

	ACA-107-T Ultra Wide Band Chip Antenna - (3.2 ~ 7.2GHz) Application Note	
Date of Issue: April 9 th , 2015	ACA-107-T	 ESD Sensitive
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1.0 Introduction

The ACA-107-T product is a chip antenna with a broadband match covering 3200MHz to 7200MHz.

The antenna is constructed from a dielectric ceramic material with Ag patterns to form the antenna performance. Table (1) summarizes the operating frequencies, bandwidths and applications.

Table (1.0) – Operating Frequencies, Bandwidths and Applications

Frequency [MHz]	Bandwidth [MHz]	Description
5200	3200 ~ 7200	UWB

1.1 Matching and Performance of Evaluation Board

Ceramic Chip Antennas are sensitive to their application environment such as the size and location of ground planes, the dielectric constant and thickness of the PCB layers and the proximity to other objects. These parameters affect the actual centre frequency, gain and bandwidth of the antenna.

To overcome these influences and match to the ultra wide bandwidth the design utilizes a metalized matching stub on the PCB layout. The match to the antenna should be made in your final product environment to get the best performance. The performance characteristics shown in Table (2) are measured on Test Fixture and evaluation board in free space and make up the specification of the parts. These matching values may differ from those in the actual end product environment.



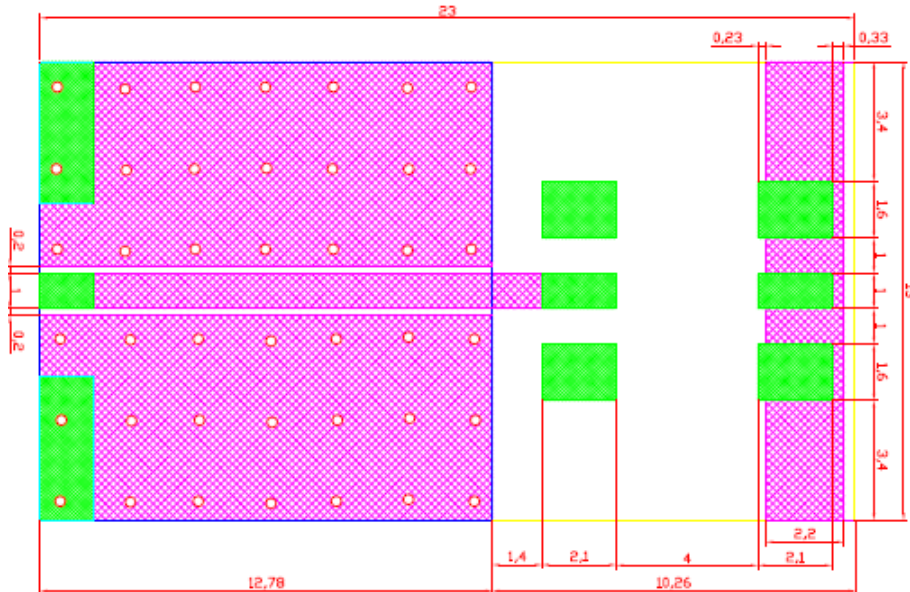
2.0 Electrical Characteristics

Table (2.0) - 2D Electrical Characteristics ACA-107-T for UWB

2D MEASUREMENTS								
Frequency Range [MHz]				3200 ~ 7200				
VSWR				(Typ 4:1) 5:1 Max				
Frequency [MHz]				3200	4200	5200	6200	7200
Gain	Azimuth	Theta	Peak	-0.88	2.73	2.51	4.16	1.31
			Average	-4.26	-1.22	-1.88	-1.10	-4.82
			Efficiency	37.50	75.50	64.86	77.62	32.96
		Phi	Peak	-3.84	-2.16	-1.91	-2.61	-5.20
			Average	-9.61	-8.20	-8.16	-9.96	-11.63
			Efficiency	10.96	15.13	15.27	10.09	6.87
	Elevation 1	Theta	Peak	-5.05	-2.32	-1.03	0.30	-0.68
			Average	-10.36	-8.84	-7.90	-6.99	-8.06
			Efficiency	9.20	13.06	16.21	19.99	15.63
		Phi	Peak	-2.99	1.98	1.81	2.92	0.20
			Average	-6.65	-3.30	-3.37	-3.04	-3.71
			Efficiency	21.62	46.77	46.02	49.65	42.55
	Elevation 2	Theta	Peak	-5.83	-3.38	-2.05	0.26	-3.56
			Average	-10.76	-9.16	-7.01	-5.74	-8.27
			Efficiency	8.39	12.13	19.90	26.66	14.89
		Phi	Peak	-0.52	2.32	1.52	1.39	1.12
			Average	-5.23	-3.30	3.30	-3.90	4.74
			Efficiency	29.99	46.77	43.05	40.73	33.57

4.0 AutoCAD Drawing of Reference PCB Design

Figure (2) - AutoCAD layout drawing ACA-107-T

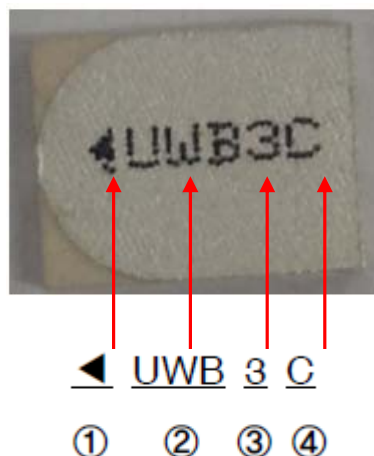


Dimensions: mm / Board Thickness 1.0mm

4.1 Marking and Input Pin identification

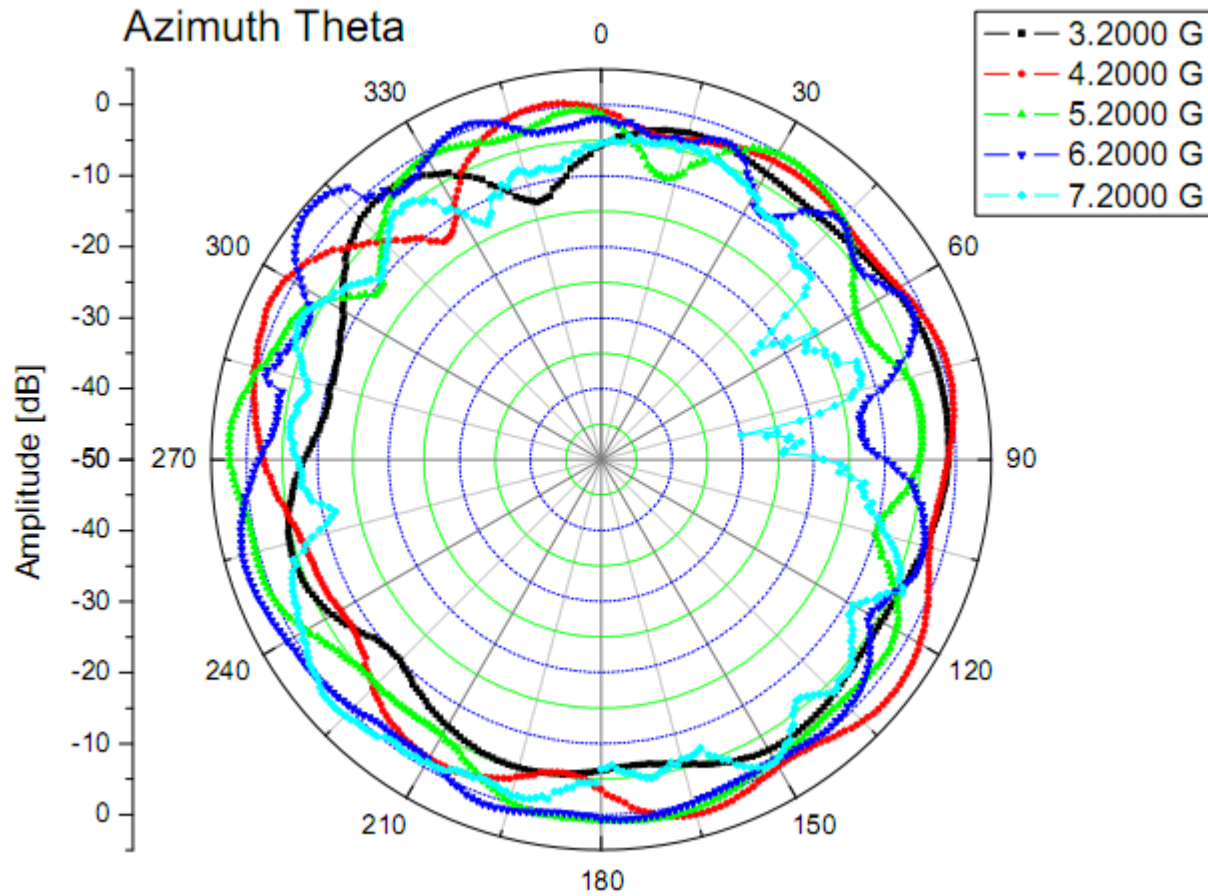
Figure (3) shows the marking of the ACA-107 and the arrow ◀ points to the input feed pad.

