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 SUZHOU AEON TECH CO.,LTD.(CHINA)
 AEON TECH (SHANGHAI) CO.,LTD(CHINA)
 DONGGUAN PARNER TECH CO.,LTD.(CHINA)



SPECIFICATION FOR APPROVAL

CUSTOMER: 合勤科技股份有限公司



PART NAME: RF PCB Antenna Assembly

PART NO.: 67-016-000001B

REVISION:

W. Y. P/NO.: C034-510687-A(SSR-81708)

REV.: X1

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :	Roh mee 	
DATE :	6/13/08 	

WHA YU GROUP

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RF PCB Antenna Assembly

Specification(Free Space)

1. Electrical Properties :

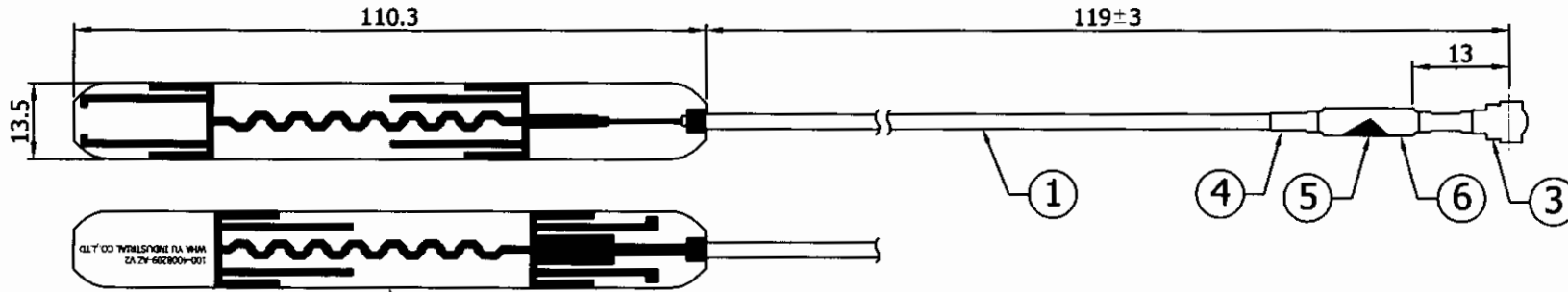
- 1.1 Frequency Range..... 2.4GHz ~ 2.5GHz /4.9GHz ~ 5.825GHz
- 1.2 Impedance 50Ω Nominal
- 1.3 VSWR 3.0 : 1 Max.
- 1.4 Radiation Omni-directional
- 1.5 Gain(peak)..... 3dBi typ. (2.4GHz ~ 2.5GHz)
5dBi typ. (4.9GHz ~ 5.825GHz)
- 1.6 Cable Loss..... 0.5dB Max.(2.4GHz ~ 2.5GHz)
0.6dB Max.(4.9GHz ~ 5.825GHz)
- 1.7 Polarization..... Linear; Vertical
- 1.8 Admitted Power..... 1W
- 1.9 Cable..... φ1.13 Coaxial Cable
- 1.10 Connector..... HRS U.FL
- 1.11 Core..... RH 4*10*2 (mm)

2. Physical Properties :

- 2.1 Operating Temp. -10°C ~ +60°C
- 2.2 Storage Temp. -10°C ~ +70°C

CG-

REV	DATE	DESCRIPTION
X1	06/10-2008	New Issue

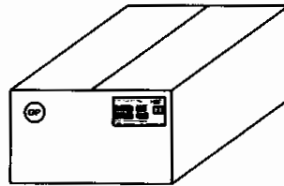


GP環保標籤

PE Bag Shrink Line

GP

Label



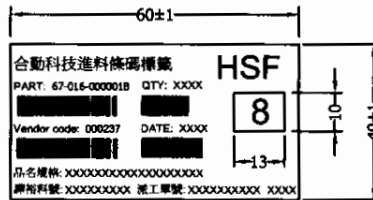
GP標籤貼於客戶料號左上角共2PCS

外箱條碼標籤貼於右上角1PCS

Carton: 320*320*200mm

Packing : 20 pcs/bag(W)105 x (L)300mm

CUSTOMER'S SIGNATURE



中包裝LABEL說明

材質：銅板紙60*40mm,白底黑字,英文字型為Arial,中文字型為新細明體,字體大小不拘,依比例(清楚為原則),條碼編制碼Code 39,依比例大小不拘(可掃描為原則).

PART:67-016-00001B

- ① Vendor code:000237(為標裕代碼)
- ② 品名規格:PCB ANTENNA,ROHS,2.4/5 GHz,2dBi/5dBi,DUAL BAND,SSR-80830,FOR DT,WHA YU
- ③ QTY:中包裝數量(依生產實際包裝數量為準)
- ④ DATE:製造日期(年/周) 例:0821
- ⑤ 標裕料號：固定列印 "標裕料號：" 無條碼直接印出標裕料號，例：C034-510100-A
- ⑥ 派工單號：固定列印 "派工單號：" 無條碼直接印出海外廠派工單號 例 :12345678
- ⑦ 100%過磅，此次批量中過磅號碼 第XXXX包or箱 例：0006
- ⑧ 製造月份1~12 例:8為8月份製造[方框尺寸(W)10*(L)13mm]
- ⑨ 以上條碼掃描後顯示如:"Vendor code:000237"只須顯示"000237";

"Vendor code:"不須顯示.

NO	DESCRIPTION	QTY	REMARK
6	H.S Tube Heat Shrink Tube	1	
5	Core RH 4*10*2mm	1	
4	H.S Tube Heat Shrink Tube	2	
3	Connector HRS U.FL	1	
2	PCB Rogers RO4350B 20mil ,1/2 Oz,Gold flash	1	
1	Cable Φ1.13mm Cable,Gray,50Ω	1	

XX.	±5.0	APPROVED	CUSTOMER:	合動		
X.	±3.0	<i>Ramao 7/08</i>	PART NO :	67-016-00001B		
.X	±1.0	CHECKED	PART NAME:	RF PCB Antenna Assembly		
.XX	±0.5	<i>鄭香廷 7/08</i>	W.Y P/NO :	C034-510687-A		
.XXX	±0.1	DRAWING	REV	UNIT	FILE :	
		<i>程</i>	X1	mm	SHEET :	1/1

M.gear Wha Yu Group

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97.7.1
淑娟

WHA YU INDUSTRIAL CO.,LTD.

