

Advance Information

Power Manager™

Gallium Arsenide Power Rectifier

MGRB1018

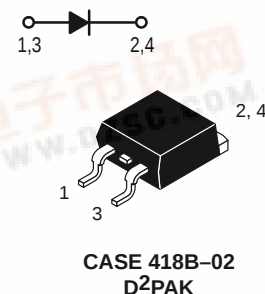
... ideally suited for high frequency power supplies, free wheeling diodes, and as polarity protection diodes, these state-of-the-art devices have the following features:

- Planar Epitaxial Construction
- Nitride Passivation for Stable Blocking Characteristics
- Monolithic Dual Die Available (MGRB2018CT)
- Epoxy Meets UL94, V_0 @ 1/8"
- Hyperfast and Soft Reverse Recovery Over Specified Temperature Range (15 ns)

Mechanical Characteristics

- Weight: 1.9 grams (approximately)
- 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
- Available in 24mm Tape and Reel, 800 units per reel by adding a T4 suffix to the part number
- Marking: MGRB1018

**GALLIUM ARSENIDE
RECTIFIER
10 AMPERES
180 VOLTS**



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	180	V
DC Forward Current ($T_C = 110^\circ\text{C}$)	I_{DC}	10	A
Peak Repetitive Forward Current (At Rated V_R , Square Wave, 20 kHz, $T_C = 85^\circ\text{C}$)	I_{FRM}	20	A
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	I_{FSM}	60	A
Operating Junction Temperature and Storage Temperature	T_J, T_{Stg}	-55 to 175	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance – Junction to Case – Junction to Ambient	$R_{\theta JC}$ $R_{\theta JA}$	4.3 53	$^\circ\text{C/W}$
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ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1), see Figure 2 ($I_F = 10$ A) ($I_F = 5$ A)	V_F	$T_J = 25^\circ\text{C}$ 1.4 1.1	$T_J = 125^\circ\text{C}$ 1.5 1.1	V
Maximum Instantaneous Reverse Current, see Figure 4 ($V_R = 180$ V) ($V_R = 90$ V)	I_R	$T_J = 25^\circ\text{C}$ 25 1	$T_J = 125^\circ\text{C}$ 685 120	μA
Typical Reverse Recovery Time (2) ($V_R = 150$ V, $I_F = 5$ A, $di/dt = 200$ A/ μs) ($V_R = 150$ V, $I_F = 10$ A, $di/dt = 200$ A/ μs)	t_{rr}	$T_J = 25^\circ\text{C}$ 12.6 13	$T_J = 125^\circ\text{C}$ 12.4 12.7	ns
Typical Peak Reverse Recovery Current ($V_R = 150$ V, $I_F = 5$ A, $di/dt = 200$ A/ μs) ($V_R = 150$ V, $I_F = 10$ A, $di/dt = 200$ A/ μs)	I_{RM}	$T_J = 25^\circ\text{C}$ 1.5 1.6	$T_J = 125^\circ\text{C}$ 1.6 1.7	A

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

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

(2) t_{rr} measured projecting from 25% of I_{RM} to ground.



