



# THE DATASHEET OF PMV19XNEAR





# PZTA44-Q

NPN high-voltage transistor

24 June 2024

Product data sheet

## 1. General description

NPN high-voltage transistor in a SOT223 (SC73) Surface-Mounted Device plastic package.

## 2. Features and benefits

- Low current (max. 300 mA)
- High voltage (max. 400 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Telecommunication

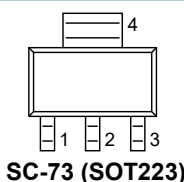
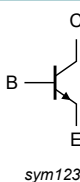
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CE0}$	collector-emitter voltage	open base	-	-	400	V
$I_C$	collector current		-	-	300	mA
$h_{FE}$	DC current gain	$V_{CE} = 10\text{ V}$ ; $I_C = 1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	40	-	-	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SC-73 (SOT223)	 sym123
2	C	collector		
3	E	emitter		
4	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PZTA44-Q</a>	SC-73	plastic, surface-mounted package with increased heatsink; 4 leads; 2.3 mm pitch; 6.5 mm x 3.5 mm x 1.65 mm body	<a href="#">SOT223</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code
PZTA44-Q	PZTA44

## 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	-	500	V
$V_{CEO}$	collector-emitter voltage	open base	-	400	V
$V_{EBO}$	emitter-base voltage	open collector	-	6	V
$I_C$	collector current		-	300	mA
$I_{CM}$	peak collector current	single pulse; $t_p \leq 1$ ms	-	300	mA
$I_{BM}$	peak base current		-	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[1] [2]	1.35	W
$T_j$	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 copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.

[2] For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

## 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] [2]	-	91	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	10	K/W

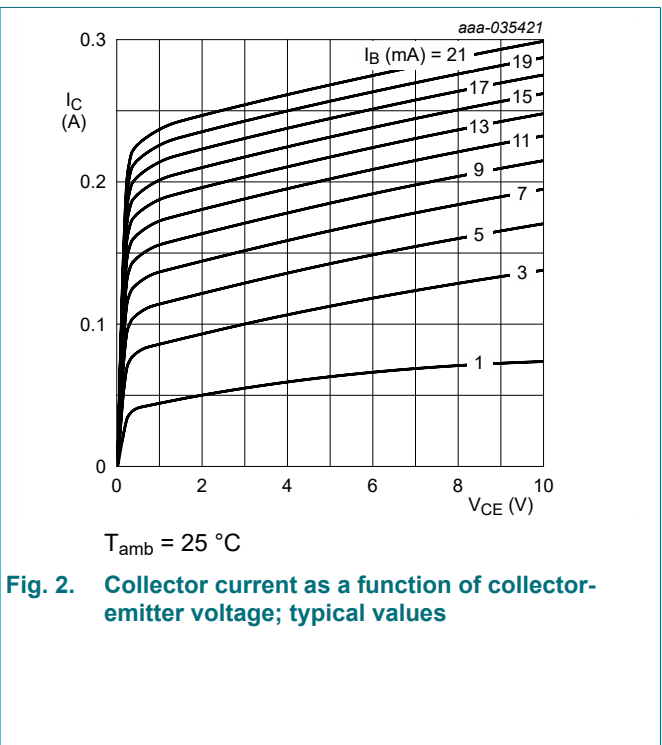
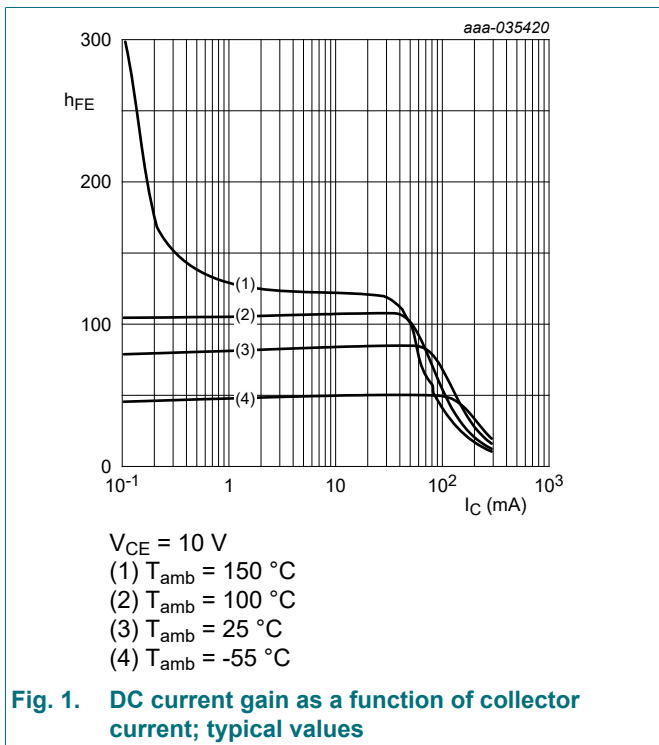
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.

