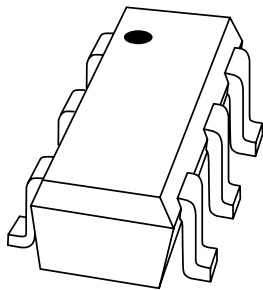


DATA SHEET



PUMF11

NPN resistor-equipped transistor;
PNP general purpose transistor

Product data sheet

2002 Apr 09

NPN resistor-equipped transistor; PNP
general purpose transistor

PUMF11

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

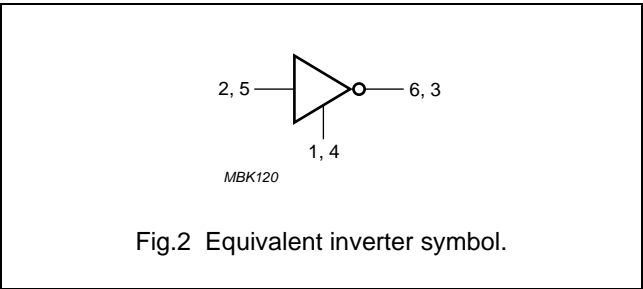
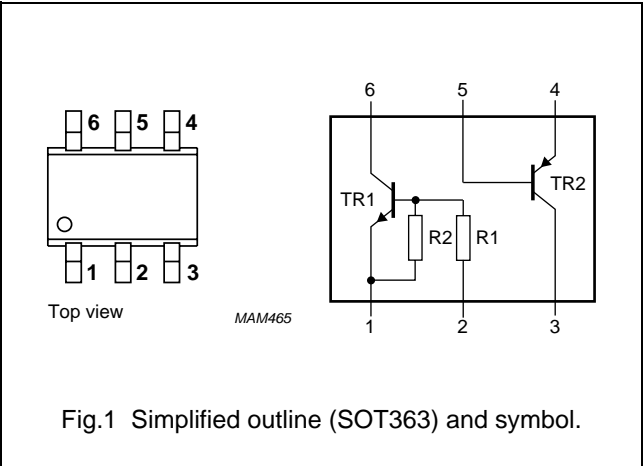
1. * = p: Made in Hong Kong.
* = t: Made in Malaysia.

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	kΩ
R2	bias resistor	47	kΩ
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	$T_{\text{amb}} \leq 25\text{ °C}$; 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	$T_{\text{amb}} \leq 25\text{ °C}$; note 1	—	300	mW

Note

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

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{\text{th j-a}}$	thermal resistance from junction to ambient	in free air; note 1	416	K/W

Note

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

NPN resistor-equipped transistor; PNP general purpose transistor

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CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
TR1 (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
		$V_{CE} = 30\text{ V}; I_B = 0; T_j = 150\text{ }^{\circ}\text{C}$	—	—	50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	—	—	0.12	mA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 5\text{ mA}$	80	—	—	
V_{CEsat}	collector-emitter 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
$\frac{R_2}{R_1}$	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
TR2 (PNP)						
I_{CBO}	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0$	—	—	-100	nA
I_{CEO}	collector-emitter cut-off current	$V_{CB} = -30\text{ V}; I_B = 0; T_j = 150\text{ }^{\circ}\text{C}$	—	—	-10	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -4\text{ V}; I_C = 0$	—	—	-100	nA
h_{FE}	DC current gain	$V_{CE} = -6\text{ V}; I_C = -1\text{ mA}$	120	—	—	
V_{CEsat}	saturation voltage	$I_C = -50\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	—	—	-200	mV
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

Note

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

APPLICATION INFORMATION

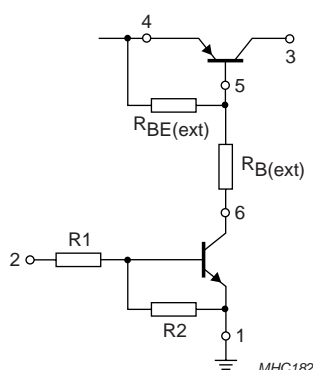


Fig.3 Typical power management circuit.

