

# Schottky Rectifier, Exceptionally Low Forward Voltage, Trench-based

## NTS560MFS

### 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
- Low Thermal Resistance
- 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

### Mechanical Characteristics:

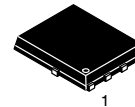
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in.
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements



ON Semiconductor®

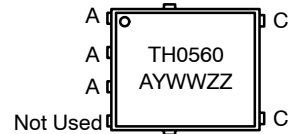
[www.onsemi.com](http://www.onsemi.com)

**SCHOTTKY BARRIER  
RECTIFIERS  
5 AMPERES  
60 VOLTS**



SO-8 FLAT LEAD  
CASE 488AA  
STYLE 2

### MARKING DIAGRAM



TH0560 = Specific Device Code  
A = Assembly Location  
Y = Year  
W = Work Week  
ZZ = Lot Traceability

### ORDERING INFORMATION

Device	Package	Shipping†
NTS560MFST1G	SO-8 FL (Pb-Free)	1500 / Tape & Reel
NTS560MFST3G	SO-8 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.

# NTS560MFS

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	60	V
Average Rectified Forward Current (Rated $V_R$ , $T_C = 145^\circ\text{C}$ )	$I_{F(AV)}$	5.0	A
Peak Repetitive Forward Current, (Square Wave, Duty = 0.5, $T_C = 144^\circ\text{C}$ )	$I_{FRM}$	10	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	100	A
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	$T_J$	-55 to +150	$^\circ\text{C}$
Unclamped Inductive Switching Energy (10 mH Inductor, Non-repetitive)	$E_{AS}$	60	mJ
ESD Rating (Human Body Model)		TBD	
ESD Rating (Machine Model)		M4	

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
Thermal Resistance, Junction-to-Case, Steady State (Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on a FR4 board)	$R_{\theta JC}$	2.4	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on a FR4 board)	$R_{\theta JA}$	60.4	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case Top (Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on a FR4 board)	$\Psi_{JCT}$	7.3	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Lead of Cathode (Assumes 600 mm <sup>2</sup> 1 oz. copper bond pad, on a FR4 board)	$\Psi_{JLC}$	5.0	$^\circ\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS

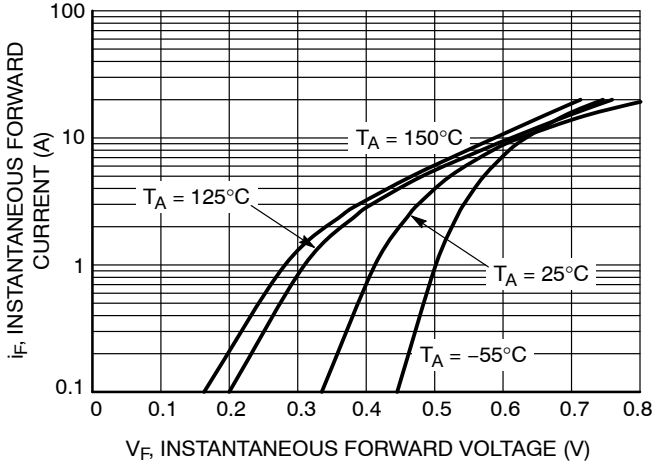
Characteristic	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 1) ( $i_F = 2.5$ Amps, $T_J = 25^\circ\text{C}$ ) ( $i_F = 5.0$ Amps, $T_J = 25^\circ\text{C}$ )  ( $i_F = 2.5$ Amps, $T_J = 125^\circ\text{C}$ ) ( $i_F = 5.0$ Amps, $T_J = 125^\circ\text{C}$ )	$V_F$	0.46 0.52  0.40 0.48	- 0.60  - 0.58	V
Instantaneous Reverse Current (Note 1) (Rated dc Voltage, $T_J = 25^\circ\text{C}$ ) (Rated dc Voltage, $T_J = 125^\circ\text{C}$ )	$i_R$	- 3.5	55 8	$\mu\text{A}$ 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.

