

# Advance Information

## Power Manager™

### Gallium Arsenide Power Rectifier

... ideally suited for high frequency power supplies, free wheeling diodes, and as polarity protection diodes, these state-of-the-art devices have the following features:

- Planar Epitaxial Construction
- Nitride Passivation for Stable Blocking Characteristics
- Monolithic Dual Die Construction – May be Paralleled for High Current Output (10A per leg or 20A per package)
- Single Die Available (MGRB1018)
- Epoxy Meets UL94, V<sub>O</sub> @ 1/8"
- Hyperfast and Soft Reverse Recovery Over Specified Temperature Range (15 ns)

#### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant & Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 50 units per plastic tube
- Available in 24mm Tape and Reel, 800 units/reel by adding a T4 suffix to the part number
- Marking: MGRB2018CT

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	180	V
Average Rectified Forward Current (At Rated V <sub>R</sub> , T <sub>C</sub> = 90°C)	I <sub>O</sub> Per Leg Per Package	10 20	A
DC Forward Current (T <sub>C</sub> = 130°C)	I <sub>DC</sub> Per Leg	10	A
Peak Repetitive Forward Current (At Rated V <sub>R</sub> , Square Wave, 20 kHz, T <sub>C</sub> = 100°C)	I <sub>FRM</sub> Per Leg	20	A
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	I <sub>FSM</sub> Per Package	60	A
Operating Junction Temperature and Storage Temperature	T <sub>J</sub> , T <sub>stg</sub>	-55 to 175	°C

#### THERMAL CHARACTERISTICS

Thermal Resistance – Junction to Case	Per Leg	R <sub>θJC</sub>	3.1	°C/W
Thermal Resistance – Junction to Ambient	Per Leg	R <sub>θJA</sub>	53	

#### ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1), see Figure 2 (I <sub>F</sub> = 10 A) (I <sub>F</sub> = 5 A)	Per Leg	V <sub>F</sub>	T <sub>J</sub> =25°C	T <sub>J</sub> =125°C	V
			1.4 1.1	1.5 1.1	
Maximum Instantaneous Reverse Current, see Figure 4 (V <sub>R</sub> = 180 V) (V <sub>R</sub> = 90 V)	Per Leg	I <sub>R</sub>	T <sub>J</sub> =25°C	T <sub>J</sub> =125°C	μA
			25 1	685 120	
Typical Reverse Recovery Time (2) (V <sub>R</sub> = 150 V, I <sub>F</sub> = 5 A, di/dt = 200 A/μs) (V <sub>R</sub> = 150 V, I <sub>F</sub> = 10 A, di/dt = 200 A/μs)	Per Leg	t <sub>rr</sub>	T <sub>J</sub> =25°C	T <sub>J</sub> =125°C	ns
			12.6 13	12.4 12.7	
Typical Peak Reverse Recovery Current (V <sub>R</sub> = 150 V, I <sub>F</sub> = 5 A, di/dt = 200 A/μs) (V <sub>R</sub> = 150 V, I <sub>F</sub> = 10 A, di/dt = 200 A/μs)	Per Leg	I <sub>RM</sub>	T <sub>J</sub> =25°C	T <sub>J</sub> =125°C	A
			1.5 1.6	1.6 1.7	

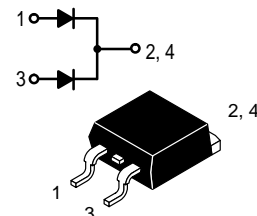
Note: This data sheet contains advance information only and is subject to change without notice.

(1) Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

(2) t<sub>rr</sub> measured projecting from 25% of I<sub>RM</sub> to ground.

