Measurement of Maximum Permissible Exposure

1. Foreword

In adopt with the Human Exposure IEEE C95.1, and according to the FCC 1.1310. The *Maximum Permissible Exposure (MPE)* is obligated to measure in order to prove the safety of radiation harmfulness to the human body.

The *Gain* of the antenna used is measured in an *Anechoic chamber.* The *maximum total power to the antenna* is to be recorded. By adopting the ***Friis Transmission Formula*** and the *power gain of the antenna,* we can find the distance right away from the product, where the limit of the MPE is.

2. Description of EUT

FCC ID	**:**	SLEW321
Product name	**:**	RISC-based Ready-to-Run Wireless Embedded Computer
Model	**:**	ThinkCore W321, ThinkCore W321-LX
Classification	**:**	Mobile Device (i) Under normal use condition, the antenna is at least 20cm away from the user; (ii) Warning statement for keeping 20cm separation distance and the prohibition of operating next to the person has been printed in the user's manual
Frequency Range	**:**	5.150GHz ~ 5.250GHz
Operating Frequency	**:**	5.180GHz ~ 5.240GHz
Supported Channel	**:**	13 Channels
Modulation Skill	**:**	DBPSK, DQPSK, CCK, OFDM
Power Type	**:**	Powered by the switching adapter, Manufacture: BALANCE ELECTRONICS CO., LTD. Model: GPSA-1200125 I/P: 100 ~ 240VAC ~ 50/60Hz 0.5A O/P: 12VDC 1.2A. Primary: 182cm length, non-shielded, without ferrite core Secondary: 186cm length, non-shielded, without ferrite core

3. Limits for *Maximum Permissible Exposure (MPE)*

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Filed Strength (H) (A/m)	Power Density (S) (mW/cm2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	100	6
3.0-30	1842/f	4.89/f	$900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	100	30
1.34-30	824/f	2.19/f	$180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

[The EUT is tested in transmit and receive modes and in the first, middle and the last channel separately. The following shows only our observation have the greatest emissions.]

According to **OET BULLETIN 56 Fourth Edition/August 1999**, **Equation for Predicting RF Fields:**

Friis Transmission Formula: $S = \frac{PG}{4\pi R^2} = \frac{21.33 \times 1.585}{4\pi (20)^2} = 0.00673 mW/cm^2$

Estimated safe separation: $R = \sqrt{\frac{PG}{4\pi}} = \sqrt{\frac{21.33 \times 1.585}{4\pi}} = 1.64 cm$

Remarks: "The safe estimated separation that the user must maintain from the antenna is at least 4.73cm"

Where: S = *power density* (in appropriate units, e.g. mW/cm2)

P = *power input* to the antenna (in appropriate units, e.g., mW)

G = *power gain* of the antenna in the direction of interest relative to an isotropic radiator

R = *distance* to the center of radiation of the antenna (appropriate units, e.g., cm)

The *Numeric gain G* of antenna with a gain specified in dB is determined by:

G = Log $^{-1}$ (***dB*** antenna gain / 10)

G = Log $^{-1}$ (2.00 / 10) = 1.585

Appendix

Antenna Specification

料件承認書

文件編號：		版本：1.0
品號：	1602020019400	製造商： 寰波
品名：	Dual-Band Omni-Directional Antenna	
規格：		
適用產品：	2.4/ 5.0/ 5.2/ 5.6/ 5.8GHz	
附件：	☐ 1.系列承認清單 ☐ 2.Moxa 內部測試報告 ✓ 3.廠商承認書 ☐ 4.UL 認證報告 ☐ 5 CSA 認證報告 ☐ 6.TUV 認證報告	
	✓ 7.RoHS 認證報告/RepNo. CE/2004/A1528 CE/2006/10629 KA/2005/40650 CE/2006/63956 CE/2004/C1498 CE/2006/63959 CE/2005/83039 CE/2004/53035 CE/2006/41802 CE/2006/47581 KE/2005/41696 CE/2004/B4117A CE/2005/92596A CE/2005/92597A CE/2006/14801A KE/2006/20995 ☐ 8. SONY 認證報告/RepNo. /自我	

核准：洪誠	審核：洪誠	撰寫：明松			發 行 章
相 關 單 位 會 簽					
				品保	
				家齊	

品號	版本	修訂內容	修訂原因	日期	修訂者
1602020019400	1.0	新料件承認		09-12-06	明松

料件檢驗標準

品號	1602020019400	品名	Dual-Band Omni-Directional Antenna	規格	2.4/ 5.0/ 5.2/ 5.6/ 5.8GHz

料件承認作業確認

1. 電氣功能之驗証 ✔ 已完成 ☐未執行，原因：
2. 實體組裝之測試 ✔ 已完成 ☐未執行，原因：
3. 執行生產可行性評估 ☐ 已完成 ✔未執行，原因：
4. 檢查供應商所附文件是否完整 ✔ 已完成 ☐未執行，原因：
5. 檢驗綠色料件標準 ✔ 符合 RoHS ☐符合 SONY ☐非綠色料件

檢驗項目

尺寸(含公差)部份

☐說明如下(單位標示公制) ✔如附之尺寸圖

Mechanism size Check/Compare (單位 ：mm)

項次	檢驗項目	檢驗方法	規格	公差	圖面位置	實測 1	實測 2	實測 3	實測 4
1									
2									
3									
4									
5									
6									
7									
8									
9									

