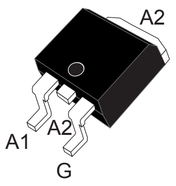
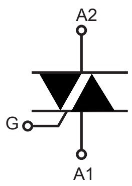
T1610T-8G

Datasheet

16 A logic level (sensitive) Triac





Product status link	
T1610T-8G	
Product summary	
$I_{T(RMS)}$	16 A
V_{DRM}/V_{RRM}	800 V
V_{DSM}/V_{RSM}	900 V
I_{GT}	10 mA

Features

- High static dV/dt
- High dynamic turn-off commutation (dI/dt)c
- 150 °C maximum junction temperature
- Three quadrants
- Surge capability V_{DSM}, V_{RSM} = 900 V
- Benefits:
  - High immunity to false turn-on thanks to high static dV/dt
  - Better turn-off in high temperature environments thanks to (dI/dt)c
  - Increase of thermal margin due to extended working T_j up to 150 °C
  - Good thermal resistance due to non-insulated tab.

Applications

- General purpose AC line load switching
- Motor control circuits
- Home appliances
- Heating
- Lighting
- Inrush current limiting circuits
- Overvoltage crowbar protection

Description

Available in SMD, the T1610T-8G Triac can be used for the on/off or phase angle control function in general purpose AC switching where high commutation capability is required. This device can be used without a snubber RC circuit when the limits defined are respected.

D^2PAK Package is UL-94,V0 flammability resin compliance.

Package environmentally friendly Ecopack®2 graded (RoHS and Halogen Free compliance).

Snubberless™ is a trademark of STMicroelectronics.

1 Characteristics

Table 1. Absolute maximum ratings (limiting values), T_j = 25 °C unless otherwise specified

Symbol	Parameter		Value	Unit
V_{DRM}/V_{RRM}	Repetitive peak off-state voltage (50-60 Hz)	T_j = 125 °C	800	V
		T_j = 150 °C	600	V
V_{DSM}/V_{RSM}	Non Repetitive peak off-state voltage	t_p = 10 ms, T_j = 25 °C	900	V
$I_{T(RMS)}$	RMS on-state current (full sine wave)	T_c = 126 °C	16	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C	t = 16.7 ms	126	A
		t = 20 ms	120	
I^2t	I^2t value for fusing	t_p = 10 ms	95	A^2s
dI/dt	Critical rate of rise of on-state current, I_G = 2 x I_{GT}, tr ≤ 100 ns	f = 100 Hz	100	A/µs
I_{GM}	Peak gate current	t_p = 20 µs, T_j = 150 °C	4	A
V_{GM}	Peak Gate Voltage		5	V
$P_{G(AV)}$	Average gate power dissipation	T_j = 150 °C	1	W
T_{stg}	Storage junction temperature range		-40 to +150	°C
T_j	Operating junction temperature range		-40 to +150	°C

Table 2. Electrical characteristics (T_j = 25 °C, unless otherwise specified)

Symbol	Test conditions		Quadrants; T_j		Value	Unit
I_{GT} (1)	V_D = 12 V, R_L = 30 Ω		I - II - III	Max.	10	mA
V_{GT}	V_D = 12 V, R_L = 30 Ω		I - II - III	Max.	1.3	V
V_{GD}	V_D = 800 V, R_L = 3.3 kΩ	T_j = 125 °C	I - II - III	Min.	0.2	V
I_L	I_G = 1.2 x I_{GT}		I - III	Max.	20	mA
	I_G = 1.2 x I_{GT}		II	Max.	30	mA
I_H (2)	I_T = 500 mA, gate open			Max.	25	mA
dV/dt (2)	V_D = 536 V, gate open		T_j = 125 °C	Min.	100	V/µs
	V_D = 402 V, gate open		T_j = 150 °C	Min.	50	V/µs
(dI/dt)c (2)	(dV/dt)c = 0.1 V/µs		T_j = 125 °C	Min.	9	A/ms
			T_j = 150 °C		5.4	
	(dV/dt)c = 10 V/µs		T_j = 125 °C	Min.	3	A/ms
			T_j = 150 °C		1.8	

1. *Minimum I_{GT} is guaranteed at 5% of I_{GT} max*
2. *For both polarities of A2 referenced to A1.*

