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NRVTSA3100E, NRVTSAF3100E

Low Forward Voltage, Low Leakage Trench-based Schottky Rectifier

ON Semiconductor®

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SCHOTTKY BARRIER RECTIFIERS 3 AMPERES 100 VOLTS

Features

- 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 Wireless, Smartphone and Notebook Adapters
- High Frequency and DC−DC Converters
- Freewheeling and OR−ing diodes
- Reverse Battery Protection
- Instrumentation
- LED Lighting

Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94−0 @ 0.125 in.
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting SurfaceTemperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements

MARKING DIAGRAMS

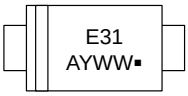


SMA
CASE 403D
STYLE 1





SMA−FL
CASE 403AA
STYLE 6



A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
NRVTSA3100ET3G	SMA (Pb−Free)	5000 / Tape & Reel
NRVTSAF3100ET3G	SMA−FL (Pb−Free)	5000 / Tape & Reel

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

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	 100	V
Average Rectified Forward Current (T_L = 134°C)	$I_{F(AV)}$	3.0	A
Peak Repetitive Forward Current, (Square Wave, 20 kHz, T_L = 127°C)	I_{FRM}	6.0	A
Non−Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	50	A
Storage Temperature Range	T_{stg}	−65 to +175	°C
Operating Junction Temperature	T_J	−55 to +175	°C
ESD Rating (Human Body Model)		1A	
ESD Rating (Machine Model)		M3	

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.

THERMAL CHARACTERISTICS

Characteristic		Symbol	Typ	Max	Unit
Maximum Thermal Resistance, Steady State (Note 1)					°C/W
NRVTSA3100E	Junction−to−Lead	$R_{\theta JL}$	−	22	
	Junction−to−Ambient	$R_{\theta JA}$	−	80	
NRVTSAF3100E	Junction−to−Lead	$R_{\theta JL}$	−	23.8	
	Junction−to−Ambient	$R_{\theta JA}$	−	82	

ELECTRICAL CHARACTERISTICS

	Symbol			
Instantaneous Forward Voltage (Note 2)	v_F			V
(i_F = 1.0 Amps, T_J = 25°C)		0.61	−	
(i_F = 3.0 Amps, T_J = 25°C)		0.88	0.995	
(i_F = 1.0 Amps, T_J = 125°C)		0.53	−	
(i_F = 3.0 Amps, T_J = 125°C)		0.66	0.70	
Reverse Current (Note 2)	i_R			
(Rated dc Voltage, T_J = 25°C)		0.90	5.0	μA
(Rated dc Voltage, T_J = 125°C)		0.62	2.0	mA
Diode Capacitance	C_d			pF
(Rated dc Voltage, T_J = 25°C, f = 1 MHz)		14.3		

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.

