Ordering number:EN2539B

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1215/2SD1815

High-Current Switching Applications

Applications

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

Features

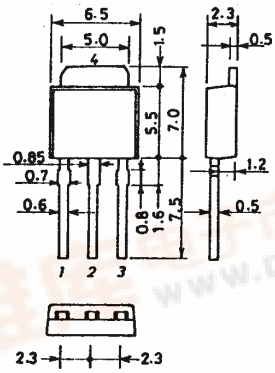
· Low collector-to-emitter saturation voltage.
· Excllent linearity of h_{FE}.
· Small-sized package permitting 2SB1215/2SD1815-applied sets to be made small and slim.
· High f_T.
· Fast switching time.

Package Dimensions

unit:mm

2045B

[2SB1215/2SD1815]



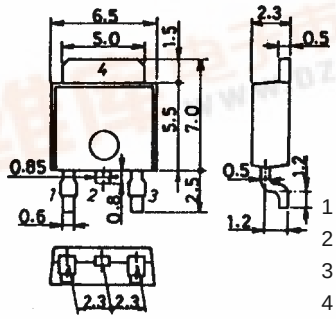
1 : Base
2 : Collector
3 : Emitter
4 : Collector

SANYO : TP

unit:mm

2044B

[2SB1215/2SD1815]



1 : Base
2 : Collector
3 : Emitter
4 : Collector

SANYO : TP-FA

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

( ) : 2SB1215

Specifications

Absolute Maximum Ratings at Ta = 25˚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
		Tc=25˚C	20	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

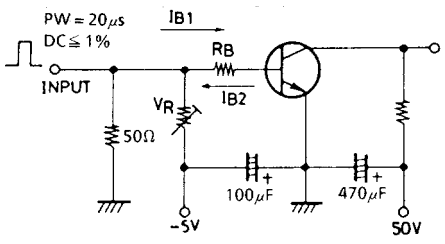
Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)100V, I_E=0			(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)5V, I_C=(–)0.5A	70*		400*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)2A	40			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)0.5A		(130)		MHz
				180		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(40)25		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)1.5A, I_B=(–)0.15A		150	400	mV
				(–200)	(–500)	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)1.5A, I_B=(–)0.15A		(–)0.9	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)120			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)100			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, 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 :

