NTSB40200CTG, NTSJ40200CTG

Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low V_F = 0.53 V at I_F = 5 A

ON Semiconductor®

http://onsemi.com

VERY LOW FORWARD VOLTAGE, LOW LEAKAGE SCHOTTKY BARRIER RECTIFIERS 40 AMPERES, 200 VOLTS

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 Devices are Pb−Free and Halogen Free/BFR Free

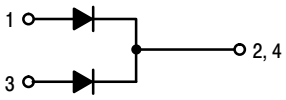
Typical Applications

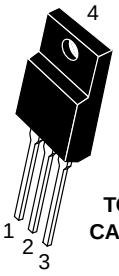
- Switching Power Supplies including Telecom AC to DC Power Stages, LED Lighting and ATX
- High Voltage DC−DC Converters
- Freewheeling and OR−ing Diodes
- Output Rectifier in Welding Power Supplies
- Industrial Automation

Mechanical Characteristics

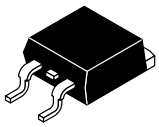
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94−0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

PIN CONNECTIONS





TO−220FP
CASE 221AH



D2PAK
CASE 418B

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

This document contains information on some products that are still under development. ON Semiconductor reserves the right to change or discontinue these products without notice.

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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	200	V
Average Rectified Forward Current (Rated V_R, T_C = 125°C) NTSB40200CTG Per device (Rated V_R, T_C = 130°C) NTSB40200CTG Per diode (Rated V_R, T_C = 65°C) NTSJ40200CTG Per device (Rated V_R, T_C = 42°C) NTSJ40200CTG Per diode	$I_{F(AV)}$	 40 20 20 20	A
Peak Repetitive Forward Current (Rated V_R, Square Wave, 20 kHz, T_C = 115°C) NTSB40200CTG Per device (Rated V_R, Square Wave, 20 kHz, T_C = 125°C) NTSB40200CTG Per diode (Rated V_R, Square Wave, 20 kHz, T_C = 40°C) NTSJ40200CTG Per device (Rated V_R, Square Wave, 20 kHz, T_C = 25°C) NTSJ40200CTG Per diode	I_{FRM}	 80 40 40 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	°C
Storage Temperature	T_{stg}	−55 to +150	°C
ESD Rating (Human Body Model)		3A	
ESD Rating (Machine Model)		M4	

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	NTSB40200CTG	NTSJ40200CTG	Unit
Typical Thermal Resistance Junction−to−Case Per Diode Junction−to−Case Per Device Junction−to−Ambient Per Device	 $R_{\theta JC}$ $R_{\theta JA}$	 1.29 0.79 40	 6.94 6.05 105	°C/W

ELECTRICAL CHARACTERISTICS

Rating	Symbol	Typ	Max	Unit
Instantaneous Forward Voltage (Note 1) (I_F = 5 A, T_J = 25°C) (I_F = 10 A, T_J = 25°C) (I_F = 15 A, T_J = 25°C) (I_F = 20 A, T_J = 25°C) (I_F = 5 A, T_J = 125°C) (I_F = 10 A, T_J = 125°C) (I_F = 15 A, T_J = 125°C) (I_F = 20 A, T_J = 125°C)	V_F	 0.68 0.74 0.79 0.84 0.53 0.60 0.64 0.68	 − − − 1.45 − − − 0.80	V
Instantaneous Reverse Current (Note 1) (V_R = 180 V, T_J = 25°C) (Rated dc Voltage, T_J = 25°C) (V_R = 180 V, T_J = 125°C) (Rated dc Voltage, T_J = 125°C)	I_R	 3 5 5.3 7	 − 100 − 30	 μA μA mA 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 ≤ 2.0%

