Ordering number:2060A

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1142/2SD1682

50V/2.5A High-Speed Switching Applications

Applications

· Power supplies, relay drivers, lamp drivers.

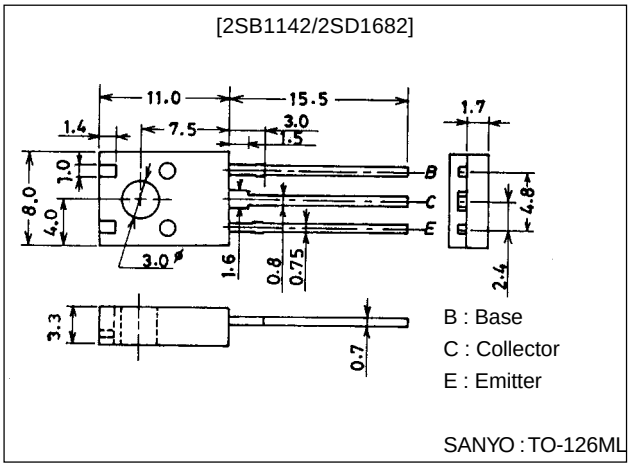
Features

· Adoption of FBET, MBIT processes.
· Low saturation voltage.
· Large current capacity and wide ASO.

Package Dimensions

unit:mm

2042A



( ) : 2SB1142

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)60	V
Collector-to-Emitter Voltage	V_{CEO}		(–)50	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)2.5	A
Collector Current (Pulse)	I_{CP}		(–)5.0	A
Collector Dissipation	P_C		1.5	W
		Tc=25˚C	10	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}=(–)50V, I_E=0			(–)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)100	nA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)2V, I_C=(–)100mA	(100)*		(400)*	
			100*		560	
	$h_{FE}2$	V_{CE}=(–)2V, I_C=(–)2A	35			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		140		MHz

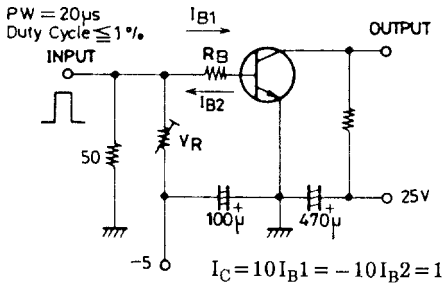
* : The 2SB1142/2SD1682 are classified by 100mA h_{FE} as follows :

2SB1142	100	R	200	140	S	280	200	T	400
2SD1682	100	R	200	140	S	280	200	T	400	280	U	560

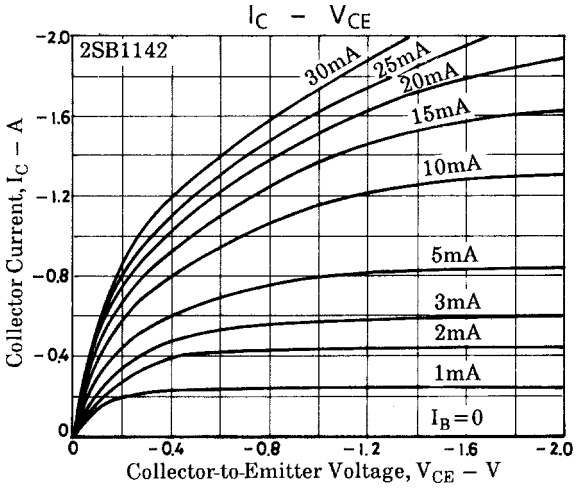
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

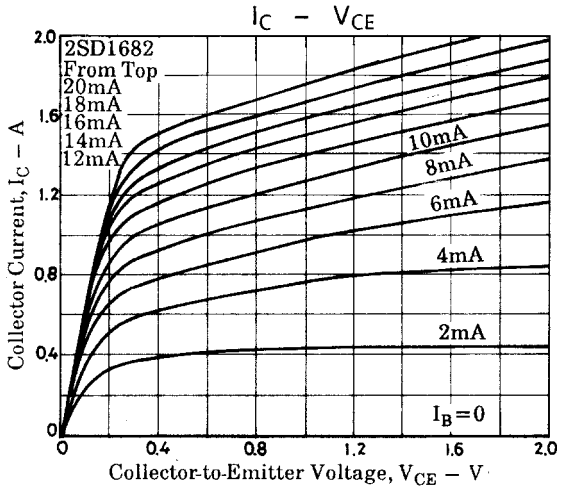
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)1A, I_B=(–)50mA		(–250)	(–500)	mV
				110	300	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)1A, I_B=(–)50mA		(–)0.85	(–)1.2	V
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(25)16		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			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		(35)35		ns
Storage Time	t_{stg}	See specified Test Circuit		(350)		ns
				550		ns
Fall Time	t_f	See specified Test Circuit		(30)30		ns

