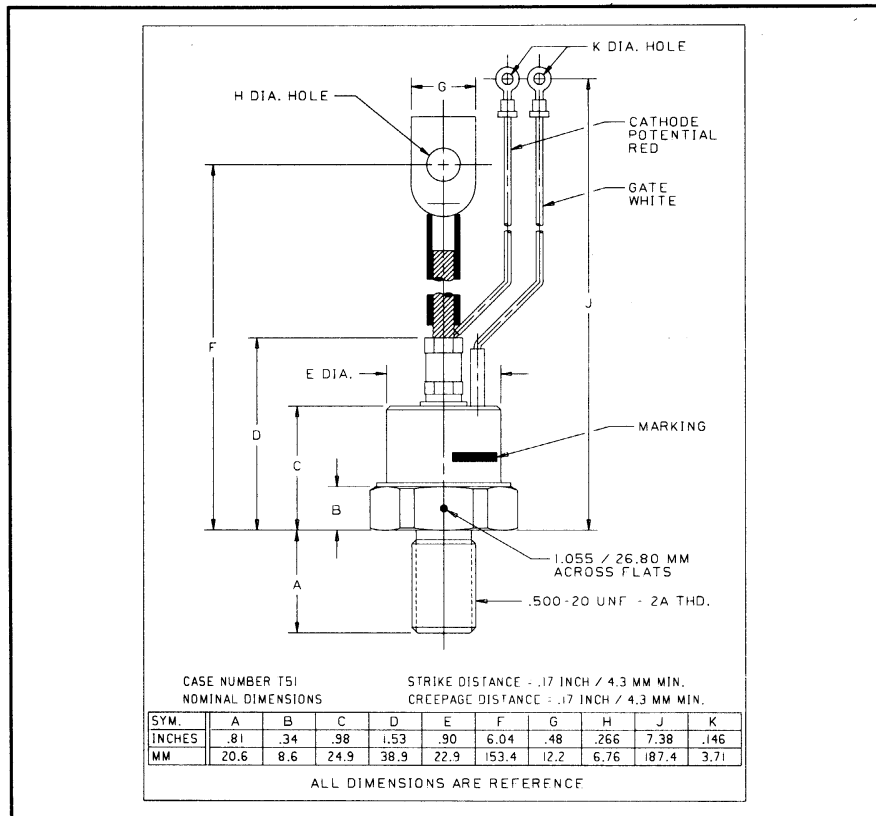
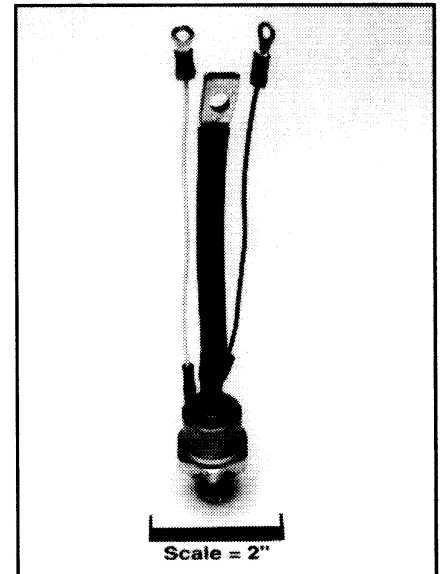


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### Phase Control SCR 50-80 Amperes (80-125 RMS) 600 Volts



T510, TO-94 (Outline Drawing) Also Available with Flag Lead, TO-83 Package



T510 Phase Control SCR  
50-80 Amperes (80-125 RMS),  
600 Volts

#### Ordering Information:

Select the complete part number you desire from the following table:

| Type | Voltage*                                       |      | Current                   |      | Turn-off                 |      | Gate Current            |      | Leads |      |
|------|------------------------------------------------|------|---------------------------|------|--------------------------|------|-------------------------|------|-------|------|
|      | V <sub>DRM</sub> & V <sub>RRM</sub><br>(Volts) | Code | I <sub>T(av)</sub><br>(A) | Code | t <sub>q</sub><br>(μsec) | Code | I <sub>GT</sub><br>(mA) | Code | Case  | Code |
| T510 | 50                                             | 00   | 50                        | 50   | 100                      | 0    | 70                      | 7    | TO-94 | AQ   |
|      | 100                                            | 01   |                           |      | (Typ.)                   |      | 100                     | 5    |       |      |
|      | 200                                            | 02   |                           |      |                          |      | 150                     | 4    |       |      |
|      | 300                                            | 03   | 80                        | 80   |                          |      |                         |      | TO-83 | AB   |
|      | 400                                            | 04   |                           |      |                          |      |                         |      |       |      |
|      | 500                                            | 05   |                           |      |                          |      |                         |      |       |      |
|      | 600                                            | 06   |                           |      |                          |      |                         |      |       |      |

