

TO: LINKSYS

SPECIFICATION FOR APPROVAL


DESCRIPTION : SMA FEMALE RP+1.13(200mm)+UFL CONNCTOR

PART NO : 199000114

慶陞 PART NO : 6303070203-200

DATE : 2007/10/30

PLEASE RETURN TO US ONE COPY OF “ SPECIFICATION FOR APPROVAL ” WITH YOUR APPROVED SIGNATURES

APPROVED SIGNATURES			
			



廣州慶隆電子
慶陞工業股份有限公司
KINSUN INDUSTRIES INC.

桃園縣中壢市普忠路 211 巷 20 號

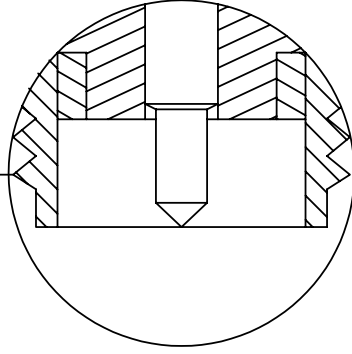
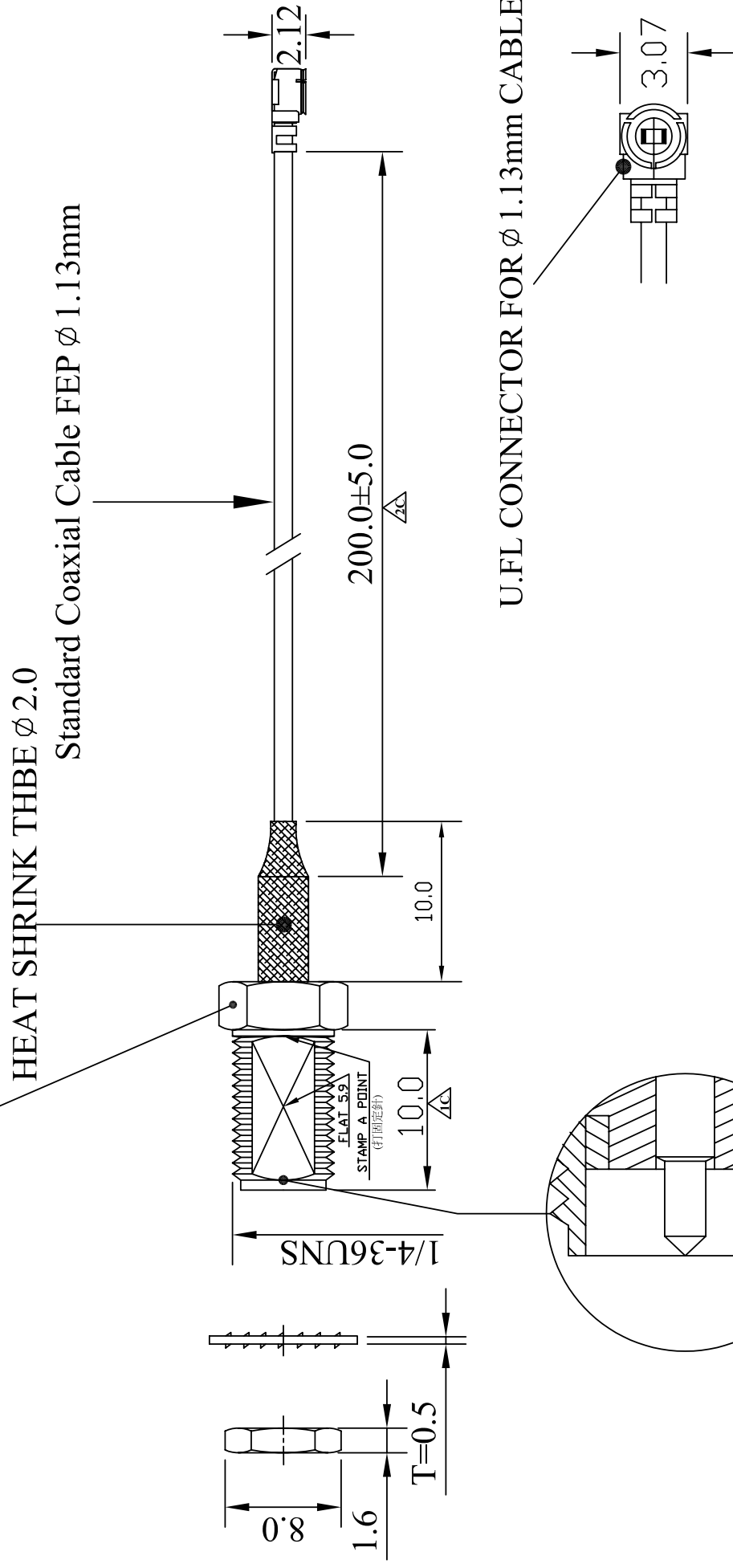
TEL : 886-3-4353551




[Http://www.kinsun.com](http://www.kinsun.com)

FAX : 886-3-4353951

e-mail: jason@kinsun.com

SMA FEMALE BULKHEAD, REVERSE FOR Ø 1.13 CABLE



設計 DR.	核准 APP.		 KINSUN 慶陞			容許公差	TOLERANCE	品名 ARTICLE	
	Hayato 2005/4/18	版本說明				REVISION NOTE	.XXX		±0.10
							.XX		±0.25
			.X	±0.38					
			X	±0.50					
			ANG	±3°	圖號	DWG NO.	6303070203-200	SMA-Female-BULK-R/P-1.13mm+PEX	
					單位 UNIT	比例 SCALE	張數 SHEET	版本 REV.	
					mm	4/1	1/1	A	



矽原精密電子股份有限公司

Silicon-Oriented Precision Electronics Co.,LTD.

樣品確認書

廠商 名稱：慶陞		品名：JS R19-07-1-1.13-50		圖號：JS R19-0003		數量：5 PCS	
NO		檢驗項目		材質：JT.3GX.2.5G		檢驗時間： 96 年 05 月 09 日	
尺寸 檢 驗	單位：mm		研發單位量測值 (Max-Min)		品保單位量測值 (Max-Min)		
	A	1.6±0.2	1.60-1.62		1.59-1.64		
	B	φ 10.2±0.2	φ 10.19- φ 10.22		φ 10.20- φ 10.25		
	C	19.1 ±0.2	19.09-19.12		19.07-19.10		
	D	φ 0.60±0.1	φ 0.60- φ 0.61		φ 0.59- φ 0.60		
	E	0.9 ±0.2	0.90-0.92		0.89-0.92		
	F	7.2±0.2	7.18-7.22		7.17-7.21		
	G	±					
	H	±					
	I	±					
	J	±					
	K	±					
	L	±					
外 觀	成型		OK		OK		
	電鍍		OK		OK		
	主體		OK		OK		
特 性	公母配合		OK		OK		
	四腳測試		N/A		N/A		
	推力測試		N/A		N/A		
	扭力測試		N/A		N/A		
	短通路測試		N/A		N/A		
	外殼轉動		N/A		N/A		
重要記事／處理對策：				檢 測 證 明 附 帶		綜 合 判 定	
				<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input checked="" type="checkbox"/> 合格 <input type="checkbox"/> 不合格	

品保：MANDY

研發：CHAD

F-QP-FD-013-01A

鹽 水 噴 霧 測 試

試驗日期: 96 年 07 月 27 日		試驗時間: 48 小時	
廠商: 矽原		試驗材質: BRASS	電鍍別:AU”
品名: JS R19-07-1-1.13-50Ω		特性:	
試驗條件: 5%鹽水		空氣壓縮: 初壓 2 微壓 1	
飽和溫度: 47℃		試驗溫度: 35℃	
結	依 C.N.S 等級判定 9.8 級,腐蝕面積 0.02%以下。		
果			
備			作 成 者
註			馬正成

Silicon Oriented Precision Electronics CO., LTD.

Customer	矽原精密電子股份有限公司		
Material	Free cutting brass		
Stability-class: JIS H 3250 C3604 BD			
CHEMICAL COMPOSITION %			
Taster	X-RAY ANALYSIS		
Measurement	VACUUM X RAY SPECTROGRAPH		
ELEMENT	STANDARD VALUE	ACTUAL VALUE	REMARK
Cu	57.0-61.0%	58.43 %	
Pb	1.8-3.7 %	3.36 %	
Fe	<0.5 %	-----	
Sn+Fe	<1.2 %	0.71 %	
Zn	REMAINDER	REMAINDER	
Other			
MECHANICAL & PHYSICAL PROPERTIES			
Tensile strength : 360 N/mm ²			
Heated*material Hardness or stability, HB or HV : (90)			
REMARK:			
ASTM Standard: CA 360 Free cutting brass.			

