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Reliability Tests Report

Product Name: TLP293
Package Name: SO4

1. Thermal tests

Test Item	Test Condition	Failure Size / Sample Size
Heat resistance (Reflow)	Peak : 260 deg.C Reflow zone : 255 deg.C 30 to 40 s, 217 deg.C 60 to 150 s Preheat : 150 to 200 deg.C , 60 to 120 s 2 times	0 / 32
Heat resistance (Flow)	Peak : 260 deg.C Immersion time : 10 s Once	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 125 deg.C(30 min) ,100 cycles	0 / 50

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
-	-	-
-	-	-
-	-	-
-	-	-

3. Life tests

Test Item	Test Condition	Failure Size / Sample Size
Steady state operation	Ta = 25 deg.C, IF = 50mA, PC = 150mW ,1000 h	0 / 30
High temp. bias	Ta = 125 deg.C, VCE = 80V ,1000 h	0 / 30
High temp. storage	Ta = 125 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
TLP293	0.84 Fit or less

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

*The general environment here means the conditions of Tj = 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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Moisture Absorption Control Level (Moisture Sensitivity Level)

Product Name : TLP293
Package Name : SO4

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.

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Electrostatic Discharge Test

1.Type of product TLP293

2.Test condition

C=100pF, R=1.5kohm, application times:3
[Referred standard: JEITA ED-4701]

3.Test result

Sample Quantity	Failure
	+/-2000V
10 pcs	0 / 10

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Protective Measures for Static Electricity

1.Storage

(1) The storage area temperature should be kept within a temperature range of 5 to 35 degrees, and relative humidity should be maintained between 45 and 75%

(2) Use anti-static containers, and do not allow external forces or loads to be applied to devices while they are in storage.

2.Transportation

(1) When transportation of plastic package devices, avoid friction between the devices and other polymeric compounds.

(2) Use anti-static containers for transportation.

3.Handling

(1) Floors, workbenches, conveyors, and floor mats must be grounded to earth to prevent accumulation of static electricity. Especially, workbenches which are in direct contact with devices and conductive floor mats must be always grounded to earth.

(2) Measurement instruments, jigs, must also be grounded to earth.

(3) Operators must wear anti-static work clothes and conductive shoes, as well as a wrist strap to have their bodies grounded to earth.
(This wrist strap must be grounded through a resistor of about 0.5 to 1M ohms for human body protection purposes.)

(4) Pack devices in anti-static containers.
Use carrying boxes made of conductive materials.

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Latch-up test

1 Type of product

TLP293

2 Latch-up test

This product cannot occur latch-up phenomenon, therefore latch-up test is not performed.

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CAUTIONS IN BOARD CLEANING PROCEDURE

The Cleaning of general semiconductor products should be taken for flux removal after soldering process with giving attention as followings :

1. Flux cleaning should be completed free of residual reactive ion such as Na, Cl, etc.

   Organic solvent acts upon water and generates corrosive gas such as hydrogen chloride. There are some cases where the device is degraded.

2. HANDLING

   Effective solvent seriously affects mark ink and resin. Operators should be careful so as not to scrub the indication mark surface with a brush or their hands when cleaning and cleaning solvent is on devices. The indication mark is erased, as the case may be.

   Dipping duration time of solvent bath and solvent dipping should be within 1 min.

3. ULTRASONIC CLEANING

   Ultrasonic cleaning that provides effective cleaning for short time much affects on the device.
   If ultrasonic cleaning is taken for hermetic seal device, resonation phenomenon to shorten the life time and catastrophic destruction occurs by some complecated factors such as the cleaning bath size, output of ultrasonic transducer, setting condition on print board, etc.
   Non-hermetic seal type(plastic package) is not affected by ultrasonic cleaning as compared with hermetic seal type.
   However coherence between resin and lead metal is degraded by cleaning solvent during long ultrasonic cleaning. We recommend to take ultrasonic cleaning for non-hermetic seal type at a minimum range.

   RECOMMENDED CONDITION OF STANDARD ULTRASONIC CLEANING

Frequency	:	27 to 29 KHz
Ultrasonic output	:	15W / Liter
Cleaning duration time	:	Less than 30 sec

   Ultrasonic cleaning should be taken with floating in cleaning solvent, that is careful the print board and device not to directly contact with ultrasonic transducer.

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