

## ***Measurement of Maximum Permissible Exposure***

### **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**

- FCC ID** : PY3WG311TV3
- Product name** : 108 Mbps Wireless PCI Adapter
- Model name** : WG311T
- 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 Channels
- Modulation Skill** : DBPSK, DQPSK, CCK, OFDM
- Power Type** : Powered by PCI of client' s device

**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:

**Friis Transmission Formula:** 
$$S = \frac{PG}{4pR^2} = \frac{220.29 \times 1.514}{4p(20)^2} = 0.066mW / cm^2$$

**Estimated safe separation:** 
$$R = \sqrt{\frac{PG}{4p}} = \sqrt{\frac{220.29 \times 1.514}{4p}} = 5.152cm$$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 5.152 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)

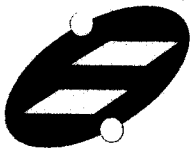
The Numeric gain G of antenna with a gain specified in dB is determined by:

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

$$G = \text{Log}^{-1} (1.80 / 10) = 1.51356$$

*Appendix*

**Antenna Specification**



**WHA YU INDUSTRIAL CO., LTD. (HEAD OFFICE)**

TAI HWA ELECTRONIC CO., LTD.(CHINA)

SHANGHAI HUA YU ELECTRONIC CO., LTD.(CHINA)

**SPECIFICATION FOR APPROVAL**

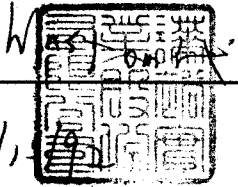
**CUSTOMER:** 友勁科技股份有限公司

**PART NAME:** 2.4G RF Antenna Assembly

**PART NO:** 11723B02\*317\*00

**W. Y. P/NO.:** C056-510131-A

**REV.:** X1

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :		
DATE :	11/15	

**WHA YU GROUP**

**WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)**

譚裕實業股份有限公司

Tel:+886-3-5714225(REP.)

