

Specification For Approval

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Customer : _____

Customer P/N : /

INVAX P/N : AN2450-3901BRS

Description : Antenna

Cortec Checked By: _____

Customer Approved By: _____



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Product Number: AN2450-3901BRS

Product Name: Antenna



1. Revision History


Revision	Date	Change Notification	Description
1.0			

Product Number: AN2450-3901BRS

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2. Specification

Sample Photo	
	
A. Electrical Characteristics	
Frequency	2400 ~ 2500 MHz 5150 ~ 5850 MHz
S.W.R.	<= 2.0 @ 2400 ~ 2500 MHz <= 2.5 @ 5150 ~ 5850 MHz The data is tested with 1M cable
Antenna Gain	2.+dBi @ 2400 ~ 2500 MHz 3.2dBi @ 5150 ~ 5850 MHz
Radiation Pattern	Omni-Directional
Max Input Power	>= 2 W
Polarization Linear	
Impedance	50 Ohm
B. Material & Mechanical Characteristics	
Material of Radiator	CU
Material of Plastic	ABS
Cable Type	RG178
Connector Type	SMA Male Reverse
C. Environmental	
Operation Temperature	- 40 °C ~ + 65 °C
Storage Temperature	- 40 °C ~ + 80 °C
Antenna Color Storage life	< 2 year

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3. Characteristics and Reliability Test

Test Items 測試項目	Test Condition and Procedure 測試方法	Requirement 要求	Result 結果
C1 V.S.W.R. 電壓駐波比	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	OK
C2 Insertion Loss 插入損失	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	N/A
C3 Antenna Gain 天線增益	Set DUT on Antenna Chamber; make individual calibration to test 設置天線暗室參數進行測試	Directive DUT specification 符合待測物規範	OK
C4 Voltage Breakdown 耐電壓	Test voltage should be applied between insulated portions, or between ground as specified. 在絕緣部分測試電壓,或指定接地面之間	Max Voltage \geq 500 V or directive material specification 最大電壓 \geq 500V 或符合材料規範	N/A
C5 Insulation Resistance 絕緣阻抗	Set Voltage: 500 \pm 50V; between the insulated portions, or between ground as specified. 設置電壓 500 \pm 50V,在絕緣部份測試或指定接地面之間	Resistance \geq 500 M ohm or directive material specification 阻抗 \geq 500M ohm 或符合材料規範	N/A
C6 Contact Resistance 接觸阻抗	Air Temp: 26°C; measured with test equipment 室溫 26°C, 指定量測設備	Directive material specification 符合材料規範	N/A
M1 Vibration 震動	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction 振幅 1.5mm ; 頻率 20~80~20Hz ; 3 個方向各 2H	1. No Visual Damage 2. Frequency Tol. \leq 5% 無明顯外觀不良; 頻率偏移 \leq 5%	OK
M2 Random Drop 跌落	GB / T2423.8-1995 Single : Height: 1.0 Meter; 3 directions; 1 time for each direction 單支天線, 高 1m ; 3 個方向各 1 次	1. No parts separated · fracture 2. Frequency Tol. \leq 5% 產品無脫落、斷裂; 頻率偏移 \leq 5%	OK
	Packing : Height: 0.76 Meter; 1 corner, 3 edges, 6 surface 包裝 : 高 0.76m , 一角、三棱、六面各一次		OK
	Antenna+Machine: Height: 0.76 Meter; 1 corner, 3 edges, 6 surface. 整機 : 高 0.76m , 一角、三棱、六面各一次		N/A
M3 Solderability	GB / T2423.28-2005	Tin evenly on full	N/A

