

【1. 適用範囲 SCOPE】

本仕様書は、 micro SD カードコネクタ について規定する。
This specification covers the micro SD CARD CONNECTOR series

【2. 製品名称及び型番 PRODUCT NAME AND PART NUMBER】

| 製品名称 Product Name | 製品型番 Part Number |
|-----------------------------|------------------|
| カードコネクタ CARD CONNECTOR | 504077-1811 |
| エンボス梱包品 Embossed Package | 504077-1891 |

【3. 定格 RATINGS】

| 項目 Item | 規格 Standard | |
|----------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|
| 最大許容電圧 Rated Voltage (MAX.) | 10 V | [AC(実効値 rms) / DC] |
| 最大許容電流 Rated Current (MAX.) | 0.5 A | |
| 使用温度範囲 Ambient temperature Range (Operating and Non-operating) | -40°C ~ +85°C *1 | |
| 保管条件 Storage Condition | 温度 Temperature | 0°C ~ +50°C |
| | 湿度 Humidity | 85%R.H. 以下(但し結露しないこと)*2 85%R.H. MAX. (No condensation) |
| | 期間 Term | 出荷後6ヶ月(未開封の場合) *3*4 For 6 months after shipment.(Under packed) |

- *1 : 通電による温度上昇分も含む。
Including terminal temperature rise.
- *2 : 保存環境は、塵埃の多い所、腐食性ガスが発生する場所及び結露は避けること。
Storage area is to be free of dust,corrosive gases and dew formation.
- *3 : 開封から実装までの許容期間は2週間以内とする。
Permissible period from opening to mounting is made within two weeks.
- *4 : 保管期限経過後は半田付け性を確認の上ご使用ください。
Please use solderability after comfirmation afterward after a term of storage passed.

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| B | 新規作成 REVISED | micro SD CARD CONN. PUSH/PULL H=1.28 WITH DETECT SW | | | | 製品仕様書 | |
| | 2012/12/27 M.YAMANAKA | THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | | | | |
| REV. | DESCRIPTION | WRITTEN BY: | CHECKED BY: | APPROVED BY: | DATE: YR/MO/DAY | | |
| J | | MYAMANAKA | M.TOMITA | YO.ITO | 2012/01/31 | | |

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【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 | ダミーカード ^{*1} 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 dummy card, measure by dry circuit, 20mV MAXIMUM, 10mA MAXIMUM. (JIS C5402 5.4) | 100 milliohms MAXIMUM |
| 4-1-2 | 絶縁抵抗 Insulation Resistance | 隣接するピン間及びピン、アース間にDC 500Vを印加し測定する。 (JIS C5402 5.2/MIL-STD-202 試験法 302) Apply 500V DC between adjacent pins or pin and ground. (JIS C5402 5.2/MIL-STD-202 Method 302) | 1000 Megohms MINIMUM |
| 4-1-3 | 耐電圧 Dielectric Strength | 隣接するピン間及びピン、アース間に、AC 500V (実効値)を1分間印加する。 (JIS C5402 5.1/MIL-STD-202 試験法 301) Apply 500V AC for 1 minute between adjacent terminals and ground. (JIS C5402 5.1/MIL-STD-202 Method 301) | 異常なきこと No Breakdown |

*1 ダミーカードとは、当社製の、端子カードパッド間の接触抵抗測定が可能な評価用カードを示す。
The dummy card shows the card for the evaluation made of our company, and makes possible to measure contact resistance.
また、本ダミーカード寸法は、“microSD Memory Card Specification”に準拠する。
The size of dummy card is based upon “microSD Memory Card Specification”.

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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 | 挿入力及び抜去力 Card Insertion / Removal Force | 毎分 25±3 mmの速さで実物カード*2を押す。 Push the actually card at the speed rate of 25±3 mm / minute. | ロック荷重 Lock force | 15N (1.5 kgf) MAXIMUM |
| | | | ロック 解除荷重 Lock release force | 1~ 10N (0.1~ 1kgf) |

*2 実物カードとは、市販品と同等のmicro SD カードを示す。 Actual card is micro SD card.

