



PUMX1

40 V, 100 mA NPN/NPN general-purpose transistor

4 December 2024

Product data sheet

1. General description

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

2. Features and benefits

- Double general-purpose transistor
- Board-space reduction
- Very small SMD plastic package
- AEC-Q101 qualified

3. Applications

- General-purpose switching and amplification

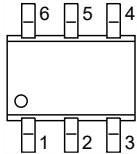
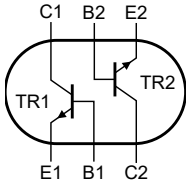
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
V_{CE0}	collector-emitter voltage	open base	-	-	40	V
I_C	collector current		-	-	100	mA
h_{FE}	DC current gain	$V_{CE} = 6\text{ V}$; $I_C = 1\text{ mA}$; $T_{amb} = 25\text{ °C}$	120	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E1	emitter TR1	 TSSOP6 (SOT363)	 sym020
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
PUMX1	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]
PUMX1	Z%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						
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	single pulse		-	200	mA
I _{BM}	peak base current			-	200	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C		-	200	mW
Per device						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	300	mW
T _j	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 copper, tin-plated and standard footprint.

9. Thermal characteristics

Table 6. Thermal characteristics

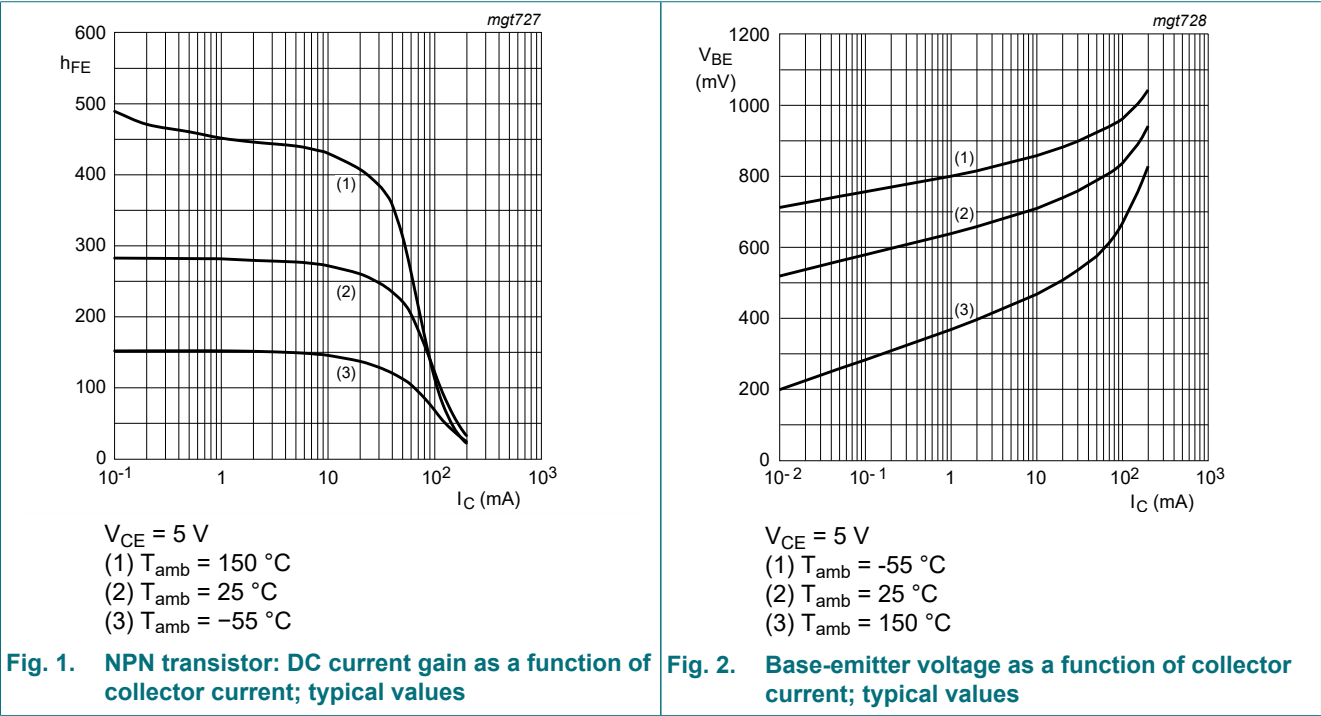
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
R _{th(j-a)}	thermal resistance from junction to ambient	in free air	[1]	-	-	416	K/W

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

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per transistor						
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 ≤ 300 µs; δ ≤ 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	-	-	1.5	pF
f _T	transition frequency	V _{CE} = 12 V; I _C = 2 mA; f = 100 MHz; T _{amb} = 25 °C	100	-	-	MHz



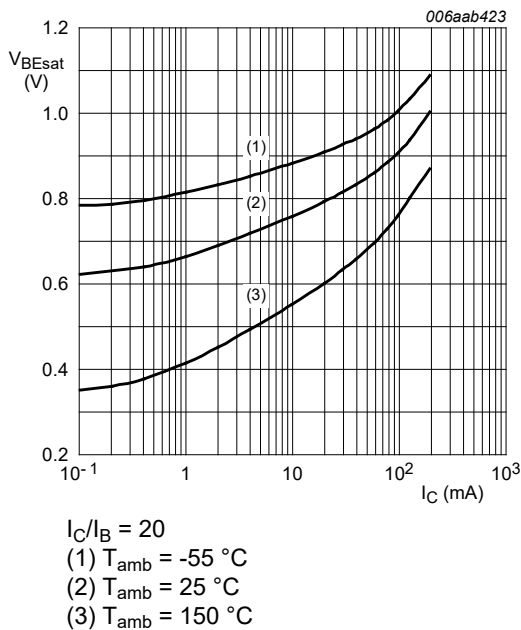


Fig. 3. Base-emitter saturation voltage as a function of collector current; typical values

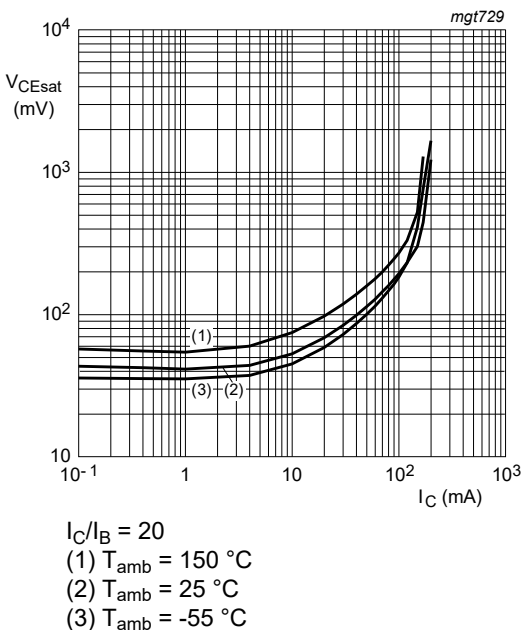


Fig. 4. Collector-emitter saturation voltage as a function of collector current; typical values

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

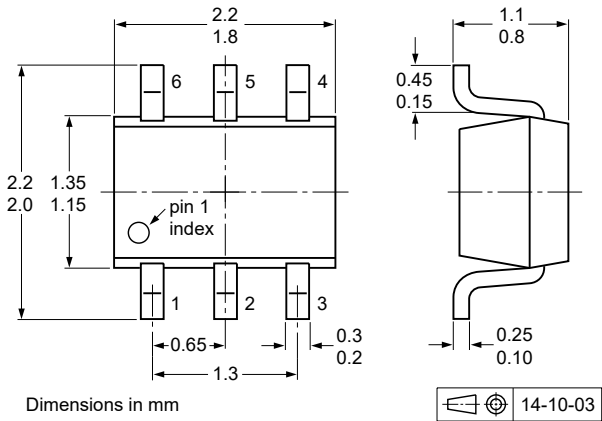


Fig. 5. Package outline TSSOP6 (SOT363)

