# DIGITRON SEMICONDUCTORS

## C122 SERIES 8A SILICON CONTROLLED RECTIFIERS

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 | C122F | C122A | C122B | C122C | C122D | C122E | C122M | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{RROM}$△ $V_{DROM}$△ | 50 | 100 | 200 | 300 | 400 | 500 | 600 | V |
| $I_{T(RMS)}$ ($T_C$ = 75°C, θ = 180°) | 8 | | | | | | | A |
| $I_{TSM}$ for one full cycle of applied principal voltage<br>400 Hz<br>60 Hz<br>50 Hz | <br>200<br>100<br>85 | | | | | | | A |
| di/dt $V_D = V_{DROM}$, $I_{GT}$ = 80mA, $t_r$ = 0.5µs | 100 | | | | | | | A/µs |
| $I^2t$ $T_J$ = -65 to +100°C, t = 1 to 8.3 ms | 40 | | | | | | | $A^2s$ |
| $P_{GM}$ * (for 10µs max) | 16 | | | | | | | W |
| $P_{G(AV)}$ * (averaging time = 10 ms max) | 0.5 | | | | | | | W |
| $T_{stg}$ | -65 to +150 | | | | | | | °C |
| $T_C$ | -65 to +100 | | | | | | | °C |
| $T_T$ During soldering for 10 s maximum | 250 | | | | | | | °C |

△ These values do not apply if there is a positive gate signal. Gate must be open or negatively biased.
* Any values of peak gate current or peak gate voltage which result in equal or lower power are permissible.

### ELECTRICAL CHARACTERISTICS

| Characteristics | Limits | | | Units |
|---|---|---|---|---|
| | Min | Typ | Max | |
| $I_{DOM}$ or $I_{ROM}$<br>$V_D = V_{DROM}$ or $V_R = V_{RROM}$, $T_C$ = 100°C | - | 0.1 | 0.5 | mA |
| $V_T$<br>$I_T$ = 16A, $T_C$ = 25°C | - | 1.45 | 1.83 | V |
| $I_{GT}$<br>$V_D$ = 12V (DC), $R_L$ = 30Ω, $T_C$ = 25°C | - | 10 | 15 | mA |
| $V_{GT}$<br>$V_D$ = 12V (DC), $R_L$ = 30Ω, $T_C$ = 25°C | - | 1.0 | 1.5 | V |
| $I_{HO}$<br>$T_C$ = 25°C | - | 20 | 30 | mA |
| dv/dt<br>$V_D = V_{DROM}$ exponential voltage rise, $T_C$ = 100°C | 10 | 100 | - | V/µs |
| $t_{gt}$<br>$V_D = V_{DROM}$, $I_T$ = 4.5A, $I_T$ = 2A, $I_{GT}$ = 80mA, 0.1 µs rise time, $T_C$ = 25°C | - | 1.6 | 2.5 | µs |
| $t_q$<br>$V_D = V_{DROM}$, $I_T$ = 2A, $t_p$ = 50µs, dv/dt = 200V/µs, di/dt = -10A/µs, $I_{GT}$ = 200mA @ $t_{ON}$, $T_C$ = 75°C | - | 10 | 35 | µs |
| $R_{\theta JC}$ | - | - | 1.8 | °C/W |
| $R_{\theta JA}$ | - | - | 75 | °C/W |

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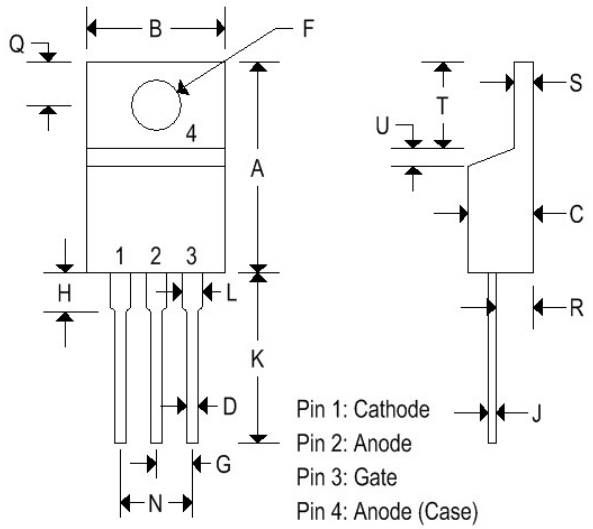
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# D I G I T R O N  S E M I C O N D U C T O R S