顏色部份

顏色：

可參考：✔sample ☐附件之色板

外觀印刷規格說明

圖案之大小、顏色、位置－ ☐如下說明 ✔參考所附文件

文字之大小、顏色、位置、字型－ ☐如下說明 ✔參考所附文件

原物料封裝及包裝說明

IC 封裝方式：

料件包裝方式：25 支裝一包,20 包裝一紙箱

特殊檢驗要求

IC 版本：

IC 外觀標示圖與標註檢驗項目：

其它注意事項

操作溫度 ：-10~55℃

Dual-Band Omni-Directional Antenna for 2.4 / 5.0 / 5.2 / 5.6 / 5.8 GHz

Version 2

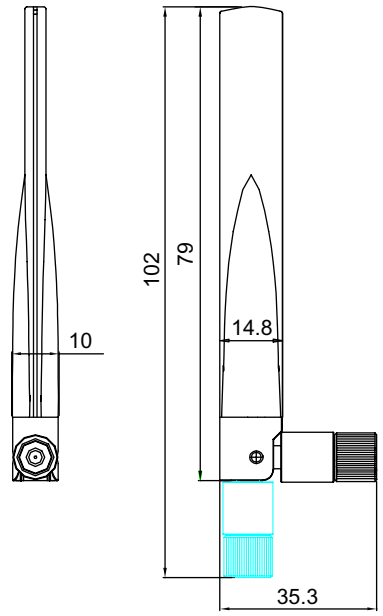
SAA05-220420

Electrical Specification

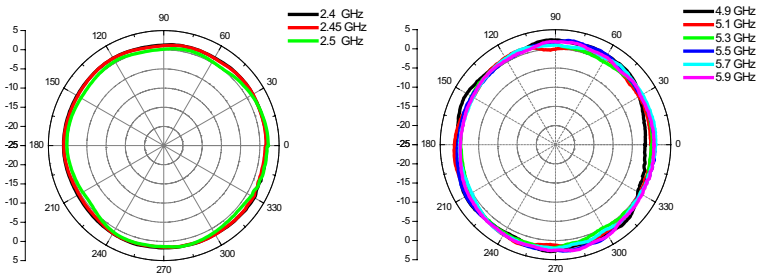
Frequency range	2400 MHz - 2500 MHz	4900 MHz - 5875 MHz
Peak Gain	2 dBi	2 dBi
Average Gain	1 dBi	1 dBi
VSWR	2.0 : 1 Max.	2.0 : 1 Max.
HPBW / horizontal	360°	360°
HPBW / vertical	80°	80°
Polarization	Linear, vertical	Linear, vertical
Power handling	2 W (cw)	2 W (cw)
Impedance	50 Ohms	50 Ohms
Connector	RP SMA Plug	

Environmental & Mechanical Characteristics

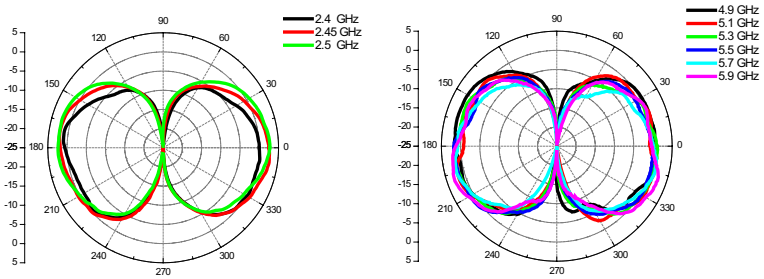
Temperature	- 10° C to +55° C
Humidity	95% @ 55° C
Radome color	Black
Weight	9 g
Dimensions	79 x 35.3 x 10 mm



H-plane Co-polarization Pattern



V-plane Co-polarization Pattern

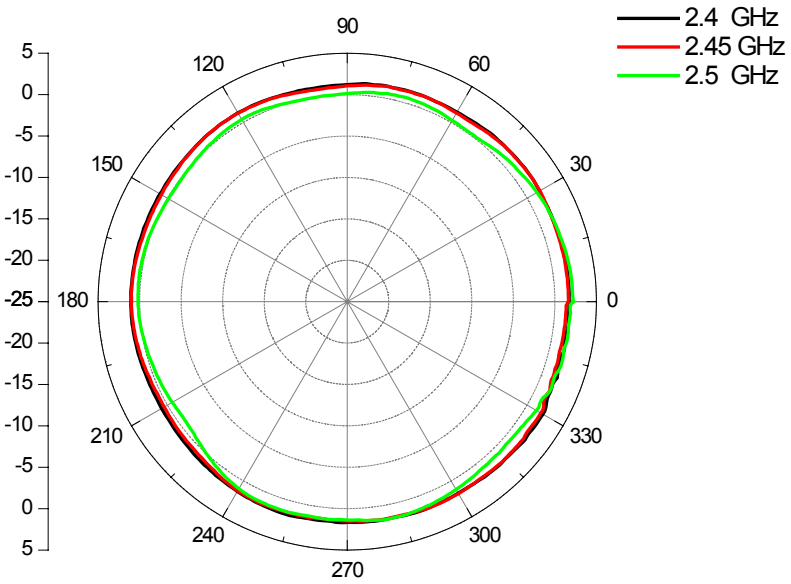


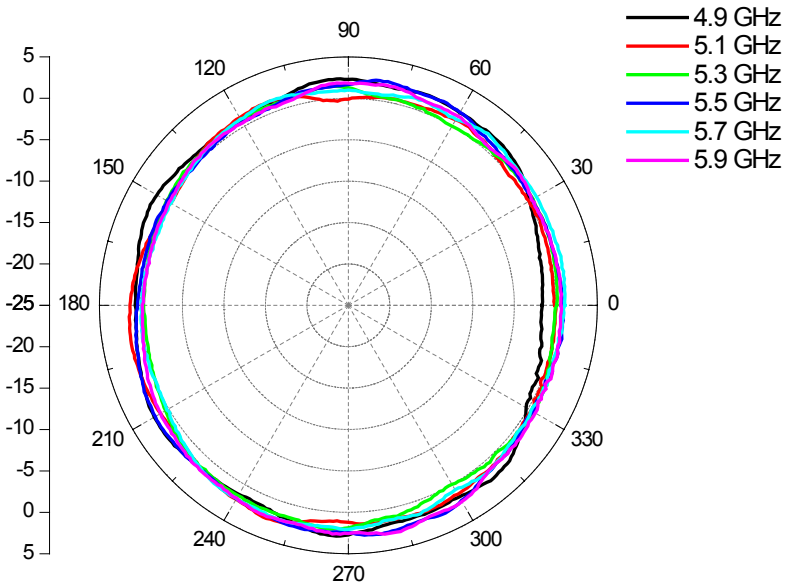
http:// www.smartant.com TEL: +886 (0)3 583-6000 FAX: +886 (0)3 583-7000 E-mail: service@smartant.com

SAA05-220420

Radiation Pattern (1/2)

