



NCR100-8L

SCR

8 April 2015

Product data sheet

1. General description

Planar passivated sensitive gate Silicon Controlled Rectifier in a SOT23 (TO-236AB) plastic package.

2. Features and benefits

- Sensitive gate
- Planar passivated for voltage ruggedness and reliability
- Surface mountable package

3. Applications

- Earth leakage circuit breakers or Ground Fault Circuit Interrupters (GFCI)
- Ignition circuits
- Low power latching circuits
- Protection circuit / shut-down circuits: lighting ballasts
- Protection circuit / shut-down circuits: Switched Mode Power Supplies

4. Quick reference data

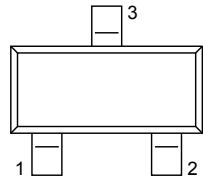

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{DRM}	repetitive peak off-state voltage		-	-	600	V
V_{RRM}	repetitive peak reverse voltage		-	-	600	V
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(init)} = 25\text{ °C}$; $t_p = 10\text{ ms}$; Fig. 4 ; Fig. 5	-	-	8	A
$I_{T(AV)}$	average on-state current	half sine wave; $T_{sp} \leq 75\text{ °C}$	-	-	0.5	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_{sp} \leq 75\text{ °C}$; Fig. 1 ; Fig. 2 ; Fig. 3	-	-	0.8	A
Static characteristics						
I_{GT}	gate trigger current	$V_D = 12\text{ V}$; $I_T = 10\text{ mA}$; $T_j = 25\text{ °C}$; Fig. 7	15	-	50	μA



5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate	 <p>TO-236AB (SOT23)</p>	 <p>sym037</p>
2	K	cathode		
3	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
NCR100-8L	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code
NCR100-8L	W8L

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		-	600	V
V_{RRM}	repetitive peak reverse voltage		-	600	V
$I_{T(AV)}$	average on-state current	half sine wave; $T_{sp} \leq 75\text{ °C}$	-	0.5	A
$I_{T(RMS)}$	RMS on-state current	half sine wave; $T_{sp} \leq 75\text{ °C}$; Fig. 1 ; Fig. 2 ; Fig. 3	-	0.8	A
I_{TSM}	non-repetitive peak on-state current	half sine wave; $T_{j(\text{init})} = 25\text{ °C}$; $t_p = 10\text{ ms}$; Fig. 4 ; Fig. 5	-	8	A
		half sine wave; $T_{j(\text{init})} = 25\text{ °C}$; $t_p = 8.3\text{ ms}$	-	9	A
I^2t	I^2t for fusing	$t_p = 10\text{ ms}$; SIN	-	0.36	A^2s
dl_T/dt	rate of rise of on-state current	$I_G = 0.1\text{ mA}$	-	50	$A/\mu s$
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	$^{\circ}C$
T_j	junction temperature		-	125	$^{\circ}C$

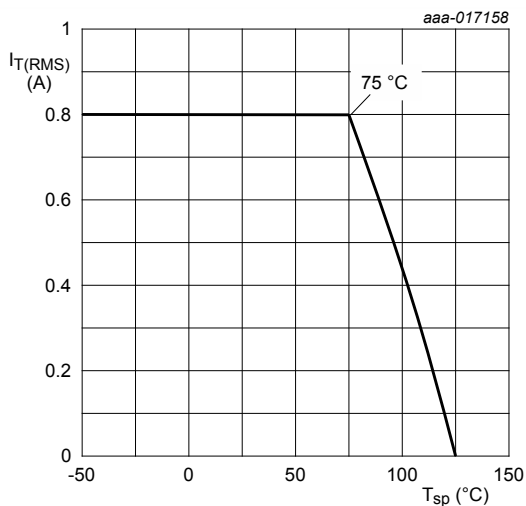
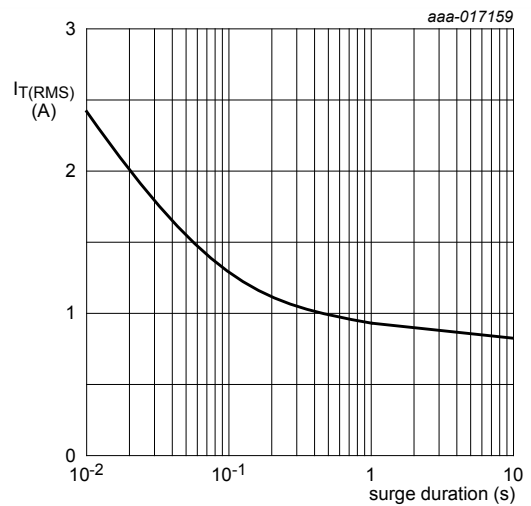


