DATA SHEET

RENESAS

SILICON TRANSISTOR
2SB1301

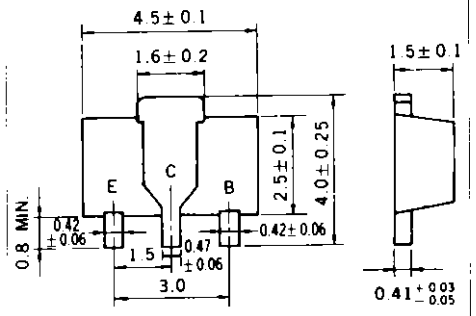
PNP SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION

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

PACKAGE DIMENSIONS

in millimeters



1. Emitter
2. Collector
3. Base

FEATURES

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

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (T_a = 25 °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
Maximum Temperatures			
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C

* PW ≦ 10 ms, Duty Cycle ≦ 50 %

** When mounted on ceramic substrate of 16 cm² x 0.7 mm

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDICTIONS
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 ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

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

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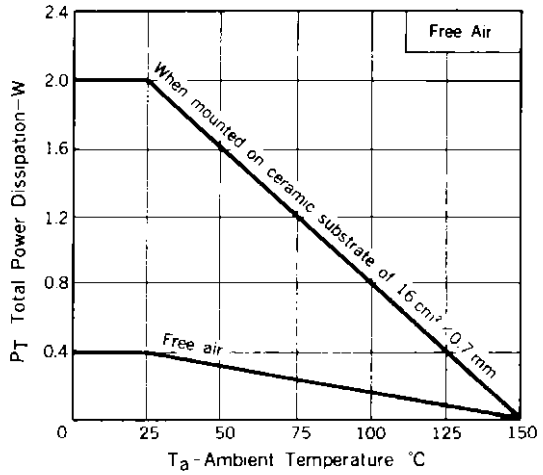
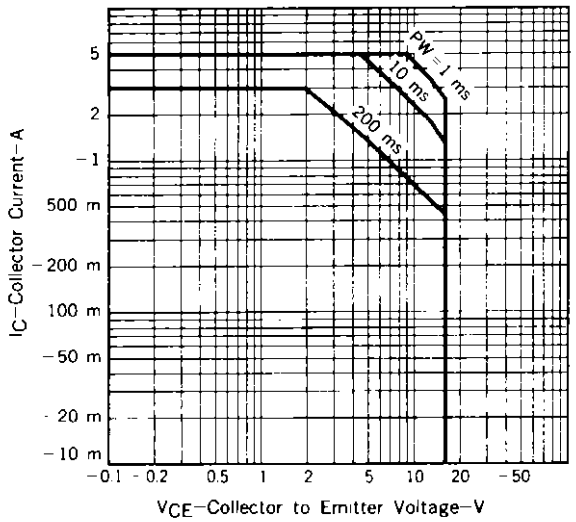
TYPICAL CHARACTERISTICS (T_a = 25 °C)

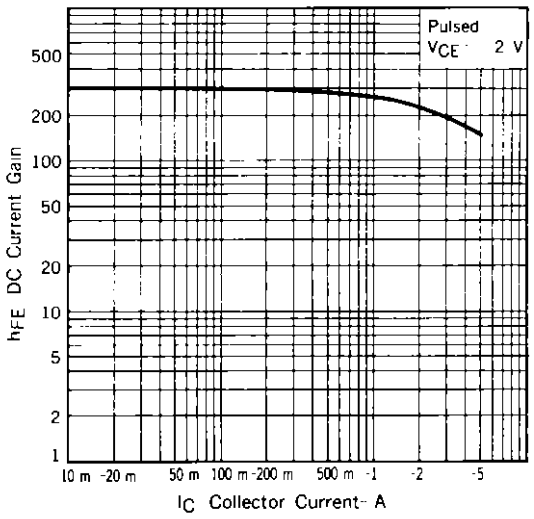
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



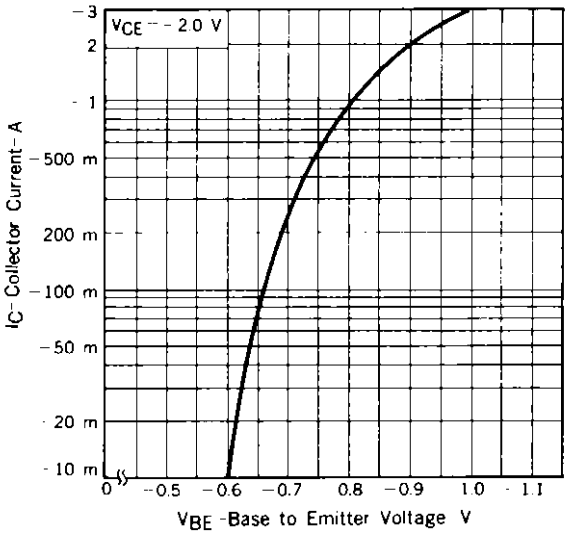
SAFE OPERATING AREA (TRANSIENT THERMAL RESISTANCE METHOD)



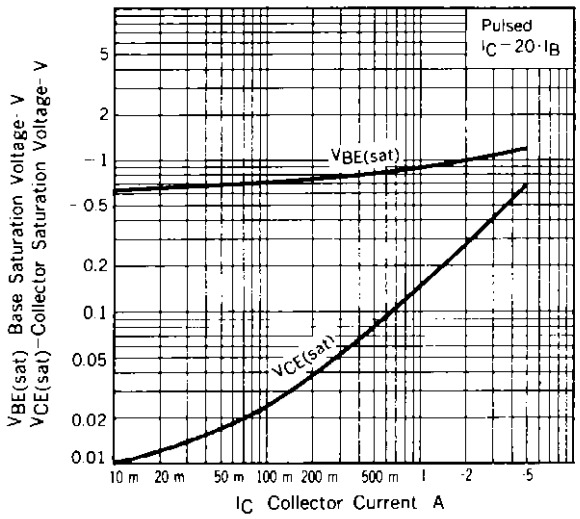
DC CURRENT GAIN vs. COLLECTOR CURRENT



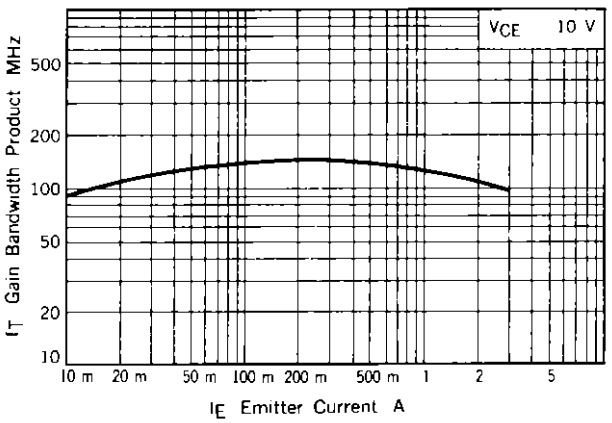
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



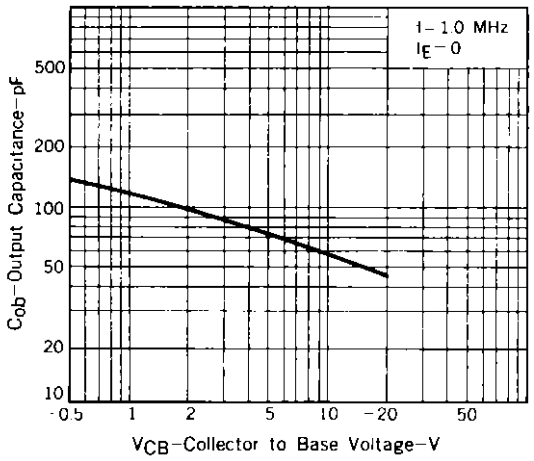
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



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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