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 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:**

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

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

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

G = 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)

譁裕實業股份有限公司

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

Fax:+ 886-3-5713853 · + 886-3-5723600

TAI HWA ELECTRONC CO., LTD. (CHINA)

台樺電業制品廠

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)

上海譁裕電子有限公司

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 :

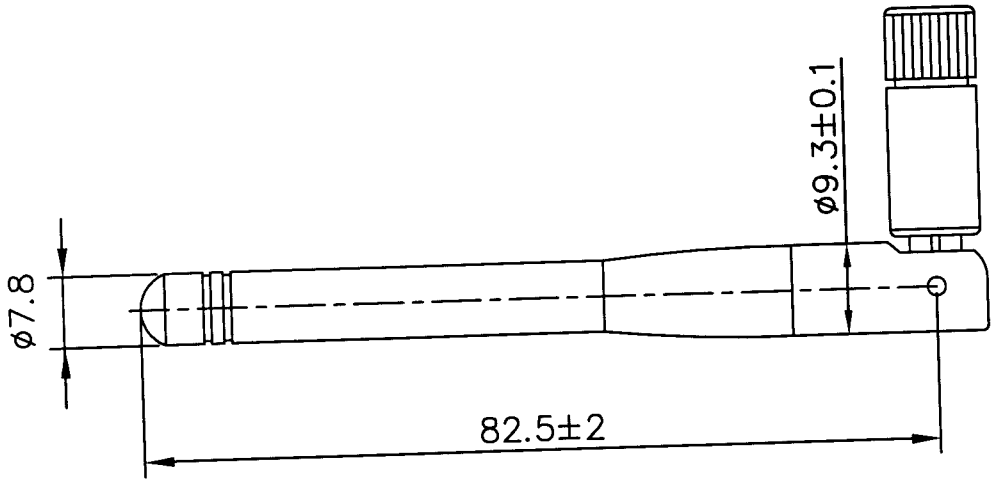
1.1 Frequency Rang..... 2.4GHz ~ 2.5GHz
1.2 Impedance ..... 50Ω Nominal
1.3 VSWR ..... 1.92 Max.
1.4 Return Loss..... -10dB Maximum
1.5 Electrical Wave..... 1/2 λ Diople
1.6 Gain..... 1.8 dBi
1.7 Admitted Power..... 1W

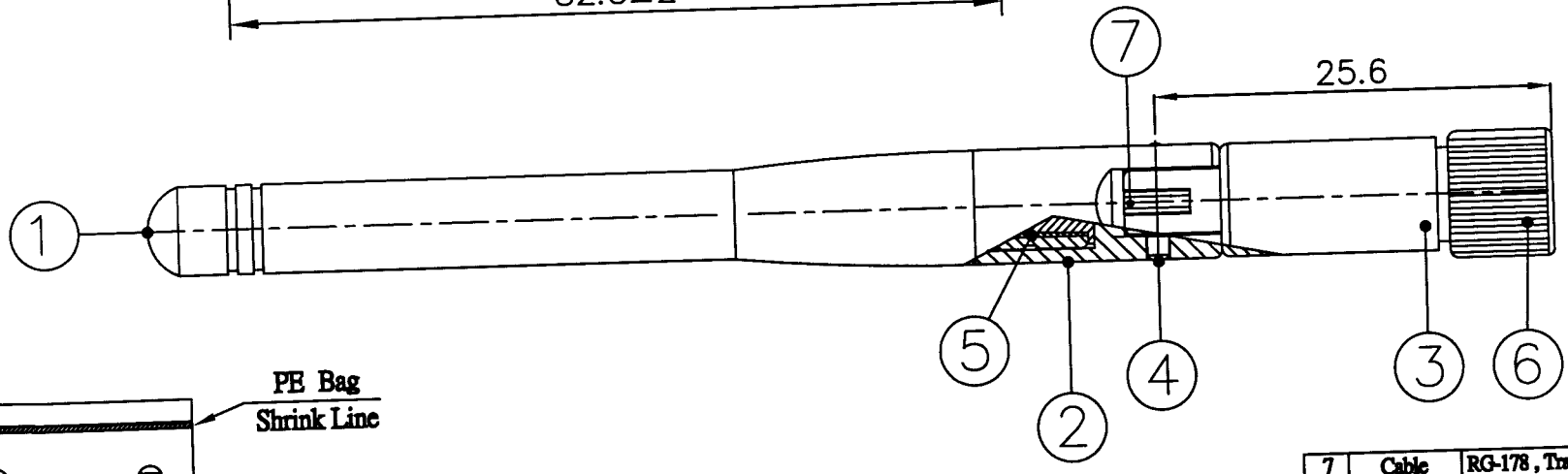
2. Physical Properties :

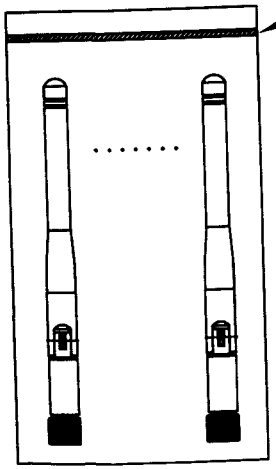
2.1 Cable..... RG-178 Cable
2.2 Antenna Cover..... TPE
2.3 Antenna Base..... PC
2.4 Operating Temp. ..... -20℃ ~ +65℃
2.5 Storage Temp. ..... -30℃ ~ +75℃
2.6 Color ..... Black
2.7 Connector..... SMA Plug Reverse

REV	DATE	DESCRIPTION
X1	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
X.	±2.0
.X	±1.0
.XX	±0.5
.XXX	±0.1

APPROVED: Winston 4/9
CHECKED:
DRAWING: Jane

CUSTOMER: 友勤科技股份有限公司
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

Wha Yu
INDUSTRIAL CO.,LTD.
譁裕實業股份有限公司