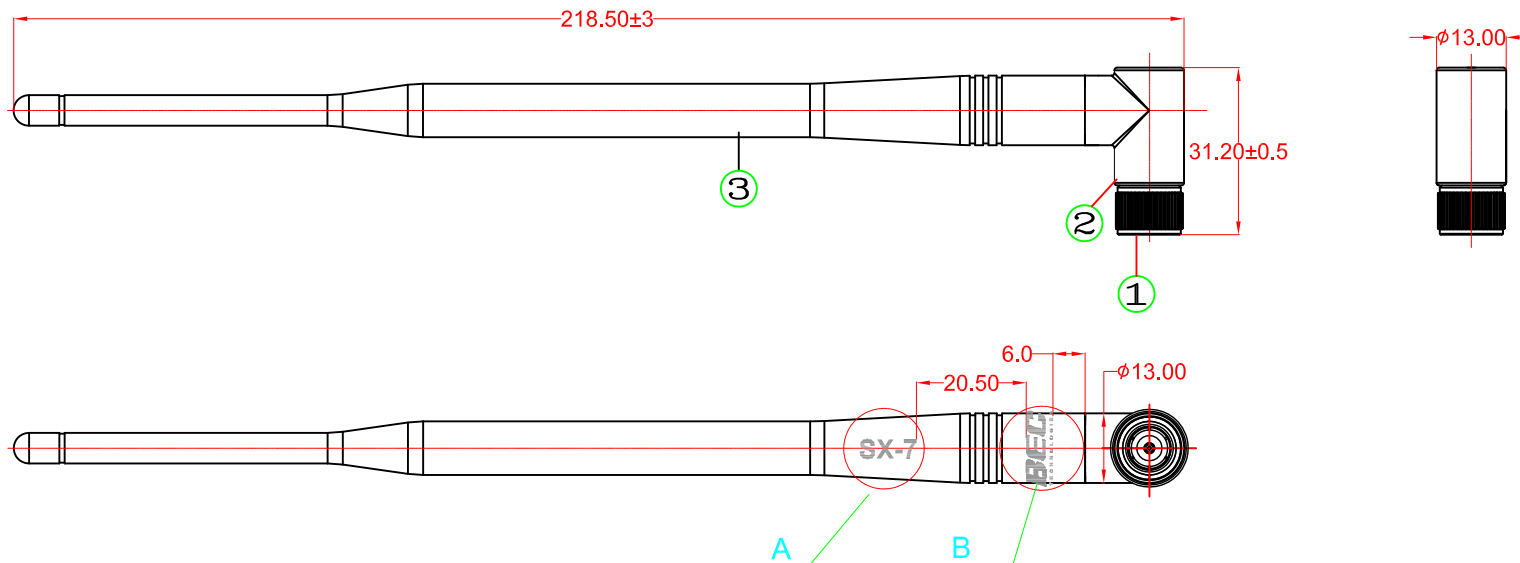
2700

RoHS

Compatible



| SIGN | DATE | DESCRIPTION | APPROVER |
|------|------|-------------|----------|
|      |      |             |          |
|      |      |             |          |
|      |      |             |          |



