



# T405Q-600B-TR & T405Q-600H

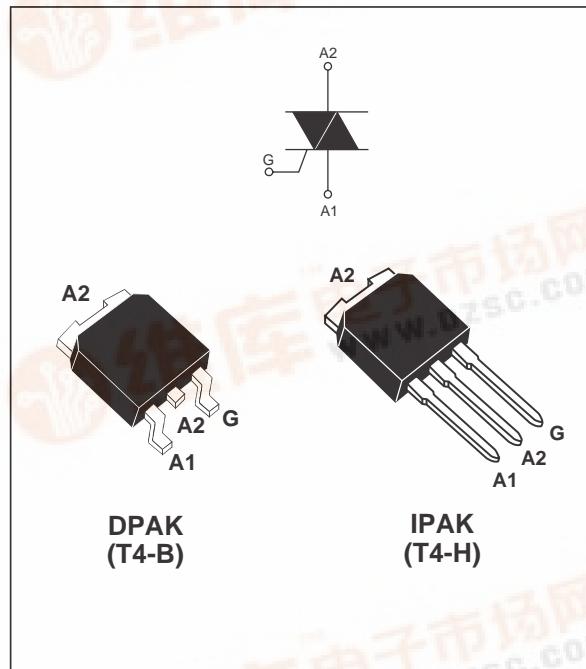
Sensitive 4Q 4A TRIAC

## MAIN FEATURES

Symbol	Value	Unit
I <sub>T(RMS)</sub>	4	A
V <sub>DRM/V<sub>RRM</sub></sub>	600	V
I <sub>GT</sub>	5	mA

## DESCRIPTION

The T405Q-600B-TR and the T405Q-600H 4 quadrants sensitive TRIACs are intended in general purpose applications where high surge current capability is required, such as irrigation systems. These TRIACs feature a gate current capability sensitivities of 5mA.



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
I <sub>T(RMS)</sub>	RMS on-state current (Full sine wave)	DPAK / IPAK	T <sub>c</sub> = 110°C
I <sub>TSM</sub>	Non repetitive surge peak on-state current (Full cycle, T <sub>j</sub> initial = 25°C )	F = 50Hz	t = 20ms
		F = 60Hz	t = 16.7ms
I <sup>2</sup> t	I <sup>2</sup> t Value for fusing	tp = 10 ms	A <sup>2</sup> s
dl/dt	Critical rate of rise of on-state current I <sub>G</sub> = 2 x I <sub>GT</sub> , tr ≤ 100ns	Repetitive F = 100 Hz	A/μs
I <sub>GM</sub>	Peak gate current	tp = 20μs	T <sub>j</sub> = 125°C
P <sub>G(AV)</sub>	Average gate power dissipation	T <sub>j</sub> = 125°C	W
T <sub>stg</sub> T <sub>j</sub>	Storage junction temperature range Operating junction temperature range	- 40 to + 150 - 40 to + 125	°C

## T405Q-600B-TR & T405Q-600H

**ELECTRICAL CHARACTERISTICS** ( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	Quadrant		T405Q	Unit
$I_{GT}^{(1)}$	$V_D=12\text{V}$ $R_L=30\Omega$	I-II-III IV	MAX.	5 10	mA
$V_{GT}$		ALL	MAX.	1.3	V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3\text{k}\Omega$ $T_j = 125^\circ\text{C}$	ALL	MIN.	0.2	V
$I_H^{(2)}$	$I_T= 100\text{mA}$		MAX.	10	mA
$I_L$	$I_G = 1.2I_{GT}$	I - III - IV II	MAX.	10 15	mA
$dV/dt^{(2)}$	$V_D=67\% V_{DRM}$ Gate open $T_j = 125^\circ\text{C}$		MIN.	10	V/ $\mu\text{s}$
$(dV/dt)c^{(2)}$	$(dI/dt)c = 1.8 \text{ A/ms}$ $T_j = 125^\circ\text{C}$		MIN.	2	V/ $\mu\text{s}$

