

SNUBBERLESS TRIAC

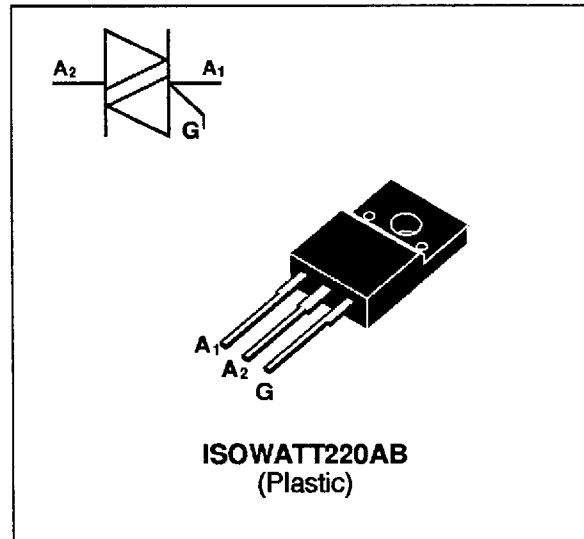
FEATURES

- $I_{T(RMS)} = 12\text{ A}$
- $V_{DRM} = V_{RRM} = 400\text{V to } 700\text{V}$
- EXCELLENT SWITCHING PERFORMANCES
- INSULATING VOLTAGE = $1500\text{V}_{(RMS)}$
- U.L. RECOGNIZED : E81734

DESCRIPTION

The T1220/1230W triacs use high performance glass passivated chip technology, housed in a fully molded plastic ISOWATT220AB package.

The SNUBBERLESS™ concept offers suppression of R-C network, and is suitable for applications such as phase control and static switch on inductive and resistive loads.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------------|---|--|--------------------------------|------------------------|
| $I_{T(RMS)}$ | RMS on-state current (360° conduction angle) | $T_c = 85\text{ °C}$ | 12 | A |
| I_{TSM} | Non repetitive surge peak on-state current (T_j initial = 25 °C) | $t_p = 16.7\text{ ms}$ (1 cycle, 60 Hz) | 132 | A |
| | | $t_p = 10\text{ ms}$ (1/2 cycle, 50 Hz) | 155 | |
| I^2t | I^2t Value (half-cycle, 50 Hz) | $t_p = 10\text{ ms}$ | 120 | A^2s |
| di/dt | Critical rate of rise of on-state current Gate supply : $I_G = 500\text{ mA}$ $dI_G/dt = 1\text{ A}/\mu\text{s}$. | Repetitive $F = 50\text{ Hz}$ | 20 | $\text{A}/\mu\text{s}$ |
| | | Non Repetitive | 100 | |
| T_{stg} T_j | Storage temperature range Operating junction temperature range | | - 40 to + 150 - 40 to + 125 | °C |
| T_l | Maximum lead temperature for soldering during 10s at 4.5 mm from case | | 260 | °C |

| Symbol | Parameter | T1220 / 1230-xxxW | | | Unit |
|------------------------|--|-------------------|-----|-----|------|
| | | 400 | 600 | 700 | |
| V_{DRM} V_{RRM} | Repetitive peak off-state voltage $T_j = 125\text{ °C}$ | 400 | 600 | 700 | V |

T1220W / 1230W

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|----------|--|-------|------|
| Rth(j-a) | Junction to ambient | 50 | °C/W |
| Rth(j-c) | Junction to case for A.C (360° conduction angle) | 2.8 | °C/W |

GATE CHARACTERISTICS (maximum values)

$P_{G(AV)} = 1 \text{ W}$ $P_{GM} = 10 \text{ W}$ ($t_p = 20 \mu\text{s}$) $I_{GM} = 4 \text{ A}$ ($t_p = 20 \mu\text{s}$)

