

# MBRB4030

Preferred Device

## SWITCHMODE™ Power Rectifier

These state-of-the-art devices use the Schottky Barrier principle with a proprietary barrier metal.

### Features

- Guardring for Stress Protection
- Maximum Die Size
- 175°C Operating Junction Temperature
- Short Heat Sink Tab Manufactured – Not Sheared
- Pb-Free Packages are Available

### Mechanical Characteristics:

- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 1.7 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads Readily Solderable
- Device Meets MSL1 Requirements
- ESD Ratings: Machine Model, C (>400 V)  
Human Body Model, 3B (>8000 V)

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	30	V
Average Rectified Forward Current (At Rated $V_R$ , $T_C = +115^\circ\text{C}$ (Note 1))	$I_{F(AV)}$	40	A
Peak Repetitive Forward Current (At Rated $V_R$ , Square Wave, 20 kHz), $T_C = +112^\circ\text{C}$	$I_{FRM}$	80	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	300	A
Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)	$I_{RRM}$	2.0	A
Storage Temperature Range	$T_{stg}$	-65 to +175	°C
Operating Junction Temperature Range (Note 2)	$T_J$	-65 to +175	°C
Voltage Rate of Change (Rated $V_R$ )	dv/dt	10,000	V/ $\mu\text{s}$
Reverse Energy (Unclamped Inductive Surge), ( $T_C = 25^\circ\text{C}$ , $L = 3.0$ mH)	W	600	mJ

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.

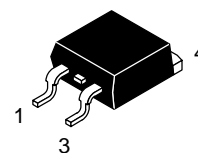
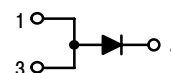
1. Rating applies when pins 1 and 3 are connected.
2. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .



ON Semiconductor®

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## SCHOTTKY BARRIER RECTIFIER 40 AMPERES, 30 VOLTS



D<sup>2</sup>PAK  
CASE 418B  
STYLE 3

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
B4030 = Device Code  
G = Pb-Free Package  
AKA = Diode Polarity

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

**Preferred** devices are recommended choices for future use and best overall value.

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## THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	°C/W
Thermal Resistance, Junction-to-Ambient (Note 4)	$R_{\theta JA}$	50	°C/W

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Notes 3 and 5), per Device ( $I_F = 20\text{ A}$ , $T_C = +25^\circ\text{C}$ ) ( $I_F = 20\text{ A}$ , $T_C = +150^\circ\text{C}$ ) ( $I_F = 40\text{ A}$ , $T_C = +25^\circ\text{C}$ ) ( $I_F = 40\text{ A}$ , $T_C = +150^\circ\text{C}$ )	$V_F$	0.46 0.34 0.55 0.45	V
Maximum Instantaneous Reverse Current (Note 5), per Device (Rated DC Voltage, $T_C = +25^\circ\text{C}$ ) (Rated DC Voltage, $T_C = +125^\circ\text{C}$ )	$I_R$	0.35 150	mA

- Rating applies when pins 1 and 3 are connected.
- Rating applies when surface mounted on the minimum pad size recommended.
- Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

## ORDERING INFORMATION

Device	Package	Shipping†
MBRB4030	D <sup>2</sup> PAK	50 Units / Rail
MBRB4030G	D <sup>2</sup> PAK (Pb-Free)	50 Units / Rail
MBRB4030T4	D <sup>2</sup> PAK	800 Units / Tape & Reel
MBRB4030T4G	D <sup>2</sup> PAK (Pb-Free)	800 Units / 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.

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## ELECTRICAL CHARACTERISTICS

