



# SMA6J series

## 600 W Transient Voltage Suppressor

5 September 2024

Product data sheet

### 1. General description

600 W uni- and bi-directional Transient Voltage Suppressor (TVS) in a SMA Surface-Mounted Device (SMD) plastic package, designed for transient voltage protection.

### 2. Features and benefits

- Rated peak pulse power at 10/1000  $\mu$ s waveform:  $P_{PPM} = 600$  W
- Reverse standoff voltage:  $V_{RWM} = 7$  V to 58 V
- Reverse current:  $I_R$  less than 1  $\mu$ A for  $V_{RWM} \geq 11$ V
- Excellent clamping capability
- Small plastic package suitable for surface-mounted design

### 3. Applications

- Power supply protection
- Power management
- Telecom, Computer, Industrial and Consumer electronics application

### 4. Quick reference data


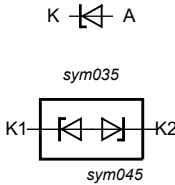
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{RWM}$	reverse standoff voltage	$T_{amb} = 25$ °C		7	-	58	V
$P_{PPM}$	rated peak pulse power	$t_p = 10/1000$ $\mu$ s; $T_{amb} = 25$ °C	[1]	-	-	600	W

[1] In accordance with IEC 61643-321 (10/1000  $\mu$ s current waveform).

## 5. Pinning information

Table 2. Pinning information

Pin	Description uni-directional	Description bi-directional	Simplified outline	Graphic symbol
1	cathode [1] [2]	cathode 1	 <p>Transparent top view SMA (SOD1001-1)</p>	 <p>K A sym035 K1 K2 sym045</p>
2	anode	cathode 2		

- [1] The marking bar indicates the cathode for uni-directional device.  
 [2] Marking bar is used for uni-directional device only.

## 6. Ordering information

Table 3. Ordering information

Type number[1]	Package		
	Name	Description	Version
SMA6J series	SMA	plastic, surface mounted package; 2 terminals; 4.30 mm x 2.65 mm x 2.10 mm body	SOD1001-1

- [1] The series consists of 58 types with reverse standoff voltages from 7 V to 58 V.

## 7. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code
SMA6J7.0A	BL6	SMA6J7.0CA	BQ3
SMA6J7.5A	BL7	SMA6J7.5CA	BQ4
SMA6J8.0A	BL8	SMA6J8.0CA	BQ5
SMA6J8.5A	BL9	SMA6J8.5CA	BQ6
SMA6J9.0A	BM2	SMA6J9.0CA	BQ7
SMA6J10A	BM3	SMA6J10CA	BQ8
SMA6J11A	BM4	SMA6J11CA	BQ9
SMA6J12A	BM5	SMA6J12CA	BR2
SMA6J13A	BM6	SMA6J13CA	BR3
SMA6J14A	BM7	SMA6J14CA	BR4
SMA6J15A	BM8	SMA6J15CA	BR5
SMA6J16A	BM9	SMA6J16CA	BR6
SMA6J17A	BN2	SMA6J17CA	BR7
SMA6J18A	BN3	SMA6J18CA	BR8
SMA6J20A	BN4	SMA6J20CA	BR9
SMA6J22A	BN5	SMA6J22CA	BS2
SMA6J24A	BN6	SMA6J24CA	BS3
SMA6J26A	BN7	SMA6J26CA	BS4
SMA6J28A	BN8	SMA6J28CA	BS5

Type number	Marking code	Type number	Marking code
SMA6J30A	BN9	SMA6J30CA	BS6
SMA6J33A	BP2	SMA6J33CA	BS7
SMA6J36A	BP3	SMA6J36CA	BS8
SMA6J40A	BP4	SMA6J40CA	BS9
SMA6J43A	BP5	SMA6J43CA	BT2
SMA6J45A	BP6	SMA6J45CA	BT3
SMA6J48A	BP7	SMA6J48CA	BT4
SMA6J51A	BP8	SMA6J51CA	BT5
SMA6J54A	BP9	SMA6J54CA	BT6
SMA6J58A	BQ2	SMA6J58CA	BT7

## 8. Limiting values

**Table 5. Limiting values**

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

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
$P_{PPM}$	rated peak pulse power	$t_p = 10/1000 \mu s$	[1]	-	600	W
$I_{PPM}$	rated peak pulse current	$t_p = 10/1000 \mu s$	[1]	-	see table 8	A
$T_j$	junction temperature			-	150	°C
$T_{amb}$	ambient temperature			-55	150	°C
$T_{stg}$	storage temperature			-55	150	°C

[1] In accordance with IEC 61643-321 (10/1000  $\mu s$  current waveform).

