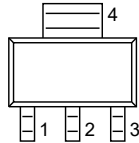



Symbol	Parameter	Conditions		Min	Typ	Max	Unit
		$V_{DM} = 402\text{ V}$ ; $T_j = 125\text{ }^{\circ}\text{C}$ ; ( $V_{DM} = 67\%$ of $V_{DRM}$ ); exponential waveform; gate open circuit; <a href="#">Fig. 14</a>		-	25	-	V/ $\mu\text{s}$

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 SC-73 (SOT223)	
2	A	anode		
3	G	gate		
4	mb	mb; connected to anode		

6. Ordering information

Table 3. Ordering information

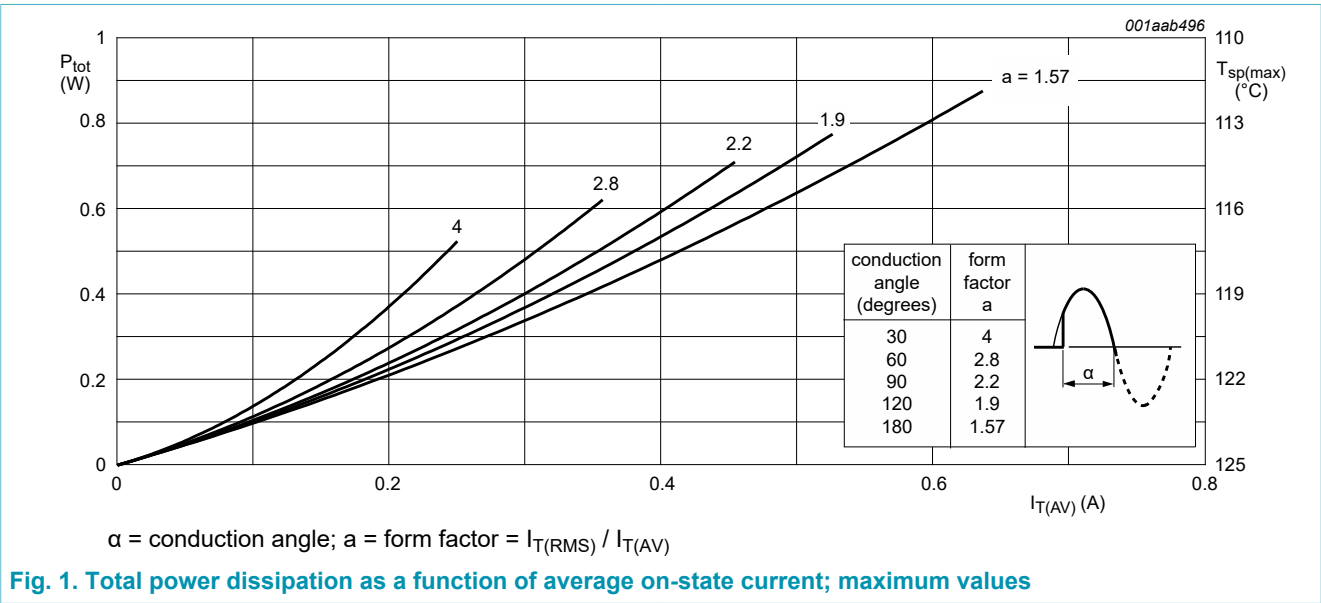
Type number	Package		
	Name	Description	Version
BT168GW	SC-73	plastic surface-mounted package with increased heatsink; 4 leads	SOT223

7. Limiting values

Table 4. 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		[1]	-	600	V
$V_{RRM}$	repetitive peak reverse voltage			-	600	V
$I_{T(AV)}$	average on-state current	half sine wave; $T_{sp} \leq 112\text{ }^{\circ}\text{C}$ ; Fig. 1		-	0.63	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_{sp} \leq 112\text{ }^{\circ}\text{C}$ ; Fig. 2; Fig. 3		-	1	A
$I_{TSM}$	non-repetitive peak on-state current	half sine wave; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$ ; $t_p = 10\text{ ms}$ ; Fig. 4; Fig. 5		-	8	A
		half sine wave; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$ ; $t_p = 8.3\text{ ms}$		-	9	A
$I^2t$	$I^2t$ for fusing	$t_p = 10\text{ ms}$ ; SIN		-	0.32	$\text{A}^2\text{s}$
$dl_T/dt$	rate of rise of on-state current	$I_T = 2\text{ A}$ ; $I_G = 10\text{ mA}$ ; $dl_G/dt = 100\text{ mA}/\mu\text{s}$		-	50	$\text{A}/\mu\text{s}$
$I_{GM}$	peak gate current			-	1	A
$V_{RGM}$	peak reverse gate voltage			-	5	V
$P_{GM}$	peak gate power			-	2	W
$P_{G(AV)}$	average gate power	over any 20 ms period		-	0.1	W
$T_{stg}$	storage temperature			-40	150	$^{\circ}\text{C}$
$T_j$	junction temperature			-	125	$^{\circ}\text{C}$

[1] Although not recommended, off-state voltages up to 800 V may be applied without damage, but the thyristor may switch to the on-state.



