Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

T1610T-8I

Logic level 16 A Triac

Datasheet — production data

Features

- High static and dynamic commutation
- Three quadrants
- Logic level (direct microcontroller driven)
- Package is RoHS (2002/95/EC) compliant
- Tab insulated, voltage = 2500 V rms
- UL certified (ref. file E81734)

Applications

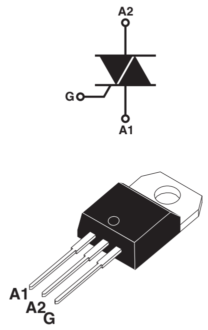
- General purpose AC line load switching
- Home appliances:
  - Fan
  - Pump
  - Solenoid
- Lighting
- Heaters
- Inrush current limiting circuits
- Overvoltage crowbar protection circuits

Description

Available in TO220AB-Insulated (ceramic insulated), the T1610T-8I series of Triac can be used in an on/off or phase angle control function in general purpose AC switching.

T1610T-8I can be directly driven through a microcontroller allowing usage of small capacitive or resistive power supplies.

Provides insulation rated at 2500 V rms (TO-220AB insulated package).



TO-220AB insulated (T1610T-8I)

Table 1. Device summary

Order code	Quadrants	Value I_{GT} (mA)
T1610T-8I	I - II - III	10

1 Characteristics

Table 2. Absolute maximum rating (T_j = 25 °C, unless otherwise specified)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	On-state rms current (full sine wave)		T_c = 108 °C	16	A
			T_c = 119 °C	12	
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C)	F = 50 Hz	t = 20 ms	120	A
		F = 60 Hz	t = 16.7 ms	126	
I^2t	I^2t Value for fusing		t_p = 10 ms	95	A^2s
V_{DRM}, V_{RRM}	Repetitive peak off-state voltage, gate open		T_j = 150 °C	600	V
			T_j = 125 °C	800	
V_{DSM}, V_{RSM}	Non repetitive surge peak off-state voltage	t_p = 10 ms	T_j = 25 °C	900	V
dI/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$		F = 100 Hz	100	A/µs
I_{GM}	Peak gate current		t_p = 20 µs	4	A
$P_{G(AV)}$	Average gate power dissipation			1	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range			-40 to +150 -40 to +150	°C
T_L	Lead temperature for soldering during 10 s (at 4 mm from case for TO220AB-ins.)			260	°C
V_{ins} (rms)	Insulation rms voltage, 1 minute, TO220AB ceramic insulated			2500	V

Table 3. Electrical characteristics (T_j = 25 °C, unless otherwise specified)

Symbol	Test conditions		Quadrant		Value	Unit
I_{GT} (1)	V_D = 12 V, R_L = 30 Ω		I - II - III	MIN.	0.5	mA
			I - II - III	MAX.	10	mA
V_{GT}	VD = 12 V, RL = 30 Ω		All	MAX.	1.3	V
V_{GD}	V_D = 800 V, R_L = 3.3 kΩ, T_j = 125 °C		All	MIN.	0.2	V
I_H (1)	I_T = 500 mA			MAX.	25	mA
I_L	I_G = 1.2 I_{GT}		I - III	MAX.	20	mA
			II		30	
dV/dt (1)	V_D = 67% x 800 V gate open	T_j = 125 °C		MIN.	100	V/µs
	V_D = 67% x 600 V gate open	T_j = 150 °C			50	
(dI/dt)c (1)	(dV/dt)c = 0.1 V/µs	T_j = 125 °C		MIN.	9	A/ms
	(dV/dt)c = 10 V/µs	T_j = 125 °C			3	
	(dV/dt)c = 0.1 V/µs	T_j = 150 °C			5.4	
	(dV/dt)c = 10 V/µs	T_j = 150 °C			1.8	
t_{GT}	gate controlled turn on time I_{TM} = 13 A, V_D = 400 V, I_G = 100 mA, dI_G/dt = 100 mA/µs, R_L = 30 Ω		I - II - III	TYP.	2	µs

