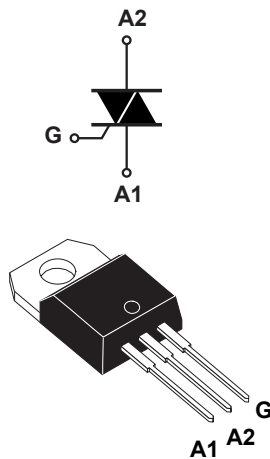


## 30 A - 800 V TO-220AB insulated H-series Snubberless™ Triac



TO-220AB insulated

### Features

- 30 A high current Triac
- 800 V symmetrical blocking voltage
- 150 °C maximum junction temperature  $T_j$
- Three triggering quadrants
- High noise immunity, static  $dV / dt$
- Robust dynamic turn-off commutation ( $di/dt$ )<sub>c</sub>
- ECOPACK®2 compliant component
- Comply with UL1557 insulation: 2.5 kV
  - Reference file: E81734

### Applications

- Home automation Smart AC plug
- Water heater, room heater and coffee machine
- AC Induction and Universal Motor control
- Inrush current limiter in AC DC rectifiers
- Lighting and automation I/O control
- General purpose AC line load control

### Description

Specifically designed to operate at 800 V and 150 °C, the **T3035H-8I** Triac provides an enhanced thermal management: this 30 A triac is the right choice for a compact drive of heavy AC loads and enables the heatsink size reduction.

Based on the ST Snubberless™ high temperature technology, it offers higher specified turn off commutation and noise immunity levels up to the  $T_j$  max.

The **T3035H-8I** safely optimizes the control of the hardest universal motors, heaters and inductive loads for industrial control and home appliances.

By using an internal ceramic pad, it provides a recognized voltage insulation, rated at 2500  $V_{RMS}$ .

Snubberless™ is a trademark of STMicroelectronics.

Product status link	
<a href="#">T3035H-8I</a>	
Product summary	
$I_{T(RMS)}$	30 A
$V_{DRM}/V_{RRM}$	800 V
$V_{DSM}/V_{RSM}$	900 V
$I_{GT}$	35 mA

# 1 Characteristics

**Table 1. Absolute maximum ratings (limiting values)**

Symbol	Parameter	Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)	$T_c = 91\text{ °C}$	30 A
$I_{TSM}$	Non repetitive surge peak on-state current (full cycle, $T_j$ initial = 25 °C)	$t = 16.7\text{ ms}$	283
		$t = 20\text{ ms}$	270
$I^2t$	$I^2t$ value for fusing	$t_p = 10\text{ ms}$	482 A <sup>2</sup> s
$di/dt$	Critical rate of rise of on-state current, $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$ , $f = 100\text{ Hz}$	$T_j = 25\text{ °C}$	100 A/ $\mu$ s
$V_{DRM}/V_{RRM}$	Repetitive peak off-state voltage		800 V
$V_{DSM}/V_{RSM}$	Non Repetitive peak off-state voltage	$t_p = 10\text{ ms}$ , $T_j = 25\text{ °C}$	900 V
$I_{GM}$	Peak gate current	$t_p = 20\text{ }\mu\text{s}$ , $T_j = 150\text{ °C}$	4 A
$P_{GM}$	Maximum gate power dissipation		5 W
$P_{G(AV)}$	Average gate power dissipation	$T_j = 150\text{ °C}$	1 W
$T_{stg}$	Storage temperature range		-40 to +150 °C
$T_j$	Operating junction temperature range		-40 to +150 °C
$T_L$	Maximum lead temperature for soldering during 10 s		260 °C
$V_{INS}$	Insulation RMS voltage, 1 minute		2.5 kV