TYPICAL CHARACTERISTICS

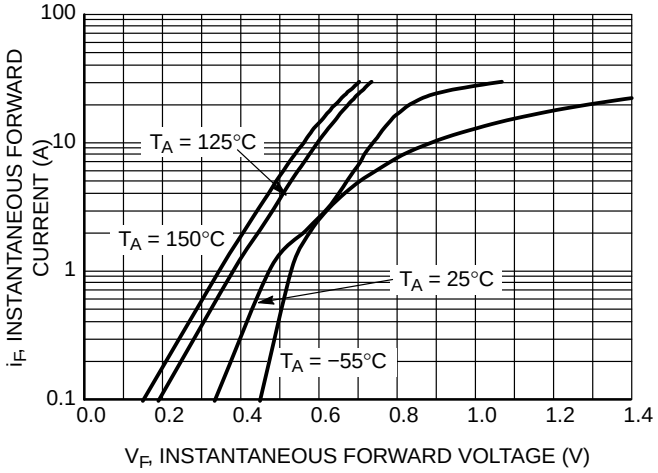


Figure 1. Typical Instantaneous Forward Characteristics

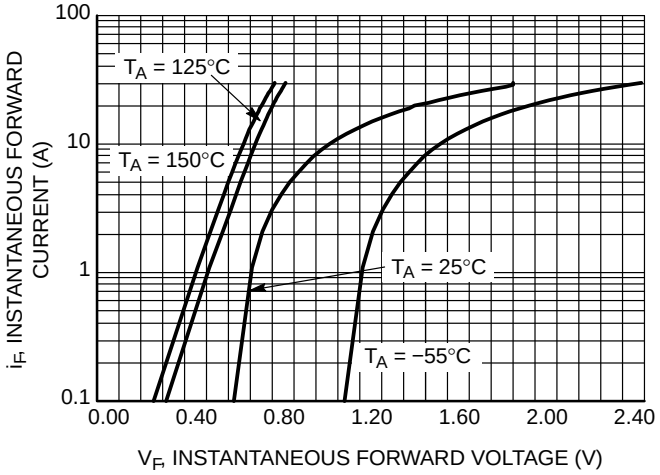


Figure 2. Maximum Instantaneous Forward Characteristics

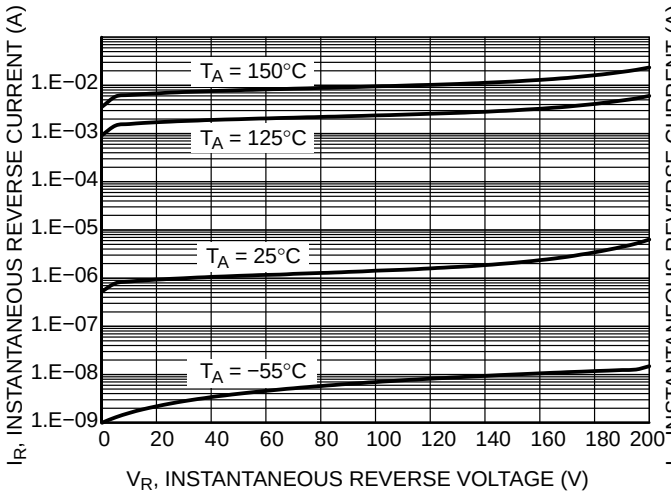


Figure 3. Typical Reverse Characteristics

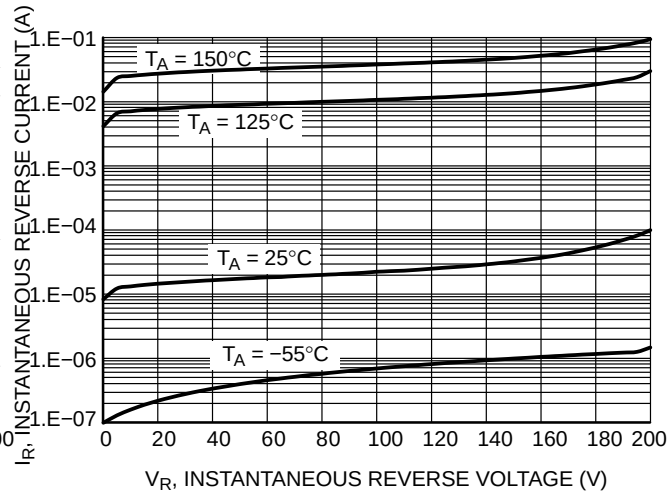


