Ordering number:2020A

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1141/2SD1681

18V/1.2A Switching Applications

Applications

· Converters, relay drivers, low-voltage and high power AF Amplifier.

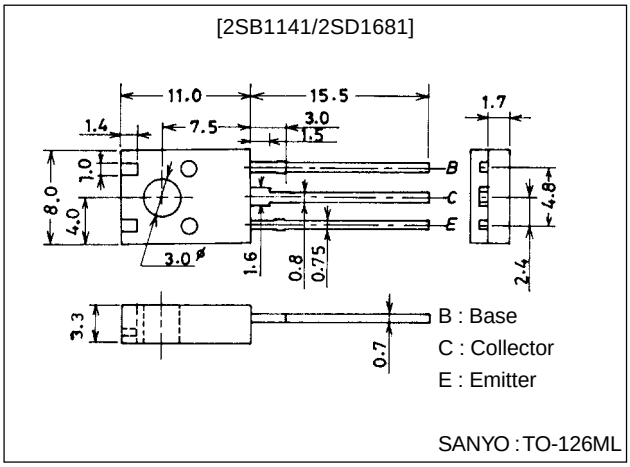
Features

· Low saturation voltage and excellent linearity of h_{FE}.
· Wide ASO.

Package Dimensions

unit:mm

2042A



( ) : 2SB1141

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)20	V
Collector-to-Emitter Voltage	V_{CEO}		(–)18	V
Emitter-to-Base Voltage	V_{EBO}		(–)5	V
Collector Current	I_C		(–)1.2	A
Collector Current (Pulse)	I_{CP}		(–)2.0	A
Collector Dissipation	P_C		1.5	W
		Tc=25˚C	10	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +125	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)15V, I_E=0			(–)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)100	nA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)2V, I_C=(–)100mA	70*		400*	
	$h_{FE}2$	V_{CE}=(–)2V, I_C=(–)1A	40			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		150		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(30)20		pF

* : The 2SB1141/2SD1681 are classified by 100mA h_{FE} as follows :

70	Q	140	100	R	200	140	S	280	200	T	400
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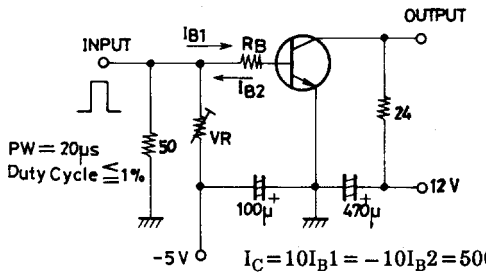
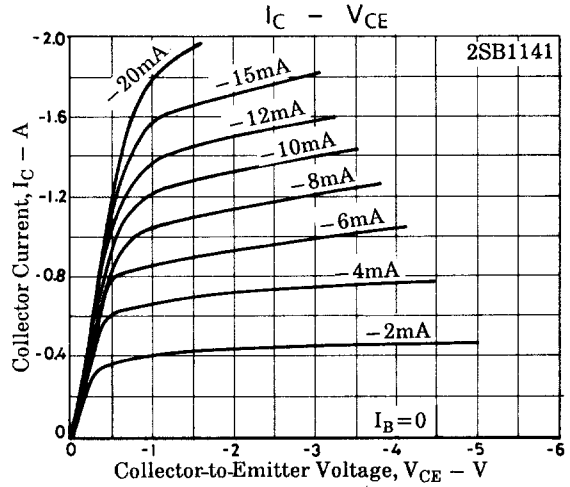
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

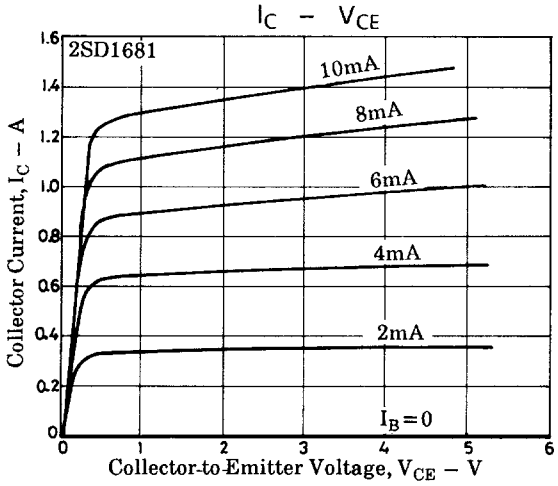
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)500mA, I_B=(–)50mA		(–170)	(–400)	mV
				120	300	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)500mA, I_B=(–)50mA		(–)0.85	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)20			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)18			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)5			V
Turn-ON Time	t_{on}	See specified Test Circuit		50		ns
Storage Time	t_{stg}	See specified Test Circuit		(60)		ns
				200		ns
Fall Time	t_f	See specified Test Circuit		70		ns