**MGRB2018CT**

**GALLIUM ARSENIDE  
RECTIFIER  
20 AMPERES  
180 VOLTS**



**CASE 418B-02  
D<sup>2</sup>PAK**

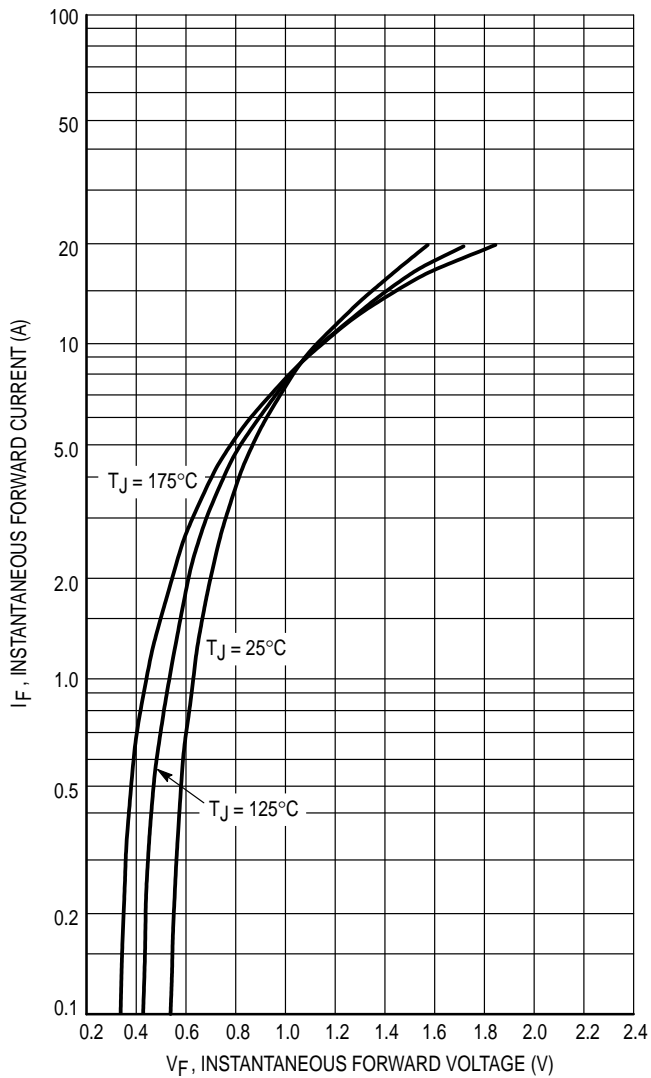


Figure 1. Typical Forward Voltage

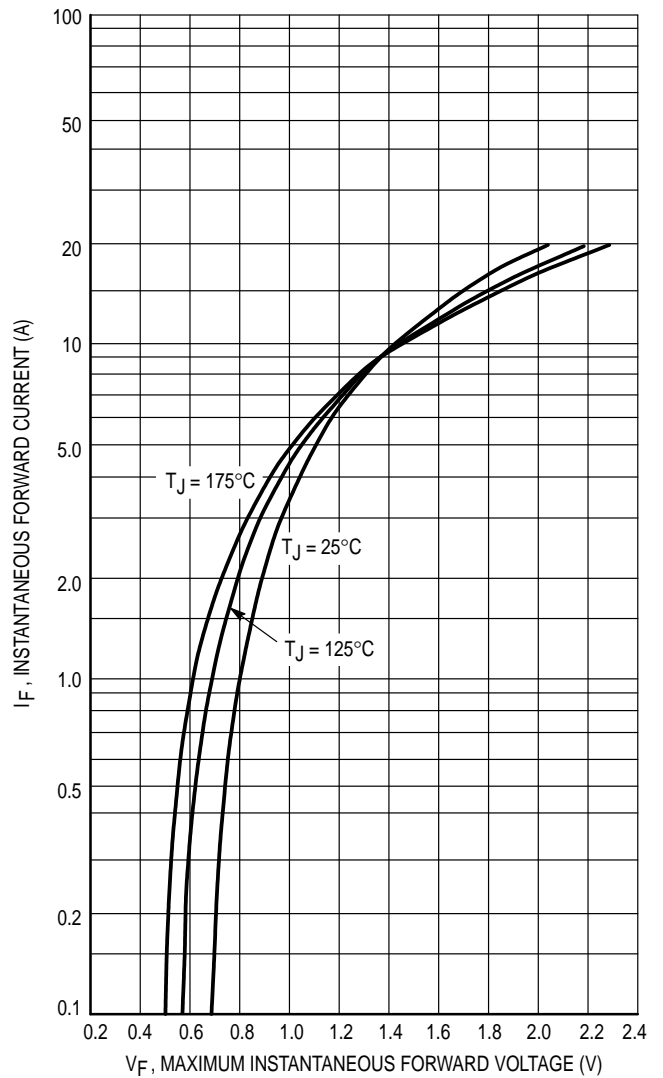


Figure 2. Maximum Forward Voltage

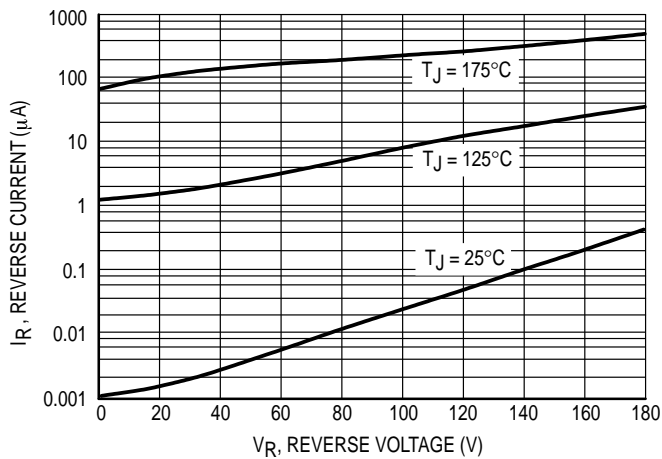


Figure 3. Typical Reverse Current

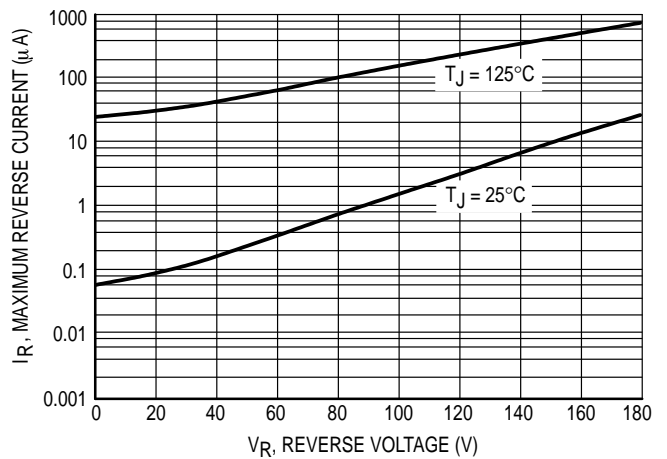


