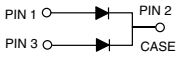
MBR40H35PT, MBR40H45PT, MBR40H50PT, MBR40H60PT

Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance

TO-247AD 3L



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

RoHS COMPLIANT
HALOGEN FREE

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 3L

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - RoHS-compliant, halogen-free, commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix 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 3L
Circuit configuration	Common cathode

MAXIMUM RATINGS (T_A = 25 °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 A, L = 10 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 (1)	I_{RRM}	2.0		1.0		A
Peak non-repetitive reverse energy (8/20 µs waveform)	E_{RSM}	30		25		mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V_C	25				kV
Voltage rate of change at (rated V_R)	dV/dt	10 000				V/µs
Operating junction temperature range	T_J	-65 to +175				°C
Storage temperature range	T_{STG}	-65 to +175				°C

Note

(1) 2.0 µs pulse width, f = 1.0 kHz

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**MBR40H35PT MBR40H45PT**		**MBR40H50PT MBR40H60PT**		**UNIT**
				TYP.	**MAX.**	**TYP.**	**MAX.**	
Maximum instantaneous forward voltage per diode (1)	I_F = 20 A	T_J = 25 °C	V_F	-	0.63	-	0.69	V
	I_F = 20 A	T_J = 125 °C		0.49	0.55	0.56	0.60	
	I_F = 40 A	T_J = 25 °C		-	0.73	-	0.83	
	I_F = 40 A	T_J = 125 °C		0.62	0.66	0.68	0.72	
Maximum reverse current at rated V_R per diode (2)		T_J = 25 °C T_J = 125 °C	I_R	- 9.0	150 25	- 6.0	150 25	µA mA

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS						
PARAMETER	**SYMBOL**	**MBR40H35PT**	**MBR40H45PT**	**MBR40H50PT**	**MBR40H60PT**	**UNIT**
Thermal resistance, junction to case per diode	$R_{\theta JC}$	1.2				°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-247AD 3L	MBR40H45PT-M3/P	5.83	P	25/tube	Tube

