

Low Forward Voltage, Low Leakage Trench-based Schottky Rectifier

NRV TSA3100E

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
 3 AMPERES
 100 VOLTS



SMA
 CASE 403D
 STYLE 1

MARKING DIAGRAM



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

ORDERING INFORMATION

Device	Package	Shipping†
NRV TSA3100ET3G	SMA	5000 /
NRV TSA3100ET3G-GA01	(Pb-Free)	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.

NRVTS3100E

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 ($T_L = 134^\circ\text{C}$)	$I_{F(AV)}$	3.0	A
Peak Repetitive Forward Current, (Square Wave, 20 kHz, $T_L = 127^\circ\text{C}$)	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	$^\circ\text{C}$
Operating Junction Temperature	T_J	-55 to +175	$^\circ\text{C}$
ESD Rating (Human Body Model)		1A	
ESD Rating (Charged Device Model)		>1000	V

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) Junction-to-Lead Junction-to-Ambient	$R_{\theta JL}$ $R_{\theta JA}$	- -	22 80	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS

Instantaneous Forward Voltage (Note 2) ($i_F = 1.0$ Amps, $T_J = 25^\circ\text{C}$) ($i_F = 3.0$ Amps, $T_J = 25^\circ\text{C}$) ($i_F = 1.0$ Amps, $T_J = 125^\circ\text{C}$) ($i_F = 3.0$ Amps, $T_J = 125^\circ\text{C}$)	V_F	0.61 0.88 0.53 0.66	- 0.995 - 0.70	V
Reverse Current (Note 2) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) (Rated dc Voltage, $T_J = 125^\circ\text{C}$)	i_R	0.90 0.62	5.0 2.0	μA mA
Diode Capacitance (Rated dc Voltage, $T_J = 25^\circ\text{C}$, $f = 1$ MHz)	C_d	14.3		pF

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.

- Assumes 600 mm² 1 oz. copper bond pad, on a FR4 board.
- Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

