



PMBT2222AMB

40 V, 600 mA NPN switching transistor

21 September 2018

Product data sheet

1. General description

NPN switching transistor in an ultra small DFN1006B-3 (SOT883B) leadless Surface-Mounted Device (SMD) plastic package.

PNP complement: PMBT2907AMB

2. Features and benefits

- High current (max. 600 mA)
- Low voltage (max. 40V)
- Leadless ultra small SMD plastic package
- Low package height of 0.37 mm
- Power dissipation comparable to SOT23

3. Applications

- Switching and linear applications
- Mobile applications

4. Quick reference data

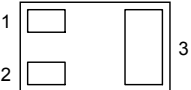
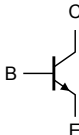
Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CE0}	collector-emitter voltage	open base	-	-	40	V
I_C	collector current		-	-	600	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms	-	-	800	mA
h_{FE}	DC current gain	$V_{CE} = 10$ V; $I_C = 150$ mA	[1]	100	-	300
		$V_{CE} = 10$ V; $I_C = 500$ mA	[1]	40	-	-

[1] Pulsed test: $t_p \leq 300$ μ s; $\delta \leq 0.02$

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 Transparent top view DFN1006B-3 (SOT883B)	 sym021
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBT2222AMB	DFN1006B-3	plastic, leadless ultra small plastic package; 3 solder lands; 0.35 mm pitch; 1.0 mm x 0.6 mm x 0.37 mm body	SOT883B

