

# NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG, NTSB20120CTT4G



ON Semiconductor®

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## Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low  $V_F = 0.54\text{ V}$  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
- Pb-Free and Halide-Free Packages are Available

### Typical Applications

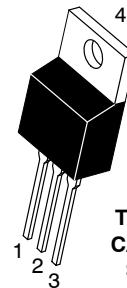
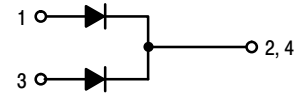
- Switching Power Supplies including Notebook / Netbook Adapters, ATX and Flat Panel Display
- High Frequency and DC-DC Converters
- Freewheeling and OR-ing diodes
- Reverse Battery Protection
- Instrumentation

### Mechanical Characteristics

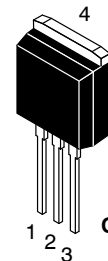
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

VERY LOW FORWARD  
VOLTAGE, LOW LEAKAGE  
SCHOTTKY BARRIER  
RECTIFIERS 20 AMPERES,  
120 VOLTS

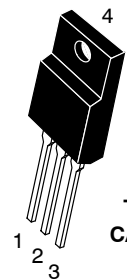
### PIN CONNECTIONS



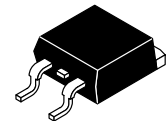
TO-220AB  
CASE 221A  
STYLE 6



I2PAK  
CASE 418D  
STYLE 3



TO-220FP  
CASE 221AH



D2PAK  
CASE 418B

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

# NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG, NTSB20120CTT4G

## MAXIMUM RATINGS

| Rating   | Symbol                          | Value       | Unit             |
|--|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                     | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 120         | V                |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_C = 130^\circ\text{C}$ )                            | $I_{F(AV)}$                     | 20<br>10    | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz, $T_C = 135^\circ\text{C}$ )         | $I_{FRM}$                       | 40<br>20    | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 120         | A                |
| Operating Junction Temperature   | $T_J$                           | -40 to +150 | $^\circ\text{C}$ |
| Storage Temperature  | $T_{stg}$                       | -40 to +150 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )  | dv/dt                           | 10,000      | V/ $\mu\text{s}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## THERMAL CHARACTERISTICS

| Rating  | Symbol                             | NTST20120CTG<br>NTSB20120CT-1G | NTSB20120CTG | NTSJ20120CTG | Unit                                     |
|---|------------------------------------|--------------------------------|--------------|--------------|--|
| Maximum Thermal Resistance per Diode<br>Junction-to-Case<br>Junction-to-Ambient | $R_{\theta JC}$<br>$R_{\theta JA}$ | 2.5<br>70                      | 1.43<br>46.8 | 4.42<br>105  | $^\circ\text{C/W}$<br>$^\circ\text{C/W}$ |

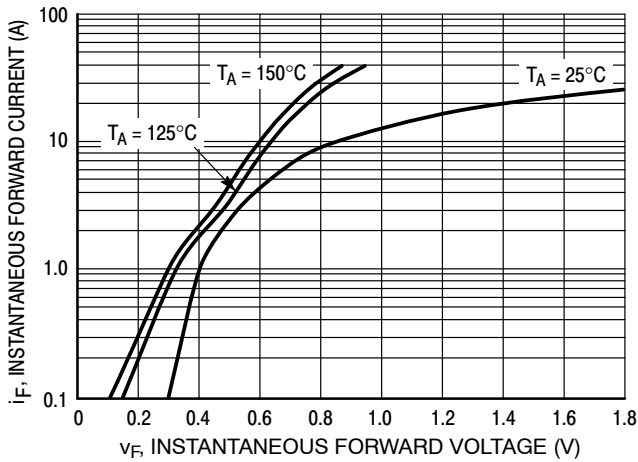
## ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

| Rating   | Symbol | Typ                              | Max                        | Unit   |
|--|--------|----------------------------------|----------------------------|--|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 5\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 10\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br><br>( $I_F = 5\text{ A}$ , $T_J = 125^\circ\text{C}$ )<br>( $I_F = 10\text{ A}$ , $T_J = 125^\circ\text{C}$ ) | $V_F$  | 0.62<br>0.90<br><br>0.54<br>0.64 | -<br>1.10<br><br>-<br>0.72 | V  |
| Maximum Instantaneous Reverse Current (Note 1)<br>( $V_R = 90\text{ V}$ , $T_J = 25^\circ\text{C}$ )<br>( $V_R = 90\text{ V}$ , $T_J = 125^\circ\text{C}$ )<br><br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )         | $I_R$  | 12<br>6<br><br>-<br>17           | -<br>-<br><br>700<br>100   | $\mu\text{A}$<br>mA<br><br>$\mu\text{A}$<br>mA |

