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-A1-XXX; AM604g
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 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: $S = \frac{PG}{4\pi R^2} = \frac{109.14 \times 1.995}{4\pi (20)^2} = 0.0433 mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{109.14 \times 1.995}{4\pi}} = 4.1625 cm$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 4.16cm"

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 $^{-1}$ (3.0 / 10) = 1.995

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)

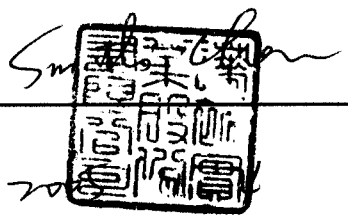
SPECIFICATION FOR APPROVAL

CUSTOMER: *華碩科技股份有限公司*

PART NAME: ***RF Cable Assembly***

PART NO.: ***REVISION:***

W. Y. P/NO.: ***C660-510075-A*** ***REV.:*** ***X1***

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :		
DATE :		

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SU ZHOU AEON TECH CO., LTD. (CHINA)
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Wujiang City,Jiangsu Province,China
Tel: + 86-512-63627980
Fax: + 86-512-63627981

RF Antenna Cable Assembly

Specification

1. Electrical Properties :

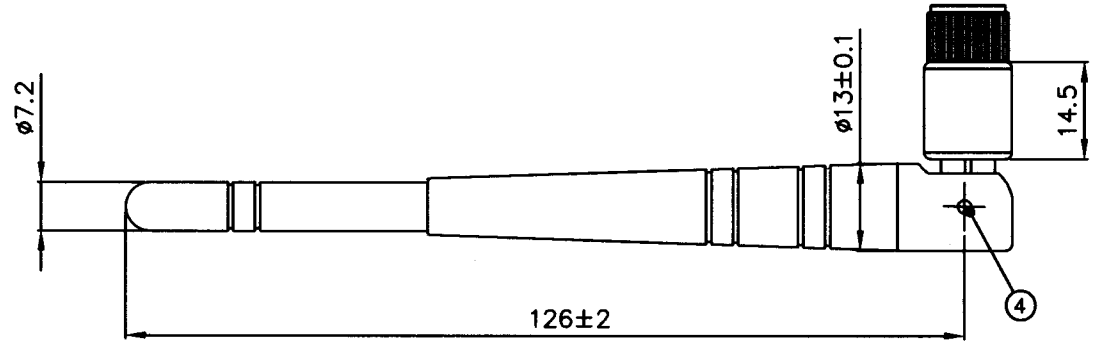
1.1	Frequency Range……	2.4GHz ~ 2.5GHz
1.2	Impedance ……	50Ω Nominal
1.3	VSWR ……	1.92 Max.
1.4	Return Loss……	-10 dB Maximum
1.5	Radiation ……	Omni-directional
1.6	Gain(peak)……	3dBi
1.7	Polarization……	Linear Vertical
1.8	Admitted Power……	1W

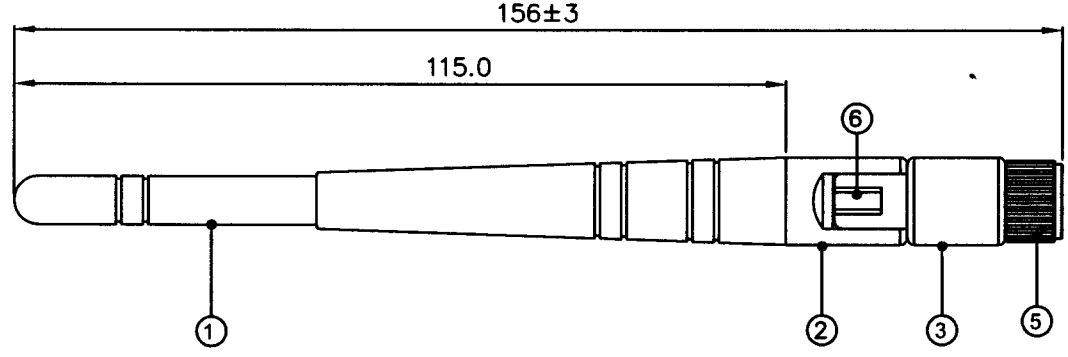
2. Physical Properties :

