DIGITRON SEMICONDUCTORS

MBR2015CTL-MBR2030CTL 20A SCHOTTKY RECTIFIERS

MAXIMUM RATINGS

Rating	Symbol	MBR		Unit
		2015CTL	2030CTL	
Peak repetitive reverse voltage **Working peak reverse voltage** **DC blocking voltage**	V_{RRM} V_{RWM} V_R	15	30	V
Average rectified forward current	$I_{F(AV)}$	10		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	10000		V/µs
Maximum thermal resistance Junction to case	$R_{\Theta JC}$	2.0		°C/W

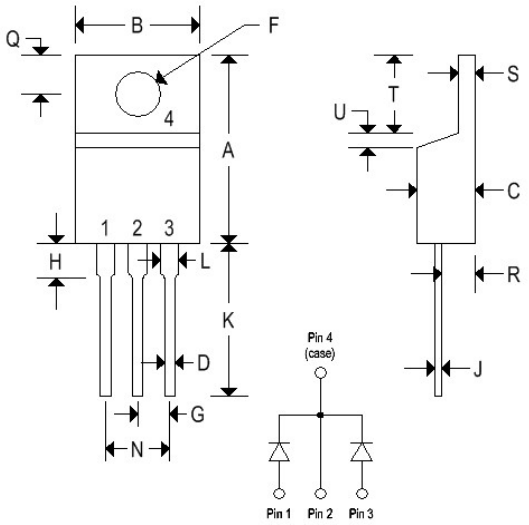
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Parameter	Symbol	MBR		Unit
		2015CTL	2030CTL	
Maximum instantaneous forward voltage (1) (I_F = 10A, T_C = 25°C) (I_F = 10A, T_C = 150°C) (I_F = 20A, T_C = 25°C) (I_F = 20A, T_C = 150°C)	V_F	0.52 0.40 0.58 0.48		V
Maximum instantaneous reverse current (1) (Rated dc voltage, T_C = 25°C) (Rated dc voltage, T_C = 100°C) (Rated dc voltage, T_C = 125°C)	I_R	5.0 40 75		mA

Note 1: Pulse test: Pulse width = 5.0ms, duty cycle ≤ 10%.

MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	Alpha-numeric
Polarity	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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Rev. 20121204

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Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).
Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

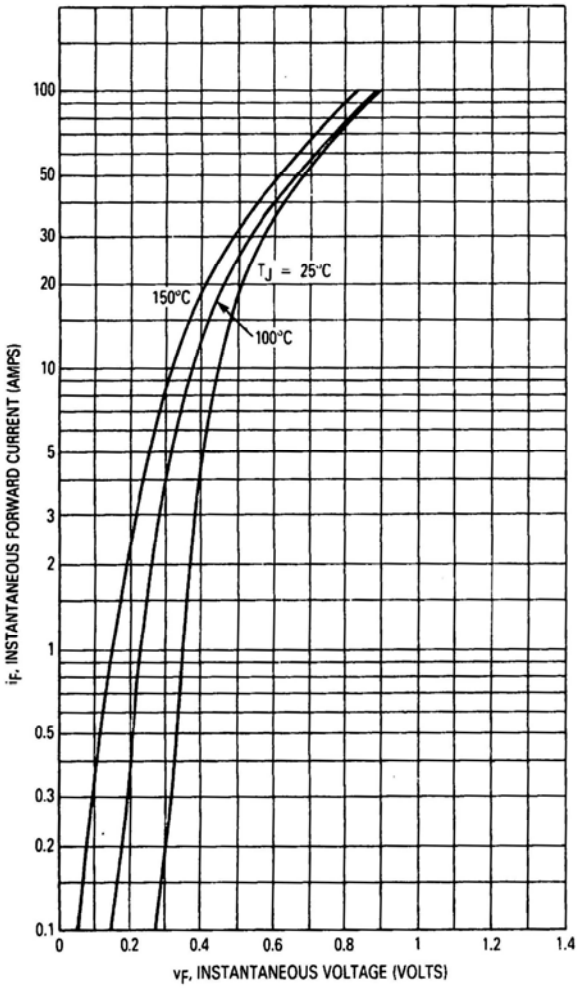


Figure 1. Typical Forward Voltage (Per Leg)

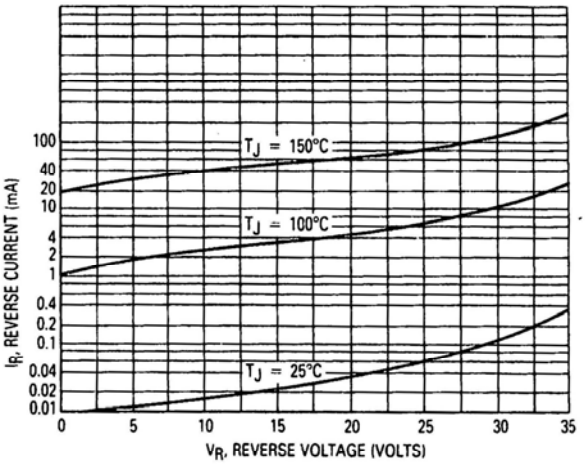


Figure 2. Typical Reverse Current (Per Leg)

