DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

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°C)	$I_{T(RMS)}$	15	Amps
Peak forward surge current (1/2 cycle, sine wave, 60 Hz, T_J = 125°C)	I_{TSM}	90	Amps
Circuit fusing considerations (T_J = 0 to +125°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	°C
Storage temperature range	T_{stg}	-65 to +150	°C

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

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	1.67	°C/W

ELECTRICAL CHARACTERISTICS(R_{GK} = 1000Ω)

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

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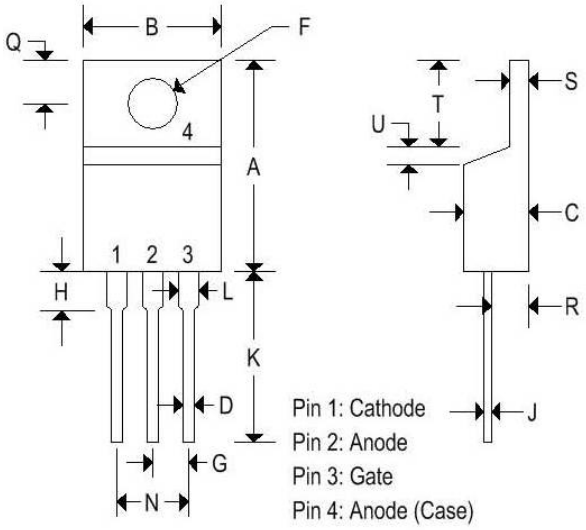
MECHANICAL CHARACTERISTICS

