

## *Measurement of MPE*

### 1. Foreword

In adopt with the Human Exposure IEEE C95.1, and according to the FCC 1.1310. The *Maximum Permissible Exposure (MPE)* is obligated to measure in order to prove the safety of radiation harmfulness to the human body.

The *Gain* of the antenna used is measured in an *Anechoic chamber*. The *maximum total power to the antenna* is to be recorded. By adopting the *Friis Transmission Formula* and the *power gain of the antenna*, we can find the distance right away from the product, where the limit of the MPE is.

### 2. Description of EUT

**Granted FCC ID** : MSQDCW625

**Product name** : Wireless Router

**Model name** : DCW625; DCW625R

**Classification** : Mobile Device

(i) Under normal use condition, the antenna is at least 20cm away from the user;

(ii) Warning statement for keeping 20cm separation distance and the prohibition of operating next to the person has been printed in the user's manual

**Frequency Range** : 2.412 GHz ~ 2.462GHz

**Supported Channel** : 11 Channel

**Modulation Skill** : DBPSK, DQPSK, CCK, OFDM

**Power Type** : Switching power supply

Mfg.: DVE ;

M/N: DSA-0151A-12 S

I/P: 100-120VAC, 50/60Hz, 40VA ;

O/P: +12VDC, 1.25A

**Power Cable** : 185cm long, non-shielded, incorporates a ferrite core

### 3. Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	100	6
3.0-30	1842/f	4.89/f	900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	100	30
1.34-30	824/f	2.19/f	180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

[The EUT is tested in transmit and receive modes and in the first, middle and the last channel separately. The following shows only our observation have the greatest emissions.]

According to OET BULLETIN 56 Fourth Edition/August 1999, Equation for Predicting RF Fields:

$$\text{Friis Transmission Formula: } S = \frac{PG}{4pR^2} = \frac{61.66 \times 1.552}{4p(20)^2} = 1.904e^{-2} \text{ mW} / \text{cm}^2$$

$$\text{Estimated safe separation: } R = \sqrt{\frac{PG}{4p}} = \sqrt{\frac{61.66 \times 1.552}{4p}} = 2.759 \text{ cm}$$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 2.759 cm."

Where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

The Numeric gain G of antenna with a gain specified in dB is determined by:

$$G = \text{Log}^{-1} ( \text{dBi antenna gain} / 10 )$$

$$G = \text{Log}^{-1} ( 1.91 / 10 ) = 1.552$$

**DESCRIPTION :**

Omni - directional antenna which is useful for 802.11b/g ( ISM band ) ,

Ex : Wireless LAN .

**SPECIFICATION :**

Part Number : <b>ADA06-1K10000</b>	
Appearance & Dimensions :	108(L) × 10.5(R) mm
Weight :	≤ 20 g
Operation Frequency :	2.4~2.4835 GHz
Impedance :	50 Ohms
Polarization :	Vertical
Antenna Gain :	1.91 dBi (Max.)
Antenna SWR :	≤ 2 : 1
Connector Type :	SMA Male RP

