

# 產品規格承認書

## Specification For Approval

日期：2008 / 04 / 28

Date

編號：ASM-84281

File No.

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Revision

承認廠商：錄森科技股份有限公司

Manufacturer

製造廠商：英碩科技股份有限公司

Manufacturer

型號品名：2.4 GHz External Antenna

Part Number

Description

INVAX P/N: AN2400-1901RS

廠商審核：

Approved By

### Invax

英碩科技股份有限公司

台北市忠孝東路五段 815 號 4 樓

Tel: 886-2-2788-5218 Fax: 886-2-2783-1658

### Cortec

東莞康捷電子有限公司

廣東省東莞市長安鎮振安路

沙頭段咸西工業區

Tel: 86-769-85388261 Fax: 86-769-85397133

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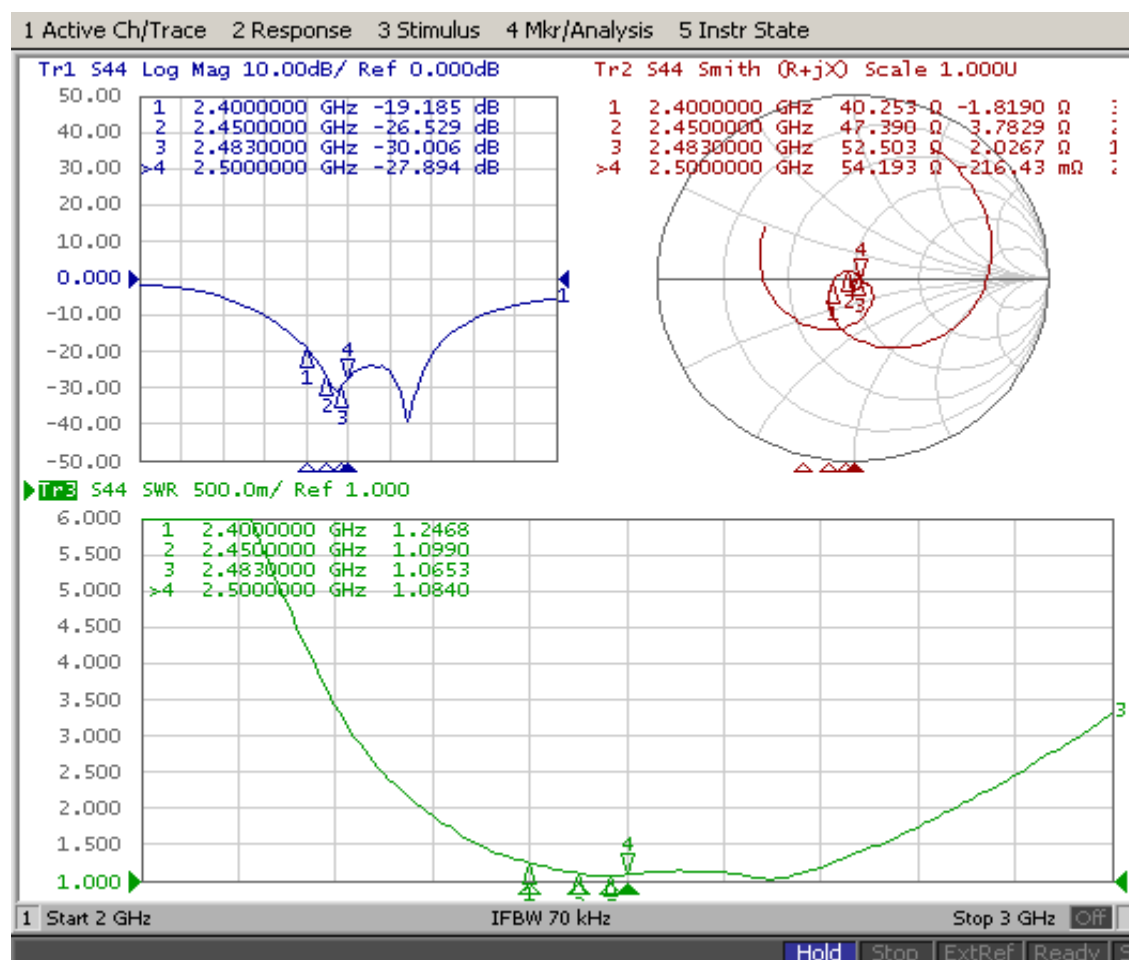
**1. Reliability Testing**

