



權億科技股份有限公司
Master Wave Technology Co., Ltd.

承認書 APPROVAL SHEET

Customers: 啟碁科技股份有限公司

Customer Model No.:

Master Wave Model No.: 98151MRSX004-220

Product Description: 8151 Replacement Ant.

Issue Date: 2009/2/10

REV.: 00

客戶承認用印 Customer Approved	權億承認用印 Confirmation Signature	
		
核准 Approve	主管 Chief	承辦 Responsible
Hero	Hero	S. Y. Liu

中壢：桃園縣中壢市南園二路1巷20號2樓

電話：03-451-9540

FAX：03-451-9542

東莞廠：廣東省東莞市常平鎮木輪工業區

蘇州廠：江蘇省蘇州市角直鎮吳淞南路95號

Antenna Total Solution Provider



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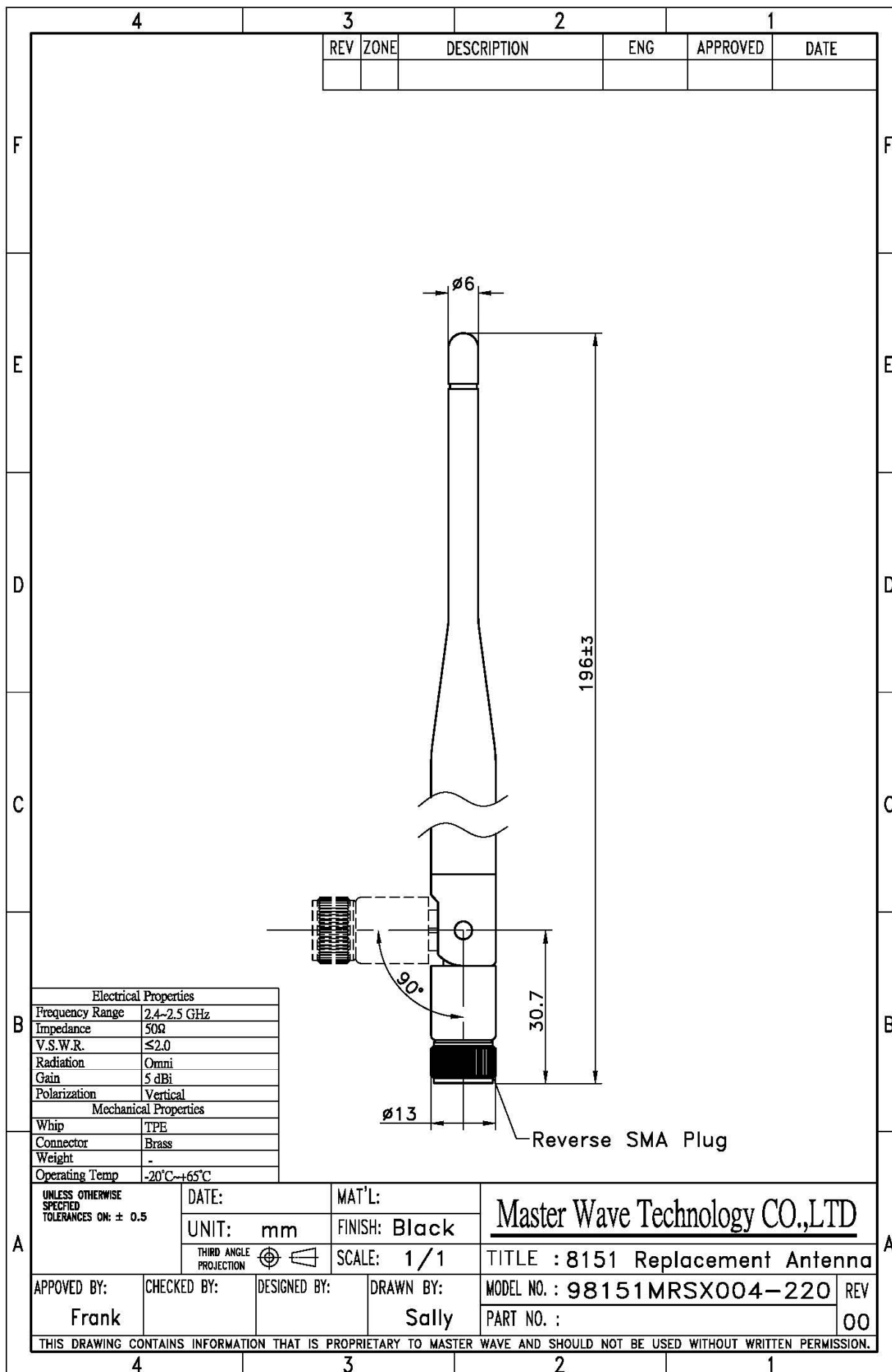
- Connector
-

4. Packing

- PE Bag
- Carton

Modification History:

REV.	Date	Content
00	2009/2/10	





Electrical Properties

Type	Replacement Antenna
Frequency range	2.4~2.5 GHz
Impedance	50 Ohms
VSWR	≤ 2.0