4-3. その他 Environmental Performance and Others

| 項目 Item | | 条件 Test Condition | 規格 Requirement | |
|------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------|
| 4-3-1 | 繰り返し挿抜 Durability (Life Cycle) | 実物カード*4にて、1分間に4~10回の速さで、挿入・抜去を10000回繰り返す。 10回毎に、エアブローを行う（乾燥風）。 Mating actual card*4 at 4-10 cycles/minute, including pause between mate/unmate to 10000 cycles. After every 10 cycles blow with dry air. | 外観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms MAXIMUM ダミーカードで測定 With the dummy card |
| 4-3-2 | 温度上昇 Temperature Rise | 最大許容電流(0.5A)を通電し、コネクタの 温度上昇分を測定する。 (UL 498) Carrying rated current load. (UL 498) | 温度上昇 Temperature Rise | 30 °C MAXIMUM |

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| 項 目 Item | | 条 件 Test Condition | 規 格 Requirement | |
|-------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| 4-3-3 | 耐振動性 Vibration | ダミーカードを嵌合させ、DC 1mA 通電状態にて、嵌合軸を含む互いに垂直な3方向に周波数10~55~10 Hz / 分、全振幅1.52mmの振動を各2時間加える。 (MIL-STD-202試験法 201) Mate dummy card and subject to the following vibration conditions, for a period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1 mA during the test. Amplitude: 1.52 mm P-P Frequency: 10-55-10 Hz Shall be traversed in 1 minute. (MIL STD-202 Method 201) | 外 観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms MAXIMUM |
| | | | 瞬 断 Discontinuity | 1.0 microsecond MAXIMUM |
| 4-3-4 | 耐 衝 撃 性 Shock | ダミーカードを嵌合させ、DC 1mA 通電状態にて、嵌合軸を含む互いに垂直な6方向に490 m/s ² (50G) の衝撃を各3回加える。 (JIS C60068-2-27 / MIL-STD-202 試験法 213) Mate dummy card and subject to the following shock conditions. 3 shocks shall be applied 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 Duration: 11 ms (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 | 変化量 Change 40 milliohms MAXIMUM |
| | | | 瞬 断 Discontinuity | 1.0 microsecond MAXIMUM |
| 4-3-5 | 耐湿性 Humidity | ダミーカードを嵌合させ +40±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。 Mate dummy card and subject to the conditions of +40±2°C, relative humidity 90-95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditions at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. | 外観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms MAXIMUM |

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| 項 目 Item | | 条 件 Test Condition | 規 格 Requirement | |
|-------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------|
| 4-3-6 | 温湿度サイクル Moisture resistance | <p>ダミーカードを嵌合させ、第7項に示す条件にて9サイクル行い、10サイクル目は段階6迄の試験を行う。但し、段階7aは初めの9サイクルのうち任意の5サイクルについて行う。試験後、室温に24時間放置する。 (MIL-STD-202 試験法 106)</p> <p>Mate dummy card and subject to the conditions specified on paragraph [7] for 9 cycles. The test specimens shall be exposed to STEP 7a during only 5 out of 9 cycles. A 10th cycles consisting of only step 1 through 6 is then performed, after which the test specimens shall be conditioned at ambient room conditions of 24 hours. (MIL-STD-202 Method 106)</p> | 外 観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms 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 | 100 Megohms MINIMUM |
| 4-3-7 | 温度サイクル Temperature cycling | <p>ダミーカードを嵌合させ、-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3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 dummy card 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°C . . . 30 minutes b) +85±2°C . . . 30 minutes</p> <p>Transit time shall be within 3 minutes. (JIS C0025)</p> | 外 観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms MAXIMUM |

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| 項 目 Item | | 条 件 Test Condition | 規 格 Requirement | |
|-------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| 4-3-8 | 耐熱性 Heat Resistance | ダミーカードを嵌合させ、85±2°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 C60068-2-2 / MIL-STD-202 試験方法108) Mate dummy card and exposed to 85±2°C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditions 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 | 変化量 Change 40 milliohms MAXIMUM |
| 4-3-9 | 耐寒性 Cold Resistance | ダミーカードを嵌合させ、-40±2°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 dummy card and exposed to -40±2°C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditions 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 | 変化量 Change 40 milliohms MAXIMUM |
| 4-3-10 | 硫化水素ガス H ₂ S Gas | ダミーカードを嵌合させ、40±2°C、相対湿度75%にて3±1ppmの亜硫酸ガス中に24時間放置する。 Mate dummy card and expose to 3±1 ppm H ₂ S gas, ambient temperature 40±2°C, relative humidity 75% for 24 hours. | 外 観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms MAXIMUM |

