



# 2SB1215/2SD1815

## High-Current Switching Applications

### Applications

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

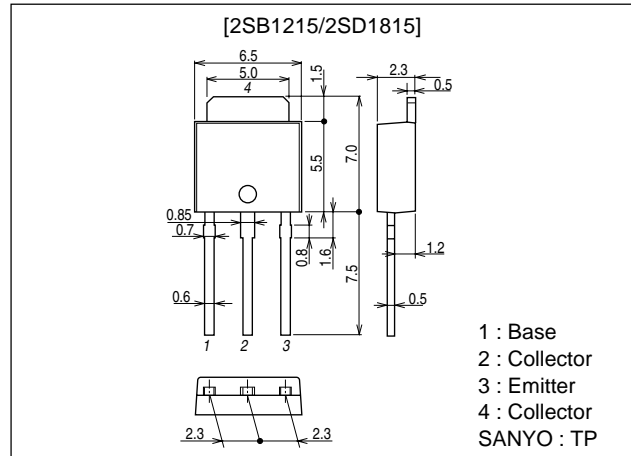
### Features

- Low collector-to-emitter saturation voltage.
- Excellent linearity of  $h_{FE}$ .
- Small-sized package permitting 2SB1215/2SD1815-applied sets to be made small and slim.
- High  $f_T$ .
- Fast switching time.

### Package Dimensions

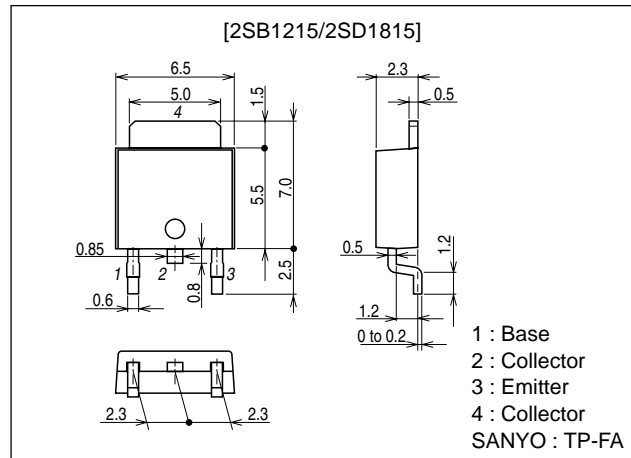
unit:mm

2045B



unit:mm

2044B



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# 2SB1215/2SD1815

( ) : 2SB1215

## Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-)120	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)100	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)3	A
Collector Current (Pulse)	$I_{CP}$		(-)6	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	$^\circ\text{C}$

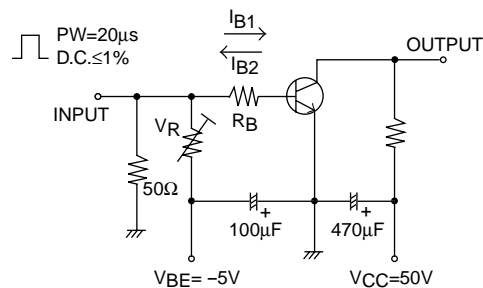
**Electrical Characteristics** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)100\text{V}, I_E=0$			(-)1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)1	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)0.5\text{A}$	70*		400*	
	$h_{FE2}$	$V_{CE}=(-)5\text{V}, I_C=(-)2\text{A}$	40			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)0.5\text{A}$		(130)		MHz
				180		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		(40)25		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)1.5\text{A}, I_B=(-)0.15\text{A}$		150	400	mV
				(-200)	(-500)	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)1.5\text{A}, I_B=(-)0.15\text{A}$		(-)0.9	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}, I_E=0$	(-)120			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}, R_{BE}=\infty$	(-)100			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		100		ns
Storage Time	$t_{stg}$	See specified Test Circuit		(800)		ns
				900		ns
Fall Time	$t_f$	See specified Test Circuit		50		ns

\* : The 2SB1215/2SD1815 are classified by 100mA  $h_{FE}$  as follows :

