



Specification

# SPECIFICATION

Part No. : PA.23

Product Name : Cellular GSM Dielectric PIFA Antenna (DPA™)

Description : Tri-band - 880~960 MHz, 1710~2170 MHz, 0dB Gain  
Size: 31mm\*6mm\*3.2mm



## REVISION STATUS

| Version | Date                      | Page | Revision Description | Prepared          | Approved      |
|---------|---------------------------|------|----------------------|-------------------|---------------|
| 01      | Jan 4 <sup>th</sup> 2006  | All  | New format           | TW Product Centre | Ronan Quinlan |
| 02      | May 29 <sup>th</sup> 2009 | All  | New Format           | TW Product Centre | Aine Doyle    |
|         |                           |      |                      |                   |               |



Specification

**1.0 Scope**

This specification is for a Tri-band GSM + UMTS/WCDMA Dielectric Monopole Antenna for internal SMT mounting.

**2.0 Electrical Specifications**

The antenna has the electrical characteristics given in Table 1 under the Taoglas standard installation conditions as shown in the Evaluation Board

| No. | Parameter             | Specification                            |
|-----|-----------------------|--|
| 1   | Frequency             | 880~960 MHz , 1710~2170 MHz              |
| 2   | Dimensions            | 31*6*3.2mm mm                            |
| 3   | Impedance             | 50 $\Omega$                              |
| 4   | VSWR                  | 3 max (depends on environment)           |
| 5   | Polarization          | Linear                                   |
| 6   | Operating Temperature | -30~85°C                                 |
| 7   | Termination           | Ag (Environmentally Friendly Lead- Free) |

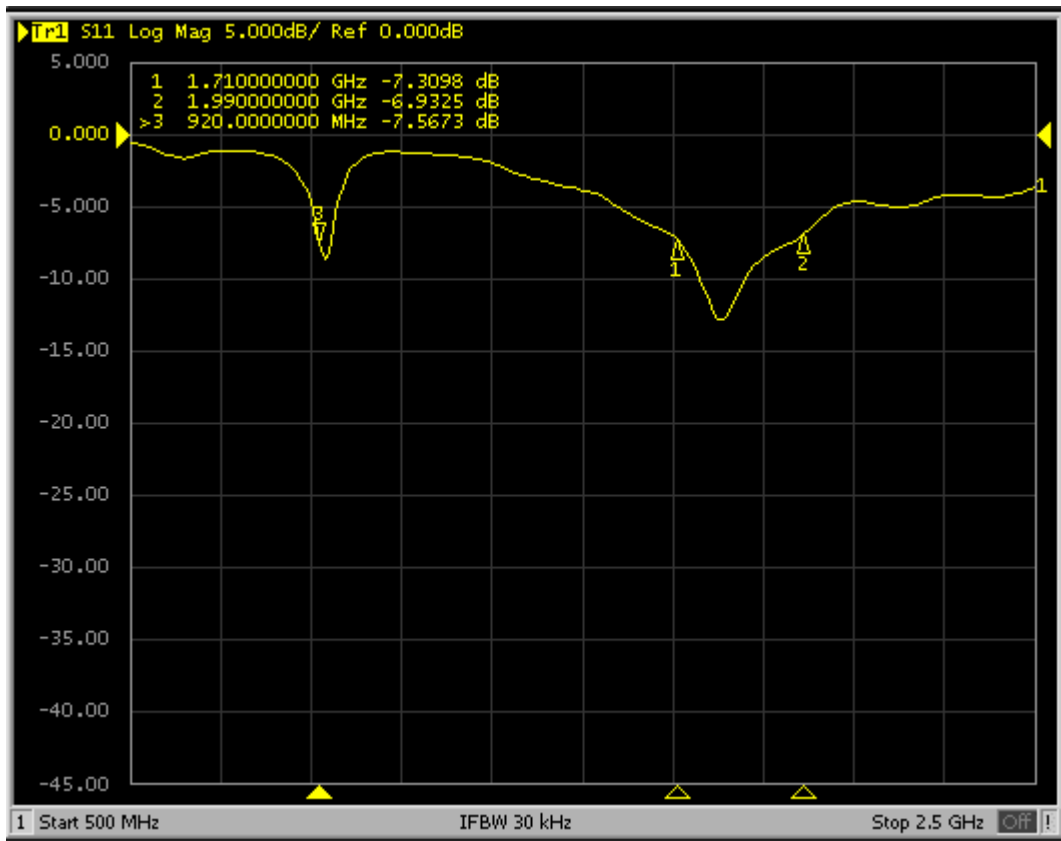
\* Data is measured on Taoglas Standard Reference PCB.

