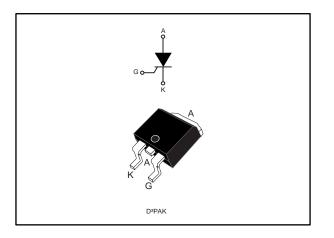


TN4015H-6G

High temperature 40 A SCRs

Datasheet - production data



Features

- High junction temperature: $T_i = 150 \ ^{\circ}C$
- High noise immunity $dV/dt = 500 V/\mu s$ up to 150 °C
- Gate triggering current IGT = 15 mA
- Off-state voltage 600 V VDRM/VRRM
- High turn on current rise $dI/dt = 100 A/\mu s$
- ECOPACK[®]2 compliant component

Applications

- Motorbike voltage regulator circuits
- Inrush current limiting circuit
- Motor control circuits and starters
- Solid state relays

Description

Thanks to its junction temperature T_i up to 150 °C, the device offers high thermal performance operation up to 40 A. Its D²PAK package allows modern SMD designs as well as compact back to back configuration.

Its trade-off noise immunity ($dV/dt = 500 V/\mu s$) versus its gate triggering current ($I_{GT} = 15 \text{ mA}$) and its turn-on current rise (dl/dt = $100 \text{ A/}\mu\text{s}$) allow to design robust and compact control circuit for voltage regulator in motorbikes and industrial drives, overvoltage crowbar protection, motor control circuits in power tools and kitchen appliances, inrush current limiting circuits.

Table 1: Device summary

Order code	Package	Vdrm/Vrrm	Іст
TN4015H-6G	D ² PAK	600 V	15 mA

May 2017

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www.st.com

This is information on a product in full production.

1 **Characteristics**

Table 2: Absolute maximum ratings (limiting values), T _j	_j = 25 °C unless otherwise specified
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Symbol	Param	Value	Unit			
I _{T(RMS)}	RMS on-state current (180 ° conduction angle)	T _c = 119 °C	40	А		
			T _c = 120 °C	25		
I _{T(AV)}	Average on-state current (180 ° conduction angle)		T _c = 125 °C	22	А	
			T _c = 128 °C	20		
	Non repetitive ourge peok on of	ata aurrant	t _p = 8.3 ms	394	٨	
Ітѕм	Non repetitive surge peak on-si	titive surge peak on-state current		360	A	
l²t	I ² t value for fusing	t _p = 10 ms	648	A ² s		
dl/dt	Critical rate of rise of on-state c $I_G = 2 \times I_{GT}$, tr $\leq 100 \text{ ns}$	f = 60 Hz	100	A/µs		
Vdrm/Vrrm	Repetitive peak off-state voltag	е	T _j = 150 °C	600	V	
Vdsm/Vrsm	Non repetitive surge peak off-st	tate voltage	t _p = 10 ms	V _{DRM} /V _{RRM} + 100	V	
I _{GM}	Peak gate current	t _p = 20 μs	T _j = 150 °C	4	А	
P _{G(AV)}	Average gate power dissipation	1	W			
V _{RGM}	Maximum peak reverse gate vo	5	V			
T _{stg}	Storage junction temperature ra	-40 to +150	°C			
Tj	Maximum operating junction ter	mperature		-40 to +150	°C	

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

Symbol	Test conditions		Value	Unit	
lgт			Max.	15	mA
Vgt	$V_{D} = 12 V, R_{L} = 33 \Omega$		Max.	1.3	V
V _{GD}	$V_D = V_{DRM}, R_L = 3.3 \text{ k}\Omega$	T _j = 150 °C	Min.	0.15	V
Ін	I⊤ = 500 mA, gate open	Max.	60	mA	
١L	I _G = 1.2 x I _{GT}	Max.	80	mA	
dV/dt	V _D = 402 V, gate open	Min.	500	V/µs	
t _{gt}	$I_{TM} = 80 \text{ A}, V_D = 402 \text{ V}, I_G = 30 \text{ mA}, (dI_G/dt) \text{ max} = 0.2 \text{ A}/\mu \text{s}$ Typ.				μs
tq	$ I_{TM} = 80 \ A, \ V_D = 402 \ V, \ (d_I/dt) off = 30 \ A/\mu s, \\ V_R = 25 \ V, \ dV_D/dt = 50 \ V/\mu s $	T _j = 150 °C	Тур.	85	μs