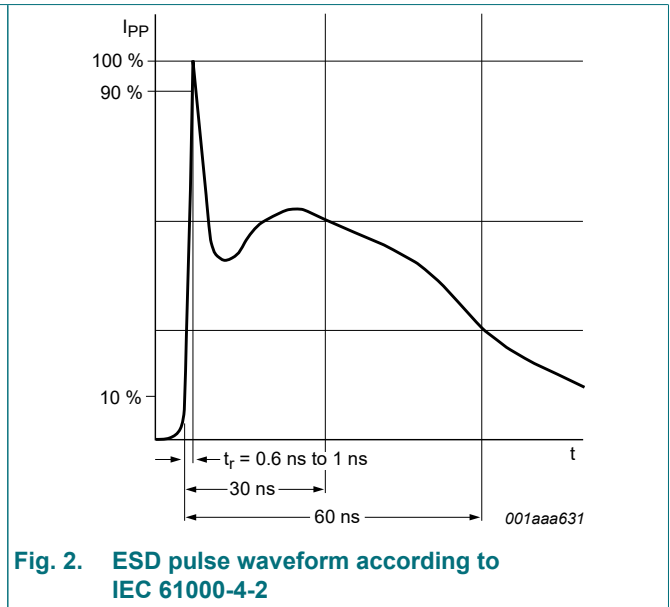
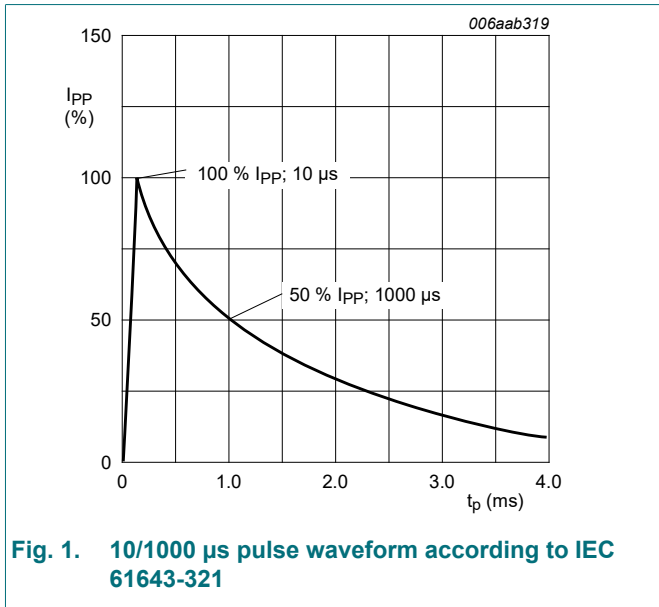
**Table 6. ESD maximum ratings**

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
$V_{ESD}$	electrostatic discharge voltage	IEC 61000-4-2; contact discharge; $T_{amb} = 25^\circ C$	[1]	-	30	kV

[1] Device stressed with ten non-repetitive ESD pulses.