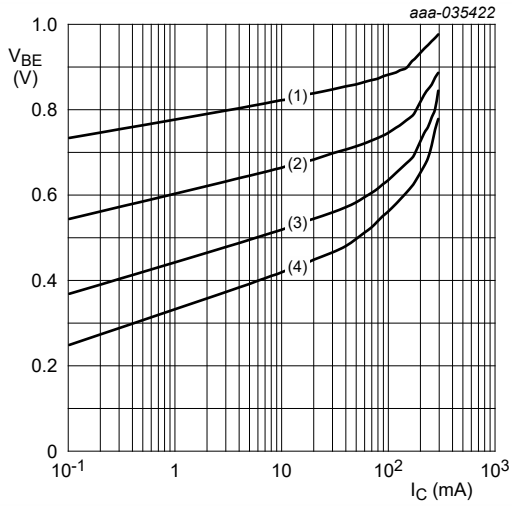
[2] For other mounting conditions, see "Thermal considerations for SOT223 in the General Part of associated Handbook".

## 10. Characteristics

Table 7. Characteristics

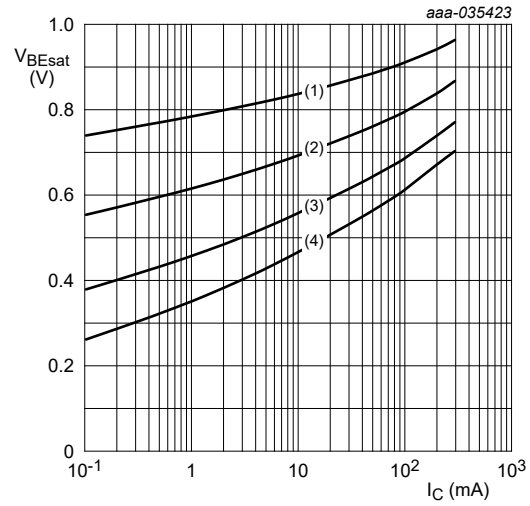
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 400\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	100	nA
		$V_{CB} = 400\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ }^\circ\text{C}$	-	-	10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 4\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 10\text{ V}; I_C = 1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	40	-	-	
		$V_{CE} = 10\text{ V}; I_C = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	50	-	200	
		$V_{CE} = 10\text{ V}; I_C = 50\text{ mA}; \text{pulsed}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^\circ\text{C}$	45	-	-	
		$V_{CE} = 10\text{ V}; I_C = 100\text{ mA}; \text{pulsed}; t_p \leq 300\text{ }\mu\text{s}; T_{amb} = 25\text{ }^\circ\text{C}$	40	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 1\text{ mA}; I_B = 0.1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	400	mV
		$I_C = 10\text{ mA}; I_B = 1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	500	mV
		$I_C = 50\text{ mA}; I_B = 5\text{ mA}; \text{pulsed}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	750	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 1\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	850	mV
$f_T$	transition frequency	$V_{CE} = 10\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	20	-	-	MHz
$C_c$	collector capacitance	$V_{CB} = 20\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	7	pF
$C_e$	emitter capacitance	$V_{EB} = 500\text{ mV}; I_C = 0\text{ A}; i_c = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	180	pF





