



## 2SB1144/2SD1684

### 100V/1.5A Switching Applications

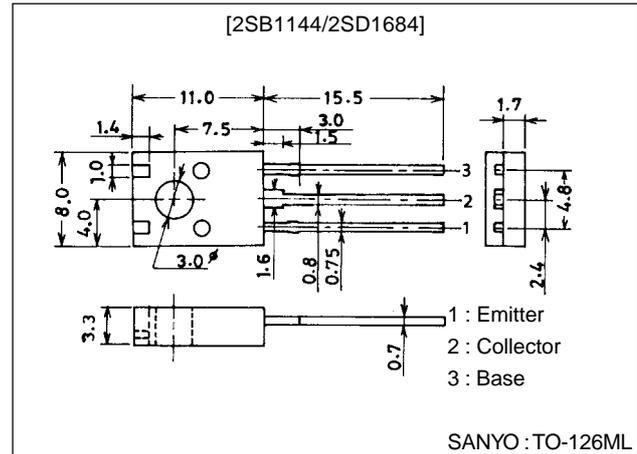
#### Features

- 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

#### Specifications

##### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)120	V
Collector-to-Emitter Voltage	$V_{CE0}$		(-)100	V
Emitter-to-Base Voltage	$V_{EB0}$		(-)6	V
Collector Current	$I_C$		(-)1.5	A
Collector Current (Pulse)	$I_{CP}$		(-)2.0	A
Collector Dissipation	$P_C$		1.5	W
		$T_c=25^\circ\text{C}$	10	W
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

##### Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)100\text{V}, I_E=0$			(-)100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)100	nA
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)100\text{mA}$	100*		400*	
	$h_{FE2}$	$V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$	30			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)50\text{mA}$		(100)		MHz
				120		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		11(18)		pF

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

100	Q	200	140	S	280	200	T	400
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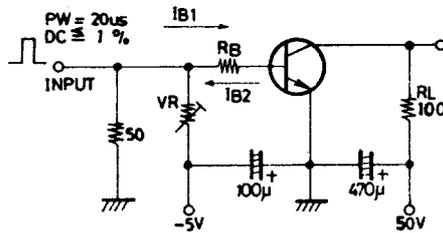
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# 2SB1144/2SD1684

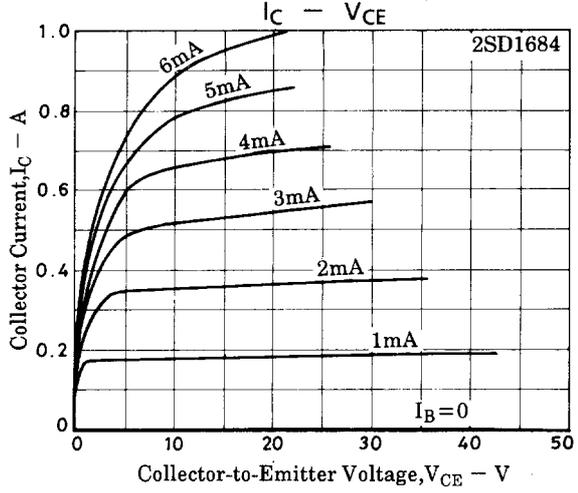
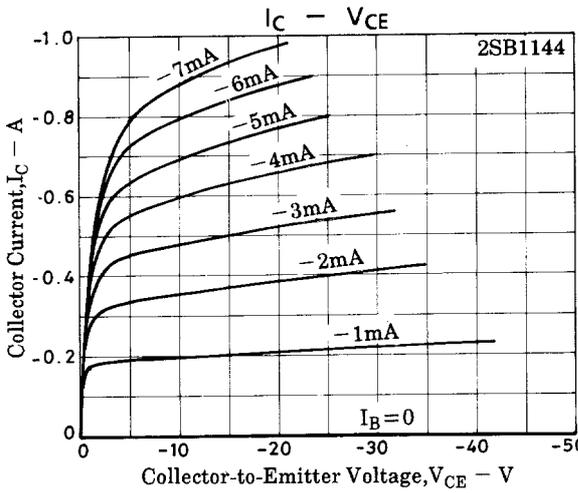
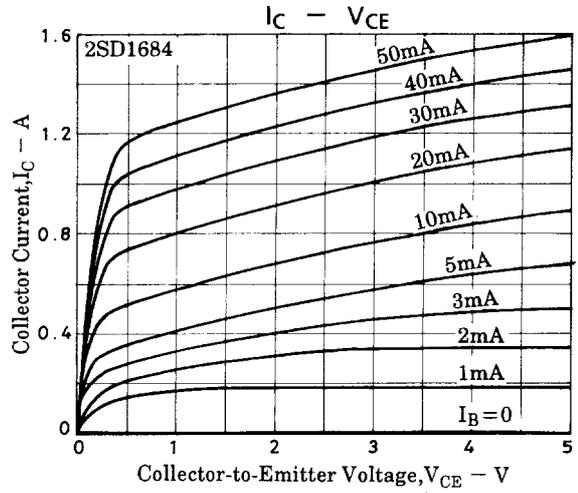
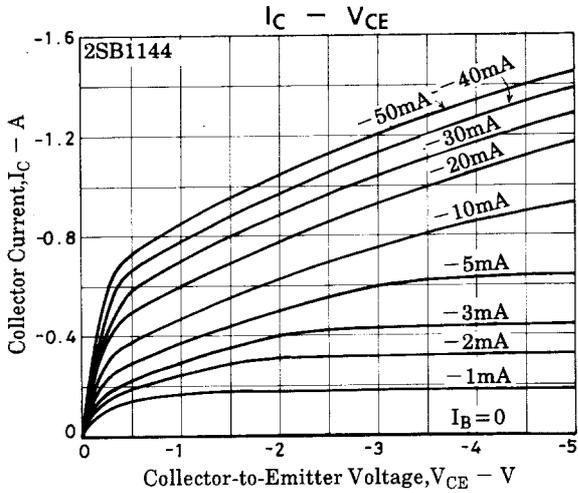
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$		(-180)	(-500)	mV
				100	300	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$		(-0.85)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-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)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

