PMSTA06

80 V, 500 mA NPN general-purpose transistor

1 July 2025 **Product data sheet**

1. General description

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

PNP complement: PMSTA56

2. Features and benefits

- High current (max. 500 mA)
- Very small SMD plastic package
- Collector-emitter voltage: 80 V
- AEC-Q101 qualified

3. Applications

- General purpose switching and amplification in e.g. telephony and professional communication equipment.

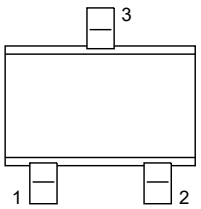
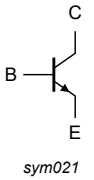
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	80	V
I_C	collector current			-	-	500	mA
h_{FE}	DC current gain	V_{CE} = 2 V; I_C = 10 mA; T_{amb} = 25 °C		50	-	-	

5. Pinning information

Table 2. Pinning information

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

SC-70 (SOT323)

sym021

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMSTA06	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]
PMSTA06	%1G

[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		-	80	V
V_{CEO}	collector-emitter voltage	open base		-	80	V
V_{EBO}	emitter-base voltage	open collector		-	4	V
I_C	collector current			-	500	mA
I_{BM}	peak base current	single pulse		-	500	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °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 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.

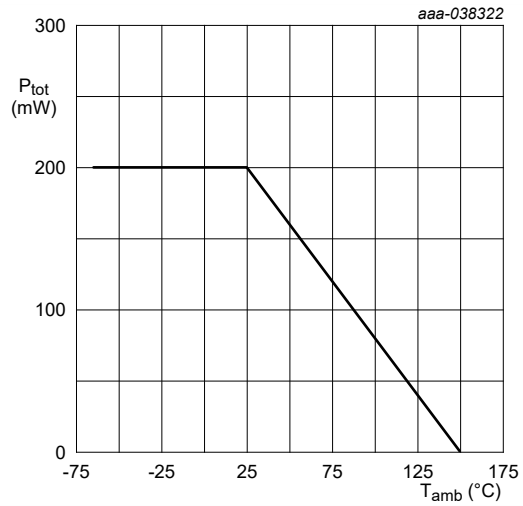


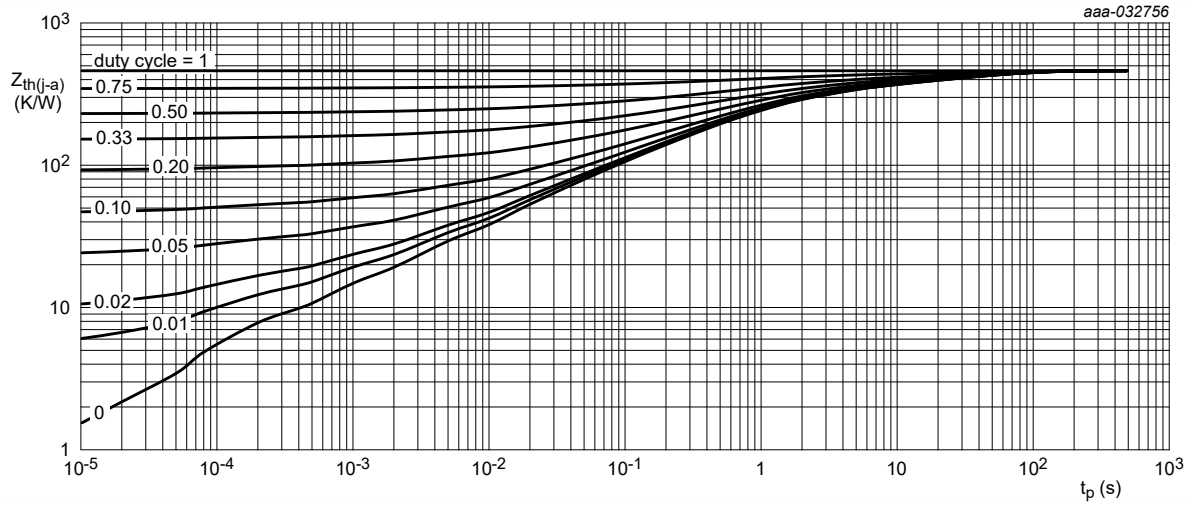
Fig. 1. Power derating curve

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, 35 µm copper, tin-plated and standard footprint.



FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint

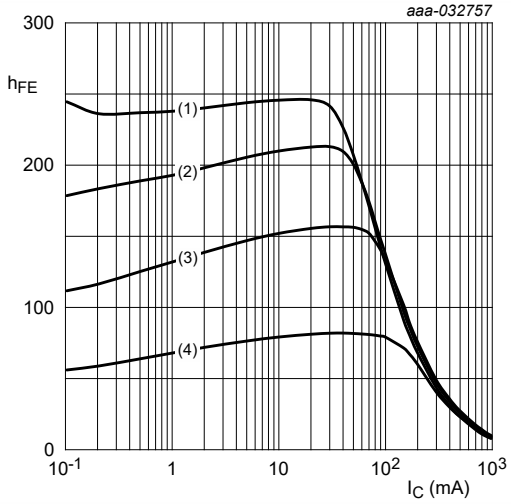
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

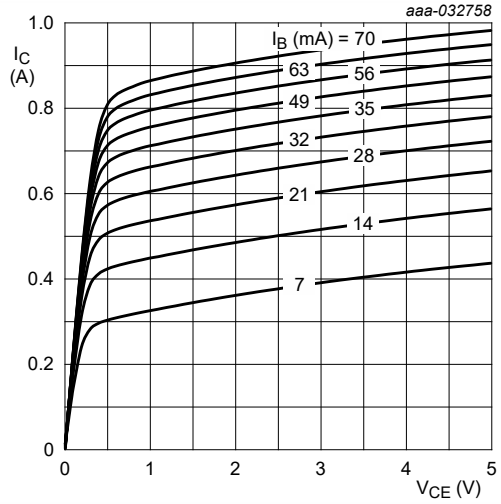
T_{amb} = 25 °C unless otherwise specified

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = 100 µA; I_E = 0 A; T_{amb} = 25 °C		80	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I_C = 2 mA; I_B = 0 A; T_{amb} = 25 °C		80	-	-	V
I_{CBO}	collector-base cut-off current	V_{CB} = 80 V; I_E = 0 A; T_{amb} = 25 °C		-	-	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 3 V; I_C = 0 A; T_{amb} = 25 °C		-	-	500	nA
h_{FE}	DC current gain	V_{CE} = 2 V; I_C = 10 mA; T_{amb} = 25 °C		50	-	-	
		V_{CE} = 1 V; I_C = 100 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		50	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 100 mA; I_B = 10 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	250	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 100 mA; I_B = 10 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02		-	-	900	mV
V_{BE}	base-emitter voltage	V_{CE} = 1 V; I_C = 100 mA; T_{amb} = 25 °C		-	-	1.2	V
f_T	transition frequency	V_{CE} = 2 V; I_C = 10 mA; f = 100 MHz; T_{amb} = 25 °C		100	-	-	MHz



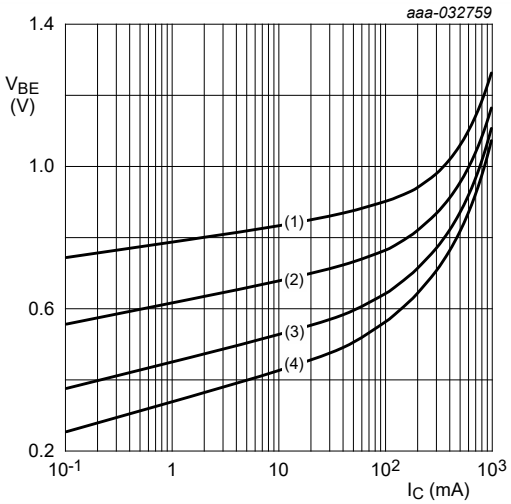
V_{CE} = 1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 100 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = −55 °C

Fig. 3. DC current gain as a function of collector current; typical values



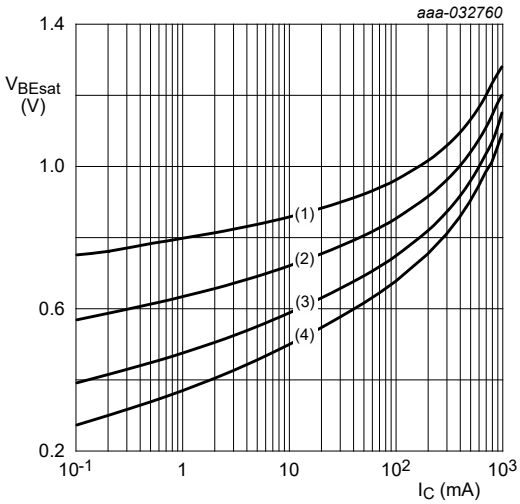
T_{amb} = 25 °C

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



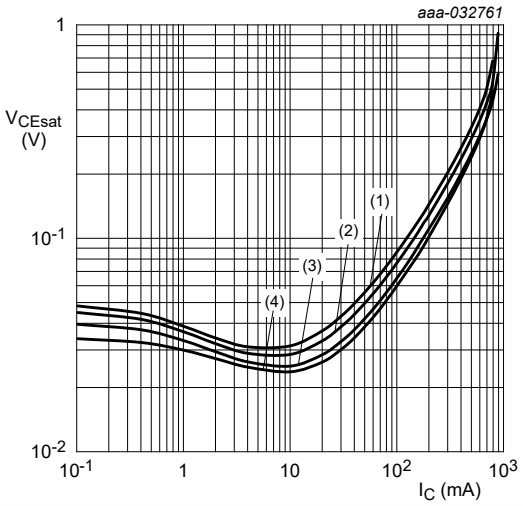
V_{CE} = 1 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 150 °C

