

## Standard SCRs, 70A

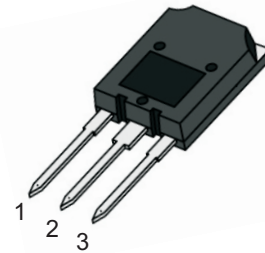
### Main Features

| Symbol            | Value       | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$      | 75          | A    |
| $V_{DRM}/V_{RRM}$ | 800 to 1800 | V    |
| $I_{GT}$          | 100         | mA   |

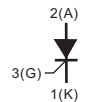
### DESCRIPTION

The 70PT series of silicon controlled rectifiers are high performance glass passivated technology, and are suitable for general purpose applications, where power handling and power dissipation are critical, such as solid state relay, welding equipment high power motor control, high power switching and phase control applications.

Base on a clip assembly technology, they offer a superior performance in surge current capabilities. Thanks to their internal ceramic pad, they provide high voltage insulation(2500V<sub>RMS</sub>).



**TO-247S (non-Insulated)**  
(70PTxxD)



| ABSOLUTE MAXIMUM RATINGS  |              |                             |                             |               |                  |
|---|--------------|-----------------------------|-----------------------------|---------------|------------------|
| PARAMETER   | SYMBOL       | TEST CONDITIONS             |                             | VALUE         | UNIT             |
| RMS on-state current full sine wave (180° conduction angle)<br>Lead current limitation  | $I_{T(RMS)}$ | TO-247S                     | $T_c=80^{\circ}\text{C}$    | 75            | A                |
| Average on-state current (180° conduction angle)  | $I_{T(AV)}$  | TO-247S                     | $T_c=80^{\circ}\text{C}$    | 70            | A                |
| Non repetitive surge peak on-state current (full cycle, $T_j$ initial = 25°C)   | $I_{TSM}$    | F = 50 Hz                   | t = 20 ms                   | 1300          | A                |
|   |              | F = 60 Hz                   | t = 16.7 ms                 | 1500          |                  |
| $I^2t$ Value for fusing   | $I^2t$       | $t_p = 10$ ms               |                             | 8450          | A <sup>2</sup> s |
| Critical rate of rise of on-state current<br>$V_D = 67\% V_{DRM}$ , $t_p = 200\mu\text{s}$ , $I_G = 0.3\text{A}$<br>$dI_G/dt = 0.3\text{A}/\mu\text{s}$ | $dI/dt$      | F = 60 Hz                   | $T_j = 125^{\circ}\text{C}$ | 150           | A/ $\mu\text{s}$ |
| Peak gate current   | $I_{GM}$     | $T_p = 20 \mu\text{s}$      | $T_j = 125^{\circ}\text{C}$ | 2.5           | A                |
| Maximum gate power  | $P_{GM}$     | $T_p = 20\mu\text{s}$       | $T_j = 125^{\circ}\text{C}$ | 10            | W                |
| Average gate power dissipation  | $P_{G(AV)}$  | $T_j = 125^{\circ}\text{C}$ |                             | 2             | W                |
| Repetitive peak off-state voltage   | $V_{DRM}$    | $T_j = 125^{\circ}\text{C}$ |                             | 800 to 1800   | V                |
| Repetitive peak reverse voltage   | $V_{RRM}$    |                             |                             |               |                  |
| Storage temperature range   | $T_{stg}$    |                             |                             | - 40 to + 150 | °C               |
| Operating junction temperature range  | $T_j$        |                             |                             | - 40 to + 125 |                  |
| Maximum peak reverse gate voltage   | $V_{RGM}$    |                             |                             | 5             | V                |

| ELECTRICAL SPECIFICATIONS (T <sub>J</sub> = 25 °C unless otherwise specified) |   |                        |         |         |         |      |      |
|---|---|------------------------|---------|---------|---------|------|------|
| SYMBOL  | TEST CONDITIONS   |                        | 70PT08D | 70PT10D | 70PT16D | Unit |      |
|   |   |                        |         | 70PT12D | 70PT18D |      |      |
| I <sub>GT</sub>   | V <sub>D</sub> = 12V, R <sub>L</sub> = 33Ω  | Max.                   | 50      | 80      | 100     | mA   |      |
| V <sub>GT</sub>   |   | Max.                   | 1.5     |         |         | V    |      |
| V <sub>GD</sub>   | V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 3.3KΩ, R <sub>GK</sub> = 220Ω              | T <sub>J</sub> = 125°C | Min.    | 0.2     |         | V    |      |
| I <sub>H</sub>  | I <sub>T</sub> = 500mA, Gate open   |                        | Max.    | 120     | 130     | 150  | mA   |
| I <sub>L</sub>  | I <sub>G</sub> = 1.2×I <sub>GT</sub>  |                        | Max.    | 150     | 180     | 200  | mA   |
| dV/dt   | V <sub>D</sub> = 67% V <sub>DRM</sub> , Gate open   | T <sub>J</sub> = 125°C | Min.    | 700     | 1000    | 1000 | V/μs |
| V <sub>TM</sub>   | I <sub>T</sub> = 100A, t <sub>p</sub> = 380μs   | T <sub>J</sub> = 25°C  | Max.    | 1.55    |         | V    |      |
| I <sub>DRM</sub><br>I <sub>RRM</sub>  | V <sub>D</sub> = V <sub>DRM</sub> , V <sub>R</sub> = V <sub>RRM</sub><br>R <sub>GK</sub> = 220Ω | T <sub>J</sub> = 25°C  | Max.    | 50      |         | μA   |      |
|   |   | T <sub>J</sub> = 125°C | Max.    | 10      |         | mA   |      |
| V <sub>to</sub>   | Threshold Voltage   |                        | Max.    | 0.85    |         | V    |      |
| R <sub>d</sub>  | Dynamic Resistance  |                        | Max.    | 10      |         | mΩ   |      |

