

豪岑電子金屬股份有限公司

HOW TSEN INTL. ELECTRONICS METAL CO., LTD.

P.T HOWSANINDO INDUSTRY(INDONESIA)

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INDONESIA : JL PANGKALAN 1-B BANTAR GEBANG, BEKASI 17310 INDONESIA

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SPECIFICATION FOR APPROVAL

Parts Name : WLAN Antenna

Type No : S-222

Rev. : D

Customer P/N : 1750006082

Date : Sep. 23rd, 2011

CUSTOMER APPROVAL & COMMENT

FULL NAME	POSITION	SIGNATURE	COMPANY STAMP	COMMENT

DATE :

RECOGNIZED

ENGINEERING

QC CHECK

Sep. 23rd, 2011
豪岑電子金屬股份有限公司
HOWTSEN Intl. Electronic Metal
發行專用章
ISO 9001-2008

HOW TSEN Intl. ELECTRONICS METAL CO., LTD.

ANTENNA SPECIFICATIONS FOR APPROVAL

1. General Description

- 1.1 Type No : S-222
1.2 Customer P/N : 1750006082

2. A DESCRIPTION & APPLICATION

*This antenna assembly is designed for use in portable °
Communications equipment over a temperature range °
Of -20 °C to +70 °C in an indoor / outdoor environment °*

3. Structure

Dimensions and material are be in conformity with the requirement of an approved drawing number °

4. Surface Appearance

Surface condition should not have scratch , pin hole , blistering (If necessary take sample for consideration)

5. ENVIRONMENTAL CHARACTERISTICS

- 5.1 Operating temperature range -20 °C to +65 °C °
5.2 Humidity range : 10 % RH to 80 % RH °

6. Electrical Characteristics

- 6.1 Testing Equipment : Agilent 8753ET Network Analyzer
6.2 Frequency Band : 2.4~2.5 GHz
6.3 Frequency Marker : 2.4 / 2.43 / 2.45 / 2.4835 / 2.5 GHz
6.4 Return Loss : ≤ -10.0 dB Maximum
6.5 V.S.W.R : 2.0:1.0 or less
6.6 Connector : SMA Male Reverse
6.7 Impedance : 50Ω Nominal Value
6.8 Gain : 2.12 dBi
6.9 Polarization : Vertical Polarization
6.10 Radiation Pattern : Near omni-directional in the horizontal plane
6.11 Admitted Power : 2W
6.12 Antenna Type : Dipole Antenna

7. Mechanical Capability

- 7.1 Qualification testing , all product shall be able to withstand the following testing °
7.2 Physical dimensions identified within this specification °
7.3 Pull Test : Tube has the capability of load 3 kgf-cm in a vertical position within 30 seconds °
7.4 Torque Test : 3 kgf-cm no damage happened °

7.5 Testing Conditions

7.5.1 Precondition at -20°C for 1 hour then expose to $+80^{\circ}\text{C}$ taking final measurements for 120 hours ◦

7.5.2 90%~95% relative humidity for 120 hours, finally allow to dry at room ambient for 4 hour ◦

8. Inspection Standard

8.1 : For Dimension to use the special inspection level of S-4 , AQL 1.0 ◦

8.2 : For Appearance to use MIL-STD-105DII AQL1.0 ◦

8.3 : For Mechanical Capability : Per lot Sampling, $n=5$, Ac 0 , Re 1 ◦

8.4 : For Environmental test : Per lot Sampling $n=3$, Ac 0 , Re 1 ◦

9. Packing Style

According to the specified packing method ◦

10. Others

Any changes in this specification should be agreed by both parties ◦

WLAN Antenna

For : 2.4~2.5 GHz

Type No. : S-222

Electrical Specification

<i>Testing Equipment</i>	<i>Agilent 8753ET Network Analyzer</i>
<i>Frequency Range</i>	<i>2.4~2.5 GHz</i>
<i>Frequency Marker</i>	<i>2.4/2.43/2.45/2.4835/2.5 GHz</i>
<i>Return Loss</i>	<i>≤ -10.0 dB Maximum</i>
<i>V.S.W.R</i>	<i>2.0:1.0 or less</i>
<i>Connector</i>	<i>SMA Male Reverse</i>
<i>Impedance</i>	<i>50Ω Nominal Value</i>
<i>Gain</i>	<i>2 dBi</i>
<i>Polarization</i>	<i>Vertical Polarization</i>
<i>Radiation Pattern</i>	<i>Near omni-directional in the horizontal plane</i>
<i>Admitted Power</i>	<i>2W</i>
<i>Antenna Type</i>	<i>Dipole Antenna</i>

