



# PUMX2

## NPN/NPN general-purpose double transistors

Rev. 01 — 10 November 2005

Product data sheet

## 1. Product profile

### 1.1 General description

NPN/NPN general-purpose double transistors in a small SOT363 (SC-88) Surface Mounted Device (SMD) plastic package.

### 1.2 Features

- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs

### 1.3 Applications

- General-purpose switching and amplification

### 1.4 Quick reference data

Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per transistor</b>						
$V_{CEO}$	collector-emitter voltage	open base	-	-	50	V
$I_C$	collector current		-	-	150	mA
$h_{FE}$	DC current gain	$V_{CE} = 6\text{ V}; I_C = 1\text{ mA}$	120	250	560	

## 2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
1	emitter TR1		
2	emitter TR2		
3	base TR2		
4	collector TR2		
5	base TR1		
6	collector TR1		

### 3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
PUMX2	SC-88	plastic surface mounted package; 6 leads	SOT363

### 4. Marking

Table 4: Marking codes

Type number	Marking code <sup>[1]</sup>
PUMX2	Z1*

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

### 5. Limiting values

Table 5: Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
<b>Per transistor</b>					
$V_{CBO}$	collector-base voltage	open emitter	-	60	V
$V_{CEO}$	collector-emitter voltage	open base	-	50	V
$V_{EBO}$	emitter-base voltage	open collector	-	7	V
$I_C$	collector current		-	150	mA
$I_{CM}$	peak collector current	single pulse; $t_p \leq 1$ ms	-	200	mA
$I_{BM}$	peak base current	single pulse; $t_p \leq 1$ ms	-	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	<sup>[1]</sup> -	180	mW
<b>Per device</b>					
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	<sup>[1]</sup> -	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.

## 6. Thermal characteristics

**Table 6: Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per transistor</b>						
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] -	-	694	K/W
<b>Per device</b>						
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] -	-	417	K/W

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

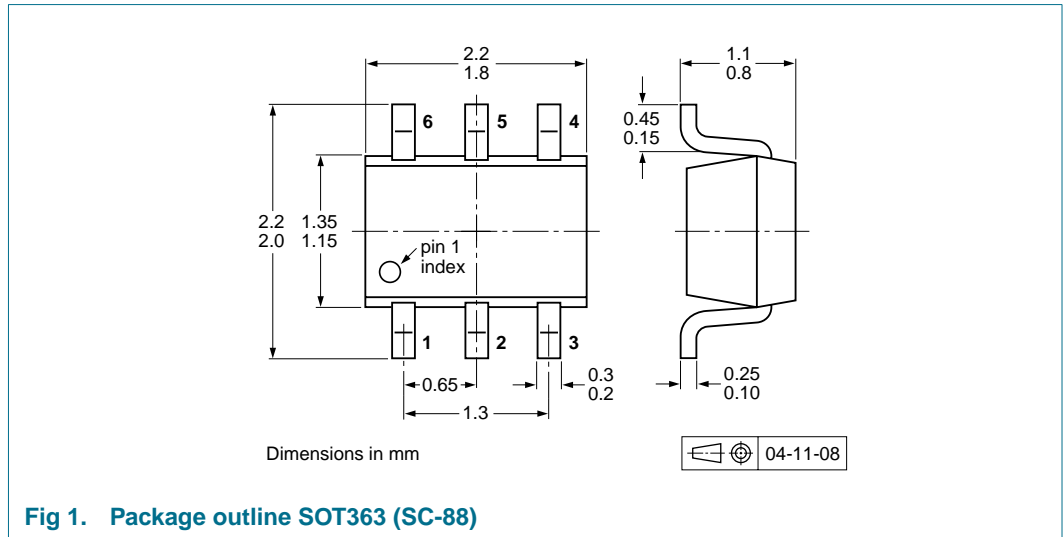
## 7. Characteristics

**Table 7: Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per transistor</b>						
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 60\text{ V}; I_E = 0\text{ A}$	-	-	100	nA
		$V_{CB} = 60\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 7\text{ V}; I_C = 0\text{ A}$	-	-	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 6\text{ V}; I_C = 1\text{ mA}$	120	250	560	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 50\text{ mA}; I_B = 5\text{ mA}$	-	-	250	mV
$f_T$	transition frequency	$V_{CE} = 12\text{ V}; I_E = 2\text{ mA}; f = 100\text{ MHz}$	100	-	-	MHz
$C_c$	collector capacitance	$V_{CB} = 12\text{ V}; I_E = I_e = 0\text{ A}; f = 1\text{ MHz}$	-	-	3	pF

## 8. Package outline



## 9. Packing information

**Table 8: Packing methods**

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

Type number	Package	Description	Packing quantity	
			3000	10000
PUMX2	SOT363	4 mm pitch, 8 mm tape and reel; T1 <a href="#">[2]</a>	-115	-135
		4 mm pitch, 8 mm tape and reel; T2 <a href="#">[3]</a>	-125	-165

[1] For further information and the availability of packing methods, see [Section 16](#).

