

1. General description

Planar passivated sensitive gate four quadrant triac in a SOT223-2L surface-mountable plastic package intended for applications requiring direct interfacing to logic level ICs and low power gate drivers.

2. Features and benefits

- Direct interfacing to logic level ICs
- Direct interfacing to low power gate drive circuits
- High blocking voltage capability
- Planar passivated for voltage ruggedness and reliability
- Surface-mountable package
- Triggering in all four quadrants
- Very sensitive gate

3. Applications

- General purpose low power motor control
- Home appliances
- Industrial process control
- Low power AC Fan controllers

4. Quick reference data

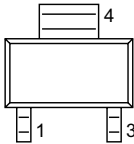
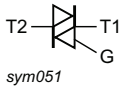
Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V _{DRM}	repetitive peak off-state voltage			800			V
V _{RRM}	repetitive peak reverse voltage			800			V
I _{T(RMS)}	RMS on-state current	full sine wave; T _{sp} ≤ 77 °C; Fig. 1 ; Fig. 2 ; Fig. 3		2			A
I _{TSM}	non-repetitive peak on-state current	full sine wave; T _{j(init)} = 25 °C; t _p = 20 ms; Fig. 4 ; Fig. 5		16			A
		full sine wave; T _{j(init)} = 25 °C; t _p = 16.7 ms		18			A
T _j	operating junction temperature			-40 to 150			°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; T2+ G+; T _j = 25 °C; Fig. 7		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2+ G-; T _j = 25 °C; Fig. 7		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2- G-; T _j = 25 °C; Fig. 7		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2- G+; T _j = 25 °C; Fig. 7		-	-	25	mA

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
I _H	holding current	V _D = 12 V; T _J = 25 °C; Fig. 9		-	-	10	mA
V _T	on-state voltage	I _T = 2 A; T _J = 25 °C; Fig. 10		-	1.3	1.6	V
Dynamic characteristics							
dV _D /dt	rate of rise of off-state voltage	V _{DM} = 536 V; T _J = 125 °C; (V _{DM} = 67% of V _{DRM}); exponential waveform; gate open circuit; Fig. 12		50	-	-	V/μs

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	T1	main terminal 1		 sym051
3	G	gate		
4	T2	main terminal 2		

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
BT232V-800ET	SOT223-2L	BT232V-800ETF	Reel	4000	SOT223d-2L	02-Apr-2025

7. Marking

Table 4. Marking codes

Type number	Marking codes
BT232V-800ET	232V8E

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions	Notes	Values	Unit
V_{DRM}	repetitive peak off-state voltage			800	V
V_{RRM}	repetitive peak reverse voltage			800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{sp} \leq 77\text{ }^{\circ}\text{C}$; Fig 1 ; Fig 2 ; Fig 3		2	A
I_{TSM}	non-repetitive peak on-state current	full sine wave; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; $t_p = 20\text{ ms}$; Fig 4 ; Fig 5		16	A
		full sine wave; $T_{j(init)} = 25\text{ }^{\circ}\text{C}$; $t_p = 16.7\text{ ms}$		18	A
I^2t	I^2t for fusing	$t_p = 10\text{ ms}$; SIN		1.28	A^2s
di_T/dt	rate of rise of on-state current	$I_G = 20\text{ mA}$; T2+ G+		50	$\text{A}/\mu\text{s}$
		$I_G = 20\text{ mA}$; T2+ G-		50	$\text{A}/\mu\text{s}$
		$I_G = 20\text{ mA}$; T2- G-		50	$\text{A}/\mu\text{s}$
		$I_G = 20\text{ mA}$; T2- G+		20	$\text{A}/\mu\text{s}$
I_{GM}	peak gate current			1	A
P_{GM}	peak gate power			2	W
$P_{G(AV)}$	average gate power	over any 20 ms period		0.1	W
T_{stg}	storage temperature			-40 to 150	$^{\circ}\text{C}$
T_j	operating junction temperature			-40 to 150	$^{\circ}\text{C}$

