



WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)  
 DONGGUAN AEON TECH CO.,LTD.(CHINA)  
 SUZHOU AEON TECH CO.,LTD.(CHINA)  
 AEON TECH (SHANGHAI) CO.,LTD(CHINA)  
 DONGGUAN PARNER TECH CO.,LTD.(CHINA)



**SPECIFICATION FOR APPROVAL**

**CUSTOMER:** 中磊電子股份有限公司

**PART NAME:** RF Antenna Cable Assembly

**PART NO:**

**REVISION:**

**W. Y. P/NO:** C147-510590-A(SSR-91757)

**REV:** X2

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :	Roma 	
DATE :	6/25	

**WHA YU GROUP**

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東莞倍能電子有限公司

Address:Hupan Industrial District, Shida Road, Tai Ling Shan Town,

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Tel:+86-769-81662366 Fax:+86-769-81602681

# *Contents*

<i>Item</i>	<i>Description</i>	<i>Page</i>
1. ....	天線規格表	..... 1
2. ....	成品圖	..... 2
3. ....	測試報告&環境圖面	..... 3~6
4. ....	Cable規格&UL	..... 7~12
5. ....	天線桿套及固定座材證&UL	..... 13~16

# RF Antenna Cable Assembly

## Specification

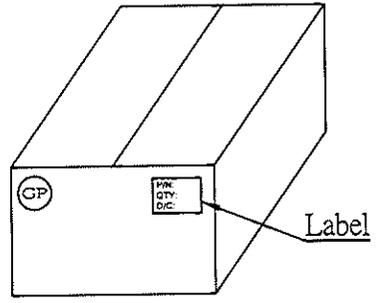
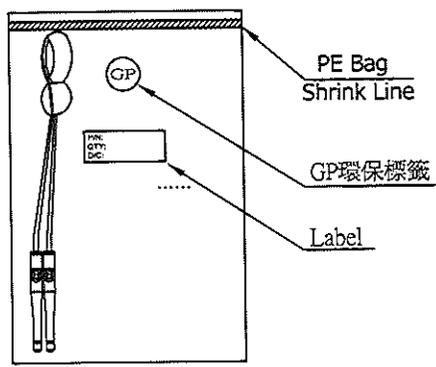
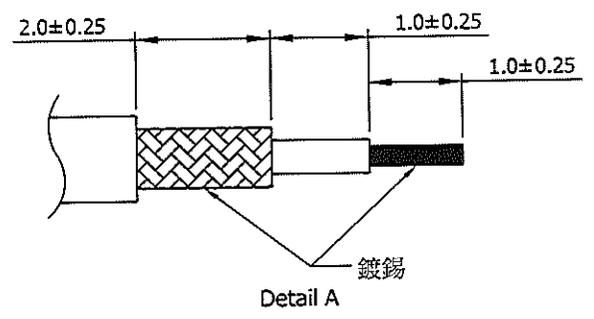
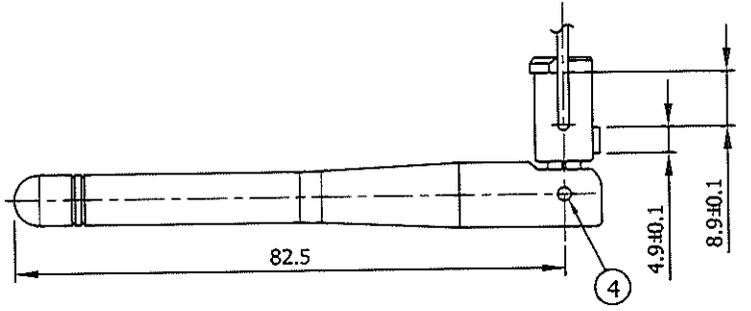
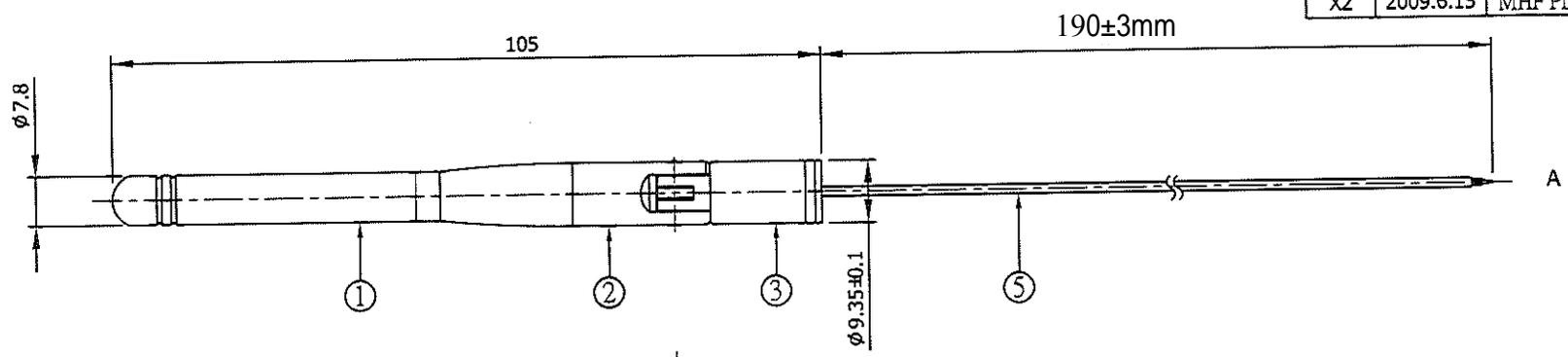
### 1. Electrical Properties :

