



# PZTA14-Q

NPN Darlington transistor

19 September 2023

Product data sheet

## 1. General description

NPN Darlington transistor in an SOT223 Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- High current (max. 500 mA)
- Low voltage (max. 30 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Pre-amplifiers requiring high input impedance

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_C$	collector current		-	-	500	mA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; T_j = 25\text{ }^\circ\text{C}$	10000	-	-	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	<p>SC-73 (SOT223)</p>	<p>aaa-037565</p>
2	C	collector		
3	E	emitter		
4	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PZTA14-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
PZTA14-Q	PZTA14

## 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		-	30	V
$V_{CES}$	collector-emitter voltage	$V_{BE} = 0$ V		-	30	V
$V_{EBO}$	emitter-base voltage	open collector		-	10	V
$I_C$	collector current			-	500	mA
$I_{CM}$	peak collector current			-	800	mA
$I_B$	base current			-	200	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	1.25	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 a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.

## 9. Thermal characteristics

Table 6. Thermal characteristics

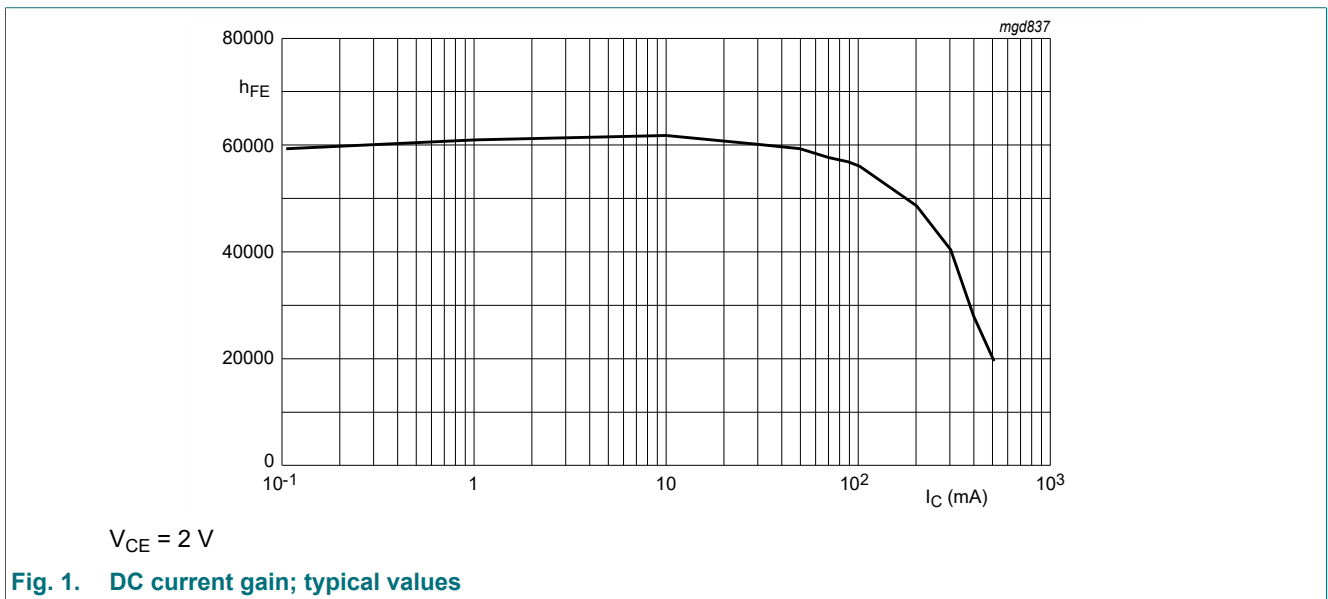
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	-	-	100	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	19	K/W

[1] Device mounted on a Printed-Circuit Board (PCB), single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 25\text{ }^\circ\text{C}$	-	-	100	nA
$I_{CES}$	collector-emitter cut-off current	$V_{CE} = 30\text{ V}; V_{BE} = 0\text{ V}; T_j = 25\text{ }^\circ\text{C}$	-	-	100	A
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 10\text{ V}; I_C = 0\text{ A}; T_j = 25\text{ }^\circ\text{C}$	-	-	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; T_j = 25\text{ }^\circ\text{C}$	10000	-	-	
		$V_{CE} = 5\text{ V}; I_C = 100\text{ mA}; T_j = 25\text{ }^\circ\text{C}$	20000	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 100\text{ mA}; I_B = 0.1\text{ mA}; T_j = 25\text{ }^\circ\text{C}$	-	-	1.5	V
$V_{BEon}$	base-emitter turn-on voltage	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V}; T_j = 25\text{ }^\circ\text{C}$	-	-	2	V
$C_{re}$	feedback capacitance	$V_{CB} = 20\text{ V}; I_C = 0\text{ A}; i_c = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	-	-	3	pF
$f_T$	transition frequency	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}; T_j = 25\text{ }^\circ\text{C}$	125	-	-	MHz



