

# MBRS410ET3

Preferred Device

## Surface Mount Schottky Power Rectifier

This device employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency rectification, or as free wheeling and polarity protection diodes, in surface mount applications where compact size and weight are critical to the system. Typical applications are AC-DC and DC-DC converters, reverse battery protection, and “ORing” of multiple supply voltages and any other application where performance and size are critical.

### Features

- Very Low  $V_F$  Accompanied by Low  $I_R$
- 1st in the Market Place with a 10  $V_R$  Schottky Rectifier
- Small Compact Surface Mountable Package with J-Bend Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Designed for Low Leakage
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guard-Ring for Stress Protection
- Pb-Free Package is Available

### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 217 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Notch in Plastic Body Indicates Cathode Lead
- ESD Ratings: Machine Model = C  
Human Body Model = 3B

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	10	V
Average Rectified Forward Current (@ $T_L = 130^\circ\text{C}$ )	$I_O$	4.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	250	A
Operating Junction Temperature	$T_J$	-65 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



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**SCHOTTKY BARRIER  
RECTIFIERS  
4.0 AMPERES, 10 VOLTS**



SMC  
CASE 403  
PLASTIC

### MARKING DIAGRAM



B4E1 = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping†
MBRS410ET3	SMC	2500/Tape & Reel
MBRS410ET3G	SMC (Pb-Free)	2500/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

# MBRS410ET3

## THERMAL CHARACTERISTICS

Characteristic	Symbol	5 mm x 5 mm (Note 2)	1 Inch x 1/2 inch	Unit
Thermal Resistance, Junction-to-Lead	$R_{\theta JL}$	12	7.0	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	109	59	

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 1)  ( $I_F = 2.0$ A) ( $I_F = 4.0$ A) ( $I_F = 8.0$ A)	$V_F$	$T_J = 25^{\circ}C$	$T_J = 100^{\circ}C$	V
		0.475	0.370	
		0.500	0.395	
Maximum Instantaneous Reverse Current (Note 1)  (Rated dc Voltage, $V_R = 5.0$ V) (Rated dc Voltage, $V_R = 10$ V)	$I_R$	$T_J = 25^{\circ}C$	$T_J = 100^{\circ}C$	$\mu A$
		50	2000	
		150	4000	

1. Pulse Test: Pulse Width  $\leq 300 \mu s$ , Duty Cycle  $\leq 2\%$ .
2. Mounted with Minimum Recommended Pad Size, PC Board FR4.

