



2SB1142/2SD1682

50V/2.5A High-Speed Switching Applications

Applications

- Power supplies, relay drivers, lamp drivers.

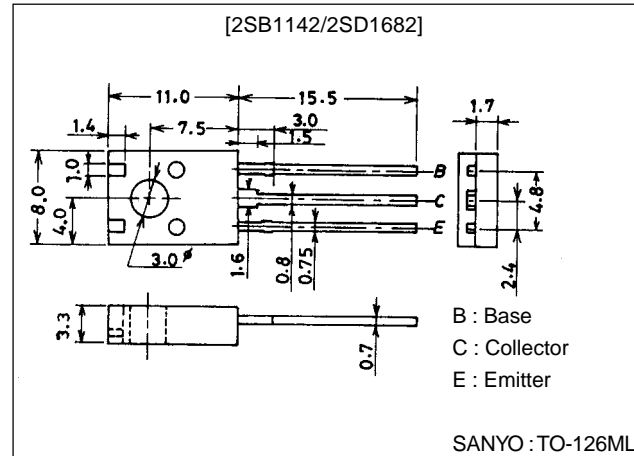
Features

- 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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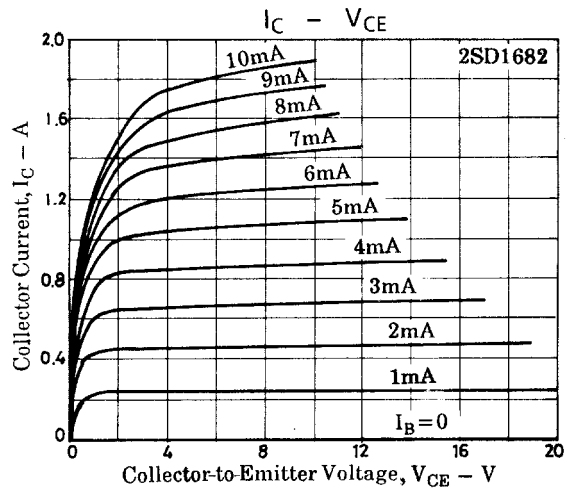
