

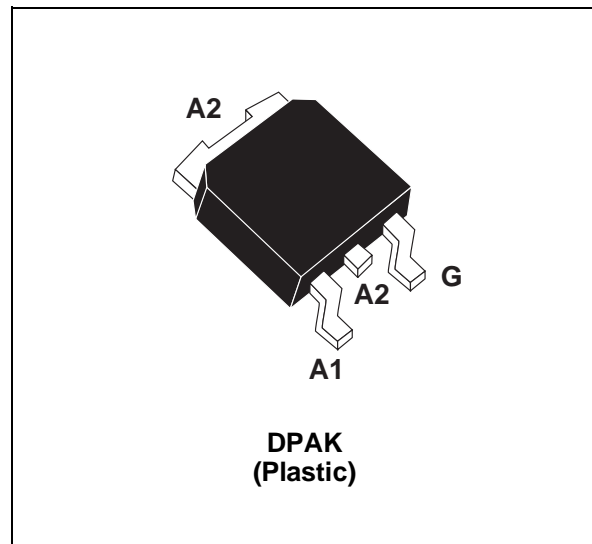
## HIGH PERFORMANCE TRIACS

### FEATURES

$I_{T(RMS)} = 4\text{ A}$   
 $V_{DRM} = 400\text{ V to }600\text{ V}$   
 SENSITIVE GATE :  $I_{GT} \leq 5\text{ mA}$   
 LOGIC LEVEL  
 HIGH NOISE IMMUNITY

### DESCRIPTION

The T405-B triac is using a high performance TOP-GLASS PNP technology. This device is intended for AC control applications using surface mount technology. The high commutation performances combined with high sensitivity make this triac perfect for direct drive from microprocessors in all applications like appliances, power tools, small motor drives etc...



### ABSOLUT MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$I_{T(RMS)}$	RMS on-state current (360° conduction angle)	$T_c = 95\text{ °C}$ 4	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25°C )	$t_p = 8.3\text{ ms}$	35
		$t_p = 10\text{ ms}$	30
$I^2t$	$I^2t$ value for fusing	$t_p = 10\text{ ms}$ 4.5	A <sup>2</sup> s
di/dt	Critical rate of rise of on-state current $I_G = 50\text{ mA}$ $di_G/dt = 0.1\text{ A}/\mu\text{s}$	Repetitive $F = 50\text{ Hz}$	10
		Non Repetitive	50
$T_{stg}$ $T_j$	Storage temperature range Operating junction temperature range	- 40 to + 150 - 40 to + 110	°C °C
$T_l$	Maximum lead temperature for soldering during 10 s	260	°C

Symbol	Parameter	T405-		Unit
		400B	600B	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 110\text{ °C}$	400	600	V

## T405-B

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
Rth (j-c)	Junction to case for DC	3.5	°C/W
Rth (j-c)	Junction to case for AC 360° conduction angle (F= 50 Hz)	2.6	°C/W

### GATE CHARACTERISTICS (maximum values)

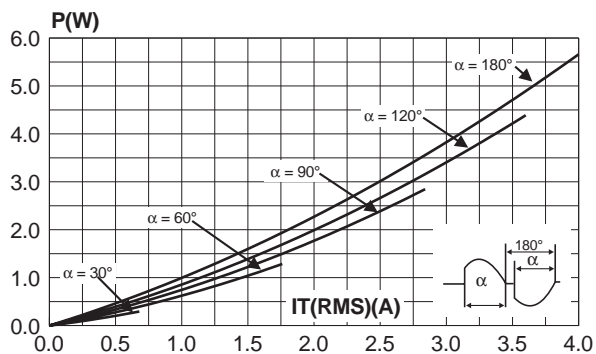
$P_{G(AV)} = 1 \text{ W}$     $P_{GM} = 10 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )    $I_{GM} = 4 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )    $V_{GM} = 16 \text{ V}$  ( $t_p = 20 \mu\text{s}$ ).

