



## 【 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 C5402-2-1) Mate applicable FPC, measure by dry circuit, 20mV MAXIMUM, 10mA MAXIMUM. (JIS C5402-2-1)	20 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、DC 500V を印加し測定する。 (JIS C5402-3-1/MIL-STD-202 試験法 302) Mate applicable FPC together and apply 500V DC between adjacent terminal and ground. (JIS C5402-3-1/MIL-STD-202 Method 302)	50 Megohm 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、AC 250V (実効値) を 1 分間印加する。 (JIS C5402-4-1/MIL-STD-202 試験法 301) Mate applicable FPC, apply 250V AC for 1 minute between adjacent terminal or ground. (JIS C5402-4-1/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	アクチュエータ 挿抜力 Actuator Insertion/ Withdrawal Force	適合 FPC を嵌合させ、アクチュエータを毎分 25±3mm の速さで挿入、抜去を行う。 Mate applicable FPC and insert and withdraw actuator at the speed rate of 25±3mm/min.	第 6 項参照 Refer to paragraph 6
4-2-2	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 の速さで引き抜く。 Insert the actuator, pull the FPC at the speed rate of 25+3/-3mm per minute.	第 7 項参照 Refer to paragraph 7

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REVISION DESCRIPTION	REVISED	<b>0.5MM PITCH FPC CONN ZIF SMT (UPPER CONTACT) -LEAD FREE-</b>					
CHANGE NO.	758442						
REVISED BY	RAJAGN	DATE	2023/05/04	DOC TYPE	DOC TYPE DESCRIPTION	DOC PART	SERIES
REV APPR BY	YNAITO	DATE	2023/08/02	PS	ENGINEERING SPECIFICATION WORD	001	54104
INITIAL RELEASE				CUSTOMER	DOCUMENT NUMBER	REVISION	SHEET
INITIAL DRWN	ESUZUKI	DATE	2004/07/19	GENERAL	PS-54104-071	D	2 OF 10
INITIAL APPR	NUKITA	DATE	2004/07/21				

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 withdraw actuator up to 20 cycles, at the speed rate of less than 10 cycle per minute.	接触抵抗 Contact Resistance	40 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 10~55~10 Hz/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) Amplitude: 1.5mm P-P Sweep time: 10~55~10 Hz in 1 minute Duration: 2 hours in each X.Y.Z. axes (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	40 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 490m/s <sup>2</sup> {50G} の衝撃を各3回加える。(JIS C60068-2-27/MIL-STD-202 試験法 213) 490m/s <sup>2</sup> {50G}, 3 strokes in each X.Y.Z. axes. (JIS C60068-2-27/MIL-STD-202 Method 213)	外観 Appearance	異常なきこと No Damage
			接触抵抗 Contact Resistance	40 milliohm MAXIMUM
			瞬断 Discontinuity	1.0 microsecond MAXIMUM

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項目 Item		条件 Test Condition	規格 Requirement	
4-3-5	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 °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	異常なきこと No Damage
			接 触 抵 抗 Contact Resistance	40 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 °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	異常なきこと No Damage
			接 触 抵 抗 Contact Resistance	40 milliohm MAXIMUM
4-3-7	耐湿性 Humidity	適合する FPC を嵌合させ、60±2℃、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 C60068-2-78/MIL-STD-202 試験法 103)  Mate applicable FPC and expose to  60+2/-2 °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 C60068-2-78/MIL-STD-202 Method 103)	外 観 Appearance	異常なきこと No Damage
			接 触 抵 抗 Contact Resistance	40 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 megohm MINIMUM

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項目 Item		条件 Test Condition	規格 Requirement	
4-3-8	温度サイクル Temperature Cycling	<p>適合する FPC を嵌合させ、-55℃に 30 分、+85℃に 30 分、これを 1 サイクルとし、10 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 C60068-2-14)</p> <p>Mate applicable FPC connectors and subject to the following conditions for 10 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. 10 cycle of</p> <p>a) -55 °C 30 minutes b) +85 °C 30 minutes (Transit time shall be with in 5 minutes) (JIS C60068-2-14)</p>	外 観 Appearance	異常なきこと No Damage
			接 触 抵 抗 Contact Resistance	40 milliohm MAXIMUM
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 °C (JIS C60068-2-11/MIL-STD-202 Method 101)</p>	外 観 Appearance	割れ、著しい 腐食等 異常なきこと No Damage
			接 触 抵 抗 Contact Resistance	40 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。 Mate applicable FPC exposed to 50+5/-5ppm SO<sub>2</sub> gas at 40+2/-2 °C for 24 hours.</p>	外 観 Appearance	異常なきこと No Damage
			接 触 抵 抗 Contact Resistance	40 milliohm MAXIMUM.