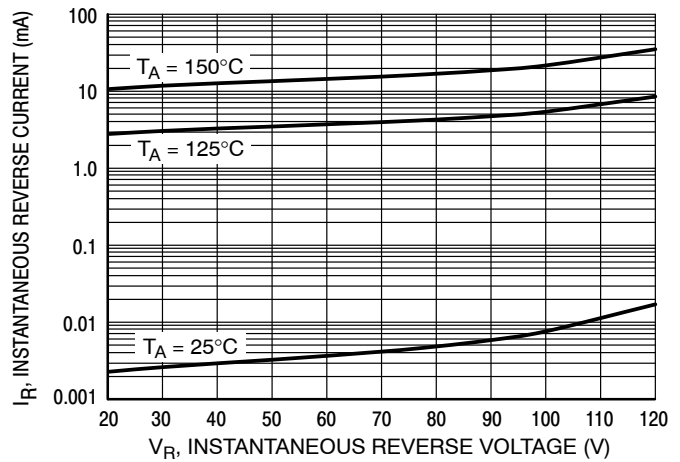
1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

**NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG,  
NTSB20120CTT4G**

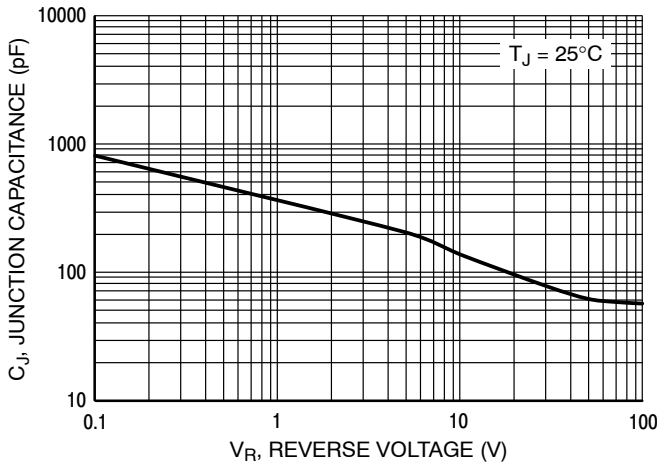
**TYPICAL CHARACTERISTICS**



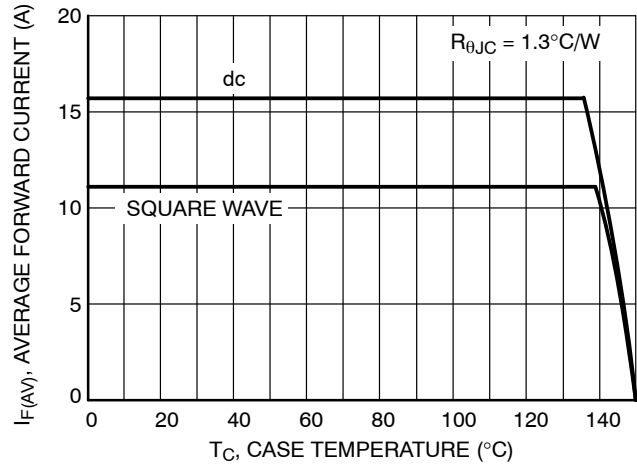
**Figure 1. Typical Instantaneous Forward Characteristics**



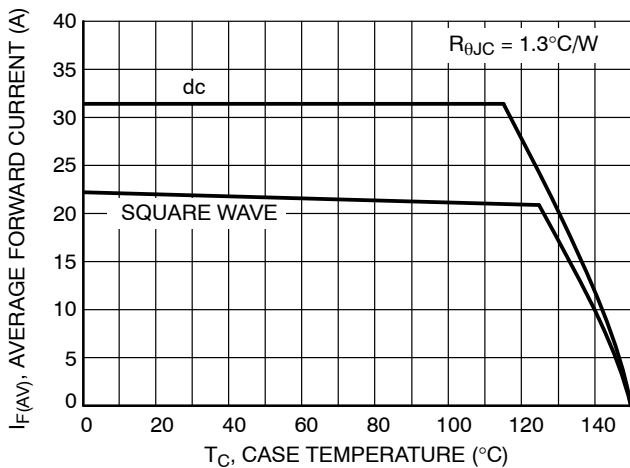
**Figure 2. Typical Reverse Current Characteristics**



