



PMST3904

NPN switching transistor

11 August 2026

Product data sheet

1. General description

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

PNP complement: PMST3906

2. Features and benefits

- Collector current capability $I_C = 200 \text{ mA}$
- Collector-emitter voltage $V_{CEO} = 40 \text{ V}$

3. Applications

- General amplification and switching

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	40	V
I_C	collector current		-	-	200	mA
h_{FE}	DC current gain	$V_{CE} = 1 \text{ V}$; $I_C = 10 \text{ mA}$; pulsed; $t_p \leq 300 \mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	300	

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
PMST3904	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]
PMST3904	%1A

[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			-	200	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	$V_{CB} = 30\text{ V}$; $I_E = 0\text{ A}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	50	nA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 6\text{ V}$; $I_C = 0\text{ A}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	50	nA
h_{FE}	DC current gain	$V_{CE} = 1\text{ V}$; $I_C = 0.1\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		60	-	-	
		$V_{CE} = 1\text{ V}$; $I_C = 1\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		80	-	-	
		$V_{CE} = 1\text{ V}$; $I_C = 10\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		100	-	300	
		$V_{CE} = 1\text{ V}$; $I_C = 50\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		60	-	-	
		$V_{CE} = 1\text{ V}$; $I_C = 100\text{ mA}$; pulsed; $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		30	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}$; $I_B = 1\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	200	mV
		$I_C = 50\text{ mA}$; $I_B = 5\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	300	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}$; $I_B = 1\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		650	-	850	mV
		$I_C = 50\text{ mA}$; $I_B = 5\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	950	mV
C_c	collector capacitance	$V_{CB} = 5\text{ V}$; $I_E = 0\text{ A}$; $i_e = 0\text{ A}$; $f = 1\text{ MHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	4	pF
C_e	emitter capacitance	$V_{EB} = 0.5\text{ V}$; $I_C = 0\text{ A}$; $i_c = 0\text{ A}$; $f = 1\text{ MHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	8	pF
f_T	transition frequency	$V_{CE} = 10\text{ V}$; $I_C = 20\text{ mA}$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		300	-	-	MHz
NF	noise figure	$V_{CE} = 5\text{ V}$; $I_C = 100\text{ }\mu\text{A}$; $R_S = 1\text{ k}\Omega$; $f = 10\text{ Hz to }15.7\text{ kHz}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	5	dB
Switching times (between 10% and 90% levels)							
t_d	delay time	$I_C = 10\text{ mA}$; $I_{Bon} = 1\text{ mA}$; $I_{Boff} = -1\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	35	ns
t_r	rise time			-	-	35	ns
t_s	storage time			-	-	200	ns
t_f	fall time			-	-	50	ns