BILL OF MATERIAL

PART NAME: RF PCB Antenna Assembly

CUSTOMER : 合勤

DATE:2008.06.10

W.Y.P/NO.C034-510687-A

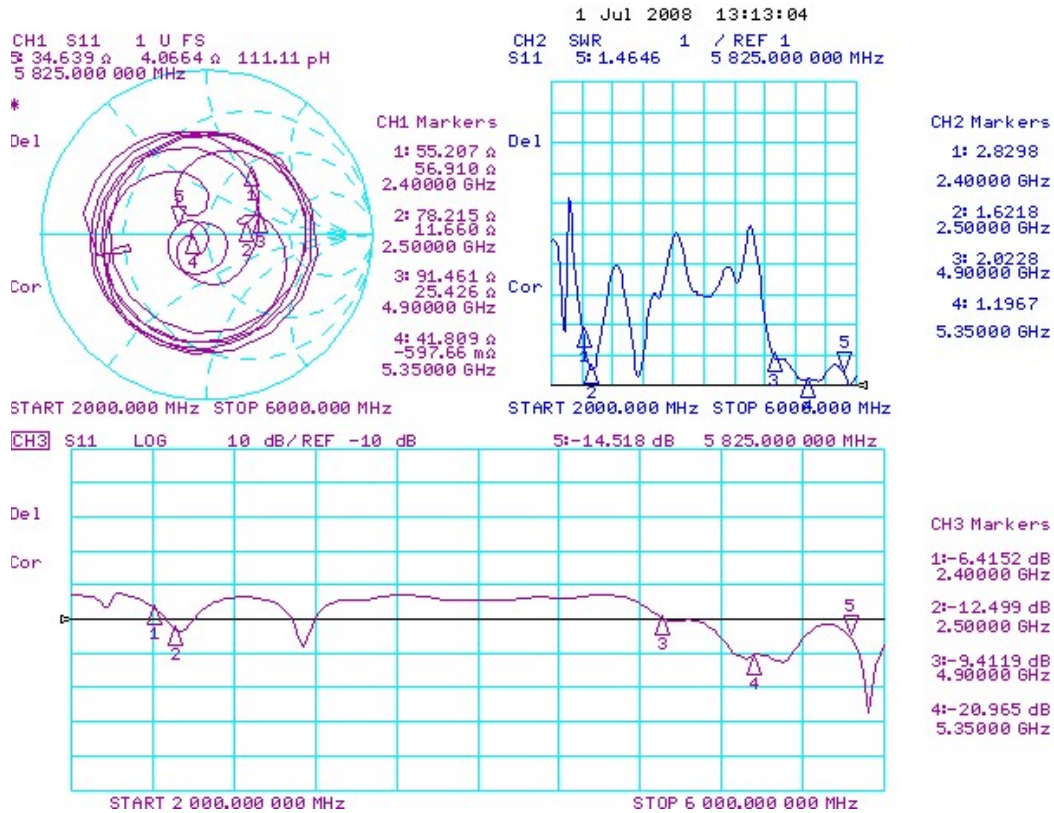
REV:X1

ITEM	PART NAME	ORIGINAL SUPPLIER	VENDER	TYPE	Description	UL NUMBER	SGS PAGE	UL防火等級
1	Cable	SWCC SHOWA	SWCC SHOWA	1354	Φ1.13mm Cable	E172803	P.37~41	60 or 80°C 30V
2	PCB	NEW ERA	Rogers	R94V0	Rogers RO4350B 20mil ,1/2 Oz,Gold flash	E98524	P.42~44	V-0
		ONSTATIC	ONSTATIC	-		-	P.45~58	-
		BAOHUA	BAOHUA	-		-	P.59~65	-
		BAOHUA	BAOHUA	-		-	P.66~72	-
3	Connector	GE	HIROSE ELECTRIC CO., LTD	310SEO	HRS U.FL	E45587	P.73~78	V-0
		HIROSE ELECTRIC CO., LTD	HIROSE ELECTRIC CO., LTD	-	HRS U.FL	-	P.79~82	-
4	Core	KING CORE	KING CORE	K5B	RH 4*10*2mm	-	P.83~89	-
5	H.S Tube	HAMBURG	HAMBURG	H-2	Heat Shrink Tube	E255394	P.90~94	125°C 600V
		HAMBURG	HAMBURG	-	INK ; White	-	P.95~99	-
6	錫膏	仲悅	仲悅	-	無鉛錫膏	-	P.100~103	-

"未經工程部許可,不得複印"

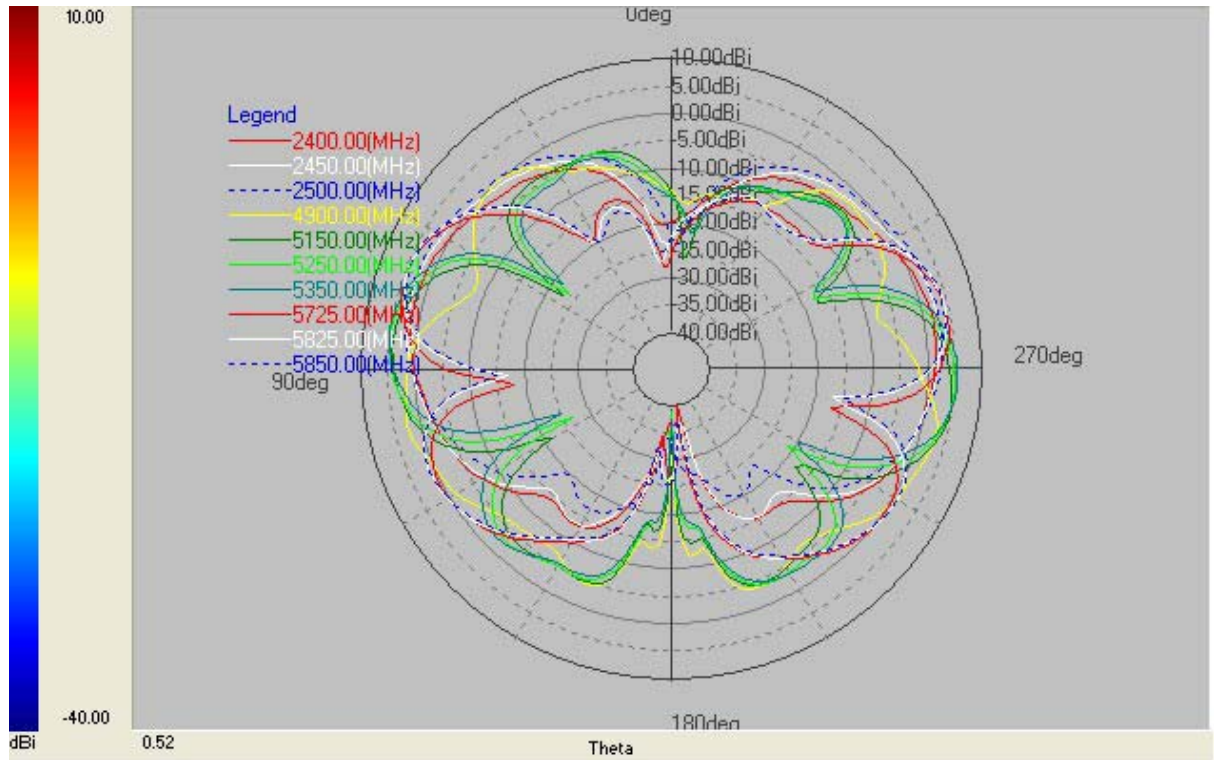
RF Antenna Assembly

P/N0 :C034-510687-A(SSR-82064) SPEC : Dual Band
Free Space

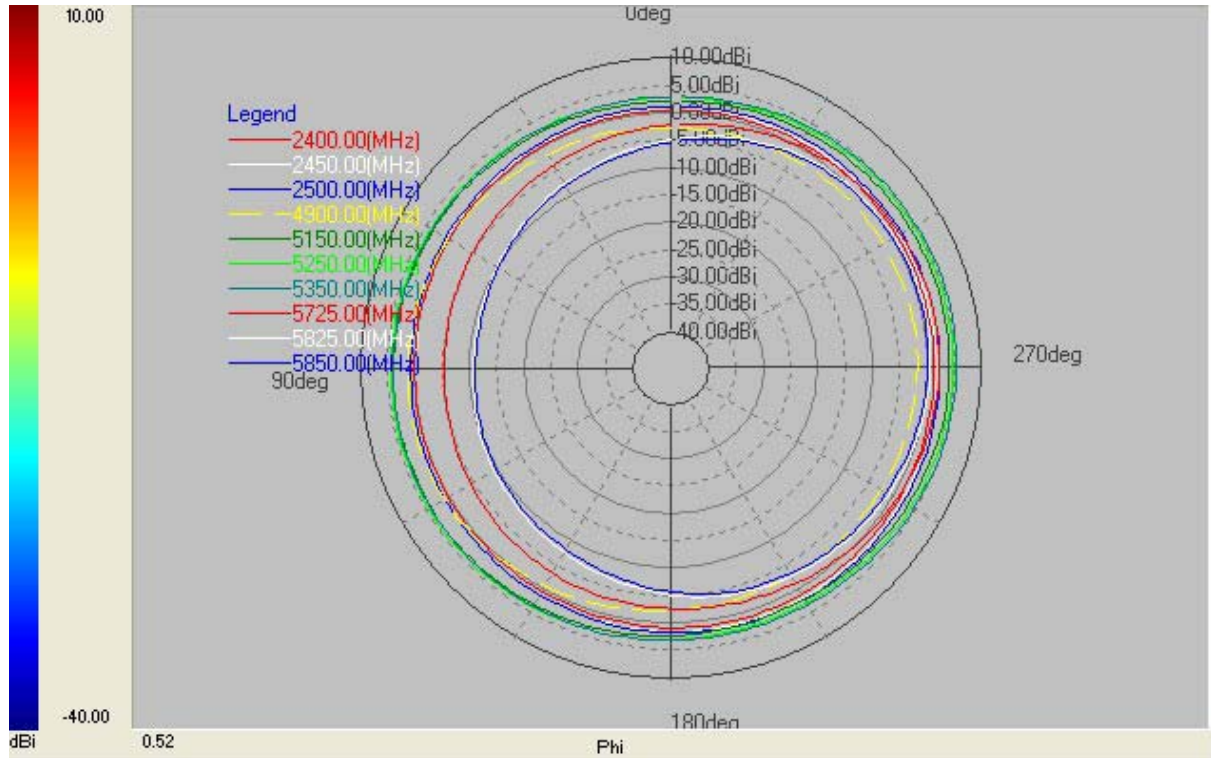


Free Space

Far-field amplitude of C034-510687-A-H(SSR-82064)



Far-field amplitude of C034-510687-A-V(SSR-82064)



Date : 2005/02/02

Our Spec. No. WS05-M016

MESSRS.

SPECIFICATION
FOR
HIGH FREQUENCY COAXIAL CABLE
" KHCX - 32AWG - SB - TA " GRAY

SHOWA ELECTRIC WIRE & CABLE CO., LTD.

