



## 2SA1683/2SC4414

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

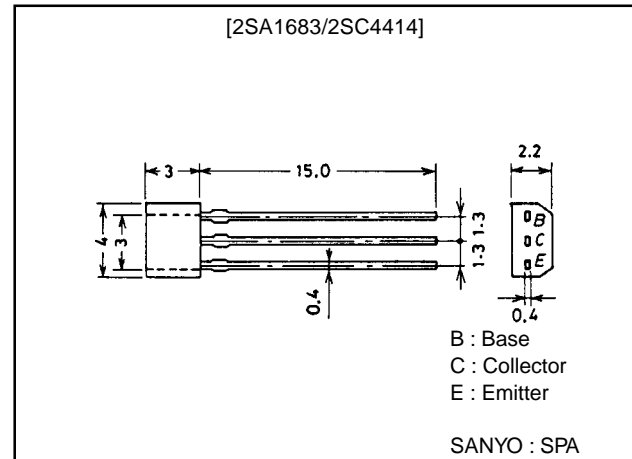
#### Features

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

#### Package Dimensions

unit:mm

2033



() : 2SA1683

#### Specifications

##### Absolute Maximum Ratings at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)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	$T_J$		150	$^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ C$

##### Electrical Characteristics at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = (-)60V, I_E = 0$			(-)0.1	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4V, I_C = 0$			(-)0.1	$\mu A$
DC Current Gain	$h_{FE1}$	$V_{CE} = (-)5V, I_C = (-)50mA$	100*		400*	
	$h_{FE2}$	$V_{CE} = (-)5V, I_C = (-)400mA$	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
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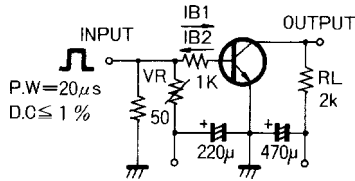
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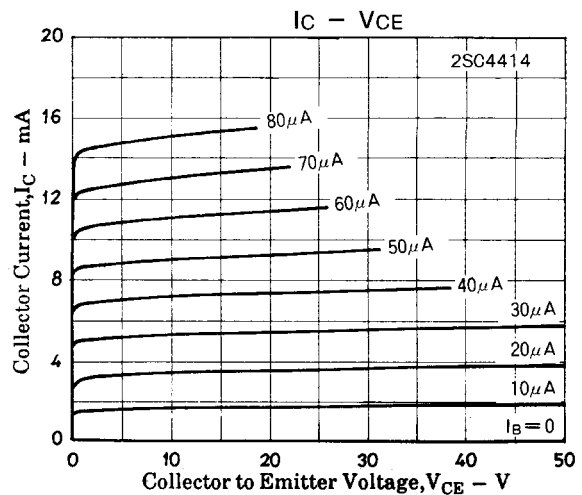
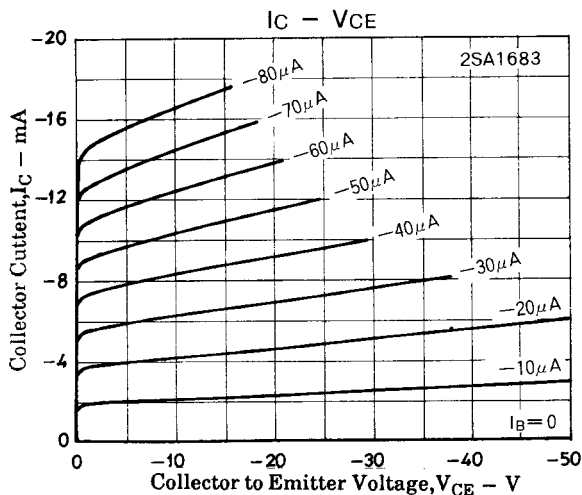
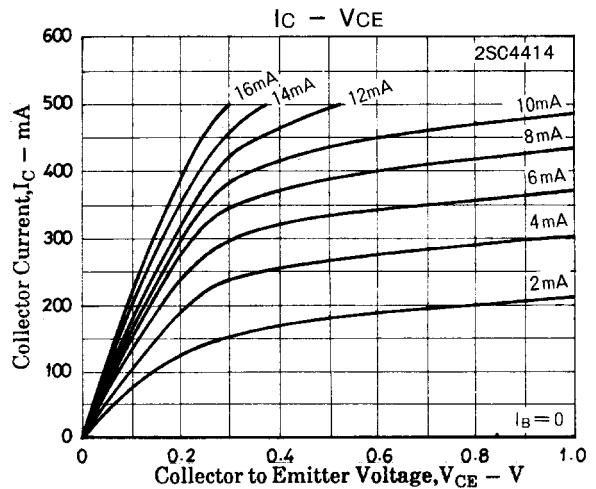
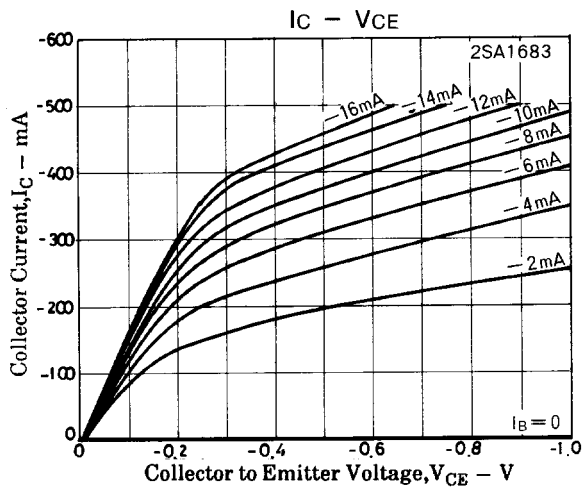
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)400mA, I_B=(-)40mA$		0.16	(-)0.5	V
				(-0.20)		V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)400mA, I_B=(-)40mA$		(-)0.9	(-)1.2	V
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(7)5		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-)100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)80			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$	(-)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

