



# 2PA1774xMB series

40 V, 100 mA PNP general-purpose transistors

Rev. 1 — 23 March 2012

Product data sheet

## 1. Product profile

### 1.1 General description

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

Table 1. Product overview

Type number	Package			NPN complement
	Nexperia	JEITA	JEDEC	
2PA1774QMB	SOT883B	-	-	2PC4617QMB
2PA1774RMB	SOT883B	-	-	2PC4617RMB
2PA1774SMB	SOT883B	-	-	-

### 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

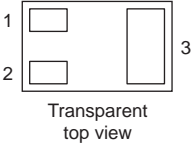
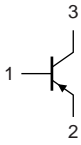
### 1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CE0}$	collector-emitter voltage	open base	-	-	-40	V
$I_C$	collector current		-	-	-100	mA
$h_{FE}$	DC current gain	$V_{CE} = -6\text{ V}; I_C = -1\text{ mA}$				
	2PA1774QMB		120	-	270	
	2PA1774RMB		180	-	390	
	2PA1774SMB		270	-	560	

## 2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	base	 <p>Transparent top view</p>	 <p>sym013</p>
2	emitter		
3	collector		

## 3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
2PA1774xMB series	DFN1006B-3	leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.37 mm	SOT883B

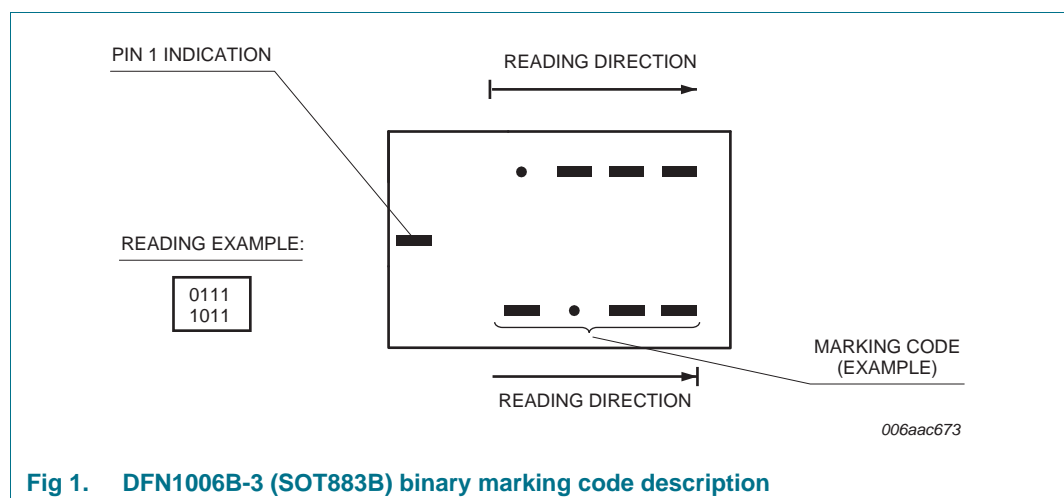
## 4. Marking

Table 5. Marking codes

Type number	Marking code <sup>[1]</sup>
2PA1774QMB	0100 0000
2PA1774RMB	0000 1101
2PA1774SMB	0000 1110

[1] For DFN1006B-3 (SOT883B) binary marking code description see [Figure 1](#).

### 4.1 Binary marking code description



## 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	-	-40	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
			[3][2]	-	590	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.

[3] Device mounted on an FR4 PCB, single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.