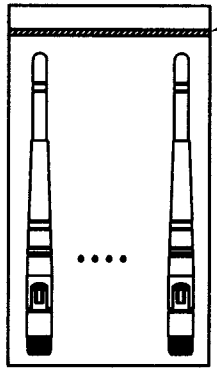
2.1	Cable……	RG-178 Coaxial Cable
2.2	Antenna Cover……	TPE
2.3	Antenna Base……	PC
2.4	Antenna Base……	PBT
2.5	Operating Temp. ……	-20℃ ~ +65℃
2.6	Storage Temp. ……	-30℃ ~ +75℃
2.7	Color ……	White
2.8	Connector…..……	SMA Plug Reverse

CG-

REV	DATE	DESCRIPTION
X1	11/02-2005	New Issue







Packing :10 pcs/bag

NO	DESCRIPTION		QTY	REMARK
6	Cable	RG-178 Cable	1	
5	Connector	SMA Plug Reverse(Ni Plated)	1	
4	Rivet	POM	2	
3	Antenna Base	PBT ; Color : White	1	
2	Antenna Base	PC ; Color : White	1	
1	Antenna Body	TPE ; Color : White	1	

CUSTOMER'S SINGATURE

XX.	±5
X.	±3.0
.X	±1.0
.XX	±0.5
.XXX	±0.1

APPROVED
CHECKED
DRAWING

CUSTOMER: 華碩
PART NO :
PARTNAME: RF Antenna Assembly
W.Y P/NO : C660-510075-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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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 Assembly***

PART NO.: ***REVISION:***

W. Y. P/NO.: ***C660-510017-A*** ***REV.:*** ***X2***

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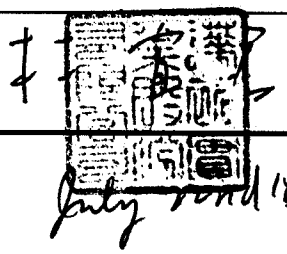
APPROVED BY :		
DATE :		

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1.7	Polarization……	Linear Vertical
1.8	Admitted Power……	1W

2. Physical Properties :

2.1	Cable……	RG-178 Coaxial Cable
2.2	Antenna Cover……	TPE
2.3	Antenna Base……	PC
2.4	Antenna Base……	PBT
2.5	Operating Temp. ……	-20℃ ~ +65℃
2.6	Storage Temp. ……	-30℃ ~ +75℃
2.7	Color ……	White,DuPont Spectramaster LS033
2.8	Connector…...……	SMA Plug Reverse

