



# PMBT5551

NPN high-voltage transistor

31 August 2020

Product data sheet

## 1. General description

NPN high-voltage transistor in a SOT23 plastic package.

## 2. Features and benefits

- Low current (max. 300 mA)
- High voltage (max. 160 V)
- AEC-Q101 qualified

## 3. Applications

- General purpose

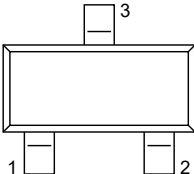
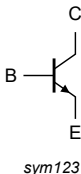
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CEO}$	collector-emitter voltage	open base	-	-	160	V
$I_C$	collector current		-	-	300	mA

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23	 sym123
2	E	emitter		
3	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBT5551	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

## 7. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
PMBT5551	%G1

[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		-	180	V
$V_{CEO}$	collector-emitter voltage	open base		-	160	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		-	600	mA
$I_{BM}$	peak base current			-	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	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]	-	-	500	K/W

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

10. Characteristics

Table 7. Characteristics  
T<sub>amb</sub> = 25 °C unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = 120 V; I <sub>E</sub> = 0 A; T <sub>j</sub> = 25 °C	-	-	50	nA
		V <sub>CB</sub> = 120 V; T <sub>amb</sub> = 100 °C	-	-	50	μA
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = 4 V; I <sub>C</sub> = 0 A	-	-	50	nA
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = 5 V; I <sub>C</sub> = 1 mA	80	-	-	
		V <sub>CE</sub> = 5 V; I <sub>C</sub> = 10 mA; T <sub>j</sub> = 25 °C	80	250	-	
		V <sub>CE</sub> = 5 V; I <sub>C</sub> = 50 mA; T <sub>j</sub> = 25 °C	30	-	-	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 1 mA	-	-	150	mV
		I <sub>C</sub> = 50 mA; I <sub>B</sub> = 5 mA	-	-	200	mV
V <sub>BEsat</sub>	base-emitter saturation voltage	I <sub>C</sub> = 10 mA; I <sub>B</sub> = 1 mA	-	-	1	V
		I <sub>C</sub> = 50 mA; I <sub>B</sub> = 5 mA	-	-	1	V
C <sub>c</sub>	collector capacitance	V <sub>CB</sub> = 10 V; I <sub>E</sub> = 0 A; i <sub>e</sub> = 0 A; f = 1 MHz	-	-	6	pF
C <sub>e</sub>	emitter capacitance	V <sub>EB</sub> = 0.5 V; I <sub>C</sub> = 0 A; i <sub>c</sub> = 0 A; f = 1 MHz	-	-	30	pF
f <sub>T</sub>	transition frequency	V <sub>CE</sub> = 10 V; I <sub>C</sub> = 10 mA; f = 100 MHz	100	300	-	MHz
NF	noise figure	V <sub>CE</sub> = 5 V; I <sub>C</sub> = 200 μA; R <sub>S</sub> = 2 kΩ; 10 Hz ≤ f ≤ 15700 Hz	-	-	8	dB

