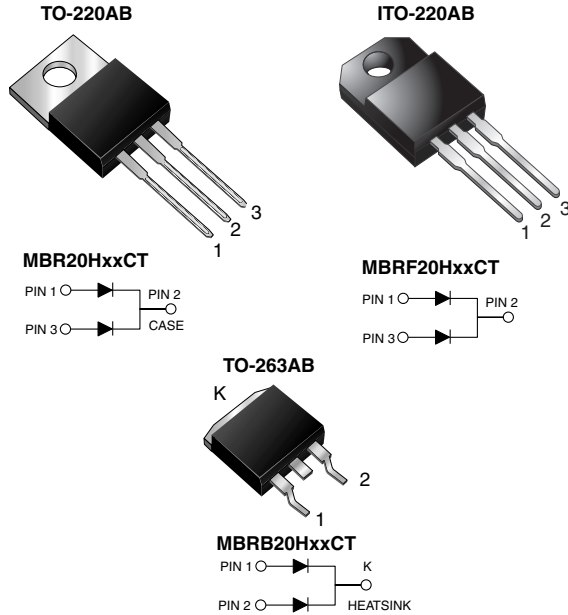


## Dual Common Cathode Schottky Rectifier

High Barrier Technology for Improved High Temperature Performance



### FEATURES

- Power pack
- 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](http://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	
$I_{F(AV)}$	2 x 10 A
$V_{RRM}$	35 V to 60 V
$I_{FSM}$	150 A
$V_F$	0.55 V, 0.61 V
$I_R$	100 $\mu$ A
$T_J \text{ max.}$	175 °C
Package	TO-220AB, ITO-220AB, TO-263AB
Diode variations	Common cathode



<b>MAXIMUM RATINGS</b> ( $T_C = 25\text{ }^\circ\text{C}$ 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) total device per diode	$I_{F(AV)}$	20				A
		10				
Non-repetitive avalanche energy per diode at $25\text{ }^\circ\text{C}$ , $I_{AS} = 4\text{ A}$ , $L = 10\text{ mH}$	$E_{AS}$	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 $t_p = 2.0\text{ }\mu\text{s}$ , 1 kHz	$I_{RRM}$	1.0		0.5		
Peak non-repetitive reverse energy (8/20 $\mu\text{s}$ waveform)	$E_{RSM}$	20		10		mJ
Electrostatic discharge capacitor voltage Human body model: $C = 100\text{ pF}$ , $R = 1.5\text{ k}\Omega$	$V_C$	25				kV
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000				V/ $\mu\text{s}$
Operating junction and storage temperature range	$T_J, T_{STG}$	- 65 to 175				$^\circ\text{C}$
Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$	$V_{AC}$	1500				V

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ 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
			$T_C = 125\text{ }^\circ\text{C}$	0.49	0.55	0.57	0.61	
		$I_F = 20\text{ A}$	$T_C = 25\text{ }^\circ\text{C}$	-	0.75	-	0.85	
			$T_C = 125\text{ }^\circ\text{C}$	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	$\mu\text{A}$
			$T_J = 125\text{ }^\circ\text{C}$	4.0	12	2.0	12	mA

**Notes**

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

<b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ 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	$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (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 <sup>(1)</sup>	1.85	45	50/tube	Tube
ITO-220AB	MBRF20H45CTHE3/45 <sup>(1)</sup>	1.99	45	50/tube	Tube
TO-263AB	MBRB20H45CTHE3/45 <sup>(1)</sup>	1.35	45	50/tube	Tube
TO-263AB	MBRB20H45CTHE3/81 <sup>(1)</sup>	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)

