

## SNUBBERLESS TRIAC

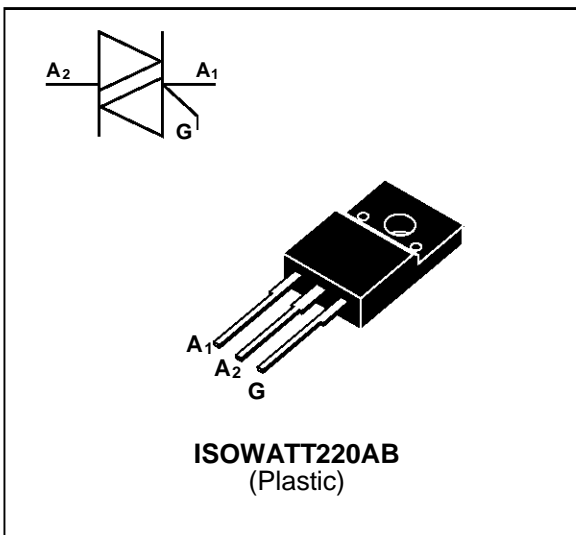
### FEATURES

- $I_{T(RMS)} = 12\text{ A}$
- $V_{DRM} = V_{RRM} = 400\text{V to } 700\text{V}$
- EXCELLENT SWITCHING PERFORMANCES
- INSULATING VOLTAGE =  $1500V_{(RMS)}$
- 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 = $25\text{ °C}$ )	$t_p = 16.7\text{ ms}$ (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 : $I_G = 500\text{ mA}$ $di_G/dt = 1\text{ A}/\mu s$ .	Repetitive $F = 50\text{ Hz}$	20	$A/\mu s$
		Non Repetitive	100	
$T_{stg}$ $T_j$	Storage temperature range Operating junction temperature range		- 40 to + 150 - 40 to + 125	$^{\circ}\text{C}$
TI	Maximum lead temperature for soldering during 10s at 4.5 mm from case		260	$^{\circ}\text{C}$

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)

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

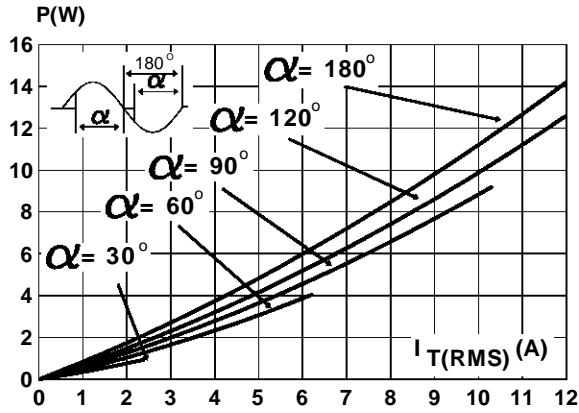
### ELECTRICAL CHARACTERISTICS

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
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	
$V_{TM}^*$	$I_{TM} = 17\text{A}$ $t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$		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	$\text{V}/\mu\text{s}$
$(dV/dt)_c^*$	$(di/dt)_c = 6.5\text{ A/ms}$ (see note)	$T_j = 125^\circ\text{C}$		MIN	10	20	$\text{V}/\mu\text{s}$

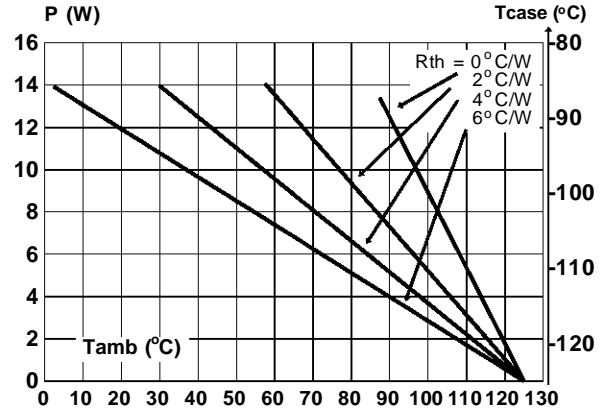
\* For either polarity of electrode A2 voltage with reference to electrode A1.

