

承 認 書

SPECIFICATION FOR APPROVAL

客 戶
CUSTOMER

Bandspeed Inc

日 期
DATE

2007/3/30

品 名
DESCRIPTION

WSL007 Mini 1.13 Dual Feed
Dual Band Flying Lead Antenna
with MMCX L175.4mm(Black)

客 戶 料 號
CUSTOMER P/N

成 品 編 號
Part No.

X3W1865A1



萬旭電業股份有限公司

WANSHIH ELECTRONIC CO., LTD.

台北縣五股鄉五工六路 72 號 3 樓

3F 72 WU KONG 6TH RD., WU KU INDUSTRIAL DISTRICT

TAIPEI HSIEN, TAIWAN, R.O.C.

TEL : (02) 22988066 (5 LINE) FAX : (02)22981102

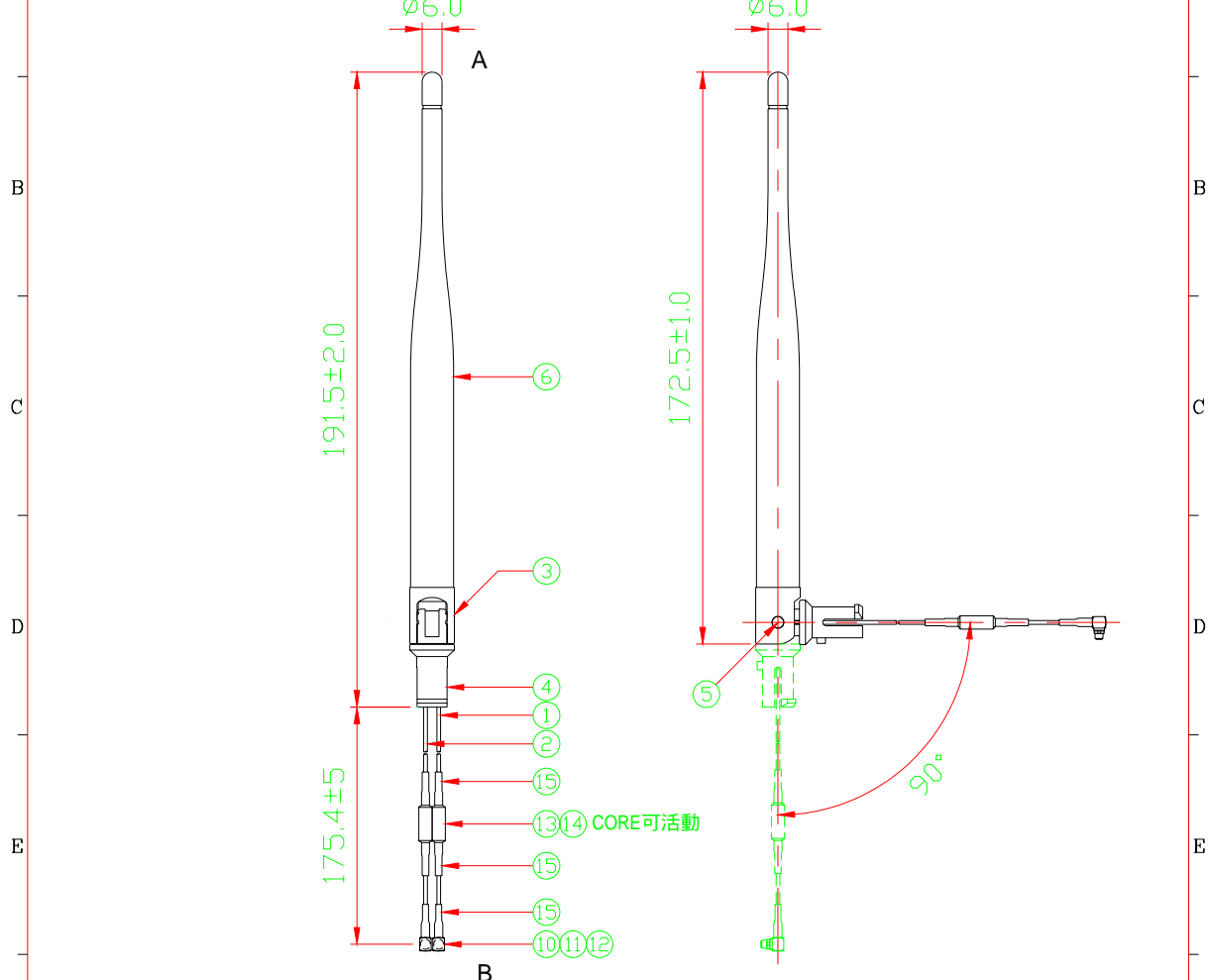
Table of Contents

Table of Contents	.....	1
Specification	.....	2
Antenna Drawing	.....	3-4
Electrical Properties		
Return Loss	.....	5
V.S.W.R	.....	6
Radiation Pattern	.....	7-8
Material Data Sheet		
Coaxial Cable	.....	9-11
Housing	.....	12
Hinge	.....	13
MMCX R/A	.....	14
EMI Sleeve Core	.....	15-17

SPECIFICATION

1. Description : Dual Feed Dual Band Flying Lead
2. Customer : Bandspeed Inc
3. Model No. : WSL007
4. Part No. : X3W1865A1
5. Standard : IEEE 802.11 a/b/g Wireless LAN
6. Antenna Profile : 191.5 mm length(see Drawing)
7. Color : Black
8. Electrical Characteristics
 - Operating Frequency : 2.4~2.5/5.15~5.35/5.725~5.85GHz
 - Antenna Type : PCB
 - Polarization Type : Linear
 - Type of Radiation : Toroid
 - Antenna Gain : 1.5 dBi Typical
 - Impedance : 50 Ohm nominal
 - V.S.W.R. : 2.5:1 Max.
9. Mechanical Characteristics
 - Swivel : 90 degrees
 - Lead Length : 175.4 mm length
 - Connector : MMCX R/A
 - Core : K5A RH4*2*10
10. Raw Material
 - Coaxial Cable : Mini 1.13
 - Housing : TPU
 - Hinge : PC+ALLOY

