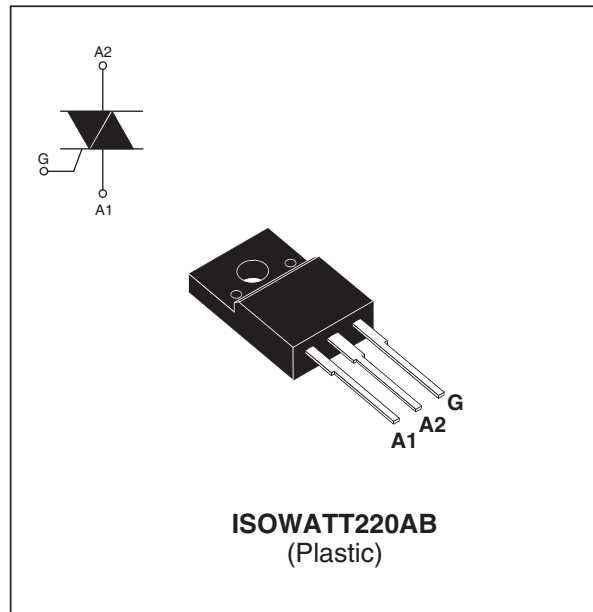


**MAIN FEATURES**

| Symbol            | Value       | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$      | 8           | A    |
| $V_{DRM}/V_{RRM}$ | 600 and 800 | V    |
| $I_{GT}$          | 20 to 30    | mA   |

**DESCRIPTION**

Based on ST' Snubberless technology providing high commutation performances, the T820-600W/800W are specially recommended for use on inductive loads, thanks to their high commutation performances, such as washing-machines drum motor controllers. They comply with UL standards (ref. E81734).



**ABSOLUTE RATINGS** (limiting values)

| Symbol             | Parameter  |            | Value                          | Unit                           |                        |
|--------------------|--|------------|--------------------------------|--------------------------------|------------------------|
| $I_{T(RMS)}$       | RMS on-state current (Full sine wave)  |            | $T_c = 100^\circ\text{C}$<br>8 | A                              |                        |
| $I_{TSM}$          | Non repetitive surge peak on-state current (Full cycle, $T_j$ initial = $25^\circ\text{C}$ ) | F = 50Hz   | t = 20ms                       | 100                            | A                      |
|                    |  | F = 60Hz   | t = 16.7ms                     | 105                            |                        |
| $I^2t$             | $I^2t$ Value for fusing  | tp = 10 ms |                                | 55                             | $\text{A}^2\text{s}$   |
| dI/dt              | Critical rate of rise of on-state current<br>$I_G = 2 \times I_{GT}$ , tr ≤ 100ns            | F = 120 Hz | $T_j = 125^\circ\text{C}$      | 50                             | $\text{A}/\mu\text{s}$ |
| $V_{DSM}/V_{RSM}$  | Non repetitive surge peak off-state voltage  | tp = 10ms  | $T_j = 25^\circ\text{C}$       | $V_{DRM}/V_{RRM} + 100$        | V                      |
| $I_{GM}$           | Peak gate current  | tp = 20μs  | $T_j = 125^\circ\text{C}$      | 4                              | A                      |
| $P_{G(AV)}$        | Average gate power dissipation   |            | $T_j = 125^\circ\text{C}$      | 1                              | W                      |
| $T_{stg}$<br>$T_j$ | Storage junction temperature range<br>Operating junction temperature range                   |            |                                | - 40 to + 150<br>- 40 to + 125 | $^\circ\text{C}$       |

