

# **SPECIFICATION**

Part No. : **PC29.07.0100A** 

Product Name : TheStripe™ Penta-band

GSM 850/900/1800/1900 & UMTS/WCDMA(3G) 2100 MHz

80mm\*30mm PCB Antenna

Features : 100mm long, 1.13 mm diameter

Miniature Co-axial Cable IPEX MHF I (U.FL) connector

Average Efficiency 62% Tested in Freespace ROHS Compliant

Photo :



#### **REVISION STATUS**

Version	Date	Page	Revision Description	Prepared	Approved
01	Jan 03 <sup>rd</sup> 2007	All	New format	TW Product Centre	Ronan Quinlan



#### 1.0Introduction

This high performance, low profile, PCB antenna is based on smart *TheStripe*™ antenna technology. It consists of a PCB antenna and mini coaxial cable. The product is a high gain Penta-band 850/900/1800/1900/2100 antenna suitable for worldwide GSM, UMTS and WCDMA applications. It's high efficiency (62% average) makes it an ideal choice to pass telecom operator's testing approvals. The product should be tested in freespace conditions connected to the client's cellular device.

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

## 2.0 Key Antenna Performance Indicators

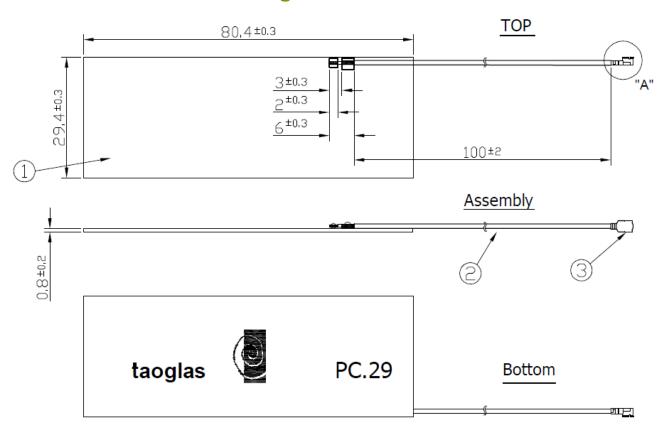
#### **Taoglas PC29.07.0100A**

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3.1	Communication System	AMPS	GSM	DCS	PCS	UMTS/WCDMA
3.2	Frequency Band	850 MHz	900 MHz	1800 MHz	1900 MHz	2100 MHz
3.3	VSWR	1.58	1.78	1.51	1.38	1.37
3.4	Return Loss	-12.96	-11.00	-13.79	-15.81	-16.11
3.5	Efficiency	56.84 %	72.98 %	63.52 %	55.79 %	63.25 %
3.6	Peak Gain	0.01 dBi	1.2 dBi	2.66 dBi	1.25 dBi	1.43 dBi
3.7	Average Gain	-2.45 dB	- 1.37 dB	- 1.97 dB	-2.53 dB	-1.99 dB
3.8	Impedance			50 Ohr	n	
3.9	Radiation Pattern			Omni-direct	ional	
3.10	Polarization			Horizont	al	



# 3.0 Mechanical Specifications

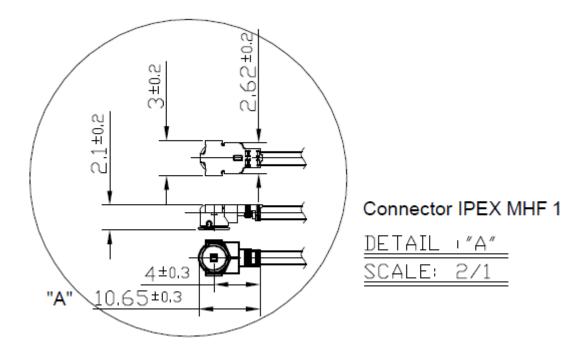
# 3.1 Dimensions and Drawing



#### 3.2 Cable and Connector

3.2.1	RF Cable	RF Coaxial Cable ψ1.13 ± 0.1mm L = 100 mm Gray Colour
3.2.1	RF Connector	Ipex MHF I (Hirose U.FL compatible)





