

MBR40L45CTG, NRVBB40L45CTT4G

SWITCHMODE™ Power Rectifier 45 V, 40 A

Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- 40 A Total (20 A Per Diode Leg)
- Guard-Ring for Stress Protection
- AEC-Q101 Qualified and PPAP Capable
- NRVBB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- These Devices are Pb-Free and are RoHS Compliant*

Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight (Approximately): 1.9 Grams (TO-220)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 50 Units Per Plastic Tube for TO-220

MAXIMUM RATINGS

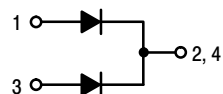
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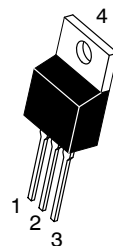
ON Semiconductor®

<http://onsemi.com>

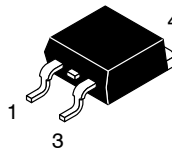
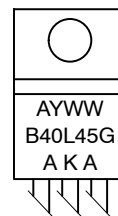
SCHOTTKY BARRIER RECTIFIERS 40 AMPERES, 45 VOLTS



MARKING DIAGRAMS



TO-220
CASE 221A
PLASTIC



D2PAK
CASE 418B
STYLE 3



B40L45 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Device
AKA = Polarity Designator

ORDERING INFORMATION

Device	Package	Shipping†
MBR40L45CTG	TO-220 (Pb-Free)	50 Units/Rail
NRVBB40L45CTT4G	D2PAK (Pb-Free)	800 /Tape & Reel

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

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

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MAXIMUM RATINGS (Per Diode Leg)

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	45	V
Average Rectified Forward Current (Rated V_R) $T_C = 145^{\circ}\text{C}$	$I_{F(AV)}$	20	A
Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz)	I_{FRM}	40	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	200	A
Operating Junction Temperature (Note 1)	T_J	-65 to +175	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-65 to +175	$^{\circ}\text{C}$
Voltage Rate of Change (Rated V_R)	dv/dt	10,000	$\text{V}/\mu\text{s}$
ESD Ratings: Machine Model = C Human Body Model = 3B		> 400 > 8000	V

THERMAL CHARACTERISTICS

Maximum Thermal Resistance - Junction-to-Case - Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1.9 72.9	$^{\circ}\text{C}/\text{W}$
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ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Maximum Instantaneous Forward Voltage (Note 2) ($I_F = 20\text{ A}$, $T_C = 25^{\circ}\text{C}$) ($I_F = 20\text{ A}$, $T_C = 125^{\circ}\text{C}$) ($I_F = 40\text{ A}$, $T_C = 25^{\circ}\text{C}$) ($I_F = 40\text{ A}$, $T_C = 125^{\circ}\text{C}$)	V_F	0.50 0.48 0.63 0.68	V
Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, $T_C = 25^{\circ}\text{C}$) (Rated DC Voltage, $T_C = 125^{\circ}\text{C}$)	i_R	1.2 275	mA

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.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.
2. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

