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

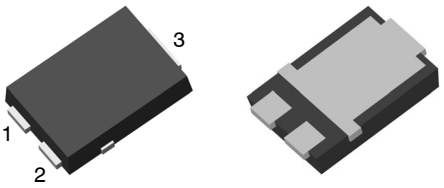
Mechanical Characteristics:

- 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)

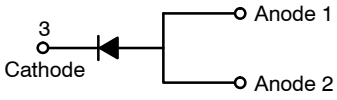
Applications

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

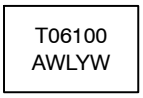
SCHOTTKY BARRIER RECTIFIER, 6 AMPERES 100 VOLTS



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.

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°C, DC)	$I_{F(DC)}$	6	A
Peak Repetitive Forward Current, (T_C = 166°C, Square Wave, Duty = 0.5)	I_{FRM}	12	A
Non−Repetitive Avalanche Energy (T_J = 25°C)	E_{AS}	145	mJ
Storage Temperature Range	T_{stg}	−65 to +175	°C
Operating Junction Temperature (Note 1)	T_J	−55 to +175	°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	°C/W
Thermal Resistance, Junction−to−Case Bottom	$R_{\theta JCB}$	2.2	°C/W
Thermal Characterization, Junction−to−Case Top	Ψ_{JCT}	1.1	°C/W
Thermal Characterization, Junction−to−Lead of Cathode	Ψ_{JLC}	0.7	°C/W

NOTE: (Assumes 600 mm^2, 1 oz. copper bond pad on a FR4 board)

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 2) (I_F = 3 A, T_J = 25°C) (I_F = 3 A, T_J = 125°C) (I_F = 6 A, T_J = 25°C) (I_F = 6 A, T_J = 125°C)	V_F	 0.52 0.47 0.62 0.56	 − − 0.68 0.62	V
Instantaneous Reverse Current (Note 2) (V_R = Rated DC Voltage, T_J = 25°C) (V_R = Rated DC Voltage, T_J = 125°C)	I_R	 6.2 3.3	 50 15	 μA mA
Junction Capacitance (V_R = 1 V, T_J = 25°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 ≤ 2.0%.

