





PRODUCT SPECIFICATION



LANGUAGE

JAPANESE  
ENGLISH

【4. 性能 PERFORMANCE】

4-1. 電気的性能 Electrical Performance

項目 Item		条件 Test Condition	規格 Requirement
4-1-1	接触抵抗 Contact Resistance	適合FPCを嵌合させ、開放電圧 20mV以下、短絡電流10mA以下にて測定する。 (JIS C5402 5.4)  Mate applicable FPC, measure by dry circuit, 20mV MAXIMUM, 10mA MAXIMUM. (JIS C5402 5.4)	40 milliohm MAXIMUM
4-1-2	絶縁抵抗 Insulation Resistance	適合FPCを嵌合させ、隣接するターミナル間及びターミナル、アース間に、DC500Vを印加し測定する。 (JIS C5402 5.2/MIL-STD-202 試験法 302)  Mate applicable FPC and apply 500V DC between adjacent terminal or ground. (JIS C5402 5.2/MIL-STD-202 Method 302)	50 megaohm MINIMUM
4-1-3	耐電圧 Dielectric Strength	適合FPCを嵌合させ、隣接するターミナル間及びターミナル、アース間に、AC250V(実効値)を1分間印加する。 (JIS C5402 5.1/MIL-STD-202 試験法 301)  Mate applicable FPC, apply 250V AC (rms) for 1 minute between adjacent terminal or ground. (JIS C5402 5.1/MIL-STD-202 Method 301)	異状なきこと No Breakdown

4-2. 機械的性能 Mechanical Performance

項目 Item		条件 Test Condition	規格 Requirement
4-2-1	FPC保持力 FPC Retention Force	アクチュエータ挿入状態にてFPCを毎分25±3 mmの速さで嵌合軸方向に対して真っ直ぐ引き抜く。  Insert the actuator, pull the FPC at the speed rate of 25+3/-3mm per minute.	第6項参照 Refer to paragraph 6
4-2-2	端子保持力 Terminal/Housing Retention Force	各端子を、毎分25±3mmの速さで引張る。  Apply axial pull out force on the terminal assembled in the housing at the speed rate of 25+3/-3mm per minute.	1.0N { 0.1kgf } MINIMUM

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項目 Item	条件 Test Condition	規格 Requirement
4-2-3 金具保持力 Fitting Nail/Housing Retention Force	各金具を、毎分25±3mmの速さで引張る。 Apply axial pull out force on the fitting nail assembled in the housing at the speed rate of 25+3/-3mm per minute.	1.0N { 0.1kgf } MINIMUM

4-3. その他 Environmental Performance and Others

項目 Item	条件 Test Condition	規格 Requirement	
4-3-1 アクチュエータ 繰返し動作 Repeated Actuator Insertion / Withdrawal	無通電状態にて1分間に10回以下の速さで挿入、抜去を20回繰り返す。 insert and withdrawal actuator up to 20 cycles, at the speed rate of less than 10 cycles / minute.	接触抵抗 Contact Resistance	60 milliohm MAXIMUM
4-3-2 温度上昇 Temperature Rise	適合するFPCを嵌合させ、最大許容電流を通電し、コネクタの温度上昇分を測定する。 (UL 498) Mate applicable FPC and measure the temperature rise of contact when the maximum AC rated current is passed. (UL 498)	温度上昇 Temperature Rise	30 °C MAXIMUM
4-3-3 耐振動性 Vibration	DC 1mA通電状態にて、嵌合軸を含む互いに垂直な3方向に掃引割合10~55~10Hz/分、全振幅1.5mmの振動を各2時間加える。 (JIS C60068-2-6/MIL-STD-202試験法 201) Mate applicable FPC and subject to the following vibration conditions, for a period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1mA during the test. Amplitude : 1.5mm P-P Frequency : 10-55-10 Hz shall be traversed in 1 minute. (JIS C60068-2-6/MIL-STD-202, Method 201)	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	60 milliohm MAXIMUM
		瞬断 Discontinuity	1.0 microsecond MAXIMUM

