

Schottky Barrier Rectifier, Trench-based, High Performance

NRTS6100PFS, NRVTS6100PFS

This Trench Schottky rectifier is a high performance device in a TO-277 package. The lower forward voltage, less leakage current, and small junction capacitance are suitable to high switching frequency high density DC to DC conversion applications. It offers higher avalanche energy capability for Oring or reverse protection applications. The TO-277 package provides excellent thermal performance, less land area of board space, and a 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
- Package Provided Capability of Inspection and Probe After Board Mounting
- Good Alternative Solution of SMC and DPAK Package

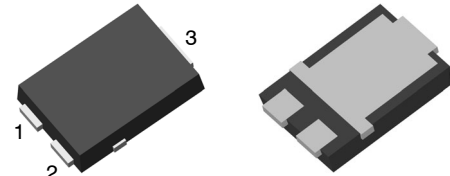
Mechanical Characteristics:

- 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
- ESD Ratings:
 - ♦ Human Body Model: ≥ 8000 V (Class 3B)
 - ♦ Charged Device Model: > 1000 V (Class C5)

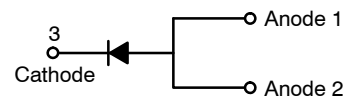
Applications

- High Switching Frequency DC/DC Converters
- 2nd Rectifier
- Oring / Reverse Protection
- Freewheeling Diode for Inductive Loads

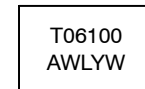
SCHOTTKY BARRIER RECTIFIER, 6 AMPERES 100 VOLTS



TO-277-3LD
CASE 340CZ



MARKING DIAGRAM



T06100 = Specific Device Code
 A = Assembly Location
 Y = Year
 W = Work Week
 WL = Wafer Lot

ORDERING INFORMATION

Device	Package	Shipping†
NRTS6100PFST3G	TO-277 (Pb-Free)	1500 / Tape & Reel
NRVTS6100PFST3G	TO-277 (Pb-Free)	1500 / 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.

NRTS6100PFS, NRVTS6100PFS

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
Continuous Forward Current ($T_C = 168^\circ\text{C}$, DC)	$I_{F(DC)}$	6	A
Peak Repetitive Forward Current, ($T_C = 166^\circ\text{C}$, Square Wave, Duty = 0.5)	I_{FRM}	12	A
Non-Repetitive Avalanche Energy ($T_J = 25^\circ\text{C}$)	E_{AS}	145	mJ
Storage Temperature Range	T_{stg}	-65 to +175	$^\circ\text{C}$
Operating Junction Temperature (Note 1)	T_J	-55 to +175	$^\circ\text{C}$

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	$R_{\theta JA}$	70	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case Bottom	$R_{\theta JCB}$	2.2	$^\circ\text{C/W}$
Thermal Characterization, Junction-to-Case Top	Ψ_{JCT}	1.1	$^\circ\text{C/W}$
Thermal Characterization, Junction-to-Lead of Cathode	Ψ_{JLC}	0.7	$^\circ\text{C/W}$

NOTE: (Assumes 600 mm², 1 oz. copper bond pad on a FR4 board)

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 2) ($I_F = 3\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 3\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 6\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 6\text{ A}$, $T_J = 125^\circ\text{C}$)	V_F	0.52 0.47 0.62 0.56	– – 0.68 0.62	V
Instantaneous Reverse Current (Note 2) ($V_R = \text{Rated DC Voltage}$, $T_J = 25^\circ\text{C}$) ($V_R = \text{Rated DC Voltage}$, $T_J = 125^\circ\text{C}$)	I_R	6.2 3.3	50 15	μA mA
Junction Capacitance ($V_R = 1\text{ V}$, $T_J = 25^\circ\text{C}$, 1 MHz)	C_J	827	–	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.