MOTOROLA

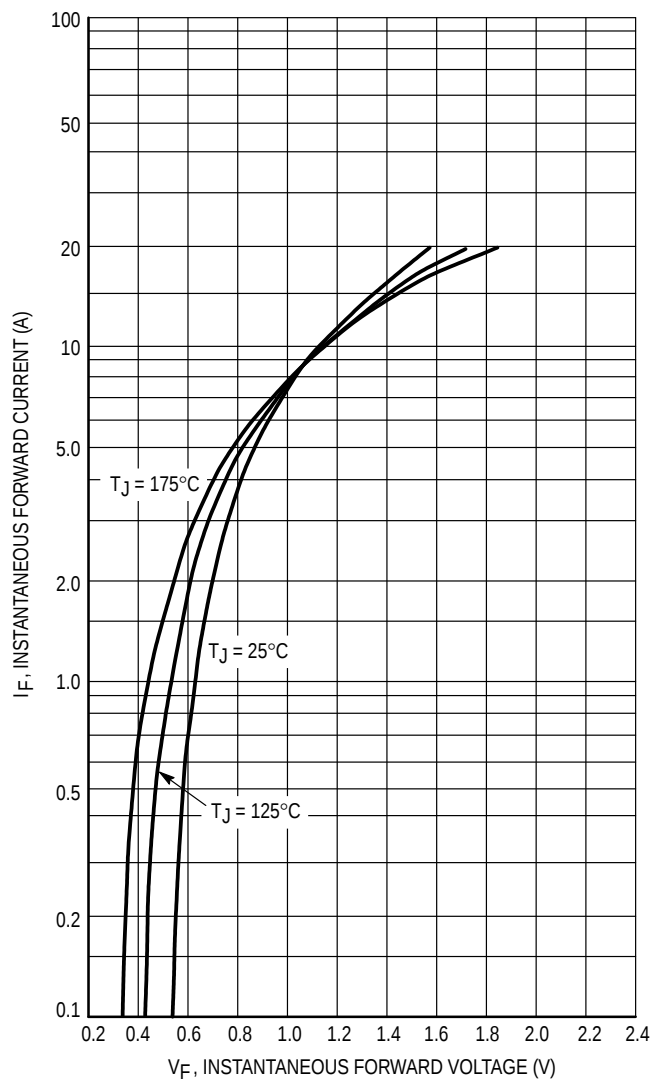


Figure 1. Typical Forward Voltage

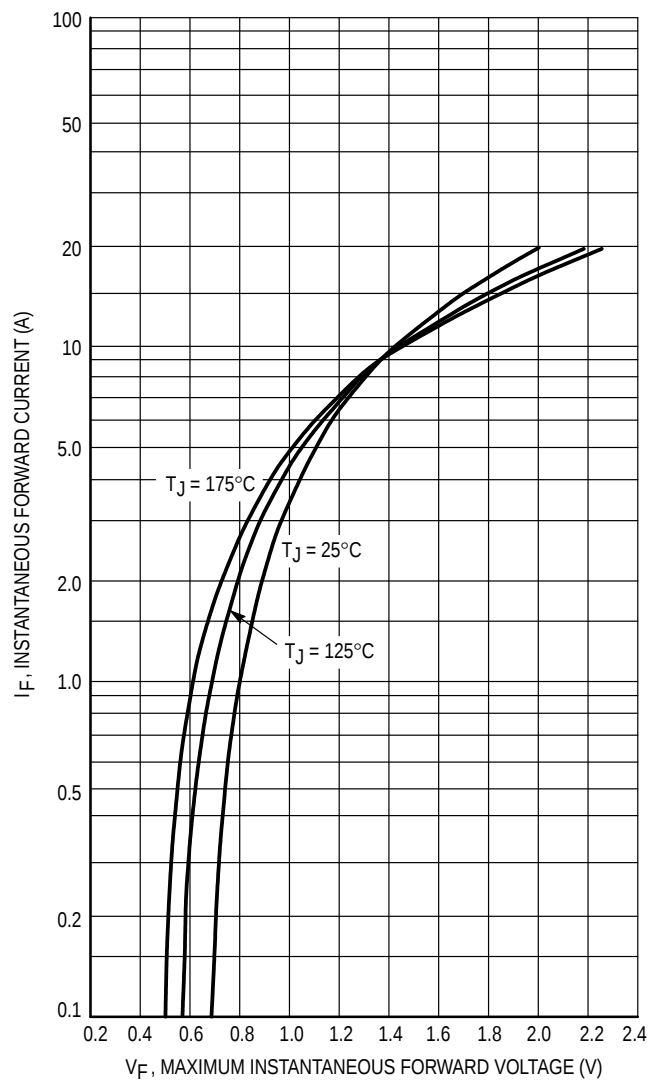


Figure 2. Maximum Forward Voltage

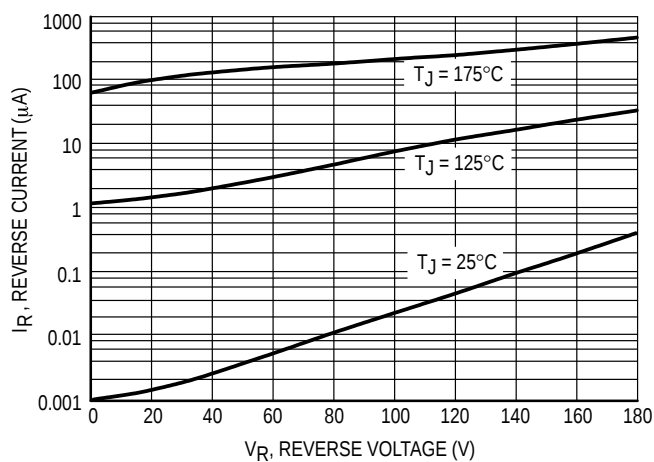


Figure 3. Typical Reverse Current

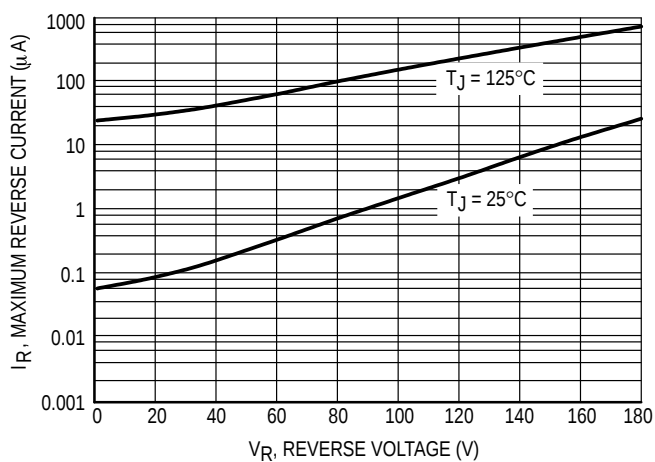


Figure 4. Maximum Reverse Current

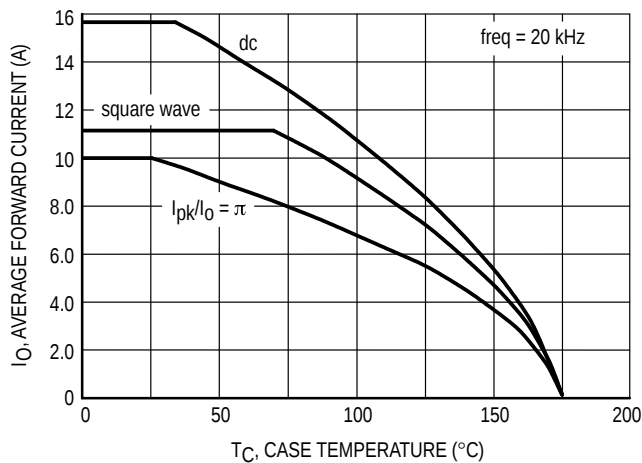


