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# NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT



ON Semiconductor®

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## 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

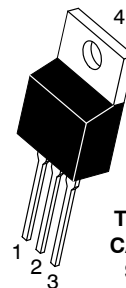
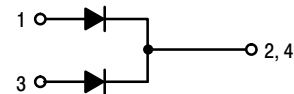
- Switching Power Supplies including Notebook / Netbook Adapters, ATX and Flat Panel Display
- High Frequency and DC-DC Converters
- Freewheeling and OR-ing diodes
- Reverse Battery Protection
- Instrumentation

### Mechanical Characteristics

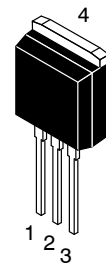
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

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

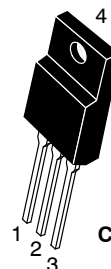
### PIN CONNECTIONS



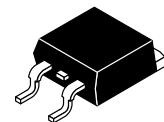
TO-220AB  
CASE 221A  
STYLE 6



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	$\mu\text{A}$ mA  $\mu\text{A}$ 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  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$



TYPICAL CHARACTERISTICS

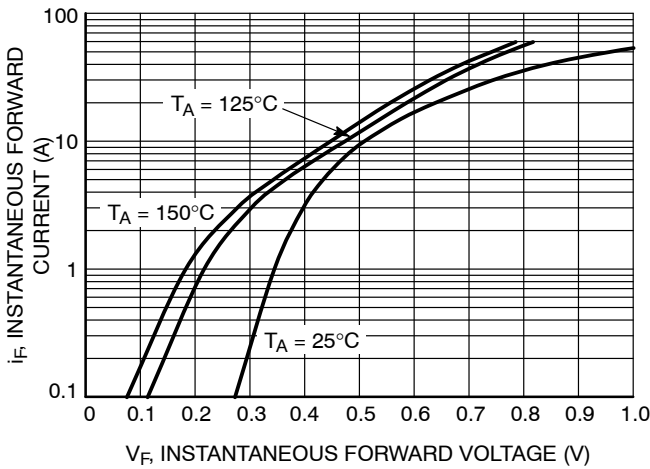


