

## 零件規格承認書

規格書( ☐ 1份 ☐ 4份 ☐ 5份 ☐ \_\_\_\_份)  
附樣品( ☐ 1份 ☐ 4份 ☐ 5份 ☐ \_\_\_\_份)

料 號: 27-382-720030

品 名 規 格: WiFi副天线

製 造 商: 一佳電子

供 應 商: 一佳電子

供應商規格料號 YJW01 139.018.301A

製作日期: 2021.06.11 備註:

發行單位		會簽單位	
Initiator:		<input type="checkbox"/> EMI/RF/ANT	
Check:		<input type="checkbox"/> QA	
Approve:		<input type="checkbox"/> ME	
		<input type="checkbox"/> EE	
		<input type="checkbox"/> PE	
		<input type="checkbox"/> Other(keypart)	
分發單位		發佈日期	
<input type="checkbox"/> QC	<input type="checkbox"/> 發行單位		
<input type="checkbox"/> 廠商	<input type="checkbox"/> EE		
<input type="checkbox"/> DCC	<input type="checkbox"/> ME		
<input type="checkbox"/> Other(Keypart)	<input type="checkbox"/> EMI/RF/ANT		



# 承认书项目表

NO .	内 容 (Contents)	页 数 (Number of Page)	页 码 (Page Code)
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10	N/A	N/A	N/A
11	-	-	-
12	-	-	-
13	-	-	-

RoHS

Compatible

CUSTOMER

PART NO

REV.

DESCRIPTION

DATE

A

首次发行

2020-01-14

B

更换FPC和线材长度

2020-06-17

C

更换FPC

2020-06-28

D

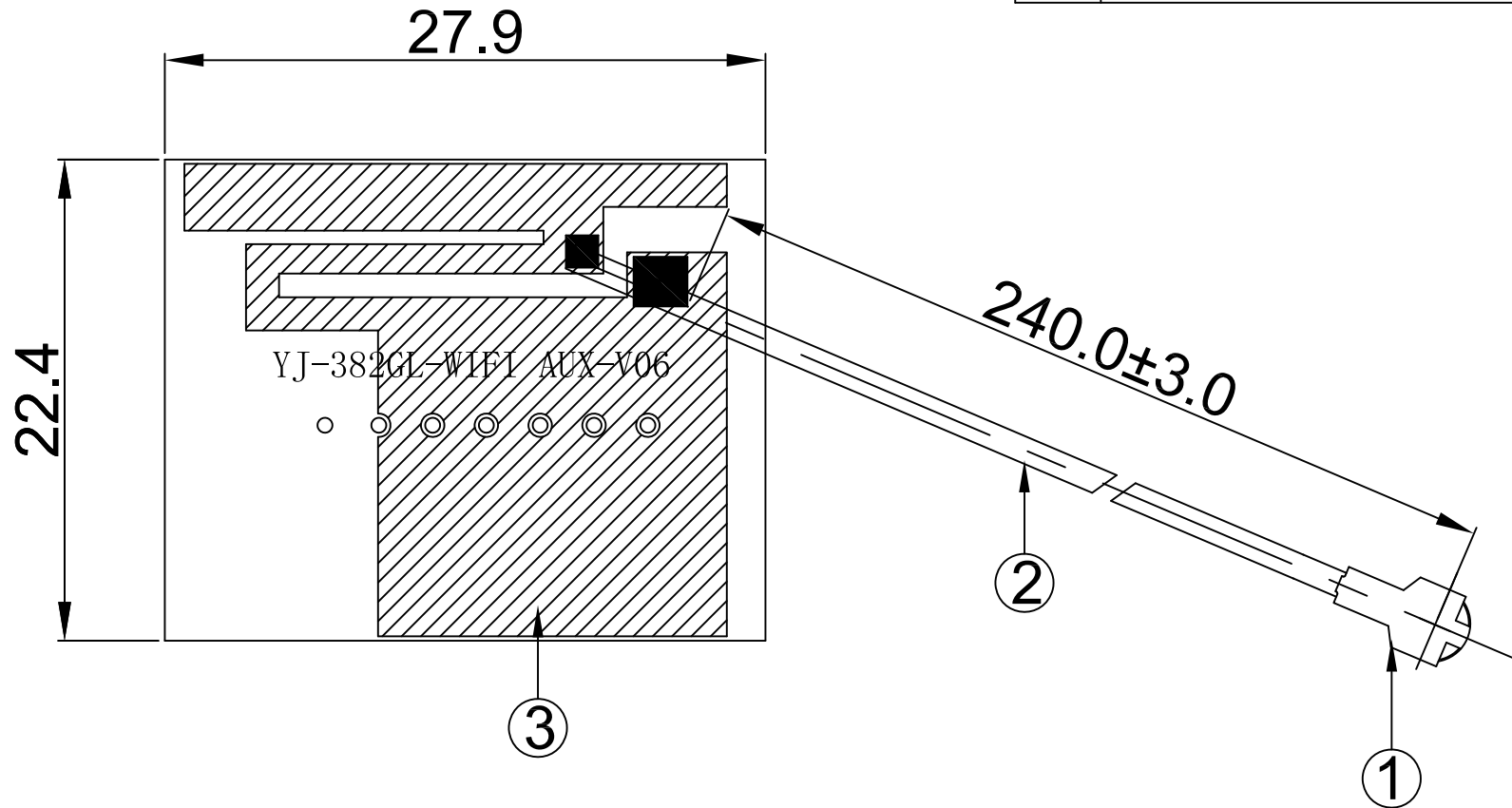
更换FPC

2020-08-06

D

更换丝印

2021-05-24



YJ-382GL-WIFI AUX-V06

240.0±3.0

3	FPCB	27.9*22.4MM	FPCB	FPC113XXX.P01	1
2	Coaxial Cable	O.D.1.13 Gray Low loss	O.D.1.13	COA10001A.P01	1
1	Mini Connector	Au Plated 4L	Cu	TER10009A.P01	1
NO	PART NAME	DESCRIPTION	Material	Part Number	Q.TY



东莞市一佳电子通讯科技有限公司

Tel :0769-82586086

Dongguan YiJia Electronics Communication Technology Co.,Ltd. Fax:0769-82586086

PART NAME:WIFI Antenna L=240mm MHF

PART NO.: YJW01.139.018 301A

DATE: 2021-05-24

APPROVED BY

CHECKED BY

DESIGNED BY

Tolerance

陈国强

文雪

黄望春

UNITS: mm

SCALE: 1/1

REVISION: A

X.X ±0.50

X.XX±0.15

X° ±3°



# 天线规格

## Antenna Specification

### Electrical Properties

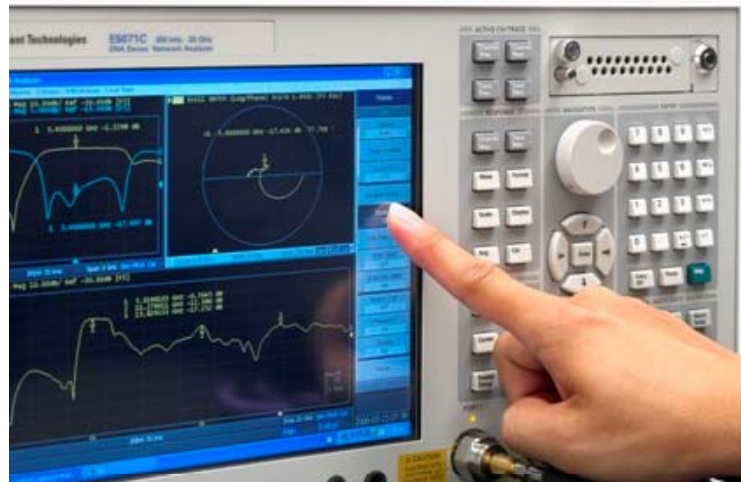
Frequency	2.4G-2.5GHz 5.15-5.85GHz
Impedance	50 Ohm Nominal
V.S.W.R	2.0 Max
Gain	2.9dBi@2.4G-2.5GHz 2.4dBi@5.15-5.85GHz
Radiation	Omni-directional
Polarization	Linear

### Physical Properties

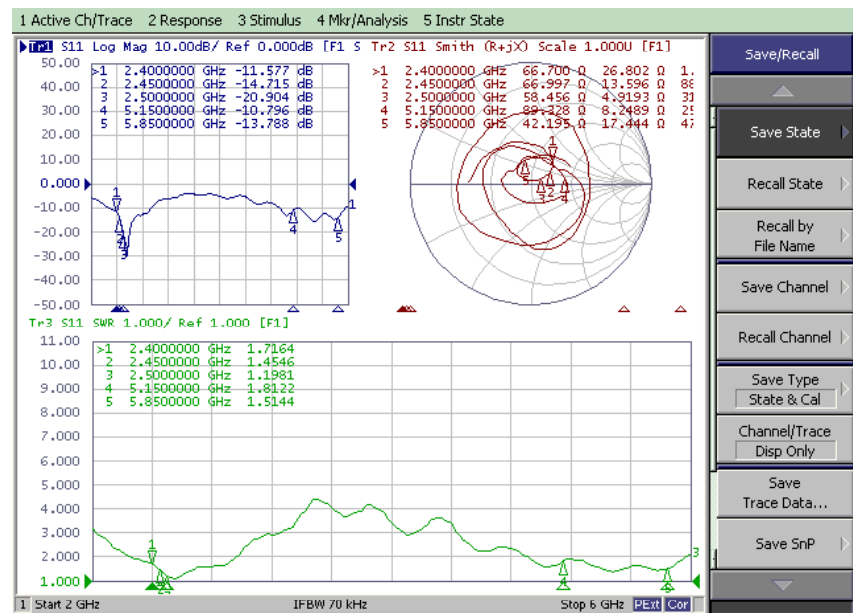
Connector	4L-IPEX
Cable Type	O.D.1.13mm低损耗
Cable Length	240mm
Cable Color	Gray
Operating Temp.	-40 ~ +85 °C
Storage Temp / Humidity.	25±5 / <70%



## Agilent E5071B



## S Parameter Test // WiFi aux Antenna





## *Antenna Passive Test*



add: 东莞市长安镇沙头社区木鱼路59号元富工业区 Tel:0769-82586086 Fax:0769-82586086



### Passive Test For WiFi Main 2.4G

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	45.7	-3.4	2.3
2410	45.0	-3.5	2.5
2420	44.5	-3.5	2.1
2430	45.7	-3.4	2.3
2440	44.9	-3.5	2.3
2450	45.4	-3.4	2.7
2460	44.9	-3.5	2.6
2470	45.4	-3.4	2.8
2480	43.9	-3.6	2.8
2490	44.0	-3.6	2.9
2500	41.8	-3.8	2.8