7. Marking

Table 4. Marking codes

Type number	Marking code
PMBT2222AMB	0110 0111

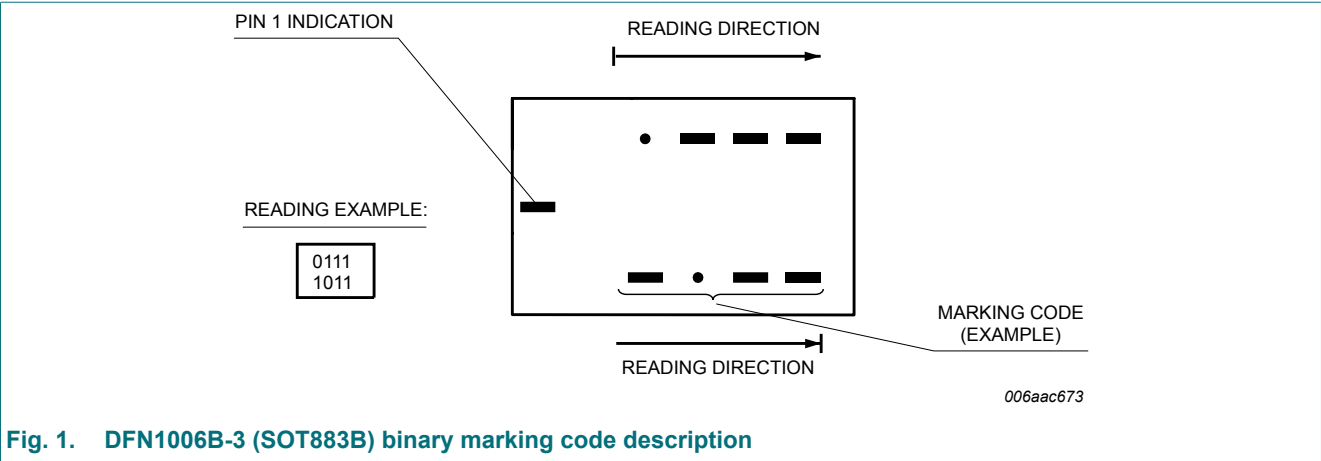


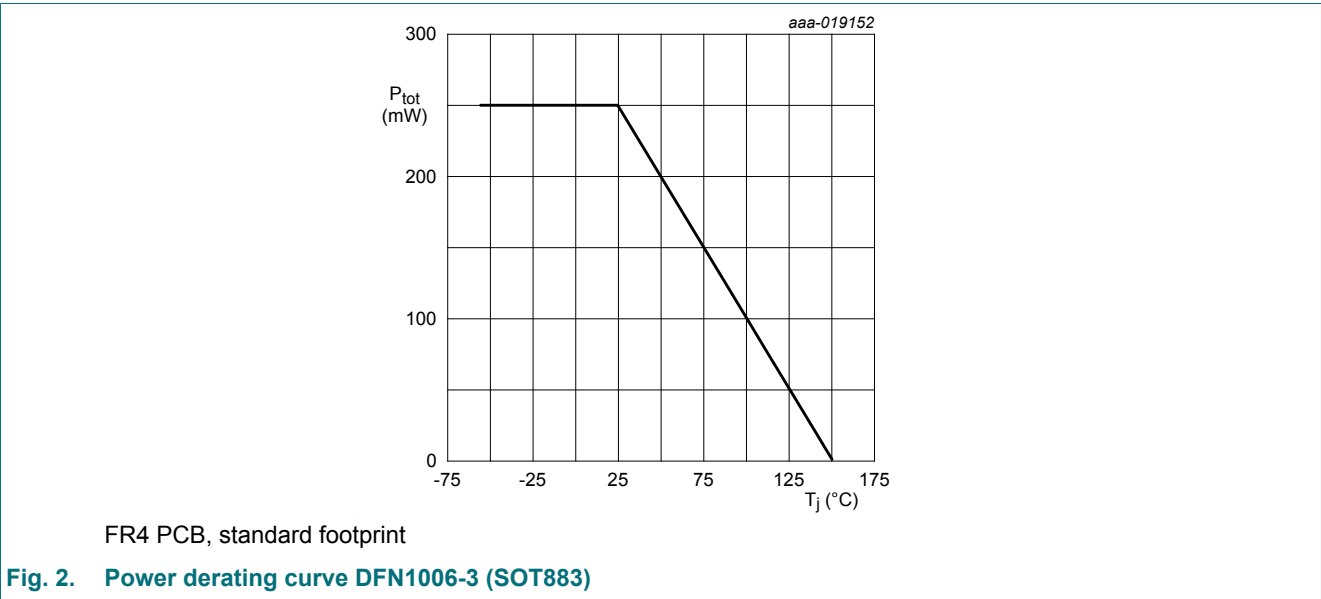
Fig. 1. DFN1006B-3 (SOT883B) binary marking code description

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		-	75	V
V _{CEO}	collector-emitter voltage	open base		-	40	V
V _{EBO}	emitter-base voltage	open collector		-	6	V
I _C	collector current			-	600	mA
I _{CM}	peak collector current	single pulse; t _p ≤ 1 ms		-	800	mA
I _{BM}	peak base current			-	200	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	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.

