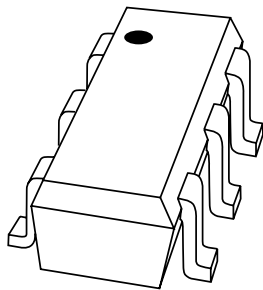


DATA SHEET



PUMF12

**PNP general purpose transistor;
NPN resistor-equipped transistor**

Product specification

2002 Nov 07

PNP general purpose transistor; NPN resistor-equipped transistor

PUMF12

FEATURES

- General purpose transistor and resistor equipped transistor in one package
- 100 mA collector current
- 50 V collector-emitter voltage
- 300 mW total power dissipation
- SOT363 package; replaces two SOT323 (SC-70) packaged devices on same PCB area
- Reduced pick and place costs.

APPLICATIONS

- Power management switch for portable equipment, e.g. cellular phone and CD player
- Switch for regulator.

DESCRIPTION

PNP general purpose transistor and an NPN resistor-equipped transistor in a SOT363 (SC-88) plastic package.

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾
PUMF12	R2*

Note

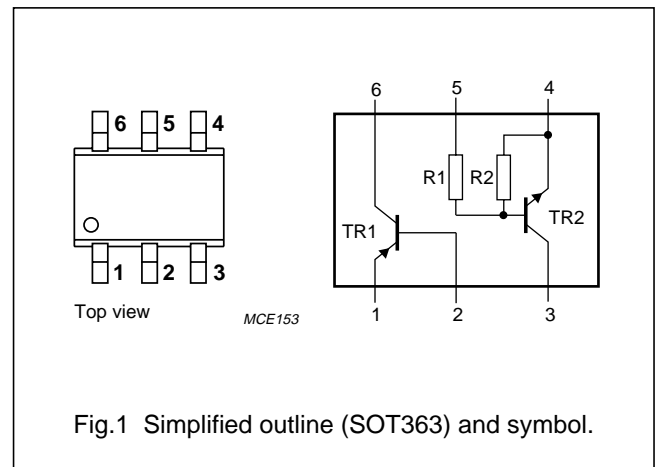
1. * = p: Made in Hong Kong.
* = t: Made in Malaysia.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
TR1 (PNP)			
V_{CEO}	collector-emitter voltage	-50	V
I_C	collector current (DC)	-100	mA
I_{CM}	peak collector current	-200	mA
TR2 (NPN)			
V_{CEO}	collector-emitter voltage	50	V
I_O	output current (DC)	100	mA
R1	bias resistor	22	k Ω
R2	bias resistor	47	k Ω

PINNING

PIN	DESCRIPTION
1, 4	emitter TR1; TR2
2, 5	base TR1; TR2
6, 3	collector TR1; TR2



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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transistor					
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	–	200	mW
T _{stg}	storage temperature range		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C
TR1 (PNP)					
V _{CBO}	collector-base voltage	open emitter	–	–50	V
V _{CEO}	collector-emitter voltage	open base	–	–40	V
V _{EBO}	emitter-base voltage	open collector	–	–5	V
I _C	collector current (DC)		–	–100	mA
I _{CM}	peak collector current		–	–200	mA
TR2 (NPN)					
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
V _i	input voltage				
	positive		–	+40	V
	negative		–	–10	V
I _o	output current (DC)		–	100	mA
I _{CM}	peak collector current		–	100	mA
Per device					
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	–	300	mW

Note

1. Device mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th j-a}	thermal resistance from junction to ambient	note 1	416	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

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CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
TR1 (PNP)						
I _{CBO}	collector cut-off current	V _{CB} = -30 V; I _E = 0	-	-	-100	nA
		V _{CB} = -30 V; I _E = 0; T _j = 150 °C	-	-	-10	μA
I _{EBO}	emitter cut-off current	V _{EB} = -4 V; I _C = 0	-	-	-100	nA
V _{CEsat}	saturation voltage	I _C = -50 mA; I _B = -5 mA; note 1	-	-	-200	mV
h _{FE}	DC current gain	V _{CE} = -6 V; I _C = -1 mA	120	-	-	
C _c	collector capacitance	V _{CB} = -12 V; I _E = i _e = 0; f = 1 MHz	-	-	2.2	pF
f _T	transition frequency	V _{CE} = -12 V; I _C = -2 mA; f = 100 MHz	100	-	-	MHz
TR2 (NPN)						
I _{CBO}	collector-base cut-off current	V _{CB} = 50 V; I _E = 0	-	-	100	nA
I _{CEO}	collector-emitter cut-off current	V _{CE} = 30 V; I _B = 0	-	-	1	μA
		V _{CE} = 30 V; I _B = 0; T _j = 150 °C	-	-	50	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0	-	-	120	μA
h _{FE}	DC current gain	V _{CE} = 5 V; I _C = 5 mA	80	-	-	
V _{CEsat}	saturation voltage	I _C = 10 mA; I _B = 0.5 mA	-	-	150	mV
V _{i(off)}	input off voltage	V _{CE} = 5 V; I _C = 100 μA	-	0.9	0.5	V
V _{i(on)}	input on voltage	V _{CE} = 0.3 V; I _C = 2 mA	2	1.1	-	V
R1	input resistor		15.4	22	28.6	kΩ
$\frac{R2}{R1}$	resistor ratio		1.7	2.1	2.6	
C _c	collector capacitance	V _{CB} = 10 V; I _E = i _e = 0; f = 1 MHz	-	-	2.5	pF

