NEC

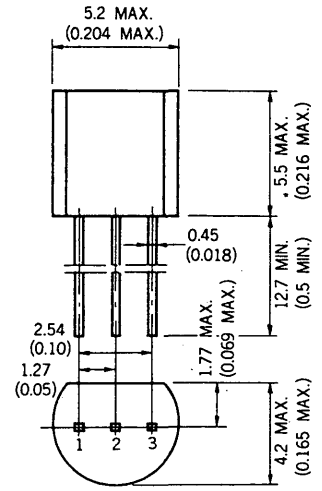
PNP SILICON TRANSISTOR
2SB1300

DESCRIPTION The 2SB1300 is designed for use in driver and output stages of audio frequency amplifiers.

FEATURES

- Low Collector Saturation Voltage
  $V_{CE(sat)}$: −0.42 V TYP. (I_C = −3.0 A, I_B = −0.15A)
- High DC Current Gain
  h_{FE} : 300 TYP. (V_{CE} = −2.0 V, I_C = −100 mA)
- High Total Power Dissipation P_T : 0.75 W (T_a = 25 °C)
- Complementary to The NEC 2SD1951 NPN Transistor

PACKAGE DIMENSIONS
in millimeters (inches)



1. EMITTER
2. COLLECTOR
3. BASE

EIAJ : SC-43A
JEDEC : TO-92
IEC : PA33

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures
- Storage Temperature . . . . . −55 to +150 °C
- Junction Temperature . . . . . +150 °C Maximum

Maximum Power Dissipation (T_a = 25 °C)
- Total Power Dissipation . . . . . 0.75 W

Maximum Voltages and Currents (T_a = 25 °C)
- V_{CBO} Collector to Base Voltage . . . . . −20 V
- V_{CEO} Collector to Emitter Voltage . . . . . −16 V
- V_{EBO} Emitter to Base Voltage . . . . . −6.0 V
- $I_{C(DC)}$ Collector Current . . . . . −3.0 A
- $I_{C(pulse)}$ *Collector Current . . . . . −5.0 A

*PW ≦ 10 ms, Duty Cycle ≦ 50 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE1}	DC Current Gain	135	300	600	–	V_{CE} = −2.0 V, I_C = −100 mA
h_{FE2}	DC Current Gain	90			–	V_{CE} = −2.0 V, I_C = −2.0 A
f_T	Gain Bandwidth Product	100	140		MHz	V_{CE} = −10 V, I_E = 50 mA
C_{ob}	Output Capacitance		60		pF	V_{CB} = −10 V, I_E = 0, f = 1.0 MHz
I_{CBO}	Collector Cutoff Current			−100	nA	V_{CB} = −20 V, I_E = 0
I_{EBO}	Emitter Cutoff Current			−100	nA	V_{EB} = −6.0 V, I_C = 0
V_{BE}	Base to Emitter Voltage	−600	−660	−700	mV	V_{CE} = −2.0 V, I_C = −100 mA
$V_{CE(sat)1}$	Collector Saturation Voltage		−0.15	−0.20	V	I_C = −1.0 A, I_B = −0.05A
$V_{CE(sat)2}$	Collector Saturation Voltage		−0.28	−0.35	V	I_C = −2.0 A, I_B = −0.1 A
$V_{CE(sat)3}$	Collector Saturation Voltage		−0.42	−0.50	V	I_C = −3.0 A, I_B = −0.15 A
$V_{BE(sat)}$	Base Saturation Voltage		−0.95	−1.2	V	I_C = −2.0 A, I_B = −0.1 A

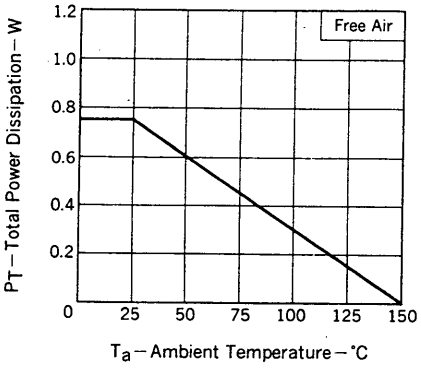
Classification of h_{FE}

Rank	L	K	U
Range	135 to 270	200 to 400	300 to 600

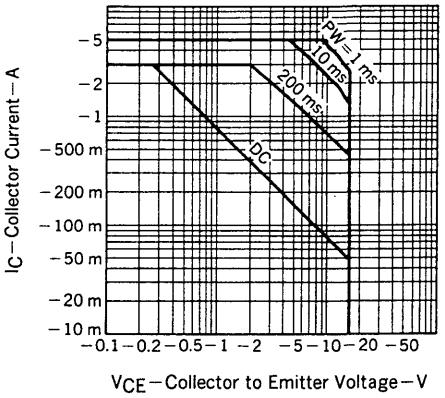
Test Conditions: V_{CE} = −2.0 V, I_C = −100 mA

TYPICAL CHARACTERISTICS (T_a = 25 °C)

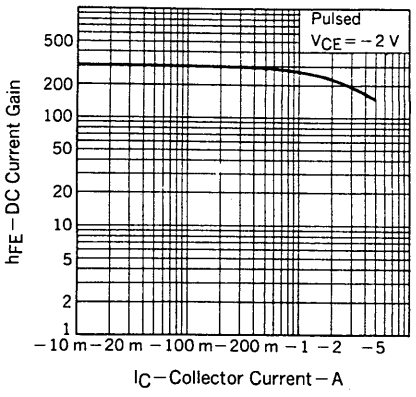
TOTAL POWER DIDDIPATION vs. AMBIENT TEMPERATURE



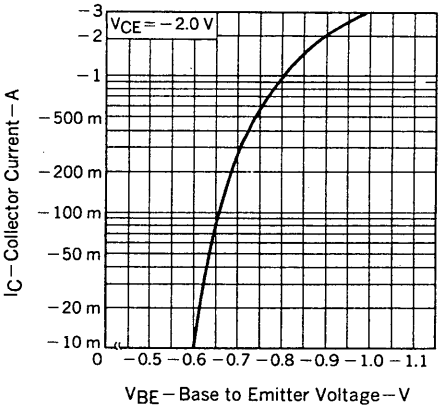
SAFE OPERATING AREA (TRANSIENT THERMAL RESISTANCE METHOD)



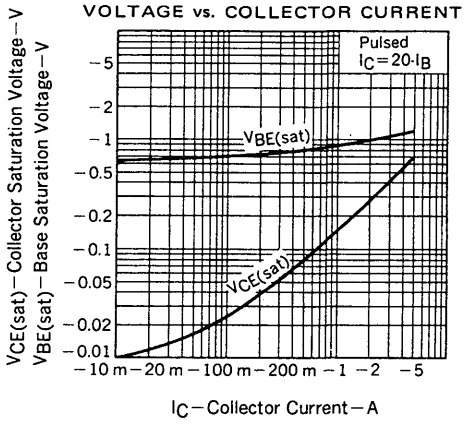
DC CURRENT GAIN vs. COLLECTOR CURRENT



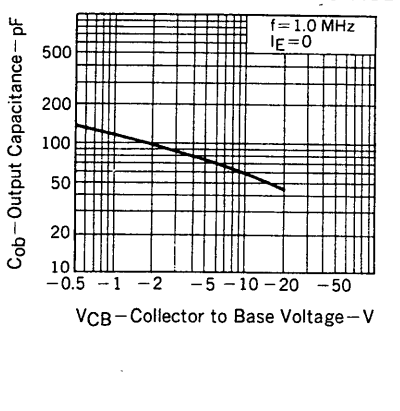
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT GAIN