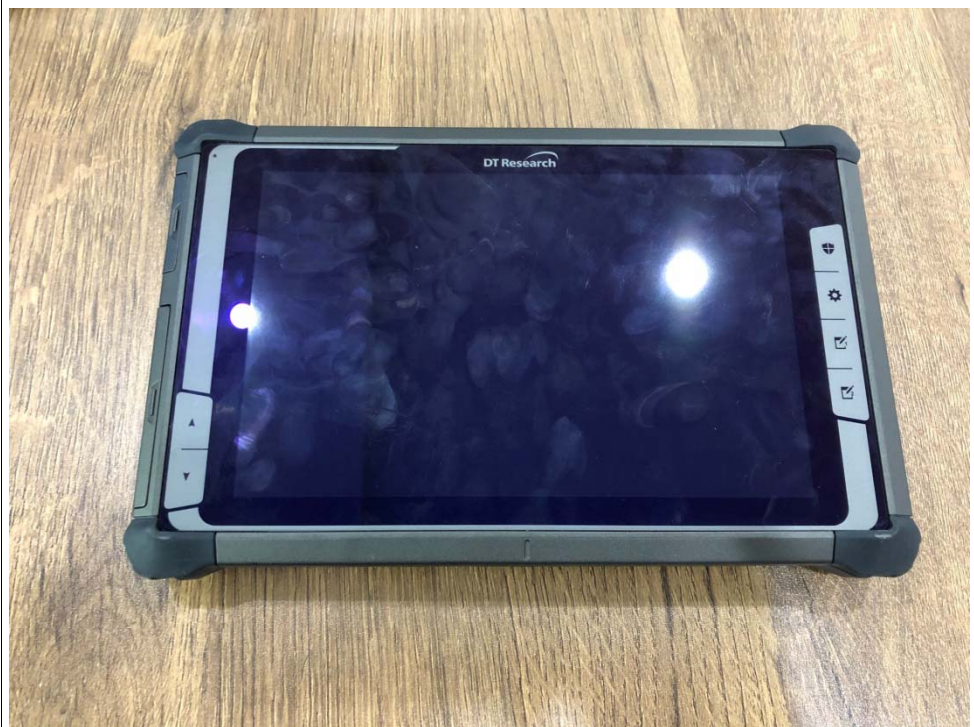
### Passive Test For WiFi Main 5.8G

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
5150	34.2	-4.7	0.6
5200	39.8	-4.0	0.5
5250	40.0	-4.0	1.6
5300	41.6	-3.8	1.3
5350	43.6	-3.6	1.4
5400	45.5	-3.4	1.2
5450	43.5	-3.6	1.3
5500	41.7	-3.8	1.1
5550	40.1	-4.0	1.4
5600	42.2	-3.7	1.8
5650	41.9	-3.8	1.9
5700	44.4	-3.5	2.4
5750	43.2	-3.6	1.7
5800	42.2	-3.7	1.1
5850	42.8	-3.7	1.2





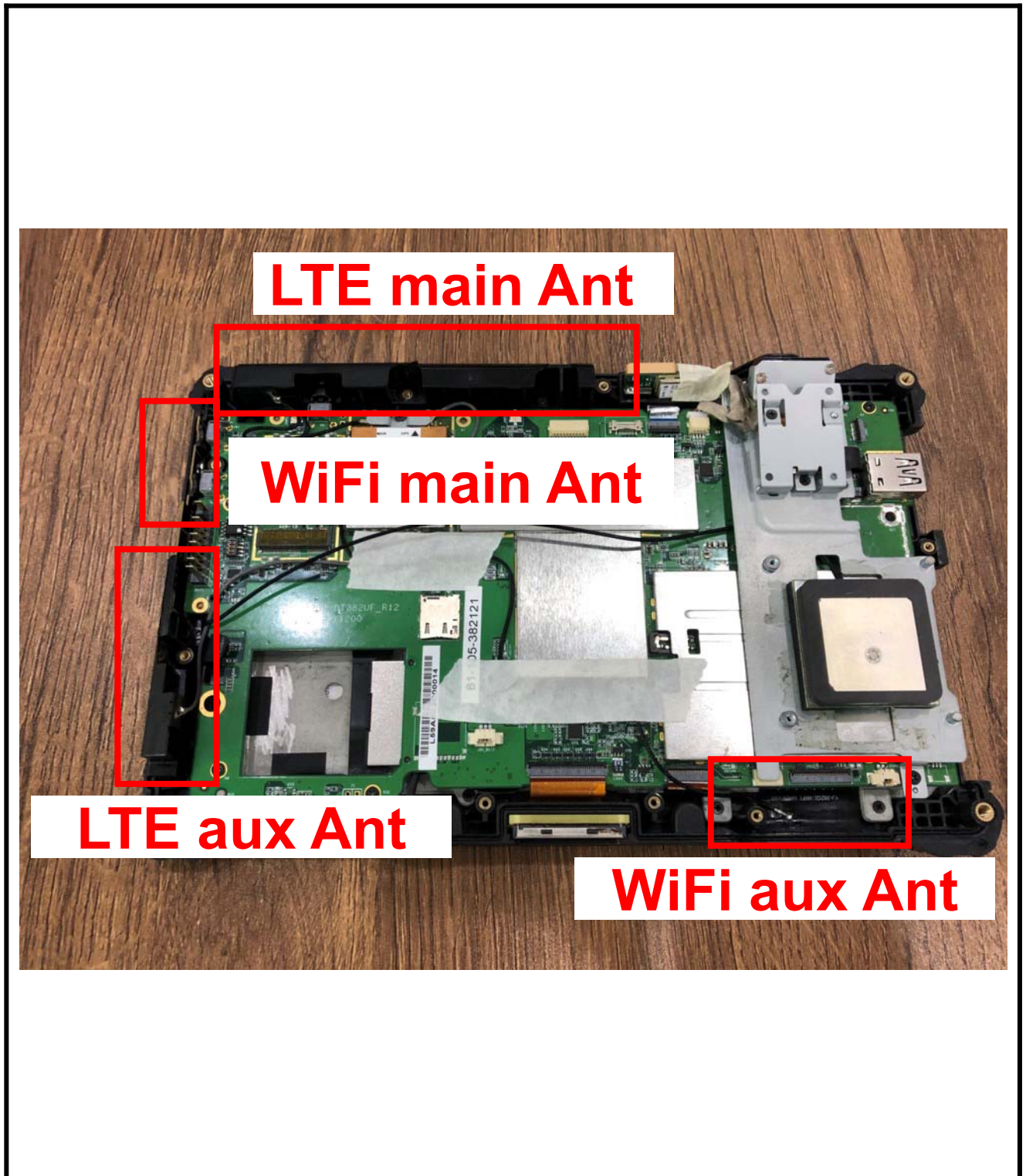
*Device*





*WiFi  
aux  
Antenna*





# Material Safety Data Sheet

**ITEM : PSM-800@ /SMH-800**

Identity (Trade Name As Used On Label)

## SECTION 1 IDENTIFICATION

Manufacturer

**UNIRES CHEMICAL INDUSTRIAL CO.,LTD.**

Address

**22CHING CHIAN 4<sup>th</sup>RD.KUANYIN INDUSTRIAL**

**DISTRICT TAOYUAN HSIEN TAIWAN**

Phone Number (For Information)

886-3-4836651 (fax)886-3-4837487

Emergency Phone Number

Telex \* **886-3-4836651**

MSDS Number\* **20110701AAA**

CAS Number\*

**07/01/2011**

Data Prepared

**HUANG CHIN HUAI**

Prepared By\*

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

## SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS	CAS No.	CONTENTS(%)	OSHA (PEL)	ACGIH (TLV)
Heavy aromtic naphtha(petroleum)	64742-94-5	<12%	N.D.	N.D.
Epoxy-Acrylic derivative	Trade secret	<48%	N.D.	N.D.
Barium sulfate	7727-43-7	<20%	dust 15mg/m3	10mg/m3
Silica, amorphous, fused	7631-86-9	<8%	N.D.	dustTLV10mg/m3
Dipropylene glycol methyl ether	34590-94-8	<12%	100ppm	200ppm

## SECTION 3 HAZARDS IDENTIFICATION

INHALATION : Highly concentrated vapor irritates nose, throat ant and lungs. May cause headache and dizziness.

EYE CONTACT : Slight irritation

SKIN CONTACT : Slight irritation

INGESTION : Harmful, if swallowed.

## SECTION 4 FIRST AID MEASURES

SKIN CONTACT : Wash with plenty of water using a soap. Do not use organic solvents.

EYE CONTACT : Rinse immediately with clean water for at least 15 minutes. If irritation persists, seek medical attention

INHALATION : Immediately carry the victim to a place where fresh air is available. If irritation persists, treat with oxygen and seek medical attention.

INGESTION :obtain medical advice immediately. It is not recommended that vomiting be induced except on medical advice



<b>SECTION 5</b>	<b>FIRE-FIGHTING MEASURES</b>
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SUITABLE EXTINGUISHING MEDIA	: Carbon dioxide, foam, powder.
UNSUITABLE EXTINGUISHING MEDIA	: water spray and water jet.
EXPOSURE HAZARDS	: Burning may release oxides of carbon, nitrogen, sulfur and other toxic gases or vapors. Do not release chemically contaminated water into drains or surface waters, and soil according to local regulations.
PROTECTIVE EQUIPMENT	: Use full protective clothing and self-contained breathing apparatus.
FIR FIREFIGHTERS MEASURES	: promptly move transferable containers to another safety area .Check the speed of fire. Extinguish the fire with suitable extinguisher from the windward side

<b>SECTION 6</b>	<b>ACCTDENTAL RELEASE MEASURES</b>
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PERSONAL PRECAUTION	: Avoid ignition sources. Avoid contact with skin, eyes and clothing. Avoid inhaling vapor.
ENVIRINMENTAL PRECAUTIONS	: Prevent contamination of soil, drains and surface waters
METHODS FOR CLEANING	: Scoop up or absorb into combustible material, wipe out a stain in use organic solvents. Dispose in accordance with local regulations.

<b>SECTION 7</b>	<b>HANDLING AND STORAGE</b>
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HANDLTNG	: Handle with care. Avoid ignition sources. Ensure good ventilation and local exhaust. Do not smoke at the workplace
STORAGE	: Store in the original sealed container at less than 20°C.Avoid direct exposure to UV and sunlights.

<b>SECTION 8</b>	<b>EXPOSURE CONTROLS/PERSINAL PROTECTION</b>
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People who know they are chemically sensitive, should avoid contact with this product.

TECHNICAL PROTECTIVE MEASURES	: No special safety measures required.
EXPOSURE CONTROL LIMITS	: (see PEL and TLV values shown in shown in section 2)
RESPIRATORY PROTECTION	: Wear suitable mask to avoid inhalation of vapor.
HAND PROTECTION	: wear chemical resistant gloves.
EYE PROTECTION	: wear safety glasses.
SKIN PROTECTION	: wear suitable protective working cloths.

<b>SECTION 9</b>	<b>PHYSICAL AND CHEMICAL PROPERTIES</b>
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BOILING	: *156°C(760mmHg)	COLOR	: <b>black</b>
FLASH	: 75.0°C	FORM	: Paste
VAPOR PRESSURE	: * 2.00mmHg(40°C)	VAPOR DENSITY	: *6.08(Air=1)
SOLUBILITY IN WATER	: * <10.7wt%	ODOR	: Mild odor
		SPECIFIC GRAVITY	: 1.18

\*Data of the organic solvents or monomers contained in this product is product is quoted.

<b>SECTION 10</b>	<b>STABILITY AND REACTIVITY</b>
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STABILITY : Stable  
CONDITIONS TO AVOID : Heat and sunlight.  
MATERIALS TO AVOID : Strong acids, strong bases, peroxides and strong oxidizing agents.  
HAZARDOUS DECOMPOSITION PRODUCTS : Burning may release oxides of carbon, nitrogen, sulfur and other toxic gases or vapors.

