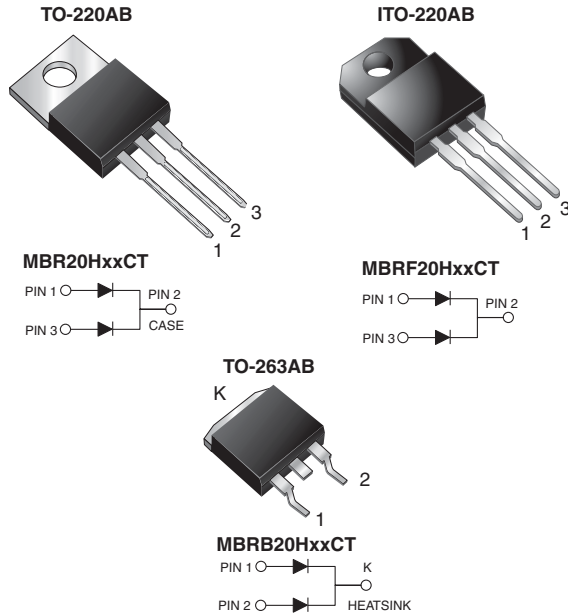


Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



FEATURES

- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- Low leakage current
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB and ITO-220AB package)
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters and polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, TO-263AB

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

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

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	10 A x 2
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	100 μ A
T_J max.	175 °C

MAXIMUM RATINGS ($T_C = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	MBR20H35CT	MBR20H45CT	MBR20H50CT	MBR20H60CT	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	50	60	V
Working peak reverse voltage	V_{RWM}	35	45	50	60	
Maximum DC blocking voltage	V_{DC}	35	45	50	60	
Maximum average forward rectified current (Fig.1)	$I_{F(AV)}$	20				A
total device current per diode		10				
Non-repetitive avalanche energy per diode at 25 °C, $I_{AS} = 4$ A, $L = 10$ mH	E_{AS}	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	150				A
Peak repetitive reverse surge current per diode at $t_p = 2.0$ μ s, 1 kHz	I_{RRM}	1.0		0.5		
Peak non-repetitive reverse energy (8/20 μ s waveform)	E_{RSM}	20		10		mJ
Electrostatic discharge capacitor voltage Human body model: $C = 100$ pF, $R = 1.5$ k Ω	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/ μ s
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to 175				°C
Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1$ min	V_{AC}	1500				V



ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MBR20H35CT MBR20H45CT		MBR20H50CT MBR20H60CT		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage per diode	$V_F^{(1)}$	$I_F = 10\text{ A}$	$T_C = 25\text{ }^\circ\text{C}$	-	0.63	-	0.71	V
		$I_F = 10\text{ A}$	$T_C = 125\text{ }^\circ\text{C}$	0.49	0.55	0.57	0.61	
		$I_F = 20\text{ A}$	$T_C = 25\text{ }^\circ\text{C}$	-	0.75	-	0.85	
		$I_F = 20\text{ A}$	$T_C = 125\text{ }^\circ\text{C}$	0.62	0.68	0.68	0.71	
Maximum reverse current per diode	$I_R^{(2)}$	Rated V_R	$T_J = 25\text{ }^\circ\text{C}$	-	100	-	100	μA
			$T_J = 125\text{ }^\circ\text{C}$	4.0	12	2.0	12	mA

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical resistance, junction to case per diode	$R_{\theta JC}$	2.0	4.0	2.0	$^\circ\text{C/W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	MBR20H45CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H45CT-E3/45	1.99	45	50/tube	Tube
TO-263AB	MBRB20H45CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB20H45CT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AB	MBR20H45CTHE3/45 ⁽¹⁾	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H45CTHE3/45 ¹⁾	1.99	45	50/tube	Tube
TO-263AB	MBRB20H45CTHE3/45 ⁽¹⁾	1.35	45	50/tube	Tube
TO-263AB	MBRB20H45CTHE3/81 ⁽¹⁾	1.35	81	800/reel	Tape and reel