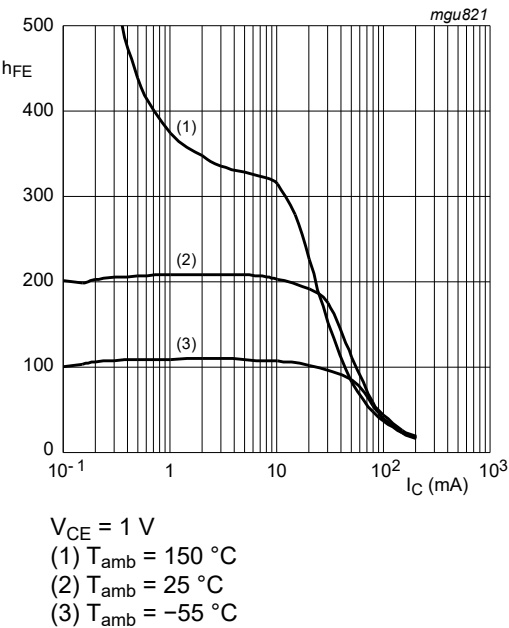


Fig. 1. DC current gain as a function of collector current; typical values

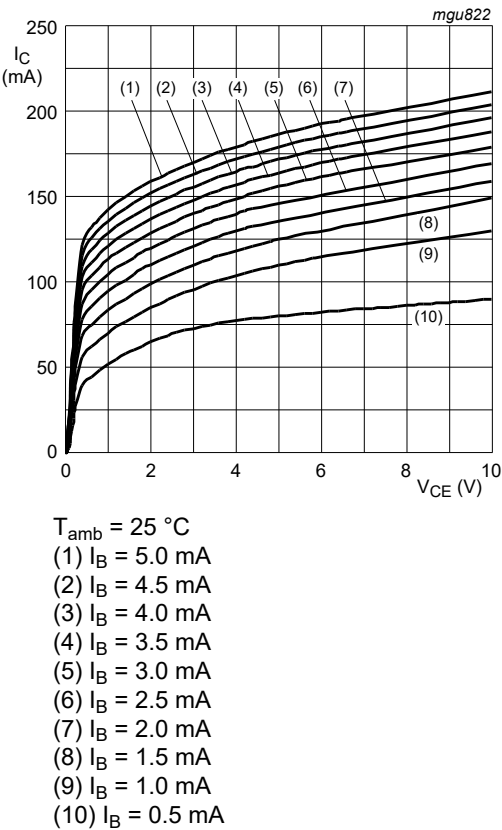


Fig. 2. Collector current as a function of collector-emitter voltage; typical values

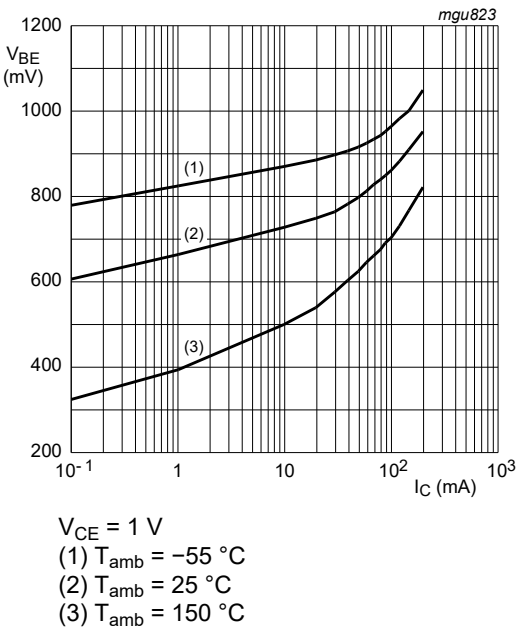


Fig. 3. Base-emitter voltage as a function of collector current; typical values

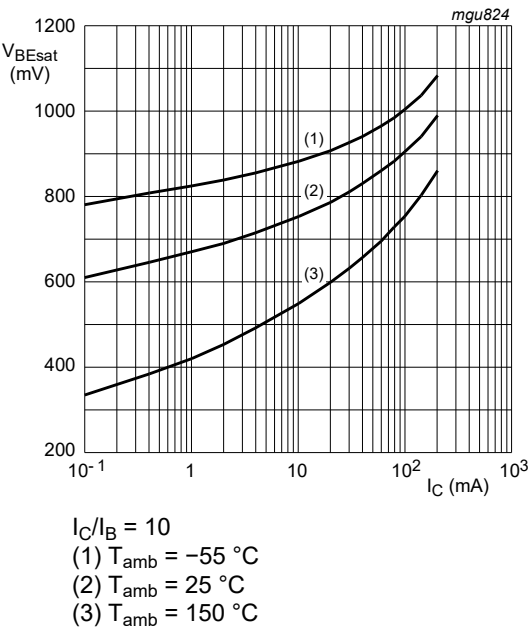
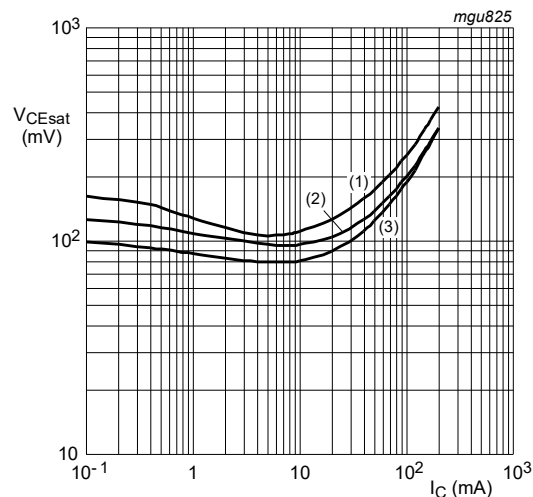


