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	**:**	PY305400025
Product Name	**:**	DOCSIS 2.0 Advanced Cable Gateway
Model Name	**:**	CGD24N
Frequency Range	**:**	IEEE 802.11b/g/n Draft 1.0 20M: 2.412GHz ~ 2.462GHz IEEE 802.11n Draft 1.0 40M: 2.422GHz ~ 2.452GHz
Channel Spacing	**:**	5MHz
Support Channel	**:**	IEEE 802.11b/g/n Draft 1.0 20M: 11 Channels IEEE 802.11n Draft 1.0 40M: 7 Channels
Modulation Skill	**:**	DBPSK, DQPSK, CCK, OFDM
Power Type	**:**	Powered by the switching adapter, Manufacture: NETGEAR Model: MT12-Y120100-A1 I/P: 100 ~ 120VAC ~ 60Hz 0.3A O/P: 12VDC 1.0A. 187cm length, non-shielded, without 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: $S = \frac{PG}{4\pi R^2} = \frac{468.95 \times 1.51}{4\pi (20)^2} = 0.141 mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{468.95 \times 1.51}{4\pi}} = 7.507 cm$

Note: "The safe estimated separation that the user must maintain from the antenna is at least 6.5cm"

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) = 1.51

Appendix

Antenna Specification

WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)
DONGGUAN AEON TECH CO.,LTD.(CHINA)
SUZHOU AEON TECH CO.,LTD.(CHINA)
AEON TECH (SHANGHAI) CO.,LTD(CHINA)
DONGGUAN PARNER TECH CO.,LTD.(CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: *ASUS*

PART NAME: *RF PCB Antenna Assembly*

PART NO.: *REVISION:*

W. Y. P/NO.: *C660S510222-A(SSR-83345)* *REV.: X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :	Romeo	
DATE :	9/15/08	

WHA YU GROUP

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Tel:+86-769-81662366 Fax:+86-769-81602681

Contents

RF PCB Antenna Assembly

Specification (With Housing)

1. Electrical Properties :

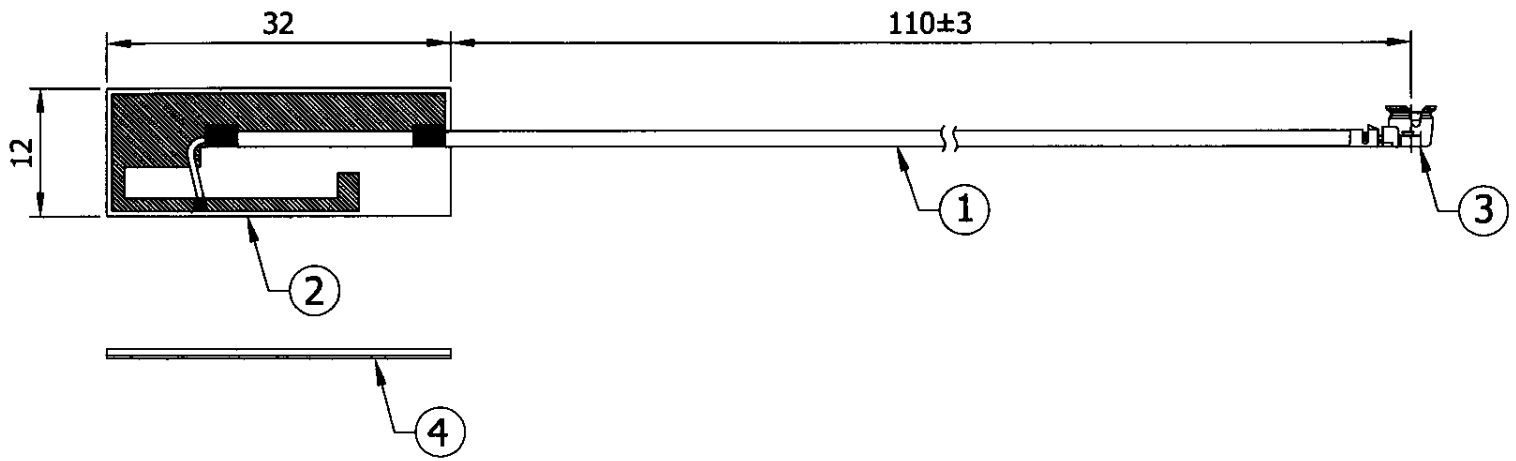
1.1	Frequency Range	2.4GHz ~ 2.5GHz
1.2	Impedance	50Ω Nominal
1.3	VSWR	1.92:1 Max.
1.4	Return Loss	-10 dB Max.
1.5	Radiation	Omni-directional
1.6	Gain(peak)	1.8dBi (excluding cable loss)
1.7	Cable Loss	0.5dB Max.
1.8	Polarization	Linear ; Vertical
1.9	Admitted Power	1W
1.10	Cable	φ1.13 Coaxial Cable
1.11	Connector	MHF