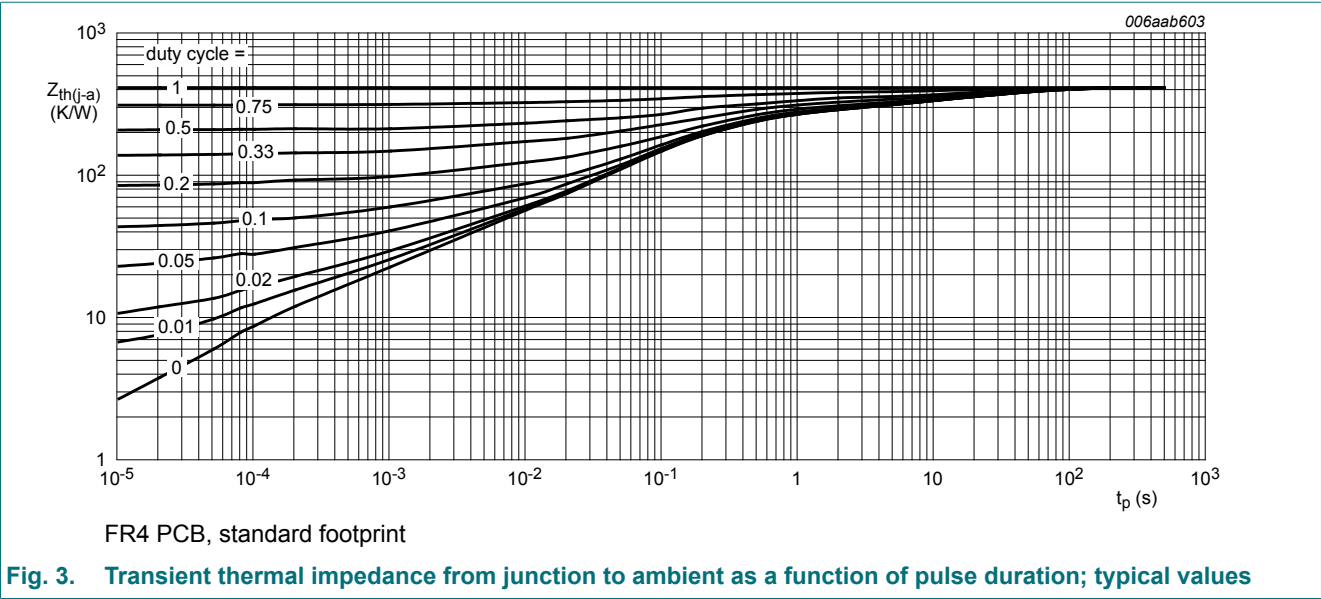


9. Thermal characteristics

Table 6. 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

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



10. Characteristics

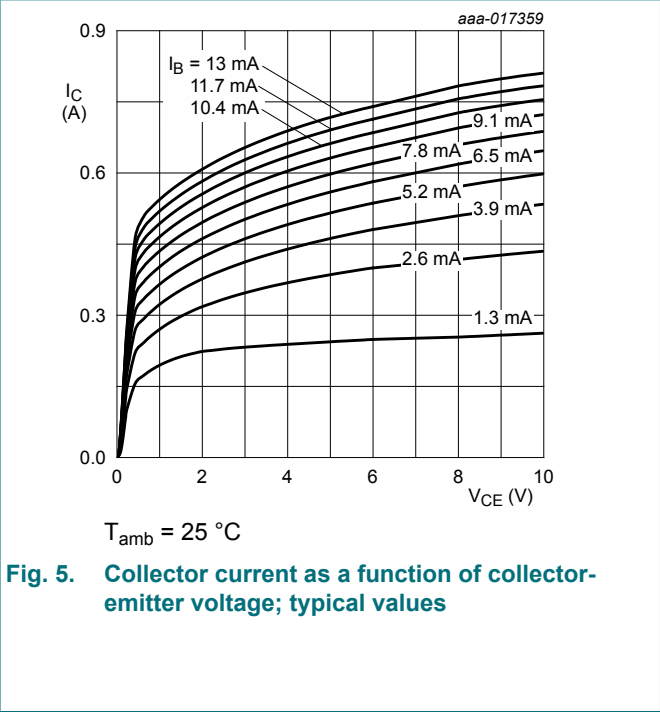
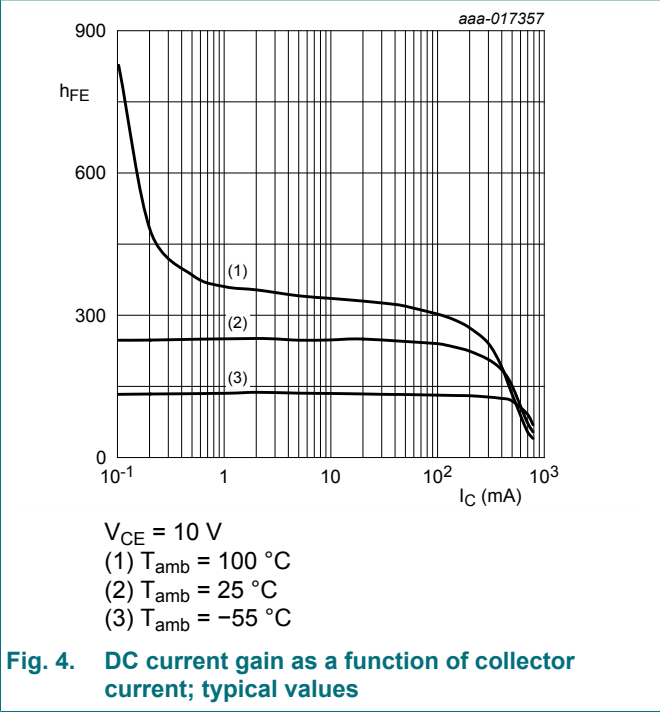
Table 7. Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 100\text{ }\mu\text{A}$; $I_E = 0\text{ A}$		75	-	-	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	$I_C = 2\text{ mA}$; $I_B = 0\text{ A}$		40	-	-	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	$I_C = 0\text{ A}$; $I_E = 100\text{ }\mu\text{A}$		6	-	-	V
I_{CBO}	collector-base cut-off current	$V_{CB} = 60\text{ V}$; $I_E = 0\text{ A}$		-	-	10	nA
		$V_{CB} = 60\text{ V}$; $I_E = 0\text{ A}$; $T_j = 125\text{ }^{\circ}\text{C}$		-	-	10	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}$; $I_C = 0\text{ A}$		-	-	10	nA
h_{FE}	DC current gain	$V_{CE} = 10\text{ V}$; $I_C = 100\text{ }\mu\text{A}$		35	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 1\text{ mA}$		50	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 10\text{ mA}$		75	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 10\text{ mA}$; $T_{amb} = -55\text{ }^{\circ}\text{C}$		35	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 150\text{ mA}$	[1]	100	-	300	
		$V_{CE} = 1\text{ V}$; $I_C = 150\text{ mA}$	[1]	50	-	-	
		$V_{CE} = 10\text{ V}$; $I_C = 500\text{ mA}$	[1]	40	-	-	