H-plane Co-polarization Pattern

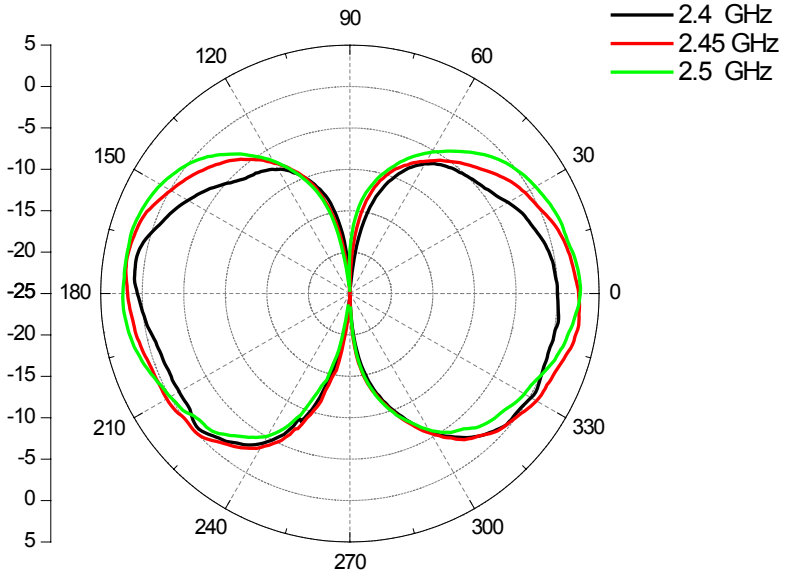


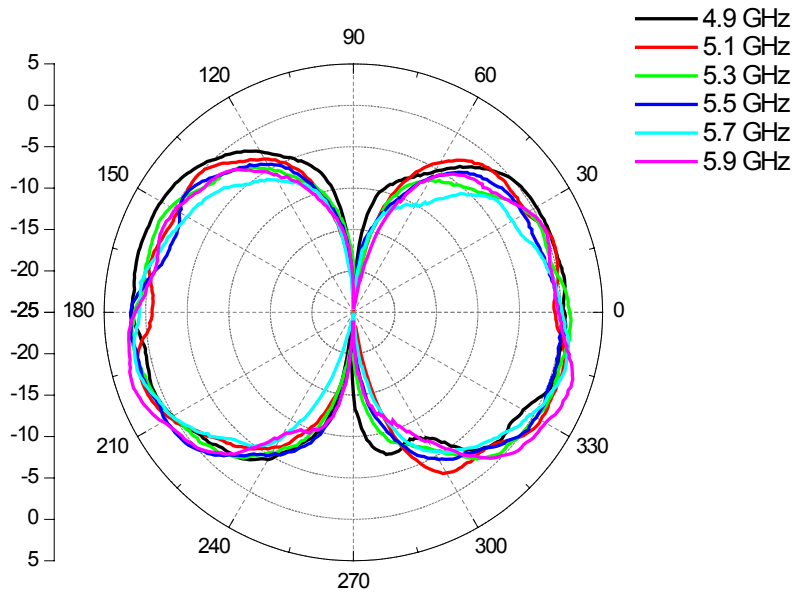


SAA05-220420

Radiation Pattern (2/2)

