

# 2SB1203/2SD1803

## High-Current Switching Applications

### Applications

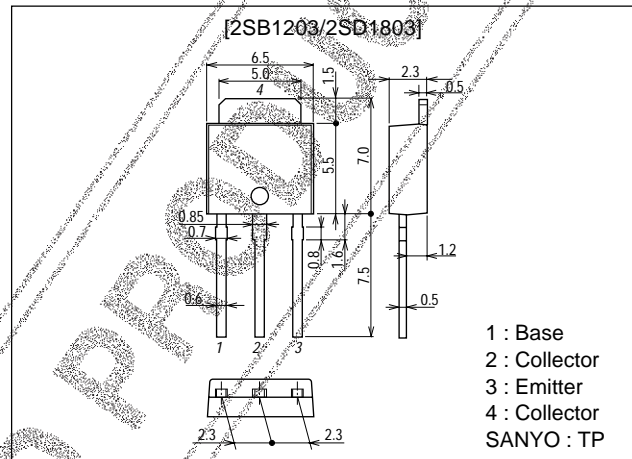
Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

### Features

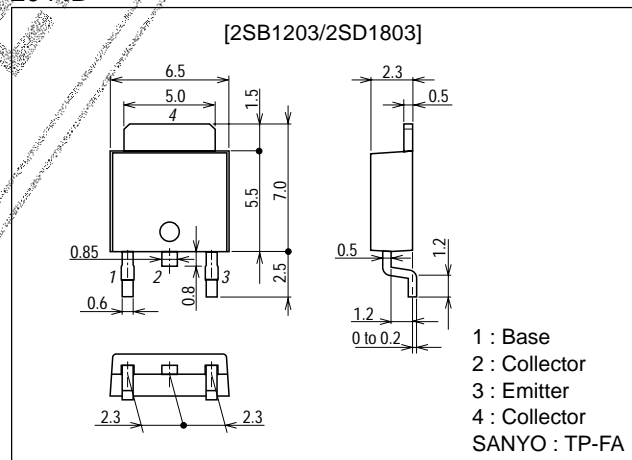
- Low collector-to-emitter saturation voltage.
- High current and high  $f_T$ .
- Excellent linearity of  $h_{FE}$ .
- Fast switching speed.
- Small and slim package making it easy to make 2SB1203/2SD1803-applied sets smaller.

### Package Dimensions

unit:mm  
2045B



unit:mm  
2044B



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**SANYO Electric Co., Ltd. Semiconductor Company**

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# 2SB1203/2SD1803

( ) : 2SB1203

## Specifications

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

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	$I_C$		(-)5	A
Collector Current (Pulse)	$I_{CP}$		(-)8	A
Collector Dissipation	$P_C$	$T_c=25\text{ }^\circ\text{C}$	1	W
			20	W
Junction Temperature	$T_J$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

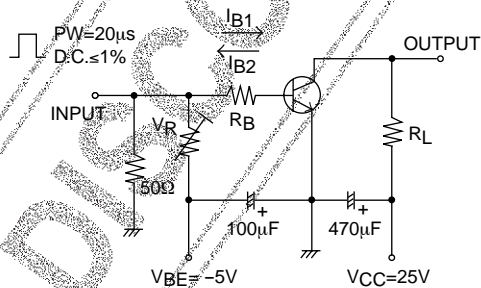
**Electrical Characteristics** at  $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)40\text{V}, I_E=0$			(-)1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)1	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)2\text{V}, I_C=(-)0.5\text{A}$	70*		400*	
	$h_{FE2}$	$V_{CE}=(-)2\text{V}, I_C=(-)4\text{A}$	35			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$		(130)		MHz
				180		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		(60)40		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)3\text{A}, I_B=(-)0.15\text{A}$		220	400	mV
				(-280)	(-550)	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)3\text{A}, I_B=(-)0.15\text{A}$		(-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	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, V_{BE}=0$	(-)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(50)		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(450)		ns
				500		ns
Fall Time	$t_f$	See specified Test Circuit.		(20)20		ns

\* : The 2SB1203/2SD1803 are classified by 0.5A  $h_{FE}$  as follows :

