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Kind regards,

Team Nexperia



65 V, 100 mA NPN general-purpose transistor Rev. 1 — 15 May 2012

Product data sheet

Product profile

1.1 General description

NPN general-purpose transistor in a leadless ultra small DFN1006B-3 (SOT883B) Surface-Mounted Device (SMD) plastic package.

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 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	65	V
I _C	collector current		-	-	100	mA
h _{FE}	DC current gain	$V_{CE} = 5 \text{ V};$ $I_{C} = 2 \text{ mA}$	200	-	450	

Pinning information 2.

Table 2. **Pinning**

Table 2.	1 111111119		
Pin	Description	Simplified outline	Graphic symbol
1	base		
2	emitter	1 3	3
3	collector	2 🔲	1—
		Transparent	. j
		top view	2
			sym021



65 V, 100 mA NPN general-purpose transistor

3. Ordering information

Table 3. Ordering information

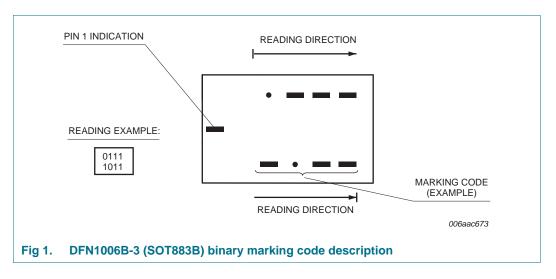
Type number	Package					
	Name	Description	Version			
BC846BMB	DFN1006B-3	leadless ultra small plastic package; 3 solder lands; body $1.0 \times 0.6 \times 0.37$ mm	SOT883B			

4. Marking

Table 4. Marking codes

Type number	Marking code
BC846BMB	0100 1011

4.1 Binary marking code description



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5. 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	-	80	V
V_{CEO}	collector-emitter voltage	open base	-	65	V
V_{EBO}	emitter-base voltage	open collector	-	6	V
I _C	collector current		-	100	mA
I _{CM}	peak collector current	single pulse; $t_p \le 1 \text{ ms}$	-	200	mA
I _{BM}	peak base current	single pulse; $t_p \le 1 \text{ ms}$	-	200	mA
P _{tot}	total power dissipation	$T_{amb} \le 25 ^{\circ}C$	[1] _	250	mW
Tj	junction temperature		-	150	°C
T _{amb}	ambient temperature		-65	+150	°C
T _{stg}	storage temperature		-65	+150	°C

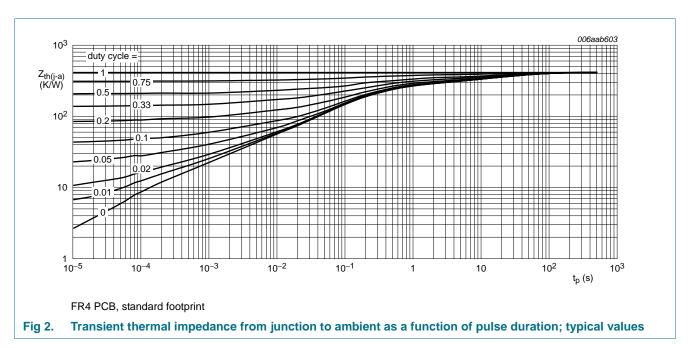
^[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

6. Thermal characteristics

Table 6. Thermal characteristics

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

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



BC846BM

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65 V, 100 mA NPN general-purpose transistor

7. Characteristics

Table 7. Characteristics

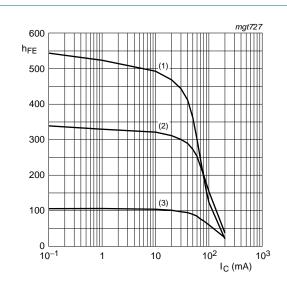
 $T_{amb} = 25$ °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
I_{CBO}	collector-base	$V_{CB} = 30 \text{ V}; I_{E} = 0 \text{ A}$		-	-	15	nΑ
cut-off current	cut-off current	$V_{CB} = 30 \text{ V; } I_E = 0 \text{ A;}$ $T_j = 150 \text{ °C}$		-	-	5	μΑ
I _{EBO}	emitter-base cut-off current	$V_{EB} = 5 \text{ V}; I_{E} = 0 \text{ A}$		-	-	100	nA
h _{FE}	DC current gain	$V_{CE} = 5 \text{ V}; I_{C} = 2 \text{ mA}$		200	-	450	
V_{CEsat}	collector-emitter	$I_C = 10 \text{ mA}; I_B = 0.5 \text{ mA}$		-	90	200	mV
	saturation voltage	$I_C = 100 \text{ mA}; I_B = 5 \text{ mA}$	[1]	-	200	400	mV
V_{BEsat}	base-emitter	$I_C = 10 \text{ mA}; I_B = 0.5 \text{ mA}$	[2]	-	760	-	mV
	saturation voltage	$I_C = 100 \text{ mA}; I_B = 5 \text{ mA}$	[2]	-	900	-	mV
V_{BE}	base-emitter voltage	$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V}$	[3]	580	660	700	mV
		$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}$	[3]	-	-	770	mV
f⊤	transition frequency	$V_{CE} = 5 \text{ V}; I_{C} = 10 \text{ mA};$ f = 100 MHz		100	-	-	MHz
C _c	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = i_e = 0 \text{ A};$ f = 1 MHz		-	2	3	pF
C _e	emitter capacitance	$V_{EB} = 0.5 \text{ V}; I_C = I_c = 0 \text{ A};$ f = 1 MHz		-	11	-	pF
NF	noise figure	$I_C = 200 \mu A; V_{CE} = 5 V;$ $R_S = 2 k\Omega; f = 1 kHz;$ B = 200 Hz		-	2	10	dB

^[1] Pulse test: $t_p \le 300~\mu s;~\delta \le 0.02.$

^[2] V_{BEsat} decreases by approximately 1.7 mV/K with increasing temperature.

^[3] V_{BE} decreases by approximately 2 mV/K with increasing temperature.



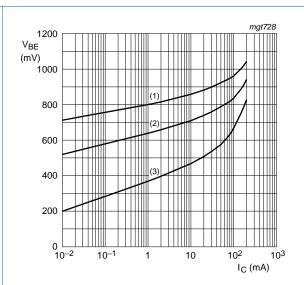
$$V_{CE} = 5 V$$

(1)
$$T_{amb} = 150 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3)
$$T_{amb} = -55 \, ^{\circ}C$$

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



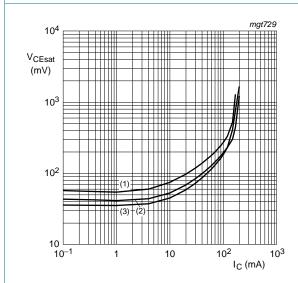
$$V_{CE} = 5 \text{ V}$$

(1)
$$T_{amb} = -55 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3)
$$T_{amb} = 150 \, ^{\circ}C$$

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



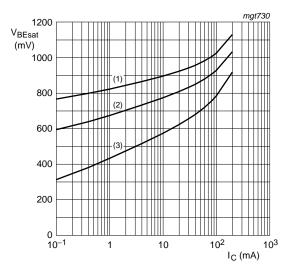
$$I_{\rm C}/I_{\rm B} = 20$$

(1)
$$T_{amb} = 150 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3)
$$T_{amb} = -55 \, ^{\circ}C$$

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



$$I_{\rm C}/I_{\rm B} = 10$$

(1)
$$T_{amb} = -55 \,^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3)
$$T_{amb} = 150 \, ^{\circ}C$$

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

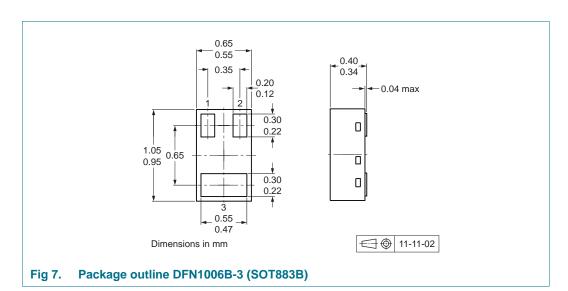
65 V, 100 mA NPN general-purpose transistor

8. Test information

9. 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.

10. Package outline



11. Packing information

Table 8. Packing methods

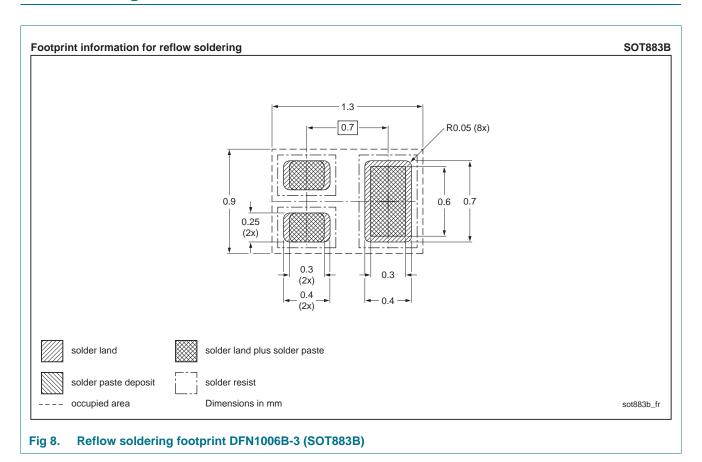
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity
			10000
BC846MBM	SOT883B	2 mm pitch, 8 mm tape and reel	-315

^[1] For further information and the availability of packing methods, see Section 15.

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12. Soldering



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13. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BC846BMB v.1	20120515	Product data sheet	-	-

65 V, 100 mA NPN general-purpose transistor

14. Legal information

14.1 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.
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BC846BMB **NXP Semiconductors**

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