



2SB1142/2SD1682

50V/2.5A High-Speed Switching Applications

Applications

- Power supplies, relay drivers, lamp drivers.

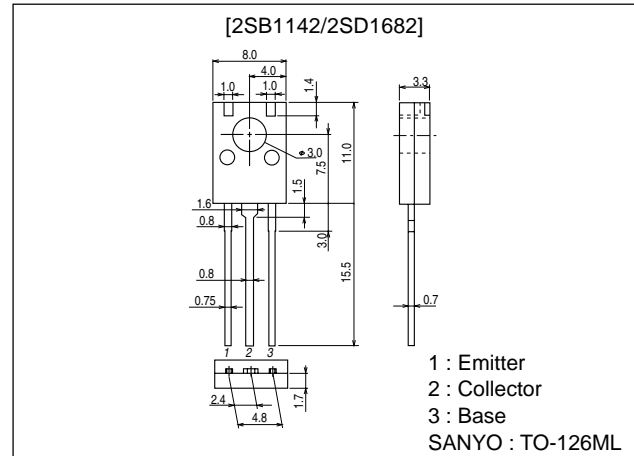
Features

- 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_{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_{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 :

Continued on next page.

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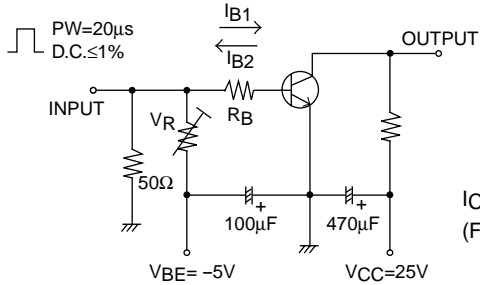
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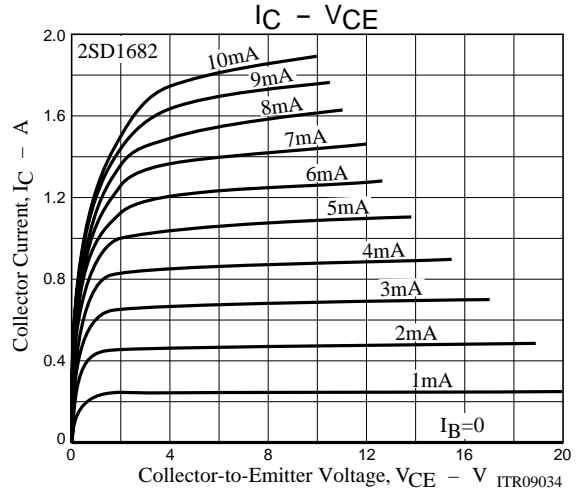
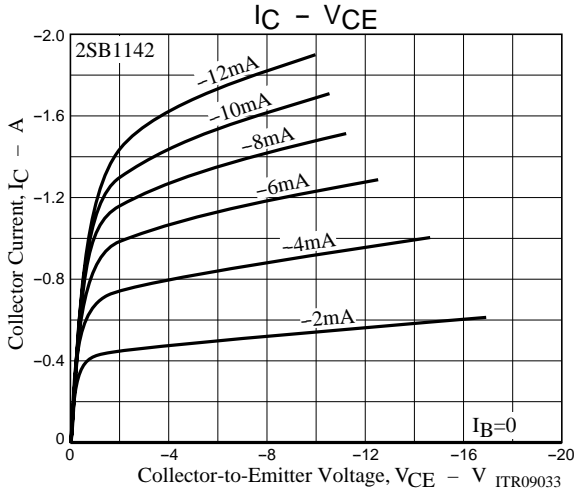
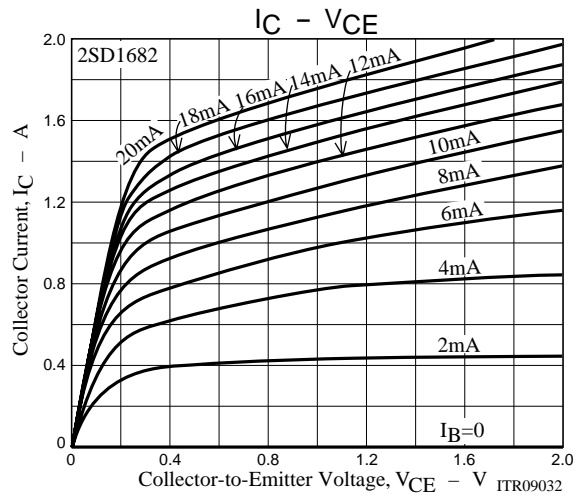
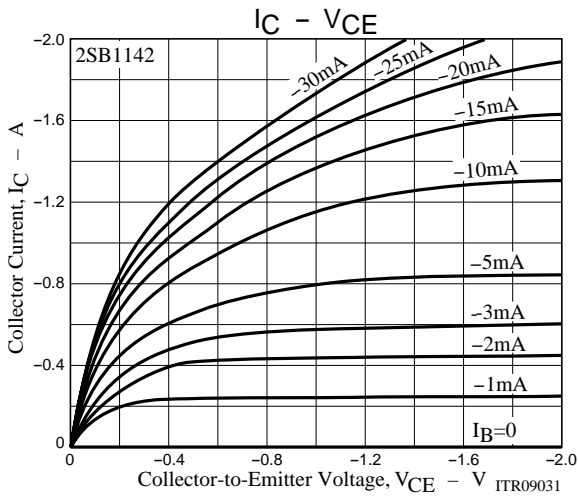
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	h_{FE1}	$V_{CE}=(-)2V, I_C=(-)100mA$	(100)*		(400)*	
	h_{FE2}	$V_{CE}=(-)2V, I_C=(-)2A$	100*		560	
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10V, I_C=(-)50mA$		140		MHz
Collector-to-Emitter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