Mechanical Properties

Material	TPE
Connector	Reverse SMA Plug
Dimension(L*W*H)	196* $\varnothing$ 13.0



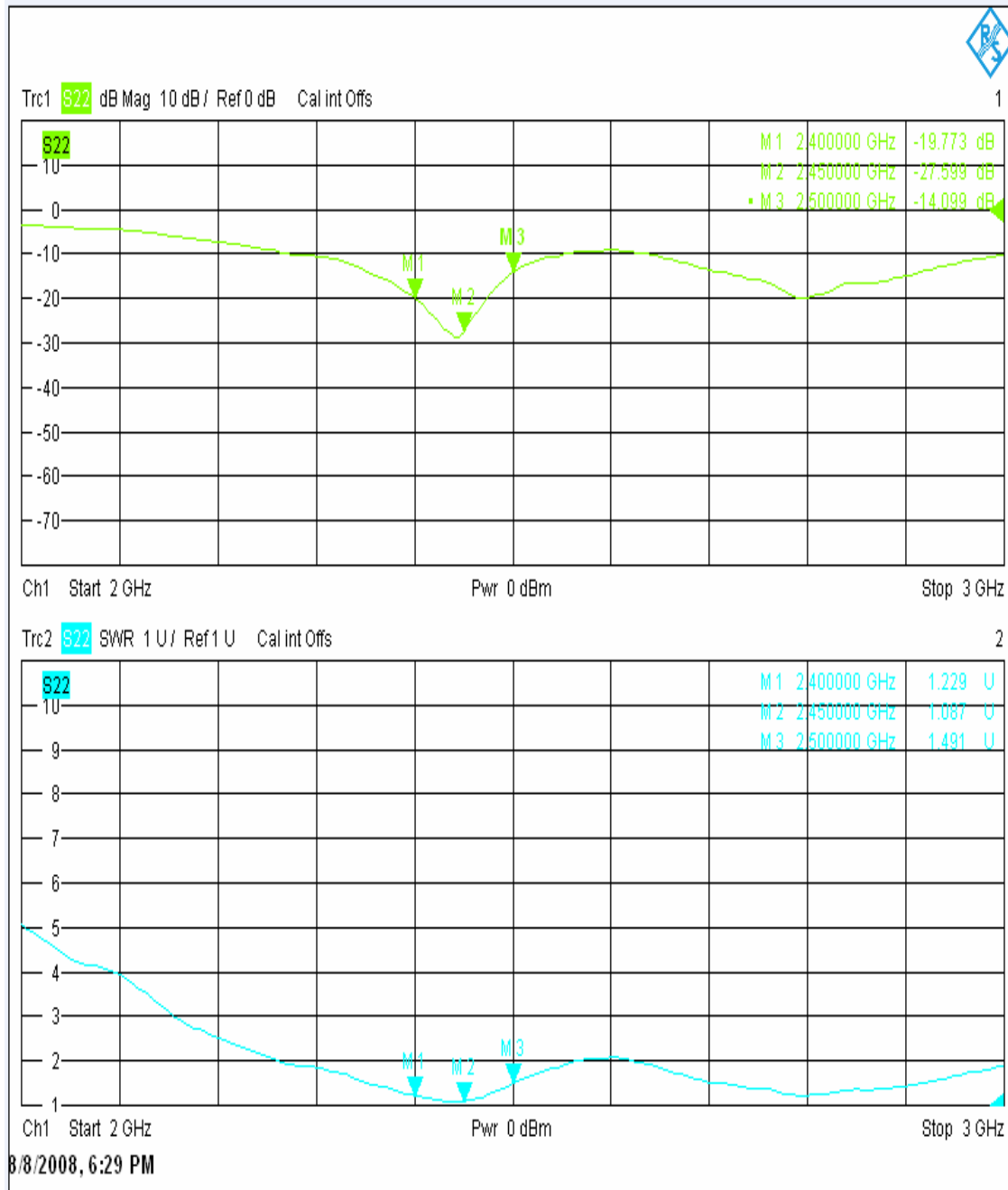
Connector

SMA

Electrical Properties	Impedance	50 ohm
	Frequency Range	0~6 GHz
	V.S.W.R	≤ 1.5
	Working Voltage	$\leq 250V_{rms}$
	Dielectric Withstanding	$\leq 670 V_{rms}$
	Voltage Insulation Resistance	≥ 2000 Megohms
	Contact Resistance	Center contact: 3.0 Milliohms (Max.) Outer contact: 2.0 Milliohms (Max.)
	Recommended coupling nut torque	4.0 in. lbs. ~ 8.8in. lbs.
	Coupling nut retention force	≥ 50 lbs.
	Contact captivation axial	≥ 5 lbs.
	Durability (mating)	≥ 500 cycles
Environmental Ratings	Operating Temperature	-65°C ~ +165°C
	Thermal shock	MIL-STD-202,METHOD 107,Condition B
	Corrosion	MIL-STD-202,METHOD 101,Condition B
	Shock	MIL-STD-202,METHOD 213,Condition I
	Vibration	MIL-STD-202,METHOD 204,Condition D
	Moisture Resistance	MIL-STD-202,METHOD 106
Material Specifications	Material Data	Material
	Body	Brass
	Center Contact	Phosphor Bronze
	Insulator	Teflon or Delrin

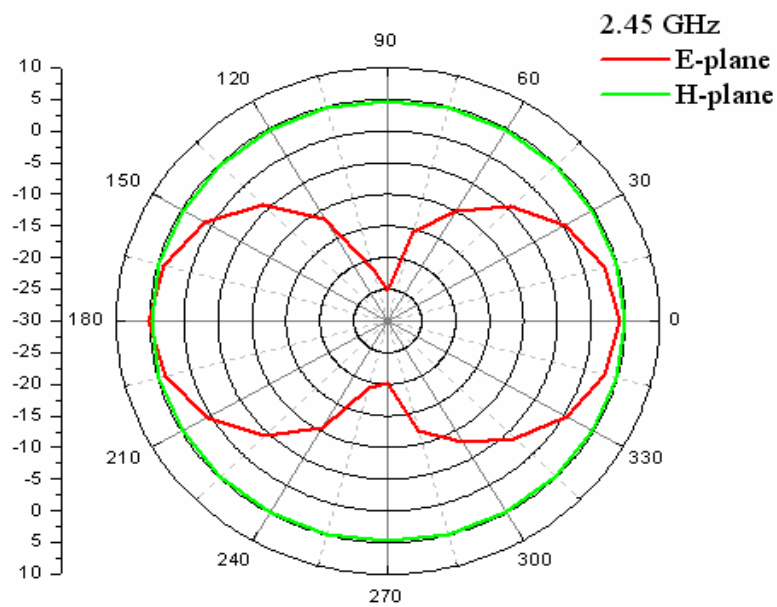
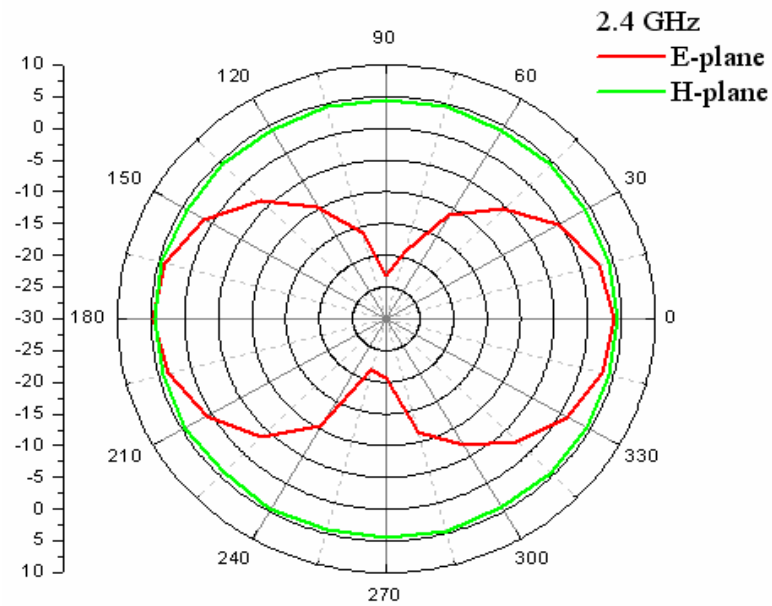


Electrical Test



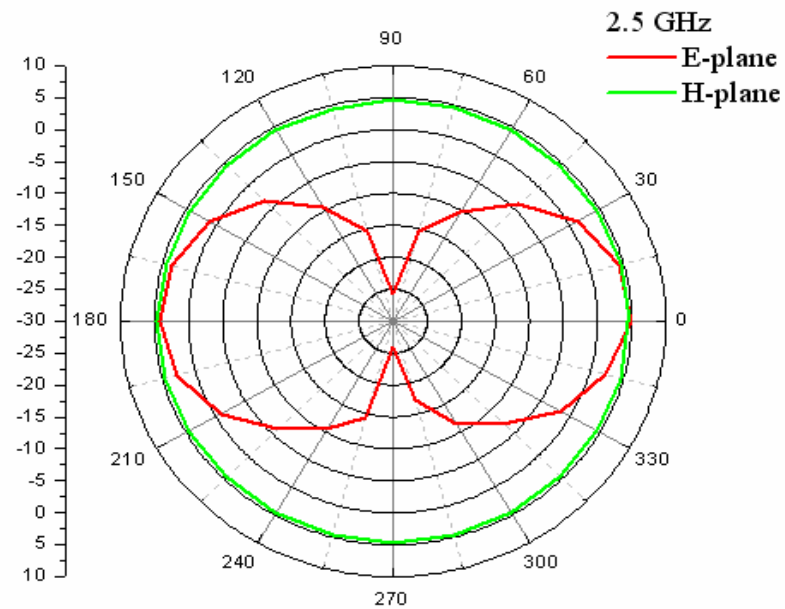


Pattern Test





Pattern Test





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承認書 APPROVAL SHEET

Customers: 啟碁科技股份有限公司

Customer Model No.:

Master Wave Model No.: 98620ZRSX000-220

Product Description: 8620 Replacement Ant.

