



PMBTA06

NPN general purpose transistor

1 July 2022

Product data sheet

1. General description

NPN general-purpose transistor encapsulated in a small SOT23 Surface-Mounted Device (SMD) plastic package.

PNP complement: PMBTA56

2. Features and benefits

- High current (max. 500 mA)
- Low voltage (max. 80 V)

3. Applications

- General purpose switching and amplification in e.g. telephony and professional communication equipment.

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CE0}	collector-emitter voltage	open base	-	-	80	V
I_C	collector current		-	-	500	mA
h_{FE}	DC current gain	$V_{CE} = 1 \text{ V}; I_C = 10 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	<p>SOT23</p>	<p>sym021</p>
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBTA06	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMBTA06	%1G

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	80	V
V_{CEO}	collector-emitter voltage	open base		-	80	V
V_{EBO}	emitter-base voltage	open collector		-	4	V
I_C	collector current			-	500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	1	A
I_{BM}	peak base current			-	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.

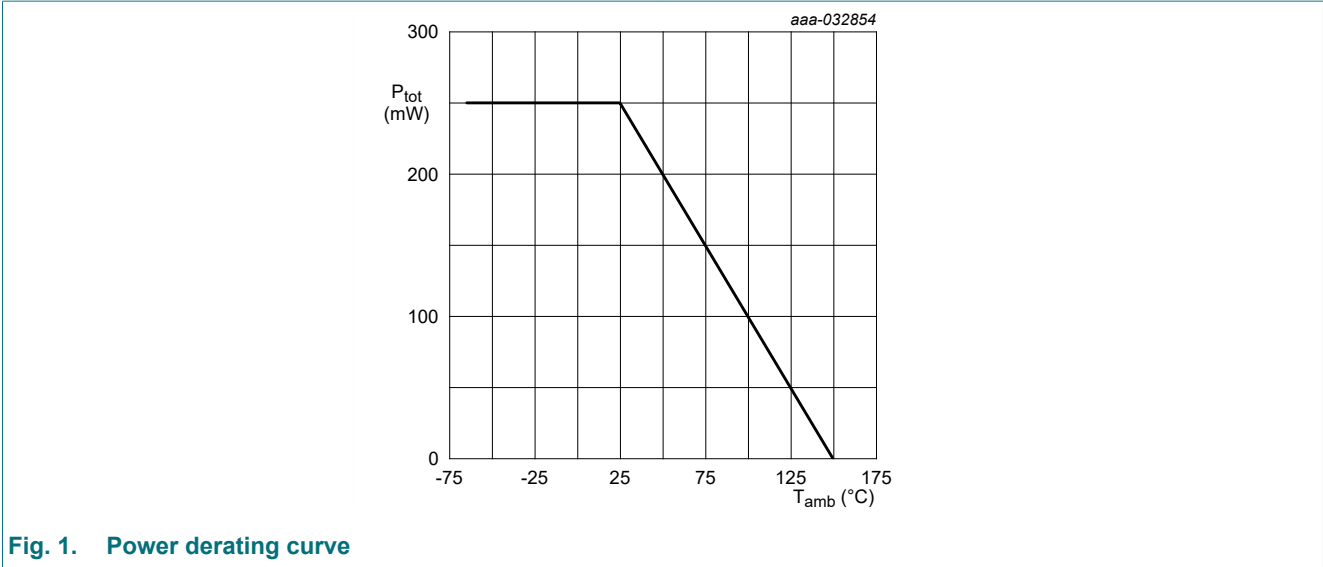


Fig. 1. Power derating curve

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

[1] Device mounted on an FR4 PCB, single-sided, 35 μm copper, tin-plated and standard footprint.

