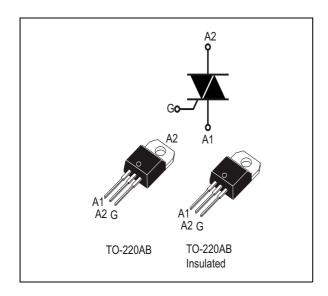


T3035H, T3050H

Snubberless™ high temperature 30 A Triacs

Datasheet - production data



Features

- High current Triac
- High immunity level
- · Low thermal resistance with clip bounding
- RoHS (2002/95/EC) compliant package
- Very high commutation (3Q) at 150 °C capability
- UL certified (ref. file E81734)

Applications

Thanks to its high electrical noise immunity level and its strong current robustness, the T3035H, T3050H series is designed for the control of AC actuators in appliances and industrial systems.

Description

Specifically designed to operate at 150 °C, the new 30 A T3035H, T3050H Triacs provide very high dynamic performance and enhanced performance in terms of power loss and thermal dissipation. This allows optimizing the heatsink size, leading to space and cost effectiveness when compared to electro-mechanical solutions.

Based on ST Snubberless $^{\text{TM}}$ technology, they offer a specified minimal commutation and high noise immunity levels valid up to the T_i max.

The T3035H, T3050H series optimize safely the control of universal motors and of inductive loads found in power tools and major appliances.

By using an internal ceramic pad, the T3035H-6I, T3050H-6I provides voltage insulation (rated at 2500 V rms).

Table 1. Device summary

Order code	Package	V _{DRM} /V _{RRM}	I _{GT}	I _{T(RMS)}
T3035H-6T	TO-220AB	600 V	35 mA	
T3050H-6T	10-220AB		50 mA	30 A
T3035H-6I	TO-220AB		35 mA	30 A
T3050H-6I	insulated		50 mA	

TM: Snubberless is a trademark of STMicroelectronics

Characteristics T3035H, T3050H

1 Characteristics

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit		
		TO-220AB	T _C = 121 °C		
I _{T(RMS)}	On-state rms current (Full sine wave)	TO-220AB insulated	T _c = 92 °C	30	Α
1.	Non repetitive surge peak on-state current	f = 50 Hz	t = 20 ms	270	Α
I _{TSM}	(Full cycle, T _j initial = 25 °C)	f = 60 Hz	t = 16.7ms	284	^
l ² t	I^2t value for fusing $t_p = 10 \text{ ms}$		487	A ² s	
V _{RSM} , V _{DSM}	Non repetitive surge peak off-state voltage	t _p = 10 μs	T _j = 25 °C	V _{RRM} , V _{DRM} +100	V
dl/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \le 100 \text{ ns}$	F = 120 Hz	T _j = 150 °C	50	A/µs
I _{GM}	Peak gate current $t_p = 20 \mu s$ $T_j = 150 ^{\circ}C$		T _j = 150 °C	4	Α
P _{G(AV)}	Average gate power dissipation $T_j = 150 ^{\circ}\text{C}$			1	W
T _{stg}	Storage junction temperature range	- 40 to + 150	°C		
Tj	Operating junction temperature range			- 40 to + 150	°C

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

Symbol	Test conditions	Quadrant		Value		Unit
Symbol	rest conditions	Quadrant		T3035H	T3050H	Oilit
I _{GT} ⁽¹⁾	$V_D = 12 \text{ V } R_1 = 33 \Omega$	1 - 11 - 111	MAX.	35	50	mA
V _{GT}	VD = 12 V KL = 33 12	1 - 11 - 111	MAX.	1.0		V
V _{GD}	$V_D = V_{DRM}$ $R_L = 3.3 \text{ k}\Omega$	1 - 11 - 111	MIN.	0.15		V
I _H ⁽²⁾	I _T = 500 mA		MAX.	60	75	mA
	1 - 121	1 - 111	MAX.	75	90	mA
l IL	_G = 1.2 l _{GT}	II	IVIAA.	90	110	IIIA
dV/dt (2)	V _D = 67 %V _{DRM} gate open	T _j = 150 °C	MIN.	1000	1500	V/µs
(dl/dt)c (2)	Without snubber	T _j = 150 °C	MIN.	33	44	A/ms

^{1.} Minimum I_{GT} is guaranted at 20 % of I_{GT} max.

