



## SPECIFICATION

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SPEC. NO.: PS-50507-XXXXX-XXX REVISION: D

PRODUCT NAME: 0.5mm/1.0mm PITCH EASY ON FPC CONN.

PRODUCT NO: 50505-XXXXX-XXX, 50506-XXXXX-XXX,  
50507-XXXXX-XXX, 50675-XXXX-XXX.  
51537-XXXXX-XXX

|   |   |   |
|---|---|---|
| PREPARED:<br><br><b>SHM</b><br><br>DATE:<br><b>2011/06/02</b> | CHECKED:<br><br><b>CARL</b><br><br>DATE:<br><b>2011/06/02</b> | APPROVED:<br><br><b>JASON</b><br><br>DATE:<br><b>2011/06/02</b> |
|---|---|---|



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## 1 Revision History

| Rev. | ECN #       | Revision Description                              | Prepared | Date       |
|------|-------------|---|----------|------------|
| O    | ECN-0811117 | NEW SPEC  | JASON    | 2008.11.17 |
| A    | ECN-0906141 | MODIFY FPC RETETION FORCE                         | JASON    | 2009.06.23 |
| B    | ECN-0909088 | FOR ADW0909029 ADD HAND SOLDERING                 | JASON    | 2009/09/10 |
| C    | ECN-1101154 | ADD PART NO                                       | K.J.SHAO | 2011.01.19 |
| D    | ECN-1106037 | MODIFY OPERATING TEMPERATURE &ADD<br>51537 SERIES | SHM      | 2011.06.02 |
|      |             |   |          |            |
|      |             |   |          |            |
|      |             |   |          |            |

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## 2 SCOPE

This specification covers performance, tests and quality requirements for **0.5mm/1.0mm PITCH EASY ON FPC CONN.**

## 3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

## 4 REQUIREMENTS

### 4.1 Design and Construction

- 4.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.
- 4.1.2 All materials conform to R.o.H.S. and the standard depends on TQ-WI-140101.

### 4.2 Materials and Finish

- 4.2.1 Contact: High performance copper alloy (**Phosphor Bronze**)  
Finish: (a) Contact Area: [Refer to the drawing.](#)  
(b) Under plate: [Refer to the drawing.](#)  
(c) Solder area: [Refer to the drawing.](#)
- 4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., **UL94V-0**
- 4.2.3 Actuator: Thermoplastic or Thermoplastic High Temp., **UL94V-0**
- 4.2.4 Fitting Nail: **Copper Alloy**, Finish: [Refer to the drawing.](#)

### 4.3 Ratings

- 4.3.1 Voltage: **50 Volts AC (per pin)**
- 4.3.2 Current: **0.5 Amperes (per pin)**  
**1.0 Amperes (per pin)**
- 4.3.3 Operating Temperature : **-40 to +85**

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## 5 Performance

### 5.1. Test Requirements and Procedures Summary

| Item                            | Requirement  | Standard   |
|---------------------------------|--|--|
| Examination of Product          | Product shall meet requirements of applicable product drawing and specification. | Visual, dimensional and functional per applicable quality inspection plan.   |
| <b>ELECTRICAL</b>               |  |  |
| Item                            | Requirement  | Standard   |
| Low Level Contact Resistance    | 40 m $\Omega$ Max. (initial)per contact<br>20 m $\Omega$ Max. Change allowed     | Mate connectors, measure by dry circuit, 20mV Max., 100mA Max.<br>(EIA-364-23)   |
| Insulation Resistance           | 1000 M $\Omega$ Min.   | Unmated connectors, apply 500 V DC between adjacent terminals.<br>(EIA-364-21)   |
| Dielectric Withstanding Voltage | No discharge, flashover or breakdown.<br>Current leakage: 1 mA max.              | 500 VAC Min. at sea level for 1 minute.<br>Test between adjacent contacts of unmated connectors.<br>(EIA-364-20)   |
| Temperature Rise                | 30 Max. Change allowed   | Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25<br>(EIA-364-70, METHOD1,CONDITION1) |