Figure 1. Typical Instantaneous Forward Characteristics

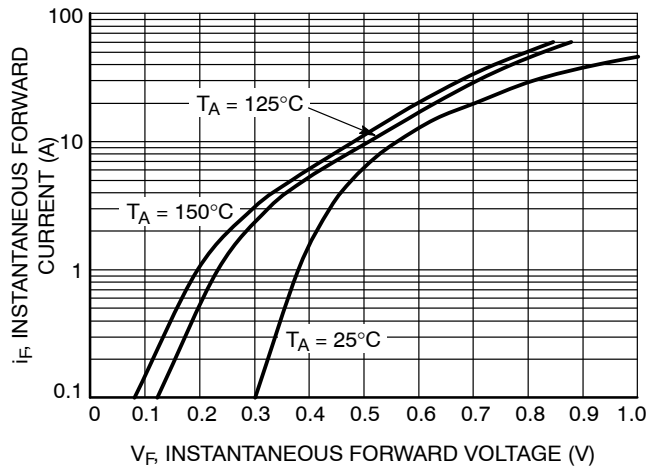


Figure 2. Maximum Instantaneous Forward Characteristics

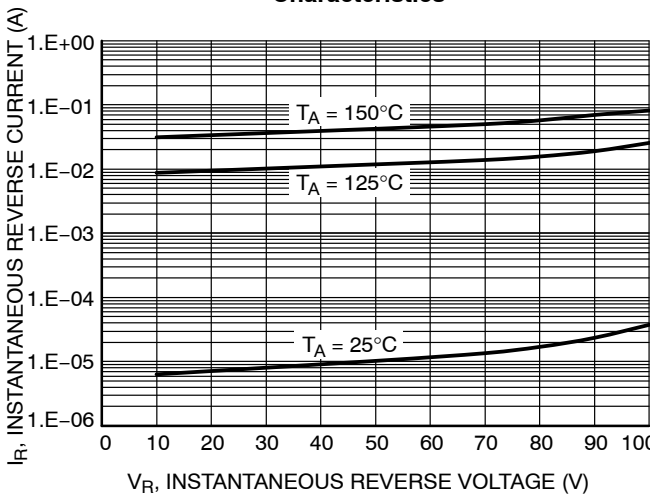


Figure 3. Typical Reverse Characteristics

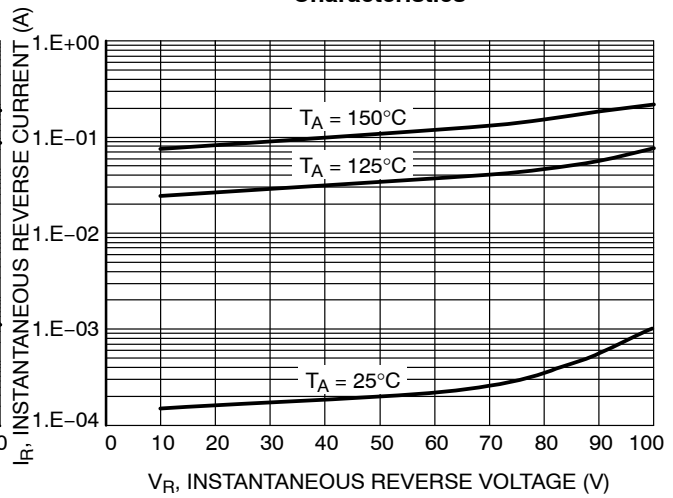


Figure 4. Maximum Reverse Characteristics

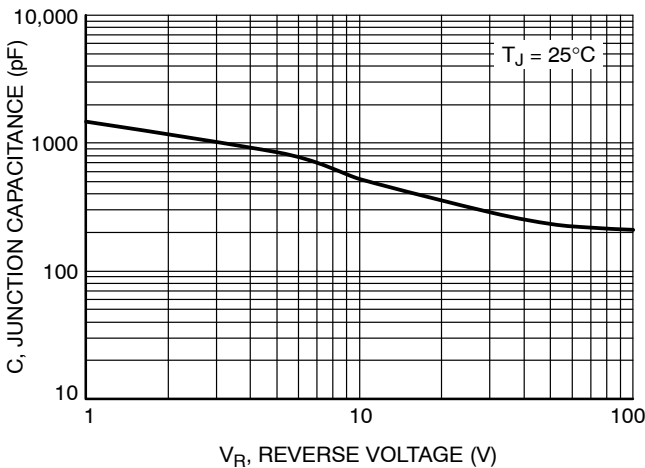


Figure 5. Typical Junction Capacitance

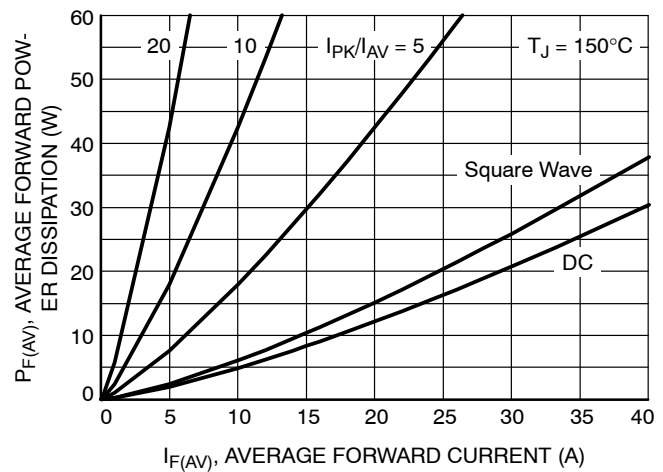


Figure 6. Forward Power Dissipation

# NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

## TYPICAL CHARACTERISTICS

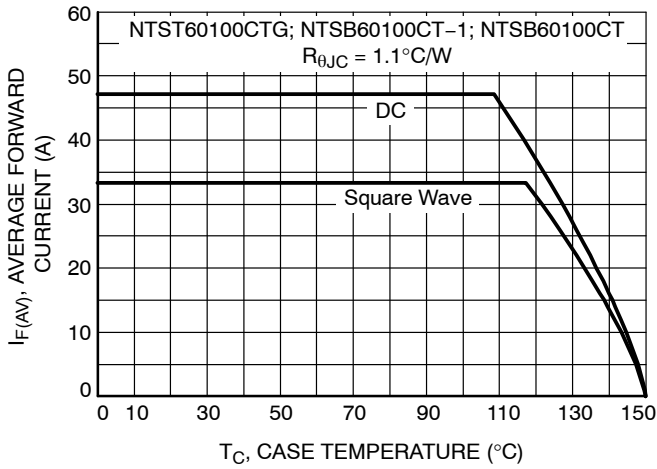


