

## Standard SCRs, 30A

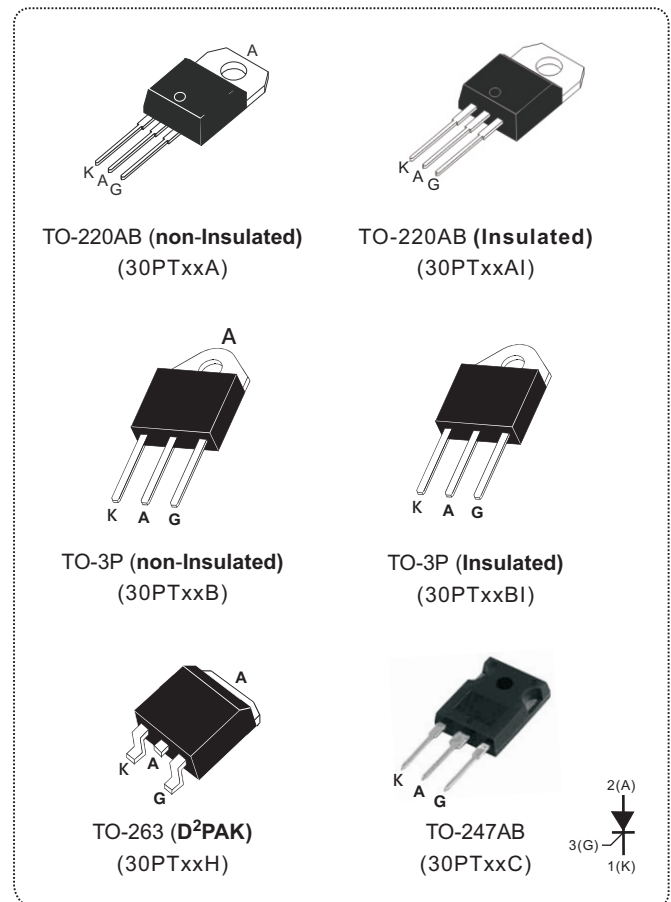
### Main Features

| Symbol            | Value       | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$      | 30          | A    |
| $V_{DRM}/V_{RRM}$ | 600 to 1200 | V    |
| $I_{GT}$          | 4 to 50     | mA   |

### DESCRIPTION

The 30PT series of silicon controlled rectifiers are high performance glass passivated technology, and are suitable for general purpose applications, where power dissipation are critical such as solid state relay, welding equipment and high power control.

Base on a clip assembly technology, they offer a superior performance in surge current capabilities.