Section A 2:1

注: SX-7为Arial Block 14 级



Section B 2:1

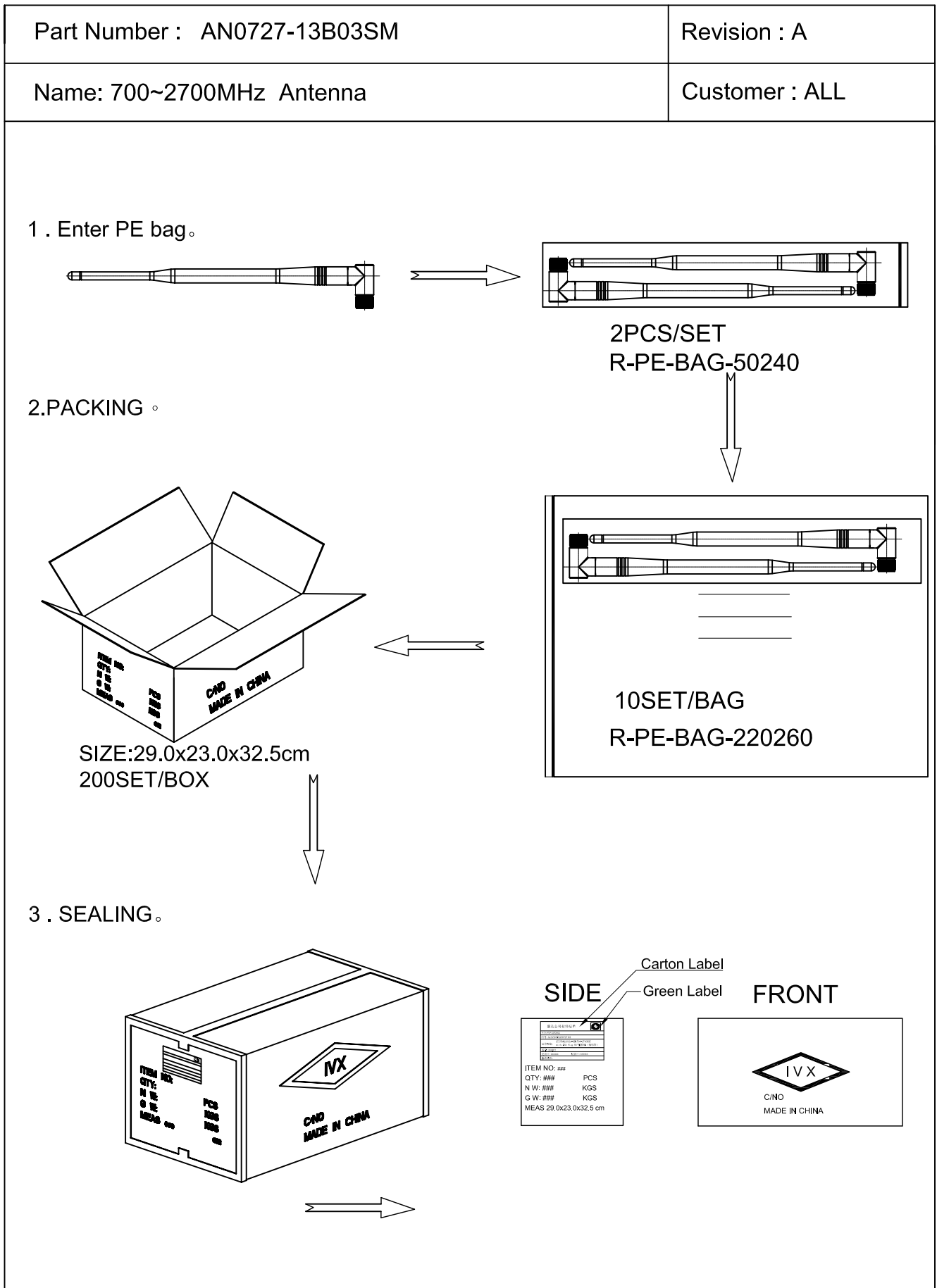
注: BEC LOGO文字颜色为  
pantone Gray 6c

Note:

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

| 3   | AN13B-01B         | Body1       | TPE      | Black    | 1    |
|-----|-------------------|-------------|----------|----------|------|
| 2   | AN9101-02B        | Base        | ABS      | Black    | 1    |
| 1   | SMA207-CCT5AN19-A | SMA Male    | Zn-Alloy | Black    | 1    |
| NO. | Part Number       | Description | Material | Finished | Q'ty |

|                          |            |            |                            |                                                                                       |                     |
|--------------------------|------------|------------|----------------------------|---------------------------------------------------------------------------------------|---------------------|
| Invax System Group.      |            |            | Cortec Technology Inc.     |                                                                                       |                     |
| <b>Cortec</b>            |            |            | Http://www.invaxsystem.com |                                                                                       | Tel :886-2-27885218 |
|                          |            |            | E-mail:info@invax.com.tw   |                                                                                       | Fax:886-2-27831658  |
| TITLE: 13B Type Antenna  |            |            |                            |                                                                                       |                     |
| PART NO.: AN0727-13B03SM |            |            | CUSTOMER P/N: /            |                                                                                       |                     |
| APP BY                   | CHK BY     | RF BY      | DES BY                     |  | Tolerance           |
| Grant                    | Jack       | SiFei      | LJHUA                      | UNITS: mm                                                                             | X.X ±0.5            |
| 2013/06/20               | 2013/06/20 | 2013/06/20 | 2013/06/20                 | SCALE: /                                                                              | X.XX ±0.2           |
|                          |            |            |                            | REVISION: A                                                                           | X° ±1               |



