UPS120e3

1.0 A Schottky Barrier Rectifier

DESCRIPTION

The Microsemi UPS120e3 Powermite® Schottky rectifier is RoHS compliant and offers low forward voltage characteristics with reverse blocking capabilities up to 20 Volt. They are ideal for surface mount applications that operate at high frequencies.
In addition to its size advantages, Powermite® package features include a full metallic bottom that eliminates possibility of solder flux entrapment during assembly, and a unique locking tab acts as an efficient heat path from die to mounting plane for external heat sinking with very low thermal resistance junction to case (bottom). 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**

KEY FEATURES

- Low thermal resistance DO-216AA 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

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	20	V
RMS Reverse Voltage	$V_{R\ (RMS)}$	14	V
Average Rectified Output Current (at rated V_R, T_C =135ºC)	I_o	1.0	A
Peak Repetitive Forward Current (at rated V_R, square wave, 100kHz, T_C=135ºC)	I_{FRM}	2.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine wave	I_{FSM}	50	A
Voltage Rate of Change (rated V_R, TJ =25ºC)	dv/dt	10,000	V/µs
Storage Temperature	T_{STG}	-55 to +150	ºC
Junction Temperature	T_J	-55 to +125	ºC

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

Thermal Resistance			
Junction-to-case (bottom)	$R_{\theta JC}$	15	ºC/ Watt
Junction-to-ambient (1)	$R_{\theta JA}$	240	ºC/ Watt

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

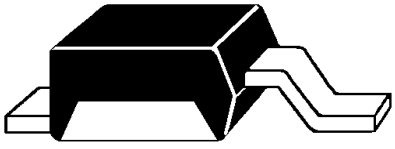
APPLICATIONS/BENEFITS

- 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 8.45 mm^2 foot print
  (See mounting pad details next page)

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: S20•
- WEIGHT: 0.016 grams (approx.)
- Package dimension on last page
- Tape & Reel option: 12 mm tape per Standard EIA-481-B, 3000 on 7 inch reel and 12,000 on 13" reel

DO-216

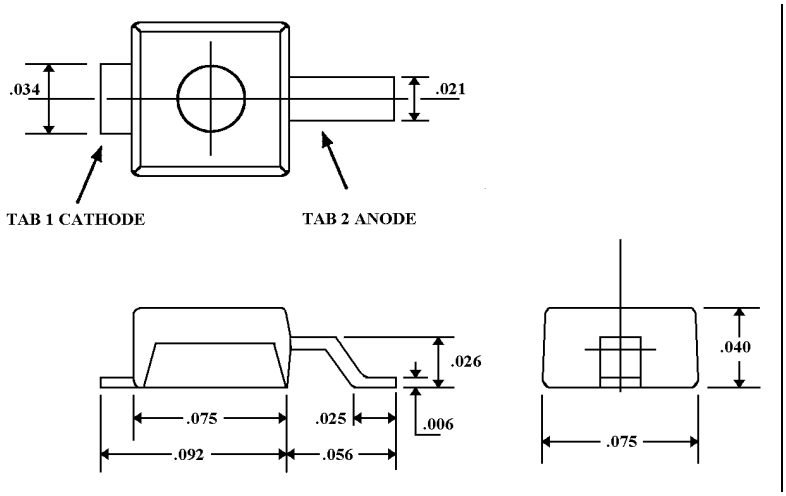


See further details and dimensions on last page

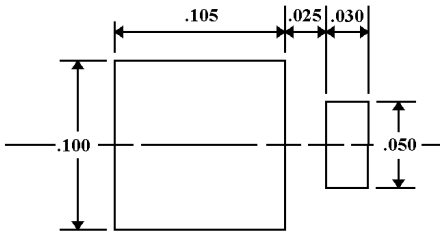
Parameter	Symbol	Conditions	T_J = 25ºC	T_J =85ºC	Units
Maximum Forward Voltage (Note 1) See Figure 2	V_F	I_F = 0.1 A I_F = 1.0 A I_F = 3.0 A	0.34 0.45 0.65	0.25 0.415 0.67	V
Maximum Instantaneous Reverse Current (Note 1)	I_R	V_R = 20 V V_R = 10 V	0.40 0.10	25 18	mA

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

PACKAGE & MOUNTING PAD DIMENSIONS



DO-216 Package (All dimensions +/-.005 inches)



