



SANYO Semiconductors

## DATA SHEET

# 2SB1142 / 2SD1682 — 50V / 2.5A High-Speed Switching Applications

PNP / NPN Epitaxial Planar Silicon Transistors

## Applications

- Power supplies, relay drivers, lamp drivers.

## Features

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

## Specifications ( ) : 2SB1142

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		(-)60	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)50	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		(-)6	V
Collector Current	I <sub>C</sub>		(-)2.5	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)5.0	A
Collector Dissipation	P <sub>C</sub>		1.5	W
		T <sub>c</sub> =25°C	10	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =(-)50V, I <sub>E</sub> =0A			(-)100	nA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)100	nA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)100mA	(100)*		(400)*	
	h <sub>FE2</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)2A	35		560*	

Continued on next page.

\* : The 2SB1142 / 2SD1682 are classified by 100mA h<sub>FE</sub> as follows :

	Rank	R	S	T	U
2SB1142	h <sub>FE</sub>	100 to 200	140 to 280	200 to 400	
2SD1682	h <sub>FE</sub>	100 to 200	140 to 280	200 to 400	280 to 560

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# 2SB1142 / 2SD1682

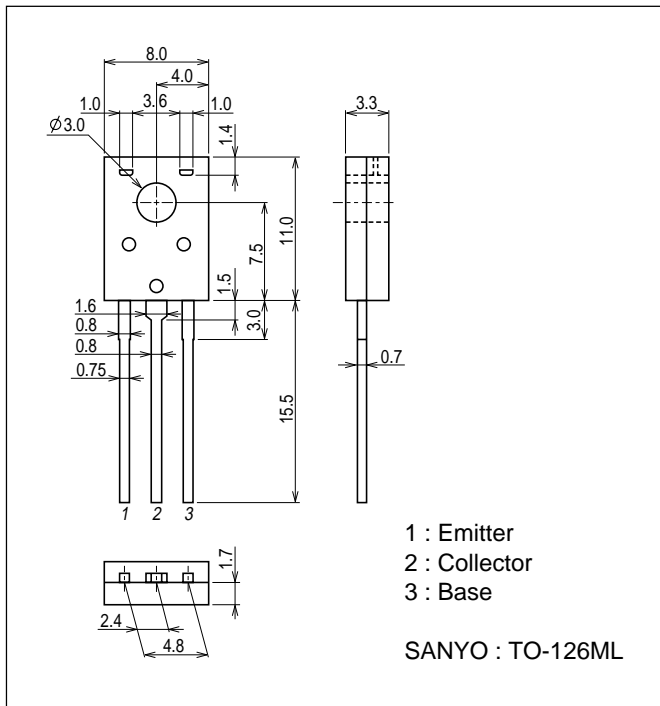
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)50mA$		140		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(25)16		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1A, I_B=(-)50mA$		(-250)110	(-500)300	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)1A, I_B=(-)50mA$		(-0.85)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0A$	(-60)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-50)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0A$	(-6)			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		(35)35		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(350)550		ns
Fall Time	$t_f$	See specified Test Circuit.		(30)30		ns

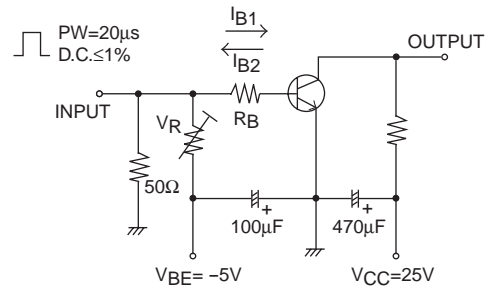
## Package Dimensions

unit : mm (typ)

