

1. General description

Planar passivated sensitive gate four quadrant triac in a SOT223 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
- Sensitive gate in four quadrants
- Surface-mountable package
- Triggering in all four quadrants

3. Applications

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

4. Quick reference data

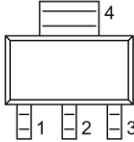
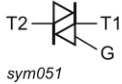
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Absolute maximum rating							
V_{DRM}	repetitive peak off-state voltage			-	-	800	V
$I_{\text{T(RMS)}}$	RMS on-state current	full sine wave; $T_{\text{sp}} \leq 88\text{ °C}$; Fig. 1 ; Fig. 2 ; Fig. 3		-	-	2	A
I_{TSM}	non-repetitive peak on-state current	full sine wave; $T_{\text{j(init)}} = 25\text{ °C}$; $t_{\text{p}} = 20\text{ ms}$; Fig. 4 ; Fig. 5		-	-	25	A
		full sine wave; $T_{\text{j(init)}} = 25\text{ °C}$; $t_{\text{p}} = 16.7\text{ ms}$		-	-	27.5	A
T_{j}	junction temperature			-	-	125	°C
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
I_{GT}	gate trigger current	$V_{\text{D}} = 12\text{ V}$; $I_{\text{T}} = 0.1\text{ A}$; T2+ G+; $T_{\text{j}} = 25\text{ °C}$; Fig. 9		-	-	10	mA
		$V_{\text{D}} = 12\text{ V}$; $I_{\text{T}} = 0.1\text{ A}$; T2+ G-; $T_{\text{j}} = 25\text{ °C}$; Fig. 9		-	-	10	mA

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
		$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; T2- G-; $T_j = 25\text{ }^\circ\text{C}$; Fig. 9		-	-	10	mA
		$V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$; T2- G+; $T_j = 25\text{ }^\circ\text{C}$; Fig. 9		-	-	10	mA
I_H	holding current	$V_D = 12\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$; Fig. 11		-	-	8	mA
V_T	on-state voltage	$I_T = 2\text{ A}$; $T_j = 25\text{ }^\circ\text{C}$; Fig. 12		-	1.2	1.5	V
Dynamic characteristics							
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 536\text{ V}$; $T_j = 125\text{ }^\circ\text{C}$; ($V_{DM} = 67\%$ 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	T1	main terminal 1		
2	T2	main terminal 2		
3	G	gate		
4	mb	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
BT134W-800E	SOT223	BT134W-800EF	Reel	4000	SOT223	16-Mar-2006

7. Marking

Table 4. Marking codes

Type number	Marking codes
BT134W-800E	134W8E

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DRM}	repetitive peak off-state voltage		-	800	V
$I_{\text{T(RMS)}}$	RMS on-state current	full sine wave; $T_{\text{sp}} \leq 88\text{ }^{\circ}\text{C}$; Fig 1 ; Fig 2 ; Fig 3	-	2	A
I_{TSM}	non-repetitive peak on-state current	full sine wave; $T_{\text{j(init)}} = 25\text{ }^{\circ}\text{C}$; $t_{\text{p}} = 20\text{ ms}$; Fig 4 ; Fig 5	-	25	A
		full sine wave; $T_{\text{j(init)}} = 25\text{ }^{\circ}\text{C}$; $t_{\text{p}} = 16.7\text{ ms}$	-	27.5	A
I^2t	I^2t for fusing	$t_{\text{p}} = 10\text{ ms}$; SIN	-	3.125	A^2s
di_{T}/dt	rate of rise of on-state current	$I_{\text{G}} = 20\text{ mA}$; T2+ G+	-	50	$\text{A}/\mu\text{s}$
		$I_{\text{G}} = 20\text{ mA}$; T2- G+	-	50	$\text{A}/\mu\text{s}$
		$I_{\text{G}} = 20\text{ mA}$; T2- G-	-	50	$\text{A}/\mu\text{s}$
		$I_{\text{G}} = 20\text{ mA}$; T2- G+	-	20	$\text{A}/\mu\text{s}$
I_{GM}	peak gate current		-	2	A
P_{GM}	peak gate power		-	5	W
$P_{\text{G(AV)}}$	average gate power	over any 20 ms period	-	0.5	W
T_{stg}	storage temperature		-40	150	$^{\circ}\text{C}$
T_{j}	junction temperature		-40	125	$^{\circ}\text{C}$

