Ordering number:EN3715

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1509/2SD2282

High-Current Switching Applications

Applications

· Relay drivers, high-speed inverters, converters.

Features

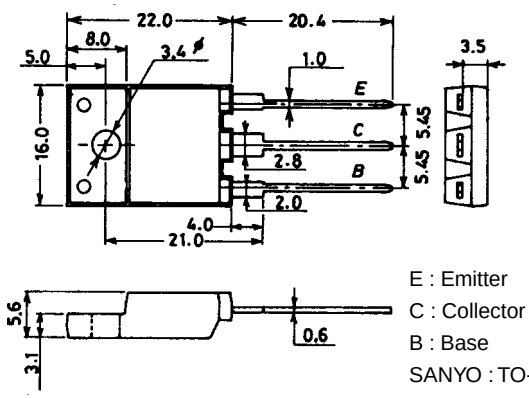
· Low collector-to-emitter saturation voltage : $V_{CE(sat)}$=–0.5V max.
· Wide ASO and highly registant to breakdown.
· Micaless package facilitating easy mounting.

Package Dimensions

unit:mm

2039A

[2SB1509/2SD2282]



E : Emitter
C : Collector
B : Base
SANYO : TO-3PML

( ) : 2SB1509

Specifications

Absolute Maximum Ratings at Ta = 25˚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		(–)15	A
Collector Current (Pulse)	I_{CP}		(–)30	A
Collector Dissipation	P_C		3.0	W
		Tc=25˚C	50	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}=(–)40V, I_E=0			0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			0.1	mA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)2V, I_C=(–)1A	70*		280*	
	$h_{FE}2$	V_{CE}=(–)2V, I_C=(–)8A	30			
Gain-Bandwidth Product	f_T	V_{CE}=(–)5V, I_C=(–)1A		20		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)8A, I_B=(–)0.4A		(–0.26)	(–0.5)	V
				0.18	0.4	V

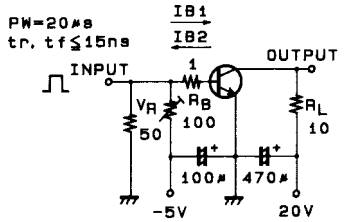
* : The 2SB1509/2SD2282 are classified by 1A h_{FE} as follows :

70	Q	140	100	R	200	140	S	280

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)1mA, I_E=0	(–)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)1mA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified test circuit.		0.2		μs
Storage Time	t_{stg}	See specified test circuit.		(0.5)		μs
				1.0		μs
Fall Time	t_f	See specified test circuit.		0.1		μs