Silicon Oriented QA



THE MATERIAL CERTS OF TEFLON

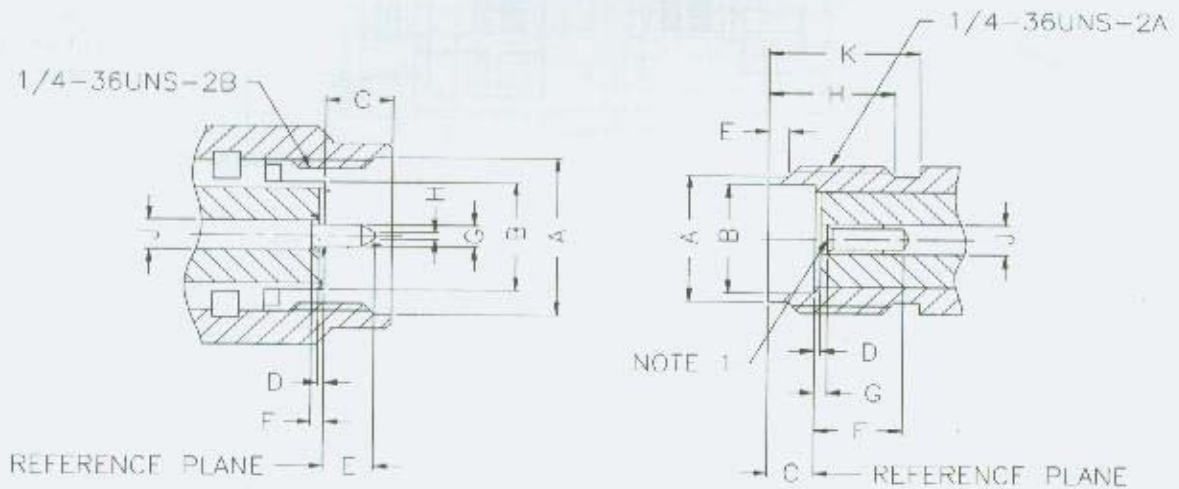
Customer	矽原精密電子股份有限公司	
Material	TEFLON	
Physical Properties		%
Physical Properties	Density g/cm ³	2.14-2.2
	Water absorption %	>0.01
Mechanical Properties	Tensile strength kg/cm ²	140-350
	Flexural strength kg/cm ²	16.4
	Rockwell hardness	D55
	Izod impact strength kg cm/cm with notch	2.5~2.7
	Taper wears mg/1000 Times	
	Friction coefficients	0.1-0.04
Heat Properties	Coefficient of linear thermal expansion $\times 10^{-6}/^{\circ}\text{C}$	7.0-10.0
	Thermal conductivity kcal/m. Hr. $^{\circ}\text{C}$	6.0
	Heat distortion temperatures $^{\circ}\text{C}$	
	Heat resistance $^{\circ}\text{C}$	260-278
Electrical Properties	Dielectric breakdown strengths KV/mm	43-50
	Coefficient of volume resistance $\Omega\text{-cm}$	10^3
REMARK:		

Silicon Oriented QA



Silicon-oriented

INTERFACE MATING DIMENSIONS



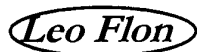
PLUG

Letter	Millimeters	
	Minimum	Maximum
A	6.35	6.73
B	4.53	4.59
C	2.54	3.43
D	0.00	0.25
E	1.91	2.54
F	0.00	0.25
G	0.90	0.94
H	0.00	0.38
J	1.24	1.30

JACK

Letter	Millimeters	
	Minimum	Maximum
A	5.28	5.49
B	4.60	4.67
C	1.88	1.98
D	0.00	0.25
E	0.38	1.14
F	2.92	-
G	0.00	0.25
H	4.32	-
J	1.24	1.30
K	5.54	-

SMA



LEOFLON ELECTRONICS INDUSTRIAL CO., LT

藍菱電子科技有限公司

耀菱電子有限公司

北縣新莊市中正路649-3號10F

TEL:02-29038223 FAX:02-29081221

E-mail : ghi@ms14.hinet.net

Homepage: <http://www.leoflon.com.tw>

合 格 承 認 書

APPROVED DATA

客 戶

CUSTOMER 慶陞工業股份有限公司

日 期

D A T E 2005年5月

品 名

FEP鐵氟龍同軸電纜線

DESCRIPTION **FEP COAXIAL CABLE**

規 格

MINI 178

AWG#32/7

ID:0.237mm (7/0.079)

S I Z E

OD:1.13mm



藍菱電子科技有限公司

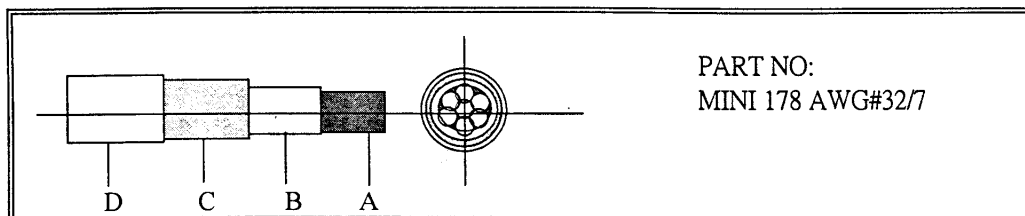
LEOFLON ELECTRONICS INDUSTRIAL CO., LTD.

TEL:886-2-2903-8223 FAX:886-2-2908-1221

台北縣新莊市中正路649-3號10樓

鐵氟龍高頻同軸電纜線

FEP TEFLON Coaxial Cable



SPECIFICATION

A:CONDUCTOR

Material	Silver Plated Copper
Stranding	7x0.079mm
Diameter	0.237mm

B:INSULATION

Material	FEP
Thickness	0.211mm
Diameter	0.66mm

C:SHIELD

Shield Type	Braid
Material	Silver Plated Copper
Coverage	95%
Diameter	0.9mm

D:JACKET

Material	FEP
Thickness	0.115mm
Overall Diameter	1.13mm

MECHANICAL CHARACTERISTICS

Operating Temperature Range	-70°C ~ 200°C
Voltage	30V
Flame Test	UL-94

LEOFLO

藍菱電子科技有限公司

LEOFLO ELECTRONICS INDUSTRIAL CO., LTD.

TEL:886-2-2903-8223 FAX:886-2-2908-1221

台北縣新莊市中正路649-3號10樓

Tensile Strength	Insulation 3789PSI
	Jacket: 4399PSI
Elongation	Insulation 320%
	Jacket: 330%

ELECTRONICAL CHARACTERISTICS

Nom. Impedance	50Ohms
Nom. Capacitance	95pF/M
Nom. Velocity of Propagation	69%
Dielectric Strength	6KV 0.5mA/Minute
Spark Test	6KV
VSWR (0~6GHz)	Less 1.3
Attenuation (dB/M)	

500MHz	2.4GHz	5.2GHz	6GHz
1.23	2.7	4.89	5.12



台灣雲林電子股份有限公司

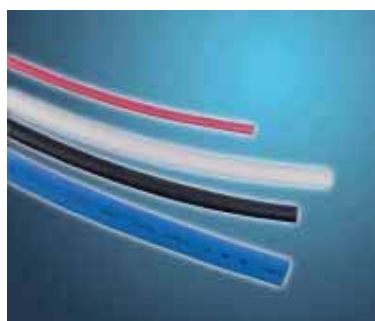
規格確認書

G5(HF)

低任意抽煙，鹵素聚烯烴管材

應用

這是 **absolutely** 環境友好的 **heat-shrinkable** 管和由鹵素自由聚烯烴和材料不毒性煙亦不有害的物質做當燒。廣泛使用在電子、通信和汽車業減少毒力風險。