\*\*Quad-band GSM 850 band is attainable with appropriate matching circuit design



Specification

### 2.1 S11 Response Curve

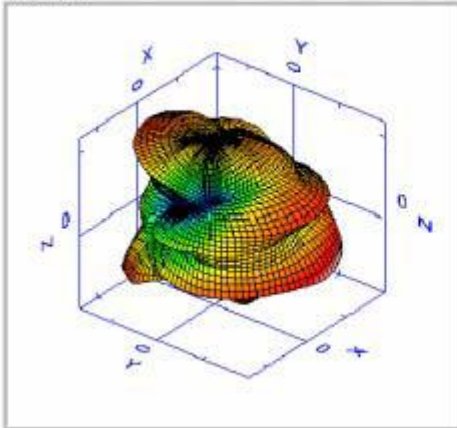




Specification

2.2 Radiation Pattern

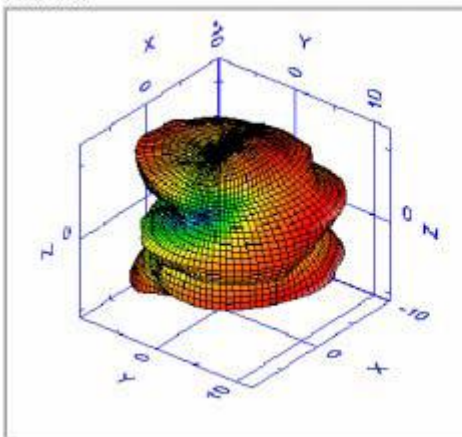
Total View



|                    |        |
|--------------------|--------|
| Frequency (MHz)    | 890.00 |
| TRP (dBm)          | -6.99  |
| Efficiency (%)     | 20.02  |
| NHPRP +/- 45 (dBm) | -8.19  |
| NHPRP +/- 30 (dBm) | -9.35  |
| Directivity (dBi)  | 4.26   |
| Gain (dBi)         | -2.73  |
| Average Gain (dB)  | -6.99  |

|                        |        |
|------------------------|--------|
| Peak EIRP (dBm)        | -2.73  |
| Max. Power (dBm)       | -2.73  |
| Min. Power (dBm)       | -14.97 |
| Avg. Power (dBm)       | -6.53  |
| Max. / Min. Ratio (dB) | 12.24  |
| Max. / Avg. Ratio (dB) | 3.8    |
| Min. / Avg. Ratio (dB) | -8.44  |

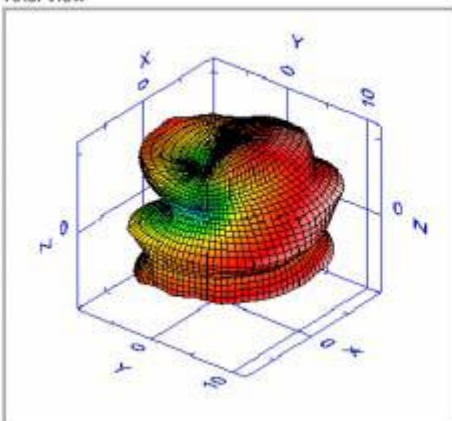
Total View



|                    |        |
|--------------------|--------|
| Frequency (MHz)    | 915.00 |
| TRP (dBm)          | -6.17  |
| Efficiency (%)     | 24.15  |
| NHPRP +/- 45 (dBm) | -7.36  |
| NHPRP +/- 30 (dBm) | -8.68  |
| Directivity (dBi)  | 3.95   |
| Gain (dBi)         | -2.22  |
| Average Gain (dB)  | -6.17  |

|                        |        |
|------------------------|--------|
| Peak EIRP (dBm)        | -2.22  |
| Max. Power (dBm)       | -2.22  |
| Min. Power (dBm)       | -15.82 |
| Avg. Power (dBm)       | -5.78  |
| Max. / Min. Ratio (dB) | 13.61  |
| Max. / Avg. Ratio (dB) | 3.66   |
| Min. / Avg. Ratio (dB) | -10.05 |

