



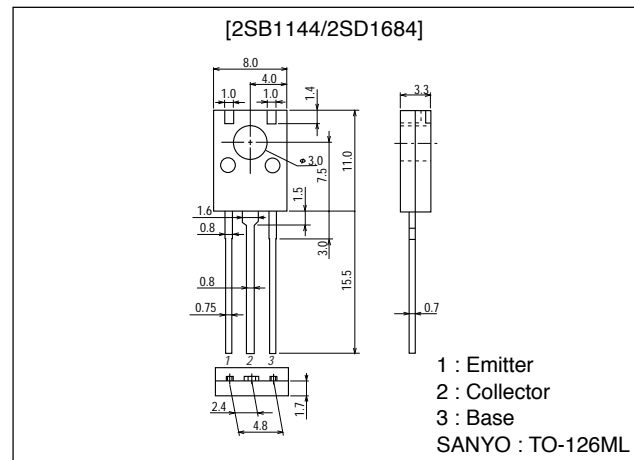
ON Semiconductor®

**ON Semiconductor
DATA SHEET**

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1144/2SD1684 — 100V/1.5A Switching Application**Features**

- Adoption of FBET and MBIT processes.
- High breakdown voltage.
- Large current capacity.
- Low saturation voltage.
- Plastic-covered heat sink facilitating high-density mounting.

Package Dimensionsunit:mm
2042B

() : 2SB1144

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		(-)120	V
Collector-to-Emitter Voltage	V_{CEO}		(-)100	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)1.5	A
Collector Current (Pulse)	I_{CP}		(-)2.0	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}	$V_{CB}=(-)100\text{V}, I_E=0$			(-)100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}, I_C=0$			(-)100	nA
DC Current Gain	h_{FE1}	$V_{CE}=(-)5\text{V}, I_C=(-)100\text{mA}$	100*		400*	
	h_{FE2}	$V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$	30			
Gain-Bandwidth Product	f_T	$V_{CE}=(-)10\text{V}, I_C=(-)50\text{mA}$		(100)		MHz
				120		MHz

* : The 2SB1144/2SD1684 are classified by 100mA h_{FE} as follows :

Rank	R	S	T
h_{FE}	100 to 200	140 to 280	200 to 400

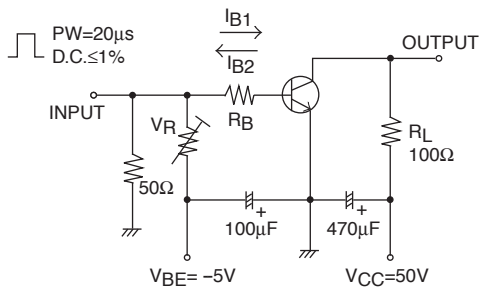
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2SB1144/2SD1684