Fax:+ 886-3-5713853 · + 886-3-5723600

**TAI HWA ELECTRONIC CO., LTD. (CHINA)**

台樺電業製品廠

Address: Pak Ho District, Hiu Street Town,

Dong Guan City, Guangdong, China

Tel: + 86-769-5599375 · + 86-769-5912375

Fax: + 86-769-5599376

**SHANGHAI HUA YU ELECTRONIC CO., LTD. (CHINA)**

上海譚裕電子有限公司

Address: Lian Ho Village Bai Ho Town, Qing

Pu Country Shanghai, China

Tel: + 86-21-59741348 · + 86-21-59743624

Fax: + 86-21-59741347

# RF Antenna Cable Assembly

## Specification

### 1. Electrical Properties :

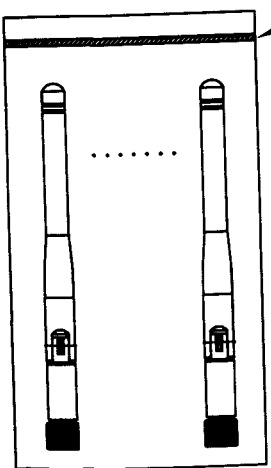
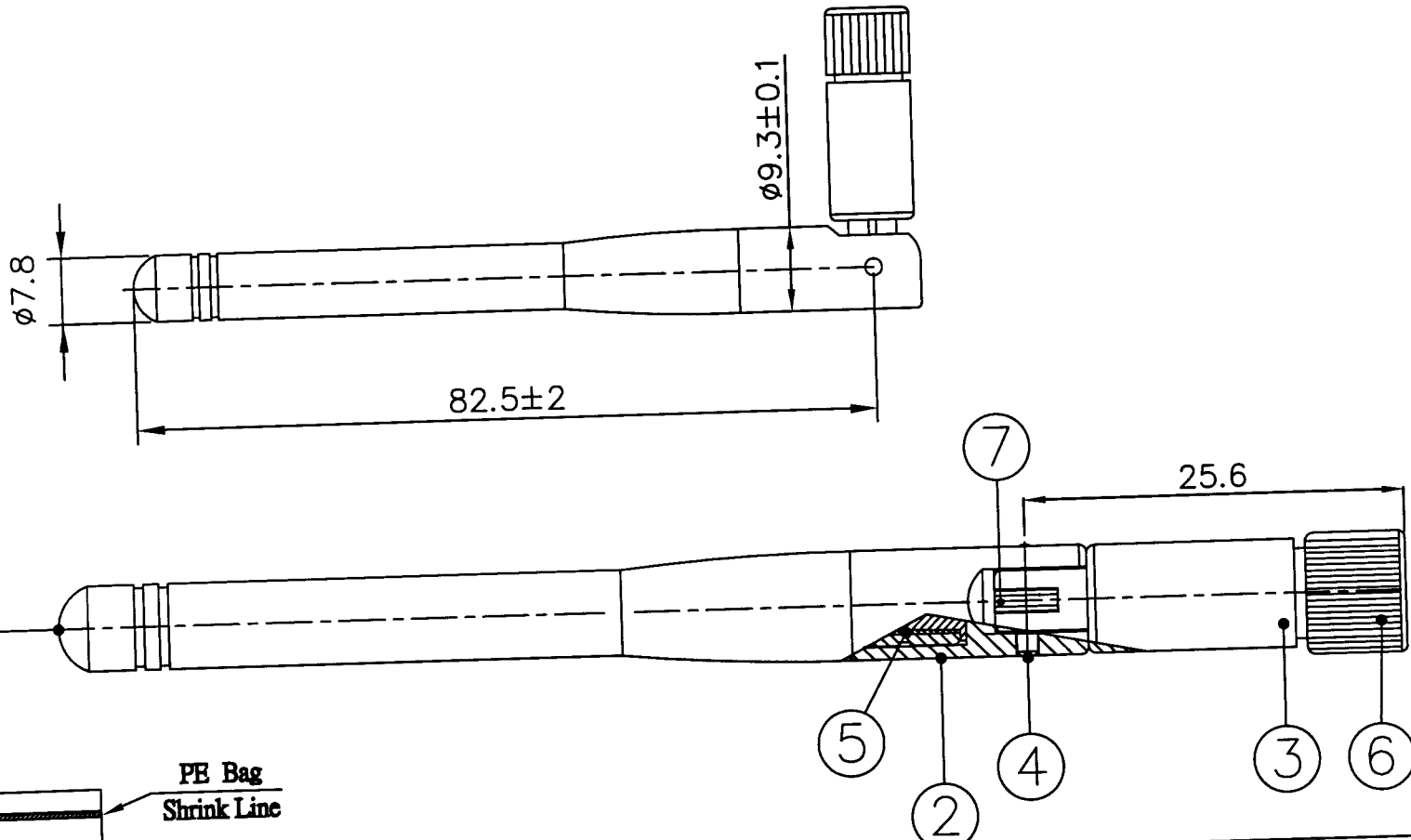
- 1.1 Frequency Rang..... 2.4GHz ~ 2.5GHz
- 1.2 Impedance ..... 50 $\Omega$  Nominal
- 1.3 VSWR ..... 1.92 Max.
- 1.4 Return Loss..... -10dB Maximum
- 1.5 Electrical Wave..... 1/2  $\lambda$  Diople
- 1.6 Gain..... 1.8 dBi
- 1.7 Admitted Power..... 1W

### 2. Physical Properties :

- 2.1 Cable..... RG-178 Cable
- 2.2 Antenna Cover..... TPE
- 2.3 Antenna Base..... PC
- 2.4 Operating Temp. .... -20 $^{\circ}$ C ~ +65 $^{\circ}$ C
- 2.5 Storage Temp. .... -30 $^{\circ}$ C ~ +75 $^{\circ}$ C
- 2.6 Color ..... Black
- 2.7 Connector..... SMA Plug Reverse