**Table 7. ESD standards compliance**

Standard	
<b>Per diode</b>	
IEC 61000-4-2; level 4 (ESD)	> 15 kV (air); > 8 kV (contact)
MIL-STD-883; class 3 (human body model)	> 4kV



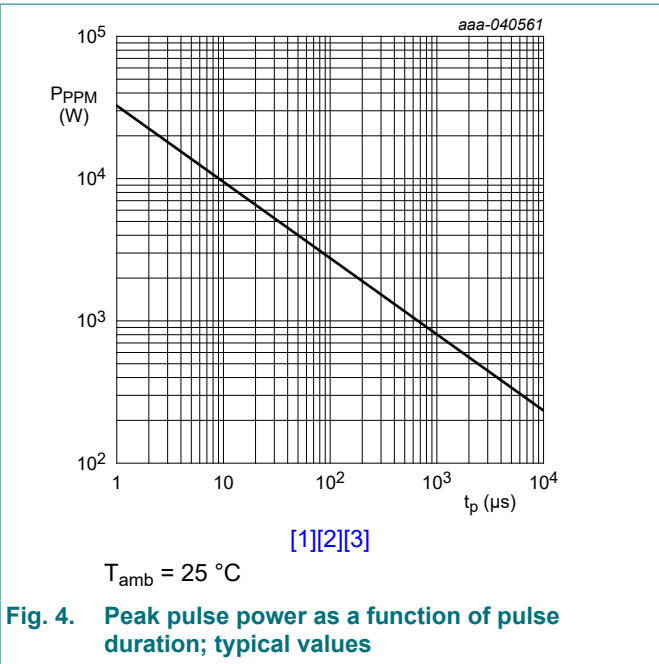
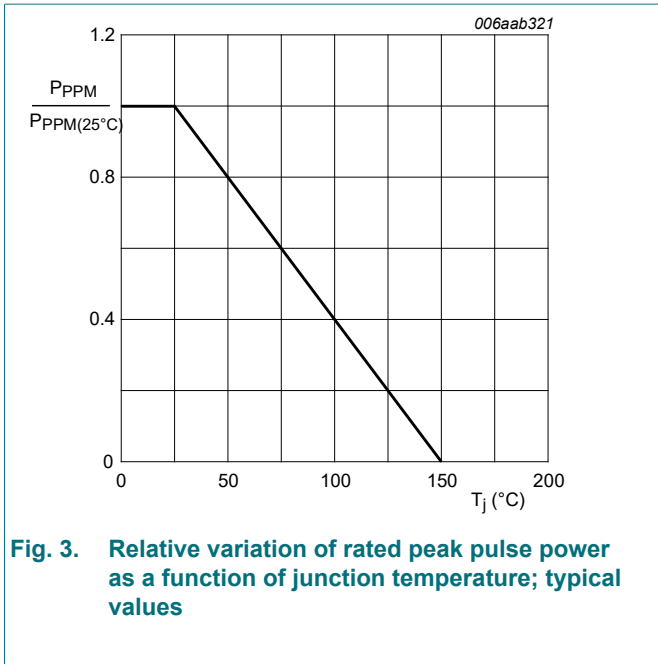
## 9. Characteristics

**Table 8. Characteristics per type;**

$T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified.