TYPICAL CHARACTERISTICS

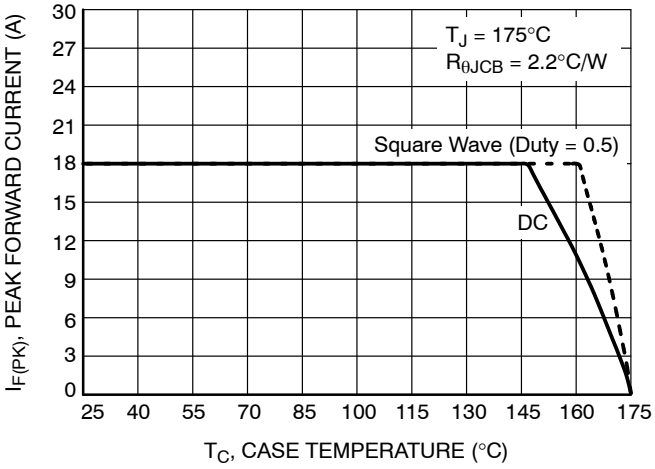


Figure 1. Forward Current Derating of Case Temperature

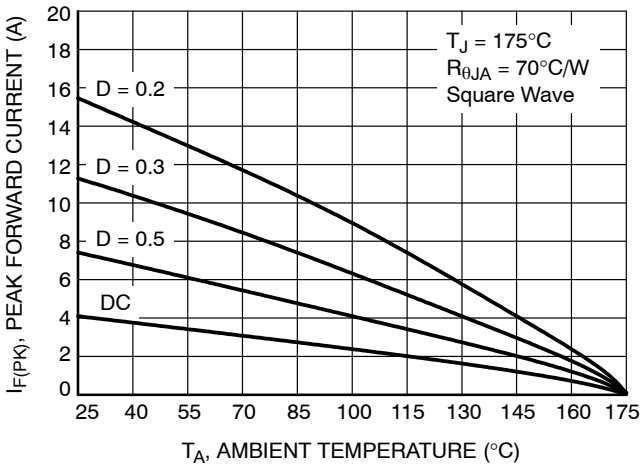


Figure 2. Forward Current Derating of Ambient Temperature

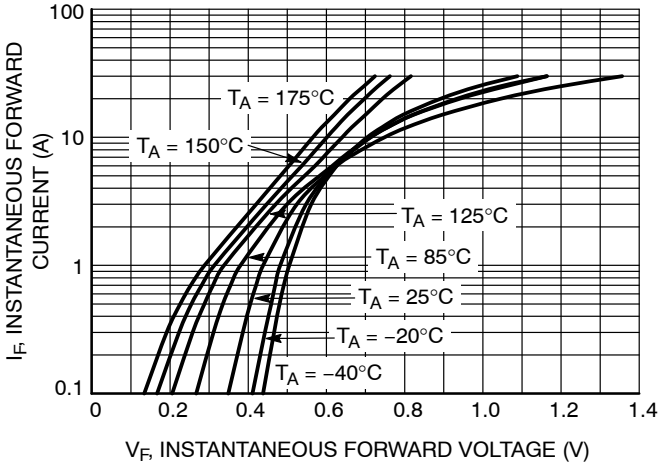


Figure 3. Typical Forward Characteristics

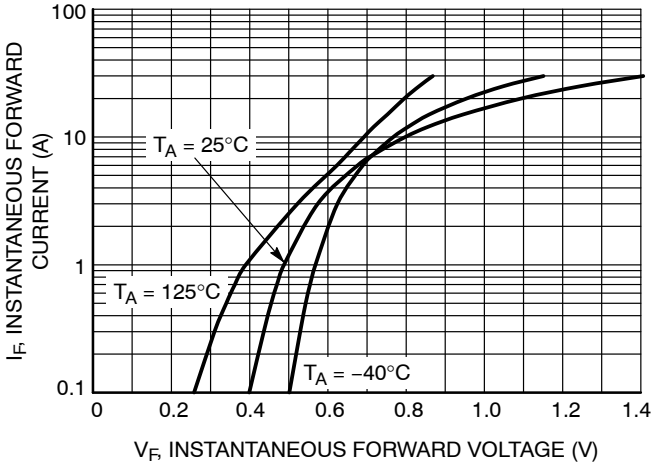


Figure 4. Maximum Forward Characteristics

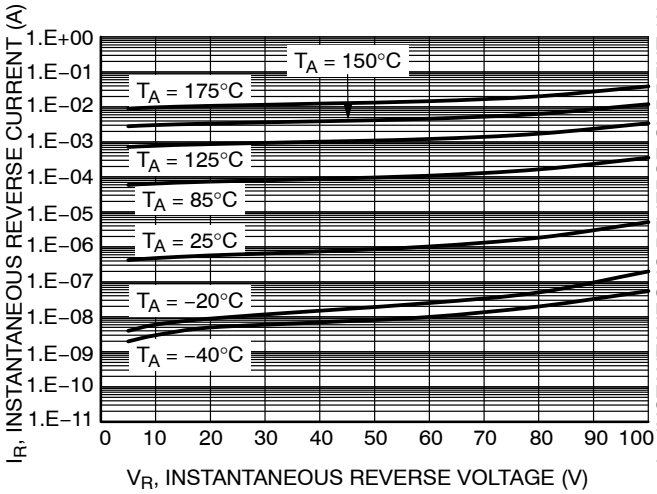