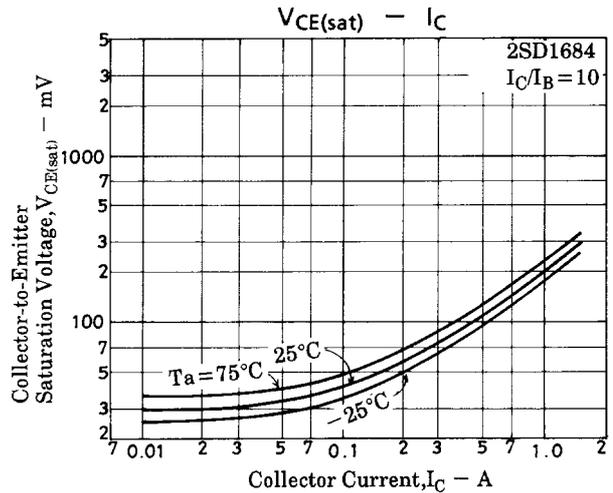
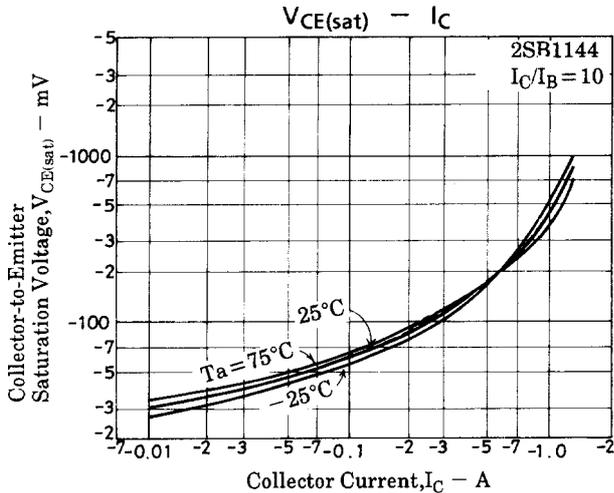
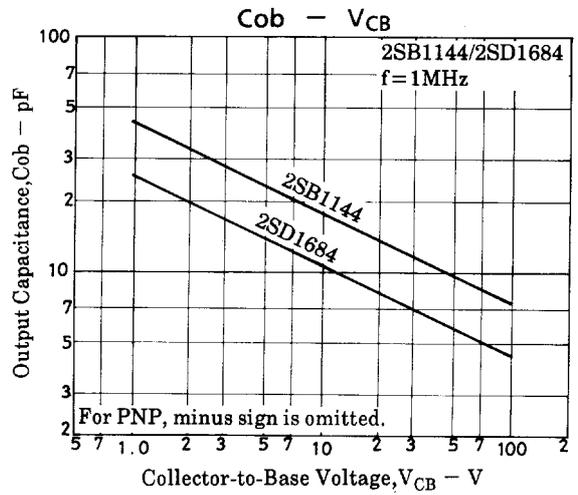
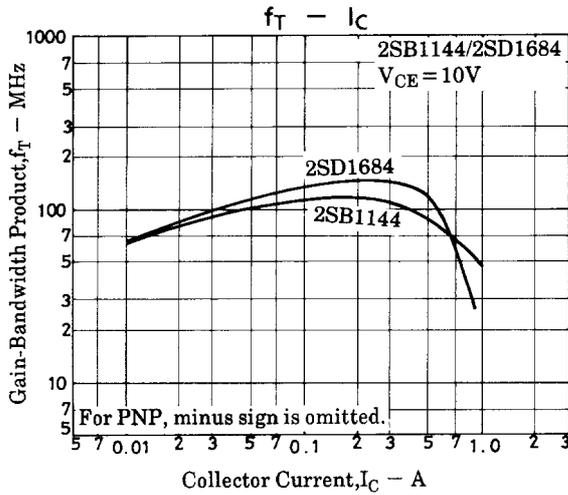
