



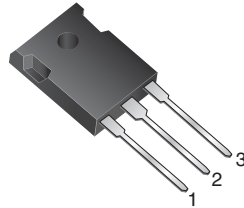
**THE DATASHEET OF  
MBR40H45CT-E3/45**



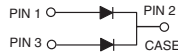


## Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



TO-247AD (TO-3P)



### FEATURES

- Power pack
- 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 s
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or polarity protection application.

### MECHANICAL DATA

Case: TO-247AD (TO-3P)

Epoxy meets UL 94 V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
$V_{RRM}$	35 V, 45 V, 50 V, 60 V
$I_{FSM}$	400 A
$V_F$	0.55 V, 0.60 V
$T_J$ max.	175 °C
Package	TO-247AD
Diode variations	Common cathode

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR40H35PT	MBR40H45PT	MBR40H50PT	MBR40H60PT	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	35	45	50	60	V
Maximum working peak reverse voltage	$V_{RWM}$	35	45	50	60	V
Maximum DC blocking voltage	$V_{DC}$	35	45	50	60	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	40				A
Non-repetitive avalanche energy per diode at 25 °C, $I_{AS} = 4\text{ A}$ , $L = 10\text{ mH}$	$E_{AS}$	80				mJ
Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	400				A
Peak repetitive reverse surge current per diode <sup>(1)</sup>	$I_{RRM}$	2.0		1.0		A
Peak non-repetitive reverse energy (8/20 $\mu\text{s}$ waveform)	$E_{RSM}$	30		25		mJ
Electrostatic discharge capacitor voltage human body model: $C = 100\text{ pF}$ , $R = 1.5\text{ k}\Omega$	$V_C$	25				kV
Voltage rate of change at (rated $V_R$ )	$dV/dt$	10 000				V/ $\mu\text{s}$
Operating junction temperature range	$T_J$	-65 to +175				°C
Storage temperature range	$T_{STG}$	-65 to +175				°C

#### Note

(1) 2.0  $\mu\text{s}$  pulse width,  $f = 1.0\text{ kHz}$



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	MBR40H35PT MBR40H45PT		MBR40H50PT MBR40H60PT		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage per diode <sup>(1)</sup>	$I_F = 20\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	$V_F$	-	0.63	-	0.69	V
	$I_F = 20\text{ A}$	$T_J = 125\text{ }^\circ\text{C}$		0.49	0.55	0.56	0.60	
	$I_F = 40\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$		-	0.73	-	0.83	
	$I_F = 40\text{ A}$	$T_J = 125\text{ }^\circ\text{C}$		0.62	0.66	0.68	0.72	
Maximum reverse current at rated $V_R$ per diode <sup>(2)</sup>		$T_J = 25\text{ }^\circ\text{C}$ $T_J = 125\text{ }^\circ\text{C}$	$I_R$	- 9.0	150 25	- 6.0	150 25	$\mu\text{A}$ mA

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width  $\leq 40\text{ ms}$

<b>THERMAL CHARACTERISTICS</b>						
PARAMETER	SYMBOL	MBR40H35PT	MBR40H45PT	MBR40H50PT	MBR40H60PT	UNIT
Thermal resistance, junction to case per diode	$R_{\theta JC}$			1.2		$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-247AD	MBR40H45PT-E3/45	6.13	45	30/tube	Tube

