

2.5 Amp MOSFET Gate Drive Optocoupler with Integrated Desat Over Current Sensing, Active Miller Current Clamping, FAULT and UVLO Status Feedback

Reliability Data Sheet

Description

The reliability data shown includes Avago Technologies reliability test data from the reliability qualification done on this product family. All of these products use the similar IC, and the same packaging materials, processes, stress conditions and testing. 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 temp) and 20 temperature cycles (-55 °C to +125 °C, 15 mins dwell, 1 min transfer). These data are taken from testing on Avago Technologies devices using internal Avago Technologies process, 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 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.

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 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.

Table 1 Demonstrated Operating Life Test Performance

Stress Test Condition	Total Device Tested	Total Device Hours	Number of Failed Units	Demonstrated MTTF(hr) @ TA = +125 °C	Demonstrated FITs @ TA = +125 °C
T _A = 125 °C V _{CC1} = 26V, V _{CC2} = 20V, V _E = 5V, I _F = 20mA	21,029	1,104,800	0	> 1,104,800	< 905

Table 2 Reliability Projection for Device 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	1,205,731	829	479,809	2,084
120	135	1,397,849	715	556,260	1,798
110	125	1,899,853	526	756,027	1,323
100	115	2,623,304	381	1,043,918	958
90	105	3,684,610	271	1,466,254	682
80	95	5,271,730	190	2,097,832	477
70	85	7,694,942	130	3,062,125	327
60	75	11,478,821	87	4,567,882	219
50	65	17,533,429	57	6,977,253	143
40	55	27,482,365	36	10,936,333	91
30	45	44,311,584	23	17,633,352	57
25	40	56,914,120	18	22,648,406	44

Table 3 Mechanical Tests (Testing done on a constructional basis)

Test Name	Reference Standard	Test Conditions	Units Tested	Units Failed
Temp Cycling	JESD-A104	-65 to 150 °C Transfer = 1 min Dwell = 15 mins 500 cycles	154	0
Physical Dimensions	JESD-B100	Conformance to datasheet package drawings	60	0
Solderability (RoHS condition)	JESD-B102	8hrs steam aging (93 °C), followed by solder dip (260 °C,5sec)	30	0
Preconditioning	J-STD-020 JA113	As per reference standard (to conform to MSL 1)	24,022	0

Table 4 Environmental Testing

Test Name	Reference Standard	Test Conditions	Units Tested	Units Failed
Temperature Humidity Bias (THB)	JESD-A101	Ta = 85 °C, RH=85% Biased Time = 1000 hours	899	0
High Temperature Bake	JESD-A103	Ta = 175°C Unbiased Time = 500 hours	154	0
Unbiased HAST	JESD-A118	Ta = 130oC, RH = 85% Unbiased Time = 96 hours	539	0

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