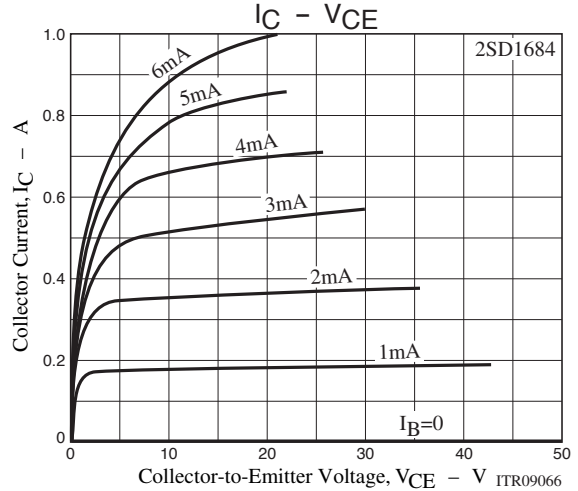
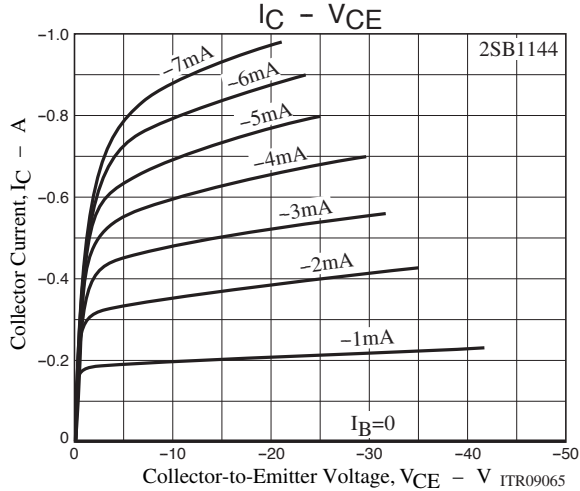
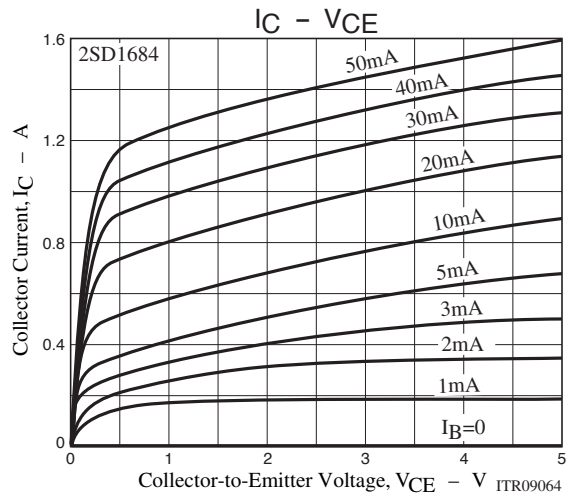
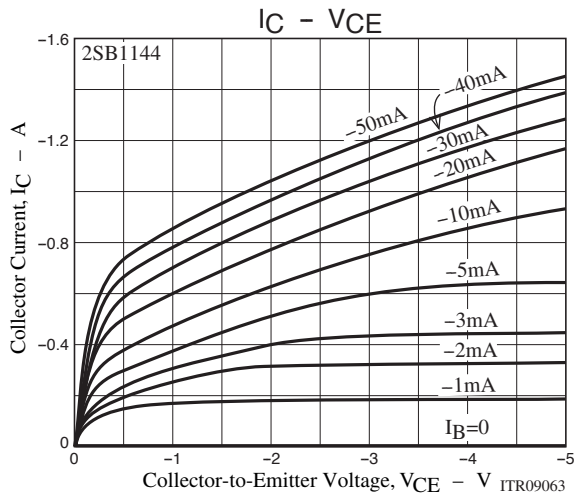
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output Capacitance	C_{ob}	$V_{CB} = (-)10V, f = 1MHz$		(18)11		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)500mA, I_B = (-)50mA$		(-180)	(-500)	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)500mA, I_B = (-)50mA$		100	300	mV
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0$	(-)120			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)100			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		(80)80		ns
Storage Time	t_{stg}	See specified Test Circuit		1000		ns
				(750)		ns
Fall Time	t_f	See specified Test Circuit		(40)50		ns