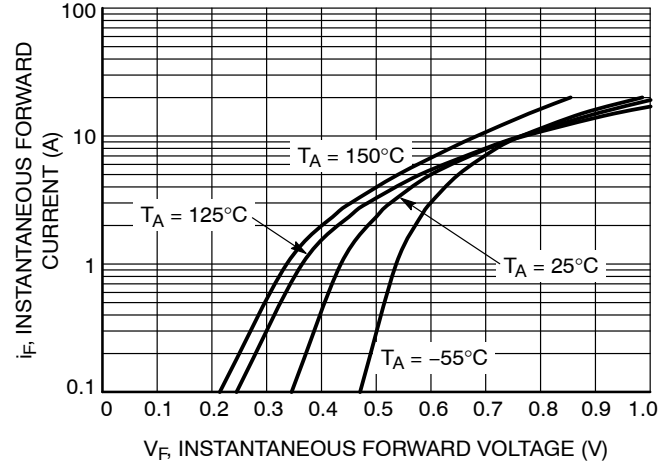
1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# NTS560MFS

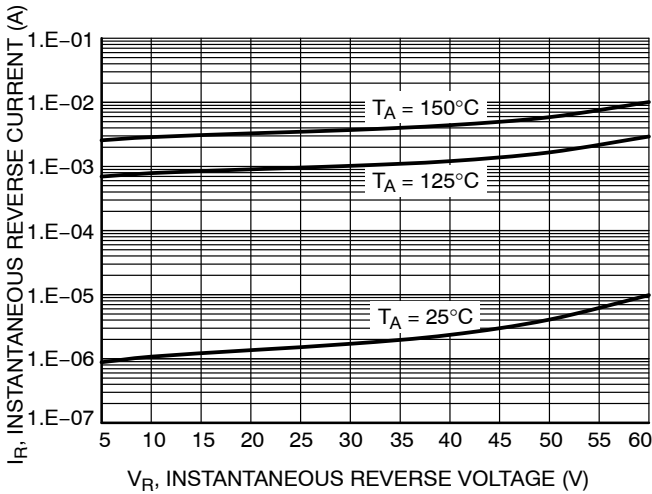
## TYPICAL CHARACTERISTICS



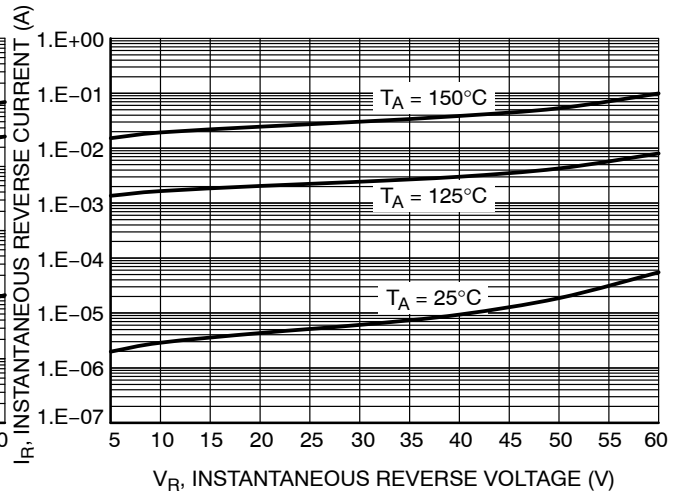
**Figure 1. Typical Instantaneous Forward Characteristics**



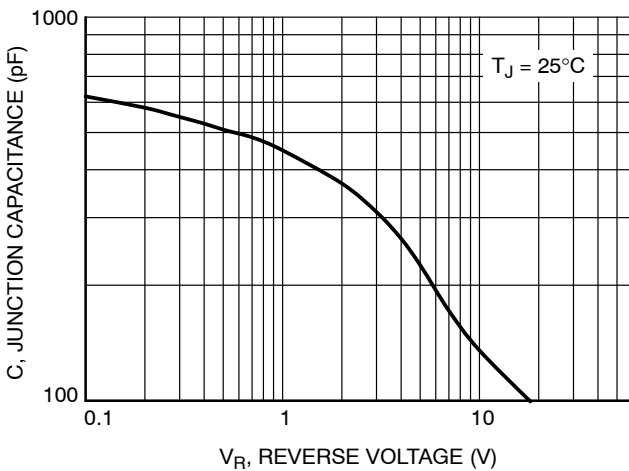
**Figure 2. Maximum Instantaneous Forward Characteristics**