Issue Date: 2009/2/12

REV.: 00

客戶承認用印 Customer Approved	權億承認用印 Confirmation Signature	
		
核准 Approve	主管 Chief	承辦 Responsible
Hero	Hero	S. Y. Liu

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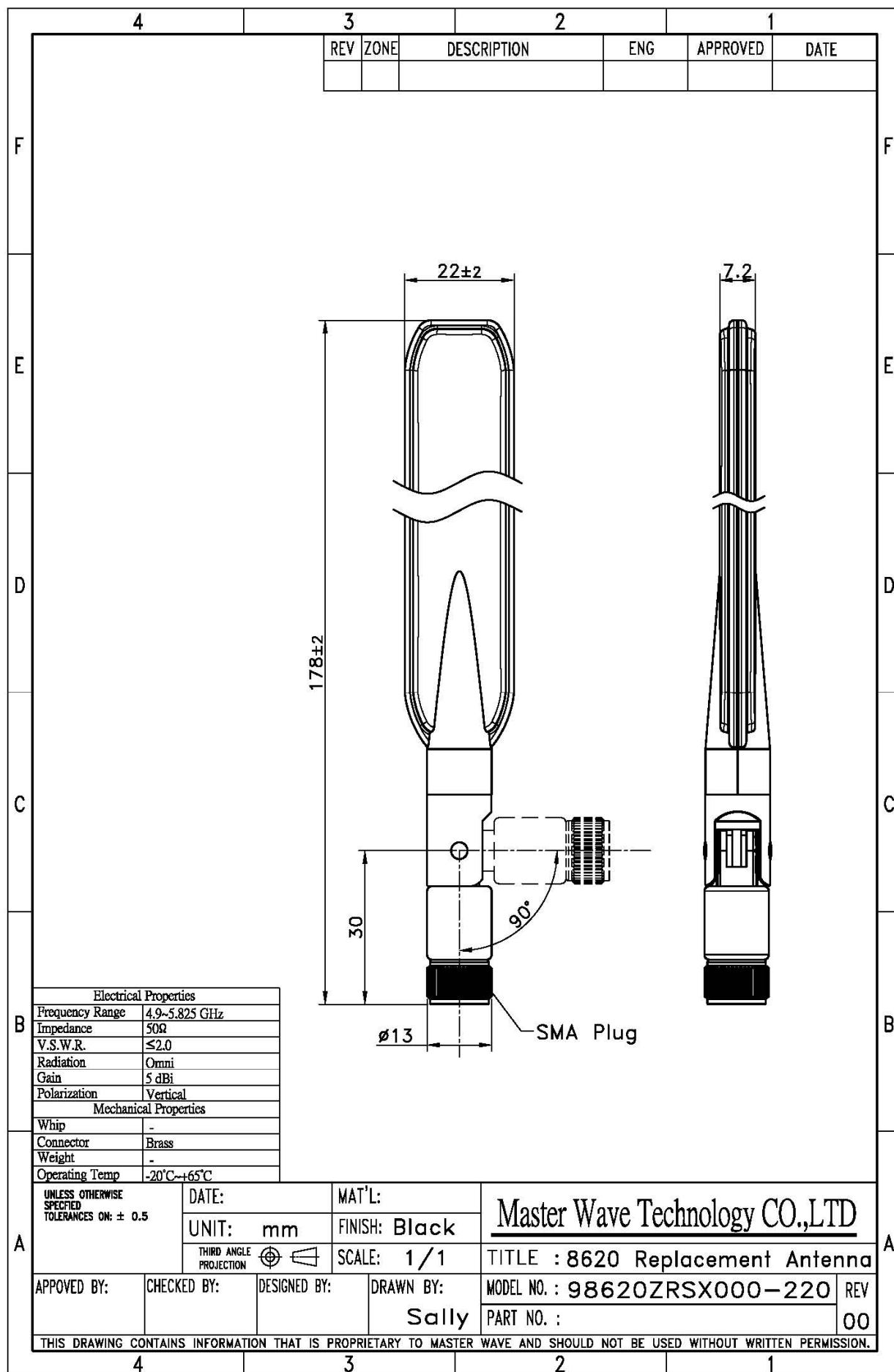
-Drawing

2. Material Certifications

-Connector

Modification History:

REV.	Date	Content
00	2009/2/12	





Connector

SMA

Electrical Properties	Impedance	50 ohm
	Frequency Range	0~6 GHz
	V.S.W.R	≤ 1.5
	Working Voltage	$\leq 250V_{rms}$
	Dielectric Withstanding	$\leq 670 V_{rms}$
	Voltage Insulation Resistance	≥ 2000 Megohms
	Contact Resistance	Center contact: 3.0 Milliohms (Max.) Outer contact: 2.0 Milliohms (Max.)
	Recommended coupling nut torque	4.0 in. lbs. ~ 8.8in. lbs.
	Coupling nut retention force	≥ 50 lbs.
	Contact captivation axial	≥ 5 lbs.
	Durability (mating)	≥ 500 cycles
Environmental Ratings	Operating Temperature	-65°C ~ +165°C
	Thermal shock	MIL-STD-202,METHOD 107,Condition B
	Corrosion	MIL-STD-202,METHOD 101,Condition B
	Shock	MIL-STD-202,METHOD 213,Condition I
	Vibration	MIL-STD-202,METHOD 204,Condition D
	Moisture Resistance	MIL-STD-202,METHOD 106
Material Specifications	Material Data	Material
	Body	Brass
	Center Contact	Brass
	Insulator	Teflon or Delrin

