



2SB1204/2SD1804

High-Current Switching Applications

An ON Semiconductor Company

Applications

- Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

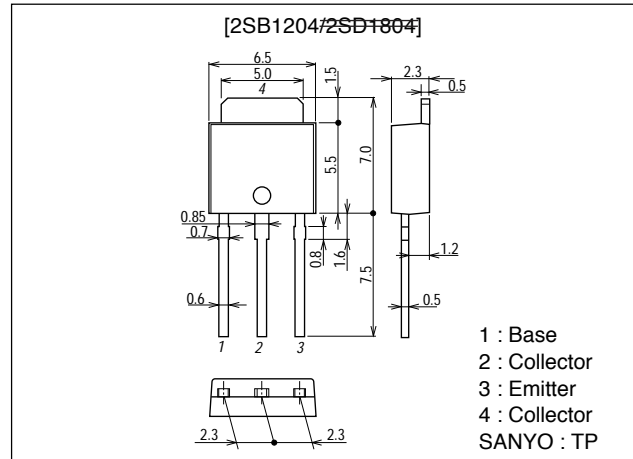
Features

- Low collector-to-emitter saturation voltage.
- High current and high f_T .
- Excellent linearity of h_{FE} .
- Fast switching time.
- Small and slim package making it easy to make 2SB1204/2SD1804-applied sets smaller.

Package Dimensions

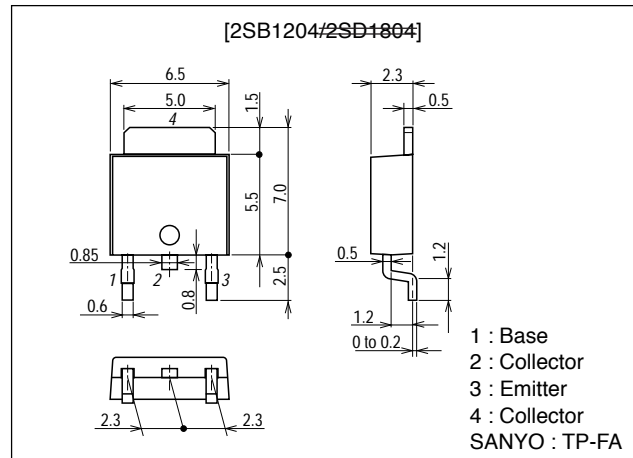
unit:mm

2045B



unit:mm

2044B



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2SB1204/2SD1804

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Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-60)	V
Collector-to-Emitter Voltage	V_{CEO}		(-50)	V
Emitter-to-Base Voltage	V_{EBO}		(-6)	V
Collector Current	I_C		(-8)	A
Collector Current (Pulse)	I_{CP}		(-12)	A
Collector Dissipation	P_C		1	W
		$T_c=25^\circ\text{C}$	20	W
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

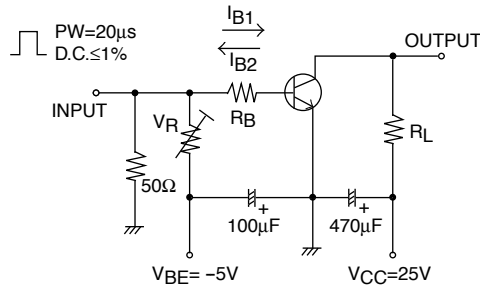
Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)40\text{V}, I_E=0$			(-1)	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4\text{V}, I_C=0$			(-1)	μA
DC Current Gain	h_{FE1}	$V_{CE}=(-)2\text{V}, I_C=(-)0.5\text{A}$	70*		400*	
	h_{FE2}	$V_{CE}=(-)2\text{V}, I_C=(-)6\text{A}$	35			
Gain-Bandwidth Product	f_T	$V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$		(130)		MHz
				180		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		(95) 65		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)4\text{A}, I_B=(-)0.2\text{A}$		200	400	mV
				(-250)	(-500)	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)4\text{A}, I_B=(-)0.2\text{A}$		(-0.95)	(-1.3)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0$	(-60)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, R_{BE}=\infty$	(-50)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}, I_C=0$	(-6)			V
Turn-ON Time	t_{on}	See specified Test Circuit		(50)		ns
Storage Time	t_{stg}	See specified Test Circuit		(450)		ns
				500		ns
Fall Time	t_f	See specified Test Circuit		20		ns

* : The 2SB1204/2SD1804 are classified by 0.5A h_{FE} as follows :