SGS 台灣網站 → [http://twap.sgs.com/sgsrsts/chn/cheres\\_tw.asp](http://twap.sgs.com/sgsrsts/chn/cheres_tw.asp)  
SGS 大陸網站 → [http://rsts.cn.sgs.com/chn/cheres\\_cn.asp](http://rsts.cn.sgs.com/chn/cheres_cn.asp)  
SGS 韓國網站 → [http://rohs.kr.sgs.com/sgsrsts/en/cheres\\_en.asp](http://rohs.kr.sgs.com/sgsrsts/en/cheres_en.asp)

COR/F-G-47a

請輸入以下報告正確資料及檢查碼以便查核

- 1. 報告編號
- 2. 報告日期 (YYYY/MM/DD)
- 3. 產品名稱 (輸入前 10 個字不含空白)
- 4. 圖示檢查碼 (依指示畫面)



物料中HSF對象物質含量調查表

|          |     |
|----------|-----|
| 康捷電子有限公司 |     |
| 填表：      | 時麗  |
| 部門：      | 研發部 |
| 職務：      | 文員  |

物料名稱： AN0727-13B03SM

| 序號 | 物料型號              | 物料各構成名稱       | 各構成物料的材質 | 測試報告裡RoHS對應物質測試結果 |       |      |          |      |       | 檢測報告編號              | 測試日期       | 測試名稱              | 測試機構名稱 |
|----|-------------------|---------------|----------|-------------------|-------|------|----------|------|-------|---------------------|------------|-------------------|--------|
|    |                   |               |          | Cd                | Pb    | Hg   | Cr(VI)   | PBBs | PBDEs |                     |            |                   |        |
| 1  | AN13B-01B         | Body          | TPEE     | N.D.              | N.D.  | N.D. | N.D.     | N.D. | N.D.  | RLSZD001081200002C  | 2012.10.10 | TPEE              | CTI    |
| 2  | AN9101-02B        | Body2         | ABS      | N.D.              | N.D.  | N.D. | N.D.     | N.D. | N.D.  | KA/2012/C1575       | 2013.01.02 | ACRYLONITRILE     | SGS    |
| 3  | SMA207-CCT5AN19-A | SMA Male      | 銅        | 66                | 31000 | N.D. | Negative |      |       | CE201314616         | 2013.01.28 | REECUTTINGBRASSBA | SGS    |
| 4  | AN13B7070         | HAT           | EVA      | N.D.              | N.D.  | N.D. | N.D.     | N.D. | N.D.  | CANEC1303661001     | 2013.03.28 | HEAT SHRINKABLE   | SGS    |
| 5  | R-HSTUBE-004N     | HSTUBE        | 鋅合金      | N.D.              | 15    | N.D. | Negative | N.D. | N.D.  | A001R121106068001-1 | 2012.11.09 | 鋅合金錠              | AOV    |
| 6  | R-RG-178U         | Cable (RG178) | FEP      | N.D.              | N.D.  | N.D. | N.D.     | N.D. | N.D.  | RLSHE001125120002C  | 2012.08.21 | 电线电缆料             | CTI    |
| 7  |                   |               | PTFE     | N.D.              | N.D.  | N.D. | N.D.     | N.D. | N.D.  | RLSHE001125120001C  | 2012.08.21 | 电线电缆料             | CTI    |
| 8  |                   |               | 鍍銀銅      | N.D.              | N.D.  | N.D. | Negative | N.D. | N.D.  | RLSHE001125120003C  | 2012.08.21 | 电线电缆料             | CTI    |

根據測試報告如實填寫鉛、鎘、汞、六價鉻、PBBs和PBDEs六項禁用物質的含量

包裝材料中鉛、鎘、汞、六價鉻總含量不超過100ppm，鎘的允許濃度為5ppm

歐盟ROHS指令豁免條款2009/95/BC、鋼中合金元素中的鉛含量達0.35%、鋁含量達0.4%、銅合金中的鉛含量達4%

## CHANG CHUN PLASTICS CO LTD

7TH FL, 301 SOHNGKIAH RD, TAIPEI 104 TW

1163

Thermoplastic Polyester Elastomer (TPEE), furnished as pellets

| Color  | Min Thk<br>(mm) | Flame<br>Class | HWI | HAI | RTI<br>Elec | RTI<br>Imp | RTI<br>Str |
|--------|-----------------|----------------|-----|-----|-------------|------------|------------|
| NC, BK | 0.8             | HB             | 4   | 0   | 50          | 50         | 50         |
|        | 3.0             | HB             | 3   | 0   | 50          | 50         | 50         |

