Ordering number:EN1720A

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1415/2SC3645

High-Voltage Switching, Predriver Applications

Features

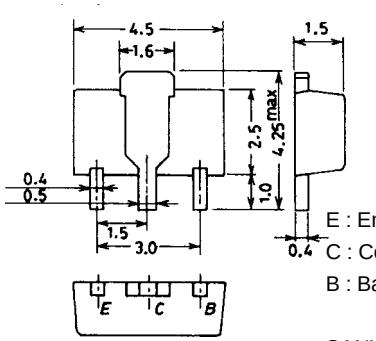
- Adoption of FBET process.
- High breakdown voltage (V_{CEO}=160V).
- Excellent linearity of h_{FE} and small Cob.
- Fast switching speed.
- Very small size marking it easy to provide high-density, small-sized hybrid ICs.

Package Dimensions

unit:mm

2038

[2SA1415/2SC3645]



E : Emitter
C : Collector
B : Base

SANYO : PCP
(Bottom view)

( ) : 2SA1415

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)180	V
Collector-to-Emitter Voltage	V_{CEO}		(–)160	V
Emitter-to-Base Voltage	V_{EBO}		(–)5	V
Collector Current	I_C		(–)140	mA
Collector Current (Pulse)	I_{CP}		(–)200	mA
Collector Dissipation	P_C1		500	mW
	P_C2	Moutned on ceramic board (250mm²×0.8mm)	1.3	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}=(–)80V, 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=(–)10mA	100*		400*	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)10mA		150		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(4.0)		pF
				3.0		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)50mA, I_B=(–)5mA		(–0.14)	(–0.4)	V
				0.07	0.3	V
Turn-ON Time	t_{on}	See sepcified Test Circuit.		0.1		µs
Storage Time	t_{stg}	See sepcified Test Circuit.		1.5		µs
Fall Time	t_f	See sepcified Test Circuit.		0.1		µs

* : The 2SA1415/2SC3645 are classified by 10mA h_{FE} as follows :