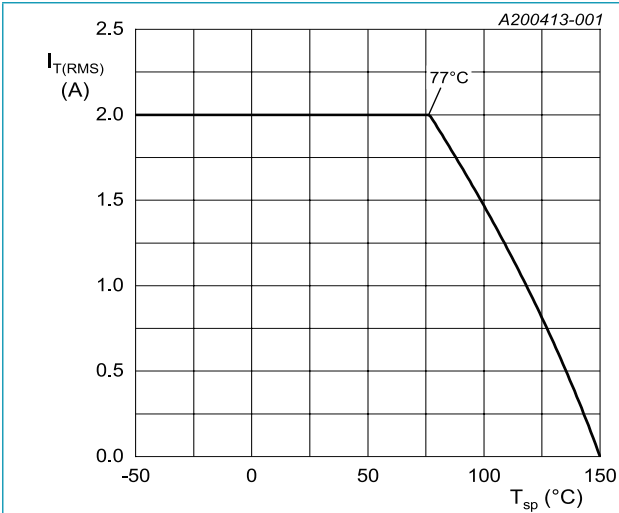


Fig. 1. RMS on-state current as a function of solder point temperature; maximum values

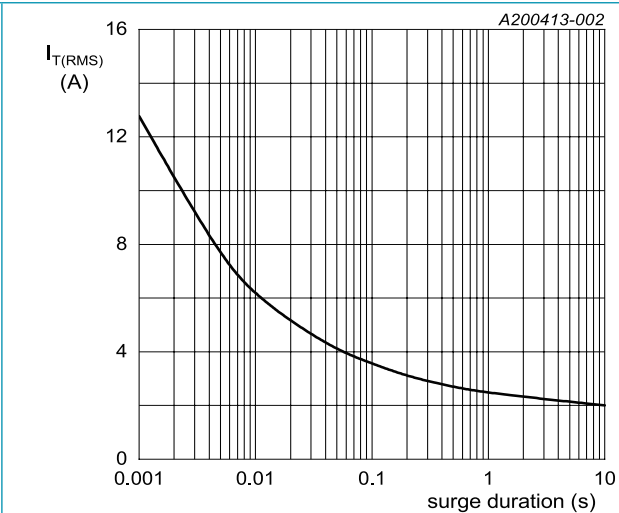


Fig. 2. RMS on-state current as a function of surge duration; maximum values
 $f = 50\text{ Hz}$; $T_{sp} = 77\text{ }^{\circ}\text{C}$

