

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	:	MSQAAM6KVIB6
Product Name	:	4-Port Wireless Ethernet Router
Model Name	:	AAM6XXXVI-B6; 6218-I1-XXX
Frequency Range	:	2.412GHz ~ 2.462GHz
Channel Spacing	:	5MHz
Support Channel	:	11 Channels
Modulation Skill	:	DBPSK, DQPSK, CCK, OFDM
Power Type	:	Powered by the AC to AC adapter, Model: AA-151A I/P: 120VAC, 60Hz, 20W O/P: 15VAC, 1A 185cm length, non-shielded, no ferrite core

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:

$$\text{Friis Transmission Formula: } S = \frac{PG}{4\pi R^2} = \frac{109.14 \times 1.51}{4\pi(20)^2} = 0.03279 \text{ mW/cm}^2$$

$$\text{Estimated safe separation: } R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{109.14 \times 1.51}{4\pi}} = 3.621 \text{ cm}$$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 3.62cm"

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)

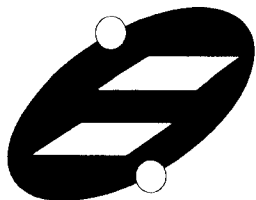
The Numeric gain G of antenna with a gain specified in dB is determined by:

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

$$G = \text{Log}^{-1} (1.8 / 10) = 1.51356$$

Appendix

Antenna Specification



WHA YU INDUSTRIAL CO., LTD. (HEAD OFFICE)
TAI HWA ELECTRONIC CO., LTD.(CHINA)
SHANGHAI HUA YU ELECTRONIC CO., LTD.(CHINA)
AEON TECH CO., LTD. (CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: 華碩電腦股份有限公司

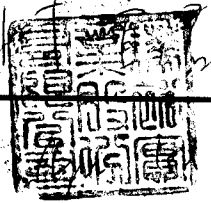
PART NAME: RF Antenna Cable Assembly

PART NO.:

REVISION:

W. Y. P/NO.: C660-510047-A

REV.: X1

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :		
DATE :		

WHA YU GROUP

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Wujiang City, Jiangsu Province, China

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Fax: + 86-512-63627981

RF Antenna Cable Assembly

Specification

1. Electrical Properties :

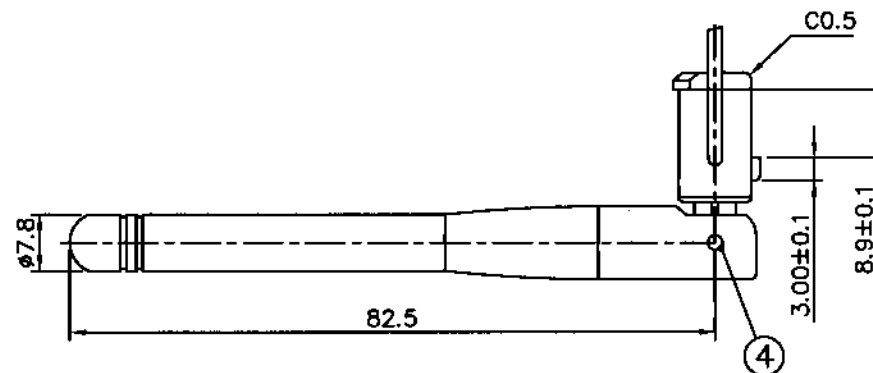
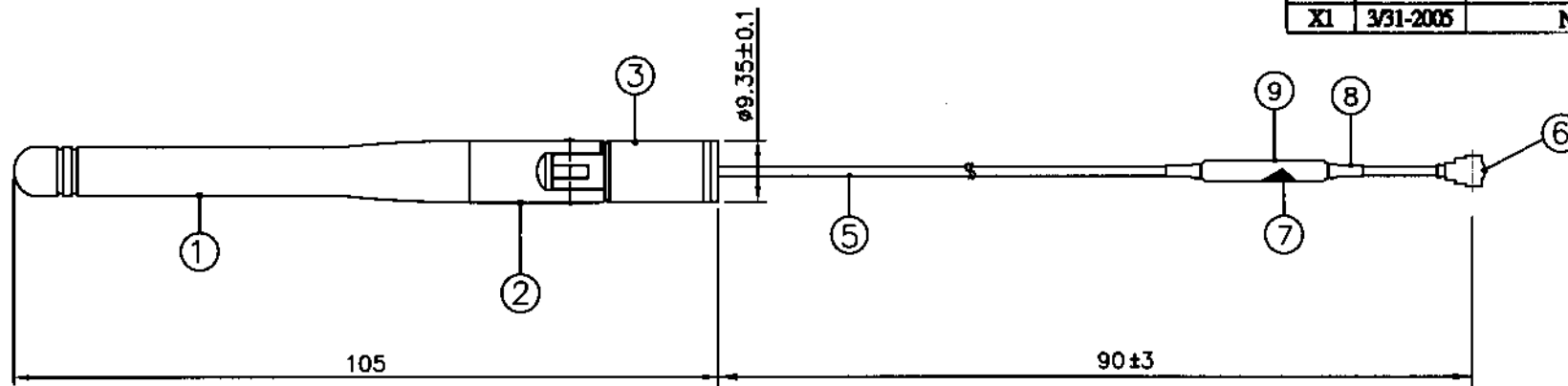
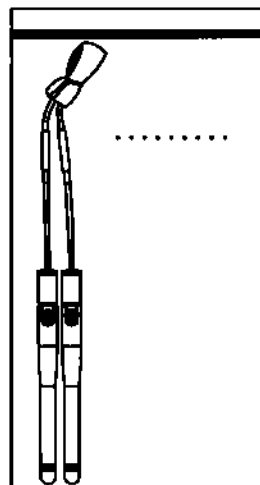
- 1.1 Frequency Range..... 2.4GHz ~ 2.5GHz
- 1.2 Impedance 50 Ω Nominal
- 1.3 VSWR 1.92 or less
- 1.4 Return Loss..... -10 dB or less
- 1.5 Electrical Wave..... 1/2 λ Dipole
- 1.6 Gain(peak)..... 1.8dBi (exclude cable loss)
- 1.7 Admitted Power..... 1W

