

## MBR2035CT-MBR2045CT

### 20A SCHOTTKY RECTIFIERS

#### FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

#### MAXIMUM RATINGS

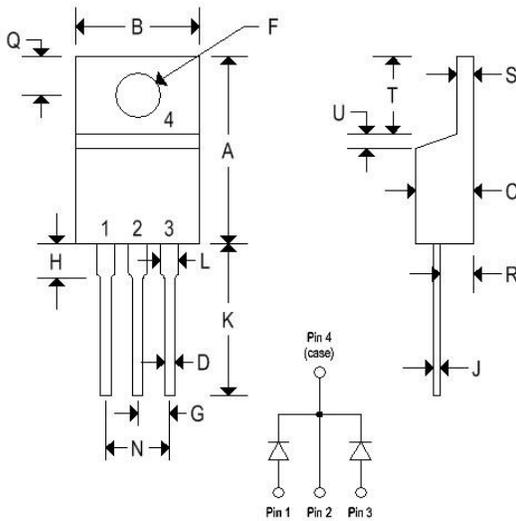
Rating	Symbol	MBR2035CT	MBR2045CT	Unit
Peak repetitive reverse voltage	$V_{RRM}$	35	45	V
Working peak reverse voltage	$V_{RWM}$			
DC blocking voltage	$V_R$			
Average rectified forward current (Rated $V_R$ )	$I_{F(AV)}$	20 @ $T_C = 135^\circ\text{C}$		A
Non-repetitive peak surge current (surge applied at rated load conditions, halfwave, single phase, 60Hz)	$I_{FSM}$	150		A
Peak repetitive reverse surge current (2.0 $\mu\text{s}$ , 1.0kHz)	$I_{RRM}$	1.0		A
Operating junction temperature range	$T_J$	-65 to +150		$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-65 to +175		$^\circ\text{C}$
Voltage rate of change (Rated $V_R$ )	dv/dt	1000		V/ $\mu\text{s}$
Maximum thermal resistance Junction to case	$R_{\theta JC}$	2.0		$^\circ\text{C}/\text{W}$

#### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	MBR2035CT	MBR2045CT	Unit
Maximum instantaneous forward voltage <sup>(1)</sup> ( $I_F = 10\text{A}$ , $T_C = 125^\circ\text{C}$ ) ( $I_F = 20\text{A}$ , $T_C = 125^\circ\text{C}$ ) ( $I_F = 20\text{A}$ , $T_C = 25^\circ\text{C}$ )	$V_F$	0.57 0.72 0.84		V
Maximum instantaneous reverse current <sup>(1)</sup> (Rated dc voltage, $T_C = 125^\circ\text{C}$ ) (Rated dc voltage, $T_C = 25^\circ\text{C}$ )	$I_R$	15 0.1		mA

### MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	Alpha-numeric
Pin out	Cathode band



	TO-220AB			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.570	0.620	14.480	15.750
B	0.380	0.405	9.660	10.280
C	0.160	0.190	4.070	4.820
D	0.025	0.035	0.640	0.880
F	0.142	0.147	3.610	3.730
G	0.095	0.105	2.420	2.660
H	0.110	0.155	2.800	3.930
J	0.018	0.025	0.460	0.640
K	0.500	0.562	12.700	14.270
L	0.045	0.060	1.150	1.520
N	0.190	0.210	4.830	5.330
Q	0.100	0.120	2.540	3.040
R	0.080	0.110	2.040	2.790
S	0.045	0.055	1.150	1.390
T	0.235	0.255	5.970	6.470
U	-	0.050	-	1.270