Figure 4. Maximum Reverse Characteristics

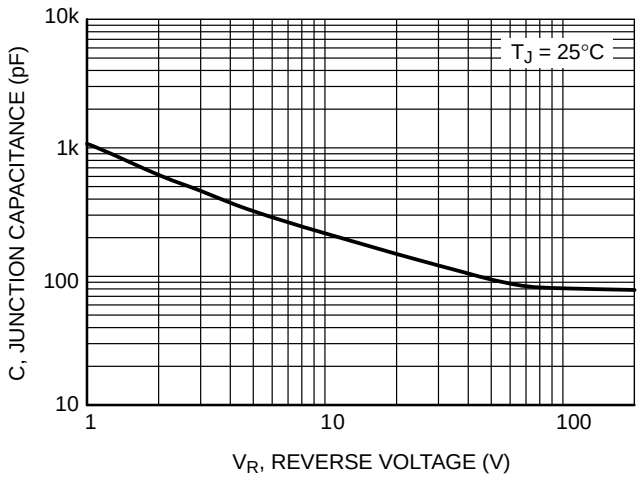


Figure 5. Typical Junction Capacitance

TYPICAL CHARACTERISTICS

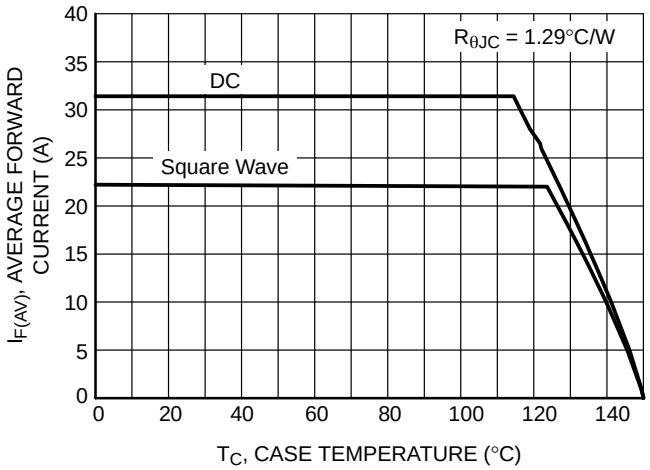


Figure 6. Current Derating per Diode (NTSB40200CT)

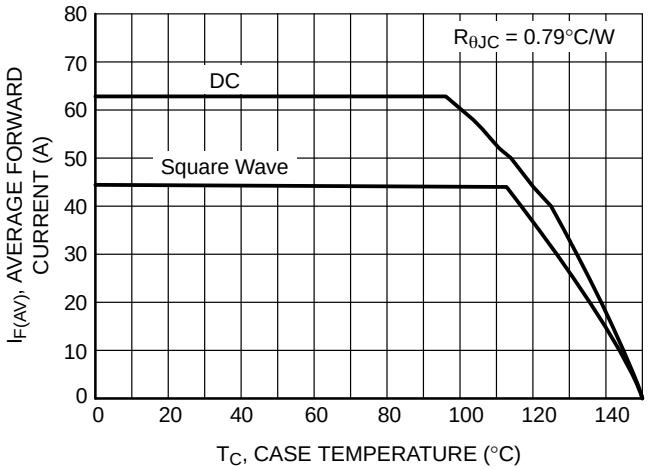


Figure 7. Current Derating per Device (NTSB40200CT)