## 6. Thermal characteristics

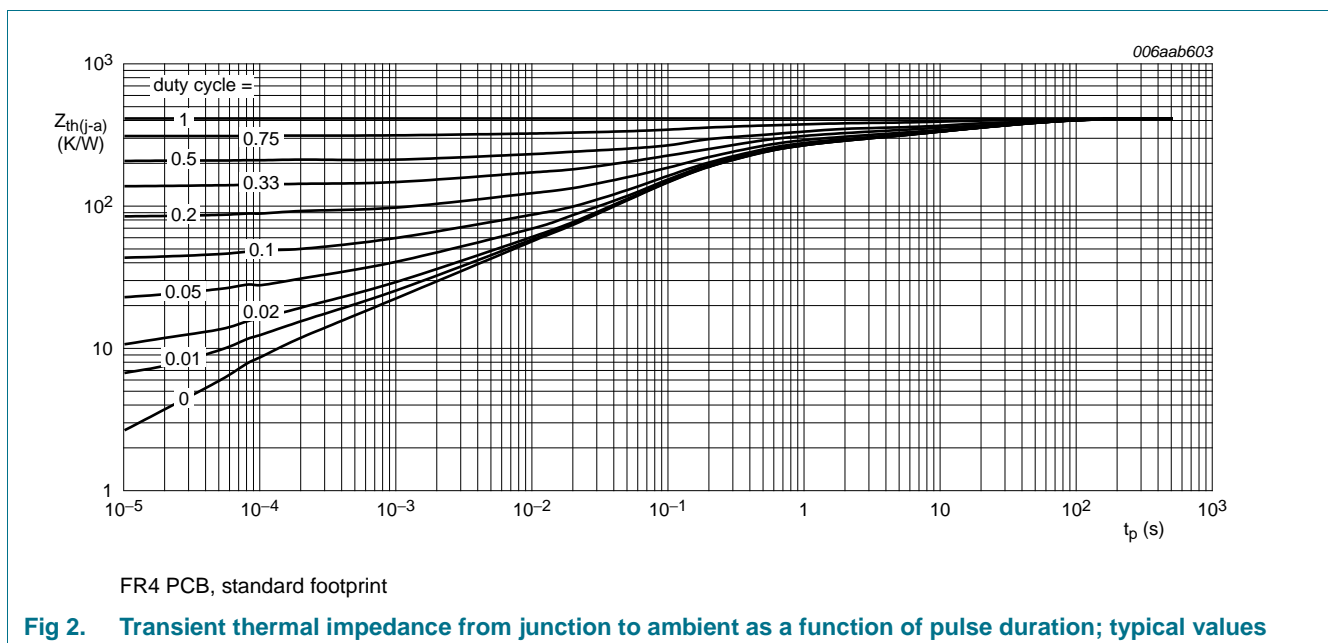
**Table 7. Thermal characteristics**

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
			[3][2]	-	212	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.

[3] Device mounted on an FR4 PCB, single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.



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

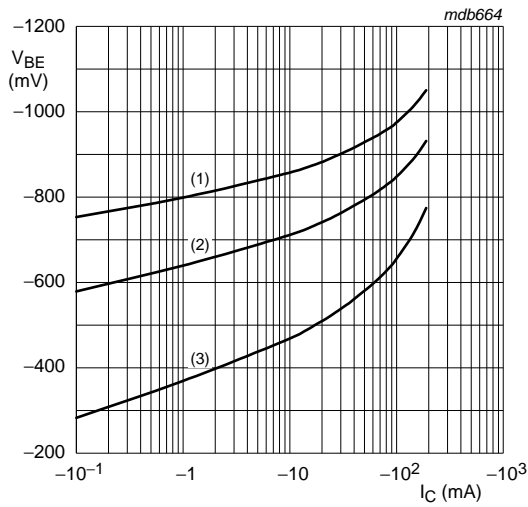
## 7. Characteristics

**Table 8. Characteristics**

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

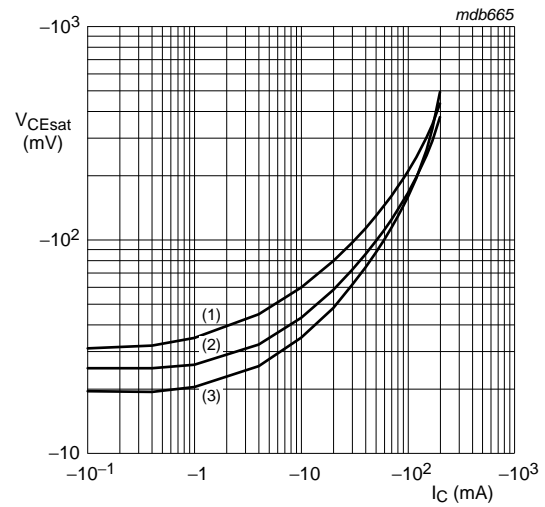
Symbol	Parameter	Conditions	Min	Typ	Max	Unit				
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0\text{ A}$	-	-	-100	nA				
		$V_{CB} = -30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$	-	-	-5	$\mu\text{A}$				
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -4\text{ V}; I_C = 0\text{ A}$	-	-	-100	nA				
$h_{FE}$	DC current gain	$V_{CE} = -6\text{ V}; I_C = -1\text{ mA}$								
							2PA1774QMB	120	-	270
							2PA1774RMB	180	-	390
							2PA1774SMB	270	-	560
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -50\text{ mA}; I_B = -5\text{ mA}$	[1]	-	-200	mV				
$f_T$	transition frequency	$V_{CE} = -12\text{ V}; I_C = -2\text{ mA}; f = 100\text{ MHz}$	100	-	-	MHz				
$C_c$	collector capacitance	$V_{CB} = -12\text{ V}; I_E = I_e = 0\text{ A}; f = 1\text{ MHz}$	-	-	2.2	pF				

[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .



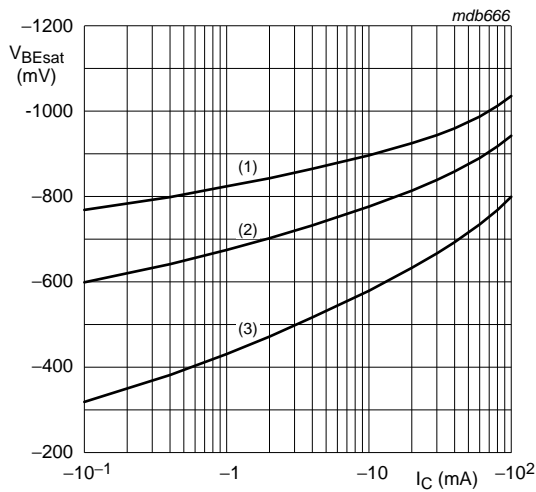
$V_{CE} = -6\text{ V}$   
 (1)  $T_{amb} = -55\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = 150\text{ °C}$

**Fig 3. Base-emitter voltage as a function of collector current; typical values**



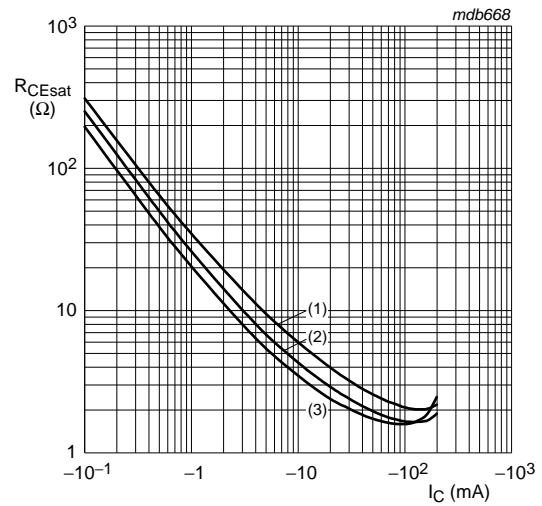
$I_C/I_B = 10$   
 (1)  $T_{amb} = 150\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = -55\text{ °C}$

**Fig 4. Collector-emitter saturation voltage as a function of collector current; typical values**



$I_C/I_B = 10$   
 (1)  $T_{amb} = -55\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = 150\text{ °C}$

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



$I_C/I_B = 10$   
 (1)  $T_{amb} = 150\text{ °C}$   
 (2)  $T_{amb} = 25\text{ °C}$   
 (3)  $T_{amb} = -55\text{ °C}$

**Fig 6. Collector-emitter equivalent on-resistance as a function of collector current; typical values**

## 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

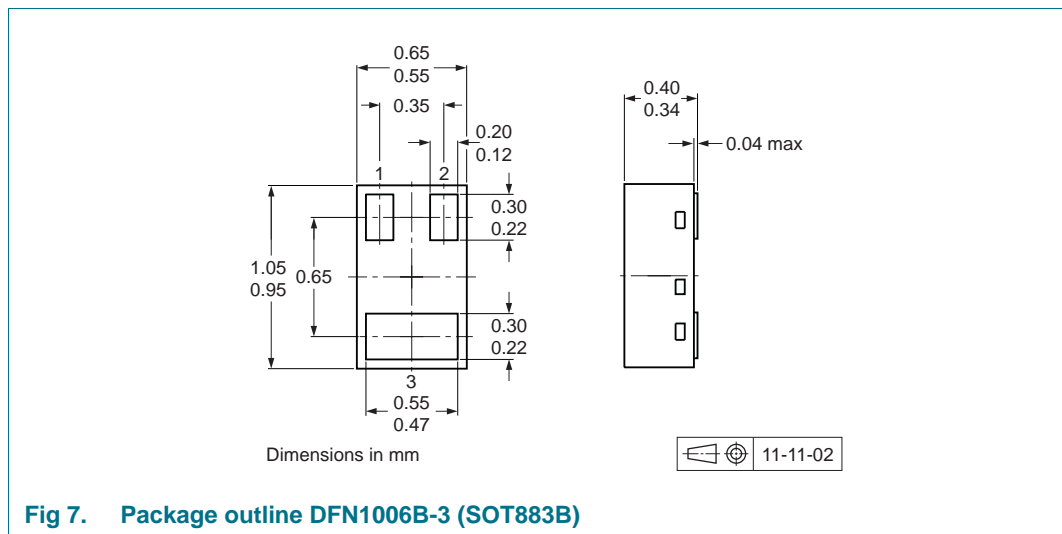


Fig 7. Package outline DFN1006B-3 (SOT883B)