特徵

- Low 煙放射
- Excellent 阻燃
- Low 溫度收縮

操作溫度範圍

·Operating 溫度: -55°C ~ 125°C

·Minimum 抽縮溫度: 70°C

·Minimum 充分補救溫度: 110

G5(HF) 低任意抽煙，鹵素聚烯烴管材

產品 Diemnsions

大小 (毫米)	作為供應(毫米)		作為補救(毫米)		包裹 (m/spool)	應用 範圍 (毫米)
	I.D	W.T	I.D (最大。)	W.T (分鐘。)		
φ 0.8	1.0.0.2	0.15.0.05	0.5	0.25.0.05	200	0.4~0.80
φ 1.0	1.5.0.3	0.20.0.05	0.6	0.33.0.05	200	0.5~0.90
φ 1.5	2.0.0.3	0.20.0.05	0.75	0.36.0.05	200	0.7~1.40
φ 2.0	2.5.0.3	0.20.0.05	1.0	0.44.0.05	200	1.0~1.80
φ 2.5	3.0.0.3	0.25.0.05	1.25	0.44.0.05	200	1.2~2.30
φ 3.0	3.5.0.3	0.25.0.05	1.5	0.44.0.05	200	1.5~2.70
φ 3.5	4.0.0.3	0.25.0.05	1.75	0.44.0.05	200	1.7~3.20
φ 4.0	4.5.0.3	0.25.0.05	2.0	0.44.0.05	200	2.0~3.60
φ 4.5	5.0.0.3	0.25.0.05	2.25	0.44.0.08	200	2.3~4.00
φ 5.0	5.5.0.3	0.25.0.05	2.5	0.56.0.08	100	2.5~4.50
φ 6.0	6.5.0.3	0.28.0.05	3.0	0.56.0.08	100	3.0~5.40
φ 7.0	7.6.0.3	0.30.0.06	3.5	0.56.0.08	100	3.5~6.30
φ 8.0	8.6.0.3	0.30.0.06	4.0	0.56.0.08	100	4.0~7.20
φ 9.0	9.6.0.3	0.30.0.06	4.5	0.56.0.08	100	4.5~8.00
φ 10.0	10.7.0.4	0.30.0.06	5.0	0.56.0.08	100	5.0~9.00
φ 11.0	11.7.0.4	0.30.0.06	5.5	0.56.0.08	100	5.0~10.0
φ 12.0	12.7.0.4	0.30.0.06	6.0	0.56.0.08	100	6.0~11.0
φ 13.0	13.7.0.4	0.35.0.07	6.5	0.69.0.08	100	6.5~12.0
φ 14.0	14.7.0.4	0.35.0.07	7.0	0.69.0.08	100	7.0~13.0
φ 15.0	15.7.0.5	0.35.0.07	7.5	0.69.0.08	100	7.5~14.0
φ 16.0	16.7.0.5	0.35.0.07	8.0	0.69.0.08	100	8.0~15.0
φ 17.0	17.5.0.6	0.35.0.12	8.5	0.70.0.08	100	8.8~16.0
φ 18.0	19.0.0.5	0.40.0.10	9.0	0.77.0.15	100	9.0~17.0
φ 20.0	21.0.0.5	0.40.0.10	10.0	0.77.0.15	50	10~19.0
φ 22.0	23.0.0.5	0.40.0.10	11.0	0.77.0.15	50	11~21.0
φ 25.0	26.0.1.0	0.45.0.10	12.5	0.87.0.15	50	12~24.0
φ 28.0	29.0.1.0	0.45.0.10	14.0	0.87.0.15	50	14~29.0
φ 30.0	31.5.0.7	0.45.0.15	15.0	0.95.0.15	50	15~29.0
φ 35.0	37.0.0.7	0.50.0.15	17.5	1.00.0.15	50	17~34.0
φ 40.0	40.5.0.7	0.50.0.15	20.0	1.00.0.15	50	20~39.0
φ 45.0	46.0.0.7	0.50.0.15	22.5	1.00.0.15	25	25~45.0
φ 50.0	50.5.0.7	0.50.0.15	25.0	1.00.0.15	25	35~70.0
φ 60.0	60.0.3.0	0.80.0.20	32.0	1.30.0.20	25	30~60.0
φ 70.0	70.0.3.0	0.80.0.20	35.0	1.50.0.20	25	35~70.0

ϕ 80.0	80.0.3.0	0.80.0.30	40.0	1.50.0.30	25	40~80.0
ϕ 90.0	90.0.4.0	0.80.0.30	43.0	1.50.0.30	25	50~100
ϕ 100	100.0.4.0	0.80.0.30	43.0	1.50.0.30	25	50~100
ϕ 120	120.0.4.0	0.80.0.30	56	1.50.0.30	15	60~120

顏色: black、white、red、blue、yellow、green, 其它顏色應要求。

特別大小, 被削減的片斷是可利用的應要求。

G5(HF) 低任意抽煙, 鹵素聚烯烴管材

技術資料

	物產	規格要求	測試方法	典型的價值
物理	縱向收縮	5% 最大。	ASTM D 2671	$\leq 5\%$
	同心	70%min 。	ASTM D 2671	$\geq 70\%$
	抗拉強度	10.4MPa 分鐘。	ASTM D 638	$\geq 12.0\text{MPa}$
	伸長在斷裂	200% 分鐘。	ASTM D 638	$\geq 300\%$
	熱震動	沒有崩裂	ASTM D 2671	通行證
	冷的彎(-55°C, 4 個小時。)	沒有崩裂	ASTM D 2671	通行證
	熱老化 158°C, 168 個小時。			
	抗拉強度在變老以後	70% 原物(分鐘。)	ASTM D 638	$\geq 80\%$
	伸長在斷裂在變老以後	100% 分鐘。	ASTM D 638	$\geq 200\%$
電子	電介質電壓承受和故障	2500V, 60sec, 沒有故障	UL224	通行證
	容量抵抗	$10^{14} \Omega \cdot \text{cm}$ 分鐘。	ASTM D 876	$\geq 10^{14} \Omega \cdot \text{cm}$
化學製品	銅腐蝕	沒有腐蝕	ASTM D 2671	通行證
	銅穩定	伸長 $\geq 100\%$	ASTM D 2671	通行證
	燃燒性	VW-1	UL224	通行證

PRODUCT SPECIFICATION

製品規格

No. PRS-1176

MHF series micro coaxial connector

(Product No. Plug 20278, Rec. 20279)

Qualification Test Report No. TR-1021

6	S2084	K.O	DEC/19/'02	K.K	Prepared by K.Ohbayashi JUN / 25 / 01	Reviewed by E,Kawabe Jun / 25 / 01	Approved by K.Katabuchi Jun / 29 / 01
5	S2082	K.O	DEC/05/'02	K.K			
4	S2076	K.O	Oct/17/'02	E.K			
3	S2064	A.H	Sep/10/'02	K.K			
2	S2031	K.O	May/17/'02	K.K			
REV.	ECN	BY	DATE	APP.			
REVISION RECORD							

DOCUMENT CLASSIFICATION	TITLE	No.
Product Specification 製品規格	MHF series micro coaxial connector	PRS-1176
<p>1. Scope / 序言</p> <p>MHF series micro coaxial connector is a wire to board connector for AWG#36,32,30 coaxial cable . MHF series micro coaxial connector は、AWG # 36,32,30同軸ケーブルの基板対ワイヤーコネクタである。</p> <p>2. Objectives / 目的</p> <p>This specification covers the requirements for product performance and test methods of MHF series microcoaxial connector 本規格は、MHF series micro coaxial connector の性能と試験条件について規定する。</p> <p>3. Part No. , construction , material and finish / 構成、材料及び仕上げ</p> <p>(1) Part No. Plug : 20278-* * * R-08,-13,-32,-18 , Receptacle : 20279-001E-01 (2) Construction, material and finish of the connector are covered as each drawings. 構成、材料及び仕上げは、各図面に指定されている通りとする。</p> <p>4. Applicable cable / 適合ケーブル</p> <p>4-1 Part No. 20278-101R-08, 20278-111R-08</p> <p>(1) Description</p> <p>Inner conductor : AWG#36(7/0.05) Silver plating annealed copper wire or silver plating tin-copper alloy Dielectric core : Fluoro-plastics ,diameter 0.4(+0.04,-0.02)mm , nominal thickness 0.125mm Outer conductor : 8/5/0.05 , nominal diameter 0.65mm , silver plating annealed copper wire Jacket : Fluoro-plastics , diameter 0.81(+0.04,-0.02)mm , nominal thickness 0.08mm</p> <p>(2) Requirements</p> <p>Characteristic impedance : 50(+2,-2)ohm by TDR method Nominal capacitance(Reference value): 96 pF/m Conductor resistance of inner conductor at 293K (20°C)(Reference value) : 1400 ohm/km Insulation resistance : 1000 mega-ohm.km MIN. Dielectric withstand voltage : no breakdown at AC1000V for 1 minutes.</p> <p>(1) 構成</p> <p>中心導体 : AWG # 36 (7/0.05), 銀メッキ軟銅線または銀メッキすず入り銅線 誘電体 : フッ素樹脂, 外径0.4(+0.04,-0.02), 標準厚さ0.125mm 外部導体 : 8/5/0.05, 標準外径0.65mm, 銀メッキ軟銅線 ジャケット : フッ素樹脂, 外径0.81(+0.04,-0.02)mm, 標準厚さ0.08mm</p> <p>(2) 仕様</p> <p>特性インピーダンス : $50 \pm 2 \Omega$ (TDR) 標準静電容量(参考値) : 96pF/m 293K(20°C)時の中心導体導体抵抗(参考値) : 1400 Ω /km 絶縁抵抗 : 1000M $\Omega \cdot km$以上 耐電圧 : AC1000V・1分間にて絶縁破壊の無い事</p> <p>4-2 Part No. 20278-101R-13, 20278-111R-13</p> <p>(1) Description</p> <p>Inner conductor : AWG#32(7/0.08) Silver plating annealed copper wire or silver plating tin-copper alloy Dielectric core : Fluoro-plastics , diameter 0.68(+0.04,-0.02)mm , nominal thickness 0.22mm Outer conductor : 16/4/0.05 , nominal diameter 0.93mm , silver plating annealed copper wire Jacket : Fluoro-plastics , diameter 1.13(+0.08,-0.05)mm , nominal thickness 0.1mm</p>		

DOCUMENT CLASSIFICATION	TITLE	No.
Product Specification 製品規格	MHF series micro coaxial connector	PRS-1176

(2) Requirements

Characteristic impedance : 50(+2,-2)ohm by TDR method

Nominal capacitance(Reference value): 97 pF/m

Conductor resistance of inner conductor at 293K (20°C)(Reference value) : 520 ohm/km

Insulation resistance : 1500 mega-ohm.km MIN.

