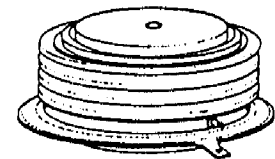


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**HIGH SPEED  
 Silicon  
 Controlled Rectifier**  
 1200 Volts, 650 A RMS

**C397/C398**

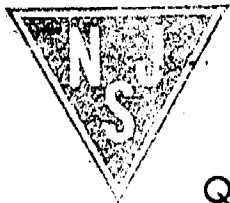


**MAXIMUM ALLOWABLE RATINGS**

| TYPES       | REPETITIVE PEAK OFF-STATE VOLTAGE, $V_{DRM}^1$<br>$T_J = -40^\circ\text{C to } +125^\circ\text{C}$ | REPETITIVE PEAK REVERSE VOLTAGE, $V_{RRM}^1$<br>$T_J = -40^\circ\text{C to } +125^\circ\text{C}$ | NON-REPETITIVE PEAK REVERSE VOLTAGE, $V_{RSM}^1$<br>$T_J = 125^\circ\text{C}$ |
|-------------|--|--|---|
| C397/C398E  | 500 Volts  | 500 Volts  | 600 Volts   |
| C397/C398M  | 600  | 600  | 720   |
| C397/C398S  | 700  | 700  | 840   |
| C397/C398N  | 800  | 800  | 960   |
| C397/C398T  | 900  | 900  | 1080  |
| C397/C398P  | 1000   | 1000   | 1200  |
| C397/C398PA | 1100   | 1100   | 1300  |
| C397/C398PB | 1200   | 1200   | 1400  |

<sup>1</sup> Half sinewave waveform, 10 ms max. pulse width.

|   |   |
|---|---|
| Peak One Cycle Surge (Non-Repetitive) On-State Current, $I_{TSM}$ ..... | 7500 Amperes                              |
| $I^2t$ (for fusing) for times $\geq 1.5$ milliseconds .....             | 95,000 (RMS Ampere) <sup>2</sup> Seconds  |
| $I^2t$ (for fusing) for times $\geq 8.3$ milliseconds .....             | 230,000 (RMS Ampere) <sup>2</sup> Seconds |
| Critical Rate-of-Rise of On-State Current, Non-Repetitive .....         | 800 A/ $\mu$ s $\uparrow$                 |
| Critical Rate-of-Rise of On-State Current, Repetitive .....             | 500 A/ $\mu$ s $\uparrow$                 |
| Average Gate Power Dissipation, $P_{G(AV)}$ .....                       | 2 Watts                                   |
| Storage Temperature, $T_{stg}$ .....                                    | -40°C to +150°C                           |
| Operating Temperature, $T_J$ .....                                      | -40°C to +125°C                           |
| Mounting Force Required .....   | 2000 Lb. $\pm$ 10%                        |
|   | 8.9 KN $\pm$ 10%                          |