## T820W / T830W

### ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C, unless otherwise specified)

| Symbol                              | Test Conditions   | Quadrant |      | T820 | T830 | Unit |
|-------------------------------------|---|----------|------|------|------|------|
| I <sub>GT</sub> <sup>(1)</sup>      | V <sub>D</sub> =12V R <sub>L</sub> =33Ω                                       | I-II-III | MAX. | 20   | 30   | mA   |
| V <sub>GT</sub>                     |   | I-II-III | MAX. | 1.3  |      | V    |
| V <sub>GD</sub>                     | V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ T <sub>j</sub> = 125°C | I-II-III | MIN. | 0.2  |      | V    |
| I <sub>H</sub> <sup>(2)</sup>       | I <sub>T</sub> = 250mA  |          | MAX. | 35   | 50   | mA   |
| I <sub>L</sub>                      | I <sub>G</sub> = 1.2I <sub>GT</sub>   | I - III  | MAX. | 50   | 70   | mA   |
|                                     |   | II       | MAX. | 60   | 80   | mA   |
| dV/dt <sup>(2)</sup>                | V <sub>D</sub> =67% V <sub>DRM</sub> Gate open T <sub>j</sub> = 125°C         |          | MIN. | 300  | 500  | V/μs |
| (di/dt) <sub>c</sub> <sup>(2)</sup> | Without snubber T <sub>j</sub> = 125°C  |          | MIN. | 4.5  | 5.5  | A/ms |

### STATIC CHARACTERISTICS

| Symbol                               | Test Conditions                              |   |      | Value  | Unit     |
|--------------------------------------|--|---|------|--------|----------|
| V <sub>TM</sub> <sup>(2)</sup>       | I <sub>TM</sub> = 11A t <sub>p</sub> = 380μs | T <sub>j</sub> = 25°C                           | MAX. | 1.4    | V        |
| V <sub>TO</sub> <sup>(2)</sup>       | Threshold voltage                            | T <sub>j</sub> = 125°C                          | MAX. | 0.85   | V        |
| R <sub>d</sub> <sup>(2)</sup>        | Dynamic resistance                           | T <sub>j</sub> = 125°C                          | MAX. | 40     | mΩ       |
| I <sub>DRM</sub><br>I <sub>RRM</sub> | V <sub>DRM</sub> = V <sub>RRM</sub>          | T <sub>j</sub> = 25°C<br>T <sub>j</sub> = 125°C | MAX  | 5<br>1 | μA<br>mA |

Note 1: Minimum IGT is guaranteed at 5% of IGT max.

Note 2: For both polarities of A2 referenced to A1.

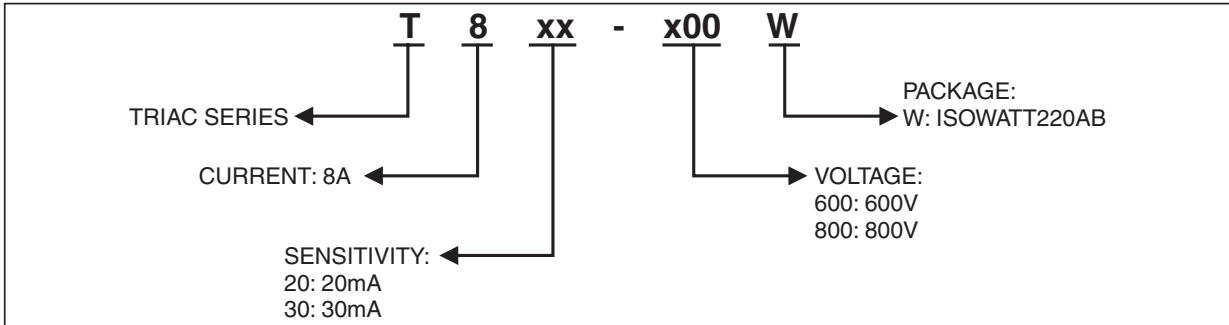
### THERMAL RESISTANCES

| Symbol               | Parameter             | Value | Unit |
|----------------------|-----------------------|-------|------|
| R <sub>th(j-a)</sub> | Junction to ambient   | 60    | °C/W |
| R <sub>th(j-c)</sub> | Junction to case (AC) | 3.1   | °C/W |

### PRODUCT SELECTOR

| Part Number | Voltage | Sensitivity | Type        | Package      |
|-------------|---------|-------------|-------------|--------------|
| T820-600W   | 600V    | 20 mA       | Snubberless | ISOWATT220AB |
| T820-800W   | 800V    | 20 mA       | Snubberless | ISOWATT220AB |
| T830-600W   | 600V    | 30 mA       | Snubberless | ISOWATT220AB |
| T830-800W   | 800V    | 30 mA       | Snubberless | ISOWATT220AB |

