Ordering number:EN3013

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1687/2SC4446

Low-Frequency General-Purpose Amplifier Applications

Features

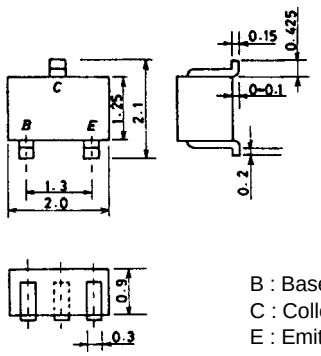
- Very small-sized package permitting the 2SA1687/2SC4446-applied sets to be made small and slim.
- High V_{EBO}.

Package Dimensions

unit:mm

2059

[2SA1687/2SC4446]



B : Base
C : Collector
E : Emitter

SANYO : MCP

( ) : 2SA1687

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}		(–)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	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			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)10V, I_C=0			(–)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)6V, I_C=(–)1mA	135*		600*	
Gain-Bandwidth Product	f_T	V_{CE}=(–)6V, I_C=(–)1mA		130		MHz

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

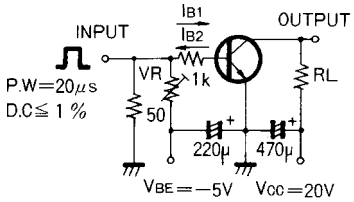
135 5 270	200 6 400	300 7 600

Marking : D (2SA1687) H (2SC4446) h_{FE} rank : 5, 6, 7

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=(–)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=(–)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 Votage	$V_{(BR)EBO}$	I_E=(–)10μA, 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

