DIGITRON SEMICONDUCTORS

C180A-C180PC 150A PHASE CONTROL SCR

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

Characteristics	Symbol	C180	Units
RMS on-state current	$I_{T(RMS)}$	235	A
Average on-state current	$I_{T(AV)}$	150	A
Peak one-cycle surge (non-repetitive) on-state current (60Hz)	I_{TSM}	3500	A
Peak one-cycle surge (non-repetitive) on-state current (50Hz)	I_{TSM}	3200	A
Critical rate of rise of on-state current (non-repetitive)	di/dt	800	A/µs
Critical rate of rise of on-state current (repetitive)	di/dt	150	A/µs
I^2t (for fusing), 8.3 ms	I^2t	50,800	A^2s
Peak gate power dissipation	P_{GM}	10	W
Average gate power dissipation	$P_{G(AV)}$	2	W
Storage temperature	T_{stg}	-40 to +150	°C
Operating temperature	T_J	-40 to +125	°C
Mounting torque		250 to 300	In.-lb.
Mounting torque		28 to 34	N-m

VOLTAGE RATINGS

Characteristics	C180A	C180B	C180C	C180D	C180E	C180N	C180S	C180M	C180T	C180P	C180PA	C180PB	C180PC
Working peak reverse voltage	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300

ELECTRICAL AND THERMAL CHARACTERISTICS

Characteristics	Symbol	Test Conditiions	C180	Units
Voltage – Blocking State Maximums Forward leakage, peak	I_{DRM}	T_J = 125°C, V_{DRM} = Rated	20	mA
Reverse leakage, peak	I_{RRM}	T_J = 125°C, V_{RRM} = Rated	20	mA
Current – Conducting State Maximums Peak on-state voltage	V_{TM}	T_J = 25°C, I_{TM} = 1500A	2.85	V
Switching Typical turn-off time	t_q	I_T = 150A, T_J = 125°C, di_R/dt = 12.5A/µsec, reapplied dv/dt = 20V/µsec, linear to 0.8V_{DRM}, V_R = 50V	100	µsec
Typical delay time	t_d	I_T = 100A, V_{DRM} = Rated, gate supply = 10V open ckt, 25Ω, 0.1 µsec rise time	1.0	µsec
Minimum critical dv/dt exponential to V_{DRM}	dv/dt	T_J = 125°C, gate open	200	V/µsec
Thermal Maximum thermal resistance, junction to case	$R_{\theta JC}$		.14	°C/W
Case to sink, lubricated	$R_{\theta CS}$		0.075	°C/W
Gate – Maximum Parameters Gate current to trigger	I_{GT}	T_C = 25°C, V_D = 6Vdc, R_L = 3Ω	150	mA
Gate voltage to trigger	V_{GT}	T_C = -40 to +125°C, V_D = 6Vdc, R_L = 3Ω	3.0	V
Non-triggering gate voltage	V_{GDM}	T_J = 125°C, Rated V_{DRM}, R_L = 1000Ω	0.15	V
Peak forward gate current	I_{GTM}		10	A
Peak reverse gate voltage	V_{GRM}		5	V

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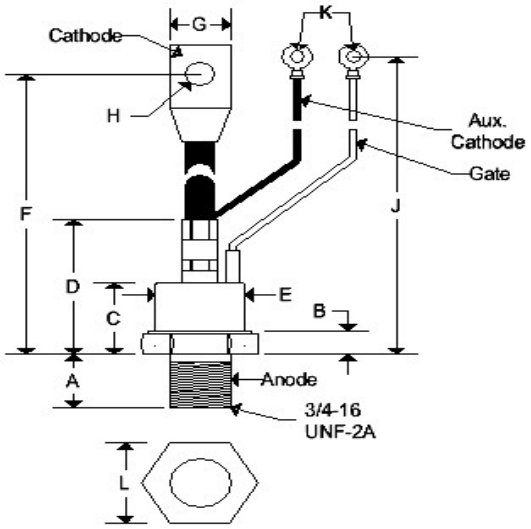
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D I G I T R O N S E M I C O N D U C T O R S

