Ordering number:EN3013

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1687/2SC4446

Low-Frequency General-Purpose Amplifier Applications

Features

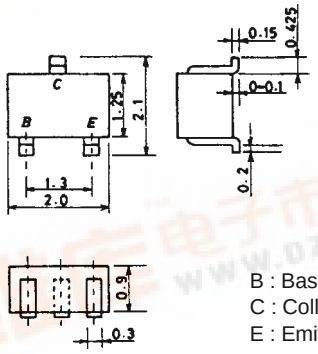
- Very small-sized package permitting the 2SA1687/ 2SC4446-applied sets to be made small and slim.
- High V_{EBO}.

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_{FE} rank : 5, 6, 7
H (2SC4446)

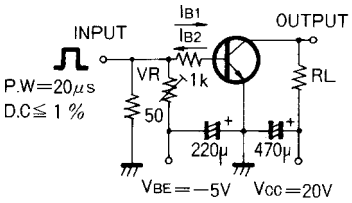
■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges,or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

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

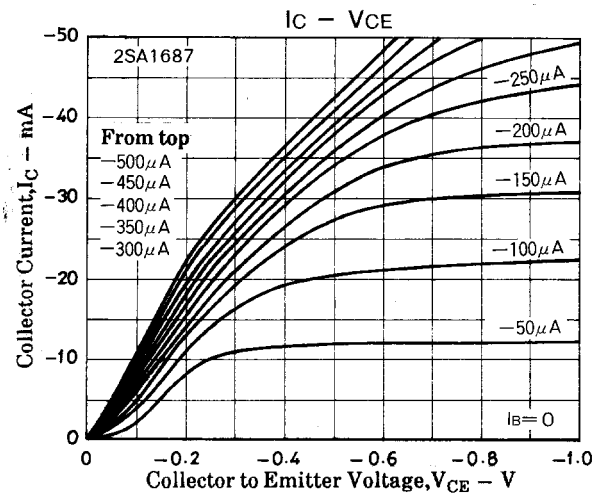
Switching Time Test Circuit

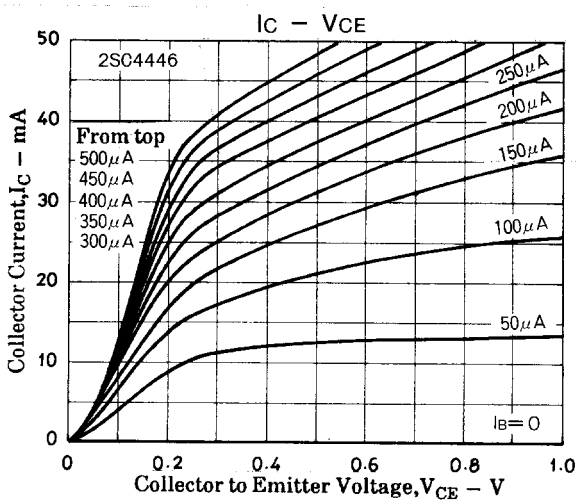


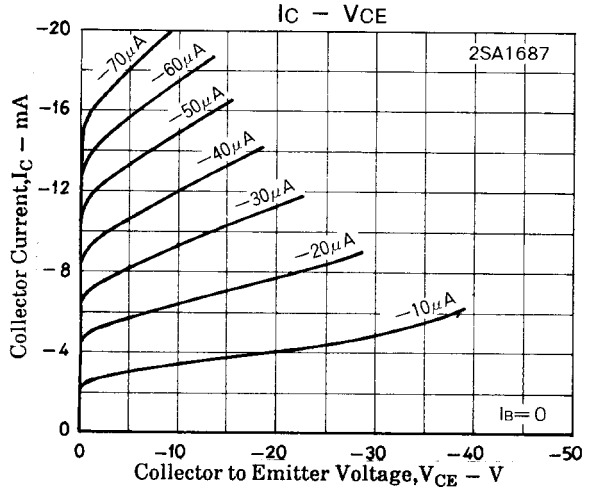
$10I_{B1}=-10I_{B2}=I_C=50mA$

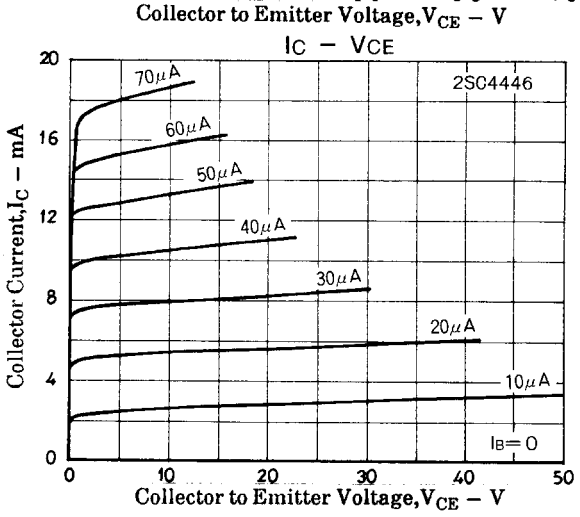
(For PNP, the polarity is reversed.)