**Table 2. Electrical characteristics ( $T_j = 25\text{ °C}$ , unless otherwise specified)**

Symbol	Test conditions	Quadrants		Value	Unit
$I_{GT}$	$V_D = 12\text{ V}$ , $R_L = 30\text{ }\Omega$	I - II - III	Min.	5	mA
	$V_D = 12\text{ V}$ , $R_L = 30\text{ }\Omega$	I - II - III	Max.	35	mA
$V_{GT}$	$V_D = 12\text{ V}$ , $R_L = 30\text{ }\Omega$	I - II - III	Max.	1.3	V
$V_{GD}$	$V_D = V_{DRM}$ , $R_L = 3.3\text{ k}\Omega$	$T_j = 150\text{ °C}$	I - II - III	Max.	0.15 V
$I_L$	$I_G = 1.2 \times I_{GT}$	I - III	Max.	75	mA
		II	Max.	90	mA
$I_H^{(1)}$	$I_T = 500\text{ mA}$ , gate open		Max.	60	mA
$dV/dt^{(1)}$	$V_D = 536\text{ V}$ , gate open	$T_j = 150\text{ °C}$	Min.	1500	V/ $\mu$ s
$(di/dt)_c^{(1)}$	Without snubber network	$T_j = 150\text{ °C}$	Min.	25	A/ms

1. For both polarities of A2 referenced to A1.

**Table 3. Static characteristics**

Symbol	Test conditions	$T_j$		Value	Unit
$V_{TM}^{(1)}$	$I_T = 42\text{ A}$ , $t_p = 380\ \mu\text{s}$	25 °C	Max.	1.55	V
$V_{TO}^{(1)}$	Threshold voltage	150 °C	Max.	0.83	V
$R_D^{(1)}$	Dynamic resistance	150 °C	Max.	16	m $\Omega$
$I_{DRM}/I_{RRM}$	$V_{DRM} = V_{RRM} = 800\text{ V}$	25 °C	Max.	5	$\mu\text{A}$
		150 °C		8.5	mA
	$V_{DRM} = V_{RRM} = 400\text{ V}$ , peak voltage	150 °C	Max.	3.6	mA

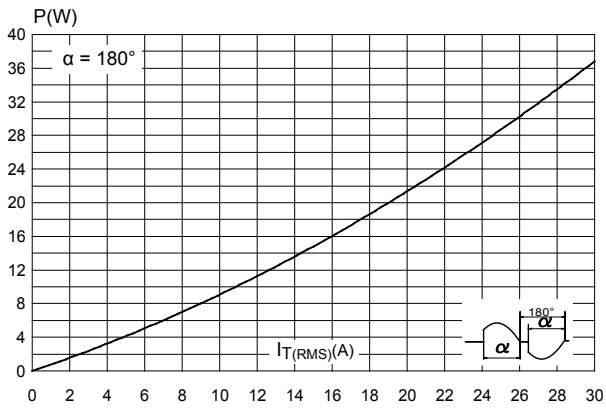
1. For both polarities of A2 referenced to A1.

**Table 4. Thermal resistance**

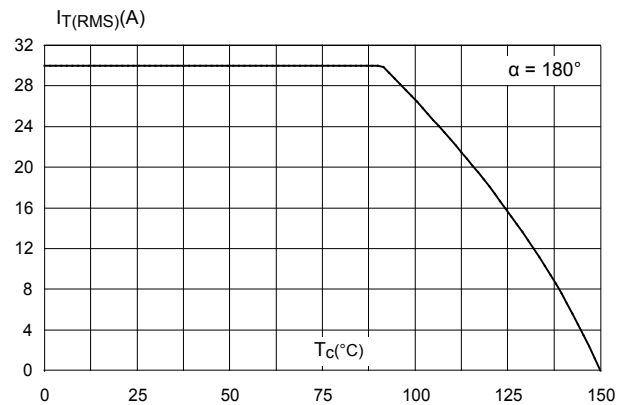
Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	Max.	1.6	°C/W
$R_{th(j-a)}$	Junction to ambient	Typ.	60	°C/W

