Ordering number:EN3012

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1683/2SC4414

Low-Frequency General-Purpose Amplifier, Low-Frequency Power Amplifier Applications

Features

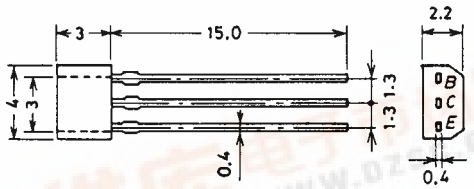
· Adoption of FBET process.
· High breakdown voltage : V_{CEO}>80V.

Package Dimensions

unit:mm

2033

[2SA1683/2SC4414]



B : Base
C : Collector
E : Emitter

SANYO : SPA

( ) : 2SA1683

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)100	V
Collector-to-Emitter Voltage	V_{CEO}		(–)80	V
Emitter-to-Base Voltage	V_{EBO}		(–)5	V
Collector Current	I_C		(–)500	mA
Collector Current (Pulse)	I_{CP}		(–)800	mA
Base Current	I_B		(–)100	mA
Collector Dissipation	P_C		300	mW
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}=(–)60V, I_E=0			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)5V, I_C=(–)50mA	100*		400*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)400mA	60			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)10mA		120		MHz

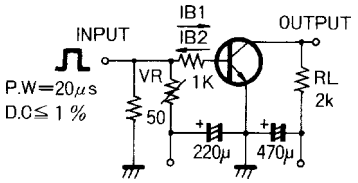
* : 2SA1683/2SC4414 are classified by 50mA h_{FE} as follows :

100	R	200	140	S	280	200	T	400

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

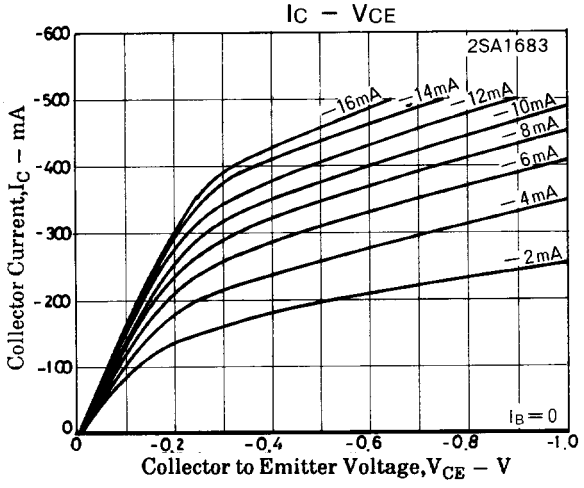
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)400mA, I_B=(–)40mA		0.16	(–)0.5	V
				(–0.20)		V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)400mA, I_B=(–)40mA		(–)0.9	(–)1.2	V
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(7)5		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)80			V
Emitter-to-Base Breakdown Votage	$V_{(BR)EBO}$	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		(500)		ns
				650		
Fall Time	t_f	See specified Test Circuit		(80)90		ns

