

**SNUBBERLESS TRIAC**

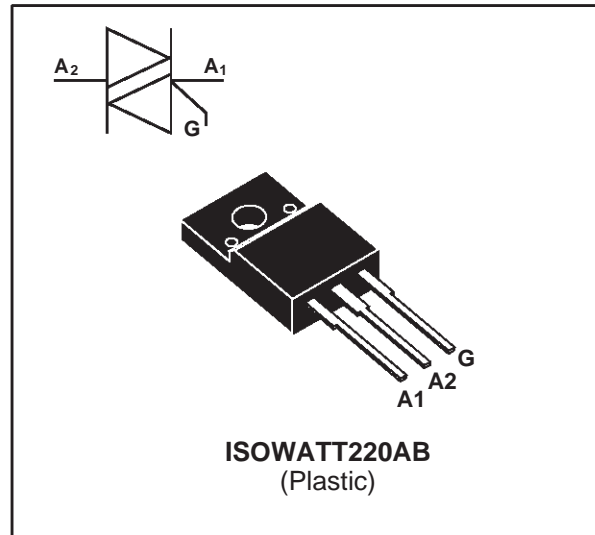
**FEATURES**

- $I_{T(RMS)} = 10\text{ A}$
- $V_{DRM} = V_{RRM} = 600\text{V}$
- EXCELLENT SWITCHING PERFORMANCES
- INSULATING VOLTAGE =  $1500\text{V}_{(RMS)}$
- U.L. RECOGNIZED : E81734

**DESCRIPTION**

The T1020-600W and 1030-600W 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)	$T_c = 90^\circ\text{C}$	10	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25^\circ\text{C}$ )	$t_p = 16.7\text{ ms}$ (1 cycle, 60 Hz)	110	A
		$t_p = 10\text{ ms}$ (1/2 cycle, 50 Hz)	125	
$I^2t$	$I^2t$ Value (half-cycle, 50 Hz)	$t_p = 10\text{ ms}$	78	$\text{A}^2\text{s}$
$di/dt$	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	$^\circ\text{C}$

Symbol	Parameter	Value	Unit
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125^\circ\text{C}$	600	V

**T1020-600W / 1030-600W****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)	3.0	°C/W

**GATE CHARACTERISTICS** (maximum values)

$P_{G(AV)} = 100 \text{ mW}$   $P_{GM} = 2 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )  $I_{GM} = 1 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )

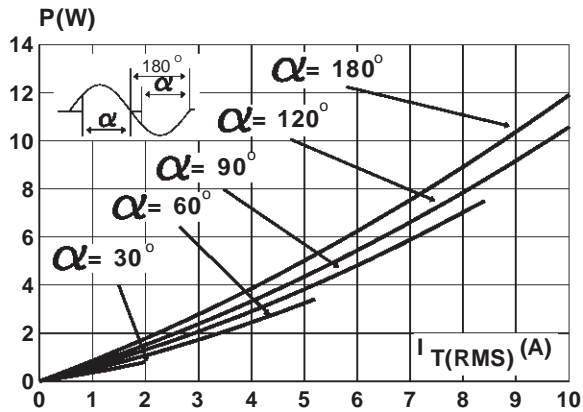
**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions	Quadrant		T1020	T1030	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	
tgt	$V_D = V_{DRM}$ $I_G = 500\text{mA}$ $di_G/dt = 3\text{A}/\mu\text{s}$ $T_j = 25^\circ\text{C}$	I-II-III	TYP	2		$\mu\text{s}$	
$I_H^*$	$I_T = 100\text{mA}$ Gate open $T_j = 25^\circ\text{C}$		MAX	35	50		
$V_{TM}^*$	$I_{TM} = 14\text{A}$ $t_p = 380\mu\text{s}$ $T_j = 25^\circ\text{C}$		MAX	1.5		V	
$I_{DRM}$ $I_{RRM}$	$V_{DRM}$ rated $V_{RRM}$ rated		$T_j = 25^\circ\text{C}$	MAX		10	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$	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/ $\mu\text{s}$	
(dV/dt)c *	(di/dt)c = 5.3 A/ms (see note) $T_j = 125^\circ\text{C}$		MIN	10	20	V/ $\mu\text{s}$	

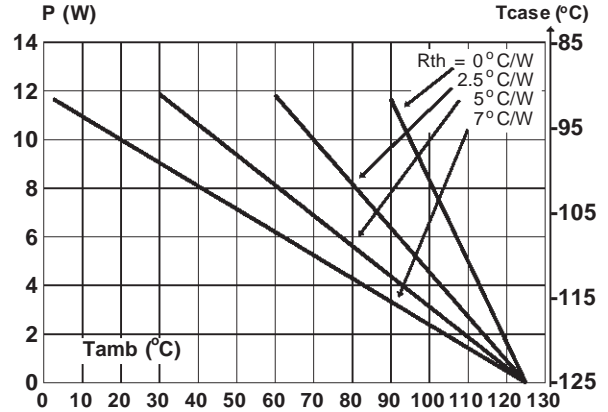
\* For either polarity of electrode A2 voltage with reference to electrode A1.