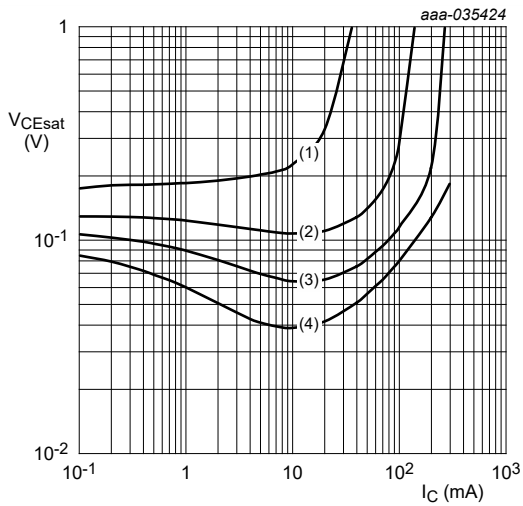
$V_{CE} = 10\text{ V}$   
 (1)  $T_{amb} = -55^\circ\text{C}$   
 (2)  $T_{amb} = 25^\circ\text{C}$   
 (3)  $T_{amb} = 100^\circ\text{C}$   
 (4)  $T_{amb} = 150^\circ\text{C}$

**Fig. 3. Base-emitter voltage as a function of collector current; typical values**



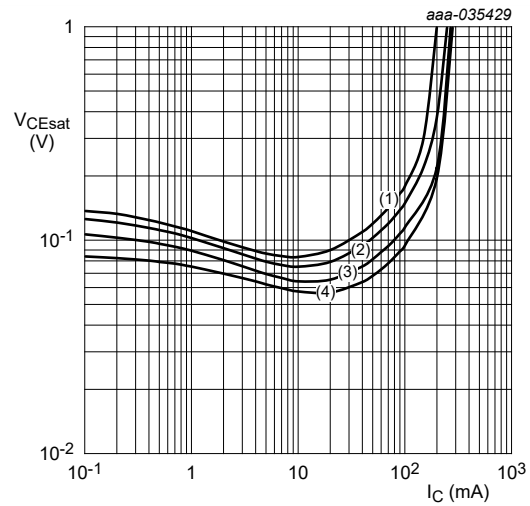
$I_C/I_B = 10$   
 (1)  $T_{amb} = -55^\circ\text{C}$   
 (2)  $T_{amb} = 25^\circ\text{C}$   
 (3)  $T_{amb} = 100^\circ\text{C}$   
 (4)  $T_{amb} = 150^\circ\text{C}$

**Fig. 4. Base-emitter saturation voltage as a function of collector current; typical values**



$T_{amb} = 25^\circ\text{C}$   
 (1)  $I_C/I_B = 50$   
 (2)  $I_C/I_B = 20$   
 (3)  $I_C/I_B = 10$   
 (4)  $I_C/I_B = 5$