TORANOMON

TOKYO JAPAN

T. Mori

T. Mori
Manager, Engineering Section
Engineering Dept.
Electronic Wire Business Unit

1. 適用(SCOPE)

本仕様書は電子機器などの内部配線に使用される細径同軸“KHCX-32AWG-SB-TA”の構造と特性について定める。

This specification covers the construction and characteristics of coaxial cable “KHCX-32AWG-SB-TA” for internal wiring of electronic equipment.

2. ケーブル型名の説明 (EXPLANATION OF CABLE TYPE)

KHCX-32AWG-SB-TA

(1) (2) (3) (4)

(1) ケーブル略称 (Cable Abbreviation)

(2) 導体サイズ (Conductor Size)

(3) Inner Conductor Type (4) Outer Conductor Type.

3. 構造(CONSTRUCTION)

項目 Item		要求特性 Requirement
内部導体 Inner conductor	材質 Material	銀めっき軟銅線 Silver coated annealed copper wire
	構成 Stranding	7/0.08mm
	外径 Diameter	標準 0.24mm Nom. 0.24mm
絶縁体 Insulation	材質 Material	FEP
	色別 Color	自然色 Natural
	厚さ Thickness	標準 0.22mm Nom. 0.22mm
	外径 Diameter	0.68 +0.04/ -0.02mm
外部導体 Outer conductor	材質 Material	錫めっき銅合金線編組 Tinned copper alloy wire braid shield
	構成 Stranding	16/4/0.05 mm
	編組密度 Coverage	Approx. 90%
シース Sheath	材質 Material	FEP
	色別 Color	灰・白・黒 Gray・White・Black
	厚さ Thickness	標準 0.10mm Nom. 0.10mm
仕上外径 Overall diameter		1.13mm +0.08/ -0.05mm
概算質量 Approximate mass		3 kg/km

4. 特性 (CHARACTERISTICS)

項目 Item	単位 Unit	要求特性 Requirements
導体抵抗 Conductor Resistance	Ω /km	597 以下 (20°C) Max. 520 (at 20°C)
絶縁抵抗 Insulation Resistance	M Ω km	1,500 以上 (DC 500V 1 分間充電後, 20°C) Min. 1,500 (After charge DC 500V for 1 min. at 20°C)
耐電圧 Dielectric Strength	-	絶縁体 : AC.1.5kV/0.15 秒間 (スパークテスト) Dielectric core : No breakdown at AC.1.5kV for 0.15sec by spark test.
		シース : AC.1.5kV/0.15 秒間 (スパークテスト) Jacket : No breakdown at AC.1.5kV for 0.15sec by spark test.
		内部導体-外部導体間 : AC.500V/1 分間 No breakdown at AC.500V for 1 min between outer conductor and inner conductor.
静電容量 Capacitance	pF/m	標準 98 (at 1kHz) Nom. 98 (at 1kHz)
特性インピーダンス Characteristic Impedance	Ω	50 \pm 2 (at TDR)
減衰量 Attenuation	dB/m	2.0GHz : 2.9 以下 Max.2.9 2.4GHz : 3.2 以下 Max.3.2 3.0GHz : 3.7 以下 Max.3.7 4.0GHz : 4.3 以下 Max.4.3 5.0GHz : 4.8 以下 Max.4.8 6.0GHz : 5.3 以下 Max.5.3
VSWR	--	2.4~2.5GHz : 1.20 以下 Max.1.20 4.8~6.0GHz : 1.40 以下 Max.1.40
耐はんだ性 Heat resistance for solder	--	絶縁体およびシースの寸法変化は 0.2mm 以下のこと。 Shrink and expansion of dielectric core or jacket should not be more than 0.2mm. 試験条件(test condition) : 255°C \pm 5°C * 3 sec.

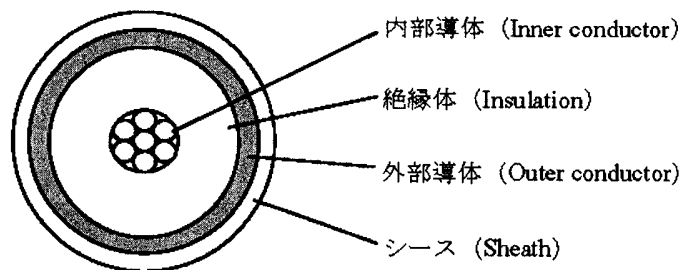


図 1 .ケーブル構造図

Fig.1. Cable Cross-Section



AVLV2.E172803 Appliance Wiring Material - Component

Page Bottom

Appliance Wiring Material - Component

See General Information for Appliance Wiring Material - Component

HANGZHOU FUTONG SHOWA WIRE & DEVICES CO LTD

E172803

1-8 FUTONG HI-TECH PARK
JINQIUDADAO RD
FUYANG, ZHEJIANG 311400 CHINA

Table of Recognized Styles							
Single-conductor, thermoplastic insulation.							
1007	1354	1571	1865	10168	10271	10380	
1015	1430	1589	10012	10198	10272	10381	
1032	1431	1617	10026	10226	10321	10494	
1061	1533	1618	10027	10234	10360	11032	
1095	1534	1672	10029	10236	10368	11033	
1185	1569	1691	10166	10237	10369		
Multiple-conductor, thermoplastic insulation.							
2444	2464	2468	2547	2835	2969	20276	20488
Single-conductor, thermoset insulation.							
3173	3266	3287	3302	3347	3386	3436	3464
3195	3271	3288	3321	3348	3416	3443	3469
3265	3272	3289	3346	3385	3417	3463	3476

Marking: Company name or tradename "FSC" , voltage rating, temperature rating, conductor size, conductor material if other than copper, and use.

Last Updated on 2007-05-23

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An independent organization working for a safer world with integrity, precision and knowledge.



Style 1354 Coaxial Cable.

Rating 60°C or 80°C, 30 V.

Conductors No. 44 AWG min, material not specified.

Insulation 2 mils minimum at any point, 125 mils maximum. The insulation may be:

Extruded solid or cellular PE, FRPE, Polypropylene, PFA, FEP, ECTFE, PTFE, ETFE, or combination thereof with or without irradiation; or tape wrapped solid or cellular PTFE, PFA, or FEP. Applied as a spiral wrapped thread (5 mils minimum, 40 mils maximum) and enclosed in a tube of insulation.

Covering Optional. Extruded PVC, PFA, Polyamide, Polyester, PVDF, FEP, PTFE, ECTFE, ETFE, PE, XLPE, XLFRPE or FRPE; lacquered braids; heat sealed PTFE, PFA or FEP tape; Polyester or Polyester-Polyethylene film. Thicknesses not specified.

Shield Optional. (Required if outer shield not provided.)

Covering Optional. Extruded PVC, PFA, PP, Polyamide, Polyester, PVDF, FEP, PTFE, ECTFE, ETFE, PE, XLPE, XLFRPE or FRPE; lacquered braids; heat sealed PTFE, PFA or FEP tape; Polyester or Polyester-Polyethylene film. Thicknesses not specified.

Outer Shield Optional. (Required if inner shield not provided.)

Outer Covering Optional. (Required if outer shield is provided.) Extruded Irradiated PE Irradiated PVC Polyurethane PVC, PFA, PP, Polyamide, Polyester, PVDF, FEP, PTFE, ECTFE, ETFE, PE, XLPE, XLFRPE or FRPE; lacquered braids; heat sealed PTFE, PVC, PFA or FEP tape; Polyester or Polyester-Polyethylene film. Thicknesses not specified.

(Continued on Page 1354A)

Standard Appliance Wiring Material UL 758.

Instructions Detailed Examination.
to UL
Representative

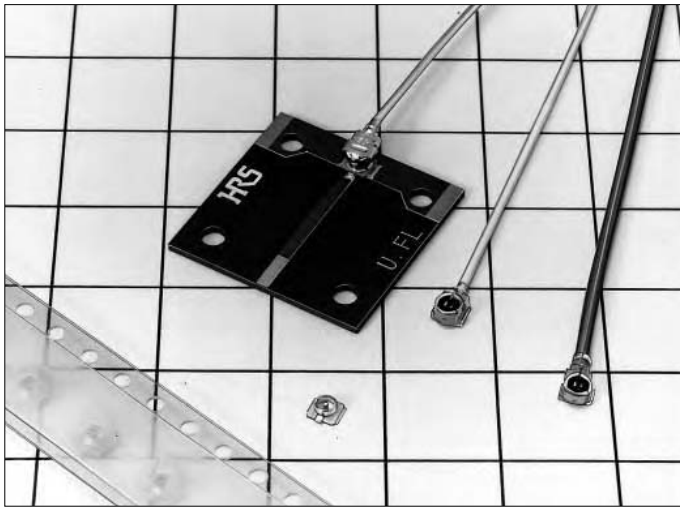
UL (4) Detailed Examination.
Counter-Check (12) Horizontal Flame Test.
Program

Marking General.

