NCR200W-10M

SCR

Rev.01 - 16 July 2026 Product data sheet

1. General description

Planar passivated SCR with sensitive gate in a SOT223 surface mountable plastic package. This SCR is designed to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

2. Features and benefits

- On-state RMS current, 2 A
- Repetitive peak off-state voltage, 1000 V
- High surge current capability
- Direct triggering from low power drivers and logic ICs
- Planar passivated for voltage ruggedness and reliability
- Surface mountable package

3. Applications

- GFCI (Ground Fault Circuit Interrupter)
- AFCI (Arc Fault Circuit Interrupter)
- RCD (Residual Current Device)
- RCBO (Residual Current circuit Breaker with Overload protection)
- AFDD (Arc Fault Detection Device)

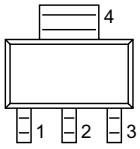
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
V_{DRM}	repetitive peak off-state voltage			1000			V
$I_{T(AV)}$	average on-state current	half sine wave; $T_c \leq 98$ °C; Fig. 1; Fig. 2; Fig. 3		1.3			A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_c \leq 98$ °C; Fig. 1; Fig. 2; Fig. 3		2			A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(init)} = 25$ °C; $t_p = 10$ ms; Fig. 4; Fig. 5		23			A
		half sine wave; $T_{j(init)} = 25$ °C; $t_p = 8.3$ ms		25			A
T_j	operating junction temperature			-40 to 125			°C
Symbol	**Parameter**	**Conditions**	**Notes**	**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
I_{GT}	gate trigger current	$V_D = 12$ V; $I_T = 0.1$ A; $R_L = 100$ Ω; $T_j = 25$ °C; Fig. 8		10	-	200	µA
I_H	holding current	$V_D = 12$ V; $R_{GK} = 1$ kΩ; $T_j = 25$ °C; Fig. 10		-	-	3	mA
V_T	on-state voltage	$I_T = 2.5$ A; $T_j = 25$ °C; Fig. 11		-	-	1.45	V
Dynamic characteristics							
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 670$ V; $T_j = 125$ °C; $R_{GK} = 1$ kΩ; (V_{DM} = 67% of V_{DRM}); exponential waveform; gate open circuit		50	-	-	V/µs

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
3	G	gate		
4	A	mounting base; connected to anode		

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
NCR200W-10M	SOT223	NCR200W-10MF	Reel	4000	SOT223	16-Mar-2006

7. Marking

Table 4. Marking codes

Type number	Marking codes	
	Assembly factory: d	Assembly factory: L
NCR200W-10M	Jdxxx 20010M	JLxxx 20010M

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8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Values	Unit
V_{DRM}	repetitive peak off-state voltage		1000	V
V_{RRM}	repetitive peak reverse voltage		1000	V
$I_{T(AV)}$	average on-state current	half sine wave; $T_c \leq 98$ °C; Fig. 1; Fig. 2; Fig. 3	1.3	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_c \leq 98$ °C; Fig. 1; Fig. 2; Fig. 3	2	A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(init)} = 25$ °C; $t_p = 10$ ms; Fig 4; Fig 5	23	A
		half sine wave; $T_{j(init)} = 25$ °C; $t_p = 8.3$ ms	25	A
I^2t	I^2t for fusing	$t_p = 10$ ms; sine-wave pulse	2.645	A^2s
dI_T/dt	rate of rise of on-state current	$I_G = 10$ mA	500	A/µs
I_{GM}	peak gate current	$t_p = 20$ us; $T_j = 125$ °C	1.2	A
P_{GM}	peak gate power		2	W
$P_{G(AV)}$	average gate power	over any 20 ms period	0.2	W
T_{stg}	storage temperature		-40 to 150	°C
T_j	operating junction temperature		-40 to 125	°C