^{2.} For both polarities of A2 referenced to A1

T3035H, T3050H Characteristics

Table	1	Statio	characteristics	
Table	4.	Static	characteristics	

Symbol	Test conditions	Value	Unit		
V _{TM} ⁽¹⁾	$I_{TM} = 42 \text{ A}$ $t_p = 380 \mu \text{s}$ $T_j = 25 ^{\circ}\text{C}$ MAX.				V
V _{to} (1)	Threshold voltage	T _j = 150 °C	MAX.	0.85	V
R _d ⁽¹⁾	Dynamic resistance	T _j = 150 °C	MAX.	15	mΩ
	V - V	T _j = 25 °C	MAX.	10	μA
I _{DRM}	$V_{DRM} = V_{RRM}$	T _j = 150 °C	IVIAX.	8.5	
I _{RRM}	V _D /V _R = 400V (at peak mains voltage)	T _j = 150 °C	MAX.	7	mA
	V _D /V _R = 200V (at peak mains voltage)	T _j = 150 °C	IVIAA.	5.5	

^{1.} for both polarities of A2 referenced to A1.

Table 5. Thermal resistance

Symbol	Parameter			Unit
R _{th(j-c)}	Junction to case (AC)	TO-220AB	0.8	°C/W
'`th(j-c)	Sunction to case (AC)	TO-220AB Insul	1.6	C/VV
R _{th(j-a)}	Junction to ambient	TO-220AB / TO-220AB Insul	60	°C/W

- I_{T(RMS)}(A)

Figure 1. Maximum power dissipation versus rms on-state current (full cycle 180°)

P(W)

40

25

20

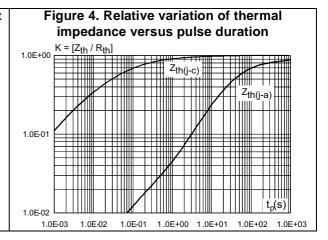
15

10

5

Figure 2. On-state rms current vs case temperature $I_{T(RMS)}(A)$ 35 30 25 TO-220AB- in s 20 10 T_C(°C) οL 0 25 50 75 100 125

Figure 3. On-state rms current versus ambient temperature (free air convection) I_{T(RMS)} (A) 3.5 3.0 2.5 2.0 1.5 1.0 0.5 T_a (°C) 0.0 50 100 150 -50 -25 0 25 75 125



Characteristics T3035H, T3050H

Figure 5. Relative variation of gate trigger current and gate trigger voltage versus junction temperature

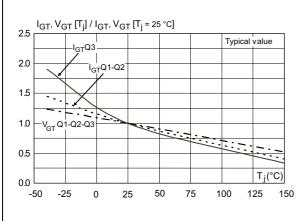


Figure 6. Relative variation of holding current and latching current vs junction temperature (typical value)

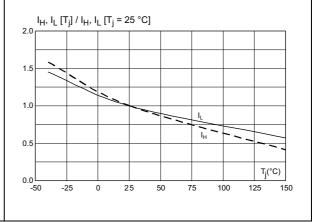


Figure 7. Surge peak on-state current vs number of cycles

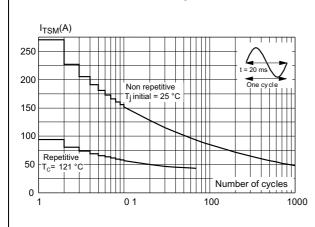


Figure 8. Non repetitive surge peak on-state current for a sinusoidal pulse

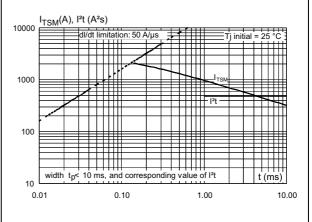


Figure 9. On state characteristics (maximum values)

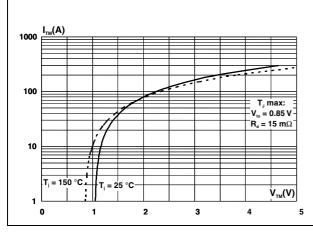
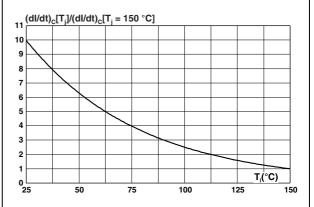


Figure 10. Relative variation of critical rate of decrease of main current verus junction temperature



