



# 2SC5990 — NPN Epitaxial Planar Silicon Transistor

## DC / DC Converter Applications

### Applications

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

### Features

- Adoption of FBET and MBIT processes.
- High current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Narrow  $h_{FE}$  width.
- High allowable power dissipation.

### Specifications

#### Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		100	V
Collector-to-Emitter Voltage	$V_{CES}$		100	V
Collector-to-Emitter Voltage	$V_{CEO}$		50	V
Emitter-to-Base Voltage	$V_{EBO}$		6	V
Collector Current	$I_C$		4	A
Collector Current (Pulse)	$I_{CP}$		7	A
Base Current	$I_B$		600	mA
Collector Dissipation	$P_C$	Mounted on a ceramic board (250mm <sup>2</sup> X0.8mm)	1.3	W
		$T_c=25^\circ\text{C}$	3.5	W
Junction Temperature	$T_J$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

#### Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=40\text{V}, I_E=0\text{A}$			0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=4\text{V}, I_C=0\text{A}$			0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=2\text{V}, I_C=500\text{mA}$	250		400	
Gain-Bandwidth Product	$f_T$	$V_{CE}=10\text{V}, I_C=500\text{mA}$		400		MHz

Marking : FH

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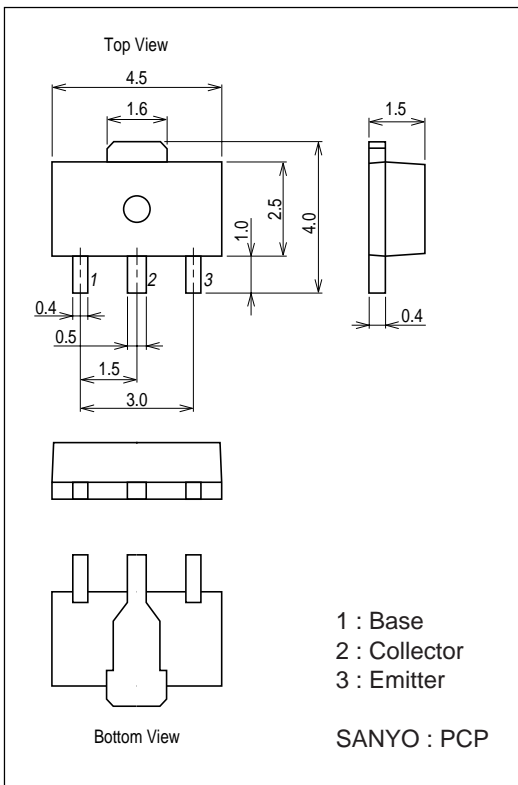
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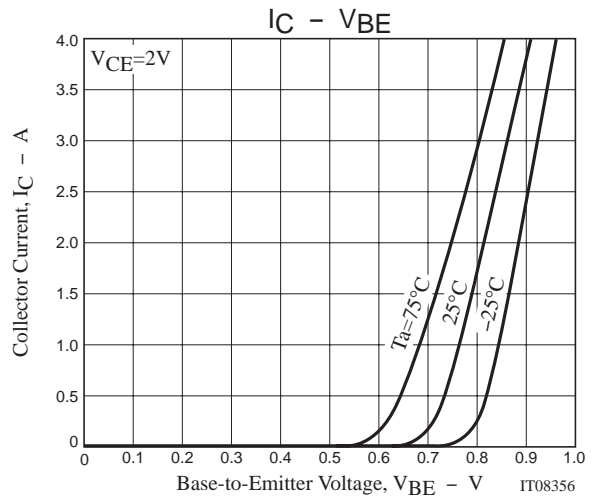
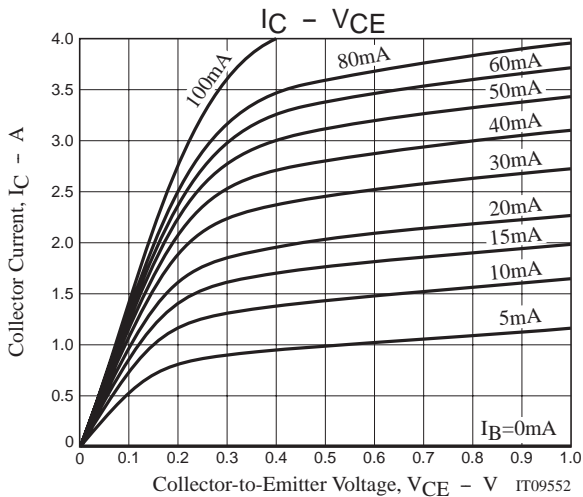
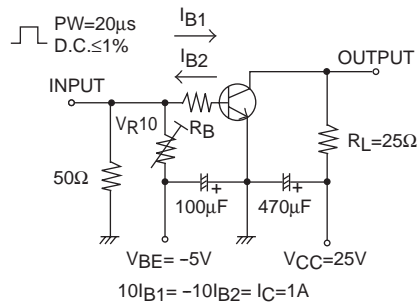
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	Cob	V <sub>CB</sub> =10V, f=1MHz		15		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =1A, I <sub>B</sub> =50mA		65	100	mV
		I <sub>C</sub> =2A, I <sub>B</sub> =100mA		110	165	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =2A, I <sub>B</sub> =100mA		0.88	1.3	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0A	100			V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CES</sub>	I <sub>C</sub> =100μA, R <sub>BE</sub> =0Ω	100			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	50			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0A	6			V
Turn-ON Time	t <sub>on</sub>	See specified Test Circuit.		35		ns
Storage Time	t <sub>stg</sub>	See specified Test Circuit.		300		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		20		ns