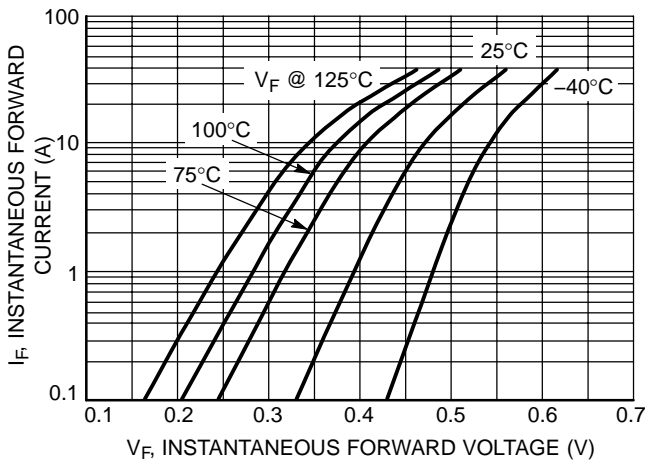


Figure 1. Typical Forward Voltage

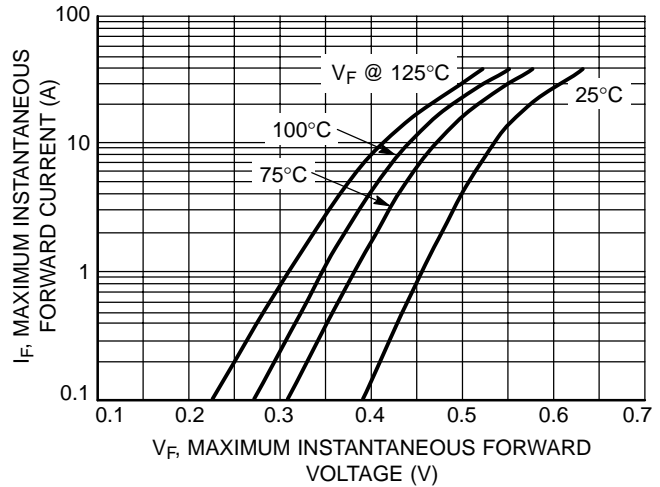


Figure 2. Maximum Forward Voltage

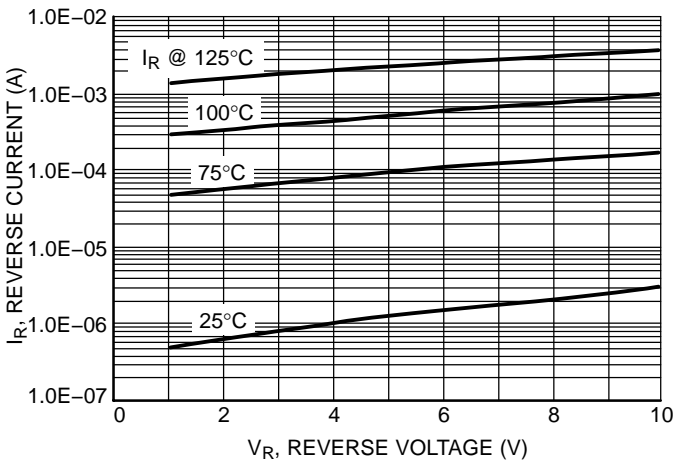


Figure 3. Typical Reverse Current

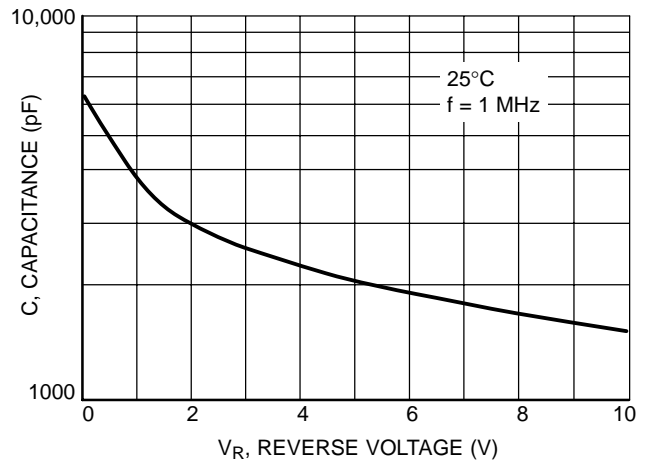


Figure 4. Typical Capacitance