TOLERANCES:		Ver	Date	ECR NO.	Drawing	Engineering Change Description
X	± 0.5					
X.X	± 0.3					
X.XX	± 0.1					
ANGULAR	± 5.0°					

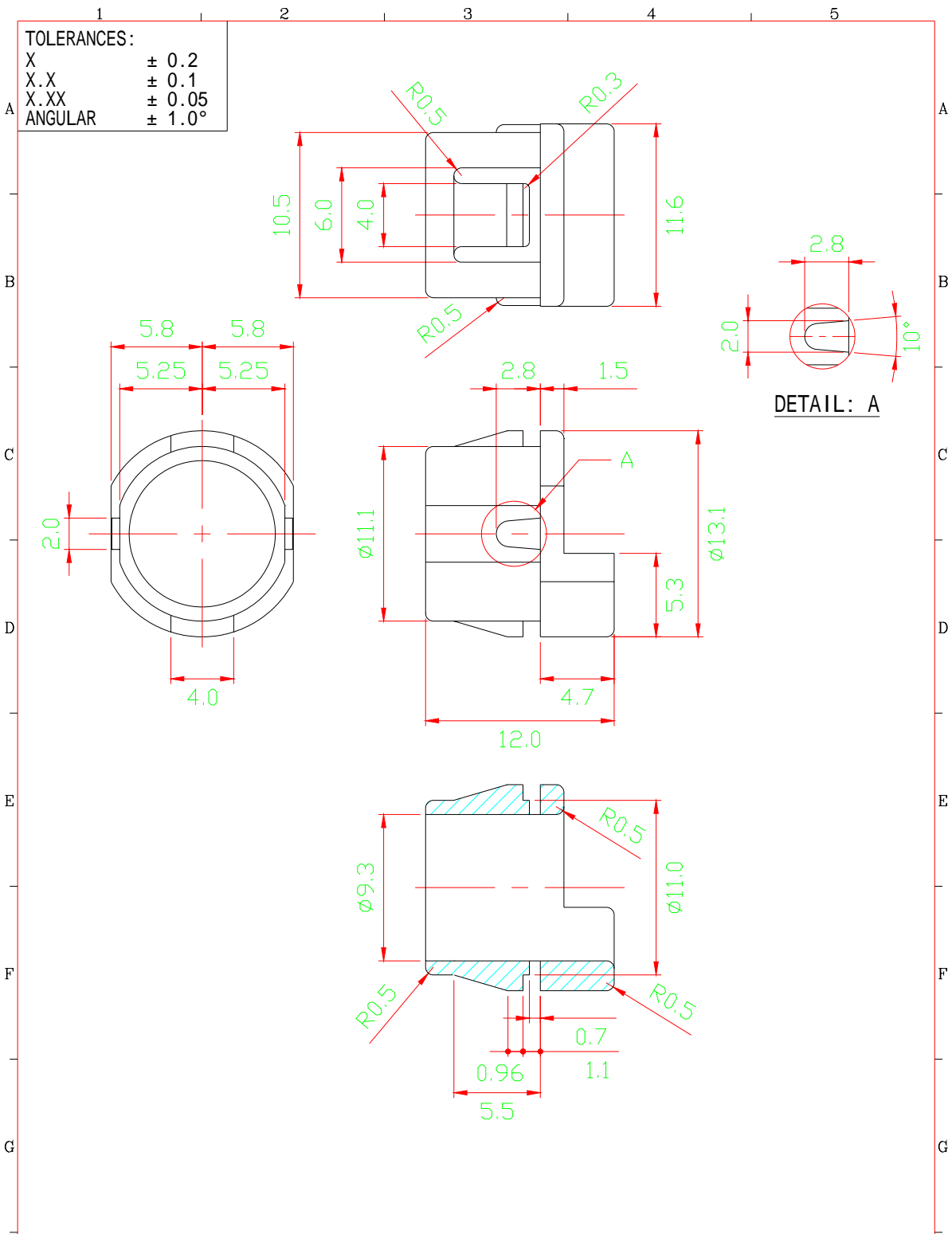


16	HOLDER	HOLDER	Black	1	or Equivalent
15	Heat Shrink Tube	@F34 2.5 L=10mm	Black	6	or Equivalent
14	Heat Shrink Tube	@F34 4.0 L=20mm	Black	2	or Equivalent
13	EMI Sleeve Core	@ K5A RH4*2*10	Black	2	or Equivalent
12	MMCX R/A Isolator	@0001A-C Isolator MMCX R/A	White	2	or Equivalent
11	MMCX R/A Side cover	@0001A-B Side cover MMCX R/A	Golden	2	or Equivalent
10	MMCX R/A (公PIN)	@0001A-A Body MMCX R/A (公 PIN)	Golden	2	or Equivalent
9	KAPTON	@90014-N KAPTON W=10mm L=10mm	Yellow	1	or Equivalent
8	KAPTON	@90014-N KAPTON W=15mm L=10mm	Yellow	1	or Equivalent
7	PCB	WPB059 V1		1	or Equivalent
6	Housing	@13 *L155 Housing	Black	1	or Equivalent
5	Rivet	@028922001-6 4.80*1.95	Black	1	or Equivalent
4	Hinge-Base	@WSL003 9.3 *29.5L Hinge-Base	Black	1	or Equivalent
3	Hinge-Holder	@WSL003 13.4 *27L Hinge-Holder	Black	1	or Equivalent
2	MINI 1.13 Coaxial Cable	@MINI RG OD:1.13	Black	1	or Equivalent
1	MINI 1.13 Coaxial Cable	@MINI OD:1.13灰 GY-193	Gray	1	or Equivalent
NO	Material	GM	Description	Color	Dim Qty Remark

Revised :				Data: 2007/03/30		Customer Part No.	
Page : 1/2	Approval	Checked	Drawed	Part Name			
	Ryan	Scott	Mandy	WSL007 Mini1.13 Dual Feed Dual Band Flying Lead Antenna with MMCX L175.4mm(Black)			
UNIT : mm				Part No.	X3W1865	REV	VERSION
Scale : FREE						A	1

WANSHIH ELECTRONIC CO., LTD.

