NTST60100CT, NTSB60100CT-1, NTSB60100CT, NTSJ60100CT

Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low V_F = 0.36 V at I_F = 5 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

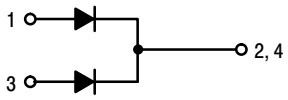
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94−0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

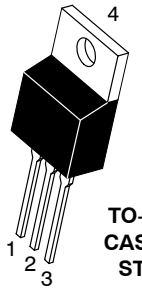
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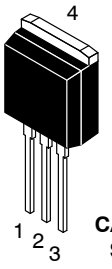
VERY LOW FORWARD VOLTAGE, LOW LEAKAGE SCHOTTKY BARRIER RECTIFIERS 60 AMPERES, 100 VOLTS

PIN CONNECTIONS

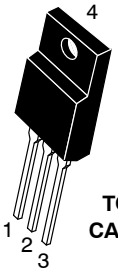




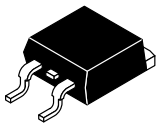
TO−220AB
CASE 221A
STYLE 6



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.

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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 at Rated V_R NTST60100CT, NTSB60100CT−1 and NTSB60100CT (Rated V_R, T_C = 115°C) per Device (Rated V_R, T_C = 125°C) per Diode NTSJ60100CT (Rated V_R, T_C = 80°C) per Device (Rated V_R, T_C = 75°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°C) per Device (Rated V_R, T_C = 120°C) per Diode NTSJ60100CT (Rated V_R, T_C = 65°C) per Device (Rated V_R, T_C = 55°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	°C
Storage Temperature	T_{stg}	−40 to +150	°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	°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 = 15 A, T_J = 25°C) (I_F = 20 A, T_J = 25°C) (I_F = 30 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) (I_F = 30 A, T_J = 125°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 V, T_J = 25°C) (V_R = 80 V, T_J = 125°C) (Rated dc Voltage, T_J = 25°C) (Rated dc Voltage, T_J = 125°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 ≤ 2.0%