## STATIC CHARACTERISTICS

Symbol	Test Conditions			Value	Unit	
$V_{TM}^{(2)}$	$I_{TM} = 5 \text{ A}$	$t_p = 380\mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.5	V
$V_{TO}^{(2)}$	Threshold voltage		$T_j = 125^\circ\text{C}$	MAX.	0.85	V
$R_d^{(2)}$	Dynamic resistance		$T_j = 125^\circ\text{C}$	MAX.	100	$\text{m}\Omega$
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	MAX	5 1	$\mu\text{A}$ mA

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

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

## THERMAL RESISTANCES

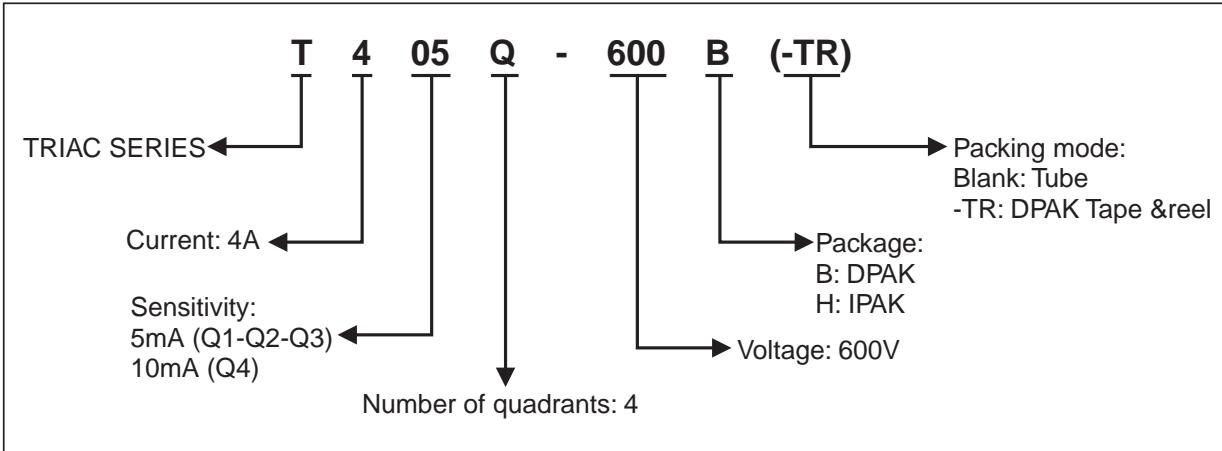
Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case (AC)			3	$^\circ\text{C/W}$
$R_{th(j-a)}$	Junction to ambient	$S = 0.5 \text{ cm}^2$	DPAK	70	$^\circ\text{C/W}$
			IPAK	100	

## PRODUCT SELECTOR

Part Number	Voltage	Sensitivity	Type	Package
T405Q-600B-TR	600V	5 mA	Sensitive	DPAK
T405Q-600H	600V	5 mA	Sensitive	IPAK

## **T405Q-600B-TR & T405Q-600H**

### **ORDERING INFORMATION**

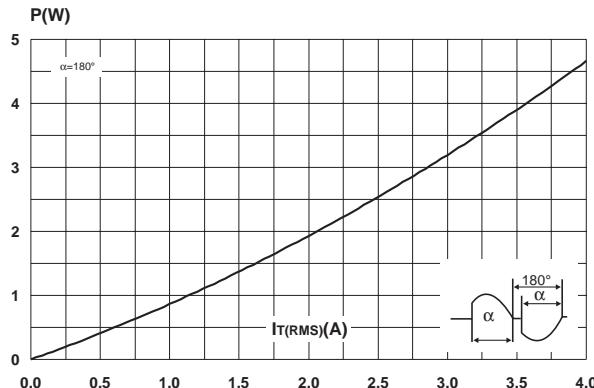


### **OTHER INFORMATION**

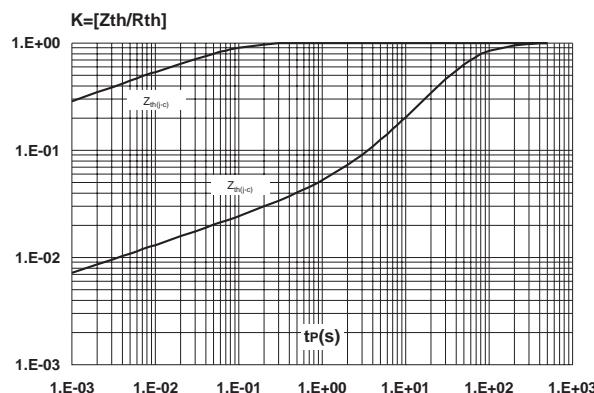
<b>Part Number</b>	<b>Marking</b>	<b>Weight</b>	<b>Base quantity</b>	<b>Packing mode</b>
T405Q-600B-TR	T405Q600	0.3 g	2500	Tape & reel
T405Q-600H	T405Q600	0.4 g	75	Tube