<b>SECTION 11</b>	<b>TOXICOLGICAL INFORMATION</b>
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PRIMARY ROUTE(S) OF ENTRY  
☒ DERMAL      ☒ INHALATION      ☐ INGESTION  
TOXICITY STUDIES : Toxicity studies have not been carried out in this product. Toxicity information available for the ingredients listed in section 2 is given below.  
HEALTH HAZARDS  
ACUTE INGESTION TOXICITY : N.E.  
ACUTE SKIN IRRITATION : Slightly irritant  
MUTAGENICITY : NONE  
CARCINOGENICITY  
☐ NTP      ☐ IARC      ☐ OSHA      ☒ NOT LISTED  
SYMPTOMS OF OVER EXPOSURE  
INHALATION : Slight irritation to respiratory tract. Highly concentrated vapor may cause headaches, and nausea.  
EYES : Slight irritation  
SKIN : Slight irritation  
INGESTION : Expected to have a low order of toxicity.

<b>SEVTION 12</b>	<b>ECOLOGICAL INFORMATION</b>
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ACUTE FISH TOXICITY : Ecological data are not available  
BIODEGRADABILTY : No data available.

<b>SEVTION 13</b>	<b>DISPOSAL CONSIDERATIONS</b>
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Incineration or landfill in accordance with local regulations.

<b>SEVTION 14</b>	<b>TRANSPORT INFORMATION</b>
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ADR : Inflammable liquid  
IMDG-CODE : Free  
IATA : Free  
US DOT : Combustible liquid

UN : Free  
FLASH POINT : 75.0°C

<b>SECTION 15</b>	<b>REGULATORY INFORMATION</b>
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EEC LABELING : Harmful

RISK PHRASES : Harmful : may cause lung damage if swallowed. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY PHRASES : Avoid contact with skin.  
: Do not breathe vapor.  
: If swallowed, do not induce vomiting :seek medical advice immediately and show this container or label.  
: Avoid release to the environment. Refer to special instructions/Safety data sheets.

<b>SECTION 16</b>	<b>OTHER INFORMATION</b>
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This product should be stored, handled and used in accordance with good industrial hygiene practices and in conformity with any legal regulation. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.

It may not be valid for this material, if used in combination with any other materials.




# Material safety data sheet

## Article and manufacturer informatio

Item name :KTM-150F WM
Ohter name: NONE
Recommended use: heat hardening printing ink
Name of manufacturer or supplier: supplier - keyway Technology Co., Ltd Manufacturer - kaiyao Technology Co., Ltd
Address of manufacturer or supplier: supplier - No.18, Lane 646, Boai street, Zhubei City, Xinzhu County Factory - No.18, Lane 646, Boai street, Zhubei City, Xinzhu County
Emergency contact: (03) 555-1822 Fax: (03) 553-1338

## Hazard identification data

Hazard classification: flammable liquid, fire hazard Category 3, acute toxicity category 5.
Label content: flammable mixed solvent 
Symbols: warning:
Hazard warning message: flammable substances, may be harmful if inhaled.
Hazard prevention measures: tightly cover the container; keep away from the ignition source - no smoking; place the container in a well ventilated place; take off the clothes as soon as they are polluted; wear eye mask / face shield; do not eat or drink when using, and avoid release to the environment
Other hazards:

## Component identification data

INGREDIENTS	% by Wt	CAS No.
Polyester resin (polymer)	20~25%	28064-14-4
Mixed solvent	20~25 %	106-65-0 ; 1119-40-0 ; 627-93-0
Titanium dioxide	30~35%	13463-67-7
Filler	10~15 %	14807-96-6
Hexamethylene diisocyanate refers to oligomer	5~10 %	21093-51-6
Butyl acetate	1~5 %	627-93-0

## First aid measures

First aid methods of different exposure routes:
Inhalation:1. remove the patient to fresh air immediately. It can only cause nose irritation and may be harmful to people. Skin contact: 1. Immediately wash with water.
Eye contact: 1. Immediately open the eyelids and wash them with mild water.
Ingestion:
Most important symptoms:
Protection for first aid personnel: wear protective gloves to avoid contact with pollutants.
Tips for doctors:.

## Fire fighting measures

Suitable extinguishing agent: dry powder

Special hazards that may be encountered during fire fighting:

Special fire fighting procedures: 1. Remove the container from the fire site and put out the fire in the upwind.

2. Stop leakage without endangering personnel safety.

3. If the leakage cannot be stopped and the surrounding area is empty, the fire will burn out.

Special protective equipment for firefighters: Firefighters must wear air breathing apparatus, fire clothing and protective gloves.

## Leakage treatment method

Personal precautions: 1. Restrict personnel access until the overflow area is completely clean.

2. It is determined that the trained personnel are responsible for the cleaning work.

3. Wear appropriate personal protective equipment.

Environmental precautions:

1. Ventilate the area.

2. Extinguish or remove all sources of ignition.

3. Report to relevant units of safety, health and environmental protection of the government.

Cleaning method: 1. Do not touch the leakage. 2. Avoid discharging into sewer or other confined space. 3. Try to prevent or reduce the leakage under the condition of safety permission. 4. Use sand, soil or other absorbing substances that do not react with leakage substances to enclose the leakage. 5. In case of a small amount of leakage, absorb it with absorbent that will not react with the leakage. Contaminated absorbents and spills are equally hazardous and should be placed in properly capped and labeled containers. Flush the spill area with water. 6. In case of a large number of spills, contact the fire department, emergency treatment unit and supplier for assistance.

## Safe handling and storage methods:

Without special measures, it is not inflammable and explosive.

Storage: no corrosive container, no reactivity, low flammability, non flammable.

## Exposure precautions

Engineering control: local exhaust device or integral air exchange device.

Control parameters: eight hour daily average allowable concentration / short time

average allowable concentration / maximum allowable concentration:

Personal protective equipment: respiratory protection:

Hand protection: impervious gloves, butyl rubber recommended, Teflon, 4h, barricale, chemrel

Eye protection: 1. Goggles (minimum 8 inches). 2. splash proof safety goggles. 3. Do not wear contact lenses. Skin and body protection: chemical protective clothing.

## Physical and chemical properties

Material state: viscous paste liquid shape: paste liquid

Color: smell: Fragrance

PH value: slightly acidic boiling point / melting point range: OC /---

Decomposition temperature: flash point not measured:

Test method: open cup and close cup

Autoignition temperature: explosion limit: LEL: uel:

Vapor pressure: vapor density: > 1 (air 1)/

Specific gravity: 1.2 ~ 1.4 (25 / 25 °C) for water solubility:

Stability and reactivity

Stability: under normal conditions  
Possible hazardous reactions under special conditions:  
Conditions to avoid:  
Substances to be avoided: acids.  
Hazardous decomposition:

### Toxicity data

Exposure route: skin contact, eye contact, ingestion  
Symptoms: eye damage  
Acute toxicity: inhalation:  
Skin: causes mild irritation. Eyes: cause mild irritation. Ingestion:  
LD50 (test animal, absorption pathway) local effect:---  
Sensitization:---  
Chronic toxicity or long-term toxicity:  
Special effect:.

### Ecological data

Ecotoxicity:  
Durability and degradability:  
Bioaccumulation:  
Mobility in soil:  
Other adverse effects:

### Waste disposal method

Waste disposal method:  
1. Handle according to the current laws and regulations.  
Consider sanitary burying or burning in a qualified solvent burning tower.

### Delivery information

UN No:  
UN transport Name:  
Transportation hazard classification:  
Packing category:  
Marine pollutants (yes / no):  
Special delivery methods and precautions:-

### Other information

References: None  
Prepared by: kaiyao Technology Co., Ltd. / No.18, Lane 646, Boai street, Zhubei City, Xinzhu County/ Tel:03-5551822 / Fax:03-5531338  
Prepared by: Xie Jinquan  
Prepared on: August 15, 2014  
Note: the above information and data are for reference only. The user shall determine the feasibility of the application according to the application requirements.

# Material safety data sheet

## 一、Goods and manufacturer information

Item name: Halogen-free polyimide copper foil substrate(Halogen-free PI -CCL)
Item number: SHIS or SHID
Name of the manufacturer or supplier / Address / Telephone/Portraiture: Suzhou Serengeti Electronic Material Co., Ltd. /NO. 168 north Taiping road, Taicang city , Jiangsu Province, China/0512-5337 8333/0512-5337 8355
Emergency contact number/Phototelephony : 0512-5337 8333/0512-5337 8355

## 二、Component identification data

Pure substance :

Chinese and English names:	1. Halogen-free epoxy resin adhesive 2. Polyimide film 3. 3. Copper foil
Synonymous name:	-
Chemical Abstracts Agency Registration Number(CAS No.):	1. (Halogen-free epoxy resin adhesive) 24969-06-0 25% ~ 41.2% 2. (Polyphenylene amine membrane) 25038-81-7 17.4% ~ 39.6% 3. (Copper foil ) 7440-50-8 28.7% ~ 48%
Hazardous substance composition(percentage composition ):	< 15(Halogen-free epoxy resin adhesive)

## 三、Hazard identification data

Most important harm and effect	Health hazard effect: No harm to the human body.
	Environment effects: -
	Physical and chemical harm: -
	Special harm: -
Cardinal symptom: -	
Hazardous classification of articles: -	

## 四、Emergency treatment

First aid methods for different ways of exposure:
Inhalation: There is no way to inhale the film.
Skin contact: No stimulation.
Eye contact: No volatiles are allowed to touch.
Ingestion: There is no possible way for the film.
Most important symptoms and harmful effects: -
Protection of first aid personnel: -
Tips for doctors: -

## 五、Fire extinguishing measures

Applicable fire-extinguishing agent: Use a fire extinguishing agent suitable for isolating the fire site.
Special hazards that may be encountered at the time of fire-fighting: Inhalation of high-temperature pyrolysis substances.
Special fire-fighting program: -
Special protective equipment for firefighters: Wear air respirator and

protective gloves and fire-fighting clothes.

#### 六、Emergency strain of leakage

Individual considerations: Use of personal protective equipment.

Environmental consideration: -

Cleaning method: -

#### 七、Safety disposal and storage method

Handle: When operating, isolate from food and beverage.

Lay in: Store in a cool, dry and well-ventilated place.

#### 八、Exposure prevention measures

Engineering control: -

Controlling parameter:

Average allowable concentration of eight hours per day/Short time average allowable concentration/Maximum allowable concentration: -

Biological index: -

Personal protective equipment:

Respiratory protection : A dust-proof mask.

Hand protection : Gloves.

Eye protection: Safety glasses.

Skin and body protection: -。

#### 九、Physical and chemical properties

Material state:	Solid body	Form:	Membrane shape
Pigment:	Light brown ~ Dark brown(PI side)	Smell:	not have
PH value :	N/A	Boiling point/Boiling spread :	N/A
Decomposition temperature :	N/A	Flash point :	N/A test method : Open cup Closed cup
Autogenous ignition temperature :	N/A	Explosion limit :	N/A
Vapour pressure:	N/A	Vapour density :	N/A

#### 十、Stability and reactivity:

Stability:	Stable under normal condition
Possible hazardous reactions in special conditions:	-
The situation to be avoided:	-
Substance to be avoided:	-
Hazardous decomposition products:	High thermal decomposition to produce nitrogen, phosphorus oxidation gas.

