NTST20100CT, NTSB20100CT-1G, NTSJ20100CTG, NTSB20100CTG

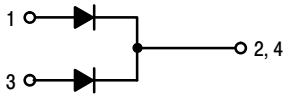
Very Low Forward Voltage Trench-based Schottky Rectifier

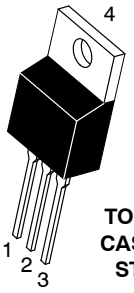
Exceptionally Low V_F = 0.50 V at I_F = 5 A

ON Semiconductor®

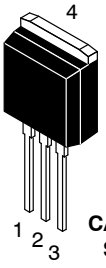
http://onsemi.com

PIN CONNECTIONS

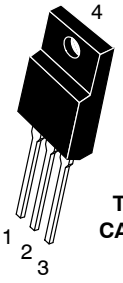




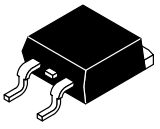
TO−220AB
CASE 221A
STYLE 6



I2PAK
CASE 418D
STYLE 3



TO−220FP
CASE 221AH



D2PAK
CASE 418B

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

ORDERING INFORMATION

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

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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 = 130°C)	Per device Per diode	$I_{F(AV)}$	 20 10	A
Peak Repetitive Forward Current (Rated V_R, Square Wave, 20 kHz, T_C = 125°C)	Per device Per diode	I_{FRM}	 40 20	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)		I_{FSM}	150	A
Operating Junction Temperature		T_J	−40 to +150	°C
Storage Temperature		T_{stg}	−40 to +150	°C
Voltage Rate of Change (Rated V_R)		dv/dt	10,000	V/μs

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	NTST20100CTG, NTSB20100CT−1G	NTSB20100CTG	NTSJ20100CTG	Unit
Maximum Thermal Resistance per Diode Junction−to−Case Junction−to−Ambient	 $R_{\theta JC}$ $R_{\theta JA}$	 2.5 70	 1.5 46.9	 4.49 105	 °C/W °C/W

ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 1) (I_F = 5 A, T_J = 25°C) (I_F = 10 A, T_J = 25°C) (I_F = 5 A, T_J = 125°C) (I_F = 10 A, T_J = 125°C)	v_F	 0.55 0.65 0.50 0.58	 − 0.83 − 0.68	V
Maximum Instantaneous Reverse Current (Note 1) (V_R = 70 V, T_J = 25°C) (V_R = 70 V, T_J = 125°C) (Rated dc Voltage, T_J = 25°C) (Rated dc Voltage, T_J = 125°C)	I_R	 17 5.3 − 12	 − − 800 25	 μA mA μA mA

