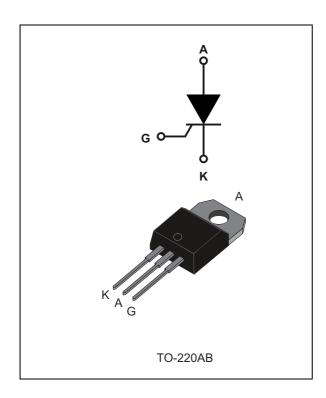
TN2015H-6T



High temperature 20 A SCRs

Datasheet - production data



Description

Thanks to a junction temperature T_j up to 150 °C and a non-isolated TO-220 package, the TN2015H-6T offers high thermal performance up to 20 A rms.

The trade-off between the device's noise immunity (dV/dt = 750 V/ μ s), its gate triggering current (I_{GT} = 15 mA) and its turn-on current rise (dI/dt = 100 A/ μ s) allows the design of robust and compact control circuits for voltage regulators in motorbikes and industrial drives, overvoltage crowbar protection, motor control circuits in power tools and kitchen appliances, and inrush current limiting circuits.

Table 1. Device summary

Order code	Package	V_{DRM}/V_{RRM}	I _{GT}
TN2015H-6T	TO-220AB	600 V	15 mA

Features

- High junction temperature: T_i = 150 °C
- High noise immunity dV/dt = 750 V/μs up to 150 °C
- Gate triggering current I_{GT} = 15 mA
- Blocking voltage V_{DRM}/V_{RRM} = 600 V
- High turn on current rise dl/dt: 100 A/µs
- ECOPACK[®]2 compliant component

Applications

- · Voltage regulator circuits for motorbikes
- · Inrush current limiting circuits
- · Motor control circuits and starters
- Light dimmers
- Solid state relays

Characteristics TN2015H-6T

1 Characteristics

Table 2. Absolute ratings

Symbol	Parameter	Value	Unit			
I _{T(RMS)}	On-state rms current (180° conduction a	T _c = 132 °C	20	Α		
			T _C = 132 °C	12.7		
I _{T(AV)}	Average on-state current (180° conduction	T _c = 137 °C	10	Α		
			T _c = 140 °C	8		
l	Non repetitive surge peak on-state curre	nt	t = 8.3 ms	197	Α	
TSM	$(T_j \text{ initial} = 25 °C)$		t = 10 ms	180	A	
l ² t	I^2 t value for fusing (T_j initial = 25 °C)	$t_p = 10 \text{ ms}$	162	A ² s		
dl/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \le 100 \text{ ns}$, $T_j = 25 \text{ °C}$	100	A/µs			
V _{DRM} , V _{RRM}	Repetitive peak off-state voltage			600	V	
I_{GM}	Peak gate current $t_p = 20 \mu s$		T _j = 150 °C	4	Α	
P _{G(AV)}	Average gate power dissipation	1	V			
T _{stg} T _j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 150	°C	
T _L	Maximum lead temperature for soldering during 10 s			260	ç	

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

Symbol	Test conditions			Value	Unit
1.	V 40 V D 00 0		Тур.	6	mA
I _{GT}	$V_D = 12 \text{ V}, R_L = 33 \Omega$	Max.	15	IIIA	
V _{GT}	$V_D = 12 \text{ V}, R_L = 33 \Omega$		Max.	1.3	V
V _{GD}	$V_D = V_{DRM}, R_L = 3.3 \text{ k}\Omega$	$V_D = V_{DRM}, R_L = 3.3 \text{ k}\Omega$ $T_j = 150 \text{ °C}$		0.2	V
I _H	I _T = 500 mA, gate open			50	mA
IL	$I_G = 1.2 \times I_{GT}$		Max.	60	mA
dV/dt	$V_D = 402 \text{ V, gate open}$ $T_j = 150 \text{ °C}$		Min.	750	V/µs
t _{gt}	$I_T = 40 \text{ A}, V_D = 600 \text{ V}, I_G = 100 \text{ mA},$ $(dI_G/dt)\text{max} = 0.2 \text{ A/}\mu\text{s}$		Тур	1.9	μs
t _q	$V_D = 402 \text{ V}, V_R = 25 \text{ V}, I_T = 20 \text{ A}, \\ (dI_G/dt) max = 30 \text{A}/\mu\text{s}, dV_D/dt = 50 \text{ V}/\mu\text{s} $ $T_j = 150 \text{ °C}$		Тур	70	μs

TN2015H-6T Characteristics

Table 4. Static characteristics

Symbol	Test conditions			Value	Unit
V_{TM}	$I_{TM} = 40 \text{ A}, t_p = 380 \mu\text{s}$	T _j = 25 °C	Max.	1.6	V
V _{t0}	Threshold voltage	T _j = 150 °C	Max.	0.82	V
R _d	Dynamic resistance	T _j = 150 °C	Max.	17.5	mΩ
I _{DRM,}	I _{DRM} , V – V – V	T _j = 25 °C	Max.	5	μΑ
I_{RRM} $V_D = V_{DRM}, V_R = V_{RRM}$	VD - VDRM, VR - VRRM	T _j = 150 °C	iviax.	2	mA