**Fig. 5. Collector-emitter saturation voltage as a function of collector current; typical values**



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

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

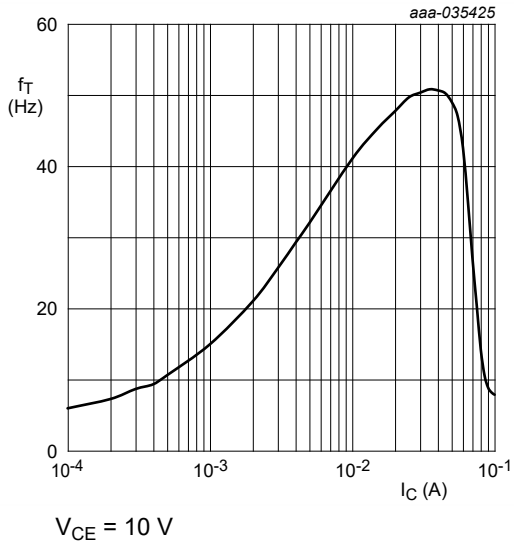


Fig. 7. Transition frequency as a function of collector current; typical values

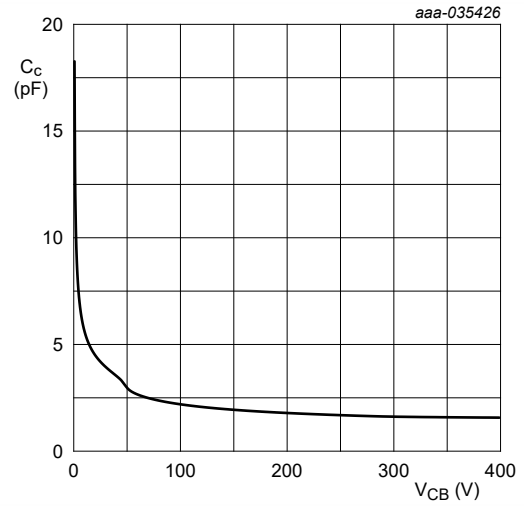


Fig. 8. Collector capacitance as a function of collector-base voltage; typical values

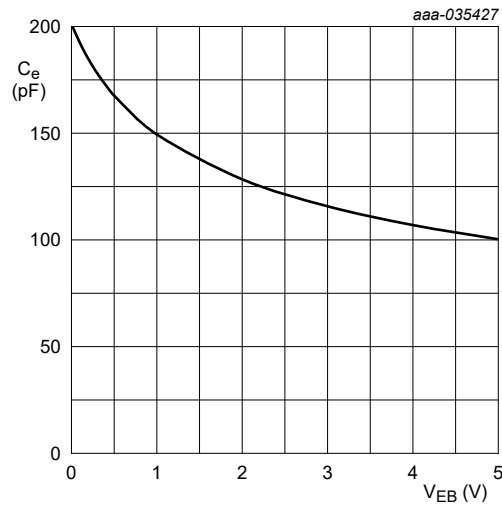


Fig. 9. Emitter capacitance as a function of emitter-base voltage; typical values

