



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 $T_a=25^\circ\text{C}$

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 $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CB0}	$V_{CB}=-50\text{V}, I_E=0\text{A}$			(-)100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-4\text{V}, I_C=0\text{A}$			(-)100	nA
DC Current Gain	h_{FE1}	$V_{CE}=-2\text{V}, I_C=(-)100\text{mA}$	(100)*		(400)*	
	h_{FE2}	$V_{CE}=-2\text{V}, I_C=(-)2\text{A}$	35		560*	

Continued on next page.

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

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

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SANYO Semiconductor Co., Ltd.

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

2SB1142 / 2SD1682

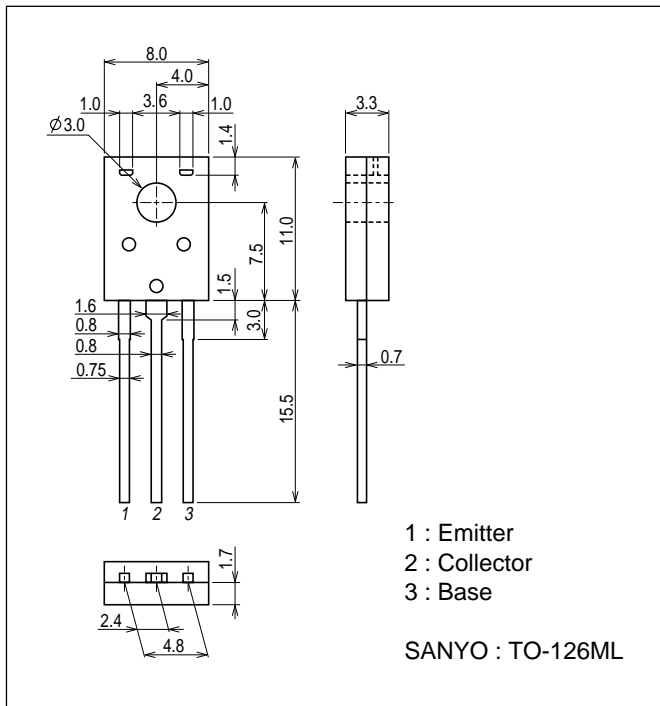
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10V, I_C=(-)50mA$		140		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10V, f=1MHz$		(25)16		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1A, I_B=(-)50mA$		(-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

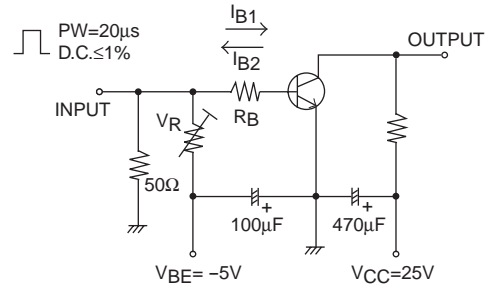
Package Dimensions

unit : mm (typ)

7516-002

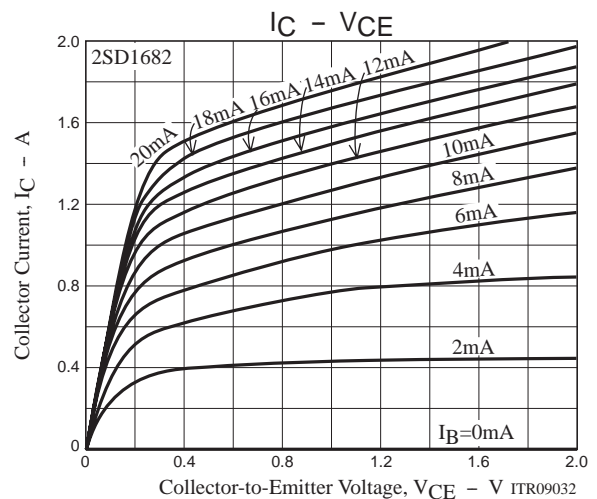
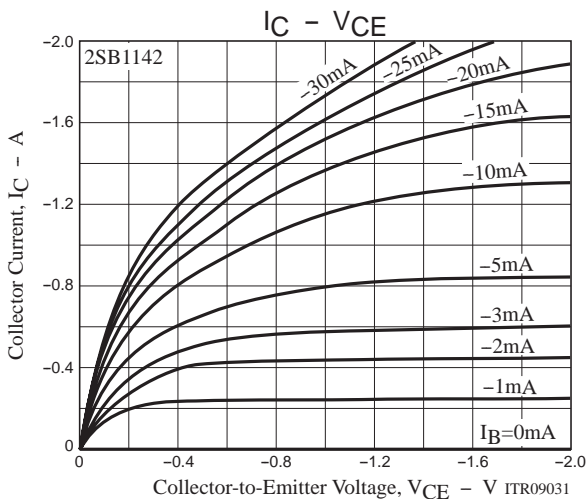


