



**THE DATASHEET OF  
MBR2045CTF-E1**



## Product Summary

$V_{RRM}$ (V)	$I_o$ (A)	$V_F$ (MAX) (V) @ +25°C	$I_R$ (MAX) (mA) @ +25°C
45	2x10	0.65	0.1

## 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 (2) and TO-220F-3 (Option 1) packages.

## Applications

- Power Supply Output Rectification
- Power Management
- Instrumentation



TO-220F-3 (Option 1)

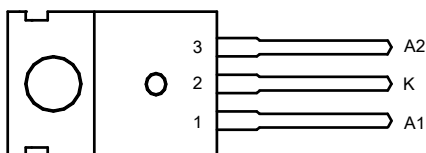


TO-220-3 (2)

- 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.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

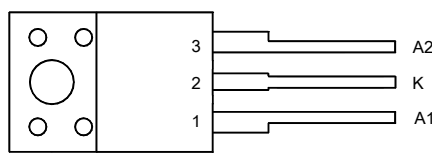
## Pin Assignments

(Front View)

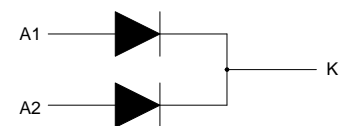


TO-220-3 (2)

(Front View)

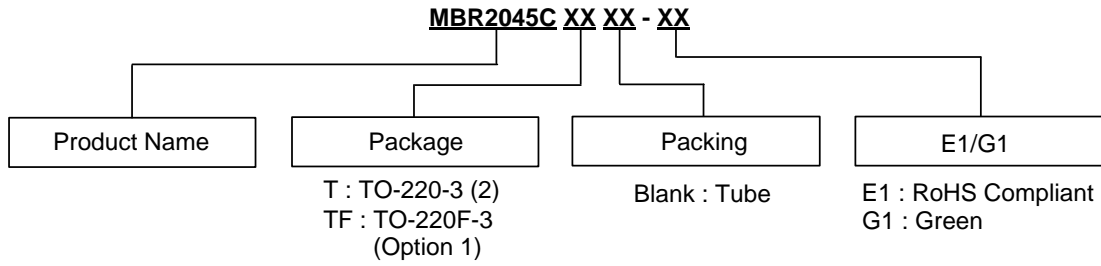


TO-220F-3 (Option 1)



Internal Structure of MBR2045C

**Ordering Information**

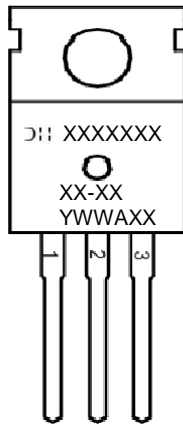


Package	Part Number	Marking ID	Packing
TO-220-3 (2)	MBR2045CT-E1	MBR2045CT-E1	50 Pieces/Tube
TO-220-3 (2)	MBR2045CT-G1	MBR2045CT-G1	50 Pieces/Tube
TO-220F-3 (Option 1)	MBR2045CTF-E1	MBR2045CTF-E1	50 Pieces/Tube
TO-220F-3 (Option 1)	MBR2045CTF-G1	MBR2045CTF-G1	50 Pieces/Tube

**Marking Information**

(1) TO-220-3 (2)

(Front View)

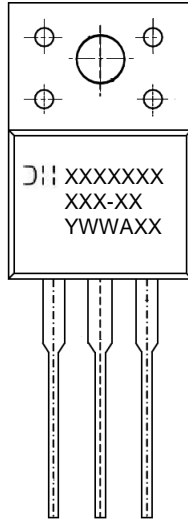


First and Second Lines: Logo and Marking ID  
(See Ordering Information)  
Third Line: Date Code  
Y: Year  
WW: Work Week of Molding  
A: Assembly House Code  
XX: 7th and 8th Digits of Batch Number

## Marking Information (Cont.)

(2) TO-220F-3 (Option 1)

(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 $V_R$ ) $T_C = +139^\circ\text{C}$	$I_{F(AV)}$	10	A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20kHz) $T_C = +137^\circ\text{C}$	$I_{FRM}$	20	A
Non Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Half Wave, Single Phase, 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 <sub>θJC</sub>	TO-220-3 (2)	2.2	°C/W
		TO-220F-3 (Option 1)	4.5	
Maximum Thermal Resistance (Junction to Ambient) (Note 6)	R <sub>θJA</sub>	TO-220-3 (2)	60	
		TO-220F-3 (Option 1)	60	