Use Internal wiring of Class 2 circuits of electronic equipment
or as insulated single in jacketed multiconductor cables.

SMT Ultra-Miniature Coaxial Connectors - Mating Heights Owing to the Lowest Profile and the Lightest

U.FL Series



■ Features

1. Mating Heights Owing to Lowest Profile

Height from the printed circuit board when mates a receptacle with a (right-angle) plug is 2.5 mm maximum. This low Profile is at the world's shortest level.

2. Extremely Small Board Occupation Area

In comparison with our E.FL Series of SMT coaxial connectors, the receptacles offer a reduction of approximately 18% of the board occupation area resulting in an area of just 7.7 mm².

3. World's Lightest

These are the world's lightest coaxial connectors.

Receptacle: 15.7 mg

Right-angle plugs

For ϕ 0.81 mm cable: 53.7 mg

For ϕ 1.13 & 1.32 mm cable: 59.1 mg

4. Can Be Used Up to a Frequency of 6 GHz

To meet the frequency requirements of a wide variety of miniature equipment, these connectors offer high frequency performance from DC to 6 GHz.

5. Can Be Used with Automatic Mounting

The embossed tape packaging specification of the receptacles permits automatic mounting.

6. Use of Ultra-Fine Teflon Cable

From among the types of suitable cable, ϕ 0.8 mm (single shield) outside diameter ultra-fine Teflon coaxial cable has been made a standard specification in consideration of improving the construction qualities and construction area.

An external diameter ϕ 1.32 mm (double shield) & ϕ 1.13mm (single shield) ultra-fine Teflon coaxial cable specification is also available.

7. Simple Removal of Connectors

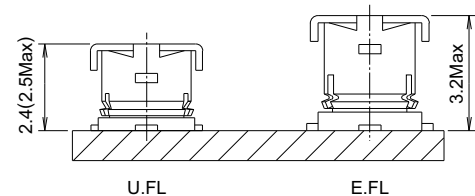
The extraction jig permits simple removal of connectors.

8. Mating Checks Are Easy

Subminiature size notwithstanding, the lock sensation permits a check of sure mating.

Meets up to 6 GHz Requirement

Figure 1. Mating Height Comparison (with Hirose Electric Products)



● Space Factor of Mated Connector

Figure 2. U.FL-LP-040 and U.FL-R-SMT

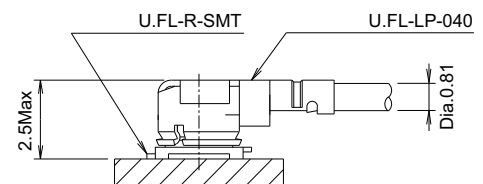
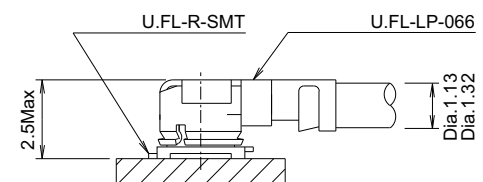


Figure 3. U.FL-LP-066 and U.FL-R-SMT



■ Applications

Mobile phones, wireless communications equipment, electronic measuring instruments, GPS, wireless LAN, Bluetooth etc.

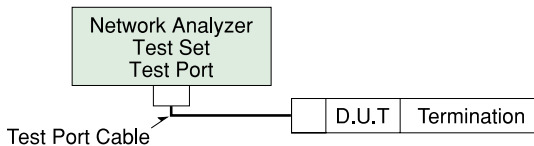
■ Product Specifications

Ratings	Nominal characteristic impedance Rated voltage Rated frequency	50Ω 60 V AC (rms) DC to 6 GHz	Operating temperature range Operating humidity	-40 C to +90 C 90% max.
---------	--	-------------------------------------	---	----------------------------

Item	Specification	Conditions	
1. Contact resistance	Center: 20 mΩ max. Outside: 10 mΩ max.	Measured at 10 mA max.	
2. Insulation resistance	500 MΩ min.	Measured at 100 V DC	
3. Withstand voltage	No line or insulation breakdown	200 V AC for 1 minute	
4. V.S.W.R.*	1.3 max.	DC to 3 GHz	
	Dia.0.81Cable	1.35	
	Dia.1.13Cable	1.4	3 to 6 GHz
	Dia.1.32Cable	1.5	
5. Female contact holding force	0.15 N min.	Measured with a ϕ 0.475 pin gauge	
6. Repetitive operation	Contact resistance 25 mΩ max. (Center) 15 mΩ max. (Outside)	30 cycles of insertion and disengagement	
7. Vibration	No momentary disconnections of 1 μ s min. No damage, cracks, or parts looseness min.	Frequency of 10 to 100 Hz, single amplitude of 1.5 mm, acceleration of 59 m/s ² , for 5 cycles in the direction of each of the 3 axes	
8. Shock	No momentary disconnections of 1 μ s min. No damage, cracks, or parts looseness	Acceleration of 735 m/s ² , 11 ms duration, sine half-wave waveform, for 6 cycles in the direction of each of the 3 axes	
9. Humidity resistance (Steady state)	No damage, cracks, or parts looseness Insulation resistance 100 MΩ min.(High temperature) Insulation resistance 500 MΩ min.(Pry)	Temperature of 40 C, humidity of 95%, let stand for 96 hours	
10. Temperature cycle	No damage, cracks, or parts looseness Contact resistance 25 mΩ max. (Center) 15 mΩ max. (Outside)	Temperature: +40 C → 5 to 35 C → +90 C → 5 to 35 C Time: 30 min. → Within 5 min. → 30 min. → Within 5 min. Cycles: 5	
11. Salt spray test	No excessive corrosion	48 hours continuous exposure to 5% salt water	

*V.S.W.R. Measurement System

The above V.S.W.R. standard values were measured using the measurement system of the diagram below.



NOTE 1: Cable type connectors were measured with SMA conversion adapters attached to both ends of the harness product of a suitable 100cm cable.

NOTE 2: Board type connectors were mounted to a 50. glass epoxy board and measurements were conducted with SMA conversion adapters attached.

■ Materials

Part	Material		Finish	Remarks
Shell	Phosphor bronze		Silver plating	_____
Male center contact	Brass		Gold plating	_____
Female center contact	Phosphor bronze		Gold plating	_____
Insulator	Plug	PBT	Black	UL94V-0
	Receptacle	LCP	Beige	UL94V-0

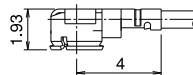
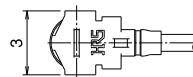
Plugs



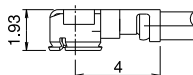
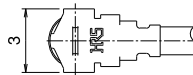
U.FL-LP-040



U.FL-LP-066



Form of Plug After Cable Wiring



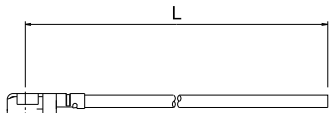
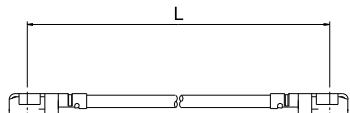
Form of Plug After Cable Wiring

Item	HRS No.	Part No.	Applicable Cable	Weight (mg)
Right-angle plug shell (for ϕ 0.81 cable)	CL331-0451-2	U.FL-LP-040	RF-MF5010 Manufactured by Nissei Electric Co., Ltd. J12B0964 Manufactured by Junkosha Co., Ltd. CO-6F-SB-CX50 Manufactured by Hitachi Cable, Ltd.	53.7/unit
Right-angle plug shell (for ϕ 1.13 cable)	CL331-0452-5	U.FL-LP-066	RF-MF5016 Manufactured by Nissei Electric Co., Ltd. J12B1054 Manufactured by Junkosha Co., Ltd.	59.1/unit
Right-angle plug shell (for ϕ 1.32 cable)			A12B0733 Manufactured by Junkosha Co., Ltd. CO-6F-DSB-CX-50 Manufactured by Hitachi Cable, Ltd.	

Please order plugs with the cable assembly specifications.

Cable Assembly

Dimension of U.FL Series assembly products should be made as indicated below.

Single-Ended Cable Assembly	Double-Ended Cable Assembly
	

Ordering Information

U.FL - **□** **LP** - **□** - **A** - **(L)**

① ② ③ ④

① Series name	U.FL
② Assembly type	Blank: Single ended 2: Double ended
③ Cable type	04 : For use with ϕ 0.81 cable 5016 : For use with ϕ 1.13 cable 066 : For use with ϕ 1.32 cable
④ Overall length (mm)	Length L is expressed in mm units.