Switching Time Test Circuit

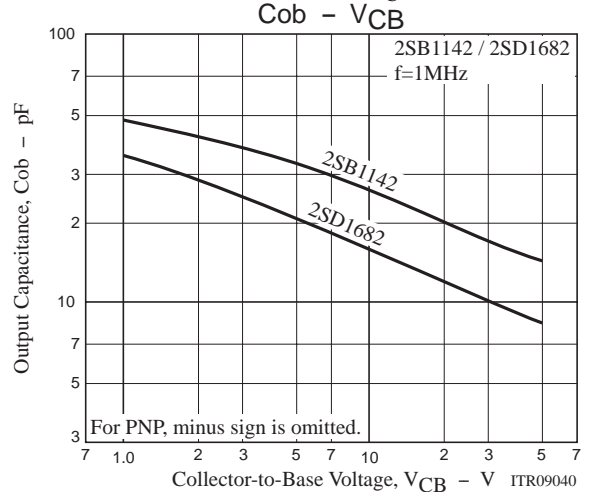
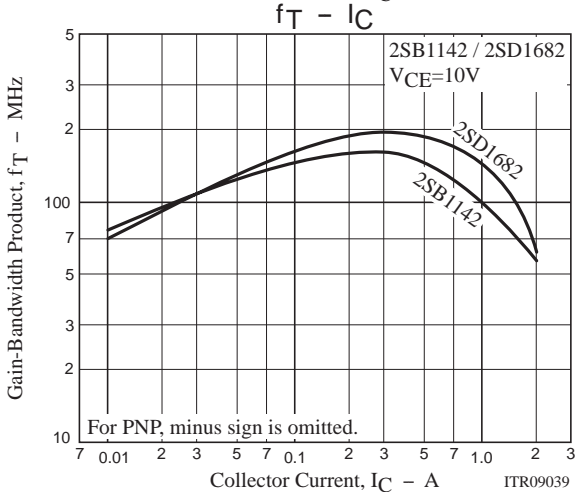
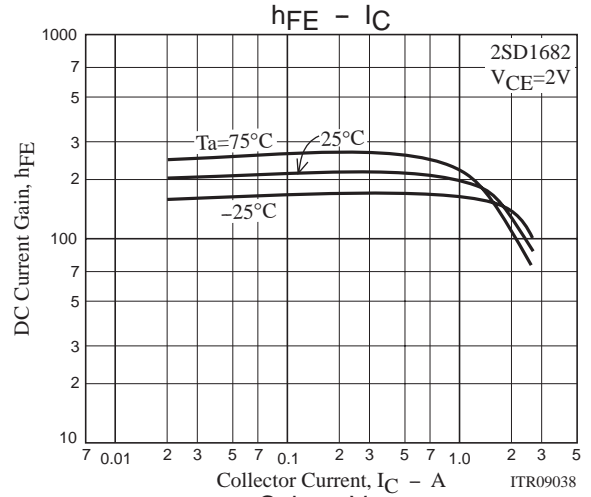
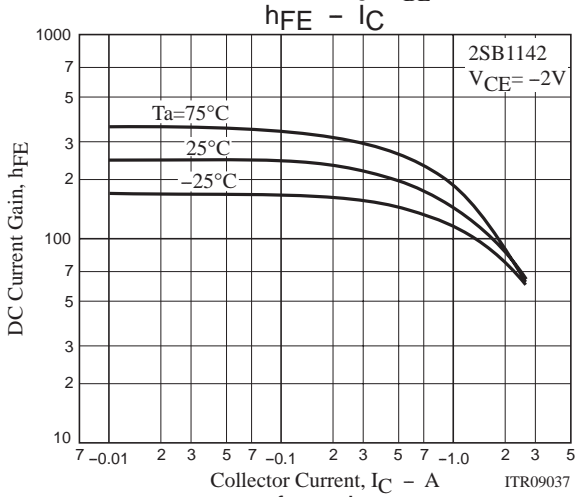