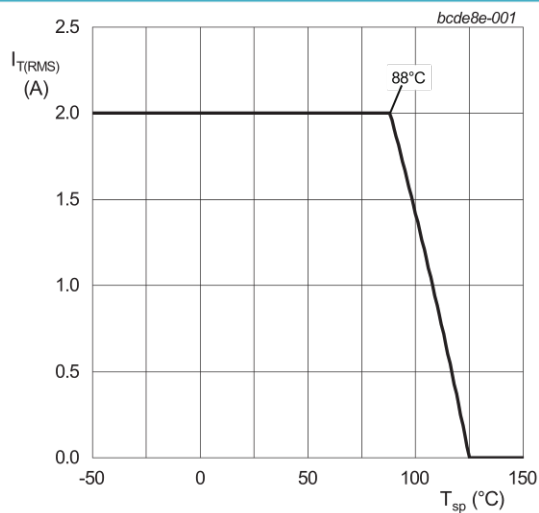


Fig. 1. RMS on-state current as a function of solder point temperature; maximum values

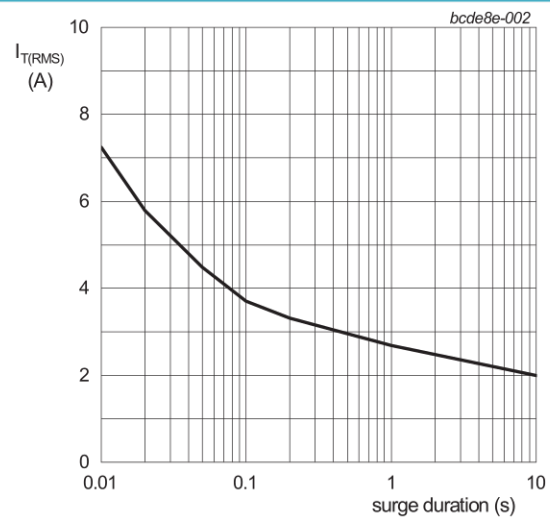


Fig. 2. RMS on-state current as a function of surge duration; maximum values
 $f = 50\text{ Hz}$; $T_{\text{sp}} = 88\text{ }^{\circ}\text{C}$