ELECTRICAL CHARACTERISTICS

| Symbol | Test Conditions | Quadrant | | T1220 | T1230 | Unit | |
|------------------------|---|---------------------------|----------|-------|-------|------|------------------|
| I_{GT} | $V_D = 12\text{V (DC)}$ $R_L = 33\Omega$ | $T_j = 25^\circ\text{C}$ | I-II-III | MAX | 20 | 30 | mA |
| V_{GT} | $V_D = 12\text{V (DC)}$ $R_L = 33\Omega$ | $T_j = 25^\circ\text{C}$ | I-II-III | MAX | 1.5 | | V |
| V_{GD} | $V_D = V_{DRM}$ $R_L = 3.3\text{k}\Omega$ | $T_j = 125^\circ\text{C}$ | I-II-III | MIN | 0.2 | | V |
| t_{gt} | $V_D = V_{DRM}$ $I_G = 500\text{mA}$ $di_G/dt = 3\text{A}/\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | I-II-III | TYP | 2 | | μs |
| I_H^* | $I_T = 100\text{mA}$ Gate open | $T_j = 25^\circ\text{C}$ | | MAX | 35 | 50 | |
| V_{TM}^* | $I_{TM} = 17\text{A}$ $t_p = 380\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | | MAX | 1.5 | | V |
| I_{DRM} I_{RRM} | VDRM rated VRRM rated | $T_j = 25^\circ\text{C}$ | | MAX | 10 | | μA |
| | | $T_j = 125^\circ\text{C}$ | | MAX | 2 | | mA |
| dV/dt^* | Linear slope up to $V_D = 67\%V_{DRM}$ Gate open | $T_j = 125^\circ\text{C}$ | | MIN | 200 | 300 | V/ μs |
| $(dV/dt)_c^*$ | $(di/dt)_c = 6.5 \text{ A/ms}$ (see note) | $T_j = 125^\circ\text{C}$ | | MIN | 10 | 20 | V/ μs |

* For either polarity of electrode A2 voltage with reference to electrode A1.

Note : In usual applications where $(di/dt)_c$ is below 6.5 A/ms, the $(dV/dt)_c$ is always lower than 10V/ μs , and, therefore, it is unnecessary to use a snubber R-C network across T1220W/ T1230W triacs.

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

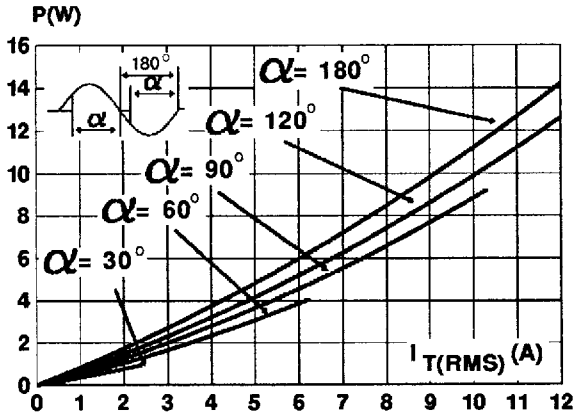


Fig.3 : RMS on-state current versus case temperature.

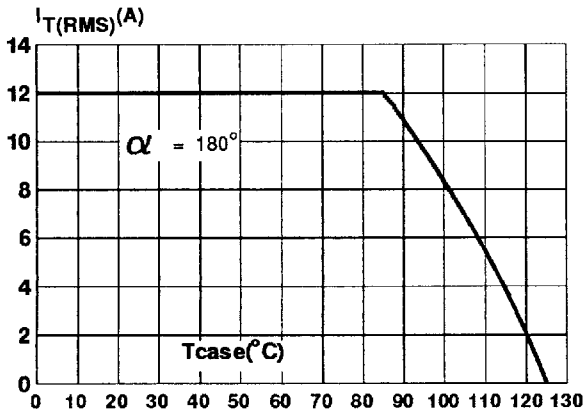


Fig.5 : Relative variation of gate trigger current and holding current versus junction temperature.