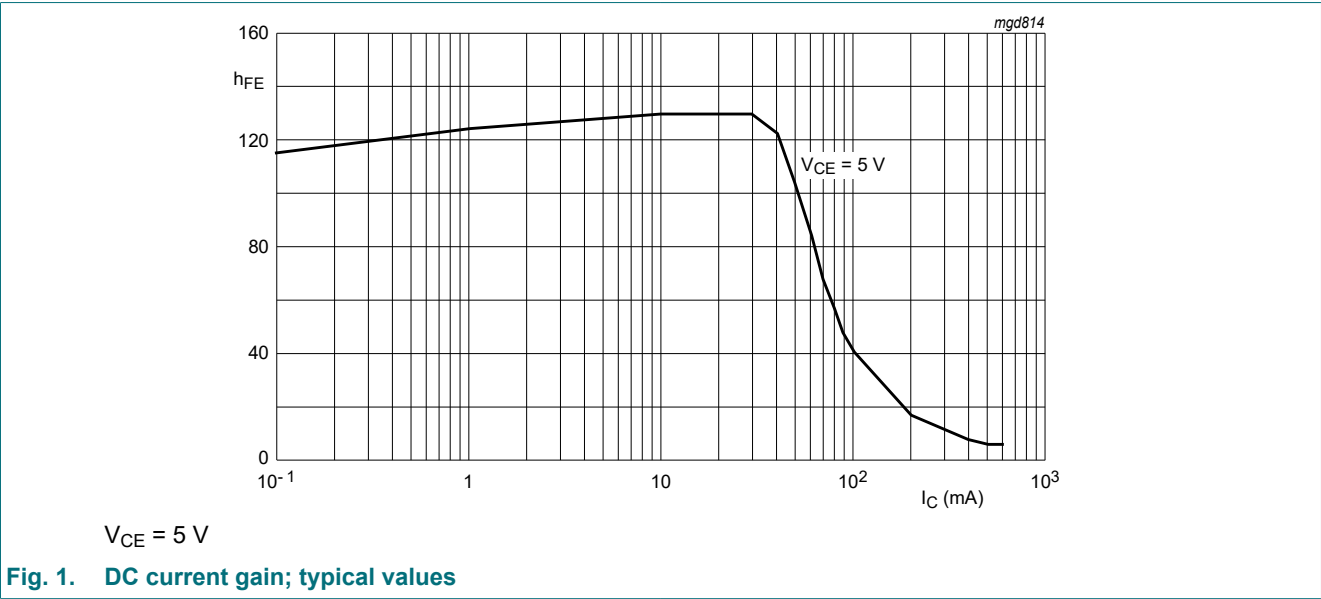


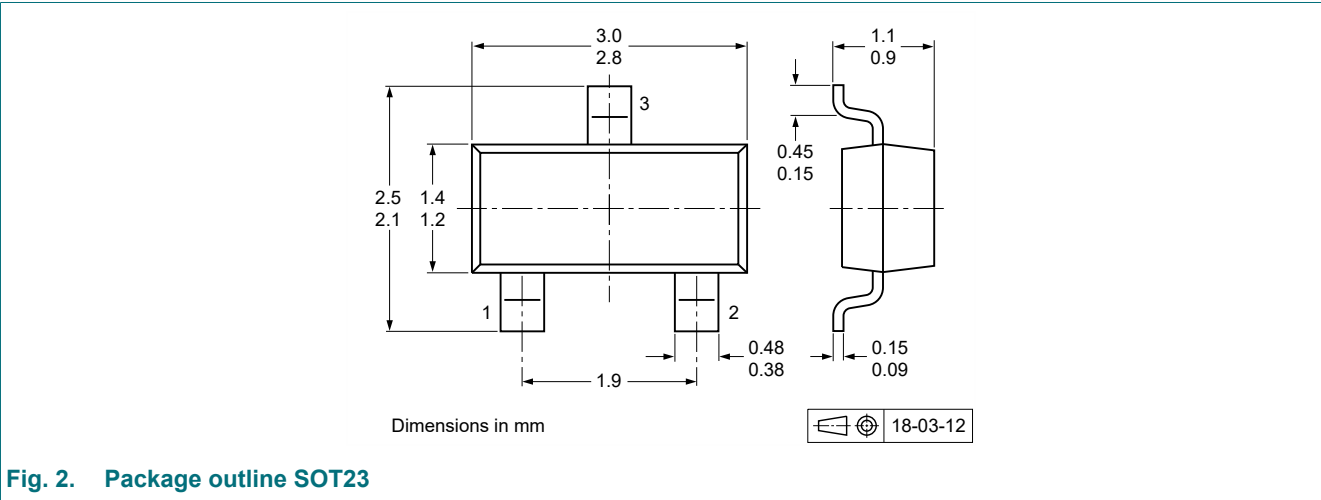
Fig. 1. DC current gain; typical values

11. Test information

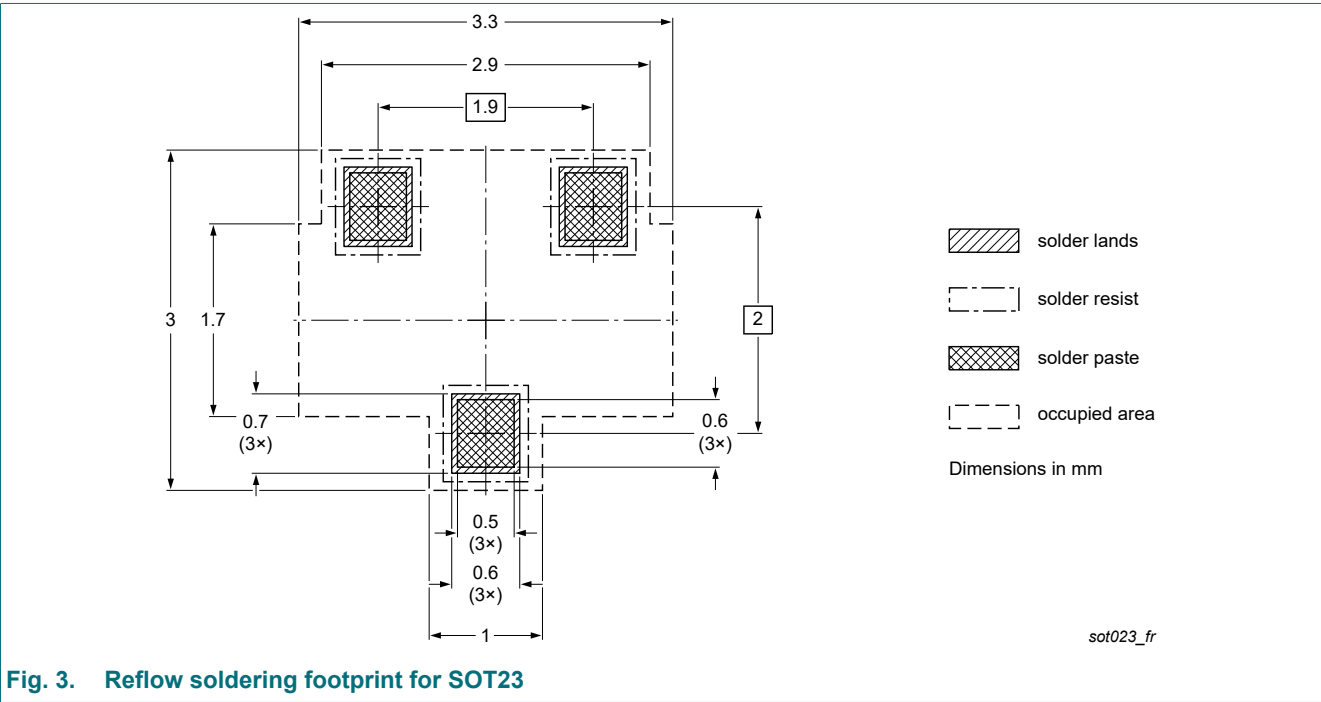
Quality information

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



13. Soldering



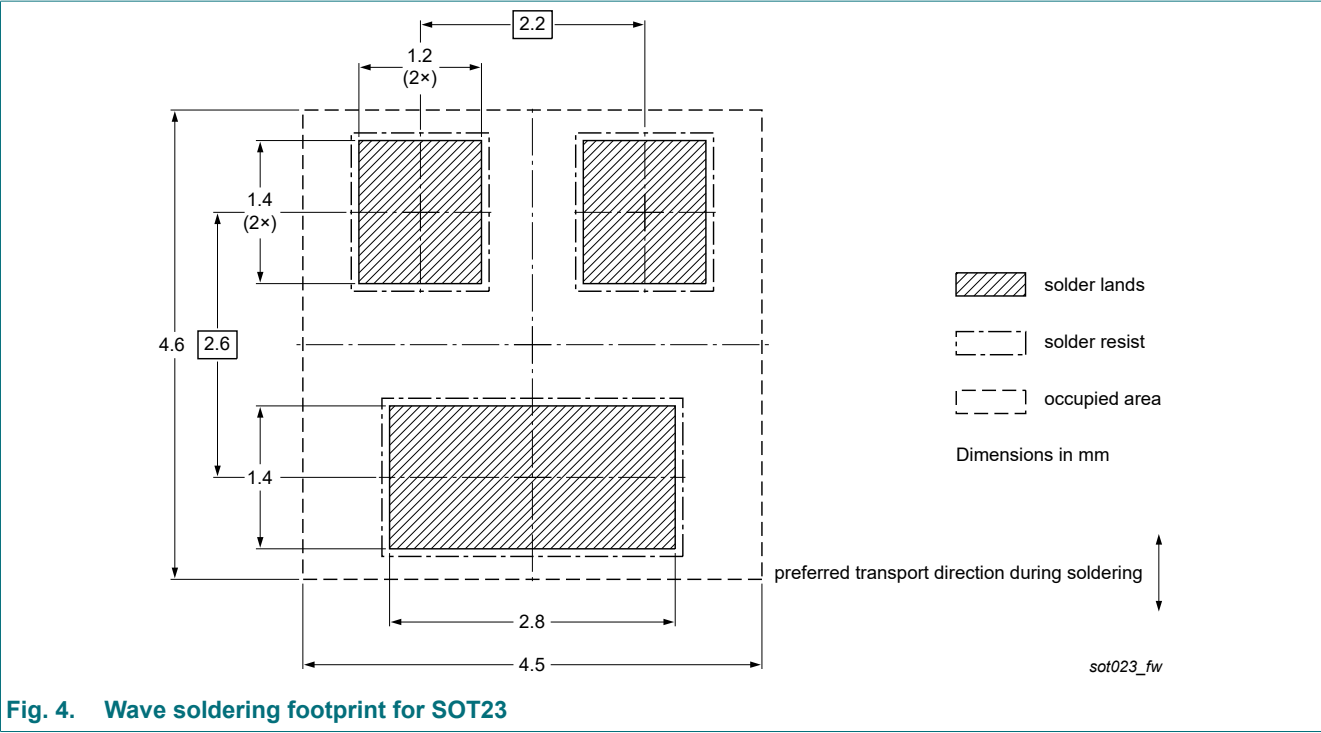


Fig. 4. Wave soldering footprint for SOT23

## 14. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMBT5551 v.3	20200831	Product data sheet	-	PMBT5551 v.2
Modifications:	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul>			
PMBT5551 v.2	20040121	Product data sheet	-	PMBT5551 v.1
PMBT5551 v.1	19990415	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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