

Part5. Antenna Spec Sheet**1. MSA-3610-2G4C1-A11 (Gray 220mm) MODEL****APPROVAL SHEET
(RoHS)**

CUSTOMER : _____

CUSTOMER'S PART NO. : _____

DESCRIPTION : **METAL STAMPING ANTENNA ASSEMBLY**

PART NO. : 3010000394ID

DATE : _____

AUTHORIZED BY : Marco Hsu

	FULLY APPROVED	PARTIALLY APPROVED	REJECTED
SIGN			
SUGGESTION			

光寶科技股份有限公司
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7.	Package	14

RF Antenna Assembly Specification

ELECTRICAL PROPERTIES

- 1.1 Frequency Range.....2.4GHz ~2.5GHz
- 1.2 Impedance.....50 Ohm Nominal
- 1.3 VSWR.....2 (Max)
- 1.4 Return Loss.....-10dB (Max)
- 1.5 Peak Gain.....2.76dBi
- 1.6 Polarization.....Linear Vertical
- 1.7 Admitted Power.....1W

PHYSICAL PROPERTIES

- 2.1 AntennaSUS430 鍍鎳
Material.....
- 2.2 Cable § 1.13 Cable (Gray)
- 2.3 Connector.....IPEX Compatible
- 2.4 Double Tape.....3M 9448
- 2.5 Pull Test $\geq 1.0\text{Kg}$
- 2.6 Operating Temp.....-40°C ~ +65°C
- 2.7 Storage Temp.....-40°C ~ +75°C

Mechanical Specification

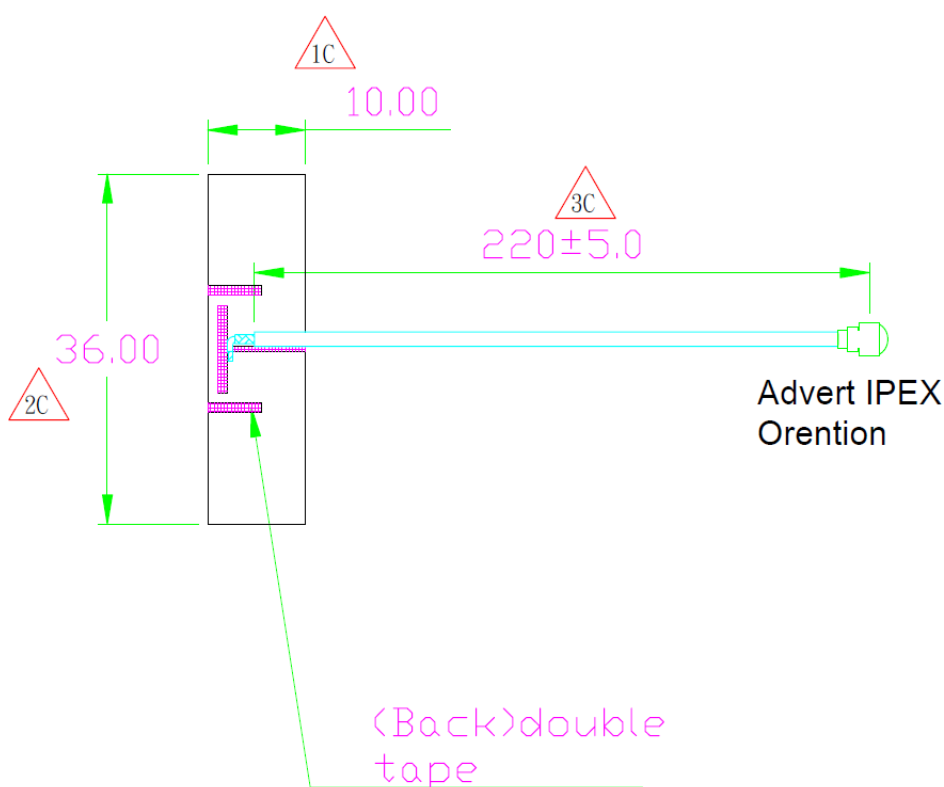
RoHS COMPLIANT

MECHANICAL

Body : SUS430(鍍鎳) T=0.3mm
Double Tape: 3M 9448 36*10mm

ELECTRICAL

Frequency : 2.4GHz
Cable : Coaxial Cable $\phi 1.13$ (Gray)
Connector: IPEX Compatible