Environmental & Mechanical Characters

<i>Temperature</i>	<i>-20 °C to +65 °C</i>
<i>Weight</i>	<i>G</i>
<i>Dimensions</i>	<i>∅</i>



HOW TSEN Intl. Electronics Metal Co., Ltd. <http://www.howtsen.com.tw>

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HOW TSEN INTL. ELECTRONICS METAL CO.,LTD.

TEST REPORT

1. Model : S-222
2. Quantity : 5 Pcs
3. Date Of Testing : March.10,2011
4. Testing Item : Pull Test
5. Testing Equipment : B-016 (Push-Pull Scale Fb30K)
6. Testing Conditions : Antenna Must Withstand a (3.0 Kgf-Cm)
- Tensile Load Applied To Over Mold For 10 Seconds.
- No Part Of The Antenna May Be Pulled Out Of The Assembly Or From The Housing.



7. Testing Result :

Sample	1	2	3	4	5	6	7	8	9	10
OK or NG	ok	ok	ok	ok	ok	-	-	-	-	-

Approved :

Tester :

HOW TSEN INTL. ELECTRONICS METAL CO.,LTD.

TEST REPORT

1. *Model* : S-222
2. *Quantity* : 5 Pcs
3. *Date Of Testing* : March.10,2011
4. *Testing Item* : Torque Test
5. *Testing Equipment* : B-001 (Mechanical Torque Meter 2-TM30)
6. *Testing Conditions* : (3.0 Kgf-Cm) No Damage Happened.



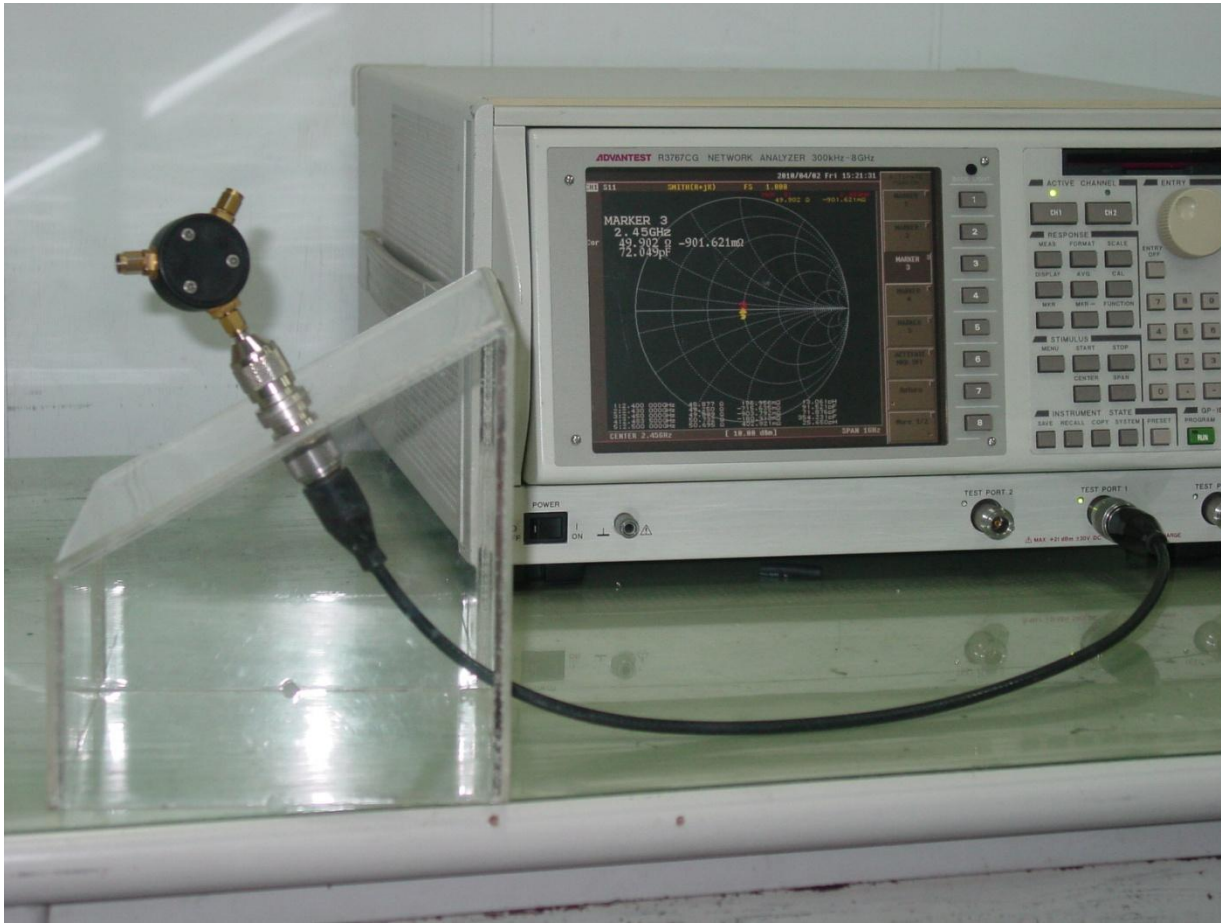
7. *Testing Result* :