AO-024-MIMO-8

MIMO Omni Antenna

Technical Sheet



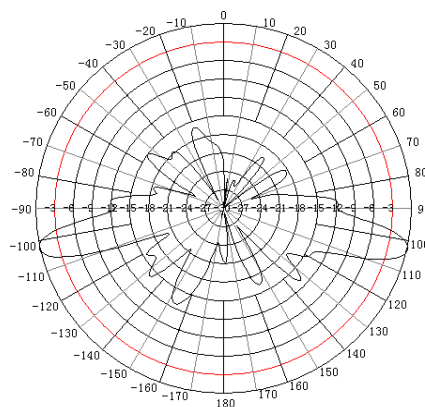
Applications

- 2.4GHz Wlan,Wi-Fi system
- IEEE802.11b,g,n
- three 2.4GHz ports

Features

- high Gain, Low VSWR
- Small Size, Light weight
- Sealed with Fiberglass

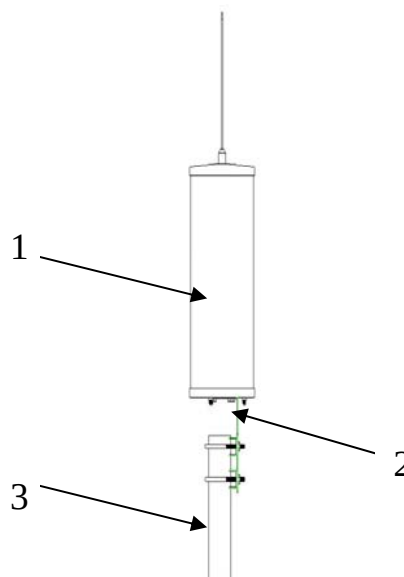
Typical E-Plane Field Pattern



Specifications

Model	AO-024-MIMO-8
Freq. Range-MHz	2400~2500
Bandwidth-MHz	100
Gain-dBi	9
Beamwidth-°	E:10 H:360
Electrical Downtilt-°	10
Isolation-dB	≥25
VSWR	≤1.5
Impedance-Ω	50
Polarization	Vertical
Max. Power-W	20
Connector Type	N Female
Dimensions-mm	Φ145×600
Weight-Kg	2
Pole Diameter-mm	φ40~φ70

Install Sketch



1. Antenna
2. "L" type bracket
3. Mast supplied by customer

AP20-050-MIMO-19

MIMO Directional Antenna

Technical Sheet

Specifications

Model	AP20-050-MIMO-19
Freq.Range-MHz	5125-6100
Bandwidth-MHz	975
Gain-dBi	19(Vertical)
	16(dual slant)
Hor.Beamwidth-°	22(Vertical)
	20(dual slant)
Ver.Beamwidth-°	14(Vertical)
	19(dual slant)
VSWR	≤1.8
Isolation-dB	≥25
F/B Ratio-dB	≥25
Max.power-W	10
Impedance-Ω	50
Polarization	±45° and vertical
Connector	3×N-type female
Dimensions-mm	305×305×12
Weight-Kg	0.8(without clamps)
Mounting	pole

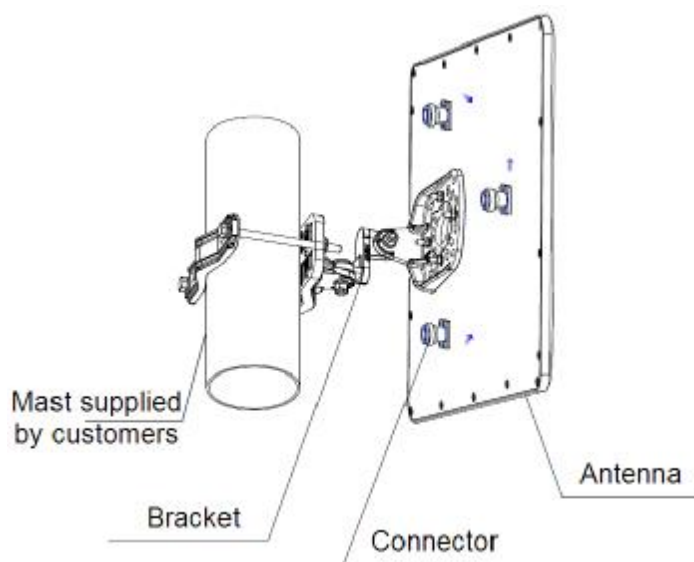
Applications

- ┆ 5.8GHz WLAN system
- ┆ 5.8GHz UNII/ISM system
- ┆ Point to point or point to multipoint

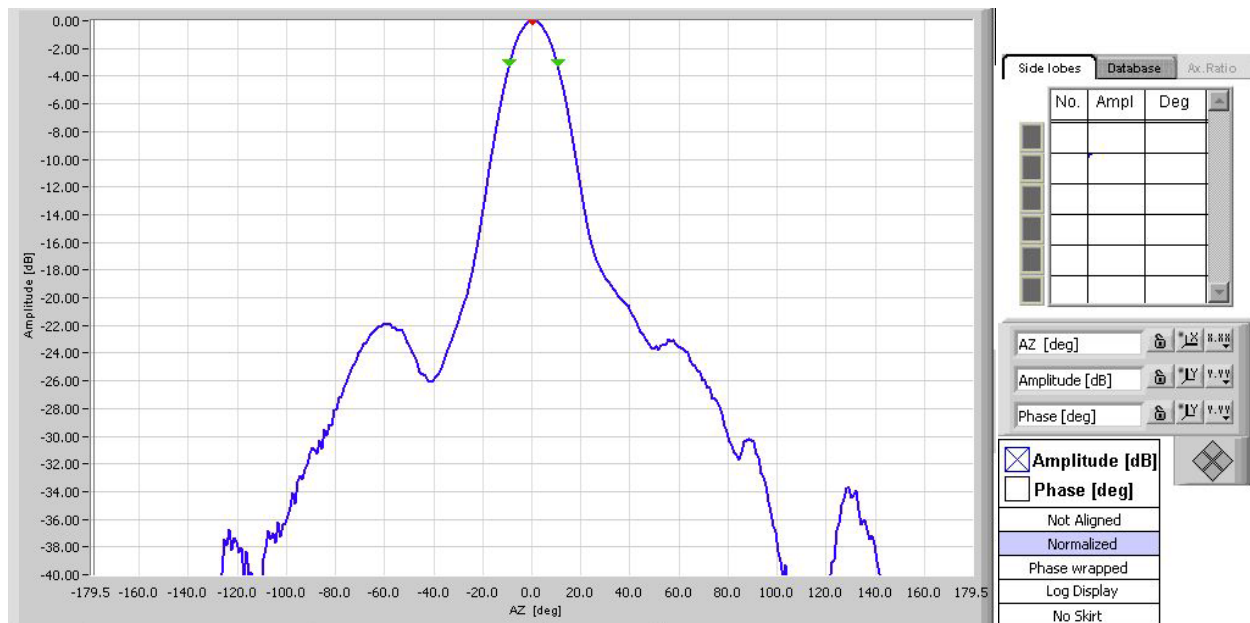
Features

- ┆ Broad band, 5.1/5.5/5.8/6.1GHz
- ┆ Triple polarization
- ┆ MIMO application
- ┆ High gain, Low VSWR
- ┆ Strong corrosion resistance ability

