

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT



ON Semiconductor®

www.onsemi.com

Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low $V_F = 0.36\text{ V}$ at $I_F = 5\text{ A}$

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
- Halide Free Devices Available
- These are Pb-Free Packages

Typical Applications

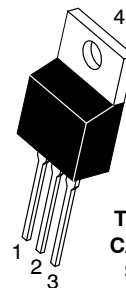
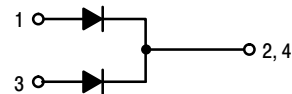
- Switching Power Supplies including Notebook / Netbook Adapters, ATX and Flat Panel Display
- High Frequency and DC-DC Converters
- Freewheeling and OR-ing diodes
- Reverse Battery Protection
- Instrumentation

Mechanical Characteristics

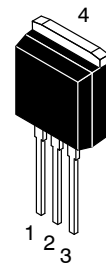
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

VERY LOW FORWARD VOLT-
AGE, LOW LEAKAGE SCHOT-
TKY BARRIER
RECTIFIERS 60 AMPERES,
100 VOLTS

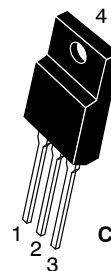
PIN CONNECTIONS



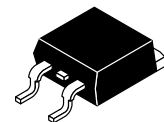
TO-220AB
CASE 221A
STYLE 6



I2PAK
CASE 418D
STYLE 3



TO-220FP
CASE 221AH



D2PAK
CASE 418B

ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

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 at Rated V_R NTST60100CT, NTSB60100CT-1 and NTSB60100CT (Rated V_R , $T_C = 115^\circ\text{C}$) per Device (Rated V_R , $T_C = 125^\circ\text{C}$) per Diode NTSJ60100CT (Rated V_R , $T_C = 80^\circ\text{C}$) per Device (Rated V_R , $T_C = 75^\circ\text{C}$) per Diode	$I_{F(AV)}$	60 30 30 30	A
Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz) NTST60100CT, NTSB60100CT-1 and NTSB60100CT (Rated V_R , $T_C = 105^\circ\text{C}$) per Device (Rated V_R , $T_C = 120^\circ\text{C}$) per Diode NTSJ60100CT (Rated V_R , $T_C = 65^\circ\text{C}$) per Device (Rated V_R , $T_C = 55^\circ\text{C}$) per Diode	I_{FRM}	120 60 30 30	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	-40 to +150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 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	NTST60100CT, NTSB60100CT-1, NTSB60100CT	NTSJ60100CT	Unit
Maximum Thermal Resistance Junction-to-Case Per Diode Per Device	$R_{\theta JC}$	1.10 0.67	3.60 3.17	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 1) ($I_F = 5\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 10\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 15\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 20\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 30\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 5\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 10\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 15\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 20\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 30\text{ A}$, $T_J = 125^\circ\text{C}$)	V_F	0.45 0.52 0.58 0.63 0.73 0.36 0.45 0.53 0.58 0.66	- - 0.63 - 0.84 - - 0.58 - 0.70	V
Maximum Instantaneous Reverse Current (Note 1) ($V_R = 80\text{ V}$, $T_J = 25^\circ\text{C}$) ($V_R = 80\text{ V}$, $T_J = 125^\circ\text{C}$) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) (Rated dc Voltage, $T_J = 125^\circ\text{C}$)	I_R	20 15 40 30	500 20 1000 85	μA mA μA mA

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.