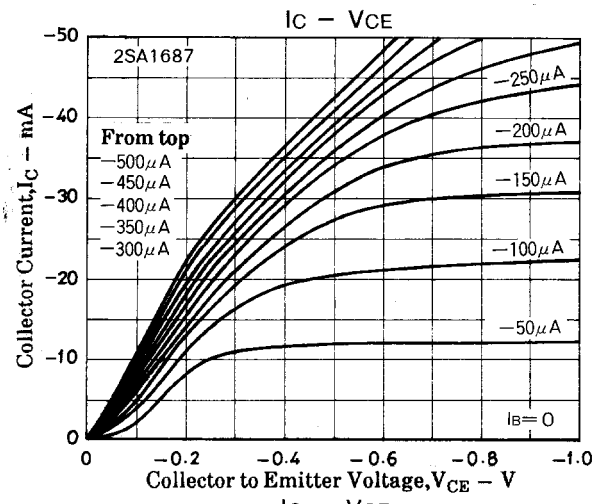
Switching Time Test Circuit

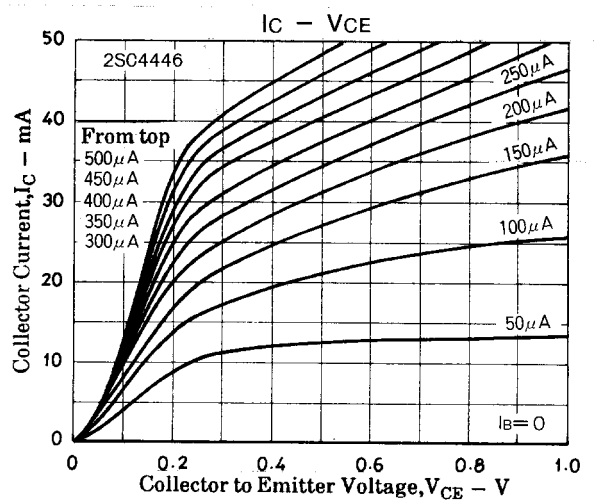


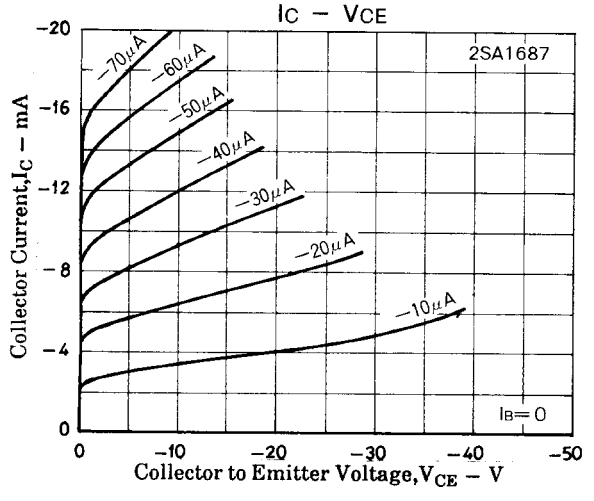
$10I_{B1}=-10I_{B2}=I_C=50mA$

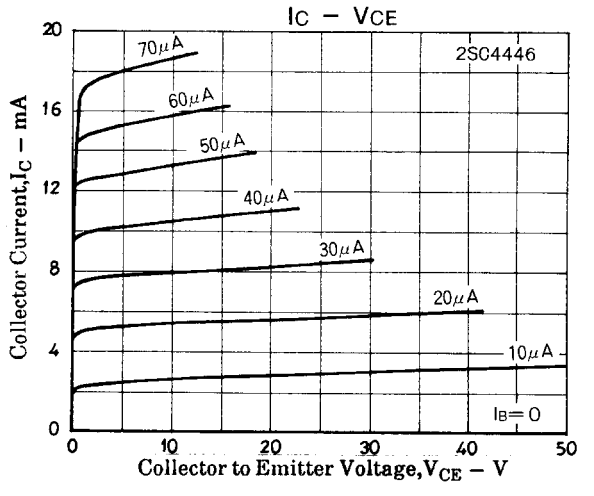
(For PNP, the polarity is reversed.)

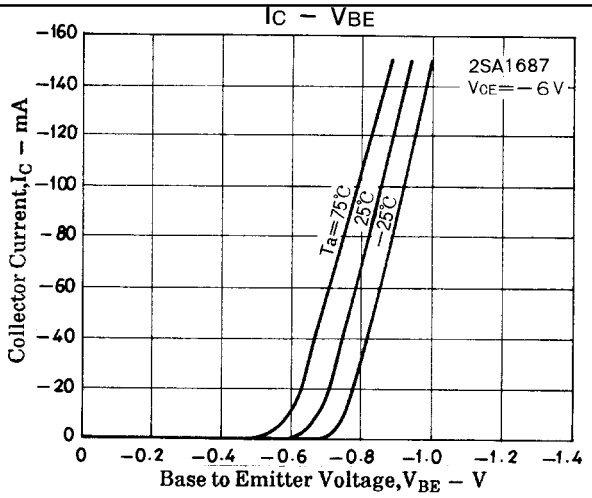
Unit (resistance : Ω, capacitance : F)

