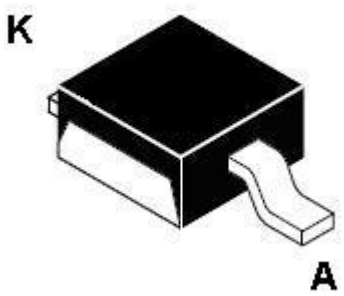
UPS120Ee3

Low Leakage Schottky Barrier Rectifier

Main product characteristics

I_O	1A
V_{RRM}	20V
$T_{j(MAX)}$	125ºC
$V_{F(MAX)}$	0.455V
$I_{R(MAX)}$	10µA



Powermite 1
(DO-216AA)

Features and benefits

- Low forward voltage drop
- Low profile package height
- Efficient heat path with integral locking bottom metal tab
- Low thermal resistance DO-216AA package

Description and applications

Single schottky rectifier assembled in Powermite 1® package which features a full metallic bottom that eliminates possibility of solder flux entrapment during assembly. The package also incorporates a unique locking tab which acts as an efficient heat path from die to mounting plane for external heat sinking with very low thermal resistance junction to case (bottom).

This product is suitable for use in switching and regulating power supplies and also charge pump circuits.

Absolute maximum ratings(1)

Symbol	Parameter	Value	Unit
V_{RRM} V_{RWM} V_R	Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	20	V
$V_{R(RMS)}$	RMS Reverse Voltage	14	V
I_O	Average rectified forward output current (T_C = 135ºC)	1.0	A
I_{FRM}	Peak repetitive forward current (100kHz square wave, T_C = 135ºC)	2.0	A
I_{FSM}	Non repetitive peak forward surge current (8.3ms single half sine wave)	50	A
dV/dt	Voltage rate of change (at max V_R)	10000	V/µs
T_{STG}	Storage temperature	-55 to +150	ºC
T_J	Junction temperature	-55 to +125	ºC

(1) All ratings at 25ºC unless specified otherwise

Characteristics

Static Electrical Characteristics

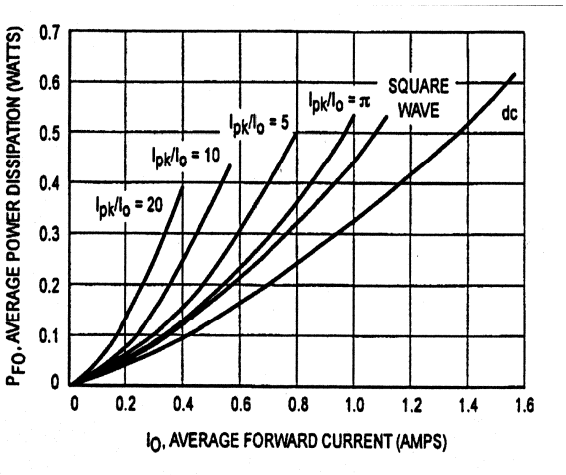
Symbol	Parameter	Test Conditions		Typ	max	Units
V_F[2]	Maximum forward voltage	T_J = 25ºC	I_F = 0.1 A		0.455	V
			I_F = 1.0 A		0.530	
			I_F = 3.0 A		0.595	
		T_J = 100ºC	I_F = 0.1 A		0.360	
			I_F = 1.0 A		0.455	
			I_F = 3.0 A		0.540	
I_R[2]	Maximum instantaneous reverse current	T_J = 25ºC	V_R = 20V		10	µA
			V_R = 10V		1.0	
			V_R = 5V		0.5	
		T_J = 100ºC	V_R = 20V		1600	
			V_R = 10V		500	
			V_R = 5V		300	
C_T	Junction capacitance	V_R = 5V, f = 1MHz				pF

[2] Measured with a test pulse of 380µs to minimize self-heating effect

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\Theta JC}$	Junction to case (bottom)	15	ºC/W
$R_{\Theta JA}$	Junction to ambient[3]	240	ºC/W

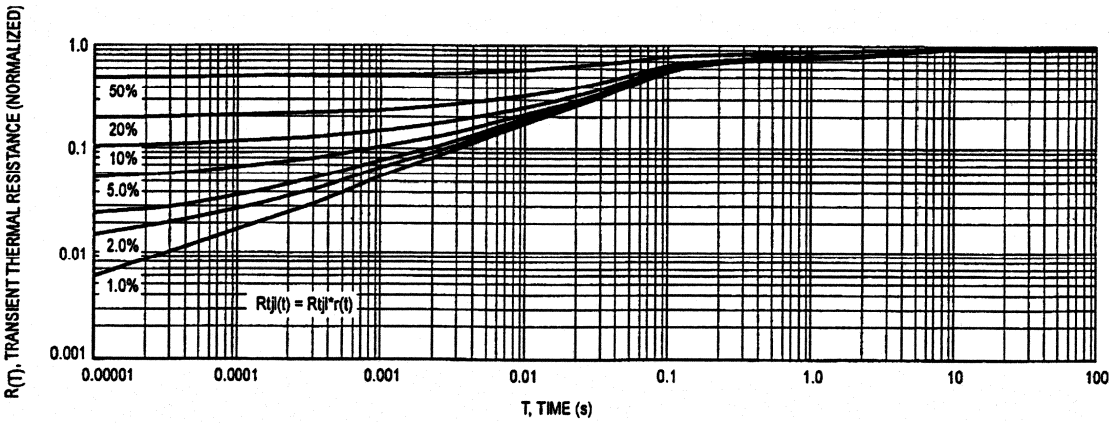
[3] Mounted on FR-4 PC board using 1oz copper with recommended minimum foot print



