PDTA123JMB



PNP resistor-equipped transistor; R1 = 2.2 kΩ, R2 = 47 kΩ Rev. 1 — 16 May 2012 Product data s

Product data sheet

1. **Product profile**

1.1 General description

PNP Resistor-Equipped Transistor (RET) in a leadless ultra small DFN1006B-3 (SOT883B) Surface-Mounted Device (SMD) plastic package.

NPN complement: PDTC123JMB.

1.2 Features and benefits

- 100 mA output current capability
- Reduces component count
- Built-in bias resistors
- Reduces pick and place costs
- Simplifies circuit design
- AEC-Q101 qualified
- Leadless ultra small SMD plastic package
- Low package height of 0.37 mm

1.3 Applications

- Low-current peripheral driver
- Control of IC inputs

- Replaces general-purpose transistors in digital applications
- 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	-	-	-50	V
Io	output current		-	-	-100	mA
R1	bias resistor 1 (input)	T _{amb} = 25 °C	1.54	2.2	2.86	kΩ
R2/R1	bias resistor ratio		17	21	26	



2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	I	input (base)		
2	G	GND (emitter)	1	
3	0	output (collector)	2 3	1 R1
			Transparent top view	
			SOT883B (DFN1006B-3)	sym003

3. Ordering information

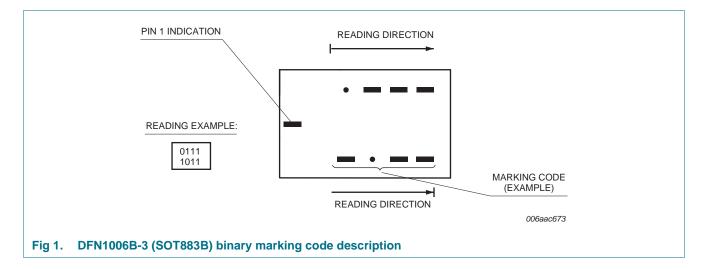
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PDTA123JMB	DFN1006B-3	Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.37 mm	SOT883B

4. Marking

Table 4. Marking codes

Type number	Marking code
PDTA123JMB	0100 1001



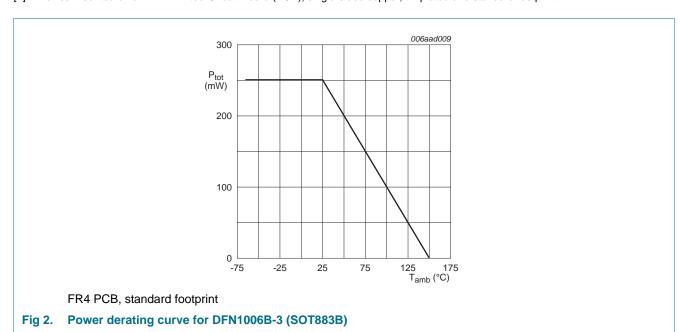
5. Limiting values

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		-	-50	V
V_{CEO}	collector-emitter voltage	open base		-	-50	V
V_{EBO}	emitter-base voltage	open collector		-	-10	V
VI	input voltage	positive		-	5	V
		negative		-	-12	V
Io	output current			-	-100	mA
I _{CM}	peak collector current	pulsed; t _p ≤ 1 ms		-	-100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	<u>[1]</u>	-	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.

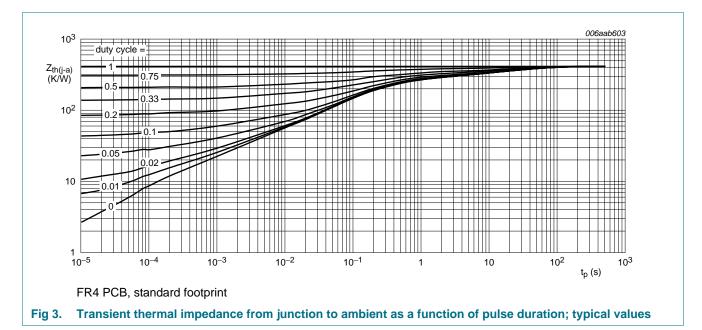


6. Thermal characteristics

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.

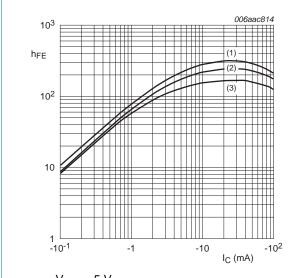


Characteristics

Characteristics Table 7.

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Symbol	Parameter	Conditions		Min	Тур	Max	Unit
I_{CBO}	collector-base cut-off current	$V_{CB} = -50 \text{ V}; I_E = 0 \text{ A}; T_{amb} = 25 \text{ °C}$		-	-	-100	nA
I _{CEO}	collector-emitter cut-off	$V_{CE} = -30 \text{ V}; I_{B} = 0 \text{ A}; T_{amb} = 25 \text{ °C}$		-	-	-1	μΑ
	current	$V_{CE} = -30 \text{ V}; I_B = 0 \text{ A}; T_j = 150 \text{ °C}$		-	-	-5	μΑ
I _{EBO}	emitter-base cut-off current	$V_{EB} = -5 \text{ V}; I_{C} = 0 \text{ A}; T_{amb} = 25 \text{ °C}$		-	-	-180	μΑ
h _{FE}	DC current gain	V_{CE} = -5 V; I_{C} = -10 mA; T_{amb} = 25 °C		100	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -5 \text{ mA}; I_B = -0.25 \text{ mA}; T_{amb} = 25 \text{ °C}$		-	-	-100	mV
$V_{I(off)}$	off-state input voltage	$V_{CE} = -5 \text{ V}; I_{C} = -100 \mu\text{A}; T_{amb} = 25 \text{ °C}$		-	-0.6	-0.5	V
$V_{I(on)}$	on-state input voltage	V_{CE} = -0.3 V; I_{C} = -5 mA; T_{amb} = 25 °C		-1.1	-0.75	-	V
R1	bias resistor 1 (input)	T _{amb} = 25 °C		1.54	2.2	2.86	kΩ
R2/R1	bias resistor ratio			17	21	26	
C _C	collector capacitance	V_{CB} = -10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	3	pF
f _T	transition frequency	V_{CE} = -5 V; I_{C} = -10 mA; f = 100 MHz; T_{amb} = 25 °C	[1]	-	180	-	MHz