Table 3. Static characteristics

Symbol	Test conditions	T_j		Value	Unit
V_{TM} (1)	I_T = 22.6 A, t_p = 380 µs	25 °C	Max.	1.55	V
V_{TO} (1)	Threshold on-state voltage	150 °C	Max.	0.85	V
R_D (1)	Dynamic resistance	150 °C	Max.	34	mΩ
I_{DRM}/I_{RRM}	V_{DRM} = V_{RRM} = 800 V	25 °C	Max.	5	µA
		125°C		1.0	mA
	V_{DRM} = V_{RRM} = 600 V	150 °C	Max.	3.6	mA

1. *For both polarities of A2 referenced to A1.*

Table 4. Thermal resistance

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	D²PAK	Max.	1.15	°C/W

1.2 Characteristics (curves)

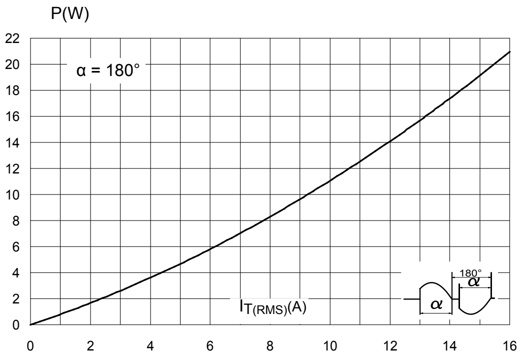


Figure 1. Maximum power dissipation versus on-state RMS current

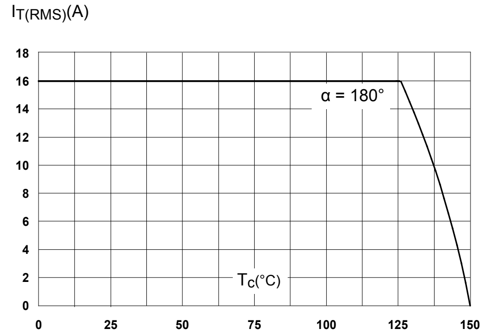


Figure 2. On-state RMS current versus case temperature

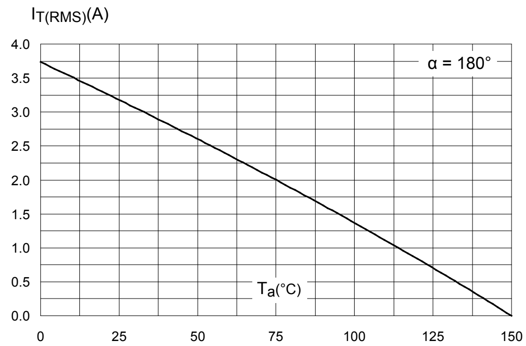


Figure 3. On-state RMS current versus ambient temperature (free air convection)

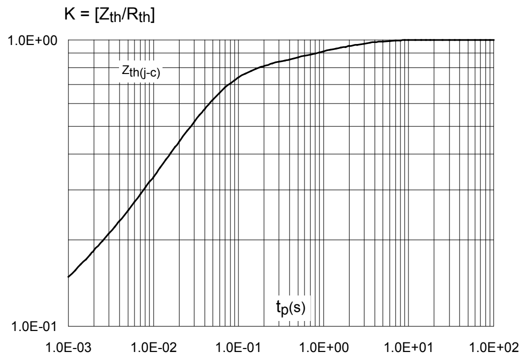


Figure 4. Relative variation of thermal impedance versus pulse duration

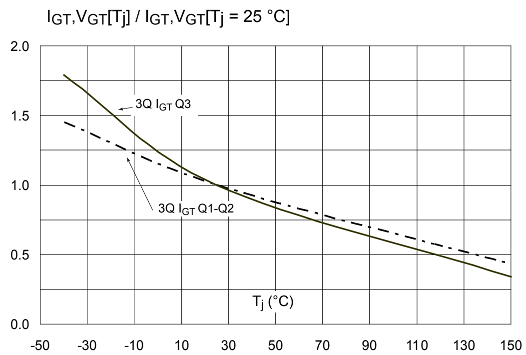


Figure 5. Relative variation of gate trigger voltage and current versus junction temperature (typical values)

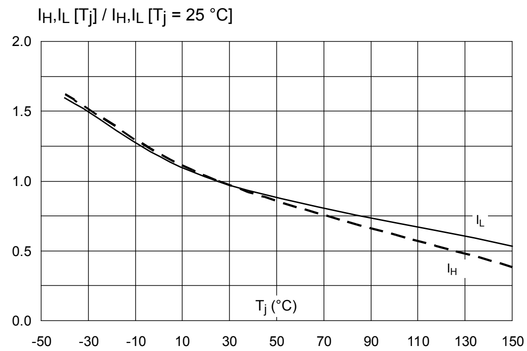


Figure 6. Relative variation of holding current and latching current versus junction temperature (typical values)