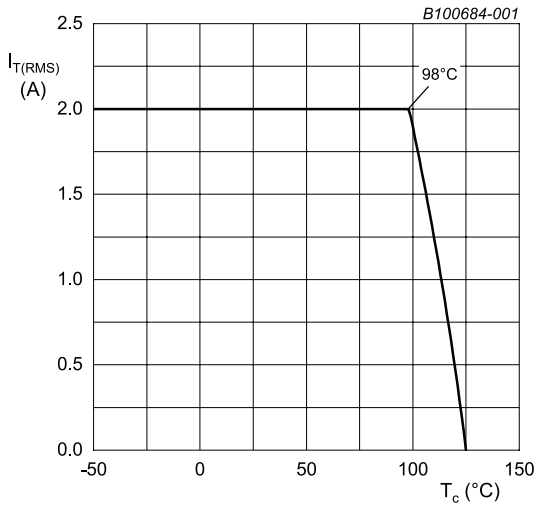
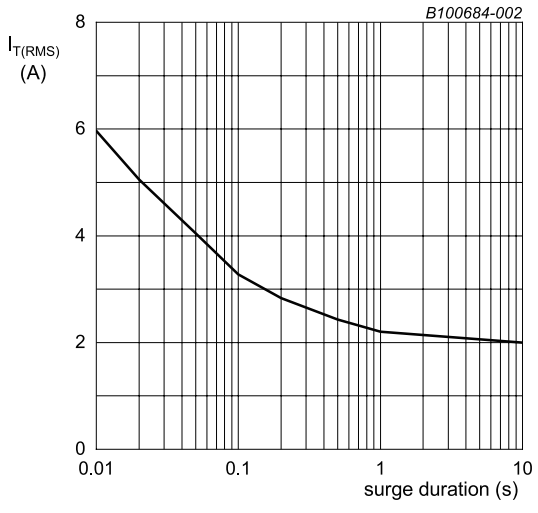


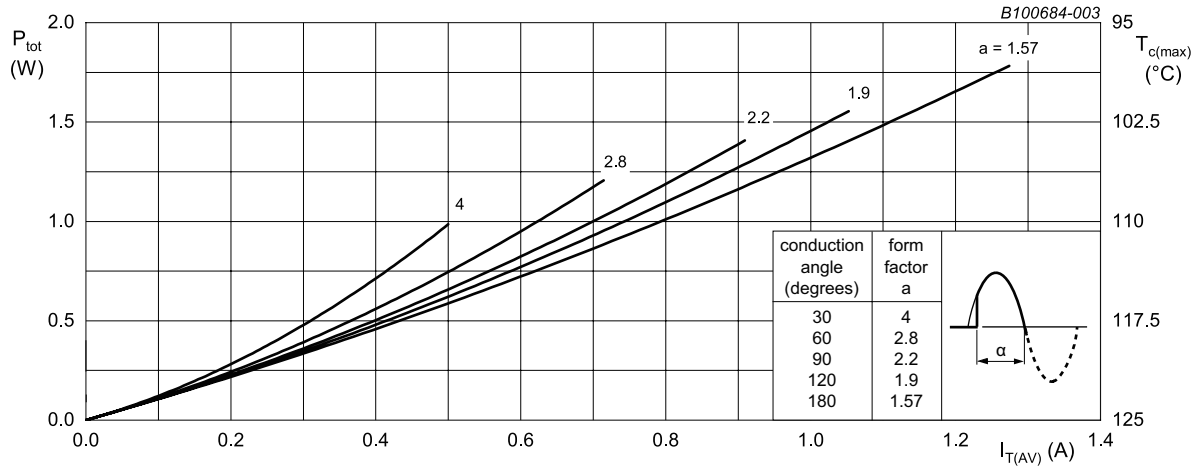
Fig. 1. RMS on-state current as a function of case temperature; maximum values



