

505922019029G		
ANT CABLE 2.4~2.5/5.1~5.9GHZ		
DWL08-220190 88/120MM 8/10DB		
	DWL08-220190	
0988-375-231		
WAPND04		
	<p data-bbox="1082 1877 1134 1910">N/A</p> <p data-bbox="1082 1933 1299 1966">2008/10/27 09:47:11</p>	
2008/10/27 15:32:02		

Omni-Directional Antenna

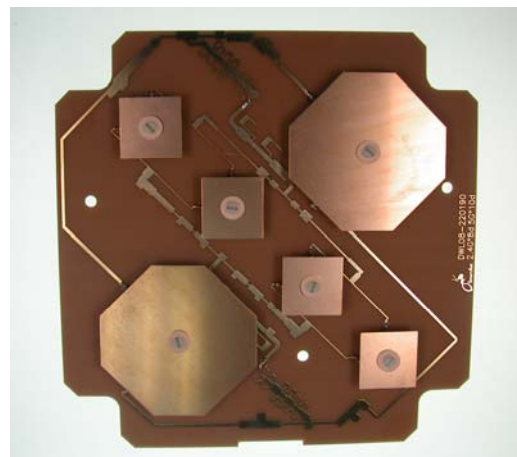
for 2.4 / 5.2 / 5.6 / 5.8 GHz

Version 1

DWL08-220190

Electrical Specification

Frequency range	2400 GHz - 2500 GHz	5100 GHz - 5900 GHz
Peak gain*	8.0 dBi	10 dBi
VSWR	2.0 : 1 Max	2.0 : 1 Max
Polarization	Dual polarization $\pm 45^\circ$	Dual polarization $\pm 45^\circ$
HPBW/horizontal	36° (2G)	20° (5G)
HPBW/vertical	65° (2G)	20° (5G)
Power handling	10W	
Down tilt	0°	
Connector	MMCX R/A plug	
Cable	RG-316,145MM,75MM	

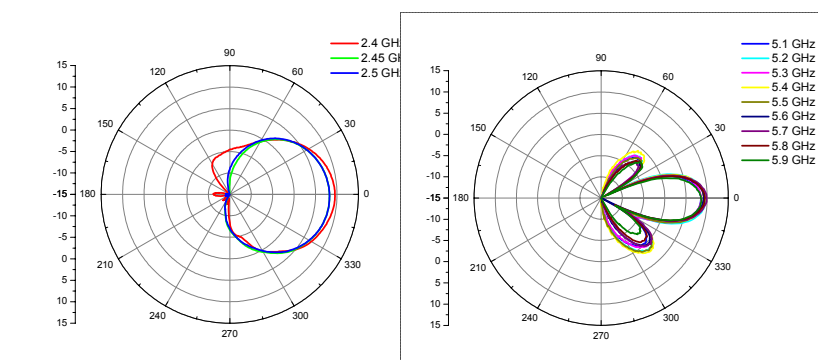


* Including cable loss.

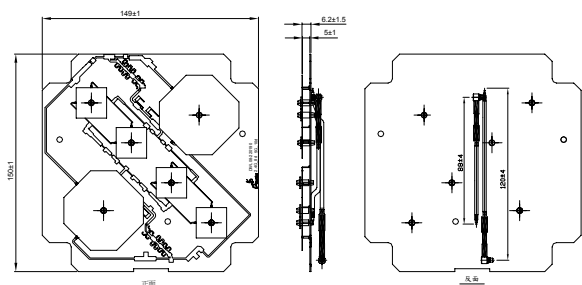
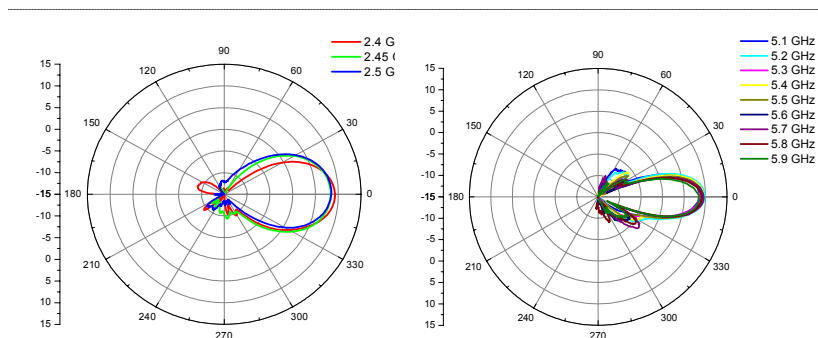
Environmental & Mechanical Characteristics

Temperature	-40°C ~ +80°C
Humidity	95% @ 55°C
Weight	63.5g
Dimensions	150*150*9mm

H-plane Co-polarization Pattern

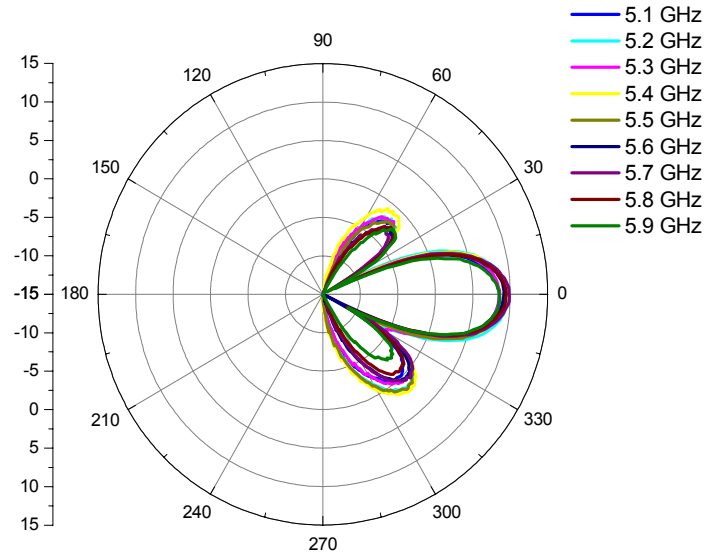
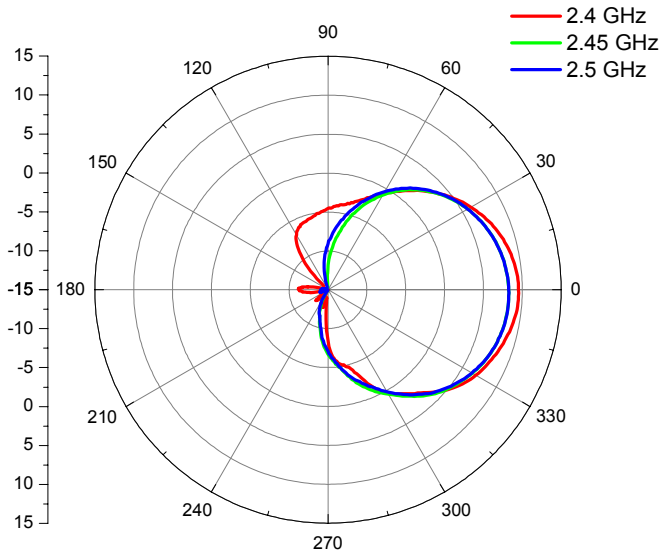