Figure 4. Maximum Reverse Current

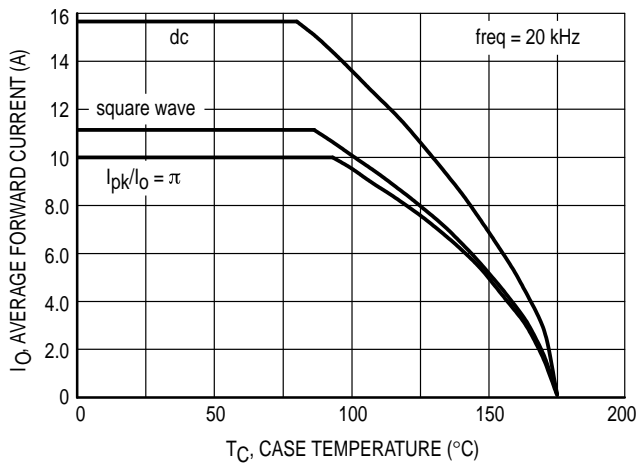


Figure 5. Current Derating Per Leg

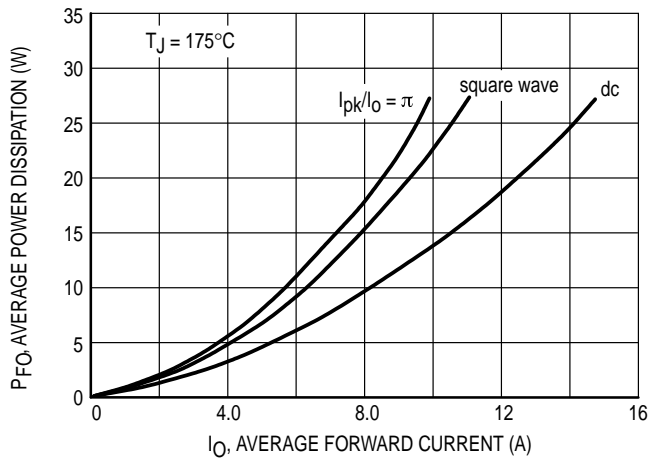


Figure 6. Forward Power Dissipation Per Leg

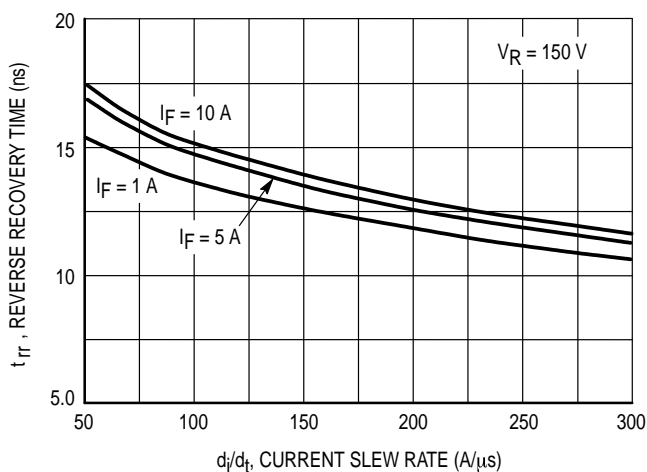


Figure 7. Typical  $t_{rr}$  Characteristics,  $T_J = 25^{\circ}C$

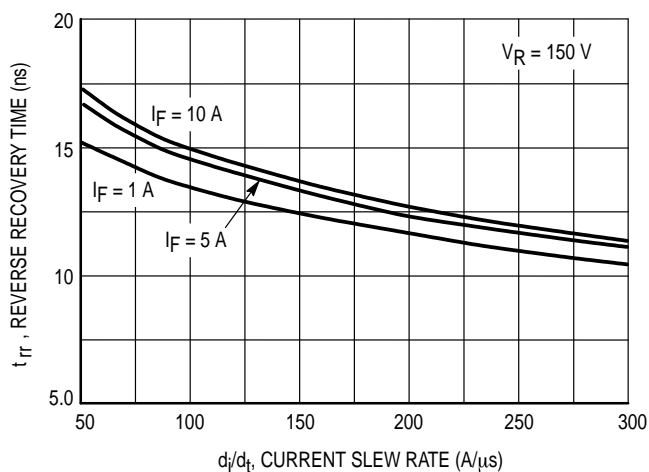


Figure 8. Typical  $t_{rr}$  Characteristics,  $T_J = 125^{\circ}C$