Test Item	Procedure	Requirement
<b>1. Visual inspection and Dimension Check</b>	Applicable methods using x5 magnification	follow specification
<b>2. Rapid Changing of Temperature</b>	-40°C (30minutes) to 90°C (30minutes); 24 cycles	After 2 hours recovery: 1. no visible damage 2. Freq. Tol.: < $\pm 5\%$
<b>3. Damp Heat</b>	24 hours at 60°C; 90 ~ 95% RH	After 2 hours recovery: 1. no visible damage 2. Freq. Tol. : < $\pm 5\%$
<b>4. Endurance</b>	24 hours at 90°C	After 2 hours recovery: 1. no visible damage 2. Freq Tol.: < $\pm 5\%$

## 2. Specification

A. Electrical Characteristics	
S.W.R.	$\leq 2.0$ @ 2400~2500 MHz
Antenna Gain	$+5.0 \pm 0.7$ dBi @ 2450 MHz
Impedance	50 Ohm
B. Material	
Material of Radiator	Cu (Plated)
Connector Type	SMA Male Reverse
C. Environmental	
Operation Temperature	- 30 °C ~ + 85 °C
Storage Temperature	- 30 °C ~ + 85 °C

## 3. S Parameter Test Data



#### 4. Antenna Radiation Pattern

##### Testing Equipment Specification:

Antenna Anechoic Chamber Dimension: 8 x 4 x 4 m

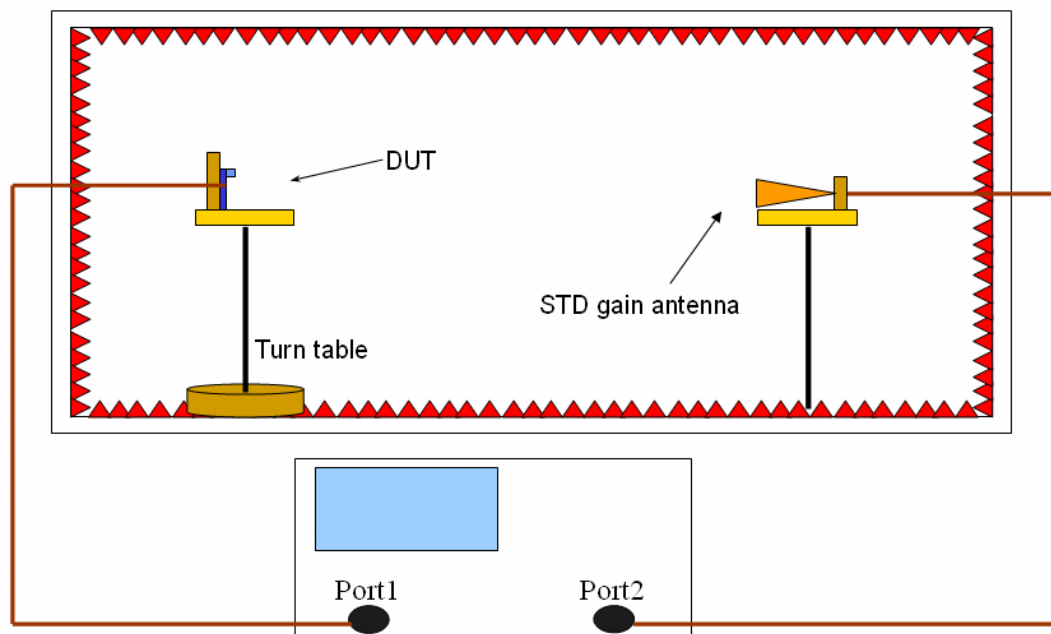
Quiet Zone: 600mm @1 GHz

Isolation: >100dB @ 1 MHz ~ 10 GHz

Testing Equipment: Agilent 5071B

Received Antenna: 0.7 ~ 6.0 GHz for Gain Calibration

Double Ridged Horn Antenna



#### 5. Mechanical Drawing

#### 6. MSDS & SGS Report



Model : 2400MHz Antenna// Cortec  
Remark : H-plane // Vertical Polazation  
Tested by : CORTEC Antenna 3D Lab // Zhang Bing Xiang