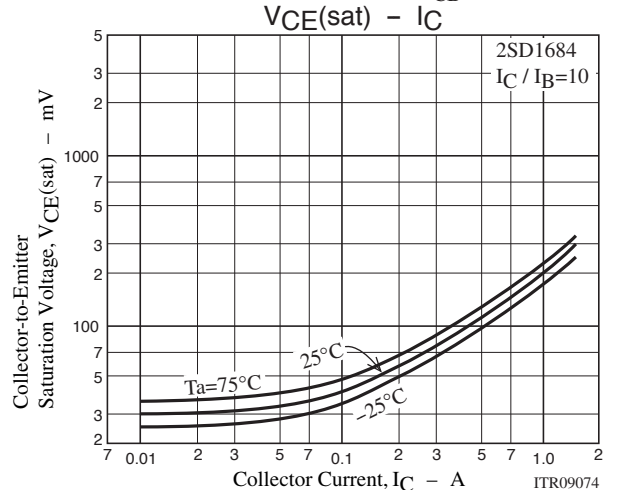
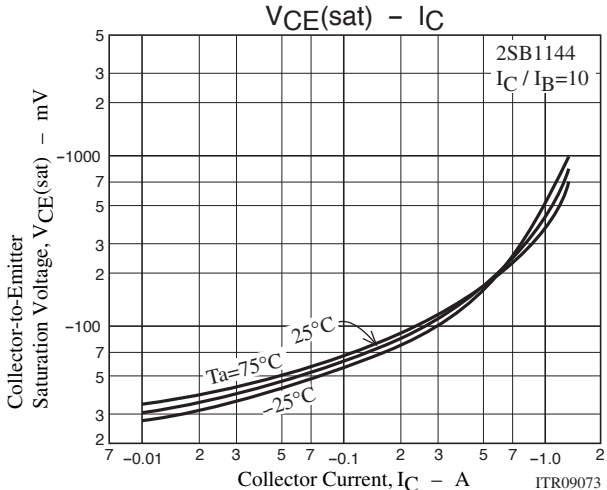
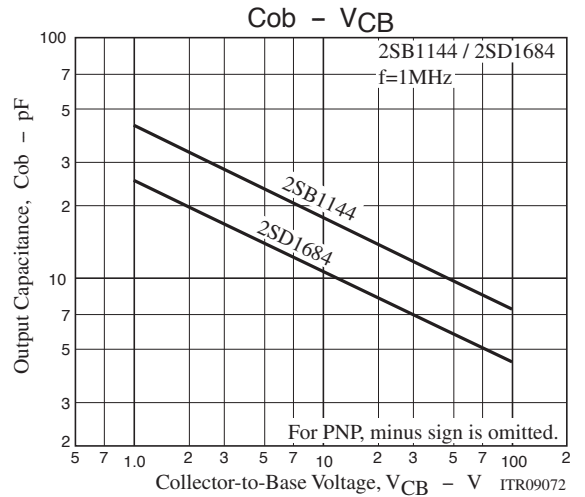
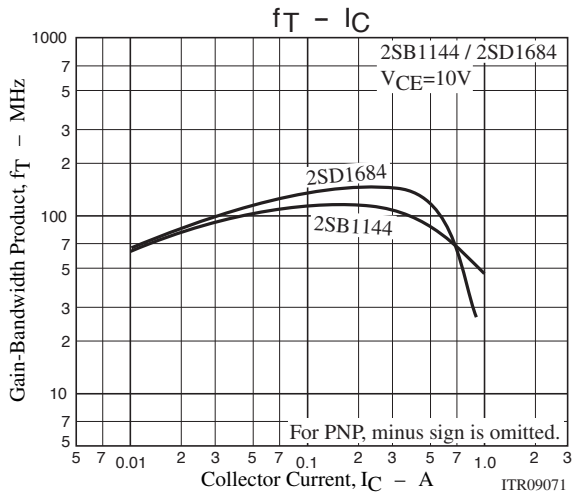
