MOTOROLA
SEMICONDUCTOR TECHNICAL DATA

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Product Preview

SWITCHMODE™ Soft Recovery Power Rectifier

D²PAK–SL Straight Lead

MSRB860-1

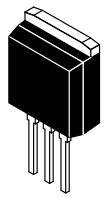
SOFT RECOVERY POWER RECTIFIER 8.0 AMPERES 600 VOLTS

Designed for use as free wheeling diodes in variable speed motor control applications and other average frequency switching power supplies. These state–of–the–art devices have the following features:

- Soft Recovery with Guaranteed Low Reverse Recovery Charge (Q_{RR}) and Peak Reverse Recovery Current (I_{RRM})
- 150°C Operating Junction Temperature
- Epoxy meets UL94, V_O @ 1/8″
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction

Mechanical Characteristics:

- Case: Molded Epoxy
- Weight: 1.9 Grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped in 50 Units per Plastic Tube
- Marking: MSRB860



CASE 418C–01, Style 2
D²PAK–SL

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	600	V
Average Rectified Forward Current (At Rated V_R, T_C = 125°C)	I_O	8.0	A
Peak Repetitive Forward Current (At Rated V_R, Square Wave, 20 kHz, T_C = 125°C)	I_{FRM}	16	A
Non–Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	I_{FSM}	100	A
Storage / Operating Case Temperature	T_{stg}, T_C	– 65 to 150	°C
Operating Junction Temperature	T_J	– 65 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance — Junction–to–Case Thermal Resistance — Junction–to–Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1.6 72.8	°C/W

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1) (I_F = 8.0 A)	V_F	**T_J = 25°C**	**T_J = 150°C**	V
Typical		1.7 *1.4*	1.3 *1.1*	
Maximum Instantaneous Reverse Current (V_R = 600 V)	I_R	**T_J = 25°C**	**T_J = 150°C**	μA
Typical		10 *2.0*	1000 *80*	
Maximum Reverse Recovery Time (2) (V_R = 400 V, I_F = 8.0 A, di/dt = 200 A/μs)	t_{rr}	**T_J = 25°C**	**T_J = 125°C**	ns
Typical		120 *95*	190 *125*	
Typical Recovery Softness Factor (V_R = 400 V, I_F = 8.0 A, di/dt = 200 A/μs)	s = tb/ta	*2.5*	*3.0*	
Typical Peak Reverse Recovery Current (V_R = 400 V, I_F = 8.0 A, di/dt = 200 A/μs)	I_{RRM}	5.8	8.3	A
Typical Reverse Recovery Charge (V_R = 400 V, I_F = 8.0 A, di/dt = 200 A/μs)	Q_{RR}	350	700	nC

This document contains information on a product under development. Motorola reserves the right to change or discontinue this product without notice.

(1) Pulse Test: Pulse Width ≤ 380 μs, Duty Cycle ≤ 2%
(2) T_{RR} measured projecting from 25% of I_{RRM} to zero current

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TYPICAL ELECTRICAL CHARACTERISTICS