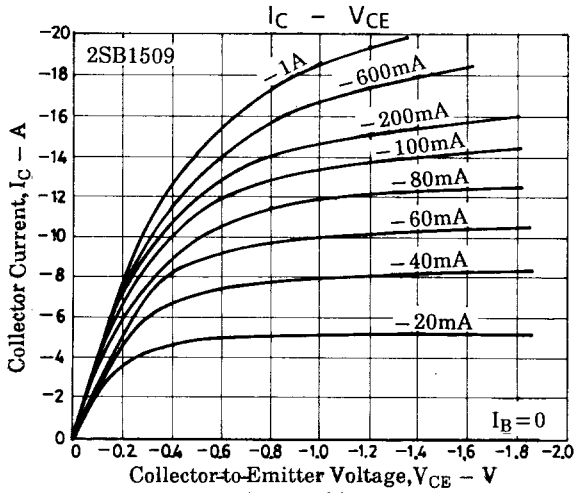
Switching Time Test Circuit

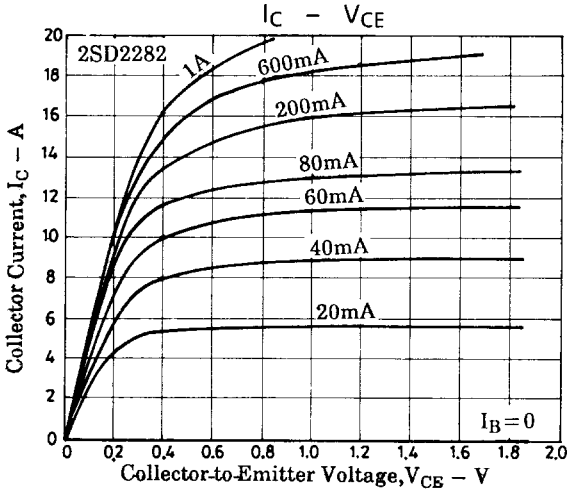


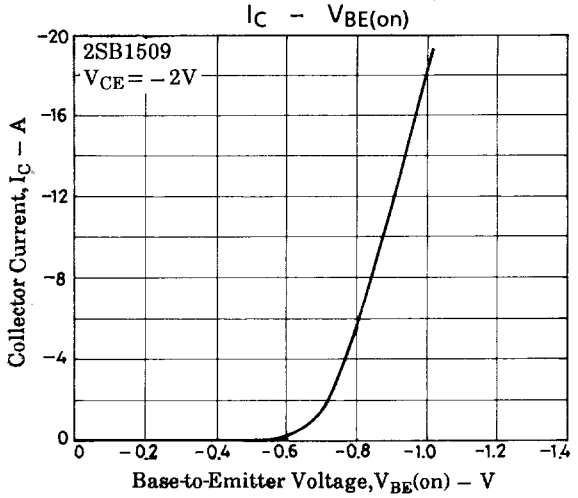
$10I_B1 = -10I_B2 = I_C = 2A$

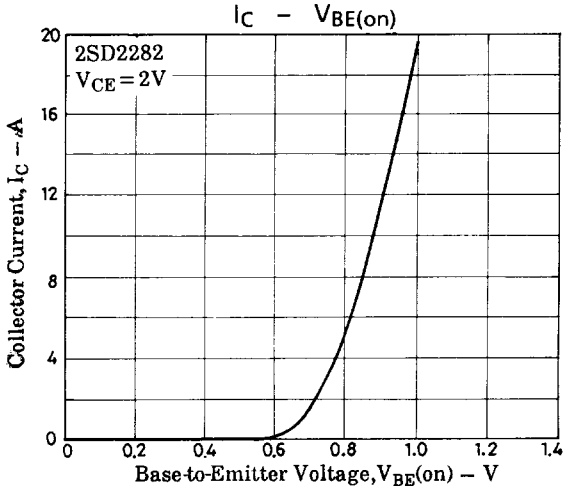
(For PNP, the polarity is reversed.)

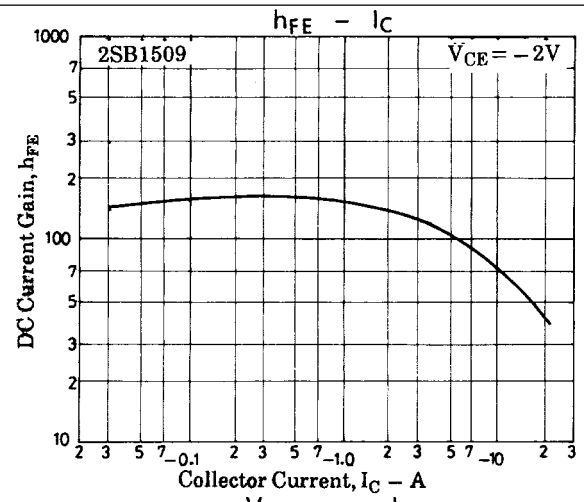
Unit (resistance : Ω, capacitance : F)