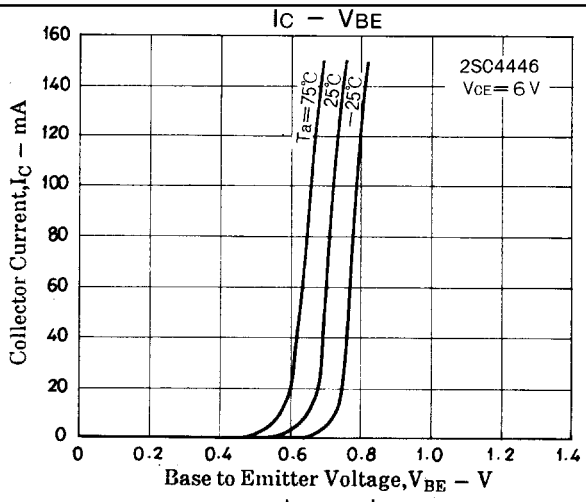


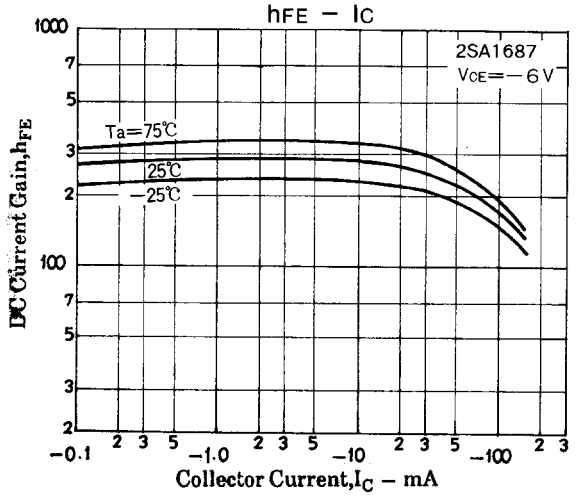


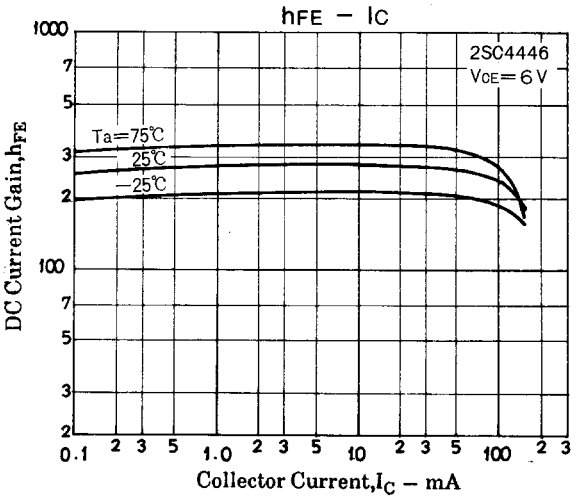


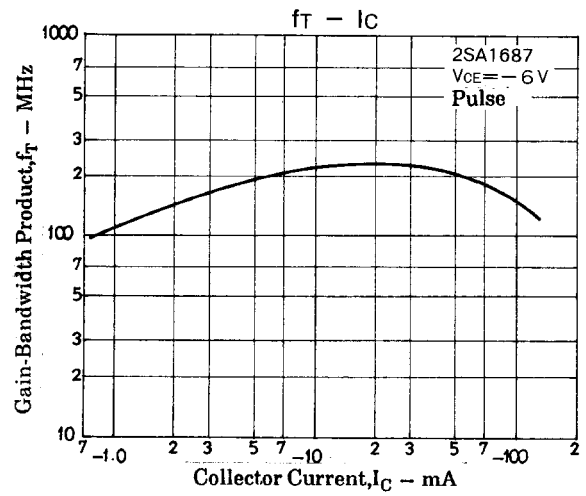


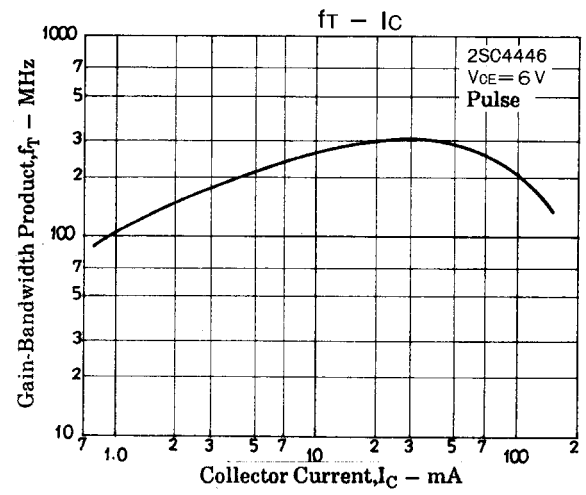

IC – VBE
2SA1687
VCE=–6V
Ta=75℃
25℃
–25℃
Collector Current,IC – mA
Base to Emitter Voltage,VBE – V

