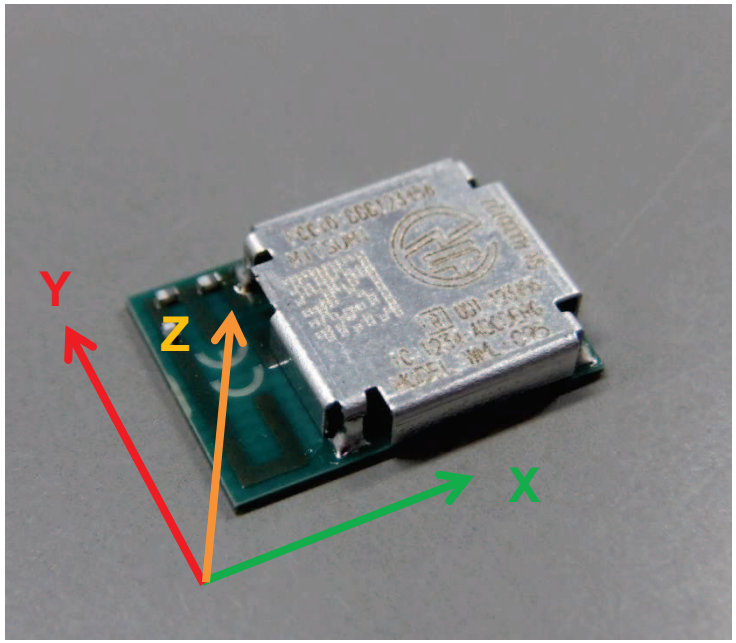
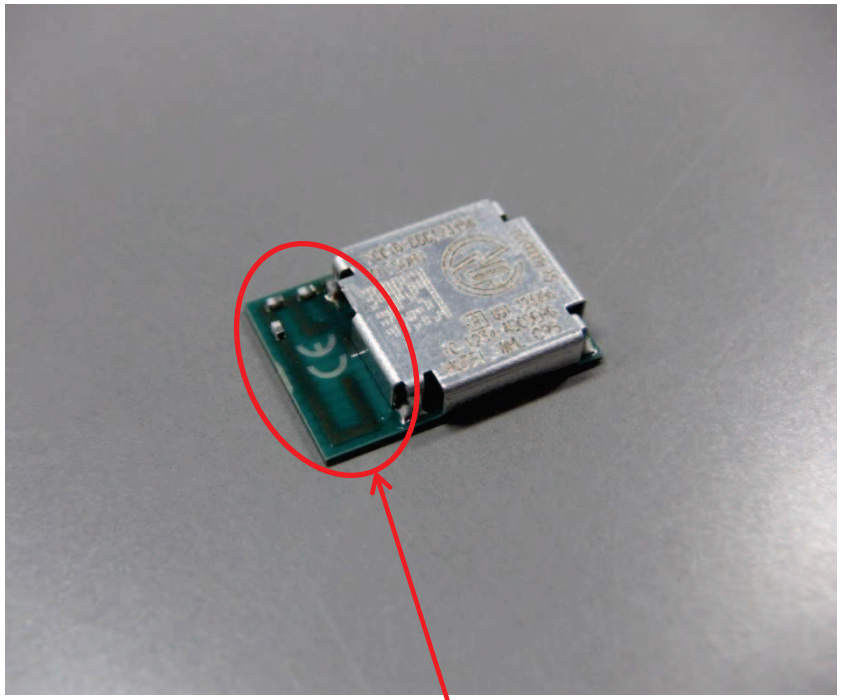
Specification