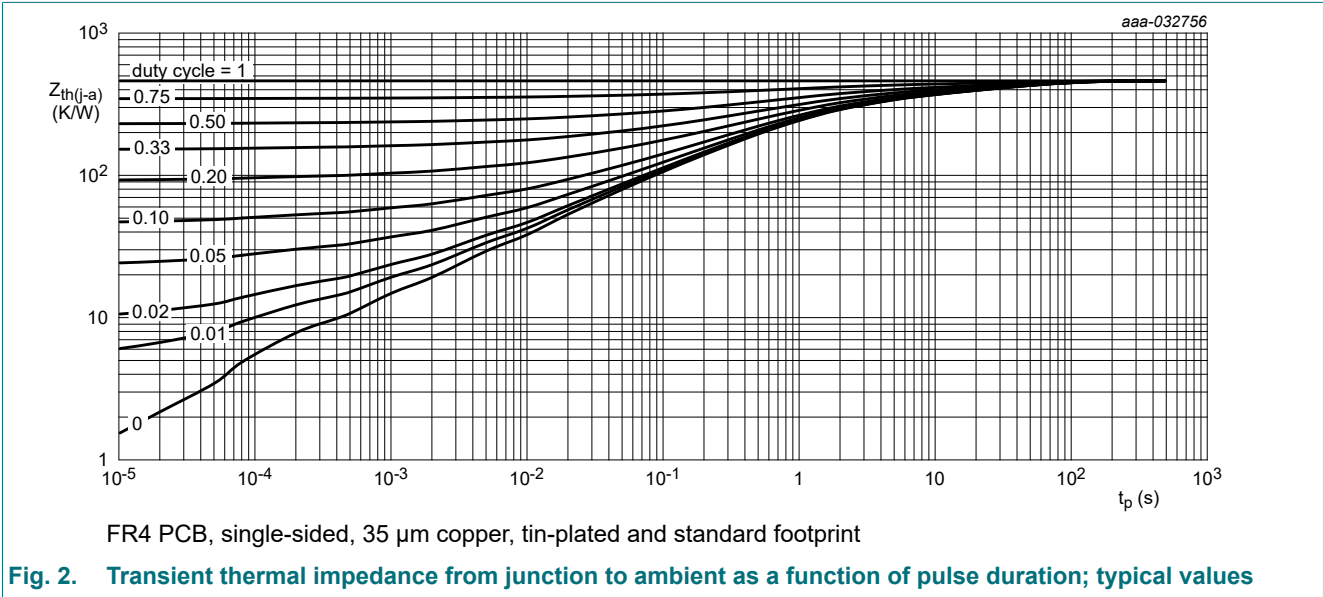


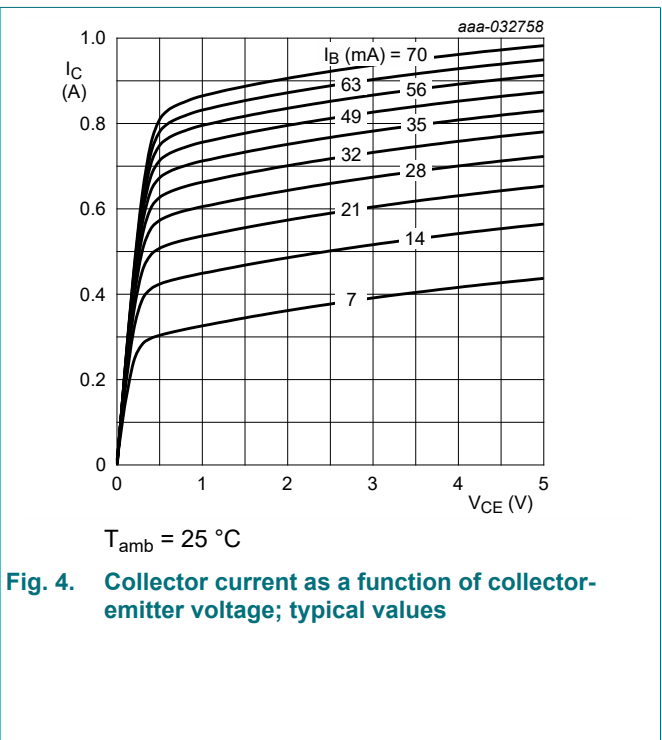
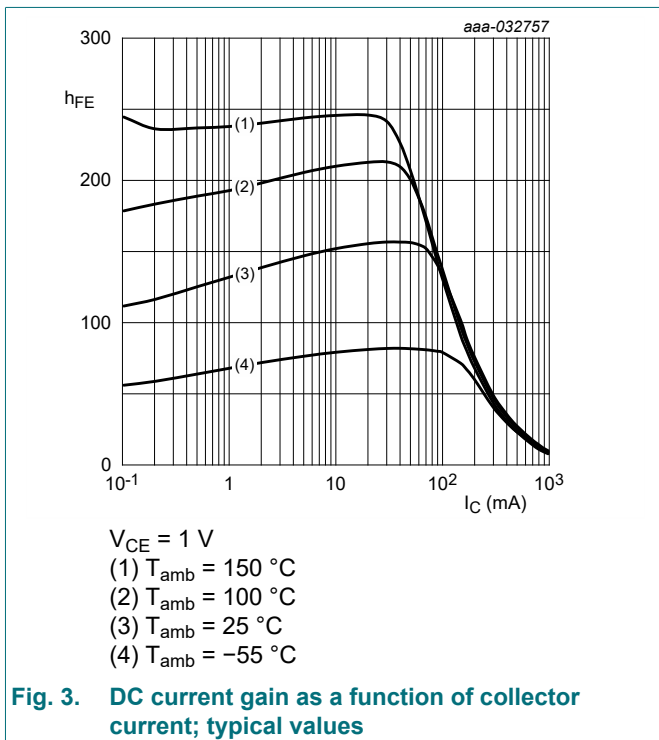
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