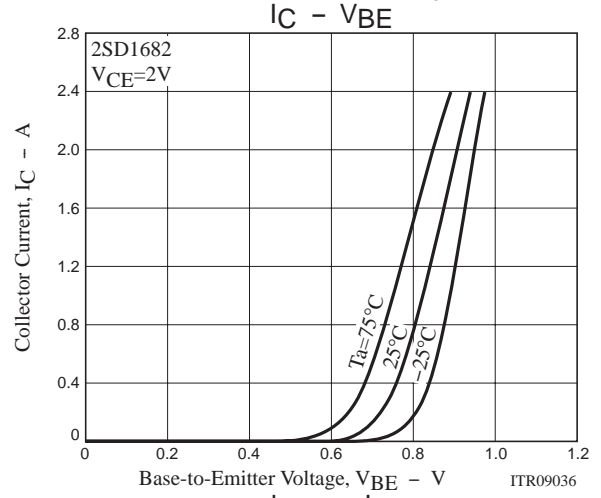
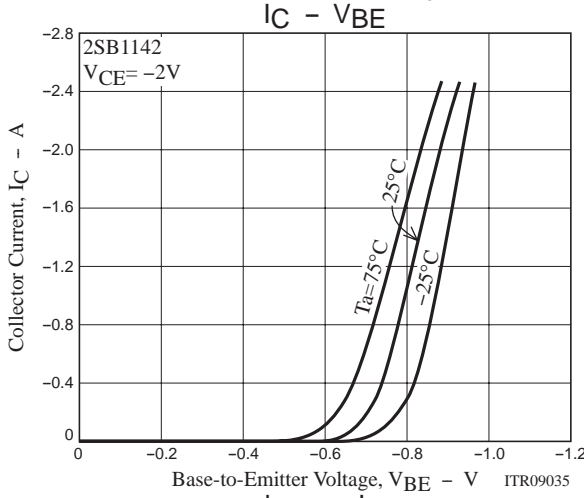
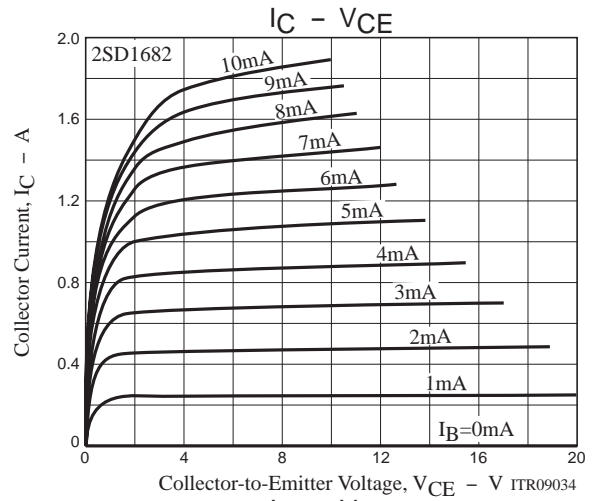
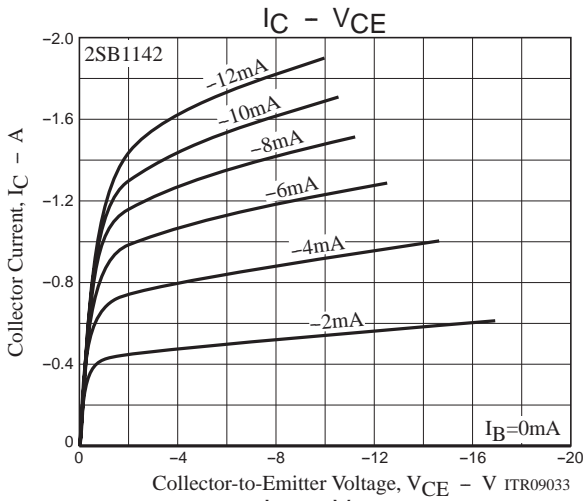