| THERMAL RESISTANCE   |                       |         |       |      |
|----------------------|-----------------------|---------|-------|------|
| SYMBOL               | Parameter             |         | VALUE | UNIT |
| R <sub>th(j-c)</sub> | Junction to case (DC) | TO-247S | 0.32  | °C/W |
| R <sub>th(j-a)</sub> | Junction to ambient   | TO-247S | 45    | °C/W |

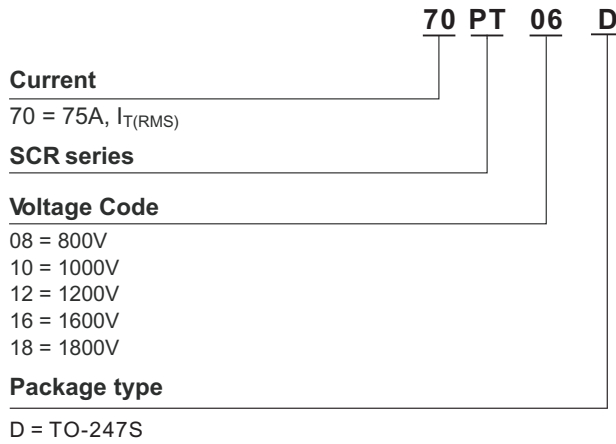
S=Copper surface under tab

| PRODUCT SELECTOR |              |        |        |        |        |             |         |
|------------------|--------------|--------|--------|--------|--------|-------------|---------|
| PART NUMBER      | VOLTAGE (xx) |        |        |        |        | SENSITIVITY | PACKAGE |
|                  | 800 V        | 1000 V | 1200 V | 1600 V | 1800 V |             |         |
| 70PTxxD          | V            | V      | V      | V      | V      | 100 mA      | TO-247S |

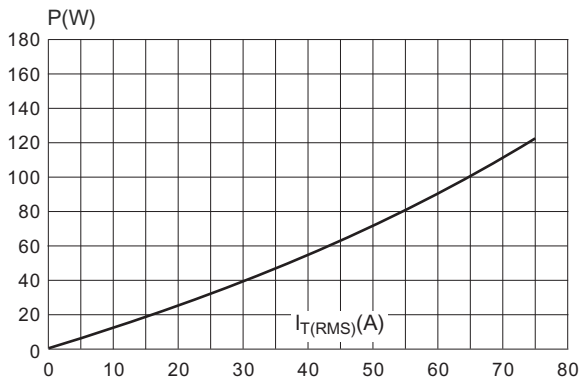
| ORDERING INFORMATION |         |         |        |           |               |
|----------------------|---------|---------|--------|-----------|---------------|
| ORDERING TYPE        | MARKING | PACKAGE | WEIGHT | BASE Q'TY | DELIVERY MODE |
| 70PTxxD              | 70PTxxD | TO-247S | 6.5g   | 30        | Tube          |

Note: xx = voltage

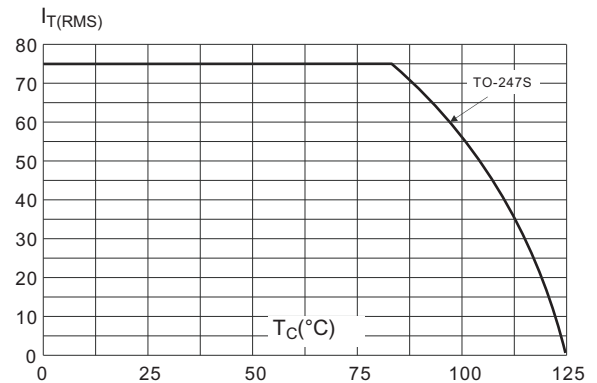
## ORDERING INFORMATION SCHEME



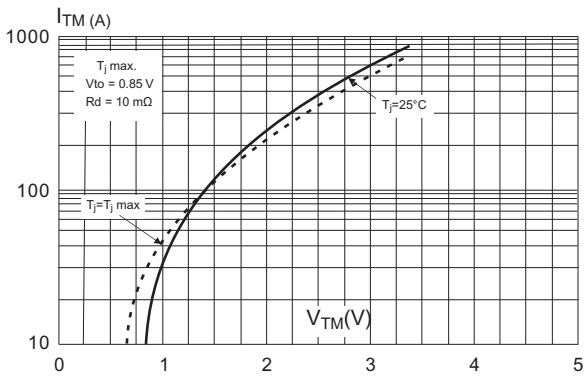
**Fig.1 Maximum power dissipation versus RMS on-state current (full cycle)**



