NEC

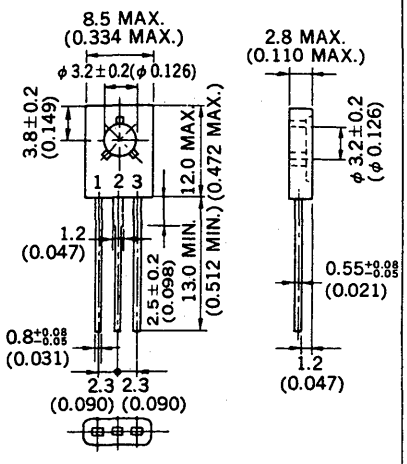
PNP SILICON POWER TRANSISTOR
2SA1156

DESCRIPTION The 2SA1156 is suitable for Low Power Switching regulator, DC-DC converter and High Voltage Switch.

FEATURES

- High Breakdown Voltage.
- Low Collector Saturation Voltage.
- High Speed Switching.
- Complementary to the NEC 2SC2752 NPN Transistor.

PACKAGE DIMENSIONS
in millimeters (inches)



1. Emitter
2. Collector connected to mounting plane
3. Base

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

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

Maximum Power Dissipations

- Total Power Dissipation (T_a = 25 °C) . . . . . 1.0 W
- Total Power Dissipation (T_c = 25 °C) . . . . . 10 W

Maximum Voltages and Currents (T_a = 25 °C)

- V_{CBO} Collector to Base Voltage . . . . . −400 V
- V_{CEO} Collector to Emitter Voltage . . . . . −400 V
- V_{EBO} Emitter to Base Voltage . . . . . −7.0 V
- $I_{C(DC)}$ Collector Current . . . . . −0.5 A
- $I_{C(pulse)}$* Collector Current . . . . . −1.0 A
- $I_{B(DC)}$ Base Current. . . . . −0.25 A

* PW ≦ 10 ms, Duty Cycle ≦ 50 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h_{FE} **	DC Current Gain	30		200	—	V_{CE} = −5.0 V, I_C = −100 mA
t_{on}	Turn On Time			1.0	μs	I_C = −100 mA, R_L = 1.5 kΩ
t_{stg}	Storage Time			4.0	μs	I_{B1} = −10 mA, I_{B2} = 20 mA, V_{CC} ≒ −150 V
t_f	Fall Time			1.0	μs	PW = 50 μs, Duty Cycle ≦ 2 %
$V_{CEO(SUS)}$	Collector to Emitter Sustaining Voltage	−400			V	I_C = −100 mA, I_B = −10 mA, L = 20 mH
$V_{CEX(SUS)}$	Collector to Emitter Sustaining Voltage	−400			V	I_C = −200 mA, I_{B1} = −I_{B2} = −20 mA $V_{BE(OFF)}$ = 5.0 V, L = 10 mH, Clamped.
I_{CBO}	Collector Cutoff Current			−100	μA	V_{CB} = −400 V, I_E = 0
I_{CEX1}	Collector Cutoff Current			−100	μA	V_{CE} = −400 V, $V_{BE(OFF)}$ = 1.5 V
I_{CEX2}	Collector Cutoff Current			−1.0	mA	V_{CE} = −400 V, $V_{BE(OFF)}$ = 1.5 V, T_a = 125 °C
I_{EBO}	Emitter Cutoff Current			−10	μA	V_{EB} = −5.0 V, I_C = 0
$V_{CE(sat)}$**	Collector Saturation Voltage			−1.0	V	I_C = −100 mA, I_B = −10 mA
$V_{BE(sat)}$**	Base Saturation Voltage			−1.2	V	I_C = −100 mA, I_B = −10 mA

