

**HIGH EFFICIENCY POWER SCHOTTKY RECTIFIER****MBR2045C****General Description**

High efficiency dual Schottky rectifier suited for switch mode power supplies and other power converters. This device is intended for use in medium voltage operation, and particularly, in high frequency circuits where low switching losses and low noise are required.

MBR2045C is available in TO-220-3 and TO-220F-3 packages.

**Features**

- Low Forward Voltage: 0.57V @125°C
- Low Power Loss/High Efficiency
- 150°C Operating Junction Temperature
- 20 A Total (10A Each Diode Leg)
- Guard-Ring for Stress Protection
- High Surge Capacity
- Pb-Free Package

**Applications**

- Power Supply Output Rectification
- Power Management
- Instrumentation

**Main Product Characteristics**

$I_{F(AV)}$	2*10A
$V_{RRM}$	45V
$T_J$	150°C
$V_{F(max)}$	0.57V

**Mechanical Characteristics**

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight (Approximately):  
1.9 Grams (TO-220-3, TO-220F-3)
- Finish: All External Surfaces Corrosion Resistant and Terminal
- Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Maximum for 10 Seconds

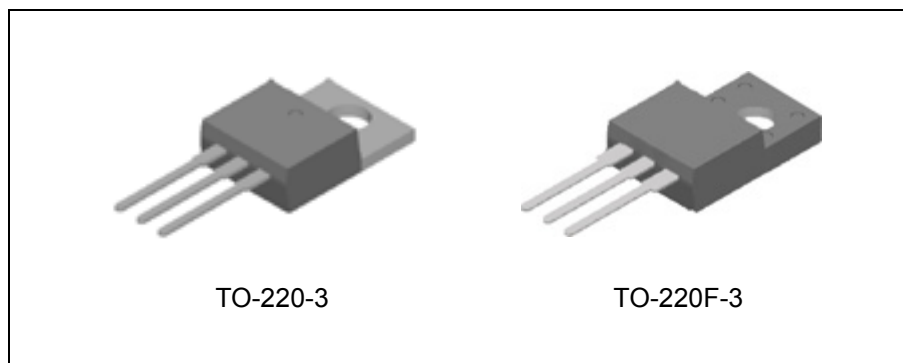
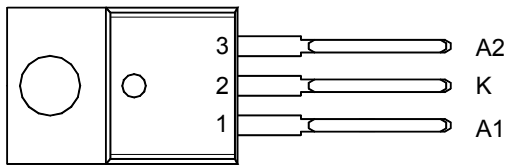


Figure 1. Package Types of MBR2045C

**Pin Configuration**

T/TFPackage  
(TO-220-3/TO-220F-3)



(Front View)

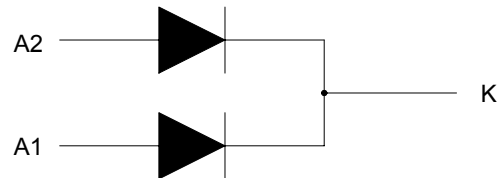
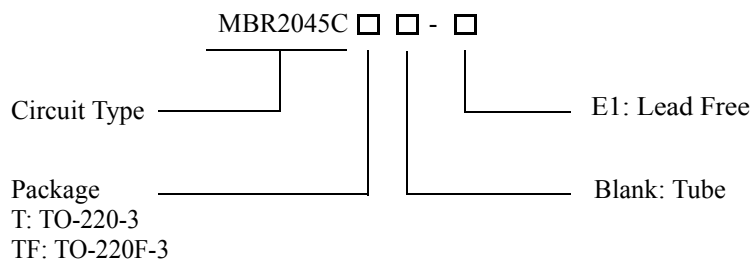


Figure 2. Pin Configuration of MBR2045C

Figure 3. Internal Structure of MBR2045C

**Ordering Information**



Package	Part Number	Marking ID	Packing Type
TO-220-3	MBR2045CT-E1	MBR2045CT-E1	Tube
TO-220F-3	MBR2045CTF-E1	MBR2045CTF-E1	Tube