| ABSOLUTE MAXIMUM RATINGS   |              |                                    |                           |               |                        |
|--|--------------|------------------------------------|---------------------------|---------------|------------------------|
| PARAMETER  | SYMBOL       | TEST CONDITIONS                    |                           | VALUE         | UNIT                   |
| RMS on-state current full sine wave<br>(180° conduction angle)                                 | $I_{T(RMS)}$ | TO-3P/TO-247AB                     | $T_c=100^\circ\text{C}$   | 30            | A                      |
|  |              | TO-220AB/TO-263                    | $T_c=95^\circ\text{C}$    |               |                        |
|  |              | TO-220AB insulated/TO-3P insulated | $T_c=80^\circ\text{C}$    |               |                        |
| Average on-state current<br>(180° conduction angle)  | $I_{T(AV)}$  | TO-3P/TO-247AB                     | $T_c=100^\circ\text{C}$   | 19            | A                      |
|  |              | TO-220AB/TO-263                    | $T_c=95^\circ\text{C}$    |               |                        |
|  |              | TO-220AB insulated/TO-3P insulated | $T_c=80^\circ\text{C}$    |               |                        |
| Non repetitive surge peak on-state current (full cycle, $T_j$ initial = 25°C)                  | $I_{TSM}$    | F = 50 Hz                          | t = 20 ms                 | 400           | A                      |
|  |              | F = 60 Hz                          | t = 16.7 ms               | 420           |                        |
| $I^2t$ Value for fusing  | $I^2t$       | $t_p = 10$ ms                      |                           | 800           | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current<br>$I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ns}$ | di/dt        | F = 60 Hz                          | $T_j = 125^\circ\text{C}$ | 50            | $\text{A}/\mu\text{s}$ |
| Peak gate current  | $I_{GM}$     | $T_p = 20$ $\mu\text{s}$           | $T_j = 125^\circ\text{C}$ | 4             | A                      |
| Maximum gate power   | $P_{GM}$     | $T_p = 20$ $\mu\text{s}$           | $T_j = 125^\circ\text{C}$ | 10            | W                      |
| Average gate power dissipation   | $P_{G(AV)}$  | $T_j = 125^\circ\text{C}$          |                           | 1             | W                      |
| Repetitive peak off-state voltage  | $V_{DRM}$    | $T_j = 125^\circ\text{C}$          |                           | 600 to 1200   | 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   |                          |                        | 30PTxxxx | Unit |      |
| I <sub>GT</sub>   | V <sub>D</sub> = 12V, R <sub>L</sub> = 33Ω  |                          |                        | Min.     | 4    | mA   |
|   |   |                          |                        | Max.     | 50   |      |
| V <sub>GT</sub>   |   |                          |                        | Max.     | 1.3  | 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.     | 75   | mA   |
| I <sub>L</sub>  | I <sub>G</sub> = 1.2×I <sub>GT</sub>  |                          |                        | Typ.     | 150  | mA   |
| dV/dt   | V <sub>D</sub> = 67% V <sub>DRM</sub> , Gate open   | V <sub>DRM</sub> ≤ 800V  | T <sub>j</sub> = 125°C | Min.     | 500  | V/μs |
|   |   | V <sub>DRM</sub> ≥ 1000V |                        |          | 250  |      |
| V <sub>TM</sub>   | I <sub>T</sub> = 60A, t <sub>p</sub> = 380μs  |                          | T <sub>j</sub> = 25°C  | Max.     | 1.6  | V    |
| I <sub>DRM</sub><br>I <sub>RDM</sub>  | V <sub>D</sub> = V <sub>DRM</sub> , V <sub>R</sub> = V <sub>RDM</sub><br>R <sub>GK</sub> = 220Ω |                          | T <sub>j</sub> = 25°C  | Max.     | 5    | μA   |
|   |   |                          | T <sub>j</sub> = 125°C | Max.     | 2    | mA   |
| V <sub>to</sub>   | Threshold Voltage   |                          | T <sub>j</sub> = 125°C | Max.     | 1.27 | V    |
| R <sub>d</sub>  | Dynamic Resistance  |                          | T <sub>j</sub> = 125°C | Max.     | 12   | mΩ   |

| THERMAL RESISTANCE   |                       |  |  |  |                            |      |      |
|----------------------|-----------------------|--|--|--|----------------------------|------|------|
| SYMBOL               | Parameter             |  |  | VALUE                                      | UNIT                       |      |      |
| R <sub>th(j-c)</sub> | Junction to case (DC) |  |  | D <sup>2</sup> PAK/TO-220AB/TO-3P/TO-247AB | 1.0                        | °C/W |      |
|                      |                       |  |  | TO-3P insulated                            | 1.2                        |      |      |
|                      |                       |  |  | TO-220AB insulated                         | 2.0                        |      |      |
| R <sub>th(j-a)</sub> | Junction to ambient   |  |  | S = 1 cm <sup>2</sup>                      | TO-263(D <sup>2</sup> PAK) | 45   | °C/W |
|                      |                       |  |  | TO-220AB/TO-220AB insulated                | 60                         |      |      |
|                      |                       |  |  | TO-3P/TO-247AB/TO-3P insulated             | 50                         |      |      |