Fig. 4. Base-emitter saturation voltage as a function of collector current; typical values



$$I_C/I_B = 10$$

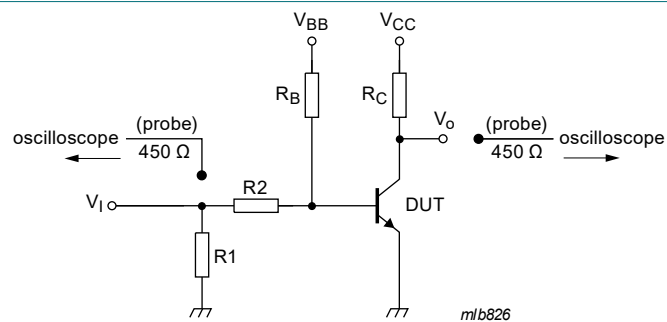
(1) $T_{amb} = 150\text{ }^{\circ}\text{C}$

(2) $T_{amb} = 25\text{ }^{\circ}\text{C}$

(3) $T_{amb} = -55\text{ }^{\circ}\text{C}$

Fig. 5. Collector-emitter saturation voltage as a function of collector current; typical values

11. Test information



$V_I = 5\text{ V}$; $t = 600\text{ }\mu\text{s}$; $t_p = 10\text{ }\mu\text{s}$; $t_r = t_f \leq 3\text{ ns}$

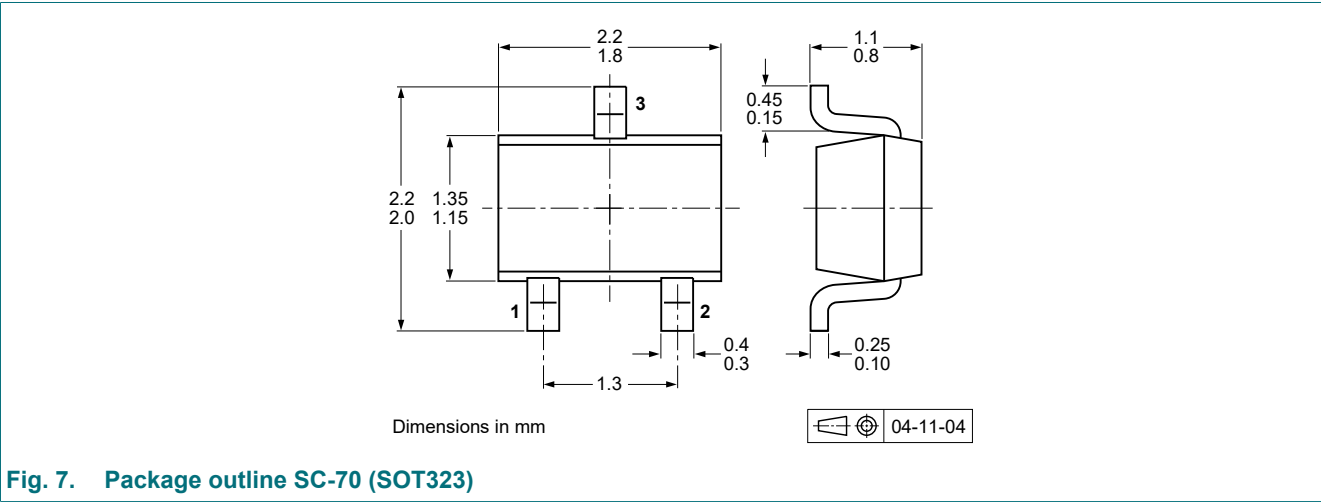
$R_1 = 56\text{ }\Omega$; $R_2 = 2.5\text{ k}\Omega$; $R_B = 3.9\text{ k}\Omega$; $R_C = 270\text{ }\Omega$