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

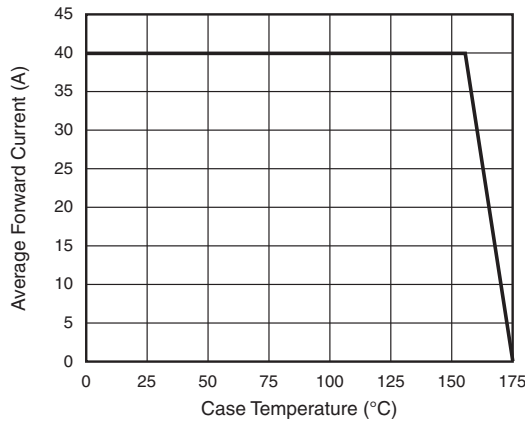


Fig. 1 - Forward Current Derating Curve

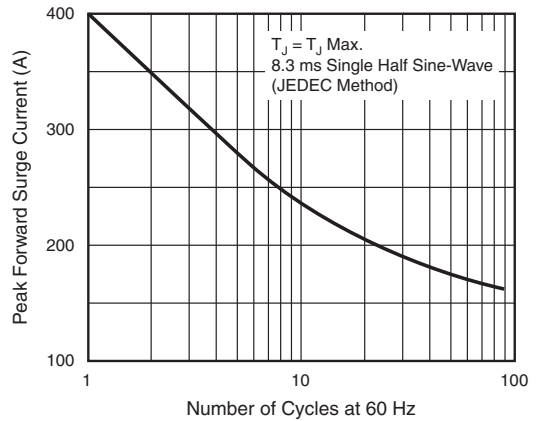


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

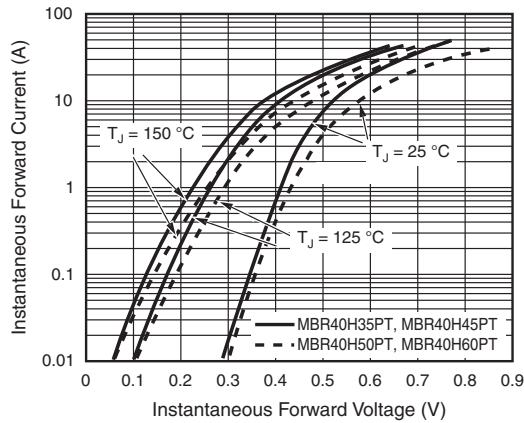


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

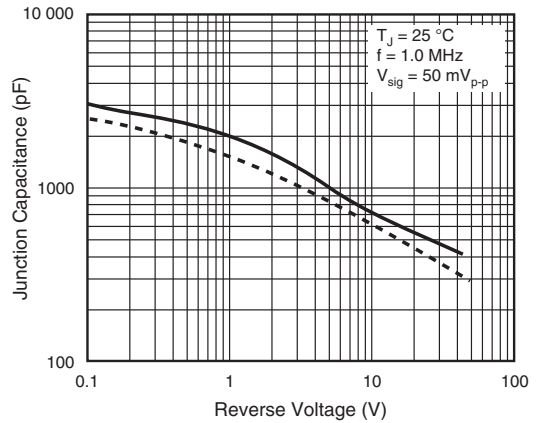


Fig. 5 - Typical Junction Capacitance Per Diode

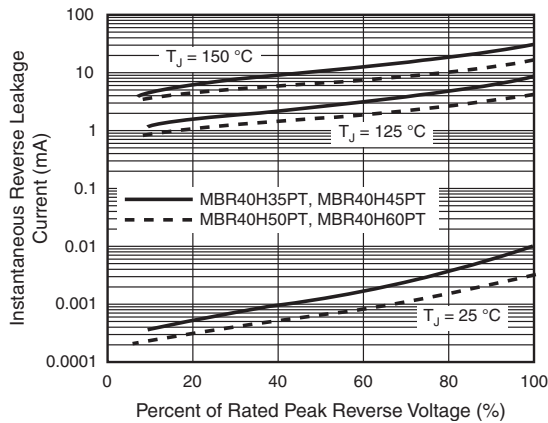


Fig. 4 - Typical Reverse Characteristics Per Diode

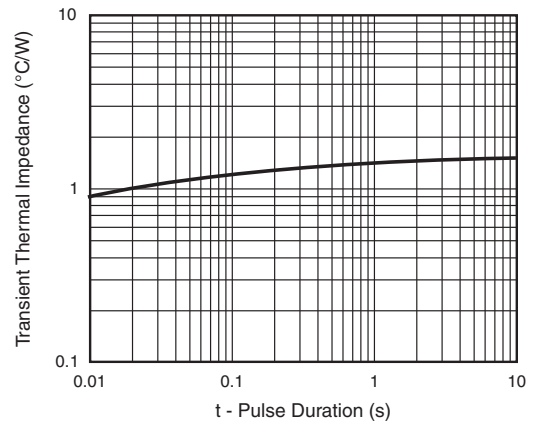
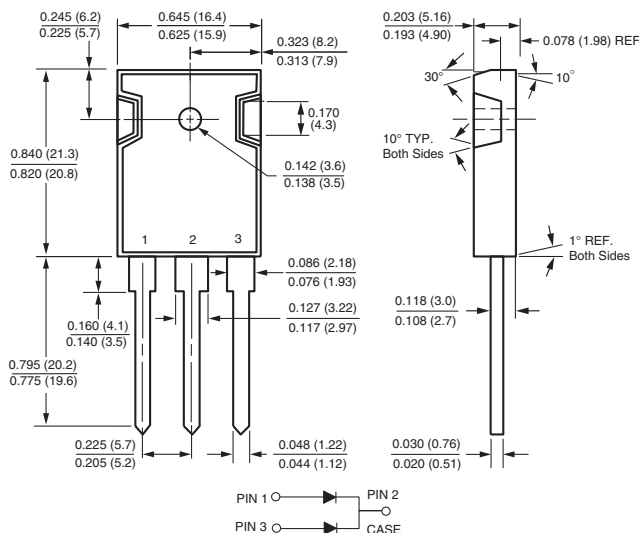


Fig. 6 - Typical Transient Thermal Impedance Per Diode

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**TO-247AD (TO-3P)**





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