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V _{CEsat}	collector-emitter saturation voltage	I _C = 150 mA; I _B = 15 mA	[1]	-	-	300	mV
		I _C = 500 mA; I _B = 50 mA	[1]	-	-	1	V
V _{BEsat}	base-emitter saturation voltage	I _C = 150 mA; I _B = 15 mA	[1]	0.6	-	1.2	V
		I _C = 500 mA; I _B = 50 mA	[1]	-	-	2	V
t _d	delay time	I _C = 150 mA; I _{Bon} = 15 mA; I _{Boff} = -15 mA		-	-	15	ns
t _r	rise time			-	-	20	ns
t _{on}	turn-on time			-	-	35	ns
t _s	storage time			-	-	200	ns
t _f	fall time			-	-	60	ns
t _{off}	turn-off time			-	-	260	ns
C _c	collector capacitance	V _{CB} = 10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz		-	-	8	pF
C _e	emitter capacitance	V _{EB} = 500 mV; I _C = 0 A; i _c = 0 A; f = 1 MHz		-	-	25	pF
f _T	transition frequency	V _{CE} = 20 V; I _C = 20 mA; f = 100 MHz	[1]	-	340	-	MHz

[1] Pulsed test: t_p ≤ 300 μs; δ ≤ 0.02



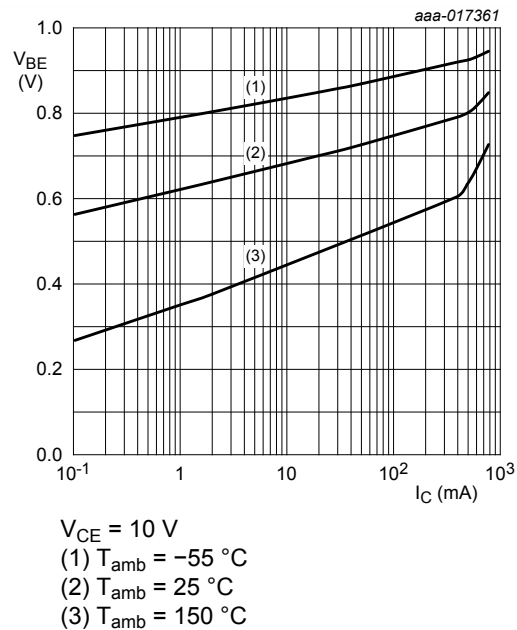


Fig. 6. Base-emitter voltage as a function of collector current; typical values

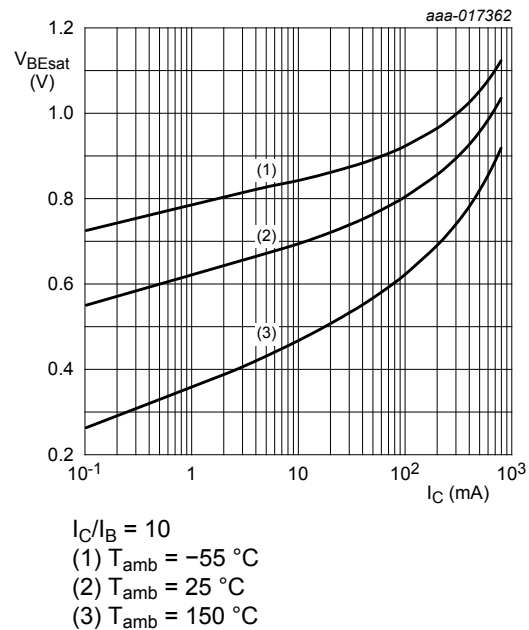


Fig. 7. Base-emitter saturation voltage as a function of collector current; typical values

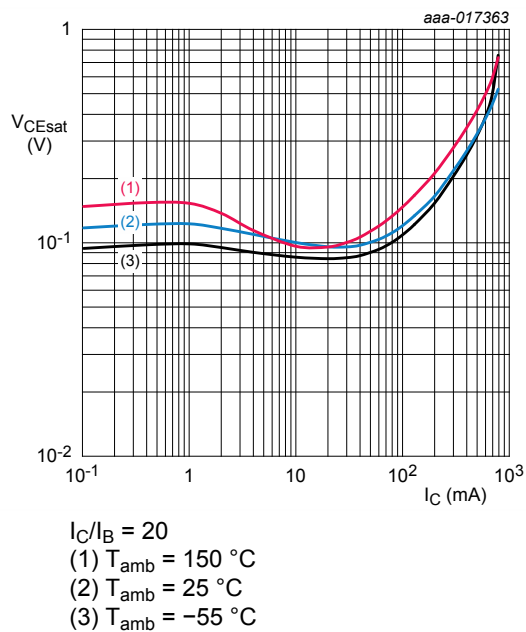


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

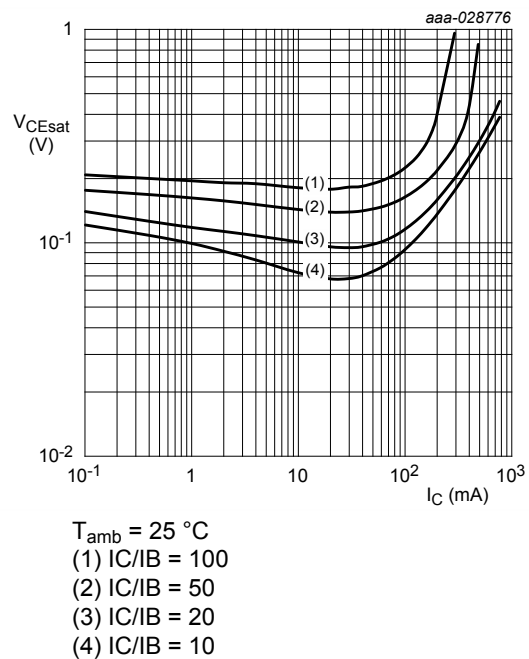


Fig. 9. Collector-emitter saturation voltage as a function of collector current; typical values

