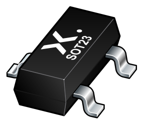


BSS63

PNP high-voltage transistor

1 July 2023 **Product data sheet**

1. General description

PNP high-voltage transistor in a SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Low current (max. 100 mA)
- High voltage (max. 100 V)

3. Applications

- High-voltage general purpose
- Switching applications

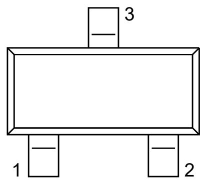
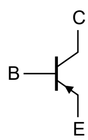
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-100	V
I_C	collector current			-	-	-100	mA
h_{FE}	DC current gain	V_{CE} = -1 V; I_C = -10 mA; T_{amb} = 25 °C		30	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SOT23	 sym132
2	E	emitter		
3	C	collector		

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6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BSS63	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]
BSS63	BM%

[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		-	-110	V
V_{CEO}	collector-emitter voltage	open base		-	-100	V
V_{EBO}	emitter-base voltage	open collector		-	-6	V
I_C	collector current			-	-100	mA
I_{CM}	peak collector current			-	-100	mA
I_{BM}	peak base current			-	-100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

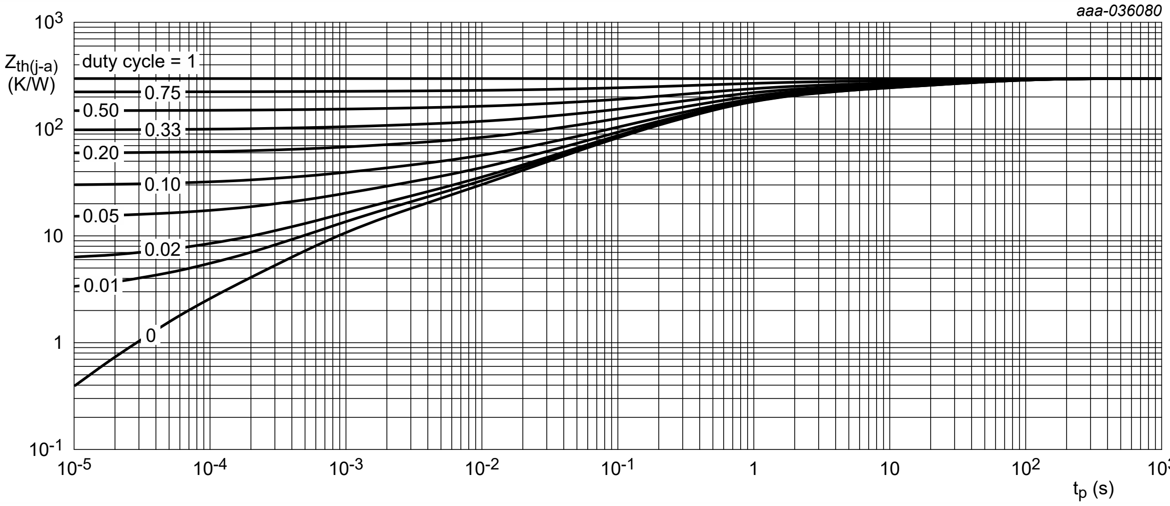
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

9. Thermal characteristics

Table 6. Thermal characteristics

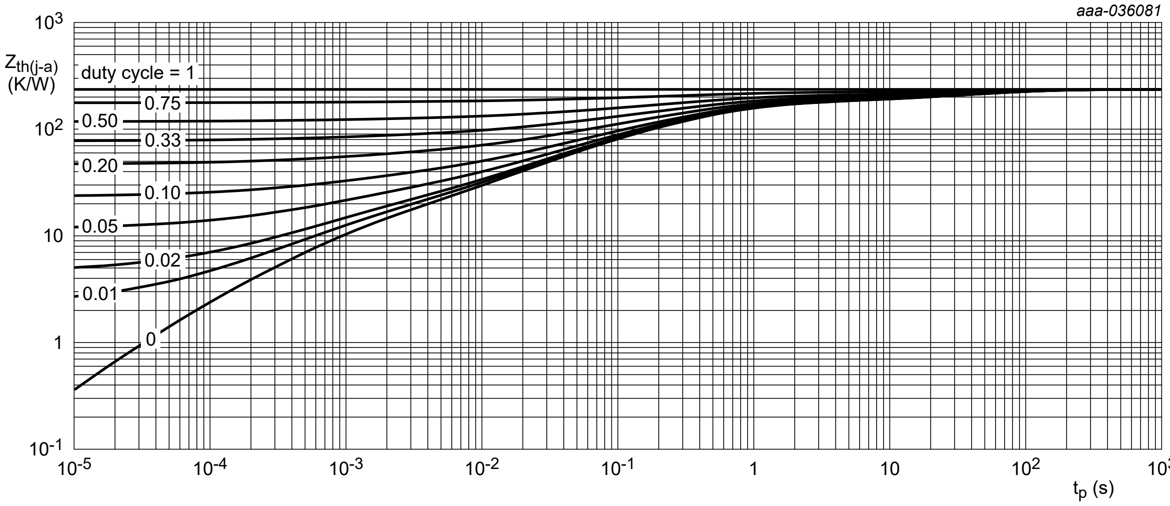
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

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



FR4 PCB, single-sided, 70 µm copper, tin-plated and standard footprint.

Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



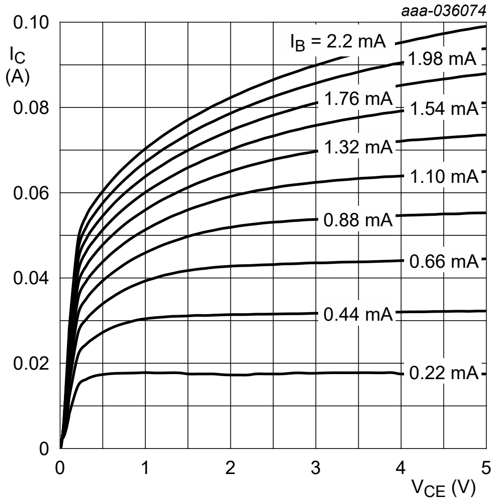
FR4 PCB, single-sided, 70 µm copper, tin-plated, 1 cm^2 footprint.

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

10. Characteristics

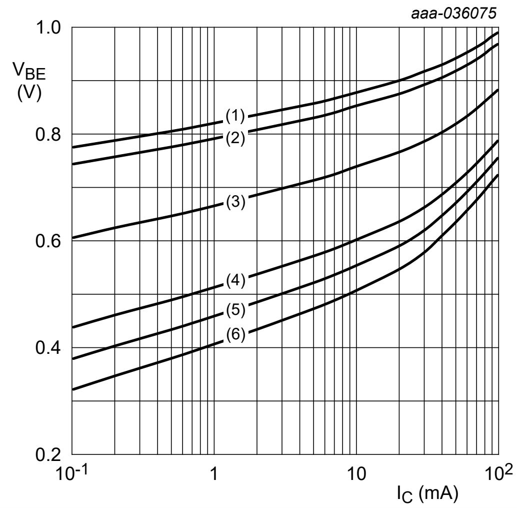
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = -90 V; I_E = 0 A; T_{amb} = 25 °C		-	-	-100	nA
		V_{CB} = -90 V; I_E = 0 A; T_j = 150 °C		-	-	-50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = -6 V; I_C = 0 A; T_{amb} = 25 °C		-	-	-100	nA
h_{FE}	DC current gain	V_{CE} = -1 V; I_C = -10 mA; T_{amb} = 25 °C		30	-	-	
		V_{CE} = -1 V; I_C = -25 mA; T_{amb} = 25 °C		30	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -25 mA; I_B = -2.5 mA; T_{amb} = 25 °C		-	-	-250	mV
V_{BEsat}	base-emitter saturation voltage			-	-	-900	mV
f_T	transition frequency	V_{CE} = -5 V; I_C = -25 mA; f = 100 MHz; T_{amb} = 25 °C		50	85	-	MHz
C_c	collector capacitance	V_{CB} = -10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	3	-	pF



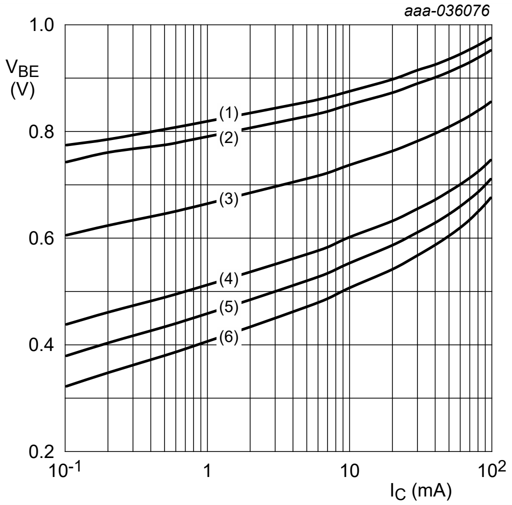
T_{amb} = 25 °C

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



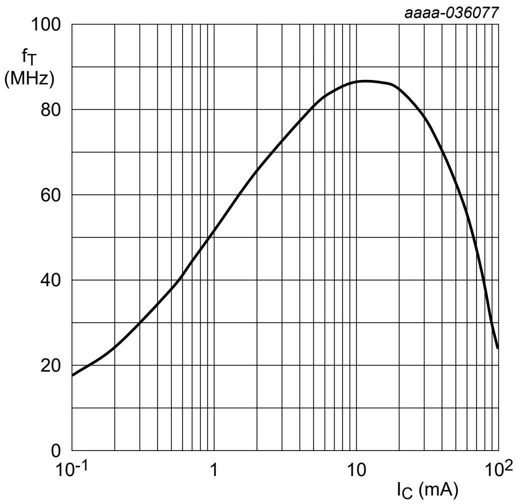
V_{CE} = 1 V; T_{amb} = 25 °C
(1) T_{amb} = -55°C
(2) T_{amb} = -40°C
(3) T_{amb} = 25°C
(4) T_{amb} = 100°C
(5) T_{amb} = 125°C
(6) T_{amb} = 150°C

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



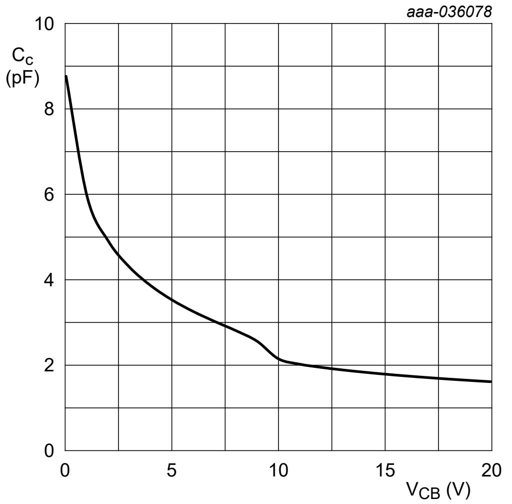
V_{CE} = 5 V; T_{amb} = 25 °C
V_{CE} = 1 V; T_{amb} = 25 °C
(1) T_{amb} = -55°C
(2) T_{amb} = -40°C
(3) T_{amb} = 25°C
(4) T_{amb} = 100°C
(5) T_{amb} = 125°C
(6) T_{amb} = 150°C

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



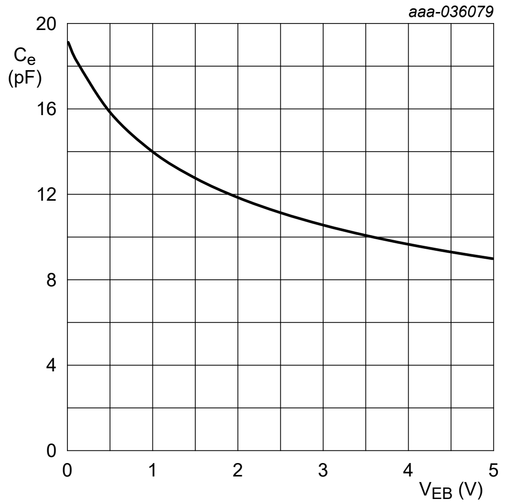
V_{CE} = 5 V; T_{amb} = 25 °C

Fig. 6. Transition frequency as a function of collector current; typical values



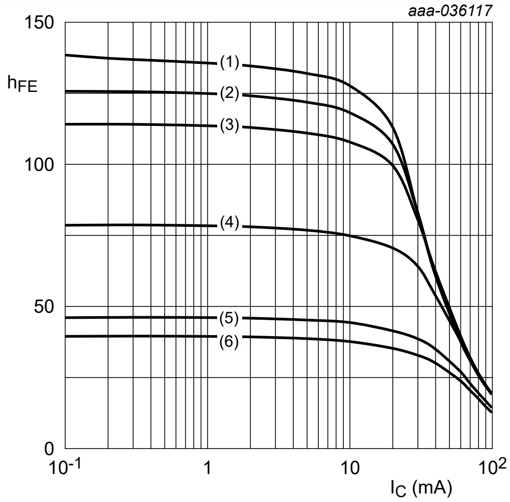
f = 1 MHz; T_{amb} = 25 °C

Fig. 7. Collector capacitance as a function of collector-base voltage; typical values



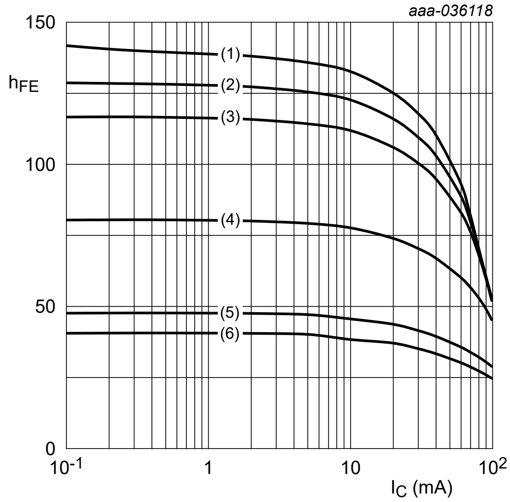
f = 1 MHz; T_{amb} = 25 °C

Fig. 8. Emitter capacitance as a function of emitter-base voltage; typical values



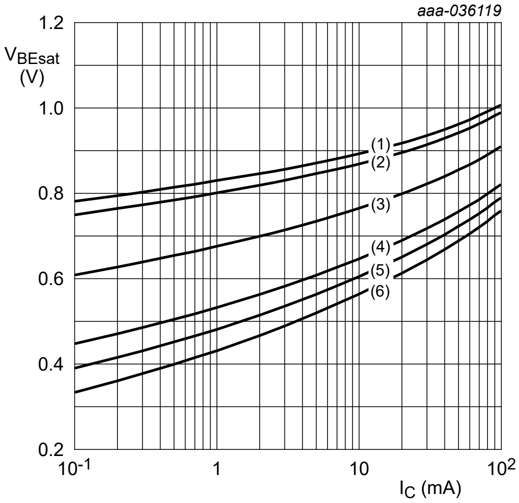
V_{CE} = 1 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = −40 °C
(6) T_{amb} = −55 °C

Fig. 9. DC current gain as a function of collector current; typical values



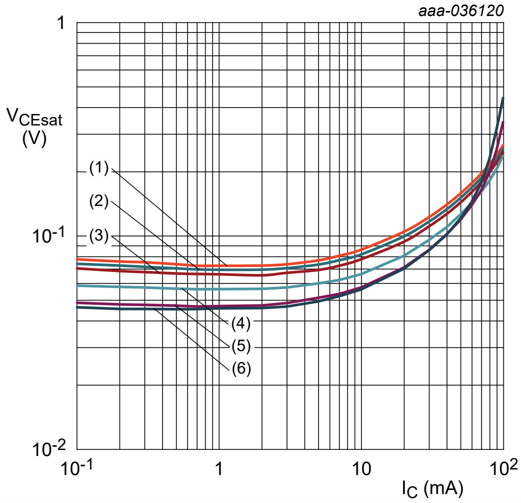
V_{CE} = 5 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = −40 °C
(6) T_{amb} = −55 °C

Fig. 10. DC current gain as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = −55 °C
(2) T_{amb} = −40 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = 100 °C
(5) T_{amb} = 125 °C
(6) T_{amb} = 150 °C

Fig. 11. Base-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 100 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = −40 °C
(6) T_{amb} = −55 °C

Fig. 12. Collector-emitter saturation voltage as a function of collector current; typical values

