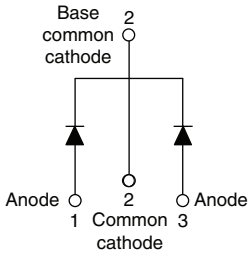
Schottky Rectifier, 2 x 15 A

TO-220AB



FEATURES

- 150 °C T_J operation
- Center tap TO-220, D^2PAK and TO-262 packages
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level

Pb-free Available

RoHS* COMPLIANT

DESCRIPTION

This center tap 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. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
$I_{F(AV)}$	2 x 15 A
V_R	35/45 V
I_{RM}	100 mA at 125 °C

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform (per device)	30	A
V_{RRM}		35/45	V
I_{FRM}	T_C = 123 °C (per leg)	30	A
I_{FSM}	t_p = 5 µs sine	1020	
V_F	20 Apk, T_J = 125 °C	0.6	V
T_J	Range	- 65 to 150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	MBR3035CTPbF	MBR3045CTPbF	UNITS
Maximum DC reverse voltage	V_R	35	45	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	per leg	$I_{F(AV)}$	T_C = 123 °C, rated V_R	15	A
	per device			30	
Peak repetitive forward current per leg		I_{FRM}	Rated V_R, square wave, 20 kHz, T_C = 123 °C	30	
Non-repetitive peak surge current		I_{FSM}	5 µs sine or 3 µs rect. pulse; Following any rated load condition and with rated V_{RRM} applied	1020	
			Surge applied at rated load conditions halfwave, single phase, 60 Hz	200	
Non-repetitive avalanche energy per leg		E_{AS}	T_J = 25 °C, I_{AS} = 2 A, L = 5 mH	10	mJ
Repetitive avalanche current per leg		I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A = 1.5 x V_R typical	2	A

* Pb containing terminations are not RoHS compliant, exemptions may apply

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V_{FM} (1)	30 A	T_J = 25 °C	0.76	V
		20 A	T_J = 125 °C	0.6	
		30 A		0.72	
Maximum instantaneous reverse current	I_{RM} (1)	T_J = 25 °C	Rated DC voltage	1	mA
		T_J = 125 °C		100	
Threshold voltage	$V_{F(TO)}$	T_J = T_J maximum		0.29	V
Forward slope resistance	r_t			13.6	mΩ
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °C		800	pF
Typical series inductance	L_S	Measured from top of terminal to mounting plane		8.0	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/µs

Note

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

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range		T_J		- 65 to 150	°C
Maximum storage temperature range		T_{Stg}		- 65 to 175	
Maximum thermal resistance, junction to case per leg		R_{thJC}	DC operation	1.5	°C/W
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased Only for TO-220	0.50	
Maximum thermal resistance, junction to ambient		R_{thJA}	DC operation For D^2PAK and TO-262	50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum		Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device			Case style TO-220AB	MBR3045CT	