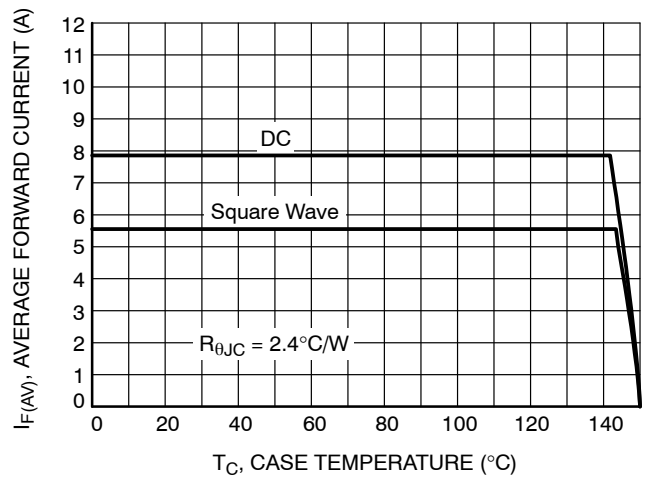
**Figure 3. Typical Reverse Characteristics**



**Figure 4. Maximum Reverse Characteristics**



**Figure 5. Typical Junction Capacitance**



**Figure 6. Current Derating per Device**

# NTS560MFS

## TYPICAL