S=Copper surface under tab

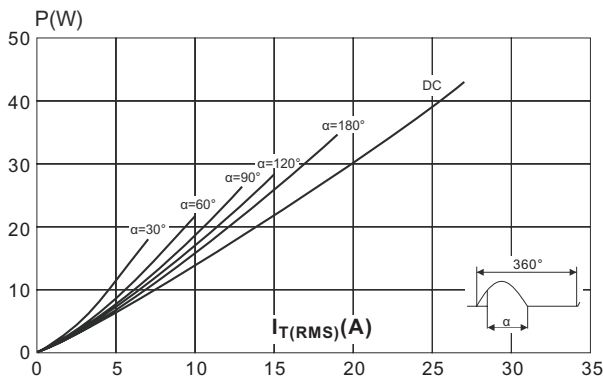
| PRODUCT SELECTOR |              |       |        |        |             |                    |
|------------------|--------------|-------|--------|--------|-------------|--------------------|
| PART NUMBER      | VOLTAGE (xx) |       |        |        | SENSITIVITY | PACKAGE            |
|                  | 600 V        | 800 V | 1000 V | 1200 V |             |                    |
| 30PTxxA/30PTxxAI | V            | V     | V      | V      | 50 mA       | TO-220AB           |
| 30PTxxH          | V            | V     | V      | V      | 50 mA       | D <sup>2</sup> PAK |
| 30PTxxB/30PTxxBI | V            | V     | V      | V      | 50 mA       | TO-3P              |
| 30PTxxC          | V            | V     | V      | V      | 50 mA       | TO-247AB           |

| ORDERING INFORMATION |          |                            |        |           |               |
|----------------------|----------|----------------------------|--------|-----------|---------------|
| ORDERING TYPE        | MARKING  | PACKAGE                    | WEIGHT | BASE Q'TY | DELIVERY MODE |
| 30PTxxA              | 30PTxxA  | TO-220AB                   | 2.0g   | 50        | Tube          |
| 30PTxxAI             | 30PTxxAI | TO-220AB (insulated)       | 2.3g   | 50        | Tube          |
| 30PTxxH              | 30PTxxH  | TO-263(D <sup>2</sup> PAK) | 2.0g   | 50        | Tube          |
| 30PTxxB              | 30PTxxB  | TO-3P                      | 4.3g   | 30        | Tube          |
| 30PTxxBI             | 30PTxxBI | TO-3P insulated            | 4.8g   | 30        | Tube          |
| 30PTxxC              | 30PTxxC  | TO-247AB                   | 5g     | 30        | Tube          |

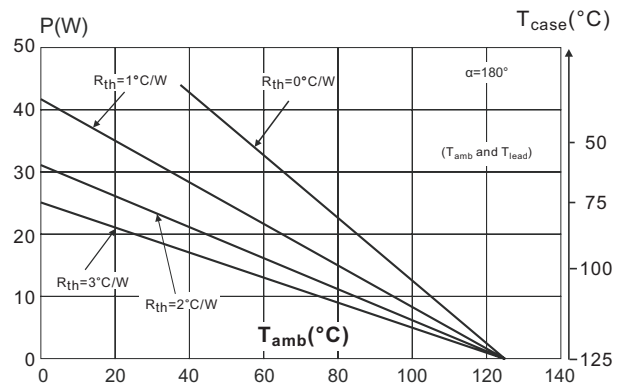
Note: xx = voltage

| ORDERING INFORMATION SCHEME |  |
|-----------------------------|--|
| <b>30 PT 06 AI</b>          | <p><b>Current</b><br/>30 = 30A, <math>I_{T(RMS)}</math></p> <p><b>SCR series</b></p> <p><b>Voltage Code</b><br/>06 = 600V<br/>08 = 800V<br/>10 = 1000V<br/>12 = 1200V<br/>16 = 1600V</p> <p><b>Package type</b><br/>A = TO-220AB (non-insulated)<br/>AI = TO-220AB ( insulated)<br/>B = TO-3P (non-insulated)<br/>BI = TO-3P ( insulated)<br/>C = TO-247AB<br/>H = TO-263 (D<sup>2</sup>PAK)</p> |

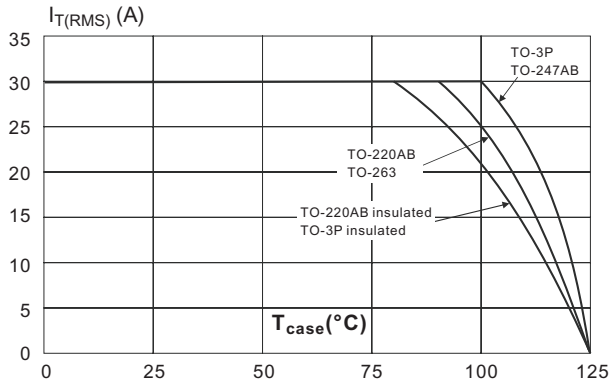
**Fig.1 Maximum average power dissipation versus average on-state current.**