## T405Q-600B-TR & T405Q-600H

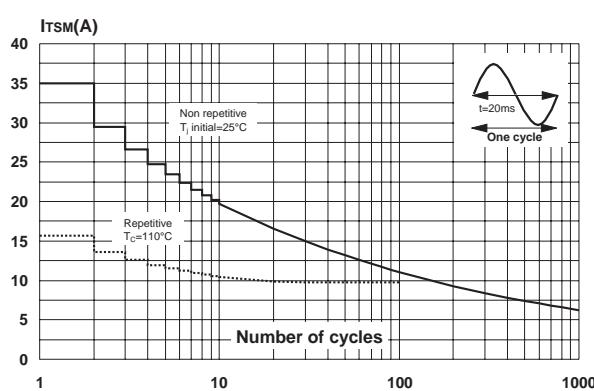
**Fig. 1:** Maximum power dissipation versus RMS on-state current.



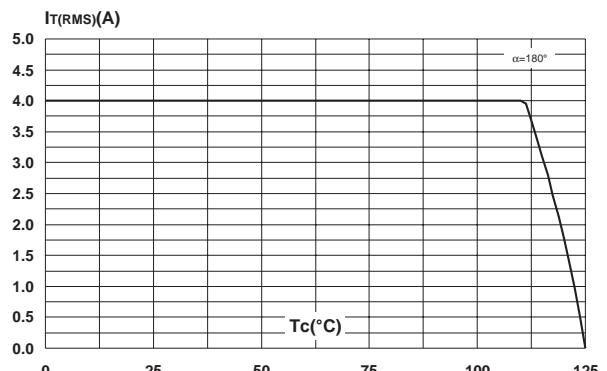
**Fig. 3:** Relative variation of thermal impedance versus pulse duration.



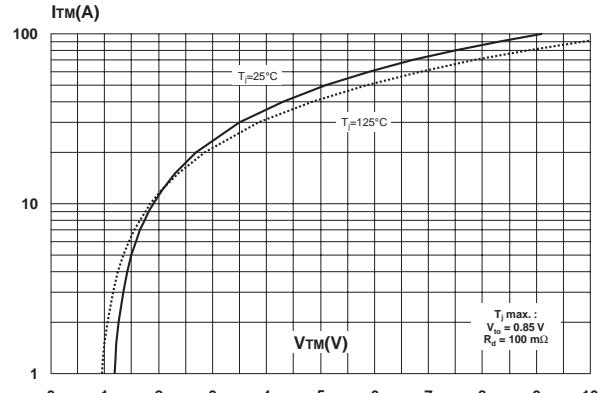
**Fig. 5:** Surge peak on-state current versus number of cycles.



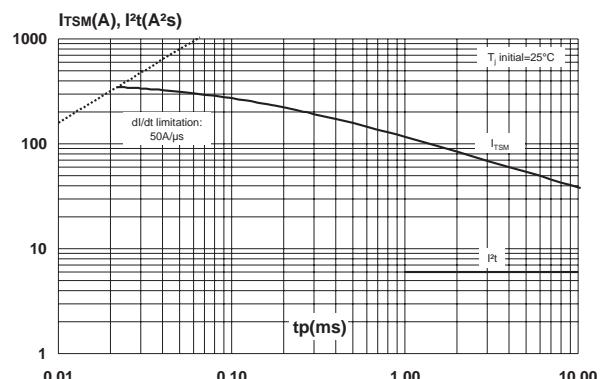
**Fig. 2:** RMS on-state current versus case temperature.



