

T1635T-8FP

16 A Snubberless™ Triac

Datasheet – production data



- Medium current Triac
- High static and dynamic commutation
- Three quadrants
- ECOPACK[®]2 compliant component
- Complies with UL standards (File ref: E81734)

Applications

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

Description

Available in through-hole full pack package, the T1635T-8FP 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 circuit when the limits defined in this datasheet are respected.

Provides UL certified insulation rated at 2 kV.

 V_{DRM}, V_{RRM}
 800
 V

 V_{DSM}, V_{RSM}
 900
 V

 I_{GT}
 35
 mA

TO-220FPAB

(T1635T-8FP)

Table 1. Device summary

Value

Unit

А

TM: Snubberless is a trademark of STMicroelectronics

Symbol

I_{T(rms)}

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This is information on a product in full production.

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1 Characteristics

Symbol	Parameter			Value	Unit	
I _{T(rms)}	On-state rms current (full sine wave	ent (full sine wave)		16	А	
Ι.	Non repetitive surge peak on-state	F = 50 Hz	t = 20 ms	120	٨	
I _{TSM}	current (full cycle, T _j initial = 25 °C)	F = 60 Hz	t = 16.7 ms	126	A	
l ² t	$I^{2}t$ value for fusing, T_{j} initial = 25 °C		t _p = 10 ms	95	A ² s	
V _{DRM} ,	Repetitive surge peak off-state voltage		T _j = 150 °C	600	V	
			T _j = 125 °C	800	V	
V _{DSM} , V _{RSM}	Non repetitive surge peak off-state	surge peak off-state voltage		900	V	
dl/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \le 100 \text{ ns}$			100	A/µs	
I _{GM}	Peak gate current	t _p = 20 μs	T _j = 150 °C	4	А	
P _{G(AV)}	Average gate power dissipation	verage gate power dissipation		1	W	
T _{stg} T _j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 150	°C	
ΤL	Maximum lead temperature for soldering during 10 s			260	°C	
V _{ins}	Insulation rms voltage, 1 minute			2	kV	

Table 3. Electrical characteristics (_i = 25 °C, unless otherwise specified)
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Symbol	Test conditions Quadrant			Value	Unit
I _{GT} ⁽¹⁾	V = 12 V P = 20.0	- -	Min.	1.75	m 4
'GT`´	$V_{\rm D}$ = 12 V, R _L = 30 Ω	1 - 11 - 111	Max.	35	mA
V _{GT}	$V_D = 12 V, R_L = 30 \Omega$	1 - 11 - 111	Max.	1.3	V
V _{GD}	$V_{D} = V_{DRM}, R_{L} = 3.3 \text{ k}\Omega, T_{j} = 125 \text{ °C}$	1 - 11 - 111	Min.	0.2	V
I _H ⁽²⁾	I _T = 500 mA		Max.	40	mA
١L	I _G = 1.2 I _{GT}	1 - 111	Max.	60	mA
۱L	IG = 1.2 IGT	П	iviax.	65	
dV/dt	$V_D = 536 V$, gate open	T _j = 125 °C	Min.	2000	V/µs
uv/ut	$V_D = 402 V$, gate open	T _j = 150 °C		1000	V/µs
(dl/dt)c	Without spubber $(dV/dt)_{C} > 20 V/us)$	T _j = 125 °C	Min.	16	A/ms
ູເຟາ/ປີເງບ	Without snubber (dV/dt)c > 20 V/µs)	T _j = 150 °C		8	

1. Minimum I_{GT} is guaranteed at 5% of I_{GT} max.

2. For both polarities of A2 referenced to A1



Symbol	Test conditions				Unit
V _T ⁽¹⁾	I _{TM} = 22.6 A, t _p = 380 μs	T _j = 25 °C	Max.	1.55	V
V _{t0} ⁽¹⁾	Threshold voltage	T _j = 150 °C	Max.	0.85	V
R _d ⁽¹⁾	Dynamic resistance	T _j = 150 °C	Max.	27	mΩ
	V _{DRM} = V _{RRM} = 800 V	T _j = 25 °C	Max.	7.5	μA
I _{DRM}	$\nabla DRM = \nabla RRM = 800 \nabla$	T _j = 125 °C	iviax.	1	mA
'KRM	$V_{\text{DRM}} = V_{\text{RRM}} = 600 \text{ V}$	T _j = 150 °C	Max.	3.0	

Table 4. Static characteristics

1. For both polarities of A2 referenced to A1

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case (AC)	3.3	°C/W
R _{th(j-a)}	Junction to ambient	60	°C/W

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

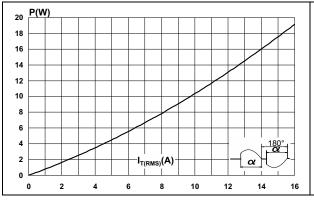
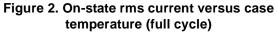


Figure 3. On-state rms current versus ambient temperature (free air convection)



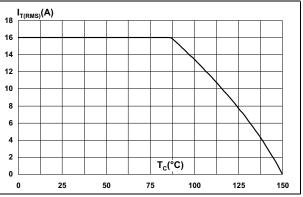
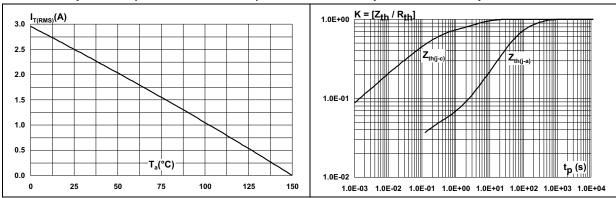


