



# CPH3110/3210

## DC/DC Converter Applications

### Applications

- Relay drivers, lamp drivers, motor drivers, and strobes.

### Features

- Adoption of MBIT processes.
- High current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Ultrasmall-sized package permitting applied sets to be made small and slim (0.9mm).
- High allowable power dissipation.

( ) : PNP

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-30)40	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-30)	V
Emitter-to-Base Voltage	$V_{EBO}$		(-6)	V
Collector Current	$I_C$		(-5)	A
Collector Current (Pulse)	$I_{CP}$		(-7)	A
Base Current	$I_B$		(-1.2)	A
Collector Dissipation	$P_C$	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	0.9	W
Junction Temperature	$T_J$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CB0}$	$V_{CB}=(-)30V, I_E=0$			(-0.1)	μA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4V, I_C=0$			(-0.1)	μA
DC Current Gain	$h_{FE}$	$V_{CE}=(-)2V, I_C=(-)500mA$	200		560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)500mA$		(250)		MHz
				290		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(52)40		pF

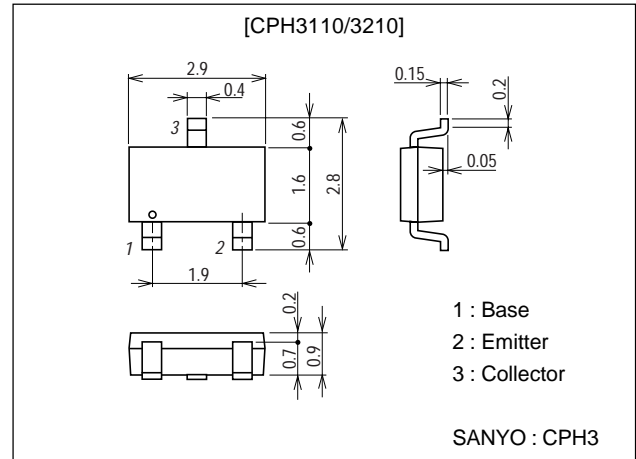
Marking : CPH3110 : AK, CPH3210 : CK

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### Package Dimensions

unit:mm

2150A



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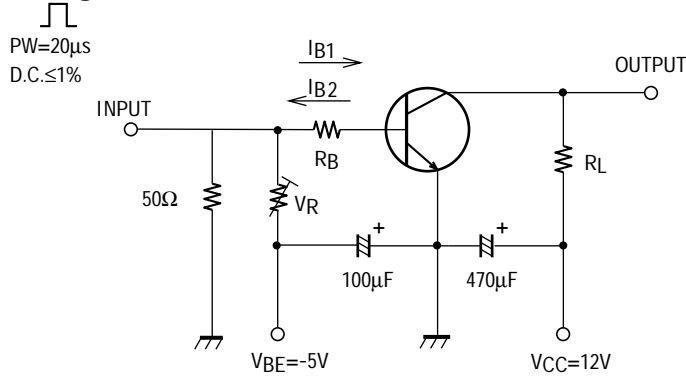
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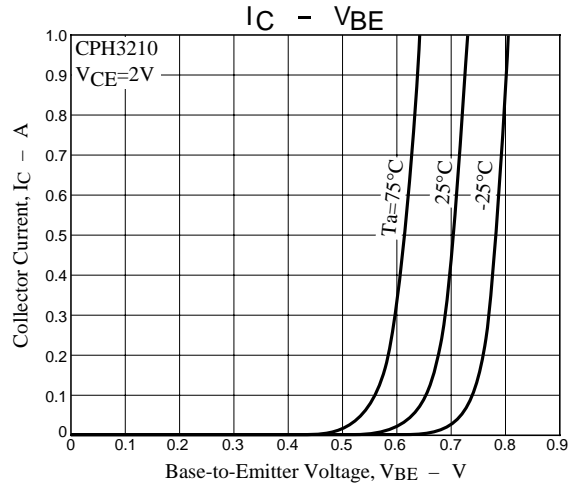
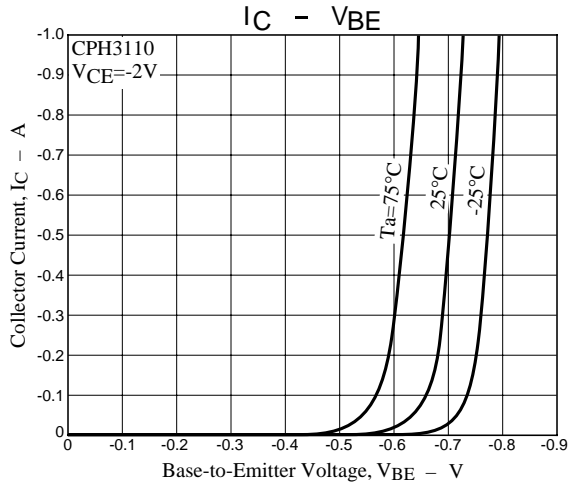
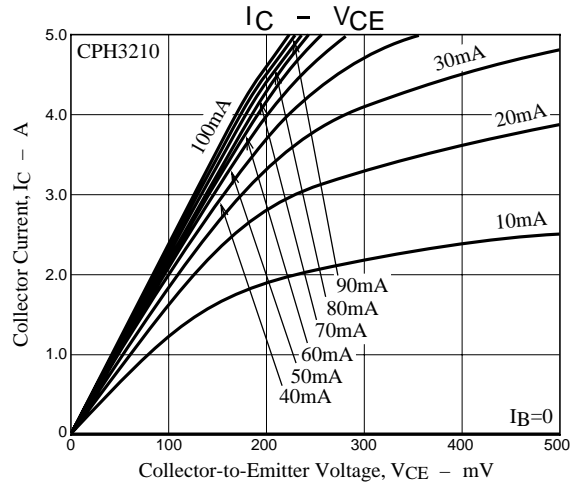
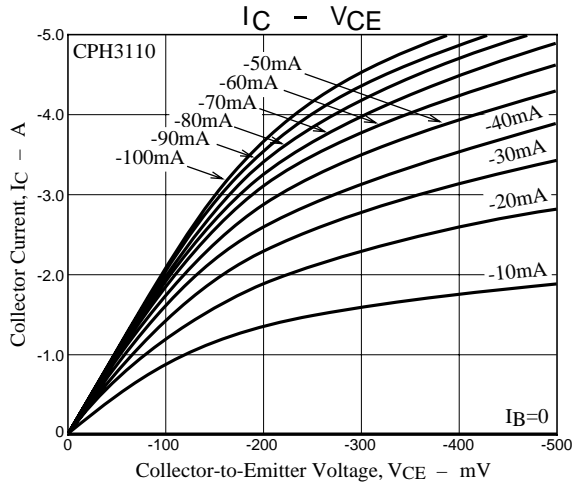
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)2.5A, I_B=(-)50mA$		(-140)	(-210)	mV
				110	165	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)2.5A, I_B=(-)50mA$		(-0.81)	(-1.2)	V
				0.82		V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$		(-30)		V
				40		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$		(-30)		V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_C=(-)10\mu A, I_C=0$		(-6)		V
Turn-ON Time	$t_{on}$	See specified test circuit.		(30)30		ns
Storage Time	$t_{stg}$	See specified test circuit.		(190)		ns
				320		ns
Turn-OFF Time	$t_f$	See specified test circuit.		(17)14		ns

