TRC® Since1985
Training Research Co., Ltd.
255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.
TEL: 886-2-26935155 FAX: 886-2-26934440

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	**:**	802.11b Access Point
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
Model No.	**:**	ME102 REV.B
FCC ID	**:**	PY3ME102RB
Frequency Range	**:**	2.412 GHz ~ 2.462GHz
Antenna Kit	**:**	2 external dipole antenna
Supported Channel:		11 Channel
Modulation Skill	**:**	DBPSK, DQPSK, CCK
Power Type	**:**	Powered by the AC-DC switching adapter
		Input: 100~120VAC, 50/60Hz, 0.3A
		Output: +5VDC, 1.0A
Applicant	**:**	Netgear, Inc.
		4500 America Parkway, Santa Clara, CA 95054.

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 (portable): $S = \frac{PG}{4\pi R^2} = \frac{76.56 \times 1.259}{4\pi (20)^2} = 1.918 \times 10^{-2}\, mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{76.56 \times 1.259}{4\pi}} = 2.77 cm$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 2.77 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 $^{-1}$ (1 / 10) = 1.259

HISTORY

□本規格共 ___ 張，變更歷史如下所列：

☑本規格共 1 張歷史卡，4 張附件，變更歷史如下所列：

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Document is release

版本	變更項目	日期
00	規格發行	02/18/2002

VENDOR: TONE-SHINE **VENDOR P/N: ANTB99-035**

BASIC RANGE	X.X	X.XX	DRAWN BY 蘇钒 12/08'01
0 - 10	±0.2	±0.08	DRAFTED BY 黃忠麟 12/08'01
10 - 20	±0.3	±0.15	CHECKED BY 陳嘉文 02/07-02
ABOVE 20	±0.5	±0.25	APPROVED BY 張志銘 02/08-02
ANGULAR DIMS±1/2 DEG			SCALE / UNIT /

達創科技股份有限公司
DELTA NETWORKS, INC.

THREE ANGLE PROJECTION

PART NAME	PART NO.	REV.
ANTENNA 2.40-2.50GHZ L=122	0990160205	00

USED ON : 4AESM-020308 PAGE 1 OF 1

FR1-03

1. General

1.1 Scope

This specification is applied for fixed 1/2 λ helical antenna. (Type 2.4GHz external standard dipole antenna.)

1.2 Operating Temperature

-10℃ ~ +75℃

1.3 Storage Temperature

-20℃ ~ +75℃

1.4 Test conditions

Standard test conditions should be from 5 to 35℃ in temperature , 45 to 85%RH and 860 to 1060 hpa in barometric pressure. Should conducted at 20±2℃ ,65±5%RH and 860 to 1060 hpa.

2. Appearances, structures and dimensions

2.1 Appearances

Finished on each part should be good, functionally free from rust, Crack and scratch.

2.2 Structures and dimensions

They are produced according to the drawing of individual product.

3. Electrical performance

	Property	Test conditions	Performance
3.1	VSWR	Proving the suitable test ,according to custamer's request and all the necessary condition of the set.(Attachment(一))	1.6 Max at 2.45GHz (<2.0)
	Frequency rensonance		Below 2.5 at 2400~2500MHz
3.2	Impedance		50±2 ohms
3.3	Directivity		Vertical type.
3.4	Antenna gain		+1 dbi, AVG.
3.5	Max. tolerance power		2.0

4. Mechanical performance

	Property	Test conditions	Performance
4.1	Pull-up strength	A static load 9.8N(1kgf)is added to vertical direction on the tip of the cap for 30 seconds by fixing antenna to set.(Attachment(二) 4.1)	There shall be no detects on structure and satisfy item-3.
4.2	Drop strength	Dropping with antenna from 160cm high to concrete. (Attachment (二)4.2)	

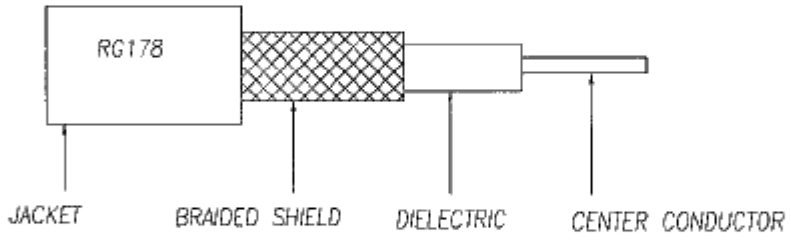
	Property	Test conditions	Performance
4.3	Torsion test	A torsion 0.3kgf is added to horizontal direction on the tip of the element holder for 5 seconds by fixing antenna to set. (Attachment(二) 4.3)	

