Dual Common Cathode Schottky Rectifier, 20A (10A x 2)

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 275°C maximum, 10 s per JESD 22B-106 (for TO-220AB and ITO-220AB package)

DESCRIPTION

The **MBR20xxCT** 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.

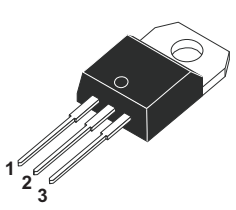
MECHANICAL DATA

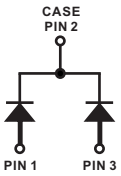
Case: TO-220AB, ITO-220AB, TO-263AB
Molding compound meets UL 94 V-O flammability rating

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

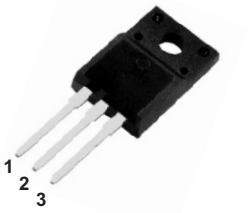
Polarity: As marked

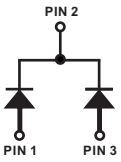
Mounting Torque: 10 in-lbs maximum



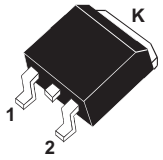


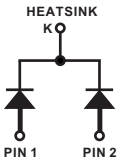
TO-220AB (MBR20xxCT)





ITO-220AB (MBRF20xxCT)





TO-263AB (MBRH20xxCT)

PRODUCT SUMMARY	
$I_{F(AV)}$	10A x 2
V_R	45V/60V
V_F at I_F	0.57V, 0.70V
I_{RM} max.	15~150mA at 125°C
T_J max.	150°C
Diode variation	Dual dice
E_{AS}	8 mJ

MAJOR RATINGS AND CHARACTERISTICS				
SYMBOL	CHARACTERISTICS	VALUE		UNIT
		MBR2045CT	MBR2060CT	
$I_{F(AV)}$	Rectangular waveform	10 x 2		A
V_{RRM}		45	60	V
I_{FSM}	t_p = 5 µs sine	1060		A
V_F	10 A_{pk}, T_J = 125°C	0.57	0.7	V
T_J	Range	-65 to 150		°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	MBR2045CT	MBR2060CT	UNIT
Maximum DC reverse voltage	V_R	45	60	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
Maximum average forward current — per device	$I_{F(AV)}$	T_C = 135°C, rated V_R		20	A
Maximum average forward current — per diode				10	
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	1060	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} = 2.0A, L = 4mH		8	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
				MBR2045CT	MBR2060CT	
Maximum forward voltage drop	V_{FM}(1)	I_F = 10A	T_J = 25°C	0.65	0.8	V
		I_F = 20A		0.84	0.95	
		I_F = 10A	T_J = 125°C	0.57	0.7	
		I_F = 20A		0.72	0.85	
Maximum instantaneous reverse current	I_{RM}(1)	T_J = 25°C	Rated DC voltage	0.1	1	mA
		T_J = 125°C		15	150	
Maximum junction capacitance	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHZ) 25°C		600	600	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
Isolation voltage (ITO-220AB only) from terminal to heatsink, t = 1 min	V_{ISO}			1500		V

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

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	VALUE			UNIT
			MBR	MBRF	MBRH	
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	2	5	2	°C/W
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.5	0.8	0.5	
Approximate weight			2	2	1.4	g
			0.07	0.07	0.05	oz.
Mounting torque minimum			6 (5)			kgf · cm (lbf · in)
Mounting torque maximum			12 (10)			

Ordering Information Table

Device code

MBR	F	20	45	CT
1	2	3	4	5

1 - Schottky MBR series

2 - Package outline
"none" for TO-220AB
"F" for ITO-220AB (TO-220F)
"H" for TO-263AB (D^2PAK)

3 - Current rating (20 = 20A, 10A x 2)

4 - Voltage ratings, 45 =45V, 60=60V

5 - Circuit configuration, Center tap common cathode, TO-220 series package

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Forward derating curve (Total)

