NRVTSM245E

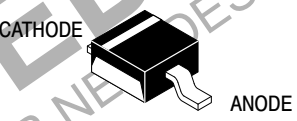
Surface Mount Trench Schottky Power Rectifier

POWERMITE®
Power Surface Mount Package

ON Semiconductor®

www.onsemi.com

SCHOTTKY TRENCH RECTIFIER
2.0 AMPERES, 45 VOLTS



POWERMITE
CASE 457

Features

- Low Profile – Maximum Height of 1.1 mm
- Small Footprint – Footprint Area of 8.45 mm^2
- Supplied in 12 mm Tape and Reel
- Low Thermal Resistance with Direct Thermal Path of Die on Exposed Cathode Heat Sink
- Fine Lithography Trench−based Schottky Technology for Very Low Forward Voltage and Low Leakage
- Fast Switching with Exceptional Temperature Stability
- Low Power Loss and Lower Operating Temperature
- Higher Efficiency for Achieving Regulatory Compliance
- High Surge Capability
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These are Pb−Free and Halide−Free Devices

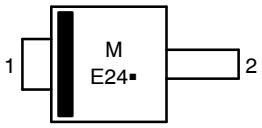
Typical Applications

- Switching Power Supplies including Adapters & Flat Panel Displays
- High Frequency and DC−DC Converters
- Freewheeling and OR−ing diodes
- Reverse Battery Protection
- Instrumentation

Mechanical Characteristics:

- Powermite is JEDEC Registered as D0−216AA
- Case: Molded Epoxy
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Weight: 16.3 mg (Approximately)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Maximum for 10 Seconds

MARKING DIAGRAM



M = Date Code
E24 = Device Code
▪ = Pb−Free Package
(Marking Style 1)

ORDERING INFORMATION

Device	Package	Shipping†
NRVTSM245ET1G	Powermite (Pb−Free)	3000 / Tape & Reel
NRVTSM245ET3G	Powermite (Pb−Free)	12000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	45	V
Average Rectified Forward Current (T_L = 168°C)	I_O	2.0	A
Peak Repetitive Forward Current (Square Wave, 20 kHz, T_L = 167°C)	I_{FRM}	4.0	A
Non−Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	50	A
Storage and Operating Junction Temperature Range (Note 1)	T_{stg}, T_J	−65 to +175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction−to−Lead (Note 2)	Ψ_{JCL}	6.3	°C/W
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	82	°C/W
Thermal Resistance, Junction−to−Ambient (Note 3)	$R_{\theta JA}$	200	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 4) (I_F = 2 A, T_J = 25°C) (I_F = 2 A, T_J = 125°C)	V_F	 0.65 0.58	V
Maximum Instantaneous Reverse Current (Note 4) (Rated dc Voltage, T_J = 25°C) (Rated dc Voltage, T_J = 125°C)	I_R	 75 3	 μA mA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Mounted with 700 mm^2 copper pad size (Approximately 1 in^2) 1 oz FR4 Board.
3. Mounted with pad size approximately 20 mm^2 copper, 1 oz FR4 Board.
4. Pulse Test: Pulse Width ≤ 380 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

