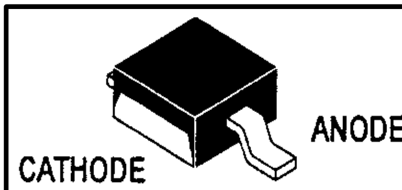
Microsemi Watertown, MA
Progress Powered by Technology

580 Pleasant St.
Watertown, MA 02472
PH: (617) 926-0404
FAX: (617) 924-1235

UPS120

SURFACE MOUNT
1A SCHOTTKY RECTIFIER
POWERMITE® Power Surface Mount Package

SCHOTTKY BARRIER RECTIFIER
1.0 AMPERES
20 VOLTS



Features:

- Low Profile -- Maximum Height of 1.1 mm
- Small Footprint -- Footprint Area of 8.45 mm^2
- Low V_F 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

Mechanical Characteristics:

- Powermite is JEDEC Registered as DO-216AA
- Case: Molded Epoxy
- Epoxy Meets UL94, VO at 1/8"
- Weight: 62 mg (appoximately)
- 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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	20	V
Average Rectified Forward Current (At Rated V_R, T_C = 135°C)	I_O	1.0	A
Peak Repetitive Forward Current (At Rated V_R, Square Wave, 100 KHz, T_C = 135°C	I_{FRM}	2.0	A
Non-Repetitive Peak Surge Current (Non-Repetitive peak surge current, halfwave, single phase, 60 Hz)	I_{FSM}	50	A
Storage / Operating Case Temperature	T_{stg}, T_C	-55 to 150	°C
Operating Junction Temperature	T_J	-55 to 125	°C
Voltage Rate of Change (Rated V_R, T_J = 25°C)	dv/dt	10,000	V/µs

Thermal Characteristics

Thermal Resistance - Junction-to-Lead (Anode) (1} Thermal Resistance - Junction-to-Tab (Cathode) (1} Thermal Resistance - Junction-to-Ambient (1}	Rtji Rtjtab Rtja	35 15 248	°C/W

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

Watertown, MA
Microsemi
Progress Powered by Technology

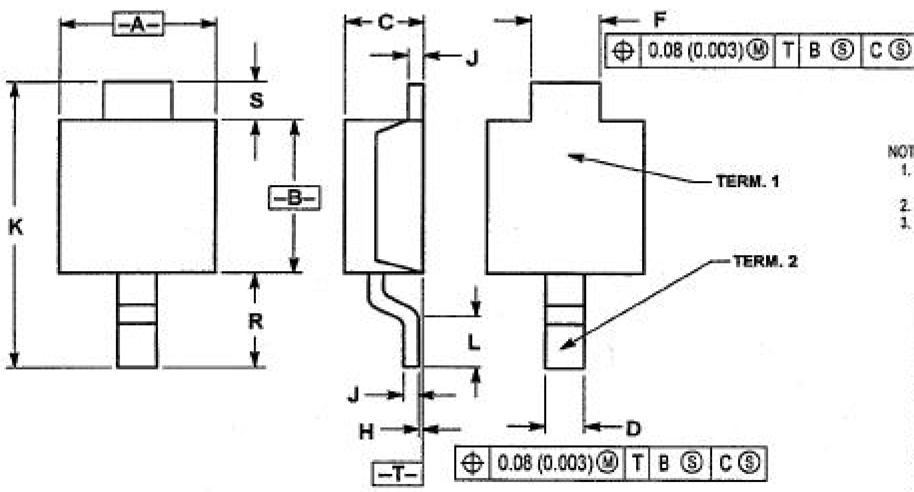
UPS120

Electrical Characteristics

Maximum Instantaneous Forward Voltage (1), See Figure 2	V_F	T_J = 25°C	T_J = 85°C	V
(I_F = 0.1 A)		0.34	0.25	
(I_F = 1.0 A)		0.45	0.415	
(I_F = 3.0 A)		0.65	0.67	
Maximum Instantaneous Reverse Current, See Figure 4	I_R	T_J = 25°C	T_J = 85°C	mA
(V_R = 20 V)		0.40	25	
(V_R = 10 V)		0.10	18	

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

MECHANICAL DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.75	2.05	0.069	0.081
B	1.75	2.15	0.069	0.085
C	0.85	1.15	0.033	0.045
D	0.40	0.65	0.016	0.026
F	0.70	1.00	0.028	0.039
H	−0.05	+0.10	−0.002	+0.004
J	0.10	0.25	0.004	0.010
K	3.60	3.90	0.142	0.154
L	0.50	0.80	0.020	0.031
R	1.10	1.50	0.043	0.059
S	0.25	0.85	0.010	0.033

