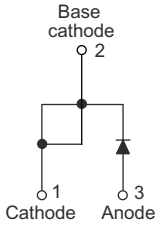
Schottky Rectifier, 7.5 A

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 and long term reliability
- Compliant to RoHS
- Designed and qualified according to JEDEC-JESD47



TO-220AC

DESCRIPTION

The MBR745 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
- Converters
- Freewheeling diodes
- Reverse battery protection.

PRODUCT SUMMARY	
Package	TO-220AC
$I_{F(AV)}$	7.5A
V_R	45V
V_F at I_F	0.57V
I_{RM} max.	15mA at 125°C
T_J max.	150°C
Diode variation	Single die
E_{AS}	7 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUE	UNIT
$I_{F(AV)}$	Rectangular waveform	7.5	A
V_{RRM}		45	V
I_{FSM}	t_p = 5 µs sine	690	A
V_F	7.5 A_{pk}, T_J = 125°C	0.57	V
T_J	Range	-65 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	MBR745	UNIT
Maximum DC reverse voltage	V_R	45	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**VALUE**	**UNIT**
Maximum average forward current	$I_{F(AV)}$	T_C = 131°C, rated V_R		7.5	A
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	690	A
		Surge applied at rated load condition half wave single phase 60 Hz		150	
Non-repetitive avalanche energy	E_{AS}	T_J = 25°C, I_{AS} = 2A, L = 3.5mH		7	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		2	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**VALUE**	**UNIT**
Maximum forward voltage drop	V_{FM}(1)	15A	T_J = 25°C	0.84	V
		7.5A	T_J = 125°C	0.57	
		15A		0.72	
Maximum instantaneous reverse current	I_{RM}(1)	T_J = 25°C	Rated DC voltage	0.1	mA
		T_J = 125°C		15	
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHZ) 25°C		400	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		1000	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 175	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	3	°C/W
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.5	
Approximate weight			2	g
			0.07	oz.
Mounting torque minimum			6 (5)	kgf · cm (lbf · in)
Mounting torque maximum			12 (10)	
Marking device		Case style TO-220AC	MBR745	

Ordering Information Table

Device code

MBR	7	45
①	②	③

1 - Schottky MBR series

2 - Current rating (7 = 7.5A)