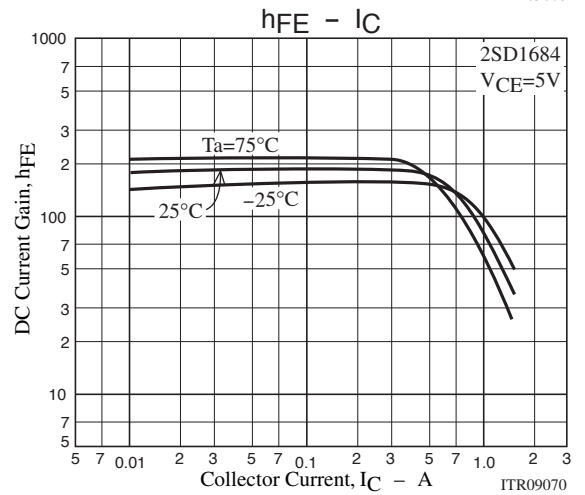
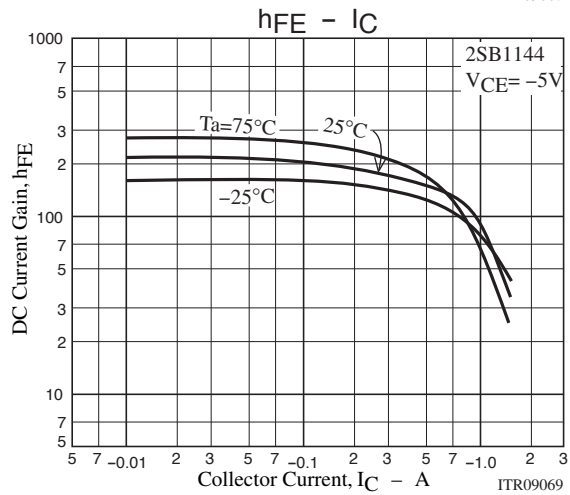
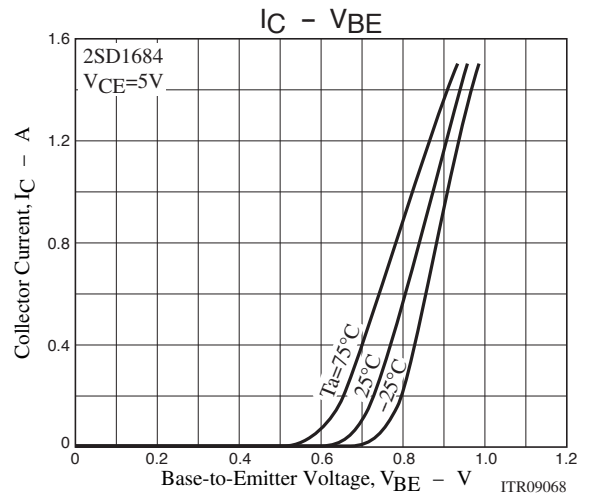
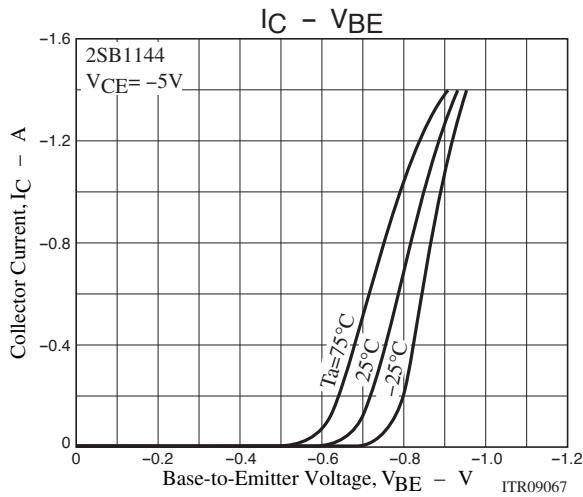
Switching Time Test Circuit