Location: **Chamber**

Date: **2007/11/22**

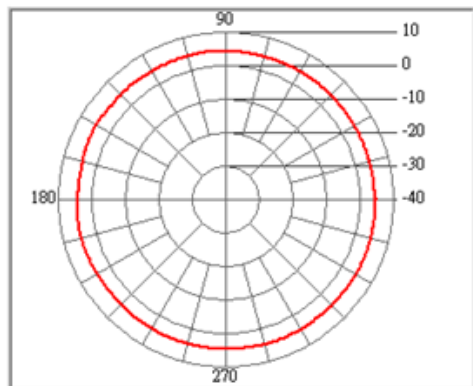
Time: **下午 05:32:55**

Temperatuer (°C): **22.00**

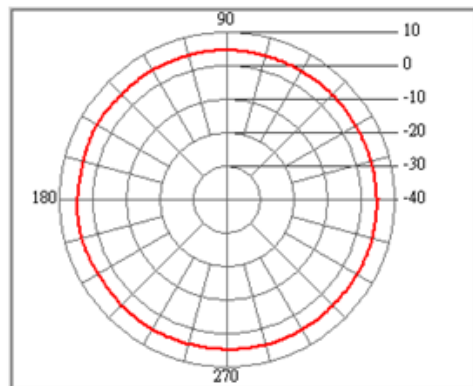
Humidity (%): **55.00**

Approved by:

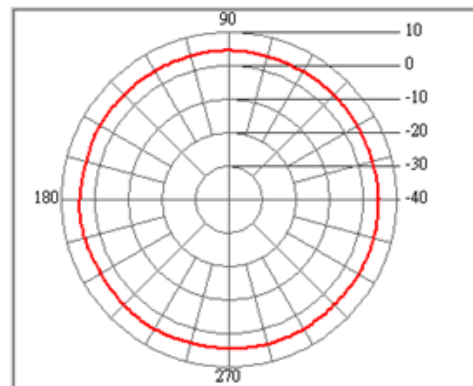
Freq. (MHz)	2390	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain (dBi)	4.81	5	4.83	4.77	5.05	4.54	4.66	4.7	4.53	4.49	4.38	3.79
Peak Degree	342	343	343	1	0	0	2	360	358	359	354	349
AV Gain (dBi)	4.44	4.6	4.41	4.27	4.46	3.97	4.17	4.18	3.93	3.83	3.68	3.16



