

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

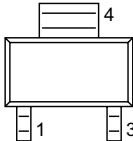
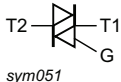
Table 1. Quick reference data

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; $T_{sp} \leq 77\text{ °C}$; Fig. 1 ; Fig. 2 ; Fig. 3		2			A
I_{TSM}	non-repetitive peak on-state current	full sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 20\text{ ms}$; Fig. 4 ; Fig. 5		16			A
		full sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 16.7\text{ ms}$		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	$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; T2+ G+; $T_j = 25\text{ °C}$; Fig. 7		-	-	10	mA
		$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; T2+ G-; $T_j = 25\text{ °C}$; Fig. 7		-	-	10	mA
		$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; T2- G-; $T_j = 25\text{ °C}$; Fig. 7		-	-	10	mA
		$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; T2- G+; $T_j = 25\text{ °C}$; Fig. 7		-	-	25	mA

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
I_H	holding current	$V_D = 12\text{ V}$; $T_j = 25\text{ °C}$; Fig. 9		-	-	10	mA
V_T	on-state voltage	$I_T = 2\text{ A}$; $T_j = 25\text{ °C}$; Fig. 10		-	1.3	1.6	V
Dynamic characteristics							
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 536\text{ V}$; $T_j = 125\text{ °C}$; ($V_{DM} = 67\%$ of V_{DRM}); exponential waveform; gate open circuit; Fig. 12		50	-	-	V/ μ s
dV_{com}/dt	rate of change of commutating voltage	$V_D = 400\text{ V}$; $T_j = 110\text{ °C}$; $dI_{com}/dt = 0.44\text{ A/ms}$		2	-	-	V/ μ s

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; $T_{sp} \leq 77\text{ °C}$; Fig 1 ; Fig 2 ; Fig 3		2	A
I_{TSM}	non-repetitive peak on-state current	full sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 20\text{ ms}$; Fig 4 ; Fig 5		16	A
		full sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 16.7\text{ ms}$		18	A
I^2t	I^2t for fusing	$t_p = 10\text{ ms}$; SIN		1.28	A ² s
di_T/dt	rate of rise of on-state current	$I_G = 20\text{ mA}$; T2+ G+		50	A/ μ s
		$I_G = 20\text{ mA}$; T2+ G-		50	A/ μ s
		$I_G = 20\text{ mA}$; T2- G-		50	A/ μ s
		$I_G = 20\text{ mA}$; T2- G+		20	A/ μ 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	°C
T_j	operating junction temperature			-40 to 150	°C

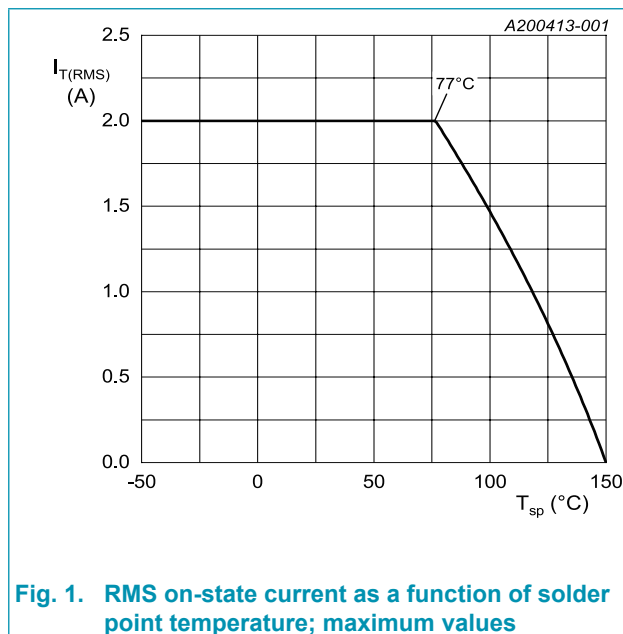


Fig. 1. RMS on-state current as a function of solder point temperature; maximum values