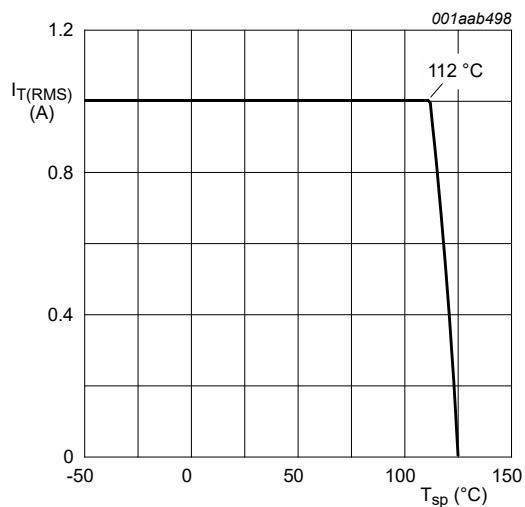


Fig. 2. RMS on-state current as a function of solder point temperature; maximum values

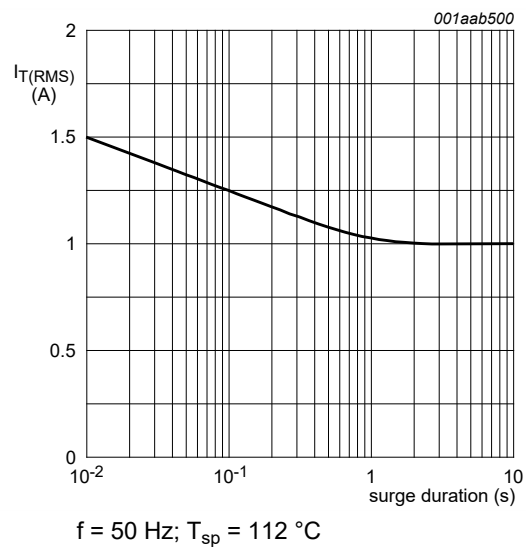


Fig. 3. RMS on-state current as a function of surge duration; maximum values

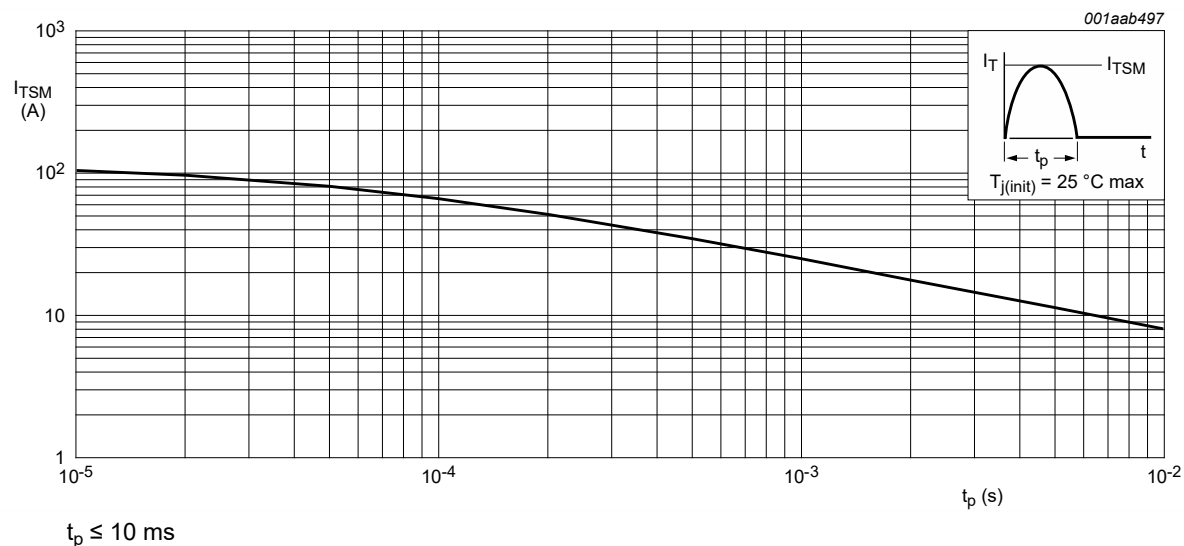
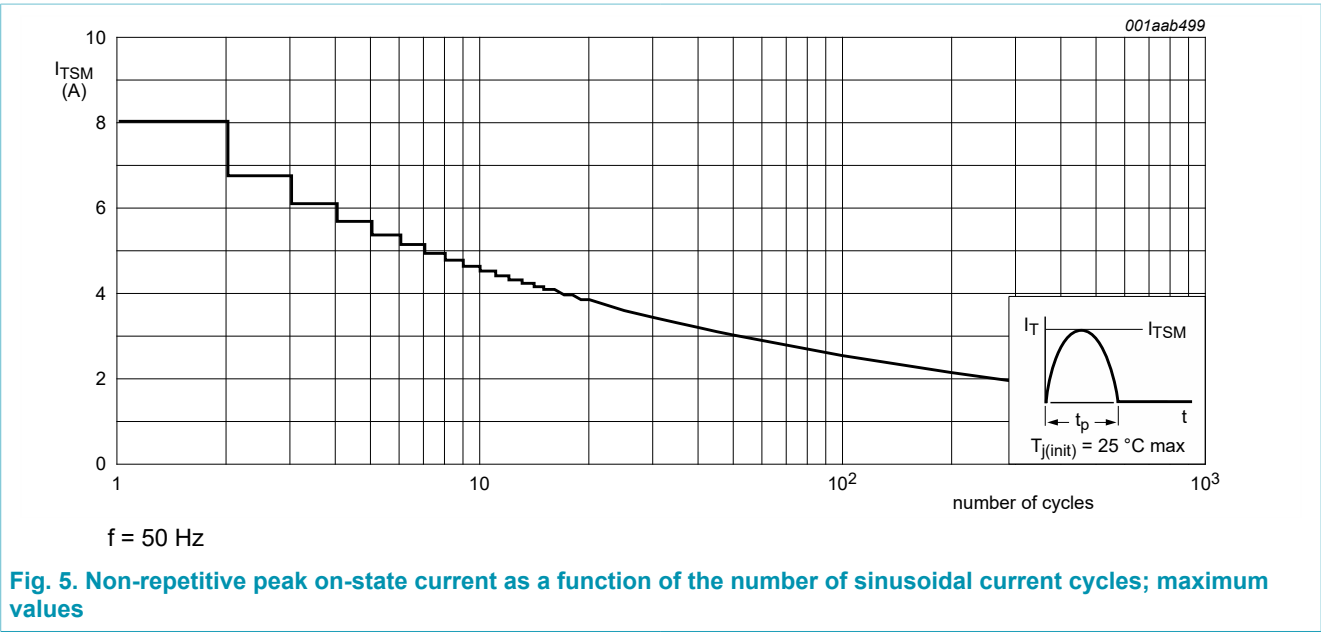