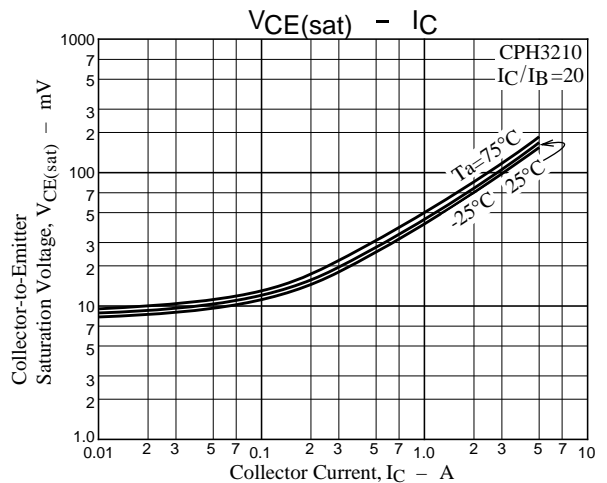
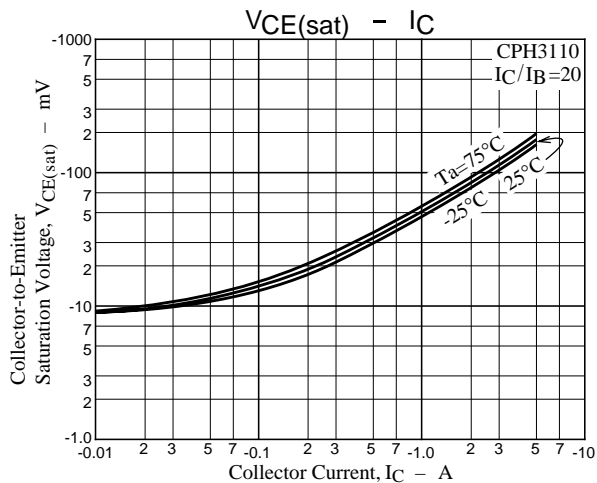
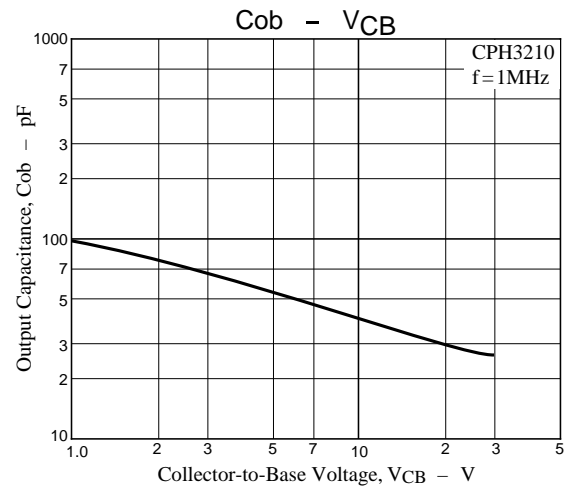
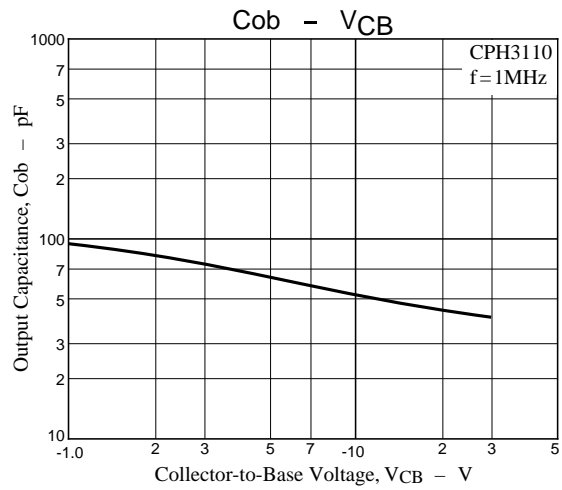
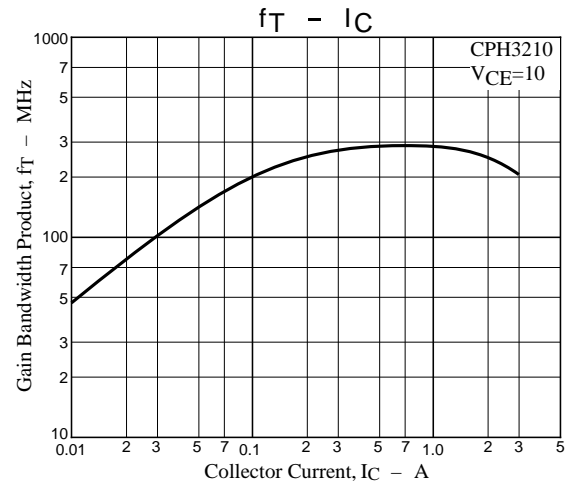
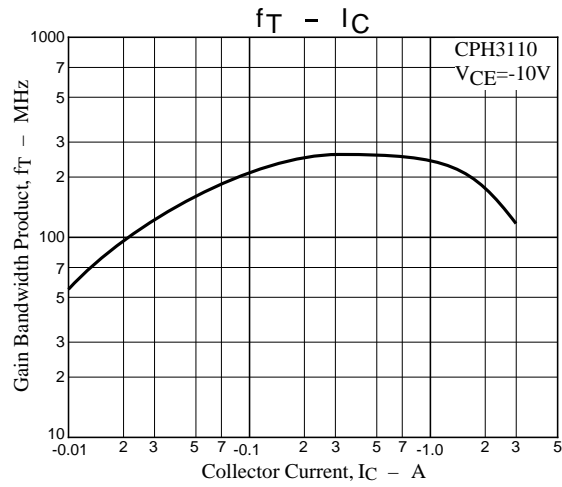
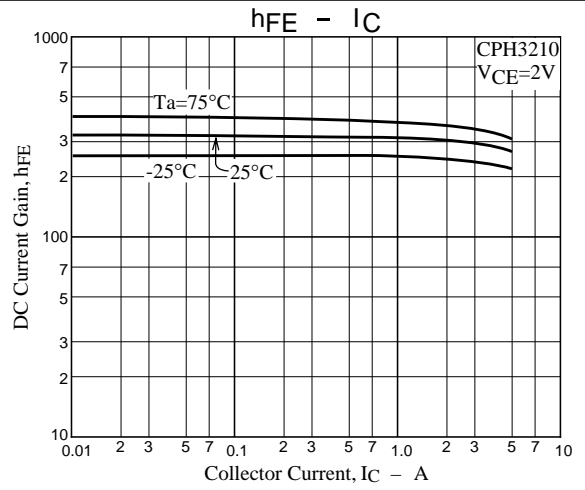
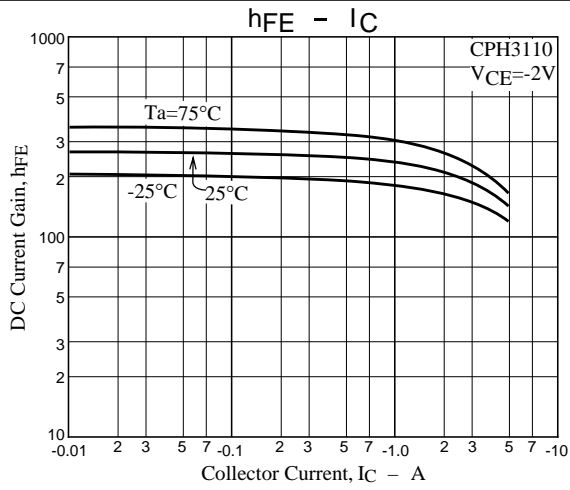
## Switching Time Test Circuit