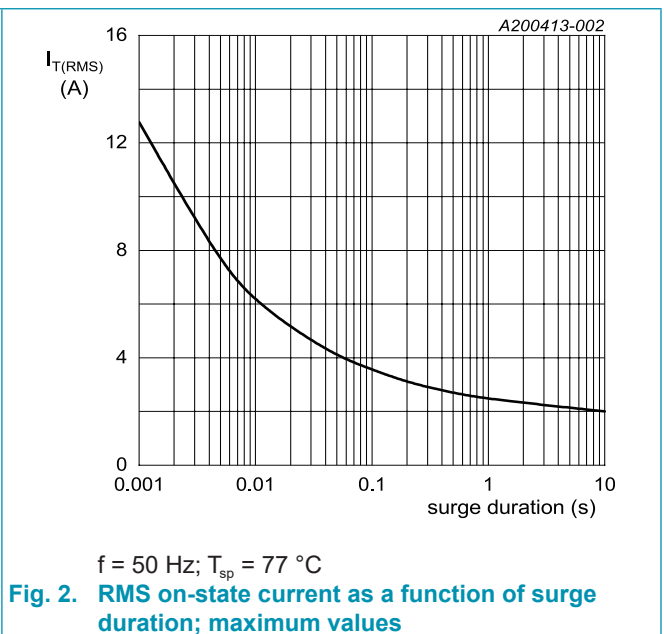


Fig. 2. RMS on-state current as a function of surge duration; maximum values
 $f = 50\text{ Hz}$; $T_{sp} = 77\text{ °C}$

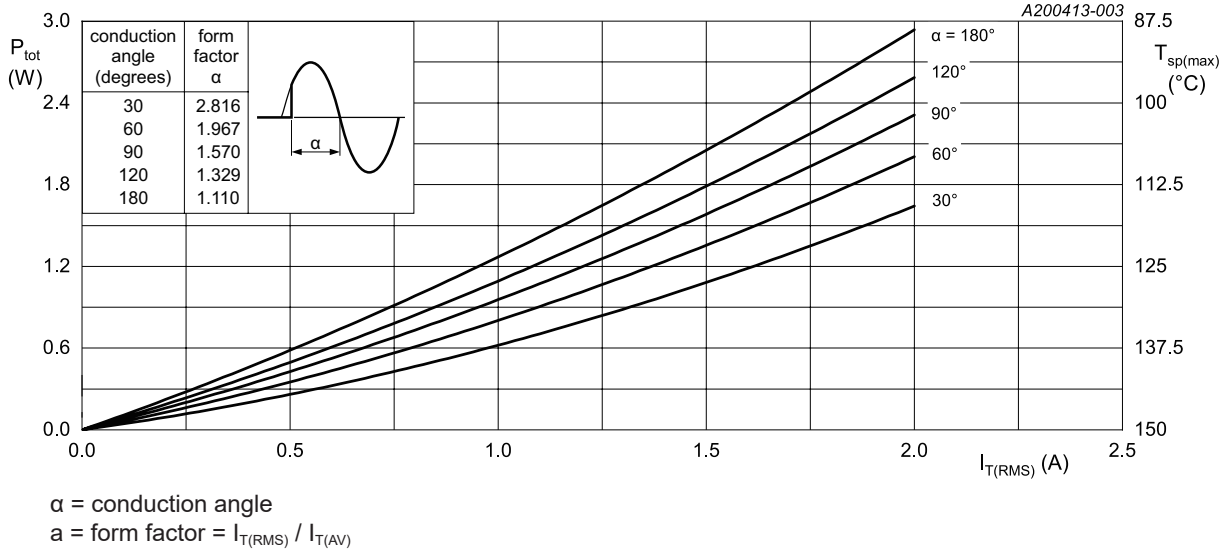


Fig. 3. Total power dissipation as a function of RMS on-state current; maximum values

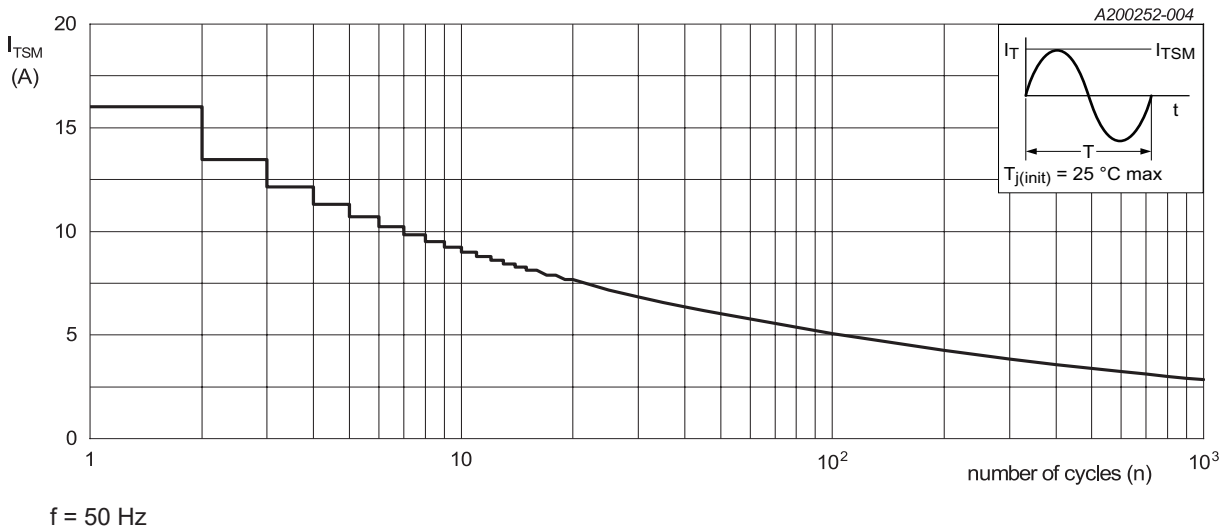


Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

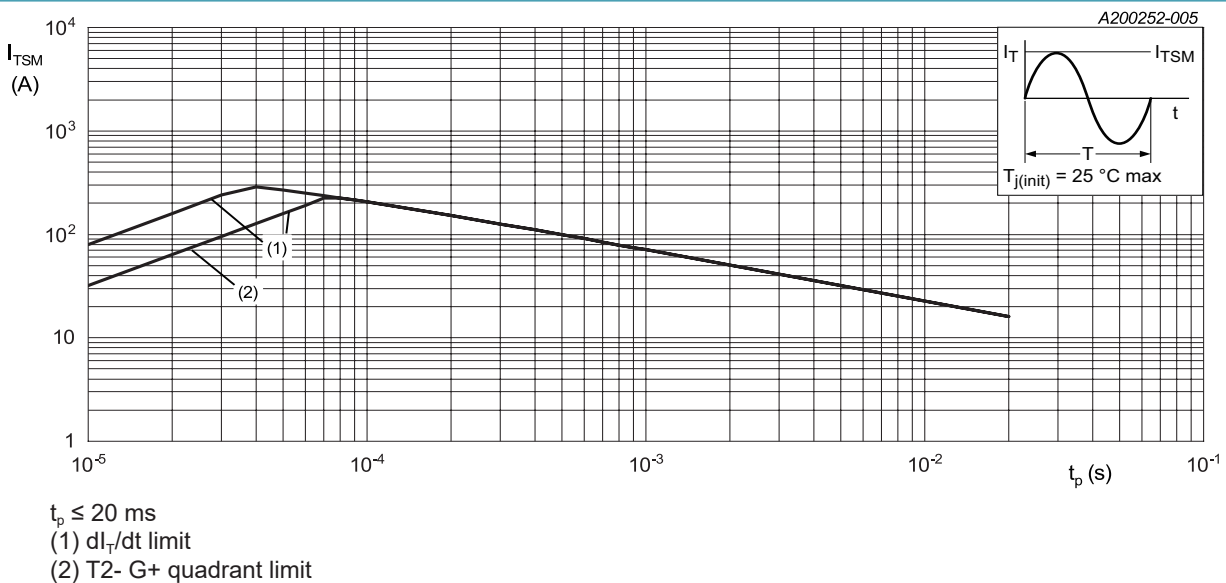
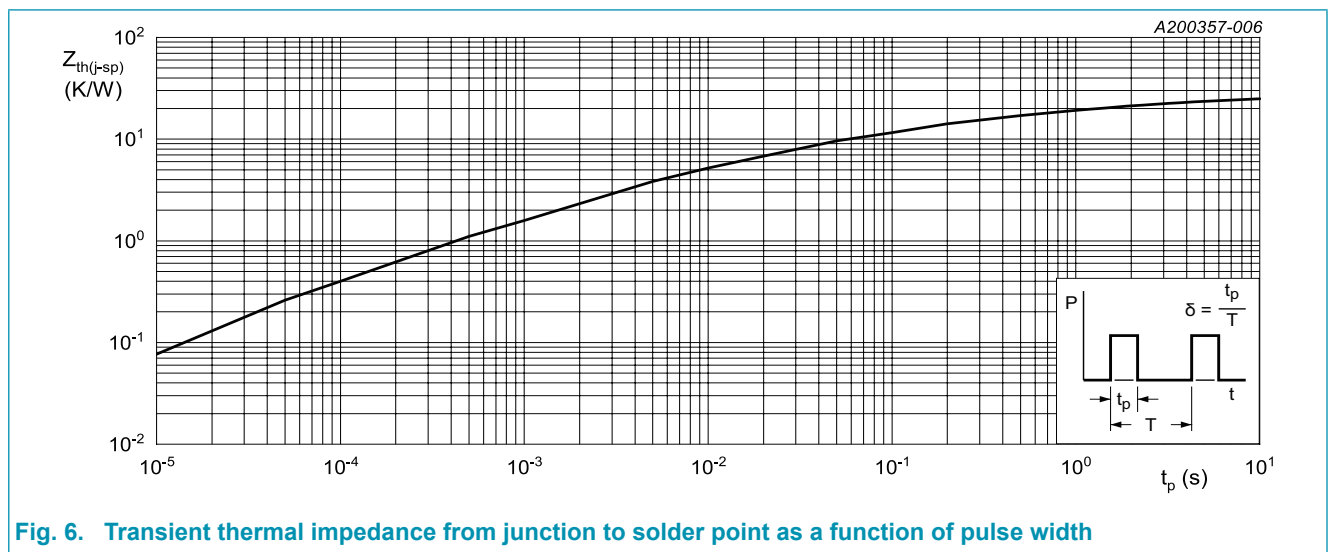


Fig. 5. Non-repetitive peak on-state current as a function of pulse width; maximum values

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	$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T2+ G+;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 7		-	-	10	mA
		$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T2+ G-;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 7		-	-	10	mA
		$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T2- G-;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 7		-	-	10	mA
		$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T2- G+;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 7		-	-	25	mA
I_L	latching current	$V_D = 12\text{ V}; I_G = 0.1\text{ A}; T2+ G+;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 8		-	-	15	mA
		$V_D = 12\text{ V}; I_G = 0.1\text{ A}; T2+ G-;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 8		-	-	25	mA
		$V_D = 12\text{ V}; I_G = 0.1\text{ A}; T2- G-;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 8		-	-	15	mA
		$V_D = 12\text{ V}; I_G = 0.1\text{ A}; T2- G+;$ $T_j = 25\text{ }^\circ\text{C};$ Fig. 8		-	-	15	mA
I_H	holding current	$V_D = 12\text{ V}; T_j = 25\text{ }^\circ\text{C};$ Fig. 9		-	-	10	mA
V_T	on-state voltage	$I_T = 2\text{ A}; T_j = 25\text{ }^\circ\text{C};$ Fig. 10		-	1.3	1.6	V
V_{GT}	gate trigger voltage	$V_D = 12\text{ V}; I_T = 0.1\text{ A}; T_j = 25\text{ }^\circ\text{C};$ Fig. 11		-	-	1	V
		$V_D = 400\text{ V}; I_T = 0.1\text{ A}; T_j = 150\text{ }^\circ\text{C}$		0.2	-	-	V
I_D	off-state current	$V_D = 800\text{ V}; T_j = 25\text{ }^\circ\text{C}$		-	-	10	μA
		$V_D = 800\text{ V}; T_j = 150\text{ }^\circ\text{C}$		-	-	1	mA
I_R	reverse current	$V_R = 800\text{ V}; T_j = 25\text{ }^\circ\text{C}$		-	-	10	μA
		$V_R = 800\text{ V}; T_j = 150\text{ }^\circ\text{C}$		-	-	1	mA
Dynamic characteristics							
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 536\text{ V}; T_j = 125\text{ }^\circ\text{C}; (V_{DM} = 67\% \text{ of } V_{DRM});$ exponential waveform; gate open circuit; Fig. 12		50	-	-	V/ μs
dV_{com}/dt	rate of change of commutating voltage	$V_D = 400\text{ V}; T_j = 110\text{ }^\circ\text{C}; dI_{com}/dt = 0.44\text{ A/ms}$		2	-	-	V/ μs