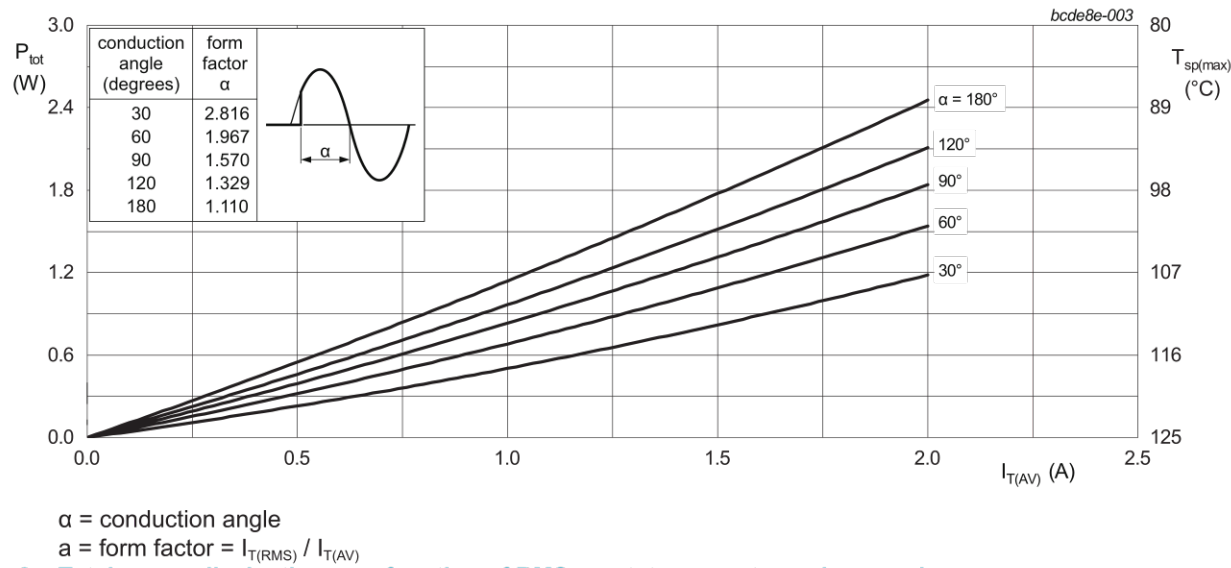


Fig. 3. Total power dissipation as a function of RMS on-state current; maximum values

