Ordering number:2041A

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1144/2SD1684

100V/1.5A Switching Applications

Features

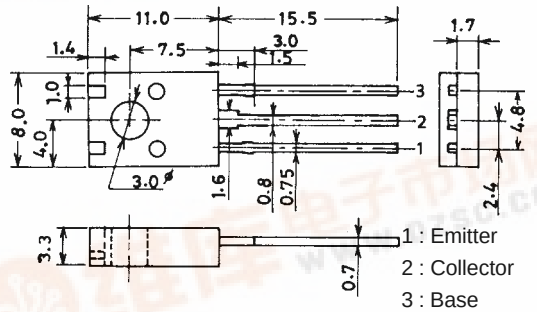
- Adoption of FBET and MBIT processes.
- High breakdown voltage.
- Low saturation voltage.
- Plastic-covered heat sink facilitating high-density mounting.

Package Dimensions

unit:mm

2042B

[2SB1144/2SD1684]



1 : Emitter
2 : Collector
3 : Base

SANYO : TO-126ML

( ) : 2SB1144

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		(–)1.5	A
Collector Current (Pulse)	I_{CP}		(–)2.0	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

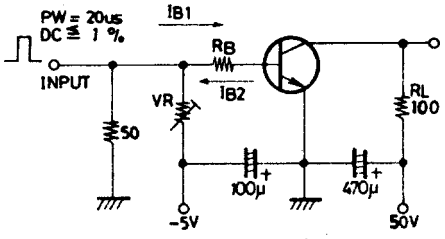
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)100V, I_E=0			(–)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)100	nA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)5V, I_C=(–)100mA	100*		400*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)1A	30			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		(100)		MHz
				120		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		11(18)		pF

* : The 2SB1144/2SD1684 are classified by 100mA h_{FE} as follows :

100	Q	200	140	S	280	200	T	400

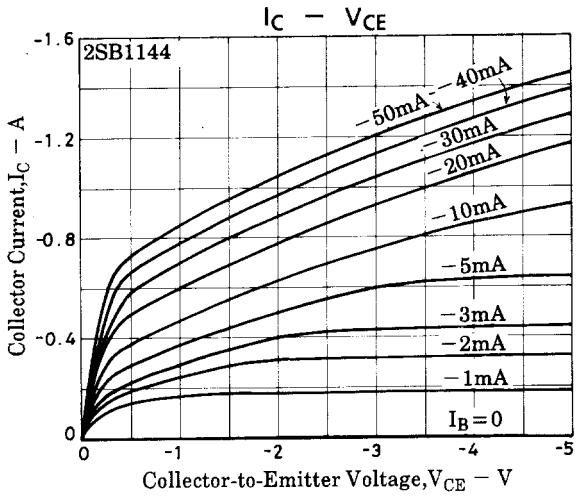
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)500mA, I_B=(–)50mA		(–180)	(–500)	mV
				100	300	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)500mA, I_B=(–)50mA		(–)0.85	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	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)80		ns
Storage Time	t_{stg}	See specified Test Circuit		1000		ns
				(750)		ns
Fall Time	t_f	See specified Test Circuit		(40)50		ns

