# SWITCHMODE™ Soft Recovery Power Rectifier Plastic TO-220 Package

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:

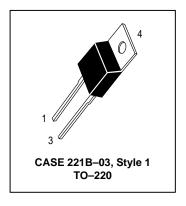
- Soft Recovery with Guaranteed Low Reverse Recovery Charge (QRR) and Peak Reverse Recovery Current (IRRM)
- 150°C Operating Junction Temperature
- Popular TO-220 Package
- Epoxy meets UL94, Vo @ 1/8"
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction

#### **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: MSR860

# **MSR860**

SOFT RECOVERY POWER RECTIFIER 8.0 AMPERES 600 VOLTS



#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit V	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	VRRM VRWM VR	600		
Average Rectified Forward Current (At Rated V <sub>R</sub> , T <sub>C</sub> = 125°C)	lo	8.0	Α	
Peak Repetitive Forward Current (At Rated V <sub>R</sub> , Square Wave, 20 kHz, T <sub>C</sub> = 125°C)	IFRM	16	Α	
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	IFSM	100	Α	
Storage / Operating Case Temperature	T <sub>stg</sub> , T <sub>C</sub>	- 65 to 150	°C	
Operating Junction Temperature	TJ	- 65 to 150	°C	

#### THERMAL CHARACTERISTICS

Thermal Resistance — Junction–to–Case	R <sub>0</sub> JC	1.6	°C/W	l
Thermal Resistance — Junction-to-Ambient	$R_{\theta JA}$	72.8		

## **ELECTRICAL CHARACTERISTICS**

Maximum Instantaneous Forward Voltage (1) (I <sub>F</sub> = 8.0 A)	٧F	T <sub>J</sub> = 25°C	T <sub>J</sub> = 150°C	V
Typical		1.7 1.4	1.3 1.1	
Maximum Instantaneous Reverse Current (V <sub>R</sub> = 600 V)	IR	T <sub>J</sub> = 25°C	T <sub>J</sub> = 150°C	μΑ
Typical		10 2.0	1000 <i>80</i>	
Maximum Reverse Recovery Time (2) (V <sub>R</sub> = 400 V, I <sub>F</sub> = 8.0 A, di/dt = 200 A/μs)	t <sub>rr</sub>	T <sub>J</sub> = 25°C	T <sub>J</sub> = 125°C	ns
		120	190	l '
Typical		95	190 125	
Typical  Typical Recovery Softness Factor (V <sub>R</sub> = 400 V, I <sub>F</sub> = 8.0 A, di/dt = 200 A/μs)	s = tb/ta			
77	s = tb/ta	95	125	A

<sup>(1)</sup> Pulse Test: Pulse Width ≤ 380 µs, Duty Cycle ≤ 2%

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<sup>(2)</sup> TRR measured projecting from 25% of IRRM to zero current

## TYPICAL ELECTRICAL CHARACTERISTICS

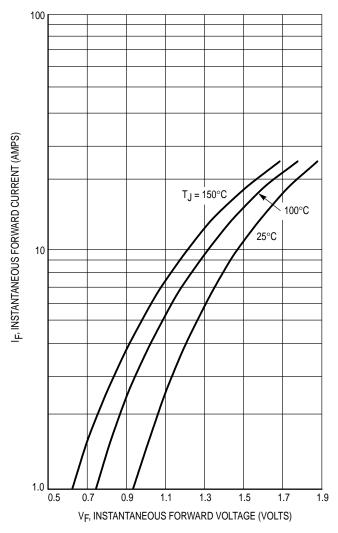


Figure 1. Typical Forward Voltage

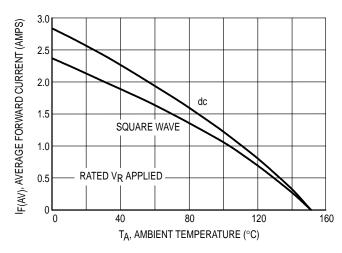
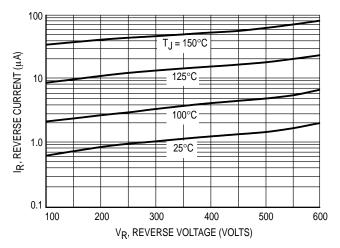


Figure 4. Current Derating, Ambient



**Figure 2. Typical Reverse Current** 

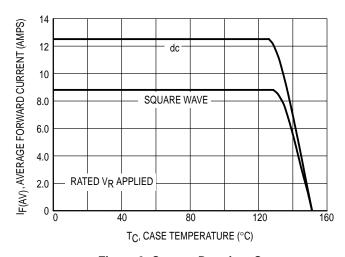


Figure 3. Current Derating, Case

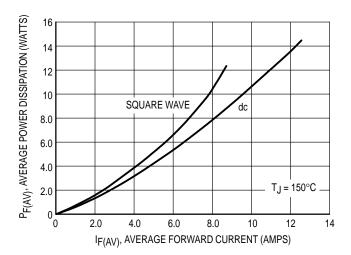
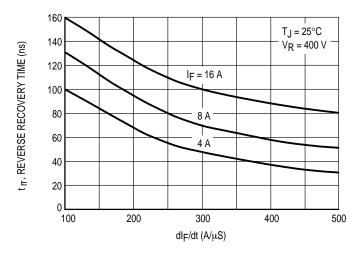