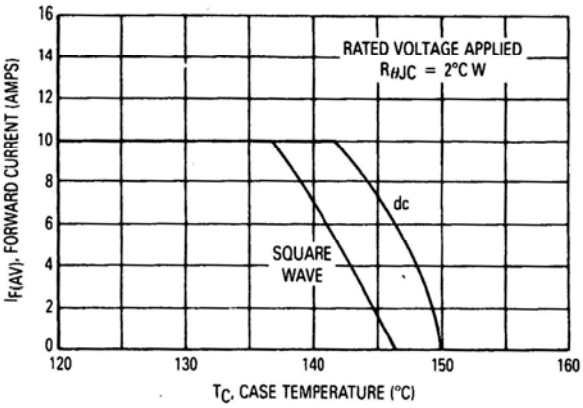


Figure 3. Current Derating, Case

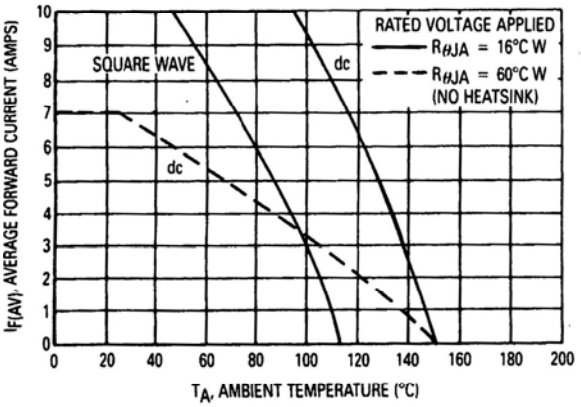


Figure 4. Current Derating, Ambient

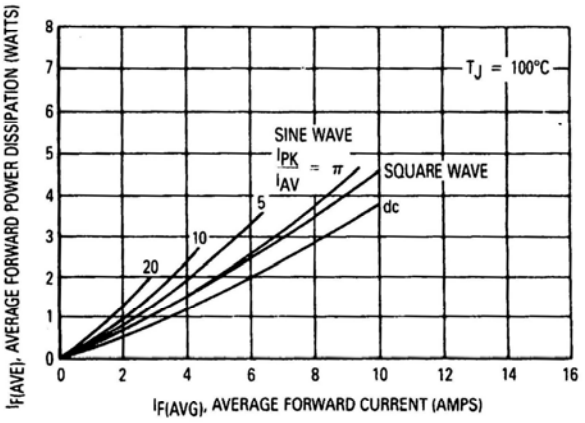


Figure 5. Forward Power Dissipation

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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 6.)

Rectification efficiency measurements show that operation will be satisfactory up to several megahertz. For example, relative waveform rectification efficiency is approximately 70 percent 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.

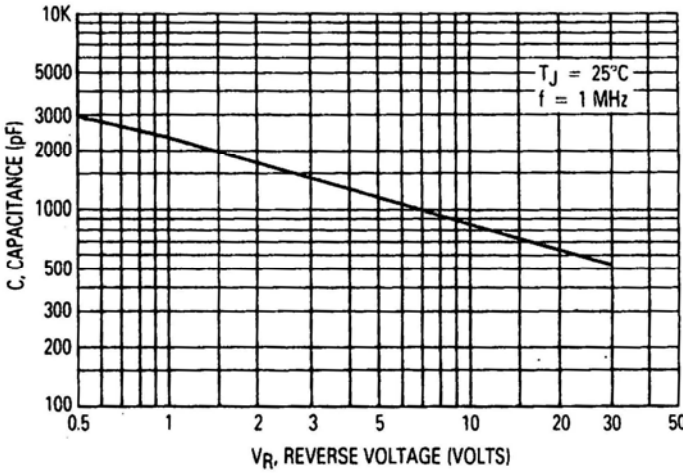


Figure 6. Typical Capacitance

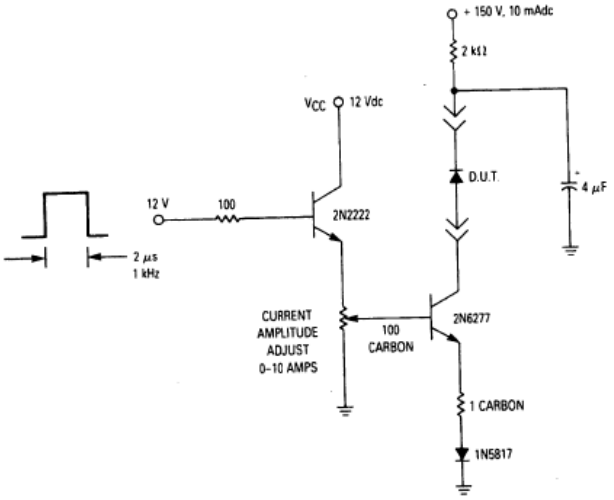


Figure 7. Test Circuit for dv/dt and Reverse Surge Current

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