

**UPS120**

**SURFACE MOUNT  
 1A SCHOTTKY RECTIFIER  
 POWERMITE<sup>®</sup> Power Surface Mount Package**

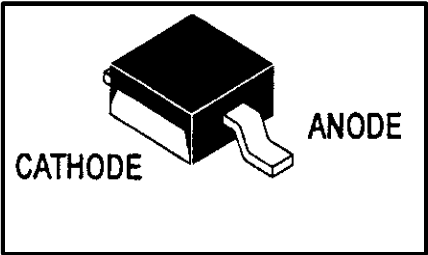
**Features:**

- Low Profile -- Maximum Height of 1.1 mm
- Small Footprint -- Footprint Area of 8.45 mm<sup>2</sup>
- Low V<sub>F</sub> Provides Higher Efficiency and Extends Battery Life
- Supplied in 12 mm Tape and Reel -- 12,000 Units per Reel
- Low Thermal Resistance with Direct Thermal Path of Die on Exposed Cathode Heat Sink

**SCHOTTKY BARRIER  
 RECTIFIER  
 1.0 AMPERES  
 20 VOLTS**

**Mechanical Characteristics:**

- Powermite is JEDEC Registered as DO-216AA
- Case: Molded Epoxy
- Epoxy Meets UL94, VO at 1/8"
- Weight: 62 mg (approximately)
- Device Marking: S20
- Lead and Mounting Surface Temperature for Soldering Purposes, 260°C Maximum for 10 Seconds



**Description:**

The UPS120 Powermite Schottky rectifier is designed to offer optimized forward voltage characteristics for battery powered portable products such as cellular and cordless phones, chargers, notebook computers, printers, PDA's and PCMCIA cards. Typical applications include ac/dc and dc-dc converters, reverse battery protection and "Oring" of multiple supply voltages.

The Powermite's patented heat sink design offers the same thermal performance rating as an SMA while being 50% smaller in footprint area and less than 1 mm in overall height. The result is a unique, highly efficient Schottky rectifier in a space saving surface mount package.

**Maximum Ratings**

RATING	SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	20	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
Average Rectified Forward Current (At Rated V <sub>R</sub> , T <sub>C</sub> = 135°C)	I <sub>O</sub>	1.0	A
Peak Repetitive Forward Current (At Rated V <sub>R</sub> , Square Wave, 100 KHz, T <sub>C</sub> = 135°C)	I <sub>FRM</sub>	2.0	A
Non-Repetitive Peak Surge Current (Non-Repetitive peak surge current, halfwave, single phase, 60 Hz)	I <sub>FSM</sub>	50	A
Storage / Operating Case Temperature	T <sub>stg</sub> , T <sub>C</sub>	-55 to 150	°C
Operating Junction Temperature	T <sub>J</sub>	-55 to 125	°C
Voltage Rate of Change (Rated V <sub>R</sub> , T <sub>J</sub> = 25°C)	dv/dt	10,000	V/ms

**Thermal Characteristics**

Thermal Resistance - Junction-to-Lead (Anode) (1)	R <sub>tji</sub>	35	°C/W
Thermal Resistance - Junction-to-Tab (Cathode) (1)	R <sub>tjtab</sub>	15	
Thermal Resistance - Junction-to-Ambient (1)	R <sub>tja</sub>	248	

