

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

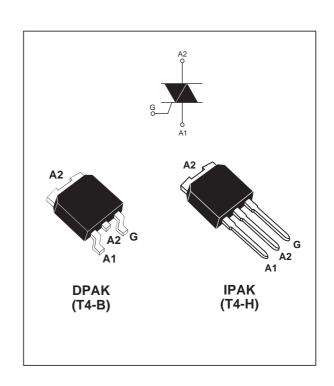
# Sensitive 4Q 4A TRIAC

#### **MAIN FEATURES**

Symbol	Value	Unit
I <sub>T(RMS)</sub>	4	А
V <sub>DRM</sub> /V <sub>RRM</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   Tc= 110°C		4	Α
I <sub>TSM</sub>	Non repetitive surge peak on-state	F = 50Hz	t = 20ms	35	Α
	current (Full cycle, T <sub>j</sub> initial = 25°C)		t = 16.7ms	38	
I <sup>2</sup> t	I <sup>2</sup> t Value for fusing	tp = 10 ms		6	A <sup>2</sup> s
dl/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , tr $\leq 100$ ns	Repetitive F = 100 Hz		50	A/µs
I <sub>GM</sub>	Peak gate current	tp = 20µs	tp = 20µs Tj = 125°C		Α
P <sub>G(AV)</sub>	Average gate power dissipation Tj = 125°C			0.5	W
T <sub>stg</sub> T <sub>j</sub>	Storage junction temperature range Operating junction temperature range	- 40 to + 150 - 40 to + 125	°C		

July 2002 - Ed: 1A 1/7

## **ELECTRICAL CHARACTERISTICS** (Tj = 25°C, unless otherwise specified)

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

## **STATIC CHARACTERISTICS**

Symbol	Test Conditions	Value	Unit		
V <sub>TM</sub> <sup>(2)</sup>	$I_{TM} = 5 \text{ A}$ tp = 380µs	Tj = 25°C	MAX.	1.5	V
V <sub>TO</sub> <sup>(2)</sup>	Threshold voltage	Tj = 125°C	MAX.	0.85	V
R <sub>d</sub> <sup>(2)</sup>	Dynamic resistance	Tj = 125°C	MAX.	100	mΩ
I <sub>DRM</sub> I <sub>RRM</sub>	$V_{DRM} = V_{RRM}$	Tj = 25°C Tj = 125°C	MAX	5 1	μA mA

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

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

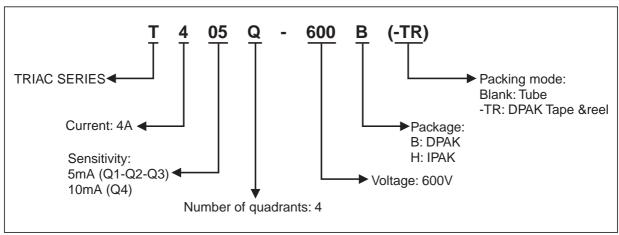
#### THERMAL RESISTANCES

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

#### PRODUCT SELECTOR

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

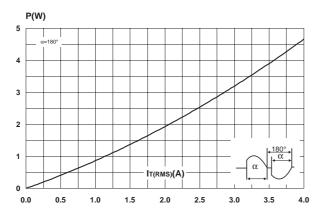
#### **ORDERING INFORMATION**



## OTHER INFORMATION

Part Number	Marking	Weight	Weight Base quantity	
T405Q-600B-TR	T405Q600	0.3 g	2500	Tape & reel
T405Q-600H	T405Q600	0.4 g	75	Tube

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



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

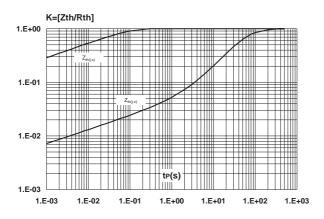
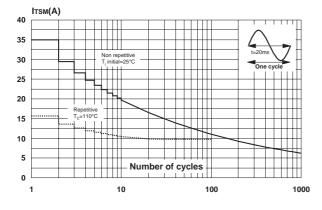


Fig. 5: Surge peak on-state current versus number of cycles.