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%

TYPICAL CHARACTERISITICS

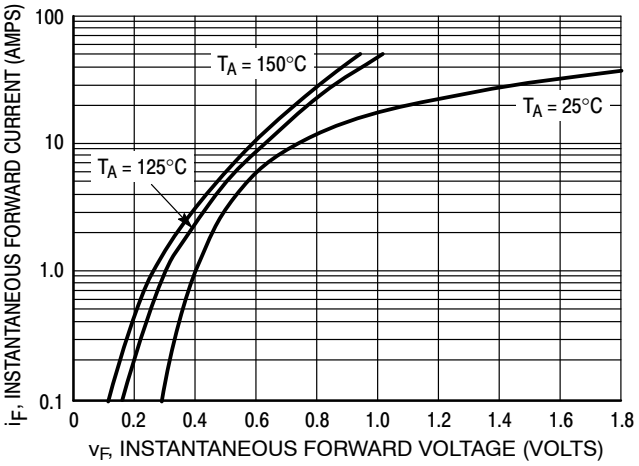


Figure 1. Typical Forward Voltage

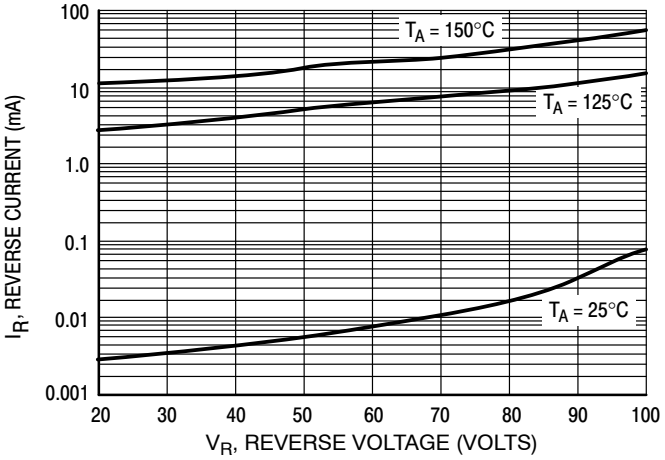


Figure 2. Typical Reverse Current

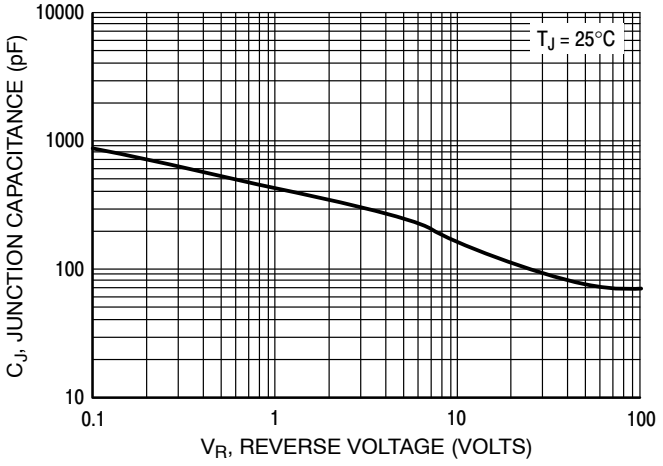


Figure 3. Typical Junction Capacitance

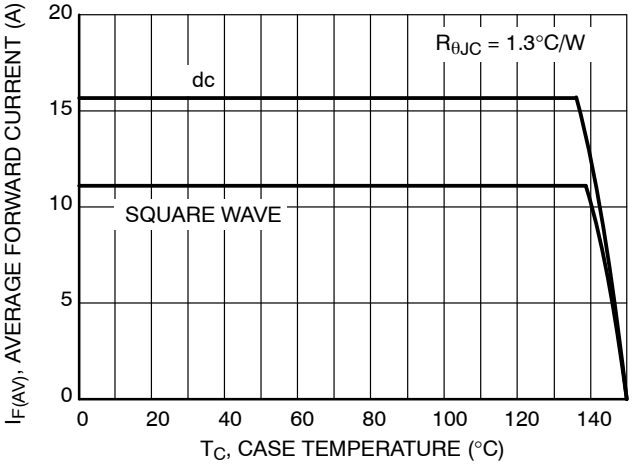