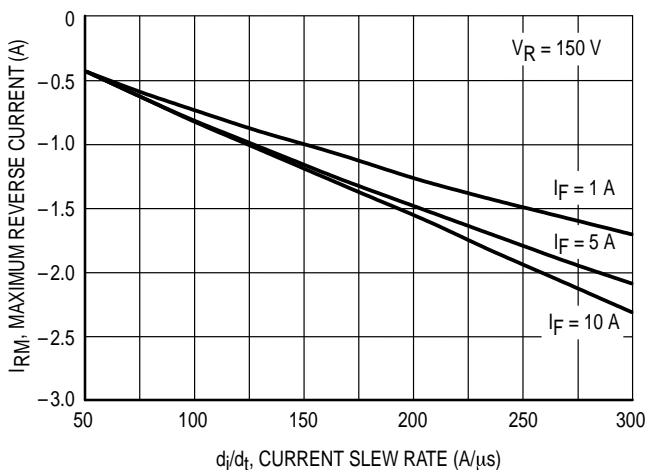


Figure 9. Typical  $I_{RM}$  Characteristics,  $T_J = 25^{\circ}C$

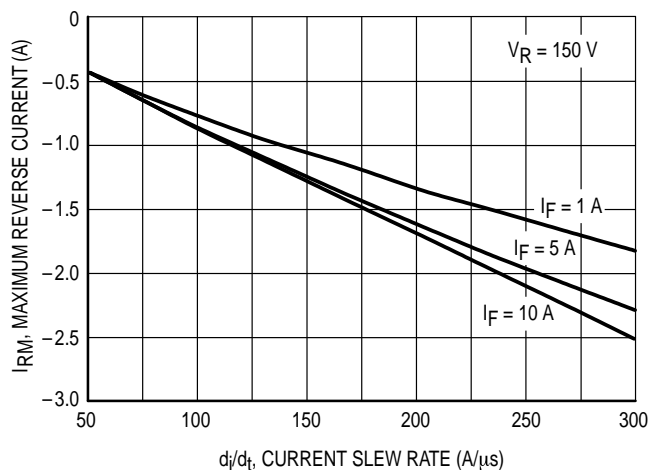


Figure 10. Typical  $I_{RM}$  Characteristics,  $T_J = 125^{\circ}C$

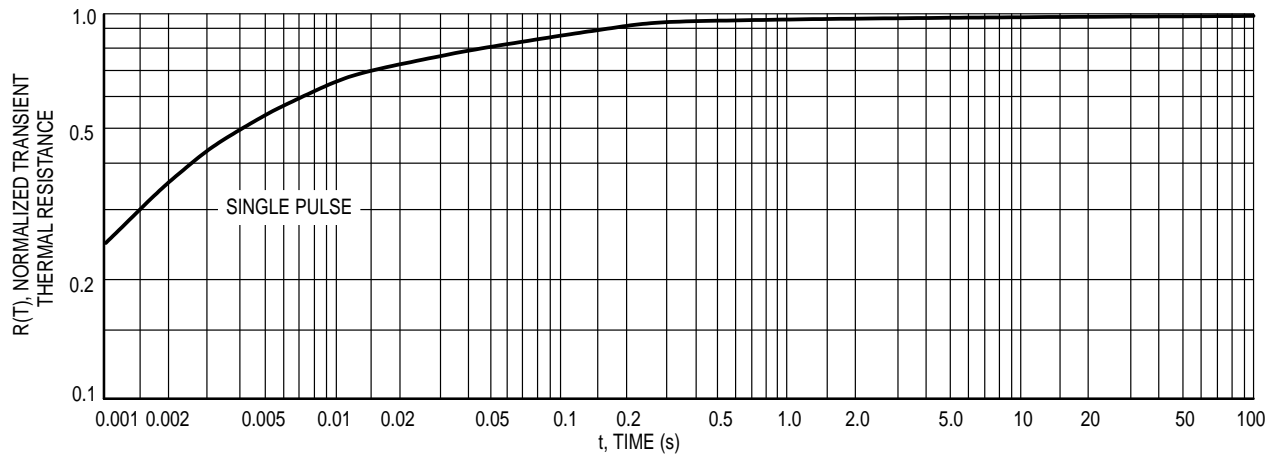


Figure 11. Typical Thermal Response

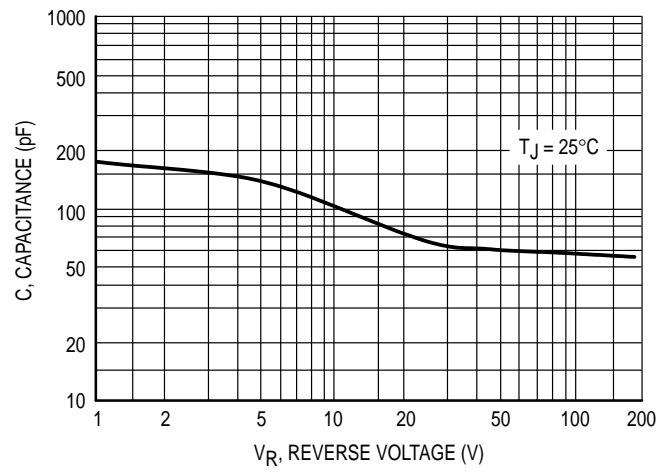
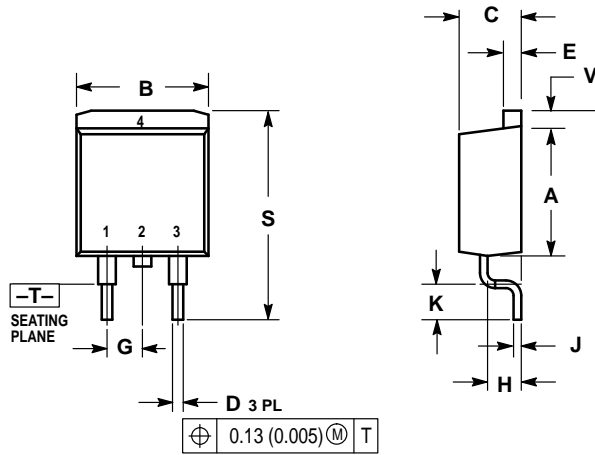


Figure 12. Typical Capacitance

# PACKAGE DIMENSIONS




- NOTES:  
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION: INCH.

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
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
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

**CASE 418B-02  
 ISSUE B**

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