PEMB19; PUMB19

PNP/PNP resistor-equipped transistors; R1 = 22 k Ω , R2 = open

Rev. 02 — 1 September 2009

Product data sheet

1. Product profile

1.1 General description

PNP/PNP resistor-equipped transistors

Table 1. Product overview

Type number	pe number Package		NPN/PNP	NPN/NPN	
	NXP	JEITA	complement	complement	
PEMB19	SOT666	-	PEMD19	PEMH19	
PUMB19	SOT363	SC-88	PUMD19	PUMH19	

1.2 Features

- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place cost

1.3 Applications

- Low current peripheral driver
- Control of IC inputs
- Replacement of general-purpose transistors in digital 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	-	-	-50	V
I _O	output current (DC)		-	-	-100	mA
R1	bias resistor 1 (input)		15.4	22	28.6	kΩ



2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
1	•	Cimpiniou cumio	Cymioci
-	GND (emitter) TR1	6 5 4	6 5 4
2	input (base) TR1		
3	output (collector) TR2		R1
4	GND (emitter) TR2		TR2
5	input (base) TR2		TR1
6	output (collector) TR1	001aab555	R1
			1 2 3
			006aaa268

3. Ordering information

Table 4. Ordering information

Type number	Package				
	Name	Description	Version		
PEMB19	-	plastic surface mounted package; 6 leads	SOT666		
PUMB19	SC-88	plastic surface mounted package; 6 leads	SOT363		

4. Marking

Table 5. Marking codes

Type number	Marking code ^[1]
PEMB19	6D
PUMB19	T3*

[1] * = -: made in Hong Kong

* = p: made in Hong Kong

* = t: made in Malaysia

* = W: made in China

5. Limiting values

Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
Per transis	stor				
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	-	-5	V
Io	output current (DC)		-	-100	mA
I _{CM}	peak collector current		-	-100	mA
P _{tot}	total power dissipation	$T_{amb} \le 25 ^{\circ}C$			
	SOT363		<u>[1]</u> -	200	mW
	SOT666		[1] [2] -	200	mW
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		-	150	°C
T _{amb}	ambient temperature		-65	+150	°C
Per device					
P _{tot}	total power dissipation	$T_{amb} \le 25 ^{\circ}C$			
	SOT363		<u>[1]</u> -	300	mW
	SOT666		[1] [2] _	300	mW

^[1] Device mounted on a FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Per transis	tor					
R _{th(j-a)}	thermal resistance from junction to ambient	$T_{amb} \le 25 ^{\circ}C$				
	SOT363		<u>[1]</u> -	-	625	K/W
	SOT666		[1] [2]	-	625	K/W
Per device						
R _{th(j-a)}	thermal resistance from junction to ambient	T _{amb} ≤ 25 °C				
	SOT363		<u>[1]</u> -	-	416	K/W
	SOT666		[1] [2]	-	416	K/W

^[1] Device mounted on a FR4 printed-circuit board, single-sided copper, tin-plated and standard footprint.

^[2] Reflow soldering is the only recommended soldering method.

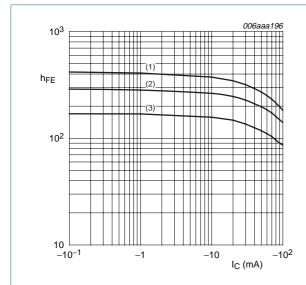
^[2] Reflow soldering is the only recommended soldering method.

7. Characteristics

Table 8. Characteristics

T_{amb} = 25 °C unless otherwise specified

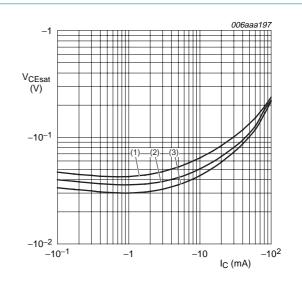
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Per transis	stor					
I _{СВО}	collector-base cut-off current	$V_{CB} = -50 \text{ V}; I_E = 0 \text{ A}$	-	-	-100	nA
I _{CEO} collector-emitter cut-off current	$V_{CE} = -30 \text{ V}; I_{B} = 0 \text{ A}$	-	-	-1	μΑ	
	cut-off current	$V_{CE} = -30 \text{ V}; I_{B} = 0 \text{ A};$ $T_{j} = 150 ^{\circ}\text{C}$	-	-	-50	μΑ
I _{EBO}	emitter-base cut-off current	$V_{EB} = -5 \text{ V}; I_C = 0 \text{ A}$	-	-	-100	nA
h _{FE}	DC current gain	$V_{CE} = -5 \text{ V}; I_{C} = -1 \text{ mA}$	100	-	-	
V _{CEsat}	collector-emitter saturation voltage	$I_C = -10 \text{ mA}; I_B = -0.5 \text{ mA}$	-	-	-150	mV
R1	bias resistor 1 (input)		15.4	22	28.6	kΩ
C _c	collector capacitance	$V_{CB} = -10 \text{ V}; I_E = i_e = 0 \text{ A};$ f = 1 MHz	-	-	3	pF