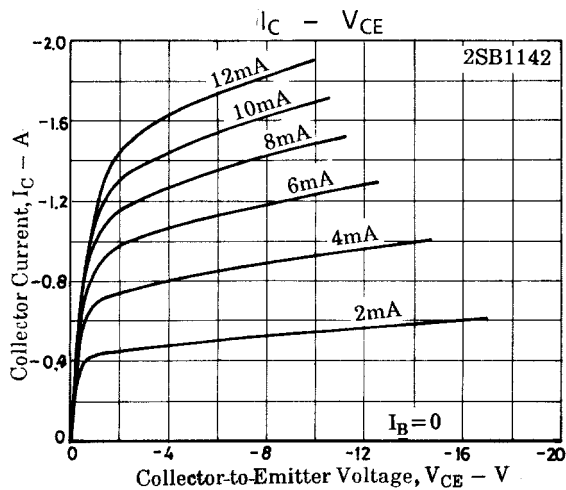
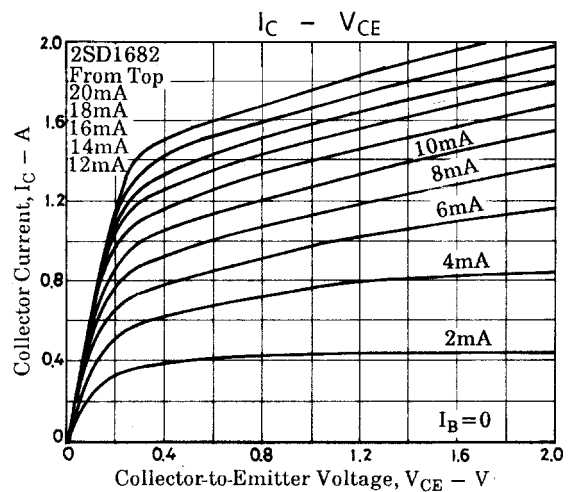
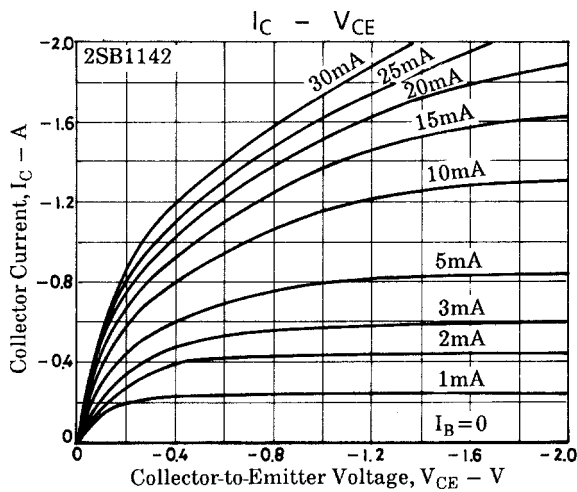
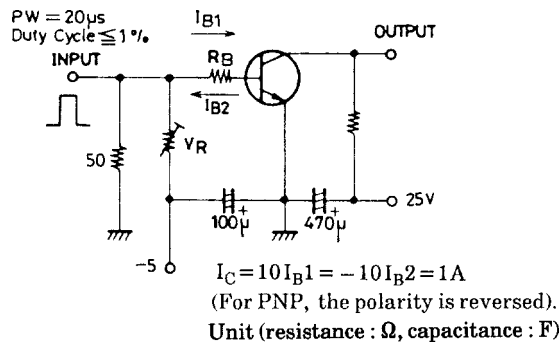
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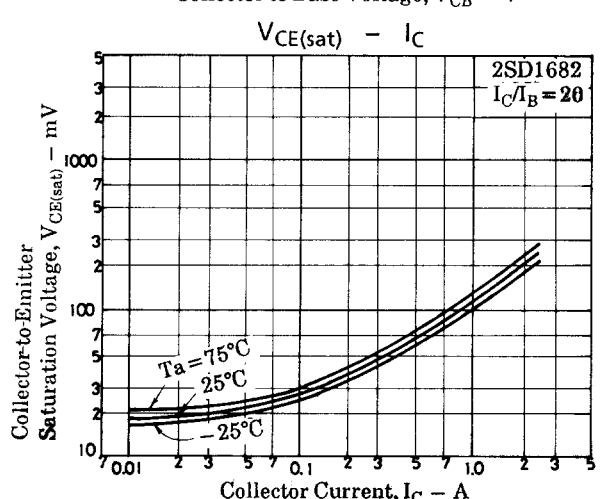