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

**HIGH EFFICIENCY POWER SCHOTTKY RECTIFIER****MBR2045C****Absolute Maximum Ratings (Each Diode Leg) (Note 1)**

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	45	V
Average Rectified Forward Current (Rated $V_R$ ) $T_C=139^\circ\text{C}$	$I_{F(AV)}$	10	A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz) $T_C=137^\circ\text{C}$	$I_{FRM}$	20	A
Non Repetitive Peak Surge Current (Surge applied at rated load conditions half wave, single phase, 60 Hz)	$I_{FSM}$	150	A
Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0kHz)	$I_{RRM}$	1.0	A
Operating Junction Temperature (Note 2)	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to 150	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	10000	V/ $\mu\text{s}$
ESD (Machine Model=C)		>400	V
ESD (Human Body Model=3B)		>8000	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Note 2: The heat generated must be less than the thermal conductivity from Junction to Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .

**Thermal Characteristics**

Parameter	Symbol	Condition	Value	Unit	
Maximum Thermal Resistance	$R_{\theta JC}$	Junction to Case	TO-220-3	2.2	$^\circ\text{C}/\text{W}$
			TO-220F-3	4.5	
	$R_{\theta JA}$	Junction to Ambient	TO-220-3	60	

**HIGH EFFICIENCY POWER SCHOTTKY RECTIFIER****MBR2045C****Electrical Characteristics (Each Diode Leg)**

Parameter	Condition	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage Drop (Note 3)	$I_F=10\text{ A}, T_C=25^\circ\text{C}$	$V_F$	0.59	0.65	V
	$I_F=10\text{ A}, T_C=125^\circ\text{C}$		0.50	0.57	
	$I_F=20\text{ A}, T_C=25^\circ\text{C}$		0.71	0.84	
	$I_F=20\text{ A}, T_C=125^\circ\text{C}$		0.67	0.72	
Maximum Instantaneous Reverse Current (Note 3)	Rated DC Voltage, $T_C=125^\circ\text{C}$	$I_R$	5	15	mA
	Rated DC Voltage, $T_C=25^\circ\text{C}$		0.01	0.1	

Note 3: Pulse Test: Pulse Width=300 $\mu$ s, Duty Cycle $\leq$ 2.0%.



