TRC® Since1985
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Measurement of MPE

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

Granted FCC ID	:	RTQLW2110P
Product name	:	IEEE 802.11b Wireless LAN PCI Adaptor
Model name	:	LW2110P
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 Channel
Modulation Skill	:	DBPSK, DQPSK, CCK
Power Type	:	Power by the Protocol Control Information of computer

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: $S = \frac{PG}{4\pi R^2} = \frac{92.897 \times 1.514}{4\pi (20)^2} = 0.02798 mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{92.897 \times 1.514}{4\pi}} = 3.345 cm$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 3.345 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 $^{-1}$ (1.8 / 10) = 1.514

PARNER

弘晶科技股份有限公司
PARNER TECHNOLOGY CO., LTD.
高生國際企業有限公司
SUPERGRADE INTERNATIONAL ENTERPRISE LTD.

樣品承認書
APPROVAL SHEET

客戶名稱(CUSTOMER)：友勁科技股份有限公司

製造廠牌(BRAND)：譁裕實業

品名編號(DESCRIPTION)：C512-510070-A

客戶編號(CUSTOMER P/N)：

客戶機種編號(CUSTOMER NODEL NO.)：

樣品數量(SAMPLE QTY)：

承認書日期(ISSUE DATE)：92 年 4 月 1 日

承認日期(APPROVAL DATE)：　年　月　日

AUTHORIZED SIGNATURE	
PARNER TECHNOLOGY	CUSTOMER

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TEL：886-2-2888-1868　聯絡人：洪世澤
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RF Antenna Cable Assembly

Specification

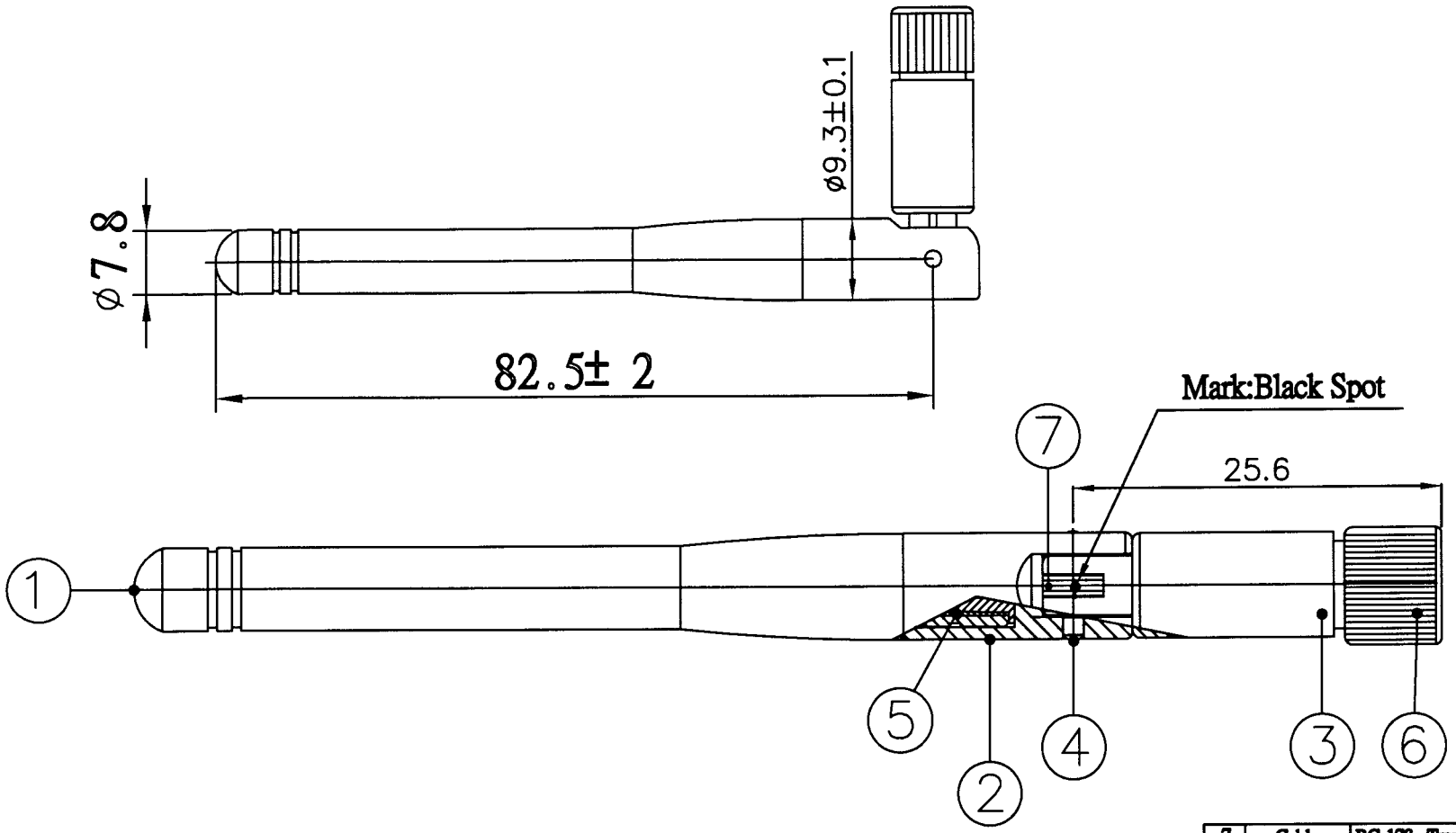
1. Electrical Properties :