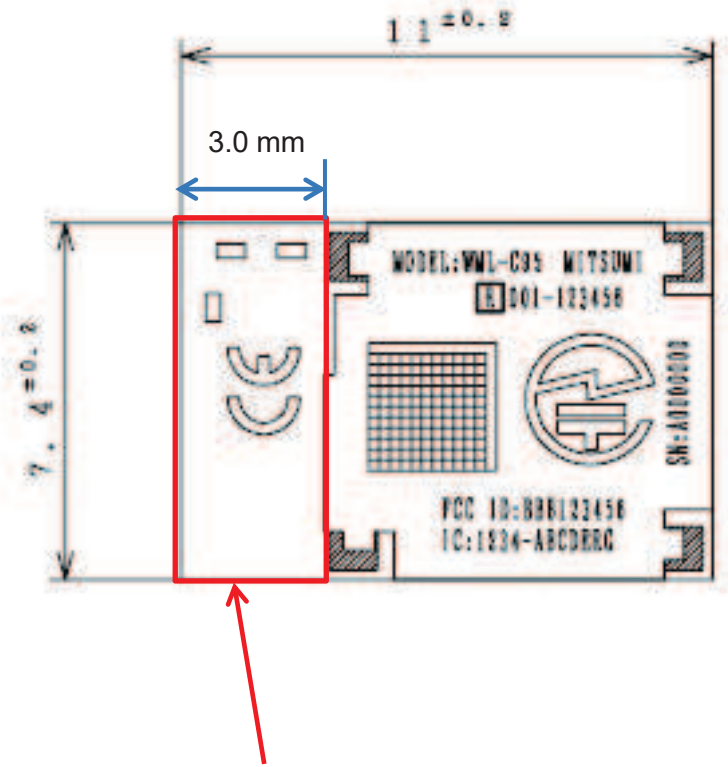
Item	Characteristics
Frequency Range	2402MHz～2480MHz
Input Impedance	50Ω
VSWR	<2.5
Polarization	Linearly Polarization
Peak Gain	−5.68dBi (Z−X plane 2484MHz)



WML-C95 Antenna Placement



Antenna (printed antenna)



Antenna area (7.4 mm x 3.0 mm)

Measurement of Antenna Radiation Characteristics

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Calibrated Equipment:

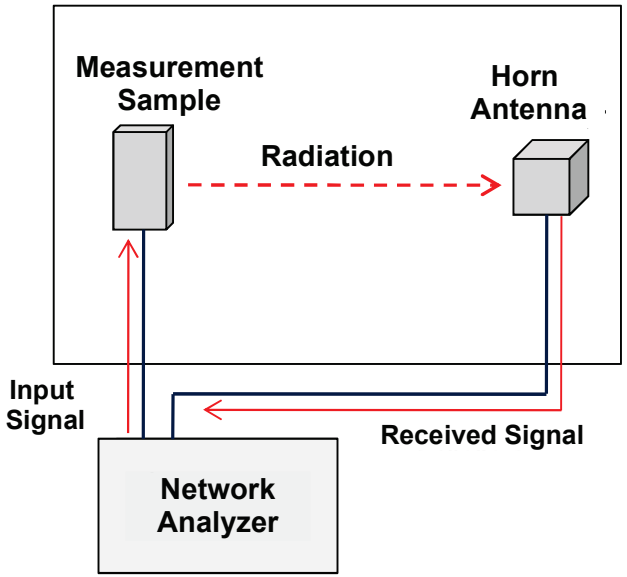
- **Network Analyzer: Agilent E5071C (9kHz～8.5GHz)**
- **Horn Antenna**
- **Reference Dipole Antenna**
- **Anechoic Chamber (turn table, radio wave absorber and wooden box)**