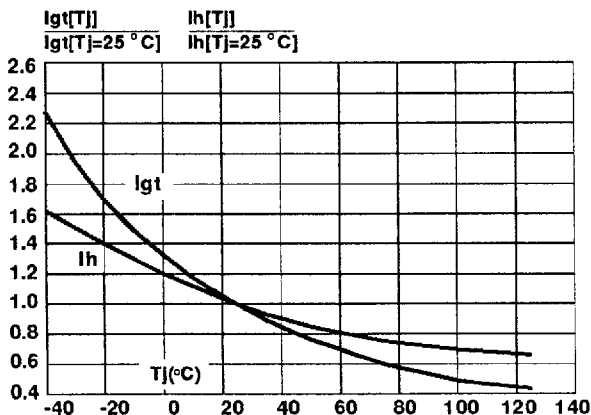


Fig.2 : Correlation between maximum power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.

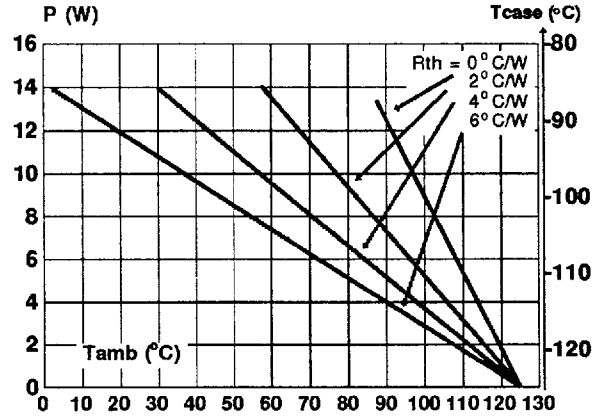


Fig.4 : Thermal transient impedance junction to case and junction to ambient versus pulse duration.

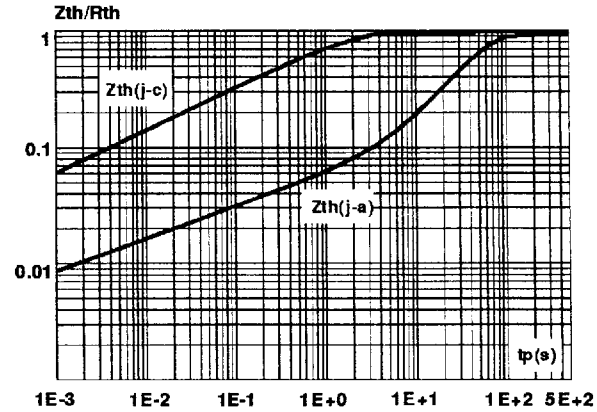
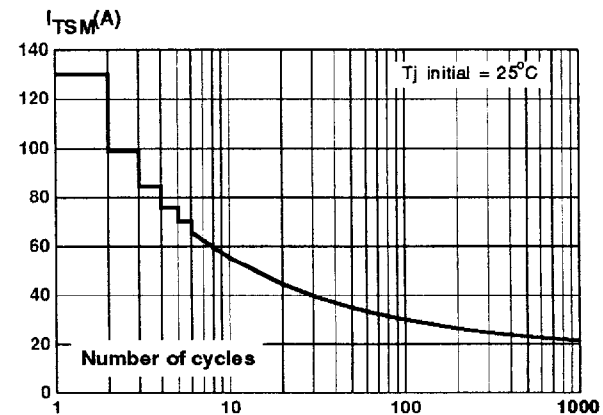


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.