Figure 5. Current Derating Per Leg

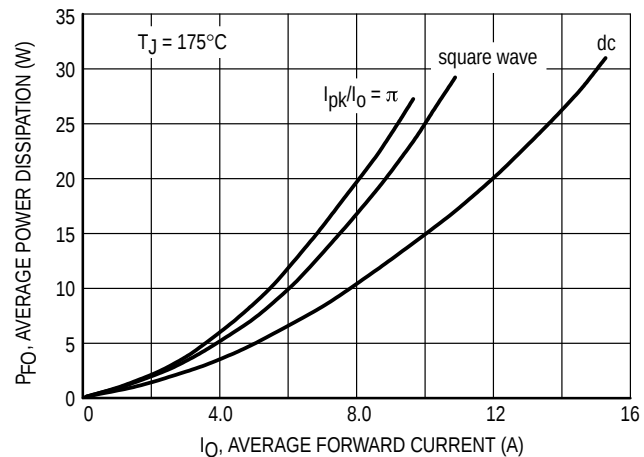


Figure 6. Forward Power Dissipation Per Leg

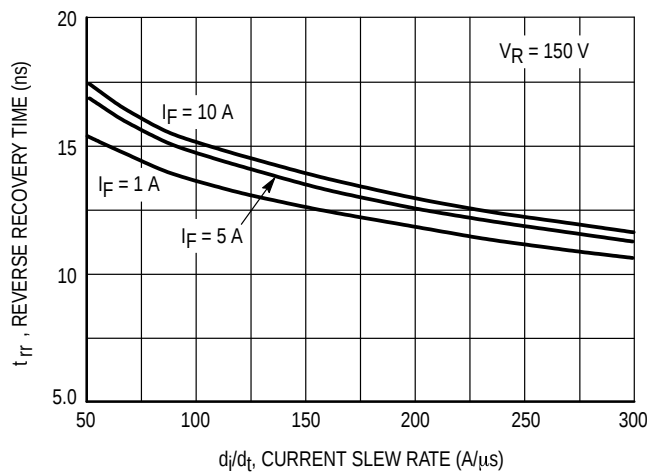


Figure 7. Typical t_{rr} Characteristics, $T_J = 25^{\circ}\text{C}$

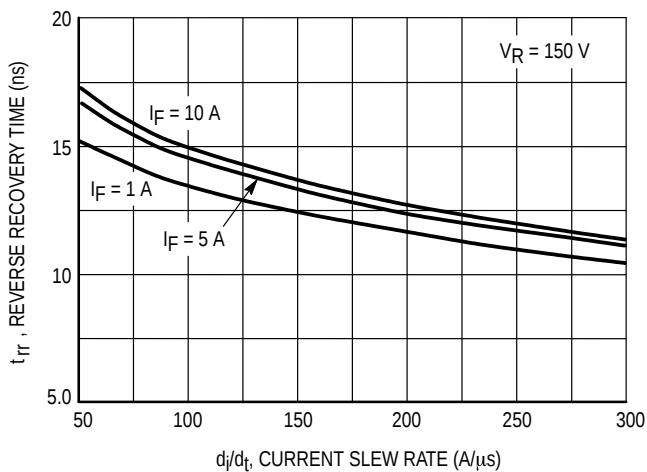


Figure 8. Typical t_{rr} Characteristics, $T_J = 125^{\circ}\text{C}$