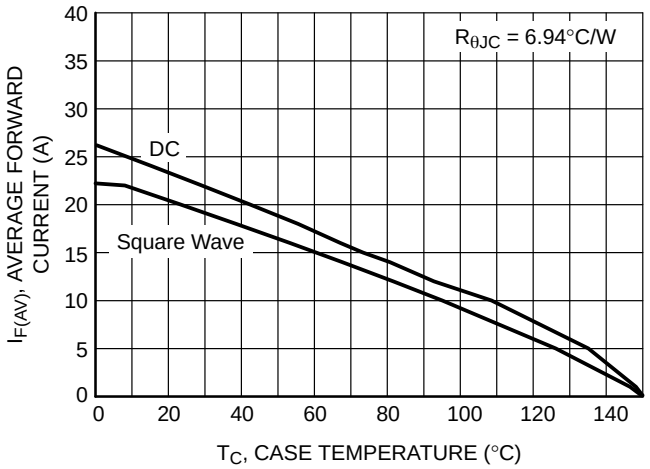


Figure 8. Current Derating per Diode (NTSJ40200CTG)

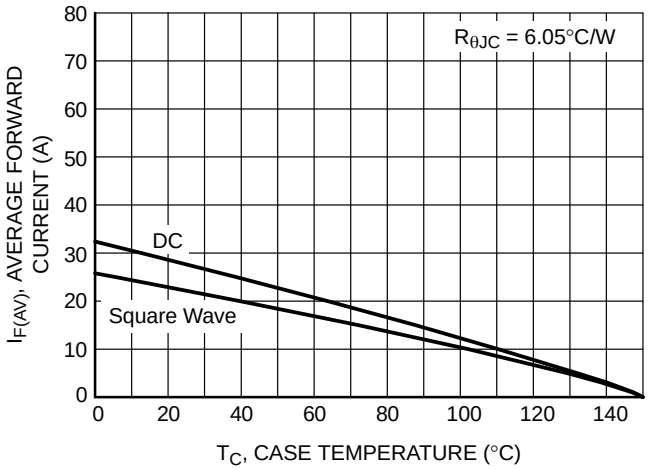


Figure 9. Current Derating per Device (NTSJ40200CTG)