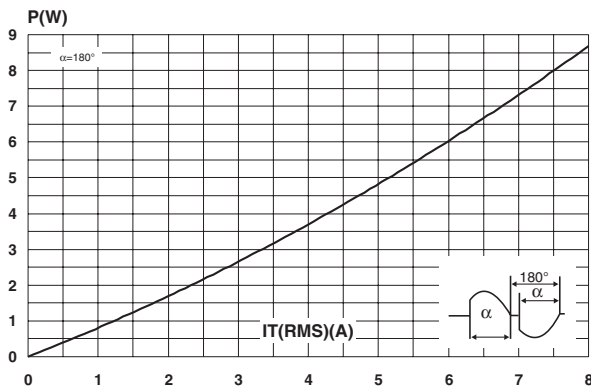
**ORDERING INFORMATION**



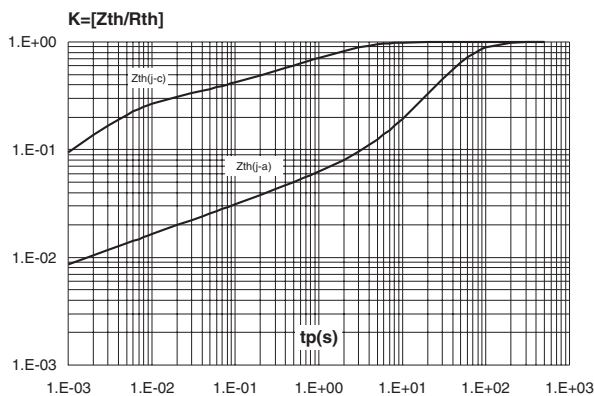
**OTHER INFORMATION**

| Part Number | Marking  | Weight | Base quantity | Packing mode |
|-------------|----------|--------|---------------|--------------|
| T820-600W   | T820600W | 2.3 g  | 50            | Tube         |
| T820-800W   | T820800W | 2.3 g  | 50            | Tube         |
| T830-600W   | T830600W | 2.3 g  | 50            | Tube         |
| T830-800W   | T830800W | 2.3 g  | 50            | Tube         |

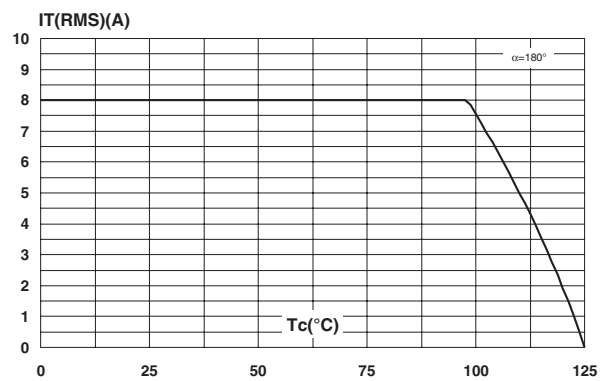
**Fig. 1:** Maximum power dissipation versus RMS on-state current.



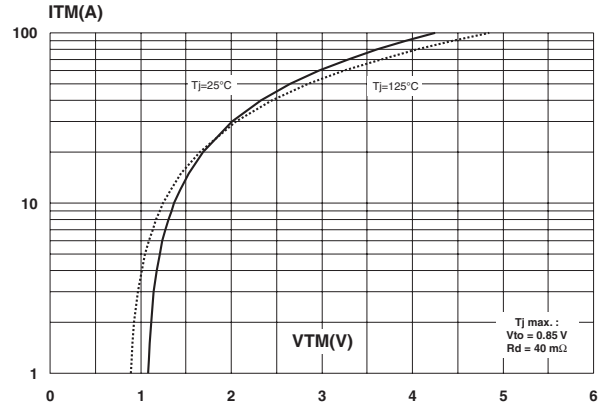
**Fig. 3:** Relative variation of thermal impedance versus pulse duration.