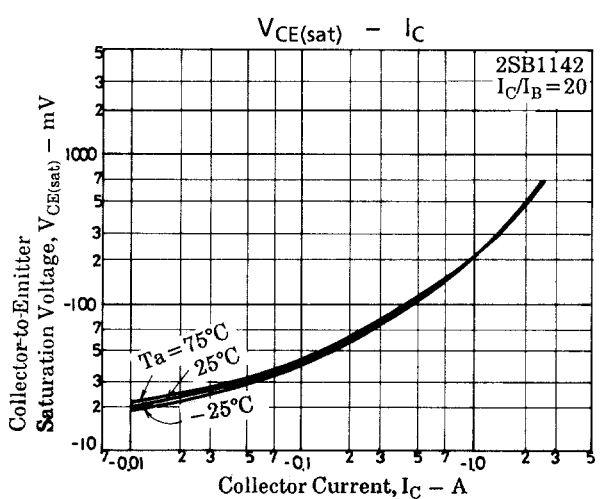
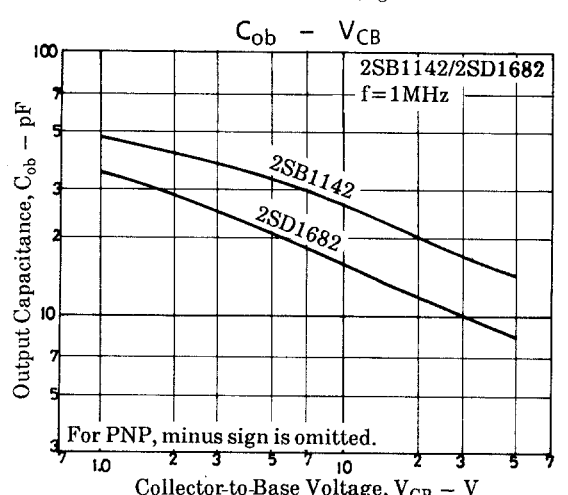
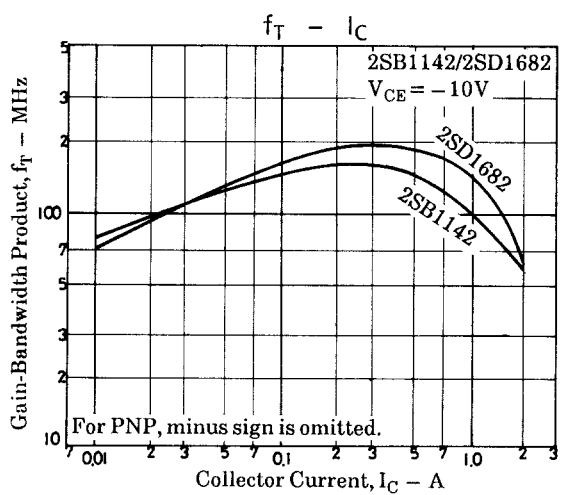
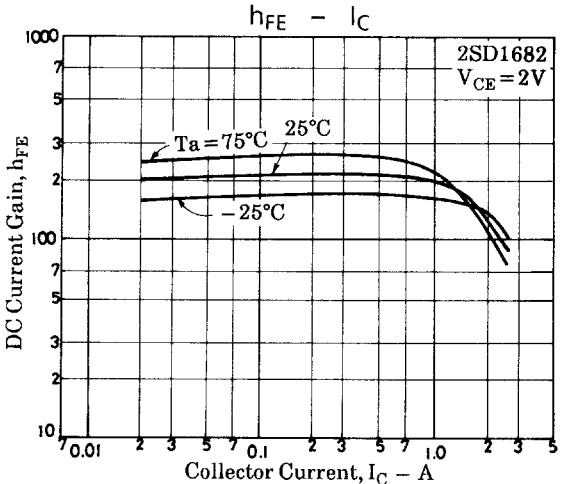
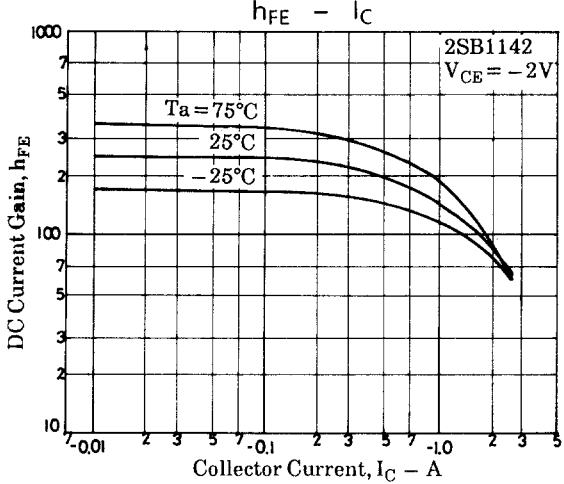
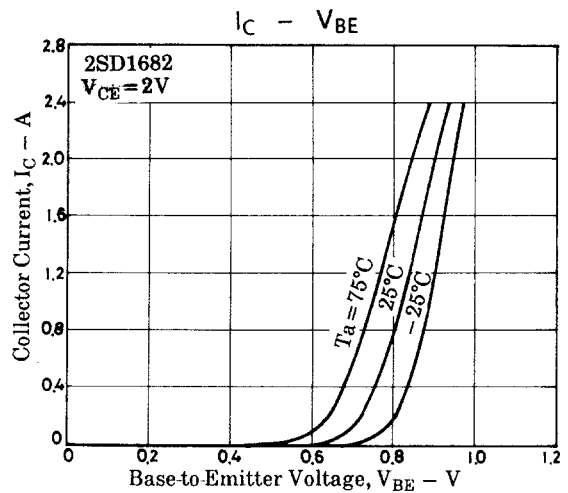
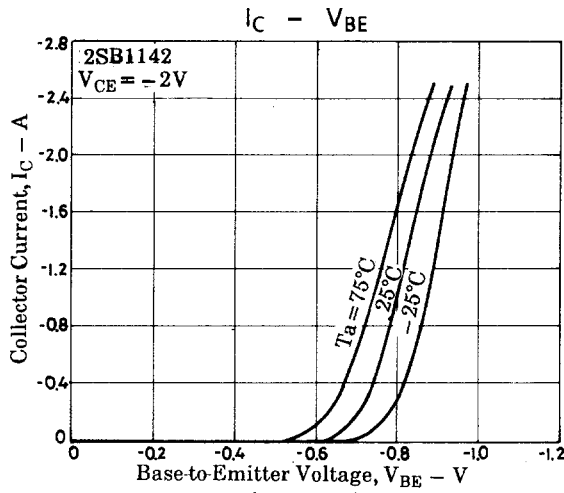
2SB1142/2SD1682

