



PMST4401

NPN switching transistor

15 May 2025

Product data sheet

1. General description

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

PNP complement: PMST4403

2. Features and benefits

- High current (max. 600 mA)
- Low voltage (max. 40 V)
- AEC-Q101 qualified

3. Applications

- General purpose switching and linear amplification, especially in portable equipment

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CE0}	collector-emitter voltage	open base	-	-	40	V
I_C	collector current		-	-	600	mA
h_{FE}	DC current gain	$V_{CE} = 1 \text{ V}$; $I_C = 10 \text{ mA}$; $T_{amb} = 25 \text{ }^{\circ}\text{C}$	80	-	-	

5. Pinning information

Table 2. Pinning information

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

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMST4401	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]
PMST4401	%2X

[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		-	60	V
V _{CEO}	collector-emitter voltage	open base		-	40	V
V _{EBO}	emitter-base voltage	open collector		-	6	V
I _C	collector current			-	600	mA
I _{CM}	peak collector current			-	600	mA
I _{BM}	peak base current			-	200	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} = 60 V; I _E = 0 A; T _{amb} = 25 °C		-	-	50	nA
		V _{CB} = 60 V; I _E = 0 A; T _j = 150 °C		-	-	10	µA
I _{EBO}	emitter-base cut-off current	V _{EB} = 6 V; I _C = 0 A; T _{amb} = 25 °C		-	-	50	nA
h _{FE}	DC current gain	V _{CE} = 1 V; I _C = 0.1 mA; T _{amb} = 25 °C		20	-	-	
		V _{CE} = 1 V; I _C = 1 mA; T _{amb} = 25 °C		40	-	-	
		V _{CE} = 1 V; I _C = 10 mA; T _{amb} = 25 °C		80	-	-	
		V _{CE} = 1 V; I _C = 150 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		100	-	300	
		V _{CE} = 2 V; I _C = 500 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		40	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 150 mA; I _B = 15 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	400	mV
		I _C = 500 mA; I _B = 50 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	750	mV
V _{BEsat}	base-emitter saturation voltage	I _C = 150 mA; I _B = 15 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	950	mV
		I _C = 500 mA; I _B = 50 mA; pulsed; t _p ≤ 300 µs; δ ≤ 0.02; T _{amb} = 25 °C		-	-	1.2	V
C _c	collector capacitance	V _{CB} = 5 V; I _E = 0 A; i _e = 0 A; f = 1 MHz; T _{amb} = 25 °C		-	-	8	pF
C _e	emitter capacitance	V _{EB} = 0.5 V; I _C = 0 A; i _c = 0 A; f = 1 MHz; T _{amb} = 25 °C		-	-	30	pF
f _T	transition frequency	V _{CE} = 10 V; I _C = 20 mA; f = 100 MHz; T _{amb} = 25 °C		250	-	-	MHz
Switching times (between 10% and 90% levels)							
t _d	delay time	I _C = 150 mA; I _{Bon} = 15 mA; I _{Boff} = -15 mA; T _{amb} = 25 °C		-	-	15	ns
t _r	rise time			-	-	20	ns
t _{on}	turn-on time			-	-	35	ns
t _s	storage time			-	-	200	ns
t _f	fall time			-	-	60	ns
t _{off}	turn-off time			-	-	250	ns

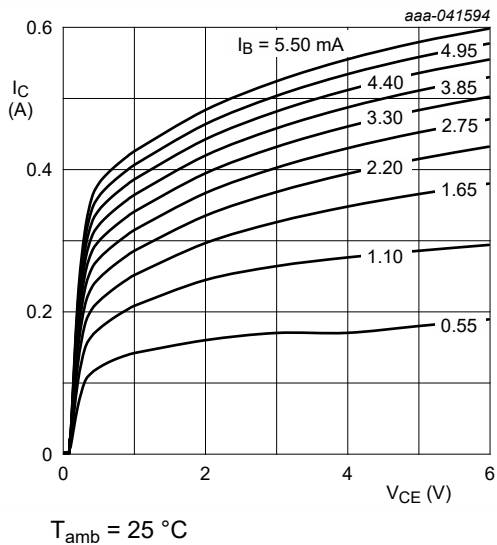


Fig. 1. Collector current as a function of collector-emitter voltage; typical values

