PBSS4140U

40V Low VCEsat NPN Transistor

4 August 2025 Product data sheet

1. General description

NPN low V_{CEsat} transistor in a SOT323 Surface-Mounted Device (SMD) plastic package.

PNP complement: PBSS5140U

2. Features and benefits

- Low collector-emitter saturation voltage
- High current capabilities
- Improved device reliability due to reduced heat generation
- Enhanced performance over SOT231A general purpose packaged transistors
- AEC-Q101 qualified

3. Applications

- General purpose switching and muting
- LCD backlighting
- Supply line switching circuits
- Battery driven equipment (mobile phones, video cameras and hand-held devices)

4. Quick reference data

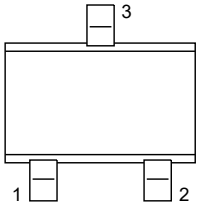
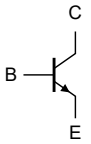
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	40	V
I_C	collector current			-	-	1	A
R_{CEsat}	collector-emitter saturation resistance	I_C = 500 mA; I_B = 50 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	260	500	mΩ

nexperia

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. Marking

Table 3. Marking codes

Type number	Marking code[1]
PBSS4140U	41%

[1] % = placeholder for manufacturing site code

7. Limiting values

Table 4. 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		-	40	V
V_{CEO}	collector-emitter voltage	open base		-	40	V
V_{EBO}	emitter-base voltage	open collector		-	5	V
I_C	collector current			-	1	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	2	A
I_{BM}	peak base current			-	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	mW
			[2]	-	350	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 copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm^2.

8. Thermal characteristics

Table 5. Thermal characteristics

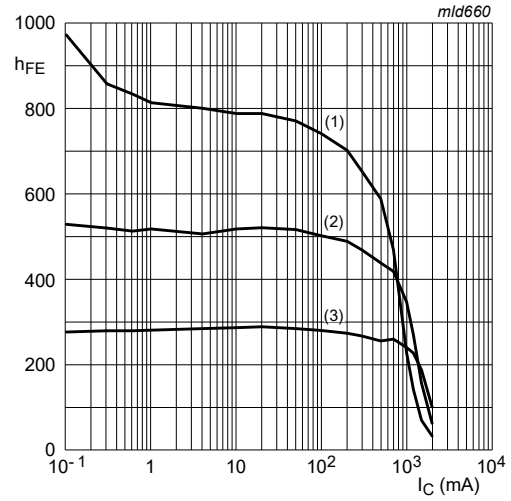
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W
			[2]	-	-	357	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm^2.

9. Characteristics

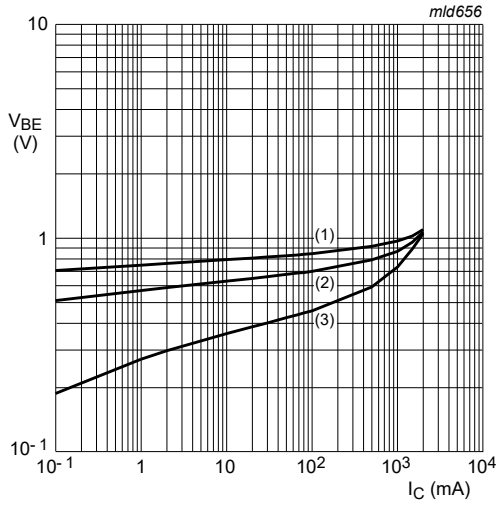
Table 6. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = 40 V; I_E = 0 A; T_{amb} = 25 °C		-	-	100	nA
		V_{CB} = 40 V; I_E = 0 A; T_j = 150 °C		-	-	50	µA
I_{CEO}	collector-emitter cut-off current (base open)	I_B = 0 A; V_{CE} = 30 V; T_{amb} = 25 °C		-	-	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 1 mA; T_{amb} = 25 °C		300	-	-	
		V_{CE} = 5 V; I_C = 500 mA; T_{amb} = 25 °C		300	-	900	
		V_{CE} = 5 V; I_C = 1 A; T_{amb} = 25 °C		200	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 100 mA; I_B = 1 mA; T_{amb} = 25 °C		-	-	200	mV
		I_C = 500 mA; I_B = 50 mA; T_{amb} = 25 °C		-	-	250	mV
		I_C = 1 A; I_B = 100 mA; T_{amb} = 25 °C		-	-	500	mV
R_{CEsat}	collector-emitter saturation resistance	I_C = 500 mA; I_B = 50 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	260	500	mΩ
				-	-	500	Ω
V_{BEsat}	base-emitter saturation voltage	I_C = 1 A; I_B = 100 mA; T_{amb} = 25 °C		-	-	1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = 5 V; I_C = 1 A; T_{amb} = 25 °C		-	-	1.1	V
f_T	transition frequency	V_{CE} = 10 V; I_C = 50 mA; f = 100 MHz; T_{amb} = 25 °C		150	-	-	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	10	pF



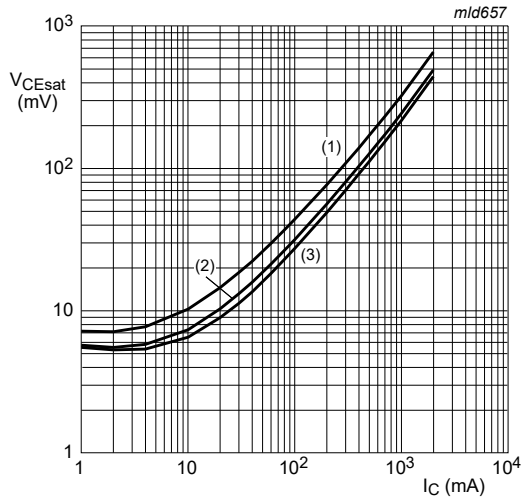
V_{CE} = 5 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

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



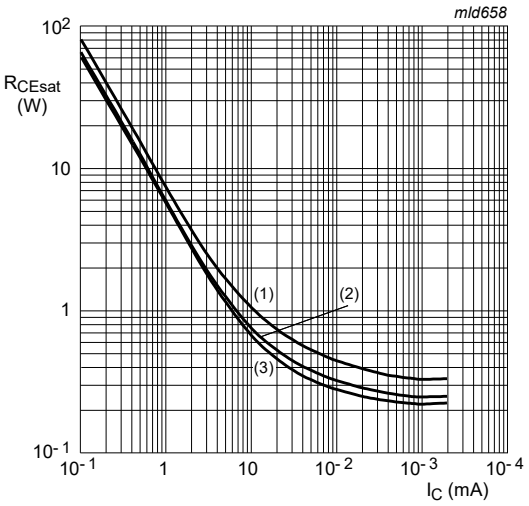
V_{CE} = 5 V
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

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



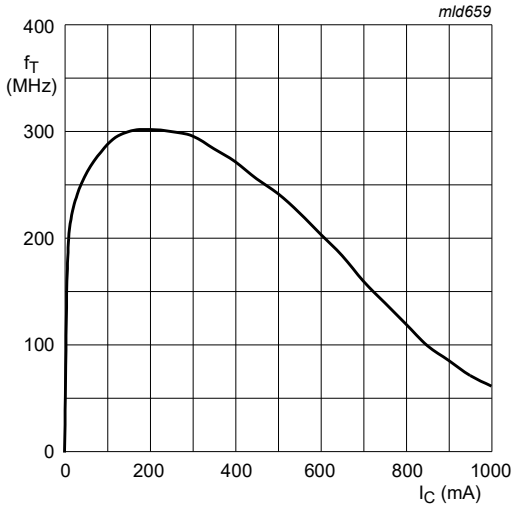
I_C/I_B = 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 3. Collector-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. Equivalent on-resistance as a function of collector current; typical values



V_{CE} = 10 V

Fig. 5. Transition frequency as a function of collector current; typical values

10. Package outline

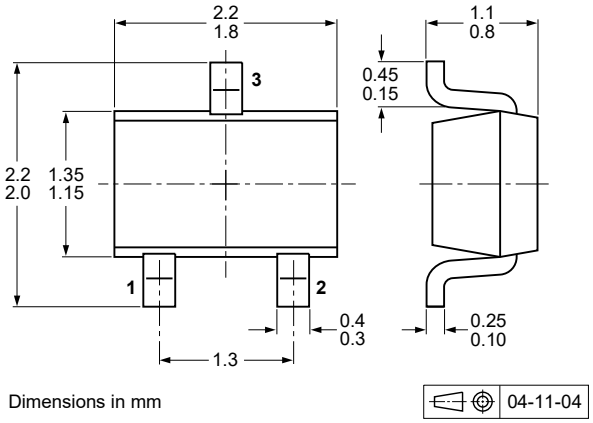


Fig. 6. Package outline SC-70 (SOT323)

11. Soldering

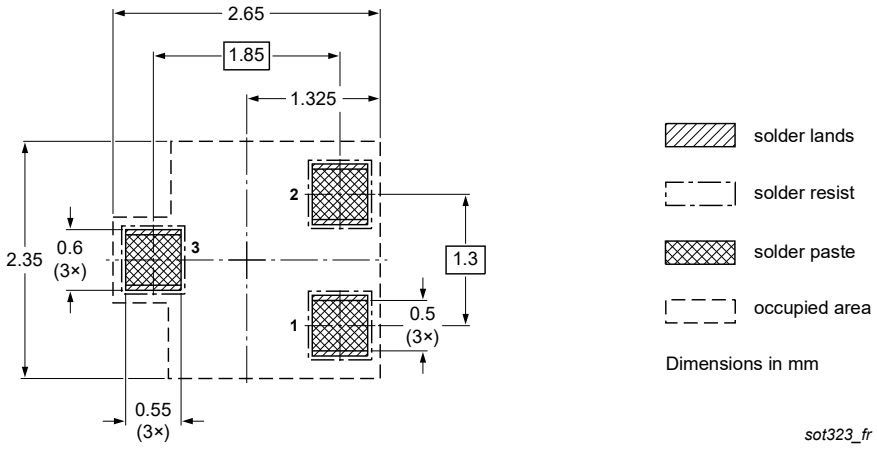


Fig. 7. Reflow soldering footprint for SC-70 (SOT323)

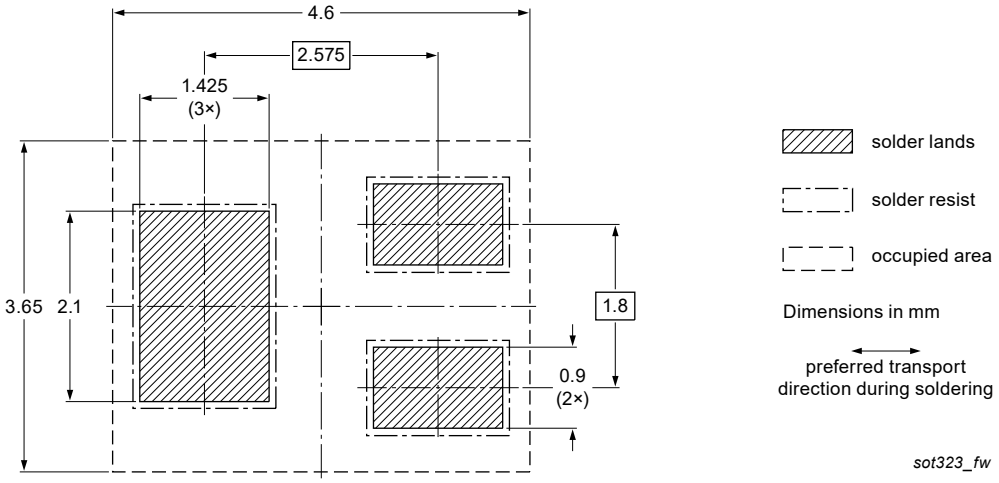


Fig. 8. Wave soldering footprint for SC-70 (SOT323)

12. Revision history

Table 7. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS4140U v.2	20250804	Product data sheet	-	PBSS4140U v.1
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.			
PBSS4140U v.1	20030929	Product data sheet	-	-

13. 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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