

2PD2150

20 V, 3 A NPN low VCEsat transistor

23 September 2026 **Product data sheet**

1. General description

NPN low V_{CEsat} transistor in a medium power SOT89 (SC-62/TO-243) flat lead Surface-Mounted Device (SMD) plastic package.

PNP complement: 2PB1424

2. Features and benefits

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High collector current gain (h_{FE}) at high I_C
- High efficiency due to less heat generation
- Smaller required Printed-Circuit Board (PCB) area than for conventional transistors
- AEC-Q101 qualified

3. Applications

- DC-to-DC conversion
- MOSFET gate driving
- Motor control
- Charging circuits
- Power switches (e.g. motors, fans)
- Thin Film Transistor (TFT) backlight inverter

4. Quick reference data

Table 1. Quick reference data

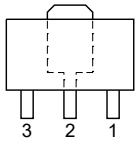
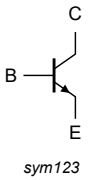
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	20	V
I_C	collector current			-	-	3	A
I_{CM}	peak collector current	single pulse; $t_p \leq$ 1 ms		-	-	5	A
V_{CEsat}	collector-emitter saturation voltage	I_C = 2 A; I_B = 0.1 A; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	0.2	0.5	V

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5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter	 SOT89	 sym123
2	C	collector		
3	B	base		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
2PD2150	SOT89	plastic, surface-mounted package; 3 leads; 1.5 mm pitch; 4.5 mm x 2.5 mm x 1.5 mm body	SOT89

7. Marking

Table 4. Marking codes

Type number	Marking code
2PD2150	M2

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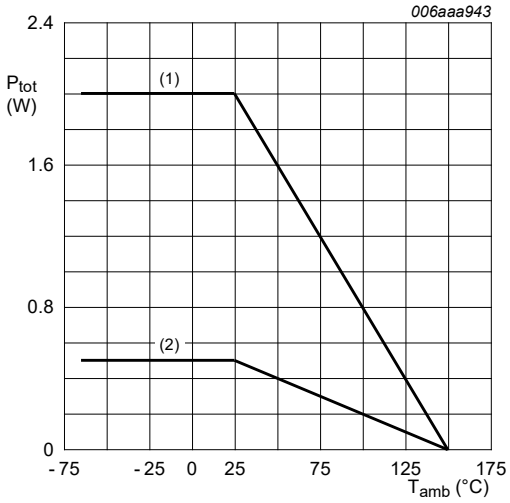
8. Limiting values

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		-	40	V
V_{CEO}	collector-emitter voltage	open base		-	20	V
V_{EBO}	emitter-base voltage	open collector		-	6	V
I_C	collector current			-	3	A
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	0.5	W
			[2]	-	2	W
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 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on a ceramic PCB, Al_2O_3, standard footprint.



