



# BSR14-Q

## NPN switching transistors

22 December 2025

Product data sheet

## 1. General description

NPN switching transistor in a small SOT23 Surface-Mounted Device (SMD) plastic package.

PNP complements: BSR16-Q

## 2. Features and benefits

- High current (max. 800 mA)
- Low voltage (max. 40 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Switching and linear applications

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CE0}$	collector-emitter voltage	open base	-	-	40	V
$I_C$	collector current		-	-	800	mA
$h_{FE}$	DC current gain	$V_{CE} = 10\text{ V}$ ; $I_C = 150\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ }^\circ\text{C}$	100	-	300	

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	<p>SOT23</p>	<p>sym021</p>
2	E	emitter		
3	C	collector		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BSR14-Q</a>	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	<a href="#">SOT23</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BSR14-Q	U8%

[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	-	75	V
$V_{CEO}$	collector-emitter voltage	open base	-	40	V
$V_{EBO}$	emitter-base voltage	open collector	-	6	V
$I_C$	collector current		-	800	mA
$I_{CM}$	peak collector current		-	800	mA
$I_{BM}$	peak base current		-	200	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	-	250	mW
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	150	°C
$T_{stg}$	storage temperature		-65	150	°C

## 9. Thermal characteristics

Table 6. Thermal characteristics

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

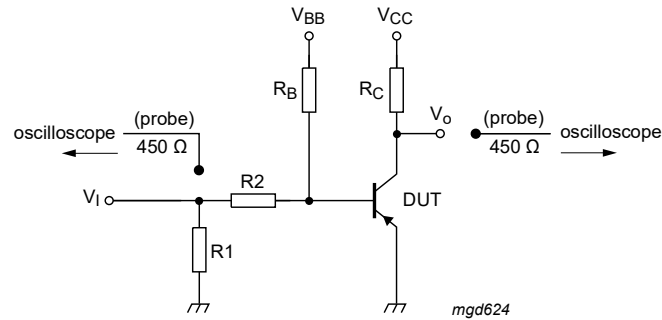
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 60 \text{ V}; I_E = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	10	nA
		$V_{CB} = 60 \text{ V}; I_E = 0 \text{ A}; T_J = 150 \text{ }^\circ\text{C}$	-	-	10	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5 \text{ V}; I_C = 0 \text{ A}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	10	nA
$h_{FE}$	DC current gain	$V_{CE} = 10 \text{ V}; I_C = 0.1 \text{ mA}; \text{pulsed}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	35	-	-	
		$V_{CE} = 10 \text{ V}; I_C = 1 \text{ mA}; \text{pulsed}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	50	-	-	
		$V_{CE} = 10 \text{ V}; I_C = 10 \text{ mA}; \text{pulsed}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	75	-	-	
		$V_{CE} = 10 \text{ V}; I_C = 150 \text{ mA}; \text{pulsed}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	100	-	300	
		$V_{CE} = 1 \text{ V}; I_C = 150 \text{ mA}; \text{pulsed}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	50	-	-	
		$V_{CE} = 10 \text{ V}; I_C = 500 \text{ mA}; \text{pulsed}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02; T_{amb} = 25 \text{ }^\circ\text{C}$	40	-	-	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 150 \text{ mA}; I_B = 15 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	300	mV
		$I_C = 500 \text{ mA}; I_B = 50 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	1	V
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 150 \text{ mA}; I_B = 15 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	0.6	-	1.2	V
		$I_C = 500 \text{ mA}; I_B = 50 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	2	V
$C_c$	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = 0 \text{ A}; i_e = 0 \text{ A}; f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	8	pF
$f_T$	transition frequency	$V_{CE} = 20 \text{ V}; I_C = 20 \text{ mA}; f = 100 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}$	300	-	-	MHz
<b>Switching times (between 10% and 90% levels); See section "Test information" for resistor calculation and test conditions</b>						
$t_d$	delay time	$I_C = 150 \text{ mA}; I_{Bon} = 15 \text{ mA}; I_{Boff} = -15 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	15	ns
$t_r$	rise time		-	-	20	ns
$t_{on}$	turn-on time		-	-	35	ns
$t_s$	storage time		-	-	200	ns
$t_f$	fall time		-	-	60	ns
$t_{off}$	turn-off time		-	-	250	ns