Test dates: 2015/04/09

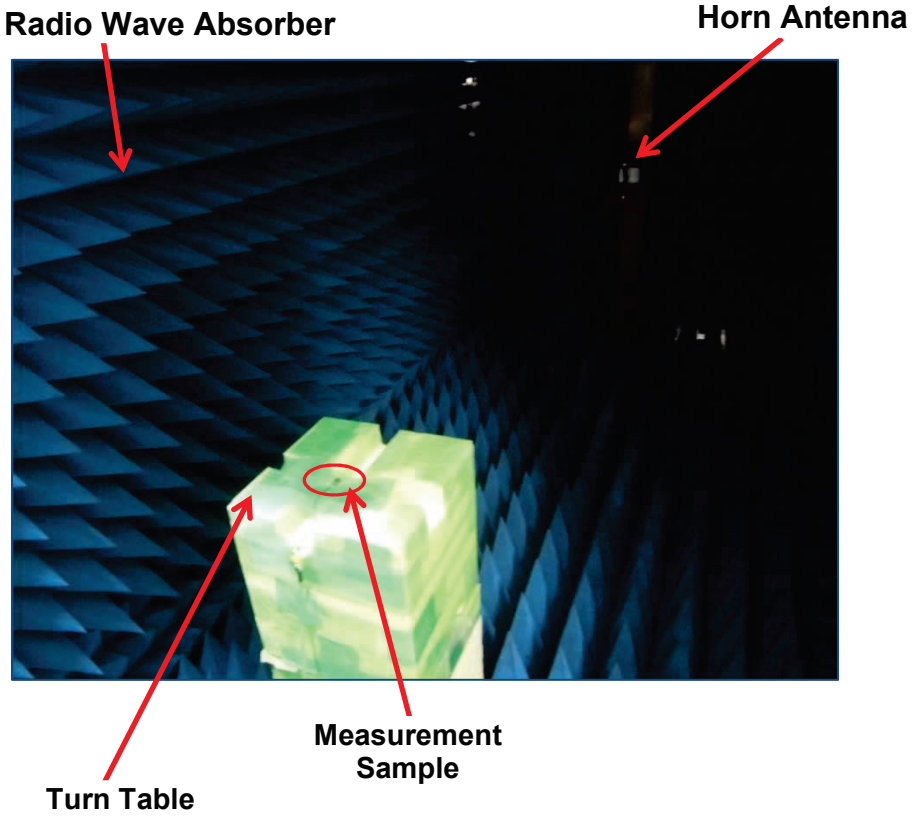
Names of test personnel: Watanabe Koichi

Names of commercial test software being used: ANT_TEST_V1

Description of how measurements



Test Setup Photo

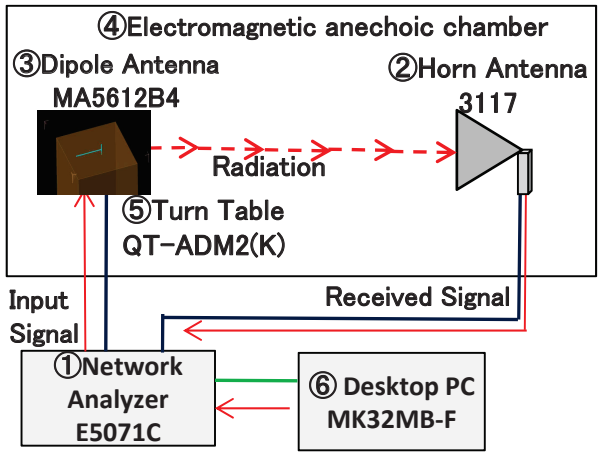


Antenna Gain Measurement Principle

MITSUMI

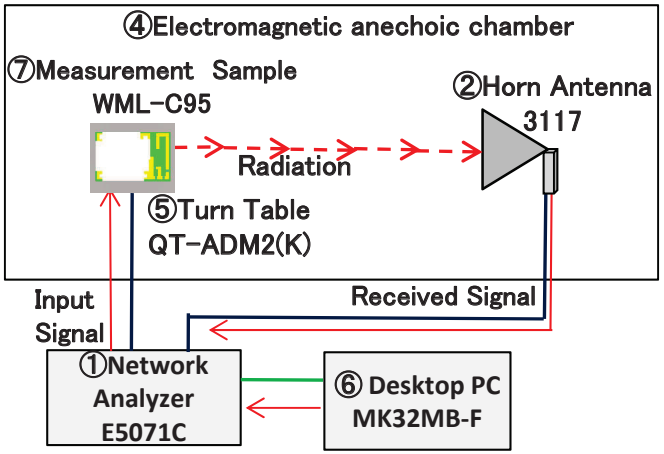
Based on reference dipole antenna (MA5612B) with a known gain, configure it and find the gain of the measurement sample (EUT).

