

Schottky Rectifier, Trench-based, Low Forward Voltage, Low Leakage

NTSS5100, NTSAF5100

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
- 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



ON Semiconductor®

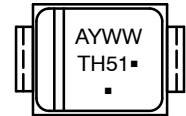
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SCHOTTKY BARRIER RECTIFIERS 5 AMPERES 100 VOLTS

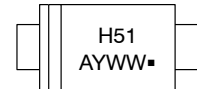
MARKING DIAGRAM



SMB
CASE 403A



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†
NTSS5100T3G	SMB (Pb-Free)	2500 / Tape & Reel
NTSAF5100T3G	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.

NTSS5100, NTSAF5100

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 ($T_L = 73^\circ\text{C}$)	$I_{F(AV)}$	5.0	A
Peak Repetitive Forward Current, (Square Wave, Duty = 0.5, $T_L = 54^\circ\text{C}$)	I_{FRM}	10	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 (Note 1)	T_J	-55 to +175	$^\circ\text{C}$
ESD Rating (Human Body Model)		1B	
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.

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	Max	Unit
Maximum Thermal Resistance, Steady State (Note 2)			
(NTSAF5100) Junction-to-Lead	$R_{\theta JL}$	25	$^\circ\text{C/W}$
Junction-to-Ambient	$R_{\theta JA}$	90	$^\circ\text{C/W}$
Junction-to-Case Top	Ψ_{JCT}	33	$^\circ\text{C/W}$
(NTSS5100) Junction-to-Lead	$R_{\theta JL}$	13.1	$^\circ\text{C/W}$
Junction-to-Ambient	$R_{\theta JA}$	71.1	$^\circ\text{C/W}$
Junction-to-Case Top	Ψ_{JCT}	2.6	$^\circ\text{C/W}$

2. Assumes 600 mm² 1 oz. copper bond pad, on a FR4 board

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 3) ($i_F = 3.0$ Amps, $T_J = 25^\circ\text{C}$) ($i_F = 5.0$ Amps, $T_J = 25^\circ\text{C}$) ($i_F = 3.0$ Amps, $T_J = 125^\circ\text{C}$) ($i_F = 5.0$ Amps, $T_J = 125^\circ\text{C}$)	V_F	0.56 0.65 0.50 0.56	- 0.69 - 0.61	V
Reverse Current (Note 3) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) (Rated dc Voltage, $T_J = 125^\circ\text{C}$)	i_R	2.6 2.2	25 9	μA mA
Diode Capacitance (Rated dc Voltage, $T_J = 25^\circ\text{C}$, $f = 1$ MHz)	C_j	54.4		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.

3. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

NTSS5100, NTSAF5100

TYPICAL CHARACTERISTICS

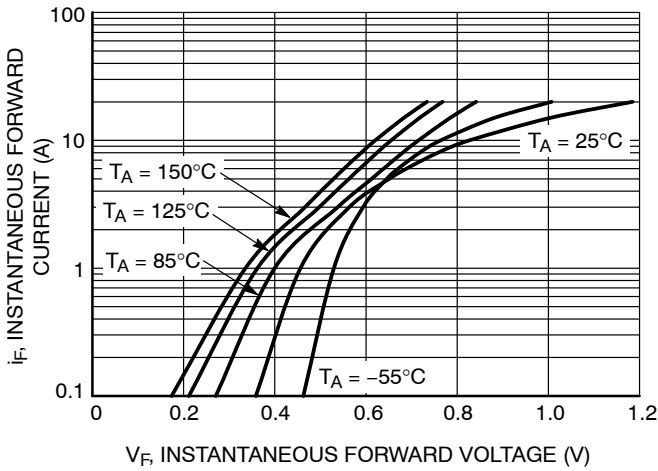


Figure 1. Typical Instantaneous Forward Characteristics

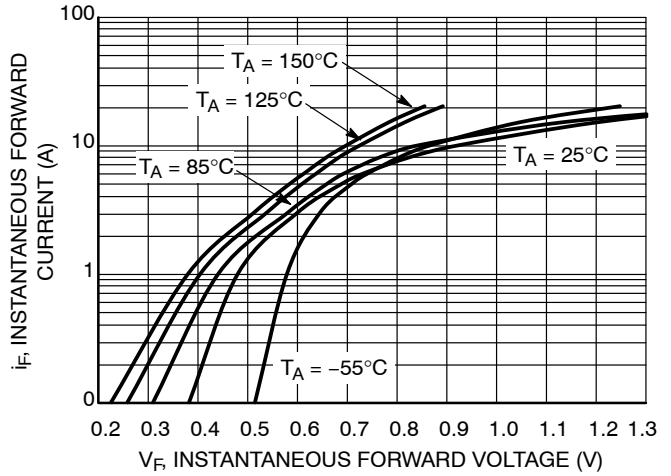


Figure 2. Maximum Instantaneous Forward Characteristics

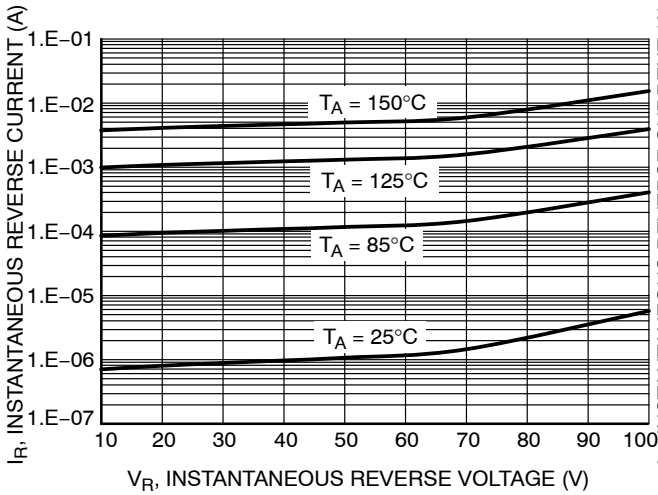


Figure 3. Typical Reverse Characteristics

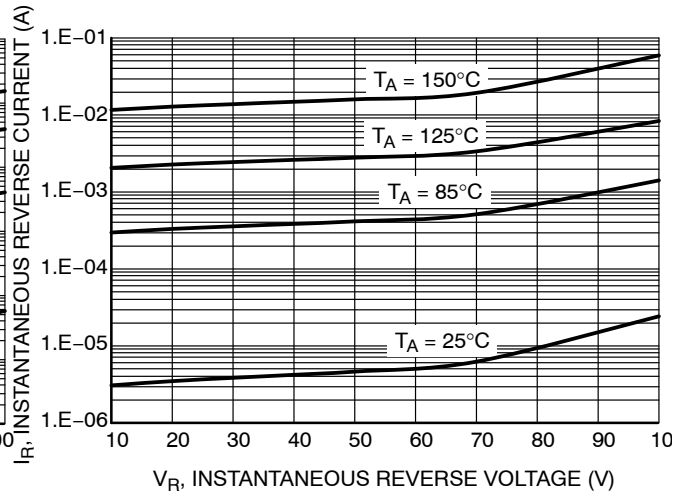


Figure 4. Maximum Reverse Characteristics

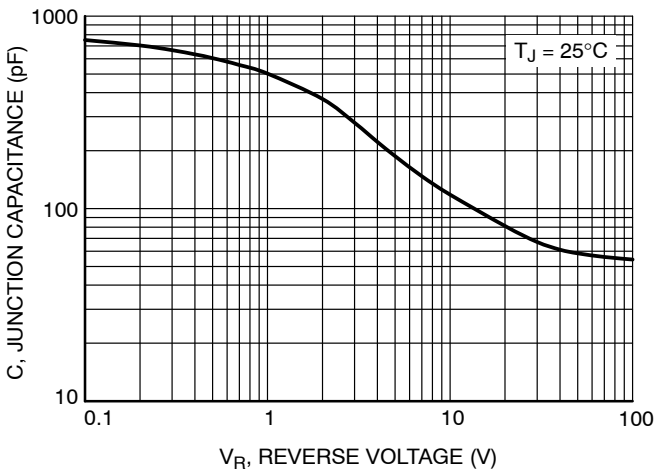


Figure 5. Typical Junction Capacitance

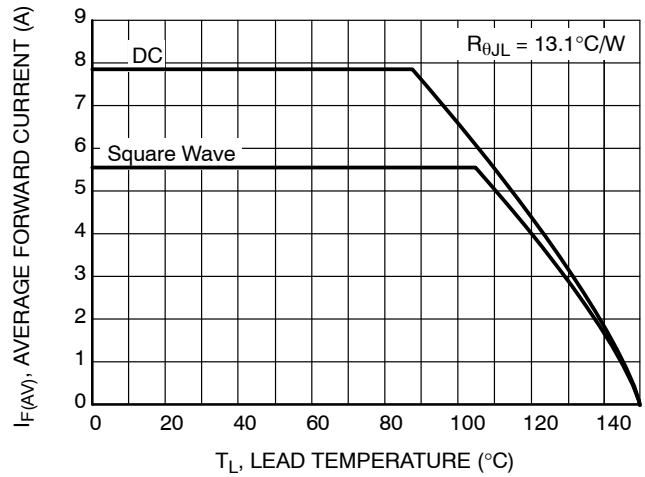


Figure 6. Current Derating for NTSS5100