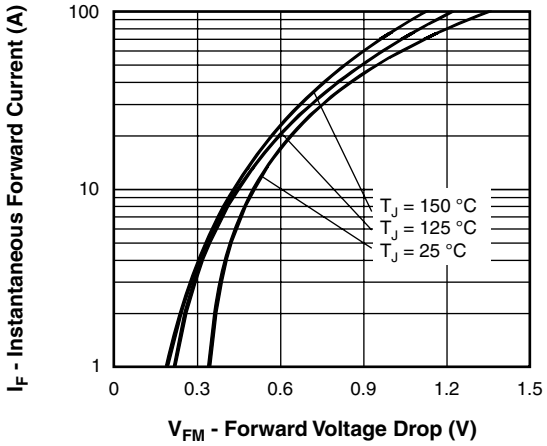


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

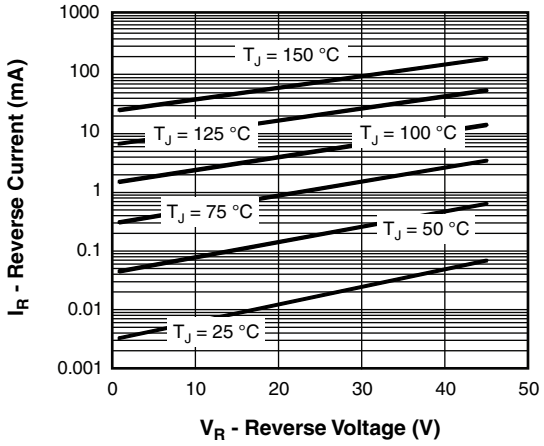


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

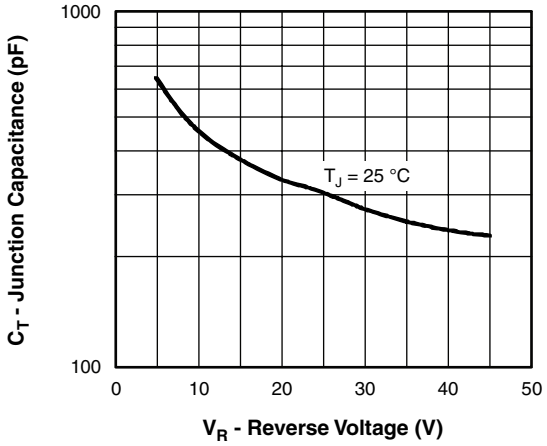


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

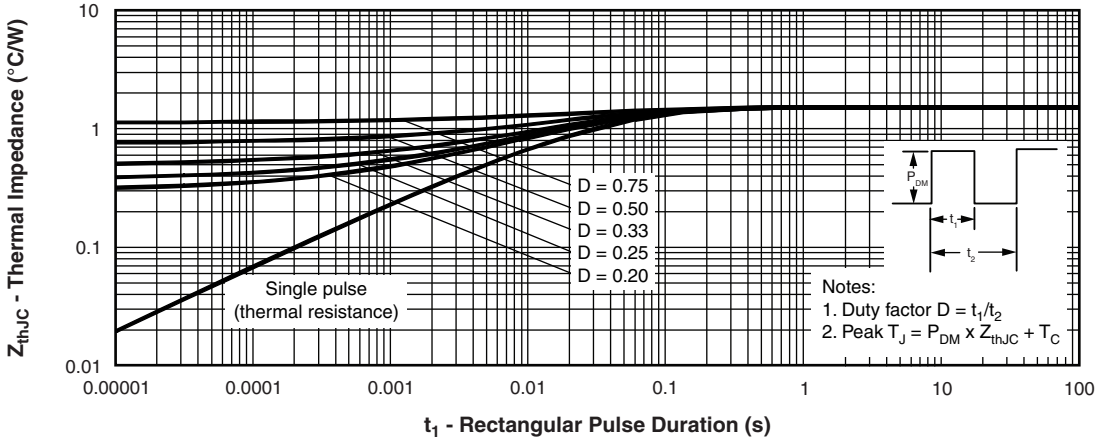


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

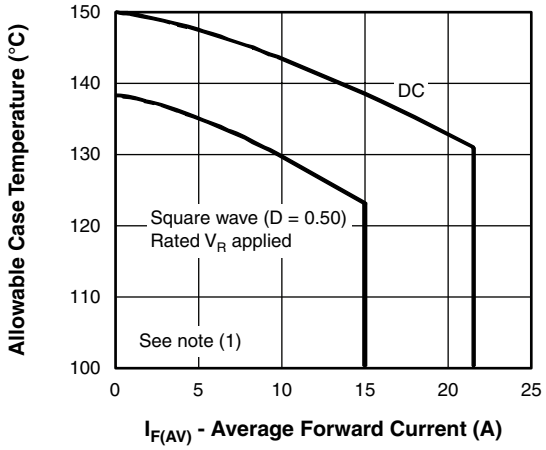


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

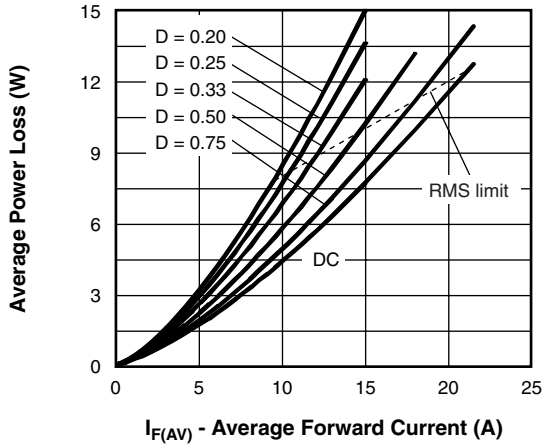


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

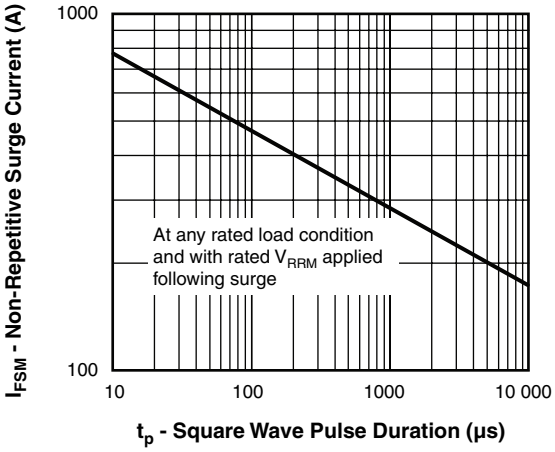


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at ($I_{F(AV)}$/D) (see fig. 6);
Pd_{REV} = Inverse power loss = $V_{R1} \times I_R$ (1 - D); I_R at V_{R1} = Rated V_R

ORDERING INFORMATION TABLE

Device code

MBR	30	45	CT	PbF
1	2	3	4	5

- 1 - Schottky MBR series
- 2 - Current rating (30 = 30 A)
- 3 - Voltage ratings (35 = 35 V, 45 = 45 V)
- 4 - CT = Essential part number
- 5 - • None = Standard production
  • PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95222
Part marking information	http://www.vishay.com/doc?95225

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