Characteristics

Table 4: Static characteristics						
Symbol	Test conditions	Test conditions Valu				
Vтм	I _{TM} = 80 A, t _p = 380 μs	T _j = 25 °C	Max.	1.6	V	
Vто	Threshold voltage	T _j = 150 °C	Max.	0.85	V	
RD	Dynamic resistance $T_j = 1$		Max.	10	mΩ	
I _{DRM} , I _{RRM}		T _j = 25 °C	Max.	10	μA	
	$V_{D} = V_{DRM} = V_{RRM}$	T _j = 150 °C	ividă.	6	mA	

Table 5: Thermal parameters

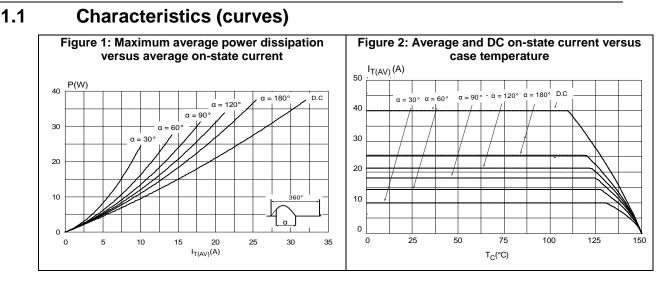
Symbol	Paramete	Value	Unit		
R _{th(j-c)}	Junction to case (DC)	Max.	0.8	80 AA/	
R _{th(j-a)}	Junction to ambient (DC) $S^{(1)} = 1 \text{ cm}^2$		Тур.	45	°C/W

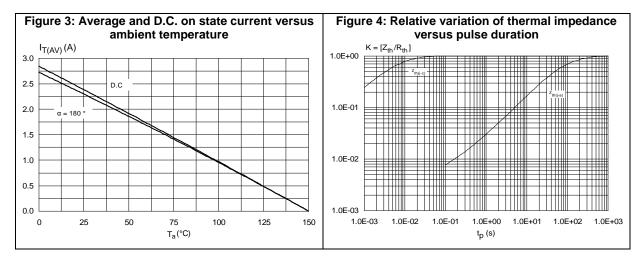
Notes:

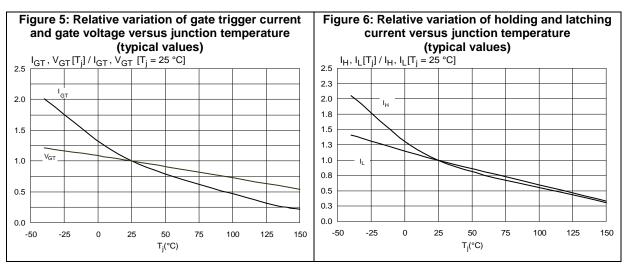
 $^{(1)}S$ = Copper surface under tab



Characteristics







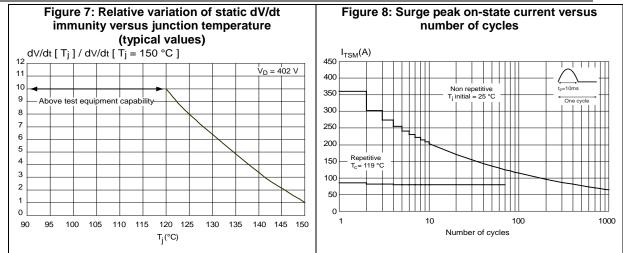
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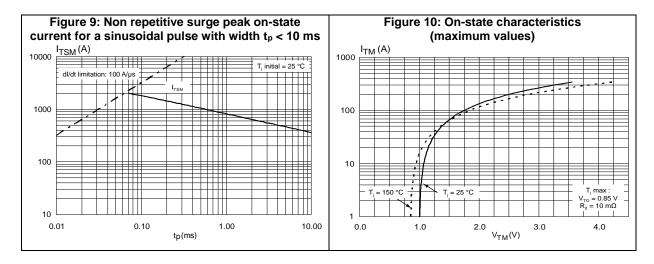
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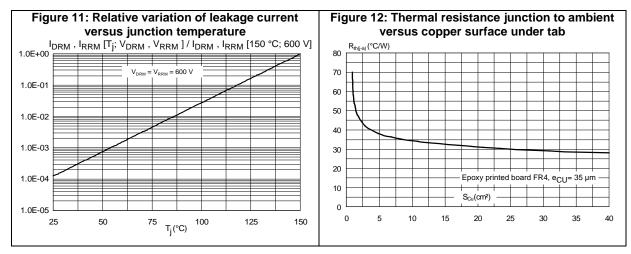