#### 十一、Toxic data

Acute toxicity:	N/A
Local effect :	N/A
Sensitivity:	N/A

Chronic or long-term toxicity:	N/A
Special effects :	N/A

十二、Ecological data

Possible environmental impact/Environmental flow cloth:	-
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十三、Disposal method

Handle according to local environmental laws and regulations.
---

十四、Transport information

International shipping regulations:	Not available for IATA, ICAO. (Non-dangerous goods)
UN number :	--
Domestic transportation regulations:	--
Special delivery methods and matters needing attention:	--

十五、Regulatory data

Applicable regulations:	Applicable to RoHS, GP, WEEE.
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十六、Other data

Rdocument ation :	--		
Tabulating unit:	Name:	Suzhou Serengeti Electronic Material Co., Ltd.	
	Address/Telephone:	NO. 168 north Taiping road, Taicang city , Jiangsu Province/0512-5337 8333	
Lister:	Professional ranks and titles : Department Manager		Name: Huang long
Tabulation date:	16 February, 2019		
Remarks:	The symbol "--" in the above data indicates that there is no relevant information at present. All data and data are used for reference only. Users should judge their availability according to the application requirements.		

# MATERIAL SAFETY DATA SHEET

## 产 品 安 全 资 料

Section1 Preparation Identification and Company 样品标公司

Preparation Identification 标记: 防氧化原液DX-808HT

Manufacturers Name 公司名称: 深圳市东方星化工科技有限公司

Manufacturers Address 地址: 东莞市虎门镇大宁村大板地工业区

Emergency Telephone Number 联系电话: 0769-85015502

Emergency Tex Number 传真: 0769-85015500

Postal code 邮政编码: 523900

Section 2 Composition information on Ingredients

成份组成

学名

化学文摘社登记号码

浓度(%)

(Chemical Name)

(CASNO)

(Concentration)

苯并咪唑 Benzimidazole

95-14-7

1%

甲酸 Formic acid

64-18-6

3%

添加剂 Additives

-----

0.05%

DI 水DI water

7732-18-5

95.95%

Section 3 Hazards Identification

危险性概述

Safety and Risk 安全和危险性: DX-808HT contain formic acid which may cause severe burns. 含有甲酸可能导致灼伤

Section 4 First Aid Measures

急救措施

Eyes 眼睛: flush with plenty of clean, cool water for 15 minutes and get immediate medical attention 大量清水冲洗并尽快就医

Skin 皮肤: flush with plenty of clean, cool water for 15 minutes 大量清水冲洗15 分钟

Ingestion 食入: get immediate medical attention 尽快就医

Section 5 Fire Fighting Measures

消防措施

不可燃

Section 6 Accidental Release Measures

泄漏应急措施

Personal Precautions 个人防护: wears protective clothing, chemical safety goggles, respirator, face shield and rubber gloves 穿戴耐酸防护服, 护目镜、面罩和橡胶手套

Clean-up Procedure 清洗: flush with plenty of clean, cool water 用大量清水冲洗

Section 7 Handling and Storage

操作与储存

Ventilation 通风: Store indoors in a cool dry area

阴凉干燥处

Temperature 温度: Store indoors in a cool dry area

阴凉干燥处

Containers 容器: Keep containers tightly closed. Loosen closure cautiously when opening. 保持容器密封, 打开时慎重

Incompatible Materials 不相容物质: alkalis and oxidizers 碱性和氧化物

Pot Life 有效期: six months 6 个月

Section8 Exposure Controls /Personal Protection 接触控制与个人防护

Ventilation 通风: Exhaust ventilation is recommended 推荐抽出式通风



**Respiration 呼吸:** respirator。Avoid breathing vapors or mist。防毒面具  
避免吸入蒸汽或烟雾

**Eyes and Face 眼睛和脸:** chemical safety goggles and face shield 护目镜  
和脸罩

**Hands and Skin 手和皮肤:** rubber gloves 橡胶手套

**Clothing :** protective clothing 耐酸防护服

Section 9 Physical and Chemical Properties 物理和化学特性

**Appearance 外观:** 浅蓝色液体

**Odour 气味:** 淡醋酸味

**PH:** 2.7±0.3

Section 10: Stability and Reactivity 稳定性和反应活性

**Chemical Stability 化学稳定性:** 弱的反应能力

**Incompatible Materials 不相容物质:** alkalis and oxidizers 碱性和氧化物

Section 11 Toxicological Information 毒性资料

NDA 无毒

Section 12 Disposal Consideration 废弃处理

Dispose of material in approved sites 中和后过滤排放，过滤物交当地合法  
批准单位。

Section 13 生态资料

生态毒性: 无

生物降解性: 无

非生物降解性: 无

其它有害作用: 无

Section 14 法规信息

通用法规:

劳工安全卫生规则

特定化学物预防标准

Section 15 运送资料

国内运输规定: 依道路交通安全规则第84 条

Section 16 其他资料

制表单位: 深圳市东方星化工科技有限公司

制表地址: 东莞市虎门镇大宁村大板地工业区

制表部门: 品质部

制表日期: 2017 年 1 月



## Article Information Sheet

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This product is defined as an article based on the definition of an Article under China New Chemical Environmental Management Method MEP Decree No. 7, and does not require a Safety Data Sheet under Dangerous Chemical Safety Management Regulatory China State Council Decree No. 591 and China GB/T16483-2008 Safety Data Sheet for Chemical Products Content and Order of Sections. This article information sheet (AIS) is provided as a courtesy in response to a customer request. When used as recommended or under ordinary conditions, the product should not present a health and safety hazard. However, use or processing of the product not in accordance with the product's recommendations or not under ordinary conditions may affect the performance of the product and may present potential health and safety hazards.

**Document Group:** 07-7168-3  
**Issue Date:** 2015/05/19

**Version Number:** 1.00  
**Supersedes Date:** Initial Issue

### SECTION 1: Identification

#### 1.1. Product identifier

3M™ 300LSE Adhesive Transfer Tapes: 8132LE, 8153LE, 9453FL, 9453LE, 9471FL, 9471LE, 9472FL, 9472LE, 9472LEU, 9653LE, 9671LE, 9672LE and 9698LE

**Other means of identification**

#### 1.2. Recommended use and restrictions on use

##### Recommended use

Bonding & Attachment, Industrial use

#### 1.3. Supplier's details

**Company:** 3M Company  
**Division:** Industrial Adhesives and Tapes Division  
**ADDRESS:** 3M Center, St. Paul, MN 55144, USA  
**Phone:** 021-22105335  
**FAX:** 021-22105036  
**E Mail:** Tox.cn@mmm.com  
**Website:** www.3m.com.cn

#### 1.4. Emergency telephone number

021-22105335

### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

This product is considered to be an article and is exempt from GHS classification.

3M™ 300LSE Adhesive Transfer Tapes: 8132LE, 8153LE, 9453FL, 9453LE, 9471FL, 9471LE, 9472FL, 9472LE, 9472LEU, 9653LE, 9671LE, 9672LE and 9698LE

## SECTION 3: Composition/information on ingredients

This material is a mixture.

<b>Ingredient</b>	<b>C.A.S. No.</b>	<b>% by Wt</b>
Paper or Film Liner	Mixture	Not Applicable
Acrylic Polymer Adhesive	Trade Secret	100

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

**Inhalation:**

No need for first aid is anticipated.

**Skin Contact:**

No need for first aid is anticipated.

**Eye Contact:**

No need for first aid is anticipated.

**If Swallowed:**

No need for first aid is anticipated.

## SECTION 5: Fire-fighting measures

In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Not applicable.

### 6.2. Environmental precautions

Not applicable.

### 6.3. Methods and material for containment and cleaning up

Not applicable.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions.

### 7.2. Conditions for safe storage including any incompatibilities

No special storage requirements.

## SECTION 8: Exposure controls/personal protection

This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical

3M™ 300LSE Adhesive Transfer Tapes: 8132LE, 8153LE, 9453FL, 9453LE, 9471FL, 9471LE, 9472FL, 9472LE, 9472LEU, 9653LE, 9671LE, 9672LE and 9698LE

under normal use conditions. No engineering controls or personal protective equipment (PPE) are necessary.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	Solid
Specific Physical Form:	Roll of Tape
Appearance/Odor	Translucent adhesive, slight acrylate odor, paper or film quick release liner
Odor threshold	<i>Not Applicable</i>
pH	<i>Not Applicable</i>
Melting point/Freezing point	<i>No Data Available</i>
Boiling point/Initial boiling point/Boiling range	<i>Not Applicable</i>
Flash Point	<i>Not Applicable</i>
Evaporation rate	<i>Not Applicable</i>
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	<i>Not Applicable</i>
Flammable Limits(UEL)	<i>Not Applicable</i>
Vapor Pressure	<i>Not Applicable</i>
Vapor Density	<i>Not Applicable</i>
Density	<i>Not Applicable</i>
Relative Density	<i>Not Applicable</i>
Water solubility	Nil
Solubility- non-water	<i>Not Applicable</i>
Autoignition temperature	<i>Not Applicable</i>
Decomposition temperature	<i>Not Applicable</i>
Viscosity	<i>Not Applicable</i>
Volatile Organic Compounds	<i>Not Applicable</i>
Percent volatile	<i>Not Applicable</i>
VOC Less H2O & Exempt Solvents	<i>Not Applicable</i>

## SECTION 10: Stability and reactivity

This material is considered to be non reactive under normal use conditions.

## SECTION 11: Toxicological information

### Inhalation:

This product may have a characteristic odor; however, no adverse health effects are anticipated.

### Skin Contact:

No health effects are expected

### Eye Contact:

No health effects are expected

### Ingestion:

No health effects are expected

### Additional Information:

This product, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use

**3M™ 300LSE Adhesive Transfer Tapes: 8132LE, 8153LE, 9453FL, 9453LE, 9471FL, 9471LE, 9472FL, 9472LE, 9472LEU, 9653LE, 9671LE, 9672LE and 9698LE**

may affect the performance of the product and may present potential health and safety hazards.

## **SECTION 12: Ecological information**

This article is expected to present a low environmental risk either because use and disposal are unlikely to result in a significant release of components to the environment or because those components that may be released are expected to have insignificant environmental impact.

## **SECTION 13: Disposal considerations**

Dispose of contents/container in accordance with the local/regional/national/international regulations.

## **SECTION 14: Transport Information**

Not hazardous for transportation.

## **SECTION 15: Regulatory information**

### **15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

This product is an article and is exempted from Measures on Environmental Management of New Chemical Substances and from IECSC inventory listing requirements.

## **SECTION 16: Other information**

### **References**

United Nations 'Recommendations on the Transport of Dangerous Goods - Model Regulations '

United Nations 'Globally Harmonized System of Classification and Labelling of Chemicals (GHS)'.

### **Revision information:**

Conversion to AIS.

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**3M People's Republic of China AISs are available at [www.3m.com.cn](http://www.3m.com.cn)**

## MATERIAL SAFETY DATA SHEET

### 物 质 安 全 资 料 表

#### 1 、 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION 产品和公司资料

##### 1.1PRODUCT MAME: Polyimide reinforcement plate

产品名称: Pi 补强片

##### 1.2PRODUCT USE: Flexible printed circuit Boards.

用途: 用于挠性印制电路板.