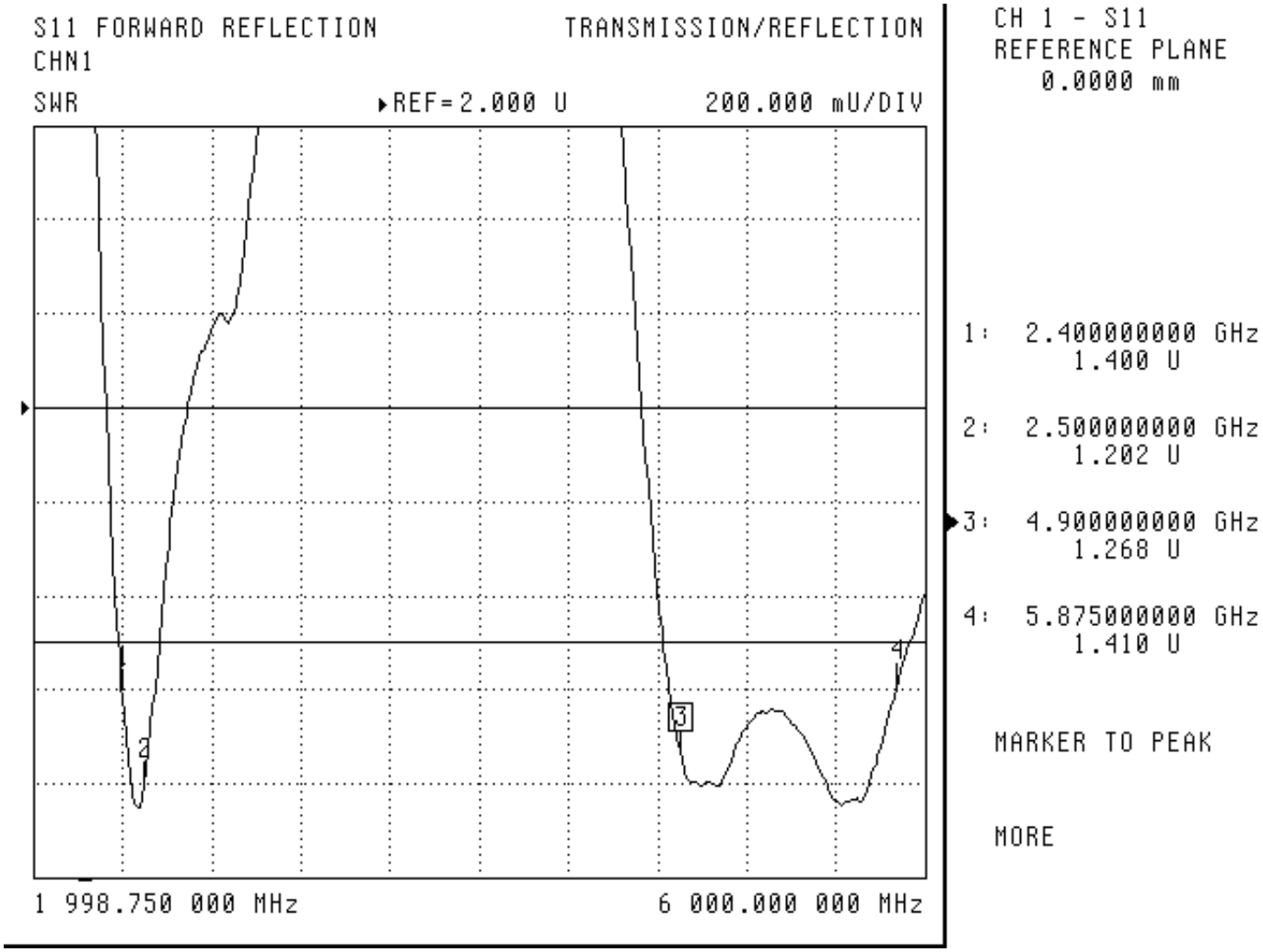
V-plane Co-polarization Pattem





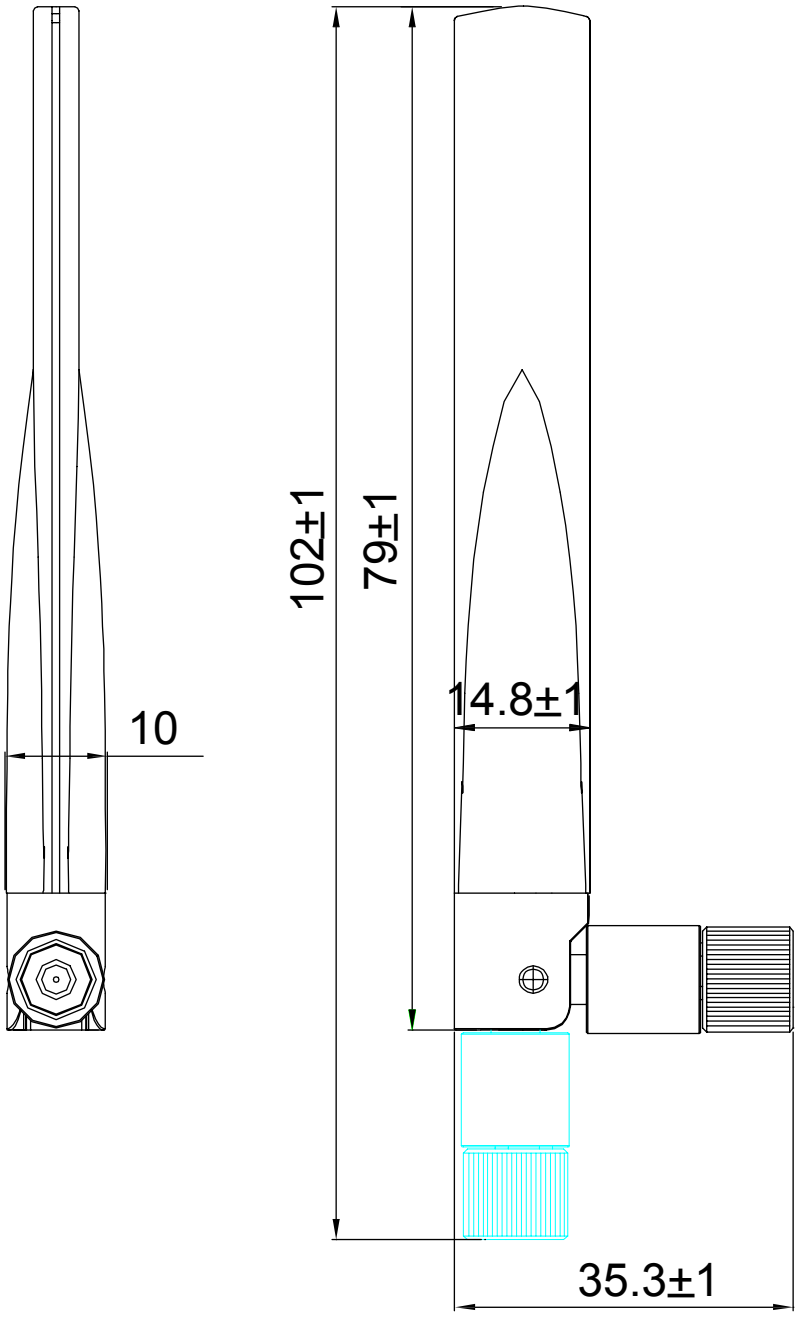
SAA05-220420

VSWR



SAA05-220420

Product Drawing



Reliability Test Report (1/2)

寰波科技股份有限公司

SmartAnt Telecom Co.,Ltd.

Reliability Test Report

Model： SAA05-220420

Product Name：Dual-Band Omni-Directional Antenna

Nickname：小小王子

Frequency：2.4GHz~2.5GHz
4.9GHz~5.875GHz

VSWR：2.0：1 Max

Test Results：■ PASS □ NG

Approved By	Review By	Prepared By

Reliability Test Report (2/2)

Reliability Test Result :

	Test Group		A					Judgment
	Test Sample No.		01	02	03	04	05	
Test Flow	1	Composite Temperature/Humidity Cycling Test	○	○	○	○	○	PASS
	2	Cold Test	○	○	○	○	○	PASS
	3	High Temperature Test	○	○	○	○	○	PASS
	4	Pull Force	○	○	○	○	○	NA
	5	Angel Measurement	○	○	○	○	○	PASS

Conclusion: All visual inspection is normal and function is ok.

Reliability Test Specification:

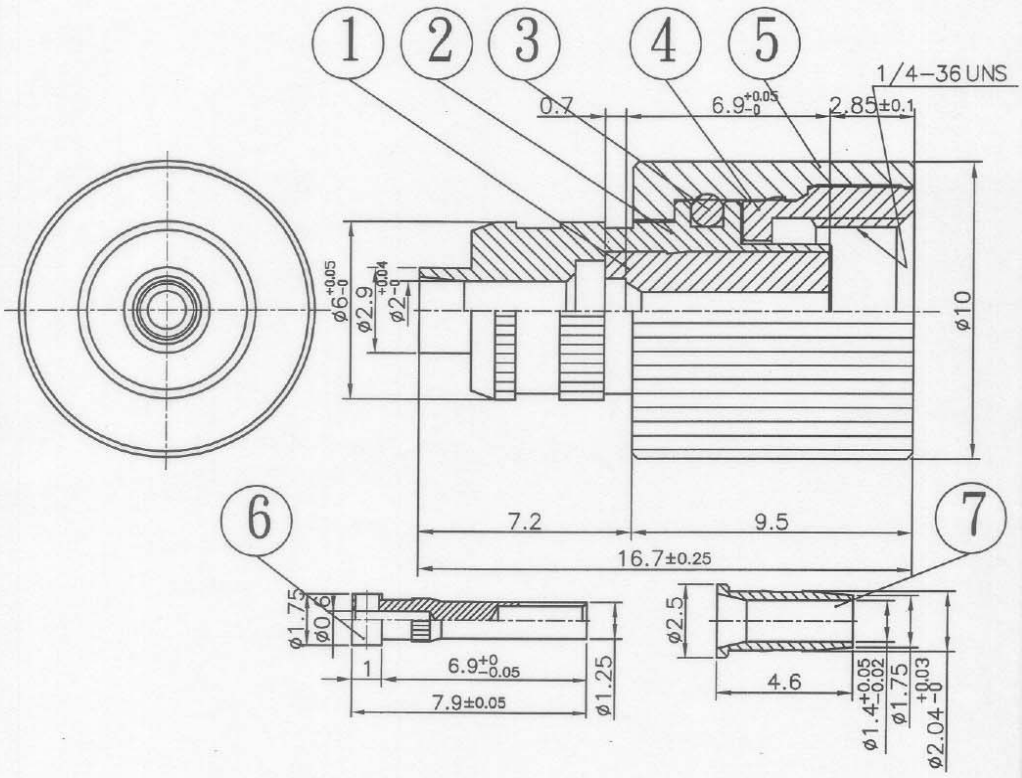
No	Test Item	Duration	Temperature	Refer to standard	Note
1	Composite Temperature/Humidity Cycling Test	65hr	-10~55℃ 95%RH	IEC 68-2-30	NA
2	Cold Test	50hr	-10℃	IEC 68-2-1	NA
3	High Temperature Test	50hr	55℃	IEC 68-2-2	NA
4	Pull Force	EA/Time	23±5℃	Smartant Standard	NA
5	Angel Measurement	EA/Time	23±5℃	Smartant Standard	NA

