



# 2SB1142/2SD1682

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

### Applications

- Power supplies, relay drivers, lamp drivers.

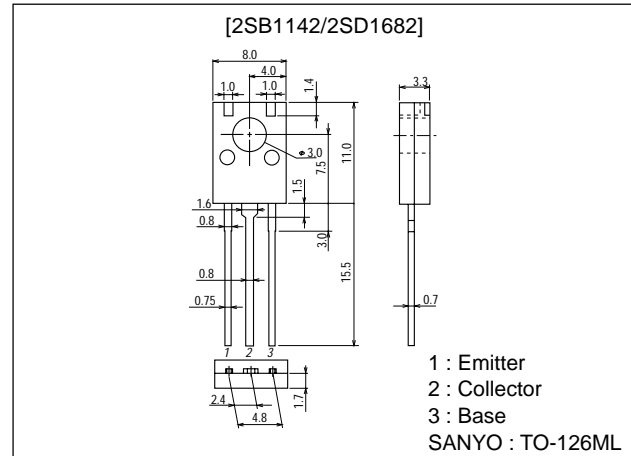
### Features

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

### Package Dimensions

unit:mm

2042B



() : 2SB1142

### Specifications

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

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
		$T_c=25^\circ\text{C}$	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	$I_{CBO}$	$V_{CB}=(-)50\text{V}, I_E=0$			(-)100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)100	nA

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

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2SB1142	Rank	Q	S	T	
	$h_{FE}$	100 to 200	140 to 280	200 to 400	
2SD1682	Rank	R	S	T	U
	$h_{FE}$	100 to 200	140 to 280	200 to 400	280 to 560

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**SANYO Electric Co., Ltd. Semiconductor Company**

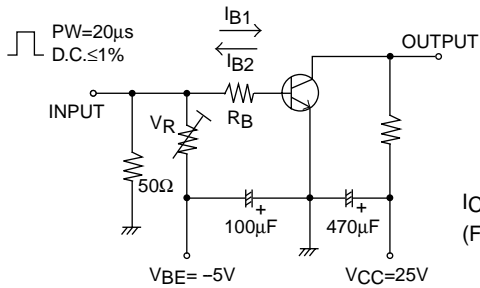
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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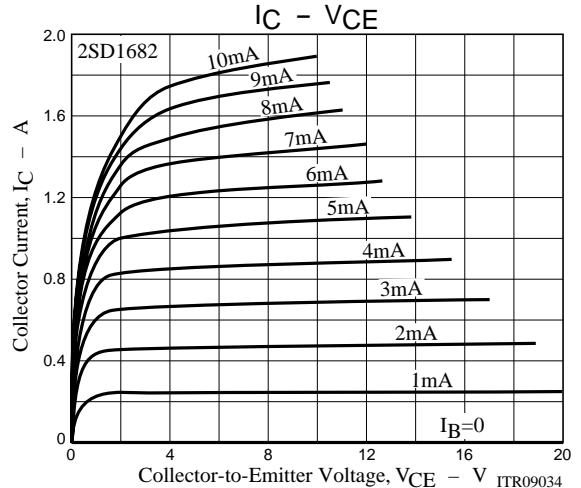
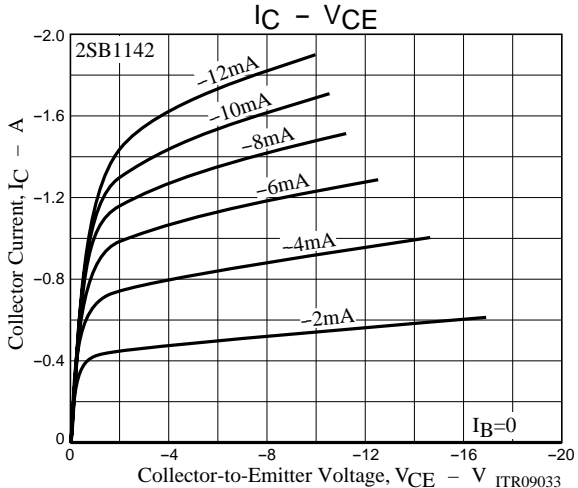
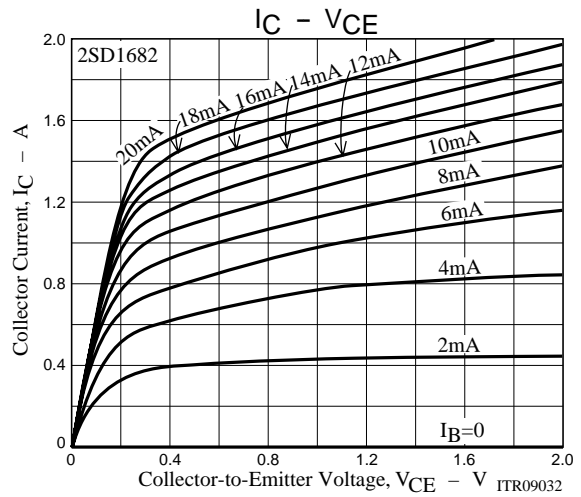
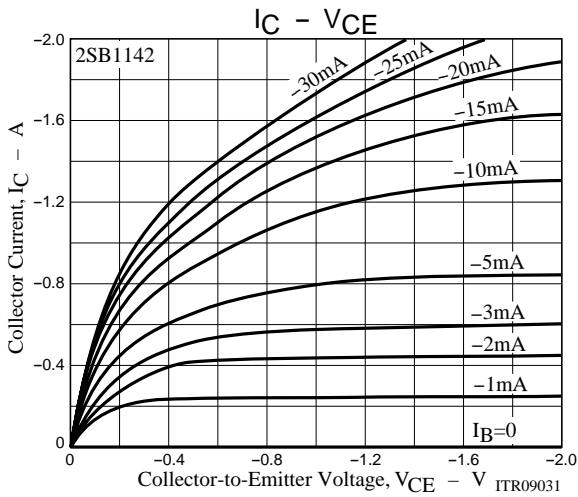
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)2V, I_C=(-)100mA$	(100)*		(400)*	
	$h_{FE2}$	$V_{CE}=(-)2V, I_C=(-)2A$	100*		560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)50mA$		140		MHz
Collector-to-Emitter 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