## 1.1 Characteristics (curves)

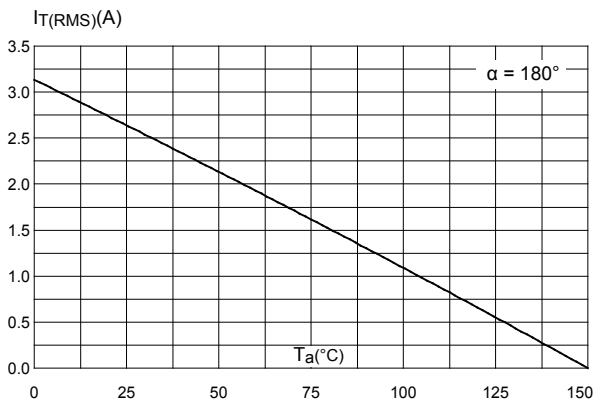
**Figure 1. Maximum power dissipation versus on-state RMS current**



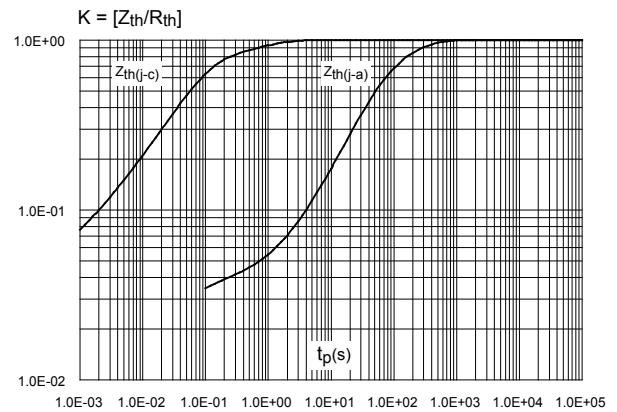
**Figure 2. On-state RMS current versus case temperature**



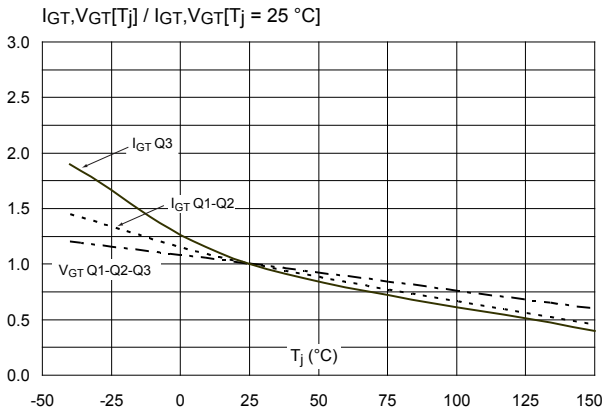
**Figure 3. On-state RMS current versus ambient temperature (free air convection)**



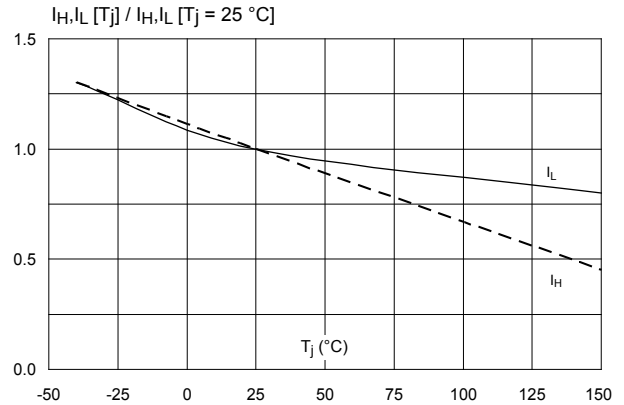
**Figure 4. Relative variation of thermal impedance versus pulse duration**