f = 50 Hz; T_c = 98 °C

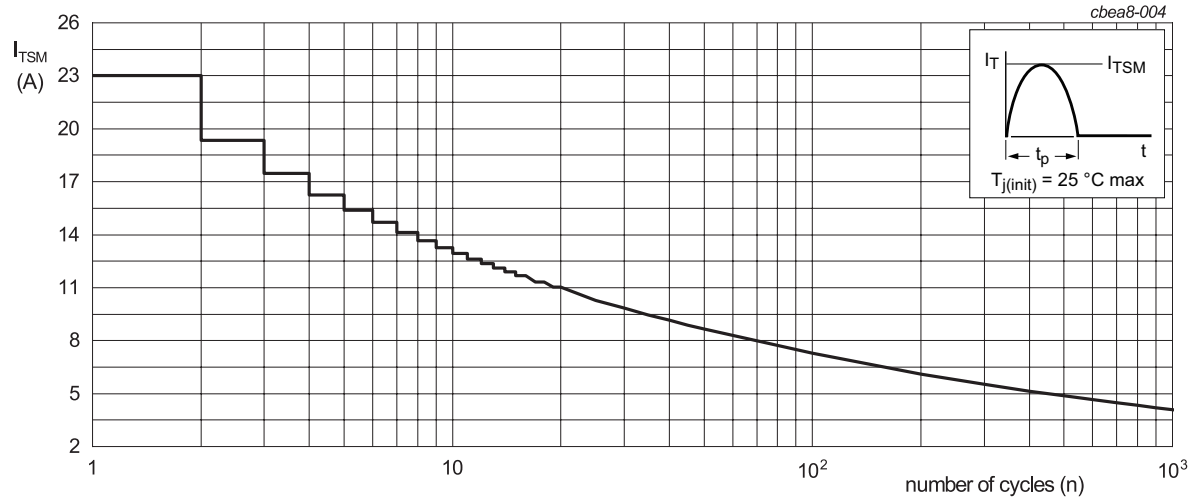
Fig. 2. RMS on-state current as a function of surge duration; maximum values

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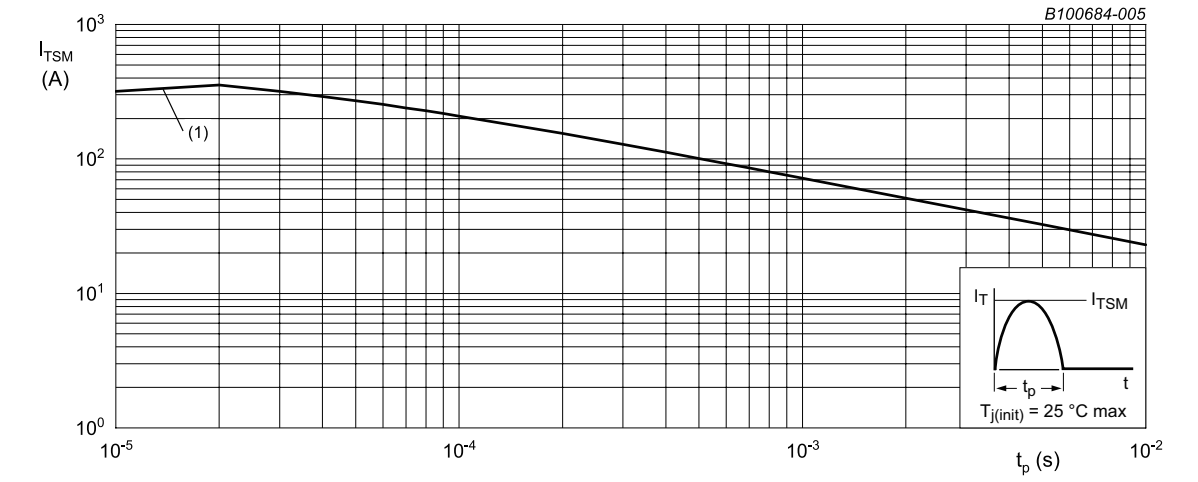
α = conduction angle
a = form factor = $I_{T(RMS)}$ / $I_{T(AV)}$

Fig. 3. Total power dissipation as a function of RMS on-state current; maximum values



f = 50 Hz

Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values



$t_p \leq 10$ ms
(1) dI_T/dt limit

Fig. 5. Non-repetitive peak on-state current as a function of pulse duration; maximum values

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9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	Fig 6		-	-	15	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; printed circuit board mounted: minimum footprint; Fig 7		-	120	-	K/W