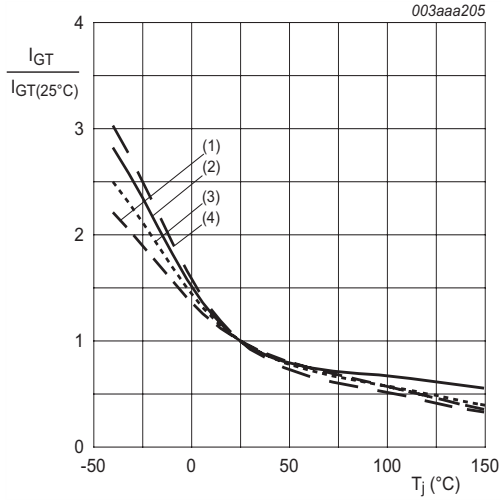


Fig. 7. Normalized gate trigger current as a function of junction temperature

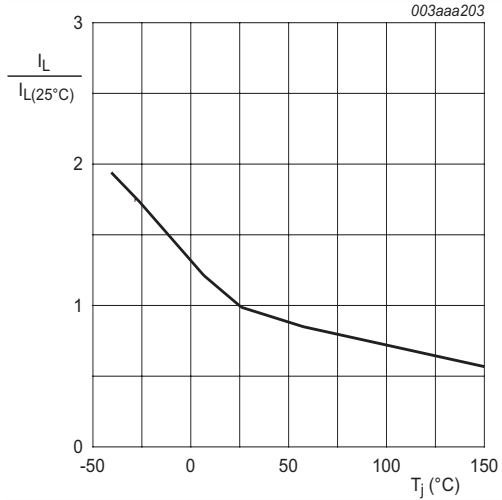


Fig. 8. Normalized latching current as a function of junction temperature

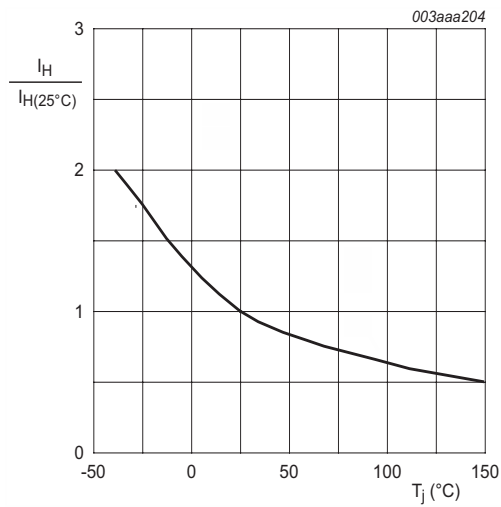
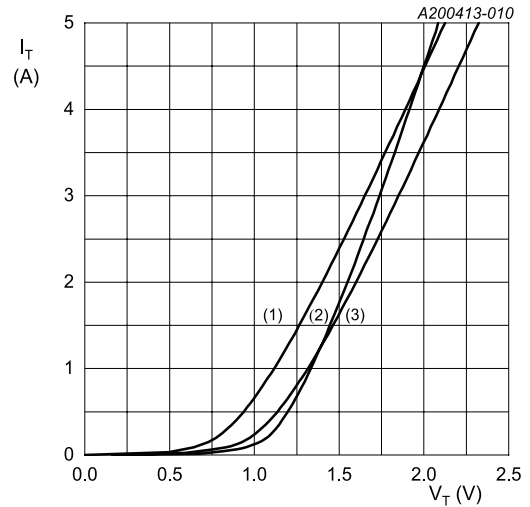


Fig. 9. Normalized holding current as a function of junction temperature



$V_o = 1.186 \text{ V}; R_s = 0.2000 \Omega$

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

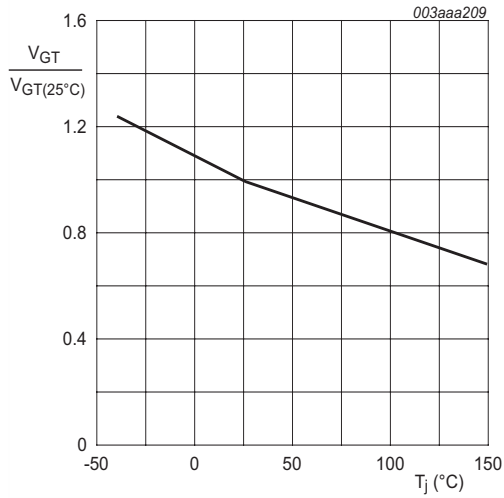
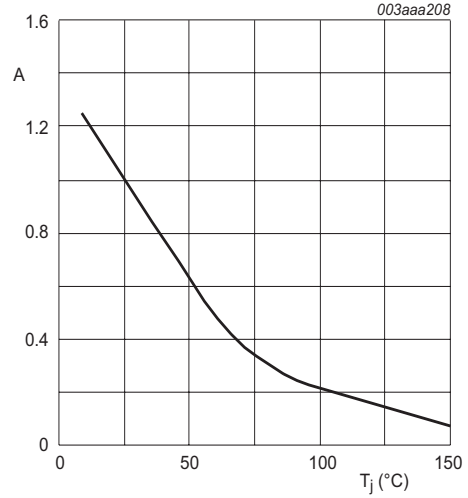