<i>Sample</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
<i>OK or NG</i>	<i>ok</i>	<i>ok</i>	<i>ok</i>	<i>ok</i>	<i>ok</i>	-	-	-	-	-

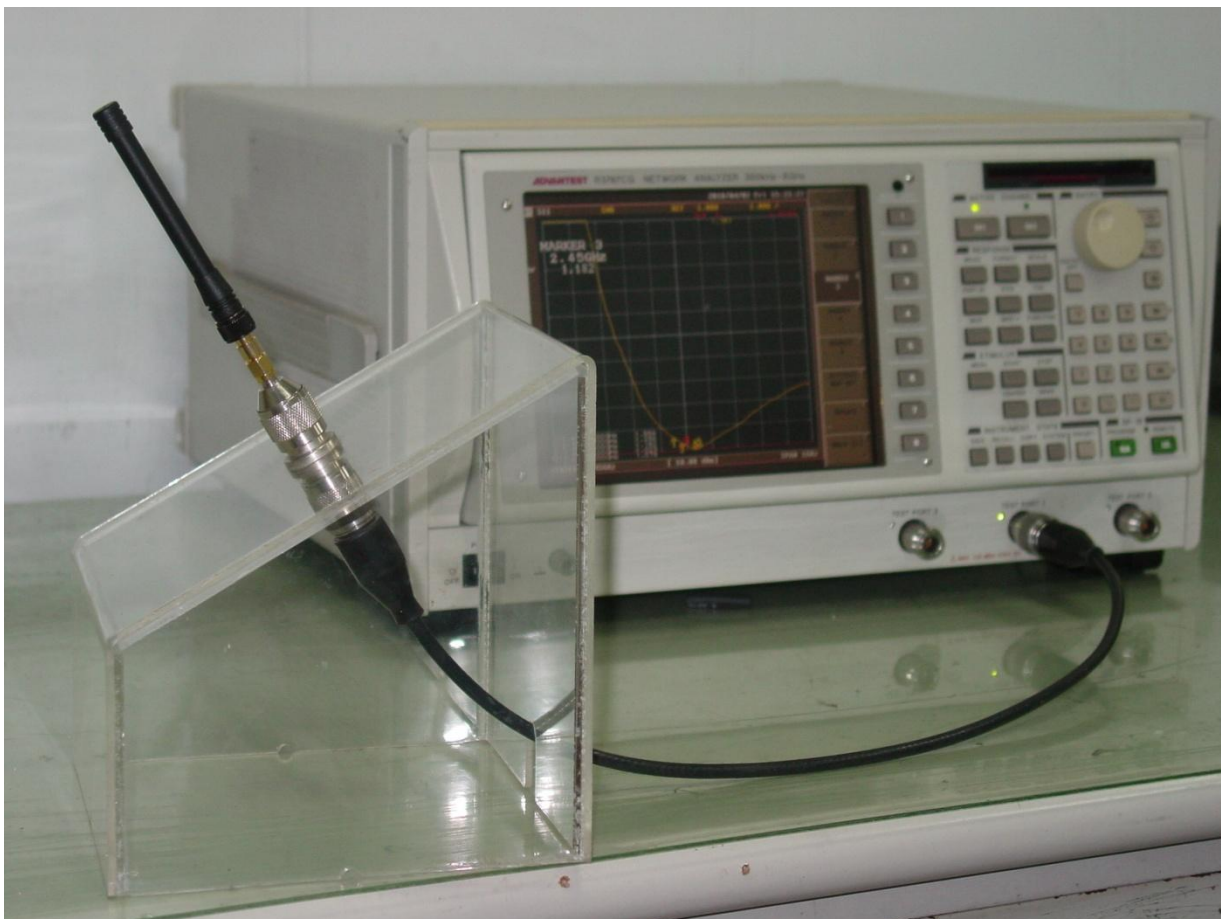
Approved :

