Miniature Stubby SMA

Features

- 824-960/1710-1990/2170MHz
- 1/4 Wave Monopole Antenna
- Omni-Directional
- VSWR <3.0
- SMA Connector
- 50Ω Impedance
- 0dBi Gain
- ABS / Rubber Housing
- Operates from –40 to+70^{0}C

Applications

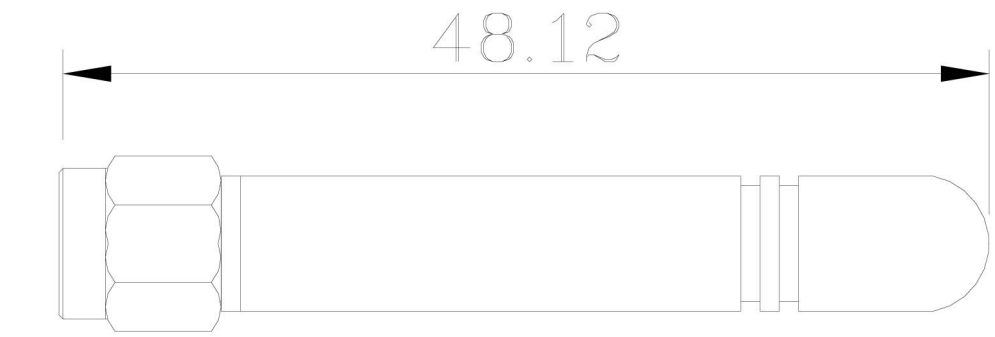
- General Low Power Radio
- M2M Applications
- Telemetry

A Miniature antenna for demanding applications. This antenna provides operation a high performance across a broad spectrum of frequencies. Housed in a rugged low profile ABS, this antenna is compact and resistant to Vandalism.

Ordering Information

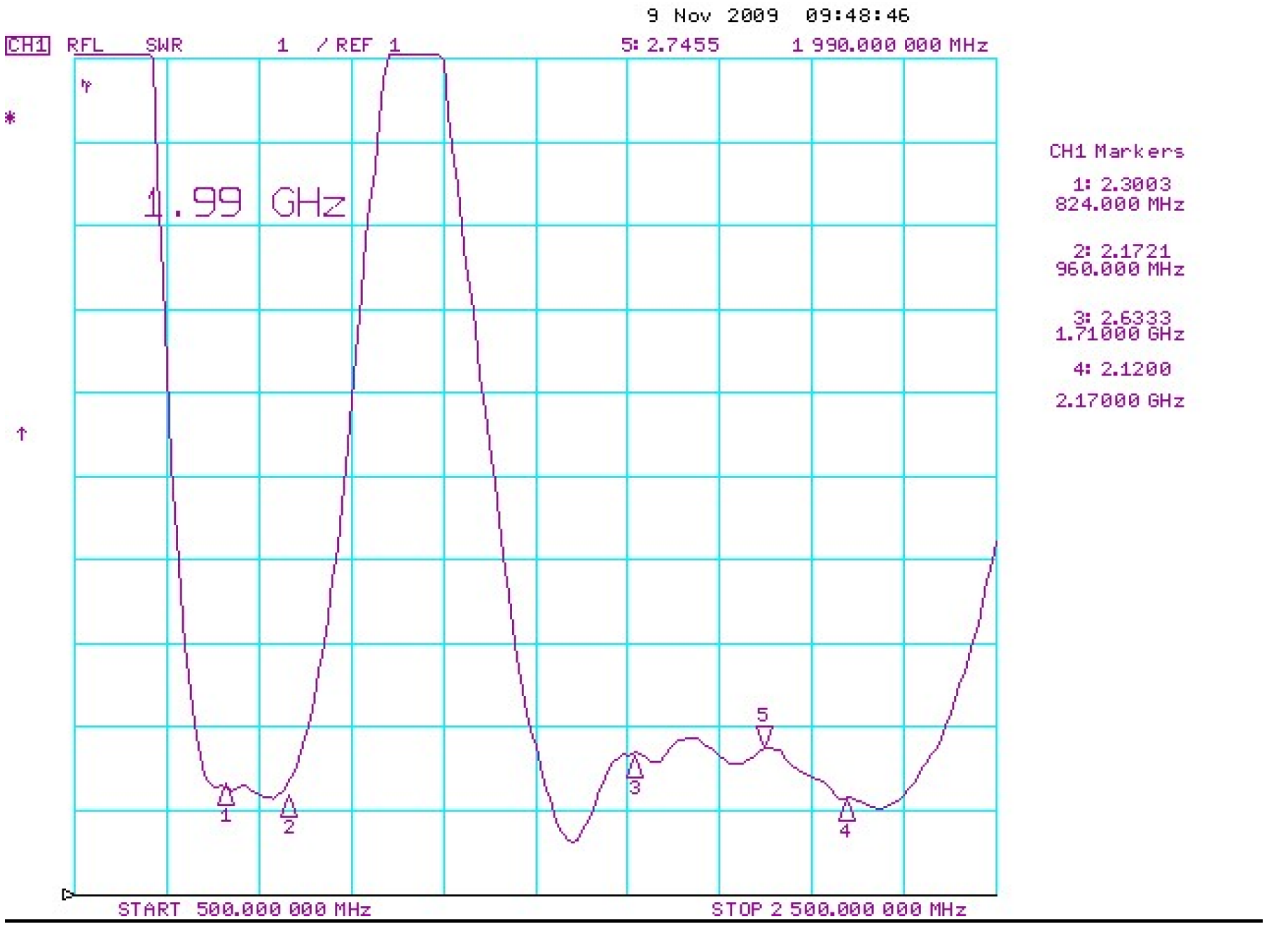
Part No	Description
ANT-MSTUB-SMAF	Stubby Antenna LTE 824-960/1710-1990/2170MHz SMA(Female)
ANT-MSTUBR-SMAM	Stubby Antenna LTE 824-960/1710-1990/2170MHz SMA(Male)