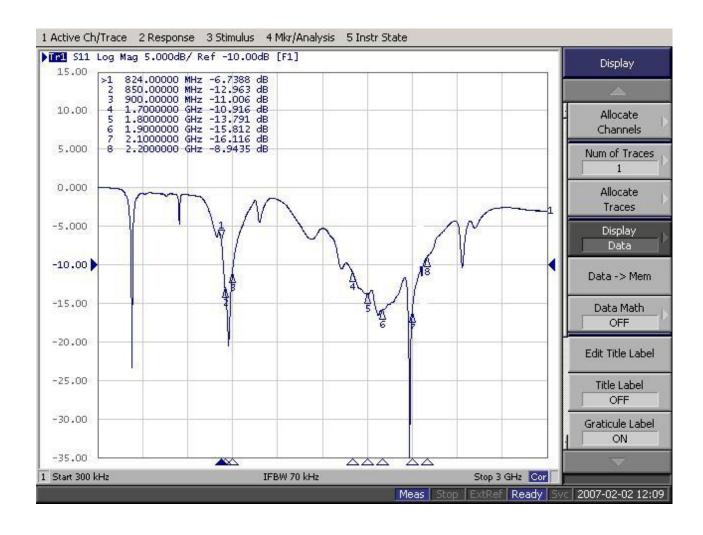
## 4.0 Antenna Placement

Antenna designed to for testing when connected outside the client's device and placed in freespace conditions, for example on plastic foam block. Final product can use pre-applied double sided adhesive tape, slot or screwmount



#### 5.0 Antenna Electrical Characteristics

#### 5.1 Return Loss





# 6.0 Environmental Conditions and Reliability

## **6.1 Environmental Conditions**

2.1.1	Operation Temperature	-40°C to + 85°C
2.1.2	Storage Temperature	-40°C to + 95°C
2.1.3	Relative Humidity	40% to 95%

# 6.2 Reliability

Test Items	Procedure	Requirement
Thermal Shock	Starting at -40 for 30minutes and then cycled to +85 to remain 30minutes (a complete cycle).  To repeat 5 complete cycles.  (Refer to IEC 68-2-14 Method Na)	The value of return loss must be within product specifications after this test.      No physical deformation should be evident.
Storage Temperature (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)	The value of return loss must be within product specifications after this test.      No physical deformation should be evident.
Storage Temperature (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)	The value of return loss must be within product specifications after this test.      No physical deformation should be evident.
Operating Temperature (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)	The value of return loss must met specification     during test/after test     No mechanical defects after test.
Operating Temperature (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)	The value of return loss must met specification     during test/after test     and mechanical defects after test.



# 7.0 Antenna Test Procedures and Setup

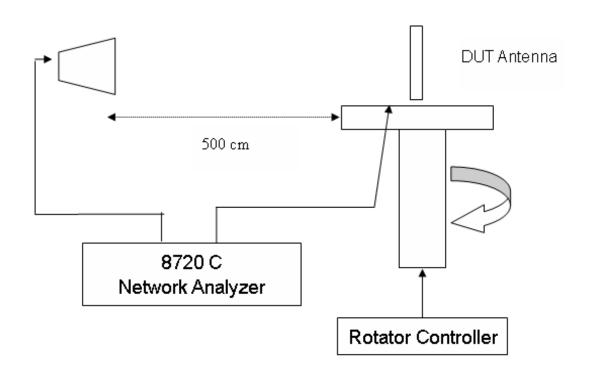
#### 7.1 Test Procedure for VSWR/Return Loss

7.1.1 STEP 1 Route Cable in Correct Position
 7.1.2 STEP 2 Connect Antenna to Module
 Connect feed-line to network analyze
 7.1.3 STEP 3 - Assemble Antenna in Correct Position
 7.1.4 STEP 4 - Assemble Housing

