

PEMH30; PUMH30

NPN/NPN double resistor-equipped transistors;
R1 = 2.2 k Ω , R2 = open

Rev. 01 — 28 March 2006

Product data sheet

1. Product profile

1.1 General description

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

Table 1. Product overview

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

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 BC847BS and BC847BV

1.4 Quick reference data

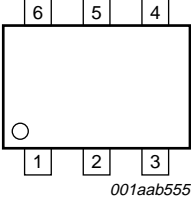
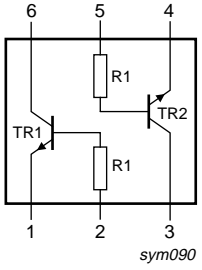
Table 2. Quick reference data

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	k Ω

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		

3. Ordering information

Table 4. Ordering information

Type number	Package		Version
	Name	Description	
PEMH30	-	plastic surface mounted package; 6 leads	SOT666
PUMH30	SC-88	plastic surface mounted package; 6 leads	SOT363

4. Marking

Table 5. Marking codes

Type number	Marking code ^[1]
PEMH30	2S
PUMH30	*B1

[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 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 ≤ 1 ms	-	100	mA	
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C				
	SOT363		[1]	-	200	mW
	SOT666		[1][2]	-	200	mW
Per device						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C				
	SOT363		[1]	-	300	mW
	SOT666		[1][2]	-	300	mW
T _j	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.

[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

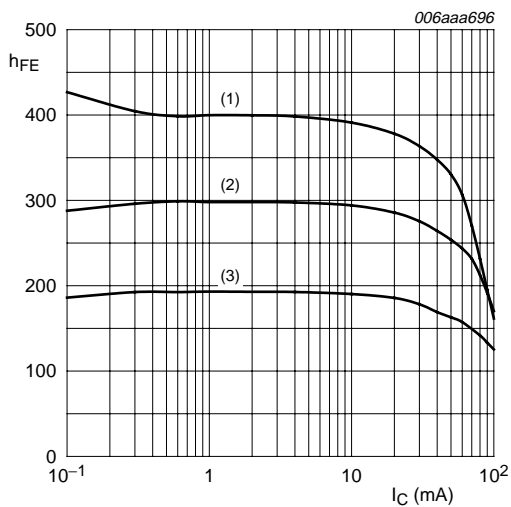
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

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

7. Characteristics

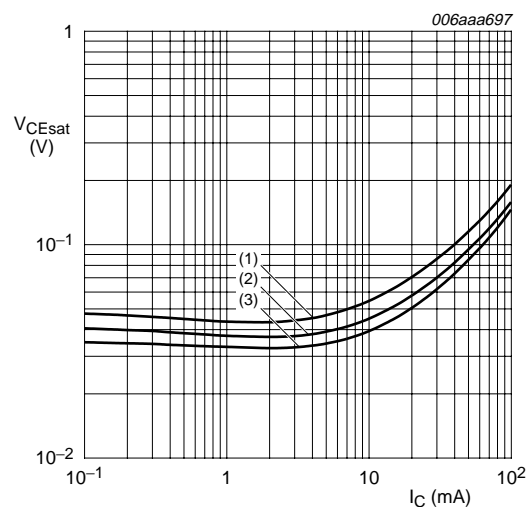
Table 8. Characteristics
T_{amb} = 25 °C unless otherwise specified.

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	-	-	2.5	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