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

TYPICAL CHARACTERISTICS

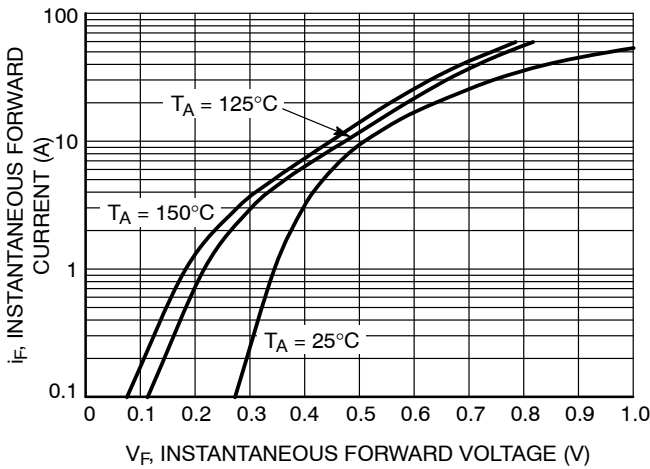


Figure 1. Typical Instantaneous Forward Characteristics

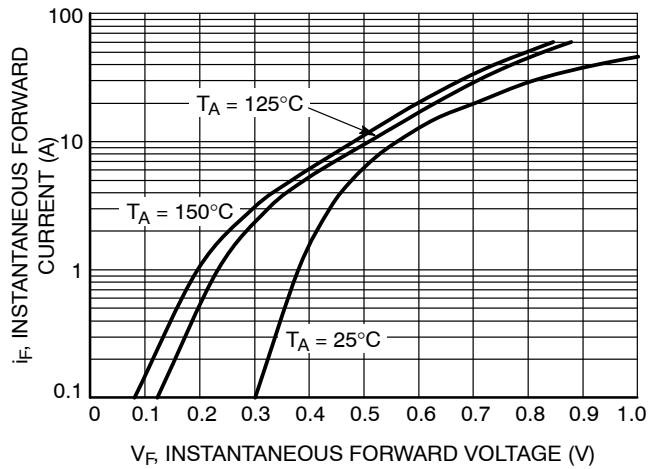


Figure 2. Maximum Instantaneous Forward Characteristics

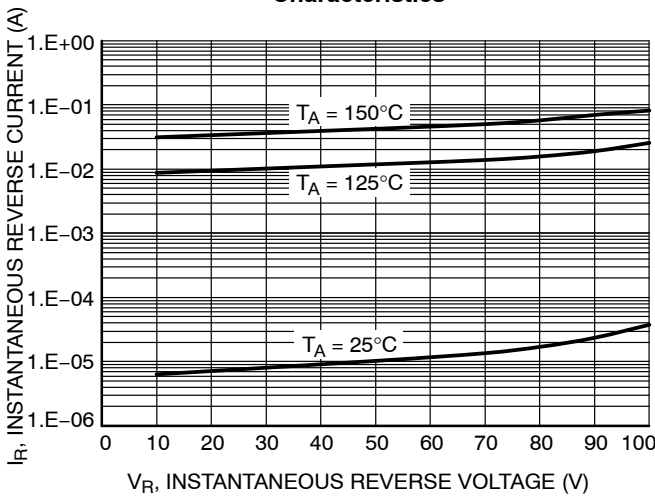


Figure 3. Typical Reverse Characteristics

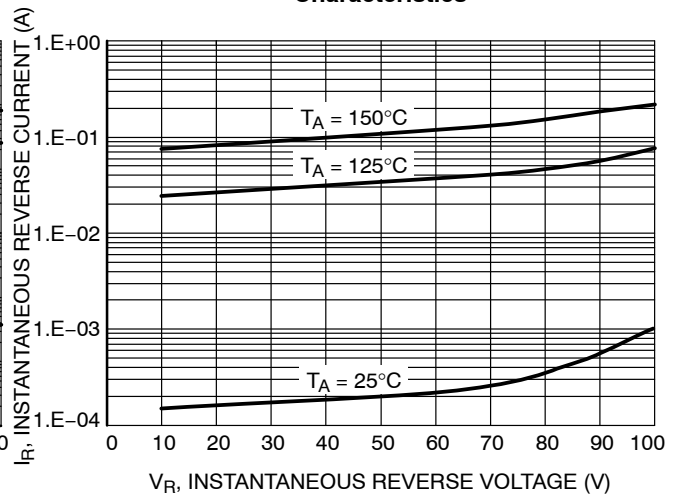