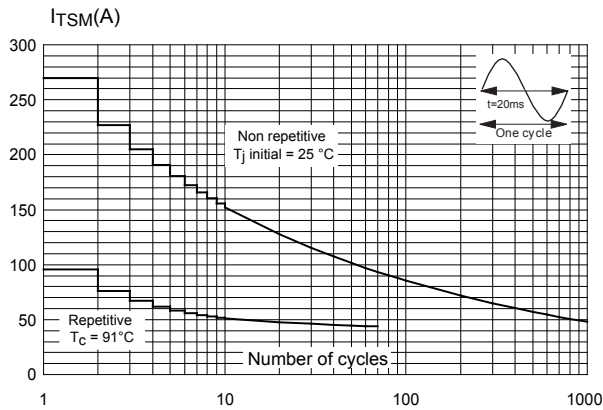
**Figure 5. Relative variation of gate trigger voltage and current versus junction temperature (typical values)**



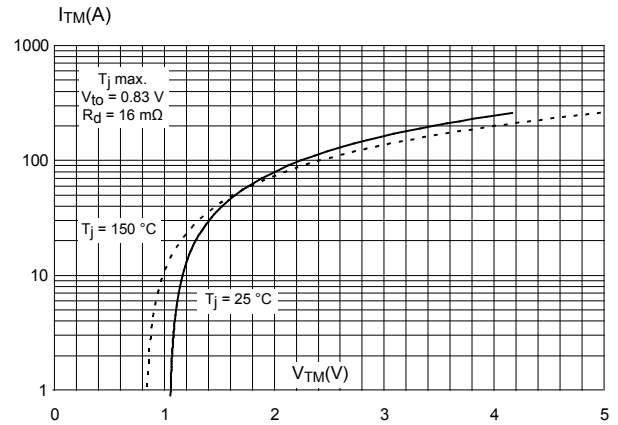
**Figure 6. Relative variation of holding current and latching current versus junction temperature (typical values)**



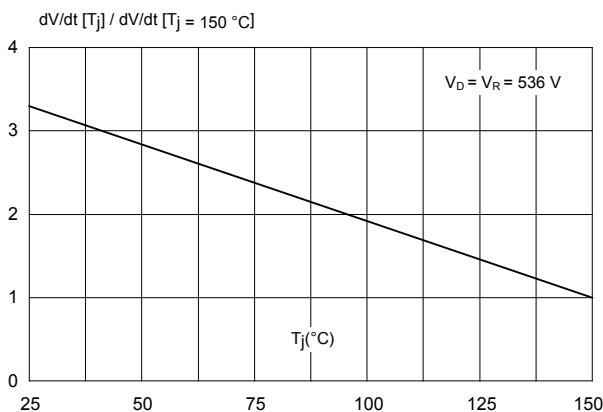
**Figure 7. Surge peak on-state current versus number of cycles**



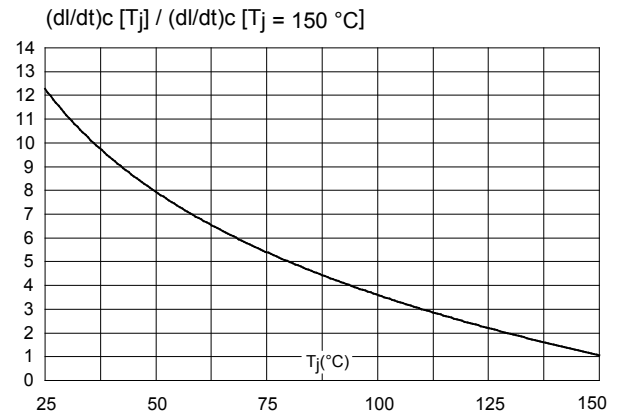
**Figure 8. On-state characteristics (maximum values)**



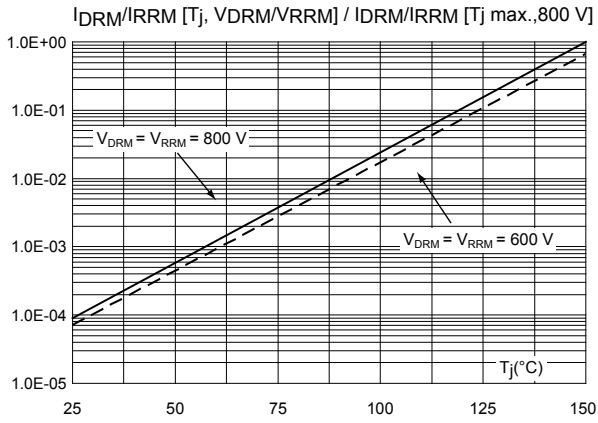
**Figure 9. Relative variation of static dV/dt immunity versus junction temperature**



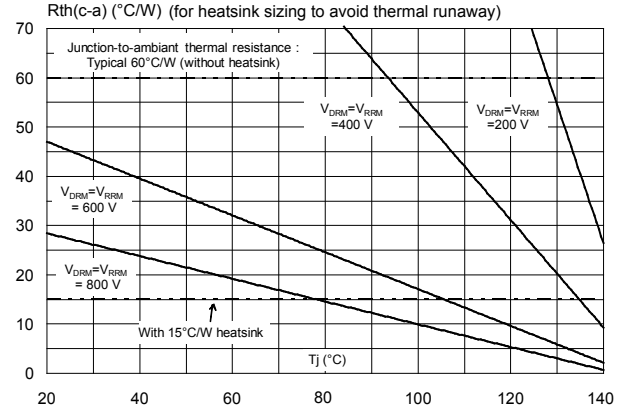
**Figure 10. Relative variation of critical rate of decrease of main current versus junction temperature**



**Figure 11. Relative variation of leakage current versus junction temperature for different values of blocking voltage**



**Figure 12. Recommended maximum case-to-ambient thermal resistance versus ambient temperature for different peak off-state voltages**



