ACNV3130, ACNW3130/3190, ACPL-312U, HCNW3120, HCPL-315J/314J, HCPL-J314/J312, ACPL-J313



Isolated Gate Drive Optocouplers

Reliability Data Sheet

Description

This document's reliability data shown includes Broadcom reliability test data from the tests done on this product family. All of these products use the similar wafer technology. The data in Table 1 and Table 2 reflect actual test data for devices on a per-channel basis. 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 mins dwell, 1 min transfer). These data are 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.

Operating Life Test

For valid system reliability calculations, it is necessary to adjust for the time when the system is not in operation. Note that if you are using MIL-HDBK-217 for predicting component reliability, the results may not be comparable to those given in Table 2 due to different conditions and factors that have been accounted for in MIL-HDBK-217. For example, it is unlikely that your application will exercise all available channels at full rated power with the IC always ON as Broadcom testing does. Thus, your application total power and duty cycle must be carefully considered when comparing Table 2 to predictions using MIL-HDBK-217.

Definition of Failure

Inability to switch, i.e., *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.

Failure Rate Projections

The demonstrated point mean time to failure (MTTF) is measured at the absolute maximum stress condition. The failure rate projections in Table 2 uses the Arrhenius acceleration relationship, where a 0.43 eV activation energy is used as in the hybrid section of MIL-HDBK-217.

Application Information

The data of Table 1 and Table 2 were obtained on devices with high temperature operating life duration. An exponential (random) failure distribution is assumed, expressed in units of FIT (failures per billion device hours) are only defined in the random failure portion of the reliability curve.

Test Results

Table 1 Demonstrated Operating Life Test Performance

Stress Test Condition	Total Device	Total Device	Number of Failed	Demonstrated MTTF(hr)	Demonstrated FITs
	Tested	Hours	Units	at T _A = +125°C	at T _A = +125°C
T _A and V _{CC} Bias (Based on DS)	4,274	4,274,000	0	4,274,000	234

Table 2 Reliability Projection for Devices Listed in Title

Ambient Temperature (°C)	Junction Temperature (°C)	Typical (60% Confidence)		90% Confidence	
		MTTF (Hr/Fail)	FITs (Fail/10 ⁹ h)	MTTF (Hr/Fail)	FITs (Fail/10 ⁹ h)
125	140	4,664,458	214	1,856,175	539
120	135	5,407,681	185	2,151,933	465
110	125	7,349,719	136	2,924,747	342
100	115	10,148,445	99	4,038,472	248
90	105	14,254,186	70	5,672,311	176
80	95	20,394,075	49	8,115,618	123
70	85	29,768,448	34	11,846,056	84
60	75	44,406,663	23	17,671,188	57
50	65	67,829,361	15	26,992,016	37
40	55	106,317,552	9	42,308,007	24
30	45	171,422,623	6	68,215,920	15
25	40	220,176,459	5	87,617,022	11

For product information and a complete list of distributors, please go to our web site: www.broadcom.com.

Broadcom, the pulse logo, Connecting everything, Avago Technologies, Avago, and the A logo are among the trademarks of Broadcom in the United States, certain other countries and/or the EU.

Copyright © 2017 Broadcom. All Rights Reserved.

The term "Broadcom" refers to Broadcom Limited and/or its subsidiaries. For more information, please visit www.broadcom.com.

Broadcom reserves the right to make changes without further notice to any products or data herein to improve reliability, function, or design.

Information furnished by Broadcom is believed to be accurate and reliable. However, Broadcom does not assume any liability arising out of the application or use of this information, nor the application or use of any product or circuit described herein, neither does it convey any license under its patent rights nor the rights of others.

ACXX-HCXX-IGDO-RDS101 – January 24, 2017

