



PDTA124XT

PNP resistor-equipped transistor; R1 = 22 k Ω , R2 = 47 k Ω

18 October 2024

Product data sheet

1. General description

PNP Resistor-Equipped Transistor (RET) in a small SOT23 Surface-Mounted Device (SMD) plastic package.

NPN complement: PDTC124XT

2. Features and benefits

- Built-in bias resistors
- Simplifies circuit design
- 100 mA output current capability
- Reduces component count
- Reduces pick and place costs
- AEC-Q101 qualified

3. Applications

- Digital applications
- Cost-saving alternative for BC857 series in digital applications
- Control of IC inputs
- Switching loads

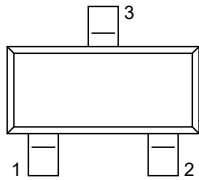
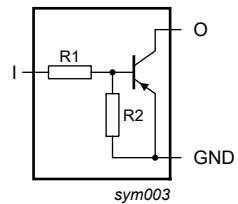
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CEO}	collector-emitter voltage	open base	-	-	-50	V
I _O	output current		-	-	-100	mA
R1	bias resistor 1 (input)	T _{amb} = 25 °C	15.4	22	28.6	k Ω
R2/R1	bias resistor ratio		1.7	2.1	2.6	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	I	input (base)	 SOT23	 sym003
2	G	GND (emitter)		
3	O	output (collector)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PDTA124XT	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PDTA124XT	%47

[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
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	-	-7	V
V_I	input voltage		-40	7	V
I_O	output current		-	-100	mA
I_{CM}	peak collector current		-	-100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	250	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

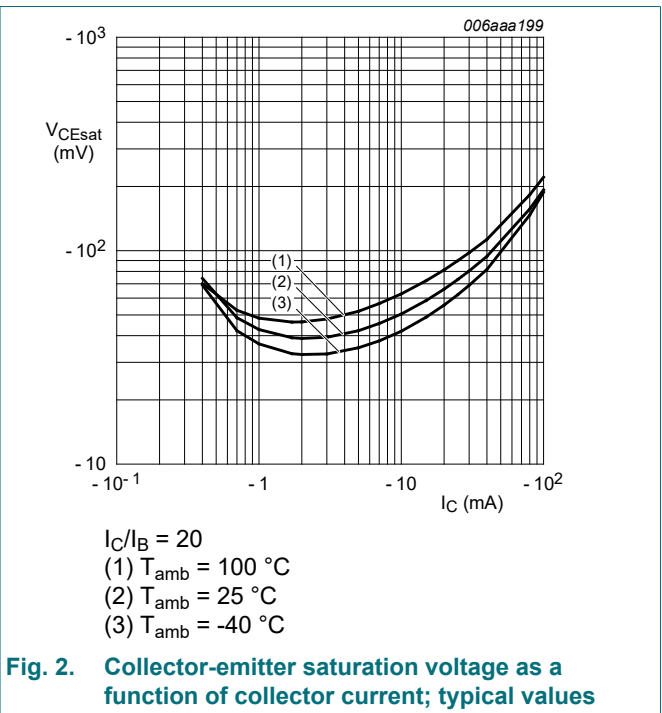
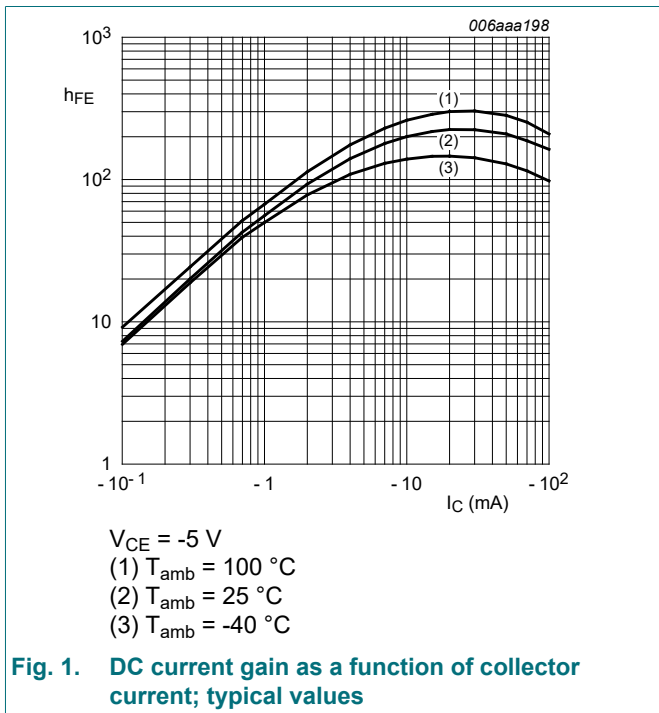
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	$T_{amb} \leq 25\text{ °C}$	[1]	-	500	K/W

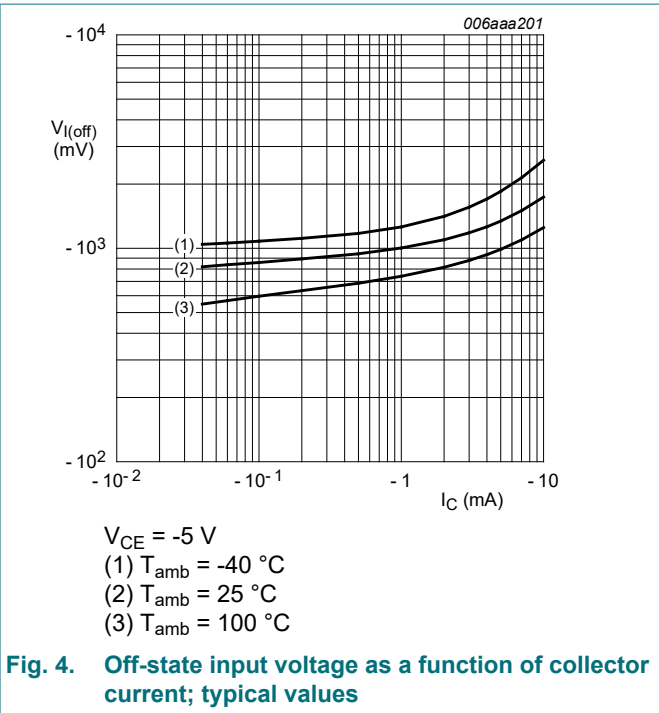
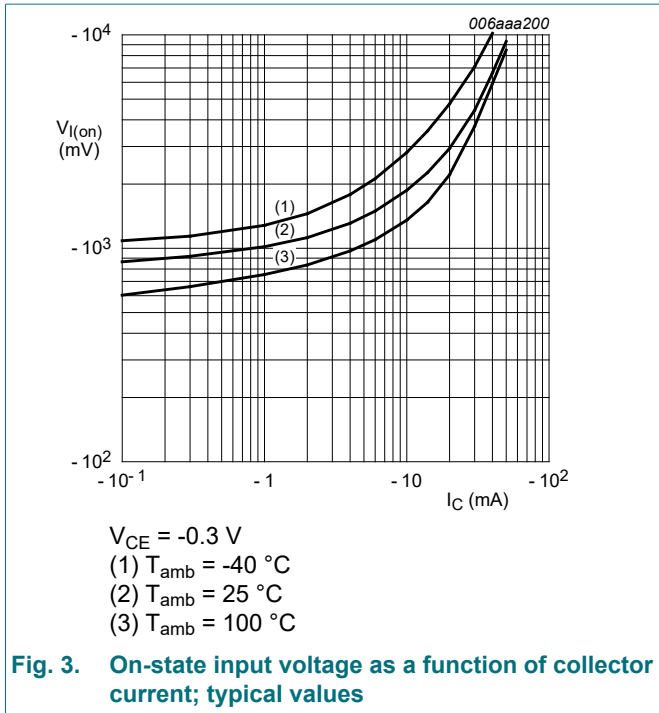
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	$V_{CB} = -50\text{ V}; I_E = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-100	nA
I_{CEO}	collector-emitter cut-off current	$V_{CE} = -30\text{ V}; I_B = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-100	nA
		$V_{CE} = -30\text{ V}; I_B = 0\text{ A}; T_j = 150\text{ °C}$	-	-	-5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0\text{ A}; T_{amb} = 25\text{ °C}$	-	-	-120	μA
h_{FE}	DC current gain	$V_{CE} = -5\text{ V}; I_C = -5\text{ mA}; T_{amb} = 25\text{ °C}$	80	-	-	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; T_{amb} = 25\text{ °C}$	-	-	-150	mV
$V_{I(off)}$	off-state input voltage	$V_{CE} = -5\text{ V}; I_C = -100\text{ μA}; T_{amb} = 25\text{ °C}$	-	-0.8	-0.5	V
$V_{I(on)}$	on-state input voltage	$V_{CE} = -0.3\text{ V}; I_C = -2\text{ mA}; T_{amb} = 25\text{ °C}$	-2	-1.1	-	V
R1	bias resistor 1 (input)	$T_{amb} = 25\text{ °C}$	15.4	22	28.6	kΩ
R2/R1	bias resistor ratio		1.7	2.1	2.6	
C_c	collector capacitance	$V_{CB} = -10\text{ V}; I_E = 0\text{ A}; i_e = 0\text{ A}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$	-	-	3	pF



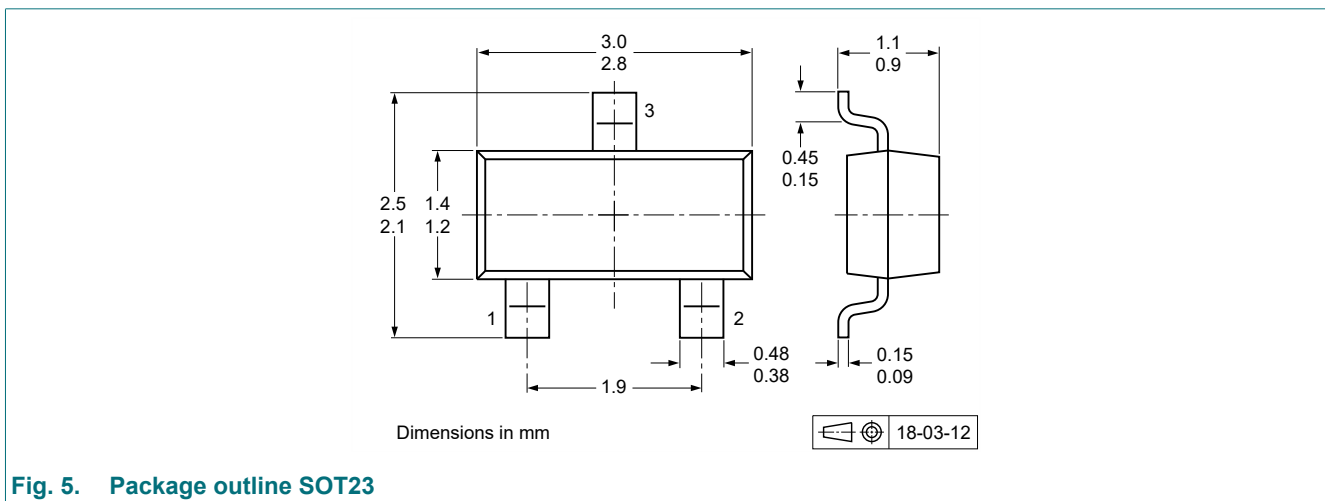


11. Test information

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



13. Soldering

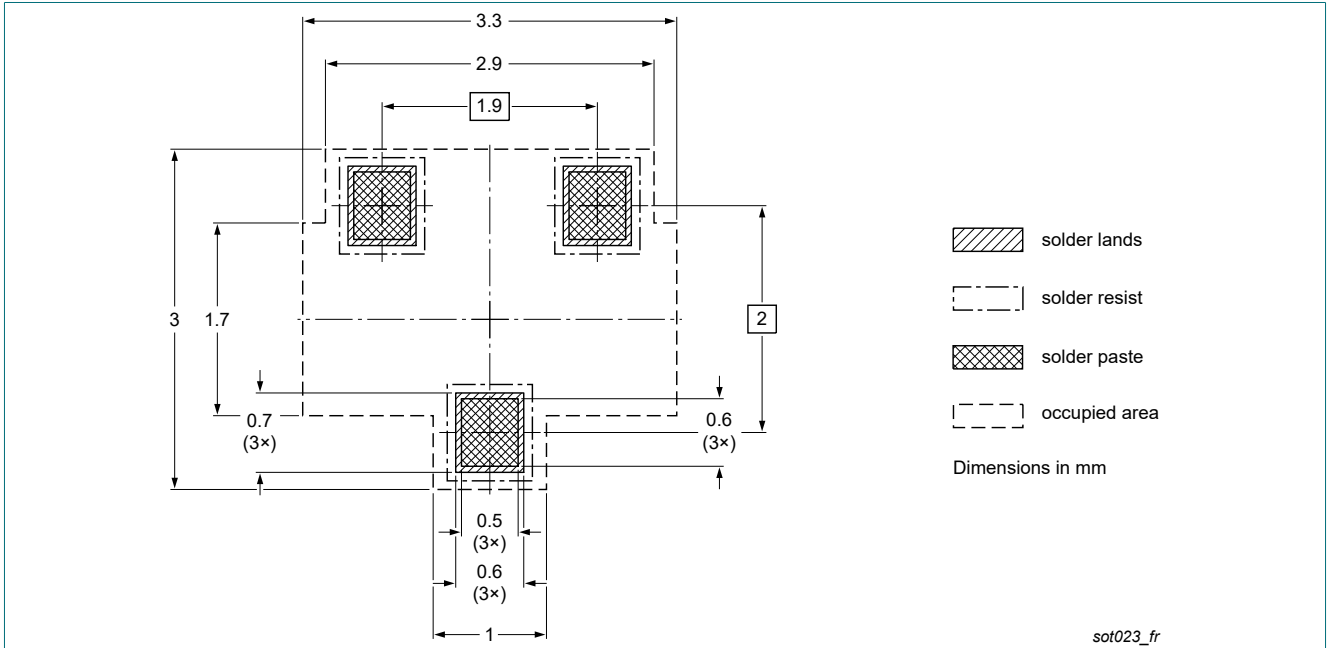


Fig. 6. Reflow soldering footprint for SOT23

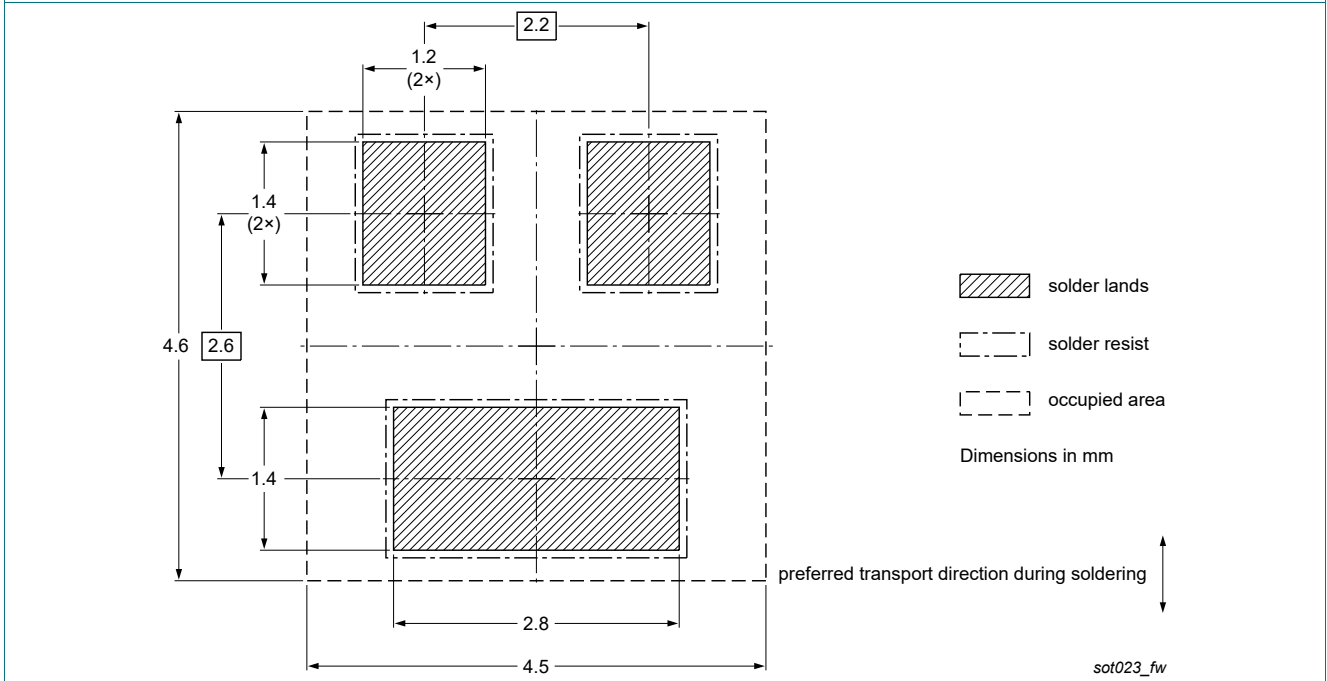


Fig. 7. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PDTA124XT v.9	20241018	Product data sheet	-	PDTA124X_SER_8
Modifications:	<ul style="list-style-type: none"> Family data sheet reduced to single type data sheet. Section "Packing information" removed. 			
PDTA124X_SER_8	20090903	Product data sheet	-	PDTA124X_SER_7
PDTA124X_SER_7	20050811	Product data sheet	-	PDTA124X_SERIES_6
PDTA124X_SERIES_6	20040804	Product specification	-	PDTA124X_SERIES_5
PDTA124X_SERIES_5	20040407	Product specification	-	PDTA124X_SERIES_4
PDTA124X_SERIES_4	20030414	Product specification	-	PDTA124XE_3 PDTA124XEF_2
PDTA124XE_3	19990521	Product specification	-	PDTA124XE_2
PDTA124XE_2	19981125	Product specification	-	PDTA124XE_1
PDTA124XE_1	19971215	Product specification	-	-
PDTA124XEF_2	19990525	Preliminary specification	-	PDTA124XEF_1
PDTA124XEF_1	19981116	Preliminary 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".
- [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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