\* For 700V and Above, see T500

**Example:** Type T510 rated at 80A average with V<sub>DRM</sub> = 600V, I<sub>GT</sub> = 150MA, and standard flexible lead, order as:

| Type    | Voltage | Current | Turn-off | Gate Current | Leads |
|---------|---------|---------|----------|--------------|-------|
| T 5 1 0 | 0 6     | 8 0     | 0        | 4            | A Q   |

#### Features:

- ☐ Center Fired, di/namic Gate
- ☐ All Diffused Design
- ☐ Low V<sub>TM</sub>
- ☐ Compression Bonded Encapsulation
- ☐ Hermetic Glass to Metal Seal
- ☐ Low Gate Current

#### Applications:

- ☐ Phase control
- ☐ Power Supplies
- ☐ Light Dimmers
- ☐ Motor Control



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**T510 Phase Control SCR**  
50-80 Amperes (80-125 RMS),  
600 Volts

### Absolute Maximum Ratings

| Characteristics                                           | Symbol       | T510 _ 50   | T510 _ 80   | Units            |
|-----------------------------------------------------------|--------------|-------------|-------------|------------------|
| RMS Forward Current                                       | $I_{T(rms)}$ | 80          | 125         | Amperes          |
| Average Forward Current                                   | $I_{T(av)}$  | 50          | 80          | Amperes          |
| One-half Cycle Surge Current                              | $I_{TSM}$    | 1200        | 1600        | Amperes          |
| 3 Cycle Surge Current                                     | $I_{TSM}$    | 950         | 1250        | Amperes          |
| 10 Cycle Surge Current                                    | $I_{TSM}$    | 800         | 1080        | Amperes          |
| Minimum Rate of Rise of On-State Current (Non-repetitive) | $di/dt$      | 100         | 100         | Amperes/ $\mu s$ |
| $I^2t$ (for Fusing), $\geq 8.3$ milliseconds              | $I^2t$       | 6000        | 10700       | $A^2sec$         |
| Peak Gate Power Dissipation                               | $P_{GM}$     | 16          | 16          | Watts            |
| Average Gate Power Dissipation                            | $P_{G(av)}$  | 3           | 3           | Watts            |
| Storage Temperature                                       | $T_{stg}$    | -40 to +150 | -40 to +150 | $^{\circ}C$      |
| Operating Temperature                                     | $T_j$        | -40 to +125 | -40 to +125 | $^{\circ}C$      |
| Mounting Torque                                           |              | 130         | 130         | in-lb            |



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50-80 Amperes (80-125 RMS),  
600 Volts

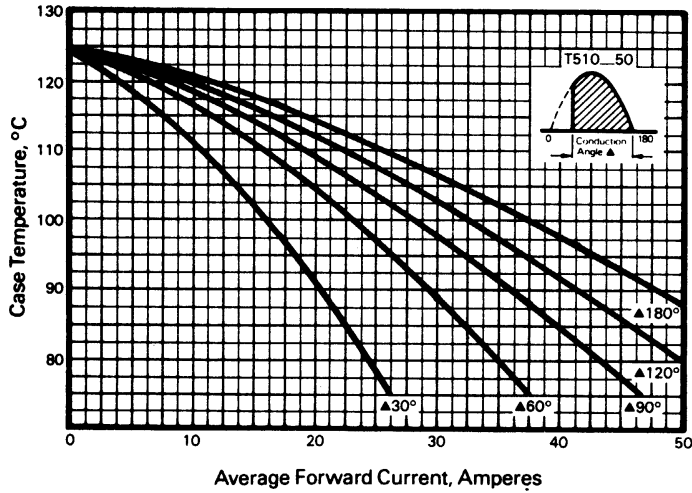
### Electrical and Thermal Characteristics

