

## PNP SILICON POWER TRANSISTOR 2SA1396

**DESCRIPTION** The 2SA1396 is PNP silicon epitaxial transistor designed for switching regulator, DC-DC converter and high frequency power amplifier application.

- FEATURES**
- Easy mount by eliminating Insulation Sheet and Bushing.
  - Low Collector Saturation Voltage.
  - High Switching Speed.
  - Complementary to 2SC3568.

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures

Storage Temperature . . . . . -55 to + 150 °C

Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipation (T<sub>c</sub> = 25 °C)

Total Power Dissipation . . . . . 30 W

Maximum Voltages and Currents (T<sub>a</sub> = 25 °C)

V<sub>CB0</sub> Collector to Base Voltage . . . . . -100 V

V<sub>CEO</sub> Collector to Emitter Voltage . . . . . -100 V

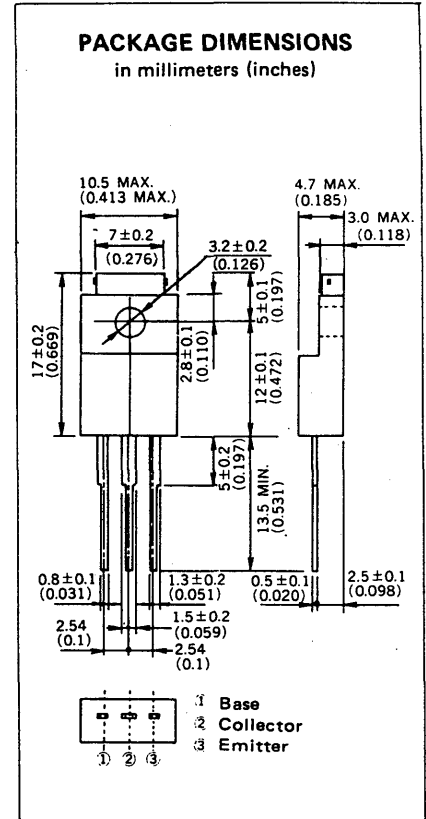
V<sub>EBO</sub> Emitter to Base Voltage . . . . . -7.0 V

I<sub>C(DC)</sub> Collector Current (DC) . . . . . -10 A

I<sub>C(pulse)</sub> Collector Current (pulse)\* . . . . . -20 A

I<sub>B(DC)</sub> Base Current (DC) . . . . . -5.0 A

\* PW ≤ 300 μs, Duty Cycle ≤ 10 %



**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT.	TEST CONDITIONS
t <sub>on</sub>	Turn-on Time			0.5	μs	(I <sub>C</sub> = -5.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = -0.5 A R <sub>L</sub> = 10 Ω, V <sub>CC</sub> = 50 V)
t <sub>stg</sub>	Storage Time			1.5	μs	
t <sub>f</sub>	Fall Time			0.5	μs	
h <sub>FE1</sub>	DC Current Gain**	40		200	-	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -0.5 A
h <sub>FE2</sub>	DC Current Gain**	40		200	-	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -3.0 A
h <sub>FE3</sub>	DC Current Gain**	20			-	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -5.0 A
V <sub>CE(sat)</sub>	Collector Saturation Voltage**			-0.6	V	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -0.5 A
V <sub>BE(sat)</sub>	Base Saturation Voltage**			-1.5	V	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -0.5 A
V <sub>CEO(SUS)</sub>	Collector to Emitter Sustaining Voltage	-100			V	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -0.5 A, L = 1 mH
V <sub>CEx(SUS)1</sub>	Collector to Emitter Sustaining Voltage	-100			V	I <sub>C</sub> = -5.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = -0.5 A, T <sub>a</sub> = 125 °C, L = 180 μH, Clamped
V <sub>CEx(SUS)2</sub>	Collector to Emitter Sustaining Voltage	-100			V	I <sub>C</sub> = -10 A, I <sub>B1</sub> = -1.0 A, -I <sub>B2</sub> = 0.5 A, L = 180 μH, Clamped
I <sub>CB0</sub>	Collector Cutoff Current			-10	μA	V <sub>CB</sub> = -100 V, I <sub>E</sub> = 0
I <sub>CER</sub>	Collector Cutoff Current			-1.0	mA	V <sub>CE</sub> = -100 V, R <sub>BE</sub> = 51 Ω, T <sub>a</sub> = 125 °C
I <sub>CEx1</sub>	Collector Cutoff Current			-10	μA	V <sub>CE</sub> = -100 V, V <sub>BE(OFF)</sub> = 1.5 V
I <sub>CEx2</sub>	Collector Cutoff Current			-1.0	mA	V <sub>CE</sub> = -100 V, V <sub>BE(OFF)</sub> = 1.5 V, T <sub>a</sub> = 125 °C
I <sub>EBO</sub>	Emitter Cutoff Current			-10	μA	V <sub>EB</sub> = -5.0 V, I <sub>C</sub> = 0

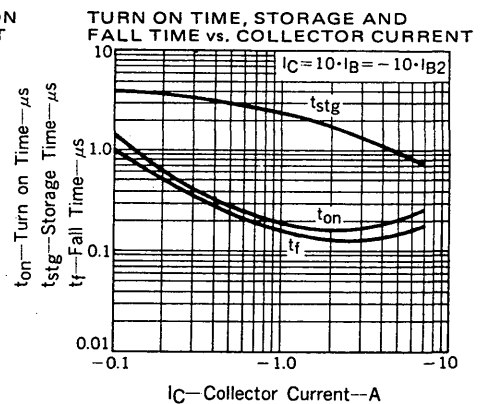
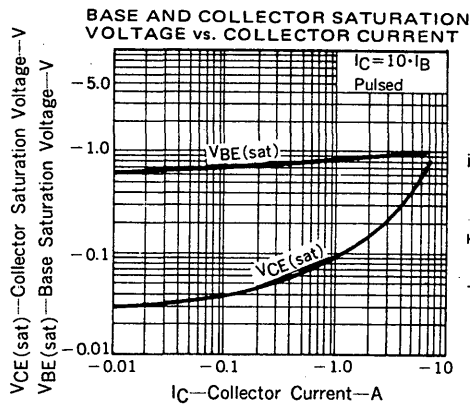
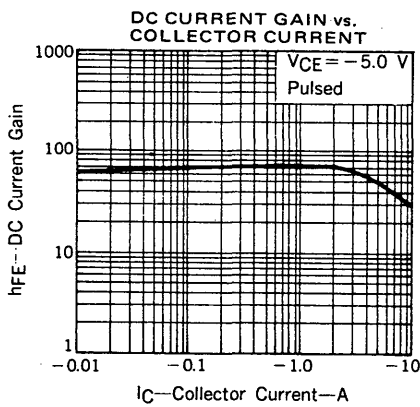
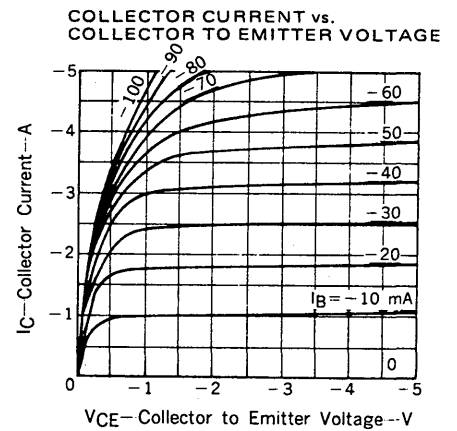
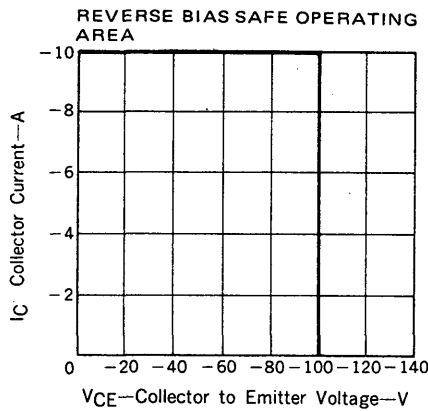
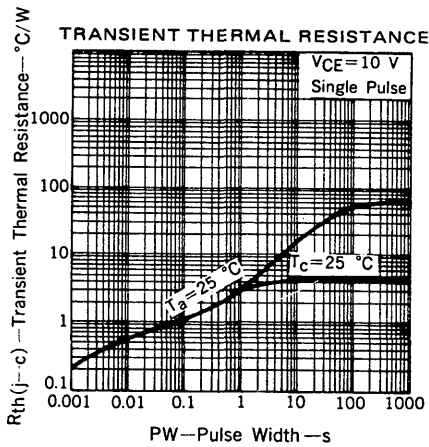
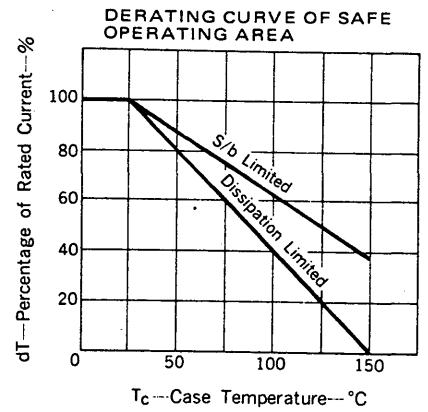
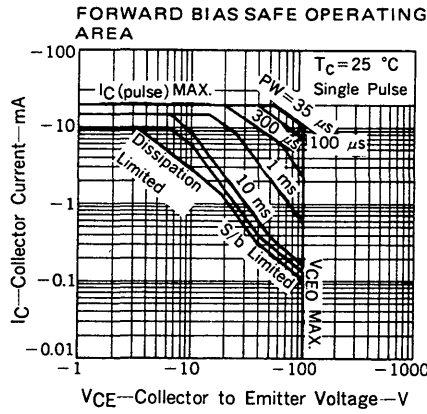
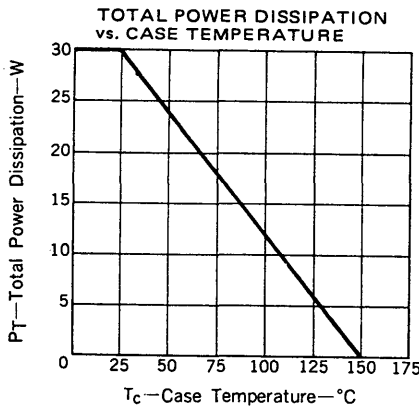
\*\*PW ≤ 350 μs, Duty Cycle ≤ 2 %

**Classification of h<sub>FE2</sub>**

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

Test Conditions: V<sub>CE</sub> = -5.0 V, I<sub>C</sub> = -3.0 A

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



SWITCHING TIME ( $t_{on}$ ,  $t_{stg}$ ,  $t_f$ ) TEST CIRCUIT