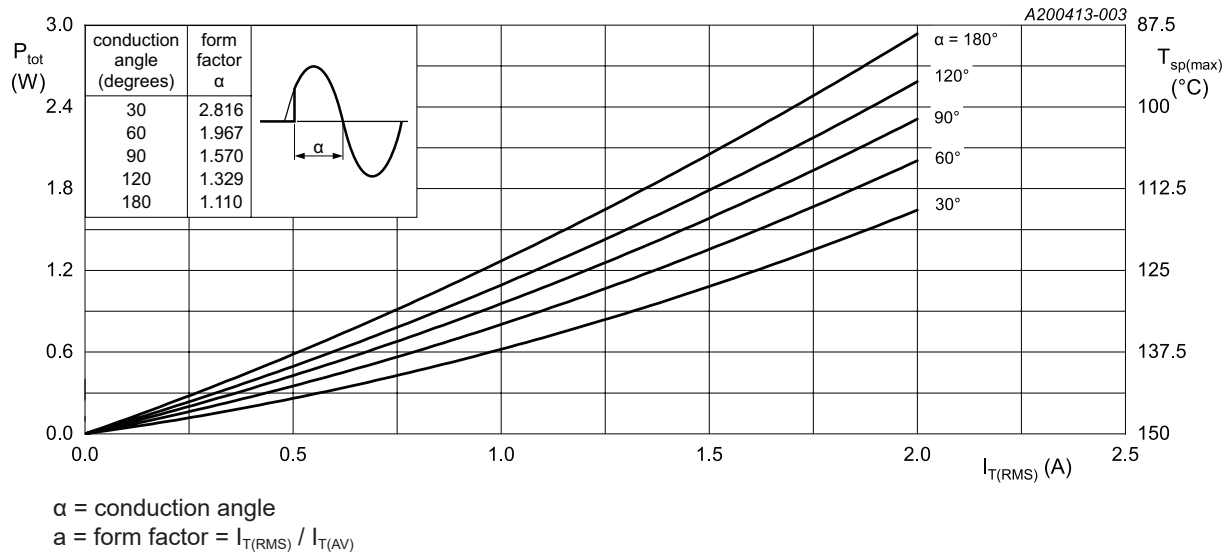


Fig. 3. Total power dissipation as a function of RMS on-state current; maximum values