T1220W / 1230W

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

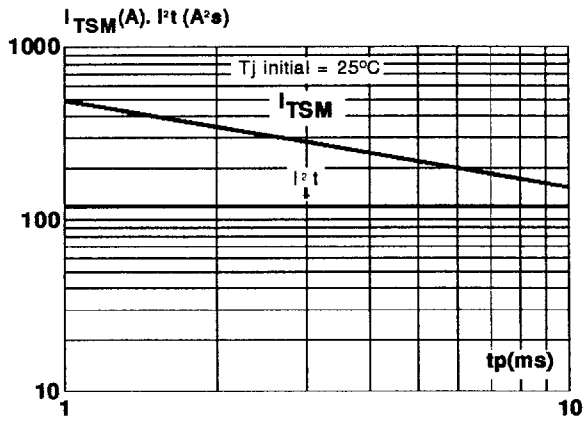
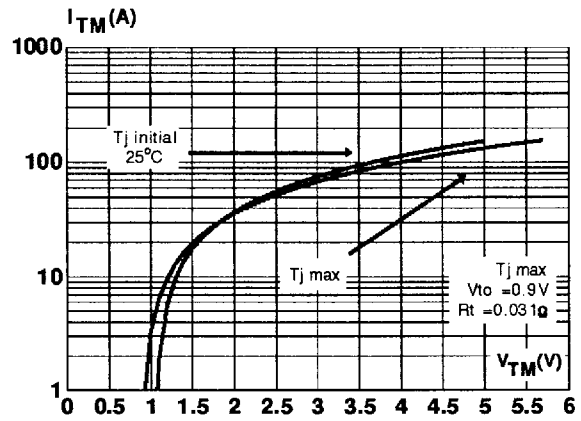
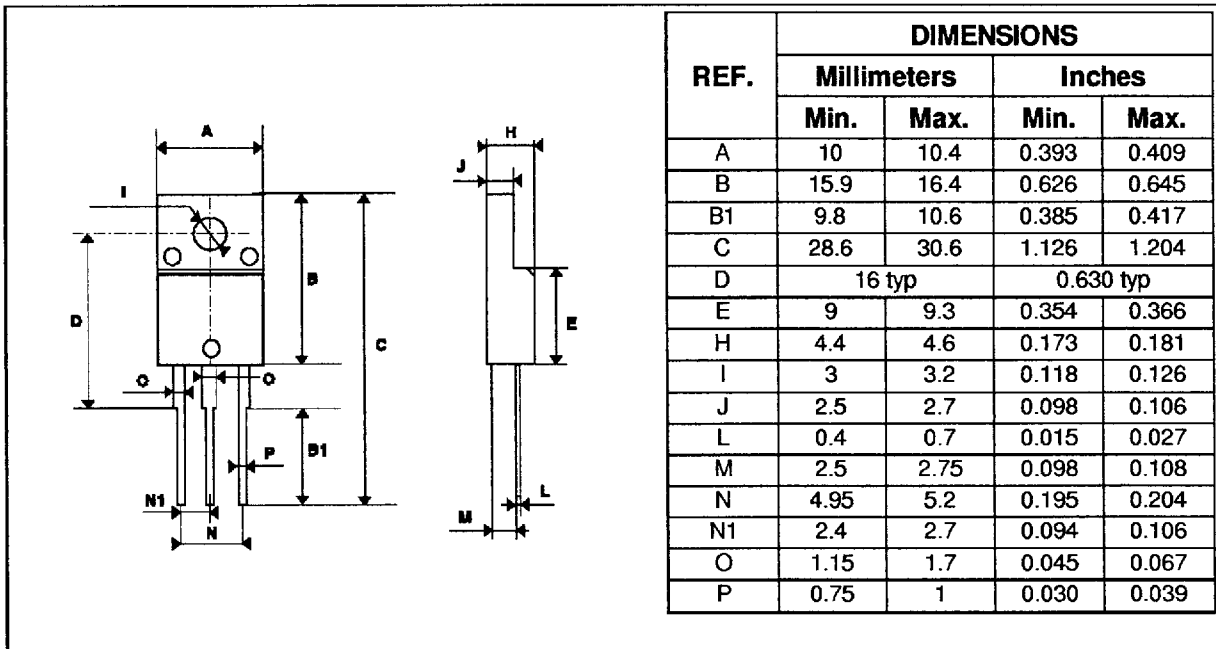


Fig.8 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA
ISOWATT220AB


Cooling method : C

Marking : Type number

Weight : 2.1g

Recommended torque value : 0.55 m.N.

Maximum torque value : 0.70 m.N.

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