



SANYO Semiconductors

# DATA SHEET

## CPH5520 — PNP / NPN Epitaxial Planar Silicon Transistors

# High-Current Switching Applications

### Applications

- Relay drivers, lamp drivers, motor drivers, gate drivers.

### Features

- Composite type with a PNP transistor and an NPN transistor contained in one package, facilitating high-density mounting.
- Ultrasmall package facilitate miniaturization in end products. (0.9mm mounting height)

### Specifications ( ) : PNP

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	VCBO		(-50)80	V
Collector-to-Emitter Voltage	VCEO		(-50)80	V
Emitter-to-Base Voltage	VEBO		(-)6	V
Collector Current	IC		(-)2	A
Collector Current (Pulse)	ICP		(-)5	A
Base Current	IB		(-)400	mA
Collector Dissipation	PC	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm) 1unit	0.9	W
Total Power Dissipation	PT	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)	1.2	W
Junction Temperature	TJ		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Marking : EW

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**SANYO Semiconductor Co., Ltd.**

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# CPH520

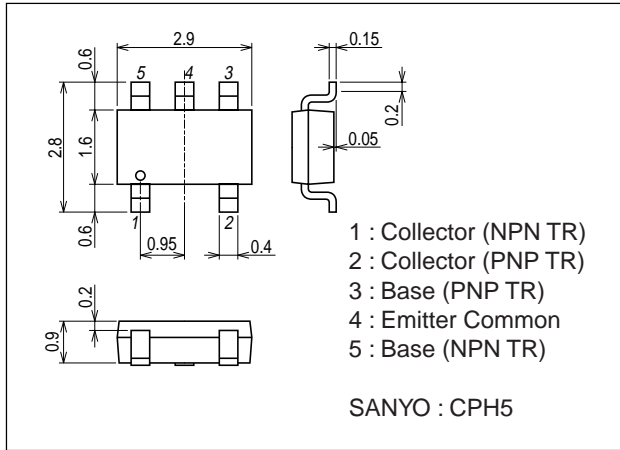
## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =(-)40V, I <sub>E</sub> =0A			(-)1	μA
Emitter Cutoff Current	IEBO	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)100mA	200		560	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)300mA		420		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(16)8		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =(-)1A, I <sub>B</sub> =(-)50mA		(-165)130	(-330)260	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =(-)1A, I <sub>B</sub> =(-)50mA		(-)0.9	(-)1.2	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0A	(-50)80			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞	(-50)80			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)35		ns
Storage Time	t <sub>stg</sub>	See specified Test Circuit.		(200)330		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		(24)40		ns

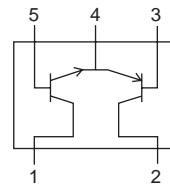
## Package Dimensions

unit : mm (typ)

7017A-009



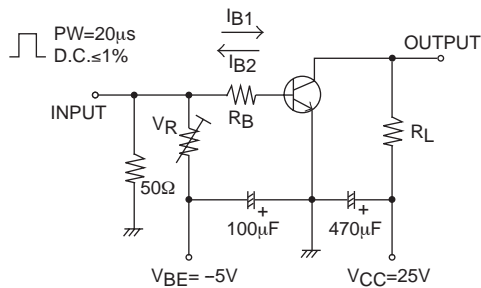
## Electrical Connection



- 1 : Collector (NPN TR)
- 2 : Collector (PNP TR)
- 3 : Base (PNP TR)
- 4 : Emitter Common
- 5 : Base (NPN TR)