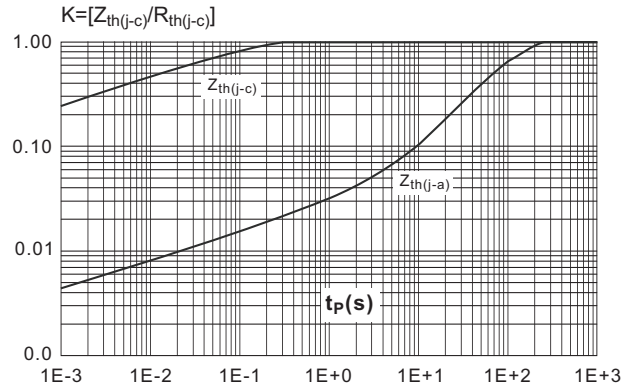
**Fig.2 Correlation between maximum average power dissipation and maximum allowable temperature**



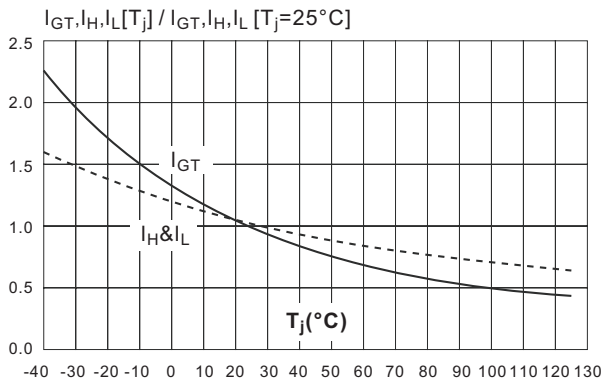
**Fig.3 RMS on-state current versus case temperature.**



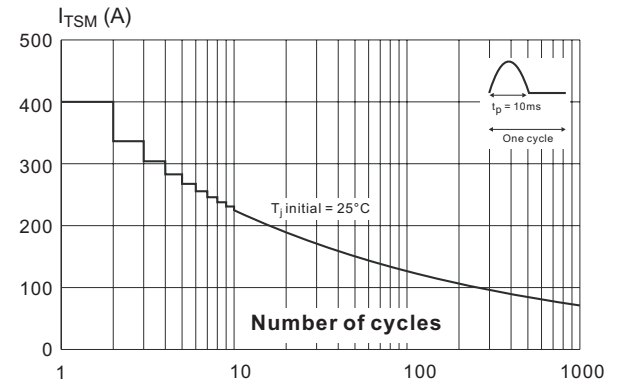
**Fig.4 Relative variation of thermal impedance versus pulse duration.**



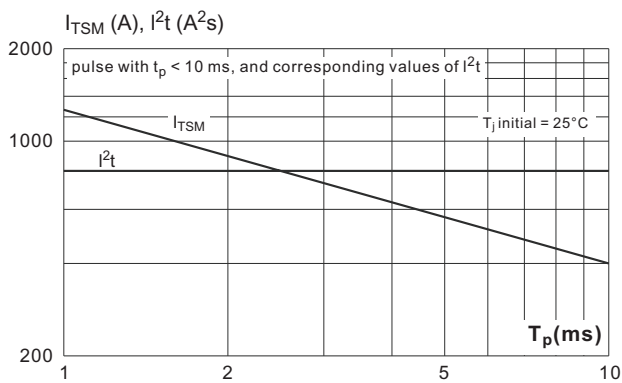
**Fig.5 Relative variation of gate trigger current versus junction temperature.**