1. For both polarities of A2 referenced to A1

Table 4. Static characteristics

Symbol	Test conditions			Value	Unit
V_{TM} (1)	I_{TM} = 22.6 A, t_p = 380 µs	T_j = 25 °C	MAX.	1.55	V
V_{to} (1)	Threshold voltage	T_j = 150 °C	MAX.	0.85	V
R_d (1)	Dynamic resistance	T_j = 150 °C	MAX.	30	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM} = 800 V	T_j = 25 °C	MAX.	5	µA
		T_j = 125 °C		1	mA
	V_{DRM} = V_{RRM} = 600 V	T_j = 150 °C		3.6	

1. for both polarities of A2 referenced to A1

Table 5. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	2.1	°C/W
$R_{th(j-a)}$	Junction to ambient	60	°C/W

Figure 1. Maximum power dissipation versus on-state rms current (full cycle)

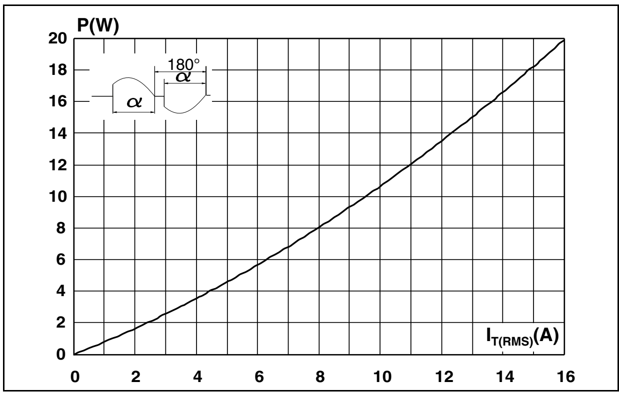


Figure 2. On-state rms current versus case temperature (full cycle)

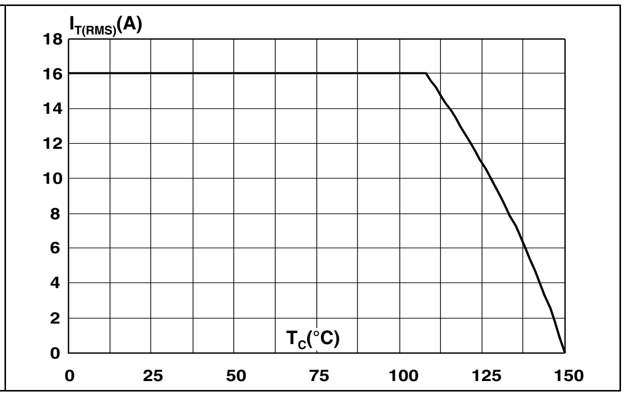


Figure 3. On-state rms current versus ambient temperature (free air convection)

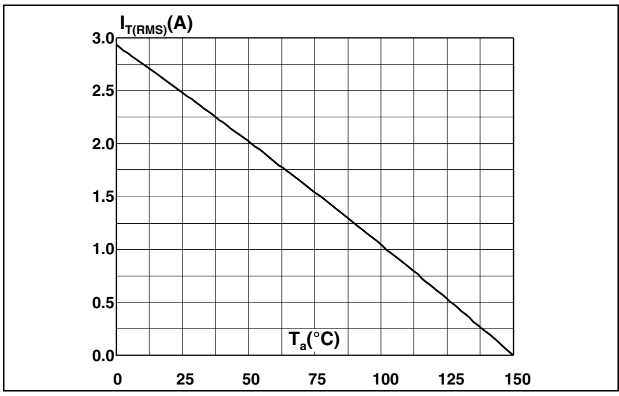


Figure 4. Relative variation of thermal impedance versus pulse duration

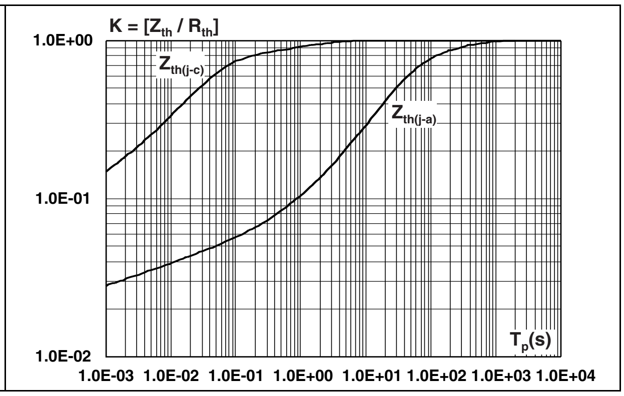


Figure 5. On-state characteristics (maximum values)

