



TS820-B/T

SENSITIVE SCR

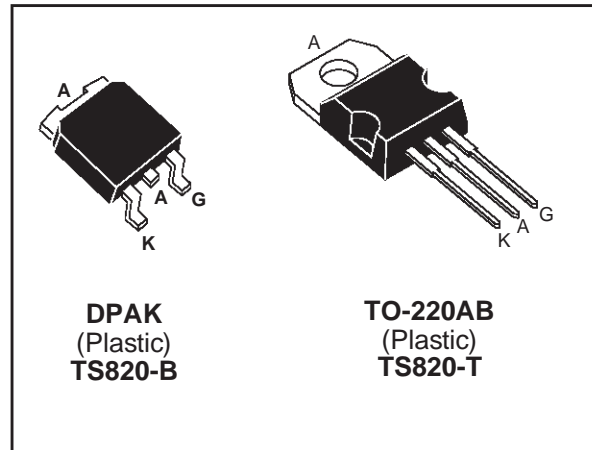
FEATURES

- $I_{T(RMS)} = 8A$
- $V_{DRM}/V_{RRM} = 400, 600V, 700V$
- $I_{GT} < 200\mu A$
- SMD PACKAGE

DESCRIPTION

The TS820-B/T series of SCR use a high performance TOPGLASS PNP technology.

The parts are intended for general purpose applications using surface mount or through hole technology.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------------|--|-------------------------------|--------------------------------|------------------|
| $I_{T(RMS)}$ | RMS on-state current (180° conduction angle) | $T_c = 110^\circ C$ | 8 | A |
| $I_{T(AV)}$ | Average on-state current (180° conduction angle) | $T_c = 110^\circ C$ | 5 | A |
| I_{TSM} | Non repetitive surge peak on-state current (T_j initial = 25°C) | $t_p = 8.3ms$ $t_p = 10ms$ | 73 70 | A |
| I^2t | I^2t Value for fusing | $t_p = 10ms$ | 24 | A ² s |
| di/dt | Critical rate of rise of on-state current $I_G = 10 mA$ $di_G/dt = 0.1 A/\mu s$. | | 100 | A/ μs |
| T_{stg} T_j | Storage junction temperature range Operating junction temperature range | | - 40 to + 150 - 40 to + 125 | °C |
| TI | Maximum temperature for soldering during 10s | | 260 | °C |

| Symbol | Parameter | TS820- | | | Unit |
|-----------|---|--------|--------|--------|------|
| | | 400B/T | 600B/T | 700B/T | |
| V_{DRM} | Repetitive peak off-state voltage | 400 | 600 | 700 | V |
| V_{RRM} | $T_j = 125^\circ C$ $R_{GK} = 220 \Omega$ | | | | |

TS820-B/T

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|----------|---|-----------------|-------|------|
| Rth(j-a) | Junction to ambient (S=0.5cm ²) | DPAK | 70 | °C/W |
| | | TO-220AB | 60 | |
| Rth(j-c) | Junction to case for DC | DPAK / TO-220AB | 2.0 | °C/W |

GATE CHARACTERISTICS (maximum values)

$P_G (AV) = 0.2 \text{ W}$ $P_{GM} = 3 \text{ W}$ ($t_p = 20 \mu\text{s}$) $I_{GM} = 1.2 \text{ A}$ ($t_p = 20 \mu\text{s}$)

ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | | Type | Value | Unit |
|-----------|---|---------------------------|------|-------|------------------|
| I_{GT} | $V_D = 12\text{V (DC)}$ $R_L = 140\Omega$ | $T_j = 25^\circ\text{C}$ | MAX | 200 | μA |
| V_{GT} | $V_D = 12\text{V (DC)}$ $R_L = 140\Omega$ | $T_j = 25^\circ\text{C}$ | MAX | 0.8 | V |
| V_{GD} | $V_D = V_{DRM}$ $R_L = 3.3\text{k}\Omega$ $R_{GK} = 220\Omega$ | $T_j = 125^\circ\text{C}$ | MIN | 0.1 | V |
| V_{RG} | $I_{RG} = 10\mu\text{A}$ | $T_j = 25^\circ\text{C}$ | MIN | 8 | V |
| I_H | $I_T = 50\text{mA}$ $R_{GK} = 1\text{K}\Omega$ | $T_j = 25^\circ\text{C}$ | MAX | 5 | mA |
| V_{TM} | $I_{TM} = 16\text{A}$ $t_p = 380\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | MAX | 1.6 | V |
| I_{DRM} | $V_D = V_{DRM}$ $R_{GK} = 220\Omega$ | $T_j = 25^\circ\text{C}$ | MAX | 5 | μA |
| I_{RRM} | $V_R = V_{RRM}$ $R_{GK} = 220\Omega$ | $T_j = 125^\circ\text{C}$ | MAX | 1 | mA |
| dV/dt | $V_D = 67\%V_{DRM}$ $R_{GK} = 220\Omega$ | $T_j = 125^\circ\text{C}$ | MIN | 5 | V/ μs |

ORDERING INFORMATION Add "-TR" suffix for Tape & Reel shipment

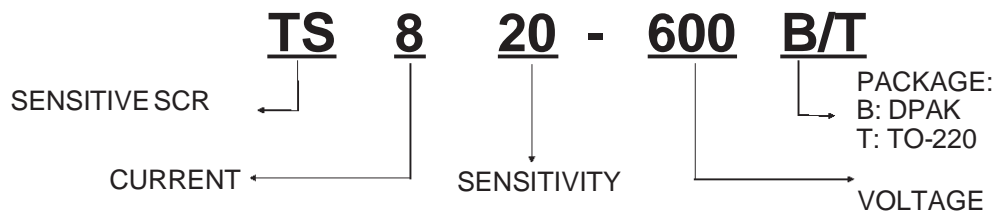


Fig. 1: Maximum average power dissipation versus average on-state current.

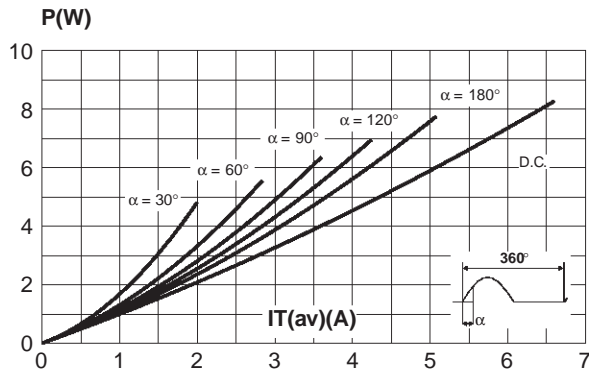


Fig. 2: Correlation between maximum average power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.

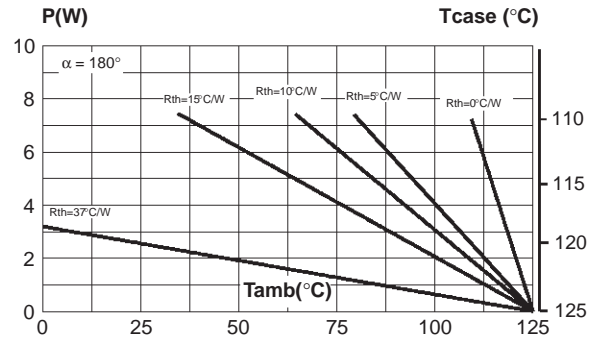


Fig. 3-1: Average and D.C. on-state current versus case temperature (TO-220AB).

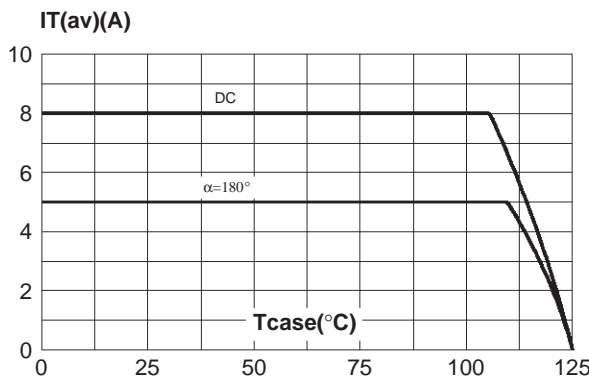


Fig. 3-2: Average and D.C. on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout) (DPAK).

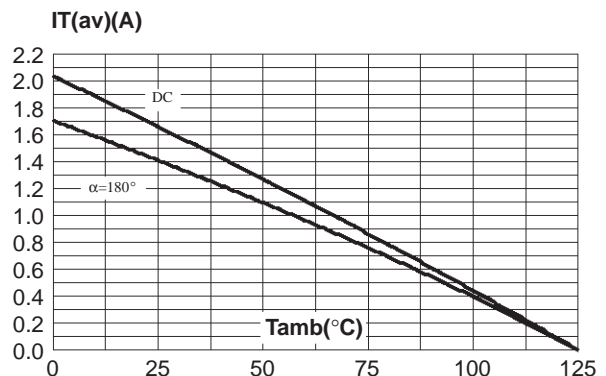


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration.

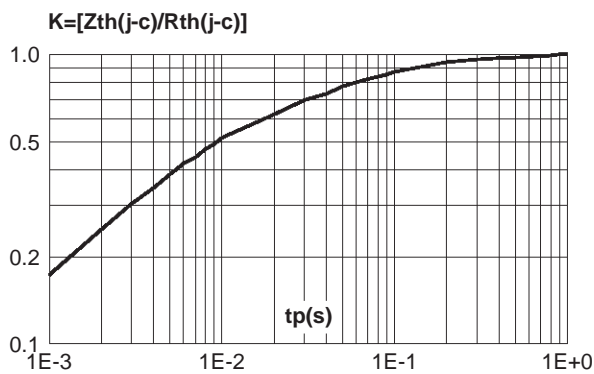


Fig. 4-5: Relative variation of thermal impedance junction to ambient versus pulse duration (recommended pad layout, FR4 PC board) (DPAK).

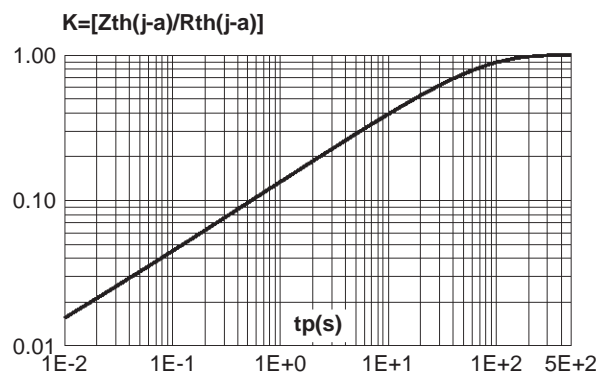


Fig. 5: Relative variation of gate trigger current and holding current versus junction temperature.

