DATA SHEET
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Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low V_F = 0.53 V at I_F = 5 A

NTSB40200CT, NRVTSB40200CT

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
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable*
- These Devices are Pb−Free and Halide Free

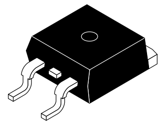
Typical Applications

- 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

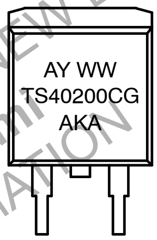
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94−0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 s

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



D^2PAK−3
CASE 418B

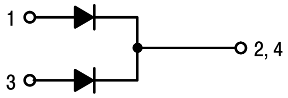
MARKING DIAGRAM



D^2PAK−3

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

PIN CONNECTIONS



ORDERING INFORMATION

Device	Package	Shipping†
NTSB40200CTG	D^2PAK−3 (Pb−Free/ Halide Free)	50 / Units / Tube
NTSB40200CTT4G	D^2PAK−3 (Pb−Free/ Halide Free)	800 / Tape & Reel
NRVTSB40200CTT4G*	D^2PAK−3 (Pb−Free/ Halide Free)	800 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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) Per device (Rated V_R, T_C = 130°C) Per diode	$I_{F(AV)}$	 40 20	A
Peak Repetitive Forward Current (Rated V_R, Square Wave, 20 kHz, T_C = 115°C) Per device (Rated V_R, Square Wave, 20 kHz, T_C = 125°C) Per diode	I_{FRM}	 80 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	Value	Unit
Typical Thermal Resistance			°C/W
Junction−to−Case Per Diode	$R_{\theta JC}$	1.29	
Junction−to−Case Per Device		0.79	
Junction−to−Ambient Per Device	$R_{\theta JA}$	40	