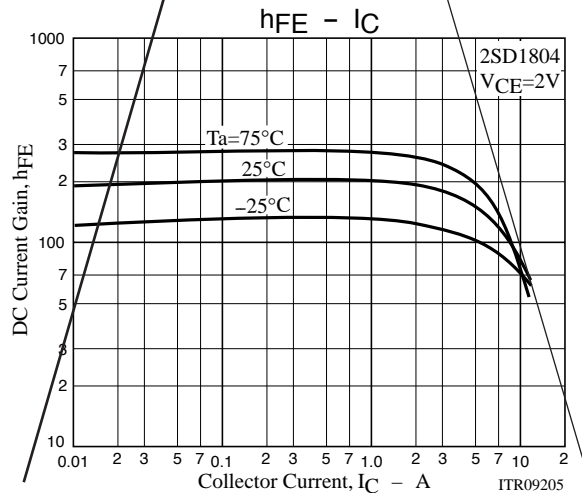
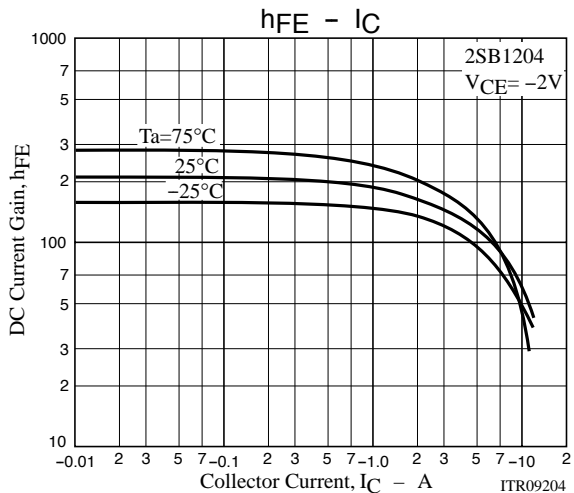
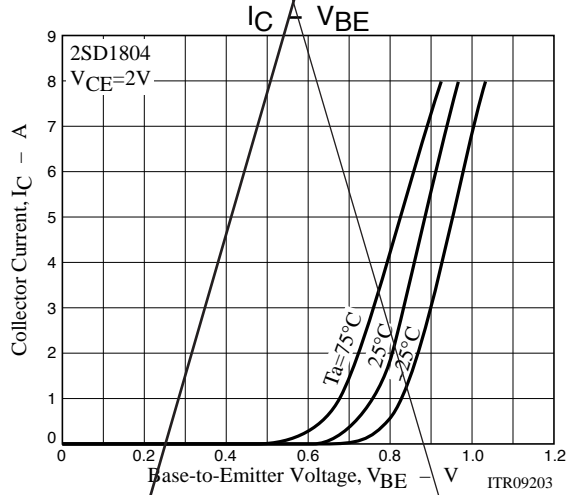
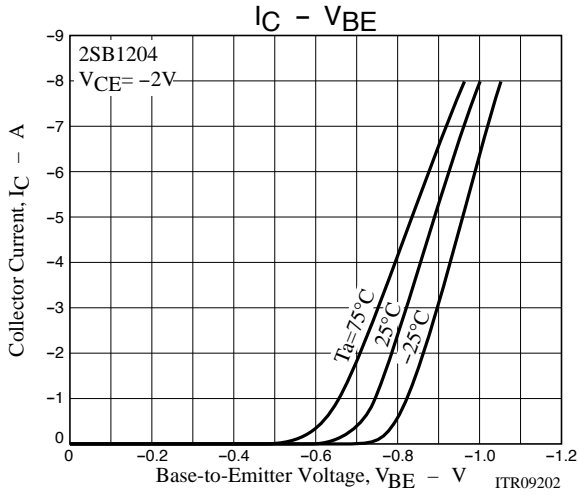
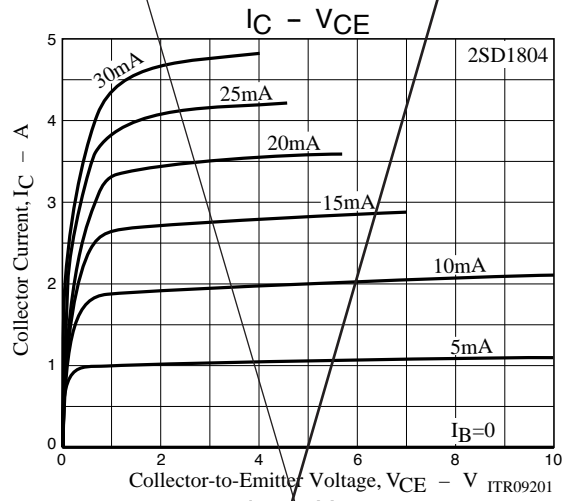
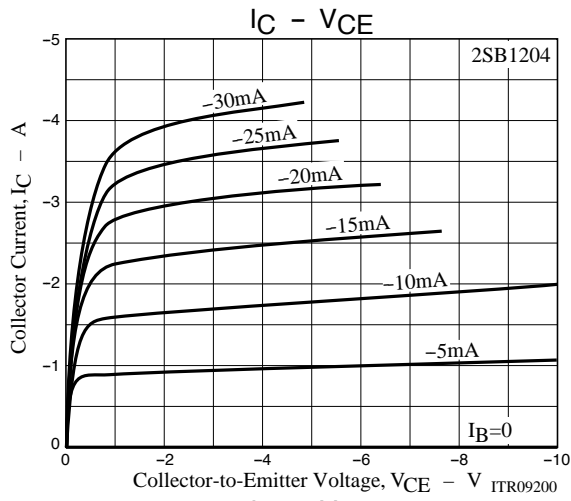
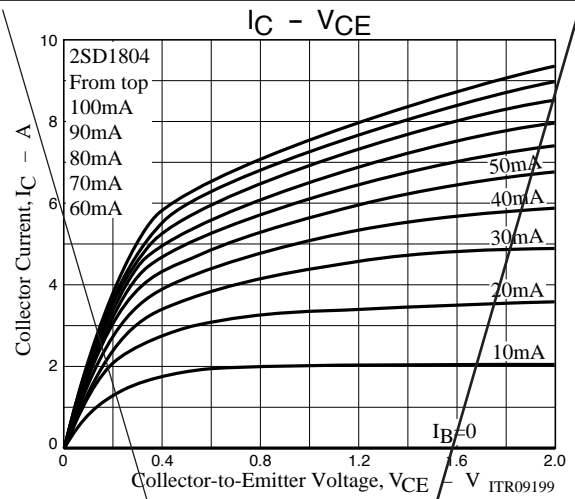
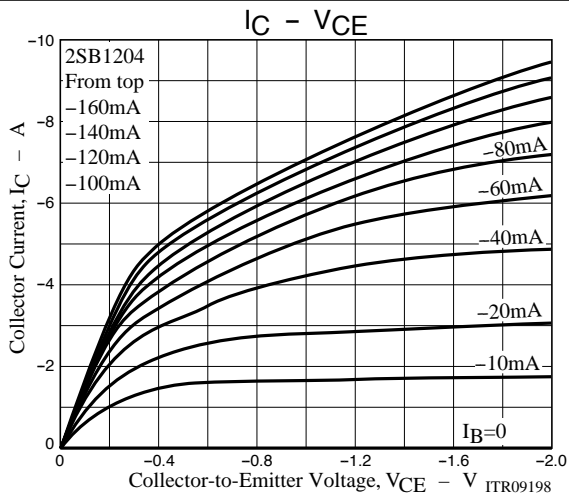
Rank	Q	R	S	T
h_{FE}	70 to 140	100 to 200	140 to 280	200 to 400