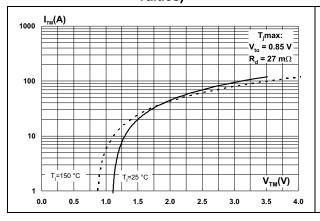
Figure 4. Relative variation of thermal impedance versus pulse duration

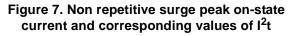


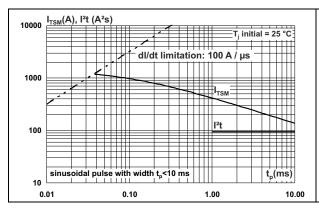


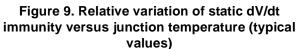
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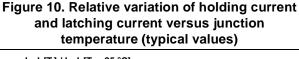
Figure 5. On-state characteristics (maximum values)











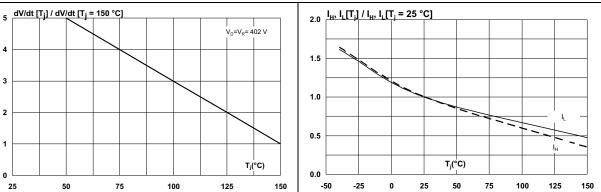


Figure 6. Surge peak on-state current versus number of cycles

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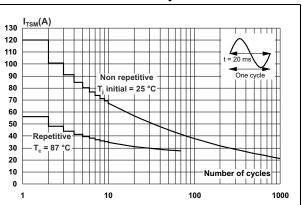
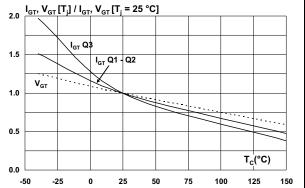


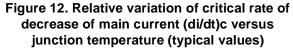
Figure 8. Relative variation of gate trigger current and gate voltage versus junction temperature (typical values)



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



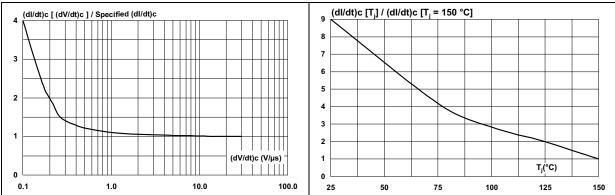
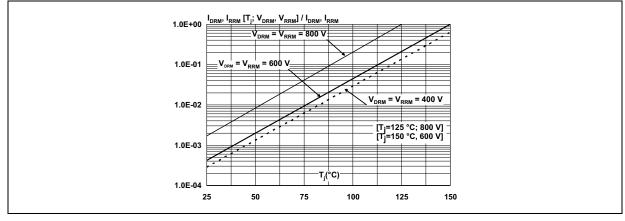


Figure 13. Relative variation of leakage current versus junction temperature for different values of blocking voltage (typical values)





2 Package information

- Lead-free package
- Recommended torque: 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.

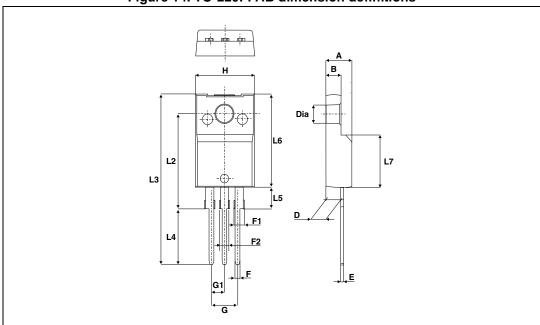


Figure 14. TO-220FPAB dimension definitions



Dimensions						
Ref.	Millim	ieters	Incl	nes		
	Min.	Max.	Min.	Max.		
А	4.4	4.6	0.173	0.181		
В	2.5	2.7	0.098	0.106		
D	2.5	2.75	0.098	0.108		
E	0.45	0.70	0.018	0.027		
F	0.75	1	0.030	0.039		
F1	1.15	1.70	0.045	0.067		
F2	1.15	1.70	0.045	0.067		
G	4.95	5.20	0.195	0.205		
G1	2.4	2.7	0.094	0.106		
Н	10	10.4	0.393	0.409		
L2	16	Гур.	0.63	Тур.		
L3	28.6	30.6	1.126	1.205		
L4	9.8	10.6	0.386	0.417		
L5	2.9	3.6	0.114	0.142		
L6	15.9	16.4	0.626	0.646		
L7	9.00	9.30	0.354	0.366		
Dia.	3.00	3.20	0.118	0.126		

Table 6. TO-220FPAB dimension values



3 Ordering information

Triac	т 	16 	35	т.	8	FP
Current						
16 = 16 A						
Gate sensitivity						
35 = 35 mA						
Specific application						
T = Increased (dl/dt)c and dV/dt producing reduced I _T	SM					
<u>Voltage (V_{DRM}, V_{RRM})</u> 8 = 800 ∨						
8 = 800 V						
Package FP = TO-220FPAB						

Figure 15. Ordering information scheme

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
T1635T-8FP	T1635T-8FP	TO-220FPAB	2.0 g	50	Tube

4 Revision history

Date	Revision	Changes
27-May-2013	1	Initial release.
12-June-2013	2	Added UL certification information.
08-Jan-2015	3	Updated Features, Table 2 and Table 5.



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