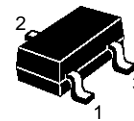


SMALL SIGNAL PNP TRANSISTORS

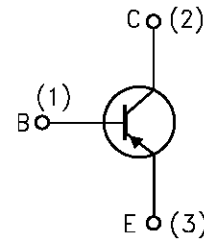
Type	Marking
BSR15	T7
BSR16	T8

- SILICON EPITAXIAL PLANAR PNP TRANSISTORS
- MINIATURE PLASTIC PACKAGE FOR APPLICATION IN SURFACE MOUNTING CIRCUITS
- MEDIUM CURRENT AF AMPLIFICATION AND SWITCHING
- NPN COMPLEMENTS ARE RESPECTIVELY BSR13 AND BSR14



SOT-23

INTERNAL SCHEMATIC DIAGRAM



SC08810

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BSR15	BSR16	
V_{CBO}	Collector-Emitter Voltage ($V_{BE} = 0$)	-60	-60	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	-40	-60	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	-5		V
I_{CM}	Collector Peak Current	-0.6		A
P_{tot}	Total Dissipation at $T_c = 25^\circ\text{C}$	350		mW
T_{stg}	Storage Temperature	-65 to 150		$^\circ\text{C}$
T_j	Max. Operating Junction Temperature	150		$^\circ\text{C}$

BSR15/BSR16

THERMAL DATA

$R_{thj-amb}$ •	Thermal Resistance Junction-Ambient	Max	350	°C/W
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• Mounted on a ceramic substrate area = 15 x 15 x 0.5 mm

ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEX}	Collector Cut-off Current	$V_{CE} = -30\text{ V}$ $V_{BE} = -3\text{ V}$			-50	nA
I_{BEX}	Base Cut-off Current	$V_{CE} = -30\text{ V}$ $V_{BE} = -3\text{ V}$			-50	nA
I_{CBO}	Collector Cut-off Current ($I_E = 0$)	$V_{CB} = -50\text{ V}$ for BSR15 for BSR16 $V_{CB} = -50\text{ V}$ $T_j = 150\text{ °C}$ for BSR15 for BSR16			-20 -10 -20 -10	nA nA μA μA
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ($I_B = 0$)	$I_C = -10\text{ mA}$ for BSR15 for BSR16	-40 -60			V V
$V_{(BR)CBO}^*$	Collector-Base Breakdown Voltage ($I_e = 0$)	$I_C = -10\text{ }\mu\text{A}$	-60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ($I_c = 0$)	$I_E = -10\text{ }\mu\text{A}$	-5			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = -150\text{ mA}$ $I_B = -15\text{ mA}$ $I_C = -500\text{ mA}$ $I_B = -50\text{ mA}$			-0.4 -1.6	V V
$V_{BE(sat)}^*$	Collector-Base Saturation Voltage	$I_C = -150\text{ mA}$ $I_B = -15\text{ mA}$ $I_C = -500\text{ mA}$ $I_B = -50\text{ mA}$			-1.3 -2.6	V V
h_{FE}^*	DC Current Gain	$I_C = -0.1\text{ mA}$ $V_{CE} = -10\text{ V}$ for BSR15 for BSR16 $I_C = -1\text{ mA}$ $V_{CE} = -10\text{ V}$ for BSR15 for BSR16 $I_C = -10\text{ mA}$ $V_{CE} = -10\text{ V}$ for BSR15 for BSR16 $I_C = -150\text{ mA}$ $V_{CE} = -10\text{ V}$ for BSR15 for BSR16 $I_C = -500\text{ mA}$ $V_{CE} = -10\text{ V}$ for BSR15 for BSR16	35 75 50 100 75 100 100 100 30 50		300 300	
f_T	Transition Frequency	$I_C = -50\text{ mA}$ $V_{CE} = -20\text{ V}$ $f = 100\text{ MHz}$	200			MHz
C_{CB}	Collector Base Capacitance	$I_E = 0$ $V_{CB} = -10\text{ V}$ $f = 1\text{ MHz}$			8	pF
C_{EB}	Emitter Base Capacitance	$I_C = 0$ $V_{EB} = -2\text{ V}$ $f = 1\text{ MHz}$			30	pF

