

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	:	NHPWLG1202
Product name	:	802.11g Wireless PCI Adapter
Model name	:	W LG-1202, WNC- 0300, LWS5410P, NWP-0108G, ALL0281A
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 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

[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:
$$S = \frac{PG}{4\pi R^2} = \frac{220.29 \times 1.514}{4\pi (20)^2} = 0.066 \text{ mW} / \text{cm}^2$$

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

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/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:

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

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

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

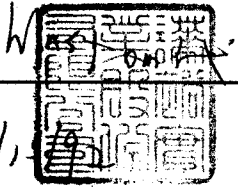
CUSTOMER: 友勁科技股份有限公司

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 :		

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 :

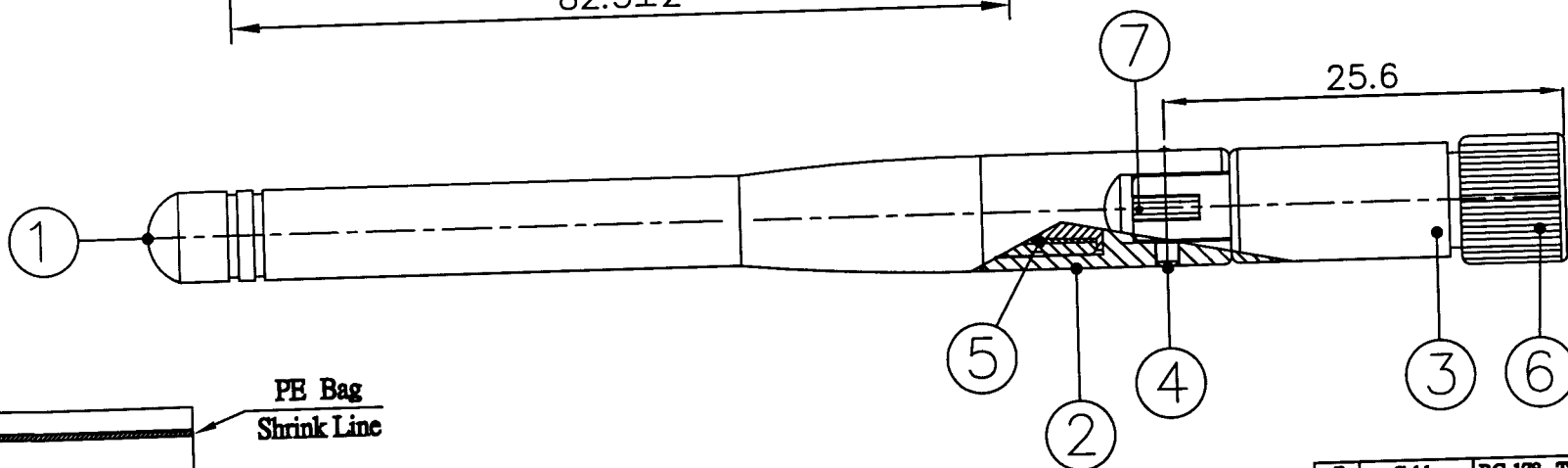
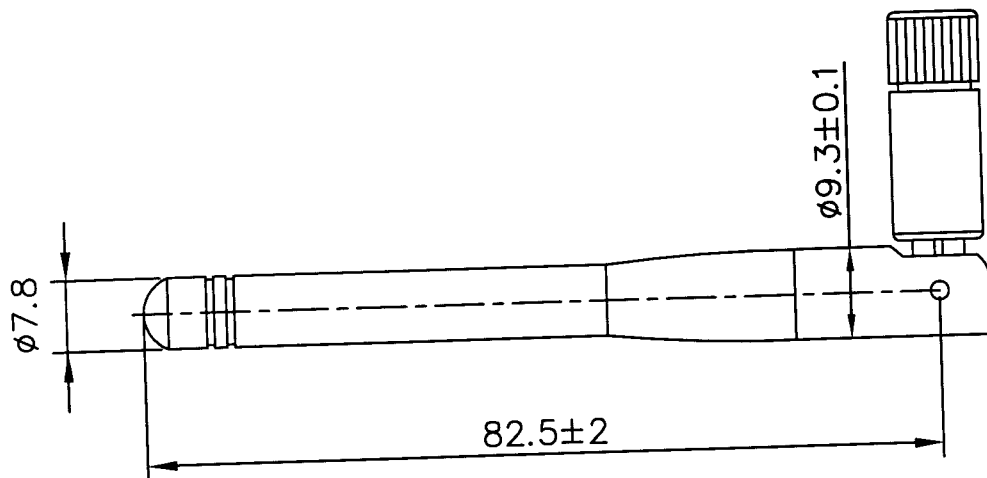
- 1.1 Frequency Rang..... 2.4GHz ~ 2.5GHz
- 1.2 Impedance 50 Ω Nominal
- 1.3 VSWR 1.92 Max.
- 1.4 Return Loss..... -10dB Maximum
- 1.5 Electrical Wave..... $1/2 \lambda$ Diople
- 1.6 Gain..... 1.8 dBi
- 1.7 Admitted Power..... 1W

2. Physical Properties :

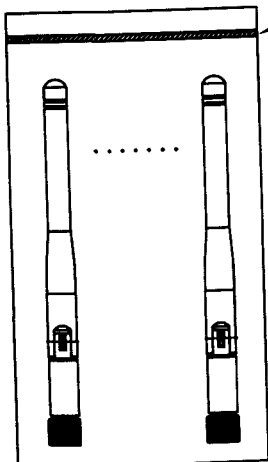
- 2.1 Cable..... RG-178 Cable
- 2.2 Antenna Cover..... TPE
- 2.3 Antenna Base..... PC
- 2.4 Operating Temp. -20°C ~ +65°C
- 2.5 Storage Temp. -30°C ~ +75°C
- 2.6 Color Black
- 2.7 Connector..... SMA Plug Reverse

CG-

REV	DATE	DESCRIPTION
X1	11/17-2003	New Issue



PE Bag
Shrink Line



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

XX	±3.0	APPROVED
X	±2.0	Checked
X	±1.0	Checked
XX	±0.5	DRAWING
XXX	±0.1	
⊕	⊖	

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 :

X1 m/m SHEET : 1/1

CUSTOMER'S SIGNATURE



Wha Yu
INDUSTRIAL CO.,LTD.

譚裕實業股份有限公司

THIS DRAWING, AND ITS INHERENT DESIGN CONCEPTS,
ARE THE PROPERTY OF WHA YU AND AS SUCH MAY NOT
BE COPIED, REPRODUCED, OR GIVEN TO THIRD PARTIES
WITHOUT THE WRITTEN CONSENT OF WHA YU.