

APPROVAL SHEET

For : 藍天電腦股份有限公司
CLEVO Computer Company

MODEL : M720S-L Bluetooth Antenna

DESCRIPTION : ANTENNA BLUETOOTH 2.4G/5G PIFA BT (灰色) 精乘 M720S(無鉛)

wgt P/N : SK720BLPI01+B

CUSTOMER P/N : 6-23-7M72S-020

DATE : 18 MAY.,2007

Manager	Chief	Engineer
Johnson	Joy	Rick

Check	Responser



精乘科技股份有限公司

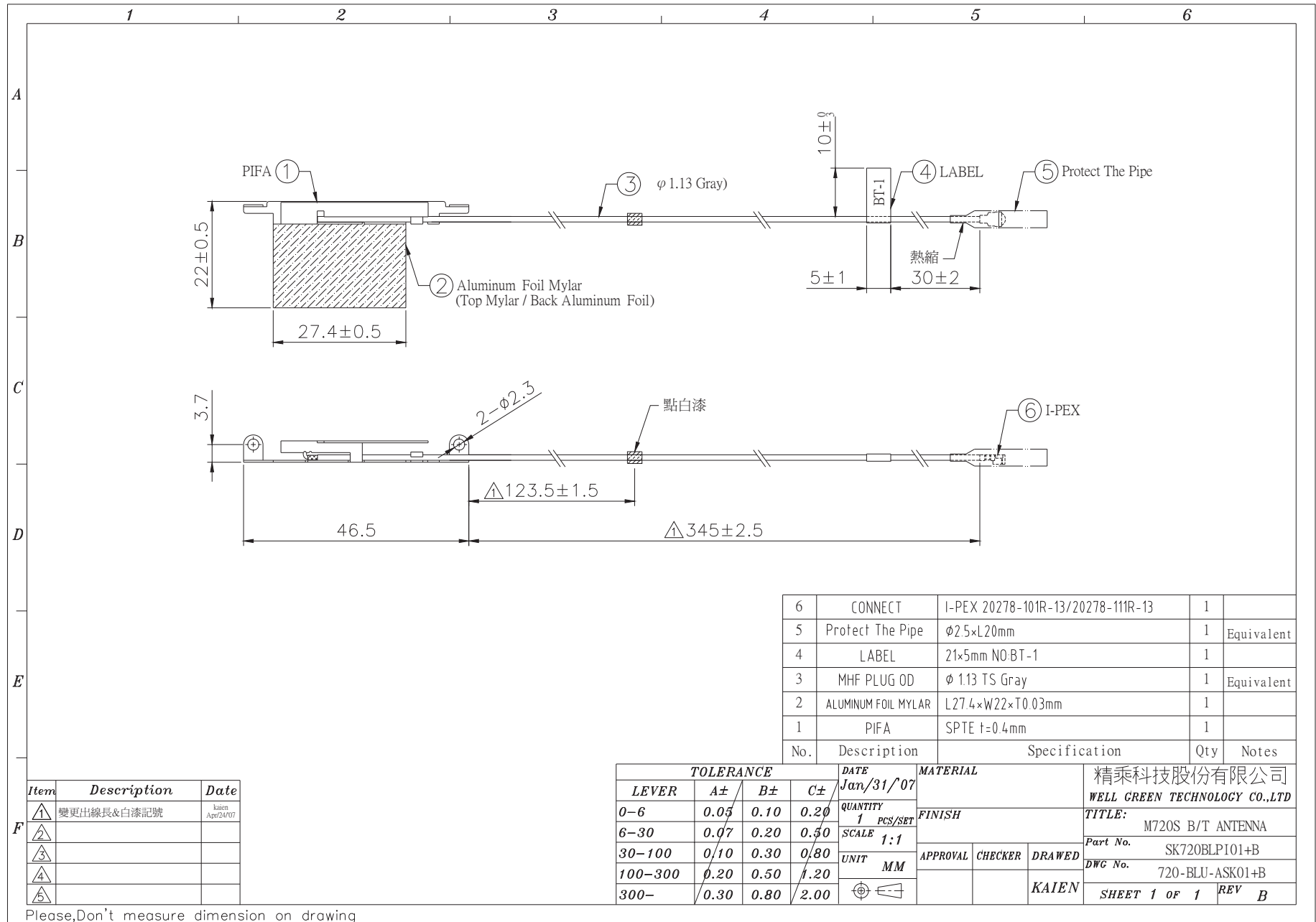
Well Green Technology Co., Ltd.

桃園縣平鎮市民族路雙連二段 118 巷 51 弄 20 號

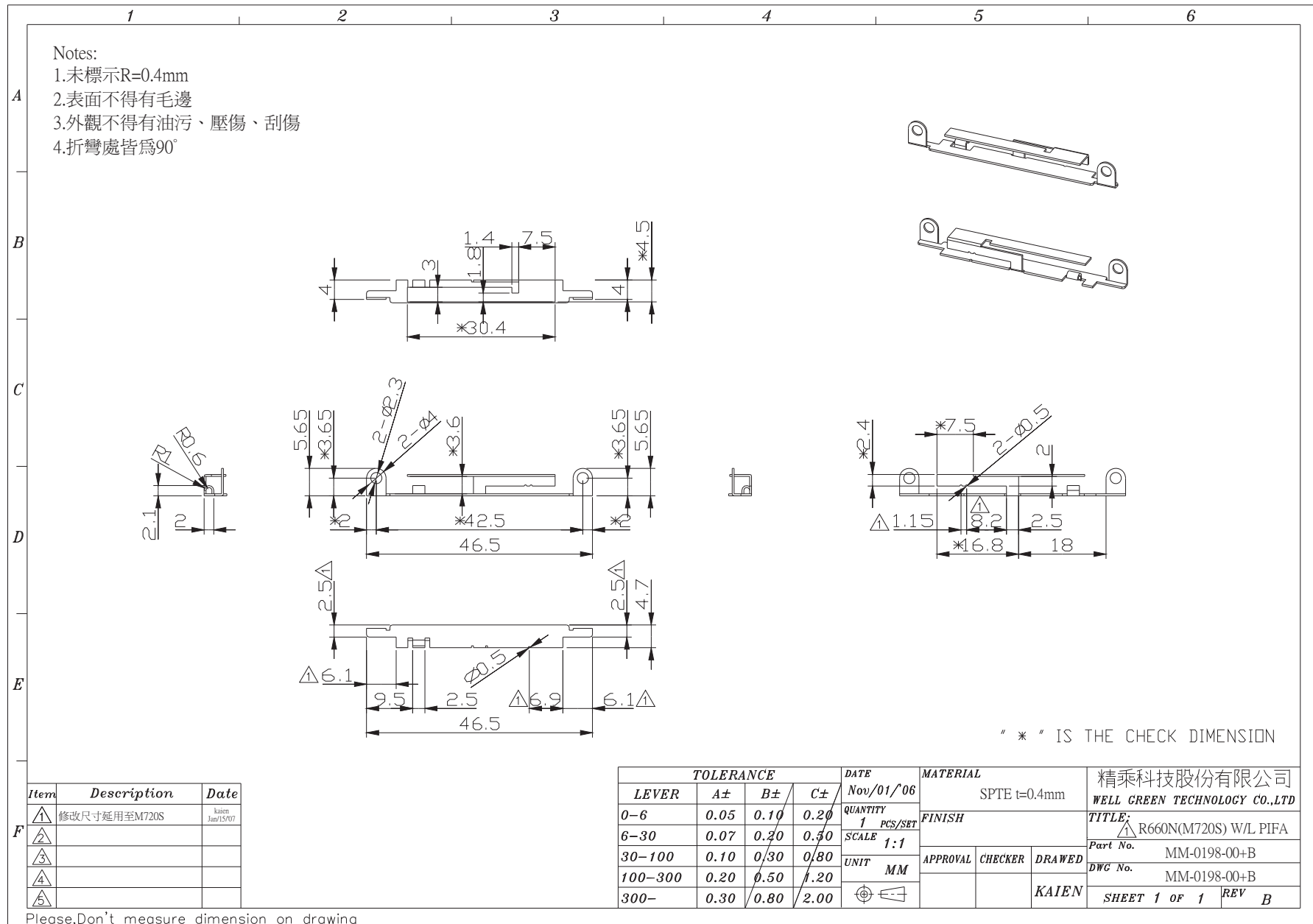
No. 20, Alley51 ,Lane 118,ShuangLian Sec.2,Mintzu Rd.,
PingJen City, TaoYuan Hsien, Taiwan, R.O.C