V-plane Co-polarization Pattern

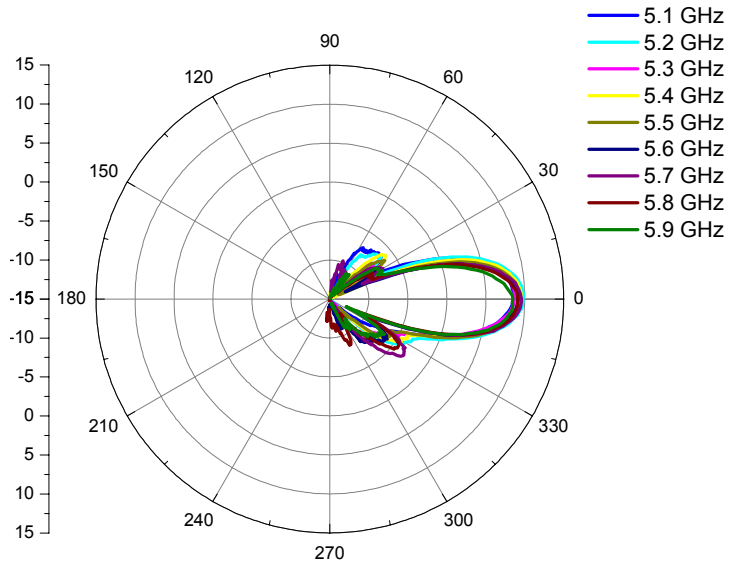
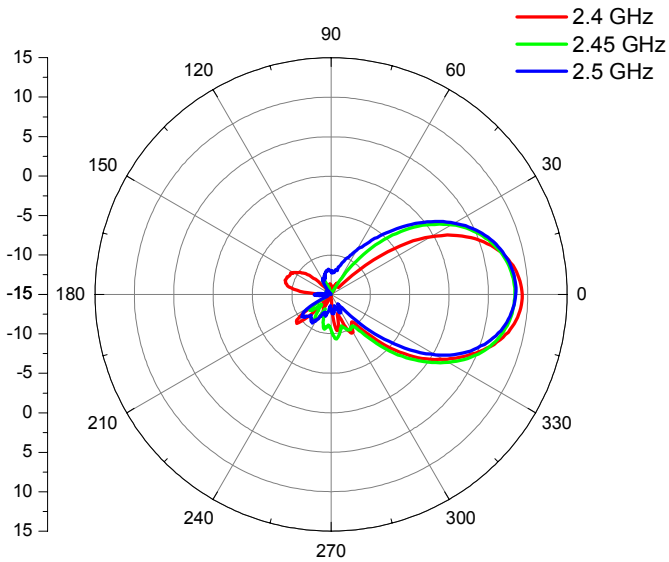


Radiation Pattern

H-plane Co-polarization Pattern



V-plane Co-polarization Pattern



VSWR

S21 FORWARD TRANSMISSION
CHN3

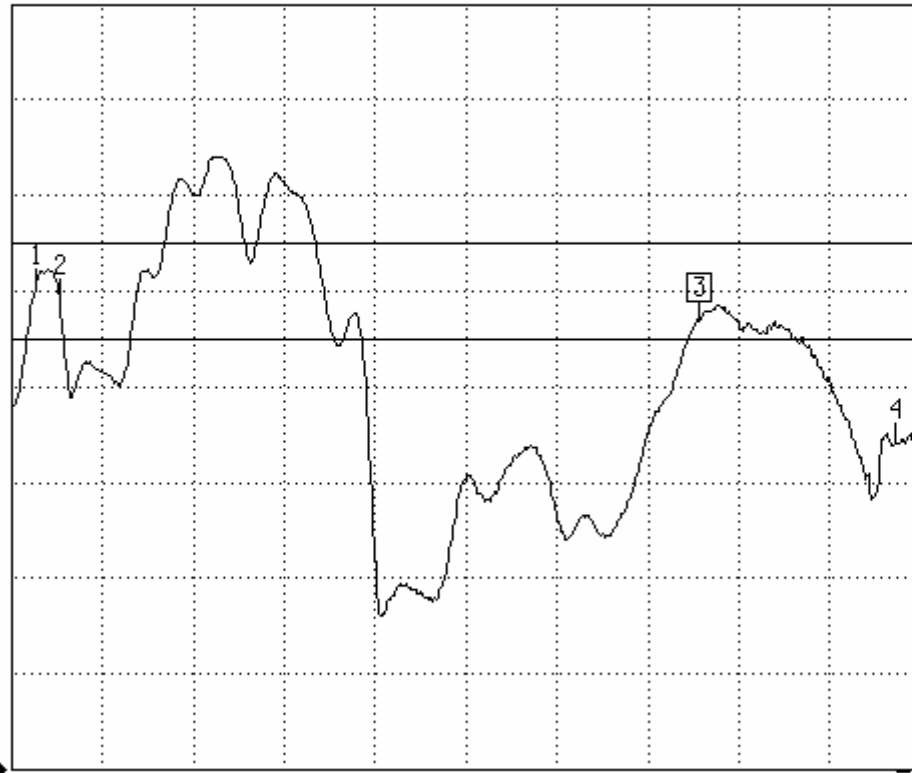
TRANSMISSION/REFLECTION

LOG MAGNITUDE

REF = -47.480 dB

5.000 dB/DIV

CH 3 - S21
REFERENCE PLANE
0.0000 mm



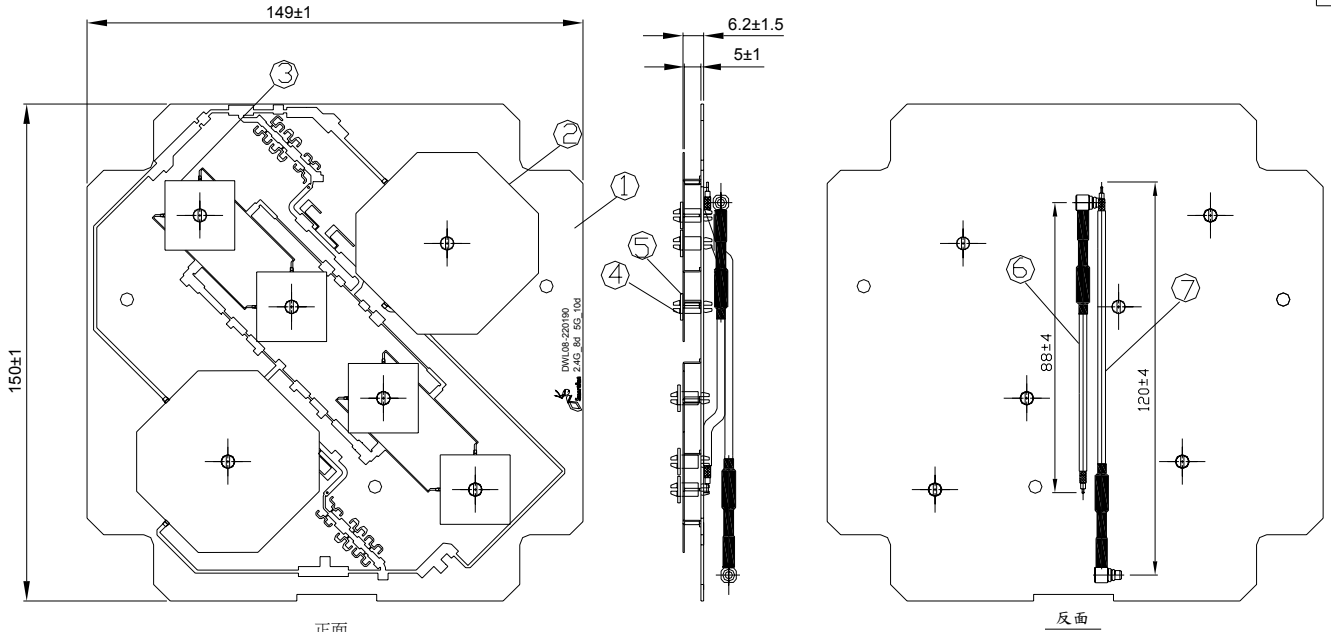
- 1: 2.400000000 GHz
-22.417 dB
- 2: 2.500000000 GHz
-22.919 dB
- 3: 5.100000000 GHz
-24.055 dB
- 4: 5.900000000 GHz
-30.488 dB