Total View



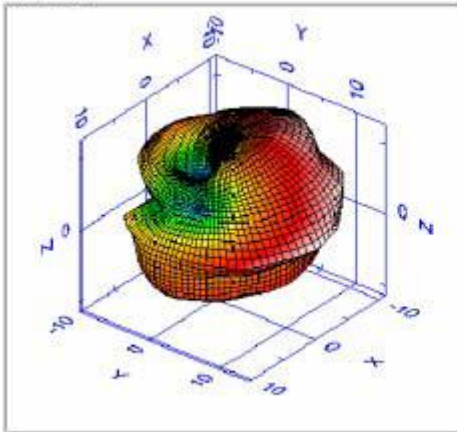
|                    |        |
|--------------------|--------|
| Frequency (MHz)    | 935.00 |
| TRP (dBm)          | -5.84  |
| Efficiency (%)     | 26.04  |
| NHPRP +/- 45 (dBm) | -6.87  |
| NHPRP +/- 30 (dBm) | -8.16  |
| Directivity (dBi)  | 3.39   |
| Gain (dBi)         | -2.45  |
| Average Gain (dB)  | -5.84  |

|                        |        |
|------------------------|--------|
| Peak EIRP (dBm)        | -2.45  |
| Max. Power (dBm)       | -2.45  |
| Min. Power (dBm)       | -14.86 |
| Avg. Power (dBm)       | -5.69  |
| Max. / Min. Ratio (dB) | 12.41  |
| Max. / Avg. Ratio (dB) | 3.23   |
| Min. / Avg. Ratio (dB) | -9.17  |



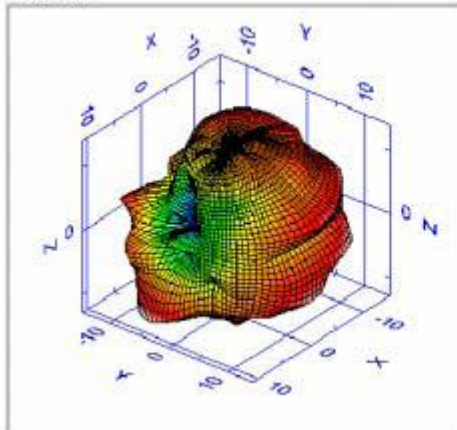
Specification

Total View



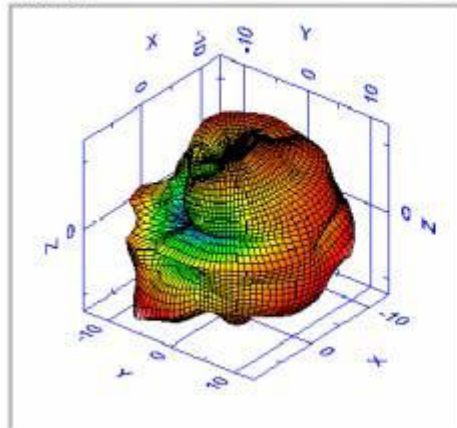
|                        |        |
|------------------------|--------|
| Frequency (MHz)        | 960.00 |
| TRP (dBm)              | -5.27  |
| Efficiency (%)         | 29.7   |
| NHPRP +/- 45 (dBm)     | -6.15  |
| NHPRP +/- 30 (dBm)     | -7.32  |
| Directivity (dBi)      | 3.94   |
| Gain (dBi)             | -1.33  |
| Average Gain (dB)      | -5.27  |
| Peak EIRP (dBm)        | -1.33  |
| Max. Power (dBm)       | -1.33  |
| Min. Power (dBm)       | -15.58 |
| Avg. Power (dBm)       | -5.34  |
| Max. / Min. Ratio (dB) | 14.25  |
| Max. / Avg. Ratio (dB) | 4.02   |
| Min. / Avg. Ratio (dB) | -10.24 |