ELECTRICAL CHARACTERISTICS

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

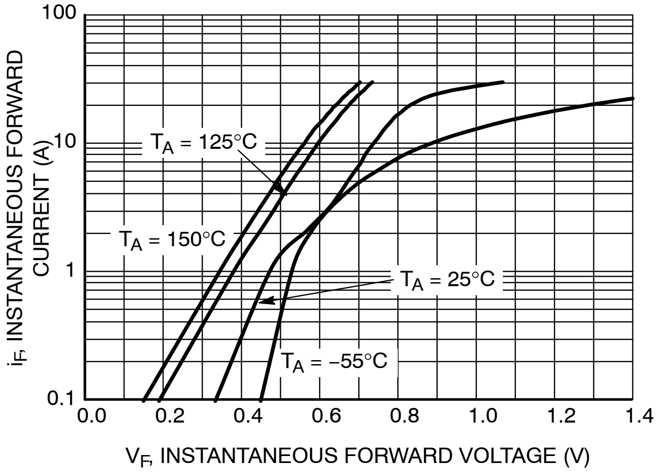


Figure 1. Typical Instantaneous Forward Characteristics

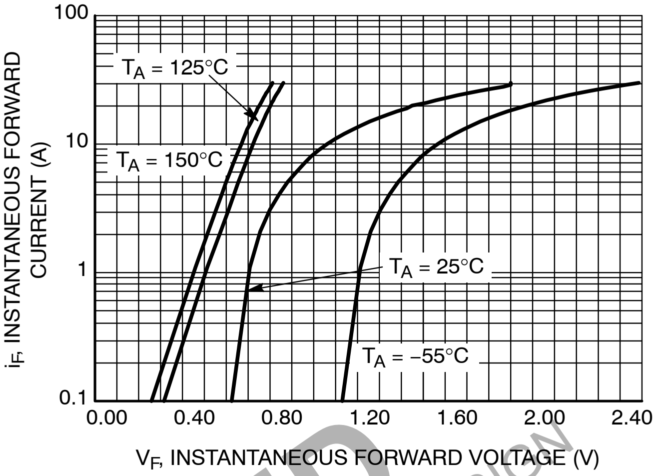


Figure 2. Maximum Instantaneous Forward Characteristics

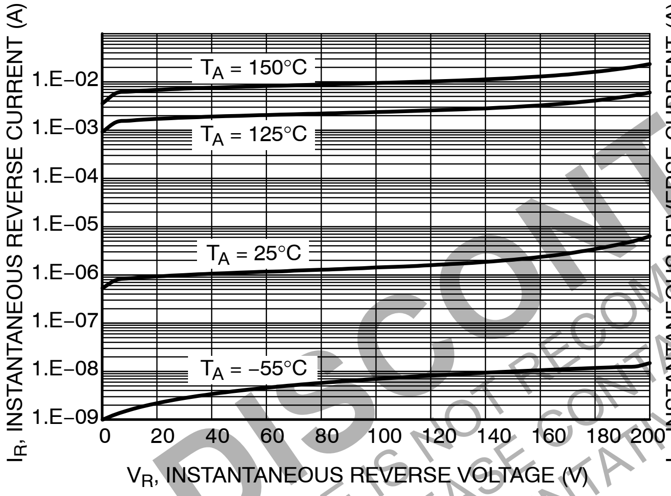


Figure 3. Typical Reverse Characteristics

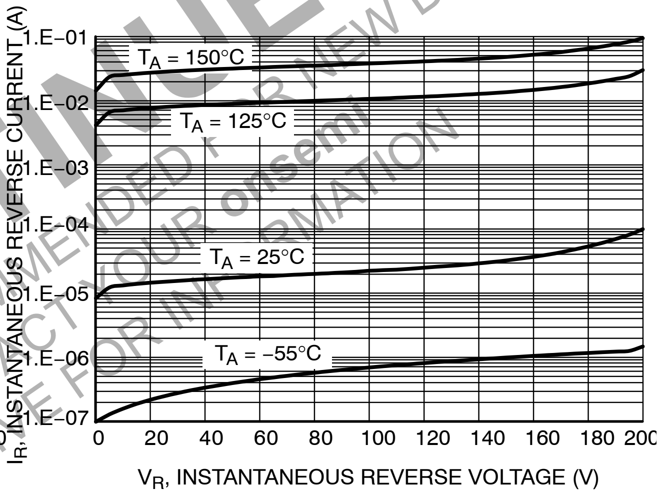


Figure 4. Maximum Reverse Characteristics