(1) Ceramic PCB, Al_2O_3, standard footprint
(2) FR4 PCB, standard footprint

Fig. 1. Power derating curves

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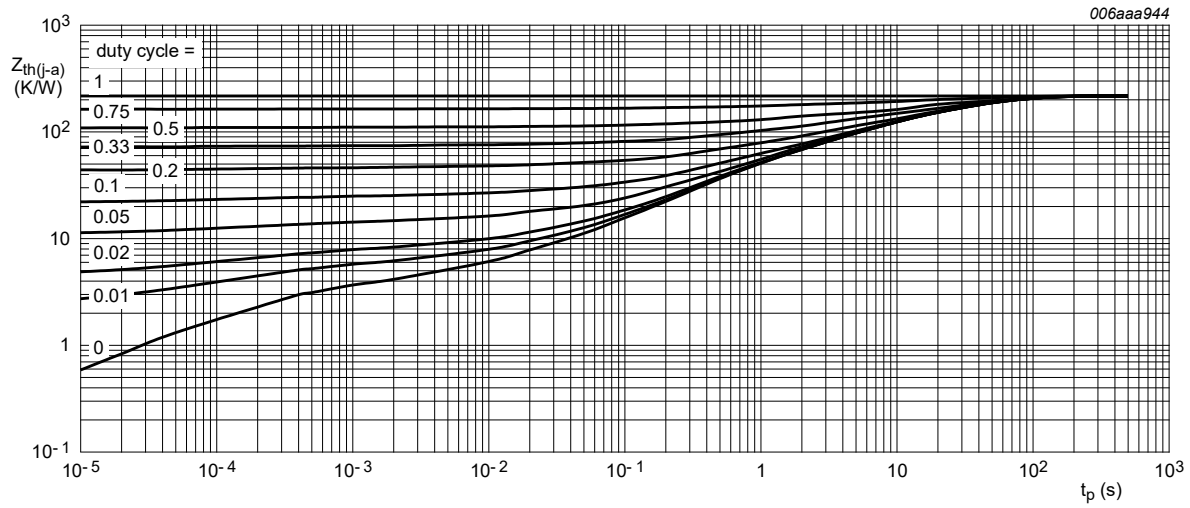
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9. Thermal characteristics

Table 6. Thermal characteristics

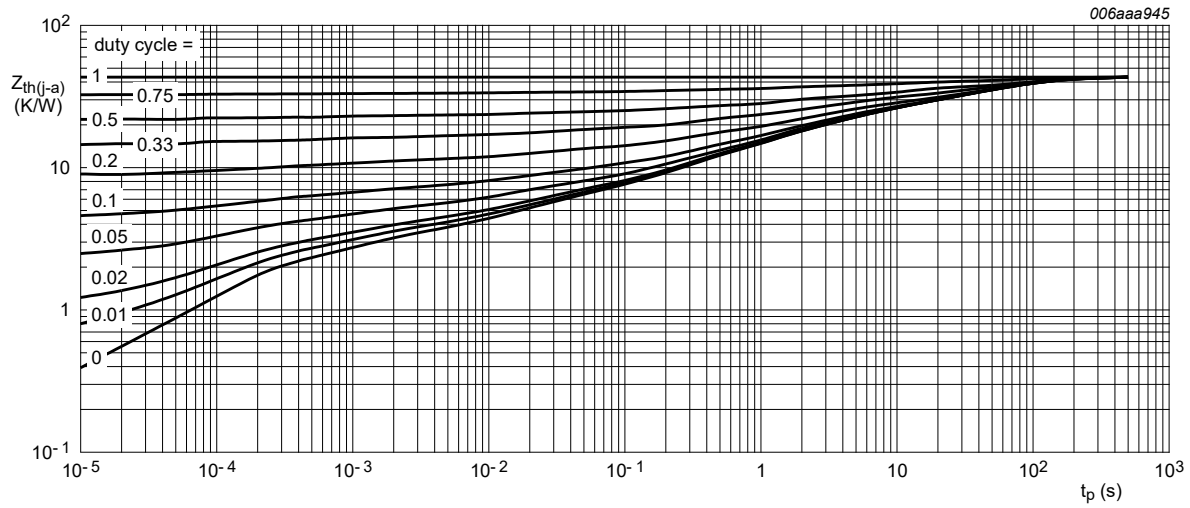
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	250	K/W
			[2]	-	-	62	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on a ceramic PCB, Al_2O_3, standard footprint.



FR4 PCB, standard footprint

Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



Ceramic PCB, Al_2O_3, standard footprint

Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

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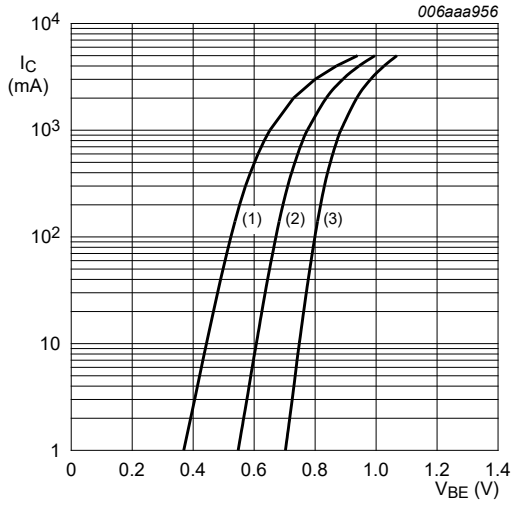
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10. Characteristics

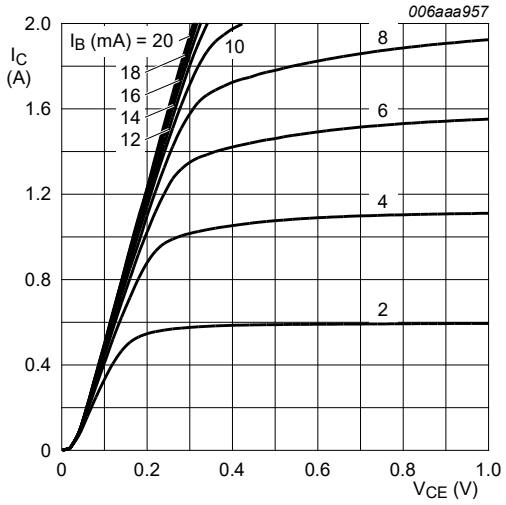
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0 A; T_{amb} = 25 °C		-	-	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 2 V; I_C = 0.1 A; δ ≤ 0.02; T_{amb} = 25 °C		180	-	390	
V_{CEsat}	collector-emitter saturation voltage	I_C = 2 A; I_B = 0.1 A; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		-	0.2	0.5	V
f_T	transition frequency	V_{CE} = 2 V; I_C = 0.5 A; f = 100 MHz; T_{amb} = 25 °C		-	220	-	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	20	-	pF
C_e	emitter capacitance	V_{EB} = 5 V; I_C = 0 A; i_c = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	180	-	pF



V_{CE} = 2 V
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

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



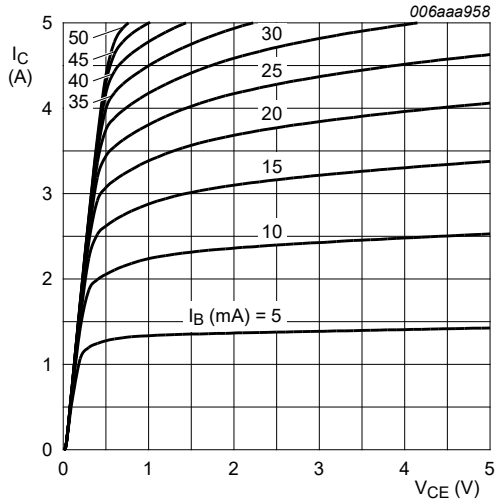
T_{amb} = 25 °C

Fig. 5. Collector current as a function of collector-emitter voltage; typical values

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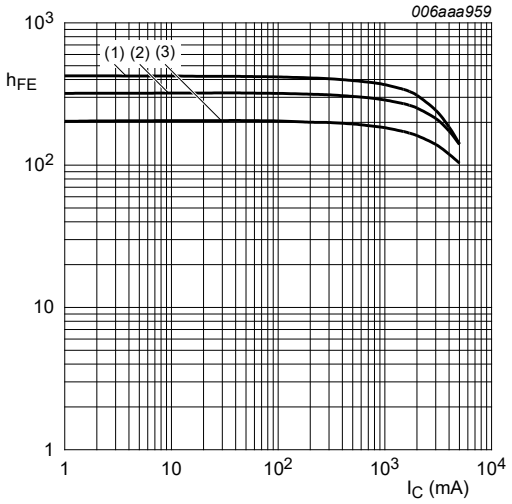
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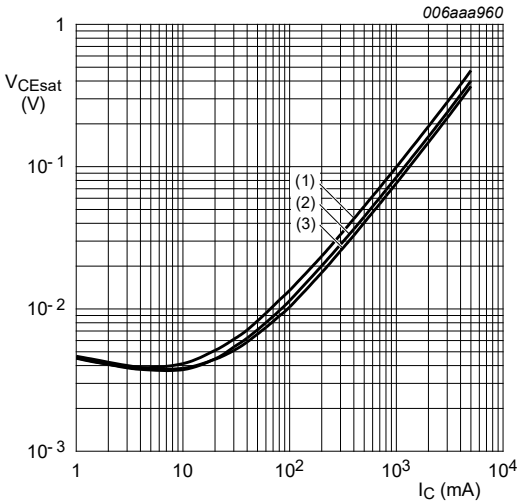
T_{amb} = 25 °C

Fig. 6. Collector current as a function of collector-emitter voltage; typical values



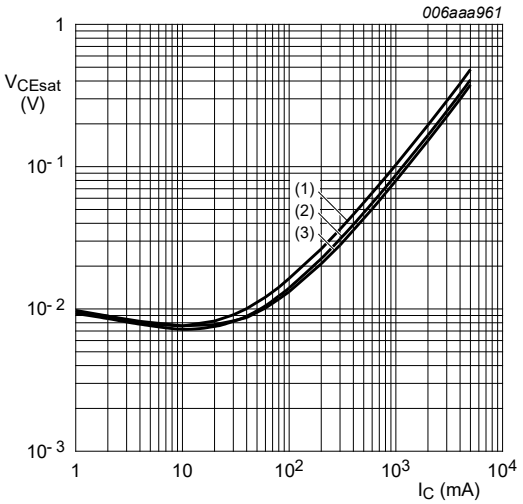
V_{CE} = 2 V
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

Fig. 7. DC current gain as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values



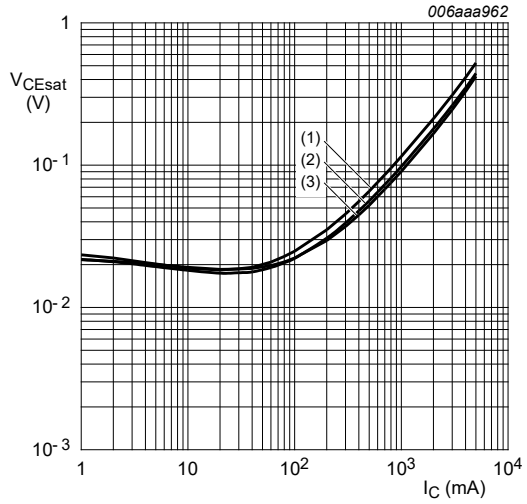
I_C/I_B = 20
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

Fig. 9. Collector-emitter saturation voltage as a function of collector current; typical values

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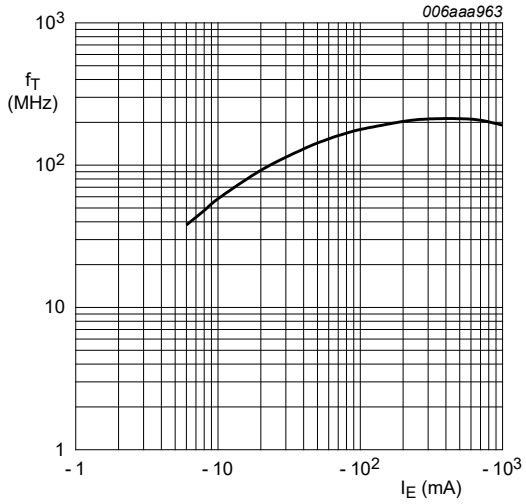
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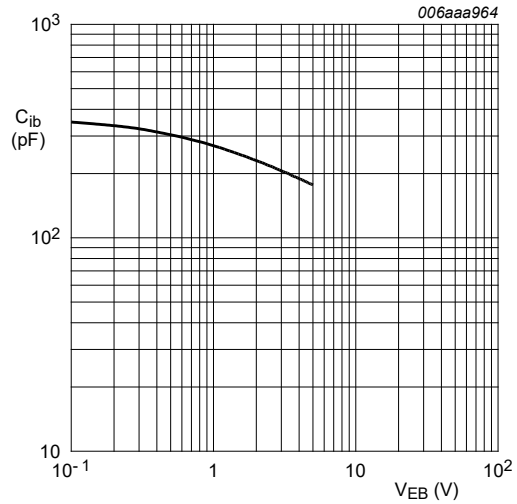
I_C/I_B = 50
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -40 °C

Fig. 10. Collector-emitter saturation voltage as a function of collector current; typical values



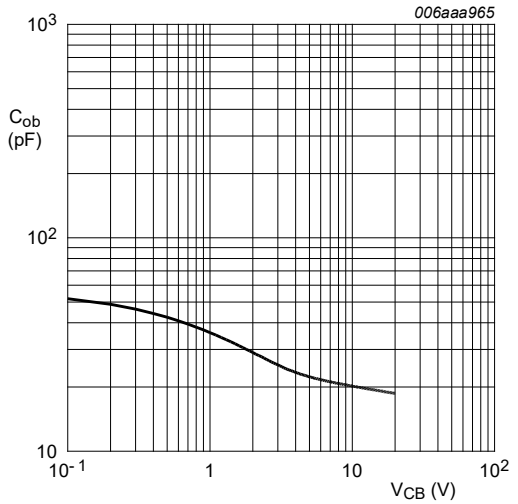
T_{amb} = 25 °C
V_{CE} = 2 V

Fig. 11. Transition frequency as a function of emitter current; typical values



T_{amb} = 25 °C
f = 1 MHz
$I_E = i_e$ = 0 A

Fig. 12. Common-base input capacitance as a function of emitter-base voltage; typical values



T_{amb} = 25 °C
f = 1 MHz
$I_E = i_e$ = 0 A

Fig. 13. Common-base output capacitance as a function of collector-base voltage; 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.

