JOINSOON ELECTRONICS MFG.CO.,LTD.

建舜電子製造股份有限公司

承 認 書

APPROVAL SHEET

客戶名稱(CUSTOMER): MITAC

品　　名(DESCRIPTION): TF041-BT ANTENNA;ASSY,V100
MITAC P/N:796125070004

品　　號(PART NO): IA-060093

承認號碼(APPROVAL SHEET NO): 060117

客戶承認 (CUSTOMER APPROVAL)

建舜電子製造股份有限公司

JOINSOON ELECTRONICS MFG. CO., LTD

目錄

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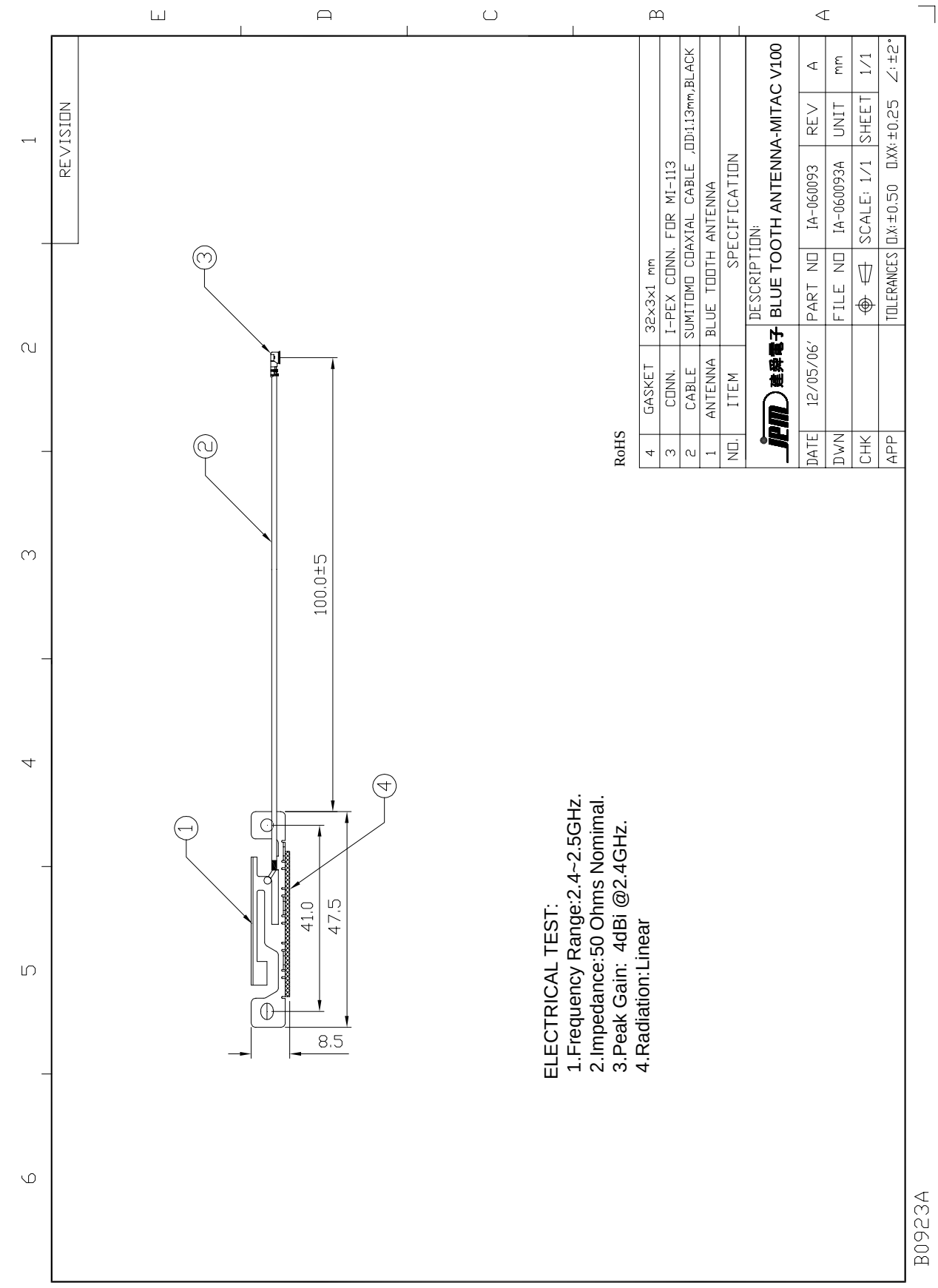
承認序號 (APPROVAL SHEET NO.)	060117			**發行日期 (RELEASED DATE)**
品名規格 (DESCRIPTION)	**TF041-BT ANTENNA;ASSY,V100**			
檔案號碼 (FILE NO.)	**IA-060093**	**版次 (REV)**	**A**	
工程師 (ENGINEER)				
品保確認 (QC. CHK.)				
工程確認 (ENG. CHK.)				

