

C122F1, C122B1

Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Designed primarily for full-wave ac control applications, such as motor controls, heating controls and power supplies; or wherever half-wave silicon gate-controlled, solid-state devices are needed.

- Glass Passivated Junctions and Center Gate Fire for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Blocking Voltage to 200 Volts
- Device Marking: Logo, Device Type, e.g., C122F1, Date Code

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage ⁽¹⁾ ($T_J = 25$ to 100°C , Sine Wave, 50 to 60 Hz; Gate Open) C122F1 C122B1	V_{DRM} , V_{RRM}	50 200	Volts
On-State RMS Current (180° Conduction Angles; $T_C = 75^\circ\text{C}$)	$I_{\text{T(RMS)}}$	8.0	Amps
Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave, 60 Hz, $T_C = 75^\circ\text{C}$)	I_{TSM}	90	Amps
Circuit Fusing Considerations ($t = 8.3$ ms)	I^2t	34	A^2s
Forward Peak Gate Power (Pulse Width = $10\text{ }\mu\text{s}$, $T_C = 70^\circ\text{C}$)	P_{GM}	5.0	Watts
Forward Average Gate Power ($t = 8.3$ ms, $T_C = 70^\circ\text{C}$)	$P_{\text{G(AV)}}$	0.5	Watt
Forward Peak Gate Current (Pulse Width = $10\text{ }\mu\text{s}$, $T_C = 70^\circ\text{C}$)	I_{GM}	2.0	Amps
Operating Junction Temperature Range	T_J	-40 to $+125$	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to $+150$	$^\circ\text{C}$

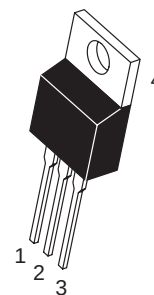
(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.



ON Semiconductor

<http://onsemi.com>

SCRs
8 AMPERES RMS
50 thru 200 VOLTS



TO-220AB
CASE 221A
STYLE 3

PIN ASSIGNMENT	
1	Cathode
2	Anode
3	Gate
4	Anode

ORDERING INFORMATION

Device	Package	Shipping
C122F1	TO220AB	500/Box
C122B1	TO220AB	500/Box

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THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.8	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	$^{\circ}\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Peak Repetitive Forward or Reverse Blocking Current ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$, Gate Open)	I_{DRM}, I_{RRM}	—	—	10	μA
$T_C = 25^{\circ}\text{C}$ $T_C = 125^{\circ}\text{C}$		—	—	0.5	mA

ON CHARACTERISTICS

Peak On-State Voltage ⁽¹⁾ ($I_{TM} = 16 \text{ A Peak}$, $T_C = 25^{\circ}\text{C}$)	V_{TM}	—	—	1.83	Volts
Gate Trigger Current (Continuous dc) ($V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$)	I_{GT}	—	—	25	mA
$T_C = 25^{\circ}\text{C}$ $T_C = -40^{\circ}\text{C}$		—	—	40	
Gate Trigger Voltage (Continuous dc) ($V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$)	V_{GT}	—	—	1.5	Volts
$T_C = 25^{\circ}\text{C}$ $T_C = -40^{\circ}\text{C}$		—	—	2.0	
Gate Non-Trigger Voltage (Continuous dc) ($V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$, $T_C = 125^{\circ}\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current ($V_{AK} = 12 \text{ Vdc}$, Initiating Current = 200 mA, Gate Open)	I_H	—	—	30	mA
$T_C = 25^{\circ}\text{C}$ $T_C = -40^{\circ}\text{C}$		—	—	60	
Turn-Off Time ($V_D = \text{Rated } V_{DRM}$) ($I_{TM} = 8 \text{ A}$, $I_R = 8 \text{ A}$)	t_q	—	50	—	μs

DYNAMIC CHARACTERISTICS

Critical Rate-of-Rise of Off-State Voltage ($V_{AK} = \text{Rated } V_{DRM}$, Exponential Waveform, Gate Open, $T_C = 100^{\circ}\text{C}$)	dv/dt	—	50	—	$\text{V}/\mu\text{s}$
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(1) Pulse Test: Pulse Width $\leq 1 \text{ ms}$, Duty Cycle $\leq 2\%$.

Voltage Current Characteristic of SCR

Symbol	Parameter
V_{DRM}	Peak Repetitive Off State Forward Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Off State Reverse Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Peak On State Voltage
I_H	Holding Current

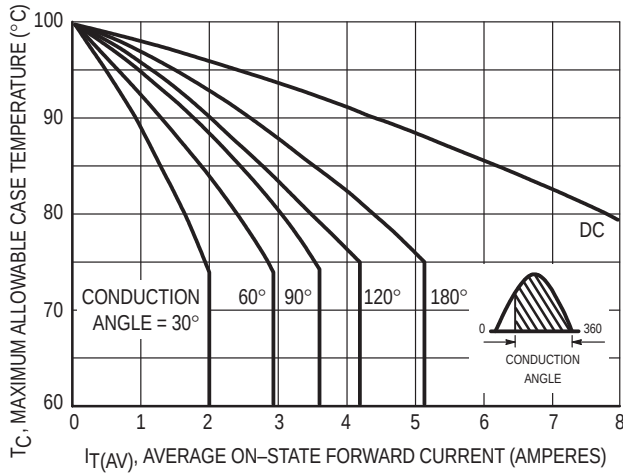
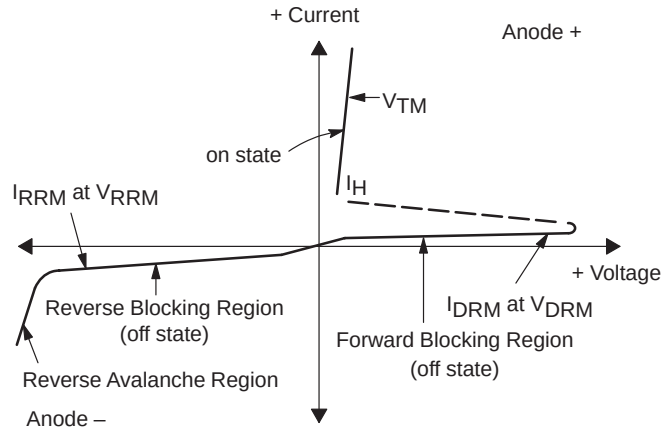


