



## 2SB1142/2SD1682

### 50V/2.5A High-Speed Switching Applications

#### Applications

- Power supplies, relay drivers, lamp drivers.

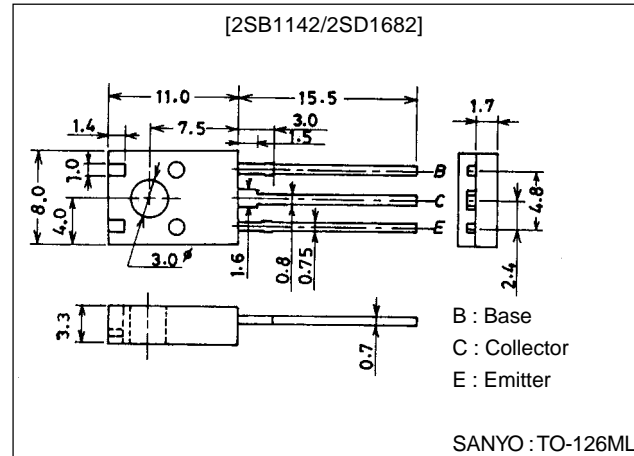
#### Features

- 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	$V_{CB0}$		(-)-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
		$T_c=25^\circ\text{C}$	10	W
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

##### Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=-50\text{V}, I_E=0$			(-)-100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=-4\text{V}, I_C=0$			(-)-100	nA
DC Current Gain	$h_{FE1}$	$V_{CE}=-2\text{V}, I_C=-100\text{mA}$	(100)*		(400)*	
			100*		560	
	$h_{FE2}$	$V_{CE}=-2\text{V}, I_C=-2\text{A}$	35			
Gain-Bandwidth Product	$f_T$	$V_{CE}=-10\text{V}, I_C=-50\text{mA}$		140		MHz