1

2

3

4

A

A

B

B

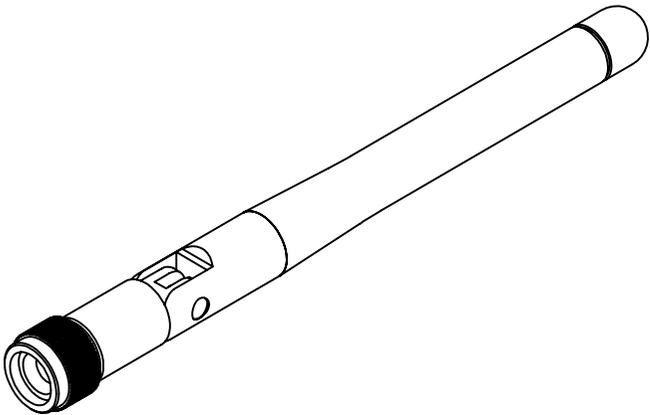
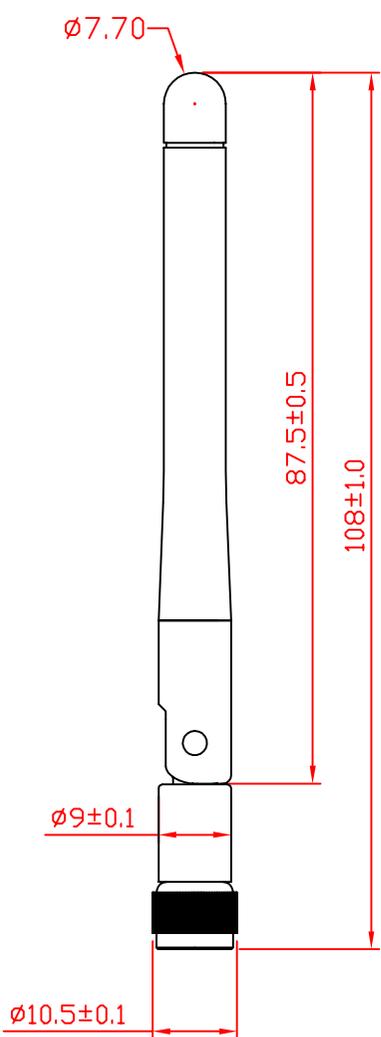
C

C

D

D

REV.	DESCRIPTION	DRAWN/DATE	CHECK/DATE	APPROVED/DATE



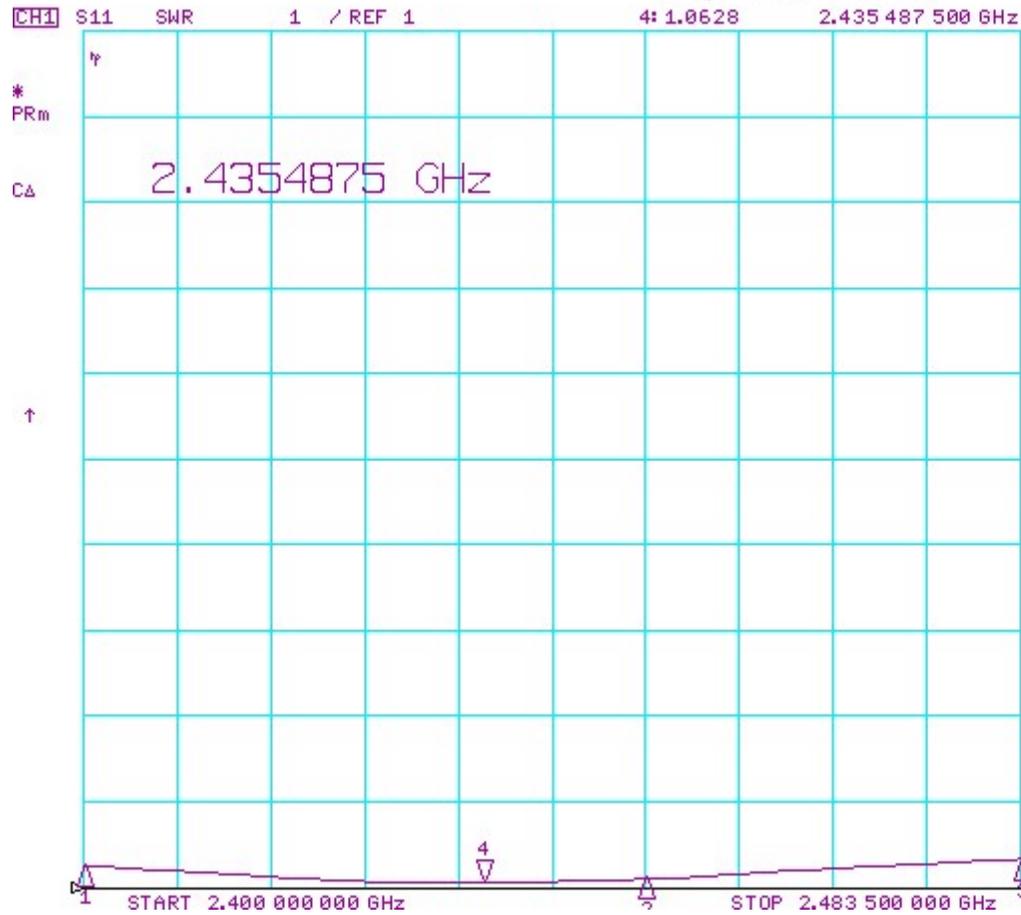
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X. ±0.20	X° ±2.0°	Duan	91-01-22
.X ±0.10	.X° ±1.0°	DESIGN	DATE
.XX ±0.05	.XX° ±0.5°	Duan	91-01-22
.XXX ±0.03		CHECKED	DATE
		Duan	91-01-22
MATL		APPROVED	DATE
FINISH		方鴻明	91-01-22
SCALE 1 : 1	UNIT mm		
SHEET 1 OF 1			