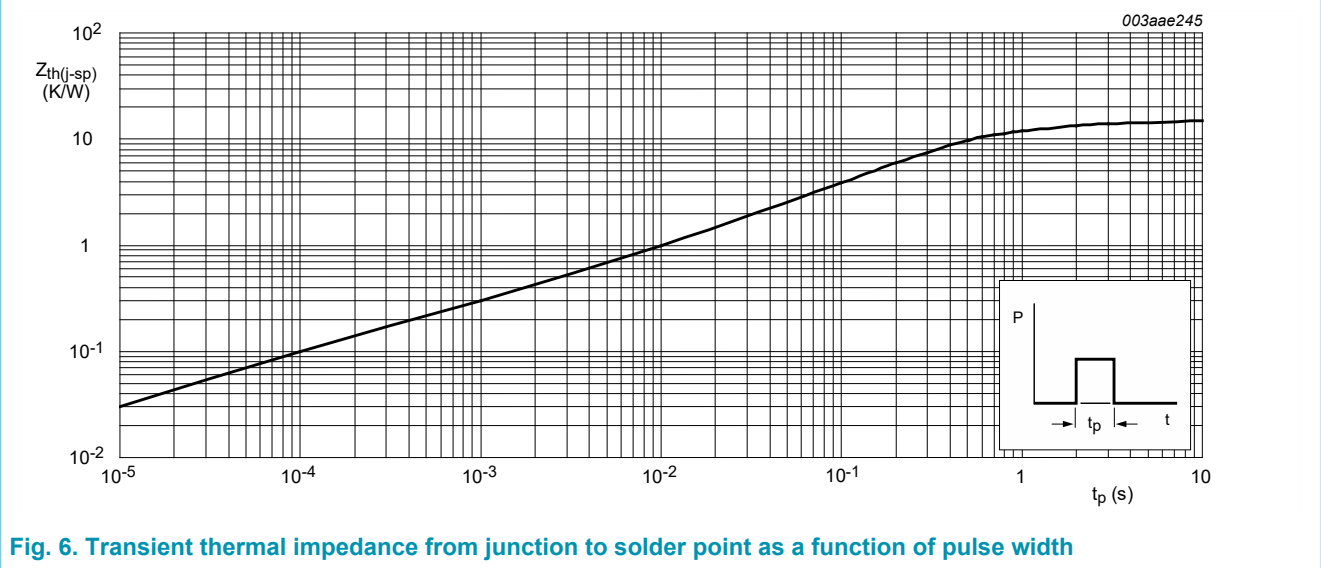
Fig. 4. Non-repetitive peak on-state current as a function of pulse width for sinusoidal currents; maximum values

