



SANYO Semiconductors

## DATA SHEET

# 2SA2209 — PNP Epitaxial Planar Silicon Transistor

## 50V / 15A High-Speed Switching Applications

### Applications

- High-speed switching applications (switching regulator, driver circuit).

### Features

- Adoption of MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		-50	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		-50	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		-6	V
Collector Current	I <sub>C</sub>		-15	A
Collector Current (Pulse)	I <sub>CP</sub>		-20	A
Base Current	I <sub>B</sub>		-3	A
Collector Dissipation	P <sub>C</sub>		1	W
		T <sub>C</sub> =25°C	20	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> =-40V, I <sub>E</sub> =0A			-10	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =-4V, I <sub>C</sub> =0A			-10	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =-2V, I <sub>C</sub> =-330mA	200		500	
	h <sub>FE2</sub>	V <sub>CE</sub> =-2V, I <sub>C</sub> =-10A	50			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =-10V, I <sub>C</sub> =-700mA		120		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =-10V, f=1MHz		140		pF

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# 2SA2209

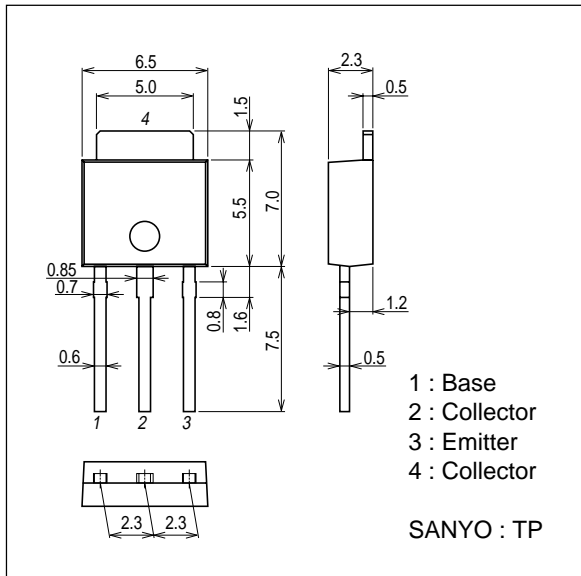
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -7.5A, I_B = -375mA$		-250	-500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -7.5A, I_B = -375mA$			-1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -100\mu A, I_E = 0A$	-50			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1mA, R_{BE} = \infty$	-50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -100\mu A, I_C = 0A$	-6			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		80		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		300		ns
Fall Time	$t_f$	See specified Test Circuit.		45		ns

## Package Dimensions

unit : mm (typ)

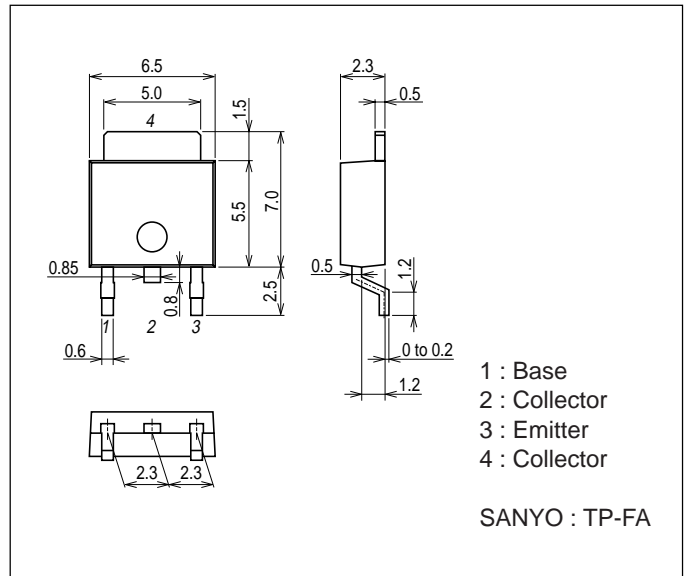
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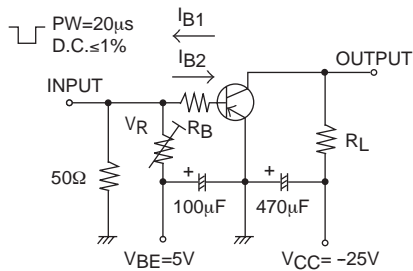
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unit : mm (typ)

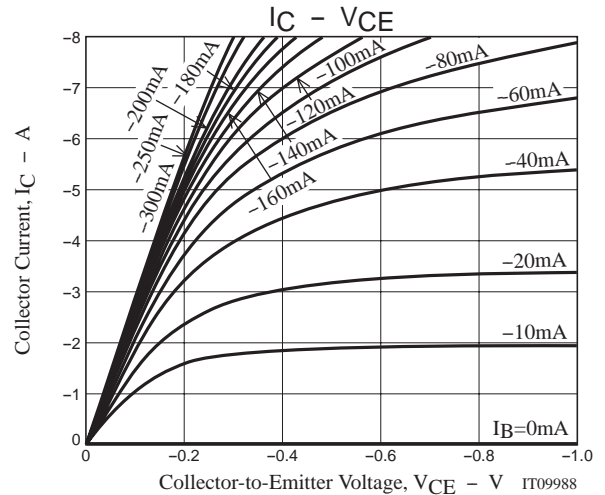
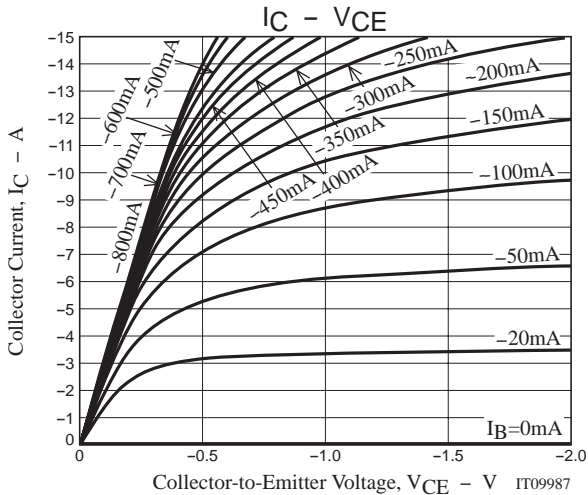
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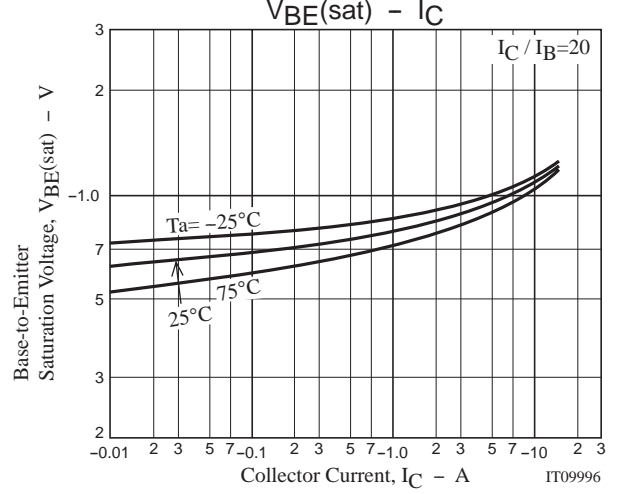
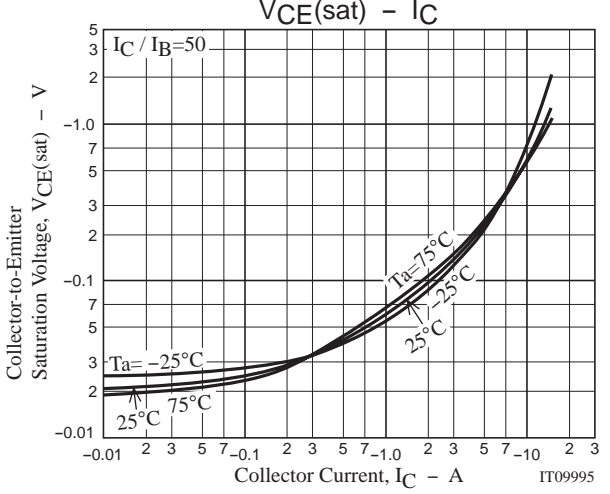
