Ordering number:2063A

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1143/2SD1683

50V/4A Switching Applications

Applications

· Voltage regulators, relay drivers, lamp drivers, electrical equipment.

Features

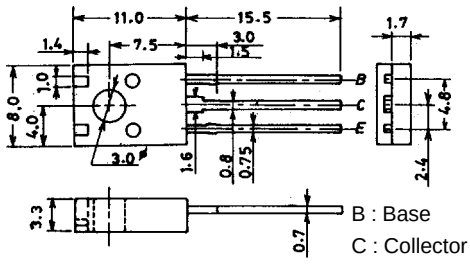
· Adoption of FBET, MBIT processes.
· Low saturation voltage.
· Large current capacity and wide ASO.

Package Dimensions

unit:mm

2042A

[2SB1143/2SD1683]



B : Base
C : Collector
E : Emitter

SANYO : TO-126ML

( ) : 2SB1143

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		(–)4	A
Collector Current (Pulse)	I_{CP}		(–)6	A
Collector Dissipation	P_C		1.5	W
		Tc=25˚C	10	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			(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)2V, I_C=(–)100mA	100*		560*	
	$h_{FE}2$	V_{CE}=(–)2V, I_C=(–)3A	40			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		150		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(39)25		pF

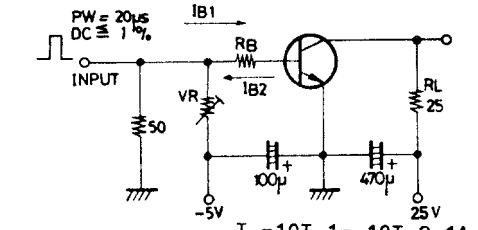
* ; The 2SB1143/2SD1683 are classified by 100mA h_{FE} as follows :

100	R	200	140	S	280	200	T	400	280	U	560

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=(–)2A, I_B=(–)100mA		(–350)	(–700)	mV
				190	500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)2A, I_B=(–)100mA		(–)0.94	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, 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=(–)10μA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit		(70)70		ns
Storage Time	t_{stg}	See specified Test Circuit		(450)		ns
				650		ns
Fall Time	t_f	See specified Test Circuit		(30)35		ns