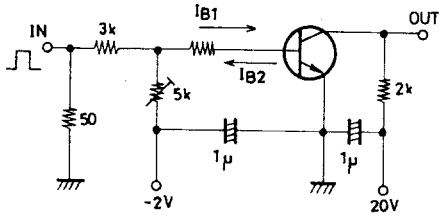
100 R 200	140 S 280	200 T 400

Marking 2SA1415 : AA
2SC3645 : CA

h_{FE} rank : R, S, T

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

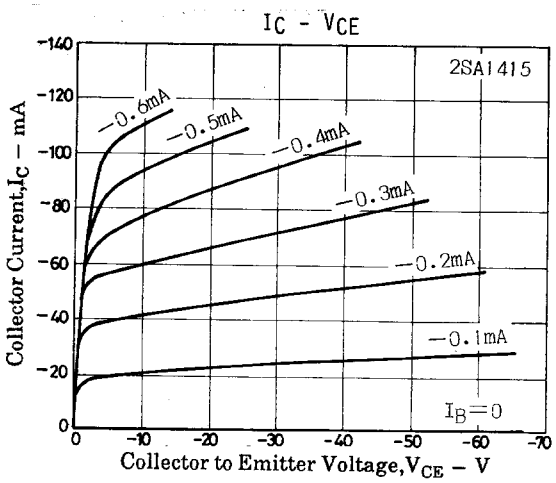
Switching Time Test Circuit

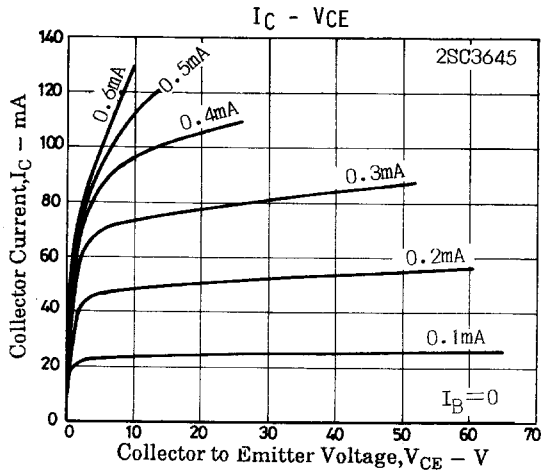


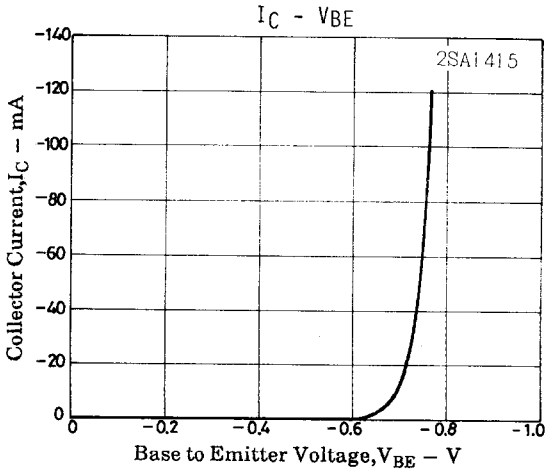
$I_C = 10I_{B1} = 10I_{B2} = 10mA$

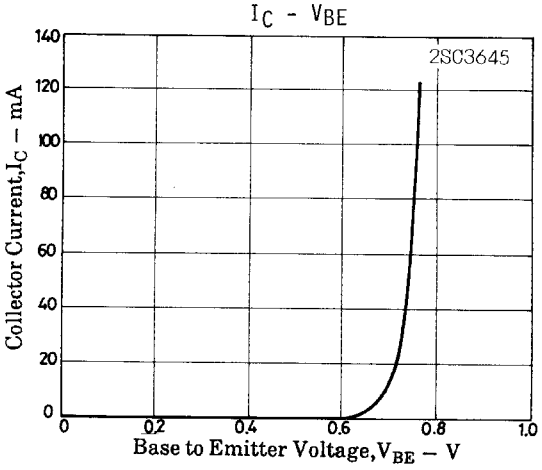
(For PNP, the polarity is reversed)

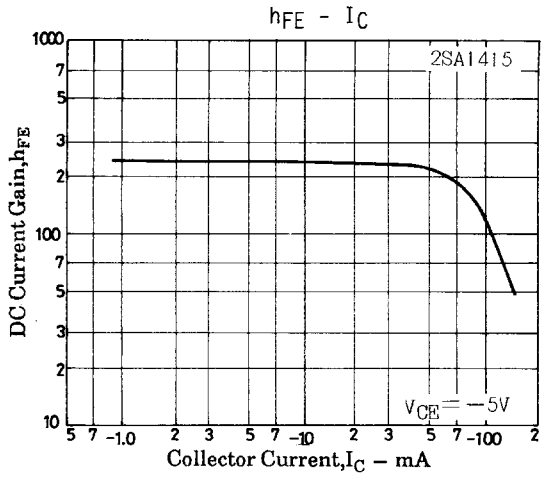
Unit (resistance : Ω, capacitance : F)