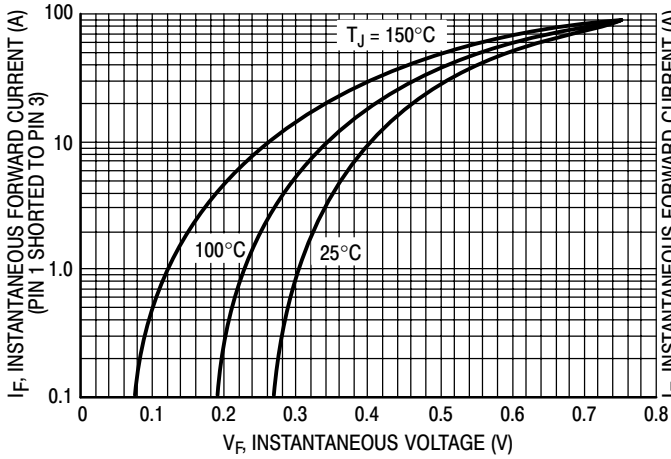


Figure 1. Maximum Forward Voltage

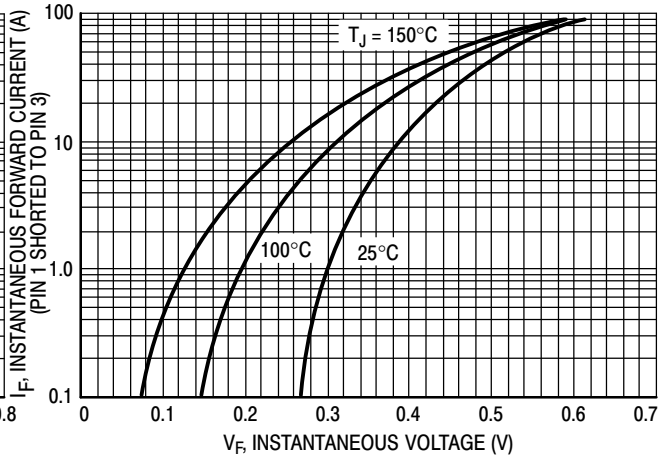


Figure 2. Typical Forward Voltage

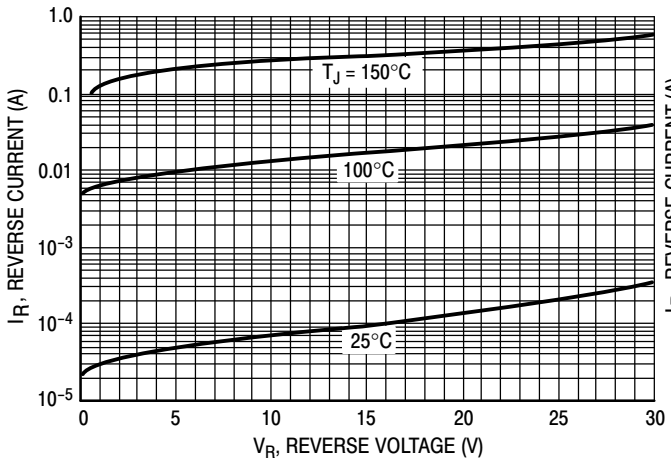


Figure 3. Maximum Reverse Current

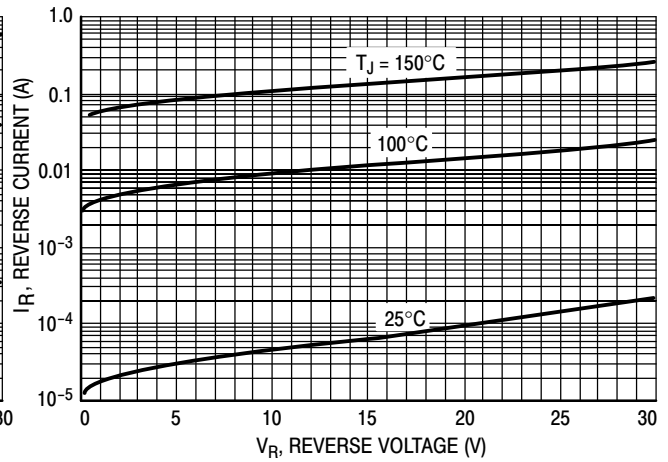


Figure 4. Typical Reverse Current

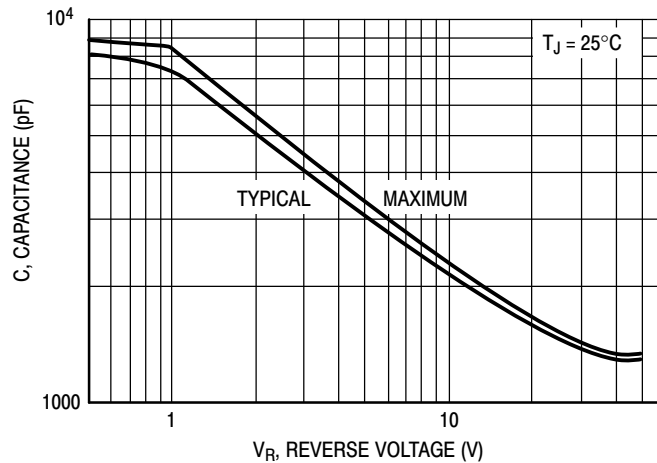


Figure 5. Maximum and Typical Capacitance

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## ELECTRICAL CHARACTERISTICS

