

**ACFJ-3405, ACPL-302J/335J, ACPL-337J/336J/339J/352J,
ACPL-H342/K342, ACPL-P340/W340/P341/W341/P343/W343,
ACPL-P345/P346/W345/W346, ACPL-P347/P349/W347/W349,
ACPL-P480, ACPL-P483/W483/M483, ACPL-P484/W484/M484,
ACNU-4803/4804, HCPL-3120, ACPL-3130, ACPL-H312/K312,
ACPL-T350, HCPL-T250**

Isolated Gate Drive Optocouplers and IPM Interfaces

Description

The reliability data includes Broadcom reliability test data from the reliability tests done on this product family. All these products use a similar wafer technology. The data in [Table 1](#) and [Table 2](#) reflects 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-minute dwell, 1-minute transfer).

ATTENTION: This data is taken from testing on Broadcom® devices using internal Broadcom processes, material specifications, design standards, and statistical process controls. It is 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, meaning *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 when the device 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](#) use 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 in [Table 1](#) and [Table 2](#) was obtained on devices with a high-temperature operating life duration. An exponential failure distribution is assumed, expressed in units of FIT (failures per billion device hours), and is defined only in the random failure portion of the reliability curve.

Test Results

Table 1: Demonstrated Operating Life Test Performance

Stress Test Condition	Total Devices Tested	Total Device Hours	Number of Failed Units	Demonstrated MTTF (Hr) at $T_A = +125^{\circ}\text{C}$	Demonstrated FITs at $T_A = +125^{\circ}\text{C}$
$T_A = 125^{\circ}\text{C}$, V_{CC} Bias (Based on Data Sheet)	4,771	4,895,700	0	4,895,700	204

Table 2: Reliability Projection for the Devices Listed in the Title

Ambient Temperature ($^{\circ}\text{C}$)	Junction Temperature ($^{\circ}\text{C}$)	Typical (60% Confidence)		90% Confidence	
		MTTF (Hr/Fail)	FITs (Fail/ 10^9h)	MTTF (Hr/Fail)	FITs (Fail/ 10^9h)
125	140	5,342,955	187	2,126,175	470
120	135	6,194,288	161	2,464,955	406
110	125	8,418,816	119	3,350,184	298
100	115	11,624,647	86	4,625,912	216
90	105	16,327,613	61	6,497,411	154
80	95	23,360,616	43	9,296,124	108
70	85	34,098,594	29	13,569,195	74
60	75	50,866,098	20	20,241,655	49
50	65	77,695,883	13	30,918,300	32
40	55	21,782,601	8	48,462,169	21
30	45	196,357,917	5	78,138,671	13
25	40	252,203,531	4	100,361,875	10

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