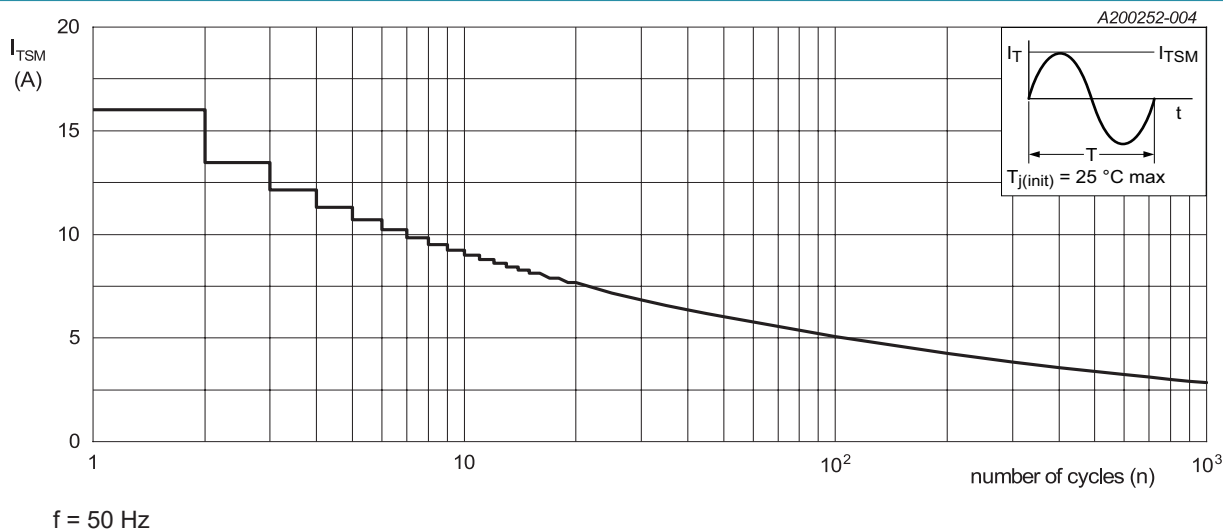


Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

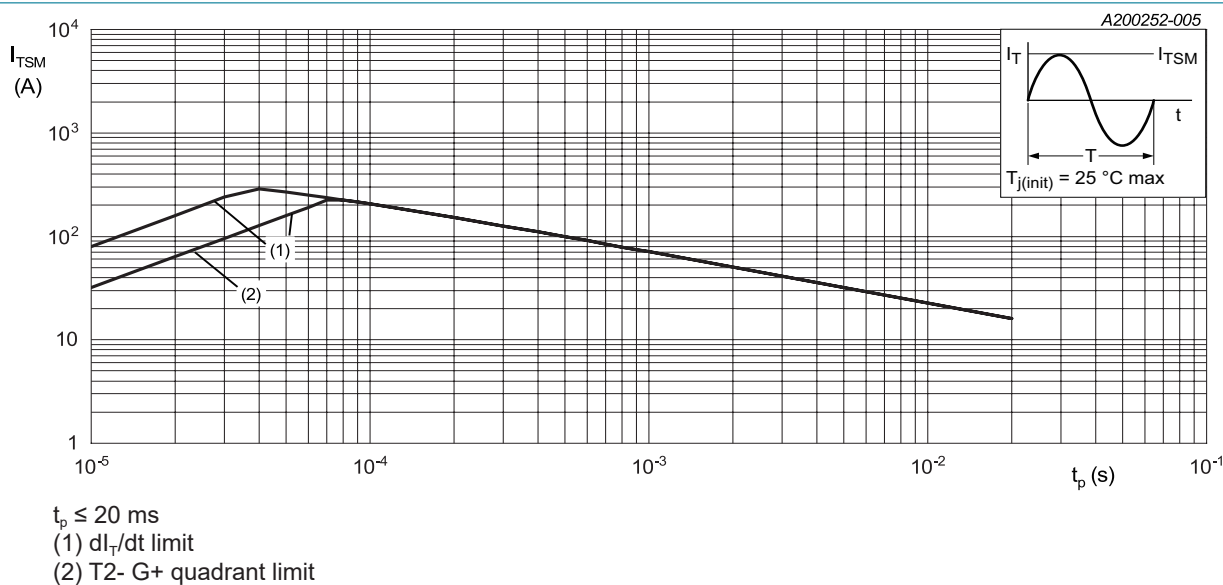
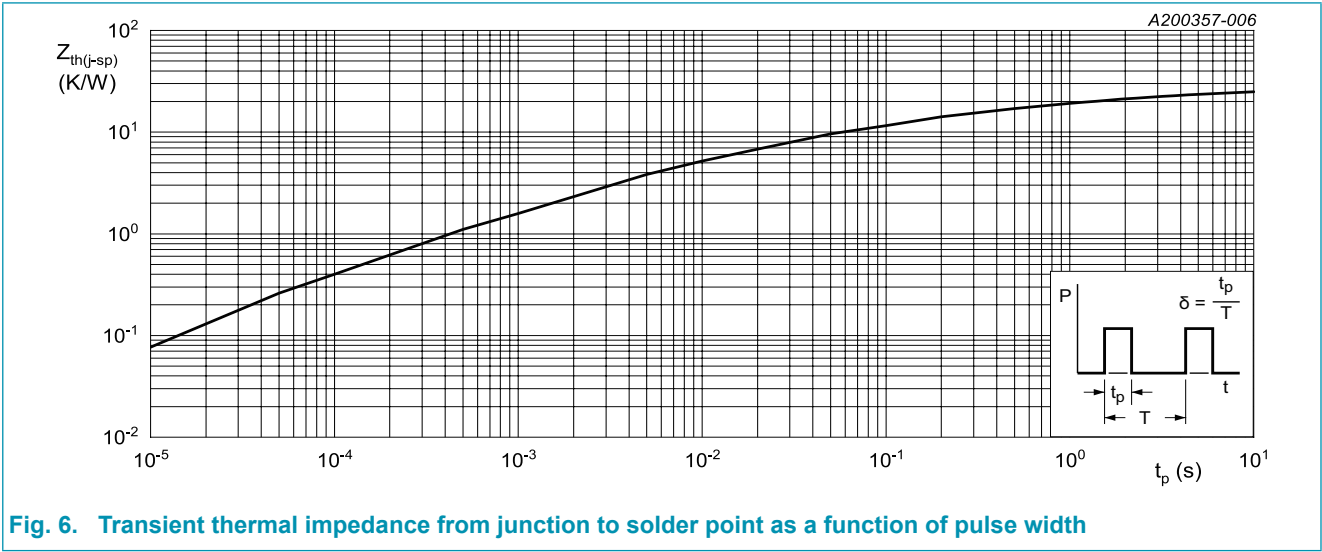


Fig. 5. Non-repetitive peak on-state current as a function of pulse width; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