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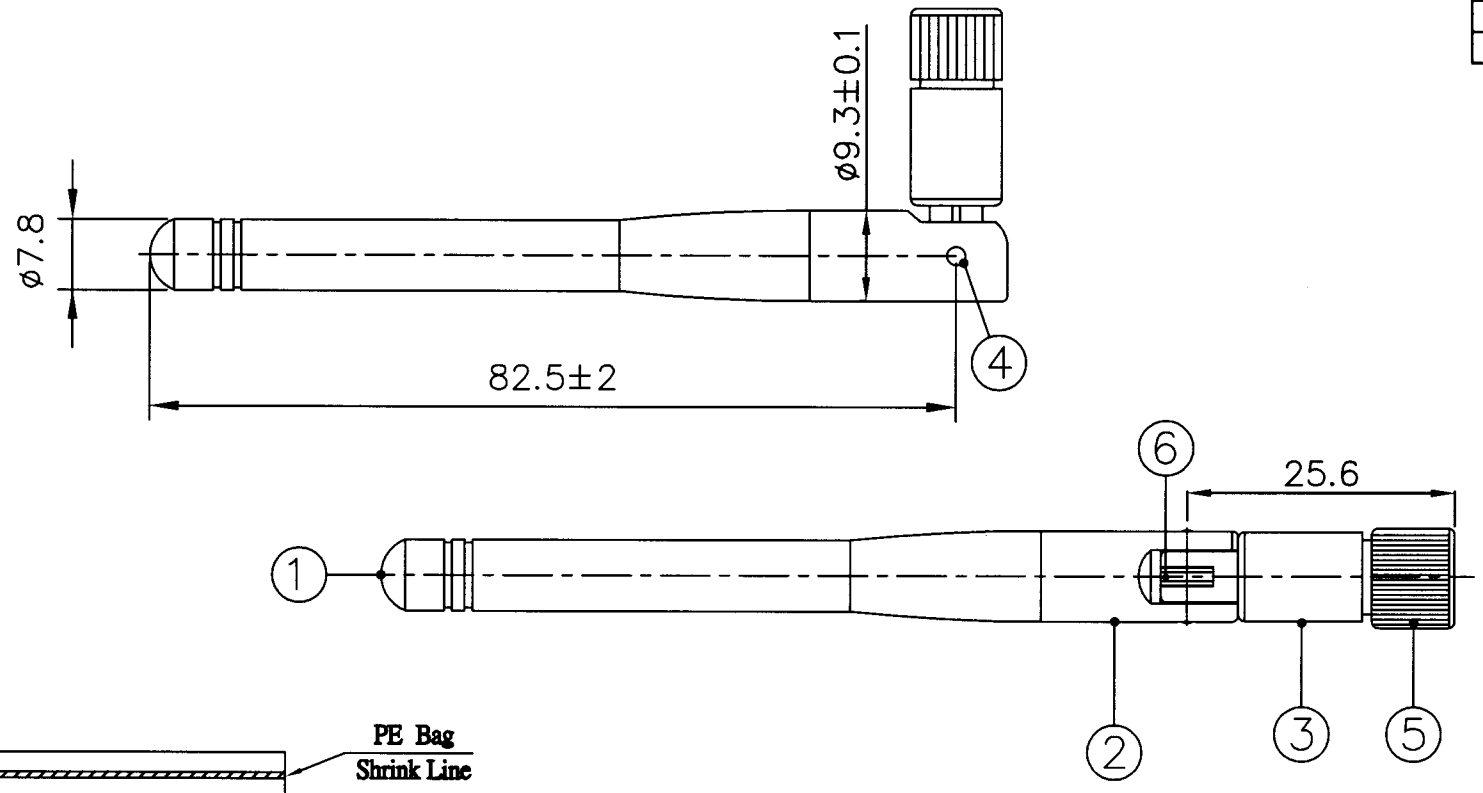
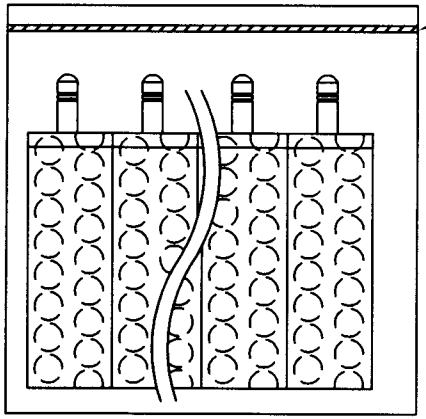
REV	DATE	DESCRIPTION
X1	07/02-2004	New Issue
X2	7/20-2005	Modify Bottom Base material





Packing : 20 pcs/bag

NO	DESCRIPTION	QTY	REMARK
6	Cable — RG-178 , Translucent Brown ; 50 Ω	1	
5	Connector — SMA Straight Plug/Reverse (Ni Plated)	1	
4	Rivet — Brass , Plated Ni	2	
3	Antenna Base — PBT ; Color:DuPont Spectramaster LS033	1	
2	Antenna Base — PC ; Color:DuPont Spectramaster LS033	1	
1	Antenna Cover — TPE ; Color:DuPont Spectramaster LS033	1	

CUSTOMER'S SINGATURE

XX.	±5
X.	±1.0
.X	±0.1
.XX	±0.01
.XXX	±0.005

APPROVED
CHECKED 陳淑玲
DRAWING 2005.7.20 程淑娟

CUSTOMER: 華碩科技股份有限公司
PART NO :
PARTNAME: RF Antenna Cable Assembly
W.Y P/NO : C660-510017-A

REV	UNIT	FILE :
X2	m/m	SHEET : 1/1

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