Ordering number:EN4493

FP204

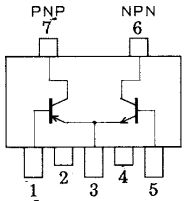
PNP/NPN Epitaxial Planar Silicon Transistors

Push-Pull Circuit Applications

Features

- Composite type with a PNP transistor and an NPN transistor in one package, facilitating high-density mounting.
- The FP204 is composed of 2 chips, one being equivalent to the 2SB1123 and 2SD1623, which are placed in one package.

Electrical Connection

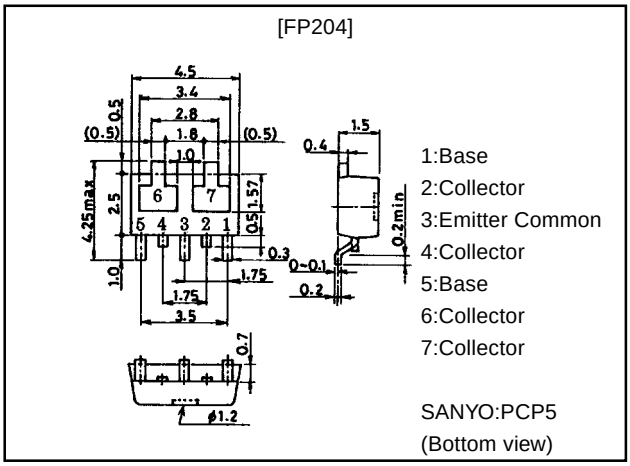


1:Base
2:Collector
3:Emitter Common
4:Collector
5:Base
6:Collector
7:Collector
(Top view)

Package Dimensions

unit:mm

2097A



1:Base
2:Collector
3:Emitter Common
4:Collector
5:Base
6:Collector
7:Collector

SANYO:PCP5
(Bottom view)

Specifications

Absolute Maximum Ratings at Ta = 25˚C

( ) : PNP

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}		(–)6	V
Collector Current	I_C		(–)2	A
Collector Current (Pulse)	I_{CP}		(–)4	A
Base Current	I_B		(–)0.4	A
Collector Dissipation	P_C	Mounted on ceramic board (250mm²×0.8mm) 1unit	0.8	W
Total Power Dissipation	P_T	Mounted on ceramic board (250mm²×0.8mm)	1.1	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

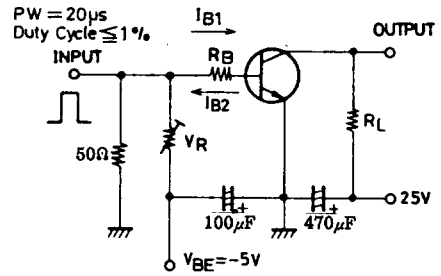
Electrical Characteristics at Ta=25˚C

Parameter	Symbol	Conditons	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)50V, I_E=0			(–)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)100	nA
DC Current Gain	h_{FE}	V_{CE}=(–)2V, I_C=(–)100mA	140		400	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		150		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(22)		pF
				12		pF
C-E Saturation Voltage	$V_{CE(sat)}$	I_C=(–)1.0A, I_B=(–)50mA		(–250)	(–500)	mV
				150	300	mV
B-E Saturation Voltage	$V_{BE(sat)}$	I_C=(–)1.0A, I_B=(–)50mA		(–)0.9	(–)1.2	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)60			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit		60		ns
Storage Time	t_{stg}	See specified Test Circuit		(450) 550		ns
Fall Time	t_f	See specified Test Circuit		30		ns