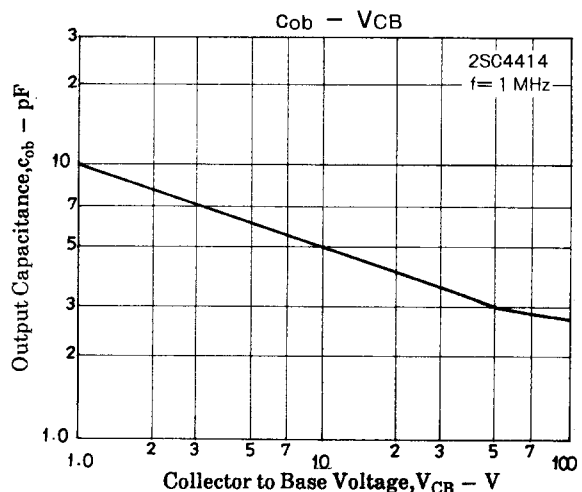
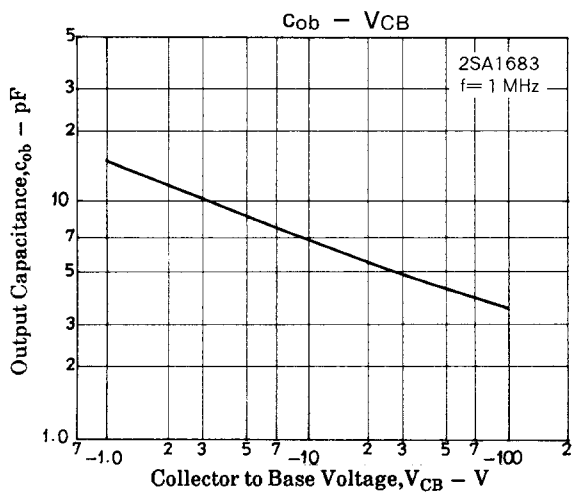
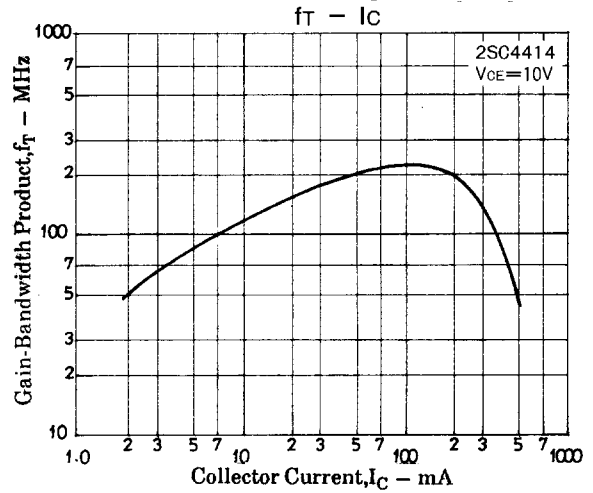
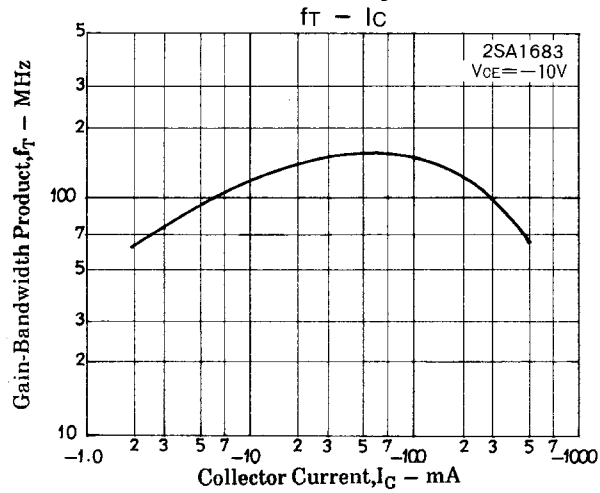