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| 項 目 Item | | 条 件 Test Condition | 規 格 Requirement | |
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| 4-3-11 | 塩水噴霧 Salt Spray | ダミーカードを嵌合させ、+35±2°Cにて5±1%重量比の塩水を48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。 (MIL-STD-1344) Mate dummy card and exposed 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% Spray time: 48 hours Ambient temperature: +35±2°C (MIL-STD-1344) | 外 観 Appearance | 異常なきこと No Damage |
| | | | 接触抵抗 Contact Resistance | 変化量 Change 40 milliohms MAXIMUM |
| 4-3-12 | 半田付け性 Solderability | 端子先端より0.5mmの位置まで250±5°Cの半田に3±0.5秒浸す。 (使用半田 : M705-221BM5-42-11 Sn-96.5/Ag-3.0/Cu-0.5) Dip solder tails into the molten solder (held at 250±5°C) up to 0.5mm from the tip of tails for 3±0.5 sec. (Type of solder used : M705-221BM5-42-11 Sn-96.5/Ag-3.0/Cu-0.5) | 濡れ性 Solder Wetting | 浸漬面積の 90%以上 90% of immersed area must show no voids, Pinholes |

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| 4-3-13 | <p>半田耐熱性 Resistance to soldering heat</p> | <p><リフロー条件> 第6項条件を2回繰り返す。 (When reflowing) Repeat Paragraph6,Condition two times.</p> <p><手半田> こて先温度を350±5℃とし、5±0.5秒ではんだ付けする。 (Solder iron method) Solder temperature :350±5℃ Immersion time: 5±0.5 sec.</p> <p>但し、端子に異常のないこと。 However, excessive pressure shall not be applied to the terminal.</p> | <p>外 観 Appearance</p> | <p>端子ガタ、割れ等 異常なきこと No Damage</p> |
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(): 参考規格 Reference Standard
{ }: 参考単位 Reference Unit

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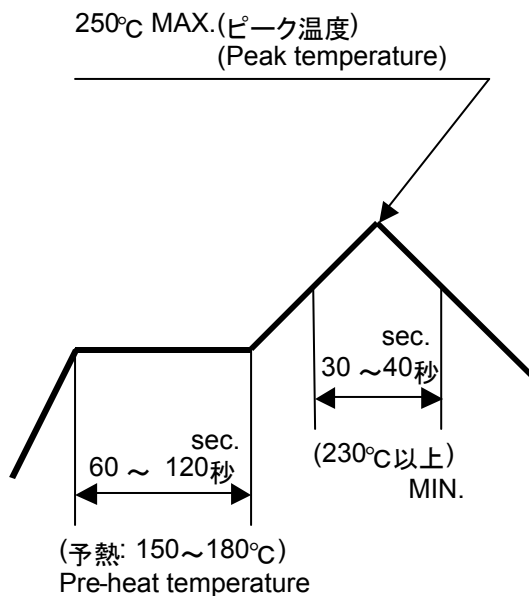
【5. 外観形状、寸法及び材質 PRODUCT SHAPE, DIMENSIONS AND MATERIALS】

図面参照

Refer to the drawing.

【6.リフロー条件 REFLOW CONDITION】

温度条件グラフ
TEMPERATURE CONDITION GRAPH



注記

NOTES

- 1.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)の御確認を御願い致します。

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.