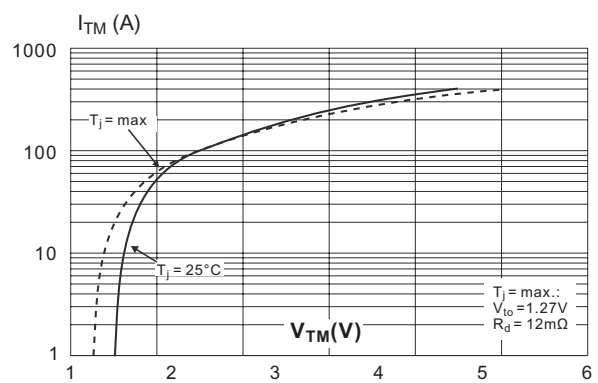
**Fig.6 Surge peak on-state current versus number of cycles.**



**Fig.7 Non-repetitive surge peak on-state current and corresponding value of  $I^2t$  versus sinusoidal pulse width**

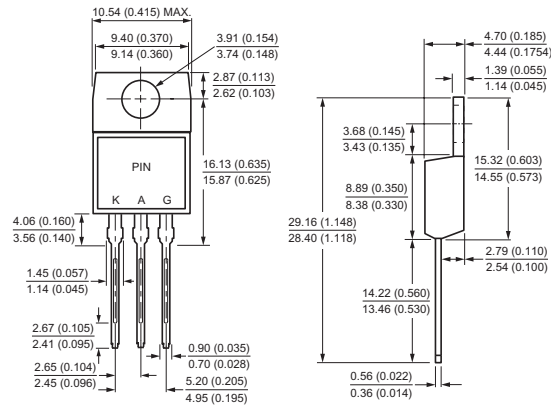


**Fig.8 On-state characteristics (maximum values)**

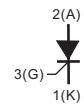
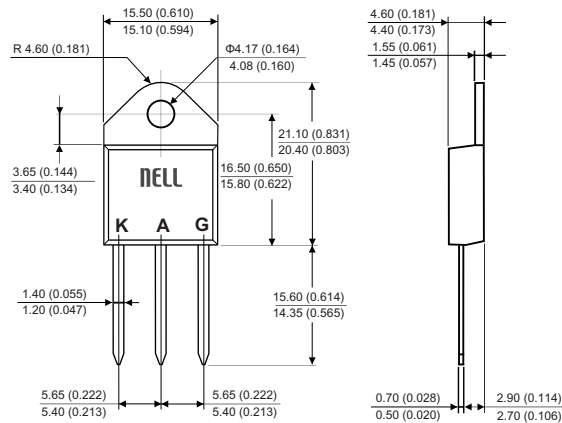


## Case Style

**TO-220AB**



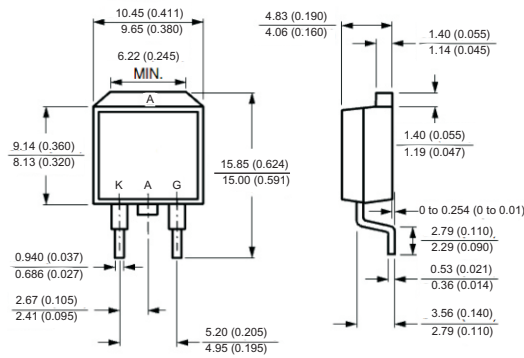
**TO-3P**



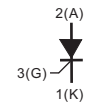
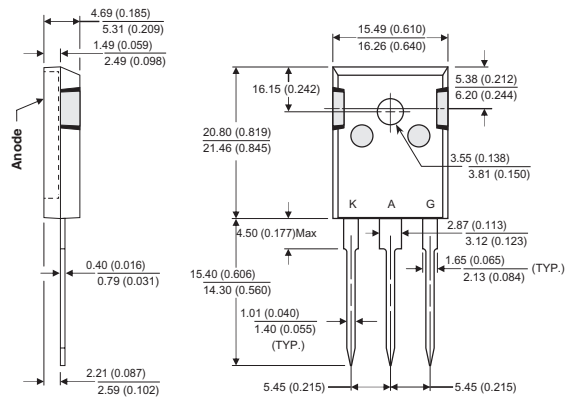
All dimensions in millimeters(inches)

**Case Style**

**TO-263(D<sup>2</sup>PAK)**



**TO-247AB**



All dimensions in millimeters(inches)