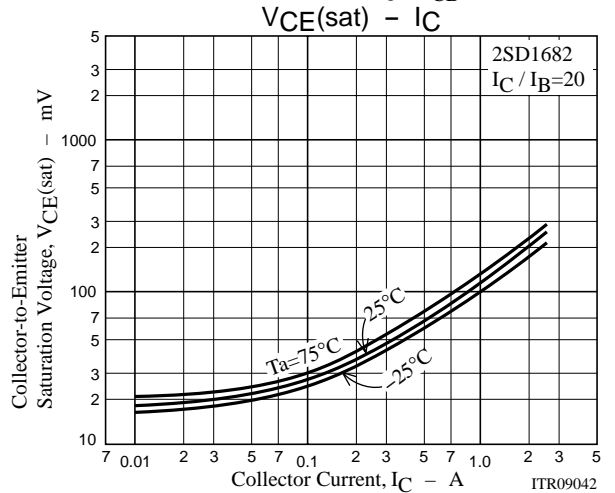
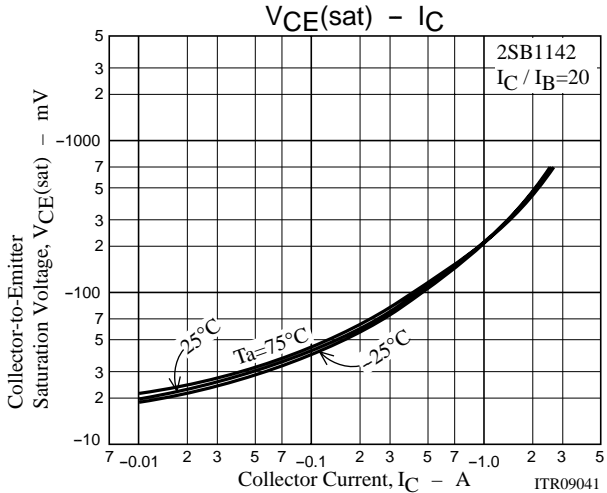
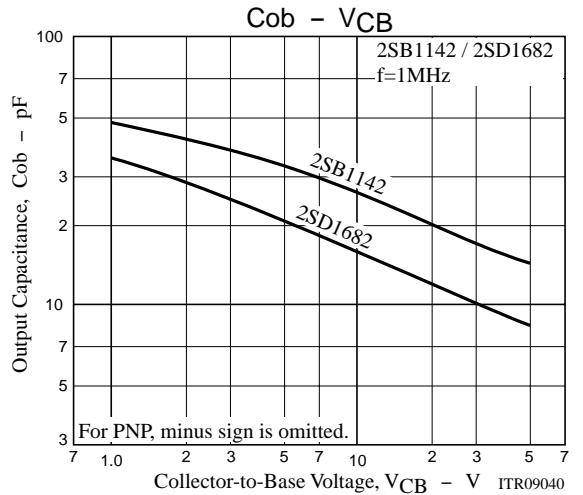
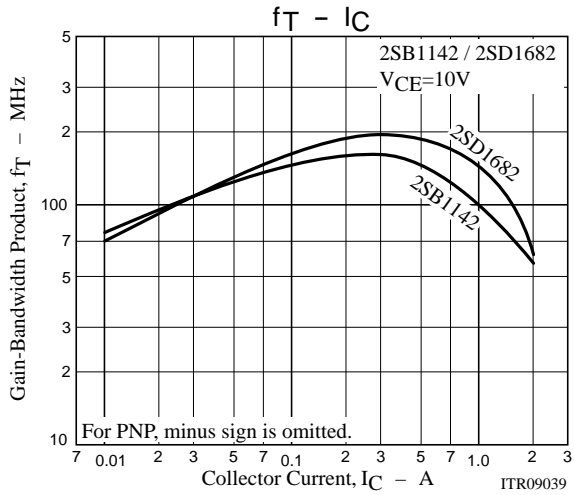