[2] T1: normal taping

[3] T2: reverse taping

10. Soldering

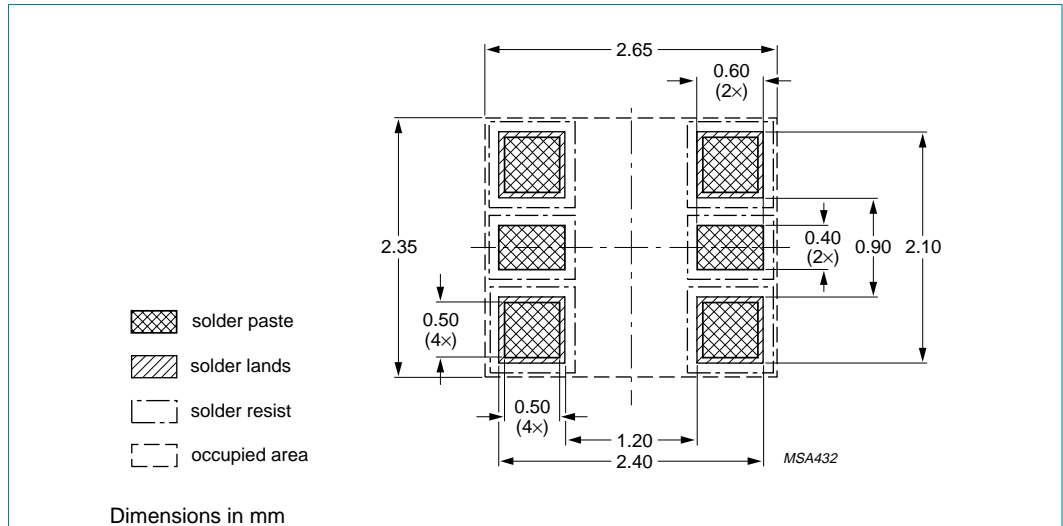


Fig 2. Reflow soldering footprint SOT363 (SC-88)

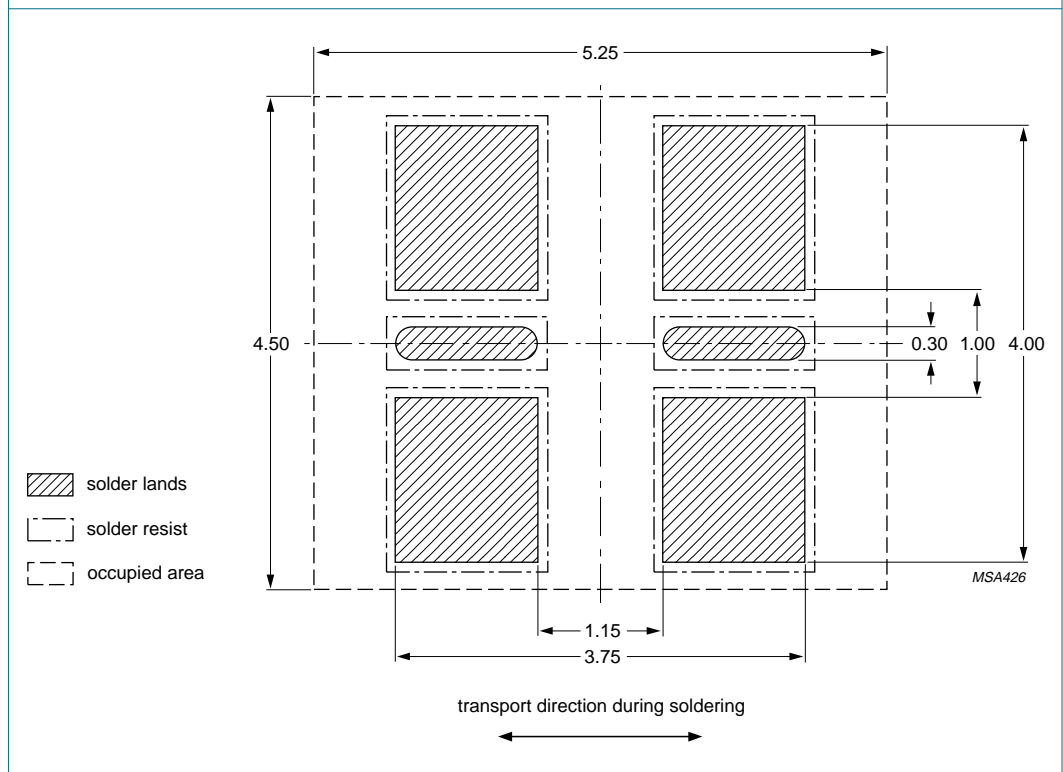


Fig 3. Wave soldering footprint SOT363 (SC-88)

## 11. Revision history

**Table 9:** Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
PUMX2_1	20051110	Product data sheet	-	-	-

## 12. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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