TYPICAL CHARACTERISTICS

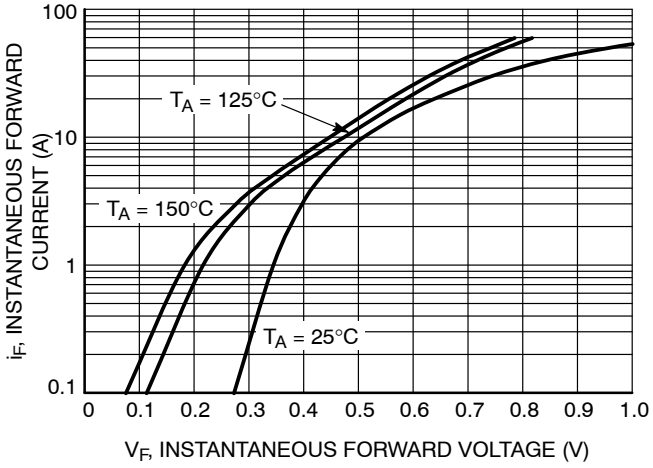


Figure 1. Typical Instantaneous Forward Characteristics

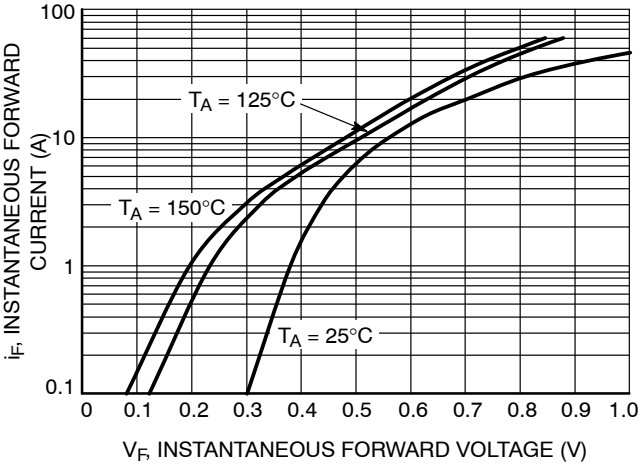


Figure 2. Maximum Instantaneous Forward Characteristics

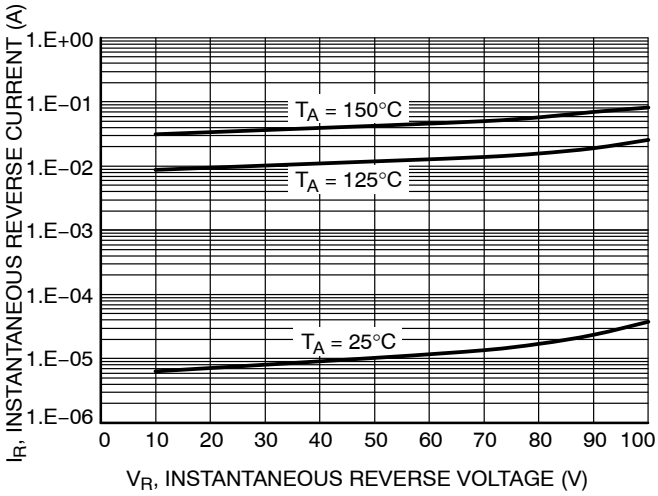


Figure 3. Typical Reverse Characteristics

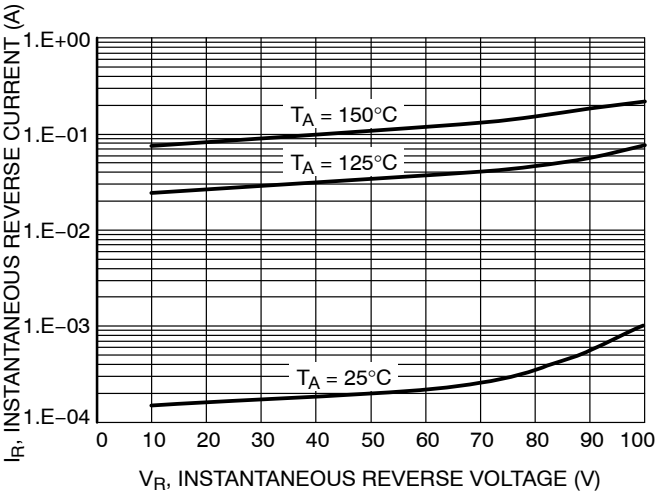