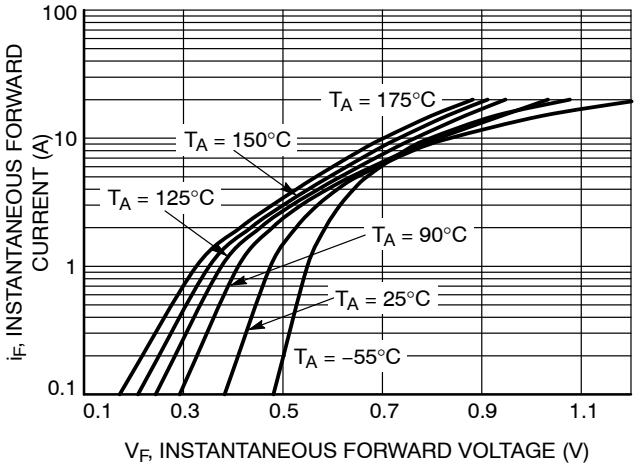


Figure 1. Typical Instantaneous Forward Characteristics

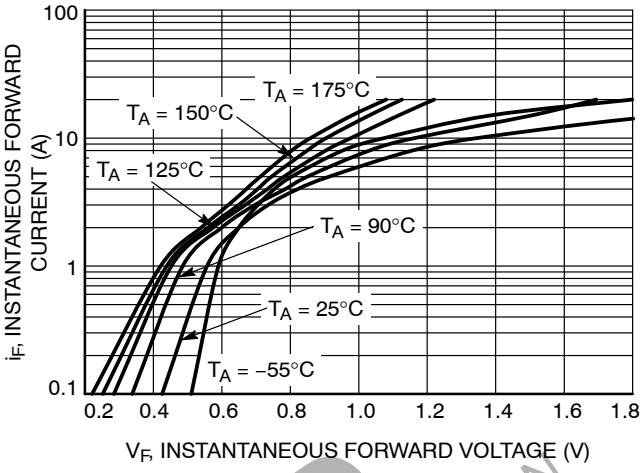


Figure 2. Maximum Instantaneous Forward Characteristics

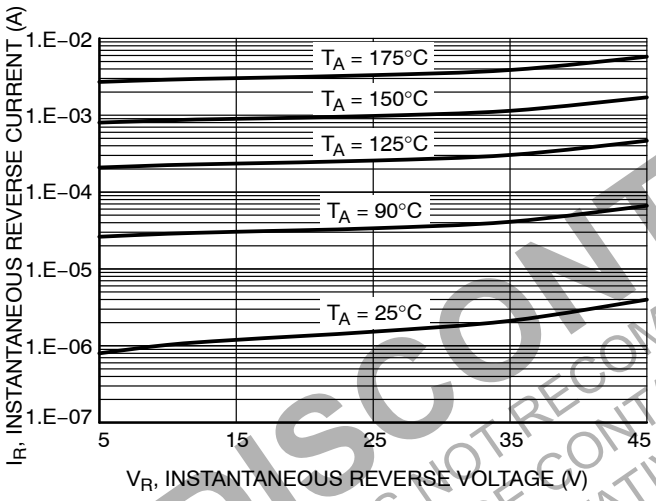


Figure 3. Typical Reverse Characteristics

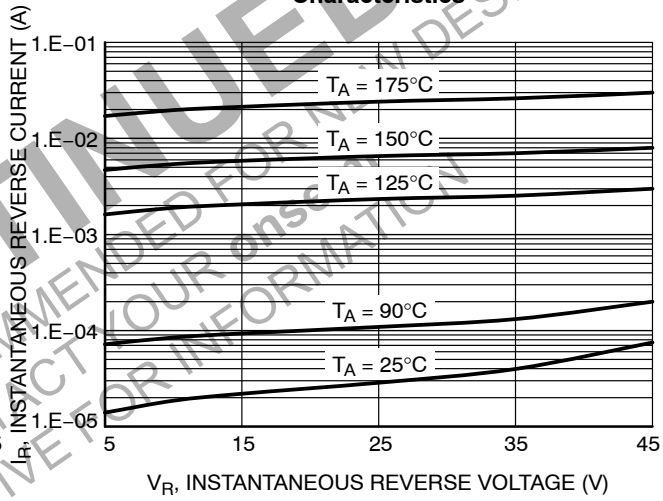


Figure 4. Maximum Reverse Characteristics

