

## Mechanical and Environmental Testing

## Reliability Data Sheet

## Description

This document's reliability data includes Broadcom reliability test data from the reliability tests done on this product family. All of these products use similar processes and materials. The data in [Table 1](#) and [Table 2](#) reflects actual test data for devices. Before stress, all devices are preconditioned at MSL 1 using a solder reflow process (260°C peak temperature) and 20 temperature cycles (–55°C to +125°C, 15 minutes dwell, 1 minute transfer). This data is taken from testing on Broadcom devices using internal Broadcom processes, material specifications, design standards, and statistical process controls.

**They are not transferable to other manufacturers' similar part types.**

## Definition of Failure

Abnormal resistance, that is, "open or short failure", is the definition of failure in this data sheet. Specifically, failure occurs when the device fails contact resistance either high or low, when the device experiences abnormal leakage, or both.

## Reliability Testing

Broadcom subjects the devices to a series of reliability tests, including environmental, mechanical, and electrical tests, to ensure that the product meets the intended reliability expectations. The tables provided in this data sheet show the results of reliability testing conducted by Broadcom over a period of time as shown in the test conditions.

Table 1 Mechanical Tests (Testing Done on a Constructional Basis)

Test Name	Reference Standard	Test Conditions	Units Tested	Units Failed
Temperature Cycling	JESD-A104	–55°C to 125°C, Transfer = 1 min, Dwell = 15 mins, 1000 cycles	2279	0
Preconditioning	JESD-020 JESD-A113	As per reference standard (to conform to MSL 1)	2827	0

Table 2 Environmental Tests (Testing Done on a Constructional Basis)

Test Name	Reference Standard	Test Conditions	Units Tested	Units Failed
Temperature-Humidity-Bias	JESD-A101	T <sub>A</sub> = 85°C, RH=85%, Biased, Time = 1000 hrs	1174	0
Highly Accelerated Stress Test (HAST)	JESD-A110	T <sub>A</sub> = 130°C, RH =85%, Unbiased, Time = 96 hrs	221	0
Unbiased Highly Accelerated Stress Test (uHAST)	JESD-A118	T <sub>A</sub> = 130°C, RH =85%, Unbiased, Time = 96 hrs	462	0
Autoclave	JESD-A102	T <sub>A</sub> = 121°C, RH =100%, Unbiased, Time = 96 hrs	560	0
High Temperature Bake	JESD-A103	T <sub>A</sub> = 150°C, Unbiased, Time = 1000hrs	461	0

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