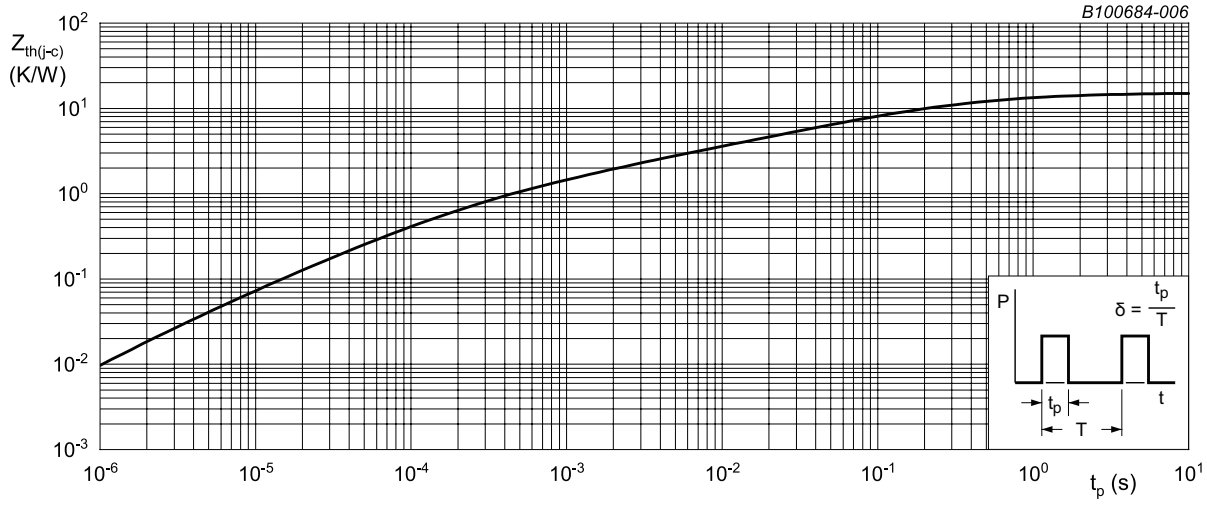
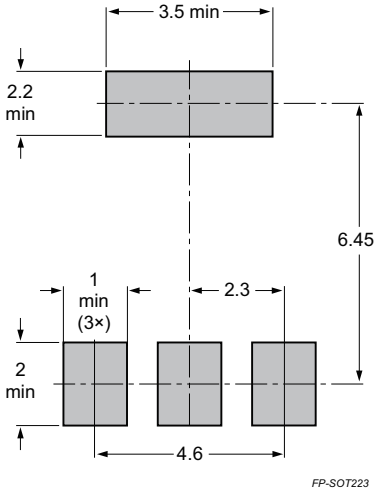


Fig. 6. Transient thermal impedance from junction to case as a function of pulse duration



All dimensions are in mm

Fig. 7. Minimum footprint SOT223

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10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
I_{GT}	gate trigger current	V_D = 12 V; I_T = 0.1 A; R_L = 100 Ω; T_j = 25 °C; Fig. 8		10	-	200	µA
I_L	latching current	V_D = 12 V; I_T = 0.1 A; R_{GK} = 1 kΩ; T_j = 25 °C; Fig. 9		-	-	5	mA
I_H	holding current	V_D = 12 V; R_{GK} = 1 kΩ; T_j = 25 °C; Fig. 10		-	-	3	mA
V_T	on-state voltage	I_T = 2.5 A; T_j = 25 °C; Fig. 11		-	-	1.45	V
V_{GT}	gate trigger voltage	V_D = 12 V; I_T = 0.1 A; R_L = 100 Ω; T_j = 25 °C; Fig. 12		-	-	0.8	V
		V_D = 800 V; I_T = 0.1 A; R_L = 100 Ω; T_j = 125 °C; Fig. 12		0.25	-	-	V
V_{RG}	gate reverse voltage	I_{RG} = 2 mA; T_j = 25 °C		10	-	-	V
I_D	off-state current	V_D = 1000 V; R_{GK} = 1 kΩ; T_j = 25 °C		-	-	1	µA
		V_D = 1000 V; R_{GK} = 1 kΩ; T_j = 125 °C		-	-	100	µA
I_R	reverse current	V_R = 1000 V; R_{GK} = 1 kΩ; T_j = 25 °C		-	-	1	µA
		V_R = 1000 V; R_{GK} = 1 kΩ; T_j = 125 °C		-	-	100	µA
Dynamic characteristics							
dV_D/dt	rate of rise of off-state voltage	V_{DM} = 670 V; T_j = 125 °C; (V_{DM} = 67% of V_{DRM}); exponential waveform; gate open circuit		50	-	-	V/µs