TEL: +886-3-420-6428 ; FAX: +886-3-420-6418

一、成品圖



二、零件圖



三、BOM

	1	2	3	4	5	6
	B O M					
A	ITEM	DESCRIPTION	SPECIFICATION	Q'TY	VENDER	P/N
	1	PIFA ANTENNA	M720S RL PIFA	1		MM-0198-00+B
	2	COAXIAL CABLE	素材AXON TS φ 1.13*384mm(Gary)	1		CA-0072-22+B
	3	CONNECTOR	I-PEX Connector	1		CN-0032-00-A
B	4	Label	L21*W5*T0.08 mm(BT-1)	1		LA-0023-05+A
	5	鋁箔MYLAR	L27.4*W22*T0.03 mm	1		GT-0192-00+A
	6	塑膠保護套	φ 2.5* 25mm (透明)	1		TB-2503-03-A
	7					
C	8					
	9					
	10					
	11					
D	12					
	13					
	14					
E	15					

F	Item	Description	Date
		變更出線長&白漆記號	kuim Apr/24/07

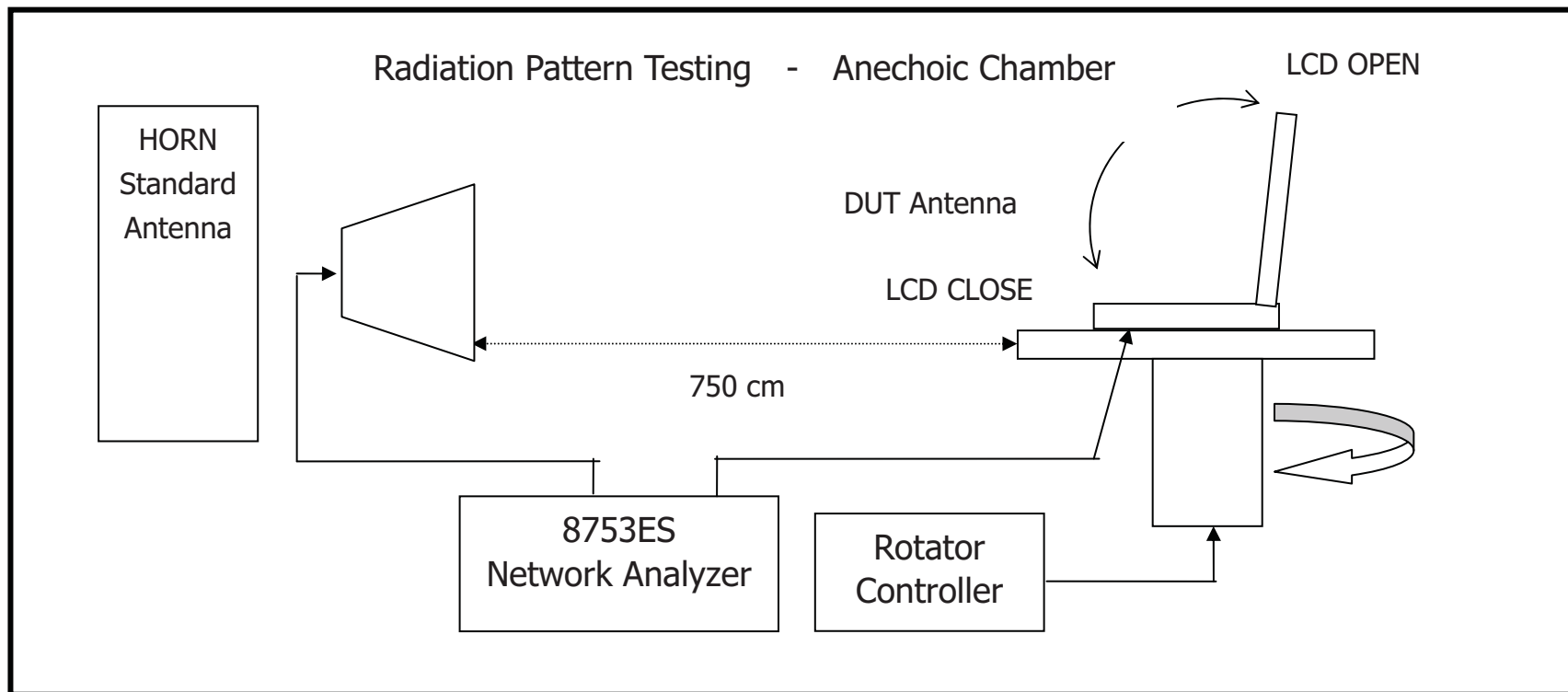
TOLERANCE				DATE	MATERIAL		
LEVER	A±	B±	C±	96/02/01			
0-6	0.05	0.10	0.20	QUANTITY 1 PCS/SET	FINISH		
6-30	0.07	0.20	0.50	SCALE 1:1			
30-100	0.10	0.30	0.80	UNIT MM	APPROVAL	CHECKER	DRAWED
100-300	0.20	0.50	1.20				JASON
300-	0.30	0.80	2.00				

精乘科技股份有限公司			
WELL GREEN TECHNOLOGY CO.,LTD			
TITLE: M720S B/T Antenna			
Part No. SK720BLPI01+B			
DWG No. 720-BLU-BSK01+B			
SHEET 1 OF 1 REV B			



I 、Antenna Testing Conditions:

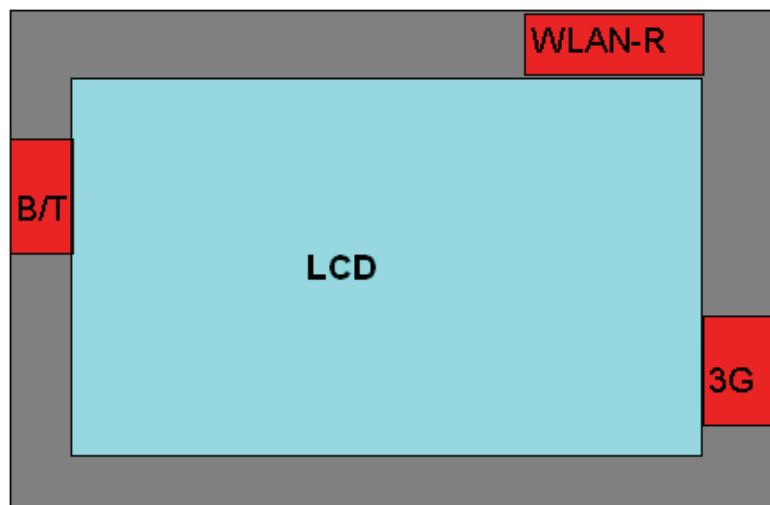
1. Testing set up:





2. Mechanical dimensions

Antenna M720S PIFA
Cable $\phi 1.13$
Bluetooth
Left side



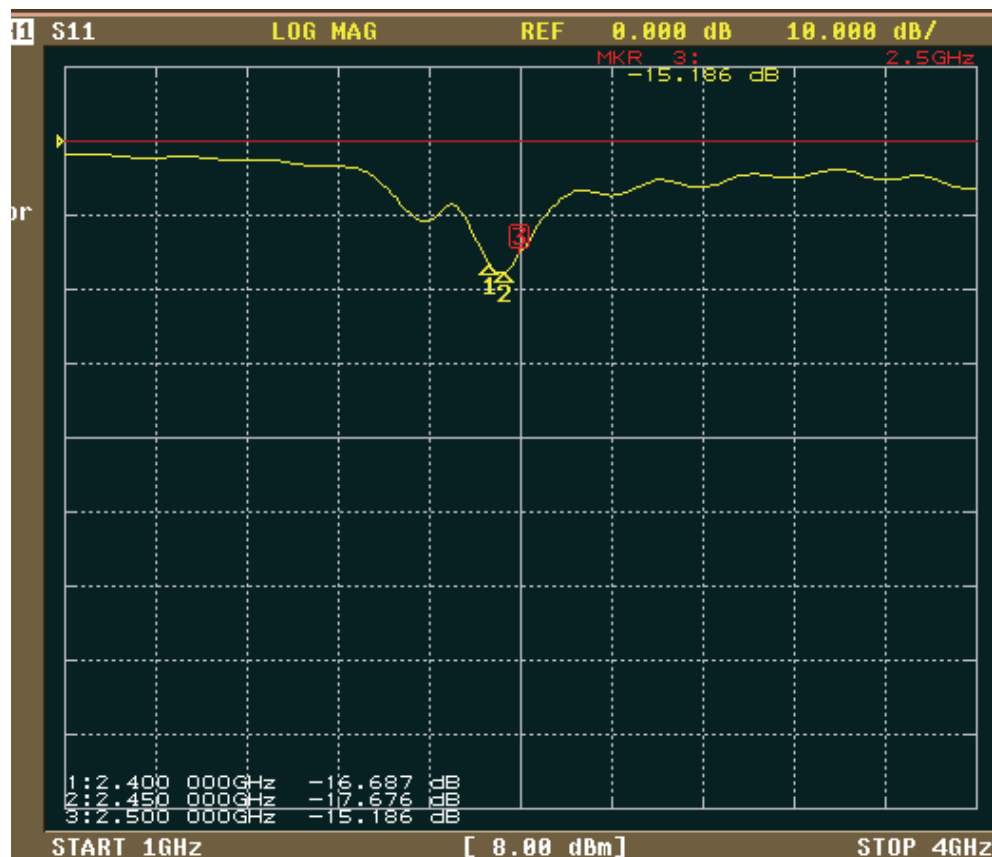


II. Test results

Antenna	Application	Placement	Cable dia. Φ mm
<u>M720S</u>	<u>Bluetooth</u>	<u>Left side</u>	<u>1.13</u>

1. Return Loss

Antenna	Center freg. @MHz	BW @MHz	Return Loss		
			2.4GHz	2.45GHz	2.5GHz
M720S	2450		-16.68	-17.67	-15.18





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2. VSWR

Antenna	Center freg. @MHz	BW @MHz	VSWR		
			2.4GHz	2.45GHz	2.5GHz
M720S	2450		1.33	1.29	1.42