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

TYPICAL CHARACTERISTICS

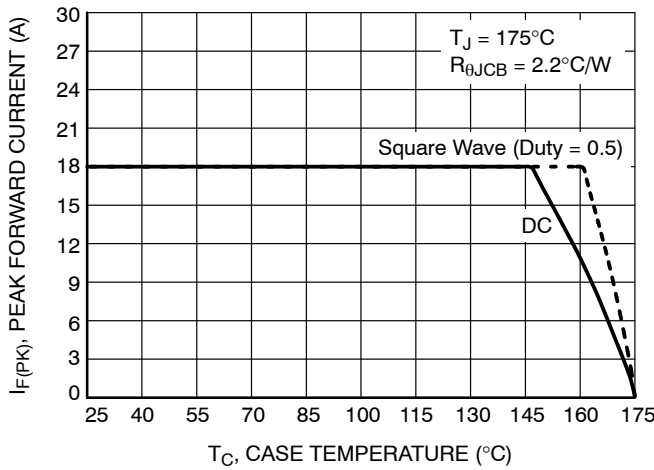


Figure 1. Forward Current Derating of Case Temperature

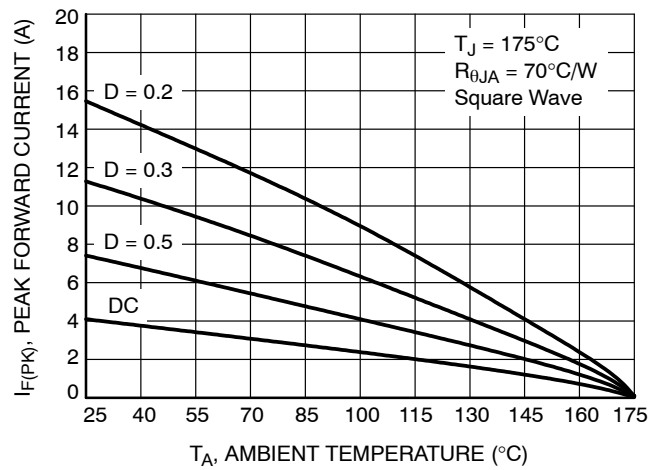


Figure 2. Forward Current Derating of Ambient Temperature

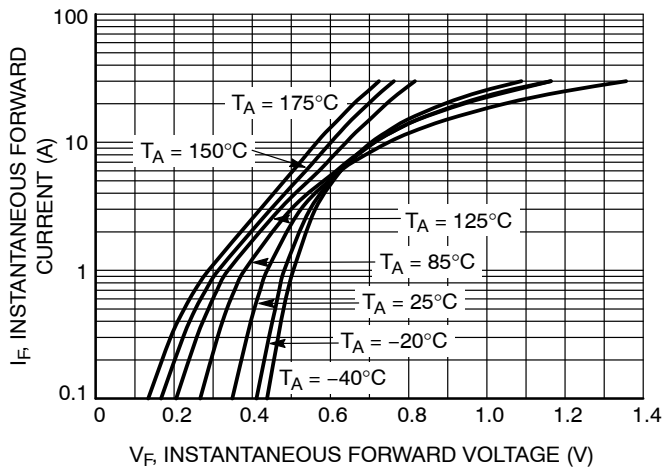


Figure 3. Typical Forward Characteristics

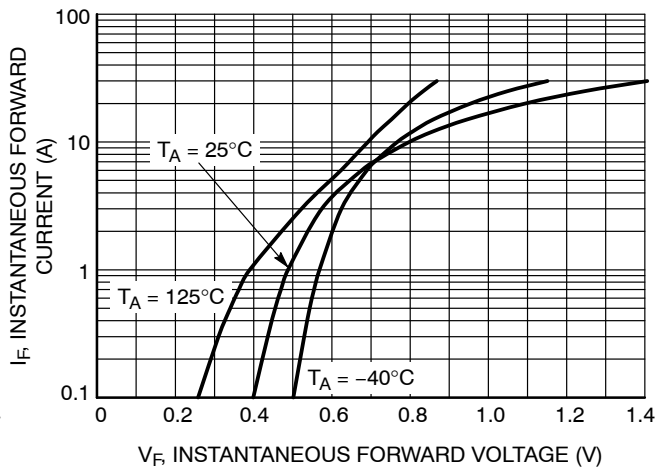


Figure 4. Maximum Forward Characteristics

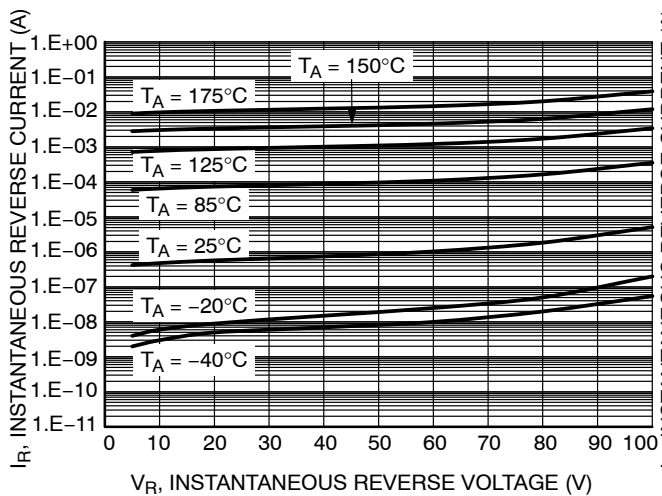


Figure 5. Typical Reverse Characteristics

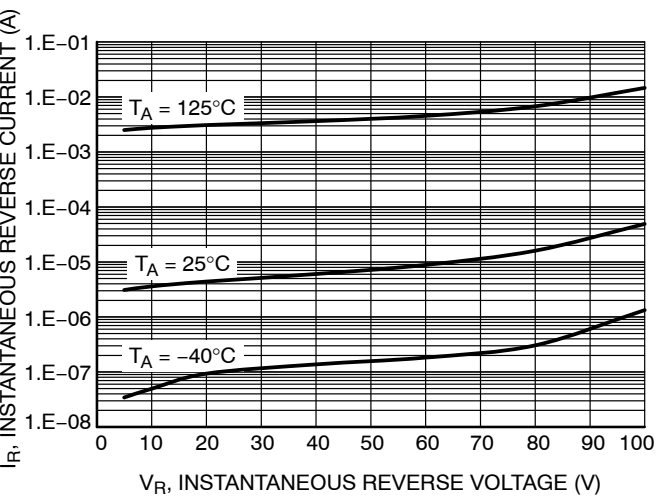


Figure 6. Maximum Reverse Characteristics

NRTS6100PFS, NRVTS6100PFS

TYPICAL CHARACTERISTICS

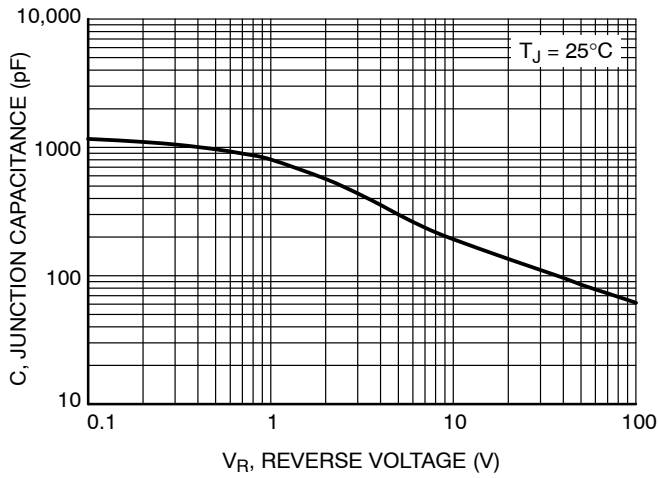


Figure 7. Typical Junction Capacitance

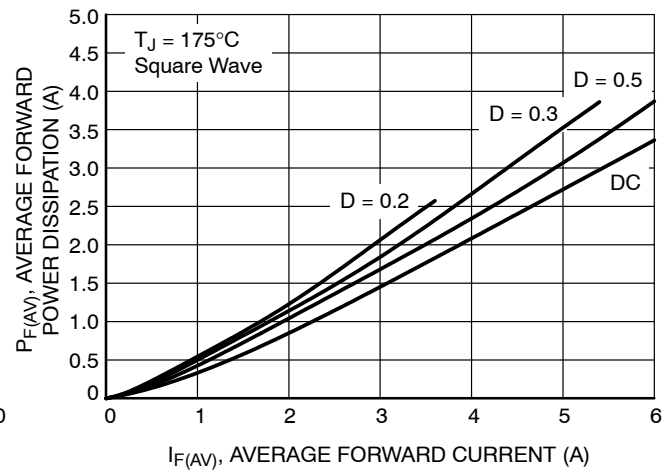