## C122 SERIES — 8A SILICON CONTROLLED RECTIFIERS

### MECHANICAL CHARACTERISTCS

| | |
|---|---|
| **Case** | TO-220AB |
| **Marking** | Body painted, alpha-numeric |
| **Pin out** | See below |




| | TO-220AB | | | |
|---|---|---|---|---|
| | Inches | | Millimeters | |
| | Min | Max | Min | Max |
| A | 0.575 | 0.620 | 14.600 | 15.750 |
| B | 0.380 | 0.405 | 9.650 | 10.290 |
| C | 0.160 | 0.190 | 4.060 | 4.820 |
| D | 0.025 | 0.035 | 0.640 | 0.890 |
| F | 0.142 | 0.147 | 3.610 | 3.730 |
| G | 0.095 | 0.105 | 2.410 | 2.670 |
| H | 0.110 | 0.155 | 2.790 | 3.930 |
| J | 0.014 | 0.022 | 0.360 | 0.560 |
| K | 0.500 | 0.562 | 12.700 | 14.270 |
| L | 0.045 | 0.055 | 1.140 | 1.390 |
| N | 0.190 | 0.210 | 4.830 | 5.330 |
| Q | 0.100 | 0.120 | 2.540 | 3.040 |
| R | 0.080 | 0.110 | 2.040 | 2.790 |
| S | 0.045 | 0.055 | 1.140 | 1.390 |
| T | 0.235 | 0.255 | 5.970 | 6.480 |
| U | - | 0.050 | - | 1.270 |
| V | 0.045 | - | 1.140 | - |
| Z | - | 0.080 | - | 2.030 |

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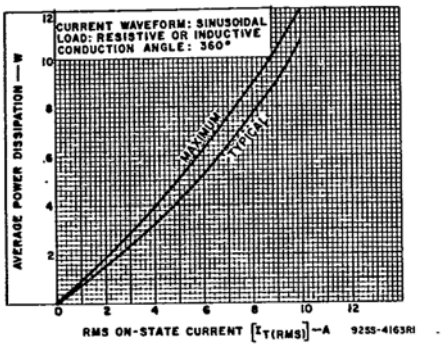