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12. Package outline

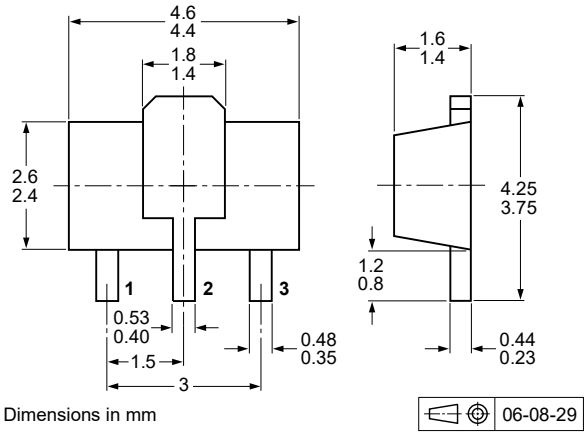


Fig. 14. Package outline SOT89

13. Soldering

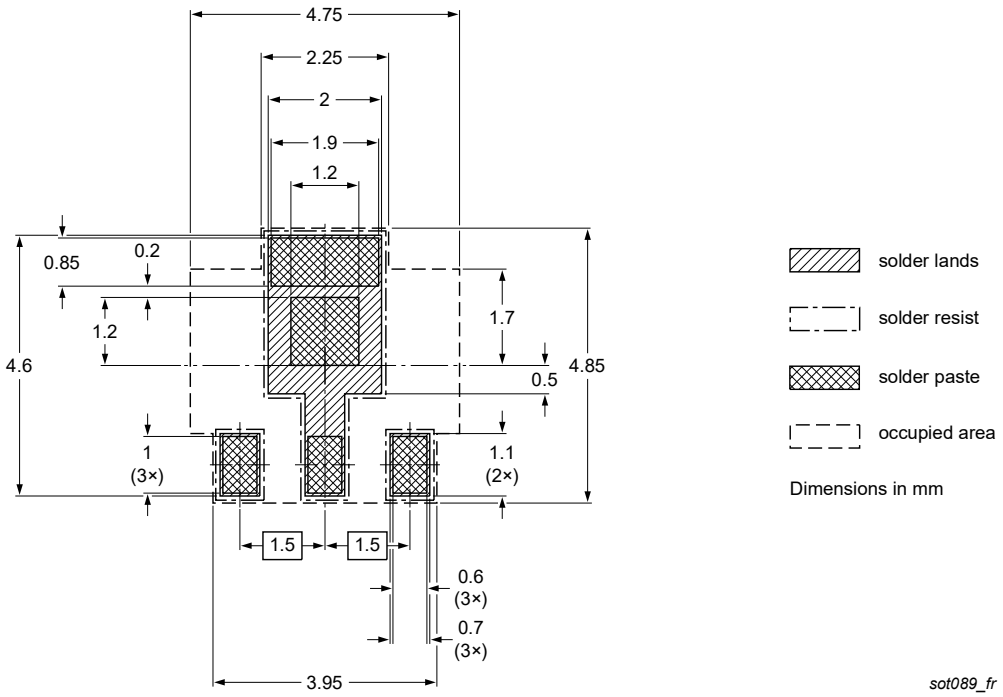


Fig. 15. Reflow soldering footprint for SOT89

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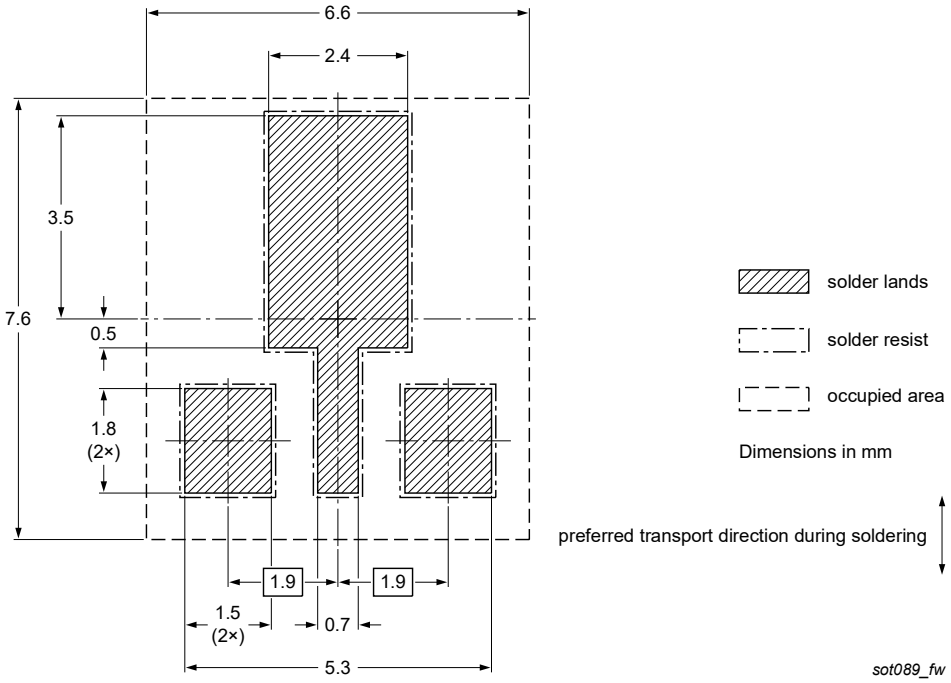


Fig. 16. Wave soldering footprint for SOT89

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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
2PD2150 v.3	20260923	Product data sheet	-	2PD2150_2
Modifications:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate.			
2PD2150_2	20070102	Product data sheet	-	2PD2150_1
2PD2150_1	20050422	Product data sheet	-	-

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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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