FIGURE 1 — MAXIMUM FORWARD VOLTAGE

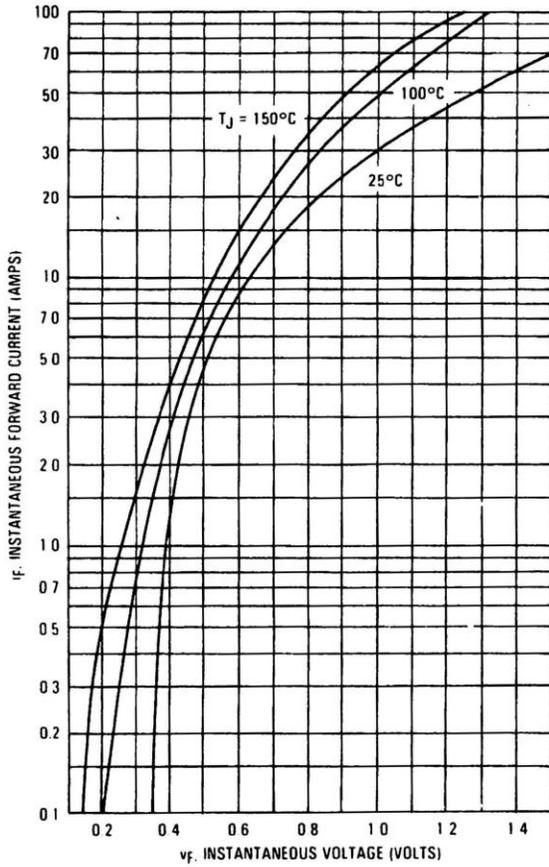


FIGURE 2 — TYPICAL FORWARD VOLTAGE

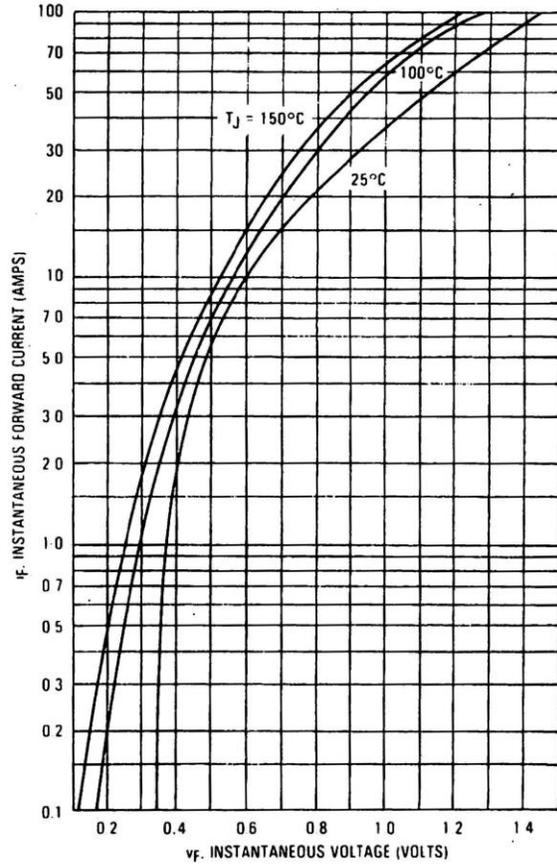


FIGURE 3 — MAXIMUM REVERSE CURRENT

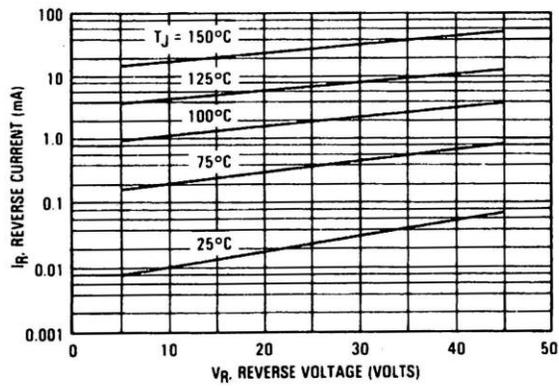


FIGURE 4 — MAXIMUM SURGE CAPABILITY

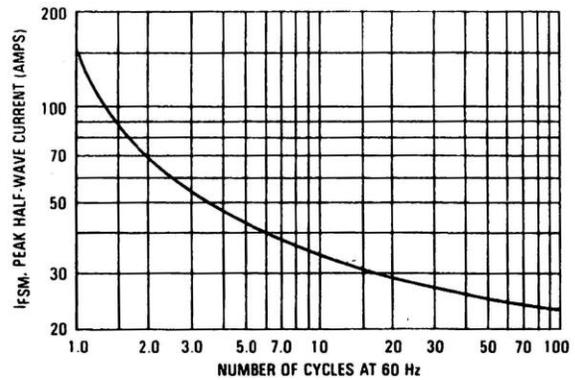


FIGURE 5 — CURRENT DERATING, INFINITE HEATSINK

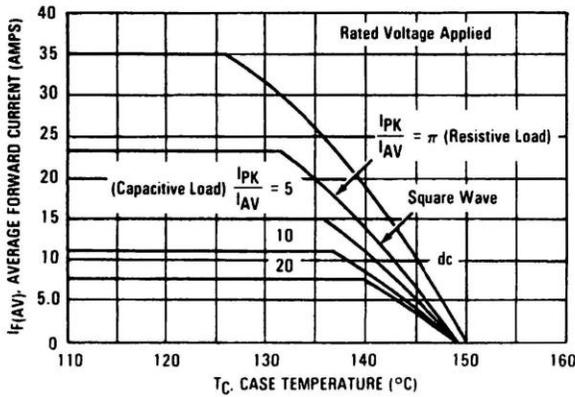


FIGURE 6 — CURRENT DERATING,  $R_{\theta JA} = 16^\circ C/W$

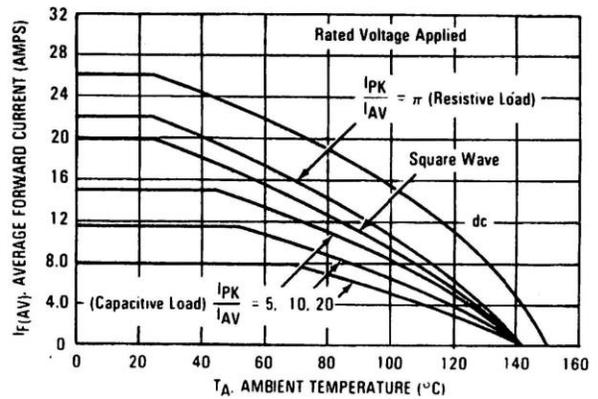


FIGURE 7 — FORWARD POWER DISSIPATION

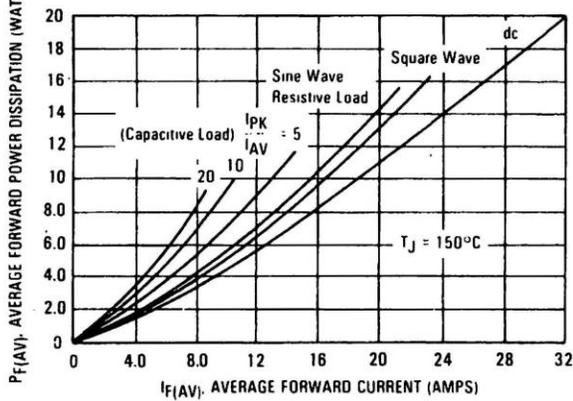


FIGURE 8 — CURRENT DERATING, FREE AIR

