

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	Package		
	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	Тур	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	-40	V
I _C	collector current		-	-	-100	mΑ
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		
2	emitter	1 3	3
3	collector	2 🔲 🔲	1 —
		Transparent	2
		top view	_
			sym013

3. Ordering information

Table 4. Ordering information

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

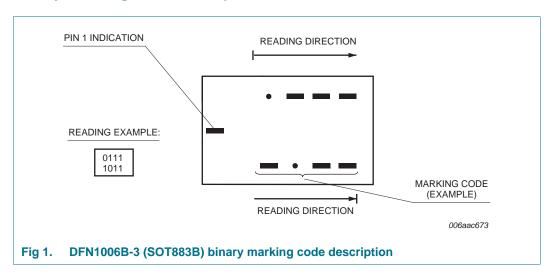
4. Marking

Table 5. Marking codes

Type number	Marking code ^[1]
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



2PA1774XMB_SER

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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		-	-40	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I _C	collector current			-	-100	mA
I _{CM}	peak collector current	single pulse; $t_p \le 1 \text{ ms}$		-	-200	mA
I _{BM}	peak base current	single pulse; $t_p \le 1 \text{ ms}$		-	-100	mA
P _{tot}	total power dissipation	$T_{amb} \le 25 ^{\circ}C$	[1][2]	-	250	mW
			[3][2]	-	590	mW
Tj	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.

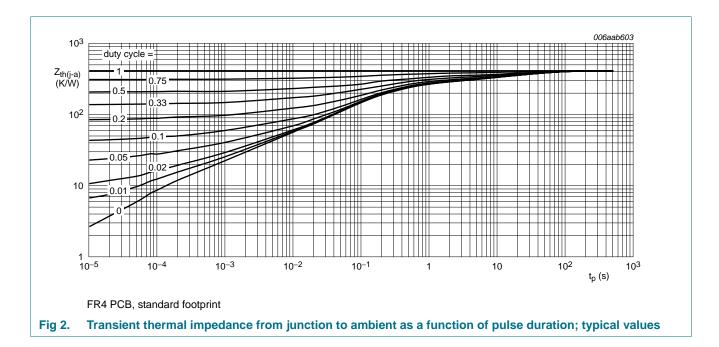
^[3] Device mounted on an FR4 PCB, single-sided copper, mounting pad for collector 1 cm².

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$R_{th(j-a)}$	u ,	in free air	[1][2]	-	500	K/W
junction to ambient		[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 cm².



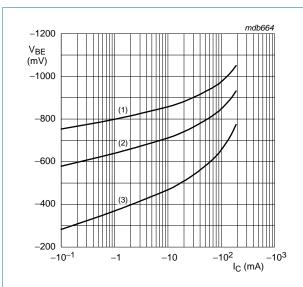
7. Characteristics

Table 8. Characteristics

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
I _{CBO}	collector-base	$V_{CB} = -30 \text{ V}; I_E = 0 \text{ A}$	-	-	-100	nA
	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	$V_{EB} = -4 \text{ V}; I_{C} = 0 \text{ A}$	-	-	-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 MHz	100	-	-	MHz
C _c	collector capacitance	$V_{CB} = -12 \text{ V}; I_E = I_e = 0 \text{ A};$ f = 1 MHz	-	-	2.2	pF

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



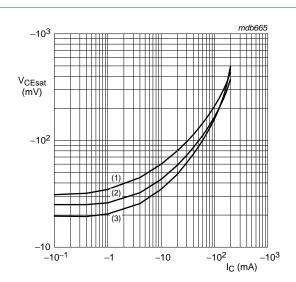
$$V_{CE} = -6 \text{ V}$$

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

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

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

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



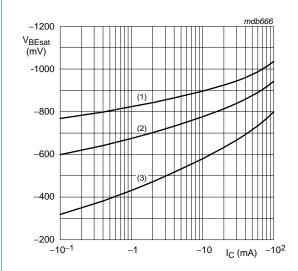
$$I_{\rm C}/I_{\rm B} = 10$$

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

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

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

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



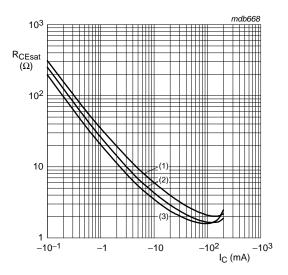
$$I_{\rm C}/I_{\rm B} = 10$$

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

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

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

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



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

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

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

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

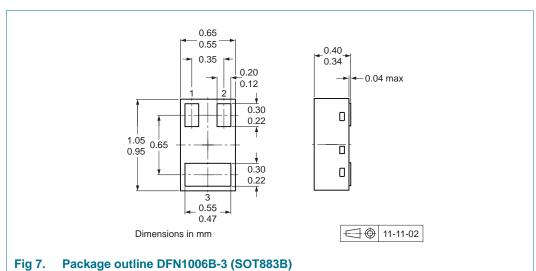
Fig 6. Collector-emitter equivalent on-resistance as a function of collector current; typical values

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



10. Packing information

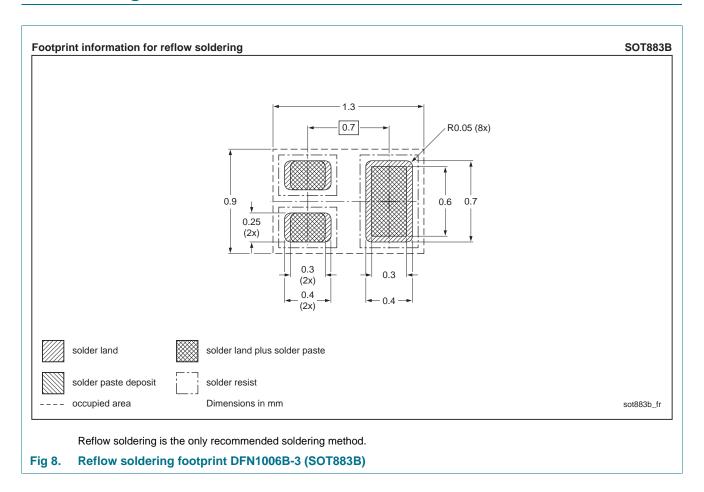
Table 9. Packing methods

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

Type number	Package	ackage Description	
			10000
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 <u>Section 14</u>.

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[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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2PA1774xMB series

40 V, 100 mA PNP general-purpose transistors

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2PA1774xMB series

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