Figure 1

Watertown, MA
Microsemi
Progress Powered by Technology

UPS120

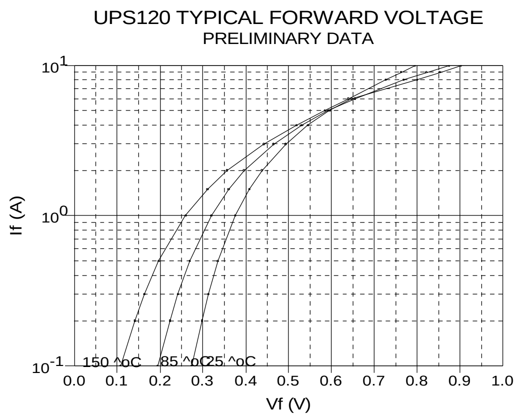


Figure 2

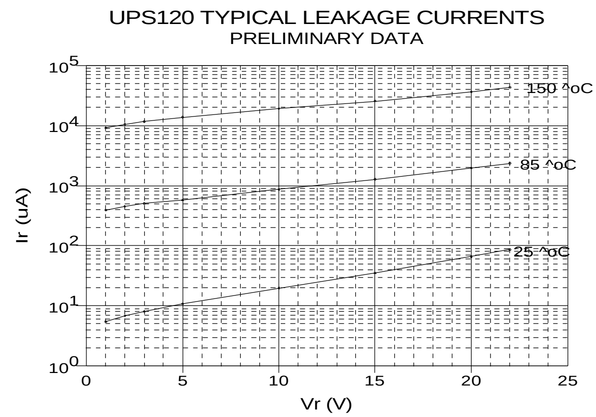


Figure 3

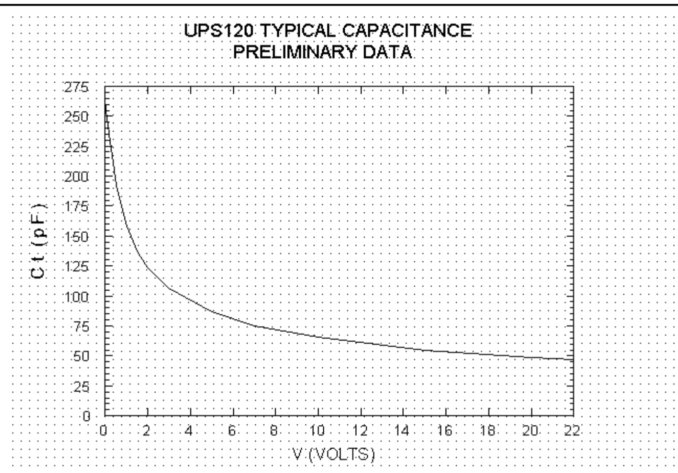


Figure 4

Preliminary Data

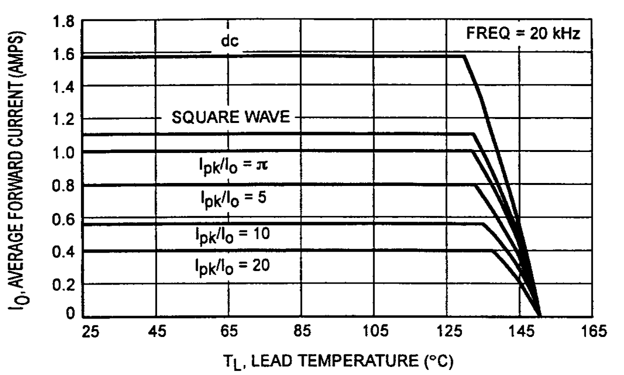


Figure 5. Current Derating

Preliminary Data

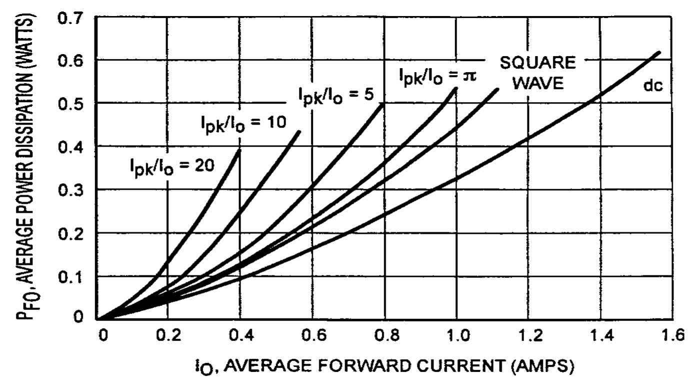


Figure 6. Forward Power Dissipation

Preliminary Data