REV	DATE	DESCRIPTION
XI	11/17-2003	New Issue

CG-



Packing : 25 pcs/bag

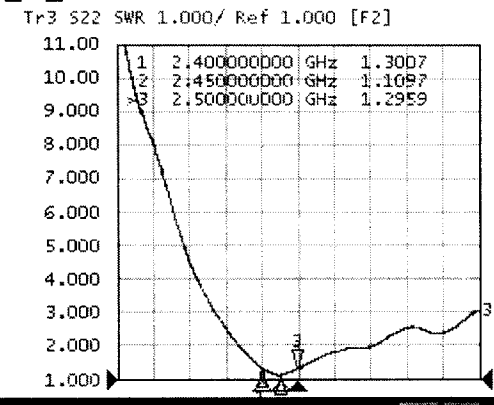
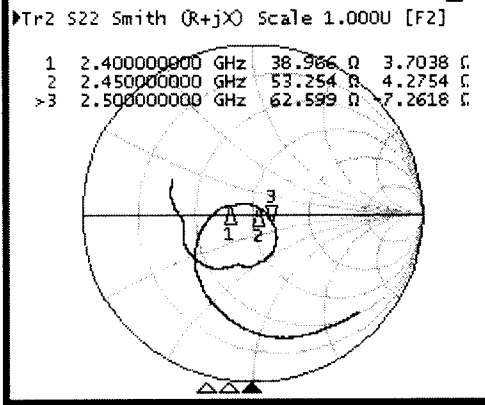
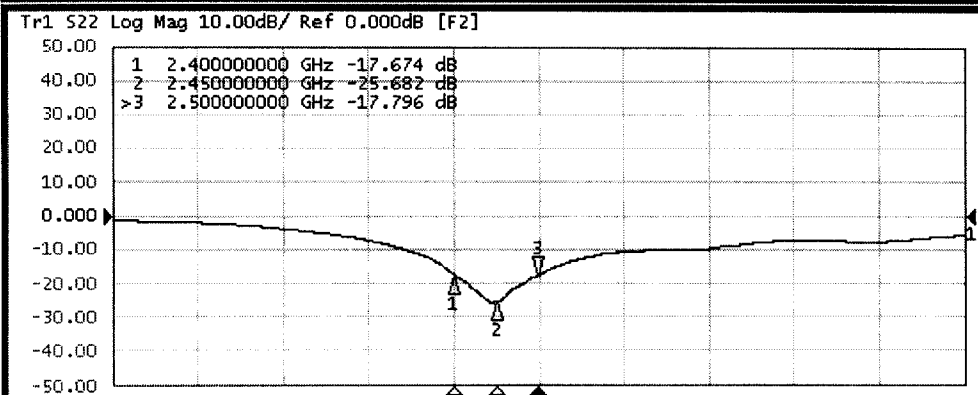
NO	DESCRIPTION	QTY	REMARK
7	Cable	RG-178, Translucent Brown; 50 Ω	1
6	Connector	SMA Straight Plug/Reverse	1
5	Ground Tube	Brass, Ni plated	1
4	Rivet	Brass, Cr Plated (Black)	2
3	Antenna Base	PC; Color: Black	1
2	Antenna Base	PC; Color: Black	1
1	Antenna Cover	TPE; Color: Black	1

CUSTOMER'S SINGATURE

XX	±3.0	APPROVED
X	±2.0	<i>Winston</i>
X	±1.0	CHECKED
XX	±0.5	<i>[Signature]</i>
XXX	±0.1	DRAWING
		<i>Jane</i>

CUSTOMER: 友勁科技股份有限公司		
PART NO : 11723B02*317*00		
PARTNAME: RF Antenna Assembly		
W.Y P/NO : C056-510131-A		
REV	UNIT	FILE :
XI	m/m	SHEET : 1/1

**Wha Yu INDUSTRIAL CO.,LTD.**  
**譚裕實業股份有限公司**  
 THIS DRAWING, AND ITS INHERANT DESIGN CONCEPTS, ARE THE PROPERTY OF WEA YU AND AS SUCH MAY NOT BE COPIED, REPRODUCED, OR GIVEN TO THIRD PARTIES WITHOUT THE WRITTEN CONSENT OF WEA YU.



