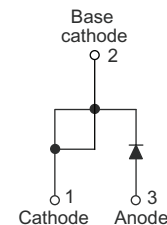


Schottky Rectifier, 16 A



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 MBR1645 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)}	16A
V _R	45V
V _F at I _F	0.57V
I _{RM} max.	40mA at 125°C
T _J max.	150°C
Diode variation	Single die
E _{AS}	24 mJ

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUE	UNIT
I _{F(AV)}	Rectangular waveform	16	A
V _{RRM}		45	V
I _{FSM}	t _p = 5 μs sine	1800	A
V _F	16 A _{pk} , T _J = 125°C	0.57	V
T _J	Range	-65 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR1645	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 = 134°C, rated V _R		16	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	1800	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} = 3.6A, L = 3.7mH		24	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		3.6	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
Maximum forward voltage drop	$V_{FM}^{(1)}$	16A	$T_J = 25^{\circ}\text{C}$	0.63	V
		16A	$T_J = 125^{\circ}\text{C}$	0.57	
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25^{\circ}\text{C}$	Rated DC voltage	0.2	mA
		$T_J = 125^{\circ}\text{C}$		40	
Maximum junction capacitance	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25°C		1400	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 175	
Maximum thermal resistance, junction to case	R _{thJC}	DC operation	1.5	°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 maximum			6 (5)	kgf · cm (lbf · in)
			12 (10)	
Marking device		Case style TO-220AC	MBR1645	

Ordering Information Table

Device code

MBR	16	45
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①

②

③

①

- Schottky MBR series

②

- Current rating (16 = 16A)