Figure (3) - ACA-107-Top Marking



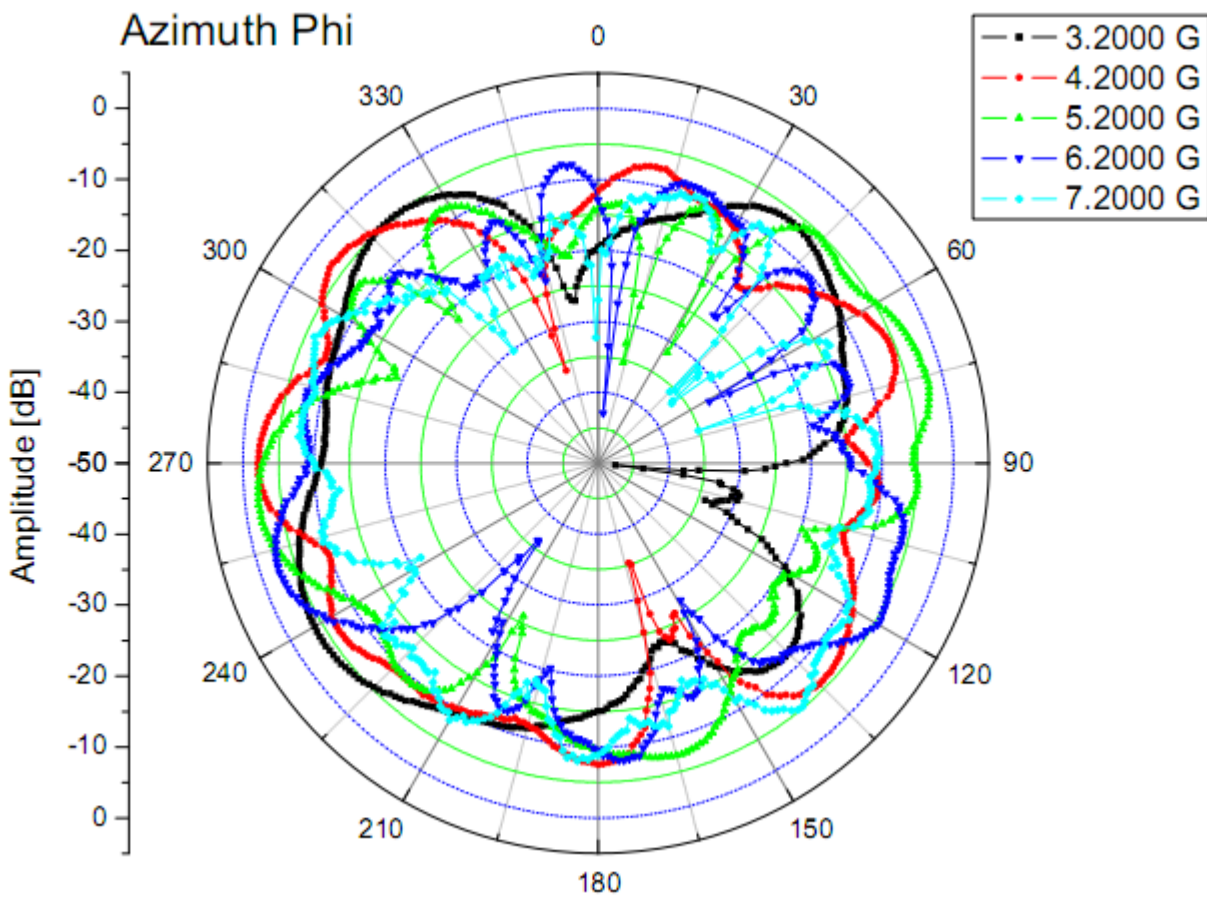
5.0 2D Radiation Pattern

Figure (4) - 2D Radiation Pattern - ACA-107-T Azimuth Theta



