



# 2SA2044 / 2SC5710

## DC / DC Converter Applications

### Applications

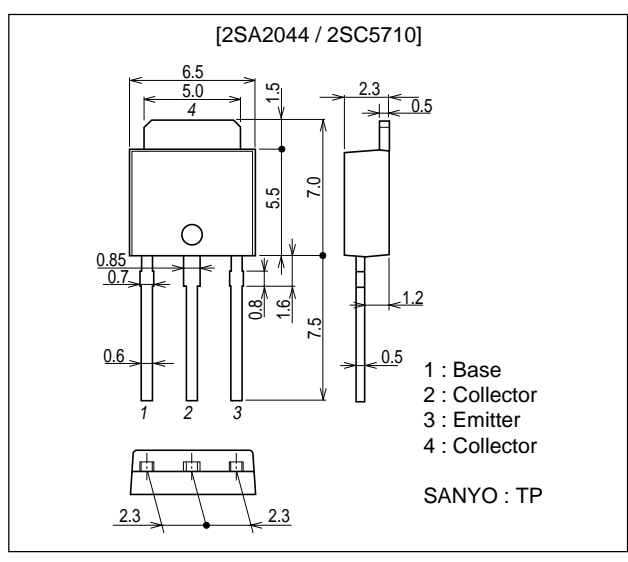
- Relay drivers, lamp drivers, motor drivers, strobes.

### Features

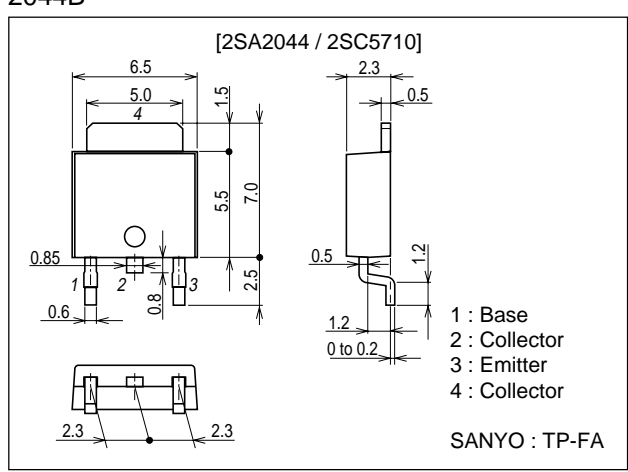
- Adoption of FBET and MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- High allowable power dissipation.

### Package Dimensions

unit : mm  
2045B



unit : mm  
2044B



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## Specifications

( ) : 2SA2044

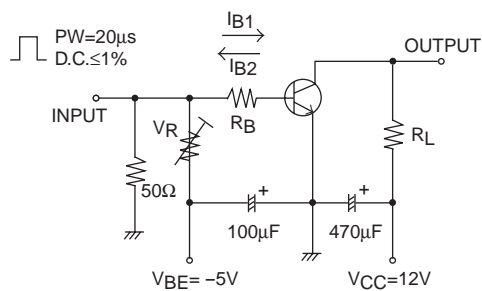
**Absolute Maximum Ratings** at  $T_a=25^\circ\text{C}$

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	$I_C$		(-)9	A
Collector Current (Pulse)	$I_{CP}$		(-)12	A
Base Current	$I_B$		(-)1.2	A
Collector Dissipation	$P_C$		1	W
		$T_c=25^\circ\text{C}$	15	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	$I_{CBO}$	$V_{CB}=-30\text{V}, I_E=0$			(-)0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$			(-)0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$	200		560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=-10\text{V}, I_C=-500\text{mA}$		(290)320		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, f=1\text{MHz}$		(52)40		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-4\text{A}, I_B=-200\text{mA}$		(-200)180	(-340)270	mV
		$I_C=-2.5\text{A}, I_B=-50\text{mA}$		(-170)130	(-290)195	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-2.5\text{A}, I_B=-50\text{mA}$		(-)0.85	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	(-30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, R_{BE}=\infty$	(-)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	(-)6			V
Turn-On Time	$t_{on}$	See specified test circuit.		30		ns
Storage Time	$t_{stg}$	See specified test circuit.		(190)320		ns
Fall Time	$t_f$	See specified test circuit.		15		ns

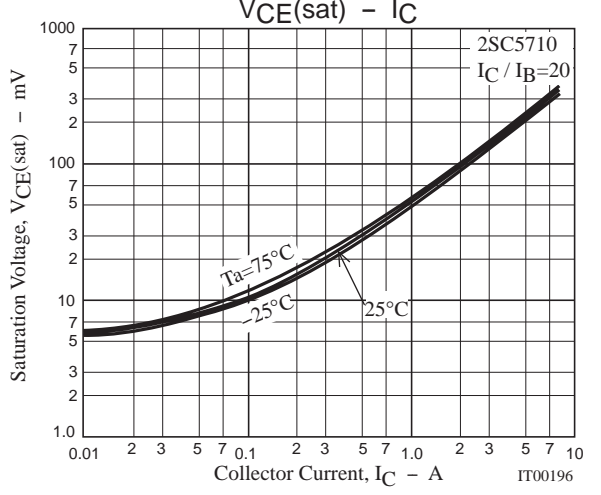
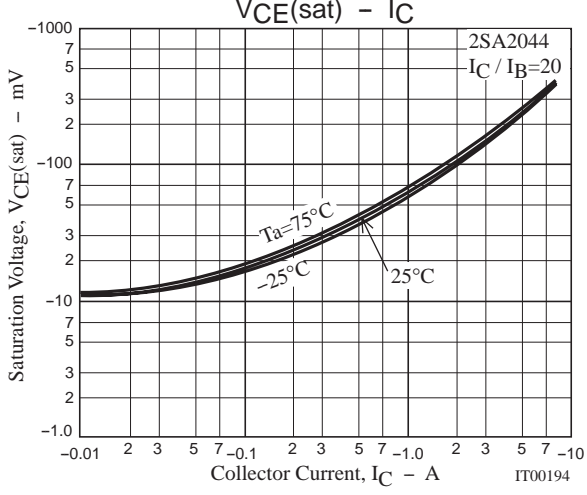
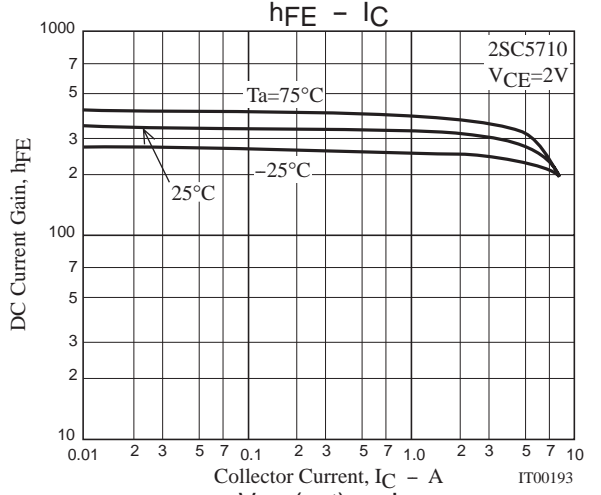
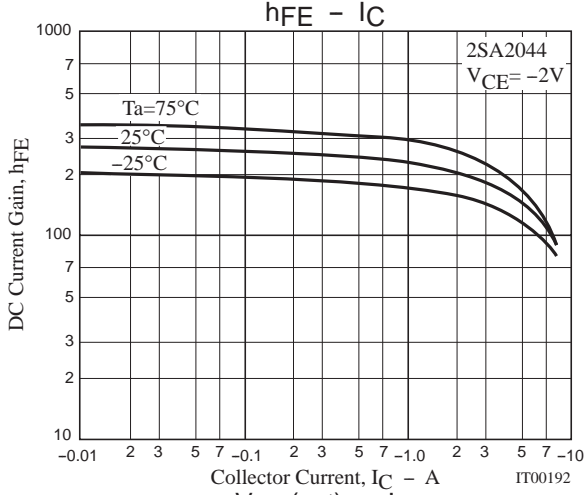
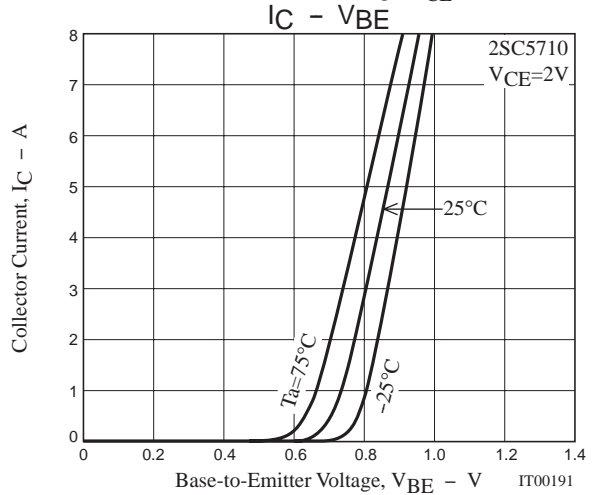
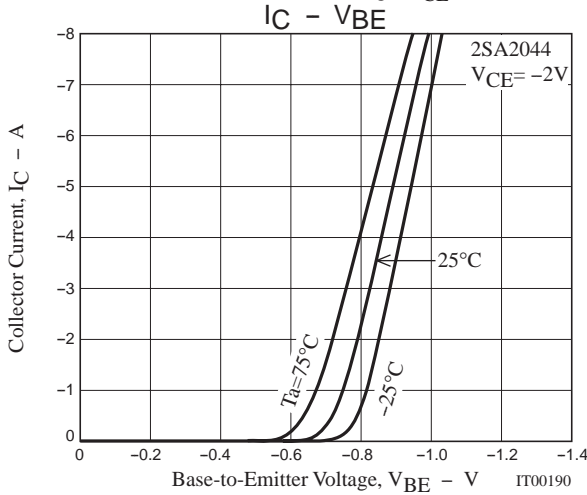
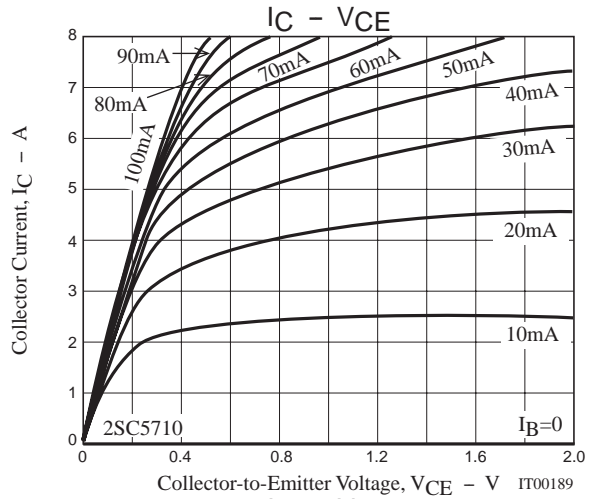
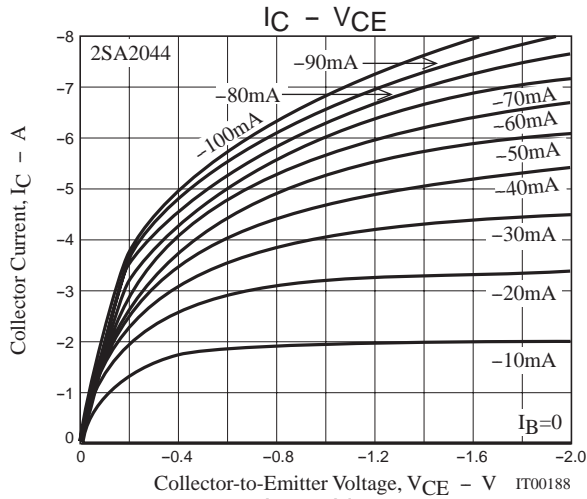
## Swicthing Time Test Circuit



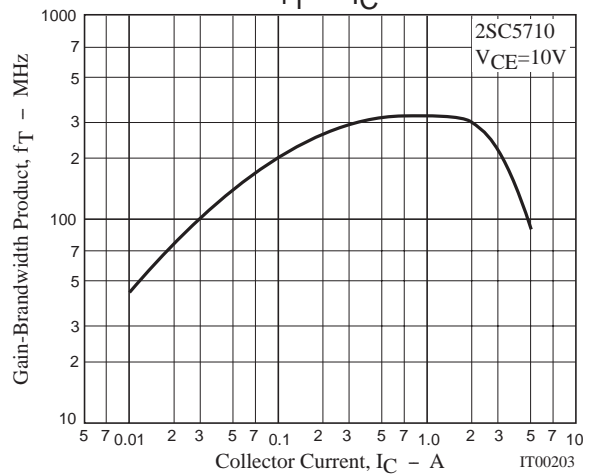
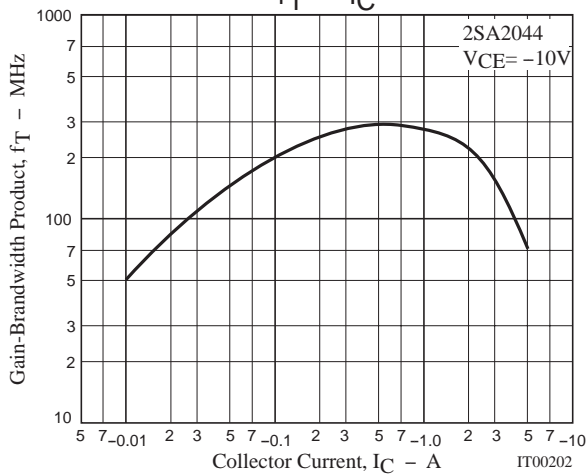
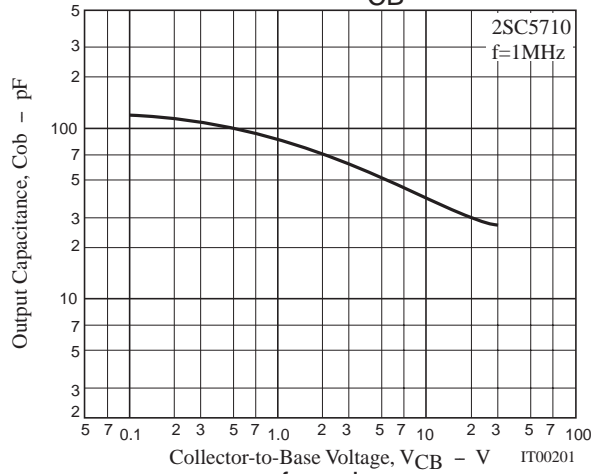
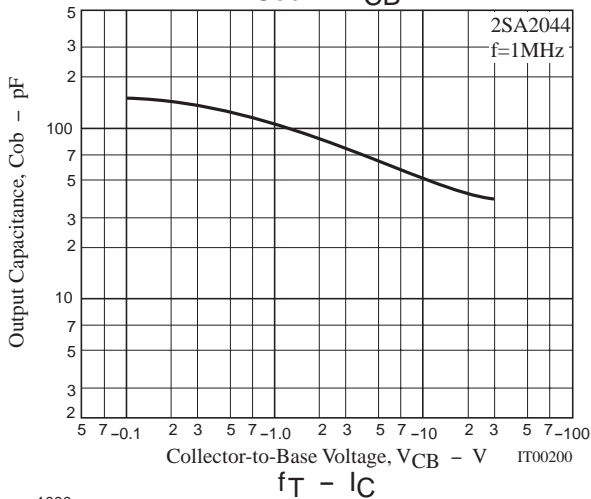