Figure 1. Current Derating (Half-Wave)

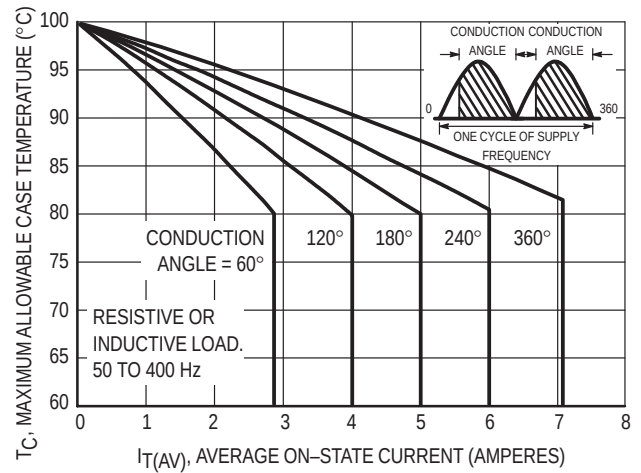


Figure 2. Current Derating (Full-Wave)

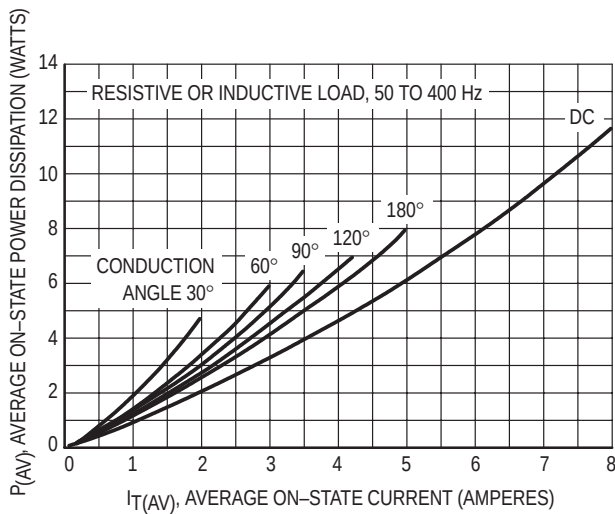


Figure 3. Maximum Power Dissipation (Half-Wave)

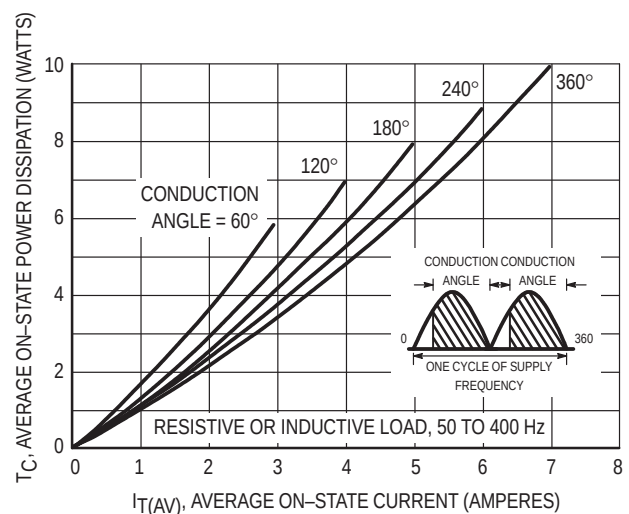
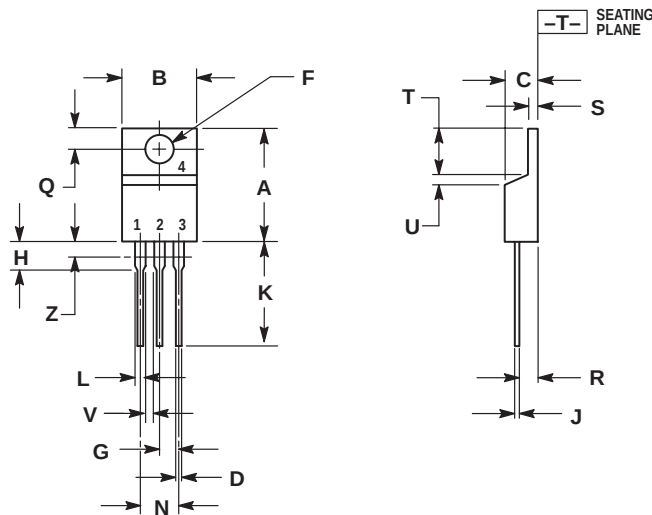


Figure 4. Maximum Power Dissipation (Full-Wave)

C122F1, C122B1

PACKAGE DIMENSIONS

TO-220AB CASE 221A-07 ISSUE Z



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

- STYLE 3:
- PIN 1. CATHODE
 - ANODE
 - GATE
 - ANODE

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