1. Assumes 600 mm^2 1 oz. copper bond pad, on a FR4 board.
2. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

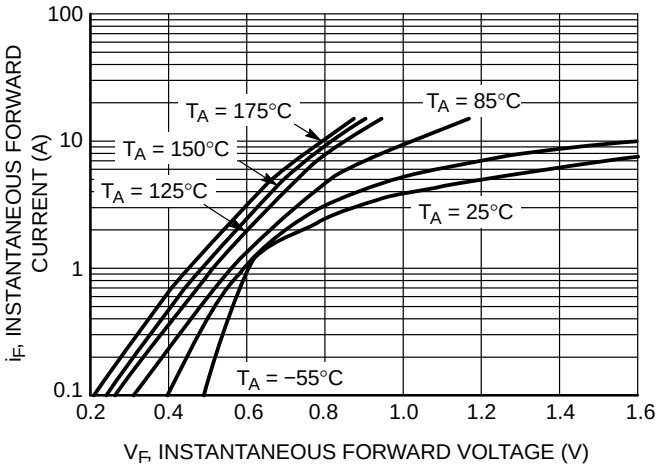


Figure 1. Typical Instantaneous Forward Characteristics

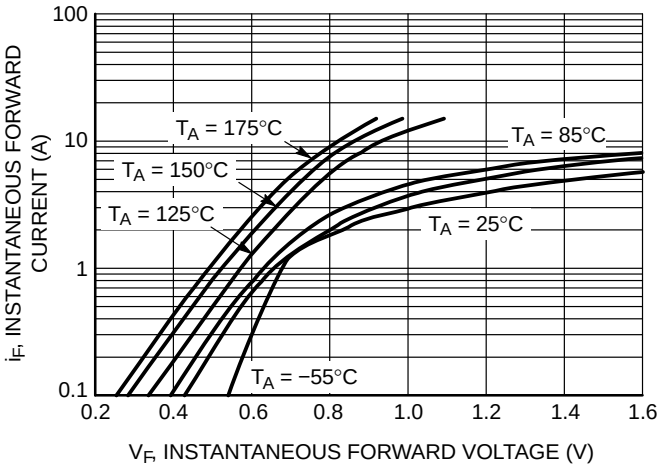


Figure 2. Maximum Instantaneous Forward Characteristics

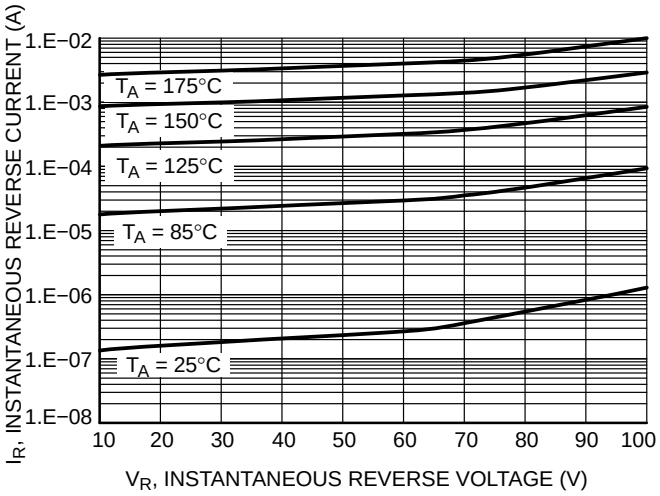