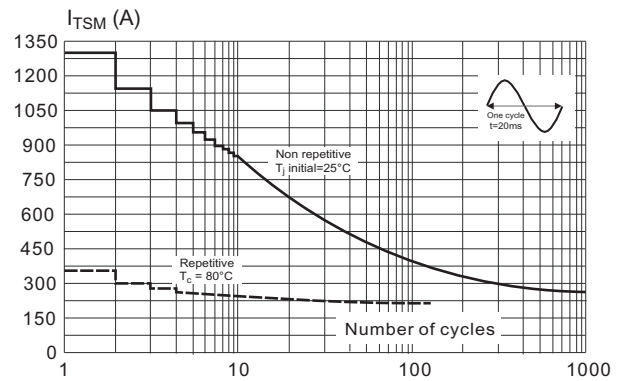
**Fig.2 RMS on-state current versus case temperature (full cycle)**



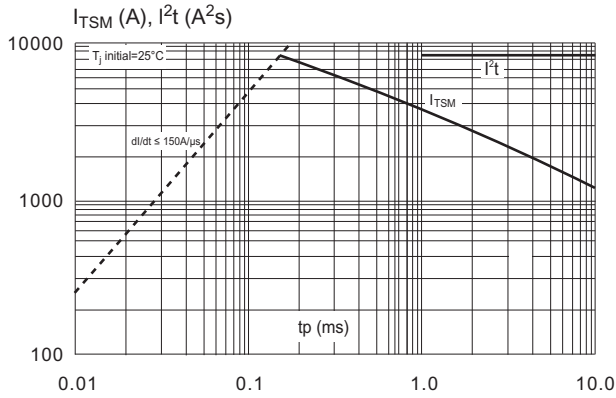
**Fig.3 On-state characteristics (maximum values).**



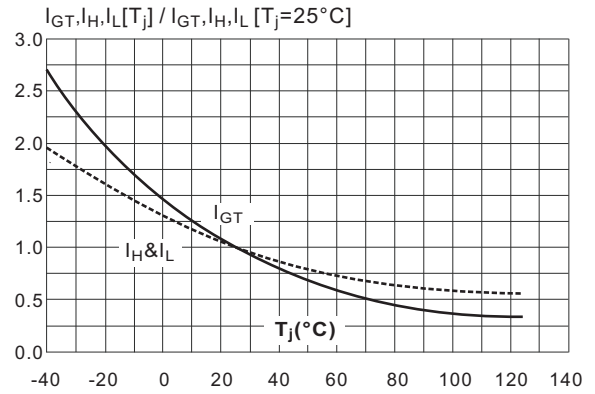
**Fig.4 Surge peak on-state current versus number of cycles.**



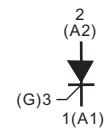
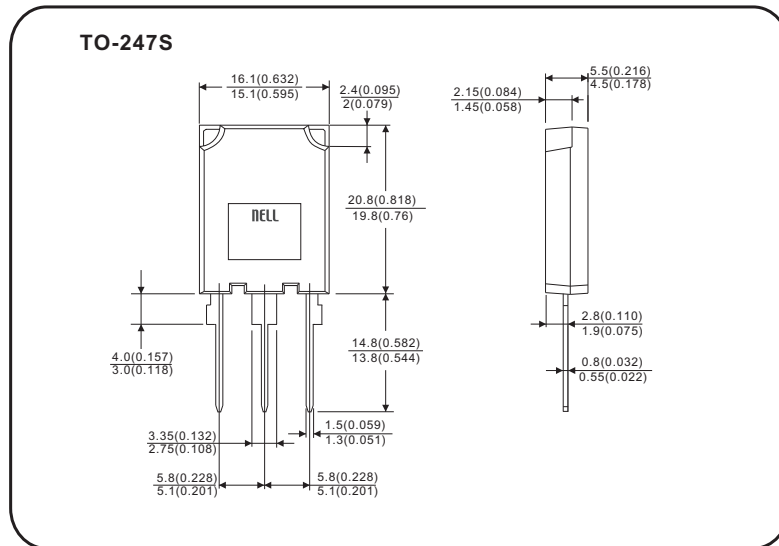
**Fig.5 Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms, and corresponding value of  $I^2t$ .**



**Fig.6 Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)**



## Case Style



All dimensions in millimeters (inches)