## Package Dimensions

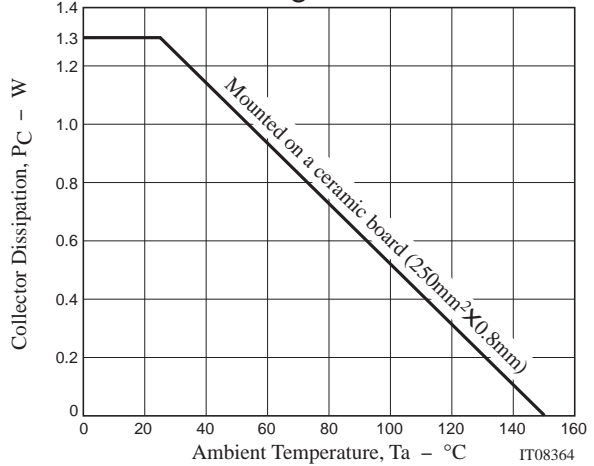
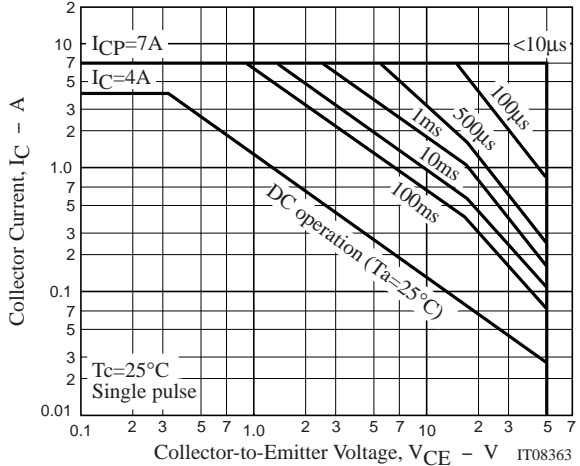
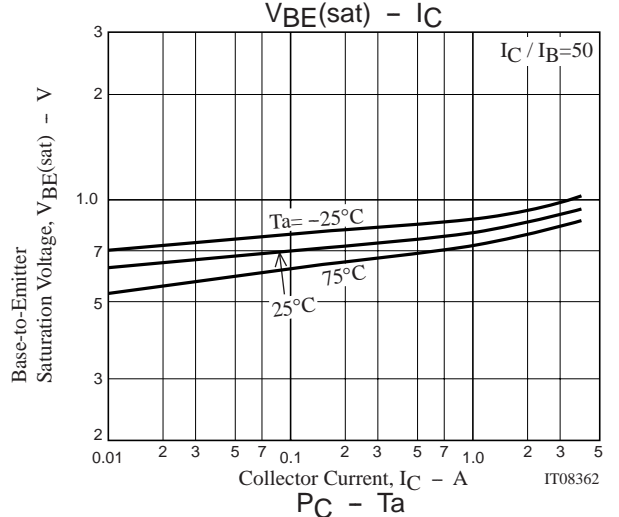
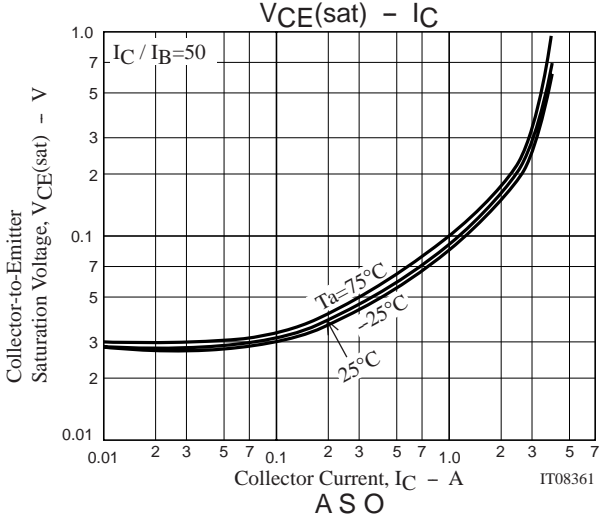
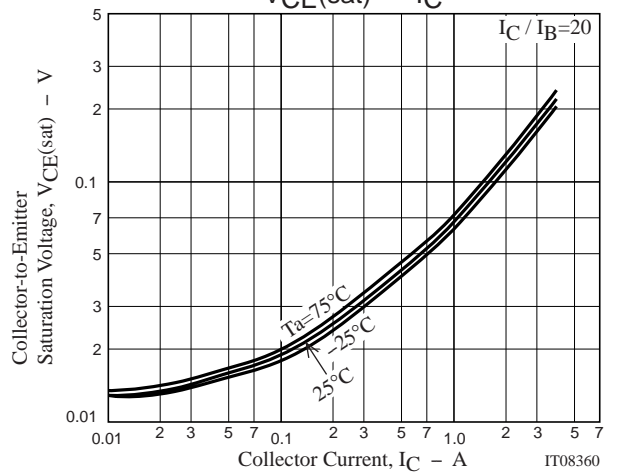
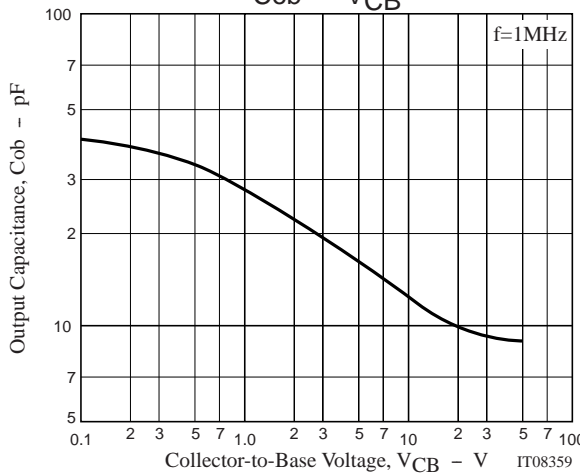