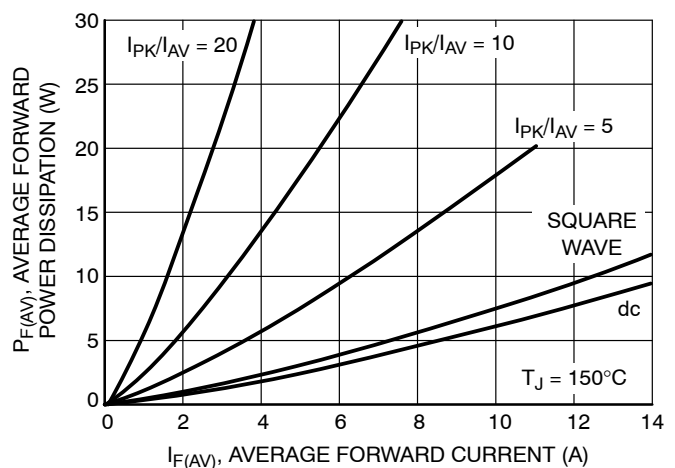
**Figure 3. Typical Junction Capacitance**



**Figure 4. Current Derating per Leg**



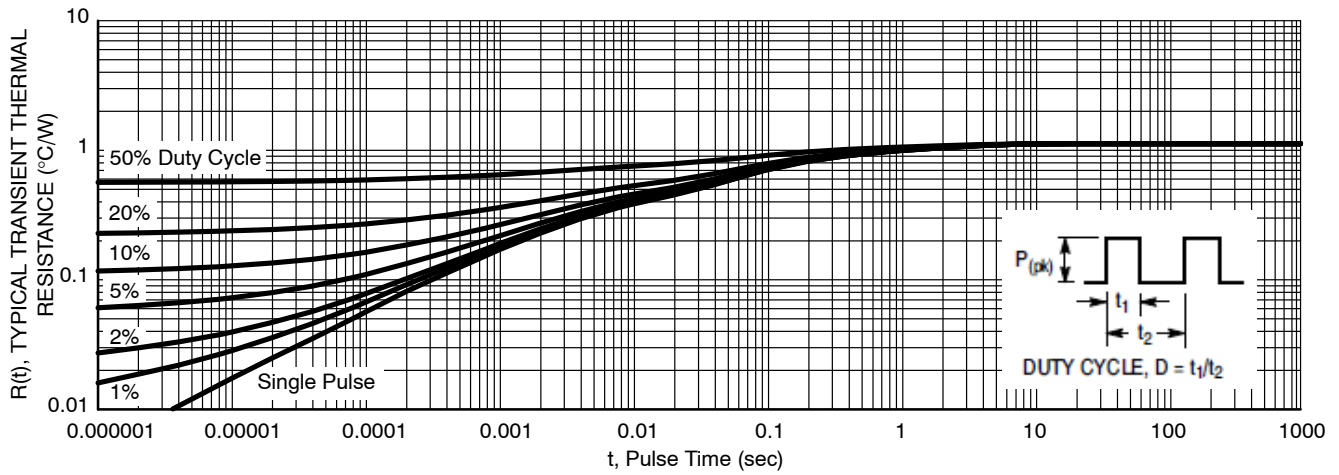
**Figure 5. Current Derating**



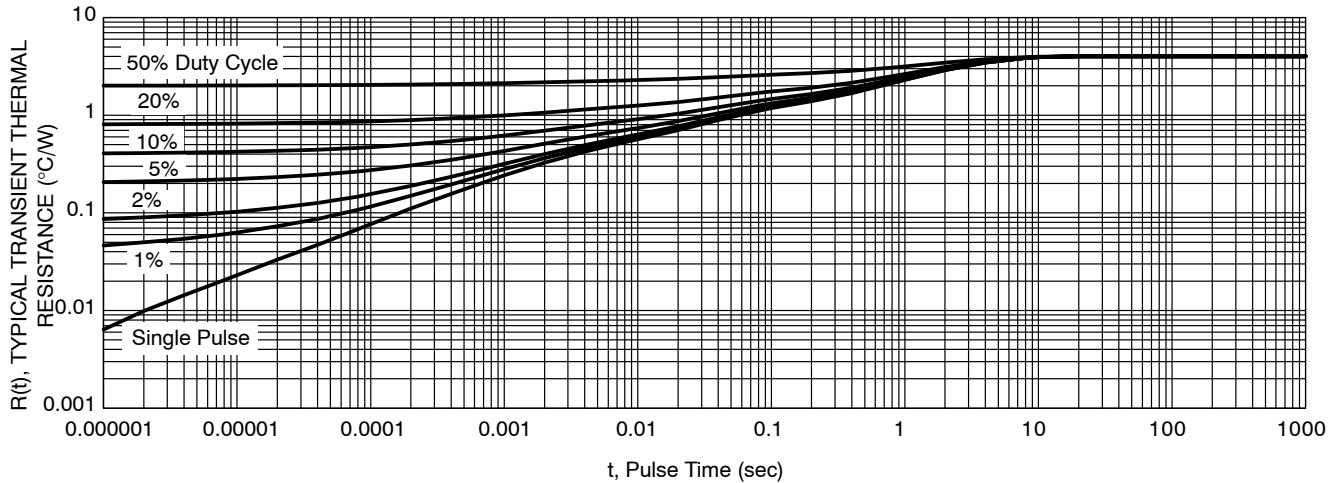
**Figure 6. Forward Power Dissipation**

**NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG,  
NTSB20120CTT4G**