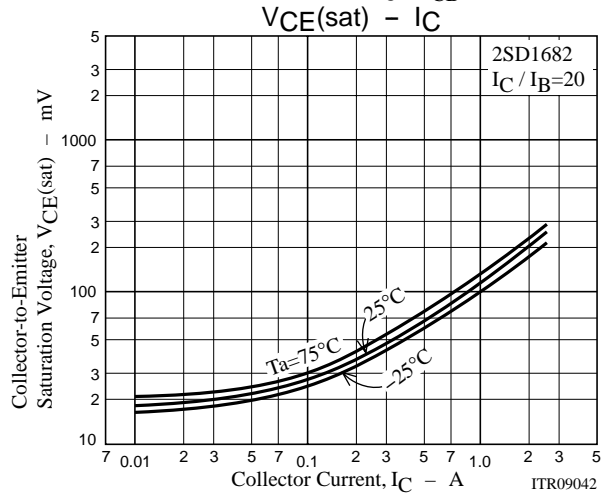
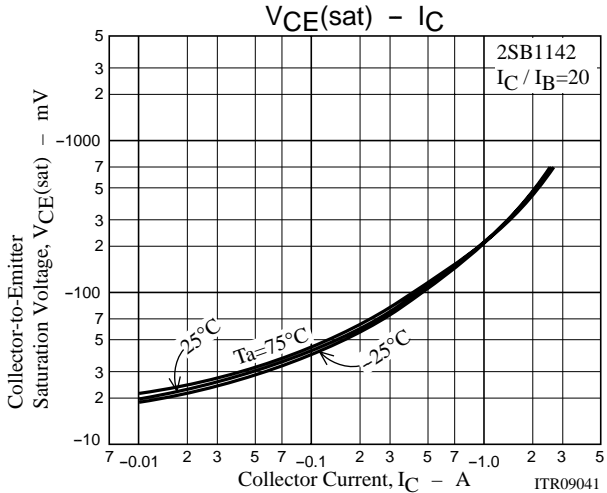
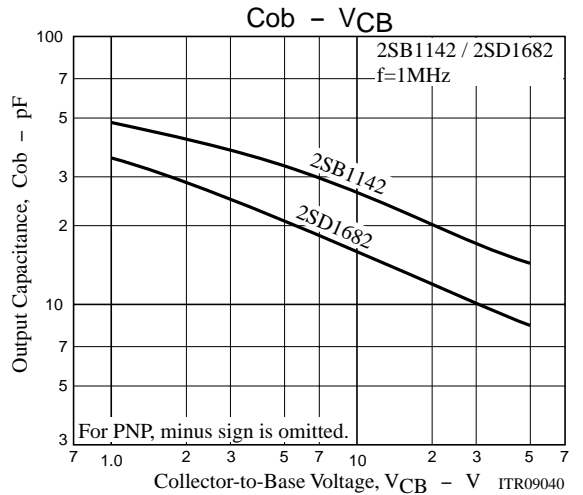
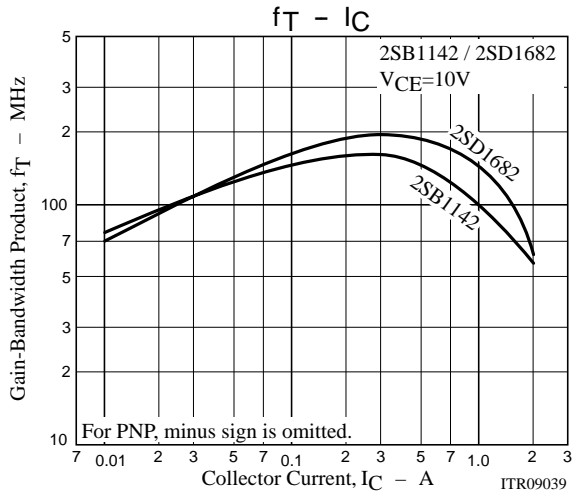
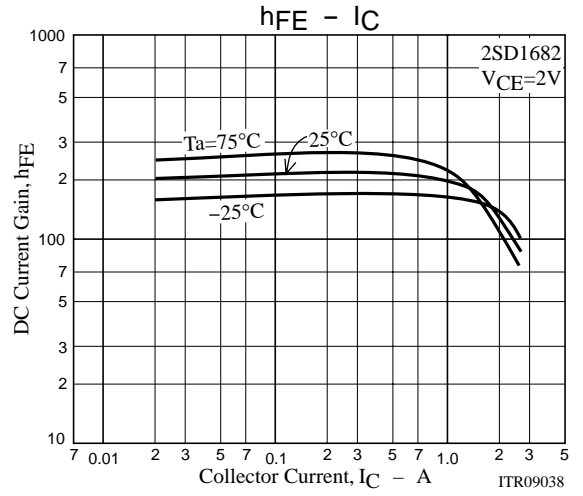
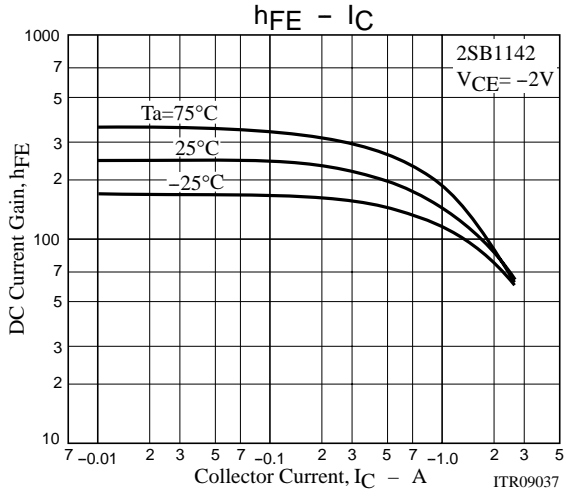
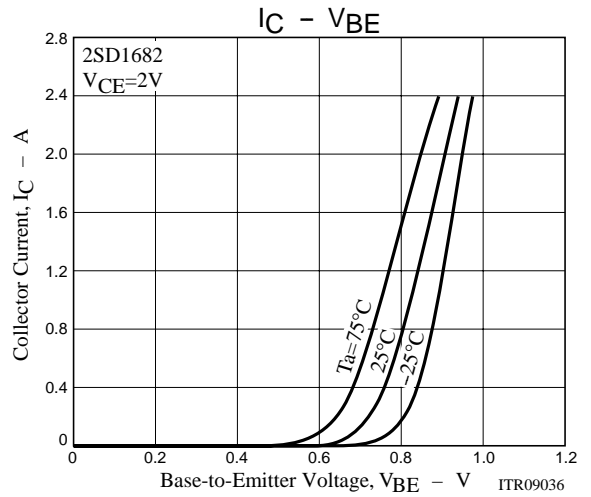
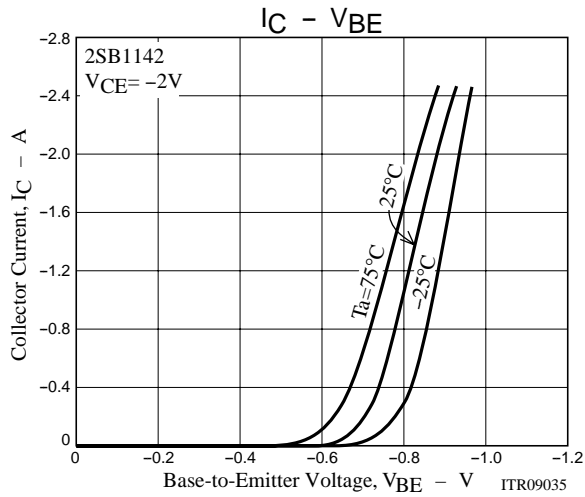
## Switching Time Test Circuit



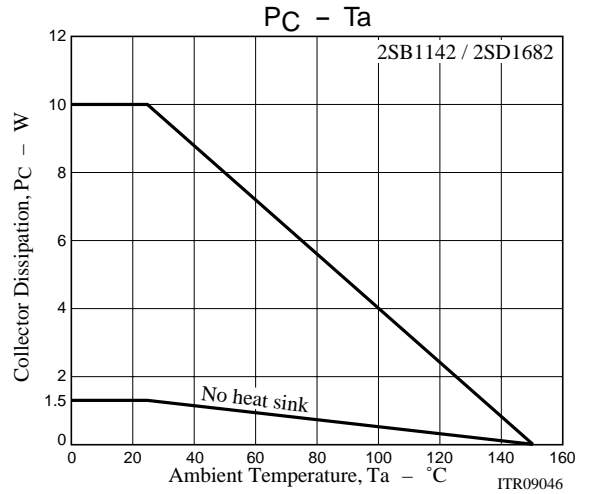
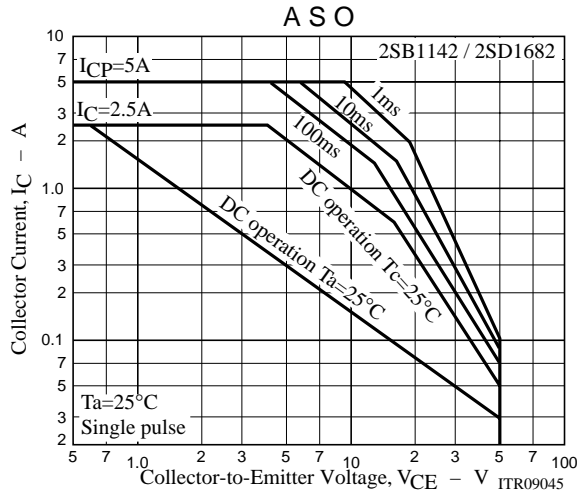
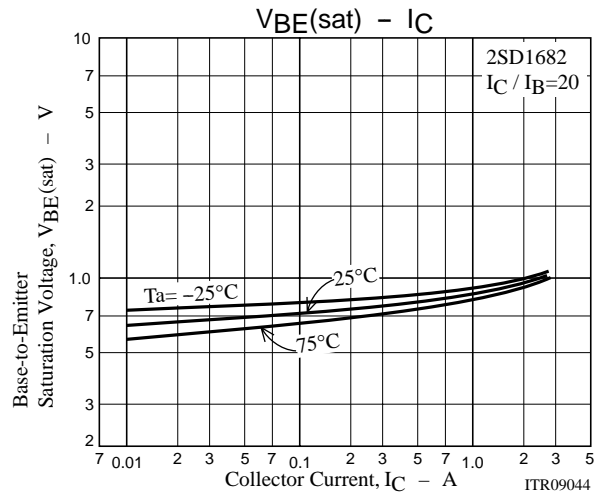
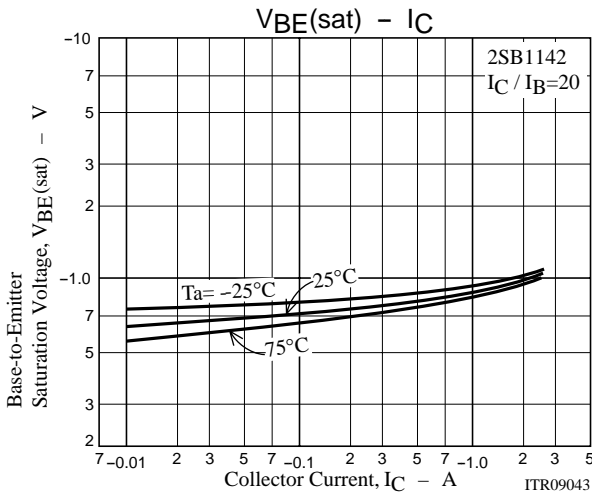
$I_C=10I_{B1}=-10I_{B2}=1A$   
(For PNP, the polarity is reversed.)



# 2SB1142/2SD1682



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