Quality Semi-Conductors

## CHARACTERISTICS

| TEST  | SYMBOL                  | MIN. | TYP. | MAX.  | UNITS                        | TEST CONDITION   |
|---|-------------------------|------|------|---|------------------------------|--|
| Repetitive Peak Reverse and Off-State Current   | $I_{RRM}$ and $I_{DRM}$ | --   | 5    | 20  | mA                           | $T_J = +25^\circ\text{C}$<br>$V = V_{DRM} = V_{RRM}$   |
| Repetitive Peak Reverse and Off-State Current   | $I_{RRM}$ and $I_{DRM}$ | --   | 20   | 45  | mA                           | $T_J = 125^\circ\text{C}$<br>$V = V_{DRM} = V_{RRM}$   |
| Thermal Resistance  | $R_{\theta JC}$         | --   | .05  | .06   | $^\circ\text{C}/\text{Watt}$ | Junction-to-Case (DC) (Double-Side Cooled)   |
| Critical Rate-of-Rise of Off-State Voltage (Higher values may cause device switching) | $dv/dt$                 | 200  | 500  | --  | $\text{V}/\mu\text{sec}$     | $T_J = 125^\circ\text{C}$ , Gate Open. $V_{DRM} = \text{Rated}$ , Linear or Exponential Rising Waveform.<br>Exponential $dv/dt = \frac{V_{DRM}}{\tau}$ (.632)  |
| Higher minimum $dv/dt$ selections available -- consult factory.                       |                         |      |      |   |                              |  |
| DC Gate Trigger Current   | $I_{GT}$                | --   | 50   | 150   | mA dc                        | $T_C = +25^\circ\text{C}$ , $V_D = 6 \text{ Vdc}$ , $R_L = 3 \text{ Ohms}$   |
|   |                         | --   | 75   | 300   |                              | $T_C = -40^\circ\text{C}$ , $V_D = 6 \text{ Vdc}$ , $R_L = 3 \text{ Ohms}$   |
|   |                         | --   | 15   | 125   |                              | $T_C = +125^\circ\text{C}$ , $V_D = 6 \text{ Vdc}$ , $R_L = 3 \text{ Ohms}$  |
| DC Gate Trigger Voltage   | $V_{GT}$                | --   | 3    | 5   | Vdc                          | $T_C = -40^\circ\text{C}$ to $25^\circ\text{C}$ , $V_D = 6 \text{ Vdc}$ , $R_L = 3 \text{ Ohms}$   |
|   |                         | --   | 1.25 | 3.0   |                              | $T_C = 25^\circ\text{C}$ to $+125^\circ\text{C}$ , $V_D = 6 \text{ Vdc}$ , $R_L = 3 \text{ Ohms}$  |
|   |                         | 0.15 | --   | --  |                              | $T_C = 125^\circ\text{C}$ , $V_{DRM}$ , $R_L = 1000 \text{ Ohms}$  |
| Peak On-State Voltage   | $V_{TM}$                | --   | 2.7  | 3.0   | Volts                        | $T_C = +25^\circ\text{C}$ , $I_{TM} = 3000 \text{ Amps Peak}$ .<br>Duty Cycle $\leq .01\%$ . Pulse Width = 1 ms.   |
| Turn-On Delay Time  | $t_d$                   | --   | 0.5  | --  | $\mu\text{sec}$              | $T_C = +25^\circ\text{C}$ , $I_{TM} = 50 \text{ A dc}$ , $V_{DRM}$ . Gate Supply: 20 volt open circuit, 20 ohms, 0.1 $\mu\text{sec}$ max. rise time. ††, †††   |
| Conventional Circuit Commutated Turn-Off Time (with Reverse Voltage)                  | $t_q$                   | --   | 20   | †   | $\mu\text{sec}$              | (1) $T_C = +125^\circ\text{C}$<br>(2) $I_{TM} = 500 \text{ Amps}$ .<br>(3) $V_R = 50 \text{ Volts Min}$ .<br>(4) $V_{DRM}$ (Reapplied)<br>(5) Rate-of-rise of reapplied off-state voltage = $20 \text{ V}/\mu\text{sec}$ (linear)<br>(6) Commutation $di/dt = 25 \text{ Amps}/\mu\text{sec}$<br>(7) Repetition rate = 1 pps.<br>(8) Gate bias during turn-off interval = 0 volts, 100 ohms |
|   |                         |      | 35   | †   |                              |  |
|   |                         | 30   | 40   | (1) $T_C = +125^\circ\text{C}$<br>(2) $I_{TM} = 500 \text{ Amps}$ .<br>(3) $V_R = 50 \text{ Volts Min}$ .<br>(4) $V_{DRM}$ (Reapplied)<br>(5) Rate-of-rise of reapplied off-state voltage = $200 \text{ V}/\mu\text{sec}$ (linear)<br>(6) Commutation $di/dt = 25 \text{ Amps}/\mu\text{sec}$<br>(7) Repetition rate = 1 pps.<br>(8) Gate bias during turn-off interval = 0 volts, 100 ohms |                              |  |
|   |                         | 45   | 60   |   |                              |  |
| Conventional Circuit Commutated Turn-Off Time (with Feedback Diode)                   | $t_{q(\text{diode})}$   | --   | 40   | †   | $\mu\text{sec}$              | (1) $T_C = +125^\circ\text{C}$<br>(2) $I_{TM} = 500 \text{ Amps}$<br>(3) $V_R = 1 \text{ Volt}$<br>(4) $V_{DRM}$ (Reapplied)<br>(5) Rate-of-rise of reapplied off-state voltage = $200 \text{ V}/\mu\text{sec}$ (linear)<br>(6) Commutation $di/dt = 25 \text{ Amps}/\mu\text{sec}$<br>(7) Repetition rate = 1 pps.<br>(8) Gate bias during turn-off interval = 0 volts, 100 ohms          |
|   |                         |      | 60   | †   |                              |  |