(1) Pulse Test: Pulse Width ≤250 ms, Duty Cycle ≤2%

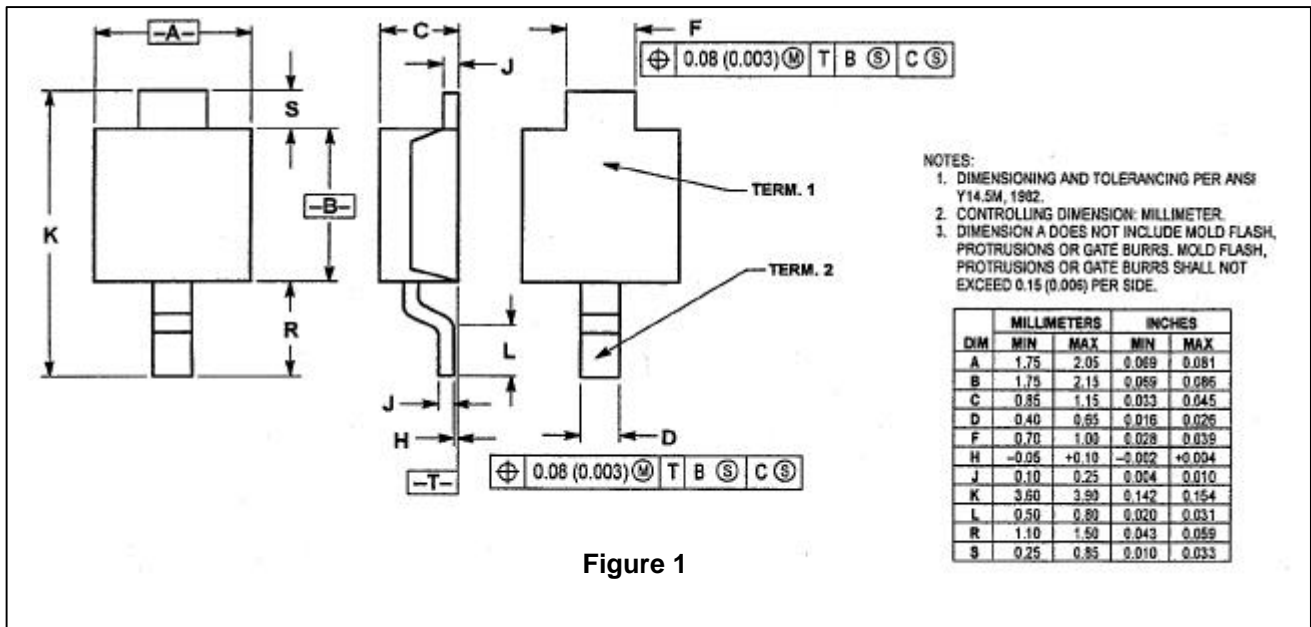
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Electrical Characteristics