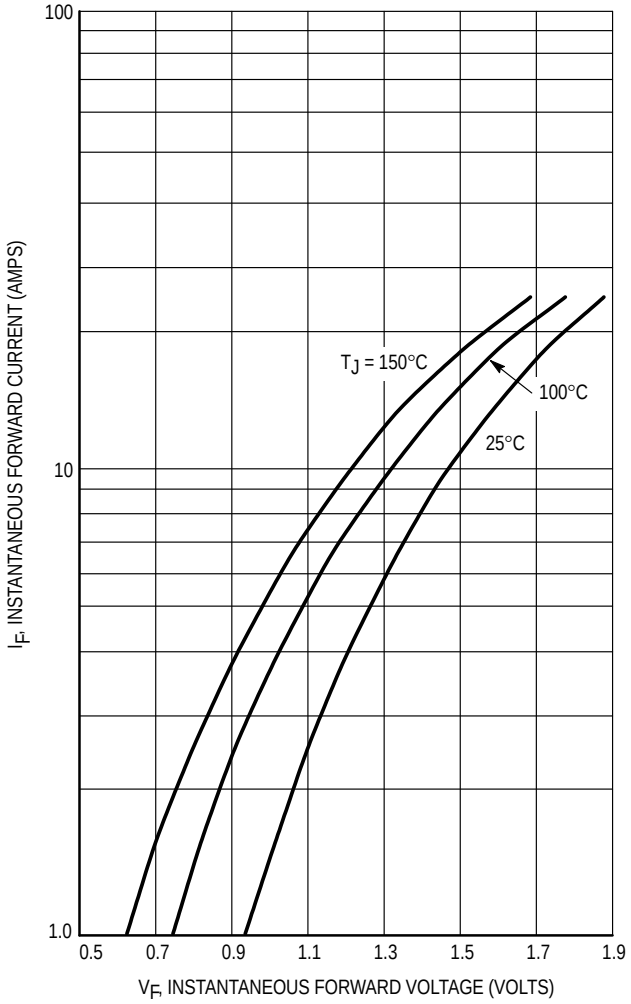


Figure 1. Typical Forward Voltage

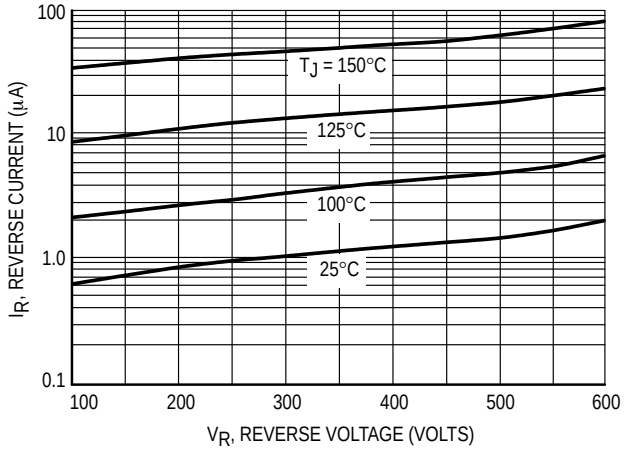


Figure 2. Typical Reverse Current

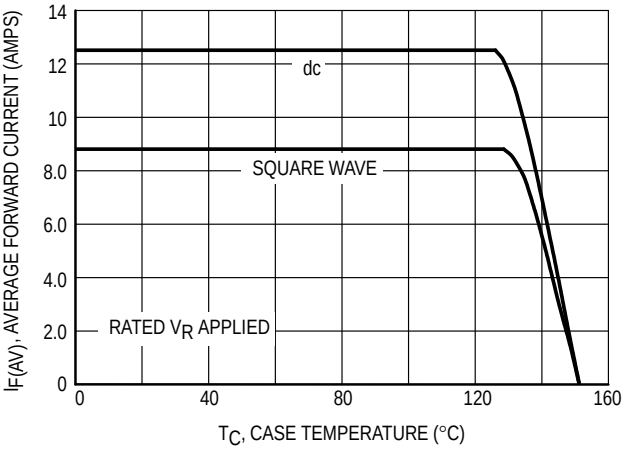


Figure 3. Current Derating, Case

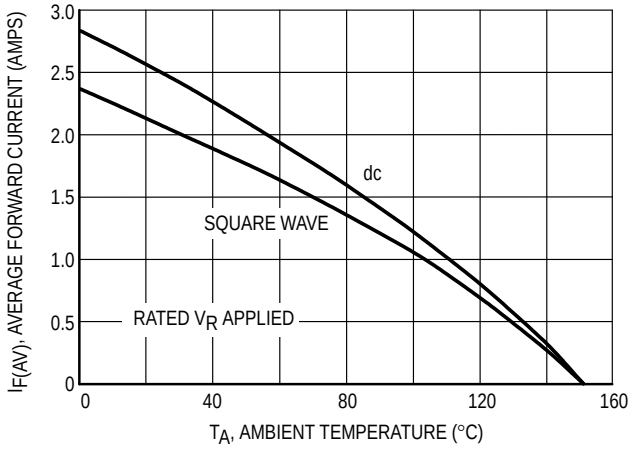


Figure 4. Current Derating, Ambient

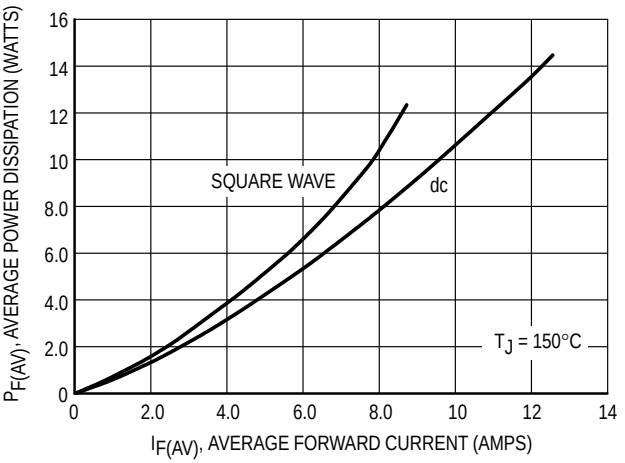


Figure 5. Power Dissipation

TYPICAL ELECTRICAL CHARACTERISTICS

