

PUMB11

PNP/PNP resistor-equipped double transistor; R1 = 10 k Ω , R2 = 10 k Ω

1 October 2022

Product data sheet

1. General description

PNP/PNP double Resistor-Equipped Transistor (RET) in a very SOT363 (SC-88) Surface-Mounted Device (SMD) plastic package.

NPN/PNP complement: PUMD3

NPN/NPN complement: PUMH11

2. Features and benefits

- 100 mA output current capability
- Built-in bias resistors
- Simplifies circuit design
- Reduces component count
- Reduces pick and place costs

3. Applications

- Low current peripheral drivers
- Control of IC inputs
- Replaces general-purpose transistors in digital applications

4. Quick reference data

Table 1. Quick reference data							
Symbol	Parameter	Conditions		Min	Тур	Max	Unit
Per transistor			·				
V _{CEO}	collector-emitter voltage	open base		-	-	-50	V
I _O	output current			-	-	-100	mA
R1	bias resistor 1 (input)		[1]	7	10	13	kΩ
R2/R1	bias resistor ratio		[1]	0.8	1	1.2	

[1] See "Section 11: Test information" for resistor calculation and test conditions.

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5. Pinning information

Table 2	2. Pinning info	rmation		
Pin	Symbol	Description	Simplified outline	Graphic symbol
1	GND1	GND (emitter) TR1		O1 I2 GND2
2	11	input (base) TR1		
3	O2	output (collector) TR2		
4	GND2	GND (emitter) TR2		
5	12	input (base) TR2		
6	01	output (collector) TR1		
			TSSOP6 (SOT363)	GND1 11 02
				006aaa212

6. Ordering information

Table 3. Ordering information

Type number	Package	'ackage				
	Name	Description	Version			
PUMB11	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	<u>SOT363</u>			

7. Marking

Table 4. Marking codes	
Type number	Marking code[1]
PUMB11	B%1

[1] % = placeholder for manufacturing site code

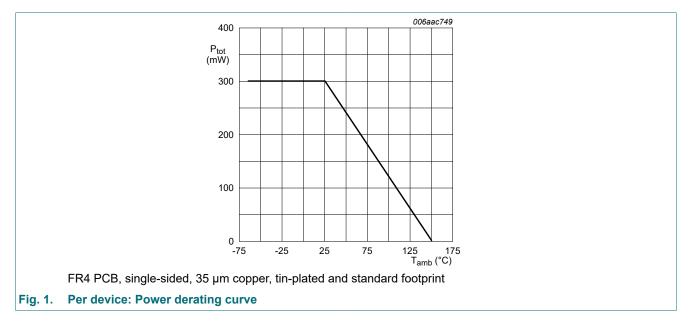
8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per transist	or		I			
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
VI	input voltage	positive		-	10	V
		negative		-	-40	V
I _O	output current			-	-100	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	200	mW
Per device		1	L			
P _{tot}	total power dissipation	T _{amb} = 25 °C	[1]	-	300	mW
Tj	junction temperature			-	150	°C
T _{amb}	ambient temperature			-65	150	°C
T _{stg}	storage temperature			-65	150	°C

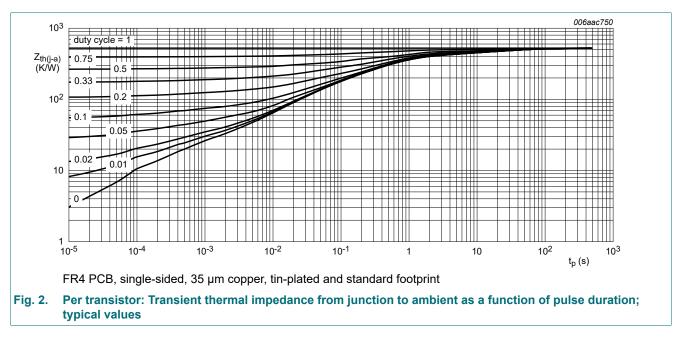
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided, 35 µm copper, tin-plated and standard footprint.



9. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Мах	Unit
Per transist	tor						
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	[1]	-	-	625	K/W
Per device							
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	[1]	-	-	417	K/W

[1] Device mounted on an FR4 PCB, single-sided, 35 µm copper, tin-plated and standard footprint.



10. Characteristics

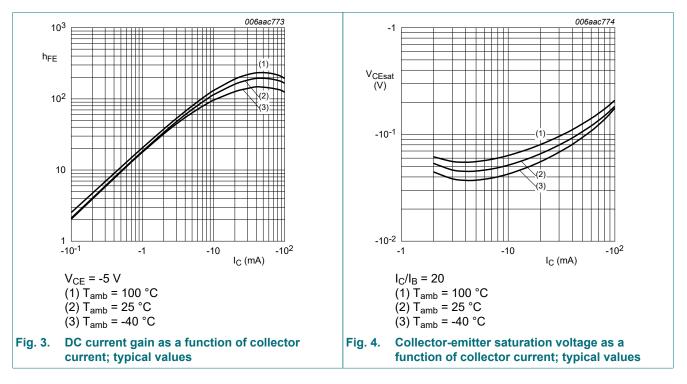
Table 7. Characteristics

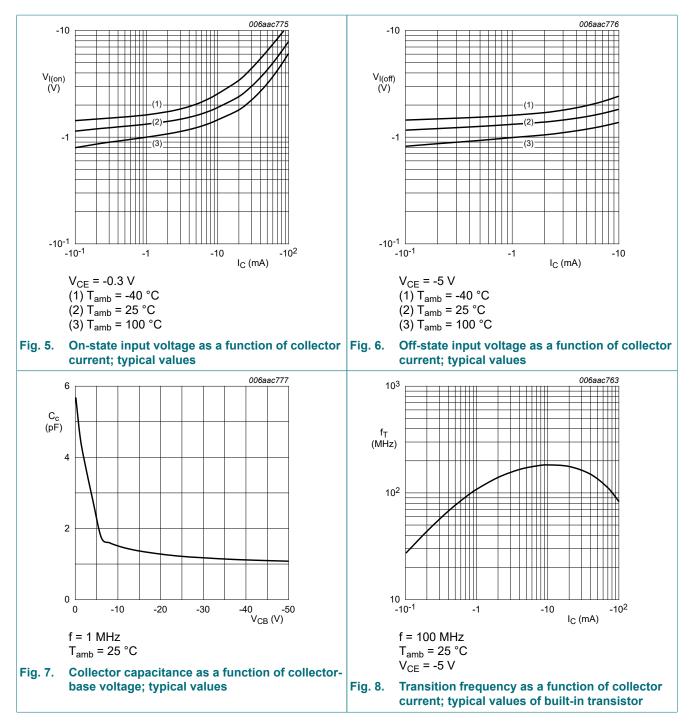
T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
Per transist	or	1		I			
V _{(BR)CBO}	collector-base breakdown voltage	I _C = -100 μA; I _E = 0 A		-50	-	-	V
V _{(BR)CEO}	collector-emitter breakdown voltage	I _C = -2 mA; I _B = 0 A		-50	-	-	V
I _{CBO}	collector-base cut-off current	V _{CB} = -50 V; I _E = 0 A		-	-	-100	nA
I _{CEO} collector-emitter cut-off current	collector-emitter cut-off	V _{CE} = -30 V; I _B = 0 A		-	-	-1	μA
	V _{CE} = -30 V; I _B = 0 A; T _j = 150 °C		-	-	-5	μA	
I _{EBO}	emitter-base cut-off current	V _{EB} = -5 V; I _C = 0 A		-	-	-400	μΑ
h _{FE}	DC current gain	V _{CE} = -5 V; I _C = -5 mA		-30	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = -10 mA; I _B = -0.5 mA		-	-	-100	mV
V _{I(off)}	off-state input voltage	V _{CE} = -5 V; I _C = -100 μA		-	-1.1	-0.8	V
V _{I(on)}	on-state input voltage	V _{CE} = -0.3 V; I _C = -10 mA		-2.5	-1.8	-	V
R1	bias resistor 1 (input)		[1]	7	10	13	kΩ
R2/R1	bias resistor ratio		[1]	0.8	1	1.2	
C _c	collector capacitance	V _{CB} = -10 V; I _E = 0 A; i _e = 0 A; f = 1 MHz		-	-	3	pF
f _T	transition frequency	V _{CE} = -5 V; I _C = -10 mA; f = 100 MHz	[2]	-	180	-	MHz

[1] See "Section 11: Test information" for resistor calculation and test conditions.

