ACPL-785E , 5962-9755701EPx
HCPL-7851, 5962-9755701HPx
Hermetically Sealed, Analog Isolation Amplifier

Reliability Data Sheet

Description

The Avago Technologies reliability data shown represents the high reliability class of this product family. Both of the products listed use the same LEDs, ICs, DLA approved packaging materials, processes, stress conditions and testing per MIL-PRF-38534. Additionally, Avago Technologies internal processes, material specifications, design standards, and statistical process controls are utilized. The data 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 LED(s) always ON as Avago Technologies testing does. Thus, your application total power and duty cycle must be carefully considered when comparing Table 2 to predictions using MIL-HDBK-217.

Table 1. Demonstrated Operating Life Test Performance

Stress Test Condition	Total Devices Tested	Total Device Hours	Number of Failed Units	Demonstrated MTTF (hr) @ T_A = +125 °C	Demonstrated FITs @ T_A = +125 °C
T_A = +125°C V_{CC} = 5.5V V_{IN} = N/A V_{OUT} = N/A T_J = +150 °C	240	1,080,000	0	> 1,080,000	< 923

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 2 times the minimum recommended drive current (but not exceeding the max 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 2 were obtained on MIL-PRF-38534 screened devices with high temperature operating life duration up to 5000 hours. 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.

Environmental Testing

All high reliability hermetic optocouplers listed meet the 100% screening and quality conformance inspection testing of MIL-PRF-38534 Class H.

Table 2. Reliability Projections for Devices Listed In Title

Ambient Temperature (°C)	Junction Temperature (°C)	Typical (60% Confidence)		90% Confidence	
		MTTF (Hr/fail)	FITs (Fail/10^9hr)	MTTF (Hr/fail)	FITs (Fail/10^9hr)
125	150	1,178,665	848	469,038	2,132
120	145	1,357,008	737	540,008	1,852
110	135	1,817,465	550	723,242	1,383
100	125	2,470,164	405	982,977	1,017
90	115	3,410,787	293	1,357,288	737
80	105	4,790,684	209	1,906,405	525
70	95	6,854,237	146	2,727,575	367
60	85	10,004,866	100	3,981,336	251
50	75	14,924,618	67	5,939,103	168
40	65	22,796,743	44	9,071,736	110
30	55	35,732,223	28	14,219,281	70
25	50	45,204,937	22	17,988,853	56

Table 3. ESDS Classification per Method 3015, MIL-STD-883

Part Number	ESD Class
5962-9755701HPx, HCPL-7851	1
5962-9755701EPx, ACPL-785E	1

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

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