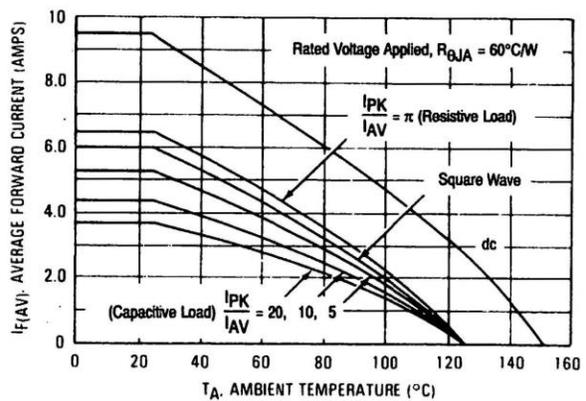
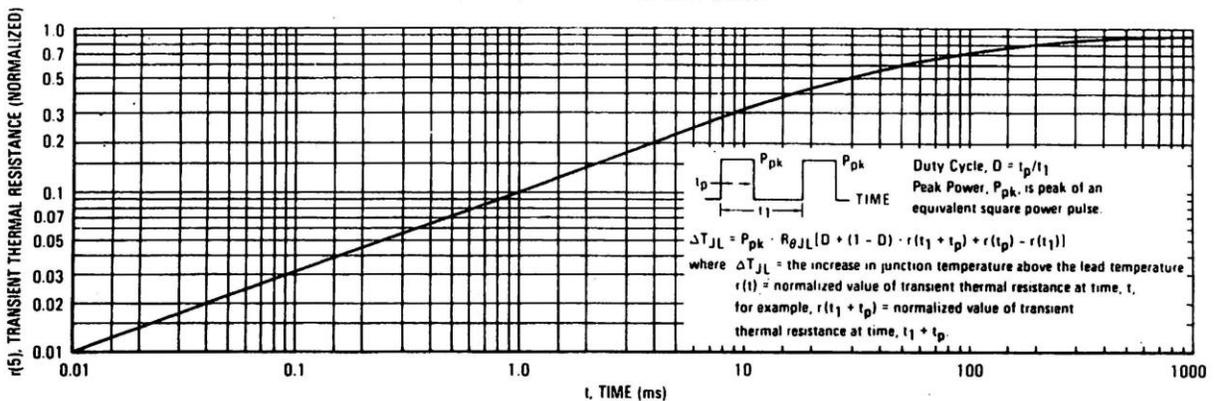


FIGURE 9 — THERMAL RESPONSE

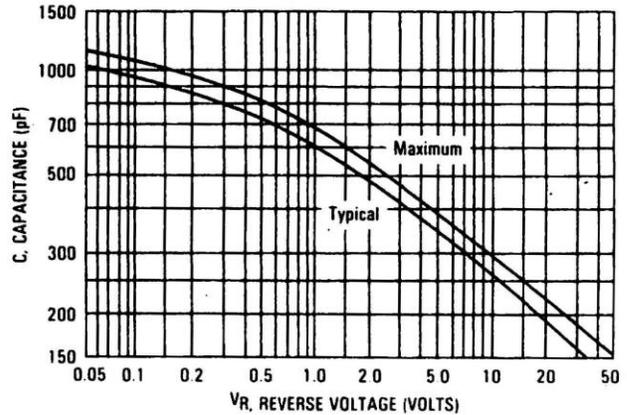


**HIGH FREQUENCY OPERATION**

Since current flow in a Schottky rectifier is the result of majority carrier conduction, it is not subject to junction diode forward and reverse recovery transients due to minority carrier injection and stored charge. Satisfactory circuit analysis work may be performed by using a model consisting of an ideal diode in parallel with a variable capacitance. (See Figure 10.)

Rectification efficiency measurements show that operation will be satisfactory up to several megahertz. For example, relative waveform rectification efficiency is approximately 70 per cent at 2.0 MHz, e.g., the ratio of dc power to RMS power in the load is 0.28 at this frequency, whereas perfect rectification would yield 0.406 for sine wave inputs. However, in contrast to ordinary junction diodes, the loss in waveform efficiency is not indicative of power loss; it is simply a result of reverse current flow through the diode capacitance, which lowers the dc output voltage.

**FIGURE 10 — CAPACITANCE**



**FIGURE 11 — TEST CIRCUIT FOR dv/dt AND REVERSE SURGE CURRENT**