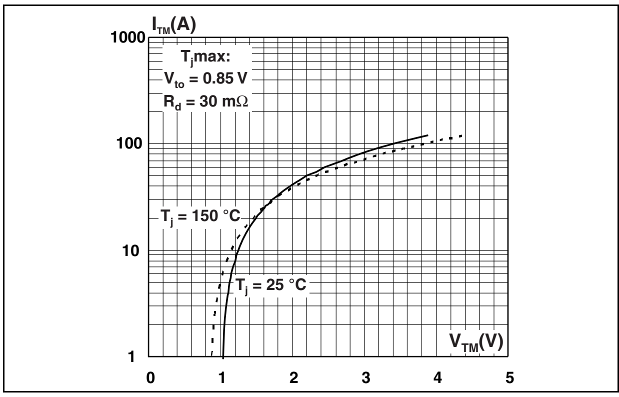


Figure 6. Surge peak on-state current versus number of cycles

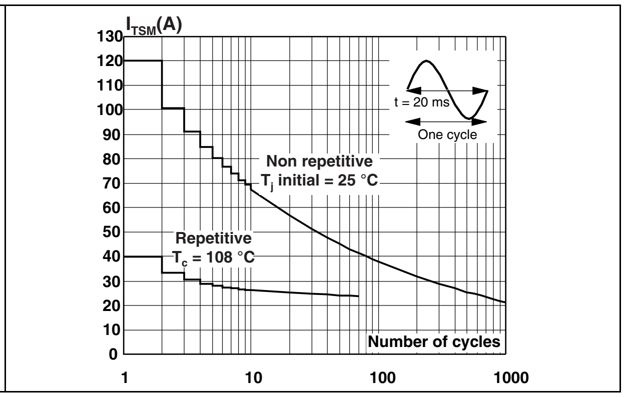


Figure 7. Non repetitive surge peak on-state current and corresponding values of I^2t

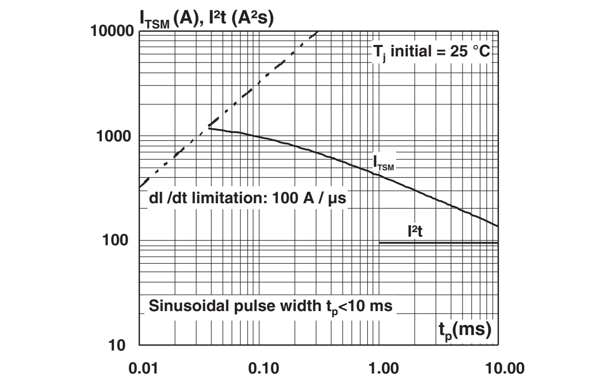


Figure 8. Relative variation of gate trigger current versus junction temperature (typical values)

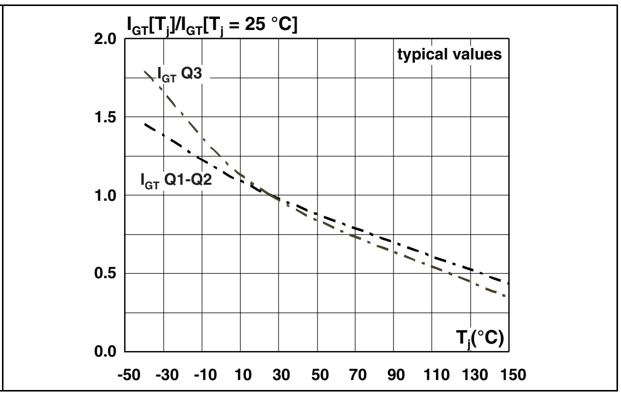


Figure 9. Relative variation of gate trigger voltage versus junction temperature (typical values)