SAA05-220420

Material Approval - Connector (1/7)

REV:1

NO.	REV' NO.	DATE	NOTE	REV' BY	APPROVED	REMARK
⚠						
⚠						



NOTE:
1. PATENT PENDING
2. GENERAL TOLERANCE: ±0.1mm

Q'TY	NO.	DWG. NO.	PART NAME	MATL	REMARK
1	7	XAE4B035	RP-SSMA-PIN	PHOS.BRZN	Gold 1u"
1	6	XAF4B034	RP-SSMA-E	BRASS	Gold 1u"
1	5		SSMA-D-X1	DELRIN	Black
1	4		SSMA-A-X	BRASS	Gold 1u"
1	3		SSMA-O	NBR	Black
1	2		SSMA-B-X	BRASS	Gold 1u"
1	1		RP-SSMA-P	HD.PE	

SCALE	MATL	FINISHED	ASS'Y	
5/1				
THIRD ANGLE	UNIT mm		PART NAME RP-SSMA-BL	DWG. NO. XAA4C626
APPROVED	CHECKED			
John 92.10.27	Irven 92.10.27	LILY 92.10.27		

Material Approval - Connector (2/7)

REV:1

SPECIFICATIONS		
VOLTAGE WITHSTANDING	AC500V	
CURRENT RATING	1A	
IMPEDANCE	50Ω	REMARK
FREQUENCY RANGE	6 GHz	
CABLE TYPE	RG 178	
WEIGHT		

STANDARD SPEC

NO	ITEM	CONDITION	SPEC. MAX	SPEC. MIN	SPEC. UNIT	SPEC. TIME	CHECK(1) A	CHECK(1) B
1	THREAD	USE GO –NO GO GAUGE TEST					–	○
2	INSULATION RESISTANCE	DC 500V, >5000 MΩ		5000	MΩ		–	○
3	VSWR	6 GHz, ≦1.5	1.5				–	○
4	Salt Spray	Min. 48 Hours		48	hrs		–	○
5	TEMPERATURE RANGE	-20℃~85℃						
6	-	-	-					

PART NAME	CONTROL NO.	RECORD	CHECK	APPROVED
RP SSMA-BL		Lily 10/6-03'	Irven 10/6-03'	John 10/7-03'
DWG. NO.	ASS'Y DWG. NO.			

(1) A : OFTEN CHECK B : REGULAR CHECK

Material Approval - Connector (3/7)

宮前五金股份有限公司 REV:1

BRASS 黃銅材質

檢驗報告表

編號:：　　91年4月22日

客戶		
品名	FREE CUTTING BRASS ROD	
規格	JIS H3250 C3604 BD	
項目 \ 數據	成份含量	備註
化學成份% Cu	57.0 - 61.0	
化學成份% pb	1.8 - 3.7	
化學成份% Fe	< 0.5	
化學成份% Sn+Fe	< 1.2	
化學成份% Zn	REMAINDER	
其它		
其它		
其它		

宮前五金股份有限公司 (TEL:(03)3282411-5)

桃園縣龜山鄉頂湖一街 24號　TEL: (03) 3283065-70

Material Approval - Connector (4/7)

宮前五金股份有限公司 REV:1

BRASS 黃銅材質

檢驗報告表

編號:：　　91年4月22日

客戶			
品名		FREE CUTTING BRASS ROD	
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項目 \ 數據		成份含量	備註
化學成份%	Cu	57.0 - 61.0	
	pb	1.8 - 3.7	
	Fe	< 0.5	
	Sn+Fe	< 1.2	
	Zn	REMAINDER	
其它			

宮前五金股份有限公司 TEL:(03)3283211-5

桃園縣龜山鄉頂湖一街 24 號　TEL: (03) 3283065-70

Dual-Band Omni-Directional Antenna for 2.4 / 5.0 / 5.2 / 5.6 / 5.8 GHz

Version 2

SAA05-220420

Material Approval - Connector (5/7)

USI

UNITHENE® 聯塑烯 HIGH DENSITY POLYETHYLENE RESINS

高密度聚乙烯塑膠原料

產品 Products / 物性 Physical Properties	單位 UNIT	檢驗方法 TEST METHOD (ASTM)	擠壓 Extrusion	射出成型 Injection Molding						迴轉成型 Rotomolding
			LH901	LH606	LH606-13	LH614	LH506	LH514	LH523	LH405
主要用途 MAIN APPLICATIONS			•扁絲加工 •粗圓絲加工 •薄膜與平板擠壓 •Flat yarn •Coarse monofilament •Film & Sheet extrusion	•射出成型 •細圓絲加工 •Injection molding •Fine monofilament	•射出成型(用於製造塑膠箱) •Injection molding for crate	•射出成型 •鑄膜擠壓 •Injection molding •Casting	•射出成型 •Injection molding	•射出成型 •鑄膜擠壓 •Injection molding •Casting	•射出成型 •Injection molding	•迴轉成型 •射出成型 •Rotation molding •Injection molding
熔融指數 MELT INDEX	克/10分 g/10min	D1238	0.95	6.0	6.0	12	6.0	12	23	6.0
密度 DENSITY	克/立方公分 g/cm³	D1505	0.953	0.962	0.962	0.962	0.955	0.956	0.956	0.938
降伏點抗張強度 YIELD POINT TENSILE STRENGTH A.模片(MOLDED) B.吹膜(BLOWN FILM) MD*/TD**	公斤/平方公分 kg/cm²	D638 D882	A. 250 B. —	A. 310 B. —	A. 320 B. —	A. 310 B. —	A. 250 B. —	A. 250 B. —	A. 230 B. —	A. 230 B. —
斷裂點抗張強度 BREAK POINT TENSILE STRENGTH A.模片(MOLDED) B.吹膜(BLOWN FILM) MD*/TD**	公斤/平方公分 kg/cm²	D638 D882	A. 300 B. —	A. 220 B. —	A. 220 B. —	A. 150 B. —	A. 290 B. —	A. 180 B. —	A. 290 B. —	A. 240 B. —
伸長率 ELONGATION A.模片(MOLDED) B.吹膜(BLOWN FILM) MD*/TD**	百分率 %	D638 D882	A. 1100 B. —	A. 600 B. —	A. 620 B. —	A. 170 B. —	A. 760 B. —	A. 550 B. —	A. 300 B. —	A. 1100 B. —
抗衝擊強度 IZOD IMPACT STRENGTH	公斤力公分/公分 kg-cm/cm	D256	55	7.0	7.0	3.5	11	4.0	3.5	8.0
彈性係數(模片) 1% SECANT MODULUS (MOLDED)	公斤/平方公分 kg/cm²	D638	7400	9900	10000	10000	8400	7800	7600	6800
扭轉剛性 TORSIONAL STIFFNESS	公斤/平方公分 kg/cm²	D1043	6100	12500	12500	12100	10000	9600	9200	5800
彎曲剛性 FLEXURAL STIFFNESS	公斤/平方公分 kg/cm²	D747	11000	9900	9900	9800	9200	8300	8200	6600
低溫脆裂溫度 LOW TEMPERATURE BRITTLENESS	度/半數破壞 °C /F50*	D746	<-76	<-76	<-76	<-76	<-76	<-76	<-76	<-76
維氏軟化溫度 VICAT SOFTENING TEMPERATURE	度 °C	D1525	125	127	127	126	125	125	125	115
熔點 MELTING POINT	度 °C	D2117	130	131	131	131	129	129	128	125
硬度 HARDNESS	蕭氏 D Shore D	D2240	68	69	69	69	68	68	68	62