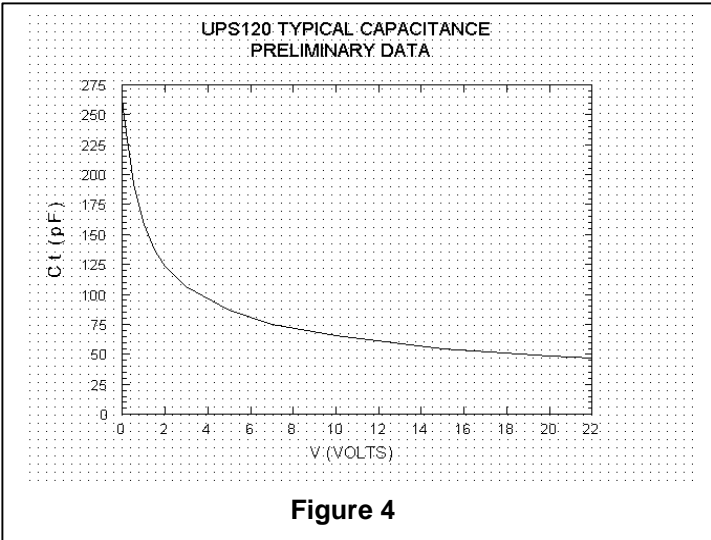
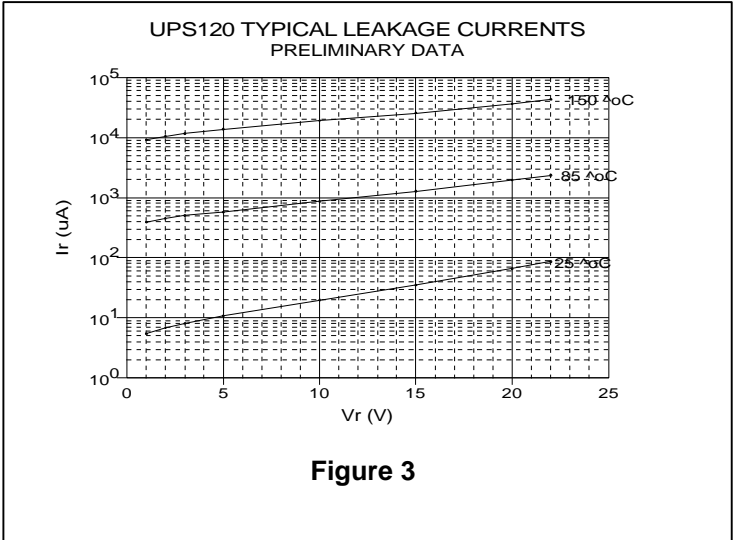
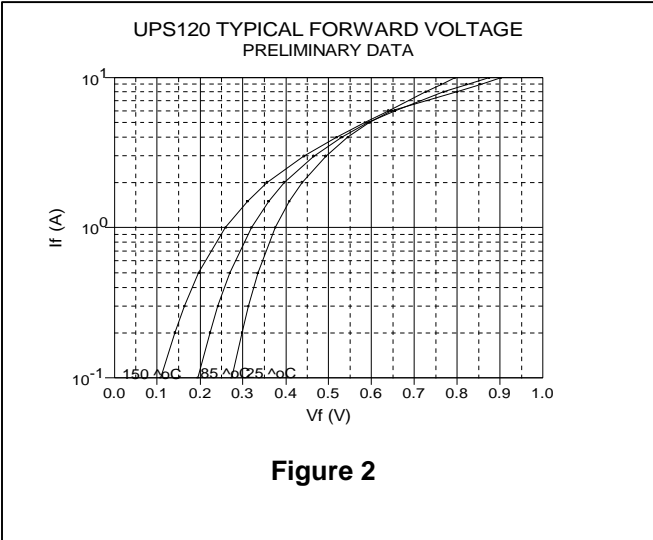
<b>Maximum Instantaneous Forward Voltage (1), See Figure 2</b> ( $I_F = 0.1 \text{ A}$ ) ( $I_F = 1.0 \text{ A}$ ) ( $I_F = 3.0 \text{ A}$ )	$V_F$	$T_J = 25^\circ\text{C}$	$T_J = 85^\circ\text{C}$	<b>V</b>
		<b>0.34</b>	<b>0.25</b>	
		<b>0.45</b>	<b>0.415</b>	
<b>Maximum Instantaneous Reverse Current, See Figure 4</b> ( $V_R = 20 \text{ V}$ ) ( $V_R = 10 \text{ V}$ )	$I_R$	$T_J = 25^\circ\text{C}$	$T_J = 85^\circ\text{C}$	<b>mA</b>
		<b>0.40</b>	<b>25</b>	
		<b>0.10</b>	<b>18</b>	

(1) Pulse Test: Pulse Width  $\leq 250 \text{ ns}$ , Duty Cycle  $\leq 2\%$ .

**MECHANICAL DIMENSIONS**

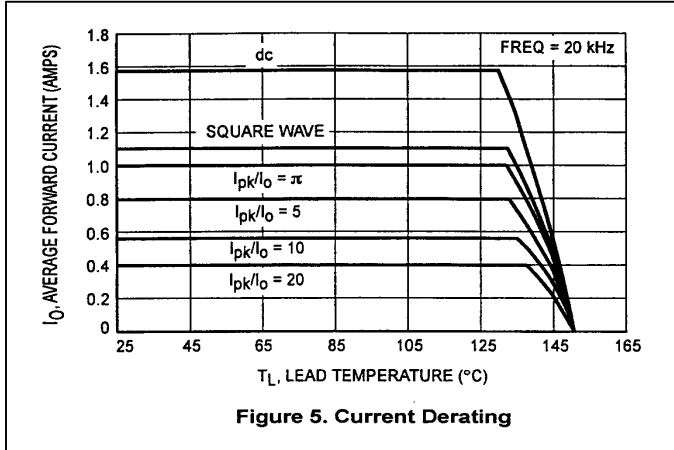


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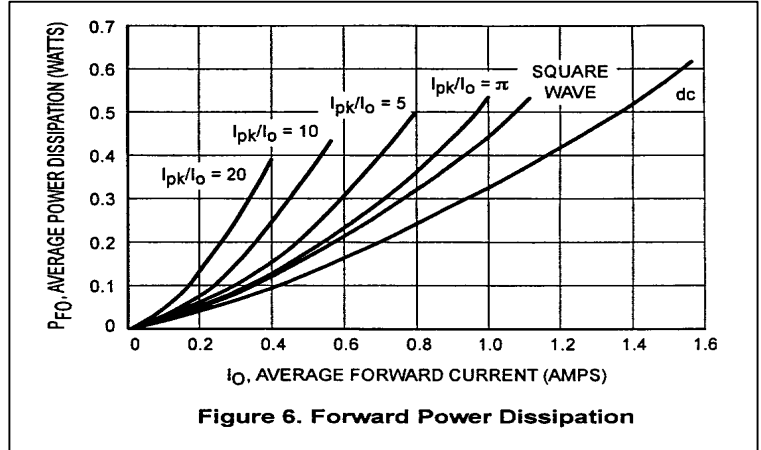