Figure 3. Typical Reverse Characteristics

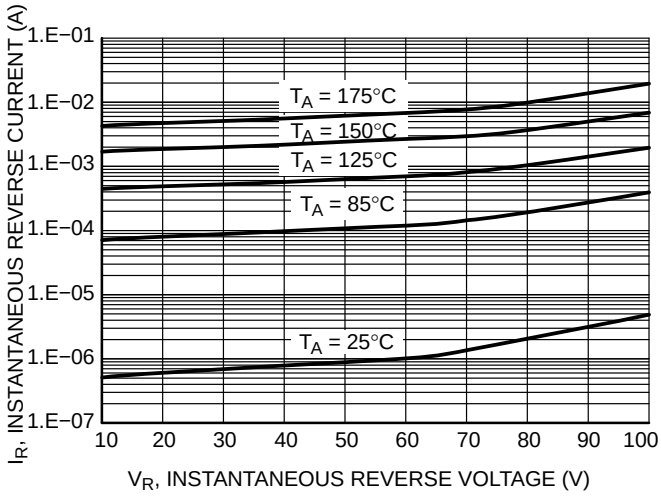


Figure 4. Maximum Reverse Characteristics

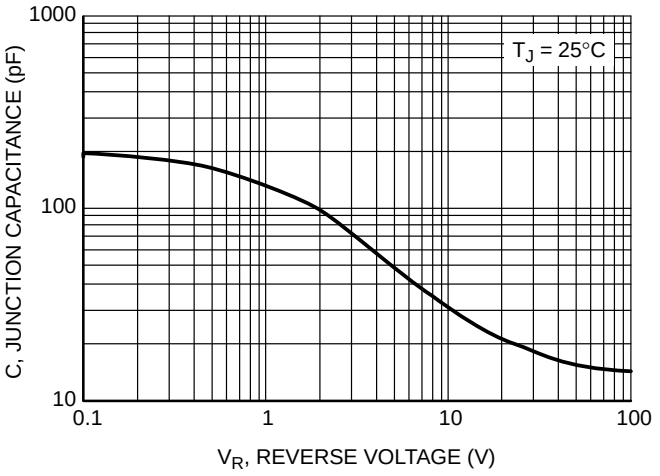


Figure 5. Typical Junction Capacitance

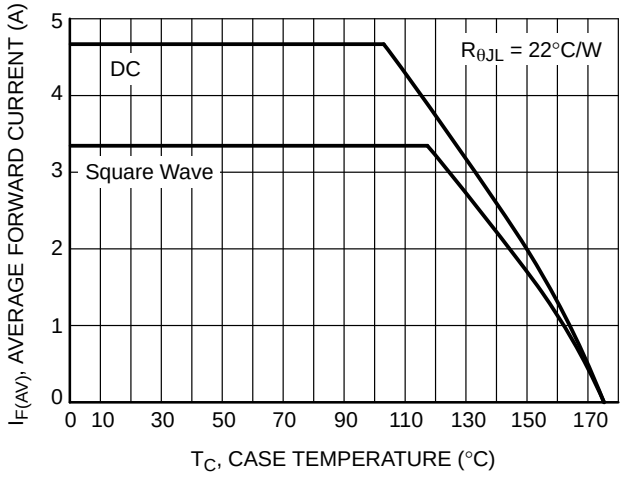


Figure 6. Current Derating for NRVTSA3100E

TYPICAL CHARACTERISTICS

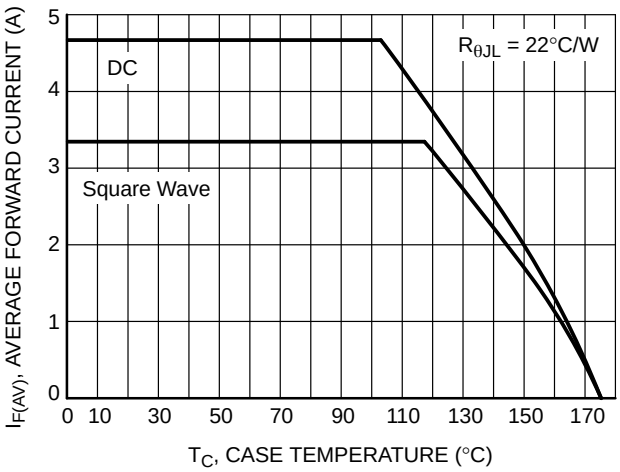