## 7.2 3D Radiation Pattern Testing

#### 7.2.1 Test Setup Diagram

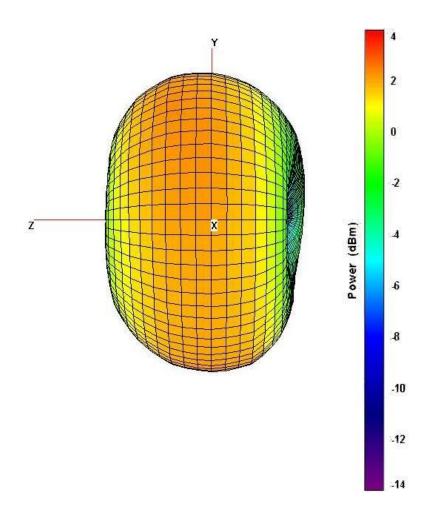
## Radiation Pattern Testing - Anechoic Chamber



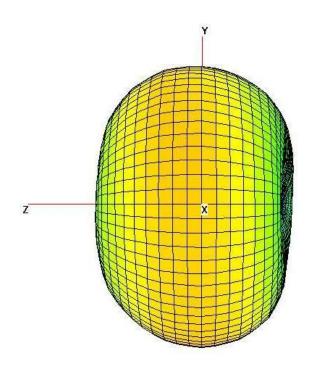


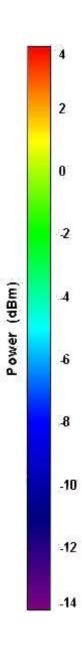
## 7.2.2 3D Radiation Patterns



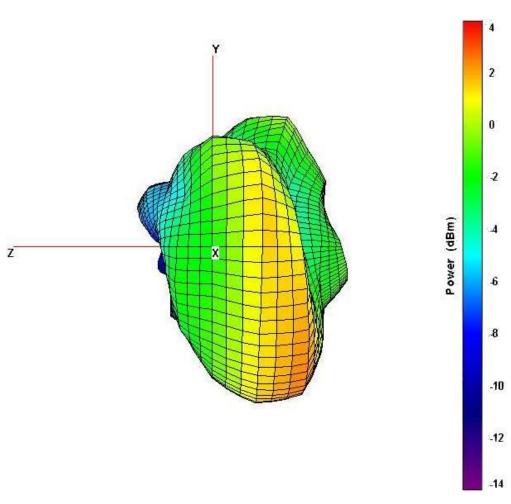




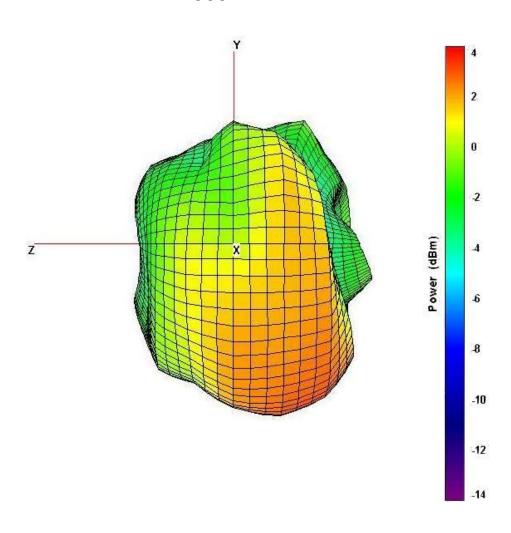




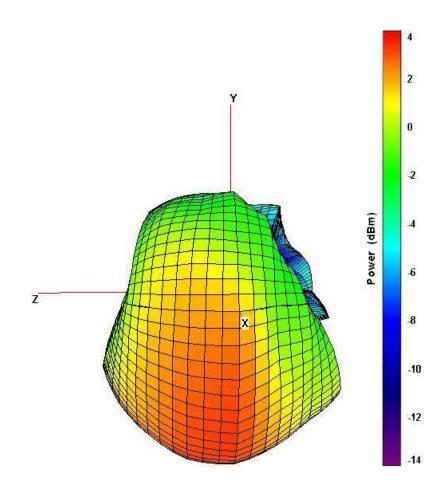














## 7.2.3 3D CHAMBER TESTING – TABULAR RESULTS

Peak EIRP (dBm)	300 1900	1800 1900	900	850	Channel
Ant. Port Input Pwr. (dBm)					Note
Tot. Rad. Pwr. (dBm)	4.5		20	4	Note
Peak EIRP (dBm)	0 (	0 0	0	0	
Directivity (dBi)	033 -2.53429	.97033 -2.53429	36794 -1.93	2.45333	Tot. Rad. Pwr. (dBm)
Efficiency (dB)	1.24876	.66193 1.24876	20176 2.66	015689	Peak EIRP (dBm)
Efficiency (%)         56.8417         72.9803         63.5283         55.76           Gain (dBi)         0.015689         1.20176         2.66193         1.248           NHPRP ±Pi/4 (dBm)         -3.02704         -1.92238         -2.97144         -3.454           NHPRP ±Pi/6 (dBm)         -4.06616         -2.96253         -4.30533         -4.764           NHPRP ±Pi/8 (dBm)         -5.02906         -3.92452         -5.46289         -5.866           Upper Hem. PRP (dBm)         -5.26654         -4.1779         -8.15472         -6.785           Lower Hem. PRP (dBm)         -5.67008         -4.58827         -3.16646         -4.580           NHPRP4 / TRP Ratio (dB)         -0.57372         -0.55444         -1.00111         -0.920           NHPRP4 / TRP Ratio (dB)         -1.61284         -1.59459         -2.335         -2.230           NHPRP6 / TRP Ratio (dB)         -1.61284         -1.59459         -2.335         -2.230           NHPRP6 / TRP Ratio (dB)         -2.57573         -2.55658         -3.49256         -3.332           NHPRP8 / TRP Ratio (dB)         -2.81321         -2.80996         -6.18439         -4.251           UHPRP / TRP Ratio (dB)         -3.21676         -3.22033         -1.19613         -2.046 <td>226 3.7830</td> <td>.63226 3.78305</td> <td>.5697 4.63</td> <td>2.46902</td> <td>Directivity (dBi)</td>	226 3.7830	.63226 3.78305	.5697 4.63	2.46902	Directivity (dBi)
Gain (dBi)         0.015689         1.20176         2.66193         1.248           NHPRP ±Pi/4 (dBm)         -3.02704         -1.92238         -2.97144         -3.454           NHPRP ±Pi/6 (dBm)         -4.06616         -2.96253         -4.30533         -4.764           NHPRP ±Pi/8 (dBm)         -5.02906         -3.92452         -5.46289         -5.866           Upper Hem. PRP (dBm)         -5.26654         -4.1779         -8.15472         -6.785           Lower Hem. PRP (dBm)         -5.67008         -4.58827         -3.16646         -4.580           NHPRP4 / TRP Ratio (dB)         -0.57372         -0.55444         -1.00111         -0.920           NHPRP4 / TRP Ratio (dB)         -1.61284         -1.59459         -2.335         -2.230           