Figure 4. Current Derating per Leg

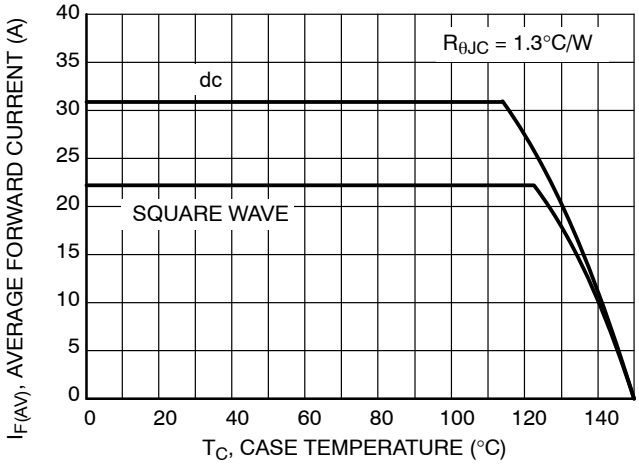


Figure 5. Current Derating

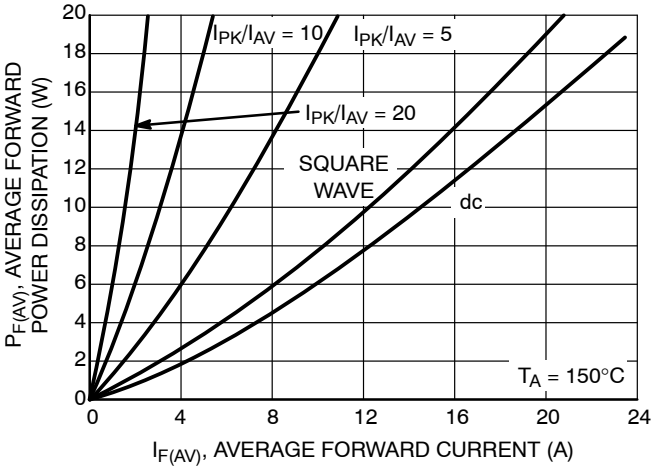


Figure 6. Forward Power Dissipation

TYPICAL CHARACTERISITICS

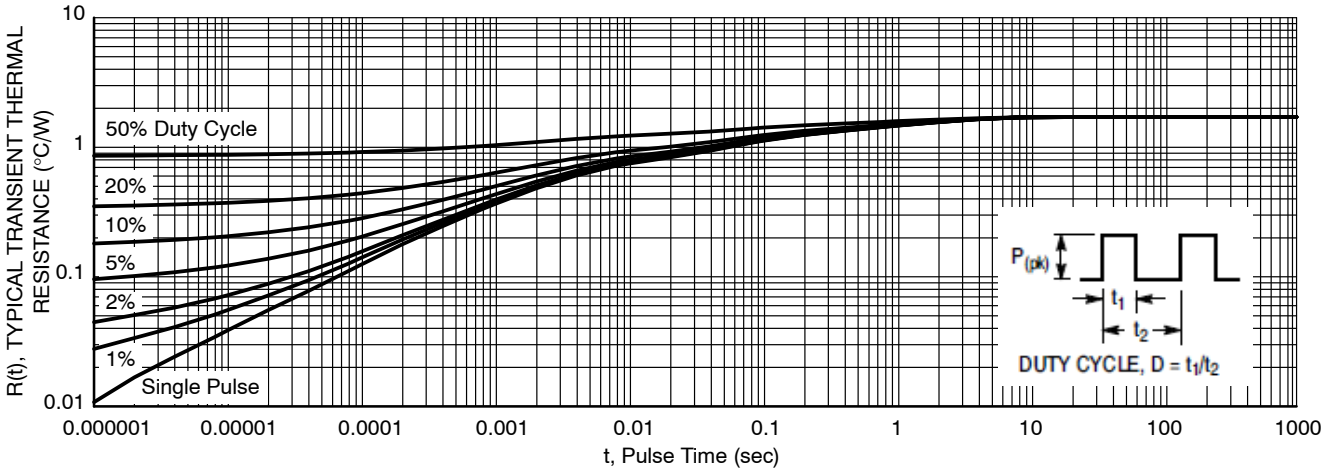


Figure 7. Typical Transient Thermal Response, Junction−to−Case for NTST20100CT and NTSB20100CT−1G