(Package) 16pcs/Bag

△	New Release	11/28/12	Fchou
LTR	DESCRIPTION	DATE	REQ. BY

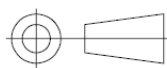
※凡標記△/C記號者, 為品管檢驗之尺寸

設計 DR.	核准 APPD.
Fchou	Marco
2011/06/28	2012/06/28
版本說明	REVISION NOTE

容許公差	TOLERANCE
.XXX	±0.20
.XX	±0.35
.X	±0.50
X	±1.00
ANG	±5

品名
ARTICLE
MSA-3610-2G4C1-A11

MAGLAYERS



單位 UNIT	比例 SCALE	張數 SHEET	版本 REV.
mm	****	1	A

Test Report

ELECTRICAL CHARACTERISTICS

P/NO: MSA-3610-2G4C1-A11

Spec: 2.4~2.5 GHz

S11



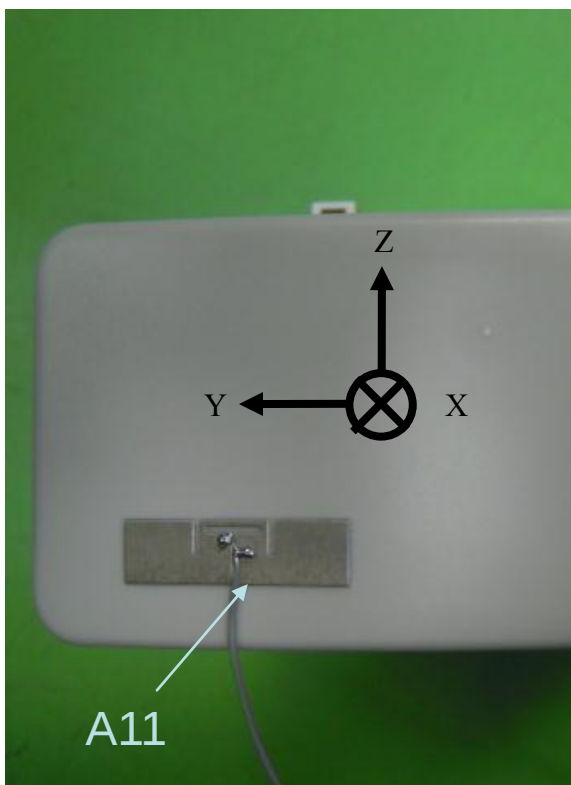
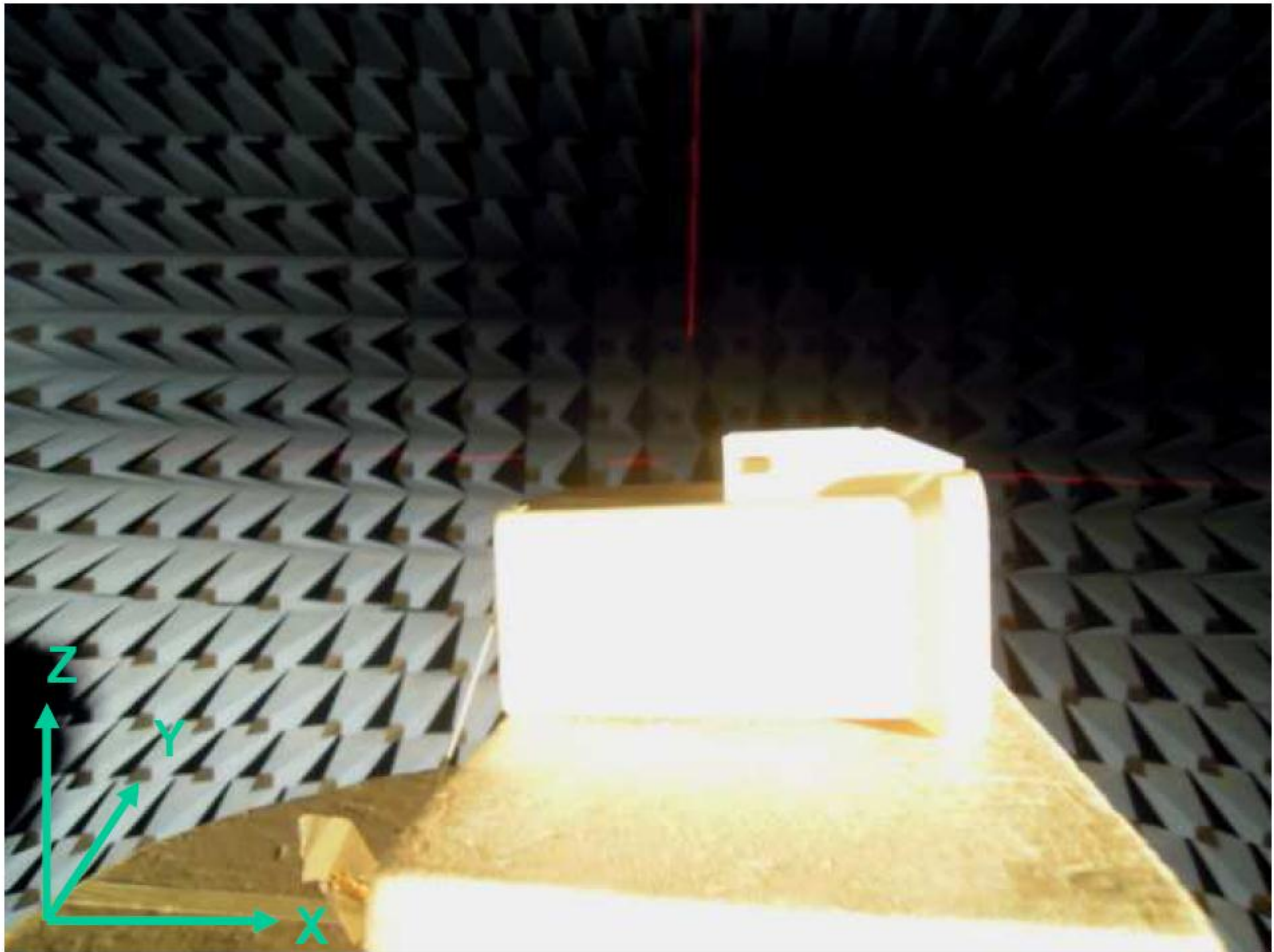
VSWR



