

# **Specification**

Part No. : **PC27.09.0100A** 

Product Name : TheStripe™

850 / 900 / 1800 / 1900MHz GSM PCB Antenna

W/100mm 1.13 Coaxial Cable MMCX (M) R/A

Connector

Feature : 100mm long, 1.13 mm diameter

850 / 900 / 1800 / 1900MHz GSM

Miniature Co-Axial Cable MMCX(M)RA

Dims: 34mm\*7mm\*0.8mm

**RoHS Compliant** 





### 1. Introduction

This miniaturized low profile PCB antenna is based on smart TheStripe™ antenna technology. It consists of a PCB antenna and 1.13mm coaxial cable with MMCX(M) 90 degree connector.

Further optimization can be done upon receipt of the client's device at a local Taoglas facility.

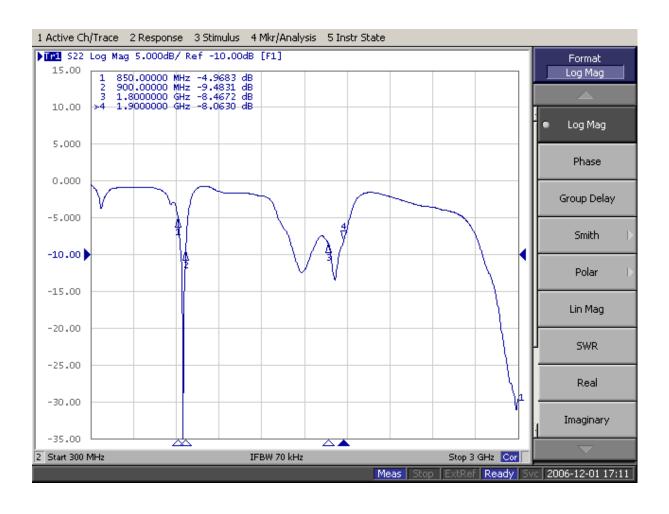
## 2. Specifications

| CELLULAR                                         |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
|--------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|                                                  |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
|                                                  |                                                                    |                                                                                                                                                                                     | 1900MHz                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |
|                                                  |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| 3.59                                             | 2.02                                                               | 2.21                                                                                                                                                                                | 2.3                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |
| -4.96 dB                                         | -9.48 dB                                                           | -8.46 dB                                                                                                                                                                            | -8.06 dB                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |
| 56.84%                                           | 72.98%                                                             | 63.52%                                                                                                                                                                              | 55.79%                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |
| 0.01dBi                                          | 1.2dBi                                                             | 2.66dBi                                                                                                                                                                             | 1.25dBi                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |
| -2.45dB                                          | - 1.37dB                                                           | - 1.97dB                                                                                                                                                                            | -2.53dB                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |
| 50 Ohm                                           |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| Omnidirectional                                  |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| Horizontal                                       |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| MECHANCIAL                                       |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| 34 * 7 * 0.8mm                                   |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| RF Coaxial Cable $\psi$ 1.13 ± 0.1mm, L = 100 mm |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| Gray Color                                       |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| MMCX(M)RA                                        |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| ENVIRONMENTAL                                    |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| -20°C to + 55°C                                  |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| -30°C to + 75°C                                  |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| 40% to 95%                                       |                                                                    |                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
|                                                  | AMPS<br>800MHz<br>3.59<br>-4.96 dB<br>56.84%<br>0.01dBi<br>-2.45dB | AMPS GSM  800MHz 900MHz  3.59 2.02  -4.96 dB -9.48 dB  56.84% 72.98%  0.01dBi 1.2dBi  -2.45dB -1.37dB  50 C  Omnidir  Horiz  MECHANCIAL  34 * 7 * 1 * 1 * 1 * 1 * 1 * 1 * 1 * 1 * 1 | AMPS GSM DCS  800MHz 900MHz 1800MHz  3.59 2.02 2.21  -4.96 dB -9.48 dB -8.46 dB  56.84% 72.98% 63.52%  0.01dBi 1.2dBi 2.66dBi  -2.45dB -1.37dB -1.97dB  50 Ohm  Omnidirectional  Horizontal  MECHANCIAL  34 * 7 * 0.8mm  RF Coaxial Cable ψ1.13 ± 0.1mm, L = Gray Color  MMCX(M)RA  ENVIRONMENTAL  -20°C to + 55°C  -30°C to + 75°C |  |  |  |  |  |