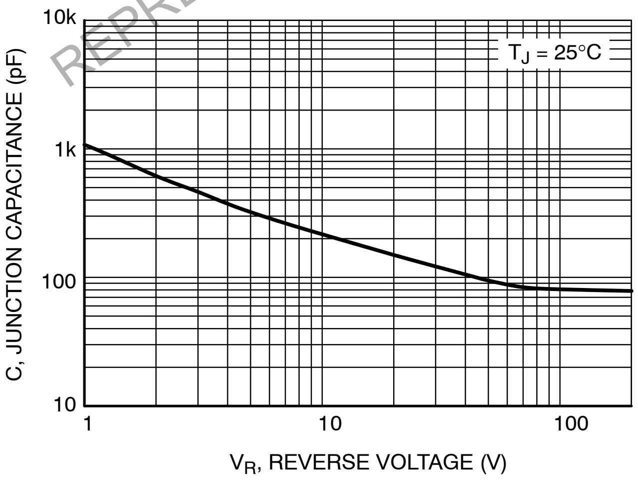


Figure 5. Typical Junction Capacitance

TYPICAL CHARACTERISTICS

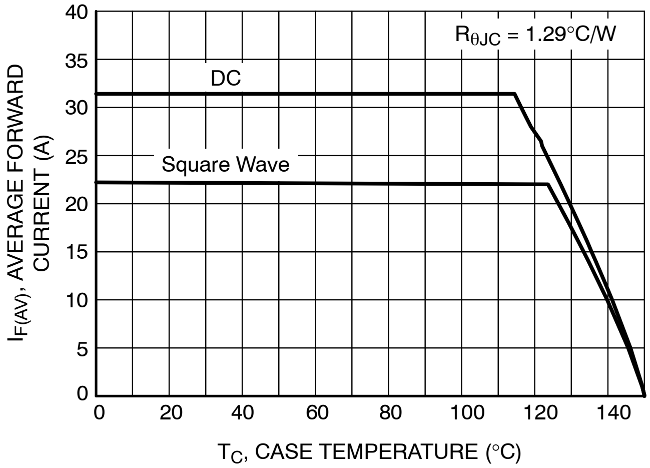


Figure 6. Current Derating per Diode

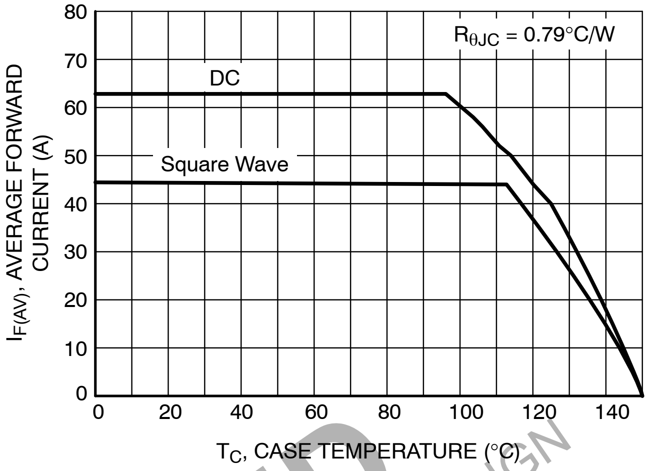


Figure 7. Current Derating per Device

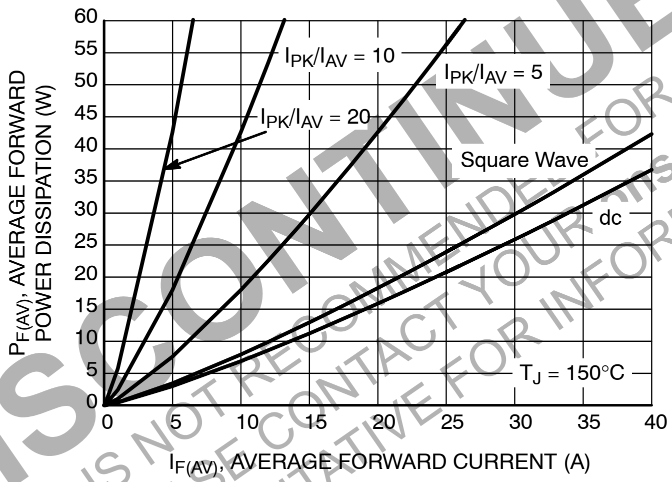


Figure 8. Forward Power Dissipation

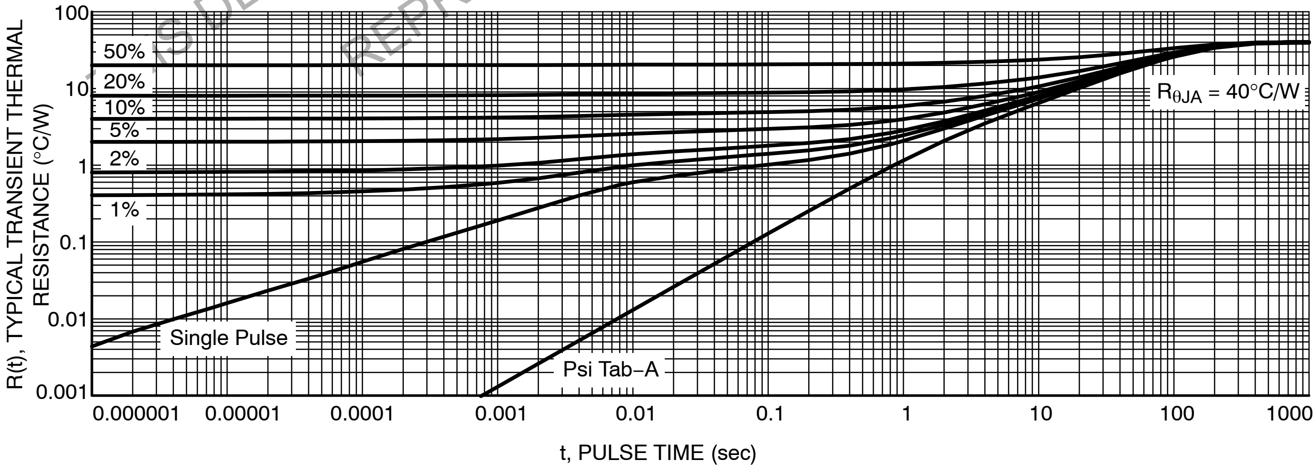
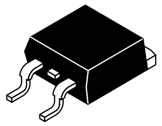