Figure 7. Surge peak on-state current versus number of cycles

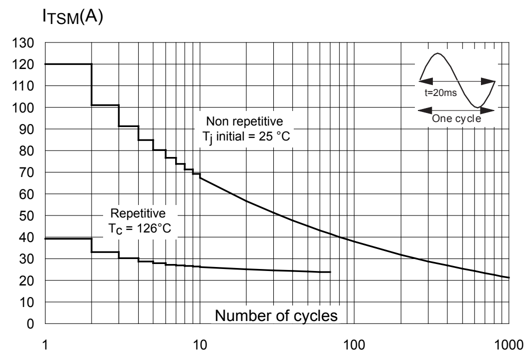


Figure 8. Non repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms

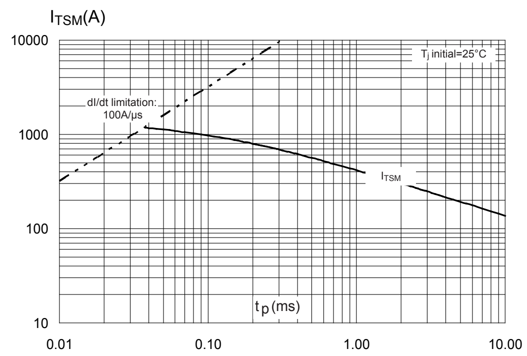


Figure 9. On-state characteristics (maximum values)

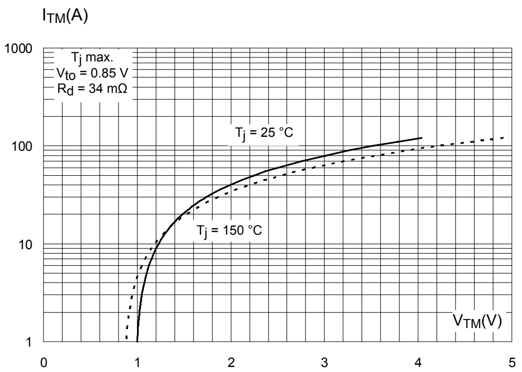


Figure 10. Relative variation of critical rate of decrease of main voltage versus junction temperature

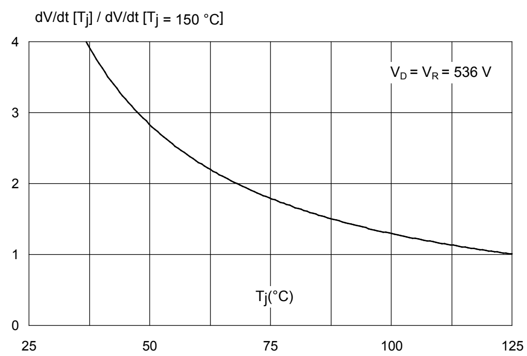


Figure 11. Relative variation of critical rate of decrease of main current versus junction temperature (typical values)

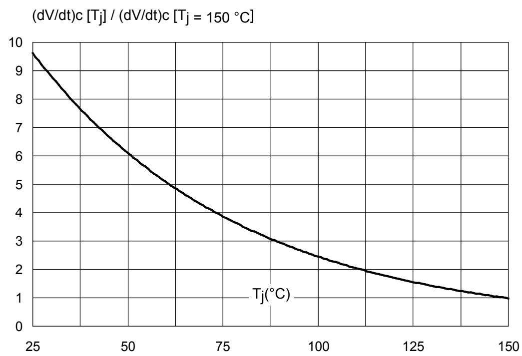
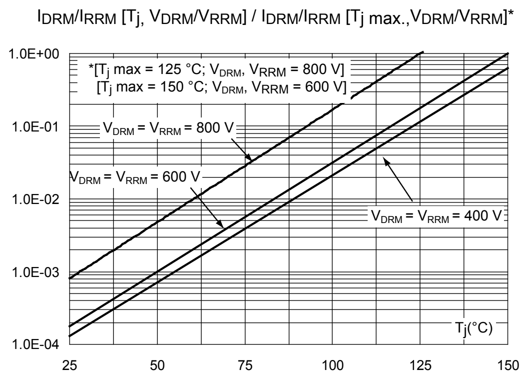