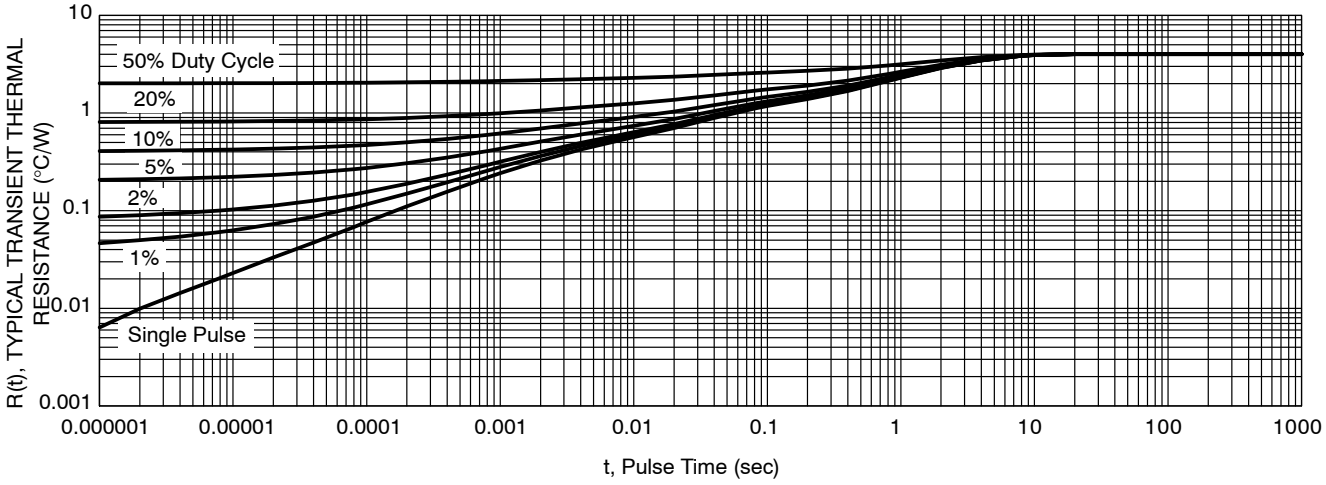


Figure 8. Typical Transient Thermal Response, Junction−to−Case for NTSJ20100CTG

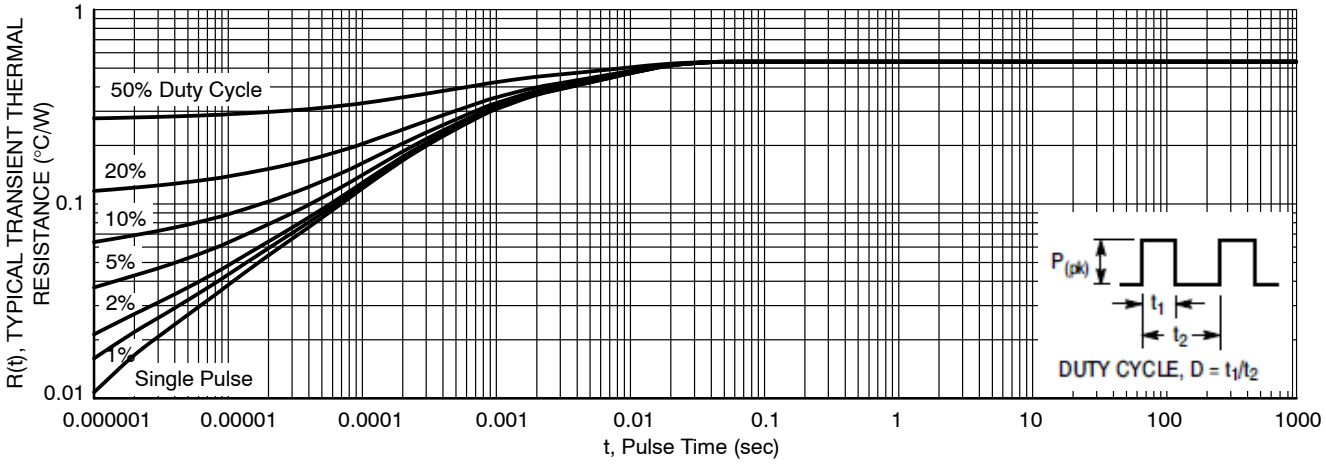
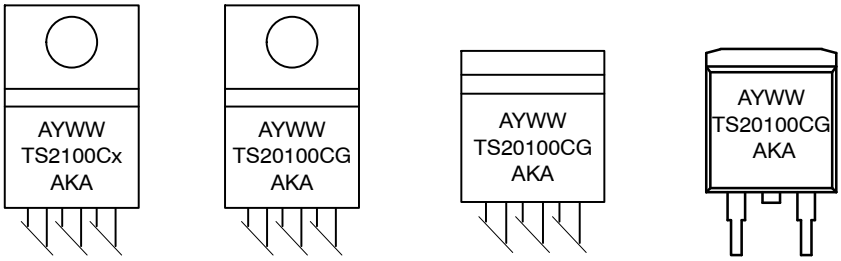


Figure 9. Typical Transient Thermal Response for NTSB20100CTG

ORDERING INFORMATION

Device	Package	Shipping
NTST20100CTG	TO−220AB (Pb−Free)	50 Units / Rail
NTSB20100CT−1G	I^2PAK (Pb−Free)	50 Units / Rail
NTSJ20100CTG	TO−220FP (Halide−Free)	50 Units / Rail
NTSB20100CTG	D^2PAK (Pb−Free)	50 Units / Rail
NTSB20100CTT4G	D^2PAK (Pb−Free)	800 / Tape & Reel

