



Lead-Free Product Family & Recommended Soldering Profile

Won-Top Electronics Co., Ltd. offers most of its diodes and rectifiers in an external lead free finish versions. These include packages of,

SMD Diodes & Rectifiers	SOD-923, SOD-723, SOD-523, SOD-323, SOD-123, SOD-123FL, SOT-523, SOT-363, SOT-323, SOT-23, Quadro-MELF, Micro-MELF, Mini-MELF, MELF, SMA, SMA-LF, SMB, SMB-FL, SMC, DPAK, D ² PAK, TO-277/A
Power-pack Rectifiers	TO-220A, TO-220AC, TO-220AB, TO-220, TO-3P, TO-247AC, ITO-220A, ITO-220AC, ITO-220AB, ITO-220, DO-4, DO-5
Axial Lead Diodes	R-1, A-405, DO-35, DO-35 GLASS, DO-41, DO-41 GLASS, DO-15, DO-201AD, DO-201AE, R-6, P-600
SMD Bridge Rectifiers	DF-S, MB-S, MBL-S, TB-S, TB-S Flat
Dual In-Line Bridge Rectifiers	DIL
Single In-Line Bridge Rectifiers	GBP, KBP, KBPM, GBL, KBL, GBU, KBU, GBJ-6, KBJ-4, RS-5, KBPC-S, D3K
Round Bridge Rectifiers	WOB, RB-20
Square Bridge Rectifiers	KBPC-3, KBPC-6, KBPC-8, MP-10, MP-15, GBPC, KBPC, KBPC-P, KBPC-PS, KBPC-PW, GBPC-W, KBPC-W, MT, SVT

The above products may be ordered in lead free finish versions by adding the suffix “-LF” to the existing product type number. The plating is Matte Tin. Standard SnPb plated products are not suggested for new design. New products will only be released with lead free plating.

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.

Reflow begins at a preheat of 150°C to 200°C for 60 to 180 sec. and up to peak reflow temperature of 260°C at ramp-up rate 3°C/sec. All products will withstand within 5°C of peak reflow temperature of 260°C for 20 to 40 sec. A detailed reflow profile according to JEDEC J-STD-020C is shown below.

Profile Feature	Lead-Free Assembly
Average Ramp-Up Rate ($T_{S_{max}}$ to T_P)	3°C/second max.
Preheat Temperature Min ($T_{S_{min}}$) Temperature Max ($T_{S_{max}}$) Time ($t_{s_{min}}$ to $t_{s_{max}}$)	150°C 200°C 60 – 180 seconds
Time maintained above: Temperature (T_L) Time (t_L)	217°C 60 – 150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_p)	20 – 40 seconds
Ramp-Down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

Note: All temperatures refer to topside of the package, measured on the package body surface.