## 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

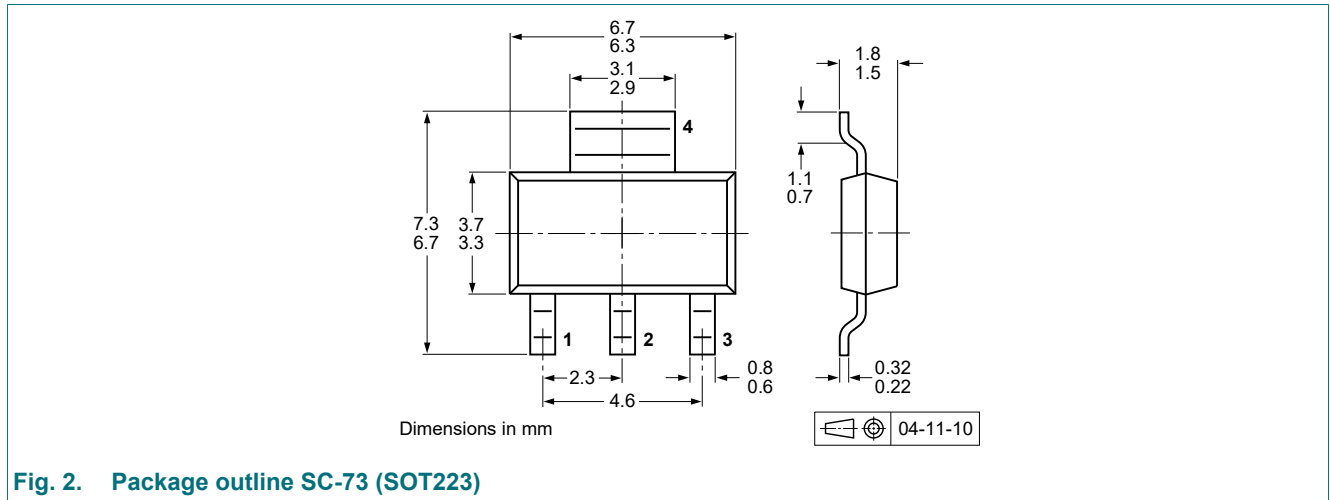


Fig. 2. Package outline SC-73 (SOT223)