### ELECTRICAL CHARACTERISTICS

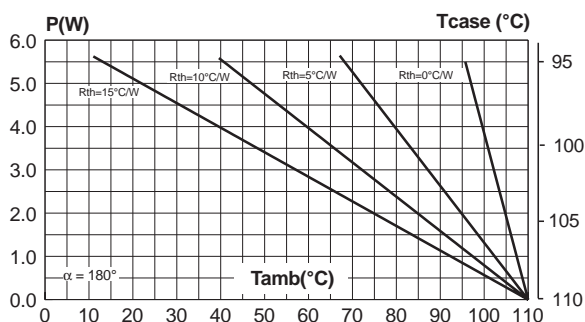
Symbol	Test Conditions		Quadrant		Value	Unit
$I_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	5	mA
$V_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	1.5	V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3\text{k}\Omega$	$T_j=110^\circ\text{C}$	I-II-III	MIN	0.2	V
tgt	$V_D=V_{DRM}$ $I_G = 40\text{mA}$ $dI_G/dt = 0.5\text{A}/\mu\text{s}$ $I_{TM} = 5.5\text{A}$	$T_j=25^\circ\text{C}$	I-II-III	TYP	2	$\mu\text{s}$
$I_L$	$I_G=1.2 I_{GT}$	$T_j=25^\circ\text{C}$	I-II-III	MAX	15	mA
$I_H$ *	$I_T= 100\text{mA}$ gate open	$T_j=25^\circ\text{C}$		MAX	10	mA
$V_{TM}$ *	$I_{TM}= 5.5\text{A}$ $t_p= 380\mu\text{s}$	$T_j=25^\circ\text{C}$		MAX	1.75	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}$ Rated $V_{RRM}$ Rated	$T_j=25^\circ\text{C}$		MAX	10	$\mu\text{A}$
		$T_j=110^\circ\text{C}$		MAX	2	mA
$dV/dt$ *	Linear slope up to $V_D=67\%V_{DRM}$ gate open	$T_j=110^\circ\text{C}$		MIN	5	V/ $\mu\text{s}$
				TYP	20	
$(dI/dt)_c$ *	$(dV/dt)_c = 0.1\text{V}/\mu\text{s}$	$T_j=110^\circ\text{C}$		MIN	1.8	A/ms

\* For either polarity of electrode A<sub>2</sub> voltage with reference enceenceto electrode A<sub>1</sub>.

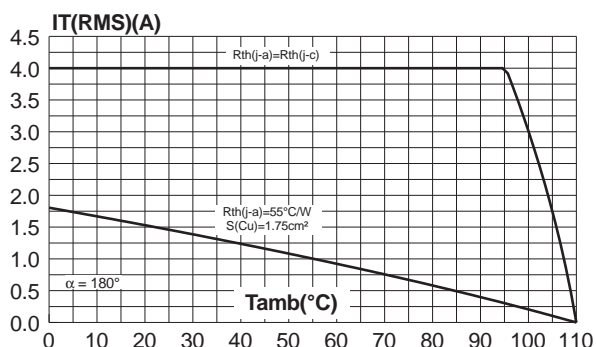
**Fig. 1:** Maximum power dissipation versus rms on-state current.



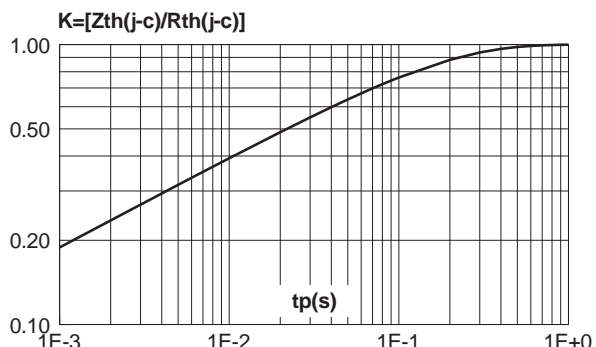
**Fig. 2:** Correlation between maximum power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink+contact.



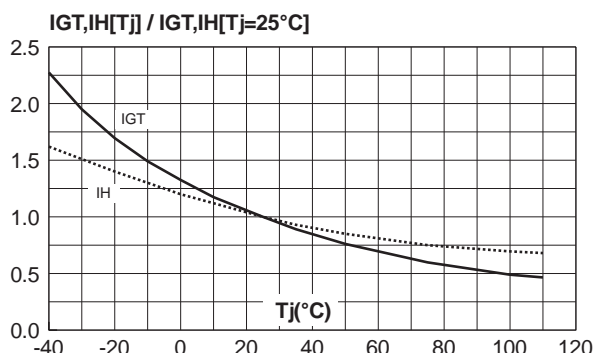
**Fig. 3:** RMS on-state current versus ambient temperature.