##### 1.3Product Model 产品型号

Model:HS2025、HS3025、HS4025、HS5025、HS6025、HS7025、HS8025、HS9025、HS10025

##### 1.4 公司名称及地址: 深圳市溢海通电子有限公司

NAME of COMPANY and ADDRESS: Shenzhen YiHaiTong Electronics Co.,ltd

广东省深圳市宝安区沙井后亭第二工业区 57 号福新大厦 B 栋 602

Building B, Fuxin Chuangke Building,  
No.57 Baoan District, Shenzhen, China

Shajing Houting Second Industrial Zone,

FOR MORE INFORMATION CALL:

IN CASE OF EMERGENCY CALL:

紧急联络电话: (Monday~Saturday,9:00am~6:00pm) (24Hours/Day, 7 Days/Week)

0755-33238080

0755-33238080

#### 2 、 COMPOSITION INFORMATION ON INGREDIENTS 组成成份资料

##### 2.1 The main ingredient 主要成分

Ingredient name chemical abstract number weight ratio 成分名称 化学文摘号 重量比

Polyimide film 25038-81-7 30-50% 聚酰亚胺薄膜 25038-81-7 30~50%

Remove 10-25% of the release film / paper when it is used 离形膜/纸 使用时撕掉 10~25%

Acrylates 141-32-2 25-40% 丙烯酸酯 141-32-2 25~40%

Acrylic acid 79-10-7 10-20% 丙烯酸 79-10-7 10~20%

##### 2.2 hazardous ingredients 危害物质成分

No. SGS Test Report:No.CANML1412085401, No.CANML1412085402

##### 2.3 Molecular Structure:分子结构

#### 3 、 HAZARDS IDENTIFICATION 危害性资料

3.1 hazard class filled by GB13690-92 " Classification of hazardous chemicals used and signs " requirement.:

危险性类别 按 GB13690-92 《常用危险化学品的分类及标志》规定填写。

Insoluble in water, no melting point , soluble in acid, alkali .

不溶于水，无熔点，易溶于强酸、强碱。

3.2 Nonflammable sheet material, Fumes if decomposed may irritate eyes、nose and throat..

是一种难燃的片状材料。当分解时产生的气体会刺激眼睛、鼻和咽喉。

POTENTIAL HEALTH HAZARDS:

3.3 A brief description of the extent of environmental harm when hazards caused by certain concentrations of various chemical and biological harm .

环境危害 简要描述化学品在一定浓度时对各种生物造成的危害及其造成危害的程度。

Produces CO<sub>2</sub> and CO decomposition.

分解时会产生 CO<sub>2</sub> 和 CO。

3.4 SKIN: Adhesive may cause moderate skin irritation.

皮肤：胶粘剂可能导致中等程度皮肤过敏。

3.5 EYES: Adhesive may cause eye moderate irritated, Fumes may irritate eyes.

眼睛：胶粘剂可能导致中等程度眼睛过敏。

3.6 INHALATION : Trace of chemical solvents may diffused to air in the processes of varnish preparation and coating production.

吸入物：在涂覆生产过程中，会有很少量化学溶剂挥发出来。

3.7 INGESTION: Not determined.

摄食：没有参考值。

#### 4 、 FIRST AID MEASURES 首要援助措施

SKIN: Washing the contaminated clothing in flowing water.

皮肤：脱下已污染衣服，用流动水冲洗。

EYE: Washing with flowing water for 15 minutes, consult the physician If irritation persists.

眼睛：用流动水冲洗 15 分钟，如过敏现象持续发生，请求助于医生。

INHALATION : Such as dust, smoke to much move to fresh air. If can not breathe, give mouth-to-mouth resuscitation and Call physician.

吸入：如粉末烟尘太多请转移到有新鲜空气的地方，如没有呼吸，请进行人工呼吸，并致电医生。

INGESTION: If large amounts are ingested, consult physician.

摄食：如摄入大量，请致电医生。

ADVICE TO PHYSICIAN: Treat symptomatically.

建议医生：处理出现的症状。

#### 5 、 FIRE FIGHTING MEASURES 火灾测试

FLAMMABLE PROPERTIES: N/A

易燃性：不适用

FLASH POINT: N/A

闪点：不适用

FLASH POINT METHOD: N/A

闪点方式：不适用



**AUTOIGNITION TEMPERATURE:** Not determined

自燃点温度：无规定

**UPPER FLAME LIMIT (Volume% in air) :** N/A

燃烧上限：不适用

**LOWER FLAME LIMIT (Volume% in air) :** N/A

燃烧下限：不适用

**FLAME PROPAGATION RATE (Solids) :** UL94 V-0

燃烧等级：UL94 V-0

**OSHAFLAMMABILITY CLASS:** N/A

燃烧级别：不适用

**EXTINGUISHING MEDIA:** Water, CO<sub>2</sub> and dry chemical.

灭火介质：水、CO<sub>2</sub> 及干化学品

**SPECIAL FIREFIGHTING PRECAUTIONS/INSTRUCTIONS:**

特别火灾指导：

Firemen should wear proper protective equipment and positive pressure self-contained breathing apparatus.

消防员须身穿保护装置及正压呼吸设施。

## 6 、 ACCIDENTAL RELEASE MEASURES 意外事故的应变措施

**IN CASE OF SPILL OR OTHER RELEASE :** ( Always wear recommended personal protection equipment )

如有泄漏或其他释放：（通常身穿所推荐的保护设施）

Not applicable for the solid material.

不适用于固体材料。

Spills and releases may have to be reported to local authorities.

有关泄漏应报告当地政府。

## 7 、 HANDLING AND STORAGE 仓贮指南

**7.1 Handling Precautions** refers to the process of the operation of the safety of chemicals and personal protection points to note.

操作注意事项 指对化学品操作过程中的安全注意要点和个体防护。

No.

暂无.

### 7.2 Storage Precautions 存储注意事项

a) disposal: storage spaces non fireworks ,sit housekeeping standards to prevent dust.

处置：存放场所严禁烟火，做好整理、整顿以避免灰尘。

b) Storage: high stability, non-reactive under normal storage conditions.

存储：稳定性高，正常的存储条件下无反应。

## 8 、 EXPOSURE CONTROLS / PERSONAL PROTECTION 泄漏控制 / 个人保护

**ENGINEERING CONTROLS:** Use local exhaust ventilation to control dust..

工程控制：使用当地除尘通风设施。

**PERSONAL PROTECTIVE EQUIPMENT:** 个人保护措施：

**SKIN PROTECTION :** For brief contact to dust,no precautions other than clean bodycovering clothing should

needed.Use gloves and aprons when prolonged or frequently repeated contact occurs.

皮肤保护：对于短暂性的接触粉尘，需要时清洗身体或衣服，无预防措施。对于长期性的接触，要配

带手套和围裙。

**EYE PROTECTION:** Use appropriate eye protection when machining material.

眼睛保护：当加工材料时使用眼睛保护装置。

**RESPIRATORY PROTECTION:** When respiratory protection is required for certain operations, use a NIOSH-approved dust respirator.

呼吸保护：当进行产生大量粉尘的操作时使用规范的粉尘防毒面罩。

**ADDITIONAL RECOMMENDATIONS:** N/A

其它建议：不适用。

## **9 、 PHYSICAL AND CHEMICAL PROPERTIES** 物理化学性能

### **9.1 Appearance products** 产品外观

Yellow 、 brown 、 black and so on, odorless solid flake materials

黄色，棕色和黑色等，无味固体片状材料。

### **9.2 PHYSICAL STATE:** Solid

物理形态：固体

### **9.3 ODOR:** None, unless heated

气味：无味，除非加热

### **9.4 Heat of combustion**

燃烧热 94-V0

### **9.5 SOLUBILITY IN WATER:** (Weight%) Negligible in water

水溶性：（重量%）在水中可忽略

### **9.6 The main purpose** 主要用途

Mainly used in packing, printing, screen printing, pad printing, nameplates, membrane switches, flexible circuits,

Insulation products, circuit boards, laser security, laminating , electronic, film sealing material, reflective materials,

Waterproof material, medicine(plaster with paper),toilet paper, adhesive, die punching processing and other industries.

主要应用于包装、印刷、丝印、移印、铭板、薄膜开关、柔性线路、绝缘制品、线路板、激光防伪、

贴合、电子、密封材料用膜、反光材料、防水材料、医药（膏药用纸）、卫生用纸、胶粘制品、模切冲型

加工等行业领域。

## **10 、 STABILITY AND REACTIVITY** 稳定性及反应性

### **10.1 NORMALLY STABLE:** (conditions to avoid) Stable

通常稳定：稳定

### **10.2 INCOMPATIBILITIES:** Not determined

不兼容性：不确定

### **10.3 HAZARDOUS POLYMERIZATION?** None

危险聚合物：无

### **10.4 Condition to avoid** 避免接触的条件

Not available: 无资料

#### 10.5Decompositon products 分解产物

Produces Co 2 and Co decomposition.

分解时会产生 Co 2 和 Co.

#### 11 、 TOXICOLOGICAL INFORMATION 毒物学的资料

##### 11.1Acute Toxicity 急性毒性

N/A

##### 11.2Subacute and chronic toxicity 亚急性和慢性毒性

N/A

##### 11.3Irritating 刺激性

N/A

##### 11.4Sensitization 致敏性

N/A

##### 11.5Mutagenicity 致突变性

N/A

##### 11.6Carcinogenicity 致癌性

N/A

##### 11.7Other 其他

N/A

#### 12 、 ECOLOGICAL INFORMATION 生态学资料

Not Biodegradable

非生物降解。

#### 13 、 DISPOSAL CONSIDERATIONS 处置问题

Is the unused product a hazardous waste substances list of country hazardous waste if discarded? No.

列入国家危险废物名录的危险废物不能够再利用时是否被丢弃? 不。

OTHER DISPOSAL CONSIDERATIONS : Dispose must be made in accordance with all applicable Local

regulations.

其它处置问题: 处置必须遵循当地的法律法规。

Suggestion method after products will be discarded :

(1)、Separate reuse method: crush products into powder, recycling as a filler.

(2)、Incineration method: incinerate the unused products, this method may cause organic compound gas.

(3)、Bury into deep earth.

产品报废之后有以下几种处置方法:

(1)、分离法: 将产品粉碎, 可作填充料;

(2)、焚烧法: 焚烧过程中可能产生有机化合物气体;

(3)、填埋法。

#### 14 、 TRANSPORT INFORMATION 运输资料

For additional information on shipping regulations affecting this material,contact the information number found

on the first page.

附带资料是当运输规则影响到物料时, 请和第一页所提供的联系方式联系。

#### 15 、 REGULATORY INFORMATION 法规资料

#### 15.1 Domestic Chemical Safety regulations 国内化学品安全管理法规

“Material Safety Data Sheet preparation specified range” GB/T 16483-2008

《化学品安全技术说明书编写规定范围》GB/T 16483-2008

“Chemical Dangerous Goods Safety Management Regulations” (February 17, 1987 the State Council issued).

《化学危险物品安全管理条例》（1987 年 2 月 17 日国务院发布）

“Common Hazardous Chemicals and signs” (GB13690-1992).