1.1 Frequency Rang..... 2.4GHz ~ 2.5GHz
1.2 Impedance ..... 50Ω Nominal
1.3 VSWR .....2.0 Max.
1.4 Return Loss..... -9.5 dB 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 50Ω
2.2 Connector.....SMA Straight Plug/Reverse
2.3 Antenna Cover.....TPE
2.4 Antenna Base..... PC
2.5 Operating Temp. .....-20℃ ~ +65℃
2.6 Storage Temp. .....-30℃ ~ +75℃
2.7 Color .....Black

REV	DATE	DESCRIPTION
X1	04/01-2003	New Issue



NO	DESCRIPTION	QTY	REMARK
7	Cable — RG-178 , Translucent Brown ; 50 Ω	1	
6	Connector — SMA Straight Plug ReverseColor ; Black	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	

XX.	±3.0
X.	±2.0
.X	±1.0
.XX	±0.5
.XXX	±0.1

APPROVED

CHECKED

DRAWING

CUSTOMER'S SINGATURE

CUSTOMER: 弘晶科技股份有限公司

PART NO :

PARTNAME: RF Antenna Cable Assembly

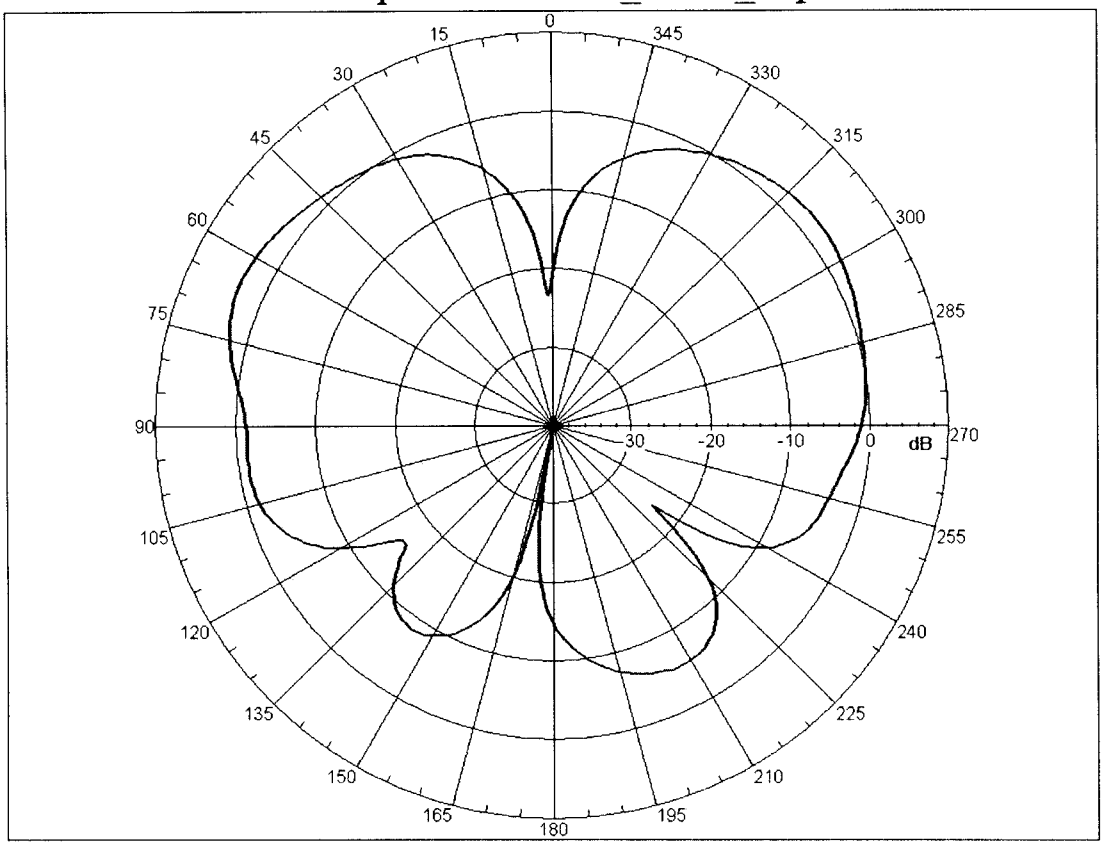
W.Y P/NO : C512-510070-A

REV	UNIT	FILE :
X1	m/m	SHEET : 1/1

Wha Yu
INDUSTRIAL CO.,LTD.
譁裕實業股份有限公司

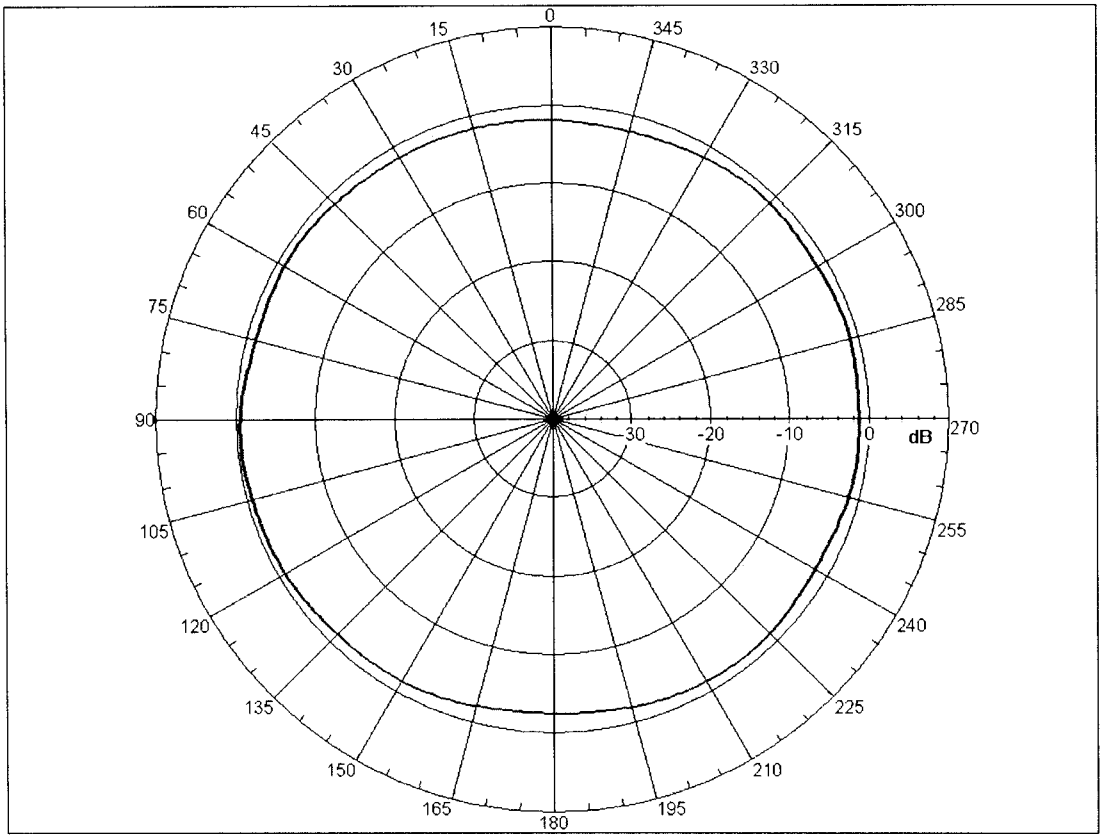
pci_sma_e-plane (1000x808x24b jpeg)