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TYPICAL CHARACTERISTICS

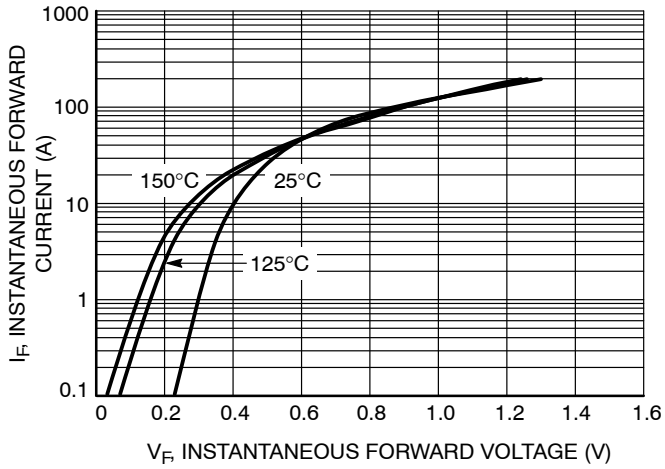


Figure 1. Typical Forward Voltage

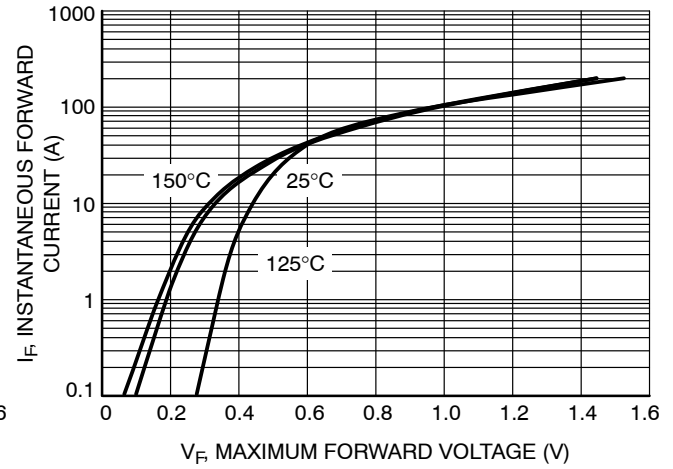


Figure 2. Maximum Forward Voltage

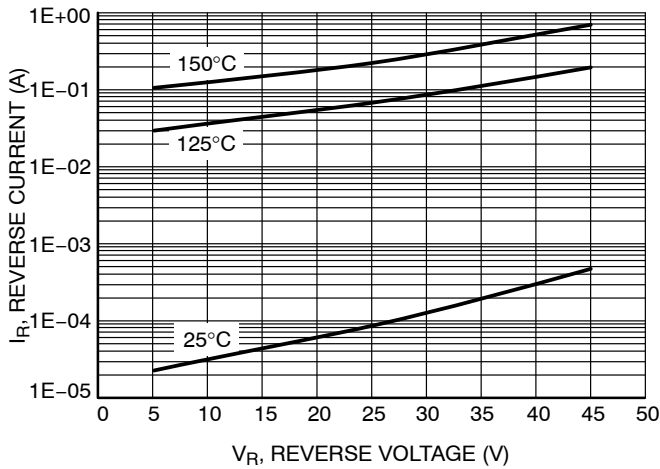


Figure 3. Typical Reverse Current

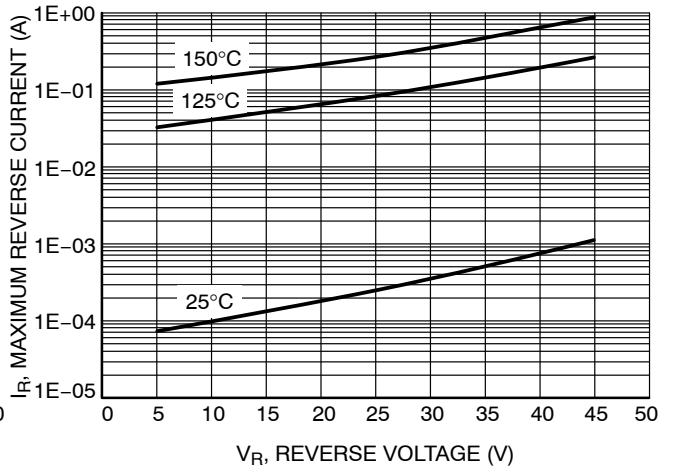


Figure 4. Maximum Reverse Current