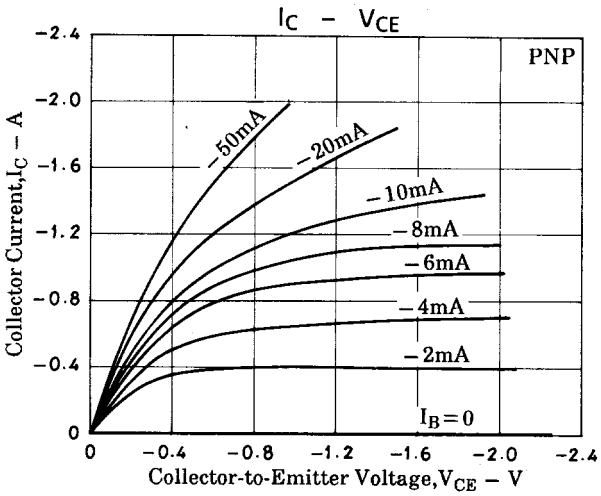
Marking:204

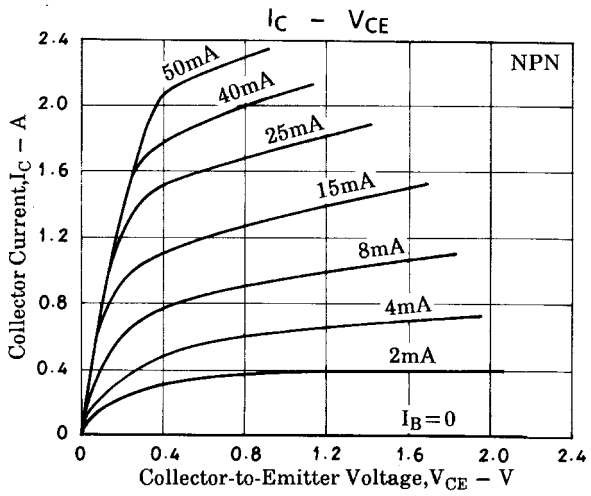
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

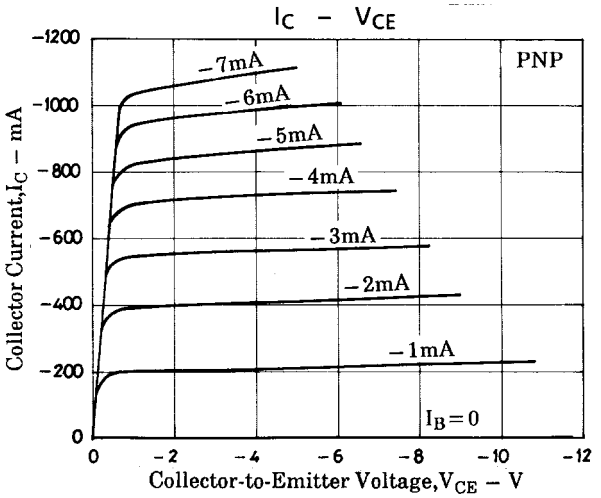
Switching Time Test Circuit

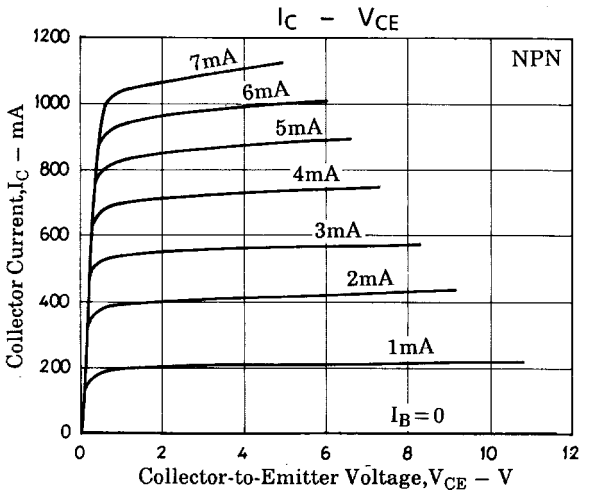


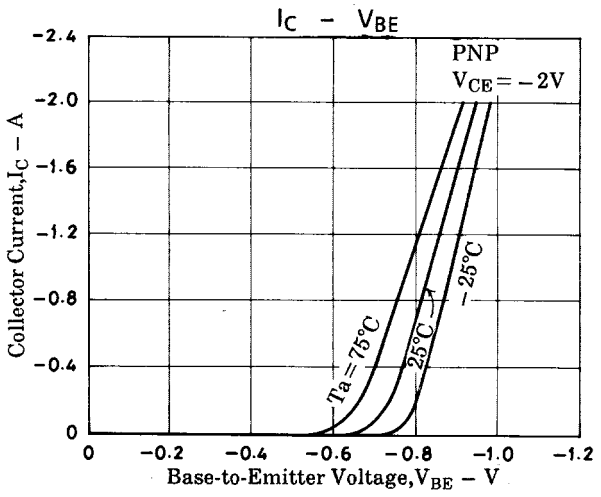
$I_C = 10I_{B1} = -10I_{B2} = 500mA$, $V_{CC} = 25V$
For PNP, the polarity is reversed.

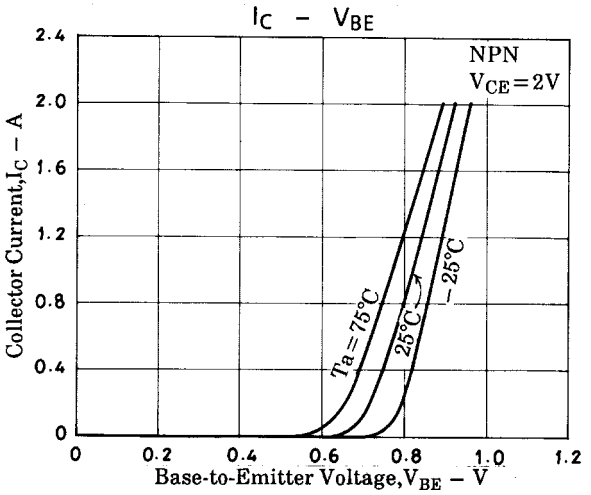


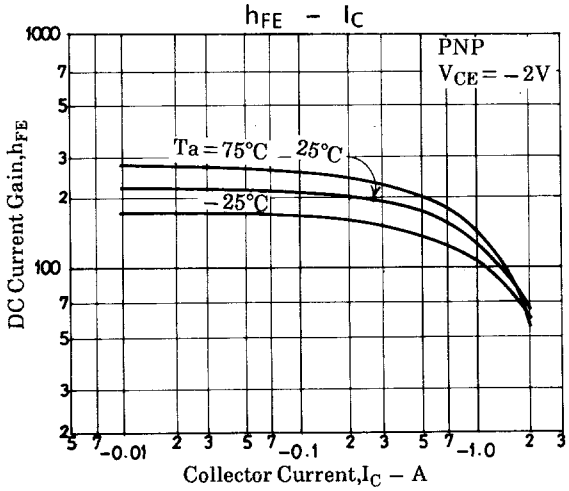


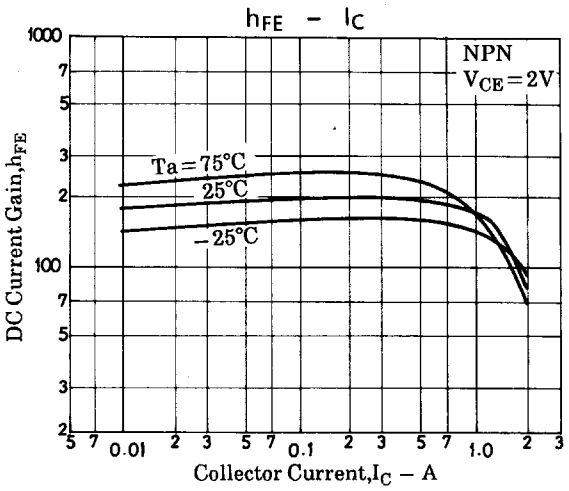


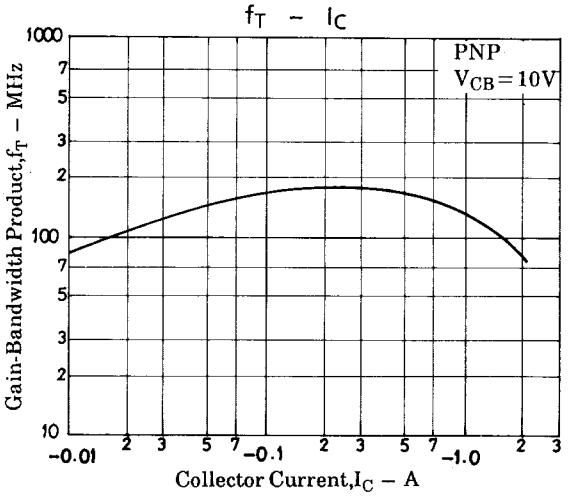


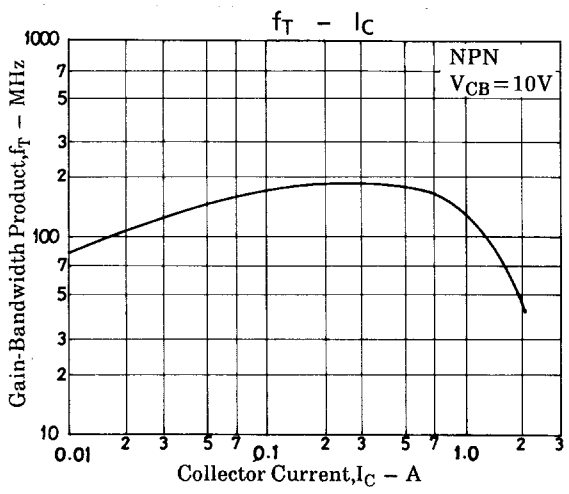


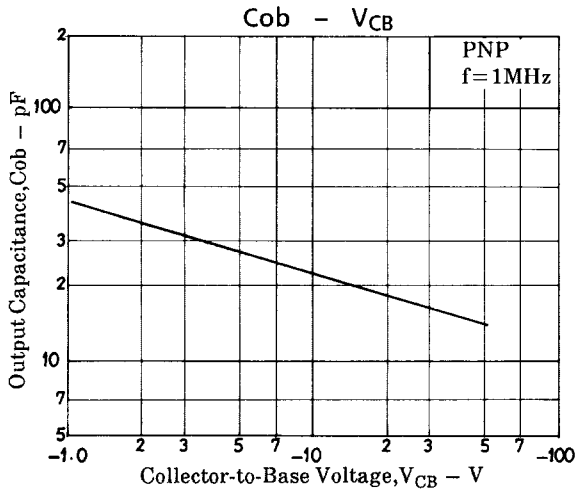