Figure 7. Current Derating per Diode

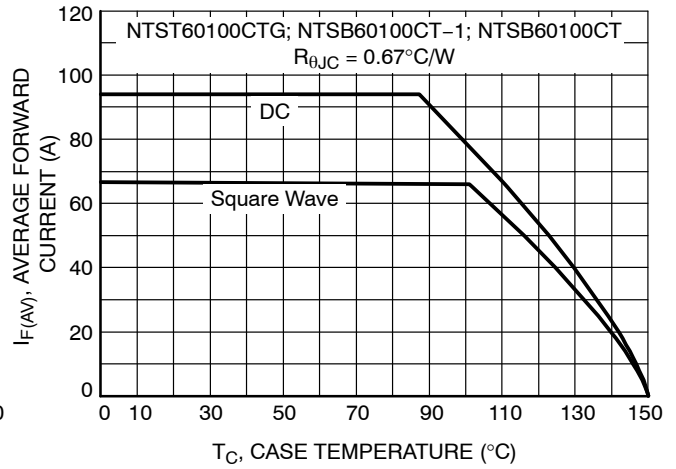


Figure 8. Current Derating per Device

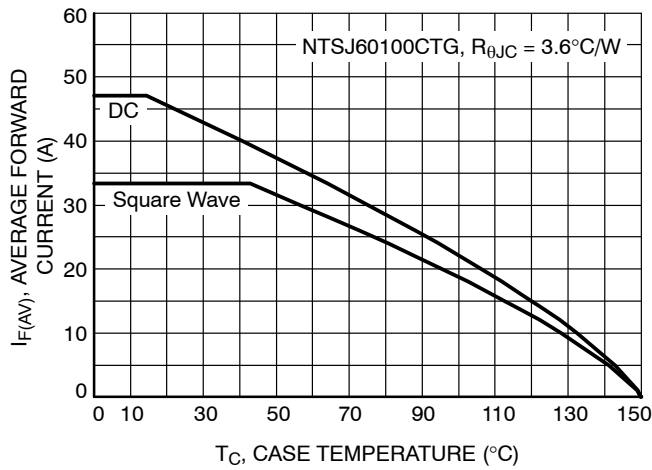


Figure 9. Current Derating per Diode

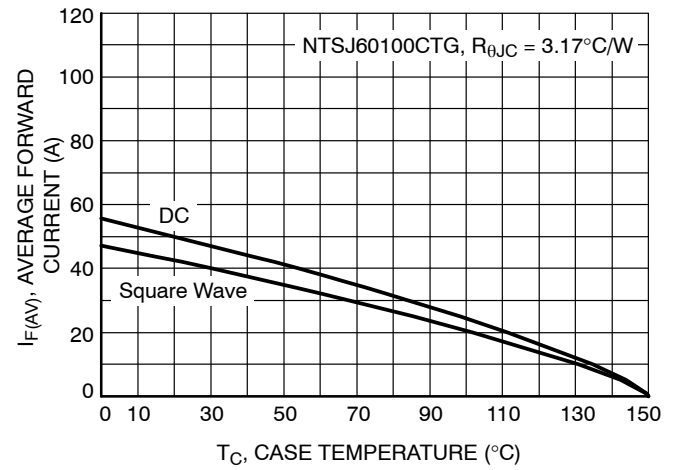


Figure 10. Current Derating per Device

NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

TYPICAL CHARACTERISTICS

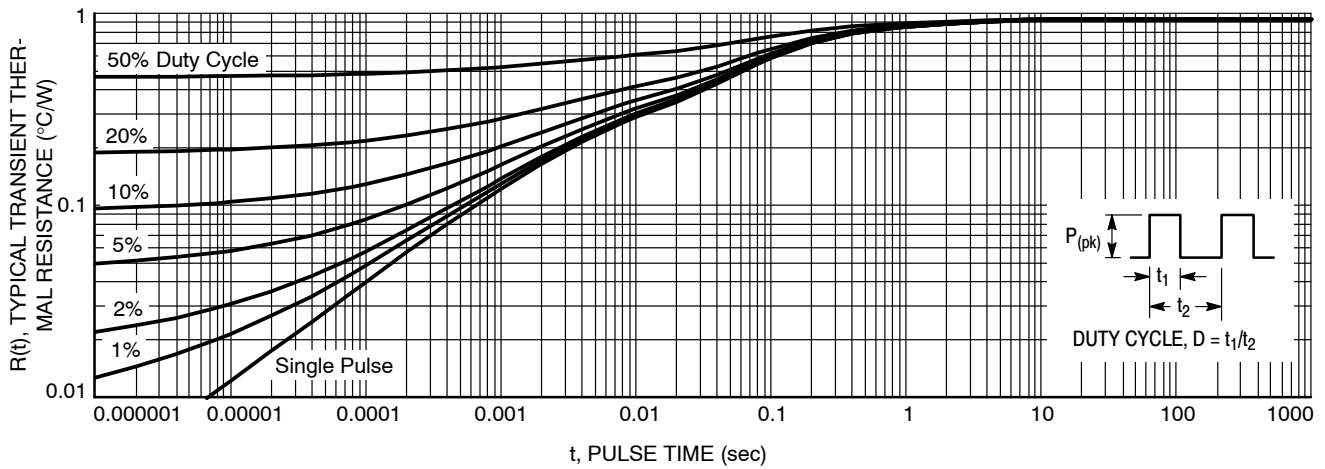


Figure 11. NTST60100CT, NTSB60100CT-1G and NTSB60100CT Typical Transient Thermal Response