**Note** : In usual applications where  $(di/dt)_c$  is below 6.5 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 T1220W / T1230W triacs.

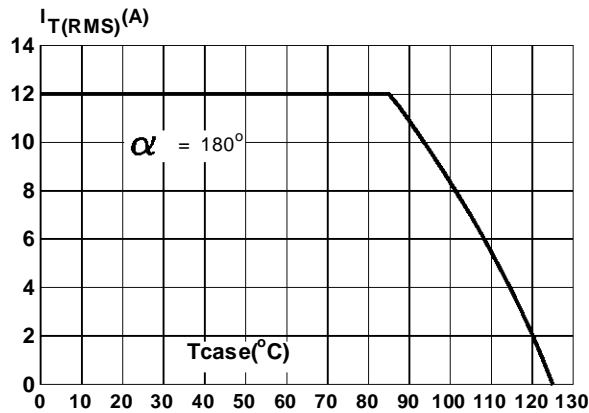
**Fig.1 :** Maximum power dissipation versus RMS on-state current.



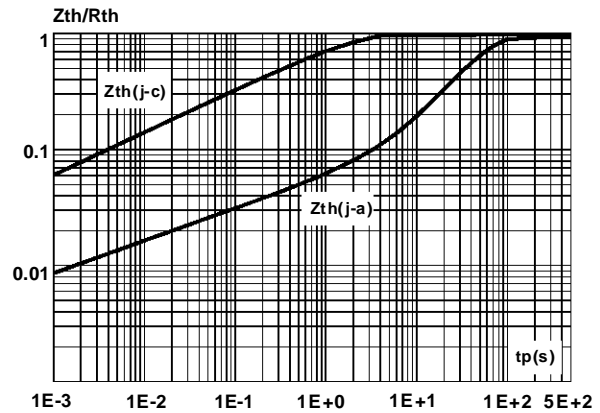
**Fig.2 :** Correlation between maximum power dissipation and maximum allowable temperature (Tamb and Tcase) for different thermal resistances heatsink + contact.



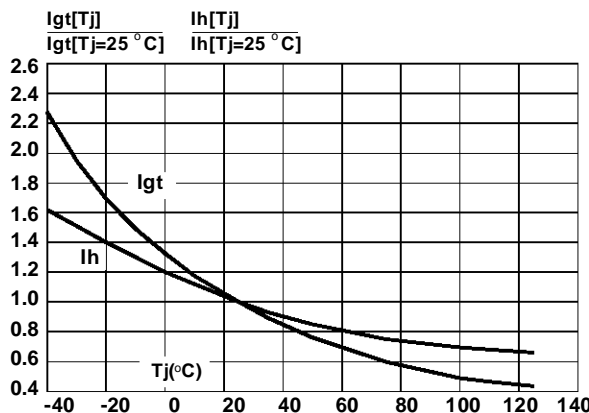
**Fig.3 :** RMS on-state current versus case temperature.



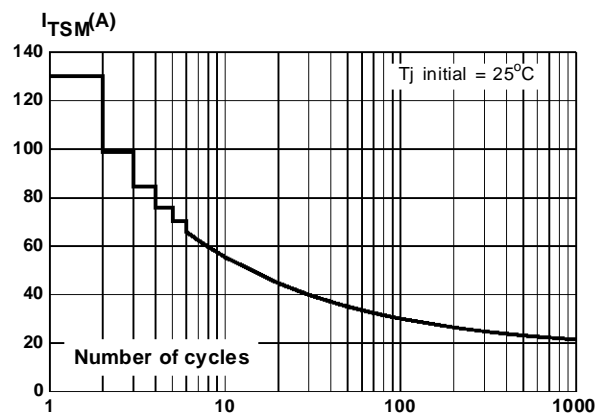
**Fig.4 :** Thermal transient impedance junction to case and junction to ambient versus pulse duration.