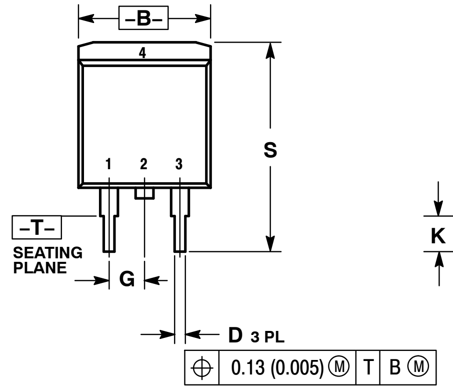
Figure 9. Typical Transient Thermal Response per Device (NTSB40200CTG)

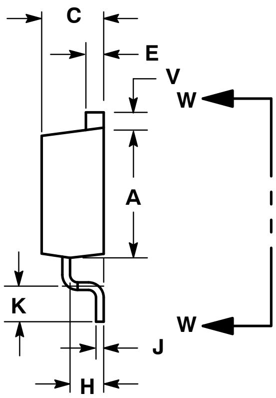


D^{2}PAK 3
CASE 418B−04
ISSUE L

DATE 17 FEB 2015

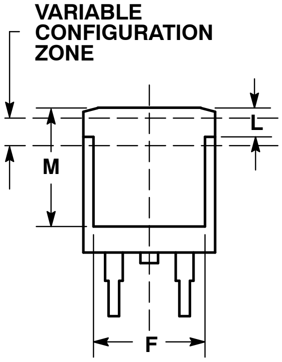
SCALE 1:1



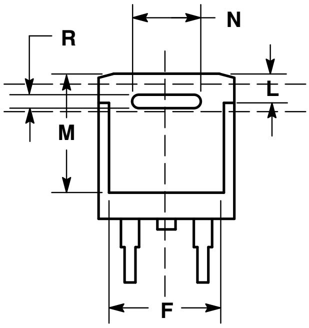


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418B−01 THRU 418B−03 OBSOLETE, NEW STANDARD 418B−04.

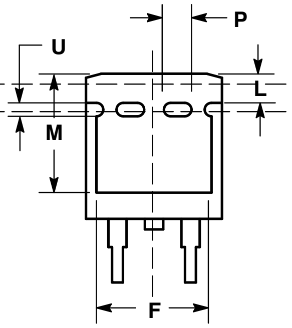
	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	1.83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

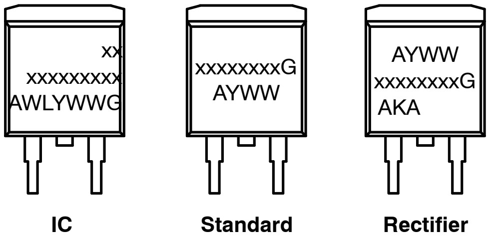
STYLE 6:
PIN 1. NO CONNECT
2. CATHODE
3. ANODE
4. CATHODE

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

D^{2}PAK 3
CASE 418B−04
ISSUE L

DATE 17 FEB 2015

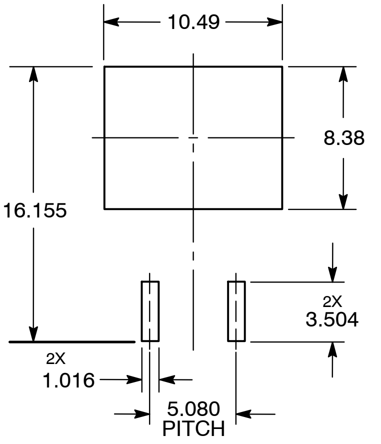
GENERIC MARKING DIAGRAM*



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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DESCRIPTION:	**D^{2}PAK 3**	**PAGE 2 OF 2**

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