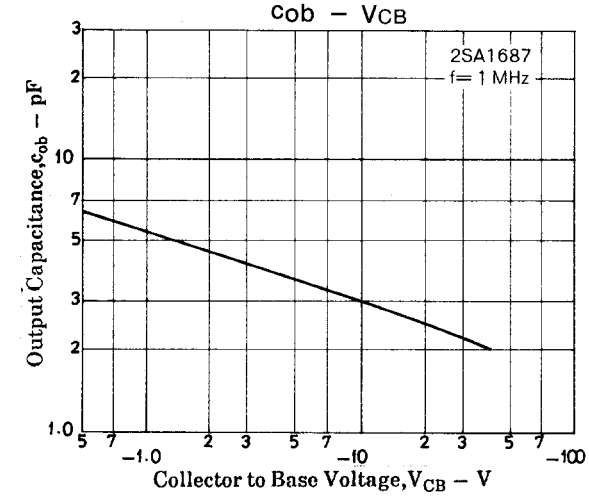

IC – VBE
2SC4446
VCE=6V
Ta=75℃
25℃
–25℃
Collector Current,IC – mA
Base to Emitter Voltage,VBE – V

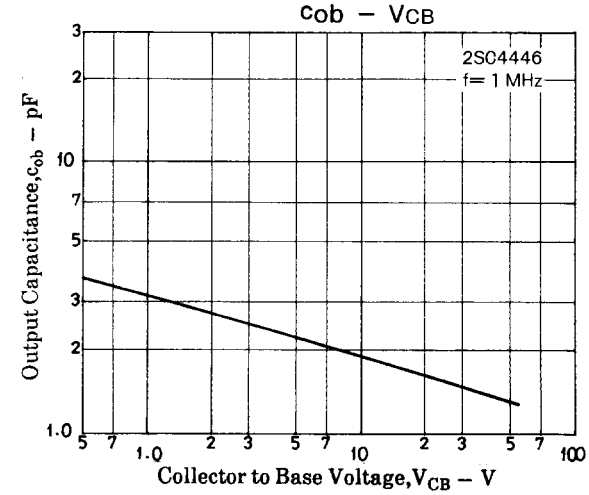

hFE – IC
2SA1687
VCE=–6V
Ta=75℃
25℃
–25℃
DC Current Gain,hFE
Collector Current,IC – mA

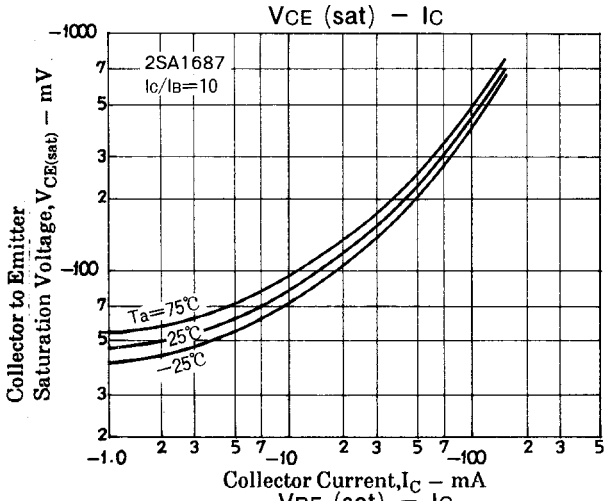

hFE – IC
2SC4446
VCE=6V
Ta=75℃
25℃
–25℃
DC Current Gain,hFE
Collector Current,IC – mA

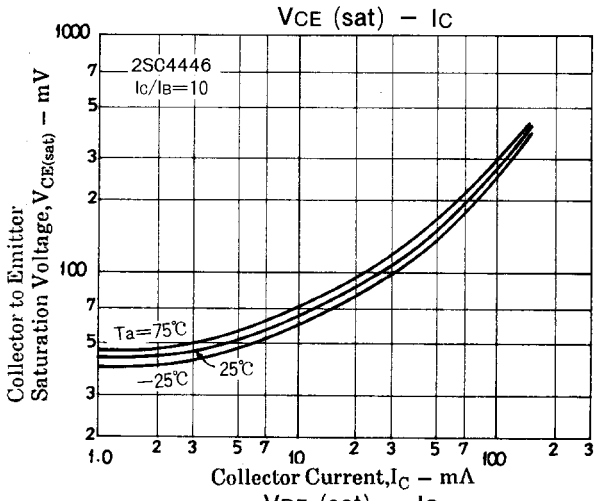

fT – IC
2SA1687
VCE=–6V
Pulse
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA

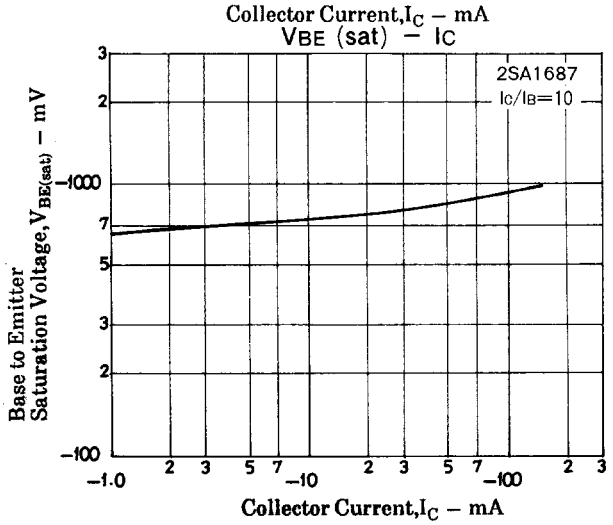

fT – IC
2SC4446
VCE=6V
Pulse
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA

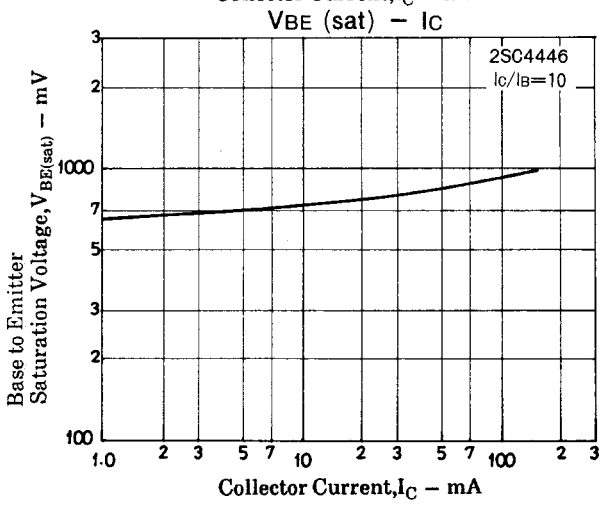

Cob – VCB
2SA1687
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V

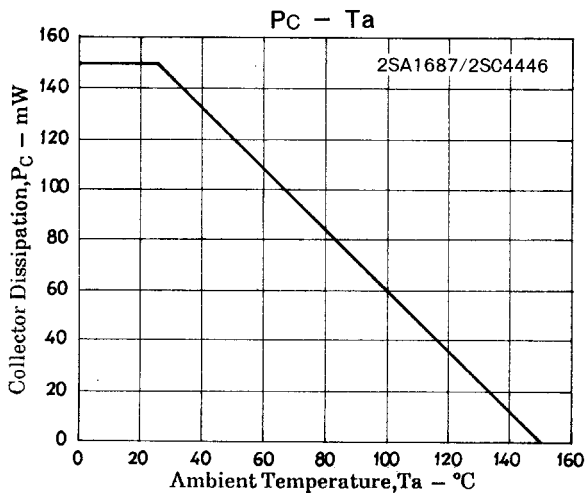

Cob – VCB
2SC4446
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V


VCE (sat) – IC
2SA1687
IC/IB=10
Ta=75°C
25°C
–25°C
Collector to Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA


VCE (sat) – IC
2SC4446
IC/IB=10
Ta=75°C
25°C
–25°C
Collector to Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA


VBE (sat) – IC
2SA1687
IC/IB=10
Base to Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – mA


VBE (sat) – IC
2SC4446
IC/IB=10
Base to Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – mA


PC – Ta
2SA1687/2SC4446
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C