

Measurement of MPE

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 ²)	Averaging Time E ² , H ² or S (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	100	6
3.0-30	1842/f	4.89/f	900/f ²	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	100	30
1.34-30	824/f	2.19/f	180/f ²	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

According to OET BULLETIN 56 Fourth Edition/August 1999,

Equation for Predicting RF Fields:

$$S = \frac{PG}{4\pi(R)^2} = \frac{30.9 \times 2.838}{4\pi(20)^2} = 1.745 \times 10^{-2} \text{ mW/cm}^2$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

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

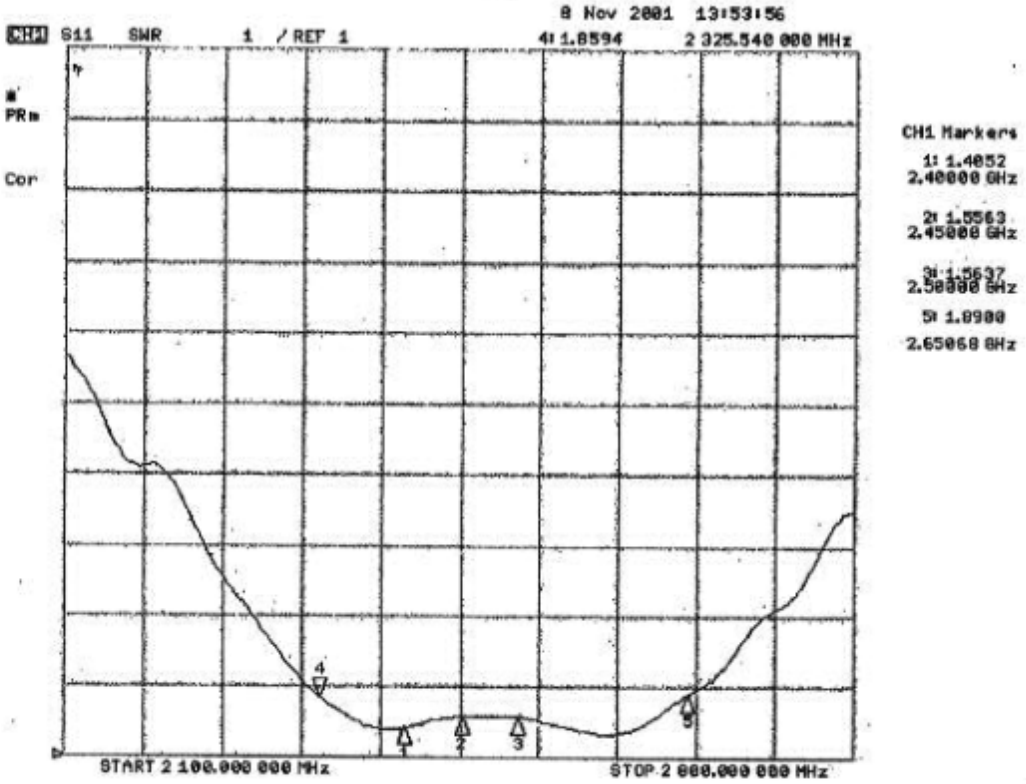
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

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

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

$$G = \text{Log}^{-1} (4.53/10) = 2.838$$

VSWR



Title : IW-144 2.45GHz Antenna

Frequency Band : 2.4~2.5GHz

Date : 2001.11.08

No:

Z-01003

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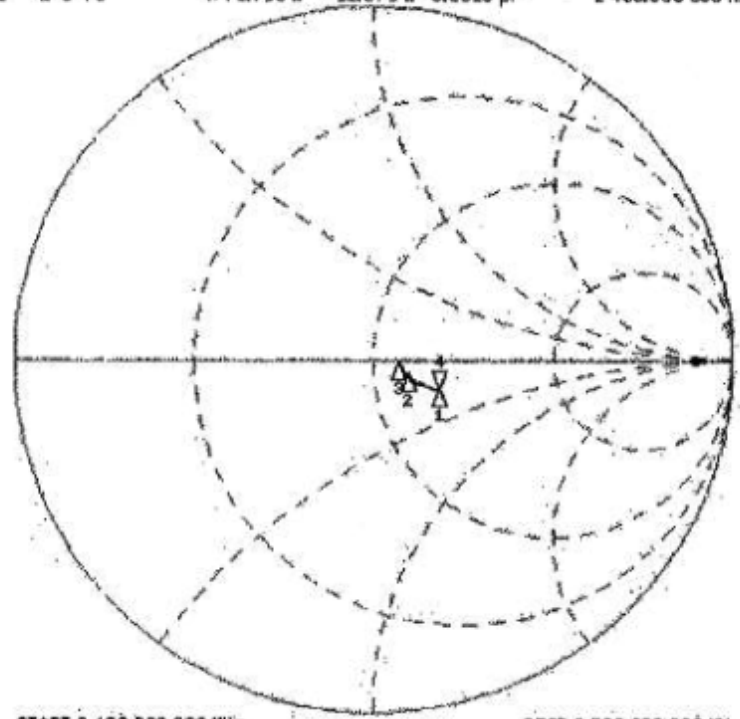
Smith Chart