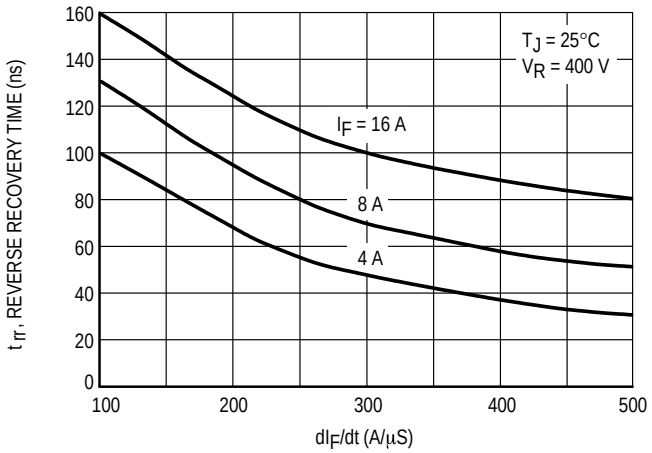


Figure 6. Typical Reverse Recovery Time

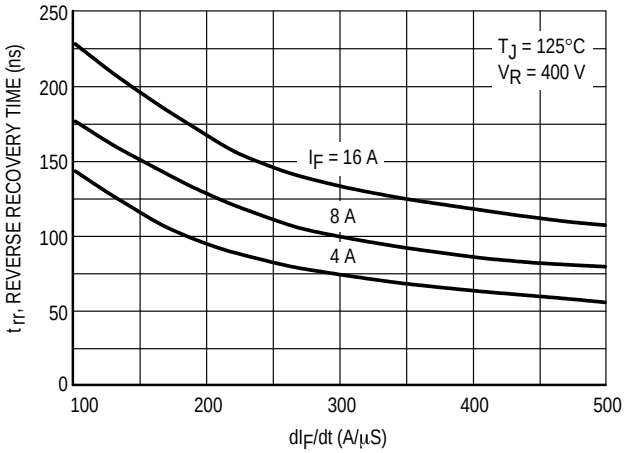


Figure 7. Typical Reverse Recovery Time

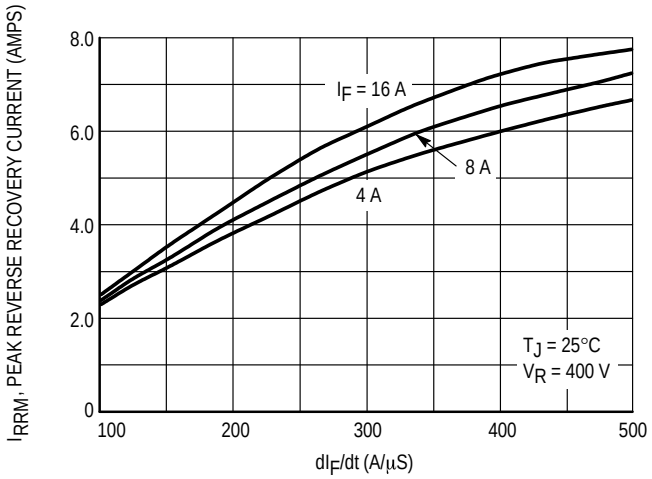


Figure 8. Typical Peak Reverse Recovery Current

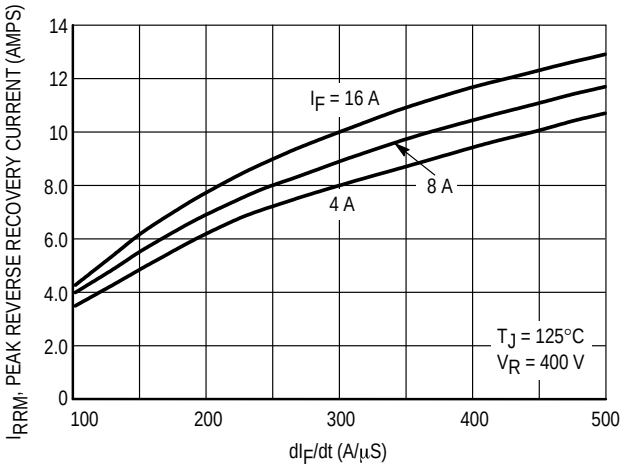


Figure 9. Typical Peak Reverse Recovery Current

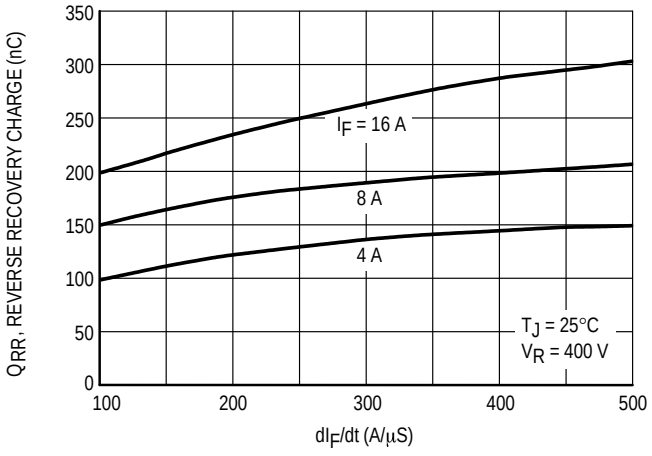