2. Physical Properties :

- 2.1 Cable..... Φ 1.13 Coaxial 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..... I-PEX MHF Plug Connector

CG-

REV	DATE	DESCRIPTION
XI	3/31-2005	New Issue

PE Bag
Shrink Line

Packing : 25 pcs/bag

9	Tube	Heat Shrink Tube	1	
8	Tube	Heat Shrink Tube	2	
7	Core	RH 4*25*1.5	1	
6	Connector	MHF Connector	1	
5	Cable	φ1.13 Coaxial Cable	1	
4	Rivet	Brass, Zn Plated (Black)	2	
3	Antenna Base	PC; Color: Black	1	
2	Antenna Base	PC; Color: Black	1	
1	Antenna Body	TPE; Color: Black	1	
NO	DESCRIPTION		QTY	REMARK

CUSTOMER'S SIGNATURE

XX	±3.0	APPROVED
X	±2.0	Checked
I	±1.0	Checked
XX	±0.5	Checked
XXX	±0.1	DRAWING
程淑娟		

CUSTOMER: 華碩電腦股份有限公司

PART NO :

PARTNAME: RF Antenna Cable Assembly

W.Y P/N: C660-510047-A

REV UNIT FILE :

X1 m/m SHEET: 1/1

Wha Yu
INDUSTRIAL CO.,LTD.

華裕實業股份有限公司

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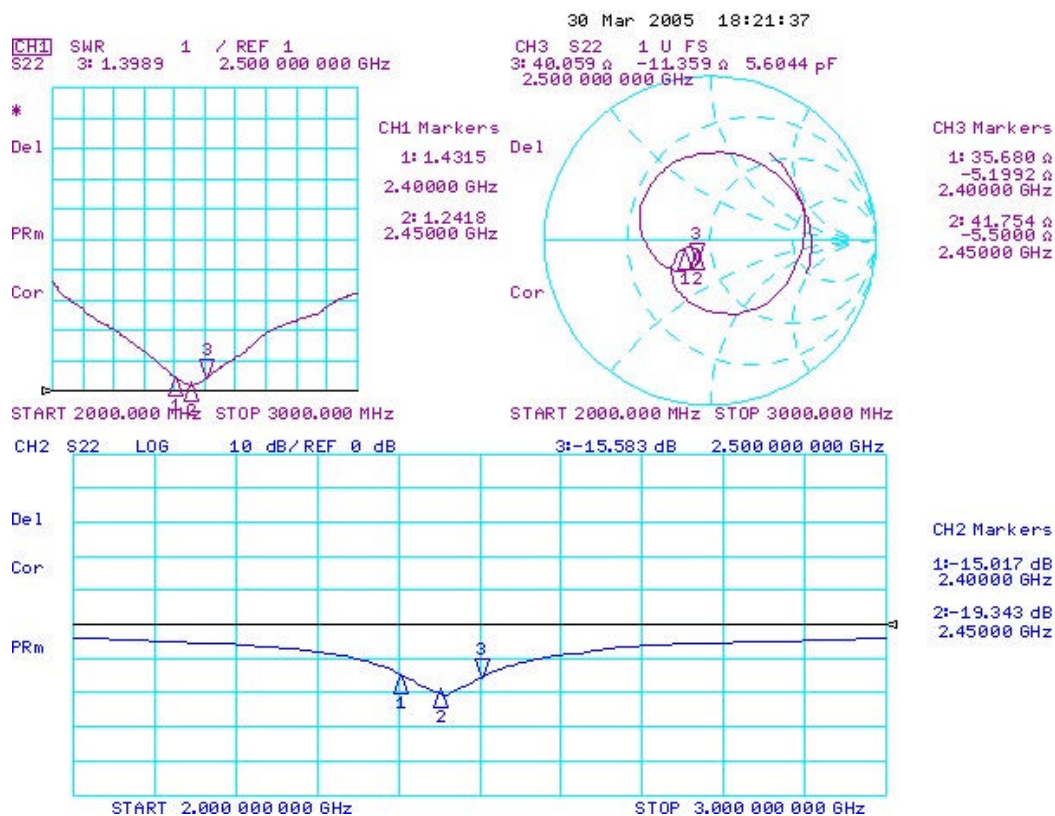


