

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 ($T_c = 25^\circ\text{C}$)

Total Power Dissipation 30 W

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

V_{CBO} Collector to Base Voltage -100 V

V_{CEO} Collector to Emitter Voltage -100 V

V_{EBO} Emitter to Base Voltage -7.0 V

$I_C(\text{DC})$ Collector Current (DC) -10 A

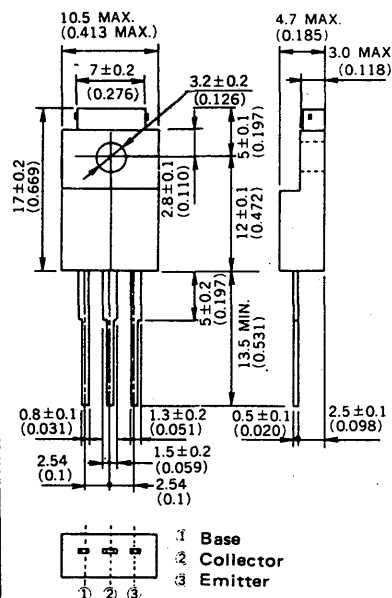
$I_C(\text{pulse})$ Collector Current (pulse)* -20 A

$I_B(\text{DC})$ Base Current (DC) -5.0 A

* $PW \leq 300 \mu\text{s}$, Duty Cycle $\leq 10\%$

PACKAGE DIMENSIONS

in millimeters (inches)



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

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT.	TEST CONDITIONS
t_{on}	Turn-on Time			0.5	μs	$I_C = -5.0 \text{ A}$, $I_{B1} = -I_{B2} = -0.5 \text{ A}$ $R_L = 10 \Omega$, $V_{CC} = 50 \text{ V}$
t_{stg}	Storage Time			1.5	μs	
t_f	Fall Time			0.5	μs	
h_{FE1}	DC Current Gain**	40		200	—	$V_{CE} = -5.0 \text{ V}$, $I_C = -0.5 \text{ A}$
h_{FE2}	DC Current Gain**	40		200	—	$V_{CE} = -5.0 \text{ V}$, $I_C = -3.0 \text{ A}$
h_{FE3}	DC Current Gain**	20		—	—	$V_{CE} = -5.0 \text{ V}$, $I_C = -5.0 \text{ A}$
$V_{CE(sat)}$	Collector Saturation Voltage**			-0.6	V	$I_C = -5.0 \text{ A}$, $I_B = -0.5 \text{ A}$
$V_{BE(sat)}$	Base Saturation Voltage**			-1.5	V	$I_C = -5.0 \text{ A}$, $I_B = -0.5 \text{ A}$
$V_{CEO(SUS)}$	Collector to Emitter Sustaining Voltage	-100			V	$I_C = -5.0 \text{ A}$, $I_B = -0.5 \text{ A}$, $L = 1 \text{ mH}$
$V_{CEX(SUS)1}$	Collector to Emitter Sustaining Voltage	-100			V	$I_C = -5.0 \text{ A}$, $I_{B1} = -I_{B2} = -0.5 \text{ A}$, $T_a = 125^\circ\text{C}$, $L = 180 \mu\text{H}$, Clamped
$V_{CEX(SUS)2}$	Collector to Emitter Sustaining Voltage	-100			V	$I_C = -10 \text{ A}$, $I_{B1} = -1.0 \text{ A}$, $-I_{B2} = 0.5 \text{ A}$, $L = 180 \mu\text{H}$, Clamped
I_{CBO}	Collector Cutoff Current			-10	μA	$V_{CB} = -100 \text{ V}$, $I_E = 0$
I_{CER}	Collector Cutoff Current			-1.0	mA	$V_{CE} = -100 \text{ V}$, $R_{BE} = 51 \Omega$, $T_a = 125^\circ\text{C}$
I_{CEX1}	Collector Cutoff Current			-10	μA	$V_{CE} = -100 \text{ V}$, $V_{BE(OFF)} = 1.5 \text{ V}$
I_{CEX2}	Collector Cutoff Current			-1.0	mA	$V_{CE} = -100 \text{ V}$, $V_{BE(OFF)} = 1.5 \text{ V}$, $T_a = 125^\circ\text{C}$
I_{EBO}	Emitter Cutoff Current			-10	μA	$V_{EB} = -5.0 \text{ V}$, $I_C = 0$

