

# Trench Schottky Rectifier, Very Low Leakage

# NRVTSS5100E, NRVTSAF5100E

#### **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 Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements

# SCHOTTKY BARRIER RECTIFIERS 5 AMPERES 100 VOLTS





SMB CASE 403A SMA-FL CASE 403AA STYLE 6

#### **MARKING DIAGRAMS**





A = Assembly Location
Y = Year
WW = Work Week
Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	100	V
Average Rectified Forward Current (T <sub>L</sub> = 100°C)	I <sub>F(AV)</sub>	5.0	Α
Peak Repetitive Forward Current, (Square Wave, 20 kHz, T <sub>L</sub> = 83°C)	I <sub>FRM</sub>	10	А
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I <sub>FSM</sub>	50	А
Storage Temperature Range	T <sub>stg</sub>	−65 to +175	°C
Operating Junction Temperature	TJ	−55 to +175	°C
ESD Rating (Human Body Model)		1B	
ESD Rating (Charged Device Model)		> 1000	<b>V</b>

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	Max	Unit
Maximum Thermal Resistance,	Steady State (Note 1)		00	Ma Im	°C/W
(NRVTSAF5100E)	Junction-to-Lead		$R_{ heta JL}$	56 (25)	
	Junction-to-Ambient		$R_{\theta JA}$	90	
(NRVTSS5100E)	Junction-to-Lead		$R_{ heta JL}$	13.1	
	Junction-to-Ambient	1	$R_{\theta JA}$	71.1	

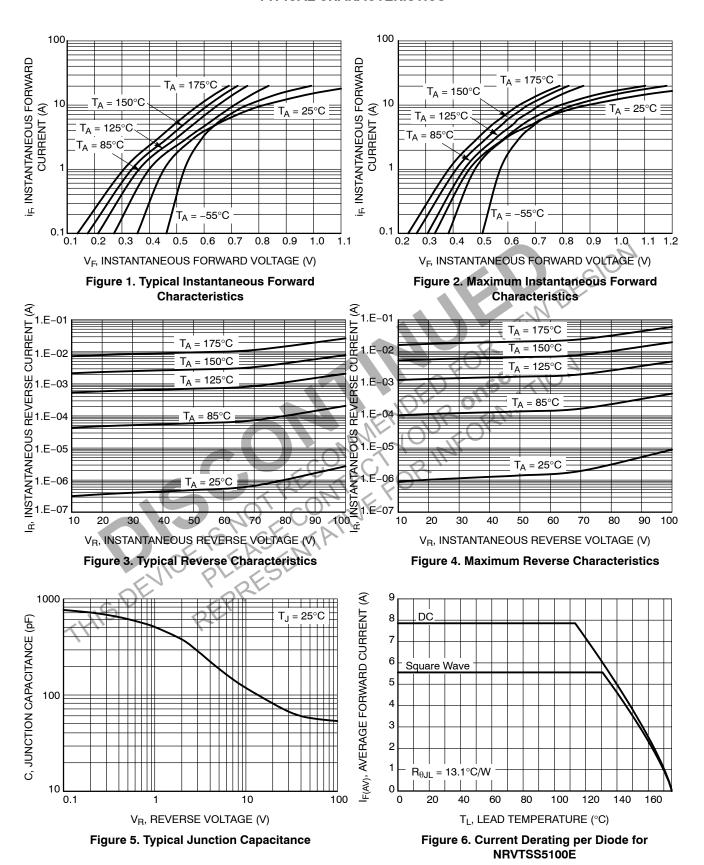
<sup>1.</sup> Assumes 600 mm<sup>2</sup> 1 oz. copper bond pad, on a FR4 board

## **ELECTRICAL CHARACTERISTICS**

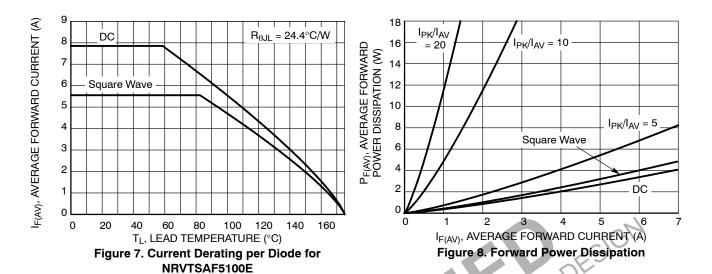
Characteristic	Symbol	Тур	Max	Unit
Instantaneous Forward Voltage (Note 2)	VF			V
$(i_F = 3.0 \text{ A}, T_J = 25^{\circ}\text{C})$		0.56	_	
$(i_F = 5.0 \text{ A}, T_J = 25^{\circ}\text{C})$		0.65	0.69	
(i <sub>F</sub> = 3.0 A, T <sub>J</sub> = 125°C)		0.50	_	
$(i_F = 5.0 \text{ A}, T_J = 125^{\circ}\text{C})$		0.56	0.62	
Reverse Current (Note 2)	i <sub>R</sub>			
(Rated dc Voltage, T <sub>J</sub> = 25°C)		2.6	29	μΑ
(Rated dc Voltage, T <sub>J</sub> = 125°C)		2.2	5	mA
Diode Capacitance	C <sub>d</sub>			pF
(Rated dc Voltage, T <sub>J</sub> = 25°C, f = 1 MHz)		54.4		

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. Pulse Test: Pulse Width = 300  $\mu$ s, Duty Cycle  $\leq$  2.0%.

