UPS1040CTe3

10 A Dual Schottky Barrier Rectifiers

DESCRIPTION

This UPS1040CTe3 in the Powermite3® package is a high efficiency center-tap dual 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.

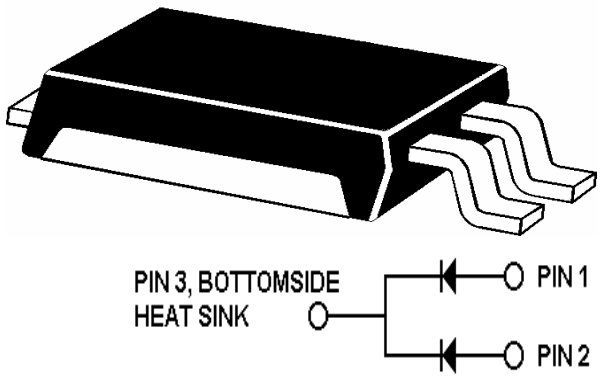
IMPORTANT: For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

ABSOLUTE MAXIMUM RATINGS AT 25º 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 8.3ms Single half sine wave Superimposed on Rated Load@ T_c =90 ºC	I_{FSM}	150	A
Storage Temperature	T_{STG}	-55 to +150	ºC
Junction Temperature	T_J	-55 to +125	ºC

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

Thermal Resistance (dual device)			
Junctions-to Bottom (Case)	$R_{\theta JC}$	2.5	ºC/Watt



KEY FEATURES

- Very low thermal resistance package
- Dual center-tap Schottky configuration with common cathode
- 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 MXUPS1040CTe3 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 5

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: S1040CT•
- 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) Per Element	V_F	I_F = 5 A , T_J =25 ºC I_F = 5 A , T_J =100 ºC I_F = 10 A , T_J =25 ºC I_F = 10 A , T_J =100 ºC		0.44 0.39 0.51 0.50	0.48 0.42 0.57 0.55	V
Reverse Breakdown Voltage (Note 1)	V_{BR}	I_R = 500 uA	40			V
Reverse Current (Note1) Per Element	I_R	V_R = 35V, T_j = 25 ºC V_R = 35V, T_j =100 ºC V_R = 17.5V, T_j = 25 ºC V_R = 17.5V, T_j = 100 ºC		35 4 15 2	150 10 80 5	uA mA uA mA
Capacitance Per Element	C_T	V_R = 4 V; f = 1 MH_Z		375		pF