11. Package outline

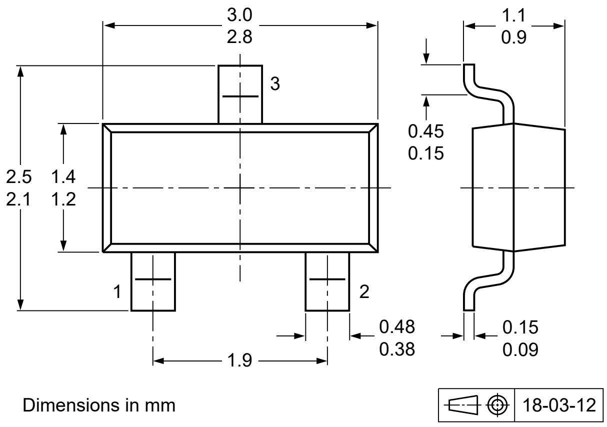


Fig. 13. Package outline SOT23

12. Soldering

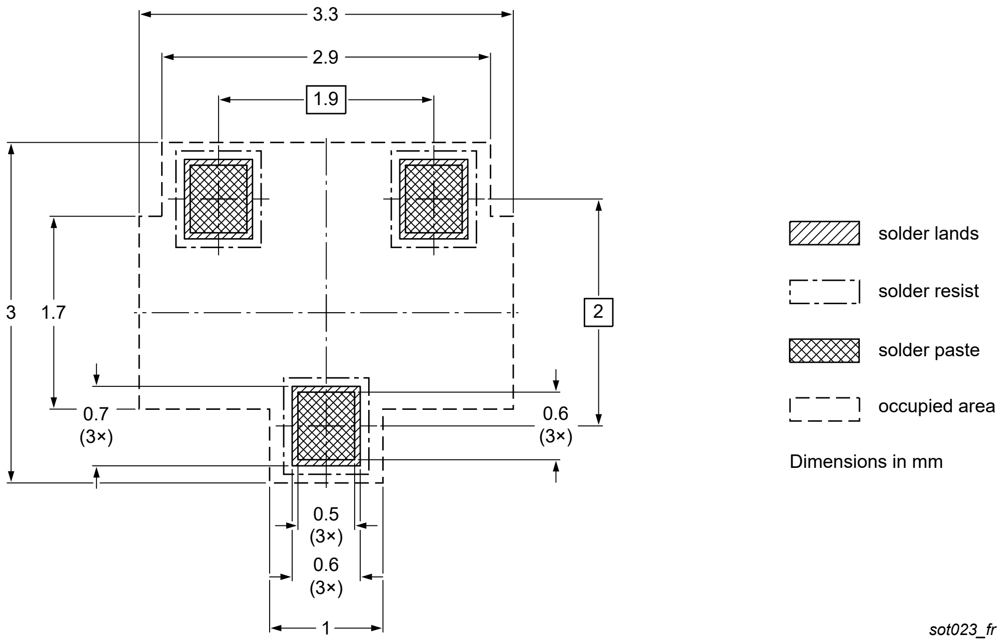


Fig. 14. Reflow soldering footprint for SOT23

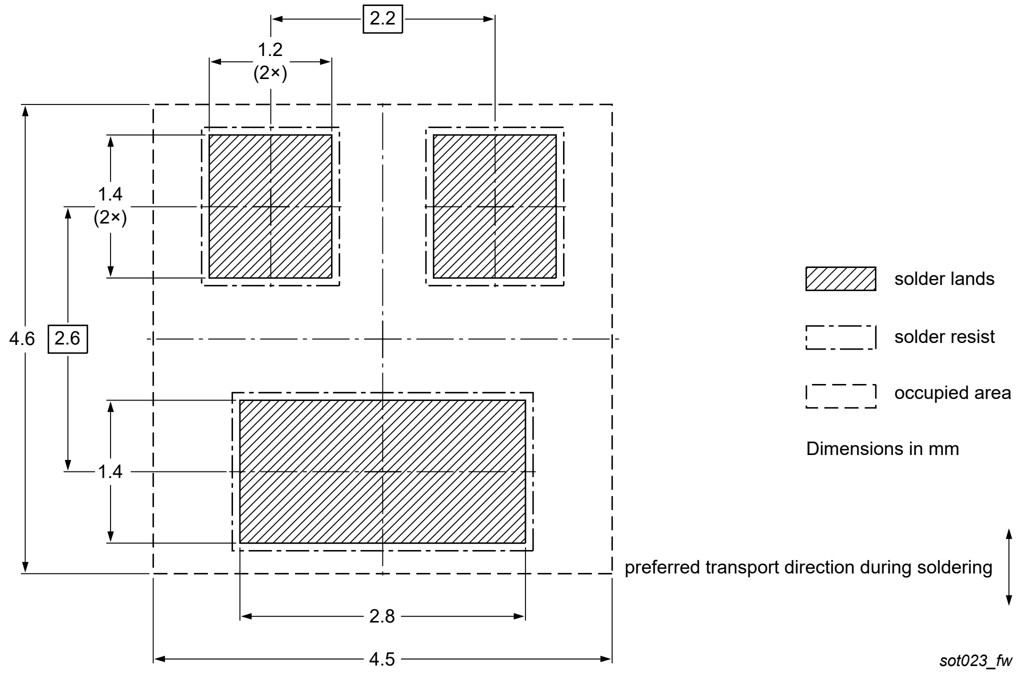


Fig. 15. Wave soldering footprint for SOT23

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BSS63 v.3	20230701	Product data sheet	-	BSS63 v.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. • Thermal characteristics and Characteristics: Graphs added • Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
BSS63 v.2	20040116	Product data sheet	-	BSS63 v.1
BSS63 v.1	19990415	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".
[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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