Doc. No : FMT-0513-D7



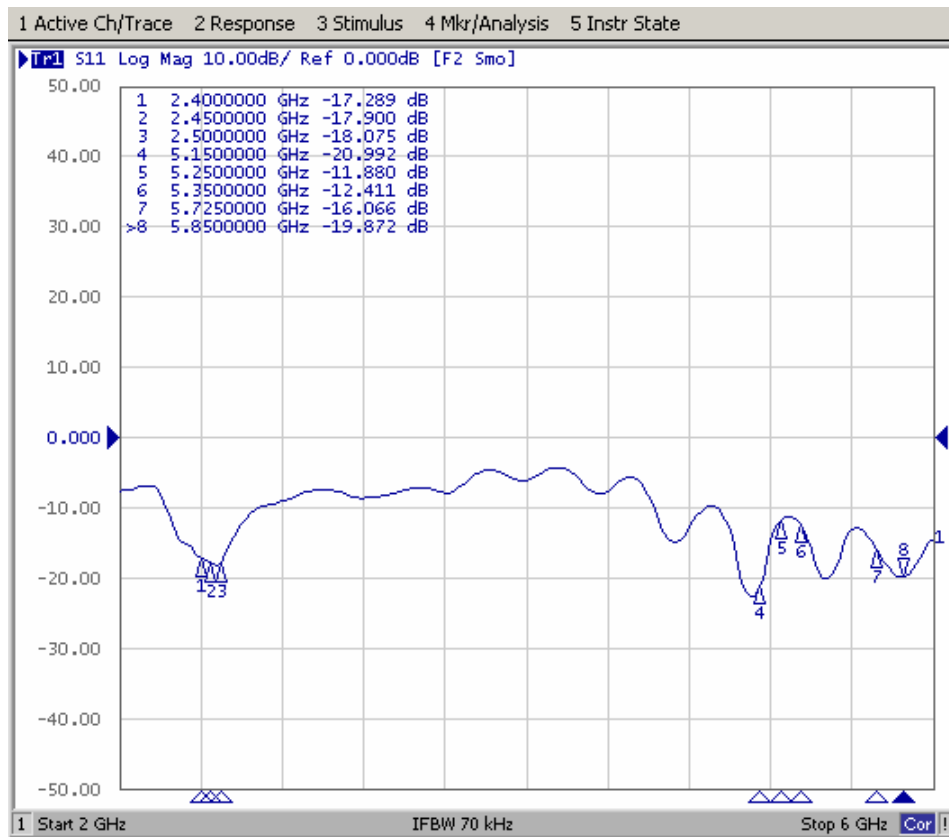
Revised :		Data: 2007/03/30		Customer			
Page : 2/2	Approval	Checked	Drawn	Part No.			
	Ryan	Scott	Mandy	Part Name	HOLDER		
UNIT : mm				Part No.	X3W1865	REV A	VERSION 1
Scale : FREE							

WANSHIH ELECTRONIC
CO., LTD.

Doc. No : FMT-0513-D7

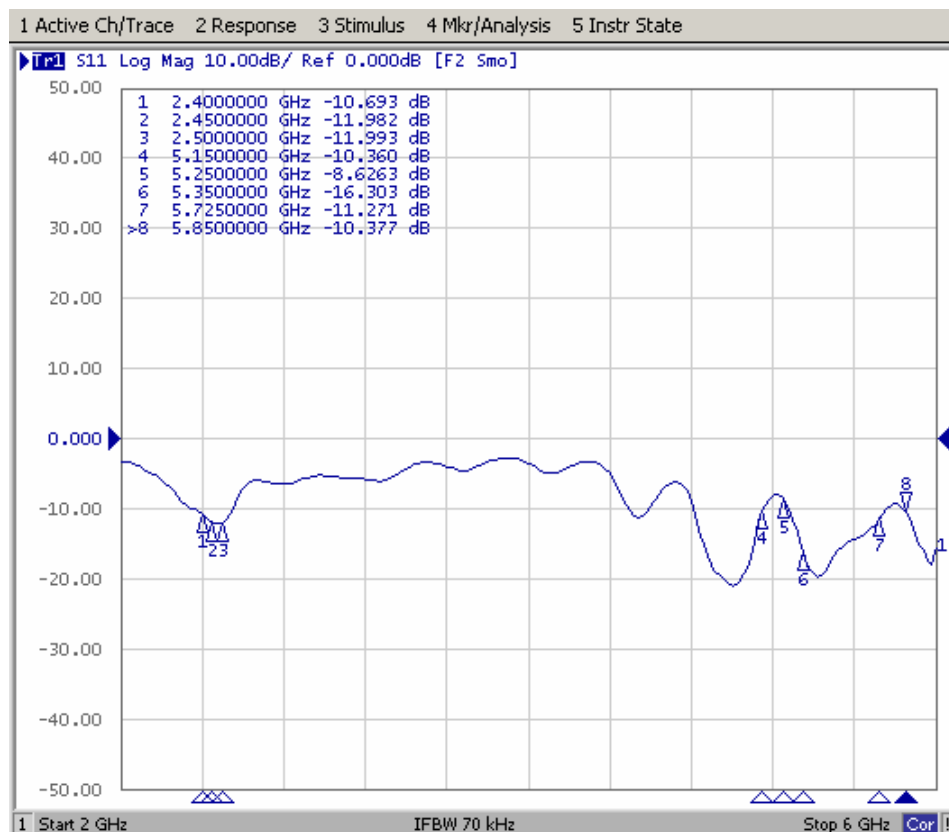
Electrical Properties

Return Loss(Gray Cable)