Figure 4. Maximum Reverse Characteristics

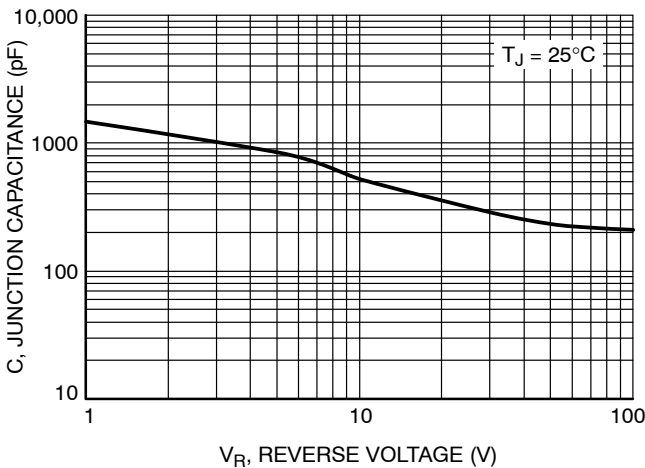


Figure 5. Typical Junction Capacitance

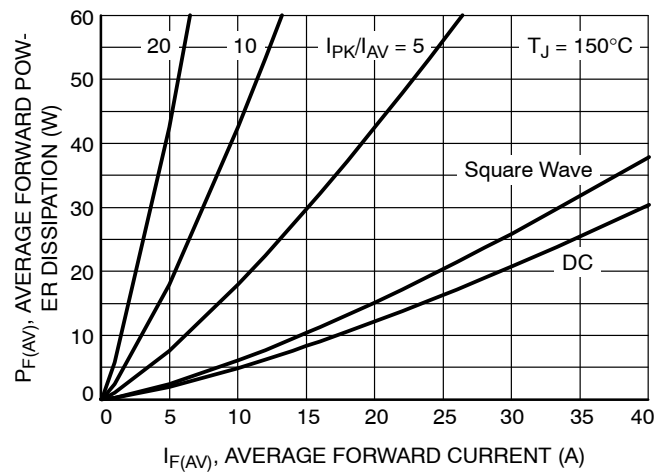


Figure 6. Forward Power Dissipation

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

TYPICAL CHARACTERISTICS

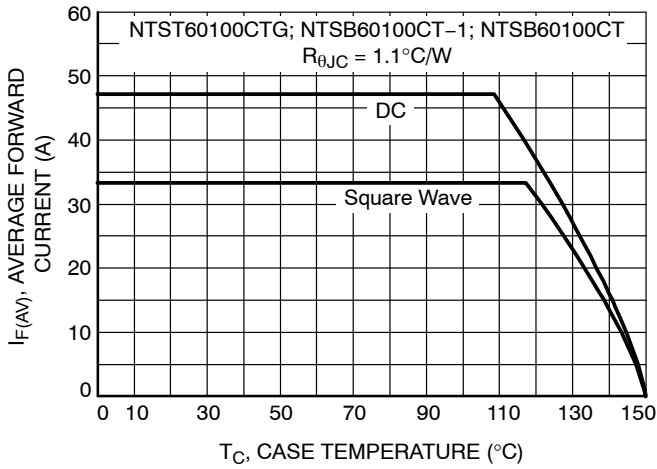


Figure 7. Current Derating per Diode

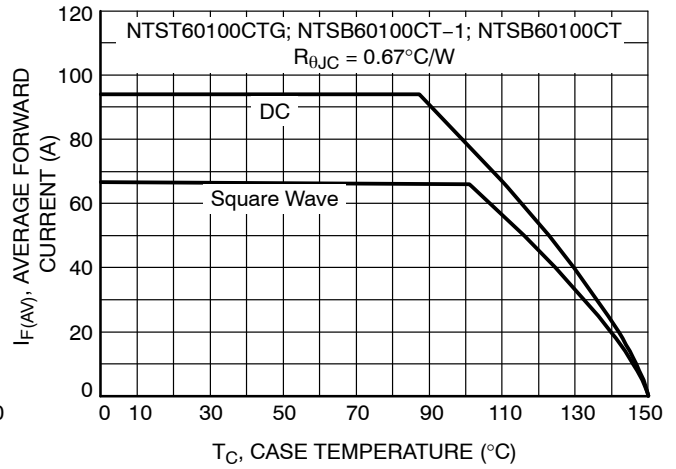