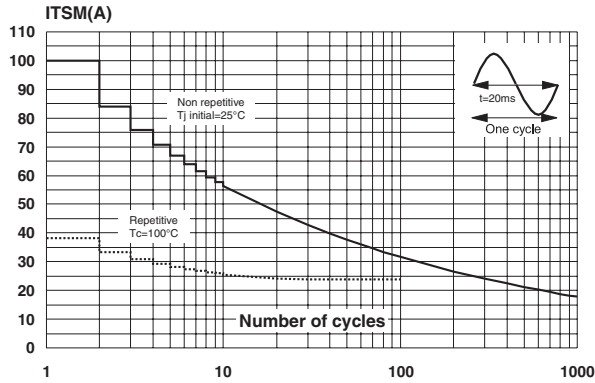
**Fig. 2:** RMS on-state current versus case temperature.



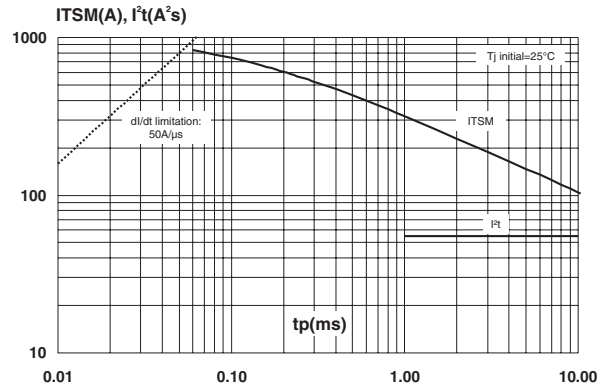
**Fig. 4:** On-state characteristics (maximum values).



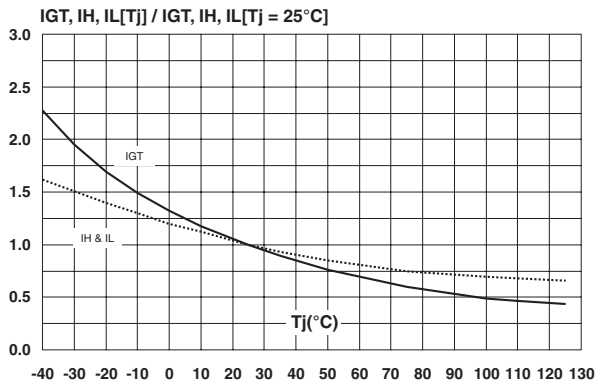
**Fig. 5:** Surge peak on-state current versus number of cycles.



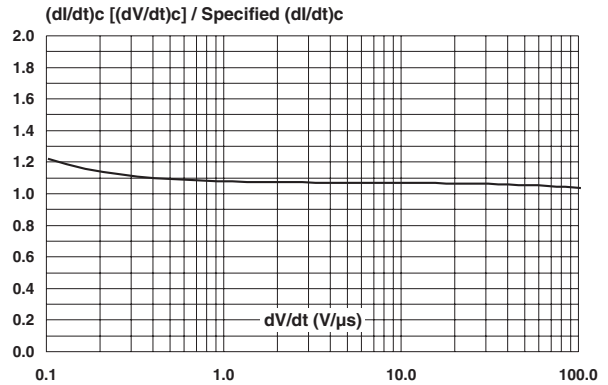
**Fig. 6:** Non repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$ .



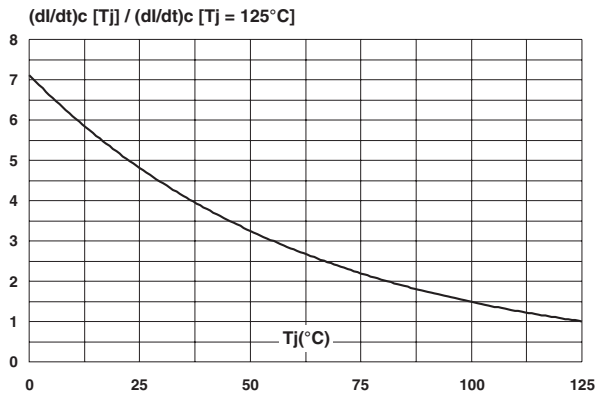
**Fig. 7:** Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).