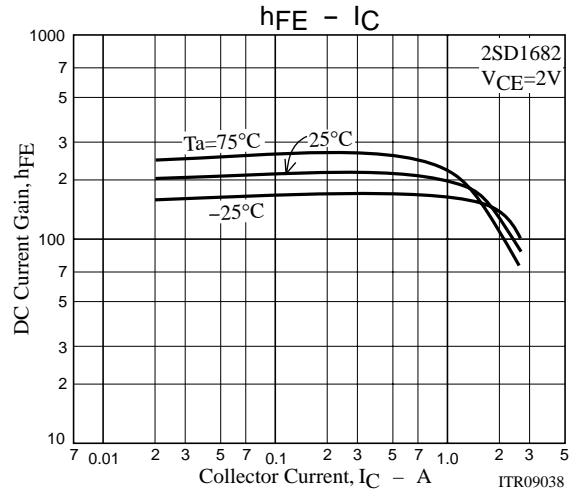
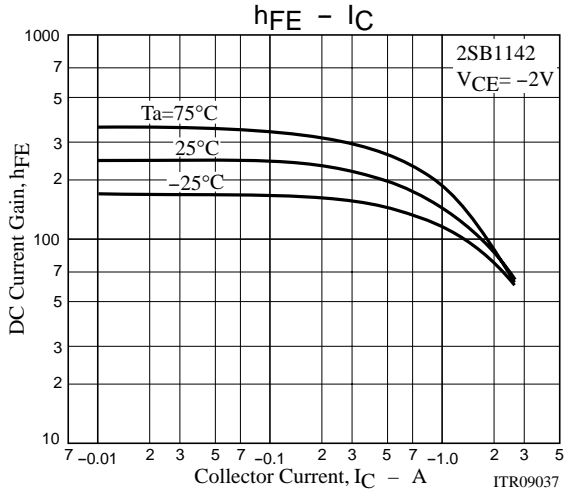
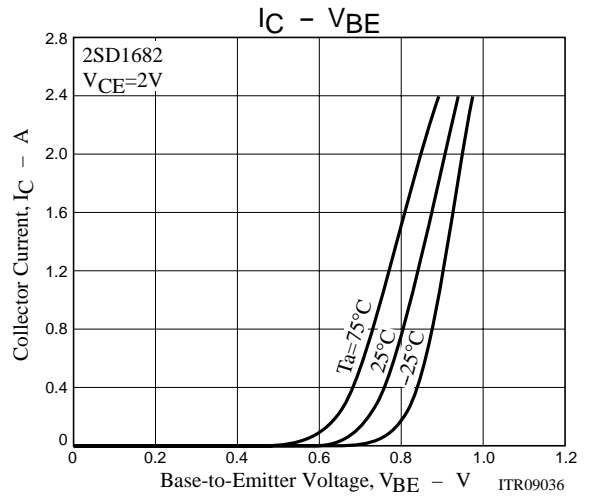
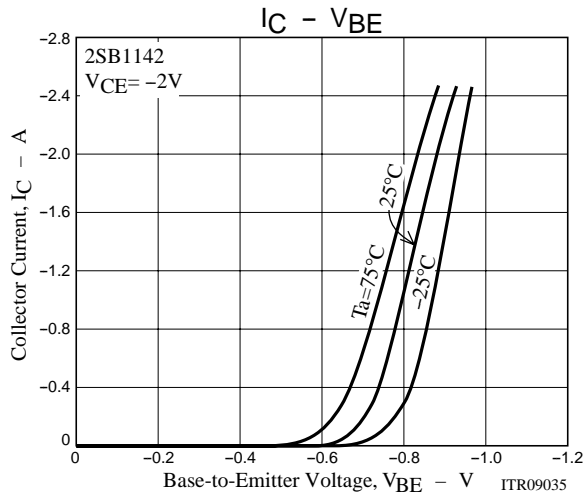
Switching Time Test Circuit



