Ordering number:EN3713

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1507/2SD2280

50V/7A High-Current Switching Applications

Applications

· Relay drivers, high-speed inverters, converters.

Features

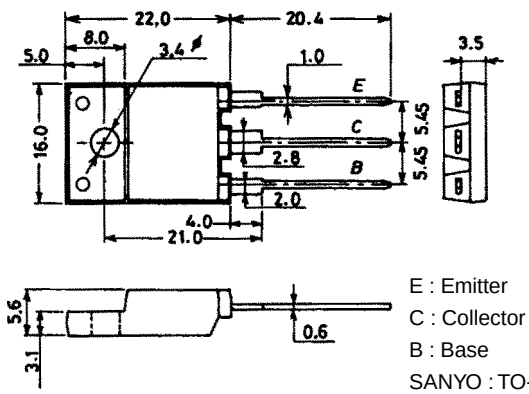
· Low collector-to-emitter saturation voltage : $V_{CE(sat)}$=(–)0.4V max.
· Wide ASO and highly registant to breakdown.
· Micaless package facilitating easy mounting.

Package Dimensions

unit:mm

2039A

[2SB1507/2SD2280]



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

( ) : 2SB1507

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		(–)7	A
Collector Current (Pulse)	I_{CP}		(–)20	A
Collector Dissipation	P_C		3.0	W
		Tc=25˚C	40	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=(–)5A	30			
Gain-Bandwidth Product	f_T	V_{CE}=(–)5V, I_C=(–)1A		10		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)4A, I_B=(–)0.4A			(–)0.4	V

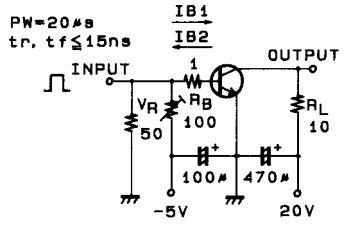
* : The 2SB1507/2SD2280 are classified by 1A h_{FE} as follows :

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.		(0.7)		μs
				0.9		μs
Fall Time	t_f	See specified test circuit.		(0.1)		μs
				0.3		μs

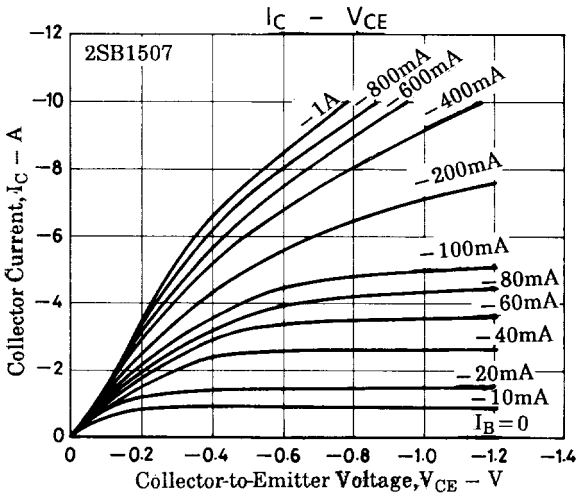
Switching Time Test Circuit

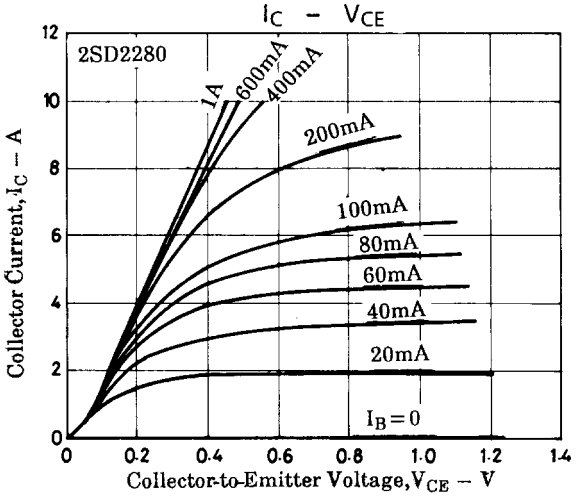


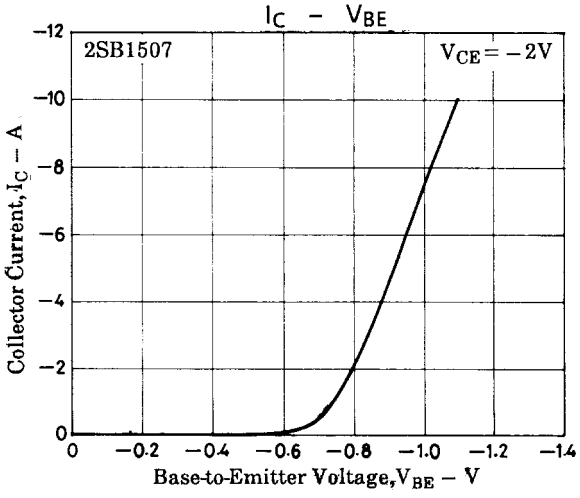
$10I_B1 = -10I_B2 = I_C = 2A$

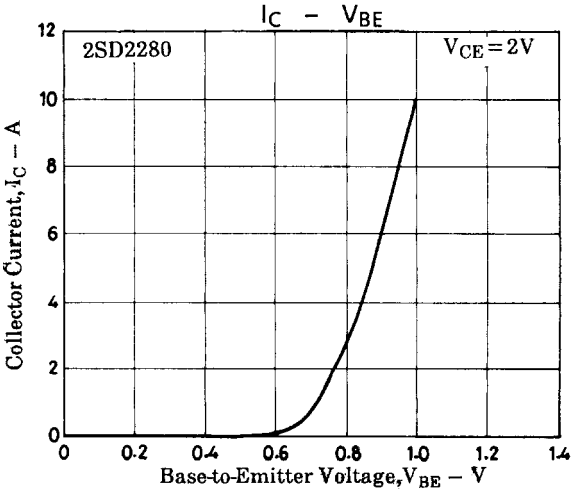
(For PNP, the polarity is reversed.)

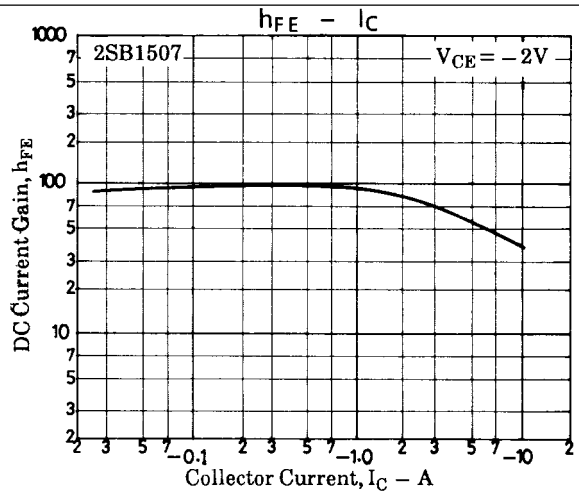
Unit (resistance : Ω, capacitance : F)