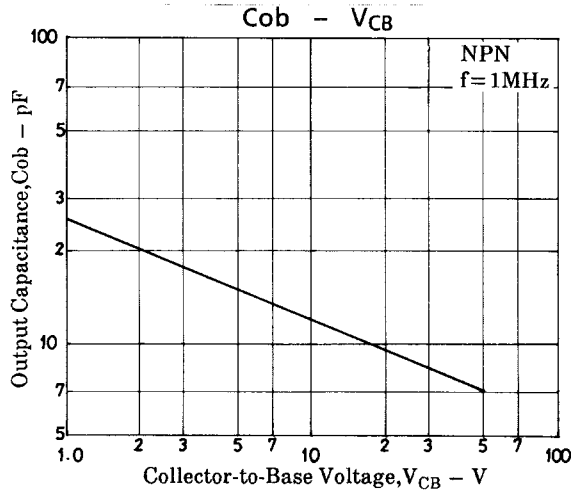

hFE – IC
PNP
VCE=–2V
Ta=75°C
25°C
–25°C
DC Current Gain,hFE
Collector Current,IC – A

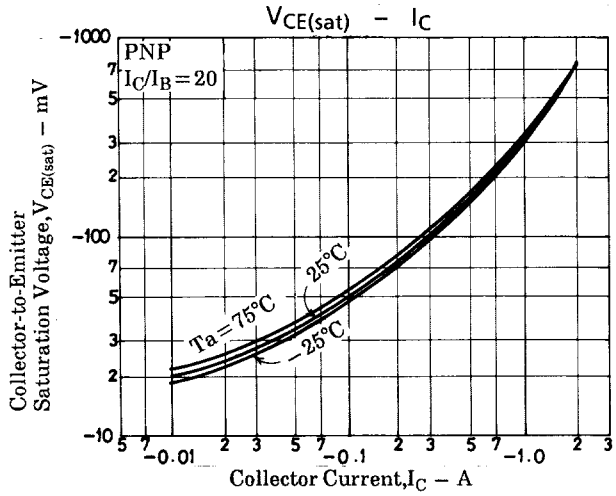

hFE – IC
NPN
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain,hFE
Collector Current,IC – A