Fig. 1. RMS on-state current as a function of solder point temperature; maximum values



$f = 50\text{ Hz}$; $T_{sp} = 75\text{ °C}$

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

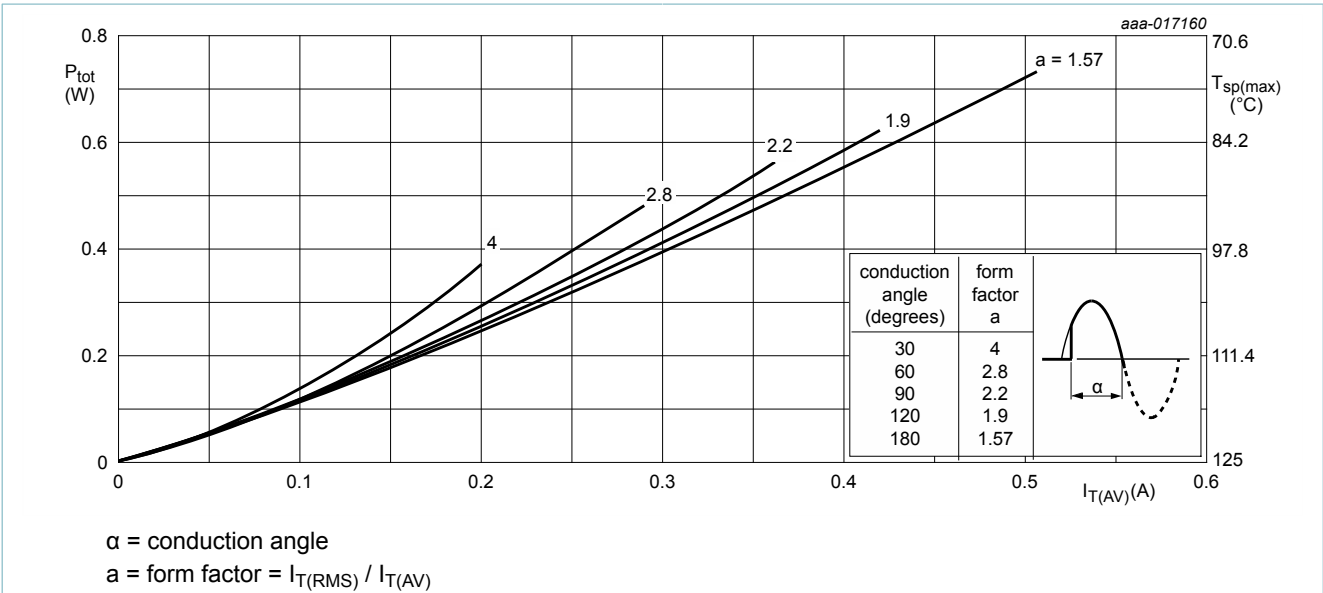


Fig. 3. Total power dissipation as a function of average on-state current; maximum values