Figure 7. Current Derating for NRVTSAF3100E

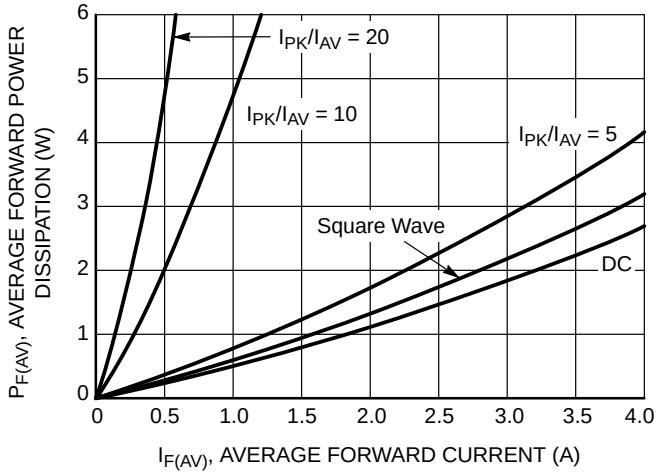


Figure 8. Forward Power Dissipation

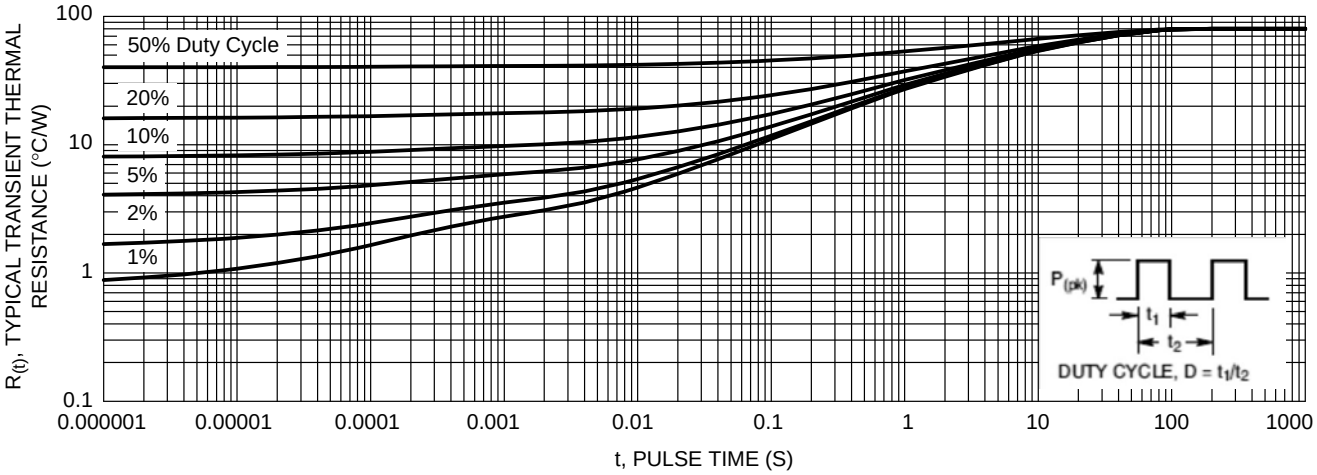


Figure 9. Typical Transient Thermal Response, Junction−to−Ambient for NRVTSA3100E

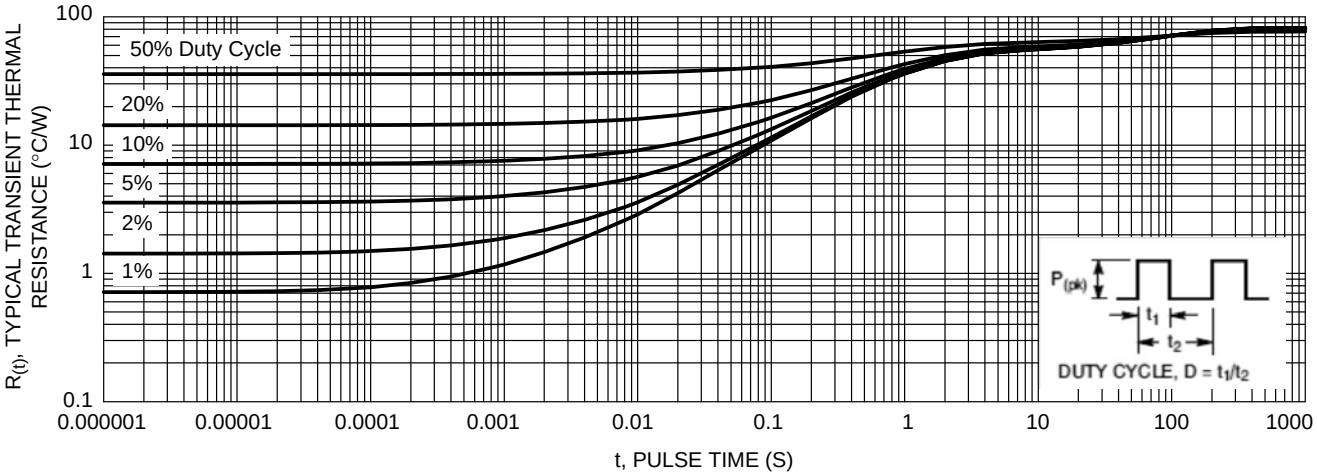
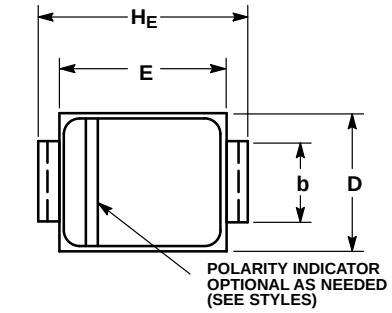