S21

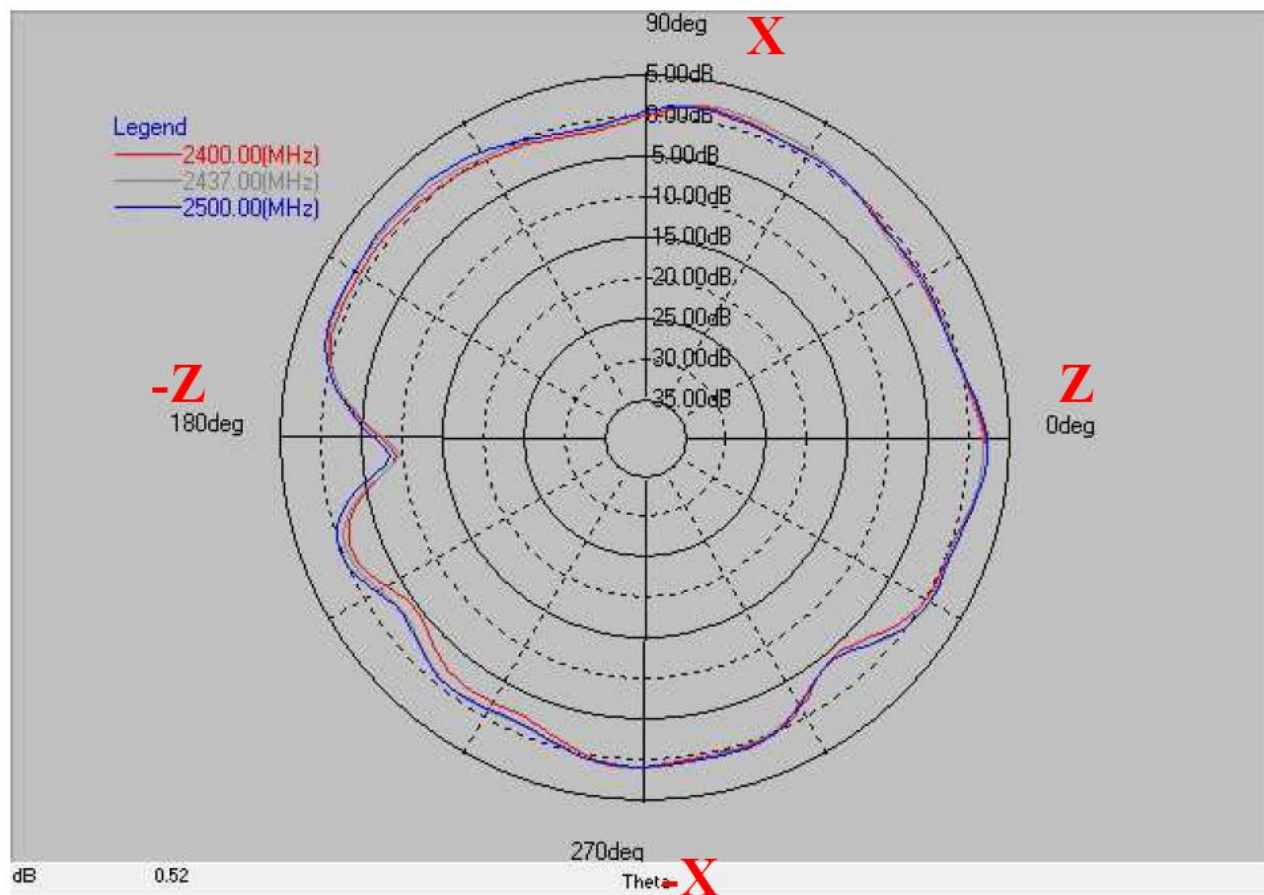


Experimental Setup



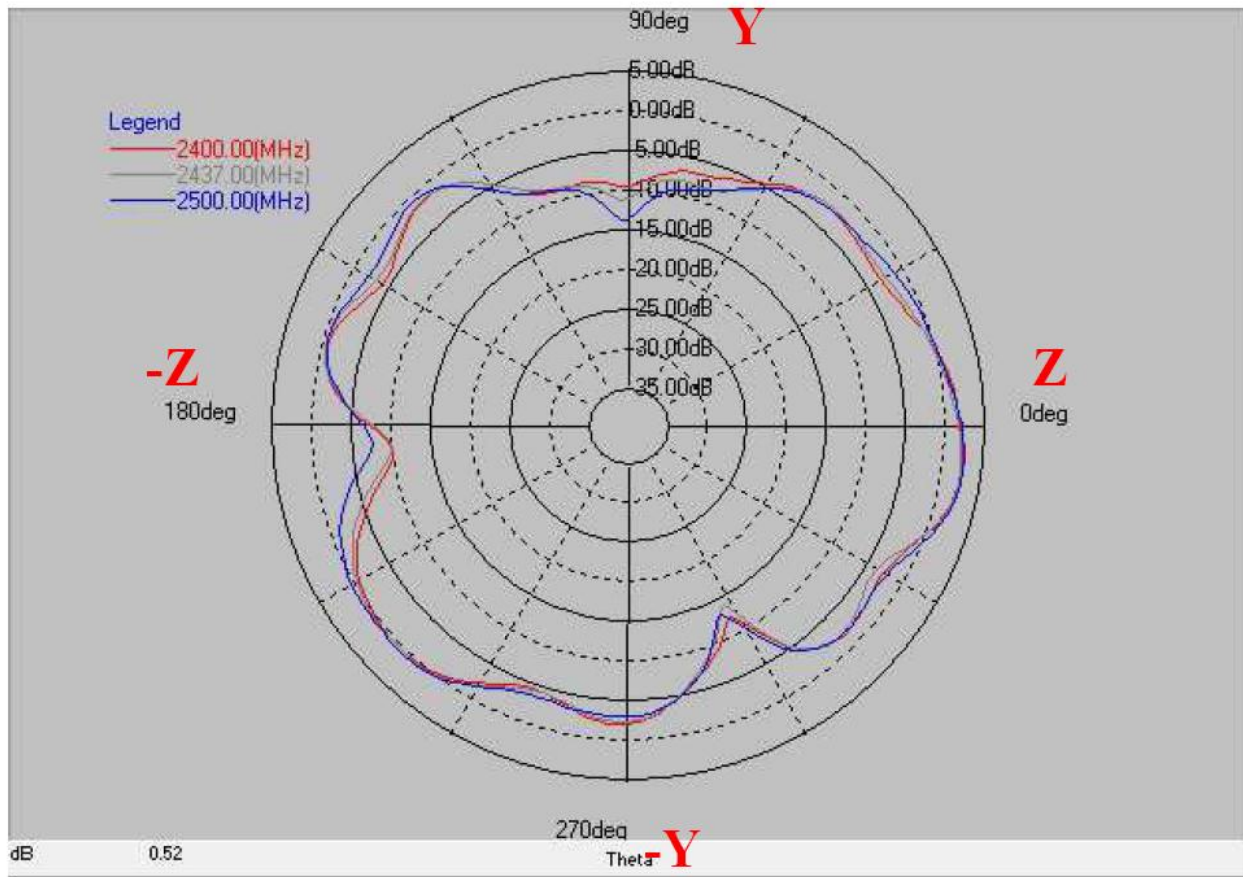
Radiation Pattern:

Frequency(MHz) : 2400~2500. X-Z Plane



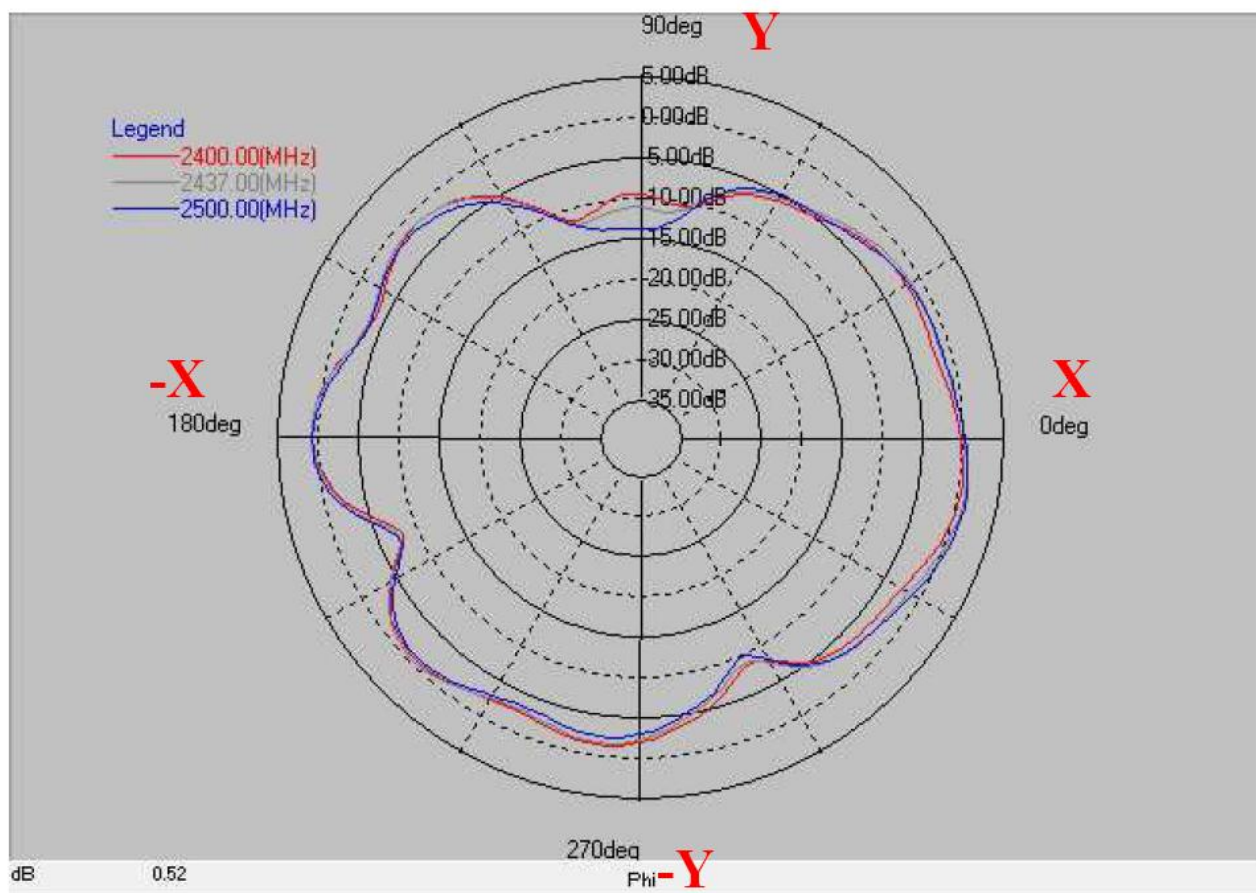
Layer	Max value	Min value	Average
2400(MHz)	2.30 dB	-9.27 dB	-0.56 dB
2437(MHz)	1.98 dB	-9.61 dB	-0.21 dB
2500(MHz)	2.34 dB	-8.35 dB	-0.08 dB