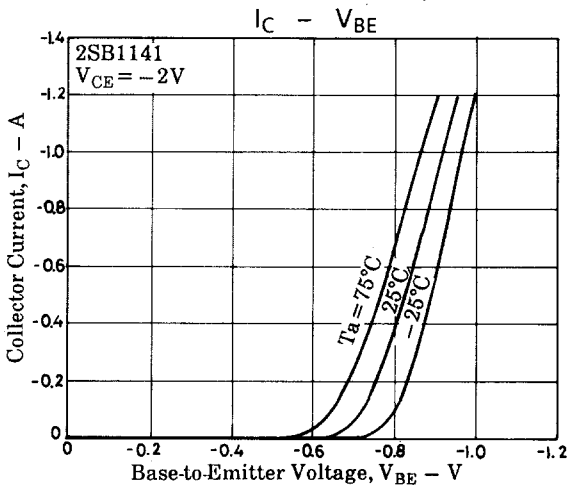
Switching Time Test Circuit

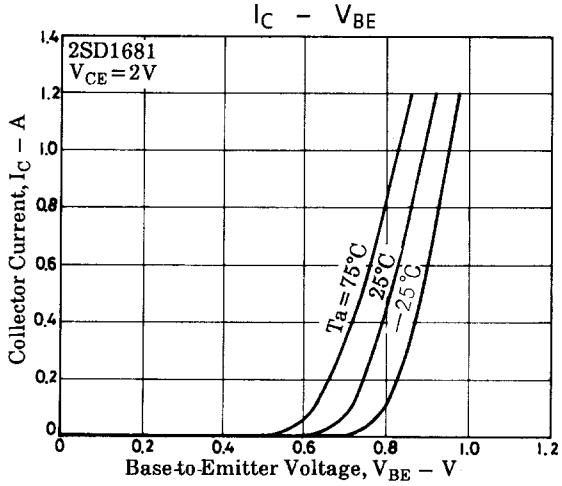


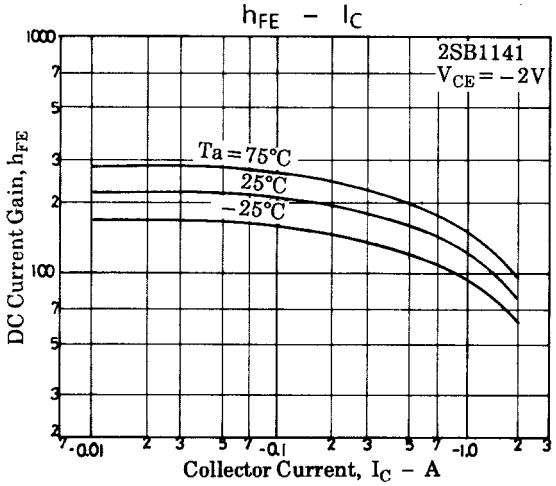
$I_C = 10I_B1 = -10I_B2 = 500mA$
(For PNP, the polarity is reversed).
Unit (resistance : Ω, capacitance : F)

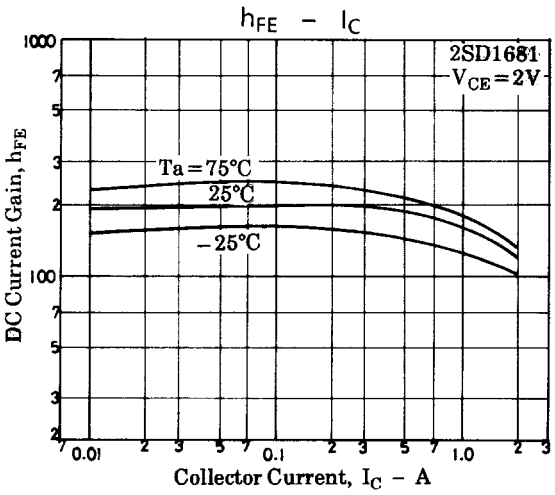


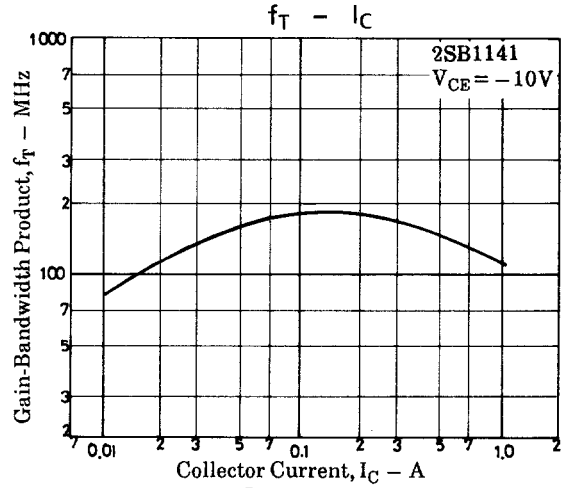


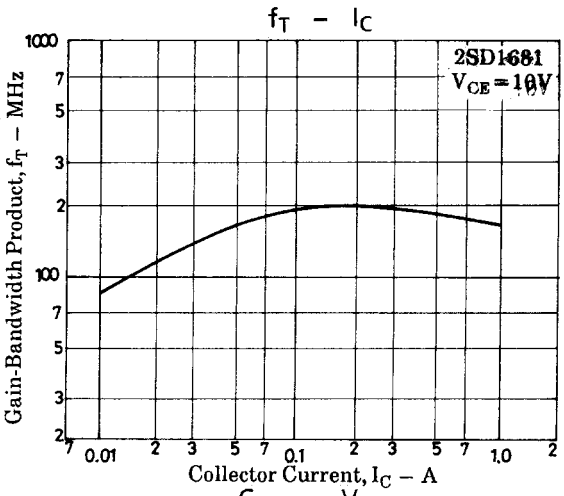


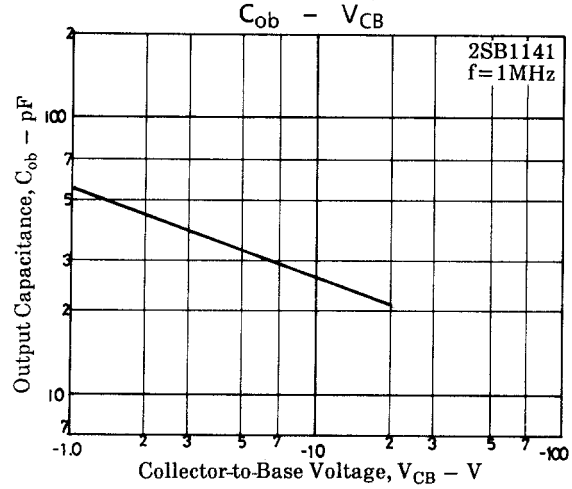


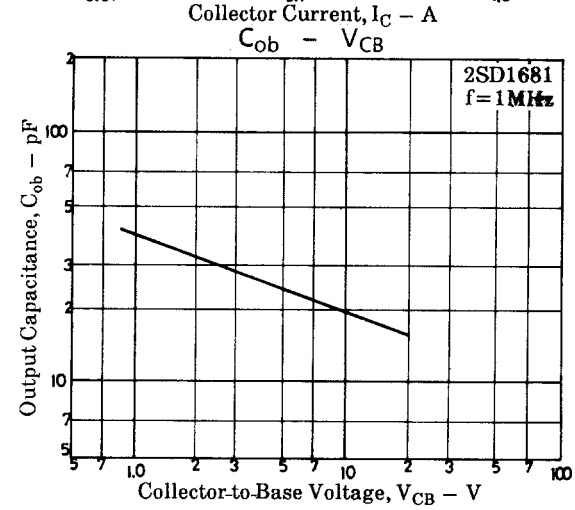

hFE – IC
2SB1141
VCE = –2V
Ta = 75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A

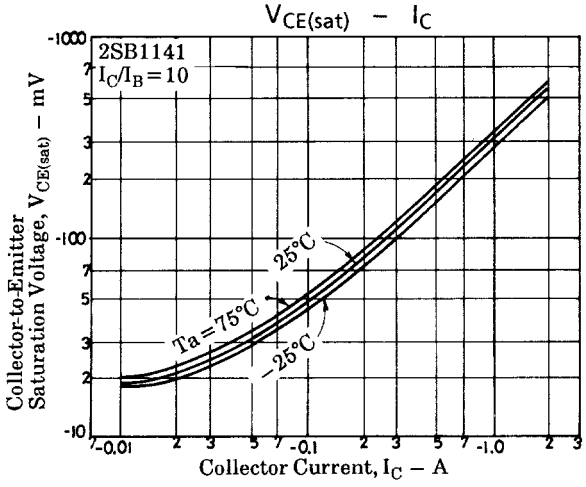

hFE – IC
2SD1681
VCE = 2V
Ta = 75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A

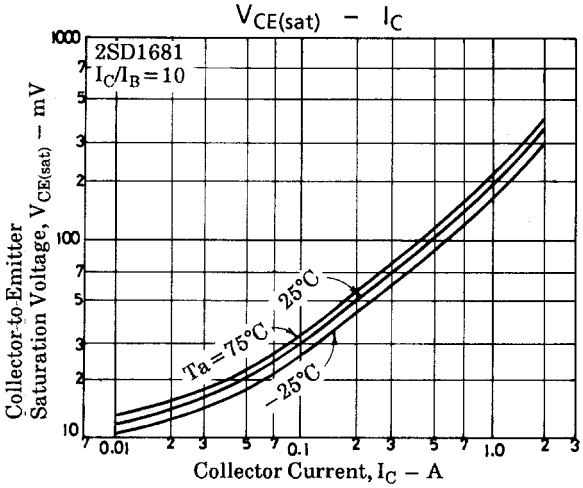

fT – IC
2SB1141
VCE = –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A


fT – IC
2SD1681
VCE = 10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A


Cob – VCB
2SB1141
f = 1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V


Cob – VCB
2SD1681
f = 1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V


VCE(sat) – IC
2SB1141
IC/IB = 10
25°C
Ta = 75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A


VCE(sat) – IC
2SD1681
IC/IB = 10
25°C
Ta = 75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A