- 1.1 Frequency Range.....2.4GHz ~ 2.5GHz
- 1.2 Impedance ..... 50...Nominal.....
- 1.3 VSWR .....1.92:1.Max.....
- 1.4 Return Loss.....-10 dB Max.....
- 1.5 Radiation .....Omni-directional.....
- 1.6 Gain(peak).....2.0dBi (excluding cable loss )
- 1.7 Cable Loss.....0.9dB.Max.....
- 1.8 Polarization.....Linear.; Vertical.....
- 1.9 Admitted Power.....1W.....
- 1.10 Cable.....1.13.Cable..

### 2. Physical Properties :

- 2.1 Antenna Body..... TPE
- 2.2 Antenna Base..... PC
- 2.3 Antenna Base..... PC
- 2.4 Operating Temp. .... -10 ~ +60
- 2.5 Storage Temp. .... -10 ~ +70
- 2.6 Color ..... Black

REV	DATE	DESCRIPTION
X1	2009.6.8	New Issue
X2	2009.6.15	MHF PLUG改為剝皮鍍錫



GP標籤貼於外箱兩邊側面左上角共2PCS  
標示Label貼於外箱兩邊側面共2PCS

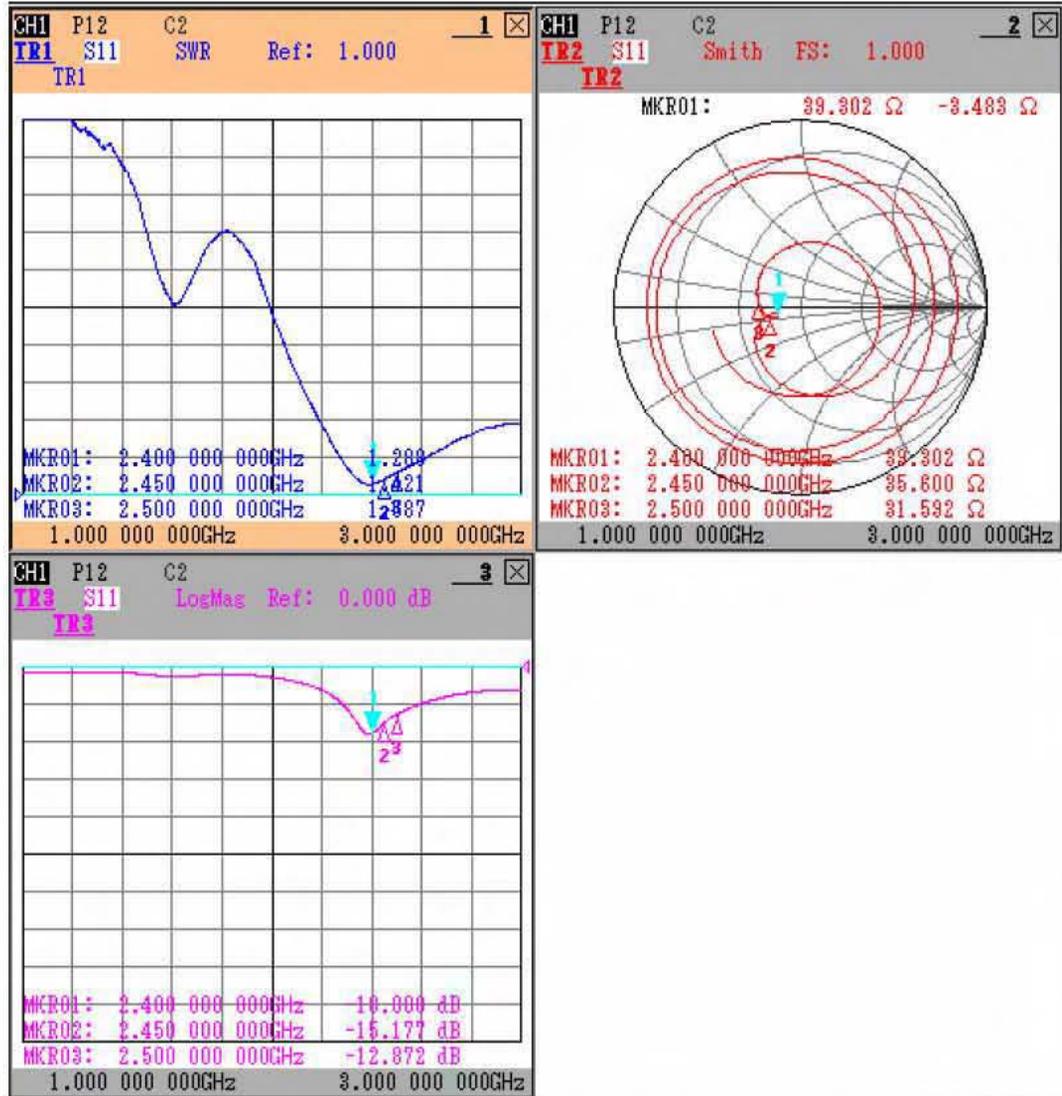
5	Cable	φ1.13 Coaxial Cable	1	
4	Rivet	POM ; Color : Black	2	
3	Antenna Base	PC ; Color : Black	1	
2	Antenna Base	PC ; Color : Black	1	
1	Antenna Body	TPE ; Color : Black	1	
NO	DESCRIPTION		QTY	REMARK

