

SILICON TRANSISTOR

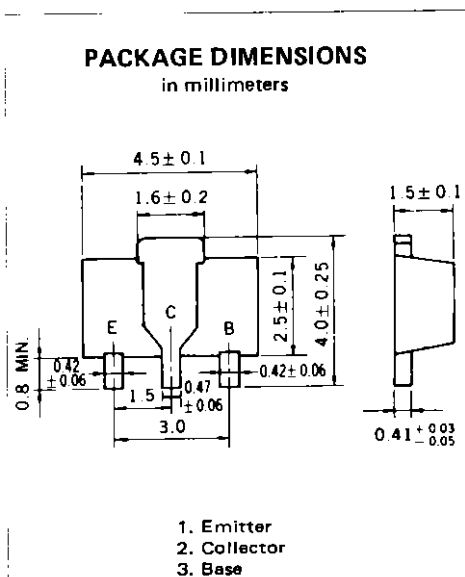
2SB1301

PNP SILICON EPITAXIAL TRANSISTOR

POWER MINI MOLD

DESCRIPTION

2SB1301 is designed for audio frequency power amplifier and switching application, especially in Hybrid Integrated Circuits.



FEATURES

- World Standard Miniature Package
- High DC Current Gain $h_{FE} = 135$ to 600
- Low $V_{CE(sat)} \cdot V_{CE(sat)} = -0.42$ V at 3.0 A
- Complement to 2SD1952

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents ($T_a = 25^\circ\text{C}$)

Collector to Base Voltage	V_{CBO}	-20	V
Collector to Emitter Voltage	V_{CEO}	-16	V
Emitter to Base Voltage	V_{EBO}	-6	V
Collector Current (DC)	I_C	-3	A
Collector Current (Pulse)*	I_C	-5	A

Maximum Power Dissipation

Total Power Dissipation at 25°C Ambient Temperature**	P_T	2.0	W
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Maximum Temperatures

Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 10$ ms, Duty Cycle $\leq 50\%$

** When mounted on ceramic substrate of $16\text{ cm}^2 \times 0.7$ mm

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

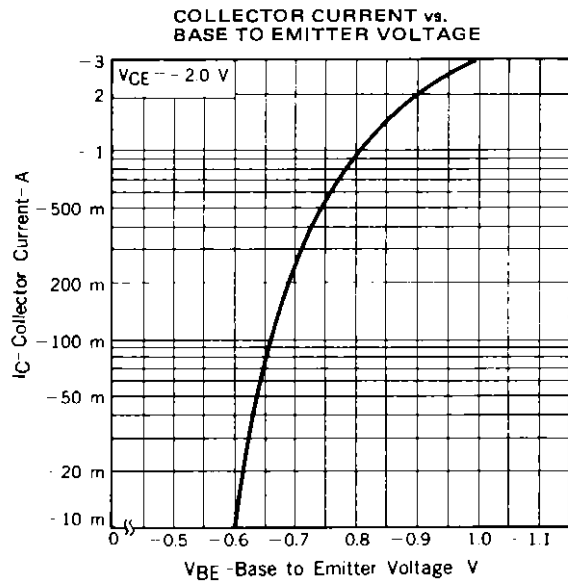
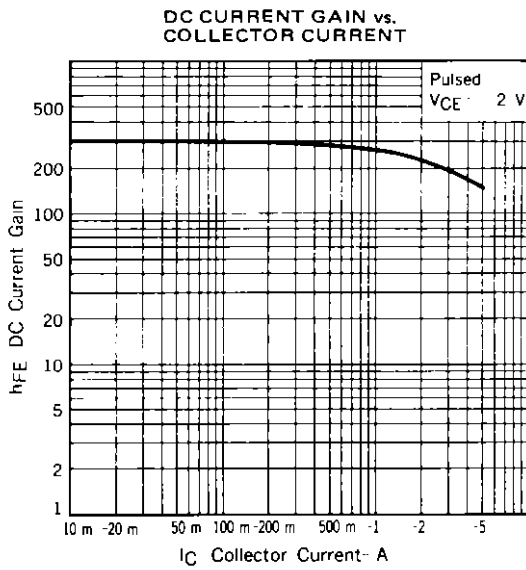
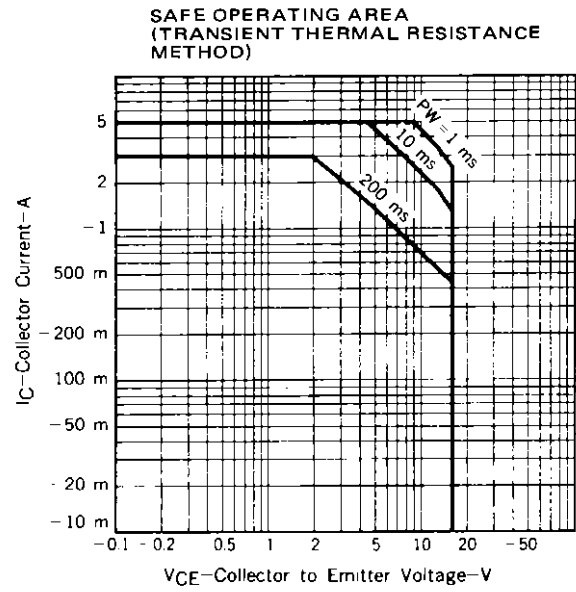
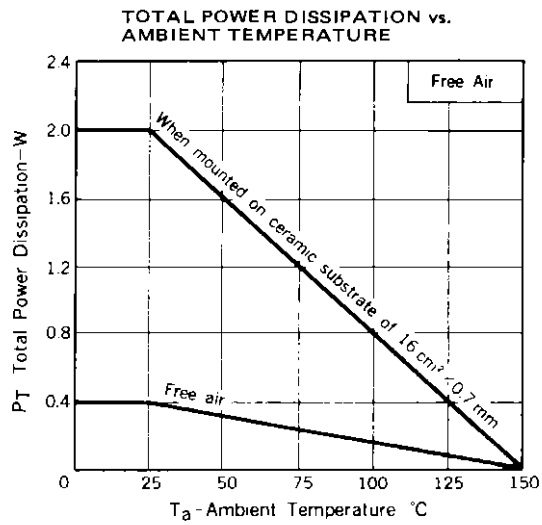
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			-100	nA	$V_{CB} = -20$ V, $I_E = 0$
Emitter Cutoff Current	I_{EBO}			-100	nA	$V_{EB} = -6.0$ V, $I_C = 0$
DC Current Gain	h_{FE1}^{***}	135	350	600		$V_{CE} = -2.0$ V, $I_C = -100$ mA
DC Current Gain	h_{FE2}^{***}	90				$V_{CE} = -2.0$ V, $I_C = -2.0$ A
Collector Saturation Voltage	$V_{CE(sat)}^{***}$		-0.28	-0.35	V	$I_C = -2.0$ A, $I_B = -0.1$ A
Base Saturation Voltage	$V_{BE(sat)}^{***}$		-0.95	-1.2	V	$I_C = -2.0$ A, $I_B = -0.1$ A
Base to Emitter Voltage	V_{BE}^{***}	-0.6	-0.66	-0.7	V	$V_{CE} = -2.0$ V, $I_C = -100$ mA
Gain Bandwidth Product	f_T	100	140		MHz	$V_{CE} = -10$ V, $I_E = 50$ mA
Output Capacitance	C_{ob}		60		pF	$V_{CB} = -10$ V, $I_E = 0$, $f = 1.0$ MHz

