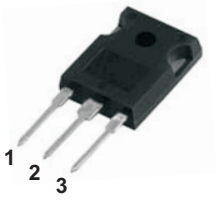
Dual Common-Cathode Schottky Rectifier, 40A (20A x 2), 45V / 60V

Pb Available RoHS* COMPLIANT

FEATURES

- 150°C T_J operation
- High frequency operation
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness, long term reliability and overvoltage protection
- Compliant to RoHS
- Designed and qualified according to JEDEC-JESD47
- Solder bath temperature 260°C maximum, 40 s per JESD 22B-106 (for TO-247AB package)



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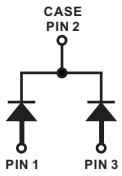


DESCRIPTION

The **MBR4045PT** Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150°C junction temperature.

APPLICATIONS

- Switching mode power supplies
- DC to DC converters
- Freewheeling diodes
- Reverse battery protection.

MECHANICAL DATA

Case: TO-247AB (TO-3P)
Molding compound meets UL 94 V-O flammability rating
Terminals: Mat tin plated leads, solderable per J-STD-002 and JESD 22-B102
Polarity: As marked
Mounting Torque: 10 in-lbs maximum

PRODUCT SUMMARY	
$I_{F(AV)}$	20A x 2
V_R	45V/ 60V
V_F at I_F	0.60V/0.62V
I_{RM} max.	100mA at 125°C
T_J max.	150°C
Diode variation	Dual dice, Common cathode
E_{AS}	20 mJ

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUE		UNIT
		MBR4045PT	MBR4060PT	
$I_{F(AV)}$	Rectangular waveform	20 x 2		A
V_{RRM}		45	60	V
I_{FSM}	8.3 ms single half sine-wave	400		A
V_F	20 A_{pk}, T_J = 125°C	0.60	0.62	V
T_J	Range	-65 to 150		°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VALUE		UNIT
		MBR4045PT	MBR4060PT	
Maximum DC reverse voltage	V_R	45	60	V
Maximum working peak reverse voltage	V_{RWM}	45	60	
Maximum DC blocking voltage	V_{DC}	45	60	

VOLTAGE RATINGS

PARAMETER	SYMBOL	SYMBOL	MBR		UNIT
			4045PT	4060PT	
Maximum average forward current (per device / per diode)	$I_{F(AV)}$	T_C = 125°C, rated V_R	40 20		A
Peak repetitive forward current per leg	I_{FRM}	Rated V_R, square wave, 20KHz, T_C = 125C°	40		A
Non-repetitive peak surge current	I_{FSM}	Surge applied at rated load condition half wave single phase 60 Hz	400		A
Non-repetitive avalanche energy	E_{AS}	T_J = 25°C, I_{AS} = 3A, L = 4.4mH	20		mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A = 1.5 x V_R typical	3		A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE		UNIT
				MBR4045PT	MBR4060PT	
Maximum forward voltage drop	V_{FM}(1)	I_F = 20A	T_J = 25°C	0.70	0.72	V
		I_F = 40A		0.80	0.82	
		I_F = 20A	T_J = 125°C	0.60	0.62	
		I_F = 40A		0.75	0.80	
Maximum instantaneous reverse current	I_{RM}(1)	T_J = 25°C	Rated DC voltage	1		mA
		T_J = 125°C		100		
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHZ) 25°C		900	500	pF
Typical series inductance	L_S	Measured from top of terminal to mounting plane		8		nH
Maximum voltage rate of change	dV/dt	Rated V_R		10000		V/µs

Note
(1) Pulse width < 300 µs, duty cycle < 2%

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		**SYMBOL**	**TEST CONDITIONS**	**VALUE**	**UNIT**
Maximum junction temperature range		T_J		-65 to 150	°C
Maximum storage temperature range		T_{stg}		-65 to 150	
Maximum thermal resistance, junction to case		R_{thJC}	DC operation	1.2	°C/W
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	0.4	
Approximate weight				6.2	g
				0.22	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	

Ordering Information Table

Device code

MBR	40	45	PT
1	2	3	4

1 - Schottky MBR series
2 - Current rating (40 = 40A, 20A x 2)
3 - Voltage ratings, 45 =45V, 60 = 60V
4 - Circuit configuration, Center tap common cathode, TO-247AB series package

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Forward current derating curve