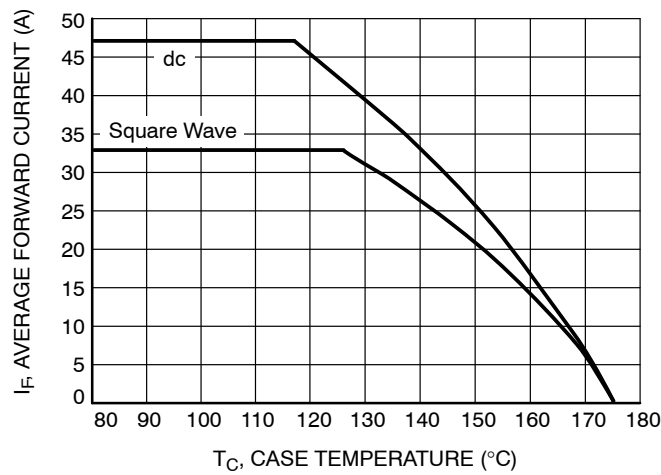


Figure 5. Current Derating for MBR40L45CTG

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TYPICAL CHARACTERISTICS

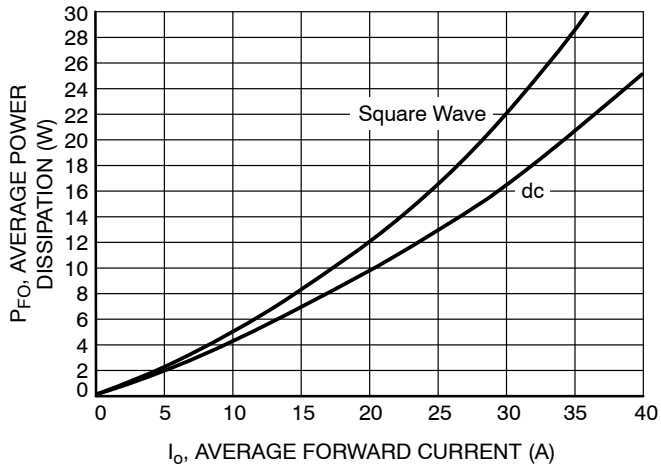


Figure 6. Forward Power Dissipation

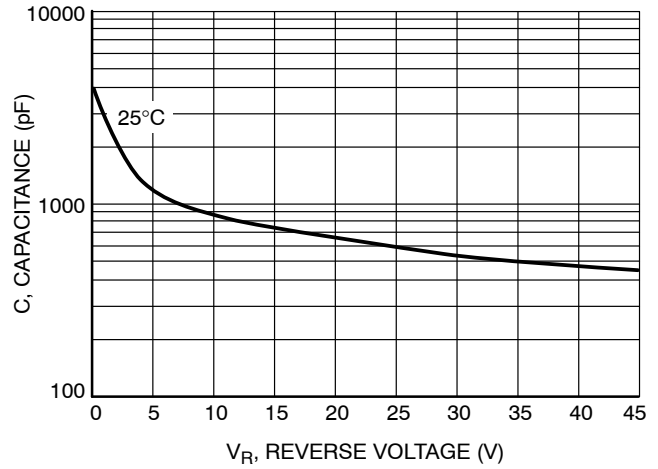


Figure 7. Capacitance

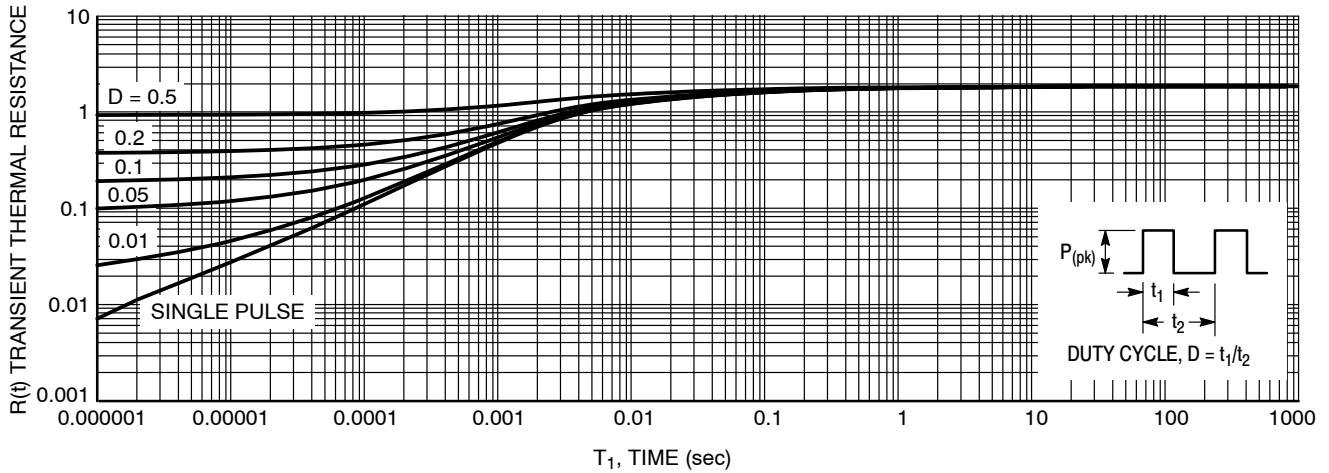
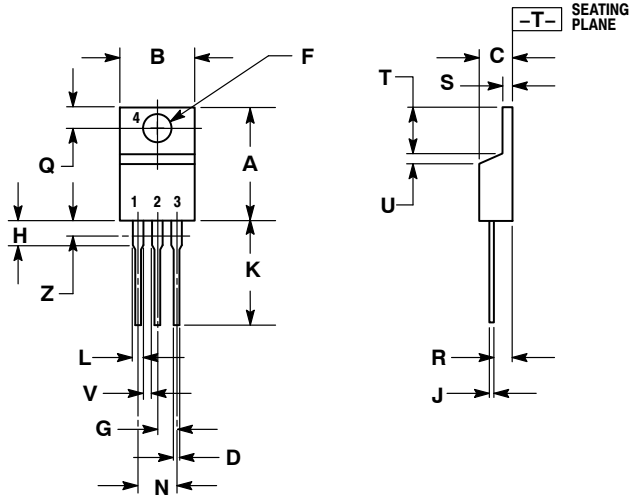