NHPRP6 / TRP Ratio (dB)         -1.61284         -1.59459         -2.335         -2.230           NHPRP6 / TRP Ratio (dB)         -2.57573         -2.55658         -3.49256         -3.332           NHPRP8 / TRP Ratio (dB)         -2.81321         -2.80996         -6.18439         -4.251           UHPRP / TRP Ratio (dB)         -3.21676         -3.2203         -1.19613         -2.046           LHPRP / TRP Ratio (dB)         -3.845463         1.05517         9.54643         6.845 <td>033 -2.53429</td> <td>.97033 -2.53429</td> <td>36794 -1.9</td> <td>2.45333</td> <td>Efficiency (dB)</td>	033 -2.53429	.97033 -2.53429	36794 -1.9	2.45333	Efficiency (dB)
NHPRP ±Pi/4 (dBm)	283 55.7919	3.5283 55.7919	.9803 63.	56.8417	Efficiency (%)
NHPRP ±Pi/6 (dBm)	1.24876	.66193 1.24876	20176 2.66	015689	Gain (dBi)
NHPRP ±Pi/8 (dBm)	144 -3.45498	.97144 -3.45498	92238 -2.9	3.02704	NHPRP ±Pi/4 (dBm)
Upper Hem. PRP (dBm) -5.26654 -4.1779 -8.15472 -6.785 Lower Hem. PRP (dBm) -5.67008 -4.58827 -3.16646 -4.580 NHPRP4 / TRP Ratio (dB) -0.57372 -0.55444 -1.00111 -0.920 NHPRP4 / TRP Ratio (%) 87.6251 88.0149 79.4126 80.85 NHPRP6 / TRP Ratio (dB) -1.61284 -1.59459 -2.335 -2.230 NHPRP6 / TRP Ratio (%) 68.9789 69.2693 58.4117 59.83 NHPRP8 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (dB) -2.81321 -2.80996 -6.18439 -4.251 UHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 UHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 UHPRP / TRP Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 178 2 + Phi BW (°) 360 360 88 1 -Phi BW (°) 38 38 19 -Th. BW (°) 43 42 27 Boresight Phi (°) 43 42 27 Boresight Phi (°) 90 90 120 1 Maximum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -15.575 -17.9994 -11.0462 -11.40 Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 168 1  E-Plane BW (°) 360 360 360 168 1  E-Plane BW (°) 360 360 360 168 1	533 -4.76442	.30533 -4.76442	96253 -4.30	4.06616	NHPRP ±Pi/6 (dBm)
Lower Hem. PRP (dBm) -5.67008 -4.58827 -3.16646 -4.580 NHPRP4 / TRP Ratio (dB) -0.57372 -0.55444 -1.00111 -0.920 NHPRP4 / TRP Ratio (%) 87.6251 88.0149 79.4126 80.89 NHPRP6 / TRP Ratio (dB) -1.61284 -1.59459 -2.335 -2.230 NHPRP6 / TRP Ratio (dB) -1.61284 -1.59459 -2.335 -2.230 NHPRP6 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (dB) -2.81321 -2.80996 -6.18439 -4.251 UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 178 22 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 88 1 -Phi BW (°) 360 360 88 1 -Phi BW (°) 38 38 19 -Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Phi (°) 90 90 120 1 Maximum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) -2.45333 -1.36794 -1.97033 -2.534 Min/Avg Ratio (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 360 168 1	289 -5.86661	.46289 -5.86661	92452 -5.46	5.02906	NHPRP ±Pi/8 (dBm)