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項目 Item		条件 Test Condition	規格 Requirement	
4-3-11	耐アンモニア性 NH <sub>3</sub> Gas	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。 Mate applicable FPC exposed to NH <sub>3</sub> gas evaporating from 28 % for 40 minutes.	接触抵抗 Contact Resistance	40 milliohm MAXIMUM
4-3-12	半田付け性 Solderability	端子先端より 0.2mm、金具先端より 0.2mm の位置まで、245±3°C の半田に 3±0.5 秒浸す。 Soldering Time: 3±0.5second Solder Temperature: 245±3°C 0.2mm from terminal tip 0.2mm from fitting nail tip	濡れ性 Solder Wetting	浸漬面積の 90%以上 90% of immersed area must show no voids, pin holes
4-3-13	半田耐熱性 Resistance to Soldering Heat	(リフロー時) 第 8 項の条件を 2 回繰り返す。 (When reflowing) Repeat paragraph 8,condition two times..	外観 Appearance	端子ガタ、割れ等 異常なきこと No Damage
		(手半田時) 端子先端より 0.2mm、金具先端より 0.2mm の位置まで、370～400°C の半田ゴテにて最大 5 秒加熱後。 Solder Time: 5 second MAX. Solder Temperature: 370～400°C 0.2mm from terminal tip 0.2mm from fitting nail tip		

( ) : 参考規格 Reference Standard

{ } : 参考単位 Reference Unit

**【 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. アクチュエータ挿抜力 ACTUATOR INSERTION/WITHDRAWAL FORCE】

極数 No. of CIRCUIT	単位 UNIT	挿入力（最大値） INSERTION FORCE (MAXIMUM)			抜去力（最大値） WITHDRAWAL FORCE (MAXIMUM)		
		初回 1st	6回目 6th	20回目 20th	初回 1st	6回目 6th	20回目 20th
30	N {kgf}	53.9 {5.5}	51.9 {5.3}	51.9 {5.3}	62.7 {6.4}	58.8 {6.0}	58.8 {6.0}
32	N {kgf}	55.8 {5.7}	53.9 {5.5}	53.9 {5.5}	64.6 {6.6}	60.7 {6.2}	60.7 {6.2}
33	N {kgf}	56.8 {5.8}	54.8 {5.6}	54.8 {5.6}	65.6 {6.7}	61.7 {6.3}	61.7 {6.3}
34	N {kgf}	57.8 {5.9}	55.8 {5.7}	55.8 {5.7}	66.6 {6.8}	62.7 {6.4}	62.7 {6.4}
35	N {kgf}	58.8 {6.0}	56.8 {5.8}	56.8 {5.8}	67.6 {6.9}	63.7 {6.5}	63.7 {6.5}
36	N {kgf}	59.7 {6.1}	57.8 {5.9}	57.8 {5.9}	68.6 {7.0}	64.6 {6.6}	64.6 {6.6}
38	N {kgf}	61.7 {6.3}	59.7 {6.1}	59.7 {6.1}	70.5 {7.2}	66.6 {6.8}	66.6 {6.8}
40	N {kgf}	63.7 {6.5}	61.7 {6.3}	61.7 {6.3}	72.5 {7.4}	68.6 {7.0}	68.6 {7.0}
43	N {kgf}	66.6 {6.8}	64.6 {6.6}	64.6 {6.6}	75.4 {7.7}	71.5 {7.3}	71.5 {7.3}
44	N {kgf}	67.6 {6.9}	65.6 {6.7}	65.6 {6.7}	76.4 {7.8}	72.5 {7.4}	72.5 {7.4}
45	N {kgf}	68.6 {7.0}	66.6 {6.8}	66.6 {6.8}	77.4 {7.9}	73.5 {7.5}	73.5 {7.5}
46	N {kgf}	69.6 {7.1}	67.6 {6.9}	67.6 {6.9}	78.4 {8.0}	74.5 {7.6}	74.5 {7.6}
50	N {kgf}	73.5 {7.5}	71.5 {7.3}	71.5 {7.3}	82.3 {8.4}	78.4 {8.0}	78.4 {8.0}