*F50=50% failure 50%破裂或脆裂
+MD : Machine Direction 縱向：加工方向
++TD : Transverse Direction 橫向：橫切方向

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公元二 oo 一年六月發行
ISSUED IN June 2001

REV:1

Material Approval - Connector (6/7)

REV:1

Home | What's New | Product | Company

Polyplastics Product lines> POM(TEPCON) Grade Line-Up

Product
Product Lines
POM(TEPCON)
Brand Name List

Search
Search for :
GO
Site Map
Global Top

▶POM(TEPCON) Polyplastics Taiwan Co., Ltd. 台灣寶

POM(TEPCON) Grade Line-Up(ISO)

Item	Unit	Testing Method	M25	M90	M130	Standard M270	M3
			High Viscocity	General	High Fluidity	High Fluidity·High Cycle	High Fluidity Cycle
Density	g/cm³	ISO 1183	1.41	1.41	1.41	1.41	1.4
Stress at yield	MPa	ISO 527-1, 2	59	62	62	63	6:
Strain at break	%	ISO 527-1, 2	40*	35*	33*	30*	28
Tensile modulus	MPa	ISO 527-1, 2	2,500	2,700	2,700	2,800	2,8
Flexural strength	MPa	ISO 178	81	87	87	88	8
Flexural modulus	MPa	ISO 178	2,350	2,500	2,500	2,550	2,5
Charpy notched impact strength	kJ/m²	ISO 179/1eA	8.0	6.0	5.5	5.3	5.
Temperature of deflection under load (1.80MPa)	°C	ISO 75-1, 2	90	95	100	100	10
Coefficient of linear thermal expansion (23-55°C) Parallel	×10-5/°C	ISO 11359-2	13	12	11	11	1
Coefficient of linear thermal expansion (23-55°C) transverse	×10⁻⁵/°C	ISO 11359-2	12	12	11	11	1
Electric strength	kV/mm	IEC 60243-1	19	19	19	19	1
Volume resistivity	Ohm·cm	IEC 60093	1×10¹⁴	1×10¹⁴	1×10¹⁴	1×10¹⁴	1×1
Surface resistivity	Ohm	IEC 60093	1×10¹⁶	1×10¹⁶	1×10¹⁶	1×10¹⁶	1×1
Comparative tracking index	CTI	IEC 60112	600+	600+	600+	600+	60
Arc resistance (UL)	s	—	—	—	—	—	—
Flammability	—	UL94	HB	HB	HB	HB	H

DELRIN 材質.

* Nominal strain at break

- All figures in the table are the typical values of the material and not the minimu the material specifications.
- For qualified values of UL (Underwriters Laboratories Inc.) refer to the yellow No.E146187) issued by UL

1)Please note that these···

SAA05-220420

Material Approval - Connector (7/7)

FAX NO. =

P. 002 REV:1

NANCAR®

NBR POLYMER DATA

NBR 特性

NANCAR® 1051

NANCAR® 1051 rubber is a cold polymerized, high acrylonitrile copolymer with excellent oil resistance. This polymer has excellent processing characteristics in compounds whore improved flow and knitting are desired and is especially valuable in high durometer compounds.

NANCAR® 1051 rubber provides good processing and building tack. It is suggested for use in molded goods, friction stock and similar applications.

POLYMER PROPERTIES

	Typical Value
Bound acrylonitrile, %	41
Mooney viscosity, ML_{1+4} @ 100 ℃	68
Heat loss, %	0.4
Ash, %	0.6
Specific gravity,	1.00
Solubility in MEK, %	100
Stabilizer,	Slight staining

COMPOUND PROPERTIES

	Cured @ 150 ℃ Minutes	Typical Value
Compound mooney, ML_{1+4} @ 100 ℃	—	85
Mooney scorch, large rotor, @ 125 ℃		
Minimum viscosity	—	51
Minutes to 5 points rise, t_5	—	27.5
Minutes to 35 points rise, t_{35}	—	32.0
Tensile strength, kg / cm²	40	255
Elongation, %	40	480
Modulus at 300 % elongation, kg / cm²	20	124
	40	156
	60	166
Hardness, Durometer A, points	40	72
Compression set, @ 100 ℃ × 70hours, %	60	58

TEST RECIPE ASTM D-3187

	Parts
NANCAR 1051	100.00
NBS 370 Znic oxide	3.00
Sulfur, 2 % $MgCO_3$ coated	1.50
NBS 372 Stearic acid	1.00
NBS 378 HAF black	40.00
NBS 384 TBBS	0.70
Total	146.20