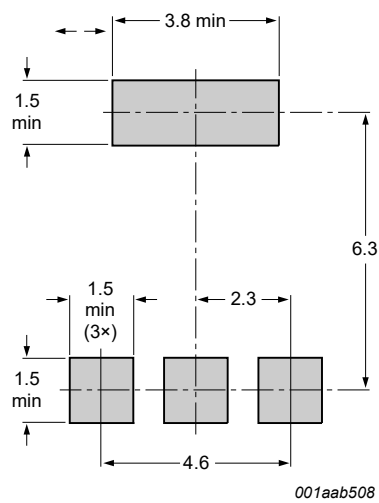


8. Thermal characteristics

Table 5. Thermal characteristics

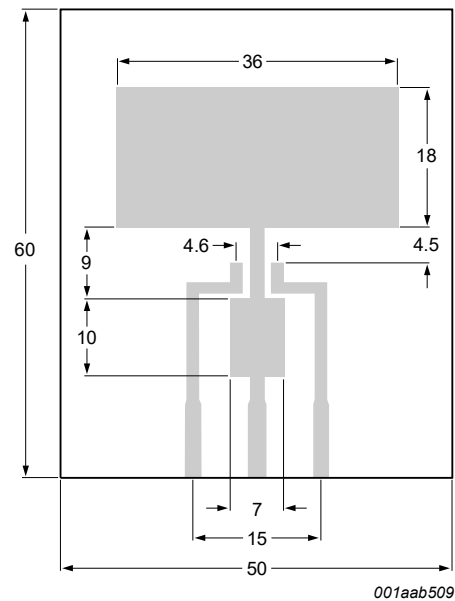
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point	<a href="#">Fig. 6</a>	-	-	15	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	printed circuit board mounted; minimum footprint; <a href="#">Fig. 7</a>	-	156	-	K/W
		printed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





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

## 9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Static characteristics</b>							
$I_{GT}$	gate trigger current	$V_D = 12\text{ V}$ ; $I_T = 10\text{ mA}$ ; $T_j = 25\text{ }^\circ\text{C}$ ; <a href="#">Fig. 9</a>		20	50	200	$\mu\text{A}$
$I_L$	latching current	$V_D = 12\text{ V}$ ; $I_G = 0.5\text{ mA}$ ; $T_j = 25\text{ }^\circ\text{C}$ ; $R_{GK(\text{ext})} = 1\text{ k}\Omega$ ; <a href="#">Fig. 10</a>		-	2	6	mA
$I_H$	holding current	$V_D = 12\text{ V}$ ; $T_j = 25\text{ }^\circ\text{C}$ ; $R_{GK(\text{ext})} = 1\text{ k}\Omega$ ; <a href="#">Fig. 11</a>		-	2	5	mA
$V_T$	on-state voltage	$I_T = 1.2\text{ A}$ ; $T_j = 25\text{ }^\circ\text{C}$ ; <a href="#">Fig. 12</a>		-	1.25	1.7	V
$V_{GT}$	gate trigger voltage	$V_D = 12\text{ V}$ ; $I_T = 10\text{ mA}$ ; $T_j = 25\text{ }^\circ\text{C}$ ; <a href="#">Fig. 13</a>		-	0.5	0.8	V
		$V_D = 600\text{ V}$ ; $I_T = 10\text{ mA}$ ; $T_j = 125\text{ }^\circ\text{C}$		0.2	0.3	-	V
$I_D$	off-state current	$V_D = 600\text{ V}$ ; $R_{GK(\text{ext})} = 1\text{ k}\Omega$ ; $T_j = 125\text{ }^\circ\text{C}$		-	0.05	0.1	mA
$I_R$	reverse current	$V_R = 600\text{ V}$ ; $T_j = 125\text{ }^\circ\text{C}$ ; $R_{GK(\text{ext})} = 1\text{ k}\Omega$		-	0.05	0.1	mA
<b>Dynamic characteristics</b>							
$dV_D/dt$	rate of rise of off-state voltage	$V_{DM} = 402\text{ V}$ ; $T_j = 125\text{ }^\circ\text{C}$ ; $R_{GK} = 1\text{ k}\Omega$ ; ( $V_{DM} = 67\%$ of $V_{DRM}$ ); exponential waveform; <a href="#">Fig. 14</a>		500	800	-	V/ $\mu\text{s}$
		$V_{DM} = 402\text{ V}$ ; $T_j = 125\text{ }^\circ\text{C}$ ; ( $V_{DM} = 67\%$ of $V_{DRM}$ ); exponential waveform; gate open circuit; <a href="#">Fig. 14</a>		-	25	-	V/ $\mu\text{s}$
$t_{gt}$	gate-controlled turn-on time	$I_{TM} = 2\text{ A}$ ; $V_D = 600\text{ V}$ ; $I_G = 10\text{ mA}$ ; $dI_G/dt = 0.1\text{ A}/\mu\text{s}$ ; $T_j = 25\text{ }^\circ\text{C}$		-	2	-	$\mu\text{s}$
$t_q$	commutated turn-off time	$V_{DM} = 402\text{ V}$ ; $T_j = 125\text{ }^\circ\text{C}$ ; $I_{TM} = 1.6\text{ A}$ ; $V_R = 35\text{ V}$ ; $(dI_T/dt)_M = 30\text{ A}/\mu\text{s}$ ; $dV_D/dt = 2\text{ V}/\mu\text{s}$ ; $R_{GK(\text{ext})} = 1\text{ k}\Omega$ ; ( $V_{DM} = 67\%$ of $V_{DRM}$ )		-	100	-	$\mu\text{s}$