MARKER TO PEAK

MORE

Product Drawing

REV: 1



GENERAL TOLERANCE RANGE

<input type="checkbox"/> PCB(电路板)	±1MIL
<input checked="" type="checkbox"/> MACHINING(加工作)	X=±0.5 X.X=±0.2 X.XX=±0.1
<input type="checkbox"/> STAMP(冲製件)	X=±0.6 X.X=±0.3 X.XX=±0.1
<input type="checkbox"/> INJECTION(射出件)	X=±1 X.X=±0.5 X.XX=±0.15
<input type="checkbox"/> CASTING(壓鑄件)	X=±1 X.X=±0.5 X.XX=±0.15
<input type="checkbox"/> PACKING(包材)	X=±6 X.X=±3 X.XX=±1
<input type="checkbox"/> ASSEMBLY(組套件)	X=±4 X.X=±2 X.XX=±0.5
ANGLES: X=±2° X.X=±1° X.XX=±0.5°	

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LTR	REV. RECORD	DR	APVD

7		Cable Assembly- RG316 125MM/MMCX R/A PLIG	1
6		Cable Assembly- RG316 93MM/MMCX R/A PLIG	1
5		Nylon WS4-10	6
4		Round Spacer MSP-5	6
3		5G Patch(21*21MM)	4
2		2G Patch(52*52MM)	2
1		PCB OF FR4	1
ITEM	PART NO.	DESCRIPTION	Q'TY
Surface Treatment		MTL	
寰波科技股份有限公司 SmartAnt SmartAnt Telecom Co., Ltd.		DRAWN	May 09/04/08
DRW TITLE		ENGR	May 09/04/08
Cable Ass'y OF USI05-220170		APVD	
DWG.NO		SCALE	2:1 UNIT mm

Material Approval

PCB (1/1)

NAN YA PLASTICS CORPORATION
COPPER CLAD LAMINATE
QUALITY TEST REPORT

55, Wei Wang St.
Shu-Lin
Taipei, Taiwan

TEL:(02)26806311 FAX:(02)26807234

DATE:2008/02/21

PALLET NO:

CUSTOMER: 文翔公司

ORDER NO: HC2FALB2

LOT NO: 8216042A

MATERIAL SPEC.: NP-140TL H/H 0.77mm 1240mm x 1030mm WL (OVERALL THICKNESS)

IPC DESIGNATION: L21 0300 HH/HH C/A 48.8" x 40.5" (f x g)

REQUIREMENT: IPC-4101B

SPECIFICATION SHEET: IPC-4101B / 21

GLASS FIBER, COPPER FOIL SOURCE: NAN YA

NAN YA PLASTICS
COPPER CLAD LAMINATE
QUALITY ASSURANCE

CHARACTERISTICS	UNIT	CONDITIONING	SPECIFICATION	RESULTS
VISUALS(SUB-/SURFACE)	-	IPC-4101B	A	OK
METAL THICKNESS	μm	IPC-4101B	T:12.5-14.5/ H:17.8-20.8/ 1:30.9-37.7 2:68.8-74.8/3:92.7-113.3/4:123.3-150.7 5:154.3-188.6/6:185.2-226.2	17.9
DIELECTRIC CONSTANT(1MHZ)		C 24/23/50	<5.4 (FRD/FMD: <4.3)	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 ↑	9.1E6
VOLUME RESISTANCE	MΩ-cm	C 96/35/90	<0.50mm 10 ⁶ ↑ ≥0.50mm -----	4.9E8
VOLUME RESISTIVITY	MΩcm	E 24/125	10 ³ ↑	8.5E5
DISSIPATION FACTOR(1MHZ)		C 24/23/50	0.035 ↓ (CFRD - CFMD:0.015 ↓)	0.018
ARC-RESISTANCE	sec	D48/50+D1/2 /23	60 ↑ FRD - FMD:120 ↑ G8R/G8T : G7R/G7T : GRT/GMT : 90 ↑	121
FLEXURAL STRENGTH	N/mm ²	LENGTHWISE A	<0.50mm ----- ≥0.50mm 414.27 ↑	569
FLEXURAL STRENGTH	N/mm ²	CROSSWISE A	<0.50mm ----- ≥0.50mm 345.28 ↑	421
THICKNESS	-	A	≤1.2mm CLASS C/M >1.2mm CLASS B/L	OK
THERMAL STRESS		288°C x 40sec	NO BLISTER DELAMINATION	OK
WARP AND TWIST	%	0.5-0.78 mm A >0.79 mm A	SINGLE DOUBLE 2.0 ↓ 1.5 ↓ 1.5 ↓ 1.0 ↓	.213
PRESSURE VESSEL		15psi x30min + 260°C x 20sec	IPC-TM-650	OK
MOISTURE ABSORPTION	%	E1/105+des+D24/23	≥0.50 mm 0.80% ↓	.167
TENSILE STRENGTH	lb/in	AFTER THERMAL STRESS	Q - Toz:3.0 ↑ Hoz:(<0.5mm/>=0.5mm:3.5/5.0 ↑) Ioz(inc) ↑ :(<0.5mm/>=0.5mm:4.5/6.0 ↑)	8.12
TG GLASS TRANSITION TEMP	°C	E-2/105	140±5	140.9
FLAMMABILITY	sec	D 48/23/50 E 24/125	UL-94-V0 VDE-0860	OK
DIELECTRIC BREAKDOWN	KV		40 ↑	57
CONSTRUCTION	-	A	同Results	7628*4

THIS IS TO CERTIFY THAT THE MATERIAL BEING FURNISHED TO YOU MEETS THE IPC-4101B • RoHS AND SS-00259.
THE RESULTS OF THIS QUALITY TEST REPORT IS PASS.

