Schottky Barrier Rectifier Trench-based, High Performance

NRVTS3060MFS

This Trench Schottky rectifier is high performance device in SO−8 FL package. The lower forward voltage, less leakage current, and small junction capacitance are suitable to high switching frequency high density DC to DC conversion application. Offering higher avalanche energy capability for Oring or reverse protection application. The SO−8 FL package provides an excellent thermal performance, less land area of board space, and low profile.

Features

- Lower Forward Voltage Drop
- Less Leakage Current in High Temperature
- Small Junction Capacitance for High Switching Frequency
- Higher Avalanche Energy Capability
- 175°C Operating Junction Temperature
- Good Alternative Solution of SMC and DPAK Package
- Small Footprint − Land Area: 31.2 mm^2
- Low Profile − Maximum Height of 1.1 mm
- NRVTS Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Weight: 95 mg (Approximately)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Maximum for 10 Seconds
- MSL 1

Applications

- High Switching Frequency DC/DC Converter
- 2nd Rectifier
- Freewheeling Diode used with Inductive Load
- Oring / Reverse Protection

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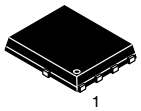
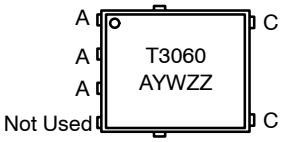
TRENCH SCHOTTKY RECTIFIER 30 AMPERES 60 VOLTS



SO−8 FLAT LEAD CASE 488AA STYLE 2

MARKING DIAGRAM



T3060	= Specific Device Code
A	= Assembly Location
Y	= Year
W	= Work Week
ZZ	= Lot Traceability

ORDERING INFORMATION

Device	Package	Shipping†
NRVTS3060MFST3G	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.

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
Continuous Forward Current (T_C = 164°C, DC)		$I_{F(DC)}$	30	A
Peak Repetitive Forward Current (T_C = 162°C, Square Wave, Duty = 0.5)		I_{FRM}	60	A
Non−Repetitive Peak Surge Current	Sinusoidal Halfwave, 8.3 ms	I_{FSM}	350	A
	Square wave, 1 ms		600	
	Square wave, 100 μs		1200	
Non−Repetitive Avalanche Energy (T_J = 25°C)		E_{AS}	800	mJ
Storage Temperature Range		T_{stg}	−65 to +175	°C
Operating Junction Temperature Range (Note 1)		T_J	−55 to +175	°C
ESD Rating (Human Body Model)			3B	
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.

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
Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	56	°C/W
Thermal Resistance, Junction−to−Case Bottom (Note 2)	$R_{\theta JCB}$	0.65	°C/W
Thermal Characterization, Junction−to−Case Top (Note 2)	ψ_{JCT}	3.72	°C/W
Thermal Characterization, Junction−to−Lead of Cathode (Note 2)	ψ_{JLC}	1.44	°C/W

2. Assume 600 mm^2, 1 oz. copper bond pad on a FR4 board.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage	V_F			V
(I_F = 15 A, T_J = 25°C)		0.48	–	
(I_F = 15 A, T_J = 125°C)		0.40	–	
(I_F = 30 A, T_J = 25°C)		0.53	0.60	
(I_F = 30 A, T_J = 125°C)		0.48	0.57	
Instantaneous Reverse Current	I_R			
(V_R = Rated DC Voltage, T_J = 25°C)		17	100	μA
(V_R = Rated DC Voltage, T_J = 125°C)		10	30	mA
Junction Capacitance	C_J			pF
(V_R = 1 V, T_J = 25°C, f = 1 MHz)		3140	–	

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 ≤ 2.0%.