CHARACTERISTICS

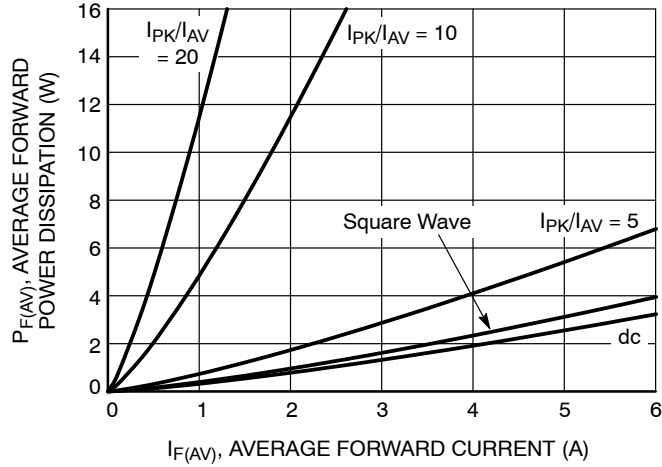


Figure 7. Forward Power Dissipation

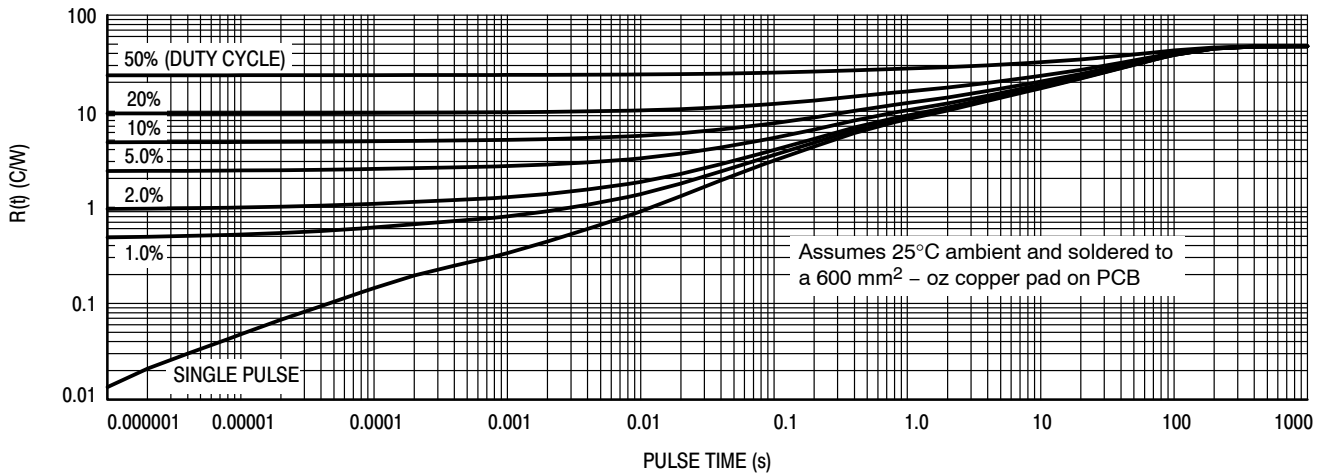


Figure 8. Typical Thermal Characteristics

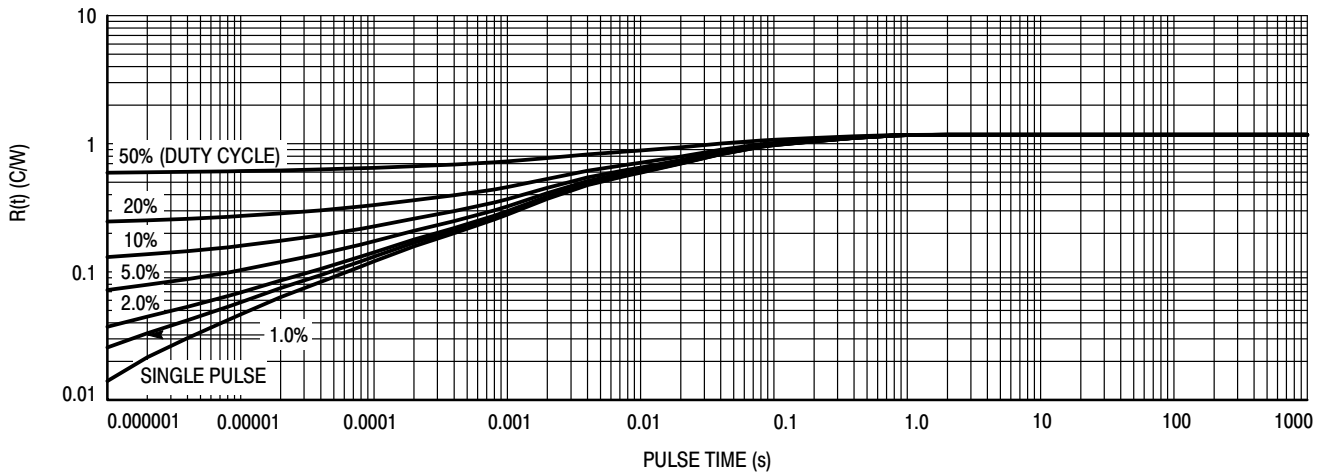
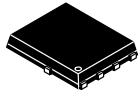