## 11. Test information

### Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 12. Package outline

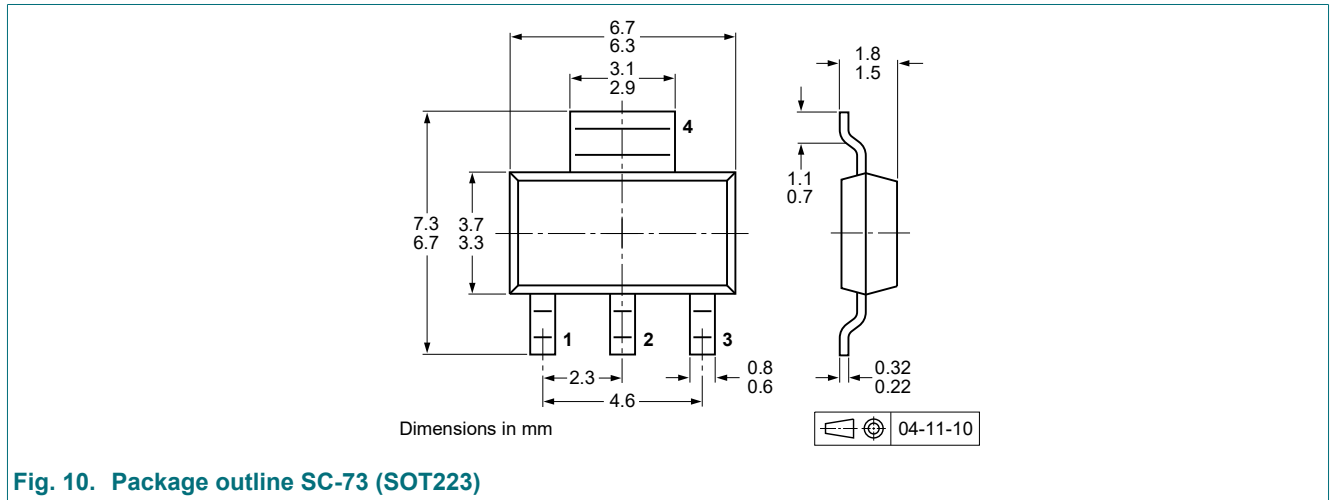


Fig. 10. Package outline SC-73 (SOT223)

## 13. Soldering

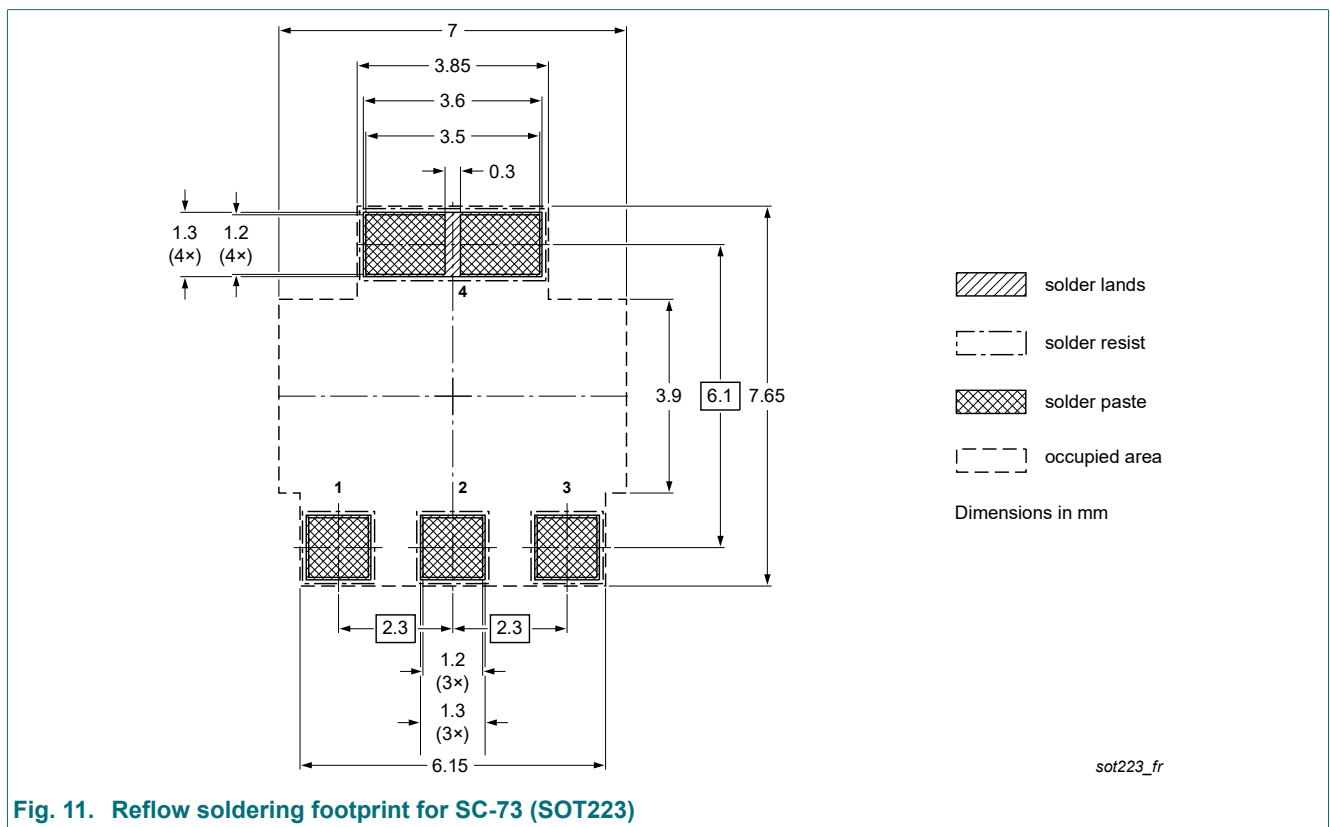


Fig. 11. Reflow soldering footprint for SC-73 (SOT223)