## 11. Test information



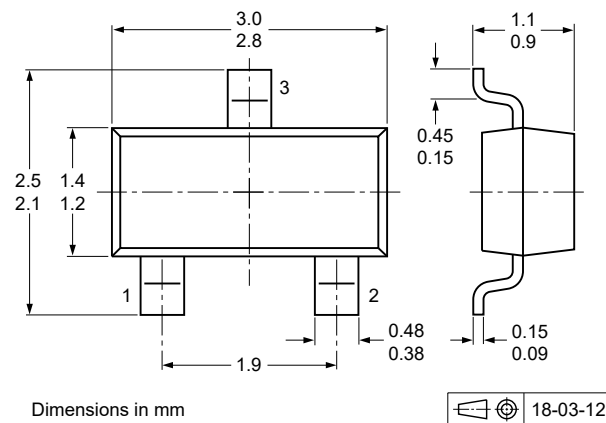
$V_i = 9.5 \text{ V}$ ;  $T = 500 \text{ } \mu\text{s}$ ;  $t_p = 10 \text{ } \mu\text{s}$ ;  $t_r = t_f \leq 3 \text{ ns}$   
 $R_1 = 68 \text{ } \Omega$ ;  $R_2 = 325 \text{ } \Omega$ ;  $R_B = 325 \text{ } \Omega$ ;  $R_C = 160 \text{ } \Omega$   
 $V_{BB} = -3.5 \text{ V}$ ;  $V_{CC} = 29.5 \text{ V}$   
 Oscilloscope: input impedance  $Z_i = \geq 100 \text{ } \Omega$

