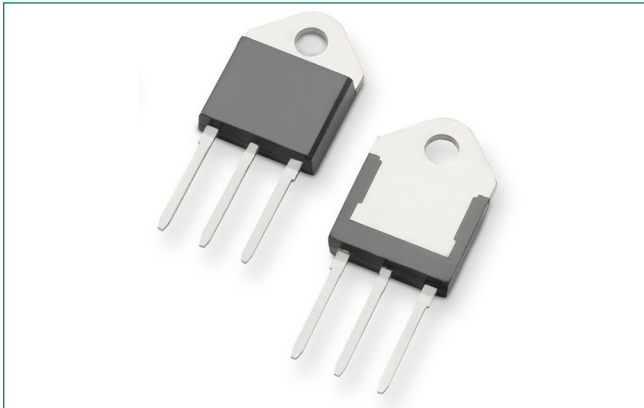


Pxxx0ME 5kA SIDACtor Series® in TO-218



Description

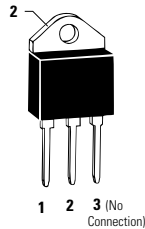
The 5kA series SIDACtor® components are designed to protect equipment located in high exposure environments from severe overvoltage transients.

Setup in a robust TO-218 package, the 5kA series are ideal for use in data interface and AC power line for CATV amplifiers, Telecom Base Station equipment and Cell Towers.

Agency Approvals

| Agency | Agency File Number |
|--------|--------------------|
| | E133083 |

Pinout Designation



Features and Benefits

- Low voltage overshoot
- Low on-state voltage
- Does not degrade surge capability after multiple surge events within limit.
- Fails short circuit when surged in excess of rating
- Rugged TO-218 package
- 5000A 8/20 μs surge rating
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)
- RoHS compliant, lead-free and halogen-free
- UL Recognized as an Isolated Loop Circuit Protector to UL 497B

Schematic Symbol



Applicable Global Standards

- TIA-968-A
- TIA-968-B
- ITU K.20/21/45 Enhanced Level
- ITU K.20/21/45 Basic Level
- GR 1089 Intra-building
- IEC 61000-4-5 2nd Edition
- YD/T 1082
- YD/T 993
- YD/T 950
- GR 1089 Inter-building

Electrical Characteristics

| Part Number | Marking | V_{DRM} @ $I_{DRM} = 5\mu A$ | V_S @ $100V/\mu s$ | I_H | I_S | I_T | V_T @ $I_T = 2.2 A$ | Capacitance @ 1MHz, 2V bias | |
|-------------|---------|-----------------------------------|-------------------------|--------|--------|--------|--------------------------|--------------------------------|--------|
| | | V min | V max | mA min | mA max | A max | V max | pF min | pF max |
| P1500MEL | P1500ME | 140 | 180 | 50 | 800 | 2.2/25 | 4 | 400 | 650 |
| P1900MEL | P1900ME | 155 | 220 | 50 | 800 | 2.2/25 | 4 | 400 | 650 |
| P2300MEL | P2300ME | 180 | 260 | 50 | 800 | 2.2/25 | 4 | 350 | 600 |
| P2600MEL | P2600ME | 220 | 300 | 50 | 800 | 2.2/25 | 4 | 300 | 600 |
| P3100MEL | P3100ME | 275 | 350 | 50 | 800 | 2.2/25 | 4 | 300 | 550 |
| P3500MEL | P3500ME | 320 | 400 | 50 | 800 | 2.2/25 | 4 | 300 | 500 |
| P3800MEL | P3800ME | 350 | 430 | 50 | 800 | 2.2/25 | 4 | 300 | 500 |
| P4800MEL | P4800ME | 450 | 600 | 20 | 800 | 2.2/25 | 4 | 300 | 500 |

Notes:
 1. Absolute maximum ratings measured at $T_c = 25^\circ C$ (unless otherwise noted).
 2. Components are bi-directional (unless otherwise noted).
 3. I_T is a free air rating and heat sink is at 25A

Surge Ratings

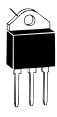
| Series | I _{PP} | | | I _{TSM} / 60 Hz | di/dt |
|--------|--|--|--|--------------------------|-------|
| | 1.2/50 ¹ 8/20 ² | 10/350 ¹ 1.2/50 ² | 10/1000 ¹ 10/1000 ² | | |
| | A min | A min | A min | | |
| E | 5000 ³ | 1500 | 1100 | 400 | 630 |

Notes:

1. Voltage waveform in μs
2. Current waveform in μs
3. For surge rating of P3800MEL, it is minimum 4kA and typical 5kA @8/20 μs .