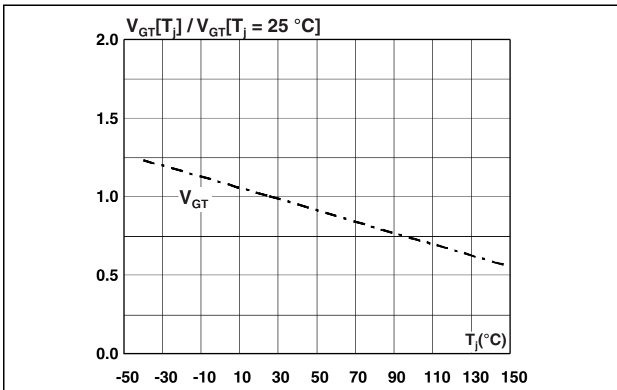


Figure 10. Relative variation of holding current and latching current versus junction temperature

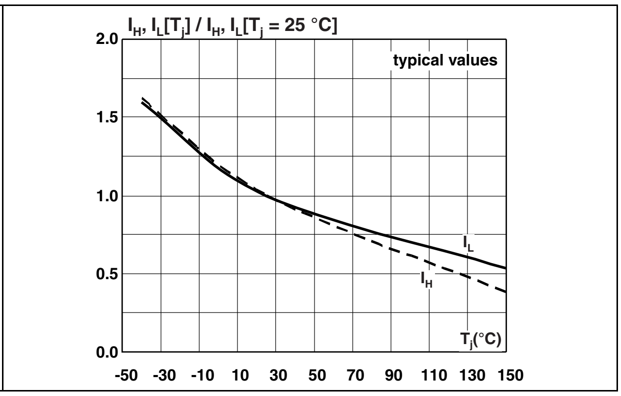


Figure 11. Relative variation of critical rate of decrease of current (dI/dt)c versus reapplied (dV/dt)c

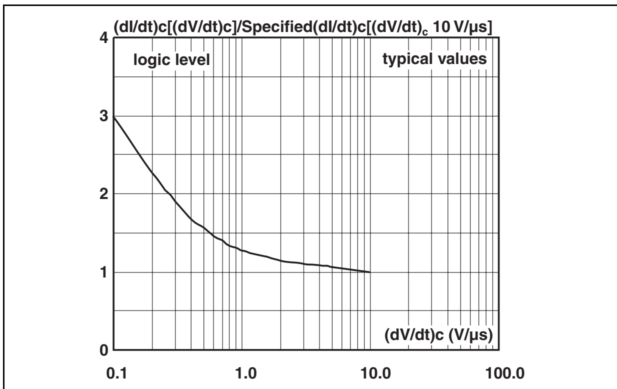


Figure 12. Relative variation of critical rate of decrease of current (dI/dt)c versus junction temperature

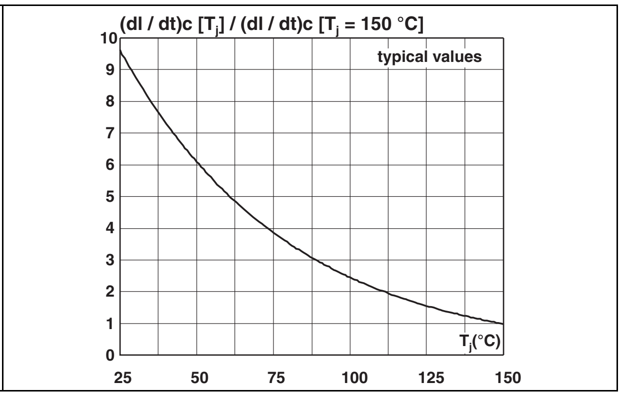


Figure 13. Relative variation of static dV/dt immunity versus junction temperature

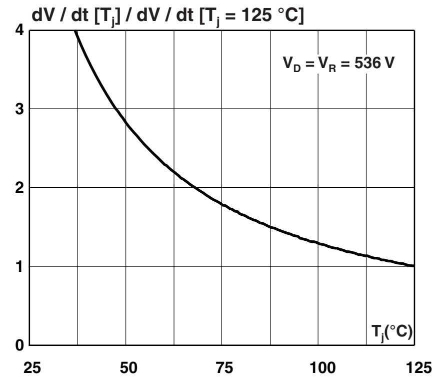


Figure 14. Relative variation of static dV/dt immunity versus junction temperature