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項 目 Item		条 件 Test Condition	規 格 Requirement	
4-3-4	耐 衝 撃 性 Mechanical Shock	DC 1mA通電状態にて、嵌合軸を含む互いに垂直な6方向に、490s <sup>2</sup> {50G}の衝撃を作業時間11millisecondで各3回加える。 (JIS C60068-2-27/MIL-STD-202 試験法 213)  Mate applicable FPC and subject to the following shock conditions. 3 times of shocks shall be applied for each 6 directions along 3 mutually perpendicular axes, passing DC 1mA current during the test. (Total of 18 shocks) Test pulse : Half Sine Peak value : 490m/s <sup>2</sup> {50G} Duration : 11 milliseconds (JIS C60068-2-27/MIL-STD-202 Method 213)	外 観 Appearance	異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM
			瞬 断 Discontinuity	1.0 microsecond MAXIMUM
4-3-5	耐 熱 性 Heat Resistance	適合するFPC嵌合させ、85±2℃の雰囲気中に96時間放置後取り出し、1～2時間室温に放置する。 ( JIS C60068-2-2/MIL-STD-202 試験法 108 )  Mate applicable FPC and expose to 85+2/-2 degree C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. ( JIS C60068-2-2/MIL-STD-202 Method 108 )	外 観 Appearance	異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM
4-3-6	耐 寒 性 Cold Resistance	適合するFPCを嵌合させ、-40±2℃の雰囲気中に96時間放置後取り出し、1～2時間室温に放置する。 ( JIS C60068-2-1 )  Mate applicable FPC and expose to -40+2/-2 degree C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. ( JIS C60068-2-1 )	外 観 Appearance	異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM

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項 目 Item		条 件 Test Condition	規 格 Requirement	
4-3-7	耐 湿 性 Humidity	<p>適合するFPCを嵌合させ、60±2°C、相対湿度90～95%の雰囲気中に96時間放置後、取り出し、1～2時間室温に放置する。 (JIS C60068-2-3/MIL-STD-202 試験法103)</p> <p>Mate applicable FPC and expose to 60+2/-2 degree C, relative humidity 90 to 95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (JIS C60068-2-3/MIL-STD-202 Method 103)</p>	外 観 Appearance	異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM
			耐 電 圧 Dielectric Strength	4-1-3項 満足のこと Must meet 4-1-3
			絶 縁 抵 抗 Insulation Resistance	20 megaohm MINIMUM
4-3-8	温 度 サ イ ク ル Temperature Cycling	<p>適合するFPCを嵌合させ、-55±3°Cに30分、+85±2°Cに30分、これを1サイクルとし、5サイクル繰り返す。但し、温度移行時間は、5分以内とする。試験後1～2時間室温に放置する。 (JIS C0025)</p> <p>Mate applicable FPC connectors and subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.</p> <p>1 cycle a) -55+3/-3 degree C 30 minutes b) +85+2/-2 degree C 30 minutes (Transit time shall be with in 5 minutes) (JIS C0025)</p>	外 観 Appearance	異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM

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項 目 Item		条 件 Test Condition	規 格 Requirement	
4-3-9	塩水噴霧 Salt Spray	<p>適合するFPCを嵌合させ、35±2℃にて、重量比5±1%の塩水を48±4時間噴霧し、試験後常温で水洗いした後、室温で乾燥させる。 ( JIS C60068-2-11/MIL-STD-202 試験法101 )</p> <p>Mate applicable FPC and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed.</p> <p>NaCl solution Concentration : 5+1/-1 % Spray time : 48±4 hours Ambient temperature : 35+2/-2 degree C ( JIS C60068-2-11/MIL-STD-202 Method 101 )</p>	外 観 Appearance	割れ、著しい腐食等 異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM
4-3-10	亜硫酸ガス SO <sub>2</sub> Gas	<p>適合するFPCを嵌合させ、40±2℃、50±5ppmの亜硫酸ガス中に24時間放置する。</p> <p>Mate applicable FPC exposed to 50+5/-5ppm SO<sub>2</sub> gas at 40+2/-2 degree C for 24 hours.</p>	接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM.
4-3-11	耐アンモニア性 NH <sub>3</sub> Gas	<p>適合するFPCを嵌合させ、濃度28%のアンモニア水を入れた容器中に40分間放置する。</p> <p>Mate applicable FPC exposed to NH<sub>3</sub> gas evaporating from 28 % for 40 minutes.</p>	接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM
4-3-12	半田付け性 Solderability	<p>端子先端より0.2mm、金具先端より0.2mmの位置まで、245±5℃の半田に3±0.5秒浸す。</p> <p>Dip soldertails into the molten solder {held at 245+3/-3 degree C} up to 0.2mm from terminal tip or fitting nail tip for 3±0.5seconds.</p>	濡 れ 性 Solder Wetting	浸漬面積の75%以上 75% of immersed area must show no voids, pin holes