11. Test information

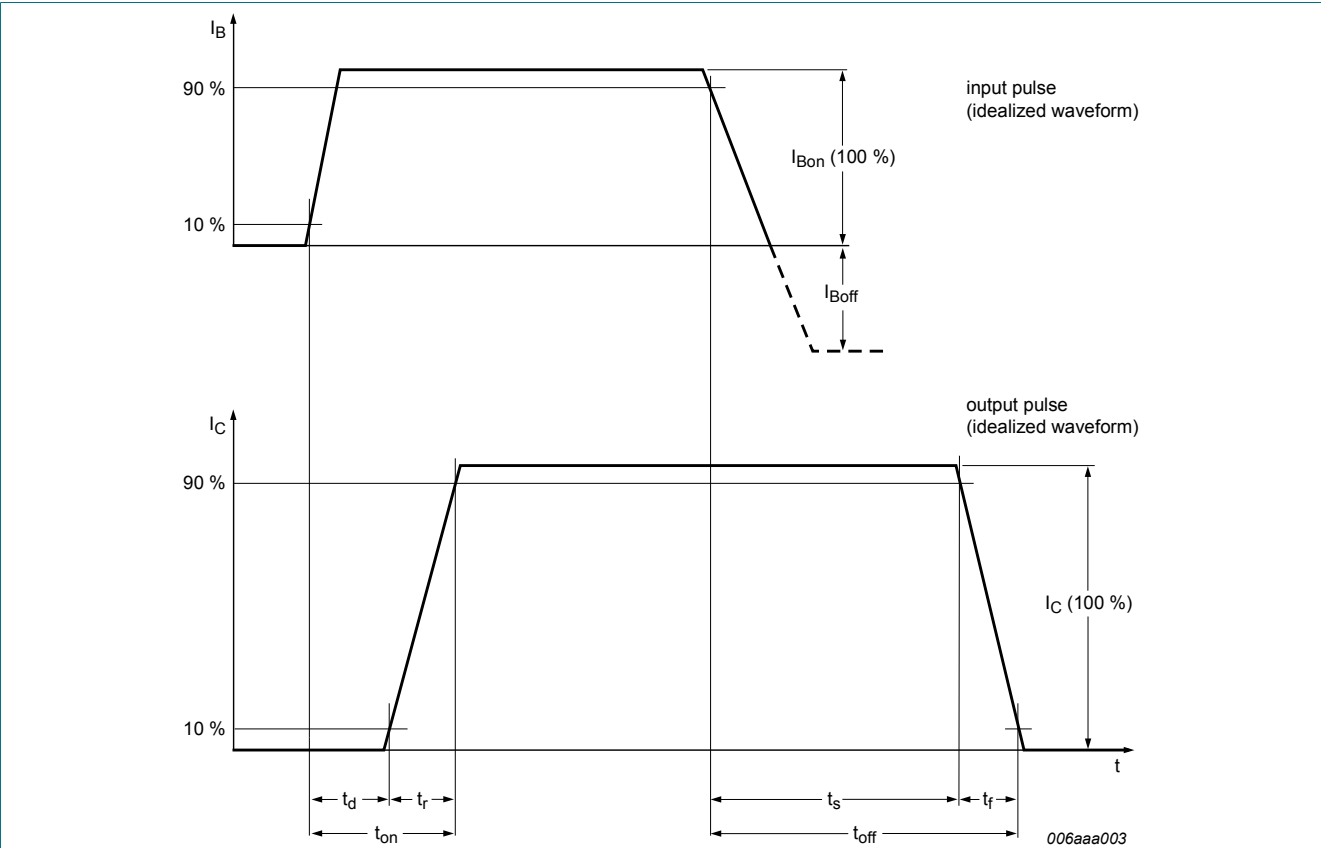


Fig. 10. Transistor switching time definition

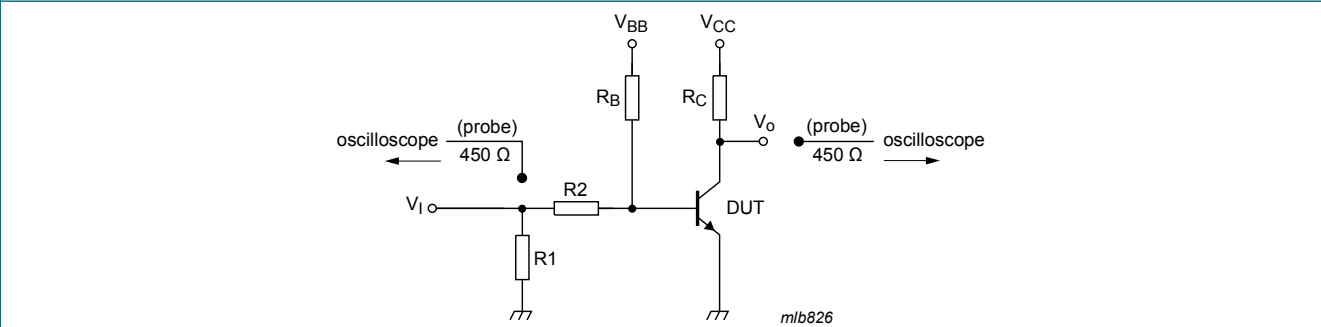