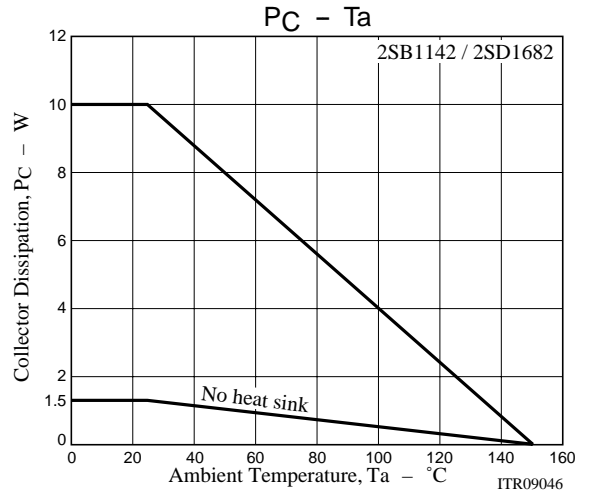
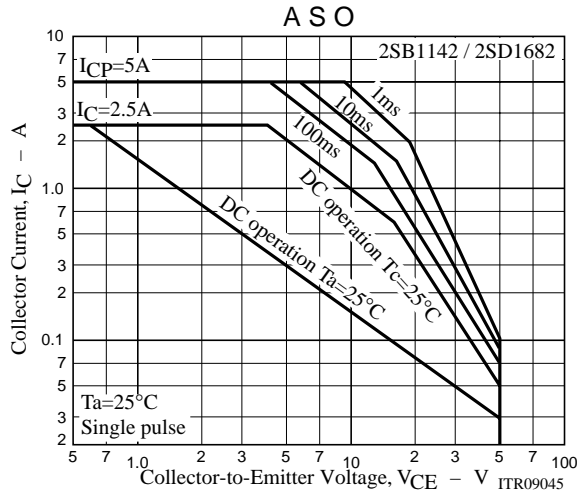
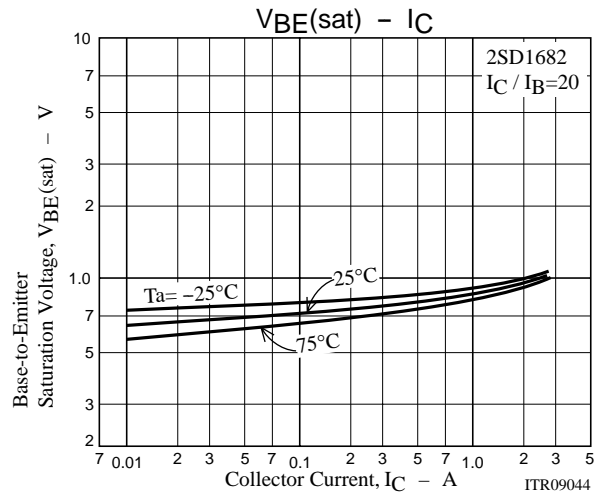
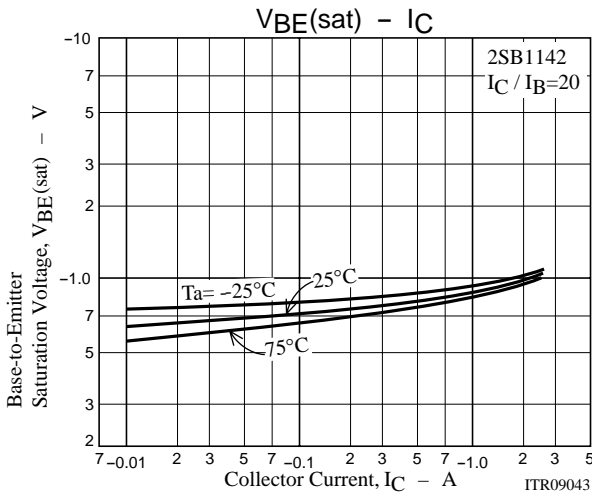
$I_C=10I_{B1} = -10I_{B2}=1A$
(For PNP, the polarity is reversed.)



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