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

### Electrical Characteristics (Each Diode Leg)

Characteristic	Symbol	Typ	Max	Rating	Test Condition
Maximum Instantaneous Forward Voltage Drop (Note 7)	V <sub>F</sub>	0.59	0.65	V	I <sub>F</sub> = 10A, T <sub>C</sub> = +25°C
		0.50	0.57		I <sub>F</sub> = 10A, T <sub>C</sub> = +125°C
Maximum Instantaneous Reverse Current (Note 7)	I <sub>R</sub>	5	15	mA	Rated DC Voltage, T <sub>C</sub> = +125°C
		0.01	0.1		Rated DC Voltage, T <sub>C</sub> = +25°C

Note 7: Short duration pulse test used to minimize self-heating effect, Pulse Test Width = 300µs, Duty Cycle < 2.0%.

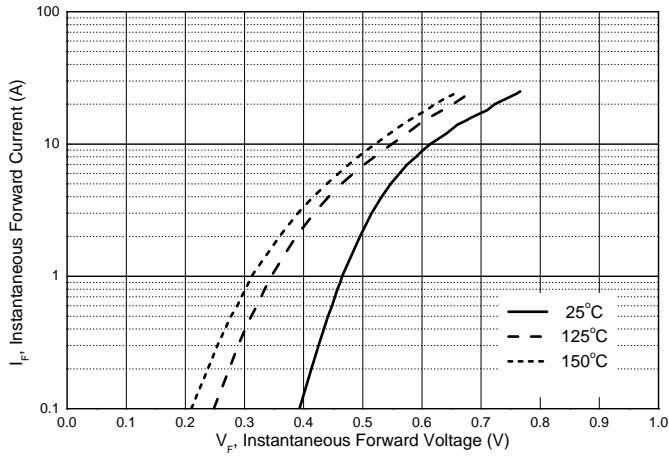


Figure 1. Typical Forward Voltage

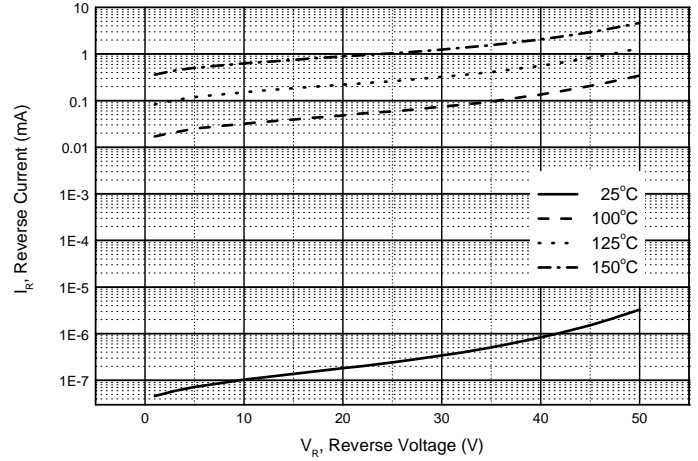


Figure 2. Typical Reverse Current

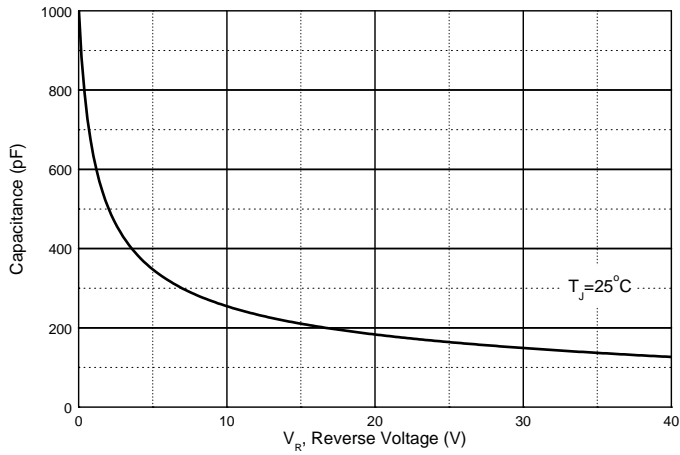


Figure 3. Capacitance vs.  $V_R$ , Reverse Voltage

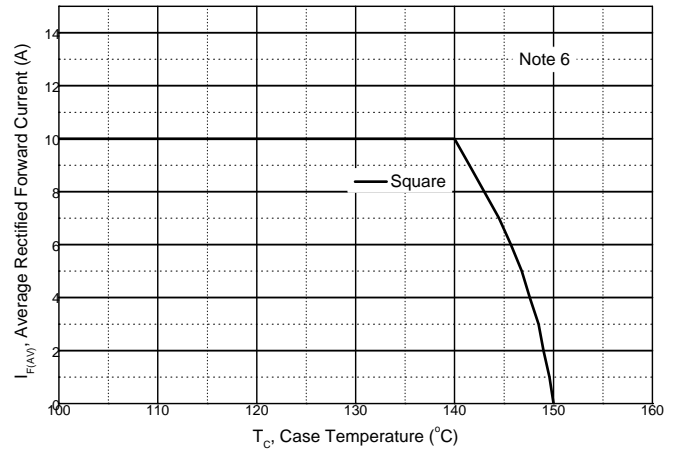
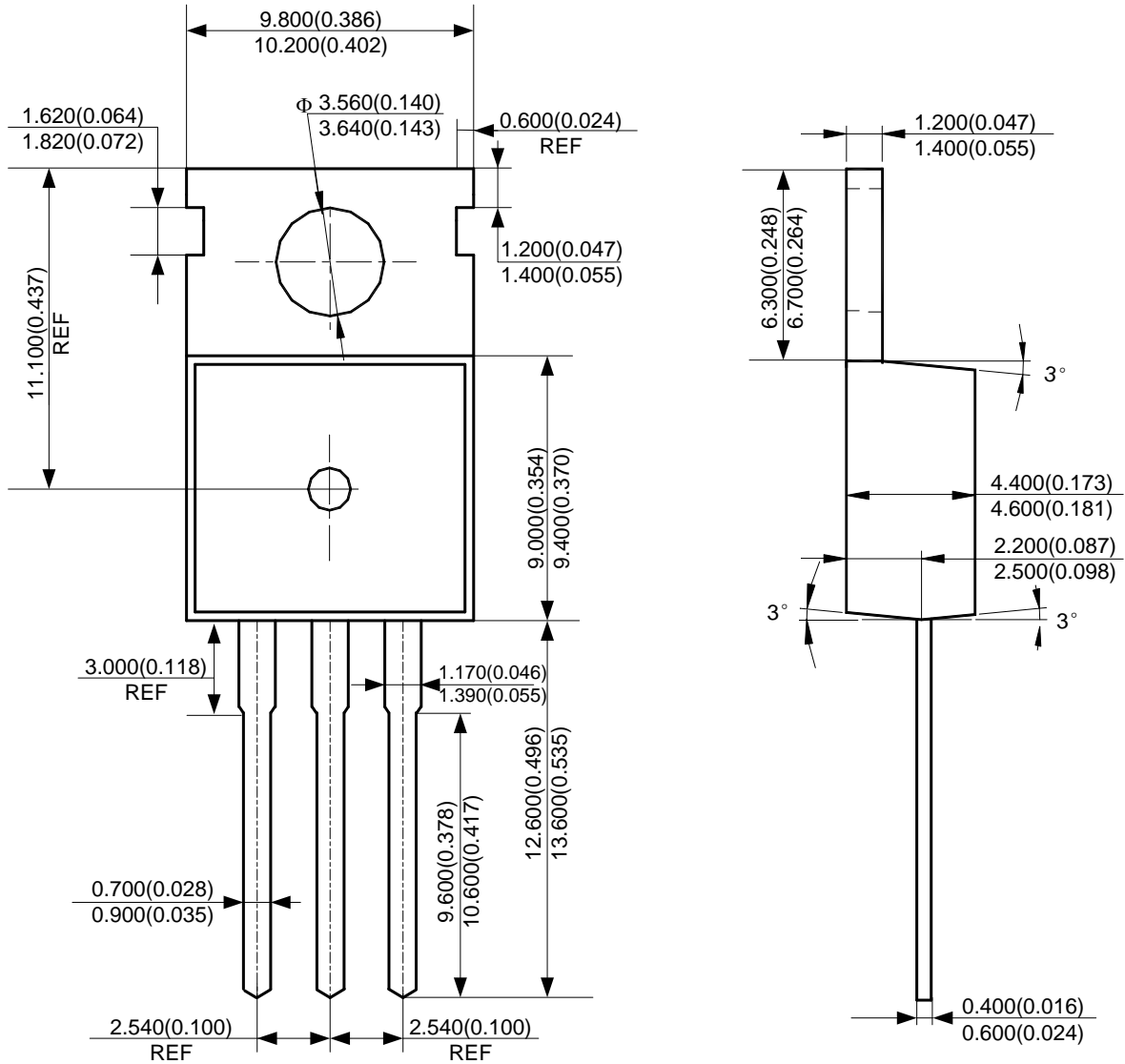


