



PMSTA42

NPN high-voltage transistor

8 October 2024

Product data sheet

1. General description

NPN high-voltage transistor in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

PNP complements: PMSTA92

2. Features and benefits

- High current (max. 500 mA)
- High voltage (max. 200 V)

3. Applications

- High-voltage switching in telephony applications

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CE0}	collector-emitter voltage	open base	-	-	300	V
I_C	collector current		-	-	100	mA
h_{FE}	DC current gain	$V_{CE} = 10 \text{ V}$; $I_C = 1 \text{ mA}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	25	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SC-70 (SOT323)	 sym021
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMSTA42	SC-70	plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body	SOT323

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMSTA42	%1D

[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		-	300	V
V _{CEO}	collector-emitter voltage	open base		-	300	V
V _{EBO}	emitter-base voltage	open collector		-	6	V
I _C	collector current			-	100	mA
I _{CM}	peak collector current			-	200	mA
I _{BM}	peak base current			-	100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	200	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 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

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]	-	-	625	K/W

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

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	$V_{CB} = 200\text{ V}$; $I_E = 0\text{ A}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	100	nA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 6\text{ V}$; $I_C = 0\text{ A}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	100	nA
h_{FE}	DC current gain	$V_{CE} = 10\text{ V}$; $I_C = 1\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	25	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 10\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	40	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 30\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	40	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 20\text{ mA}$; $I_B = 2\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	500	mV
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	F
f_T	transition frequency	$V_{CE} = 20\text{ V}$; $I_C = 10\text{ mA}$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$	50	-	-	MHz

11. Package outline

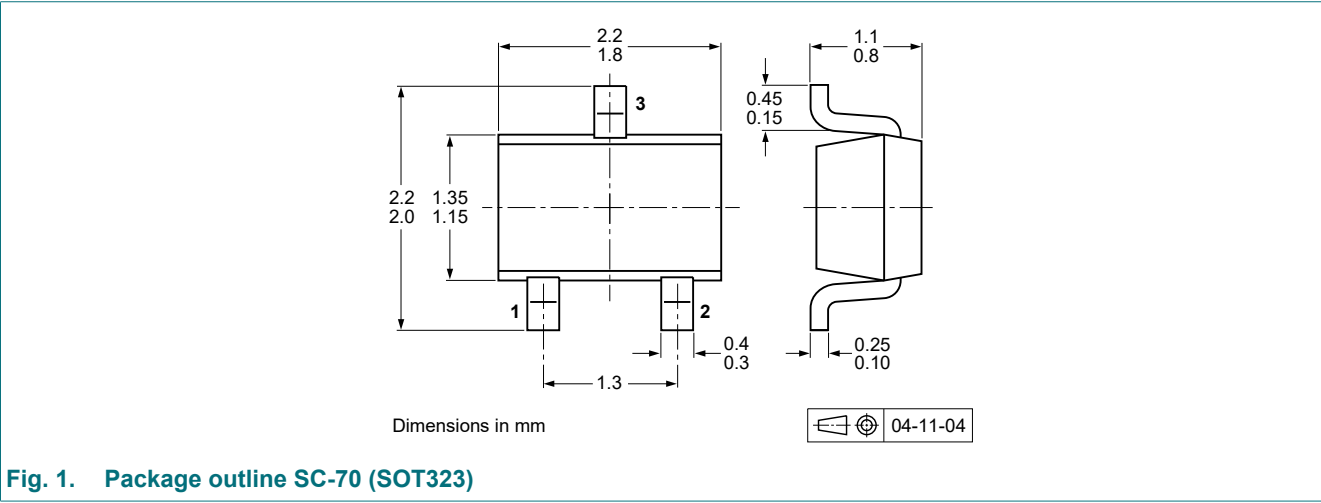


Fig. 1. Package outline SC-70 (SOT323)