Dual-Band Omni-Directional Antenna for 2.4 / 5.0 / 5.2 / 5.6 / 5.8 GHz

Version 2

SAA05-220420

Material Approval - Radome

ABS Characteristics

POLYLAC

特性 Typical Proper	試驗法 ASTM Test	單位 Units	一般級(General Purpose)						防火級(Flame Retardant)					耐熱級(Hifh Heart)		
			PA-707	PA-757	PA-717C	PA-727	PA-747	PA-709	PA-765	PA-765A	PA-765B	PA-764	PA-764B	PA-777B	PA-777D	PA-777E
引張強度 Tensile Strenght	D-638	kg/cm² (lb/in²)	500 (7,090)	480 (6,800)	450 (6,380)	485 (6,870)	385 (5,470)	400 (5,670)	690 (5,530)	400 (5,670)	400 (5,670)	370 (5,250)	430 (6,100)	430 (6,100)	440 (6,240)	440 (6,240)
延伸率 Tensile Elongation	D-638	%	15	20	25	20	30	40	15	15	25	15	20	15	15	10
彎曲彈性率 Flexural Modulus	D-790	10^4 kg/cm² (lb/in²)	2.9 (4.1)	2.7 (3.8)	2.5 (3.5)	2.7 (3.8)	2.2 (3.1)	2.3 (3.2)	2.1 (3.0)	2.3 (3.2)	2.4 (3.4)	2.0 (2.8)	2.3 (3.2)	2.4 (3.4)	2.5 (3.5)	2.5 (3.5)
彎曲強度 Flexural Strenght	D-790	10^4 kg/cm² (lb/in²)	860 (12,200)	790 (11,200)	720 (10,200)	780 (11,000)	620 (8,800)	640 (9,070)	620 (8,800)	640 (9,070)	650 (9,200)	590 (8,360)	660 (9,370)	700 (9,920)	750 (10,630)	750 (10,630)
洛氏硬度 Rockwell Hardness	D-790		R-116	R-116	R-115	R-110	R-108	R-102	R-100	R-100	R-102	R-96	R-102	R-112	R-115	R-115
IZOD衝擊強度 (NOTCHED) IZOD Impact Strenght)	D-256	1/8" kg-cm/cm (ft-lb/in)	14 (2.6)	20 (3.7)	28 (5.2)	26 (4.8)	41 (7.5)	45 (8.4)	22 (4.0)	24 (4.4)	26 (4.8)	14 (2.6)	20 (3.7)	23 (4.3)	17 (3.2)	12 (2.2)
		1/4" kg-cm/cm (ft-lb/in)	14 (2.6)	18 (3.3)	25 (4.6)	23 (4.2)	36 (6.6)	40 (7.4)	18 (3.3)	20 (3.7)	22 (4.0)	12 (2.2)	15 (2.8)	20 (3.7)	14 (2.6)	11 (2.0)
軟化點 Vicat Softening Temp	D-1525	℃(°F)	105 (221)	105 (221)	104 (219)	105 (221)	103 (217)	105 (221)	90 (194)	92 (197)	95 (203)	97 (208)	101 (214)	115 (239)	125 (257)	129 (264)
熱變形溫度 H.D.T	D-648 (annealed) (unanealed)	℃(°F)	99(210) 88(190)	99(210) 88(190)	98(208) 87(189)	99(210) 88(190)	97(206) 86(187)	98(208) 88(190)	83(181) 73(165)	85(185) 76(179)	86(187) 79(174)	92(198) 79(174)	96(205) 81(178)	107(225) 97(206)	115(239) 105(221)	120(248) 109(228)
比重 Specific Gravity	D-792	23/23℃	1.06	1.05	1.04	1.04	1.03	1.03	1.19	1.17	1.16	1.19	1.16	1.03	1.06	1.07
流動係數 Melt Flow Index	D-1238	200℃x5kg g/10min(Cond.G)	1.9	1.8	1.2	1.8	1.2	0.5	5.2	4.8	4.2	3.3	2.8	–	–	–
	ISO-1133*	220℃x5kg g/10min	20	22	12	19	13	5	60	48	42	33	28	6.7	6.0	5.0
燃燒率 Flammability		File No. E56070 UL & C-UL	1/16" HB	1/16" HB	1/16" HB	1/16" HB	1/16" HB	1/16" HB	1/16" V-O 1/10"5VA	1/12"V-O 1/10"5VA	1/10"V-O 1/16" V-2 1/8"5VA	1/16"V-O 1/10"5VA	1/10"V-O 1/8"5VA	1/16" HB	1/16" HB	1/16" HB
產品特性			高光澤性 高剛性	高剛性 高光澤性	一般射出成型用	電鍍級	超高強度 射出成型用	超高衝擊強度 押管用	難燃性 耐光性	難燃性 耐光性	難燃性 耐光性 耐熱性	難燃性 耐光性 耐熱性	難燃性 耐光性 耐熱性	耐熱性	超耐熱性	超高耐熱
Product Description			High Gloss High Rigid	High Gloss Medium	Medium Impact	Electro-Plating	High Impact	Super pact	F.R High Flow	F.R High Flow	F.R Medium Impact	F.R Weather Resistant	F.R Weather Resistant	High Heat High Impact	Super Hifh Heat	Super Hifh Heat

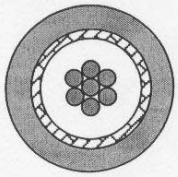
http:// www.smartant.com TEL: +886 (0)3 583-6000 FAX: +886 (0)3 583-7000 E-mail: service@smartant.com

Dual-Band Omni-Directional Antenna for 2.4 / 5.0 / 5.2 / 5.6 / 5.8 GHz

SAA05-220420

Material Approval - Cable (1/2)

SPECIFICATION

STYLE	200℃ 30V COAXIAL	DOCUMENT NO : A30178B001	
SIZE	RG-178B/U	ESTABLISHED DATE: 2000/06/29	
STANDARD : MIL-C-17			
Conductor	Size	AWG	30
	Material	----	Silver-Coated Copper Clad Steel
	Conductors No.	----	7
	Conductors Size	mm	0.102
	O.D.	mm	0.30
Insulation	Average Thickness	mm	0.28
	Diameter	mm	0.86
	Material	----	FEP
	Color	----	Clear
Braid	Material	----	Silver-Coated Copper
	Construction	mm	16 / 3 / 0.10
	Coverage	%	95
Jacket	Average Thickness	mm	0.25
	Diameter	mm	1.80 ±0.05
	Material	----	FEP
	Color	----	Brown
Marking	M17/93-RG178B/U WONDERFUL		
Drawing			

AK001/210X297/1.0 PAGE : 1
EDITION : 1.0 REVISED DATE :
MAKER : CONFIRM : APPROVAL :

WONDERFUL WIRE CABLE CO., LTD

SAA05-220420

Material Approval - Cable (2/2)

SPECIFICATION

Electrical & Physical Properties			
Item			RG-178B/U
Rating Temp Voltage			200℃ 30V
Conductor Resistance			838.0 OHM/KM/20℃ MAX.
Insulation Resistance			100 MEGA OHM/KM MIN.
Dielectric Strength			AC 1.0 KV/Minute
Spark Test			0.5 KV
Insulation	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / ㎟)
		Elongation	200% MIN.
	Aged	Tensile Strength	**UNAGED MIN.75%(168HRS×232℃)**
		Elongation	**UNAGED MIN.75%(168HRS×232℃)**
Jacket	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / ㎟)
		Elongation	200% MIN.
	Aged	Tensile Strength	**UNAGED MIN.75%(168HRS×232℃)**
		Elongation	**UNAGED MIN.75%(168HRS×232℃)**
Nom. Impedance			50 Ohms
VSWR			MAX. 1.3 at 0.4G~3GHz
Nom. Vel. of Prop.			69.5%
Flame Test			VW-1 OK