**Typical Performance Characteristics**

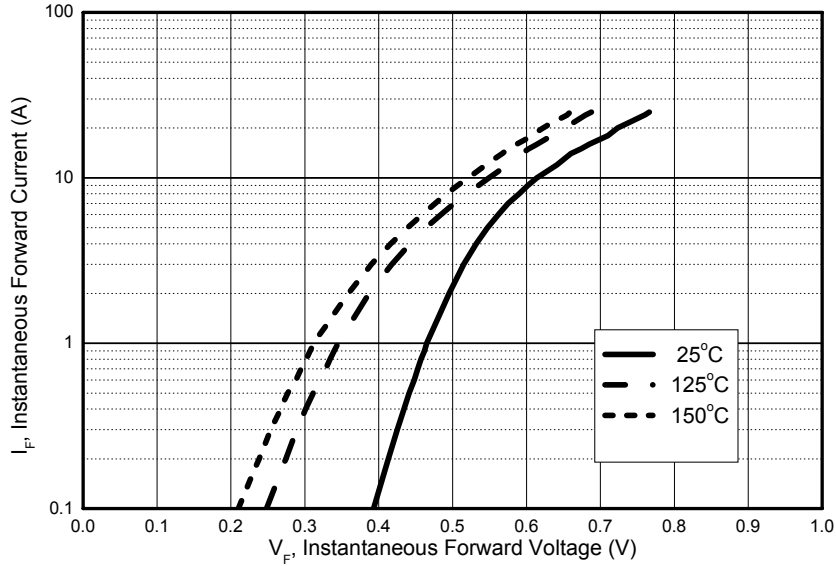


Figure 4. Typical Forward Voltage

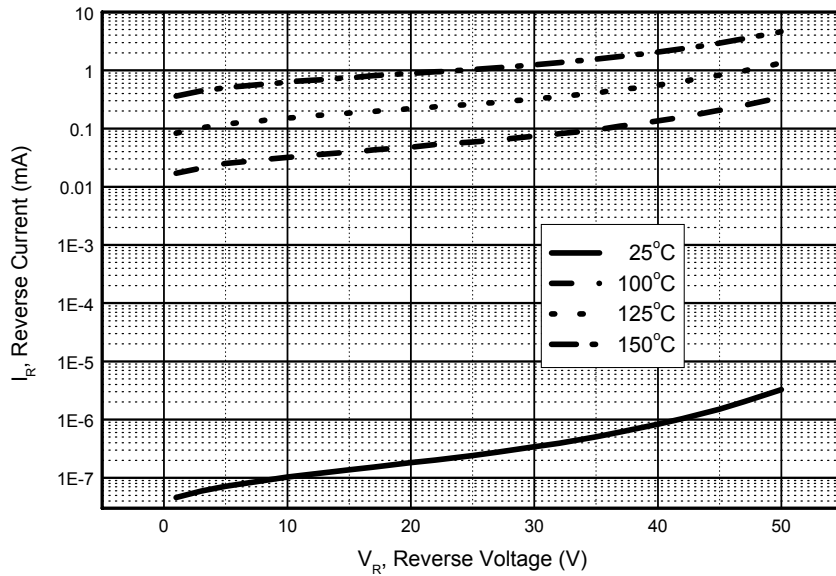


Figure 5. Typical Reverse Current



**Typical Performance Characteristics (Continued)**

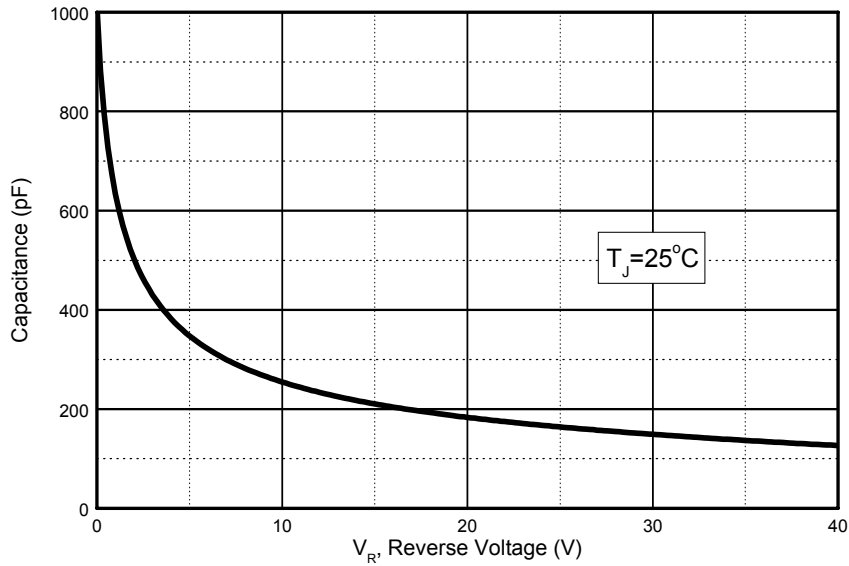


Figure 6. Capacitance

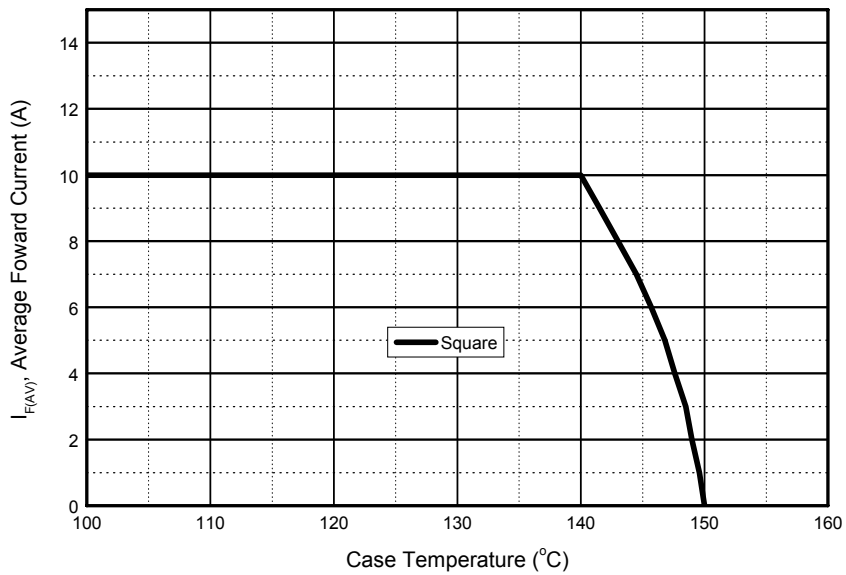


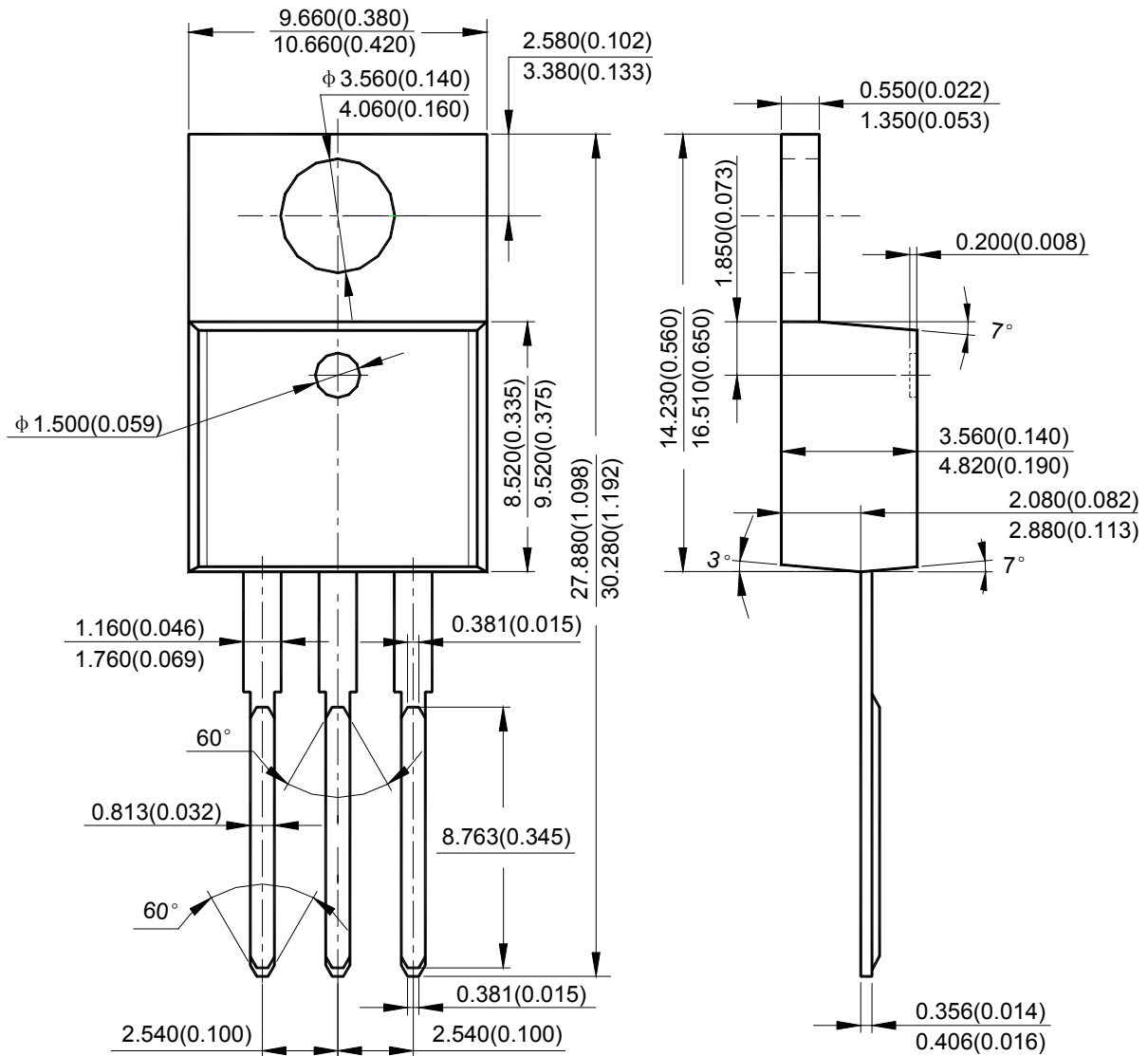
Figure 7. Average Forward Current vs. Case Temperature (Square, Each Diode)