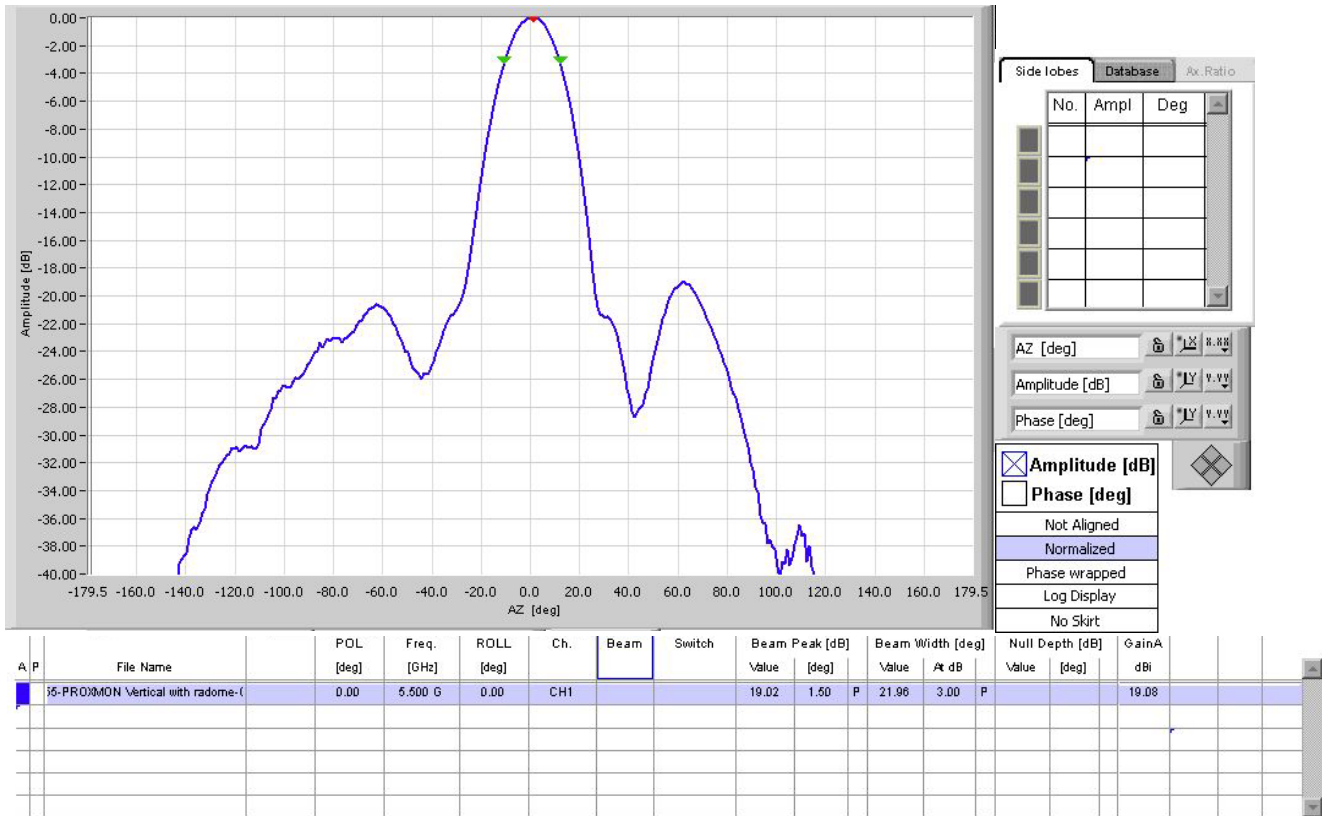
Installation sketch



MIMO E-plane Dual Slant

[illegible]

MIMO H-plane Vertical pol.



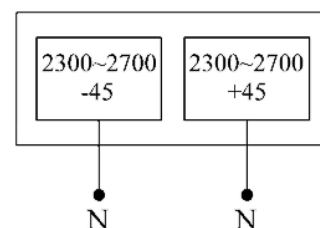
Wide-band Panel	2300~2700
Dual Polarization	X
Half-power Beam Width	90°
Fixed Electrical Downtilt	0°

XPo1 2300~2700MHz 90° 14dBi 0° Tilt

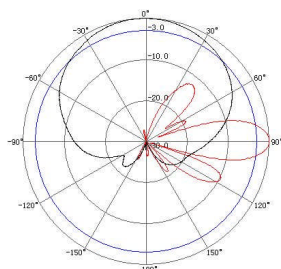
Electrical specifications	AS90-024-MIMO-13	
Frequency range (MHz)	2300~2500	2500~2700
Polarization	±45°	
Gain (dBi)	2×13.5	2×14
Electrical Downtilt (°)	0	
Half-power beam width (°)	Horizontal:90 Vertical:15.5	Horizontal:88 Vertical:15
Sidelobe suppression for first sidelobe above main beam (dB)	≥15	
Front-to-back ratio (dB)	≥23	
Cross-polar discrimination (dB)	≥15(±60°≥10)	
Isolation (dB)	≥30	
Impedance (Ω)	50	
VSWR	≤1.5	
Intermodulation IM3 (2×43dBm carrier)	≤-150dBc	
Maximum power (W)	200	
Lighting protection	DC Ground	



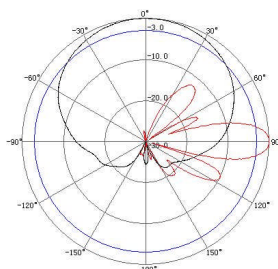
Mechanical specifications	
Connector	2×N Female
Connector position	Bottom
Height/width/depth (mm)	500×128×56
Packing size (mm)	600×230×160
Weight (kg)	1.5
Radome material	UPVC
Radome color	Gray
Mechanical tilt (°)	0~15
Operating temperature (°C)	-40~60
Rated wind velocity (m/s)	60
Suitable pole diameter (mm)	35~75
Mounting kit	JM-2400RZ1



2300~2500MHz: ±45° Polarization



2500~2700MHz: ±45° Polarization



AS90-050-MIMO-16-T 4.9-6.1 GHz Triple Polarizations MIMO Base Station Antenna, 90



The Triple Polarization Sector antenna provides coverage of 4.9-6.1 GHz frequency band in a single antenna radome.

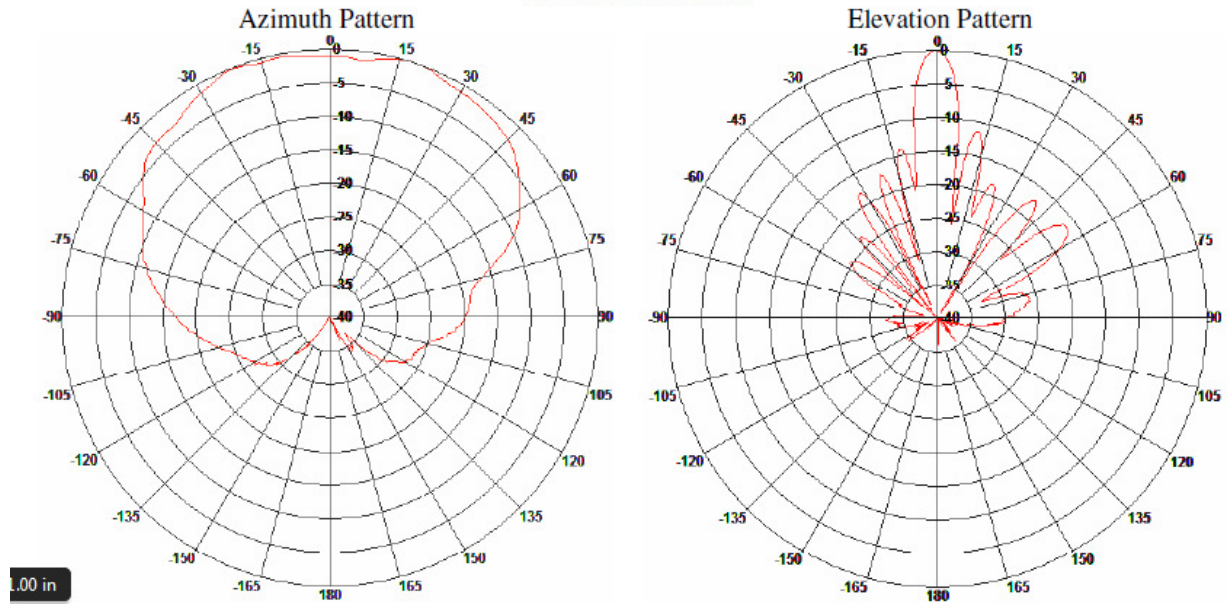
- light weight and durable construction
- 3 Ports: Dual Slant ($\pm 45^\circ$) and Vertical Polarization
- UV protected radome made of plastic
- specially designed for MIMO applications for optimal decorrelation