MOUNTING PAD in inches

CHARTS AND GRAPHS

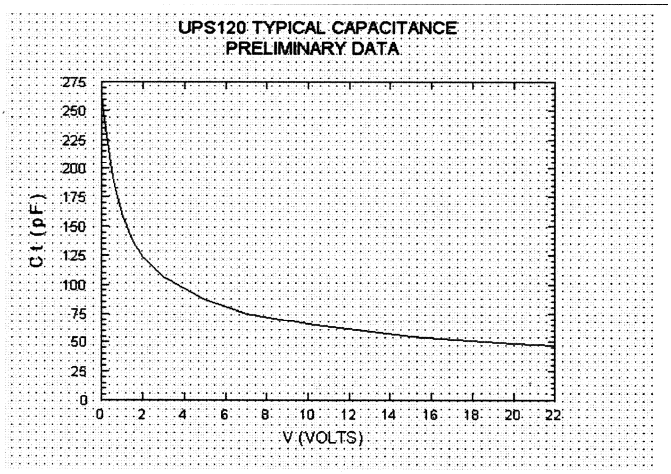


FIGURE 1

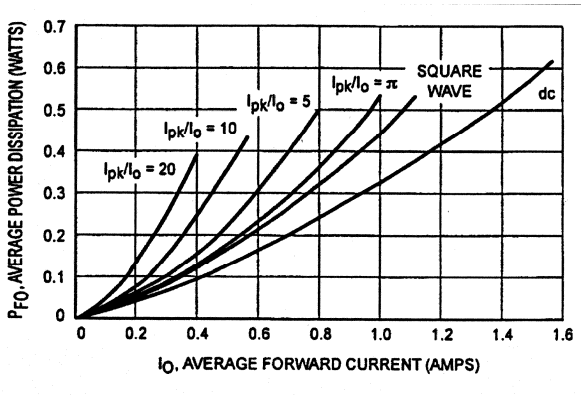


FIGURE 2
Forward Power Dissipation

* Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of T_J therefore must include forward and reverse power effects. The allowable operating T_J may be calculated from the equation:

$T_J = T_{J\,max} = r(t)(Pf+Pr)$ where
r(t) = thermal impedance under given conditions.
Pf = forward power dissipation, and
Pr = reverse power dissipation

This graph displays the derated allowable T_J due to reverse bias under DC conditions only and is calculated as $T_J = T_{J\,max}$-r(t) Pr, Where r(t)=Rthja. For other power applications further calculations must be performed.

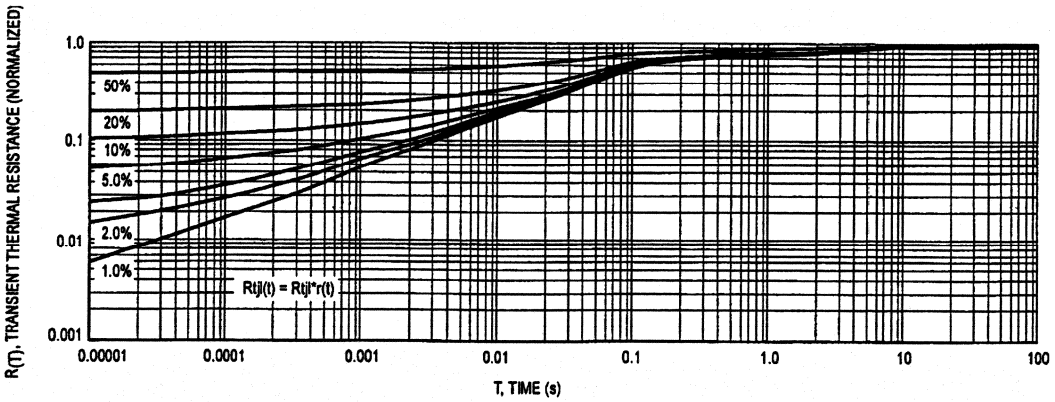


FIGURE 3 – Thermal Impedance Junction to Case (bottom)

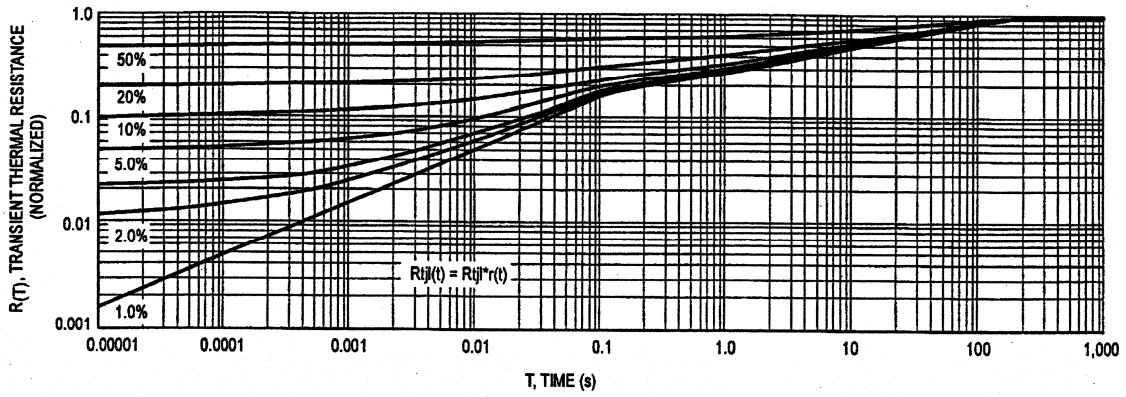


FIGURE 4 – Thermal Impedance Junction to Ambient