



# 2SA1593/2SC4135

## High-Voltage Switching Applications

### Applications

- Power supplies, relay drivers, lamp drivers.

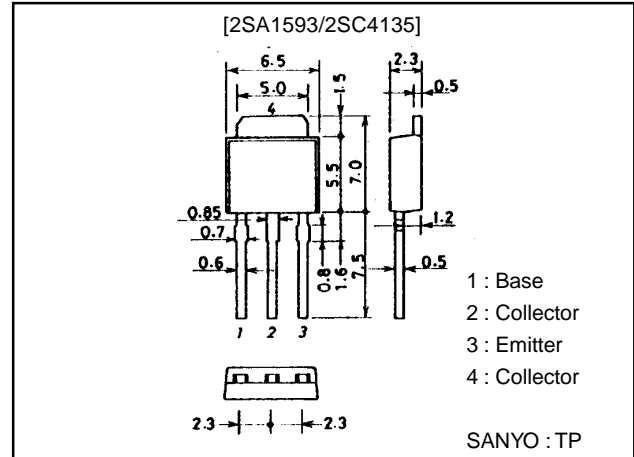
### Features

- Adoption of FBET, MBIT processes.
- High breakdown voltage and large current capacity.
- Fast switching speed.
- Small and slim package permitting 2SA1593/2SC4135-applied sets to be made more compact.

### Package Dimensions

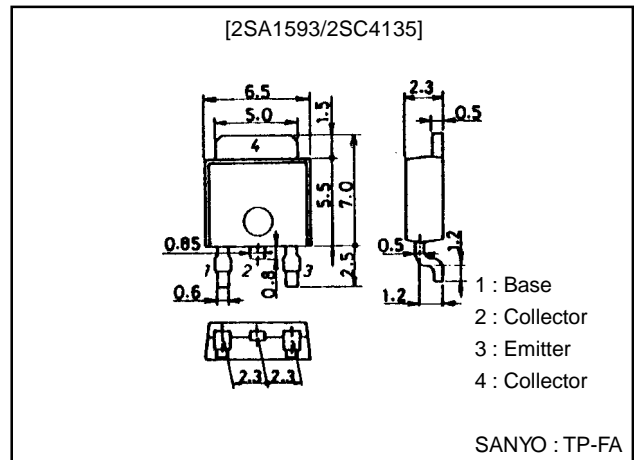
unit:mm

2045B



unit:mm

2044B



( ) : 2SA1593

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-)120	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)100	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)2	A
Collector Current (Pulse)	$I_{CP}$		(-)3	A
Collector Dissipation	$P_C$		1	W
		$T_c=25^\circ\text{C}$	15	W
Junction Temperature	$T_J$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

\* : The 2SA1593/2SC4135 are classified by 100mA  $h_{FE}$  as follows :

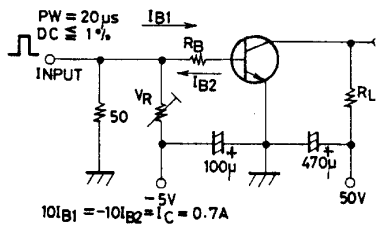
100	R	200	140	S	280	200	T	400
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## Electrical Characteristics at Ta = 25°C

