

## SMALL SIGNAL PNP TRANSISTORS

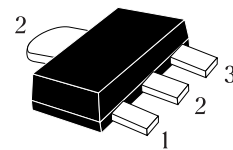
PRELIMINARY DATA

Ordering Code	Marking
BSR31	R31
BSR33	R33

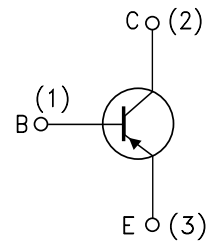
- SILICON EPITAXIAL PLANAR PNP MEDIUM VOLTAGE TRANSISTORS
- SOT-89 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE AND REEL PACKING
- THE NPN COMPLEMENTARY TYPES ARE BSR41 AND BSR43 RESPECTIVELY

### APPLICATIONS

- MEDIUM VOLTAGE LOAD SWITCH TRANSISTORS
- OUTPUT STAGE FOR AUDIO AMPLIFIERS CIRCUITS
- AUTOMOTIVE POST-VOLTAGE REGULATION


**SOT-89**

### INTERNAL SCHEMATIC DIAGRAM



SC08810

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BSR31	BSR33	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-70	-90	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-60	-80	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	-5		V
$I_C$	Collector Current	-1		A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	-2		A
$I_B$	Base Current	-0.1		A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms)	-0.2		A
$P_{tot}$	Total Dissipation at $T_{amb} = 25$ °C	1.35		W
$T_{stg}$	Storage Temperature	-65 to 150		°C
$T_j$	Max. Operating Junction Temperature	150		°C

## BSR31 BSR33

### THERMAL DATA

$R_{thj-amb}$ •	Thermal Resistance Junction-Ambient	Max	92.6	°C/W
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• Device mounted on a PCB area of 1 cm<sup>2</sup>

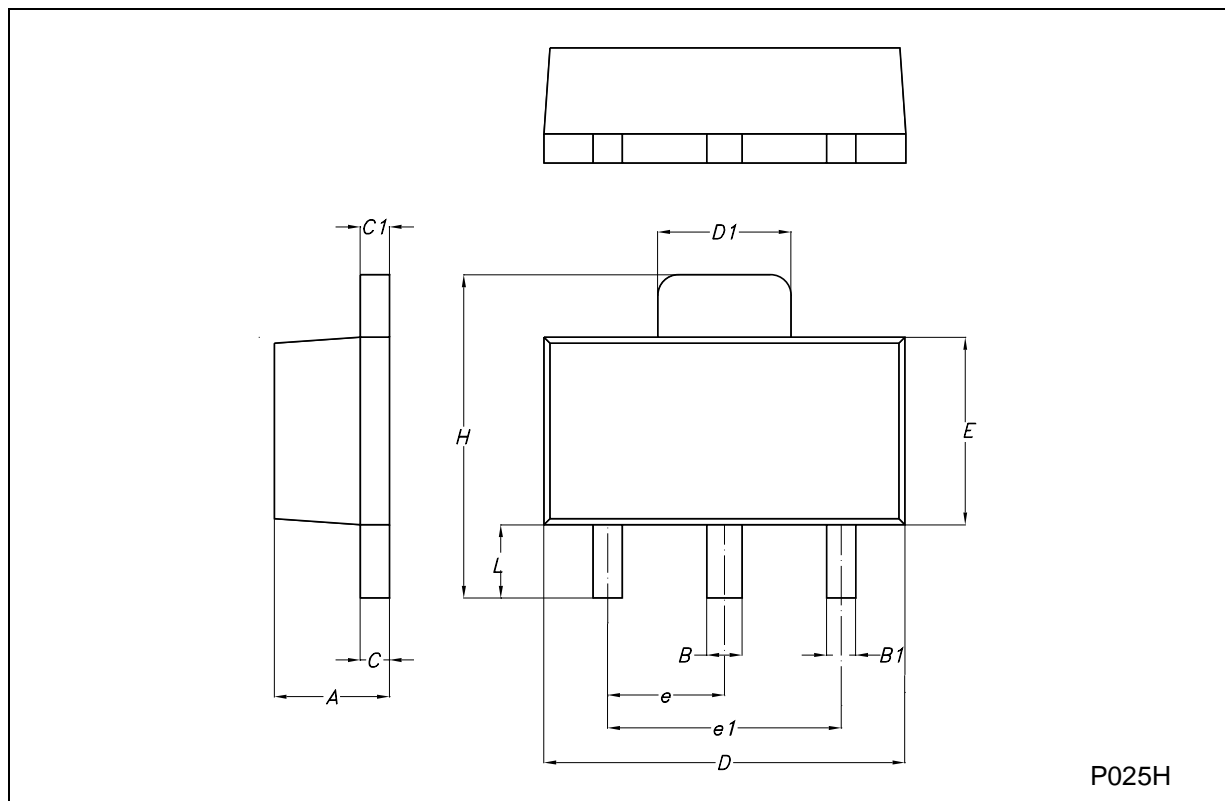
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current (I <sub>E</sub> = 0)	V <sub>CB</sub> = -60 V V <sub>CB</sub> = -60 V      T <sub>j</sub> = 150 °C			-100 -50	nA μA
$I_{EBO}$	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> = -5 V			-100	nA
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)	I <sub>C</sub> = -100 μA for <b>BSR31</b> for <b>BSR33</b>	-70 -90			V V
V <sub>(BR)CEO*</sub>	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0)	I <sub>C</sub> = -20 mA for <b>BSR31</b> for <b>BSR33</b>	-60 -80			V V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)	I <sub>E</sub> = -10 μA	-5			V
V <sub>CE(sat)*</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -150 mA    I <sub>B</sub> = -15 mA I <sub>C</sub> = -500 mA    I <sub>B</sub> = -50 mA			-0.25 -0.5	V V
V <sub>BE(sat)*</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = -150 mA    I <sub>B</sub> = -15 mA I <sub>C</sub> = -500 mA    I <sub>B</sub> = -50 mA			-1 -1.2	V V
h <sub>FE*</sub>	DC Current Gain	I <sub>C</sub> = -100 μA    V <sub>CE</sub> = -5 V I <sub>C</sub> = -100 mA    V <sub>CE</sub> = -5 V I <sub>C</sub> = -500 mA    V <sub>CE</sub> = -5 V	30 100 50		300	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = -50 mA    V <sub>CE</sub> = -10 V f = 100 MHz	100			MHz

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 1.5 %

## SOT-89 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.4		1.6	55.1		63.0
B	0.44		0.56	17.3		22.0
B1	0.36		0.48	14.2		18.9
C	0.35		0.44	13.8		17.3
C1	0.35		0.44	13.8		17.3
D	4.4		4.6	173.2		181.1
D1	1.62		1.83	63.8		72.0
E	2.29		2.6	90.2		102.4
e	1.42		1.57	55.9		61.8
e1	2.92		3.07	115.0		120.9
H	3.94		4.25	155.1		167.3
L	0.89		1.2	35.0		47.2



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