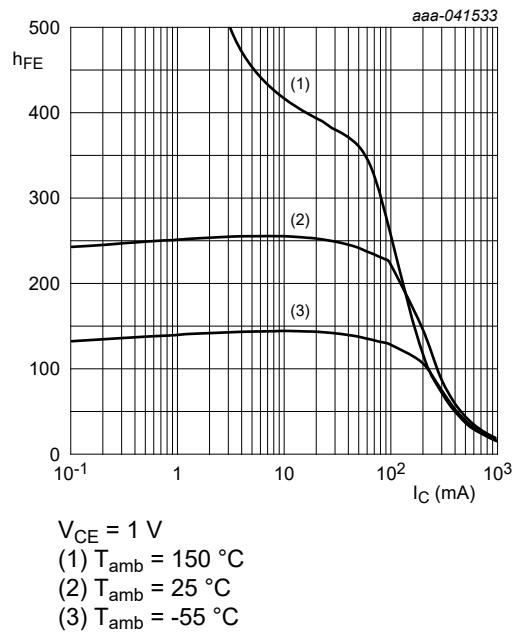


Fig. 2. DC current gain as a function of collector current; typical values

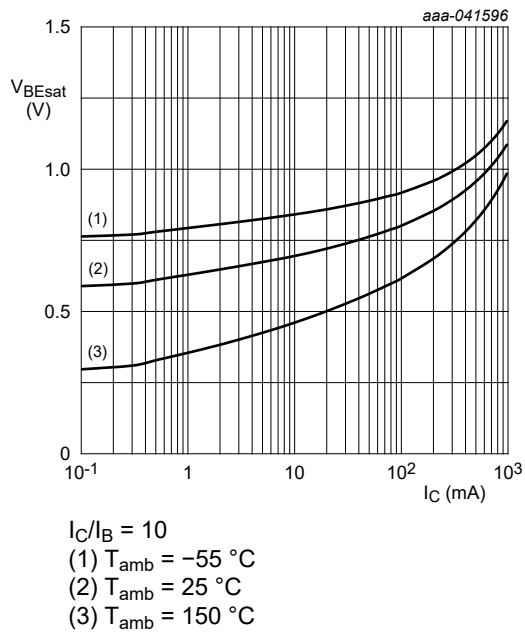


Fig. 3. Base-emitter saturation voltage as a function of collector current; typical values

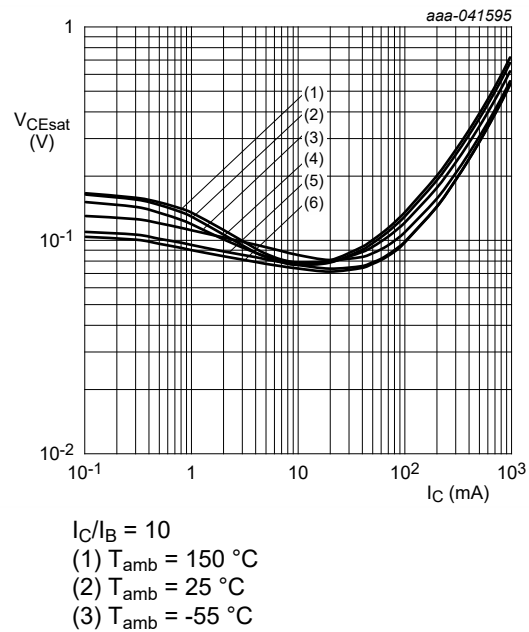


Fig. 4. Collector-emitter saturation voltage as a function of collector current; typical values