Figure 8. Thermal Response
Junction-to-Case for MBR40L45CTG

MBR40L45CTG, NRVBB40L45CTT4G

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

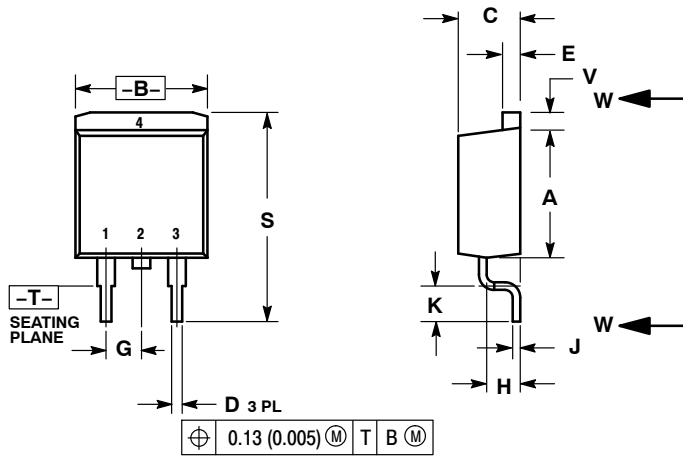
STYLE 6:

- PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

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PACKAGE DIMENSIONS

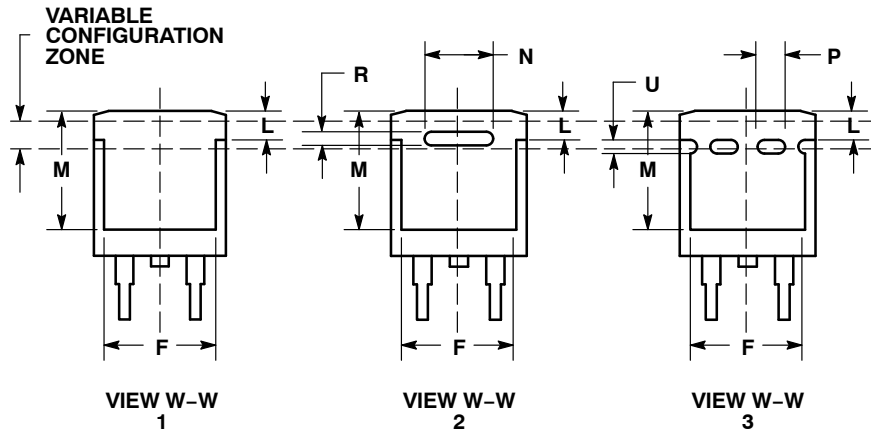
D²PAK 3
CASE 418B-04
ISSUE J



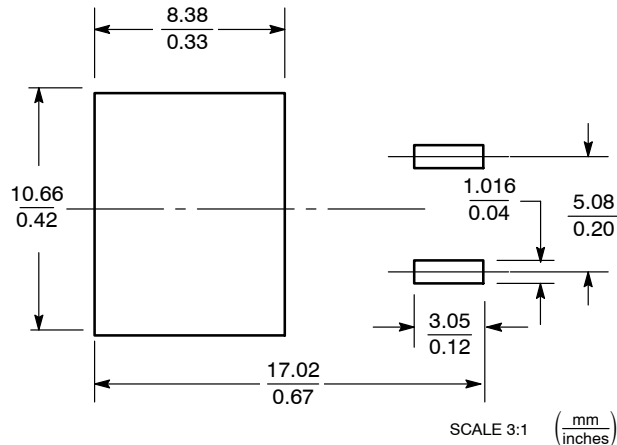
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

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

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



SOLDERING FOOTPRINT*



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

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