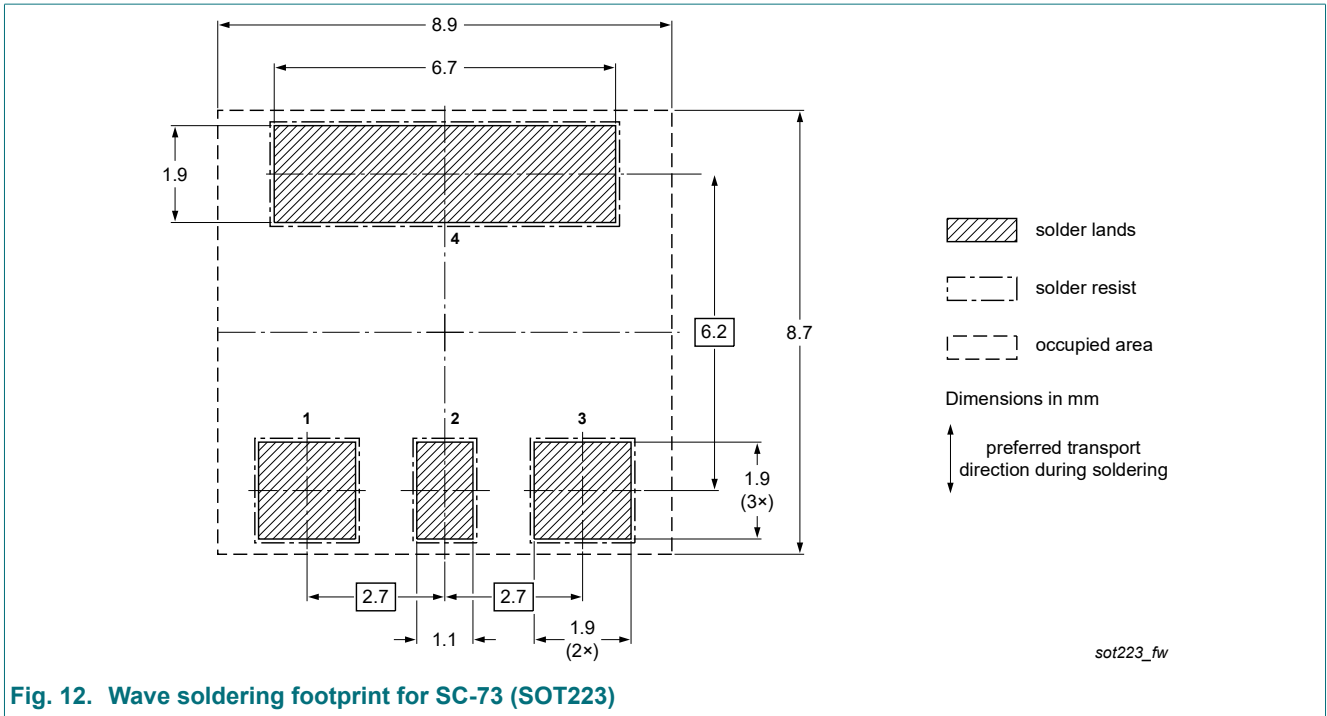


Fig. 12. Wave soldering footprint for SC-73 (SOT223)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PZTA44-Q v.2	20240624	Product data sheet	-	-
Modifications:	<ul style="list-style-type: none"><li>• Pinning information: Table 2 corrected</li><li>• Characteristics: Figures 1 - 9 added</li></ul>			
PZTA44-Q v.1	20211209	Product data sheet	-	-

## 15. 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.

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