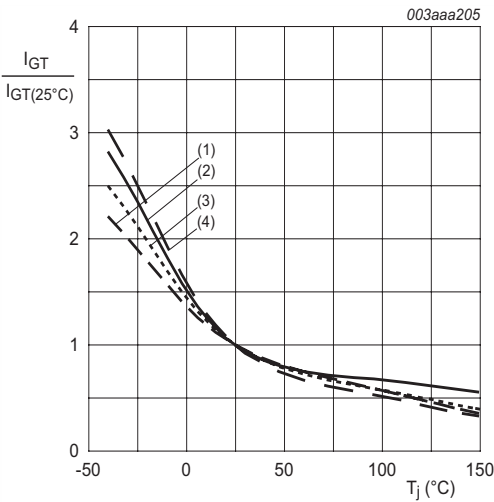
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point	full cycle; Fig 6		-	-	25	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; printed-circuit board mounted; pad area		-	65	-	K/W



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
I _{GT}	gate trigger current	V _D = 12 V; I _T = 0.1 A; T2+ G+; T _j = 25 °C; Fig. 7		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2+ G-; T _j = 25 °C; Fig. 7		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2- G-; T _j = 25 °C; Fig. 7		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2- G+; T _j = 25 °C; Fig. 7		-	-	25	mA
I _L	latching current	V _D = 12 V; I _G = 0.1 A; T2+ G+; T _j = 25 °C; Fig. 8		-	-	15	mA
		V _D = 12 V; I _G = 0.1 A; T2+ G-; T _j = 25 °C; Fig. 8		-	-	25	mA
		V _D = 12 V; I _G = 0.1 A; T2- G-; T _j = 25 °C; Fig. 8		-	-	15	mA
		V _D = 12 V; I _G = 0.1 A; T2- G+; T _j = 25 °C; Fig. 8		-	-	15	mA
I _H	holding current	V _D = 12 V; T _j = 25 °C; Fig. 9		-	-	10	mA
V _T	on-state voltage	I _T = 2 A; T _j = 25 °C; Fig. 10		-	1.3	1.6	V
V _{GT}	gate trigger voltage	V _D = 12 V; I _T = 0.1 A; T _j = 25 °C; Fig. 11		-	-	1	V
		V _D = 400 V; I _T = 0.1 A; T _j = 150 °C		0.2	-	-	V
I _D	off-state current	V _D = 800 V; T _j = 25 °C		-	-	10	μA
		V _D = 800 V; T _j = 150 °C		-	-	1	mA
I _R	reverse current	V _R = 800 V; T _j = 25 °C		-	-	10	μA
		V _R = 800 V; T _j = 150 °C		-	-	1	mA
Dynamic characteristics							
dV _D /dt	rate of rise of off-state voltage	V _{DM} = 536 V; T _j = 125 °C; (V _{DM} = 67% of V _{DRM}); exponential waveform; gate open circuit; Fig. 12		50	-	-	V/μs



