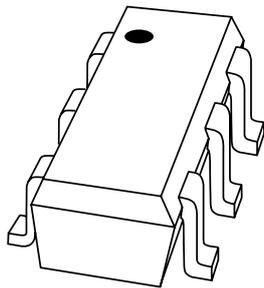


DATA SHEET



PUMF11

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

Product specification

2002 Apr 09

NPN resistor-equipped transistor; PNP general purpose transistor

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FEATURES

- Resistor-equipped transistor and general purpose 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

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

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾
PUMF11	R1*

Note

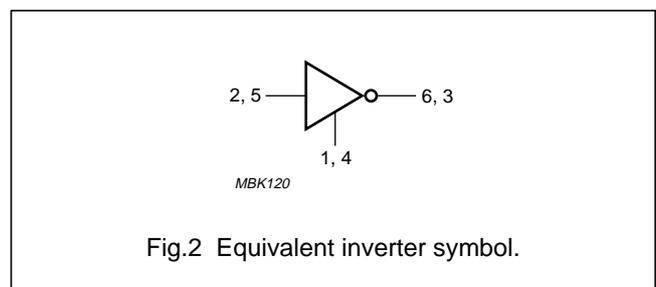
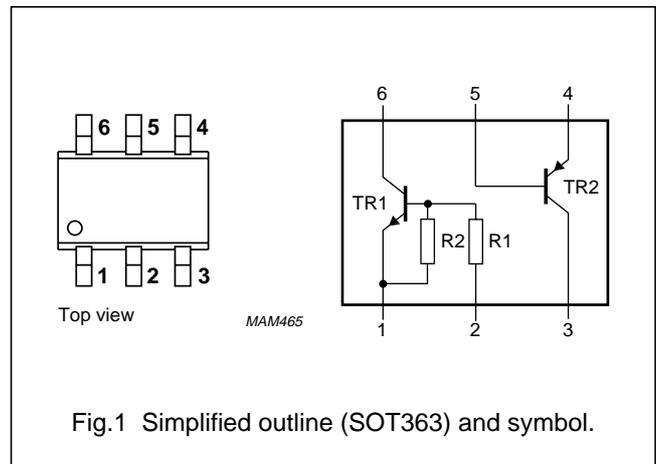
1. * = p: Made in Hong Kong.
* = t: Made in Malaysia.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
TR1 (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
TR2 (PNP)			
V_{CEO}	collector-emitter voltage	50	V
I_C	collector current (DC)	100	mA
I_{CM}	peak collector current	200	mA

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		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C
TR1 (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
TR2 (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
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	in free air; 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 (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	–	–	0.12	mA
h _{FE}	DC current gain	V _{CE} = 5 V; I _C = 5 mA	80	–	–	
V _{CEsat}	collector-emitter 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
TR2 (PNP)						
I _{CBO}	collector-base cut-off current	V _{CB} = –30 V; I _E = 0	–	–	–100	nA
I _{CEO}	collector-emitter cut-off current	V _{CB} = –30 V; I _B = 0; T _j = 150 °C	–	–	–10	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = –4 V; I _C = 0	–	–	–100	nA
h _{FE}	DC current gain	V _{CE} = –6 V; I _C = –1 mA	120	–	–	
V _{CEsat}	saturation voltage	I _C = –50 mA; I _B = –5 mA; note 1	–	–	–200	mV
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

Note

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

APPLICATION INFORMATION

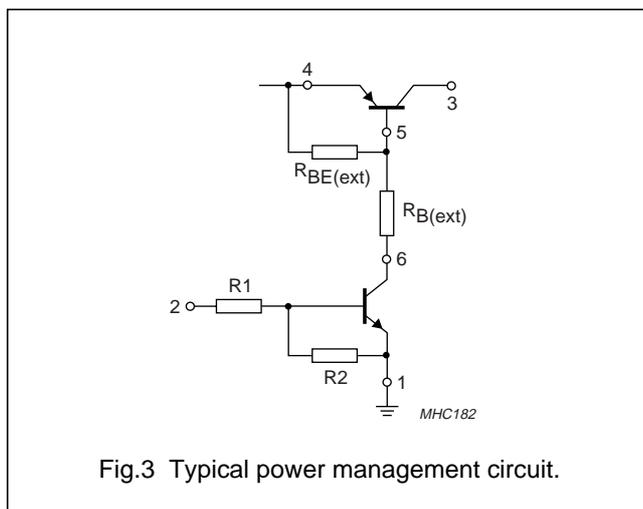


Fig.3 Typical power management circuit.