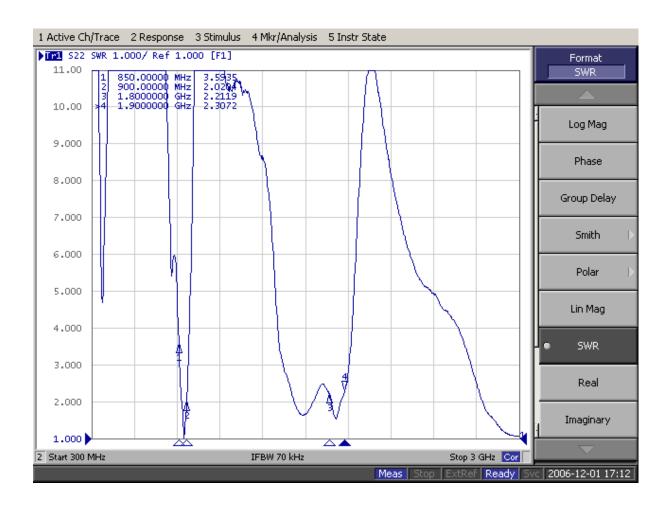
## 3. Antenna Characteristics

#### 3.1. Return loss





#### **3.2. VSWR**





# 4. Reliability

| Test Items                             | Procedure                                                                                                                                                     | Requirement                                                                                                                                                         |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thermal Shock                          | Starting at -40 for 30 minutes and then cycled to +85 to remain 30 minutes (a complete cycle).  To repeat 5 complete cycles. (Refer to IEC 68-2-14 Method Na) | <ol> <li>The value of return loss<br/>must be within product<br/>specifications after this test.</li> <li>No physical deformation<br/>should be evident.</li> </ol> |
| Storage<br>Temperature<br>(Cold)       | Samples must be put into -30°C chamber for 72 hours and samples shall be powered during test.  (Refer to IEC 68-2-1 Method Aa)                                | <ol> <li>The value of return loss must<br/>be within product<br/>specifications after this test.</li> <li>No physical deformation<br/>should be evident.</li> </ol> |
| Storage<br>Temperature<br>(Dry Heat)   | Samples must be put into +75°C chamber for 72 hours and samples shall be powered during test.  (Refer to IEC 68-2-1 Method Ba)                                | <ol> <li>The value of return loss must<br/>be within product<br/>specifications after this test.</li> <li>No physical deformation<br/>should be evident.</li> </ol> |
| Operating<br>Temperature<br>(Cold)     | Samples must be put into -20°C chamber for 2 hours and samples shall be powered during test.  (Refer to IEC 68-2-1 Method Aa)                                 | <ol> <li>The value of return loss must<br/>met specification during<br/>test/after test</li> <li>No mechanical defects after<br/>test.</li> </ol>                   |
| Operating<br>Temperature<br>(Dry Heat) | Samples must be put into +65°C chamber for 72 hours and samples shall be powered during test.  (Refer to IEC 68-2-1 Method Ba)                                | <ol> <li>The value of return loss must<br/>met specification during<br/>test/after test</li> <li>No mechanical defects after<br/>test.</li> </ol>                   |