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

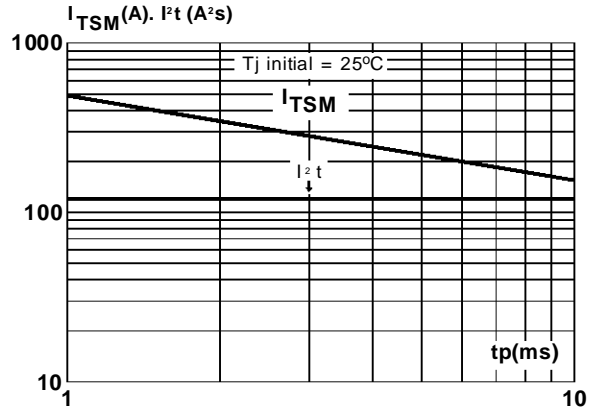


**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

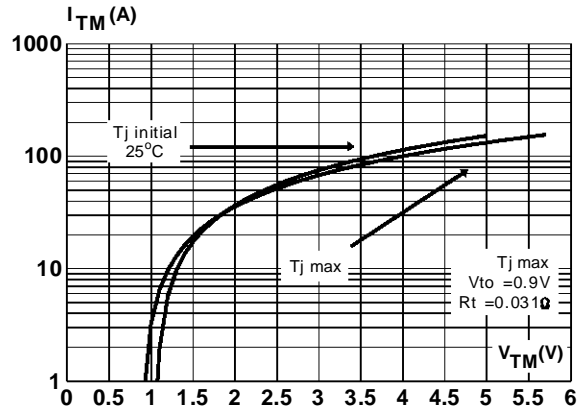


## T1220W / 1230W

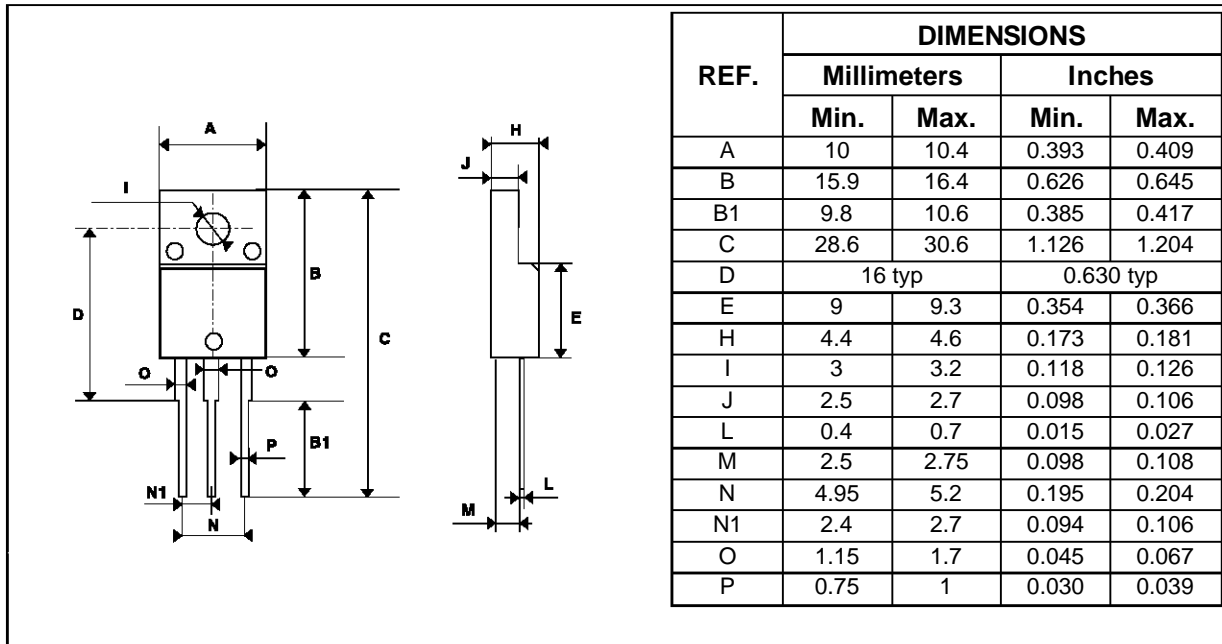
**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**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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