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項 目 Item		条 件 Test Condition	規 格 Requirement
4-3-13	半田耐熱性 Resistance to Soldering- Heat	赤外線リフロー時 <u>INFRARED REFLOW METHOD</u>  第7項参照。 第7項の条件にて、2回リフローを行う。  See paragraph 7 Expose the specimen to the infrared reflow condition the test item 7 two times.	外観の変形及びピンなどの 著しいガタがなく、電気的性能・機 械的性能に異状なきこと  Without deformation of product shape or excessive looseness of the terminals. Electrical characteristics and mechanical characteristics shall be satisfied.
		<u>手半田時</u> <u>Soldering iron method</u>  端子先端、及び金具先端より0.2mmの位置ま で、350±10℃の半田ゴテにて5±0.5秒加熱す る。但し、異常な加圧のないこと。  Heating soldertails using a soldering iron at 350+10/-10 degree C within 0.2mm from the tip of the soldertails and fitting nail for 5+0.5/-0.5 seconds. However, without too much pressure to the terminal pin and fitting nail.	

( ) : 参考規格

Reference Standard

各項目の評価サンプルは、4-3-13のリフロー条件にて実装しております。また、半田ペーストは、無鉛半田 (Sn-3Ag-0.5Cu) を使用しています。

推奨メタルマスク厚さ: 0.12mm

推奨メタルマスク開口率: 100%

The board samples of the specification test were reflowed under the reflow profile of 4-3-13.

Cream soldering paste : Sn-3Ag-0.5Cu

Recommended metal mask thickness : 0.12mm

Recommended metal mask aperture rate : 100%

【5. 外観形状、寸法及び材質 PRODUCT SHAPE, DIMENSIONS AND MATERIALS】

図面参照 Refer to the drawing.

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## 【6. FPC保持力 FPC RETENTION FORCE】

極数 No of CIRCUIT	単位 UNIT	保持力(最小値) Retention Force (MINIMUM)
		初回 1 <sup>st</sup>
8	N {kgf}	4.30 {0.43}

\* FPCの仕様により保持力が影響を受ける為、規格を満たさない事があります。

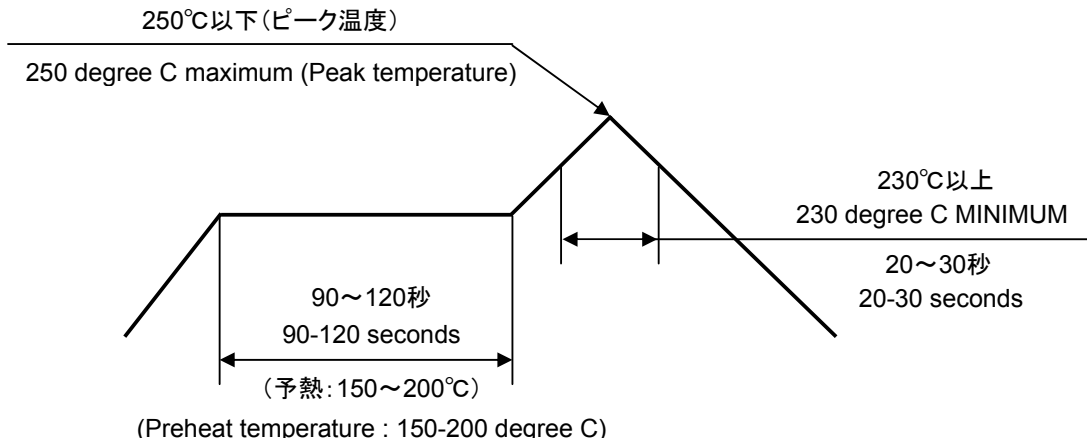
There may be the case which the connector performance does not meet the above specification, because the different FPC manufacturers have their own unique specification.

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【7. リフロー条件 REFLOW CONDITION】



温度条件グラフ  
TEMPERATURE CONDITION GRAPH  
(基板表面温度)  
(TEMPERATURE ON BOARD PATTERN SIDE)

注記: 本リフロー条件に関しては、リフロー装置及び基板などにより条件が異なります。  
事前に実装評価(リフロー評価)の御確認を御願ひ致します。

NOTE : This reflow condition may change by the actual reflow machine, p.c.boards, and so on.  
Please check soldering appearance by using your own reflow condition before production  
because there is a possibility of solder wicking.

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## 【8. 注意事項 NOTES】

8-1

製品の取扱に関しては取扱説明書がございますので、ご参照下さい。  
Please refer to the instruction manual for the details.