TYPICAL CHARACTERISTICS

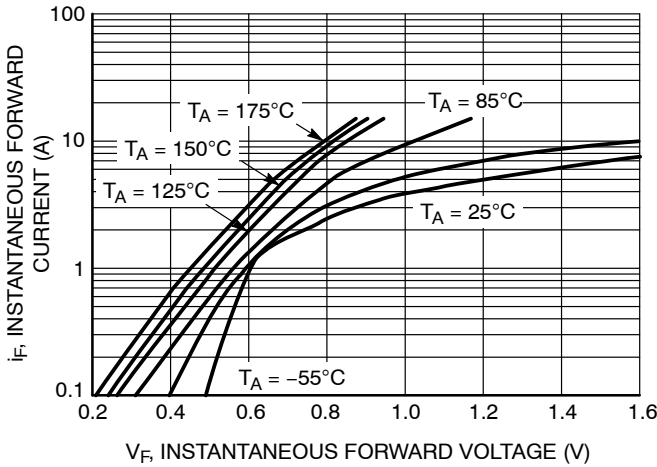


Figure 1. Typical Instantaneous Forward Characteristics

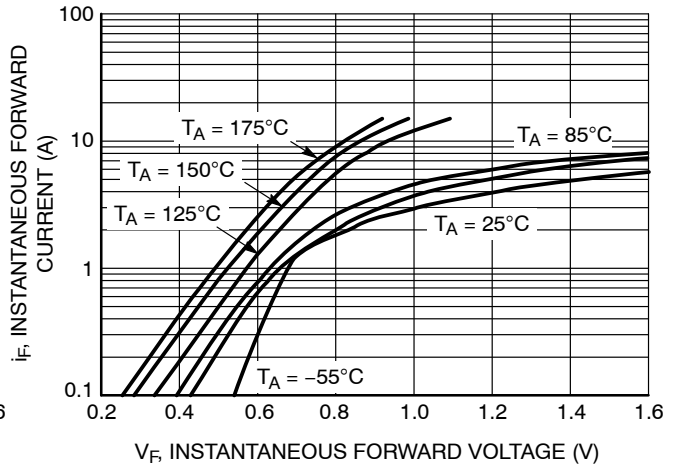


Figure 2. Maximum Instantaneous Forward Characteristics

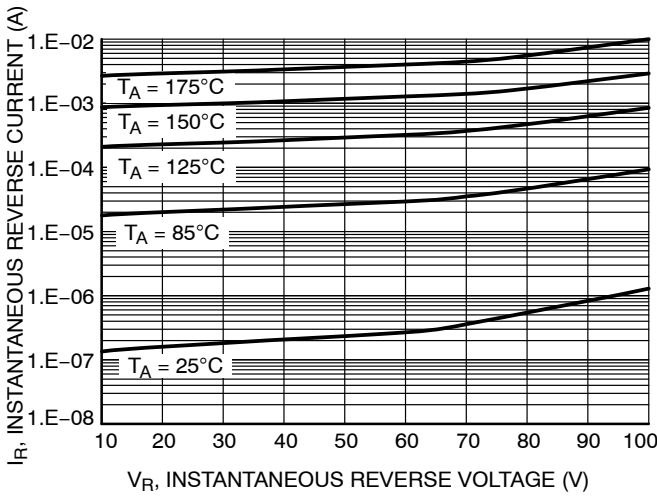


Figure 3. Typical Reverse Characteristics

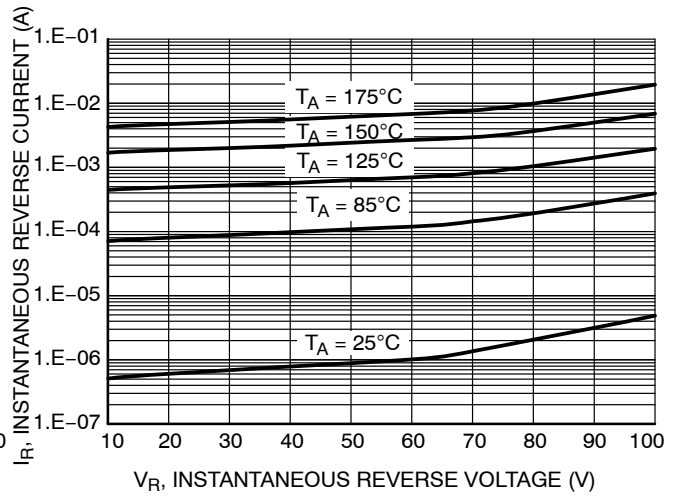


Figure 4. Maximum Reverse Characteristics

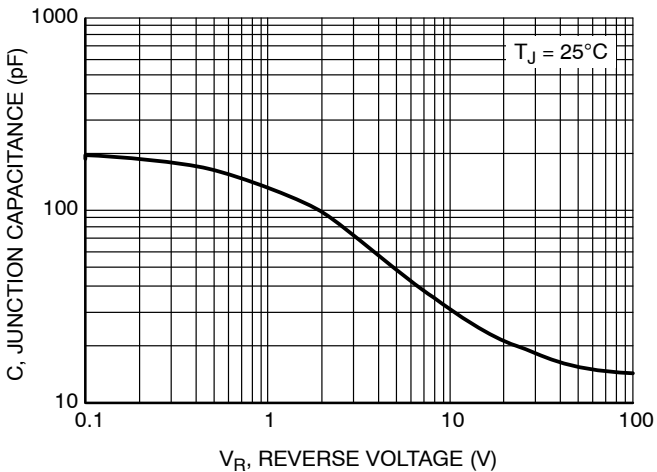


Figure 5. Typical Junction Capacitance

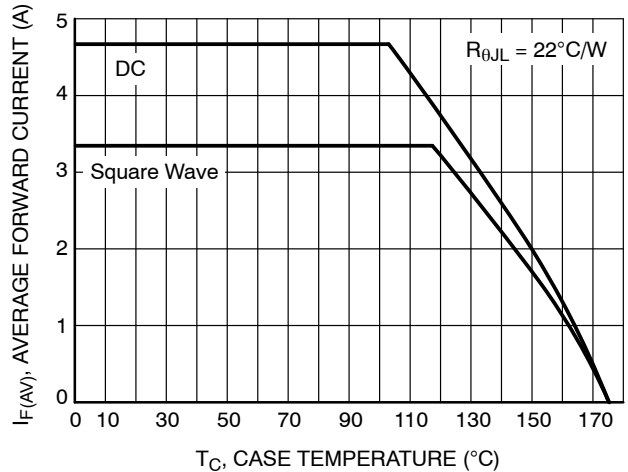


Figure 6. Current Derating

NRVTS3100E

TYPICAL CHARACTERISTICS

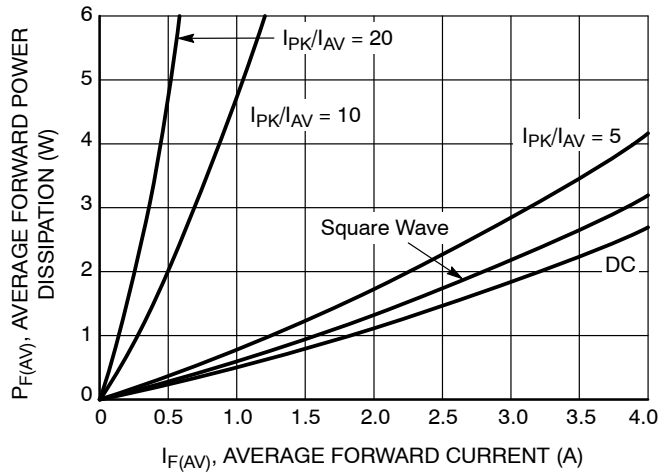


Figure 7. Forward Power Dissipation

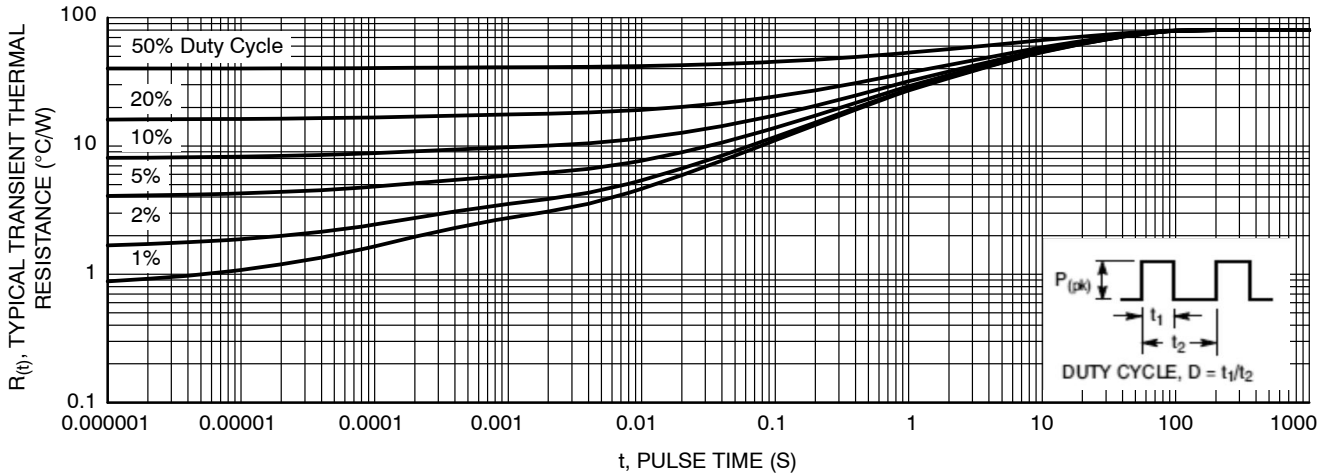


Figure 8. Typical Transient Thermal Response, Junction-to-Ambient

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS



STYLE 1 STYLE 2

SCALE 1:1

SMA
CASE 403D
ISSUE J

DATE 22 OCT 2021



POLARITY INDICATOR
OPTIONAL AS NEEDED

NOTES:

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

DIM	MILLIMETERS			INCHES		
	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
<i>b</i>	1.27	1.45	1.63	0.050	0.057	0.064
<i>c</i>	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
HE	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



STYLE 1:
PIN 1. CATHODE (POLARITY BAND)
2. ANODE

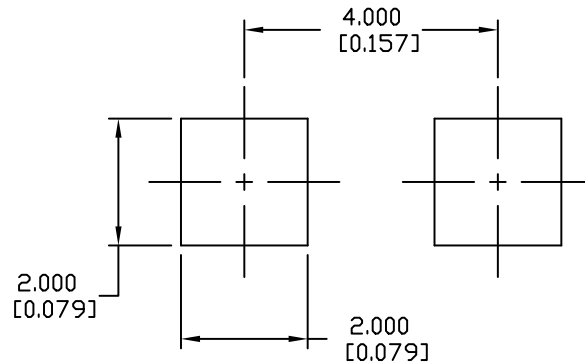
STYLE 2:
NO POLARITY

GENERIC MARKING DIAGRAM*



STYLE 1 STYLE 2

xxxx = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package



RECOMMENDED MOUNTING FOOTPRINT

*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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