Figure 4. Maximum Reverse Characteristics

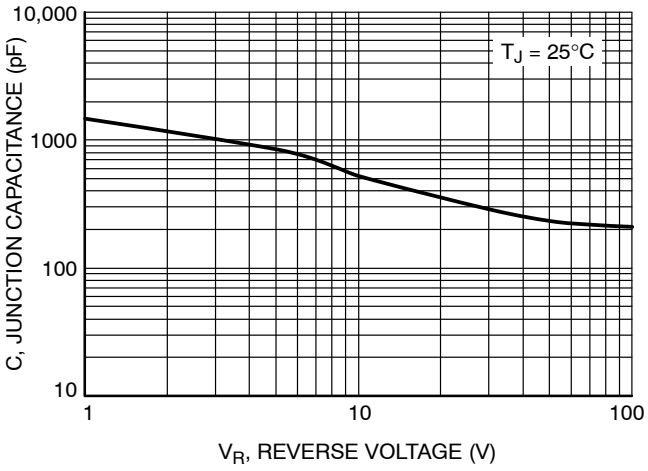


Figure 5. Typical Junction Capacitance

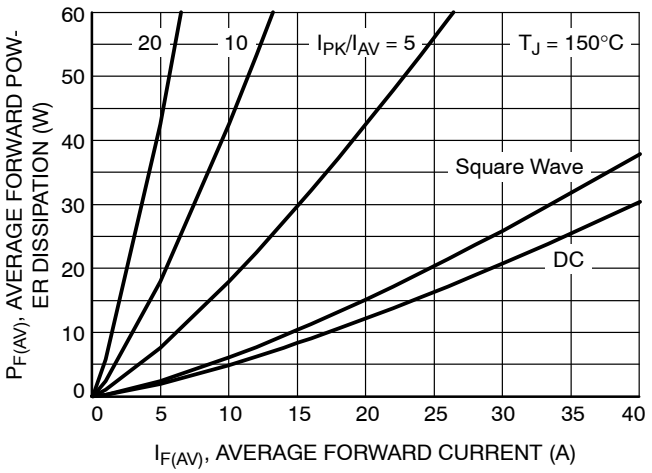


Figure 6. Forward Power Dissipation

TYPICAL CHARACTERISTICS

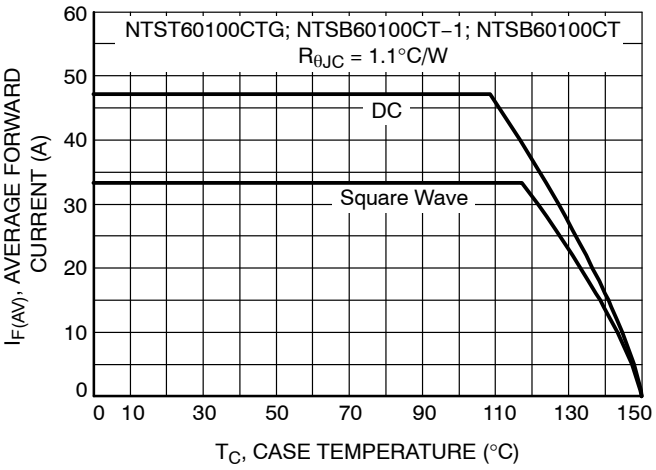


Figure 7. Current Derating per Diode

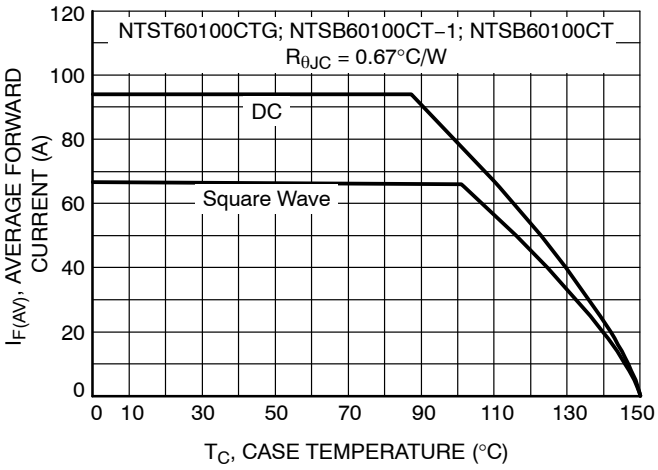