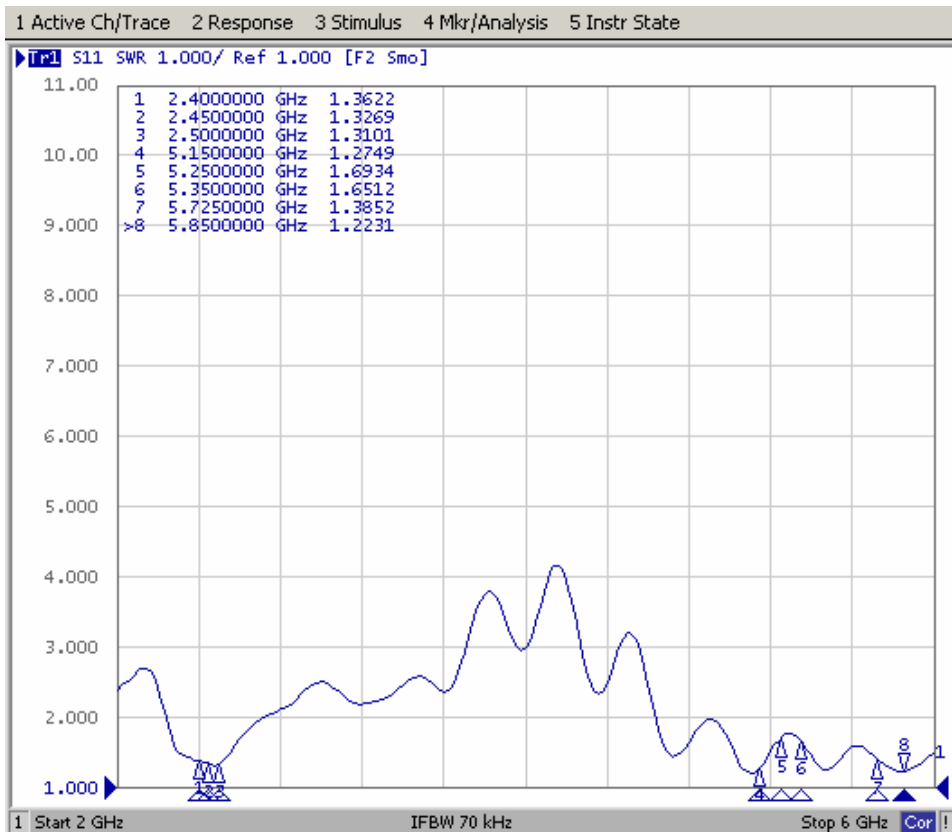
Electrical Properties

Return Loss(Black Cable)



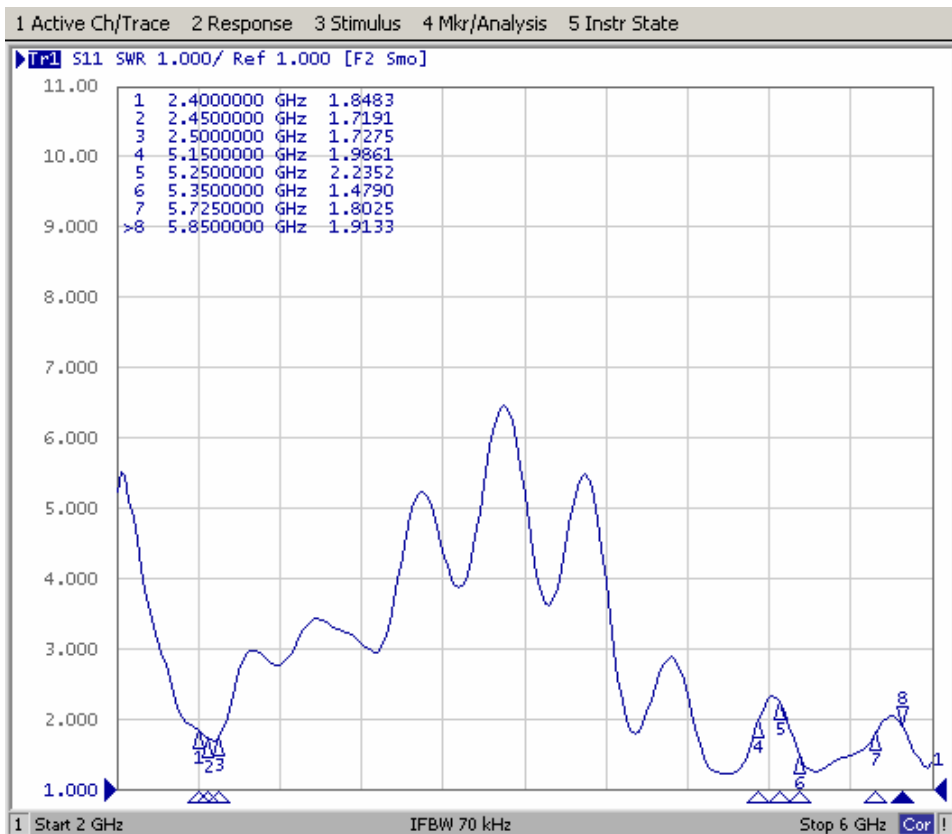
Electrical Properties

V.S.W.R(Gray Cable)



Electrical Properties

V.S.W.R(Black Cable)



Electrical Properties

Radiation Pattern-H Plane(Gray Cable)

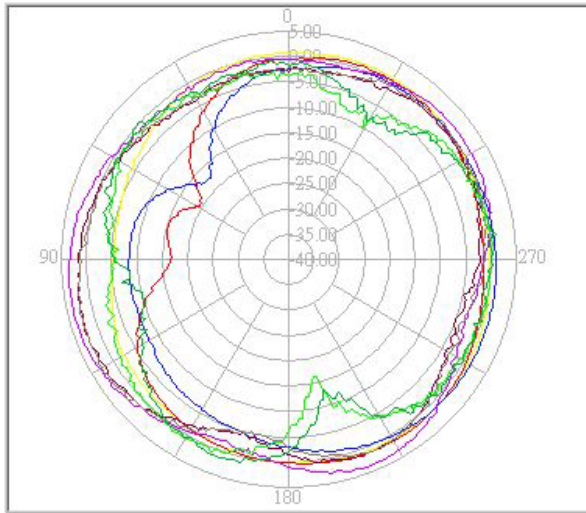


萬旭電業股份有限公司

Model No: thrsld-dd-u

Antenna Position: Horizontal

Test Mode: H



Freq(MHz)	peak(dBi)	Angle(o)	Avg(dBi)
2400.00	1.30	28.16	-0.46
2450.00	1.49	146.94	-1.42
2500.00	1.52	123.67	-1.93
5150.00	3.86	154.29	1.08
5250.00	2.60	247.35	-0.70
5350.00	2.82	241.22	-0.54
5725.00	0.94	213.06	-2.15
5850.00	1.43	202.04	-2.00