3 - Voltage ratings — 45=45V

Fig.1 Maximum forward voltage drop characteristics

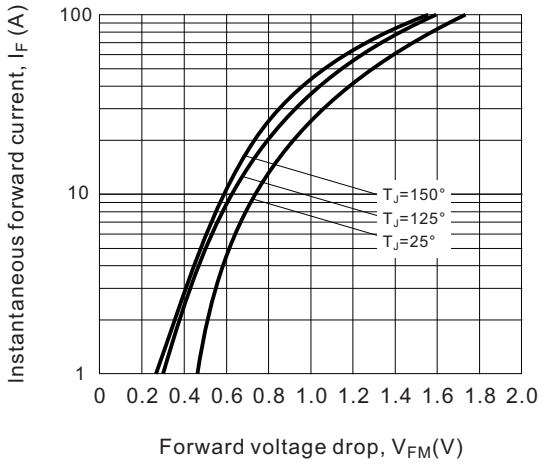


Fig.2 Typical values of reverse current vs. reverse voltage

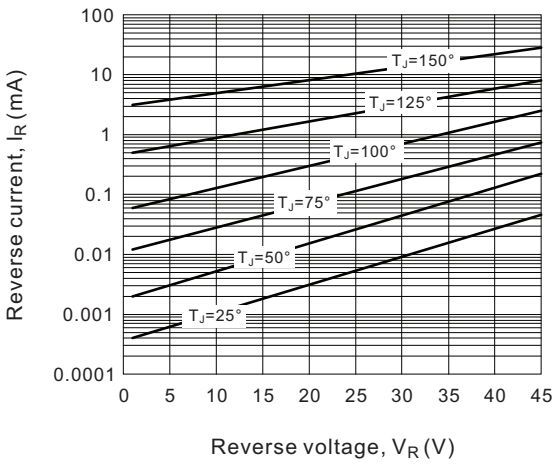


Fig.3 Typical junction capacitance vs. reverse voltage

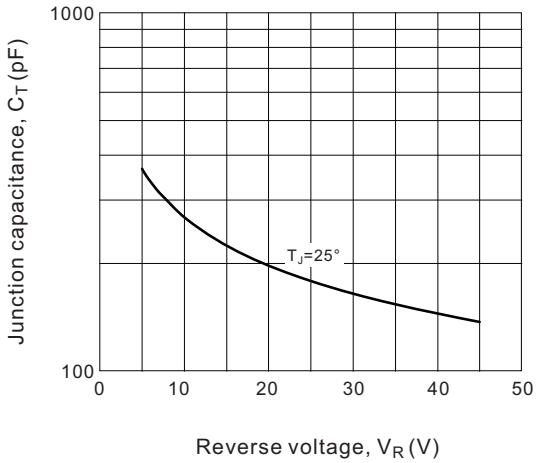


Fig.4 Maximum allowable case temperature vs. average forward current

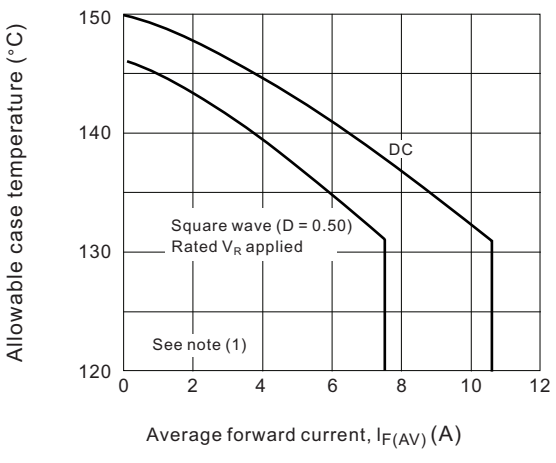


Fig.5 Maximum thermal impedance $R_{th(j-c)}$ characteristics

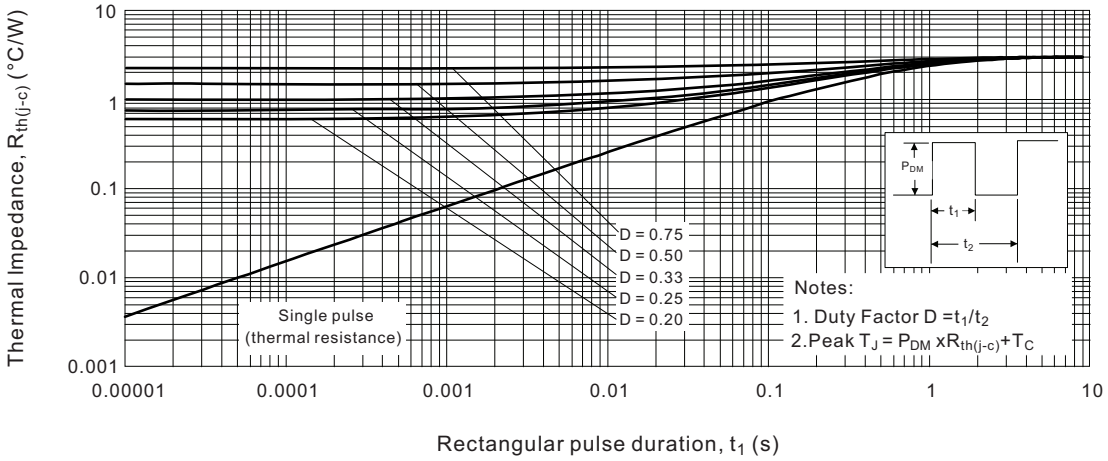


Fig.6 Forward power loss characteristics

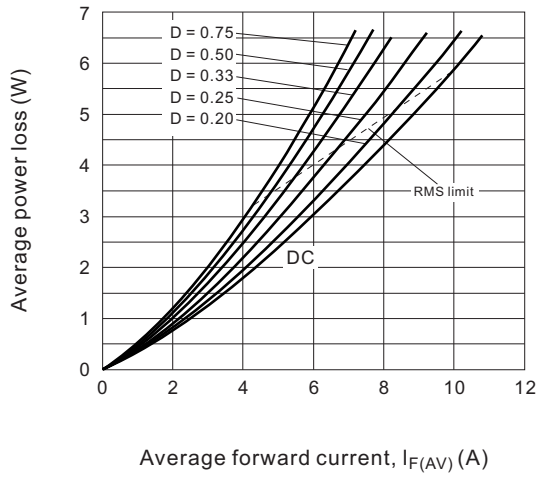
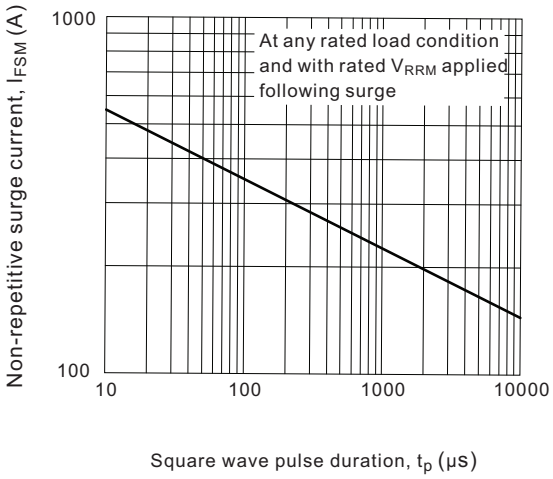


Fig.7 Maximum non-repetitive surge current



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

TO-220AC Package Outline