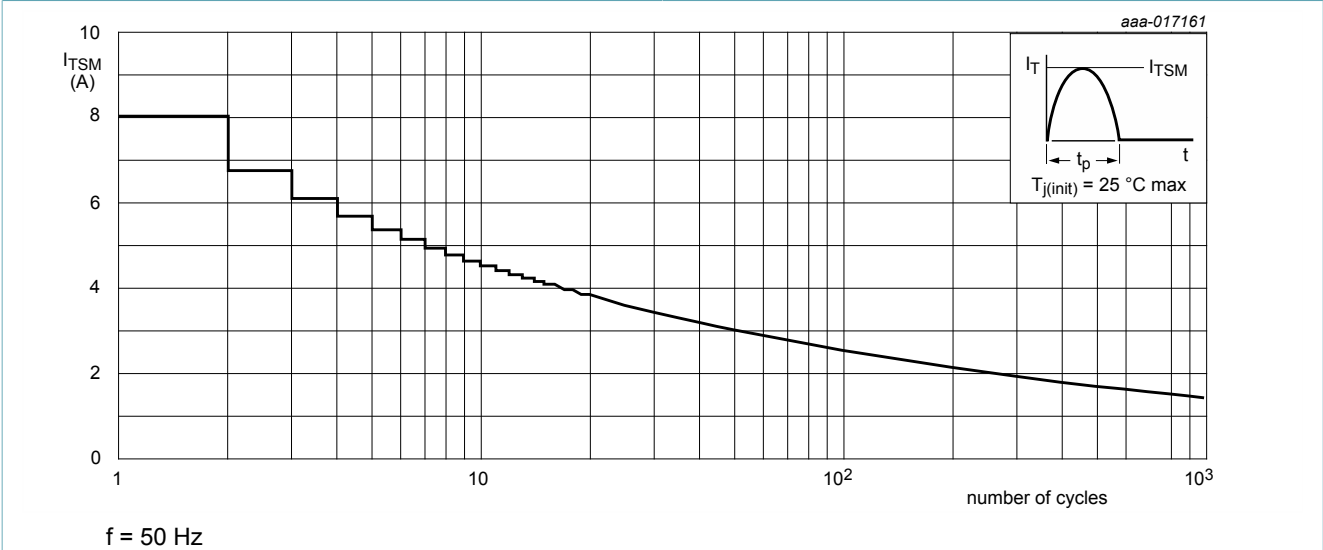


Fig. 4. Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

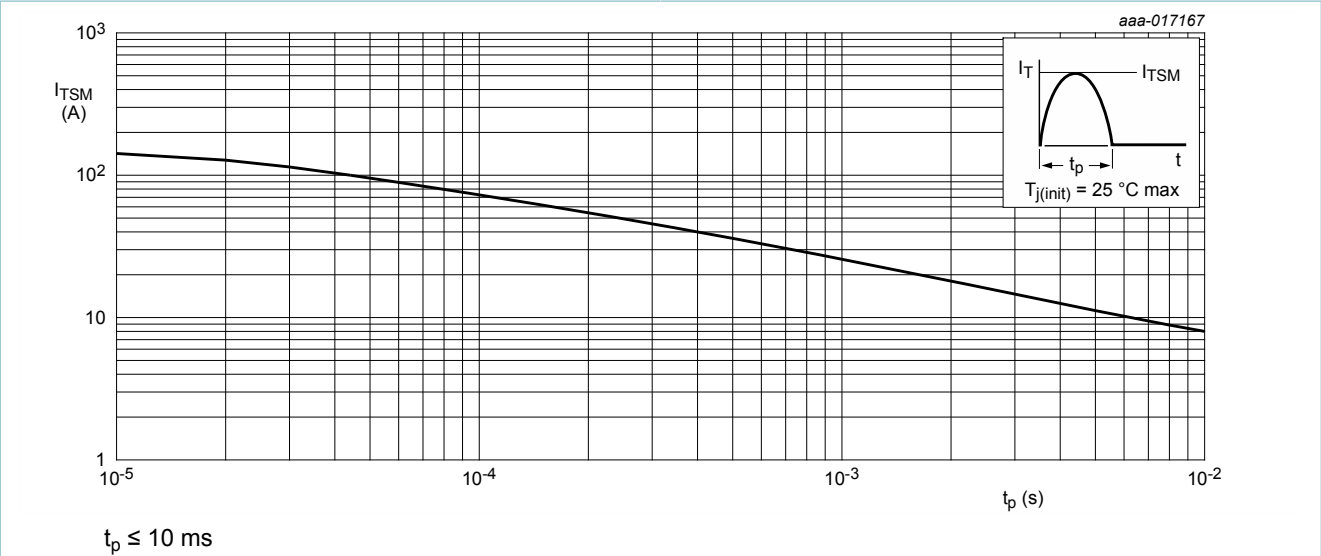


Fig. 5. Non-repetitive peak on-state current as a function of pulse width for sinusoidal currents; maximum values

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	Fig. 6	-	-	23	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for anode 6 sq cm.	-	105	-	K/W