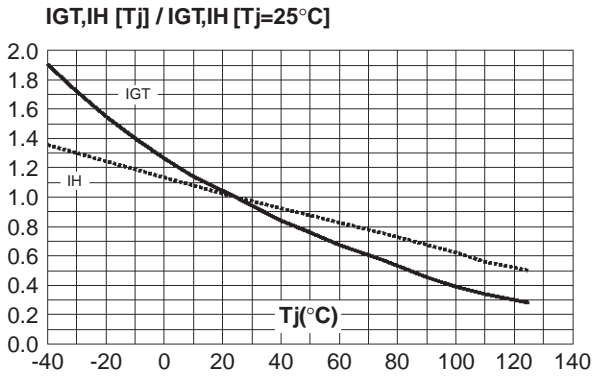


Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

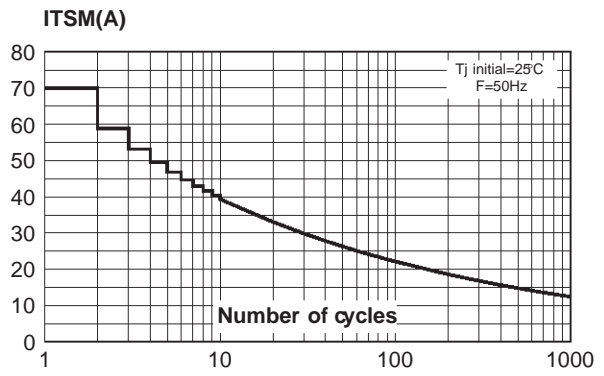


Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t .

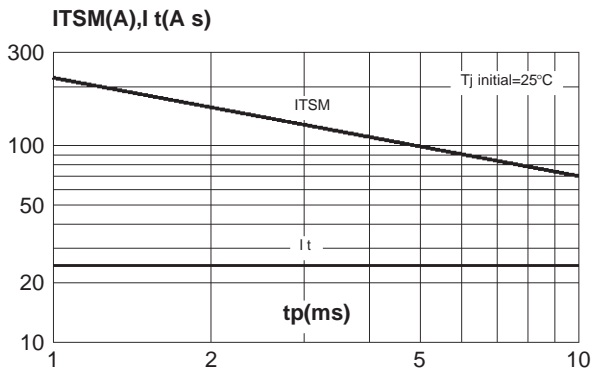


Fig. 8: On-state characteristics (maximum values).

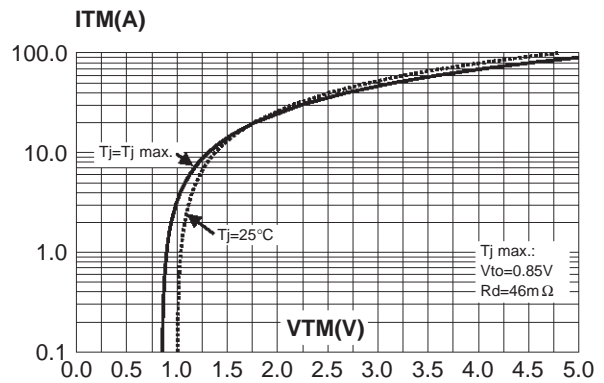


Fig. 9: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: $35\mu\text{m}$) (DPAK).