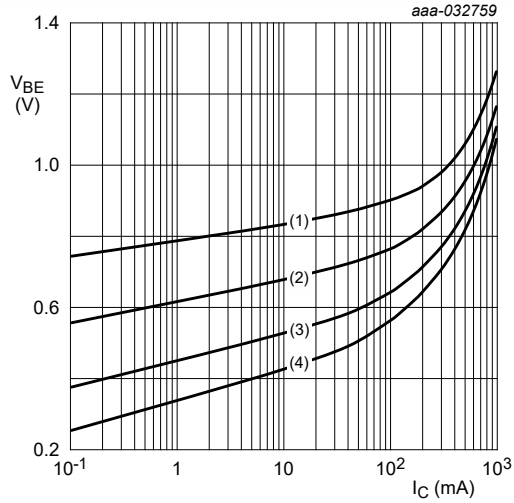
10. Characteristics

Table 7. Characteristics

$T_{amb} = 25\text{ °C}$ unless otherwise specified

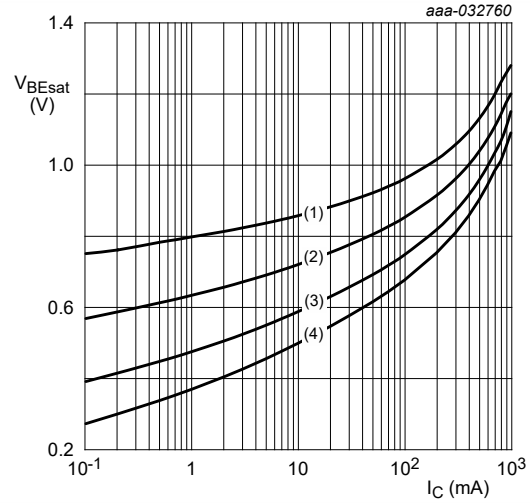
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 100\ \mu\text{A}$; $I_E = 0\ \text{A}$; $T_{amb} = 25\text{ °C}$	80	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = 2\ \text{mA}$; $I_B = 0\ \text{A}$; $T_{amb} = 25\text{ °C}$	80	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage (collector open)	$I_E = 0\ \text{A}$; $I_C = 100\ \mu\text{A}$; $T_{amb} = 25\text{ °C}$	4	-	-	V
I_{CBO}	collector-base cut-off current	$V_{CB} = 80\ \text{V}$; $I_E = 0\ \text{A}$; $T_{amb} = 25\text{ °C}$	-	-	50	nA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\ \text{V}$; $I_C = 0\ \text{A}$; $T_{amb} = 25\text{ °C}$	-	-	50	nA
h_{FE}	DC current gain	$V_{CE} = 1\ \text{V}$; $I_C = 10\ \text{mA}$; $T_{amb} = 25\text{ °C}$	100	-	-	
		$V_{CE} = 1\ \text{V}$; $I_C = 100\ \text{mA}$; $T_{amb} = 25\text{ °C}$	100	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 100\ \text{mA}$; $I_B = 10\ \text{mA}$; $T_{amb} = 25\text{ °C}$	-	-	0.25	V
V_{BE}	base-emitter voltage	$V_{CE} = 1\ \text{V}$; $I_C = 100\ \text{mA}$; $T_{amb} = 25\text{ °C}$	-	-	1.2	V
f_T	transition frequency	$V_{CE} = 2\ \text{V}$; $I_C = 10\ \text{mA}$; $f = 100\ \text{MHz}$; $T_{amb} = 25\text{ °C}$	100	-	-	MHz