Comparative Tracking Index (CTI): 0

Dimensional Stability (%): -

High-Voltage Arc Tracking Rate (HVTR): 0

High Volt, Low Current Arc Resis (D495): 4

Dielectric Strength (kV/mm): -

Volume Resistivity (10<sup>x</sup> ohm-cm): -

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 2009-06-24

Last Revised: 2009-07-01

Underwriters Laboratories Inc®



## IEC and ISO Test Methods

| Test Name                      | Test Method     | Units             | Thickness<br>Tested (mm) | Value          |
|--------------------------------|-----------------|-------------------|--------------------------|----------------|
| Flammability                   | IEC 60695-11-10 | Class (color)     | 0.8                      | HB75 (IIC, BK) |
|                                |                 |                   | 3.0                      | HB40 (IIC, BK) |
| Glow-Wire Flammability (GWFI)  | IEC 60695-2-12  | C                 | -                        | -              |
| Glow-Wire Ignition (GWIT)      | IEC 60695-2-13  | C                 | -                        | -              |
| IEC Comparative Tracking Index | IEC 60112       | Volts (Max)       | -                        | -              |
| IEC Ball Pressure              | IEC 60695-10-2  | C                 | -                        | -              |
| ISO Heat Deflection (1.80 MPa) | ISO 75-2        | C                 | -                        | -              |
| ISO Tensile Strength           | ISO 527-2       | MPa               | -                        | -              |
| ISO Flexural Strength          | ISO 178         | MPa               | -                        | -              |
| ISO Tensile Impact             | ISO 8256        | kJ/m <sup>2</sup> | -                        | -              |
| ISO Izod Impact                | ISO 180         | kJ/m <sup>2</sup> | -                        | -              |
| ISO Charpy Impact              | ISO 179-2       | kJ/m <sup>2</sup> | -                        | -              |

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## ABS

Component - Plastics

E56070

### CHI MEI CORPORATION

59-1 SAN CHIA, JEN TE, TAINAN HSIEN 717 TW

### PA-757(+)

Acrylonitrile Butadiene Styrene (ABS), "Polylac", furnished as pellets

|       | Min Thk | Flame |     |     | RTI  | RTI | RTI |
|-------|---------|-------|-----|-----|------|-----|-----|
| Color | (mm)    | Class | HWI | HAI | Elec | Imp | Str |
| ALL   | 1.5     | HB    | 4   | 0   | 85   | 80  | 85  |
|       | 3.0     | HB    | 3   | 0   | 85   | 80  | 85  |