- 2.温度条件は、半田接合部とする。

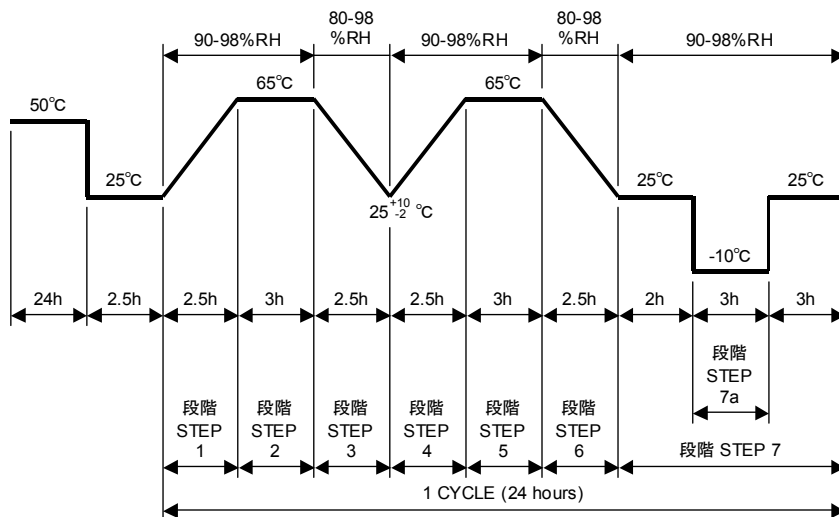
Let temperature conditions be the solder joint of connector.

推奨メタルマスク厚さ : t=0.1mm
Thickness of METAL MASK

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【7. 温湿度サイクル試験条件 MOISTURE RESISTANCE CINDITION】

MIL-STD-202 試験法106
MIL-STD-202 Method 106



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【8. 使用上の注意事項 APPLICATION NOTES】

8-1. カード抜け防止

Card omission prevention

本品にはカード抜け防止用の簡易ロックを設けていますが、カードを嵌合した状態で落下させたり、衝撃を加えるとカードが抜けてきます。従って、筐体にカード抜け防止用の蓋等を設置してください。その場合、カードロック状態でのカードと蓋等の隙間は0.4mm以下にしてください。

The microSD card is dropped while having engaged or the impact is added and the card comes off to this item though a simple lock for the card omission prevention is installed in the metal shell. Therefore, please set up the lid for the card omission prevention etc. in the enclosure. In that case, please adjust the spaces such as cards and lids in the state of the card lock to 0.4 mm or less.

8-2. 半田付け後の洗浄

Washing process after soldering

本品を半田付け後に洗浄をする場合は、半田付け部のみ部分的に洗浄を行ってください。ジャブ漬け等の洗浄をした場合は、カードの挿入、抜去が困難になる場合があります。

If a washing process is performed after reflow, please only wash the soldering area on the printed wired board (PWB). If the entire PWB is soaked in water, there is the possibility that the card insertion and card extraction may become more difficult.

8-3. 衝撃時・負荷時におけるカード検知スイッチの電気的性能

Electrical Performance on Detect Switch when the shock or additional force is loaded

本品に強い衝撃や強い負荷が加わると、瞬間的にカード検知スイッチとシェルが同電位になることが有ります。

When an unexpected shock or additional force is loaded on the connector, the shell or detect switch may become deformed and make contact. This will cause the electric potential of Detect Switch to equal to the electric potential of the Metal shell.

8-4. その他

Others

8-4-1. セットへの組み込み後、コネクタに直接大きな振動及び負荷等が加わらない様に、取り付け基板に固定対策をして下さい。

When the connector is mounted on a daughter board, please ensure that the board has sufficient mechanical support and is not subject to excessive or direct vibration or shock.

8-4-2. コネクタ接触部には触れないで下さい。

Please do not touch the contact area of connector.

8-4-3. 本仕様書記載のリフロー条件に従って実装を行って下さい。

Please mount the connector in accordance with the reflow condition which is given by this specification.

8-4-4. 基板実装後に基板を直接積み重ねない様に、注意して下さい。

Please do not stack up the PWBs after mounting the connectors on the PWB.

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8-4-5. FPC使用時の注意点 Notes for using FPC

コネクタの反り防止のために実装時及び実使用時はFPCの下または周辺に補強版を入れコネクタを固定して下さいませご配慮願います。また、別途ご相談願います。

In order to prevent bowing when mounting and using the connector, please ensure to attach a stiffener on the back side of connector.