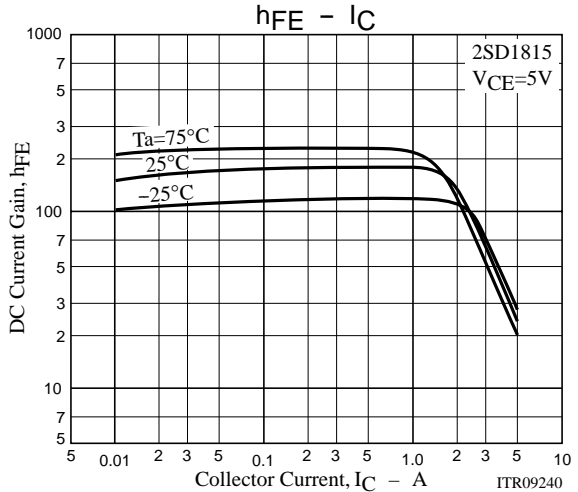
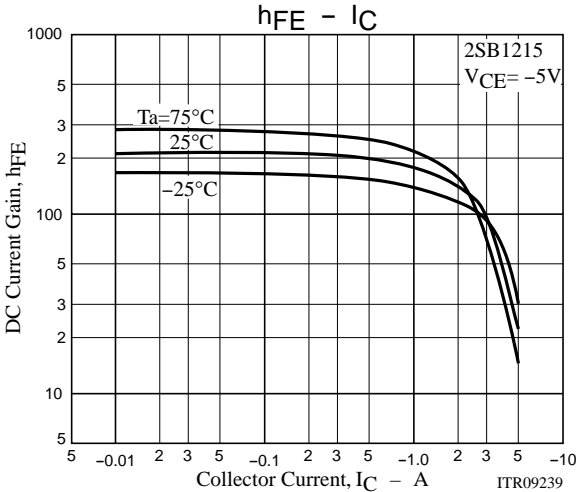
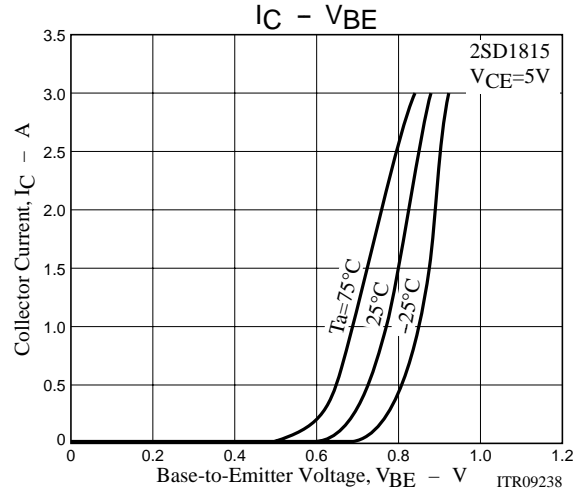
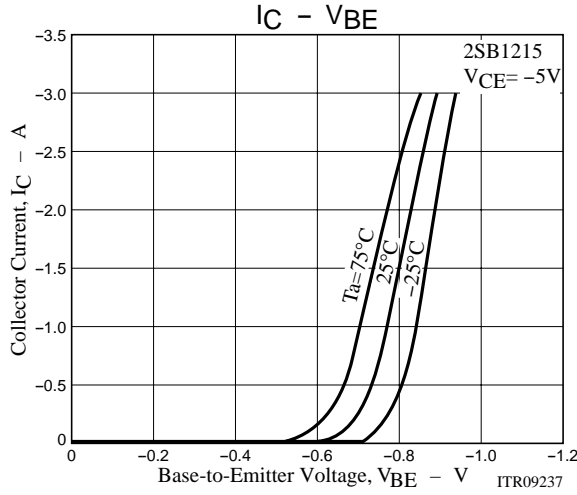
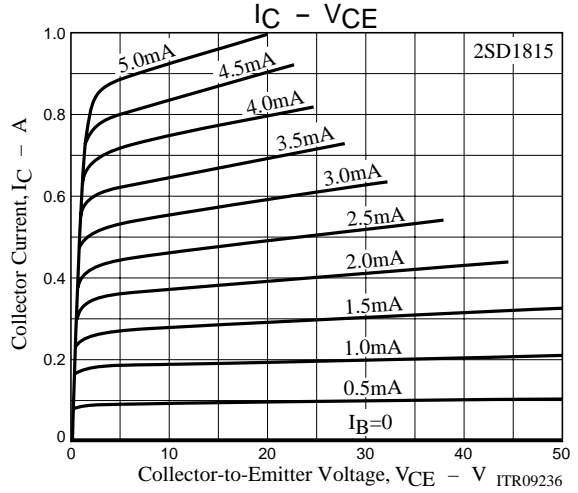