Frequency(MHz) : 2400~2500. Y-Z Plane



Layer	Max value	Min value	Average
2400(MHz)	2.50 dB	-12.44 dB	-2.51 dB
2437(MHz)	2.48 dB	-14.21 dB	-2.50 dB
2500(MHz)	2.76 dB	-13.99 dB	-2.10 dB

Frequency(MHz) : 2400~2500. X-Y Plane



Layer	Max value	Min value	Average
2400(MHz)	0.73 dB	-11.90 dB	-2.89 dB
2437(MHz)	0.87 dB	-12.42 dB	-2.62 dB
2500(MHz)	1.12 dB	-13.99 dB	-2.80 dB

Cable Specification

江阴神宇通信www.shenyucable.com

型号 Type	RF-1.13/50	料号 P/N	SY113/50-033(Gray)	
结构图 Structure drawing				
结构特性 Structure characteristics				
结构 Structure	项目 Item	标准值 Standard value		
①内导体 Inner conductor	材料 Material	镀银铜线 Silverplated copper wire		
	组成:总根数/单根外径(mm) Makeup:total / O.D. of every wire(mm)	7/0.083		
	(绞合)标称外径(mm) (Intertwist)NOM.O.D.(mm)	0.249±0.02		
②绝缘层 Insulation	材料 Material	聚全氟乙丙烯 FEP		
	颜色 Color	透明 Clarity		
	标称外径(mm) NOM.O.D.(mm)	0.7±0.02		
③外导体 Outer conductor	材料 Material	镀锡铜线 Tinned copper wire		
	组成:总根数/单根外径(mm) Makeup:total / O.D. of every wire(mm)	4/0.05		
	标称外径(mm) NOM.O.D.(mm)	0.92±0.05		
	覆盖率(%) Coverage ratio(%)	≥90		
④护套层 Jacket	材料 Material	聚全氟乙丙烯 FEP		
	颜色 Color	灰 Gray		
	标称外径(mm) NOM.O.D.(mm)	1.13±0.05		
电性能特性 Electrical characteristics				
项目 Item	标准值 Standard value	项目 Item	频率 Frequency	标准值 Standard value 单位 Unit:dB/m
电容(pF/m) Capacitance(pF/m)	98	衰减 Attenuation	1GHz	≤2.2
速率(%) Velocity(%)	70		2GHz	≤3.1
阻抗(Ω) Impedance(Ω)	50±2		3GHz	≤3.8
驻波比 Standing wave ratio	≤1.3@0~6GHz		4GHz	≤4.4
最大工作电压(V) Max.operating voltage(V)	1000		5GHz	≤4.9
最大工作频率(GHz) Max.operating frequency(GHz)	6		6GHz	≤5.4
机械性能特性 Mechanical characteristics				
项目 Item	单位 Unit	标准值 Standard value		
最小弯曲半径(一次) Min.bending radius static	mm	4		
最小弯曲半径(重复) Min.bending radius repeated	mm	—		
工作温度范围 Operating temperature	℃	-55~+200		

Salt Atmosphere test

美磊電子科技(昆山)有限公司 Experiment Report		Number	Date	Page
			2012.11.25	1/1
		Approved by	Checked by	Designed by
		何耀輝	李向陽	官麗媛
Experiment Name:	MSA-3610-2G4C1-A11 Salt Spray Test			
Experiment Goal:	Confirm that material quality after the salt spray experiment whether to have the rusty phenomenon			
Experiment Equipm	Salt Spray Test Machine			
Experiment Person	官麗媛			
Experiment Date:	2012.11.25			
Experiment Procedure	1.Take 2 pcs samples to make the salt spray test according to the below experimental condition:			
	Salt Spray Test Condition			
	Brine strength:5%		Experiment Temperature:35℃	
	Pressure barrel temperature:47℃		Experiment Time : 8H	
	2.After testing 8 hours, take out and check without rusty is OK (as below):			
				
	Before			
				
After				
Experiment Conclusion	After 8 hours salt spray experiment, the product does not have the outward appearance exceptionally and the rusty phenomenon, then determination is OK			

FORM NO : KEGR004-A

Pull Test

 美磊電子科技(昆山)有限公司 Experiment Report		Number	Date	Page																							
			2012.11.30	1/1																							
		Approved by	Checked by	Designed by																							
		何耀輝	李向陽	官麗媛																							
Experiment Name:	MSA-3610-2G4C1-A11 pulling force test																										
Experiment Goal:	Confirming the pulling force of IPEX																										
Experiment Equipm	Pulling Force Machine																										
Experiment Person	官麗媛																										
Experiment Date:	2012.11.30																										
Experiment Procedure:	1.Take 10 pcs after assembly to pulling force test, the step is as follow :																										
	   																										
	After Assembly Test Result																										
	2.Pulling force test data :																										
	Pulling force specification : $\geq 1\text{Kg}$ <table border="1"> <thead> <tr> <th>NO</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>Determined</th> </tr> </thead> <tbody> <tr> <td>Data</td> <td>1.72</td> <td>1.47</td> <td>1.46</td> <td>1.65</td> <td>1.42</td> <td>1.65</td> <td>1.74</td> <td>1.53</td> <td>1.56</td> <td>1.63</td> <td>OK</td> </tr> </tbody> </table>				NO	1	2	3	4	5	6	7	8	9	10	Determined	Data	1.72	1.47	1.46	1.65	1.42	1.65	1.74	1.53	1.56	1.63
NO	1	2	3	4	5	6	7	8	9	10	Determined																
Data	1.72	1.47	1.46	1.65	1.42	1.65	1.74	1.53	1.56	1.63	OK																
Experiment Conclusion:	Take 10 pcs after assembly to pulling force test , the pulling force data under the specification. The determination is OK.																										

2. MSA-3610-2G4C1-A12 (Gray 400mm) MODEL

APPROVAL SHEET (RoHS)

CUSTOMER : _____

CUSTOMER'S PART NO. : _____

DESCRIPTION : **METAL STAMPING ANTENNA ASSEMBLY**

PART NO. : 3010000395ID

DATE : _____

AUTHORIZED BY : Marco Hsu

	FULLY APPROVED	PARTIALLY APPROVED	REJECTED
SIGN			
SUGGESTION			

光寶科技股份有限公司
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 E-mail : <http://www.liteon.com>

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RF Antenna Assembly Specification

ELECTRICAL PROPERTIES

- 1.1 Frequency Range.....2.4GHz ~2.5GHz**
- 1.2 Impedance.....50 Ohm Nominal**
- 1.3 VSWR.....2 (Max)**
- 1.4 Return Loss.....-10dB (Max)**
- 1.5 Peak Gain.....2.69dBi**
- 1.6 Polarization.....Linear Vertical**
- 1.7 Admitted Power.....1W**

PHYSICAL PROPERTIES

- 2.1 Antenna Material.....SUS430 鍍鎳**
- 2.2 Cable § 1.13 Cable (Gray)**
- 2.3 Connector.....IPEX Compatible**
- 2.4 Double Tape.....3M 9448**
- 2.5 Pull Test ≥ 1.0Kg**
- 2.6 Operating Temp.....-40℃ ~ +65℃**
- 2.7 Storage Temp.....-40℃ ~ +75℃**

Mechanical Specification

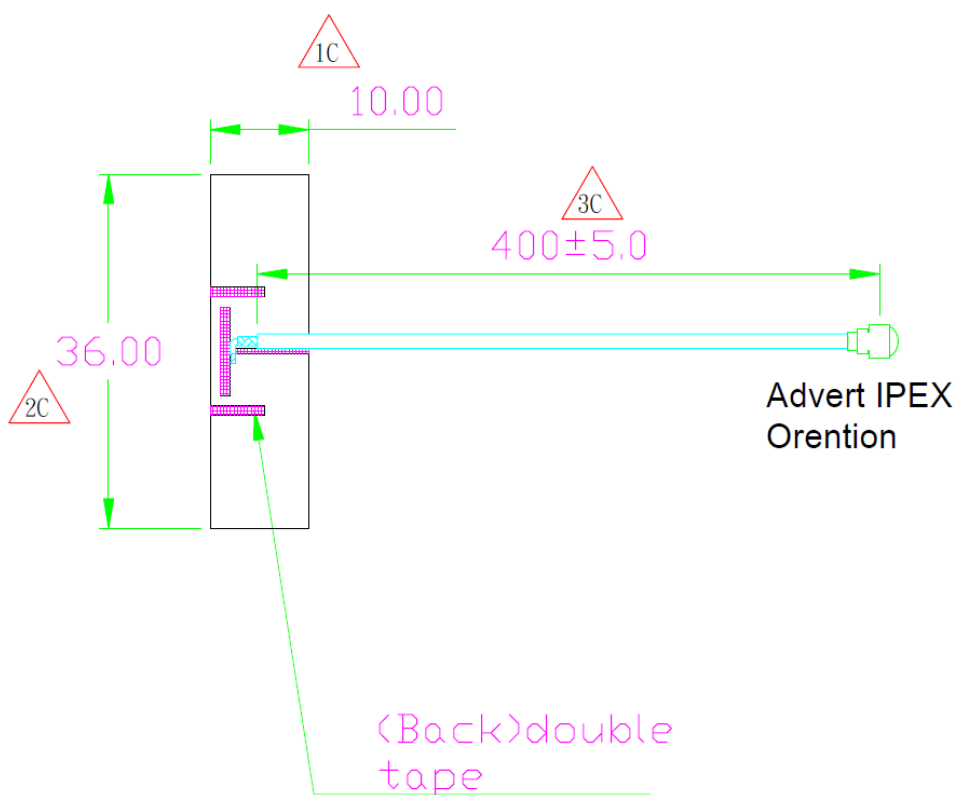
RoHS COMPLIANT

MECHANICAL

Body : SUS430(鍍鎳) T=0.3mm
Double Tape: 3M 9448 36*10mm

ELECTRICAL

Frequency : 2.4GHz
Cable : Coaxial Cable $\phi 1.13$ (Gray)
Connector: IPEX Compatible



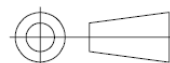
(Package) 16pcs/Bag

	New Release	11/28/12	Fchou
LTR	DESCRIPTION	DATE	REQ. BY
設計 DR.	核准 APPD.		
Fchou	Marco		
2011/06/28	2012/06/28		
版本說明	REVISION NOTE		
MAGLAYERS			