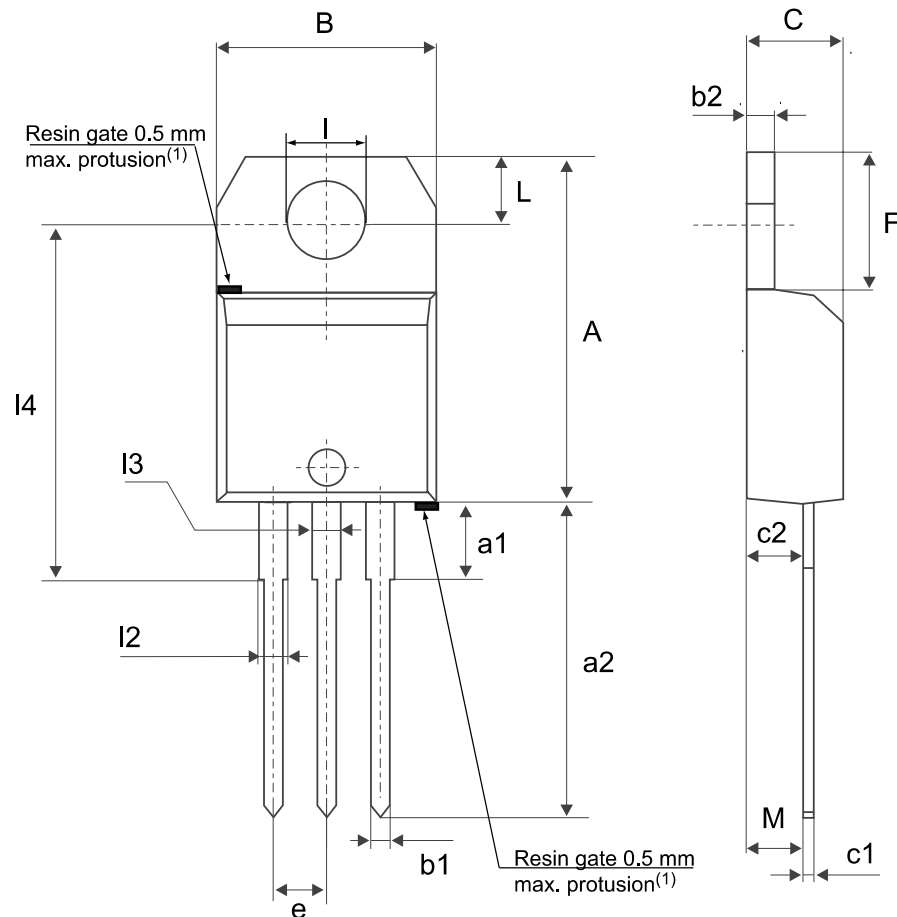
## 2 Package information

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](http://www.st.com). ECOPACK® is an ST trademark.

### 2.1 TO-220AB insulated package information

- Epoxy resin is halogen free and meets UL94 flammability standard, level V0
- Lead-free plating package leads
- Recommended torque: 0.4 to 0.6 N·m

Figure 13. TO-220AB insulated package outline



(1) Resin gate position accepted in one of the two positions or in the symmetrical opposites.

**Table 5. TO-220AB insulated package mechanical data**

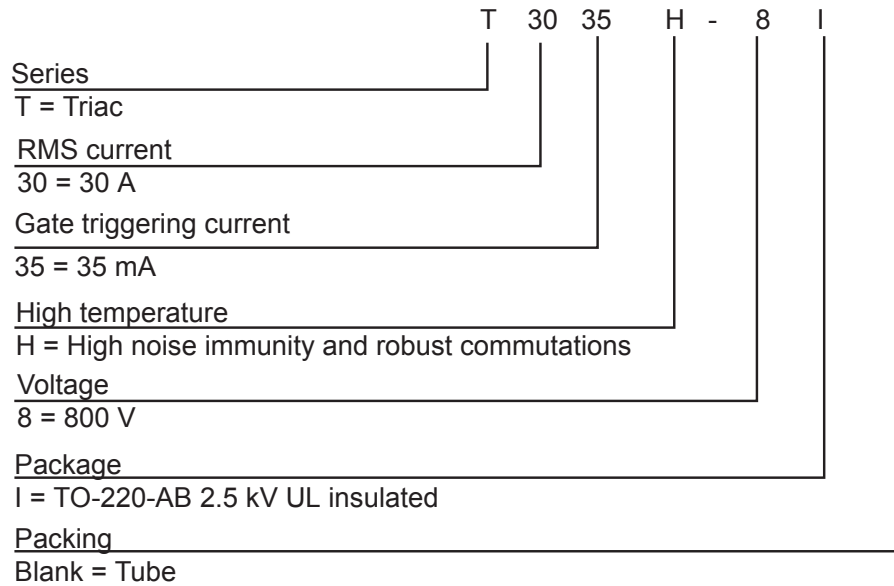
Ref.	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.5984		0.6260
a1		3.75			0.1476	
a2	13.00		14.00	0.5118		0.5512
B	10.00		10.40	0.3937		0.4094
b1	0.61		0.88	0.0240		0.0346
b2	1.23		1.32	0.0484		0.0520
C	4.40		4.60	0.1732		0.1811
c1	0.49		0.70	0.0193		0.0276
c2	2.40		2.72	0.0945		0.1071
e	2.40		2.70	0.0945		0.1063
F	6.20		6.60	0.2441		0.2598
l	3.73		3.88	0.1469		0.1528
L	2.65		2.95	0.1043		0.1161
l2	1.14		1.70	0.0449		0.0669
l3	1.14		1.70	0.0449		0.0669
l4	15.80	16.40	16.80	0.6220	0.6457	0.6614
M		2.6			0.1024	

1. Inch dimensions are for reference only.



### 3 Ordering information

**Figure 14. Ordering information scheme**



**Table 6. Ordering information**

Marking	Package	Weight	Base qty.	Delivery mode
T3035H-8I	TO-220AB Ins.	2.3 g	50	Tube

## Revision history

**Table 7. Document revision history**

Date	Version	Changes
27-Jul-2018	1	Initial release.

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