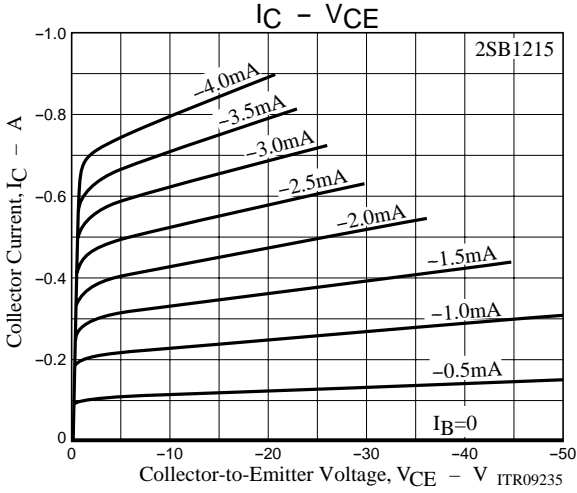
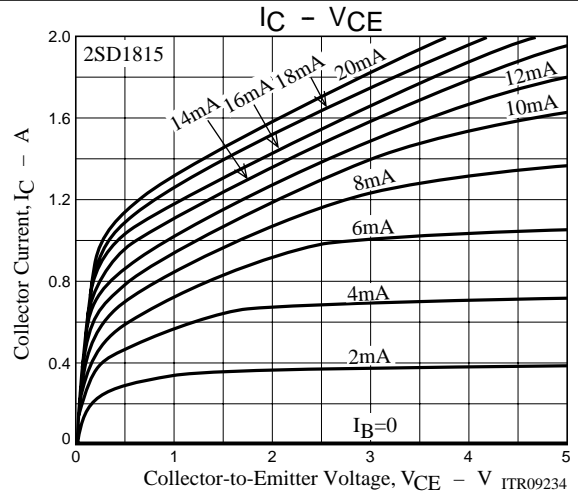
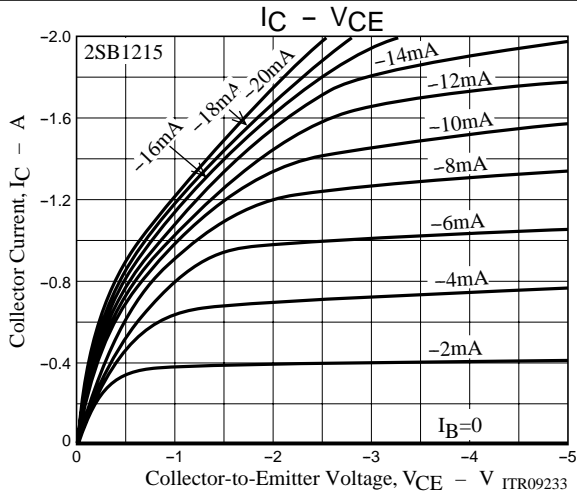
Rank	Q	R	S	T
$h_{FE}$	70 to 140	100 to 200	140 to 280	200 to 400