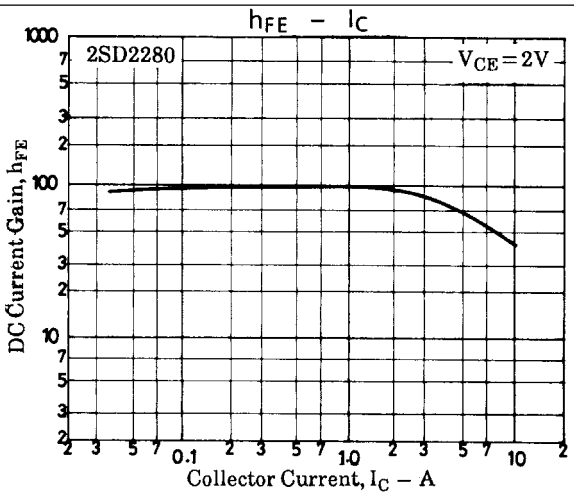


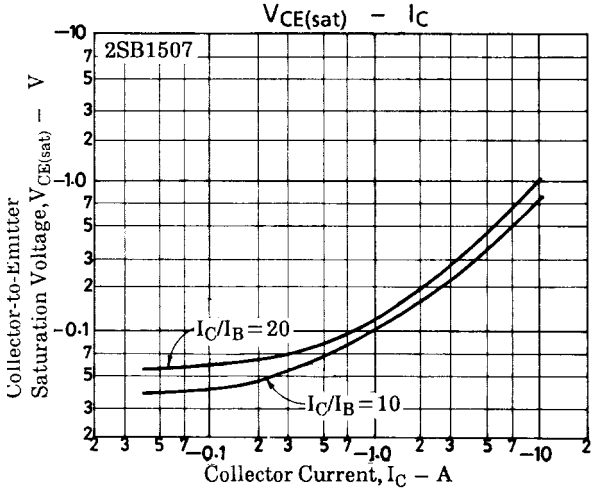


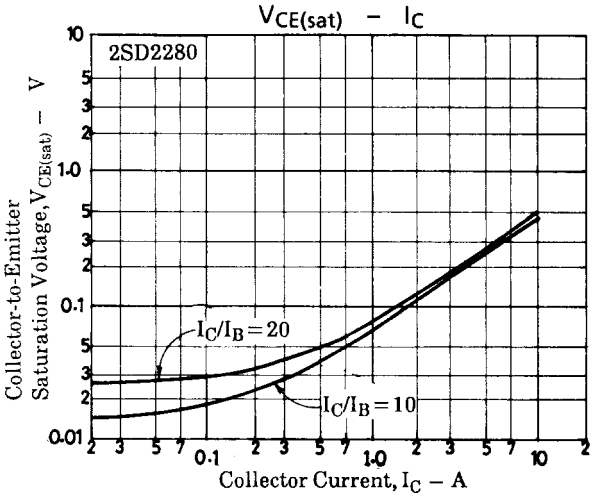


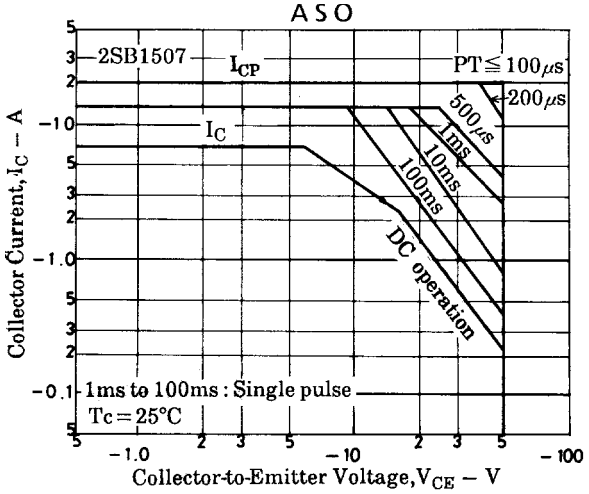


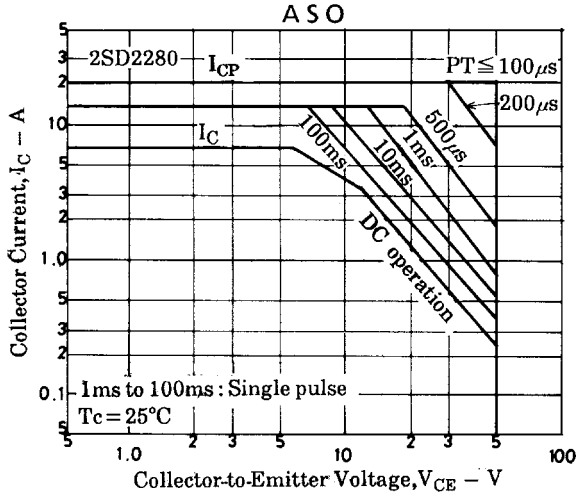

hFE – IC
2SB1507
VCE = –2V
DC Current Gain, hFE
Collector Current, IC – A


hFE – IC
2SD2280
VCE = 2V
DC Current Gain, hFE
Collector Current, IC – A


VCE(sat) – IC
2SB1507
IC/IB = 20
IC/IB = 10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A


VCE(sat) – IC
2SD2280
IC/IB = 20
IC/IB = 10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A


ASO
2SB1507
ICP
IC
PT≦100μs
200μs
500μs
1ms
10ms
100ms
DC operation
1ms to 100ms : Single pulse
Tc = 25°C
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V


ASO
2SD2280
ICP
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PT≦100μs
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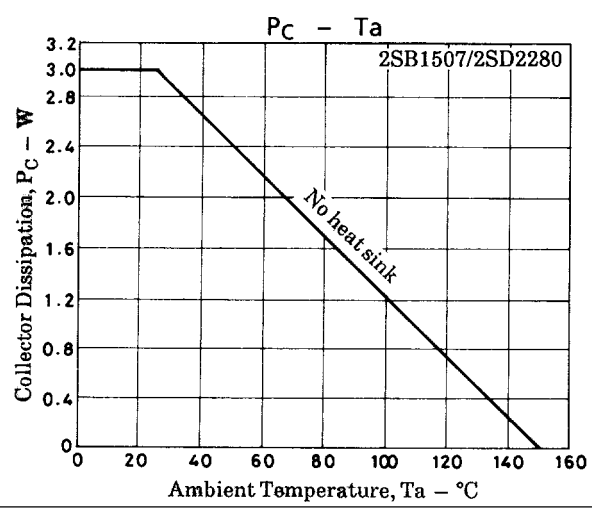
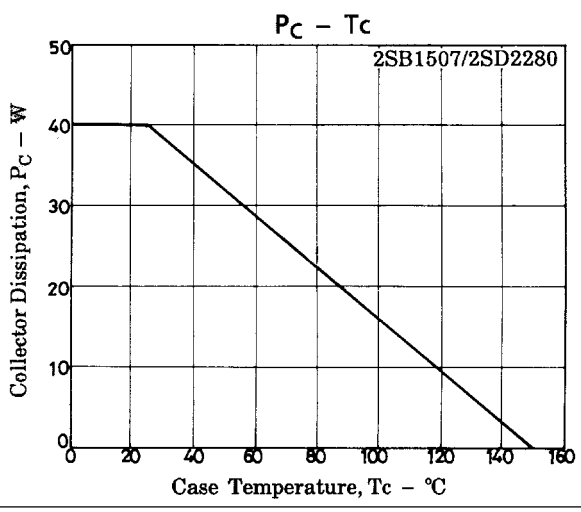
500μs
1ms
10ms
100ms
DC operation
1ms to 100ms : Single pulse
Tc = 25°C
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V


PC – Ta
2SB1507/2SD2280
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C


PC – Tc
2SB1507/2SD2280
Collector Dissipation, PC – W
Case Temperature, Tc – °C