NTSS5100, NTSAF5100

TYPICAL CHARACTERISTICS

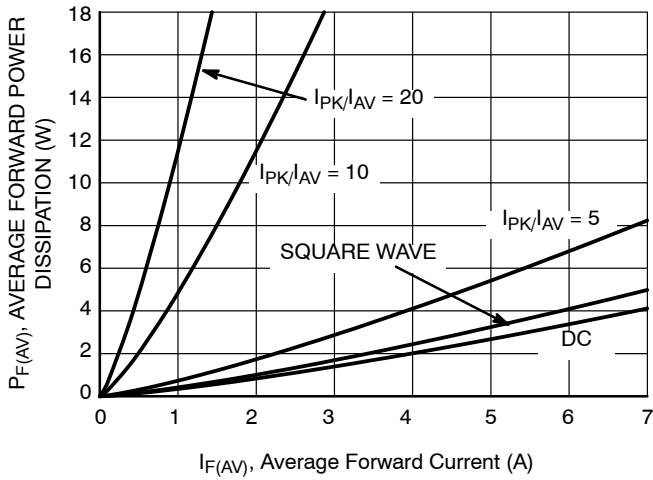


Figure 7. Forward Power Dissipation

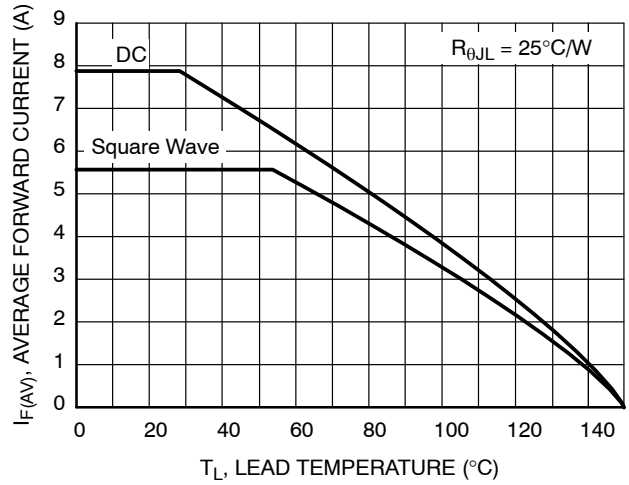


Figure 8. Current Derating for NTSAF5100

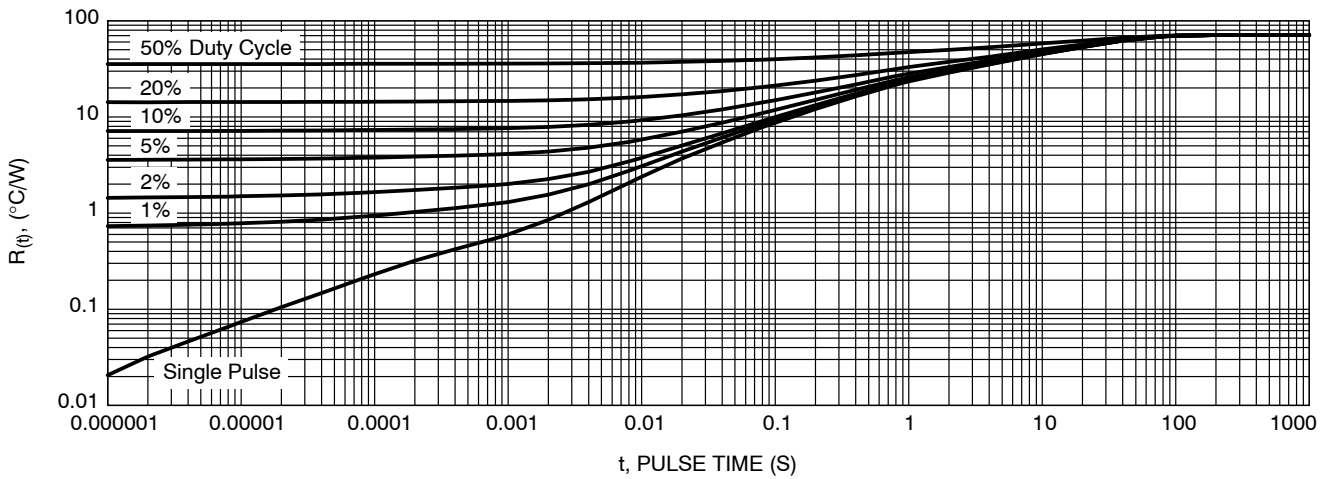


Figure 9. Typical Transient Thermal Response, Junction-to-Ambient for NTSS5100

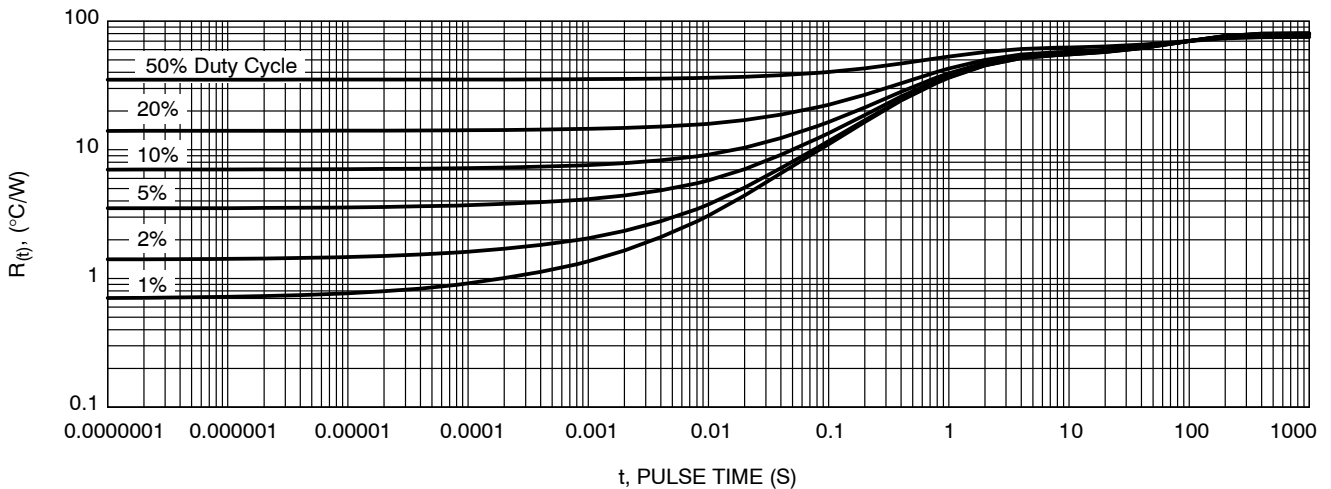


Figure 10. Typical Transient Thermal Response, Junction-to-Ambient for NTSAF5100

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 1:1

Polarity Band



SCALE 1:1

Non-Polarity Band

SMB
CASE 403A-03
ISSUE J

DATE 19 JUL 2012



SOLDERING FOOTPRINT*