Figure 8. Current Derating per Device

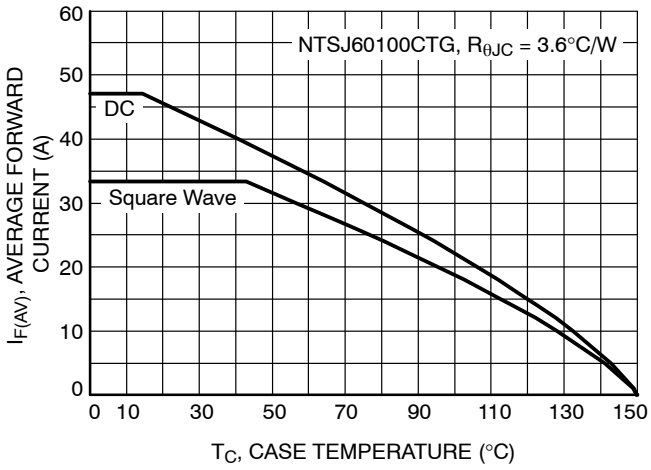


Figure 9. Current Derating per Diode

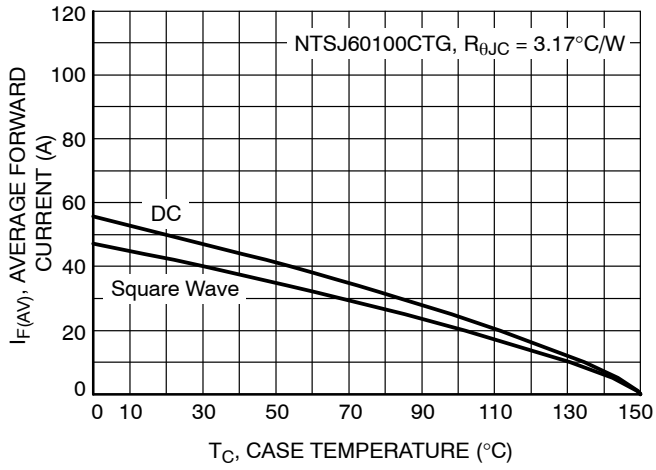


Figure 10. Current Derating per Device

TYPICAL CHARACTERISTICS

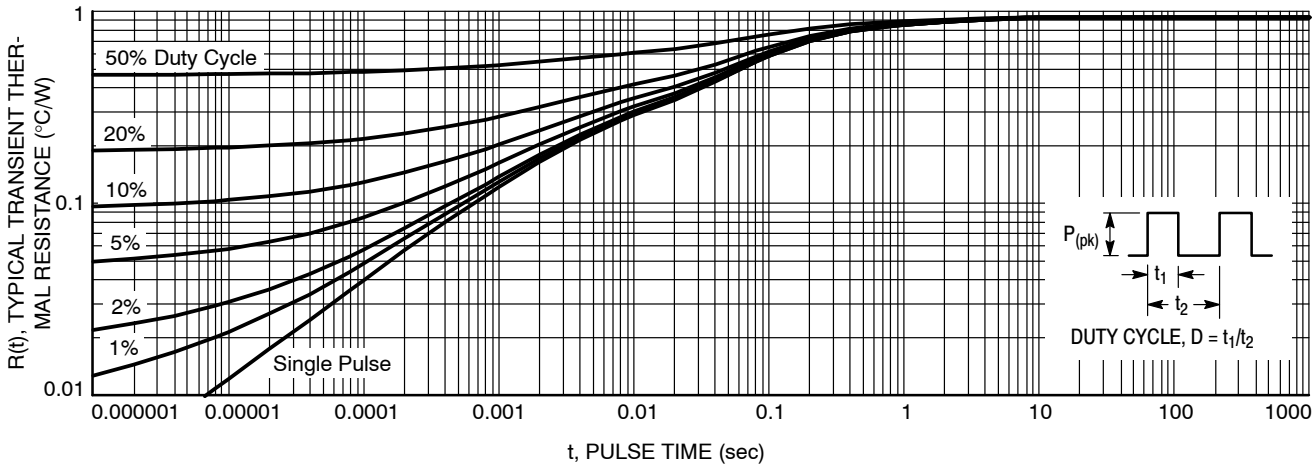


Figure 11. NTST60100CT, NTSB60100CT−1G and NTSB60100CT Typical Transient Thermal Response