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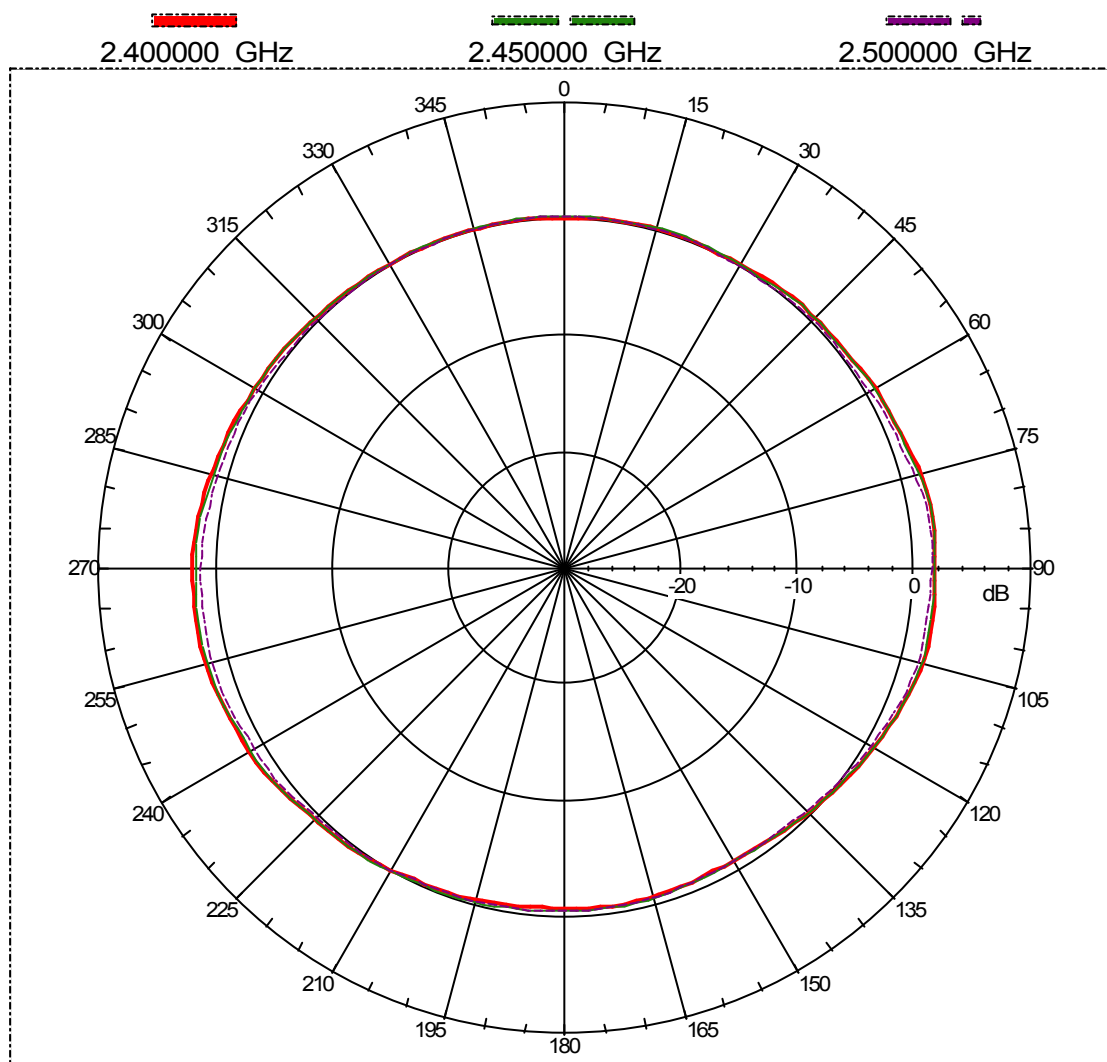
RF Antenna Assembly

P/NO :C660-540047-A SPEC : 2.4GHz



3/31/2005

Far-field amplitude of C660-510047-A-V.nsi



Far-field amplitude of C660-510047-A-H.nsi