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| <b>MECHANICAL</b>                     |   |  |
|---------------------------------------|---|--|
| <b>Item</b>                           | <b>Requirement</b>                      | <b>Standard</b>  |
| Durability                            | 20 cycles.                              | The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of <b>25.4 ± 3mm/min.</b> (EIA-364-09)   |
| FPC Retention Force                   | Refer to page.10<br>FPC retention force | A connector shall be soldered on a board and insert the actuator, pull the FPC at the speed rate of <b>25.4 ± 3 mm/min.</b>  |
| Terminal /Housing Retention Force     | 150gf Min.                              | Operation Speed : <b>25.4 ± 3 mm/minute.</b><br>Measure the contact retention force with tester.   |
| Fitting Nail /Housing Retention Force | 0.1kgf MIN.                             | Operation Speed : <b>25.4 ± 3 mm/minute.</b><br>Measure the contact retention force with tester.   |
| Vibration                             | 1 $\mu$ s Max.                          | The electrical load condition shall be 100 mA maximum for all contacts. Subject to a simple harmonic motion having amplitude of 0.76mm (1.52mm maximum total excursion) in frequency between the limits of <b>10 and 55 Hz.</b> The entire frequency range, from <b>10 to 55 Hz</b> and return to <b>10 Hz</b> , shall be traversed in approximately 1 minute. This motion shall be applied for 2 hours in each of three mutually perpendicular directions. (EIA-364-28 Condition I) |
| Shock (Mechanical)                    | 1 $\mu$ s Max.                          | Subject mated connectors to <b>50 G's</b> (peak value) <b>half-sine</b> shock pulses of <b>11 milliseconds</b> duration. Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks). The electrical load condition shall be 100mA maximum for all contacts. (EIA-364-27, test condition A)   |

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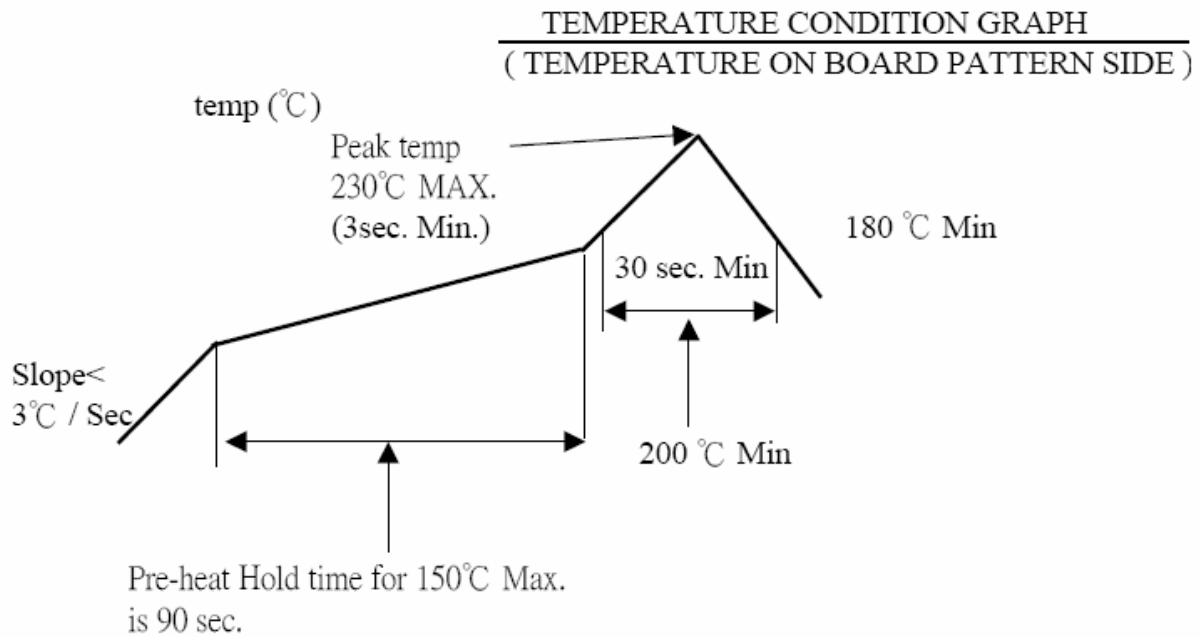
### ENVIRONMENTAL