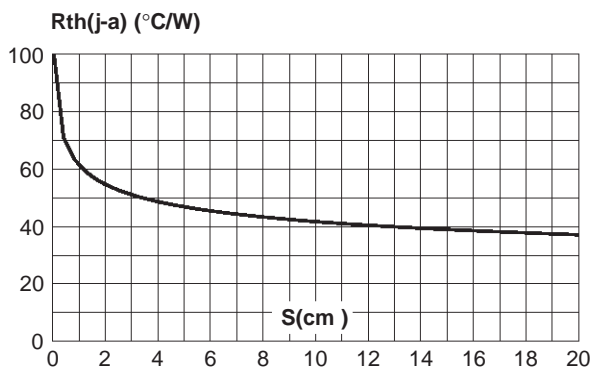
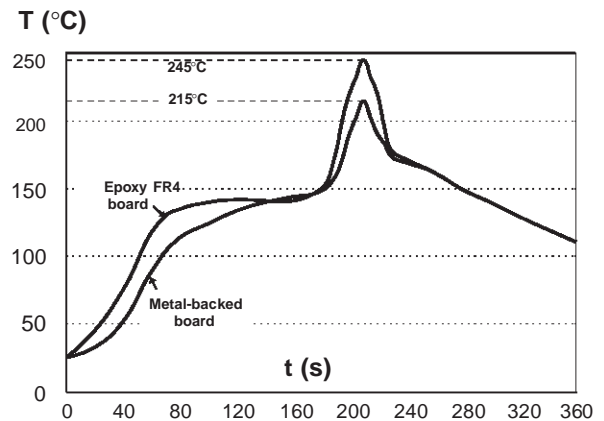
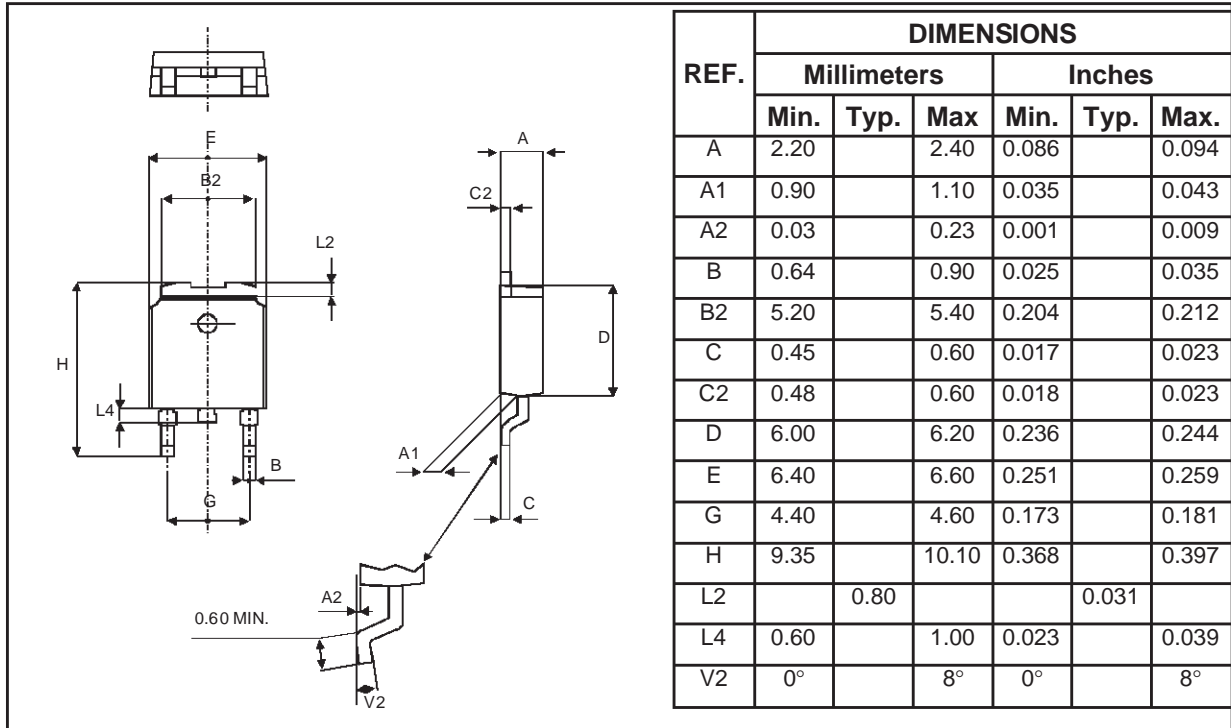


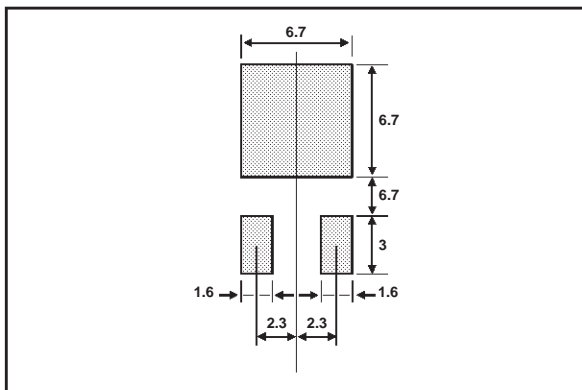
Fig. 10: Typical reflow soldering heat profile, either for mounting on FR4 or metal-backed boards.