8. Package outline

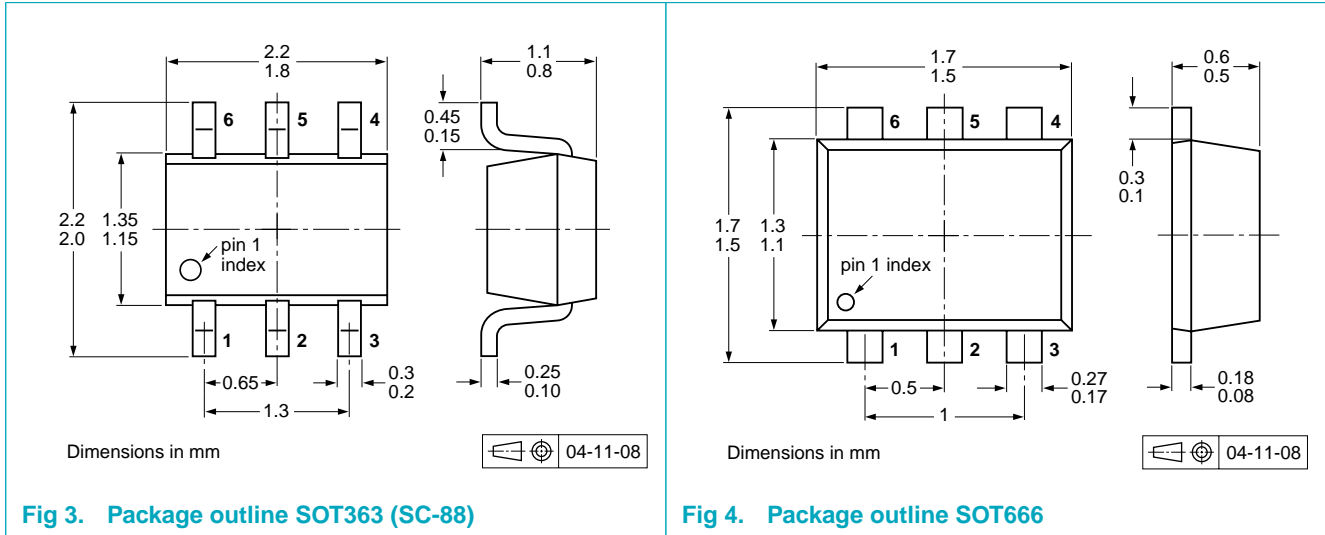


Fig 3. Package outline SOT363 (SC-88)

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
PEMH30	SOT666	2 mm pitch, 8 mm tape and reel	-	-	-315	-
		4 mm pitch, 8 mm tape and reel	-	-115	-	-
PUMH30	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

10. Soldering

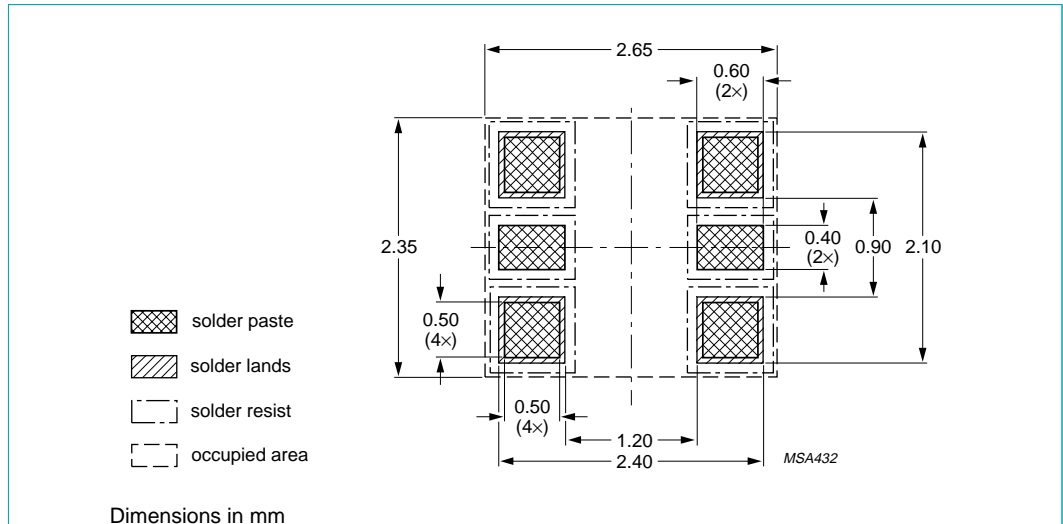


Fig 5. Reflow soldering footprint SOT363 (SC-88)