Mechanical Detail—Straight Version



SMA

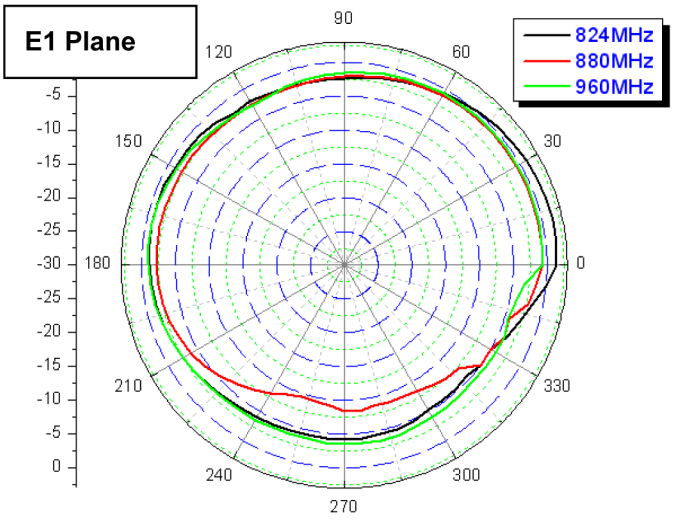
Performance Data — VSWR

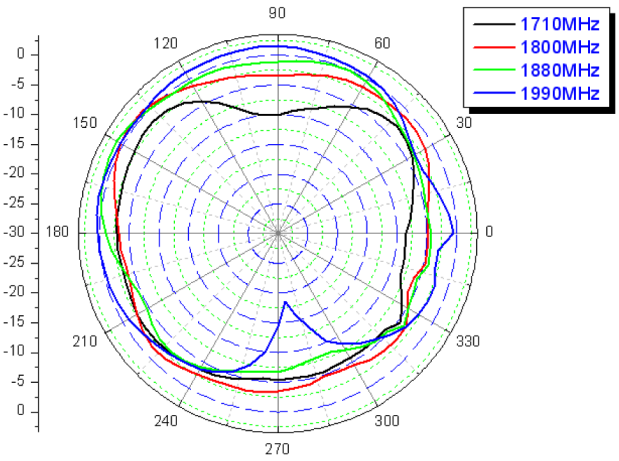


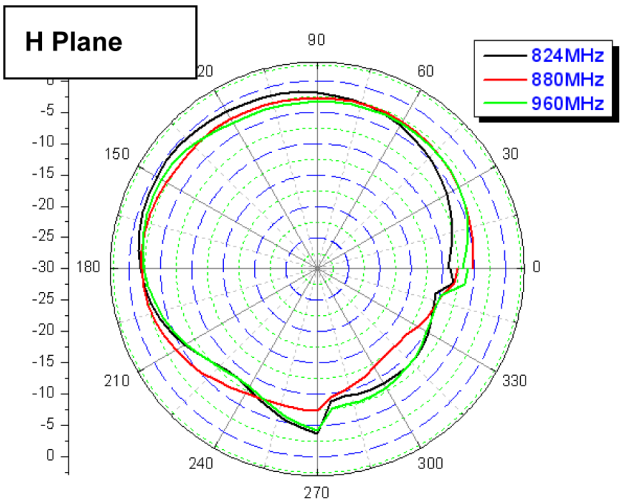
ANT-MSTUB Antenna

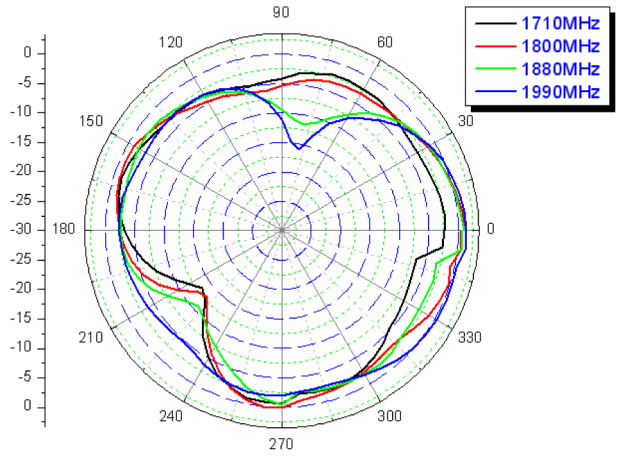
Performance Data – RETURN LOSS

Frequency (MHz)	H Plane			E1 Plane		
Unit dBi	Max.	Min.	Avg.	Max.	Min.	Avg.
824	1.52	-5.61	-1.64	-0.45	-10.65	-4.09
880	-0.60	-9.54	-2.94	-1.88	-12.53	-4.42
960	-0.42	-4.52	-2.06	-1.36	-10.19	-4.47
1710	-1.89	-10.09	-3.62	-0.65	-13.31	-3.39
1800	0.79	-9.60	-2.60	1.20	-13.02	-2.30
1880	1.16	-10.93	-2.54	1.03	-11.55	-2.98
1990	1.57	-18.53	-1.21	1.44	-15.88	-2.22









Performance Data

Total	Frequency (MHz)	824	960	1710	1990	2170
	Point Values					
	Ant. Port Input Pwr. (dBm)	0	0	0	0	0
	Tot. Rad. Pwr. (dBm)	-3.02158	-4.53846	-3.43015	-3.35456	-2.55152
	Peak EIRP (dBm)	-0.273484	-2.20475	-0.31156	-0.177191	0.578211
	Directivity (dBi)	2.7481	2.33372	3.11859	3.17737	3.12973
	Efficiency (dB)	-3.02158	-4.53846	-3.43015	-3.35456	-2.55152
	Efficiency (%)	49.8703	35.1685	45.3925	46.1896	55.571
	Gain (dBi)	-0.273484	-2.20475	-0.31156	-0.177191	0.578211
	NHPRP i/4 (dBm)	-4.7446	-6.37139	-4.52182	-4.23522	-3.53953
	NHPRP i/6 (dBm)	-6.34653	-7.99471	-5.92586	-5.58046	-4.96417
	NHPRP i/8 (dBm)	-7.517	-9.23127	-7.02402	-6.7178	-6.12253