Cable Assembly Overall Length Standard Tolerance

Overall Length L (mm)	Standard Tolerance (mm)
$35 \leq L \leq 200$	± 4
$200 < L \leq 500$	± 8
$500 < L \leq 1000$	± 12
$1000 < L$	$\pm 1.5\%$

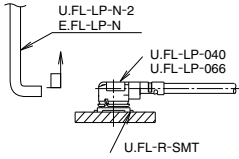
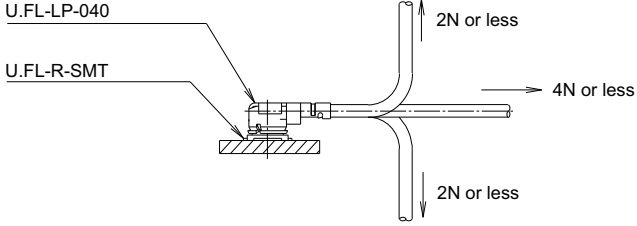
Note: Shortest length L is 35 mm.

Part No. of Cable Assembly	CL No.	Description
U.FL-2LP-04-A-(L)	321-1937-2-***	Dia. 0.81mm Double Ended Cable Assembly
U.FL-LP-04-A-(L)	321-1998-7-***	Dia. 0.81mm Single Ended Cable Assembly
U.FL-2LP-5016-A-(L)	321-2493-6-***	Dia. 1.13mm Double Ended Cable Assembly
U.FL-LP-5016-A-(L)	321-2492-3-***	Dia. 1.13mm Single Ended Cable Assembly
U.FL-2LP-066-A-(L)	321-2170-7-***	Dia. 1.32mm Double Ended Cable Assembly
U.FL-LP-066-A-(L)	321-2573-3-***	Dia. 1.32mm Single Ended Cable Assembly

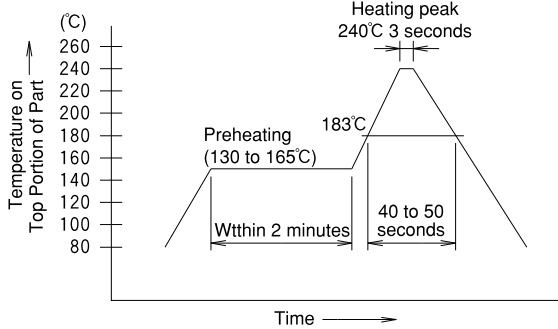
Please contact Hirose Sales Representative about cable length and cable end treatment.

■ Usage Precautions

1. Plugs

<p>(1) Connection/ disconnection of connectors</p>	<p>1) To disconnect connectors, hook the end portion of E.FL-LP-N and U.FL-LP-N-2 onto the connector cover and pull off vertically in the direction of the connector coupling axis. To remove the connector directly, hold the connector cover and pull off vertically in the direction of the connector coupling axis. (Please exercise caution so as not to injure fingertips or nails.)</p> <p>2) To couple the connectors, the coupling axes of both connectors are aligned and the connectors are inserted as perpendicularly as possible. Do not attempt to insert on an extreme angle.</p>	
<p>(2) Permissible load on the cable after connector coupling.</p>	<p>After the connectors are coupled, do not apply a load to the cable in excess of the values indicated in the diagram below.</p> 	
<p>(3) Precautions</p>	<p>Please note that excessive twisting in the action of insertion or removal will cause damage.</p>	

2. Receptacles

<p>(1) Recommended temperature profile (Reference)</p>	<p>Recommended Temperature Profile (Reference)</p>  <p>1) The temperature indicates the printed circuit board surface temperature of the connector lead portion. 2) The reflow soldering method should be performed at a peak temperature of 240 C or less at the surface of the printed circuit board. 3) The temperature profile will change depending on conditions which include such factors as the size of the board, the solder used, and the solder thickness.</p>	
<p>(2) Recommended hand soldering conditions (Reference)</p>	<p>Soldering iron temperature: 350 C Soldering time: Within 5 seconds</p>	
<p>(3) Recommended screen thickness</p>	<p>0.15 mm</p>	



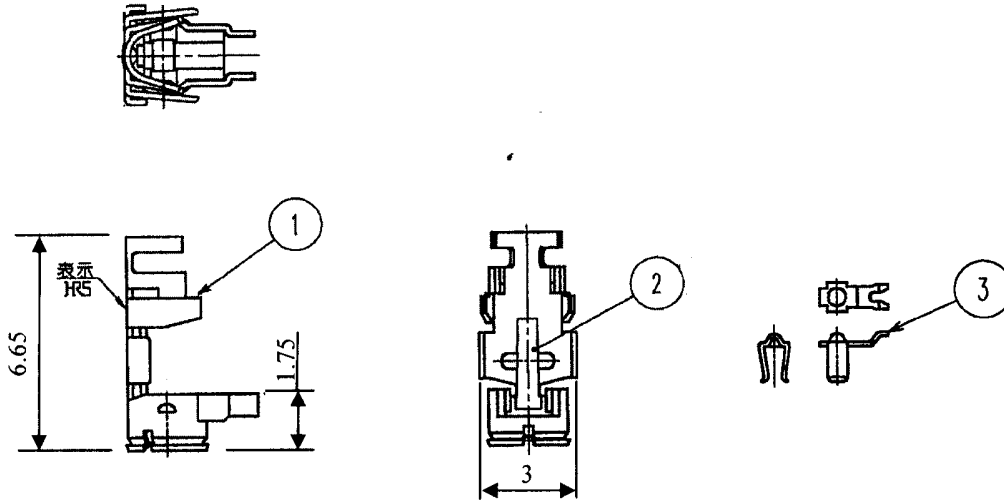
譚裕實業股份有限公司

WHA YU INDUSTRIAL CO., LTD

HRS Connector Material Data Sheet

譚裕料號 Whyu P/N	100-5080003-AZ 100-5080004-AZ	產品名稱 Product Name	1.13mm cable Plug [U.FL-LP-066(02)] 1.13mm cable conductor [U.FL-CONTACT(02)]
------------------	----------------------------------	----------------------	--

U.FL Connector Structure Drawing



Material Parts

Surface Plating

Material Parts									Surface Plating	
1	Shell	Phos. Bronze	Cu	Sn	P	Zn	Pb		Sliver Plating(2 μ m)	
2	Isolation	PBT	Polybutylene Terephthalte(UL 94V-0)							NA / (Color:Black)
3	Crimp Pin	Phos. Bronze	Cu	Sn	P	Zn	Pb		Gold Plating (0.3 μ m)	

Remark : durability 30 matings
Vendor : HIROSE Company





QMFZ2 Component - Plastics

Friday, October 24, 2003

E45587

GE PLASTICS JAPAN LTD

CUSTOMER SERVICE & LOGISTICS 2-2 KINUGAOKA MOKA-SHI TOCHIGI-KEN 321-4392 JAPAN

Material Designation: **310SE0(w)**

Product Description: Polybutylene Terephthalate (PBT), flame retardant, designated "Valox" 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	75	140	-	-
	0.71	V-0	4	0	120	120	140	-	-
	1.5	V-0	3	0	120	120	140	-	-
	3.0	V-0, 5VA	2	0	120	120	140	-	-

CTI: 3

HVTR: 4

D495: 6

IEC Ball Pressure (°C): -

Dielectric Strength (kV/mm):
22

Volume Resistivity (10^xohm-cm): 15

Dimensional Stability(%): 0.05

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): -

(w) Recognition includes the use of surface dyes.

NOTE Material designations may be followed by a color nomenclature consisting of either an alpha/numeric or a numeric/alpha combination.

Report Date: 7/20/1979

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.



Advanced Circuit Materials Division, 100 S. Roosevelt Avenue, Chandler, Arizona 480-961-1382, FAX: 480-961-4533

Certificate of Compliance Test Data Sheet

Material Safety Data Sheets (MSDS) for Rogers products are available on our web site at www.rogerscorporation.com/acm. If you cannot access this web site contact your Rogers Customer Service Representative.