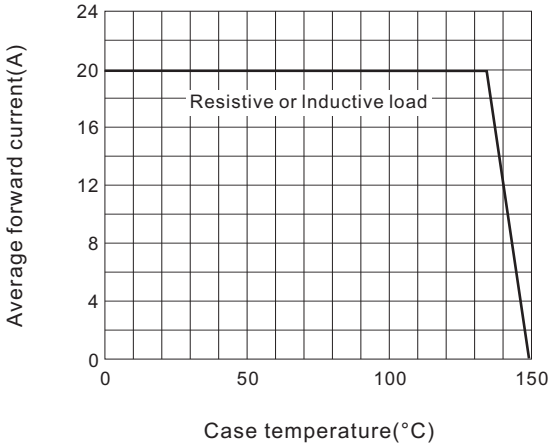


Fig.2 Maximum non-repetitive peak forward surge current per diode

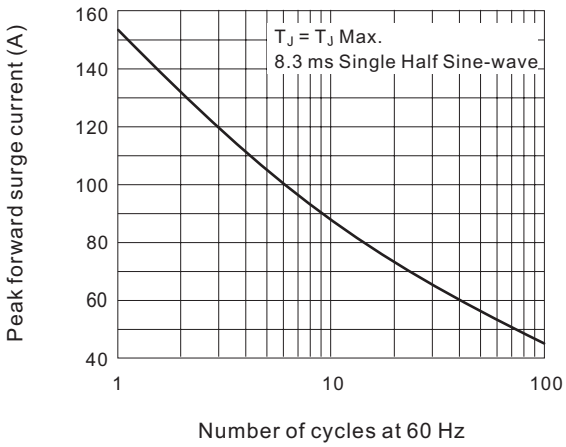


Fig.3 Typical instantaneous forward characteristics per diode

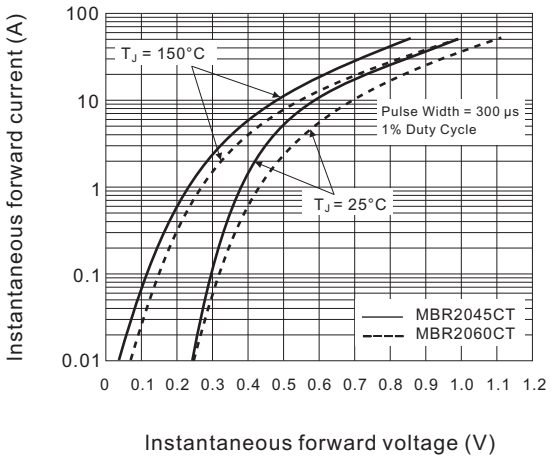


Fig.4 Typical reverse characteristics per diode

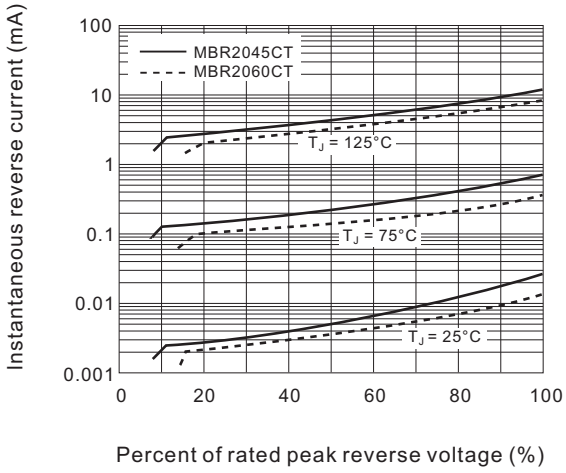


Fig.5 Typical junction capacitance per diode

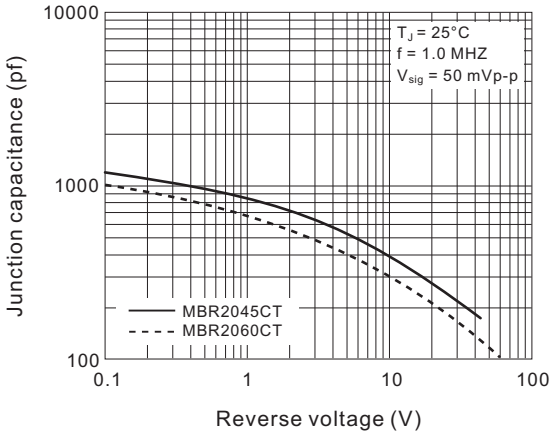
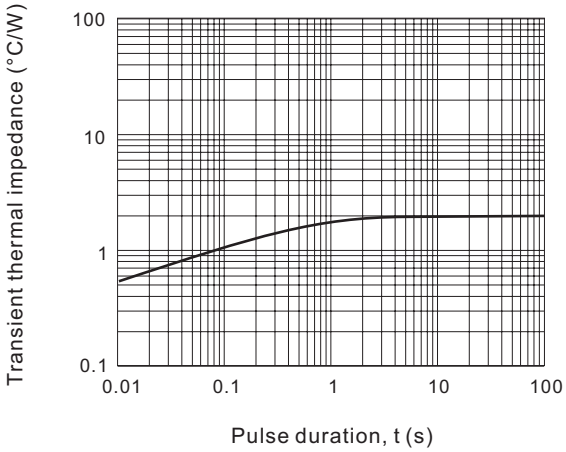
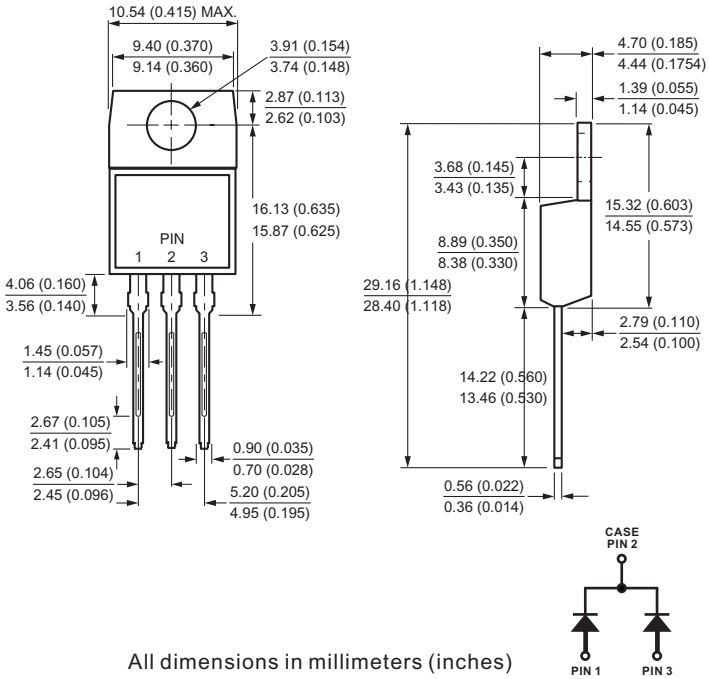