QUICK REFERENCE DATA

Antenna Dimension	47.5*12*8.5 mm
Connector	I-PEX
Cable Length	MI-113,100mm,BLACK
Peak Gain	≦4.0 dBi
Polarization	Linear
Impedance	50Ω
Operating Temperature	-40~90 ℃
Maximum Power	1W

Product Drawing



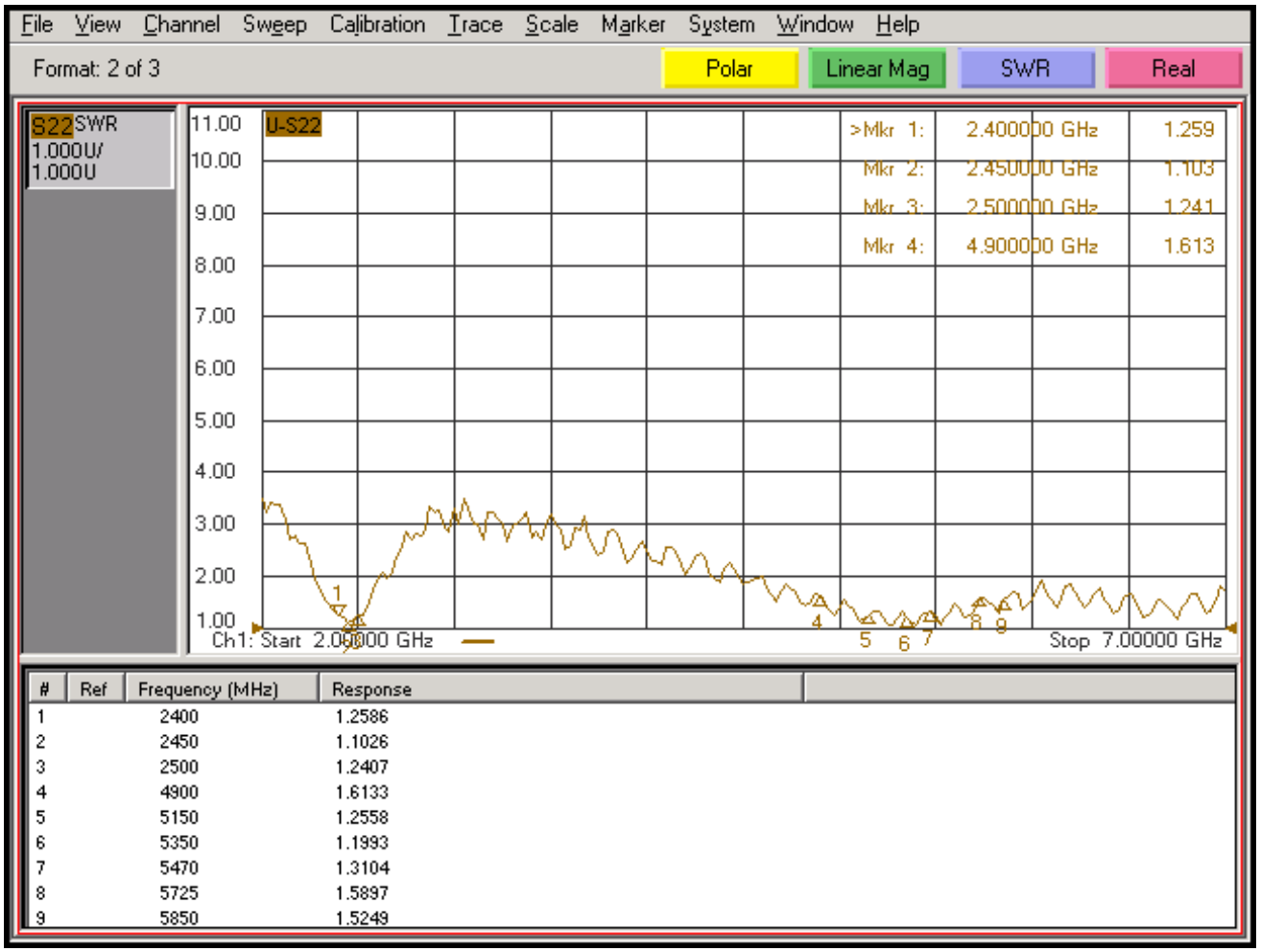
ELECTRICAL TEST:
1.Frequency Range:2.4~2.5GHz.
2.Impedance:50 Ohms Nomimal.
3.Peak Gain: 4dBi @2.4GHz.
4.Radiation:Linear