*** Pulsed: $PW \leq 350$ μs , Duty Cycle $\leq 2\%$

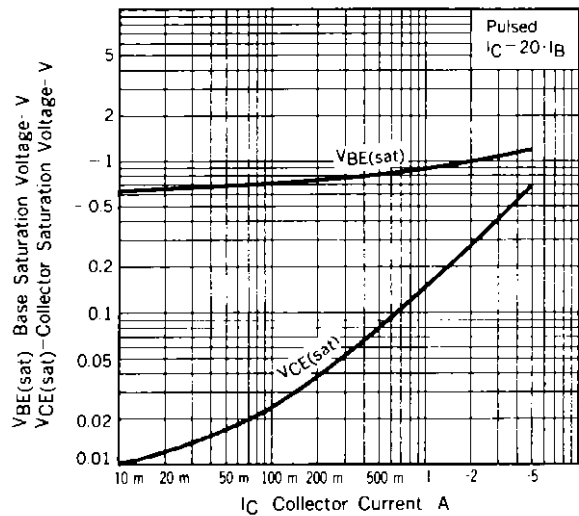
h_{FE} Classification

MARKING	ZR	ZQ	ZP
h_{FE}	135 to 270	200 to 400	300 to 600

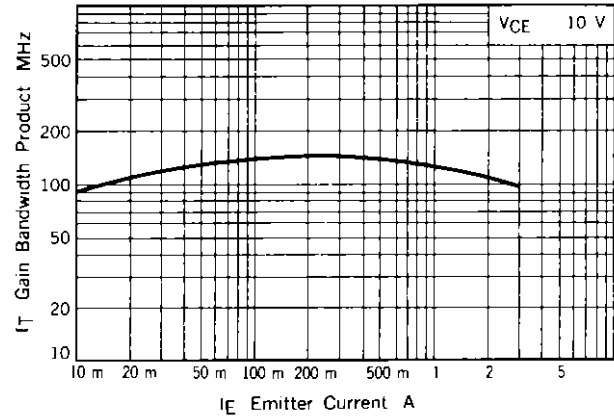
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



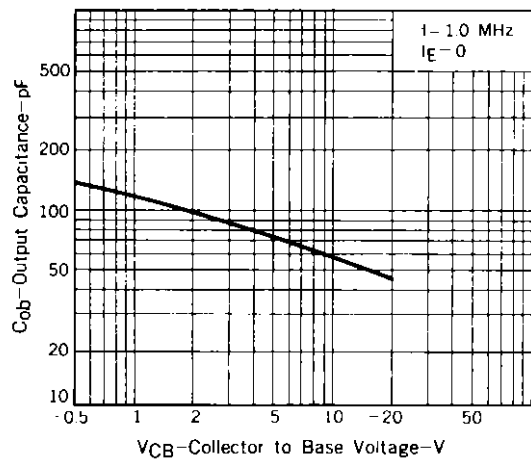
BASE AND COLLECTOR SATURATION
VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENT GAIN



OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134

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