Total View



|                        |         |
|------------------------|---------|
| Frequency (MHz)        | 1710.00 |
| TRP (dBm)              | -8.16   |
| Efficiency (%)         | 15.27   |
| NHPRP +/- 45 (dBm)     | -9.12   |
| NHPRP +/- 30 (dBm)     | -10.4   |
| Directivity (dBi)      | 3.92    |
| Gain (dBi)             | -4.24   |
| Average Gain (dB)      | -8.16   |
| Peak EIRP (dBm)        | -4.24   |
| Max. Power (dBm)       | -4.24   |
| Min. Power (dBm)       | -20.59  |
| Avg. Power (dBm)       | -8.14   |
| Max. / Min. Ratio (dB) | 16.35   |
| Max. / Avg. Ratio (dB) | 3.9     |
| Min. / Avg. Ratio (dB) | -12.44  |

Total View

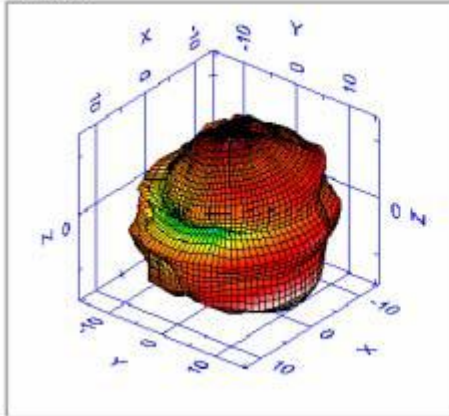


|                        |         |
|------------------------|---------|
| Frequency (MHz)        | 1750.00 |
| TRP (dBm)              | -7.39   |
| Efficiency (%)         | 18.23   |
| NHPRP +/- 45 (dBm)     | -8.35   |
| NHPRP +/- 30 (dBm)     | -9.67   |
| Directivity (dBi)      | 4.26    |
| Gain (dBi)             | -3.13   |
| Average Gain (dB)      | -7.39   |
| Peak EIRP (dBm)        | -3.13   |
| Max. Power (dBm)       | -3.13   |
| Min. Power (dBm)       | -19.09  |
| Avg. Power (dBm)       | -7.46   |
| Max. / Min. Ratio (dB) | 15.95   |
| Max. / Avg. Ratio (dB) | 4.33    |
| Min. / Avg. Ratio (dB) | -11.63  |



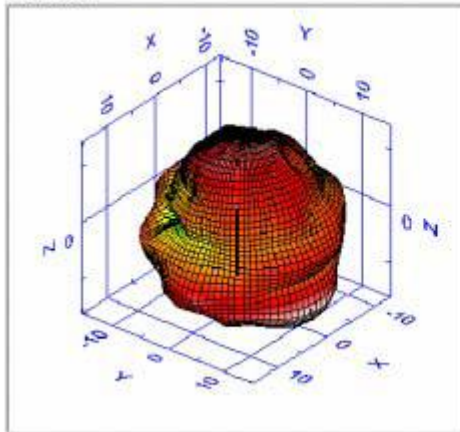
Specification

Total View



|                    |         |                        |        |
|--------------------|---------|------------------------|--------|
| Frequency (MHz)    | 1890.00 | Peak EIRP (dBm)        | -3.7   |
| TRP (dBm)          | -7.26   | Max. Power (dBm)       | -3.7   |
| Efficiency (%)     | 18.8    | Min. Power (dBm)       | -20.89 |
| NHPRP +/- 45 (dBm) | -8.26   | Avg. Power (dBm)       | -6.99  |
| NHPRP +/- 30 (dBm) | -9.56   | Max. / Min. Ratio (dB) | 17.19  |
| Directivity (dBi)  | 3.56    | Max. / Avg. Ratio (dB) | 3.29   |
| Gain (dBi)         | -3.7    | Min. / Avg. Ratio (dB) | -13.9  |
| Average Gain (dB)  | -7.26   |                        |        |