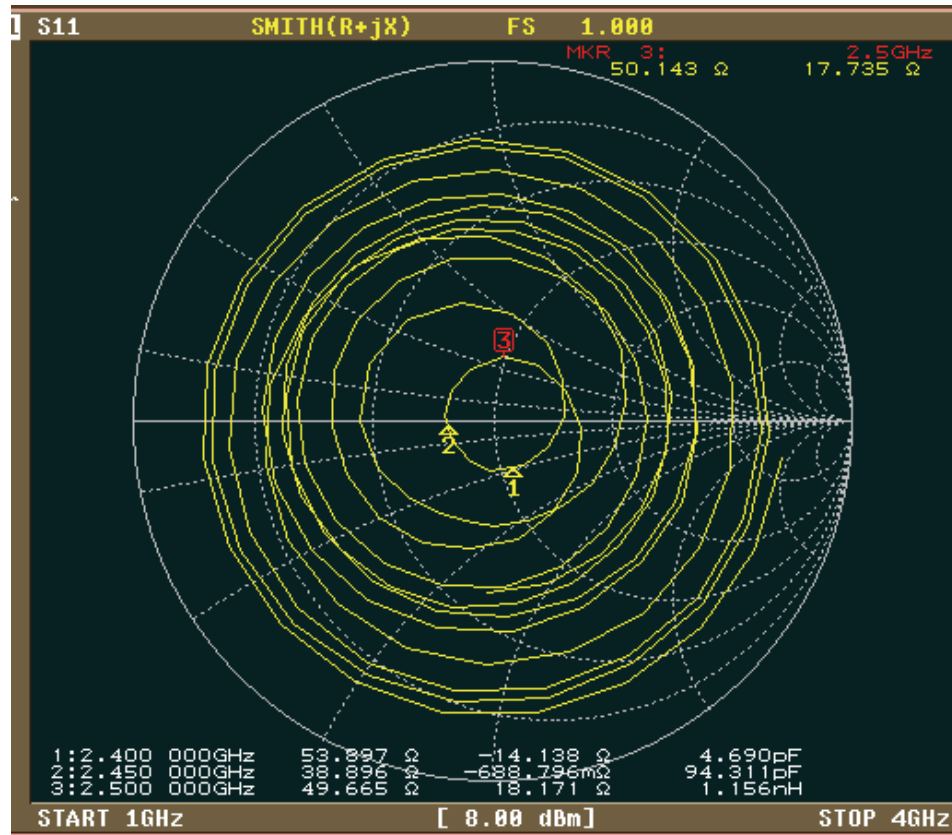




Well Green Technology Co., Ltd

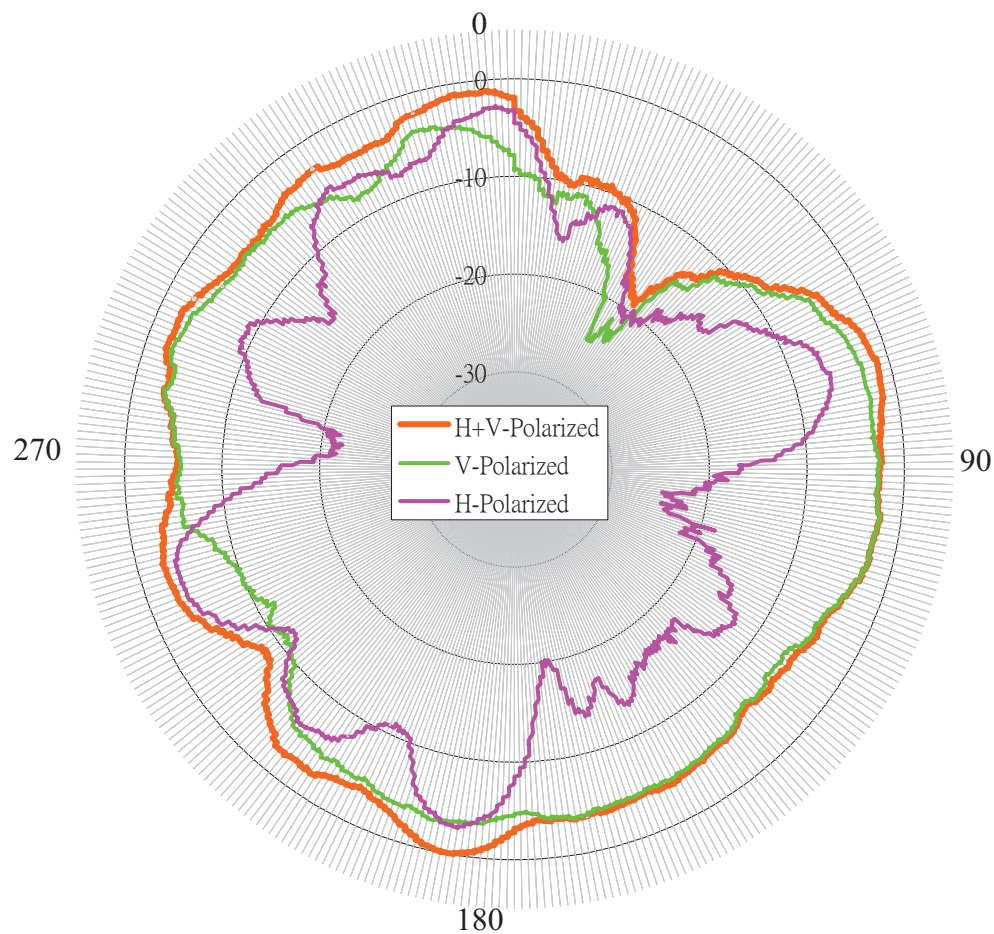
No. 20, Alley51 ,Lane 118,ShuangLian Sec.2,Mintzu Rd.,
PingJen City, TaoYuan Hsien, Taiwan, R.O.C
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3. Smith Chart





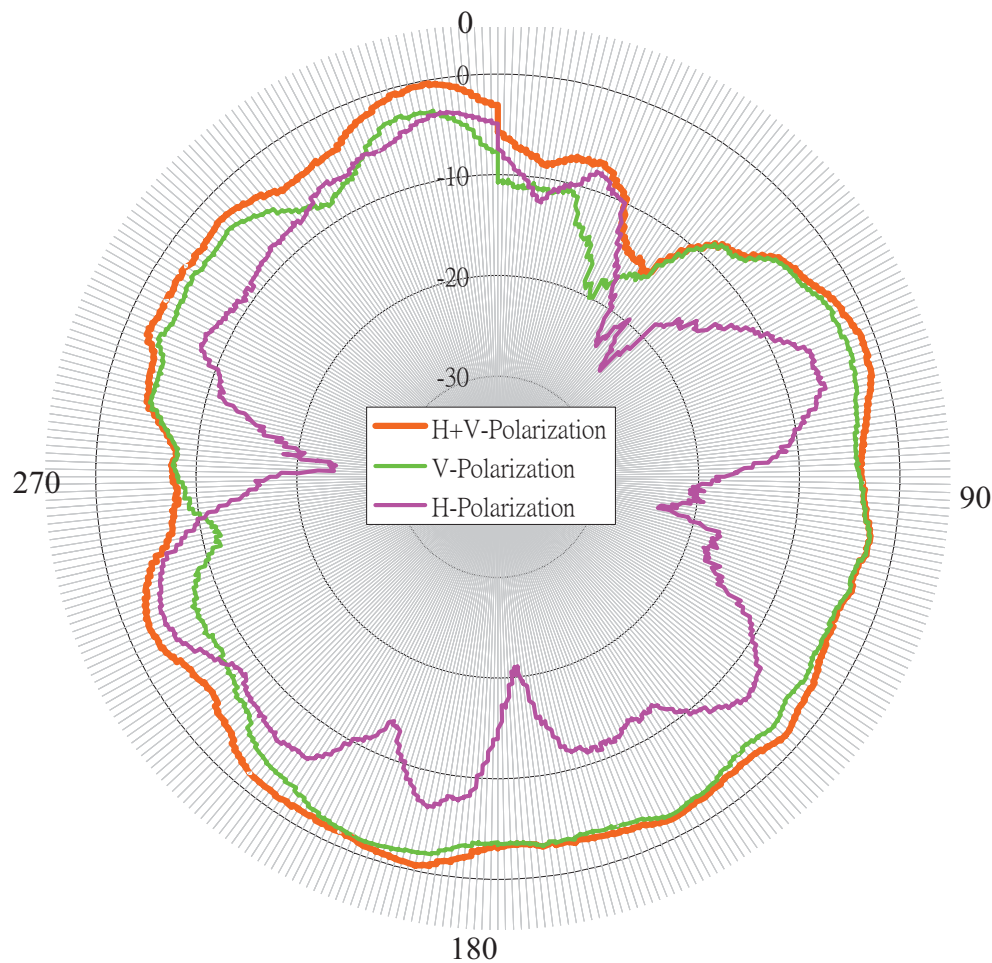
4. Radiation Pattern of XY Plane(Azimuth)-(Open)



Center Frequency	2400 MHz
Vertical peak Gain (dBi)	-2.20
Vertical Average Gain (dBi)	-5.41
Horizontal peak Gain (dBi)	-2.76
Horizontal Average Gain (dBi)	-9.03
Hori+Vert peak Gain (dBi)	-0.09
Hori+Vert Average Gain (dBi)	-3.84