1 Start 2 GHz IFBW 70 kHz Stop 3 GHz

SYSTEM

Abort Printing

Printer Setup

Invert Image ON

Dump Screen Image

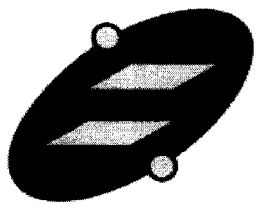
E5091A Setup

Misc Setup

Backlight ON

Firmware Revision

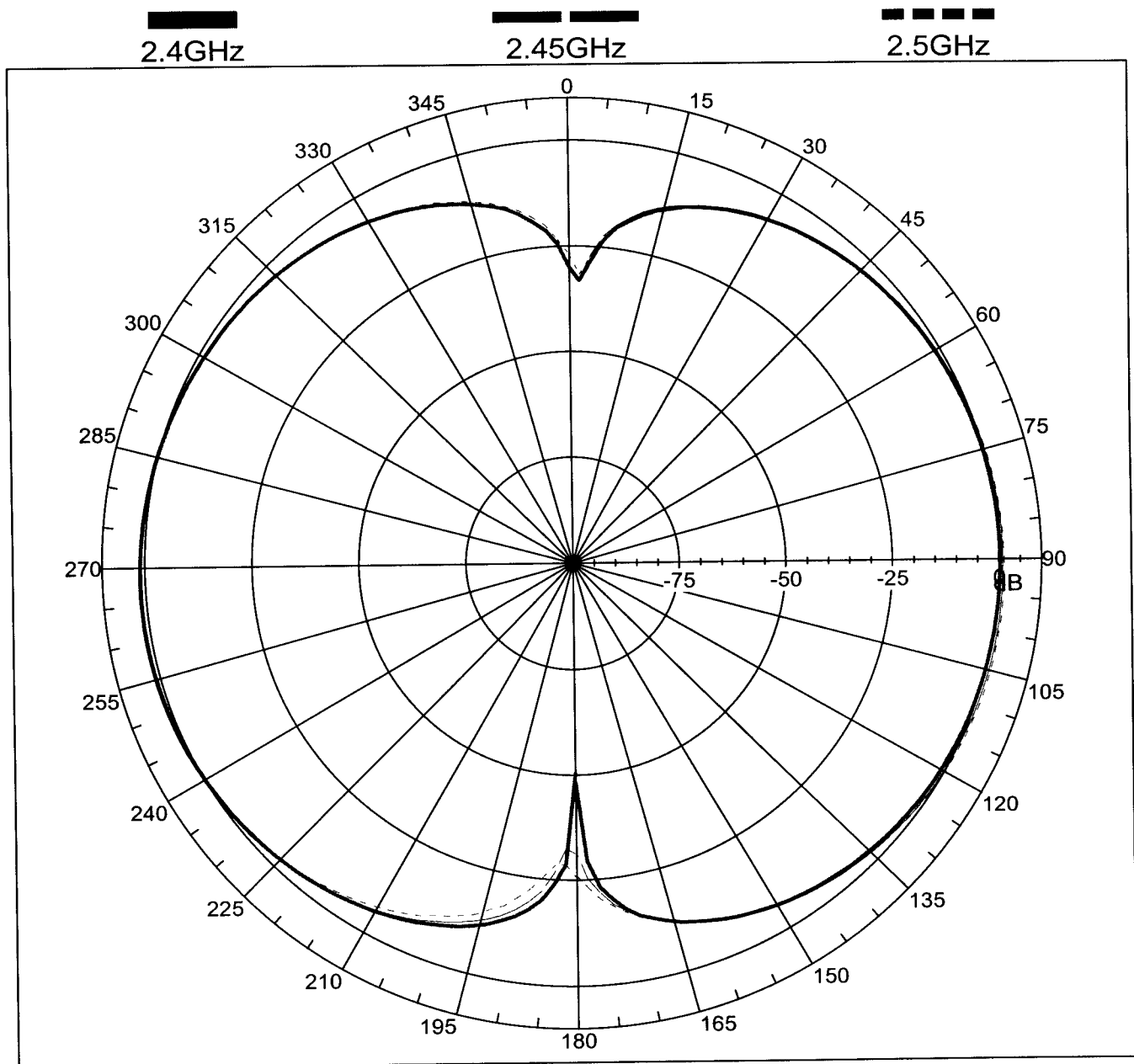
2003-11-17 10:57



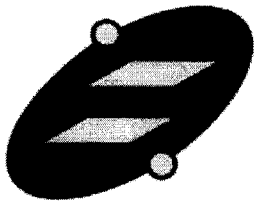
# 譚裕實業股份有限公司

## WHA YU INDUSTRIAL CO., LTD

Far-field amplitude of 2.4GHz small dipole antenna-E-plane.nsi







# 譚裕實業股份有限公司

## WHA YU INDUSTRIAL CO., LTD

Far-field amplitude of 2.4GHz small dipole antenna-H-plane.nsi