③

- Voltage ratings

45=45V

Fig.1 Maximum forward voltage drop characteristics

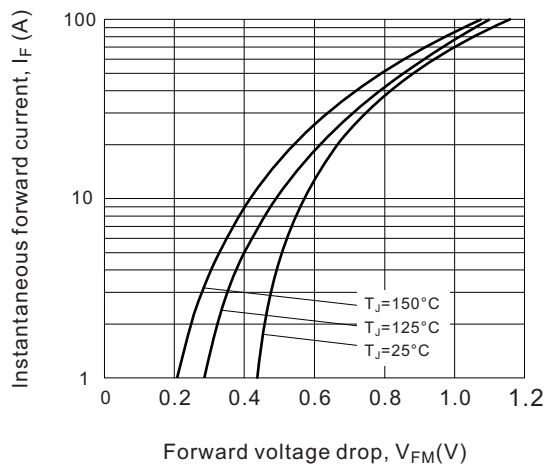


Fig.2 Typical values of reverse current vs. reverse voltage

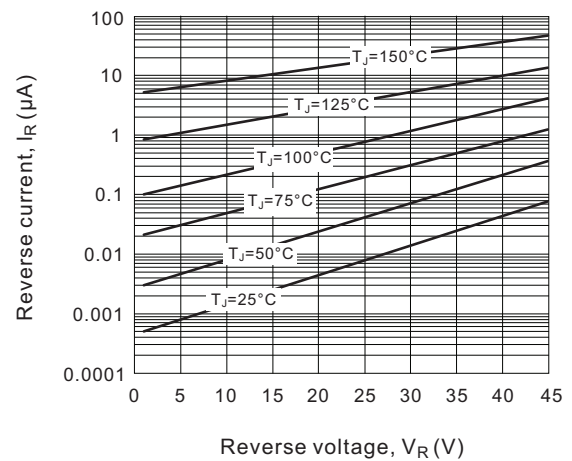


Fig.3 Typical junction capacitance vs. reverse voltage

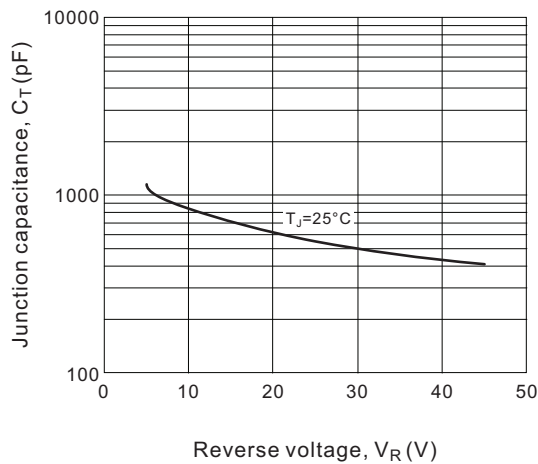


Fig.4 Maximum allowable case temperature vs. average forward current

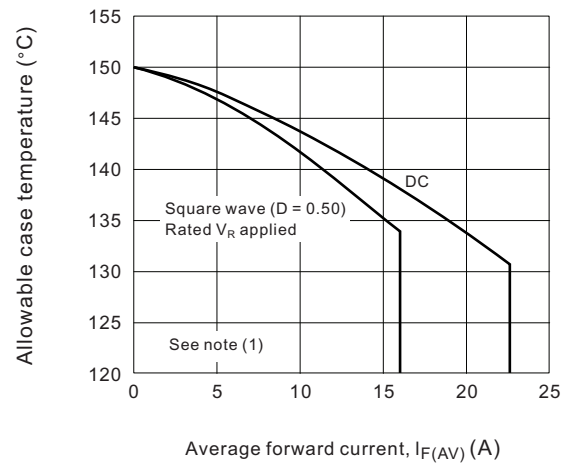
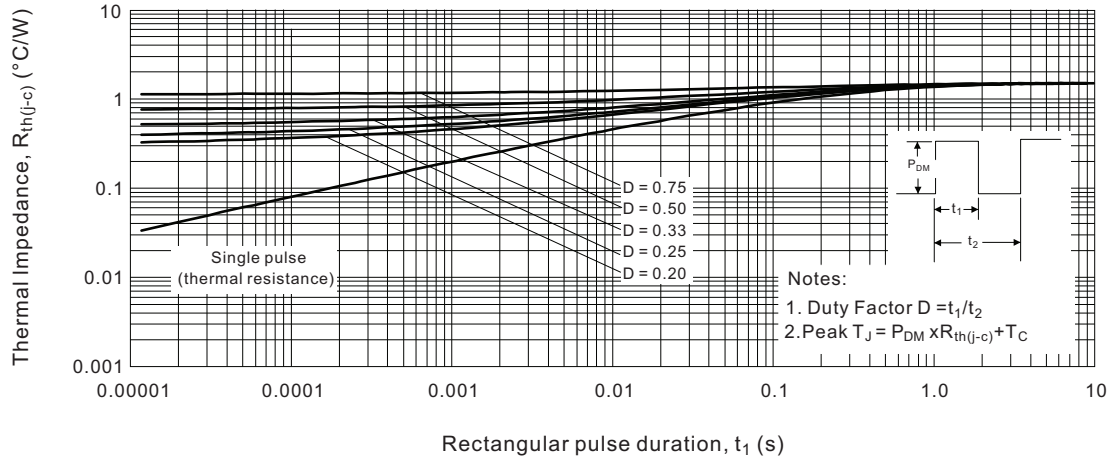
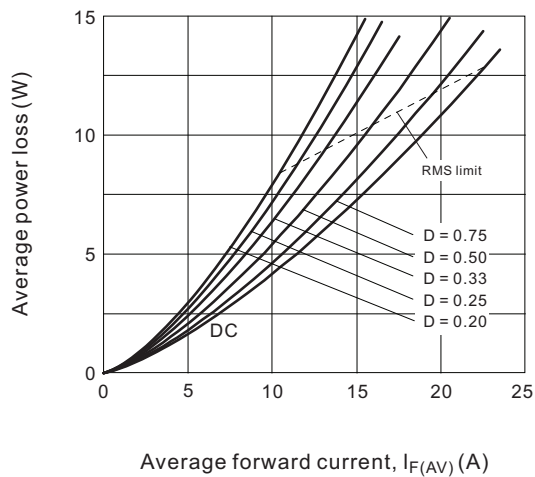
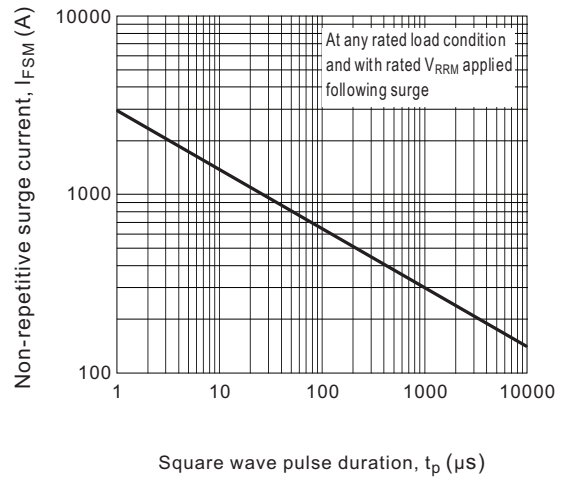
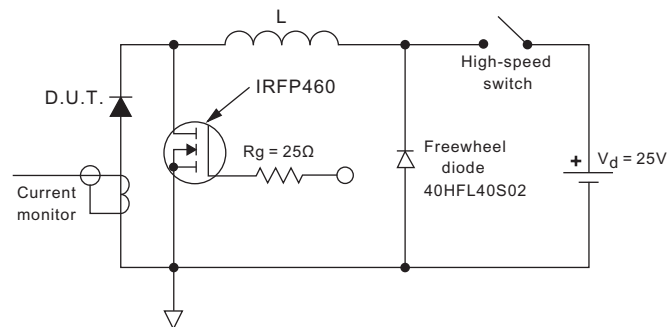


Fig.5 Maximum thermal impedance $R_{th(j-c)}$ characteristics

Fig.6 Forward power loss characteristics

Fig.7 Maximum non-repetitive surge current (per leg)

Fig.8 Unclamped inductive test circuit

Note

(1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$

P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig.6);

P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1-D)$; I_R at V_{R1} = Rated V_R