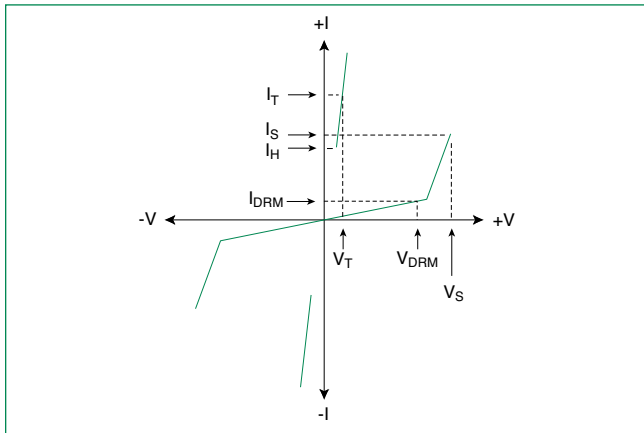
- Peak pulse current rating (I_{PP}) is repetitive and guaranteed for the life of the product.
 - The component must initially be in thermal equilibrium with $-40^\circ\text{C} \leq T_J \leq +150^\circ\text{C}$

Thermal Conditions

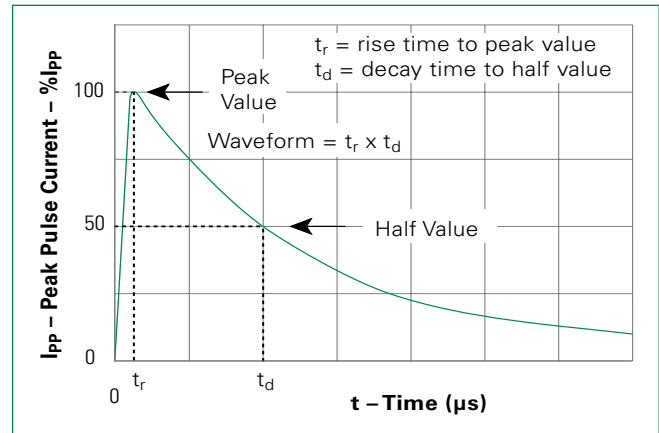
| Package | Symbol | Parameter | Value | Unit |
|--|--------------------|---|-------------|------|
|  TO-218 | T _{JO} | Operating Junction Temperature Range | -40 to +150 | °C |
| | T _S | Storage Temperature Range | -65 to +150 | °C |
| | T _C | Maximum Case Temperature | 100 | °C |
| | R _{θJC} * | Thermal Resistance: Junction to Case | 1.7 | °C/W |
| | R _{θJA} | Thermal Resistance: Junction to Ambient | 56 | °C/W |

*R_{θJC} rating assumes the use of a heat sink and on state mode for extended time at 25 A, with average power dissipation of 29.125 W.