Figure 5. Typical Reverse Characteristics

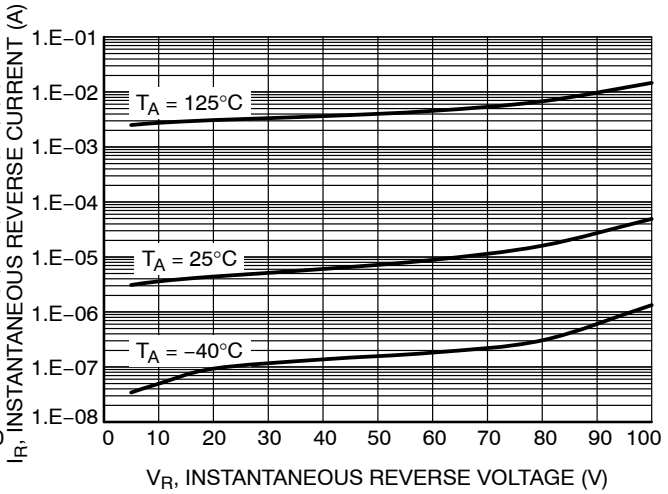


Figure 6. Maximum Reverse Characteristics

TYPICAL CHARACTERISTICS

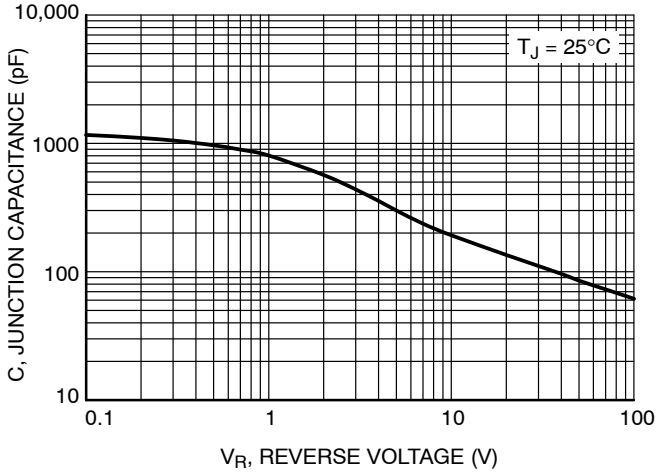


Figure 7. Typical Junction Capacitance

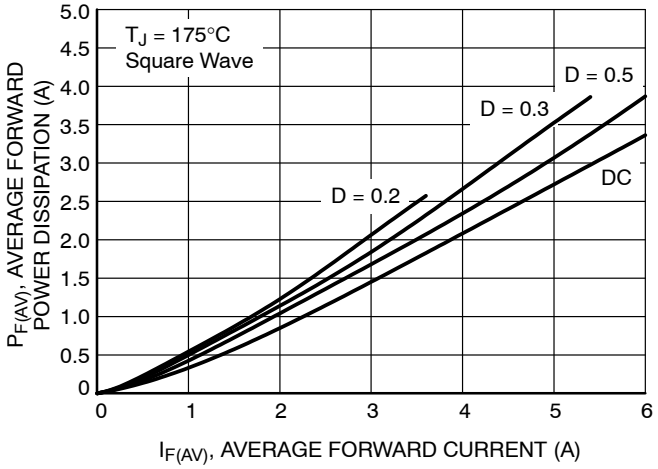


Figure 8. Average Forward Power Dissipation

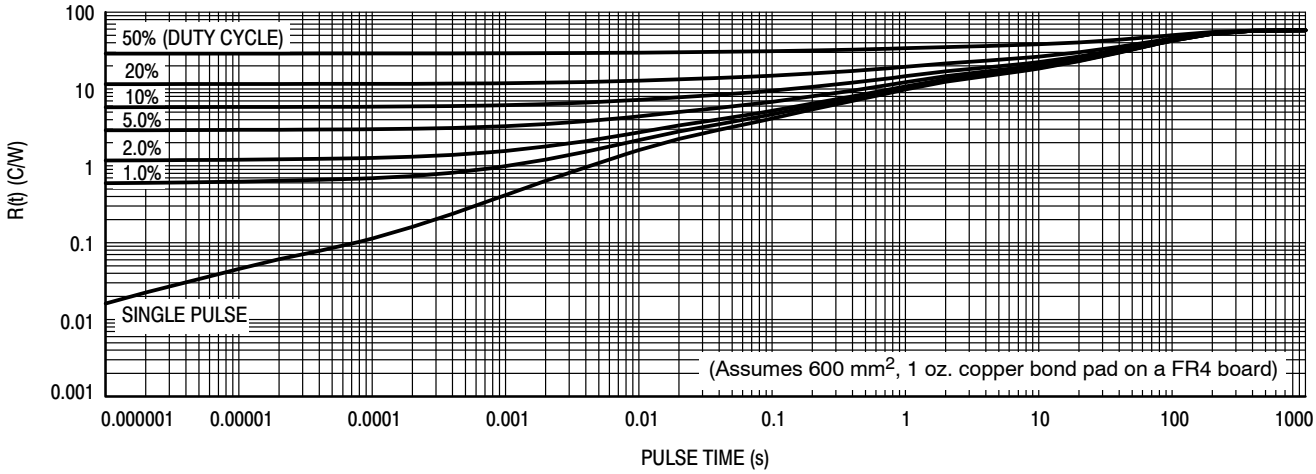
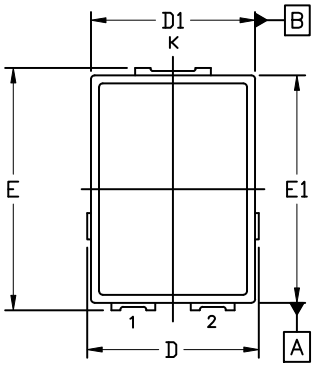