※凡標記 記號者, 為品管檢驗之尺寸

容許公差	TOLERANCE
.XXX	± 0.20
.XX	± 0.35
.X	± 0.50
X	± 1.00
ANG	± 5

品名
ARTICLE
MSA-3610-2G4C1-A12



單位 UNIT	比例 SCALE	張數 SHEET	版本 REV.
mm	****	1	A

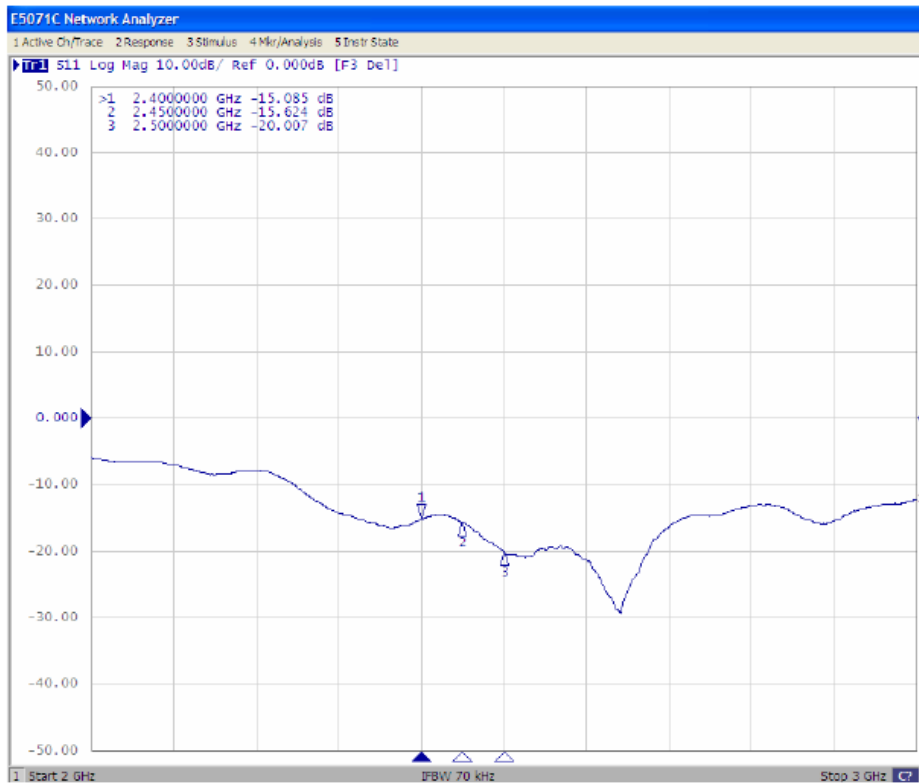
Test Report

ELECTRICAL CHARACTERISTICS

P/NO: MSA-3610-2G4C1-A12

Spec: 2.4~2.5 GHz

S11



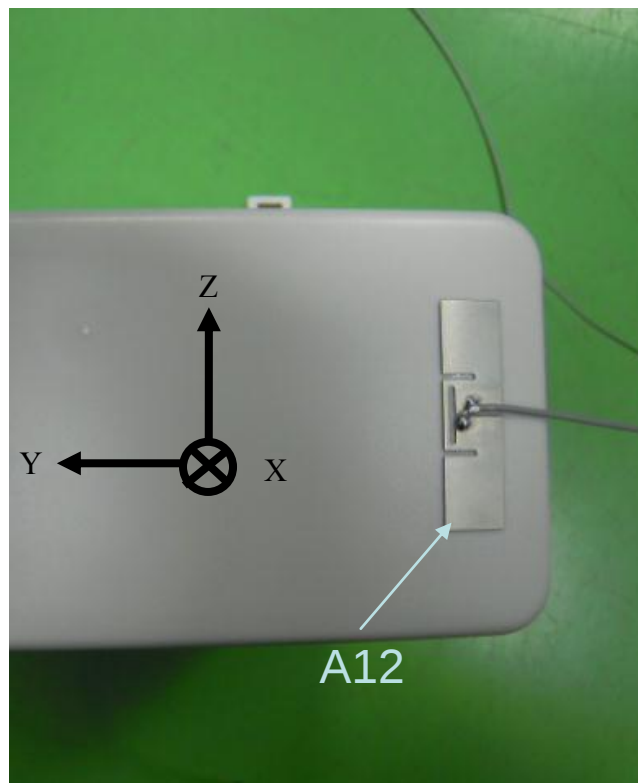
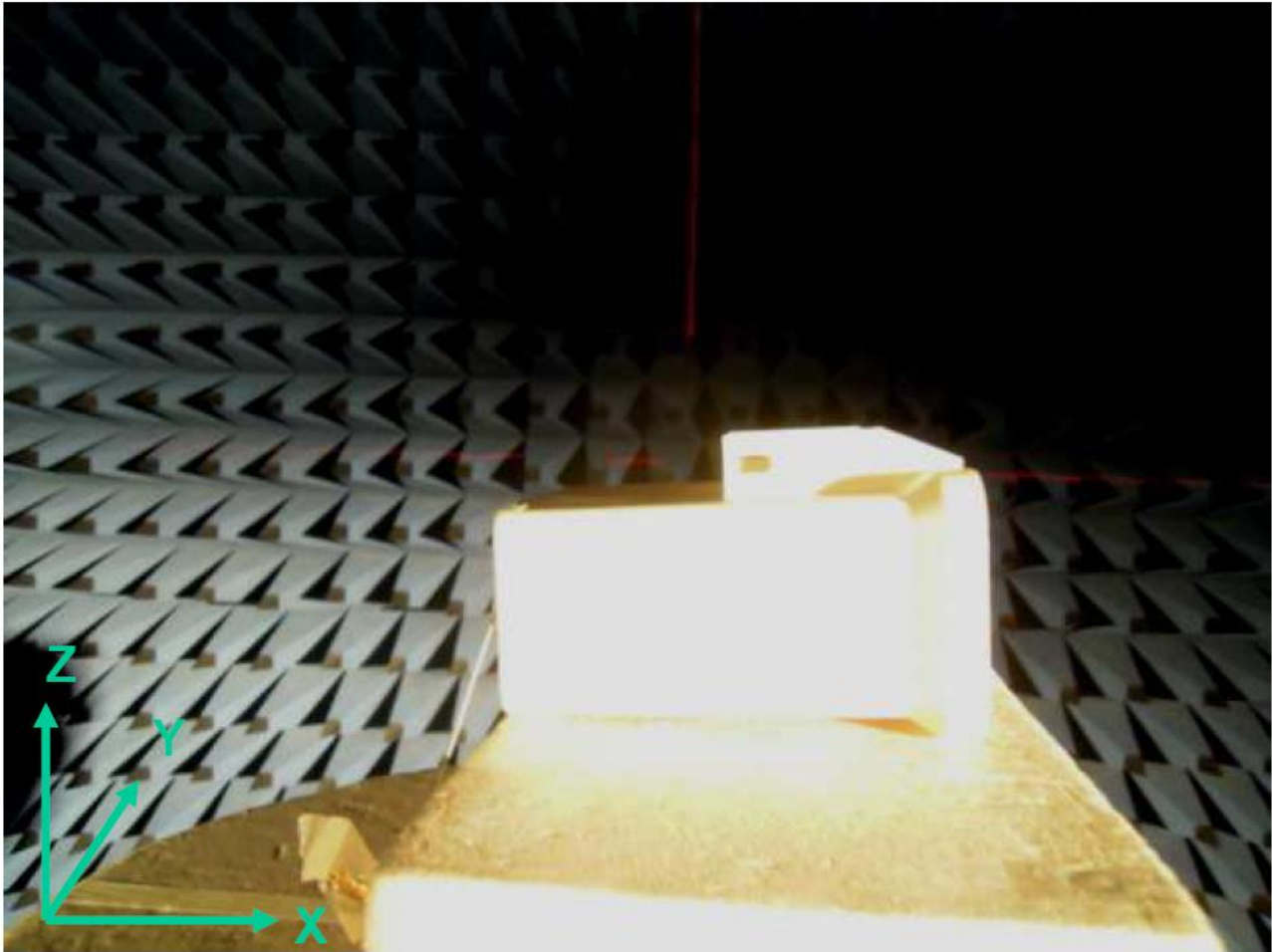
VSWR