Top view

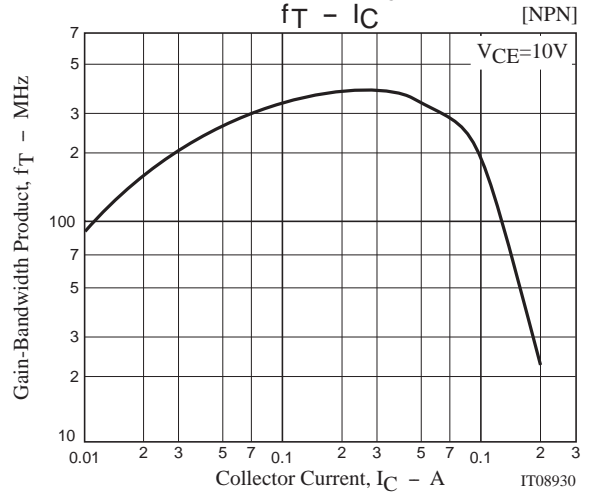
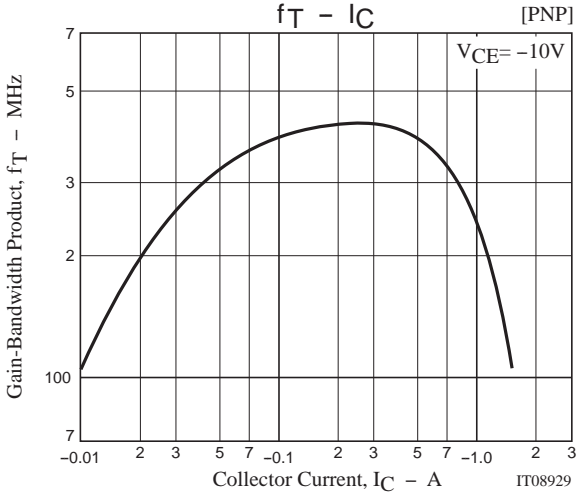
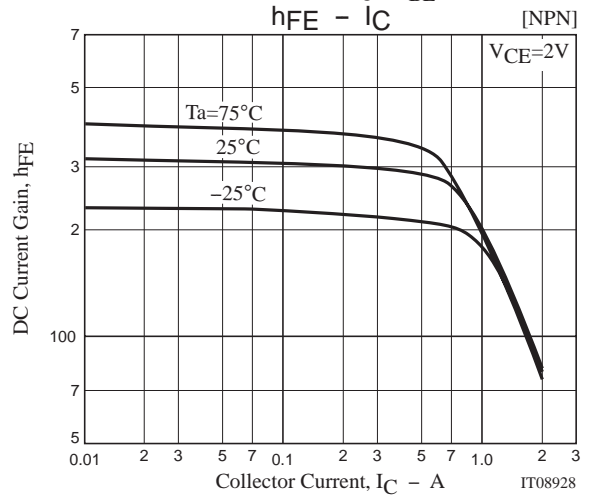
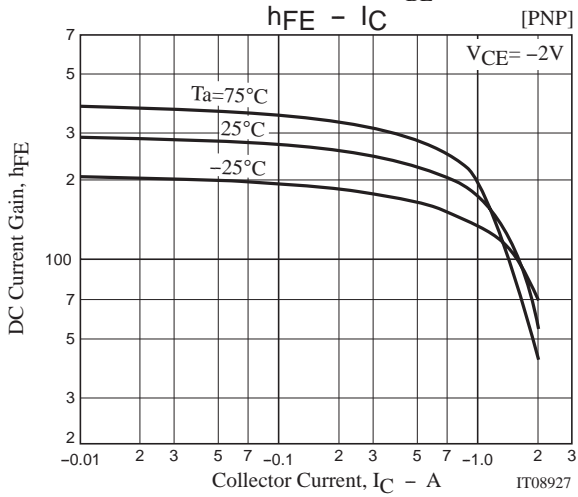
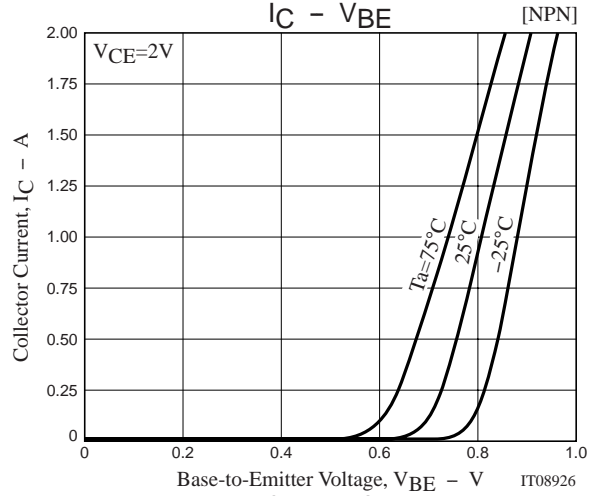
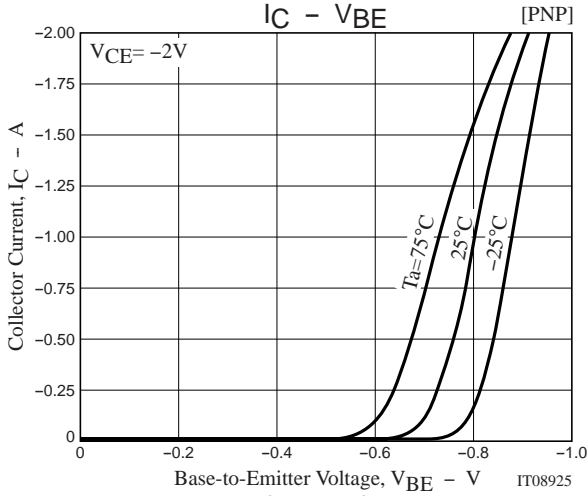
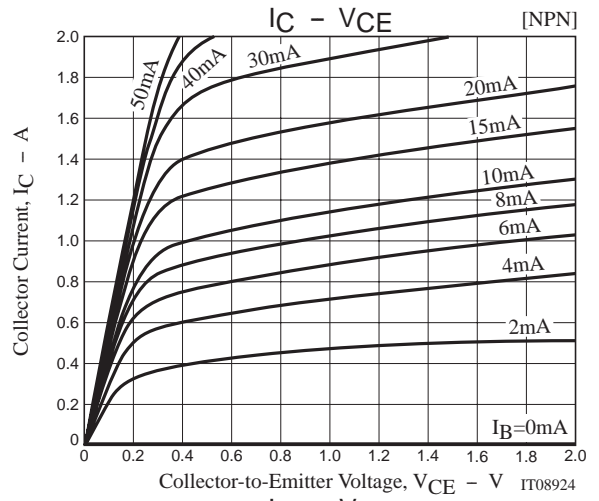
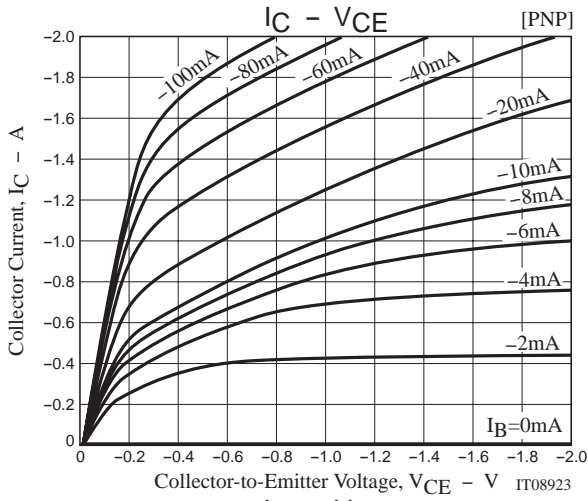
## Switching Time Test Circuit