Specifications:	
<i>Electrical</i>	
Frequency range	4.9- 6.1 GHz
GAIN : Vertical Pol.	16 dBi
Dual Slant Pol.	16 dBi
VSWR, max.	1.7 : 1
Polarization	Dual Slant $\pm 45^\circ$ and Vertical
3 dB Beam-Width-Azimuth, typ.	Dual Slant : 90° ; V- Pol 90°
3 dB Beam-Width-Elevation, typ.	Dual Slant : 8° ; V- Pol 8°
Front to Back Ratio, min.	-30 dB
Port to Port Isolation, min.	-30 dB
Input power, max	10 Watt
Input Impedance	50 Ohm
Lightning Protection	DC Grounded
<i>Mechanical</i>	
Dimensions (HxWxD)	370 x 370 x 40 mm (14.5" x14.5" x1.6")
Connector	3 x N-Type Female
Weight	2.1 Kg
Mounting	MNT-22
Radome	UV Protected Polycarbonate
Back Plane	Aluminum protected through chemical passivation
<i>Environmental</i>	
Operating Temperature Range	- 40°C to + 65°C
Vibration	According to IEC 60721-3-4
Wind Load	200 Km/h (Survival)
Flammability	UL94
Water Proofing	IP-67
Humidity	ETS 300 019-1-4,EN 302 085 (Annex A.1.1)
Salt Fog	According to IEC 68-2-11

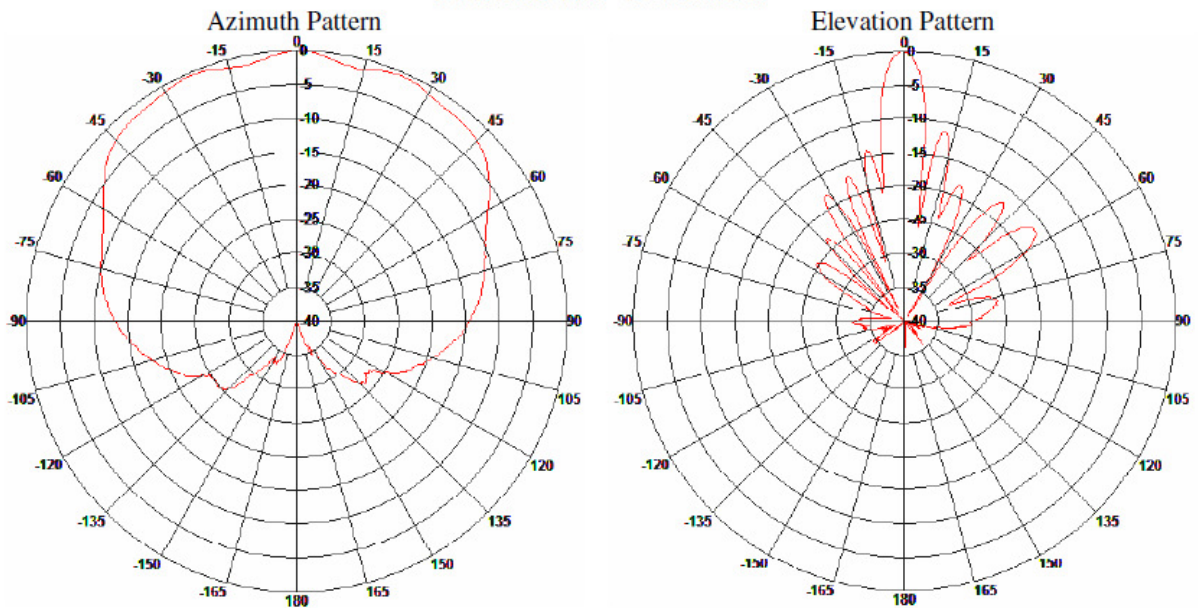
AS90-050-MIMO-16-T 4.9–6.1 GHz Triple Polarizations MIMO Base Station Antenna, 90

Radiations Patterns	
Frequency	5500 MHz
Gain, typ.	16 dBi

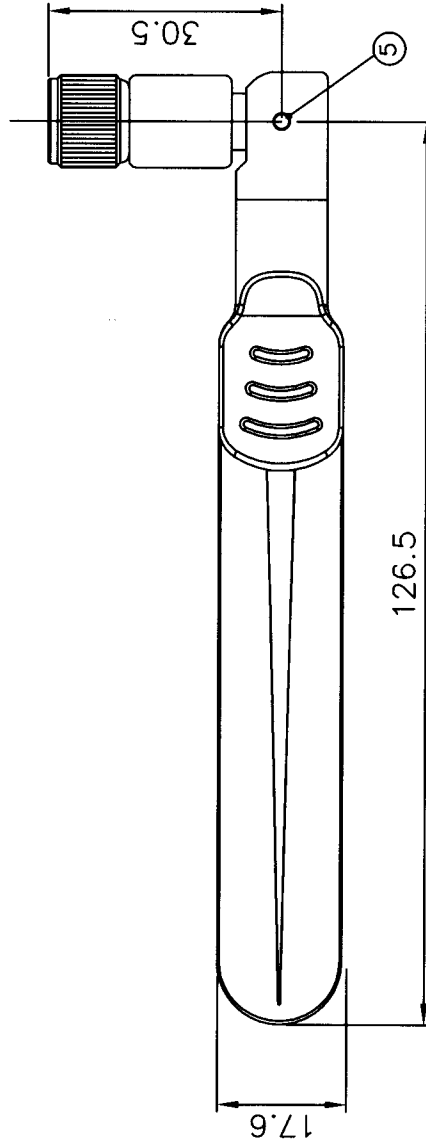
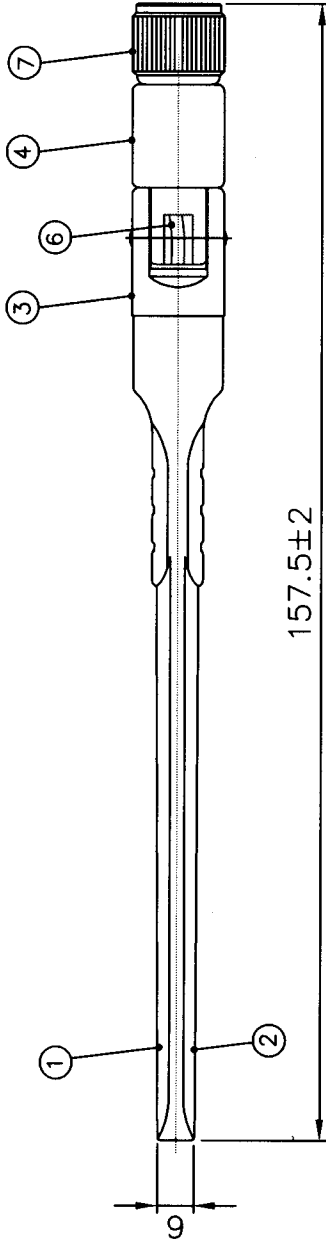
Vertical Polarization