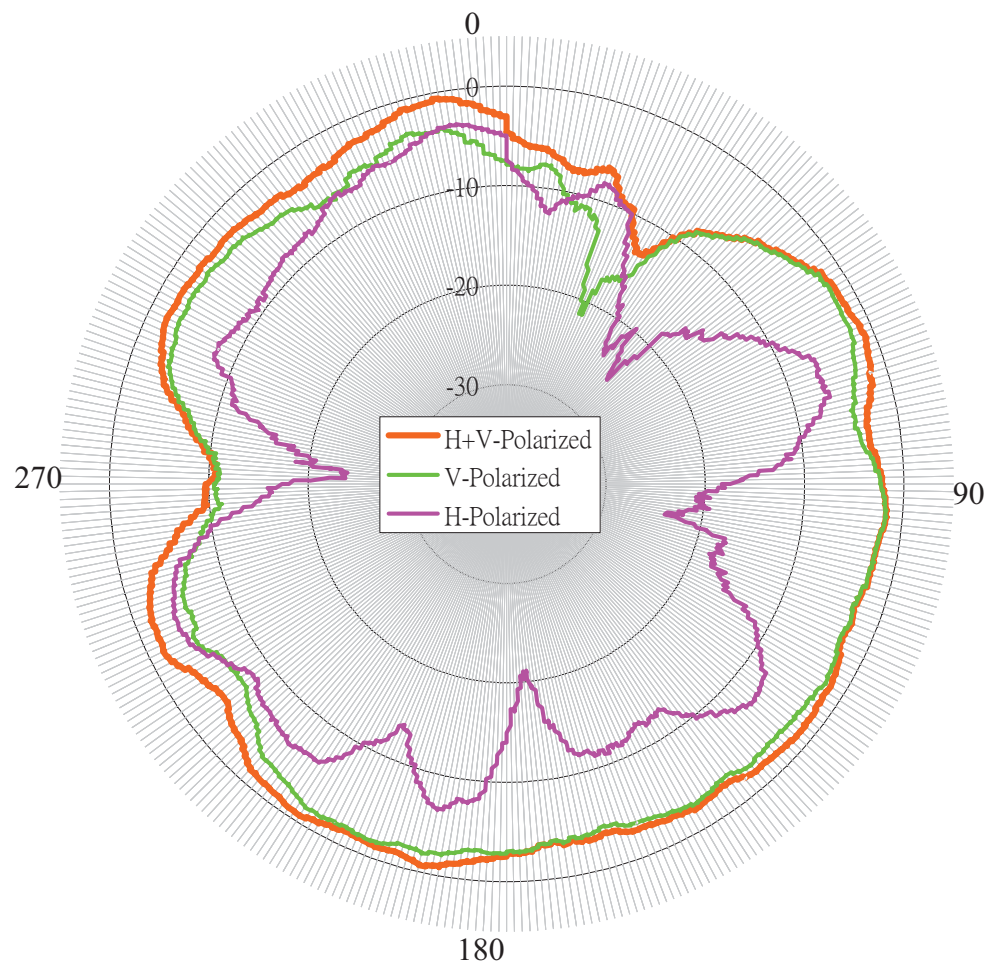
5. Radiation Pattern of XY Plane(Azimuth)-(Open)



Center Frequency	2450 MHz
Vertical peak Gain (dBi)	-1.41
Vertical Average Gain (dBi)	-4.62
Horizontal peak Gain (dBi)	-3.39
Horizontal Average Gain (dBi)	-8.83
Hori+Vert peak Gain (dBi)	-0.32
Hori+Vert Average Gain (dBi)	-3.23



6. Radiation Pattern of XY Plane(Azimuth)-(Open)



Center Frequency	2500 MHz
Vertical peak Gain (dBi)	-1.58
Vertical Average Gain (dBi)	-4.16
Horizontal peak Gain (dBi)	-3.44
Horizontal Average Gain (dBi)	-8.88
Hori+Vert peak Gain (dBi)	-0.60
Hori+Vert Average Gain (dBi)	-2.90

四、SPECIFICATIONS:

● Electrical Properties

Frequency Range	: 2.4~2.5GHz
Impedance	: 50Ohms nominal
VSWR	: ≤ 2.0
Peak Gain	: $-5.0\text{dBi} \leq \text{peak gain} \leq 3\text{dBi}$
Standard Connector	: I-PEX Connector

SPECIFICATION

FOR

REP INSULATE HIGH-FREQUENCY
COAXIAL CABLE
FWS 5030 UL 1979

ISSUED Oct. 17, 2003

REVISED Aug. 29, 2005

MADE BY *S. Seki*

APPROVALS Y. YASUKAWA



KURABE INDUSTRIAL CO., LTD

KURABE INDUSTRIAL CO., LTD

SP3831K-X	FEP INSULATED HIGH-FREQUENCY COAXIAL CABLE (FWS 5030) UL 1979	PAGE	1/4
PRODUCT STANDARD			

1. SCOPE

This standard covers "FEP insulated High-Frequency coaxial cable".
 These cable are approved by UL as Style 1979 AWM (File E46702 or E246998)
 [UL1979:105°C, 30V]
 Use: Internal wiring of Class 2 Circuits of Electronic Equipment.

2. CONSTRUCTION

Construction and dimensions of the cable are shown in Figure.1 and Table 1.

3. PERFORMANCE

Performance of the finished cable is shown in Table 2. The test methods are in accordance with applicable test methods described in UL 758.

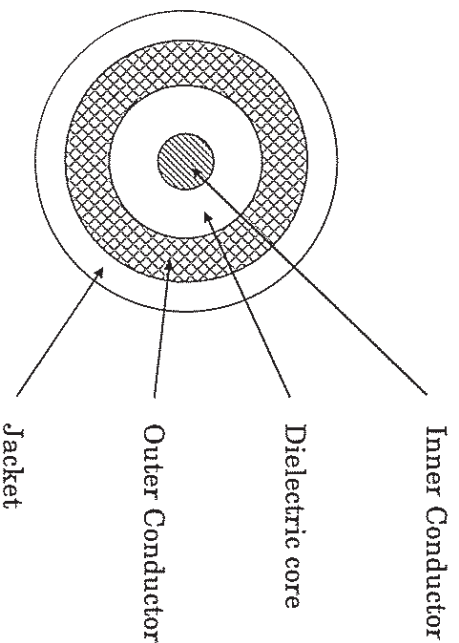


Figure 1.

KURABE INDUSTRIAL CO., LTD

SP3831K-X
PRODUCT
STANDARD

FEP INSULATED HIGH-FREQUENCY COAXIAL CABLE (FWS 5030) UL 1979

PAGE

2/4

Table 1. Construction

Item	Unit	Specified Value
Inner Conductor	Material	— Silver coated annealed copper wire
	Stranding	No./mm 7/0.08
	Dia.(approx.)	0.24
Dielectric Core	Material	— FEP
	Thick (nom.)	mm 0.22
	Dia.	mm 0.68±0.05
Outer Conductor	Color	— Natural
	Material	— Tinned annealed copper wire
	Type	— Braid (16/4/0.05)
Jacket	Dia.(approx)	mm 0.93
	Material	— FEP
	Thick (nom.)	mm 0.10
Jacket	Dia.	mm 1.13 +0.10/-0.06
	Color	— Standard colors are white,black,brown,and gray.

Table 2. Performance

Item	Unit	Specified Value	Note
Appearance	—	Faultless in visible	—
Inner conductor resistance	Ω /km	Max.597	at 20°C
Insulation resistance	M Ω ·km	Min.1500	at 20°C
		Dielectric core: No breakdown at AC1.5kV for 0.15sec.	Spark test
Dielectric strength	—	Jacket: No breakdown at AC1.5kV for 0.15sec.	Spark test
		No breakdown at AC500V for 1min.	Outer conductor to inner conductor
Heat resistance for solder	—	Shrink or expansion of dielectric core are not more than 0.5mm	※
Capacitance	pF/m	nom. 98	at 1kHz
Characteristic impedance	Ω	50±2	TDR method
		2.0	1.0GHz
		2.9	2.0GHz
		3.2	2.4GHz
		3.7	3.0GHz
		4.3	4.0GHz
Attenuation (nom.)	dB/m	4.8	5.0GHz
		5.3	6.0GHz

※ After immersion of dielectric core, 10mm into soldering pot which is 255°C±5°C for 5 seconds, shrinkage or expansion of the dielectric core must not exceed 0.5mm.

