PEMB30; PUMB30

PNP/PNP double resistor-equipped transistors; R1 = 2.2 kΩ, R2 = open

Rev. 02 — 2 September 2009 Product data sheet

1. Product profile

1.1 General description

PNP/PNP double Resistor-Equipped Transistors (RET) in Surface-Mounted Device (SMD) plastic packages

Table 1. Product overview

Type number	Package		NPN/PNP complement	NPN/NPN complement
	NXP	JEITA		
PEMB30	SOT666	-	PEMD30	PEMH30
PUMB30	SOT363	SC-88	PUMD30	PUMH30

1.2 Features

- 100 mA output current capability
- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs

1.3 Applications

- Low current peripheral driver
- Control of IC inputs
- Cost-saving alternative for BC857BS and BC857BV

1.4 Quick reference data

Table 2. Quick reference data

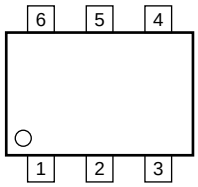
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
V_{CEO}	collector-emitter voltage	open base	-	-	–50	V
I_O	output current		-	-	–100	mA
R1	bias resistor 1 (input)		1.54	2.2	2.86	kΩ

NXP founded by Philips

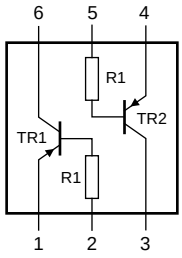
2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
1	GND (emitter) TR1		
2	input (base) TR1		
3	output (collector) TR2		
4	GND (emitter) TR2		
5	input (base) TR2		
6	output (collector) TR1		



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006aaa268

3. Ordering information

Table 4. Ordering information

Type number	Package		
	Name	Description	Version
PEMB30	-	plastic surface-mounted package; 6 leads	SOT666
PUMB30	SC-88	plastic surface-mounted package; 6 leads	SOT363

4. Marking

Table 5. Marking codes

Type number	Marking code[1]
PEMB30	2T
PUMB30	*B2

[1] * = -: made in Hong Kong
* = p: made in Hong Kong
* = t: made in Malaysia
* = W: made in China

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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
Per transistor						
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
I_O	output current			-	–100	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	–100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C				
	SOT363		[1]	-	200	mW
	SOT666		[1][2]	-	200	mW
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C				
	SOT363		[1]	-	300	mW
	SOT666		[1][2]	-	300	mW
T_{stg}	storage temperature			–65	+150	°C
T_j	junction temperature			-	150	°C
T_{amb}	ambient 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.

6. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air					
	SOT363		[1]	-	-	625	K/W
	SOT666		[1][2]	-	-	625	K/W
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air					
	SOT363		[1]	-	-	416	K/W
	SOT666		[1][2]	-	-	416	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.

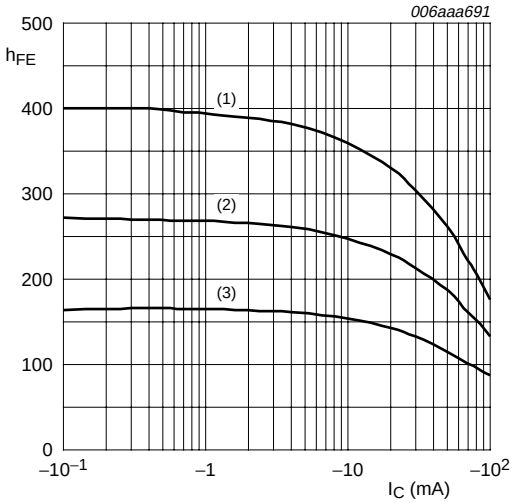
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7. Characteristics

Table 8. Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
I_{CBO}	collector-base cut-off current	V_{CB} = –50 V; I_E = 0 A	-	-	–100	nA
I_{CEO}	collector-emitter cut-off current	V_{CE} = –30 V; I_B = 0 A	-	-	–1	µA
		V_{CE} = –30 V; I_B = 0 A; T_j = 150 °C	-	-	–50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = –5 V; I_C = 0 A	-	-	–100	nA
h_{FE}	DC current gain	V_{CE} = –5 V; I_C = –20 mA	30	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = –10 mA; I_B = –0.5 mA	-	-	–150	mV
R1	bias resistor 1 (input)		1.54	2.2	2.86	kΩ
C_c	collector capacitance	V_{CB} = –10 V; I_E = i_e = 0 A; f = 1 MHz	-	-	3	pF