1) Measuring Dipole Antenna of Known Gain



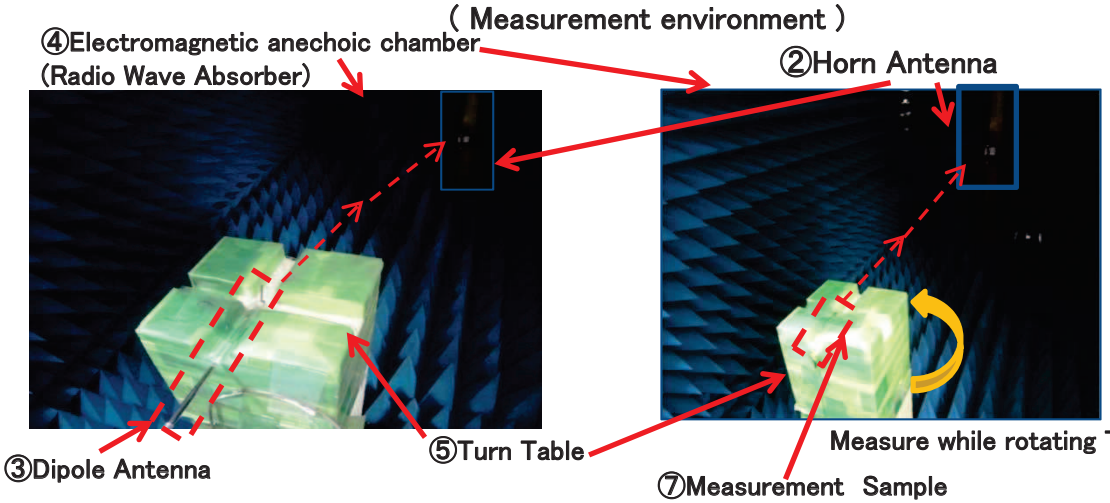
Program Control : Software_ANT_TEST_V1

2) Measuring EUT Gain



Program Control : Software_ANT_TEST_V1

(Measurement environment)



Equipment List

	Decscription & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
①	Network Analyzer Agilent	E5071C	MY46100567	Mar. 2015	Mar. 2016
②	Horn Antenna ETS-Lindgren	3117	00140386	N / A	N / A
③	Dipole Antenna Anritsu	MA5612B4	M72980	N / A	N / A
④	Electromagnetic anechoic chamber TDK, ECE, TSS-JAPAN, MWF, TOKIN Corporation	N / A	N / A	N / A	N / A
⑤	Turn Table CENTRAL MOTOR WHEEL Co., LTD.	QT-ADM2(K)	N02048B	N / A	N / A
⑥	Desktop PC NEC	MK32MB-F	37003791A	N / A	N / A
⑦	Measurement Sample Mitsumi	WML-C95	A0000127	N / A	N / A

Software_ANT_TEST_V1: Automatic Acquisition of Antenna Characteristics

Antenna gain measurement method

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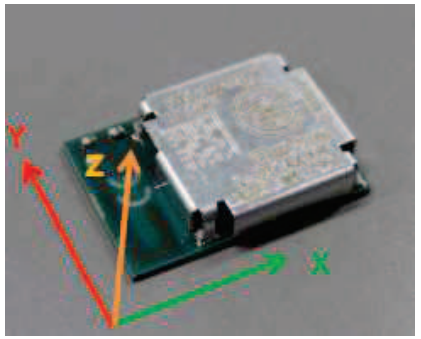
1) Calibration of the measurement environment using dipole antenna.
(result :"X")

2) Object measurement.
Measurement is performed in three directions of the X-Y plane, Y-Z plane, and Z-X plane of the measurement sample.
(result :"Y")

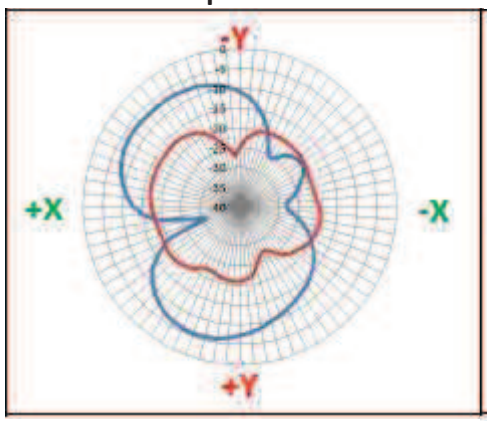


3) Calculate based on the results of A and B
(Result : **Gain EUT ＝Y －X ＋ 2.14)**

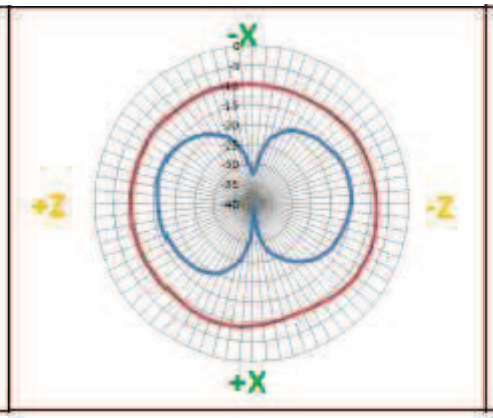
4) Plot based on the results of 3).

