

MCR1000 SERIES

SILICON CONTROLLED 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	Value	Unit
Peak forward reverse blocking voltage MCR1000-4 MCR1000-6 MCR1000-8	V_{DRM} , V_{RRM}	200 400 600	Volts
Forward current RMS (all conduction angles, $T_C = 25^\circ\text{C}$)	$I_{T(RMS)}$	15	Amps
Peak forward surge current (1/2 cycle, sine wave, 60 Hz, $T_J = 125^\circ\text{C}$)	I_{TSM}	90	Amps
Circuit fusing considerations ($T_J = 0$ to $+125^\circ\text{C}$, $t = 1$ to 8.3ms)	I^2t	34	A^2s
Forward peak gate voltage	V_{GM}	± 20	Volts
Forward peak gate current	I_{GM}	1.5	Amps
Operating junction temperature range	T_J	0 to $+125$	$^\circ\text{C}$
Storage temperature range	T_{stg}	-65 to $+150$	$^\circ\text{C}$

THERMAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta JC}$	1.67	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($R_{GK} = 1000\Omega$)

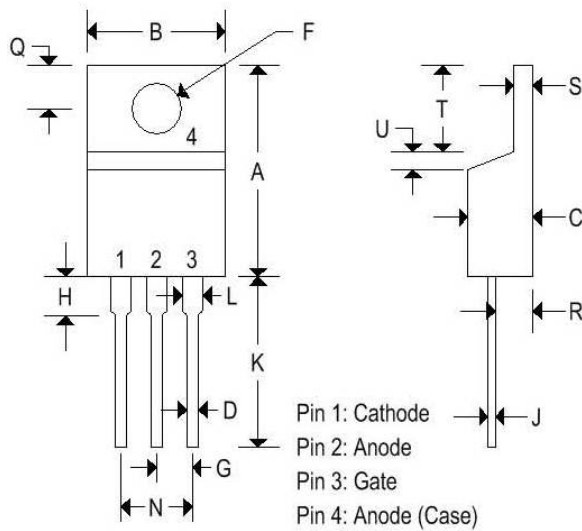
Characteristic	Symbol	Min	Typ.	Max	Unit
Peak forward blocking current (Rated V_{DRM} @ $T_J = 125^\circ\text{C}$)	I_{DRM}	-	-	2.0	mA
Peak reverse blocking current (Rated V_{RRM} @ $T_J = 125^\circ\text{C}$)	I_{RRM}	-	-	2.0	mA
Peak reverse blocking voltage	V_{RRM}	-	-	100	Volts
Forward "on" voltage ($I_{TM} = 20\text{A}$ peak)	V_{TM}	-	3.5	4.0	Volts
Gate trigger voltage (continuous dc) ($V_{AK} = 12\text{Vdc}$, $R_L = 100\Omega$) ($V_{AK} = \text{Rated } V_{DRM}$, $R_L = 100\Omega$, $T_J = 125^\circ\text{C}$)	V_{GT} V_{GD}	- 0.2	2.0 -	2.5 -	Volts
Holding current ($V_{AK} = 12\text{Vdc}$)	I_H	-	10	40	mA
Turn on time See Figure 6	t_{gt}	-	-	200	ns
Turn off time ($V_{DRM} = \text{rated voltage}$) ($I_{TM} = 3.0\text{A}$, $I_R = 2.0\text{A}$, $dv/dt = 100\text{V}/\mu\text{s}$)	t_q	-	6.0	8.0	μs
Forward voltage application rate ($T_J = 125^\circ\text{C}$, $R_{GK} \leq 200\Omega$) (Figure 7)	dv/dt	1000	-	-	$\text{V}/\mu\text{s}$
Maximum rate of change of on state current (Rated V_{DRM} , $I_{TM} = 20\text{A}$, $T_J = 125^\circ\text{C}$)	di/dt	-	-	100	$\text{A}/\mu\text{s}$