5.1 2D Radiation Pattern

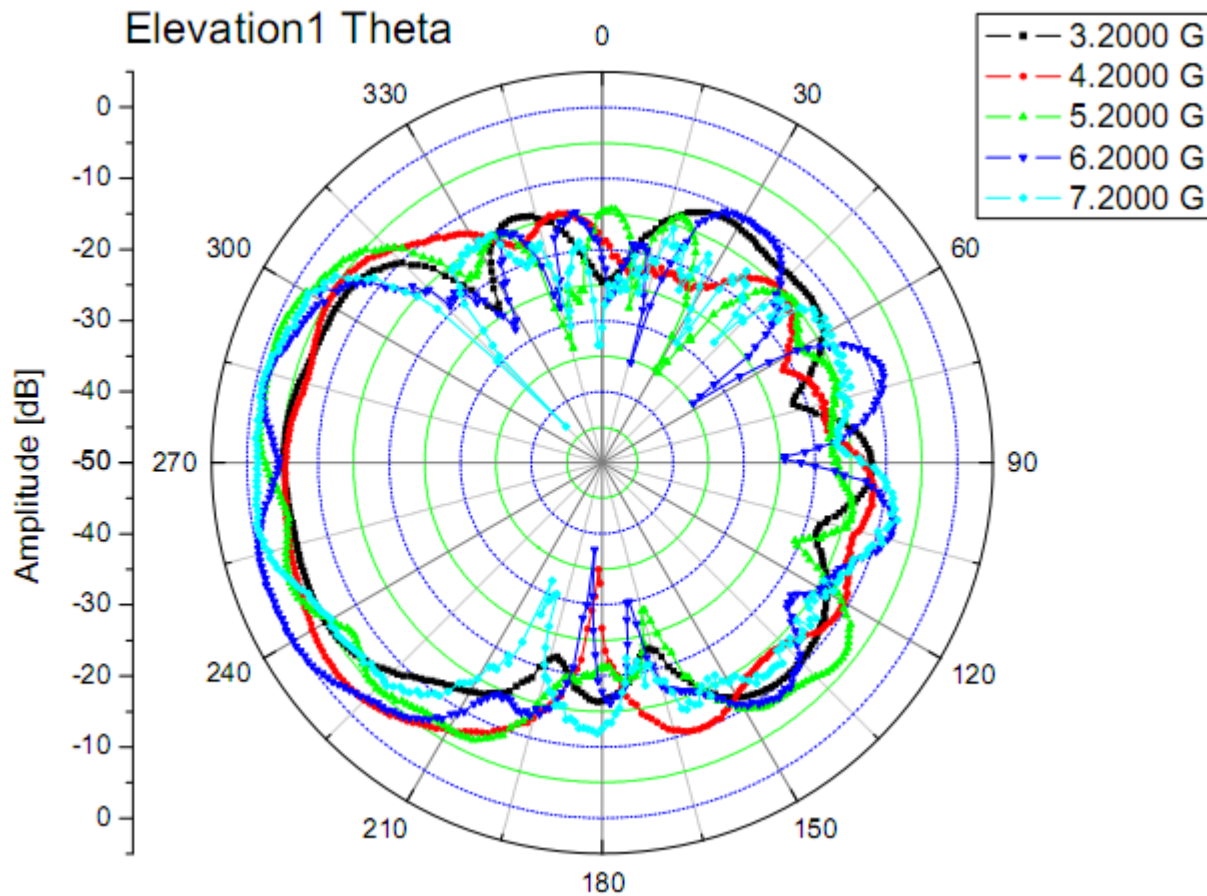
Figure (5) - 2D Radiation Pattern - ACA-107-T Azimuth Phi