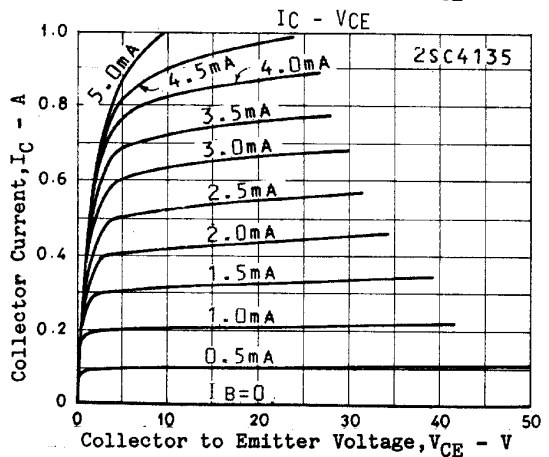
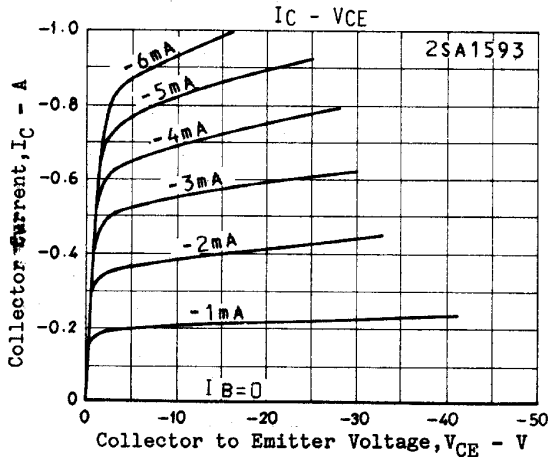
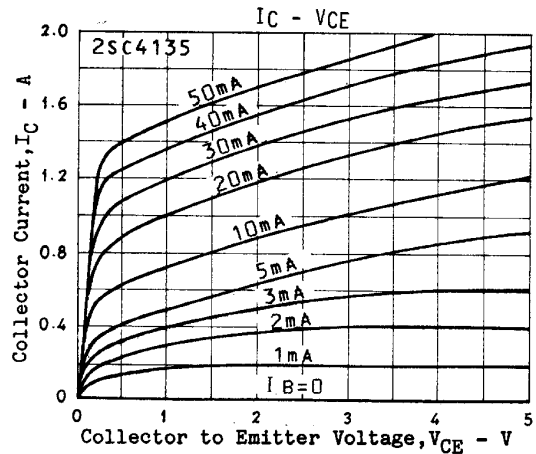
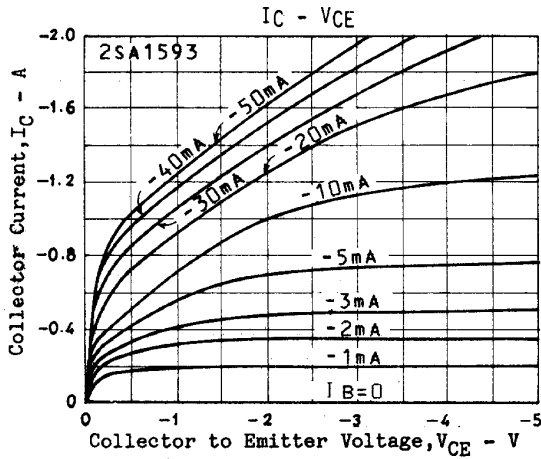
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)100V, I_E=0$			(-100)	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4V, I_C=0$			(-100)	nA
DC Current Gain	$h_{FE}$	$V_{CE}=(-)5V, I_C=(-)100mA$	100*		400*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)100mA$		120		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(25)		pF
				16		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1A, I_B=(-)100mA$		(-0.22)	(-0.6)	V
				0.13	0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)1A, I_B=(-)100mA$		(-0.85)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-120)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-100)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$	(-6)			V
Turn-ON Time	$t_{on}$	See specified Test Circuit		(80)		ns
				80		ns
Storage Time	$t_{stg}$	See specified Test Circuit		(750)		ns
				1000		ns
Fall Time	$t_f$	See specified Test Circuit		(40)		ns
				50		ns