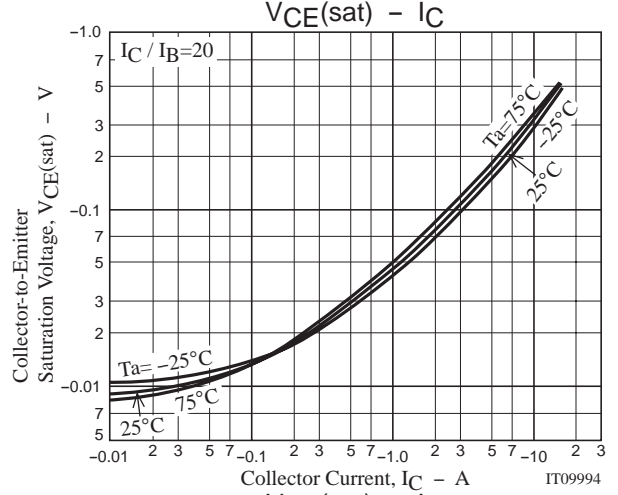
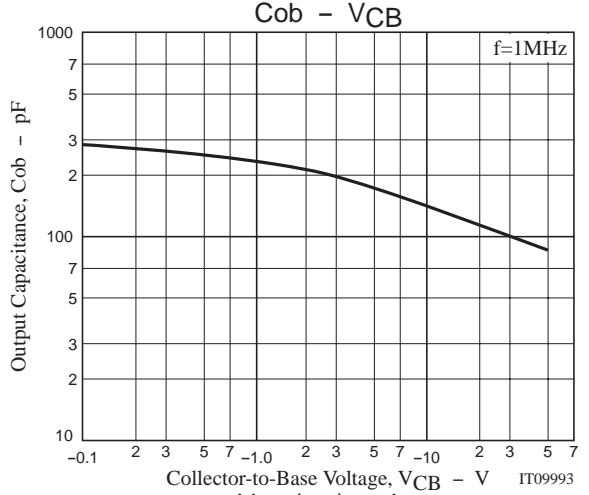
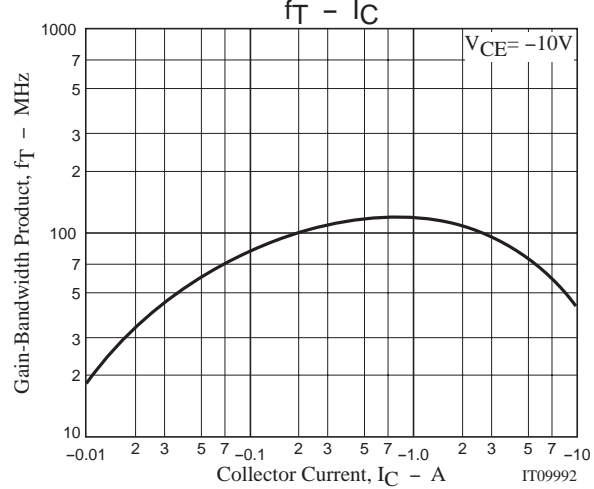
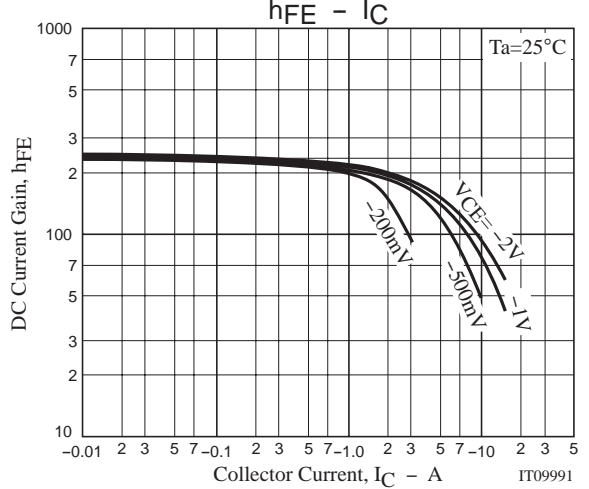
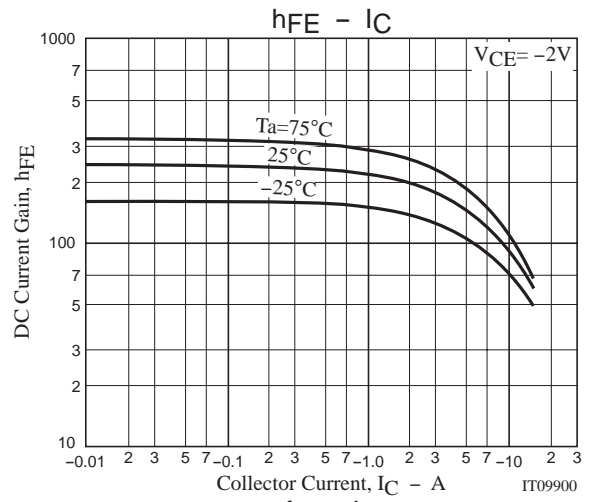
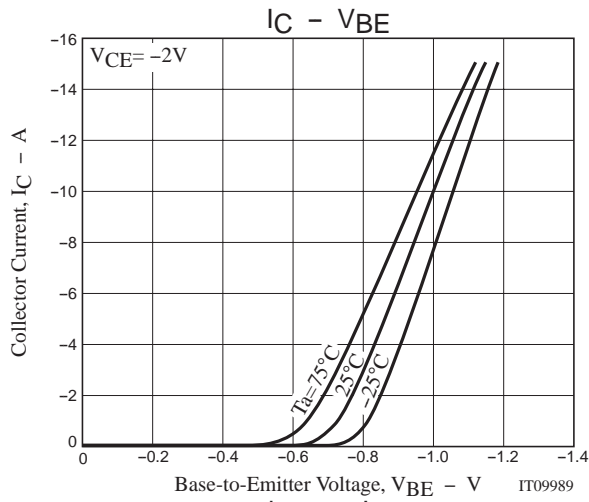