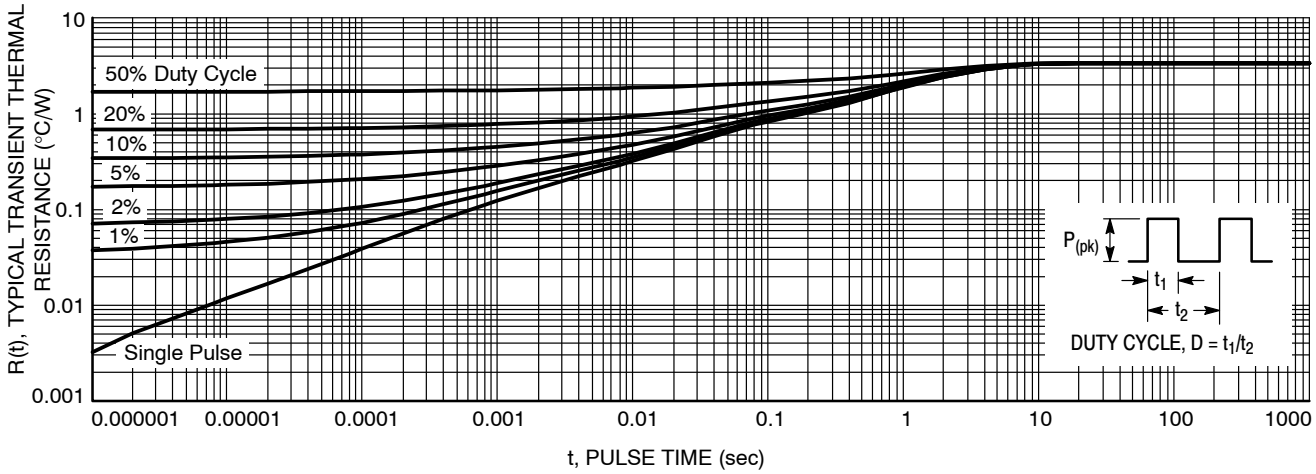
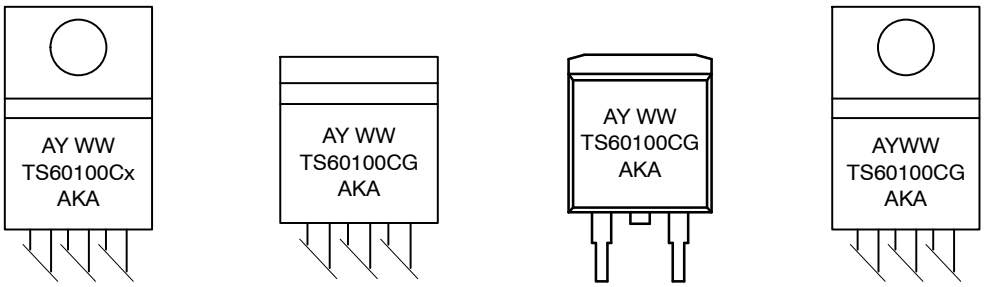


Figure 12. NTSJ60100CTG Typical Transient Thermal Response

ORDERING INFORMATION

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

MARKING DIAGRAMS

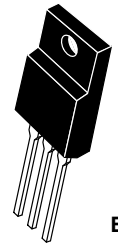


TO−220AB I^2PAK D^2PAK TO−220FP

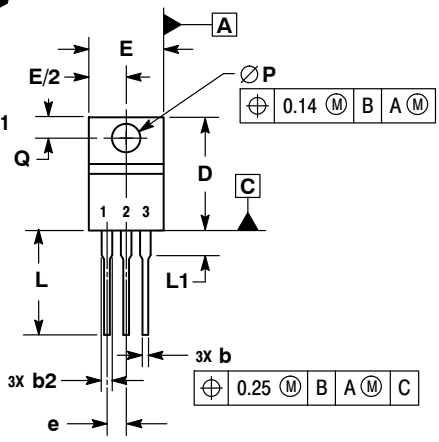
A = Assembly Location
Y = Year
WW = Work Week
AKA = Polarity Designator
x = G or H
G = Pb−Free Package
H = Halide−Free Package

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

DATE 30 SEP 2014



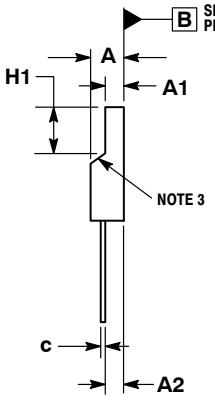
SCALE 1:1



FRONT VIEW



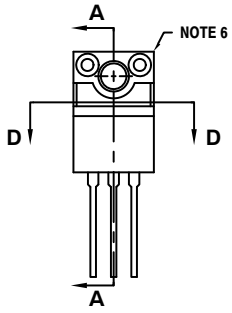
SECTION D−D



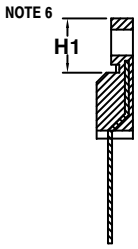
SIDE VIEW

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 ENVELOP 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

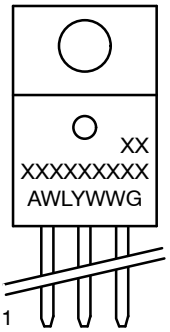


ALTERNATE CONSTRUCTION



SECTION A−A

GENERIC MARKING DIAGRAM*



A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
G = Pb−Free Package

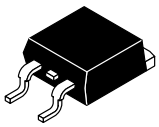
*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