Electrical Properties

Radiation Pattern-H Plane(Black Cable)

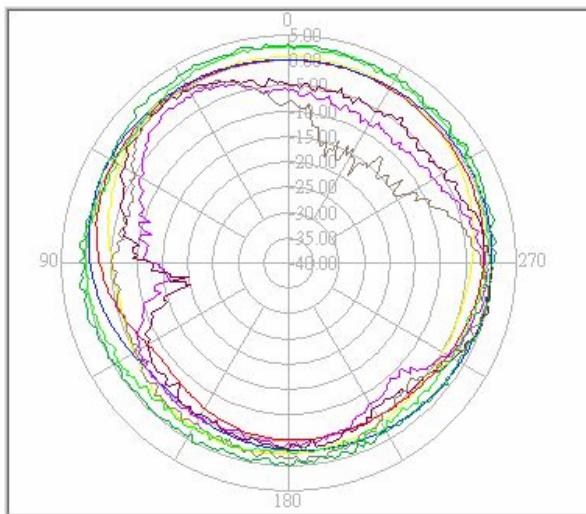


萬旭電業股份有限公司

Model No: thrsld-dd-d

Antenna Position: Horizontal

Test Mode: H



Freq(MHz)	peak(dBi)	Angle(o)	Avg(dBi)
2400.00	0.78	346.53	-1.87
2450.00	0.41	326.94	-1.96
2500.00	0.92	307.35	-0.74
5150.00	-0.57	91.84	-4.91
5250.00	0.54	102.86	-3.62
5350.00	0.61	322.04	-3.84
5725.00	2.79	346.53	-0.12
5850.00	3.51	346.53	0.92

Electrical Properties

Radiation Pattern-E Plane(Gray Cable)

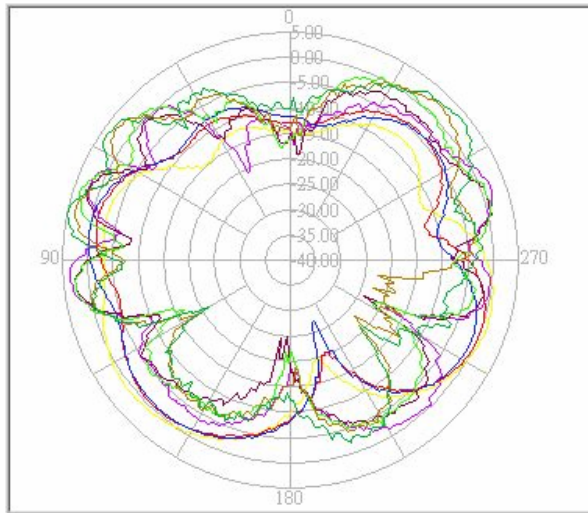


萬旭電業股份有限公司

Model No: thrsld-dd-u

Antenna Position: Horizontal

Test Mode: E



Freq(MHz)	peak(dBi)	Angle(o)	Avg(dBi)
2400.00	1.05	230.20	-3.81
2450.00	0.11	112.65	-4.43
2500.00	0.09	277.96	-4.33
5150.00	3.54	264.49	-2.89
5250.00	2.60	262.04	-3.87
5350.00	3.59	287.76	-2.83
5725.00	3.59	282.96	-3.28
5850.00	5.01	281.63	-2.23

Electrical Properties

Radiation Pattern-E Plane(Black Cable)

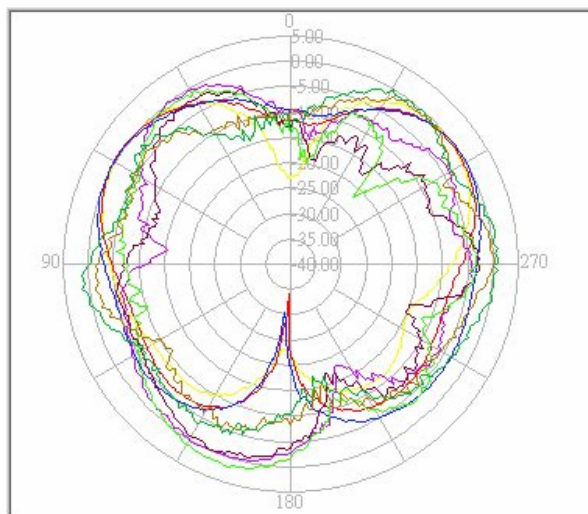


萬旭電業股份有限公司

Model No: thrsld-dd-d

Antenna Position: Horizontal

Test Mode: E



Freq(MHz)	peak(dBi)	Angle(o)	Avg(dBi)
2400.00	0.29	303.67	-5.07
2450.00	0.42	302.45	-4.56
2500.00	0.39	298.78	-3.53
5150.00	0.37	208.16	-4.47
5250.00	-0.07	203.27	-5.91
5350.00	1.92	197.14	-4.20
5725.00	0.34	88.16	-4.78
5850.00	1.62	263.27	-3.51

Material Data Sheet

Mini-1.13 Coaxial Cable

SPECIFICATION FOR APPROVAL

DOCUMENT: A3132TS001

STYLE : COAXIAL CABLE
105°C 30V

SIZE: 32AWG×1C
BRAID : TS

RECOGNIZED: UL 1979



WONDERFUL HI-TECH CO.,LTD.