8 Nov 2001 13:57:25
 S11 1 U FS 4178.793 a -11.879 a 5.5825 pF 2400.000 000 MHz

PRn

CA

↑



CH1 Markers
 1| 78.793 a
 -11.879 a
 2.40000 GHz
 2| 58.125 a
 -4.8510 a
 2.45000 GHz
 3| 57.412 a
 -785.88 na
 2.50000 GHz

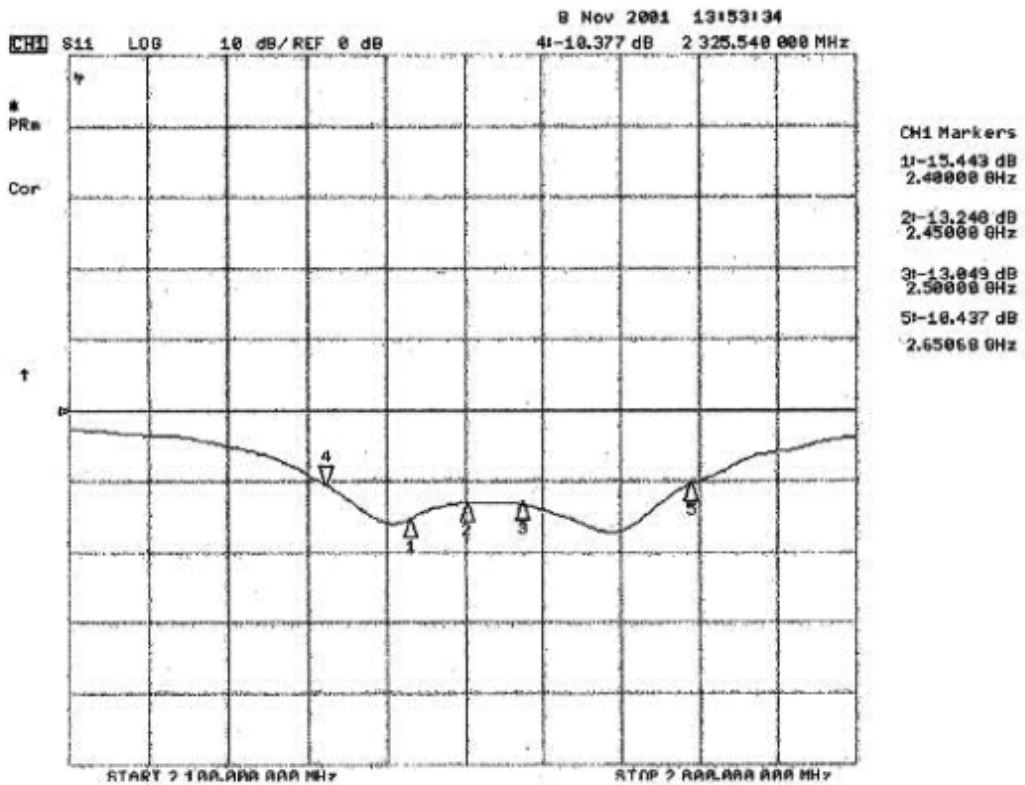
Title : IW-144 2.45GHz Antenna

Frequency Band : 2.4~2.5GHz

Date : 2001.11.08

	No: Z-01003	REV 0	Page 3 OF 6
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Return Loss



Title : IW-144 2.45GHz Antenna

Frequency Band : 2.4~2.5GHz

Date : 2001.11.08

No:

Z-01003

REV

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Radiation Pattern Testing - Anechoic Chamber