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

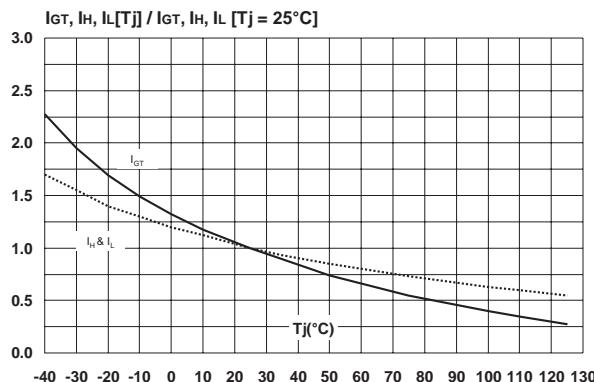


**Fig. 6:** Non repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$ .

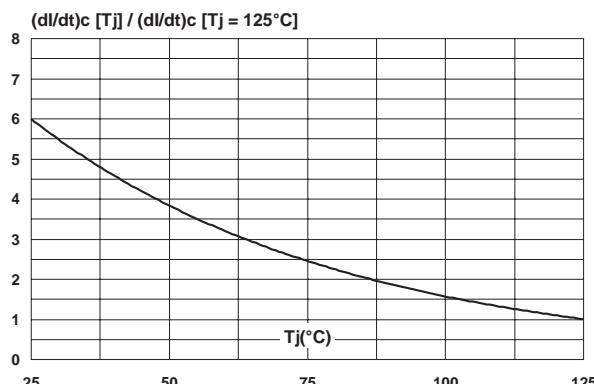


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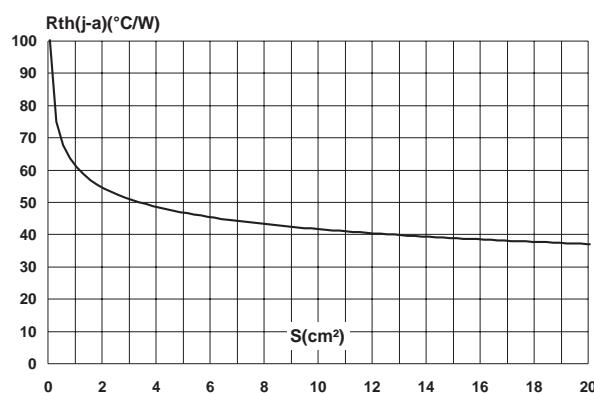
**Fig. 7:** Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).



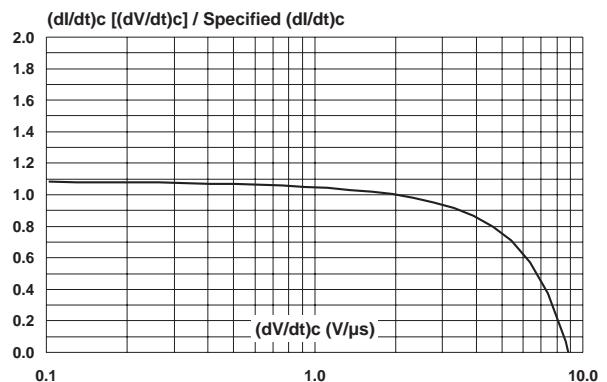
**Fig. 9:** Relative variation of critical rate of decrease of main current versus junction temperature.



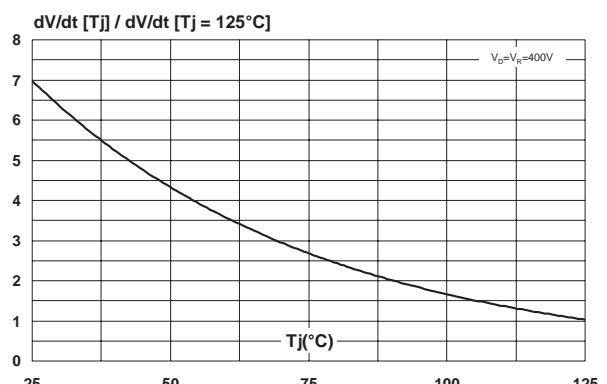
**Fig. 11:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4, Cu = 35 $\mu$ m).