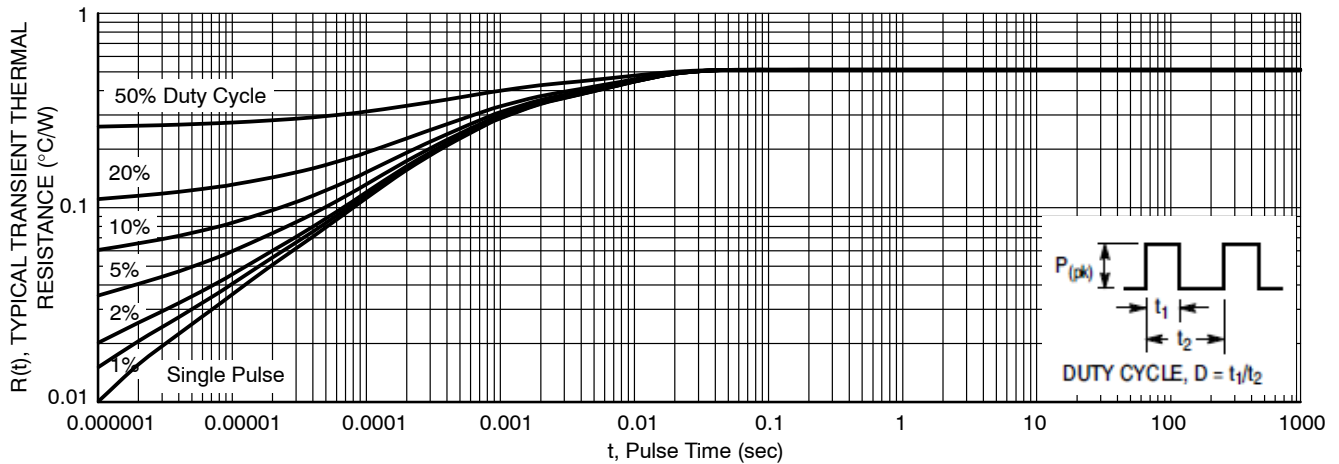
**TYPICAL CHARACTERISTICS**



**Figure 7. Typical Transient Thermal Response for NTST20120CT and NTSB20120CT-1G**



**Figure 8. Typical Transient Thermal Response for NTSJ20120CTG**



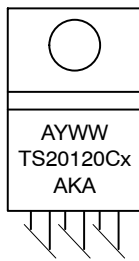
**Figure 9. Typical Transient Thermal Response for NTSB20120CTG**

**NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG,  
NTSB20120CTT4G**

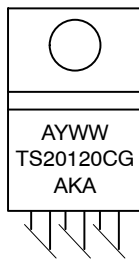
**ORDERING INFORMATION**

| Device         | Package                         | Shipping          |
|----------------|---------------------------------|-------------------|
| NTST20120CTG   | TO-220AB<br>(Pb-Free)           | 50 Units / Rail   |
| NTSJ20120CTG   | TO-220FP<br>(Halide-Free)       | 50 Units / Rail   |
| NTSB20120CT-1G | I <sup>2</sup> PAK<br>(Pb-Free) | 50 Units / Rail   |
| NTSB20120CTG   | D <sup>2</sup> PAK<br>(Pb-Free) | 50 Units / Rail   |
| NTSB20120CTT4G | D <sup>2</sup> PAK<br>(Pb-Free) | 800 / Tape & Reel |

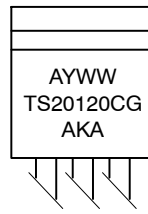
**MARKING DIAGRAMS**



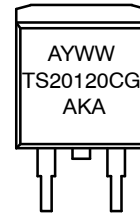
TO-220AB



TO-220FP



I<sup>2</sup>PAK



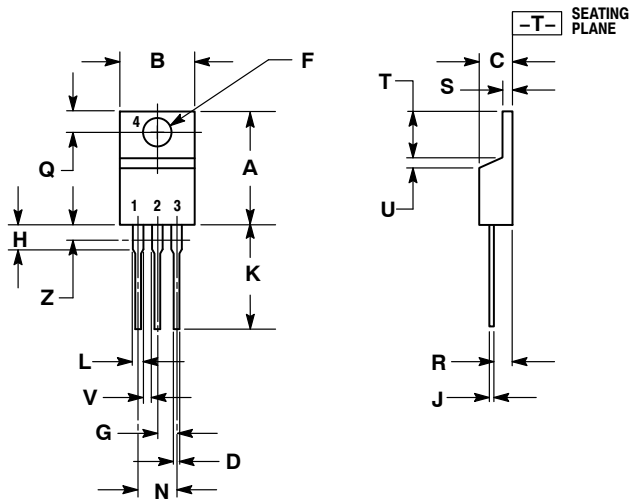
D<sup>2</sup>PAK

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

# NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG, NTSB20120CTT4G

## PACKAGE DIMENSIONS

### TO-220 CASE 221A-09 ISSUE AF



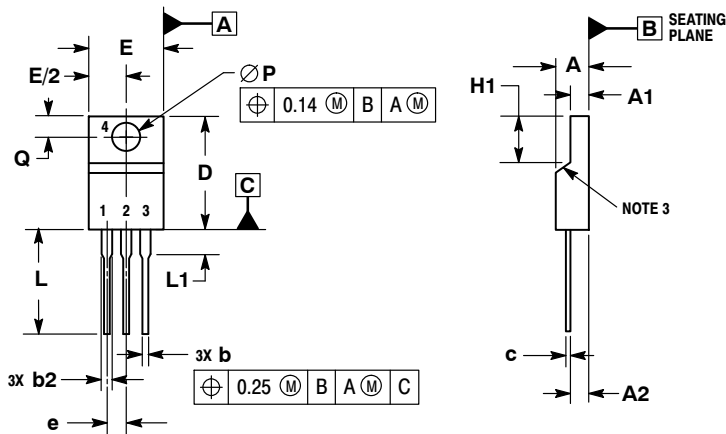
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.570  | 0.620 | 14.48       | 15.75 |
| B   | 0.380  | 0.405 | 9.66        | 10.28 |
| C   | 0.160  | 0.190 | 4.07        | 4.82  |
| D   | 0.025  | 0.035 | 0.64        | 0.88  |
| F   | 0.142  | 0.161 | 3.61        | 4.09  |
| G   | 0.095  | 0.105 | 2.42        | 2.66  |
| H   | 0.110  | 0.155 | 2.80        | 3.93  |
| J   | 0.014  | 0.025 | 0.36        | 0.64  |
| 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

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



NOTES:

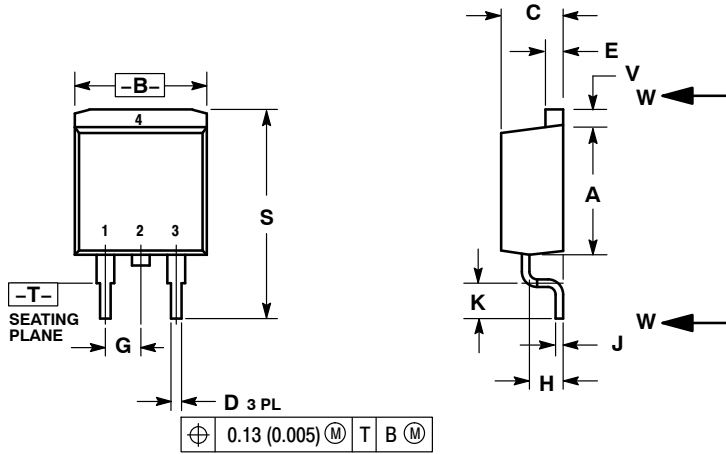
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.00.

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | 4.30        | 4.70  |
| A1  | 2.50        | 2.90  |
| A2  | 2.50        | 2.70  |
| 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  | 6.70        | 7.10  |
| L   | 12.70       | 14.73 |
| L1  | ---         | 2.80  |
| P   | 3.00        | 3.40  |
| Q   | 2.80        | 3.20  |

**NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG,  
NTSB20120CTT4G**

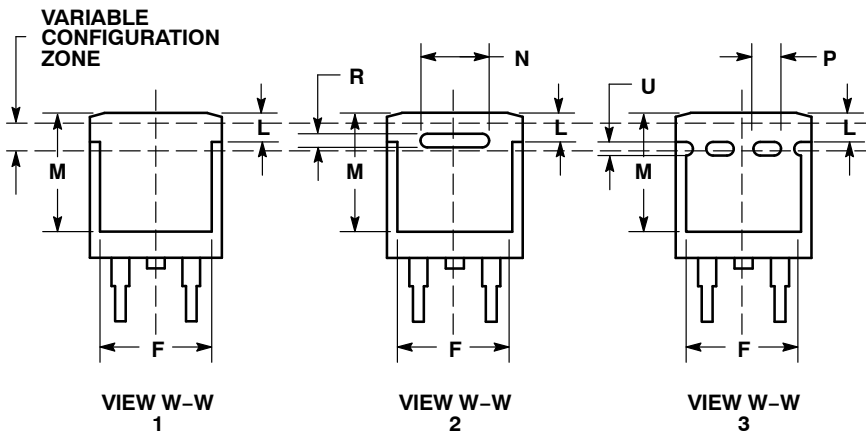
**PACKAGE DIMENSIONS**

**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.

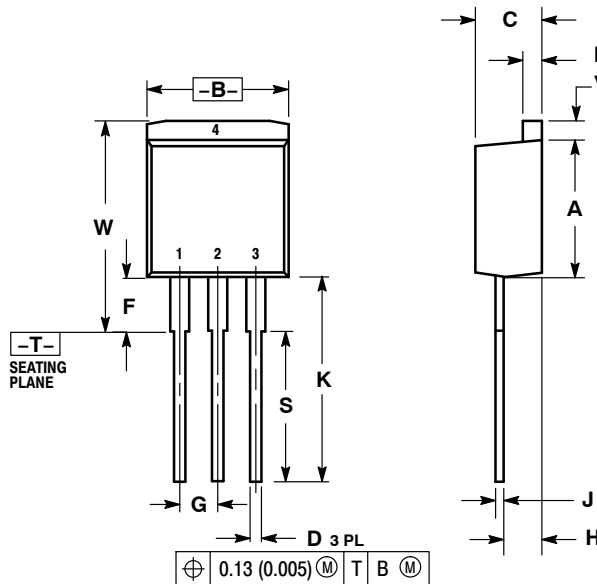
| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.340     | 0.380 | 8.64        | 9.65  |
| B   | 0.380     | 0.405 | 9.65        | 10.29 |
| C   | 0.160     | 0.190 | 4.06        | 4.83  |
| 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  |



# NTST20120CT, NTSJ20120CTG, NTSB20120CT-1G, NTSB20120CTG, NTSB20120CTT4G

## PACKAGE DIMENSIONS


I<sup>2</sup>PAK (TO-262)  
CASE 418D  
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:  
PIN 1: ANODE  
2: CATHODE  
3: ANODE  
4: CATHODE

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- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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## JONHON

«JONHON» (основан в 1970 г.)

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(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А