$$I_C = 10I_{B1} = -10I_{B2} = 1A$$

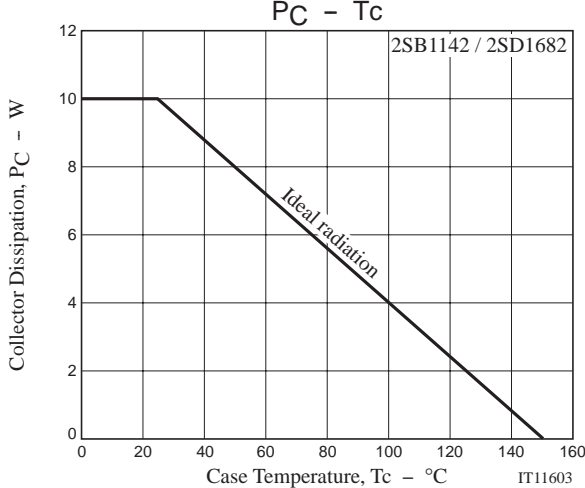
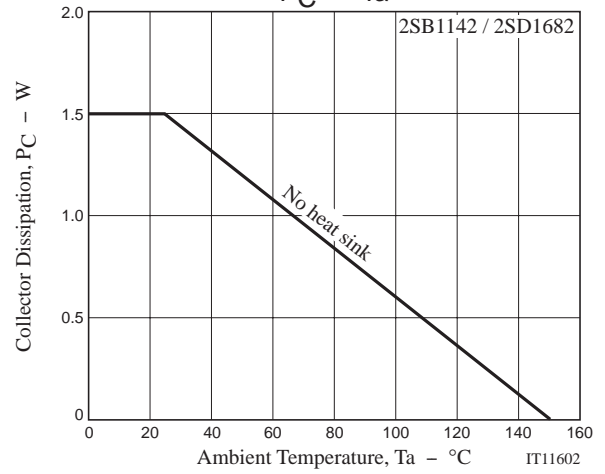
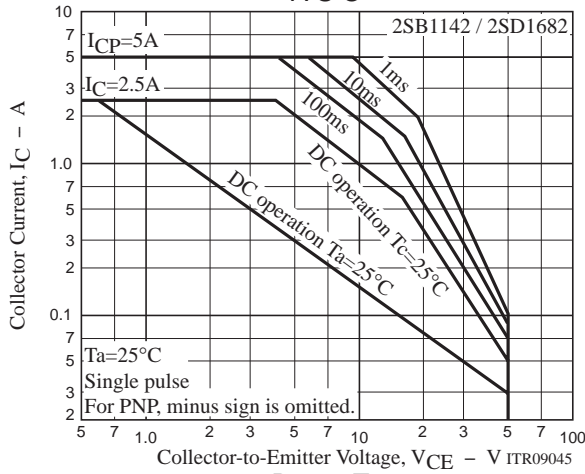
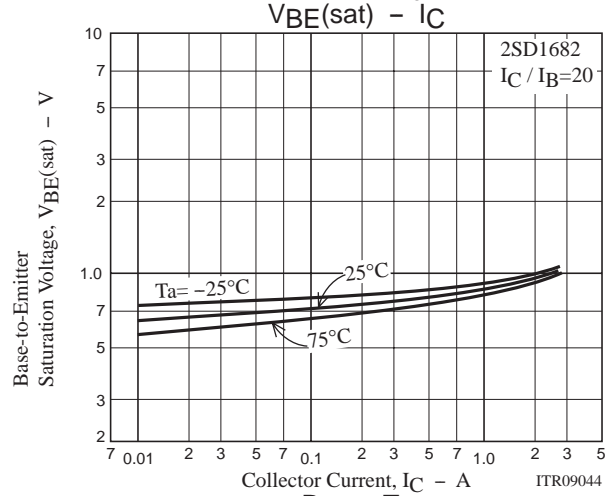
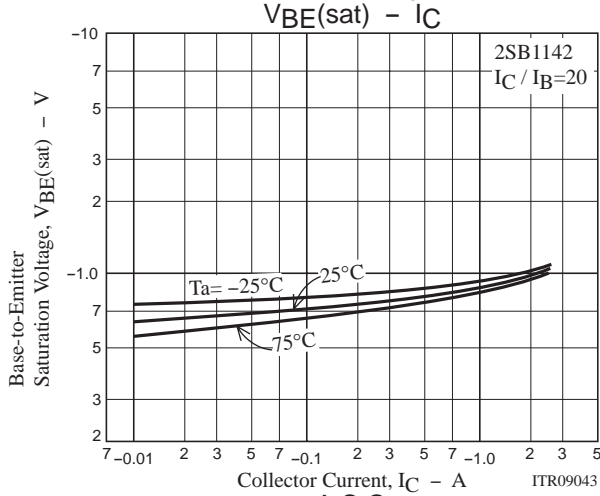