Figure 8. Current Derating per Device

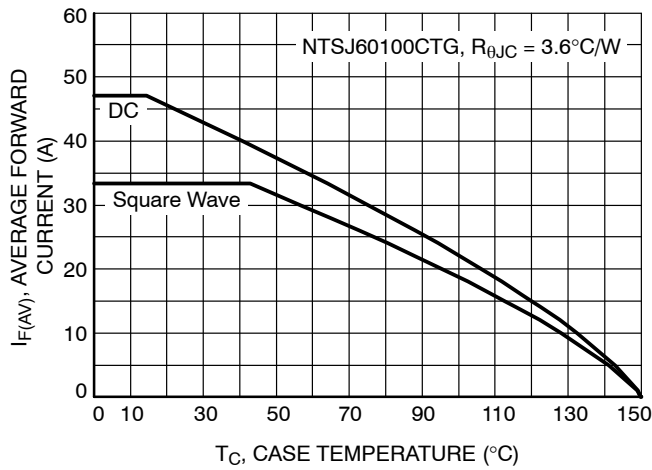


Figure 9. Current Derating per Diode

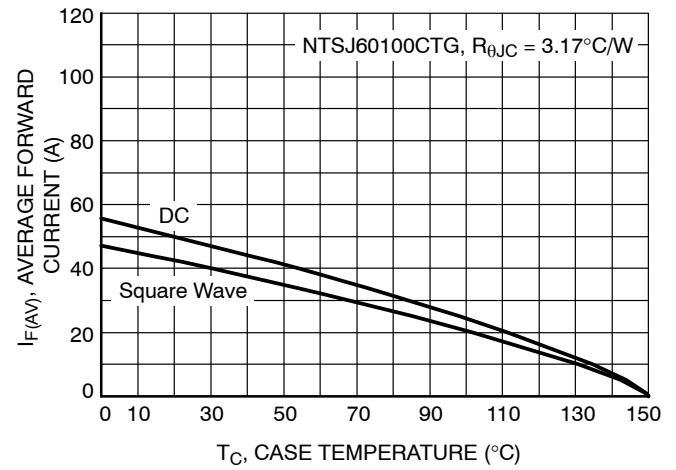


Figure 10. Current Derating per Device

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

TYPICAL CHARACTERISTICS

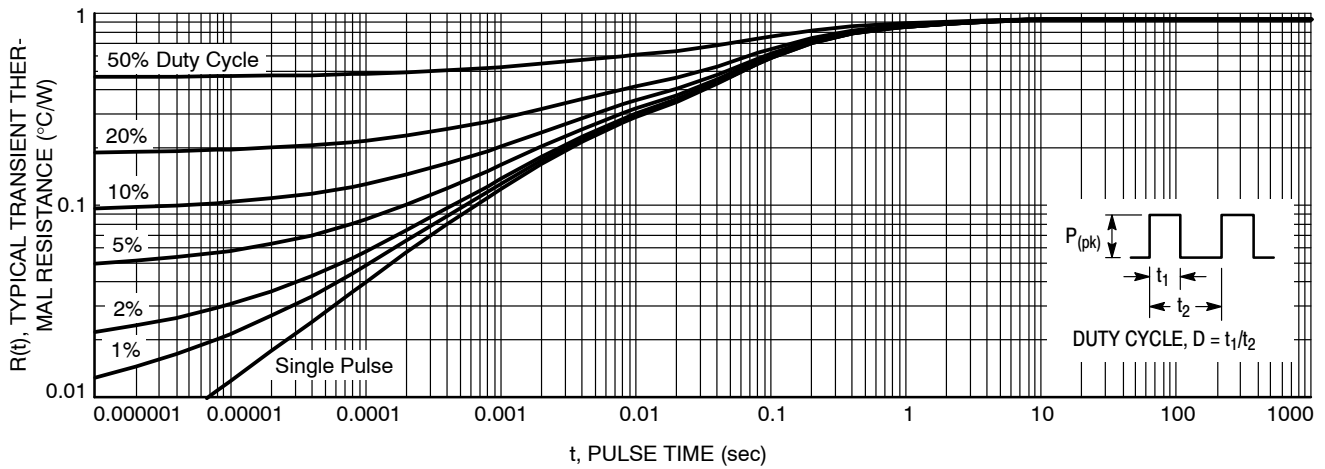


Figure 11. NTST60100CT, NTSB60100CT-1G and NTSB60100CT Typical Transient Thermal Response