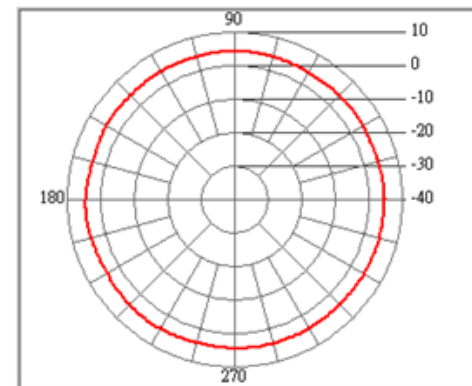
2390



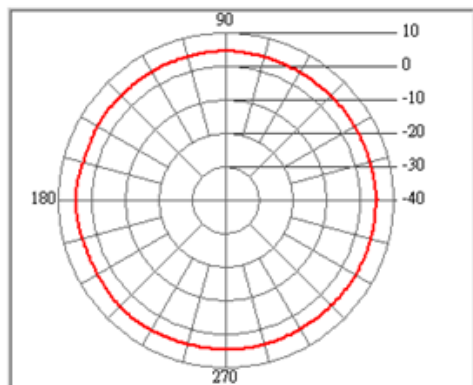
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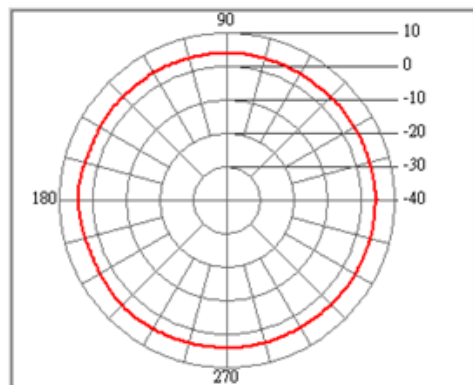
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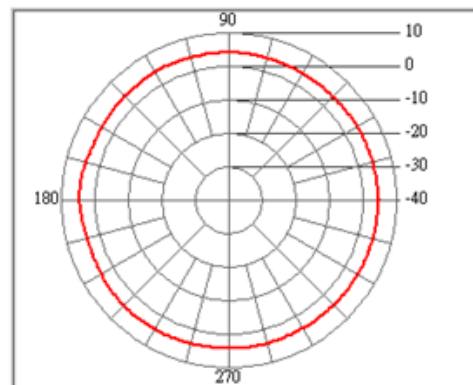
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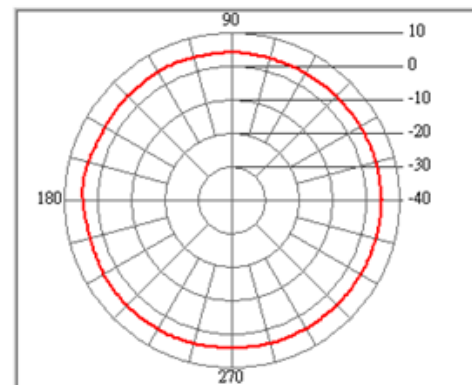
2430



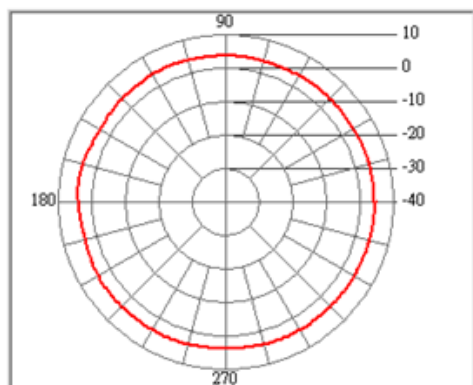
2440



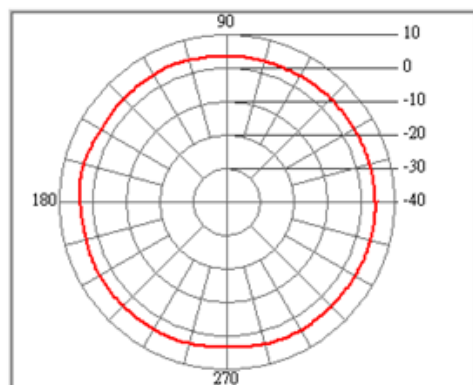
2450



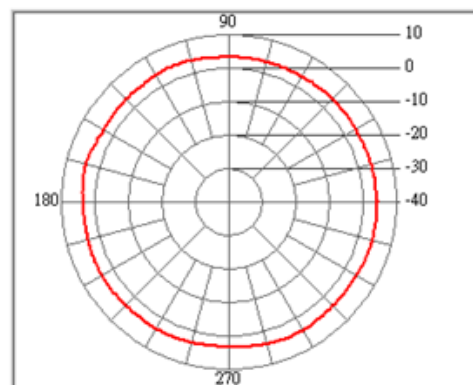
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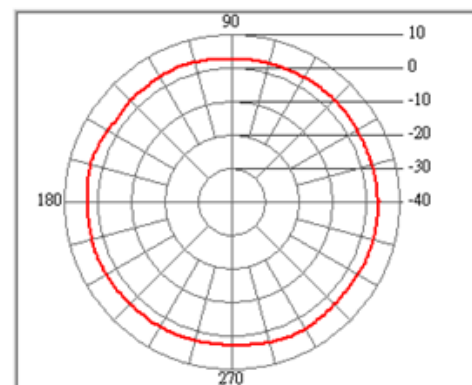
2470