| Characteristics                                   | Symbol            | Test Conditions                                                                                                                                                     | T510 _ _50                 | T510 _ _80 | Units                        |
|---------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|------------------------------|
| <b>Current - Conducting State Maximums</b>        |                   |                                                                                                                                                                     |                            |            |                              |
| Forward Voltage Drop                              | $V_{TM}$          | $T_j = 25^\circ\text{C}$ , $I_{TM} = 500\text{A}$                                                                                                                   | 3.5                        | 2.2        | Volts                        |
| <b>Voltage - Blocking State Maximums</b>          |                   |                                                                                                                                                                     |                            |            |                              |
| Rep. Peak Forward Blocking Voltage (Rated Limit)  | $V_{DRM}$         |                                                                                                                                                                     | 600                        | 600        | Volts                        |
| Repetitive Peak Reverse Voltage (Rated Limit)     | $V_{RRM}$         |                                                                                                                                                                     | 600                        | 600        | Volts                        |
| Non-Rep. Trans. Peak Rev. Voltage (Rated Limit)   | $V_{RSM}$         | $t_p \leq 5.0 \text{ msec}$                                                                                                                                         | 700                        | 700        | Volts                        |
| Forward Leakage Current                           | $I_{DRM}$         | $T_j = 125^\circ\text{C}$ , $V_{DRM} = \text{Rated}$                                                                                                                | 10                         | 10         | mA                           |
| Reverse Leakage Current                           | $I_{RRM}$         | $T_j = 125^\circ\text{C}$ , $V_{RRM} = \text{Rated}$                                                                                                                | 10                         | 10         | mA                           |
| <b>Switching</b>                                  |                   |                                                                                                                                                                     |                            |            |                              |
| Typical Turn-off Time                             | $t_q$             | $I_T = 50\text{A}$ , $di_R/dt = 5 \text{ A}/\mu\text{sec}$ ,<br>reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ linear<br>to $0.8 V_{DRM}$ , $T_j = 125^\circ\text{C}$ | 100                        | 100        | $\mu\text{sec}$              |
| Typical Turn-on Time                              | $t_{on}$          | $I_T = 100\text{A}$ , $V_D = 100\text{V}$                                                                                                                           | 4                          | 4          | $\mu\text{sec}$              |
| Minimum Critical $dv/dt$ Exponential to $V_{DRM}$ | $dv/dt$           | $T_j = 125^\circ\text{C}$                                                                                                                                           | 300                        | 300        | $\text{V}/\mu\text{sec}$     |
| <b>Thermal</b>                                    |                   |                                                                                                                                                                     |                            |            |                              |
| Maximum Resistance, Junction to Case              | $R_{\theta(j-c)}$ |                                                                                                                                                                     | 0.28                       | 0.28       | $^\circ\text{C}/\text{Watt}$ |
| Maximum Resistance, Case to Sink (Lubricated)     | $R_{\theta(c-s)}$ |                                                                                                                                                                     | 0.12                       | 0.12       | $^\circ\text{C}/\text{Watt}$ |
| <b>Gate - Maximum Parameters</b>                  |                   |                                                                                                                                                                     |                            |            |                              |
| Gate Current to Trigger                           | $I_{GT}$          | $T_j = 25^\circ\text{C}$ , $V_D = 12\text{V}$                                                                                                                       | (See Ordering Information) |            | mA                           |
| Gate Voltage to Trigger                           | $V_{GT}$          | $T_j = 25^\circ\text{C}$ , $V_D = 12\text{V}$                                                                                                                       | 3                          | 3          | Volts                        |
| Non-Triggering Gate Voltage                       | $V_{GDM}$         | $T_j = 125^\circ\text{C}$ , $V_{DRM} = \text{Rated}$                                                                                                                | 0.15                       | 0.15       | Volts                        |
| Peak Forward Gate Current                         | $I_{GTM}$         |                                                                                                                                                                     | 4                          | 4          | Amperes                      |
| Peak Reverse Gate Voltage                         | $V_{GRM}$         |                                                                                                                                                                     | 5                          | 5          | Volts                        |