Dielectric withstand voltage : no breakdown at AC1000V for 1 minutes.

(1) 構成

中心導体 : AWG # 32(7/0.08), 銀メッキ軟銅線または銀メッキすず入り銅線

誘電体 : フッ素樹脂, 外径0.68(+0.04,-0.02), 標準厚さ0.22mm

外部導体 : 16/4/0.05, 標準外径0.93mm, 銀メッキ軟銅線

ジャケット : フッ素樹脂, 外径1.13(+0.08,-0.05)mm, 標準厚さ0.1mm

(2) 仕様

特性インピーダンス : $50 \pm 2 \Omega$ (TDR)

標準静電容量(参考値) : 97pF/m

293K(20°C)時の中心導体導体抵抗(参考値) : $520 \Omega / \text{km}$

絶縁抵抗 : $1500 \text{M} \Omega \cdot \text{km}$ 以上

耐電圧 : AC1000V・1分間にて絶縁破壊の無い事

4-3 Part No. 20278-101R-32, 20278-111R-32

(1) Description

Inner conductor : AWG#32(7/0.08)

Silver plating annealed copper wire or silver plating tin-copper alloy

Dielectric core : Fluoro-plastics , diameter 0.66(+0.05,-0.05)mm , nominal thickness 0.21mm

First outer conductor : 16/5/0.05, tin plating annealed copper wire

Second outer conductor : 16/6/0.05, nominal diameter 1.12mm , tin plating annealed copper wire

Jacket : Fluoro-plastics , diameter 1.32(+0.1,-0.1)mm , nominal thickness 0.1mm

(2) Requirements

Characteristic impedance : 50(+2,-2)ohm by TDR method

Nominal capacitance(Reference value): 95 pF/m

Conductor resistance of inner conductor at 293K (20°C) (Reference value) : 520 ohm/km

Insulation resistance : 1500 mega-ohm.km MIN.

Dielectric withstand voltage : no breakdown at AC1000V for 1 minutes.

(1) 構成

中心導体 : AWG # 32(7/0.08), 銀メッキ軟銅線または銀メッキすず入り銅線

誘電体 : フッ素樹脂, 外径0.66(+0.05,-0.05), 標準厚さ0.21mm

外部導体(内側) : 16/5/0.05, すずメッキ軟銅線

外部導体(外側) : 16/6/0.05, 標準外径1.12mm, すずメッキ軟銅線

ジャケット : フッ素樹脂, 外径1.32(+0.1,-0.1)mm, 標準厚さ0.1mm

(2) 仕様

特性インピーダンス : $50 \pm 2 \Omega$ (TDR)

標準静電容量(参考値) : 95pF/m

293K(20°C)時の中心導体導体抵抗(参考値) : $520 \Omega / \text{km}$

絶縁抵抗 : $1500 \text{M} \Omega \cdot \text{km}$ 以上

耐電圧 : AC1000V・1分間にて絶縁破壊の無い事

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<p>4-4 Part No. 20278-101R-18, 20278-111R-18 RG178 B/U</p> <p>(1) Description Inner conductor : AWG#30(7/0.102) , silver plating copper clad steel wire Dielectric core : Fluoro-plastics , diameter 0.84(+0.03,-0.03)mm , nominal thickness 0.268mm Outer conductor : 16/3/0.1 , nominal diameter 1.35mm , silver plating copper wire Jacket : Fluoro-plastics , diameter 1.8(+0.1,-0.1)mm , nominal thickness 0.23mm</p> <p>(2) Requirements Characteristic impedance : 50(+2,-2)ohm by TDR method Nominal capacitance(Reference value): 95 pF/m Conductor resistance of inner conductor at 293K (20°C) (Reference value) : 805 ohm/km Insulation resistance : 1500 mega-ohm.km MIN. Dielectric withstand voltage : no breakdown at AC2000V for 1 minutes.</p> <p>(1) 構成 中心導体 : AWG # 30 (7 / 0. 102) , 銀メッキ銅被鋼線 誘電体 : フッ素樹脂, 外径0. 84 (±0. 03) , 標準厚さ0. 268mm 外部導体 : 16 / 3 / 0. 1, 標準外径1. 35mm, 銀メッキ軟銅線 ジャケット : フッ素樹脂, 外径1. 8 (±0. 1)mm, 標準厚さ0. 23mm</p> <p>(2) 仕様 特性インピーダンス : 50 ± 2 Ω (TDR) 標準静電容量(参考値) : 95pF / m 293K (20°C) 時の中心導体導体抵抗(参考値): 805 Ω / km 絶縁抵抗 : 1500M Ω ・km以上 耐電圧 : AC2000V・1分間にて絶縁破壊の無い事</p> <p>5. Ratings / 定格 (1) Rated voltage / 電圧 : AC60Vrms (2) Nominal characteristic impedance / 公称特性インピーダンス : 50 Ω (3) Frequency / 周波数 : DC~6GHz (4) VSWR : Plug 1.3 MAX at 0.1~3GHz 1.5 MAX at 3~6GHz Receptacle 1.3 MAX at 0.1~3GHz. 1.4 MAX at 3~6GHz (5) Service Temperature / 使用温度範囲 : 233~363K (-40~+90°C)</p> <p>6. Test methods and performance / 試験及び性能</p> <p>6-1 Test condition / 試験条件 Unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202 全ての測定と試験は、MIL-STD-202 に基づき以下の条件で行う。 Temperature / 温度 : 288~308K (15~35°C) Humidity / 湿度 : 45~75%RH</p>		

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6-2 Sample quantity / 試料数

- (1) Insulation resistance / 絶縁抵抗 : 10pcs.
- (2) Dielectric withstanding voltage / 耐電圧 : 10pcs.
- (3) VSWR : 5pcs.
- (4) Unmating force / 抜去力 : 10pcs
- (5) Crimp strength / 引張強度 : 10pcs
- (6) Durability / 耐久性 : 10pcs.
- (7) Cable retention force / ケーブル保持力 : 10pcs.
- (8) Vibration / 振動 : 10pcs.
- (9) Shock / 衝撃 : 10pcs.
- (10) Thermal shock / 温度サイクル : 10pcs.
- (11) Humidity / 湿度 : 10pcs.
- (12) Salt water spray / 塩水噴霧 : 10pcs.
- (13) Solderability / 半田付け性 : 10pcs.
- (14) Reflow soldering heat resistance / 半田耐熱性 : 10pcs.

6-3-1 Electrical / 電気的性能

(1) Contact Resistance / 接触抵抗

A. Testing: Solder the receptacle connector to the test board and mate the plug connector together, then measure the contact resistance as shown in Fig.1 by the four terminal method.

Apply the low level condition in accordance with MIL-STD-202, Method 307.

Open circuit voltage : 20mV MAX

Circuit current : 10mA MAX. (DC or AC1kHz)

Contact resistance of inner contact : <resistance of A-E> - <resistance of B-E>

Contact resistance of ground contact : <resistance of A-D> - <resistance of B-D>

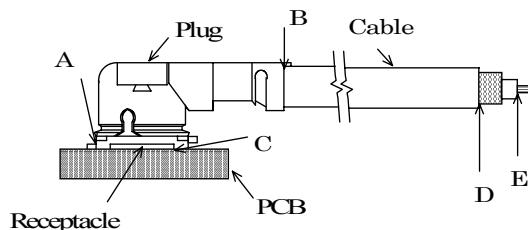


Fig.1

B. Requirements :

Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.

Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A. 試験法: テスト基板にリセプタクルコネクタを半田付けし、プラグコネクタと嵌合させ、Fig. 1のように4端子法にて下記の条件で測定する。 MIL-STD-202 試験法 307 に準拠。

開回路電圧: 20mV以下

試験電流 : 10mA (DCもしくはAC1kHz)

中心導体 : <A-E間の電気抵抗> - <B-E間の電気抵抗>

外部導体 : <A-D間の電気抵抗> - <B-D間の電気抵抗>

B. 必要条件: 中心導体 初期 20m Ω 以下, 試験後 25m Ω 以下

外部導体 初期 10m Ω 以下, 試験後 15m Ω 以下

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(2) Insulation resistance / 絶縁抵抗

A. Testing : Mate the plug and receptacle connector together, then apply DC 100 V between the inner contact and the ground contact in accordance with MIL-STD-202, Method 302.

B.Requirements : Initial 500 Mohm MIN. after testing 100 Mohm MIN.

A.試験法：リセプタクル及びプラグコネクタを互いに嵌合させ、中心導体と外部導体の間に DC 100Vを印加し、測定する。MIL-STD-202 試験法 302 に準拠。

B.必要条件：初期 500MΩ 以上 試験後 100MΩ 以上

(3) Dielectric withstanding voltage / 耐電圧

A. Testing : Mate the receptacle and plug connector together, then apply AC 200 Vrms between the inner contact and the ground contact for a minute in accordance with MIL-STD-202, Method 301.