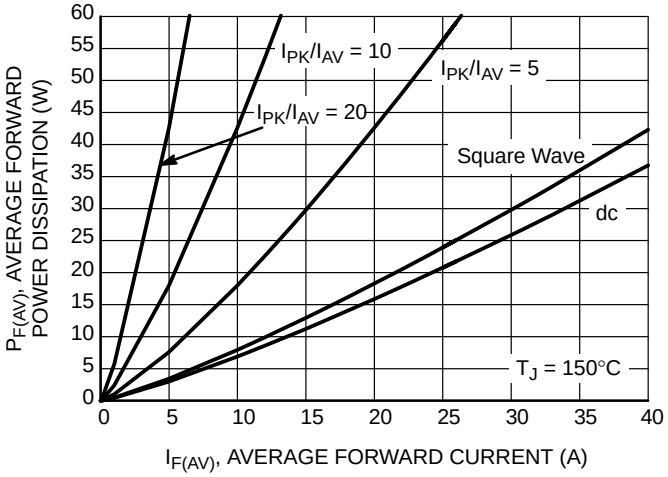


Figure 10. Forward Power Dissipation

TYPICAL CHARACTERISTICS

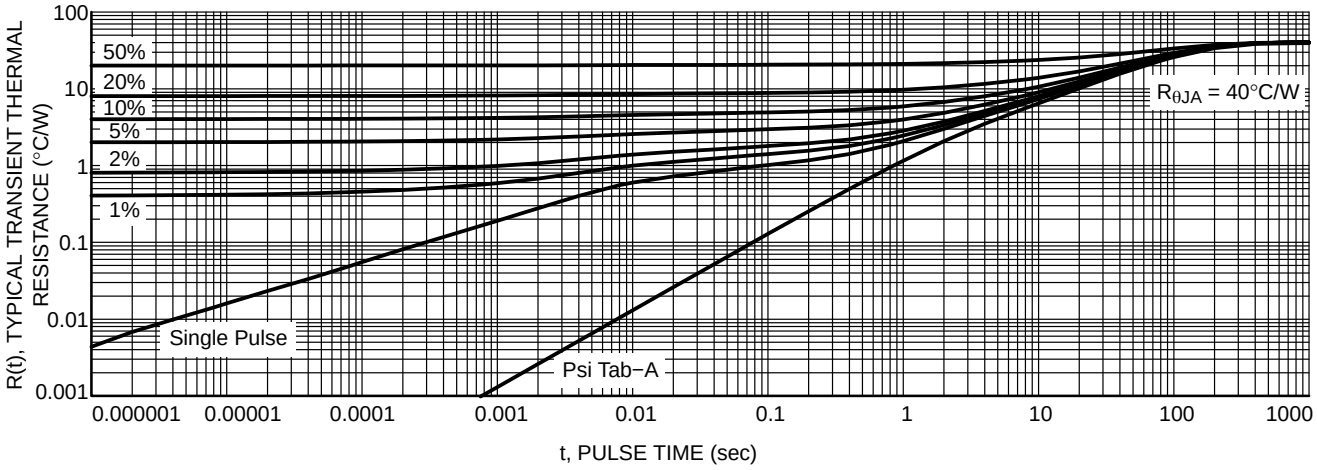


Figure 11. Typical Transient Thermal Response per Device (NTSB40200CTG)

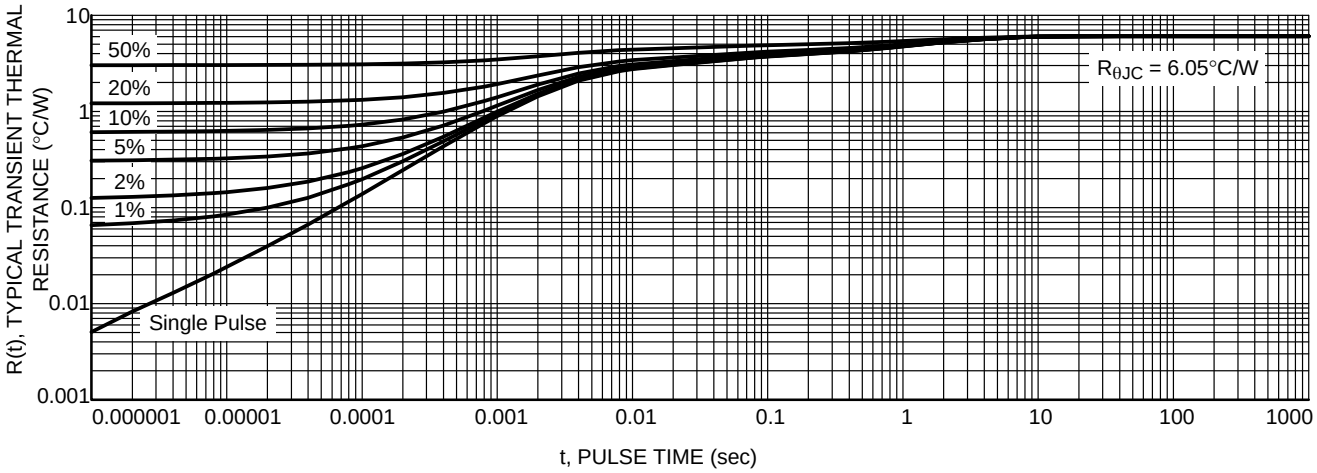
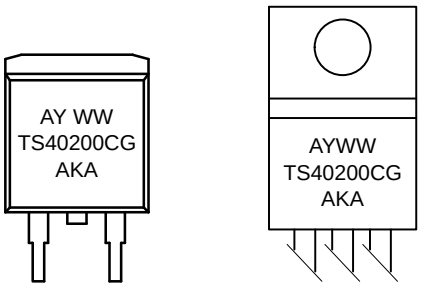


Figure 12. Typical Transient Thermal Response per Device (NTSJ40200CTG)