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

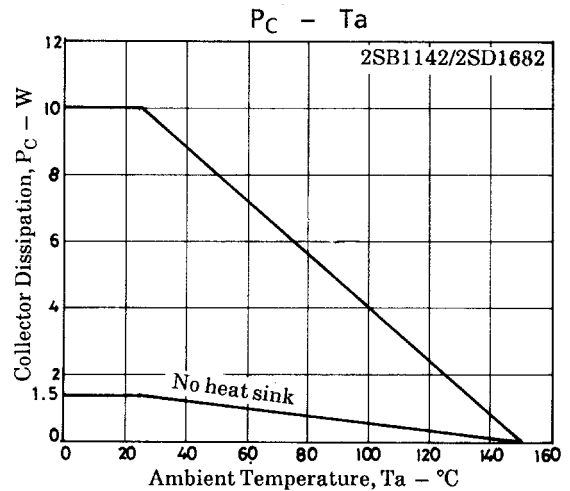
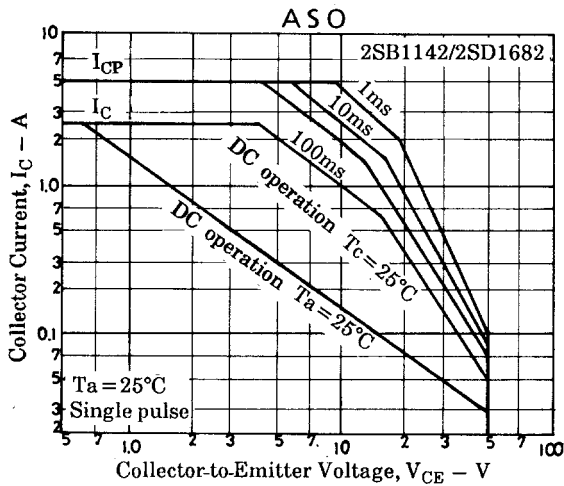
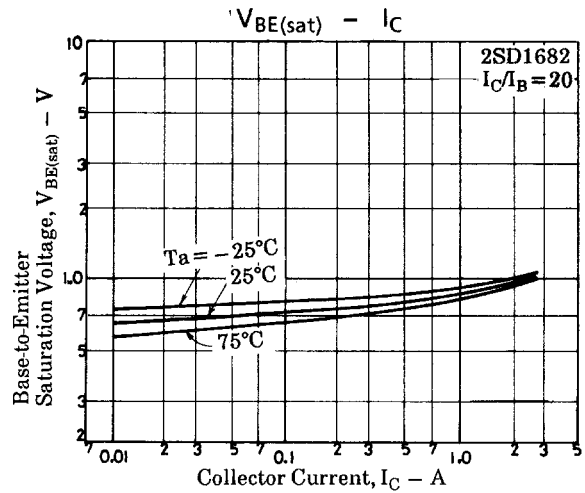
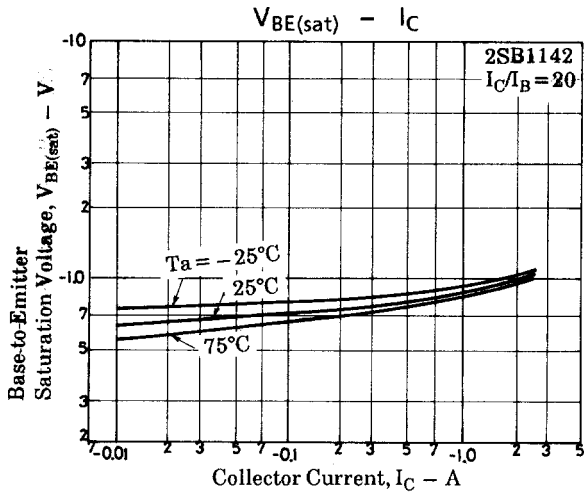
Switching Time Test Circuit



2SB1142/2SD1682



2SB1142/2SD1682



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