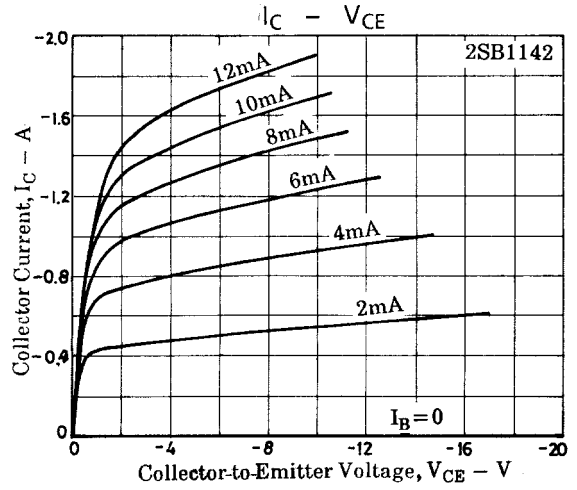
Switching Time Test Circuit

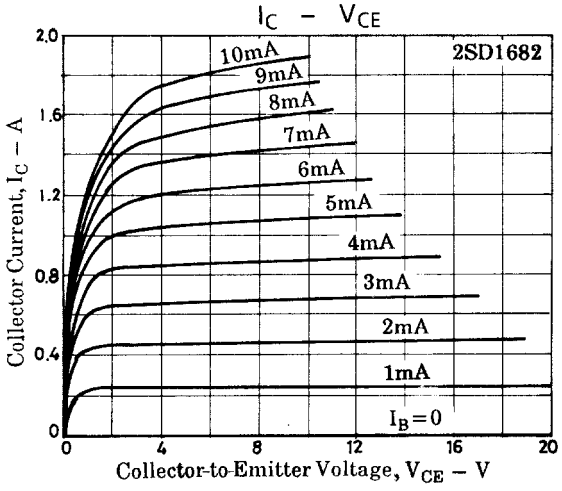


$I_C = 10I_B1 = -10I_B2 = 1A$
(For PNP, the polarity is reversed).
Unit (resistance : Ω, capacitance : F)

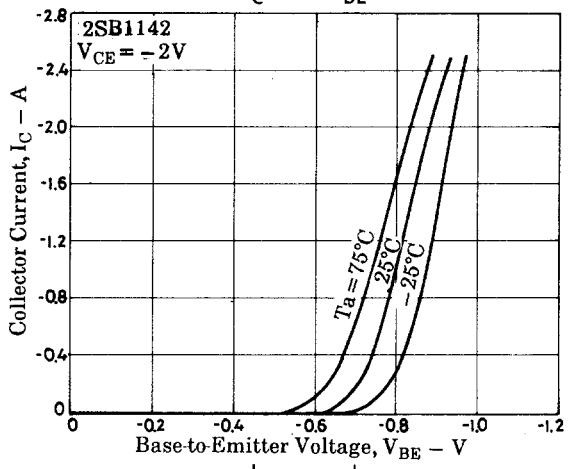




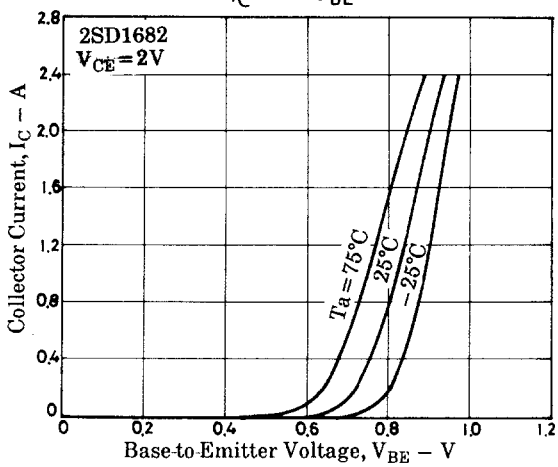




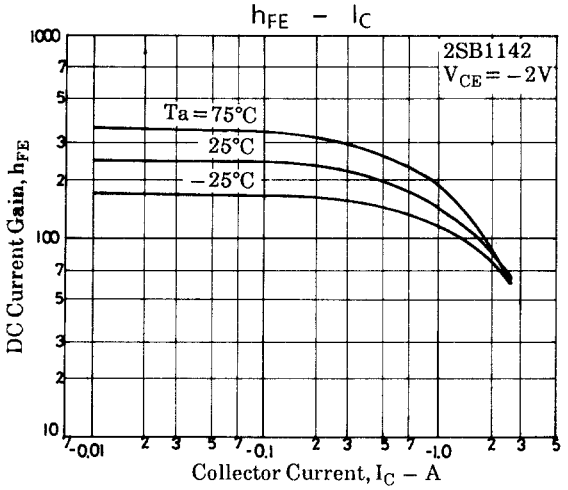
I_C – V_{BE}



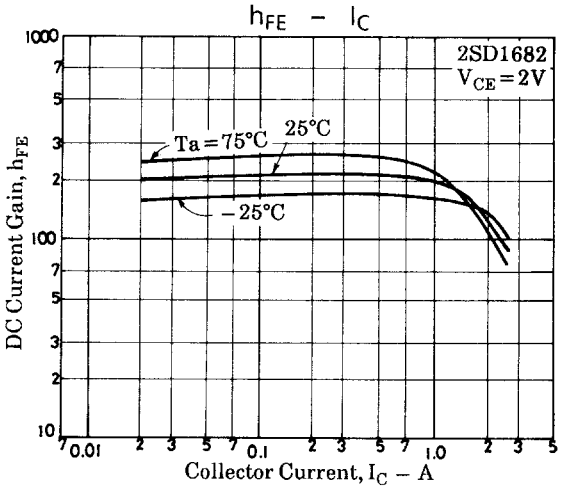
I_C – V_{BE}



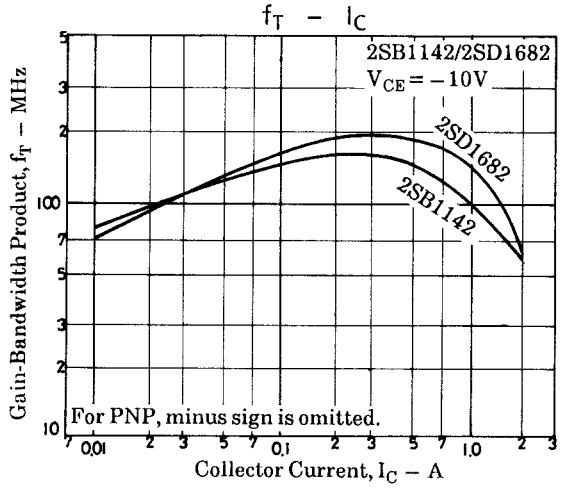
h_{FE} – I_C



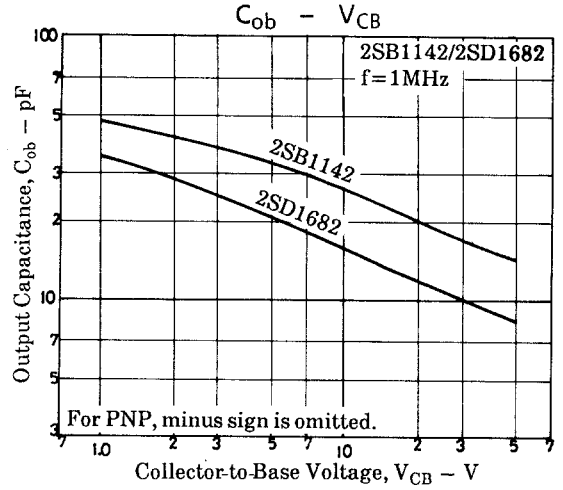
h_{FE} – I_C



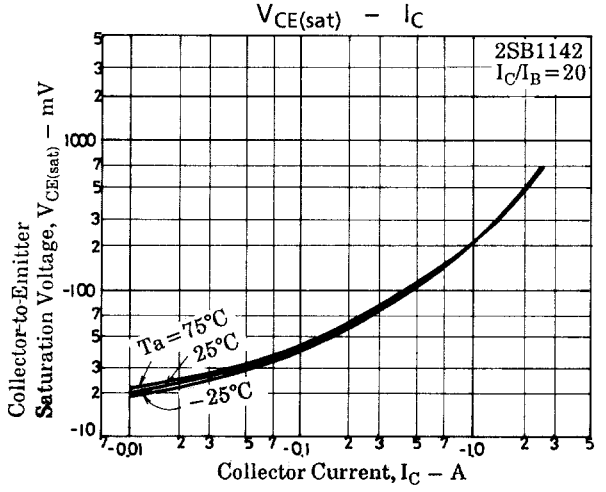
f_T – I_C



C_{ob} – V_{CB}



$V_{CE(sat)}$ – I_C



$V_{CE(sat)}$ – I_C