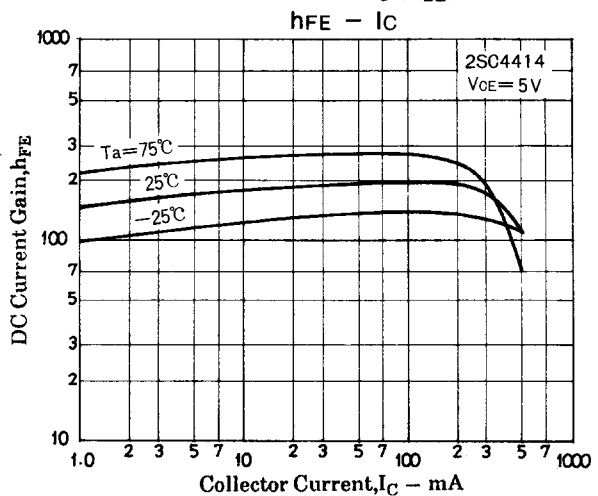
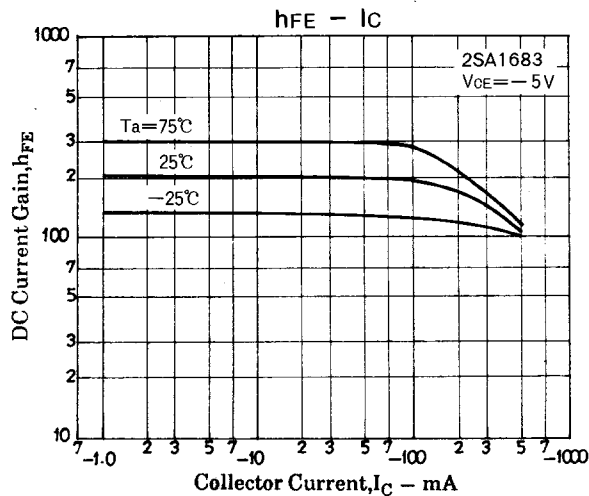
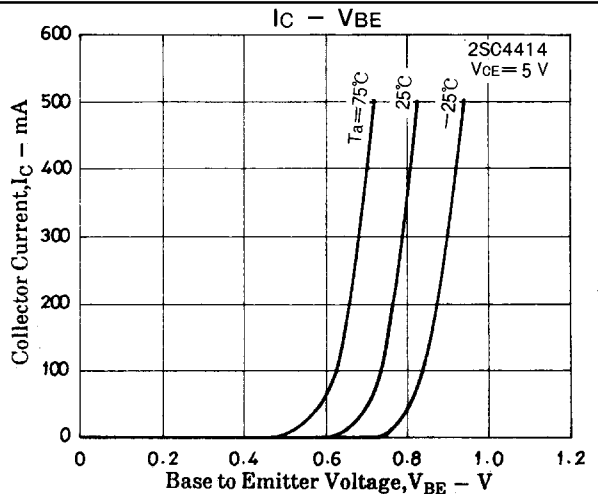
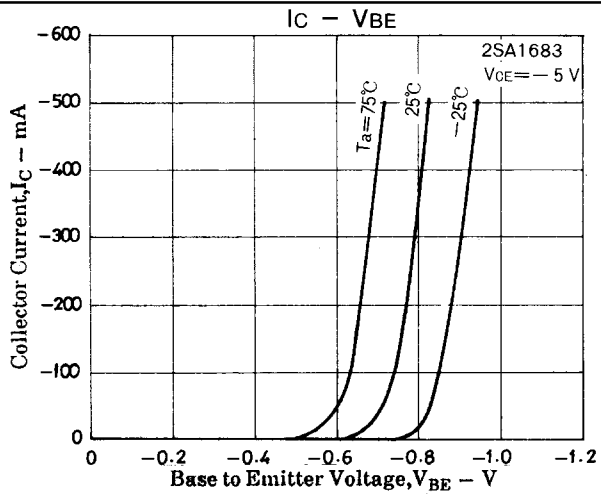