TYPICAL CHARACTERISTICS

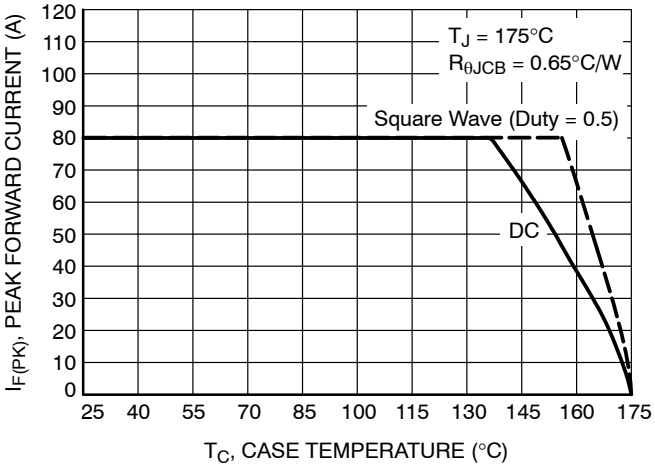


Figure 1. Forward Current Derating of Case Temperature

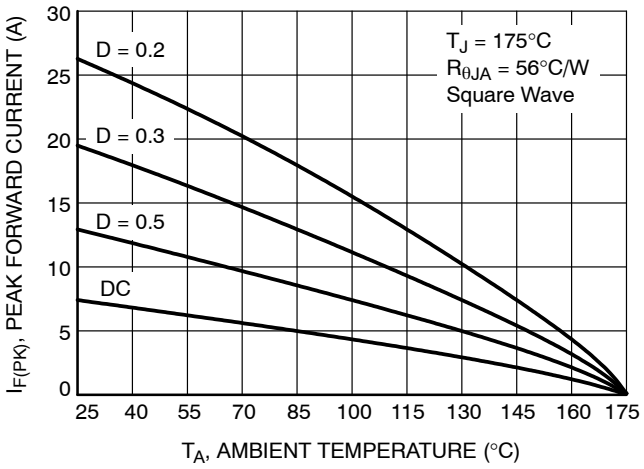


Figure 2. Forward Current Derating of Ambient Temperature

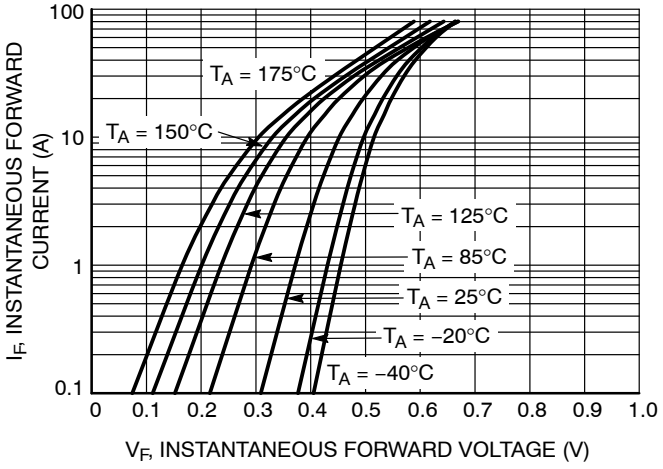


Figure 3. Typical Forward Characteristics

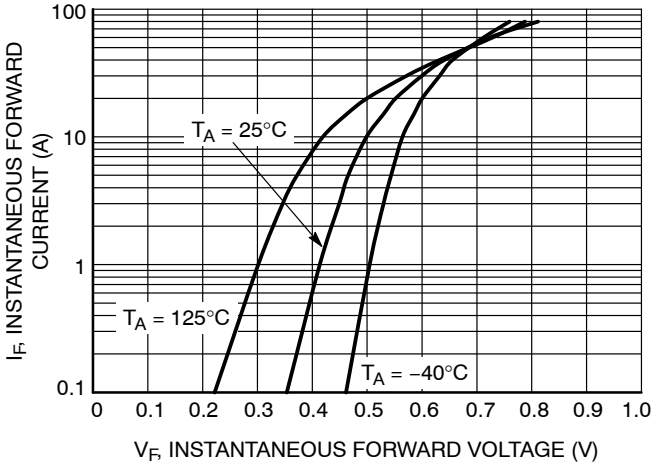


Figure 4. Maximum Forward Characteristics

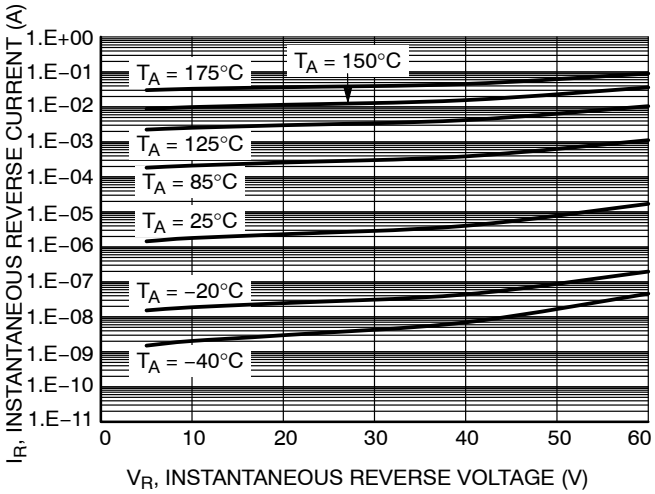