TN4015H-6G

Characteristics







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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*. ECOPACK[®] is an ST trademark.

- Epoxy meets UL94, V0
- Lead-free, halogen-free package

2.1 D²PAK package information

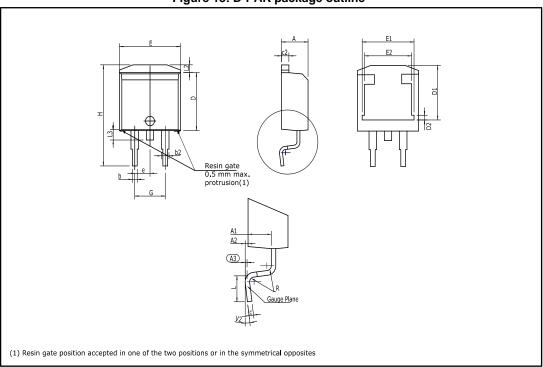


Figure 13: D²PAK package outline



TN4015H-6G

Package information

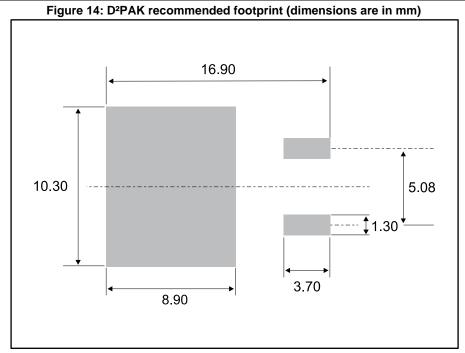
	Table 6: D ² PAK package mechanical data					
			Di	imensions		
Ref.		Millimeters			Inches ⁽¹⁾	
	Min.	Тур.	Max.	Min.	Тур.	Max.
А	4.30		4.60	0.1693		0.1811
A1	2.49		2.69	0.0980		0.1059
A2	0.03		0.23	0.0012		0.0091
A3		0.25			0.0098	
b	0.70		0.93	0.0276		0.0366
b2	1.25		1.7	0.0492		0.0669
С	0.45		0.60	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
е	2.54			0.1		
Е	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
Н	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	
V2	0°		8°	0°		8°

Notes:

 $\ensuremath{^{(1)}}\xspace$ Dimensions in inches are given for reference only



Package information



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3 Ordering information

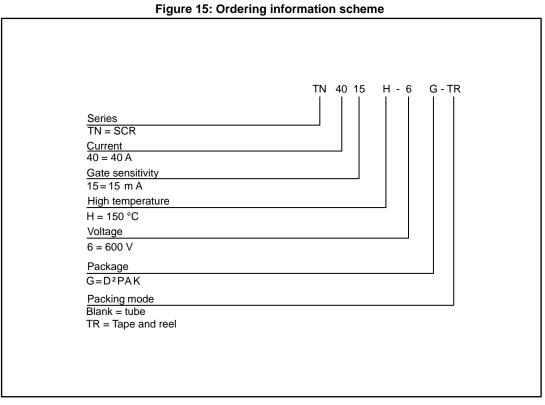


Table	7:	Ordering	information
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Order code	Marking	Package	Weight	Base qty.	Delivery mode
TN4015H-6G	TN4015H6	D ² PAK	1.5 g	50	Tube
TN4015H-6G-TR	TN4015H6	D ² PAK	1.5 g	1000	Tape and reel

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
01-Aug-2016	1	Initial release.
22-May-2017	2	Updated Figure 13: "D2PAK package outline".



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