* Pulsed: Pulse duration = 300 μs , duty cycle $\leq 2\%$

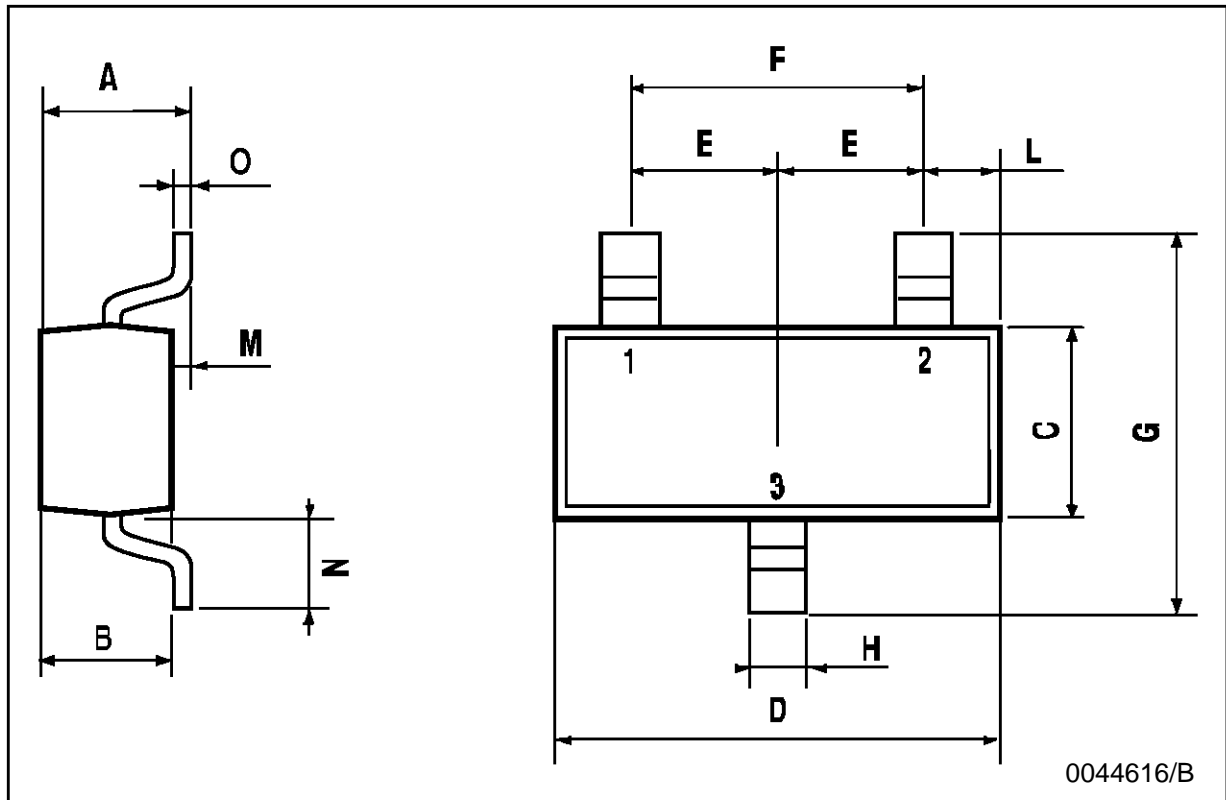
ELECTRICAL CHARACTERISTICS (Continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_d	Delay Time	$I_C = -150 \text{ mA}$ $I_{B1} = -15 \text{ mA}$			10	ns
t_r	Rise Time				40	ns
t_{on}	Switching On Time				45	ns
t_s	Storage Time	$I_C = -150 \text{ mA}$ $I_{B1} = -I_{B2} = -15 \text{ mA}$			80	ns
t_f	Fall Time				30	ns
t_{off}	Switching Off Time				100	ns

* Pulsed: Pulse duration = 300 μs , duty cycle $\leq 2\%$

SOT-23 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.85		1.1	33.4		43.3
B	0.65		0.95	25.6		37.4
C	1.20		1.4	47.2		55.1
D	2.80		3	110.2		118
E	0.95		1.05	37.4		41.3
F	1.9		2.05	74.8		80.7
G	2.1		2.5	82.6		98.4
H	0.38		0.48	14.9		18.8
L	0.3		0.6	11.8		23.6
M	0		0.1	0		3.9
N	0.3		0.65	11.8		25.6
O	0.09		0.17	3.5		6.7



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