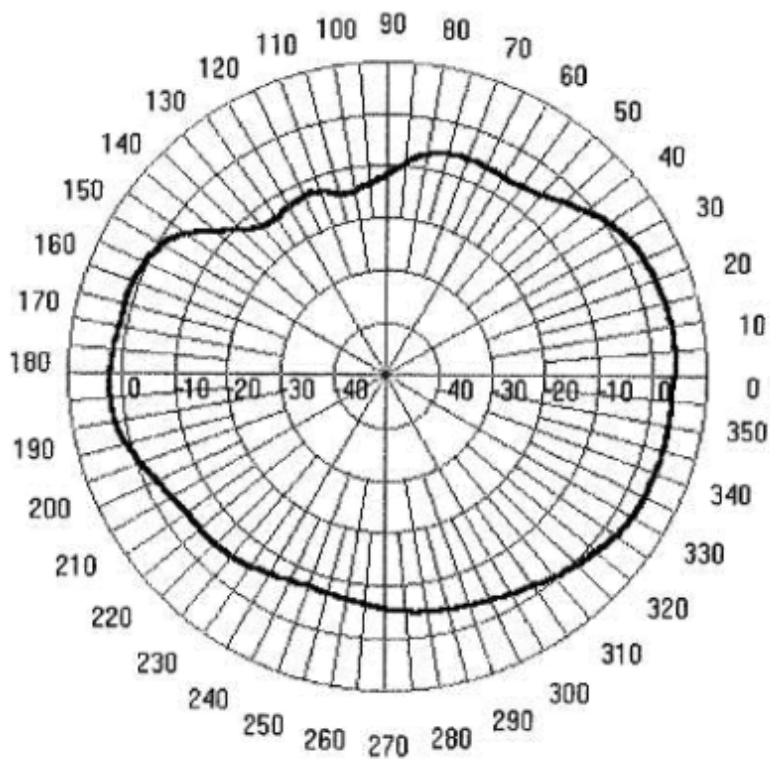
Antenna : IW-144

Vertical

Test Frequency : 2.45GHz

Peak Gain : 4.53dBi

Average Gain : -3.11dBi



No:

Z-01003

REV

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Radiation Pattern Testing - Anechoic Chamber

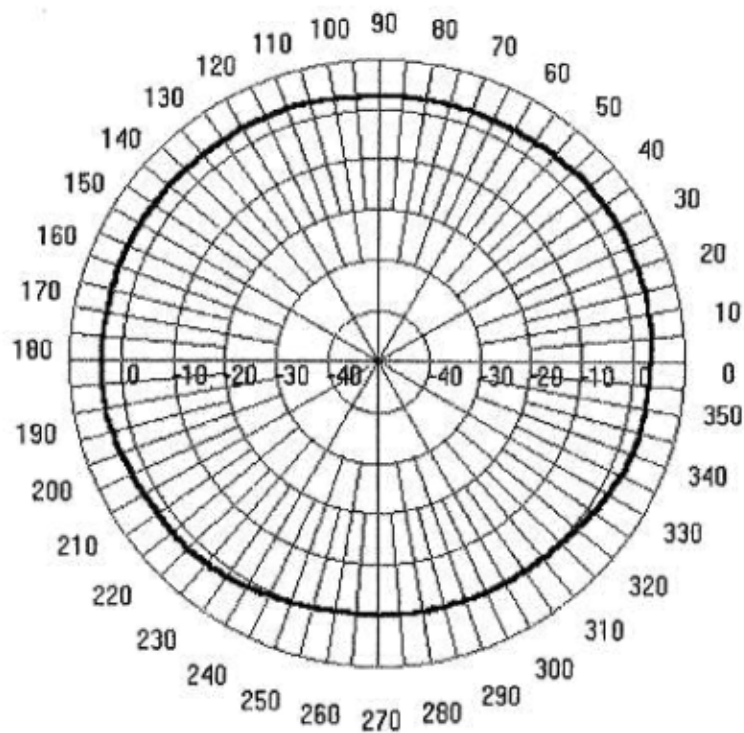
Antenna : IW-144

Horizontal X-Y

Test Frequency : 2.45GHz

Peak Gain : 4.31dBi

Average Gain : 2.58dBi



No:

Z-01003

REV

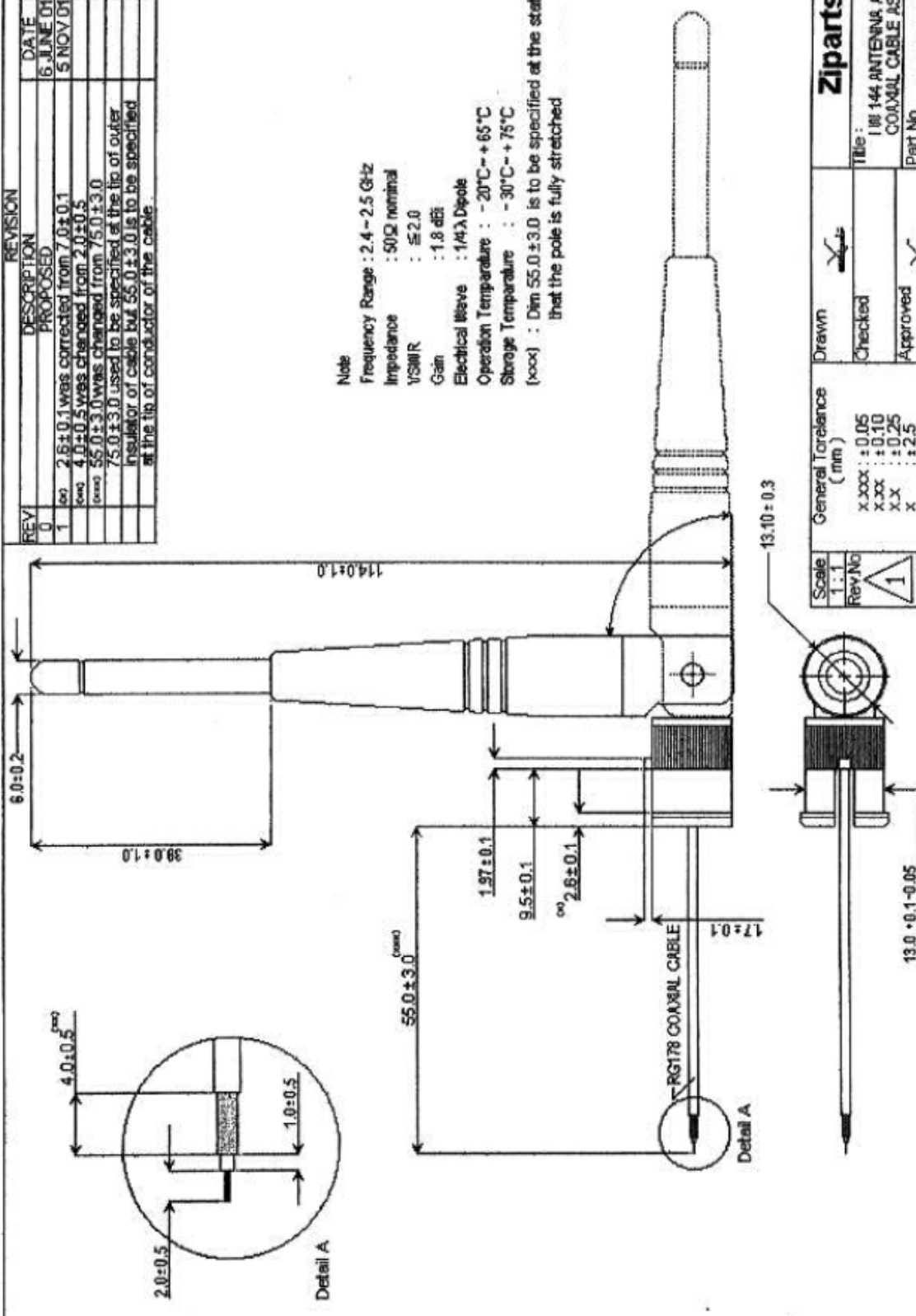
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REV	DESCRIPTION	DATE	MADE BY
0	PROPOSED	6 JUN 01	Y. S
1	2.6±0.1 was corrected from 7.0±0.1	5 NOV 01	Y. S
	4.0±0.5 was changed from 2.0±0.5		
	55.0±3.0 was changed from 75.0±3.0		
	75.0±3.0 used to be specified at the tip of outer insulator of cable but 55.0±3.0 is to be specified at the tip of conductor of the cable		

Note
 Frequency Range : 2.4 ~ 2.5 GHz
 Impedance : 50Ω nominal
 VSWR : ≤ 2.0
 Gain : 1.8 dBi
 Electrical Wave : 1/4λ Dipole
 Operation Temperature : -20°C ~ +65°C
 Storage Temperature : -30°C ~ +75°C
 (xxx) : Dim 55.0±3.0 is to be specified at the status that the pole is fully stretched



Scale		General Tolerance (mm)		Drawn		Ziparts	
1:1	1:1	x.xxx : ±0.05	x.xx : ±0.10	Checked	Approved	Title :	100 144 ANTENNA AND RG178 COAXIAL CABLE ASSEMBLY
Rev No	1	x.x : ±0.25	x : ±2.5			Part No	Z00144 - RG178