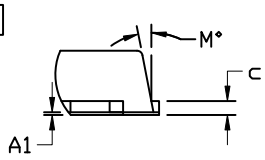
Figure 9. Typical Thermal Characteristics, Junction−to−Ambient

PACKAGE DIMENSIONS

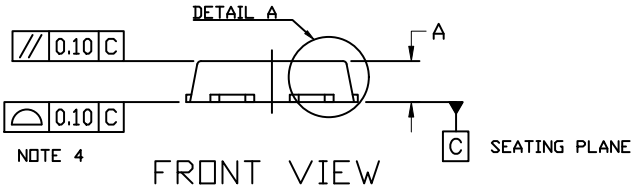
TO−277−3LD
CASE 340CZ
ISSUE A



TOP VIEW



DETAIL A

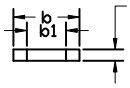


FRONT VIEW

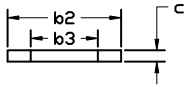
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS b, b1,b2,b3,b6 AND c TO BE MEASURED ON FLAT SECTION OF THE LEAD, BETWEEN 0.13 AND 0.25mm FROM LEAD TIP.
4. COPLANARITY APPLES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. POSITIONAL TOLERANCE 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.

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

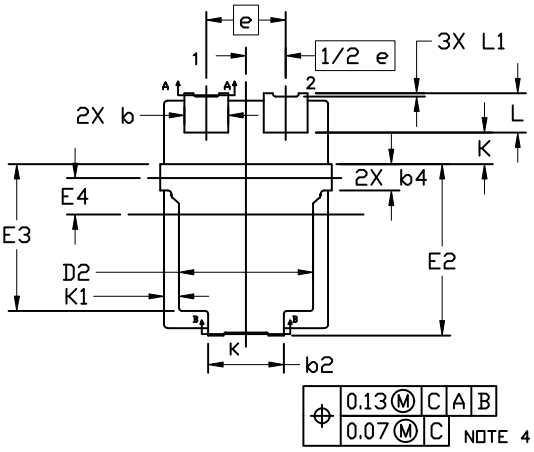
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
E	6.35	6.50	6.65
E1	6.05	6.10	6.15
E2	4.50	4.60	4.70
E3	3.84	3.94	4.04
E4		0.98 REF	
e		2.13 BSC	
K		0.85 REF	
K1		0.40 REF	
L	0.90	1.05	1.20
L1	0.02	---	---
M	---	---	12°



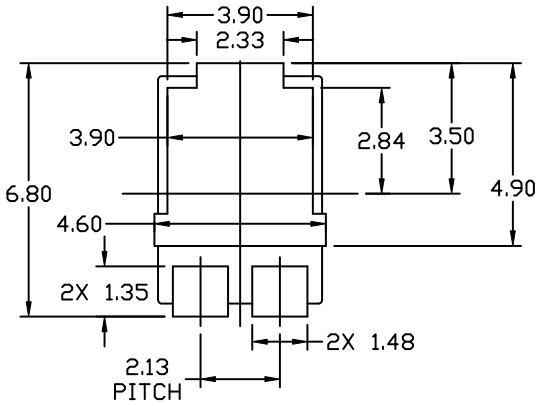
SECTION A−A



SECTION B−B



BOTTOM VIEW



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.

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

◊

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

onsemi:

NRTS6100PFST3G NRVTS6100PFST3G