Ordering number:EN3582

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1768/2SC4612

High-Voltage Switching Applications

Applicaitons

· Color TV sound output, converter, inverter.

Features

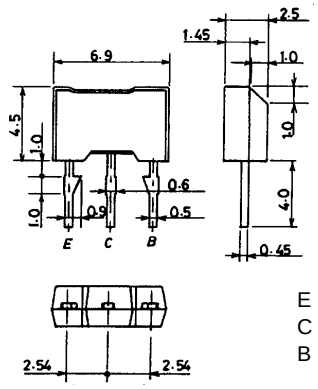
· Adoption of MBIT process.
· High breakdown voltage, large current capacity.
· Fast switching speed.

Package Dimensions

unit:mm

2064

[2SA1768/2SC4612]



E : Emitter
C : Collector
B : Base

SANYO : NMP

( ) : 2SA1768

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)180	V
Collector-to-Emitter Voltage	V_{CEO}		(–)160	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)0.7	mA
Collector Current (Pulse)	I_{CP}		(–)1.5	mA
Collector Dissipation	P_C		1	W
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}=(–)120V, 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=(–)100mA	100*		400*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)10mA	90			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=–50mA		120		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(11)8		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=250mA, I_B=(–)25mA		(–0.2)	(–0.5)	V
				0.12	0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=250mA, I_B=(–)25mA		(–)0.85	(–)1.2	V

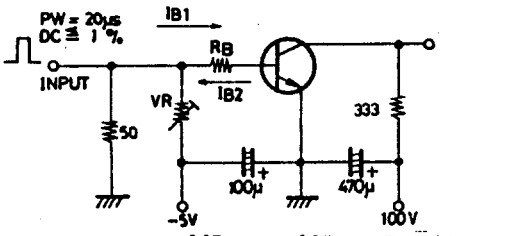
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μA, I_E=0	(–)180			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, R_{BE}=∞	(–)160			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA, I_C=0	6			V
Turn-ON Time	t_{on}	See specified Test Circuit		(60)50		ns
Storage Time	t_{stg}	See specified Test Circuit		(900)		ns
				1000		ns
Fall Time	t_f	See specified Test Circuit		(60)60		ns

* : The 2SA1768/2SC4612 are classified by 100mA h_{FE} as follows :

100 R 200	140 S 280	200 T 400

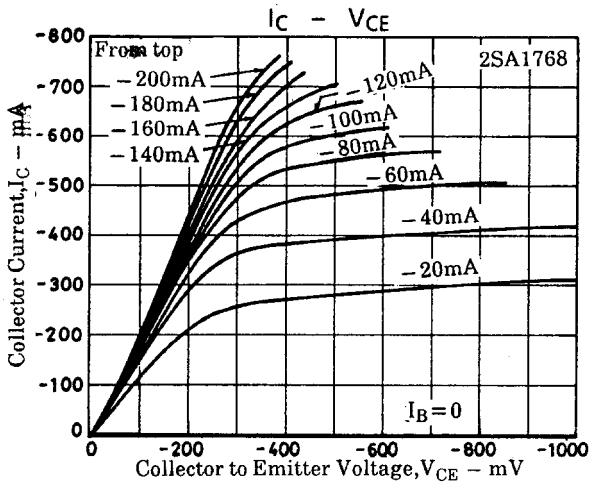
Switching Time Test Circuit

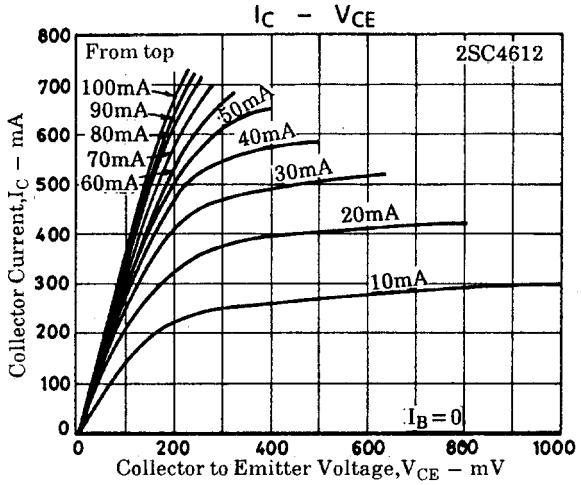


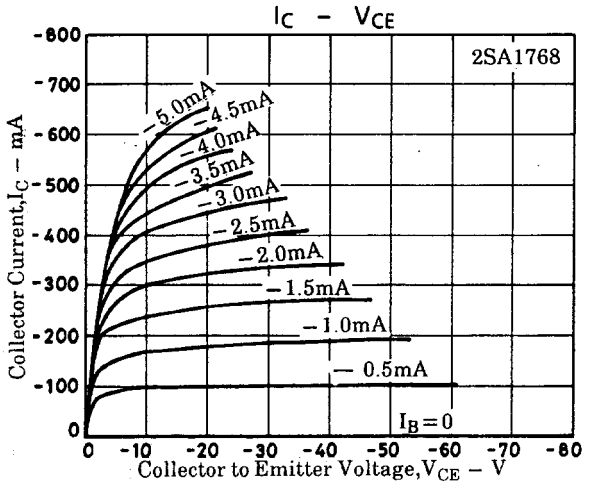
$20I_{B1} = -20I_{B2} = I_C = 300mA$

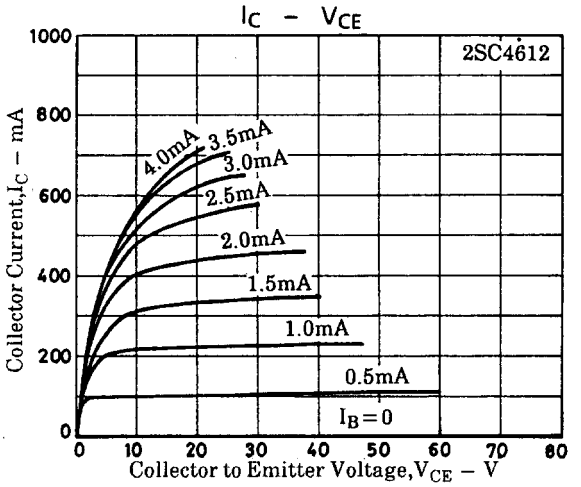
(For PNP, the polarity is reversed.)

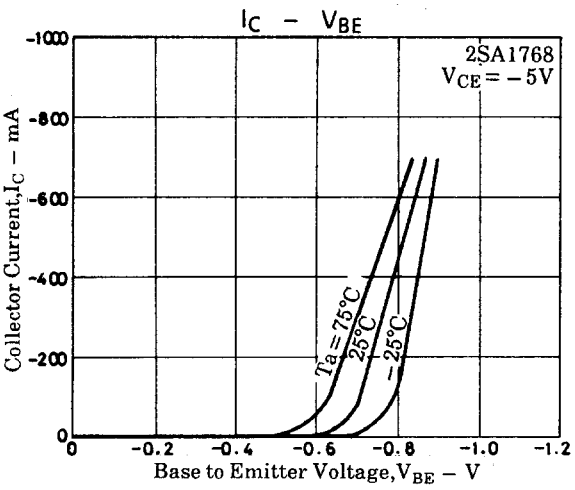
Unit (resistance : Ω, capacitance : F)