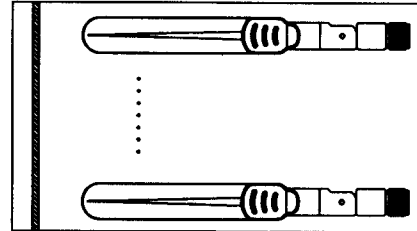
Dual Slant $\pm 45^\circ$ Polarization



A		B		C		D		E		F		G	
REV		DATE		DESCRIPTION									
X1		6/24-2005		New Issue									
X2		7/4-2005		Modify all									



PE Bag
Shrink Line



NO	DESCRIPTION	QTY	REMARK
7	Connector	1	
6	Cable	1	
5	Rivet	1	
4	Antenna Base	1	
3	Antenna Base	1	
2	Antenna Housing(S)	1	
1	Antenna Housing(M)	1	

Wha Yu
INDUSTRIAL CO.,LTD.
譚裕實業股份有限公司

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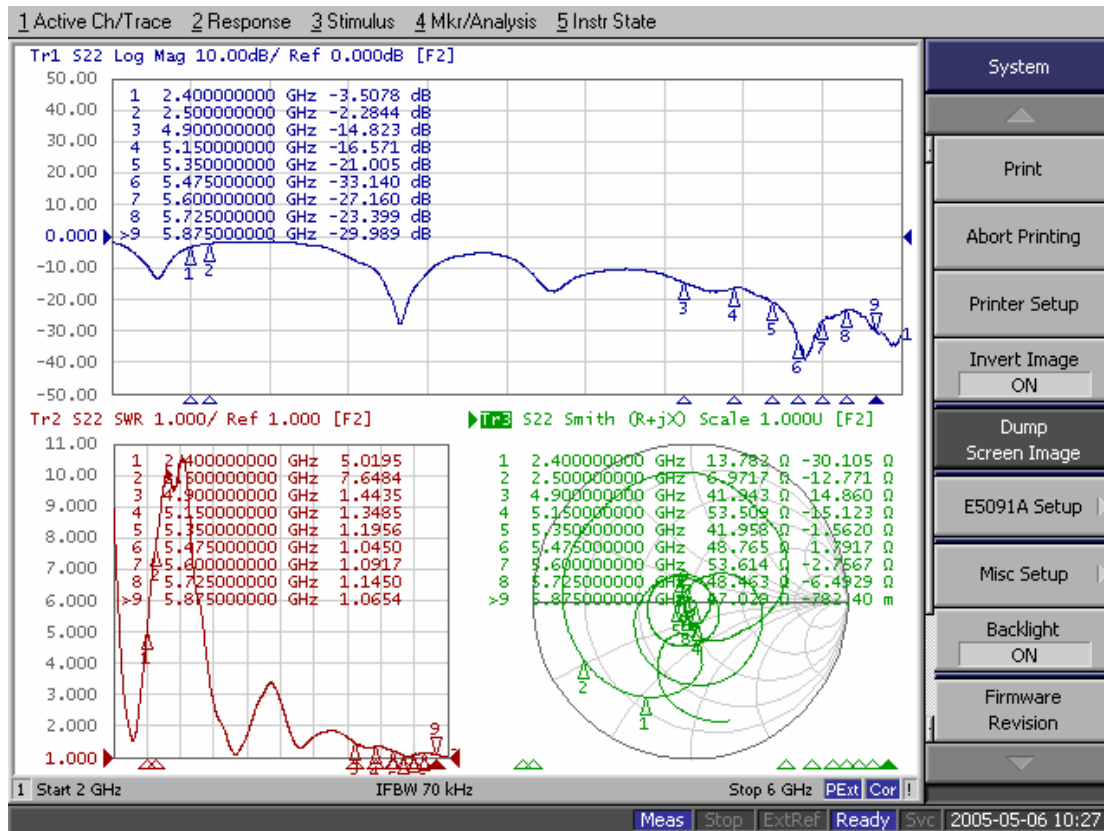
CUSTOMER: Fire tide	
PART NO :	
PARTNAME: RF Antenna Assembly	
W.Y PNO : C812-510012-A	
REV	UNIT FILE :
X2	m/m SHEET : 1/1