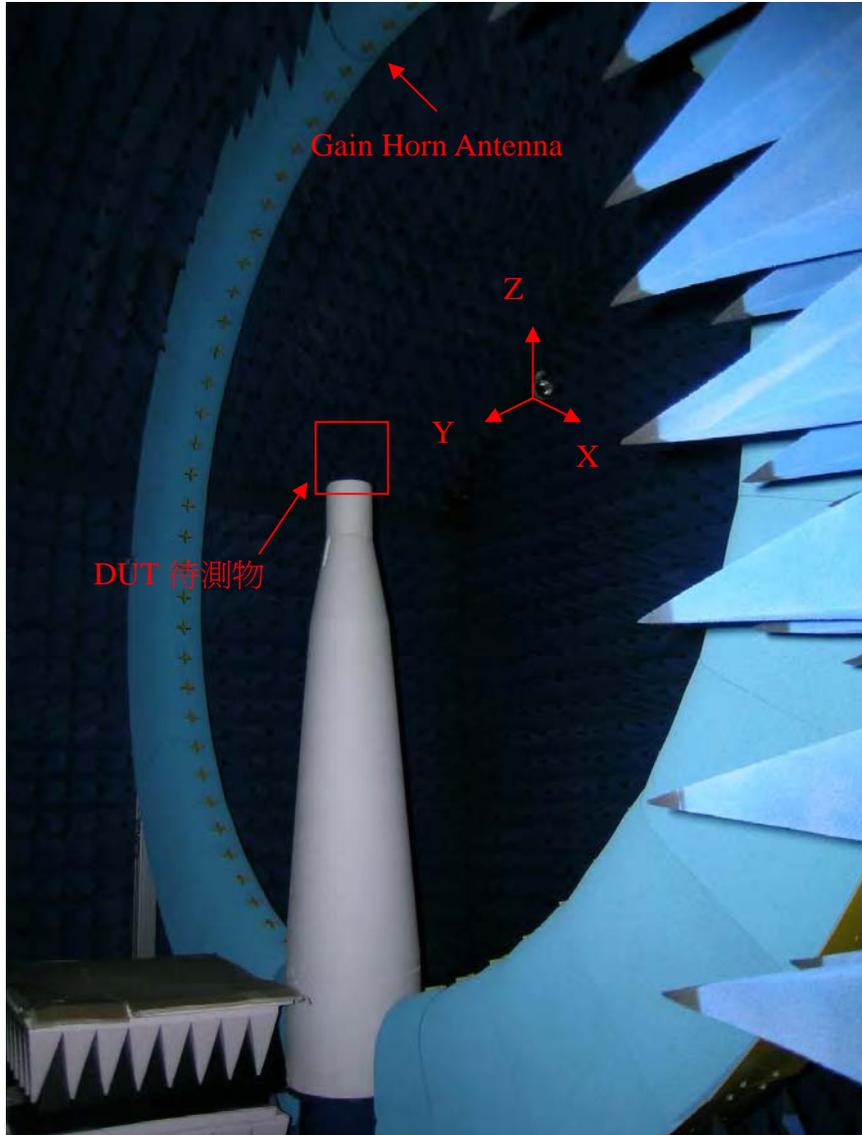
Packing: 25PCS/Bag

CUSTOMER'S SIGNATURE	XX	±5	APPROVED	 CUSTOMER: 中磊 PART NO : PARTNAME: RF Antenna Assembly W.Y P/NO : C147-510590-A REV UNIT FILE : SSR-91757 X2 m/m SHEET : 1/1
	X	±3.0	CHECKED	
	.X	±1.0		
	.XX	±0.5	DRAWING	
	.XXX	±0.1		

**M.gear** Wha Yu Group

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	XY	YZ	XZ
0°	Right	Up	Up
90°	Back	Back	Right
180°	Left	Down	Down
270°	Front	Front	Left