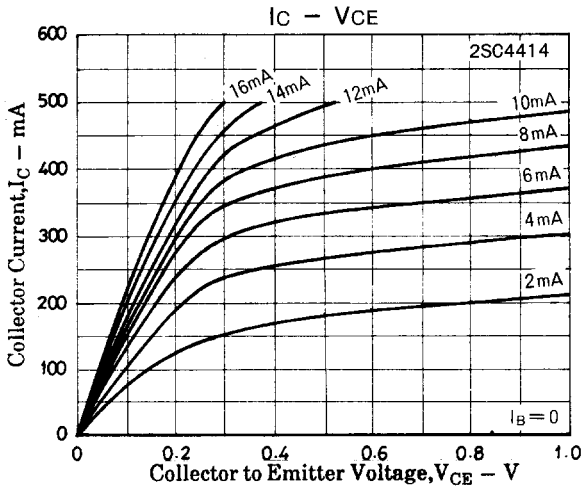
Switching Time Test Circuit

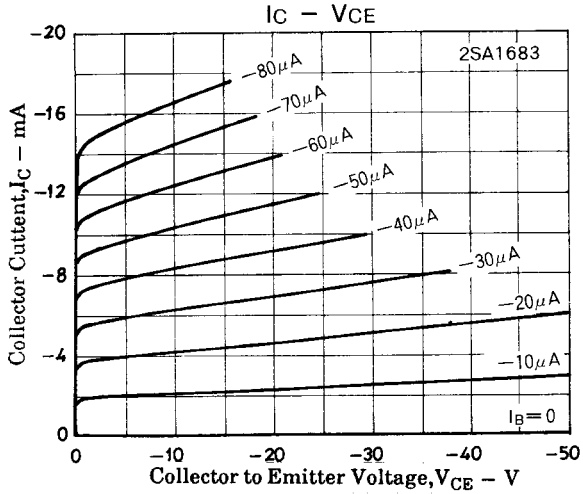


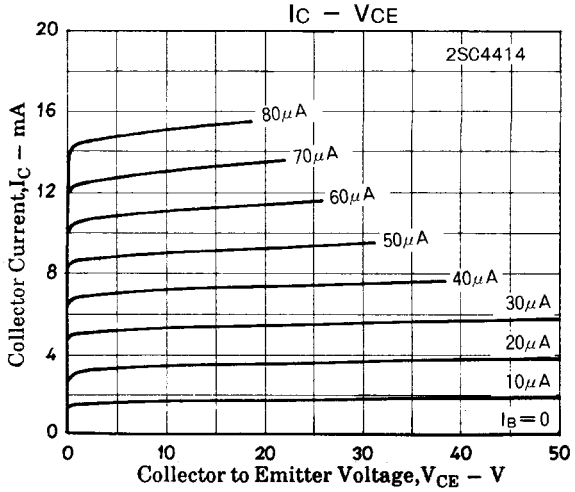
V_{BE}=–5V, V_{CC}=20V
$10I_{B1}$=–$10I_{B2}$=I_C=200mA
(For PNP, the polarity is reserved.)

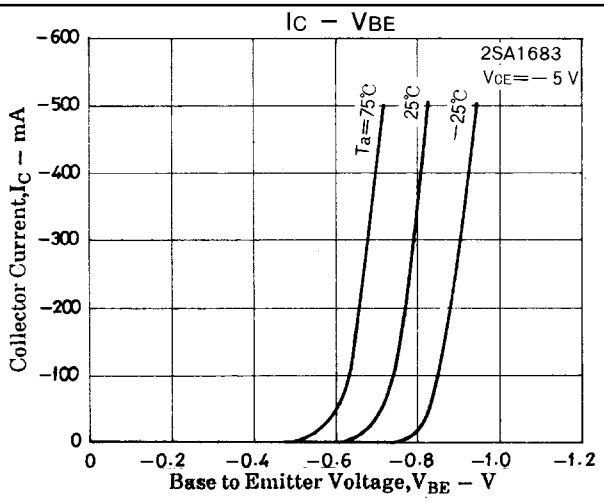
Unit (resistance : Ω, capacitance : F)