8-2

適合するFPCの導体部は、金めっき品を使用願います。  
Please make the conductor area of applicable FPC only gold plating.

8-3

量産前にご使用になるFPCとの相性確認を行った上で、ご使用をお願い致します。  
Please check the compatibility of FPC which you will use in your mass production.

8-4

本製品の樹脂部に黒点等が確認される場合がありますが、製品性能には影響はございません。  
Although there may be some small dark spots on this product, the product performance will not be affected.

8-5

リフロー条件によっては、樹脂部に変色が発生する場合がありますが、製品性能に影響はございません。  
There may be a case which changes housing color by depending on reflow conditions. However, it does not affect on connector performance.

8-6

リフロー条件によっては、端子めっき部よりヨリ等が発生する場合がありますが、製品性能に影響はございません。  
There may be a case which the plating surface looks wavy by depending on reflow conditions. However, it does not affect on connector performance.

8-7

本製品の成形品は、46NYLONを使用しています。保管中、運搬中の条件でリフロー時にブリストア等の不具合が生じる恐れがありますが、製品の性能に影響はございません。  
The material of mold is made by 46 NYLON. You may find the blistering during reflow because of under the condition of storage and/or transportation, however, it does not affect any product functionality

8-8

本製品の成形品に多少の傷が確認される場合がありますが、製品性能に影響はございません。  
There may be a case where some scratches are checked by the mold. However, it does not affect on connector performance.

8-9

平坦度の実装性能は、実装基板の反りの影響を含まないものと致します。  
The mounting performance of coplanarity does not include the effect in warpage of P.C. board.

8-10

実装後において手半田コテによるリペアーを行なう際は、必ず仕様書掲載の条件(4-3-13)以内で行って下さい。条件を超えて実施した場合、端子の抜け、接点ギャップの変化、モールドの変形、溶融等、破損の原因になります。  
When you need to repair the connector after reflow by using a solder iron, please perform under the conditions of this product specification (4-3-13).

8-11

本製品の一般性能確認はガラエポ基板にて実施しております。フレキシブル基板等の特殊な基板へ実装する場合は、事前に実装確認等を行った上でご使用願います。  
This connector performance was tested based on using rigid printed circuit board. Please try to check the mounting performance of connector etc. in advance when you use the special board, such as flexible printed circuit board.

8-12

弊社の推奨基板パターン寸法は、あくまでも推奨になります。  
The board layout is our sales drawing shows only recommendation.

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8-13

FPCを嵌合させる際、FPCをたわませて挿入しないで下さい。また、斜めからの挿入もしないで下さい。コンタクトの挫屈、FPC導体めくれに至るケースがあります。

When you mate the FPC into connector, please avoid to bow down the FPC and avoid to inset FPC diagonally. It may cause a contact buckling and/or evert the conductor of FPC.

8-14

アクチュエータを開く際、及び開いた後、必要以上にアクチュエータが開く方向に負荷を与えないで下さい。アクチュエータやハウジングの破損、端子変形等の原因となります。

When you open the actuator or after you open the actuator, please do not put the extra load to the direction of opening. It may cause the actuator damage, the housing damage, and/or terminal deformation.

8-15

FPCの取り回し方によって、FPCの抜け、接触不良等が発生する可能性があります。御社基板のスペース上、コネクタに負担のかかる位置への取り付けはしないで下さい。

There is a possibility of the defect in electrical continuity and/or coming off from connector when the cabling of FPC in the application is not appropriate. Please avoid the case that you may locate the FPC which put on some load on the connector by constraint because of your limited space of P.C. board.

8-16

コネクタにFPCを装着した状態で、FPCに過度の負荷が加わらないように注意して下さい。

コネクタのロックが解除されたり、FPCが断線、破損したりする原因になります。

特に、連続的に加わる場合はFPCを固定するようにして下さい。

Please avoid to put extra pressure on FPC while inserting into the connector. It may cause the connector to unlock or damage the conductor of FPC. If there is a possibility of putting constant pressure on the FPC, please fix FPC with additional engineering.

8-17

ハウジングのFPC挿入間口に多少の反りが発生する場合がありますが、電気的性能に影響はございません。

There may be a case which some warp and/or bow may occur at the FPC insertion frontage of housing. However, it does not affect on electric performance of a connector.

【9. 環境指令への適合 COMPLIANCE WITH ENVIRONMENTAL DIRECTIVE】

1. ELV及びRoHS適合品

ELV and RoHS Compliant

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