TITLE	
SMA-90° -180°	
SERIES	SIZE A4
DRAWING NO. ADA06-1K10000	REV.



30 Apr 2002 09:30:57



CH1 Markers

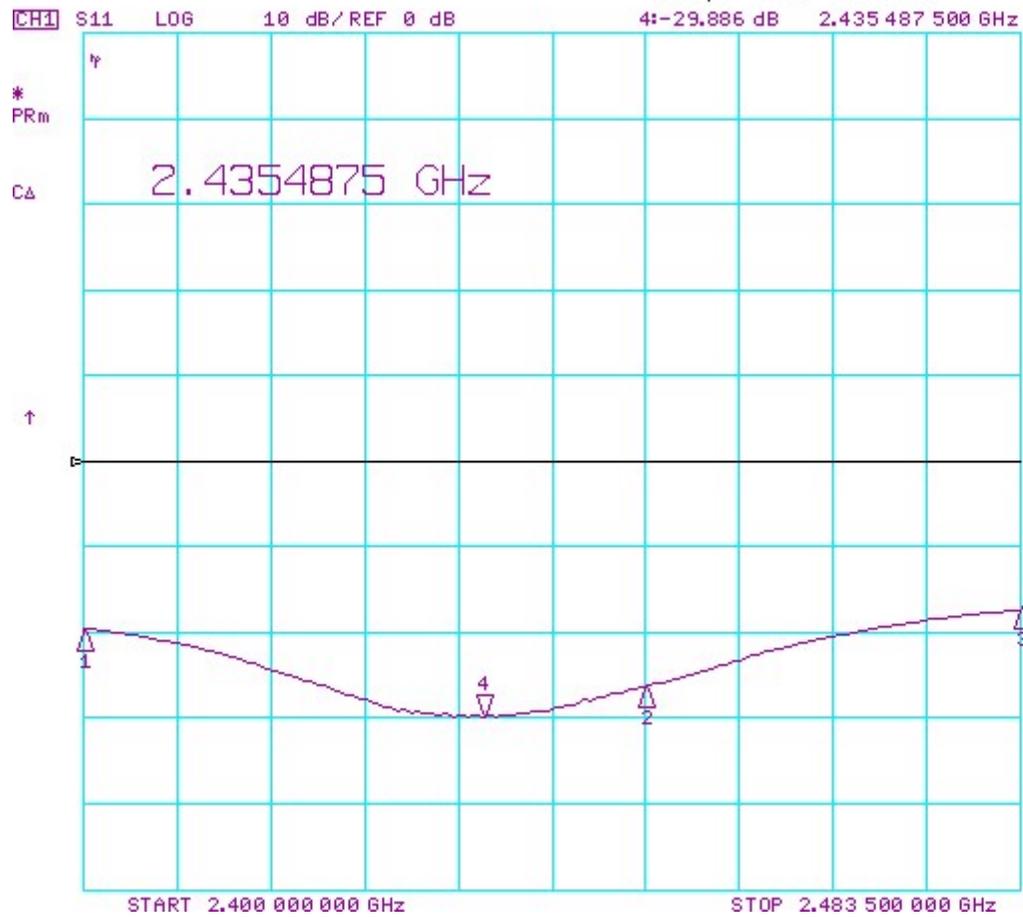
1: 1.2407  