## Switching Time Test Circuit

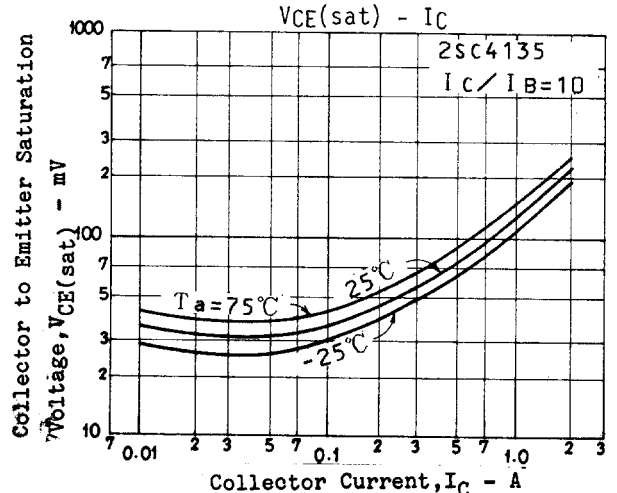
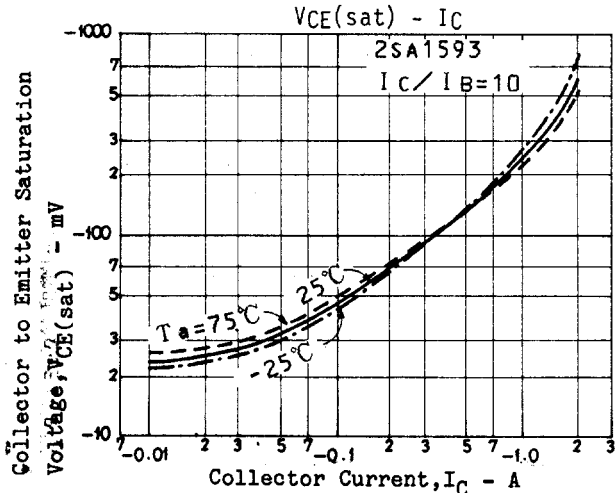
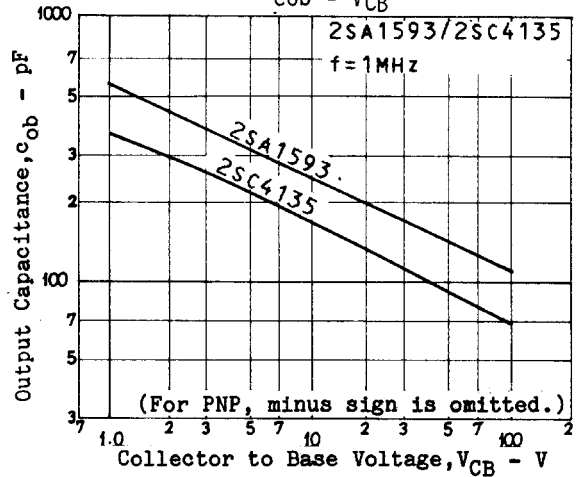
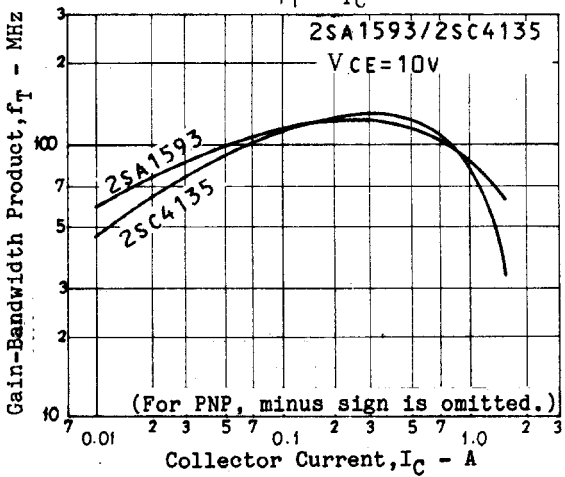