# MBRS410ET3

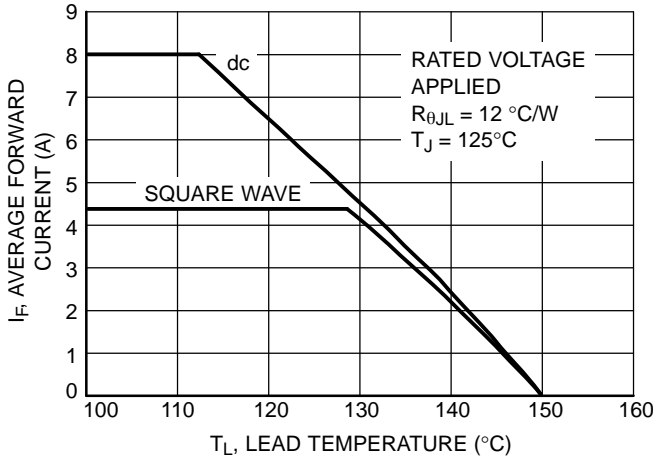


Figure 5. Current Derating, Junction-to-Lead

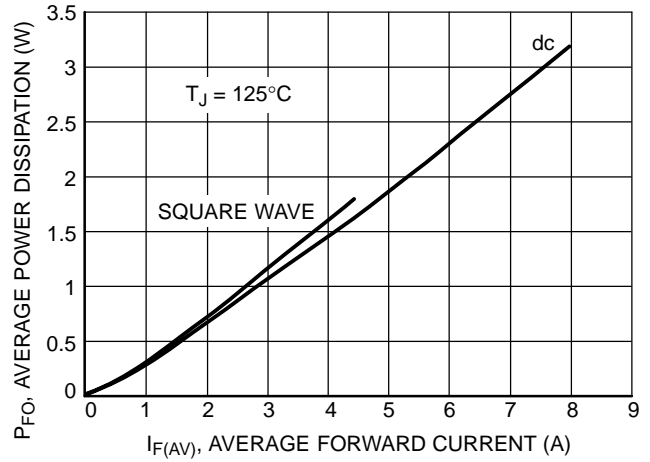


Figure 6. Forward Power Dissipation

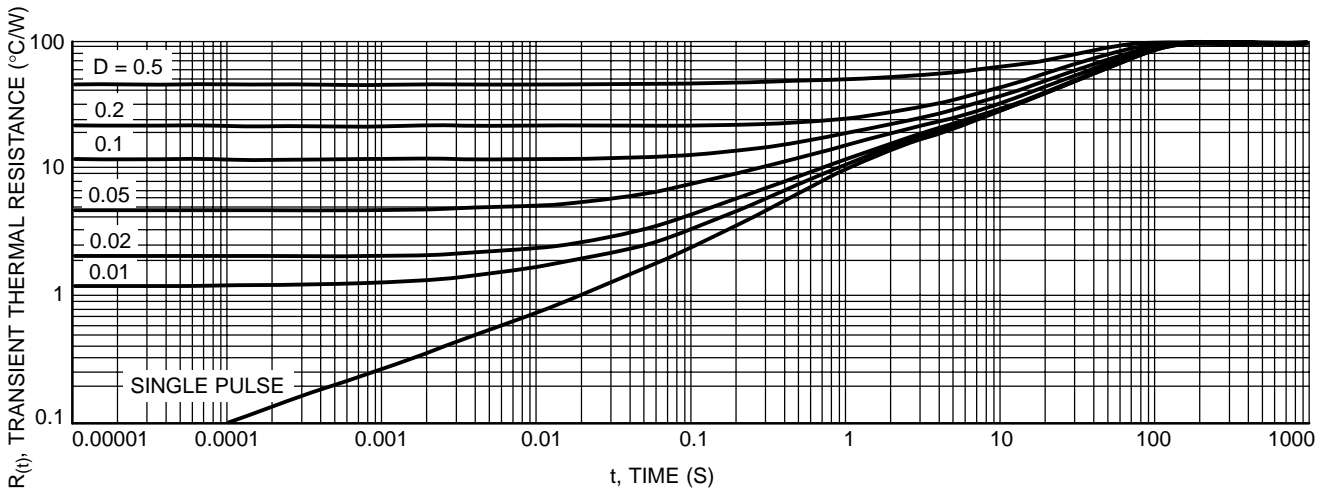


Figure 7. Thermal Response, Junction-to-Ambient (min pad)