## 13. Soldering

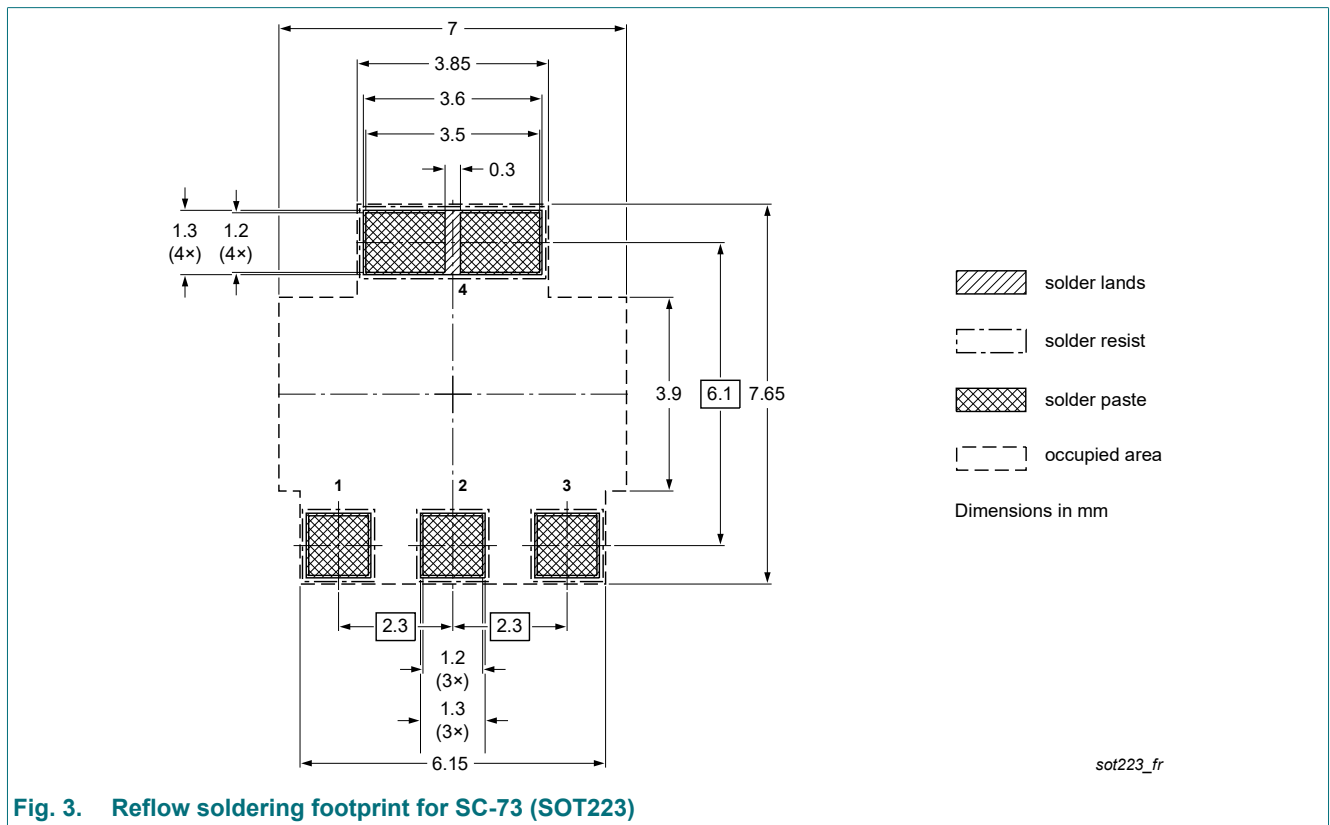


Fig. 3. Reflow soldering footprint for SC-73 (SOT223)

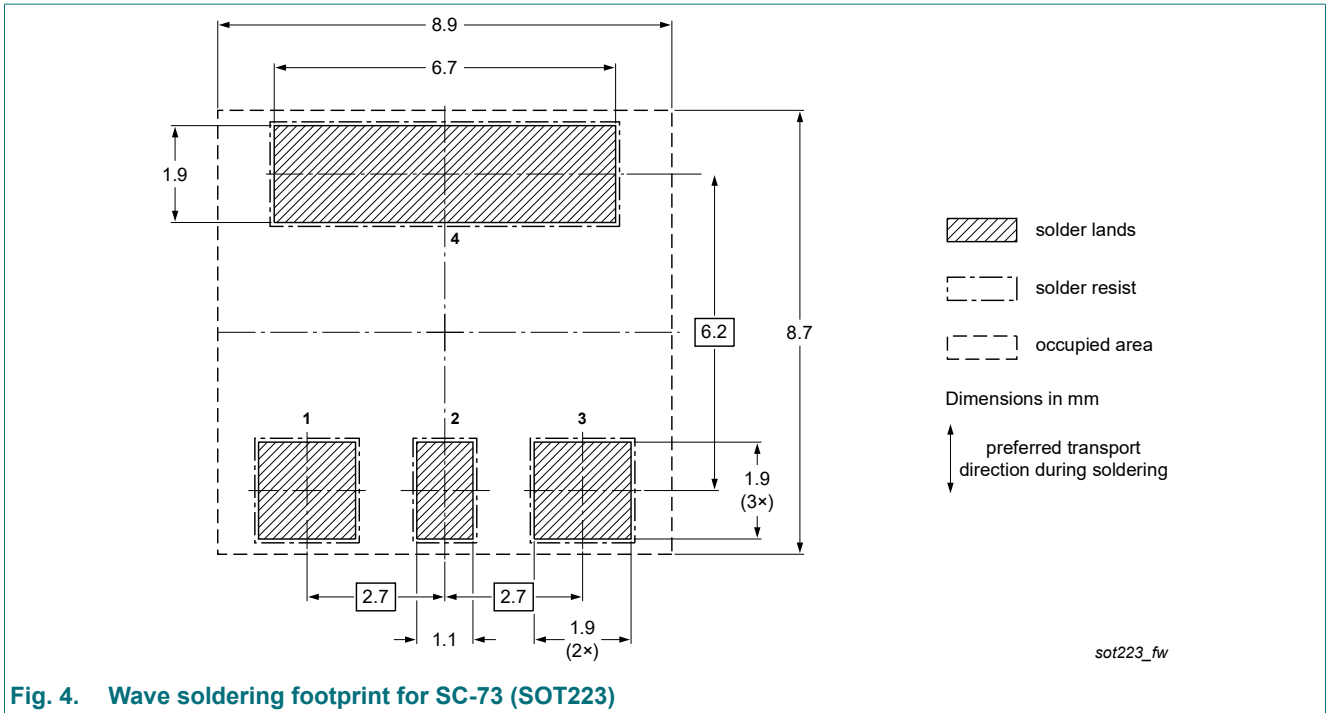


Fig. 4. Wave soldering footprint for SC-73 (SOT223)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PZTA14-Q v.1	20230919	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.
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