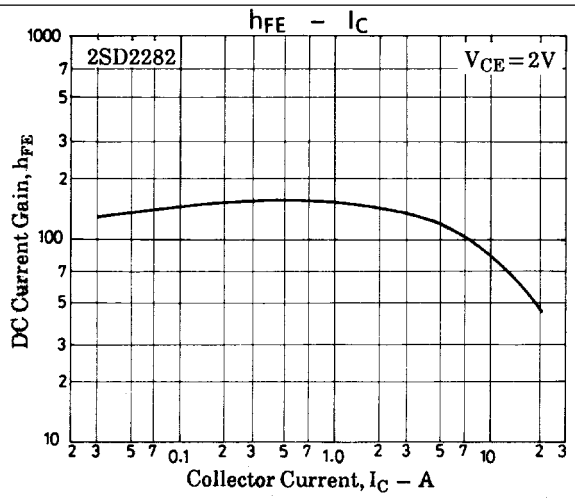


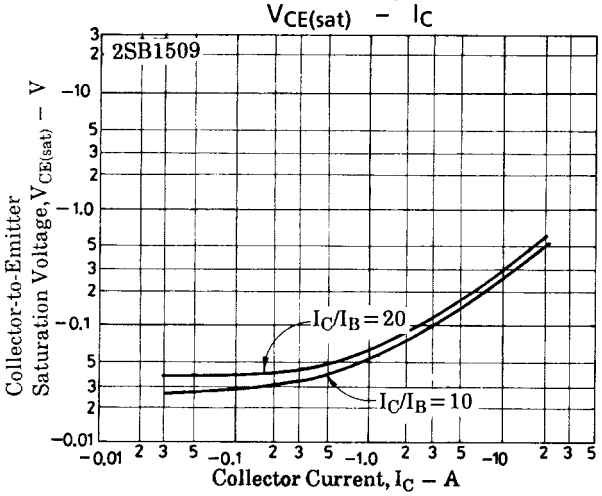


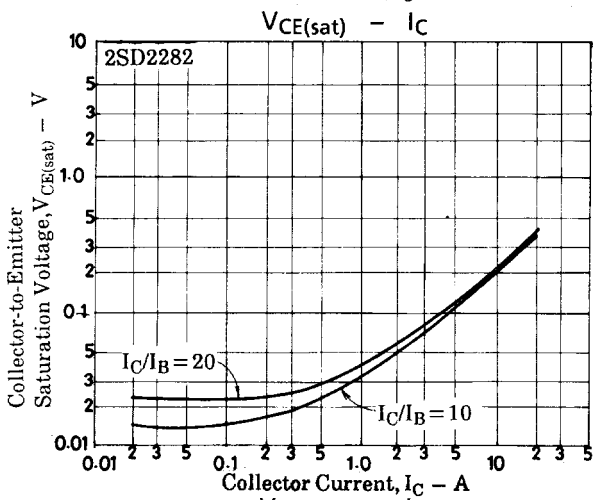


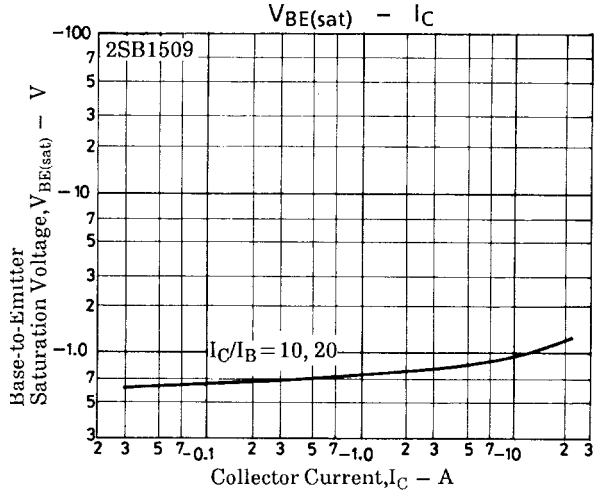


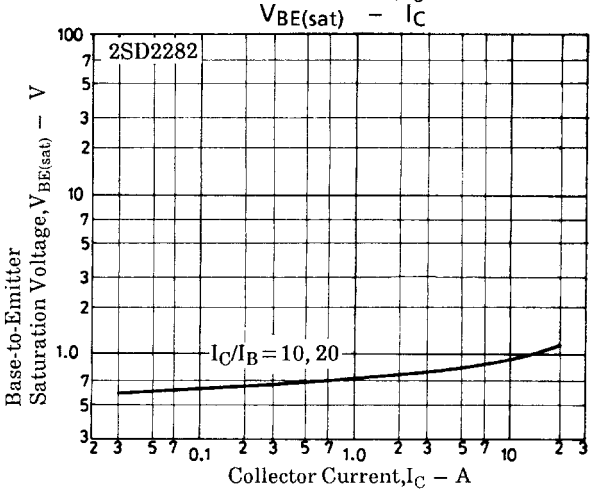

hFE – IC
2SB1509
VCE = –2V
DC Current Gain, hFE
Collector Current, IC – A

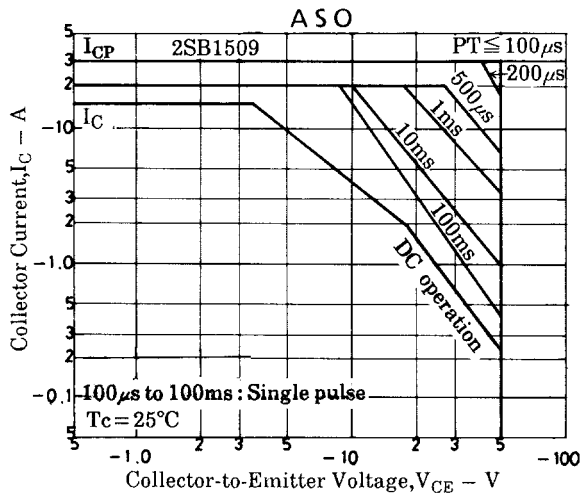

hFE – IC
2SD2282
VCE = 2V
DC Current Gain, hFE
Collector Current, IC – A

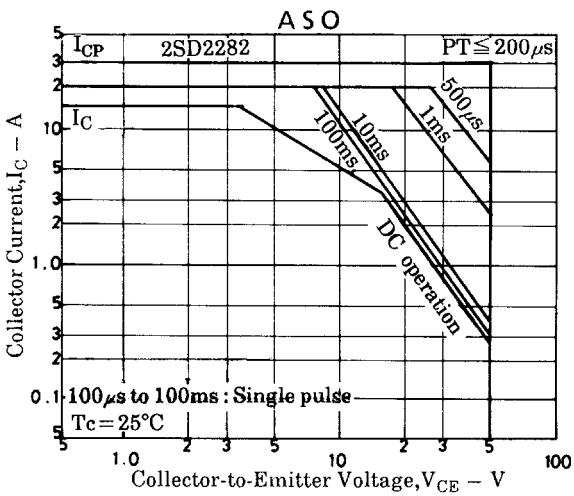

VCE(sat) – IC
2SB1509
IC/IB = 20
IC/IB = 10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A


VCE(sat) – IC
2SD2282
IC/IB = 20
IC/IB = 10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A


VBE(sat) – IC
2SB1509
IC/IB = 10, 20
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A


VBE(sat) – IC
2SD2282
IC/IB = 10, 20
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A


ASO
ICP
2SB1509
PT≦100μs
200μs
500μs
1ms
10ms
100ms
DC operation
IC
100μs to 100ms : Single pulse
Tc = 25°C
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V


ASO
ICP
2SD2282
PT≦200μs
500μs
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10ms
100ms
DC operation
IC
100μs to 100ms : Single pulse
Tc = 25°C
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V