S21

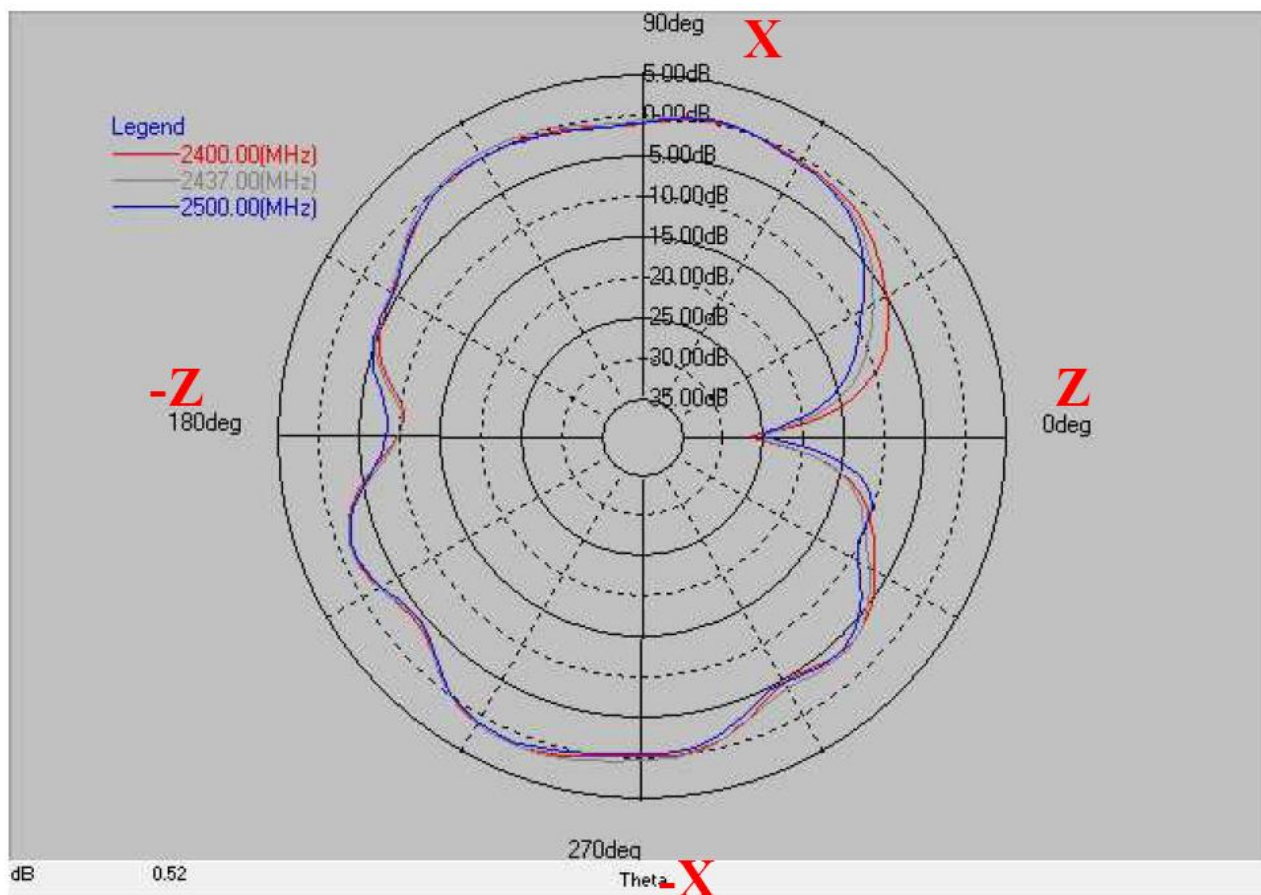


Experimental Setup



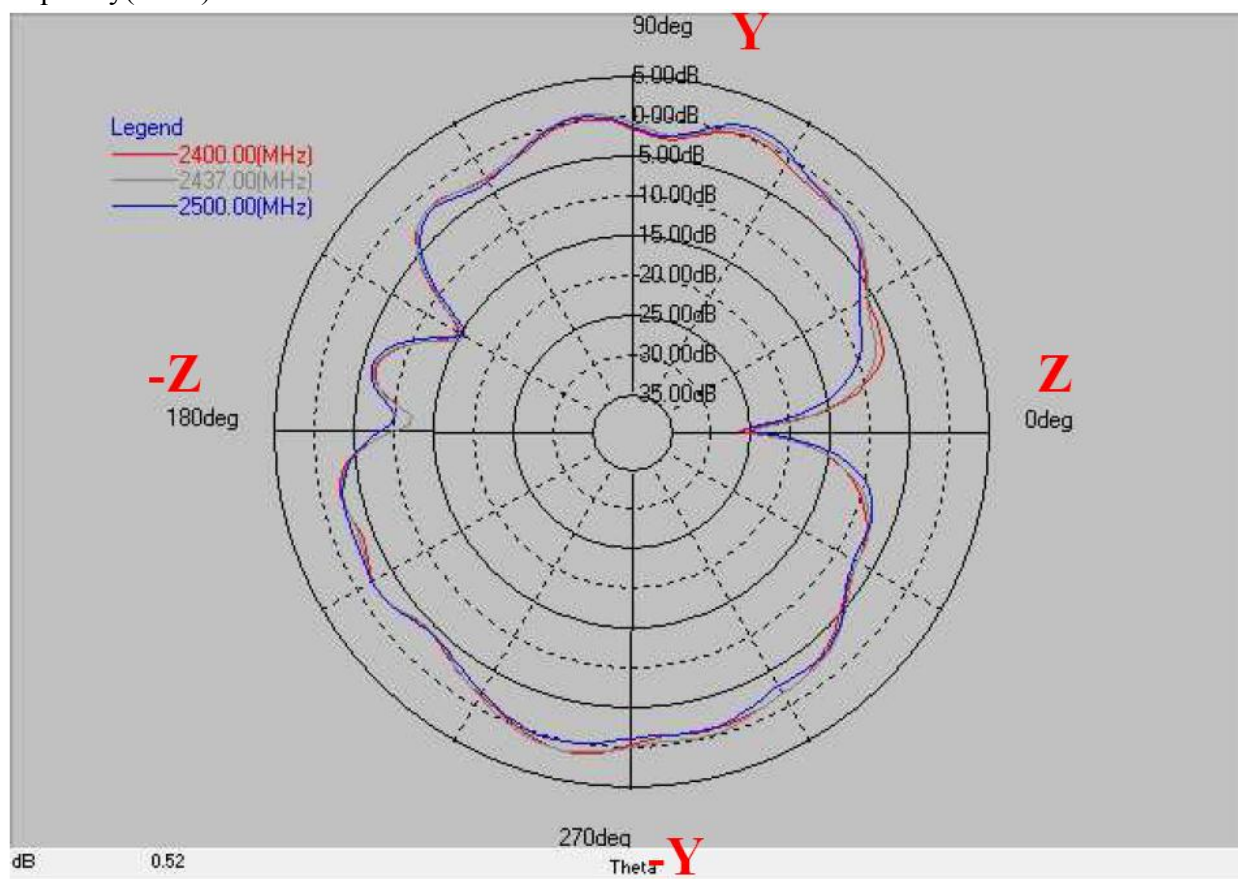
Radiation Pattern:

Frequency(MHz) : 2400~2500. X-Z Plane



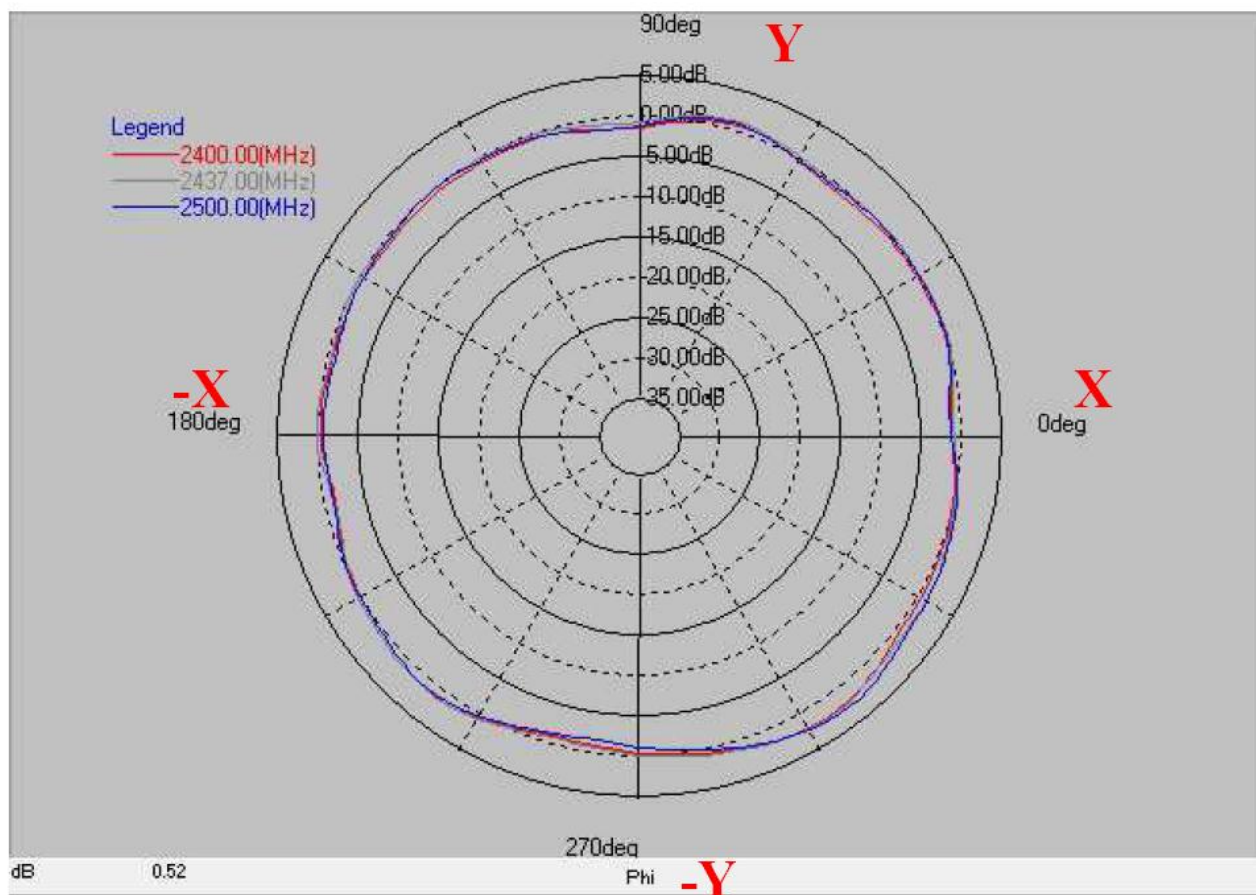
Layer	Max value	Min value	Average
2400(MHz)	1.32 dB	-26.24 dB	-2.45 dB
2437(MHz)	1.36 dB	-25.17 dB	-2.33 dB
2500(MHz)	1.01 dB	-25.01 dB	-2.71 dB

