PZTA44

NPN high-voltage transistor

1 October 2022 **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)

3. Applications

- Telecommunication

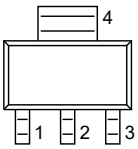
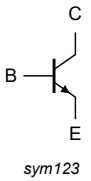
4. Quick reference data

Table 1. Quick reference data

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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base		
2	C	collector		
3	E	emitter		
4	C	collector		

SC-73 (SOT223)

sym123

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PZTA44	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	SOT223

7. Marking

Table 4. Marking codes

Type number	Marking code
PZTA44	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^2.
[2] For other mounting conditions, see “Thermal considerations for SOT223 in the General Part of associated Handbook”.

9. Thermal characteristics

Table 6. Thermal characteristics

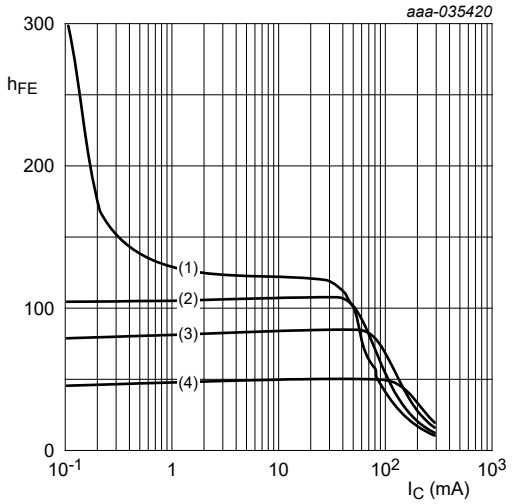
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	91	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	10	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm^2.
[2] For other mounting conditions, see “Thermal considerations for SOT223 in the General Part of associated Handbook”.

10. Characteristics

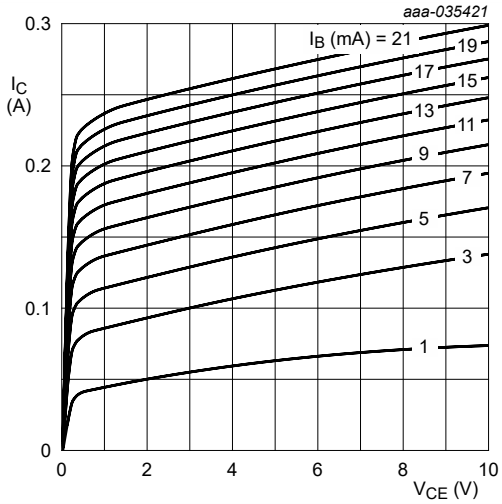
Table 7. Characteristics

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



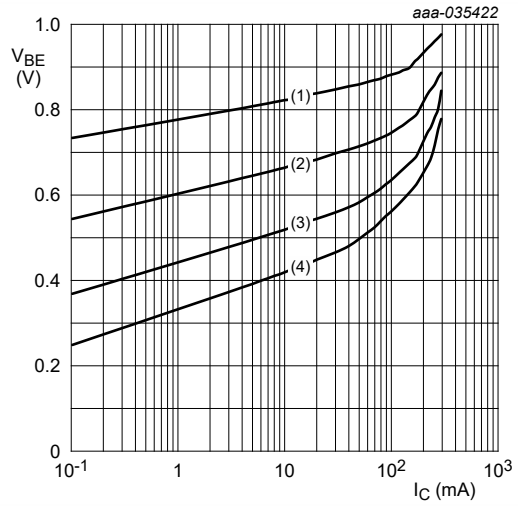
V_{CE} = 10 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 100 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -55 °C