## Switching Time Test Circuit

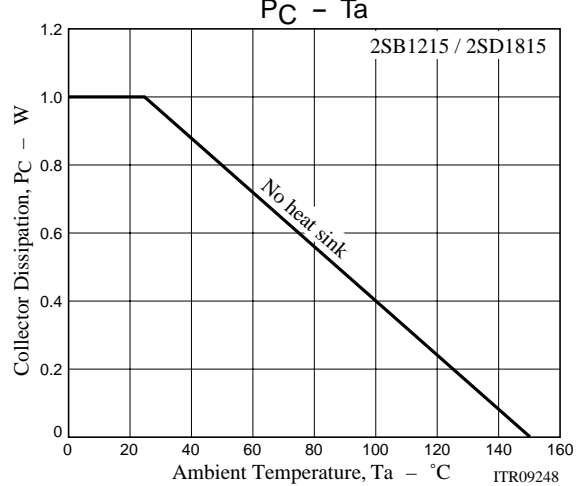
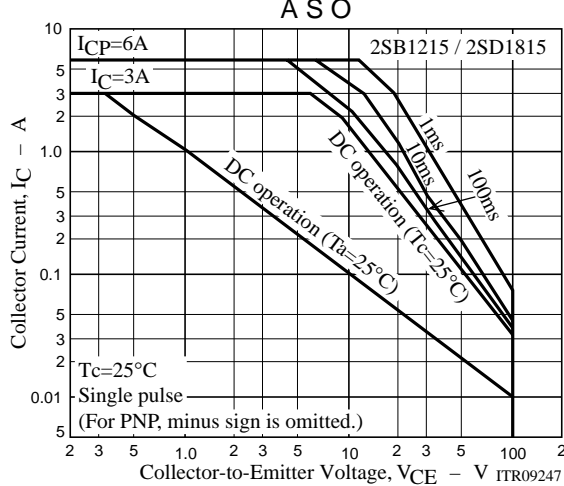
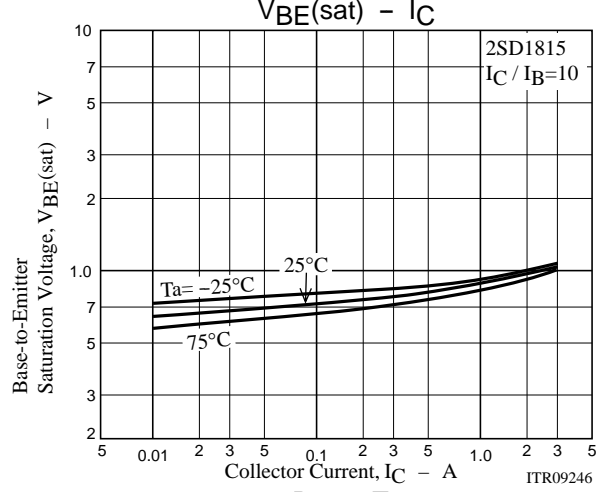
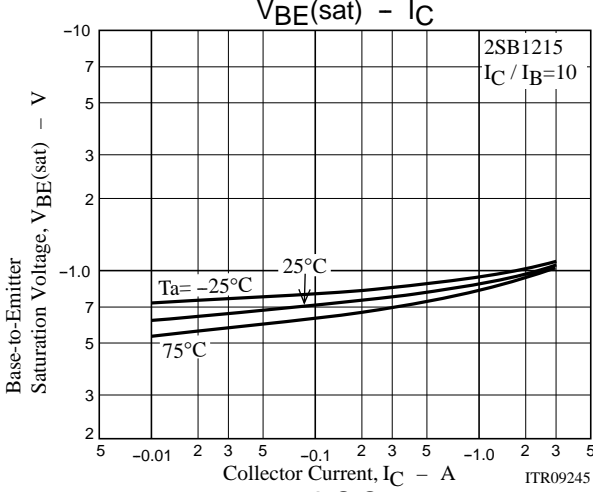
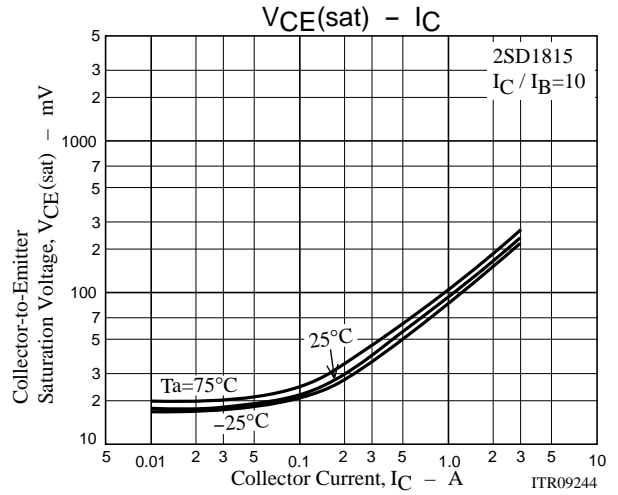
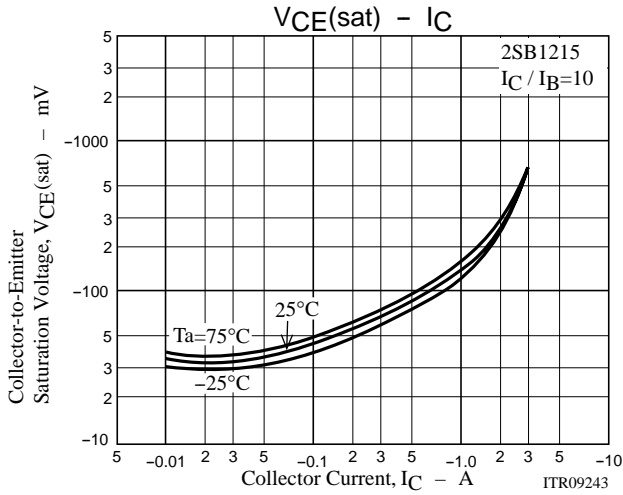