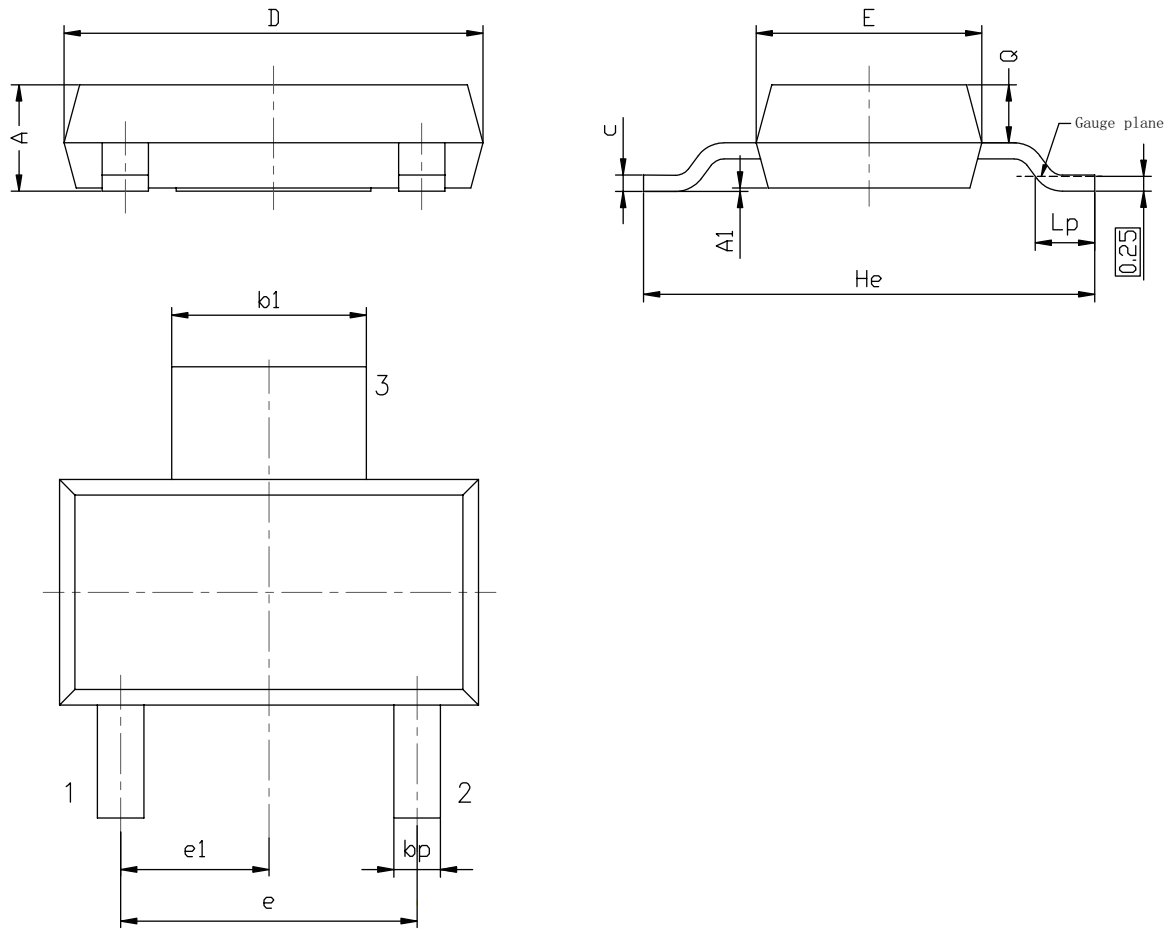
Fig. 11. Normalized gate trigger voltage as a function of junction temperature



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

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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13. Contents

1. General description.....	1
2. Features and benefits	1
3. Applications	1
4. Quick reference data	1
5. Pinning information.....	2
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values	3
9. Thermal characteristics	5
10. Characteristics.....	6
11. Package outline	9
12. Legal information	10
13. Contents	12

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Date of release: 14 July 2025