NHPRP4 / TRP Ratio (dB) -0.57372 -0.55444 -1.00111 -0.920 NHPRP4 / TRP Ratio (%) 87.6251 88.0149 79.4126 80.89 NHPRP6 / TRP Ratio (dB) -1.61284 -1.59459 -2.335 -2.230 NHPRP6 / TRP Ratio (%) 68.9789 69.2693 58.4117 59.83 NHPRP8 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (%) 47.6787 47.6395 75.9253 62.42 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 360 178 22 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 360 88 11 - Phi BW (°) 360 360 360 88 11 - Phi BW (°) 360 360 360 88 11 - Th. BW (°) 38 38 39 -1 - Th. BW (°) 38 38 39 -1 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 360 360 168 1  E-Plane BW (°) 360 360 360 360 360 168 1  E-Plane BW (°) 360 360 360 360 360 360 360 360 360 360	472 -6.78538	.15472 -6.78538	.1779 -8.1	5.26654	Upper Hem, PRP (dBm)
NHPRP4 / TRP Ratio (%) 87.6251 88.0149 79.4126 80.89 NHPRP6 / TRP Ratio (dB) -1.61284 -1.59459 -2.335 -2.230 NHPRP6 / TRP Ratio (%) 68.9789 69.2693 58.4117 59.83 NHPRP8 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (%) 47.6787 47.6395 75.9253 62.42 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 360 178 2 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 360 88 1 Phi BW (°) 360 360 46 Front/Back Ratio (dB) 9.845463 1.05517 9.54643 6.845 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 1.05517 9.54643 Front/Back Ratio (dB) 0.845463 1.05517 9.5464	646 -4.58066	.16646 -4.58066	58827 -3.16	5.67008	Lower Hem. PRP (dBm)
NHPRP6 / TRP Ratio (dB) -1.61284 -1.59459 -2.335 -2.230 NHPRP6 / TRP Ratio (%) 68.9789 69.2693 58.4117 59.83 NHPRP8 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (dB) -2.81321 -2.80996 -6.18439 -4.251 UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (%) 47.6787 47.6395 75.9253 62.42 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 360 178 2 + Phi BW (°) 360 360 88 1 - Phi BW (°) 0 0 90 Theta BW (°) 81 80 46 + Th. BW (°) 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 360 168 1  HE-Plane BW (°) 360 360 360 360 168 1	111 -0.92069	.00111 -0.92069	55444 -1.00	0.57372	NHPRP4 / TRP Ratio (dB)
NHPRP6 / TRP Ratio (%) 68.9789 69.2693 58.4117 59.83 NHPRP8 / TRP Ratio (dB) -2.57573 -2.55658 -3.49256 -3.332 NHPRP8 / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (dB) -2.81321 -2.80996 -6.18439 -4.251 UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (%) 47.6787 47.6395 75.9253 62.42 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 360 178 2 + Phi BW (°) 360 360 360 88 1 - Phi BW (°) 0 0 90 Theta BW (°) 81 80 46 + Th. BW (°) 38 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 360 98 1	126 80.8967	9.4126 80.8967	.0149 79.4	87.6251	NHPRP4 / TRP Ratio (%)
NHPRP8 / TRP Ratio (dB)	335 -2.23013	-2.335 -2.23013	59459 -2	1.61284	NHPRP6 / TRP Ratio (dB)
NHPRP8 / TRP Ratio (%) 55.2621 55.5062 44.7449 46.42 UHPRP / TRP Ratio (dB) -2.81321 -2.80996 -6.18439 -4.251 UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (%) 47.6787 47.6395 75.9253 62.42 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 178 2 + Phi BW (°) 360 360 88 1 - Phi BW (°) 0 0 90 Theta BW (°) 81 80 46 + Th. BW (°) 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Phi (°) 90 90 120 1 Maximum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Minimum Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40 Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 98 1	117 59.8394	8.4117 59.8394	.2693 58.4	68.9789	NHPRP6 / TRP Ratio (%)