KURABE INDUSTRIAL CO., LTD

SP3831K-X	FEP INSULATED HIGH-FREQUENCY COAXIAL CABLE (FWS 5030) UL 1979	PAGE	3/4
PRODUCT STANDARD			

4. INSPECTION

An inspection is took place in accordance with applicable test methods. The cable has to pass the specifications described Table 1 and Table 2.

5. TEST METHOD

The test methods are in accordance with applicable test methods described in UL 758.
(Test methods for rubber or plastic insulated wires and cables).

6. TEMPERATURE RATING

105 °C

7. VOLATGE RATING

30 V

8. MARKING ON TAG

Each reel of finished cable is tagged to indicate following information:

- (1) Designation of the cable (Style No designation),
- (2) Maximum working voltage,
- (3) Maximum working temperature,
- (4) Conductor size,
- (5) Nominal insulation thickness,
- (6) Length,
- (7) Date of manufacture or LOT No. ,
- (8) Manufacture's name,
- (9) Specification No., and
- (10) Use of cable, and

※ Please refer to UL file No. to know the production factory of the cable.

KURABE HAMAKITA FACTORY (JAPAN)	E46702-H
KURABE INDUSTRIAL (VIETNAM) Co.,LTD	E46702-V
KURABE INDUSTRIAL (SHANGHAI) Co.,LTD	E46702-C or E246998

9. PACKAGE

The finished cables are cut into a shipping length of 200 meters, coiled or reeled and packed securely to prevent injuries during transportation.

Note: Odd length of the finished wires, which are not shorter than 20 meters may be accepted for shipping.

KURABE INDUSTRIAL CO., LTD

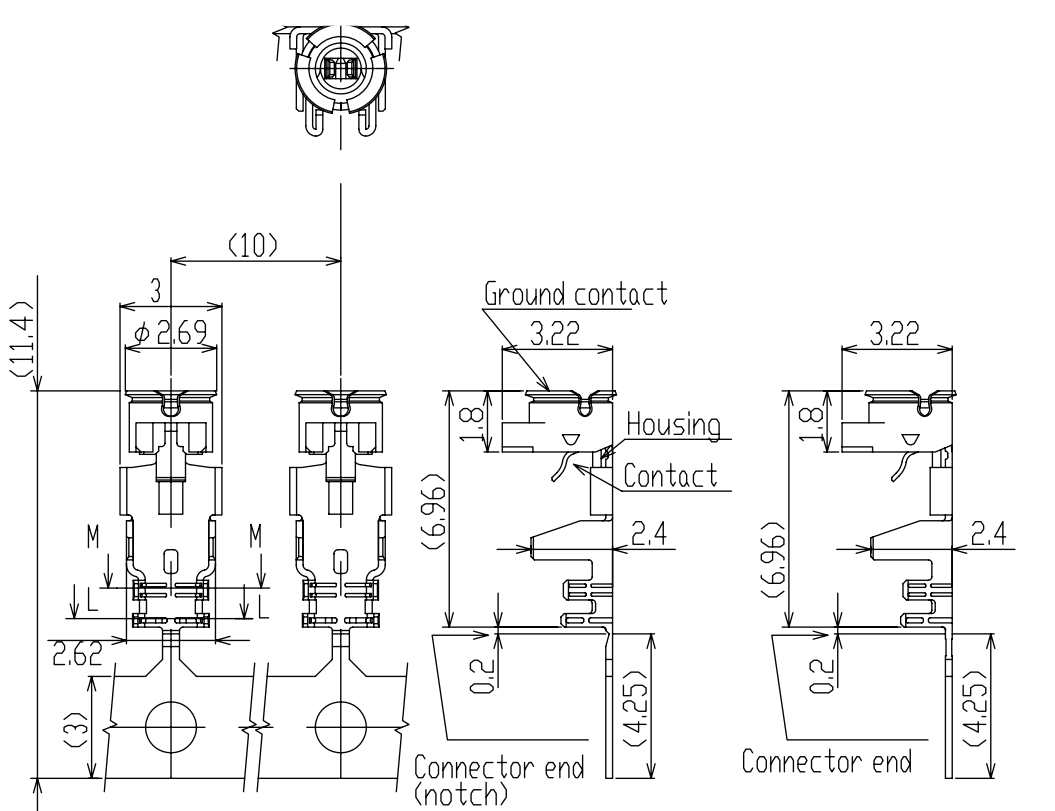
SP3831K-X	FEP INSULATED HIGH-FREQUENCY COAXIAL CABLE (FWS 5030) UL 1979	PAGE	4/4
PRODUCT STANDARD			

10. APPLICATION NOTES

- 10-1. For use other than the use mutually agreed, compatibility should be carefully confirmed in each practical use by user.
- 10-2. It is recommended to make a trial run for each practical application.
- 10-3. In case a design for use of cable is changed, please contact our sales department, if necessary. Do not use under extreme mechanical stress such as hard bending, tightening, and twisting. The use under extreme mechanical stress may cause not only shortening the life span of cable but also troubles such as decline of dielectric strength.
- 10-4. Handling precautions
 - ① Do not hurt the insulation and sheath of the cable by making holes and scratches. And avoid any sharp edge when wiring so as not to injure cables.
 - ② Avoid unnecessary excessive force to cable, such as pulling, twisting, bending or tightening.
- 10-5. Storage precautions
 - Avoid continuous exposure to sunlight.

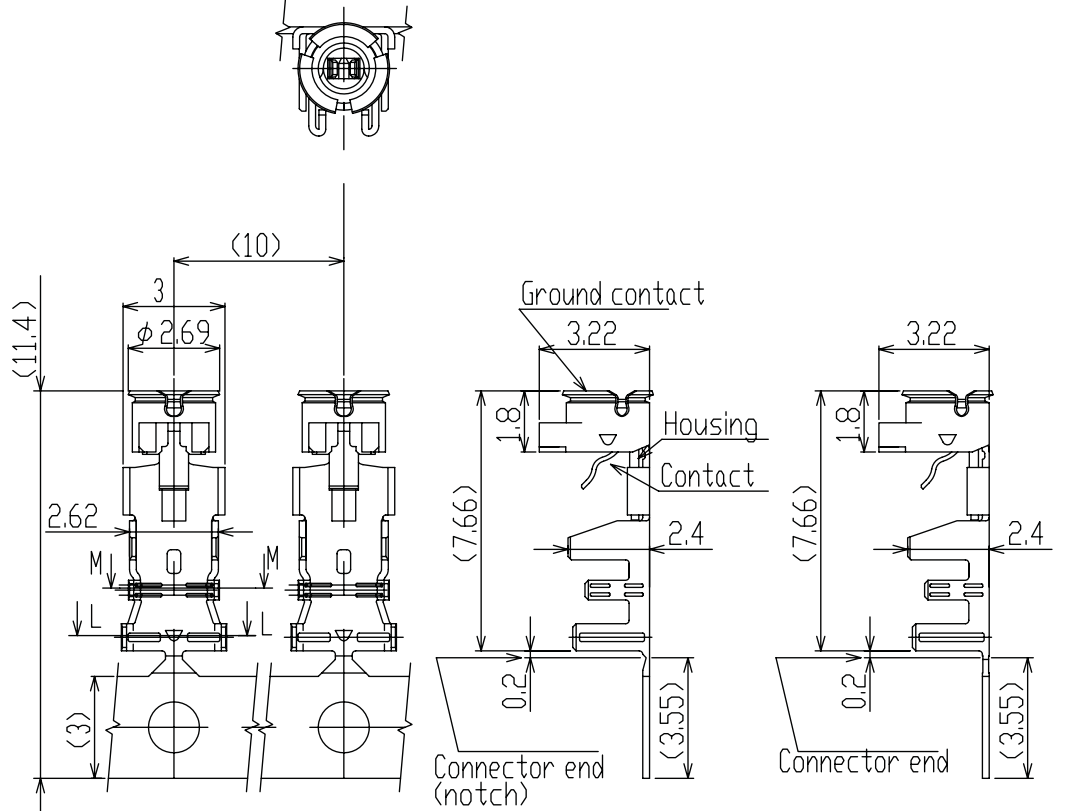
PART NO.
20278-**1R-**

I-PEX CONNECTOR



Part No.20278-101R-08
20278-101R-13
20278-101R-32
For hand tool
(with notch)

