



PRODUCT SPECIFICATION



LANGUAGE

JAPANESE
ENGLISH

【 4 . 性能 PERFORMANCE 】

項目 Item		条件 Test Condition	規格 Requirement
4-1-1	接 触 抵 抗 Contact Resistance	適合FFC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 FFC, 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FFC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 FFC together and apply 500V DC between adjacent terminal and ground. (JIS C5402 5.2/MIL-STD-202 Method 302)	50 megaohm MINIMUM
4-1-3	耐 電 圧 Dielectric Strength	適合FFC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。感度電流は、2mAとする。 (JIS C5402 5.1/MIL-STD-202 試験法 301) Mate applicable FFC, apply 250V AC for 1minute between adjacent terminal or ground and trip current 2mA. (JIS C5402 5.1/MIL-STD-202 Method 301)	異状なきこと No Breakdown

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4-2. 機械的性能 Mechanical Performance

項目 Item		条件 Test Condition	規格 Requirement
4-2-1	FFC保持力 FFC Retention Force	アクチュエータ挿入状態にてFFCを毎分 25±3 mm の速さで引き抜く。 Insert the actuator, pull the FFC 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の速さで引っ張る。 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
4-2-3	GND端子保持力 Ground Terminal Retention Force	各GND端子を毎分25±3mmの速さで引っ張る。 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

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	1分間に10回以下の速さで挿入、抜去を20回繰り返す。 When insert and withdrawal up to 20 cycles repeatedly at a rate of 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FFC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 FFC 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

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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 FFC 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
4-3-4	耐 衝 撃 性 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 ² {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 FFC 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 ² {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FFCを嵌合させ、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 FFC 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

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4-3-6	耐寒性 Cold Resistance	適合するFFCを嵌合させ、 $-40\pm 2^{\circ}\text{C}$ 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 FFC 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
4-3-7	耐湿性 Humidity	適合するFFCを嵌合させ、 $60\pm 2^{\circ}\text{C}$ 、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) Mate applicable FFC 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)	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	適合するFFCを嵌合させ、 $-55\pm 3^{\circ}\text{C}$ に30分、 $+85\pm 2^{\circ}\text{C}$ 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。 Mate applicable FFC 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. 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)	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	適合するFFCを嵌合させ、 $35\pm 2^{\circ}\text{C}$ にて、重量比 $5\pm 1\%$ 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) Mate applicable FFC 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. NaCl solution Concentration : $5+1/-1\%$ Spray time : $48+4/-4$ hours Ambient temperature : $35+2/-2$ degree C (JIS C60068-2-11/MIL-STD-202 Method 101)	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 ₂ Gas	適合するFFCを嵌合させ、 $40\pm 2^{\circ}\text{C}$ 、 $50\pm 5\text{ppm}$ の亜硫酸ガス中に24時間放置する。 Mate applicable FFC exposed to $50+5/-5\text{ppm}$ SO ₂ gas at $40+2/-2$ degree C for 24 hours.	外 観 Appearance	異状なきこと No Damage
			接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM.
4-3-11	耐アンモニア性 NH ₃ Gas	適合するFFC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。 Mate applicable FFC exposed to NH ₃ gas evaporating from 28 % for 40 minutes.	接 触 抵 抗 Contact Resistance	60 milliohm MAXIMUM
4-3-12	半田付け性 Solderability	端子先端より0.2mmの位置まで $245\pm 5^{\circ}\text{C}$ の半田に2~3秒浸す。 Dip soldertails into the molten solder{held at $245+5/-5$ degree C}up to 0.2mm from the bottom of the housing for 2-3 seconds.	濡 れ 性 Solder Wetting	浸漬面積の95%以上 95% of immersed area must show no voids, pin holes

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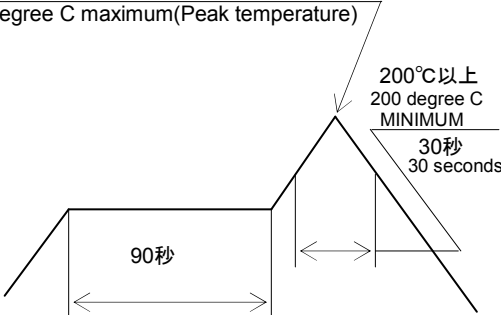


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項目 Item		条件 Test Condition	規格 Requirement	
4-3-13	半田耐熱性 Resistance to Soldering- Heat	<u>赤外線リフロー時</u> INFRARED REFLOW METHOD <u>赤外線リフロー条件</u> INFRARED REFLOW CONDITION 250℃以下（ピーク温度） 250 degree C maximum(Peak temperature)  200℃以上 200 degree C MINIMUM 30秒 30 seconds 90秒 （予熱：150℃以下） (Preheat temperature : 150 degree C MAXIMUM) <u>温度条件グラフ</u> 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等により条件が異なりますので、事前にリフロー評価の確認をお願いします。 NOTE: Please check the reflow soldering condition by your own devices beforehand. Because the condition change by the soldering devices, p.c.board, and so on.	外 観 Appearance	端子ガタ 割れ等 異状無きこと No Damage

() : 参考規格
: Reference Standard

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

図面参照 Refer to the drawing.

【6. FFC保持力 FFC RETENTION FORCE】

極数 No of CIRCUIT	単位 UNIT	保持力（最小値） Retention Force (MINIMUM)	
		初回 1 st	10回目 10 th
15	N {kgf}	2.0 {0.20}	1.5 {0.15}
24	N {kgf}	3.5 {0.35}	2.7 {0.27}
33	N {kgf}	5.0 {0.51}	4.0 {0.41}

* 上記の値は、端子接触部厚さ0.3mm、GND端子接触部厚さ0.5mmのFFCを使用した際の値になります。
The above-mentioned value is the value when FFC thickness is 0.3mm(Terminal contact part)
0.5mm(Ground Terminal contact part).

* FFC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 FFC manufacturers have their own unique specification.

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【7. 注意事項 NOTES】

7-1

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.

7-2

本製品の一般性能確認はガラエポ基板にて実施おります。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.

7-3

FFCの取り回し方によって、FFC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、コネクタに負担の掛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 FFC in the application is not appropriate. Please avoid the case that you may locate the FFC which put on some load on the connector by constraint because of your limited space of P.C. board.

7-4

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.

7-5

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以内で行なって下さい。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)

7-6

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.

7-7

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.

7-8

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.

7-9

樹脂部のウエルド部に線が確認される場合がありますが、仕様書試験条件を超える使用をしない限り、製品性能には影響はございません。
There may be a case which the line be found to weld part of housing. However, as long as use that exceeds the specifications examination condition is not done, it does not affect on connector performance.

7-10

アクチュエータの開閉は、製品が基板に実装された状態で実施願います。
Please execute the opening and closing of the actuator with the product mounted on the P.C. board .

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7-11

量産前にご使用になるFFC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 FFC which you will use in your mass production.

7-12

FFCを嵌合させる際、FFC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、FFC導体めくれに至るケースがあります。

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

7-13

コネクタにFFCを装着した状態で、FFC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、FFC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FFCを固定するようにして下さい。

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

7-14

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ください。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. 環境指令への適合 COMPLIANCE WITH ENVIRONMENTAL DIRECTIVE】

ELV及びRoHS適合品

ELV and RoHS Compliant

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A	RELEASED	'06/08/24	J2007-0388	TR.SUZUKI	H.HIRATA
B	REVISED	'07/10/19	J2008-1357	R.TSURUOKA	T.HARUYAMA
C	REVISED	'09/04/09	J2009-2240	M.TAKASAKI	M.HAYASHI

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