PUMZ1

NPN/PNP general purpose transistor

21 November 2024 Product data sheet

1. General description

Two independently operating NPN/PNP general-purpose double transistors in a very small SOT363 (SC-88) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Low current (max. 100 mA)
- Low voltage (max. 40 V)
- Reduces number of components and boardspace.
- AEC-Q101 qualified

3. Applications

- General purpose switching and amplification

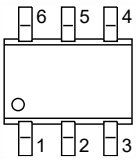
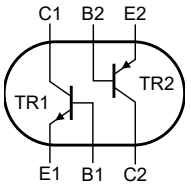
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity							
V_{CEO}	collector-emitter voltage	open base		-	-	40	V
I_C	collector current			-	-	100	mA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E1	emitter TR1	 **TSSOP6 (SOT363)**	 *sym019*
2	B1	base TR1		
3	C2	collector TR2		
4	E2	emitter TR2		
5	B2	base TR2		
6	C1	collector TR1		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PUMZ1	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	SOT363

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PUMZ1	F%Z

[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 transistor; for the PNP transistor with negative polarity						
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			-	100	mA
I_{CM}	peak collector current			-	200	mA
I_{BM}	peak base current			-	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C		-	200	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	300	mW

[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	-	-	416	K/W

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

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor; for the PNP transistor with negative polarity							
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0 A; T_{amb} = 25 °C		-	-	100	nA
		V_{CB} = 30 V; I_E = 0 A; T_j = 150 °C		-	-	10	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 4 V; I_C = 0 A; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 6 V; I_C = 1 mA; T_{amb} = 25 °C		120	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 50 mA; I_B = 5 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	200	mV
C_c	collector capacitance	V_{CB} = 12 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C; TR1		-	-	1.5	pF
		V_{CB} = 12 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C; TR2		-	-	2.2	pF
f_T	transition frequency	V_{CE} = 12 V; I_C = 2 mA; f = 100 MHz; T_{amb} = 25 °C		100	-	-	MHz

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

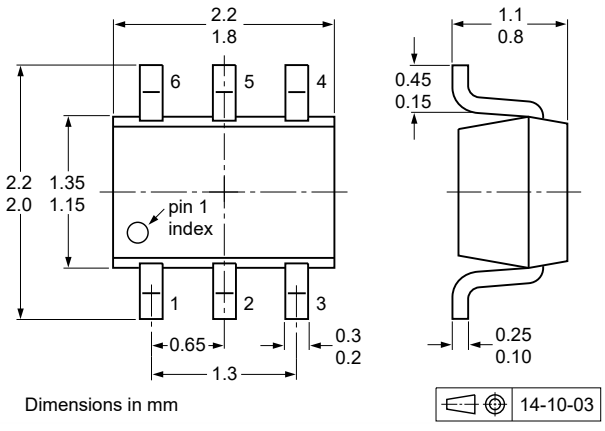


Fig. 1. Package outline TSSOP6 (SOT363)

13. Soldering

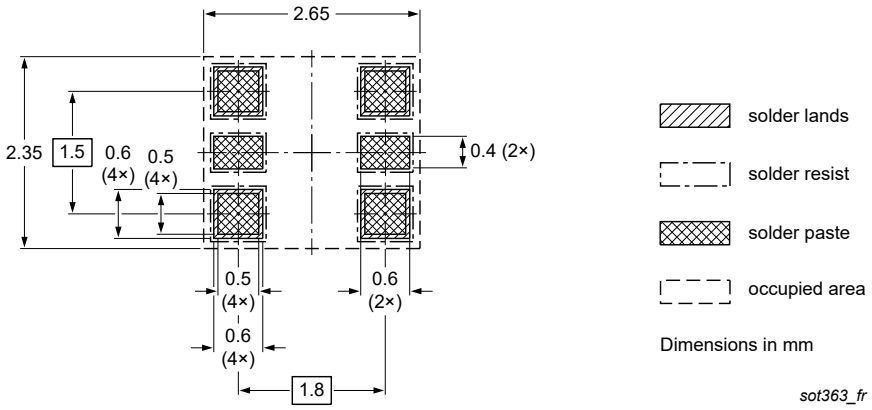


Fig. 2. Reflow soldering footprint for TSSOP6 (SOT363)

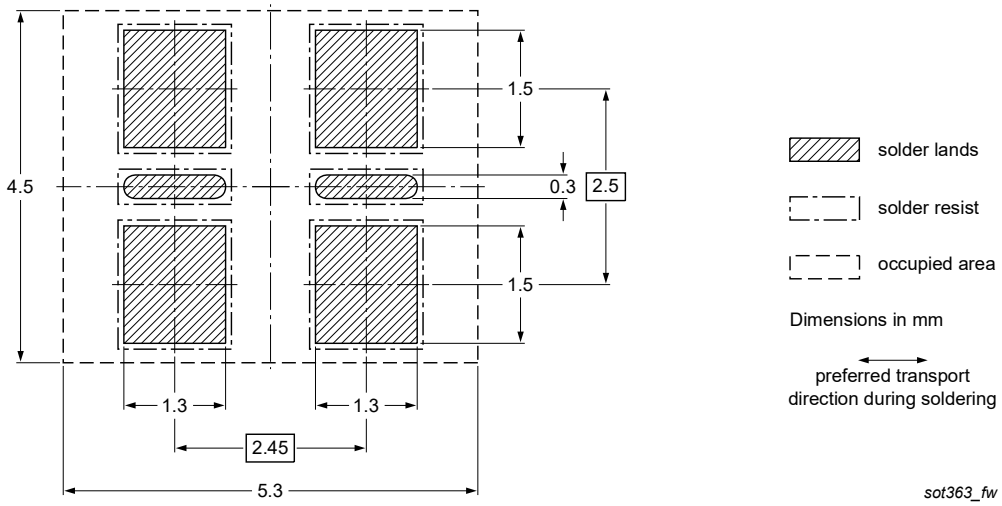


Fig. 3. Wave soldering footprint for TSSOP6 (SOT363)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PUMZ1 v.3	20241121	Product data sheet	-	PUMZ1 v.2
Modification:	• Family data sheet reduced to single type data sheet.			
PUMZ1 v.2	20041015	Product data sheet	-	PUMZ1 v.1
PUMZ1 v.1	20020506	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.

[1] 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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Date of release: 21 November 2024

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