Figure 10. Typical Transient Thermal Response, Junction−to−Ambient for NRVTSAF3100E

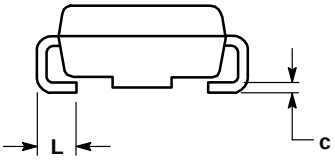
PACKAGE DIMENSIONS

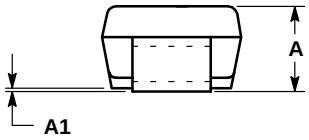
SMA
CASE 403D−02
ISSUE G



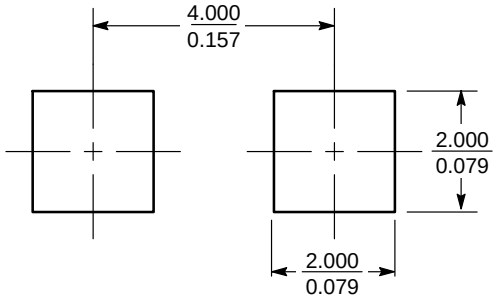
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	1.97	2.10	2.20	0.078	0.083	0.087
A1	0.05	0.10	0.20	0.002	0.004	0.008
b	1.27	1.45	1.63	0.050	0.057	0.064
c	0.15	0.28	0.41	0.006	0.011	0.016
D	2.29	2.60	2.92	0.090	0.103	0.115
E	4.06	4.32	4.57	0.160	0.170	0.180
H_E	4.83	5.21	5.59	0.190	0.205	0.220
L	0.76	1.14	1.52	0.030	0.045	0.060





SOLDERING FOOTPRINT*

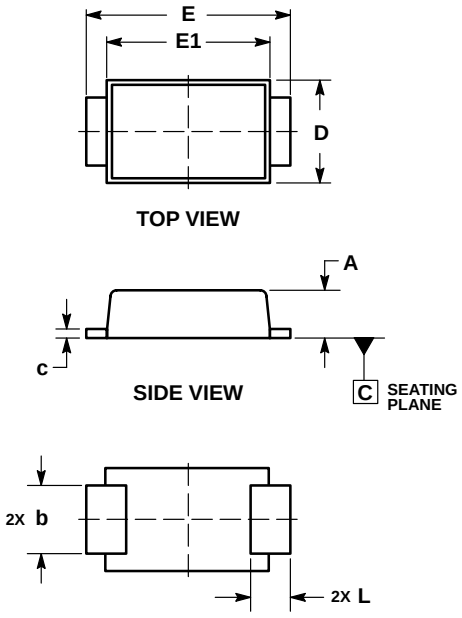


SCALE 8:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

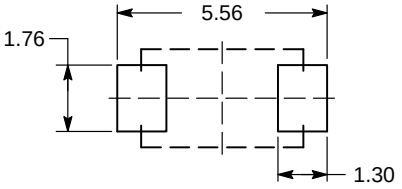
SMA−FL
CASE 403AA
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.90	1.10
b	1.25	1.65
c	0.15	0.30
D	2.40	2.80
E	4.80	5.40
E1	4.00	4.60
L	0.70	1.10

RECOMMENDED SOLDER FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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