Figure 10. Typical Reverse Recovery Charge

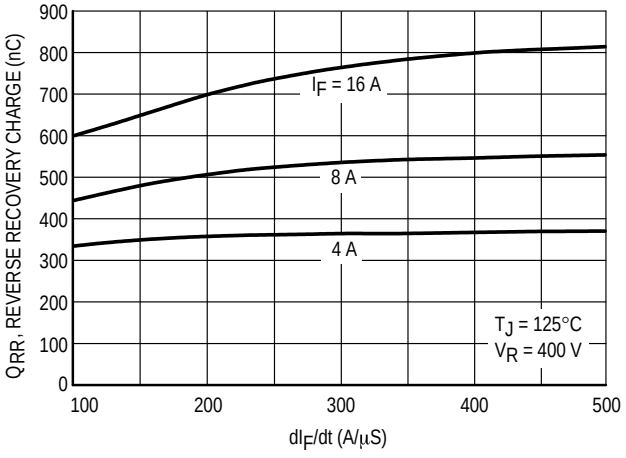


Figure 11. Typical Reverse Recovery Charge

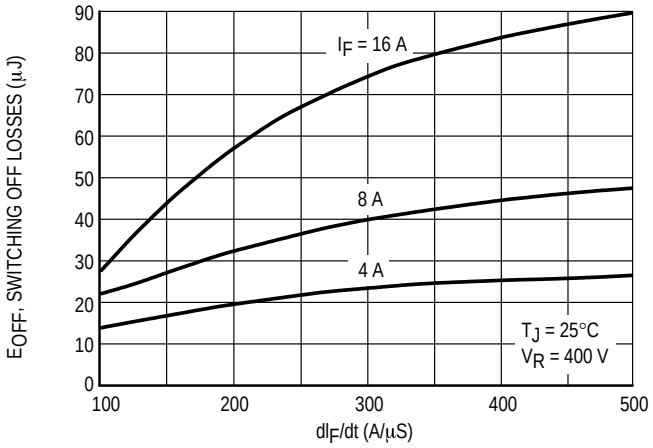


Figure 12. Typical Switching Off Losses

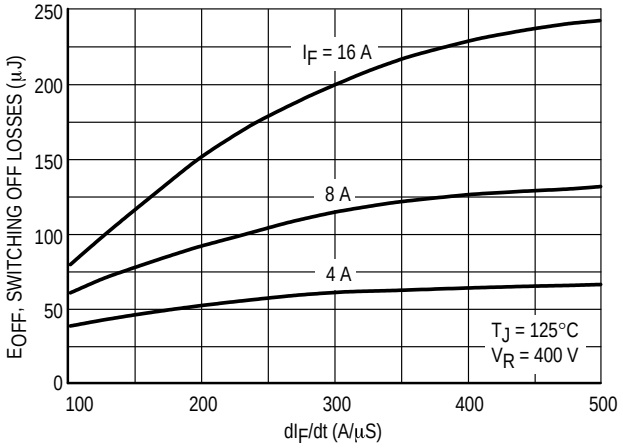


Figure 13. Typical Switching Off Losses

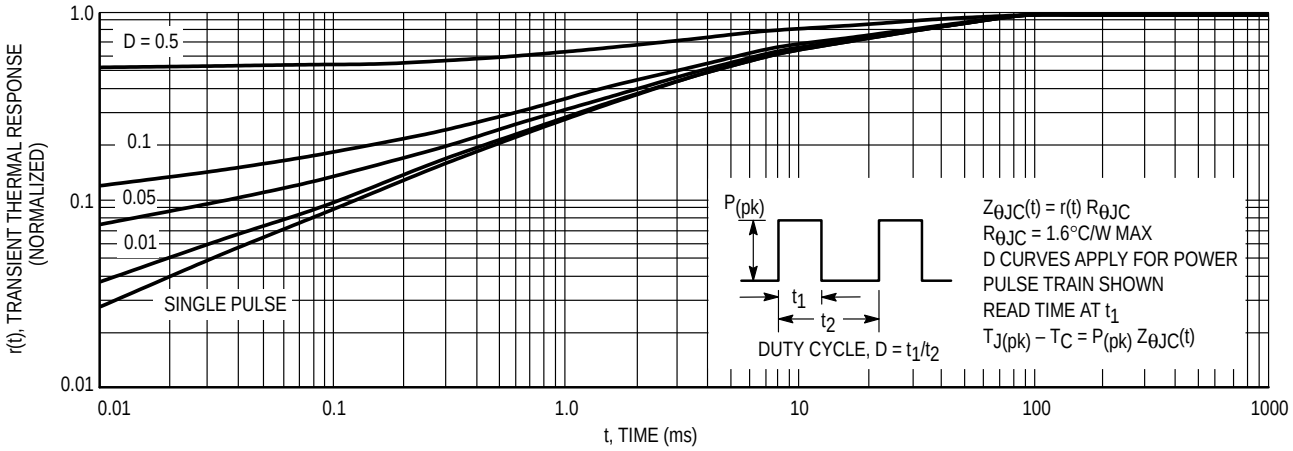
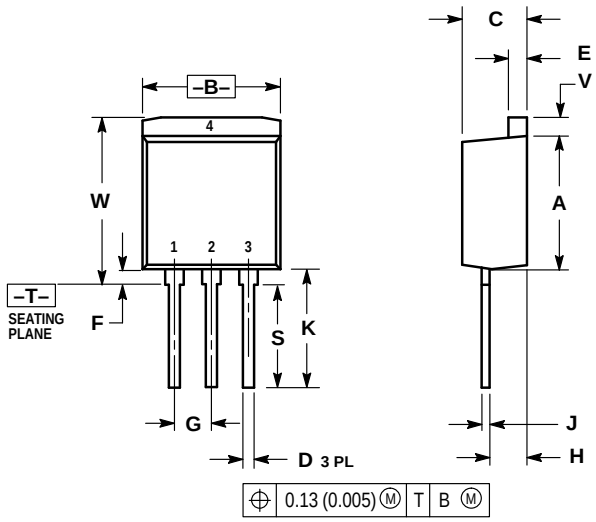


Figure 14. Thermal Response

PACKAGE DIMENSIONS



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

	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	0.039 REF		1.00 REF	
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	0.280	0.360	7.11	9.14
S	0.276 REF		7.00 REF	
V	0.045	0.055	1.14	1.40
W	0.423	0.462	10.75	11.75

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

CASE 418C–01
ISSUE O

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