Switching Time Test Circuit

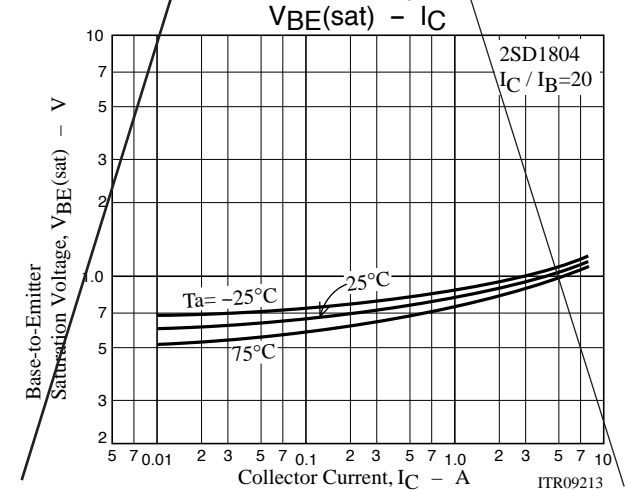
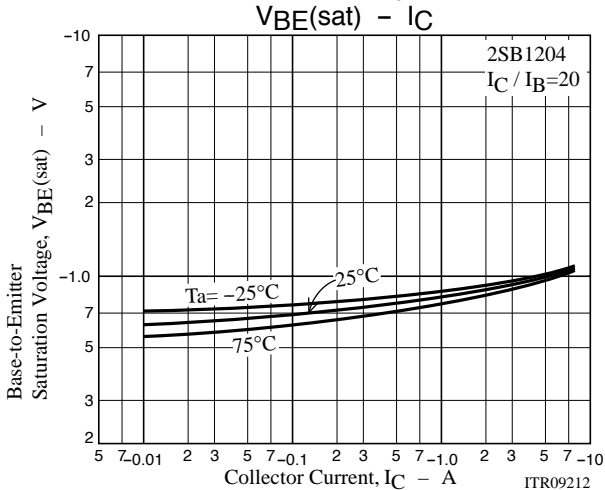
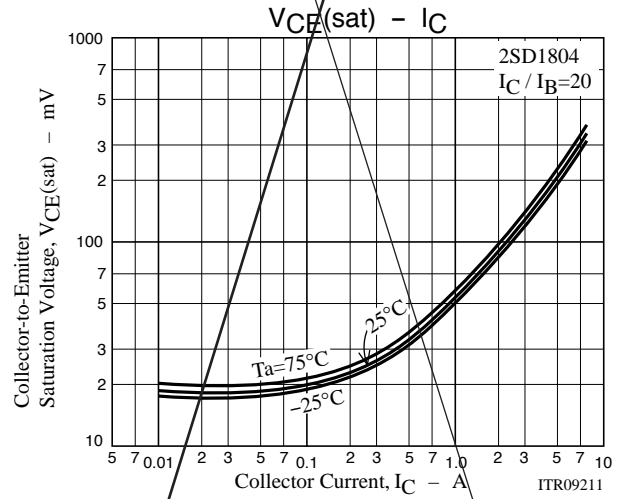
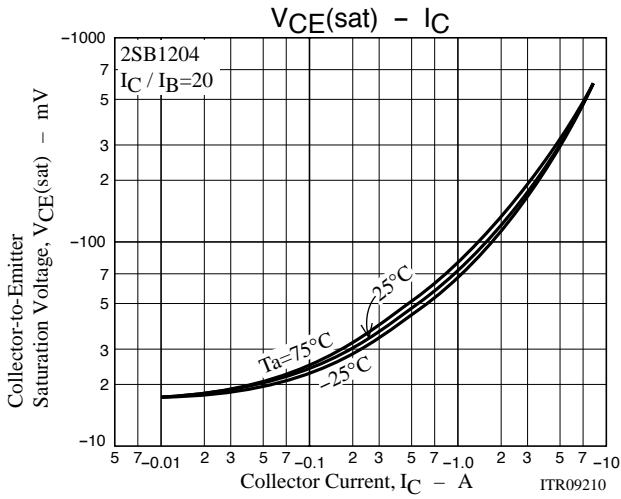
