PMBTA56

PNP general purpose transistor

1 April 2023 **Product data sheet**

1. General description

PNP general-purpose transistor in a small SOT23 plastic package. NPN complement: PMBTA06.

2. Features and benefits

- High current (max. 500 mA)
- Low voltage (max. 80 V).

3. Applications

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

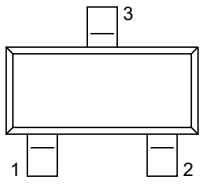
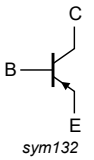
4. Quick reference data

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} = -1 V; I_C = -10 mA; T_{amb} = 25 °C		100	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23	 sym132
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBTA56	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[1]
PMBTA56	%2G

[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		-	-5	V
I_C	collector current			-	-500	mA
I_{CM}	peak collector current	single pulse; $t_p \leq$ 1 ms		-	-1	A
I_{BM}	peak base current			-	-200	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 PCB, single-sided, 35 µm 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

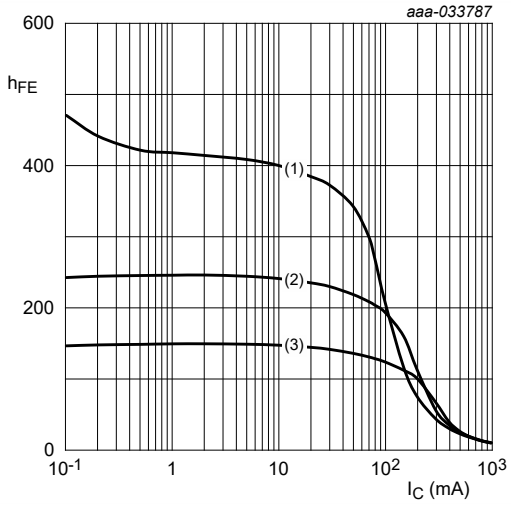
[1] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

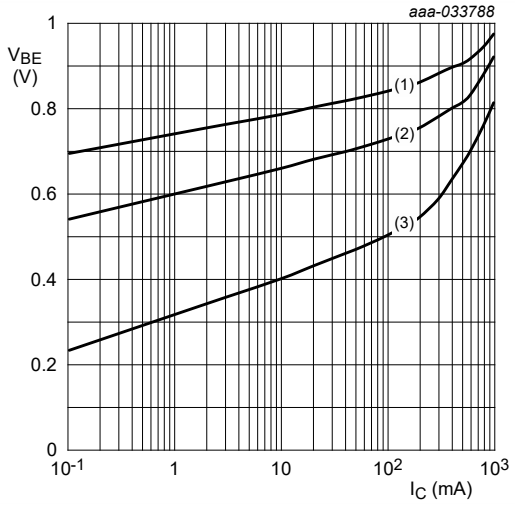
T_{amb} = 25 °C unless otherwise specified

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 = -1 mA; I_B = 0 A; T_{amb} = 25 °C		-80	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage (collector open)	I_E = -100 µA; I_C = 0 A; T_{amb} = 25 °C		-5	-	-	V
I_{CBO}	collector-base cut-off current	V_{CB} = -80 V; I_E = 0 A		-	-	-50	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A		-	-	-50	nA
h_{FE}	DC current gain	V_{CE} = -1 V; I_C = -10 mA; T_{amb} = 25 °C		100	-	-	
		V_{CE} = -1 V; I_C = -100 mA		100	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -100 mA; I_B = -10 mA		-	-	-0.25	V
V_{BE}	base-emitter voltage	V_{CE} = -1 V; I_C = -100 mA		-	-	-1.2	V
f_T	transition frequency	V_{CE} = -1 V; I_C = -100 mA; f = 100 MHz		50	-	-	MHz



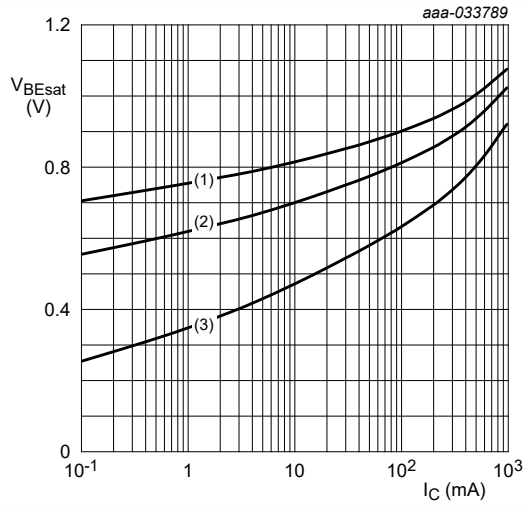
V_{CE} = 1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −40 °C

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



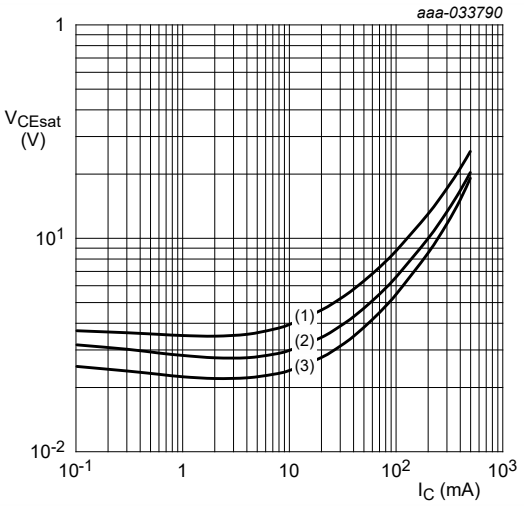
V_{CE} = 5 V
(1) T_{amb} = -40 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

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



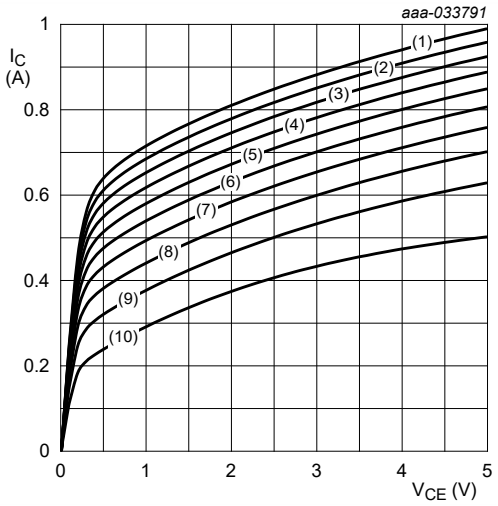
I_C/I_B = 10
(1) T_{amb} = -40 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 3. 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} = 25 °C
(3) T_{amb} = -55 °C

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



T_{amb} = 25 °C
(1) I_B = 50 mA
(2) I_B = 45 mA
(3) I_B = 40 mA
(4) I_B = 35 mA
(5) I_B = 30 mA
(6) I_B = 25 mA
(7) I_B = 20 mA
(8) I_B = 15 mA
(9) I_B = 10 mA
(10) I_B = 5 mA

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

11. Package outline

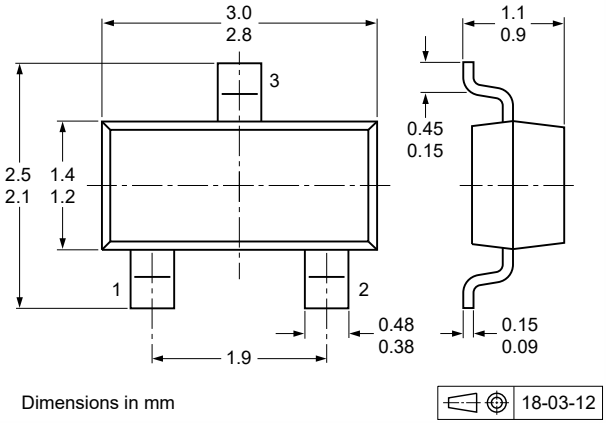


Fig. 6. Package outline SOT23

12. Soldering

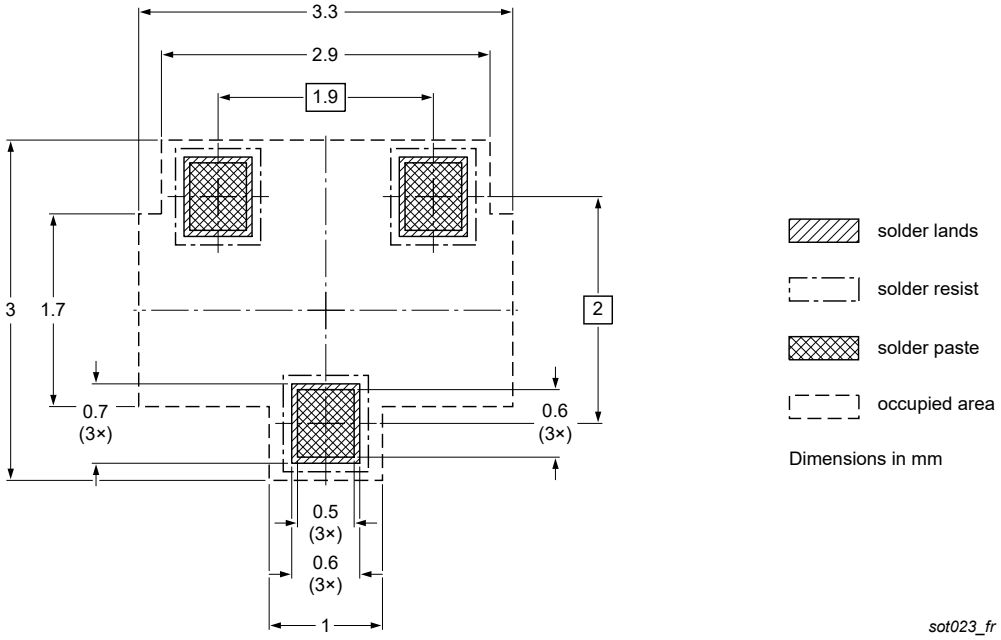


Fig. 7. Reflow soldering footprint for SOT23

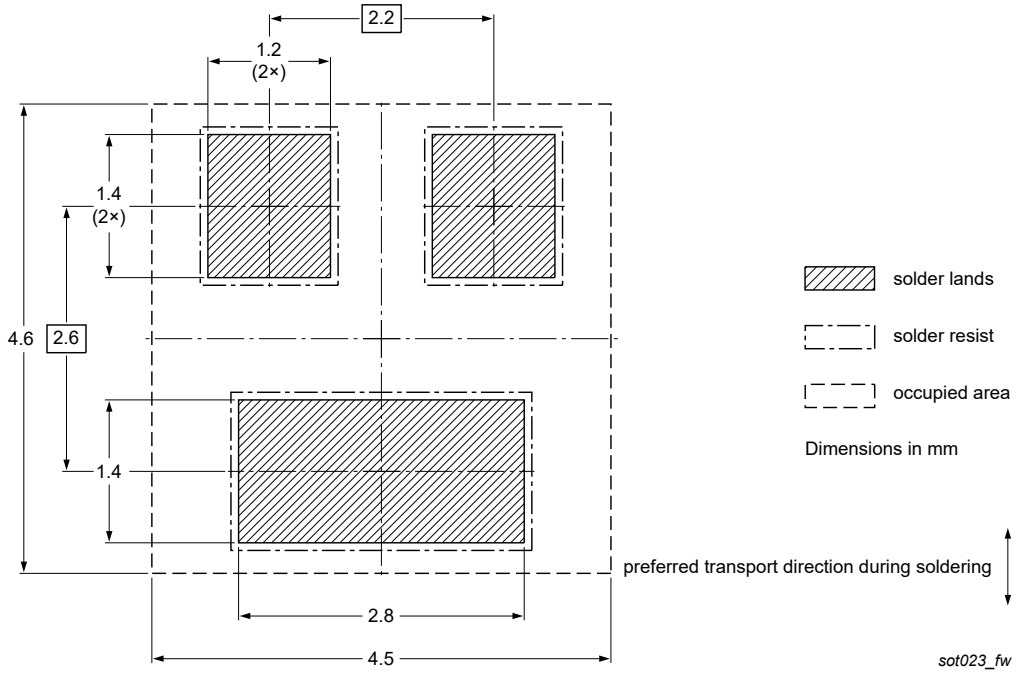


Fig. 8. Wave soldering footprint for SOT23

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMBTA56 v.3	20230401	Product data sheet	-	PMBTA56 v.2
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Product changed to non automotive. Please refer to the automotive product(s) with -Q.			
PMBTA56 v.2	20040109	Product data sheet	-	PMBTA56 v.1
PMBTA56 v.1	19990409	Product specification	-	-

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".
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