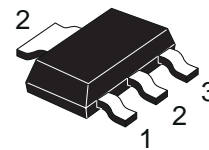


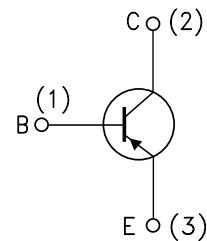
## MEDIUM POWER AMPLIFIER

ADVANCE DATA

- SILICON EPITAXIAL PLANAR PNP TRANSISTORS
- MINIATURE PLASTIC PACKAGE FOR APPLICATION IN SURFACE MOUNTING CIRCUITS
- GENERAL PURPOSE MAINLY INTENDED FOR USE IN MEDIUM POWER INDUSTRIAL APPLICATION AND FOR AUDIO AMPLIFIER OUTPUT STAGE
- NPN COMPLEMENTS ARE BSP40, BSP41, BSP42 AND BSP43 RESPECTIVELY


**SOT-223**

### INTERNAL SCHEMATIC DIAGRAM



SC08810

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BSP30/BSP31	BSP32/BSP33	
$V_{CBO}$	Collector-Base Voltage ( $I_E = 0$ )	-70	-90	V
$V_{CEO}$	Collector-Emitter Voltage ( $I_B = 0$ )	-60	-80	V
$V_{CES}$	Collector-Emitter Voltage ( $R_{BE} = 1K\Omega$ )	-70	-90	V
$V_{EBO}$	Emitter-Base Voltage ( $I_C = 0$ )	-5		V
$I_C$	Collector Current	-1		A
$I_B$	Base Current	-0.1		A
$P_{tot}$	Total Dissipation at $T_c = 25^\circ C$	2		W
$T_{stg}$	Storage Temperature	-65 to 150		$^\circ C$
$T_j$	Max. Operating Junction Temperature	150		$^\circ C$

**THERMAL DATA**

$R_{thj-amb}$ •	Thermal Resistance Junction-Ambient	Max	62.5	°C/W
$R_{thj-tab}$ •	Thermal Resistance Junction-Collector Tab	Max	8	°C/W