## 10. Packing information

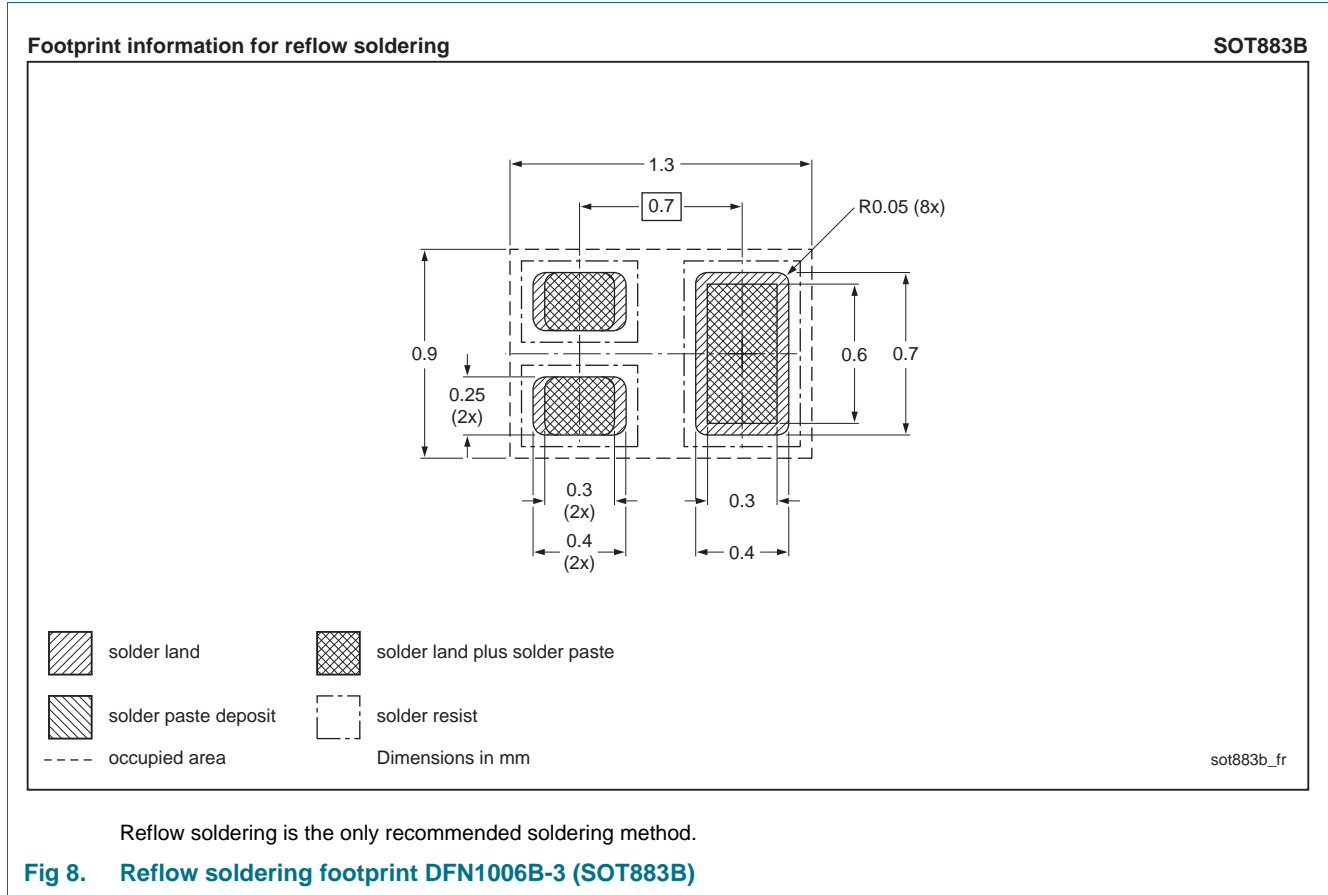
**Table 9. Packing methods**

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

Type number	Package	Description	Packing quantity
			<b>10000</b>
2PA1774xMB series	DFN1006B-3 (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





## 12. Revision history

**Table 10. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
2PA1774XMB_SER v.1	20120323	Product data sheet	-	-

## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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