Ordering number:EN2511A

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1593/2SC4135

High-Voltage Switching Applications

Applications

· Power supplies, relay derivers, lamp drivers.

Features

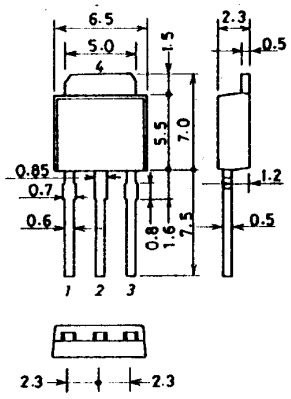
· Adoption of FBET, MBIT processes.
· High breakdown voltage and large current capacity.
· Fast switching speed.
· Small and slim package permitting 2SA1593/ 2SC4135-applied sets to be made more compact.

Package Dimensions

unit:mm

2045B

[2SA1593/2SC4135]



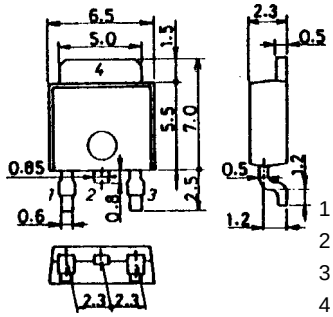
1 : Base
2 : Collector
3 : Emitter
4 : Collector

SANYO : TP

unit:mm

2044B

[2SA1593/2SC4135]



1 : Base
2 : Collector
3 : Emitter
4 : Collector

SANYO : TP-FA

( ) : 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
		Tc=25˚C	15	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

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

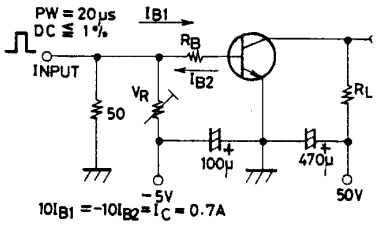
100	R	200	140	S	280	200	T	400

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Electrical Characteristics at Ta = 25˚C

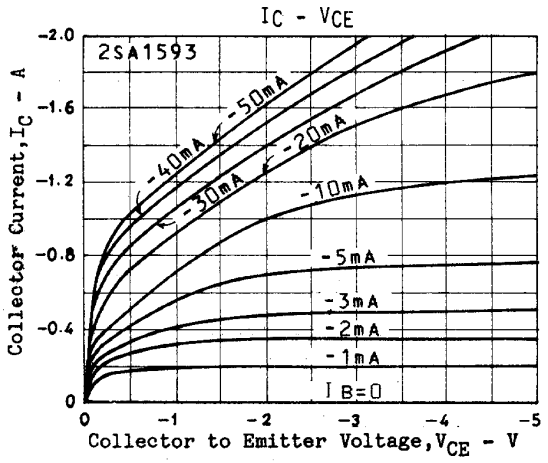
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)100V, I_E=0			(–)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)100	nA
DC Current Gain	h_{FE}	V_{CE}=(–)5V, I_C=(–)100mA	100*		400*	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)100mA		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=(–)10μA, I_E=0	(–)120			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)100			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		(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

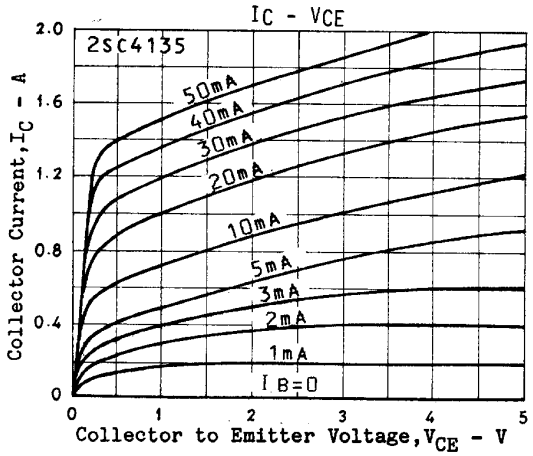
Switching Time Test Circuit

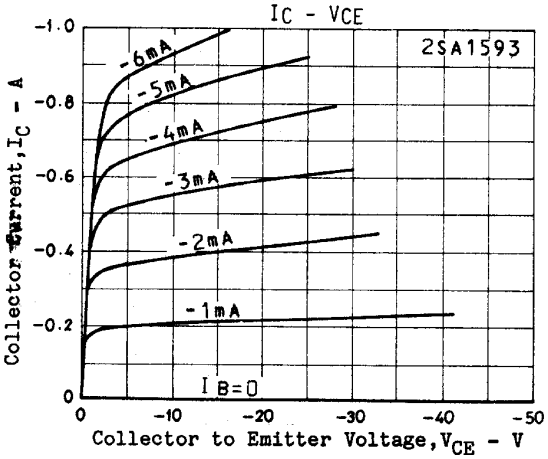


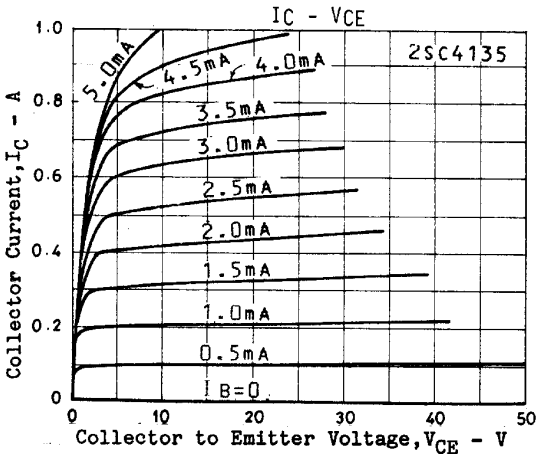
Unit (resistance :Ω, capacitance : F)

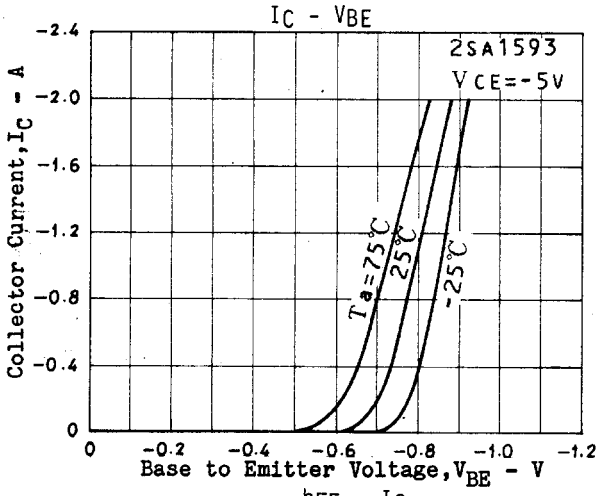
(For PNP, the polarity is reversed.)

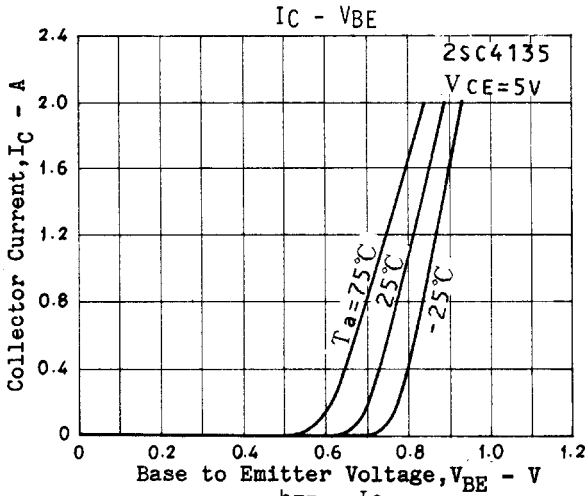


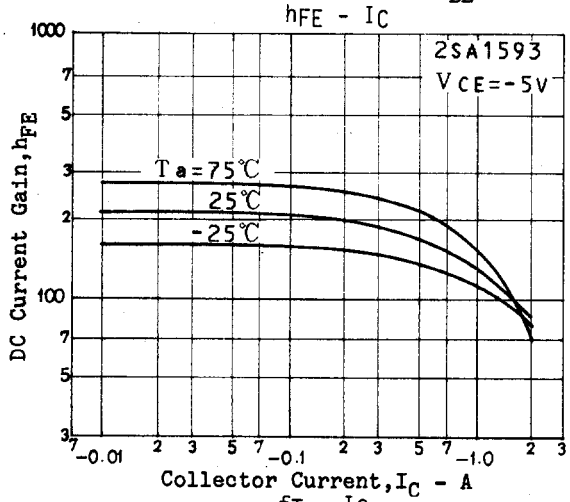


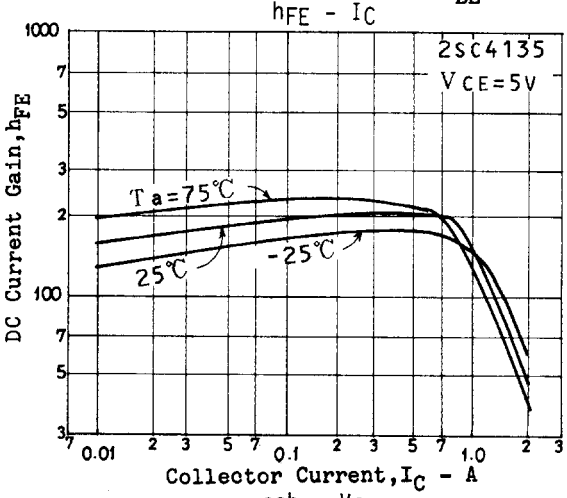


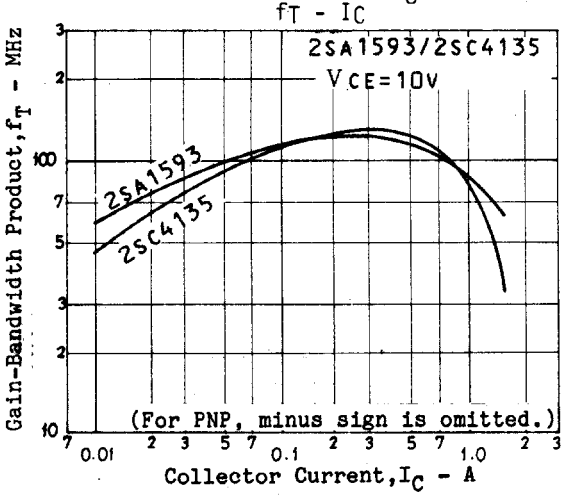


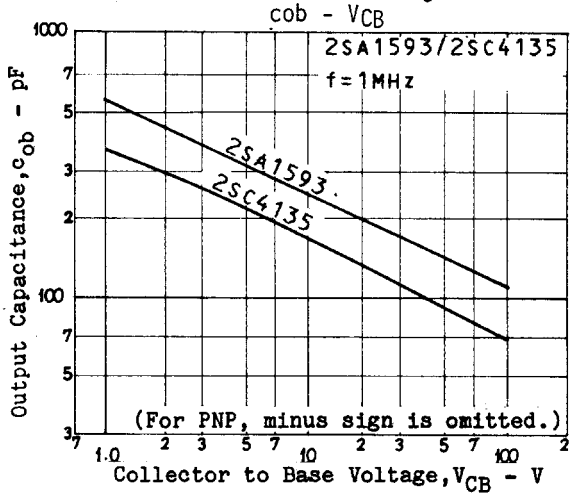

IC - VBE
2SA1593
VCE=-5V
Ta=75℃
25℃
-25℃
Collector Current, IC - A
Base to Emitter Voltage, VBE - V

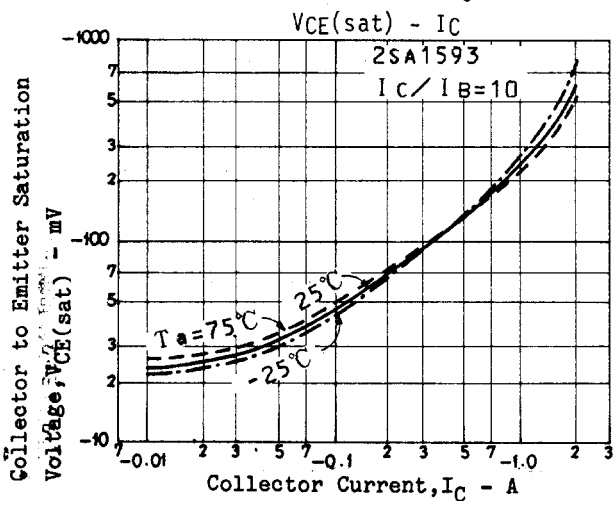

IC - VBE
2SC4135
VCE=5V
Ta=75℃
25℃
-25℃
Collector Current, IC - A
Base to Emitter Voltage, VBE - V

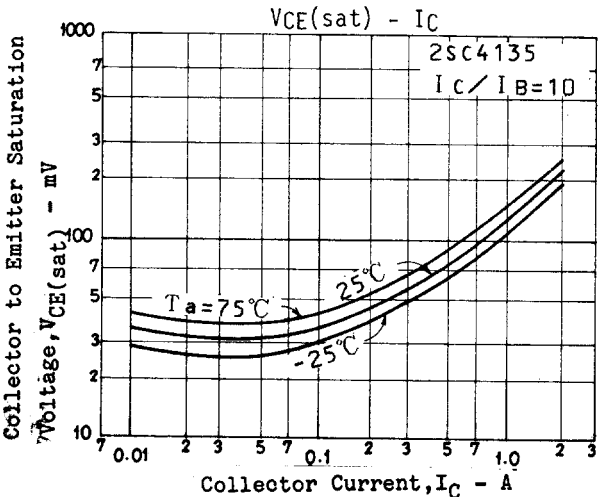

hFE - IC
2SA1593
VCE=-5V
Ta=75℃
25℃
-25℃
DC Current Gain, hFE
Collector Current, IC - A


hFE - IC
2SC4135
VCE=5V
Ta=75℃
25℃
-25℃
DC Current Gain, hFE
Collector Current, IC - A


fT - IC
2SA1593/2SC4135
VCE=10V
2SA1593
2SC4135
(For PNP, minus sign is omitted.)
Gain-Bandwidth Product, fT - MHz
Collector Current, IC - A


cob - VCB
2SA1593/2SC4135
f=1MHz
2SA1593
2SC4135
(For PNP, minus sign is omitted.)
Output Capacitance, cob - pF
Collector to Base Voltage, VCB - V


VCE(sat) - IC
2SA1593
IC/IB=10
Ta=75℃
25℃
-25℃
Collector to Emitter Saturation Voltage, VCE(sat) - mV
Collector Current, IC - A


VCE(sat) - IC
2SC4135
IC/IB=10
Ta=75℃
25℃
-25℃
Collector to Emitter Saturation Voltage, VCE(sat) - mV
Collector Current, IC - A