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES

($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

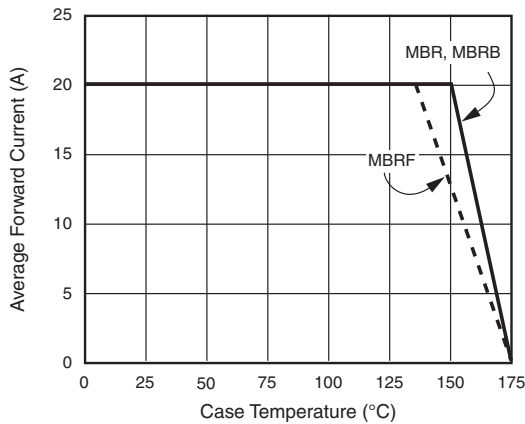


Fig. 1 - Forward Current Derating Curve (Total)

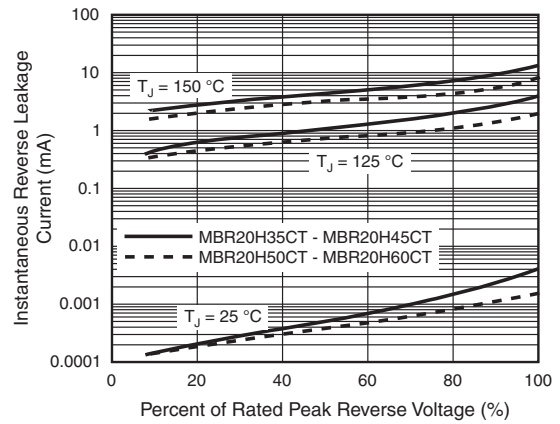


Fig. 4 - Typical Reverse Characteristics Per Diode

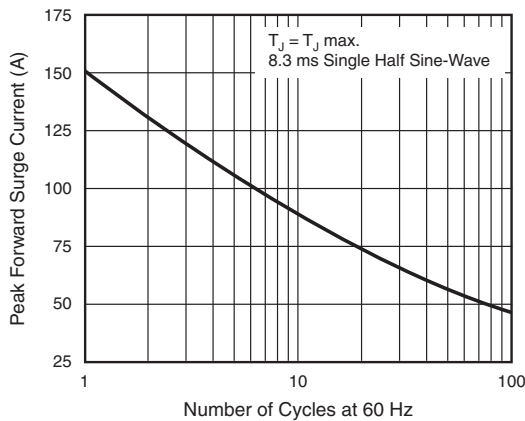


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

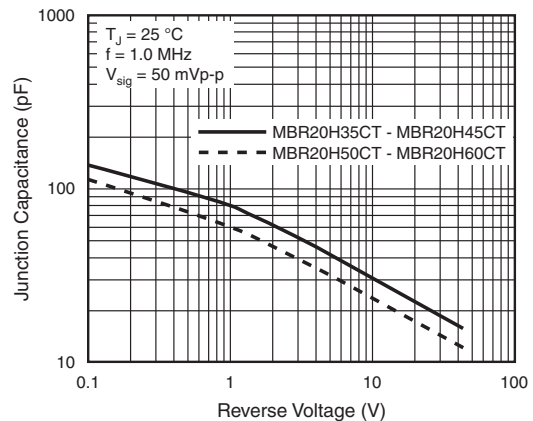


Fig. 5 - Typical Junction Capacitance Per Diode