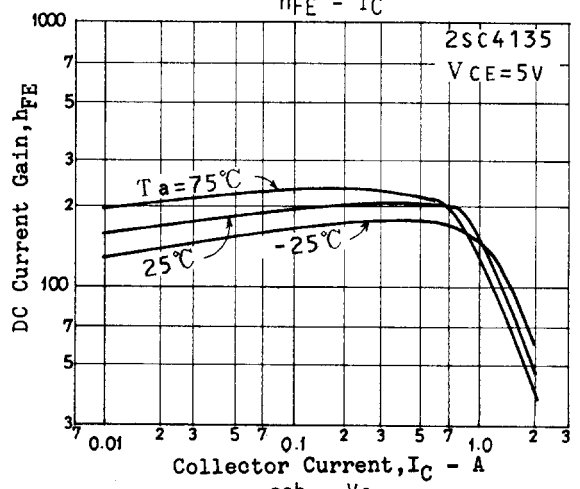
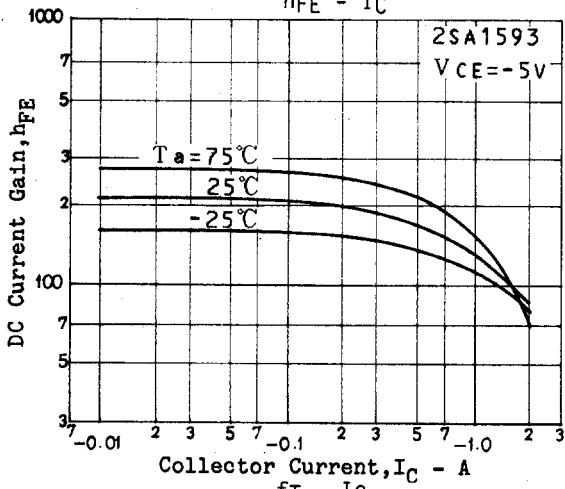
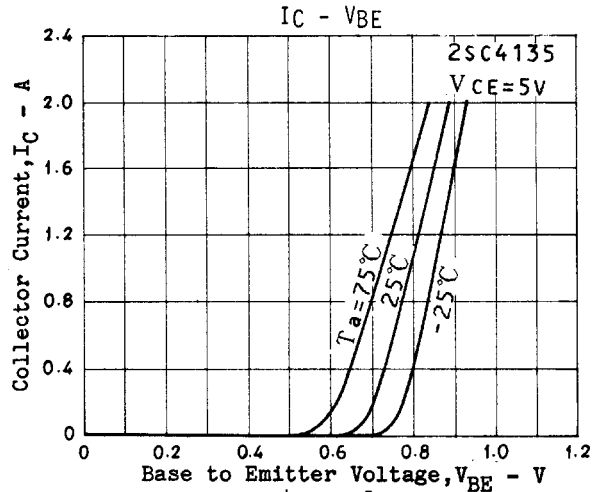
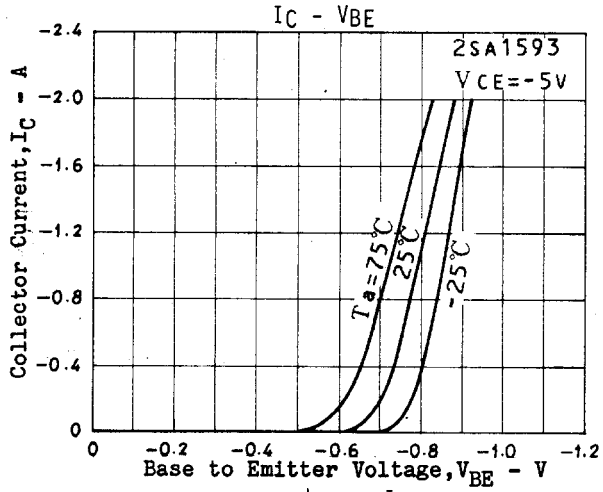


