

# 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

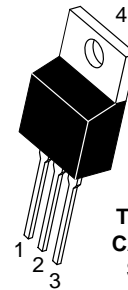
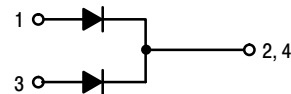


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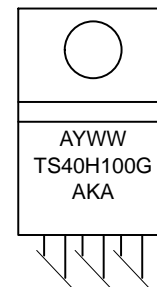
## VERY LOW FORWARD VOLT- AGE, SCHOTTKY BARRIER RECTIFIERS 40 AMPERES, 100 VOLTS

### 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.

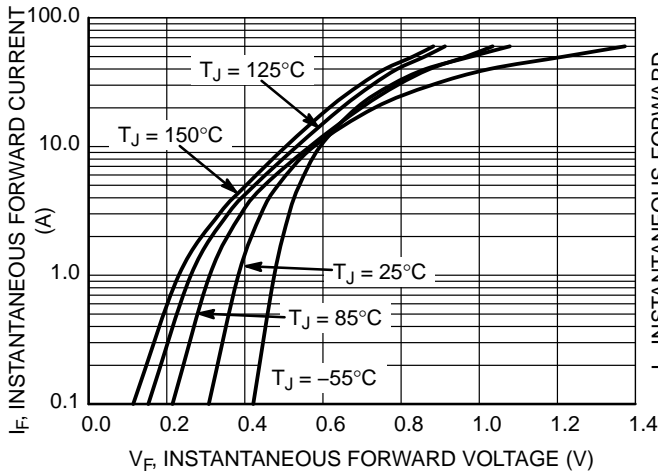
2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## ORDERING INFORMATION

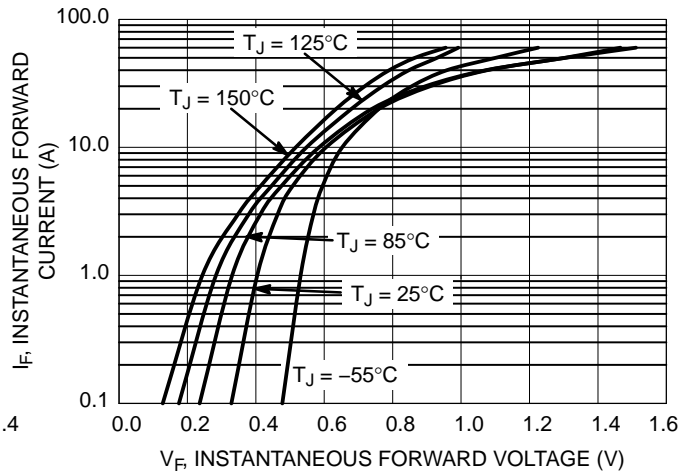
Device	Package	Shipping
NRTST40H100CTG	TO-220AB (Pb-Free)	50 Units / Rail

# NRTST40H100CT

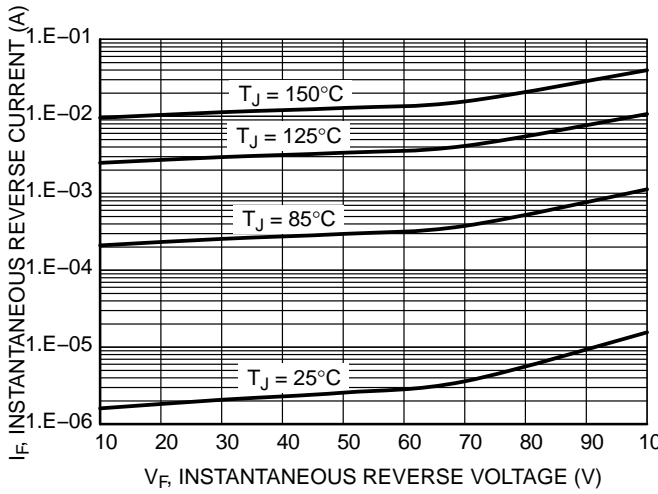
## TYPICAL CHARACTERISTICS



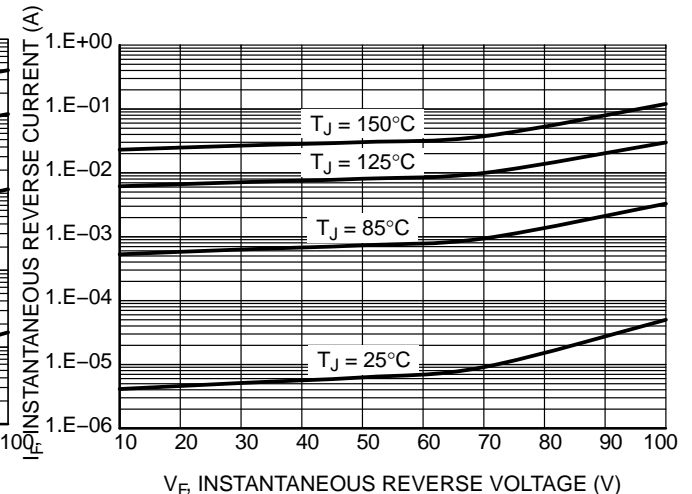
**Figure 1. Typical Instantaneous Forward Characteristics**



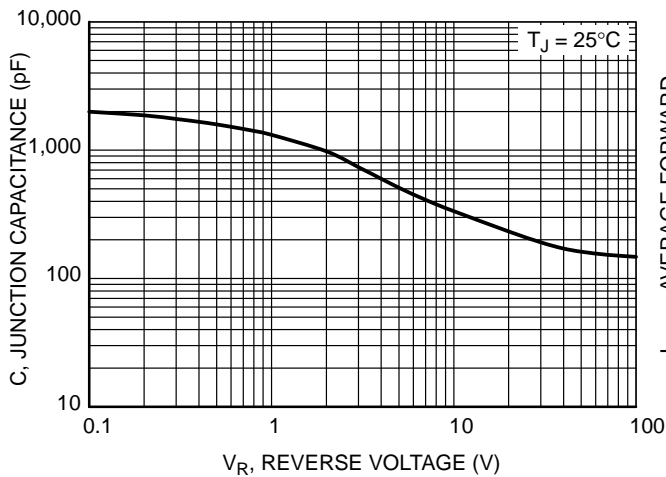
**Figure 2. Maximum Instantaneous Forward Characteristics**



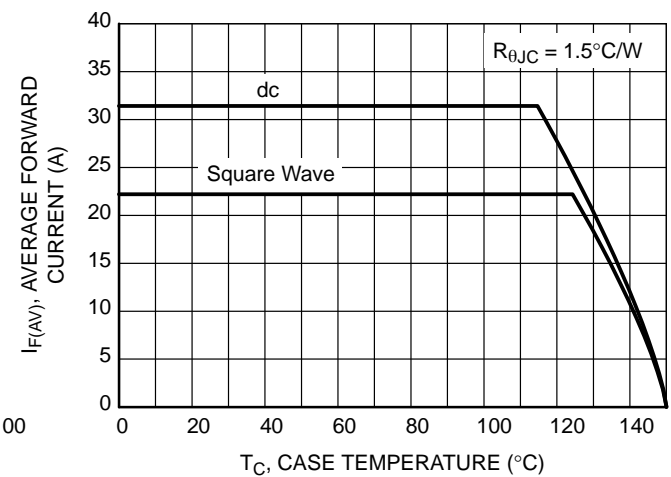
**Figure 3. Typical Reverse Characteristics**