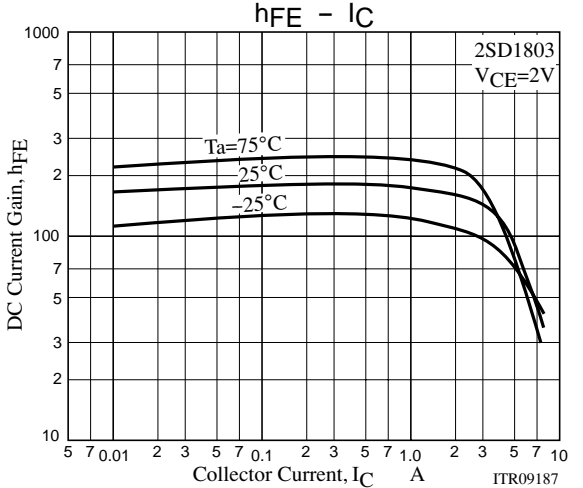
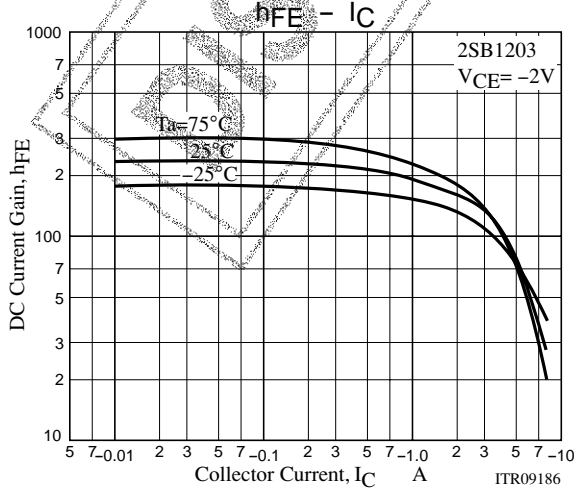
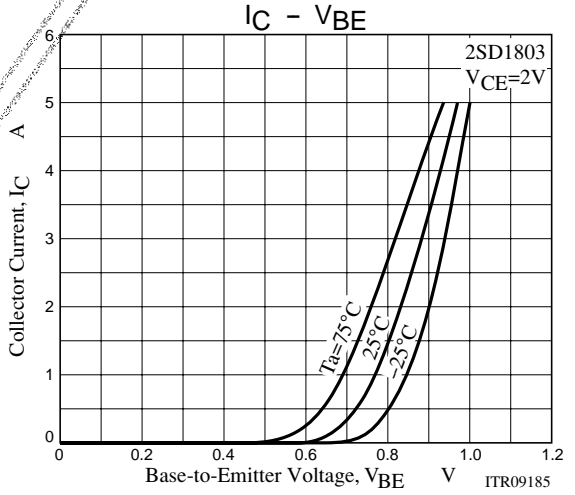
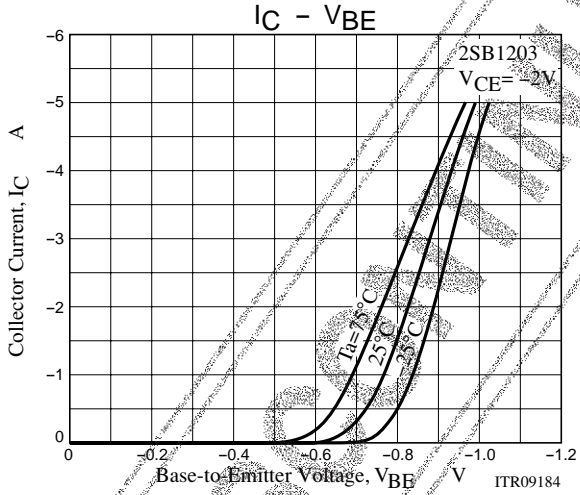
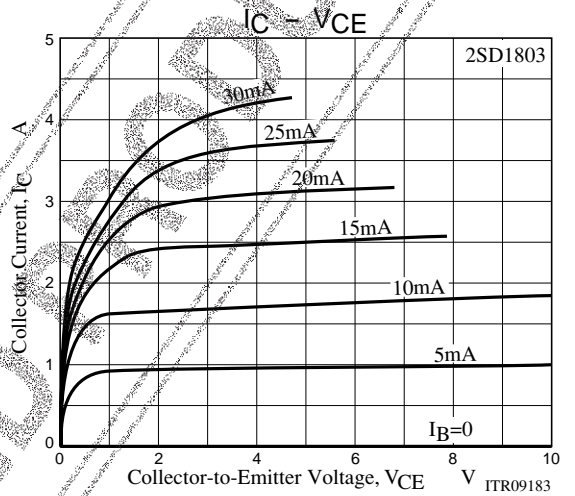
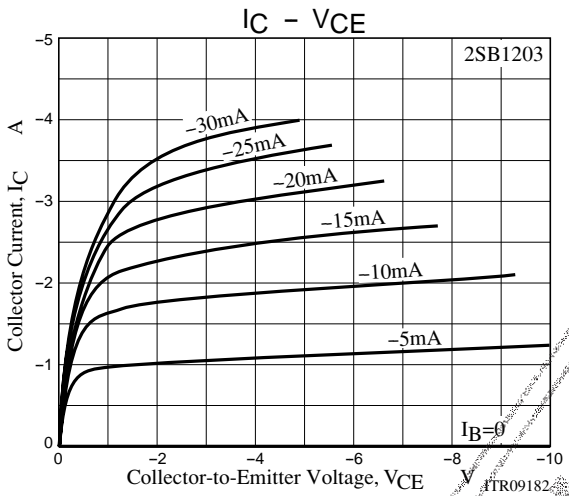
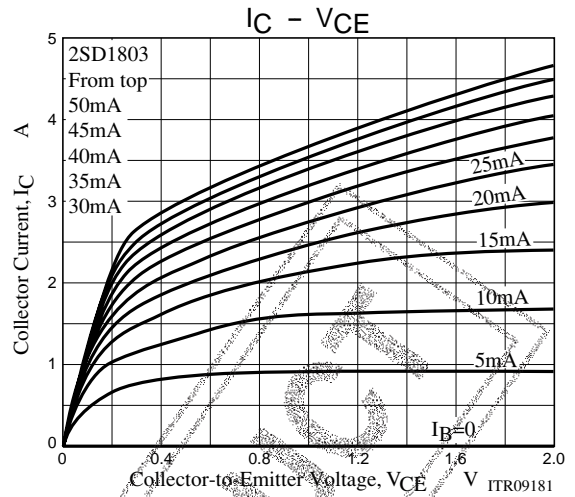
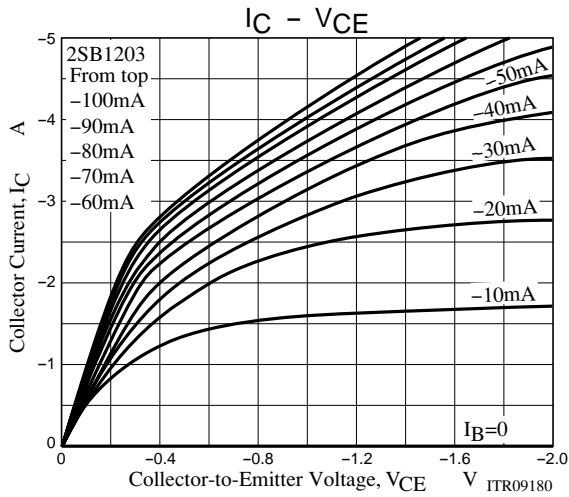
Rank	Q	R	S	T
$h_{FE}$	70 to 140	100 to 200	140 to 280	200 to 400