Type number		Reverse standoff voltage $V_{RWM}$ (V)	Breakdown voltage $V_{BR}$ (V) at test current $I_T$			Reverse leakage current $I_{RM}$ at $V_{RWM}$ ( $\mu\text{A}$ ) [1]	Test current $I_T$ (mA)	Clamping voltage $V_{CL}$ (V)	
uni-directional	bi-directional		Max	Min	Typ			Max	Max
SMA6J7.0A	SMA6J7.0CA	7.0	7.78	8.19	8.60	200/400	10	12.0	50
SMA6J7.5A	SMA6J7.5CA	7.5	8.33	8.77	9.21	100/200	1	12.9	46.6
SMA6J8.0A	SMA6J8.0CA	8.0	8.89	9.36	9.83	50/100	1	13.6	44.2
SMA6J8.5A	SMA6J8.5CA	8.5	9.44	9.92	10.40	20/40	1	14.4	41.7
SMA6J9.0A	SMA6J9.0CA	9.0	10.00	10.55	11.10	10/20	1	15.4	39
SMA6J10A	SMA6J10CA	10	11.10	11.70	12.30	5/10	1	17.0	37
SMA6J11A	SMA6J11CA	11	12.20	12.85	13.50	1	1	18.2	33
SMA6J12A	SMA6J12CA	12	13.30	14.00	14.70	1	1	19.9	31
SMA6J13A	SMA6J13CA	13	14.40	15.15	15.90	1	1	21.5	29
SMA6J14A	SMA6J14CA	14	15.60	16.40	17.20	1	1	23.2	25.9
SMA6J15A	SMA6J15CA	15	16.70	17.60	18.50	1	1	24.4	25.1
SMA6J16A	SMA6J16CA	16	17.80	18.75	19.70	1	1	26.0	23.1
SMA6J17A	SMA6J17CA	17	18.90	19.90	20.90	1	1	27.6	22.6
SMA6J18A	SMA6J18CA	18	20.00	21.05	22.10	1	1	29.2	21.5
SMA6J20A	SMA6J20CA	20	22.20	23.35	24.50	1	1	32.4	19.4
SMA6J22A	SMA6J22CA	22	24.40	25.65	26.90	1	1	35.5	17
SMA6J24A	SMA6J24CA	24	26.70	28.10	29.50	1	1	38.9	16
SMA6J26A	SMA6J26CA	26	28.90	30.40	31.90	1	1	42.1	14.9
SMA6J28A	SMA6J28CA	28	31.10	32.75	34.40	1	1	45.4	13.8
SMA6J30A	SMA6J30CA	30	33.30	35.05	36.80	1	1	48.4	12.5
SMA6J33A	SMA6J33CA	33	36.70	38.65	40.60	1	1	53.3	11.8
SMA6J36A	SMA6J36CA	36	40.00	42.10	44.20	1	1	58.1	10.4
SMA6J40A	SMA6J40CA	40	44.40	46.75	49.10	1	1	64.5	9.7
SMA6J43A	SMA6J43CA	43	47.80	50.30	52.80	1	1	69.4	8.7
SMA6J45A	SMA6J45CA	45	50.00	52.65	55.30	1	1	72.7	8.3
SMA6J48A	SMA6J48CA	48	53.30	56.10	58.90	1	1	77.4	8.1
SMA6J51A	SMA6J51CA	51	56.70	59.70	62.70	1	1	82.4	7.4
SMA6J54A	SMA6J54CA	54	60.00	63.15	66.30	1	1	87.1	6.9
SMA6J58A	SMA6J58CA	58	64.40	67.80	71.20	1	1	93.6	6.7

[1]  $I_{RM}$  Max. is doubled for bi-directional type with  $V_{RWM} \leq 10$  V



- [1] Peak pulse power derating curve derived from typical measured values using 8/20 μs and 10/1000 μs waveforms.
- [2] In accordance with IEC 61000-4-5 (8/20 μs waveforms).
- [3] In accordance with IEC 61643-321 (10/1000 μs waveforms).