Table 5. Thermal resistance

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case (AC)	1.0	°C/W
R _{th(j-a)}	Junction to ambient (DC)	60	°C/W

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

20 P(W) α = 180°. DC. 18 α = 120° α = 90° 16 14 $\alpha = 30$ 12 10 8 6 4 2 $I_{\mathsf{T}(\mathsf{AV})}(\mathsf{A})$ 15 10

Figure 2. Average and DC on-state current versus case temperature

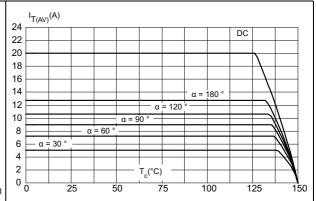
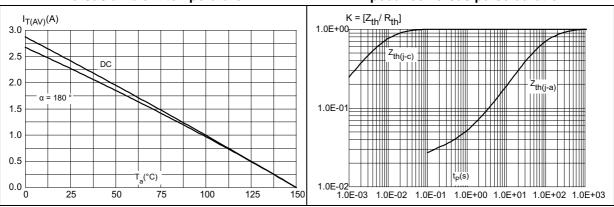


Figure 3. Average and DC on-state current versus ambient temperature

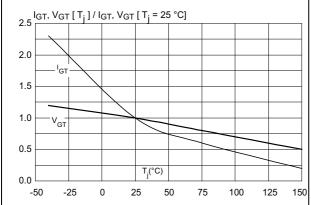
Figure 4. Relative variation of thermal impedance versus pulse duration



Characteristics TN2015H-6T

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

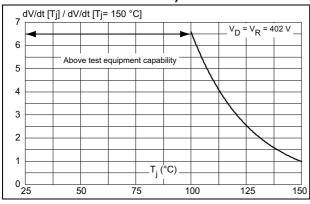
Figure 6. Relative variation of holding current and latching current versus junction temperature (typical values)



2.5 2.0 1.5 1.0 0.5 0.0 -50 -25 0 25 50 75 100 125 150

Figure 7. Relative variation of static dV/dt immunity versus junction temperature (typical values)

Figure 8. Surge peak on-state current versus number of cycles



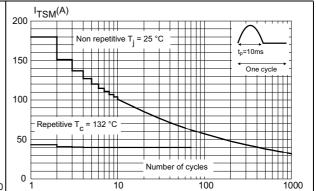
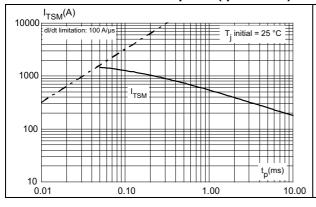
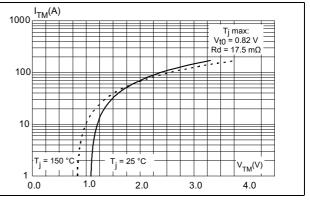


Figure 9. Non-repetitive surge peak on-state current for a sinusoidal pulse (tp < 10 ms)

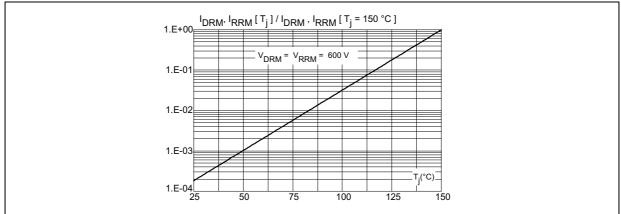
Figure 10. On-state characteristics (maximum values)





TN2015H-6T Characteristics

Figure 11. Relative variation of leakage current versus junction temperature (tp < 10 ms)



Package information TN2015H-6T

2 Package information

- Epoxy meets UL94, V0
- Lead-free package
- Halogen free molding compound
- 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.

B Ø I b2 F F A A I2 C2 M C1

Figure 12. TO-220AB dimension definitions

TN2015H-6T Package information

Table 6. TO-220AB dimension values

	Dimensions						
Ref.		Millimeters	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	
l2	1.14		1.70	0.044		0.066	
13	1.14		1.70	0.044		0.066	
М		2.60			0.102		

Ordering information TN2015H-6T

3 Ordering information

Figure 13. Ordering information scheme

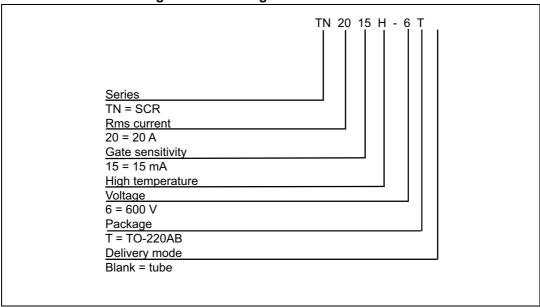


Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
TN2015H-6T	TN2015H6	TO-220AB	2.3 g	50	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
25-Feb-2015	1	Initial release.

IMPORTANT NOTICE - PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2015 STMicroelectronics - All rights reserved



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

STMicroelectronics: TN2015H-6T