B.Requirements : No creeping discharge, flashover, nor insulator breakdown shall occur.

A.試験法：リセプタクル及びプラグコネクタを互いに嵌合させ、中心導体と外部導体の間にAC200V(実効値)を一分間印加する。MIL-STD-202 試験法 301 に準拠。

B.必要条件：沿面放電、空中放電、絶縁破壊等の異常のないこと。

(4) VSWR

A. Testing : Measure the VSWR as shown in Fig.3 by the network analyzer.

Frequency :100M~6GHz

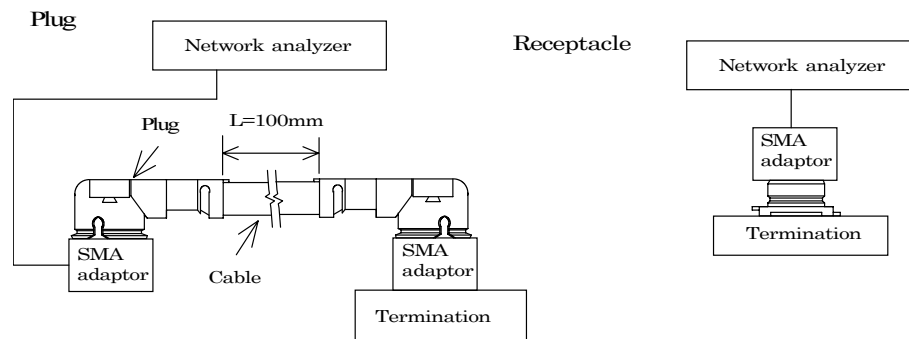


Fig.3

B.Requirements : Plug 1.3 MAX at 0.1~3GHz 1.5 MAX at 3~6GHz

Receptacle 1.3 MAX at 0.1~3GHz. 1.4 MAX at 3~6GHz

A.試験法：ネットワークアナライザーにて Fig.3 のようにVSWRを測定する。

周波数 : 100M~6GHz

B.必要条件：Plug 1.3以下 0.1~3GHz 1.5以下 3~6GHz

Receptacle 1.3以下 0.1~3GHz 1.4以下 3~6GHz

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6-3-2 Mechanical / 機械的性能

(1) Unmating force / 抜去力

A. Testing : Unmate the receptacle connector (soldered to the test board) and plug at a speed 25 ± 3 mm/minutes along the mating by the push-on/pull-off machine .

B.Requirements :

Total unmating force : Initial 5N MIN. after 30 cycles 3N MIN.

Unmating force of inner contact : Initial 0.15N MIN. after 30 cycles 0.1N MIN

A.試験法:挿抜試験機を用いて、基板に半田付けしたリセプタクルとプラグを嵌合軸と平行に毎分 25 ± 3 mmの速度で挿抜する。

B.必要条件:

総合抜去力:初回抜去力 5N以上 ,30回後抜去力 3N以上

中心導体 :初回抜去力 0.15N以上 ,30回後抜去力 0.1N以上

(2) Crimp strength / 引張強度

A.Testing : Pull the cable as shown in Fig.5 at a speed 25 ± 3 mm/minutes by tensile strength machine.

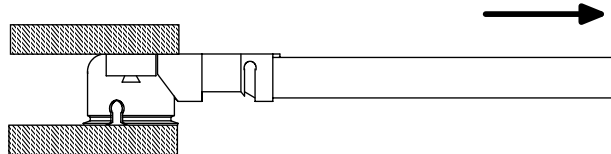


Fig.5

B.Requirements : 10N MIN

A.試験法:引張試験機を用いて、毎分 25 ± 3 mmの速度でケーブルを引張り、強度を測定する。

B.必要条件: 10N以上

(3) Durability / 耐久性

A. Testing : Mate and umate the receptacle connector (soldered to the test board) and plug 30 cycles at a speed 25 ± 3 mm/minutes along the mating by the push-on/pull-off machine .

B.Requirements :

Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.

Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法:挿抜試験機を用いて、基板に半田付けしたリセプタクルとプラグを嵌合軸と平行に毎分 25 ± 3 mmの速度で30回挿抜する。

B.必要条件 中心導体接触抵抗 : 初期 20m Ω 以下, 試験後 25m Ω 以下

外部導体接触抵抗 : 初期 10m Ω 以下, 試験後 15m Ω 以下

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(4) Cable retention force / ケーブル保持力

A. Testing : Apply force on the cable as shown in Fig.2.

During the testing, run 100mA DC to check electrical discontinuity.

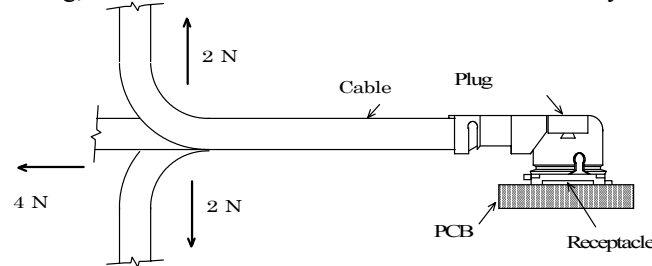


Fig.2

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.

Electrical discontinuity : No electrical discontinuity greater than 1 micro-sec. shall occur.

Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.

Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法: Fig. 2のようにケーブルに力を加える。尚、試験中にDC100mAの電流を流して電氣的瞬断を確認する。

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
 電流瞬断 : 試験中、1 マイクロ秒を超える電氣的瞬断の無いこと。
 中心導体接触抵抗 : 初期 20m Ω 以下、試験後 25m Ω 以下
 外部導体接触抵抗 : 初期 10m Ω 以下、試験後 15m Ω 以下

(5) Vibration / 振動

A. Testing : Apply the following vibration to the mating connector .

During the testing, run 100mA DC to check electrical discontinuity.

Frequency : 10Hz → 100Hz → 10Hz / approx 15 minutes.

Half amplitude ,Peak value of acceleration: 1.5mm or 59m/s² (6G)

Directions , cycle : 3 mutually perpendicular direction ,
 5 cycles(approx 75min)about each direction

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.

Electrical discontinuity : No electrical discontinuity greater than 1micro-sec. shall occur.

Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.

Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.

A.試験法: 嵌合状態のコネクタを、下記の振動を加える。尚、試験中にDC100mAの電流を流して電氣的瞬断を確認する。

周波数 : 10Hz→100Hz→10Hz / 約15分間

片振幅,加速度: 1.5mm or 59m/s² (6G)

方向,サイクル: 3つの互いに直角な方向について各5サイクル(約75分)実施

B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。
 電流瞬断 : 試験中、1 マイクロ秒を超える電氣的瞬断の無いこと。
 中心導体接触抵抗 : 初期 20m Ω 以下、試験後 25m Ω 以下
 外部導体接触抵抗 : 初期 10m Ω 以下、試験後 15m Ω 以下

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<p>(6) Shock / 衝撃</p> <p>A. Testing : Apply the following vibration to the mating connector in accordance with MIL-STD-202, Method 213, Condition B. During the testing, run 100mA DC to check electrical discontinuity.</p> <p>Peak value of acceleration: 735m/s² (75G)</p> <p>Duration : 11msec</p> <p>Wave Form : half sinusoidal</p> <p>Directions , cycle : 6 mutually perpendicular direction , 3 cycles about each direction</p> <p>B.Requirements</p> <p>Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.</p> <p>Electrical discontinuity : No electrical discontinuity greater than 1 micro-sec. shall occur.</p> <p>Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.</p> <p>Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.</p> <p>A.試験法: 嵌合状態のコネクタを、衝撃試験機に取り付け、下記の衝撃を加える。尚、試験中にDC100mAの電流を流して電氣的瞬断を確認する。MIN-STD-202 試験法 213 試験条件 B に準拠。</p> <p>最大加速度: 735m/s² (75G)</p> <p>標準持続時間: 11msec.</p> <p>波形: 半波正弦波</p> <p>方向: 直交する6方向、各3回</p> <p>B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。</p> <p>電流瞬断 : 試験中、1 マイクロ秒を超える電氣的瞬断の無いこと。</p> <p>中心導体接触抵抗 : 初期 20m Ω 以下、試験後 25m Ω 以下</p> <p>外部導体接触抵抗 : 初期 10m Ω 以下、試験後 15m Ω 以下</p> <p>6-3-3 Environmental / 耐環境性</p> <p>(1) Thermal shock/ 温度サイクル</p> <p>A. Testing : Apply the following environment to the mating connector .</p> <p>Temperature ,duration</p> <p>:233K/30minutes→278~308K/5minutes MAX.→363K/30minutes→278~308K/5minutes MAX.</p> <p>(-40℃) (5~35℃) (90℃) (5~35℃)</p> <p>No. of cycles : 5 cycles</p> <p>B.Requirements</p> <p>Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.</p> <p>Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX.</p> <p>Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX.</p> <p>Insulation resistance : initial 500 mega-ohm MIN. after testing 100 mega-ohm MIN.</p> <p>A.試験法: 嵌合状態のコネクタを、下記の雰囲気放置する。</p> <p>1サイクルの条件</p> <p>: 233K / 30分 → 278~308K / 5分以下 → 363K / 30分 → 278~308K / 5分以下</p> <p>(-40℃) (5~35℃) (90℃) (5~35℃)</p> <p>実施サイクル : 5サイクル</p> <p>B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。</p> <p>中心導体接触抵抗 : 初期 20m Ω 以下、試験後 25m Ω 以下</p> <p>外部導体接触抵抗 : 初期 10m Ω 以下、試験後 15m Ω 以下</p> <p>絶縁抵抗 : 初期 500M Ω 以上 試験後 100M Ω 以上</p>		