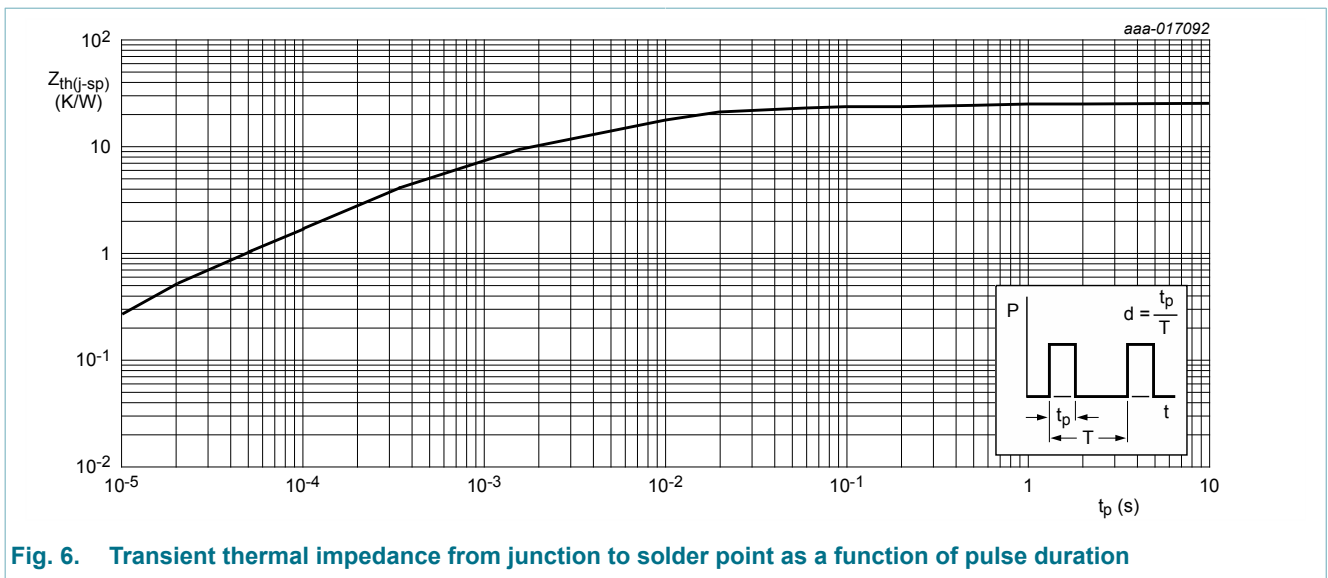


Fig. 6. Transient thermal impedance from junction to solder point as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
I_{GT}	gate trigger current	$V_D = 12\text{ V}$; $I_T = 10\text{ mA}$; $T_j = 25\text{ °C}$; Fig. 7	15	-	50	μA
I_L	latching current	$V_D = 12\text{ V}$; $I_G = 0.5\text{ mA}$; $R_{GK} = 1\text{ k}\Omega$; $T_j = 25\text{ °C}$; Fig. 8	-	-	6	mA
I_H	holding current	$V_D = 12\text{ V}$; $R_{GK} = 1\text{ k}\Omega$; $T_j = 25\text{ °C}$; Fig. 9	-	-	3	mA
V_T	on-state voltage	$I_T = 1.2\text{ A}$; $T_j = 25\text{ °C}$; Fig. 10	-	1.25	1.7	V
V_{GT}	gate trigger voltage	$V_D = 12\text{ V}$; $I_T = 10\text{ mA}$; $T_j = 25\text{ °C}$; Fig. 11	-	0.5	0.8	V
		$V_D = 400\text{ V}$; $I_T = 10\text{ mA}$; $T_j = 125\text{ °C}$; Fig. 11	0.3	0.5	-	V
I_D	off-state current	$V_D = 600\text{ V}$; $T_j = 125\text{ °C}$; $R_{GK} = 1\text{ k}\Omega$	-	0.05	0.1	mA
I_R	reverse current	$V_R = 600\text{ V}$; $T_j = 125\text{ °C}$; $R_{GK} = 1\text{ k}\Omega$	-	0.05	0.1	mA
Dynamic characteristics						
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 402\text{ V}$; $T_j = 125\text{ °C}$; $R_{GK} = 1\text{ k}\Omega$; exponential waveform; ($V_{DM} = 67\%$ of V_{DRM})	100	-	-	$\text{V}/\mu\text{s}$
t_{gt}	gate-controlled turn-on time	$I_{TM} = 0.8\text{ A}$; $V_D = 600\text{ V}$; $I_G = 10\text{ mA}$; $dI_G/dt = 0.1\text{ A}/\mu\text{s}$; $T_j = 25\text{ °C}$	-	2	-	μs
t_q	commutated turn-off time	$V_{DM} = 402\text{ V}$; $T_j = 125\text{ °C}$; $I_{TM} = 0.8\text{ A}$; $V_R = 35\text{ V}$; $(dI_T/dt)_M = 30\text{ A}/\mu\text{s}$; $dV_D/dt = 2\text{ V}/\mu\text{s}$; $R_{GK} = 1\text{ k}\Omega$	-	100	-	μs