Frequency(MHz) : 2400~2500. Y-Z Plane



Layer	Max value	Min value	Average
2400(MHz)	1.10 dB	-26.24 dB	-3.02 dB
2437(MHz)	1.10 dB	-25.17 dB	-2.74 dB
2500(MHz)	1.32 dB	-25.01 dB	-3.08 dB

Frequency(MHz) : 2400~2500. X-Y Plane



Layer	Max value	Min value	Average
2400(MHz)	2.14 dB	-1.71 dB	-0.11 dB
2437(MHz)	2.23 dB	-1.21 dB	0.25 dB
2500(MHz)	2.69 dB	-1.78 dB	0.04 dB

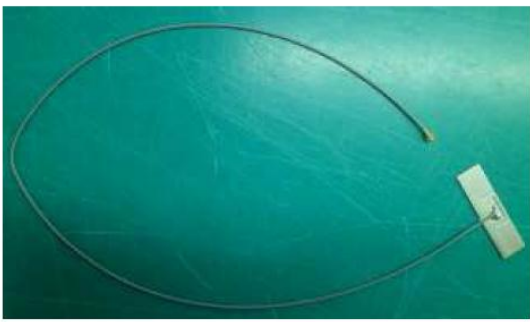
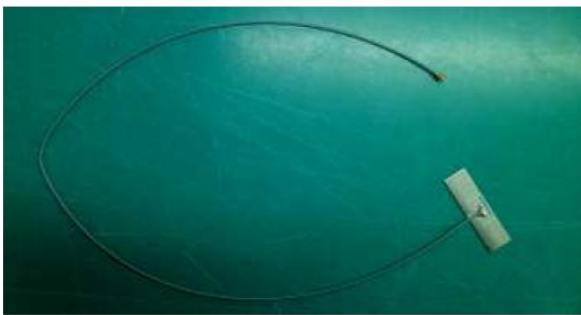
Cable Specification

江阴神宇通信www.shenyucable.com

型号 Type	RF-1.13/50	料号 P/N	SY113/50-033(Gray)	
结构图 Structure drawing				
结构特性 Structure characteristics				
结构 Structure	项目 Item	标准值 Standard value		
①内导体 Inner conductor	材料 Material	镀银铜线 Silverplated copper wire		
	组成:总根数/单根外径(mm) Makeup:total / O.D. of every wire(mm)	7/0.083		
	(绞合)标称外径(mm) (Intertwist)NOM.O.D.(mm)	0.249±0.02		
②绝缘层 Insulation	材料 Material	聚全氟乙丙烯 FEP		
	颜色 Color	透明 Clarity		
	标称外径(mm) NOM.O.D.(mm)	0.7±0.02		
③外导体 Outer conductor	材料 Material	镀锡铜线 Tinned copper wire		
	组成:总根数/单根外径(mm) Makeup:total / O.D. of every wire(mm)	4/0.05		
	标称外径(mm) NOM.O.D.(mm)	0.92±0.05		
	覆盖率(%) Coverage ratio(%)	≥90		
④护套层 Jacket	材料 Material	聚全氟乙丙烯 FEP		
	颜色 Color	灰 Gray		
	标称外径(mm) NOM.O.D.(mm)	1.13±0.05		
电性能特性 Electrical characteristics				
项目 Item	标准值 Standard value	项目 Item	频率 Frequency	标准值 Standard value 单位 Unit:dB/m
电容(pF/m) Capacitance(pF/m)	98	衰减 Attenuation	1GHz	≤2.2
速率(%) Velocity(%)	70		2GHz	≤3.1
阻抗(Ω) Impedance(Ω)	50±2		3GHz	≤3.8
驻波比 Standing wave ratio	≤1.3@0~6GHz		4GHz	≤4.4
最大工作电压(V) Max.operating voltage(V)	1000		5GHz	≤4.9
最大工作频率(GHz) Max.operating frequency(GHz)	6		6GHz	≤5.4
机械性能特性 Mechanical characteristics				
项目 Item	单位 Unit	标准值 Standard value		
最小弯曲半径(一次) Min.bending radius static	mm	4		
最小弯曲半径(重复) Min.bending radius repeated	mm	—		
工作温度范围 Operating temperature	℃	-55~+200		

Salt Atmosphere test

 美磊電子科技(昆山)有限公司 Experiment Report	Number	Date	Page
		2012.11.25	1/1
	Approved by	Checked by	Designed by
	何耀輝	李向陽	官麗媛

Experiment Name:	MSA-3610-2G4C1-A12 Salt Spray Test		
Experiment Goal:	Confirm that material quality after the salt spray experiment whether to have the rusty phenomenon		
Experiment Equipm	Salt Spray Test Machine		
Experiment Person	官麗媛		
Experiment Date:	2012.11.25		
Experiment Procedure	1.Take 2 pcs samples to make the salt spray test according to the below experimental condition:		
	Salt Spray Test Condition		
	Brine strength:5%	Experiment Temperature:35°C	
	Pressure barrel temperature:47°C	Experiment Time : 8H	
	2.After testing 8 hours, take out and check without rusty is OK (as below):		
			
	Before		
			
	After		
	Experiment Conclusion	After 8 hours salt spray experiment, the product does not have the outward appearance exceptionally and the rusty phenomenon, then determination is OK	

Pull Test

美磊電子科技(昆山)有限公司 Experiment Report		Number	Date	Page							
			2012.11.30	1/1							
		Approved by	Checked by	Designed by							
		何耀輝	李向陽	官麗媛							
Experiment Name:	MSA-3610-2G4C1-A12 pulling force test										
Experiment Goal:	Confirming the pulling force of IPEX										
Experiment Equipm	Pulling Force Machine										
Experiment Person	官麗媛										
Experiment Date:	2012.11.30										
Experiment Procedure:	1.Take 10 pcs after assembly to pulling force test, the step is as follow :										
	 After Assembly		 								
	 Test Result										
	2.Pulling force test data :										
	Pulling force specification : $\geq 1\text{Kg}$										
NO	1	2	3	4	5	6	7	8	9	10	Determined
Data	1.63	1.47	1.46	1.65	1.42	1.65	1.74	1.53	1.56	1.63	OK
Experiment Conclusion:	Take 10 pcs after assembly to pulling force test , the pulling force data under the specification. The determination is OK.										

FORM NO : KEGR004-A