### 1. Thermal tests

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test Condition</th>
<th>Failure Size / Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat resistance</td>
<td>Peak : 260 deg.C (a moment)</td>
<td>0 / 32</td>
</tr>
<tr>
<td>Reflow zone</td>
<td>230 deg.C 30 to 50 s</td>
<td></td>
</tr>
<tr>
<td>Preheat</td>
<td>180 to 190 deg.C , 60 to 120 s</td>
<td></td>
</tr>
<tr>
<td>Reflow zone</td>
<td>230 deg.C 30 to 50 s</td>
<td></td>
</tr>
<tr>
<td>Preheat</td>
<td>180 to 190 deg.C , 60 to 120 s</td>
<td></td>
</tr>
<tr>
<td>Heat resistance</td>
<td>4 times</td>
<td></td>
</tr>
<tr>
<td>Peak : 260 deg.C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immersion time</td>
<td>10 s</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>cycling</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>Ta = 125 deg.C, VDD = 18V ,1000 h</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>Ta = 150 deg.C ,1000 h</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>Ta = 85 deg.C, RH = 85% ,1000 h</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>Ta = 85 deg.C, RH = 85%, VDD = 18V ,1000 h</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>Ta = 121 deg.C(203kPa)(Unsaturated) ,96h</td>
<td></td>
</tr>
</tbody>
</table>

### 2. Mechanical tests

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test Condition</th>
<th>Failure Size / Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solderability</td>
<td>Solder bath : Sn-Ag-Cu 245 deg.C , 5 s ,once (using Flux)</td>
<td>0 / 11</td>
</tr>
<tr>
<td></td>
<td>Solder bath : Sn-Pb 230 deg.C , 5 s ,once (using Flux)</td>
<td></td>
</tr>
</tbody>
</table>

### 3. Life tests

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test Condition</th>
<th>Failure Size / Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Solder bath : Sn-Ag-Cu 245 deg.C , 5 s ,once (using Flux)</td>
<td>0 / 11</td>
</tr>
<tr>
<td></td>
<td>Solder bath : Sn-Pb 230 deg.C , 5 s ,once (using Flux)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
## Estimated Failure Rate

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Estimated failure rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC4W53FU</td>
<td>11 Fit or less</td>
</tr>
</tbody>
</table>

Above estimated value is determined with the standard operation under the general environment:

*The general environment here means the conditions of $T_j \leq 55\degree C$ and no application of surge and so on.

The Estimated Failure Rate contained herein represents the result of our internal product reliability tests, and is provided for your reference only.

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Heat-resistant Mounting Conditions

Product Name: FTC4W53FU
Package Name: FSM8

1. Reflow
   - Peak: 260 deg.C (a moment)
   - Reflow zone: 230 deg.C, 30 to 50 seconds
   - Preheat: 180 to 190 deg.C, 60 to 120 seconds

   **NOTE:**
   Heat resistant conditions are based on the device surface temperature.
   An example of a temperature profile is shown in Fig.1.
   This profile has indicated the maximum of a device heat-resistance guarantee.
   Please set preheating temperature/heating temperature as the best temperature according to the kind of solder paste to use, within the limits of Fig.1.

For the packages allowing mounting twice or more, the mounting should be completed with the interval from the first to the last mounting being within 2 weeks.

2. Others
   - We urge you to verify well before mounting to assure enough solder joint strength.

   **Fig.1. Example of Heat-resistant Temperature Profile**

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Moisture Absorption Control Level (Moisture Sensitivity Level)

Product Name: TC4W53FU
Package Name: SM8

Always store the Product under moisture sensitivity level equivalent to level 1 (JEDEC J-STD-020 Moisture Sensitivity Level). In the event the Product is stored otherwise, the applicable warranty, if any, is void.

Always perform reflow soldering in accordance with methods and conditions as specified in applicable engineering documents or specifications provided by Toshiba, or as instructed in writing by your TOSHIBA sales representative.

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