Tester :

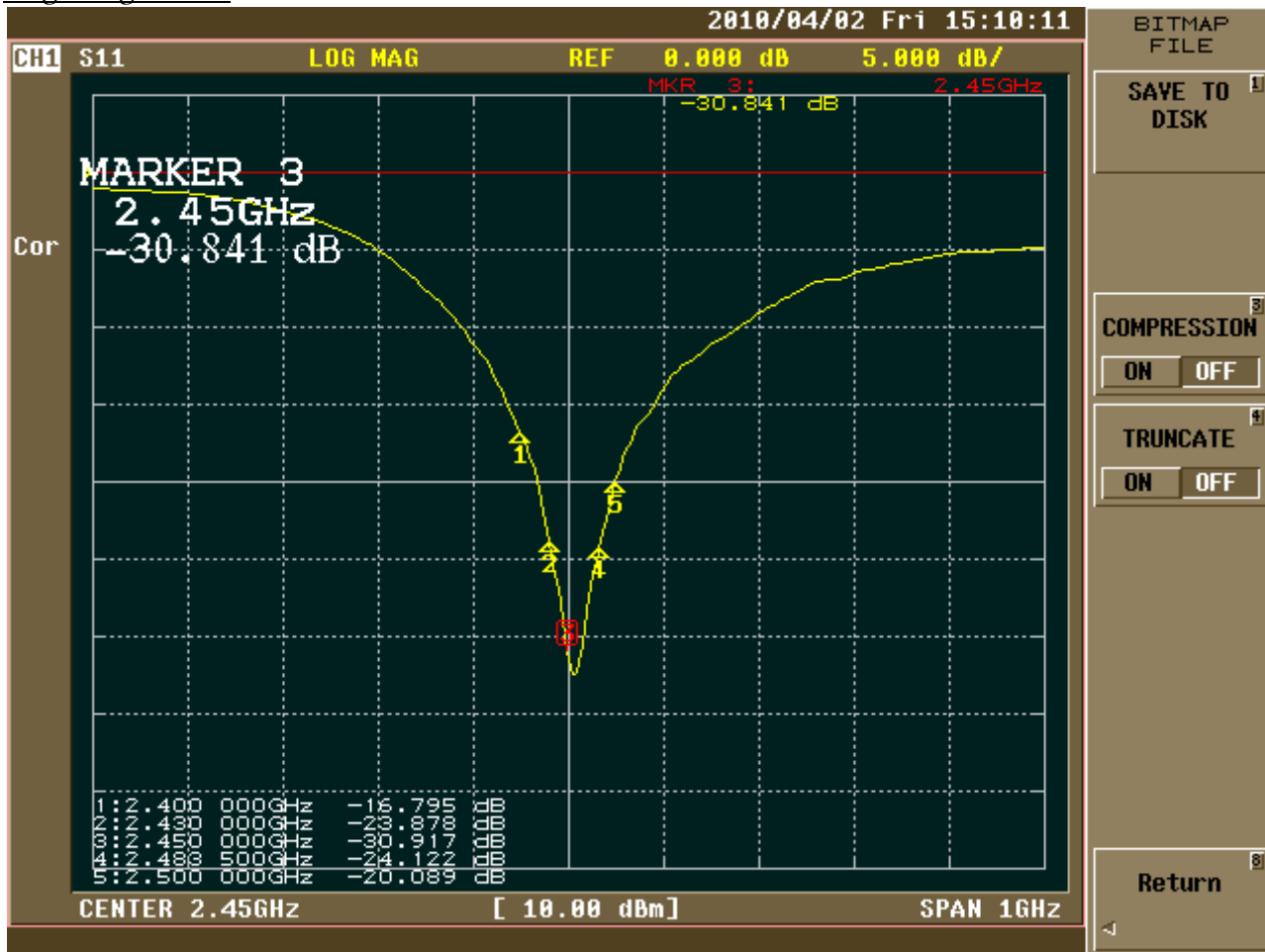
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