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

GRAPHS

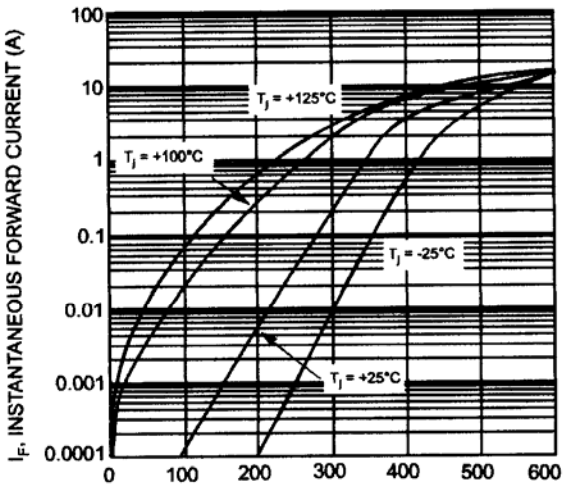


Fig. 1 Typical Forward Characteristics, Per Element

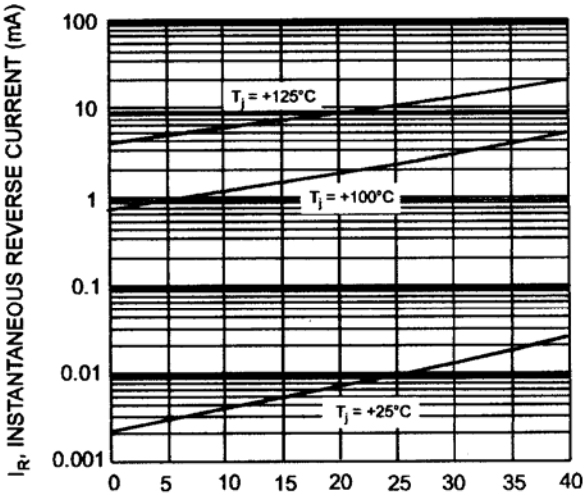


Fig. 2 Typical Reverse Characteristics, Per Element

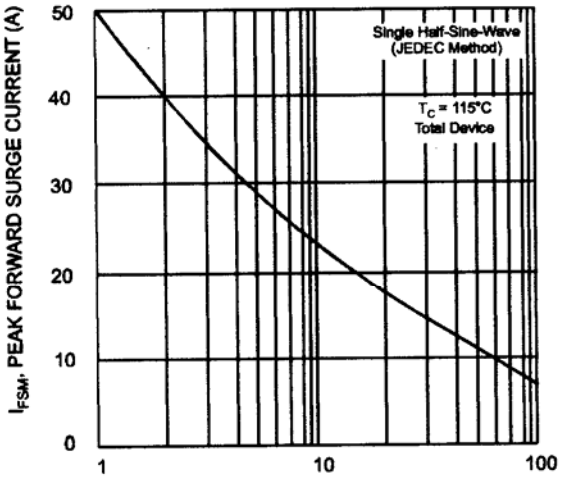


Fig. 3 Max Non-Repetitive Peak Fwd Surge Current

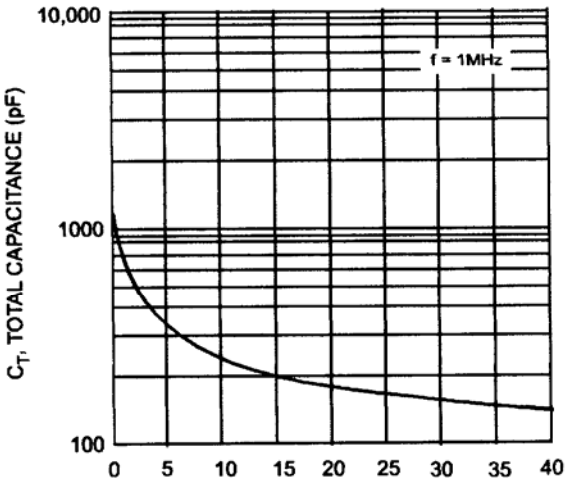


Fig. 4 Typical Capacitance
vs. Reverse Voltage, Per Element

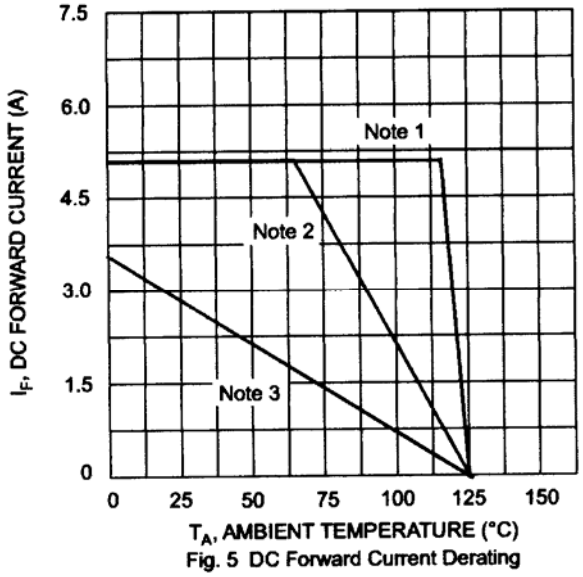


Fig. 5 DC Forward Current Derating

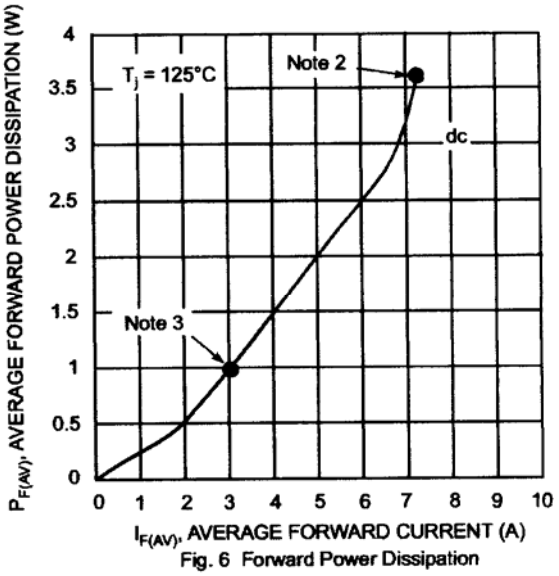
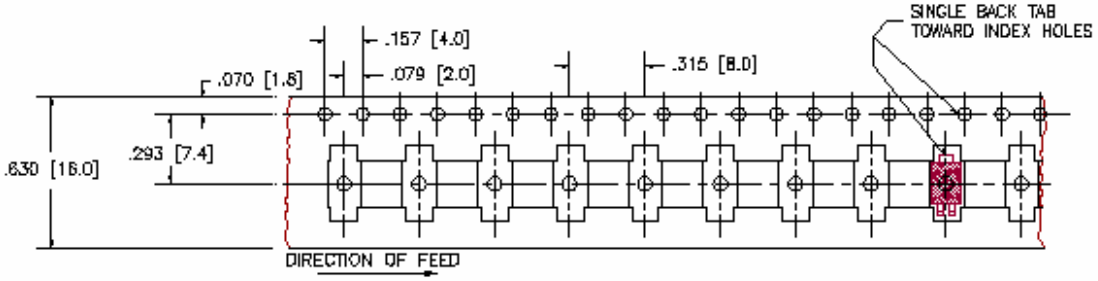


Fig. 6 Forward Power Dissipation

