

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; $T_C = 75^\circ\text{C}$) | $I_T(\text{RMS})$ | 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 = $10 \mu\text{s}$, $T_C = 70^\circ\text{C}$) | P_{GM} | 5.0 | Watts |
| Forward Average Gate Power ($t = 8.3$ ms, $T_C = 70^\circ\text{C}$) | $P_{G(AV)}$ | 0.5 | Watt |
| Forward Peak Gate Current (Pulse Width = $10 \mu\text{s}$, $T_C = 70^\circ\text{C}$) | 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 | $^\circ\text{C}$ |

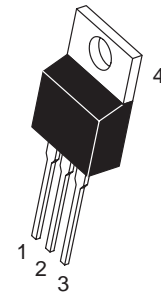
(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that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

C122F1, C122B1

THERMAL CHARACTERISTICS

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

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

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 |
| $T_C = 25^{\circ}C$ | | — | — | 0.5 | $m A$ |
| $T_C = 125^{\circ}C$ | | — | — | | |

ON CHARACTERISTICS

| | | | | | |
|---|----------|-----|----|------|---------|
| Peak On-State Voltage ⁽¹⁾ ($I_{TM} = 16 \text{ A Peak}$, $T_C = 25^{\circ}C$) | V_{TM} | — | — | 1.83 | Volts |
| Gate Trigger Current (Continuous dc) ($V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$) | I_{GT} | — | — | 25 | $m A$ |
| $T_C = 25^{\circ}C$ | | — | — | 40 | |
| $T_C = -40^{\circ}C$ | | — | — | | |
| Gate Trigger Voltage (Continuous dc) ($V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$) | V_{GT} | — | — | 1.5 | Volts |
| $T_C = 25^{\circ}C$ | | — | — | 2.0 | |
| $T_C = -40^{\circ}C$ | | — | — | | |
| Gate Non-Trigger Voltage (Continuous dc) ($V_{AK} = 12 \text{ V}$, $R_L = 100 \text{ Ohms}$, $T_C = 125^{\circ}C$) | V_{GD} | 0.2 | — | — | Volts |
| Holding Current ($V_{AK} = 12 \text{ Vdc}$, Initiating Current = 200 $m A$, Gate Open) | I_H | — | — | 30 | $m A$ |
| $T_C = 25^{\circ}C$ | | — | — | 60 | |
| $T_C = -40^{\circ}C$ | | — | — | | |
| 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, $T_C = 100^{\circ}C$) | dv/dt | — | 50 | — | $V/\mu s$ |
|--|---------|---|----|---|-----------|

(1) Pulse Test: Pulse Width $\leq 1 \text{ ms}$, Duty Cycle $\leq 2\%$.

C122F1, C122B1

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 |

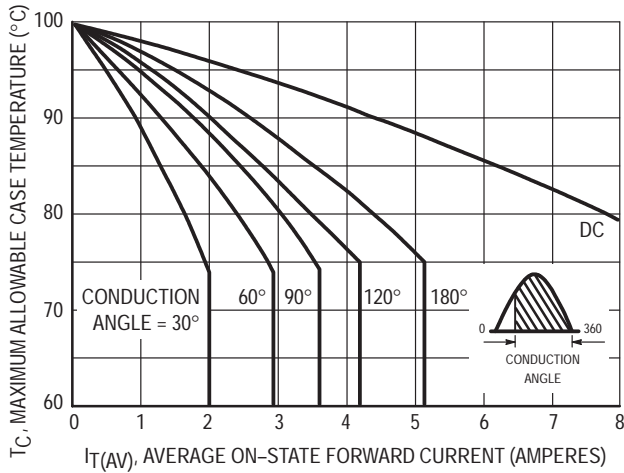
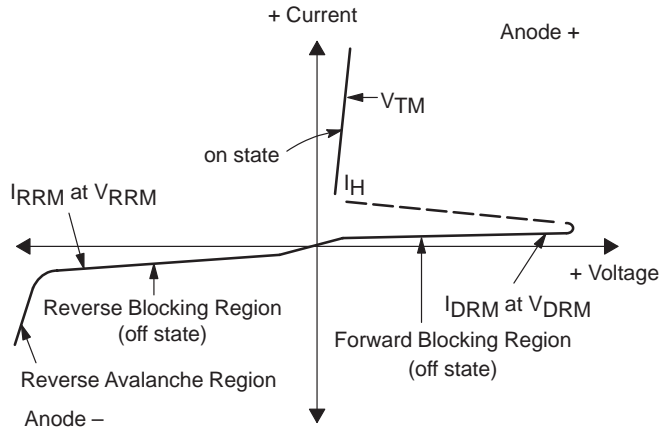