STYLE 1:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE

STYLE 2:
PIN 1. CATHODE
2. ANODE
3. GATE

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DESCRIPTION:	**TO−220 FULLPACK, 3−LEAD**		**PAGE 1 OF 1**

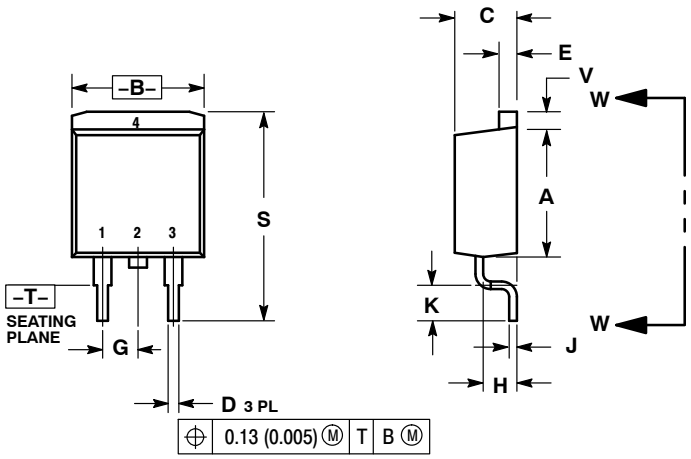
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SCALE 1:1

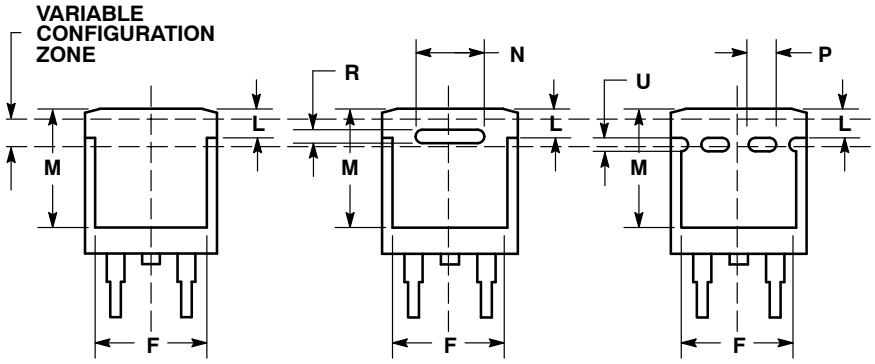
D²PAK 3
CASE 418B–04
ISSUE L

DATE 17 FEB 2015



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

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 4:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 5:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 6:
PIN 1. NO CONNECT
2. CATHODE
3. ANODE
4. CATHODE

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

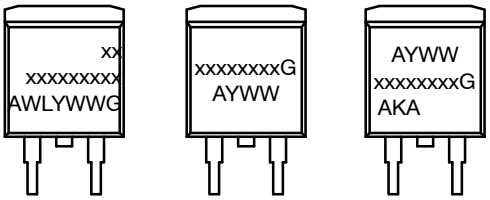
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D²PAK 3
CASE 418B−04
ISSUE L

DATE 17 FEB 2015

GENERIC MARKING DIAGRAM*

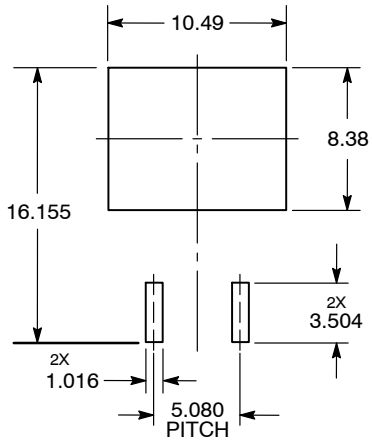


IC **Standard** **Rectifier**

xx	= Specific Device Code
A	= Assembly Location
WL	= Wafer Lot
Y	= Year
WW	= Work Week
G	= Pb−Free Package
AKA	= Polarity Indicator

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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