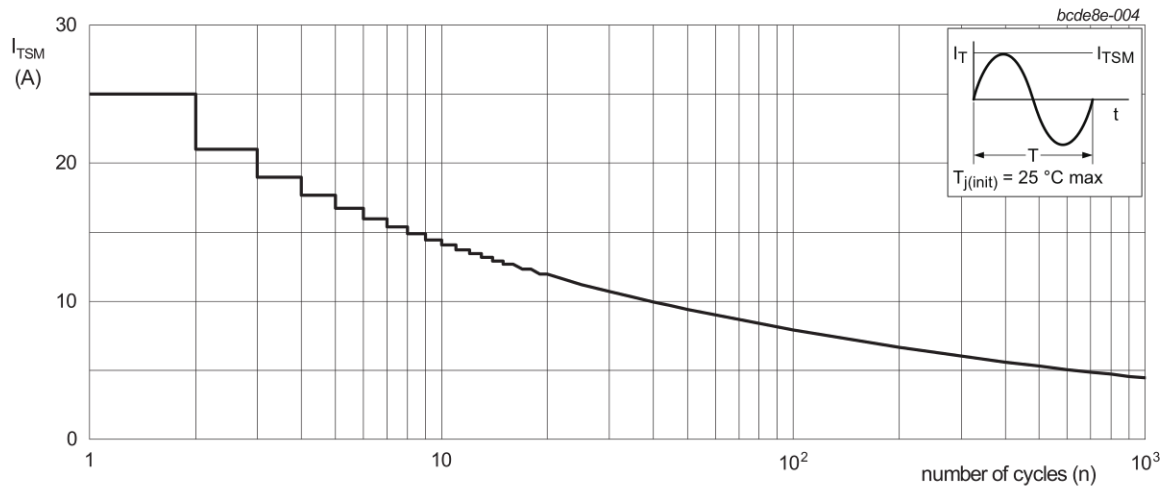


Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

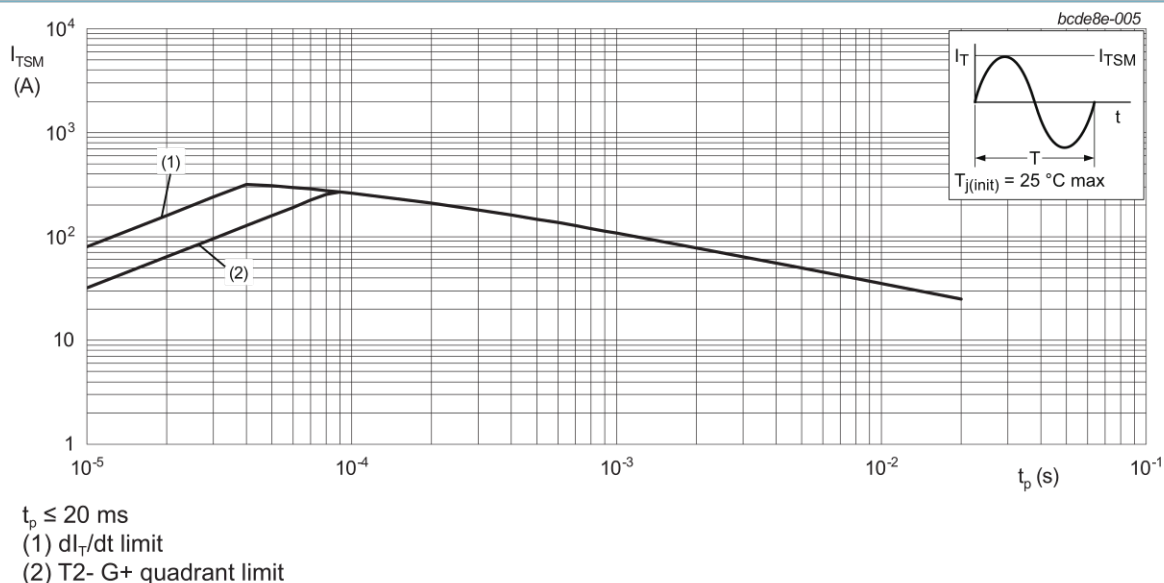


Fig. 5. Non-repetitive peak on-state current as a function of pulse width; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point	full cycle; Fig 6		-	-	15	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	full cycle; printed circuit board mounted; minimum footprint; Fig 7		-	156	-	K/W
		full cycle; printed circuit board mounted; pad area; Fig 8		-	70	-	K/W

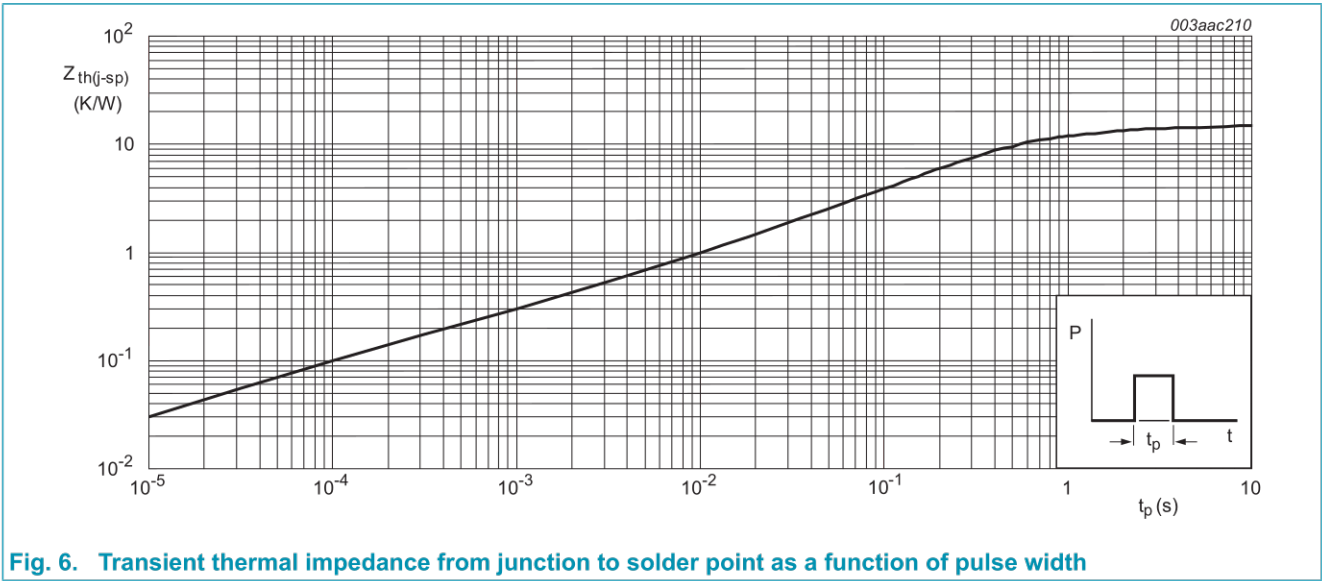
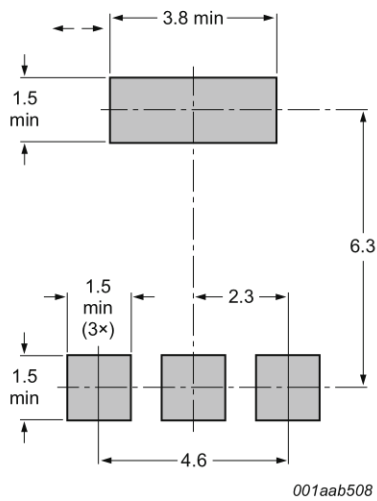
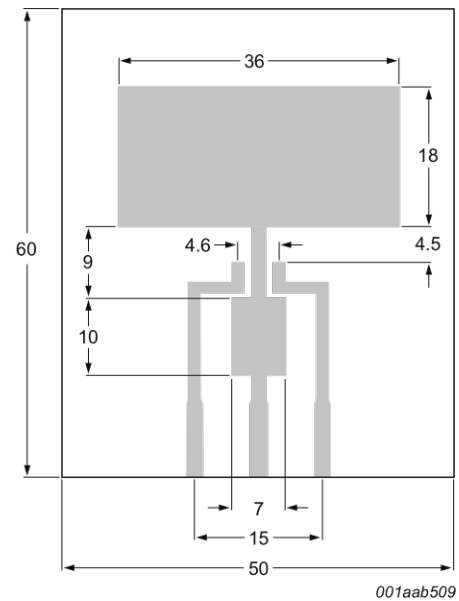