## Switching Time Test Circuit

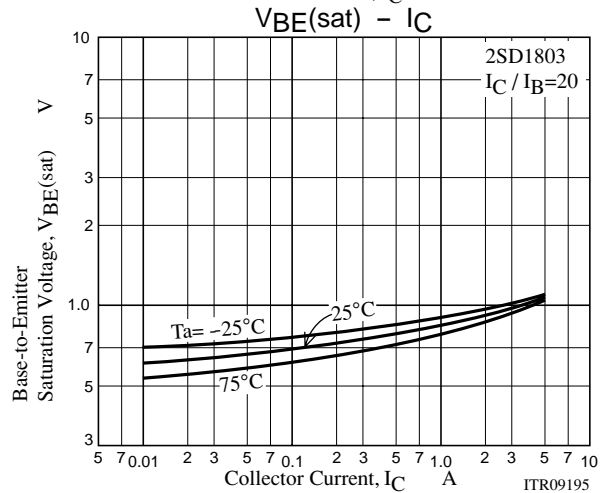
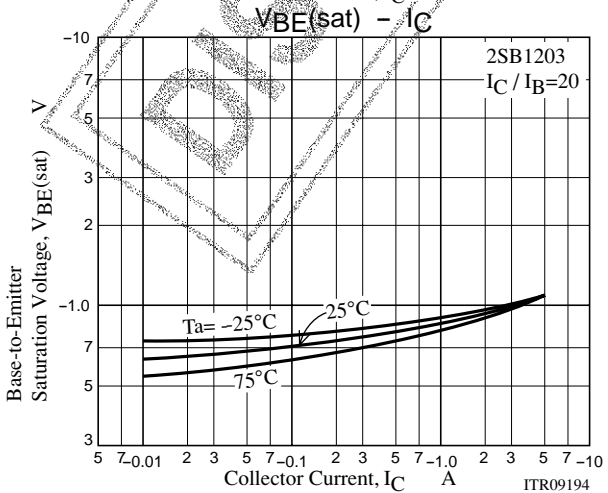
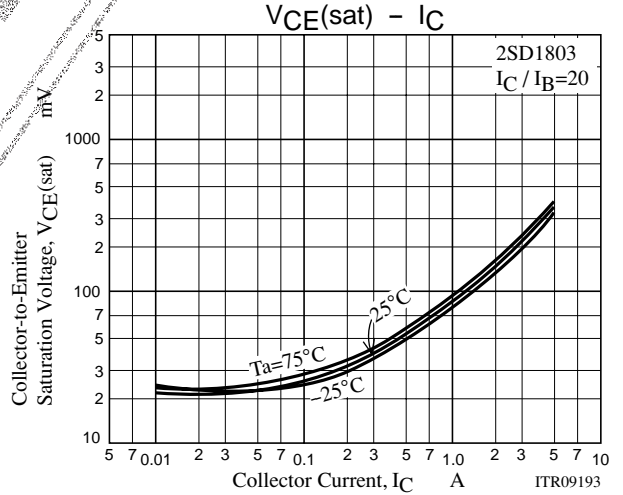
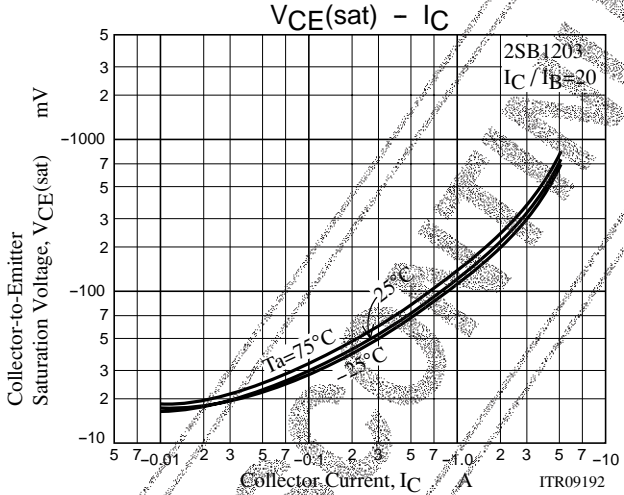
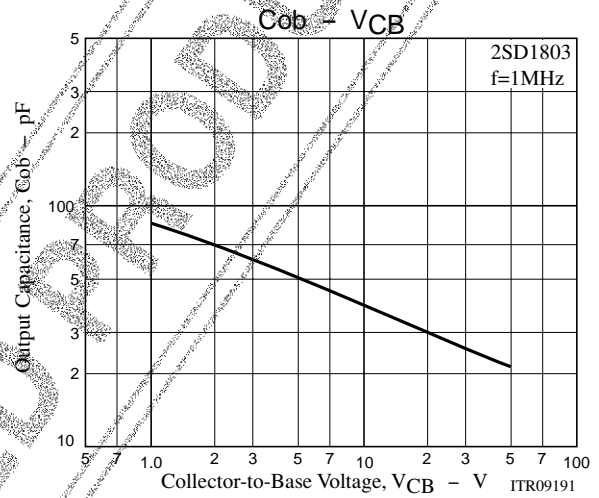
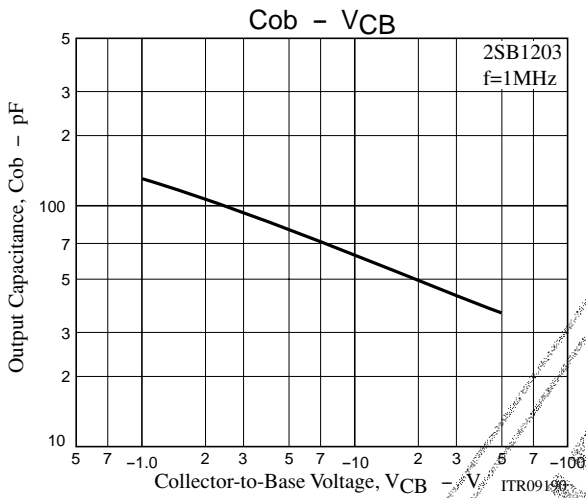
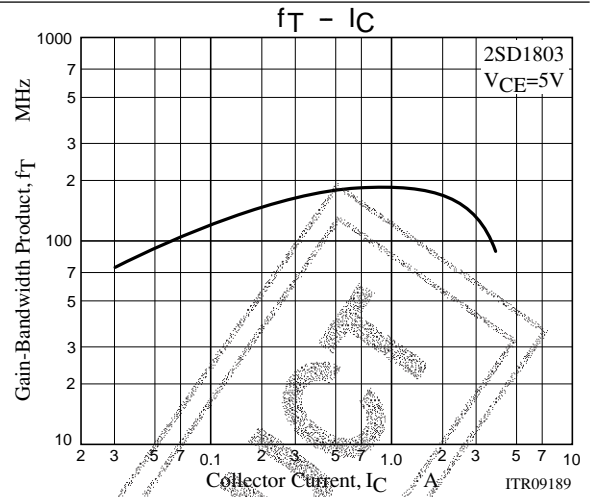
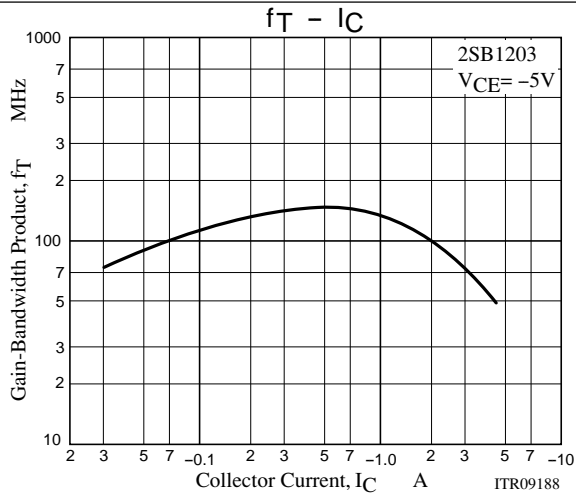