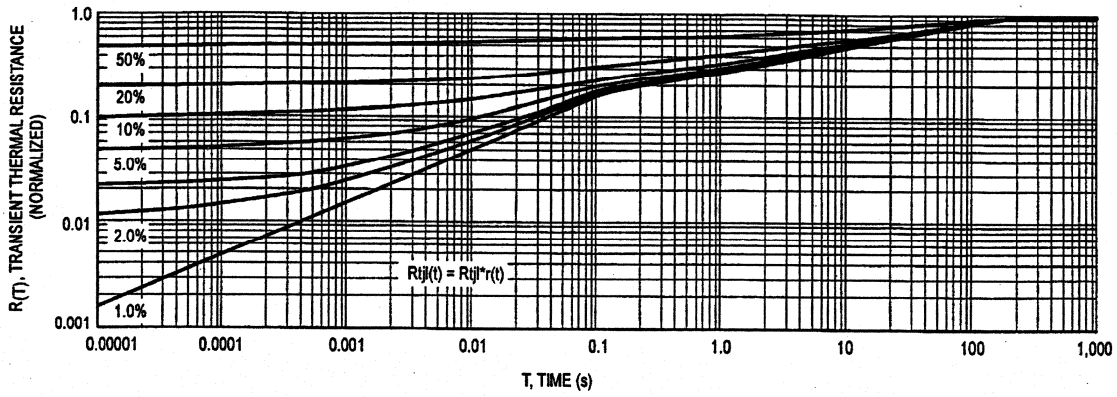
Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of T_J therefore must include forward and reverse power effects. The allowable operating T_J may be calculated from the equation:

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

This graph displays the de-rated 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.



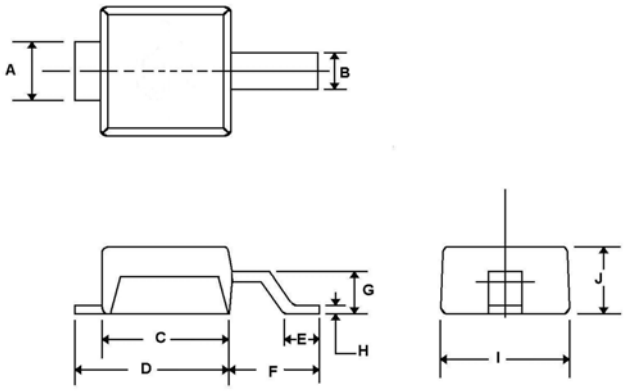
Thermal Impedance Junction to Case (bottom)



Thermal Impedance Junction to Ambient

Mechanical Characteristics

Physical dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.73	0.99	0.029	0.039
B	0.40	0.66	0.016	0.026
C	1.77	2.03	0.070	0.080
D	2.21	2.46	0.087	0.097
E	0.50	0.76	0.020	0.030
F	1.29	1.54	0.051	0.061
G	0.53	0.78	0.021	0.031
H	0.10	0.20	0.004	0.008
I	1.77	2.03	0.070	0.080
J	0.89	1.14	0.035	0.045

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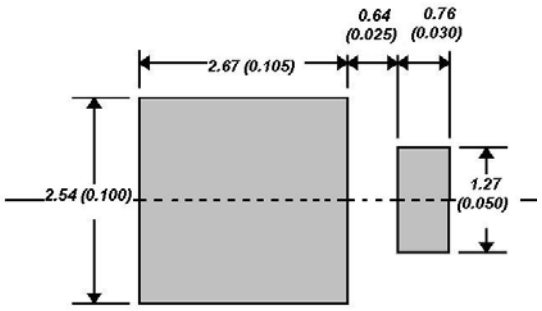
Footprint dimensions



Powermite 1® footprint dimensions in *mm (inches)*

Package materials & information

Case : Epoxy meets UL94V-0

Electrode finish : Matte Sn plating - fully RoHS compliant

Marking code :

20E

Ordering information

Product order code	Marking	Package	Weight	Base qty	Delivery mode
UPS120Ee3 / TR7	20E	Powermite 1 (DO-216AA)	0.016 g	3000	Tape and reel (7 inch)
UPS120Ee3 / TR13	20E	Powermite 1 (DO-216AA)	0.016 g	12000	Tape and reel (13 inch)

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