Fig. 6. Transient thermal impedance from junction to solder point as a function of pulse width



All dimensions are in mm

Fig. 7. Minimum footprint SOT223



All dimensions are in mm

Printed circuit board:

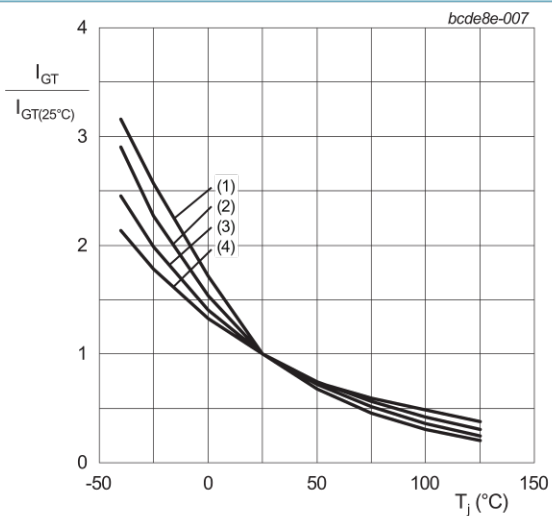
FR4 epoxy glass (1.6 mm thick), copper laminate
(35 um thick)

Fig. 8. Printed circuit board pad area: SOT223

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; T2+ G+; T _J = 25 °C; Fig. 9		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2+ G-; T _J = 25 °C; Fig. 9		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2- G-; T _J = 25 °C; Fig. 9		-	-	10	mA
		V _D = 12 V; I _T = 0.1 A; T2- G+; T _J = 25 °C; Fig. 9		-	-	10	mA
I _L	latching current	V _D = 12 V; I _G = 0.1 A; T2+ G+; T _J = 25 °C; Fig. 10		-	-	10	mA
		V _D = 12 V; I _G = 0.1 A; T2+ G-; T _J = 25 °C; Fig. 10		-	-	15	mA
		V _D = 12 V; I _G = 0.1 A; T2- G-; T _J = 25 °C; Fig. 10		-	-	10	mA
		V _D = 12 V; I _G = 0.1 A; T2- G+; T _J = 25 °C; Fig. 10		-	-	10	mA
I _H	holding current	V _D = 12 V; T _J = 25 °C; Fig. 11		-	-	8	mA
V _T	on-state voltage	I _T = 2 A; T _J = 25 °C; Fig. 12		-	1.2	1.5	V
V _{GT}	gate trigger voltage	V _D = 12 V; I _T = 0.1 A; T _J = 25 °C; Fig. 13		-	-	1	V
		V _D = 400 V; I _T = 0.1 A; T _J = 125 °C		0.2	0.5	-	V
I _D	off-state current	V _D = 800 V; T _J = 25 °C		-	-	5	μA
		V _D = 800 V; T _J = 125 °C		-	-	0.5	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		50	-	-	V/μs
dV _{com} /dt	rate of change of commutating voltage	V _D = 400 V; T _J = 125 °C; dI _{com} /dt = 0.44 A/ms; gate open circuit		2	-	-	V/μs