$I_C=10\text{mA}, I_B1=-10\text{mA}, I_B2=2\text{mA}$   
(For PNP, the polarity is reversed.)

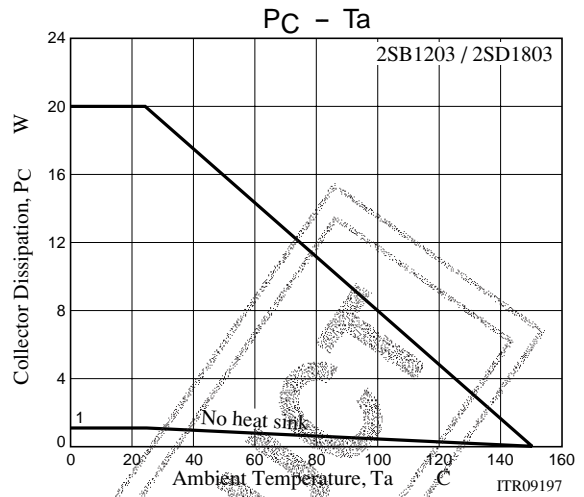
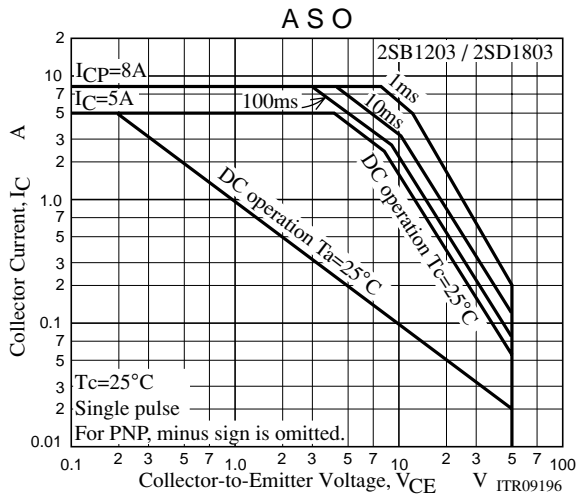
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