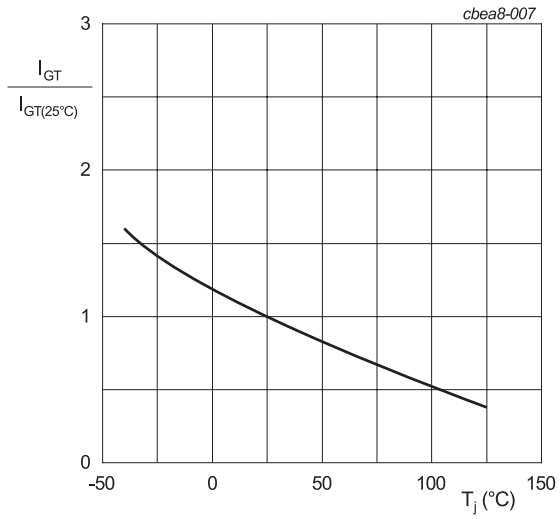


Fig. 8. Normalized gate trigger current as a function of junction temperature

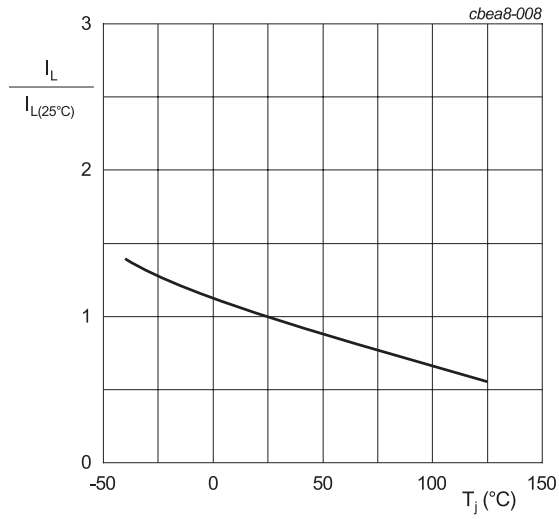


Fig. 9. Normalized latching current as a function of junction temperature

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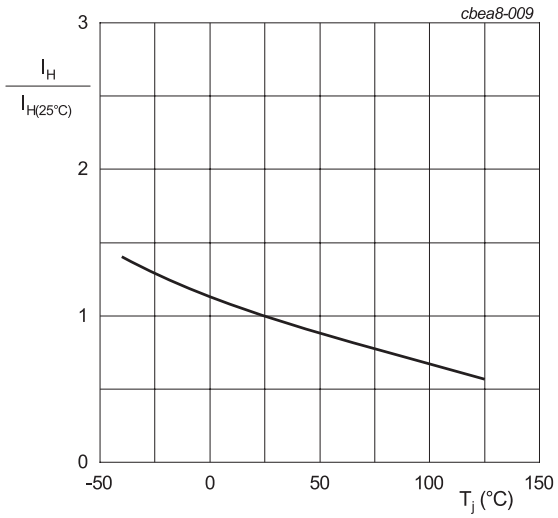
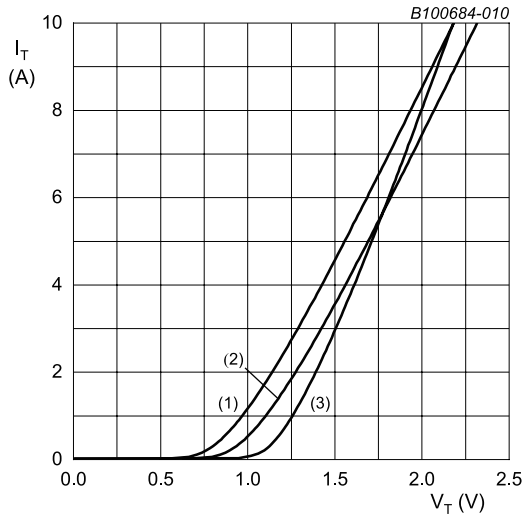


Fig. 10. Normalized holding current as a function of junction temperature



V_o = 1.031 V; R_s = 0.1175 Ω
(1) T_j = 125 °C; typical values
(2) T_j = 125 °C; maximum values
(3) T_j = 25 °C; maximum values