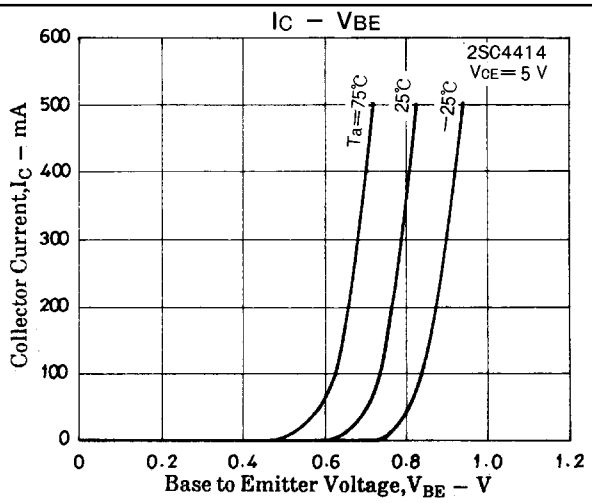


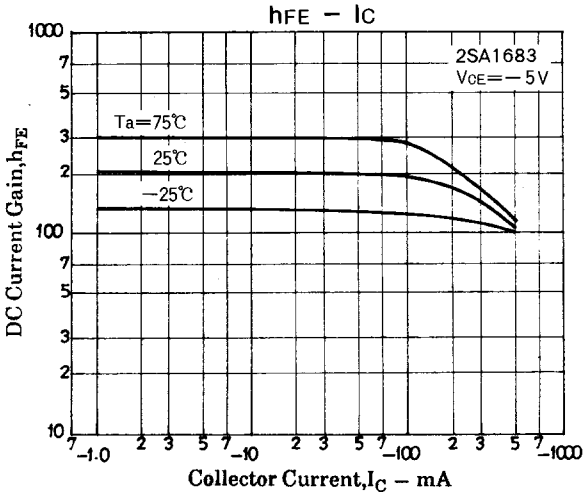


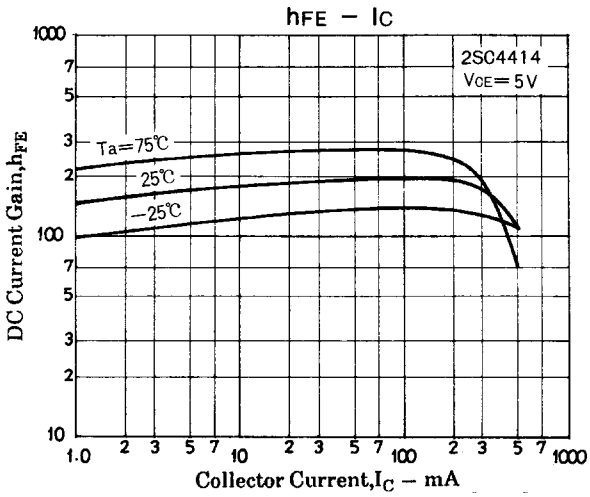


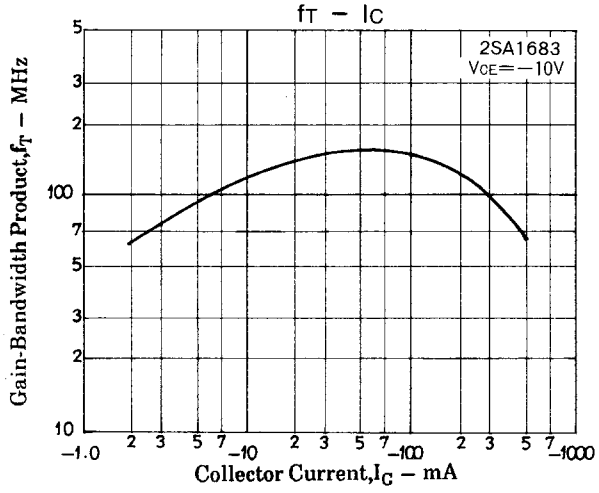


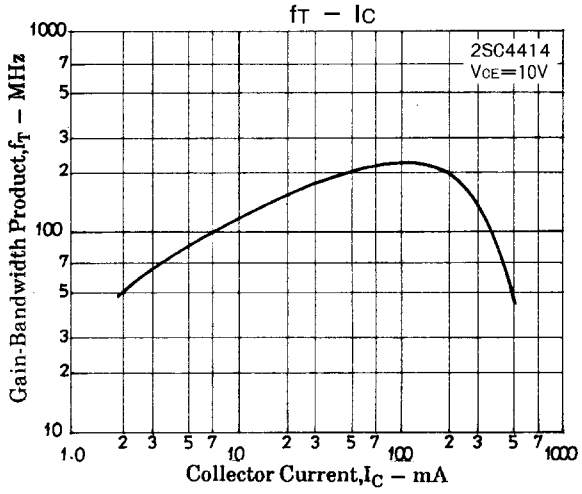

IC – VBE
2SA1683
VCE=– 5 V
Ta=75℃
25℃
–25℃
Collector Current,IC – mA
Base to Emitter Voltage,VBE – V

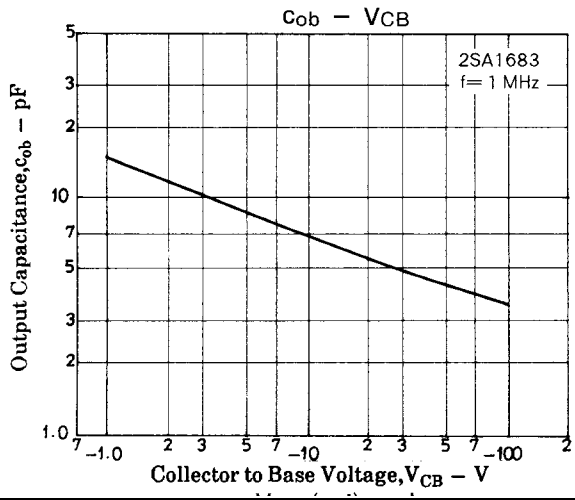

IC – VBE
2SC4414
VCE= 5 V
Ta=75℃
25℃
–25℃
Collector Current,IC – mA
Base to Emitter Voltage,VBE – V

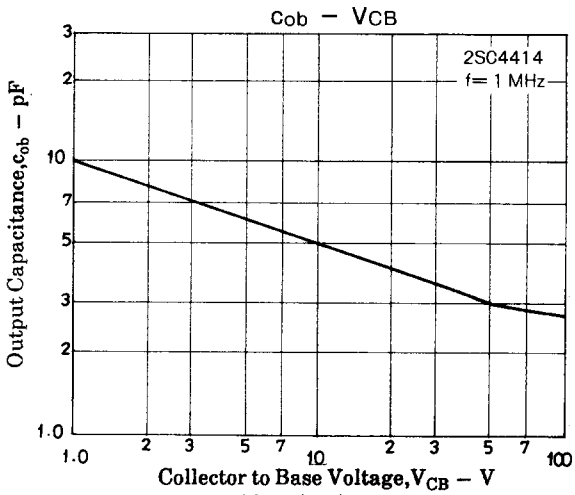

hFE – IC
2SA1683
VCE=– 5V
Ta=75℃
25℃
–25℃
DC Current Gain,hFE
Collector Current,IC – mA


hFE – IC
2SC4414
VCE= 5V
Ta=75℃
25℃
–25℃
DC Current Gain,hFE
Collector Current,IC – mA


fT – IC
2SA1683
VCE=–10V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA


fT – IC
2SC4414
VCE=10V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA


Cob – VCB
2SA1683
f= 1 MHz
Output Capacitance,cob – pF
Collector to Base Voltage,VCB – V


Cob – VCB
2SC4414
f= 1 MHz
Output Capacitance,cob – pF
Collector to Base Voltage,VCB – V