- (1) $T_{amb} = 100 \, ^{\circ}C$
- (2) $T_{amb} = 25 \, ^{\circ}C$
- (3) $T_{amb} = -40 \, ^{\circ}C$

Fig 1. 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) $T_{amb} = 25 \, ^{\circ}C$
- (3) $T_{amb} = -40 \, ^{\circ}C$

Fig 2. Collector-emitter saturation voltage as a function of collector current; typical values

8. Package outline

Plastic surface-mounted package; 6 leads

SOT363

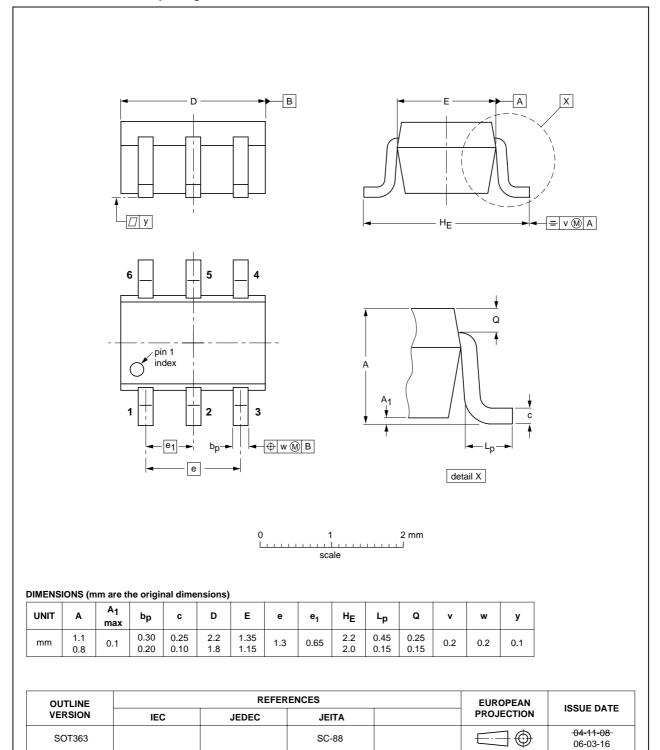


Fig 3. Package outline SOT363 (SC-88)

SOT666 Plastic surface-mounted package; 6 leads - A Х H_{E} pin 1 index С ⊕ w M A detail X 2 mm scale **DIMENSIONS** (mm are the original dimensions) UNIT Ε D Α bp С e₁ H_{E} L_{p} у 0.6 0.27 0.18 1.7 1.3 1.7 0.3 1.0 0.5 0.5 0.17 0.08 1.5 0.1 1.1 REFERENCES **EUROPEAN** OUTLINE ISSUE DATE VERSION **PROJECTION** IEC **JEDEC** JEITA 04-11-08 \bigcirc SOT666 06-03-16

Fig 4. Package outline SOT666

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PNP/PNP resistor-equipped transistors; R1 = 22 k Ω , R2 = open

9. Packing information

Table 9. Packing methods

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

Type number	Package	Description		Packing qua	ntity	
				3000	4000	10000
PEMB19	SOT666	4 mm pitch, 8 mm tape and reel;		-	-115	-
PUMB19	SOT363	4 mm pitch, 8 mm tape and reel; T1	[2]	-115	-	-135
PUMB19	SOT363	4 mm pitch, 8 mm tape and reel; T2	[3]	-125	-	-165

^[1] For further information and the availability of packing methods, see Section 12.

^[2] T1: normal taping

^[3] T2: reverse taping

10. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PEMB19_PUMB19_2	20090901	Product data sheet	-	PEMB19_PUMB19_1
Modifications:	 This data sheet was changed to reflect the new company name NXP Semiconductors including new legal definitions and disclaimers. No changes were made to the technic content. 			
	Figure 3 "Pac	ckage outline SOT363 (SC	-88)": updated	
	Figure 4 "Pac	ckage outline SOT666": up	dated	
PEMB19_PUMB19_1	20050202	Product data sheet	-	-

11. Legal information

11.1 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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions"
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