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

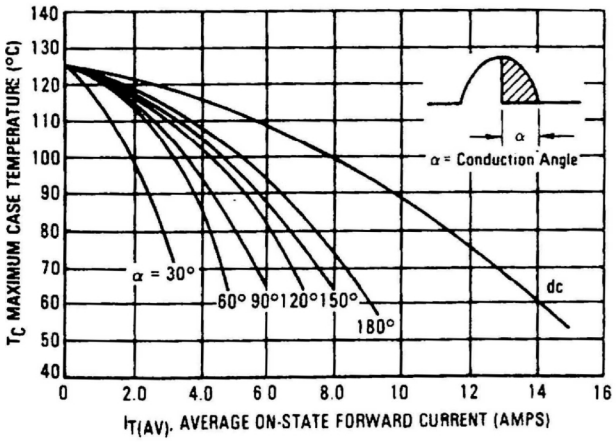

FIGURE 2 — MAXIMUM ON-STATE POWER DISSIPATION

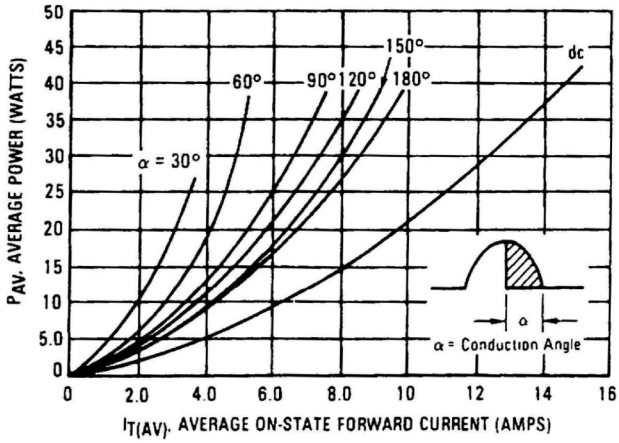

FIGURE 3 — TYPICAL GATE TRIGGER VOLTAGE

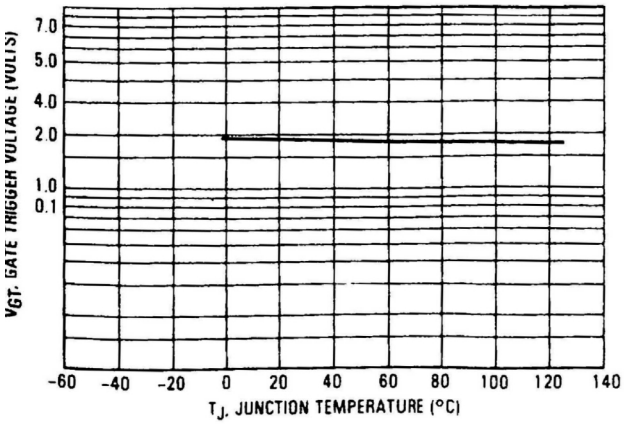

FIGURE 4 — TYPICAL HOLDING CURRENT

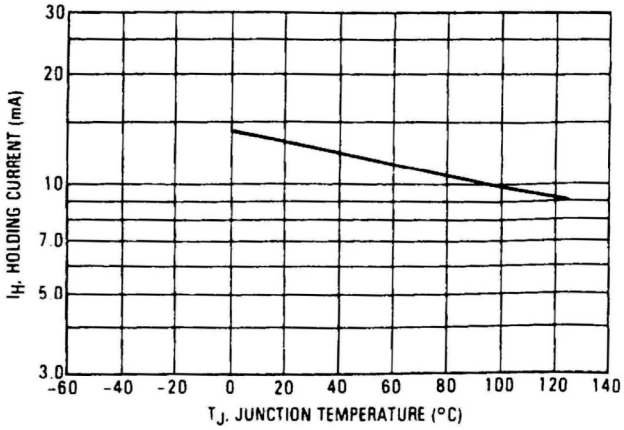

FIGURE 5 — THERMAL RESPONSE

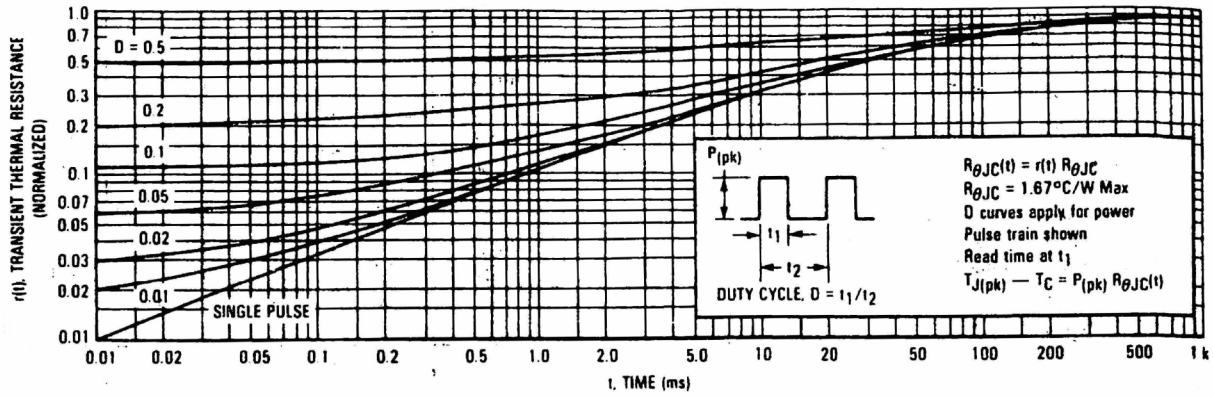

FIGURE 6 — MCR1000 SERIES TYPICAL TURN-ON CIRCUIT WITH CMOS GATING

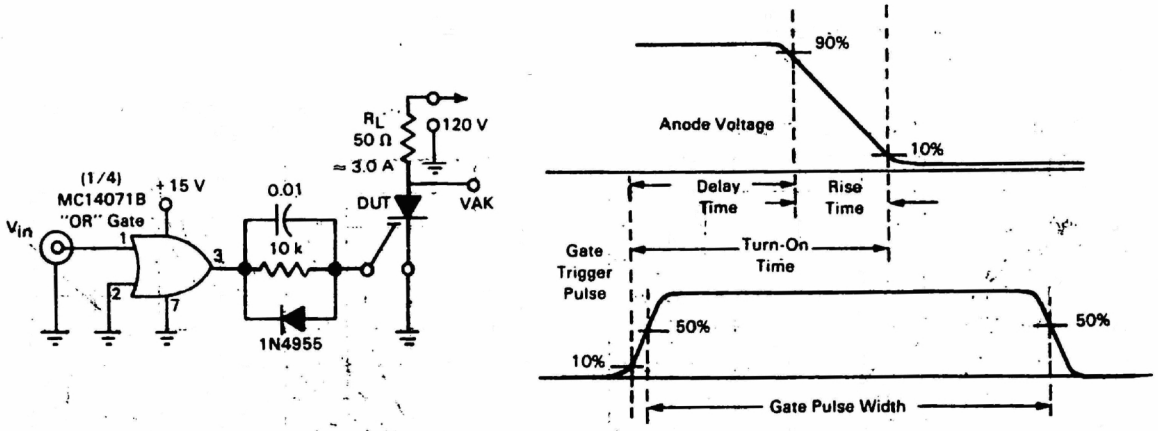

FIGURE 7 — TYPICAL dv/dt CAPABILITY