T3035H, T3050H Characteristics

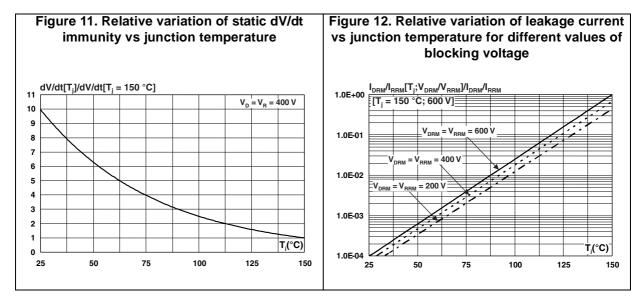
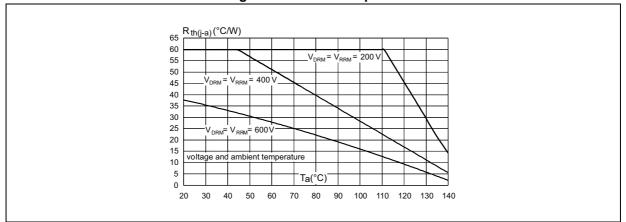


Figure 13. Acceptable junction to ambient thermal resistance versus repetitive peak off-state voltage and ambient temperature



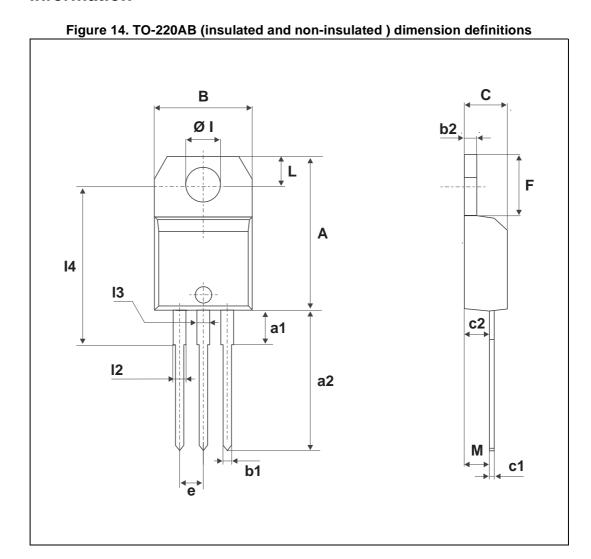
Package information T3035H, T3050H

2 Package information

- Epoxy meets UL94, V0
- 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.

2.1 TO-220AB (insulated and non-insulated) package information



T3035H, T3050H Package information

Table 6. TO-220AB package mechanical data

			Dime	nsions		
Ref.		Millimeters			Inches	
	Min.	Тур.	Max.	Min.	Тур.	Max.
А	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
В	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
С	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
е	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
14	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
12	1.14		1.70	0.044		0.066
13	1.14		1.70	0.044		0.066
М		2.60			0.102	

Ordering information T3035H, T3050H

3 Ordering information

Figure 15. Ordering information scheme

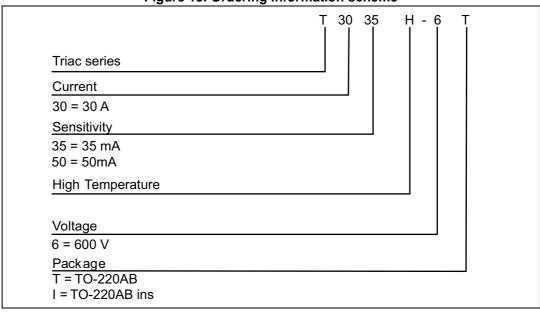


Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
T3035H-6T	T3035H 6T	TO-220AB			
T3050H-6T	T3050H 6T	10-220AB	224	50	Tube
T3035H-6I	T3035H 6I	TO-220AB	2.3 g	50	rube
T3050H-6I	T3050H 6I	Insulated			

4 Revision history

Table 8. Document revision history

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Date	Revision	Changes		
28-Jan-2010	1	Initial release.		
17-May-2010	2	Updated maximum T _j in <i>Table 2</i> .		
14-Dec-2010	3	Updated I _{GT} in <i>Table 1</i> .		
20-Sep-2011	4	Updated: Features.		
21-Jul-2015	5	Update Table 2 and reformatted to current standard.		

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