Total View



|                    |         |                        |        |
|--------------------|---------|------------------------|--------|
| Frequency (MHz)    | 1990.00 | Peak EIRP (dBm)        | -3.73  |
| TRP (dBm)          | -7.39   | Max. Power (dBm)       | -3.73  |
| Efficiency (%)     | 18.24   | Min. Power (dBm)       | -21.27 |
| NHPRP +/- 45 (dBm) | -8.57   | Avg. Power (dBm)       | -7.18  |
| NHPRP +/- 30 (dBm) | -9.92   | Max. / Min. Ratio (dB) | 17.53  |
| Directivity (dBi)  | 3.66    | Max. / Avg. Ratio (dB) | 3.45   |
| Gain (dBi)         | -3.73   | Min. / Avg. Ratio (dB) | -14.09 |
| Average Gain (dB)  | -7.39   |                        |        |



Specification

### 3.0 Mechanical Dimensions

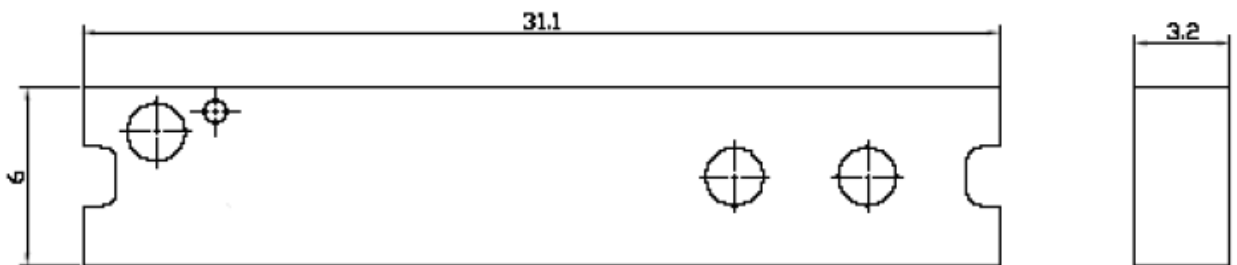
#### 3.1 PA.23 Antenna Outline Dimensions