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



I_C/I_B = 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 150 °C

Fig. 6. Base-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 100 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -55 °C

Fig. 7. Collector-emitter saturation voltage as a function of collector current; 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

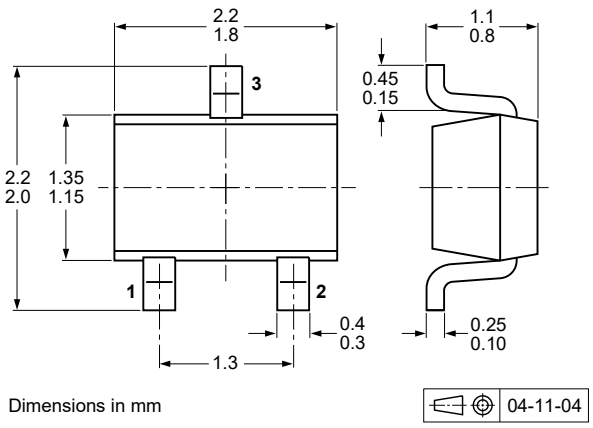


Fig. 8. Package outline SC-70 (SOT323)

13. Soldering

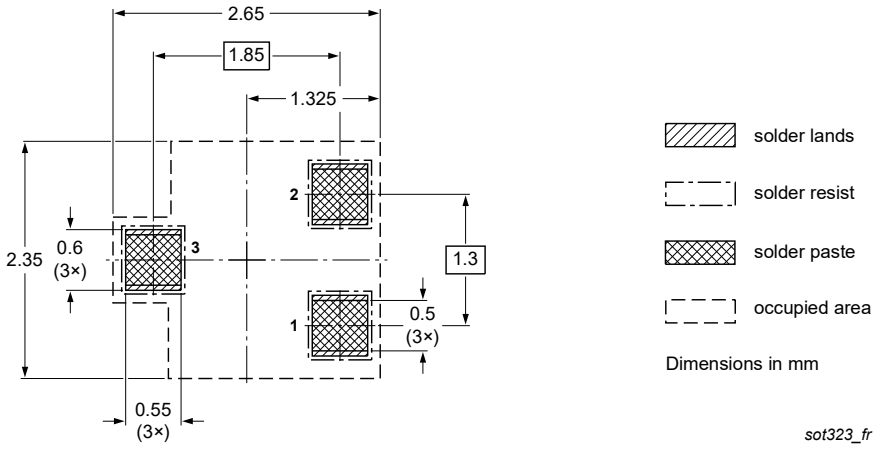


Fig. 9. Reflow soldering footprint for SC-70 (SOT323)

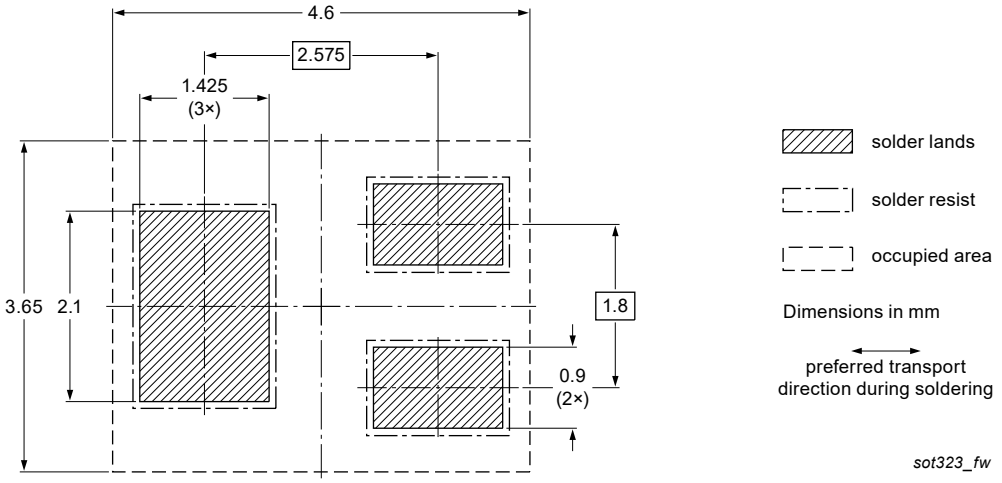


Fig. 10. Wave soldering footprint for SC-70 (SOT323)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMSTA06 v.4	20250701	Product data sheet	-	PMSTA05_06 v.3
Modifications:	• Family data sheet split to single type data sheet • Section "Packing information" removed			
PMSTA05_06 v.3	20100722	Product data sheet	-	PMSTA05_06_2
PMSTA05_06_2	19990429	Product specification	-	PMSTA05_06_1
PMSTA05_06_1	19970616	Product specification	-	-

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.

[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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Date of release: 1 July 2025