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

100	R	200	140	S	280	200	T	400
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2SD1682

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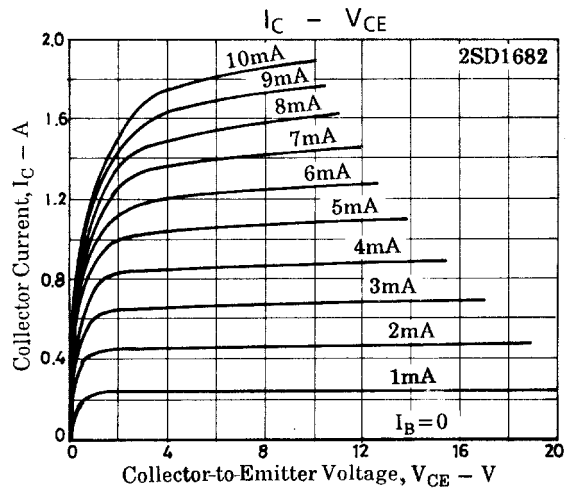
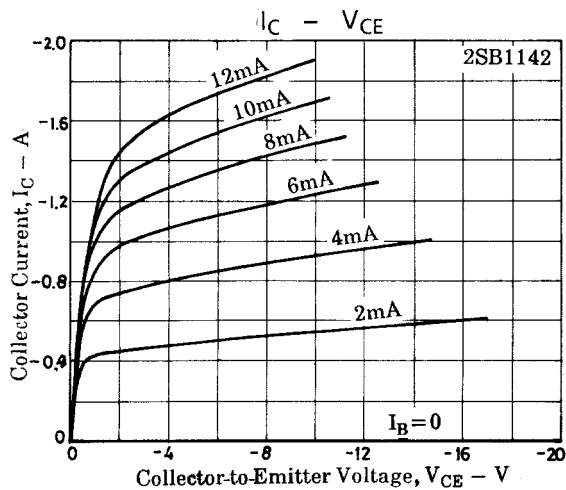
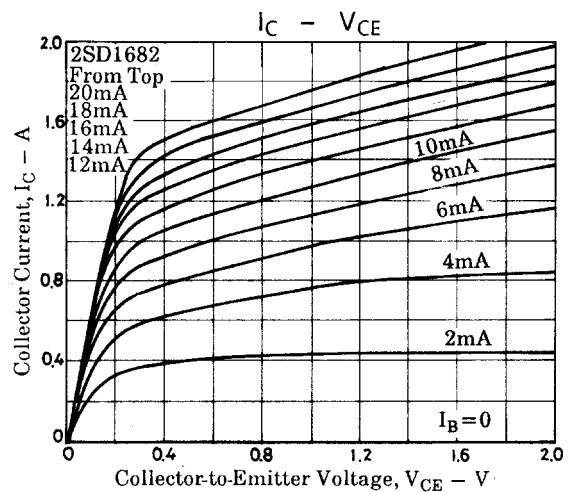
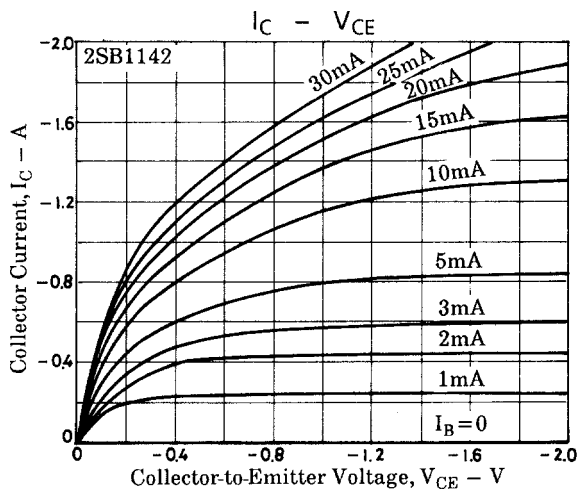
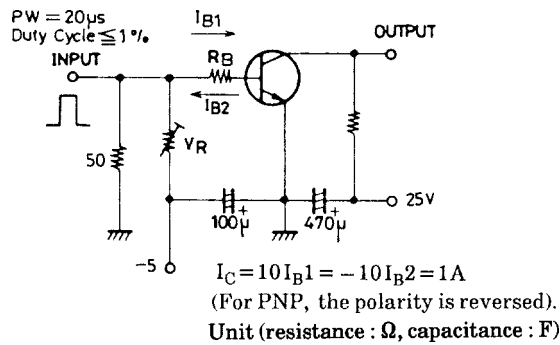