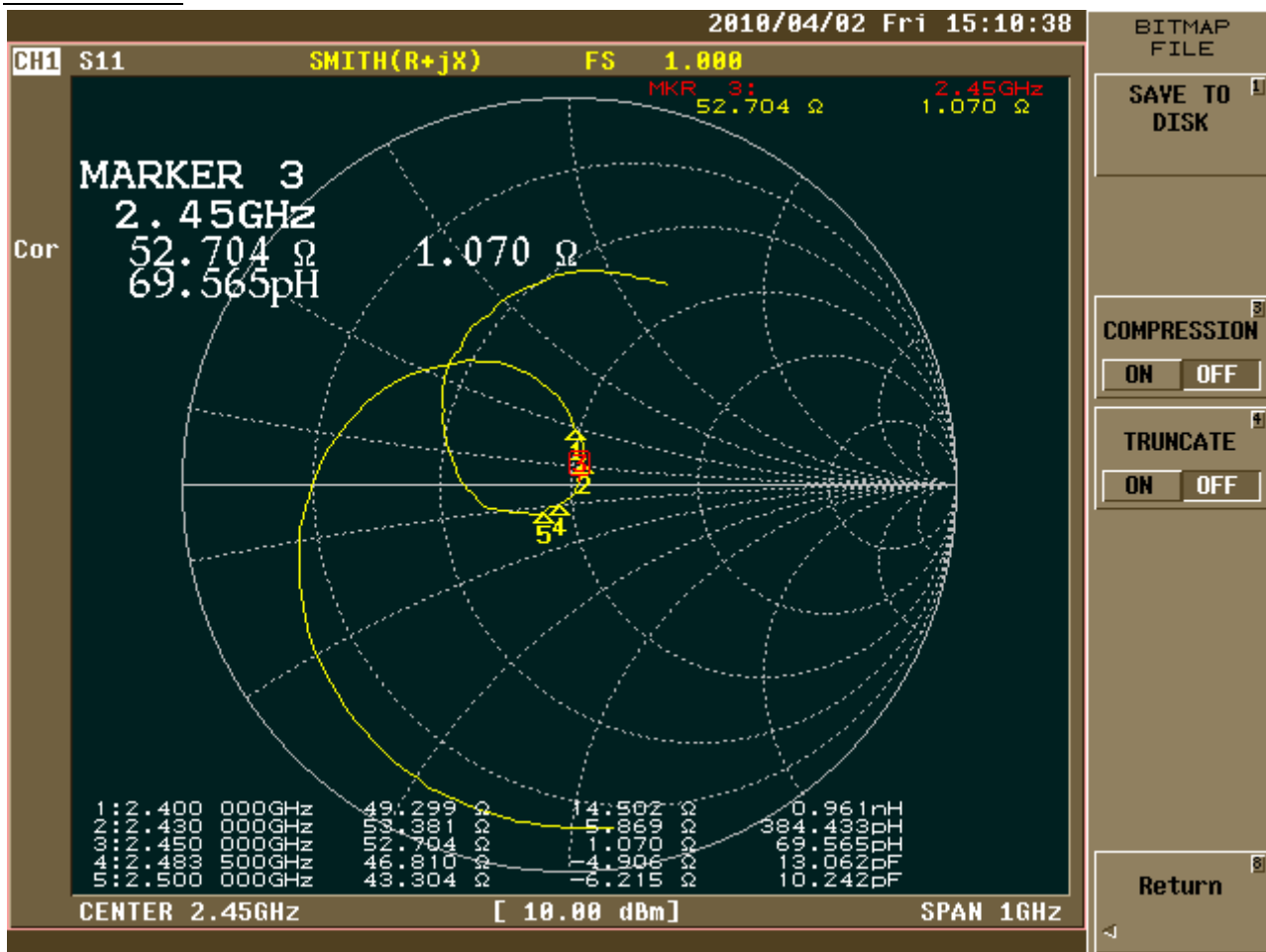