2.40000 GHz

2: 1.1019  
2.45000 GHz

3: 1.3246  
2.48350 GHz



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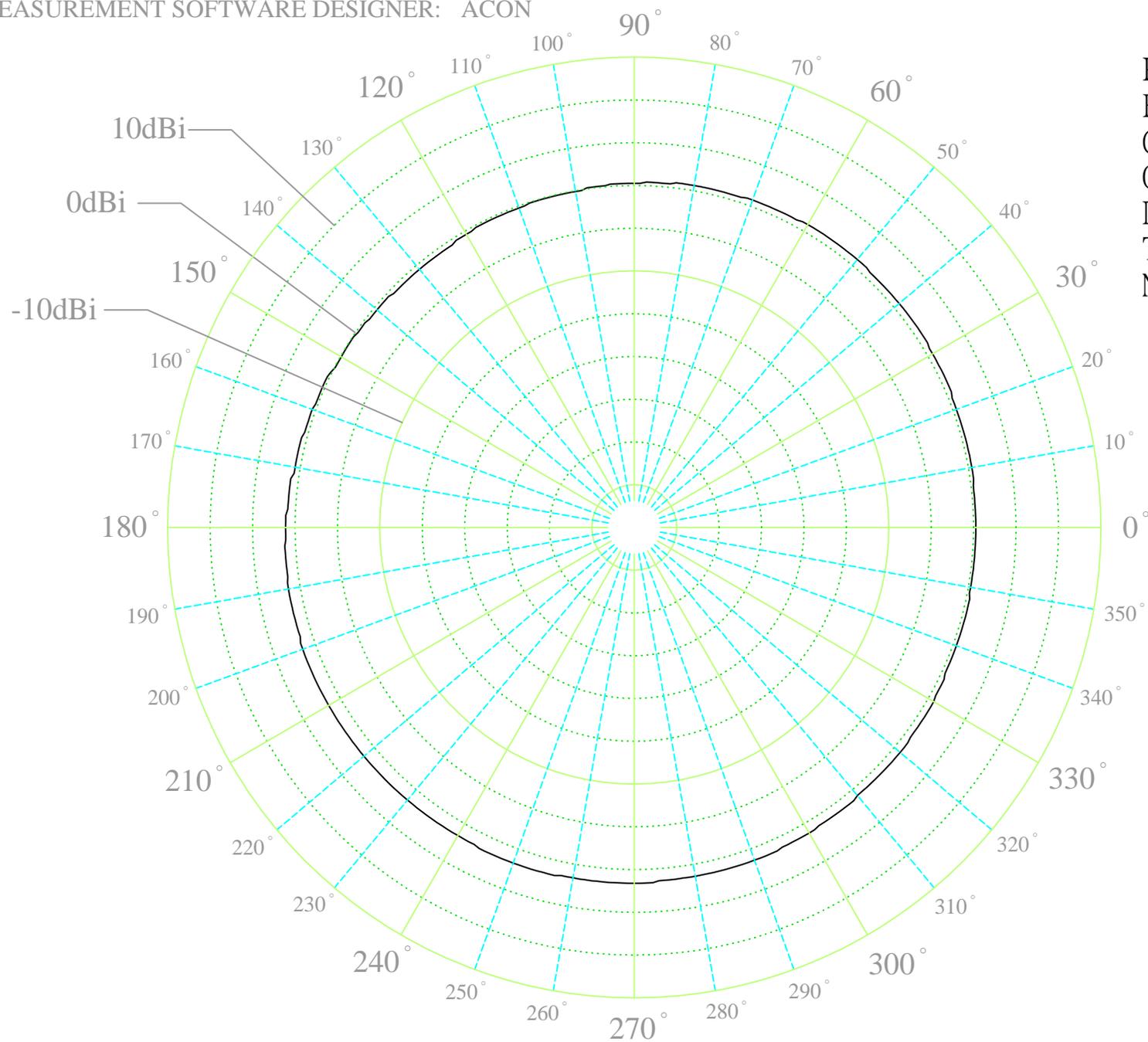


