

# NRTST40H100CT

## Very Low Forward Voltage Trench-based Schottky Rectifier

### 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 Devices

### Typical Applications

- Switching Power Supplies including Notebook / Netbook Adapters, ATX and Flat Panel Display
- 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
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

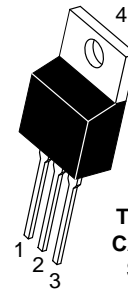
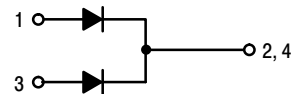


ON Semiconductor®

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

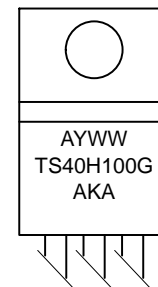
## VERY LOW FORWARD VOLT- AGE, SCHOTTKY BARRIER RECTIFIERS 40 AMPERES, 100 VOLTS

### PIN CONNECTIONS



TO-220AB  
CASE 221A  
STYLE 6

### MARKING DIAGRAM



TO-220AB

A = Assembly Location  
Y = Year  
WW = Work Week  
AKA = Polarity Designator  
G = Pb-Free Package

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# NRTST40H100CT

## 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 (Rated $V_R$ , $T_C = 118^\circ\text{C}$ ) (Rated $V_R$ , $T_C = 131^\circ\text{C}$ )	$I_{F(AV)}$ Per device Per diode	40 20	A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz, $T_C = 113^\circ\text{C}$ ) (Rated $V_R$ , Square Wave, 20 kHz, $T_C = 128^\circ\text{C}$ )	$I_{FRM}$ Per device Per diode	80 40	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	250	A
Operating Junction Temperature	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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.

## THERMAL CHARACTERISTICS

Rating	Symbol	NRTST40H100CTG	Unit
Maximum Thermal Resistance per Device (Note 1) Junction-to-Case Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1.0 69.3	$^\circ\text{C/W}$ $^\circ\text{C/W}$

1. Assumes 150 mm<sup>2</sup> 1 oz. copper band pad, on a FR4 board.

## ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 2) ( $I_F = 10\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $I_F = 20\text{ A}$ , $T_J = 25^\circ\text{C}$ )  ( $I_F = 10\text{ A}$ , $T_J = 125^\circ\text{C}$ ) ( $I_F = 20\text{ A}$ , $T_J = 125^\circ\text{C}$ )	$V_F$	0.58 0.73  0.53 0.65	- 0.76  - 0.68	V
Maximum Instantaneous Reverse Current (Note 2) ( $V_R = 70\text{ V}$ , $T_J = 25^\circ\text{C}$ ) ( $V_R = 70\text{ V}$ , $T_J = 125^\circ\text{C}$ )  (Rated dc Voltage, $T_J = 25^\circ\text{C}$ ) (Rated dc Voltage, $T_J = 125^\circ\text{C}$ )	$I_R$	4 4  16 11	- -  50 30	$\mu\text{A}$ mA  $\mu\text{A}$ mA
Diode Capacitance (Rated dc Voltage, $T_J = 25^\circ\text{C}$ , $f = 1\text{ MHz}$ )	$C_d$	147	-	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.

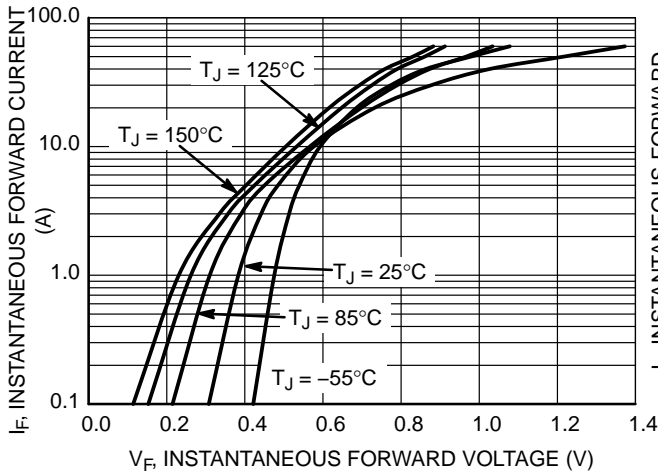
2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## ORDERING INFORMATION

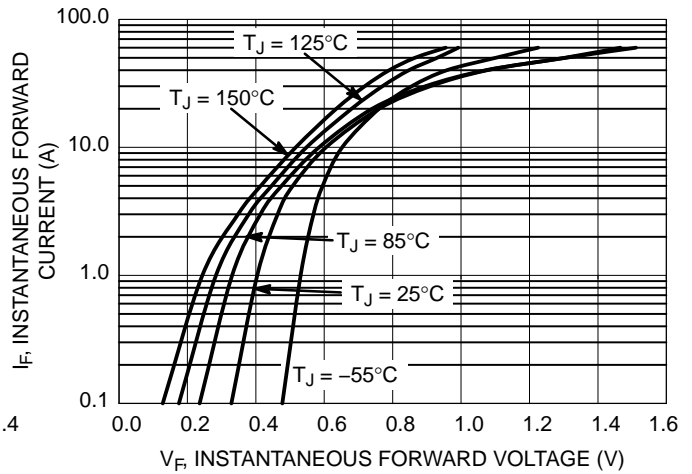
Device	Package	Shipping
NRTST40H100CTG	TO-220AB (Pb-Free)	50 Units / Rail

# NRTST40H100CT

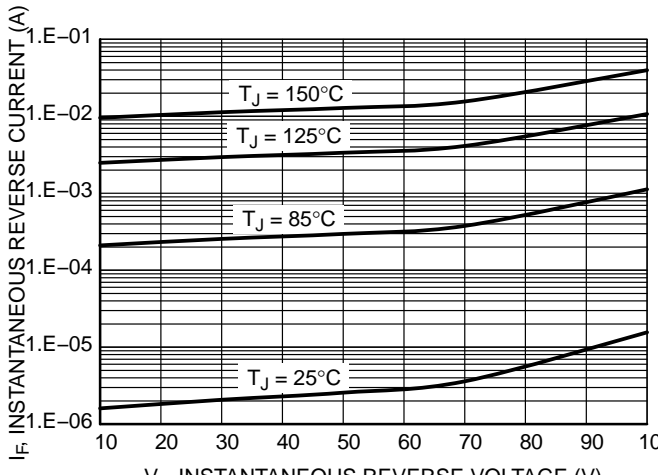
## TYPICAL CHARACTERISTICS



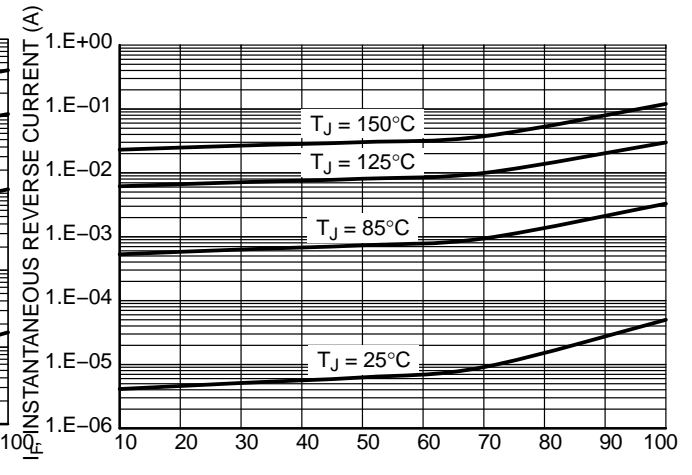
**Figure 1. Typical Instantaneous Forward Characteristics**



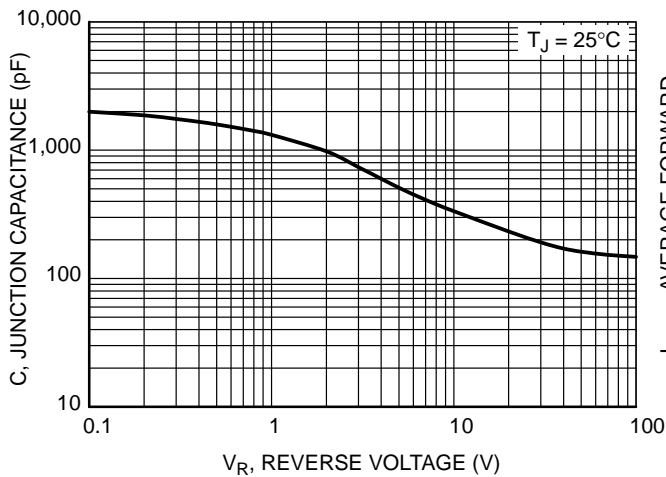
**Figure 2. Maximum Instantaneous Forward Characteristics**



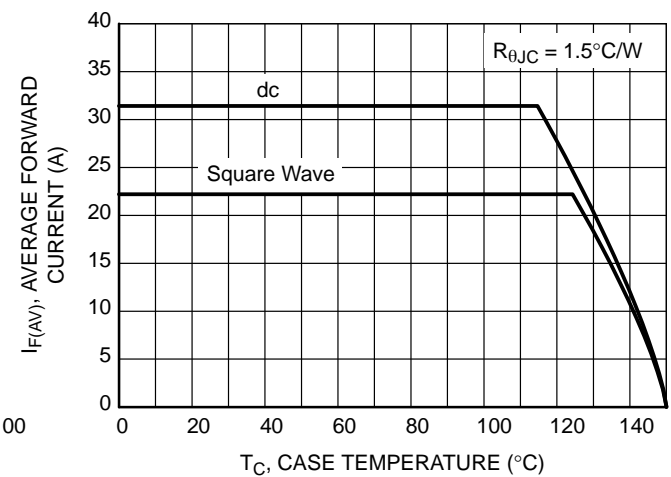
**Figure 3. Typical Reverse Characteristics**