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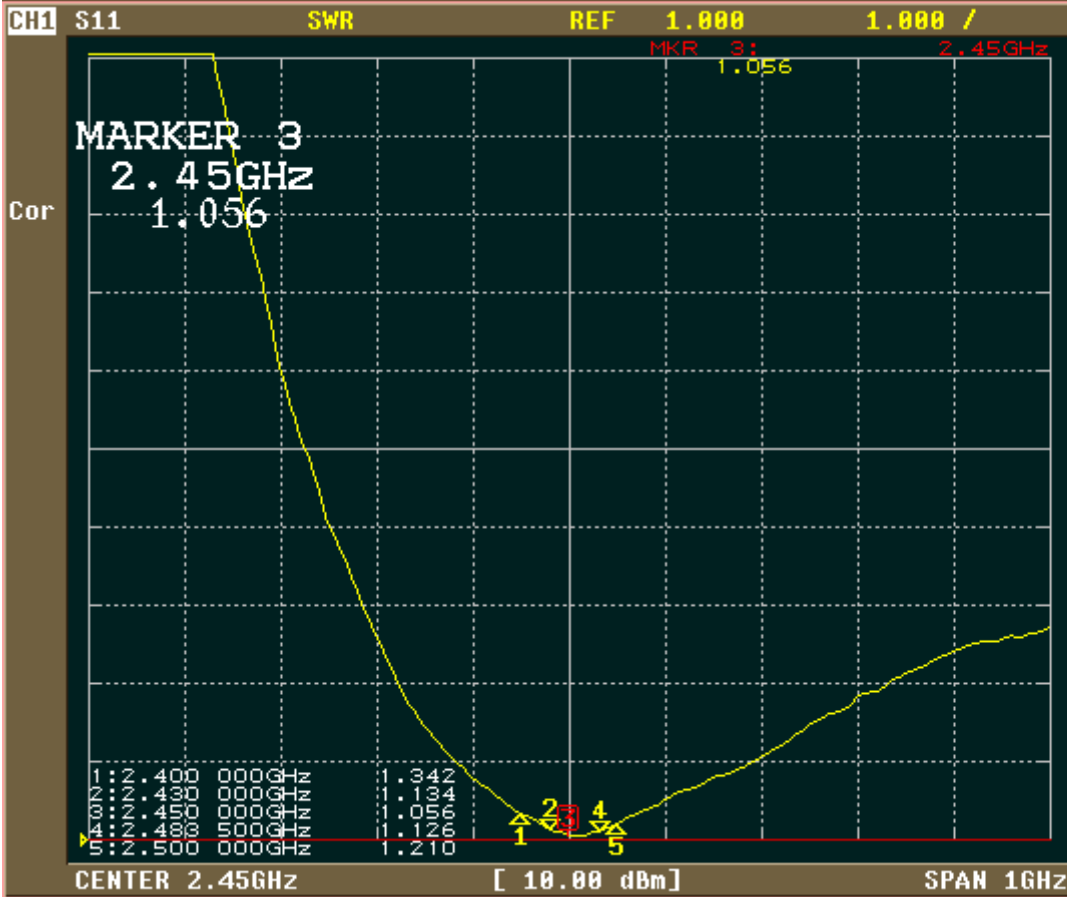