[2] Characteristics of built-in transistor





11. Test information

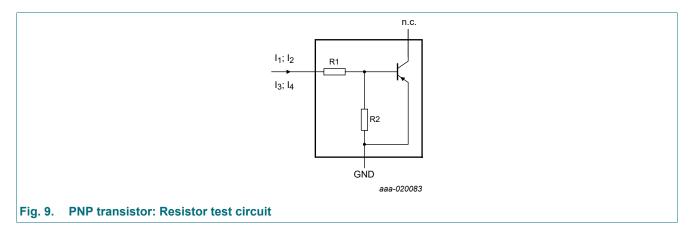
Resistor calculation

Calculation of bias resistor 1 (R1) •

$$R_{1} = \frac{V(I_{2}) - V(I_{1})}{I_{2} - I_{1}}$$

Calculation of bias resistor ratio (R2/R1) •

$$\frac{R2}{R1} = \frac{V(I_4) - V(I_3)}{R1 \cdot (I_4 - I_3)} - 1$$

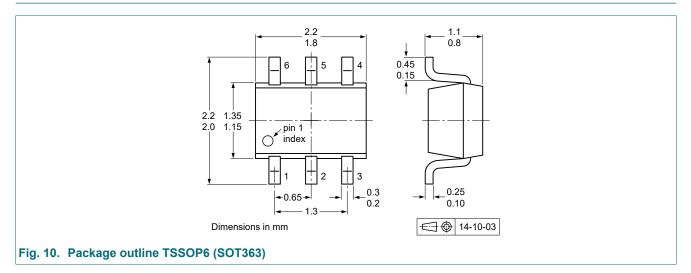


Resistor test conditions

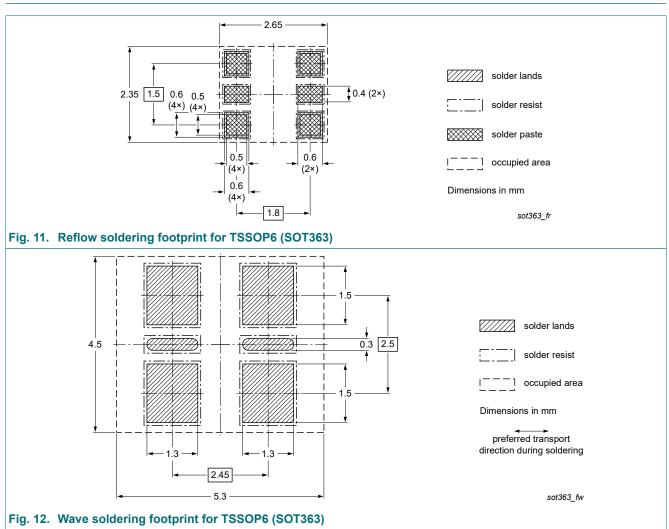
Table 8. Resistor test conditions

PUMB11	R1 (kΩ)	R2 (kΩ)	Test conditions			
			I ₁	l ₂	l ₃	I ₄
TR1 (PNP)	10	10	-350 µA	-450 µA	350 µA	450 µA
TR2 (PNP)	10	10	-350 µA	-450 μA	350 µA	450 µA

12. Package outline



13. Soldering



14. Revision history

Table 9. Revision histo	ry			
Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PUMB11 v.5	20221001	Product data sheet	-	PEMB11_PUMB11 v.4
Modifications:	Nexperia.Legal texts have beeFamily data sheet re	()	mpany name where appr I sheet.	opriate.
PEMB11_PUMB11 v.4	20111130	Product data sheet	-	PEMB11_PUMB11 v.3
PEMB11_PUMB11 v.3	20031003	Product data sheet	-	PUMB11 v.2
PUMB11 v.2	20010913	Preliminary specification	-	PUMB11 v.1
PUMB11 v.1	20000808	Product specification	-	-

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

 Please consult the most recently issued document before initiating or completing a design.

- [2] The term 'short data sheet' is explained in section "Definitions".
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