Part No.20278-111R-08
20278-111R-13
20278-111R-32
For semi auto
termination machine
(without notch)



Part No.20278-101R-18
For hand tool
(with notch)

Part No.20278-111R-18
For semi auto
termination machine
(without notch)

GENERAL TOLERANCE	
6 MAX.	±0.2
6 OVER MAX.30	±0.3
30 OVER MAX.120	±0.5
ANGLE	±2°

11C	Z3041	K.O	Mar/24/03	K.K	4	Z2023	K.O	JAN/30/02	E.K
10C	Z3014	K.O	JAN/31/03	K.K	3	Z1256	K.O	NOV/14/01	K.K
9C	Z2239	K.O	NOV/15/02	E.K	2	Z1197	K.O	AUG/27/01	K.K
8C	Z2224	K.O	OCT/17/02	E.K	1	Z1118	K.O	JUN/26/01	K.K
7B	Z2180	K.O	JUL/29/02	E.K	0	Z1109	K.O	JUN/13/01	
6B	Z2146	K.O	JUN/24/02	K.K					
5B	Z2117	A.H	MAY/17/02	K.K					
12C	Z3052	K.O	Apr/16/03	K.K					
REVI	ECN	BY	DATE	APP	REVI	ECN	BY	DATE	APP
REV.RECORD					SERIES No. 2814				

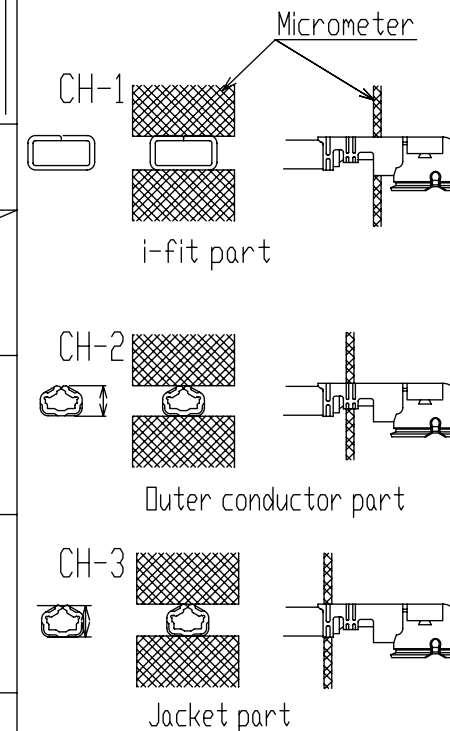
DESIGN'D BY	DATE
K.Dhbayashi	JUN/13/01
CHK'D BY	DATE
APP'D BY	DATE
K.Katabuchi	JUN/13/01
CUSTOMER COPY	PROJECTION
	6/1m

I-PEX Interconnect and Packaging Electronics TOKYO, JAPAN

TITLE: MHF series micro coaxial connector plug vertical (ground contact : gold plating)

SCALE: 6/1m UNIT: mm DWG. No. 20278 SHEET REV. 1/3 12C

Part No.	20278-101R-08 20278-111R-08	20278-101R-13 20278-111R-13	20278-101R-32 20278-111R-32	20278-101R-18 20278-111R-18
Applicable cable nominal dimension				
Braided shield of Outer conductor 外部導体の編組	Single / 1重編組	Single / 1重編組	Double / 2重編組	Single / 1重編組
P/N of hand Tool	90187-008C	90187-013C	90187-032C	90233-018
P/N of semi auto termination machine	90213-008C	90213-013C	90213-032C	90232-018
Sect. M-M				
Sect. L-L				
Crimp Height	CH-1	1.34~1.40	1.34~1.40	1.34~1.40
	CH-2	0.76~0.84	1.06~1.14	1.20~1.30
	CH-3	0.85~0.97	1.15~1.35	1.26~1.46



Crimp Height

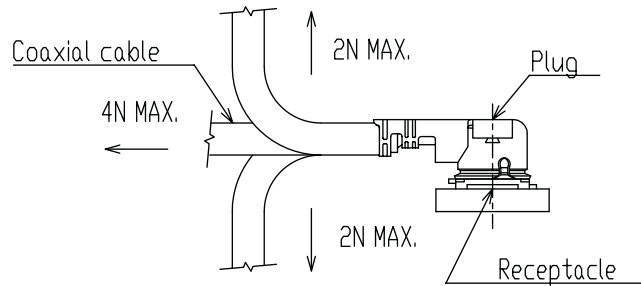
GENERAL TOLERANCE	
6 MAX.	±0.2
6 OVER MAX.30	±0.3
30 OVER MAX.120	±0.5
ANGLE	±2°

DESIGN'D BY	DATE		TITLE	MHF series micro coaxial connector plug vertical (ground contact : gold plating)						
CHK'D BY	DATE									
APP'D BY	DATE									
REV. ECN	BY	DATE	APP	CUSTOMER COPY	PROJECTION	SCALE	UNIT	DWG. No.	SHEET	REV.
REV. RECORD								20278	2/3	12C
SERIES No. 2814										

Notes

1. Material
 (1) Housing : PBT , UL94V-0 , black
 (2) Contact
 phosphor bronze
 gold plating 0.1μm MIN.
 over nickel 1.27μm MIN.
 (3) Ground contact
 phosphor bronze
 gold plating 0.05μm MIN.
 over nickel 1.27μm MIN.
 2. Packing : reel
 3. Mating partner part No.
 : 20279-001E-01
 4. Permissible load of cable at mating

1. 材料
 (1) ハウジング : PBT , UL94V-0 , 黒色
 (2) コンタクト
 りん青銅
 金メッキ0.1μm MIN.
 下地 ニッケル1.27μm MIN.
 (3) グランドコンタクト
 りん青銅
 金メッキ0.05μm MIN.
 下地 ニッケル1.27μm MIN.
 2. 梱包 : リール
 3. かん合相手 part No.
 : 20279-001E-01
 4. コネクタかん合後のケーブルに対する荷重

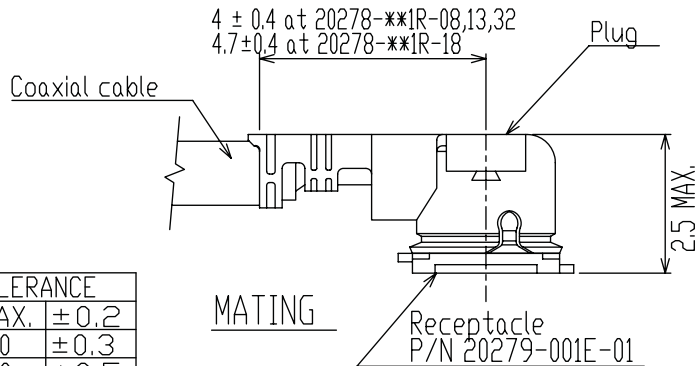


5. Suggestions for mating & unmating operation.

5. コネクタかん合時および抜去時の注意

5-1 Mating.
 Please mate the connector straightly to vertical direction as much as possible, adjusting the mating axis of plug and receptacle. As excessive slant angle mating may break the connector , please don't do it.