Figure 5. Power Dissipation

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## TYPICAL ELECTRICAL CHARACTERISTICS



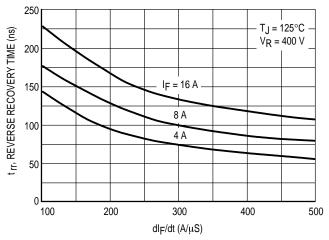
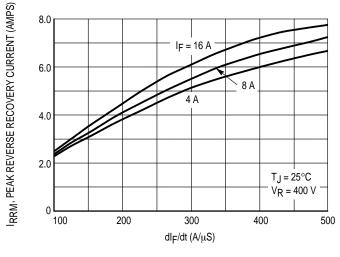


Figure 6. Typical Reverse Recovery Time

Figure 7. Typical Reverse Recovery Time



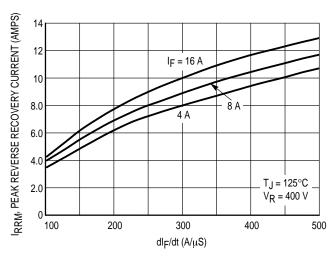
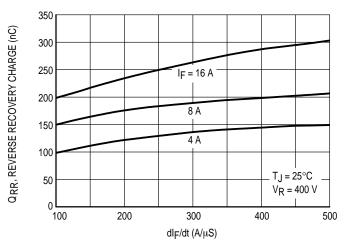


Figure 8. Typical Peak Reverse Recovery Current

Figure 9. Typical Peak Reverse Recovery Current



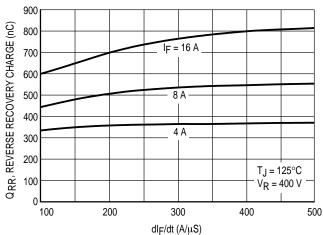
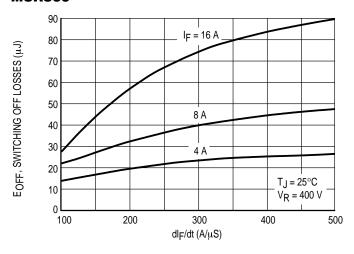


Figure 10. Typical Reverse Recovery Charge

Figure 11. Typical Reverse Recovery Charge

# **MSR860**



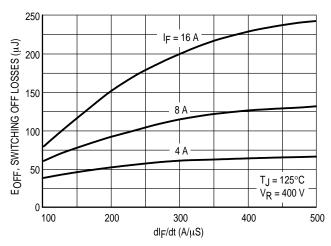


Figure 12. Typical Switching Off Losses

Figure 13. Typical Switching Off Losses

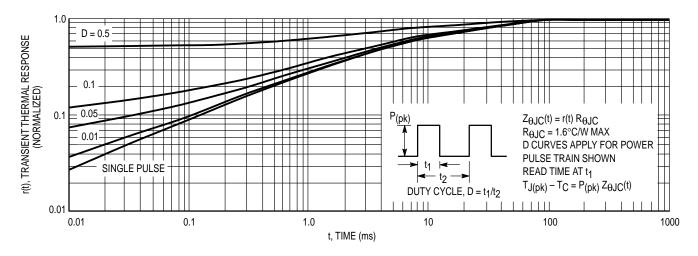
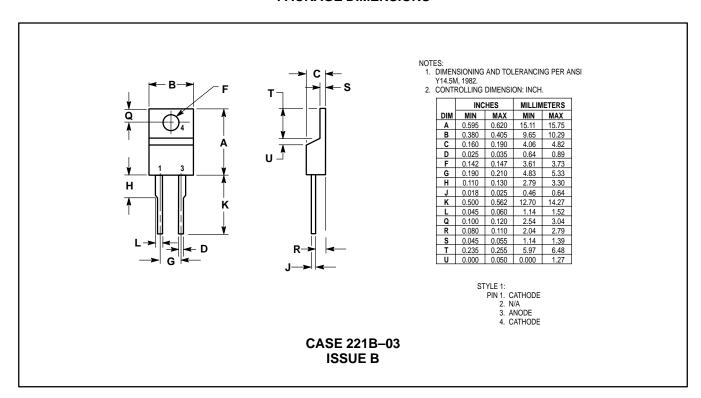


Figure 14. Thermal Response

## **PACKAGE DIMENSIONS**



#### **MSR860**

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