Figure 4. Average Rectified Forward Current vs. Case Temperature (Square, Each Diode)

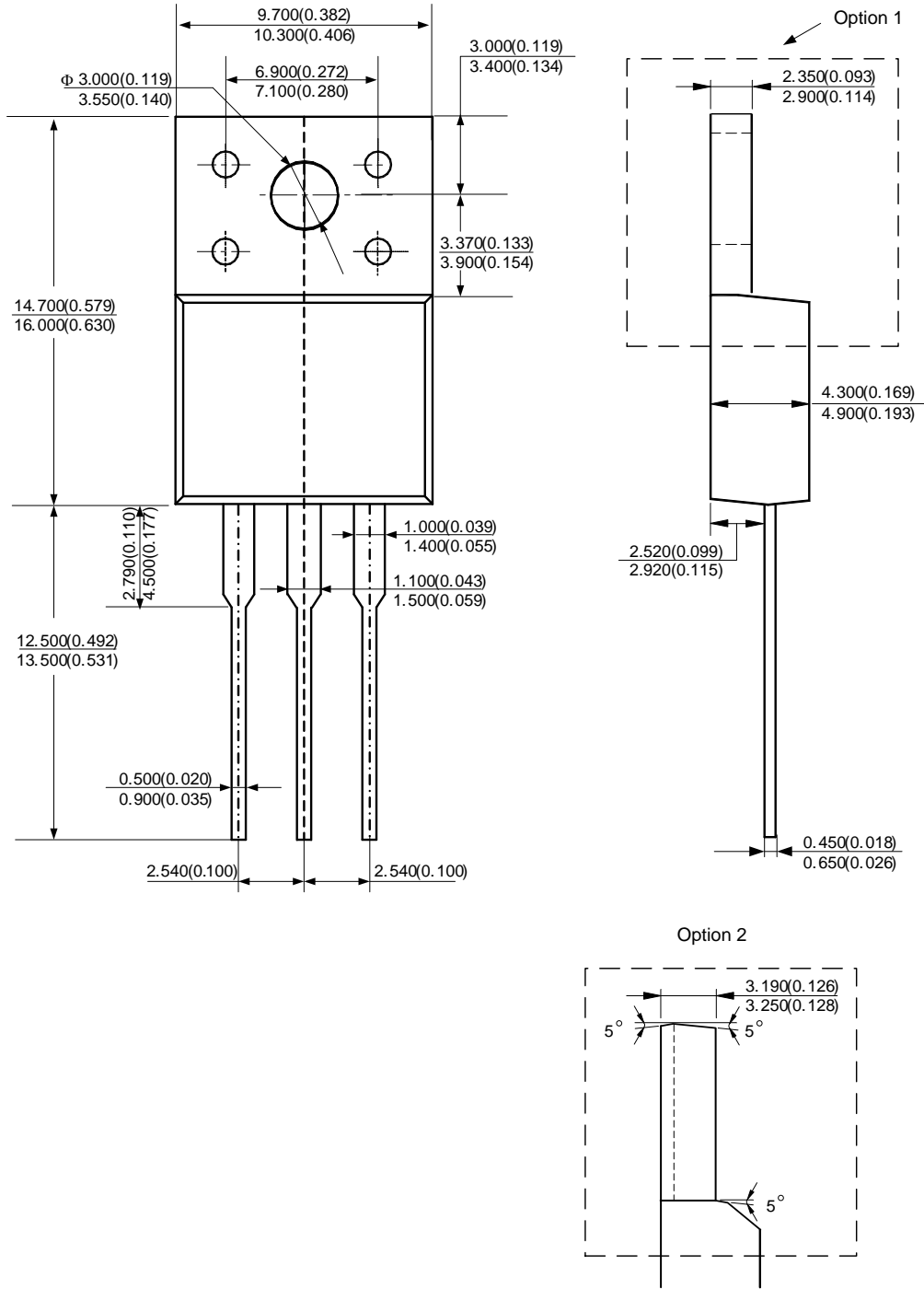
**Package Outline Dimensions** (All dimensions in mm(inch).)

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



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

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



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