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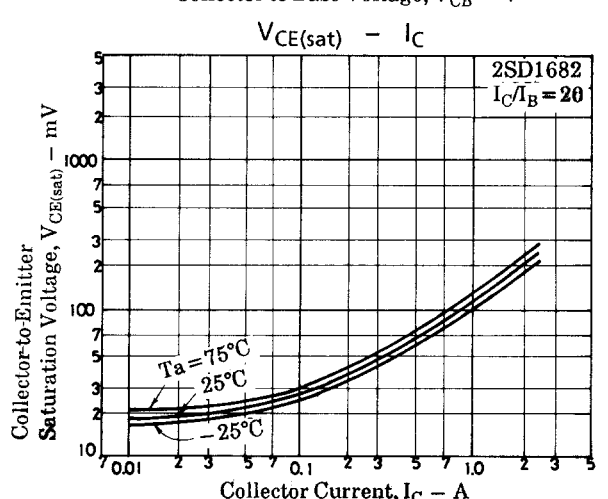
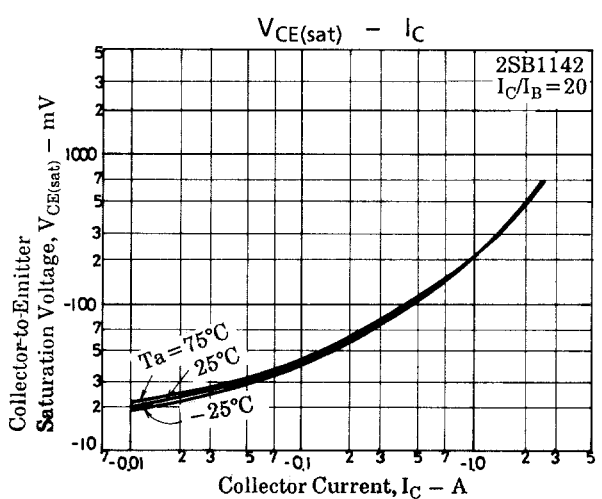
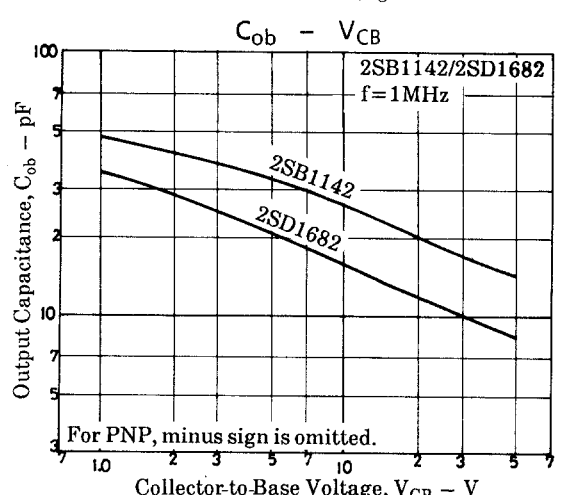
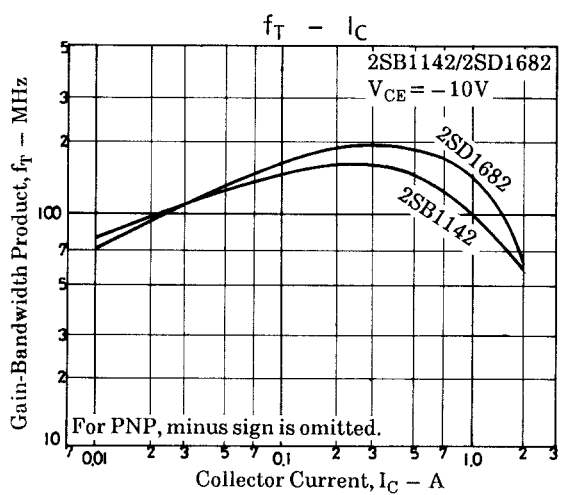
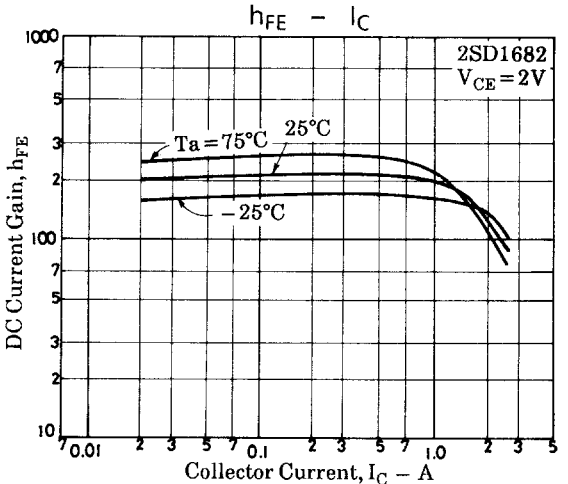
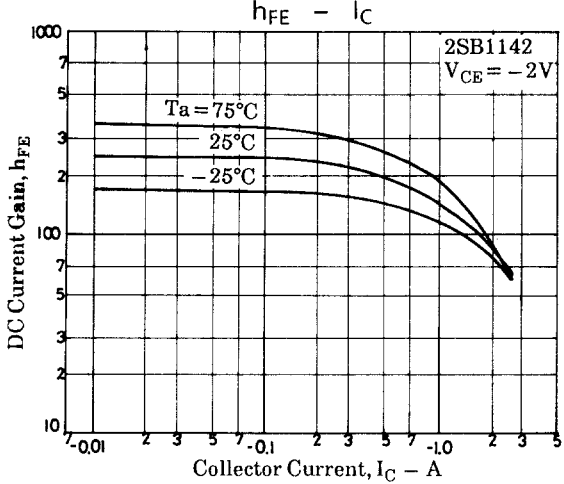
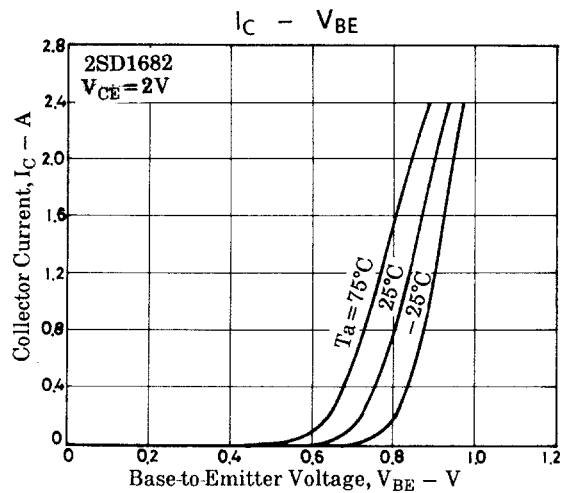
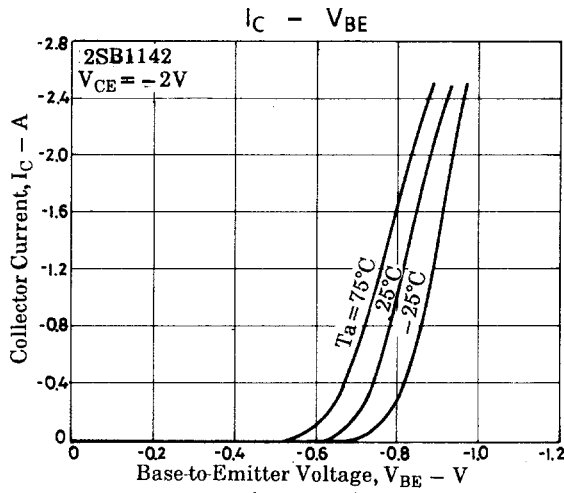
# 2SB1142/2SD1682