Fig.6 Typical transient thermal Impedance per diode

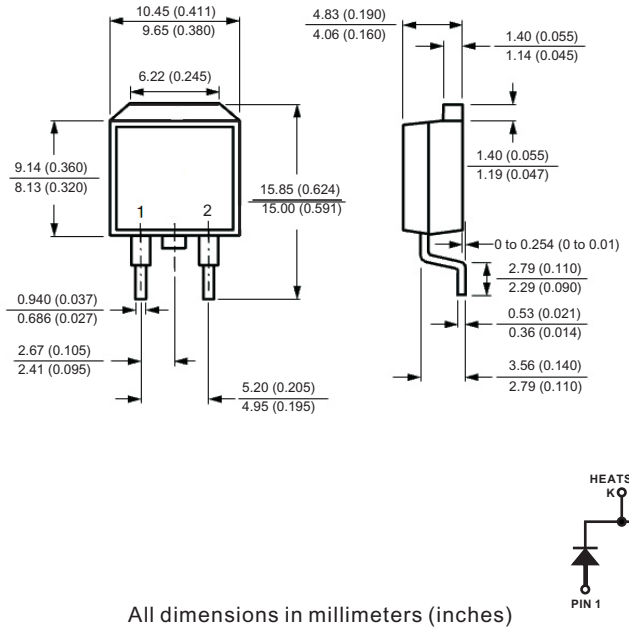


TO-220AB(MBR20xxCT)



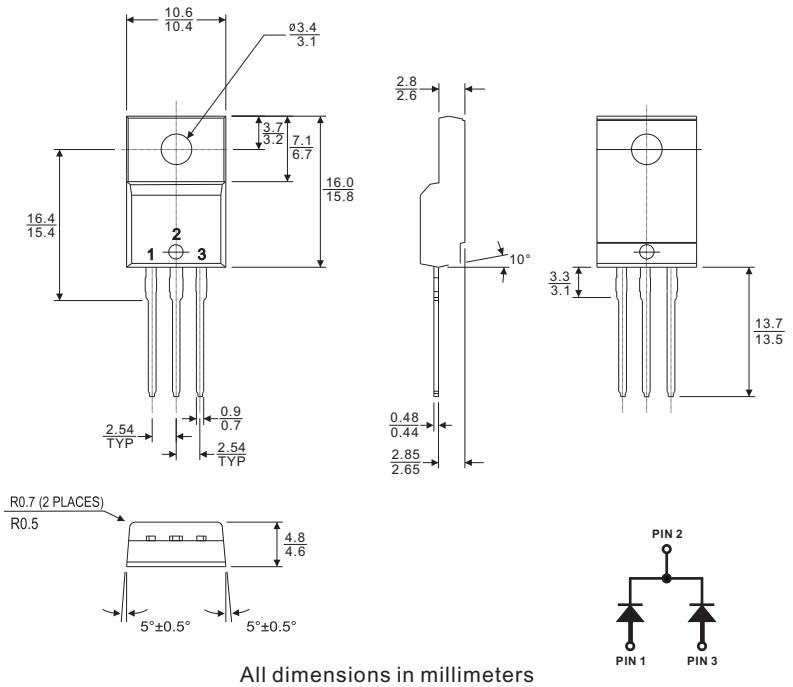
All dimensions in millimeters (inches)

TO-263AB(MBRH20xxCT)



All dimensions in millimeters (inches)

ITO-220AB(MBRF20xxCT)



All dimensions in millimeters