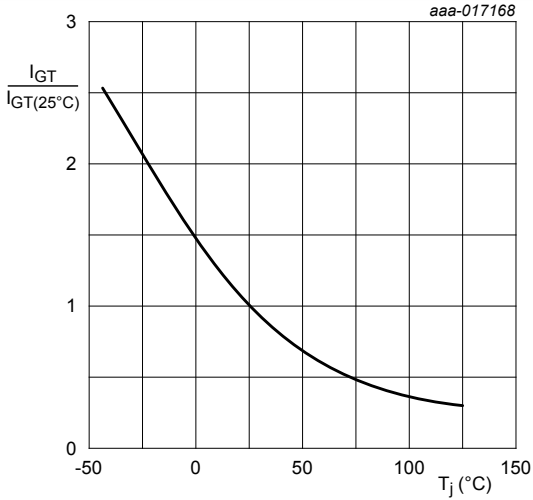


Fig. 7. Normalized gate trigger current as a function of junction temperature

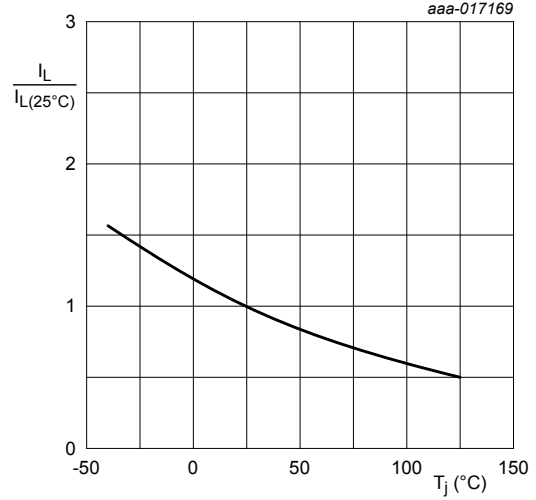


Fig. 8. Normalized latching current as a function of junction temperature

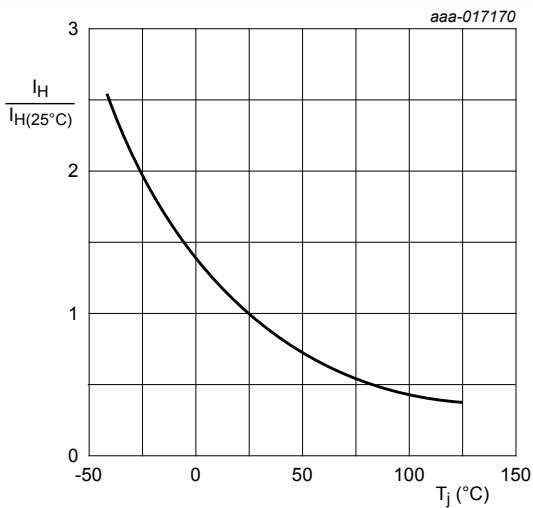
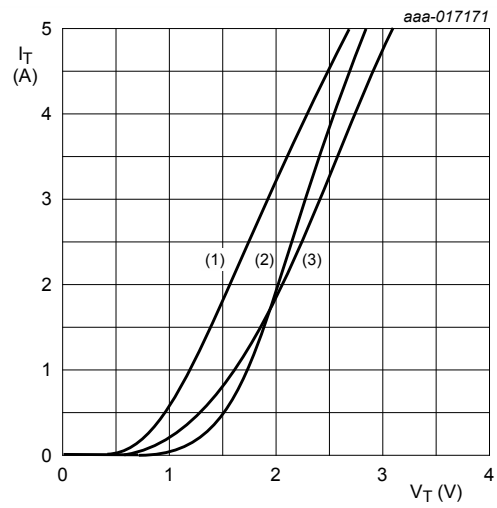


Fig. 9. Normalized holding current as a function of junction temperature



$V_o = 1.173 \text{ V}; R_s = 0.216 \Omega$
 (1) $T_j = 125^\circ\text{C}$; typical values
 (2) $T_j = 25^\circ\text{C}$; maximum values
 (3) $T_j = 125^\circ\text{C}$; maximum values