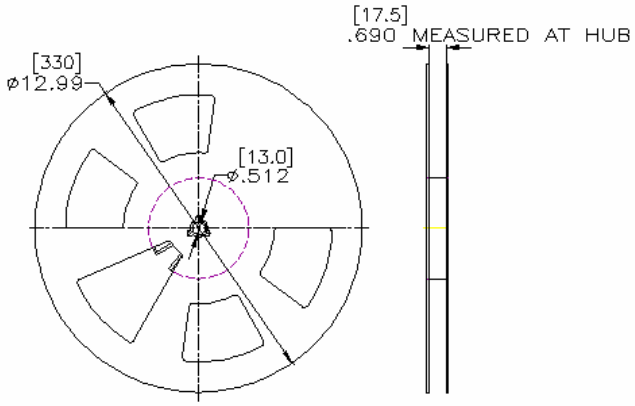
NOTE 1: $T_A = T_C$ at case bottom where $R_{\theta JC}$ =2.5° C/W (dual device) and $R_{\theta CA}$ = 0° C/W (infinite heat sink).
NOTE 2: Device mounted on GETEK substrate, 2" x 2", 2 oz. copper , double-sided , cathode pad dimensions 0.75" x 1.0", anode pad dimensions 0.25" x 1.0". $R_{\theta JA}$ in range of 20-35° 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 page 5.

TAPE & REEL

16 mm TAPE



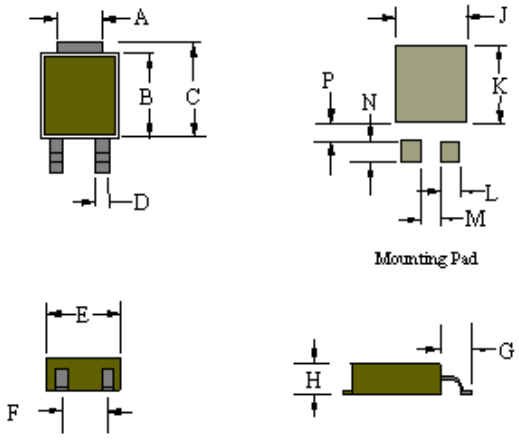
13 INCH REEL



PACKAGE & PAD LAYOUT DIMENSIONS

PACKAGING:

	INCHES	MILLIMETERS
DIM	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



NOTES: