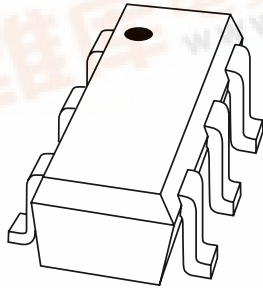


DISCRETE SEMICONDUCTORS

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

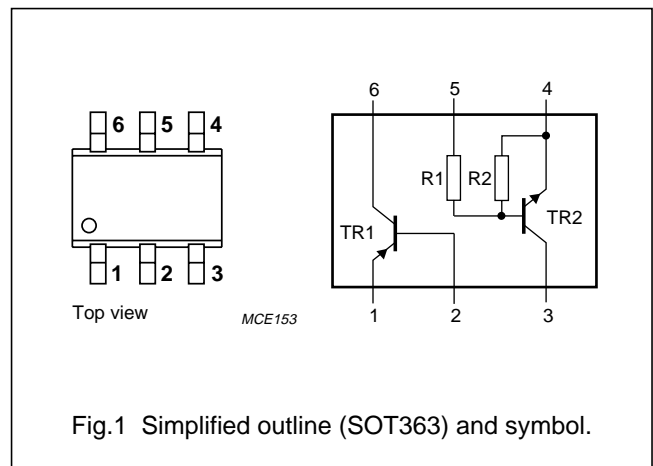
1. * = p: Made in Hong Kong.
* = t: Made in Malaysia.

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	$T_{amb} \leq 25\text{ °C}$; 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	$T_{amb} \leq 25\text{ °C}$; 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

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
TR1 (PNP)						
I_{CBO}	collector cut-off current	$V_{CB} = -30\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = -30\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	–10	μA
I_{EBO}	emitter cut-off current	$V_{EB} = -4\text{ V}; I_C = 0$	–	–	–100	nA
V_{CEsat}	saturation voltage	$I_C = -50\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–	–200	mV
h_{FE}	DC current gain	$V_{CE} = -6\text{ V}; I_C = -1\text{ mA}$	120	–	–	
C_C	collector capacitance	$V_{CB} = -12\text{ V}; I_E = i_e = 0; f = 1\text{ MHz}$	–	–	2.2	pF
f_T	transition frequency	$V_{CE} = -12\text{ V}; I_C = -2\text{ mA}; f = 100\text{ MHz}$	100	–	–	MHz
TR2 (NPN)						
I_{CBO}	collector-base cut-off current	$V_{CB} = 50\text{ V}; I_E = 0$	–	–	100	nA
I_{CEO}	collector-emitter cut-off current	$V_{CE} = 30\text{ V}; I_B = 0$	–	–	1	μA
		$V_{CE} = 30\text{ V}; I_B = 0; T_j = 150\text{ °C}$	–	–	50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	120	μA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 5\text{ mA}$	80	–	–	
V_{CEsat}	saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	–	–	150	mV
$V_{i(off)}$	input off voltage	$V_{CE} = 5\text{ V}; I_C = 100\text{ }\mu\text{A}$	–	0.9	0.5	V
$V_{i(on)}$	input on voltage	$V_{CE} = 0.3\text{ V}; I_C = 2\text{ mA}$	2	1.1	–	V
R1	input resistor		15.4	22	28.6	k Ω
$\frac{R2}{R1}$	resistor ratio		1.7	2.1	2.6	
C_C	collector capacitance	$V_{CB} = 10\text{ V}; I_E = i_e = 0; f = 1\text{ MHz}$	–	–	2.5	pF

Note

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

APPLICATION INFORMATION

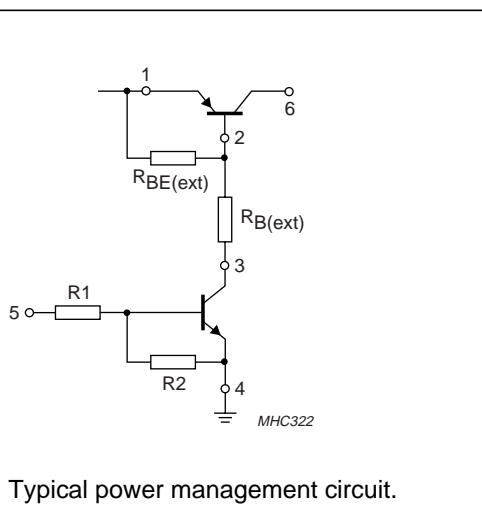


Fig.2 Typical power management circuit.