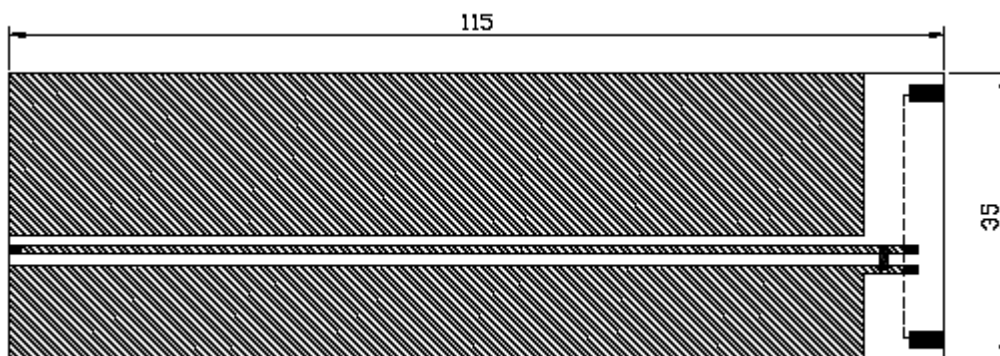
Top Side



Underside SMT Contact Pads View



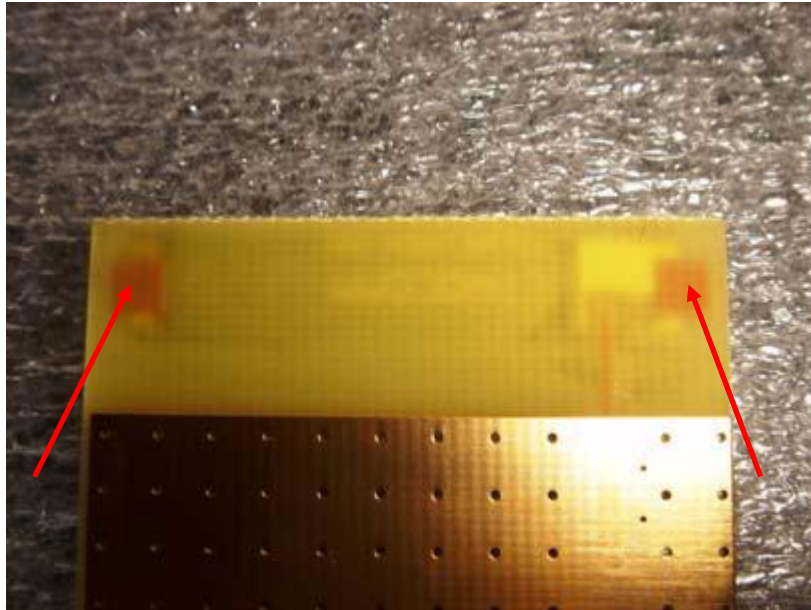
#### 3.2 Evaluation board dimensions



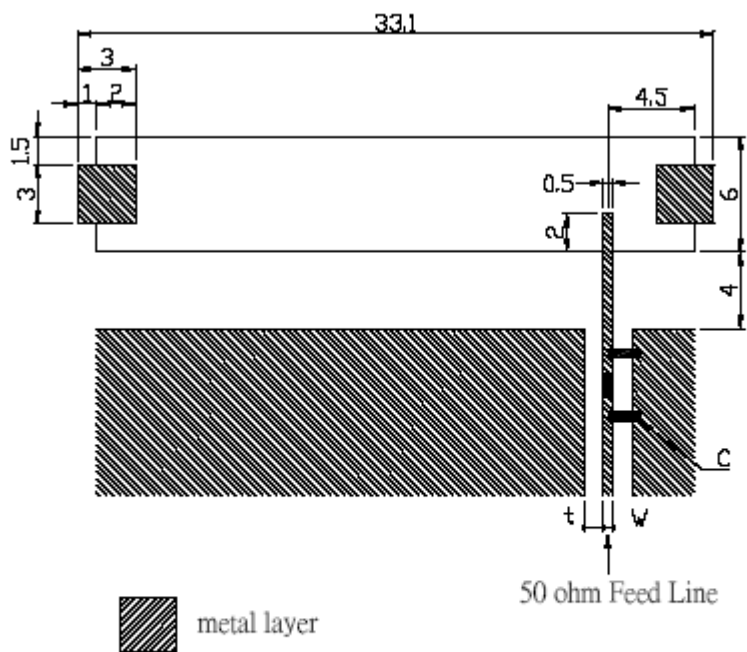


Specification

3.3 Recommended layout (as per Taoglas evaluation board)



View from underneath board – note solder pads either side – laid out on non metal area  
 Layout dimensions - Allow 6mm clearance all around if possible (minimum 4mm)



 metal layer

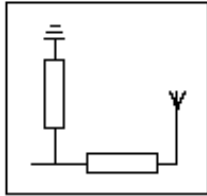
t,w=Unique dimensioning according to your PCB.  
 C=inductor and capacitor values according to your specific device.



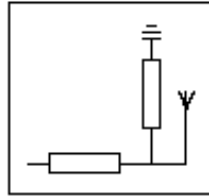
Specification

### 3.4 Recommended Transmission Line and Matching Network

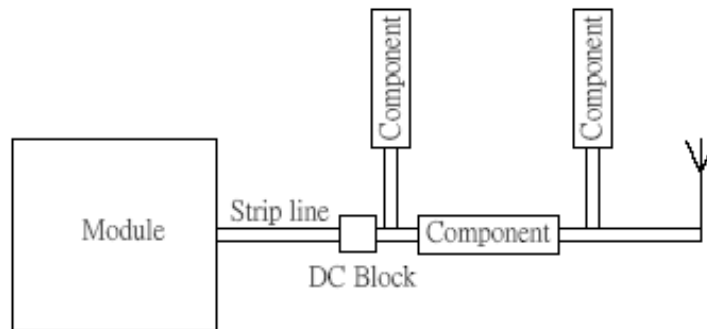
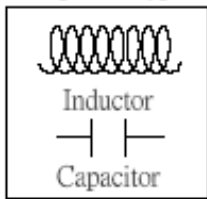
Typical config.1



Typical config.2



Component types



The matching network has to be individually designed using one,two or three components.