	Upper Hem. PRP (dBm)	-5.74067	-7.0721	-5.69479	-6.16282	-4.67429
	Lower Hem. PRP (dBm)	-6.34403	-8.08427	-7.34124	-6.57675	-6.67857
	NHPRP4 / TRP Ratio (dB)	-1.72302	-1.83292	-1.09167	-0.880662	-0.988006
	NHPRP4 / TRP Ratio (%)	67.2509	65.5704	77.7738	81.6458	79.6525
	Near Horz. TRP for i/4 (dBm)	-3.23945	-4.86624	-3.01667	-2.73007	-2.03438
	NHPRP6 / TRP Ratio (dB)	-3.32495	-3.45624	-2.49571	-2.2259	-2.41265
	NHPRP6 / TRP Ratio (%)	46.5055	45.1207	56.2897	59.8977	57.3767
	Near Horz. TRP for i/6 (dBm)	-3.33623	-4.98441	-2.91556	-2.57016	-1.95387
	NHPRP8 / TRP Ratio (dB)	-4.49542	-4.69281	-3.59387	-3.36324	-3.57101
	NHPRP8 / TRP Ratio (%)	35.5188	33.9406	43.7133	46.0974	43.9439
	Near Horz. TRP for i/8 (dBm)	-3.34539	-5.05967	-2.85242	-2.54619	-1.95093
	UHPRP / TRP Ratio (dB)	-2.71909	-2.53364	-2.26463	-2.80827	-2.12277
	UHPRP / TRP Ratio (%)	53.4676	55.8003	59.3659	52.381	61.3371
	Upper Hem.Total Radiated Pwr (dBm)	-2.73037	-4.0618	-2.68449	-3.15252	-1.66399
	LHPRP / TRP Ratio (dB)	-3.32245	-3.5458	-3.91109	-3.22219	-4.12705
	LHPRP / TRP Ratio (%)	46.5324	44.1997	40.6341	47.619	38.6629
	Lower Hem. Total Radiated Pwr(dBm)	-3.33373	-5.07397	-4.33094	-3.56645	-3.66827
	Front/Back Ratio (dB)	2.08198	2.04379	5.71434	2.40834	5.19069
	Phi BW (?	282	125	194	151	238
	+ Phi BW (?	63	61	138	112	103