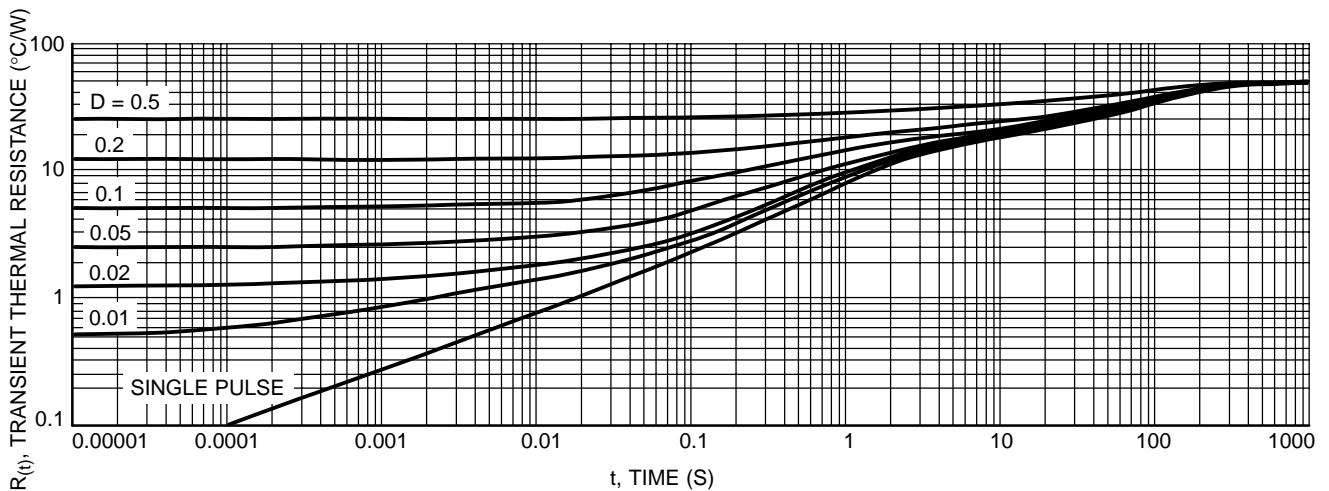
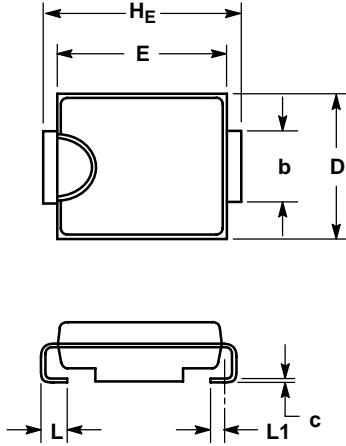


Figure 8. Thermal Response, Junction-to-Ambient (1 inch pad)

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## PACKAGE DIMENSIONS

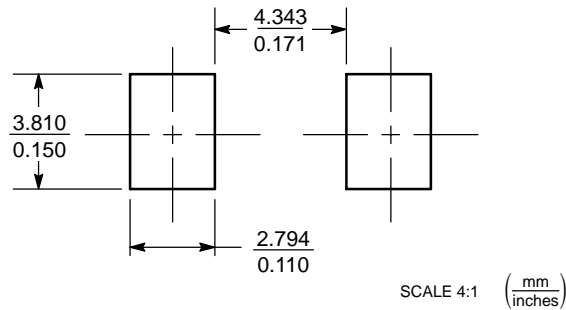
SMC  
PLASTIC PACKAGE  
CASE 403-03  
ISSUE E




- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.  
4. 403-01 THRU -02 OBSOLETE, NEW STANDARD 403-03.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.90	2.13	2.41	0.075	0.084	0.095
A1	0.05	0.10	0.15	0.002	0.004	0.006
b	2.92	3.00	3.07	0.115	0.118	0.121
c	0.15	0.23	0.30	0.006	0.009	0.012
D	5.59	5.84	6.10	0.220	0.230	0.240
E	6.60	6.86	7.11	0.260	0.270	0.280
HE	7.75	7.94	8.13	0.305	0.313	0.320
L	0.76	1.02	1.27	0.030	0.040	0.050
L1	0.51 REF			0.020 REF		

## SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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