NOTES:

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

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	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
c	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*



- XXXXX = Specific Device Code
 - A = Assembly Location
 - Y = 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.

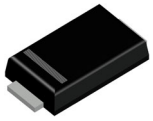
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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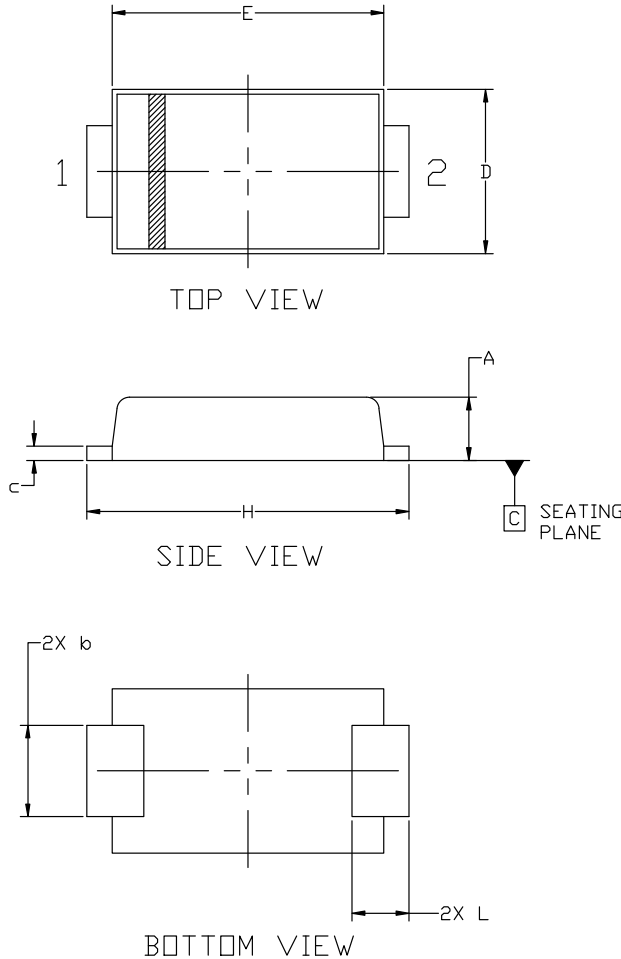
MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS



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

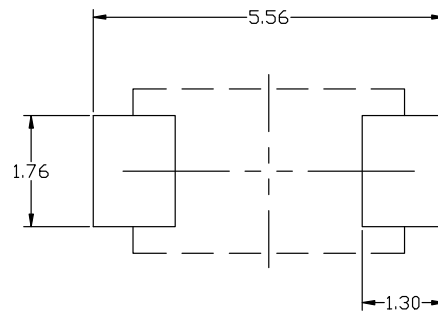
DATE 18 JAN 2024



NOTES:

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

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.90	1.00	1.10
b	1.25	1.45	1.65
c	0.15	0.225	0.30
D	2.40	2.60	2.80
E	4.00	4.30	4.60
H	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 ON Semiconductor Soldering and Mounting Techniques Reference manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code
 A = Assembly Location
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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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