Gain EUT

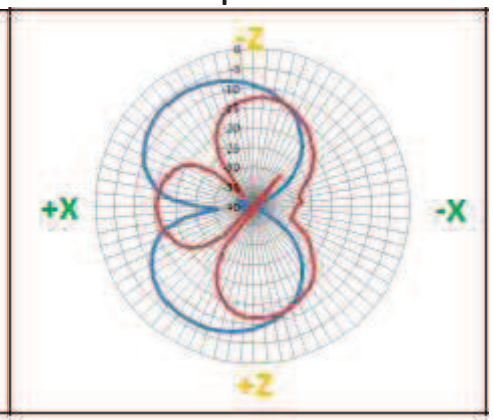
X-Y plane



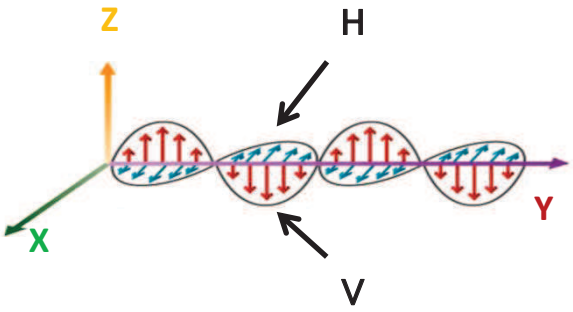
Y-Z plane



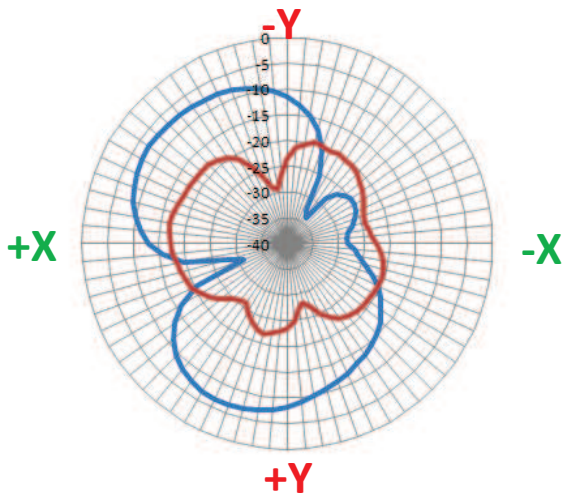
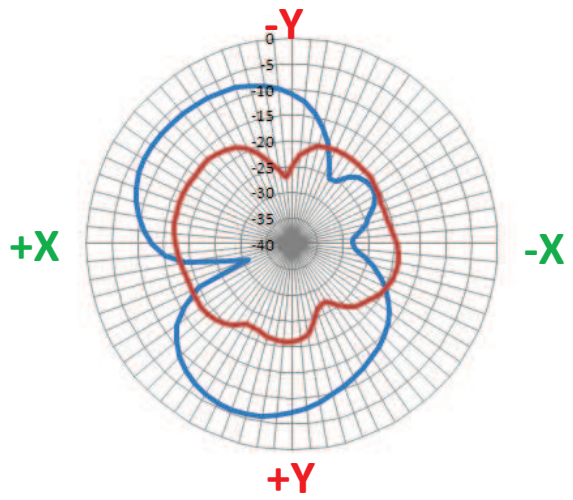
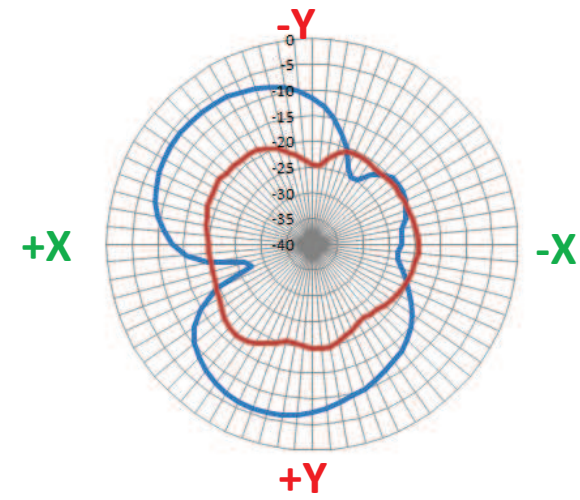
Z-X plane