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
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	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)50			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		(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

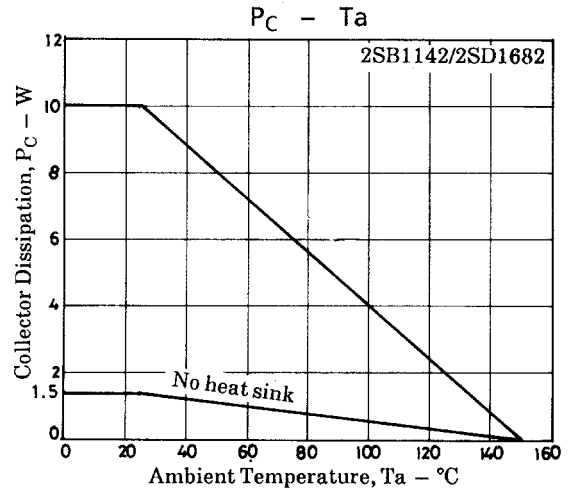
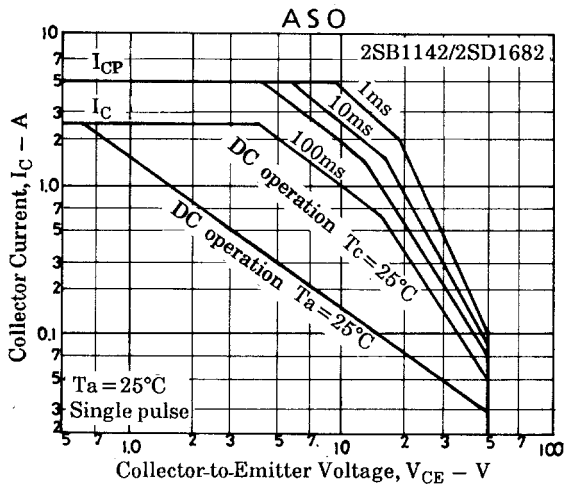
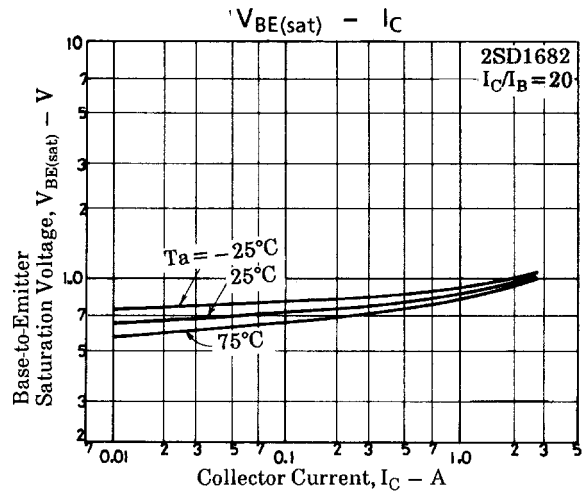
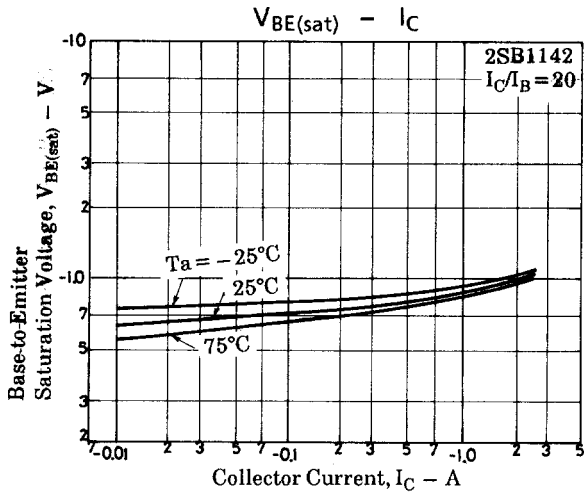
## Switching Time Test Circuit



# 2SB1142/2SD1682



## 2SB1142/2SD1682



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