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

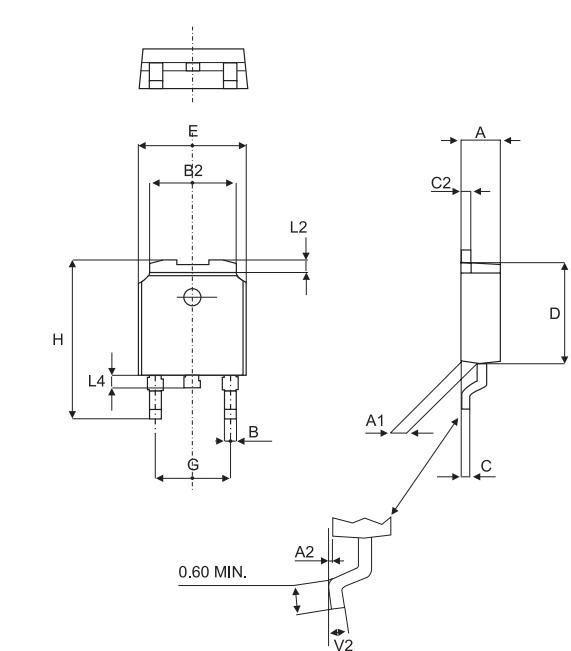


**Fig. 10:** Relative variation of static dV/dt immunity versus junction temperature.



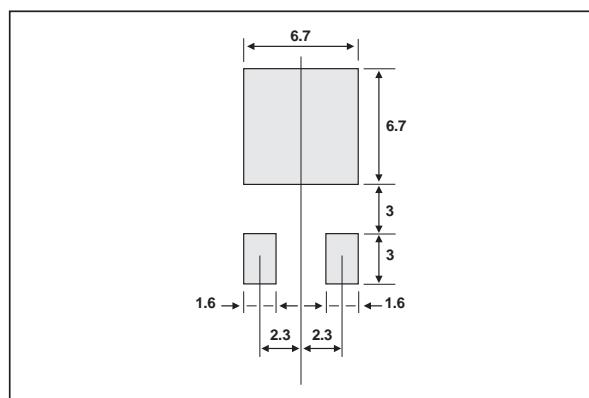
## T405Q-600B-TR & T405Q-600H

### PACKAGE MECHANICAL DATA DPAK



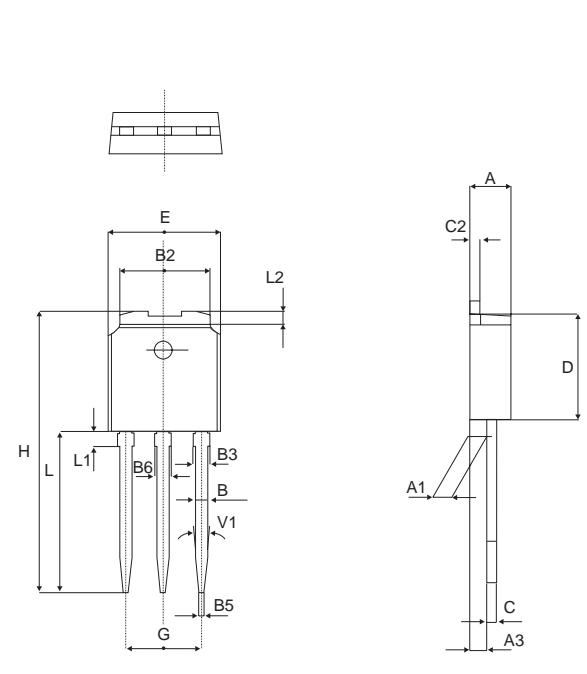
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

### FOOTPRINT



## T405Q-600B-TR & T405Q-600H

### PACKAGE MECHANICAL DATA IPAK



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.2		2.4	0.086		0.094
A1	0.9		1.1	0.035		0.043
A3	0.7		1.3	0.027		0.051
B	0.64		0.9	0.025		0.035
B2	5.2		5.4	0.204		0.212
B3			0.85			0.033
B5		0.3			0.035	
B6			0.95			0.037
C	0.45		0.6	0.017		0.023
C2	0.48		0.6	0.019		0.023
D	6		6.2	0.236		0.244
E	6.4		6.6	0.252		0.260
G	4.4		4.6	0.173		0.181
H	15.9		16.3	0.626		0.641
L	9		9.4	0.354		0.370
L1	0.8		1.2	0.031		0.047
L2		0.8	1		0.031	0.039
V1			10°			10°

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