Test results

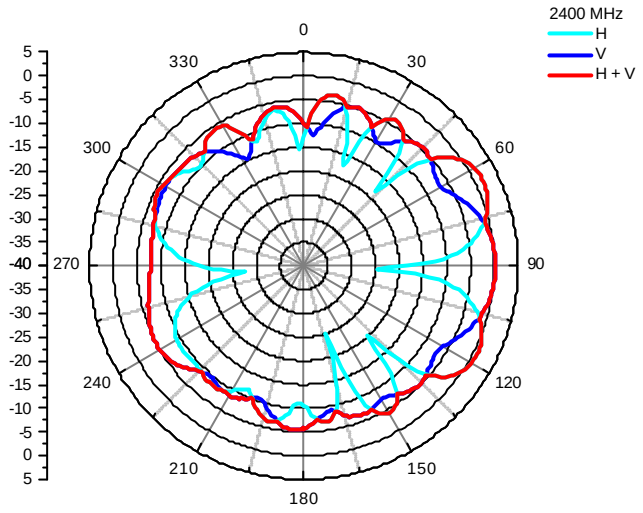
1. Peak Gain&Ave.Gain

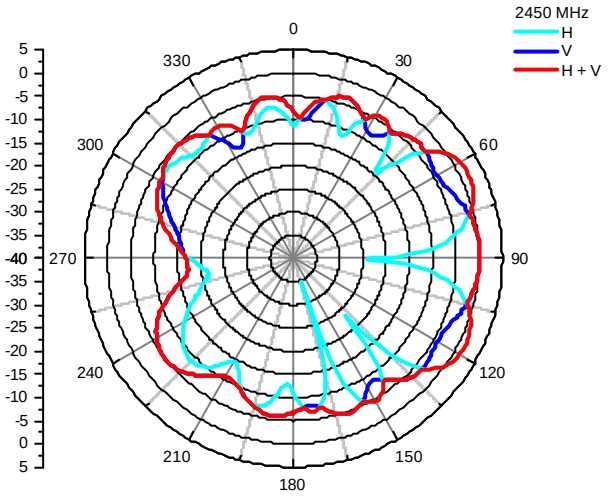
Antenna	Peak Gain (dBi)			Ave. Gain (dBi)		
	2.4GHz	2.45GHz	2.5GHz	2.4GHz	2.45GHz	2.5GHz
BT	-0.55	-0.70	-0.57	-3.67	-3.56	-3.72

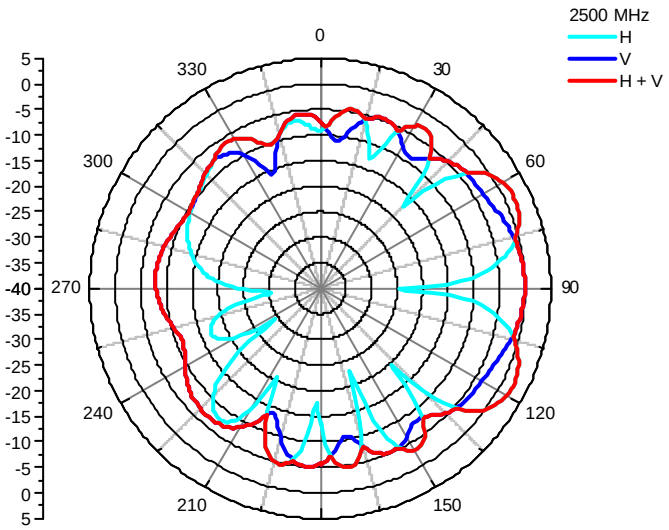
2. 2.VSWR



3. Radiation Pattern







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			UL94難燃性 UL94 FLAME CLASS	ULﾌｧｲﾙNo. UL FILE No.
		材質名 MATERIAL	型名 CAT No.	材料メーカ MANUFACTURER		
1	HOUSING	PBT	3116	WINTECH POLYMER LTD.	V－0	E 213445

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

	部品 COMPONENT	材料／MATERIAL			UL94難燃性 UL94 FLAME CLASS	ULﾌｧｲﾙNo. UL FILE No.
		材質名 MATERIAL	型名 CAT No.	材料メーカ MANUFACTURER		
1	HOUSING	LCP	E130i	POLYPLASTICS CO.,LTD.	V－0	E 106764

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

	部品 COMPONENT	材料／MATERIAL			UL94難燃性 UL94 FLAME CLASS	ULﾌｧｲﾙNo. UL FILE No.
		材質名 MATERIAL	型名 CAT No.	材料メーカ MANUFACTURER		
1	HOUSING	LCP	A430	POLYPLASTICS CO.,LTD.	V－0	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

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

REV.	ECN	BY	DATE	APP.
7	S3008	K.O	MAR/24/’03	K.K
6	S2084	K.O	DEC/19/’02	K.K
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
REVISION RECORD				