APPROVED BY :

PASS

Material Approval

Reflector (1/1)

REPORT OF MATERIAL TEST

DATE: JUN. 20, 2007



Customer: 鑫隆實業股份有限公司
 Applied Standard: CNS 5503 Phosphor Bronze Sheets, Plates and Strips
 Commodity: C 5191 R PHOSPHOR BRONZE STRIP (B)
 99 ISO 9001-4MS17005-00
 台正字第 3545 號

Chemical Analysis Test

Work No.	Size of Product		P(%)	Sn(%)	Cu&Sn(%)	Fe(%)	Mn(%)	Zn(%)	Ni(%)	As(%)	Sb(%)	Bi(%)	
	Thickness (mm)	Width (mm)											
990228	0.400	625.000	0.030 - 0.350	6.50 - 7.00	min. 99.50								
			0.137	5.305	99.971								

Mechanical & Physical Test

Work No.	Size of Product		Dimension Test		Tension Test		Hardness Test	Grain Size (mm)	Electric Conductivity (%)
	Thickness (mm)	Width (mm)	Thickness (mm)	Width (mm)	Tensile Strength (kgf/mm ²)	Elongation (%)			
990228	0.400	625.000	9000	(-) 0.10 - (+) 0.09	60 - 70	min. 8	190 - 230	0.010	14.2
			9000		62.53	24.02	190.0 - 191.0		

MINCHALI METAL INDUSTRY CO., LTD.
 11, Pei Yuan Road, Chung Li City, Taiwan, R. O. C.
 TEL: (886)03421-1118 FAX: (886)03421-1719

4010066

Material Approval

MMCX Connector (1/4)

試驗報告表

TEST REPORT

供應商名稱 vendor name	茂豐精密工業股份有限公司 Mawfeng Precision Industrial Co., Ltd.			日期:	95年05月08日
				DATE	2006.05.08
試材名稱 Material	銅合金 Copper Alloys	合金編號 Alloys No.	C3604BD	試材編號 Material No.	
化學試驗 (Chemical Testing)					
試驗方法 Experimental Condition	X-線光譜分析法(X one line spectra analysis method)				
使用儀器名稱 Instrumentation name	X光電腦分析儀(VACUUM X RAY SPECTROGRAPH)				
元素名稱 Element name	標準含量(%) Standard contents	試片含量(%) Sample contents	元素名稱 Element name	標準含量(%) Standard contents	試片含量(%) Sample contents
銅 (Cu)	57.0-61.0	58.8±0.1	鐵 (Fe)	<0.5	0.3±0.1
鋅 (Zn)	REM	REM	矽 (Si)	_____	_____
錫 (Sn)	Fe+Sn<1.2	0.3±0.1	錳 (Mn)	_____	_____
鉛 (Pb)	1.8-3.7	3.3±0.1	銻 (Sb)	_____	_____
鎳 (Ni)	_____	_____	鋁 (Al)	_____	_____
磷 (P)	_____	_____	其他 (Others)	_____	_____
備註 (Remarks)	DLA.5.5mm				
分析員 (Analyze a member)	蔡聰銘	主管 (Supervisor)	張國桐		

Material Approval

MMCX Connector (2/4)

BRUSHWELLMAN
ENGINEERED MATERIALS

Shoemakersville Road, Shoemakersville, PA 19555
Phone: 610-562-2211 ; Fax: 610-562-6610

Repeat printout

Page
1 of 2

EW0798-R

Brush Wellman Singapore (S) Pte.
Ltd.
110 Paya Lebar Road, #02-01
409009 SINGAPORE
SINGAPORE

Material Certificate				
Date	06/08/2006			
Purchase order item/date	882922 / 05/09/1960			
Or tray item/date shipped	80308052 900001 / 06/08/2006			
Order item/date	183350 000010 / 05/09/2006			
Customer nbr	11617			
Customer part nbr				
Customer spec				
Rev	Type	Comp	Class	Grade

Our Material: K554480400 ROD CD M25 H .08268 X 4>. |
*Brush Wellman Inc. declares that this product is in conformance with Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)."

Brush Wellman testing for chemical composition (by Optical Emission Spectrometry), is conducted at our Elmhurst, OH Laboratories. Testing of mechanical or physical properties is conducted at laboratories which are accredited by American Association for Laboratory Accreditation.

This material was inspected and tested for conformity as required in accordance with the noted part, specification, and revision number. The quantitative test data obtained from these tests are available for review by the buyer.

Batch 0000509849 / Quantity 85.275 KG

Characteristic	Unit	Value	Specification Limits	
			Lower	Upper
CDA (UNS) Alloy	-	C17300		
ASTM Temper	-	T004		
Brush Spec Nbr.	-	BWJ-RW5.00-2		
<u>Dimensional Attributes</u>				
Diameter	-	0.08260		
Diameter Plus	-	0.00000		
Diameter Minus	-	0.00039		
Length	-	38.42525		
<u>Mechanical/Physical Properties</u>				
Grain Size	mm	0.017 0.026		0.050
Tensile	kg/mm2	77.0	63.0	86.0
Yield @ 0.2% Offset	kg/mm2	62.0	52.0	74.0
Elongation (4D or 2")	%	13.0	10.0	
Hardness Scale	-	HV		
Hardness Value	-	251.0	200.0	270.0
The material supplied with this certification has not been heat treated. The following properties were achieved in Brush Wellman's Laboratory. They represent what you may expect after heat treating the material, using the time and temperatures shown.				
R1 Temper	-	HT		
R1 Heat Treat Time	hrs	2.00	2.00	2.00
R1 Heat Treat Temp	°C	316	316	316



This Report may not be reproduced, except in full, without written approval. *Metric and MDS in the USA*

Material Approval

MMCX Connector (3/4)

BRUSHWELLMAN
ENGINEERED MATERIALS

EW0298-R

Brush Wellman Singapore (S) Pte.
Ltd.
110 Paya Lebar Road, #02-01
409009 SINGAPORE

Delivery Item/Date
80308052 900001 /
06/08/2006

Page
2 of 2

R1 Tensile	kg/mm2	145.0	130.0	150.0
R1 Yield	kg/mm2	138.0	112.0	141.0
R1 Elongation	%	2.0	2.0	9.0
R1 Hardness Scale	-	HV		
R1 Hardness Value		409.0	383.0	445.0

Chemistry Composition

Beryllium	%	1.85	1.80	2.00
Ni+Co	%	0.25		0.35
Ni+Co+Fe	%	0.25		0.60
Silicon	%	0.05		0.15
Aluminum	%	0.03		0.10
Lead	%	0.36	0.20	0.40
Alloy Balance	-	COPPER		

Lot Identification

Heat Number	-	20033
Piece Lot/Coil No.	-	18335001

Miley T. Schroffer

Quality Representative



Material Approval

MMCX Connector (4/4)

APPENDIX

Fluo-Tech PTFE Rod is manufactured with virgin PTFE powder by ram extrusion or compression molding and is conformed to meet the requirement of ASTM.

TABLE 1 Detail Specification for PTFE Rod

ITEM	PROPERTY	ASTM TEST METHOD	VALUE
1	Specific gravity	D792	2.15 - 2.2
2	Tensile strength	D638	280 - 350 kg/cm ²
3	Elongation	D638	200 - 400 %
4	Dielectric strength	D149	30 KV/mm
5	Deformation under load. 6.9Mpa,50c, %	D621	3.5 - 6
6	Dissipation factor 1 KHz	D150	Less than 0.0005
7	Dielectric constant 1 KHz	D150	2.0-2.1
8	Volume resistivity	D257	>10 ¹⁶
9	Surface resistivity	D257	10 ¹⁷
10	Flexural modulus	D790	430 - 500Mpa
11	Compressibility	D1147	16 - 20 %
12	Hardness, durometer	D2240	D53 - D60
13	Impact strength	D256	16 kg-cm/cm
14	Coefficient of linear thermal expansion,per C. 30C to 80C, 10 ⁻⁵ C	D696	12.3 to 11.6



Material Approval

Cable (1/3)

SPECIFICATION FOR APPROVAL

DOCUMENT: A30316U008

STYLE : 105°C 30V
RG-316/U

SIZE: 7/0.17 SCCS

RECOGNIZED: UL 1979



WONDERFUL HI-TECH CO.,LTD

OFFICE : 72WU KONG 6TH ROAD,
WU KU IND. DISTRICT
TAIPEI HSIEN, TAIWAN

TEL : (02)22988033
FAX : (02)22988031-2

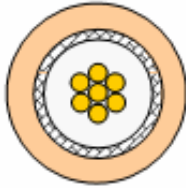
FACTORY : 17 PEI YUAN ROAD,
CHUNG-LI IND. PARK
TAIWAN, R.O.C.