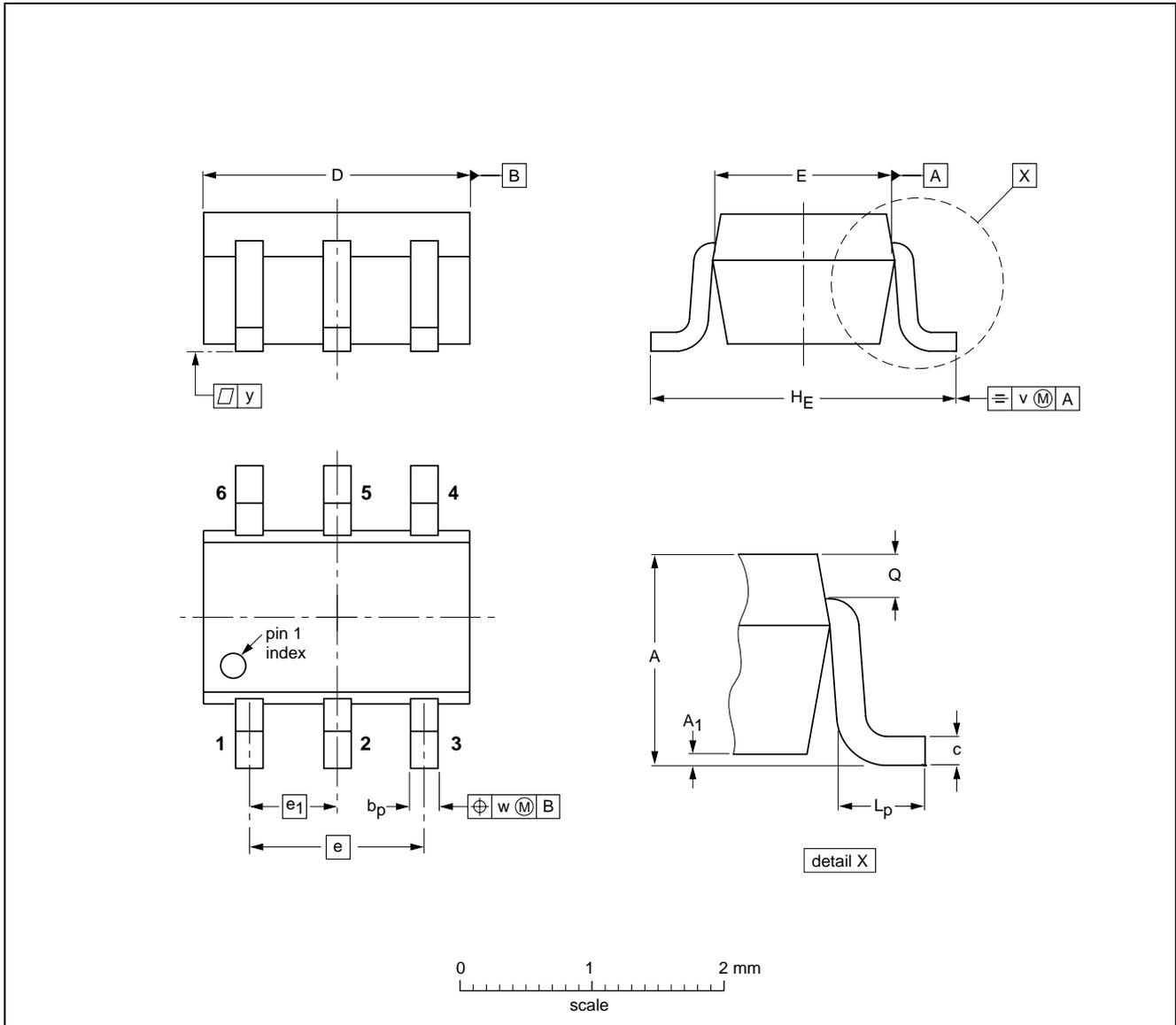
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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	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 ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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