70	Q	140	100	R	200	140	S	280	200	T	400

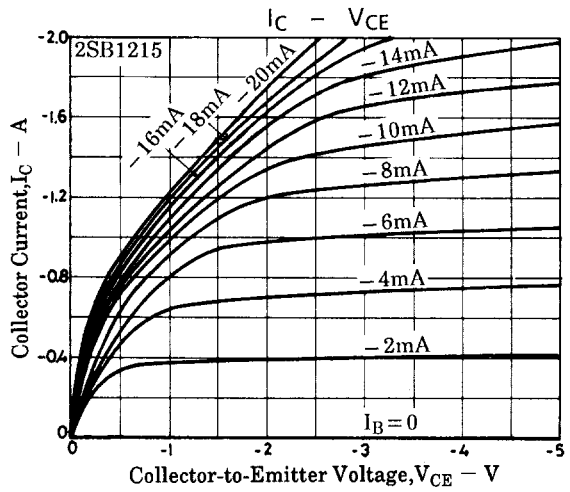
Switching Time Test Circuit

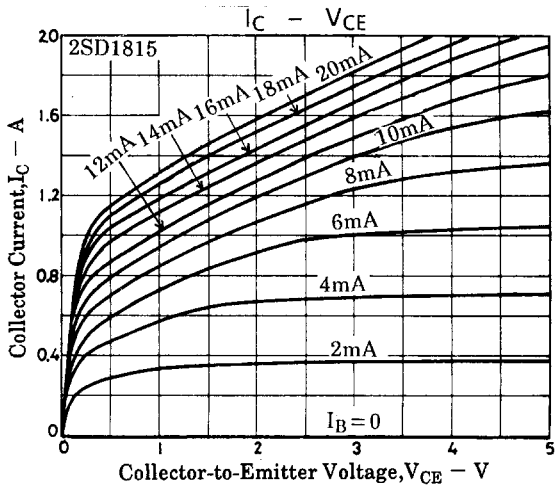


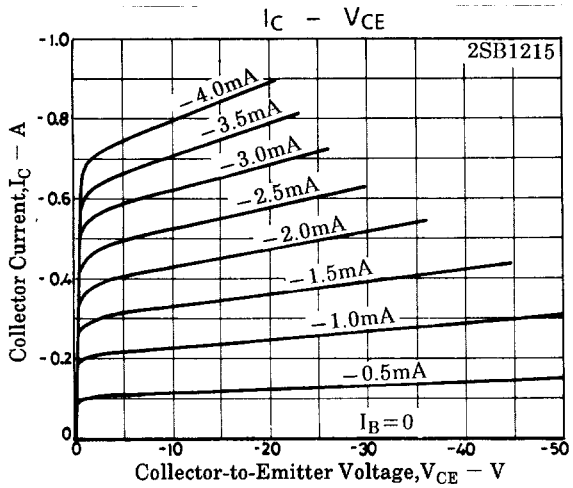
$I_C = 10I_{B1} = -10I_{B2} = 1.5A$

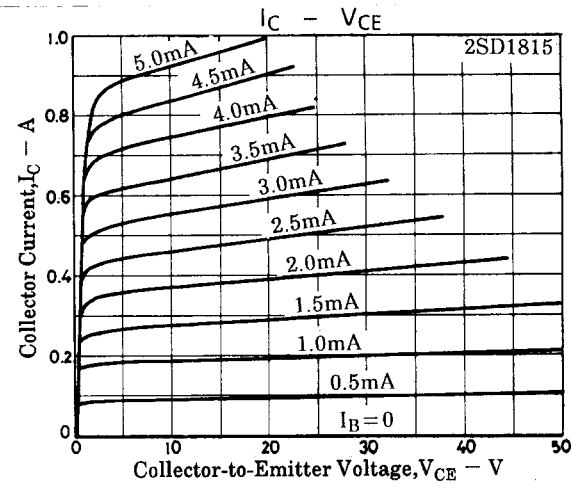
(For PNP, the polarity is reversed.)

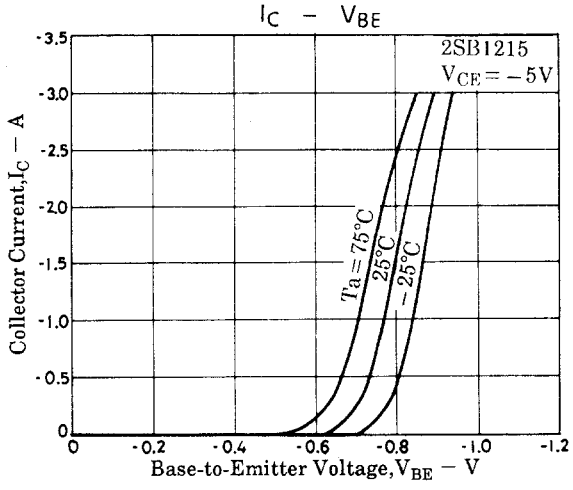
Unit (resistance : Ω, capacitance : F)

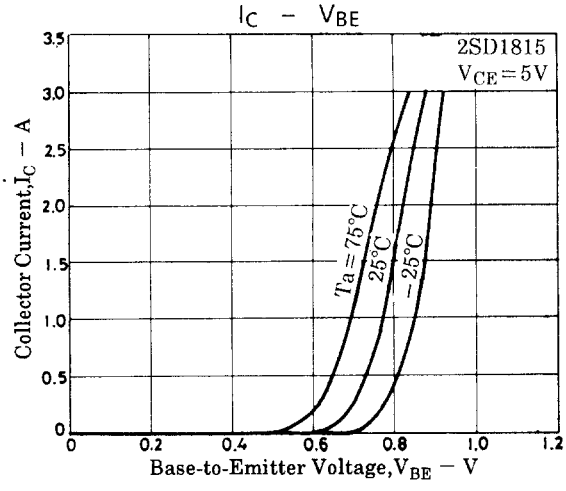

I_C – V_{CE}
2SB1215
–14mA
–12mA
–10mA
–8mA
–6mA
–4mA
–2mA
–16mA
–18mA
–20mA
I_B=0
Collector Current,I_C – A
Collector-to-Emitter Voltage,V_{CE} – V

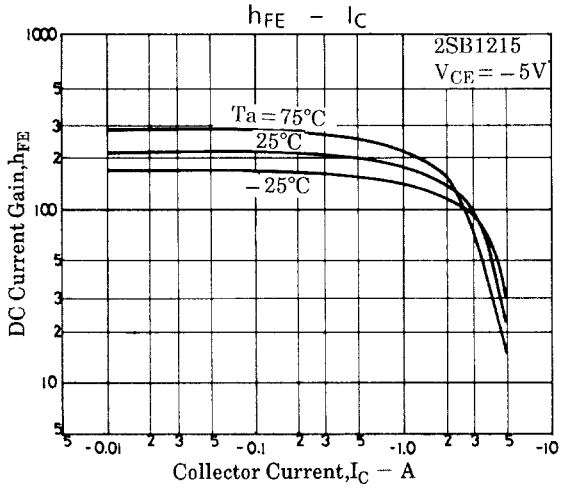

I_C – V_{CE}
2SD1815
12mA
14mA
16mA
18mA
20mA
10mA
8mA
6mA
4mA
2mA
I_B=0
Collector Current,I_C – A
Collector-to-Emitter Voltage,V_{CE} – V