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

Fig. 9. Normalized gate trigger current as a function of junction temperature

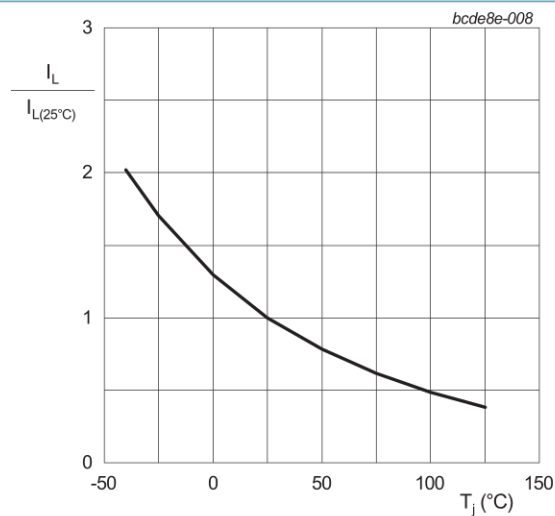


Fig. 10. Normalized latching current as a function of junction temperature

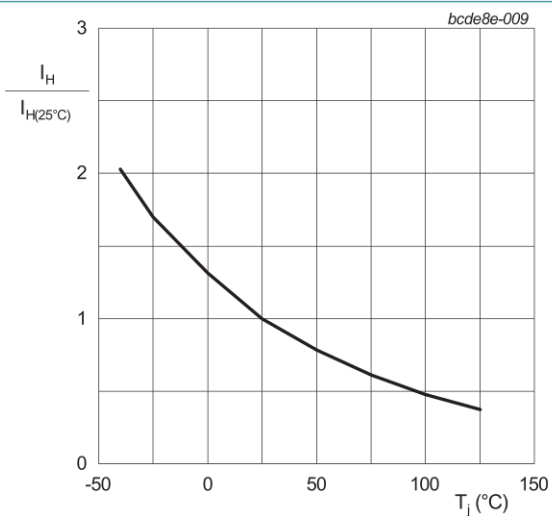
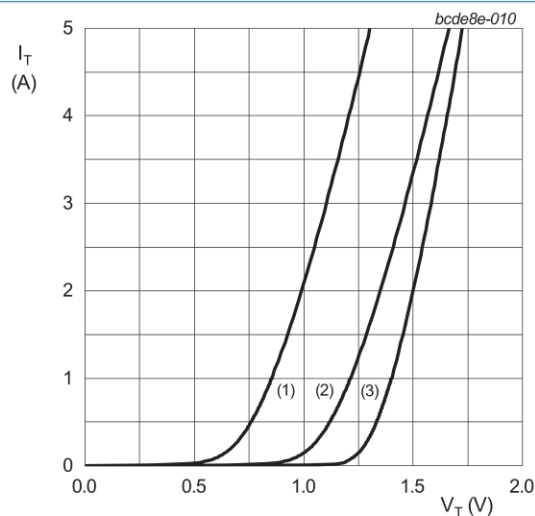


Fig. 11. Normalized holding current as a function of junction temperature



- $V_o = 1.166 \text{ V}$; $R_s = 0.0884 \text{ } \Omega$
- (1) $T_j = 125 \text{ } ^\circ\text{C}$; typical values
 - (2) $T_j = 125 \text{ } ^\circ\text{C}$; maximum values
 - (3) $T_j = 25 \text{ } ^\circ\text{C}$; maximum values