12. Soldering

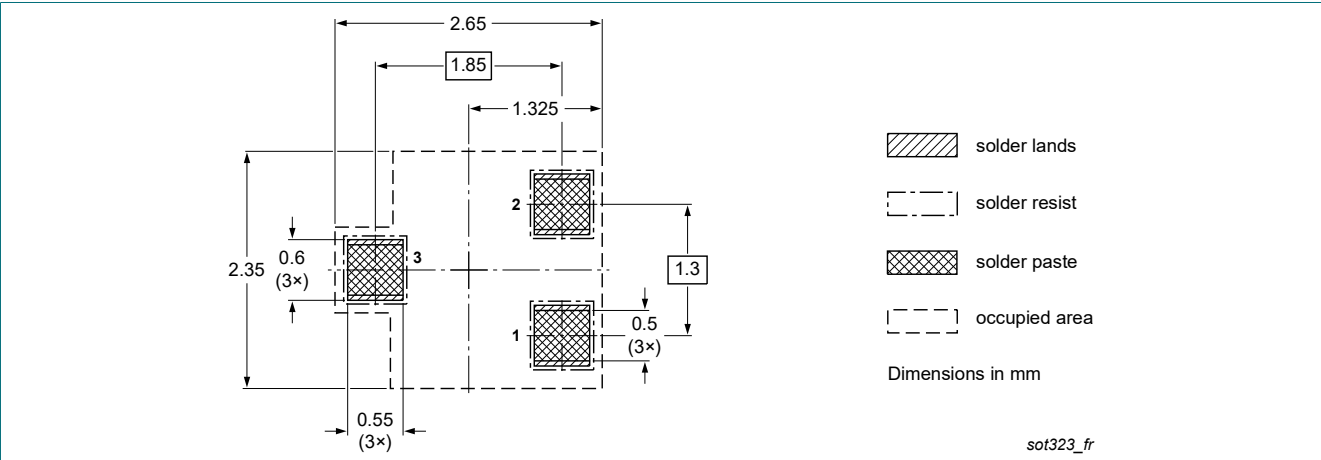


Fig. 2. Reflow soldering footprint for SC-70 (SOT323)

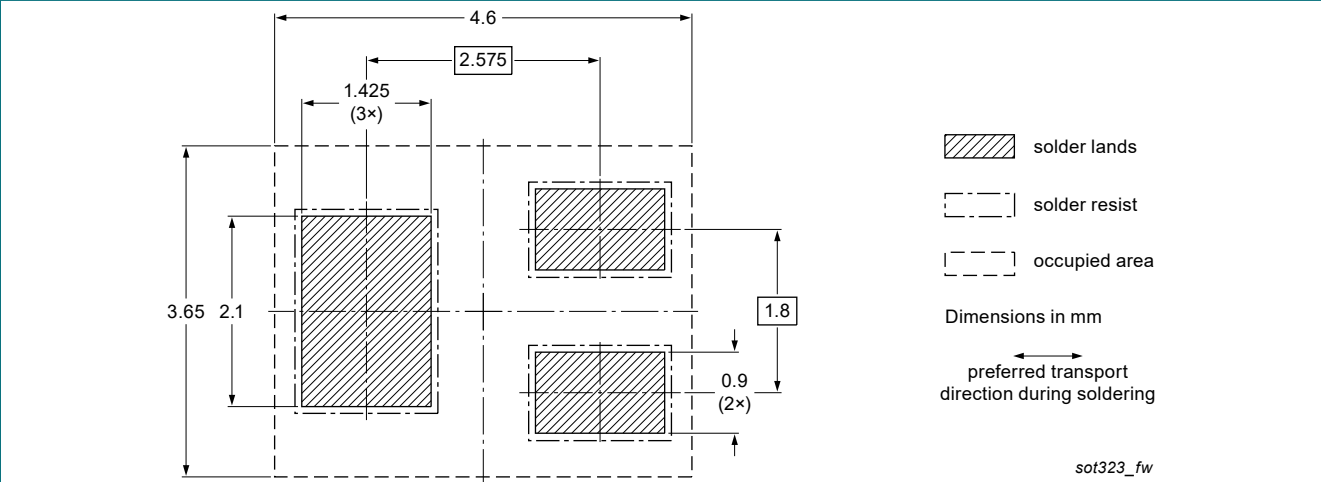


Fig. 3. Wave soldering footprint for SC-70 (SOT323)

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMSTA42 v.4	20241008	Product data sheet	-	PMSTA42 v.3
Modifications:	<ul style="list-style-type: none">Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
PMSTA42 v.3	20230629	Product data sheet	-	PMSTA42_43 v.2
PMSTA42_43 v.2	19990521	Product data sheet	-	PMSTA42_43 v.1
PMSTA42_43 v.1	19970619	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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Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information..... 1

6. Ordering information..... 2

7. Marking..... 2

8. Limiting values..... 2

9. Thermal characteristics..... 2

10. Characteristics..... 3

11. Package outline..... 3

12. Soldering..... 4

13. Revision history..... 5

14. Legal information..... 6

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