Customer:	NEW ERA ELECTRONICS CO LTD		
Rogers Job #:	00091918	Item #:	1
Customer Order #:	4610001614/MPO970400133		
Customer Part #:			

Material Description:	2008005 RO4350B 48X36 5E/5E 0100+-001/DI		
Quantity Shipped:	10		

Rogers Corporation certifies that the material shipped has typical properties as hereby reported. The material has been tested in accordance with the test methods as prescribed in:

Specification:			

PROPERTY	Test Parameter	Specification Values	Test Results This Shipment
Dielectric Constant	10 GHz	3.4300 - 3.5300 range	3.462 - 3.475
Dissipation Factor	10 GHz	0.0060 max	0.0032 - 0.0036

Peel Strength(LBS/IN.) Thermal Stress CU type: 1/2 OZ EDC Min value 4.6

Exceptions: Tested in accordance with IPC-4103

Special Test:

Load Number(s)	Date of Manufacture	Quantity
G-00027116-00022471	05/04/08	10

Certified by:  5-6-8
Holmstrom, Michael A **Date**

Certificate #: 90111864 **Date printed:** 05/06/2008

- Laminate Surface Quality inspected per IPC-4103 Class "A" unless otherwise agreed to by Customer and Rogers Corp.
- Laminate using Ohmega foil is twice Class "A" unless otherwise agreed to by Customer and Rogers Corp.
- For "Fabrication Guidelines" see Rogers website <http://www.rogerscorporation.com/acm/litintbl.htm>.
- Shelf life of RO/4400 prepregs is 12 months from Date of Manufacture when stored under conditions noted in data sheet. Data sheet can be located at Rogers website <http://www.rogerscorporation.com/mwu/pdf/RO4400sandfab.pdf>

The world runs better with Rogers.



www.rogerscorporation.com

ZPMV2.E98524
Wiring, Printed - Component

Enhanced searching capability for this category can be found in UL's iQ Family of Databases (www.ul.com/iq).

[Page Bottom](#)

Wiring, Printed - Component

[See General Information for Wiring, Printed - Component](#)

NEW ERA ELECTRONICS CO LTD

E98524

45 15TH JAN WAN-JAN VILLAGE
HSIN-WU HSIANG, TAOYUAN HSIEN 327 TAIWAN

Type	Cond Width		Cond Thk	SS/ DS	Max	Solder		Max	Flame Class	Meets UL796 DSR	C T I
	Min	Edge			Area	Limits	Oper				
	mm(in)	mm(in)			mm(in)	C	sec	C			
Multilayer printed wiring boards.											
2M	0.06 (0.002)	0.06 (0.002)	17 (0.67) Int:34	DS	25.4 (1.0)	260	20	130	V-0	All	-
R1	0.19 (0.007)	0.19 (0.007)	34 (1.34) Int:34	DS	25.4 (1.0)	260	10	105	V-1	-	-
R2	0.19 (0.007)	0.2 (0.008)	34 (1.34) Int:34	DS	25.4 (1.0)	260	10	105	V-0	-	-
T1	0.2 (0.008)	0.2 (0.008)	34 (1.34) Int:34	DS	25.4 (1.0)	260	10	130	V-0	-	-
Single layer printed wiring boards.											
1	0.4 (0.016)	1.76 (0.069)	35 (1.38)	DS	25.4 (1.0)	260	3	105	V-0	All	-
1S	0.05 (0.002)	0.06 (0.002)	17 (0.67)	DS	25.4 (1.0)	260	20	130	V-0	All	-
R94V0	0.027 (0.001)	0.027 (0.001)	17 (0.67)	DS	25.4 (1.0)	260	10	90	V-0	-	-
T94V0	0.027 (0.001)	0.027 (0.001)	17 (0.67)	DS	25.4 (1.0)	260	10	105	V-0	-	-
Single layer printed wiring boards-metal base laminate.											
HC1094V0	0.16 (0.006)	0.17 (0.007)	102 (4.02)	SS	25.4 (1.0)	260	10	130	V-0	-	-

Marking: Company name or tradename "NEE" and type designation. May be followed by a suffix to denote factory identification.

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TABLE IA - PARAMETER PROFILE INDICES

Type	Pattern Limits			Solder Limits		Maximum Operating Temp. (°C)	UL 94 Flame Class
	Min. Width (mm)	Max. Area Diameter (mm)	Min. Edge Width (mm)	Max. Temp. (°C)	Max. Time (sec.)		
1	0.38	25.4	1.14	260	3	105	V-0
1S	0.05	25.4	0.06	260	20	130	V-0
T94V0	0.05	25.4	0.06	260	20	105	V-0
R94V0	0.07	25.4	0.07	260	10	90	V-0

TABLE IB - SILVER CONDUCTOR LIMITATIONS

Type	Silver Conductor Materials Present (YES) or (No)	Min. Spacing Between Adjacent Silver Conductors of Different Potential (mm)	Maximum Voltage Withstood Between Silver Conductors (V dc)
1	No	Not Determined	Not Determined
1S	No	Not Determined	Not Determined
T94V0	No	Not Determined	Not Determined
R94V0	No	Not Determined	Not Determined

TABLE II - BASE MATERIALS

Type	Base Material &			Min. Thk. mm	Min. Copper Thk. mics	SS/ DS ^o	Mfg. Process	Meets UL 746E DSR	CTI (PLC)
	UL/ ANSI Grade	Mfr +	Grade						
1	FR-4	P	PCL-FR -(a) (a)!	1.6	34.3	DS	A	Yes	-
*	FR-4	N	15193##	1.6	34.3	DS	A	Yes	-
*	CEM-3	GE	GEPEG	1.6	34.3	DS	A	Yes	-
*	FR-4	H	MCL-E-67	1.6	34.3	DS	A	Yes	-
*	FR-4	MA	R-1705	1.6	34.3	DS	A	Yes	-
*	FR-4	MI	CCL-EL170	1.6	34.3	DS	A	Yes	-
*	FR-4	NY	FR-4-86	1.6	34.3	DS	A	Yes	-
*	CEM-3	NY	CEM-3-86	1.6	34.3	DS	A	Yes	-
*	FR-4	K	TLC-551	1.6	34.3	DS	A	Yes	-

& - Recognized Component, (QMTS2)

@ - SS - Single Sided; DS - Double Sided or Single Sided

+ - P: Polyclad (E45456); N: Nelco (E169552); GE: General Electric (E35132);
H: Hitachi (E80148); MA: Matsushita Electric Works (E81336); MI:
Mitsubishi Gas Chemical (E81340); NY: Nan Ya (E98983); K: Kyocera
Chemical (E81934)

! - Acceptable Alternatives:

Mfr. (File No.)	Laminates
Polyclad PCL-FR-(a) (a) (E45456)	1. PCL-FR-226, PCL-FR-240 2. PCL-FR-226 Turbo, PCL-FR-240 Turbo 3. PCL-FR-370 4. PCL-FR-254, PCL-HP-850, PCL-HP-870
Isola ED-130 family(E41625)	1. Duraver-E-Cu#104ML, ED130UV, FR402, FR4-74, IS402, IS410, and IS410BC 2. Duraver-E-Cu#114, Duraver-E-Cu#117, FR405 3. FR406, FR406N, IS406BC

TABLE II - BASE MATERIALS

Type	Base Material &			Min. Thk. (mm)	Min. Copper Thk. (mic)	SS/ DS [@]	Mfg. Process	Meets UL 746E DSR	CTI (PLC)
	UL/ ANSI Grade	Mfr +	Grade						
1S	FR-4	P	PCL-FR -(a) (a)!	0.63	17	DS	B	Yes	-
	FR-4	HW	HW-4	0.63	17	DS	B	Yes	-
	FR-4	TL	LS-4	0.63	17	DS	B	Yes	-
	FR-4	TL	LS-4Y	0.63	17	DS	B	Yes	-
T94V0	-	T	RF-35	0.26	17	DS	C	-	-
R94V0	-	R	RO-4350B	0.17	17	DS	C	-	-

& - Recognized Component, (QMTS2)

@ - SS - Single Sided; DS - Double Sided or Single Sided

+ - HW: Hwa Woei (E140111); TL: Taiwan Leader (E176891); NY: Nan Ya (E98983);
P: Polyclad (E45456); T: Tonoga: (E121087); R: Rogers (E102763)

! - *Acceptable Alternatives:

Mfr. (File No.)	Laminates
Polyclad PCL-FR-(a) (a) (E45456)	1. PCL-FR-226, PCL-FR-240 2. PCL-FR-226 Turbo, PCL-FR-240 Turbo 3. PCL-FR-370 4. PCL-FR-254, PCL-HP-850, PCL-HP-870
Isola ED-130 family(E41625)	1. Duraver-E-Cu#104ML, ED130UV, FR402, FR4-74, IS402, IS410, and IS410BC 2. Duraver-E-Cu#114, Duraver-E-Cu#117, FR405 3. FR406, FR406N, IS406BC

TABLE IA - PARAMETER PROFILE INDICES

Type	Pattern Limits			Solder Limits		Maximum Operating Temp. (°C)	UL 94 Flame Class
	Min. Width (mm)	Max. Area Diameter (mm)	Min. Edge Width (mm)	Max. Temp. (°C)	Max. Time (sec.)		
2M	0.05	25.4	0.06	260	20	130	V-0
T1	0.20	25.4	0.20	260	10	130	V-0
R1	0.19	25.4	0.19	260	10	105	V-1
R2	0.19	25.4	0.20	260	10	105	V-0