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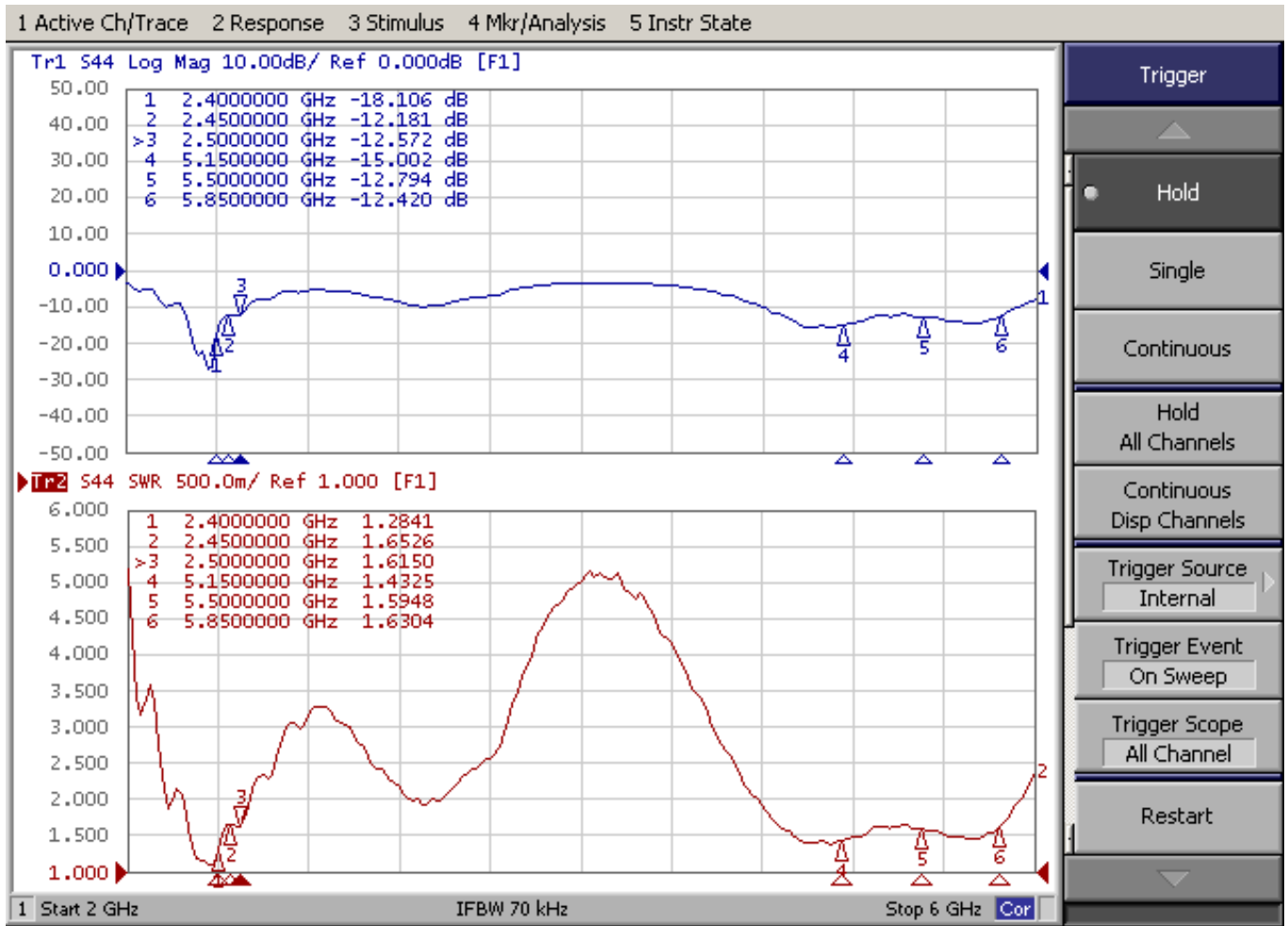
	可焊性	Temp: 260±5° C;Duration: 5 seconds 溫度 260±5° C;持續 5 秒	上錫均勻飽滿	
M4	Pull Test 拉力	Holding with individual specification; force applied to axis of terminal .單獨定義產品端子拉力	1. Directive DUT specification 2. Frequency Tol.≤5% 符合待測物規範;頻率偏移≤5%	OK
M5	Torque Test 扭力	Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal 單獨定義產品端子之順時針及逆時針扭力	1. Directive DUT specification 2. Frequency Tol.≤ 5% 符合待測物規範;頻率偏移≤5%	N/A
M6	Dimension 尺寸	Inspection of dimension, color, material, package, surface process.检查尺寸,颜色,材料,包装,表面處理	Directive DUT specification 符合待測物規範	OK
E1	Waterproof 防水	With Reference to IEC 60529 // IP Code Definition 參考 IEC60529 IP 定義	Directive DUT specification 符合待測物規範	N/A
E2	Salt Spray 鹽霧	GB / T 2423.17-2008 Temp: 35°C; RH: ≥ 95%; NaCl solution: ≥ 5%;Time: 24H 溫度 35°C ; 濕度≥95%;鹽水濃度≥5% ; 測試 24H	1. No Visual Damage 2. Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	N/A