Fig. 12. On-state current as a function of on-state voltage

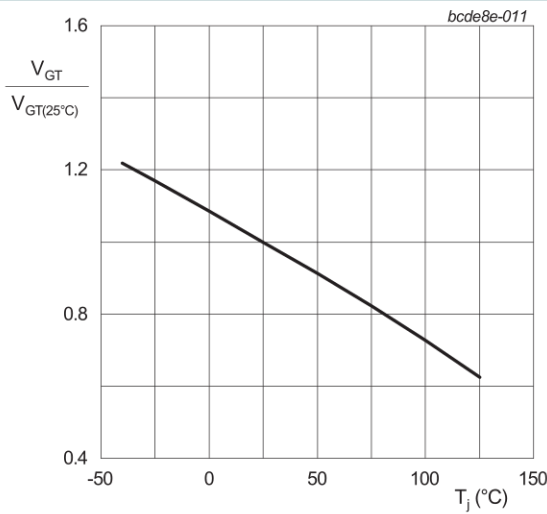
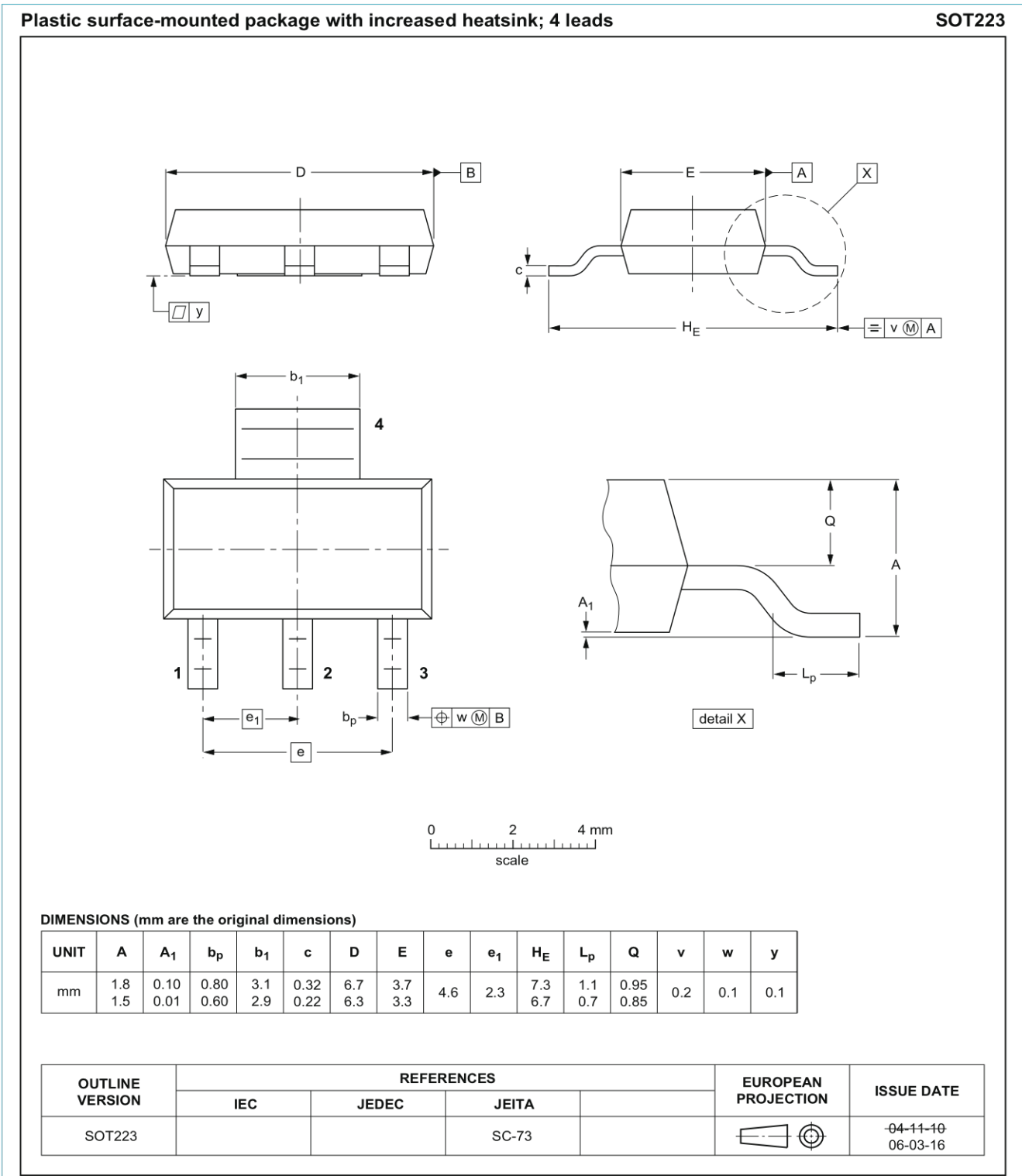


Fig. 13. Normalized gate trigger voltage as a function of junction temperature

11. Package outline



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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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