TABLE IB - SILVER CONDUCTOR LIMITATIONS

Type	Silver Conductor Materials Present (YES) or (No)	Min. Spacing Between Adjacent Silver Conductors of Different Potential (mm)	Maximum Voltage Withstood Between Silver Conductors (V dc)
2M	No	Not Determined	Not Determined
T1	No	Not Determined	Not Determined
R1	No	Not Determined	Not Determined
R2	No	Not Determined	Not Determined

TABLE II - BASE MATERIALS

Type	Base Material &										Meets UL 746B DSR	CTI (PLC)	
	Individual Laminate Matl.					Individual Bonding Sheet Matl.							
	UL/ ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)	UL/ ANSI Grade	Mfr. +	Grade	Min. Thk. (mic)	Total Build- Up Thk. (mm)	Con- ductor Thk.# (mic)			PWB Mfg. Proc.
2M	FR-4	P	PCL-FR -(a) (a) i	100	FR-4	P	PCL-FRP -(a) (a) i	50	0.63	E:17 I:34	A	Yes	-
	FR-4	NY	FR-4-TL	100	FR-4	NY	NYP-1	50	0.63	E:17 I:34	A	Yes	-
	FR-4	NY	NP-140TL	100	FR-4	NY	NP-140B	50	0.63	E:17 I:34	A	Yes	-
TI%	-	T	RF-35/FR-406	50	-/FR-4	I	FR406BS	50	0.49	E:34 I:34	A	-	-
R1	-	R	RO4350	100	-	R	RO4450	100	0.45	E:34 I:34	A	-	-
R2%	-	R	RO4350/FR-406	100	-/FR-4	I	FR406BS	50	0.42	E:34 I:34	A	-	-

& - Recognized Component, (QMTS2)

+ - *P: Polyclad (E45456); I: Isola (E41625); NY: Nan Ya (E98983); T: Tonoga (E121087); R: Rogers (E102763)

- I = Maximum internal thickness; E = Minimum external thickness

! - Acceptable Alternatives:

Mfr. (File No.)	Laminates / Prepregs
Polyclad PCL-FR-(a) (a) (E45456)	1. PCL-FR-226, PCL-FR-240/ PCL-FRP-226, PCL-FRP-240 2. PCL-FR-226 Turbo, PCL-FR-240 Turbo/ PCL-FRP-226 Turbo, PCL-FRP-240 Turbo 3. PCL-FR-370/ PCL-FRP-370 4. PCL-FR-254, PCL-FR-850, PCL-FR-870/ PCL-FRP-254, PCL-FRP-850, PCL-FRP-870
Isola ED-130 family (E41625)	1. Duraver-E-Cu#104ML, ED130UV, FR402, FR4-74, IS402, IS410, and IS410BC/ DuraverE#104ML, ED-##, FR402-B15, FR-4+++ , IS410++++, and IS410BC 2. Duraver-E-Cu#114, Duraver-E-Cu#117, FR405/ E#114ML, Duraver-E#117, FR405BS 3. FR406, FR406N, IS406BC/ FR406+++

§ - Dissimilar generic material hybrid construction, please see table IIIA and IIIB for detail construction.

TABLE IA - PARAMETER PROFILE INDICES

Type	Pattern Limits			Solder Limits		Maximum Operating Temp. (°C)	UL 94 Flame Class
	Min. Width (mm)	Max. Area Diameter (mm)	Min. Edge Width (mm)	Max.	Max.		
				Temp. (°C)	Time (sec.)		
HC1094V0	0.16	25.4	0.17	260	10	130	V-0

TABLE IB - SILVER CONDUCTOR LIMITATIONS

Type	Silver Conductor Materials Present (YES) or (No)	Min. Spacing Between Adjacent Silver Conductors of Different Potential (mm)	Maximum Voltage Withstood Between Silver Conductors (V dc)
HC1094V0	YES, Immersion Silver	N/A@	N/A@

@ - Boards coated with Immersion Silver do not require conductor limitations in accordance with the exception in UL796, 7.2 and UL796F, 2.3.25.

Note: Reference to silver conductors infers silver conductors and silver plated conductors, for purposes of this report, unless otherwise indicated.

TABLE II - BASE MATERIALS

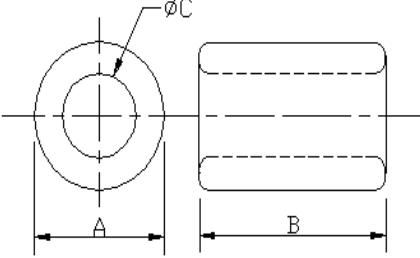
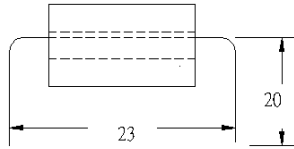
Type	UL/ ANSI Grade	Mfr +	Grade	Base Material &				Metal Thk. Min (mic)	Metal Thk. Max (mic)	Min. Copper Thk. (mic)	SS/ DS®	PWB Mfg. Process	Meets UL 746E DSR	CTI (PLC)
				Metal Base Dielectric Thk		Metal Type								
				Min (mic)	Max (mic)	Copper								
HCI094V0	-	TH	T-preg IKA	200	200	Copper	1020	1020	102-340	SS	A	-	-	

& - Recognized Component, (QMTS2)

@ - SS - Single Sided; DS - Double Sided or Single Sided

+ - TH: Thermagon (E165095)

SPECIFICATION

CUSTOMER:		CUST.P/N:	
ITEM:	K5B RH 4x10x2	K.C.P/N:	PS0404IA
(1) SHAPE : 		A	4±0.2 m/m
		B	10±0.4 m/m
		C	2±0.15 m/m
		D	m/m
		E	m/m
		F	m/m
		G	m/m
(2) ELECTRICAL REQUIREMENTS: $Z_1 = 37^{-0}$ OHM AT 25 MHz $Z_2 = 63^{-0}$ OHM AT 100 MHz		(3) TEST CONDITIONS: 1. IMPEDANCE ANALYZER: HP4191A TEST FIXTURE: HP16092A 2. WIRE: $\phi 0.65$ T.C.W*63m/m/2TS 3. DRAWING: 	
(4) PACKING <input checked="" type="checkbox"/> IN BULK <input type="checkbox"/> VACUUM <input type="checkbox"/> INSERTION 2000 PCS/BAGS* 4 BAG/INNER BOX* 4 BOXES/CARTON = 32000 PCS PCS/PLATE* PLATES/CARTON= PCS PCS/TRAY* TRAYS/CARTON= PCS		(5) APPEARANCE (1) AREA OF BREAK : < 2 m/m ² (2) SUM OF BREAKING AREA : < 3 m/m ² (3) DEPTH OF BREAK : < 1 m/m	
(6) REMARK:		Approved by	
		Checked by	
		Drawn by	
		DWG.NO.	

