

DESCRIPTION

This UPS1040e3 in the Powermite3[®] package is a high efficiency Schottky rectifier that is also RoHS compliant offering high current/power capabilities previously found only in much larger packages. They are ideal for SMD applications that operate at high frequencies. In addition to its size advantages, the Powermite3[®] package includes a full metallic bottom that eliminates the possibility of solder flux entrapment during assembly and a unique locking tab act as an efficient heat path to the heat-sink mounting. Its innovative design makes this device ideal for use with automatic insertion equipment.

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**ABSOLUTE MAXIMUM RATINGS AT 25° C
(UNLESS OTHERWISE SPECIFIED)**

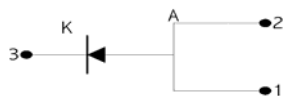
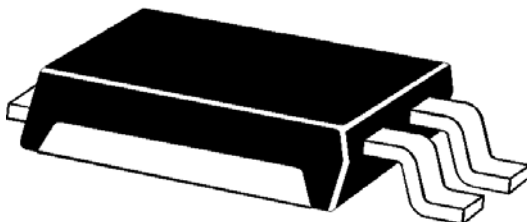
| Rating | Symbol | Value | Unit |
|---|---------------------------------|-------------|------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 40 | V |
| RMS Reverse Voltage | V_R (RMS) | 28 | V |
| Average Rectified Output Current | I_o | 10 | A |
| Non-Repetitive Peak Forward Surge Current 8.3 ms Single half sine wave Superimposed on Rated Load@ $T_c = 90^\circ\text{C}$ | I_{FSM} | 150 | A |
| Storage Temperature | T_{STG} | -55 to +150 | °C |
| Junction Temperature | T_J | -55 to +150 | °C |

THERMAL CHARACTERISTICS

| Thermal Resistance | | | |
|---------------------------|-----------------|-----|----------|
| Junction-to-case (bottom) | $R_{\theta JC}$ | 3.2 | °C/ Watt |
| Junction to ambient (1) | $R_{\theta JA}$ | 65 | °C/ Watt |

(1) When mounted on FR-4 PC board using 2 oz copper with recommended minimum foot print


Powermite 3™



KEY FEATURES

- Very low thermal resistance package
- RoHS Compliant with e3 suffix part number
- Guard-ring-die construction for transient protection
- Efficient heat path with Integral locking bottom metal tab
- Low forward voltage
- Full metallic bottom eliminates flux entrapment
- Compatible with automatic insertion
- Low profile-maximum height of 1mm
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, and JANTXV are available by adding MQ, MX, or MV prefixes respectively to part numbers. For example, designate MXUPS1040e3 for a JANTX (consult factory for Tin-Lead plating).
- Optional 100% avionics screening available by adding MA prefix for 100% temperature cycle, thermal impedance and 24 hours HTRB (consult factory for Tin-Lead plating)

APPLICATIONS/BENEFITS

- Switching and Regulating Power Supplies.
- Silicon Schottky (hot carrier) rectifier for minimal reverse voltage recovery
- Elimination of reverse-recovery oscillations to reduce need for EMI filtering
- Charge Pump Circuits
- Reduces reverse recovery loss with low I_{RM}
- Small foot print  = 190 X 270 mils (1:1 Actual size)
See mounting pad details on pg 3

MECHANICAL & PACKAGING

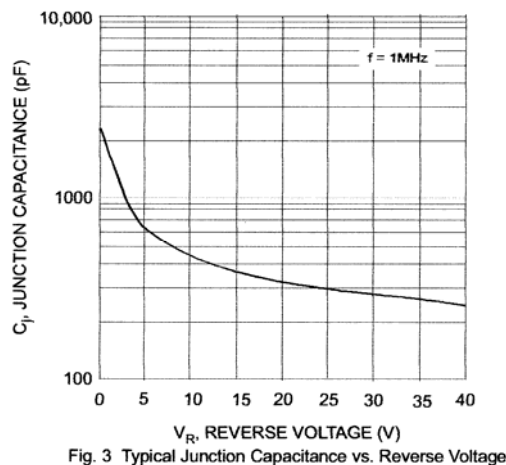
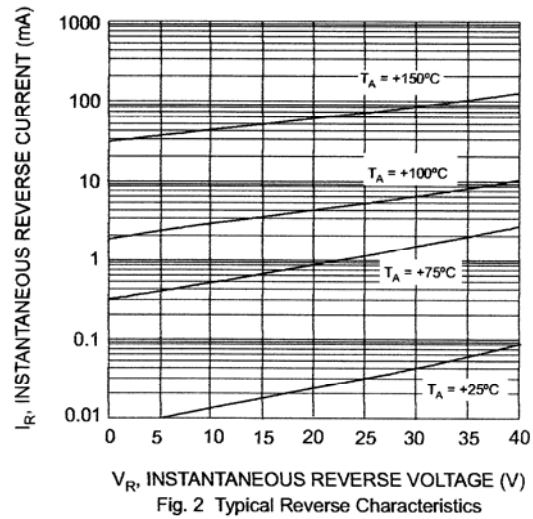
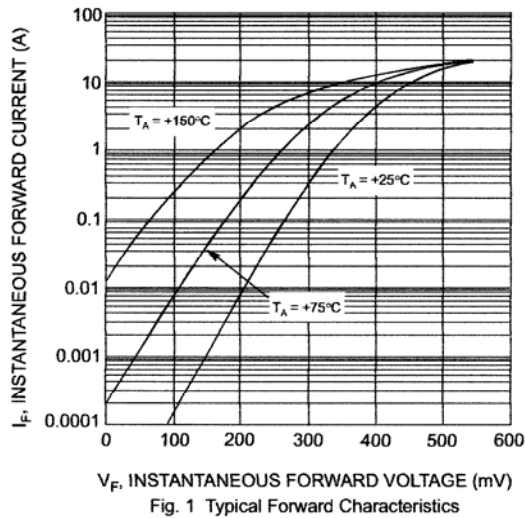
- CASE: Void-free transfer molded thermosetting epoxy compound meeting UL94V-0
- FINISH: Annealed matte-Tin plating over copper and readily solderable per MIL-STD-750 method 2026 (consult factory for Tin-Lead plating)
- POLARITY: See figure (left)
- MARKING: S1040•
- WEIGHT: 0.072 gram (approx.)
- Package dimension on last page
- Tape & Reel option: 16 mm tape per Standard EIA-481-B, 5000 on 13" reel