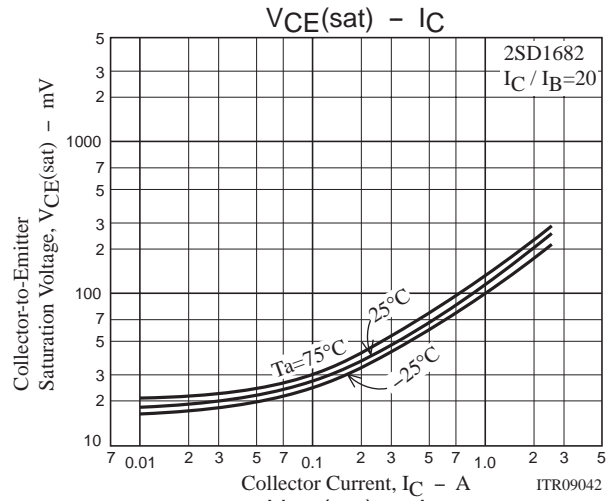
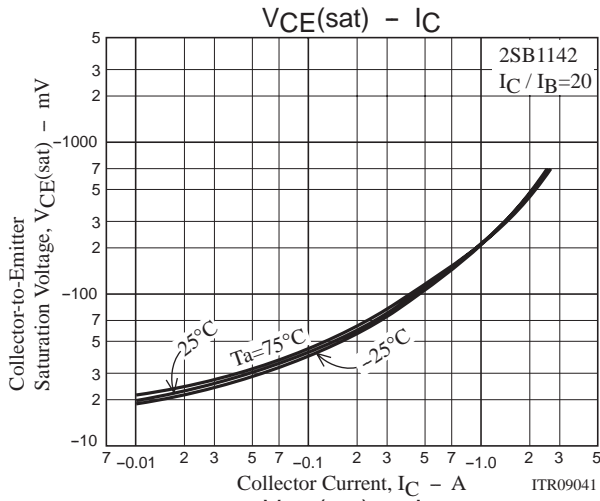
For PNP, the polarity is reversed.



2SB1142 / 2SD1682



2SB1142 / 2SD1682



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