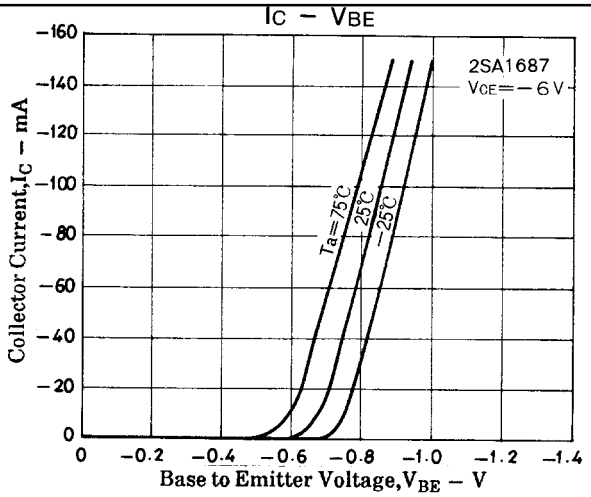
Unit (resistance : Ω, capacitance : F)

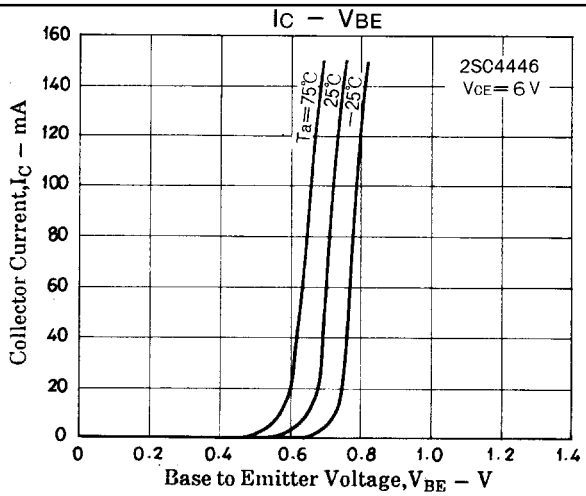


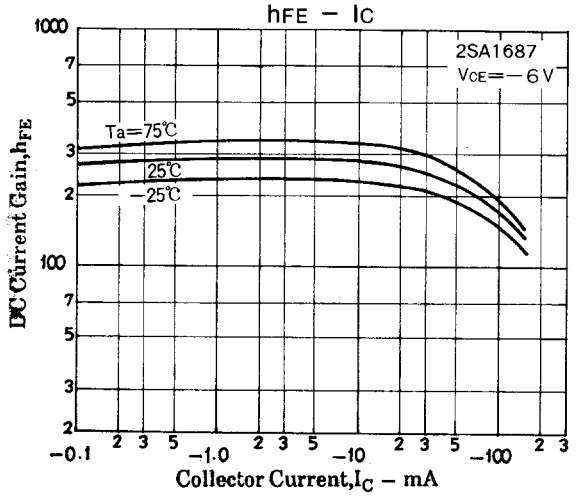


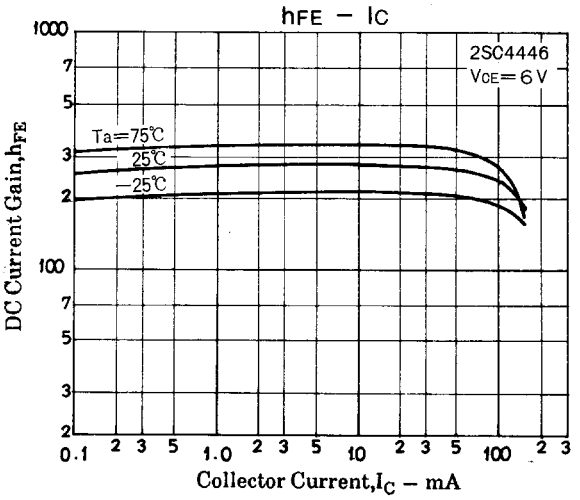


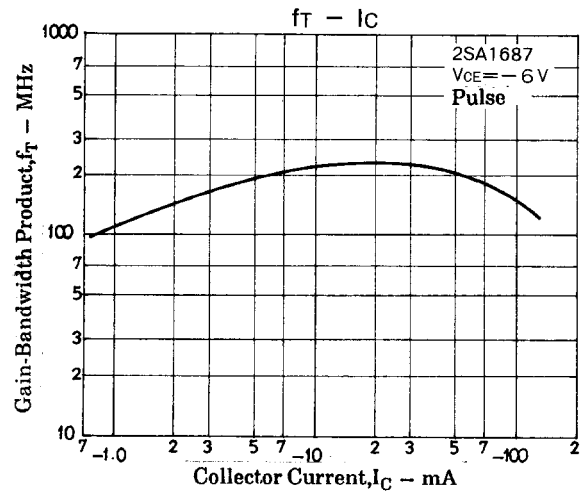


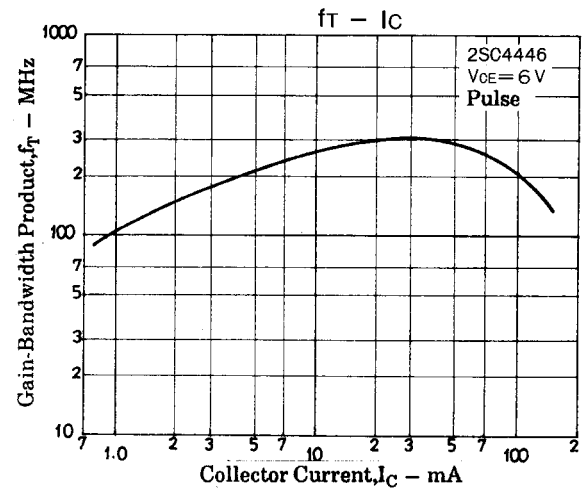

IC – VBE
2SA1687
VCE=–6V
Ta=75℃
25℃
–25℃
Collector Current,IC – mA
Base to Emitter Voltage,VBE – V