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

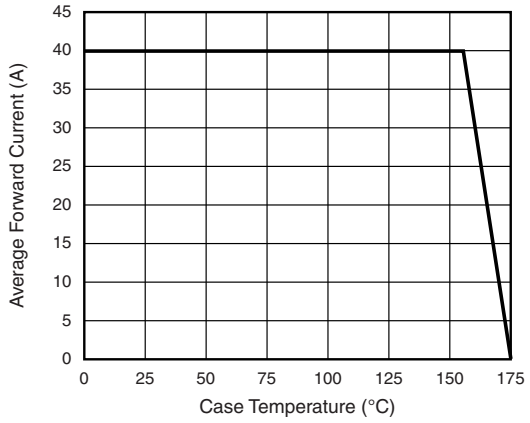


Fig. 1 - Forward Current Derating Curve

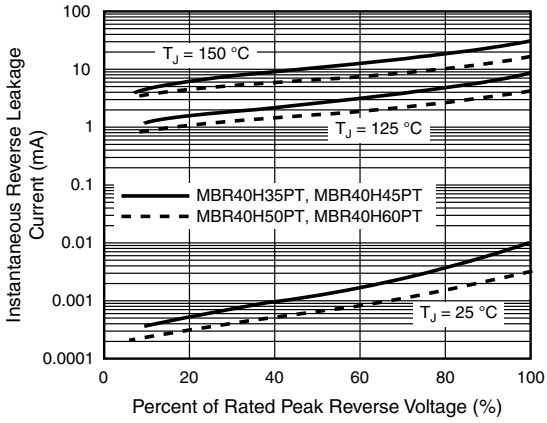


Fig. 4 - Typical Reverse Characteristics Per Diode

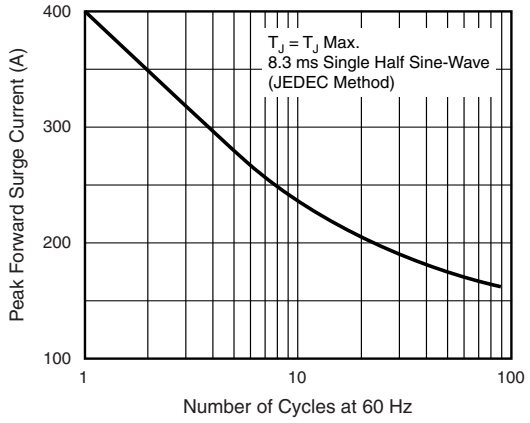


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

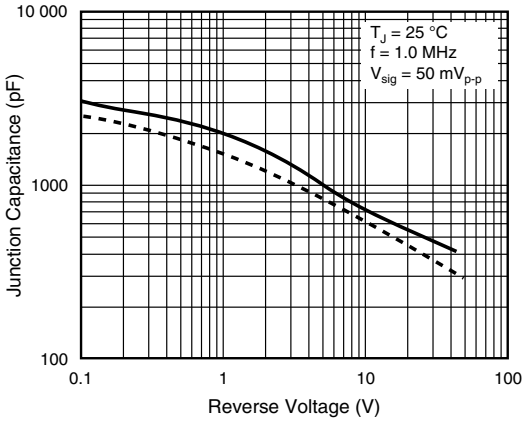


Fig. 5 - Typical Junction Capacitance Per Diode

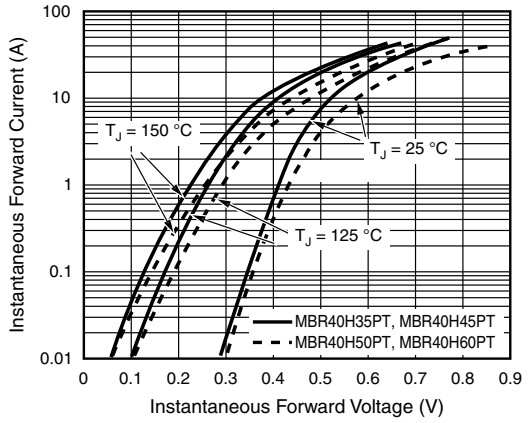


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

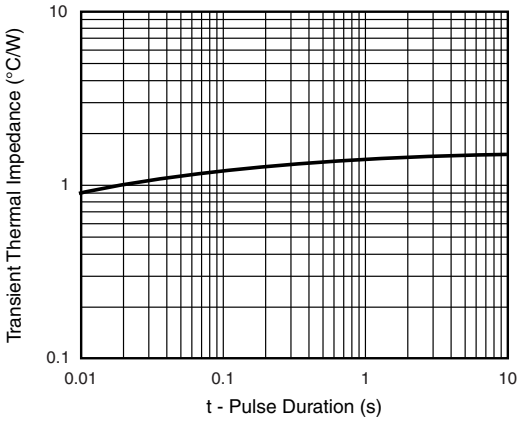
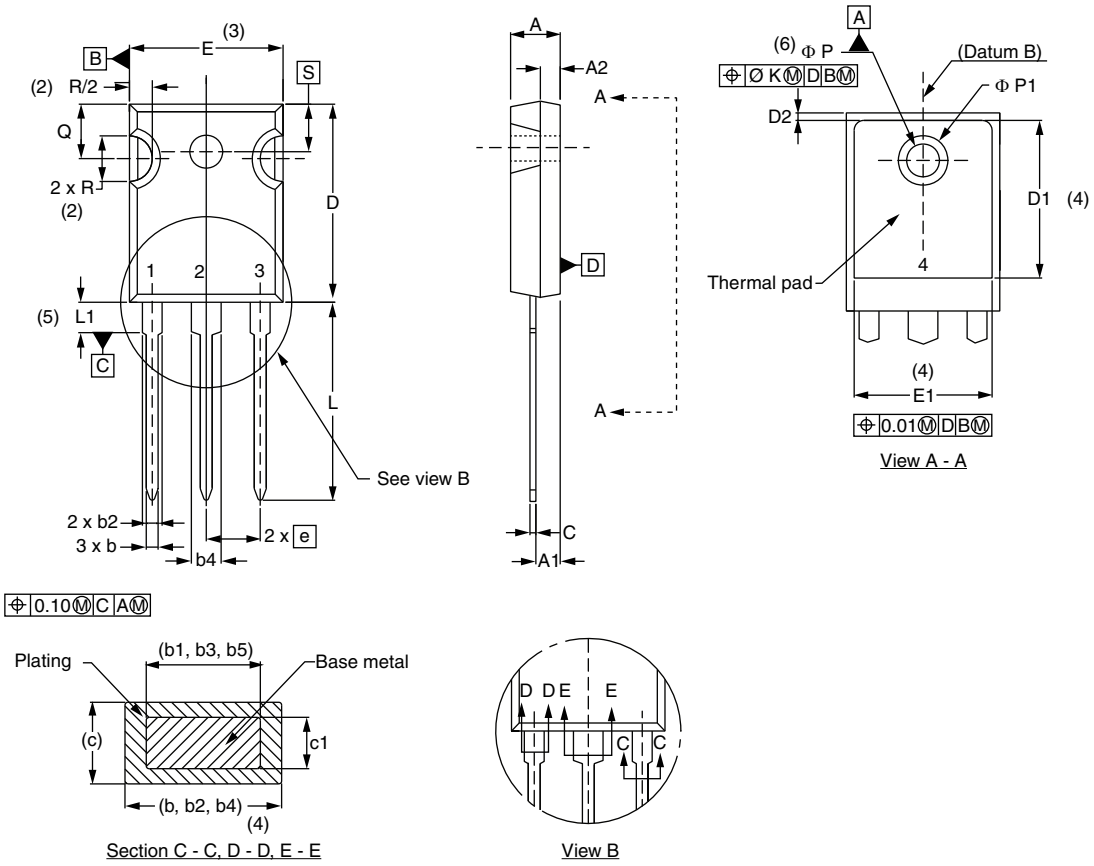


Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in millimeters (inches) TO-247AD 3L



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.65	5.31	0.183	0.209	
A1	2.21	2.59	0.087	0.102	
A2	1.50	2.49	0.059	0.098	
b	0.99	1.40	0.039	0.055	
b1	0.99	1.35	0.039	0.053	
b2	1.65	2.39	0.065	0.094	
b3	1.65	2.34	0.065	0.092	
b4	2.59	3.43	0.102	0.135	
b5	2.59	3.38	0.102	0.133	
c	0.38	0.89	0.015	0.035	
c1	0.38	0.84	0.015	0.033	
D	19.71	20.70	0.776	0.815	3
D1	13.08	-	0.515	-	4

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
D2	0.51	1.30	0.020	0.051	
E	15.29	15.87	0.602	0.625	3
E1	13.46	-	0.53	-	
e	5.46 BSC		0.215 BSC		
Ø K	0.254		0.010		
L	19.81	20.32	0.780	0.800	
L1	3.71	4.29	0.146	0.169	
Ø P	3.56	3.66	0.14	0.144	
Ø P1	-	6.98	-	0.275	
Q	5.31	5.69	0.209	0.224	
R	4.52	5.49	0.178	0.216	
S	5.51 BSC		0.217 BSC		

Notes

(1) Dimensioning and tolerancing per ASME Y14.5M-1994
(2) Contour of slot optional
(3) Dimension D and E do not include mold flash. These dimensions are measured at the outermost extremes of the plastic body
(4) Thermal pad contour optional with dimensions D1 and E1
(5) Lead finish uncontrolled in L1
(6) Ø P to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
(7) Outline conforms to JEDEC® outline TO-247 with exception of dimension A min., D, E min., Q min., S, and note 4

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