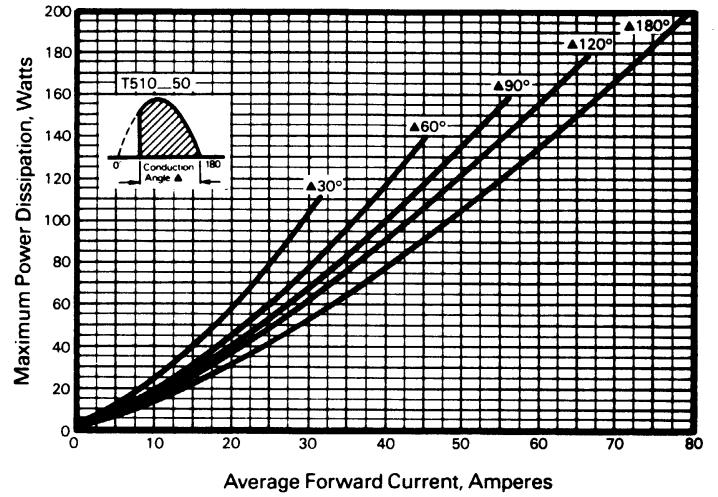
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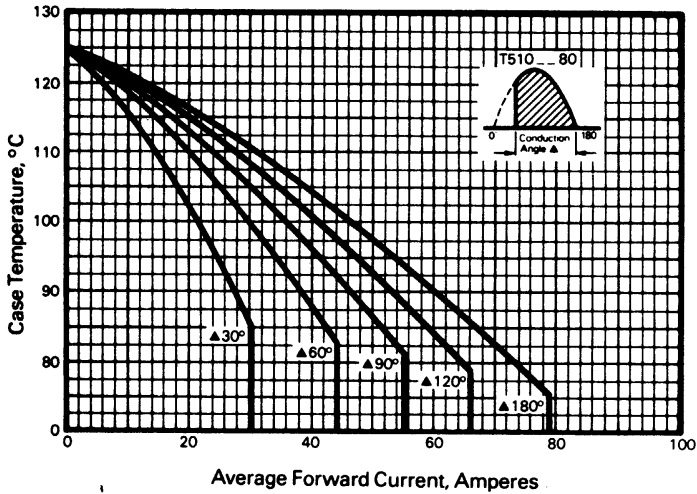
Maximum Case Temperature Vs. Forward Current



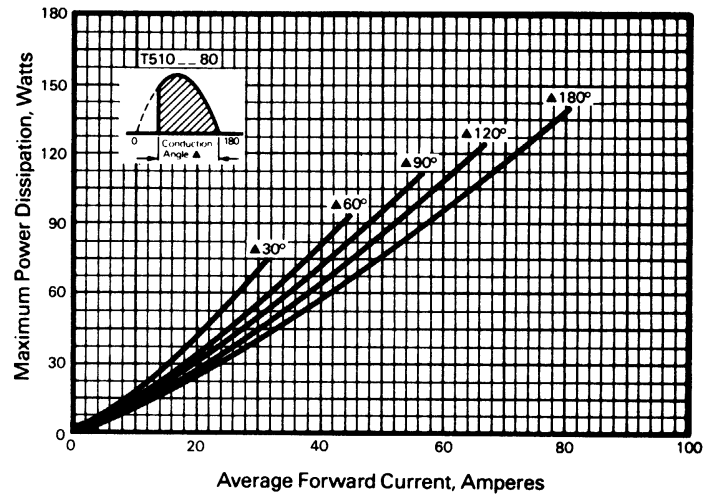
Maximum Power Dissipation Vs. Forward Current



Maximum Case Temperature Vs. Forward Current



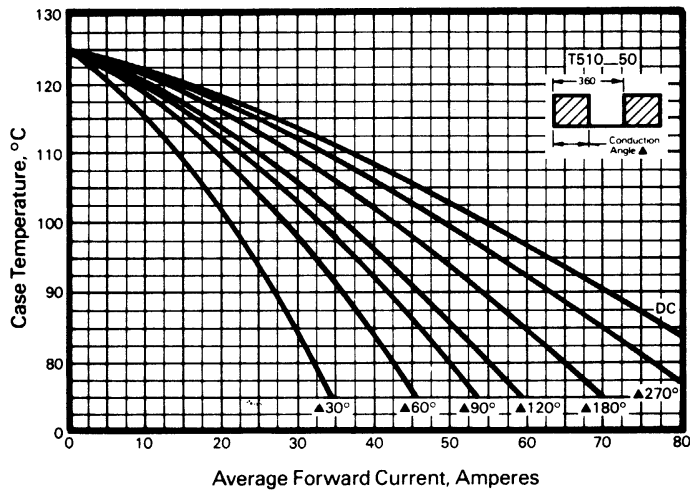
Maximum Power Dissipation Vs. Forward Current