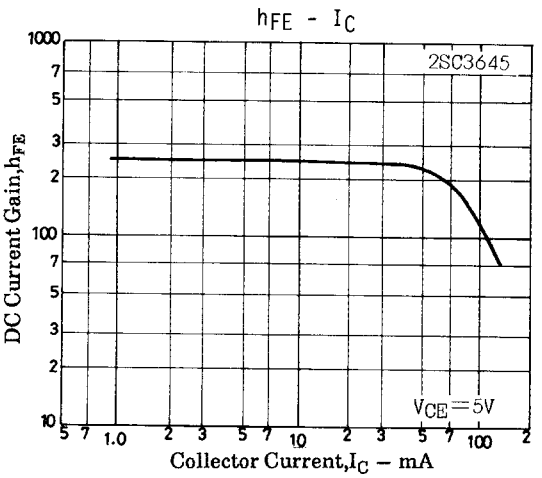


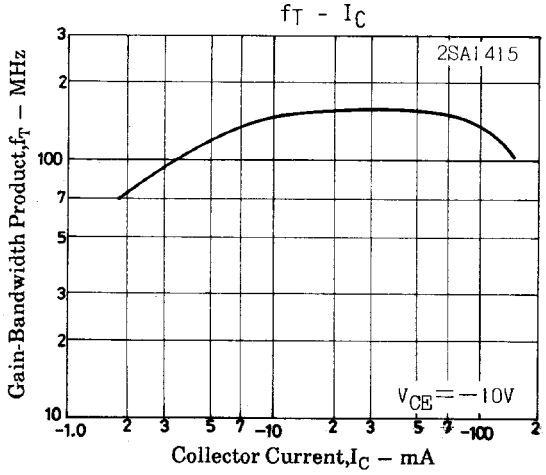


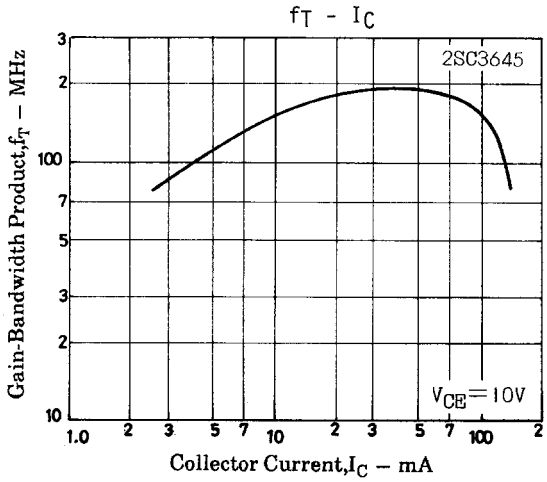


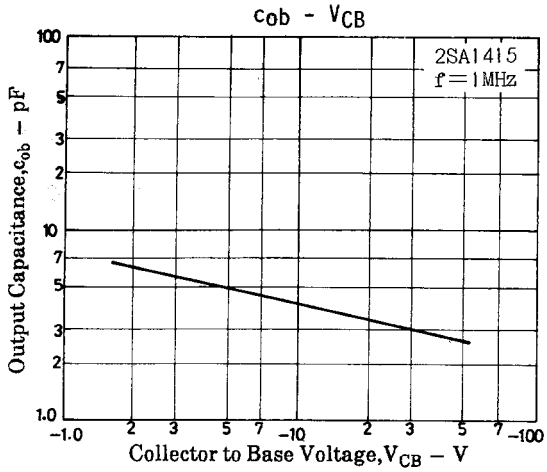


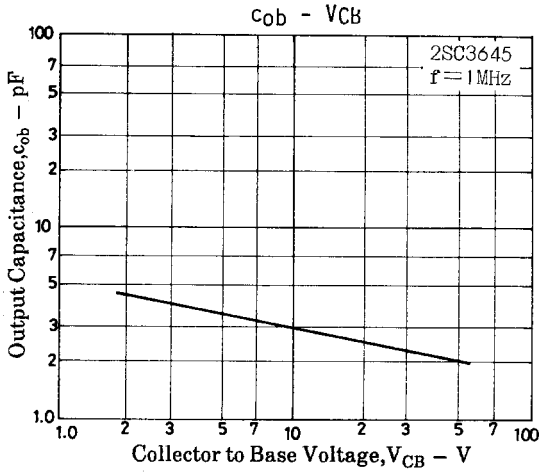


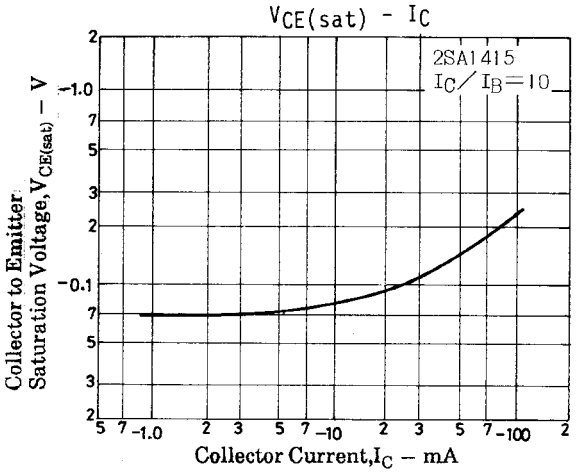


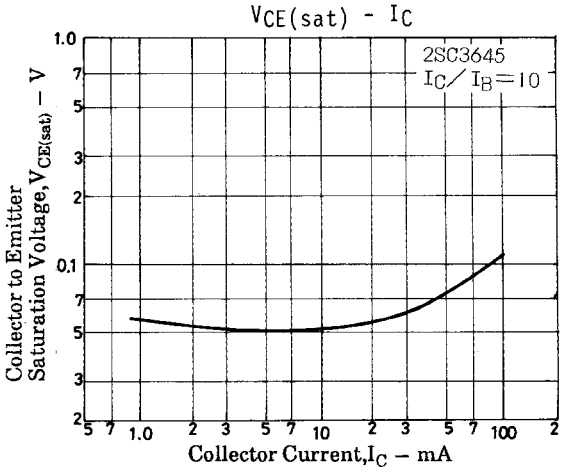

fT - IC
2SA1415
VCE=−10V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA

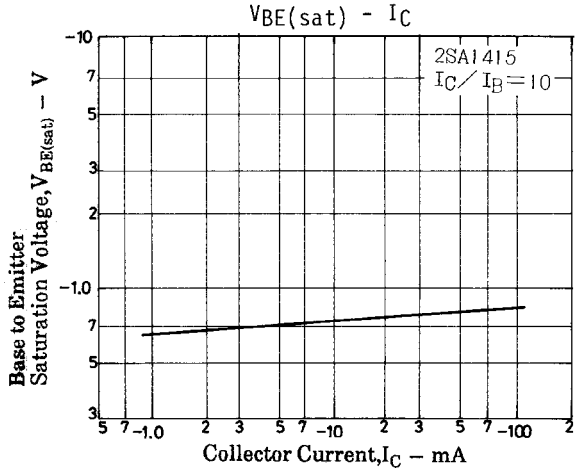

fT - IC
2SC3645
VCE=10V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA

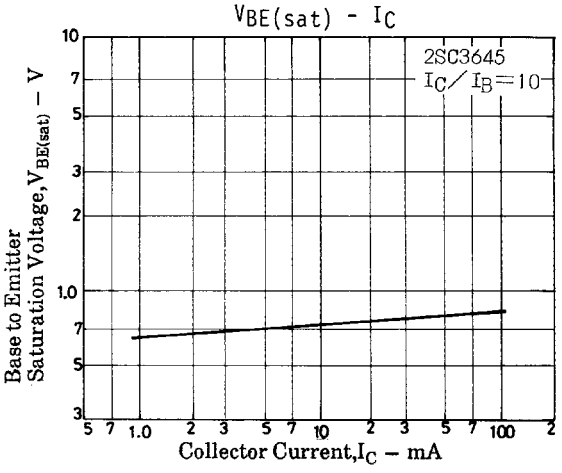

Cob - VCB
2SA1415
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V


Cob - VCB
2SC3645
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V


VCE(sat) - IC
2SA1415
IC/IB=10
Collector to Emitter Saturation Voltage,VCE(sat) – V
Collector Current,IC – mA


VCE(sat) - IC
2SC3645
IC/IB=10
Collector to Emitter Saturation Voltage,VCE(sat) – V
Collector Current,IC – mA


VBE(sat) - IC
2SA1415
IC/IB=10
Base to Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – mA


VBE(sat) - IC
2SC3645
IC/IB=10
Base to Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – mA