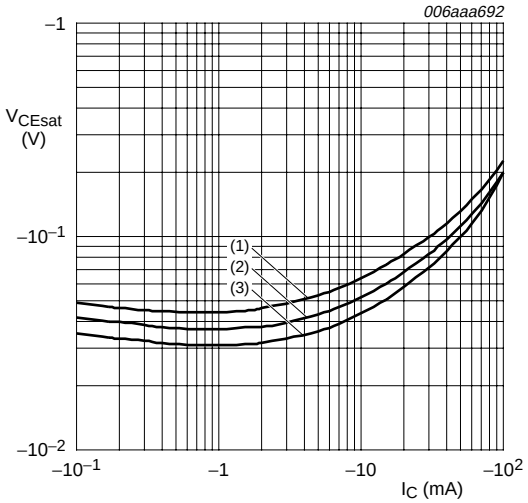
V_{CE} = –5 V

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = –40 °C

Fig 1. DC current gain as a function of collector current; typical values



I_C/I_B = 20

(1) T_{amb} = 100 °C

(2) T_{amb} = 25 °C

(3) T_{amb} = –40 °C

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

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8. Package outline

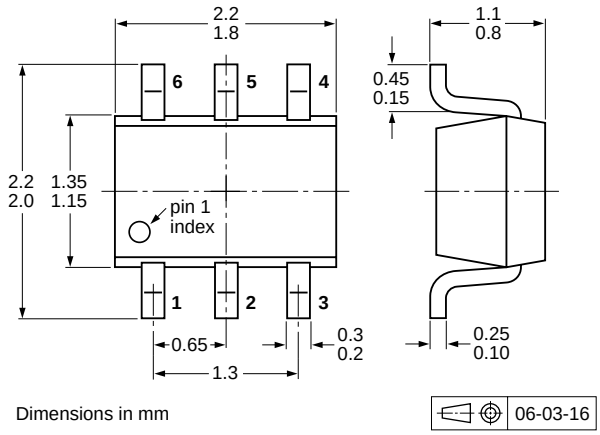


Fig 3. Package outline SOT363 (SC-88)

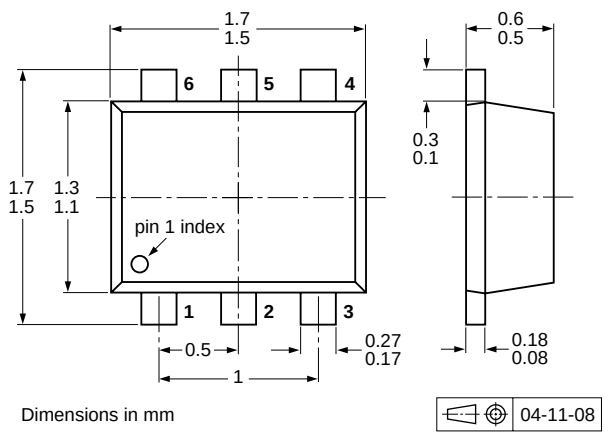


Fig 4. Package outline SOT666

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 quantity			
			3000	4000	8000	10000
PEMB30	SOT666	2 mm pitch, 8 mm tape and reel	-	-	-315	-
		4 mm pitch, 8 mm tape and reel	-	-115	-	-
PUMB30	SOT363	4 mm pitch, 8 mm tape and reel; T1 [2]	-115	-	-	-135
		4 mm pitch, 8 mm tape and reel; T2 [3]	-125	-	-	-165

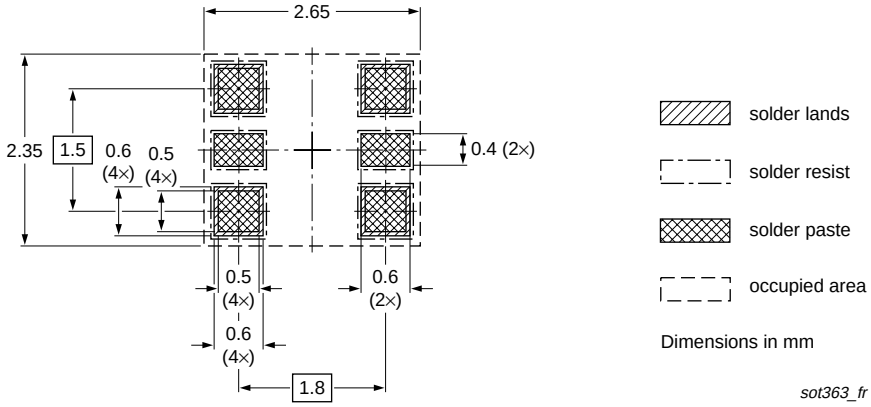
[1] For further information and the availability of packing methods, see Section 13.