Fig. 1. DC current gain as a function of collector current; typical values



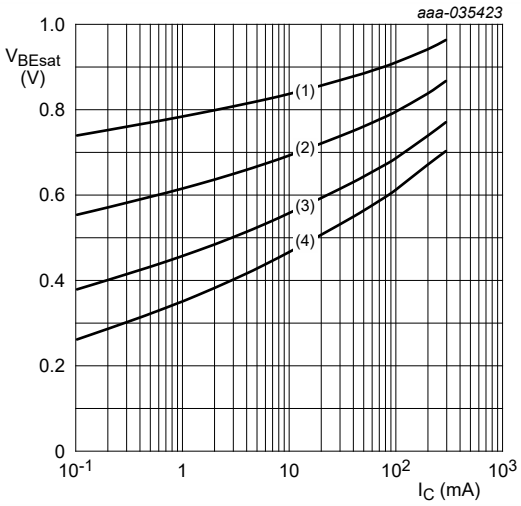
T_{amb} = 25 °C

Fig. 2. Collector current as a function of collector-emitter voltage; typical values



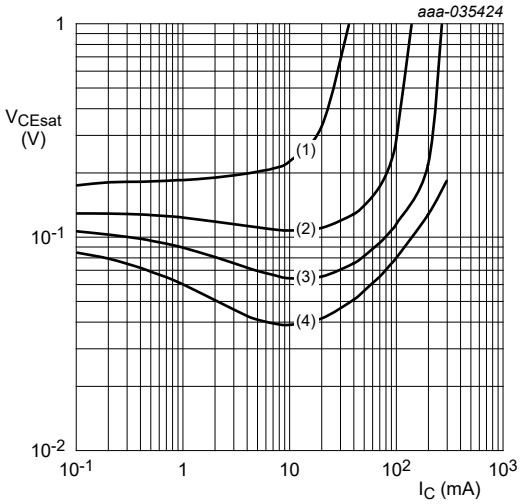
V_{CE} = 10 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 150 °C

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



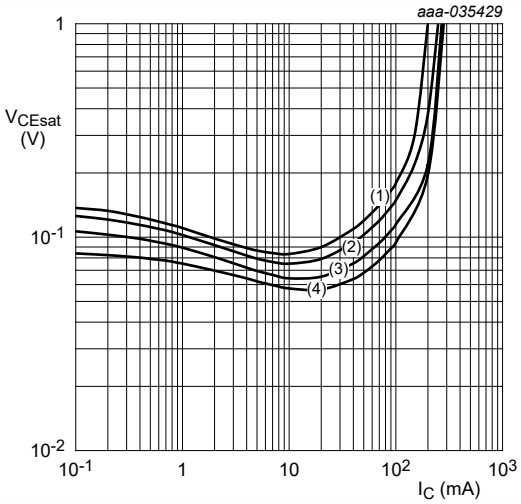
I_C/I_B = 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 150 °C

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



T_{amb} = 25 °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 °C
(2) T_{amb} = 100 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -55 °C

