

ACPL-C740, ACPL-C877, ACNT-H87A/ H87B/H870 Current Sense Optocoupler

Description

The reliability data shown includes Broadcom[®] reliability test data from the reliability tests done on this product family. All of these products use the 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 temp) 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.**

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 (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 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 of Table 1 and Table 2 was 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 Devices | Total Device | Number of | Demonstrated MTTF(hr) | Demonstrated FITs |
|---------------------------------------|---------------|--------------|--------------|-----------------------|-------------------|
| | Tested | Hours | Failed Units | @ Ta = +125°C | @ Ta = +125°C |
| Ta = 125°C, Vcc Bias (Based on DS) | 847 | 847,000 | 0 | 847,000 | 1181 |

Table 2: Reliability Projection for Device Listed in Title

| Ambient Temperature (°C) | Junction Temperature (°C) | Typical (60% Confidence) | | 90% Confidence | |
|-----------------------------|------------------------------|--------------------------|-----------------------------------|------------------|-----------------------------------|
| | | MTTF (Hour/fail) | FITs (Fail/10 ⁹ hours) | MTTF (Hour/fail) | FITs (Fail/10 ⁹ hours) |
| 125 | 140 | 924,379 | 1082 | 367,847 | 2719 |
| 120 | 135 | 1,071,667 | 933 | 426,459 | 2345 |
| 110 | 125 | 1,456,531 | 687 | 579,612 | 1725 |
| 100 | 115 | 2,011,168 | 497 | 800,324 | 1249 |
| 90 | 105 | 2,824,824 | 354 | 1,124,110 | 890 |
| 80 | 95 | 4,041,596 | 247 | 1,608,313 | 622 |
| 70 | 85 | 5,899,362 | 170 | 2,347,592 | 426 |
| 60 | 75 | 8,800,291 | 114 | 3,501,988 | 286 |
| 50 | 65 | 13,442,084 | 74 | 5,349,143 | 187 |
| 40 | 55 | 21,069,482 | 47 | 8,384,390 | 119 |
| 30 | 45 | 33,971,680 | 29 | 13,518,691 | 74 |
| 25 | 40 | 43,633,472 | 23 | 17,363,504 | 58 |

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