[2] T1: normal taping

[3] T2: reverse taping

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10. Soldering



Dimensions in mm

Fig 5. Reflow soldering footprint SOT363 (SC-88)

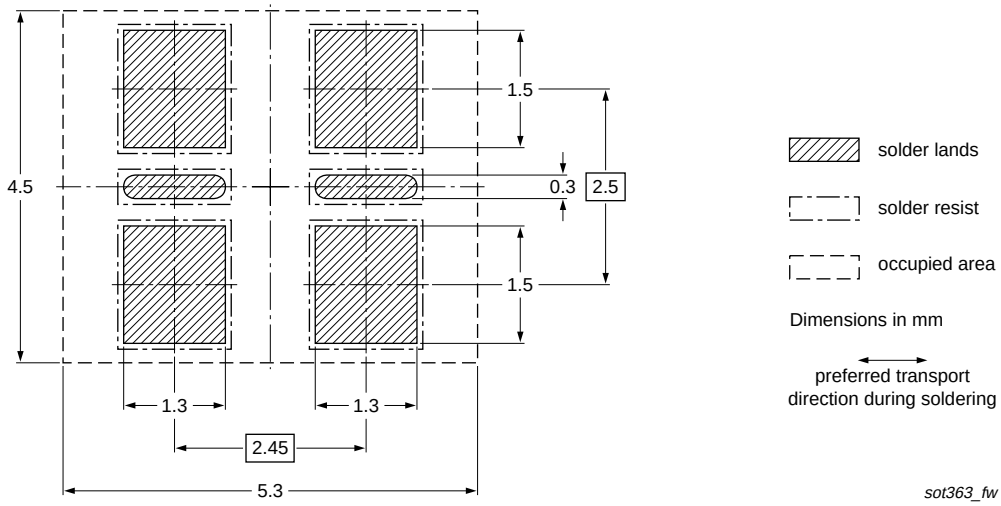
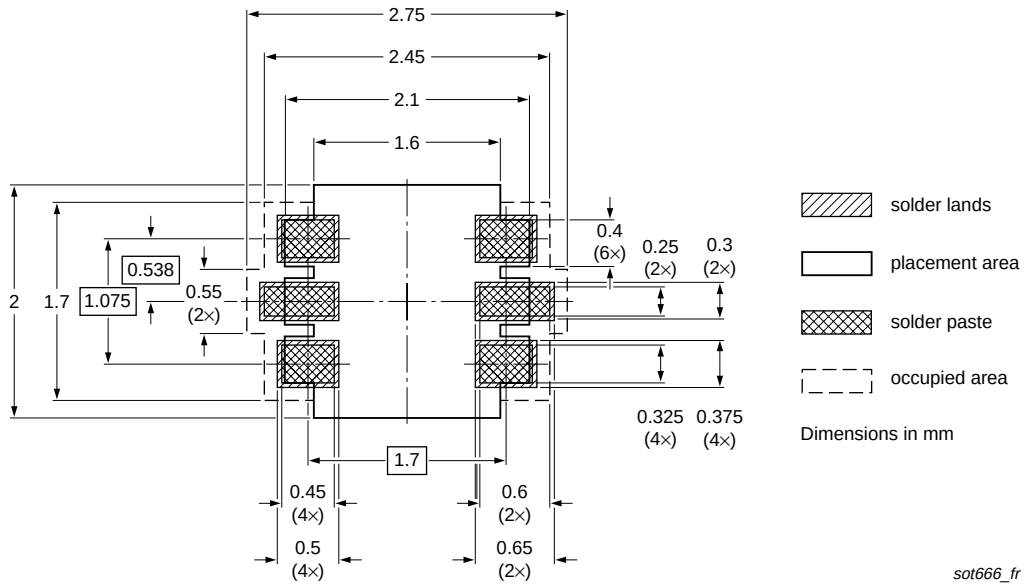


Fig 6. Wave soldering footprint SOT363 (SC-88)

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Reflow soldering is the only recommended soldering method.

Fig 7. Reflow soldering footprint SOT666

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11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PEMB30_PUMB30_2	20090902	Product data sheet	-	PEMB30_PUMB30_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 technical content. • Figure 3 “Package outline SOT363 (SC-88)”: updated • Figure 5 “Reflow soldering footprint SOT363 (SC-88)”: updated • Figure 6 “Wave soldering footprint SOT363 (SC-88)”: updated • Figure 7 “Reflow soldering footprint SOT666”: updated			
PEMB30_PUMB30_1	20060331	Product data sheet	-	-

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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.

[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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