Prepared by	Reviewed by	Approved by
K.Ohbayashi JUN / 25 / 01	E,Kawabe Jun / 25 / 01	K.Katabuchi Jun / 29 / 01

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

1．Scope ／ 序言

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。

2. Objectives ／ 目的

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。

3. Part No. , construction , material and finish ／ 構成、材料及び仕上げ

(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。

4. Applicable cable ／ 適合ケーブル

4-1 Part No. 20278-101R-08, 20278-111R-08

(1) Description

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

(2) Requirements

Characteristic impedance : 50(+2,-2)ohm by TDR method
Nominal capacitance(Reference value): 96 pF/m
Conductor resistance of inner conductor at 293K (20℃)(Reference value) : 1400 ohm/km
Insulation resistance : 1000 mega-ohm.km MIN.
Dielectric withstand voltage : no breakdown at AC1000V for 1 minutes.

(1) 構成

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

(2) 仕様

特性インピーダンス ： 50±2Ω （TDR）
標準静電容量(参考値） ： 96pF／m
293K(20℃)時の中心導体導体抵抗(参考値） ： 1400Ω ／km
絶縁抵抗 ： 1000MΩ ・km以上
耐電圧 ： AC1000V・1分間にて絶縁破壊の無い事

4-2 Part No. 20278-101R-13, 20278-111R-13

(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 0.68(+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

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(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℃)(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±2Ω (TDR)
標準静電容量(参考値) ： 97pF／m
293K(20℃)時の中心導体導体抵抗(参考値) ： 520Ω ／km
絶縁抵抗 ： 1500MΩ ・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℃) (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±2Ω (TDR)
標準静電容量(参考値) ： 95pF／m
293K(20℃)時の中心導体導体抵抗(参考値) ： 520Ω ／km
絶縁抵抗 ： 1500MΩ ・km以上
耐電圧 ： AC1000V・1分間にて絶縁破壊の無い事

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4-4 Part No. 20278-101R-18, 20278-111R-18
RG178 B/U

(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

(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℃) (Reference value) : 805 ohm/km
Insulation resistance : 1500 mega-ohm.km MIN.
Dielectric withstand voltage : no breakdown at AC2000V for 1 minutes.

(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

(2) 仕様
特性インピーダンス ： 50±2Ω （TDR）
標準静電容量(参考値) ： 95pF／m
293K(20℃)時の中心導体導体抵抗(参考値)： 805Ω ／km
絶縁抵抗 ： 1500MΩ ・km以上
耐電圧 ： AC2000V・1分間にて絶縁破壊の無い事

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 ： 50Ω
(3) Frequency / 周波数 ： DC～6GHz
(4) VSWR : Plug1.3 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℃）

6. Test methods and performance ／ 試験及び性能

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℃）
Humidity / 湿度 ： 45～75%RH

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6-2-1 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>

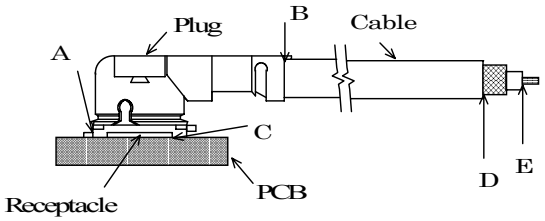

Fig.1

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 20mΩ 以下, 試験後 25mΩ 以下
外部導体 初期 10mΩ 以下, 試験後 15mΩ 以下

(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。

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(4) VSWR

A. Testing : Measure the VSWR as shown in Fig.3 by the network analyzer.
Frequency :100M~6GHz

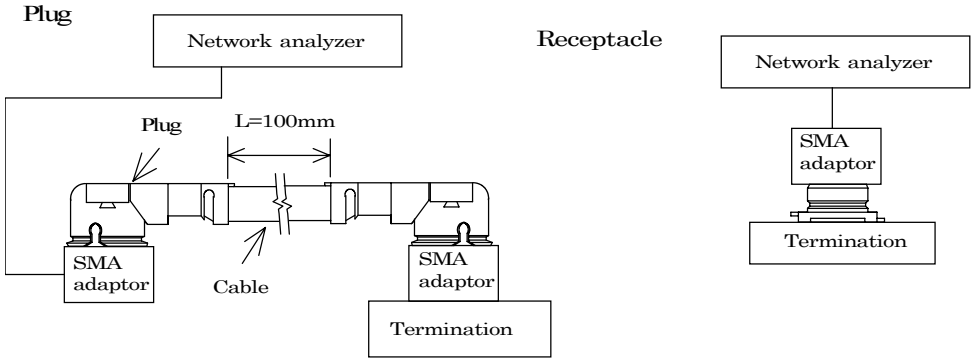

Fig.3

B.Requirements : Plug1.3 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

6-2-2 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±3mm/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±3mm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±3mm/minutes by tensile strength machine.