| Item  | Requirement  | Standard   |
|---|--|--|
| Resistance to <b>Wave</b><br>Soldering Heat   | See Product Qualification and Test Sequence Group <b>10 (Lead Free)</b>  | Solder Temp. :<br>265±5 , 10±0.5sec.   |
| Resistance to <b>Reflow</b><br>Soldering Heat | See Product Qualification and Test Sequence Group <b>10 (Lead Free)</b>  | Pre Heat : 150 ~180 ,<br>60~120sec.<br>Heat : 230 Min., 40sec Min.<br>Peak Temp. : 260 Max,<br>10sec Max.  |
| Thermal Shock                                 | See Product Qualification and Test Sequence Group <b>4</b>   | Mate module and subject to follow condition for 5 cycles.<br>1 cycles:<br>-55 +0/-3 , 30 minutes<br>+85 +3/-0 , 30 minutes<br>(EIA-364-32, test condition I)               |
| Humidity                                      | See Product Qualification and Test Sequence Group <b>4</b>   | Mated Connector<br>40 , 90~95% RH,<br>96 hours.<br>(EIA-364-31,Condition A, Method II)   |
| Temperature Life                              | See Product Qualification and Test Sequence Group <b>5</b>   | Subject mated connectors to temperature life at <b>85</b> for <b>96 hours</b> .<br>(EIA-364-17, Test condition A)  |
| Salt Spray<br>(Only For Gold Plating)         | See Product Qualification and Test Sequence Group <b>6</b>   | Subject mated/unmated connectors to 5% salt-solution concentration, 35<br><b>(I) Gold flash for 8 hours</b><br><b>(II) Gold plating 5 u" for 96 hours.</b><br>(EIA-364-26) |
| Solder ability                                | Tin plating:<br>Solder able area shall have minimum of 95% solder coverage.<br>Gold plating:<br>Solder able area shall have minimum of 75% solder coverage | And then into solder bath,<br>Temperature at <b>245 ±5</b> , for <b>4-5</b> sec.<br>(EIA-364-52)   |
| Hand Soldering<br>Temperature Resistance      | Appearance: No damage  | T 350 , 3sec at least.   |

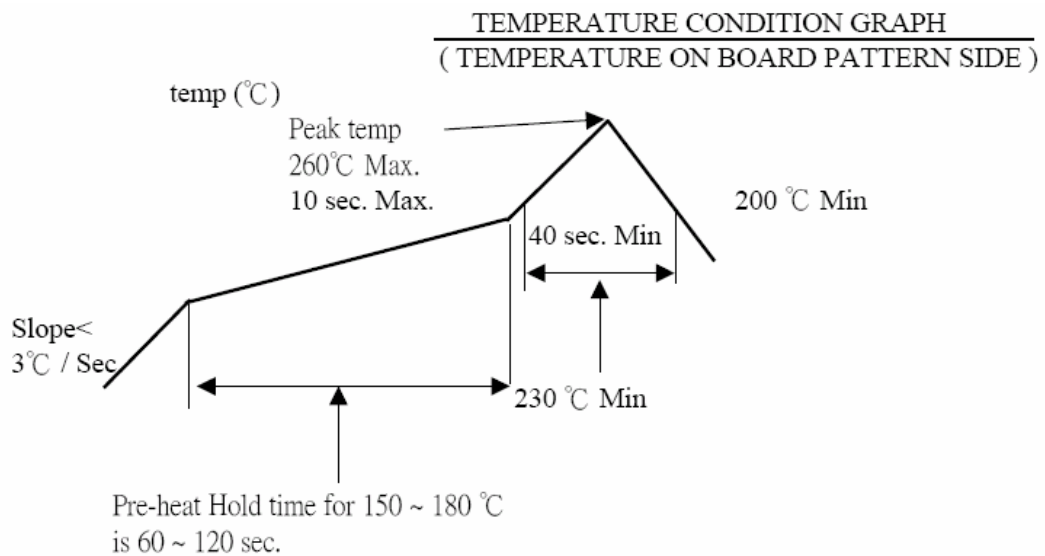
**Note.** Flowing Mixed Gas shall be conducted by customer request.