Total	Frequency (MHz)	824	960	1710	1990	2170
	Point Values					
	- Phi BW (?	219	64	56	39	135
	Theta BW (?	107	304	122	115	82
	+ Th. BW (?	50	204	87	72	58
	- Th. BW (?	57	100	35	43	24
	Boresight Phi (?	33.65	53.4	304.1	42.05	56.7
	Boresight Th. (?	45	60	60	75	45
	Maximum Power (dBm)	-0.273484	-2.20475	-0.31156	-0.177191	0.578211
	Minimum Power (dBm)	-15.3831	-20.1007	-16.2884	-15.7609	-14.7237
	Average Power (dBm)	-2.7917	-4.2109	-4.0649	-4.32296	-3.55684
	Max/Min Ratio (dB)	15.1096	17.896	15.9768	15.5837	15.3019
	Max/Avg Ratio (dB)	2.51822	2.00615	3.75334	4.14577	4.13505
	Min/Avg Ratio (dB)	-12.5914	-15.8898	-12.2235	-11.4379	-11.1669
	Average Gain (dB)	-3.02158	-4.53846	-3.43015	-3.35456	-2.55152
	E-Plane BW (?	87	102	191	102	84
	+ E-Plane BW (?	46	64	142	54	22
	- E-Plane BW (?	41	38	49	48	62
	H-Plane BW (?	360	360	97	81	102
	+ H-Plane BW (?	360	360	51	36	57
	- H-Plane BW (?	0	0	46	45	45

6. Measurement Setup

（1）Reflection Coefficient Measurement：

（a）Instrument： Network Analyzer

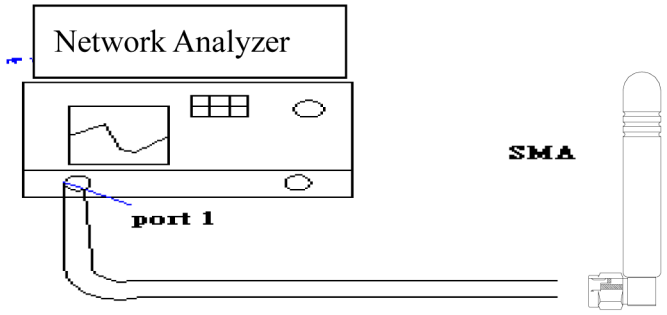
（b）Setup：

（I）Calibrate the Network Analyzer by one port calibration using O.S.L calibration kits.

（II）Connect the antenna under test to the Network Analyzer.

（III）Measure the S11(reflection coefficient) shown in Fig. 1.

（IV）Generally, the S11 is less than －10dB to ensure the 90% power into antenna and only less than 10% power back to system



（2）Pattern measurement：

a．The anechoic chamber is a far–field measurement system with size of 7m×3.3m×3.3m. The quiet zone region is 30cm x 30cm x 30cm in the center of the rotator.