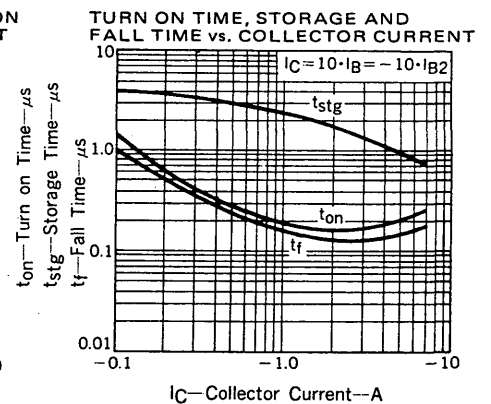
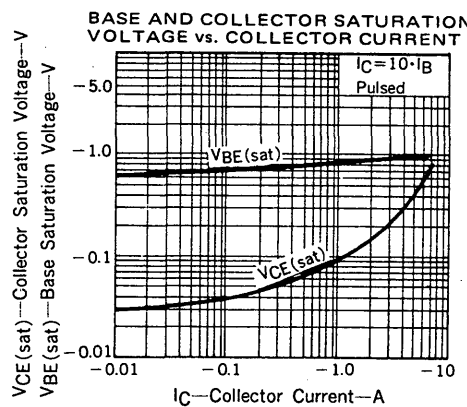
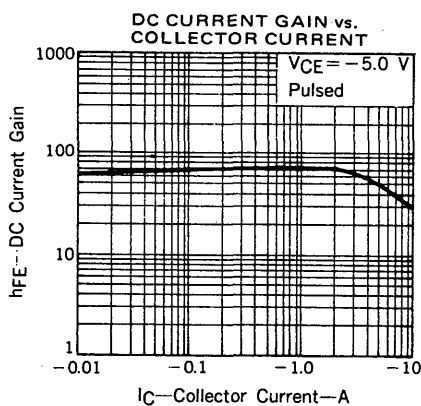
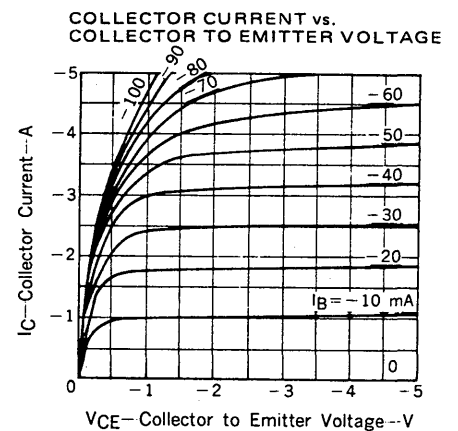
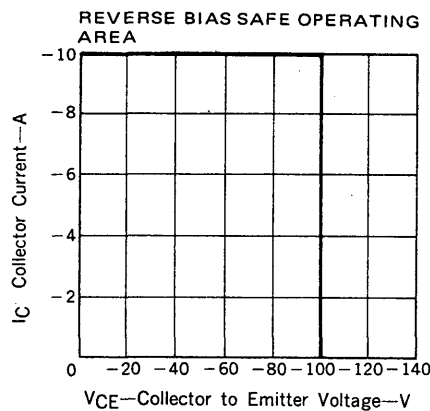
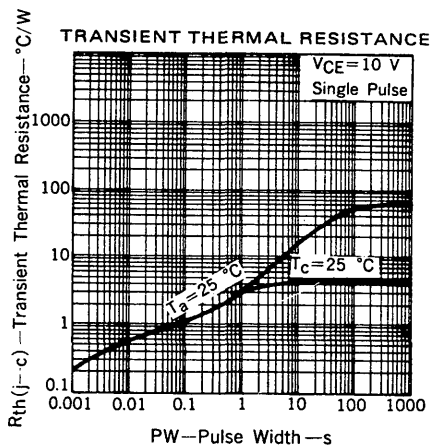
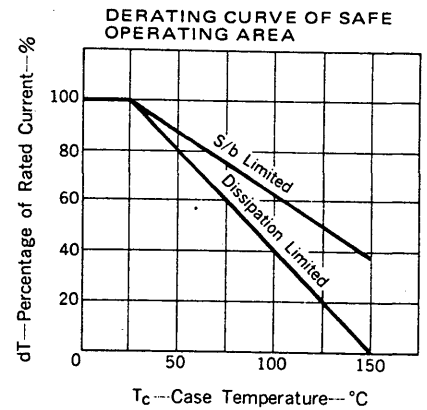
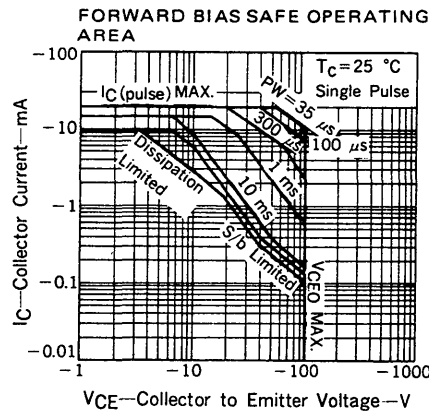
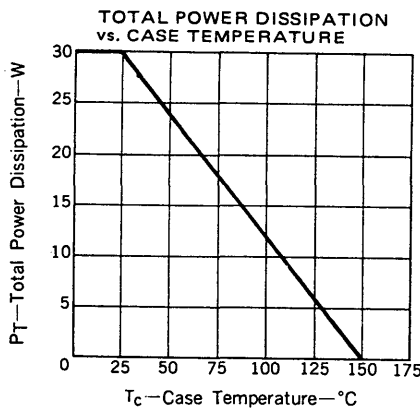
** $PW \leq 350 \mu\text{s}$, Duty Cycle $\leq 2\%$

Classification of h_{FE2}

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

Test Conditions: $V_{CE} = -5.0 \text{ V}$, $I_C = -3.0 \text{ A}$

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



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