5.2 2D Radiation Pattern

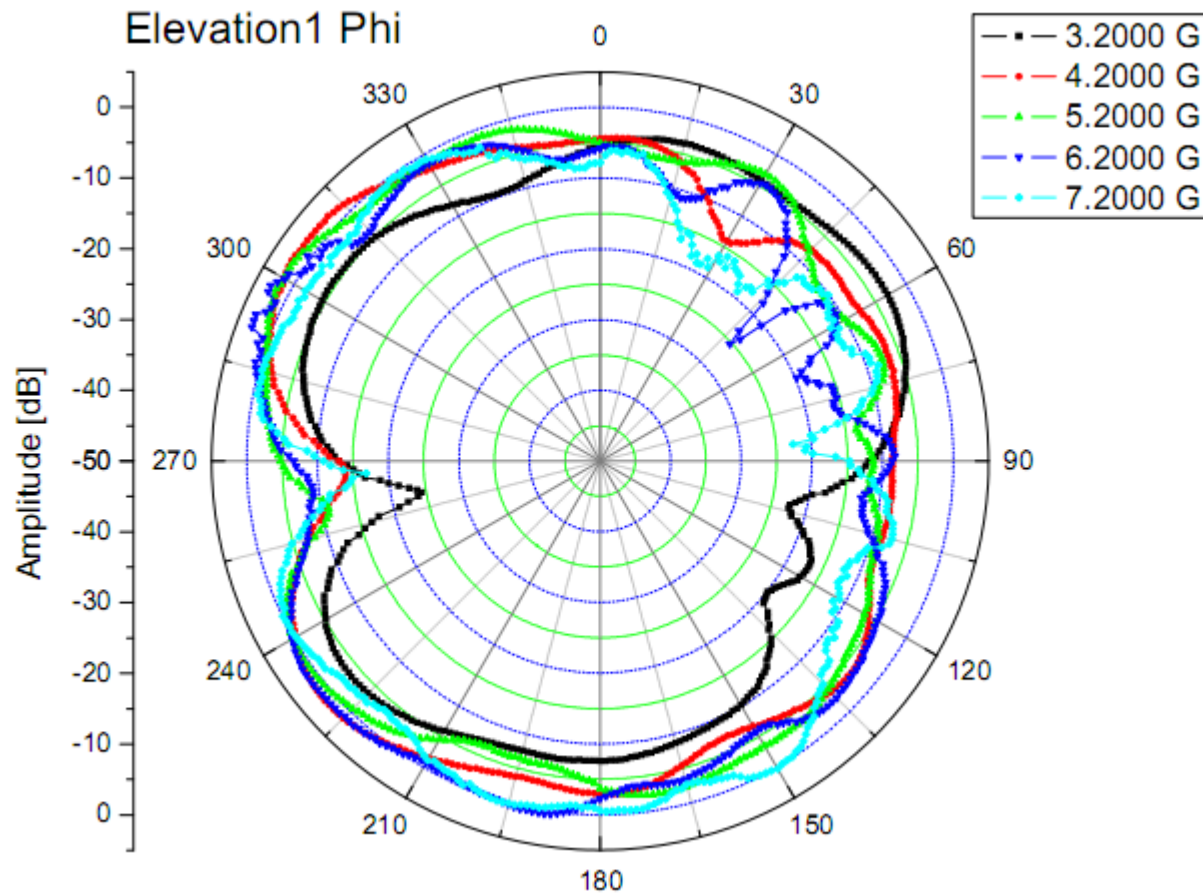
Figure (6) - 2D Radiation Pattern - ACA-107-T Elevation 1 Theta