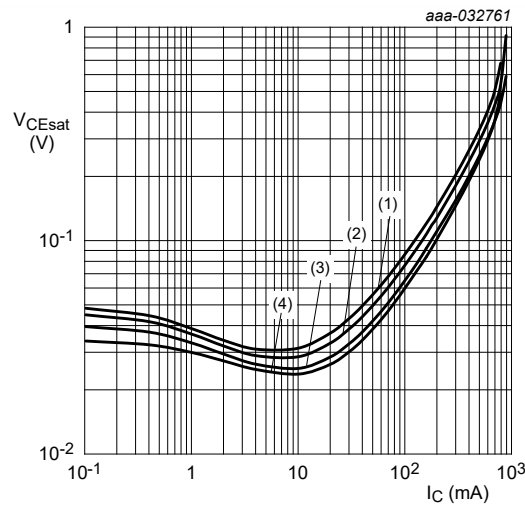
$V_{CE} = 1\text{ V}$
 (1) $T_{amb} = -55\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = 100\text{ °C}$
 (4) $T_{amb} = 150\text{ °C}$

Fig. 5. Base-emitter voltage as a function of collector current; typical values



$I_C/I_B = 10$
 (1) $T_{amb} = -55\text{ °C}$
 (2) $T_{amb} = 25\text{ °C}$
 (3) $T_{amb} = 100\text{ °C}$
 (4) $T_{amb} = 150\text{ °C}$

Fig. 6. Base-emitter saturation voltage as a function of collector current; typical values



$I_C/I_B = 10$
 (1) $T_{amb} = 150\text{ °C}$
 (2) $T_{amb} = 100\text{ °C}$
 (3) $T_{amb} = 25\text{ °C}$
 (4) $T_{amb} = -55\text{ °C}$

Fig. 7. Collector-emitter saturation voltage as a function of collector current; typical values