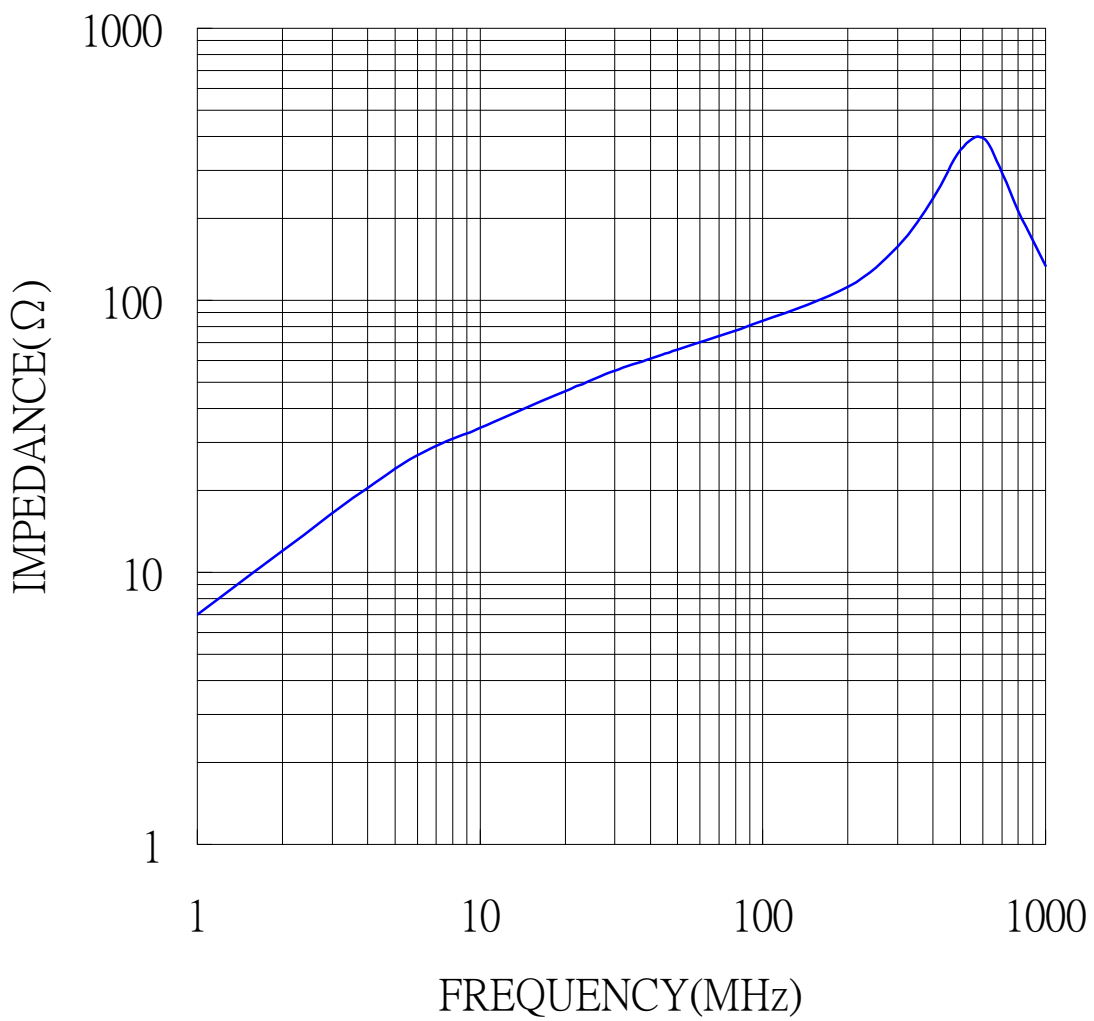


King Core Electronics Inc.
 Tel: 886-3-4782511 (Rep.)
 Fax: 886-3-4759923
 E-mail : kc@mail.kingcore.com.tw

ER011B

K5B RH 4x10x2

PS0404IA



King Core Electronics Inc.

Tel: 886-3-4782511 (Rep.)

Fax: 886-3-4759923

E-mail: kc@mail.kingcore.com.tw

MATERIAL SAFETY DATA SHEET

<p>1. General Information</p> <p>Product name : HAMBURG H-2</p> <p>Supplier : HANPAO CO.,LTD. jianshe Rd., longsheng chun longhua town, bao An District,shenzhen city, Guangdong,china. Tel: 0755-28126898 Fax: 0755-28126080</p> <p>Emergency Tel. No. : HANPAO CO.,LTD. jianshe Rd., longsheng chun longhua town, bao An District,shenzhen city, Guangdong,china. Tel: 0755-28126898</p>
<p>2. Composition</p> <p>Irradiated cross-linkied, flexible polyolefin, flame retardant, hea shrinkable tubing.</p>
<p>3. Hazards Identification</p> <p>Most important hazards: If the product is overheated or burned, harmful vapors shall be formed. The heated product has the potential to cause thermal burns, if touched.</p> <p>< Note > Durning heat-shrinking process, a slight characteristic odor of plastic may be noticed. This odor is not harmful.</p>
<p>4. First aid measures</p> <p>Inhalation : If vapors from the burning or overheated product are inhaled, provide fresh air. If symptoms are not reduced, seek medical advice.</p> <p>Skin contact: If the heated product contacts skin, remove the product immediately.</p> <p>Eye contact: If the heated product contacts eyes, rinse thoroughly with plenty of water for at least 15 minutes and seek medical advice.</p> <p>Ingestion: Seek medical advice.</p>
<p>5. Fire-fighting measures</p> <p>Suitable extinguishing media: water spray, dry powder, CO2 foam.</p> <p><Note> The product is flame-retarded(self-extinguish), but will burn, if continuously exposed to flame. Use the extinguishing media appropriate for the source of the fire. The self-contained breathing apparatus and the personal protective equipment may be needed in the evnt of large fires.</p>

MATERIAL SAFETY DATA SHEET**6. Accidental release measures**

Personal precautions: Avoid contact with the heated product. Gloves may be required to handle the product, when hot. If overheated, avoid breathing fumes which may be emitted.
 Environmental precaution: In common with all good industrial practice, install in well ventilated areas only.

Methods for cleaning up: Sweep up and down in a disposal container.

7. Handling: No special handling advice required.

Storage: Store at room temperature in unopened packs to avoid direct sunlight.

8. Exposure controls / personal protection

Technical measures: Normal manufacturing environment.
 Personal protection equipment: Under normal operation, not necessary.

Hand protection: Gloves may be required to handle the product, when hot.

Eye protection: Under normal operation, not necessary.

Other protection: Under normal operation, not necessary.

9. Physical and chemical properties

Form: : liquor(tubing)

Color(standard) : Black, red, yellow, green, blue and white

Odor : Slight characteristic plastic odor.

Melting point/range : The material has melting point, 90 °C nominal, but it will not flow over

Boiling point/range : Not applicable

Flash point : Unknown

Ignition point : Unknown

Explosive properties : Not applicable

Vapor pressure : Not applicable

Specific gravity(20 °C): 1.35 nominal

Water solubility (20 °C): Small molecular solubility in water

10. Stability and preparation

Stability : Stable at normal conditions. Recommended max. operating temperature is 125°C.
 Don't heat over 300°C to avoid harmful vapors which may be formed at high temperature.

Material to avoid: None

Hazardous decomposition products: None under normal conditions. If the product is overheated or burned, harmful vapors (carbon monoxide and hydrogen halides) may be generated.

MATERIAL SAFETY DATA SHEET**11. Toxicological information**

Acute toxicity : Unknown

Skin : Not irritating, but the heated product has potential to cause thermal burn.

Eyes : If the product is overheated or burned, vapors may irritate eyes.

Inhalation : Harmful vapors produced by overheating or burning may cause irritation to the upper respiratory tract.

Ingestion : Not digestible.

Further information : During heating process of the product, slight plastic smell may cause discomfort for susceptible persons.

12. Ecological information

Biodegradability : Unknown (no data)

Aquatic toxicity : Unknown (no data)

Further information : Unknown (no data)

13. Disposal considerations:Product : Incinerate or bury in accordance with local and national regulations.
Contact proper local authorities

Contaminated packing : Cardboard boxes and reels can be delivered to local recycling facilities.

14. Transport information

Not classified as dangerous with regard to the transport regulation.

15. Regulatory Information

According to EC directive : Unknown

Symbol : Not applicable

R-phrase : Not applicable

S-phrase : Not applicable

16. Other Information

The information provided in this Product Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or property assurances.

The information released only to the specific material designed and maybe be valid for such a material used in combination with any other materials or in any other materials or in any process, unless specified in this text.

Aproval by
YINHAIYUN

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YDPU2.E255394 Tubing, Extruded Insulating - Component

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Tubing, Extruded Insulating - Component

See General Information for Tubing, Extruded Insulating - Component

HAMBURG INDUSTRIES CO LTD

E255394

6TH FL

12 LANE 270 PEI SHEN RD, SEC 3

SHEN KENG HSIANG, TAIPEI HSIEN 222 TAIWAN

Cat. No.	Max V	Max Oper Temp	Shrinkdown Class	Col Recognized	Max Temp Rated Oil Resistance * C	VW-1 Rated #
Flexible Heat Shrinkable Polyolefin tubing.						
H-2(+)	600	125	I	All except CL	None	Yes##
H-2 (CB)	150	125	I	Black and White	None	Yes

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

VW-1 flammability rating limited to Black color only.

+ in the designation represents CTMS/TMS.

(CB) - Indicates 150V rated thin-walled tubing with a wall thickness in accordance with UL 224.

Marking: Company name Recognized Component Mark, the catalog designation, temperature rating in degrees C, and voltage rating appear on tags attached to both ends of the tubing or on the shipping spool label or smallest unit container.

Last Updated on 2006-06-30

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PRODUCTS

CLASS 9032 01 - INSULATING DEVICES AND MATERIALS Insulating Tubing and Sleeving

- Flexible, heat-shrinkable, Cross-linked polyolefin tubing:

Cat No	Voltage Rating (V)	Temp Rating (C)	Trade Size (mm)	Notes
HAMBURG H-2	600	125	1.0-30	1

Note: In all colours except clear or translucent.

SGS Test Report

Product : RF PCB Antenna Assembly

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Result for RoHS : PASS