Figure 9. Typical Transient Thermal Response Characteristics, Junction-to-Case

# MECHANICAL CASE OUTLINE

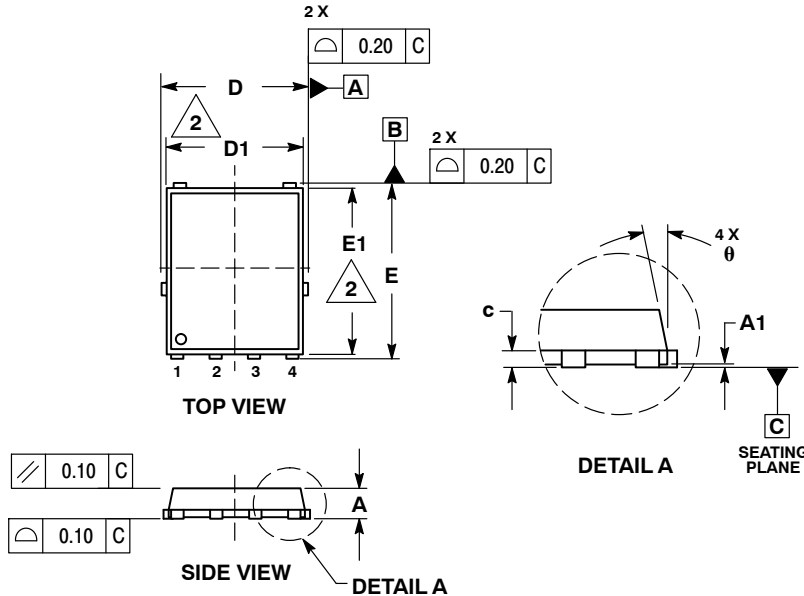
## PACKAGE DIMENSIONS



1  
SCALE 2:1

DFN5 5x6, 1.27P  
(SO-8FL)  
CASE 488AA  
ISSUE N

DATE 25 JUN 2018

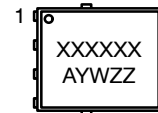


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

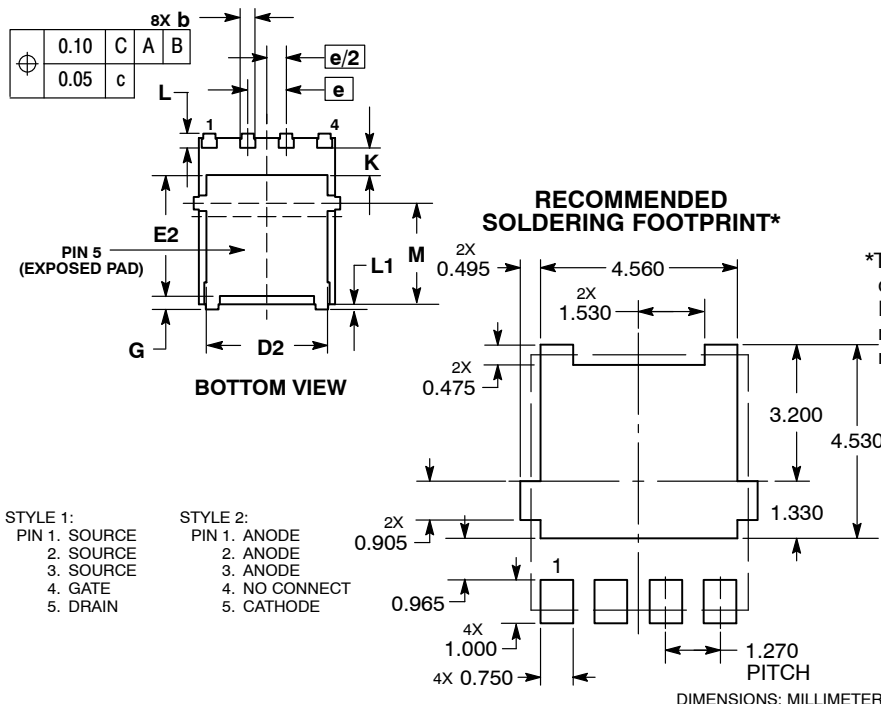
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	---	0.05
b	0.33	0.41	0.51
c	0.23	0.28	0.33
D	5.00	5.15	5.30
D1	4.70	4.90	5.10
D2	3.80	4.00	4.20
E	6.00	6.15	6.30
E1	5.70	5.90	6.10
E2	3.45	3.65	3.85
e	1.27 BSC		
G	0.51	0.575	0.71
K	1.20	1.35	1.50
L	0.51	0.575	0.71
L1	0.125 REF		
M	3.00	3.40	3.80
θ	0°	---	12°

### GENERIC MARKING DIAGRAM\*



- XXXXXX = Specific Device Code
- A = Assembly Location
- Y = Year
- W = Work Week
- ZZ = Lot Traceability

\*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. SOURCE  
2. SOURCE  
3. SOURCE  
4. GATE  
5. DRAIN
- STYLE 2:  
PIN 1. ANODE  
2. ANODE  
3. ANODE  
4. NO CONNECT  
5. CATHODE

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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DESCRIPTION:	DFN5 5x6, 1.27P (SO-8FL)	PAGE 1 OF 1

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