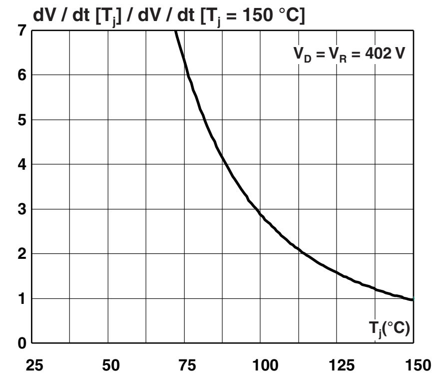
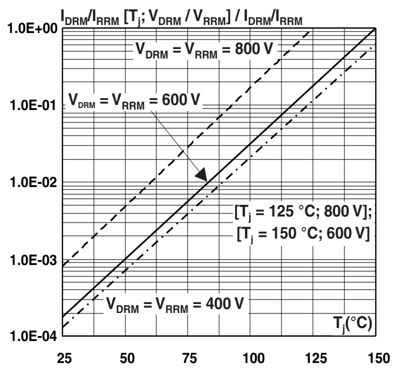


Figure 15. Relative variation of leakage current versus junction temperature for different values of blocking voltage

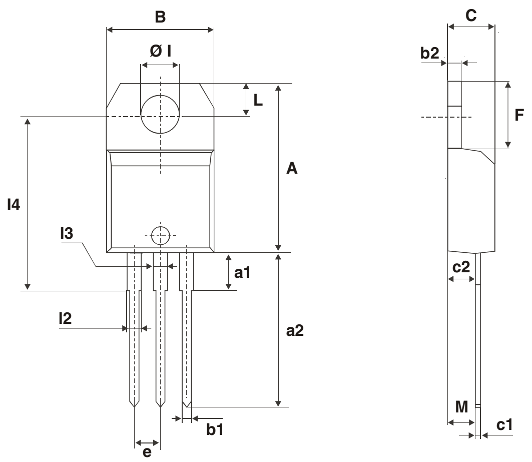


2 Package information

- Epoxy meets UL94, V0
- Recommended torque value: 0.4 to 0.6 N·m

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

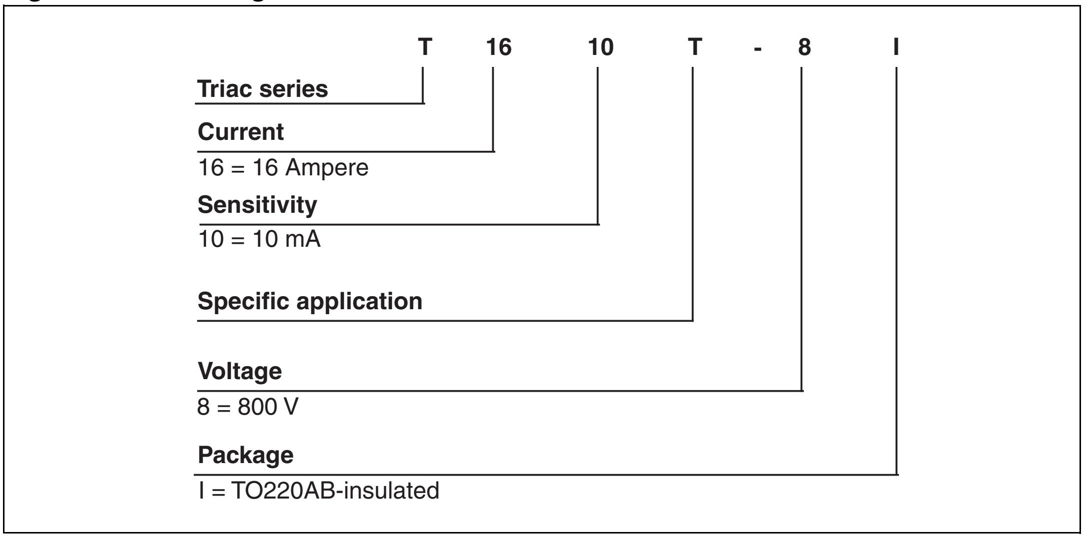
Table 6. TO-220AB insulated dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

3 Ordering information scheme

Figure 16. Ordering information scheme



4 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
T1610T-8I	T1610T-8I	TO-220AB insulated	2.3	50	Tube

5 Revision history

Table 8. Document revision history

Date	Revision	Changes
08-Aug-2011	1	First issue.
20-Jan-2012	2	Corrected subscripting error in *Table 3*.
25-Apr-2012	3	Updated UL certification.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com