TEL : (03)4527777
FAX : (03)4517214

Material Approval

Cable (2/3)

 **WONDERFUL HI-TECH CO., LTD**
SPECIFICATION

STYLE	105°C 30V UL1979	DOCUMENT NO : A30316U007	
SIZE	RG-316/U	ESTABLISHED DATE: 2004/03/22	
STANDARD : MIL-C-17			
Conductor	Size	AWG	26
	Material	----	Silver-Coated Copper Clad Steel
	Conductors No.	----	7
	Conductors Size	mm	0.17
	O.D.	mm	0.51
Insulation	Average Thickness	mm	0.51
	Diameter	mm	1.53 ±0.03
	Material	----	FEP
	Color	----	Clear
Braid	Material	----	Silver-Coated Copper
	Construction	mm	16 / 5 / 0.10
	Coverage	%	95
Jacket	Average Thickness	mm	0.30
	Diameter	mm	2.53 ±0.10
	Material	----	FEP
	Color	----	Brown
Marking	M17/113-RG316 MIL-C-17 WONDERFUL		
Drawing			

AK001/210X297/1.0

PAGE : 1

EDITION : 1.2

MAKER : C.Y.CHEN

CONFIRM : S.N.WONG

APPROVAL : W.J.WANG

Material Approval

Cable (3/3)



WONDERFUL HI-TECH CO., LTD. SPECIFICATION

Electrical & Physical Properties						
Item		RG-316/U				
Rating Temp Voltage		105°C 30V				
Conductor Resistance		302 OHM/KM/20°C MAX.				
Insulation Resistance		3000 MEGA OHM/KM MIN.				
Dielectric Strength		AC 1 KV/Minute				
Spark Test		5 KV				
Insulation	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / m m ²)			
		Elongation	200% MIN.			
	Aged	Tensile Strength	UNAGED MIN 75%(168HRS×232°C)			
		Elongation	UNAGED MIN 75%(168HRS×232°C)			
Jacket	Unaged	Tensile Strength	2500 PSI MIN.(1.76 Kg / m m ²)			
		Elongation	200% MIN.			
	Aged	Tensile Strength	UNAGED MIN.75%(168HRS×232°C)			
		Elongation	UNAGED MIN.75%(168HRS×232°C)			
Nom. Impedance		50 Ohms				
Nom. Capacitance		95.8 pF/m				
Nom. Vel. of Prop.		69.5%				
VSWR (0 – 6 GHZ)		UNDER 1.3				
Attenuation (dB/100m)	1MHZ	100MHZ	1.8GHZ	2.4GHZ	5.2GHZ	6GHZ
	10.2	34.1	180	206	315	345

AK001/210X297/1.0

PAGE : 2

EDITION : 1.2

MAKER : C.Y.CHEN

CONFIRM : S.N.WONG

APPROVAL : W.J.WANG

Material Approval

Nylon Washer (1/1)

QMFZ2 Component - Plastics

Wednesday, September 15, 2004

E41938

E I DUPONT DE NEMOURS & CO INC

ENGINEERING POLYMERS CHESTNUT RUN PLAZA PO BOX 80713 WILMINGTON DE 19880

Material Designation: 101(+)(f1), 101F(+)(f1), 101L(+)(f1), E101(+)(f1), E101L(f1), 132F(+)(f1), 135F(+)(f1)

Product Description: Polyamide 66 (PA66), designated "Zytel" furnished as pellets.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str	IEC GWIT	IEC GWFI
ALL	0.71	V-2	4	0	130	75	85	725	960
	1.5	V-2	3	0	130	75	85	750	960
	3	V-2	2	0	130	75	85	800	960
	6	V-2	2	0	130	75	85	800	960
CTI: 0		HVTR: 0		D495: 6				IEC Ball Pressure (C): -	
Dielectric Strength (kV/mm): 13		Volume Resistivity (10 ¹⁰ ohm-cm): 14						Dimensional Stability(%): -	
ISO Tensile Strength (MPa): -		ISO Flexural Strength (MPa): -						ISO Heat Deflection (C): -	
ISO Tensile Impact (kJ/m ²): -		ISO Izod Impact (kJ/m ²): -						ISO Charpy Impact (kJ/m ²): -	

(+) Virgin and regrind up to 50% by weight inclusive, have the same basic material characteristics.

(f1) Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.

NOTE (1) Material designations that are color pigmented may be followed by suffix letters and numbers. (2) Material designations may be prefixed by "ZYT" or "MIN" or "ZEN" or "DEL" or "CRA" or "RYN".

Report Date: 7/29/1996

Underwriters Laboratories Inc®

UL94 small-scale test data does not pertain to building materials, furnishings and related contents. UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.

Material Approval

Tubing Spacer (1/1)

QMFZ2 Component - Plastics

Friday, October 24, 2003

E44716

RHODIA ENGINEERING PLASTICS

QUARTIER BELLE-ETOILE AVE RAMBOZ BOITE POSTALE 64 65192 ST FONS CEDEX FRANCE

Material Designation: B 50H1(r1)

Product Description: Polycarbonate 66/6 (PA66/6), designated "Techmyl" furnished as pellets.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str	IEC GWIT	IEC GWFI
ALL	0.38	V-0	4	0	120	-	-	-	-
	0.75	V-0	4	0	120	90	95	-	-
BK	1	V-0, 5VB	4	0	120	90	95	-	-
	1.5	V-0	4	0	120	90	95	-	-
	3	V-0	3	0	120	90	95	-	-

CTI: 0

HVTR: 0

D*95: 6

IEC Ball Pressure (C) -

Dielectric Strength (kV/mm) -

Volume Resistance (10¹⁴ Ohm-cm) -

Dimensional Stability (%) -

ISO Tensile Strength (MPa) -

ISO Flexural Strength (MPa) -

ISO Heat Deflection (C) -

ISO Tensile Impact (kJ/m²) -

ISO Izod Impact (kJ/m²) -

ISO Charpy Impact (kJ/m²) -

(r1) Virgin and regrind up to 50% by weight incl. have the same basic material characteristics, except for the 5VB rating.

Report Date: 10/21/1993

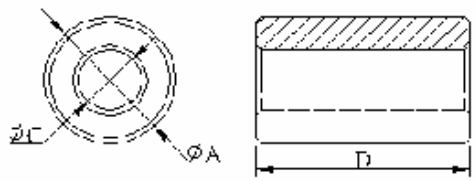
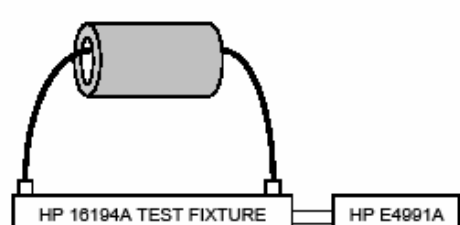
Underwriters Laboratories Inc®

UL94 small-scale test data does not pertain to building materials, furnishings and related contents. UL94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by U.L.I.