《常用危险化学品的分类和标志》（GB13690-1992）

“Air Pollutant Emission Standards” GB16297-1996

《大气污染物综合排放标志》GB16297-1996

“Sour gas transportation safety regulations” SY6506-2000

《含硫气田安全输送规程》SY6506-2000

“Chemical Dangerous Goods Safety Management Regulation implementing rules” (the Labor Fa[1992] No.677)

《化学危险物品安全管理条例实施细则》（化劳发【1992】677 号）

“Industrial sites safe use of chemicals” (1996 workers are No.423)

《工业场所安全使用化学品规定》(1996 劳都发 423 号)

“Dangerous Goods Classification and code ” GB6944-1986

《危险货物分类和品名编号》GB6944-1986

“Transport of Dangerous Goods Package CATEGORY principle” GB/T15098-1994

《危险货物运输包装类别划分原则》GB/T15098-1994

“Transport of Dangerous Goods Management Regulations” (formerly the Ministry of Railways issued)1995

《危险货物运输管理规则》（原铁道部颁布）1995 年

These laws and regulations for the safe use of hazardous chemicals, production, storage, transport, handling, etc.

are made relevant regulations.

以上法规对化学危险品的安全使用，生产，存储，运输，装卸等方面均做了相关规定。

附 加 法 规 资 料 :

Shenzhen YIHAITONG Electronic Co., Ltd. does not use PBBs or PBDEs as flame retardant in the resin system of the products 深圳市溢海通电子有限公司 没有采用多溴联苯或多溴联苯醚作为阻燃剂在产品的树脂体系当中

16 、 OTHER INFORMATION 其它资料 CURRENT ISSUS DATE: 现在版本日期: 2015-11-12

PREVIOUS ISSUE DATE: 2014-6-25

首次版本日期: 2014-6-25

福建微波通通信有限公司  
物质安全数据表 (MSDS)

一.物品名称与厂商资料

物品名称：同轴电缆
物品编号：RF113 单银低损耗线
制造商或供货商名称地址及电话：福建微波通通信有限公司 福建省上杭县南岗工业区兴杭路 23 号
紧急联络电话及传真：TEL:0597-3990101,FAX:0597-3885101

二.成分辨析资料

纯物质：

中文名称	同义名称	化学文摘社登记号码(CAS No.)
镀银铜线	SC	Cu:7440-50-8,Ag:7440-22-4
聚全氟乙丙烯	FEP	FEP:25067-11-2
铜箔	Copper Foil	Cu:7440-50-8,PET:25038-59-9
镀锡铜线	TC	Cu:7440-50-8,Sn:7440-31-5
聚全氟乙丙烯	FEP	FEP:25067-11-2

危害物质：

危害物质	浓度或浓度范围 (ppm)
铅及其化合物 Pb	<1000
镉及其化合物 Cd	<100
汞及其化合物 Hg	<1000
六价铬及其化合物 Cr <sup>6+</sup>	<1000
SVHC205 种物质	禁止使用

三. 危害辨识数据

最重要危害	健康危害效应：260℃以上可能分解，需安装排气装置。
与效应	环境影响：按照废弃物处理及清扫法规处理，不可燃烧。



	物理性及化学性危害：无
	特殊危害：无
主要症状：对人的神经系统产生损害。	
危害物质分类：大气和水源。	

#### 四. 急救措施：

不同暴露途径之急救方法
吸入：若吸入熔融树脂释放的气体，将患者移至通风处
皮肤接触：被熔融树脂碰触皮肤，需即可以大量清水冷却后，依照烫伤之临床方式处理
眼睛接触：大量清水冲洗。
食入：用清水漱口。
最重要症状及危害效应：无
对急救人员之防护：对流换气。
对医师之提示：吸氧

#### 五. 灭火措施：

适用灭火剂：水，化学干粉，二氧化碳，泡沫。
灭火时可能遇到之特殊危害：避免气体吸入。
特殊灭火程序：移除可燃物。
消防人员之特殊防护设备：防毒面具。

#### 六. 泄露处理方法

个人注意事项：粉状和颗粒状树脂。
环境注意事项：不可填埋。
清理方法：按照废弃物处理及清扫法规处理，不可燃烧。

#### 七. 安全处置与储存方法

处置：避免高温和火源接触。
存储：通风干燥处。

#### 八. 暴露预防措施



深圳微波通线缆有限公司

地址：深圳市光明新区公明街道马山头村第四工业区78C三楼

电话：0755-29886180

传真：0755-29886180

福建微波通通信技术有限公司

地址：福建省上杭县南岗工业区兴杭路23号

电话：0597-3990109

传真：0597-3885101

工程控制：无

控制参数：八小时日时量平均容许浓度/短时间时量平均容许浓度/最高容许浓度：未定

生物指标：未定

个人防护措施：

呼吸防护：安装排气装置

手部防护：佩戴手套

眼睛防护：不需要

皮肤及身体防护：不需要

卫生措施：不需要

## 九. 物理及化学性质

物质状态：固体	形状：白色粉末/透明颗粒
颜色：白色/透明	气味：无
PH 值：7	沸点/沸点范围：-
分解温度：380°C/360°C	闪火点：-
自燃温度：-	爆炸界限：-
蒸汽压：-	蒸汽密度：-
密度：2.05/2.15g/cm <sup>3</sup>	溶解度：-

## 十. 安定性及反应性

安全性：常温下及其安定且具化学惰性

特殊情况下可能之危害反应：高温或燃烧分解气体对人体神经系统有损害。

应避免之状况：不可燃烧。

应避免之物质：金属钠及其强酸的混合物。

危害分解物：气体及粉尘。

## 十一. 毒性资料

急毒性：无

局部效应：无

致敏效应：无



深圳微波通线缆有限公司

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电话：0755-29886180

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慢毒性或长期毒性：无

特殊效应：无

## 十二. 生态资料

可能之环境影响/环境流布：此项产品无法被生物分解，但可经适当之方式予以回收利用，

不含铅，汞，镉，铬等添加物或复合物。

## 十三. 废弃处置方法

废弃处置方法：按照废弃物处理及清扫法规要求送专业资质公司处置

## 十四. 运送资料

国际运送规定：此物质无危险性。

联合国编号：无

国内运送规定：无

特殊运送方法及注意事项：无

## 十五. 法规资料

适用法规：遵循欧盟 REACH 法规相关要求。

## 十六. 其他资料

参考文献：-

制表单位：福建微波通通信有限公司

地址：福建省上杭县南岗工业区兴杭路 23 号区 78C 三楼

电话：0597-3990101

制表人：职称：品质主管

姓名：黄炜

制表日期：2020-03-01



深圳微波通线缆有限公司

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电话：0597-3990109 传真：0597-3885101

**PRODUCT SPECIFICATION**

製品規格

**No. PRS-1907****MHF4L Connector**

Plug Parts No. : 20565-001R-13,20572-001R-08

Receptacle Parts No. : 20579-001E-01

**Qualification Test Report No. TR-14097**

					Prepared by	Reviewed by	Approved by
0	S14352	K.H	Nov./24/'14		K.Hashiba Nov./24/'14	T.Tagawa Nov./27/'14	T.Takano Nov./27/'14
REV.	ECN	BY	DATE	APP.			
REVISION RECORD							

DOCUMENT CLASSIFICATION  PRODUCT SPECIFICATION 製品規格	TITLE  MHF4L Connector Plug Parts No. : 20565-001R-13,20572-001R-08 Receptacle Parts No. : 20579-001E-01	No.  PRS-1907
<p><b>1. 適応範囲／Scope</b>  本規格は、MHF4L Connector の性能と試験条件について規定する。  試験条件は“PCI Express® M.2 Electromechanical Specification DRAFT Revision 1.0”に準ずる。  This specification covers the requirements for product performance and test methods of MHF4L Connector.  Test method is complied with “PCI Express® M.2 Electromechanical Specification DRAFT Revision 1.0”.</p> <p><b>2. 製品名称及び製品型番／Product Name and Parts No.</b>  <b>2.1 製品名称／Product Name</b>  MHF4L connector</p> <p><b>2.2 製品型番／Parts No.</b>  Plug : 20565-001R-13  20572-001R-08  Receptacle : 20579-001E-01</p> <p><b>3. 定格／Rating</b>  <b>3.1 適応ケーブル／Applicable cable</b>  3.1.1 Part No. 20565-001R-13  (1) 構成  中心導体 : AWG#32(7/0.08), 銀メッキ軟銅線  誘電体 : フッ素樹脂, 外径 0.68(+0.04,-0.02)mm, 標準厚さ 0.22mm  外部導体 : 16/4/0.05, 標準外径 0.93mm, 銀メッキ軟銅線または錫メッキ軟銅線  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 : <math>50 \pm 2 \Omega</math> (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) : <math>520 \Omega / \text{km}</math>  絶縁抵抗 : <math>1,500 \text{M} \Omega \cdot \text{km}</math> 以上  耐電圧 : AC 500V・1 分間にて絶縁破壊の無い事</p> <p>(1) Description  Inner conductor : AWG#32(7/0.08)  Silver plating annealed copper wire  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 or tin-copper alloy  Jacket : Fluoro-plastics , diameter 1.13(+0.08,-0.05)mm , nominal thickness 0.1mm</p> <p>(2) Requirements  Characteristic impedance : <math>50 \pm 2 \Omega</math> by TDR method  Nominal capacitance(Reference value) : 97 pF/m  Conductor resistance of inner conductor at 293K (20℃)(Reference value) : <math>520 \Omega / \text{km}</math>  Insulation resistance : <math>1,500 \text{M} \Omega \cdot \text{km}</math> MIN.  Dielectric withstand voltage : no breakdown at AC 500V for 1 minutes.</p>		

DOCUMENT CLASSIFICATION  PRODUCT SPECIFICATION 製品規格	TITLE  MHF4L Connector Plug Parts No. : 20565-001R-13,20572-001R-08 Receptacle Parts No. : 20579-001E-01	No.  PRS-1907
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## 3.1.2 Part No. 20572-001R-08

## (1) 構成

中心導体 : AWG#36(7/0.05),銀メッキ軟銅線

誘電体 : フッ素樹脂,外径 0.4(+0.04,-0.02)mm,標準厚さ 0.125mm

外部導体 : 8/5/0.05,標準外径 0.65mm, 銀メッキ軟銅線または錫メッキ軟銅線

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 :  $50 \pm 2 \Omega$  (TDR)

標準静電容量(参考値) : 96pF/m

293K(20℃)時の中心導体抵抗(参考値) : 1,400  $\Omega$ /km絶縁抵抗 : 1,000M $\Omega$ ・km 以上

耐電圧 : AC 1,000V・1分間にて絶縁破壊の無い事

## (1) Description

Inner conductor : AWG#36(7/0.05)

Silver plating annealed copper wire

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 or tin-copper alloy

Jacket : Fluoro-plastics , diameter 0.81(+0.04,-0.02)mm , nominal thickness 0.08mm

## (2) Requirements

Characteristic impedance :  $50 \pm 2 \Omega$  by TDR method

Nominal capacitance(Reference value): 96 pF/m

Conductor resistance of inner conductor at 293K (20℃)(Reference value) : 1,400  $\Omega$ /kmInsulation resistance : 1,000 M $\Omega$ ・km MIN.

Dielectric withstand voltage : no breakdown at AC 1,000V for 1 minutes.

