



## 2SA1687/2SC4446

### Low-Frequency General-Purpose Amplifier Applications

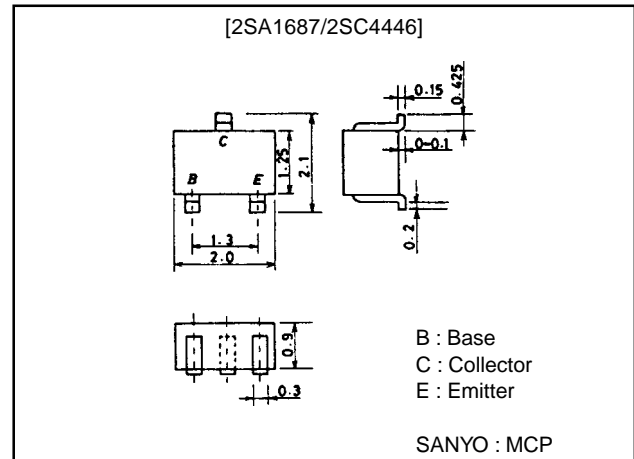
#### Features

- Very small-sized package permitting the 2SA1687/2SC4446-applied sets to be made small and slim.
- High  $V_{EBO}$ .

#### Package Dimensions

unit:mm

2059



() : 2SA1687

#### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)60	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)50	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)15	V
Collector Current	$I_C$		(-)150	mA
Collector Current (Pulse)	$I_{CP}$		(-)300	mA
Base Current	$I_B$		(-)30	mA
Collector Dissipation	$P_C$		150	mW
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = (-)40\text{V}, I_E = 0$			(-)0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)10\text{V}, I_C = 0$			(-)0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = (-)6\text{V}, I_C = (-)1\text{mA}$	135*		600*	
Gain-Bandwidth Product	$f_T$	$V_{CE} = (-)6\text{V}, I_C = (-)1\text{mA}$		130		MHz

\* : The 2SA1687/2SC4446 are classified by 1mA  $h_{FE}$  as follows :

135	5	270	200	6	400	300	7	600
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Marking : D (2SA1687)  $h_{FE}$  rank : 5, 6, 7

H (2SC4446)

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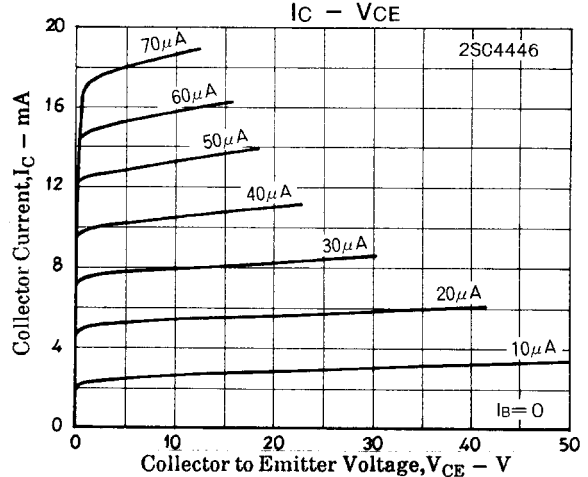
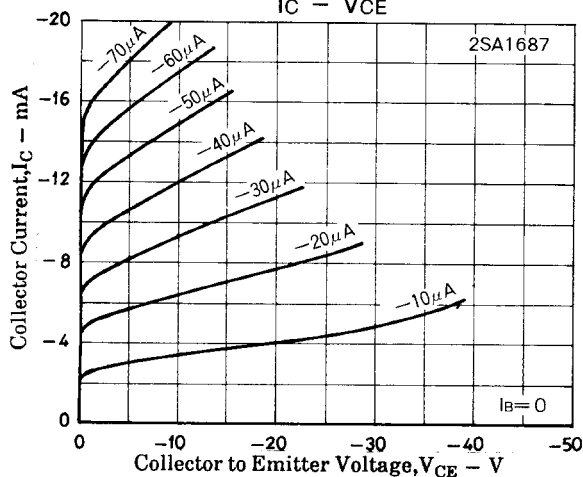
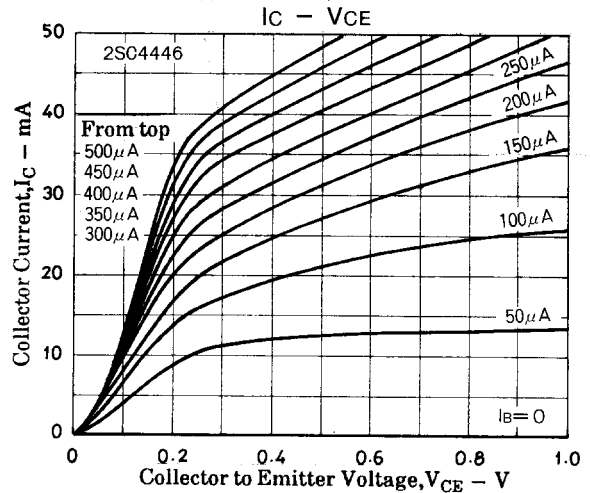
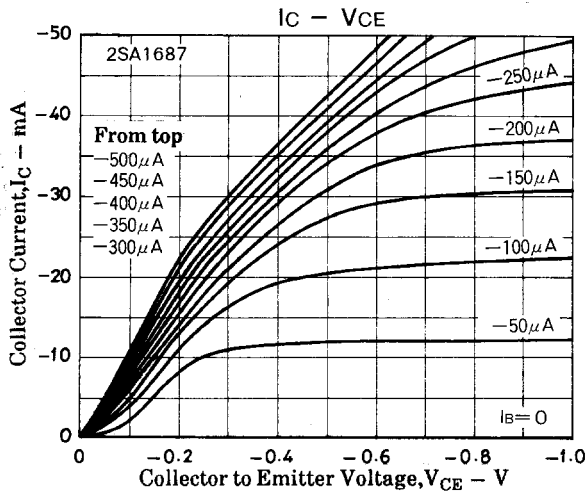
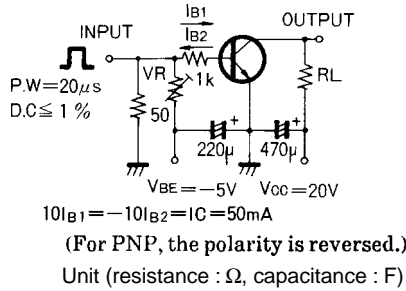
**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

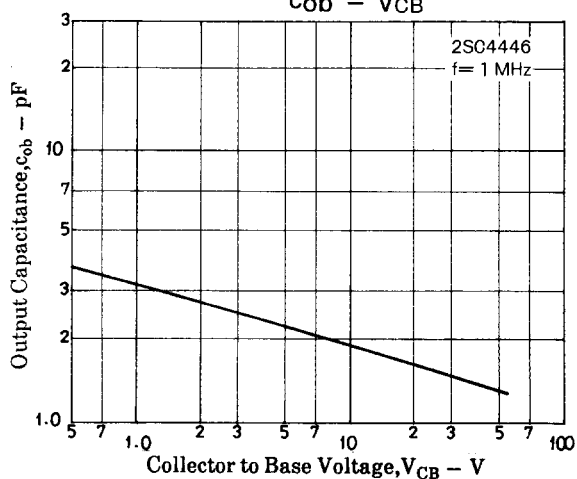
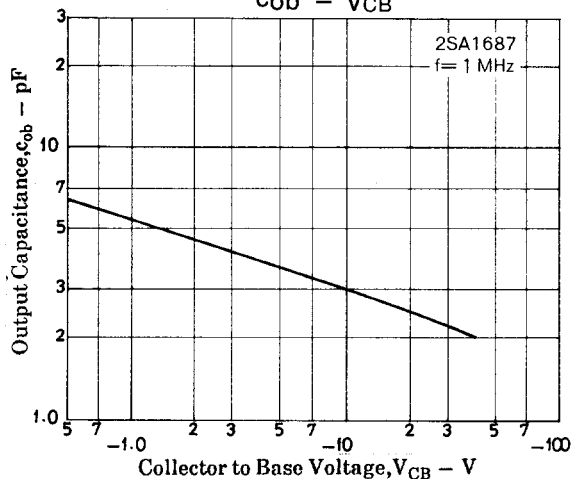
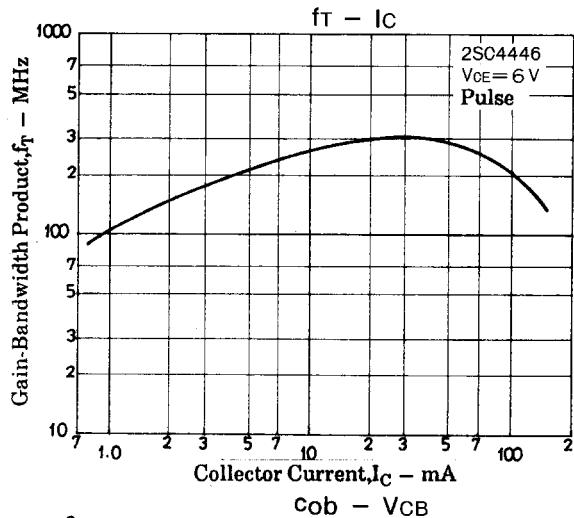
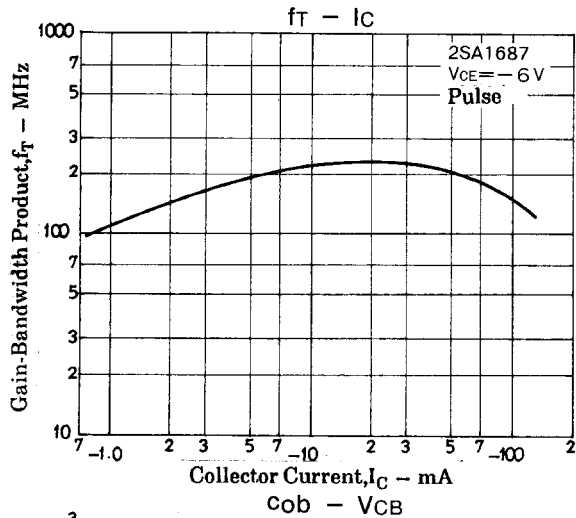