Material Approval

Core (1/2)

SPECIFICATION

Customer : 亞 驪		Item : B29 RH 4.5X12X2.8		Date : 15/OCT/07	
Mechanical Assembly			Ref. No :		
			Dimension		
			A	4.50 ±0.30	mm
			B		mm
			C	2.80 ±0.20	mm
			D	12.00 ±0.40	mm
			E		mm
			F		mm
			P		mm
			H		mm
Electrical Requirement					
Impedance	min 35 Ω	Test Frequency	25MHz		
Impedance	min 75 Ω	Test Frequency	100MHz		
Test equipment : HP - E4991A					
WINDING		AWG#22X100mm AT 1 T		MODEL NO:	MD-05-764
			1. Chip-Off area: 0.3mm ² Max		
			2. Burr Height : 0.3 mm Max		
REMARK :					
Approved by	Checked by	Reported by	Approved by Customer		

Material Approval

Core (2/2)

INSPECTION DATA

Customer	亞 聯		Date	15-Oct-07		
Item	B29 RH4.5X12X2.8		Ref. No.			
Part No.			Test Frequency	1~1000MHz		
Test equipment	HP- E4991A,16194A		Coil Spec.	AWG#22X100mm AT 1 Turn		
	IMPEDANCE		DIMENSION (UNIT : mm)			
FREQ.	25 MHz	100 MHz	A	C	D	
SPEC.	MIN 350	MIN 750	30.30 4.50	30.20 2.80	30.40 12.00	
1	43.5	96.0	4.42	2.73	12.04	
2	44.6	96.4	4.43	2.71	12.07	
3	44.3	94.5	4.46	2.74	12.04	
4	45.5	96.6	4.46	2.75	12.02	
5	45.0	97.5	4.44	2.68	12.10	
6						
7						
8						
9						
10						
X	44.56	96.20	4.44	2.72	12.05	
R	1.98	3.01	0.04	0.07	0.08	
APPROVED BY:			CHECKED BY:		REPORTED BY:	

Material Approval

Sumitube (1/4)

ZHI YAN ELECTRONICS CO., LTD

11F.-8, No.109, Sec1, Jhongshan Rd, Sinjhuang City, Taipei County
242, Taiwan (R.O.C)

TEL(886)2-8522-7261 FAX(886)2-8522-7265

PRODUCT SPECIFICATION

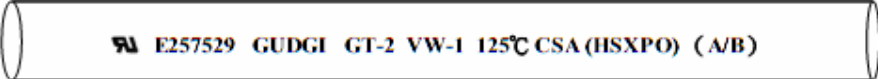
16-Apr-07 2nd Edition

1. PRODUCT NAME (1) HALOGEN FREE Heat-Shrinkable Tubing GT2 (2) Color : RED · YEL · GRN · BLU · GRY · BLK · WHT		3. STANDARD (1) UL224 File No. : E257529 (2) CSA C22.2 NO.198.1 File No. : 234653			
2. APPLICABLE SPECIFICATION (1) This specification covers the requirements for Flexible Heat-Shrinkable Polyolefin Cross-Link Tubing Class I (2) Voltage 600V Temperature 125°C Rating		4. SHRIKABLE PROPERTIES (1) Radial shrinkage : 50% min. (2) Longitudinal shrinkage : -10% max. (3) Minimum shrink temperature : 90°C			
5. STANDARD SIZE					
Nominal Size (mm)	Size as supplies (mm)		Size as recovered (mm)		Standard Length (M)
	Inside Diameter	Wall Thickness	Maximum Inside Dimeter	Minimum Wall Thickness	
1.0 X 0.2	1.5 ± 0.2	0.20 ± 0.08	0.50	0.33	200
1.5 X 0.2	2.1 ± 0.2	0.20 ± 0.08	0.75	0.36	200
2.0 X .02	2.7 ± 0.2	0.20 ± 0.09	1.00	0.44	200
2.5 X 0.2	3.2 ± 0.2	0.25 ± 0.09	1.25	0.44	200
3.0 X 0.25	3.7 ± 0.3	0.25 ± 0.09	1.50	0.44	200
3.5 X 0.25	4.2 ± 0.3	0.25 ± 0.09	1.75	0.44	200
4.0 X 0.25	4.7 ± 0.3	0.25 ± 0.09	2.00	0.44	200
5.0 X 0.25	5.7 ± 0.3	0.28 ± 0.10	2.50	0.56	100
6.0 X 0.25	6.7 ± 0.4	0.28 ± 0.10	3.00	0.56	100
7.0 X 0.25	7.7 ± 0.4	0.27 ± 0.10	3.50	0.56	100
8.0 X 0.25	8.7 ± 0.4	0.27 ± 0.10	4.00	0.56	100
9.0 X 0.25	9.7 ± 0.4	0.27 ± 0.10	4.50	0.56	100
10.0 X 0.25	10.7 ± 0.4	0.27 ± 0.10	5.00	0.56	100
11.0 X 0.25	11.7 ± 0.4	0.27 ± 0.10	5.50	0.56	100
12.0 X 0.25	12.7 ± 0.4	0.27 ± 0.10	6.00	0.56	100
13.0 X 0.30	13.7 ± 0.4	0.33 ± 0.12	6.50	0.69	50
14.0 X 0.30	14.7 ± 0.4	0.33 ± 0.12	7.00	0.69	50
15.0 X 0.30	15.7 ± 0.5	0.33 ± 0.12	7.50	0.69	50
16.0 X 0.30	16.7 ± 0.5	0.33 ± 0.12	8.00	0.69	50
18.0 X 0.35	18.7 ± 0.5	0.37 ± 0.13	9.00	0.77	50
20.0 X 0.35	20.7 ± 0.6	0.37 ± 0.13	10.0	0.77	50
22.0 X 0.40	22.7 ± 0.6	0.37 ± 0.13	11.0	0.77	50
25.0 X 0.40	25.8 ± 0.8	0.42 ± 0.14	12.5	0.87	50
28.0 X 0.45	28.8 ± 0.8	0.45 ± 0.14	14.0	0.87	50
30.0 X 0.45	30.8 ± 0.8	0.45 ± 0.14	15.0	0.87	50

Material Approval

Sumitube (2/4)

6. CHARACTERISTICS		
Property	Test Condition	Values
Tensile strength		10.4 MPa (1500 psi) min.
Elongation		200% min.
Tensile strength after aging	158°C x 7days	7.3 MPa (1050 psi) min.
Elongation after aging	OR	100% min.
Flexibility	134°C x 60days	No crack
Deformation	125°C x 1hr	50% max.
Heat shock	250°C x 4hr	No crack
Cold bend	-30°C x 1hr	No crack
Corrosion of bare copper	Aging at 158°C x 7days after humidity conditioned for 1day	No discoloration or corrosion of copper
Copper stability		100% min. elongation
Flammability		Self-extinguish satisfied VW-1
Dielectric withstand		No breakdown for 60 sec. At 2.5kV (AC)
Breakdown voltage		2.5kV (AC) min.
Dielectric withstand after aging	158°C x 7days OR 134°C x 60days	No breakdown for 60 sec. At 2.5kV (AC)
breakdown voltage after aging		2.5kV (AC) min. and retains min. 40% of original value
Volumn resistivity		$10^{11} \Omega$ -CM min.

7. MARKING
The following information shall be legible cleanly by durably ink-printed on the surface of the tubing.
(1) UL FILE NO.
(2) Manufactue's name
(3) Flame retardant test class
(4) Temperature Rating
(5) Nominal Size of the tubing
(6) Maximum recovered inside diameter
(7) Type designation
(Example)


8. PACKING
This standard length given in the Construction table. Other length are available upon special need not to be damaged during transporting and storage.