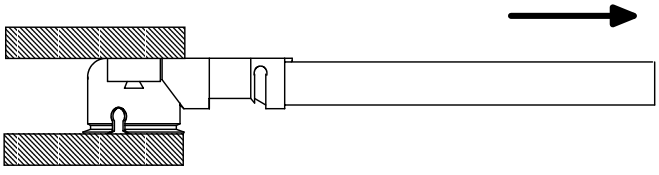

Fig.5

B.Requirements : 20278-1*1R-08,13,32 : 10N MIN, 20278-1*1R-18 : 15N MIN,

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

B.必要条件: 20278-1*1R-08,13,32 : 10N以上, 20278-1*1R-18 : 15N以上

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(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±3mm/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±3mm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 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 ： 初期 10mΩ 以下, 試験後 15mΩ 以下

(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.

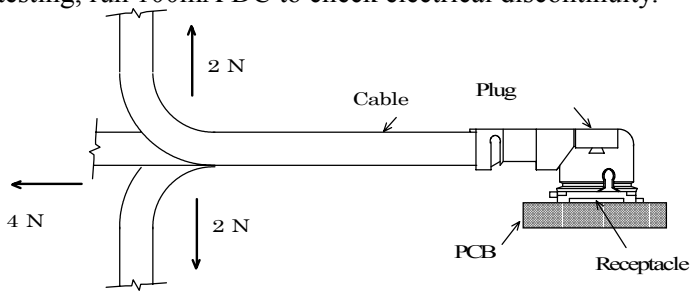

Fig.2

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Electrical discontinuity : No electrical discontinuity grater 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の電流を流して電気的瞬断を確認する。

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気的瞬断の無いこと。
中心導体接触抵抗 ： 初期 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 ： 初期 10mΩ 以下, 試験後 15mΩ 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/s^2 (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 grater 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.

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

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の電流を流して電気的瞬断を確認する。

周波数 :10Hz→100Hz→10Hz ／ 約15分間
片振幅,加速度:1．5mm or 59m／s^2（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気的瞬断の無いこと。
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

(6) Shock / 衝撃

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.

Peak value of acceleration: 735m/s^2 (75G)
Duration : 11msec
Wave Form : half sinusoidal
Directions , cycle : 6 mutually perpendicular direction , 3 cycles about each direction

B.Requirements

Appearance : Looseness between the parts, chipping, breakage or other abnormality shall not occur.
Electrical discontinuity : No electrical discontinuity grater 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: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の電流を流して電気的瞬断を確認する。MIN-STD-202 試験法 213 試験条件 B に準拠。

最大加速度:735m／s^2（75G）
標準持続時間:11msec.
波形: 半波正弦波
方向:直交する6方向、各3回

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気的瞬断の無いこと。
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

6-2-3 Environmental / 耐環境性

(1) Thermal shock/ 温度サイクル

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

Temperature ,duration
:233K/30minutes→278~308K/5minutes MAX.→363K/30minutes→278~308K/5minutes MAX.
(-40℃) (5~35℃) (90℃) (5~35℃)
No. of cycles : 5 cycles

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.

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

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。
1サイクルの条件
:233K／30分→278～308K／5分以下→363K／30分→278～308K／5分以下
（－40℃） （5～35℃） （90℃） （5～35℃）
実施サイクル :5サイクル
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 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下
絶縁抵抗 : 初期 500MΩ 以上 試験後 100MΩ 以上

(2) Humidity / 湿度
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±2℃)
Humidity : 90～95%RH
Duration : 96 hours
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.
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±2K（40±2℃）
湿度:90～95%RH
時間:96時間
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 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 : 初期 10mΩ 以下, 試験後 15mΩ 以下
絶縁抵抗 : 初期 500MΩ 以上 試験後 100MΩ 以上

(3) Salt water spray / 塩水噴霧
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±2℃)
Salt water density by weight : 5±1%
Duration : 48 hours
B.Requirements : Appearance no abnormality adversely affecting the performance shall occur.

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±2K（35±2℃）
塩水濃度:5±1%（重量比）
時間 :48時間
B.必要条件 : 外観 著しい腐食の無い事。

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

(4) High temperature life / 高温

A. Testing : Apply the following environment to the mating connector.
Temperature : 363±2 K (90±2℃) Duration : 96 hours

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.