UHPRP / TRP Ratio (dB)	256 -3.33232	.49256 -3.33232	55658 -3.49	2.57573	NHPRP8 / TRP Ratio (dB)
UHPRP / TRP Ratio (%) 52.3213 52.3605 24.0747 37.57 LHPRP / TRP Ratio (dB) -3.21676 -3.22033 -1.19613 -2.046 LHPRP / TRP Ratio (%) 47.6787 47.6395 75.9253 62.42 Front/Back Ratio (dB) 0.845463 1.05517 9.54643 6.845 Phi BW (°) 360 360 178 2 + Phi BW (°) 360 360 88 1 - Phi BW (°) 0 0 90 Theta BW (°) 81 80 46 + Th. BW (°) 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Phi (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 360 98 1	449 46.4268	4.7449 46.4268	.5062 44.1	55.2621	NHPRP8 / TRP Ratio (%)
LHPRP / TRP Ratio (dB)	439 -4.25109	.18439 -4.25109	30996 -6.18	2.81321	UHPRP / TRP Ratio (dB)
LHPRP / TRP Ratio (%)	747 37.5743	4.0747 37.5743	.3605 24.0	52.3213	UHPRP / TRP Ratio (%)
Front/Back Ratio (dB)	613 -2.04636	.19613 -2.04636	22033 -1.19	3.21676	LHPRP / TRP Ratio (dB)
Phi BW (°) 360 360 178 2  + Phi BW (°) 360 360 88 1  - Phi BW (°) 0 0 90  Theta BW (°) 81 80 46  + Th. BW (°) 38 38 19  - Th. BW (°) 43 42 27  Boresight Phi (°) 255 255 300 2  Boresight Th. (°) 90 90 120 1  Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248  Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94  Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540  Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19  Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788  Min/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40  Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534  E-Plane BW (°) 360 360 360 98 1	253 62.4257	5.9253 62.4257	.6395 75.9	47.6787	LHPRP / TRP Ratio (%)
+ Phi BW (°) 360 360 88 1 - Phi BW (°) 0 0 90 Theta BW (°) 81 80 46 + Th. BW (°) 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40 Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 360 98 1	6.84502	.54643 6.84502	05517 9.54	845463	Front/Back Ratio (dB)
- Phi BW (°) 0 0 90 Theta BW (°) 81 80 46 + Th. BW (°) 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40 Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 98 1	178 201	178 201	360	360	Phi BW (°)
Theta BW (°) 81 80 46   + Th. BW (°) 38 38 19   - Th. BW (°) 43 42 27   Boresight Phi (°) 255 255 300 2   Boresight Th. (°) 90 90 120 1   Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248   Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94   Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540   Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19   Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788   Min/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40   Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534   E-Plane BW (°) 360 360 360 98 1	88 128	88 125	360	360	+ Phi BW (°)