Figure 8. Average Forward Power Dissipation

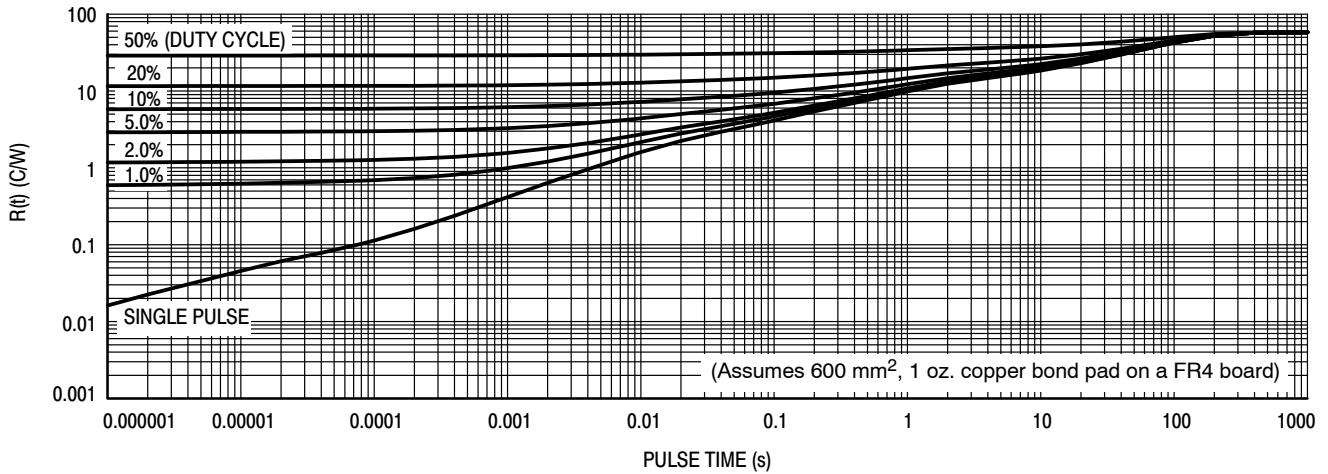


Figure 9. Typical Thermal Characteristics, Junction-to-Ambient

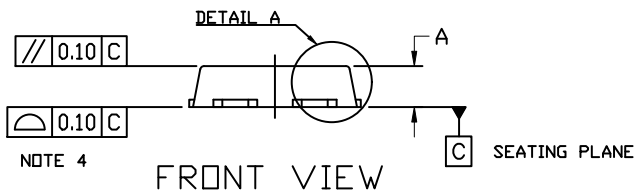
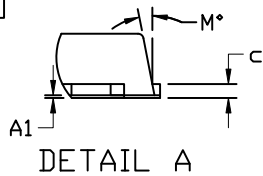
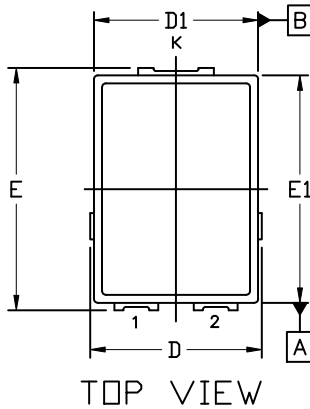
NRTS6100PFS, NRVTS6100PFS

PACKAGE DIMENSIONS

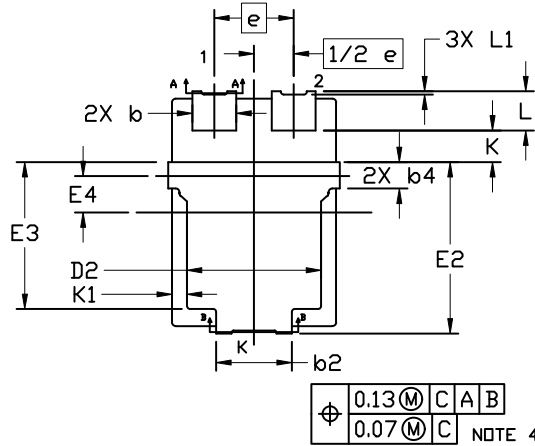
TO-277-3LD CASE 340CZ ISSUE A

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS b, b1, b2, b3, b6 AND c TO BE MEASURED ON FLAT SECTION OF THE LEAD, BETWEEN 0.13 AND 0.25mm FROM LEAD TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. POSITIONAL TOLERANCE APPLIES TO THE TERMINALS AND EXPOSED PAD.
6. A1 IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
7. DIMENSIONS D AND E TO BE DETERMINED AT DATUM PLANE C.



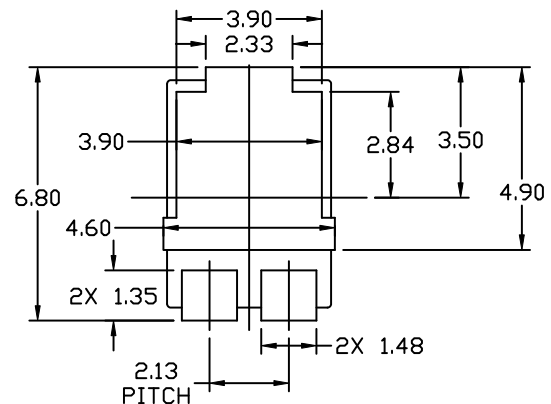
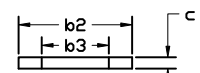
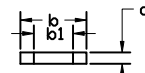
NOTE 4



NOTE 4

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.00	1.10	1.20
A1	---	0.01	0.05
b	1.13	1.18	1.28
b1	0.70 REF		
b2	1.98	2.03	2.13
b3	1.20 REF		
b4	0.71 REF		
c	0.20 REF		
D	4.45	4.60	4.75
D1	4.35	4.40	4.45
D2	3.50	3.60	3.70

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
E	6.35	6.50	6.65
E1	6.05	6.10	6.15
E2	4.50	4.60	4.70
E3	3.84	3.94	4.04
E4	0.98 REF		
e	2.13 BSC		
K	0.85 REF		
K1	0.40 REF		
L	0.90	1.05	1.20
L1	0.02	---	---
M	---	---	12°



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

NRTS6100PFS, NRVTS6100PFS

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com

onsemi Website: www.onsemi.com

TECHNICAL SUPPORT

North American Technical Support:

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative