Ordering number : ENN6915

PNP / NPN Epitaxial Planar Silicon Transistors

2SA2044 / 2SC5710

DC / DC Converter Applications

Applications

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

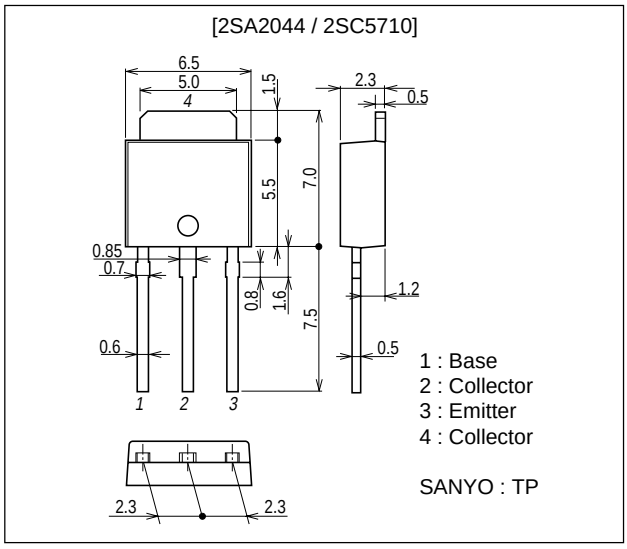
Features

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

Package Dimensions

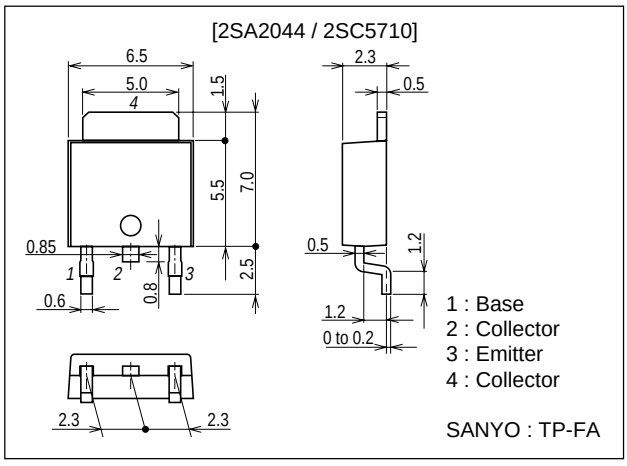
unit : mm

2045B



unit : mm

2044B



Specifications

( ) : 2SA2044

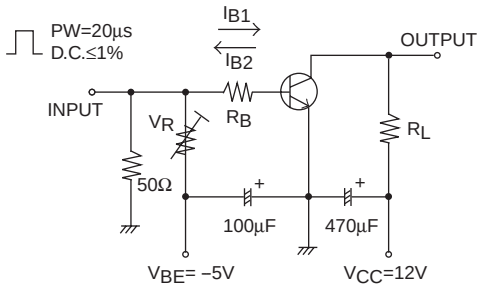
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-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
		Tc=25°C	15	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Electrical Characteristics at Ta=25°C

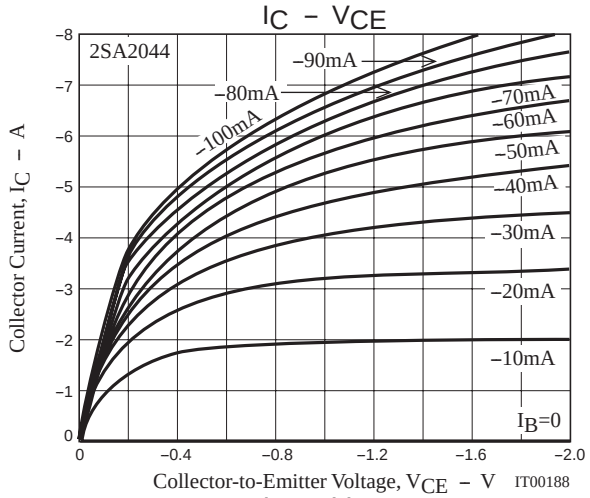
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(-)30V, I_E=0			(-)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0			(-)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(-)2V, I_C=(-)500mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(-)10V, I_C=(-)500mA		(290)320		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(52)40		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(-)4A, I_B=(-)200mA		(-200)180	(-340)270	mV
		I_C=(-)2.5A, I_B=(-)50mA		(-170)130	(-290)195	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(-)2.5A, I_B=(-)50mA		(-)0.85	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)10μA, I_E=0	(-30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(-)1mA, R_{BE}=∞	(-)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(-)10μA, 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