MARKING DIAGRAMS

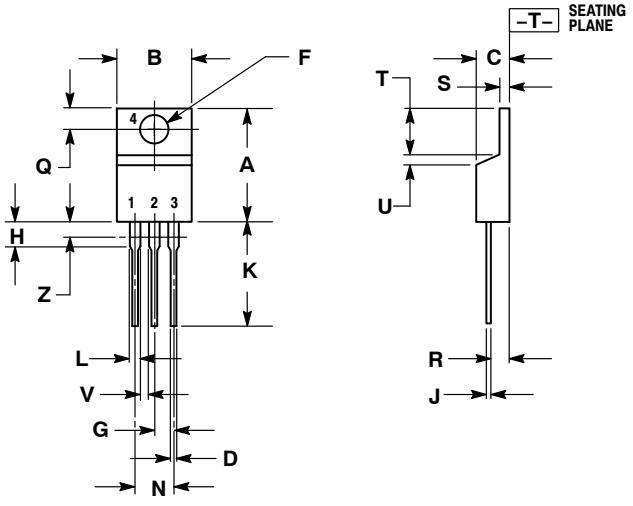


TO−220AB TO−220FP I^2PAK D^2PAK

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

PACKAGE DIMENSIONS

TO−220
CASE 221A−09
ISSUE AF

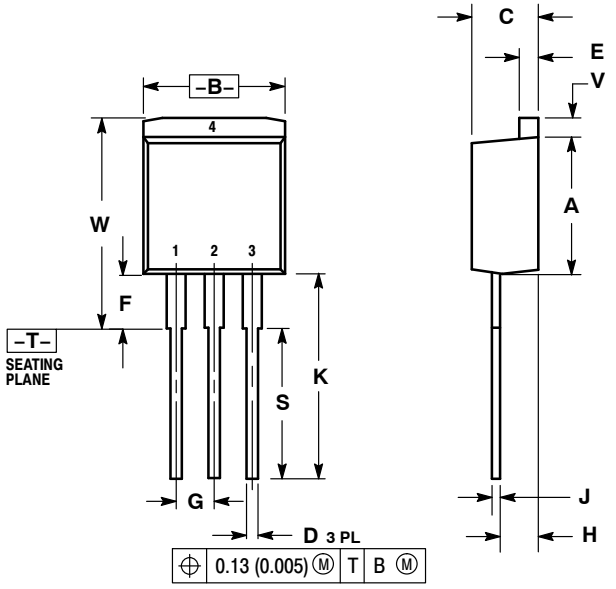


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	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:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

I²PAK (TO−262)
CASE 418D
ISSUE D

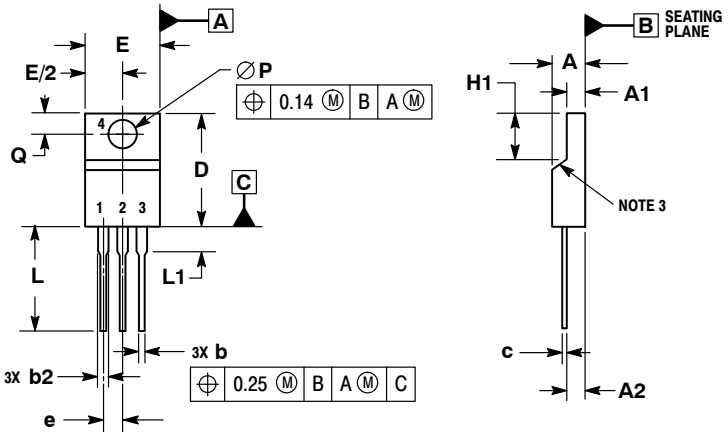


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	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

PACKAGE DIMENSIONS

TO−220 FULLPACK, 3−LEAD
CASE 221AH
ISSUE B

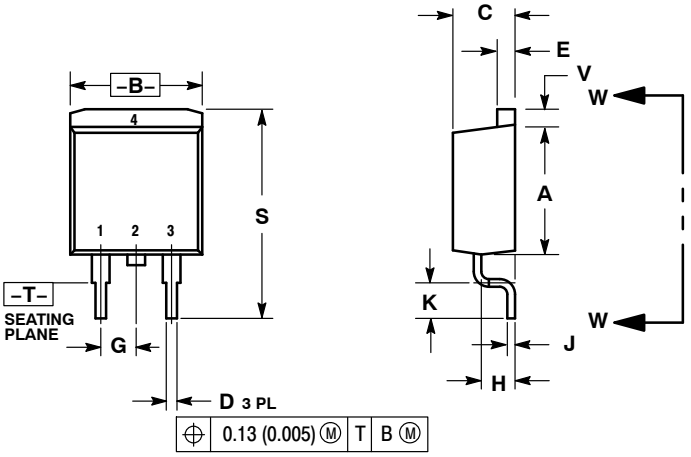


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED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

	MILLIMETERS	
DIM	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

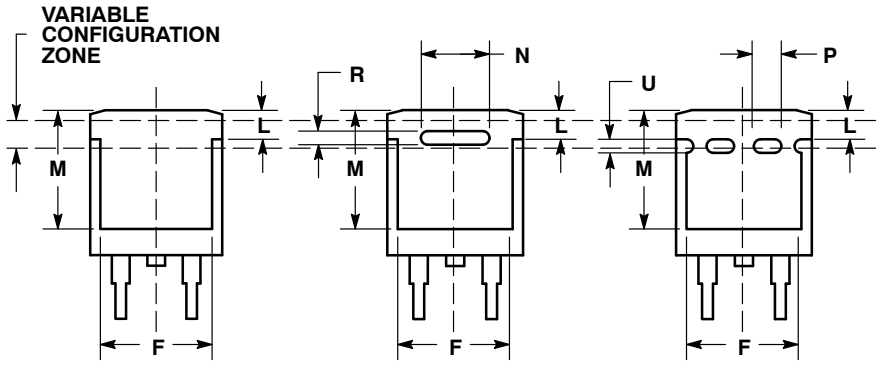
PACKAGE DIMENSIONS

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.

	INCHES		MILLIMETERS	
DIM	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



VIEW W−W 1 | VIEW W−W 2 | VIEW W−W 3

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