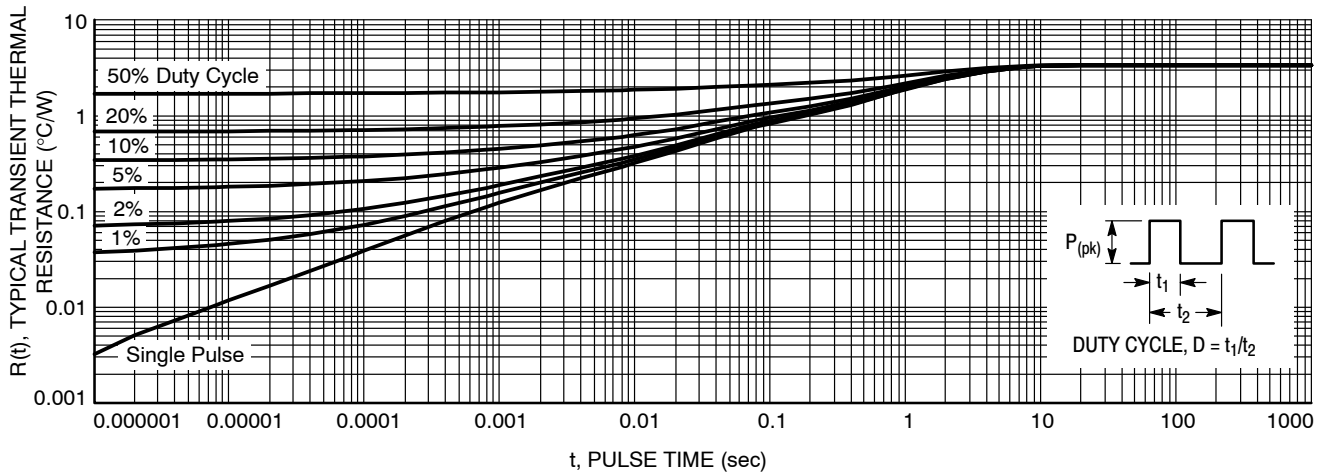


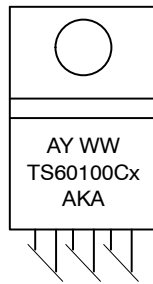
Figure 12. NTSJ60100CTG Typical Transient Thermal Response

# NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

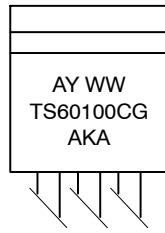
## ORDERING INFORMATION

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

## MARKING DIAGRAMS



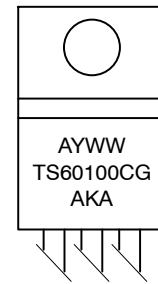
TO-220AB



I<sup>2</sup>PAK



D<sup>2</sup>PAK



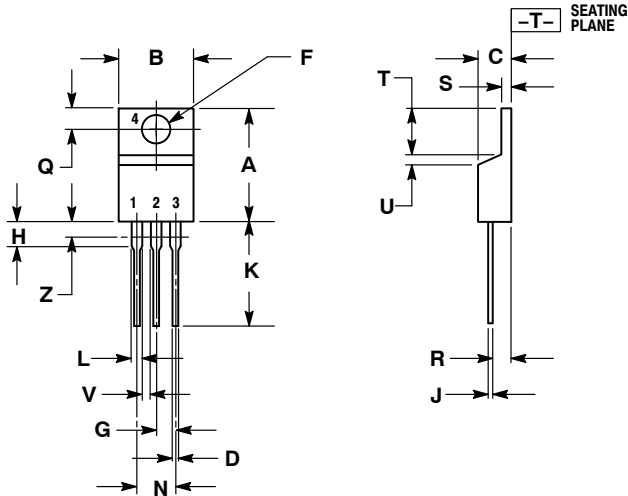
TO-220FP

- 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



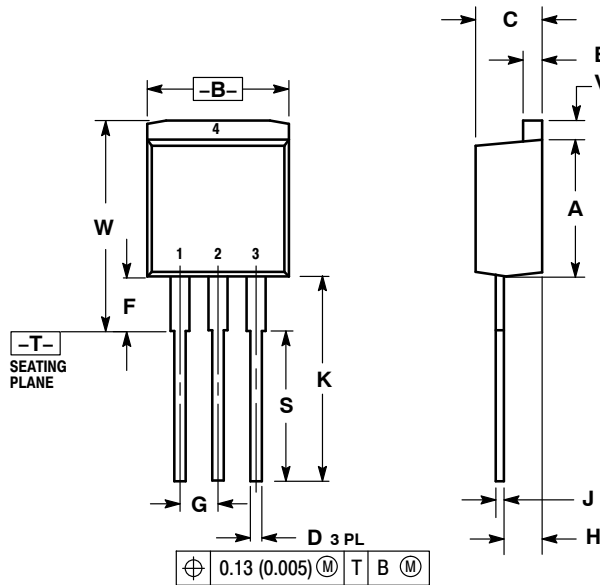
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