## 3.2 使用条件／Operating Condition

電圧/Rated voltage	AC60Vr.m.s			
公称特性インピーダンス/ Nominal characteristic impedance	50 ohm.			
周波数/Frequency	Plug : 0.1GHz～6GHz Receptacle : 0.1GHz～12GHz			
VSWR	Frequency	0.1～3GHz	3～6GHz	6～12GHz
	Plug	1.30 MAX.	1.45 MAX.	
	Receptacle	1.30 MAX.	1.40 MAX.	1.85 MAX.
使用温度範囲/ Service temperature	233K～363K (-40℃～90℃)			

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#### 4. 試験及び性能 / Test and Performance

##### 試験条件 / Test Condition

本試験の初期とは、出荷時の状態のことである。

特に指定のない限り、測定と試験は、MIL-STD-202 に基づき以下の条件で行う。

This initial test is equal to it's at shipping condition and unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202.

温度 / Temperature ... 288K~308K (15°C~35°C)

気圧 / Pressure ... 866hPa~1066hPa (650mmHg~800mmHg)

相対湿度 / Relative Humidity ... 45~75%R.H.

#### 4.1. 電氣的性能 / Electrical Performance

No	項目 / Items	試験条件 / Test Conditions	規格 / Specifications
1.	接触抵抗	テスト基板にリセプタクルコネクタを半田付けし、プラグコネクタを嵌合させ、開回路電圧 20mV DC 以下、短絡電流 10mA DC 以下で 4 端子法に芯線及びシールド線の図 1 に示す区間の接触抵抗を測定する。 MIL-STD-202 試験法 307 に準拠。	[中心コンタクト] 初期: 20mΩ MAX. 試験後: $\angle$ R 20mΩ MAX. [外部コンタクト] 初期: 20mΩ MAX. 試験後: $\angle$ R 20mΩ MAX.
	Contact Resistance	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 methods. Apply the low level condition of 20mV MAX. DC for the open circuit voltage and 10mA MAX. DC for the closed circuit current in accordance with MIL-STD-202, Method 307.	[Inner contact] Initial: 20mΩ MAX. After testing: $\angle$ R 20mΩ MAX. [Ground contact] Initial: 20mΩ MAX. After testing: $\angle$ R 20mΩ MAX.
2.	絶縁抵抗	リセプタクル及びプラグコネクタを嵌合させた状態で、中心導体と外部導体の間に DC100V を印加し、測定する。 MIL-STD-202 試験法 302 に準拠。	初期 : 500 MΩ MIN. 試験後 : 100 MΩ MIN.
	Insulation Resistance	Mate the plug and receptacle connector together, and then apply DC 100 V between the inner contact and the ground contact in accordance with MIL-STD-202, Method 302.	Initial : 500 MΩ MIN. After testing : 100 MΩ MIN.
3.	耐電圧	リセプタクル及びプラグコネクタを嵌合させ、隣接する端子間に AC200V (実効値) を一分間印加する。 MIL-STD-202 試験法 301 に準拠。	沿面放電、空中放電、絶縁破壊等の異常無きこと。
	Dielectric Withstanding Voltage	Mate the receptacle and plug connector together, then apply AC 200V(rms) between the neighboring contacts for a minute in accordance with MIL-STD-202, Method 301.	No creeping discharge, flashover, no insulator breakdown shall occur.
4.	VSWR	ネットワークアナライザーにて図 2 のように電圧定在波比を測定する。 周波数 : 0.1GHz ~ 12GHz	[Plug] 1.30 MAX. at 0.1~3GHz 1.45 MAX. at 3~6GHz
		Measure the VSWR as shown in Fig.2 by the network analyzer. Frequency : 0.1GHz ~ 12GHz	[Receptacle] 1.30 MAX. at 0.1~3GHz 1.40 MAX. at 3~6GHz 1.85 MAX. at 6~12GHz

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<b>4.2.機械的性能／Mechanical Performance</b>			
No	項目 / Items	試験条件 / Test Conditions	規格 / Specifications
1.	挿入力 / 抜去力	テスト基板にリセプタクルを半田付けする。その後、試料を挿抜試験機に取り付け、嵌合軸に平行に毎分 $25 \pm 3\text{mm}$ の速度で、初期及び 30 回目の挿入抜去力を測定する。	[挿入力／Mating] 初期/Initial : 30 N MAX. 30 回目/30cycles: 30 N MAX.
	Mating Force And Un-mating Force	Solder the receptacle connector to the test board, then place the board and plug on push-on/pull-off machine, measure of initial and mating/un-mating 30 cycles at a speed $25 \pm 3\text{mm/min.}$ along the mating axis.	[抜去力／Un-mating] 初期/Initial : 20 N MAX. 5N MIN. 30 回目/30cycles: 20 N MAX. 3N MIN.
2.	30 度引張	プラグ及びリセプタクルコネクタを嵌合させた状態で、図.3 の様にケーブルを $30^\circ$ 傾け、10[N]の力で矢印の方向に 10 回引張る。	[外観] 異常無き事。 [瞬断] 試験中、 $1\mu\text{s}$ を超える電氣的瞬断の無き事。
	Cable retention force at 30 degree	Mate Plug with Receptacle and tilt cable by 30 degree and pull the cable by 10N force with 10cycles toward arrowhead direction. (Fig.3)	[Appearance] No abnormality [Electrical discontinuity] No electrical discontinuity grater than $1\mu\text{s}$ .
3.	水平引張	プラグ及びリセプタクルコネクタを嵌合させた状態で、図.4 の様に $\phi 1.13\text{cable}$ は水平方向 20[N]の力で引張る。 $\phi 0.81\text{cable}$ の場合は、10[N]の力で引張る。	[外観] 異常無き事。 [瞬断] 試験中、 $1\mu\text{s}$ を超える電氣的瞬断の無き事。
	Cable retention force at 0 degree	Mate Plug with Receptacle and pull the $\phi 1.13$ cable by 20N force toward horizontal direction. (Fig.4) In case of $\phi 0.81$ cable strength should have more than 10N.	[Appearance] No abnormality [Electrical discontinuity] No electrical discontinuity grater than $1\mu\text{s}$ .
4.	耐久性	テスト基板にリセプタクルを半田付けする。その後、試料を挿抜試験機に取り付け、嵌合軸に平行に毎分 $25 \pm 3\text{mm}$ の速度で、30 回挿入抜去を行う。	[外観] 異常無き事。 [接触抵抗] 4.1.1 を満足する事。
	Durability	Solder the receptacle connector to the test board, then place the board and plug on the push-on/pull-off machine, and repeat mating and un-mating 30 cycles at a speed $25 \pm 3\text{mm/min.}$ along the mating axis.	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1.
5.	半田剥離強度	テスト基板に半田付けされたリセプタクルコネクタを図.5 のように各方向から押す。 コネクタが破壊されときの強度を測定する。	[剥離強度] 20N MIN.
	Receptacle shearing strength	Solder the receptacle connector to the test board, Push the receptacle connector from each directions as Shown in Fig.5. Measure the strength when the connector is broken.	[Shearing strength] 20N MIN.

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No	項目 / Items	試験条件 / Test Conditions	規格 / Specifications
6.	耐振動性	DC100mA の電流を流しながら、嵌合状態のコネクタに下記の振動を加える。 周波数: 10Hz → 100Hz → 10Hz / 約 15 分間 片振幅、加速度 : 1.5mm or 59m/s <sup>2</sup> (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。	[外観] 異常無き事。 [接触抵抗] 4.1.1.を満足する事。 [瞬断] 試験中、1 μs を超える電氣的瞬断の無き事。
	Vibration	Apply the following vibration to the mating connector. During the testing, run 100mA DC to check electrical discontinuity. Frequency : 10Hz → 100Hz → 10Hz / approx 15minutes. Half amplitude, Peak value of acceleration : 1.5mm or 59m/s <sup>2</sup> (6G) Directions , cycle : 3 mutually perpendicular direction, 5 cycles (approx 75minutes.) for each direction.	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1. [Electrical discontinuity] No electrical discontinuity grater than 1 μs.
7.	耐衝撃性	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。 最大加速度 : 735m/s <sup>2</sup> (75G) 標準持続時間 : 11m/sec 波形 : 半波正弦波 方向 : 直交する 6 方向、各 3 回	[外観] 異常無き事。 [接触抵抗] 4.1.1.を満足する事。 [瞬断] 試験中、1 μs を超える電氣的瞬断の無き事。
	Shock	Apply the following shock 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 <sup>2</sup> (75G) Duration : 11msec Wave Form : Half sinusoidal Directions , cycle : 6 mutually perpendicular direction , 3 cycles for each direction	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1. [Electrical discontinuity] No electrical discontinuity grater than 1 μs.



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<b>4.3.耐環境性能 / Environmental Performance</b>			
No	項目 / Items	試験条件 / Test Conditions	規格 / Specifications
1.	熱衝撃	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、以下の環境条件に暴露する。 MIL-STD-202 試験法 107 試験条件 A に準拠。 温度 : 218K(-55℃):30 分→358K(85℃):30 分 移動時間 : 5 分以下 回数 : 5 サイクル	[外観] 異常無き事。 [接触抵抗] 4.1.1.を満足する事。 [絶縁抵抗] 4.1.2.を満足する事。 [耐電圧] 4.1.3.を満足する事。
	Thermal Shock	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment in accordance with MIL-STD-202, Method 107, Condition A. Temperature: 218K(-55℃): 30min. → 358K(85℃): 30min. Transition time: 5min. MAX. No. of cycles : 5 cycles	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1. [Insulation Resistance] Shall meet 4.1.2. [Dielectric Withstanding Voltage] Shall meet 4.1.3.
2.	高温寿命	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、以下の環境条件に暴露する。 MIL-STD-202 試験法 108 試験条件 B に準拠。 温度: 363±2K (90±2℃) 期間: 96 時間	[外観] 異常無き事。 [接触抵抗] 4.1.1.を満足する事。
	High Temperature Life	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment in accordance with MIL-STD-202, Method 108, Condition B. Temperature: 363±2K (90±2℃) Duration: 96 hours	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1.
3.	湿度(定常状態)	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、以下の環境条件に暴露する。 MIL-STD-202 試験法 103 試験条件 A に準拠。 温度: 313±2K (40±2℃) 湿度: 90~95%RH 期間: 96 時間	[外観] 異常無き事。 [接触抵抗] 4.1.1.を満足する事。 [絶縁抵抗] 4.1.2.を満足する事。 [耐電圧] 4.1.3.を満足する事。
	Humidity (Steady State)	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment in accordance with MIL-STD-202, Method 103, Condition A. Temperature: 313±2K (40±2℃) Humidity : 90~95%RH Duration : 96 hours	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1. [Insulation Resistance] Shall meet 4.1.2. [Dielectric Withstanding Voltage] Shall meet 4.1.3.



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No	項目 / Items	試験条件 / Test Conditions	規格 / Specifications
4.	塩水噴霧	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、以下の環境条件に暴露する。 MIL-STD-202 試験法 101 試験条件 B に準拠。 温度 : $308 \pm 2\text{K}$ ( $35 \pm 2^\circ\text{C}$ ) 塩水濃度 : $5 \pm 1\%$ [重量比] 期間 : 48 時間	[外観] 異常無き事。 [接触抵抗] 4.1.1.を満足する事。
	Salt Water Spray	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment in accordance with MIL-STD-202, Method 101, Condition B. Temperature : $308 \pm 2\text{K}$ ( $35 \pm 2^\circ\text{C}$ ) Salt water density: $5 \pm 1\%$ [by weight] Duration : 48 hours	[Appearance] No abnormality [Contact Resistance] Shall meet 4.1.1.
5.	硫化水素ガス	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、以下の環境条件に暴露する。 温度 : $313 \pm 2\text{K}$ ( $40 \pm 2^\circ\text{C}$ ) 相対湿度: $80 \pm 5\%\text{RH}$ ガス : $\text{H}_2\text{S}$ $3 \pm 1\text{ppm}$ 期間 : 48 時間	[外観] 性能上有害な異常無き事。 [接触抵抗] 4.1.1.を満足する事。
	$\text{H}_2\text{S}$ Gas	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment Temperature : $313 \pm 2\text{K}$ ( $40 \pm 2^\circ\text{C}$ ) Relative Humidity: $80 \pm 5\%\text{RH}$ Gas : $\text{H}_2\text{S}$ $3 \pm 1\text{ppm}$ Duration : 48 hours	[Appearance] No abnormality adversely affecting the performance shall occur. [Contact Resistance] Shall meet 4.1.1.

#### 4.4.その他 (Others)

No	項目 / Items	試験条件 / Test Conditions	規格 / Specifications
1.	半田付け性	端子の半田付け部を $518 \pm 5\text{K}$ ( $245 \pm 5^\circ\text{C}$ ) の半田槽内に $5 \pm 0.5$ 秒間浸す。フラックスは、RMA 型を使用し、5~10 秒間浸漬するものとする。 MIL-STD-202F 試験法 208E に準拠。	浸した面積の 95%以上に半田が付着し、かつピンホール空隙が1箇所集中せず、5%以下である事。
	Solder ability	Dip the soldering point of the contacts in the solder bath at $518 \pm 5\text{K}$ ( $245 \pm 5^\circ\text{C}$ ) for $5 \pm 0.5$ seconds after immersing the time in the flux of RMA type for 5 to 10 seconds in accordance with MIL-STD-202F, Method 208E.	The surface of the dipped contact must become 95% wet and the non-wetted pinholes must not accumulate in one area but be distributed and must be less than 5% of the contact area to be soldered.
2.	半田耐熱性	リフロー温度プロファイルは図 6 を参照。 リフロー回数は 2 回以内。 メタルマスクサイズは図 7 を参照。	機能を損なう変形及び欠陥の無き事。
	Soldering Heat Resistance	Reflow temperature profile as shown in Fig.6. The number of times of Reflow is within 2. Metal mask size Fig.7	No abnormality adversely affecting the performance shall not occur.

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#### 4.5 試験順序と試料数 / Test Sequence and Sample Quantity

**表(Table)1 試験順序と試料数 / Test Sequence and Sample Quantity**

※グループ表中の番号は、試験順序を示す。

The number of group is test sequence.

試験項目 / Test Item		Group															
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
(1)	接触抵抗 Contact Resistance						1,3		1,3	1,3	1,5	1,3	1,5	1,3	1,3		
(2)	絶縁抵抗 Insulation resistance										2,6		2,6				
(3)	耐電圧 Dielectric withstanding voltage	1									3,7		3,7				
(4)	VSWR		1														
(5)	挿抜力/抜去力 mating force/Unmating force			1													
(6)	30度引張 Cable retention force at 30 degree				1												
(7)	水平引張 Cabel retention force at 0 degree					1											
(8)	耐久性 Durability						2										
(9)	半田剥離強度 Shearing strength							1									
(10)	耐振動性 Vibration								2								
(11)	耐衝撃性 Shock									2							
(12)	熱衝撃 Thermal shock										4						
(13)	高温寿命 High temperature life											2					
(14)	湿度(定常状態) Humidity (steady state)												4				
(15)	塩水噴霧 Salt Water Spray													2			
(16)	硫化水素ガス H <sub>2</sub> S Gas														2		
(17)	半田付け性 Solder ability															1	
(18)	半田耐熱性 Soldering Heat Resistance																1
Sample QTY pcs.	Plug	10	10	10	10	10	10	---	10	10	10	10	10	10	10	---	---
	Receptacle	10	10	10	10	10	10	12	10	10	10	10	10	10	10	10	10
Test Board pcs.		10	10	10	10	10	10	12	10	10	10	10	10	10	10	10	10

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## 5. 測定方法／Measuring method

### 5.1 接触抵抗測定方法／Measuring method of Contact Resistance

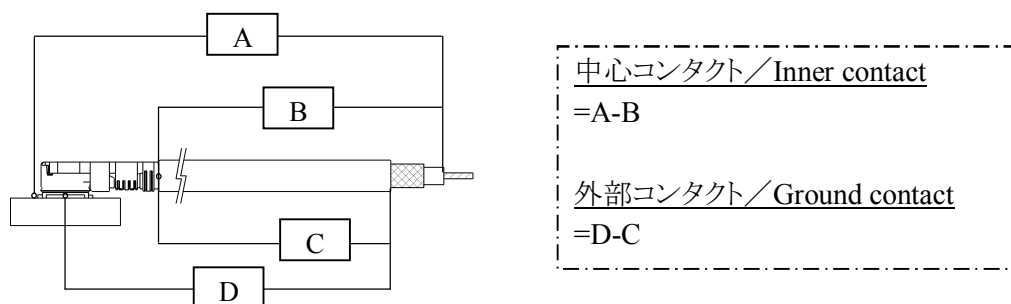


図 1. 接触抵抗

(Fig.1 Contact Resistance)

### 5.2 VSWR 測定方法／Measuring method of VSWR

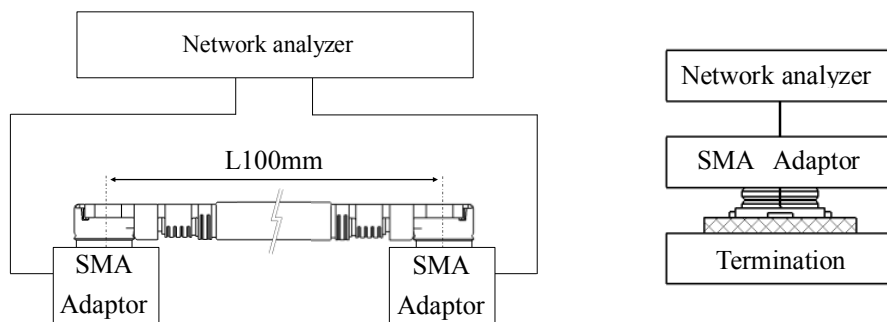


図 2. VSWR

(Fig.2 VSWR)

### 5.3 30 度引張測定方法／Measuring method of Cable retention force at 30 degree

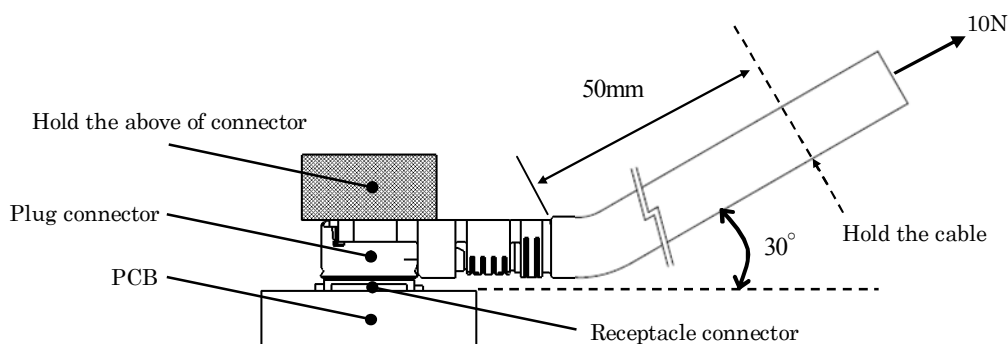


図 3. 30 度引張

(Fig.3 Cable retention force at 30 degree)

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#### 5.4 水平引張測定方法／Measuring method of cable retention force at 0 degree

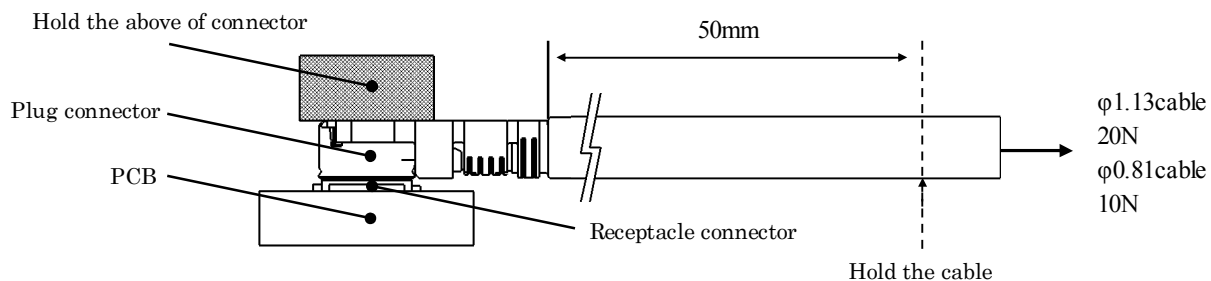


図 4. 水平引張

(Fig.4 Cable retention force at 0 degree)

#### 5.5 半田剥離強度測定方法／Measuring method of receptacle shearing strength

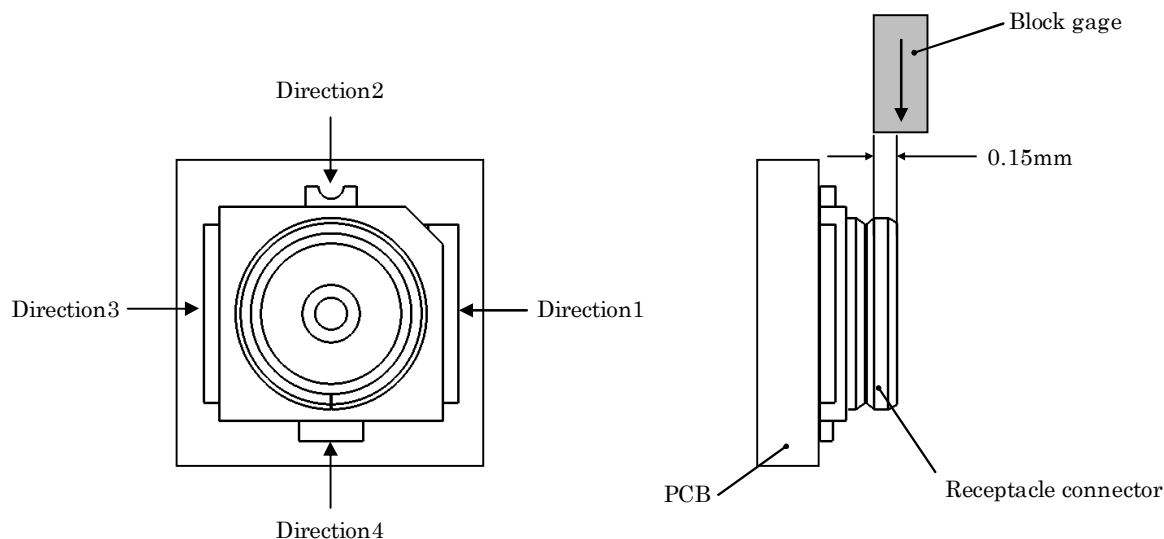


図 5. 半田剥離強度

(Fig.5 Receptacle shearing strength)