



# PMST5550

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.

## 2. Features and benefits

- Low current (max. 300 mA)
- High voltage (max. 160 V)

## 3. Applications

- Switching and amplification in high voltage applications such as telephony.

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CE0}$	collector-emitter voltage	open base	-	-	140	V
$I_C$	collector current		-	-	300	mA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}$ ; $I_C = 1\text{ mA}$ ; $T_{amb} = 25\text{ °C}$	60	-	-	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	<p>SC-70 (SOT323)</p>	<p>sym123</p>
2	E	emitter		
3	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">PMST5550</a>	SC-70	plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body	<a href="#">SOT323</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMST5550	%1F

[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	-	160	V
$V_{CEO}$	collector-emitter voltage	open base	-	140	V
$V_{EBO}$	emitter-base voltage	open collector	-	6	V
$I_C$	collector current		-	300	mA
$I_{CM}$	peak collector current		-	600	mA
$I_{BM}$	peak base current		-	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[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

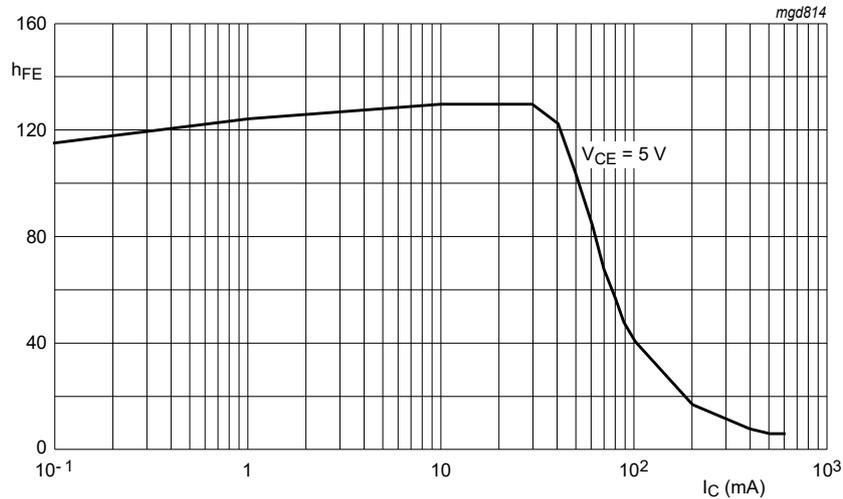
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	625	K/W

[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	$V_{CB} = 100 \text{ V}; I_E = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	100	nA
		$V_{CB} = 100 \text{ V}; I_E = 0 \text{ A}; T_{amb} = 100 \text{ }^\circ\text{C}$	-	-	100	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 4 \text{ V}; I_C = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	50	nA
$h_{FE}$	DC current gain	$V_{CE} = 5 \text{ V}; I_C = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	60	-	-	
		$V_{CE} = 5 \text{ V}; I_C = 10 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	60	-	250	
		$V_{CE} = 5 \text{ V}; I_C = 50 \text{ mA}; \text{pulsed}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	20	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10 \text{ mA}; I_B = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	150	mV
		$I_C = 50 \text{ mA}; I_B = 5 \text{ mA}; \text{pulsed}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	250	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 10 \text{ mA}; I_B = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	1	V
		$I_C = 50 \text{ mA}; I_B = 5 \text{ mA}; \text{pulsed}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	1.2	V
$C_c$	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = 0 \text{ A}; i_e = 0 \text{ A}; f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	6	pF
$C_e$	emitter capacitance	$V_{EB} = 0.5 \text{ V}; I_C = 0 \text{ A}; i_c = 0 \text{ A}; f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	30	pF
$f_T$	transition frequency	$V_{CE} = 10 \text{ V}; I_C = 10 \text{ mA}; f = 100 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	-	MHz
NF	noise figure	$V_{CE} = 5 \text{ V}; I_C = 200 \mu\text{A}; R_S = 2 \text{ k}\Omega; f = 10 \text{ Hz to } 15.7 \text{ kHz}$	-	-	8	dB