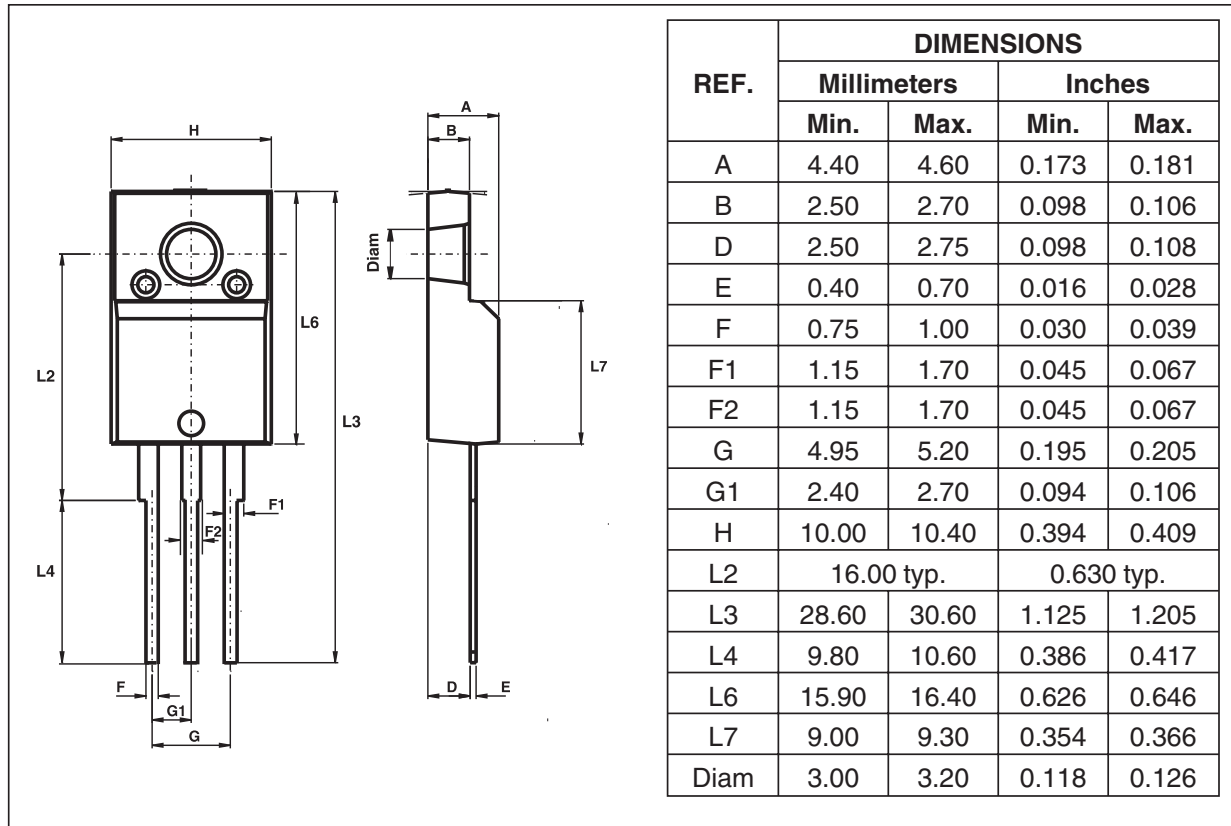
**Fig. 8:** Relative variation of critical rate of decrease of main current versus reapplied  $dV/dt$  (typical values).



**Fig. 9:** Relative variation of critical rate of decrease of main current versus junction temperature.



**PACKAGE MECHANICAL DATA**  
ISOWATT220AB



- Cooling method : C
- Recommended torque value : 0.55 m.N.
- Maximum torque value : 0.70 m.N.