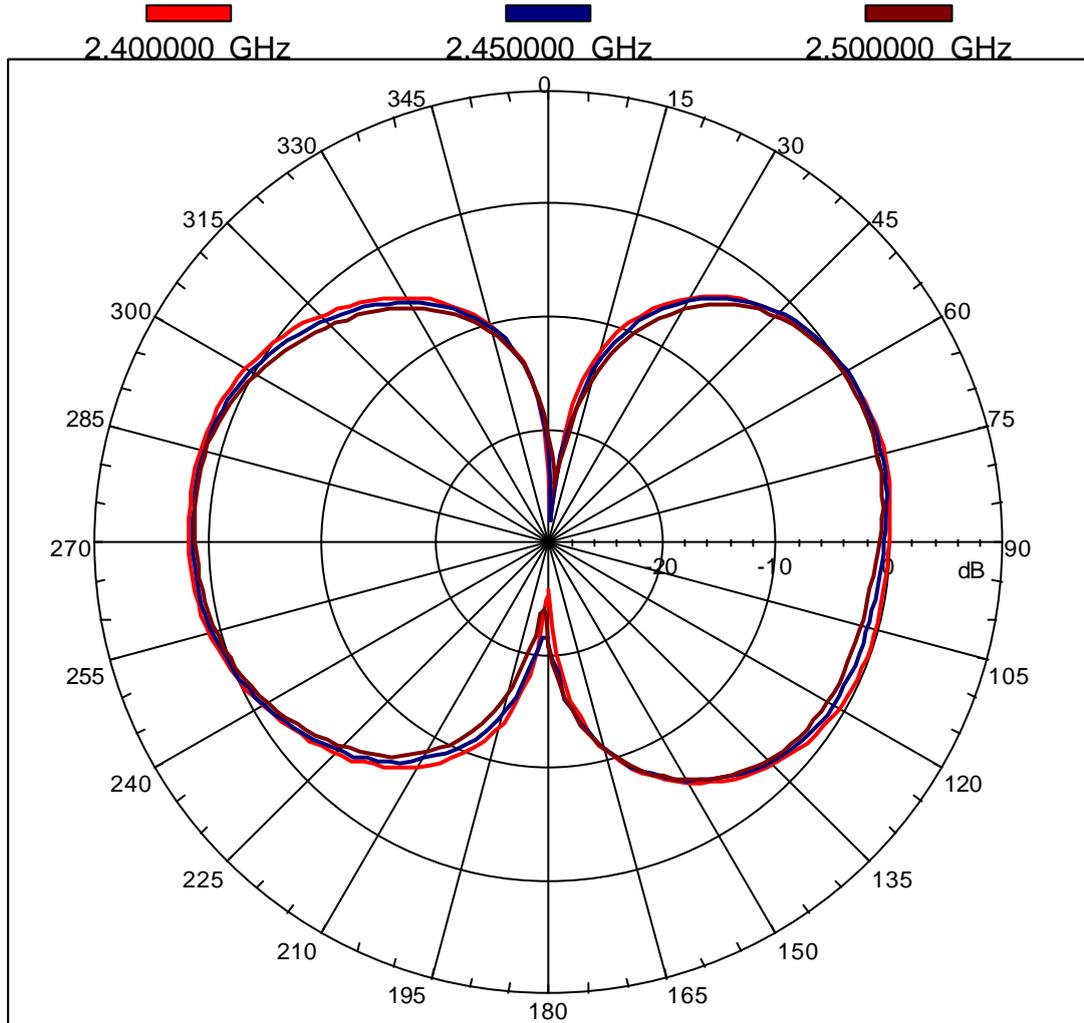
Wha Yu Group

RF Antenna Cable Assembly  
SPEC:2.4~2.5GHz

P/NO:C147-510590-A

NO:SSR-91757

### Far-field amplitude of C147-510590-A H.nsi



2009.6.15



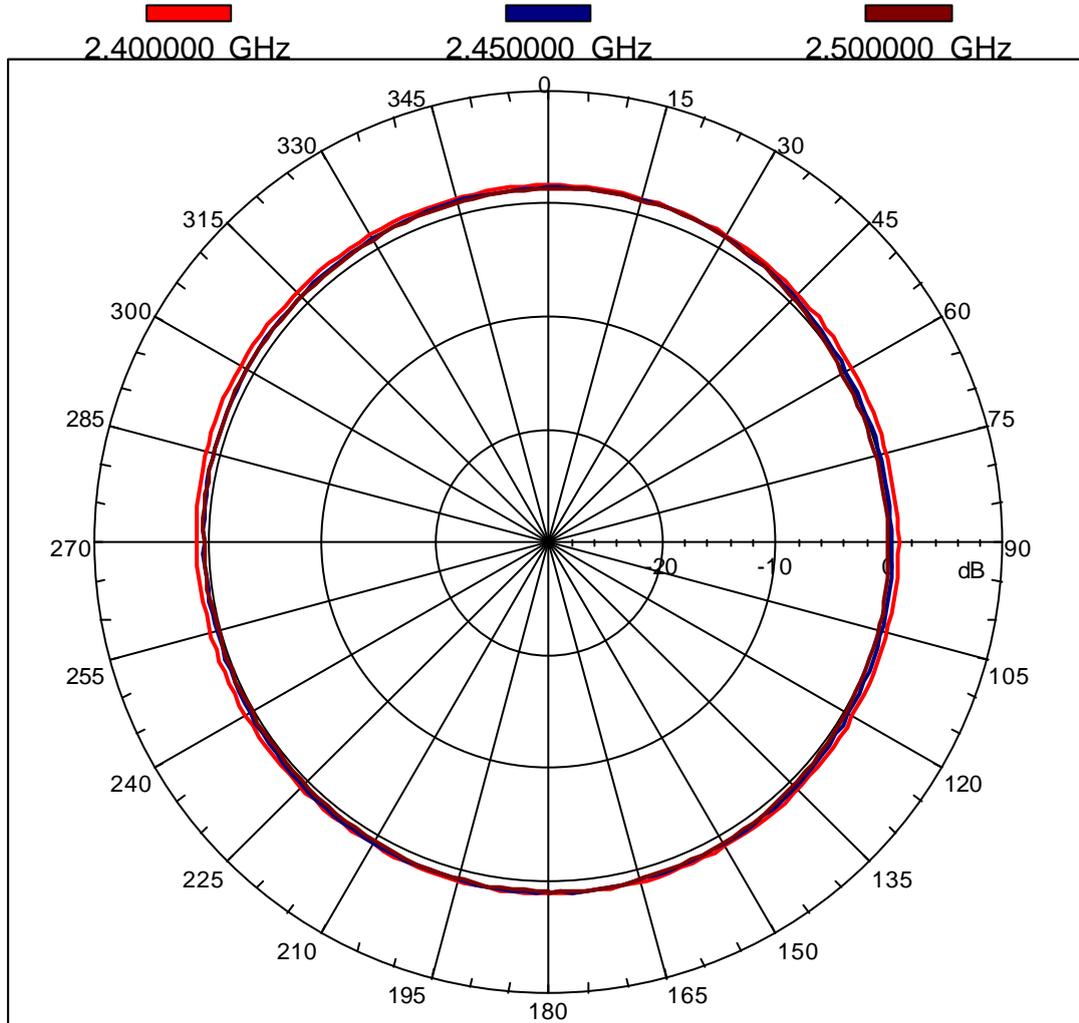
Wha Yu Group

RF Antenna Cable Assembly  
SPEC:2.4~2.5GHz

P/NO:C147-510590-A

NO:SSR-91757

### Far-field amplitude of C147-510590-A V.nsi



2009.6.15

Date : 2005/02/02

Our Spec. No. WS05-M016

MESSRS.

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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	$\Omega$ /km	597 以下 (20°C) Max. 520 (at 20°C)
絶縁抵抗 Insulation Resistance	M $\Omega$ 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	$\Omega$	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.

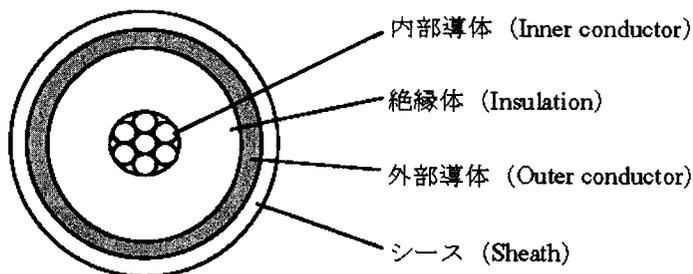


図 1 .ケーブル構造図

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

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.

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Rating 60°C or 80°C, 30 V.