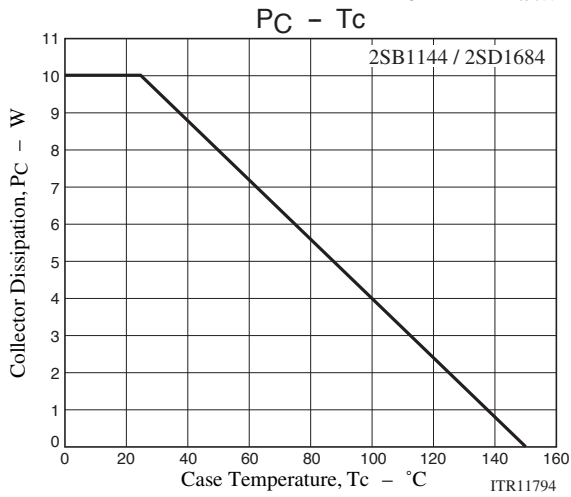
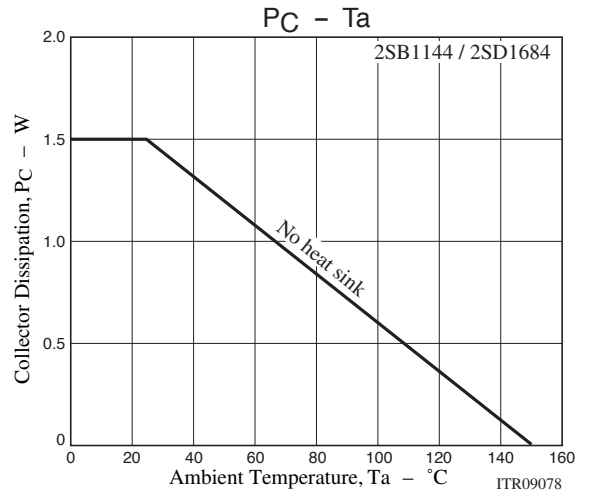
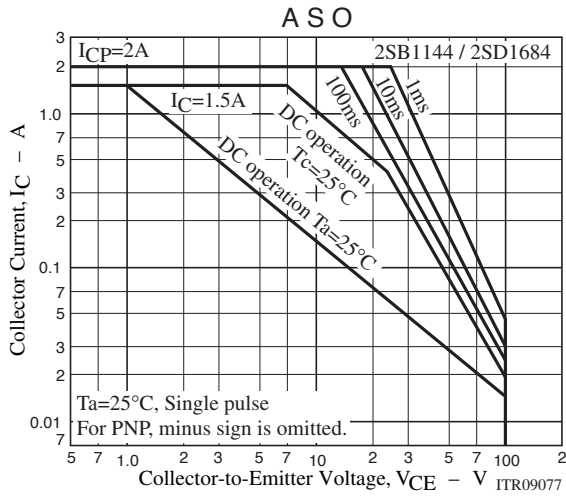
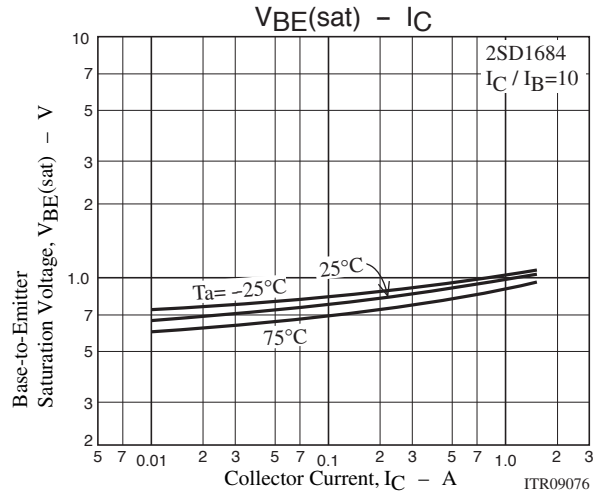
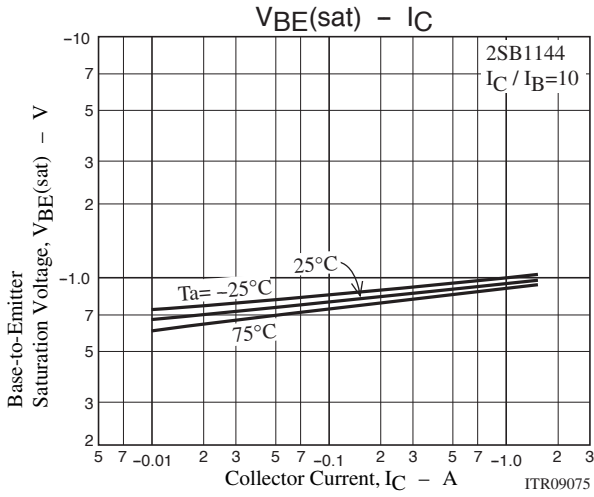
$$I_C = 10I_{B1} = -10I_{B2} = 500mA$$



2SB1144/2SD1684



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