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

### I<sup>2</sup>PAK (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:

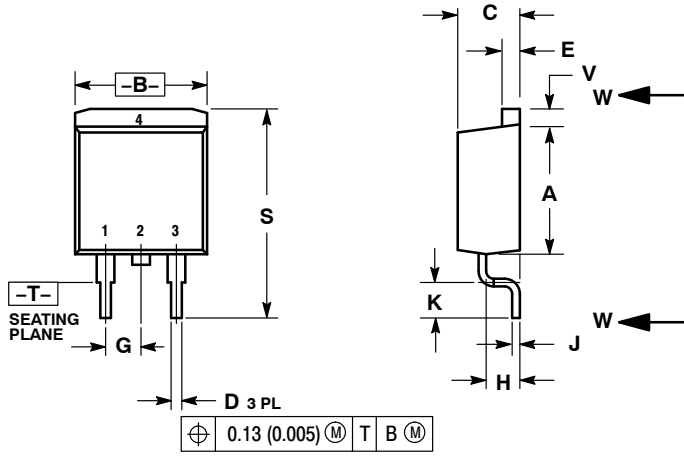
1. ANODE
2. CATHODE
3. ANODE
4. CATHODE



# NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

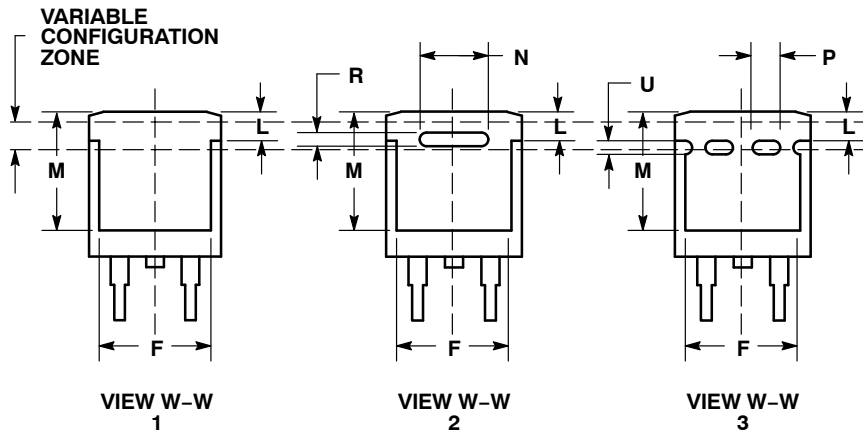
## PACKAGE DIMENSIONS

**D<sup>2</sup>PAK 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.

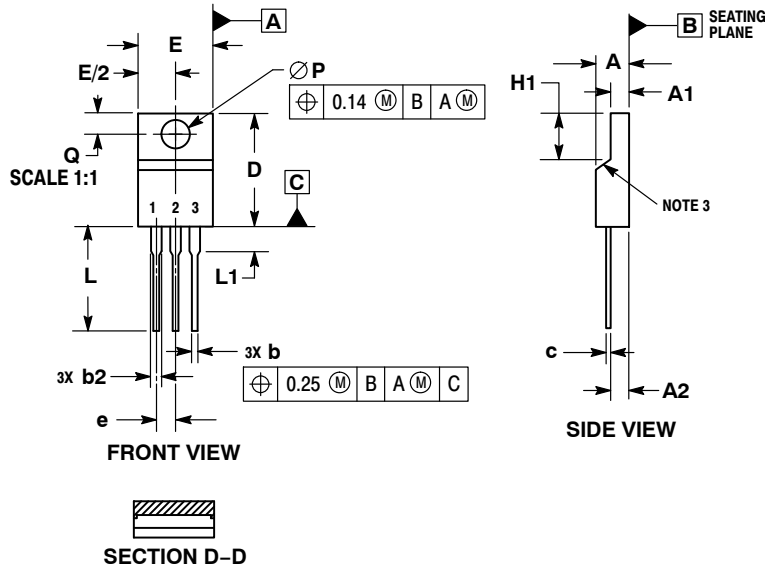
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	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

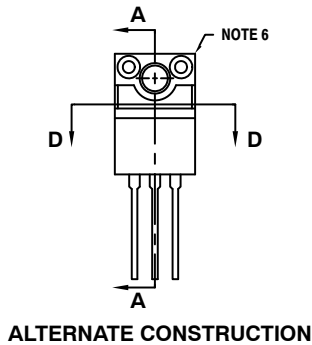
### TO-220 FULLPACK, 3-LEAD CASE 221AH ISSUE F



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.

DIM	MILLIMETERS	
	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



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