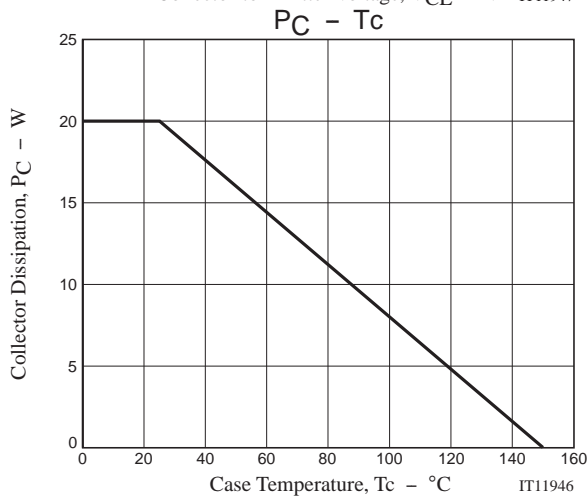
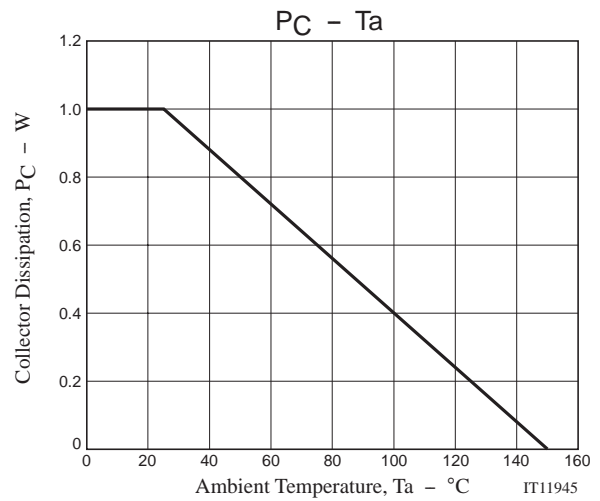
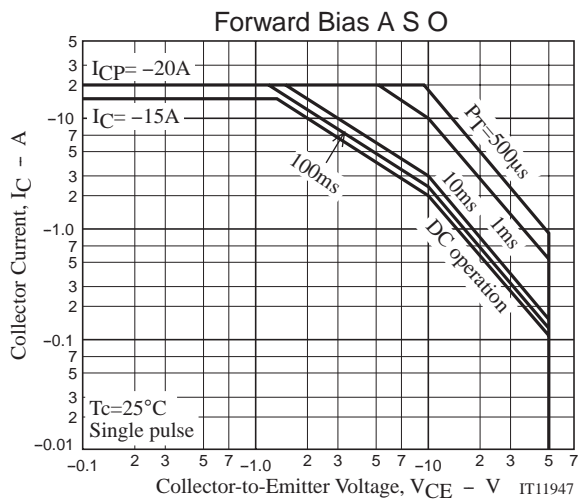
## Switching Time Test Circuit



$$I_C = 20I_{B1} = -20I_{B2} = -7A$$







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