+ Th. BW (°) 38 38 19 - Th. BW (°) 43 42 27 Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40 Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 98 1	90 76	90 76	0	0	- Phi BW (°)
- Th. BW (°)	46 66	46 66	80	81	Theta BW (°)
Boresight Phi (°) 255 255 300 2 Boresight Th. (°) 90 90 120 1 Maximum Power (dBm) 0.015689 1.20176 2.66193 1.248 Minimum Power (dBm) -19.5093 -20.8812 -13.7782 -14.94 Average Power (dBm) -3.93427 -2.8818 -2.73192 -3.540 Max/Min Ratio (dB) 19.525 22.083 16.4401 16.19 Max/Avg Ratio (dB) 3.94996 4.08357 5.39385 4.788 Min/Avg Ratio (dB) -15.575 -17.9994 -11.0462 -11.40 Average Gain (dB) -2.45333 -1.36794 -1.97033 -2.534 E-Plane BW (°) 360 360 168 1 + E-Plane BW (°) 360 360 98 1	19 41	19 41	38	38	+ Th. BW (°)
Boresight Th. (°)         90         90         120         1           Maximum Power (dBm)         0.015689         1.20176         2.66193         1.248           Minimum Power (dBm)         -19.5093         -20.8812         -13.7782         -14.94           Average Power (dBm)         -3.93427         -2.8818         -2.73192         -3.540           Max/Min Ratio (dB)         19.525         22.083         16.4401         16.19           Max/Avg Ratio (dB)         3.94996         4.08357         5.39385         4.788           Min/Avg Ratio (dB)         -15.575         -17.9994         -11.0462         -11.40           Average Gain (dB)         -2.45333         -1.36794         -1.97033         -2.534           E-Plane BW (°)         360         360         168         1           + E-Plane BW (°)         360         360         98         1	27 25	27 25	42	43	- Th. BW (°)
Maximum Power (dBm)         0.015689         1.20176         2.66193         1.248           Minimum Power (dBm)         -19.5093         -20.8812         -13.7782         -14.94           Average Power (dBm)         -3.93427         -2.8818         -2.73192         -3.540           Max/Min Ratio (dB)         19.525         22.083         16.4401         16.19           Max/Avg Ratio (dB)         3.94996         4.08357         5.39385         4.788           Min/Avg Ratio (dB)         -15.575         -17.9994         -11.0462         -11.40           Average Gain (dB)         -2.45333         -1.36794         -1.97033         -2.534           E-Plane BW (°)         360         360         168         1           + E-Plane BW (°)         360         360         98         1	300 240	300 240	255	255	Boresight Phi (°)
Maximum Power (dBm)         0.015689         1.20176         2.66193         1.248           Minimum Power (dBm)         -19.5093         -20.8812         -13.7782         -14.94           Average Power (dBm)         -3.93427         -2.8818         -2.73192         -3.540           Max/Min Ratio (dB)         19.525         22.083         16.4401         16.19           Max/Avg Ratio (dB)         3.94996         4.08357         5.39385         4.788           Min/Avg Ratio (dB)         -15.575         -17.9994         -11.0462         -11.40           Average Gain (dB)         -2.45333         -1.36794         -1.97033         -2.534           E-Plane BW (°)         360         360         168         1           + E-Plane BW (°)         360         360         98         1	120 10	120 105	90	90	Boresight Th. (°)