2480



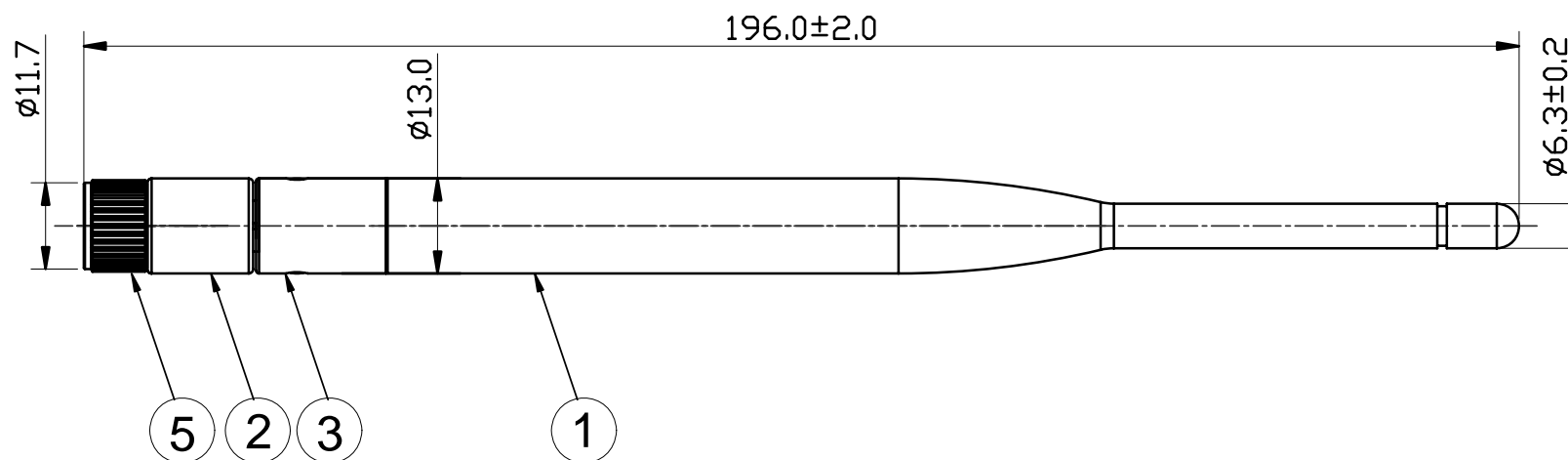
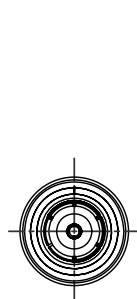
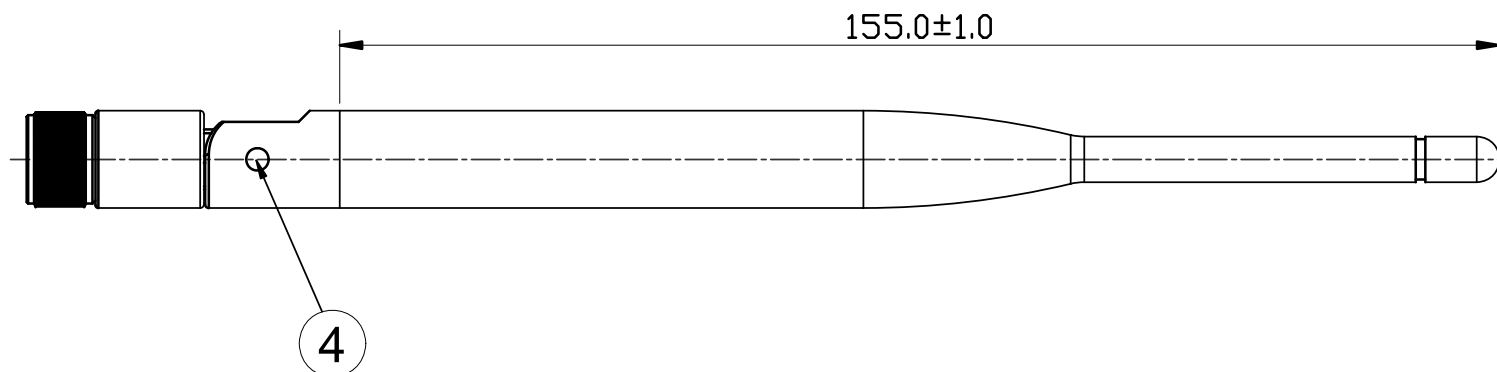
2490




2500

RoHS  
Compatible

SIGN	DATE	DESCRIPTION	APPROVER



5	R-SMA324-ZC8MRANT	SMA Male Reverse	Metal	Eletrodeposition	1
4	R-AN03-514CZ	Pin	Metal	Plate the black zinc	2
3	R-AN03-T01	Body1	PA+ABS	Black	1
2	R-AN03-T02	Body2	PA+ABS	Black	1
1	R-AN1901-01	Body	TPE	Black	1
No.	Part Number	Description	Material	Finished	Q'ty

Invax System Group. <b>Cortec</b>		Cortec Technology Inc. Http://www.invaxsystem.com E-mail:info@invax.com.tw		Tel :886-2-27885218 Fax:886-2-27831658	
TITLE: 2.4GHz Antenna					
PART NO.:AN2400-1901RS			DWG NAME: R-AN2400-1901RS.dwg		
APPROVED BY	CHECKED BY	DESIGNED BY		Tolerance	
Grant	Liu kui	Zhang yue xin		X.X	±0.1
2007.12.28	2007.12.28	2007.12.28		X.XX	±0.05
				X°	±1°
			UNITS: mm		
			SCALE: 1/1		
			REVISION: A		

## TPE Datasheet

物性項目 Property	單位 Unit	ASTM 試驗法 Test Method	TPE
比重 Specific Gravity	---	D792	0.88
模具收縮率 Shrinkage	%	D955	0.8-2.5
斷裂拉伸強度 Tensile Strength	Kg/ cm <sup>3</sup>	D638	3.1
扭曲強度 Flexural Strength	Kg/ cm <sup>3</sup>	D790	---
衝擊強度缺口 23°C Impact Strength	Kg om/om	D256	---
硬度 Hardness	A Shore	---	13
熱變形溫度 0.45 MPa Heat Deflection Temp.	°C	D648	80
熔融指數 Melt Flow Index	G/ min <sup>2</sup>	D1238	10
燃燒性 Flammability	---	UL94	HB
<p><b>Testing Data from</b></p> <p><b>東莞市合春塑料有限公司 Tel:86-0769-2774772</b></p> <p><b>台灣大雅國際股份有限公司 Tel:886-02-27775232</b></p>			



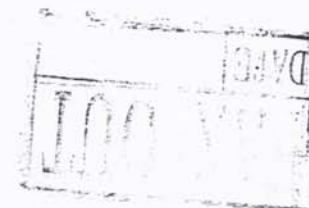


SHIYANG (ZHONG SHAN) METAL PRODUCTS CO.,LTD

世扬金属制品有限公司

TEST CERTIFICATE

材质证明书



CLIENT 客户	天诚							certificate NO. 证明书号	070127-15	
name article 品名	Brass									
LOT NO.	SIZE(MM)	OUTW GT	DESIGNATION	Cu(%)	Pb(%)	Fe(%)	Fe+Sn(%)	Cd(%)	Zn(%)	REMARK
	STANDARD	(KG)	JISC3604	57~61	1.8~3.7	≤0.5	≤1.2	≤0.0075	REM	
7916	14.5 φ		JISC3604	58.92	2.986	0.446	0.971	0.0042	REM	
兹证明本表所列产品,均依材料规格制造及试验,并符合规格之要求. WE HEREBY CERTIFY THAT MATERIAL DESCRIBED JERE IN MAS BEEN MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENT OF THE ABOVE MATERIAL SPECIFICATION.										

MANAGER: 曾敦義

PABLE: 李玉奎

DATE:2007/02/27

THE THREE INDUSTRIAL AREA NAN LANG TOWN ZHONG SHAN CITY  
中国广东省中山市南朗镇第三工业区

TEL:0760-5214770 FAX:0760-5214769  
E-Mail:sales@shiyangmetal.com



禧福工業股份有限公司材質分析報告

鋅合金

化學成份 Chemical Composition

元素	Element	國際標準	ASTMB240
鋁	(Al)		3.804%
鎂	(Mg)		0.0327%
銅	(Cu)		0.384%
鐵	(Fe)		0.0015%
鉛	(Pb)		0.0091%
錫	(Sn)		0.0017%
鎘	(Cd)		0.0010%
錳	(Mn)		0.00071%
鎳	(Ni)		0.0057%
矽	(Si)		0.0056%
鉻	(Cr)		0.0011%
鉍	(Bi)		0.00040%
鋅	(Zn)		95.8%
物理性能 Physical Properties			
密度	Density(g/cm <sup>3</sup> @21°C)		6.60
溶點範圍	Melting Range		381-387°C
凝固收縮	Solidification Shrinkage		1.17%
熱膨脹率	Thermal Expansion(m/mm/°C @20-100°C)		274
比熱	Specific Heat Capacity(J/kg/°C @20-100°C)		418.7
導熱率	Thermal Conductivity(W/m <sup>2</sup> /br/m/°C @70-140°C)		1130
導電率	Electrical Conductivity(%IACS)		2.0*E7
電阻率	Electrical Resistivity (μohm-cm@20°C)		6.3694
機械性能 Mechanical Properties			
極限抗拉強度	Ultimate Tensile Strength		283MPa
延伸率	Elongation(% in 51mm)		10%
硬度	Hardness(Brinell 500 kg)		82
抗剪強度	Sheet Strength		214 MPa
抗壓屈服強度	Compressive Yield Strength		414 MPa
抗衡擊強度	Impact Energy(Un-notched Bar 6.35*6.35mm)		58
疲勞強度	Fatigue Strength(5*10 <sup>8</sup> Cycles)		48 MPa

## Coaxial Cable Datasheet

RG-178 Coaxial Cable Specification		
1. Cable Type	MIL – C – 17 / RG-178	
2. Impedance	50 ± 3 ohm	
3. Inner Conductor	Material	silver-coated copper
	Conductor Numbers	7
	Conductor Size	0.102 mm
	Outer Diameter	0.3 mm
4. Dielectric Layer	Material	FEP
	Color	Clear
	Average Thickness	0.28 mm
	Diameter	0.86 mm
5. Braid (Shielding)	Material	silver-coated copper
	Construction	16-3-0.1 mm
	Coverage	95 %
6. Outer Cover	Material	FEP
	Color	Brown
	Average Thickness	0.25 mm
	Diameter	1.80 ± 0.05 mm
7. V.S.W.R Testing	< 1.3 (DC ~ 6.0 GHz)	
8. Attenuation (dB / 100 meter )	100 MHz	46
	900 MHz	155
	1800 MHz	295
	2400 MHz	340
	5200 MHz	505
	6000 MHz	550
9. Capacitance	97 ± 3 ( pF / meter)	
10. Maximum Power	30 dBm	
11. Spark Test	2.0 KV	
12. Rating Temp. and Volt.	200°C / 30V	
13. Conductor Resistance	335 ohm / KM / 20°C max.	
14. Dielectric Resistance	3 G ohm / KM / 20°C min.	

# ABS Datasheet

台灣台達化學工業股份有限公司  
ABS 通用級(一般用)規格性質一覽表

性 質 Properties			試驗 方法 ASTM	通用級（一般用）General Purpose						
				3000H	3000D	3000	6000	1000	5000	5000s
M E C H A N I C A L	機 械 質	ZOD 沖擊強度 (IZOD Impact Strength)	D256	34 50	30 38	25 33	23 30	21 27	17 21	13 16
		抗張強度-降伏點 (Tensile Strength at Yield)	D638	400	410	380	400	430	460	480
		抗張強度—斷裂點 (Tensile Strength at Break)		340	360	310	340	340	360	380
		伸張率-斷裂點 (Elongation at Break)	D638	60	40	40	30	30	20	20
		抗折強度 (Flexural Yield)	D790	620	600	580	640	700	750	800
T H E R M A L	熱 性 質	抗折系數 (Flexural Modulus)	D790	21,000	21,000	20,000	22,000	24,000	26,000	30,000
		熱變形溫度 (Heat Distortion Temp.)	D648	87	86	85	86	87	88	89
		Vicat 軟化溫度 (Vicat Softening Temp.)	D1525	102	101	100	101	102	103	104
		流動指數 (Melt Flow index)	D1238	0.5 6.0	1.0 10.0	1.2 12.0	1.6 16.0	1.8 18.0	2.2 20.0	2.1 19.0
		燃燒性 (Flammability)	UL-94	94HB	94HB	94HB	94HB	94HB	94HB	94HB
E L E C T R I C A L	電 氣 性	相對溫度指數 (Relative Temp index)	UL-746B	-	-	60	60	60	60	60
		抗熱線燃燒性 (High Current Arc ignition)	UL-746A	-	-	15	13	17	18	15
		抗電弧性 (High Current Arc ignition)	UL-746A	-	-	200	200	200	200	15
		電弧產生速率 (Arc Tracking Rate)	UL-746A	-	-	0	0	0	0	0
O T H E R S	其 他	比重 (Specific Gravity)	D792	1.03	1.03	1.03	1.03	1.03	1.03	1.04
		硬度 (Rockwell Hardness)	D785	103	102	100	107	110	115	119
		成型收縮 (Mold shrinkage)	D955	0.4	0.4	0.4	0.4	0.4	0.4	0.4
		吸水率 (Water Absorption)	D570	0.3	0.3	0.3	0.3	0.3	0.3	0.3

SGS 台灣網站 → [http://twap.sgs.com/sgsrsts/chn/cheres\\_tw.asp](http://twap.sgs.com/sgsrsts/chn/cheres_tw.asp)  
SGS 大陸網站 → [http://rsts.cn.sgs.com/chn/cheres\\_cn.asp](http://rsts.cn.sgs.com/chn/cheres_cn.asp)  
SGS 韓國網站 → [http://rohs.kr.sgs.com/sgsrsts/en/cheres\\_en.asp](http://rohs.kr.sgs.com/sgsrsts/en/cheres_en.asp)

請輸入以下報告正確資料及檢查碼以便查核

- 1. 報告編號
- 2. 報告日期 (YYYY/MM/DD)
- 3. 產品名稱 (輸入前 10 個字不含空白)
- 4. 圖示檢查碼 (依指示畫面)



物料中RoHS對象物質含量調查表

康捷電子有限公司	
填表：	張恆雪
部門：	研發部
職務：	文員

物料名稱：R-AN2400-1901RS

序號	物料型號	物料各構成名稱	各構成材料的材質	測試報告裡RoHS對應物質測試結果						檢測報告編號	測試日期	測試名稱	測試機構名稱
				Cd	Pb	Hg	Cr(VI)	PBBs	PBDEs				
1	R-AN1901-01	天線塑膠外套	TPE	4	15	N.D.	Negative			GZ0701016735/CHEM	2007/2/6	TPEE	大陸SGS
2	R-AN03-T02 R-AN03-T01	連接頭	PA+ABS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	CE/2007/B2671A	2007/11/21	PA+ABS ALLOY	台北SGS
3	R-AN03-514CZ	定位柱	銅	27	29017	N.D.	Negative			CANEC0800023303	2008/1/23	JisC3604BD COPPER	大陸SGS
4	R-SMA324-ZC8MRANT	SMA公頭母針	鋅合金	N.D.	22	N.D.	Negative	N.D.	N.D.	GZ0801009600/CHEM	2008/2/17	鋅合金鋅Zn-3#	大陸SGS
5	R-AN1901-06	彈簧	銅	N.D.	N.D.	N.D.	Negative			GZ0702023962/CHEM	2007/3/5	SKYEAGLE CARBON STEEL	大陸SGS
6	R-AN94-02S	Tube	銅	11	4	N.D.	Negative			SZTYR070410642/LP	2007.04.12	黃銅管	大陸SGS
7	R-RG-178U	線材	RG178	N.D.	N.D.	N.D.	Negative	N.D.	N.D.	SH7082518/CHEM	2007/8/1	COAXIAL CABLE	大陸SGS
8	R-AN1901-04A	套筒	ABS	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	KA/2007/C2091	2008/1/2	ACRYLONYTRILE	台北SGS

根據測試報告如實填寫鉛、鎘、汞、六價鉻、PBBs和PBDEs六項禁用物質的含量  
包裝材料中鉛、鎘、汞、六價鉻總含量不超過100ppm，鎘的允許濃度為5ppm