Comparative Tracking Index (CTI): 0

Dimensional Stability (%): -

High-Voltage Arc Tracking Rate (HVTR): 1

High Volt, Low Current Arc Resis (D495): 7

Dielectric Strength (kV/mm): -

Volume Resistivity ( $10^x$  ohm-cm) : -

**(+) - Optional prefix or suffix; may be used to denote usage of 0-0.5 percent acid scavengers.**

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1983-06-23

Last Revised: 2011-01-27

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## DAIKIN INDUSTRIES LTD

E52460

YODOGAWA PLANT

CHEMICAL DIV, POLYMER PRODUCTION DEPT

1-1 NISHI-HITOTSUYA

SETTSU-SHI, OSAKA 566-8585 JAPAN

|                                                                        |       | Min.      |       |   | H | H    | R T I   |   | H | D |
|------------------------------------------------------------------------|-------|-----------|-------|---|---|------|---------|---|---|---|
|                                                                        |       | Thk       | Flame | W | A | Elec | Mech    | V | 4 | C |
| Material Dsg                                                           | Color | mm        | Class | I | I |      | Imp Str | T | 9 | T |
| Ethylene/Tetraflouroethylene (E/TFE), "Neoflon", furnished as pellets. |       |           |       |   |   |      |         |   |   |   |
| EP-520                                                                 | NC    | 1.5 ONLY  | V-0   | - | - | 50   | 50 50   |   |   |   |
| EP-540                                                                 | NC    | 1.5       | V-0   | - | - | 50   | 50 50   |   |   |   |
| Ethylene/Tetraflouroethylene (E/TFE), furnished as pellets.            |       |           |       |   |   |      |         |   |   |   |
| EP-521                                                                 | NC    | 1.5       | V-0   | - | - | 50   | 50 50   |   |   |   |
| EP-522                                                                 | NC    | 1.5       | V-0   | - | - | 50   | 50 50   |   |   |   |
| EP-522BU                                                               | BL    | 1.5       | V-0   | - | - | 50   | 50 50   |   |   |   |
| EP-541                                                                 | NC    | 1.5       | V-0   | - | - | 50   | 50 50   |   |   |   |
| Florinated Ethylene Propylene (FEP), furnished as pellets, powder.     |       |           |       |   |   |      |         |   |   |   |
| NP-100                                                                 | NC    | 1.7       | V-0   | - | - | 150  | 150 150 |   |   |   |
|                                                                        |       | 3.2       | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-100H                                                                | NC    | 1.5 ONLY  | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-101                                                                 | NC    | 1.1       | V-0   | - | - | 150  | 150 150 |   |   |   |
|                                                                        |       | 3.3       | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-120                                                                 | NC    | 1.7       | V-0   | - | - | 150  | 150 150 |   |   |   |
|                                                                        |       | 3.3       | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-12X                                                                 | NC    | 1.5       | V-0   | - | - | 150  | 150 150 |   |   |   |
|                                                                        |       | 3.0       | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-20                                                                  | NC    | 1.5 ONLY  | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-20PW                                                                | NC    | 1.5 ONLY  | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-21                                                                  | NC    | 1.5 ONLY  | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-22                                                                  | NC    | 1.5 ONLY  | V-0   | - | - | 150  | 150 150 |   |   |   |
| NP-23                                                                  | NC    | 0.75 ONLY | V-0   | - | - | 150  | 150 150 |   |   |   |
|                                                                        |       |           |       |   |   |      |         |   |   |   |