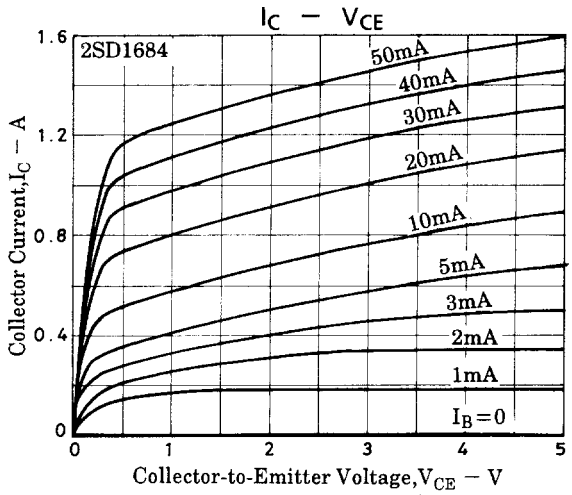
Switching Time Test Circuit

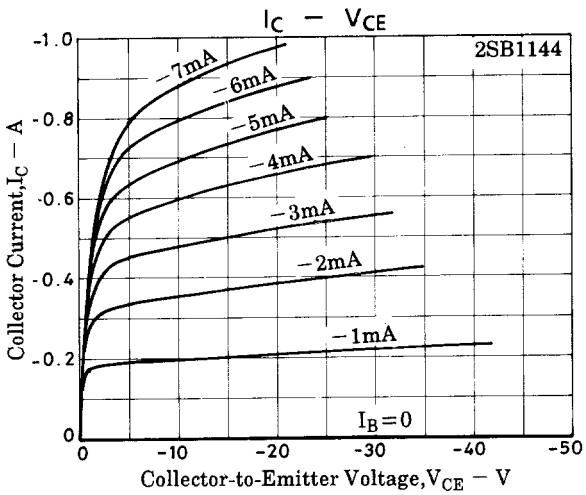


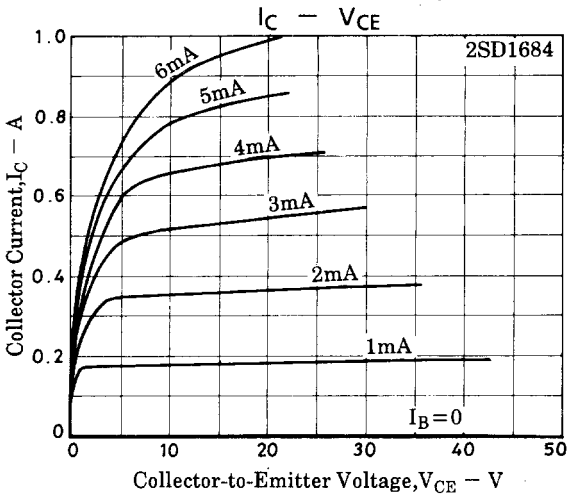
$I_C = 10I_{B1} = -10I_{B2} = 500mA$

Unit (resistance : Ω, capacitance : F)