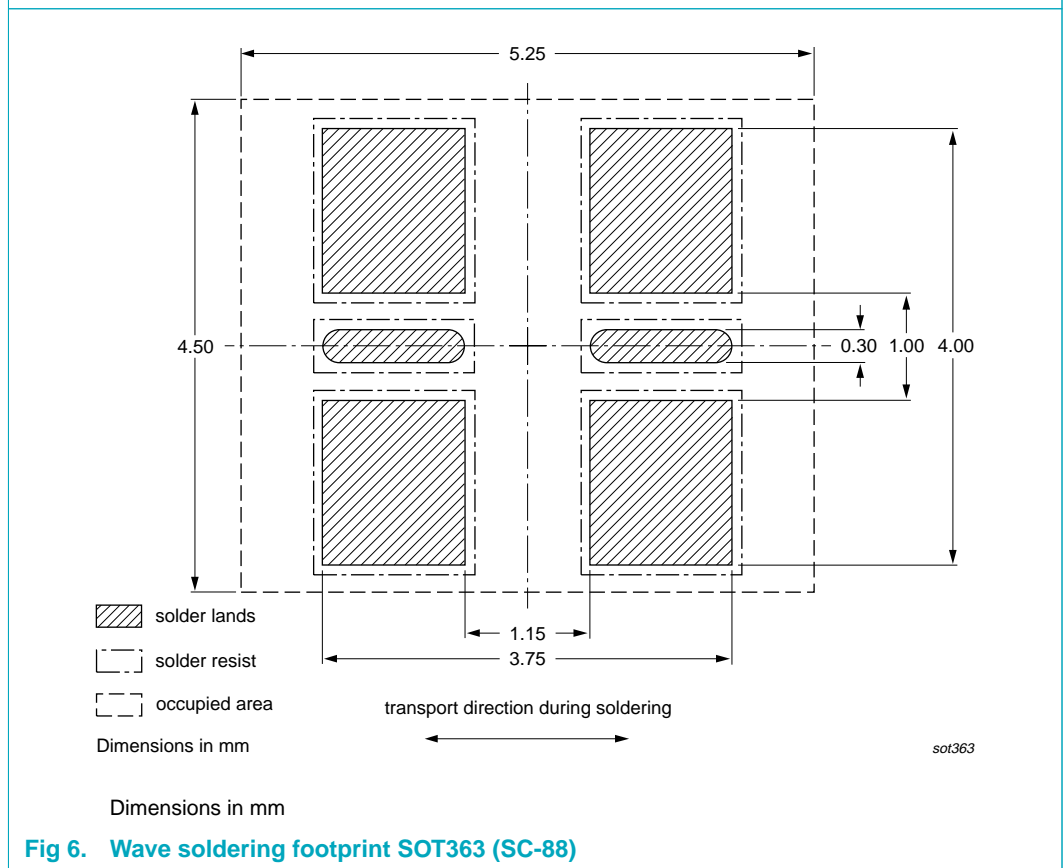
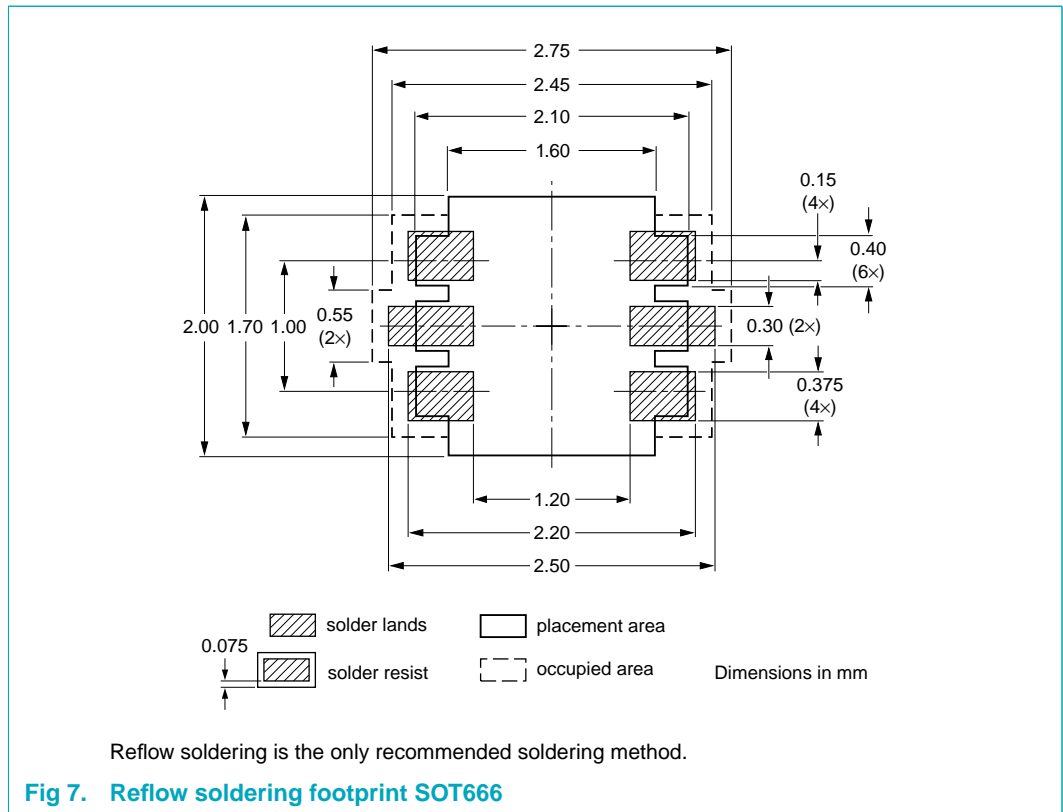


Fig 6. Wave soldering footprint SOT363 (SC-88)



11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PEMH30_PUMH30_1	20060328	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.

[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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.semiconductors.philips.com>.

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