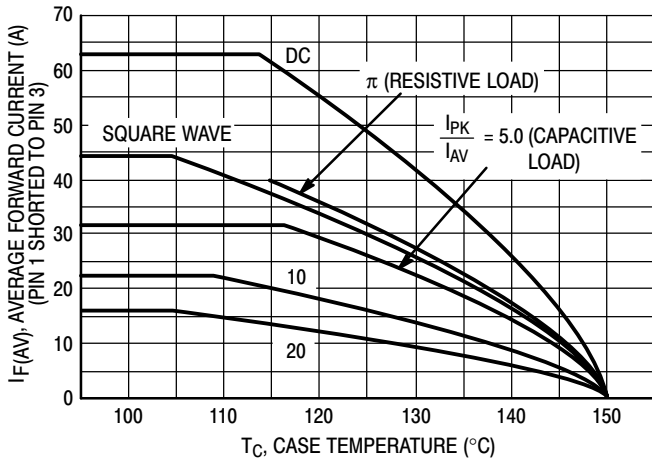


Figure 6. Current Derating, Infinite Heatsink

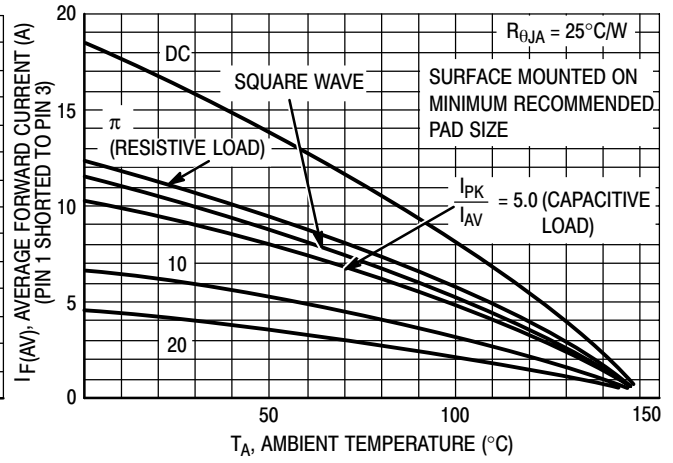


Figure 7. Current Derating

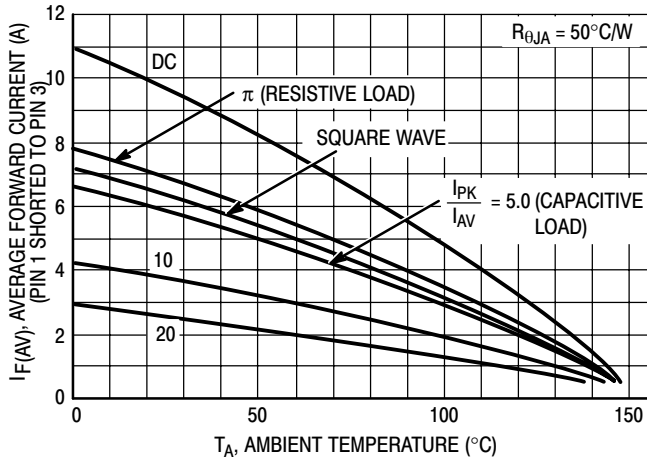


Figure 8. Current Derating, Free Air

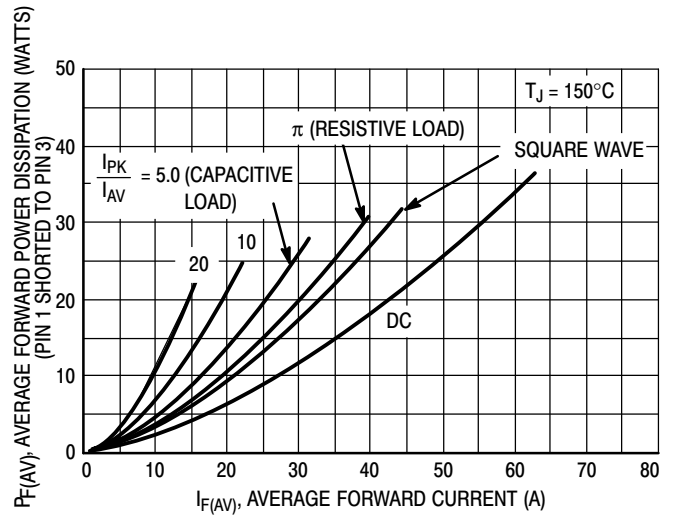


Figure 9. Forward Power Dissipation

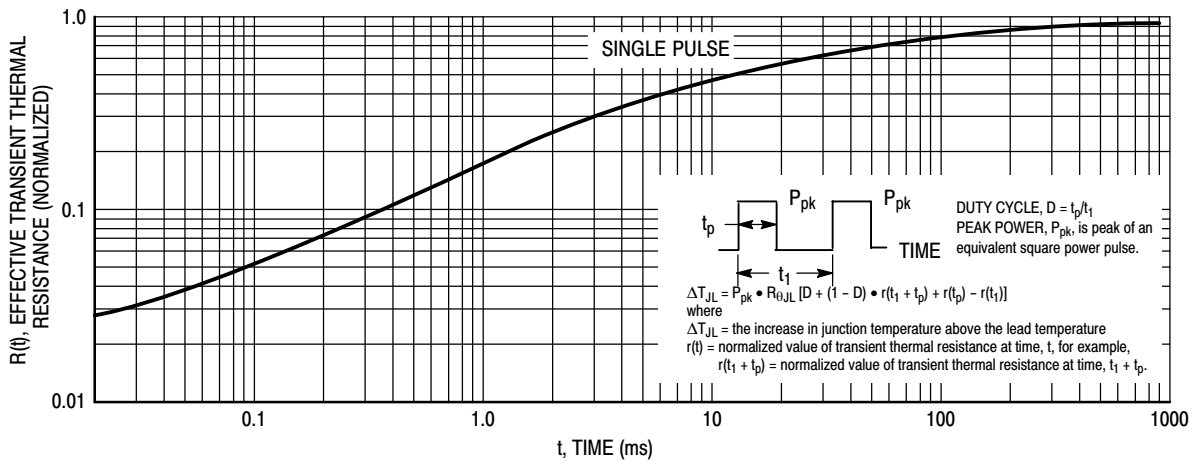
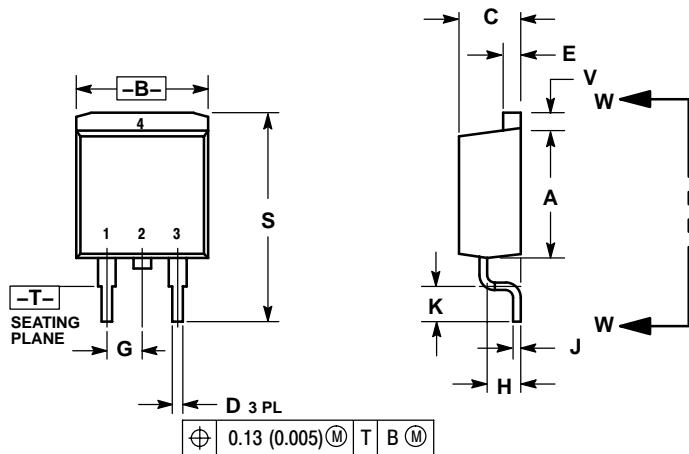


Figure 10. Thermal Response