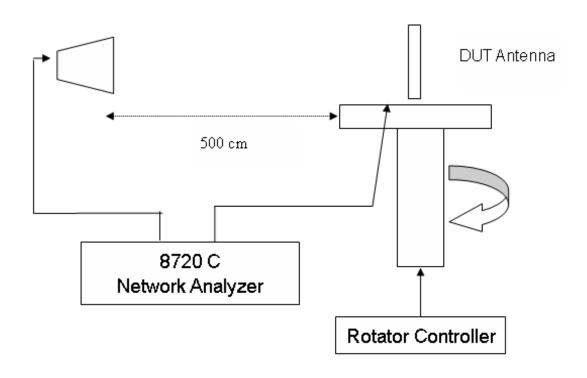


# 5. Antenna Test Procedures and Setup

### **5.1. 3D Radiation Pattern Testing**

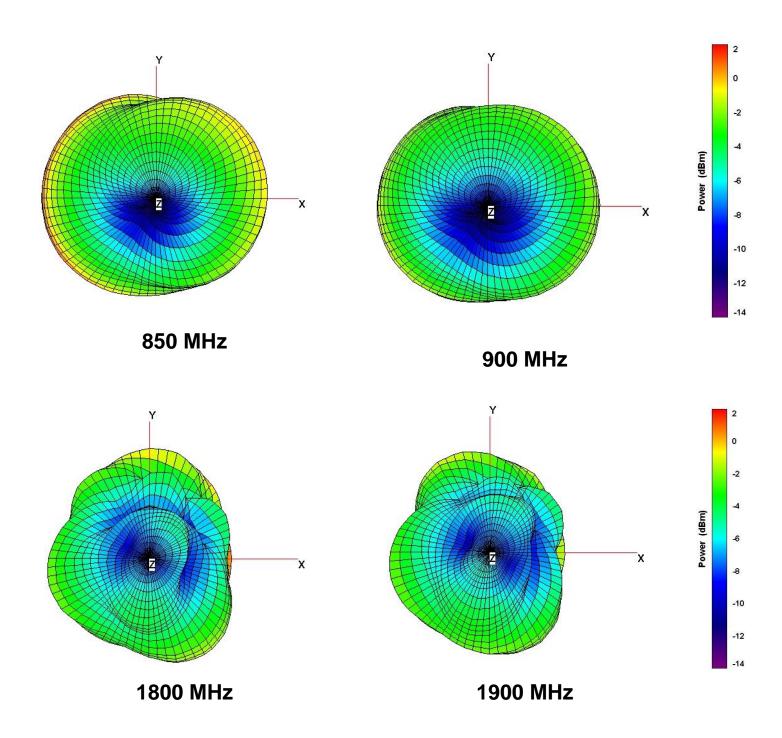
Test Setup Diagram

## Radiation Pattern Testing - Anechoic Chamber





## 5.2. 3D Radiation Pattern Testing





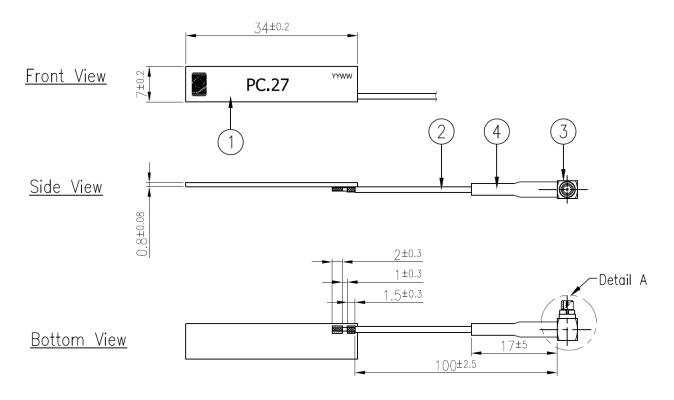
## **5.3. 3D Chamber Testing – Tabular Results**