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【 7 . FPC 保持力 FPC RETENTION FORCE】

極数 No. of CIRCUIT	単位 UNIT	保持力 (最小値) RETENTION FORCE (MINIMUM)		極数 No. of CIRCUIT	単位 UNIT	保持力 (最小値) RETENTION FORCE (MINIMUM)	
		初回 1st	10回目 10th			初回 1st	10回目 10th
30	N {kgf}	5.4 {0.55}	4.9 {0.50}	38	N {kgf}	9.4 {0.95}	8.9 {0.90}
32	N {kgf}	6.4 {0.65}	5.8 {0.60}	40	N {kgf}	10.3 {1.05}	9.8 {1.00}
33	N {kgf}	6.9 {0.70}	6.4 {0.65}	43	N {kgf}	11.8 {1.20}	11.3 {1.15}
34	N {kgf}	7.4 {0.75}	6.9 {0.70}	44	N {kgf}	12.3 {1.25}	11.8 {1.20}
35	N {kgf}	7.9 {0.80}	7.4 {0.75}	45	N {kgf}	12.7 {1.30}	12.2 {1.25}
36	N {kgf}	8.4 {0.85}	7.9 {0.80}	46	N {kgf}	13.2 {1.35}	12.7 {1.30}
				50	N {kgf}	15.2 {1.55}	14.7 {1.50}

(注 : FPC 保持力は基板に付いた状態に適用する。)

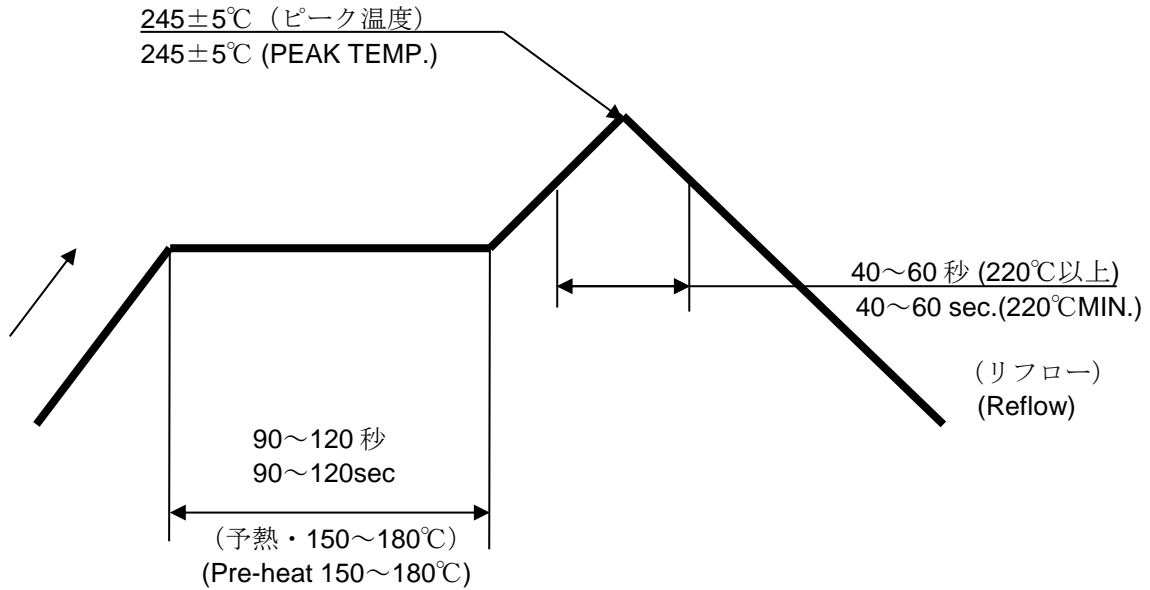
(NOTE : FPC RETENTION FORCE is applied in the state soldered with printed circuit board.)

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【 8. 赤外リフロー条件 INFRARED REFLOW CONDITION】



温度条件グラフ

(温度は基板パターン面)

TEMPERATURE CONDITION GRAPH  
(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ので、事前にリフロー評価の確認をお願い致します。また吸湿などの前処理は行わないで下さい。

NOTE; Please check the reflow soldering condition by your own devices beforehand. Because the condition changes by the soldering devices,p.c.boards,and so on. No moistuer treatment before reflow process.

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