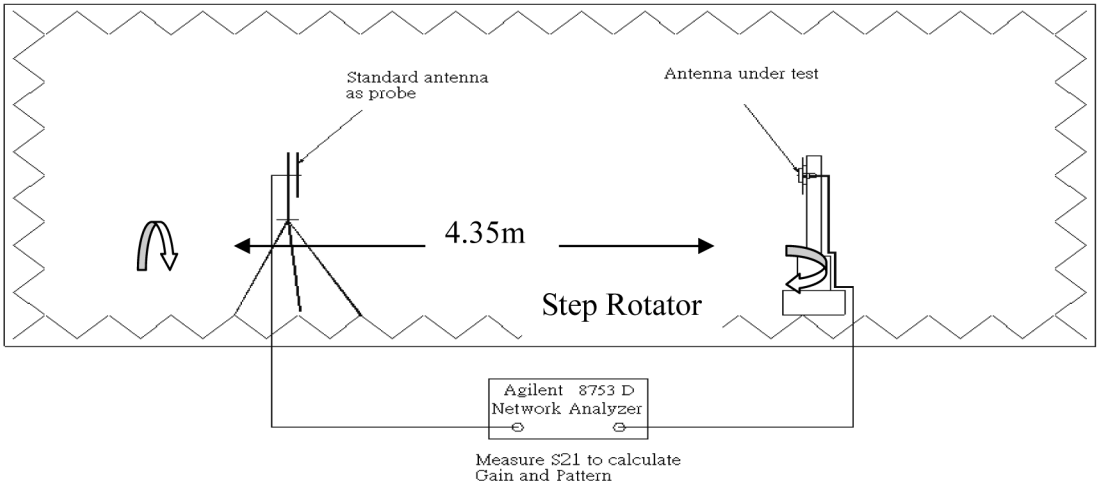


Fig.2 The interior components of the anechoic chamber

b . The probing antenna is the BBHA 9120 LFA 700MHz ~ 6GHz module (9120D horn antenna), which is placed in the one side of the chamber room. And the antenna under testing (AUT) is placed in the other side of the chamber. The distance between the probing antenna and the AUT is about 4m.

c . While we measure the radiation patterns by rotating AUT with 360 degrees and repeat again by replacing the AUT with the standard gain antenna under test, we compare both data and using a formula to obtain the gain of AUT. The standard gain antenna is a gain horn (BBHA 9120 LFA 700MHz～6GHZ).

$$G_{AUT} = G_{s\tan d} + P_{AUT} - P_{s\tan d}$$

G_{AUT} : $Gain \quad of \quad AUT$

$G_{s\tan d}$: $Gain \quad of \quad S\tan dard \quad Gain \quad Antenna$

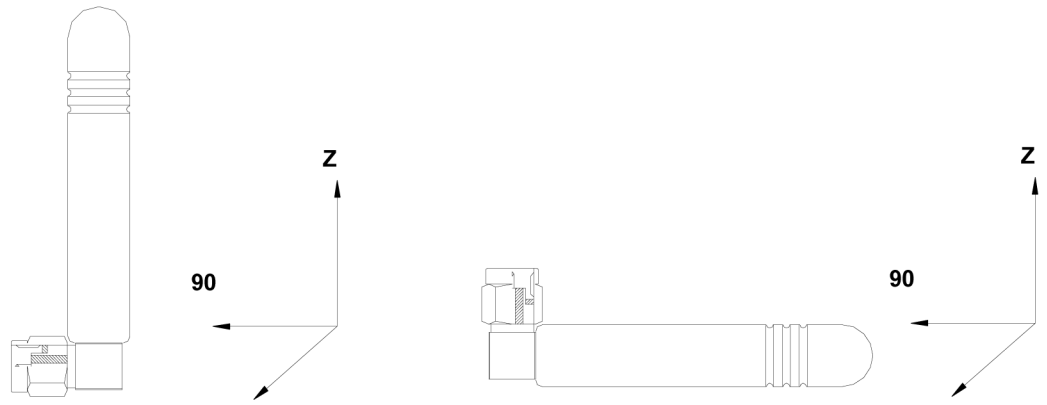
P_{AUT} : $Measured \quad Power \quad of \quad AUT$

$P_{s\tan d}$: $Measured \quad Power \quad of \quad S\tan dard \quad Gain \quad Antenna$

d . The scanning method is CW wave with 6 degree by one step.

e . We measure the radiation pattern in the free space situation at the lowest, middle and highest frequency for the H(X–Y)、E1(Y–Z) planes, which defined in figure next page.

（3）Plane definition：



H-Plane **E1-Plane**

Fig.3 The plane definition for H and E1 planes.

ANT-MSTUB Antenna

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Meets the following EC Directives

DO NOT Discard with normal waste, please recycle.

ROHS Directive
2002/95/EC

Specifies certain limits for hazardous substances.

WEEE Directive
2002/96/EC

Waste Electrical & Electronic Equipment.
This product must be disposed of through a licensed WEEE collection point.
RF Solutions Ltd fulfils its WEEE obligations by membership of an approved compliance scheme.
Environment Agency producer registration number WEE/JB0104WV

Waste Batteries and Accumulators Directive
2006/66/EC

Where batteries are fitted, before recycling the product, the batteries must be removed and disposed of at a licensed collection point.

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