C180A-C180PC **150A PHASE CONTROL SCR**

MECHANICAL CHARACTERISTICS

Case	TO-93
Marking	Alpha-numeric
Pin out	See below



	TO-93	
	Inches	Millimeters
	NOMINAL	NOMINAL
A	1.060	26.900
B	0.550	14.000
C	1.500	38.100
D	2.250	57.200
E	1.070	27.200
F	7.910	200.900
G	0.630	16.000
H	0.281	7.140
J	7.910	200.900
K	0.146	3.710
L	1.245	31.620

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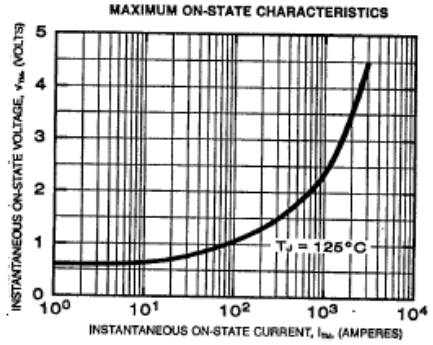
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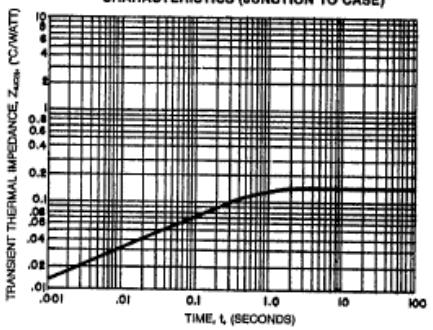
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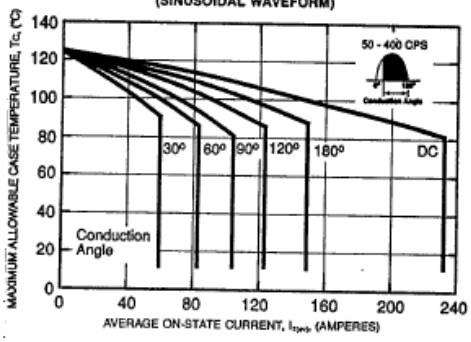
MAXIMUM ON-STATE CHARACTERISTICS



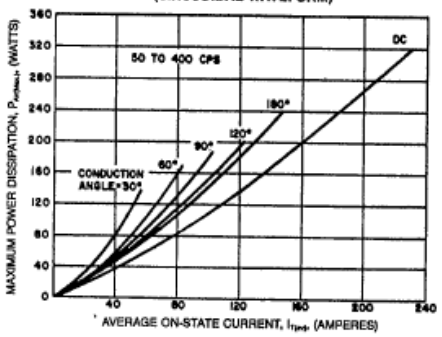
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



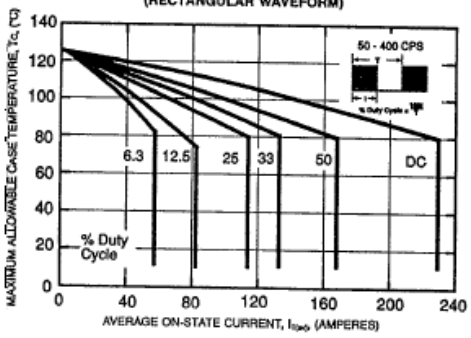
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



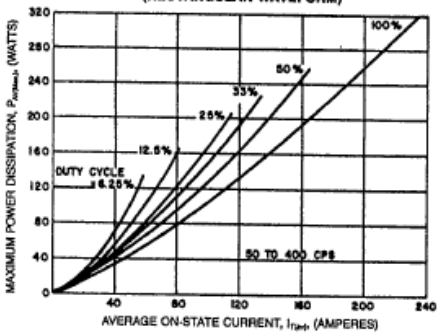
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