E3	Temperature and Humidity Chamber 恒溫恒濕	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: ≥ 90 %; Time: 24H 溫度 80°C 測試 12H 轉-40°C 測試 12H; 濕度≥ 90 % ; 時間 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	OK
E4	Thermal Shock 冷熱衝擊	GB / T 2423.22 - 2008 - 40°C (30 minutes) to + 80°C (30 minutes) ; Cycles: 24 - 40°C 測試 30 分轉 80°C 測試 30 分爲一個週期; 共 24 週期	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	OK
E5	Aging test 老化	GB / T 2423.2 - 2008 Temp: 80°C; Time: 24 hours 溫度 80°C , 測試 24H	After 2 Hours Recovery 1. No Visual Damage 2. Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	OK
E6	High Temp. 高溫	Temp. 270±10°C ; Times : 120 seconds 溫度 270±10°C , 測試時間 120 秒	No Visual Damage 無明顯外觀不良	N/A
R1	RoHS	With Reference to IEC 62321:2008 with flow chart 參考 IEC 62321 測試流程	Directive RoHS 2011/65/EU 符合 RoHS 2011/65/EU 標準	OK
R2	PFOS	With Reference to USA EPA 3550C:1996 by LC/MS 參考 USA EPA 3550C 測試流程	Directive RoHS 2006/122/EC 符合 RoHS 2011/65/EU 標準	OK