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Conductors No. 44 AWG min, material not specified.

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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.

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(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.

PEEK 材質證明



70-1 HWACHI-DONG, YEOSU-SI, JEOLLANAM-DO. KOREA HTTP://WWW.CHEMWTDE.COM

Fax : (061)680-8070

Tel : (061)680-1669,1594

### CERTIFICATE OF ANALYSIS

Customer	YOSON INTERNATIONAL CO.,LTD			
Product/Grade	Lot No.	Quantity(Kg)	Date of Issue	Shipment No.
PBT KEYFLEX BT1063D 25KG BAG	A7F0631	9000.000	2007.11.09	20216745

### TYPICAL VALUES

Test Item	Test Method	Remark	Unit	Spec	Results
Low Temp Imp'	ASTM D256	Izod Notched 1/4"	kg cm/cm	Min.3.0	5.9
Melt Flow Index	ASTM D1238	230°C x 2.16kg	g/10min	21.00~27.00	26.29
Shore Hardness	ASTM D2240		shore-D	59.0~64.0	60.9
Yield strength	ASTM D638	250 mm/min	kg/cm <sup>2</sup>	180~240	189
Flexural Modulus	ASTM D790	15 mm/min	kg/cm <sup>2</sup>	2800~3600	3270
DSC	LSYQAYD032		°C	211.0~217.0	213.4
Yellow Index	ASTM D1925	CIE(C,2°)YI	%	Max.50.00	23.00

WE HEREBY CERTIFY THAT ABOVE-MENTIONED TEST RESULTS ARE CORRECT AND MEET OUR SPECIFICATIONS.

YEOSU SPECIALTY POLYMERS PLANT

*Jae Seo Ko*

APPROVED BY D.H CHU  
Q.A. MANAGER

1054610

**LG CHEMICAL LTD**

20 YOIDO-DONG, YONGDUNGPO-GU, SEOUL 150-721 KR

**BT-1063D****Thermoplastic Elastomer (TPE), "KEYFLEX", furnished as pellets**

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
NC, BK	1.5	HB	2	0	50	50	50
	3.0	HB	2	0	50	50	50

Comparative Tracking Index (CTI): **0**

Dimensional Stability (%): -

High-Voltage Arc Tracking Rate (HVTR): **0**High Volt, Low Current Arc Resis (D495): **4**

Dielectric Strength (kV/mm): -

Volume Resistivity (10xohm-cm): -

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 the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI.

