TRC® Since1985
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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

EUT	**:**	Wireless LAN Access Point
Model No.	**:**	WA-110
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
FCC ID	**:**	PY4-WA110
Frequency Range	**:**	2412 MHz-2462 MHz
Antenna type	**:**	1 PCB antenna
Modulation Skill	**:**	DBPSK / DQPSK / CCK
Power Type	**:**	Powered by the Power adapter M/N: SA0105-A I/P: 100-240VAC, 50-60Hz O/P: +5VDC, 1.4A
Applicant	**:**	Remotek Corporation 6F-6, No.77, Sect.1, Hsin Tai Wu Rd., His-chih, Taipei, Taiwan, R.O.C.

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

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Filed Strength (H) (A/m)	Power Density (S) (mW/cm2)	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

[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, by the *Friis Transmission Formula*:**

Power density at the specific separation (Mobile): $S = \frac{PG}{4\pi R^2} = \frac{47.64 \times 1.135}{4\pi (20)^2} = 1.076 \times 10^{-2}\, mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{47.64 \times 1.135}{4\pi}} = 2.074 cm$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 2.074 cm."

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

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

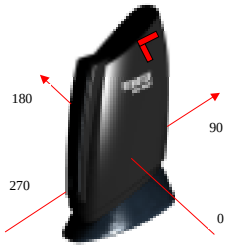
G = *power gain* of the antenna in the direction of interest relative to an isotropic radiator

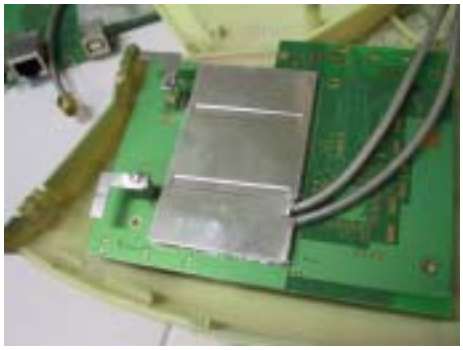
R = *distance* to the center of radiation of the antenna (appropriate units, e.g., cm)

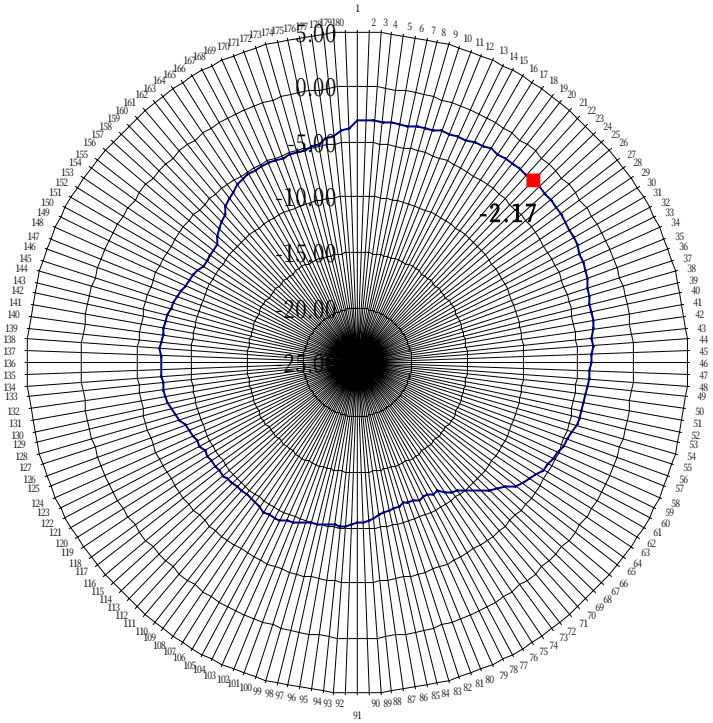
The *Numeric gain G* of antenna with a gain specified in dB is determined by:

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

G = Log $^{-1}$ (0.55 / 10) = 1.135







AP **L** METAL FRONT antenna
(站立 standup)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