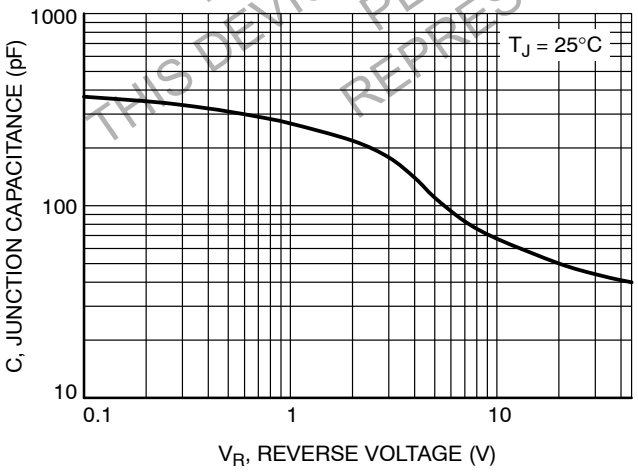


Figure 5. Typical Junction Capacitance

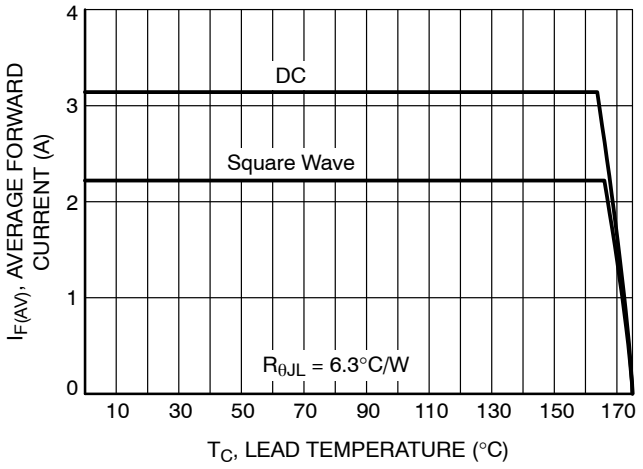


Figure 6. Current Derating

TYPICAL CHARACTERISTICS

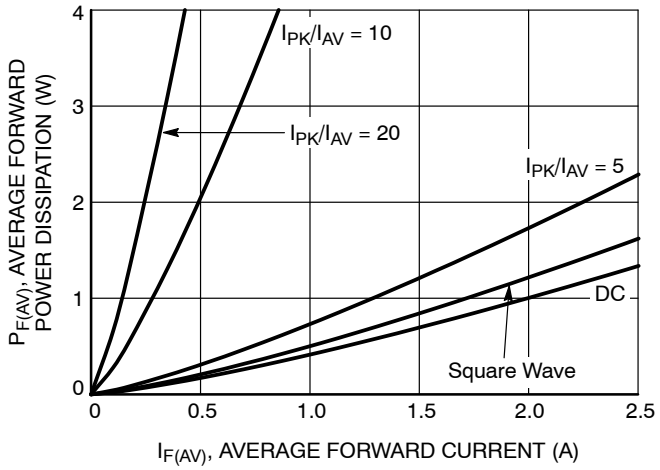


Figure 7. Forward Power Dissipation

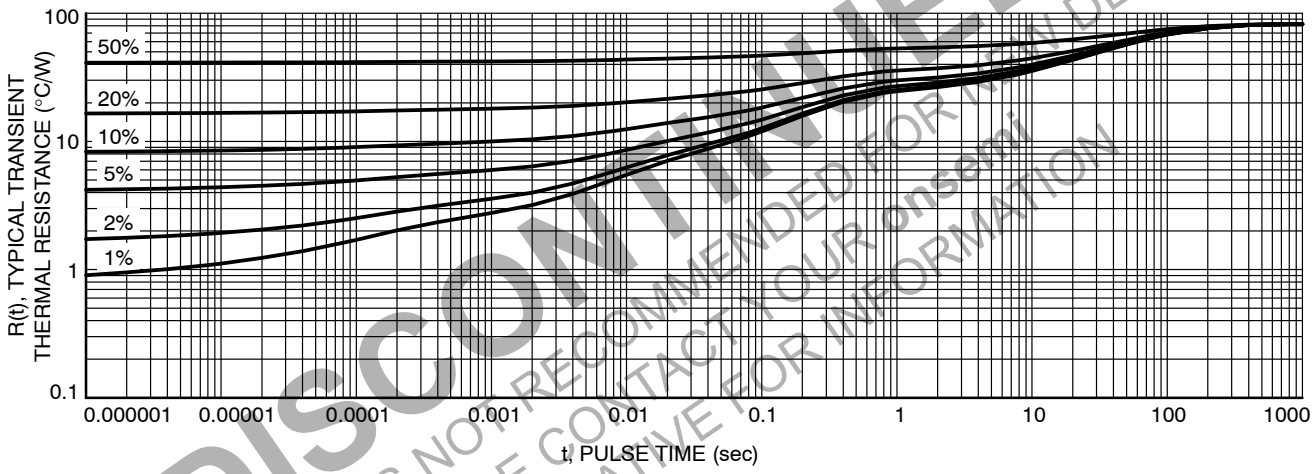
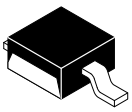


