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	**:**	NDD9561040401
Product name	**:**	Wireless Broadband Router
Model name	**:**	as Appendix A of Test report
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
Power Type	**:**	Powered by Adapter Model: DVR-1280-3 I/P: 120VAC, 60Hz；O/P: 12VDC, 1000mA

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: $S = \frac{PG}{4\pi R^2} = \frac{67.764 \times 1.585}{4\pi (20)^2} = 0.0214 mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{67.764 \times 1.585}{4\pi}} = 2.924 cm$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 2.924cm."

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:

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

$G = \text{Log}^{-1}$ (2.0 / 10) = 1.585

NInput Output Enterprise Corp.	PRODUCT SPECIFICATION	DOC. No: WL-TL-17 DATE: 25-MAR-02 REV. : C

PRODUCT NAME

2.4G ANTENNA WITH RP SMA

PART NUMBER

W205-108-D200

Signed By Customers

Approved By:

供應商: 垠 旺 精 密 股 份 有 限 公 司

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NInput Output Enterprise Corp.	PRODUCT SPECIFICATION 2.4 G ANTENNA WITH RP-SMA PLUG	DOC. No: WL-TL-17 DATE: 25-MAR-02 REV. : C

W205-108-D200 2.4G ANTENNA

SPECIFICATION

1. Electrical Properties

1-1 Frequency Range .....2.4~2.5GHz

1-2 Impedance.....50 Ohms nominal

1-3 V.S.W.R.....2.0 (Max.)

1-4 Return Loss.....-10.0 dB(Max.)

1-5 Max. Gain.....2.0dBi

1-6 Polarization..... Vertical

1-7 Admitted Power.....1W

1-8 Electrical Wave.....1/4 λ Dipole

2. Mechanical Properties

2-1 Connector.....Reverse SMA Plug

2-2 Cable.....RG178

2-3 Antenna Body.....T.P.R.

2-4 Operating Temperature Range.....-20℃ ~ +50℃

2-5 Storage Temperature Range..... -20℃ ~ +50℃

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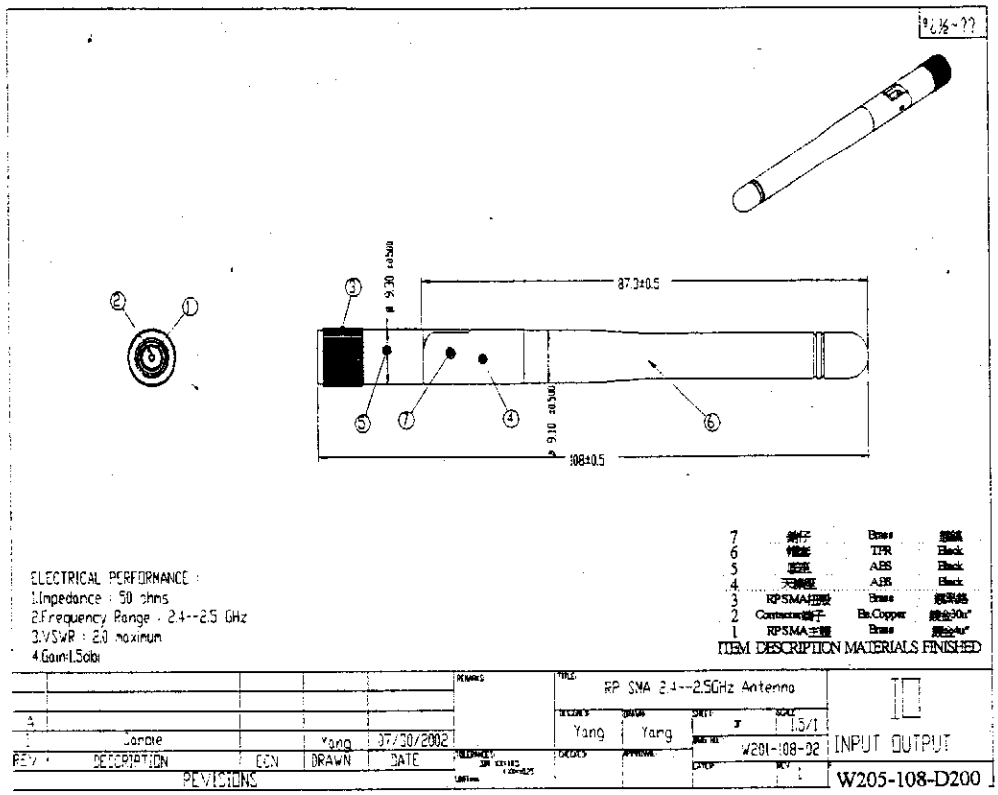

ITEM	DESCRIPTION	MATERIALS	FINISHED
7		Brass	
6		TPR	Black
5		ABS	Black
4		ABS	Black
3	RPSMA插座	Brass	
2	Contact接子	Be.Copper	镀金30u"
1	RPSMA主體	Brass	镀金4u"

ELECTRICAL PERFORMANCE :
1.Impedance : 50 ohms
2.Frequency Range : 2.4--2.5 GHz
3.VSWR : 2.0 maximum
4.Gain:1.5dbi

REV.	DESCRIPTION	ECN	DRAWN	DATE
A	Create		Yang	07/30/2002

REVISIONS

TITLE: RP SMA 2.4--2.5GHz Antenna
DESIGN'S: Yang
DRAWN: Yang
SCALE: 1.5/1
W205-108-02
INPUT OUTPUT
W205-108-D200