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MECHANICAL CHARACTERISTICS

Case:	TO-220AB
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-220AB			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.575	0.620	14.600	15.750
B	0.380	0.405	9.650	10.290
C	0.160	0.190	4.060	4.820
D	0.025	0.035	0.640	0.890
F	0.142	0.147	3.610	3.730
G	0.095	0.105	2.410	2.670
H	0.110	0.155	2.790	3.930
J	0.014	0.022	0.360	0.560
K	0.500	0.562	12.700	14.270
L	0.045	0.055	1.140	1.390
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	1.140	1.390
T	0.235	0.255	5.970	6.480
U	-	0.050	-	1.270
V	0.045	-	1.140	-
Z	-	0.080	-	2.030

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FIGURE 1 — AVERAGE CURRENT DERATING

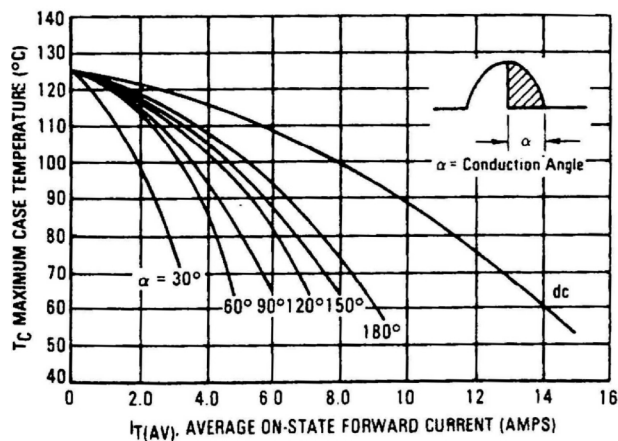


FIGURE 2 — MAXIMUM ON-STATE POWER DISSIPATION

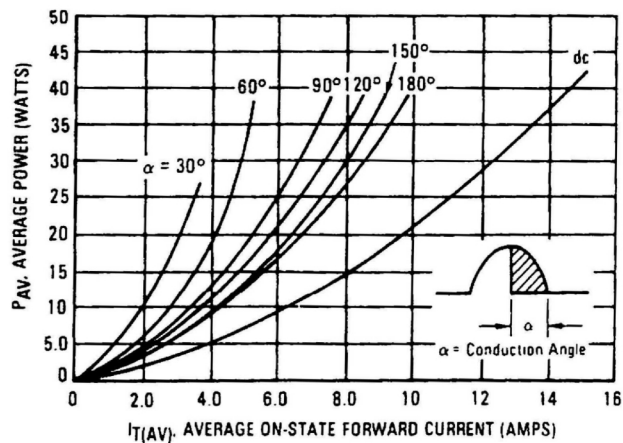


FIGURE 3 — TYPICAL GATE TRIGGER VOLTAGE

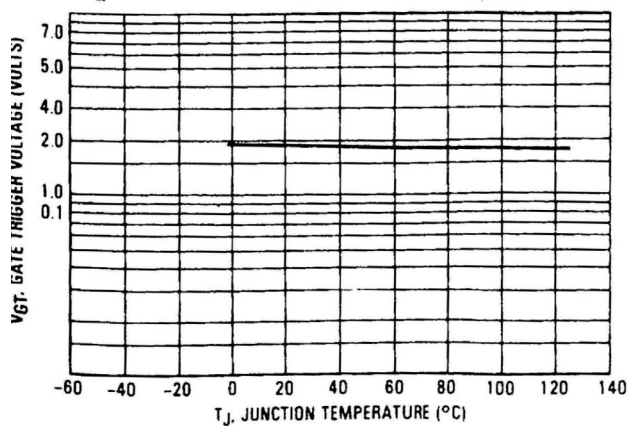
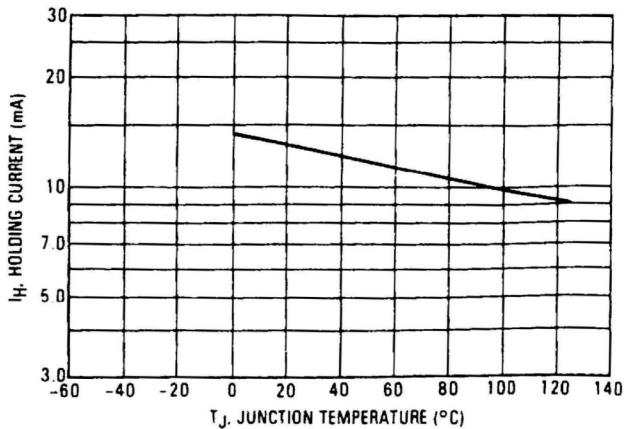