Log Magnitude



Smith Chart





BITMAP
FILE

SAVE TO
DISK

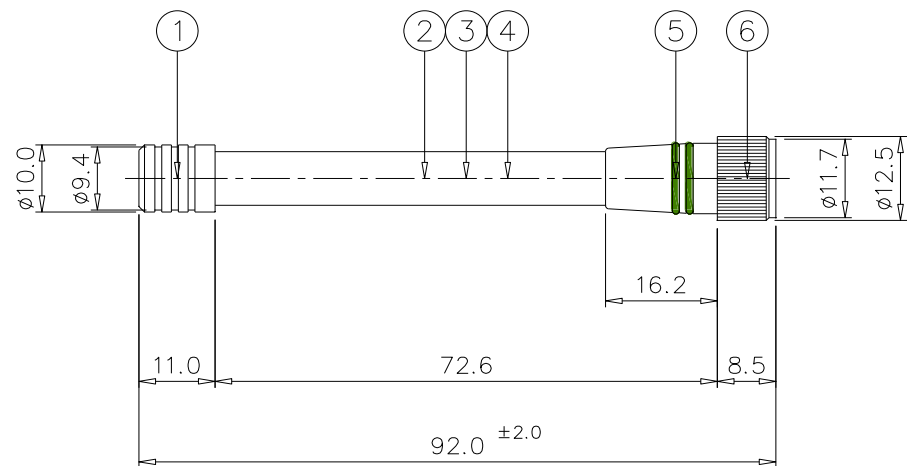
COMPRESSION

ON OFF

TRUNCATE

ON OFF

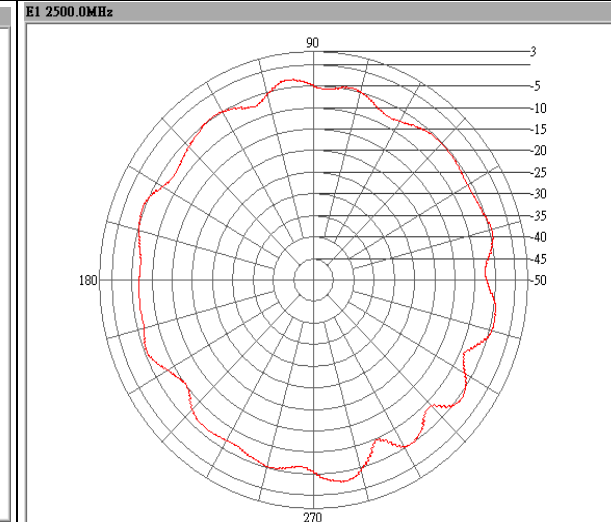
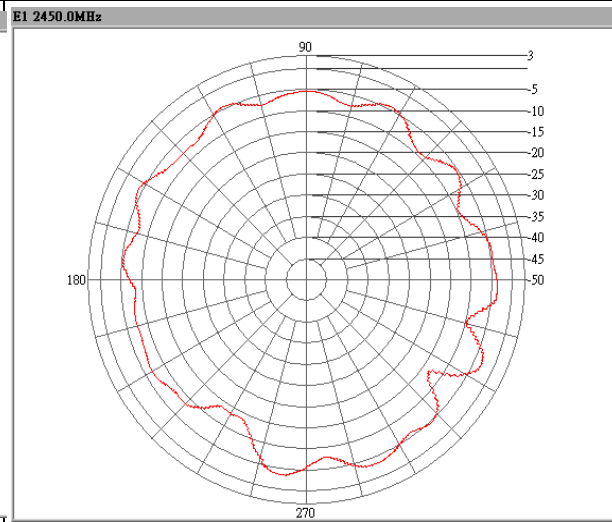
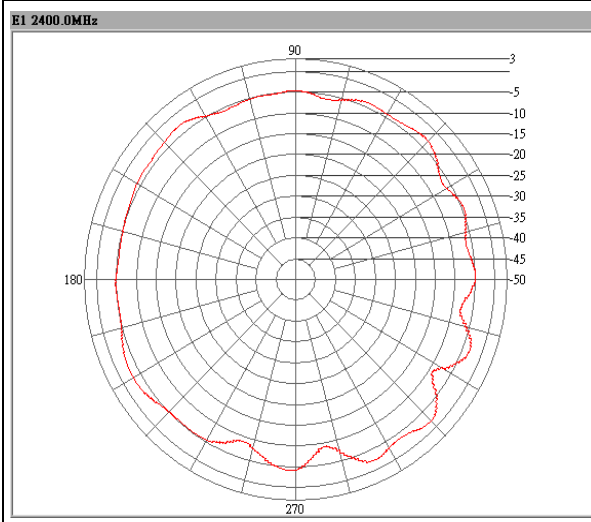
Return