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<p>(2) Humidity / 湿度</p> <p>A. Testing : Apply the following environment to the mating connector in accordance with MIL-STD-202, Method 103, Condition B . Temperature : 313 ± 2 K ($40 \pm 2^\circ\text{C}$) Humidity : 90~95%RH Duration : 96 hours</p> <p>B.Requirements Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur. Contact resistance of inner contact initial 20 milli-ohm MAX. after testing 25milli-ohm MAX. Contact resistance of ground contact initial 10 milli-ohm MAX. after testing 15milli-ohm MAX. Insulation resistance : initial 500 mega-ohm MIN. after testing 100 mega-ohm MIN.</p> <p>A.試験法: 嵌合状態のコネクタを、下記の雰囲気に放置する。MIL-STD-202 試験法 103 条件 B に準拠。 温度: 313 ± 2 K ($40 \pm 2^\circ\text{C}$) 湿度: 90~95%RH 時間: 96時間</p> <p>B.必要条件 外観 : 部品のゆるみ、欠け、割れ、その他外観上の異常の無いこと。 中心導体接触抵抗 : 初期 20m Ω 以下, 試験後 25m Ω 以下 外部導体接触抵抗 : 初期 10m Ω 以下, 試験後 15m Ω 以下 絶縁抵抗 : 初期 500M Ω 以上 試験後 100M Ω 以上</p> <p>(3) Salt water spray / 塩水噴霧</p> <p>A. Testing : Apply the following environment to the mating connector in accordance with MIL-STD-202, Method 101, Condition B. Temperature : 308 ± 2 K ($35 \pm 2^\circ\text{C}$) Salt water density by weight : $5 \pm 1\%$ Duration : 48 hours</p> <p>B.Requirements : Appearance no abnormality adversely affecting the performance shall occur.</p> <p>A.試験法: 嵌合状態のコネクタを、下記の雰囲気に放置する。 温度 : 308 ± 2 K ($35 \pm 2^\circ\text{C}$) 塩水濃度: $5 \pm 1\%$ (重量比) 時間 : 48時間</p> <p>B.必要条件 : 外観 著しい腐食の無い事。</p>		

DOCUMENT CLASSIFICATION	TITLE	No.
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6-3-4 Solder / 半田付け関連

(1) Solderability / 半田付け性

A. Testing : Dip the solder tine of the contact in the solder bath at $518 \pm 5 (245 \pm 5^{\circ}\text{C})$ for 5 ± 0.5 sec.

After immersing the tine in the flux of RMA or R type for 5 to 10 seconds in accordance with MIL-STD-202, Method 208.

B.Requirements : More than 95% of the dipped surface shall be evenly wet.

A.試験法:コンタクトの半田付け部を $518 \pm 5\text{K} (245 \pm 5^{\circ}\text{C})$ の半田槽内に 5 ± 0.5 秒浸す。フラックスは、RMA又はR型を使用し5~10秒間浸すものとする。MIL-STD-202, 試験法 208 に準拠。

B.必要条件:浸した面積の95%以上に半田がむらなく付着すること。

(2) Reflow soldering heat resistance / 半田耐熱性

A. Testing : Put on the receptacle connector to PCB , apply the heat 2 cycles as shown in Fig. 4

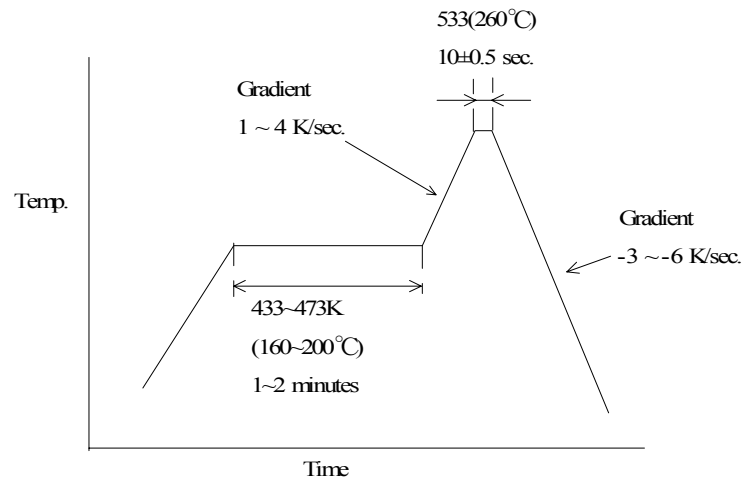


Fig.4

B.Requirements : Appearance no abnormality adversely affecting the performance shall occur.

A.試験法:基板にリセプタクルコネクタを置き、Fig. 4の条件で2回リフローを行う。

B.必要条件:機能を損なう変形及び欠陥の無い事。



Test Report

No : CE/2006/B2034 Date : 20061115 Page: 1 of 5

I-PEX JP CO., LTD.

6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013,
JAPAN



Report on the submitted sample said to be MHF PLUG HOUSING.

Style/Item No : 1844-011
Sample Receiving Date : 2006/11/08
Testing Period : 2006/11/08 TO 2006/11/15


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Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method :

- (1) With reference to BS EN 1122:2001, Method B for Cadmium Content. Analysis was performed by ICP-AES.
- (2) With reference to US EPA Method 3050B for Lead Content. Analysis was performed by ICP-AES.
- (3) With reference to US EPA Method 3052 for Mercury Content. Analysis was performed by ICP-AES.
- (4) With reference to IEC 62321, Ed.1 111/54/CDV. Determination of Hexavalent Chromium by UV/Vis Spectrometry.
- (5) With reference to US EPA 3540C for PBB/PBDE Content. Analysis was performed by GC/MS and screening via US EPA 3550C with HPLC/DAD/MS.

Test Result(s) : Please refer to next page(s).


Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.

Test Report

No : CE/2006/B2034 Date : 20061115 Page: 2 of 5

I-PEX JP CO., LTD.

6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013,
JAPAN



Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result	MDL
		No.1	
Cadmium (Cd)	(1)	n.d.	2
Lead (Pb)	(2)	39.9	2
Mercury (Hg)	(3)	n.d.	2
Hexavalent Chromium (CrVI) by alkaline extraction	(4)	n.d.	2
Sum of PBBs	(5)	n.d.	-
Monobromobiphenyl		n.d.	5
Dibromobiphenyl		n.d.	5
Tribromobiphenyl		n.d.	5
Tetrabromobiphenyl		n.d.	5
Pentabromobiphenyl		n.d.	5
Hexabromobiphenyl		n.d.	5
Heptabromobiphenyl		n.d.	5
Octabromobiphenyl		n.d.	5
Nonabromobiphenyl		n.d.	5
Decabromobiphenyl		n.d.	5
Sum of PBDEs (Mono to Nona) (Note 4)		n.d.	-
Monobromobiphenyl ether		n.d.	5
Dibromobiphenyl ether		n.d.	5
Tribromobiphenyl ether		n.d.	5
Tetrabromobiphenyl ether		n.d.	5
Pentabromobiphenyl ether		n.d.	5
Hexabromobiphenyl ether		n.d.	5
Heptabromobiphenyl ether		n.d.	5
Octabromobiphenyl ether		n.d.	5
Nonabromobiphenyl ether		n.d.	5
Decabromobiphenyl ether		n.d.	5
Sum of PBDEs (Mono to Deca)		n.d.	-

Test Part Description:

NO.1 : BLACK PLASTIC

Note : 1. mg/kg = ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Sum of Mono to NonaBDE & according to 2005/717/EC DecaBDE is exempt.