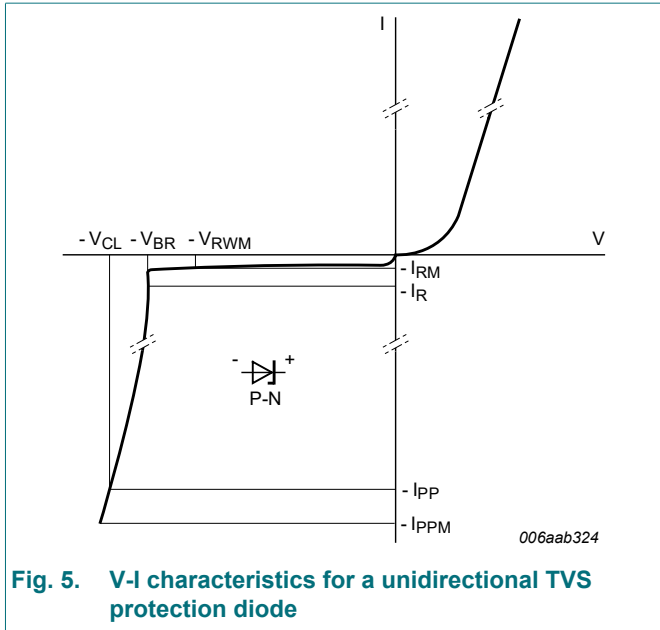


Fig. 5. V-I characteristics for a unidirectional TVS protection diode

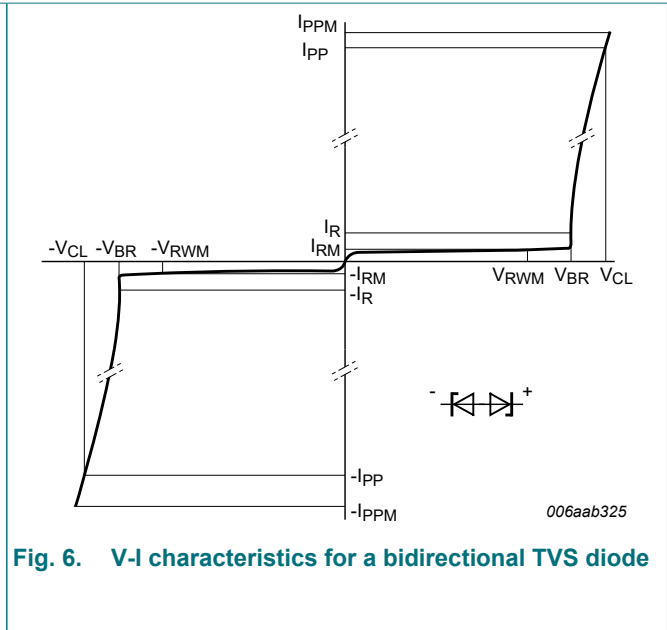


Fig. 6. V-I characteristics for a bidirectional TVS diode

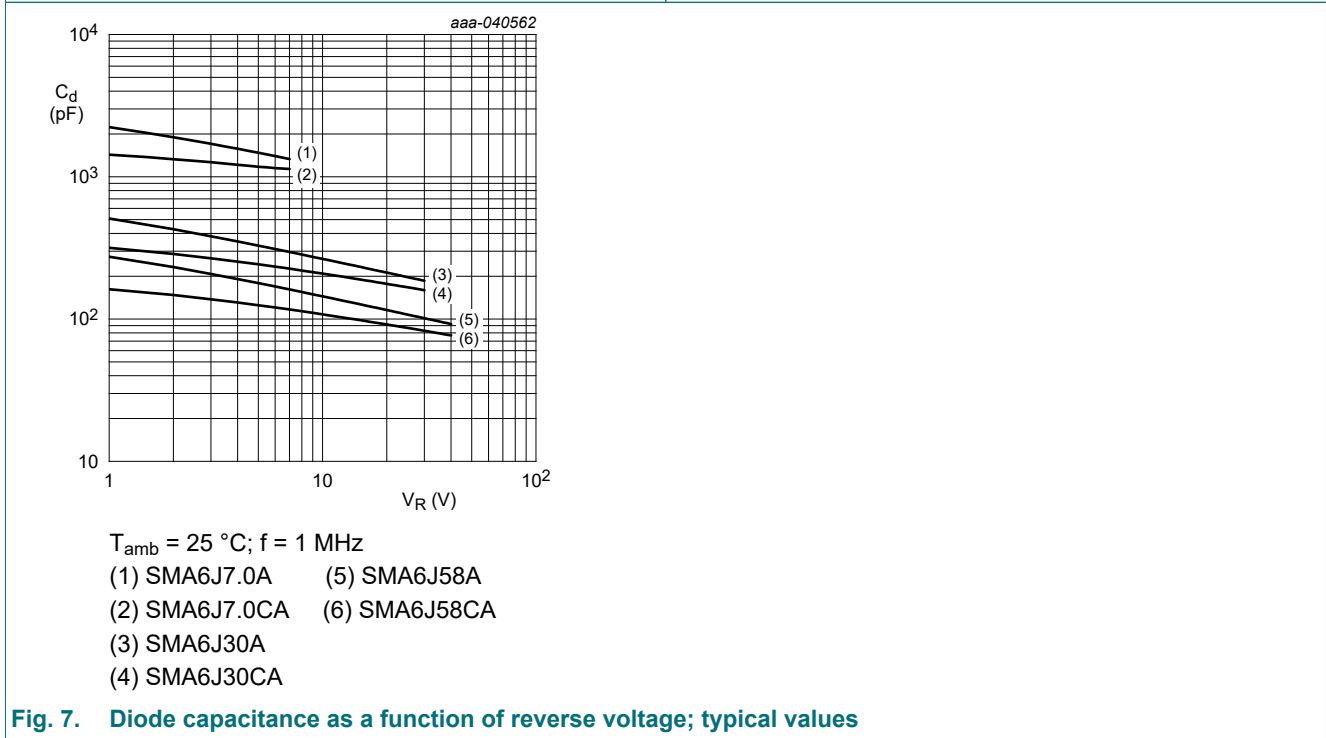
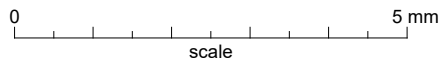
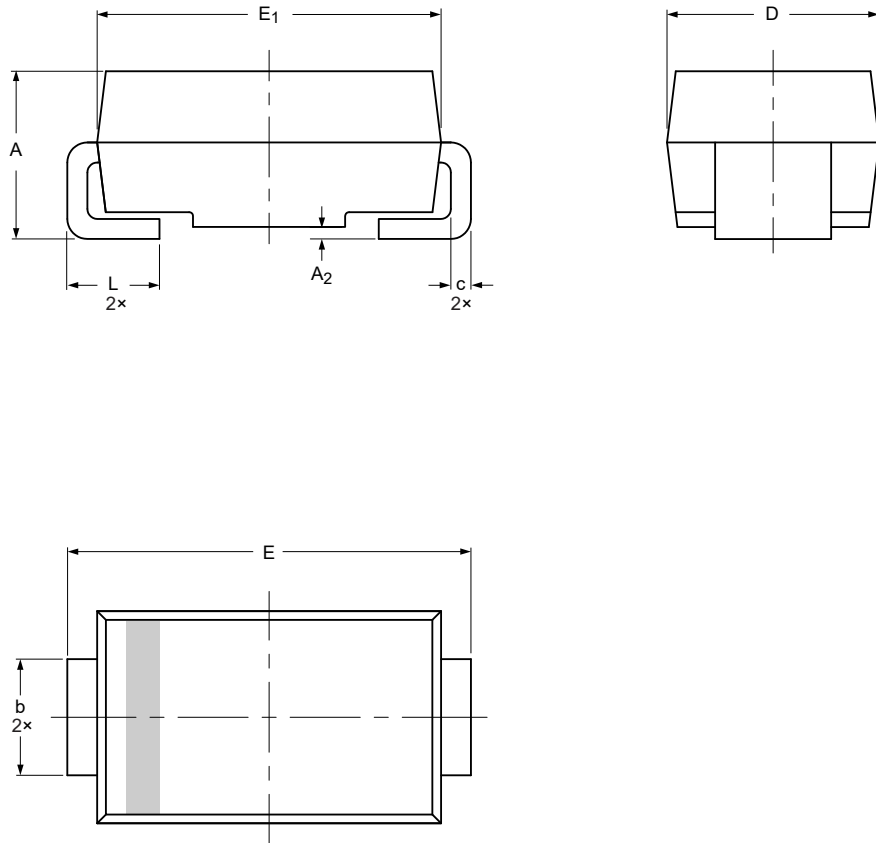


Fig. 7. Diode capacitance as a function of reverse voltage; typical values

### 10. Package outline

SMA: plastic, surface mounted package; 2 terminals; 4.30 mm x 2.65 mm x 2.10 mm body

SOD1001-1



Dimensions (mm are the original dimensions)

Unit <sup>(1)</sup>	A	A <sub>2</sub>	b	c	D	E	E <sub>1</sub>	L
max	2.45	0.20	1.65	0.36	2.92	5.59	4.60	1.52
mm nom								
min	1.95	0.05	1.25	0.15	2.40	4.80	3.95	0.75