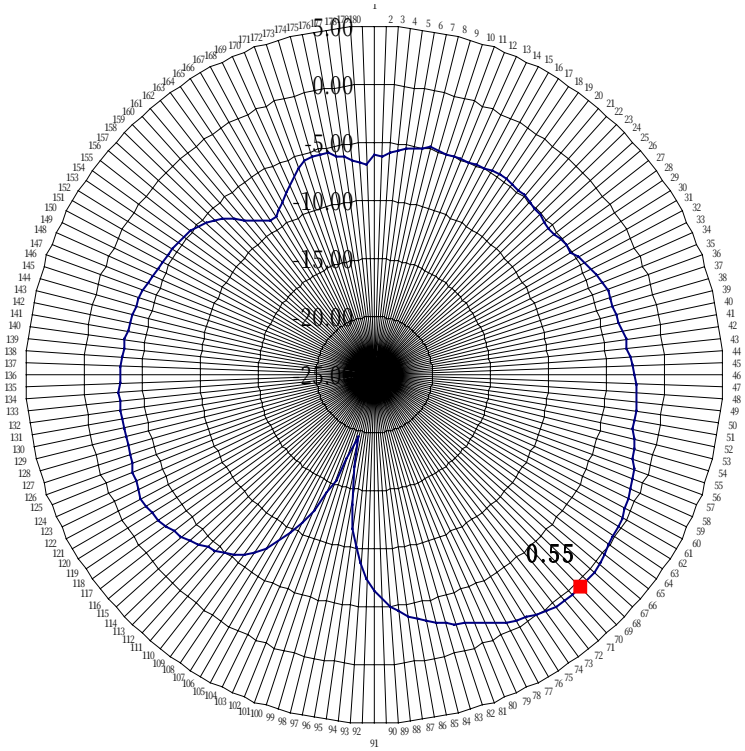
TEST POLARIZATION:VERTICAL
(H-PLANE)
TEST ANTENNA: HORN ANTENNA

TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : -2.17dBi
MIN GAIN : -11.59dBi
AVE GAIN : -6.63dBi



AP L METAL FRONT
(站立)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

TEST POLARIZATION:CROSS

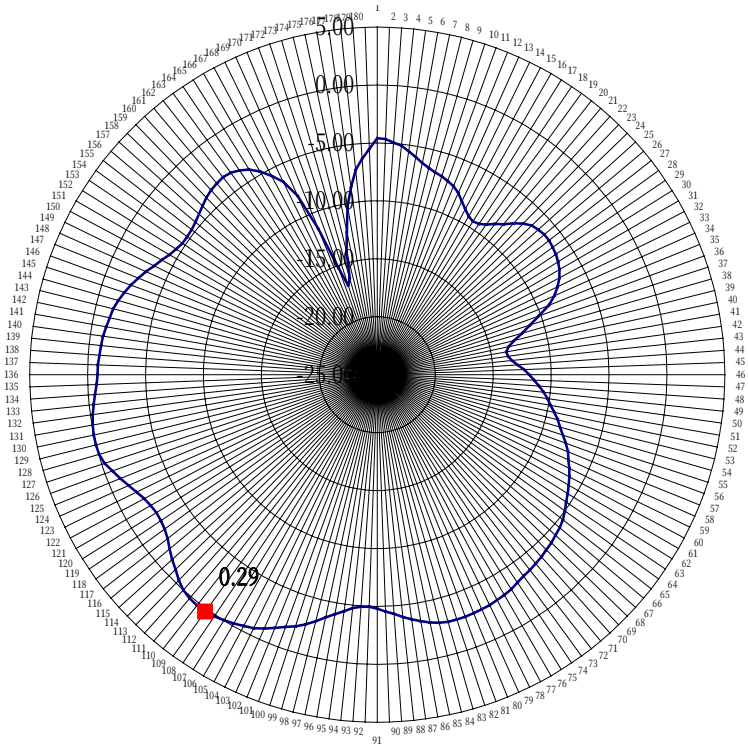
TEST ANTENNA: HORN ANTENNA

TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : 0.55dBi
MIN GAIN : -19.49dBi
AVE GAIN: -4.57dBi



AP L METAL FRONT
(平放 AP)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

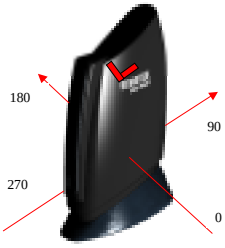
TEST POLARIZATION:HORIZONTAL
(E-PLANE)
TEST ANTENNA: HORN ANTENNA

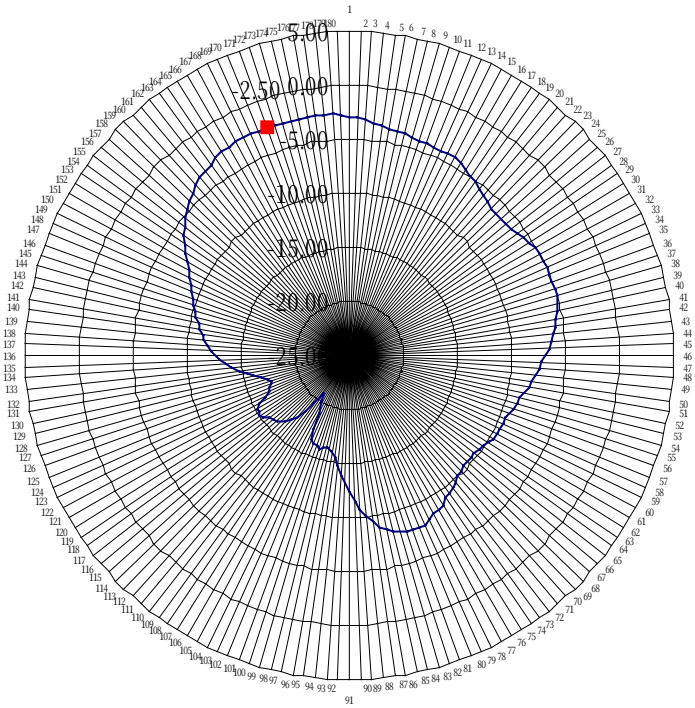
TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : 0.29dBi
MIN GAIN : -16.90dBi
AVE GAIN: -5.17dBi