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

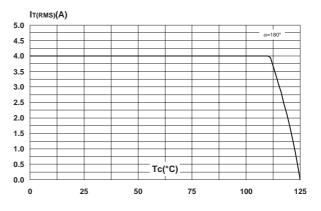
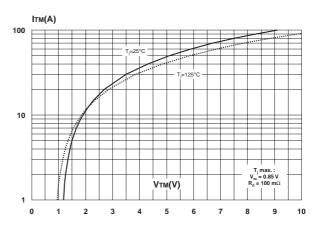
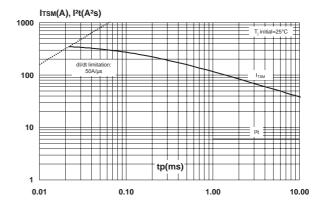


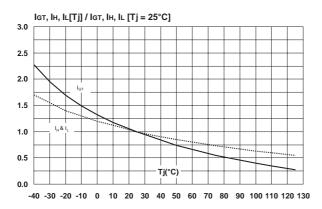
Fig. 4: On-state characteristics (maximum values).



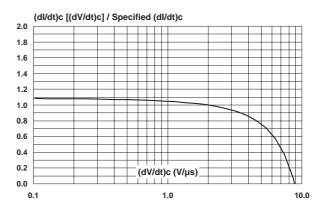
**Fig. 6:** Non repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding value of  $I^2$ t.



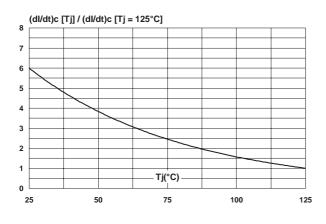
**Fig. 7:** Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).



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



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



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

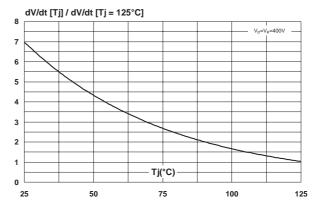
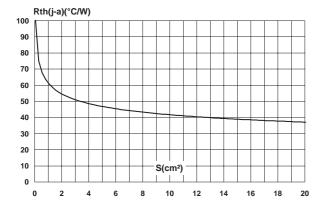
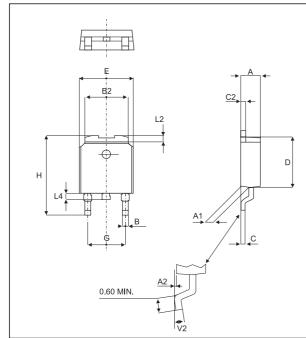


Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4,  $Cu = 35\mu m$ ).

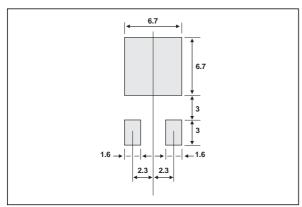


# PACKAGE MECHANICAL DATA DPAK



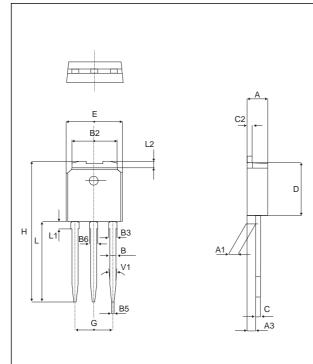
	DIMENSIONS				
REF.	Millim	neters	Inc	hes	
	Min.	Max	Min.	Max.	
Α	2.20	2.40	0.086	0.094	
A1	0.90	1.10	0.035	0.043	
A2	0.03	0.23	0.001	0.009	
В	0.64	0.90	0.025	0.035	
B2	5.20	5.40	0.204	0.212	
С	0.45	0.60	0.017	0.023	
C2	0.48	0.60	0.018	0.023	
D	6.00	6.20	0.236	0.244	
Е	6.40	6.60	0.251	0.259	
G	4.40	4.60	0.173	0.181	
Н	9.35	10.10	0.368	0.397	
L2	0.80	0.80 typ. 0.031 typ.		1 typ.	
L4	0.60	1.00	0.023	0.039	
V2	0°	8°	0°	8°	

#### **FOOTPRINT**



#### **PACKAGE MECHANICAL DATA**

**IPAK** 



	DIMENSIONS					
REF.	Millimeters		rs Inche		;	
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	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
В	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
С	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
Н	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°	

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied.

STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2002 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore Spain - Sweden - Switzerland - United Kingdom - United States.

http://www.st.com