Fig. 11. Test circuit for switching times

12. Package outline

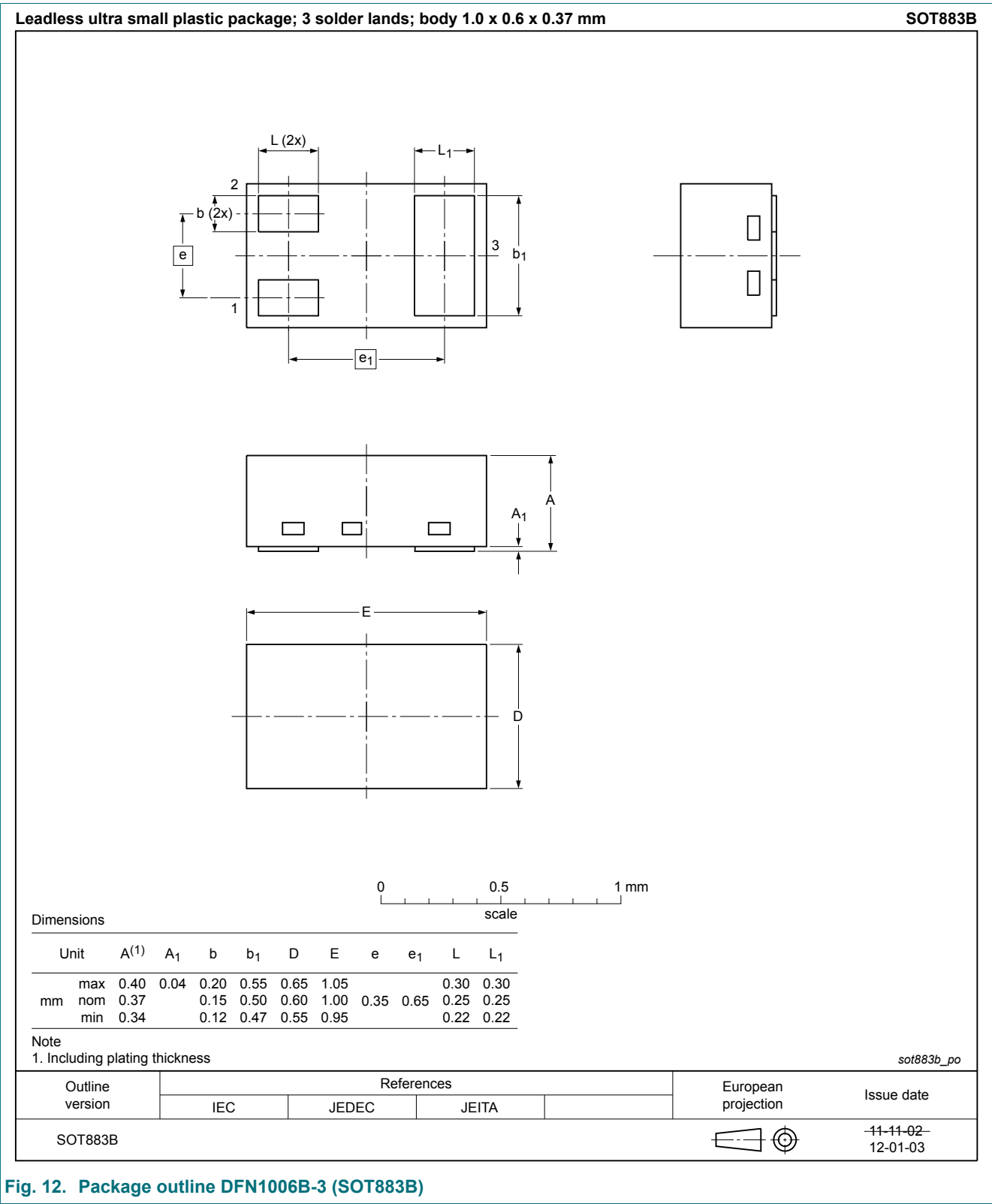


Fig. 12. Package outline DFN1006B-3 (SOT883B)