5. "-" = Not Regulated

Test Report

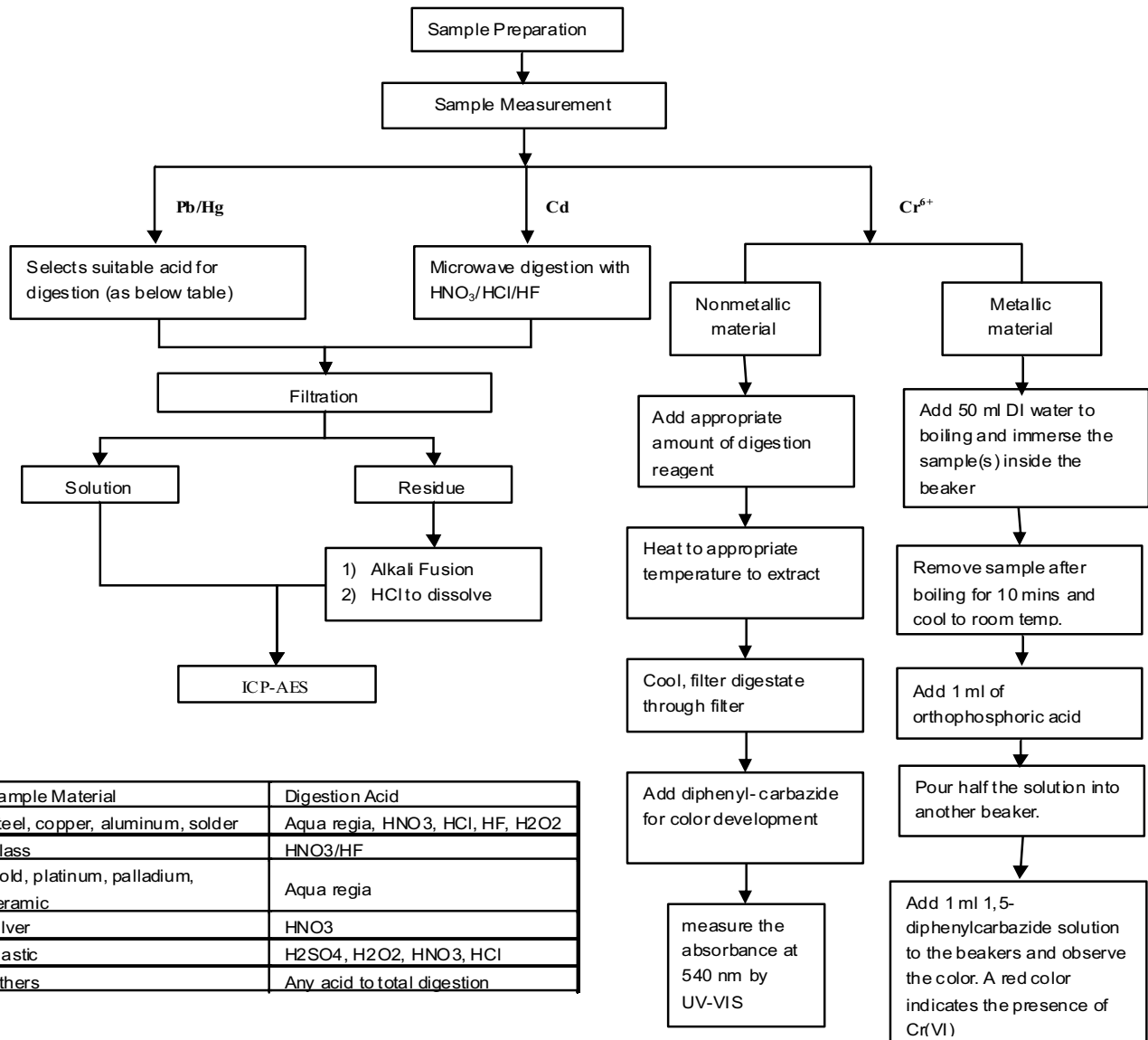
No : CE/2006/B2034 Date : 20061115 Page: 3 of 5

I-PEX JP CO., LTD.

6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013,
JAPAN



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)
- 2) Name of the person who made measurement: Troy Chang
- 3) Name of the person in charge of measurement: Daniel Yeh





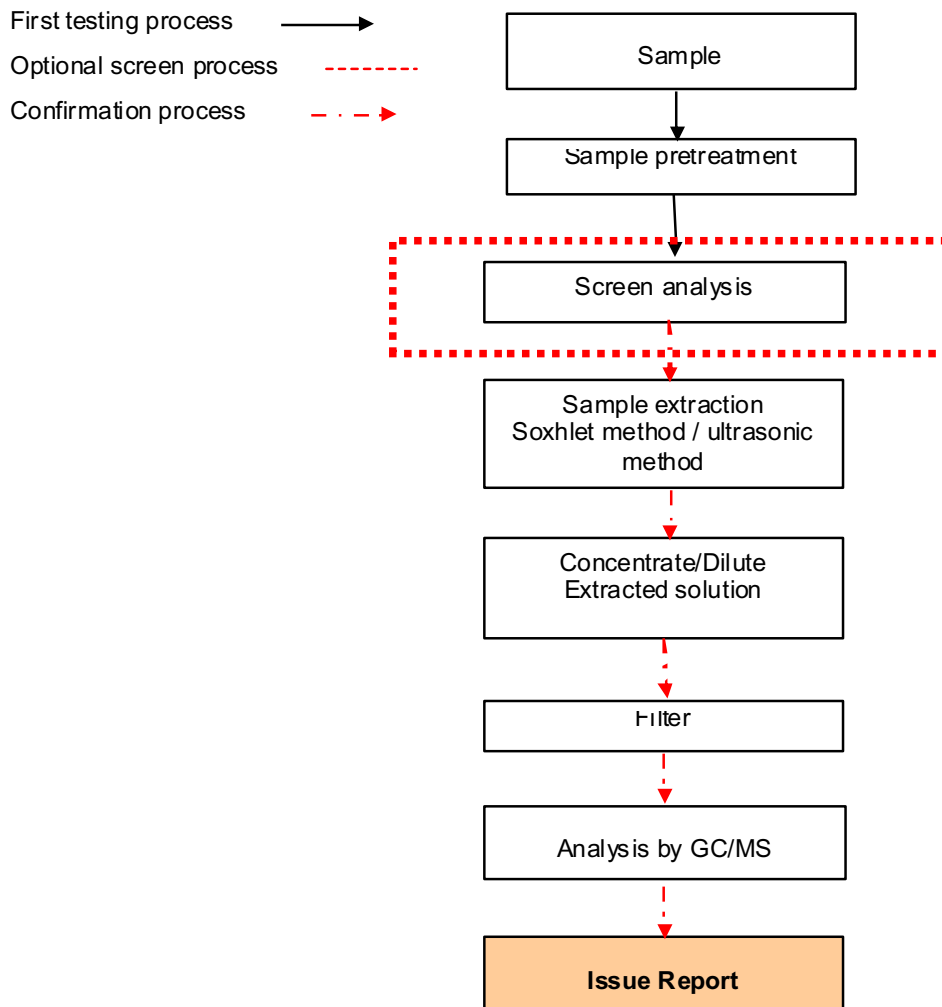
Test Report

No : CE/2006/B2034 Date : 20061115 Page: 4 of 5

I-PEX JP CO., LTD.
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JAPAN



PBB/PBDE analytical FLOW CHART





Test Report

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I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013,
JAPAN



** End of Report **



Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

No : CE/2006/B2068
Date : 20061115
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The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Description : MHF PLUG CONTACT
Style/Item No : 1845-011 (# 02)
Sample Receiving Date : 2006/11/08
Testing Period : 2006/11/08 TO 2006/11/15

=====

Test Result(s) : Please refer to next page(s).


Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.



Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

No : CE/2006/B2068
Date : 20061115
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Test Result(s)

PART NAME NO.1 : GOLDEN COLORED METAL

Test Item (s):	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to BS EN 1122:2001, Method B for Cadmium Content. Analysis was performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to US EPA Method 3050B for Lead Content. Analysis was performed by ICP-AES.	2	27.4
Mercury (Hg)	mg/kg	With reference to US EPA Method 3052 for Mercury Content. Analysis was performed by ICP-AES.	2	n.d.
Hexavalent Chromium (CrVI) by alkaline extraction	mg/kg	With reference to IEC 62321, Ed.1 111/54/CDV. Determination of Hexavalent Chromium by UV/Vis Spectrometry.	2	n.d.
Nickel (Ni)	mg/kg	With reference to US EPA Method 3050B for Nickel Content. Analysis was performed by ICP-AES.	2	34645.2
Gold (Au)	mg/kg	With reference to US EPA Method 3050B for Gold Content. Analysis was performed by ICP-AES.	2	4339.9

