BC848W

30 V, 100 mA NPN general-purpose transistor

6 May 2025 Product data sheet

1. General description

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

PNP complement: BC858W

2. Features and benefits

- General-purpose transistor
- SMD plastic package
- AEC-Q101 qualified

3. Applications

- General-purpose switching and amplification

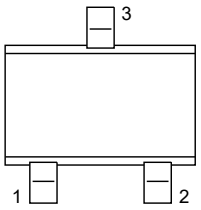
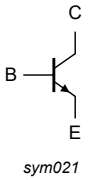
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	30	V
I_C	collector current			-	-	100	mA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 2 mA; T_{amb} = 25 °C		110	-	800	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SC-70 (SOT323)	 sym021
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BC848W	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]
BC848W	1M%

[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		-	30	V
V_{CEO}	collector-emitter voltage	open base		-	30	V
V_{EBO}	emitter-base voltage	open collector		-	5	V
I_C	collector current			-	100	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	200	mA
I_{BM}	peak base current			-	200	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 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		[1]	-	-	625	K/W

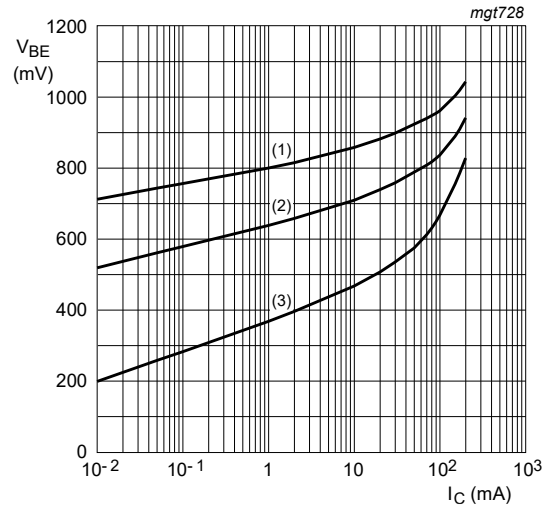
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

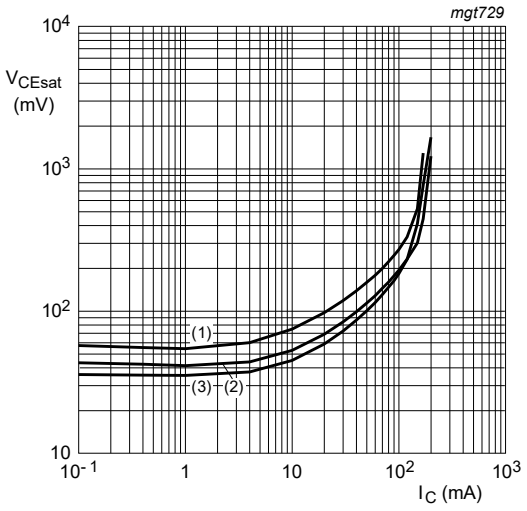
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0 A; T_{amb} = 25 °C		-	-	15	nA
		V_{CB} = 30 V; I_E = 0 A; T_j = 150 °C		-	-	5	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 µA; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 2 mA; T_{amb} = 25 °C		110	-	800	
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA; T_{amb} = 25 °C		-	90	250	mV
		I_C = 100 mA; I_B = 5 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	200	600	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA; T_{amb} = 25 °C	[1]	-	700	-	mV
		I_C = 100 mA; I_B = 5 mA; T_{amb} = 25 °C	[1]	-	900	-	mV
V_{BE}	base-emitter voltage	V_{CE} = 5 V; I_C = 2 mA; T_{amb} = 25 °C	[2]	580	660	700	mV
		V_{CE} = 5 V; I_C = 10 mA; T_{amb} = 25 °C	[2]	-	-	770	mV
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	2.5	3	pF
f_T	transition frequency	V_{CE} = 5 V; I_C = 10 mA; f = 100 MHz; T_{amb} = 25 °C		100	-	-	MHz
NF	noise figure	V_{CE} = 5 V; I_C = 200 µA; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz; T_{amb} = 25 °C		-	2	10	dB

[1] V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.
[2] V_{BE} decreases by about 2 mV/K with increasing temperature.



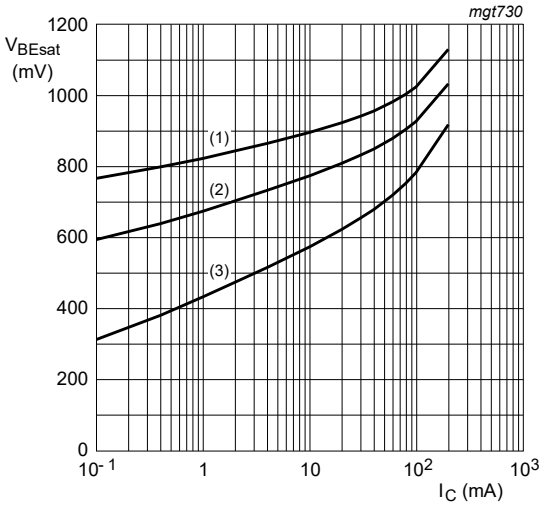
V_{CE} = 5 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 1. Base-emitter voltage as a function of collector current; typical values



I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 2. Collector-emitter saturation 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} = 150 °C

Fig. 3. Base-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

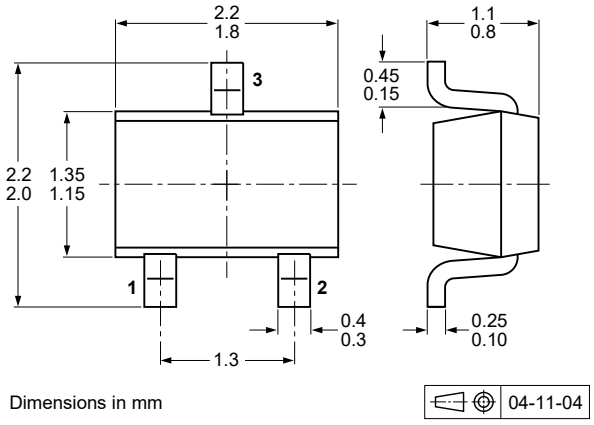


Fig. 4. Package outline SC-70 (SOT323)

13. Soldering

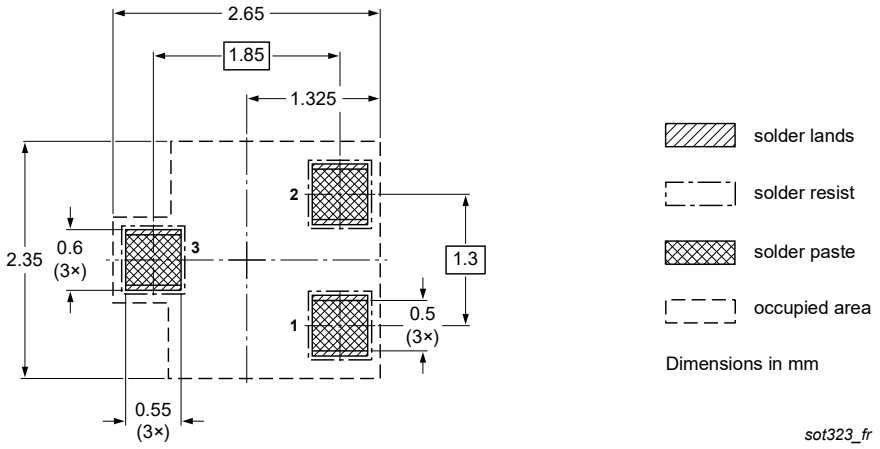


Fig. 5. Reflow soldering footprint for SC-70 (SOT323)

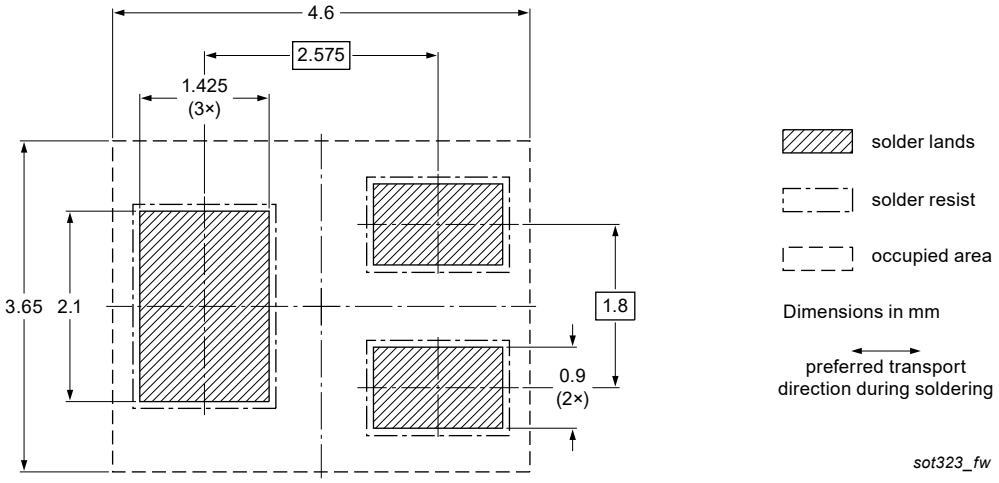
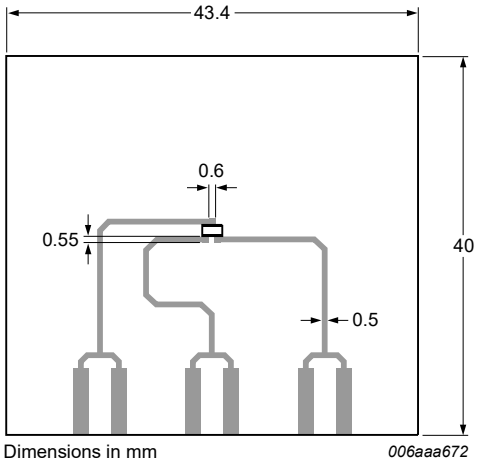


Fig. 6. Wave soldering footprint for SC-70 (SOT323)

14. Mounting



PCB thickness = 1.6 mm

Fig. 7. FR4 PCB, standard footprint SOT323 (SC-70)

15. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BC848W v.8	20250506	Product data sheet	-	BC848_SER_7
Modifications:	• Family data sheet split to single type data sheets • Section "Packing information" removed • Characteristics at conditions for I_{EBO}: typo corrected • Characteristics: h_{FE} value at I_C = 10 µA and Fig. 1 removed			
BC848_SER_7	20091117	Product data sheet	-	BC848_SER_6
BC848_SER_6	20060203	Product data sheet	-	BC846_BC847_BC848_5 BC846W_BC84BC848W_4
BC846_BC847_BC848_5	20040206	Product specification	-	BC846W_BC847W_BC848W_4
BC846W_BC847W_BC848W_4	20020204	Product specification	-	BC846W_847W_3

16. 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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