13. Soldering

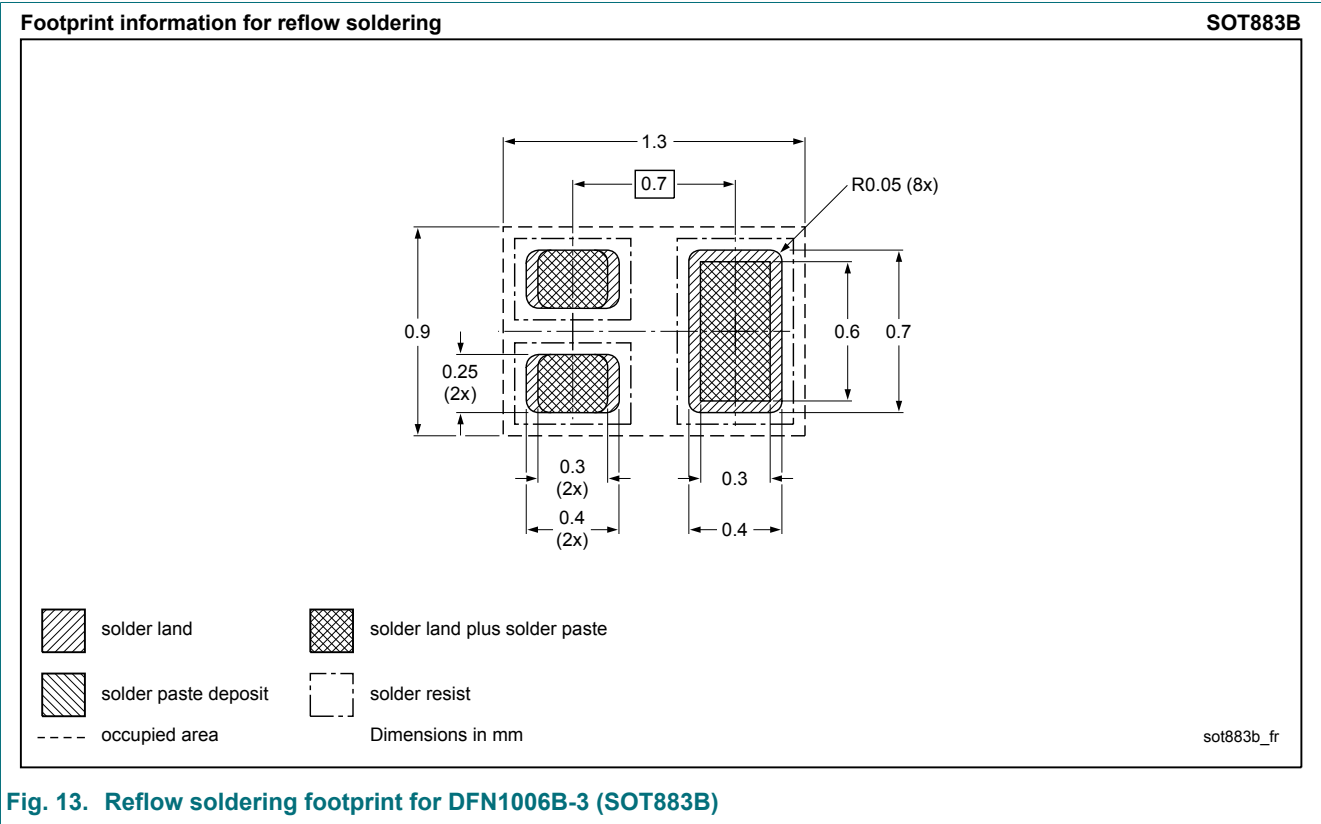


Fig. 13. Reflow soldering footprint for DFN1006B-3 (SOT883B)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMBT2222AMB v.1	20180921	Product data sheet	-	-

15. 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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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