



SANYO Semiconductors

# DATA SHEET

## 2SA2196 / 2SC6101 — PNP / NPN Epitaxial Planar Silicon Transistors DC / DC Converter Applications

### Applications

- Relay drivers, lamp drivers, motor drivers, flash.

### Features

- Adoption of MBIT process.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- High allowable power dissipation.

### Specifications ( ) : 2SA2196

#### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		(-30)40	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-30)	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-6)	V
Collector Current	I <sub>C</sub>		(-5)	A
Collector Current (Pulse)	I <sub>CP</sub>		(-7)	A
Base Current	I <sub>B</sub>		(-600)	mA
Collector Dissipation	P <sub>C</sub>		1	W
		T <sub>c</sub> =25°C	8	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

#### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =(-)30V, I <sub>E</sub> =0A			(-)0.1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)0.1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)500mA	200		560	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)500mA		(380)450		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(25)20		pF

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# 2SA2196 / 2SC6101

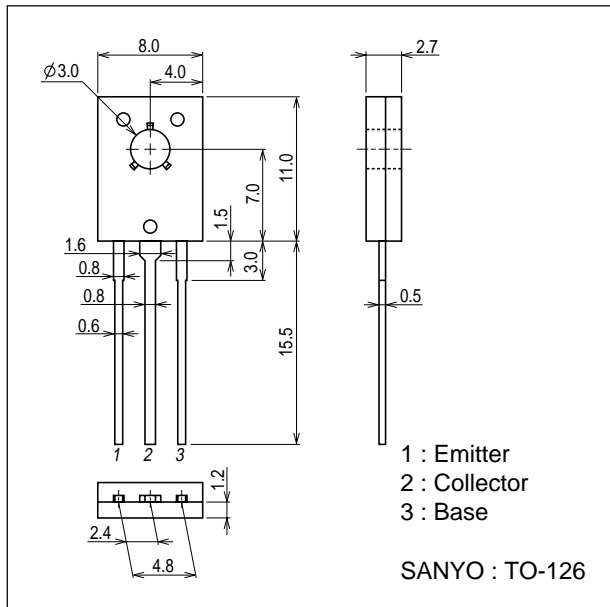
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C=(-)1.5A, I_B=(-)30mA$		(-170)135	(-255)200	mV
	$V_{CE(sat)2}$	$I_C=(-)1.5A, I_B=(-)75mA$		(-120)	(-180)	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$V_{CE}=(-)1.5V, I_B=(-)30mA$		(-0.85)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0A$	(-30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-30)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0A$	(-6)			V
Turn-On Time	$t_{on}$	See specified Test Circuit.		(50)30		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(270)300		ns
Fall Time	$t_f$	See specified Test Circuit.		(25)15		ns

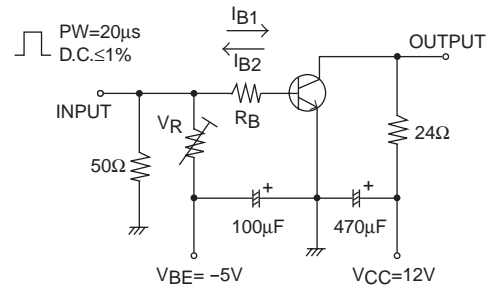
## Package Dimensions

unit : mm (typ)

7515-002

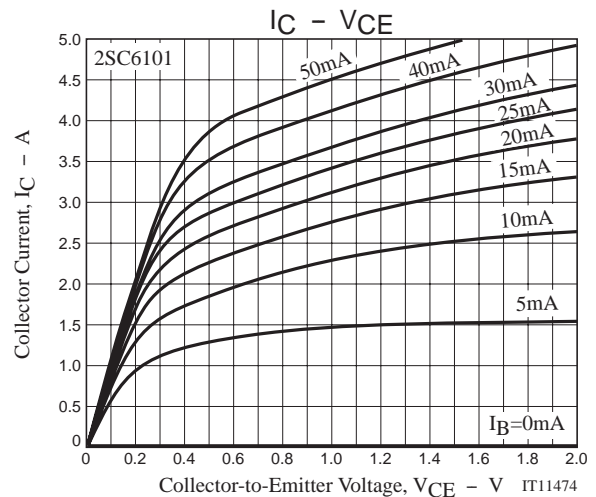
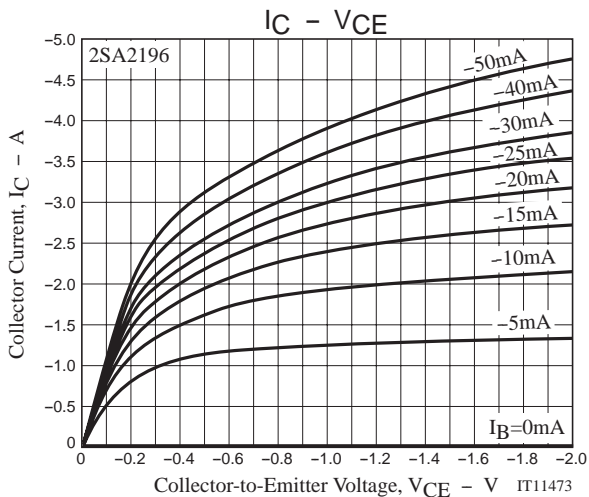