Attenuation (dB/100m)	50MHz	100MHz	400MHz	900MHz	1.8GHz	3GHz
	34.4	45.9	91.8	139.4	207.5	308.2

AK001/210X297/1.0 PAGE : 2
EDITION : 1.0 REVISED DATE :
MAKER : CONFIRM : APPROVAL :

Material Approval - PCB

I : YA PLASTICS CORPORATION
COPPER CLAD LAMINATE
QUALITY TEST REPORT

2, ıg-Yang Ind. Park,
Hsin-Kang Hsiang,
Jiayih, Taiwan

TEL:(05)3772111 FAX:(05)3771640

CUSTOMER: 文翔公司
ORDER NO: HCAFAS11
LOT NO: 4927243D
DATE:2004/10/18
PALLET NO:

MATERIAL SPEC.: NP-140TL H/H 0.77mm 1240mm x 0930mm WLCFHG (OVERALL THICKNESS)
IPC DESIGNATION: L21 0300 HH/HH B/A 48.8" x 36.6" (f x g)
REQUIREMENT: IPC-4101A
SPECIFICATION SHEET: IPC-4101A / 21

NAN YA PLASTICS
COPPER CLAD LAMINATE
QUALITY ASSURANCE

CHARACTERISTICS	UNIT	CONDITIONING	SPECIFICATION	RESULTS
VISUALS(SUB-/SURFACE)	-	IPC-4101A	A	OK
METAL THICKNESS	μm	IPC-4101A	Q:8.1~9.9 T:10.8~13.2 H:15.5~18.9 1:30.9~37.7 R:46.4~56.7 2:61.4~75.5 P:77.2~94.4 3:92.7~113.3 4:123.3~150.7	17.4
DIELECTRIC CONSTANT(1MHZ)		C 24/23/50	<5.4	4.22
SURFACE RESISTANCE	MΩ	C 96/35/90	<0.50mm 10^4↑ ≧0.50mm -----	4.5E7
SURFACE RESISTIVITY	MΩ	E 24/125	10^3↑	1.8E5
VOLUME RESISTANCE	MΩ-cm	C 96/35/90	<0.50mm 10^6↑ ≧0.50mm -----	6.5E8
VOLUME RESISIVITY	MΩcm	E 24/125	10^3↑	6.8E5
DISSIPATION FACTOR(1MHZ)		C 24/23/50	0.035↓ (CFRD、CFMD:0.020↓)	.018
ARC-RESISTANCE	sec	D48/50+D1/2 /23	60↑ (CFR5、CFM5:90↑)	121
FLEXURAL STRENGTH	N/mm²	LENGTHWISE A	<0.50mm ----- ≧0.50mm 414.27↑	560
FLEXURAL STRENGTH	N/mm²	CROSSWISE A	<0.50mm ----- ≧0.50mm 345.28↑	424
THICKNESS	m/m	A	≦1.2mm CLASS C/M >1.2mm CLASS B/L	OK
THERMAL STRESS		288℃ x 10sec	No blister delamination	OK
WARP AND TWIST	%		SINGLE DOUBLE	.296
		0.5-0.78 mm A	2.0↓ 1.5↓	
		>0.79 mm A	1.5↓ 1.0↓	
PRESSURE VESSEL		D25/119.6+des (260℃X 15sec)	IPC-TM-650	OK
MOISTURE ABSORPTION	%	E1/105+des+D24/23	<0.50 mm ≧0.50 mm 0.80% ↓ 0.35% ↓	.167
PEEL STRENGTH	lb/in	AFTER THERMAL STRESS	Qoz:5.0↑ Toz:5.0↑ Hoz:6.0↑ 1oz:8.0↑ Roz:10.0↑ 2oz:11.0↑ Poz:11.5↑ 3oz↑:12.0↑	8.97
TG GLASS TRANSITION TEMP	℃	A	140±5	140.9
FLAMMABILITY	sec	C 24/23/50	94-V0	OK
		E 24/125	94-V0	
DIELECTRIC BREAKDOWN	KV		40↑	60

THIS IS TO CERTIFY THAT THE MATERIAL BEING FURNISHED TO YOU MEETS THE IPC-4101A.
THE RESULTS OF THIS QUALITY TEST REPORT IS PASS.

APPROVED BY : N. C. Cheng. 合格

寰波科技股份有限公司

SmartAnt Telecom Co.,Ltd

Environment-Related Substances Report

Product Description: Antenna

SmartAnt P/N : SAA05-220420

Customer P/N:

2006/9/4

ENVIRONMENT-RELATED SUBSTANCES TO BE CONTROLLED-SAA05-220420

Item	Components		Test Item(Cr6+,Hg,Pb,PBBs,PBBEs<1000ppm,Cd<100ppm)							Pass/ Fail
			Cr6+	Cd	Hg	Pb	PBBs	PBBEs	Report No.	
1	Antenna Components	PCB	N.D	N.D	N.D	N.D	N.D	N.D	CE/2004/A1528	Pass
2		RG178 CABLE	N.D	N.D	N.D	N.D	N.D	N.D	CE/2006/10629	Pass
3		Joint	N.D	N.D	N.D	N.D	N.D	N.D	KA/2005/40050	Pass
4		Connector	Brass	N.D	34.9	N.D	27001.4	X	X	CE/2006/63956	Pass
			Phos.Bronze	N.D	N.D	N.D	N.D	X	X	CE/2004/C1498	Pass
			Au Plating	N.D	N.D	N.D	N.D	X	X	CE/2006/63959	Pass
			HD.PE	N.D	N.D	N.D	N.D	N.D	N.D	CE/2005/83039	Pass
			NBR	N.D	N.D	N.D	N.D	N.D	N.D	CE/2004/53035	Pass
			Delrin	N.D	N.D	N.D	N.D	N.D	N.D	CE/2006/41802,CE/2006/47581	Pass
5		Radome	N.D	N.D	N.D	N.D	N.D	N.D	KE/2005/41696	Pass
6	Packing	PE Bag	N.D	N.D	N.D	N.D	N.D	N.D	CE/2004/B4117A	Pass
7		Carton	表面紙板	N.D	N.D	N.D	11.3	X	X	CE/2005/92596A	Pass
			瓦稜芯紙	N.D	N.D	N.D	21.3	X	X	CE/2005/92597A	Pass
			INK	N.D	N.D	N.D	N.D	N.D	N.D	CE/2006/14801A	Pass
			RESIN	N.D	N.D	N.D	N.D	N.D	N.D	KE/2006/20995	Pass