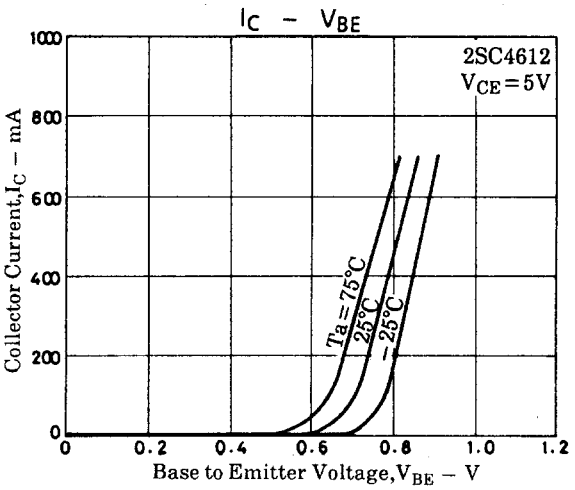


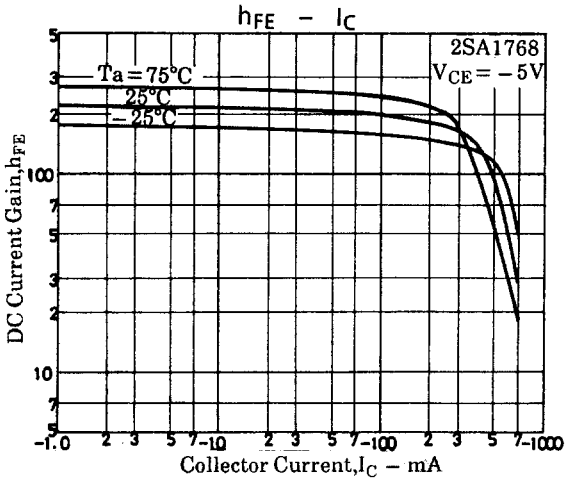


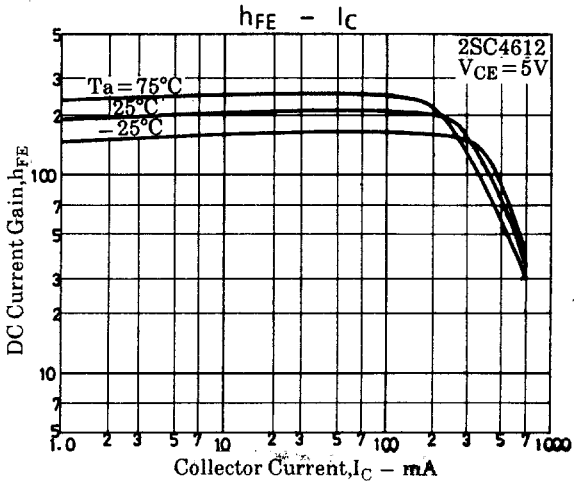


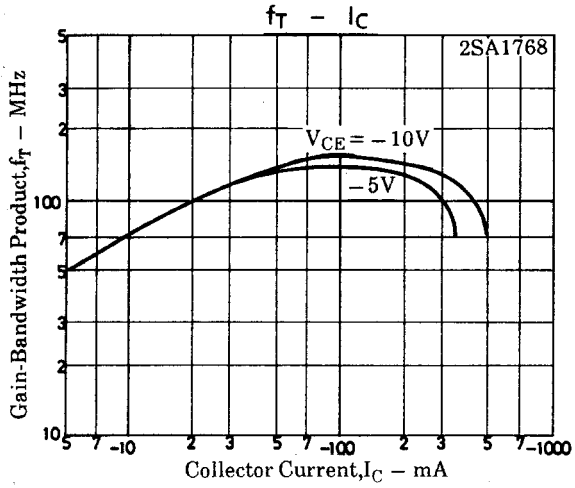


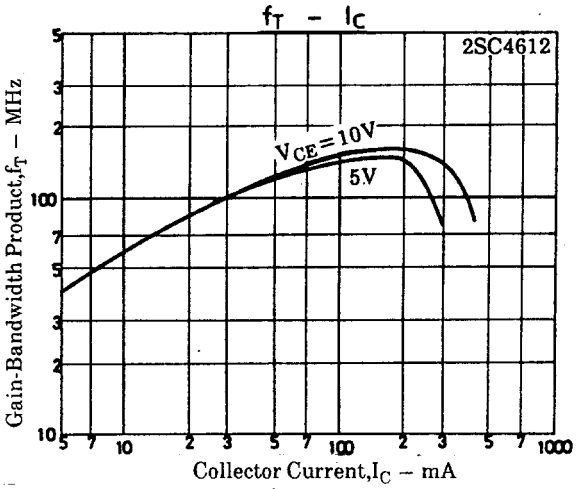

IC – VBE
2SA1768
VCE = –5V
Collector Current, IC – mA
Base to Emitter Voltage, VBE – V
Ta = 75°C
25°C
–25°C