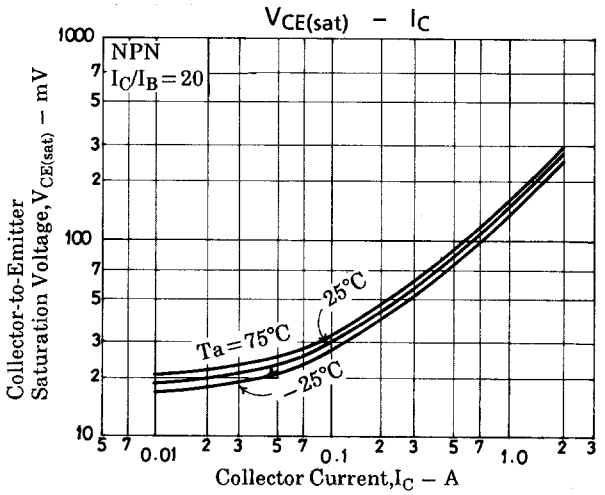

fT – IC
PNP
VCB=10V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – A


fT – IC
NPN
VCB=10V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – A

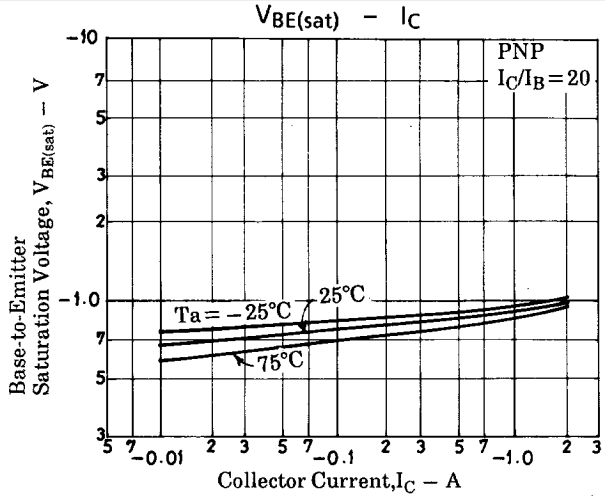

Cob – VCB
PNP
f=1MHz
Output Capacitance,Cob – pF
Collector-to-Base Voltage,VCB – V


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

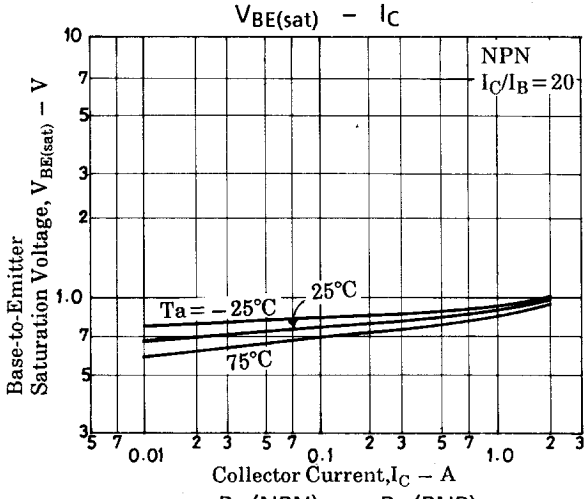

VCE(sat) – IC
PNP
IC/IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage,VCE(sat) – mV
Collector Current,IC – A


VCE(sat) – IC
NPN
IC/IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage,VCE(sat) – mV
Collector Current,IC – A

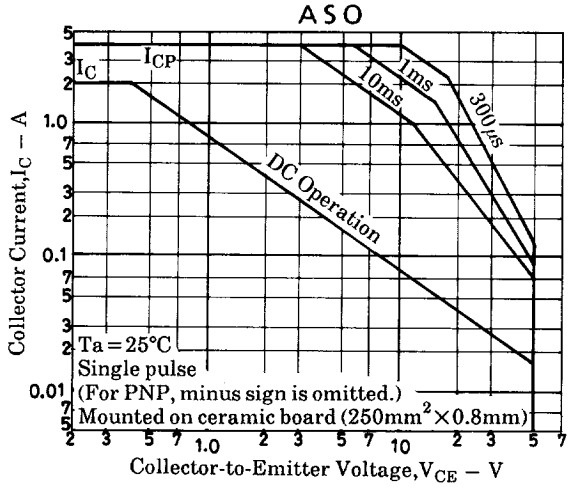
$V_{BE(sat)}$ – I_C



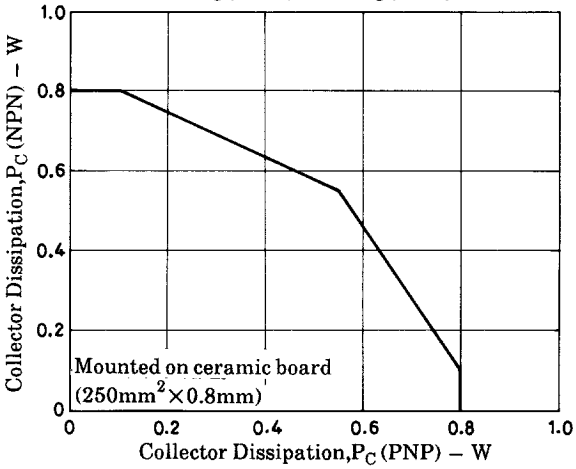
$V_{BE(sat)}$ – I_C



ASO



P_C (NPN) – P_C (PNP)



P_C – Ta