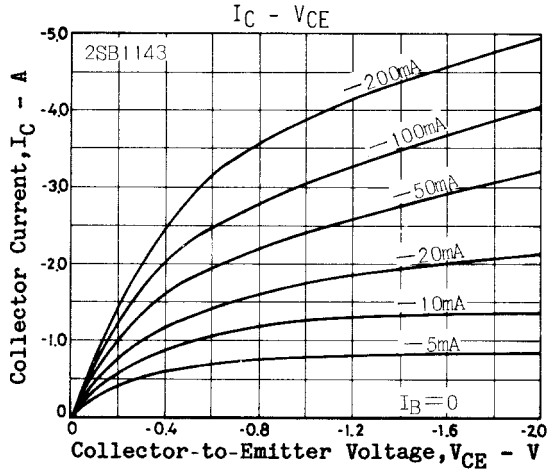
Switching Time Test Circuit

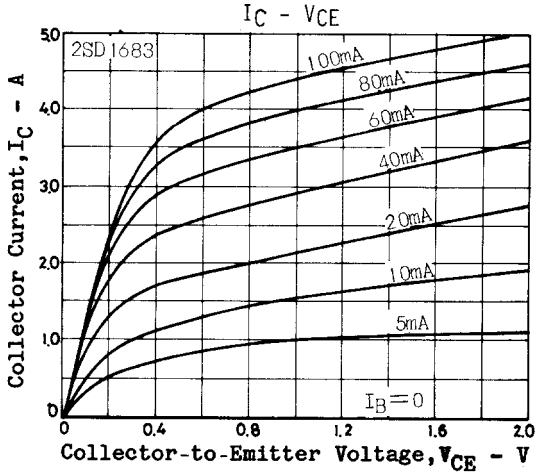


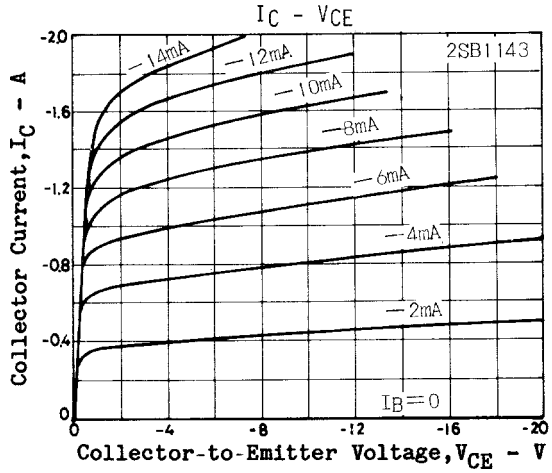
I_C=10I_B1=-10I_B2=1A

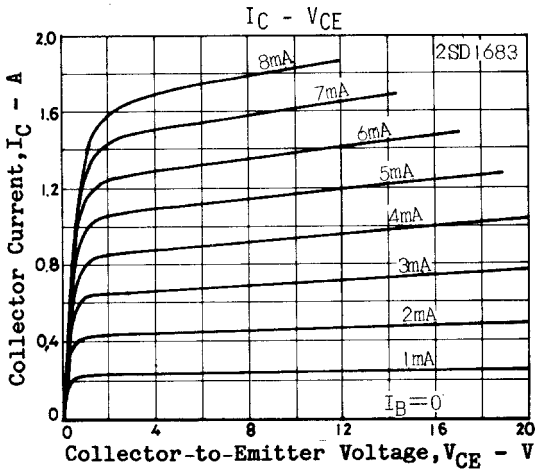
(For PNP, the polarity is reversed.)

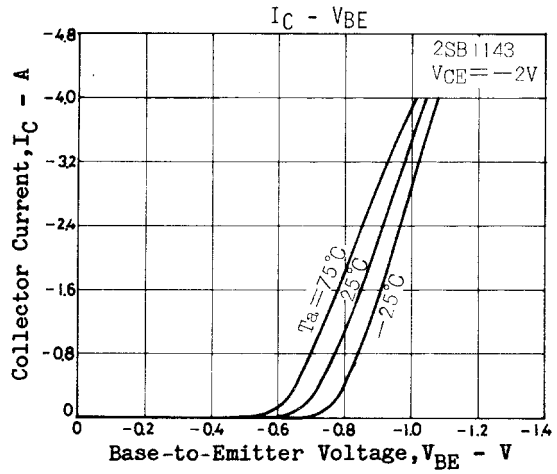
Unit (resistance : Ω, capacitance : F)

