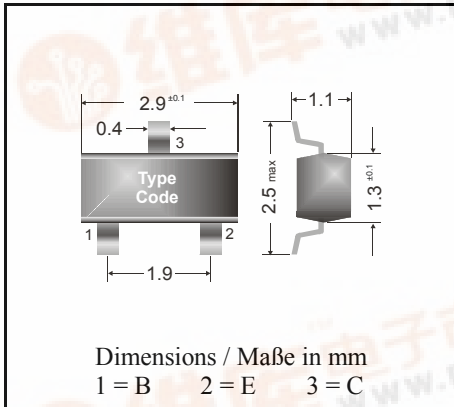


NPN

Surface mount Si-Epitaxial Planar Transistors
Si-Epitaxial Planar Transistoren für die Oberflächenmontage

NPN



Power dissipation – Verlustleistung 250 mW

Plastic case SOT-23
Kunststoffgehäuse (TO-236)

Weight approx. – Gewicht ca. 0.01 g

Plastic material has UL classification 94V-0
Gehäusematerial UL94V-0 klassifiziert

Standard packaging taped and reeled
Standard Lieferform gegurtet auf Rolle

Maximum ratings ($T_A = 25^\circ\text{C}$)

Grenzwerte ($T_A = 25^\circ\text{C}$)

			BSR 13	BSR 14
Collector-Emitter-voltage	B open	V_{CE0}	30 V	40 V
Collector-Base-voltage	E open	V_{CB0}	60 V	75 V
Emitter-Base-voltage	C open	V_{EB0}	5 V	6 V
Power dissipation – Verlustleistung		P_{tot}	250 mW ¹⁾	
Collector current – Kollektorstrom (dc)		I_C	800 mA	
Peak Collector current – Kollektor-Spitzenstrom		I_{CM}	800 mA	
Peak Base current – Basis-Spitzenstrom		I_{BM}	200 mA	
Junction temp. – Sperrschichttemperatur		T_j	150°C	
Storage temperature – Lagerungstemperatur		T_s	- 65...+ 150°C	

Characteristics ($T_j = 25^\circ\text{C}$)

Kennwerte ($T_j = 25^\circ\text{C}$)

			Min.	Typ.	Max.
Collector-Base cutoff current – Kollektorreststrom					
$I_E = 0, V_{CB} = 50\text{ V}$	BSR 13	I_{CB0}	–	–	30 nA
		I_{CB0}	–	–	10 μA
$I_E = 0, V_{CB} = 60\text{ V}$	BSR 14	I_{CB0}	–	–	10 nA
		I_{CB0}	–	–	10 μA
Emitter-Base cutoff current – Emitterreststrom					
$I_C = 0, V_{EB} = 5\text{ V}$	BSR 13	I_{EB0}	–	–	30 nA
	BSR 14	I_{EB0}	–	–	10 nA



Characteristics ($T_j = 25^\circ\text{C}$)Kennwerte ($T_j = 25^\circ\text{C}$)

		Min.	Typ.	Max.
DC current gain – Kollektor-Basis-Stromverhältnis ¹⁾				
$V_{CE} = 10\text{ V}, I_C = 0.1\text{ mA}$	BSR 13	35	–	–
$V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$	BSR 13	50	–	–
$V_{CE} = 10\text{ V}, I_C = 10\text{ mA}$	BSR 14	75	–	–
$V_{CE} = 10\text{ V}, I_C = 150\text{ mA}$	BSR 14	100	–	300
$V_{CE} = 1\text{ V}, I_C = 150\text{ mA}$	BSR 13	50	–	–
$V_{CE} = 10\text{ V}, I_C = 500\text{ mA}$	BSR 13	30	–	–
	BSR 14	40	–	–
Collector saturation volt. – Kollektor-Sättigungsspg. ¹⁾				
$I_C = 150\text{ mA}, I_B = 15\text{ mA}$	BSR 13	V_{CEsat}	–	400 mV
	BSR 14	V_{CEsat}	–	300 mV
$I_C = 500\text{ mA}, I_B = 50\text{ mA}$	BSR 13	V_{CEsat}	–	1.6 V
	BSR 14	V_{CEsat}	–	1 V
Base saturation voltage – Basis-Sättigungsspannung ¹⁾				
$I_C = 150\text{ mA}, I_B = 15\text{ mA}$	BSR 13	V_{BEsat}	–	1.3 V
	BSR 14	V_{BEsat}	0.6 V	1.2 V
$I_C = 500\text{ mA}, I_B = 50\text{ mA}$	BSR 13	V_{BEsat}	–	2.6 V
	BSR 14	V_{BEsat}	–	2 V
Gain-Bandwidth Product – Transitfrequenz				
$V_{CE} = 20\text{ V}, I_C = 20\text{ mA},$ $f = 100\text{ MHz}$	BSR 13	f_T	250 MHz	–
	BSR 14	f_T	300 MHz	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität				
$V_{CB} = 10\text{ V}, I_E = i_e = 0, f = 1\text{ MHz}$		C_{CB0}	–	8 pF
Switching times – Schaltzeiten				
turn-on time		t_{on}	–	35 ns
delay time		t_d	–	15 ns
rise time	$I_{Con} = 150\text{ mA}$ $I_{Bon} = 15\text{ mA}$	t_r	–	20 ns
turn-off time	$-I_{Boff} = 15\text{ mA}$	t_{off}	–	250 ns
storage time		t_s	–	200 ns
fall time		t_f	–	60 ns
Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft		R_{thA}	420 K/W ²⁾	
Recommended complementary PNP transistors Empfohlene komplementäre PNP-Transistoren		BSR 15, BSR 16		
Marking - Stempelung		BSR 13 = U7	BSR 14 = U8	

¹⁾ Tested with pulses $t_p = 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$ – Gemessen mit Impulsen $t_p = 300\text{ }\mu\text{s}$, Schaltverhältnis $\leq 2\%$

²⁾ Mounted on P.C. board with 3 mm^2 copper pad at each terminal
Montage auf Leiterplatte mit 3 mm^2 Kupferbelag (Löt-pad) an jedem Anschluß