11. Test information

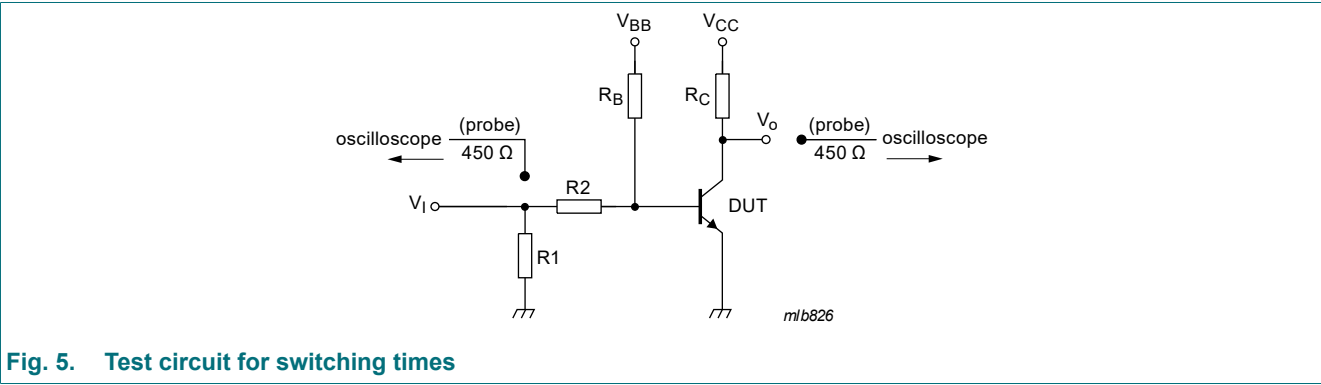


Fig. 5. Test circuit for switching times

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

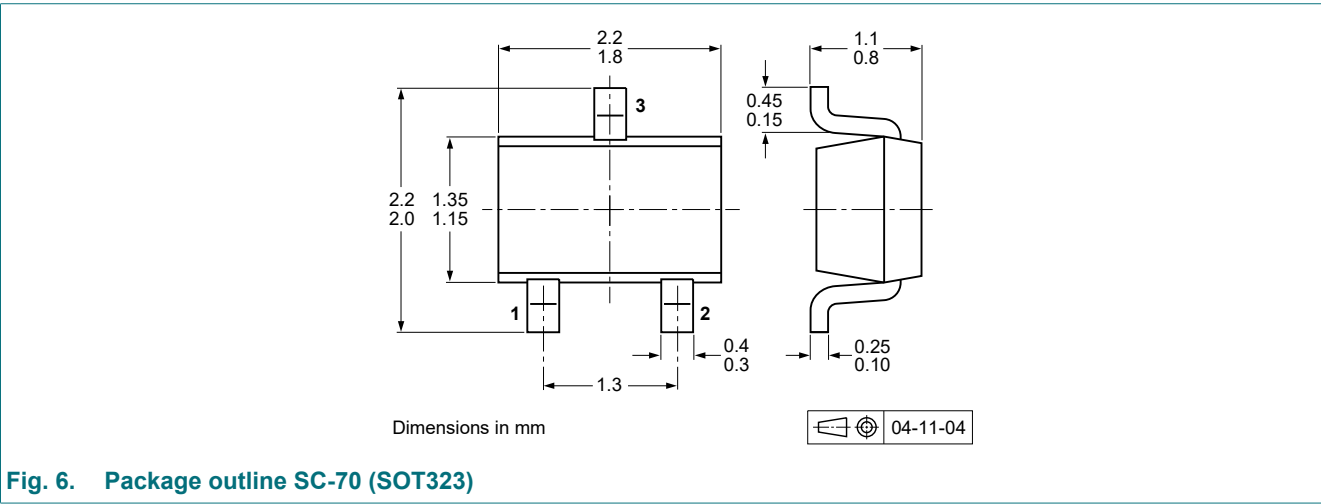
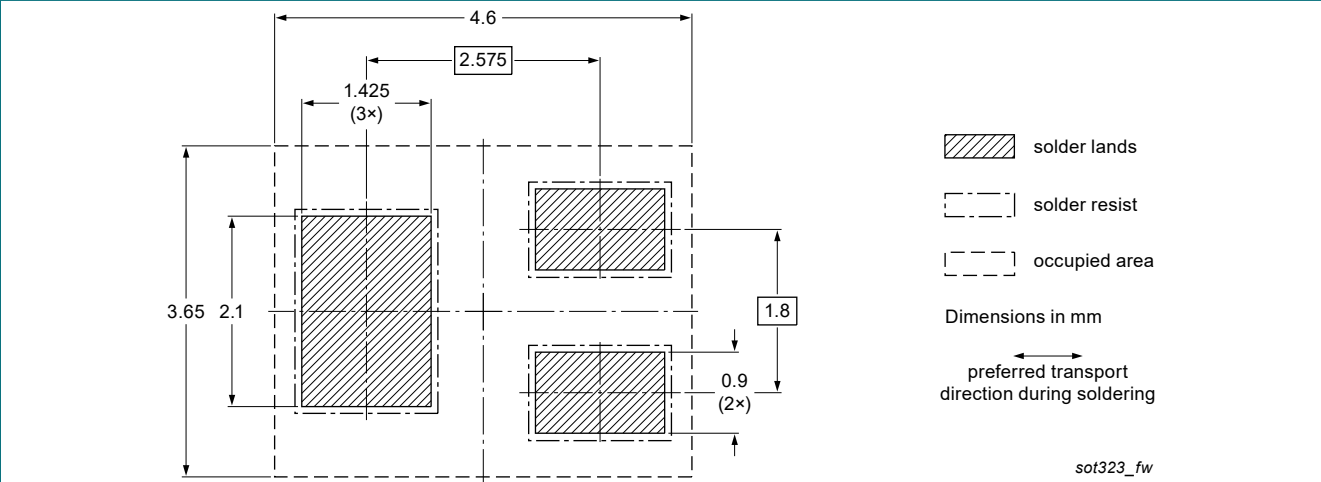
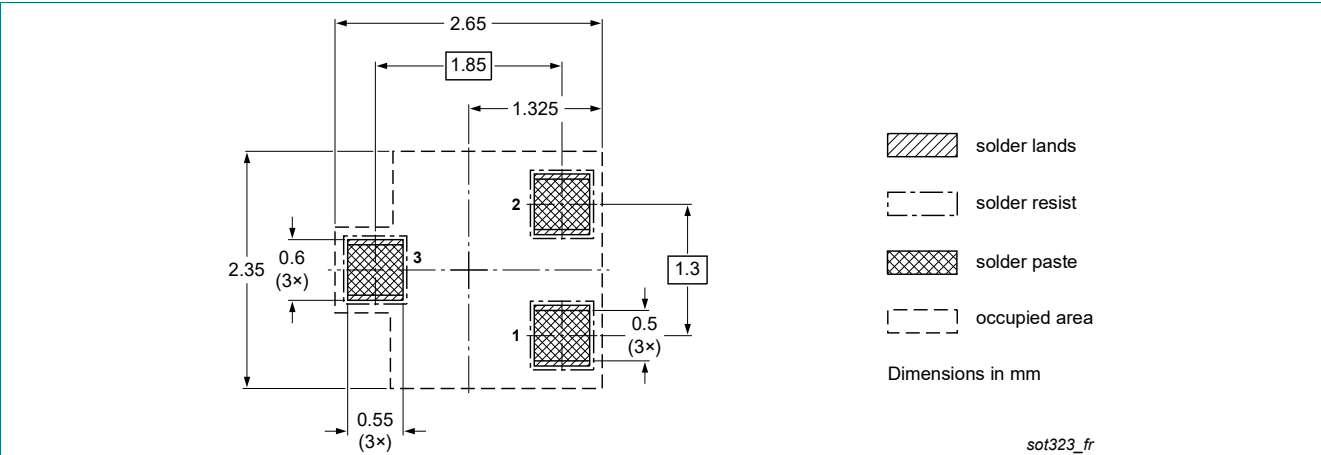


Fig. 6. Package outline SC-70 (SOT323)

13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMST4401 v.4	20250515	Product data sheet	-	PMST4401 v.3
Modifications:	- Characteristics: Conditions corrected at t_{on} - Characteristics: Figures 1 - 4 added - Test information adapted			
PMST4401 v.3	20240117	Product data sheet	-	PMST4401 v.2
PMST4401 v.2	19990422	Product data sheet	-	PMST4401 v.1
PMST4401 v.1	19970507	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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- [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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