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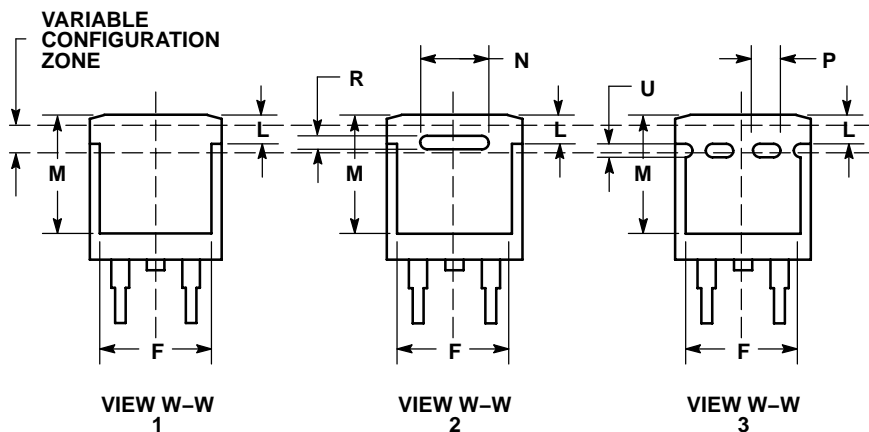
## PACKAGE DIMENSIONS

D<sup>2</sup>PAK 3  
CASE 418B-04  
ISSUE J



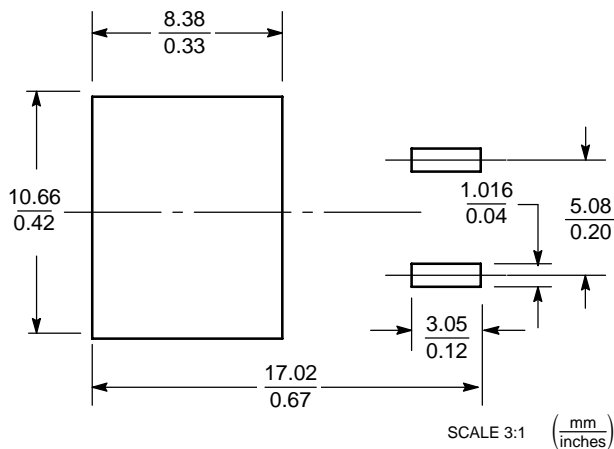
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

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:
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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