X-Y Plane

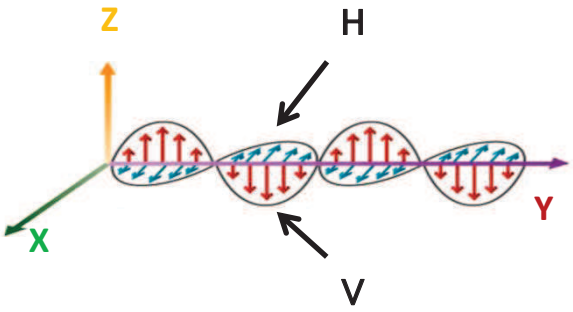


Freq.(MHz)	Peak Gain (dBi)		Average Gain (dBi)	
	H	V	H	V
2400	−6.57	−16.77	−11.15	−20.84
2442	−5.70	−16.54	−10.48	−19.69
2484	−6.00	−16.82	−10.42	−19.80

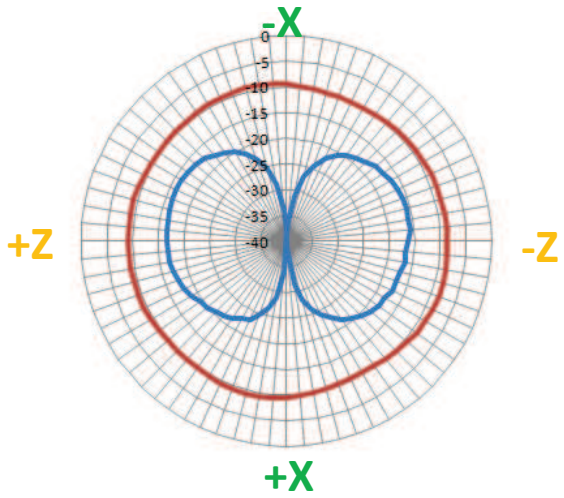
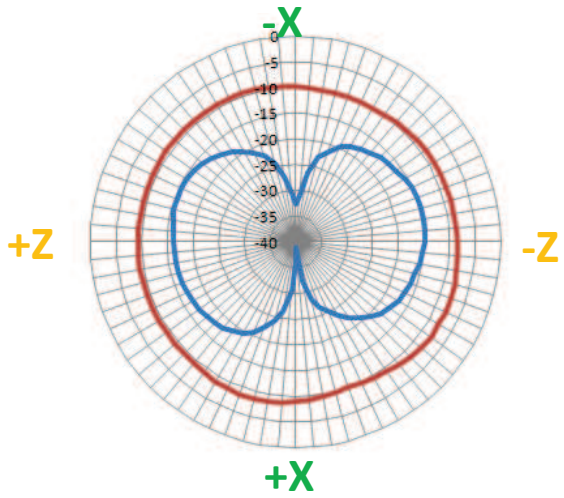
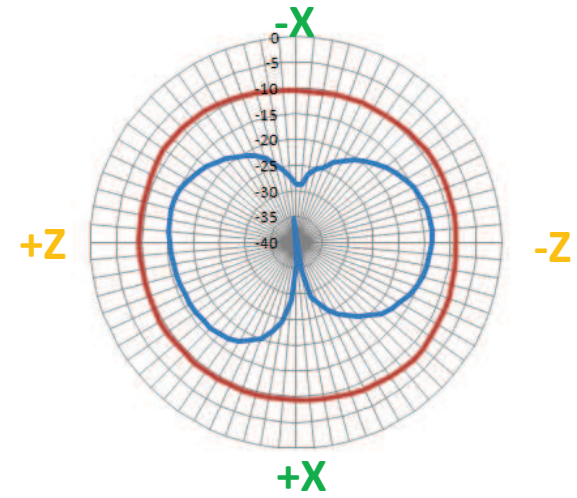
2400 MHz	2442 MHz	2484 MHz
		