PACKAGE MECHANICAL DATA
DPAK (Plastic)



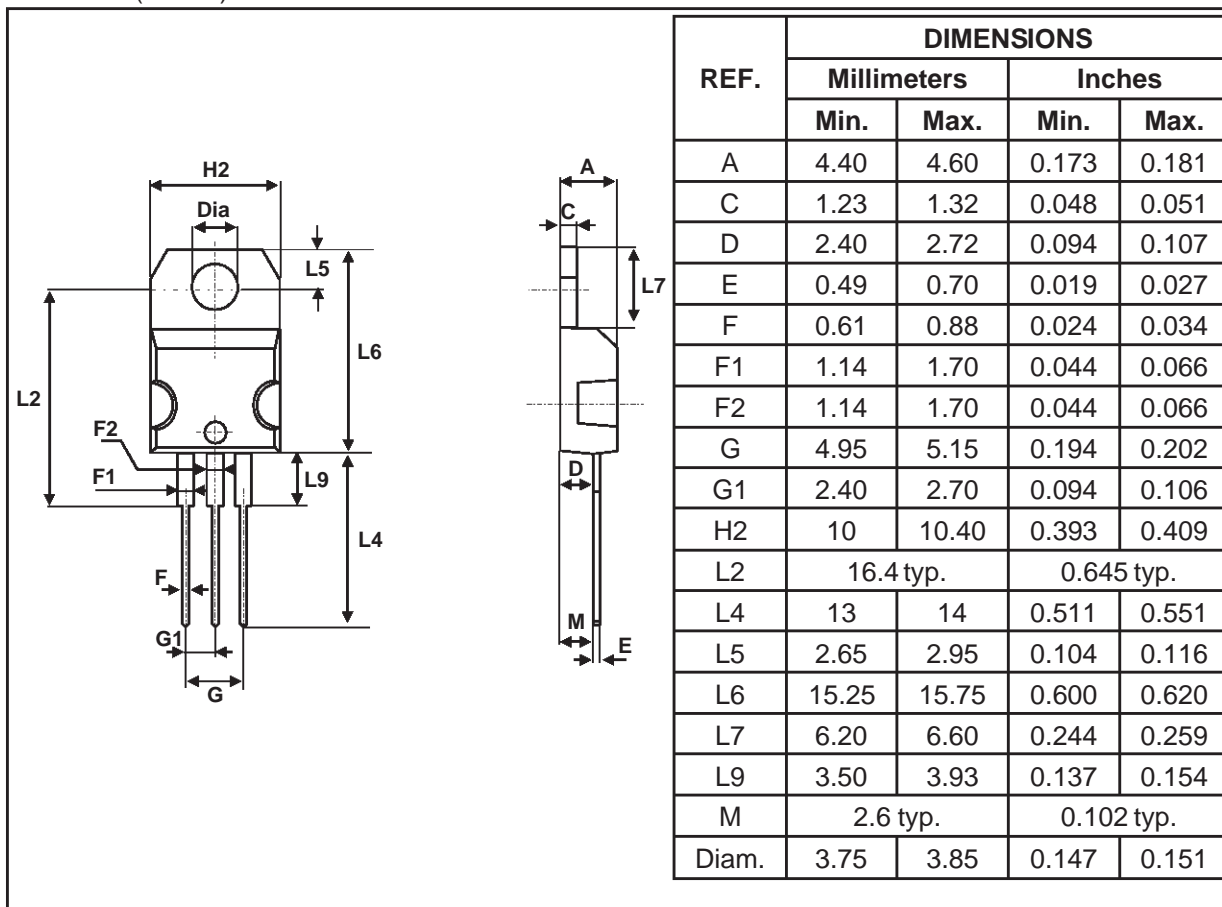
FOOT PRINT DIMENSIONS (in millimeters)



TS820-B/T

PACKAGE MECHANICAL DATA

TO-220AB(Plastic)



| Type | Marking | Package | Weight | Base qty | Delivery mode |
|---------|-----------|----------|--------|----------|---------------|
| TS820-B | TS820x00B | DPAK | 0.3 g. | 75 | Tube |
| | | | | 2500 | Tape and Reel |
| TS820-T | TS820x00T | TO-220AB | 2 g. | 50 | Tube |

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