**Figure 4. Maximum Reverse Characteristics**



**Figure 5. Typical Junction Capacitance**



**Figure 6. Current Derating per Leg**

# NRTST40H100CT

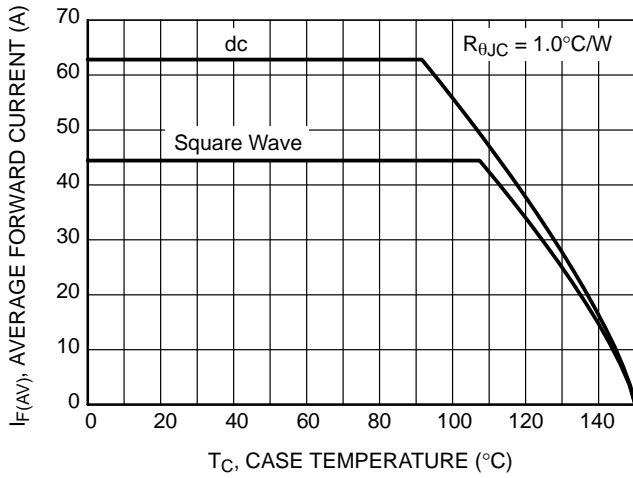


Figure 7. Current Derating, Device

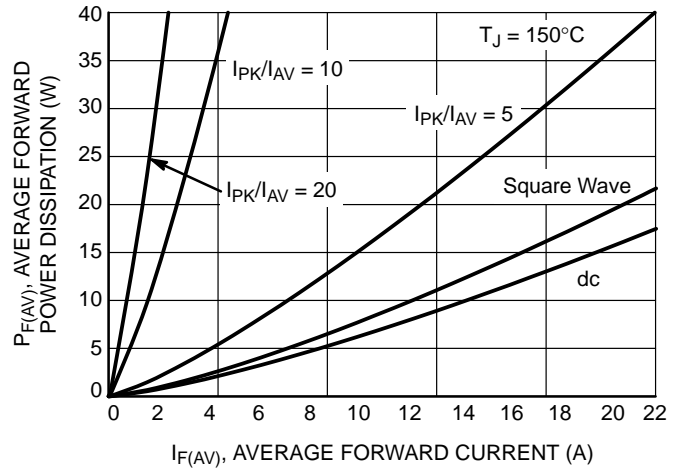


Figure 8. Forward Power Dissipation

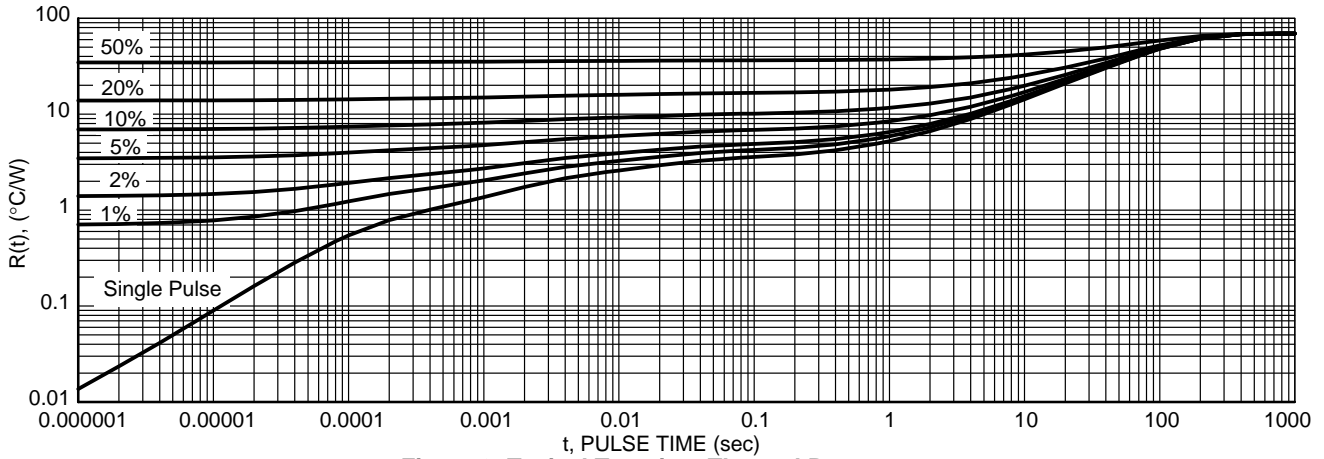


Figure 9. Typical Transient Thermal Response

**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](http://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.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at [www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)