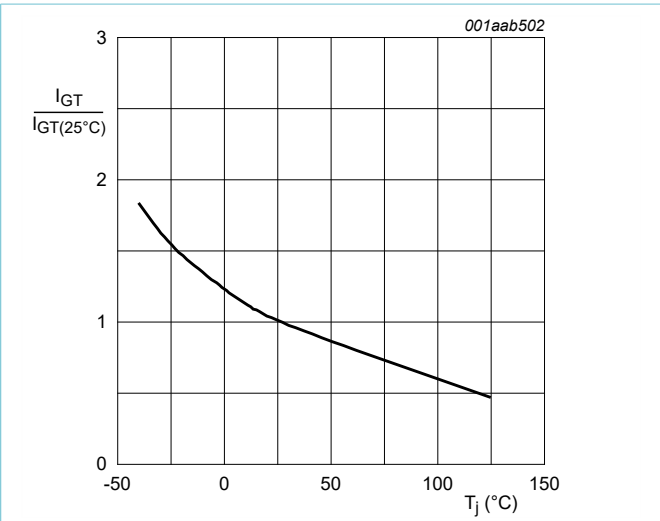


Fig. 9. Normalized gate trigger current as a function of junction temperature

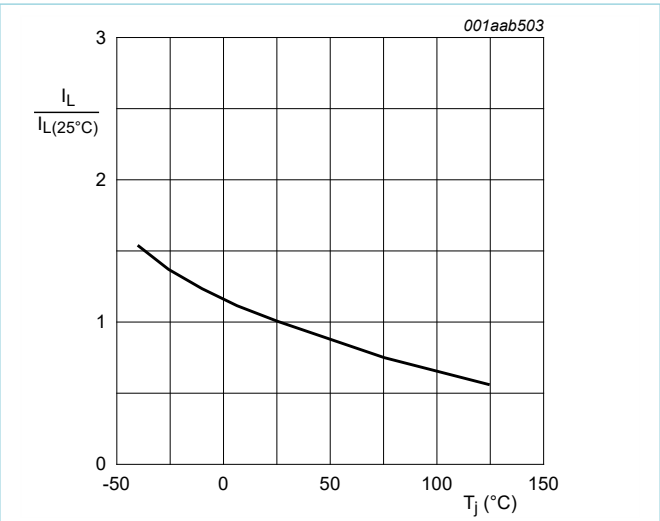


Fig. 10. Normalized latching current as a function of junction temperature