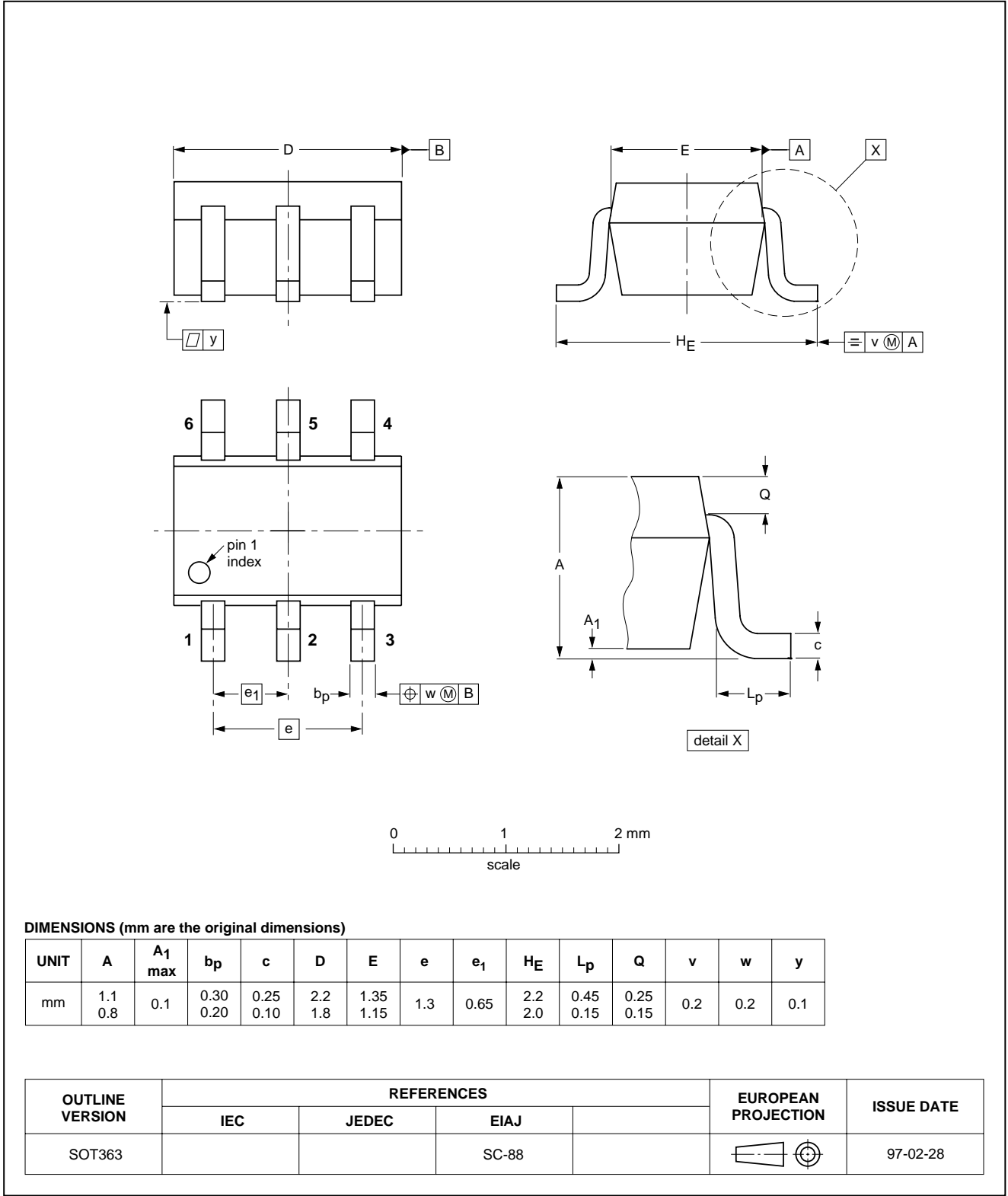
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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT363



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DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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