

TR : NPN Silicon Epitaxial Planar Transistor  
SBD : Schottky Barrier Diode



# CPH5702

## DC/DC Converter Applications

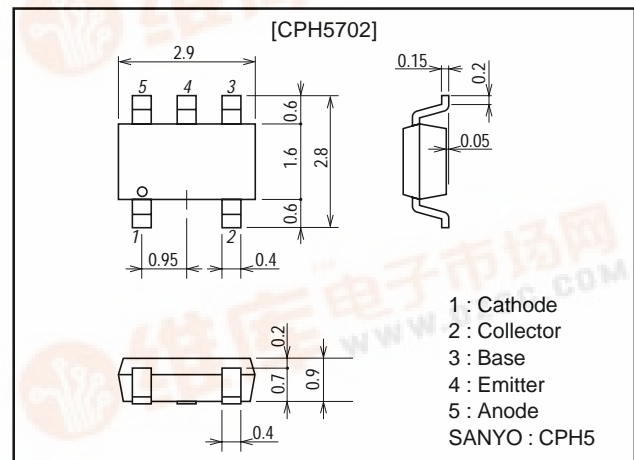
### Features

- Composite type with a NPN transistor and a Schottky barrier diode contained in one package facilitating high-density mounting.
- The CPH5702 consists of two chips encapsulated in a package which are equivalent to the CPH3209 and the SB07-03C, respectively.
- Ultrasmall-sized package permitting applied sets to be made small and slim (0.9mm).

### Package Dimensions

unit:mm

2156



### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	V <sub>CB0</sub>		40	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		30	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		5	V
Collector Current	I <sub>C</sub>		3	A
Collector Current (Pulse)	I <sub>CP</sub>		5	A
Base Current	I <sub>B</sub>		600	mA
Collector Dissipation	P <sub>C</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	0.9	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V <sub>RRM</sub>		30	V
Non-repetitive Peak Reverse Surge Voltage	V <sub>RSM</sub>		35	V
Average Output Current	I <sub>O</sub>		700	mA
Surge Current	I <sub>FSM</sub>	50Hz sine wave, 1 cycle	5	A
Junction Temperature	T <sub>J</sub>		-55 to +125	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C

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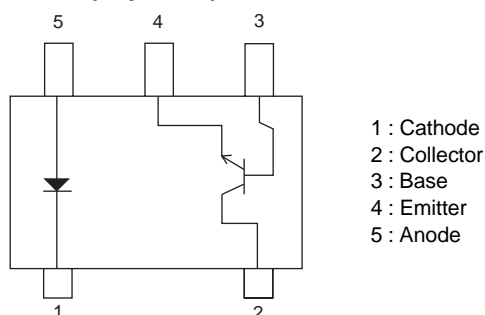
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# CPH5702

## Electrical Characteristics at Ta = 25°C

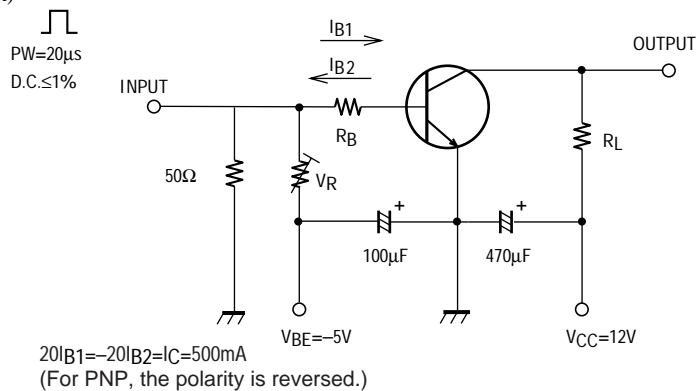
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =20V, I <sub>E</sub> =0			0.1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =4V, I <sub>C</sub> =0			0.1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA	200		560	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =500mA		450		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		20		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub> <sup>1</sup>	I <sub>C</sub> =1.5A, I <sub>B</sub> =30mA		120	185	mV
	V <sub>CE(sat)</sub> <sup>2</sup>	I <sub>C</sub> =1.5A, I <sub>B</sub> =75mA		105	155	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =1.5A, I <sub>B</sub> =30mA		0.83	1.2	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	40			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	30			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =1mA, I <sub>C</sub> =0	5			V
Turn-ON Time	t <sub>on</sub>	See specified Test Circuit.		30		ns
Storage Time	t <sub>stg</sub>	See specified Test Circuit.		300		ns
Turn-OFF Time	t <sub>f</sub>	See specified Test Circuit.		15		ns
[SBD]						
Reverse Voltage	V <sub>R</sub>	I <sub>R</sub> =300μA	30			V
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =700mA			0.55	V
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =15V			80	μA
Interterminal Capacitance	C	V <sub>R</sub> =10V, f=1MHz cycle		28		pF
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>R</sub> =100mA, See specified Test Circuit.			10	ns
Thermal Resistance	R <sub>thj-a</sub>	Mounted on a ceramic board (600mm²×0.8mm)		151		°C/W

## Electrical Connection (Top view)

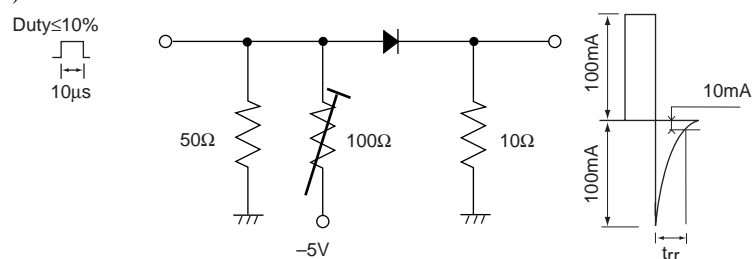


## Switching Time Test Circuit

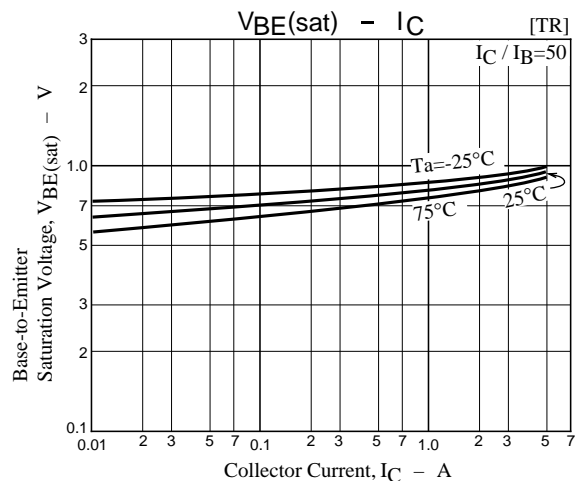
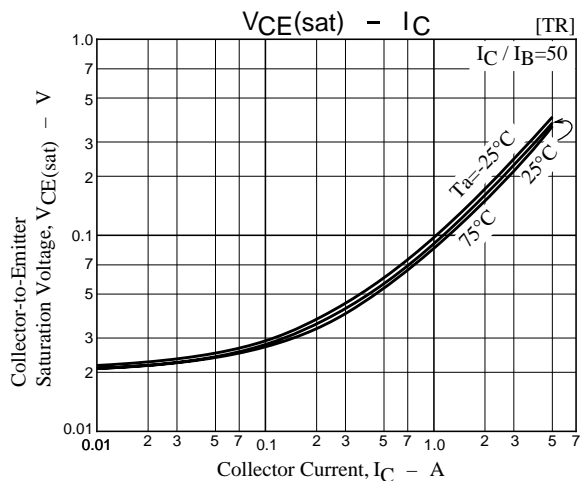
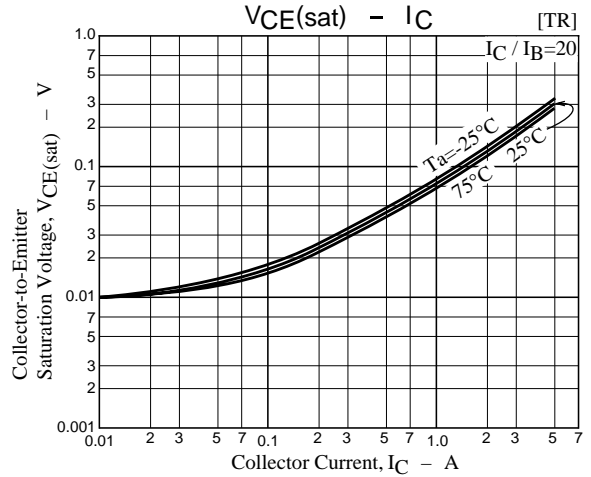
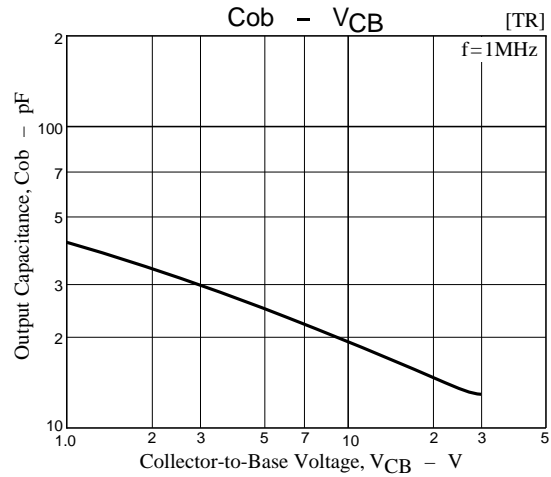
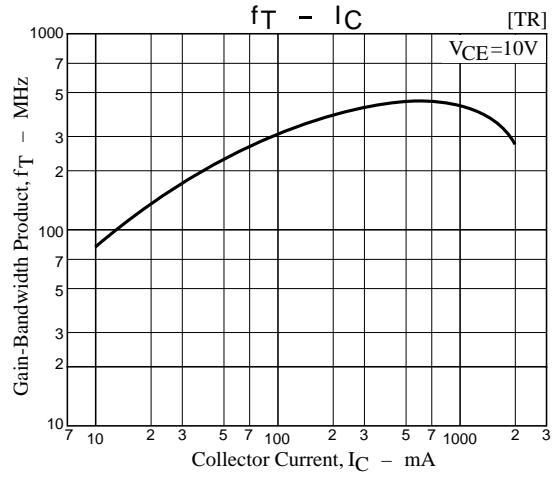
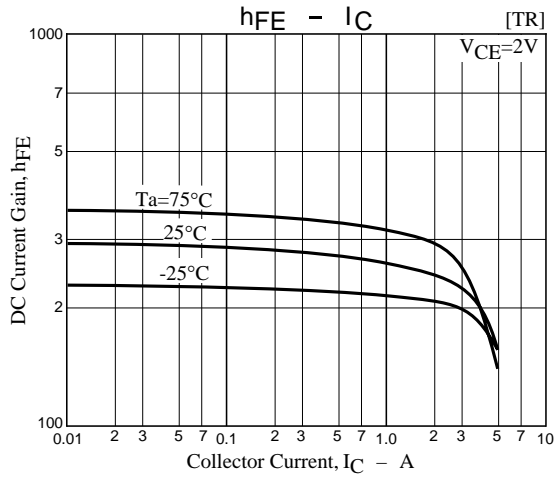
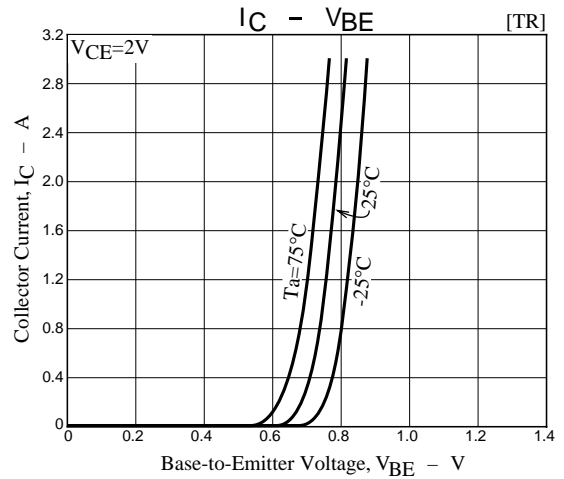
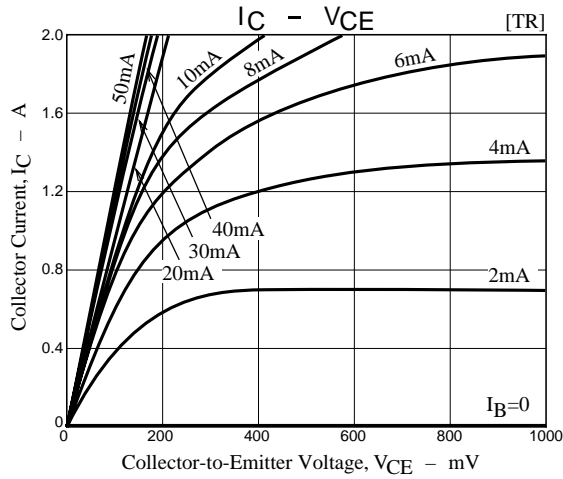
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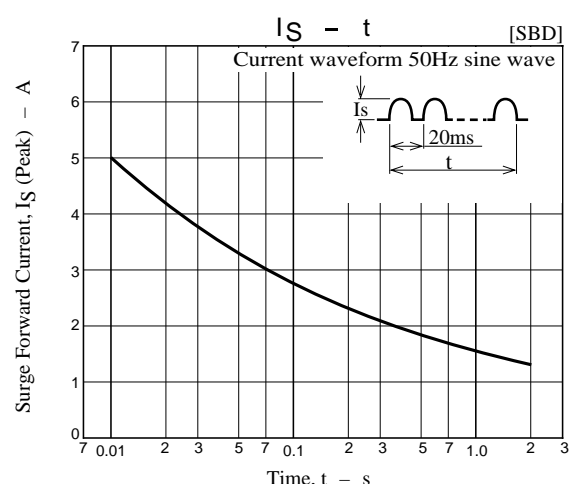
