BC857xMB series

45 V, 100 mA PNP general-purpose transistors

Rev. 1 — 21 February 2012 Product data sheet

1. Product profile

1.1 General description

PNP general-purpose transistors in a leadless ultra small SOT883B Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

Type number	Package			NPN complement
	Nexperia	JEITA	JEDEC	
BC857AMB	SOT883B	-	-	BC847AMB
BC857BMB	SOT883B	-	-	BC847BMB
BC857CMB	SOT883B	-	-	BC847CMB

1.2 Features and benefits

- Leadless ultra small SMD plastic package
- Low package height of 0.37 mm
- Power dissipation comparable to SOT23
- AEC-Q101 qualified

1.3 Applications

- General-purpose switching and amplification
- Mobile applications

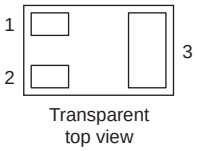
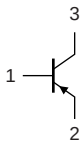
1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	–45	V
I_C	collector current		-	-	–100	mA
h_{FE}	DC current gain	V_{CE} = –5 V; I_C = –2 mA				
	BC857AMB		125	-	250	
	BC857BMB		220	-	475	
	BC857CMB		420	-	800	

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	base		
2	emitter		
3	collector		

sym013

3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
BC857xMB series	-	leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.37 mm	SOT883B

4. Marking

Table 5. Marking codes

Type number	Marking code[1]
BC857AMB	0100 0100
BC857BMB	0100 0101
BC857CMB	0100 0110

[1] For SOT883B binary marking code description, see Figure 1.

4.1 Binary marking code description

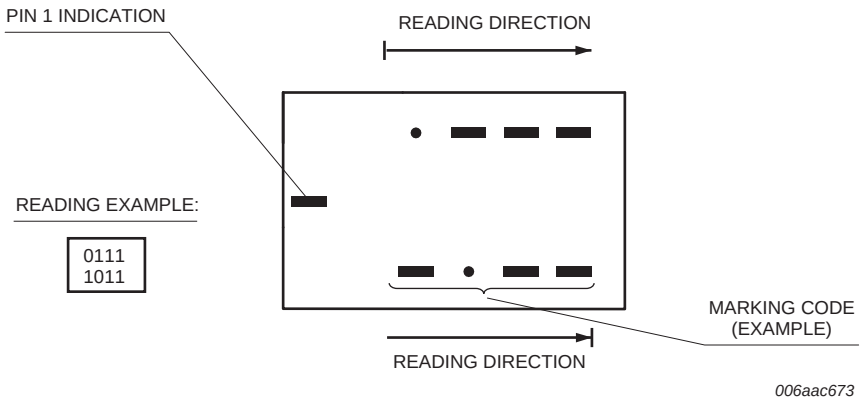


Fig 1. SOT883B binary marking code description

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5. Limiting values

Table 6. 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		-	–50	V
V_{CEO}	collector-emitter voltage	open base		-	–45	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	single pulse; $t_p \leq 1$ ms		-	–100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1][2]	-	250	mW
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] Reflow soldering is the only recommended soldering method.

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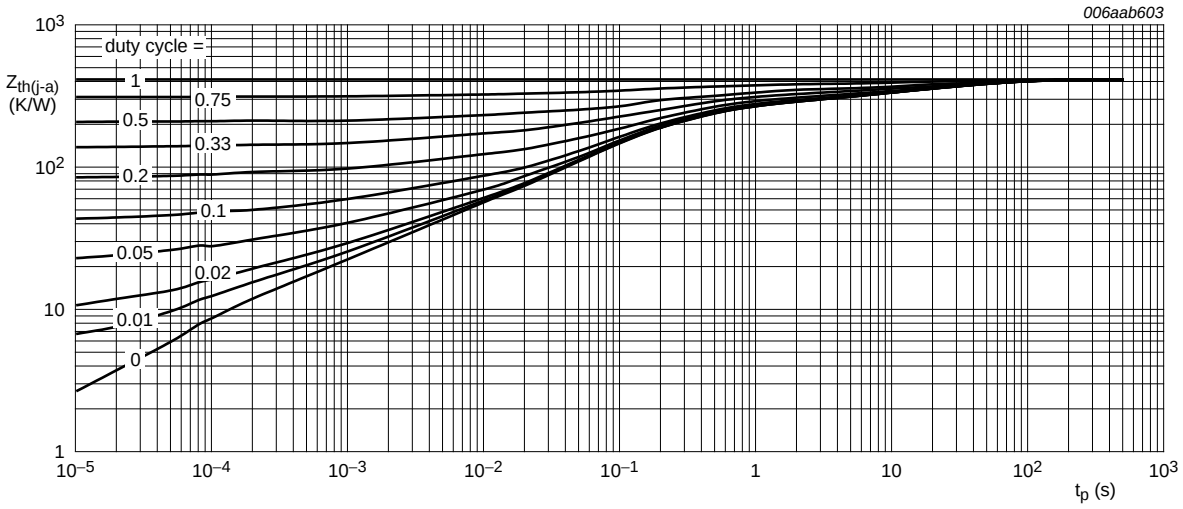
6. Thermal characteristics

Table 7. Thermal characteristics

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

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

[2] Reflow soldering is the only recommended soldering method.



FR4 PCB, standard footprint

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

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7. Characteristics

Table 8. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = –30 V; I_E = 0 A		-	-	–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 A		-	-	–100	nA
h_{FE}	DC current gain	V_{CE} = –5 V; I_C = –2 mA					
	BC857AMB			125	-	250	
	BC857BMB			220	-	475	
	BC857CMB			420	-	800	
V_{CEsat}	collector-emitter saturation voltage	I_C = –10 mA; I_B = –0.5 mA		-	-	–200	mV
		I_C = –100 mA; I_B = –5 mA	[1]	-	-	–400	mV
V_{BE}	base-emitter voltage	I_C = –2 mA; V_{CE} = –5 V		–600	-	–750	mV
		I_C = –10 mA; V_{CE} = –5 V		-	-	–820	mV
f_T	transition frequency	V_{CE} = –5 V; I_C = –10 mA; f = 100 MHz		100	-	-	MHz
C_c	collector capacitance	V_{CB} = –10 V; I_E = i_e = 0 A; f = 1 MHz		-	-	2.5	pF
NF	noise figure	I_C = –200 μA; V_{CE} = –5 V; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz		-	-	10	dB

[1] Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.

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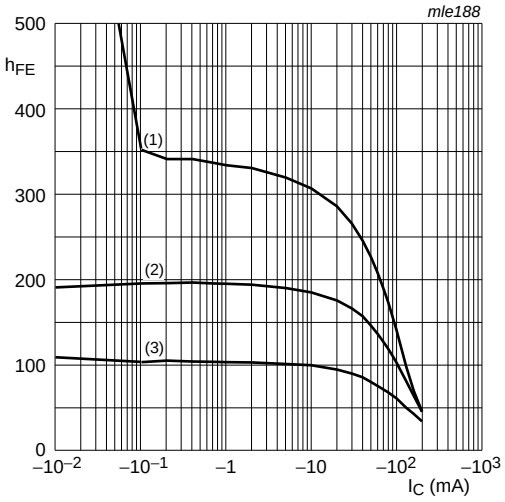


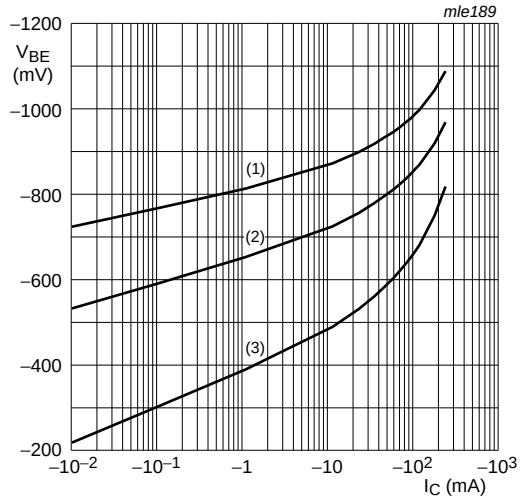
V_{CE} = −5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 3. BC857AMB: DC current gain as a function of collector current; typical values



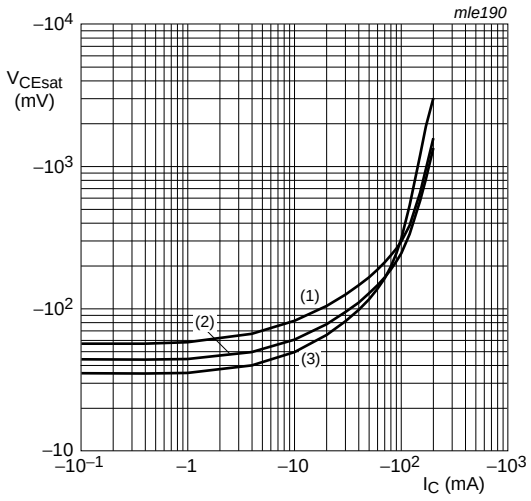
V_{CE} = −5 V

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 4. BC857AMB: Base-emitter voltage as a function of collector current; typical values



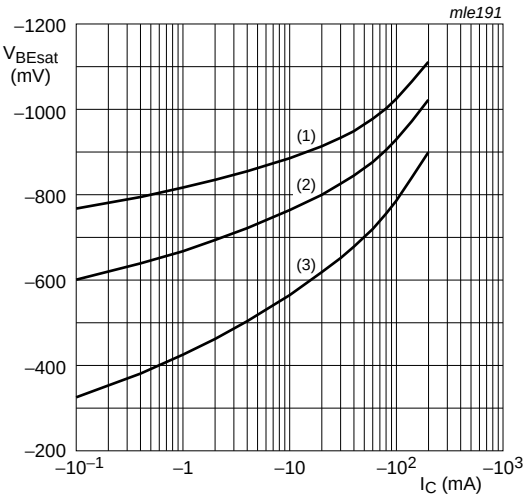
I_C/I_B = 20

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 5. BC857AMB: Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 6. BC857AMB: Base-emitter saturation voltage as a function of collector current; typical values

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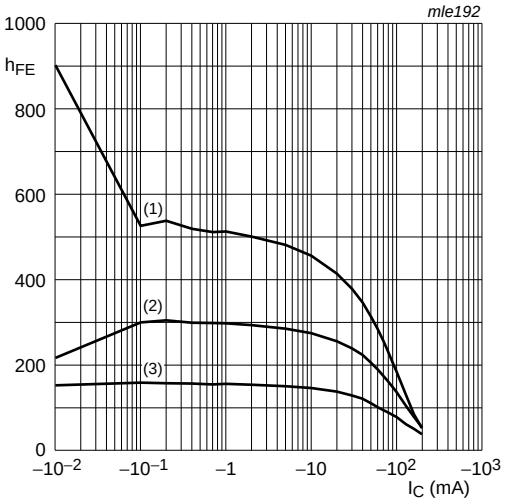


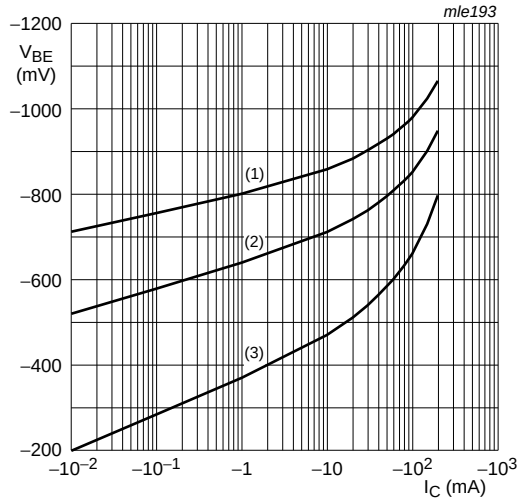
V_{CE} = −5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 7. BC857BMB: DC current gain as a function of collector current; typical values



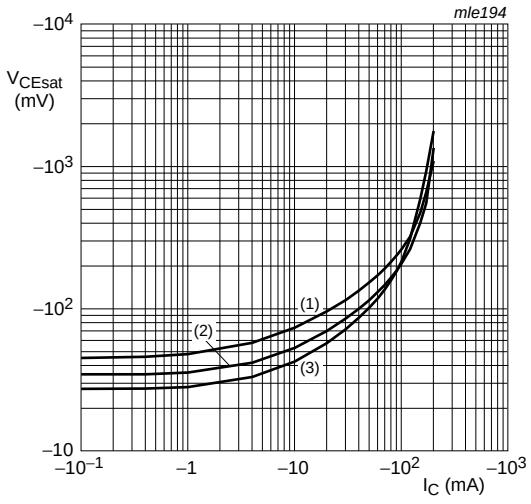
V_{CE} = −5 V

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 8. BC857BMB: Base-emitter voltage as a function of collector current; typical values



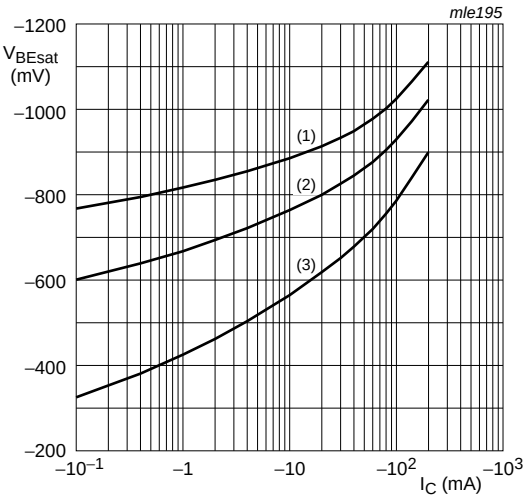
I_C/I_B = 20

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 9. BC857BMB: Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 10. BC857BMB: Base-emitter saturation voltage as a function of collector current; typical values

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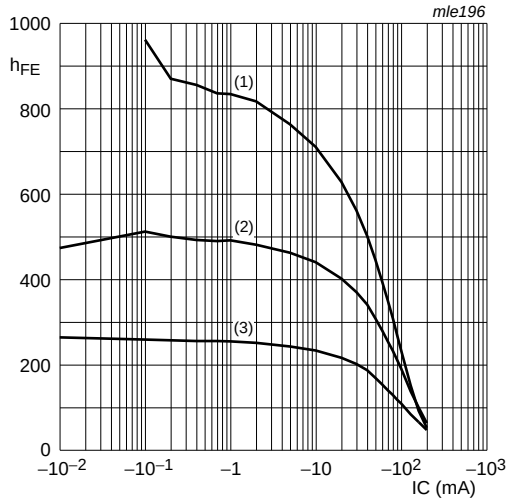


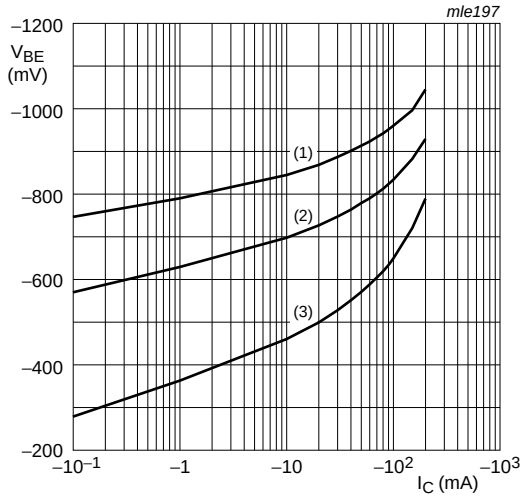
V_{CE} = −5 V

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 11. BC857CMB: DC current gain as a function of collector current; typical values



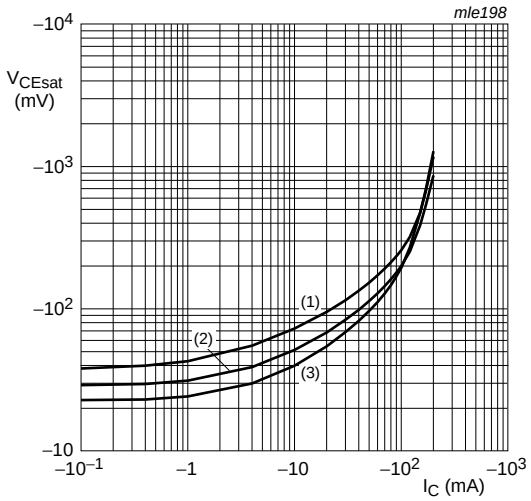
V_{CE} = −5 V

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 12. BC857CMB: Base-emitter voltage as a function of collector current; typical values



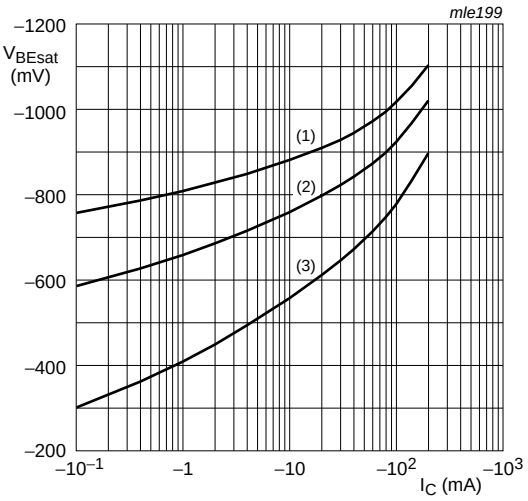
I_C/I_B = 20

(1) T_{amb} = 150 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = −55 °C

Fig 13. BC857CMB: Collector-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20

(1) T_{amb} = −55 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = 150 °C

Fig 14. BC857CMB: Base-emitter saturation voltage as a function of collector current; typical values

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8. Test information

8.1 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.

9. Package outline

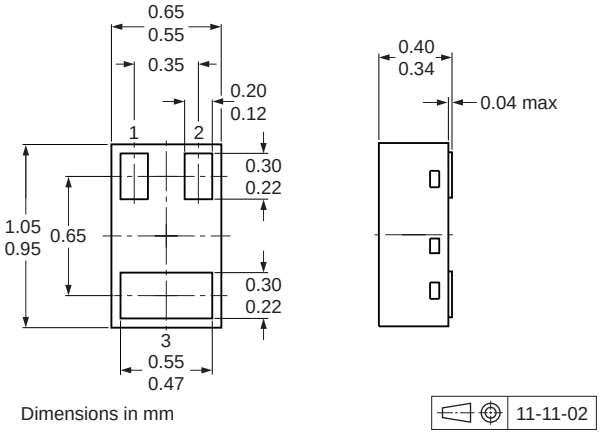

Fig 15. Package outline SOT883B

10. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity
			10000
BC857xMB series	SOT883B	2 mm pitch, 8 mm tape and reel	-315

[1] For further information and the availability of packing methods, see Section 14.

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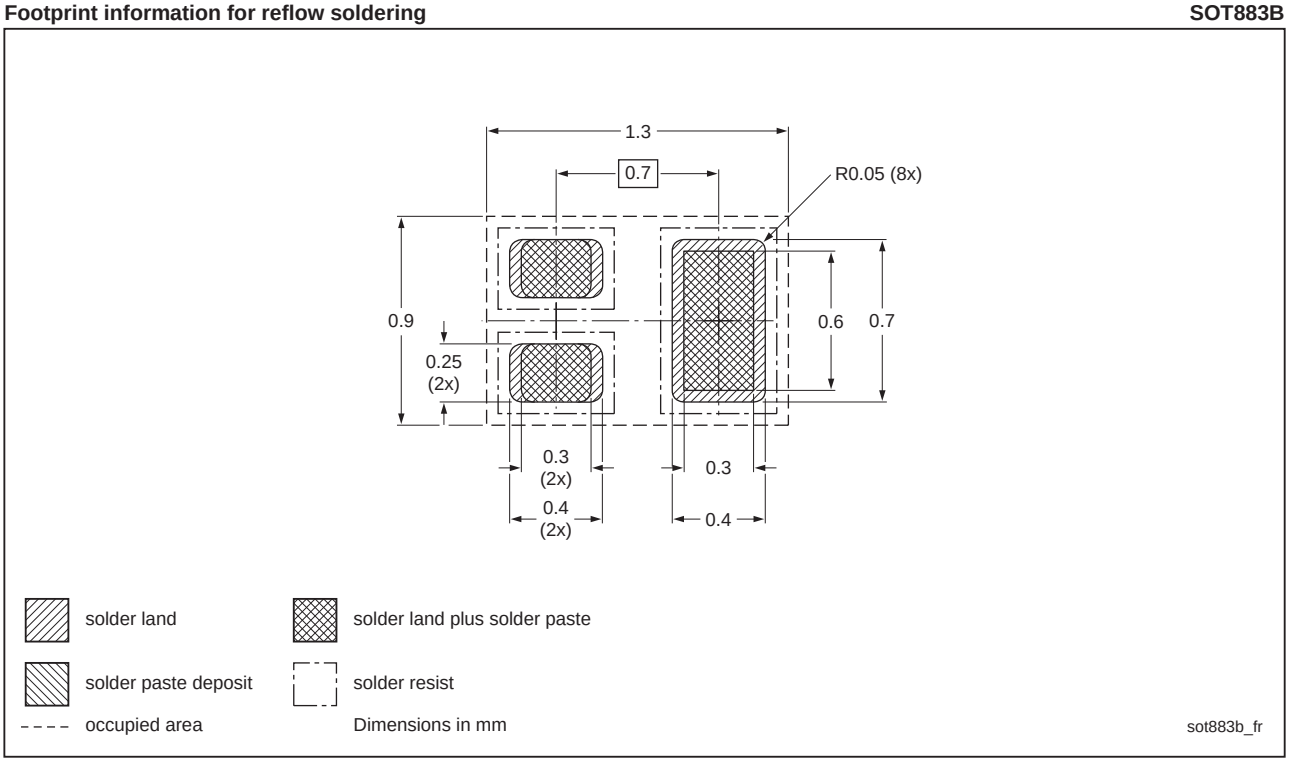
11. Soldering

Footprint information for reflow soldering **SOT883B**



Reflow soldering is the only recommended soldering method.

Fig 16. Reflow soldering footprint SOT883B

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12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BC857XMB_SER v.1	20120221	Product data sheet	-	-

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13. Legal information

13.1 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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