

Standard SCRs, 20A

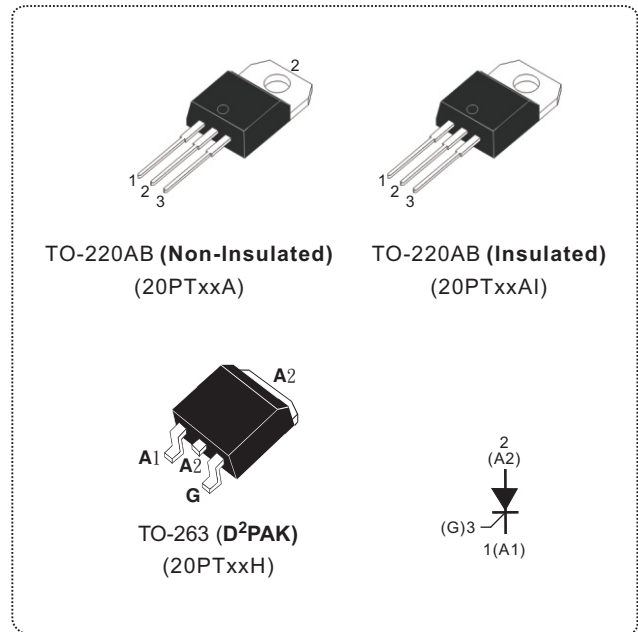
Main Features

| Symbol | Value | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$ | 20 | A |
| V_{DRM}/V_{RRM} | 600 to 1000 | V |
| I_{GT} | 3 to 25 | mA |

DESCRIPTION

The 20PT series of silicon controlled rectifiers are high performance glass passivated technology, and are suitable for general purpose applications.

Using clip assembly technology, they provide a superior performance in surge current capabilities.



| ABSOLUTE MAXIMUM RATINGS | | | | | |
|--|--------------|---------------------------|---------------------------|---------------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUE | UNIT |
| RMS on-state current full sine wave (180° conduction angle) | $I_{T(RMS)}$ | TO-263/TO-220AB | $T_c=100^\circ\text{C}$ | 20 | A |
| | | TO-220AB insulated | $T_c=80^\circ\text{C}$ | | |
| Average on-state current (180° conduction angle) | $I_{T(AV)}$ | TO-263/TO-220AB | $T_c=100^\circ\text{C}$ | 13 | A |
| | | TO-220AB 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 | 200 | A |
| | | F = 60 Hz | t = 16.7 ms | 220 | |
| I^2t Value for fusing | I^2t | $t_p = 10$ ms | | 200 | A ² s |
| Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100$ ns | dI/dt | F = 60 Hz | $T_j = 125^\circ\text{C}$ | 50 | A/ μ s |
| Peak gate current | I_{GM} | $T_p = 20$ μ s | $T_j = 125^\circ\text{C}$ | 4 | A |
| Maximum gate power | P_{GM} | $T_p = 20$ μ 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 1000 | 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 | |

| ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified) | | | | | | |
|---|---|------------------------|------|----------|------|----|
| SYMBOL | TEST CONDITIONS | | | 20PTxxxx | Unit | |
| I _{GT} | V _D = 12V, R _L = 33Ω | | | Min. | 3 | mA |
| V _{GT} | | | | Max. | 25 | |
| V _{GD} | V _D = V _{DRM} , R _L = 3.3KΩ R _{GK} = 220Ω | T _J = 125°C | Max. | 1.3 | V | |
| I _H | I _T = 500mA, Gate open | | | Min. | 0.2 | V |
| I _L | I _G = 1.2×I _{GT} | | | Max. | 40 | mA |
| dV/dt | V _D = 67% V _{DRM} , Gate open | T _J = 125°C | Min. | 60 | mA | |
| V _{TM} | I _T = 40A, t _p = 380μs | T _J = 25°C | Max. | 500 | V/μs | |
| I _{DRM} I _{RRM} | V _D =V _{DRM} , V _R =V _{RRM} R _{GK} = 220Ω | T _J = 25°C | Max. | 1.6 | V | |
| | | T _J = 125°C | Max. | 5 | μA | |
| V _{to} | Threshold Voltage | | | Max. | 2 | mA |
| R _d | Dynamic Resistance | | | Max. | 0.77 | V |
| | | T _J = 125°C | Max. | 23 | mΩ | |