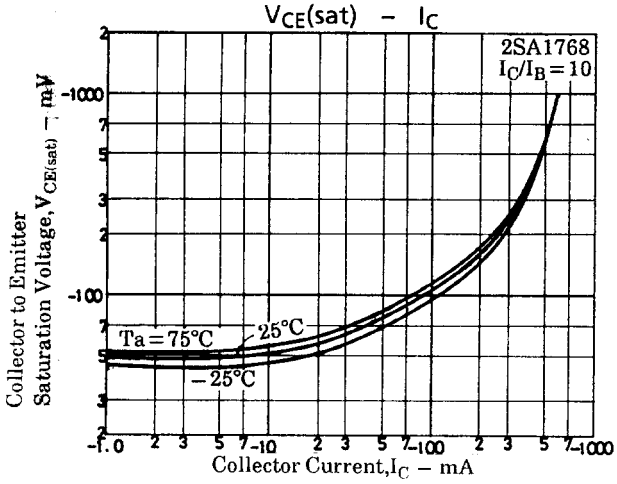

IC – VBE
2SC4612
VCE = 5V
Collector Current, IC – mA
Base to Emitter Voltage, VBE – V
Ta = 75°C
25°C
–25°C

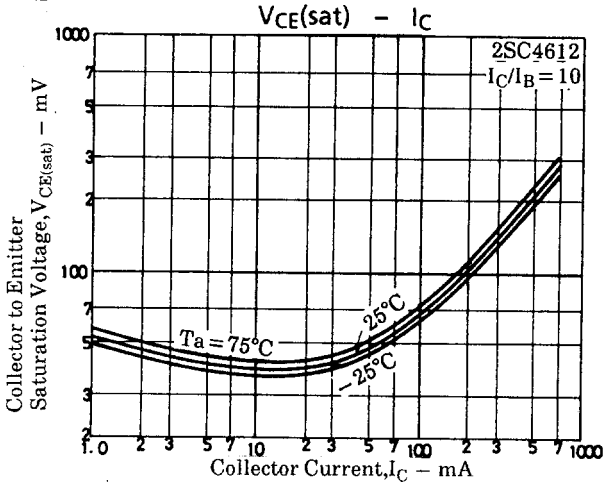

hFE – IC
2SA1768
VCE = –5V
DC Current Gain, hFE
Collector Current, IC – mA
Ta = 75°C
25°C
–25°C

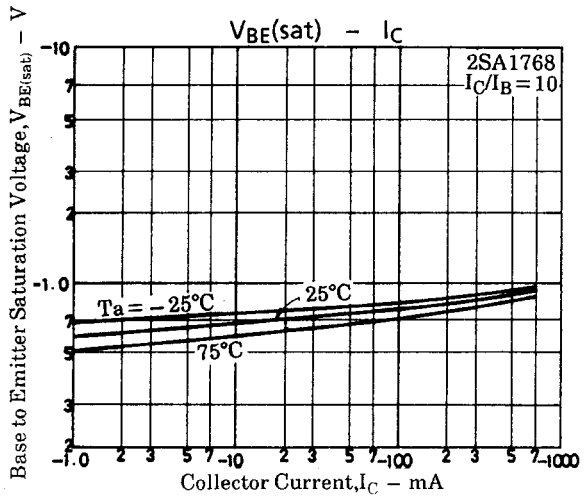

hFE – IC
2SC4612
VCE = 5V
DC Current Gain, hFE
Collector Current, IC – mA
Ta = 75°C
25°C
–25°C

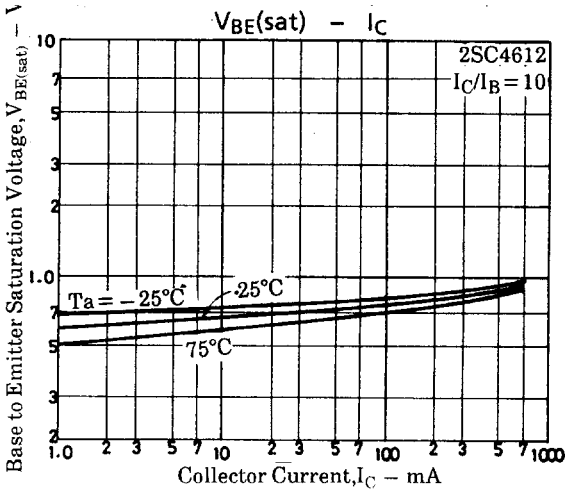

fT – IC
2SA1768
VCE = –10V
–5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA

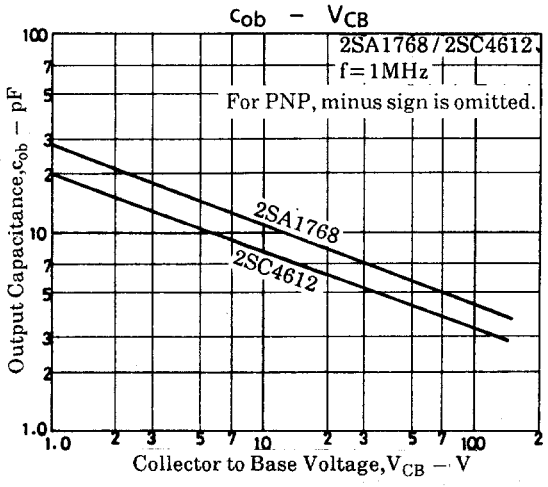

fT – IC
2SC4612
VCE = 10V
5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA

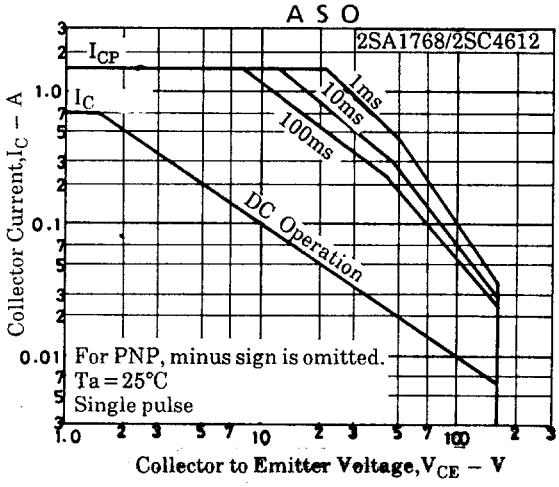

VCE(sat) – IC
2SA1768
IC/IB = 10
Collector to Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
Ta = 75°C
25°C
–25°C

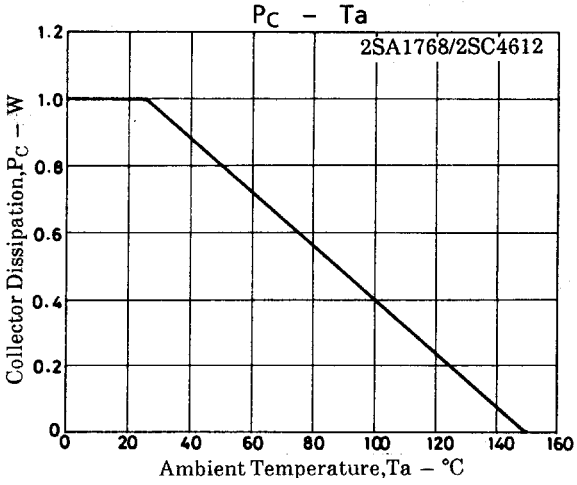

VCE(sat) – IC
2SC4612
IC/IB = 10
Collector to Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – mA
Ta = 75°C
25°C
–25°C


VBE(sat) – IC
2SA1768
IC/IB=10
Ta=–25°C
25°C
75°C
Base to Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – mA


VBE(sat) – IC
2SC4612
IC/IB=10
Ta=–25°C
25°C
75°C
Base to Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – mA


Cob – VCB
2SA1768/2SC4612
f=1MHz
For PNP, minus sign is omitted.
2SA1768
2SC4612
Output Capacitance, Cob – pF
Collector to Base Voltage, VCB – V


ASO
2SA1768/2SC4612
ICP
IC
1ms
10ms
100ms
DC Operation
For PNP, minus sign is omitted.
Ta=25°C
Single pulse
Collector Current, IC – A
Collector to Emitter Voltage, VCE – V


PC – Ta
2SA1768/2SC4612
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C