Product Number: AN2450-3901BRS

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4. Antenna - S Parameter Test Data

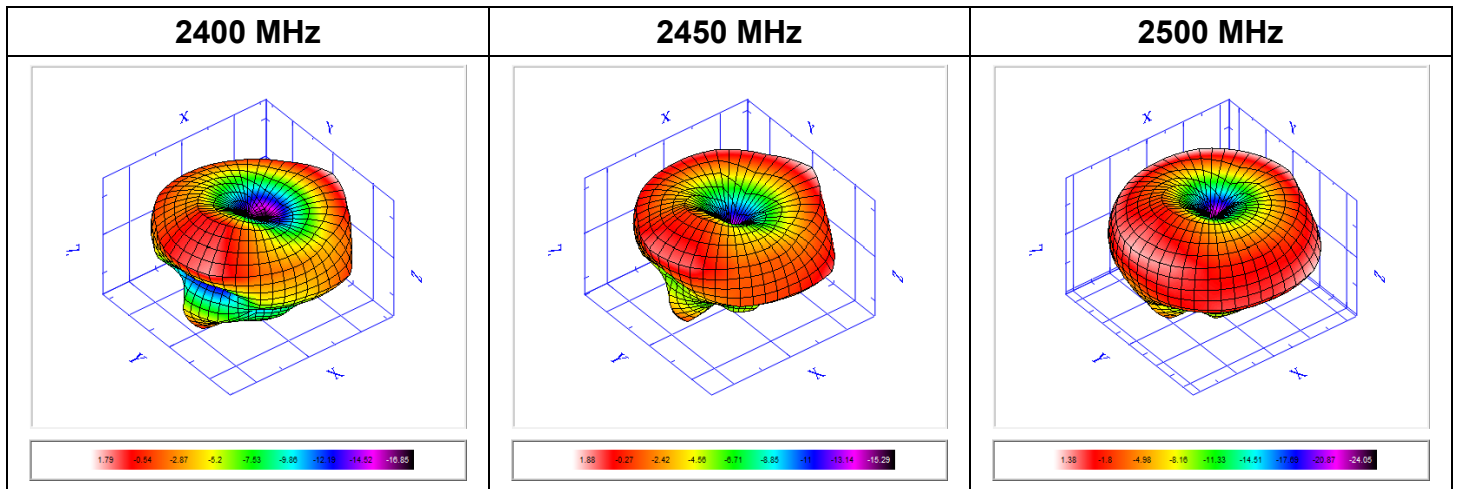


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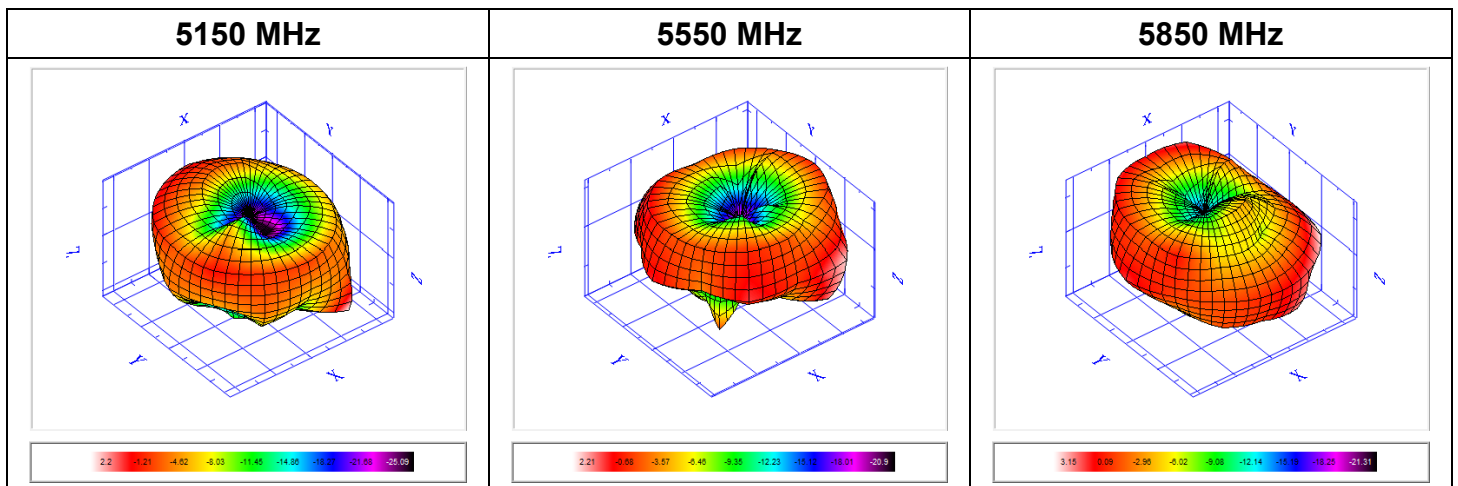
Product Name: Antenna



5. Antenna - Radiation Pattern Test Data



Frequency	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
TRP (dBm)	-2.13	-2.02	-2.1	-2.11	-2.08	-2.3	-2.24	-2.26	-2.25	-2.16	-2.33
Peak EIRP (dBm)	1.79	1.78	1.91	1.95	1.89	1.88	1.81	1.76	1.56	1.57	1.38
NHPRP +/- 45 (degree)	-2.62	-2.48	-2.54	-2.5	-2.48	-2.7	-2.67	-2.71	-2.71	-2.61	-2.75
NHPRP +/- 30 (degree)	-3.43	-3.29	-3.33	-3.24	-3.18	-3.29	-3.18	-3.17	-3.14	-2.99	-3.14
E-Theta Peak Gain (dBi)	-8.61	-8	-8.26	-8.75	-8.39	-8.48	-9.35	-9.78	-9.95	-10.19	-10.95
E-Phi Peak Gain (dBi)	1.68	1.68	1.8	1.85	1.8	1.8	1.73	1.63	1.46	1.46	1.34
E-Total Peak Gain (dBi)	1.79	1.78	1.91	1.95	1.89	1.88	1.81	1.76	1.56	1.57	1.38
Directivity (dBi)	3.92	3.81	4.01	4.05	3.97	4.17	4.05	4.03	3.81	3.73	3.71
Efficiency (%)	61.25	62.75	61.64	61.55	61.93	58.93	59.67	59.37	59.53	60.85	58.45



