

## Product Summary

$V_{RRM}$ (V)	$I_O$ (A)	$V_F$ (MAX) (V) @ +25°C	$I_R$ (MAX) (mA) @ +25°C
45	2x10	0.7	0.05

## 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.

MBR2045LC is available in TO-220-3 (2) package.

## Applications

- Power Supply Output Rectification
- Power Management
- Instrumentation

## Features

- Low Forward Voltage: 0.7V @ +25°C
- High Surge Current Capacity
- +150°C Operating Junction Temperature
- 20A Total (10A Each Diode Leg)
- Guard-Ring for Stress Protection
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**

## Mechanical Data

- Case: TO-220-3 (2)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Polarity: See Below
- Weight : TO-220-3 (2) - 1.9Grams (Approximate)

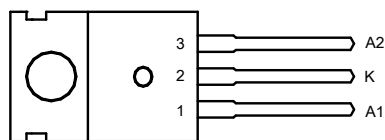


TO-220-3 (2)

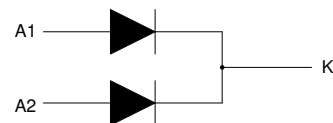
- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

## Pin Assignments

(Front View)

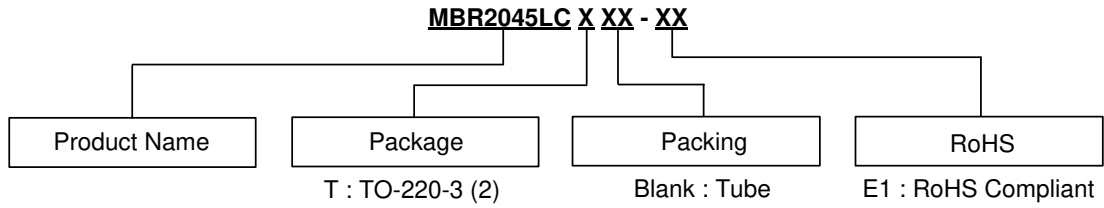


TO-220-3 (2)



Internal Structure of MBR2045LC

**Ordering Information** (Note 3)



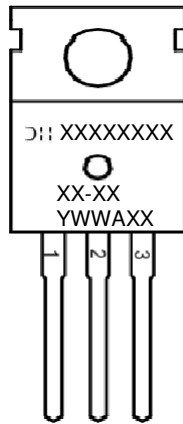
Note 3: Diodes Inc's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

Package	Part Number	Marking ID	Packing
TO-220-3 (2)	MBR2045LCT-E1	MBR2045LCT-E1	50 Pieces/Tube

**Marking Information**

(1) TO-220-3 (2)

(Front View)



First and Second Lines: Logo and Marking ID  
(See Ordering Information)  
Third Line: Date Code  
Y: Year  
WW: Work Week of Molding  
A: Assembly House Code  
XX: 7th and 8th Digits of Batch Number

**Maximum Ratings** (Each Diode Leg) (Note 4)

Characteristic	Symbol	Rating	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$	45	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_R$		
Average Rectified Forward Current (Rated $V_R$ ) $T_C = +137^\circ\text{C}$	$I_{F(AV)}$	10	A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20kHz) $T_C = +135^\circ\text{C}$	$I_{FRM}$	20	A
Non Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Half Wave, Single Phase, 60Hz)	$I_{FSM}$	150	A
Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0kHz)	$I_{RRM}$	1.0	A
Operating Junction Temperature (Note 5)	$T_J$	+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

- Notes:
- 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.
  - The heat generated must be less than the thermal conductivity from Junction to Ambient:  $dP_D/dT_J < 1/\theta_{JA}$ .

**Thermal Characteristics**

Characteristic	Symbol	Rating		Unit
Maximum Thermal Resistance (Junction to Case) (Note 6)	$R_{\theta JC}$	TO-220-3 (2)	2.0	$^\circ\text{C}/\text{W}$
Maximum Thermal Resistance (Junction to Ambient) (Note 6)	$R_{\theta JA}$	TO-220-3 (2)	60	$^\circ\text{C}/\text{W}$

Note 6: Device mounted on heat sink, with minimum recommended pad layout per <http://www.diodes.com>

**Electrical Characteristics** (Each Diode Leg)

Characteristic	Symbol	Max	Unit	Test Condition
Maximum Instantaneous Forward Voltage Drop (Note 7)	$V_F$	0.7	V	$I_F = 10A, T_C = +25^\circ C$
		0.6		$I_F = 10A, T_C = +125^\circ C$
		0.84		$I_F = 20A, T_C = +25^\circ C$
		0.72		$I_F = 20A, T_C = +125^\circ C$
Maximum Instantaneous Reverse Current (Note 7)	$I_R$	10	mA	Rated DC Voltage, $T_C = +125^\circ C$
		0.05		Rated DC Voltage, $T_C = +25^\circ C$

Note 7: Short duration pulse test used to minimize self-heating effect, Pulse Test: Pulse Width = 300 $\mu$ s, Duty Cycle  $\leq$  2.0%.