Fig. 11. On-state current as a function of on-state voltage

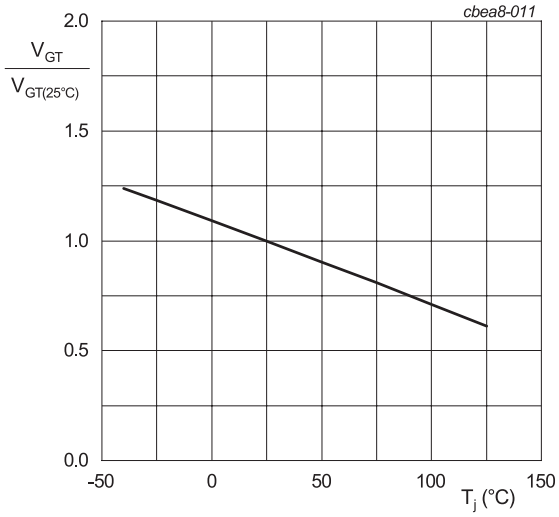


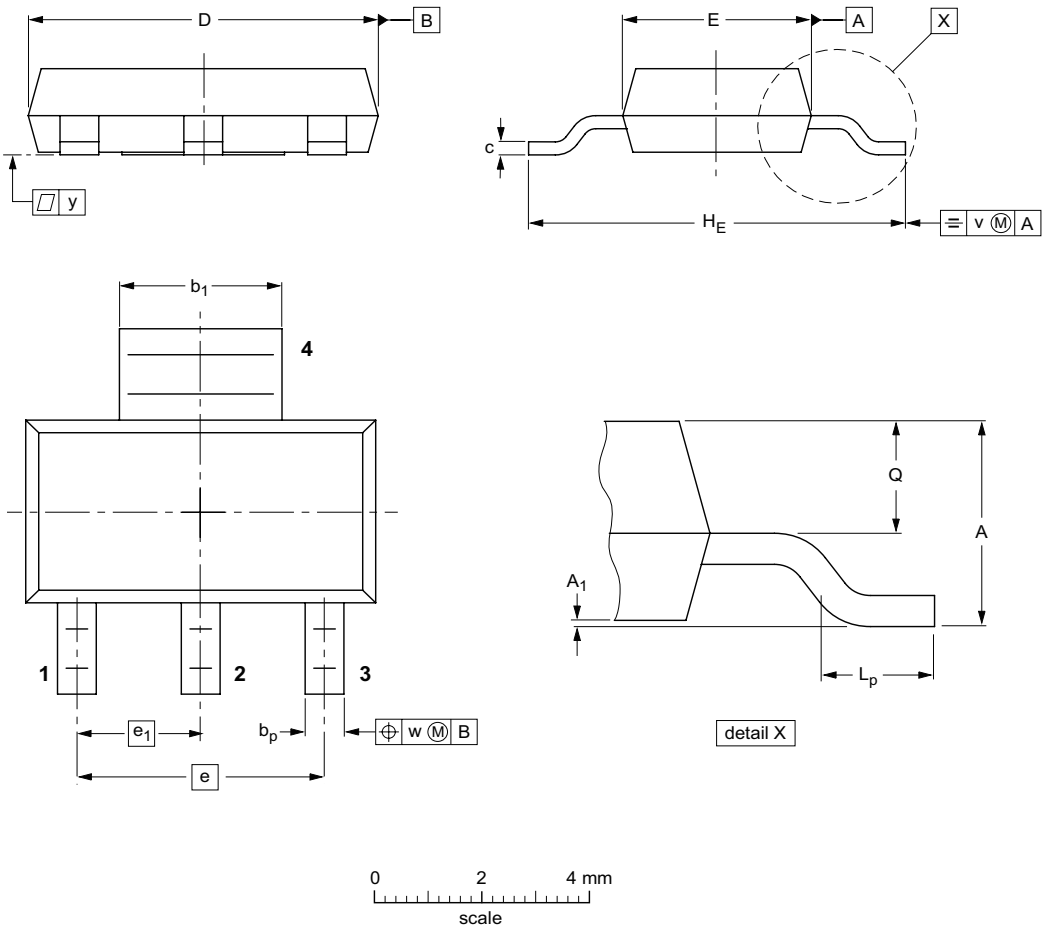
Fig. 12. Normalized gate trigger voltage as a function of junction temperature

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12. Package outline

Plastic surface-mounted package with increased heatsink; 4 leads **SOT223**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b_p	b_1	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT223			SC-73			~~04-11-10~~ 06-03-16

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