AP L METAL REAR antenna
(站立 standup)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

TEST POLARIZATION:VERTICAL
(H-PLANE)

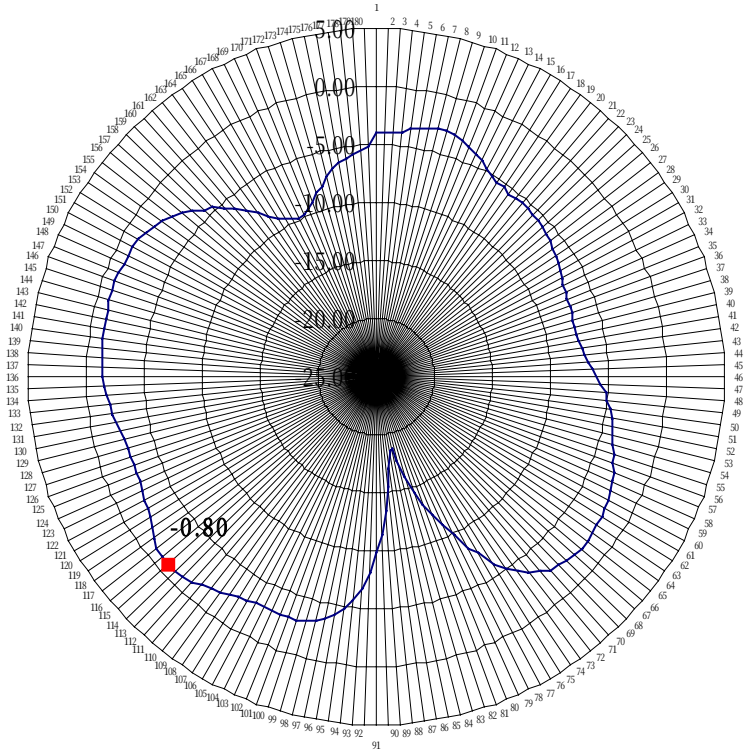
TEST ANTENNA: HORN ANTENNA

TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : -2.50dBi
MIN GAIN : -20.66dBi
AVE GAIN : -9.02dBi



AP L METAL REAR
(站立)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

TEST POLARIZATION:CROSS

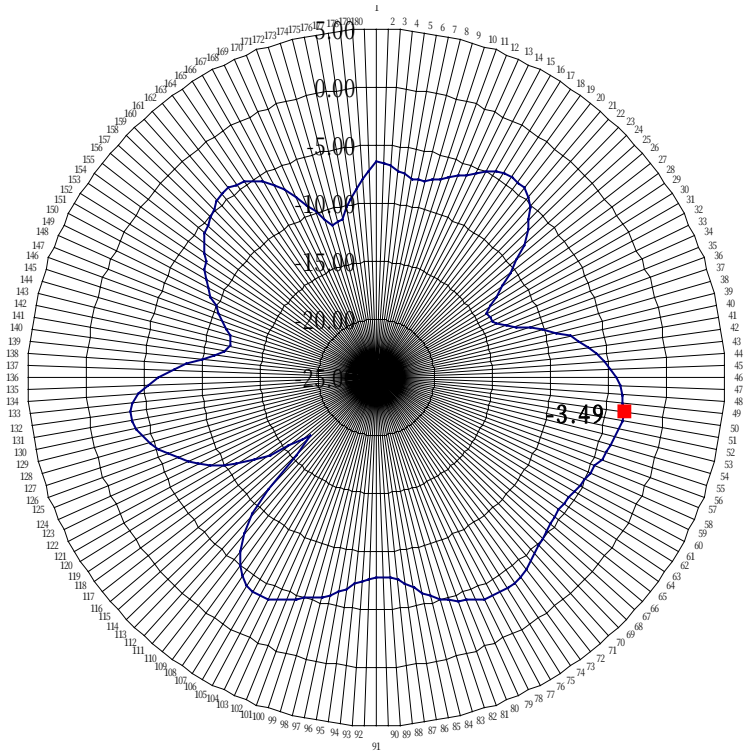
TEST ANTENNA: HORN ANTENNA

TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : -0.80dBi
MIN GAIN : -18.57dBi
AVE GAIN: -4.91dBi