5-1 コネクタ挿入時
 PlugとReceptacleのかん合軸を合わせ、できるだけ垂直に挿入して下さい。極端な斜め挿入は行わないで下さい。コネクタ破損の原因となりますので、過度なこじり挿抜は行わないで下さい。



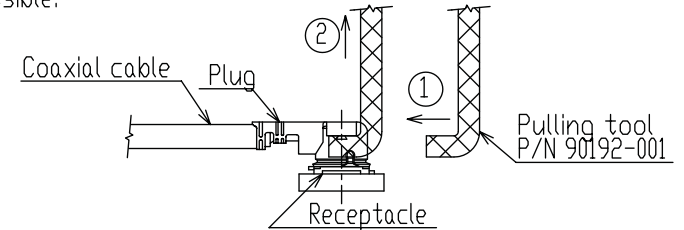
GENERAL TOLERANCE	
6 MAX.	±0.2
6 OVER MAX.30	±0.3
30 OVER MAX.120	±0.5
ANGLE	±2°

5-2 Unmating.

5-2 コネクタ抜去時

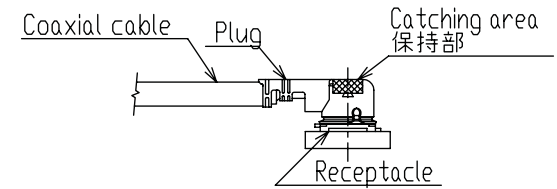
(1) In case of unmating by pulling tool.
 Please use the pulling tool as the following drawing, and please pull plug to vertical direction as directly as possible.

(1) 抜去ジグを用いる場合
 下図のようにできるだけ垂直に引き抜いて下さい。



(2) In case of unmating directly by hand
 Please catch the catching area of plug, and please pull plug to vertical direction as directly as possible.

(2) 手で直接引き抜く場合
 下図の保持部をつかみ、できるだけ垂直に引き抜いて下さい。



5-3 Crimp over standards of outer conductor

5-3 外部導体はみ出し量

Standards: Less than 10% from total numbers of outer conductor
 (Numbers of outer conductor's crimp over from outer conductor's barrel)

外部導体はみ出し量規定
 : 外部導体トータル本数の10%以下
 (外部導体バレルの外にはみ出した量)

5-4 Caution about Heat shrinkage tubes

5-4 熱収縮チューブについての注意
 熱収縮チューブで外部導体を覆う場合は、導通不良の原因になりますので、熱によりハウジングを溶融させないように注意してください。

Please be careful not to melt housing when using heat shrinkage tubes. It will become cause of open circuit.

					DESIGN'D BY	DATE	Interconnect and Packaging Electronics TOKYO, JAPAN	TITLE MHF series micro coaxial connector plug vertical (ground contact : gold plating)				
					CHK'D BY	DATE						
					APP'D BY	DATE						
REV	ECN	BY	DATE	APP	CUSTOMER COPY	PROJECTION	SCALE	UNIT	DWG. No.	SHEET	REV.	
REV.RECORD							-/m		20278	3/3	12C	
SERIES No. 2814												

No.2006-1
Sep/30/'02

材料証明書
MATERIAL CERTIFICATE

当社製品には下記の材料が使われている事を証明致します。
WE HEREBY CERTIFY THAT THE FOLLOWING MATERIALS ARE USED IN OUR PRODUCT.

PRODUCT NAME : MHF series micro coaxial connector PLUG P/N 20278-**1R-**
20308-**1R-**

部品 COMPONENT	材料/MATERIAL		
	材質名 MATERIAL	型名 CAT No.	材料メーカー MANUFACTURER
1 HOUSING	PBT	3116	WINTTECH POLYMER LTD.
			UL94難燃性 UL94 FLAME CLASS
			UL774/11No. UL FILE No. E 213445

PRODUCT NAME : MHF series micro coaxial connector RECEP. P/N 20279-001E-01

部品 COMPONENT	材料/MATERIAL		
	材質名 MATERIAL	型名 CAT No.	材料メーカー MANUFACTURER
1 HOUSING	LCP	E130i	POLYPLASTICS CO.,LTD.
			UL94難燃性 UL94 FLAME CLASS
			UL774/11No. UL FILE No. E 106764

PRODUCT NAME : MHF II connector P/N 20311-**1R-08

部品 COMPONENT	材料/MATERIAL		
	材質名 MATERIAL	型名 CAT No.	材料メーカー MANUFACTURER
1 HOUSING	LCP	A430	POLYPLASTICS CO.,LTD.
			UL94難燃性 UL94 FLAME CLASS
			UL774/11No. UL FILE No. E 106764

株式会社アイペックス
I-PEX Co.,Ltd.

APPROVAL	CHECK	ORIGINATOR
K.Katabuchi Oct/02/'02	E.Kawabe Oct/02/'02	A.Hino Oct/02/'02

FORM REV.0



QMFZ8.E213445

Plastics Certified For Canada - Component

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WINTTECH POLYMER LTD

E213445

18-1 KONAN 2-CHOME

MINATO-KU

TOKYO 108-8280, JAPAN

Mtl Dsg	Color	mm	Class	I	I	A	R	T	I	C	
											Min.
Acrylonitrile Butadiene Styrene/Polybutylene Terephthalate (ABS/PBT), flame retardant, "Duranex", furnished as pellets.											
90ISS	BK	0.8	V-2	-	-	-	60	60	60	60	
Acrylonitrile Butadiene Styrene/Polybutylene Terephthalate (ABS/PBT), glass reinforced, "Duranex", furnished as pellets.											
AN7315(++)	ALL	0.75	V-0	-	-	-	60	60	60	60	
AN75(xy)(++)											
	ALL	0.75	V-0, 5VA	3	2	3	120	105	110	3	
		1.5	V-0, 5VA	2	2	3	130	105	130		
		3.0	V-0, 5VA	2	1	3	130	105	140		
AN7515(++)	ALL	0.75	V-0, 5VA	3	1	3	120	105	110	3	
		1.5	V-0, 5VA	2	1	3	140	105	130		
		3.0	V-0, 5VA	2	1	3	140	105	140		



I-PEX CONNECTOR 拉力測試報告

步驟一 將線材I-PEX固定夾緊



步驟二 按下操作鍵,開始進行拉力測試,直到部品被破壞為止



步驟三 檢視破壞的地方,並詳加紀錄於表單中,將測試值紀錄於管制圖中

編號	1	2	3	4	5	6	7	8	9	10	AVG
拉力值	1.98	1.88	2.24	2.21	1.95	1.89	2.10	2.23	2.15	1.93	2.06

UNIT : kgw