|                                                                                            |    |           |     |   |   |     |     |     |   |   |   |
|--------------------------------------------------------------------------------------------|----|-----------|-----|---|---|-----|-----|-----|---|---|---|
| NP-30                                                                                      | NC | 1.5 ONLY  | V-0 | - | - | 150 | 150 | 150 |   |   |   |
| NP-40                                                                                      | NC | 1.5 ONLY  | V-0 | - | - | 150 | 150 | 150 |   |   |   |
| SP-100                                                                                     | NC | 1.5 ONLY  | V-0 | - | - | 150 | 150 | 150 |   |   |   |
| SP-120                                                                                     | NC | 1.5 ONLY  | V-0 | - | - | 150 | 150 | 150 |   |   |   |
| Florinated Rubber (FR), "Daiel", furnished as sheets.                                      |    |           |     |   |   |     |     |     |   |   |   |
| DC-7026023H                                                                                | GY | 0.75      | V-0 | - | - | 50  | 50  | 50  |   |   |   |
|                                                                                            |    | 2.0       | V-0 | - | - | 50  | 50  | 50  |   |   |   |
| Perfluoro Alkoxy Alkene (PFA), "Neoflon", furnished as pellets.                            |    |           |     |   |   |     |     |     |   |   |   |
| AP-210, AP-230                                                                             |    |           |     |   |   |     |     |     |   |   |   |
|                                                                                            | NC | 0.81 ONLY | V-0 | 3 | 3 | 50  | 50  | 50  | 0 | 4 | 0 |
| AP-210BK                                                                                   | BK | 0.38      | V-0 | - | - | 50  | 50  | 50  |   |   |   |
|                                                                                            |    | 1.5       | V-0 | - | - | 50  | 50  | 50  |   |   |   |
| AR-6020                                                                                    | BK | 0.89 ONLY | V-0 | - | - | 50  | 50  | 50  |   |   |   |
| AR-6040                                                                                    | BK | 0.75      | V-0 | - | - | 50  | 50  | 50  |   |   |   |
|                                                                                            |    | 1.5       | V-0 | - | - | 50  | 50  | 50  |   |   |   |
| PFA AP-201                                                                                 | NC | 0.38      | V-0 | - | - | 50  | 50  | 50  |   |   |   |
|                                                                                            |    | 0.75      | V-0 | - | - | 50  | 50  | 50  |   |   |   |
|                                                                                            |    | 1.5       | V-0 | - | - | 50  | 50  | 50  |   |   |   |
| Polychlorotrifluoroethylene (PCTFE), "Neoflon", furnished as pellets, powder.              |    |           |     |   |   |     |     |     |   |   |   |
| M-300H+                                                                                    | NC | 0.75      | V-0 | 3 | 0 | 150 | 150 | 150 | 0 | 4 |   |
|                                                                                            |    | 1.5       | V-0 | 2 | 0 | 150 | 150 | 150 |   |   |   |
|                                                                                            |    | 3.0       | V-0 | 1 | 0 | 150 | 150 | 150 |   |   |   |
| M-300P+                                                                                    | NC | 0.75      | V-0 | 3 | 0 | 150 | 150 | 150 | 0 | 4 |   |
|                                                                                            |    | 1.5       | V-0 | 2 | 0 | 150 | 150 | 150 |   |   |   |
|                                                                                            |    | 3.0       | V-0 | 1 | 0 | 150 | 150 | 150 |   |   |   |
| M-400H+                                                                                    | NC | 0.75      | V-0 | 3 | 0 | 150 | 150 | 150 | 0 | 4 |   |
|                                                                                            |    | 1.5       | V-0 | 2 | 0 | 150 | 150 | 150 |   |   |   |
|                                                                                            |    | 3.0       | V-0 | 1 | 0 | 150 | 150 | 150 |   |   |   |
| Polyphenylene Sulfide/Polytetrafluoroethylene (PPS/PTFE), "Neoflon", furnished as pellets. |    |           |     |   |   |     |     |     |   |   |   |
| SA-7600                                                                                    | GY | 0.75      | V-0 | - | - | 50  | 50  | 50  |   |   |   |
|                                                                                            |    | 1.5       | V-0 | - | - | 50  | 50  | 50  |   |   |   |
| Polytetrafluoroethylene (PTFE), "Polyflon", furnished as powder.                           |    |           |     |   |   |     |     |     |   |   |   |
| M-532                                                                                      | NC | 0.9-1.4   | V-0 | - | - | 180 | 180 | 180 |   |   |   |
| Polytetrafluoroethylene (PTFE), furnished as pellets.                                      |    |           |     |   |   |     |     |     |   |   |   |
| F-205                                                                                      | NC | 0.84      | V-0 | - | - | 180 | 180 | 180 |   |   |   |
|                                                                                            |    | 1.5       | V-0 | - | - | 180 | 180 | 180 |   |   |   |
| Polytetrafluoroethylene (PTFE), furnished as powder.                                       |    |           |     |   |   |     |     |     |   |   |   |
| F-201, F-202, F-203                                                                        |    |           |     |   |   |     |     |     |   |   |   |
|                                                                                            | NC | 0.81      | V-0 | - | 4 | 180 | 180 | 180 | 4 | 0 |   |
|                                                                                            |    | 1.5       | V-0 | - | 4 | 180 | 180 | 180 |   |   |   |
|                                                                                            |    |           |     |   |   |     |     |     |   |   |   |

|                                          |    |       |       |     |   |     |     |     |     |   |   |   |
|------------------------------------------|----|-------|-------|-----|---|-----|-----|-----|-----|---|---|---|
| M-111                                    | NC | 0.050 | VTM-0 | -   | - | 180 | 180 | 180 |     |   |   |   |
|                                          |    | 0.060 | VTM-0 | -   | - | 180 | 180 | 180 |     |   |   |   |
|                                          |    | 0.75  | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |
| M-112                                    | NC | 0.067 | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |
|                                          |    | 0.75  | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |
| M-12, M-15, M-24, M-25, M-31, M-32, M-33 |    |       |       |     |   |     |     |     |     |   |   |   |
|                                          |    | NC    | 0.81  | V-0 | 1 | 2   | 180 | 180 | 180 | 0 | 4 | 0 |
|                                          |    |       | 1.5   | V-0 | 1 | 2   | 180 | 180 | 180 |   |   |   |
| M-137                                    | NC | 0.072 | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |
|                                          |    | 0.75  | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |
| MG-1040F                                 | NC | 0.90  | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |
|                                          |    | 3.0   | V-0   | -   | - | 180 | 180 | 180 |     |   |   |   |

+ - For the HWI property PLC equals time to melt, no ignition.

Marking: Company name and material designation on container, wrapper or finished part.

Last Updated on 2005-04-13

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