H V

Y-Z Plane



Freq.(MHz)	Peak Gain (dBi)		Average Gain (dBi)	
	H	V	H	V
2400	−15.79	−8.47	−18.99	−9.40
2442	−14.62	−7.73	−17.92	−9.03
2484	−13.54	−7.75	−17.54	−9.12

2400 MHz	2442 MHz	2484 MHz
		

H V

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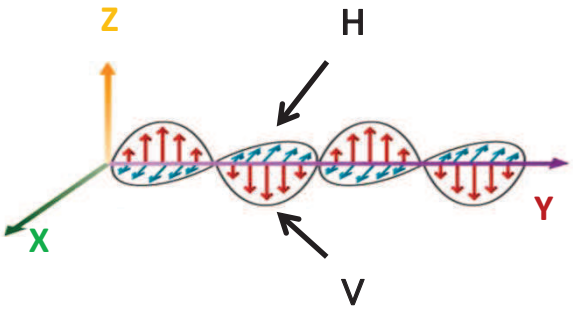
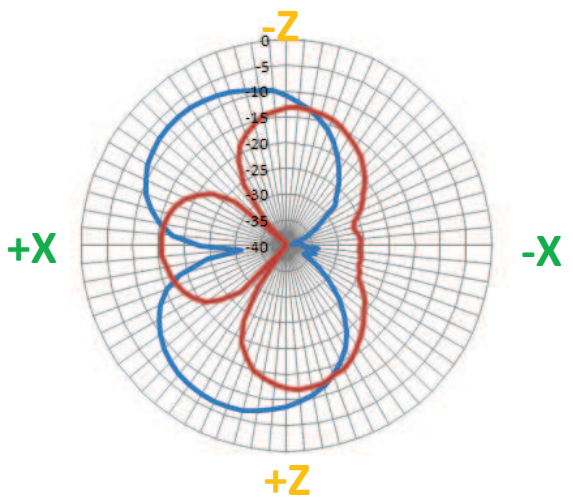
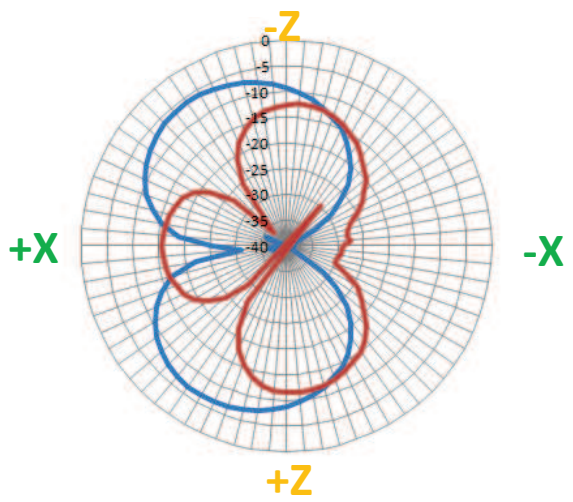
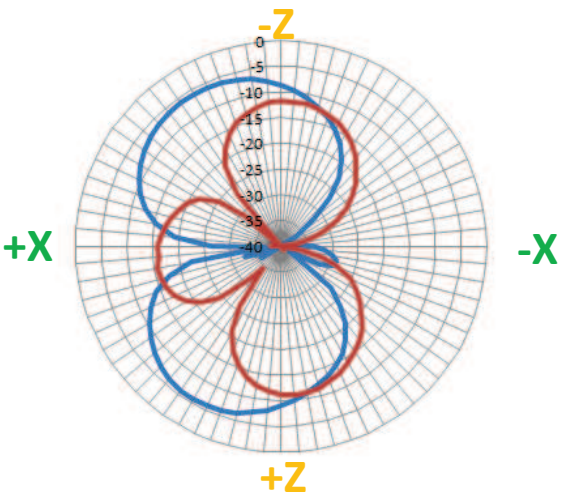
Z-X Plane



Freq.(MHz)	Peak Gain (dBi)		Average Gain (dBi)	
	H	V	H	V
2400	−6.57	−11.96	−11.48	−16.95
2442	−5.99	−11.44	−10.75	−16.41
2484	−5.68	−10.96	−10.44	−16.16

2400 MHz	2442 MHz	2484 MHz
		

H V