** Pulsed / PW ≦ 350 μs, Duty Cycle ≦ 2 %

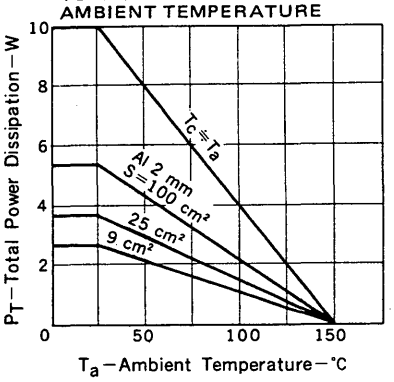
Classification of h_{FE}

Rank	N	M	L	K
Range	30 to 60	40 to 80	60 to 120	100 to 200

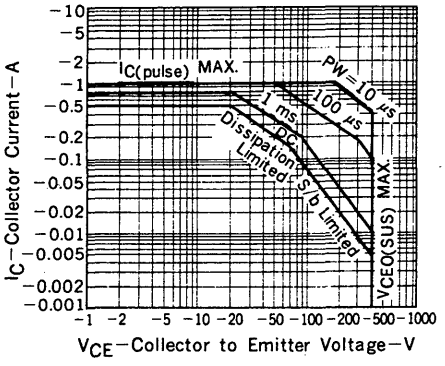
Test Conditions: V_{CE} = −5.0 V, I_C = −100 mA

TYPICAL CHARACTERISTICS (T_a = 25 °C)

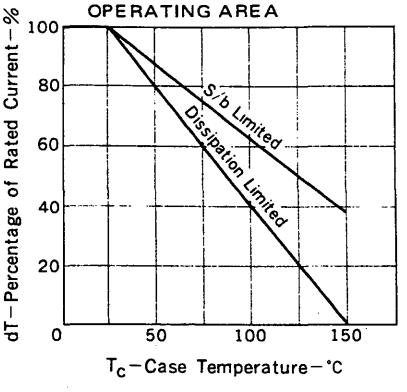
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



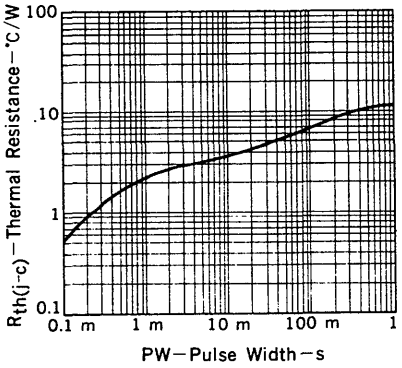
FORWARD BIAS SAFE OPERATING AREA



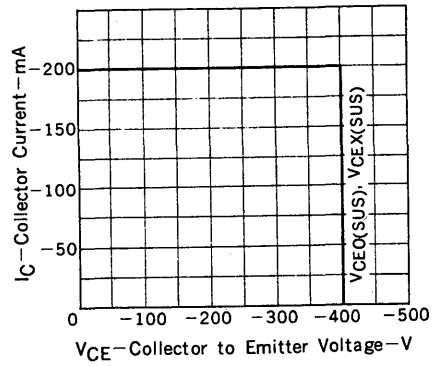
DERATING CURVE OF SAFE OPERATING AREA



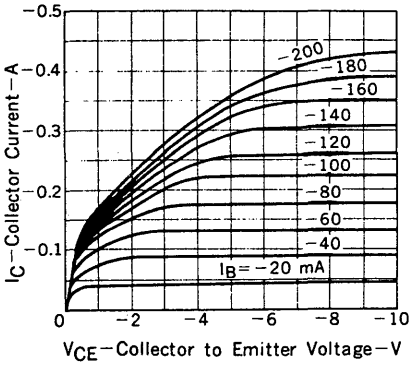
TRANSIENT THERMAL RESISTANCE



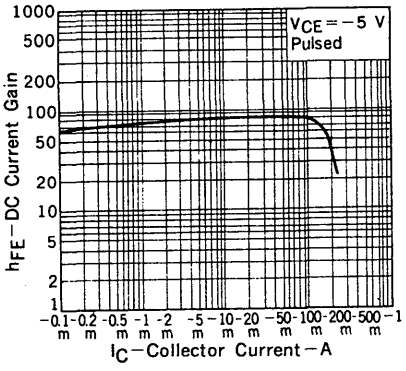
REVERSE BIAS SAFE OPERATING AREA



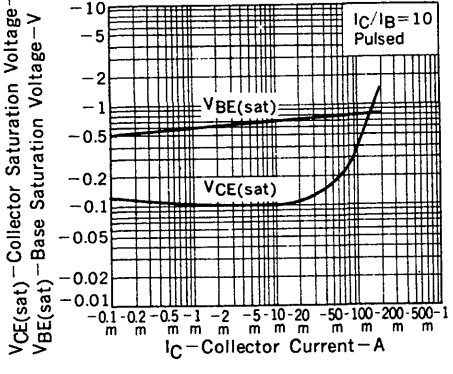
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



TURN ON TIME, STORAGE TIME AND FALL TIME vs. COLLECTOR CURRENT