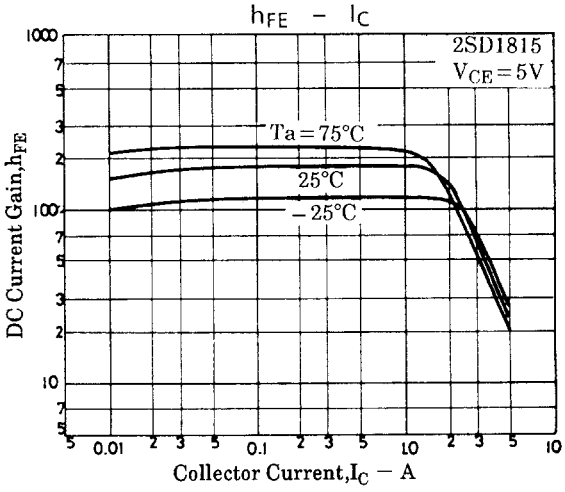

I_C – V_{CE}
2SB1215
–4.0mA
–3.5mA
–3.0mA
–2.5mA
–2.0mA
–1.5mA
–1.0mA
–0.5mA
I_B=0
Collector Current,I_C – A
Collector-to-Emitter Voltage,V_{CE} – V


I_C – V_{CE}
2SD1815
5.0mA
4.5mA
4.0mA
3.5mA
3.0mA
2.5mA
2.0mA
1.5mA
1.0mA
0.5mA
I_B=0
Collector Current,I_C – A
Collector-to-Emitter Voltage,V_{CE} – V

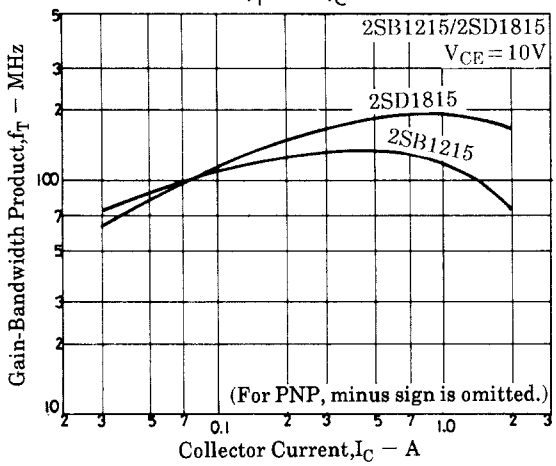

I_C – V_{BE}
2SB1215
V_{CE}=–5V
Ta=75°C
25°C
–25°C
Collector Current,I_C – A
Base-to-Emitter Voltage,V_{BE} – V


I_C – V_{BE}
2SD1815
V_{CE}=5V
Ta=75°C
25°C
–25°C
Collector Current,I_C – A
Base-to-Emitter Voltage,V_{BE} – V

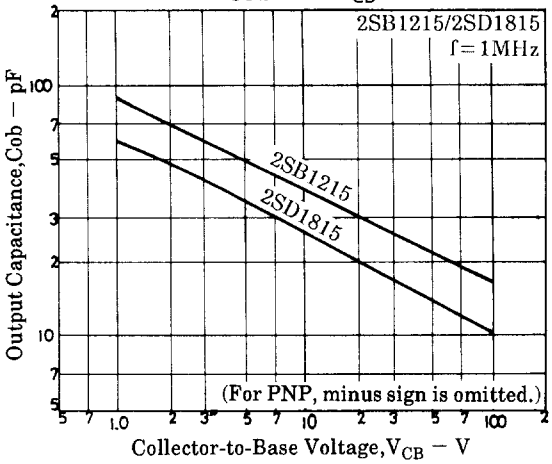

h_{FE} – I_C
2SB1215
V_{CE}=–5V
Ta=75°C
25°C
–25°C
DC Current Gain,h_{FE}
Collector Current,I_C – A


h_{FE} – I_C
2SD1815
V_{CE}=5V
Ta=75°C
25°C
–25°C
DC Current Gain,h_{FE}
Collector Current,I_C – A