## Switching Time Test Circuit

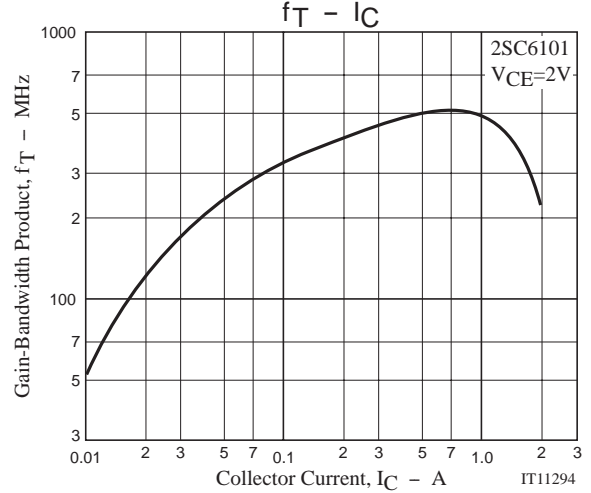
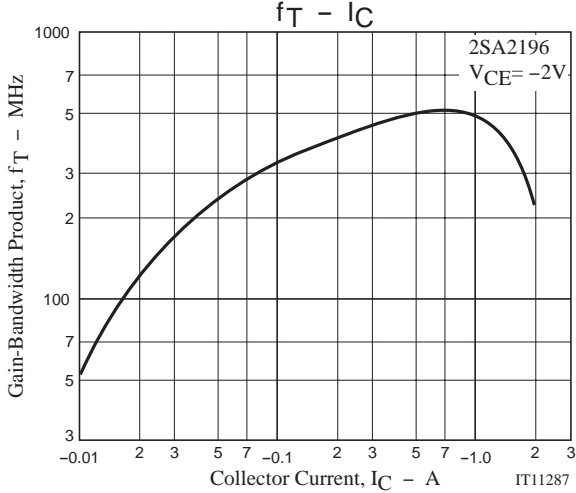
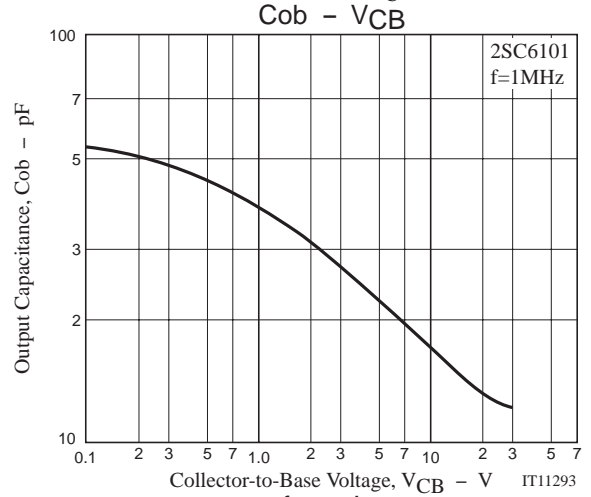
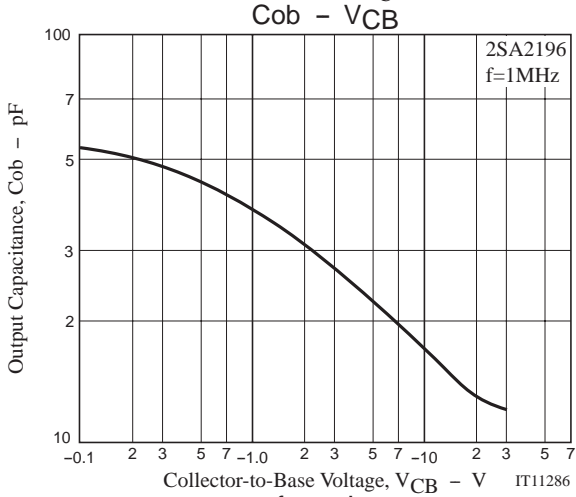