Far-field amplitude of PCI_SMA_E-plane.nsi

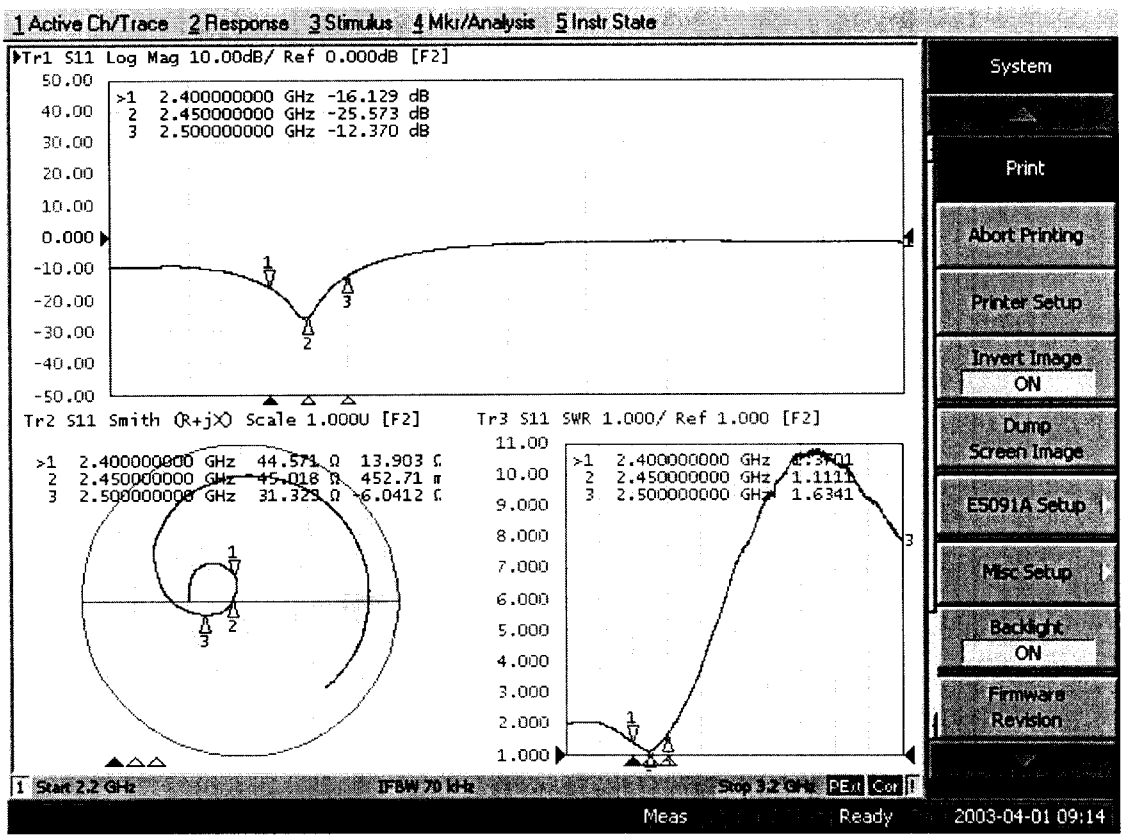


pci_sma_h-plane (1000x808x24b jpeg)

Far-field amplitude of PCI_SMA_H-plane.nsi



c512-510070-a (640x480x256 bmp)



Cable Specification

Cable : Mil-C-17 Coaxial Cable RG-178

1. Construction :
   - 1 Conductor..... **30AWG 7/38 SCCS**
   - 2 Dielectric..... PTFE OD : 0.033"±0.002"
   - 3 Shielded.....38AWG SPC OD : 0.051" Nominal
   - 4 Jacket.....FEP OD : 0.071"±0.004"

2. Physical Properities :
   - 1 Weight per 1000ft..... 6.3 lbs Maximum
   - 2 Bend Radius.....0.35" Mininum
   - 3 Operating Temperature Range -55℃~ 200℃

3. Electrical Properities:
   - 1 Impedance..... 50±2 ohms
   - 2 Capacitance..... 32 pF/ft Maximum
   - 3 Cut off Frequency..... 116 GHz
   - 4 Attenuation.....45.0 dB/100ft @ 1GHz
     64.4 dB/100ft @ 2GHz
     79.7 dB/100ft @ 3GHz
     92.7 dB/100ft @ 4GHz
     104.3 dB/100ft @ 5GHz
     115.0 dB/100ft @ 6GHz