Note

1. Device mounted on an FR4 printed-circuit board.

APPLICATION INFORMATION

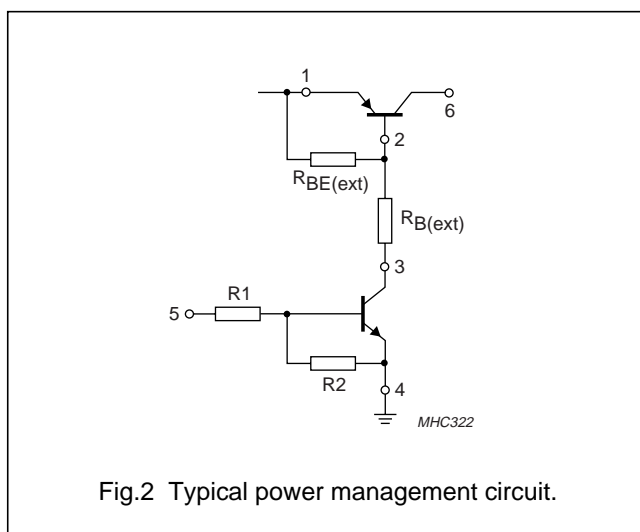


Fig.2 Typical power management circuit.

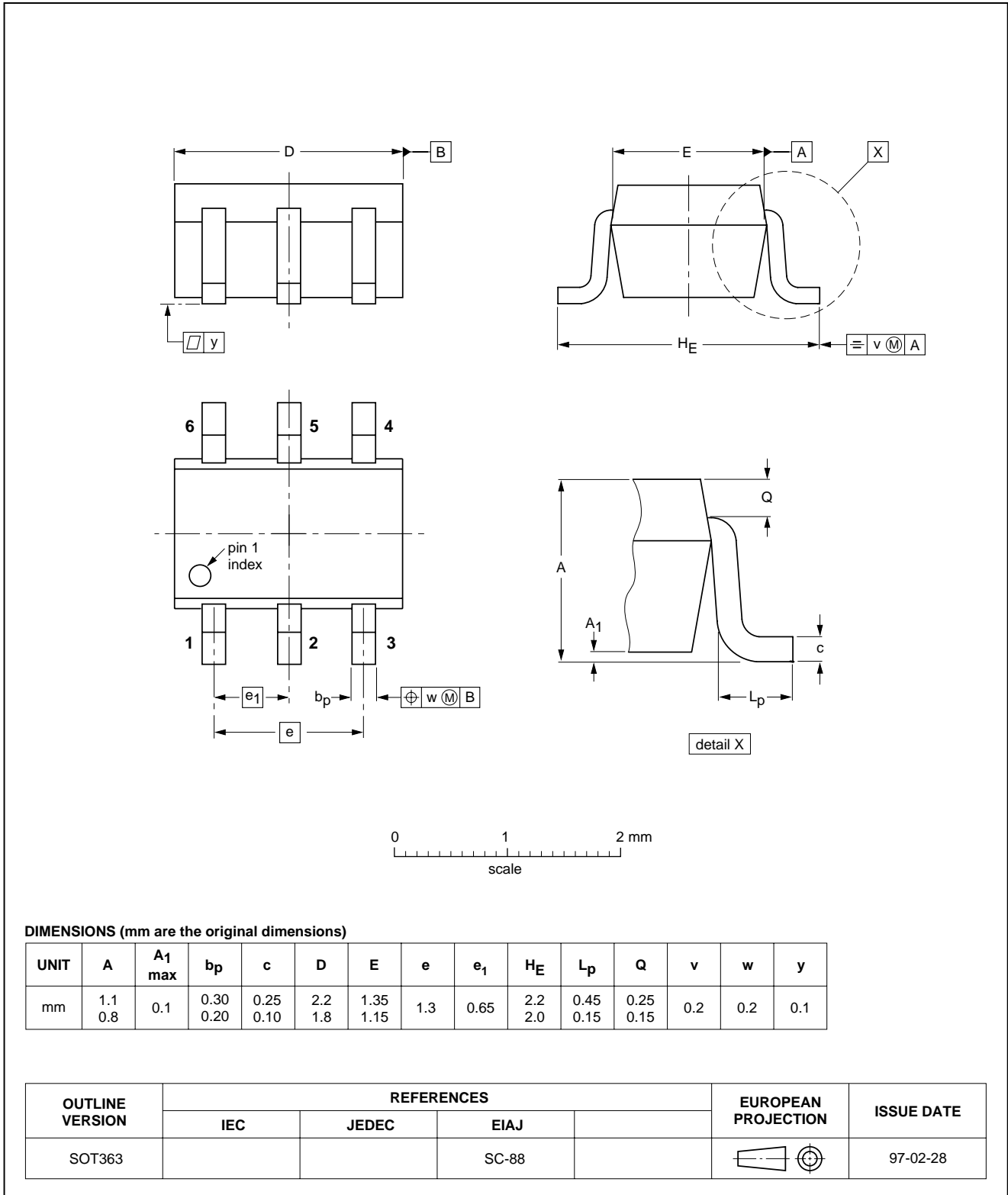
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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT363



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DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	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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III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

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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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NOTES

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Contact information

For additional information please visit <http://www.semiconductors.philips.com>. Fax: +31 40 27 24825

For sales offices addresses send e-mail to: sales.addresses@www.semiconductors.philips.com.

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