Note : 1. mg/kg = ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit

Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

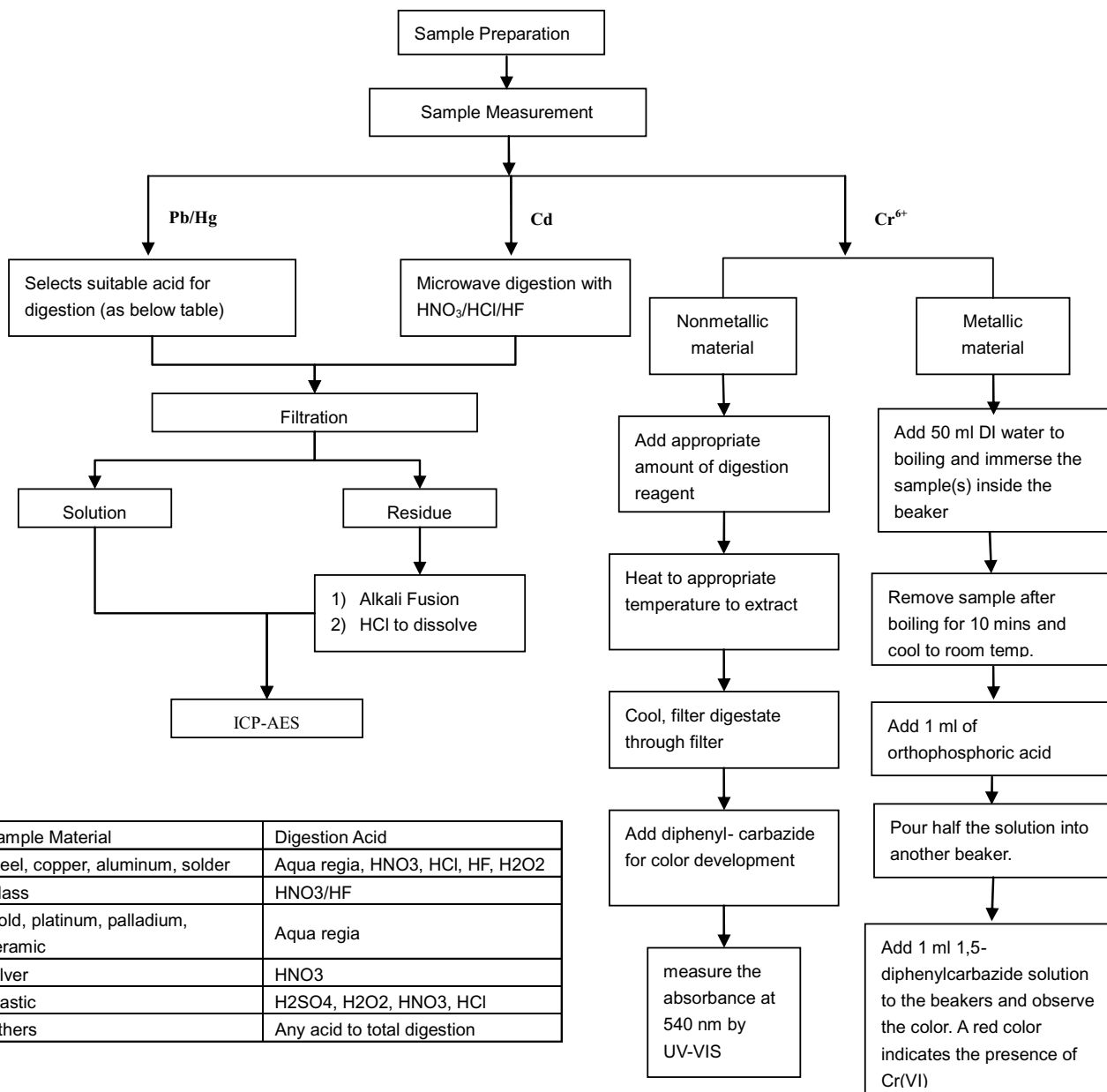
No : CE/2006/B2068
Date : 20061115
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- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)

2) Name of the person who made measurement: Troy Chang

3) Name of the person in charge of measurement: Daniel Yeh





Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

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** End of Report **



Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

No : CE/2006/B2069
Date : 20061115
Page : 1 of 4



The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Description : MHF PLUG GROUND CONTACT
Style/Item No : 1846-034
Sample Receiving Date : 2006/11/08
Testing Period : 2006/11/08 TO 2006/11/15

=====

Test Result(s) : Please refer to next page(s).


Daniel Yeh, M.R. / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.



Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

No : CE/2006/B2069
Date : 20061115
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Test Result(s)

PART NAME NO.1 : GOLDEN COLORED METAL

Test Item (s):	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to BS EN 1122:2001, Method B for Cadmium Content. Analysis was performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to US EPA Method 3050B for Lead Content. Analysis was performed by ICP-AES.	2	19.0
Mercury (Hg)	mg/kg	With reference to US EPA Method 3052 for Mercury Content. Analysis was performed by ICP-AES.	2	n.d.
Hexavalent Chromium (CrVI) by alkaline extraction	mg/kg	With reference to IEC 62321, Ed.1 111/54/CDV. Determination of Hexavalent Chromium by UV/Vis Spectrometry.	2	n.d.
Nickel (Ni)	mg/kg	With reference to US EPA Method 3050B for Nickel Content. Analysis was performed by ICP-AES.	2	24220.9
Gold (Au)	mg/kg	With reference to US EPA Method 3050B for Gold Content. Analysis was performed by ICP-AES.	2	1337.2

Note : 1. mg/kg = ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit

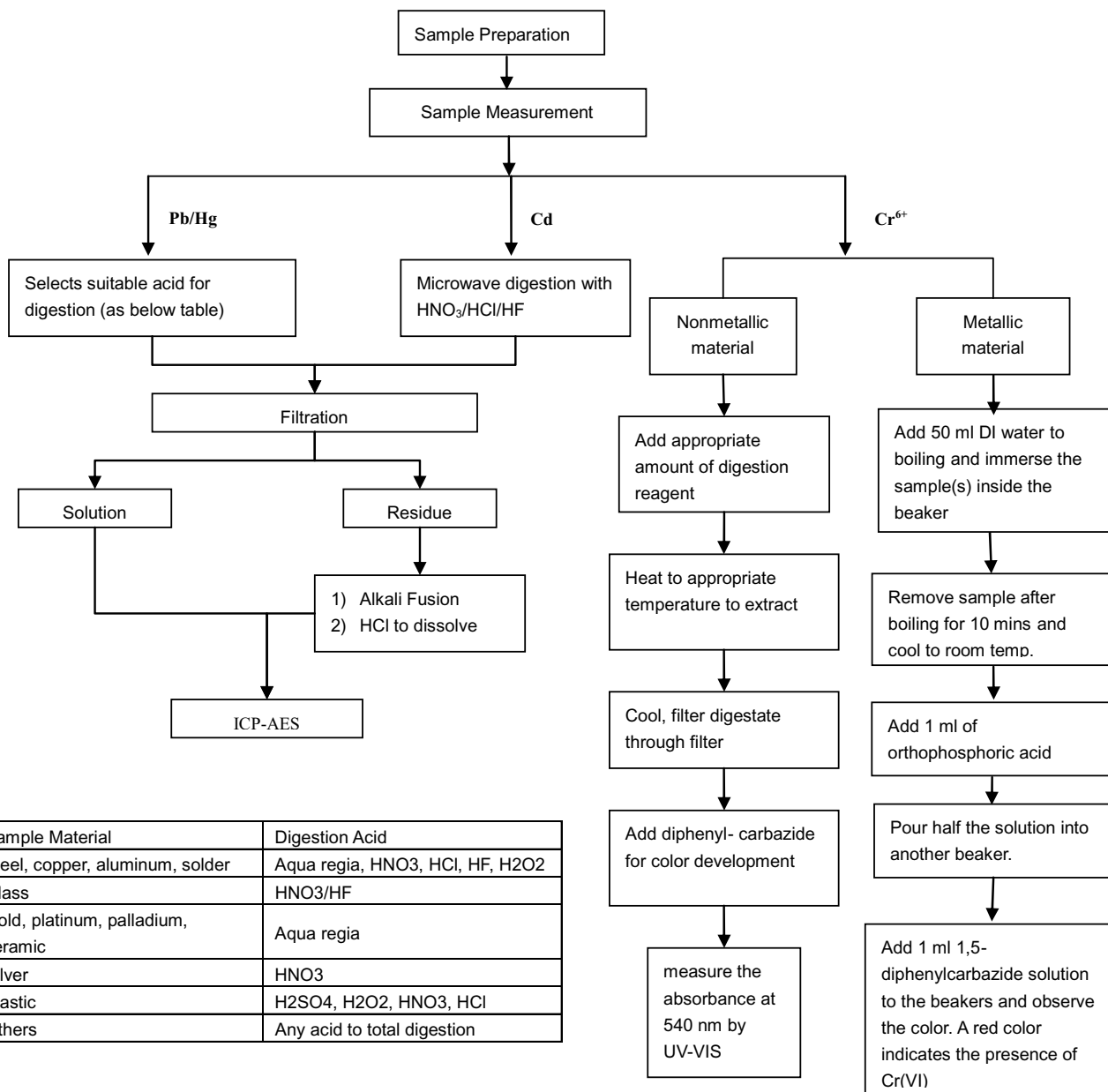
Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

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- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)
- 2) Name of the person who made measurement: Troy Chang
- 3) Name of the person in charge of measurement: Daniel Yeh



Test Report

I-PEX JP CO., LTD.
6-27-19, HARAMACHIDA, MACHIDA-CITY, TOKYO 194-0013, JAPAN

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** End of Report **