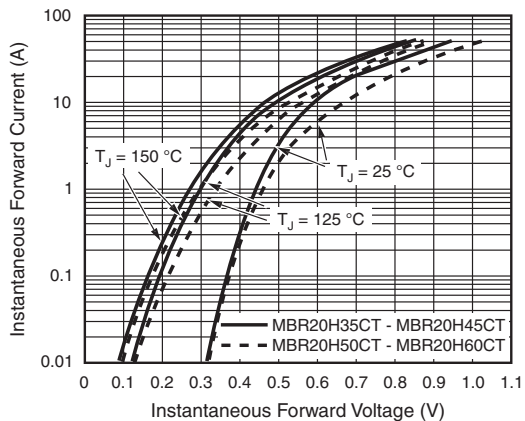


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

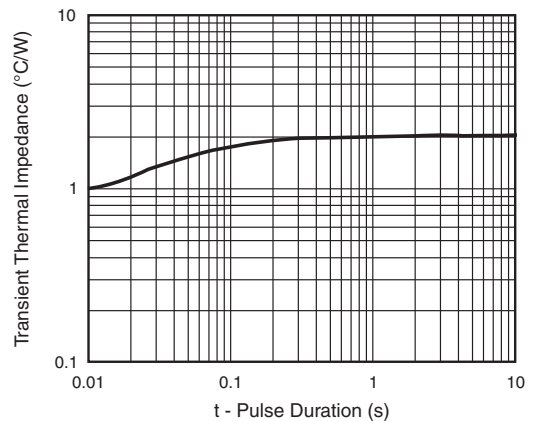
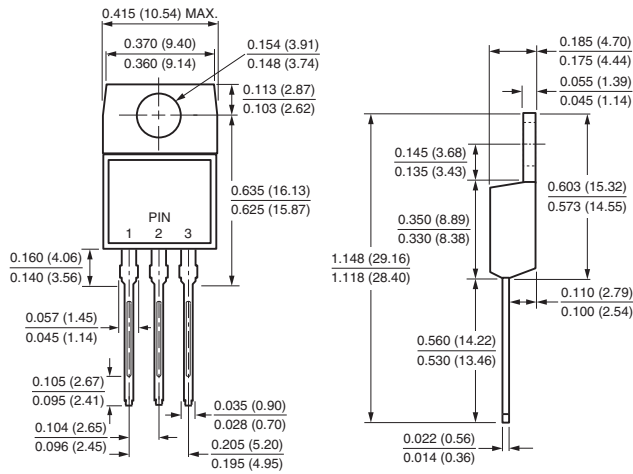


Fig. 6 - Typical Transient Thermal Impedance Per Diode

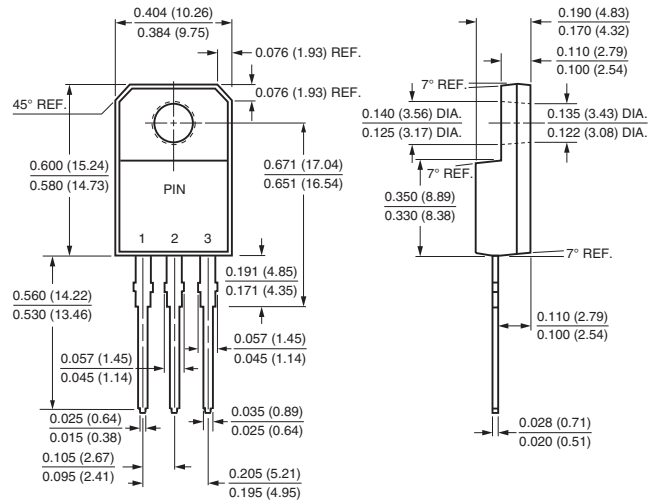


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

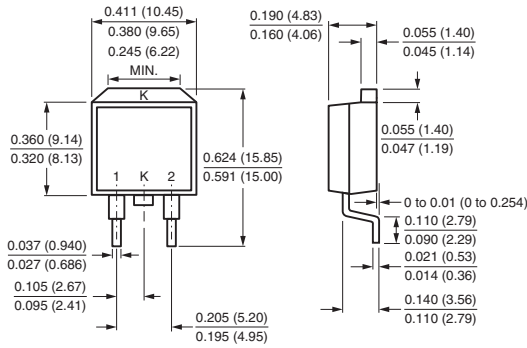
TO-220AB



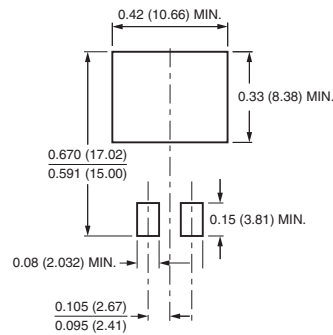
ITO-220AB



TO-263AB



Mounting Pad Layout





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