DIGITRON™ Semiconductors

High-reliability discrete products and engineering services since 1977

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	MBR		Unit
		2035CT	2045CT	
Peak repetitive reverse voltage **Working peak reverse voltage** **DC blocking voltage**	V_{RRM} V_{RWM} V_R	35	45	V
Average rectified forward current (Rated V_R)	$I_{F(AV)}$	20 @ T_C = 135°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 (2.0µs, 1.0kHz)	I_{RRM}	1.0		A
Operating junction temperature range	T_J	-65 to +150		°C
Storage temperature range	T_{stg}	-65 to +175		°C
Voltage rate of change (Rated V_R)	dv/dt	1000		V/µs
Maximum thermal resistance Junction to case	$R_{\Theta JC}$	2.0		°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	MBR		Unit
		2035CT	2045CT	
Maximum instantaneous forward voltage (1) (I_F = 10A, T_C = 125°C) (I_F = 20A, T_C = 125°C) (I_F = 20A, T_C = 25°C)	V_F	0.57 0.72 0.84		V
Maximum instantaneous reverse current (1) (Rated dc voltage, T_C = 125°C) (Rated dc voltage, T_C = 25°C)	I_R	15 0.1		mA

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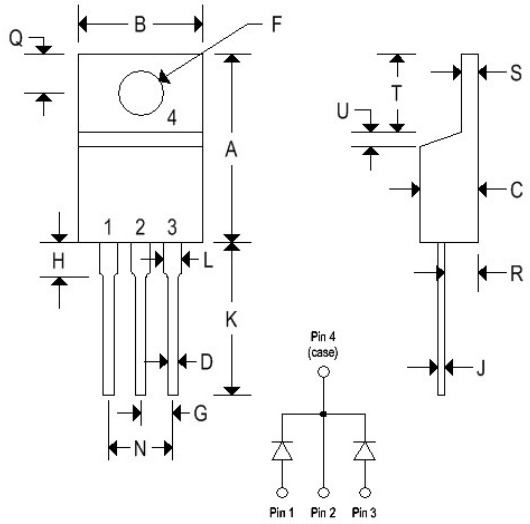
MECHANICAL CHARACTERISTICS

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

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FIGURE 1 —MAXIMUM FORWARD VOLTAGE