5.Material specification

Item	Material	Characteristic
Cover	Thermal Plastic Elastormer	Hardness:65 (Black)
Wire	RG178 Coaxial Cable	Tint Brown
Insulator	POM	Hardness:80 (Black)

6.RG178-Coatial Cable Charcterictics

6.1.Mechanical characterisitics



Center conductoe	Material	SCCS
	Composition(N/M)	7/0.1mm
	O.D.	0.30mm
Dielectric	Material	PTFE
	O.D.	0.85Min
Extermal conductor	Material	SPC
	Coverage	85%Min
	Strands	ϕ 0.06mm
Jacket	Material	FEP
	O.D.	1.85mm

6.2Electric data

Item	Specification	Unit
Capacitance	85	PF/M
Impedance	50 ± 2	Ω
Attenuation	3.5(3GHz)	dB/M

7.Weather ability

	Property	Test conditions	Performance
7.1	Dry heat proof	After leaving 240 hours at temperature 75±2℃ ,leave 1 hour in a normal ambient condition and measure. Clean the appearance before test.	There shall be no detects on cover broken or antenna drop out, satisfy item-3 and satisfy item-4.
7.2	Cold proof	After leaving 240 hours at temperature −30±2℃ ,leave 1 hour in a normal ambient condition and measure. Clean the appearance before test.	
7.3	Damp heat proof	After leaving 240 hours at temperature 40±3℃ and 90 to 95%RH,leave 1 hour in a normal ambient condition and measure. Clean the appearance before test.	

8.Packing Instructions

One parcel box contains = 15 pcs
One middle box contains = 14 parcel boxes (15 pcs x 14 parcel = 210 pcs)
One master carton contains = 4 middle boxes (210 pcs x 4 middel box = 840 pcs)

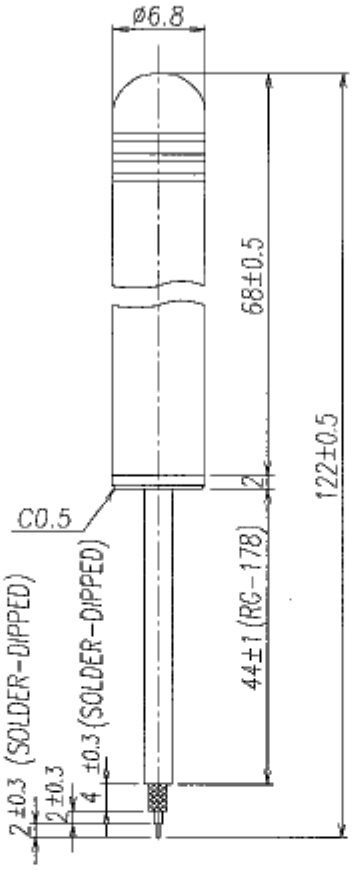
9.Sample dependability(O.C Standard)

According to MIL-STD-105D
(About 1/200 pcs ungainly to repeal one lot in all quantity.)

10.Test install

10.1 PC SIZE: PC-9801FA (NEC)
10.2 Room size: 400cm (W)X350cm(H)X630cm(L)
10.3 Net work analyzer:
Test equipment on electrical functions
Equipment by Hewlett Packard, Network Analyzer HP-8752A
by Advantest, Network Analyzer R3762A

PRODUCT CODE
T99035



ANGLE	±3°						
100以上	±0.8						
50-100以下	±0.5						
5-50以下	±0.3						
5以下	±0.2						
TOLERANCES UNLSS OTHERWISE PSEC.		LTR	PART NAME	QTY	MATERIAL	REMARK	

SYMB.	DESCRIPTION	DATE	APVD	PROJ.	UNIT	SCALE	MODEL NO.
△					mm	/	ANTB99-035
△				APVD.	CHKD.	DSGD.	TITLE
△				2001.08.16 水巡	2001.08.16 白培	2001.08.16 惠蘭	PRODUCT DRAWING
△							DRAWING NO. C90M0717

TONE-SHINE ELECTRONICS INDUSTRIAL CO.,LTD.