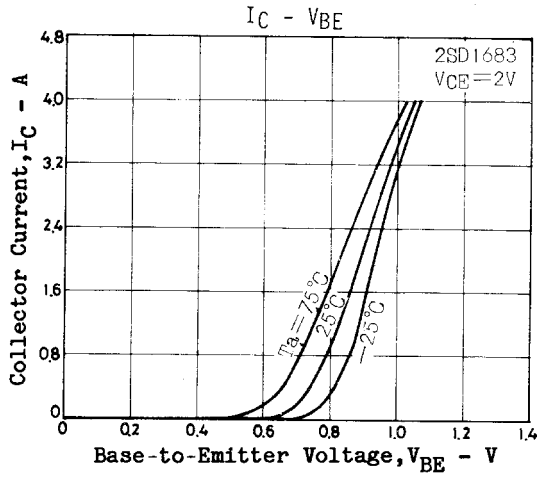


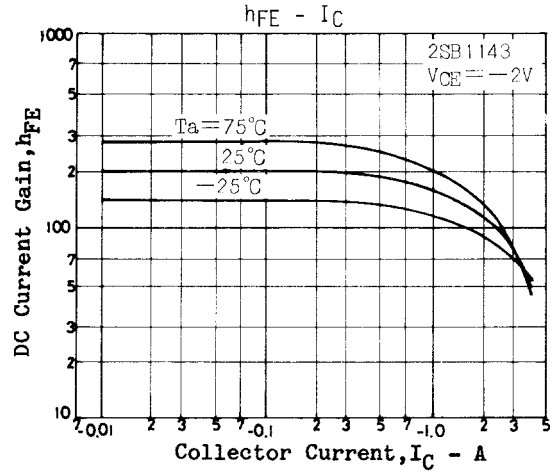


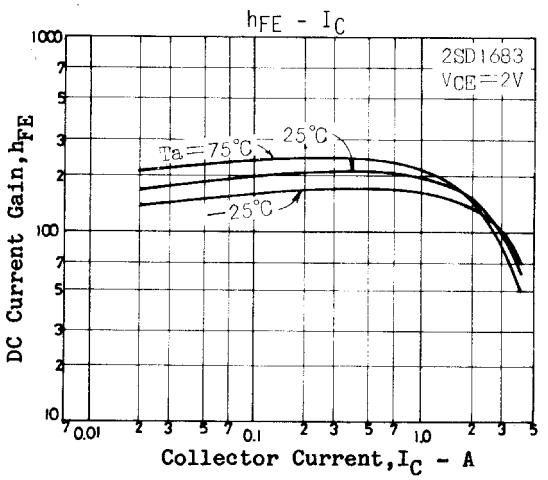


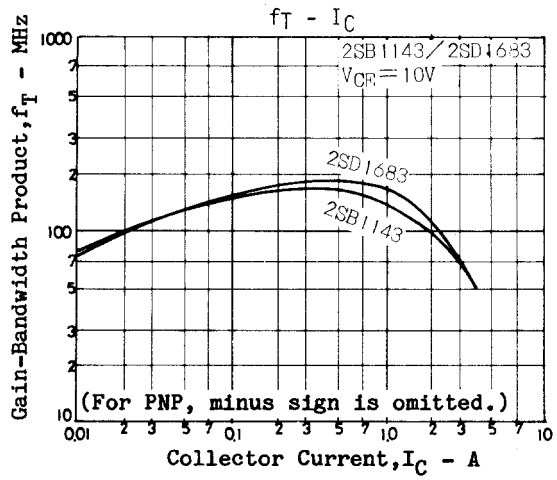


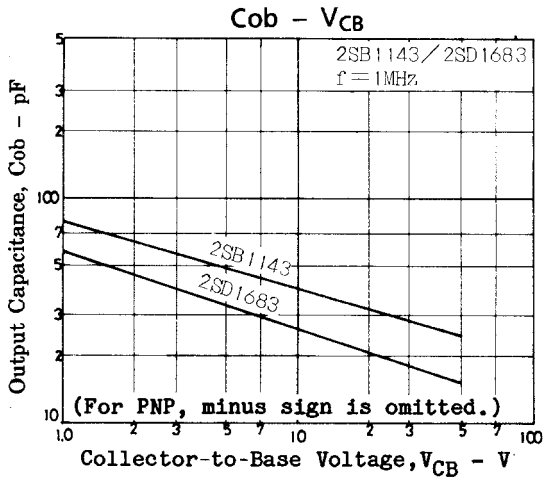

I_C - V_{BE}
2SB1143
V_{CE}=−2V
Ta=75°C
25°C
−25°C
Collector Current, I_C - A
Base-to-Emitter Voltage, V_{BE} - V

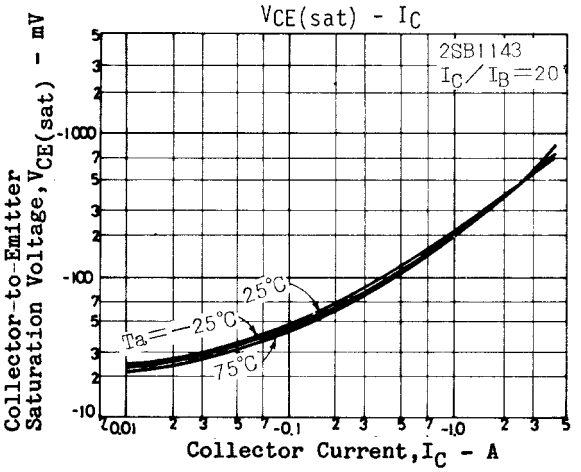

I_C - V_{BE}
2SD1683
V_{CE}=2V
Ta=75°C
25°C
−25°C
Collector Current, I_C - A
Base-to-Emitter Voltage, V_{BE} - V

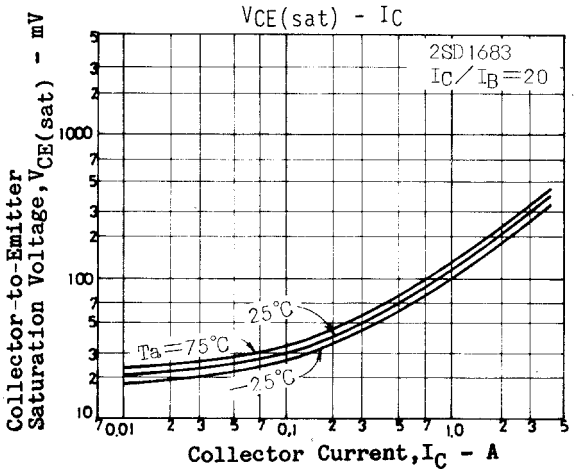

h_{FE} - I_C
2SB1143
V_{CE}=−2V
Ta=75°C
25°C
−25°C
DC Current Gain, h_{FE}
Collector Current, I_C - A


h_{FE} - I_C
2SD1683
V_{CE}=2V
Ta=75°C
25°C
−25°C
DC Current Gain, h_{FE}
Collector Current, I_C - A


f_T - I_C
2SB1143/2SD1683
V_{CE}=10V
2SD1683
2SB1143
(For PNP, minus sign is omitted.)
Gain-Bandwidth Product, f_T - MHz
Collector Current, I_C - A


Cob − V_{CB}
2SB1143/2SD1683
f=1MHz
2SB1143
2SD1683
(For PNP, minus sign is omitted.)
Output Capacitance, Cob - pF
Collector-to-Base Voltage, V_{CB} - V


V_{CE}(sat) - I_C
2SB1143
I_C/I_B=20
Ta=−25°C
25°C
75°C
Collector-to-Emitter Saturation Voltage, V_{CE}(sat) - mV
Collector Current, I_C - A


V_{CE}(sat) - I_C
2SD1683
I_C/I_B=20
Ta=75°C
25°C
−25°C
Collector-to-Emitter Saturation Voltage, V_{CE}(sat) - mV
Collector Current, I_C - A