DIGITRON SEMICONDUCTORS

MCR70-()A SERIES — 35 AMP SILICON CONTROLLED RECTIFIER
MCR71 SERIES — 55 AMP SILICON CONTROLLED RECTIFIER

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.

MAXIMUM RATINGS

Rating		Symbol	Value		Unit
			MCR70-()A	MCR71	
Repetitive peak forward or reverse blocking voltage (1) MCR70-()A MCR71	 2 3 6	V_{DRM}/V_{RRM}	 50 100 400		Volts
Peak discharge current (2)		I_{TM}	850	1700	Amps
On-state current ($T_C \leq 75°C$)		$I_{T(RMS)}$ $I_{T(AV)}$	35 22	55 35	Amps
Peak non-repetitive surge current (1/2 cycle, sine wave, 60Hz, T_J = 125°C)		I_{TSM}	350	550	Amps
Circuit fusing (t = 8.3 ms)		I^2t	510	1255	A^2s
Critical rate of rise of current (3)		di/dt	100	200	A/µs
Forward peak gate power (t ≤ 20µs)		P_{GM}	20		Watts
Forward average gate power		$P_{G(AV)}$	0.5		Watts
Forward peak gate current (t ≤ 20µs)		I_{GM}	2		Amps
Operating junction storage temperature range		T_J	-40 to +125		°C
Storage temperature range		T_{stg}	-40 to +150		°C
Mounting torque		-	30		In. lb.

1. The rated voltage can be applied over the rated operating junction temperatures without incurring damage. Ratings apply for shorted-open or shorted-gate conditions or negative voltage on the gate. Devices should not be tested for blocking capability in a manner such that the voltage supplied exceeds the rated blocking voltages.
2. Rating is for t_w = 1ms.
3. Test conditions: I_G = 150mA, V_D = Rated V_{DRM}, I_{TM} = Rated value, T_J = 125°C.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	1	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic		Symbol	Min	Typ	Max	Unit
Peak forward or reverse blocking current (rated V_{DRM} or V_{RRM}) (T_J = 25°C) (T_J = 125°C)		I_{DRM}, I_{RRM}	 - -	 - -	 10 2	 µA mA
On-state voltage (1) (I_{TM} = 70A) (I_{TM} = 175A) (I_{TM} = 850A, t_w = 1ms) (2) (I_{TM} = 1700A, t_w = 1ms) (2)	 MCR70 SERIES MCR71 SERIES MCR70 SERIES MCR71 SERIES	V_{TM}	 - - - -	 1.5 1.7 6 7	 1.85 2.1 - -	Volts
Gate trigger current (continuous dc) (V_D = 12V, R_L = 100Ω)		I_{GT}	2	10	30	mA
Gate trigger voltage (continuous dc) (V_D = 12V, R_L = 100Ω) (V_D = rated V_{DRM}, R_L = 1kΩ, T_J = 125°C)		V_{GT}	 - 0.2	 1 -	 1.5 -	Volts
Holding current (I_{TM} = 0.5A, gate open)		I_H	3	15	50	mA
Latching current (V_D = 12Vdc, I_G = 150mA, $t_r \leq$ 50µs)		I_L	-	30	60	mA
Critical rate of rise off state voltage (V_D = rated V_{DRM}, gate open, exponential waveform, T_C = 125°C)		dv/dt	10	-	-	V/µs

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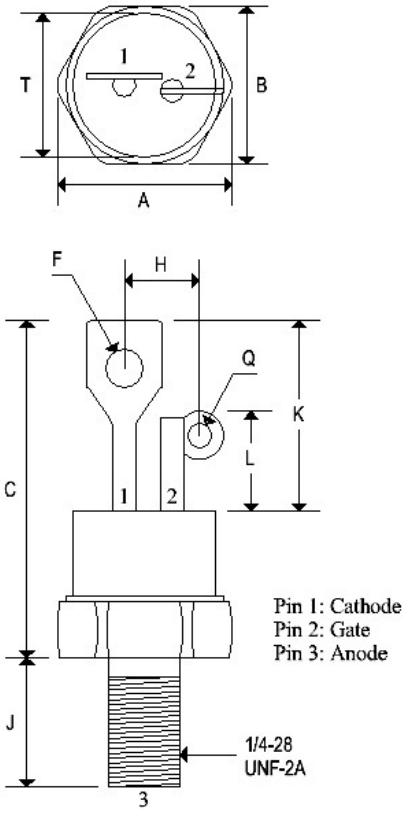
Turn on time [3] (V_D = rated V_{DRM}, I_G = 150mA) (I_{TM} = 70A, peak) (I_{TM} = 110A, peak)	 MCR70 SERIES MCR71 SERIES	t_{on}	 - -	 1 1.2	 µS

Notes:
1. Duty cycle ≤ 1%. Pulse width ≤ 300µs.
2. Characteristic applies for t_w = 1ms. t_w is defined as 5 time constants of an exponentially decaying current pulse.
3. The gate controlled turn-on time in a crowbar circuit will be influenced by the circuit inductance.