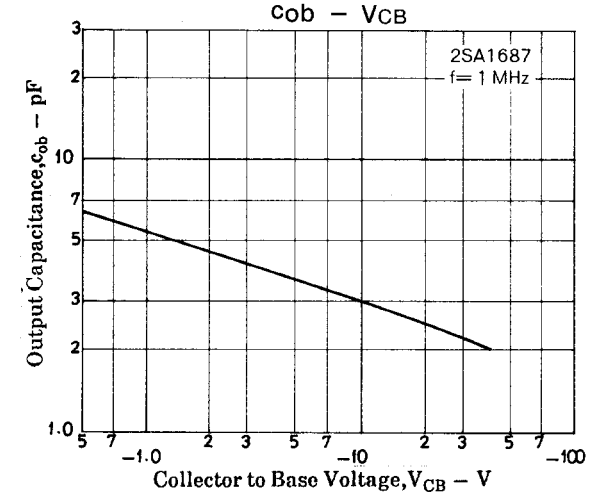

IC – VBE
2SC4446
VCE=6V
Ta=75℃
25℃
–25℃
Collector Current,IC – mA
Base to Emitter Voltage,VBE – V

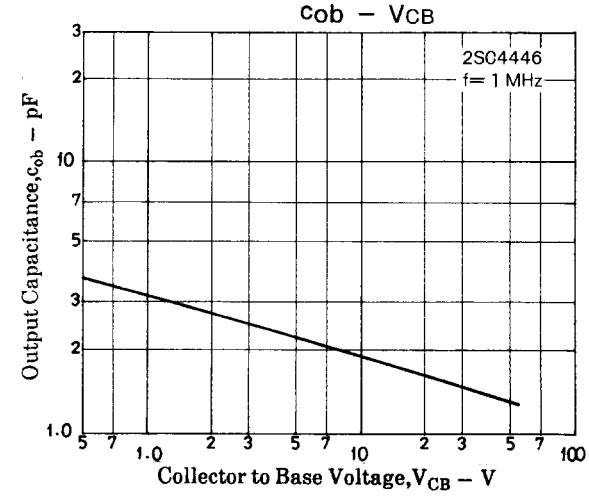

hFE – IC
2SA1687
VCE=–6V
Ta=75℃
25℃
–25℃
DC Current Gain,hFE
Collector Current,IC – mA

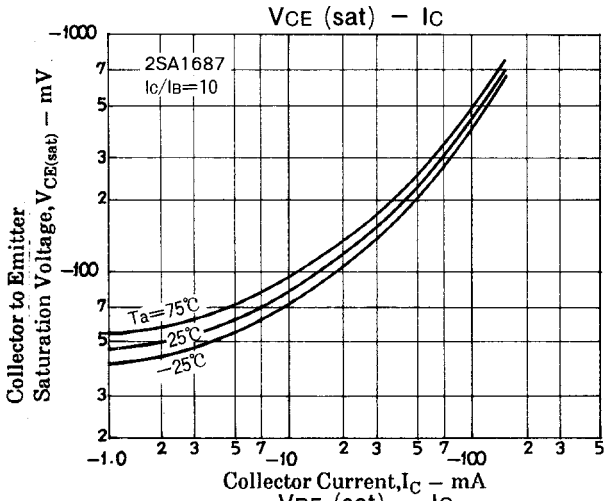

hFE – IC
2SC4446
VCE=6V
Ta=75℃
25℃
–25℃
DC Current Gain,hFE
Collector Current,IC – mA