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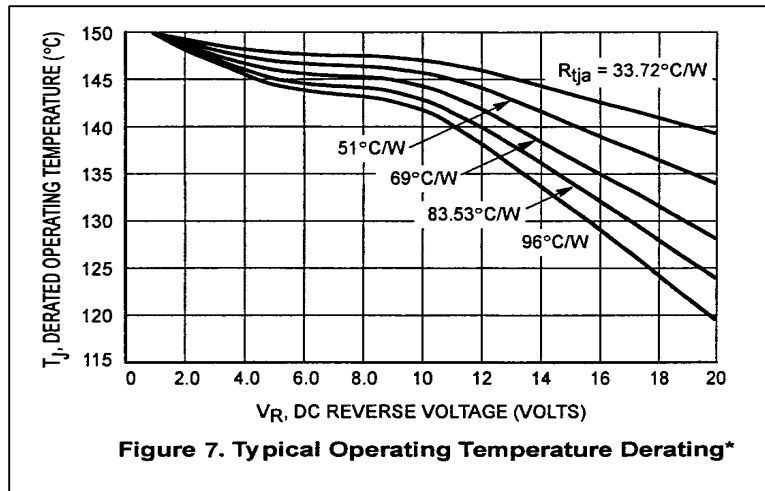
Preliminary Data



Preliminary Data



Preliminary Data



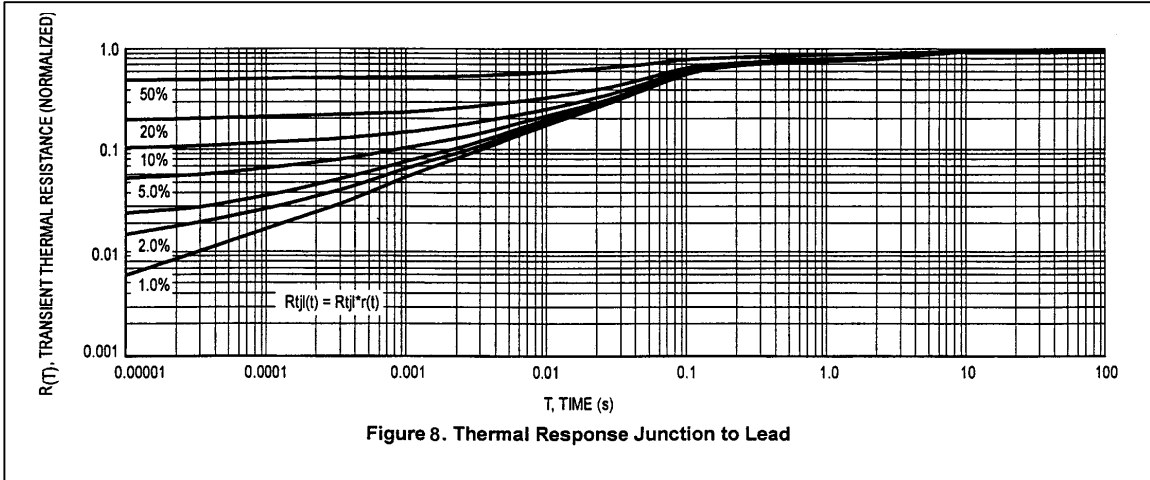
\* Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of  $T_J$  therefore must include forward and reverse power effects. The allowable operating  $T_J$  may be calculated from the equation:

$$T_J = T_{Jmax} = r(t)(P_f + P_r) \text{ where}$$

$r(t)$  = thermal impedance under given conditions.  
 $P_f$  = forward power dissipation, and  
 $P_r$  = reverse power dissipation

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

Preliminary Data



Preliminary Data