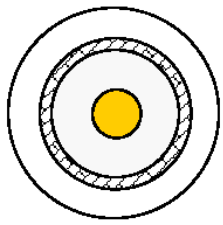
OFFICE : 72WU KONG 6TH ROAD,
WU KU IND. DISTRICT
TAIPEI HSIEN,TAIWAN

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

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

STYLE	105°C 30V UL 1979	DOCUMENT NO : A3132TS001	
SIZE	32AWG	ESTABLISHED DATE: 2005/05/11	
STANDARD :			
Conductor	Size	AWG	32
	Material	----	Silver Cover Copper
	Conductors No.	----	7
	Conductors Size	mm	0.080
	O.D.	mm	0.240
Insulation	Average Thickness	mm	0.22
	Diameter	mm	0.68 ± 0.02
	Material	----	FEP
	Color	----	Clear
Braid	Material	----	Tinned Copper
	Construction	mm	16 / 4 / 0.050
	Coverage	%	90
Jacket	Average Thickness	mm	0.13
	Diameter	mm	1.13 ± 0.05
	Material	----	FEP
	Color	----	According to custom
Marking	Non		
Drawing			



WONDERFUL HI-TECH CO., LTD.
SPECIFICATION

Electrical & Physical Properties					
Item		32AWG			
Rating Temp Voltage		105°C 30V			
Conductor Resistance		545 OHM/KM/20°C MAX.			
Insulation Resistance		1000 MEGA OHM/KM MIN.			
Dielectric Strength		AC 500 V/Minute			
Spark Test		2.5 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 ± 3 Ohms			
Nom. Capacitance		96 ± 3 pF/m			
Nom. Vel. of Prop.		69%			
VSWR Test (0 – 6 GHZ)		Less 1.3			
Flame Test		VW-1 OK			
Attenuation (dB/1m)	2.0GHZ	2.4GHZ	2.5GHZ	5.0GHZ	6.0 GHZ
	2.80	3.10	3.15	4.85	5.20

Housing Material Data Sheet

- Housing - TPU

TPU 熱塑性聚氨酯



Desmopan®

Items 項目	Test Methods 試驗方法		Unit 單位	192	385	588	KU 2-8600
	DIN	ISO		8092	8085		
Mechanical Properties 機械特性							
Tensile Yield Strength 拉伸屈服強度	53504	37	MPa	45	40	30	40
Elongation at Break 延伸率	53504	37	%	450	450	500	500
Compression Set 壓縮變形 70 hr st 22°C	53517	-	%	25	30	30	25
	53517	-	%	60	55	65	42
Physical Properties 物理特性							
Shore A Hardness 硬度	53505	868	-	94	85	88	82
Shore D Hardness 硬度	53505	868	-	42	32	33	31
Modulus of Elasticity	53455	-	MPa	45	15	30	12
Abrasion Resistance(Loss)	53516	4649	mm³	30	30	60	20
Rebound Resilience	53512	4662	%	30	42	36	45
Tear Propagation Resistance	53515	-	kN/m	90	70	55	50
Density 密度	53479	1183	g/cm³	1.23	1.20	1.15	1.11
Electrical Properties 電氣特性							
Dielectric Strength 耐電率 (50Hz,0.5kV/s) 1. Dry 2. 4 days at 80% r.h. 3. 24 h immersion in water	EC 243. VDE 0303/part 2 95mm Ø•1mm		kV/mm	14.8 13.7 13.9	17.5 17.6 17.7	20.2 20.0 20.1	NA NA NA
	IEC 93. VDE 0303/part 3 Standard test piece		Ohm	1•10 ¹² 2•10 ¹¹ 2•10 ¹¹	5•10 ¹¹ 8•10 ¹¹ 5•10 ¹¹	6•10 ¹¹ 7•10 ¹⁰ 7•10 ¹⁰	NA NA NA
	IEC 167. VDE 0303/part 3 Standard test piece		Ohm	5•10 ¹² 1•10 ¹² 2•10 ¹¹	4•10 ¹¹ 7•10 ¹⁰ 7•10 ¹⁰	1•10 ¹² 1•10 ¹¹ 1•10 ¹⁰	NA NA NA
	IEC 93. VDE 0303/part 3 95mm Ø•1mm		Ohm•cm	5•10 ¹² 7•10 ¹² 2•10 ¹¹	8•10 ¹¹ 2•10 ¹¹ 1•10 ¹¹	3•10 ¹² 2•10 ¹¹ 8•10 ¹⁰	NA NA NA
Dielectric Constant 1. At 50Hz 2. At 1kHz 3. At 1MHz 4. At 1GHz	IEC 250. VDE 0303/part 4 95mm and 50mmØ• 1mm			6.6 6.3 5.1 3.6	6.5 6.4 5.6 3.8	6.3 6.1 5.0 3.4	NA NA NA NA
	IEC 250. VDE 0303/part 4 95mm and 50mmØ• 1mm			0.025 0.034 0.075 0.022	0.029 0.018 0.060 0.032	0.024 0.025 0.084 0.024	NA NA NA NA
	IEC 112. VDE 0303/part 1 20mm•15mm•4mm		Grading	600	600	600	NA
	Raw Material Groups 原料分類				Ester	Special Ether	Ether

UL File No.:E41613(M)

The data are intended as a general guide only makes no guarantee of results and assumes no obligation or liability. 上列數據僅供參考，並不為此承擔任何責任和保證。

011-7

• Hinge (Base/Holder) - PC+ALLOY

SHINBLEND [®] ALLOY ENGINEERING PLASTIC DIVISION	SHINKONG SYNTHETIC FIBERS CORPORATION 新光合成纖維股份有限公司 8th Fl., 123, Sec.2, Nanking East Road, Taipei, Taiwan Tel: 886-2-2507-0131, 886-2-2507-1233, 30 Lines; 886-3-4932131-1730 Fax: 886-2-2506-8047, 886-3-491-5763
---	---

Technical Data

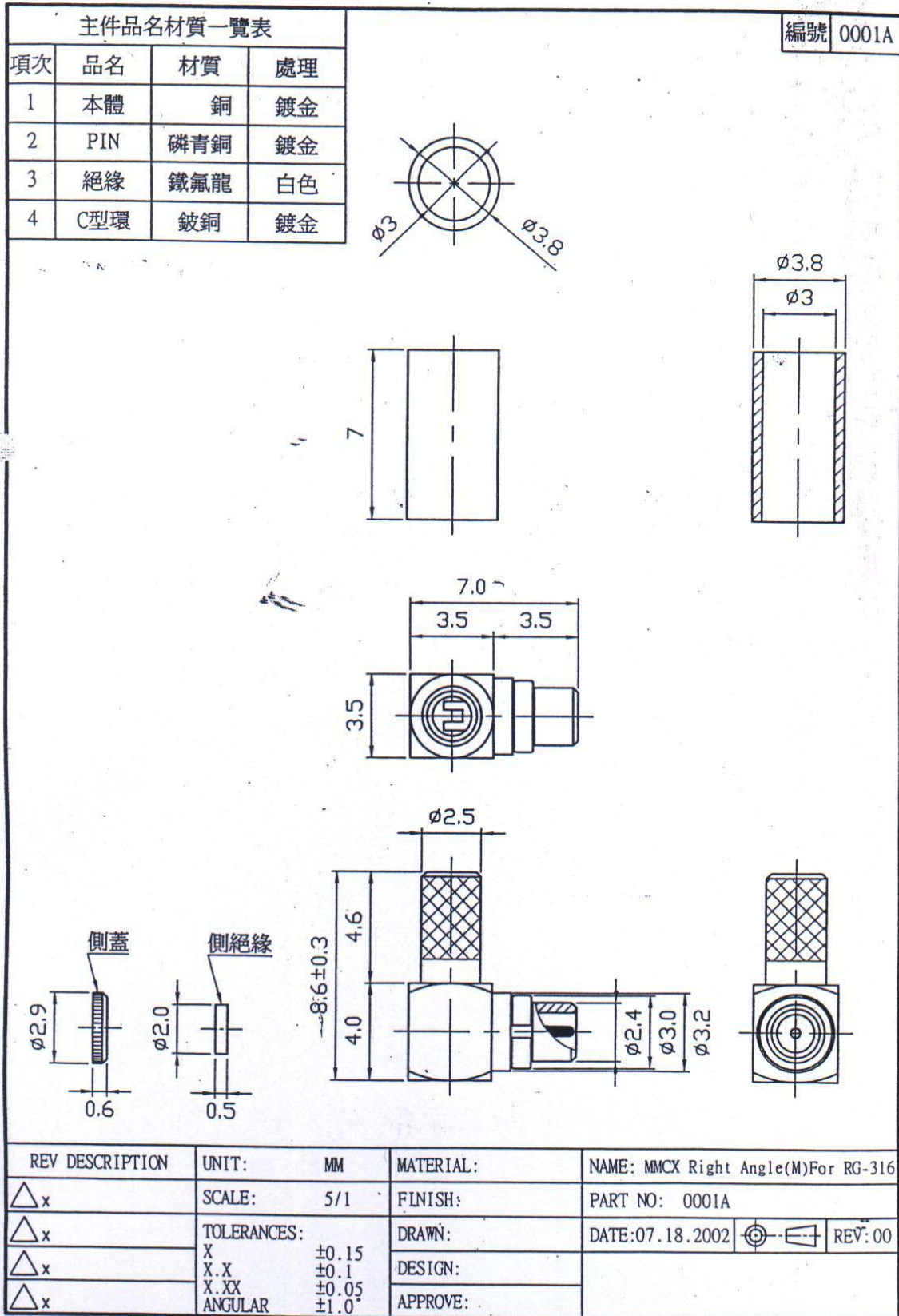
SHINBLEND [®] A724NA High Impact Grade / 超韌級 AD4011
--

		Unit	Test Method	Values
Mechanical properties		機械性質		
Izod Impact(Notched) 23°C	衝擊強度	Kg-cm/cm	ASTM D256	85
-20°C	衝擊強度	Kg-cm/cm	ASTM D256	70
-40°C	衝擊強度	Kg-cm/cm	ASTM D256	65
Tensile Strength	拉伸強度	Kg/cm ²	ASTM D638	540
Elongation	拉伸率	%	ASTM D638	100
Flexural Strength	彎曲強度	Kg/cm ²	ASTM D790	800
Flexural Modulus	彎曲模數	Kg/cm ²	ASTM D790	20000
Thermal properties		熱性質		
Heat Deflection Temperature	熱變形溫度		ASTM D648	
66psi		°C		-
264psi		°C		100
Flammability	防火性	-	UL94	-
Melting Point	熔點	°C	DSC	223
Electrical properties		電氣性質		
Dielectric Strength	介電強度	KV/MM	ASTM D149	-
Dielectric Constant	介電常數	...	ASTM D150	-
Volume Resistivity	體積電阻	Ω-CM	ASTM D257	-
Other properties		其它性質		
Specific Gravity	比重	-	ASTM D792	1.19
Water Absorption	吸水率	%	ASTM D570	0.14
Mold Shrinkage	成形收縮率		ASTM D955	
Flow	流動方向	%		0.4~0.6
Cross Flow	垂直方向	%		0.5~0.7

"Nothing in this information shall be construed as a recommendation for any use that may infringe on any patent right or as an endorsement of any material supplied by Shinkong Synthetic Fibers Corporation. We do not guarantee the applicability or the accuracy of this information or the performance of our products in any specific situation. We recommend each user of our products make its own tests to determine if the material is suitable for a particular use. The data show here are within the normal range of product properties, but they are NOT SPECIFICATION LIMITS. Additives of any kind alter some or all of the properties."

Material Data Sheet

MMCX R/A



Material Data Sheet

EMI Sleeve Core

SPECIFICATION FOR APPROVAL

CUSTOMER: 萬旭電業股份有限公司		CUS' S P/N:		DATE: 2003/10/9
ITEM: K5A RH 4X2X10		REF NO:10-13-040020100-0		
(1) DIMENSION (Unit:mm)		A	4.00	+ - 0.20 mm
				+ - mm
		C	2.00	+ - 0.15 mm
		D	10.00	+ - 0.40 mm
				+ - mm
				+ - mm
				+ - mm
				+ - mm
				+ - mm
				+ - mm
		(2) ELECTRICAL REQUIREMENTS:		
		TEST FREQ		REMARK:
		TEST FREQ		
Z	35 - 0 Ω	TEST FREQ	25 MHz	
Z	60 - 0 Ω	TEST FREQ	100 MHz	
		TEST FREQ		
COIL DATA	Qo= Lo= PF	TEST FREQ		
Winding 0.65 Φ X 63 mm T.C.W 1 TS				
(3) TEST INSTRUMENTS				
1. IMPEDANCE ANALYZER: HP4191A				
DRAWN	CHECKED	APPROVED	ISSUE NO.	
DATE	DATE	DATE	WC-RH-039	

佳真股份有限公司
CORE-TECH CORPORATION

TEL:03-4861211
FAX:03-4861210

INSPECTION DATA

ISSUE NO:WC-RH-039

CUSTOMER	萬旭電業股份有限公司	DATE	2003/10/9	Quantity	0 pcs
PART NO.	10-13-040020100-0				
ITEM	K5A RH 4X2X10				
COIL SPEC	0.65 Φ X 63 mm T.C.W 1 TS				
COIL DATA	Q0= CO= (PF)				
TEST FREQ	F0= Hz Ft= 25,100 MHz				
TEMPERATURE	28 °C Humidity 87 %				

	ELECTRIC CHAREC.				DIMENSION(Unit:mm)								
	L	Q	Z(25)	Z(100)	A	B	C	D	E	F	G	H	I
SP			35.00	60.00	4.00		2.00	10.00					
+					0.20		0.15	0.40					
-			0	0	0.20		0.15	0.40					
1			45.00	82.00	3.96		2.02	9.95					
2			47.00	84.00	3.93		2.03	9.98					
3			46.00	82.00	3.92		2.09	9.96					
4			47.00	82.00	3.91		2.03	9.98					
5			45.00	81.00	3.95		2.08	9.96					
6			46.00	80.00	3.93		2.05	10.00					
7			46.00	81.00	3.95		2.03	10.02					
8			46.00	81.00	3.93		2.07	9.95					
9			46.00	80.00	3.92		2.09	9.93					
10			45.00	82.00	3.96		2.05	9.97					
X			45.90	81.50	3.94		2.05	9.97					
R			2.00	4.00	0.05		0.07	0.09					

TEST INSTRUMENTS

1. IMPEDANCE ANALYZER: HP4191A

INSP No:

REMARK:

Inspected	Checked	Approved

CORE-TECH CORPORATION

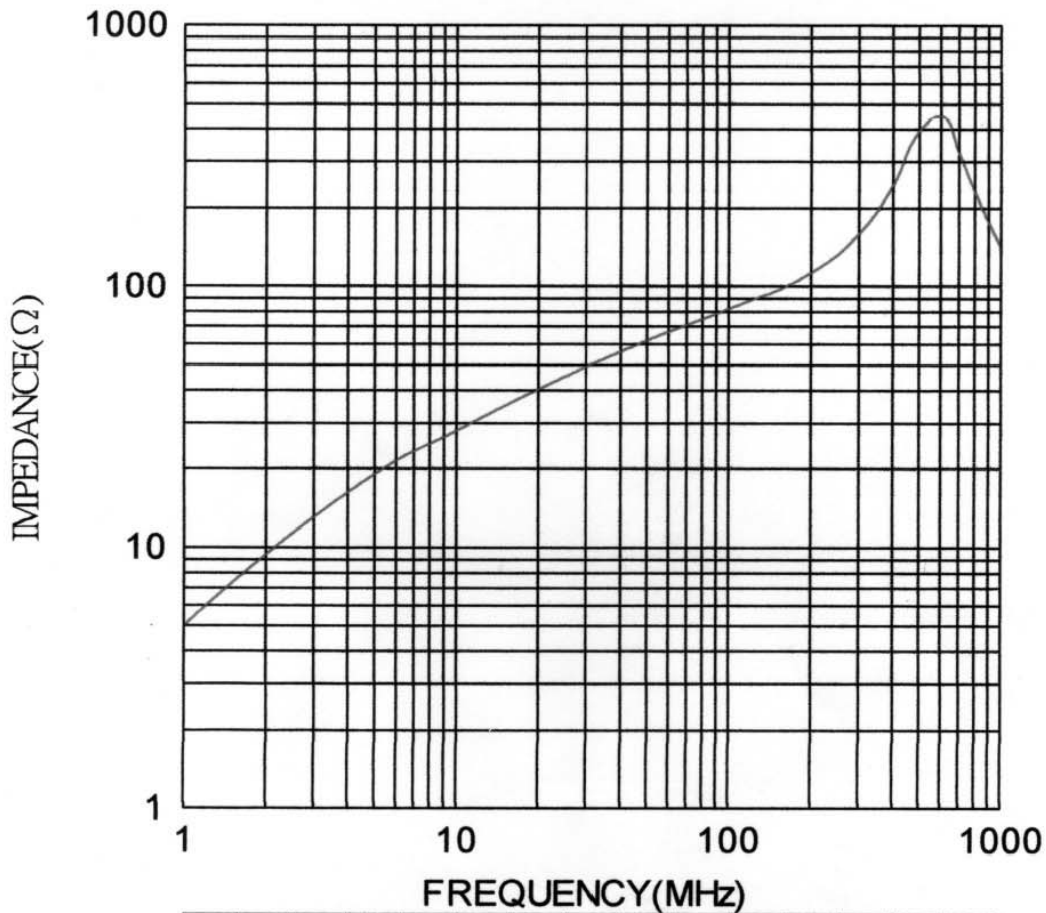
TEL: 03-4861211
FAX: 03-4861210

Z-F RESPONSE

K5A RH 4X2X10

1. TEST INSTRUMENT:HP4191A

2. WINDING:0.65ΦX63 mm T.C.W 1TS



	1	5	10	25	50	100	200	300	400	500	600	700	800	900	1000
Z—	5	19	28	45	62	82	113	160	244	392	452	322	229	176	141

(DATA BETWEEN 500MHz AND 1000MHz ARE FOR REFERENCE ONLY)

CORE-TECH CORPORATION

<http://www.coretechweb.com.tw>

E-mail:coretech@tpts1.seed.net.tw

TEL:03-4861211 FAX:03-4861210