Material Approval

Sumitube (3/4)

UL Online Certifications Directory

YDPU2.E257529 Tubing, Extruded Insulating - Component

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Tubing, Extruded Insulating - Component

[See General Information for Tubing, Extruded Insulating - Component](#)

GUD GI CO LTD

E257529

36 LANE 166, MIN SHENG NORTH RD, SEC 1

KUEI SHAN

TAOYUAN HSIEN, 333 TAIWAN

Cat. No.	Max V	Max Temp C	Col Recognized	Oil Resistance Class	VW-1 Rated #
Flexible Heat Shrinkable Polyolefin Tubing.					
GT-4	150	125	All except Clear	∅TD>	Yes
GT-2	600	125	All except Clear	∅TD>	Yes

Tubing is considered to comply with the optional VW-1 flammability requirements only if it is so marked.

Marking: Company name or "E257529", catalog designation, voltage rating, and temperature rating in degrees C and inside diameter (before and after recovery) appears on tags attached to both ends of the tubing or on the shipping spool label or smallest unit container.

[Last Updated](#) on 2006-01-23

[Questions?](#)

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Material Approval

Sumitube (4/4)

UL Online Certifications Directory

YDPU8.E257529

Tubing, Extruded Insulating Certified for Canada - Component

[Page Bottom](#)

Tubing, Extruded Insulating Certified for Canada - Component

[See General Information for Tubing, Extruded Insulating Certified for Canada -Component](#)

GUD GI CO LTD

E257529

36 LANE 166, MIN SHENG NORTH RD, SEC 1

KUET SHAN

TAOYUAN HSIEN, 333 TAIWAN

Cat. No.	Max V	Max Temp C	Col Recognized	Oil Resistance Class	VW-1 Rated #
Flexible Heat Shrinkable Polyolefin Tubing.					
GT-1	150	125	All except Clear	∅TD>	Yes
GT-2	600	125	All except Clear	∅TD>	Yes

#Tubing is considered to comply with the optional VW-1 flammability requirements only if it is so marked.

Marking: Company name or "E257529", catalog designation, voltage rating, temperature rating in degrees C, inside diameter

(before and after recovery) and the Recognized Component Mark for Canada  on tags attached to both ends of the tubing or on the shipping spool label or smallest unit container.

Last Updated on 2006-01-23

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寰波科技股份有限公司

SmartAnt Telecom Co.,Ltd.

Salt Spray Test Report

Model : DWL08-220190

Product Name : Directional Panel Antenna

Purpose : To test the surface if it could keep the body from being corroded for 48 hours without influence function.

Frequency : 2.4~2.5 GHz / 5.1~5.9 GHz

VSWR: 2.0:1 Max.

Test Results : PASS NG

Prepared By	Review By	Approved By

. Reliability Test Result :

Sample No.		01	Judgment	
		Phosphor bronze		
Test Flow	1	Salt Spray Test	○	PASS

<p>Conclusion: There was a little slight oxidization on the surface of phosphor bronze after this test, but it would not influence function.</p>	<p>PASS</p>
---	--------------------

Reliability Test Specification:

No	Test Item	Duration	Temperature	Refer to standard	Note
1	Salt Spray Test	48 hrs	35~47°C 100%RH	MIL-STD-810E Method 509.3	

1. Test Item : Salt Spray Test

1.1 Test equipment :Salt Spray Test

1.2 Test ambience :

1.2.1 Temperature : $23\pm 5^{\circ}\text{C}$

1.2.2 Humidity(RH) : $60 \pm 15\%$

1.3 Test condition :

1.3.1 Salt concentration : 5%

1.3.2 Temperature of salt solution: 35°C

1.3.3 Temperature of saturation keg: 47°C

1.3.4 PH range of salt solution: 6.5~7.2

1.3.5 Duration of test: 48hrs

1.4 Model & Quantity:

1.4.1 Product: DWL08-220190

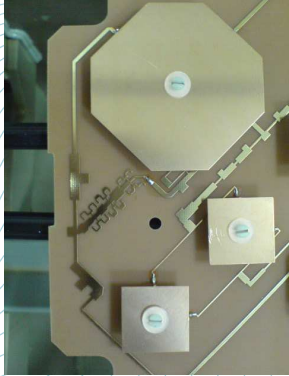
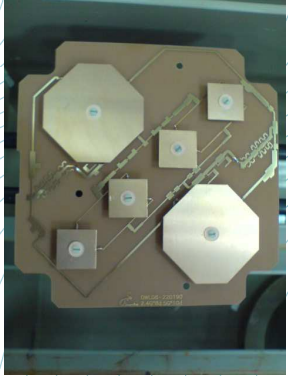
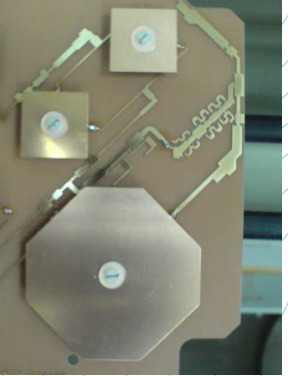
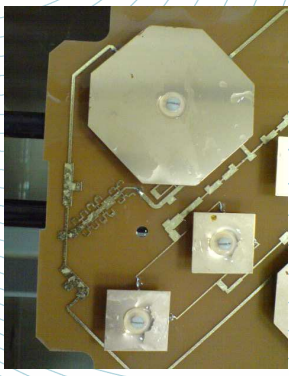
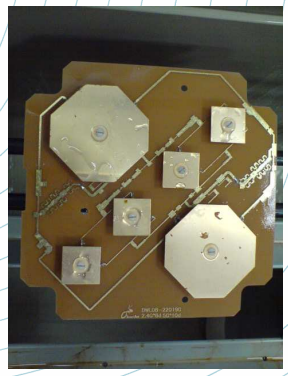
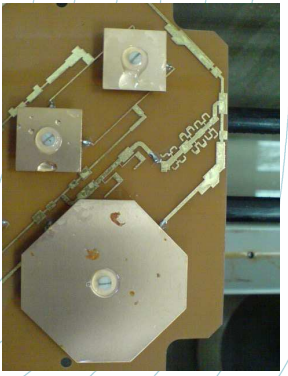
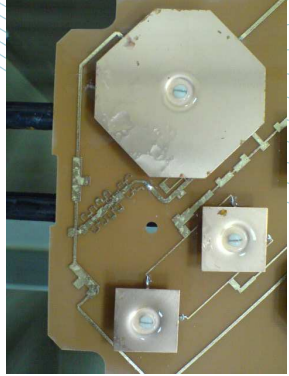
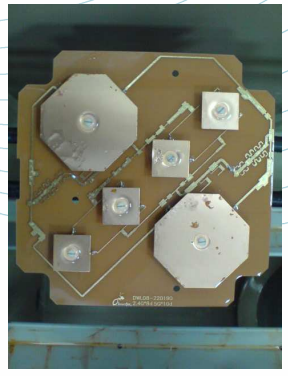
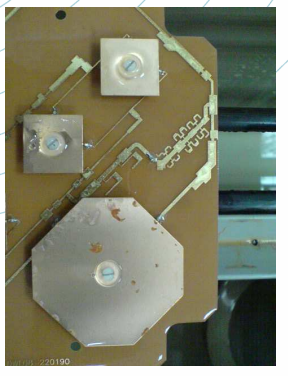
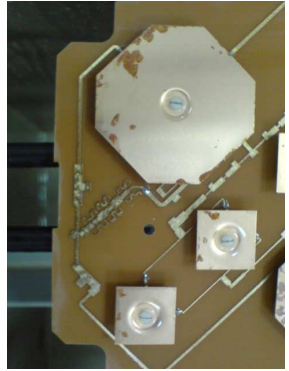
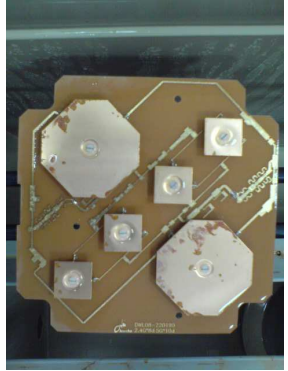