| THERMAL RESISTANCE | | | | | |
|----------------------|--|--|-----------------------------|------|------|
| SYMBOL | Parameter | | VALUE | UNIT | |
| R _{th(j-c)} | Junction to case (DC) | | D ² PAK/TO-220AB | 1.05 | °C/W |
| | | | TO-220AB insulated | 2.1 | |
| R _{th(j-a)} | Junction to ambient S = 1 cm ² | | TO-263(D ² PAK) | 45 | °C/W |
| | | | TO-220AB/TO-220AB insulated | 60 | |

S=Copper surface under tab

| PRODUCT SELECTOR | | | | | |
|------------------|--------------|-------|--------|-------------|--------------------|
| PART NUMBER | VOLTAGE (xx) | | | SENSITIVITY | PACKAGE |
| | 600 V | 800 V | 1000 V | | |
| 20PTxxA/20PTxxAI | V | V | V | 25 mA | TO-220AB |
| 20PTxxH | V | V | V | 25 mA | D ² PAK |

| ORDERING INFORMATION | | | | | |
|----------------------|----------|----------------------------|--------|-----------|---------------|
| ORDERING TYPE | MARKING | PACKAGE | WEIGHT | BASE Q'TY | DELIVERY MODE |
| 20PTxxA | 20PTxxA | TO-220AB | 2.0g | 50 | Tube |
| 20PTxxAI | 20PTxxAI | TO-220AB (insulated) | 2.3g | 50 | Tube |
| 20PTxxH | 20PTxxH | TO-263(D ² PAK) | 2.0g | 50 | Tube |

Note: xx = voltage

ORDERING INFORMATION SCHEME

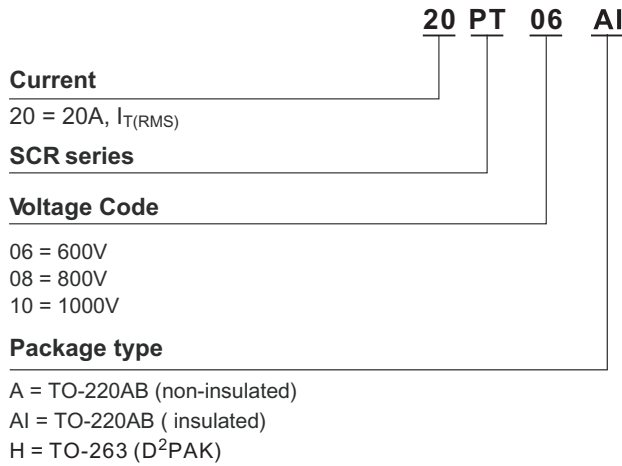


Fig.1 Maximum average power dissipation versus average on-state current.

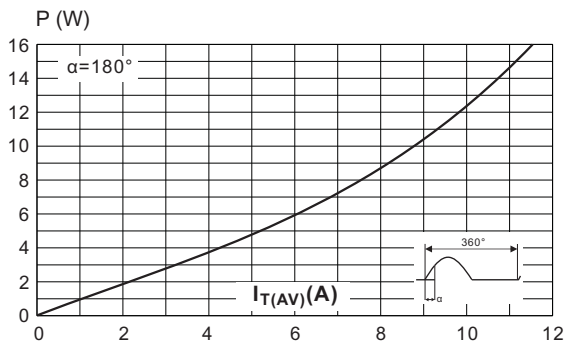


Fig.2 Average and D.C. on-state current versus case temperature.

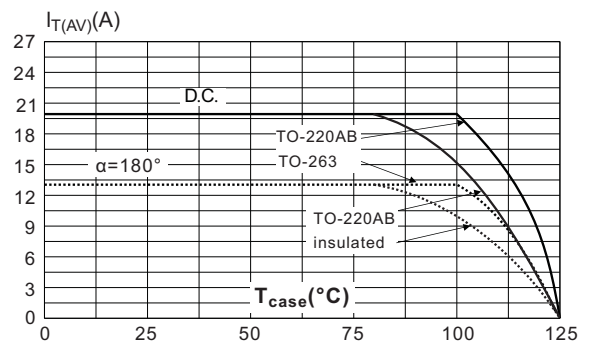


Fig.3 Average and D.C. on-state current versus ambient temperature. (copper surface under tab: S=1cm²) (D²PAK)

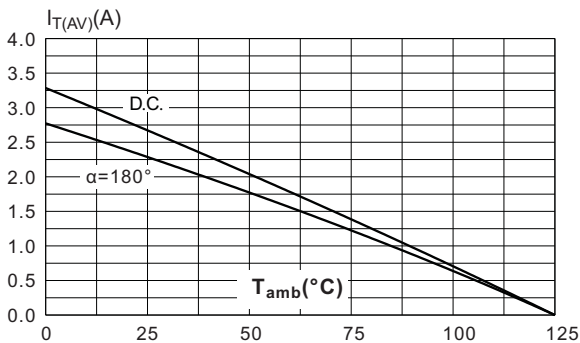


Fig.4 Relative variation of thermal impedance versus pulse duration.

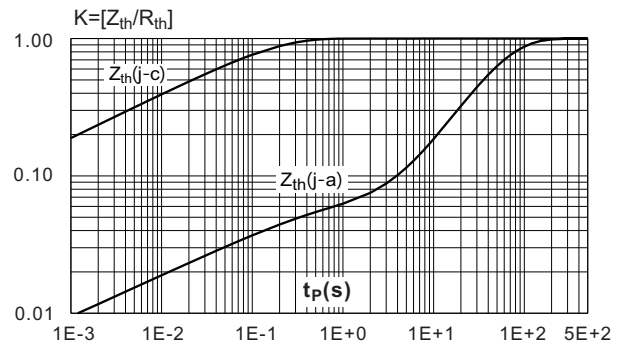


Fig.5 Relative variation of gate trigger current, holding current and latching current versus junction temperature.

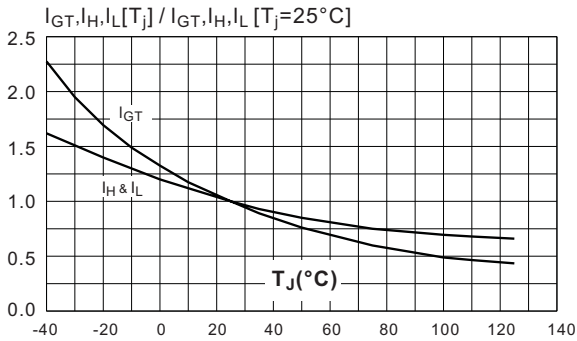


Fig.6 Surge peak on-state current versus number of cycles.

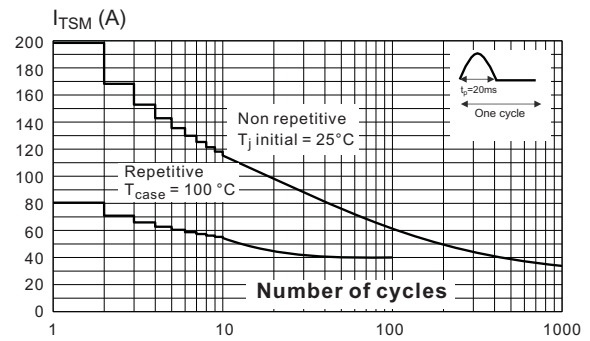


Fig.7 Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms, and corresponding values of I^2t

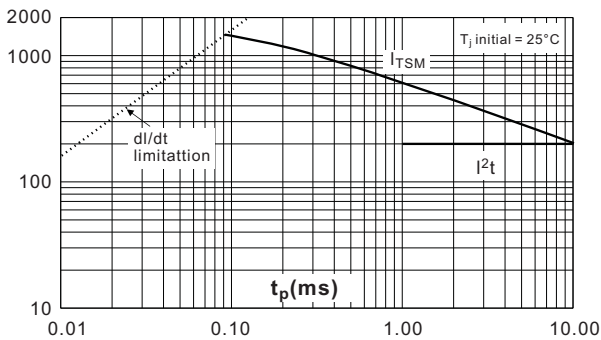


Fig.8 On-state characteristics (maximum values)

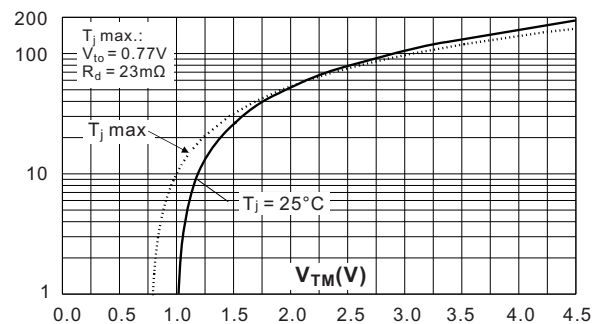
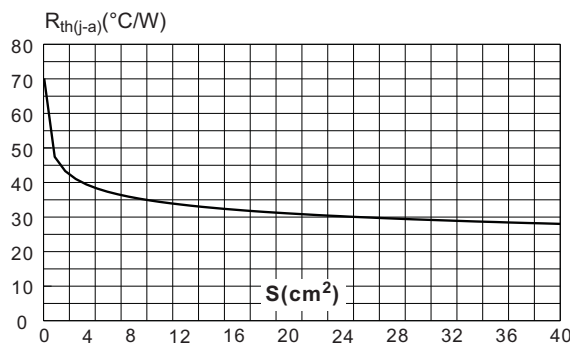
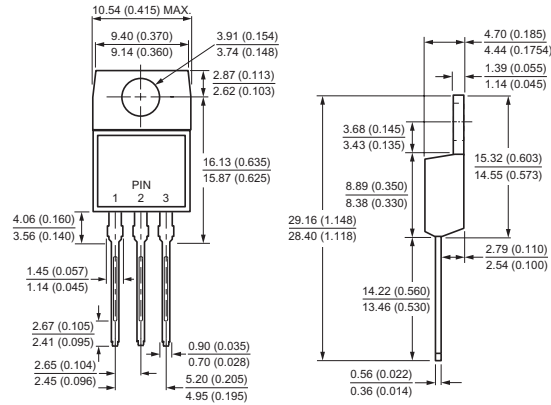


Fig.9 Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board Fr4, copper thickness: 35 μm)(D²PAK)

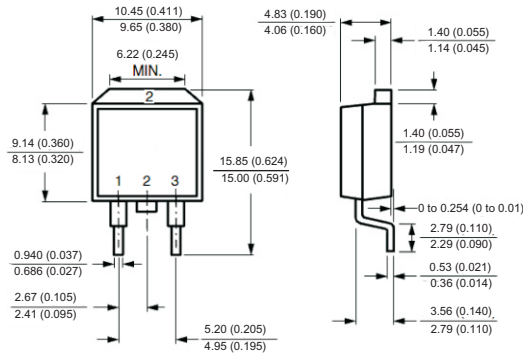


Case Style

TO-220AB



TO-263(D²PAK)



All dimensions in millimeters(inches)