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:363±2K（90±2℃） 時間:96時間

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 20mΩ 以下, 試験後 25mΩ 以下
外部導体接触抵抗 ： 初期 10mΩ 以下, 試験後 15mΩ 以下

6-2-4 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±5(245±5℃) 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±5K(245±5℃)の半田漕内に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

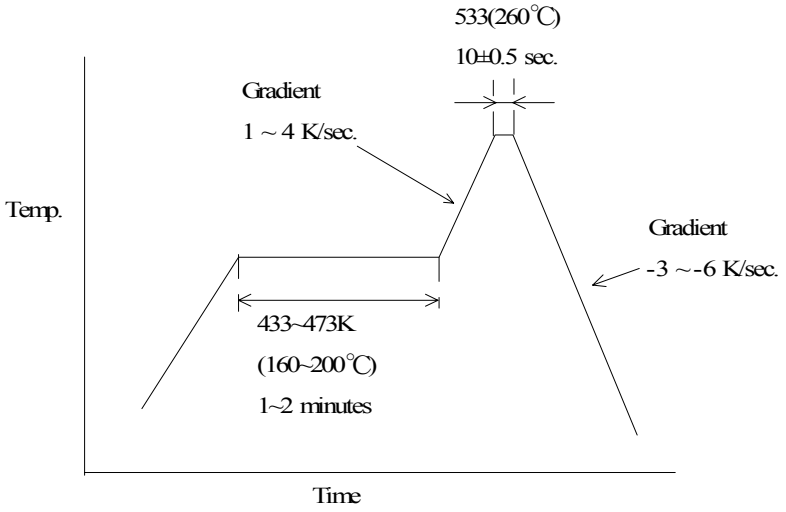

Fig.4

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。

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

6-2-5 試験順序と試料数 / Test Sequence and Sample Quantity

Test Item 試験項目		Group / グループ													
		A	B	C	D	E	F	G	H	I	L	M	N	O	P
(1)	Contact Resistance 接触抵抗					1 3	1 3	1 3	1 3	1 4	1 4		1 3		
(2)	Insulation resistance 絶縁抵抗									2 5	2 5				
(3)	Dielectric withstanding voltage 耐電圧	1													
(4)	VSWR		1												
(5)	Crimp strength 引張強度			1											
(6)	Unmating force 抜去力				1										
(7)	Durability 耐久性					2									
(8)	Cable retention force ケーブル保持力						2								
(9)	Vibration 振動							2							
(10)	Shock 衝撃								2						
(11)	Thermal shock 温度サイクル									3					
(12)	Humidity 湿度										3				
(13)	Salt water spray 塩水噴霧											1			
(14)	High temperature life 高温												2		
(15)	Solderability 半田付け性													1	
(16)	Reflow soldering heat resistance 半田耐熱性														1
Sample QTY pcs. 試料数	Plug プラグ	10	5	10	10	10	10	10	10	10	10	10	10	----	----
	Receptacle リセプタクル	10	5	----	10	10	10	10	10	10	10	10	10	10	10
Test Board pcs. 基板数		10	5	----	10	10	10	10	10	10	10	10	10	----	10

住友電工（蘇州）電子線製品有限公司
SUMITOMO ELECTRIC INTERCONNECT PRODUCTS（SUZHOU）LTD.
地址： 中國江蘇省蘇州市新區金楓路 232 號 郵編： 215129
Address: Jinfeng Road Suzhou New District Jiangsu, China

SGS TEST REPORT

Item Description : 0.7DS-PBA (TA-16/4) BLACK
Item Code : EW08-9100-0230

Expired Date : 2007.10.23

Test Requested : 1) To determine the Cadmium content on the above products.
2) To determine the Lead content on the above products.
3) To determine Mercury content on the above products.
4) To determine Hexavalent Chromium content on the above products.
5) To determine the PBBs(Polybrominated biphenyls) PBBEs(PBDEs) (Polybrominated biphenyl ethers) content on the above products.

Test Method : 1) With reference to BS EN 1122:2001,Method B or other acid digestion Analysis was performed by inductively Coupled Argon Plasma-Atomic Emission Spectrometry(ICP-AES)or Atomic Absorption Spectrometry.
2) With reference to US EPA method 3050B or other acid digestion Analysis was performed by inductively Coupled Argon Plasma-Atomic Emission Spectrometry(ICP-AES)or Atomic Absorption Spectrometry.
3) With reference to US EPA 3052 or other acid digestion Analysis was performed by inductively Coupled Argon Plasma-Atomic Emission Spectrometry(ICP-AES).
4) With reference to US EPA3060A and US EPA7196A Analysis was performed by UV-VIS Sepectrometric method.
5) With reference to US EPA 8081 , Analysis was performed by GC/MS.