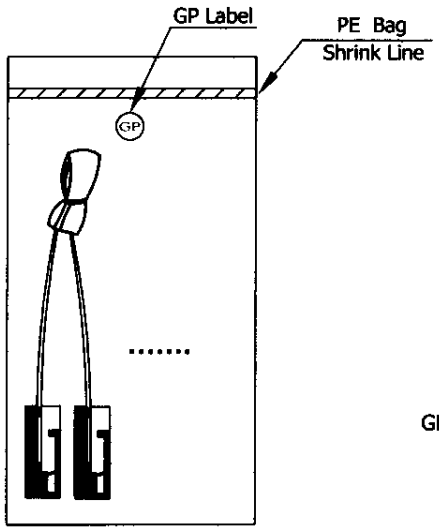
2. Physical Properties :

2.1	Operating Temp.	-10℃ ~ +60℃
2.2	Storage Temp.	-10℃ ~ +70℃

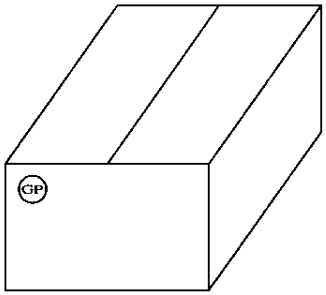
CG-

REV	DATE	DESCRIPTION
X1	09/25-2008	New Issue





Packing : 25 pcs/bag



GP標籤貼於外箱兩邊側嗖左上角共 2PCS

NO	DESCRIPTION		Q'TY	REMARK
4	雙面膠	Sony G4000	1	
3	Connector	MHF Connector	1	
2	PCB	FR4 ;24mil	1	
1	Cable	Φ1.13mm Cable,Gray,50Ω	1	

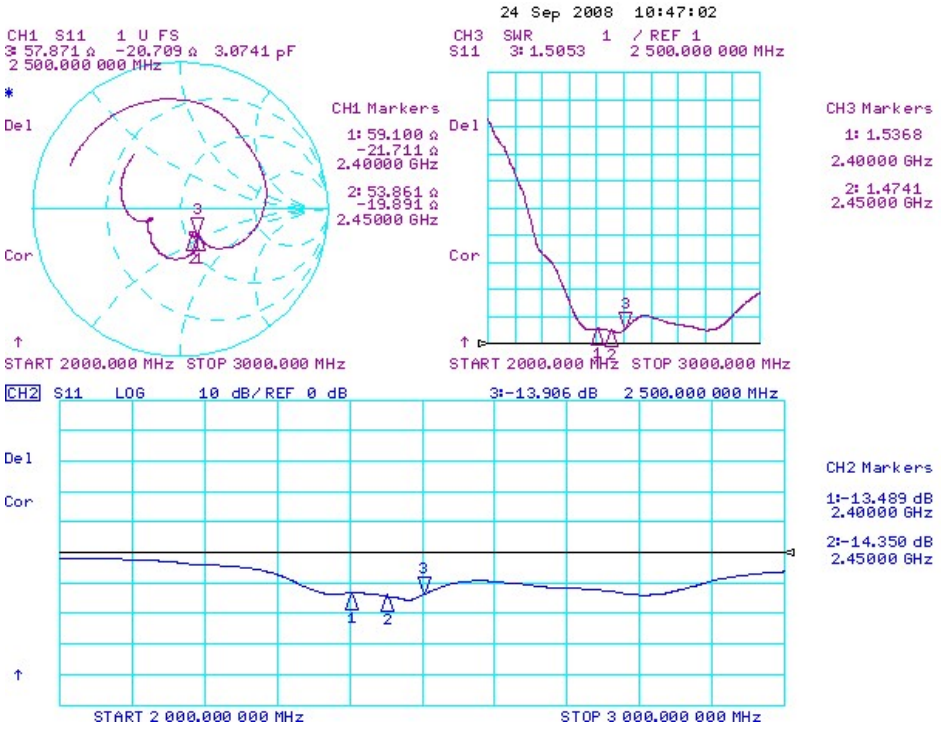
CUSTOMER'S SINGATURE

XX.	±5.0	APPROVED 周東生	CUSTOMER:	ASUS		
X.	±3.0		PART NO :			
.X	±1.0	CHECKED 鄭看廷	PART NAME:	RF PCB Antenna Assembly		
.XX	±0.5		W.Y P/NO :	C660S510222-A		
.XXX	±0.1	DRAWN 97. 9. 25 淑娟	REV	UNIT	FILE :	SSR-83345
			X1	mm	SHEET :	1/1