Figure 1. Current Derating (Half-Wave)

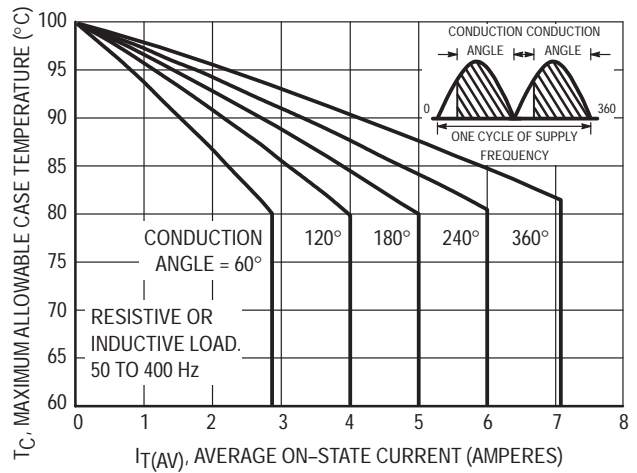


Figure 2. Current Derating (Full-Wave)

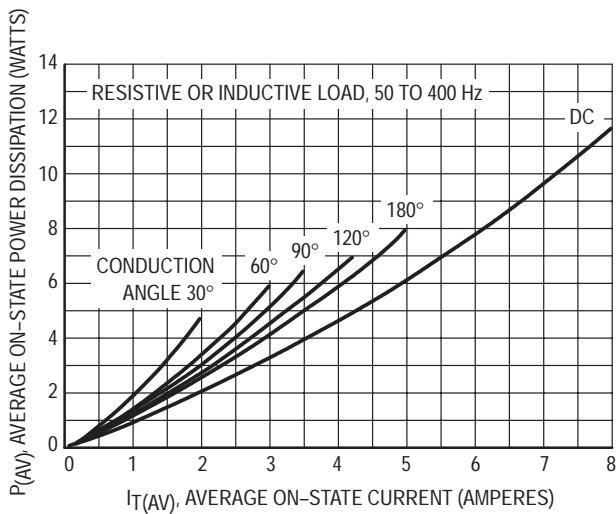


Figure 3. Maximum Power Dissipation (Half-Wave)

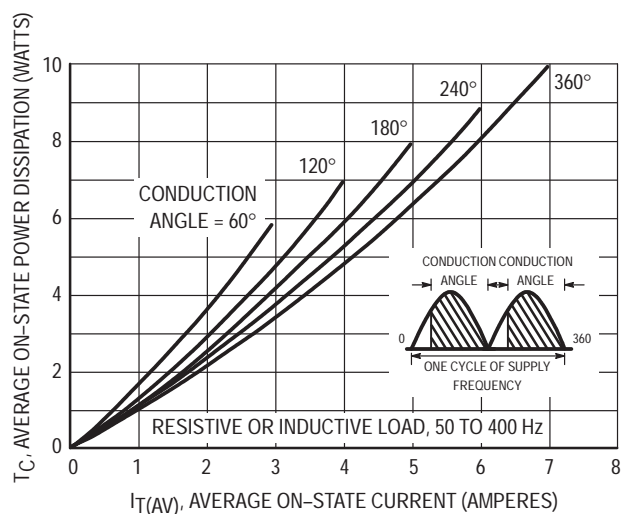
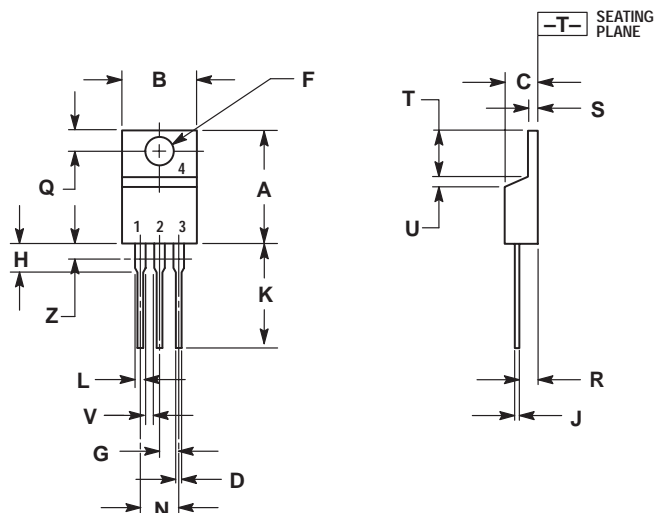


Figure 4. Maximum Power Dissipation (Full-Wave)

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:
1. CATHODE
 2. ANODE
 3. GATE
 4. ANODE

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