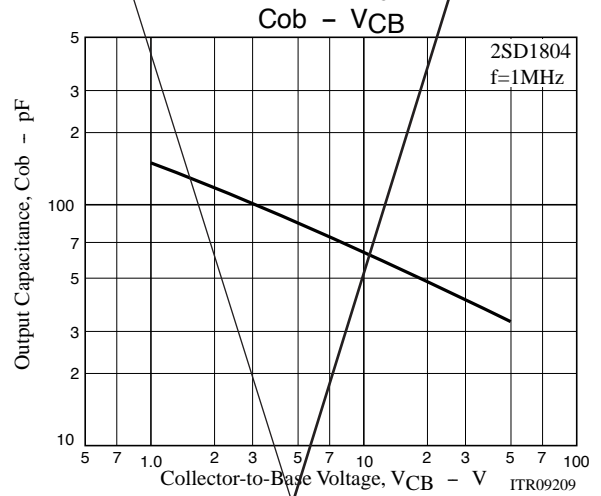
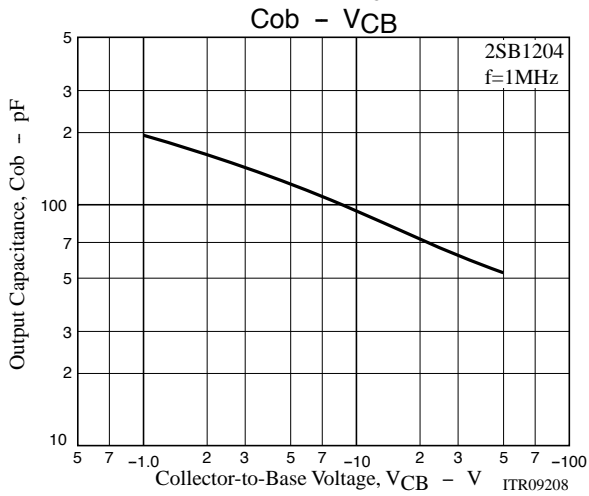
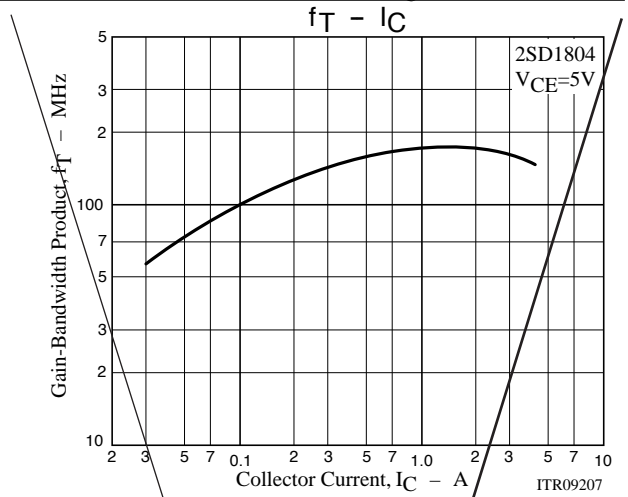
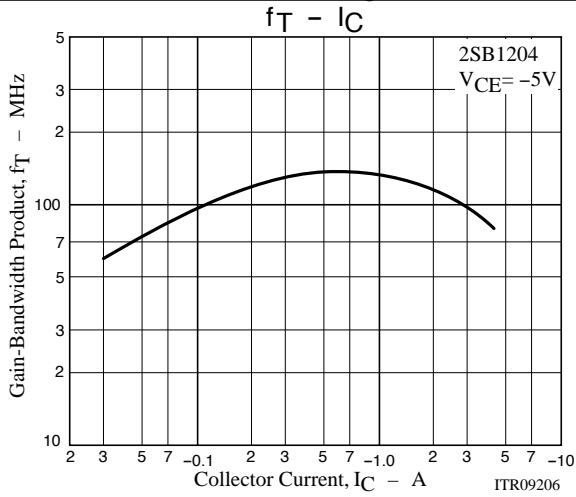