Frequency	5150	5200	5400	5550	5600	5800	5850
TRP (dBm)	-2.9	-2.56	-2.69	-2.89	-3.56	-3.13	-2.26
Peak EIRP (dBm)	2.2	3.56	2.75	2.21	1.23	1.45	3.15
NHPRP +/- 45 (degree)	-3.28	-2.84	-2.94	-3.05	-3.64	-3.3	-2.46
NHPRP +/- 30 (degree)	-3.72	-3.2	-3.07	-3.38	-4.21	-3.55	-2.74
E-Theta Peak Gain (dBi)	-8.9	-11.27	-10.04	-9.9	-12.09	-12.77	-10.32
E-Phi Peak Gain (dBi)	2.01	3.5	2.6	2.18	1.2	1.43	3.02
E-Total Peak Gain (dBi)	2.2	3.56	2.75	2.21	1.23	1.45	3.15
Directivity (dBi)	5.1	6.12	5.44	5.1	4.79	4.58	5.41
Efficiency (%)	51.26	55.4	53.88	51.35	44.08	48.69	59.38

6. Mechanical Drawing

See attached files

7. Material Description and RoHS Test Report

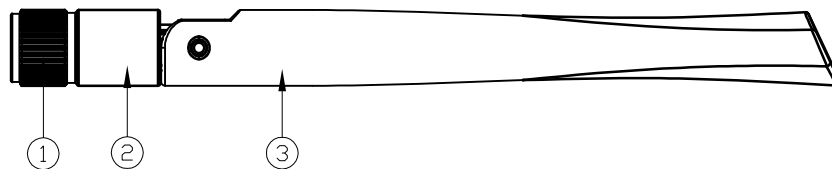
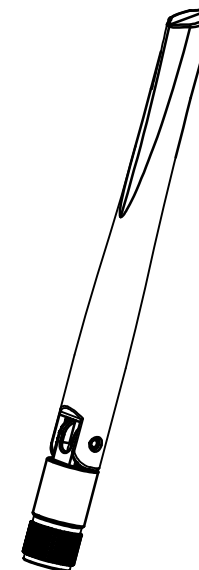
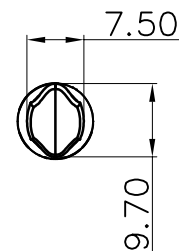
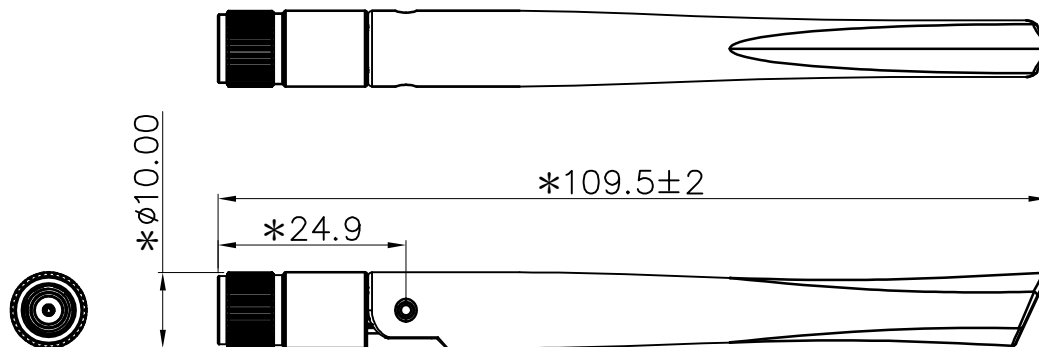
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RoHS

Compatible



SIGN	DATE	DESCRIPTION	APPROVER
△			
△			
△			



Note:

1. Mark * is important dimension; "Cpk "Identify for process control (Cpk ≥ 1.33).
2. Tolerance: Unmarked tolerance refer to the standard tolerance please.

3	BODY-AN39-01B	Body	ABS	Black	1
2	BODY1-AN39-01B	Body1	ABS	Black	1
1	SMA805-CBR5A56-E	SMA Male Reverse	Cu	Black	1
No.	Part Number	Name	Material	Finish	Q'ty

Invax System Group.				Cortec Technology Inc.	
Cortec				<small>Http://www.invaxsystem.com E-mail: info@invax.com.tw</small>	
<small>Tel: 886-2-27885218 Fax: 886-2-27831658</small>					
TITLE: 2.4&5GHz Antenna					
PART NO.: AN2450-3901BRS			CUSTOMER P/N: /		
APP BY	CHK BY	RF BY	DES BY		Tolerance
Grant	Jack	Sifei	Kenny	UNITS: mm	X.X ±0.5
2014/09/22	2014/09/22	2014/09/22	2014/09/22	SCALE: 1/1	X.XX ±0.2
				REVISION: A	X° ±1