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

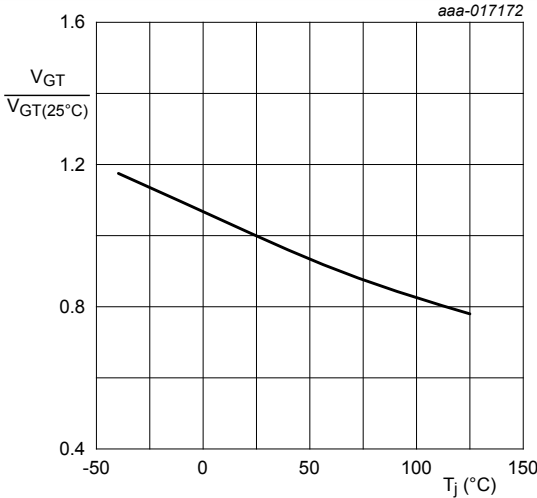


Fig. 11. Normalized gate trigger voltage as a function of junction temperature

11. Package outline

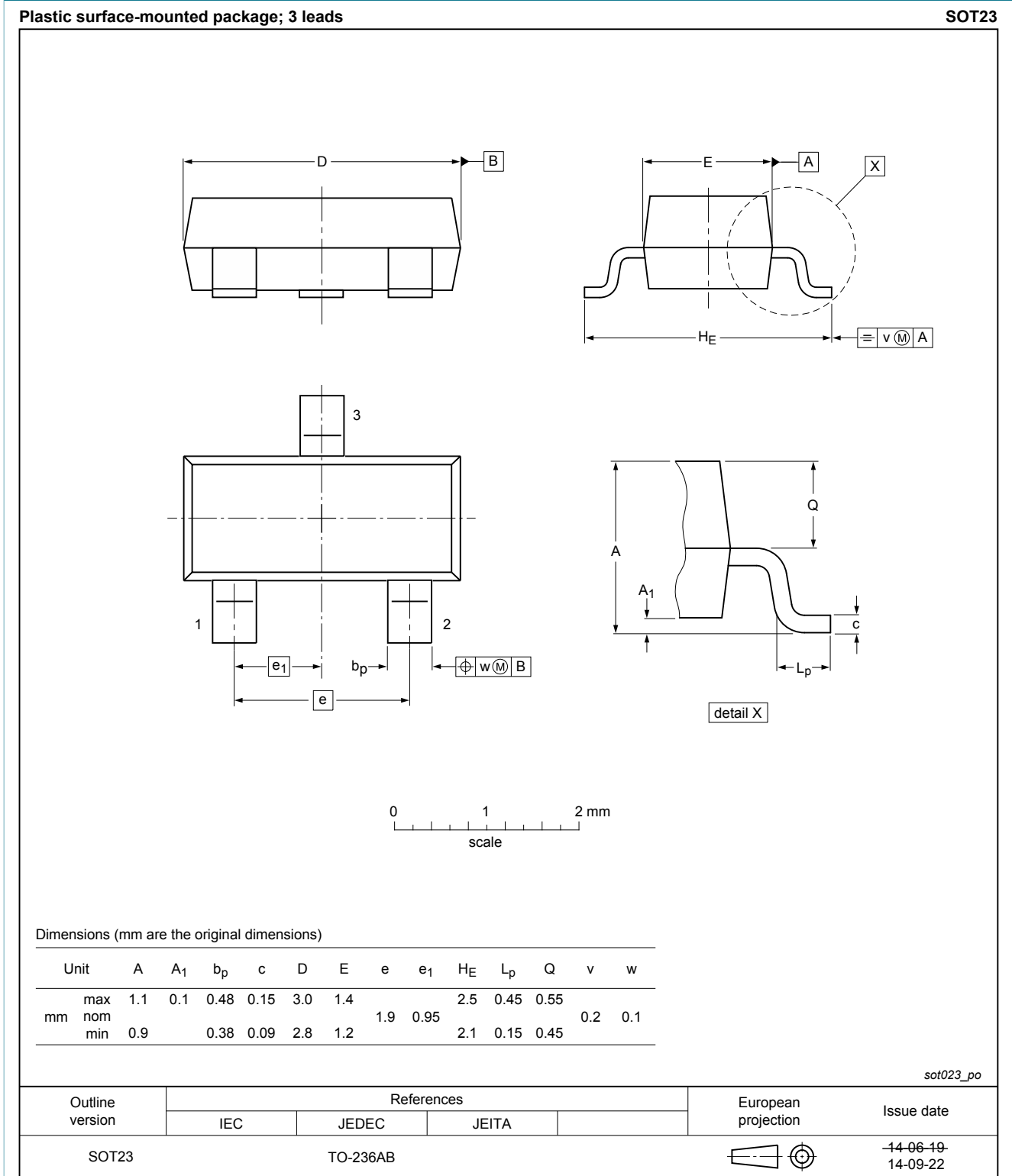


Fig. 12. Package outline TO-236AB (SOT23)

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	6
10	Characteristics	7
11	Package outline	10
12	Legal information	11
12.1	Data sheet status	11
12.2	Definitions	11
12.3	Disclaimers	11
12.4	Trademarks	12

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