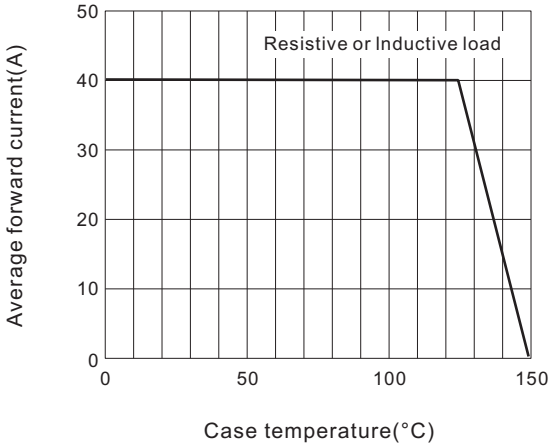


Fig.2 Maximum non-repetitive peak forward surge current per diode

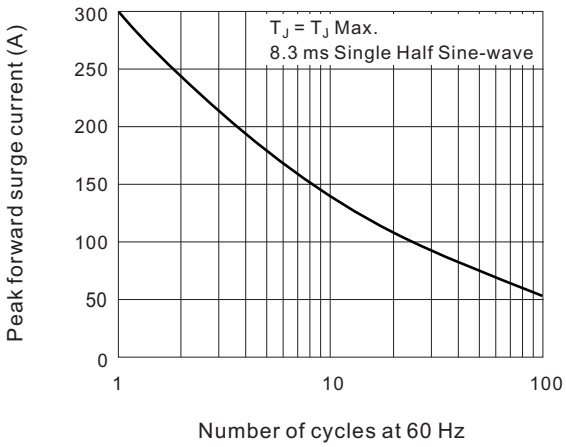


Fig.3 Typical instantaneous forward characteristics per diode

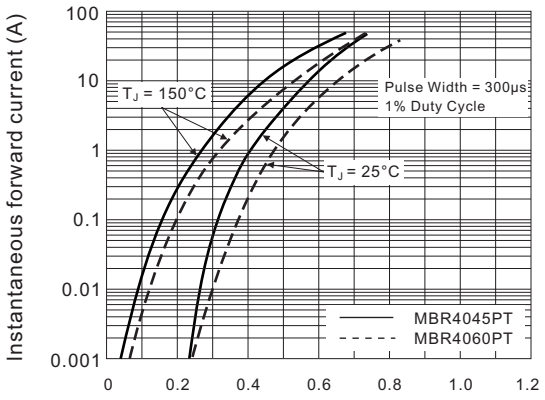


Fig.4 Typical reverse characteristics per diode

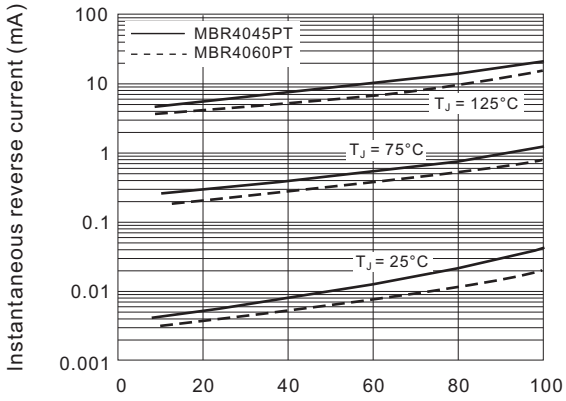


Fig.5 Typical junction capacitance per diode

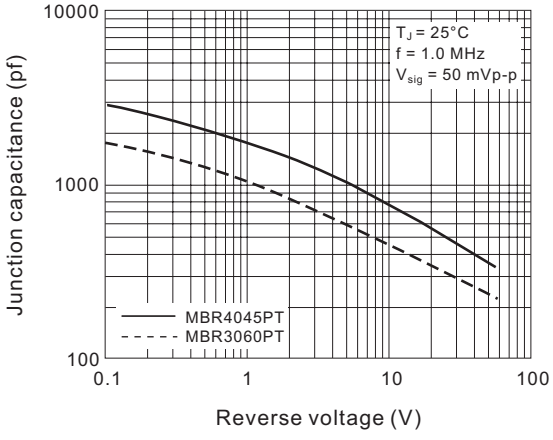
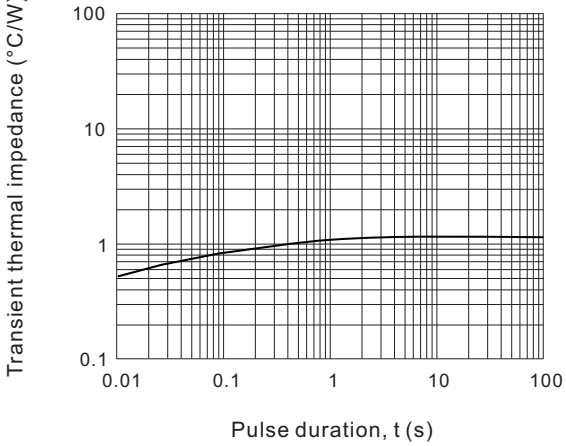


Fig.6 Typical transient thermal Impedance per diode



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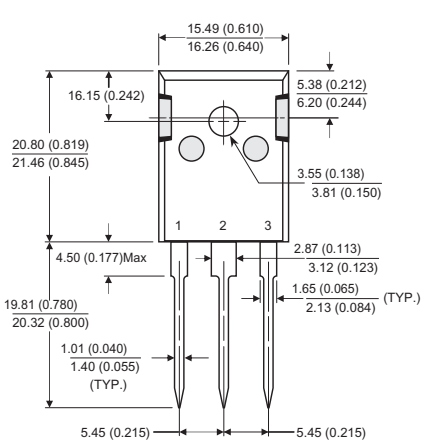

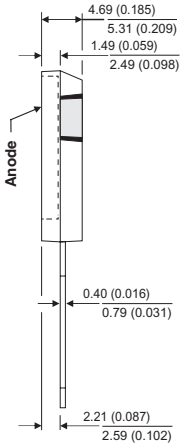

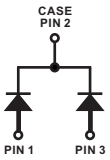

All dimensions in millimeters (inches)