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

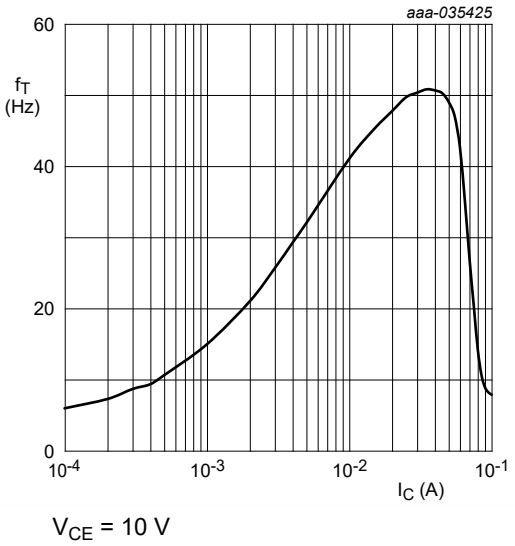


Fig. 7. Transition frequency as a function of collector current; typical values

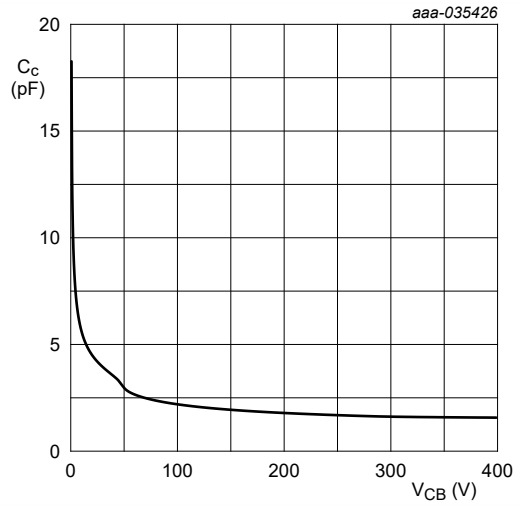


Fig. 8. Collector capacitance as a function of collector-base voltage; typical values

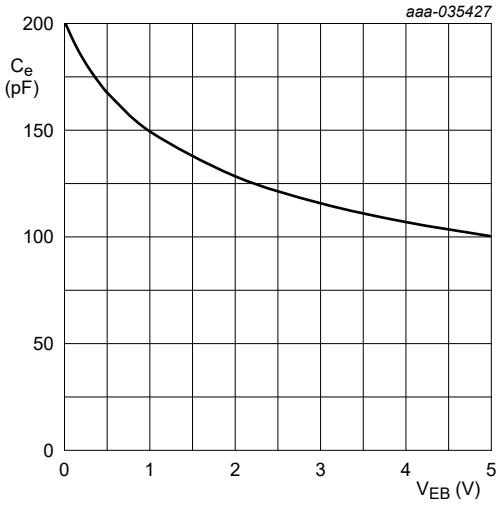


Fig. 9. Emitter capacitance as a function of emitter-base voltage; typical values

11. Package outline

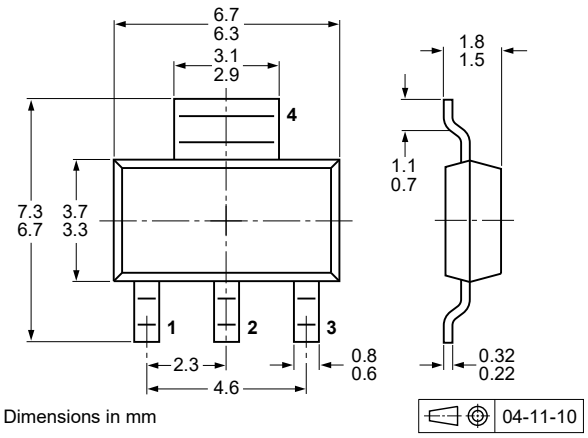


Fig. 10. Package outline SC-73 (SOT223)

12. Soldering

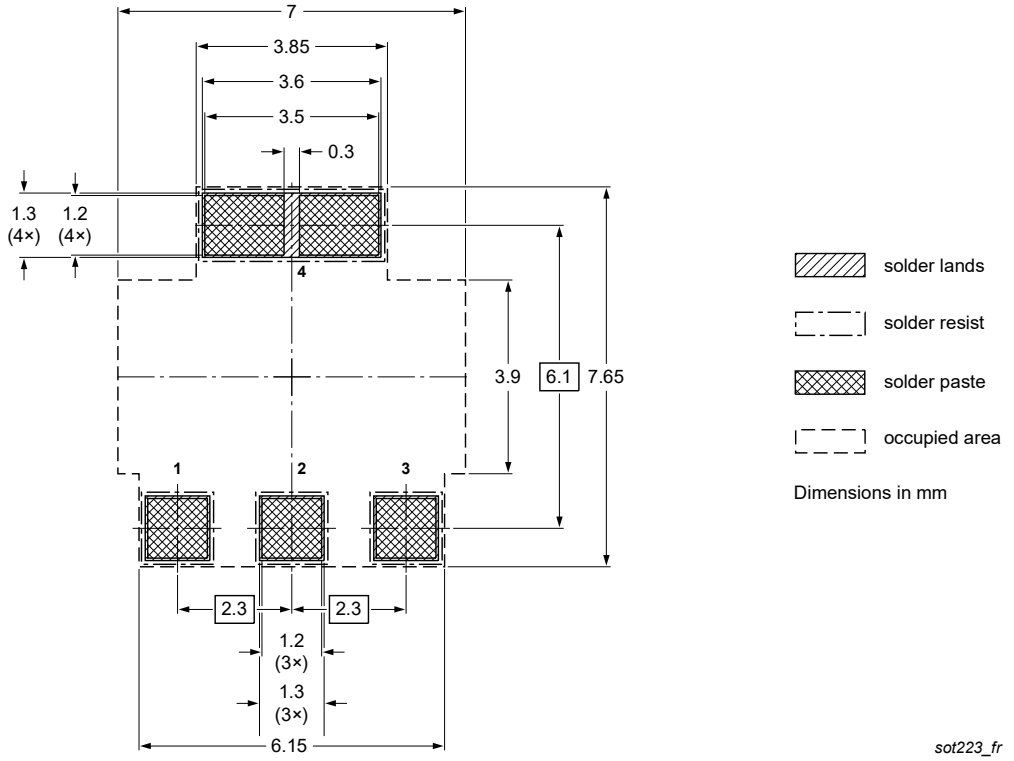


Fig. 11. Reflow soldering footprint for SC-73 (SOT223)

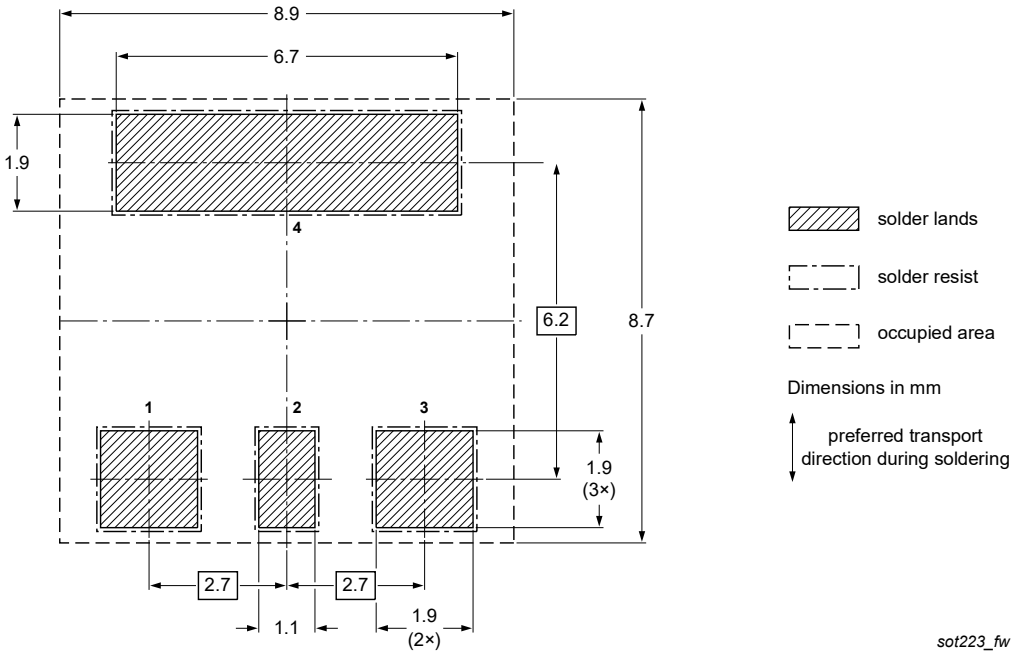


Fig. 12. Wave soldering footprint for SC-73 (SOT223)

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PZTA44 v.3	20221001	Product data sheet	-	PZTA44 v.2
Modifications:	• 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 changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
PZTA44 v.2	19990521	Product data sheet	-	PZTA44 v.1
PZTA44 v.1	19981126	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".
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Date of release: 1 October 2022

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