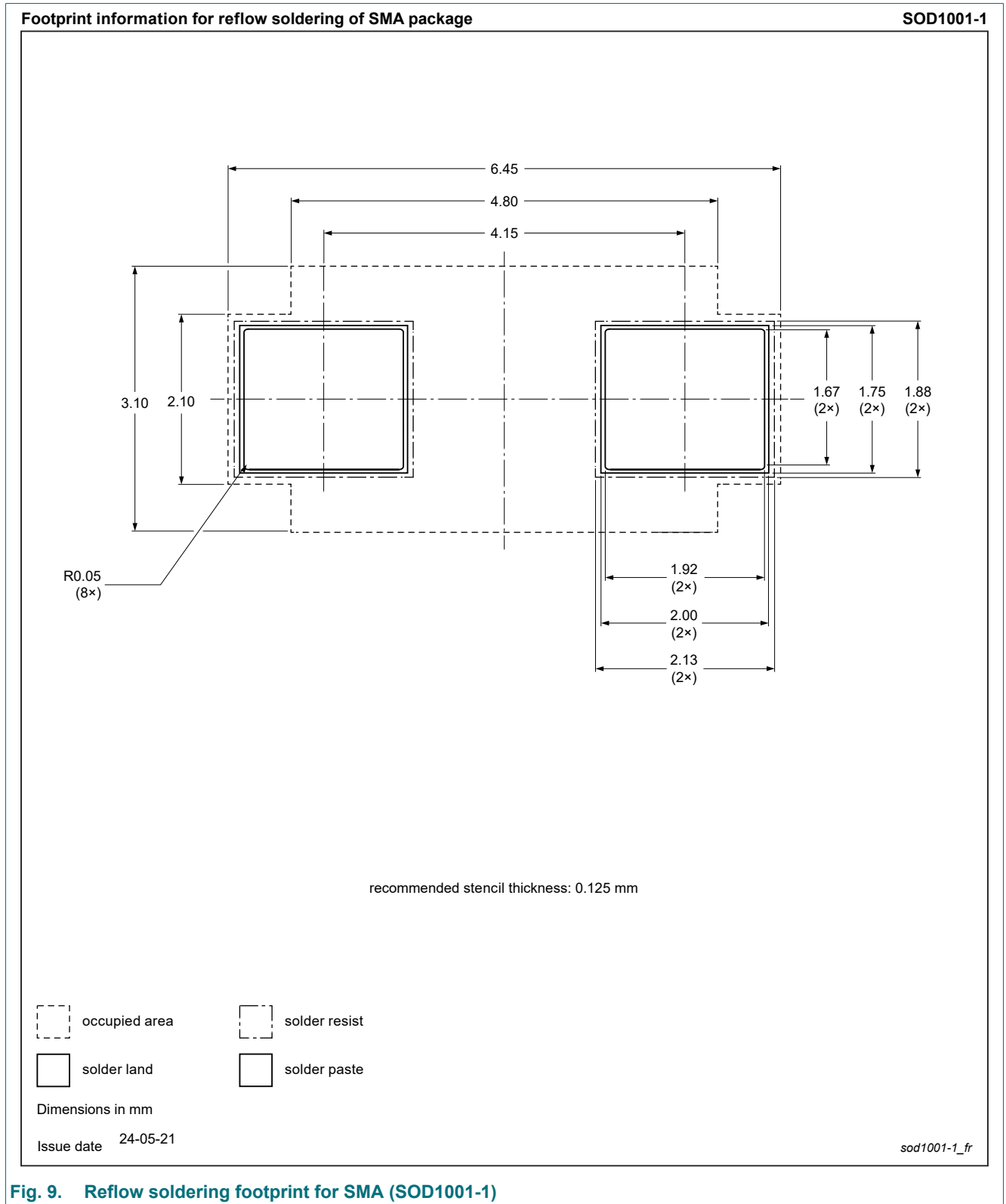
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Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOD1001-1					24-05-22

Fig. 8. Package outline SMA (SOD1001-1)



# 11. Soldering



**Fig. 9. Reflow soldering footprint for SMA (SOD1001-1)**

## 12. Revision history

Table 9. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
SMA6J_SER v.1	20240905	Product data sheet	-	-

## 13. Legal information

### Data sheet status

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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