**Mechanical Dimensions**

**TO-220-3**

**Unit: mm(inch)**

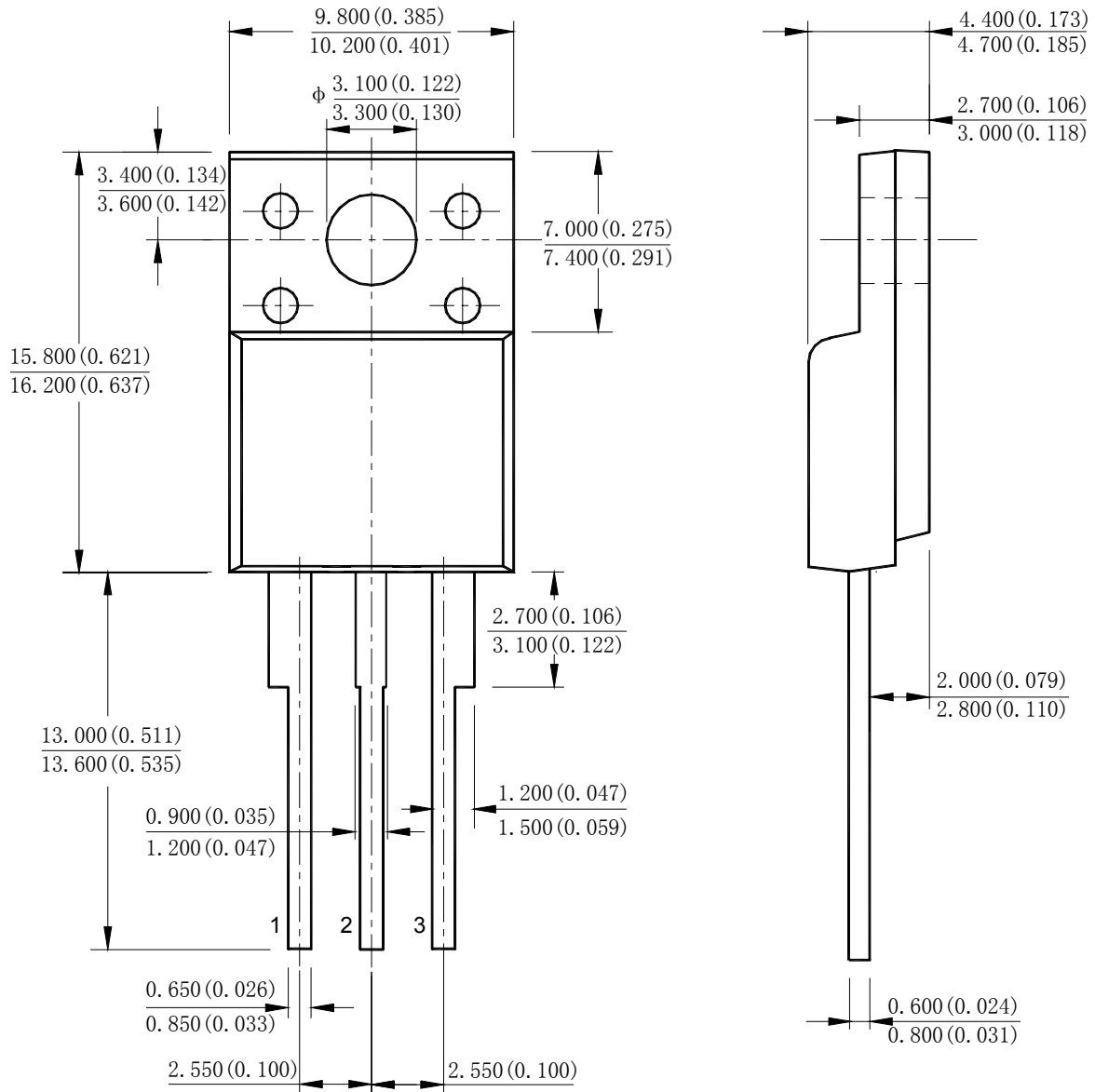




**Mechanical Dimensions (Continued)**

**TO-220F-3**

**Unit: mm(inch)**







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