#### **TYPICAL CHARACTERISTICS**



#### **TYPICAL CHARACTERISTICS**



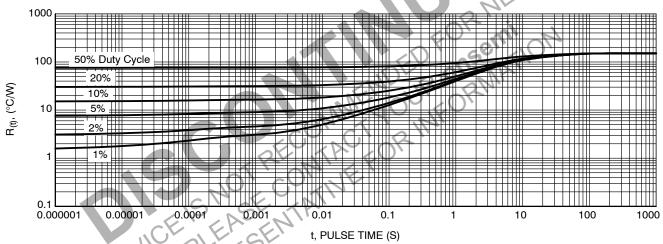


Figure 9. Transient Thermal Response, Junction-to-Ambient, for NRVTSS5100E

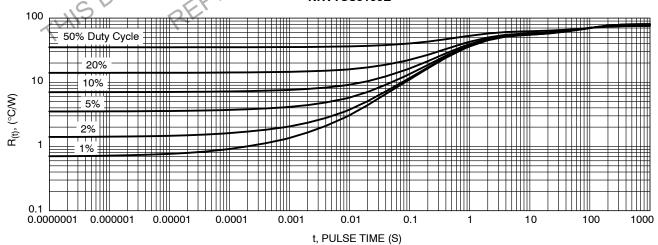


Figure 10. Transient Thermal Response, Junction-to-Ambient, for NRVTSAF5100E

#### **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
NRVTSAF5100ET3G	SMA-FL (Pb-Free)	5000 / Tape & Reel
NRVTSS5100ET3G	SMB (Pb-Free)	2500 / Tape & Reel
NRVTSS5100ET3G-GA01	SMB (Pb-Free)	2500 / Tape & Reel

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







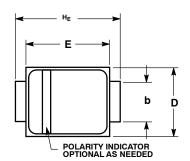


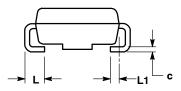
**SMB** CASE 403A-03 **ISSUE J** 

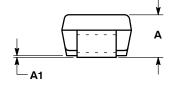
**DATE 19 JUL 2012** 

**Polarity Band** 

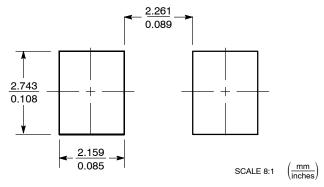
SCALE 1:1 Non-Polarity Band







#### **SOLDERING FOOTPRINT\***



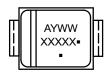
\*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

#### NOTES:

- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: INCL.
- CONTROLLING DIMENSION: INCH.
  DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L1.

	MILLIMETERS		INCHES			
DIM	MIN	NOM	MAX	MIN	NOM	MAX
Α	1.95	2.30	2.47	0.077	0.091	0.097
A1	0.05	0.10	0.20	0.002	0.004	0.008
b	1.96	2.03	2.20	0.077	0.080	0.087
С	0.15	0.23	0.31	0.006	0.009	0.012
D	3.30	3.56	3.95	0.130	0.140	0.156
E	4.06	4.32	4.60	0.160	0.170	0.181
HE	5.21	5.44	5.60	0.205	0.214	0.220
L	0.76	1.02	1.60	0.030	0.040	0.063
L1		0.51 REF		0.020 REF		

#### **GENERIC MARKING DIAGRAM\***





**Polarity Band** 

Non-Polarity Band

XXXXX = Specific Device Code = Assembly Location

= Year WW = Work Week = Pb-Free Package

(Note: Microdot may be in either location)

\*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.

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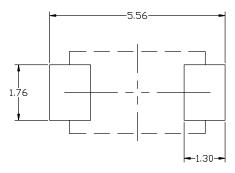
#### SMA 2.60x4.30x1.00 CASE 403AA ISSUE A

**DATE 18 JAN 2024** 

#### NOTES:

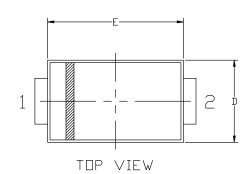
- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
- 2. CONTROLLING DIMENSION: MILLIMETERS.
- 3. FL

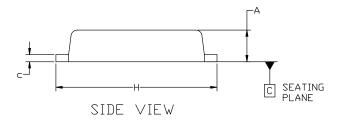
MILLIMETERS					
DIM	MIN	NDM	MAX		
Α	0.90	1.00	1.10		
b	1.25	1.45	1.65		
$\subset$	0.15	0.225	0.30		
D	2.40	2.60	2,80		
Ε	4.00	4.30	4.60		
Н	4.80	5.10	5.40		
L	0.70	0.90	1.10		

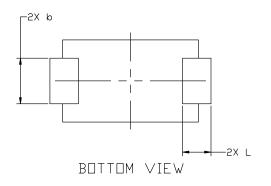


#### RECOMMENDED MOUNTING FOOTPRINT

\*For additional information on our Pb-Free strategy and soldering details, please download the DN Semiconductor Soldering and Mounting Techniques Reference manual, SDLDERRM/D.







# GENERIC MARKING DIAGRAM\*



XXXX = Specific Device Code

A = Assembly Location

Y = Year

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= 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.

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