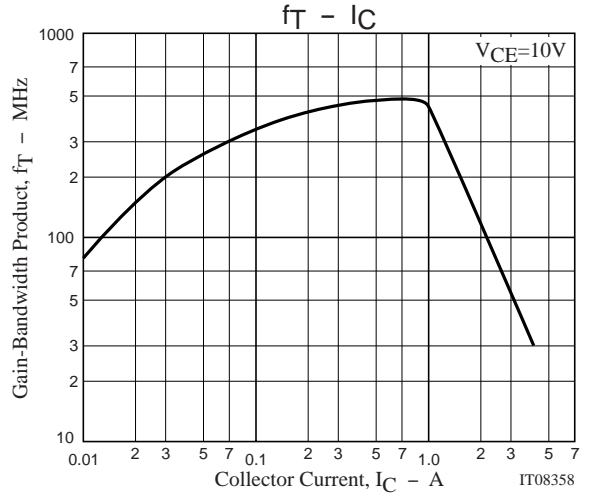
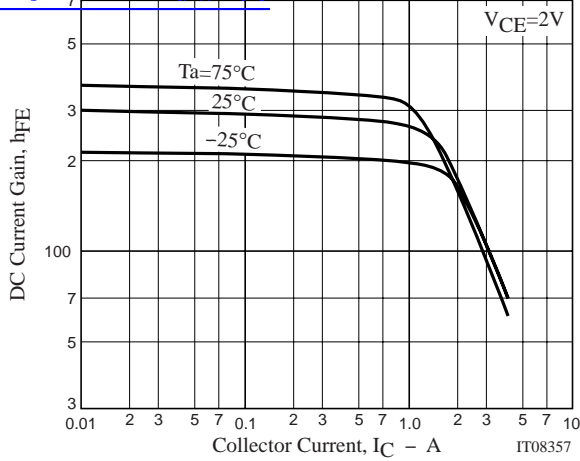
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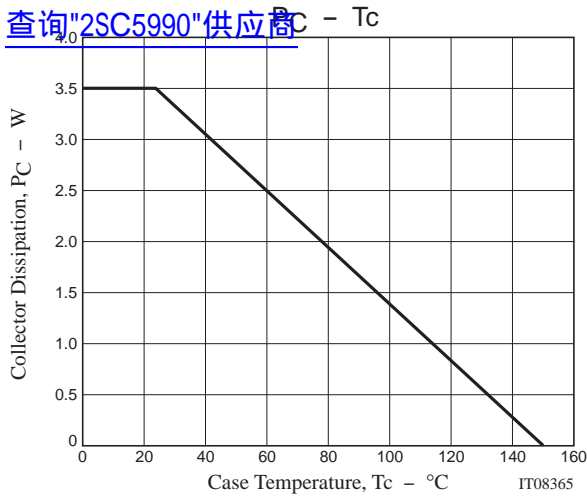


## Switching Time Test Circuit



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