• Mounted on a ceramic substrate area = 30 x 35 x 0.7 mm

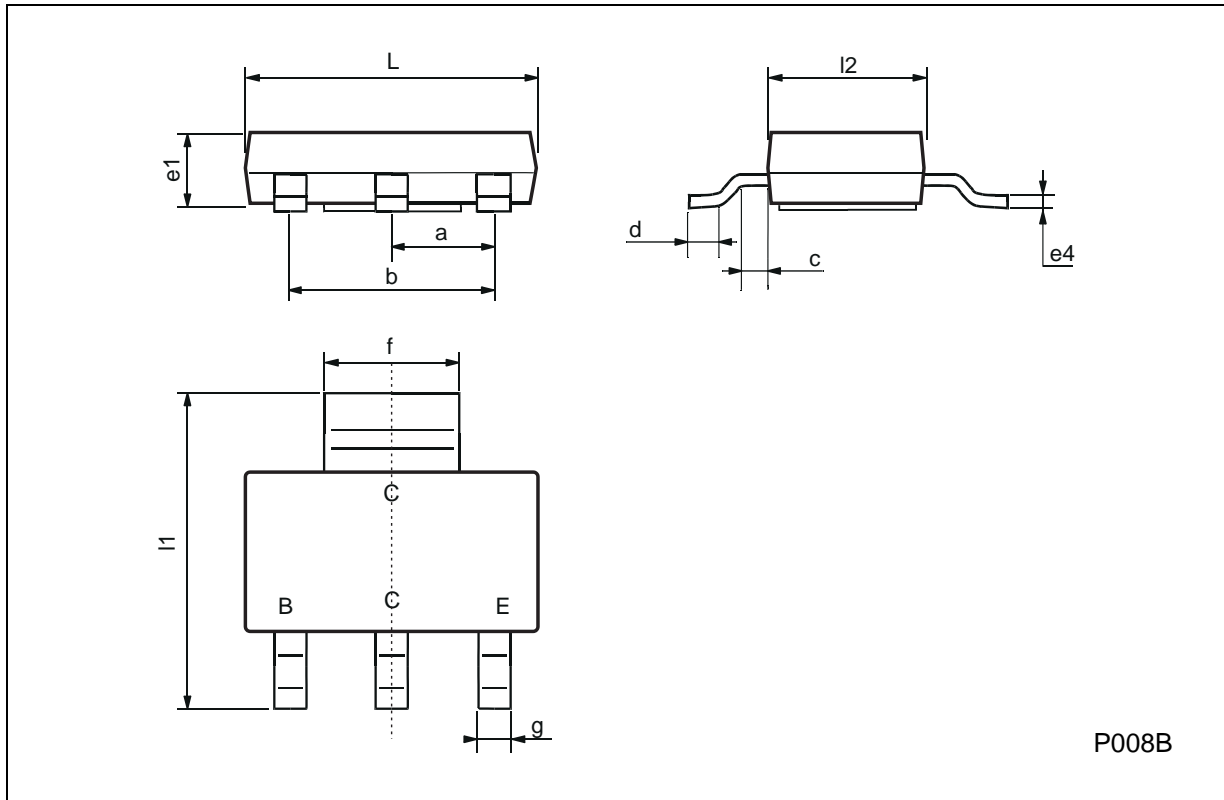
**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = -60\text{ V}$ $V_{CB} = -60\text{ V}$ $T_j = 150\text{ °C}$			-100 -50	nA $\mu\text{A}$
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_E = 0$ )	$I_C = -100\text{ }\mu\text{A}$ for <b>BSP30/BSP31</b> for <b>BSP32/BSP33</b>	-70 -90			V V
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = -10\text{ mA}$ for <b>BSP30/BSP31</b> for <b>BSP32/BSP33</b>	-60 -80			V V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage ( $V_{BE} = 0$ )	$I_C = -10\text{ }\mu\text{A}$ for <b>BSP30/BSP31</b> for <b>BSP32/BSP33</b>	-70 -90			V V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_C = 0$ )	$I_C = -10\text{ }\mu\text{A}$	-5			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = -150\text{ mA}$ $I_B = -15\text{ mA}$ $I_C = -500\text{ mA}$ $I_B = -50\text{ mA}$			-0.25 -0.5	V V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = -150\text{ mA}$ $I_B = -15\text{ mA}$ $I_C = -500\text{ mA}$ $I_B = -50\text{ mA}$			-1 -1.2	V V
$h_{FE}^*$	DC Current Gain	for <b>BSP30/BSP31</b> $I_C = -100\text{ }\mu\text{A}$ $V_{CE} = -5\text{ V}$ $I_C = -100\text{ mA}$ $V_{CE} = -5\text{ V}$ $I_C = -500\text{ mA}$ $V_{CE} = -5\text{ V}$ for <b>BSP32/BSP33</b> $I_C = -100\text{ }\mu\text{A}$ $V_{CE} = -5\text{ V}$ $I_C = -100\text{ mA}$ $V_{CE} = -5\text{ V}$ $I_C = -500\text{ mA}$ $V_{CE} = -5\text{ V}$	10 40 30		120	
$f_T$	Transition Frequency	$I_C = -50\text{ mA}$ $V_{CE} = -10\text{ V}$ $f = 35\text{ MHz}$	100			MHz
$C_{CBO}$	Collector-Base Capacitance	$I_E = 0$ $V_{CB} = -10\text{ V}$ $f = 1\text{ MHz}$			20	pF
$C_{EBO}$	Emitter-Base Capacitance	$I_C = 0$ $V_{EB} = -0.5\text{ V}$ $f = 1\text{ MHz}$			120	pF
$t_{on}$	Turn-on Time	$I_C = -100\text{ mA}$ $I_{B1} = -I_{B2} = -5\text{ mA}$			500	ns
$t_{off}$	Turn-off Time				650	ns

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$

**SOT223 MECHANICAL DATA**

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a	2.27	2.3	2.33	89.4	90.6	91.7
b	4.57	4.6	4.63	179.9	181.1	182.3
c	0.2	0.4	0.6	7.9	15.7	23.6
d	0.63	0.65	0.67	24.8	25.6	26.4
e1	1.5	1.6	1.7	59.1	63	66.9
e4			0.32			12.6
f	2.9	3	3.1	114.2	118.1	122.1
g	0.67	0.7	0.73	26.4	27.6	28.7
l1	6.7	7	7.3	263.8	275.6	287.4
l2	3.5	3.5	3.7	137.8	137.8	145.7
L	6.3	6.5	6.7	248	255.9	263.8



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