Figure 12. Relative variation of leakage current versus junction temperature for different values of blocking voltage



2 Ordering information

Figure 13. Ordering information scheme

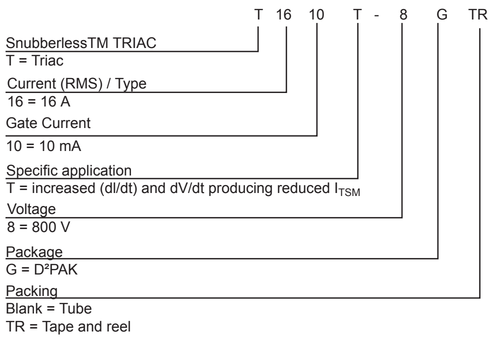


Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
T1610T-8G-TR	T1610T-8G	D²PAK	1.38 g	1000	Tape and reel
T1610T-8G				50	Tube

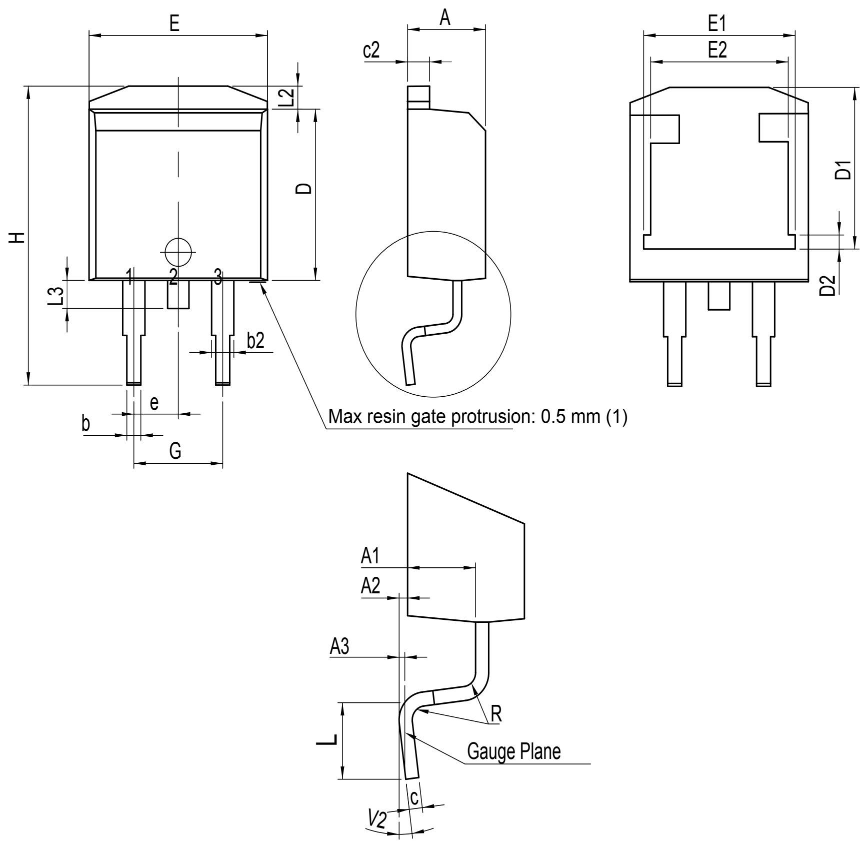
3 Package information

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.

3.1 D²PAK package information

- ECOPACK2® compliant
- Lead-free package leads finishing
- Molding compound resin is halogen-free and meets UL standard level V0

Figure 14. D²PAK package outline



(1) Resin gate is accepted in each of position shown on the drawing, or their symmetrical.

Table 6. D²PAK package mechanical data

Ref.	Dimensions					
	Millimeters			Inches1		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.1693		0.1811
A1	2.49		2.69	0.0980		0.1059
A2	0.03		0.23	0.0012		0.0091
A3		0.25			0.0098	
b	0.70		0.93	0.0276		0.0366
b2	1.25		1.7	0.0492		0.0669
c	0.45		0.60	0.0177		0.0236
c2	1.21		1.36	0.0476		0.0535
D	8.95		9.35	0.3524		0.3681
D1	7.50		8.00	0.2953		0.3150
D2	1.30		1.70	0.0512		0.0669
e		2.54			0.1	
E	10.00		10.28	0.3937		0.4047
E1	8.30		8.70	0.3268		0.3425
E2	6.85		7.25	0.2697		0.2854
G	4.88		5.28	0.1921		0.2079
H	15		15.85	0.5906		0.6240
L	1.78		2.28	0.0701		0.0898
L2	1.27		1.40	0.0500		0.0551
L3	1.40		1.75	0.0551		0.0689
R		0.40			0.0157	
V22	0°		8°	0°		8°