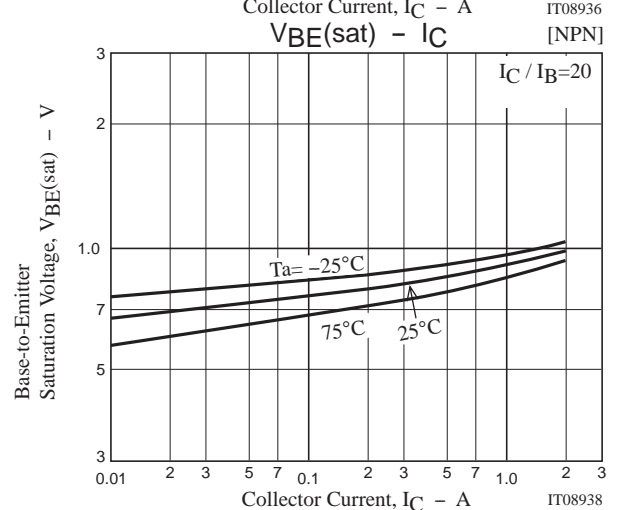
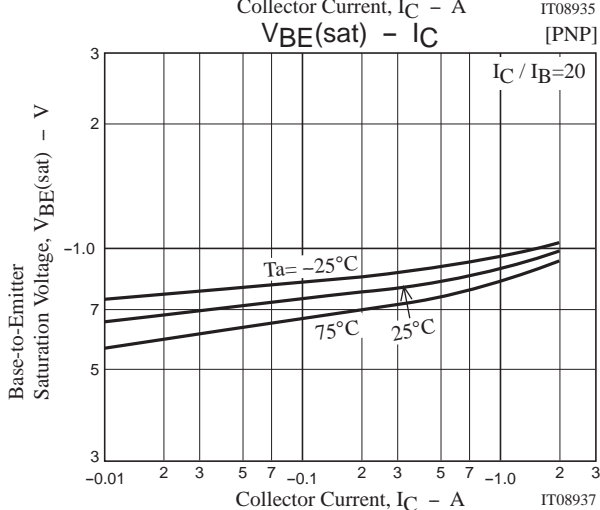
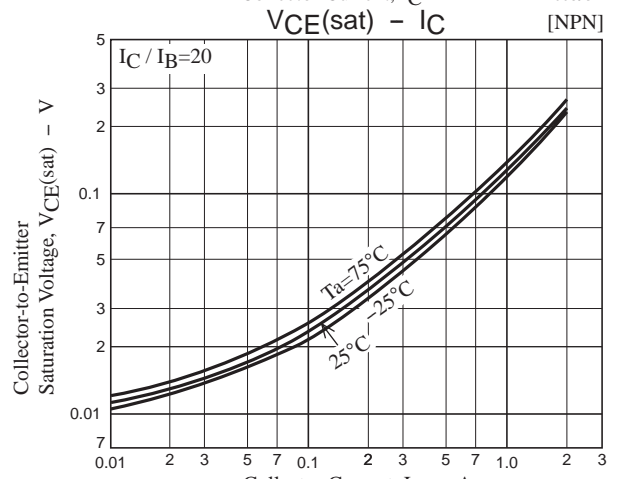
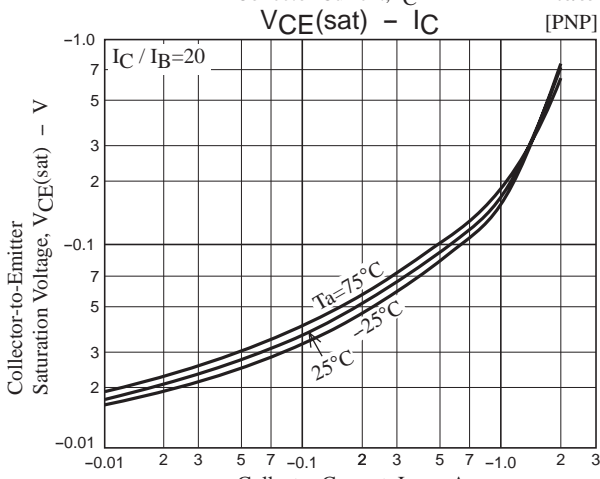
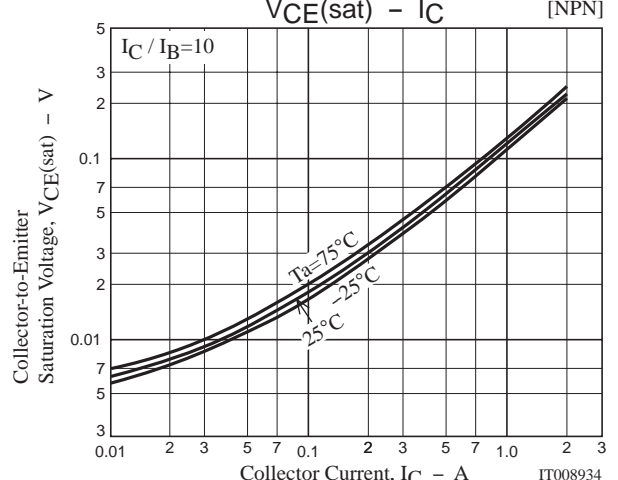
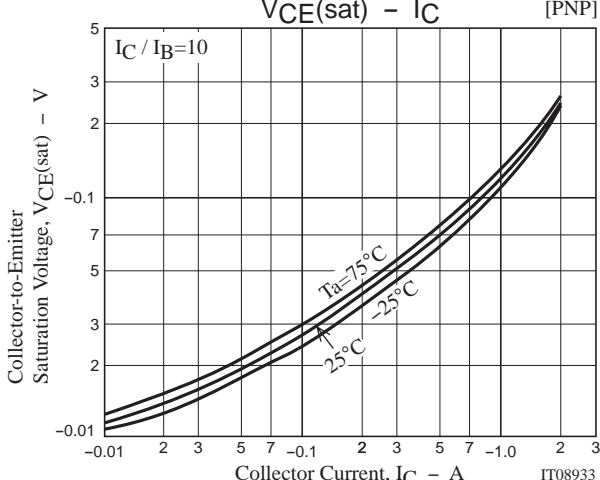
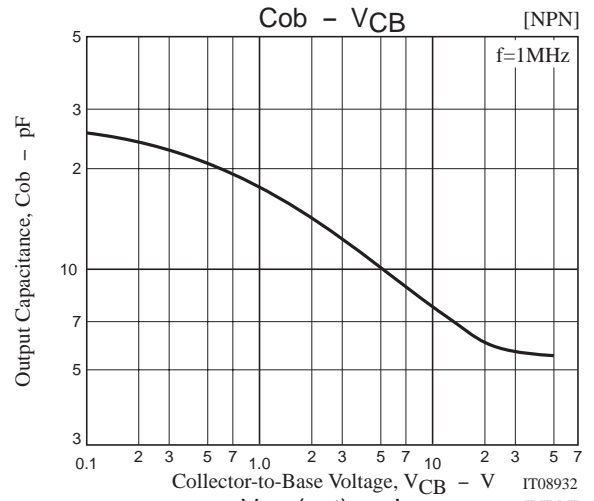
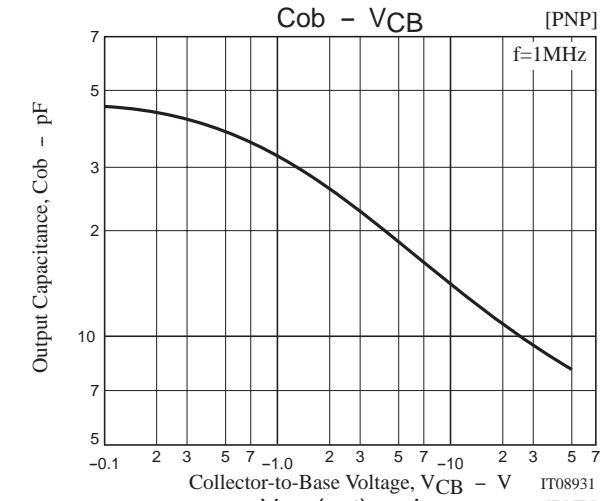
$$I_C = 10I_{B1} = -10I_{B2} = 0.7A$$

For PNP, the polarity is reversed.

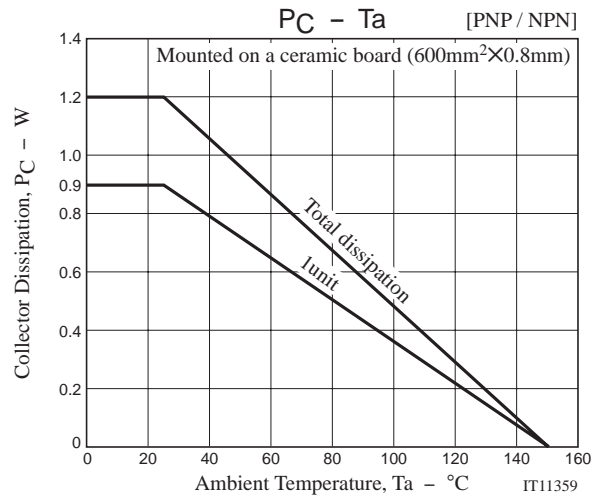
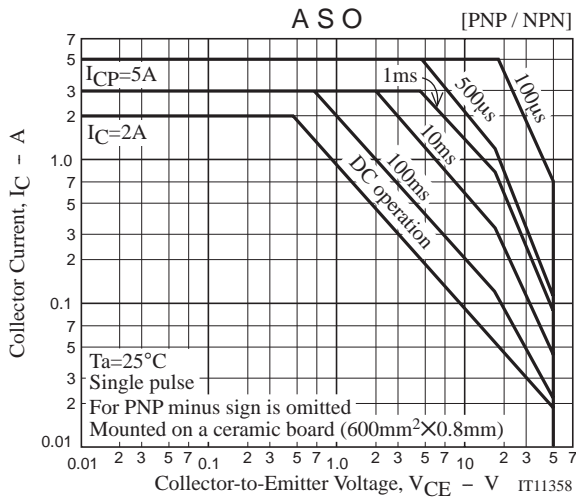
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