

# C180A-C180PC 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

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/ $\mu$ s
Critical rate of rise of on-state current (repetitive)	$di/dt$	150	A/ $\mu$ s
$I^2t$ (for fusing), 8.3 ms	$I^2t$	50,800	A <sup>2</sup> s
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 CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

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

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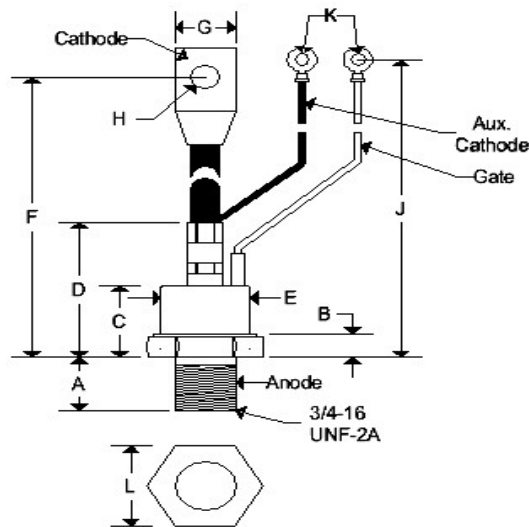
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### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

Characteristics	Symbol	Test Conditions	C180	Unit
Peak forward gate current	$I_{GTM}$		10	A
Peak reverse gate voltage	$V_{GRM}$		5	V

### MECHANICAL CHARACTERISTICS

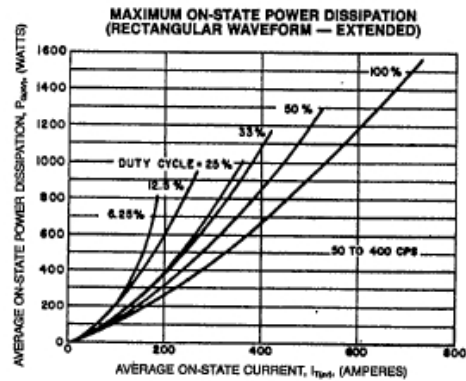
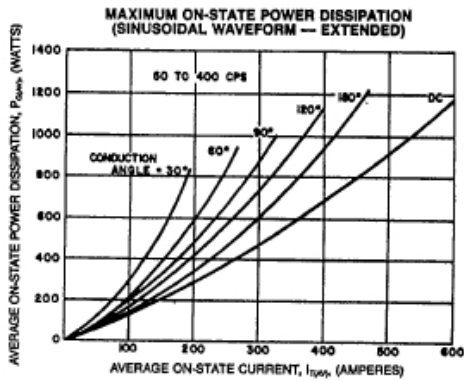
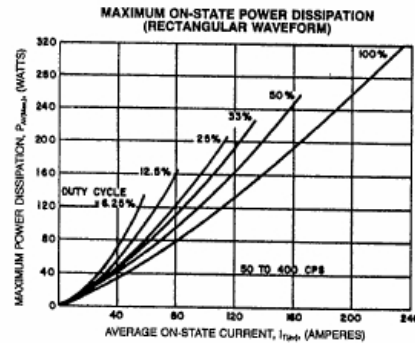
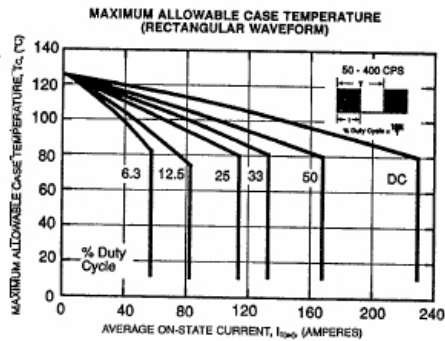
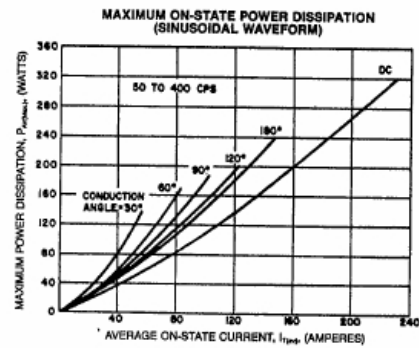
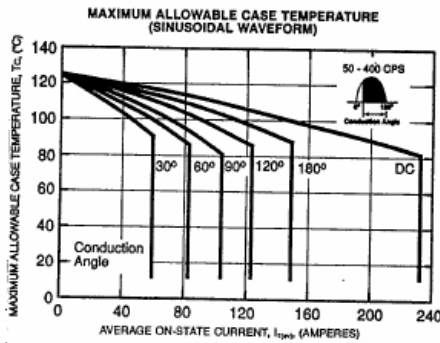
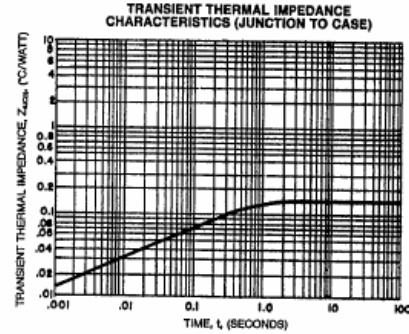
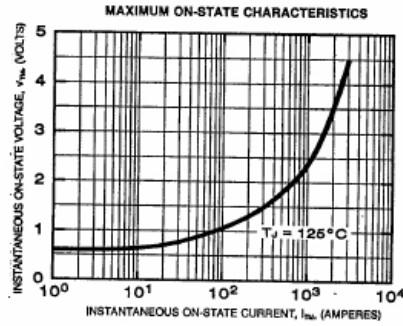
Case:	TO-93
Marking:	Body painted, alpha-numeric
Polarity:	Cathode band