M.gear Wha Yu Group

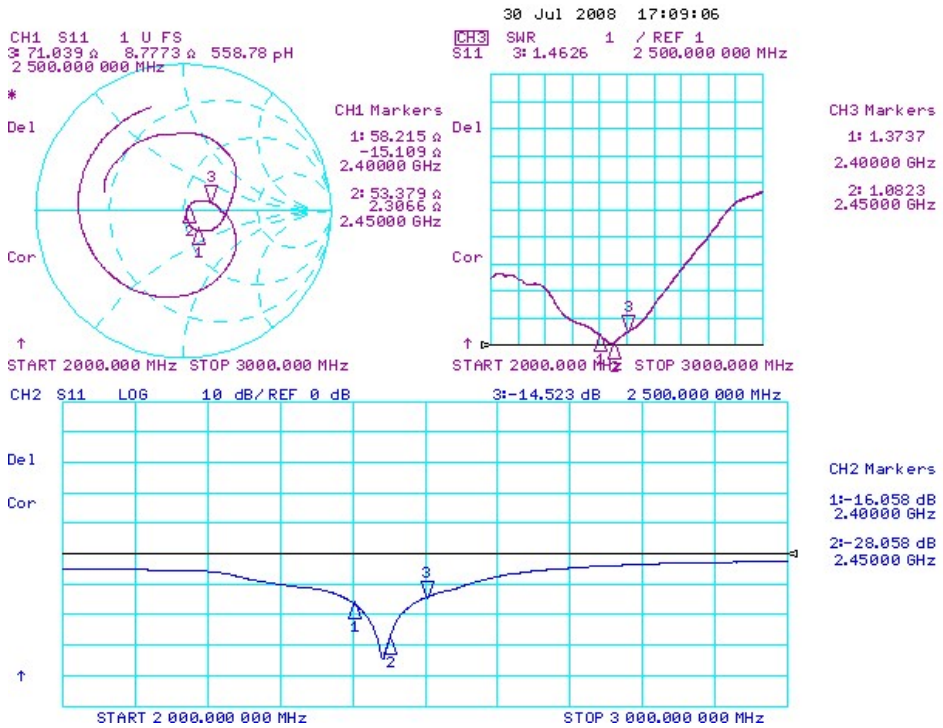
RF Antenna Assembly (Free Space)

P/NO : C660S510222-A(SSR-83345) SPEC : 2.4~2.5GHz



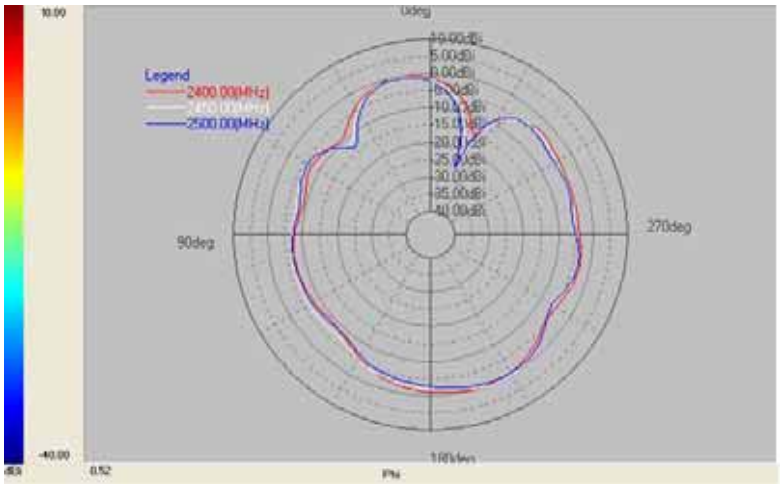
RF Antenna Assembly (With Housing)

P/NO : C660-510222-A(SSR-83345) SPEC : 2.4~2.5GHz

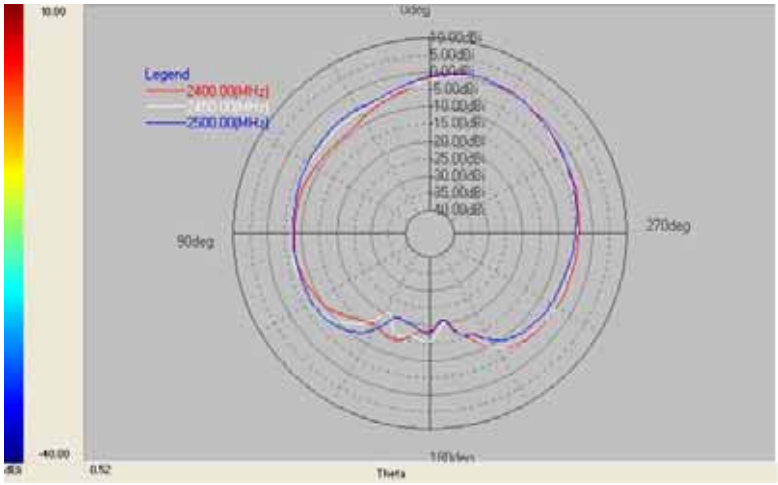


C660S510222-A (SSR-83345)-With Housing

XY -Plane



YZ -Plane



XZ -Plane