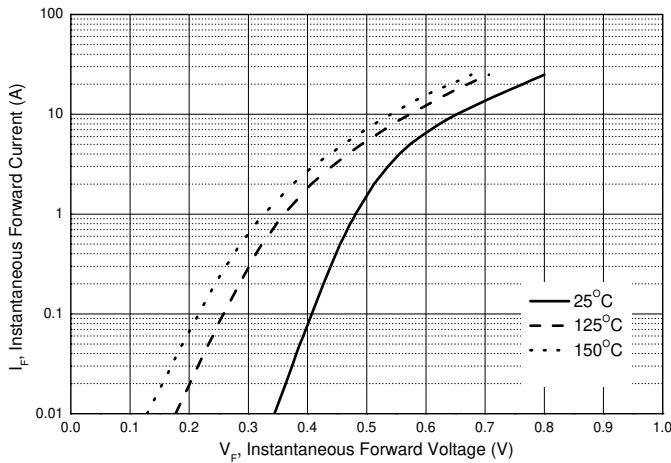


Figure 1. Typical Forward Voltage

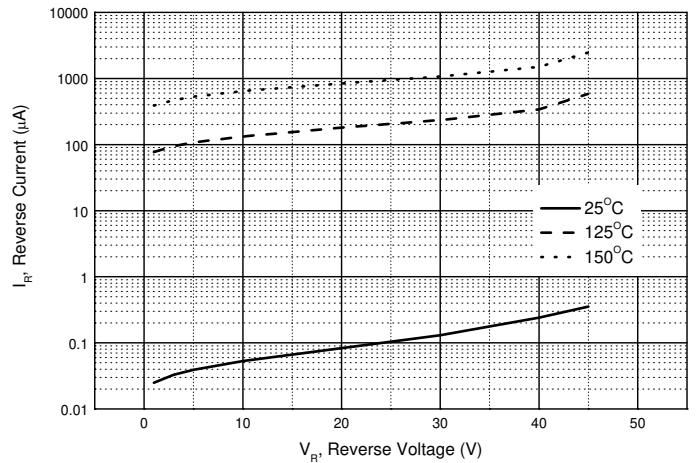


Figure 2. Typical Reverse Current

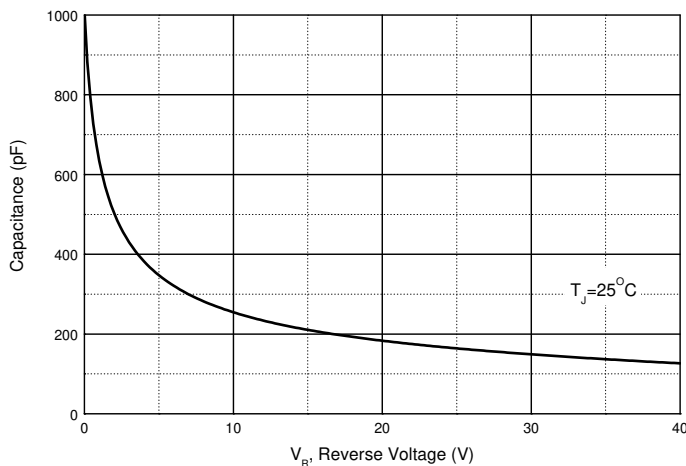


Figure 3. Capacitance vs.  $V_R$ , Reverse Voltage

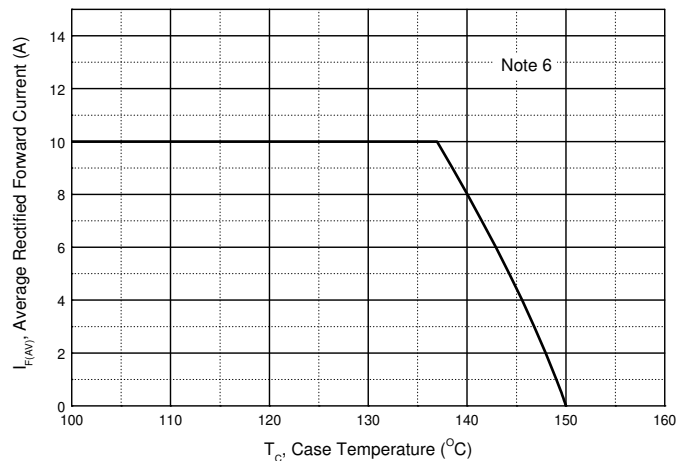
