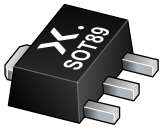


BF623

PNP high-voltage transistor

9 October 2024 **Product data sheet**

1. General description

PNP high-voltage transistor in a SOT89 (SC-62) flat lead Surface-Mounted Device (SMD) plastic package.

NPN complement: BF622

2. Features and benefits

- Low current (max. -50 mA)
- High voltage (max. -250 V)

3. Applications

- Video output stages

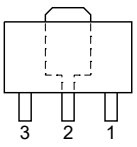
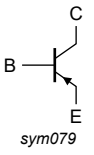
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-250	V
I_C	collector current			-	-	-50	mA
h_{FE}	DC current gain	V_{CE} = -20 V; I_C = -25 mA; T_{amb} = 25 °C		50	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter	 **SOT89**	 *sym079*
2	C	collector		
3	B	base		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BF623	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
BF623	DB

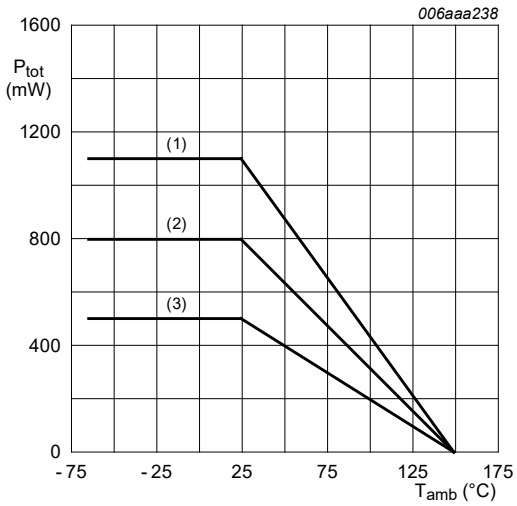
8. Limiting values

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		-	-250	V
V_{CEO}	collector-emitter voltage	open base		-	-250	V
V_{EBO}	emitter-base voltage	open collector		-	-5	V
I_C	collector current			-	-50	mA
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms		-	-100	mA
I_{BM}	peak base current			-	-50	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	0.5	W
			[2]	-	0.8	W
			[3]	-	1.1	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 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm^2.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm^2.



(1) FR4 PCB; 6 cm^2 mounting pad for collector.
(2) FR4 PCB; 1 cm^2 mounting pad for collector.
(3) FR4 PCB; standard footprint.

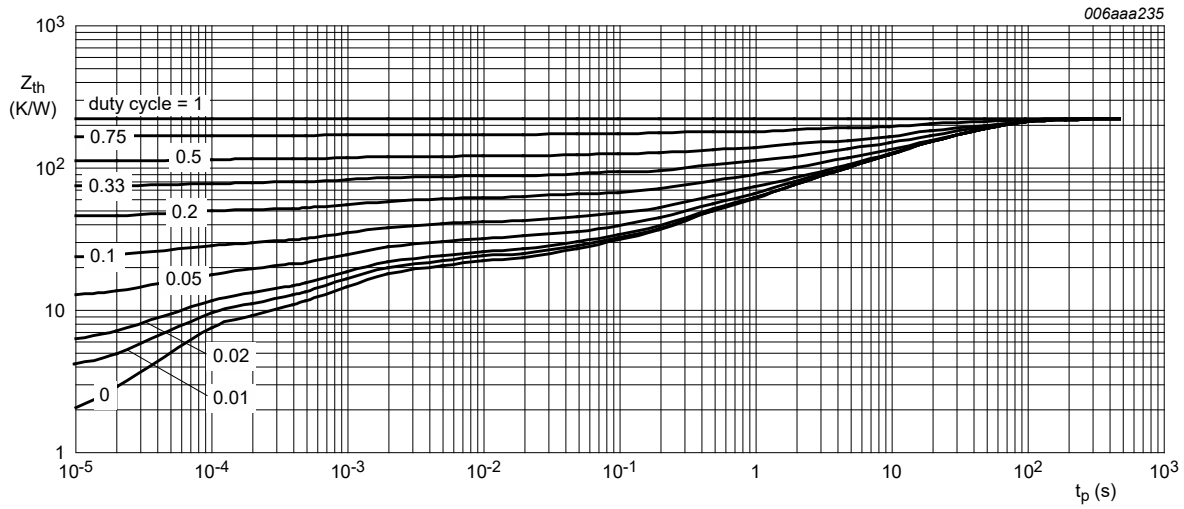
Fig. 1. Power derating curves

9. Thermal characteristics

Table 6. Thermal characteristics

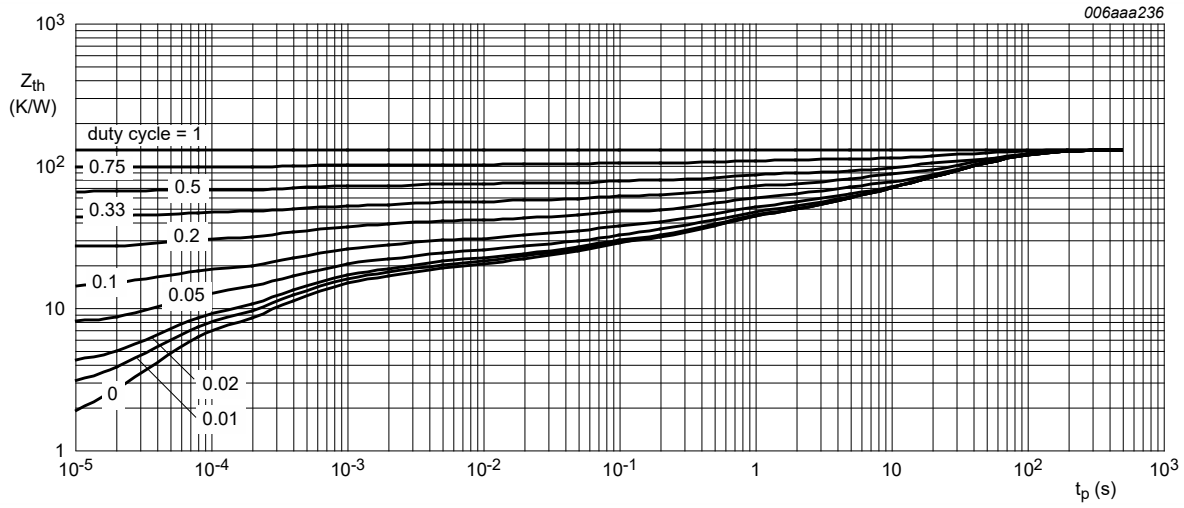
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	250	K/W
			[2]	-	-	156	K/W
			[3]	-	-	113	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	30	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm^2.
[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm^2.



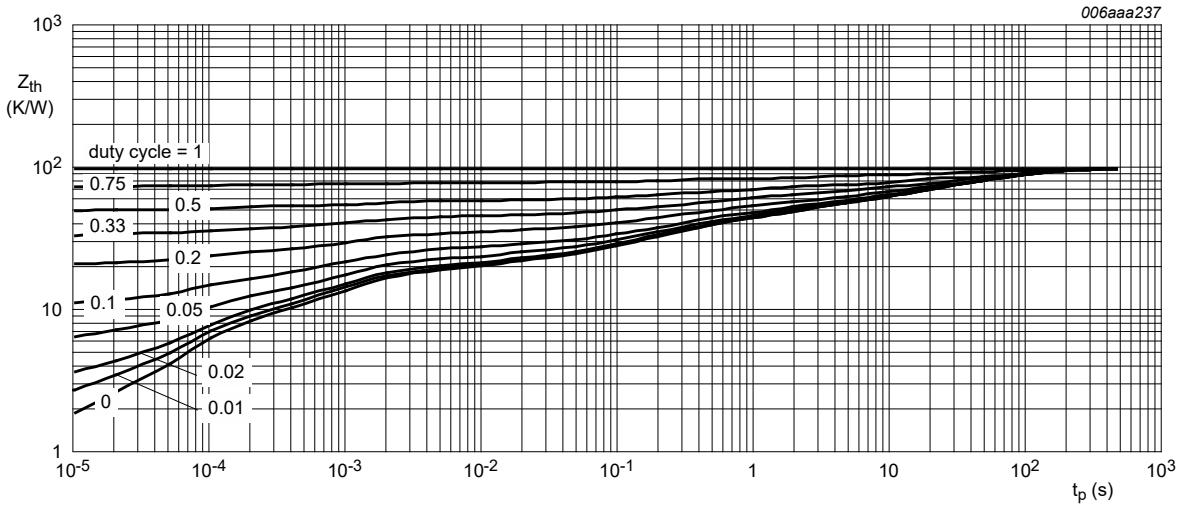
Mounted on FR4 PCB; standard footprint.

Fig. 2. Transient thermal impedance as a function of pulse time; typical values



Mounted on FR4 PCB; mounting pad for collector 1 cm^2.

Fig. 3. Transient thermal impedance as a function of pulse time; typical values



Mounted on FR4 PCB; mounting pad for collector 6 cm^2.

Fig. 4. Transient thermal impedance as a function of pulse time; typical values

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = -200 V; I_E = 0 A; T_{amb} = 25 °C		-	-	-10	nA
		V_{CB} = -200 V; I_E = 0 A; T_j = 150 °C		-	-	-10	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	-50	nA
h_{FE}	DC current gain	V_{CE} = -20 V; I_C = -25 mA; T_{amb} = 25 °C		50	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -30 mA; I_B = -5 mA; T_{amb} = 25 °C		-	-	-800	mV
C_{re}	feedback capacitance	V_{CB} = -30 V; I_C = 0 A; i_c = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	1.6	pF
f_T	transition frequency	V_{CE} = -10 V; I_C = -10 mA; f = 100 MHz; T_{amb} = 25 °C		60	-	-	MHz

11. Package outline

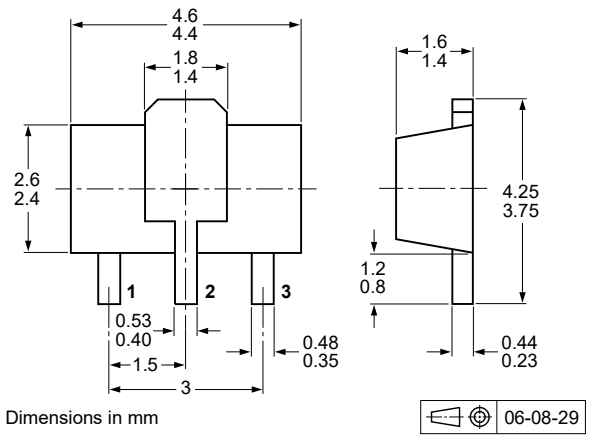


Fig. 5. Package outline SOT89

12. Soldering

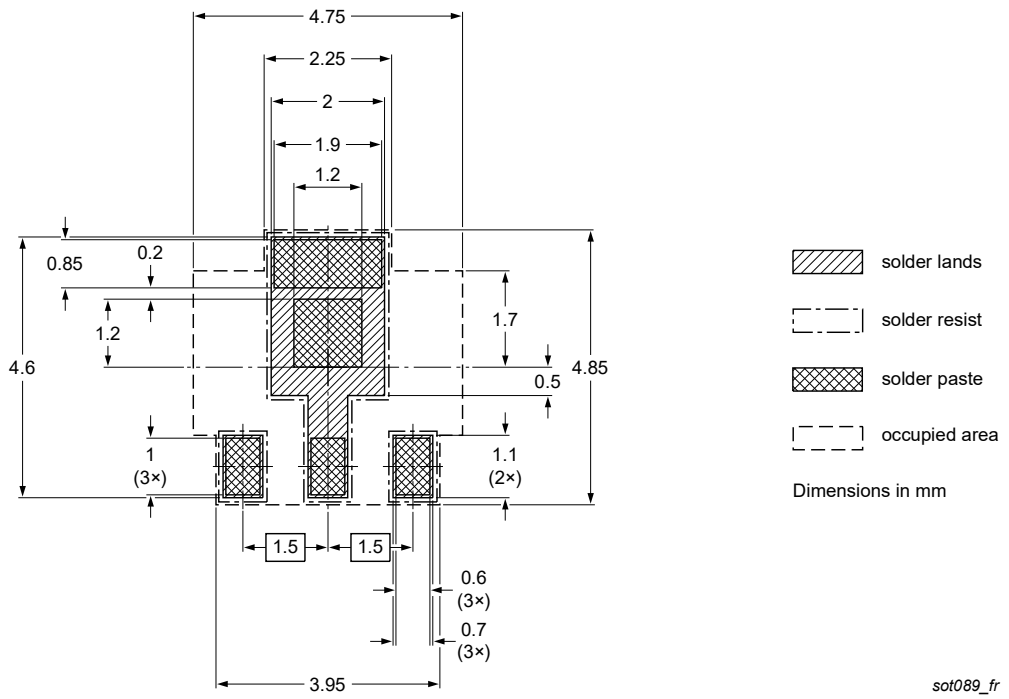


Fig. 6. Reflow soldering footprint for SOT89

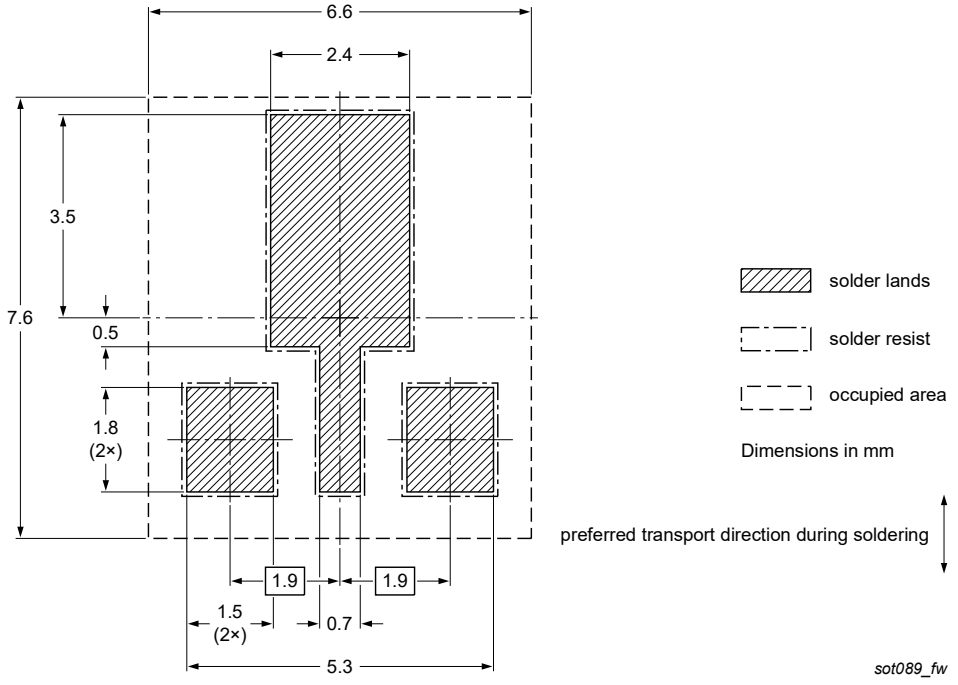


Fig. 7. Wave soldering footprint for SOT89

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BF623 v.4	20241009	Product data sheet	-	BF623 v.3
Modifications:	• Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
BF623 v.3	20230630	Product data sheet	-	BF621_623 v.2
BF621_623 v.2	20041214	Product data sheet	-	BF621_623 v.1
BF621_623 v.1	19990421	Product data sheet	-	-

14. 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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