- (1) T2- G+
- (2) T2- G-
- (3) T2+ G-
- (4) T2+ G+

Fig. 7. Normalized gate trigger current as a function of junction temperature

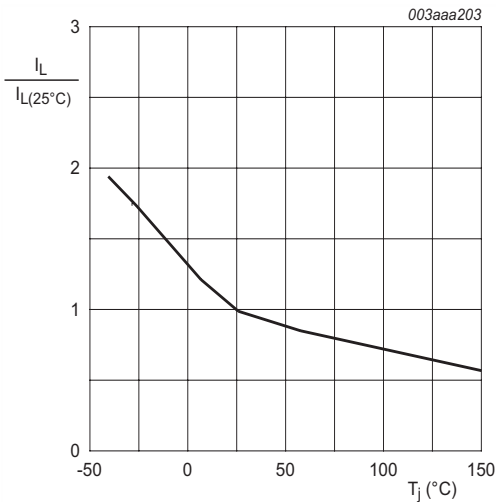


Fig. 8. Normalized latching current as a function of junction temperature

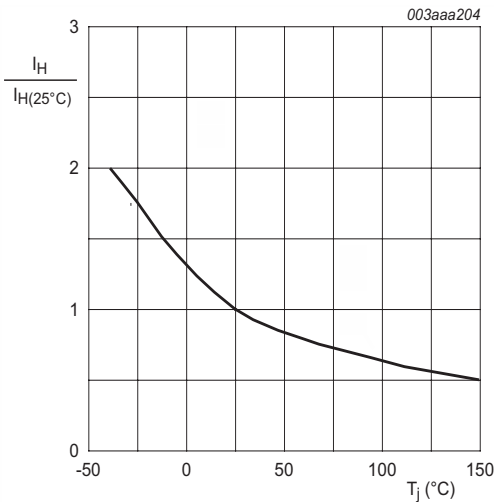
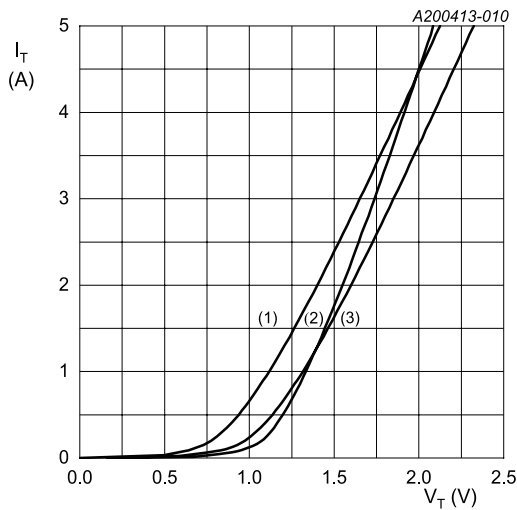


Fig. 9. Normalized holding current as a function of junction temperature



- $V_o = 1.186 \text{ V}; R_s = 0.2000 \Omega$
- (1) $T_j = 150^{\circ}\text{C}$; typical values
 - (2) $T_j = 150^{\circ}\text{C}$; maximum values
 - (3) $T_j = 25^{\circ}\text{C}$; maximum values

Fig. 10. On-state current as a function of on-state voltage

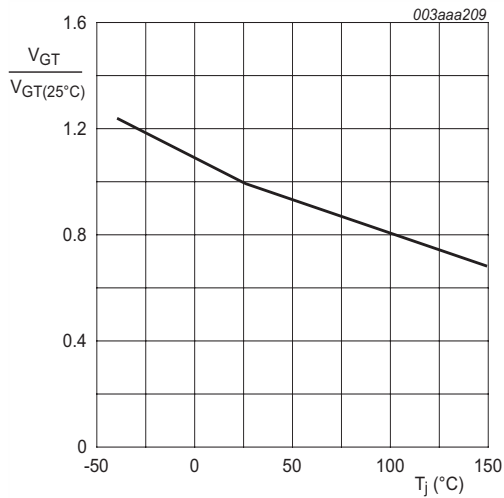
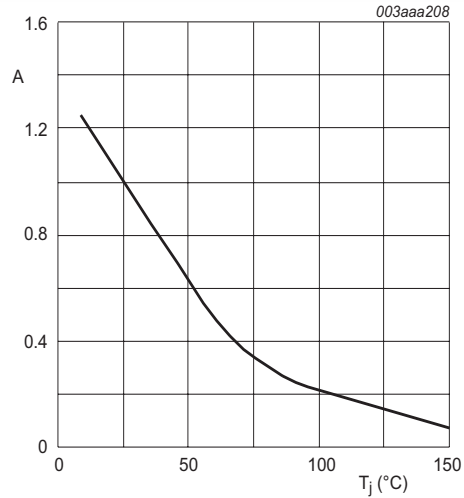