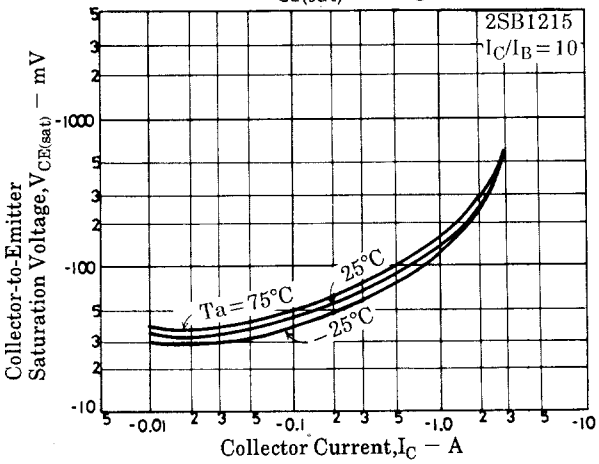
f_T – I_C



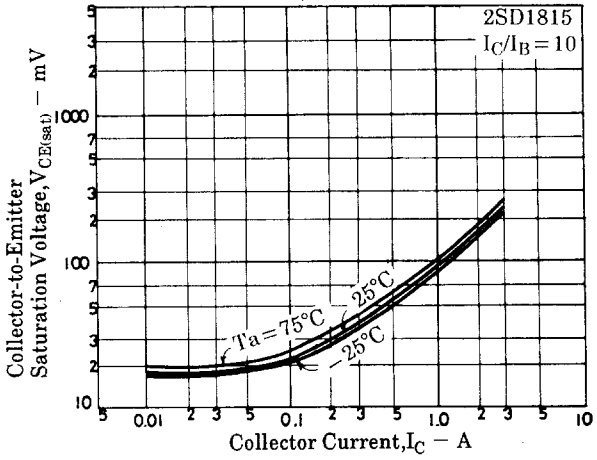
Cob – V_{CB}



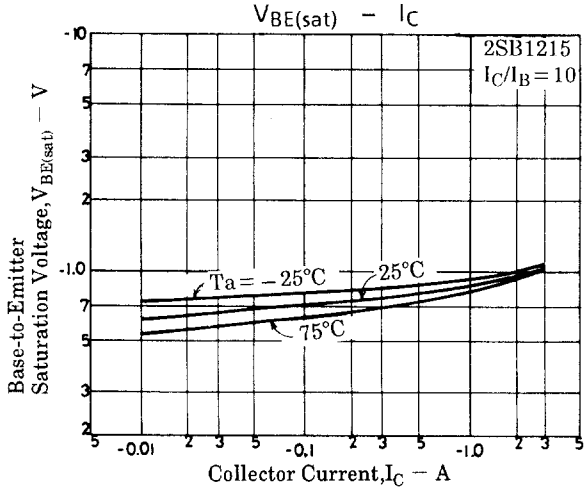
$V_{CE(sat)}$ – I_C



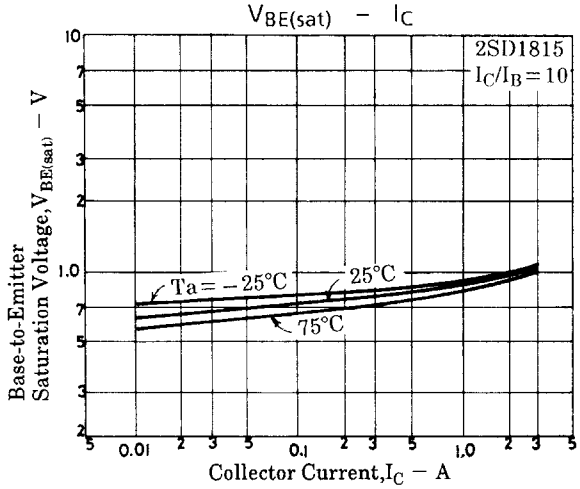
$V_{CE(sat)}$ – I_C



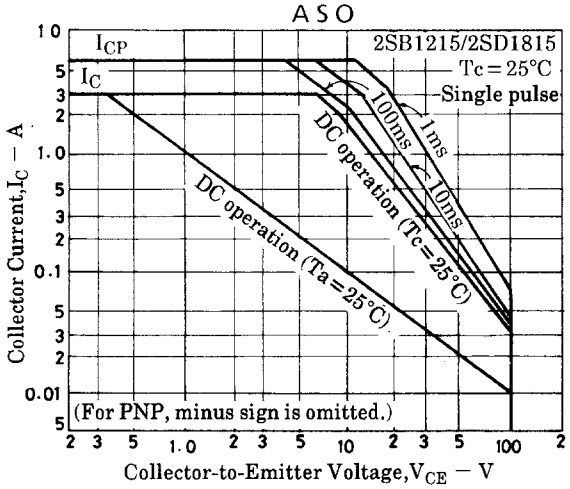
$V_{BE(sat)}$ – I_C



$V_{BE(sat)}$ – I_C



ASO



P_C – Ta