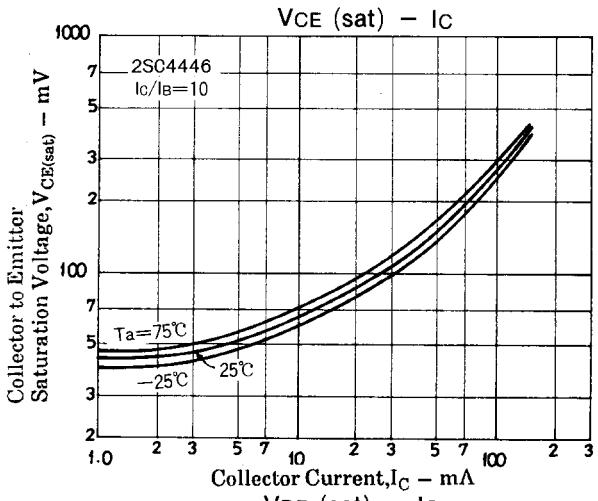

fT – IC
2SA1687
VCE=–6V
Pulse
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA

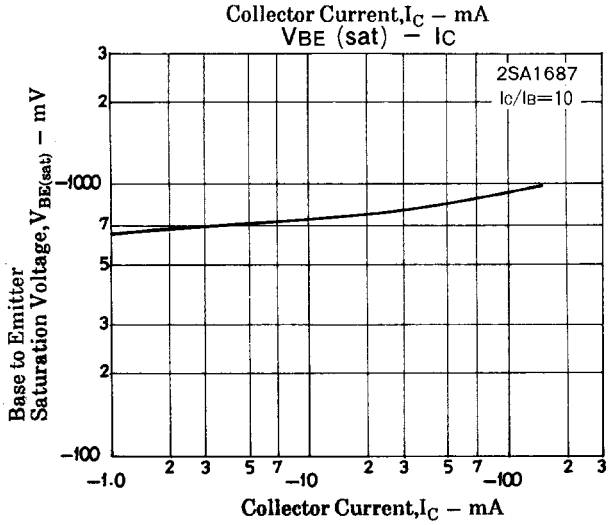

fT – IC
2SC4446
VCE=6V
Pulse
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA

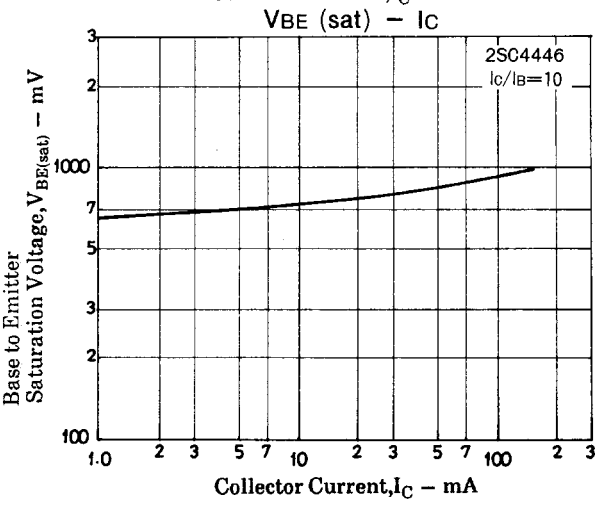

Cob – VCB
2SA1687
f=1 MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V

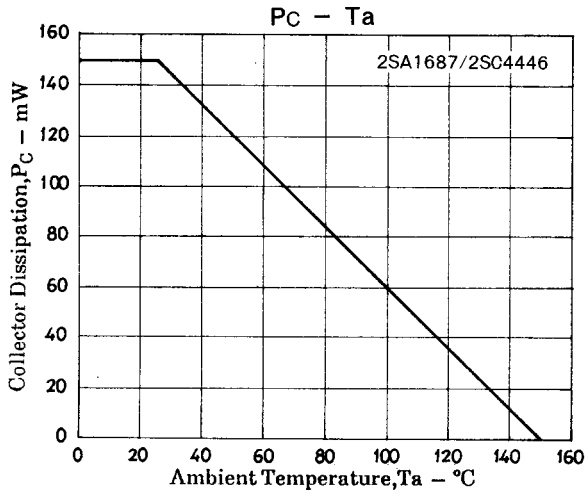

Cob – VCB
2SC4446
f=1 MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V


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


VCE (sat) – IC
2SC4446
IC/IB=10
Ta=75℃
25℃
–25℃
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