



Lead Free Product Specification

Diodes Inc. offers most small packaged discrete products in a lead free version. These include SOT-23, SOT-563, SOT-323, SOT-363, SOT-23, SOT-25/-26, SC-74R, SOT-143, SOD-523, SOD-323, SOD-123, and SC-59.

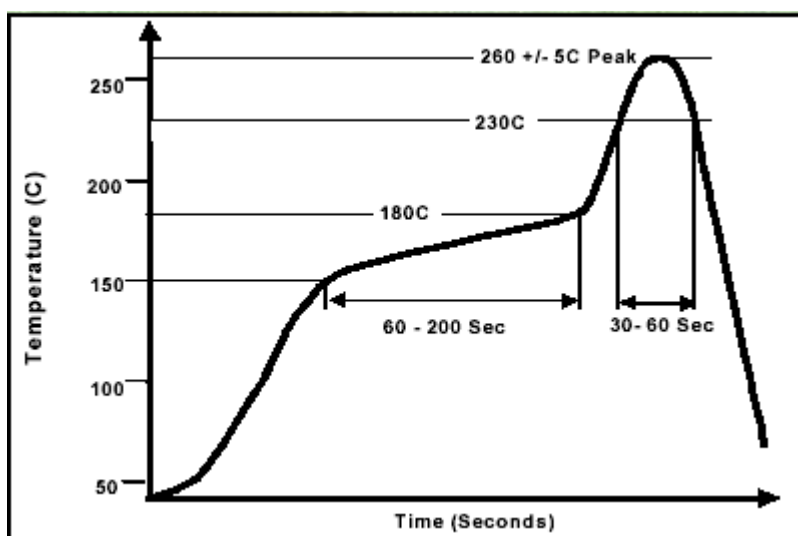
Diodes Inc. offers most other products in an external lead free finish version. These include packages SMA, SMB, SMC, DF, DPAK, TO-3P, TO-220, POWERMITE®3 and others. Please enquire about specific product availability.

The above products may be ordered in lead free finish versions by adding the suffix “-F” to the existing product type number. The plating is Matte Tin. Standard SnPb plated products as released also remain available. New products will only be released with lead free plating. Please see the product’s Data Sheet for specific lead finish information.

Lead free finished products are compatible with most lead free soldering alloys including such combinations as SnAg, SnCu and SnAgCu. The lead free finish remains backward compatible with lead containing soldering alloys.

All products will withstand a peak reflow temperature of 260°C for 10 sec. in a 230°C 60 sec. reflow zone with a preheat of 150°C to 180°C for 60 to 200 seconds. Flow soldering heat resistance is specified at 265°C for 10 sec.

Standard Soldering Profile



POWERMITE is a registered trademark of Microsemi Corporation

3050 E. Hillcrest Drive, Westlake Village, CA 91362-3154 805.446.4800 805.446.4850 fax www.diodes.com

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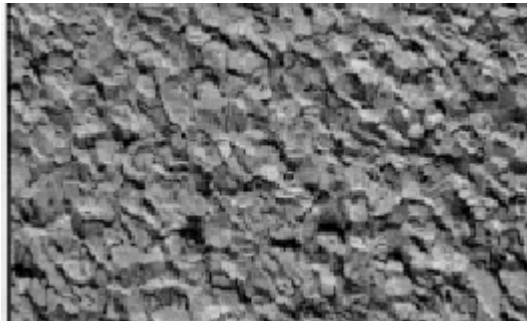
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Members of each product/package family have been tested in the Lead Free Finish versions. Test conditions and results are as follows.

Item	Test	Industry Standard	Conditions	Results
1	Plating Surface Finish	Visual	N/A	Passed
2	MSL Certification	Modified J-Std-020B	260°C Reflow Profile	Passed
3	Autoclave	JESD22-A102	121°C, 100%RH, 96 hrs	Passed
4	Temperature Cycling	JESD22-A104	-55°C - 150°C, 1000 cyc	Passed
5	Biased Humidity	JESD22-A101 JESD22-A110	85°C, 85%RH, 1000 hrs 130°C, 85%RH, 96 hrs	Passed Passed
6	Solderability	JESD22-B102	245°C, 5 sec SnPb & Sn solder	Passed
7	Medium Temperature Storage Bake	N/A	50°C, 1344 hrs (whisker growth test)	Passed
8	Plating Polymer Material	National Testing Center	N/A	Passed

Whisker growth is controlled by precise process and material control. Material grain size is controlled to 7 ~ 8 um with no organic foreign material. Plating thickness is 5 ~ 13um. Plating current density is controlled to < 40A.

Results of Whisker Growth Test:



Test Start, Week 0 (1000X)



Week 8 (2500X)

After 1344 hours, samples were stored at 85°C, 85%RH for 52 weeks. At 52 weeks, samples were inspected under 10,000X magnification. Maximum whisker growth on samples was observed to be 10um.