**Figure 4. Maximum Reverse Characteristics**

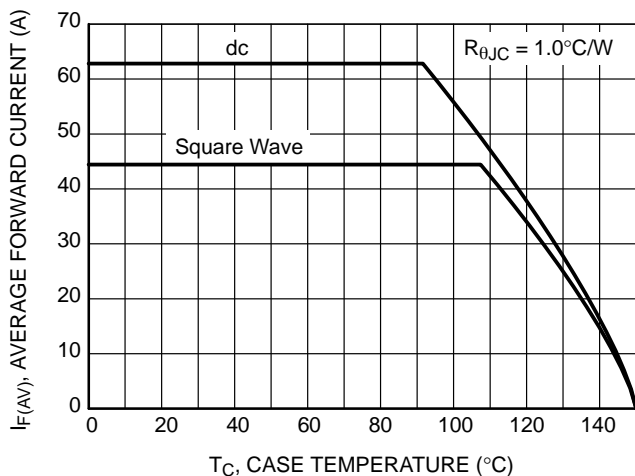


**Figure 5. Typical Junction Capacitance**

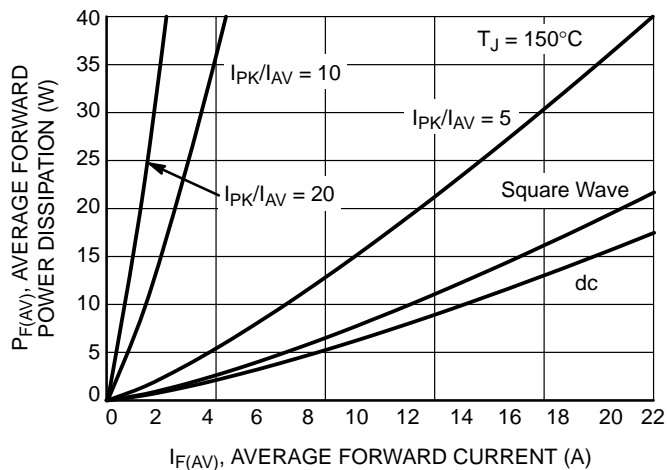


**Figure 6. Current Derating per Leg**

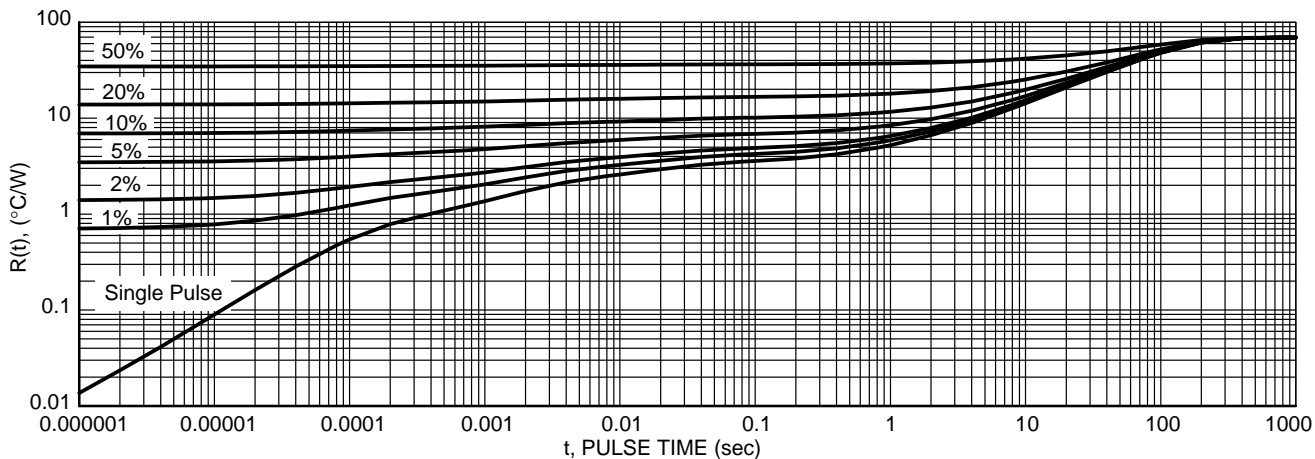
# NRTST40H100CT



**Figure 7. Current Derating, Device**



**Figure 8. Forward Power Dissipation**

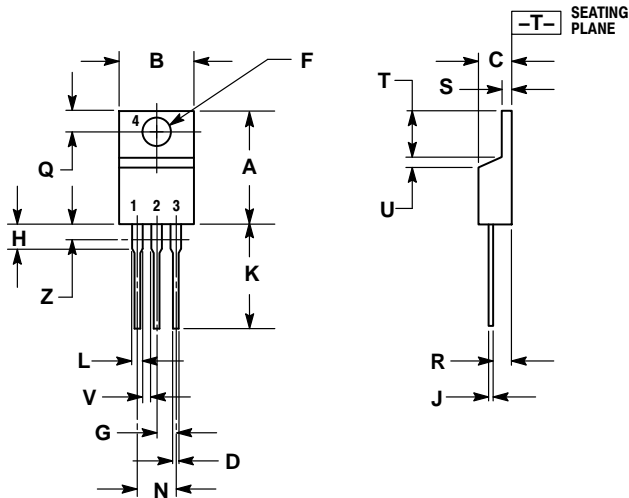


**Figure 9. Typical Transient Thermal Response**

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## PACKAGE DIMENSIONS

TO-220  
CASE 221A-09  
ISSUE AH



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.415	9.66	10.53
C	0.160	0.190	4.07	4.83
D	0.025	0.038	0.64	0.96
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.161	2.80	4.10
J	0.014	0.024	0.36	0.61
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 6:

- PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

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