	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

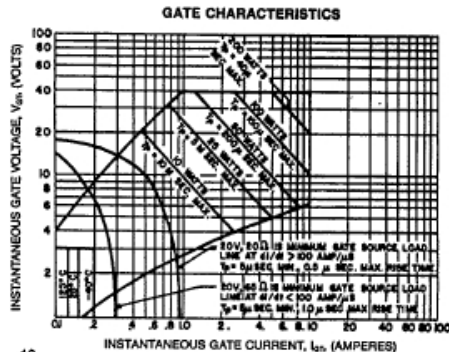
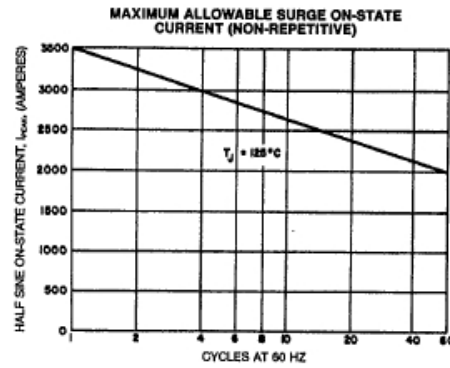
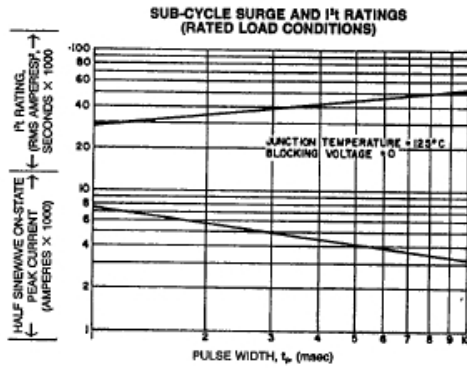
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**NOTES:**

- Maximum allowable average gate dissipation = 5 watts.
- The locus of possible dc trigger points lie outside the boundaries shown at various case temperatures.
- $T_p$  = Rectangular gate current pulse width (5  $\mu\text{s}$  min. duration; 1.0  $\mu\text{s}$  max. rise time for 20V, 65  $\Omega$  source).
- 20V - 20  $\Omega$  is the minimum gate source load line when rate of circuit current rise > 100 Amp/ $\mu\text{s}$  or anode rate of current rise > 200 Amp/ $\mu\text{s}$  ( $t_p = 5 \mu\text{s}$  min., 0.5  $\mu\text{s}$  max. rise time).

Maximum long-term repetitive anode  $dI/dt = 500 \text{ Amp}/\mu\text{s}$  with 20V - 20  $\Omega$  gate source.