**Fig. 1. Test circuit for switching times**

### 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. 2. Package outline SOT23**

### 13. Soldering

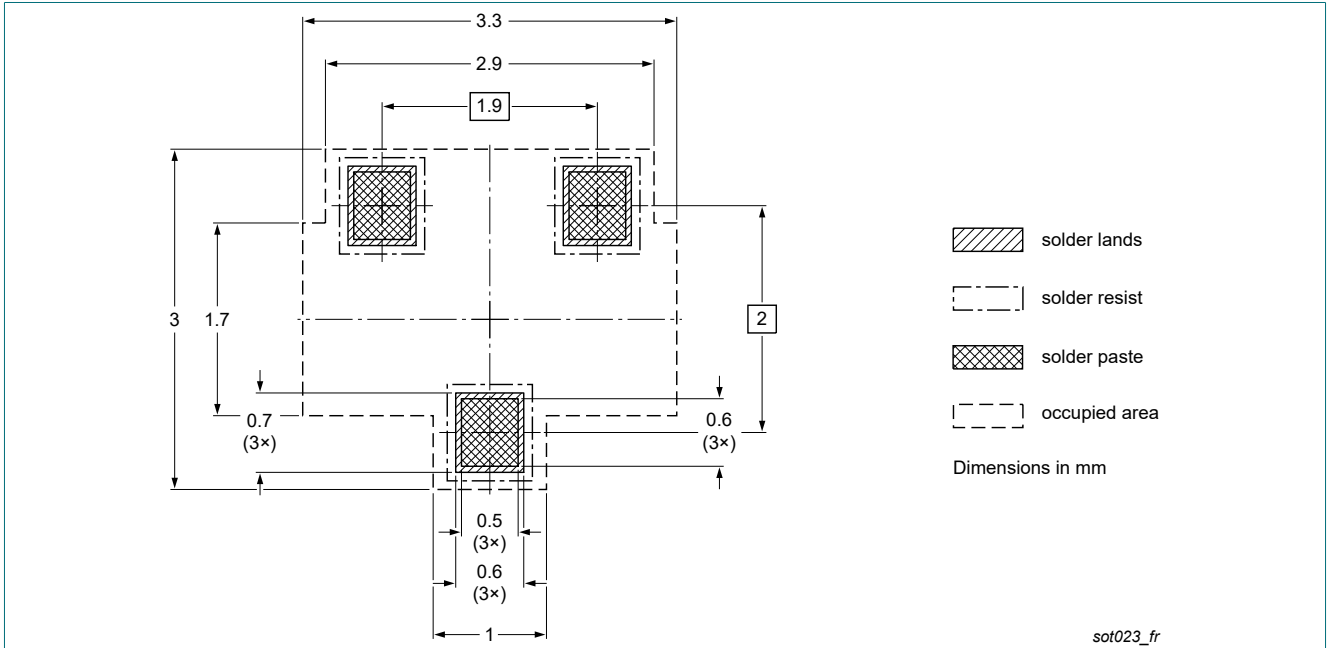


Fig. 3. Reflow soldering footprint for SOT23

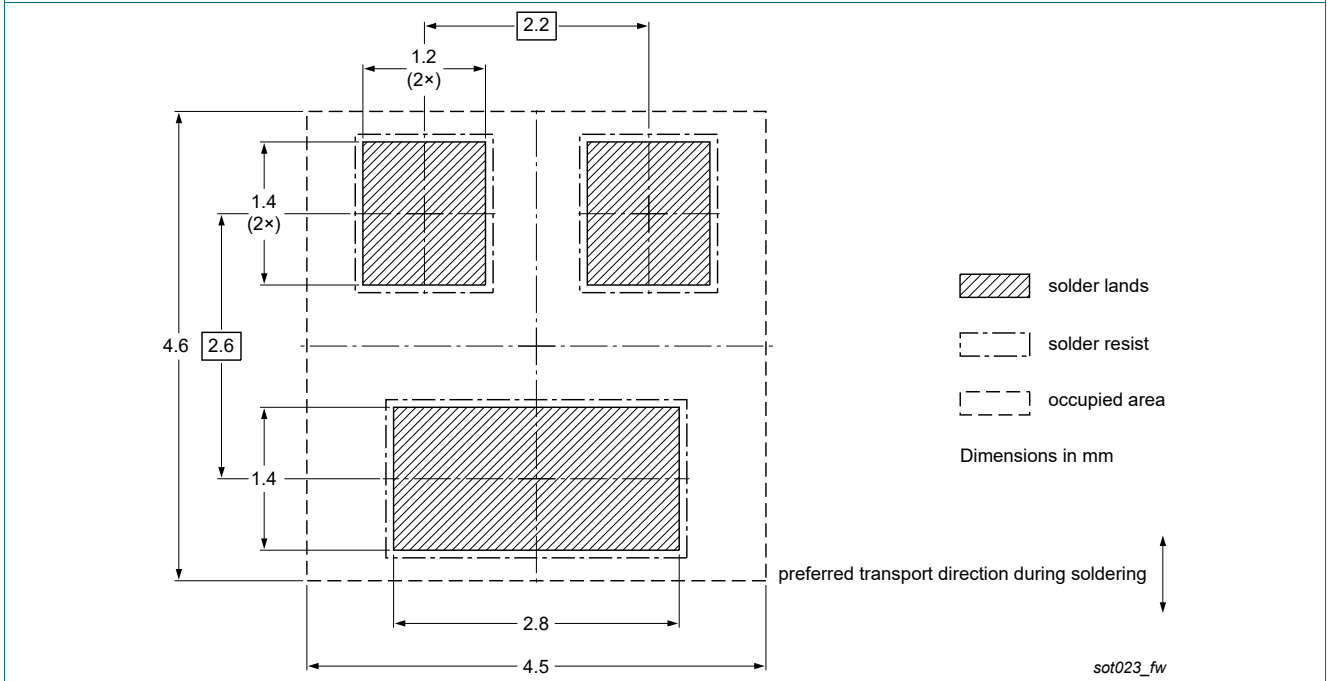


Fig. 4. Wave soldering footprint for SOT23

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BSR14-Q v.1	20251222	Product data sheet	-	-

## 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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