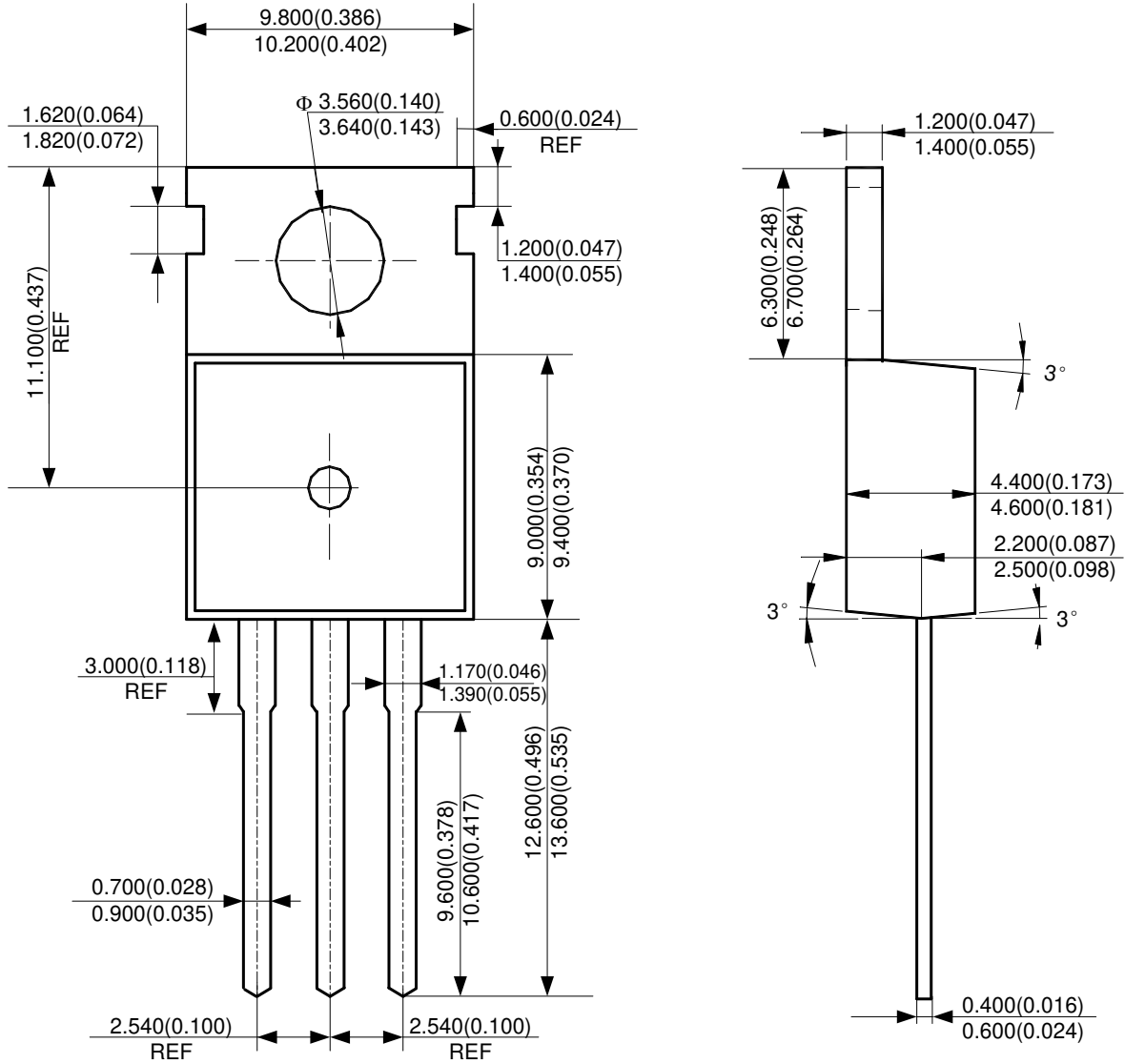


Figure 4. Average Rectified Forward Current vs. Case Temperature (Square, Each Diode)

**Package Outline Dimensions** (All dimensions in mm(inch).)

(1) Package Type: TO-220-3 (2)



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