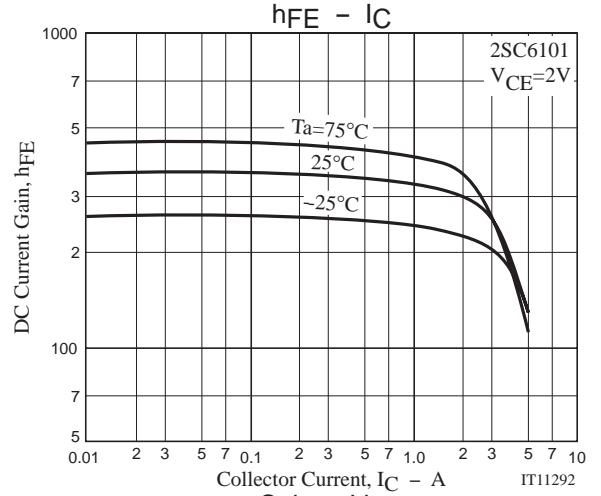
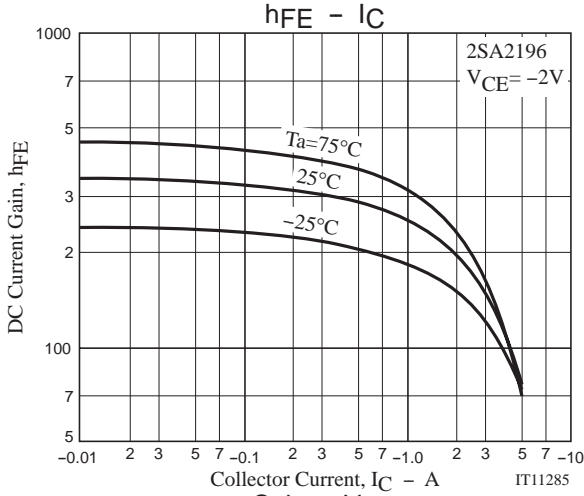
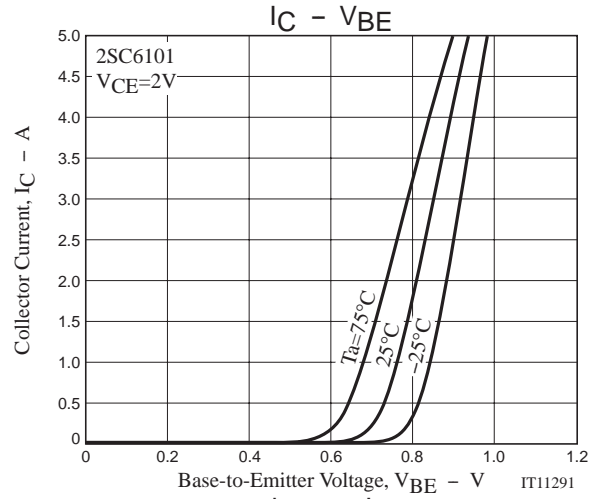
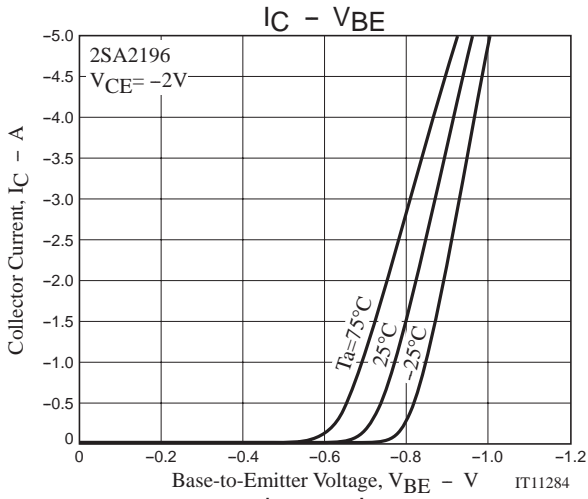