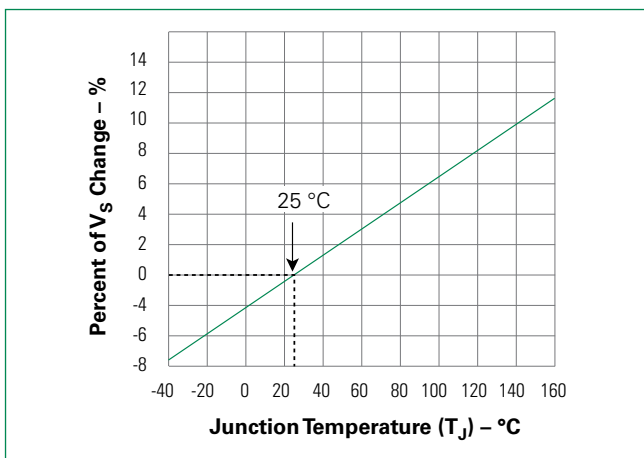
V-I Characteristics



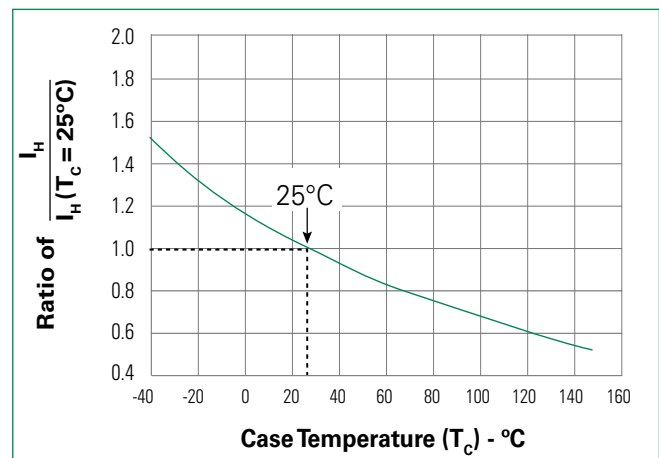
t_r x t_d Pulse Waveform



Normalized V_S Change vs. Junction Temperature

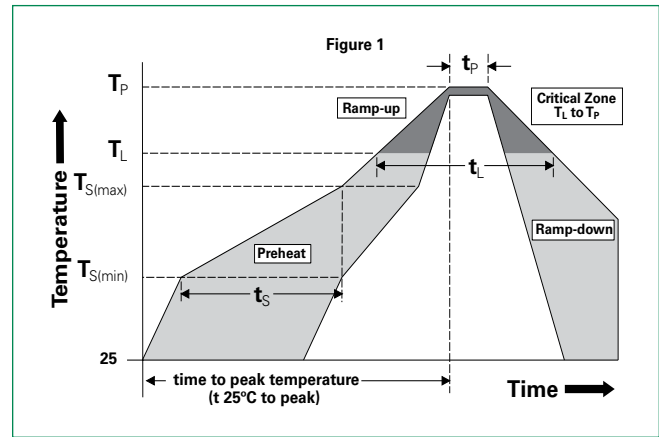


Normalized DC Holding Current vs. Case Temperature



Soldering Parameters

| | | |
|--|------------------------------------|------------------|
| Reflow Condition | | Pb-Free assembly |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | +150°C |
| | - Temperature Max ($T_{s(max)}$) | +200°C |
| | - Time (Min to Max) (t_s) | 60-180 secs. |
| Average ramp up rate (Liquidus Temp (T_L) to peak) | | 3°C/sec. Max. |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max. |
| Reflow | - Temperature (T_L) (Liquidus) | +217°C |
| | - Temperature (t_l) | 60-150 secs. |
| Peak Temp (T_p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max. |
| Ramp-down Rate | | 6°C/sec. Max. |
| Time 25°C to Peak Temp (T_p) | | 8 min. Max. |
| Do not exceed | | +260°C |



Physical Specifications

| | |
|------------------------|---|
| Lead Material | Copper Alloy |
| Terminal Finish | 100% Matte-Tin Plated |
| Body Material | UL recognized epoxy meeting flammability classification V-0 |

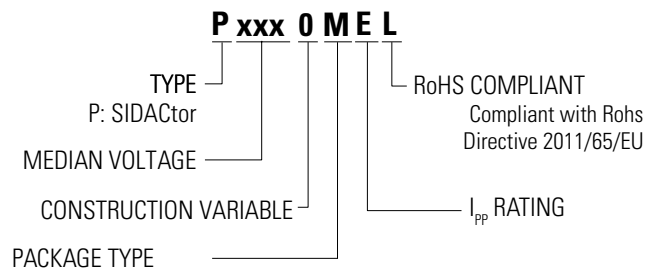
Environmental Specifications

| | |
|---|---|
| High Temp Voltage Blocking | 80% Rated V_{DRM} (V_{AC} Peak) +125°C or +150°C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101 |
| Temp Cycling | -65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104 |
| Biased Temp & Humidity | 52 V_{DC} (+85°C) 85%RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101 |
| High Temp Storage | +150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101 |
| Low Temp Storage | -65°C, 1008 hrs. |
| Thermal Shock | 0°C to +100°C, 5 min. dwell, 10 sec. transfer, 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106 |
| Autoclave (Pressure Cooker Test) | +121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/JEDEC, JESD22-A-102 |
| Resistance to Solder Heat | +260°C, 30 secs. MIL-STD-750 (Method 2031) |
| Moisture Sensitivity Level | 85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C Peak). JEDEC-J-STD-020, Level 1 |

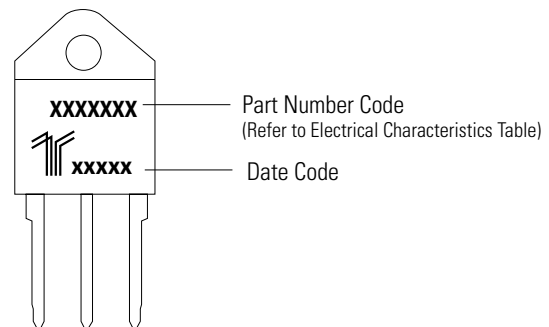
Wave Solder (THD) Parameters and Lead-Free Requirements

| Reflow Parameter | Lead-Free Requirement |
|----------------------------------|-----------------------|
| Preheat (Depending on Flux Only) | |
| Temperature Min | 150°C |
| Temperature Max | 200°C |
| Time (Min to Max) | 60 - 180 Seconds |
| Solder Pot Temperature | 245 - 265°C (Max) |
| Solder Dwell Time | 2 - 3.5 Seconds |
| Cooling | -6°C/Seconds (Max) |