FIGURE 4 — TYPICAL HOLDING CURRENT



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FIGURE 5 — THERMAL RESPONSE

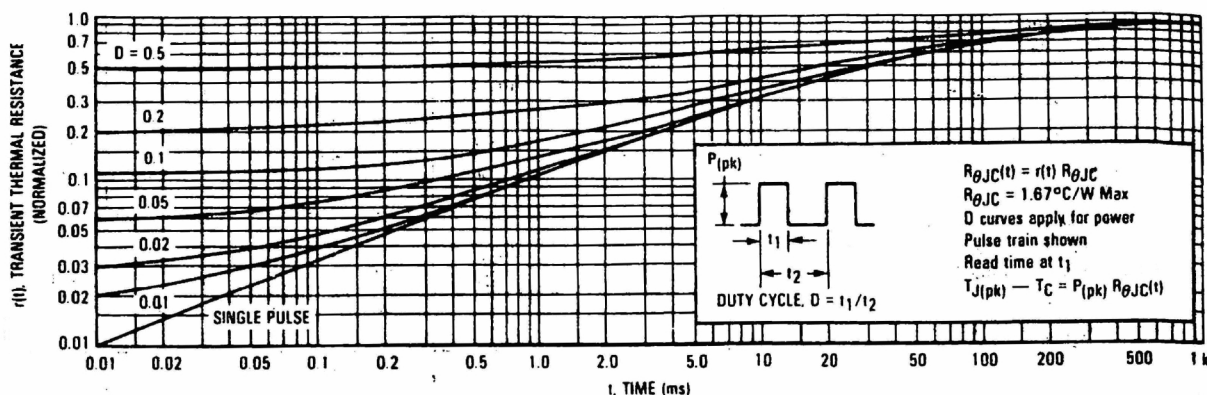


FIGURE 6 — MCR1000 SERIES TYPICAL TURN-ON CIRCUIT WITH CMOS GATING

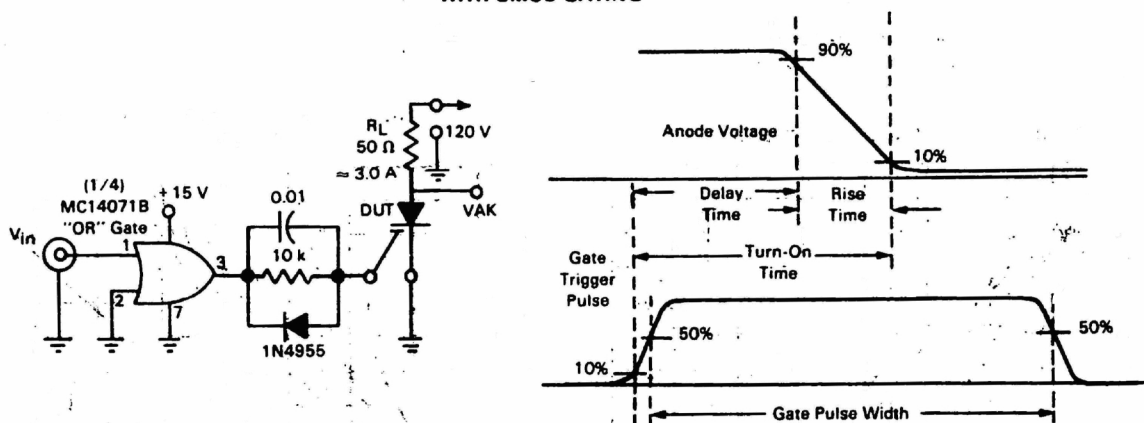


FIGURE 7 — TYPICAL dv/dt CAPABILITY