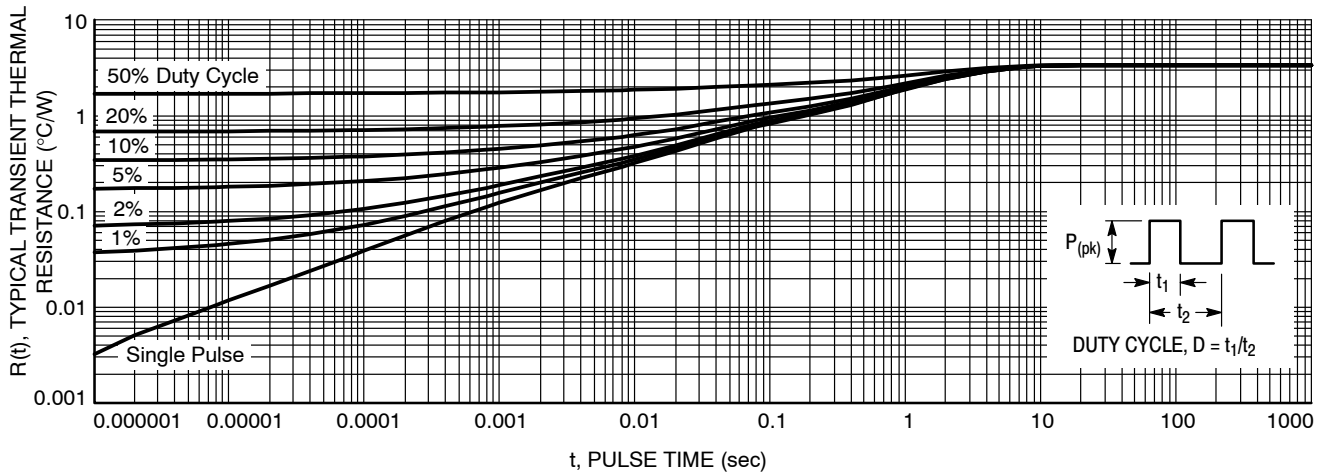


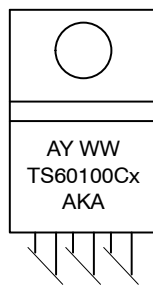
Figure 12. NTSJ60100CTG Typical Transient Thermal Response

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

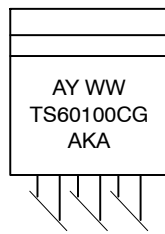
ORDERING INFORMATION

Device	Package	Shipping
NTST60100CTG	TO-220AB (Pb-Free)	50 Units / Rail
NTSB60100CT-1G	I ² PAK (Pb-Free)	50 Units / Rail
NTSB60100CTG	D ² PAK (Pb-Free)	50 Units / Rail
NTSB60100CTT4G	D ² PAK (Pb-Free)	800 / Tape & Reel
NTSJ60100CTG	TO-220FP (Halide-Free, Pb-Free)	50 Units / Rail

