


NUMBER <b>GS-12-340</b>	TYPE <b>製品規格 PRODUCT SPECIFICATION</b>		
TITLE 0.5mmピッチ FPC 用 SMT タイプコネクタ「10051922 (VLL)シリーズ」 0.5mm pitch SMT type connector for FPC " 10051922 (VLL)Series"		PAGE 1 of 10	REVISION E
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### 1. 適用範囲

#### 1. Scope

本規格は、弊社コネクタ 0.5mmピッチ FPC 用 SMT タイプコネクタ「10051922(VLL)シリーズ」に適用し、同コネクタの性能及び評価条件について規定する。

尚、本コネクタの相手側には、弊社推奨適用導体 (FPC) を用いて下記評価を行うこととする。

This specification is intended to cover the performance and evaluation conditions for "10051922 (VLL)series".

In addition, this connector must perform the following evaluation using the recommendation application conductor (FPC).

### 2. 適用製品

#### 2. Application product

TITLE	P/N
0.5mmピッチFPC用SMTタイプコネクタ「10051922(VLL)シリーズ」	10051922- **10E(H)LF
0.5mm pitch SMT type connector for FPC " 10051922(VLL) Series"	

### 3. 形状、材質、表面処理

#### 3. Shape, Material, and Finis

形状詳細は各製品図面参照。

Shape details are each referring to the drawings.

部品名 Part name	材質 Material	表面処理 Finish	備考 Note
ハウジング Housing	ガラス繊維入りLCP樹脂 Glass filled LCP	—	UL94V-0、 色：乳白色 Color : Natural
アクチュエーター Actuator (Non-Halogen free)	ガラス繊維入りポリアミド9T Glass filled 9TPA	—	UL94V-0、 色：黒 Color : Black
アクチュエーター Actuator (Halogen free)	ガラス繊維入りLCP樹脂 Glass filled LCP	—	UL94V-0、 色：乳白色 Color : Natural
コンタクト Contact	銅合金 Copper alloy	金めっき 0.05μm以上 (下地：ニッケルめっき 1μm以上) Au 0.05μm MIN. (Nickel underplate overall)	—
補強金具 Fitting nail	銅合金 Copper alloy	すずめっき 1.5μm以上 (下地：ニッケルめっき 1μm以上) Tin 1.5μm MIN. (Nickel underplate overall)	—
エンボステーブ Emboss tape	ポリエチレンテレフタレート PET	—	JIS C 0806 準拠 電子部品のテーピング (表面実装部品) JIS C 0806 Conformity
カバーテーブ Cover tape	ポリエステル Polyester	—	JIS C 0806 準拠 電子部品のテーピング (表面実装部品) JIS C 0806 Conformity
梱包用リール Reel (for packaging)	ポリスチレン Polystyrene	—	JIS C 0806 準拠 電子部品のテーピング (表面実装部品) JIS C 0806 Conformity

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#### 4. 推奨基板パターン及び適用導体 (FPC)

#### 4. Recommendation PCB pattern and Application conductor (FPC)

各製品図面参照。

Refer to each drawings.

#### 5. 性能

#### 5. Operating requirements

5.1. 定格電圧 : AC/DC 50V

5.1. Rating voltage : AC/DC 50V

5.2. 定格電流 : AC/DC 0.5A

5.2. Rating current : AC/DC 0.5A

5.3. 使用温度範囲 :  $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$  (通電による温度上昇分を含む)

5.3. Operating temperature range :  $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$  (Including temperature rise caused by application of current.)

#### 5.4. 諸性能

特に指定した条件の無い限り、以下に示す環境条件 (IEC Publication 68) で、7 項、表 2 の順序にて試験を行った時、表 1 に示す規格を全て満足すること。

常 温 :  $15 \sim 35^{\circ}\text{C}$  (判定に疑義を生じた場合  $20 \pm 1^{\circ}\text{C}$ )

常 湿 :  $25 \sim 85\% \text{Rh.}$  (判定に疑義を生じた場合  $63 \sim 67\% \text{Rh.}$ )

常気圧 :  $86 \sim 106 \text{Kpa}$

#### 5.4. Performance of various

Unless otherwise specified, when tested the ambient conditions in accordance with IEC Publication 68 as described below and evaluated with the sequence listed in Table 1, the connector shall meet the requirements.

Temperature :  $15 \sim 35^{\circ}\text{C}$

Relative humidity :  $25 \sim 85\% \text{Rh.}$

Atmospheric pressure :  $86 \sim 106 \text{Kpa}$

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表1. 諸性能  
Table 1. Performance of various

項目 Para.		規格 Requirements	試験方法 Condition
電気的性能 Electrical Requirements	接触抵抗 L.L.C.R	初期値 : 30 mΩ 以下 試験後 : Δ 20 mΩ 以下 Initial : 30 mΩ Max. Final : Δ 20 mΩ Max.	6.1.
	絶縁抵抗 Insulation resistance	初期値 : 100 MΩ 以上 ( DC 500 V 使用時 ) 試験後 : 100 MΩ 以上 ( DC 500 V 使用時 ) Initial : 100MΩ Final : 100MΩ	6.2.
	耐電圧 Dielectric Withstanding Voltage	外観の異常、短絡、絶縁破壊の無いこと。(漏れ電流2mA以下) No evidence of arc-over or insulation breakdown. (Current leakage : 2mA Max.)	6.3.
耐環境特性 Environmental Requirements	高温高湿放置(定常状態) Humidity (steady state)	割れ、膨れ等の機能を損なう欠陥の無いこと。 試験後の接触抵抗 : Δ 20 mΩ 以下 試験後の絶縁抵抗 : 100MΩ 以上 試験後の耐電圧 : 外観の異常、短絡、絶縁破壊の無いこと。 L.L.C.R : Final : Δ 20 mΩ Max., Insulation resistance Final : 100MΩ	6.4.
	高温放置 High temperature	割れ、膨れ等の機能を損なう欠陥の無いこと。 試験後の接触抵抗 : Δ 20 mΩ 以下	6.5.
	熱衝撃 Thermal Shock	No evidence of cracking, swelling or other damage. L.L.C.R : Final : Δ 20 mΩ Max.	6.6.
	塩水噴霧 Salt splay		6.7.
機械的性能 Mechanical Requirements	振動 Vibration (Low Frequency)	試験中に、部品のゆるみ、破損、1μ秒以上の瞬断が無いこと。 試験後の接触抵抗 : Δ 20 mΩ 以下 No evidence of physical or mechanical damage, or disassociation of parts, and no electrical discontinuity greater than 1 μ sec. shall occur.	6.8.
	衝撃 Physical Shock	L.L.C.R : Final : Δ 20 mΩ Max.	6.9.
	耐久性 Durability	試験後の接触抵抗 : Δ 20 mΩ 以下 There shall be no defect which spoils a function. The contact resistance shall not exceed Δ 20 mΩ	6.10.
	リフローはんだ耐熱性 Resistance to Reflow Soldering Heat	外観上、機能を損なう欠陥の無いこと There shall be no defect which spoils a function.	6.11.
	はんだ付け性 Solderability	はんだぬれ面積 90%以上 Solder wetting area shall be 90% minimum.	6.12.

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## 6. 試験方法

### 6. Test method

#### 6.1. 接触抵抗

接触抵抗は、図 1 に示すようにコネクタへ適用導体を挿入した状態で、試験電流 100mA 以下、試験電圧 DC 20mV 以下の回路条件にて測定する。(IEC 512-2、Test 2a 準拠)  
尚、測定値にはコンタクトと適用導体の導体抵抗の一部を含む。

#### 6.1. Contact resistance

The contact resistance shall not be exceed 30 mΩ before test or Δ20 mΩ after test when measured under the following conditions : (IEC 512-2, Test 2a conformity)

- (a) Method of connection : See Fig 1.
- (b) Test current : 100 mA DC
- (c) Open circuit voltage : 20 mV DC

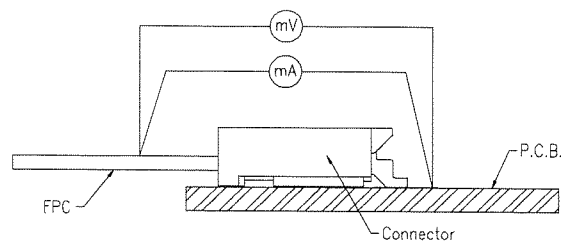


Fig 1. Test method of contact resistance

#### 6.2. 絶縁抵抗

コネクタ単体 (基板未実装状態) にて、隣接するコンタクト相互間に DC 500V を 1 分間印加した後に測定する。(IEC 512-2、Test 3a 準拠)

#### 6.2. Insulation resistance

The insulation resistance of the unmated connector shall be not less than 100 MΩ before test when measured accordance with IEC 512-2, Test 3a.

The following details shall apply :

- (a) Test Voltage : 500 V DC for 1 minute
- (b) Special Preparation : The connector shall not be mounted on PCB.
- (c) Points of Measurement : Between adjacent terminal

#### 6.3. 耐電圧

コネクタ単体 (基板未実装状態) にて、隣接するコンタクト相互間に AC 200V を 1 分間印加した後に測定する。(IEC 512-2、Test 4a 準拠)

#### 6.3. Dielectric Withstanding Voltage

There shall be no evidence of arc-over or insulation breakdown when the unmated connector is tested in accordance with IEC 512-2, Test 4a.

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The following details shall apply:

- (a) Test Voltage : 200V AC for 1 minute
- (b) Special Preparation : The connector shall not be mounted on PCB.
- (c) Points of Measurement : Between adjacent terminal

#### 6.4. 高温高湿放置(定常状態)

コネクタに適用導体を挿入した状態で、温度 40±2°C、相対湿度 90～95% の雰囲気中に 48 時間放置する。尚、測定は試験後 1 時間室温中に放置してから行う。(IEC Pub 68-2-3 準拠)

#### 6.4. Humidity

There shall be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector after the mated connector is exposed to a high humidity ambience in accordance with IEC Pub 68-2-3.

The contact resistance shall not exceed  $\Delta 20$  m $\Omega$ , and insulation resistance shall be not less than 100 M $\Omega$ .

The following details shall apply:

- (a) Ambient Temperature : 40 ± 2 °C
- (b) Relative Humidity : 90 to 95 %
- (c) Duration : 48 hours

#### 6.5. 高温放置

コネクタに適用導体を挿入した状態で、温度 85±2°C の雰囲気中に 48 時間放置する。(IEC Pub 68-2-2 準拠)

#### 6.5. High temperature

There shall be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector. The contact resistance shall not exceed  $\Delta 20$  m $\Omega$  after the mated connector is exposed to a high temperature environment in accordance with IEC Pub 68-2-2.

The following details shall apply:

- (a) Ambient Temperature : 85 ± 2 °C
- (b) Duration : 48 hours

#### 6.6. 熱衝撃

コネクタに適用導体を挿入した状態で、-55±3°C/30 分、常温/2～3 分、+85±2°C/30 分の環境サイクルに 5 サイクル暴露する。(IEC Pub 68-2-14 準拠)

#### 6.6. Thermal Shock

There shall be no evidence of cracking, swelling or other damage which would be detrimental to the function of the connector after the mated connector is exposed to alternate cycles of extreme high and low temperature in accordance with IEC Pub 68-2-14. The contact resistance shall not exceed  $\Delta 20$  m $\Omega$ .

The following details shall apply:

- (a) Temperature range : -55±0.3 °C for 30 minutes followed by  
+85 ±0.3 for 30 minutes.
- (b) Number of cycle : 5 cycle

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#### 6.7. 塩水噴霧

コネクタに適用導体を挿入した状態で、温度 35±2°C、塩水濃度 5±1% 噴霧中の試験槽内に 48 時間放置する。

尚、測定は流水中で軽く洗浄し、塩の沈着を取り除き、24 時間室温中に放置・自然乾燥した後に行う。  
(IEC Pub 68-2-11 準拠)

#### 6.7. Salt splay

There shall be no evidence of cracking, swelling or oxidation which would be detrimental to the function of the connector. The contact resistance shall not exceed  $\Delta 20 \text{ m}\Omega$  after the mated connector is exposed to a salt fog ambience in accordance with IEC Pub 68-2-11.

The following details shall apply :

- (a) Salt Solution : 5±1% by weight
- (b) Ambient Temperature : 35±2
- (c) Duration : 48 hours
- (d) Special Treatment : The measurement shall be conducted after the mated connector is mildly rinsed in running water to remove deposition of salt, followed by natural drying by placing it for 24 hours at room temperature.

#### 6.8. 振動

コネクタに適用導体を挿入した状態で、専用の振動試験治具に取り付け、0.1A を通電した状態で X, Y, Z 方向に各 2 時間(計 6 時間)、周波数範囲 10~55Hz、振幅 1.5mm の掃引振動を加える。  
(IEC Pub 68-2-6 準拠)

#### 6.8. Vibration

There shall be no evidence of physical or mechanical damage, or disassociation of parts, and no evidence of discontinuity greater than 1 microsecond when the mated connector is subjected to mechanical vibration.

The contact resistance shall not exceed  $\Delta 20 \text{ m}\Omega$  after the test. The test shall be in accordance with IEC Pub 68-2-6.

The following details shall apply :

- (a) Frequency : 10 to 50Hz, sweep vibration
- (b) Amplitude : 1.5 mm MAX.
- (c) Test Current : 0.1 A
- (d) Duration : 2 hours in each direction along 3 orthogonal axes ( 6 hours total )

#### 6.9. 衝撃

コネクタに適用導体を挿入した状態で、専用の衝撃試験治具に取り付け 0.1A を通電した状態で、加速度  $490 \text{ m/s}^2$  (50G)、作用時間 11msec.、正弦半波、3 方向各 6 回(計 18 回)の衝撃を加える。  
(IEC Pub 68-2-27 準拠)

#### 6.9. Shock

There shall be no evidence of physical or mechanical damage, or disassociation of parts, and no evidence of discontinuity greater than 1 microsecond when the mated connector is subjected to mechanical shock. The contact resistance shall not exceed  $\Delta 20 \text{ m}\Omega$  after the test. The test shall be in accordance with IEC Pub 68-2-27.

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The following details shall apply :

- (a) Test condition : 490m/s<sup>2</sup> (50 G), 11 ms, half sin wave
- (b) Number of Shock : 6 shocks along each of three perpendicular axes 18 total.
- (c) Test Current : 0.1 A

6.10. 耐久性

コネクタと適用導体の組み合わせにおいて、規定の操作方法による挿抜を 20 回繰り返す。

6.10. Durability

After 20 mating cycles, contact resistance shall not exceed Δ20 mΩ.

6.11. はんだ耐熱性

リフロー炉を 予備加熱 150~190°C/60~120 秒、はんだ付け 230°C以上/30~40 秒の条件に設定した後、基板へはんだ付けを行う。(図 2.リフロープロファイル参照)  
但し、設定温度はコンタクトはんだ付け部の温度とし、基板上のピーク温度は 260°C以下とする。

6.11. Solder Heat Resistance (IR Reflow)

There shall be no defect which spoils a function under the following conditions. (Refer to Fig.2)

- (a) Pre-Heat Temperature : 150~190 Deg C
- (b) Pre-Heat Duration : 60 ~ 120 seconds
- (c) Soldering Temperature : 230 Deg C MIN
- (d) Soldering Duration : 30 ~ 40 seconds.
- (e) Peak temperature : 260Deg C. Max

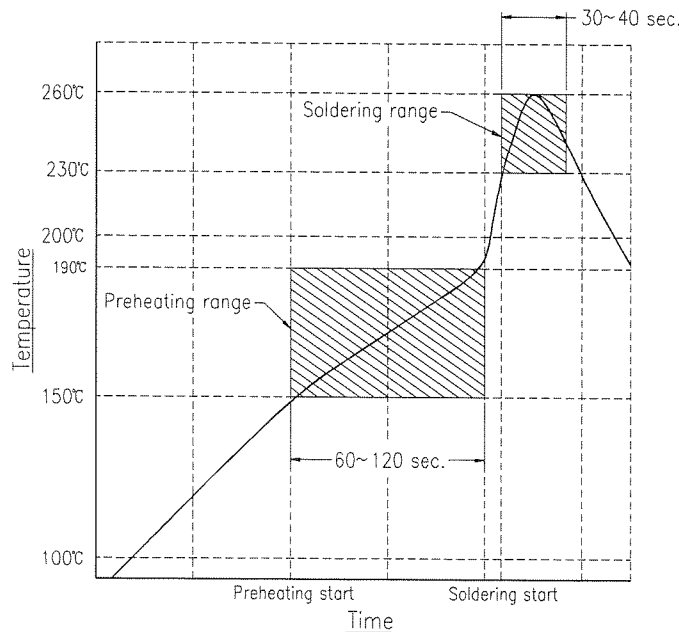


図 2.推奨リフロー温度プロファイル  
Fig.2 Recommendation reflow temperature profile

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6.12. はんだ付け性

コンタクトはんだ付け部を弱活性ロジン系フラックスに浸漬後、はんだ浴温度 235±5°C、浸漬時間 2±0.5 秒の条件ではんだ付けする。

6.12. Solderability

After soldering contact by being immersed in the weak activity rosin system flux, solder wetting area shall be 90% minimum.

The following details shall apply :

- (a) Solder temperature : 235±5°C
- (b) Immersing time : 2±0.5 seconds.

7. 試験順序

7. Test sequence

試験の順序は、表 2 に示す。

Test sequence is shown in Table 2.

8. 注記事項

8. Notice

本製品をご使用の際には、該当の Application specification を必ず一読して下さい

Please be sure to look through application specification of relevance in the case of use of this product.

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表2. 試験順序  
Table2. Test sequence

No.	試験項目	試験グループ									試験方法
		1	2	3	4	5	6	7	8	9	
1	接触抵抗 L.L.C.R		① ③	① ③	① ③	① ③		① ③	① ③		6.1.
2	絶縁抵抗 Insulation resistance	① ④									6.2.
3	耐電圧 Dielectric withstanding voltage	② ⑤									6.3.
4	高温高湿放置 Humidity	③									6.4.
5	高温放置 High temperature		②								6.5.
6	熱衝撃 Thermal shock			②							6.6.
7	塩水噴霧 Salt spray				②						6.7.
8	振動 Vibration					②					6.8.
9	衝撃 Shock						②				6.9.
10	耐久性 Durability							②			6.10.
11	リフローはんだ耐熱性 Solder Heat Resistance								①		6.11.
12	はんだ付け性 Solderability									①	6.12.

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B	ALL	REVISED	J 06-0172	4/24/'06
C	ALL	REVISED	J 06-0336	8/23/'06
D	ALL	REVISED	J 09-0016	2009/1/14
E	ALL	REVISED	J10-0171	2010/6/23

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