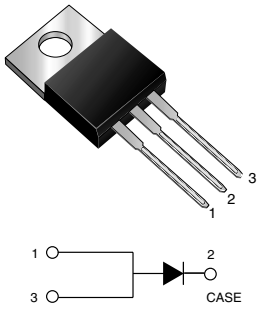
High-Voltage Trench MOS Barrier Schottky Rectifier

TO-220AB



MAJOR RATINGS AND CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	35 V, 45 V
I_{FSM}	200 A
V_F at I_F = 20 A	0.55 V
T_j max.	150 °C

FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Solder Dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, free-wheeling diodes, dc-to-dc converters or polarity protection applications.

MECHANICAL DATA

Case: TO-220AB

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
E3 suffix for commercial grade

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**M2035S**	**M2045S**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	V
Maximum average forward rectified current (see Fig. 1)	$I_{F(AV)}$	20		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200		A
Peak repetitive reverse current per leg at t_p = 2 µs, 1 kHz	I_{RRM}	2.0		A
Voltage rate of change (rated V_R)	dv/dt	10000		V/µs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage (1)	at I_F = 10 A at I_F = 20 A	T_j = 25 °C	V_F	0.52 0.62	- 0.70	V
	at I_F = 10 A at I_F = 20 A	T_j = 125 °C		0.42 0.55	- 0.61	
Maximum reverse current at rated V_R (1)		T_j = 25 °C T_j = 125 °C	I_R	80 24	200 35	µA mA
Typical junction capacitance	at 4.0 V, 1 MHz		C_J	700		pF

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**M2035S**	**M2045S**	**UNIT**
Typical thermal resistance	$R_{\theta JC}$	2.0		°C/W

ORDERING INFORMATION				
PREFERRED P/N	**UNIT WEIGHT (G)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
M2045S-E3/4W	1.877	4W	50/Tube	Tube

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

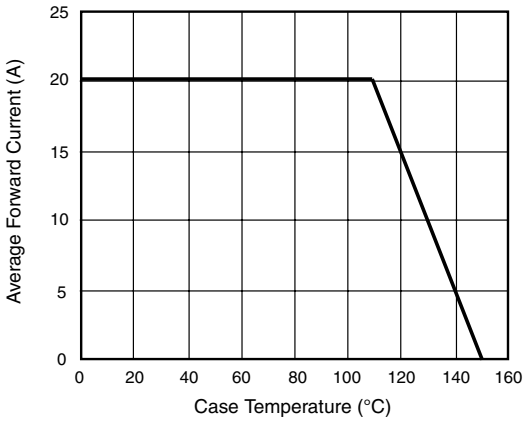


Figure 1. Forward Current Derating Curve

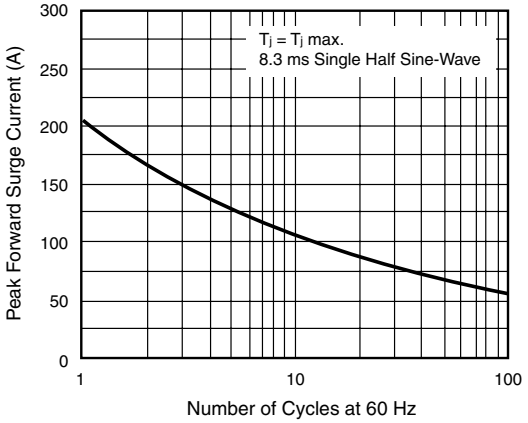


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

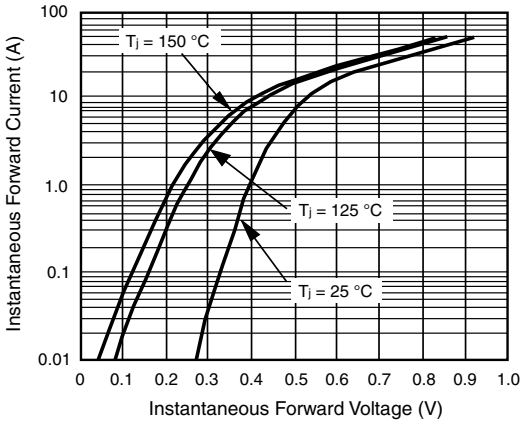


Figure 3. Typical Instantaneous Forward Characteristics

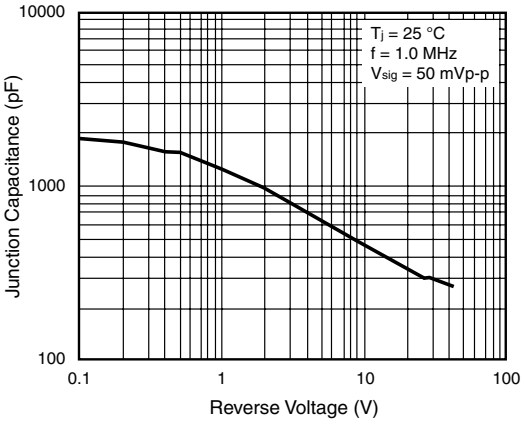


Figure 5. Typical Junction Capacitance

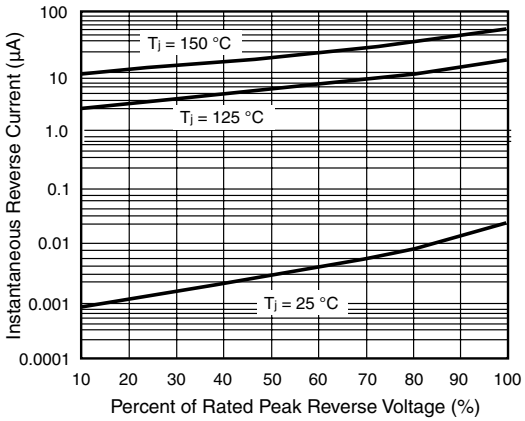
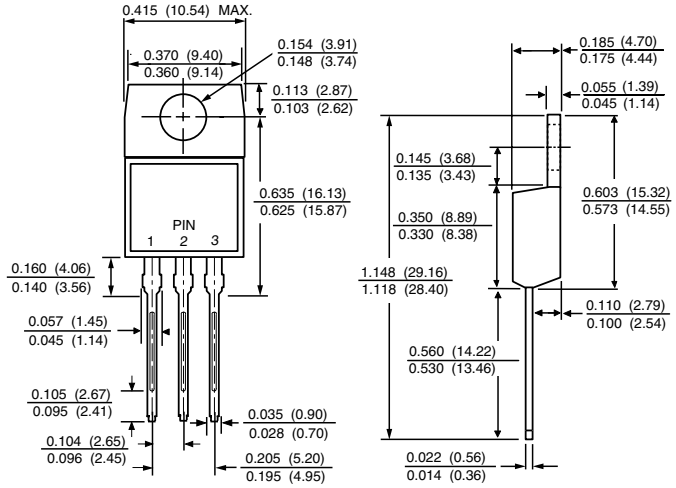


Figure 4. Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



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