1. *Dimensions in inches are given for reference only*
2. *Degrees*

Figure 15. D²PAK recommended footprint (dimensions are in mm)

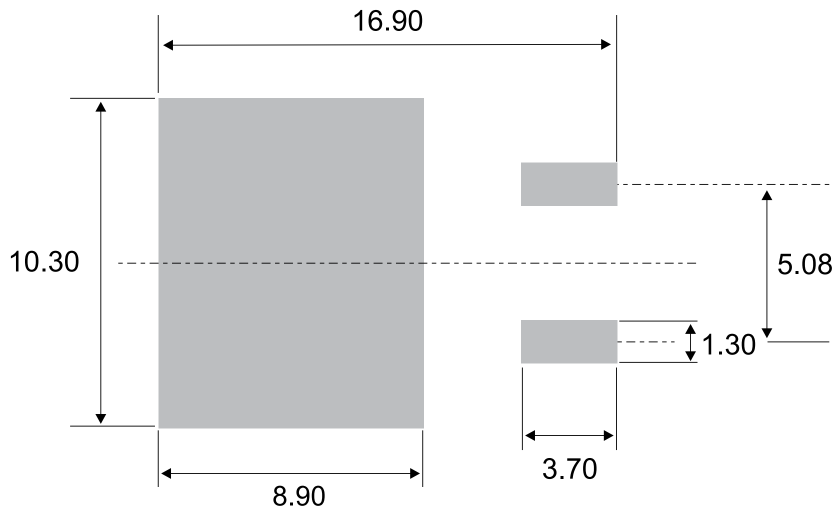
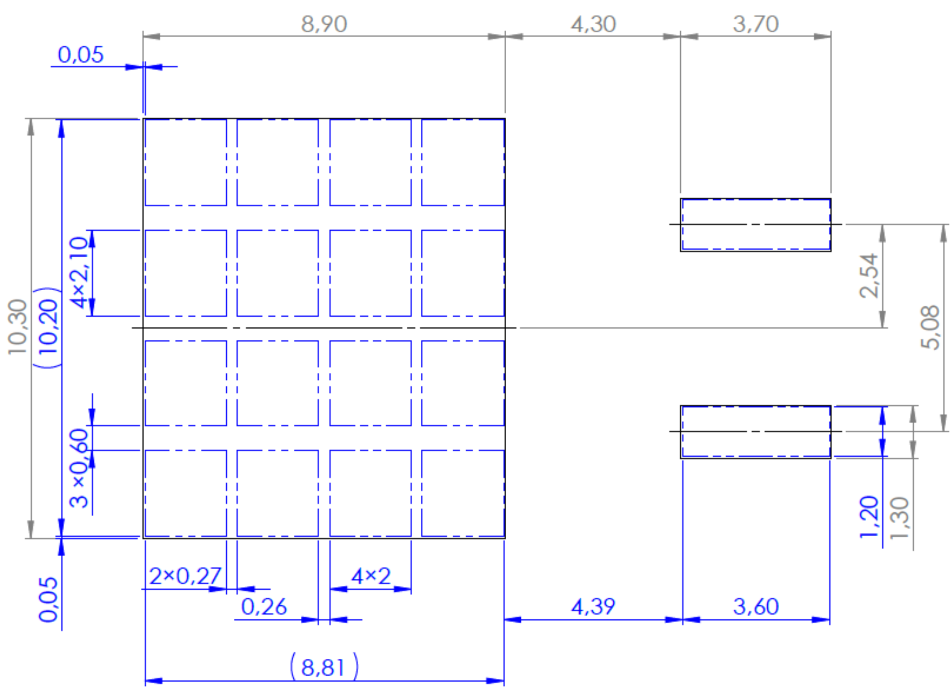


Figure 16. D²PAK stencil definitions(dimensions are in mm)



Revision history

Table 7. Document revision history

Date	Version	Changes
03-Apr-2018	1	Initial release.
17-Jul-2018	2	Updated Table 2. Electrical characteristics (T_j = 25 °C, unless otherwise specified).

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.