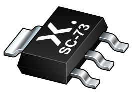


BCP52T-Q series

60 V, 1 A PNP medium power transistors

Rev. 1 — 14 November 2025 Product data sheet

1. General description

PNP medium power transistors in a medium power SOT223 (SC73) Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

Type number	Package		NPN complement
	Nexperia	JEDEC	
BCP52T-Q	SOT223	SC-73	BCP55T-Q
BCP52-10T-Q			BCP55-10T-Q
BCP52-16T-Q			BCP55-16T-Q

2. Features and benefits

- High collector current capability I_C and I_{CM}
- Three current gain selections
- High power dissipation capability
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Linear voltage regulators
- MOSFET drivers
- High-side switches
- Power management
- Amplifiers

4. Quick reference data

Table 2. Quick reference data

T_{amb} = 25 °C unless otherwise specified.

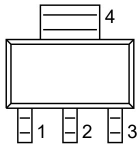
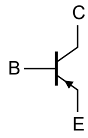
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-60	V
I_C	collector current			-	-	-1	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-	-2	A
h_{FE}	DC current gain						
	BCP52T-Q	V_{CE} = -2 V; I_C = -150 mA	[1]	63	-	250	
	BCP52-10T-Q		[1]	63	-	160	
	BCP52-16T-Q		[1]	100	-	250	

[1] pulsed; $t_p \leq 300$ µs; $\delta \leq 0.02$

nexperia

5. Pinning information

Table 3. Pinning

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

6. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
BCP52T-Q	SC-73	plastic, surface-mounted package with increased heatsink; 4 leads	SOT223
BCP52-10T-Q			
BCP52-16T-Q			

7. Marking

Table 5. Marking

Type number	Marking code
BCP52T-Q	BCP52T
BCP52-10T-Q	P5210T
BCP52-16T-Q	P5216T

8. Limiting values

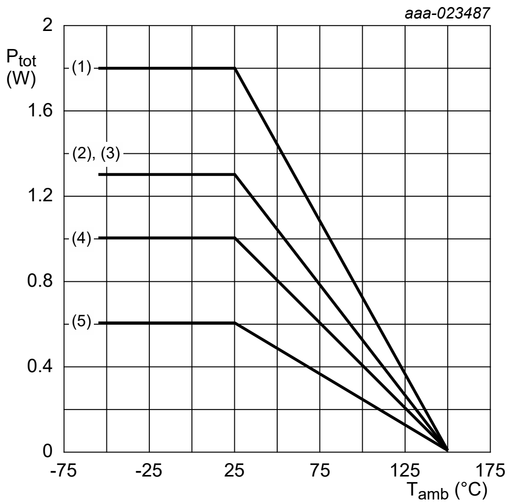
Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

T_{amb} = 25 °C unless otherwise specified.

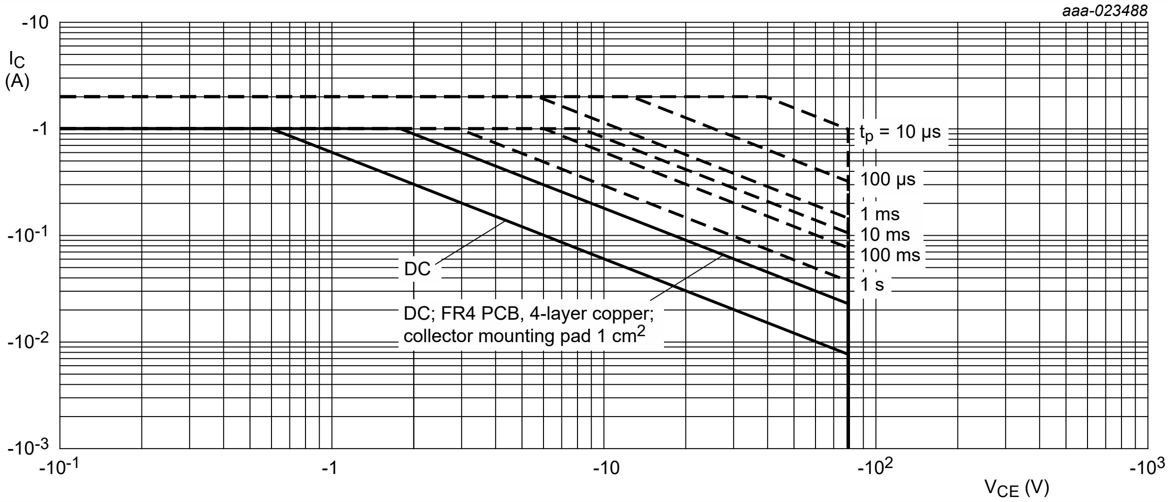
Symbol	Parameter	Conditions		Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	-60	V
V_{CEO}	collector-emitter voltage	open base		-	-60	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-1	A
I_{CM}	peak collector current	single pulse; t_p ≤ 1 ms		-	-2	A
I_B	base current			-	-0.2	A
I_{BM}	peak base current	single pulse; t_p ≤ 1 ms		-	-0.3	A
P_{tot}	total power dissipation	T_{amb} ≤ 25 °C	[1]	-	0.6	W
			[2]	-	1	W
			[3]	-	1.3	W
			[4]	-	1.3	W
			[5]	-	1.8	W
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	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.
[2] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated; mounting pad for collector 1 cm^2.
[3] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated; mounting pad for collector 6 cm^2.
[4] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated and standard footprint.
[5] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated; mounting pad for collector 1 cm^2.



(1) FR4 PCB; 4-layer copper; 1 cm^2
(2) FR4 PCB; single-sided copper; 6 cm^2
(3) FR4 PCB; 4-layer copper; standard footprint
(4) FR4 PCB; single-sided copper; 1 cm^2
(5) FR4 PCB; single-sided copper; standard footprint

Fig. 1. Power derating curves



FR4 PCB; single-sided copper; standard footprint

single pulse; T_{amb} = 25 °C

Fig. 2. Safe operating area; junction to ambient; continous and peak collector currents as a funtion of collecor-emitter voltage

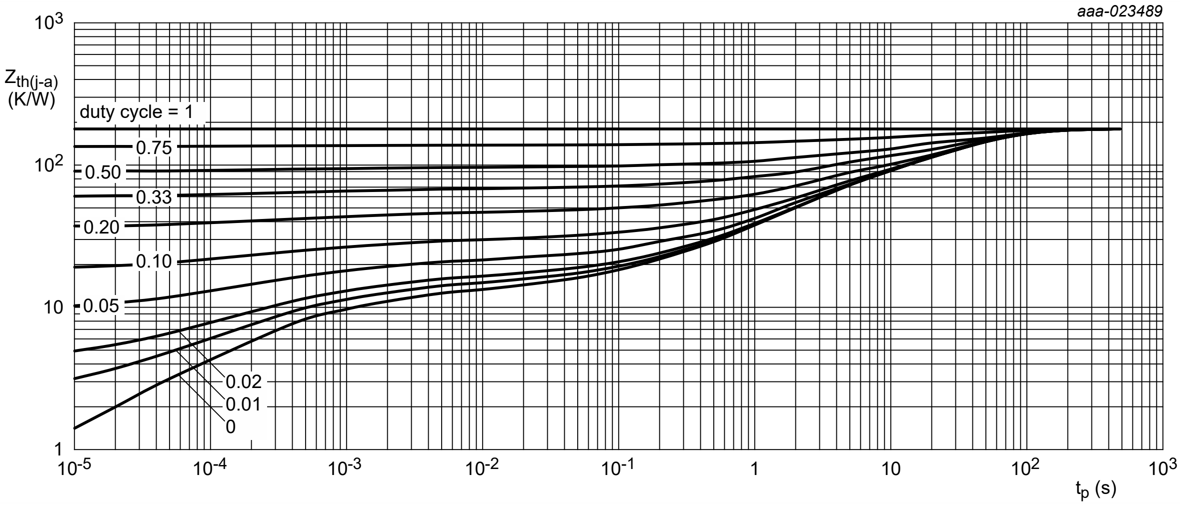
9. Thermal characteristics

Table 7. Thermal characteristics

T_{amb} = 25 °C unless otherwise specified.

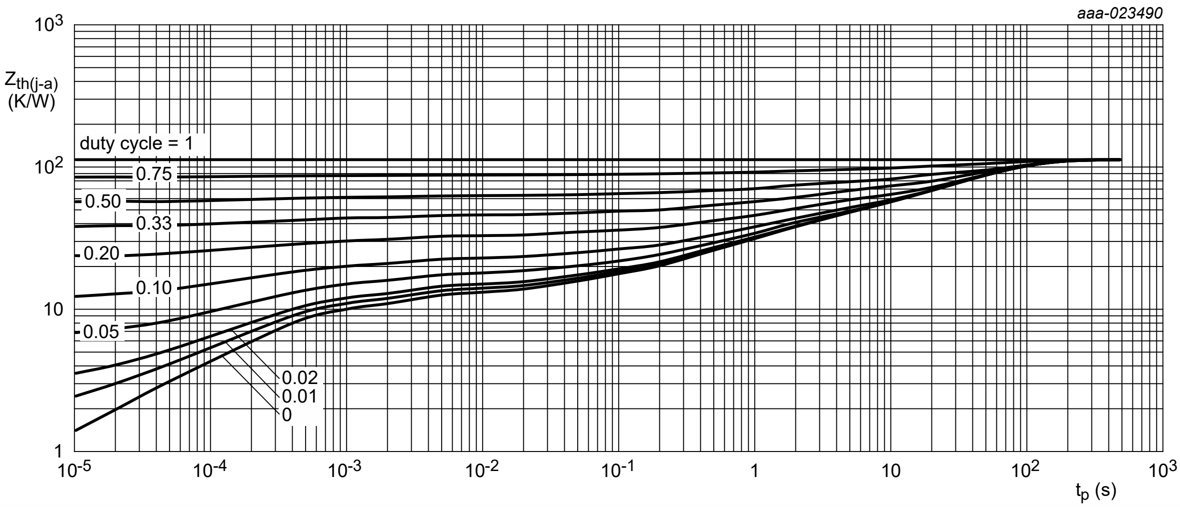
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	209	K/W
			[2]			125	K/W
			[3]			97	K/W
			[4]	-	-	97	K/W
			[5]	-	-	70	K/W
$R_{(j-sp)}$	thermal resistance from junction to solder point			-	-	18	K/W

[1] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated and standard footprint.
[2] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated; mounting pad for collector 1 cm^2.
[3] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated; mounting pad for collector 6 cm^2.
[4] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated and standard footprint.
[5] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated; mounting pad for collector 1 cm^2.



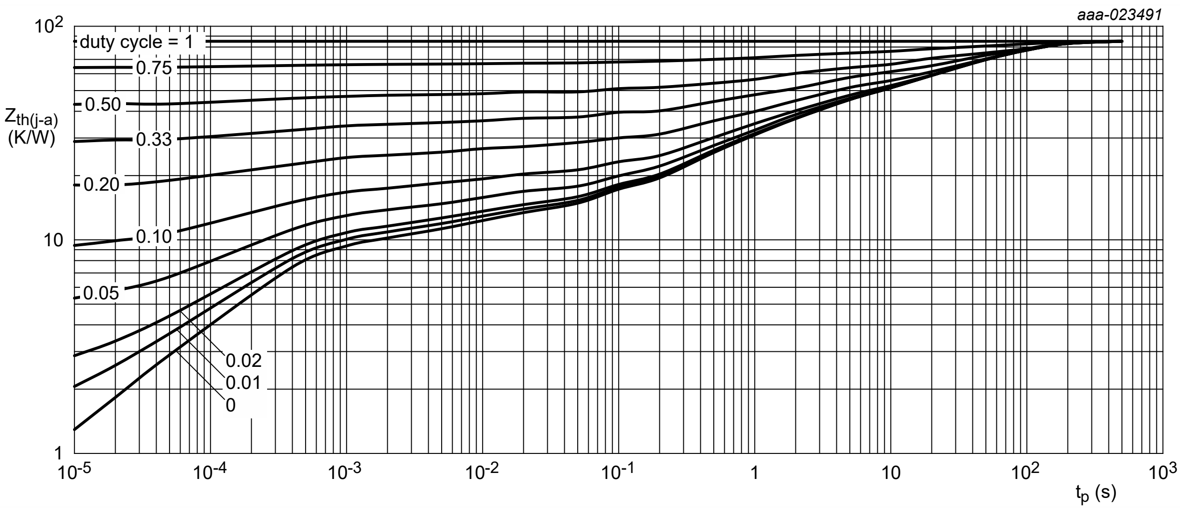
FR4 PCB; single-sided copper; tin-plated and standard footprint

Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



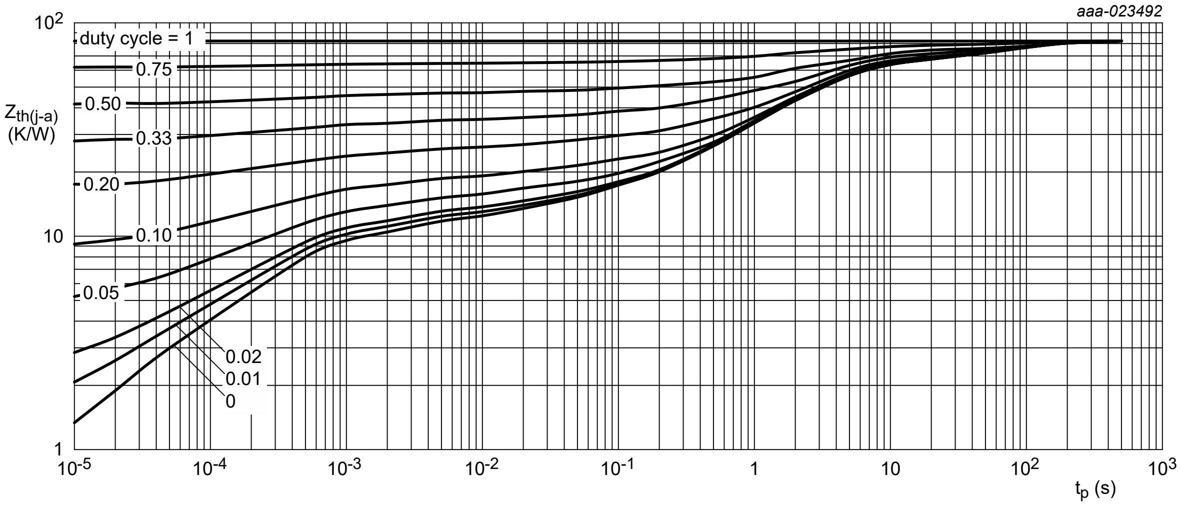
FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 1 cm^2

Fig. 4. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



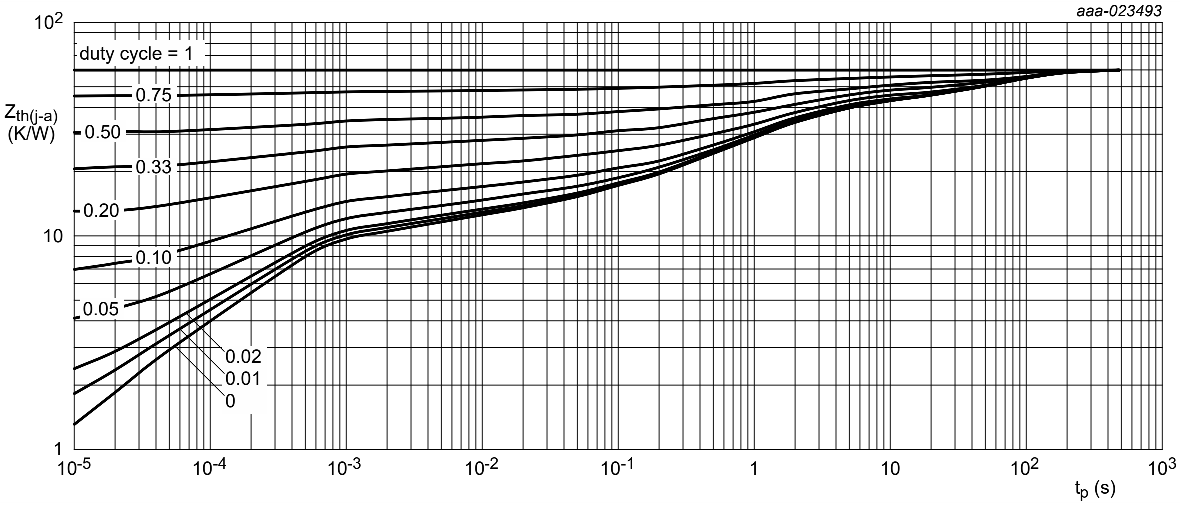
FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 6 cm^2

Fig. 5. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



FR4 PCB; 4-layer copper; tin-plated and standard footprint

Fig. 6. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



FR4 PCB; 4-layer copper; tin-plated; mounting pad for collector 1 cm^2

Fig. 7. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

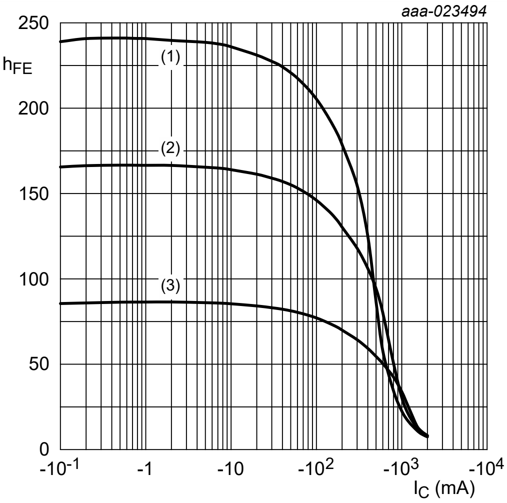
10. Characteristics

Table 8. Characteristics

T_{amb} = 25 °C unless otherwise specified.

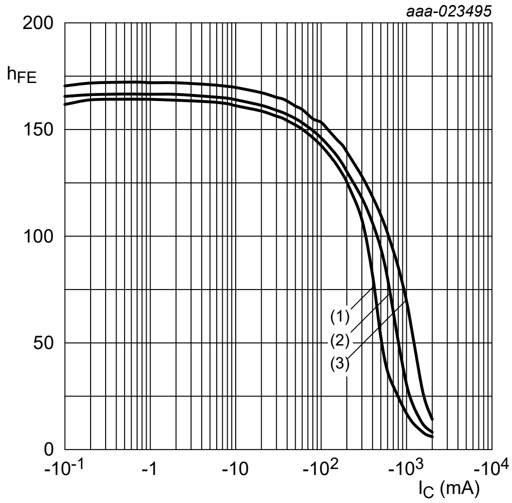
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	I_C = -100 µA; I_E = 0 A		-60	-		V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	I_C = -2 mA; I_E = 0 A		-60	-		V
$V_{(BR)EBO}$	emitter-base breakdown voltage	I_E = -100 µA; I_C = 0 A		-5	-		V
I_{CBO}	collector-base cut-off current	V_{CB} = -30 V; I_E = 0 A		-	-	-100	nA
		V_{CB} = -30 V; I_E = 0 A; T_j = 150 °C		-	-	-10	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A		-	-	-100	nA
h_{FE}	DC current gain						
	BCP52T-Q	V_{CE} = -2 V; I_C = -5 mA		63	-	-	
		V_{CE} = -2 V; I_C = -150 mA	[1]	63	-	250	
		V_{CE} = -2 V; I_C = -500 mA	[1]	40	-	-	
	BCP52-10T-Q	V_{CE} = -2 V; I_C = -5 mA		63	-	-	
		V_{CE} = -2 V; I_C = -150 mA	[1]	63	-	160	
		V_{CE} = -2 V; I_C = -500 mA	[1]	40	-	-	
	BCP52-16T-Q	V_{CE} = -2 V; I_C = -5 mA		63	-	-	
		V_{CE} = -2 V; I_C = -150 mA	[1]	100	-	250	
		V_{CE} = -2 V; I_C = -500 mA	[1]	40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -500 mA; I_B = -50 mA	[1]	-	-	-500	mV
V_{BE}	base-emitter voltage	V_{CE} = -2 V; I_C = -500 mA	[1]	-	-	-1	V
f_T	transition frequency	V_{CE} = -5 V; I_C = -50 mA; f = 100 MHz		100	140	-	MHz
C_c	collector capacitance	V_{CB} = -10 V; I_E = i_e = 0 A; f = 1 MHz		-	7	-	pF

[1] pulsed; t_p ≤ 300 µs; δ ≤ 0.02



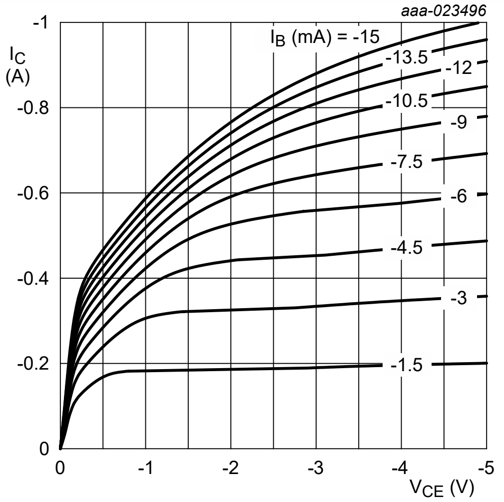
V_{CE} = -2 V
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 8. DC current gain as a function of collector current; typical values



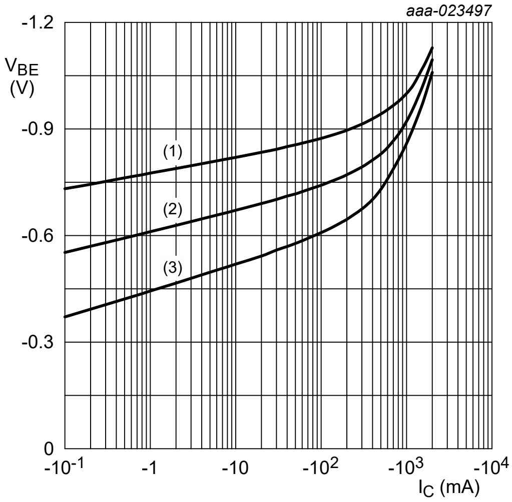
T_{amb} = 25 °C
(1) V_{CE} = -1 V
(2) V_{CE} = -2 V
(3) V_{CE} = -5 V

Fig. 9. DC current gain as a function of collector current; typical values



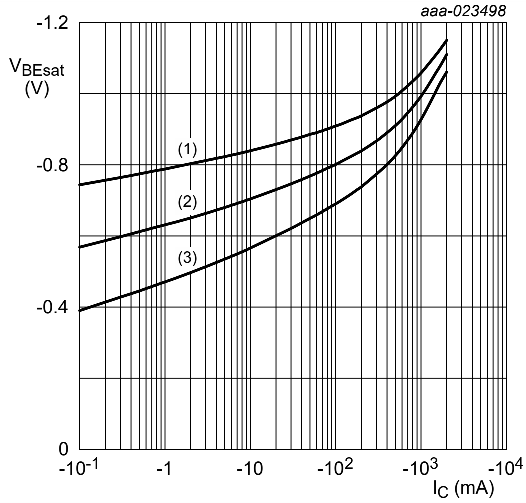
T_{amb} = 25 °C

Fig. 10. Collector current as a function of collector-emitter voltage; typical values



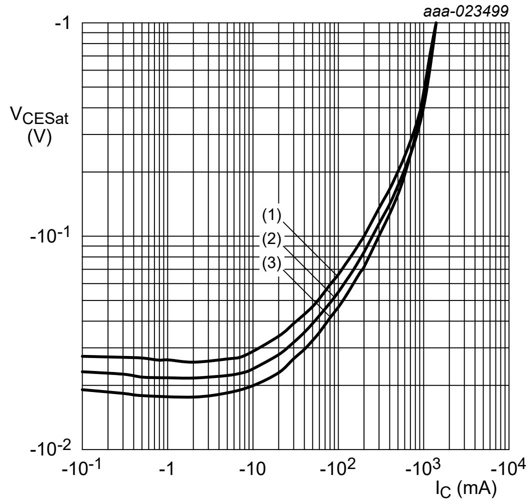
V_{CE} = -2 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C

Fig. 11. Base-emitter voltage as a function of collector current; typical values



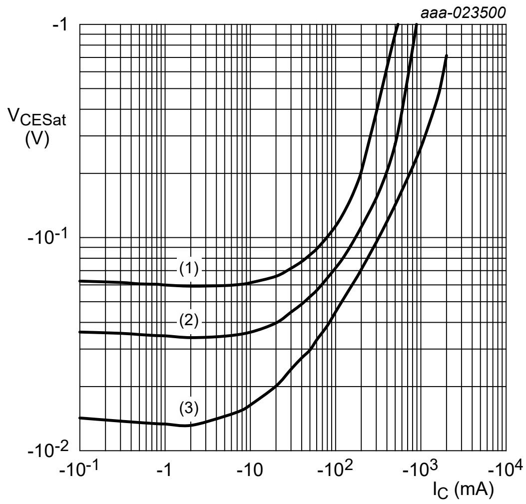
$I_C/I_B = 10$
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 100 °C

Fig. 12. Base-emitter saturation voltage as a function of collector current; typical values



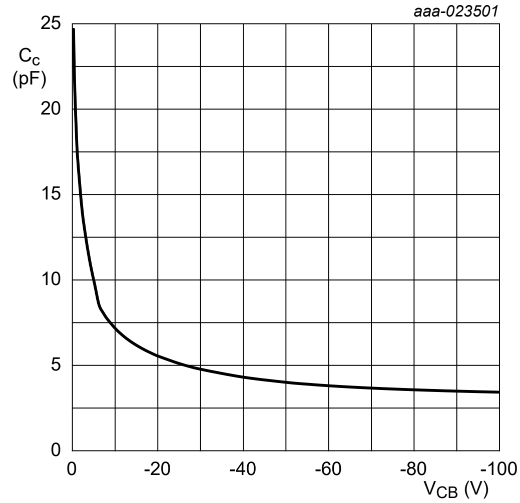
$I_C/I_B = 10$
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 13. Collector-emitter saturation voltage as a function of collector current; typical values



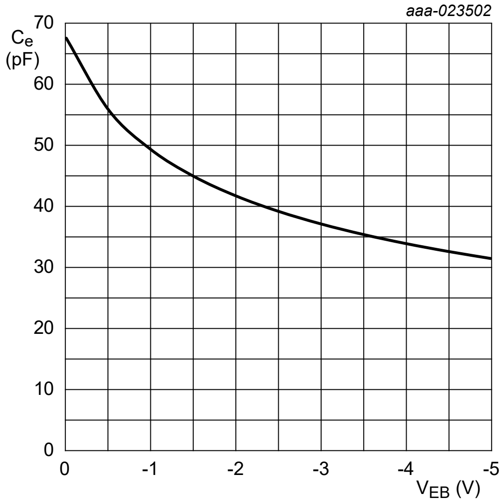
T_{amb} = 25 °C
(1) $I_C/I_B = 50$
(2) $I_C/I_B = 20$
(3) $I_C/I_B = 5$

Fig. 14. Collector-emitter saturation voltage as a function of collector current; typical values



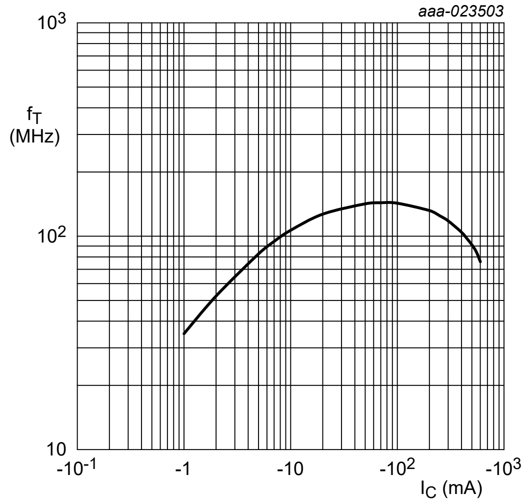
f = 1 MHz; T_{amb} = 25 °C

Fig. 15. Collector capacitance as a function of collector-base voltage; typical values



f = 1 MHz; T_{amb} = 25 °C

Fig. 16. Emitter capacitance as a function of emitter-base voltage; typical values



V_{CE} = -5 V
f = 100 MHz; T_{amb} = 25 °C

Fig. 17. Transition frequency as a function of collector current; typical values

11. Test information

11.1. 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

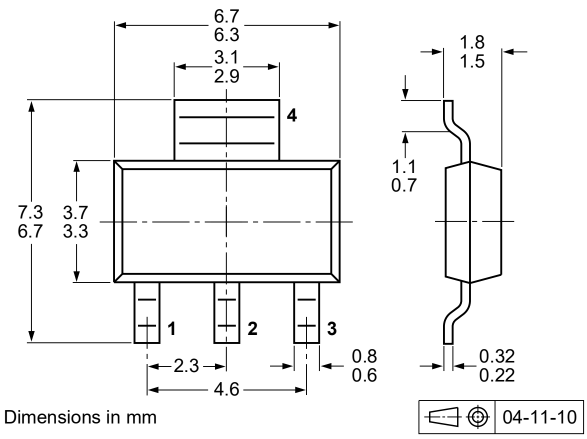
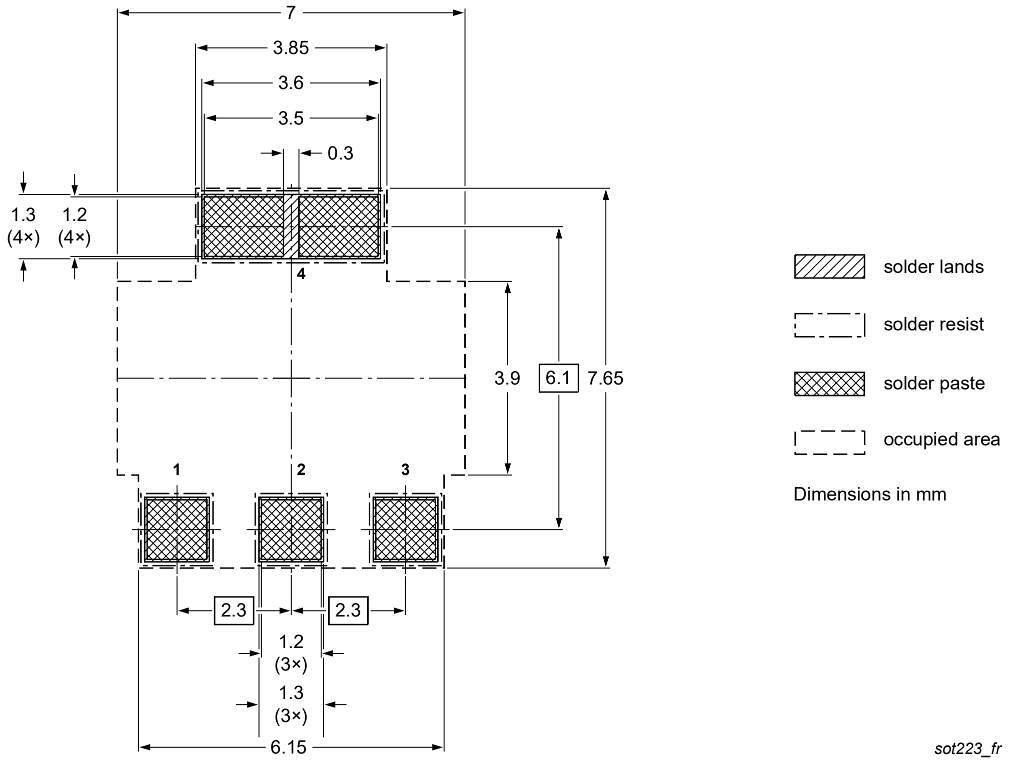


Fig. 18. Package outline SOT223 (SC-73)

13. Soldering



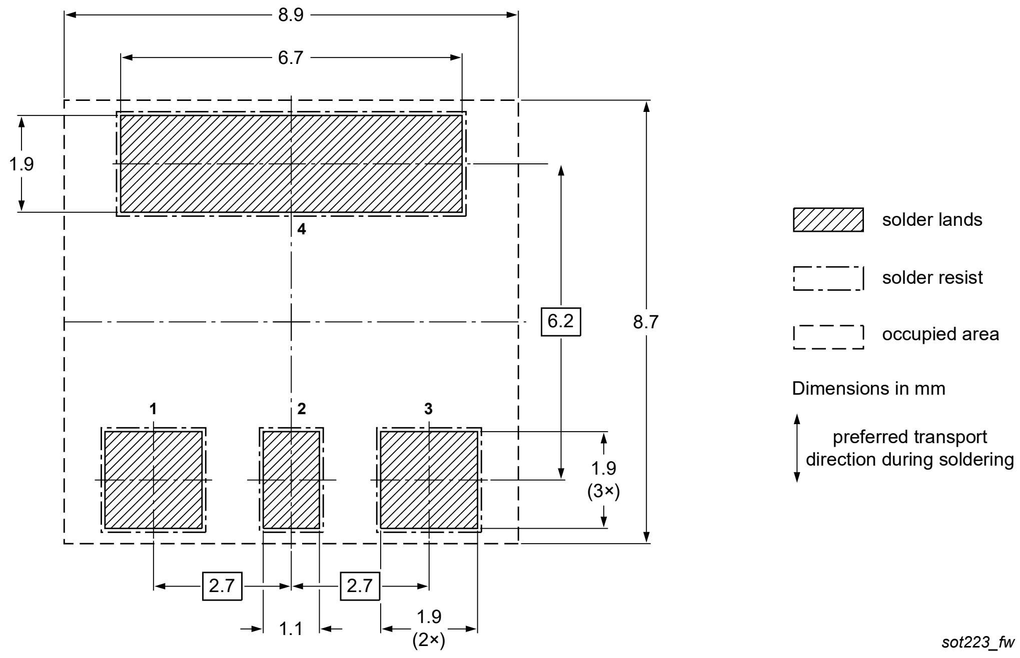


Fig. 19. Wave soldering footprint for SOT223 (SC-73)

14. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BCP52T-Q_SER v.1	20251114	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.

[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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