MECHANICAL CHARACTERISTICS

Case	TO-48
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.604	0.614	15.340	15.600
B	0.551	0.559	14.000	14.200
C	1.050	1.190	2.670	30.230
F	0.135	0.160	3.430	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.620	0.670	15.750	17.020
L	0.300	0.350	7.620	8.890
Q	0.055	0.085	1.400	2.160
T	0.501	0.505	12.730	12.830

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D I G I T R O N S E M I C O N D U C T O R S

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FIGURE 1 – PEAK CAPACITOR DISCHARGE CURRENT

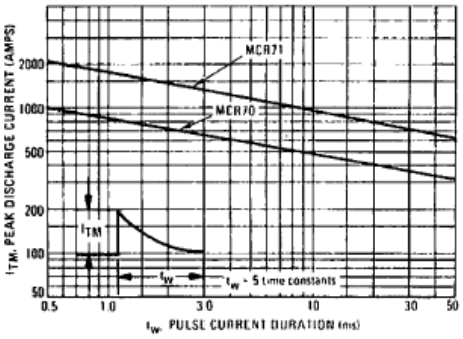

FIGURE 2 – PEAK CAPACITOR DISCHARGE CURRENT DERATING

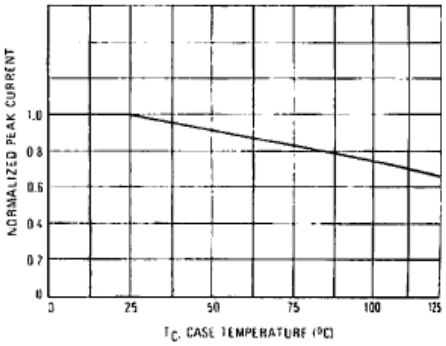

FIGURE 3 – AVERAGE CURRENT DERATING