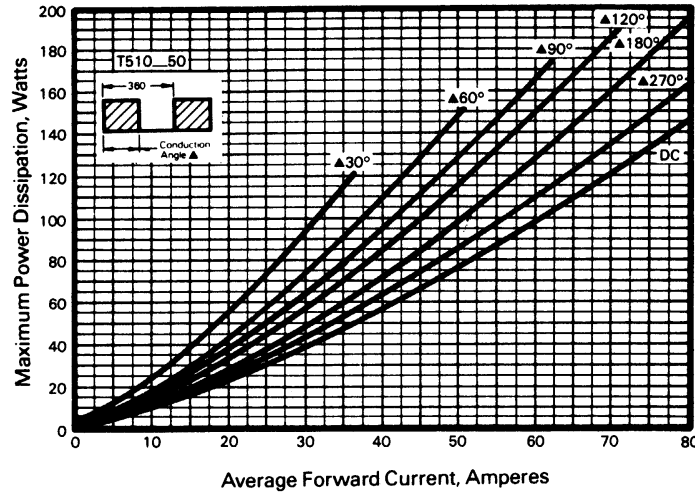
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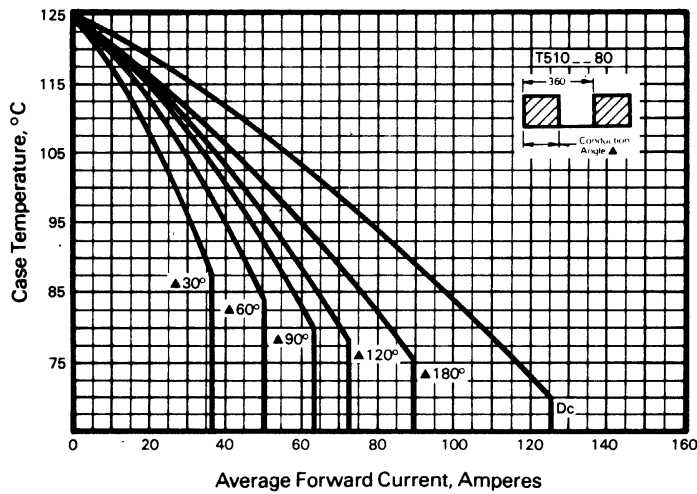
Maximum Case Temperature Vs. Forward Current



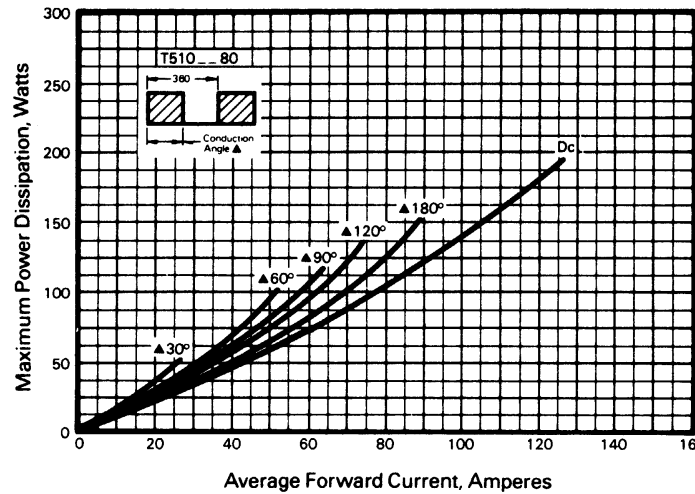
Maximum Power Dissipation Vs. Forward Current



Maximum Case Temperature Vs. Forward Current



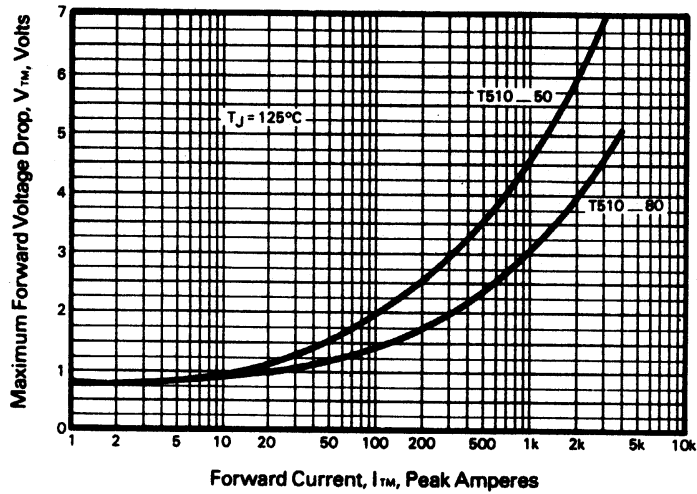
Maximum Power Dissipation Vs. Forward Current



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Maximum Forward Voltage Vs. Forward Current



Transient Thermal Impedance Vs. Time