CUSTOMER'S SIGNATURE



華裕實業股份有限公司
WHA YU INDUSTRIAL CO., LTD

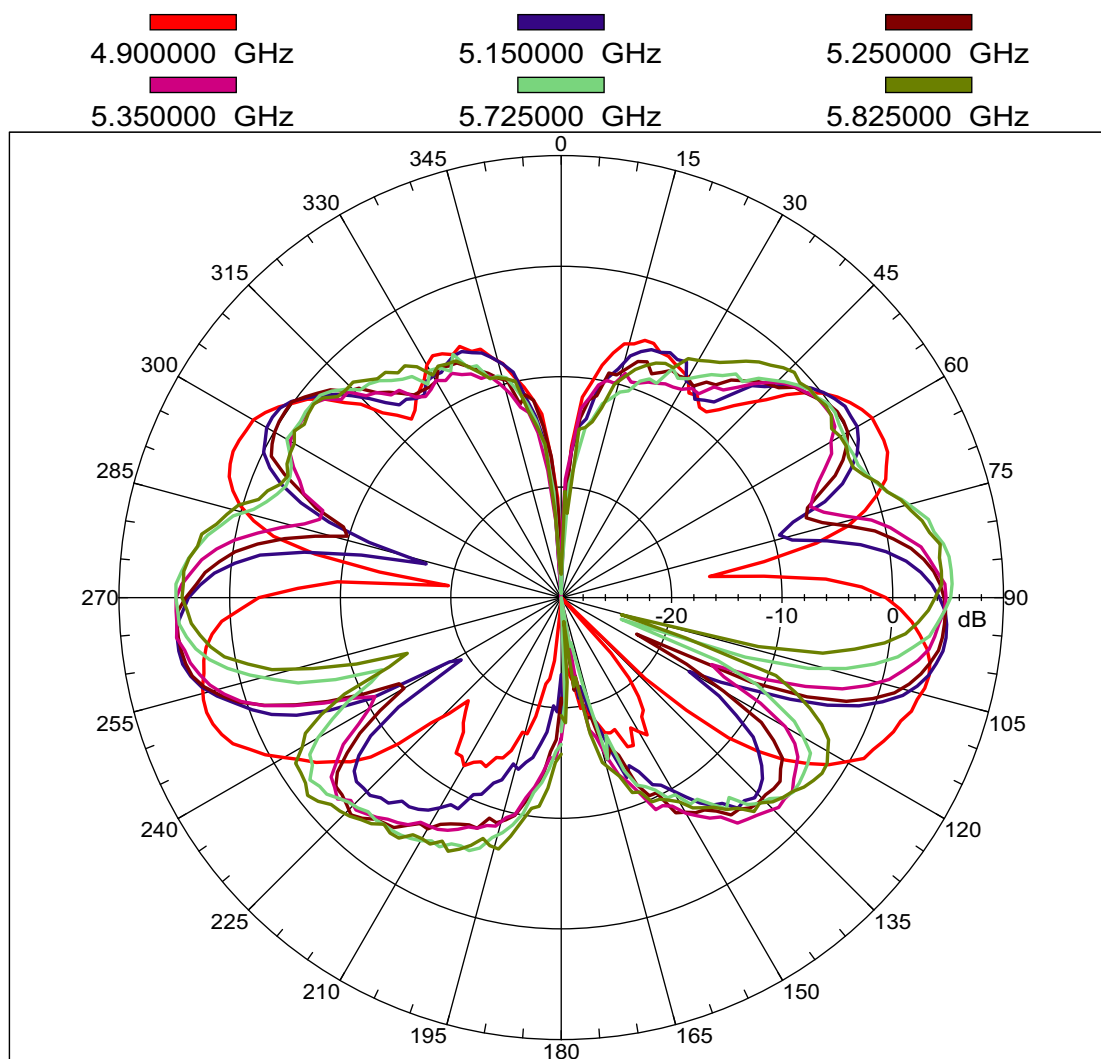
RF Antenna Assembly
P/NO :C812-510012-A SPEC : 5GHz



6/24/2005

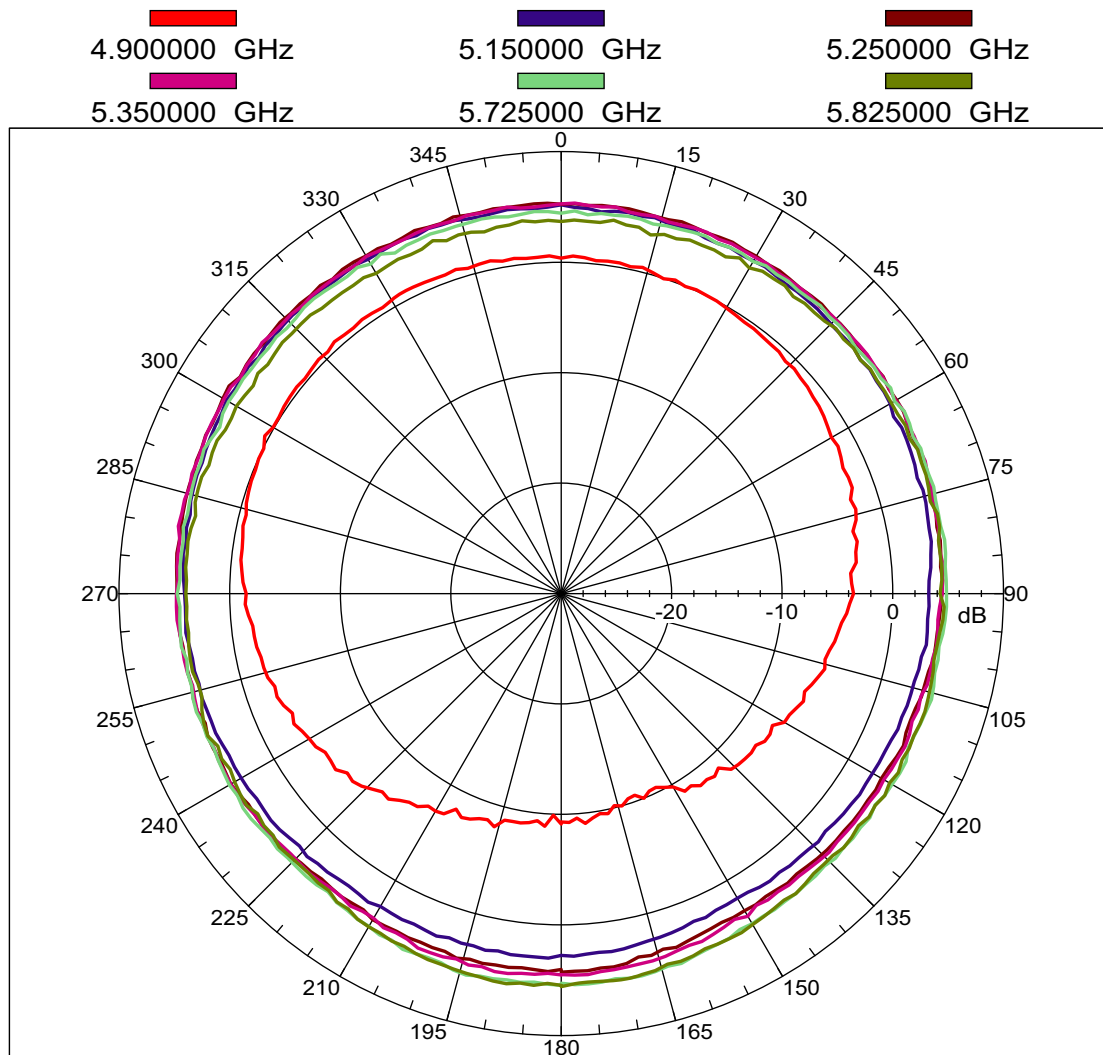


Far-field amplitude of C812-510012-A.nsi





Far-field amplitude of C812-510012-A.nsi



4.9 - 5.875 GHz MIMO Omni – Directional Base Station Antenna
Mars P/N: MA-WO55-MIMONHFT9 Firetide P/N: AO-050-MIMO-9



Specifications:

Electrical	
Frequency range	4.9 - 5.875 GHz
GAIN, typ.	3 x 9 dBi
VSWR, max.	2 : 1
Polarization	Linear, Vertical
3 dB Beam-Width, H-Plane, typ.	Omni - Directional
3 dB Beam-Width, E-Plane, typ.	10°
Input power, max	50 Watt
Input Impedance	50 Ohm
Mechanical	
Dimensions (HxDia.)	330 x 200 mm
Weight	600 gr
Connector	3 x N-Type, Female
Radome	UV Protected , Plastic
Mount	Provision for Fire Tide MIMO
Environmental	
Operating Temperature Range	- 40°C to + 65°C
Vibration	According to IEC 60721-3-4
Wind Load	200 km/h (survival)
Flammability	UL94
Water Proofing	IP-65
Humidity	ETS 300 019-1-4, EN 302 085 (annex A.1.1)
Salt Fog	According to IEC 68-2-11
Ice and Snow	25mm radial (survival)

Specifications subject to change without notice