ELECTRICAL PARAMETERS @ 25°C (unless otherwise specified)

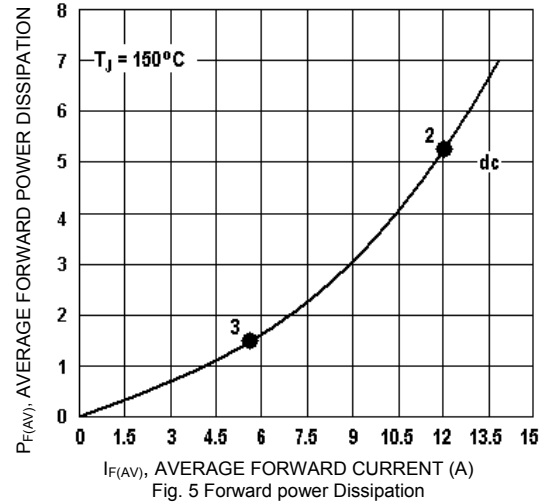
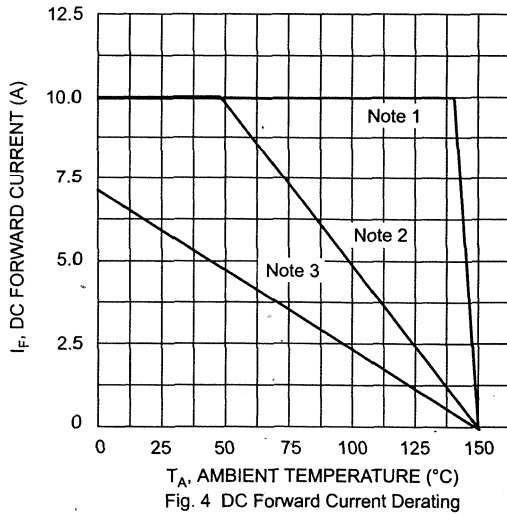
| Parameter | Symbol | Conditions | Min | Typ. | Max | Units |
|-------------------------------------|----------|---|-----|--------------|--------------|----------|
| Forward Voltage (Note 1) | V_F | $I_F = 8 \text{ A}, T_j = 25^\circ\text{C}$ $I_F = 8 \text{ A}, T_j = 125^\circ\text{C}$ $I_F = 10 \text{ A}, T_j = 25^\circ\text{C}$ | | 0.45 0.47 | 0.49 0.51 | V |
| Reverse Break Down Voltage (Note 1) | V_{BR} | $I_R = 1 \text{ mA}$ | 40 | | | V |
| Reverse Current (Note1) | I_R | $V_R = 35 \text{ V}, T_j = 25^\circ\text{C}$ $V_R = 35 \text{ V}, T_j = 100^\circ\text{C}$ | | 0.1 12.5 | 0.3 25 | mA mA |
| Capacitance | C_T | $V_R = 4.0\text{V}; f = 1 \text{ MHz}$ | | 700 | | pF |

Note: 1 Short duration test pulse used to minimize self – heating effect.

GRAPHS



GRAPHS



- NOTE 1: $T_A = T_C$ at case bottom where $R_{\theta JC} = 2.5^\circ \text{C/W}$ and $R_{\theta CA} = 0^\circ \text{C/W}$ (infinite heat sink).
- NOTE 2: Device mounted on GETEK substrate, 2" x 2", 2 oz. copper, double-sided, cathode pad dimensions 0.75" x 1.0", anode pad dimensions 0.25" x 1.0". $R_{\theta JA}$ in range of 15-30° C/W.
- NOTE 3: Device mounted on FRA-4 substrate, 2" x 2", 2 oz. copper, single-sided, pad layout $R_{\theta JA}$ in range of 65°C/W. See mounting pad dimensions on next page.

PACKAGE & MOUNTING PAD DIMENSIONS

PACKAGING:

| DIM | INCHES | | MILLIMETERS | |
|-----|---------|--|-------------|--|
| | NOMINAL | | NOMINAL | |
| A | 0.070 | | 1.778 | |
| B | 0.173 | | 4.392 | |
| C | 0.200 | | 5.080 | |
| D | 0.035 | | 0.889 | |
| E | 0.160 | | 4.064 | |
| F | 0.072 | | 1.829 | |
| G | 0.056 | | 1.422 | |
| H | 0.044 | | 1.118 | |
| J | 0.190 | | 4.826 | |
| K | 0.210 | | 5.344 | |
| L | 0.038 | | 0.965 | |
| M | 0.034 | | 0.864 | |
| N | 0.030 | | 0.762 | |
| P | 0.030 | | 0.762 | |

