

## TVS Diode Arrays General Commercial Product Reliability Information

This report shows general reliability results on commercial product families from Littelfuse TVS Diode Arrays ( SPA<sup>®</sup> Diodes) products. All test standards listed are per the Automotive Electronics Council standard AEC-Q101 and the Mil-Std-750 unless otherwise stated.

For more information about any specific device, please contact [sales@littelfuse.com](mailto:sales@littelfuse.com) for further details.

Test	Standard	Test Condition	Sample Size
Pre-conditioning	JESD22- A113	24 hours 150° C soak, 168 hours 85° C /85% RH, 3 Reflows of peak temperature 260° C	TC/AC/ H3TRB/H TRB
Temperature Cycle	JESD22-A104	-55° C to +150° C, 15 minutes dwell, 1,000 cycles	1 lots 77 pcs
Autoclave	EIA/JESD22-A102B	121° C, 100% RH, 2 ATM, 96 hours	1 lots 77 pcs
Temperature & Humidity with DC Bias	EIA/JESD22-A101B	85° C, 85% RH, V <sub>DC</sub> , 1,008 hours	1 lots 77 pcs
Resistance to Solder Heat	JESD22-A111	260° C, 10 s	1 lot 30 pcs
Moisture Sensitivity Level	JESD22-020E	24 hours 125° C soak, 168 hours 85° C /85% RH, 3 Reflows of peak temperature 260° C	1 lots 77 pcs
Solderability	JESD22-B102	Reflow	1 lot 10 pcs
High Temperature DC Blocking	M-1038, Cond. A	125° C, V <sub>DC</sub> , 1,008 hours	1 lots 77 pcs

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

Temp C.	FR(%/khr)	MTBF (K)	FITS
30	0.000023	4387687	0
60	0.000716	139725	7
80	0.005145	19435	51
100	0.029941	3340	299
125	0.210994	474	2110
150	1.180544	85	11805

1. The Mean-Time-Between-Failure (MTBF) in hours and the percent failure rate per 1,008 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.

2. The maximum operation temperature is 150° C.

3. MTBF and Failure Rate Calculation is according to JEDEC Standard JESD85.