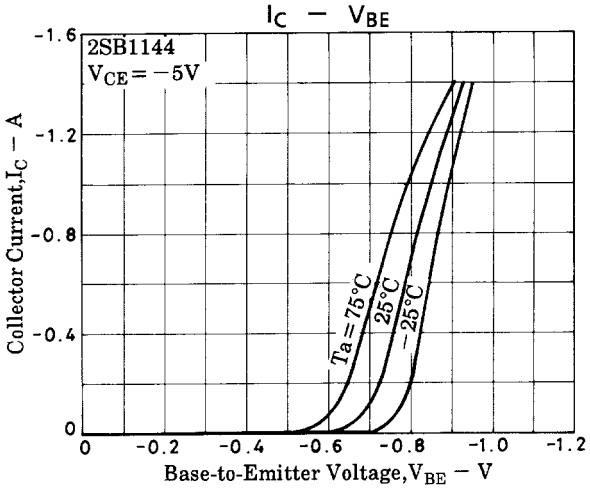




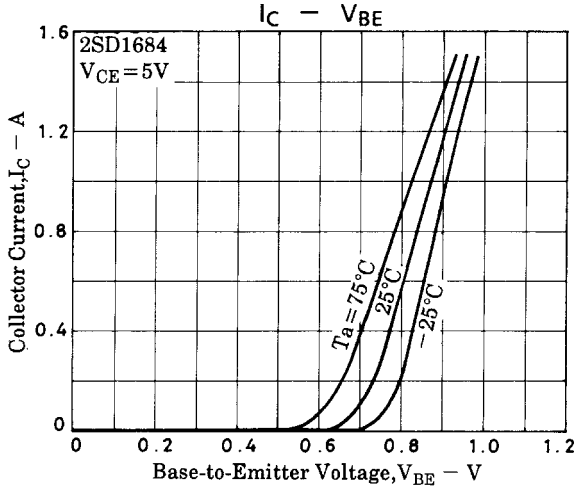




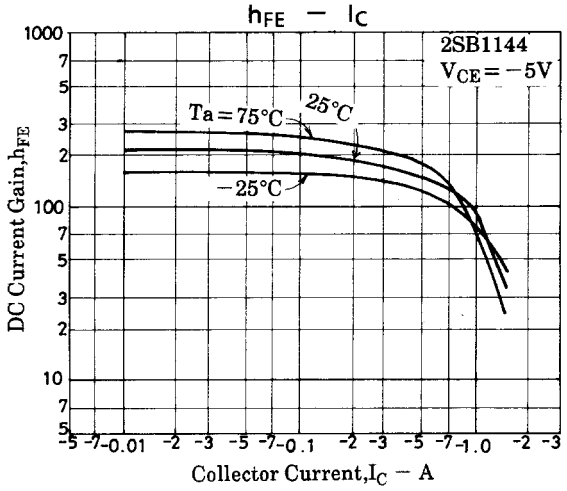
I_C — V_{BE}



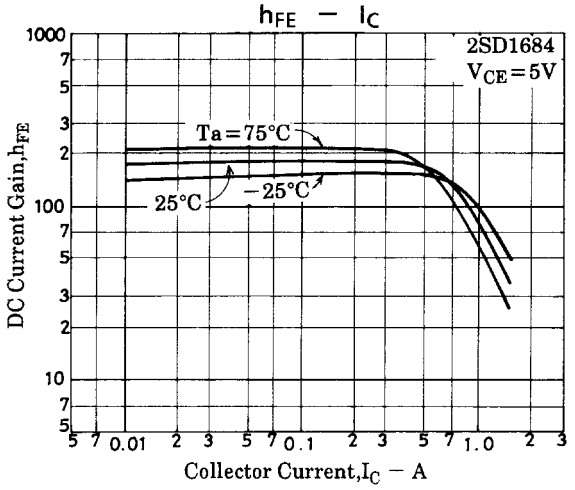
I_C — V_{BE}



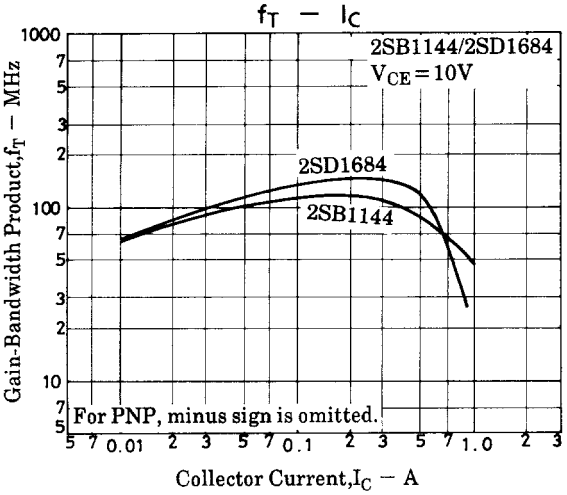
h_{FE} — I_C



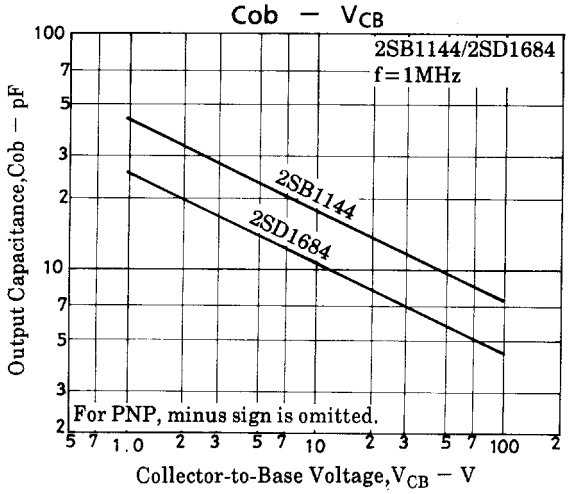
h_{FE} — I_C



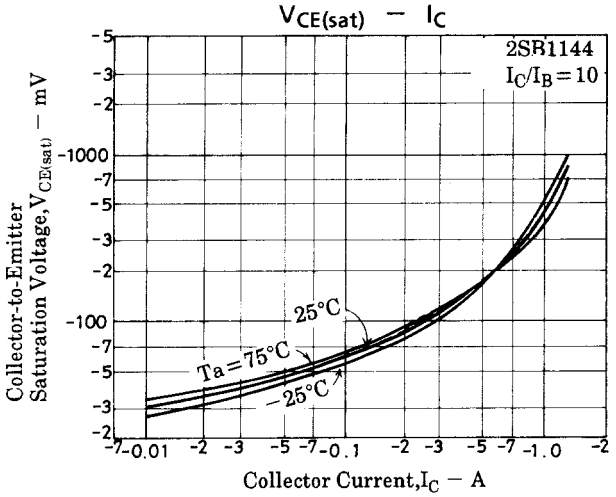
f_T — I_C



Cob — V_{CB}



$V_{CE(sat)}$ — I_C



$V_{CE(sat)}$ — I_C