$$20I_{B1} = -20I_{B2} = I_C = 500mA$$

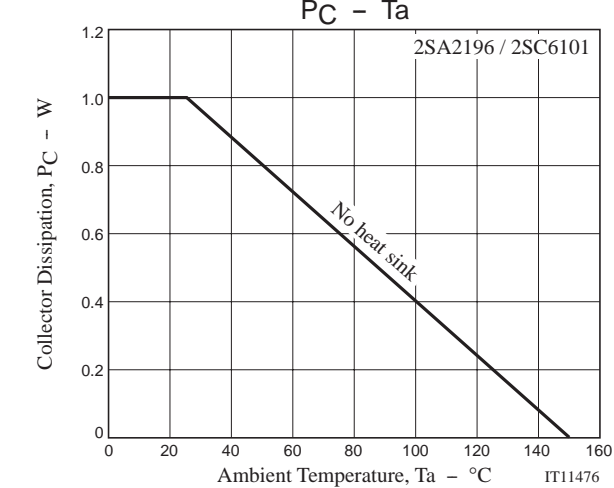
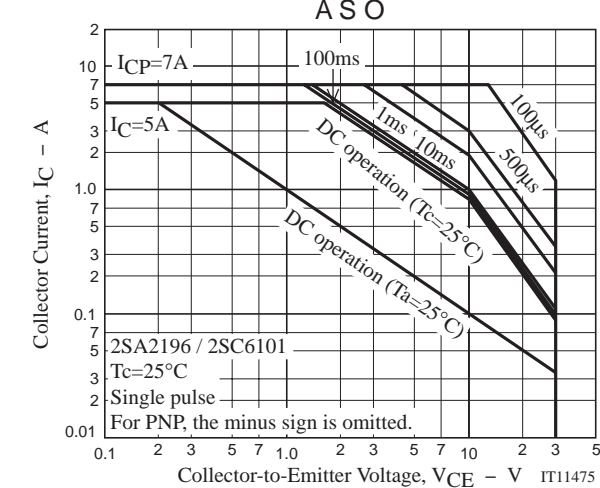
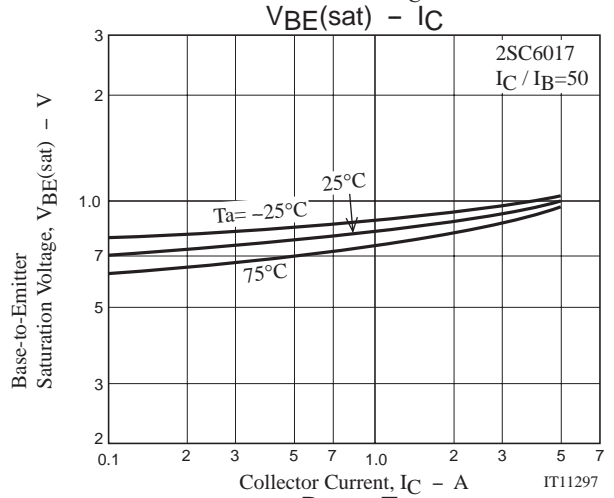
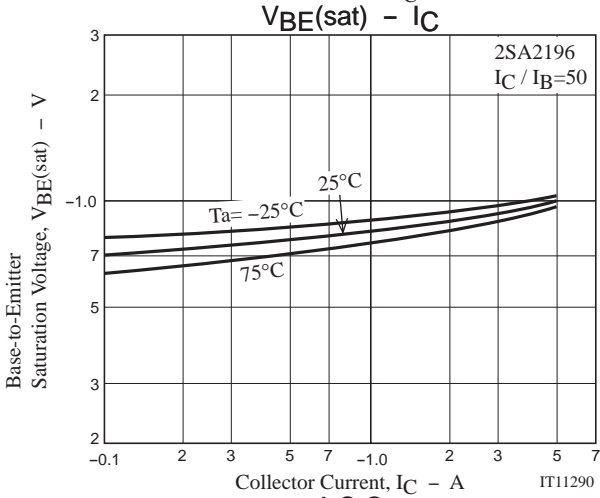
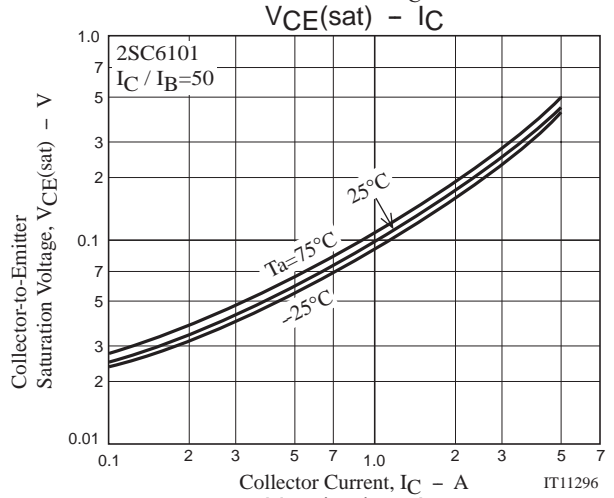