MCR70

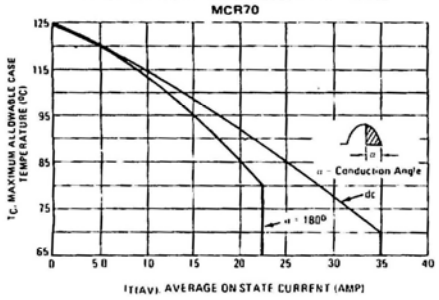

FIGURE 4 – POWER DISSIPATION
MCR70

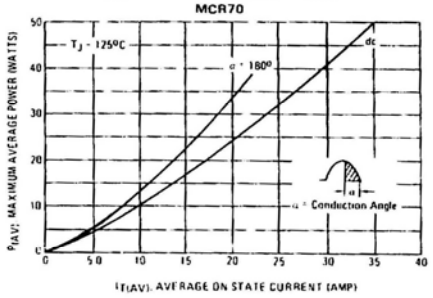

FIGURE 5 – CURRENT DERATING
MCR71

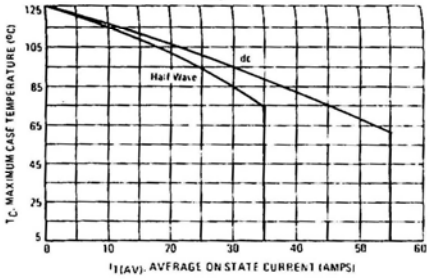

FIGURE 6 – POWER DISSIPATION
MCR71

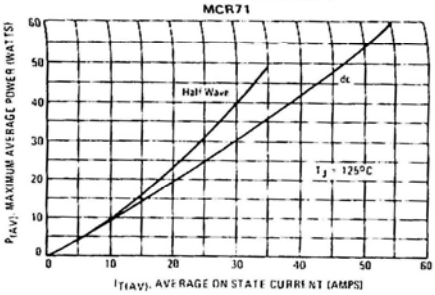

FIGURE 7 – TYPICAL THERMAL RESPONSE

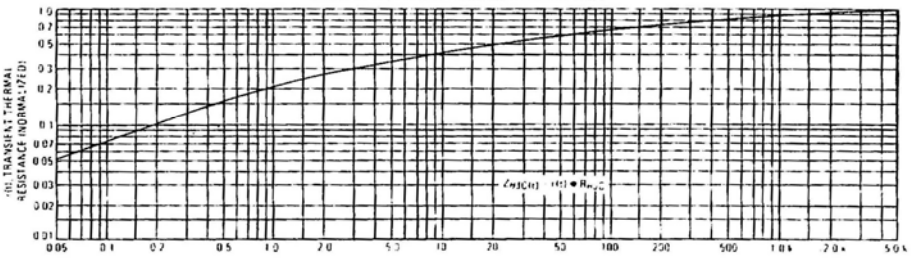

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FIGURE 8 – GATE TRIGGER CURRENT

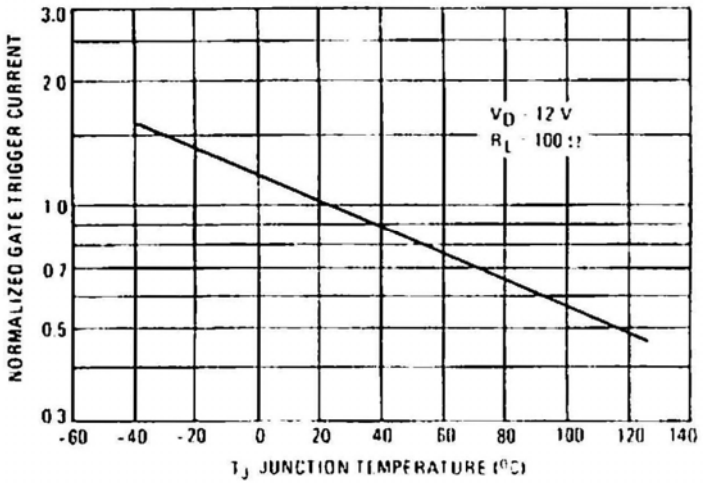


FIGURE 9 – GATE TRIGGER VOLTAGE

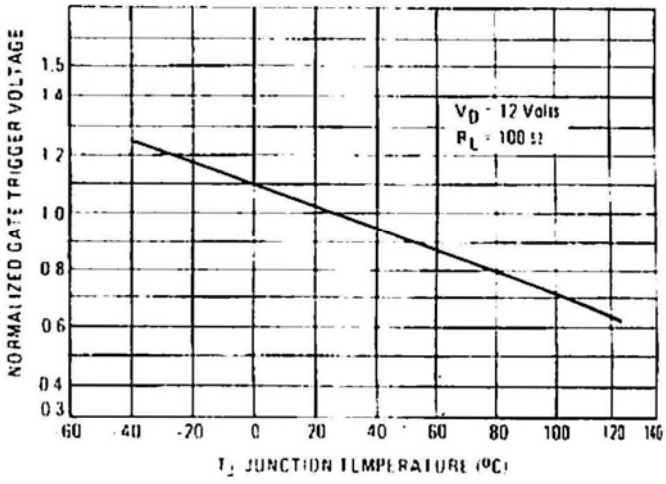
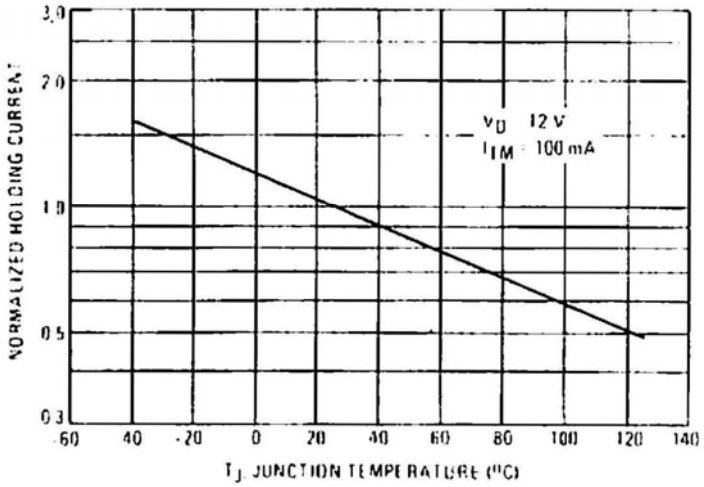


FIGURE 10 – HOLDING CURRENT



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