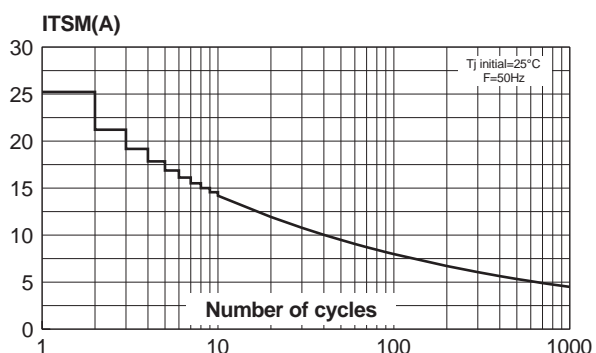
**Fig. 4:** Relative variation of thermal impedance junction to case versus pulse duration.



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

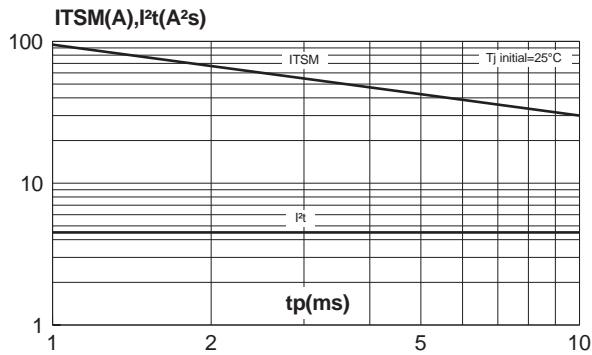


**Fig. 6:** Non repetitive surge peak on-state current versus number of cycles.

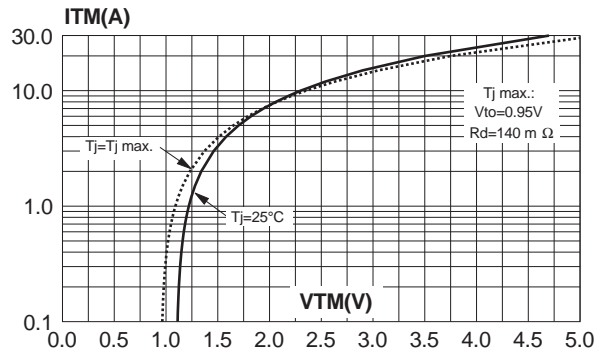


## T405-B

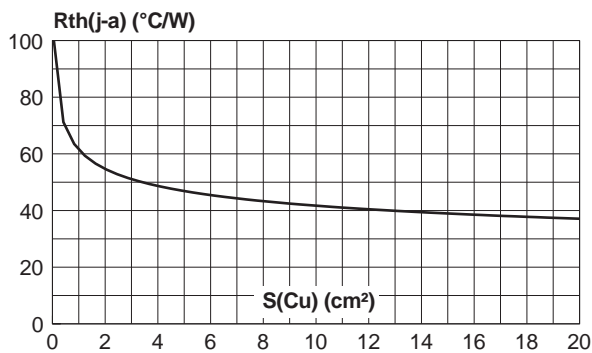
**Fig. 7:** Non repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I_2t$ .



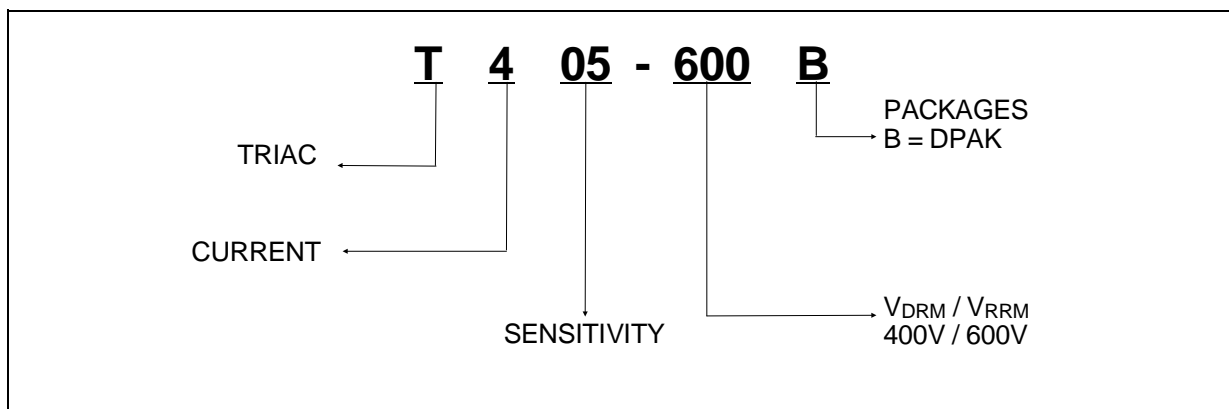
**Fig. 8:** On-state characteristics (maximum values).