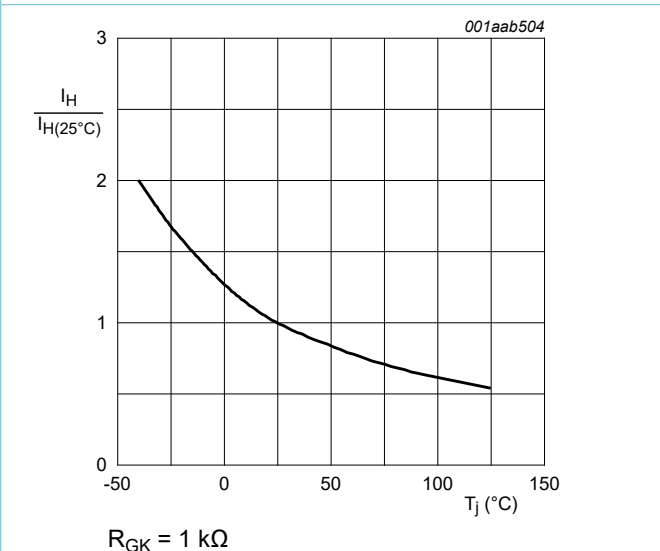


Fig. 11. Normalized holding current as a function of junction temperature

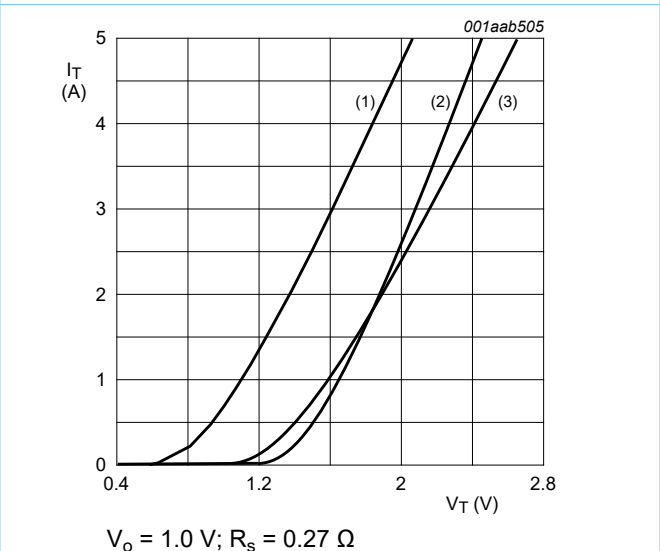
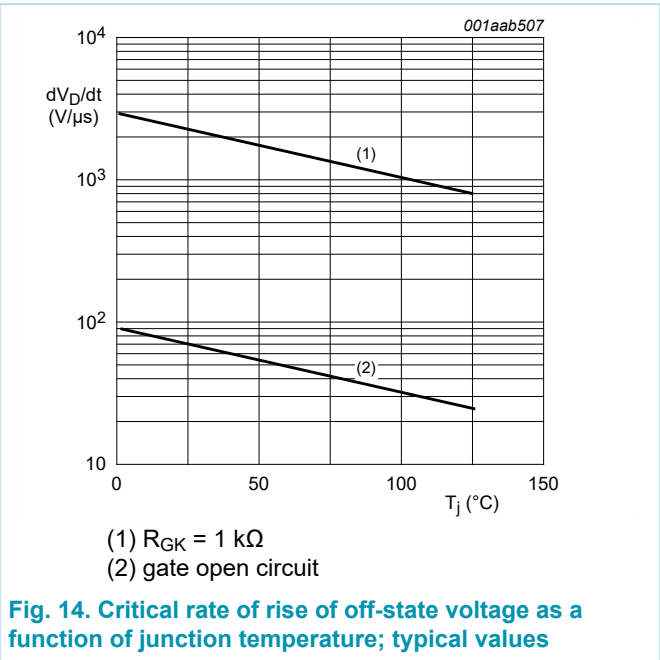
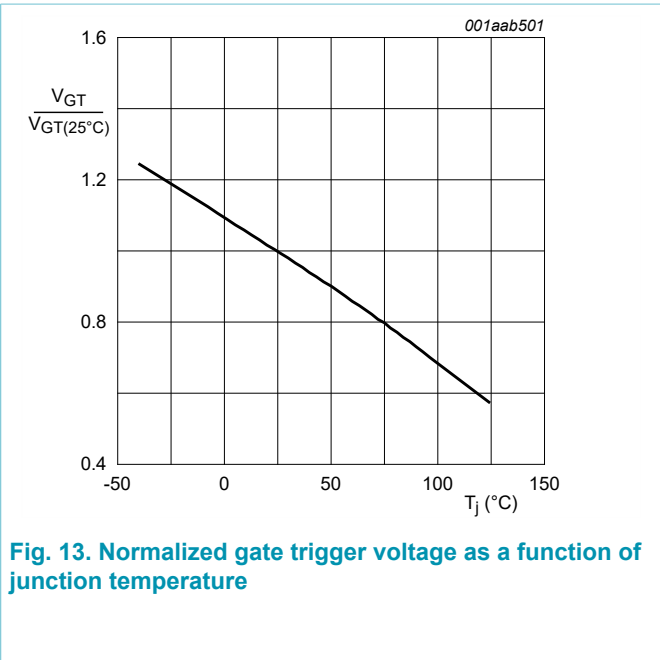


