

Automotive TVS Diode Product Reliability Information

This report shows general reliability results on automotive product families from Littelfuse's TVS. All test standards listed are per the Mil-Std-750 unless otherwise stated.

For more information about any specific device, please contact Littelfuse for further details.

Test	Standard	Test Condition	Sample Size
Pre-conditioning	JESD22A-113	24hrs 125°C bake, 168hrs 85°C /85%RH soak, 3 Reflows of peak temperature 260°C	Prior to TC/AC/H3TRB
High Temperature Reverse Bias	M1038 Method A	Junction temp, bias VR, 1008hrs	3 lots 77 pcs
Temperature Cycle	JESD22A -104	-55°C to +150°C, 15minutes dwell, 1000 cycles	3 lots 77 pcs
UHASt	JESD22A-118	130°C, 85%RH, 96hrs	3 lots 77 pcs
High Humidity High Temp. Reverse Bias	JESD22A-101	85°C, 85%RH, bias VR, 1008hrs	3 lots 77 pcs
Resistance to Solder Heat	JESD22A-111 (SMD) JESD22B-106 (PTH)	SMD 260°C, 10s PTH 270°C, 7S	1 lot 30 pcs
Moisture Sensitivity Level	J-STD-020	24hrs 125°C bake, 168hrs 85°C /85%RH soak, 3 Reflows of peak temperature 260°C	2 lots 22 pcs
Solderability	JESD22B-102	Method A for through hole Method B & D for SMD	1 lot 10 pcs

Estimate of Failure Rate, MTBF, FITS for a Given Operation Temperature (See note 1&2)

Temp °C	% FR/khrs	MTBF (K)	FITS
30	0.00001	13118051	0
55	0.00014	710876	1
85	0.00272	36797	27
100	0.00999	10008	100
125	0.07037	1421	703
150	0.39351	254	3935

The Mean-Time-Between-Failure(MTBF) in hours and the percent failure rate per 1000 hours (%FR/khr) are computed at a 60% confidence level using the chi square method and the Arrhenius derating model for various junction operating temperatures. For the calculations, a value of 1 eV was used for the activation energy.