Unit (resistance :Ω, capacitance : F)

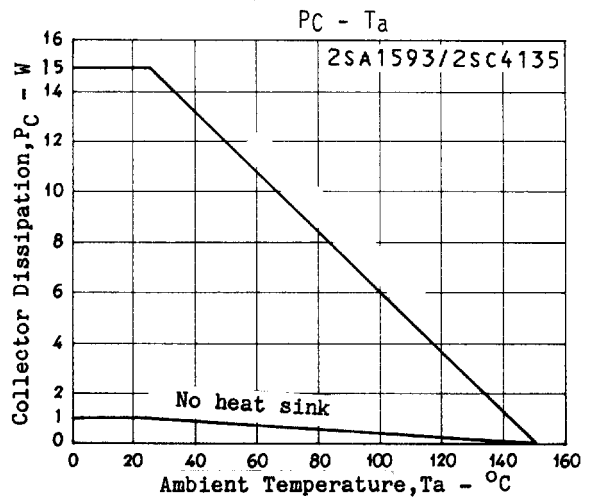
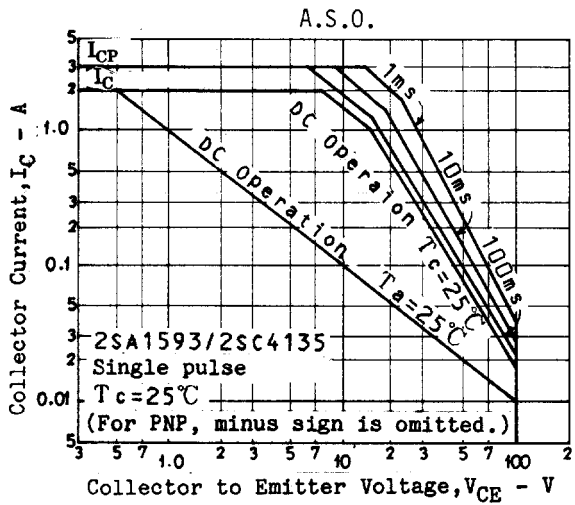
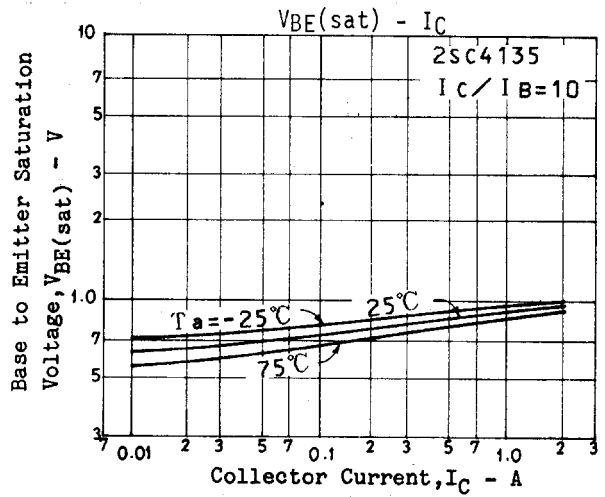
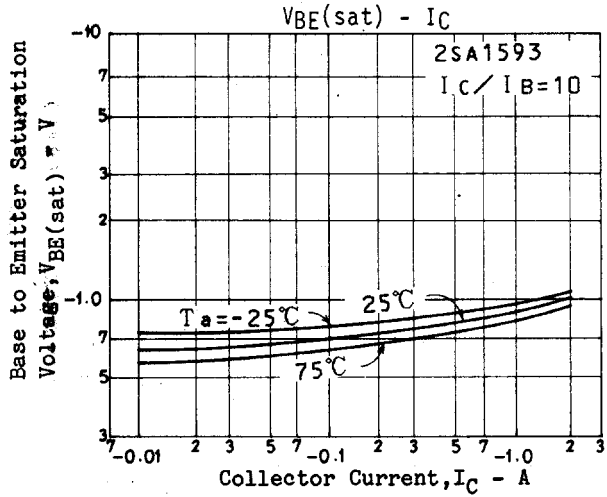
(For PNP, the polarity is reversed.)



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