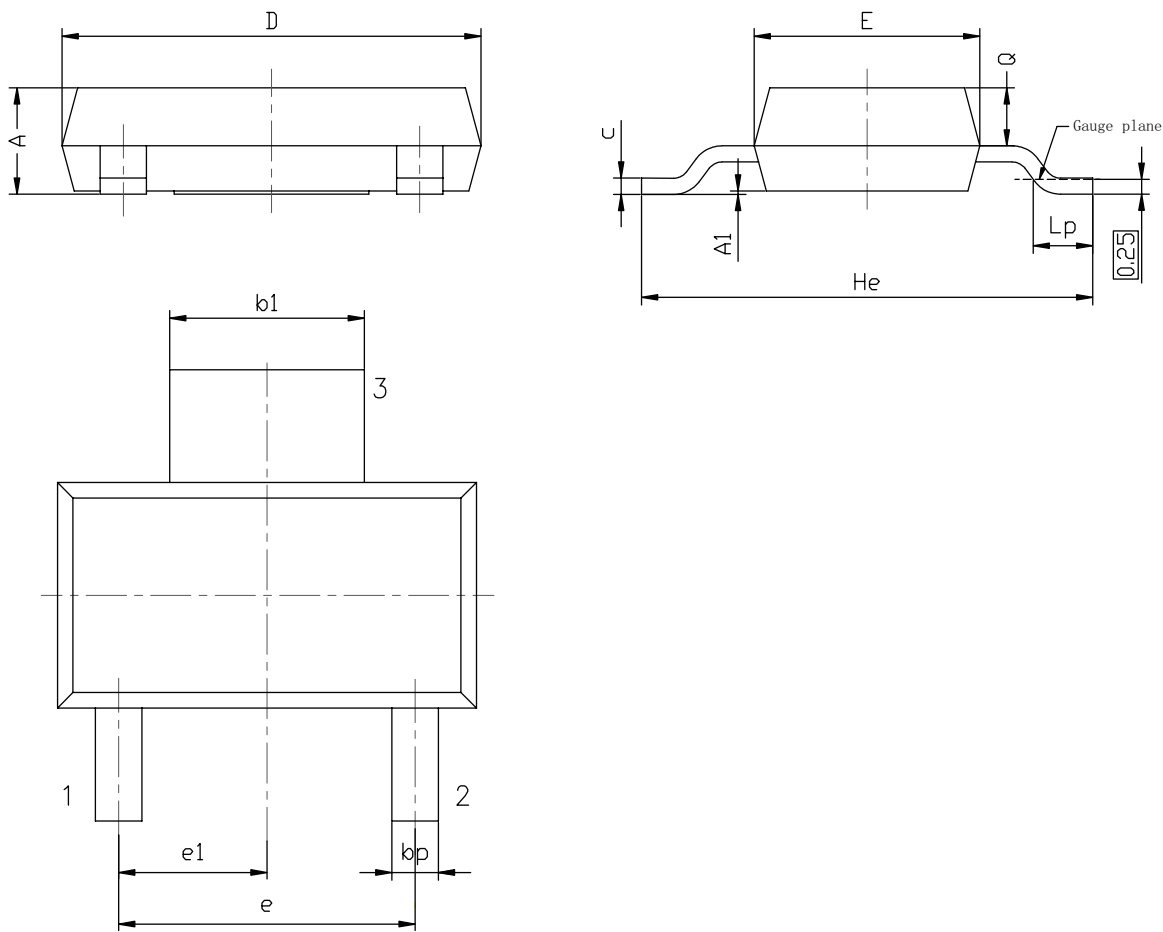
Fig. 11. Normalized gate trigger voltage as a function of junction temperature



$$A = \frac{dV_{D(T_j^{\circ}\text{C})} / dt}{dV_{D(25^{\circ}\text{C})} / dt}$$

Fig. 12. Normalized critical rate of rise of off-state voltage as a function of junction temperature; typical values

11. Package outline



Unit	A	A1	bp	b1	c	D	E	e	e1	He	Lp	Q	
mm	Min	1.50	0.01	0.66	2.90	0.23	6.30	3.30	4.50	2.20	6.70	0.75	0.82
	Max	1.81	0.12	0.85	3.13	0.35	6.70	3.70	4.70	2.40	7.30	1.20	0.93

12. Legal information

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Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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- [2] The term 'short data sheet' is explained in section "Definitions".
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