1.4.2 Quantity: 1 set (phosphor bronze)

1.5 Test conditions: Non Operation

1.6 Test method: Refer MIL-STD-810E Method 509.3



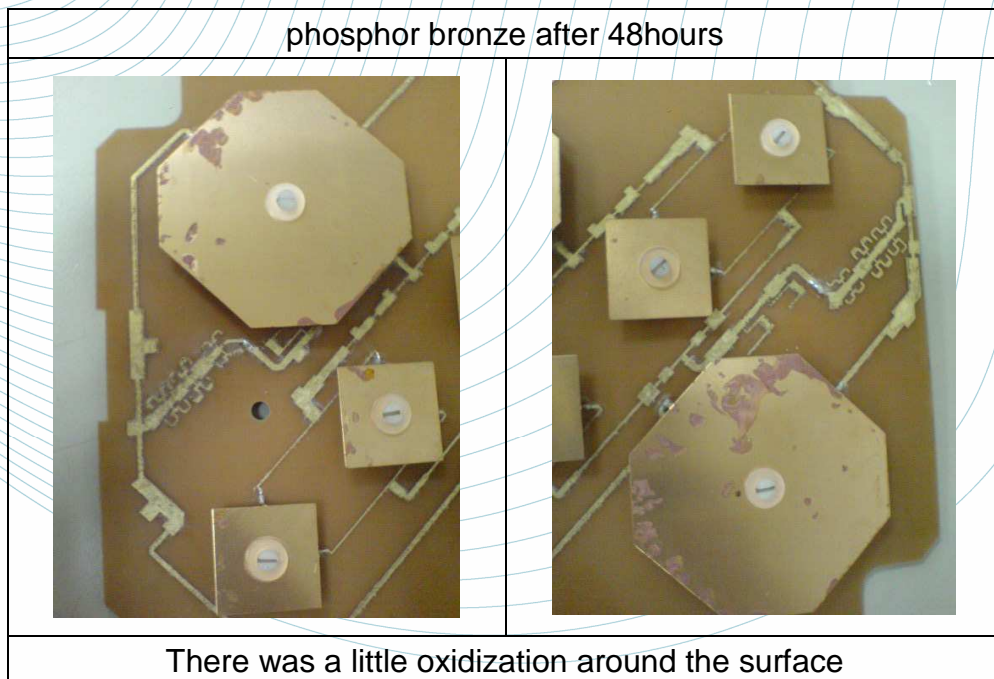
1.7 Test Result: Outlook inspection (duration time)

Test Time	DWL08-220190 phosphor bronze		
<u>0 hr</u>			
<u>20hr</u>			
<u>28hr</u>			
<u>48hr</u>			

VSWR ≤ 2.0												
NO	2.4G		2.5G		Max		5.1G		5.9G		Max	
	Before Test	After Test	Before Test	After Test	Before Test	After Test	Before Test	After Test	Before Test	After Test	Before Test	After Test
01	1.69	1.65	1.89	1.48	1.89	1.65	1.91	1.61	1.69	1.74	1.91	1.74

1.8 Conclusion:

1.8.1 There was a little oxidization around the surface of phosphor bronze without damage body after this test. (as the following photos)



1.8.2 As the test result, the slight oxidization phosphor bronze won't cause the antenna function failure.

1.8.3 This report is just for reference

(Antenna)零件承認檢驗測試報告

流程編號	IMM2008100068		送件單位	硬體研發二部		
流程狀態	<input checked="" type="checkbox"/>	First Source	送件者	洪淑豐		
	<input type="checkbox"/>	Second Source	料號	505922019029G		
檢測日期	2008/10/22		品名	ANT CABLE 2.4~2.5 / 5.1~5.9GHZ DWL08-220190 88/120MM 8/10DB		
檢測者	廖瑞廷		原製造廠商	寰波科技股份有限公司		
承認書編號	E54800		原廠型號	DWL08-220190		
樣品數	5 PCS		測試結果	合格		
Test Item			外觀尺寸			
測試項目	VSWR		Dimensions			
規格	2 MAX	2 MAX	PCB length : 150 ± 1mm	PCB Width : 149 ± 1mm	CABLE Assembly (RG316 93MM/MMCX R/A PLIG): 88 ± 4mm	CABLE Assembly (RG316 125MM/MMCX R/A PLIG): 120 ± 4mm
儀器設備	網路分析儀		游標卡尺			
儀器設定條件	2.4 GHz	5.1 GHz	/	/	/	/
CL			150	149	88	120
UCL	2	2	151	150	92	124
LCL			149	148	84	116
1	1.349	1.144	150.00	149.06	87.99	120.66
2	1.429	1.045	150.05	149.19	87.89	120.49
3	1.398	1.203	150.03	149.08	88.11	120.44
4	1.393	1.102	150.01	149.08	88.00	120.86
5	1.437	1.179	150.09	149.08	88.26	120.45
MAX	1.437	1.203	150.09	149.19	88.26	120.86
MIN	1.349	1.045	150.00	149.06	87.89	120.44
STDEV	0.035	0.063	0.04	0.05	0.14	0.18
AVERAGE	1.401	1.135	150.04	149.10	88.05	120.58
R	0.088	0.158	0.09	0.13	0.37	0.42
Ca	N/A	N/A	0.04	0.10	0.01	0.15
CP	5.73	4.59	9.32	6.39	9.46	7.41
CPK	5.73	4.59	8.98	5.77	9.35	6.34
判定	PASS	PASS	PASS	PASS	PASS	PASS
最後判定結果	合格					

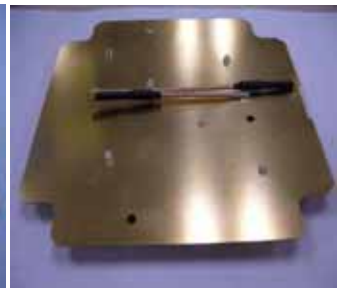
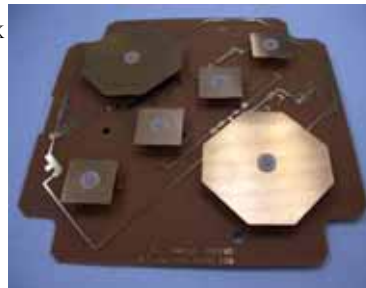
Approval: 王椅楠

Check: 黃聖友

Prepare:

測試內容:
耐溫測試
零件產地: 台灣
檢驗重點:
1. 外觀
2. 尺寸
3. 型號

外觀確認: OK





明泰科技

零組件承認附件檔案

Alpha P/N : 505922019029G

零組件品名1 : ANT CABLE 2.4~2.5/5.1~5.9GHZ

零組件品名2 :

DWL08-220190 88/120MM 8 / 10 DB