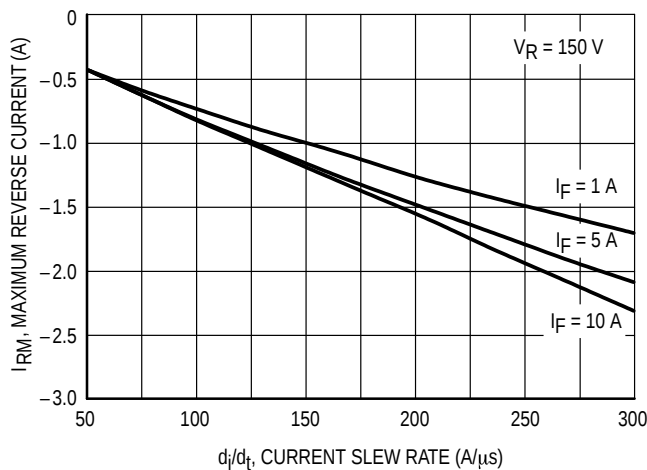


Figure 9. Typical I_{RM} Characteristics, $T_J = 25^{\circ}\text{C}$

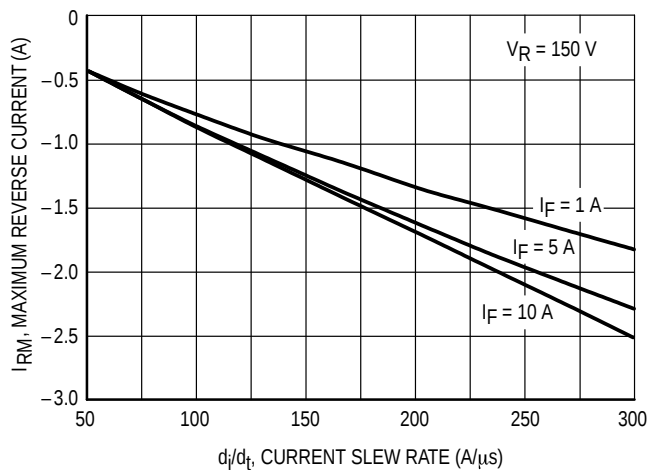


Figure 10. Typical I_{RM} Characteristics, $T_J = 125^{\circ}\text{C}$

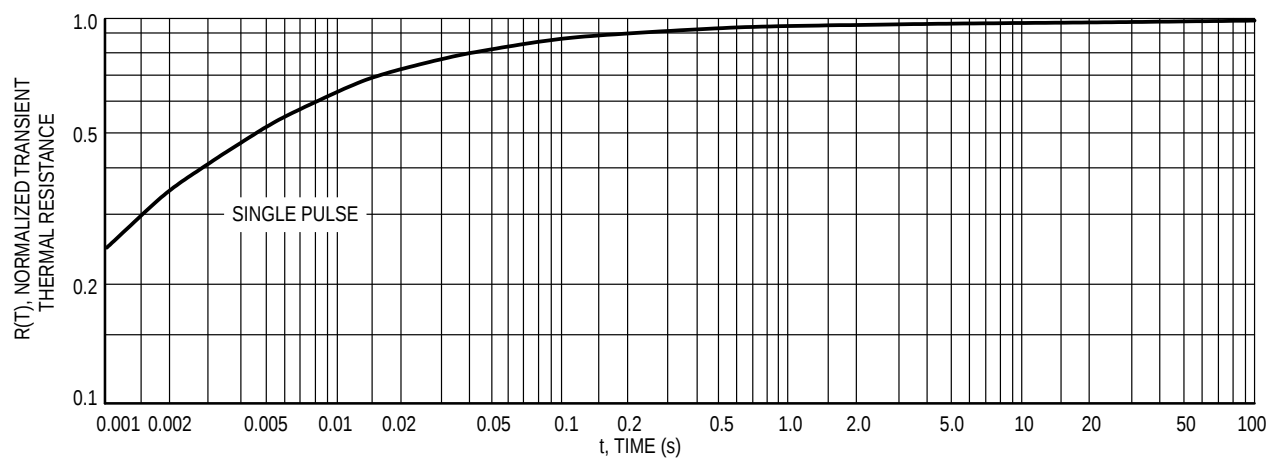


Figure 11. Typical Thermal Response