**Note** : In usual applications where (di/dt)c is below 5.3 A/ms, the (dV/dt)c is always lower than 10V/ $\mu\text{s}$ , and, therefore, it is **unnecessary** to use a snubber R-C network across T1020W / T1030W triacs.

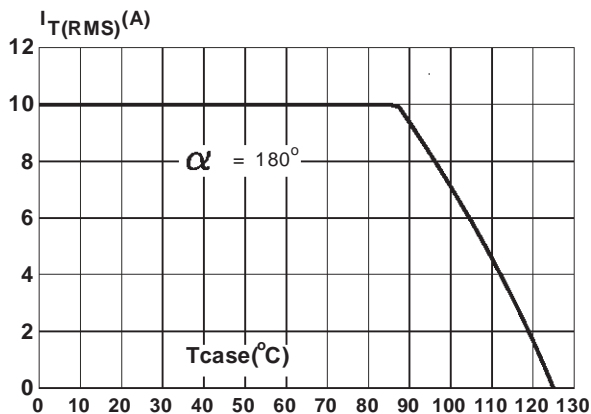
**Fig.1** : Maximum power dissipation versus RMS on-state current.



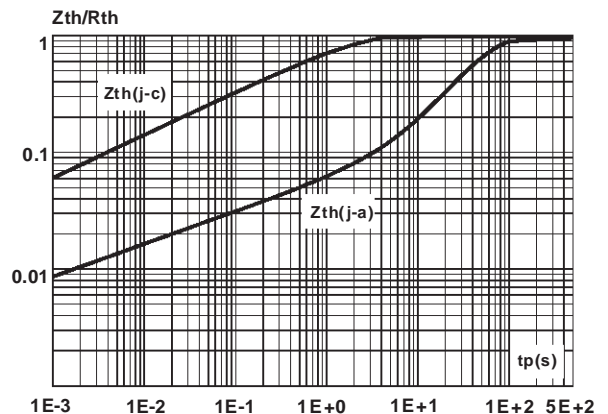
**Fig.2** : Correlation between maximum power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.



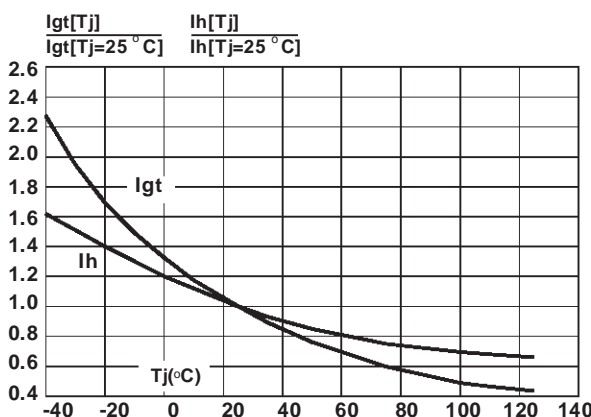
**Fig.3** : RMS on-state current versus case temperature.



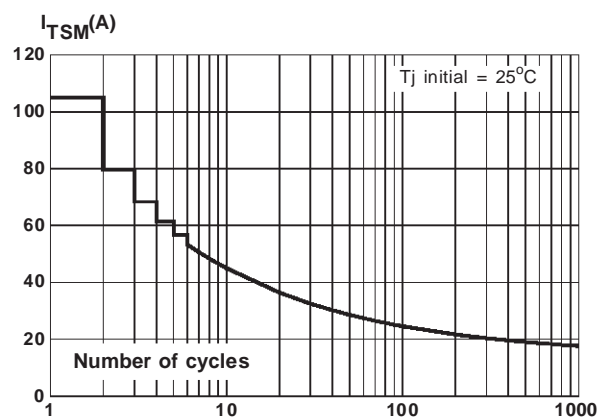
**Fig.4** : Thermal transient impedance junction to case and junction to ambient versus pulse duration.



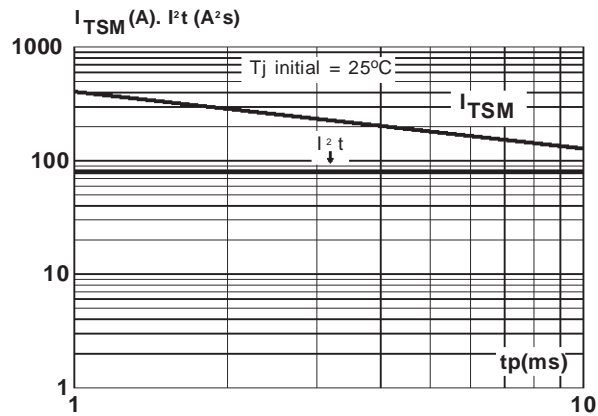
**Fig.5** : Relative variation of gate trigger current and holding current versus junction temperature.