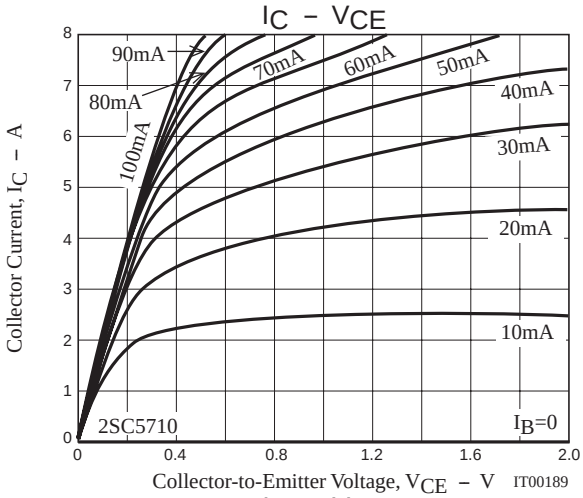
Swicthing Time Test Circuit

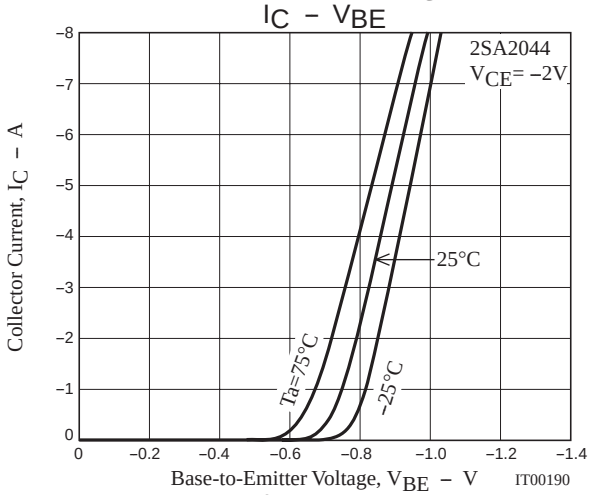


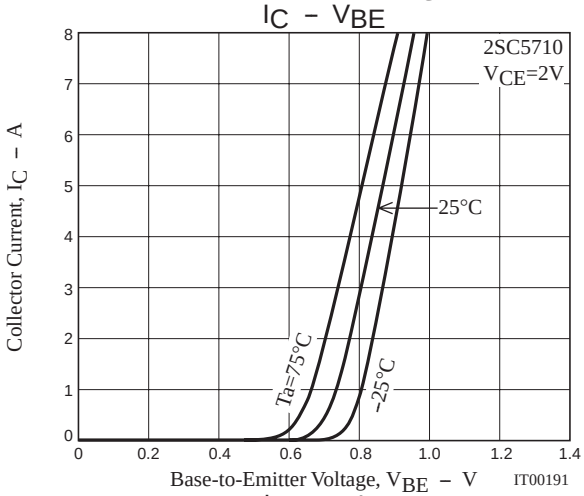
I_C=20I_{B1}= −20I_{B2}=2.5A

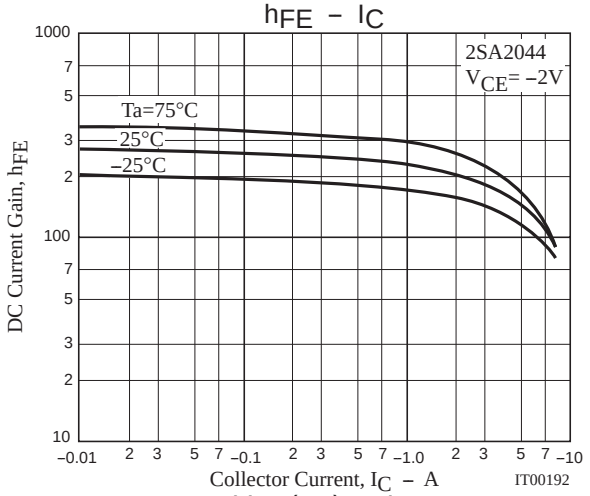
For PNP, the polarity is reversed.

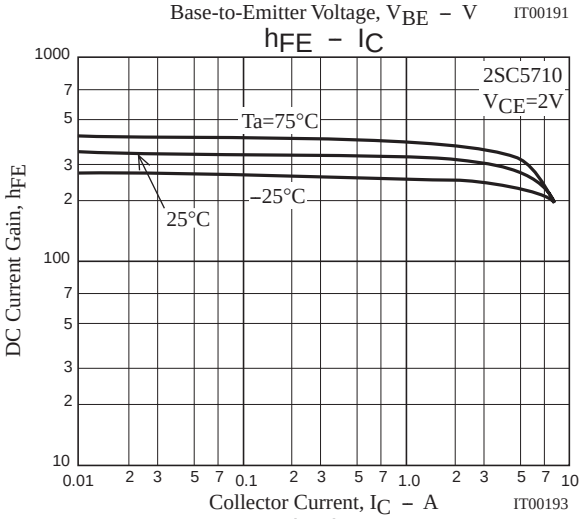

IC – VCE
2SA2044
–90mA
–80mA
–100mA
–70mA
–60mA
–50mA
–40mA
–30mA
–20mA
–10mA
IB=0
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT00188

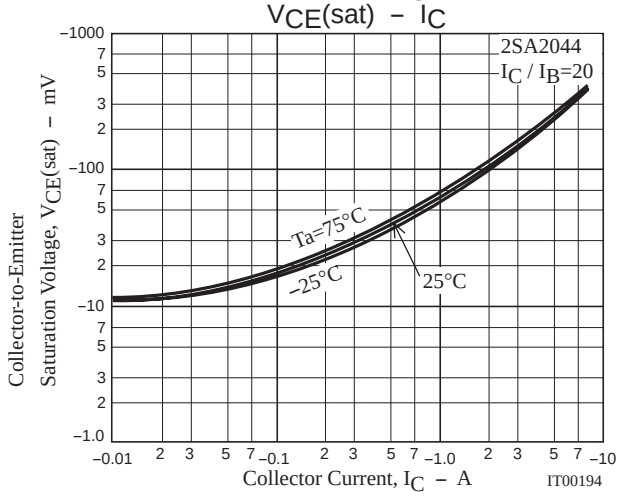

IC – VCE
90mA
80mA
100mA
70mA
60mA
50mA
40mA
30mA
20mA
10mA
2SC5710
IB=0
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT00189

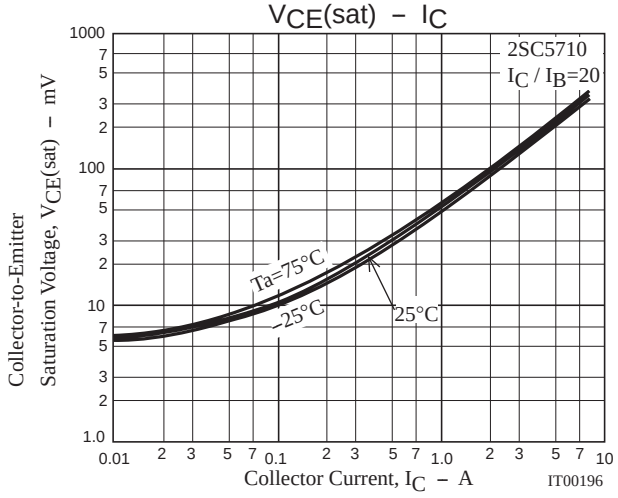

IC – VBE
2SA2044
VCE= –2V
25°C
Ta=75°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT00190

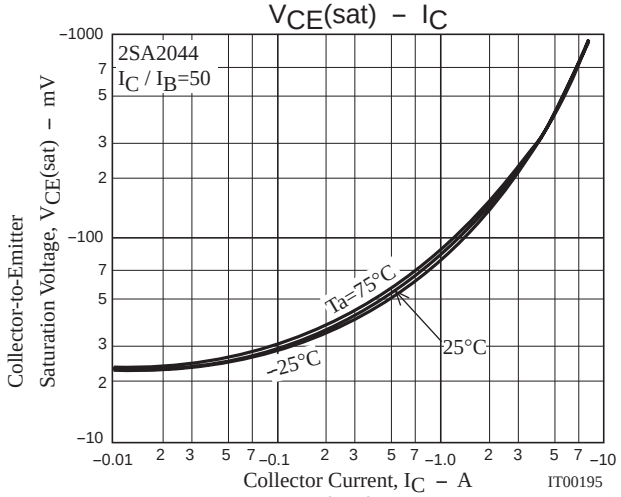

IC – VBE
2SC5710
VCE=2V
25°C
Ta=75°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT00191

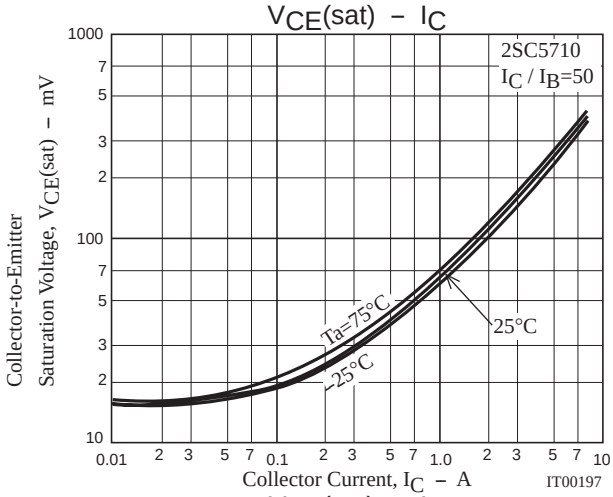

hFE – IC
2SA2044
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00192

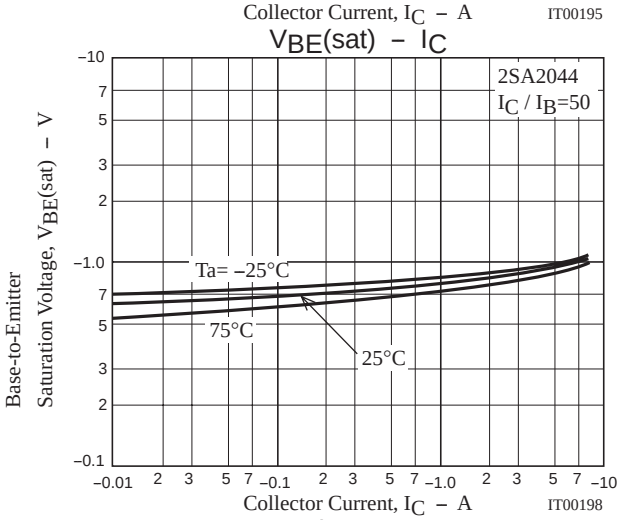

hFE – IC
2SC5710
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00193

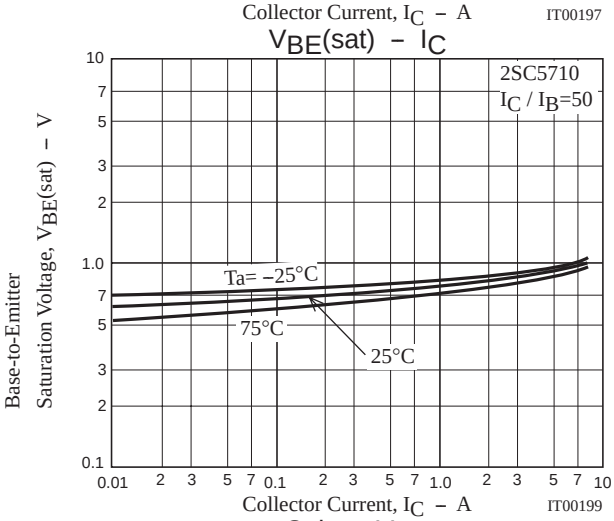

VCE(sat) – IC
2SA2044
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00194

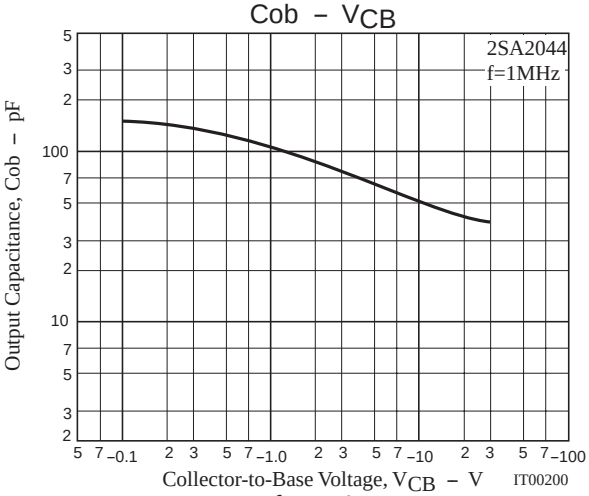

VCE(sat) – IC
2SC5710
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00196

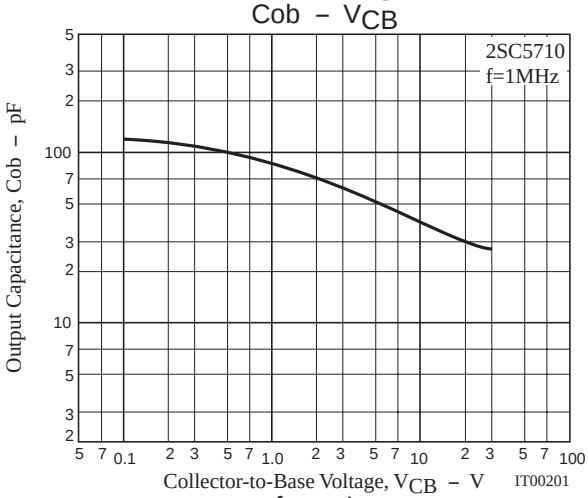

VCE(sat) – IC
2SA2044
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00195

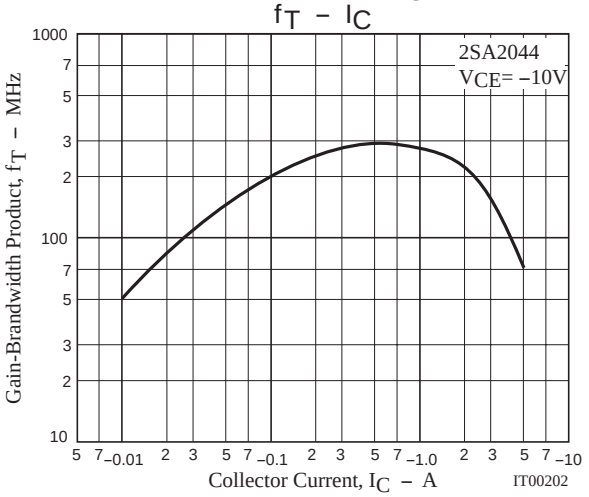

VCE(sat) – IC
2SC5710
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00197

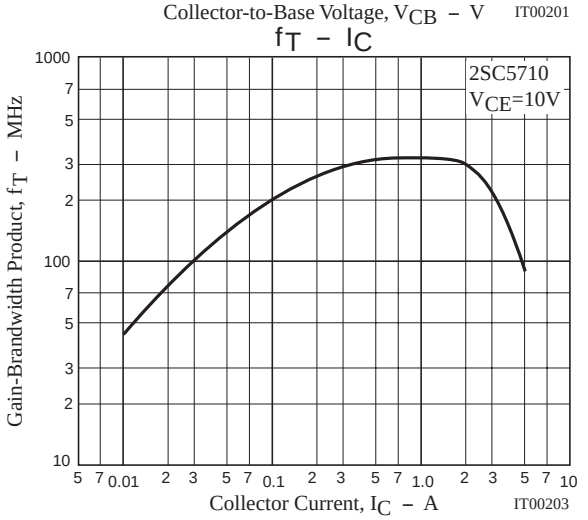

VBE(sat) – IC
2SA2044
IC / IB=50
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT00198


VBE(sat) – IC
2SC5710
IC / IB=50
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT00199


Cob – VCB
2SA2044
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT00200


Cob – VCB
2SC5710
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT00201


fT – IC
2SA2044
VCE= –10V
Gain-Brandwidth Product, fT – MHz
Collector Current, IC – A
IT00202


fT – IC
2SC5710
VCE=10V
Gain-Brandwidth Product, fT – MHz
Collector Current, IC – A
IT00203