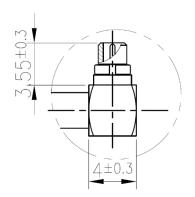
| Frequency                  | 850      | 900      | 1800     | 1900     |
|----------------------------|----------|----------|----------|----------|
| Note                       | MMCX     |          |          |          |
| Ant. Port Input Pwr. (dBm) | 0        | 0        | 0        | 0        |
| Tot. Rad. Pwr. (dBm)       | -6.70207 | -5.99557 | -3.58516 | -5.37679 |
| Peak EIRP (dBm)            | -2.40694 | -1.57714 | 1.90289  | 0.060763 |
| Directivity (dBi)          | 4.29514  | 4.41842  | 5.48805  | 5.43755  |
| Efficiency (dB)            | -6.70207 | -5.99557 | -3.58516 | -5.37679 |
| Efficiency (%)             | 21.3694  | 25.1445  | 43.801   | 28.9949  |
| Gain (dBi)                 | -2.40694 | -1.57714 | 1.90289  | 0.060763 |
| NHPRP ±Pi/4 (dBm)          | -7.60628 | -6.98737 | -4.95228 | -6.71252 |
| NHPRP ±Pi/6 (dBm)          | -8.96174 | -8.37139 | -6.68997 | -8.43839 |
| NHPRP ±Pi/8 (dBm)          | -10.17   | -9.55263 | -7.9014  | -9.58462 |
| Upper Hem. PRP (dBm)       | -11.6509 | -11.2301 | -8.08553 | -9.80534 |
| Lower Hem. PRP (dBm)       | -8.37684 | -7.54214 | -5.48811 | -7.31973 |
| NHPRP4 / TRP Ratio (dB)    | -0.90421 | -0.9918  | -1.36712 | -1.33574 |
| NHPRP4 / TRP Ratio (%)     | 81.2044  | 79.5829  | 72.9942  | 73.5235  |
| NHPRP6 / TRP Ratio (dB)    | -2.25967 | -2.37582 | -3.10481 | -3.0616  |
| NHPRP6 / TRP Ratio (%)     | 59.4338  | 57.8653  | 48.9237  | 49.4128  |
| NHPRP8 / TRP Ratio (dB)    | -3.46791 | -3.55706 | -4.31624 | -4.20784 |
| NHPRP8 / TRP Ratio (%)     | 44.9996  | 44.0853  | 37.0149  | 37.9504  |
| UHPRP / TRP Ratio (dB)     | -4.94881 | -5.2345  | -4.50037 | -4.42856 |
| UHPRP / TRP Ratio (%)      | 31.9977  | 29.9606  | 35.4784  | 36.0698  |
| LHPRP / TRP Ratio (dB)     | -1.67477 | -1.54657 | -1.90295 | -1.94294 |
| LHPRP / TRP Ratio (%)      | 68.0023  | 70.0394  | 64.5216  | 63.9302  |
| Front/Back Ratio (dB)      | 3.58199  | 5.22619  | 7.98457  | 8.74956  |
| Phi BW (°)                 | 137      | 132      | 109      | 92       |
| + Phi BW (°)               | 52       | 51       | 76       | 61       |
| - Phi B₩ (°)               | 85       | 81       | 33       | 31       |
| Theta BW (°)               | 53       | 51       | 18       | 18       |
| + Th. BW (°)               | 25       | 27       | 9        | 10       |
| - Th. BW (°)               | 28       | 24       | 9        | 8        |
| Boresight Phi (°)          | 210      | 210      | 0        | 360      |
| Boresight Th. (°)          | 120      | 120      | 135      | 135      |
| Maximum Power (dBm)        | -2.40694 | -1.57714 | 1.90289  | 0.060763 |
| Minimum Power (dBm)        | -20.7114 | -19.4284 | -12.8702 | -17.302  |
| Average Power (dBm)        | -7.56269 | -6.68836 | -3.63931 | -5.51374 |
| Max/Min Ratio (dB)         | 18.3044  | 17.8513  | 14.7731  | 17.3628  |
| Max/Avg Ratio (dB)         | 5.15575  | 5.11122  | 5.5422   | 5.5745   |
| Min/Avg Ratio (dB)         | -13.1487 | -12.7401 | -9.23091 | -11.7883 |
| Average Gain (dB)          | -6.70207 | -5.99557 | -3.58516 | -5.37679 |
| E-Plane BW (°)             | 143      | 77       | 113      | 70       |
| + E-Plane BW (°)           | 108      | 46       | 92       | 51       |
| - E-Plane BW (°)           | 35       | 31       | 21       | 19       |
| H-Plane BW (°)             | 103      | 104      | 19       | 19       |
| + H-Plane BW (°)           | 70       | 75       | 10       | 10       |
| - H-Plane BW (°)           | 33       | 29       | 9        | 9        |



## 6. Mechanical Drawings (Unit: mm)

#### 6.1. Dimensions and Drawing





|   | Name               | P/N            | Material       | Finish    | QTY |
|---|--------------------|----------------|----------------|-----------|-----|
| 1 | PC27 PCB           | 100211D010011A | Composite 0.8t | Black     | 1   |
| 2 | 1.13 Coaxial Cable | 300215C020000A | <b>FE</b> P    | Black     | 1   |
| 3 | MMCX(M)RA          | 202712G000013A | Brass          | Au Plated | 1   |
| 4 | Heat Shrink Tube   | 001315C000000A | PE             | Black     | 1   |

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