Result : Please refer to next page

住友電工（蘇州）電子線製品有限公司
SUMITOMO ELECTRIC INTERCONNECT PRODUCTS（SUZHOU）LTD.
地址： 中國江蘇省蘇州市新區金楓路 232 號 郵編： 215129
Address: Jinfeng Road Suzhou New District Jiangsu, China

Results :

Item	Description	Report No.	Test Item	Unit Measurement	Results
Silver-coated copper conductor	Conductor	SH6135839	Cadmium (Cd)	ppm wt	N.D.
			Lead (Pb)	ppm wt	N.D.
			Mercury (Hg)	ppm wt	N.D.
			Hexavalent Chromium(Cr VI)	ppm wt	N.D.
FEP	Insulation	SH6129391	Cadmium (Cd)	ppm wt	N.D.
			Lead (Pb)	ppm wt	N.D.
			Mercury (Hg)	ppm wt	N.D.
			Hexavalent Chromium(Cr VI)	ppm wt	N.D.
			PBBs	ppm wt	N.D.
			PBBEs(PBDEs)	ppm wt	N.D.
Tinned annealed copper conductor	Shield	SH6135837	Cadmium (Cd)	ppm wt	N.D.
			Lead (Pb)	ppm wt	N.D.
			Mercury (Hg)	ppm wt	N.D.
			Hexavalent Chromium(Cr VI)	ppm wt	N.D.
			PBBs	ppm wt	N.D.
			PBBEs(PBDEs)	ppm wt	N.D.
PFA	Jacket	SH6129389	Cadmium (Cd)	ppm wt	N.D.
			Lead (Pb)	ppm wt	N.D.
			Mercury (Hg)	ppm wt	N.D.
			Hexavalent Chromium(Cr VI)	ppm wt	N.D.
			PBBs	ppm wt	N.D.
			PBBEs(PBDEs)	ppm wt	N.D.
PFA-CB (Black color)	Color Batch	SH6135854	Cadmium (Cd)	ppm wt	N.D.
			Lead (Pb)	ppm wt	N.D
			Mercury (Hg)	ppm wt	N.D.
			Hexavalent Chromium(Cr VI)	ppm wt	N.D.
			PBBs	ppm wt	N.D.
			PBBEs(PBDEs)	ppm wt	N.D.

Note: N.D.= Not detected .

End of Report

Approved by

Takahashi Hirokazu
Technology Manager

Test Report

No. SH6135839/CHEM Date: Nov. 10, 2006

SUMITOMO ELECTRIC INTERCONNECT PRODUCTS (SUZHOU) LTD
NO.232 JINFENG ROAD SND SUZHOU JIANGSU CHINA

Report on the submitted sample said to be CONDUCTOR.

SGS Ref No. : 10141577-4
Buyer : SONY
Model : SILVER-COATED COPPER CONDUCTOR

Sample Receiving Date : Nov.07, 2006
Testing Period : Nov.07 –10, 2006

Test Requested : With reference to SONY SS-00259
(1) To determine Cadmium, Lead and Mercury content in the submitted metal sample.
(2) To determine Hexavalent Chromium content in the submitted sample.

Test Method : (1) With reference to IEC 62321 (Ed. 1) 111/54/CDV for Cadmium, Lead, Mercury content of metal sample.
Analysis was performed by ICP/AAS.
(2) With reference to EPA Method 3060A & 7196A.
Analysis was performed by colorimetric method (UV-VIS).

Test Results : Please refer to next pages

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Ella Zhang
Sr. Section Head

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Sandy Hao
Lab Manager

SGS-CSTC Standards Technical Services Co., Ltd.
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Member of the SGS Group (SGS SA)

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

	1	MDL
Cadmium (Cd)	ND	2
Lead (Pb)	ND	2
Mercury (Hg)	ND	2
Hexavalent Chromium (Cr VI) By colorimetric method✪	ND	2

Sample Description:
1. Silvery metal wire

Note:
(1) mg/kg = ppm
(2) MDL = Method Detection Limit
(3) ND = Not detected (Less than MDL)
(4) ✪ Hexavalent Chromium was absent on the surface of the metal sample. Analysis was performed by IEC 62321, Ed 111/54/CDV spot-test/boiling-water-eatraction.

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Sample photo:

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No. SH6129391/CHEM Date: Oct. 23, 2006

SUMITOMO ELECTRIC INTERCONNECT PRODUCTS(SUZHOU)LTD
NO.232 JINFENG ROAD SND SUZHOU JIANGSU CHINA

Report on the submitted sample said to be FEP MATERIAL.

SGS Ref No. : 10117179-8
Buyer : SONY
Model : FEP(NATURE)

Sample Receiving Date : Oct.19 2006
Testing Period : Oct.19 – 23, 2006

Test Requested : With reference to SONY SS-00259
(1) To determine Cadmium , Lead content in the submitted sample.
(2) To determine Mercury content in the submitted sample.
(3) To determine Hexavalent Chromium content in the submitted sample.
(4) To determine PBBs/PBDEs content in the submitted sample.