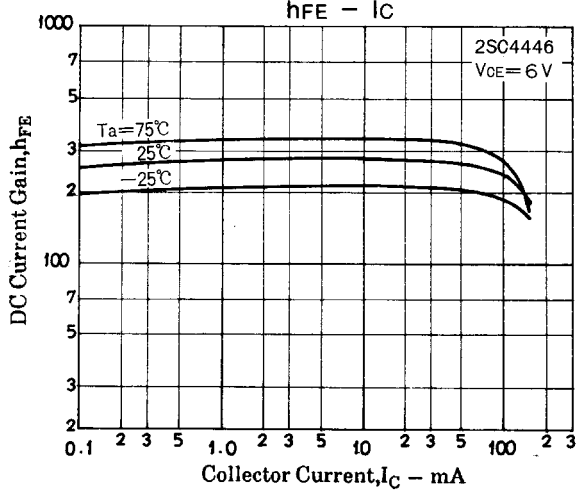
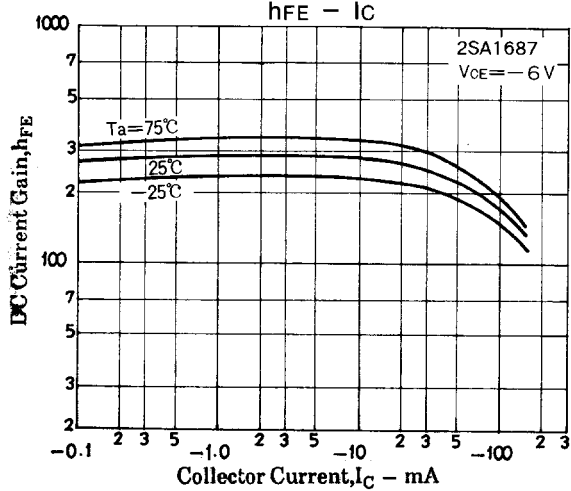
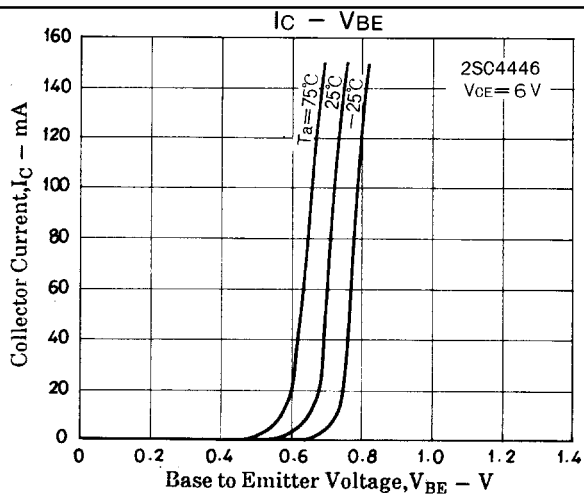
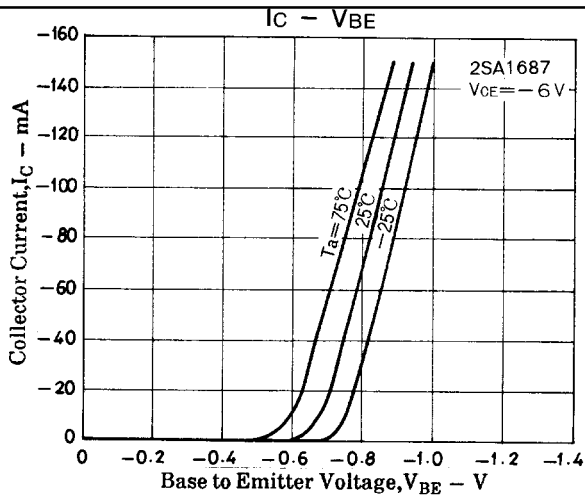
# 2SA1687/2SC4446

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)50mA, I_B=(-)5mA$		0.15	(-)0.5	V
				(-0.25)		V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)50mA, I_B=(-)5mA$		(-)0.85	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$	(-)15			V
Output Capacitance	$C_{ob}$	$V_{CB}=(-)6V, f=1MHz$		(3.5)		pF
				2.2		pF
Turn-ON Time	$t_{on}$	See specified Test Circuit		50		ns
Storage Time	$t_{stg}$	See specified Test Circuit		(460)		ns
				590		ns
Fall Time	$t_f$	See specified Test Circuit		(60)		ns
				110		ns

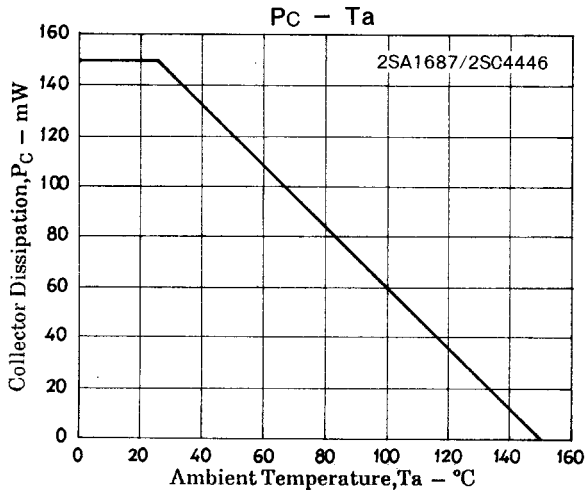
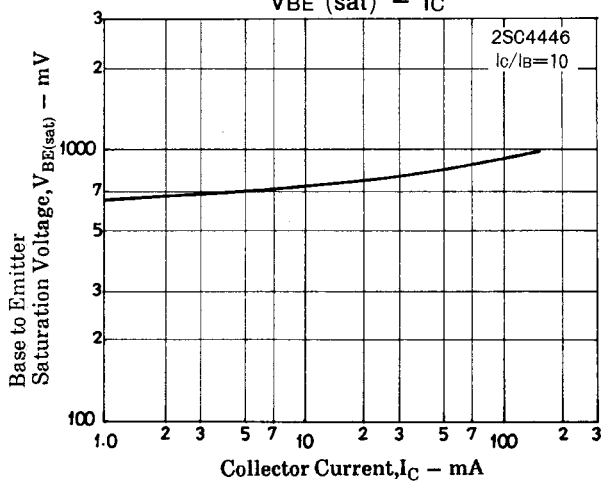
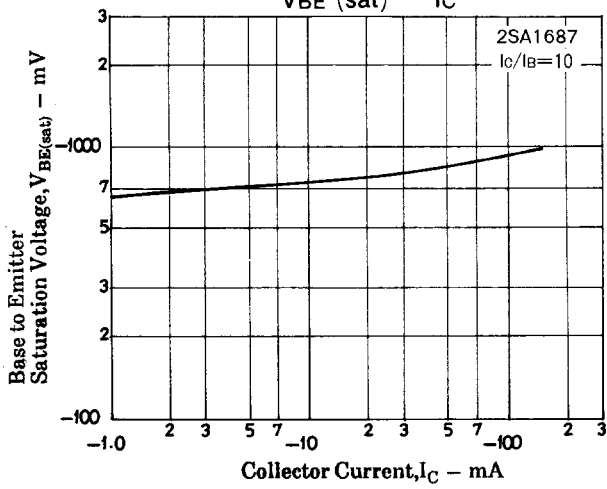
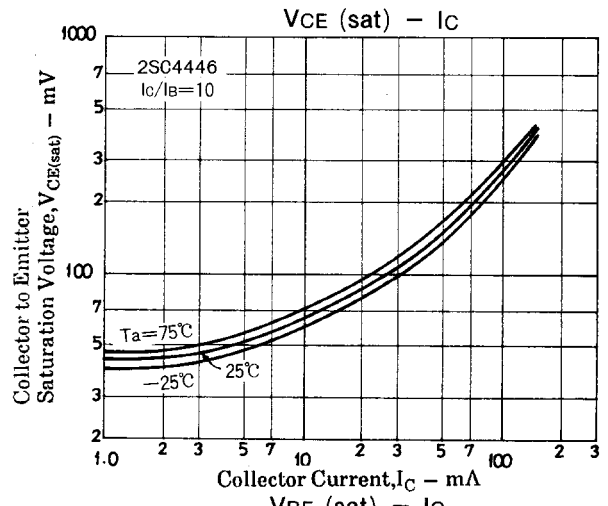
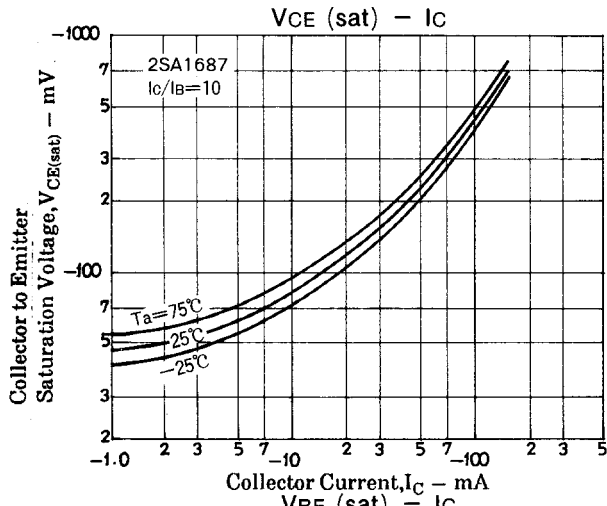
## Switching Time Test Circuit



# 2SA1687/2SC4446



# 2SA1687/2SC4446



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