If there are any questions on this, please consult Molex separately.

8-4-6 半田実装部の未半田は、ターミナル脱落、ピン間ショート、ターミナル座屈、またコネクタの基板からの外れが懸念されます。従って全てのターミナルテール部及び、ネイル部に半田付けを行って下さい。

If you leave any soldering area on this product open, there may be the possibility of a missing terminal short circuiting between pins, terminal buckling or the potential for the connector to come off of the printed circuit board.

Therefore, please solder all of the terminals and fitting nails on the printed circuit board.

8-4-7 カードの裏表・前後・縦横の逆挿しをするとカードが抜けない、またはコネクタが破損する恐れがあります。破損防止のためにもカードの向き・方向の表示を実機側にてお願い致します。

If the card is mated reversely, or upside down, there is the potential for the connector to be damaged or for the card to become stuck in the connector. Please clearly show the correct mating direction of the card in the device in order to prevent any damage to the card or the connector.

8-4-8 適合カードは規格内カードとしカードの厚みはコンタクト部0.8mm MAX.(反りを含む)とする。

The applicable card used in this connector must meet the microSD specification. The thickness of the card needs to be 0.8mm maximum at the contact area (This includes the card warpage).

8-4-9 コネクタに直接力が加わると、コネクタの変形を起こす可能性やカード排出性に影響がございます。コネクタ上面から筐体までにコネクタMAX高さから十分なクリアランスを設けてください。コネクタに直接力が加わる時は別途ご相談をお願いします。

When an excessive force is applied on the connector, there the possibility to deform the connector or for the card to be stuck in the connector.

Therefore, please ensure to maintain a suitable clearance over the maximum height of the connector. Please consult Molex if it is unavoidable to have a clearance around the connector.

8-4-10 コネクタに短時間に過度な衝撃を加えると変形や破壊を起こす可能性がございます。

コネクタへの過度な衝撃が加わらないように考慮した筐体デザインにしていただきますよう、お願いいたします。

There is a possibility to deform or damage the connector when an excessive force is applied to the connector even for a short time. Please ensure that consideration is made in the phone chassis design to prevent shock from being applied to the connector.

8-4-11 本製品のシェル表面に多少の傷が確認される事がありますが製品性能に影響ございません。

Although this product may have a small scratch on the metal shell, this will have no influence on the product's performance.

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|-----------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------|---------------------|--|
| REVISE ON PC ONLY | | TITLE: | CONFIDENTIAL | |
| B | SEE SHEET 1 OF 14 | micro SD CONN. PUSH/PULL H=1.28 WITH DETECT SW | 製品仕様書 | |
| REV. | DESCRIPTION | THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | |
| DOCUMENT NUMBER PS-504077-002 | | FILE NAME SEE SHEET 1 OF 14 | SHEET 12 of 14 | |
| EN-037(2012-05) | | | | |

- 8-4-12. 実装後において半田ごてによる手修正を行う際は、必ず仕様書掲載の条件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、熔融等、
破損の原因になります。
When conducting manual repairs using a soldering iron, please follow the soldering conditions shown
in the product specification.
If the conditions in the product spec are not followed, it may cause the terminals to fall off, a change
in the contact gap, a deformation of the housing, melting of the housing, and damage the connector.
- 8-4-13 半田ごてによる手修正を行なう際、過度の半田やフラックスを使用しないでください。
半田上がりやフラックス上がりにより、接触・機能不良にいたる場合があります。
When conducting manual repairs using a soldering iron, please do not use more solder and flux than
needed. This may cause solder wicking and flux wicking issues, and it will eventually cause a contact
defect and functional issues.
- 8-4-14 リフロー後、半田付け部に変色が見られることがありますが、製品性能に影響はありません。
Although there might be some discoloration seen on the soldering tail after reflow, this will not
influence the product's performance.

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|-----------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------|--|
| REVISE ON PC ONLY | | TITLE: | CONFIDENTIAL | |
| B | SEE SHEET 1 OF 14 | micro SD CONN. PUSH/PULL H=1.28 WITH DETECT SW | 製品仕様書 | |
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