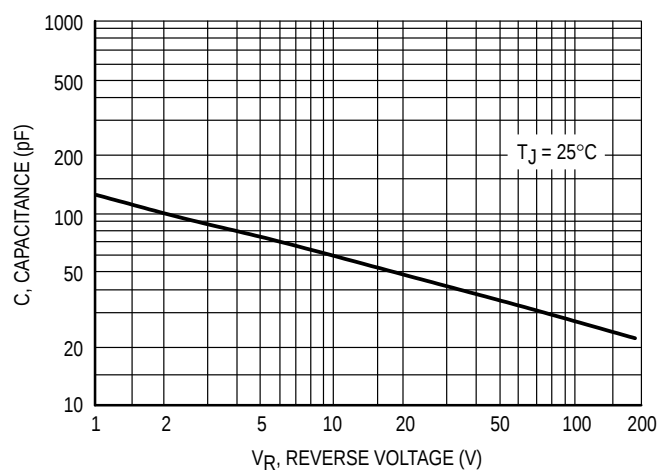
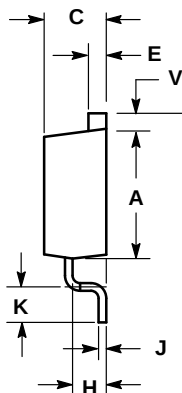
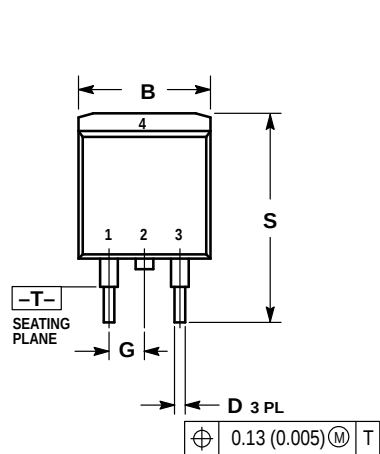


Figure 12. Typical Capacitance

PACKAGE DIMENSIONS



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

- 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

CASE 418B-02
ISSUE B

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