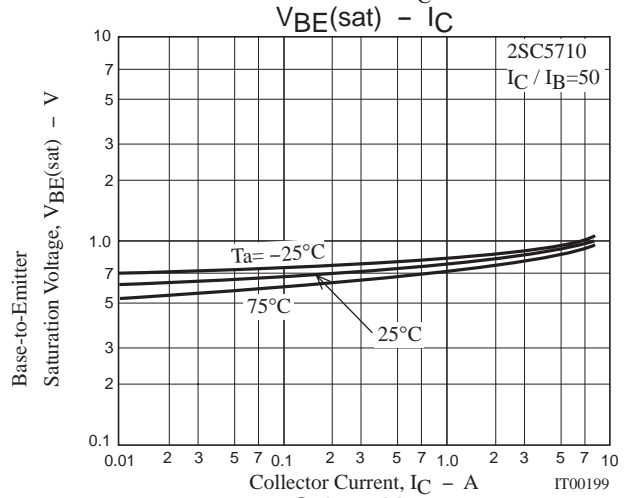
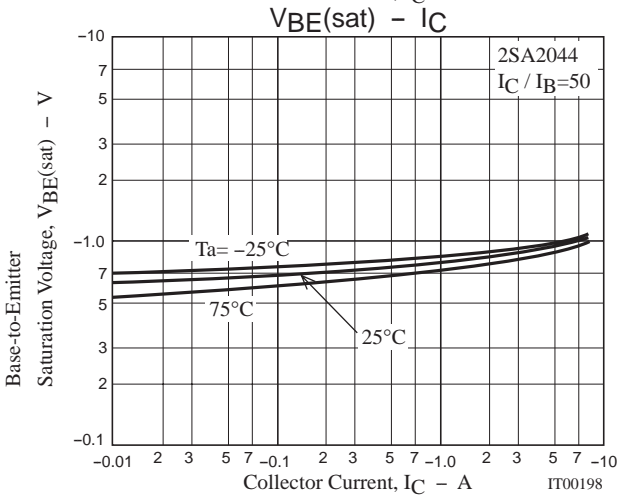
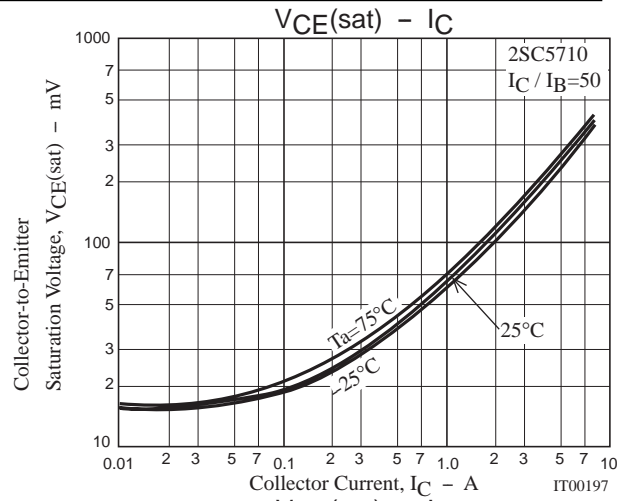
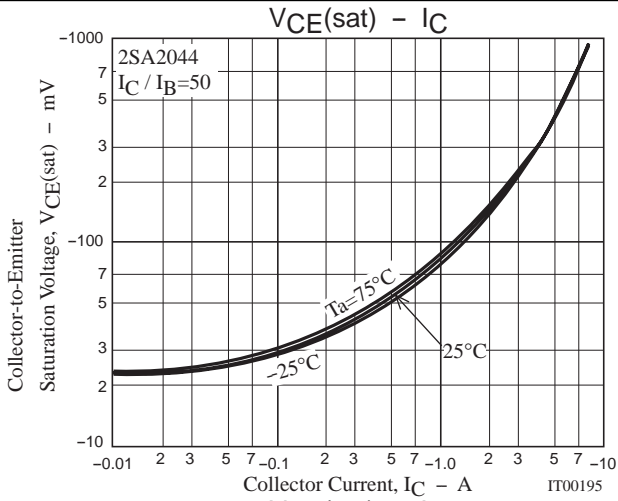
$$I_C=20I_{B1}=-20I_{B2}=2.5\text{A}$$

For PNP, the polarity is reversed.

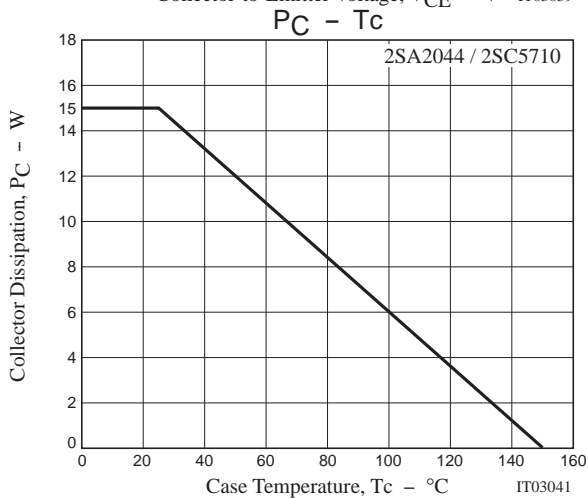
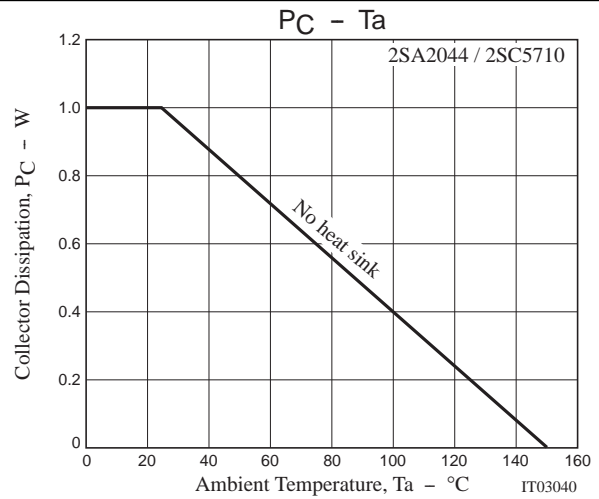
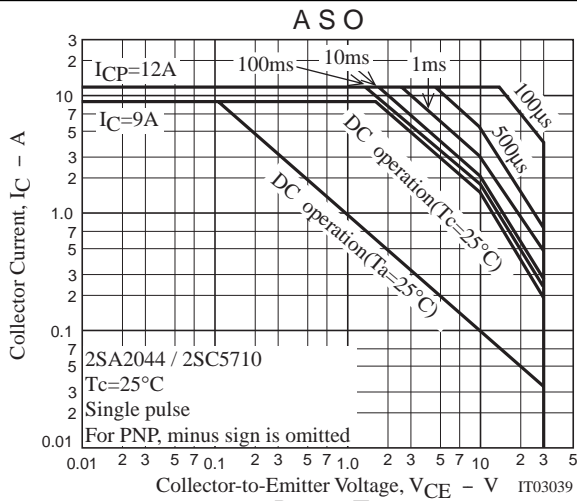
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