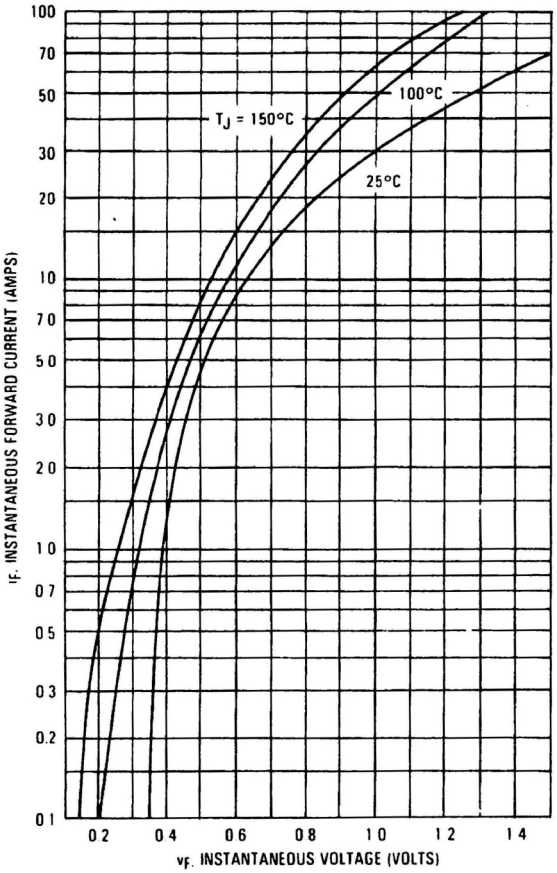

FIGURE 2 —TYPICAL FORWARD VOLTAGE

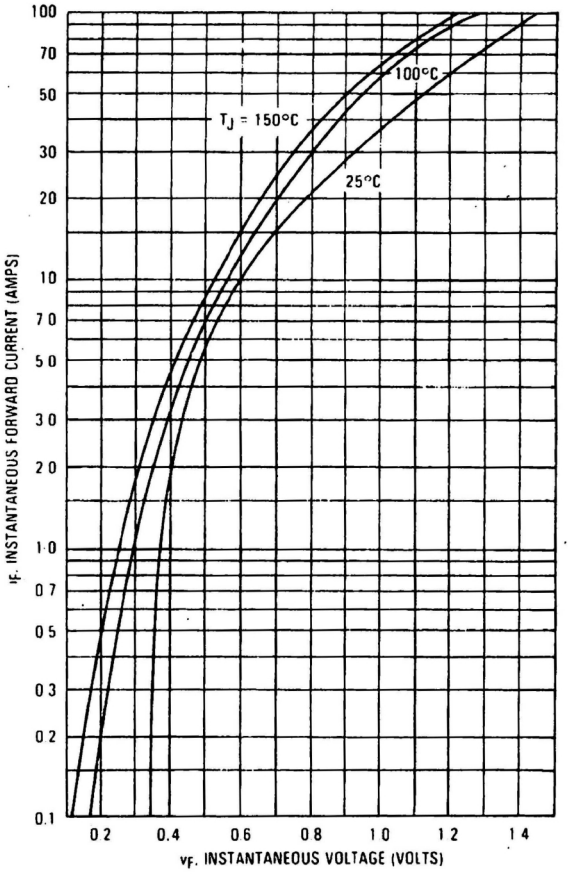

FIGURE 3 — MAXIMUM REVERSE CURRENT

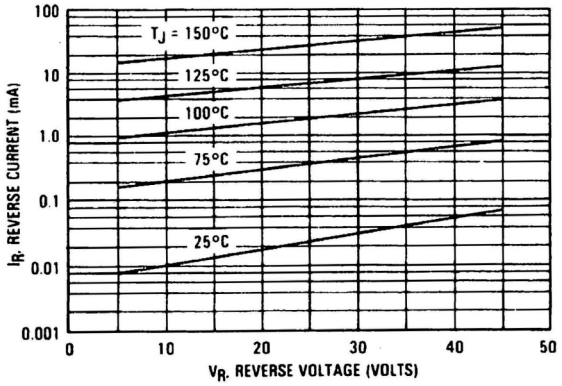

FIGURE 4 — MAXIMUM SURGE CAPABILITY

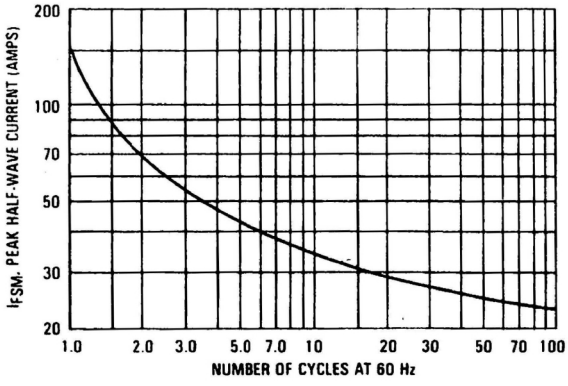

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FIGURE 5 — CURRENT DERATING, INFINITE HEATSINK

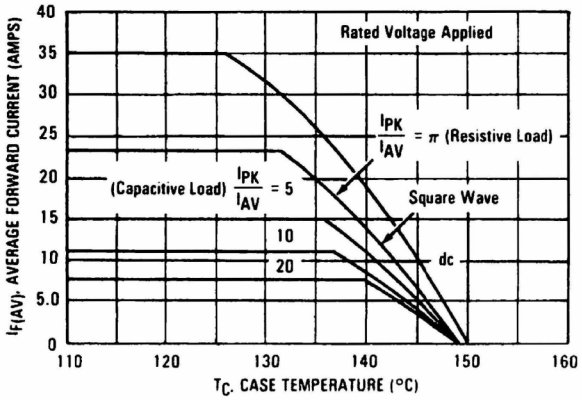


FIGURE 6 — CURRENT DERATING, $R_{\theta JA}$ = 16° C/W