Fig. 12. On-state current as a function of on-state voltage



10. Package outline

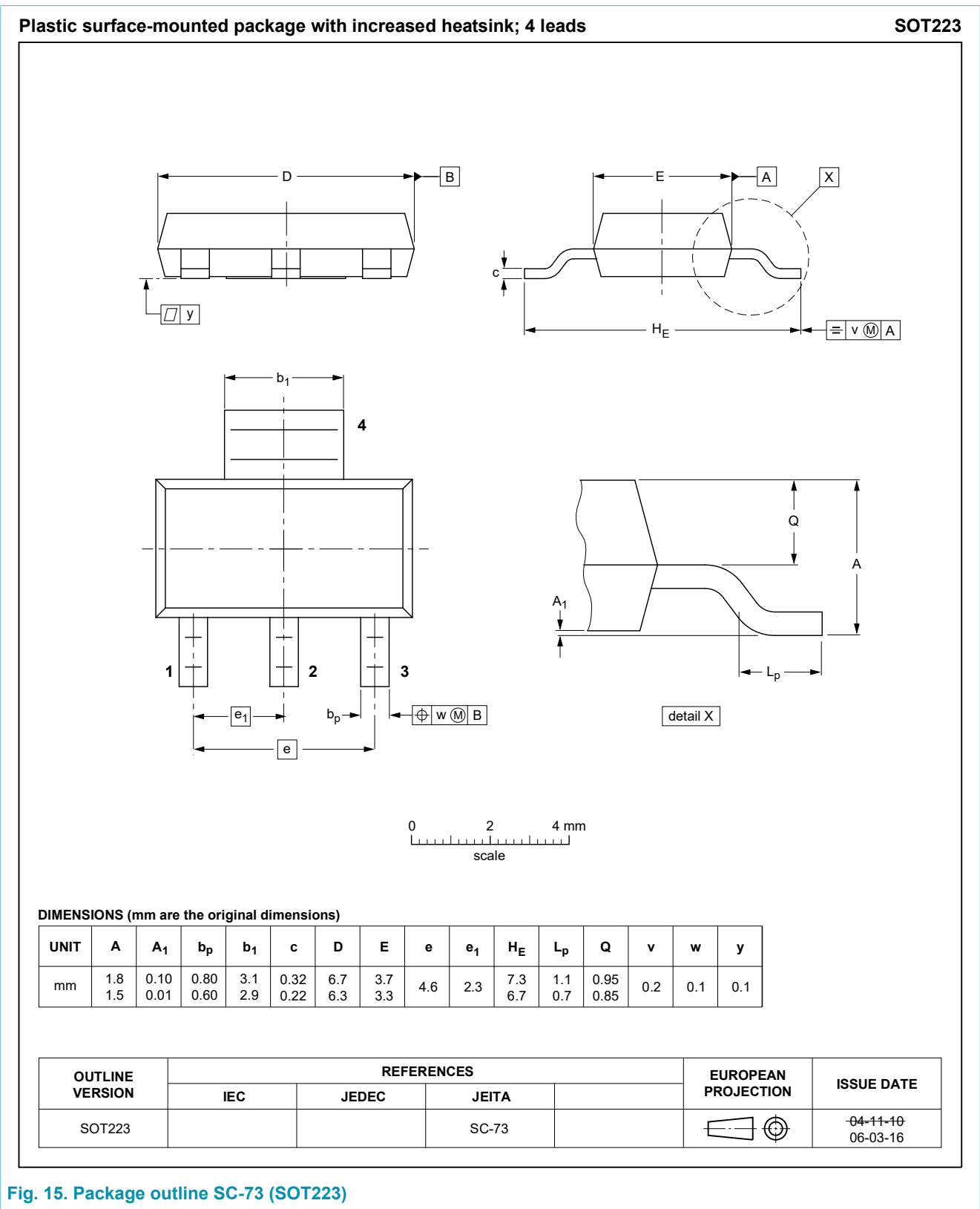
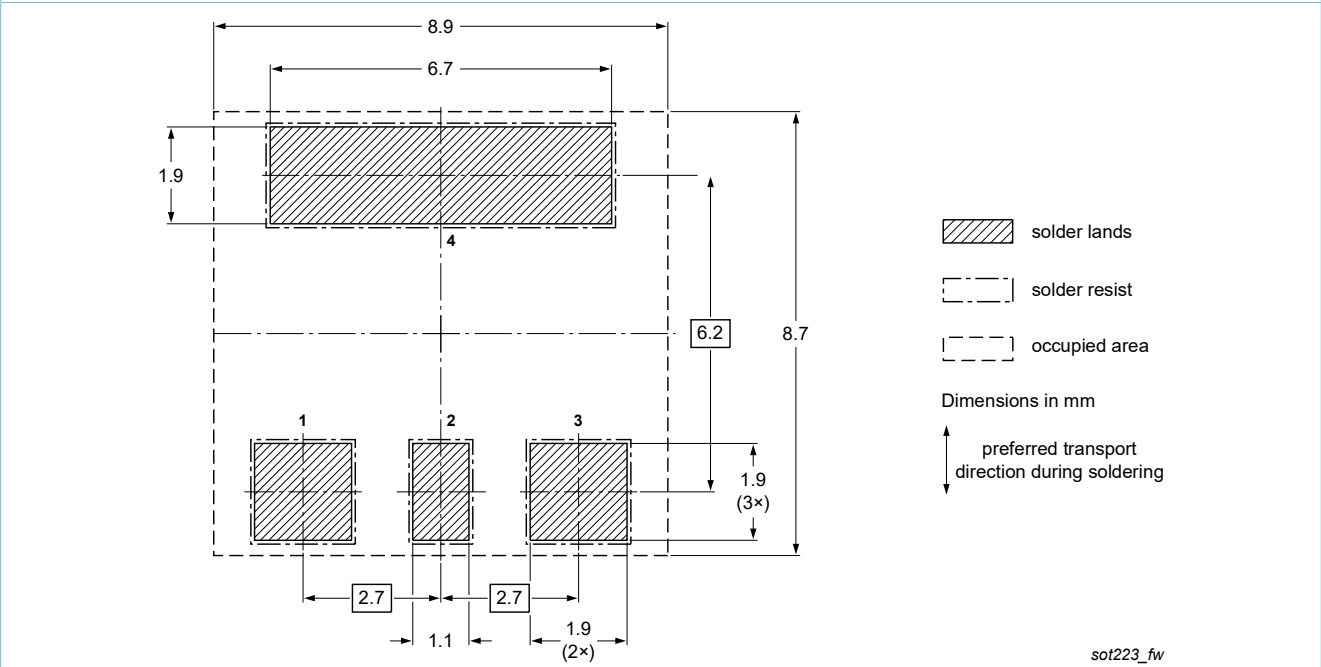
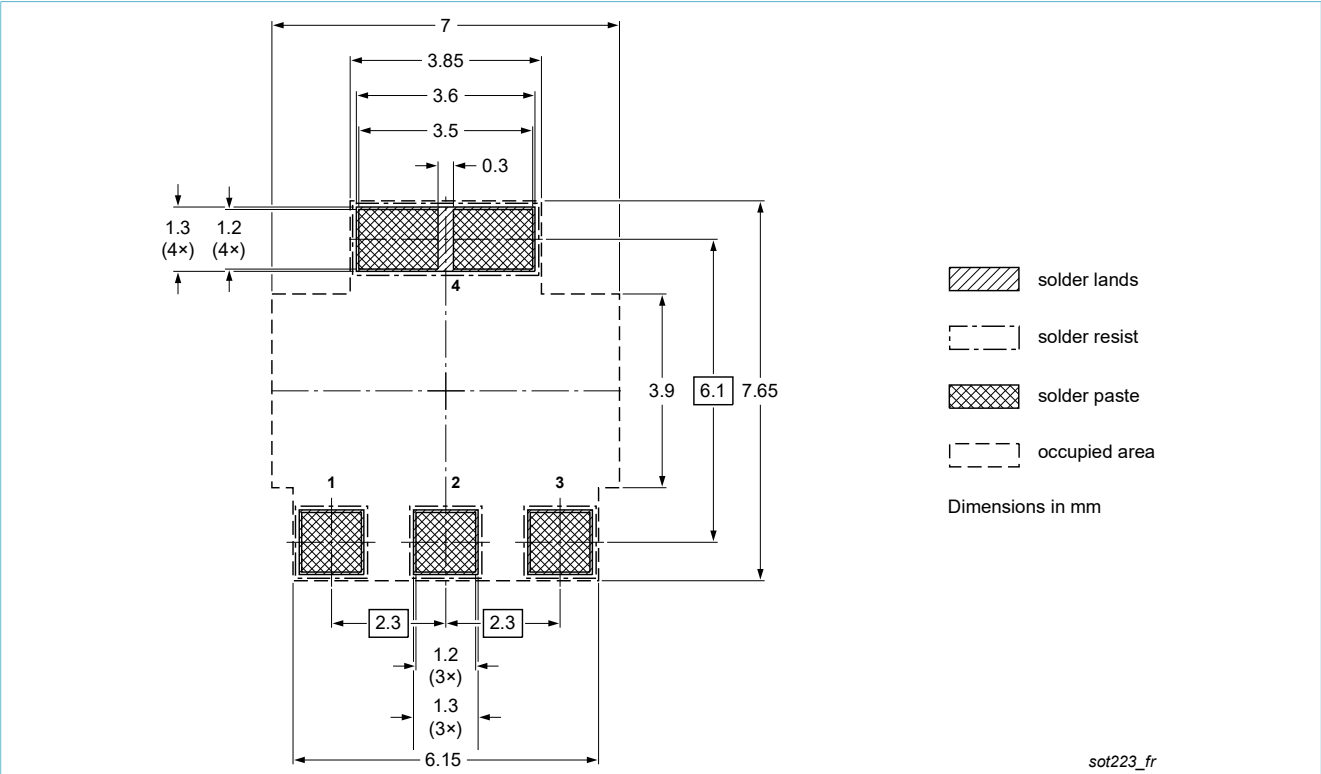


Fig. 15. Package outline SC-73 (SOT223)

11. Soldering



## 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.
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