ORDERING INFORMATION

Device	Package	Shipping
NTSB40200CTG	D^2PAK (Pb−Free)	50 Units / Rail
NTSB40200CTT4G	D^2PAK (Pb−Free)	800 / Tape & Reel
NTSJ40200CTG (In Development)	TO−220FP (Halide−Free)	50 Units / Rail

MARKING DIAGRAMS

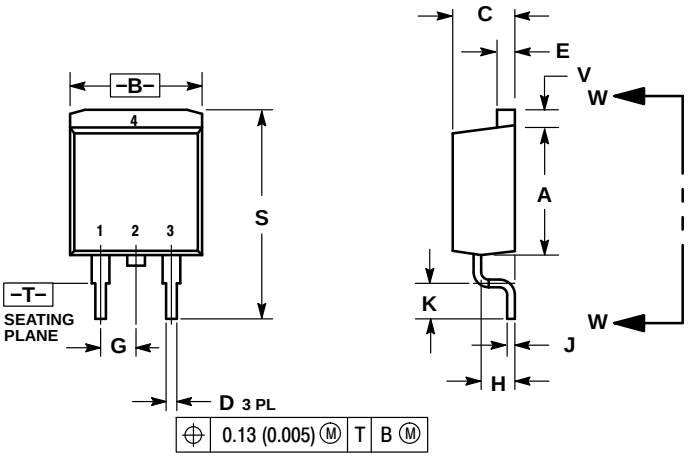


D^2PAK TO−220FP

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

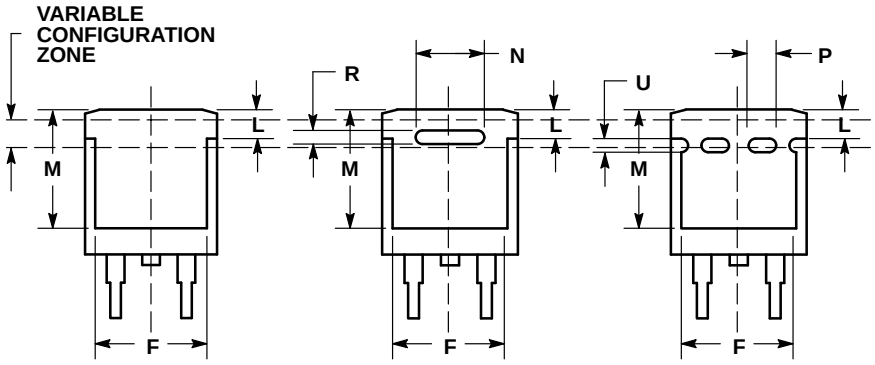
PACKAGE DIMENSIONS

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.

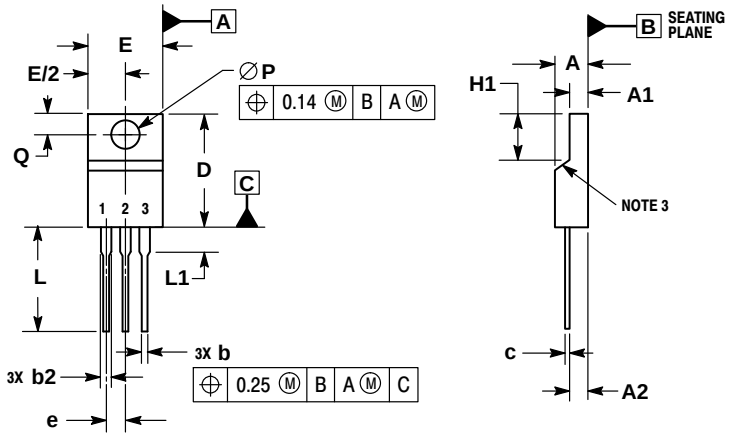
	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	1.83
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

PACKAGE DIMENSIONS

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



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	---	2.10
P	3.00	3.40
Q	2.80	3.20

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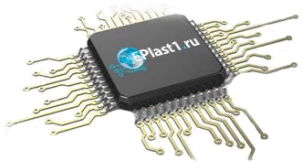
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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