13. Soldering

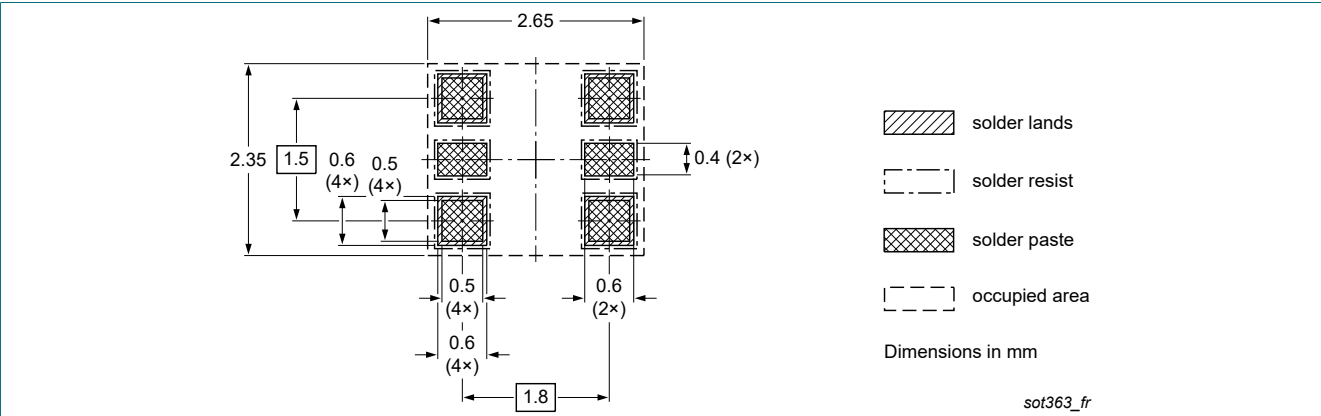


Fig. 6. Reflow soldering footprint for TSSOP6 (SOT363)

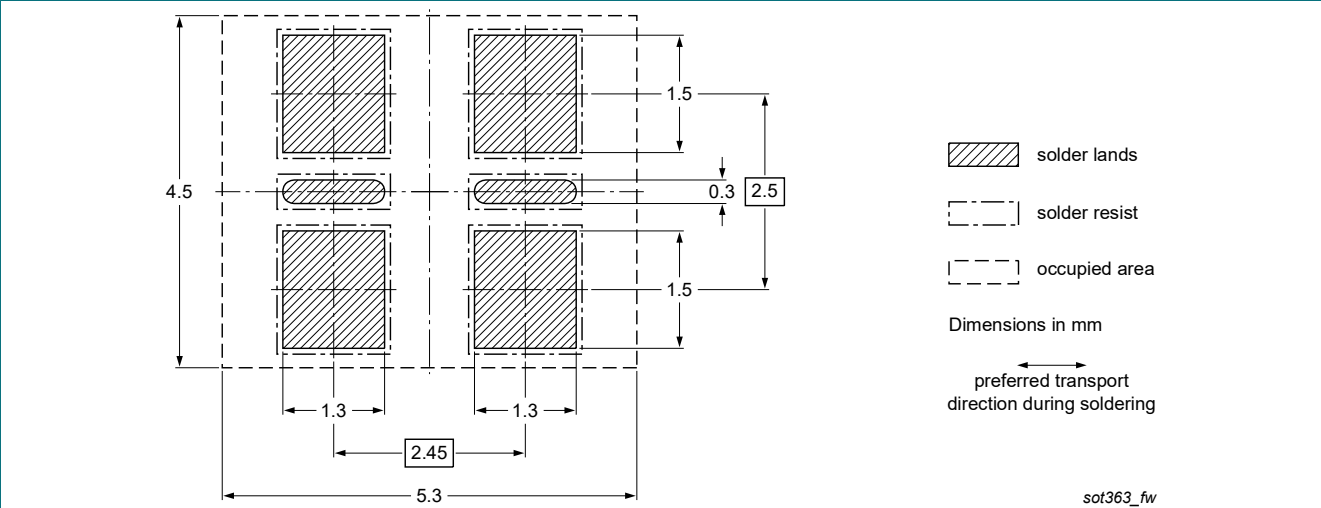


Fig. 7. Wave soldering footprint for TSSOP6 (SOT363)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PUMX1 v.5	20241204	Product data sheet	-	PUMX1 v.4
Modifications:	• Characteristics: Figures 1 - 4 added			
PUMX1 v.4	20100120	Product data sheet	-	PUMX1 v.3
PUMX1 v.3	19990414	Preliminary specification	-	PUMX1 v.2
PUMX1 v.2	19970709	Preliminary specification	-	PUMX1 v.1

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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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