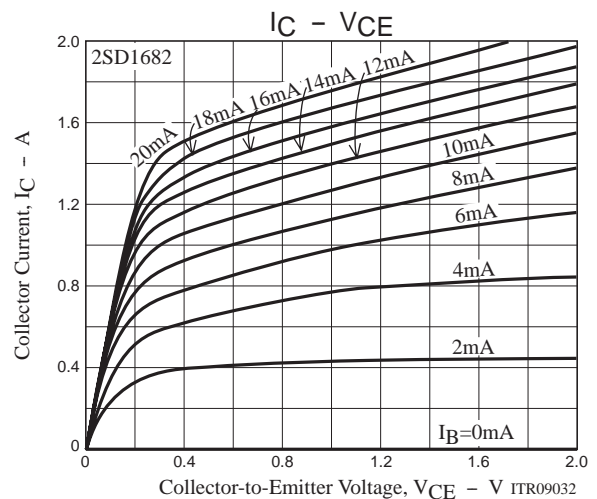
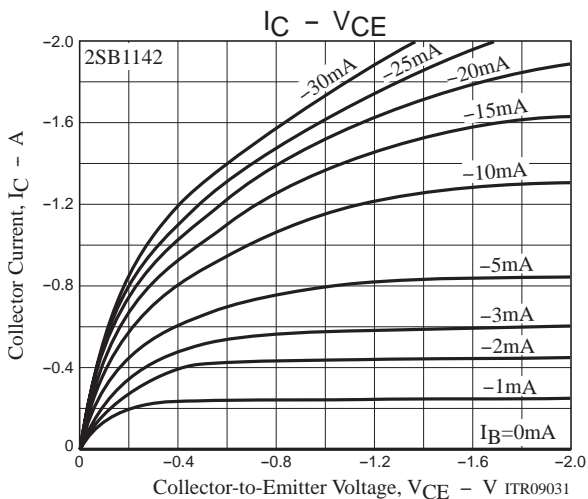
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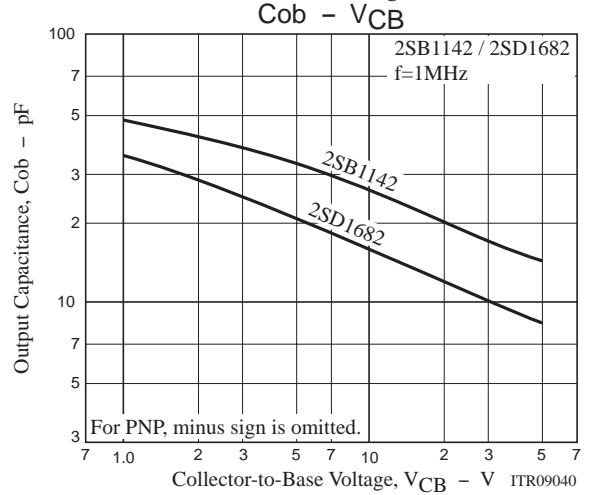
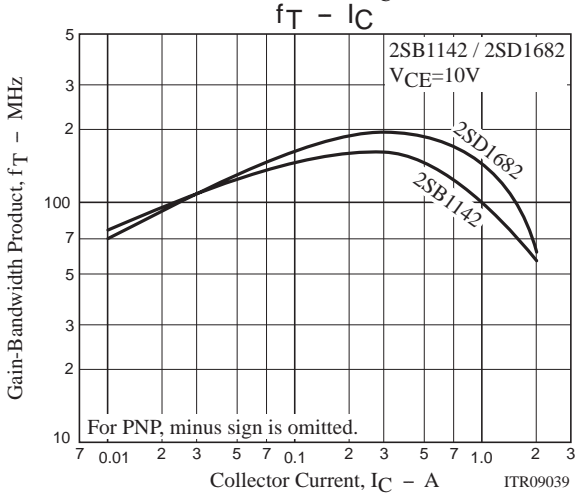
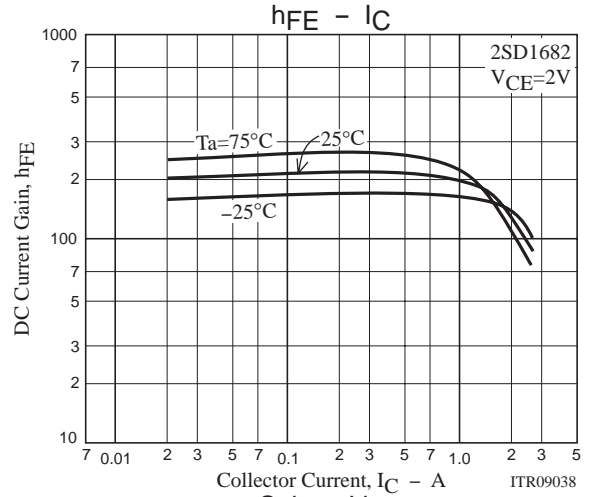
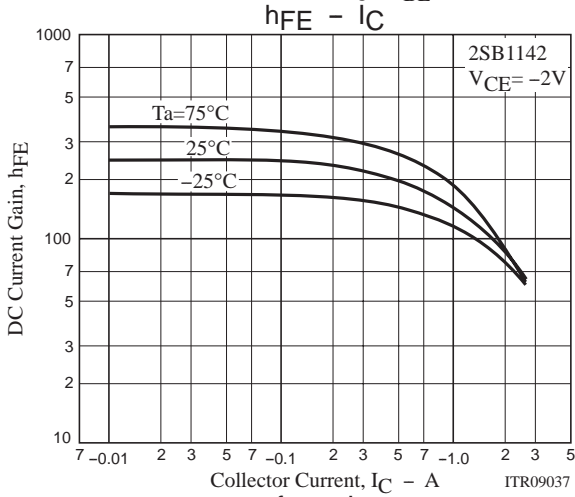
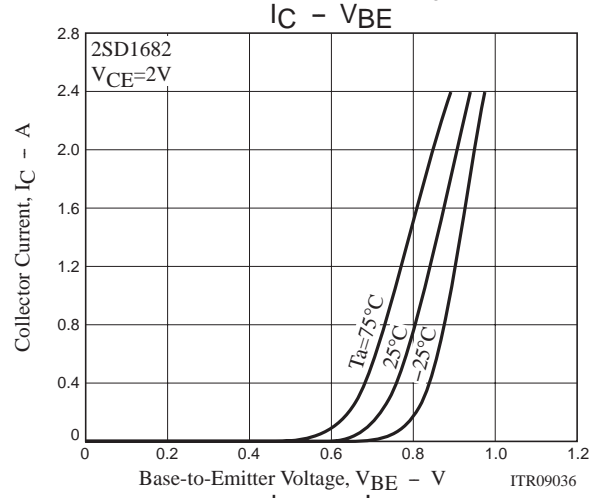
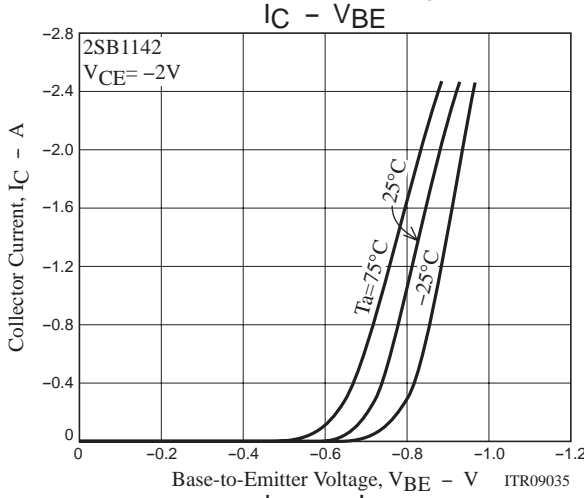
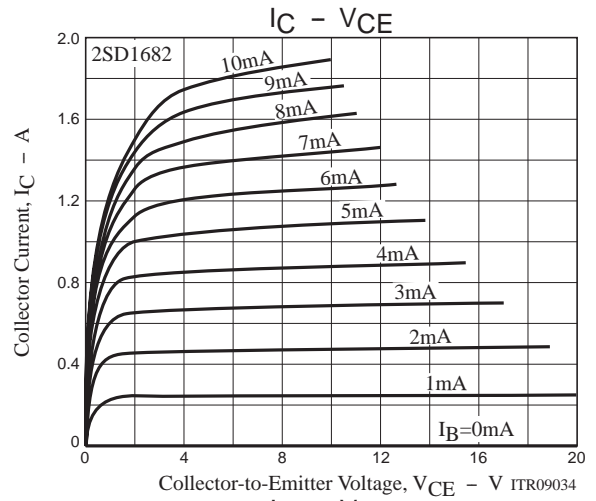
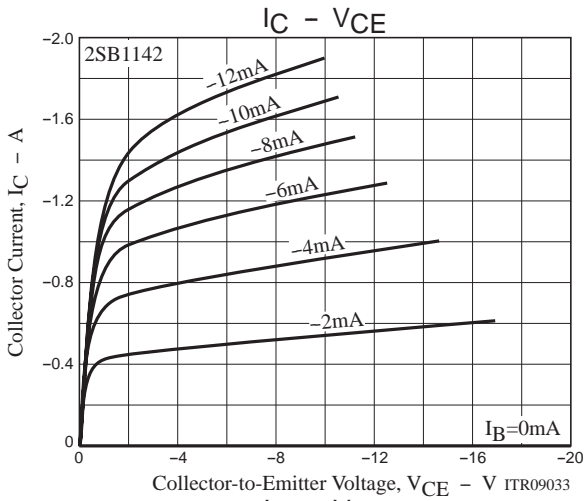
## Switching Time Test Circuit



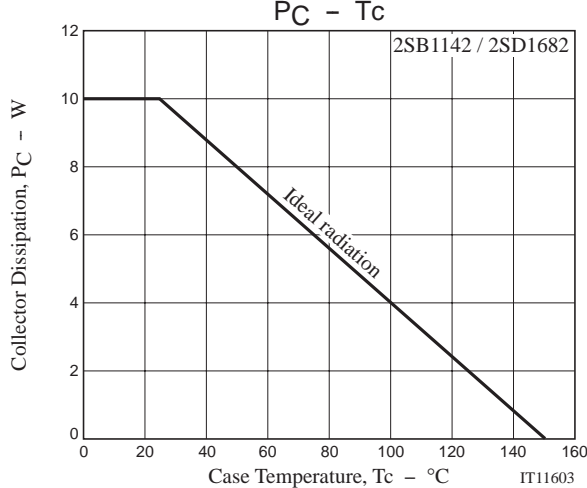
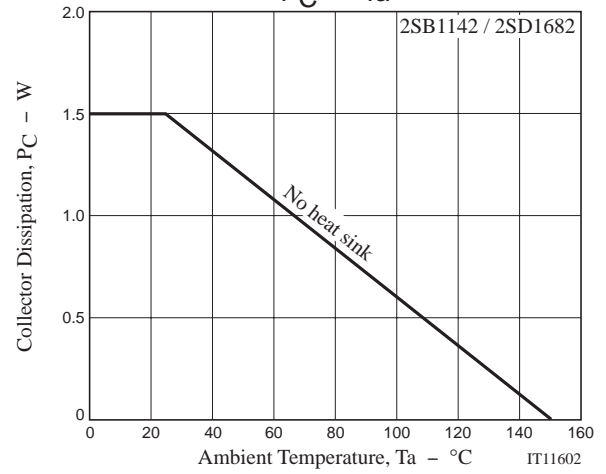
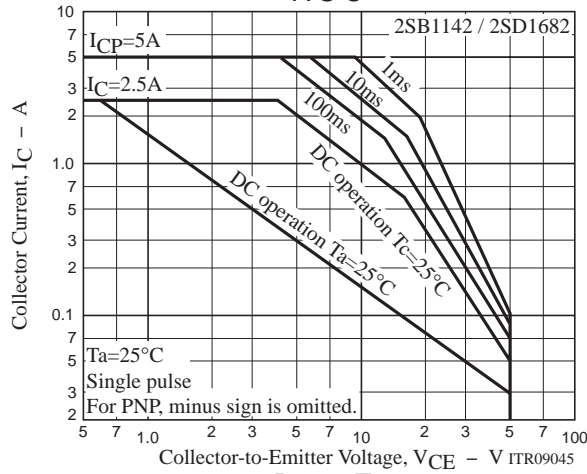
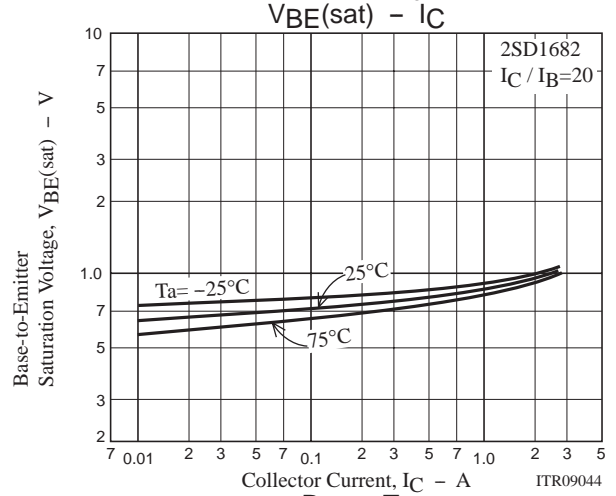
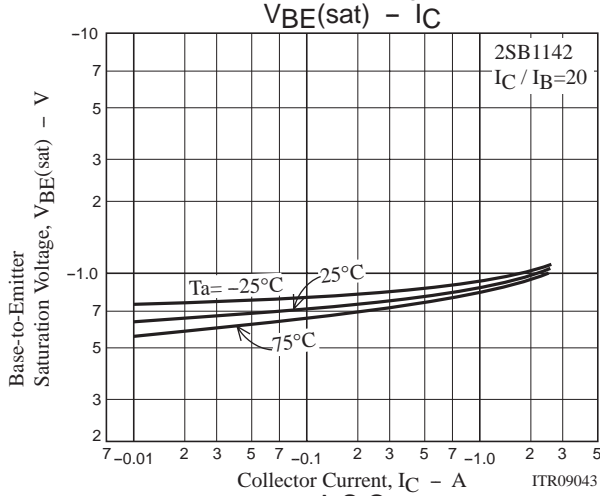
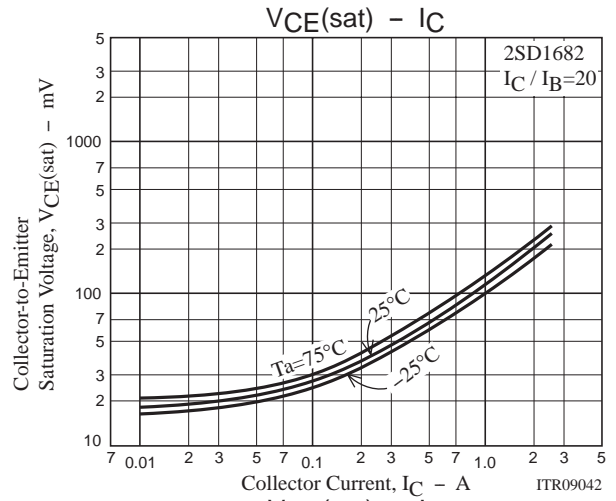
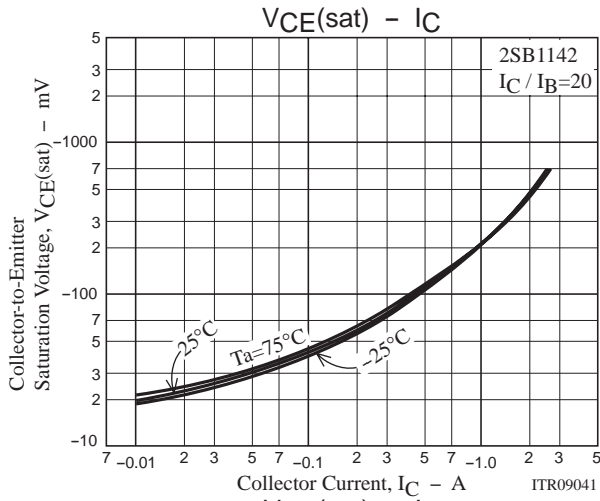
$I_C = 10I_{B1} = -10I_{B2} = 1A$   
For PNP, the polarity is reversed.



# 2SB1142 / 2SD1682



# 2SB1142 / 2SD1682



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