

Product Name: TPN4R303NL

Package Name: TSON Advance

### 1. Thermal tests

Test Item	Test Condition	Failure Size / Sample Size
Heat resistance (Reflow)	Peak : 260 deg.C(a moment) Reflow zone : 230 deg.C 30 to 50 s Preheat : 180 to 190 deg.C , 60 to 120 s 3 times	0 / 32
Heat resistance (Iron)	Temperature of the iron tip : 350 deg.C Time : 3 s Once	0 / 32
Temperature cycling	- 55 deg.C(30 min) to 150 deg.C(30 min) 100 cycles	0 / 50
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### 2. Mechanical tests

Test Item	Test Condition	Failure Size / Sample Size
Solderability	Solder bath : Sn-Ag-Cu 245 deg.C , 5 s ,once (using Flux) Solder bath : Sn-Pb 230 deg.C , 5 s ,once (using Flux)	0 / 11
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-	-	-
-	-	-
-	-	-

### 3. Life tests

Test Item	Test Condition	Failure Size / Sample Size
Steady state operation	Ta = 25 deg.C, PD = 0.7W ,1000 h	0 / 30
High temp. reverse bias	Ta = 150 deg.C, VGS = 20V ,1000 h	0 / 30
High temp. storage	Ta = 150 deg.C ,1000 h	0 / 30
High temp. high humidity storage	Ta = 85 deg.C, RH = 85% ,1000 h	0 / 30
Pressure cooker test	Ta = 121 deg.C(203kPa)(Unsaturated) ,96 h	0 / 20
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## Estimated Failure Rate

Product Name	Estimated failure rate
TPN4R303NL	0.18 Fit or less

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

\*The general environment here means the conditions of  $T_j = 55$  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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For detailed reliability test information, please contact your Toshiba sales representative.

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### 1.Reflow

Number: 3 times maximum  
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 condition 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.



Fig.1 Example of Heat-resistant Temperature Profile

### 2.Others

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

Always solder the Product in accordance with the heat-resistance mounting conditions set forth above. In the event the Product is soldered otherwise, the applicable product warranty, if any, is void.

## Moisture Absorption Control Level (Moisture Sensitivity Level)

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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.  
In the event the Product is soldered otherwise, the applicable product warranty, if any, is void.

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