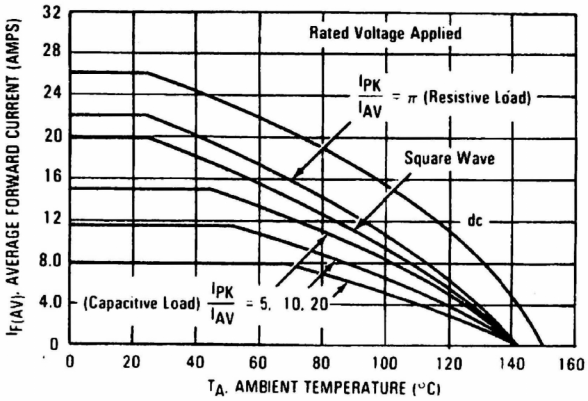


FIGURE 7 — FORWARD POWER DISSIPATION

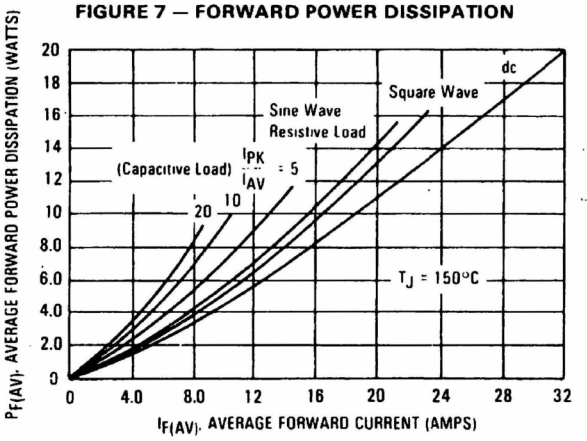


FIGURE 8 — CURRENT DERATING, FREE AIR

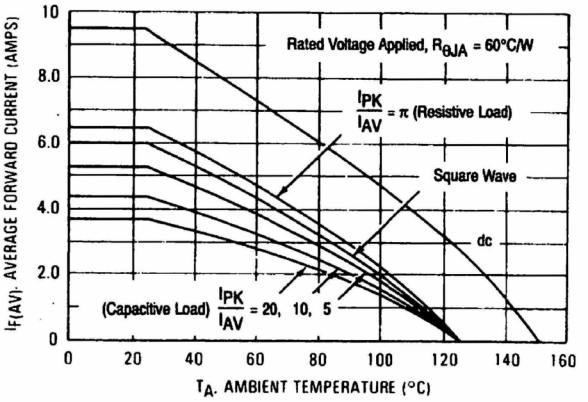
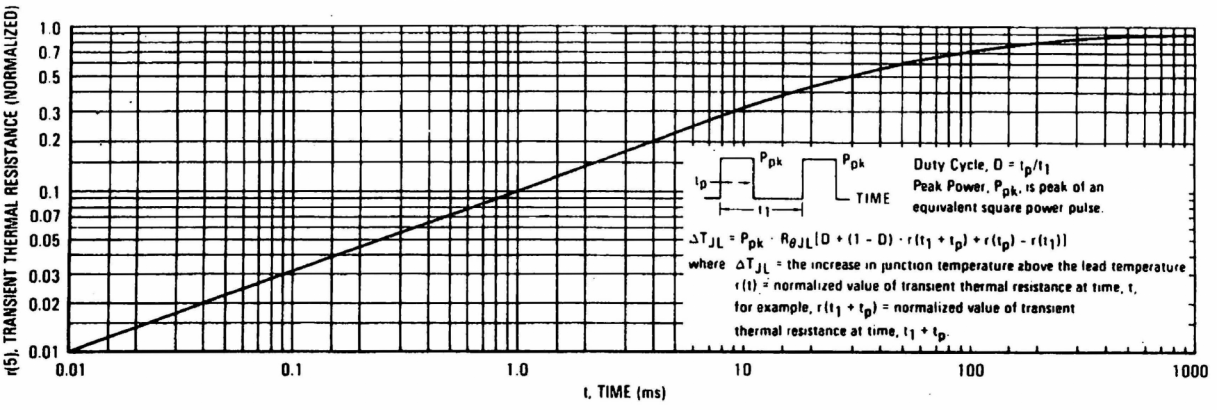


FIGURE 9 — THERMAL RESPONSE



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 efficieny 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

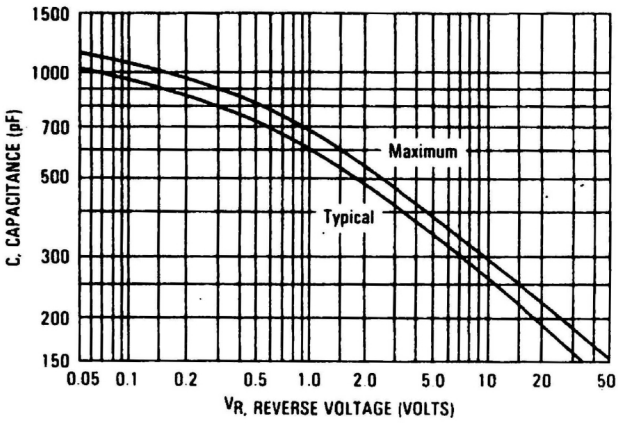


FIGURE 11 — TEST CIRCUIT FOR dv/dt AND REVERSE SURGE CURRENT