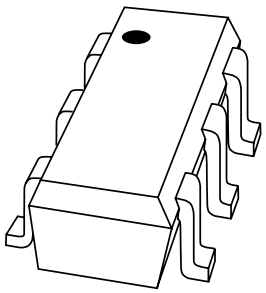
DATA SHEET



PUMF12
PNP general purpose transistor; NPN resistor-equipped transistor

Product data sheet

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	kΩ
R2	bias resistor	47	kΩ

PINNING

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

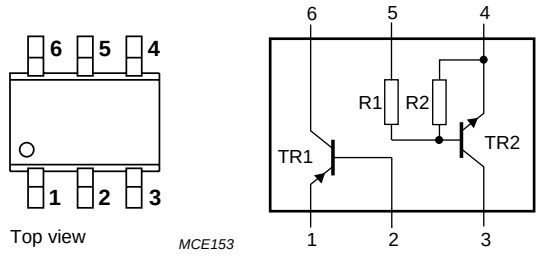


Fig.1 Simplified outline (SOT363) and symbol.

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	$T_{amb} \leq 25$ °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 negative		 – –	 +40 −10	 V V
I_O	output current (DC)		–	100	mA
I_{CM}	peak collector current		–	100	mA
Per device					
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	300	mW

Note

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

THERMAL CHARACTERISTICS

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

Note

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

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

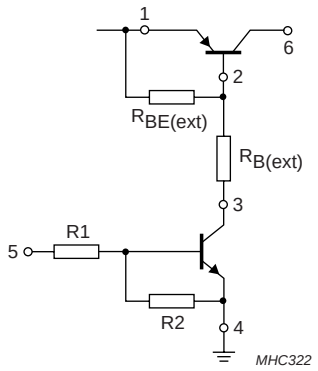
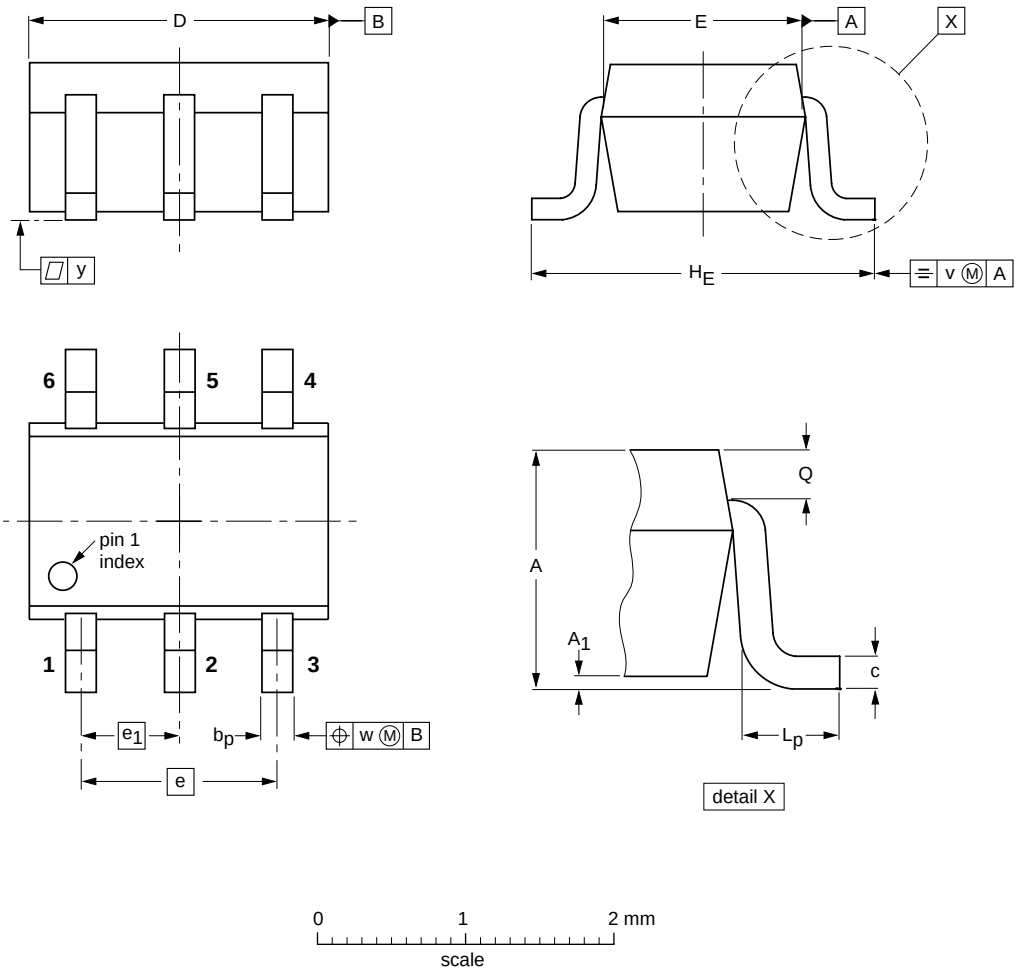


Fig.2 Typical power management circuit.

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

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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