5.3 2D Radiation Pattern

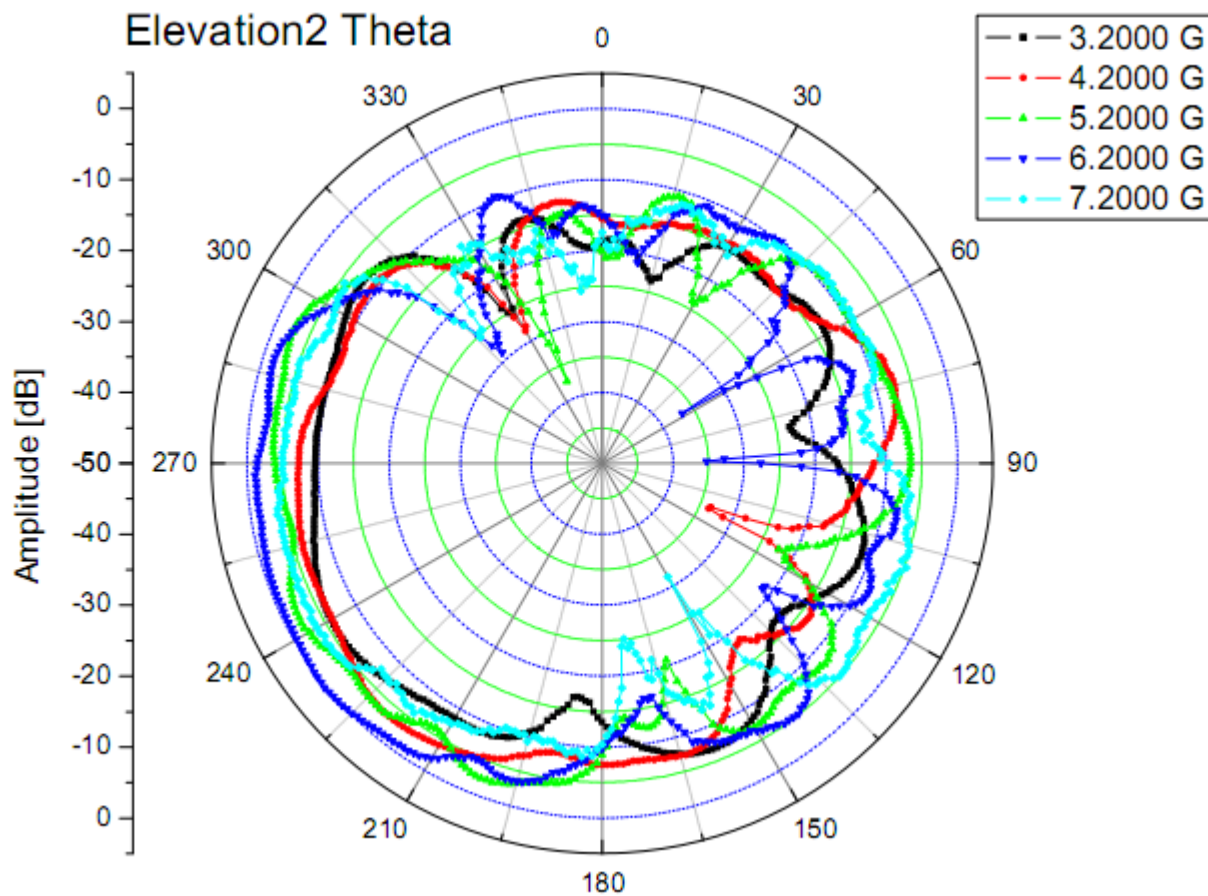
Figure (7) - 2D Radiation Pattern - ACA-107-T Elevation 1 Phi