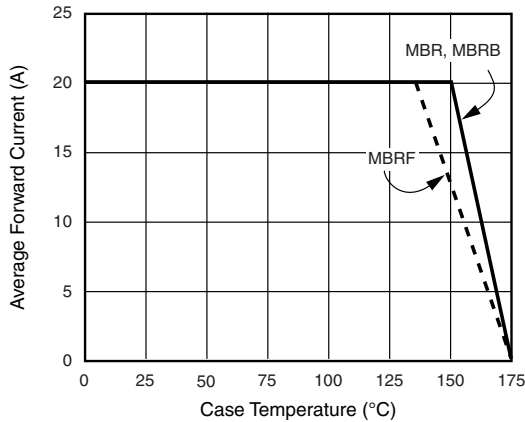


Fig. 1 - Forward Current Derating Curve (Total)

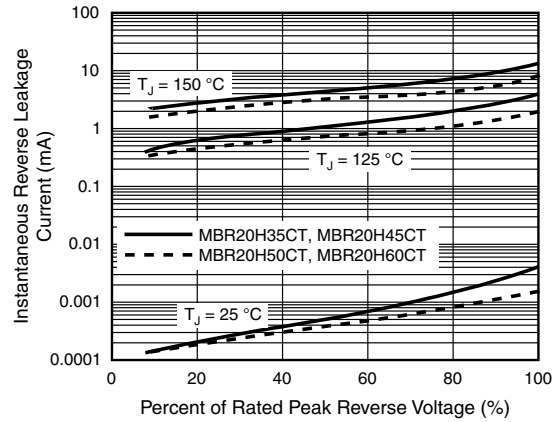


Fig. 4 - Typical Reverse Characteristics Per Diode

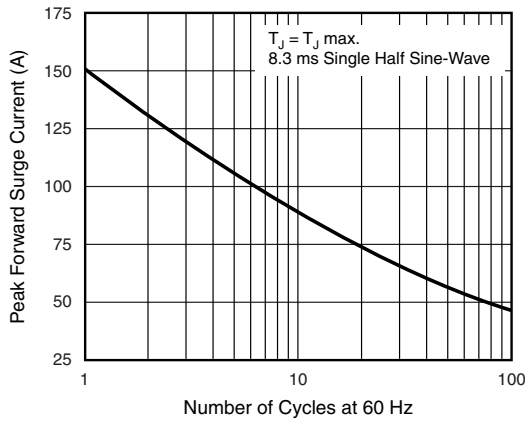


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

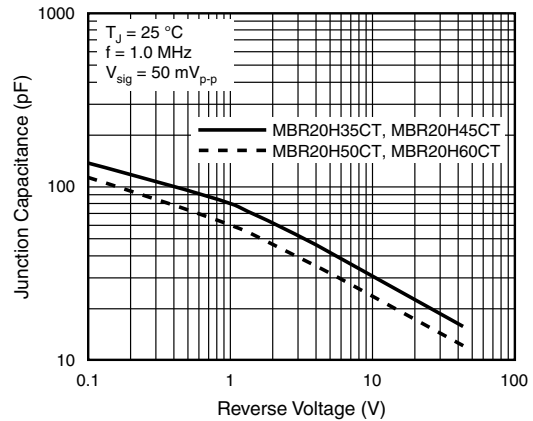


Fig. 5 - Typical Junction Capacitance Per Diode

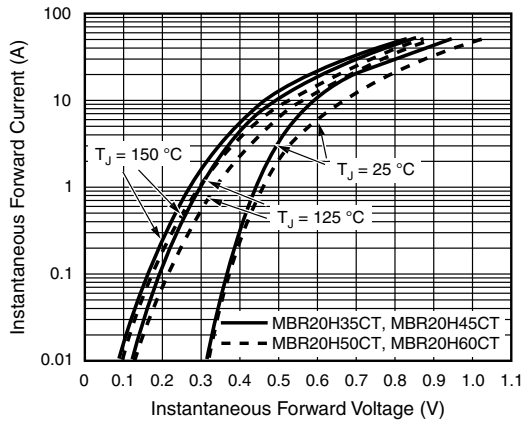


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