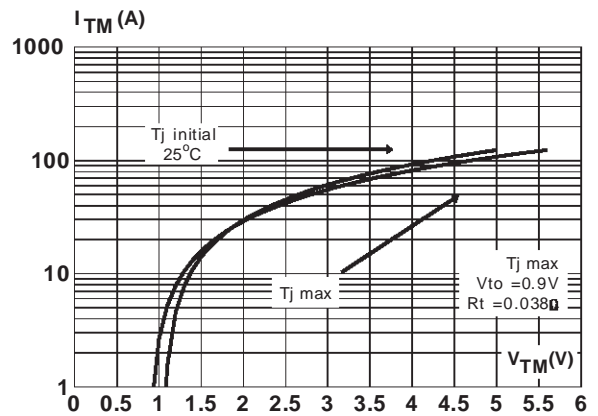
**Fig.6** : Non repetitive surge peak on-state current versus number of cycles.



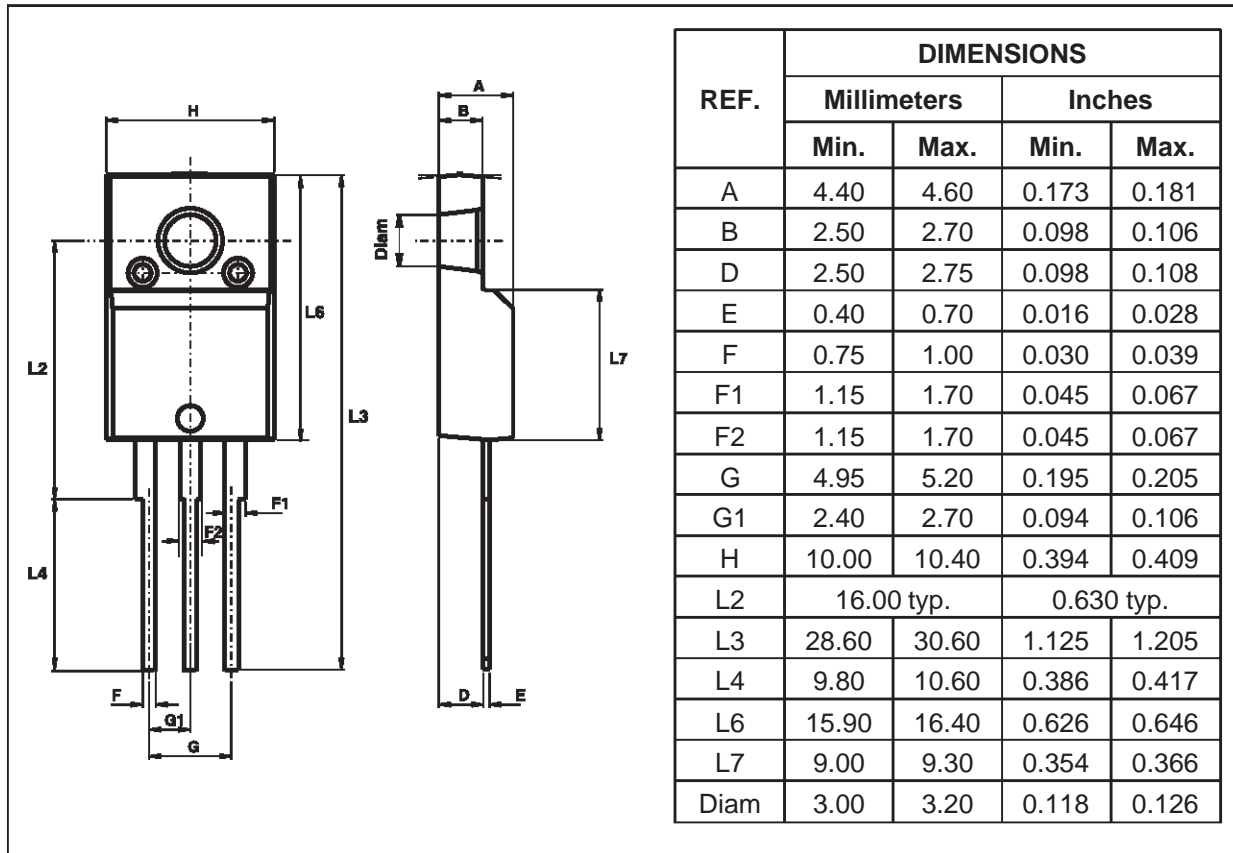
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p @ 10ms$ , and corresponding value of  $I^2t$ .



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



**PACKAGE MECHANICAL DATA**  
ISOWATT220AB



- Cooling method: C
- Marking: Type number
- Weight: 2.1 g
- Recommended torque value: 0.55 m.N.
- Maximum torque value: 0.70 m.N.

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