[1] Characteristics of built-in transistor.



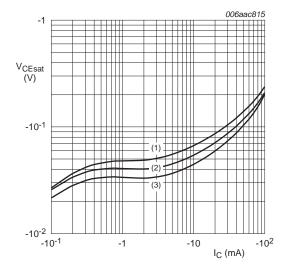


(1)
$$T_{amb} = 100 \, ^{\circ}C$$

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

(3)
$$T_{amb} = -40 \, ^{\circ}C$$

Fig 4. DC current gain as a function of collector current; typical values



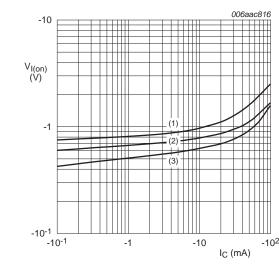
 $I_{\rm C}/I_{\rm B} = 20$

(1)
$$T_{amb} = 100 \, ^{\circ}C$$

(2)
$$T_{amb} = 25$$
 °C

(3)
$$T_{amb} = -40 \, ^{\circ}C$$

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



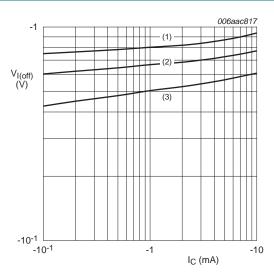
$$V_{CE} = -0.3 V$$

(1)
$$T_{amb} = -40 \, ^{\circ}C$$

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

(3)
$$T_{amb} = 100 \, ^{\circ}C$$

Fig 6. On-state input voltage as a function of collector current; typical values



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

(1)
$$T_{amb} = -40 \, ^{\circ}C$$

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

(3)
$$T_{amb} = 100 \, ^{\circ}C$$

Fig 7. Off-state input voltage as a function of collector current; typical values

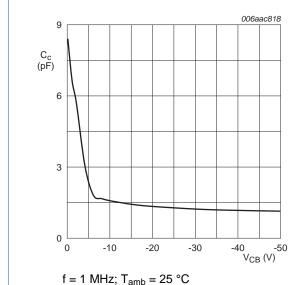
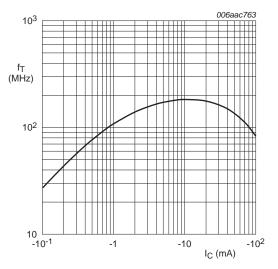


Fig 8. Collector capacitance as a function of collector-base voltage; typical values



 $V_{CE} = -5 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$

Fig 9. Transition frequency as a function of collector current; typical values of built-in transistor

8. Test information

8.1 Quality information

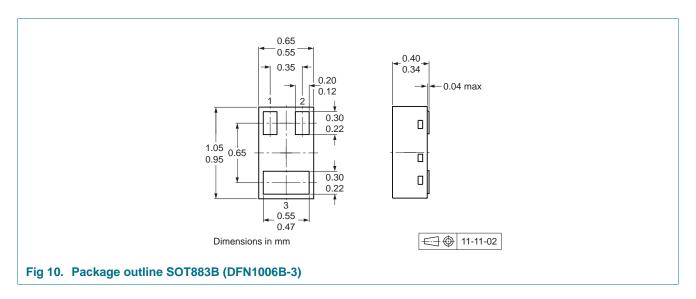
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

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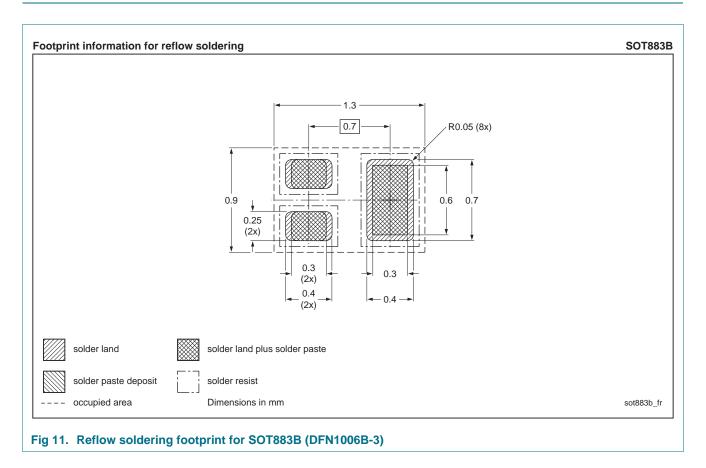
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9. Package outline



10. Soldering





11. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PDTA123JMB v.1	20120516	Product data sheet	-	-

12. Legal information

12.1 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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