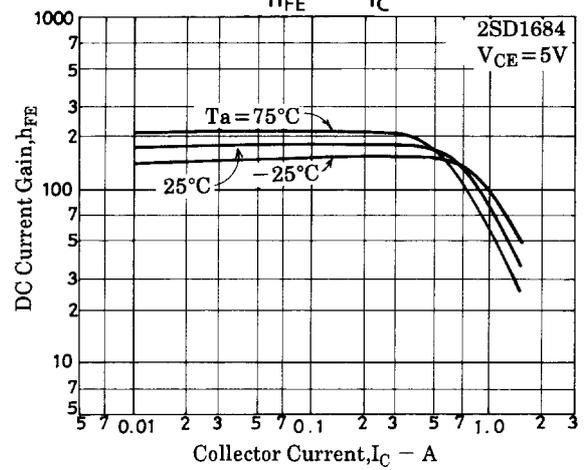
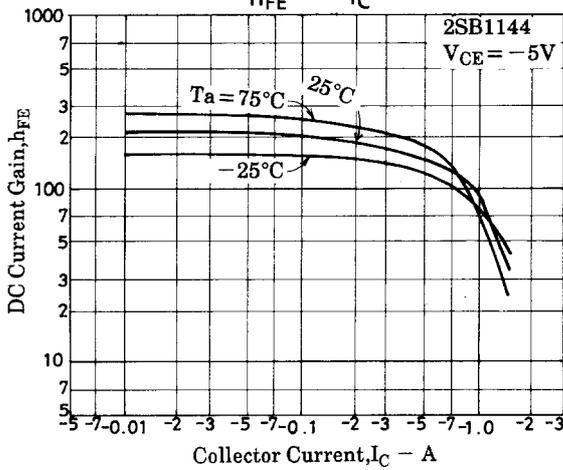
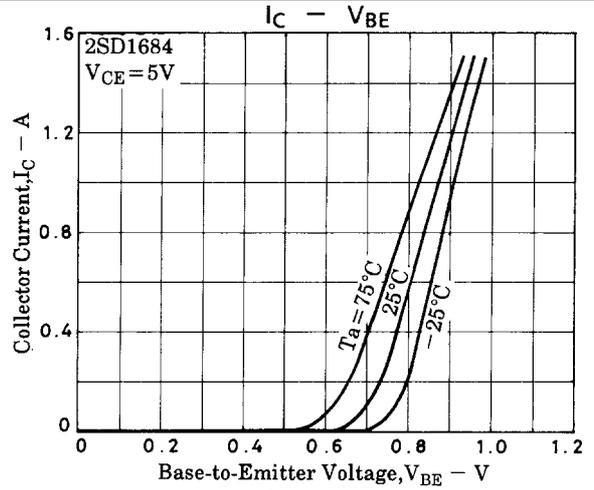
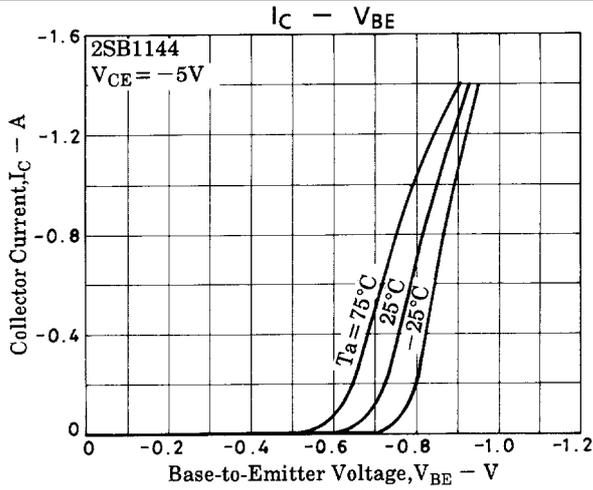


$$I_C = 10I_{B1} = -10I_{B2} = 500mA$$

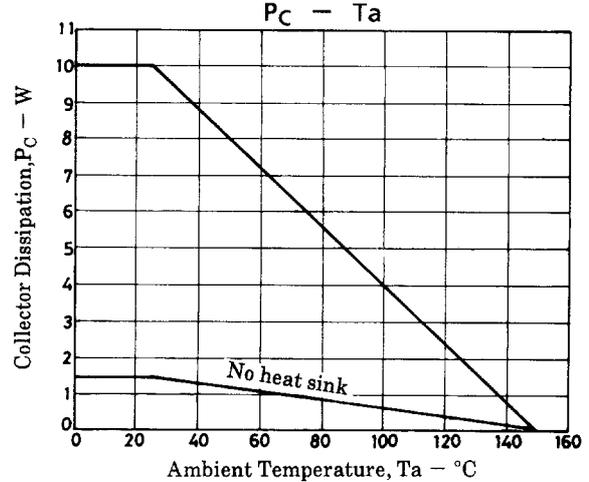
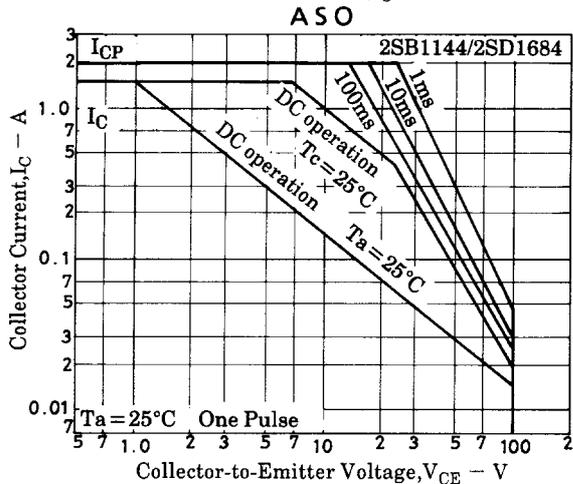
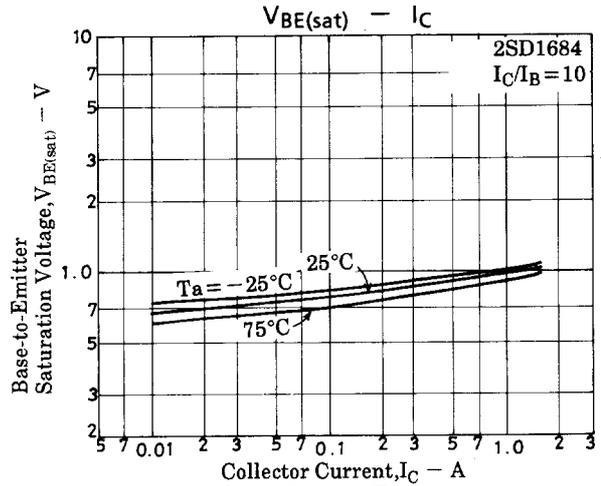
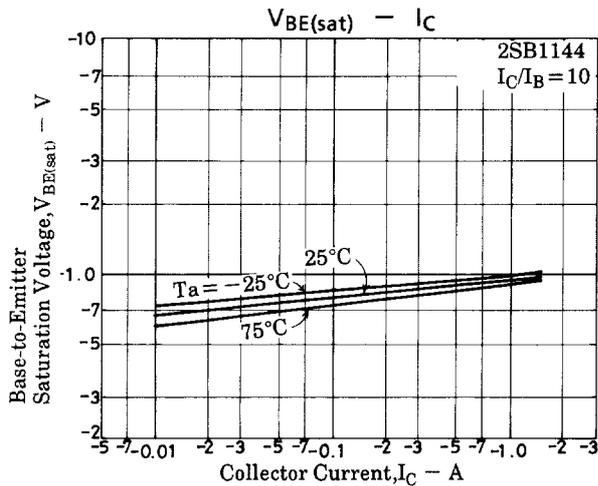
Unit (resistance :  $\Omega$ , capacitance : F)



# 2SB1144/2SD1684



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