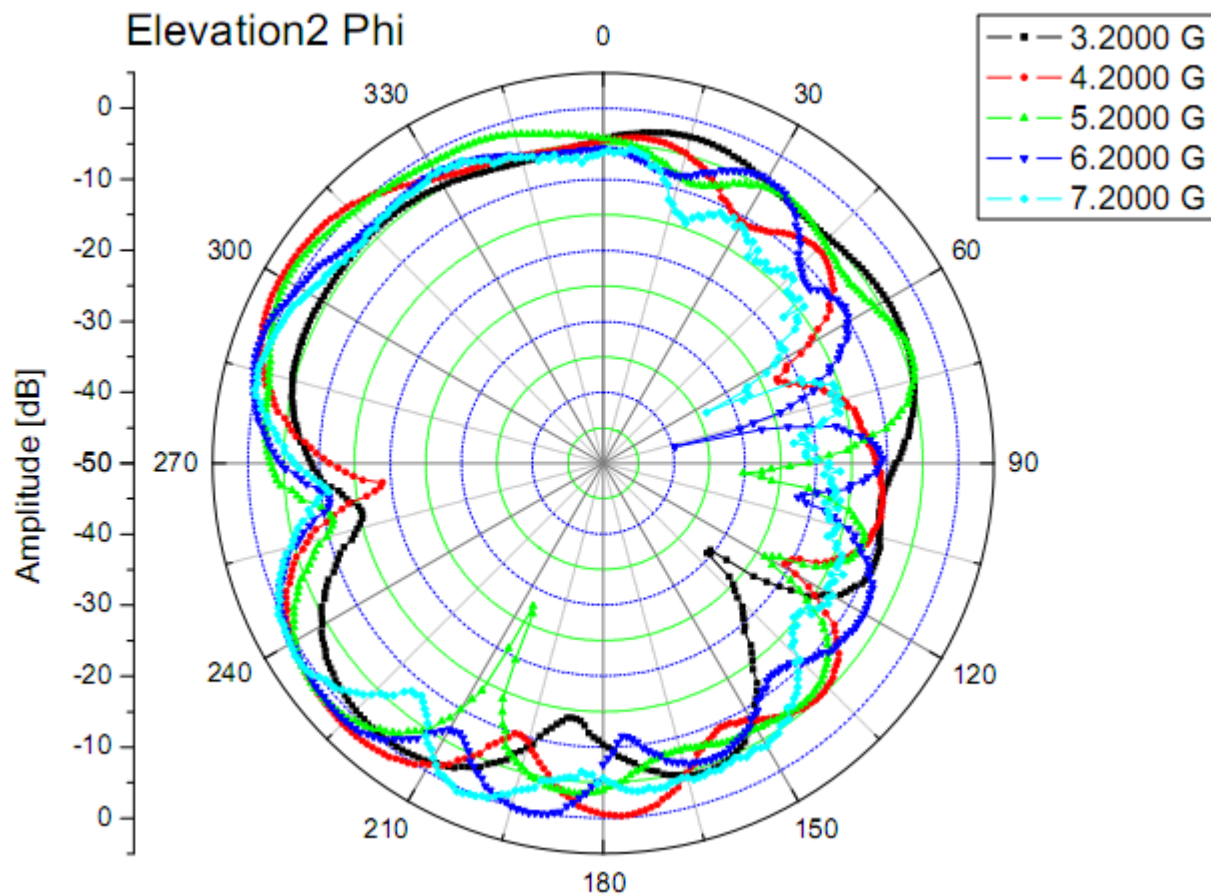
5.4 2D Radiation Pattern

Figure (8) - 2D Radiation Pattern - ACA-107-T Elevation 2 Theta

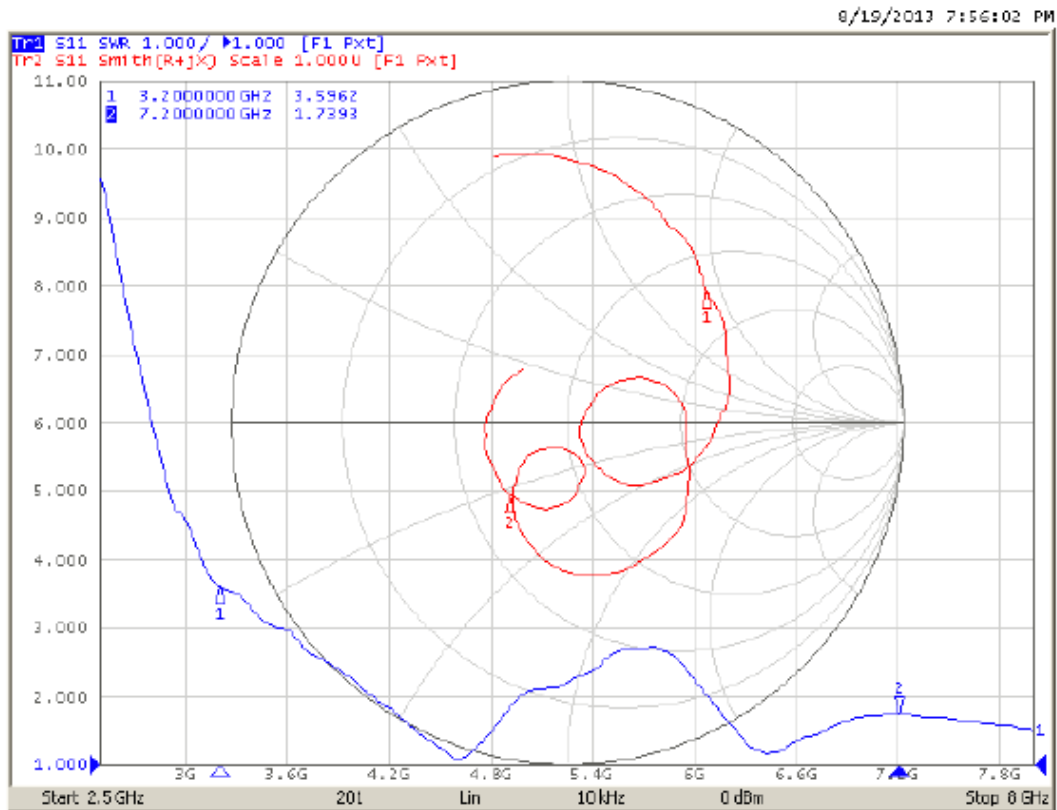





5.5 2D Radiation Pattern

Figure (9) - 2D Radiation Pattern - ACA-107-T Elevation 2 Phi



6.0 Antenna Response - VSWR / Smith Chart

Figure (10) – SWR and Smith Chart Plots for ACA-107-T


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7.0 Notes

- i) The parts are manufactured in accordance with this specification. If other conditions and specifications which are required for this specification, please contact ABRACON for more information.
- ii) ABRACON will supply the parts in accordance with this specification unless we receive a written request to modify prior to an order placement.
- iii) In no case shall ABRACON be liable for any product failure from in appropriate handling or operation of the item beyond the scope of this specification.
- iv) When changing your production process, please notify ABRACON immediately.
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- vi) All specifications and Marking will be subject to change without notice.




8.0 ABRACON LLC – TERMS & CONDITIONS OF SALE

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