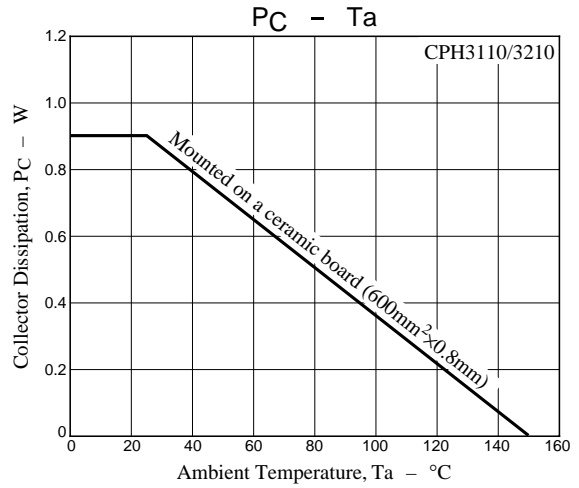
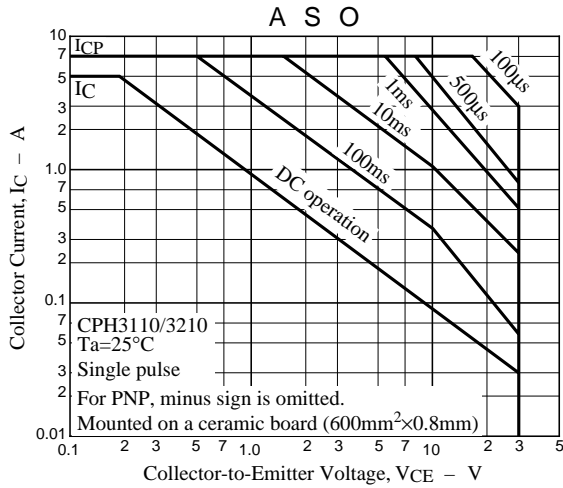
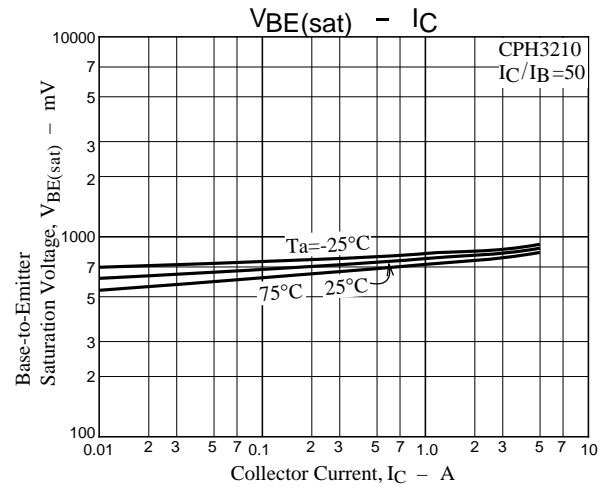
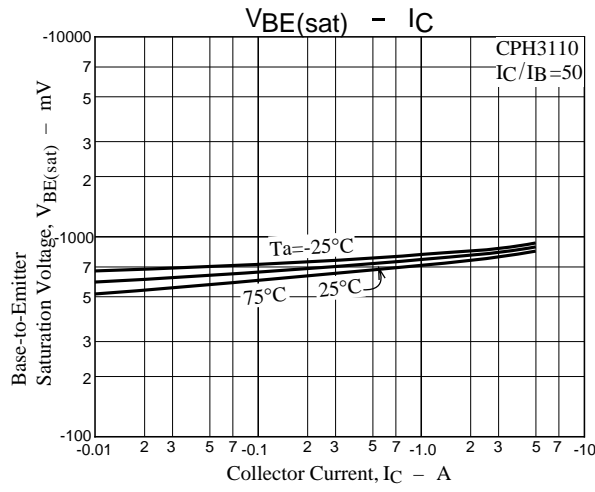
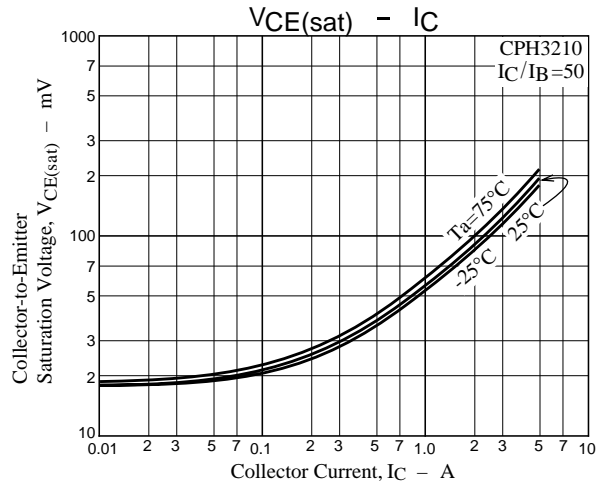
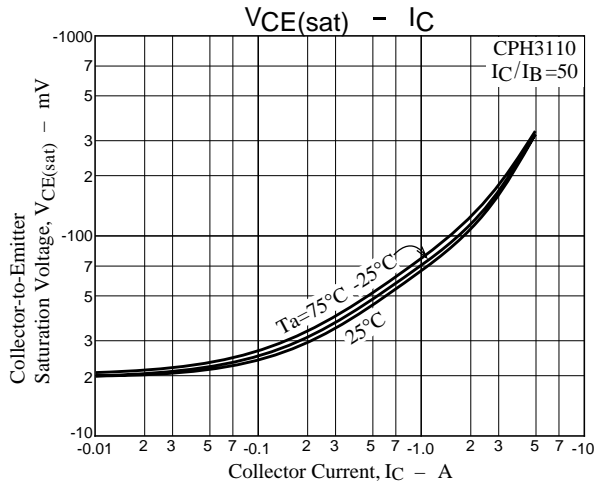
$20I_{B1} = -20I_{B2} = I_C = 2.5A$   
(For PNP, the polarity is reversed.)



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