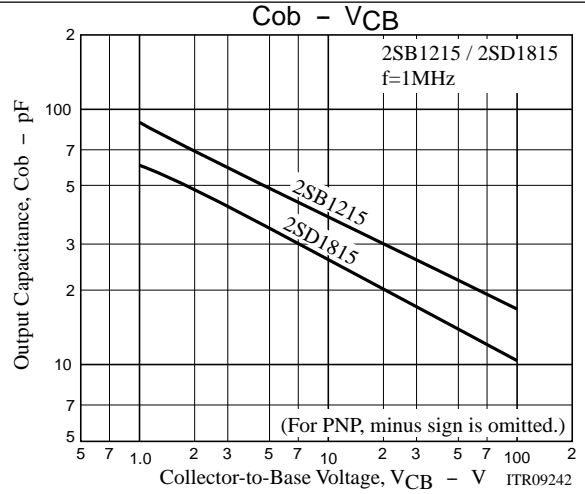
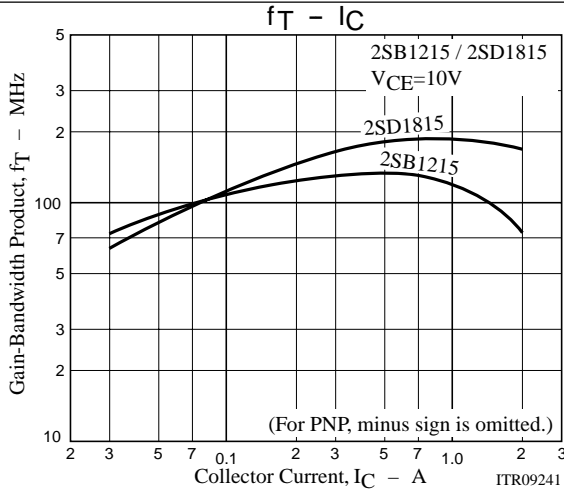


$I_C=10I_{B1} = -10I_{B2}=1.5\text{A}$   
 (For PNP, the polarity is reversed.)

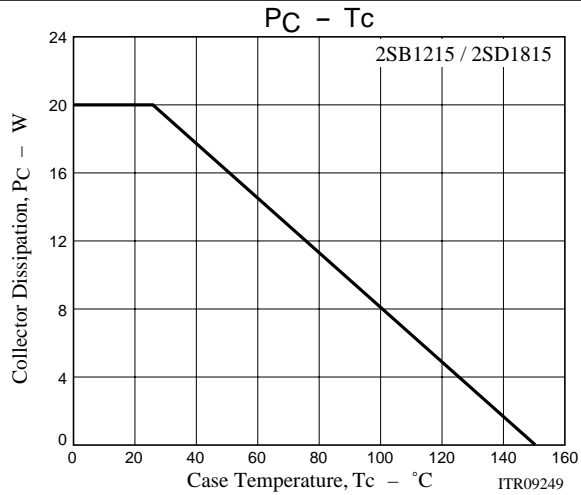
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