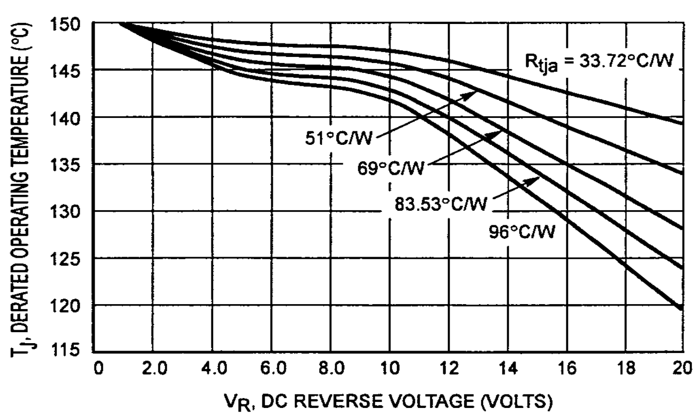


Figure 7. Typical Operating Temperature Derating*

*** 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:**

$T_J = T_{Jmax} = r(t)(Pf + Pr)$ 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.

Preliminary Data

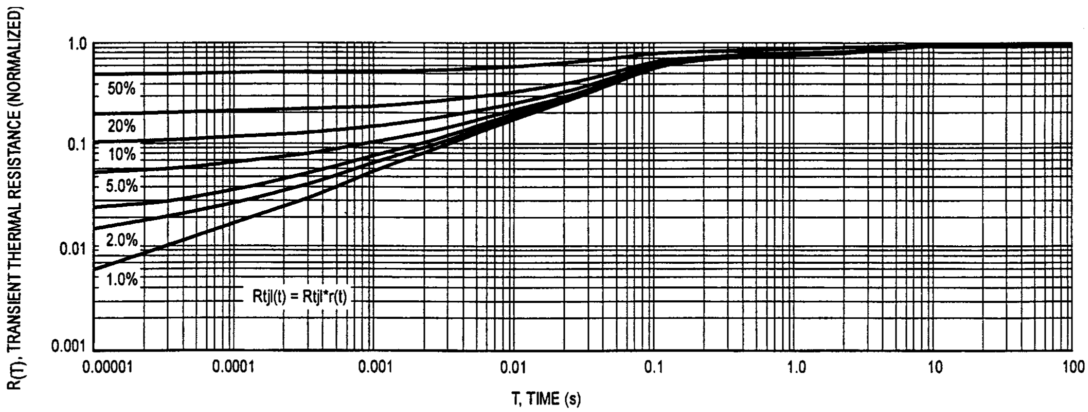


Figure 8. Thermal Response Junction to Lead

Preliminary Data

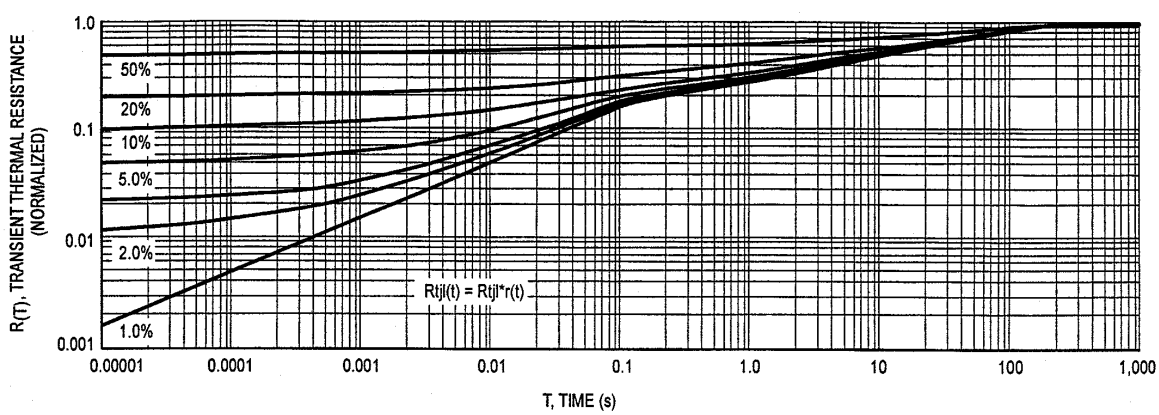


Figure 9. Thermal Response Junction to Ambient