## 6 INFRARED REFLOW CONDITION

### 6.1 General Process



### 6.2 Lead-free Process







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## 7 PRODUCT QUALIFICATION AND TEST SEQUENCE

| Test or Examination                   | Test Group    |     |     |      |     |     |   |   |   |    |
|---------------------------------------|---------------|-----|-----|------|-----|-----|---|---|---|----|
|                                       | 1             | 2   | 3   | 4    | 5   | 6   | 7 | 8 | 9 | 10 |
|                                       | Test Sequence |     |     |      |     |     |   |   |   |    |
| Examination of Product                |               |     |     | 1、7  | 1、6 | 1、4 |   |   | 1 | 1  |
| Low Level Contact Resistance          |               | 1、5 | 1、4 | 2、10 | 2、9 | 2、5 |   |   | 3 |    |
| Insulation Resistance                 |               |     |     | 3、9  | 3、8 |     |   |   |   |    |
| Dielectric Withstanding Voltage       |               |     |     | 4、8  | 4、7 |     |   |   |   |    |
| Temperature Rise                      | 1             |     |     |      |     |     |   |   |   |    |
| Durability                            |               | 3   |     |      |     |     |   |   |   |    |
| Vibration                             |               |     | 2   |      |     |     |   |   |   |    |
| Shock (Mechanical)                    |               |     | 3   |      |     |     |   |   |   |    |
| Thermal Shock                         |               |     |     | 5    |     |     |   |   |   |    |
| Humidity                              |               |     |     | 6    |     |     |   |   |   |    |
| Temperature Life                      |               |     |     |      | 5   |     |   |   |   |    |
| Salt Spray(Only For Gold Plating)     |               |     |     |      |     | 3   |   |   |   |    |
| Solder ability                        |               |     |     |      |     |     | 1 |   |   |    |
| FPC Retention Force                   |               | 2、4 |     |      |     |     |   |   |   |    |
| Terminal / Housing Retention Force    |               |     |     |      |     |     |   | 1 |   |    |
| Fitting Nail /Housing Retention Force |               |     |     |      |     |     |   | 2 |   |    |
| Resistance to Soldering Heat          |               |     |     |      |     |     |   |   | 2 |    |
| Hand Soldering Temperature Resistance |               |     |     |      |     |     |   |   |   | 2  |
| Sample Size                           | 2             | 4   | 4   | 4    | 4   | 4   | 2 | 4 | 4 | 4  |

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### 8 FPC RETENTION FORCE

UNIT: Kgf

| NO. OF Ckt. | FPC Retention Force (Min) |         | NO. OF Ckt. | FPC Retention Force (Min) |         |
|-------------|---------------------------|---------|-------------|---------------------------|---------|
|             | 1st                       | 20th    |             | 1st                       | 20th    |
| CKT         |                           |         | CKT         |                           |         |
| 4           | 0.3kgf                    | 0.2kgf  | 31          | 1.5kgf                    | 1.35kgf |
| 5           |                           |         | 32          |                           |         |
| 6           |                           |         | 33          |                           |         |
| 7           |                           |         | 34          |                           |         |
| 8           |                           |         | 35          |                           |         |
| 9           |                           |         | 36          |                           |         |
| 10          | 0.75kgf                   | 0.60kgf | 37          |                           |         |
| 11          |                           |         | 38          |                           |         |
| 12          |                           |         | 39          |                           |         |
| 13          |                           |         | 40          |                           |         |
| 14          |                           |         | 41          |                           |         |
| 15          |                           |         | 42          |                           |         |
| 16          |                           |         | 43          |                           |         |
| 17          |                           |         | 44          |                           |         |
| 18          |                           |         | 45          |                           |         |
| 19          |                           |         | 46          |                           |         |
| 20          |                           |         | 47          |                           |         |
| 21          |                           |         | 48          |                           |         |
| 22          | 49                        |         |             |                           |         |
| 23          | 50                        |         |             |                           |         |
| 24          | 51                        |         |             |                           |         |
| 25          | 1.0kgf                    | 0.85kgf | 52          |                           |         |
| 26          |                           |         | 53          |                           |         |
| 27          |                           |         | 54          |                           |         |
| 28          |                           |         | 55          |                           |         |
| 29          |                           |         | 56          |                           |         |
| 30          |                           |         | 57          |                           |         |