Report Date: 2004-11-05  
Last Revised: 2004-11-05

Underwriters Laboratories Inc®

**IEC and ISO Test Methods**

Test Name	Test Method	Units	Thickness Tested (mm)	Value
IEC Flammability	IEC 60695-11-10	Class (color)	1.5	HB75 (NC, BK)
			3.0	HB40 (NC, BK)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m2	-	-
ISO Izod Impact	ISO 180	kJ/m2	-	-
ISO Charpy Impact	ISO 179-2	kJ/m2	-	-

Underwriters Laboratories Inc®

■ Panlite L-1250Z

Category	Unit	Test Method	Condition	L-1250Z 100
Melt volume flow rate	cm <sup>3</sup> /10min	ISO 1133	300°C load 1.2kg	8
Density	kg/m <sup>3</sup>	ISO 1183	—	1200
Water absorption rate	%	ISO 62	in water 23°C24h	0.2
Light transmission	%	ASTM D 1003	thickness 3mm	88
Refractive index	—	ASTM D 542	—	1.585
Tensile modulus	MPa	ISO 527-1 and ISO 527-2	1mm/min	2400
Tensile stress at yield	MPa		50mm/min	61
Tensile strain at yield	%		50mm/min	6
Nominal tensile strain at break	%		50mm/min	>50
Flexural modulus	MPa	ISO 178	2mm/min	2350
Flexural strength	MPa		2mm/min	93
Charpy impact strength	KJ/m <sup>2</sup>	ISO 179	unnotched	NB
			notched	76
Heat deflection temperature	°C	ISO 75-1 and ISO 75-2	1.80MPa	129
			0.45MPa	142
Vicat softening temperature	°C	ISO 306	50°C/h 50N	149
Mold shrinkage	%	In-house method	parallel	0.5~0.7
			vertical	0.5~0.7
Coefficient of linear expansion	× 10 <sup>-4</sup> /°C	ISO 11359-2	parallel	0.7
			vertical	0.7
Specific inductive capacity	—	IEC 60250	100Hz	3.1
	—		1MHz	3
Dielectric loss tangent	× 10 <sup>-4</sup>	IEC 60250	100Hz	10
	× 10 <sup>-4</sup>		1MHz	90
Volume resistivity	Ω·m	IEC 60093	—	>1 × 10 <sup>13</sup>
Surface resistivity	Ω	IEC 60093	—	>1 × 10 <sup>15</sup>
Withstand voltage	MV/m	IEC 60243-1	short time test	30
Tracking resistance	—	IEC 60112	—	250
Flammability	—	UL 94	—	V-2(0.40mm) HB(1.5mm)
Temperature index	°C	UL 746B	electric 1.47mmt	125
			impact 1.47mmt	115
			non-impact 1.47mmt	125

※The values listed are specification values, not certified values.

TEIJIN CHEMICALS LTD

HIBIYA DAIBIRU BLDG 2-2 UCHISAIWAI-CHO 1-CHOME CHIYODA-KU TOKYO 100-0011 JAPAN

Material Designation: **L-1250#(f2), L-1250U#, L-1250V#, L-1250Z#(f1)**

Product Description: Polycarbonate (PC), designated "Panlite" furnished as pellets, powder.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str	IEC GWIT	IEC GWFI
ALL	0.40	V-2	4	3	80	80	80	-	-
	0.84	V-2	4	3	80	80	80	-	-
	1.5	HB	4	0	125	115	125	-	-
	3.0	HB	1	0	125	115	125	-	-
	6.0	HB	1	0	125	115	125	-	-

CTI: 2

HVTR: 4

D495: 5

IEC Ball Pressure (°C): -

Dielectric Strength (kV/mm): 24

Volume Resistivity (10<sup>8</sup>ohm-cm): 16

Dimensional Stability(%): 0

ISO Tensile Strength (MPa): -

ISO Flexural Strength (MPa): -

ISO Heat Deflection (°C): -

ISO Tensile Impact (kJ/m<sup>2</sup>): -

ISO Izod Impact (kJ/m<sup>2</sup>): -

ISO Charpy Impact (kJ/m<sup>2</sup>): -

# Material designation may be suffixed with any one or two letters.

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

(f2) Subjected to one or more of the following tests: Ultraviolet Light, Water Exposure or Immersion in accordance with UL 746C, where the acceptability for outdoor use is to be determined by UL Inc.

Report Date: 9/24/1990

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.