

HCPL-0900/0930/0931, HCPL-9000/9030/9031, HCPL-900J/901J/902J, HCPL-090J/091J/092J

High-Speed Digital Isolators Mechanical and Environmental Testing

Description

The reliability data shown includes Broadcom® reliability test data from the qualification of this product family. All of these products use similar IC, and the same packaging materials, processes, stress conditions, and testing. The data in the tables reflects actual test data for devices on a per-channel basis. This data is taken from testing 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

The inability to switch, that is “functional failure”, is the definition of failure in this data sheet. Specifically, failure occurs when the device fails to switch ON with twice the minimum recommended drive current (but not exceeding the maximum rating) or fails to switch off when there is no input current.

Reliability Testing

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

Table 1: List of HCPL-9xxx/09xx Digital Isolators

SO8 Package	300-mil DIP8 Package	SO16 Widebody Package	SO16 Narrowbody Package
HCPL-0900	HCPL-9000	HCPL-900J	HCPL-090J
HCPL-0930	HCPL-9030	HCPL-901J	HCPL-091J
HCPL-0931	HCPL-9031	HCPL-902J	HCPL-092J

SO Package Family

Table 2: Mechanical Tests (Testing Done on a Constructional Basis)

Test Name	MIL-STD-883	Test Conditions	Units Tested	Units Failed
Temp Cycle	1010 Cond. B	–55°C to 125°C, Transfer = 5 minutes, Dwell = 15 minutes, 1000 cycles	230	0
Solderability	2003	Sn 60 Pb 40 Solder, Temperature = 230°C (2 seconds)	30	0
Solvent Resistance	2015		10	0

Table 3: Environmental Testing

Test Name	MIL-STD-883	Test Conditions	Units Tested	Units Failed
Autoclave	—	T _A = 121°C, RH = 100%, Unbiased Time = 168 hours	230	0

300-mil DIP8 Package Family

Table 4: Mechanical Tests (Testing Done on a Constructional Basis)

Test Name	Reference Standard	Test Conditions	Units Tested	Units Failed
Temp Cycling	Mil Std 883, 1010 Cond. B	–55°C to 125°C, Transfer = 1 minute, Dwell = 15 minutes, 1000 cycles	160	0
Solderability (SnPb finish)	Method 2003	8 hours steam aging (93°C), followed by solder dip (245°C, 5 seconds)	10	0
Solderability (Pb-free option)	—	8 hours steam aging (93°C), followed by solder dip (260°C, 5 seconds)	10	0

Table 5: Environmental Testing

Test Name	Reference Standard	Test Conditions	Units Tested	Units Failed
Unbiased Autoclave	JA102	T _A = 121°C, RH = 100%, Unbiased Time = 168 hours	80	0
Wet Temperature Reverse Bias	—	T _A = 85°C, RH = 85%, V _{cc} = 5V, Time = 1000 hours	80	0

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