$V_{CE} = 5 \text{ V}$

Fig. 1. DC current gain; typical values

## 11. Package outline

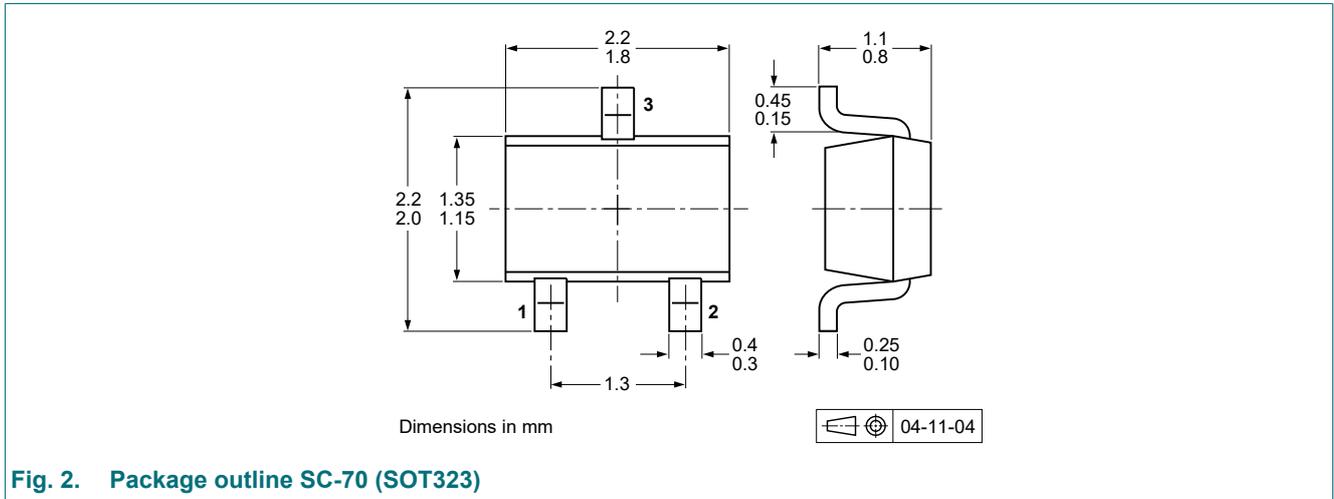


Fig. 2. Package outline SC-70 (SOT323)

## 12. Soldering

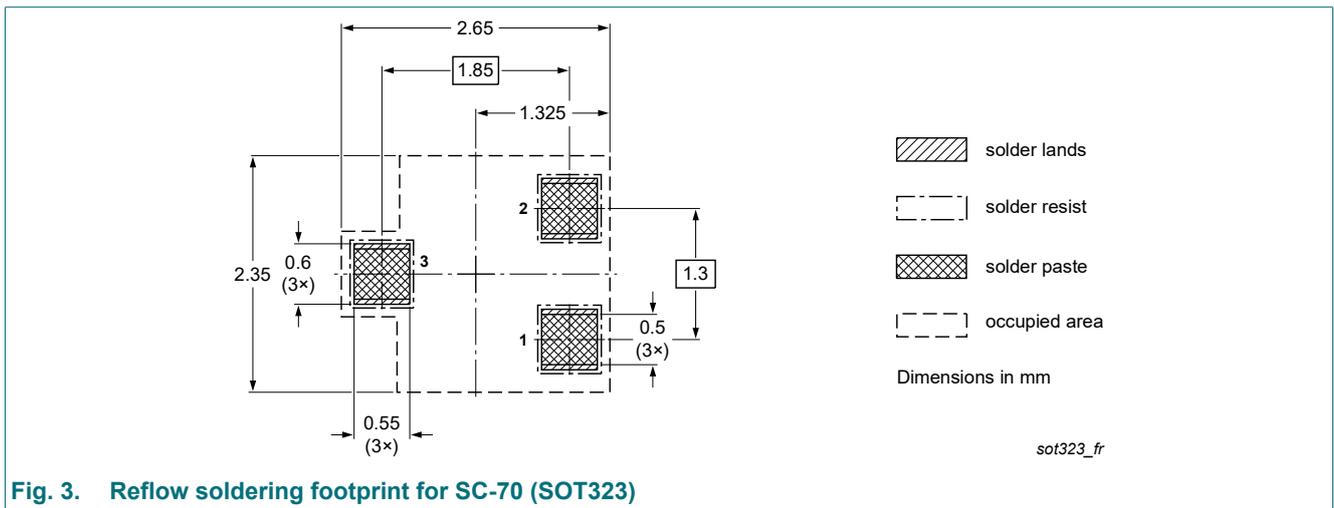


Fig. 3. Reflow soldering footprint for SC-70 (SOT323)

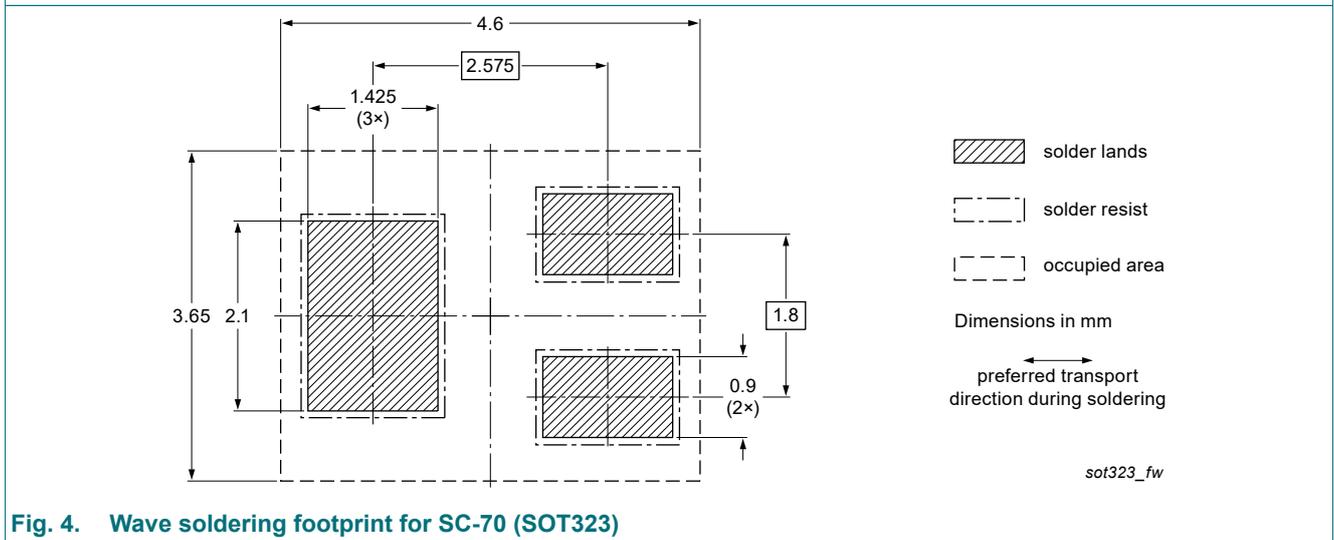


Fig. 4. Wave soldering footprint for SC-70 (SOT323)

## 13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMST5550 v.5	20241008	Product data sheet	-	PMST5550 v.4
Modifications:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul>			
PMST5550 v.4	20240119	Product data sheet	-	PMST5550 v.3
PMST5550 v.3	20230726	Product data sheet	-	PMST5550_5551 v.2
PMST5550_5551 v.2	19990429	Product data sheet	-	PMST5550_5551 v.1
PMST5550_5551 v.1	19970520	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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