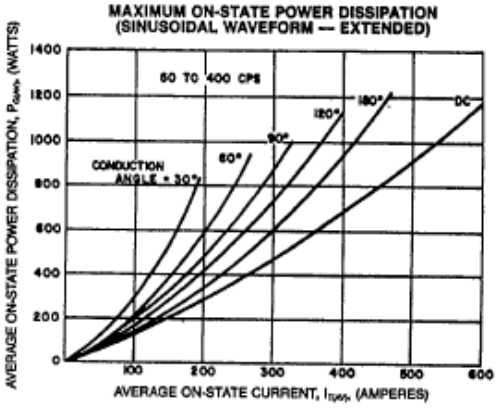
MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



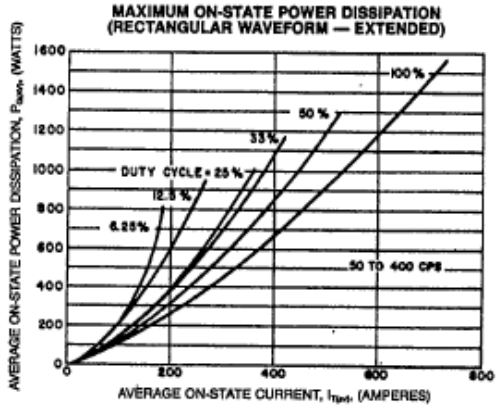
MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM — EXTENDED)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM — EXTENDED)



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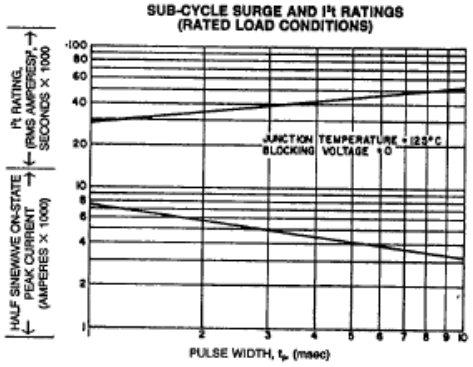
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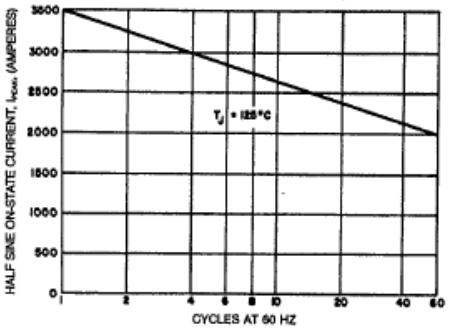
D I G I T R O N S E M I C O N D U C T O R S

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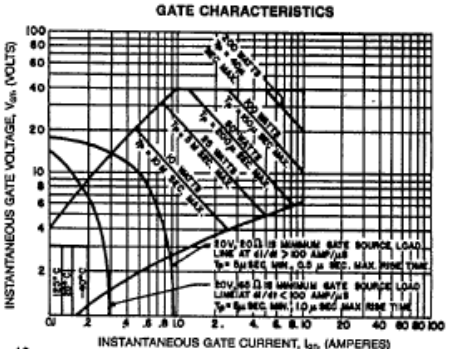
SUB-CYCLE SURGE AND I²t RATINGS (RATED LOAD CONDITIONS)



MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)



GATE CHARACTERISTICS



NOTES:

1. Maximum allowable average gate dissipation = 5 watts.
2. The locus of possible dc trigger points lie outside the boundaries shown at various case temperatures.
3. Tp = Rectangular gate current pulse width (5µs min. duration; 1.0µs max. rise time for 20V, 65Ω source).
4. 20V – 20Ω is the minimum gate source load line when rate of circuit current rise > 100 Amp/µs or anode rate of current rise > 200 Amps/µs (t_p = 5µs min., 0.5µs max. rise time).

   Maximum long-term repetitive anode di/dt = 500 Amps/µs with 20V – 20Ω gate source.

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