AP L METAL REAR
(平放)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

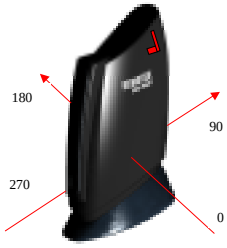
TEST POLARIZATION:HORIZONTAL
(E-PLANE)
TEST ANTENNA: HORN ANTENNA

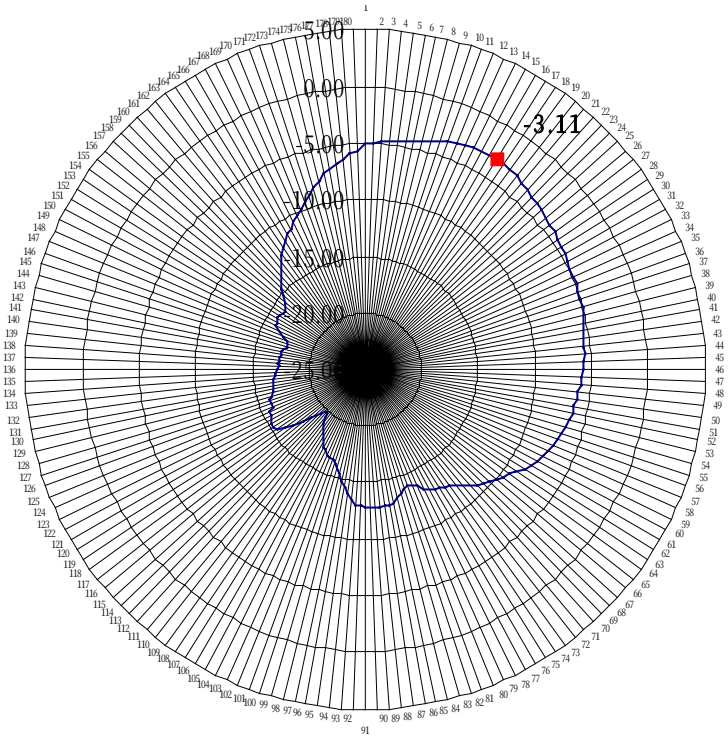
TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : -3.49dBi
MIN GAIN :-17.38 dBi
AVE GAIN: -7.02dBi





AP 7 METAL ANT. FRONT
(站立)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

TEST POLARIZATION:H-PLANE

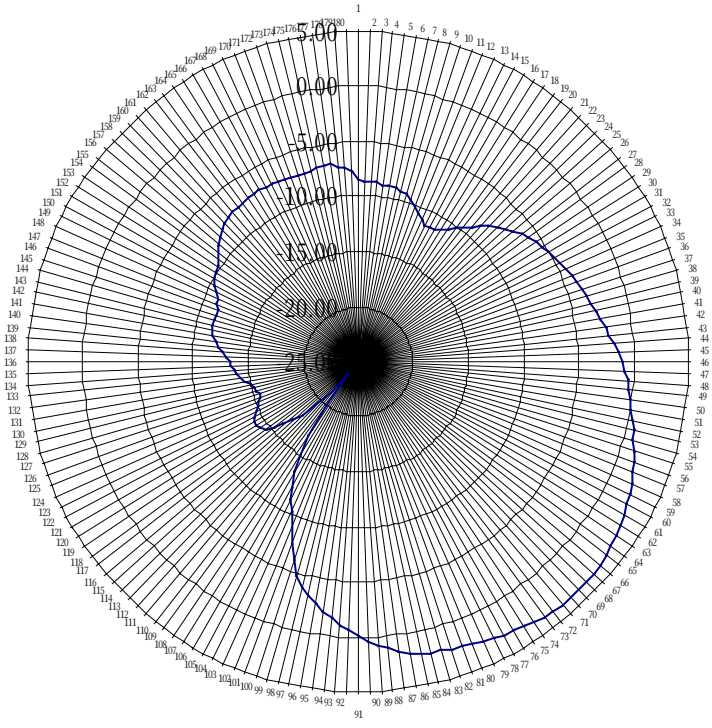
TEST ANTENNA: HORN ANTENNA

TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : -3.11dBi
MIN GAIN : -19.87dBi
AVE GAIN: -11.11dBi



AP 7 METAL ANT. FRONT
(站立)

TEST DATE:2002/01/25

TEST FREQUENCY:2450MHz

TEST POLARIZATION:CROSS

TEST ANTENNA: HORN ANTENNA

TEST STEP DEGREE: 2 DEGREE

TEST CHAMBER: RF CHAMBER

TEST PERSONNEL:BUNNY

MAX GAIN : 3.72dBi
MIN GAIN : -23.47dBi
AVE GAIN:-6.64dBi