



# 2SA2043 / 2SC5709

## DC / DC Converter Applications

### Applications

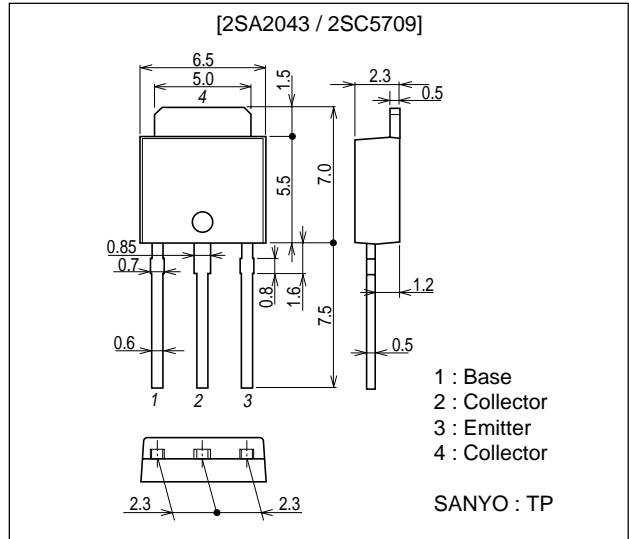
- Relay drivers, lamp drivers, motor drivers, strobes.

### Features

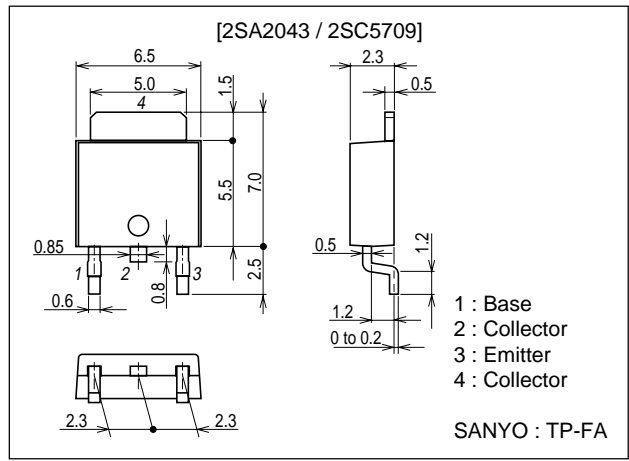
- Adoption of FBET and MBIT processes.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- High allowable power dissipation.

### Package Dimensions

unit : mm  
2045B



unit : mm  
2044B



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## Specifications

( ) : 2SA2043

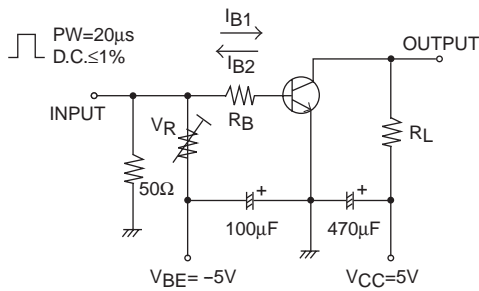
### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		(-)15	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)15	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-)5	V
Collector Current	I <sub>C</sub>		(-)10	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)13	A
Base Current	I <sub>B</sub>		(-)1.2	A
Collector Dissipation	P <sub>C</sub>		1	W
		T <sub>C</sub> =25°C	15	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =(-)12V, 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> =(-)2V, I <sub>C</sub> =(-)500mA		(220)280		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(90)50		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =(-)3A, I <sub>B</sub> =(-)60mA		(-110)120	(-170)180	mV
		I <sub>C</sub> =(-)4.5A, I <sub>B</sub> =(-)90mA		(-160)180	(-240)280	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =(-)3A, I <sub>B</sub> =(-)60mA		(-)0.85	(-)1.2	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0	(-)15			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞	(-)15			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =(-)10μA, 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.		(120)180		ns
Fall Time	t <sub>f</sub>	See specified test circuit.		(14)25		ns

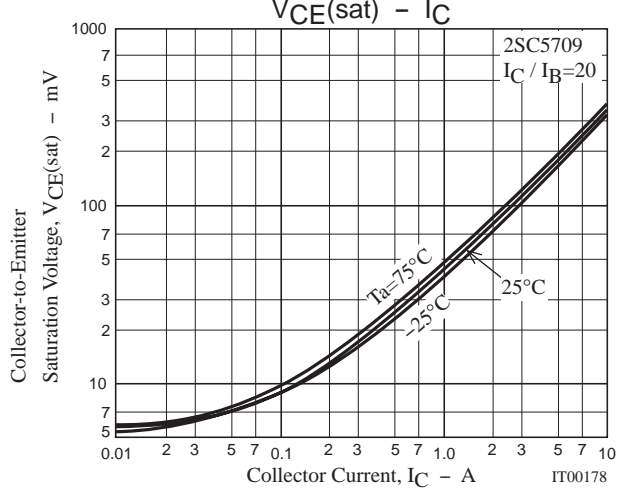
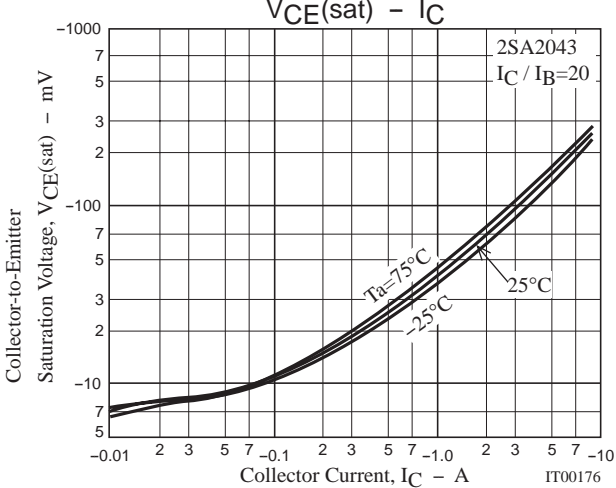
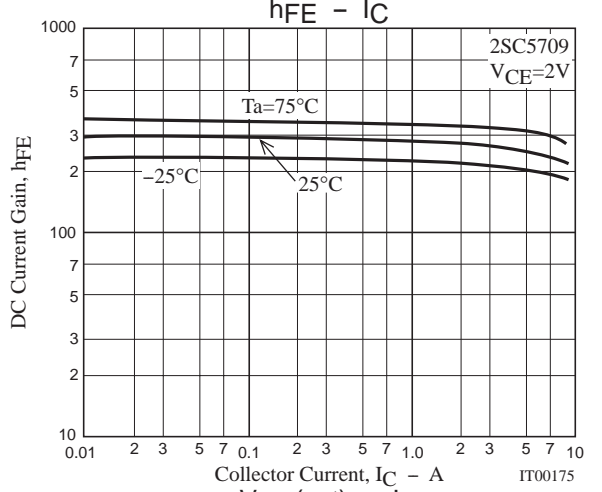
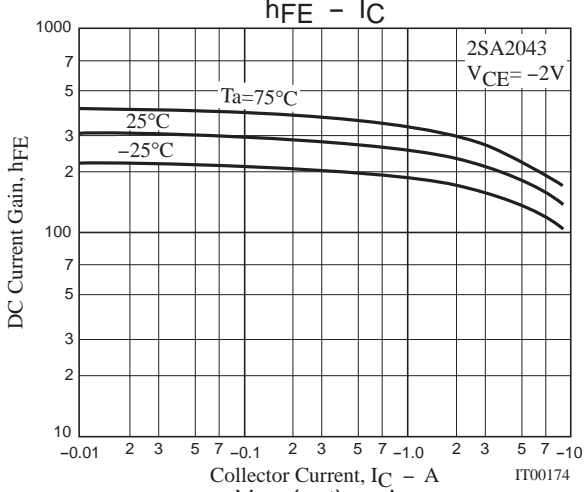
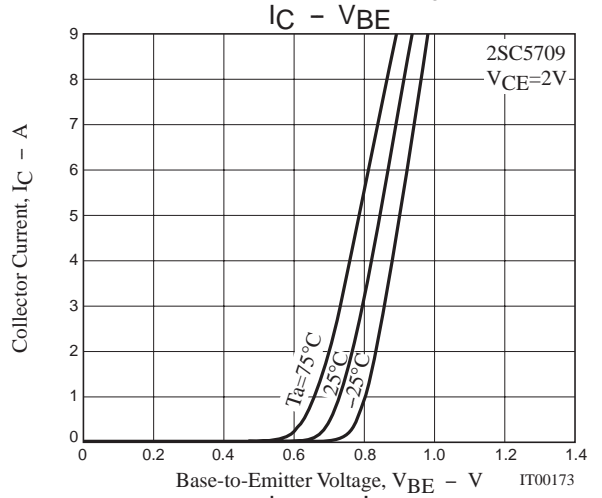
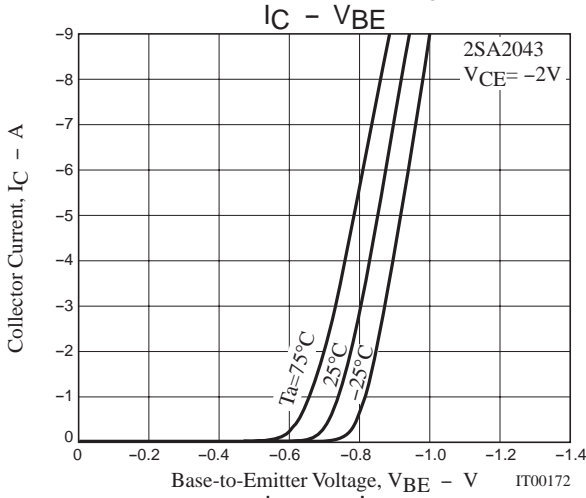
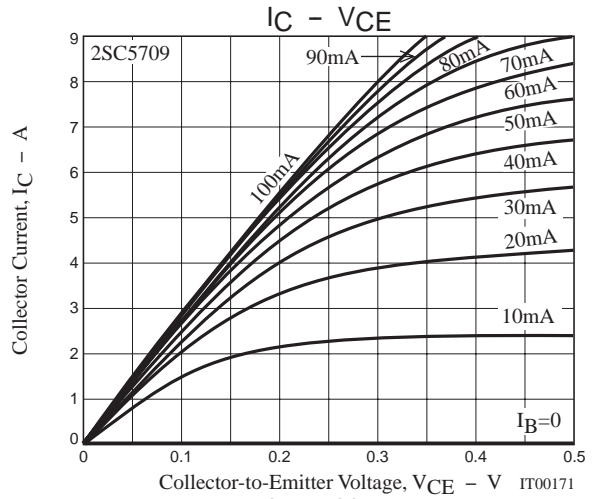
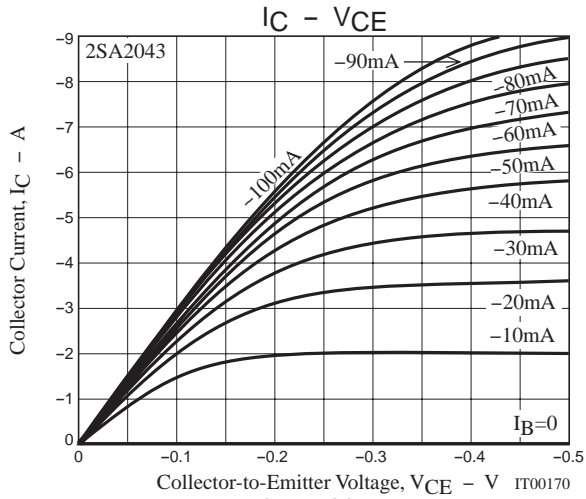
### Swicthing Time Test Circuit



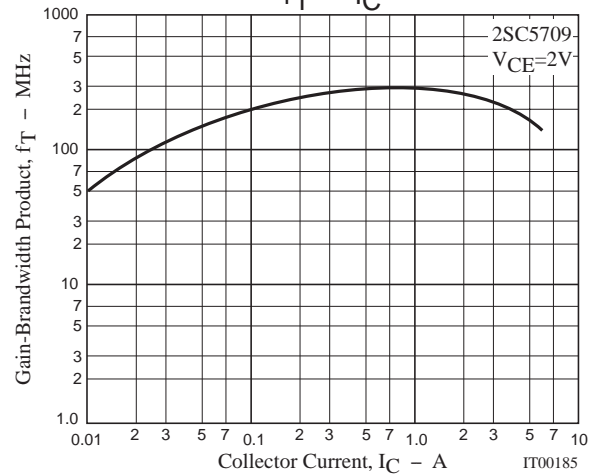
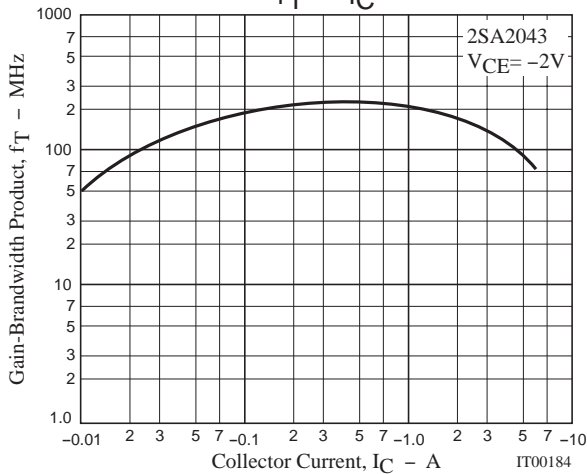
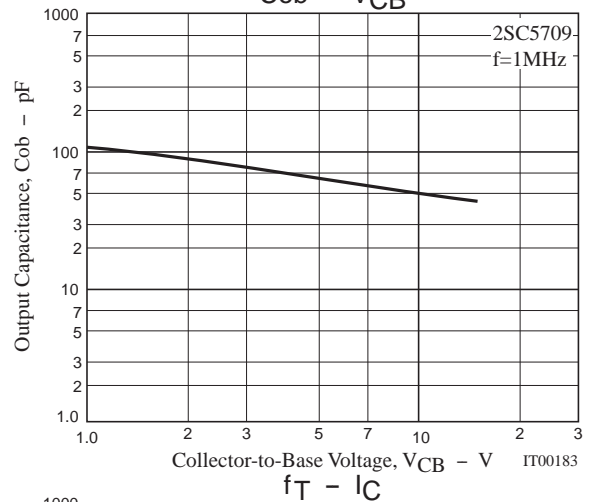
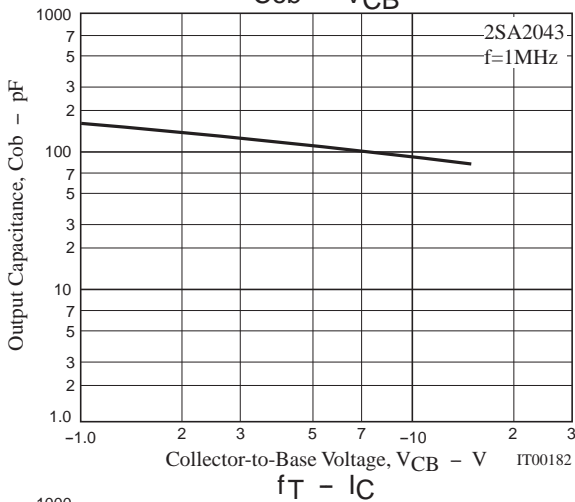
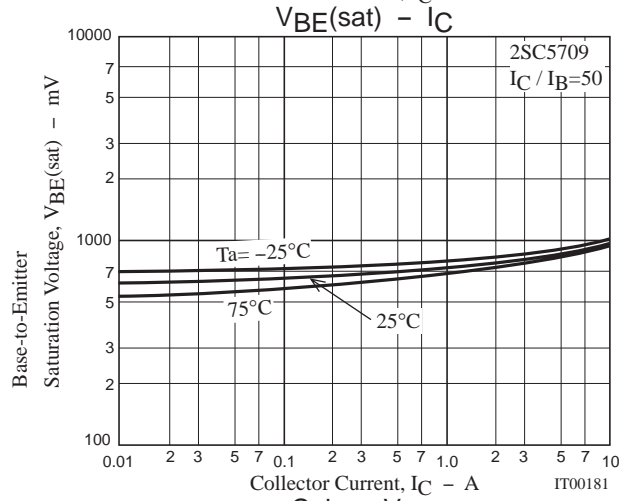
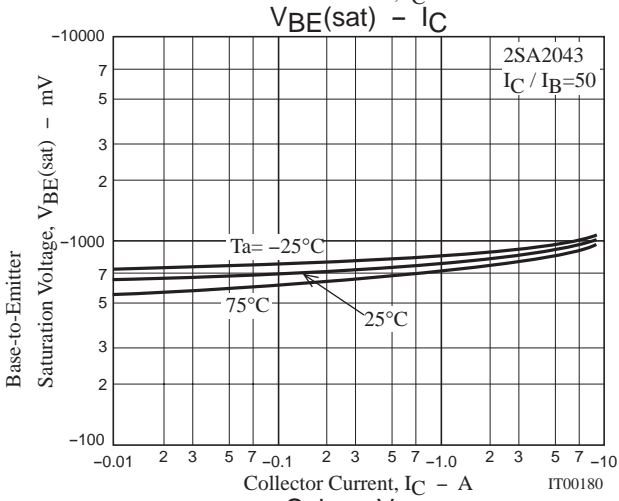
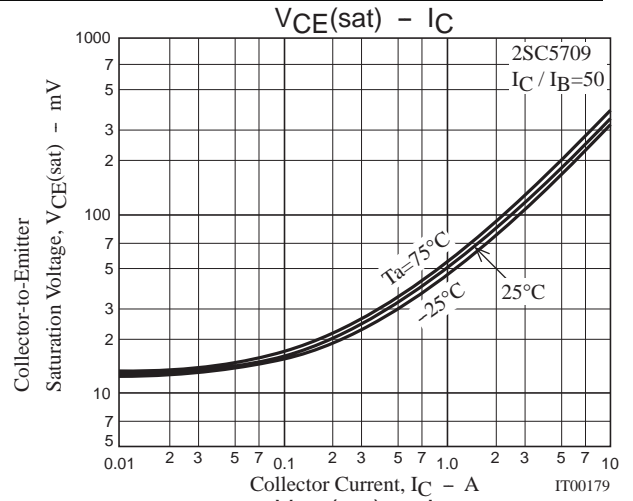
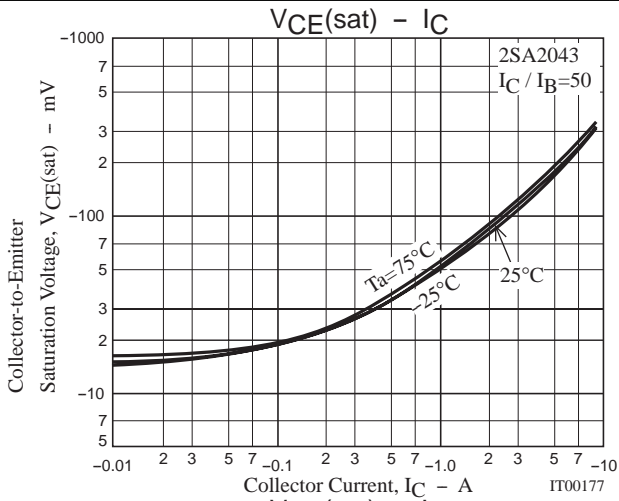
$$I_C = 20I_{B1} = -20I_{B2} = 3A$$

For PNP, the polarity is reversed.

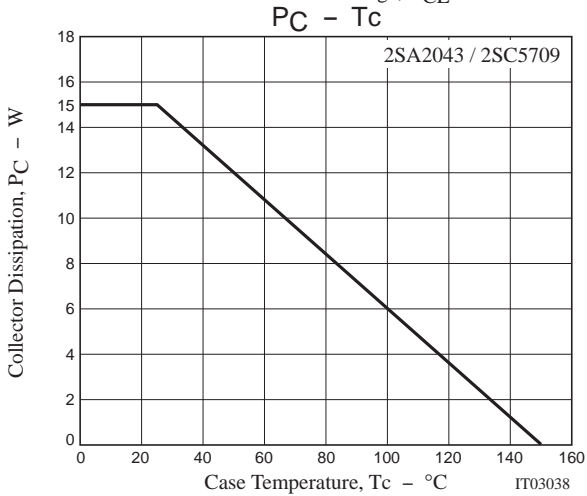
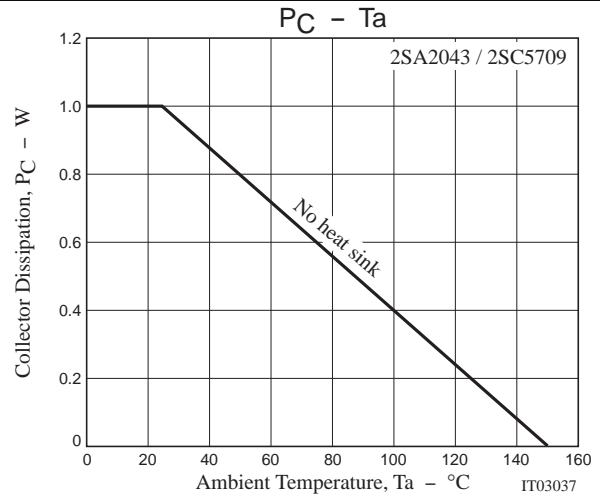
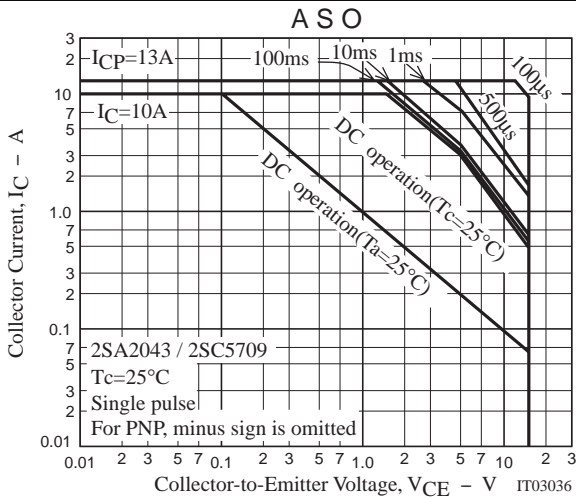
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