Figure 5. Typical Reverse Characteristics

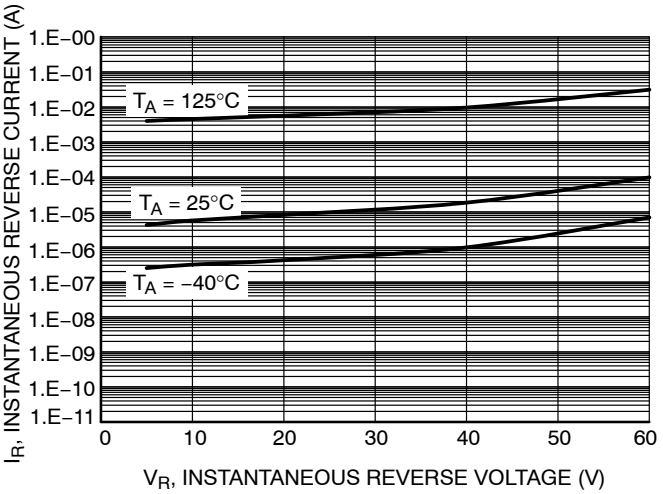


Figure 6. Maximum Reverse Characteristics

TYPICAL CHARACTERISTICS

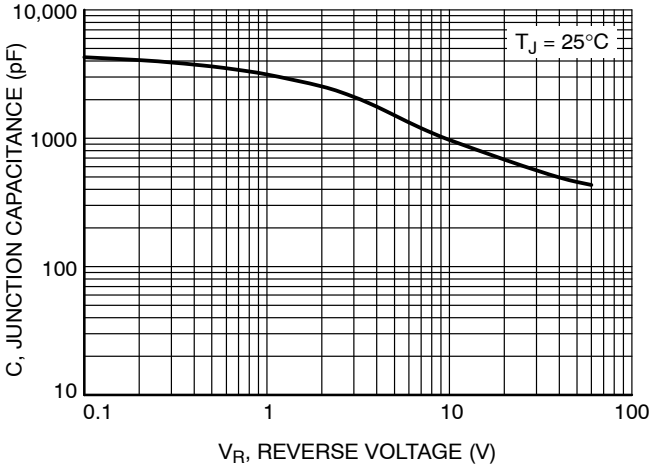


Figure 7. Typical Junction Capacitance

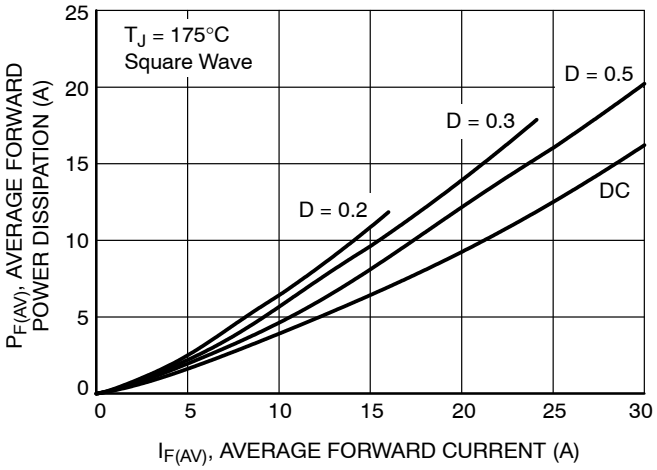


Figure 8. Average Forward Power Dissipation

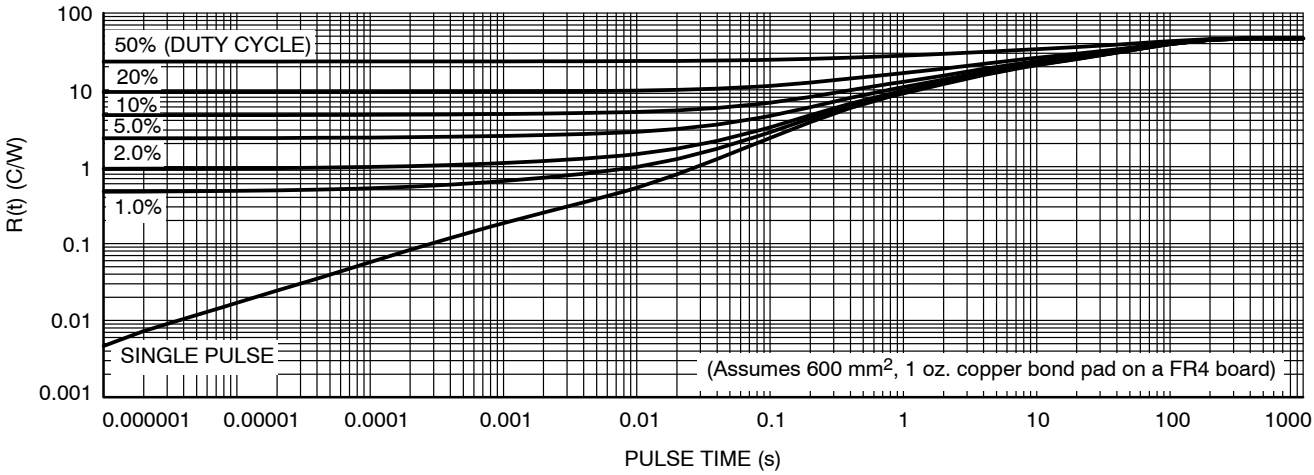
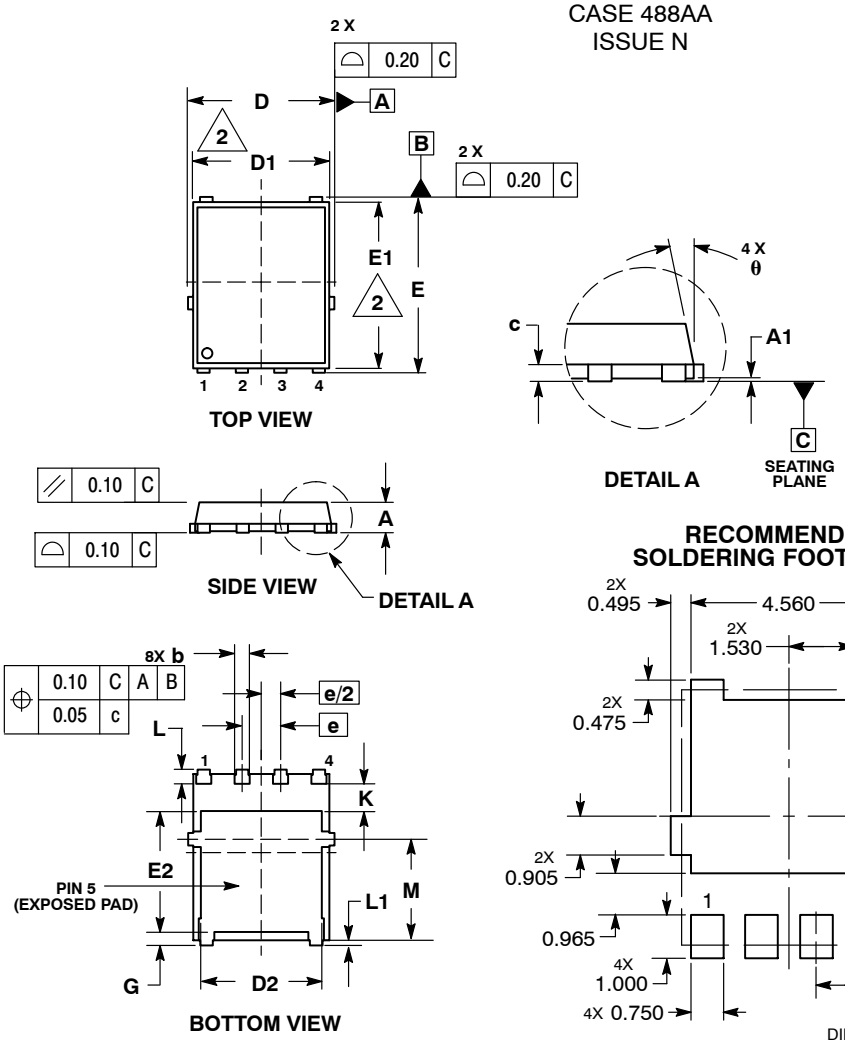


Figure 9. Typical Thermal Characteristics, Junction−to−Ambient

NRVTS3060MFS

PACKAGE DIMENSIONS

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



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.

	MILLIMETERS		
DIM	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 °

STYLE 1:
PIN 1. SOURCE
2. SOURCE
3. SOURCE
4. GATE
5. DRAIN

RECOMMENDED SOLDERING 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.

PUBLICATION ORDERING INFORMATION

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