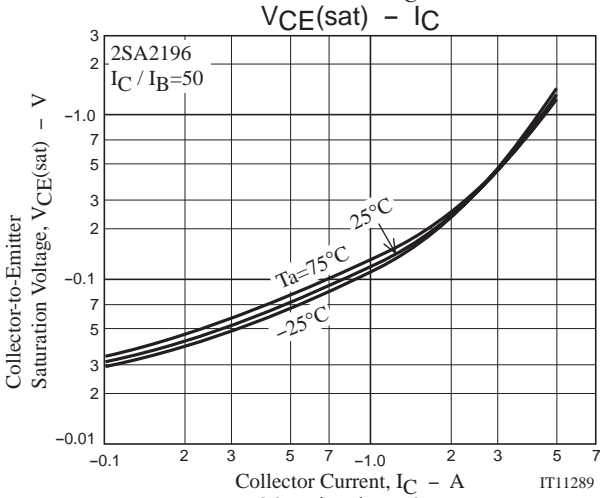
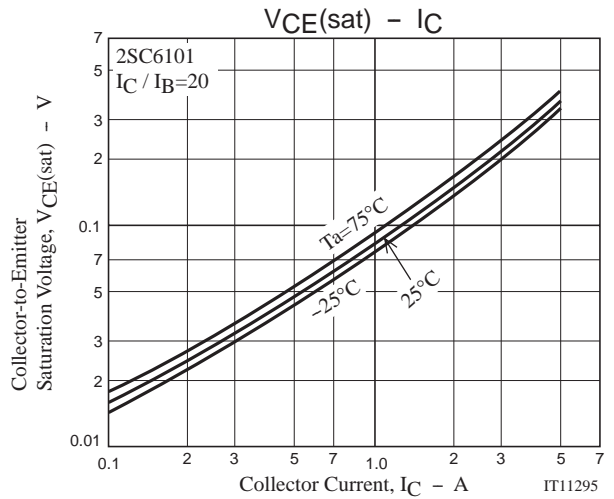
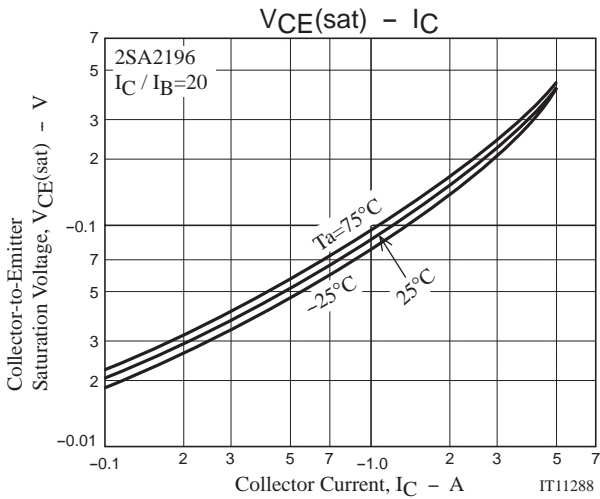
For PNP, the polarity is reversed.

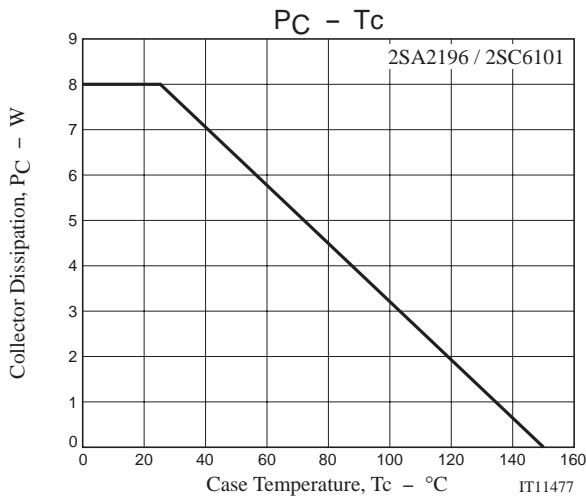


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