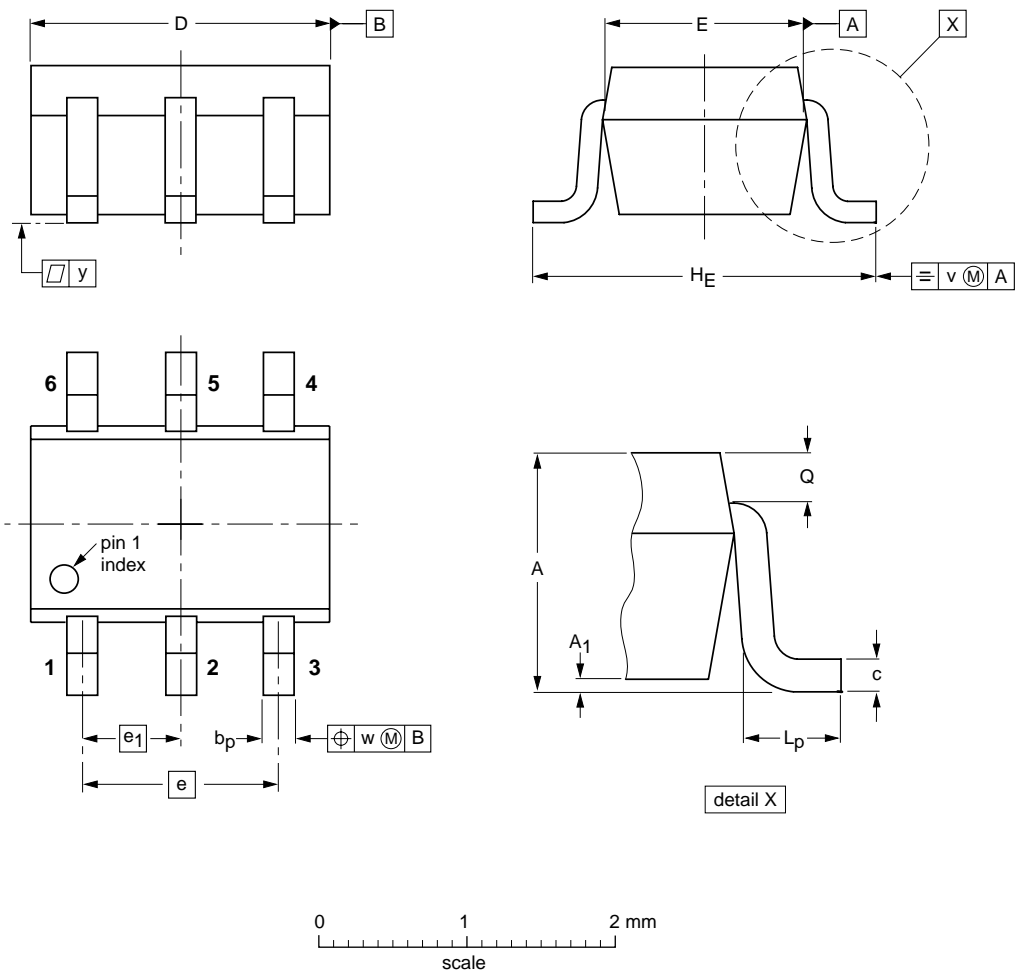
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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A1 max	bp	c	D	E	e	e1	HE	Lp	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT363			SC-88			97-02-28

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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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NOTES

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