Average Power (dBm)       -3.93427       -2.8818       -2.73192       -3.540         Max/Min Ratio (dB)       19.525       22.083       16.4401       16.19         Max/Avg Ratio (dB)       3.94996       4.08357       5.39385       4.788         Min/Avg Ratio (dB)       -15.575       -17.9994       -11.0462       -11.40         Average Gain (dB)       -2.45333       -1.36794       -1.97033       -2.534         E-Plane BW (°)       360       360       168       1         + E-Plane BW (°)       360       360       98       1	193 1.24876	.66193 1.24876	20176 2.66	015689	Maximum Power (dBm)
Max/Min Ratio (dB)     19.525     22.083     16.4401     16.19       Max/Avg Ratio (dB)     3.94996     4.08357     5.39385     4.788       Min/Avg Ratio (dB)     -15.575     -17.9994     -11.0462     -11.40       Average Gain (dB)     -2.45333     -1.36794     -1.97033     -2.534       E-Plane BW (°)     360     360     168     1       + E-Plane BW (°)     360     360     98     1	782 -14.9471	3.7782 -14.9471	.8812 -13.7	19.5093	Minimum Power (dBm)
Max/Avg Ratio (dB)       3.94996       4.08357       5.39385       4.788         Min/Avg Ratio (dB)       -15.575       -17.9994       -11.0462       -11.40         Average Gain (dB)       -2.45333       -1.36794       -1.97033       -2.534         E-Plane BW (°)       360       360       168       1         + E-Plane BW (°)       360       360       98       1	192 -3.54007	.73192 -3.54007	.8818 -2.73	3.93427	Average Power (dBm)
Min/Avg Ratio (dB)       -15.575       -17.9994       -11.0462       -11.40         Average Gain (dB)       -2.45333       -1.36794       -1.97033       -2.534         E-Plane BW (°)       360       360       168       1         + E-Plane BW (°)       360       360       98       1	401 16.1959	6.4401 16.1959	2.083 16.4	19.525	Max/Min Ratio (dB)
Average Gain (dB)     -2.45333     -1.36794     -1.97033     -2.534       E-Plane BW (°)     360     360     168     1       + E-Plane BW (°)     360     360     98     1	385 4.78883	.39385 4.78883	08357 5.39	3.94996	Max/Avg Ratio (dB)
E-Plane BW (°) 360 360 168 1 + E-Plane BW (°) 360 360 98 1	462 -11.4071	1.0462 -11.4071	.9994 -11.0	-15.575	Min/Avg Ratio (dB)
E-Plane BW (°) 360 360 168 1 + E-Plane BW (°) 360 360 98 1				2.45333	
+ E-Plane BW (°) 360 360 98 1	168 194	168 194	360	360	
	98 125	98 125	360	360	+ E-Plane BW (°)
	_		0	0	
H-Plane BW (°) 81 80 48	48 72	48 72	80	81	H-Plane BW (°)
+ H-Plane BW (°) 42 41 27	_	1000	41	42	
- H-Plane BW (°) 39 39 21			39		

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