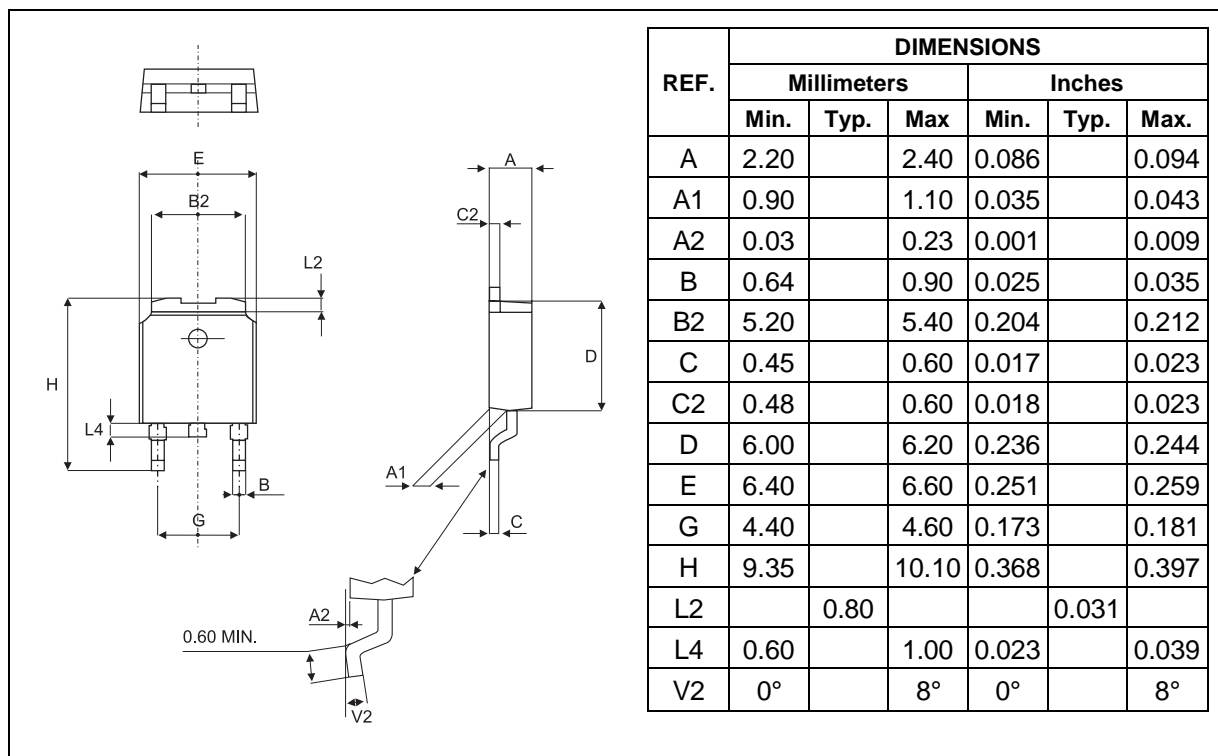
**Fig. 9:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness:  $35\mu\text{m}$ ).



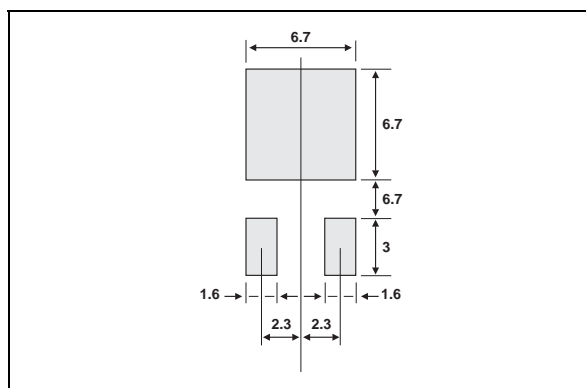
## ORDERING INFORMATION



**PACKAGE MECHANICAL DATA**  
DPAK Plastic



**FOOT PRINT DIMENSIONS (in millimeters)**



**MARKING**

TYPE	MARKING
T405-400B	T4 0540
T405-600B	T4 0560

**WEIGHT : 0.30g**

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