Test Method : (1) Alkali Fusion Method.
Analysis was performed by ICP/AAS.
(2) With reference to EPA7473.
Analysis was performed by Hg Analyzer.
(3) With reference to EPA Method 3060A & 7196A.
Analysis was performed by colorimetric method (UV-VIS).
(4) With reference to EPA Method 3540C/3550C.
Analysis was performed by GC-MS.

Test Results : Please refer to next pages

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Ella Zhang
Sr. Section Head

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Sandy Hao
Lab Manager

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

	1	MDL
Cadmium (Cd)	ND	5
Lead (Pb)	ND	10
Mercury (Hg)	ND	2
Hexavalent Chromium (Cr VI) By colorimetric method	ND	2
Sum of PBBs	ND	-
Monobromobiphenyl	ND	5
Dibromobiphenyl	ND	5
Tribromobiphenyl	ND	5
Tetrabromobiphenyl	ND	5
Pentabromobiphenyl	ND	5
Hexabromobiphenyl	ND	5
Heptabromobiphenyl	ND	5
Octabromobiphenyl	ND	5
Nonabromobiphenyl	ND	5
Decabromobiphenyl	ND	5
Sum of PBDEs	ND	-
Monobromobiphenyl ether	ND	5
Dibromobiphenyl ether	ND	5
Tribromobiphenyl ether	ND	5
Tetrabromobiphenyl ether	ND	5
Pentabromobiphenyl ether	ND	5
Hexabromobiphenyl ether	ND	5
Heptabromobiphenyl ether	ND	5
Octabromobiphenyl ether	ND	5
Nonabromobiphenyl ether	ND	5
Decabromobiphenyl ether	ND	5

Sample Description:

1. Translucence plastic pellet

Note:

(1) mg/kg = ppm
(2) MDL = Method Detection Limit
(3) ND = Not detected (Less than MDL)
(4) "-" = Not Regulated

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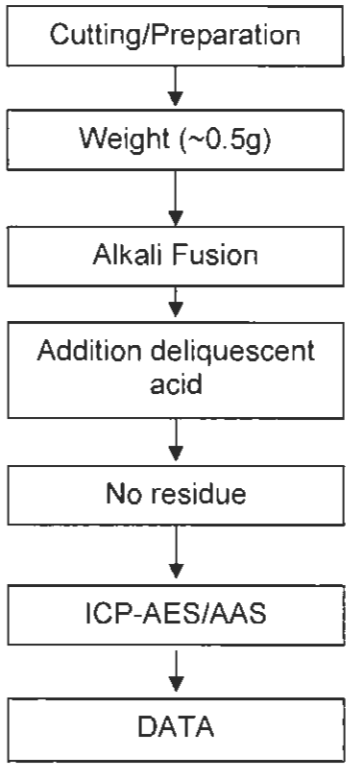
ATTACHMENTS

Cd and Pb Measurement Flowchart

Method: Alkali Fusion



The samples were dissolved totally by pre-conditioning method according to above flow chart.

Tested by : New Dong
Checked by : Terry Wang

Sample photo:

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No. SH6135837/CHEM Date: Nov. 10, 2006

SUMITOMO ELECTRIC INTERCONNECT PRODUCTS (SUZHOU) LTD
NO.232 JINFENG ROAD SND SUZHOU JIANGSU CHINA

Report on the submitted sample said to be CONDUCTOR.

SGS Ref No. : 10141577-2
Buyer : SONY
Model : TINNED ANNEALED COPPER CONDUCTOR

Sample Receiving Date : Nov.07, 2006
Testing Period : Nov.07 –10, 2006

Test Requested : With reference to SONY SS-00259
(1) To determine Cadmium, Lead and Mercury content in the submitted metal sample.
(2) To determine Hexavalent Chromium content in the submitted sample.

Test Method : (1) With reference to IEC 62321 (Ed. 1) 111/54/CDV for Cadmium, Lead, Mercury content of metal sample.
Analysis was performed by ICP/AAS.
(2) With reference to EPA Method 3060A & 7196A.
Analysis was performed by colorimetric method (UV-VIS).

Test Results : Please refer to next pages

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Ella Zhang
Sr. Section Head

Signed for and on behalf of
SGS-CSTC Chemical Laboratory

Sandy Hao
Lab Manager

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

	1	MDL
Cadmium (Cd)	ND	2
Lead (Pb)	ND	2
Mercury (Hg)	ND	2
Hexavalent Chromium (Cr VI) By colorimetric method✪	ND	2

Sample Description:
1. Silvery-grey metal wire

Note:
(1) mg/kg = ppm
(2) MDL = Method Detection Limit
(3) ND = Not detected (Less than MDL)
(4) ✪ Hexavalent Chromium was absent on the surface of the metal sample. Analysis was performed by IEC 62321, Ed 111/54/CDV spot-test/boiling-water-eatraction.

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