$V_{BE}=-5V, V_{CC}=20V$   
 $10I_{B1}=-10I_{B2}=I_C=200mA$   
 (For PNP, the polarity is reserved.)

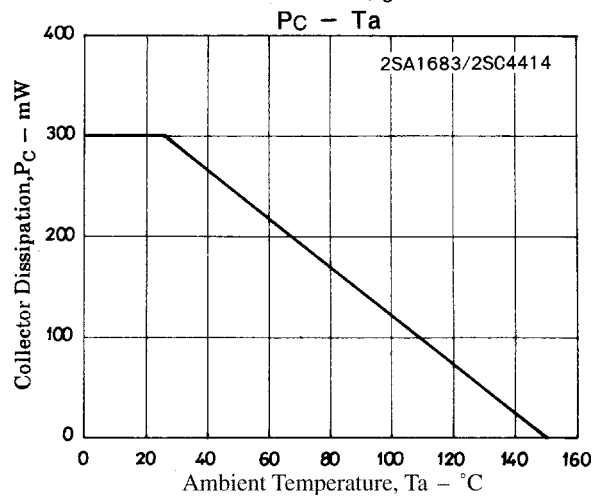
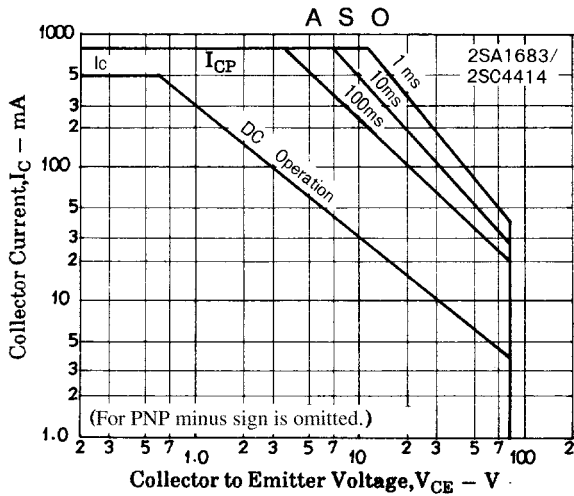
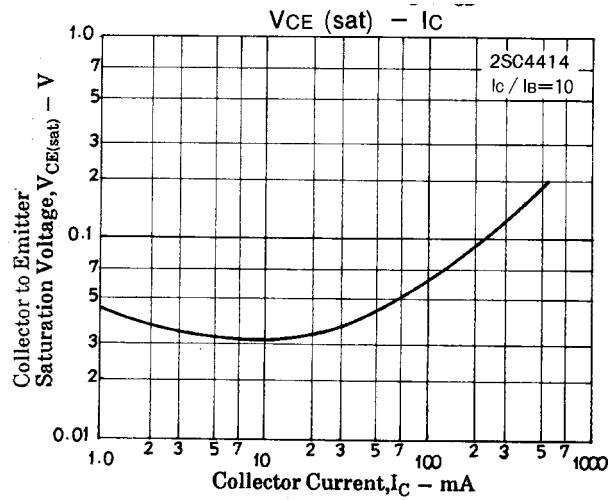
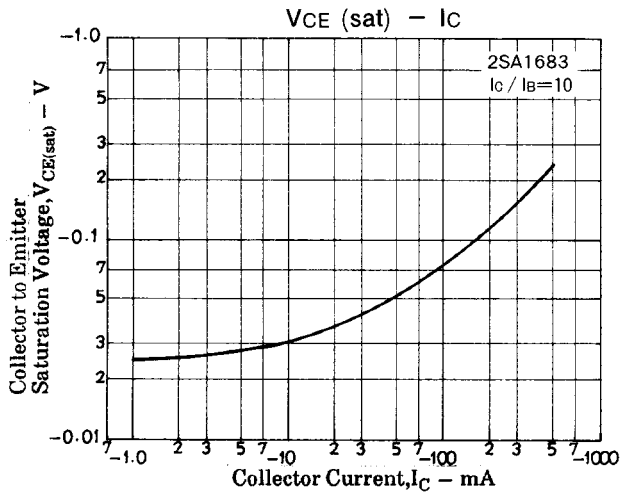
Unit (resistance :  $\Omega$ , capacitance : F)



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