*Fig. 1 — Power dissipation vs. on-state current.*

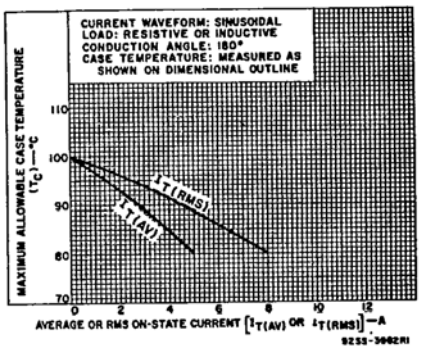



*Fig. 2 — Maximum allowable case temperature vs. on-state current.*

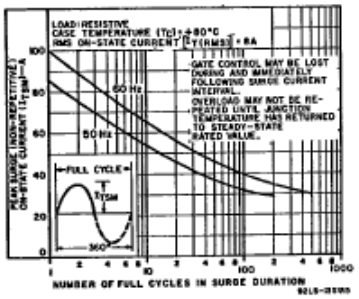



*Fig. 3 — Allowable peak surge on-state current vs. surge duration.*

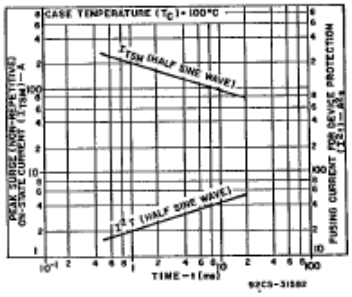



*Fig. 4 — Peak surge on-state current and fusing current as a function of time.*

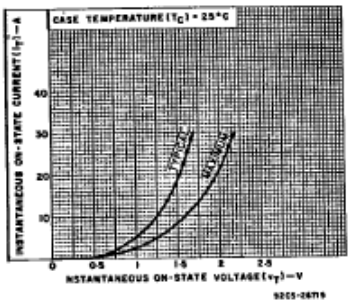



*Fig. 5 — Instantaneous on-state current vs. on-state voltage.*

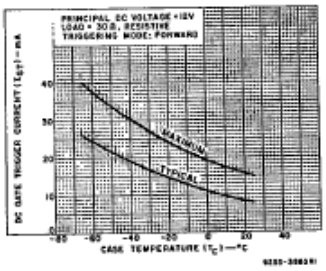



*Fig. 6 — DC gate-trigger current vs. case temperature.*

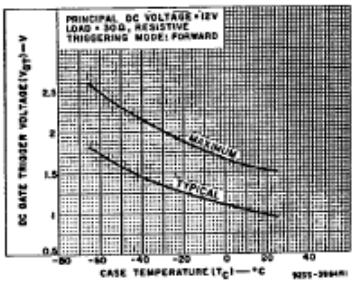



*Fig. 7 — DC gate-trigger voltage vs. case temperature.*

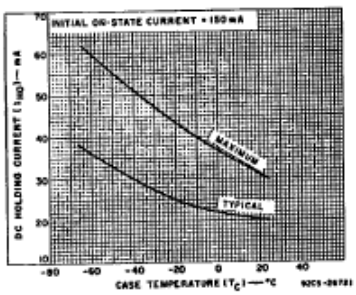



*Fig. 8 — Holding current vs. case temperature.*

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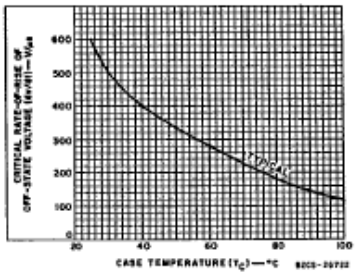



*Fig. 9 — Critical rate of rise of off-state voltage vs. case temperature.*

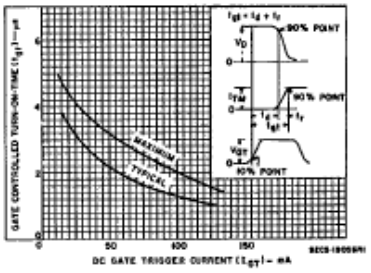



*Fig. 10 — Gate-controlled turn-on time vs. gate trigger current.*

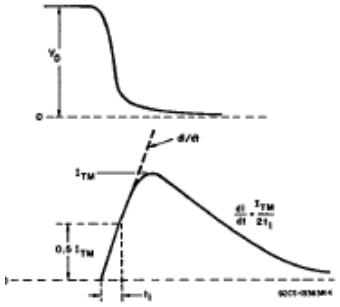



*Fig. 11 — Rate of change of on-state current with time (defining di/dt).*

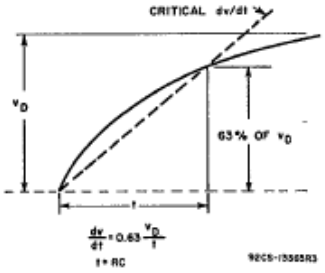



*Fig. 12 — Rate of rise of off-state voltage with time (defining critical dv/dt).*

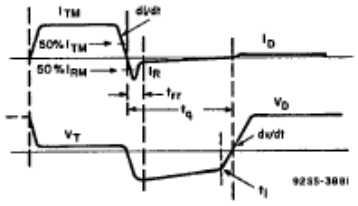
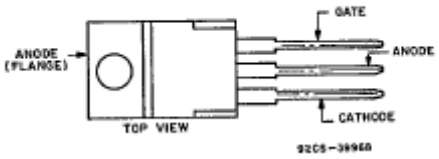



*Fig. 13 — Relationship between instantaneous on-state current and voltage, showing reference points for measurement of circuit-commutated turn-off time ($t_q$).*

**TERMINAL DESIGNATIONS**





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