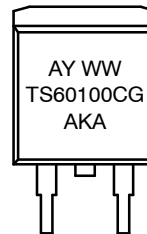
MARKING DIAGRAMS



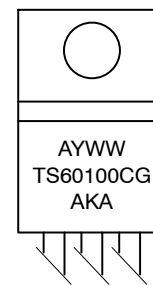
TO-220AB



I²PAK



D²PAK



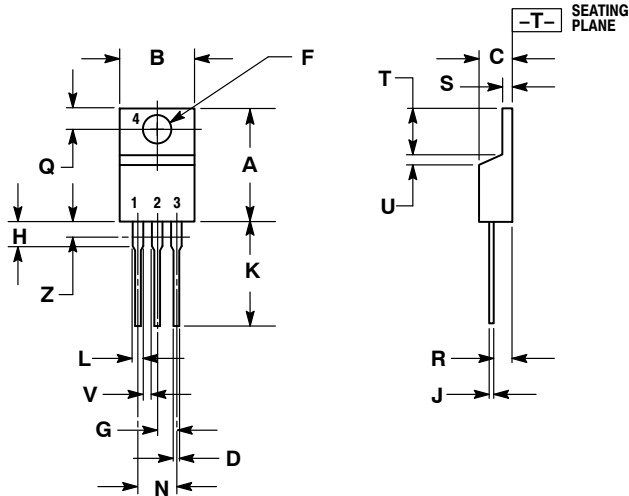
TO-220FP

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

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

PACKAGE DIMENSIONS

TO-220 CASE 221A-09 ISSUE AH



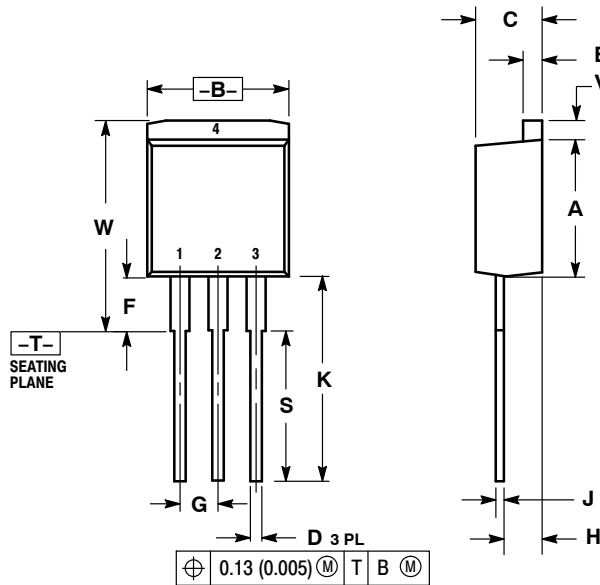
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

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:

1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

I²PAK (TO-262) CASE 418D-01 ISSUE D



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.335	0.380	8.51	9.65
B	0.380	0.406	9.65	10.31
C	0.160	0.185	4.06	4.70
D	0.026	0.035	0.66	0.89
E	0.045	0.055	1.14	1.40
F	0.122	REF	3.10	REF
G	0.100	BSC	2.54	BSC
H	0.094	0.110	2.39	2.79
J	0.013	0.025	0.33	0.64
K	0.500	0.562	12.70	14.27
S	0.390	REF	9.90	REF
V	0.045	0.070	1.14	1.78
W	0.522	0.551	13.25	14.00

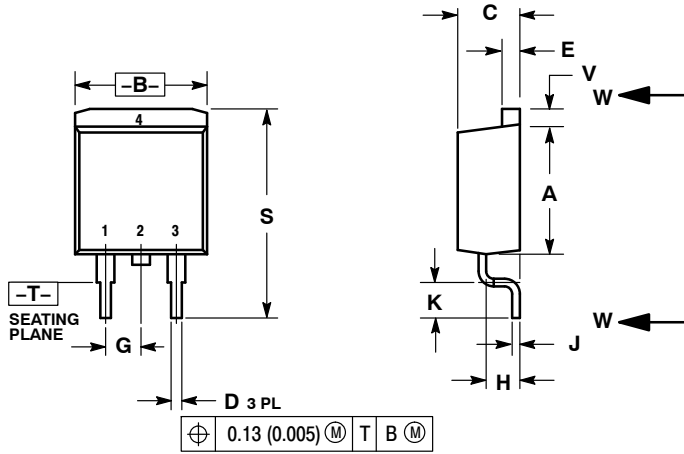
STYLE 3:

1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

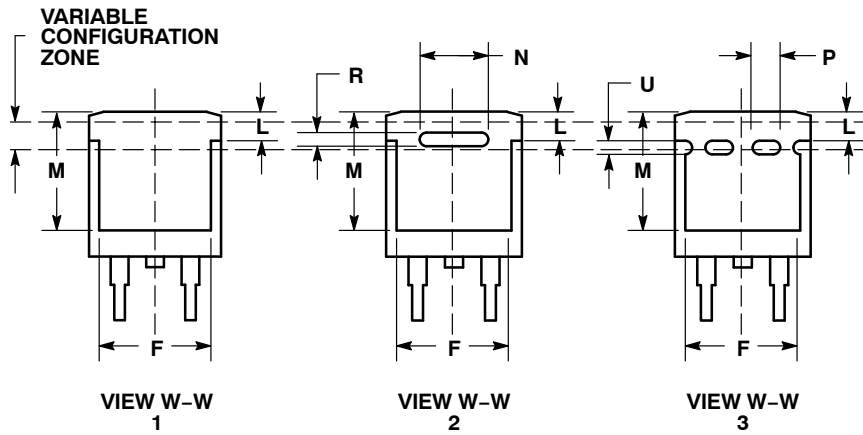
PACKAGE DIMENSIONS

D²PAK 3
CASE 418B-04
ISSUE K



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

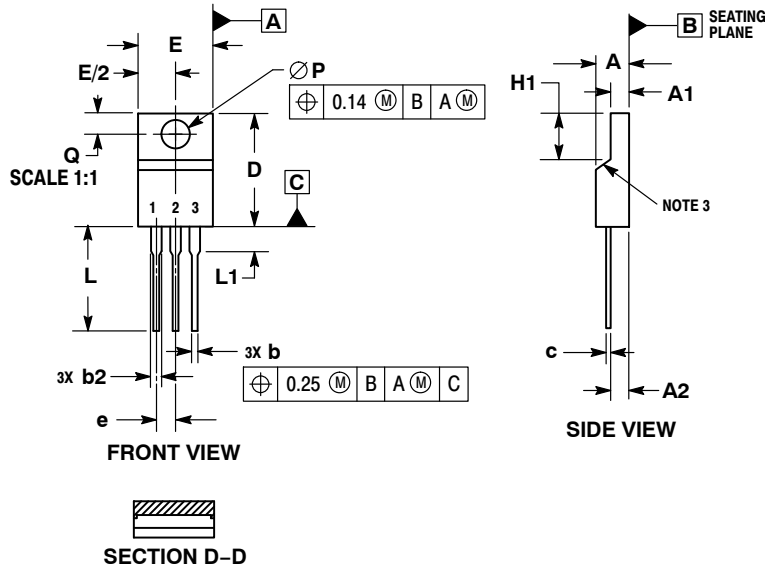
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	1.83
M	0.280	0.320	7.11	8.13
N	0.197 REF		5.00 REF	
P	0.079 REF		2.00 REF	
R	0.039 REF		0.99 REF	
S	0.575	0.625	14.60	15.88
V	0.045	0.055	1.14	1.40



NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

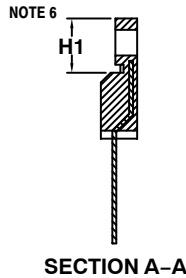
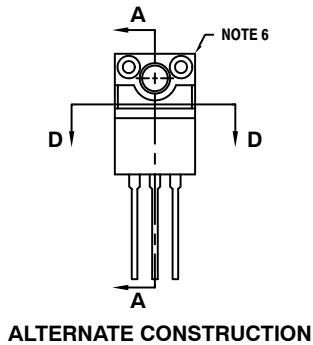
PACKAGE DIMENSIONS

TO-220 FULLPACK, 3-LEAD CASE 221AH ISSUE F



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. CONTOUR UNCONTROLLED IN THIS AREA.
 4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT OUTERMOST EXTREME OF THE PLASTIC BODY.
 5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.00.
 6. CONTOURS AND FEATURES OF THE MOLDED PACKAGE BODY MAY VARY WITHIN THE ENVELOPE DEFINED BY DIMENSIONS A1 AND H1 FOR MANUFACTURING PURPOSES.

MILLIMETERS		
DIM	MIN	MAX
A	4.30	4.70
A1	2.50	2.90
A2	2.50	2.90
b	0.54	0.84
b2	1.10	1.40
c	0.49	0.79
D	14.70	15.30
E	9.70	10.30
e	2.54 BSC	
H1	6.60	7.10
L	12.50	14.73
L1	---	2.80
P	3.00	3.40
Q	2.80	3.20



ON Semiconductor and the are registered trademarks of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries. SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC 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 SCILLC was negligent regarding the design or manufacture of the part. SCILLC 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:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative