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
	NXP	**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
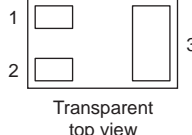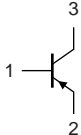
1.4 Quick reference data

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	Transparent top view	
3	collector		sym013

3. Ordering information

Table 4.   Ordering information

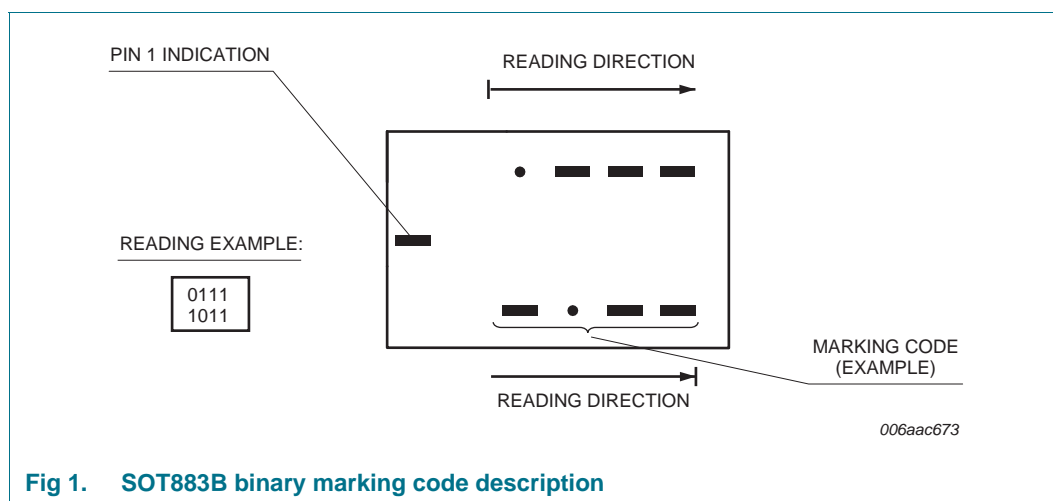| Type number	Package			Version
	Name	Description		
BC857xMB series	-	leadless ultra small plastic package; 3 solder lands; body $1.0 \times 0.6 \times 0.37$ mm		SOT883B

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

PIN 1 INDICATION

READING DIRECTION

READING EXAMPLE:

0111
1011

MARKING CODE
(EXAMPLE)

READING DIRECTION

006aac673

Fig 1.   SOT883B binary marking code description

BC857XMB_SER

Product data sheet

Rev. 1 — 21 February 2012

2 of 14

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.

BC857XMB_SER

Product data sheet   Rev. 1 — 21 February 2012   3 of 14

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.

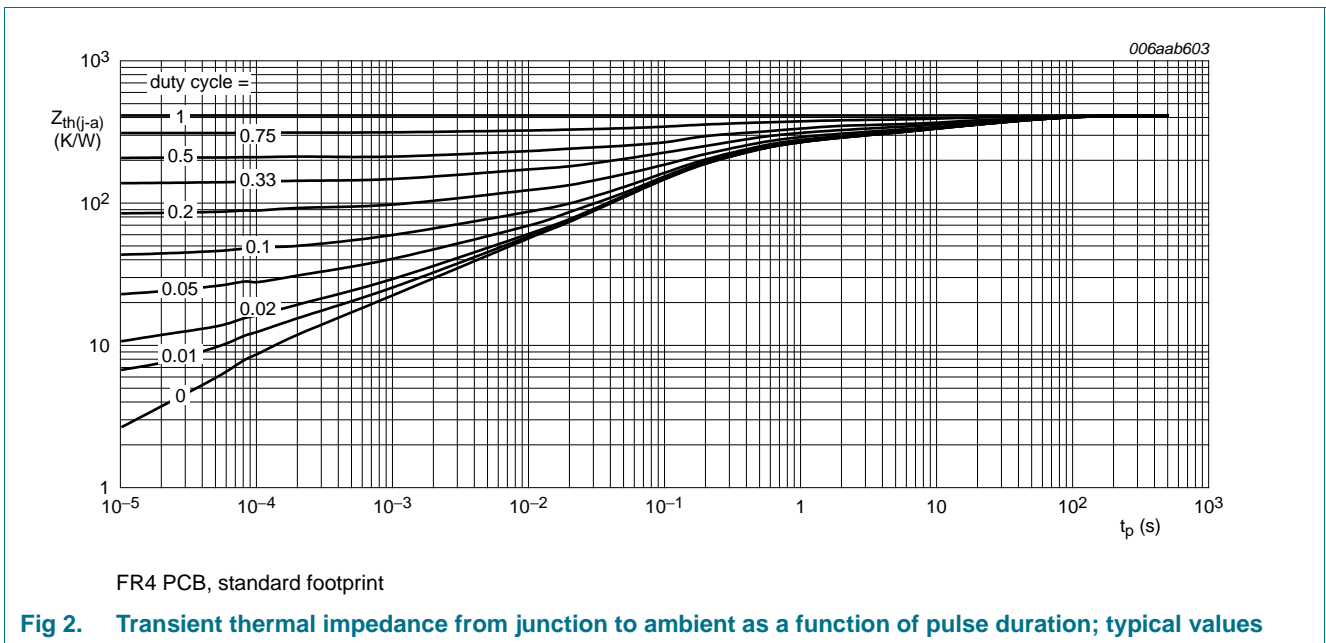[2]   Reflow soldering is the only recommended soldering method.

FR4 PCB, standard footprint

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

BC857XMB_SER

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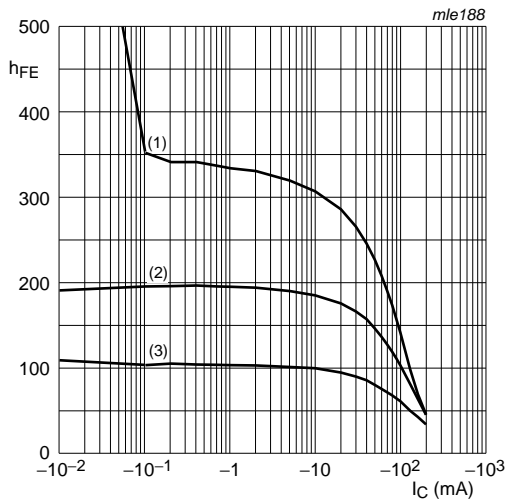**Product data sheet**

Rev. 1 — 21 February 2012

4 of 14

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; $\delta \leq 0.02$.

BC857XMB_SER

Product data sheet   **Rev. 1 — 21 February 2012**   **5 of 14**

$V_{CE} = -5$ 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**
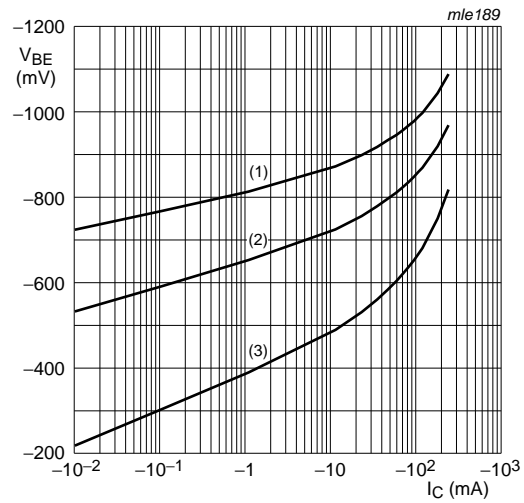
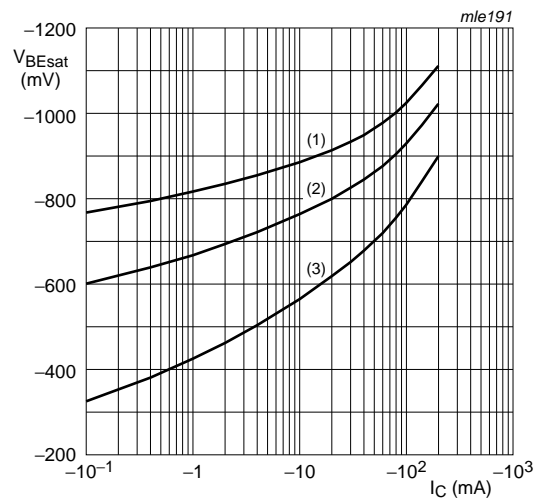$V_{CE} = -5$ V

(1) $T_{amb} = -55$ °C

(2) $T_{amb} = 25$ °C

(3) $T_{amb} = 150$ °C

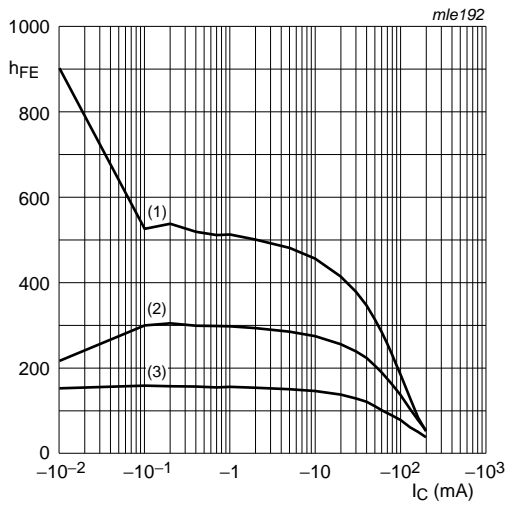**Fig 4.** **BC857AMB: Base-emitter voltage as a function of collector current; typical values**
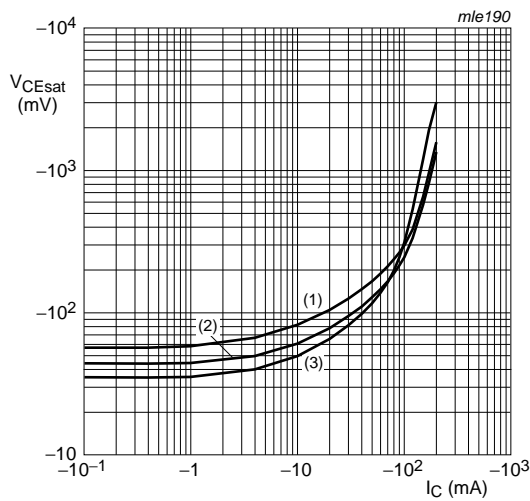
$I_C/I_B = 20$

(1) $T_{amb} = 150$ °C

(2) $T_{amb} = 25$ °C

(3) $T_{amb} = -55$ °C

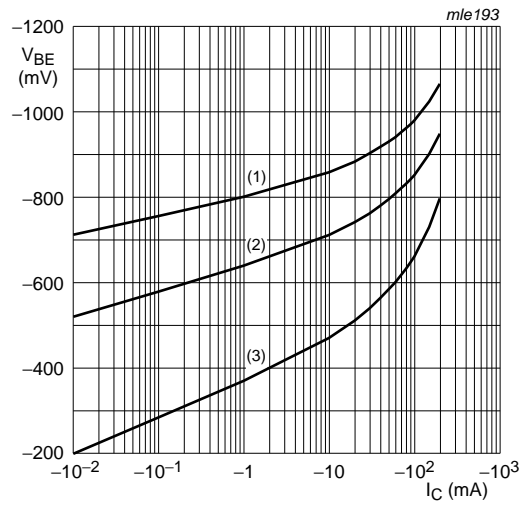**Fig 5.** **BC857AMB: Collector-emitter saturation voltage as a function of collector current; typical values**

$I_C/I_B = 20$

(1) $T_{amb} = -55$ °C

(2) $T_{amb} = 25$ °C

(3) $T_{amb} = 150$ °C

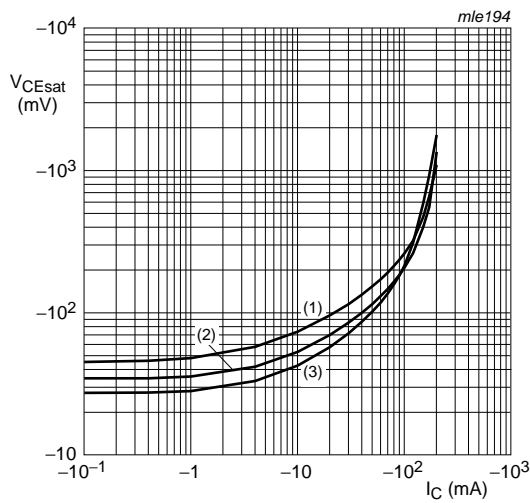**Fig 6.** **BC857AMB: Base-emitter saturation voltage as a function of collector current; typical values**

BC857XMB_SER

Product data sheet   **Rev. 1 — 21 February 2012**   6 of 14

$V_{CE} = -5$ 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**
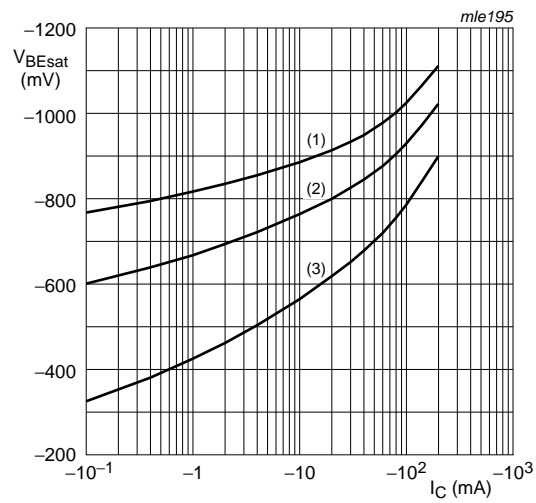
$I_C/I_B = 20$

(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**

BC857XMB_SER

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Product data sheet

Rev. 1 — 21 February 2012

7 of 14
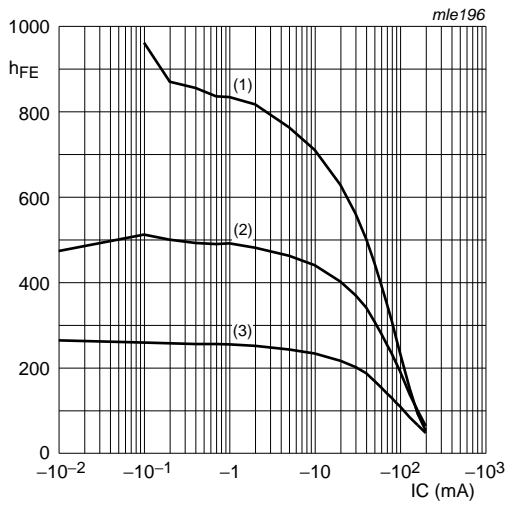
$V_{CE} = -5$ V

(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

$I_C/I_B = 20$
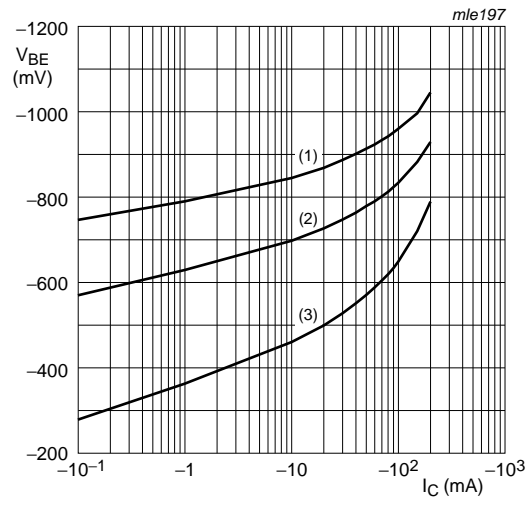
(1) $T_{amb} = -55$ °C

(2) $T_{amb} = 25$ °C

(3) $T_{amb} = 150$ °C

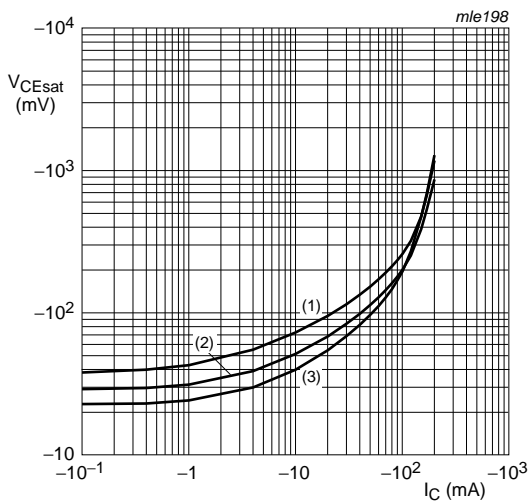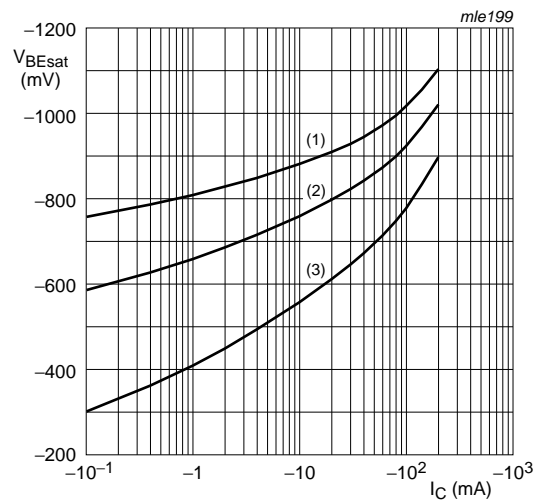**Fig 14.   BC857CMB: Base-emitter saturation voltage as a function of collector current; typical values**

BC857XMB_SER

Product data sheet

Rev. 1 — 21 February 2012

8 of 14

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

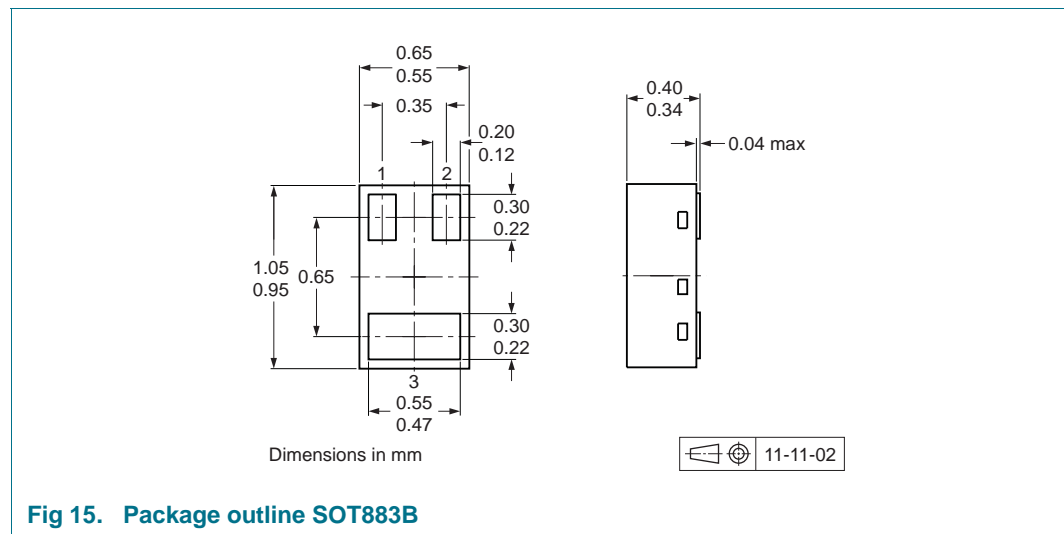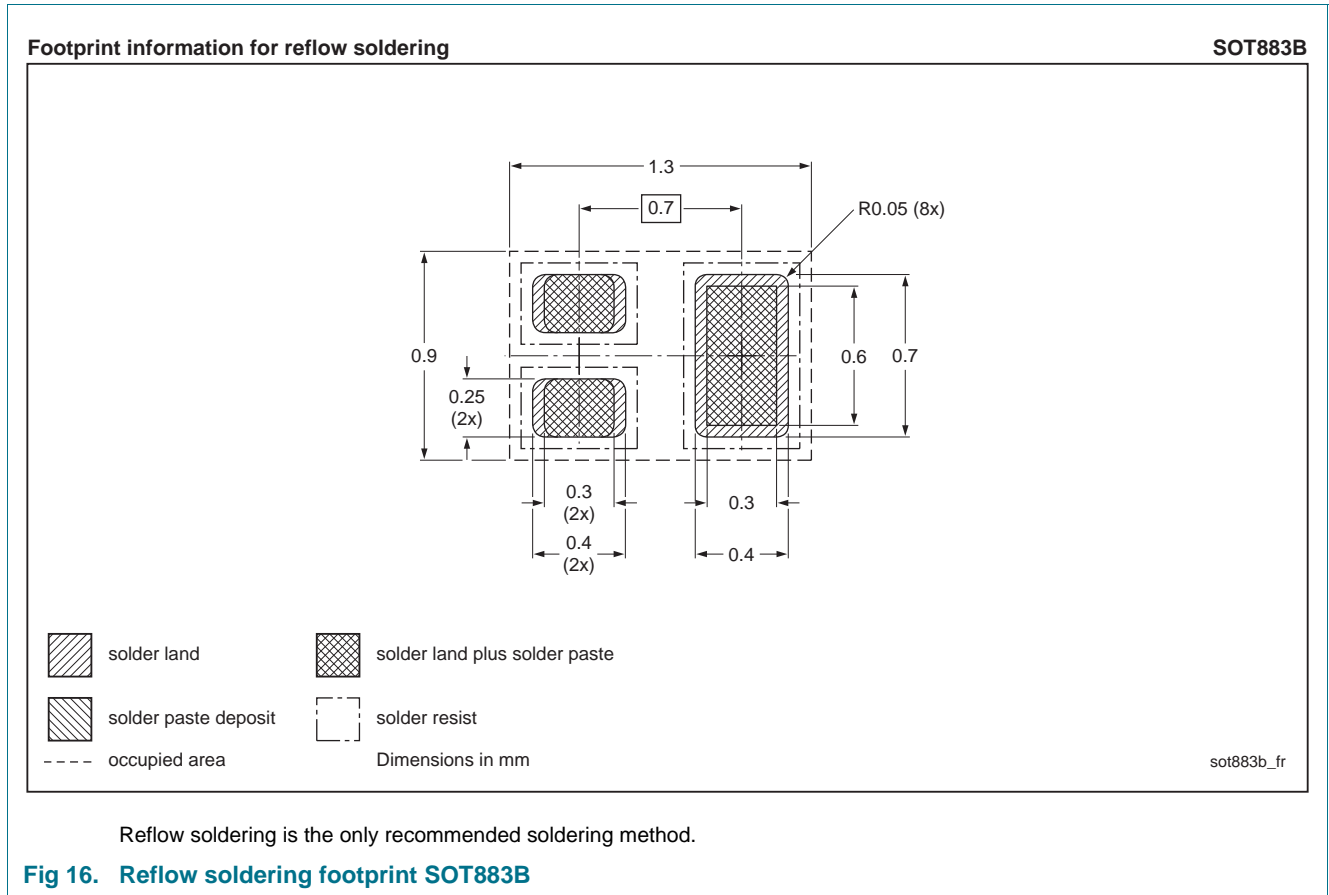## 10. Packing information

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.

11. Soldering

Footprint information for reflow soldering   SOT883B

1.3
0.7
R0.05 (8x)
0.9
0.25 (2x)
0.6   0.7
0.3 (2x)
0.3
0.4 (2x)
0.4

solder land
solder land plus solder paste
solder paste deposit
solder resist
occupied area
Dimensions in mm

sot883b_fr

Reflow soldering is the only recommended soldering method.

Fig 16. Reflow soldering footprint SOT883B

BC857XMB_SER

Product data sheet   Rev. 1 — 21 February 2012   10 of 14

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	-	-

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".

[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 URL http://www.nxp.com.

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BC857XMB_SER

Product data sheet

Rev. 1 — 21 February 2012

12 of 14

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BC857XMB_SER

Product data sheet **Rev. 1 — 21 February 2012** 13 of 14

15. Contents

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MCIMX6SX-SDB 74ALVC125BQ,115 74HC4050N 74HC4514N MK21FN1M0AVLQ12 MKV30F128VFM10 FRDM-K66F FRDM-
KW40Z FRDM-MC-LVBLDC PESD18VF1BSFYL PMF63UNEX PSMN4R0-60YS,115 HEF4028BPN RAPPID-567XFSW
MPC565MVR56 MPC574XG-176DS MPC860PCVR66D4 BT137-600E BT139X-600.127 BUK7628-100A118 BUK765R0-100E.118
BZT52H-B9V1.115 BZV85-C3V9.113 BZX79-C47.113 P5020NSE7VNB S12ZVML12EVBLIN SCC2692AC1N40 LPC1785FBD208K
LPC2124FBD64/01 LS1020ASN7KQB LS1020AXN7HNB LS1020AXN7KQB LS1043ASE7PQA T1023RDB-PC FRDM-KW24D512