Part Numbering



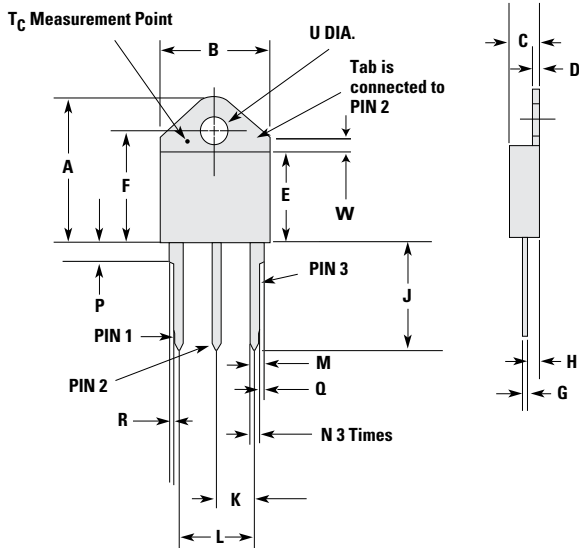
Part Marking



XXXXXXX — Part Number Code
(Refer to Electrical Characteristics Table)

xxxxx — Date Code

Dimensions — TO-218



| Dimensions | Inches | | Millimeters | |
|------------|--------|-------|-------------|-------|
| | Min | Max | Min | Max |
| A | 0.810 | 0.835 | 20.57 | 21.21 |
| B | 0.610 | 0.630 | 15.49 | 16.00 |
| C | 0.178 | 0.188 | 4.52 | 4.78 |
| D | 0.055 | 0.070 | 1.40 | 1.78 |
| E | 0.487 | 0.497 | 12.37 | 12.62 |
| F | 0.635 | 0.655 | 16.13 | 16.64 |
| G | 0.022 | 0.029 | 0.56 | 0.74 |
| H | 0.075 | 0.095 | 1.91 | 2.41 |
| J | 0.575 | 0.625 | 14.61 | 15.88 |
| K | 0.211 | 0.219 | 5.36 | 5.56 |
| L | 0.422 | 0.437 | 10.72 | 11.10 |
| M | 0.058 | 0.068 | 1.47 | 1.73 |
| N | 0.045 | 0.055 | 1.14 | 1.40 |
| P | 0.095 | 0.115 | 2.41 | 2.92 |
| R | 0.008 | 0.016 | 0.20 | 0.41 |
| U | 0.161 | 0.165 | 4.1 | 4.2 |
| W | 0.085 | 0.095 | 2.17 | 2.42 |

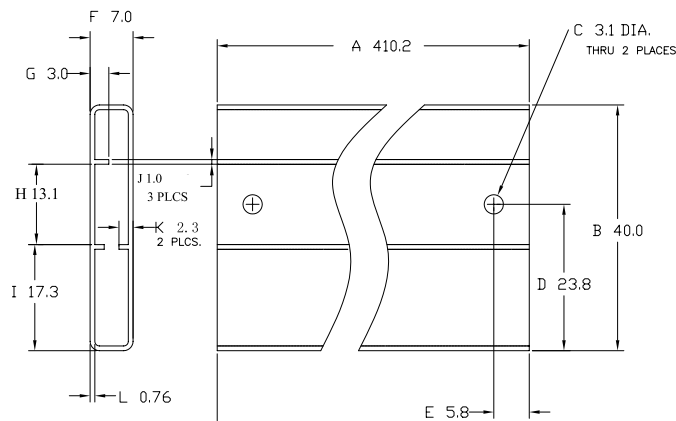
Notes:

- Mold flash shall not exceed 0.13 mm per side.
- Maximum torque to be applied to mounting tab is 8 in-lbs. (0.904 Nm).
- Pin 3 has no connection.
- Tab is non-isolated (connects to middle pin).

Packing Options

| Package Type | Description | Packing Options Quantity | Added Suffix | Industry Standard |
|--------------|-----------------------|-----------------------------------|--------------|-------------------|
| M | TO-218 (ME) Tube Pack | 250(25 per tube/10 tubes per box) | N/A | N/A |

Tube Pack Specification — TO-218



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