CH1 Markers

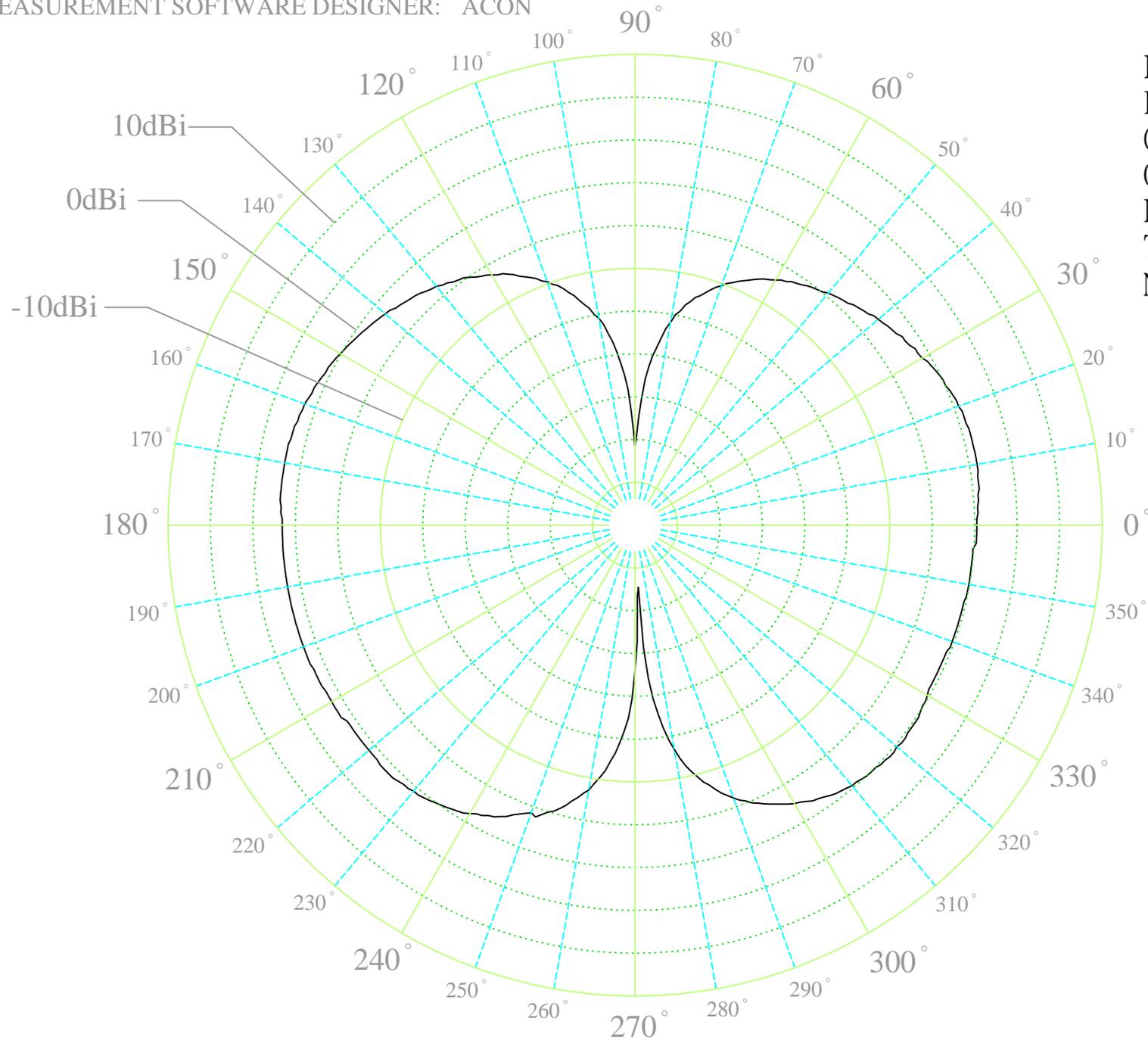
1:-19.719 dB  
2.40000 GHz

2:-26.361 dB  
2.43500 GHz

3:-17.108 dB  
2.48350 GHz



Pattern Type : H - Plane  
Frequency : 2450 MHz  
Gain : 1.75 dBi( 244° )  
Operator : TOM  
Date : 2002/4/30  
Time : AM 11:04:48  
Note : SMA-90-180 male-femal



Pattern Type : E - Plan  
Frequency : 2450 MHz  
Gain : 1.91 dBi( 167° )  
Operator : TOM  
Date : 2002/4/30  
Time : PM 05:19:15  
Note : SMA 90-180 male RP