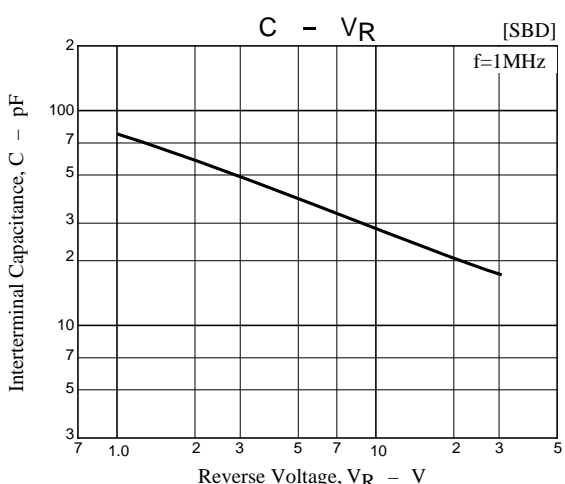
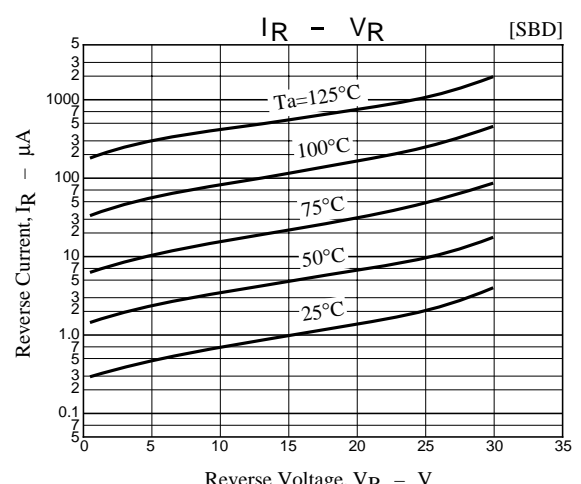
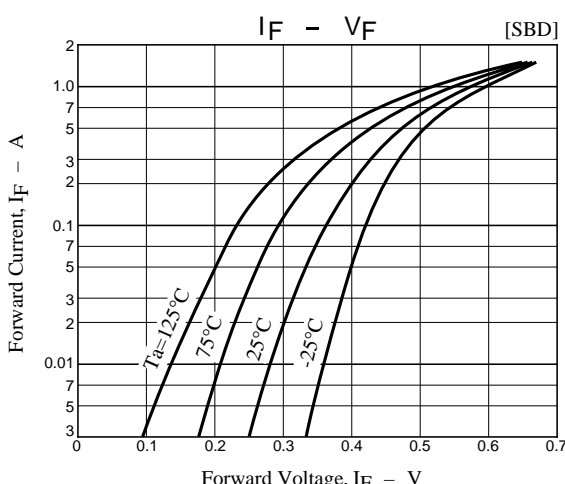
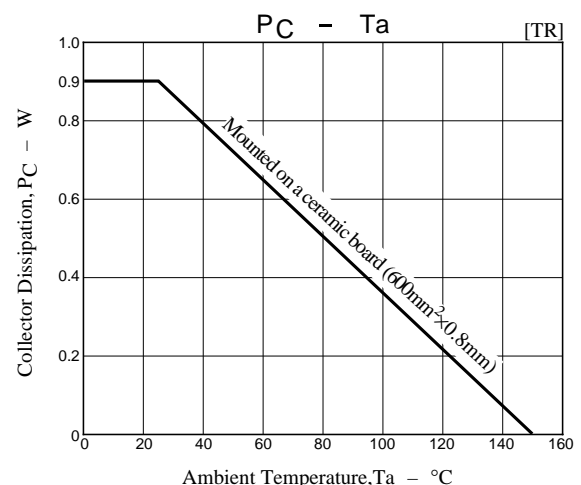
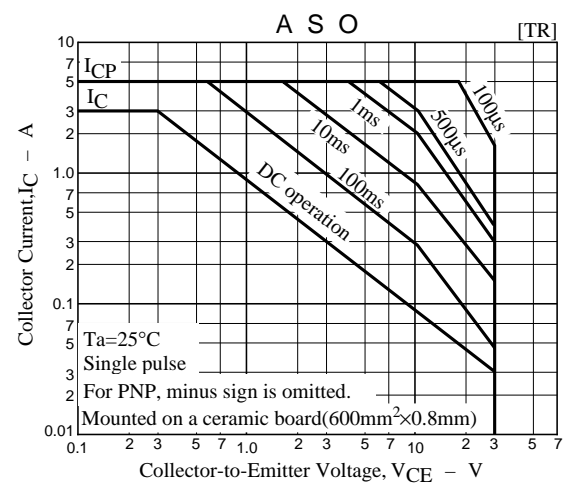
(SBD)



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