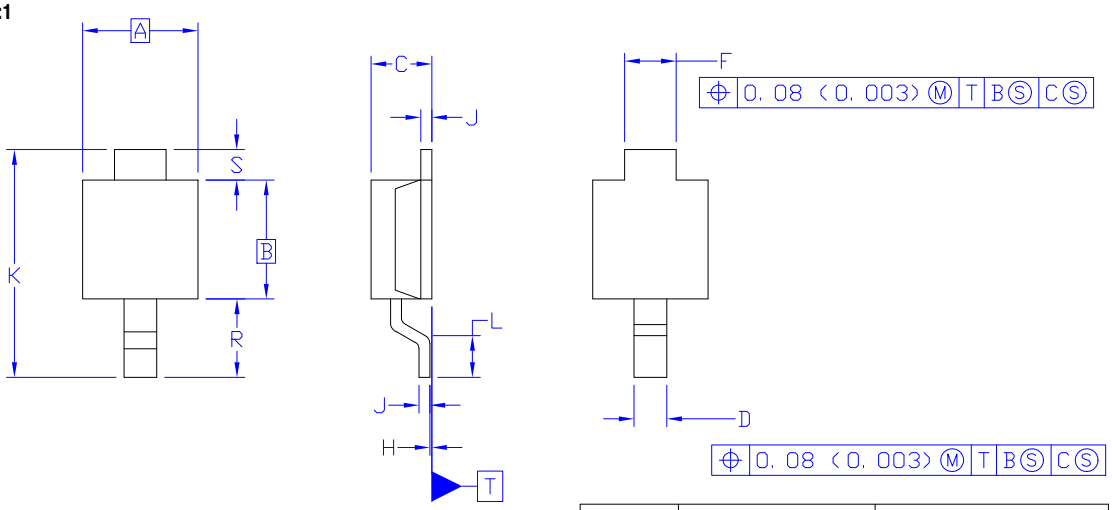
Figure 8. Thermal Response, Junction−to−Ambient

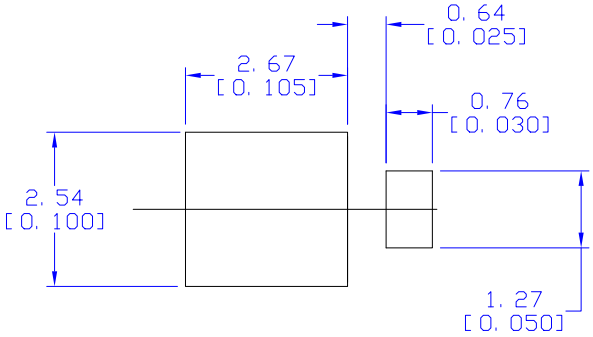


SCALE 4:1

POWERMITE
CASE 457
ISSUE G

DATE 12 JAN 2022





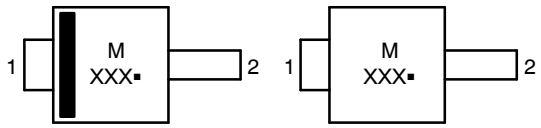
RECOMMENDED
MOUNTING FOOTPRINT

DIM	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.75	2.05	0.069	0.081
B	1.75	2.18	0.069	0.086
C	0.85	1.15	0.033	0.045
D	0.40	0.69	0.016	0.027
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	1.20	1.50	0.047	0.059
S	0.50 REF		0.019 REF	

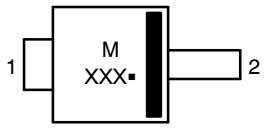
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM THE TERMINAL TIP.

GENERIC
MARKING DIAGRAMS*



STYLE 1 **STYLE 2**



STYLE 3

XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

STYLE 1:
PIN 1. CATHODE
2. ANODE

STYLE 2:
PIN 1. ANODE OR CATHODE
2. CATHODE OR ANODE
(BI−DIRECTIONAL)

STYLE 3:
PIN 1. ANODE
2. CATHODE

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DESCRIPTION:	**POWERMITE**	**PAGE 1 OF 1**

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