No	Paets Name	Material	QTY	Finish	Tolerances	Third Angle	Date	Rev.A	Name	
6	SMA Male Reverse	Brass C3604	1	BCr#1B+Golden	~6 ^{+0.05}	Scale 1:1	HOW TSEN	HOW TSEN Intel. Electronics Metal Co., Ltd.		
5	O-Ring	Rubber	1	Green	7~30 ^{+0.10}	Unit:mm				
4	Brass Tube	BST	1	-	31~80 ^{+0.15}		Designed	Checked	Approved	Name
3	Cable	RG-316	1	Black	81~250 ^{+0.20}		Charles			WLAN Antenna
2	Tube	PU-98A	1	Black	251~500 ^{+0.25}					Model No.
1	CAP	ABS	1	Black					S-222	
No	Paets Name	Material	QTY	Finish	Tolerances	Third Angle	Date	Rev.A		

2D Pattern H plane

2400MHz		2450MHz		2500MHz	
H1		H1		H1	
Max Gain (dBi)	1.03	Max Gain (dBi)	1.98	Max Gain (dBi)	0.97
Max Gain@ Angle (degree)	315	Max Gain@ Angle (degree)	335	Max Gain@ Angle (degree)	279
Min Gain (dBi)	-9.3	Min Gain (dBi)	-13.7	Min Gain (dBi)	-10.24
Min Gain@ Angle (degree)	327	Min Gain@ Angle (degree)	245	Min Gain@ Angle (degree)	217
Average Gain (dBi)	-4.7	Average Gain (dBi)	-6.28	Average Gain (dBi)	-5.87
-3dB Angle L (degree)	321.7	-3dB Angle L (degree)	340.63	-3dB Angle L (degree)	286.97
-3db Angle R (degree)	288.38	-3db Angle R (degree)	329.27	-3db Angle R (degree)	269.52
HPB (degree)	33.32	HPB (degree)	11.36	HPB (degree)	17.44
FBR (dB)	1	FBR (dB)	0.99	FBR (dB)	0.5



2D pattern E Plane

2400MHz		2450MHz		2500MHz	
E1		E1		E1	
Max Gain (dBi)	1.98	Max Gain (dBi)	2.12	Max Gain (dBi)	1.59
Max Gain@ Angle (degree)	236	Max Gain@ Angle (degree)	238	Max Gain@ Angle (degree)	236
Min Gain (dBi)	-35.18	Min Gain (dBi)	-26.99	Min Gain (dBi)	-23.25
Min Gain@ Angle (degree)	82	Min Gain@ Angle (degree)	338	Min Gain@ Angle (degree)	87
Average Gain (dBi)	-4.75	Average Gain (dBi)	-4.52	Average Gain (dBi)	-5.37
-3dB Angle L (degree)	250.1	-3dB Angle L (degree)	251.97	-3dB Angle L (degree)	251.53
-3db Angle R (degree)	224.5	-3db Angle R (degree)	229.6	-3db Angle R (degree)	225.6
HPB (degree)	25.6	HPB (degree)	22.37	HPB (degree)	25.93
FBR (dB)	4.62	FBR (dB)	10.28	FBR (dB)	7.8