$V_{BB} = -1.9\text{ V}$; $V_{CC} = 3\text{ V}$

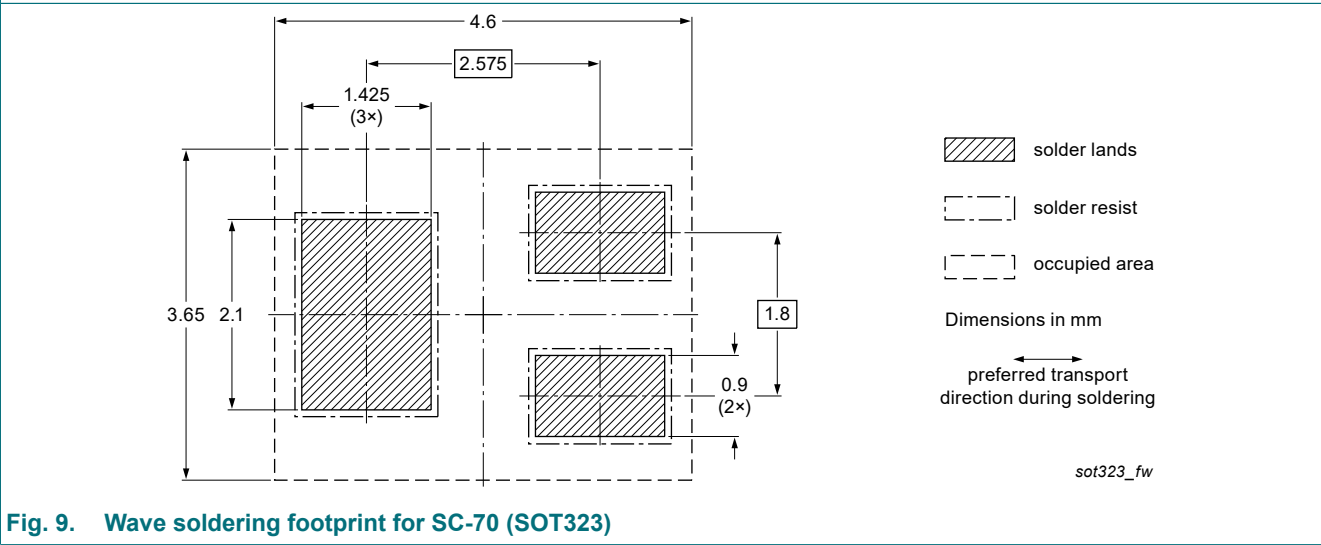
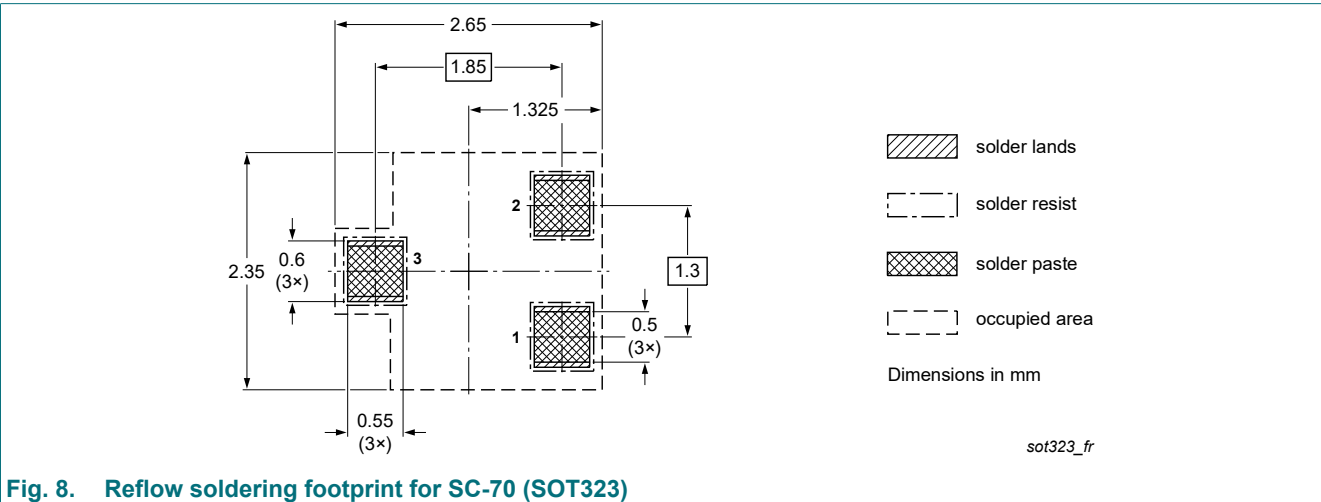
Oscilloscope: input impedance $Z_i = 50\text{ }\Omega$

Fig. 6. Test circuit for switching times

12. Package outline



13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMST3904 v.5	20260811	Product data sheet	-	PMST3904 v.4
Modifications:	• Features and benefits: AEC-Q101 qualified removed			
20250930	Product data sheet	-	PMST3904 v.3	
PMST3904 v.3	20240228	Product data sheet	-	PMST3904 v.2
PMST3904 v.2	20040421	Product data sheet	-	PMST3904 v.1
PMST3904 v.1	19990422	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".
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