$I_C = 10I_{B1} = -10I_{B2} = 4\text{A}$
 (For PNP, the polarity is reversed.)

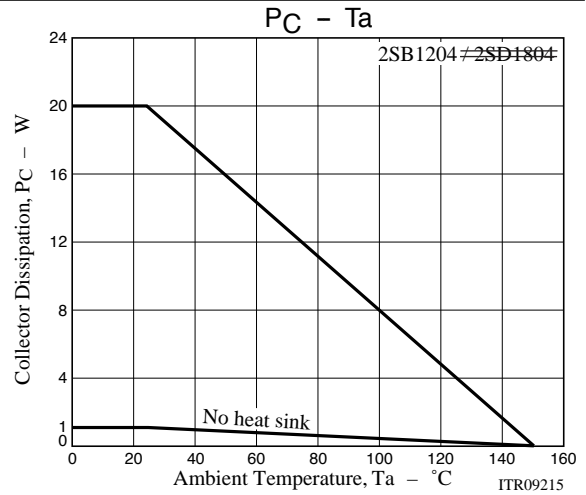
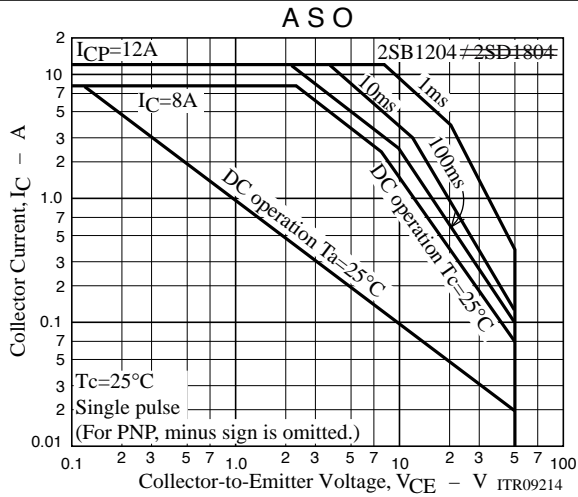
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