11. Package outline

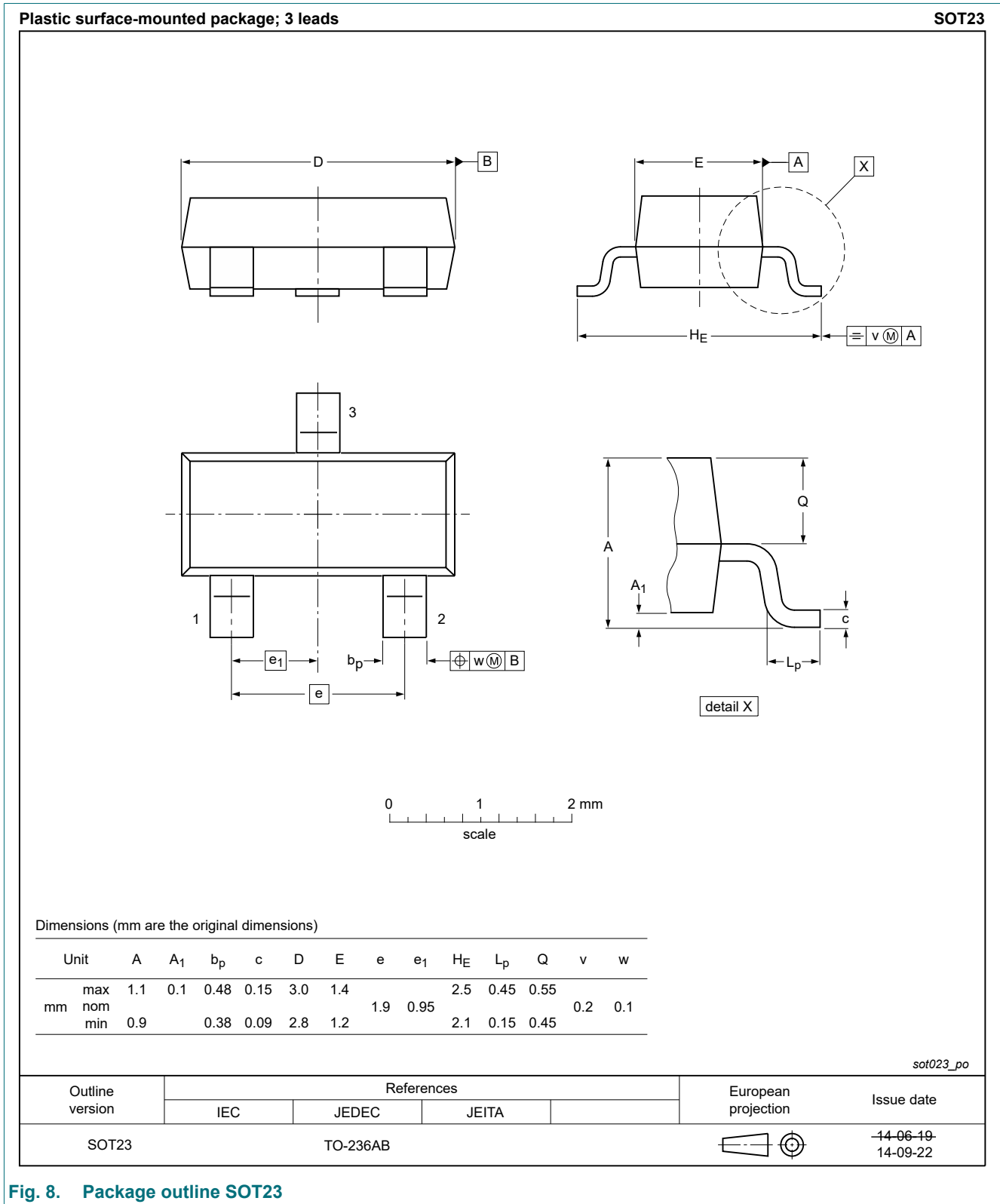


Fig. 8. Package outline SOT23

12. Soldering

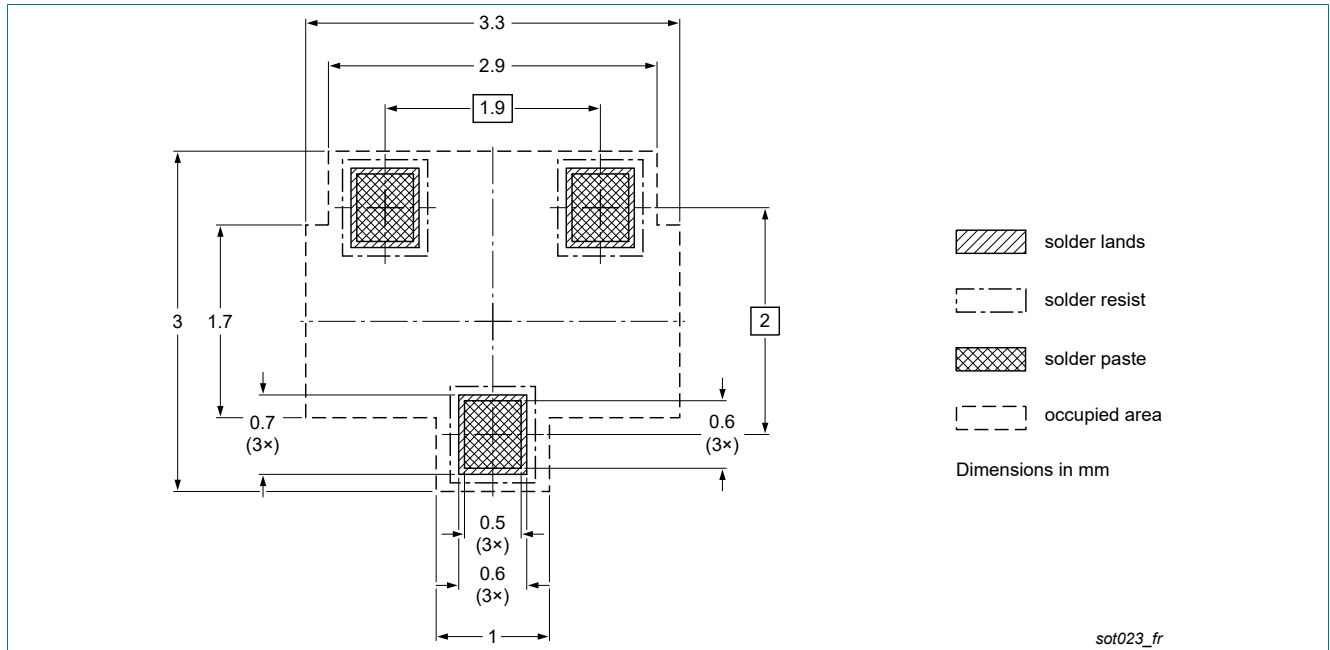


Fig. 9. Reflow soldering footprint for SOT23

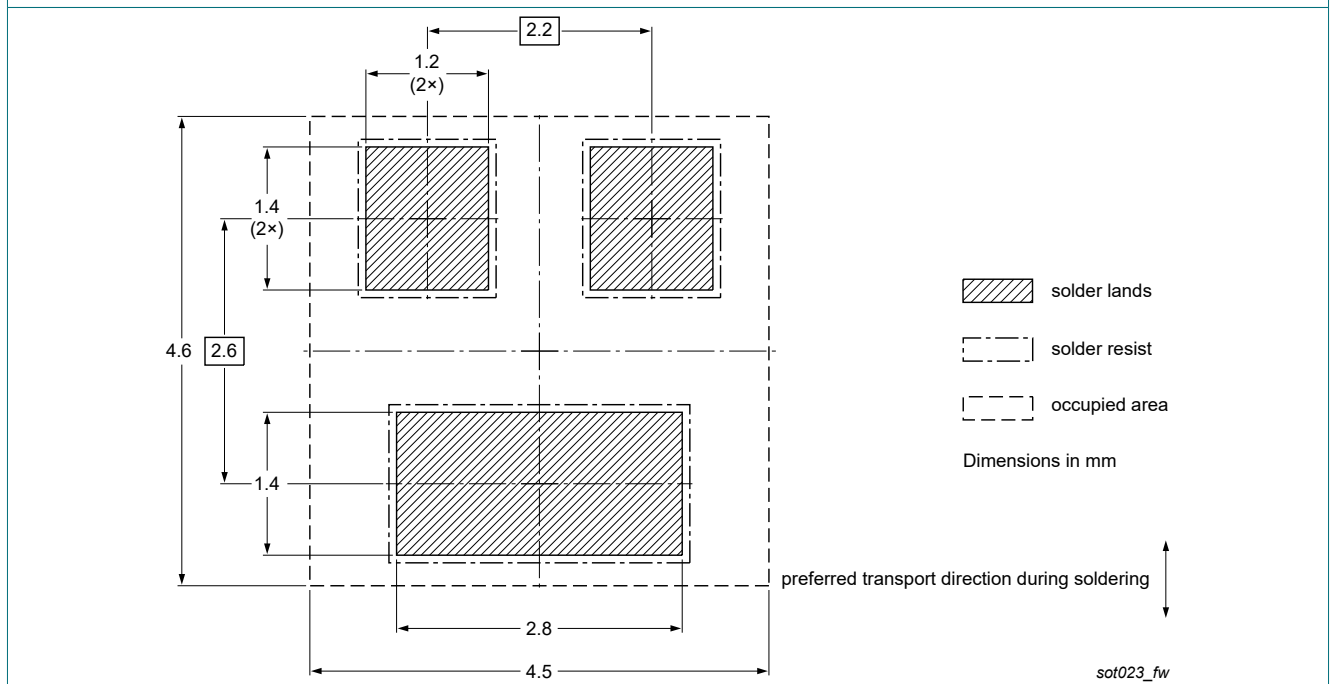


Fig. 10. Wave soldering footprint for SOT23

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMBTA06 v.3	20220701	Product data sheet	-	PMBTA06 v.2
Modifications:	<ul style="list-style-type: none"> The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. Legal texts have been adapted to the new company name where appropriate. Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s). 			
PMBTA06 v.2	20040122	Product data sheet	-	PMBTA06 v.1
PMBTA06 v.1	19990429	Product data sheet	-	-

14. 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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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