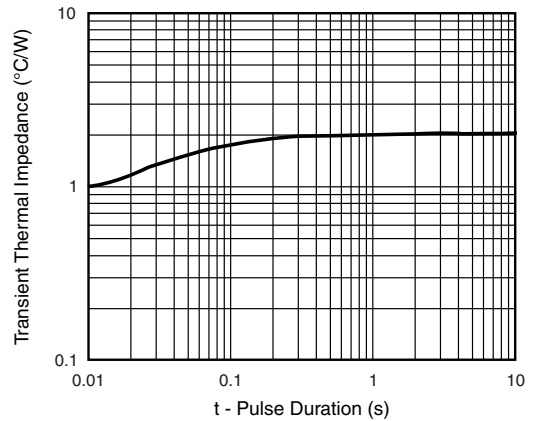
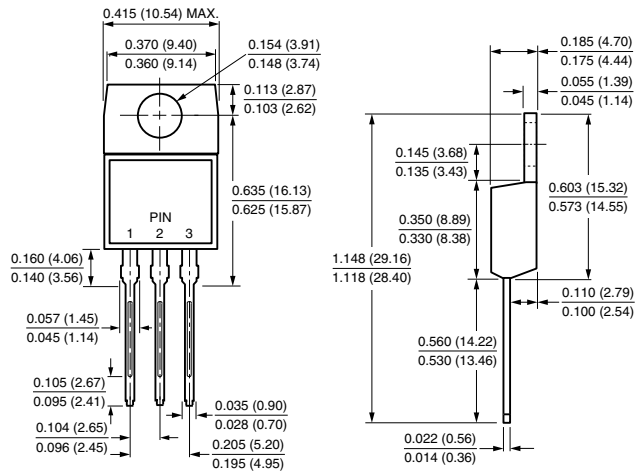


Fig. 6 - Typical Transient Thermal Impedance Per Diode

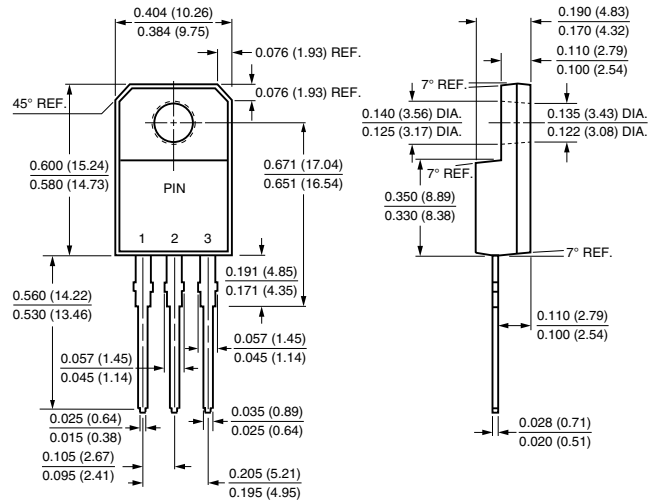


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

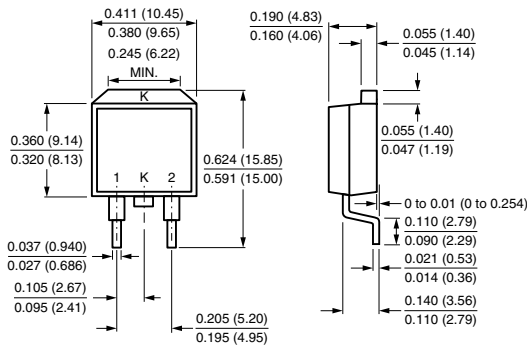
#### TO-220AB



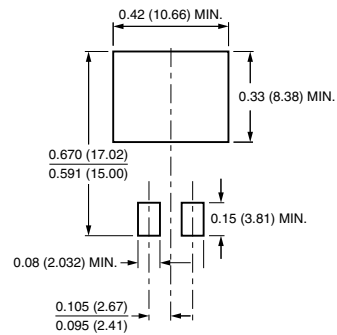
#### ITO-220AB



#### TO-263AB



#### Mounting Pad Layout





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