Ordering number:EN4778

# FP206

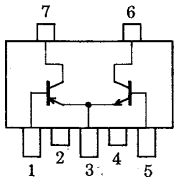
PNP/NPN Epitaxial Planar Silicon Transistors

## Push-Pull Circuit Applications

## Features

- Composite type with a PNP transistor and an NPN transistor in one package, facilitating high-density mounting.
- The FP206 is composed of 2 chips, one being equivalent to the 2SA1728 and the other 2SC4519, placed in one package.

### Electrical Connection



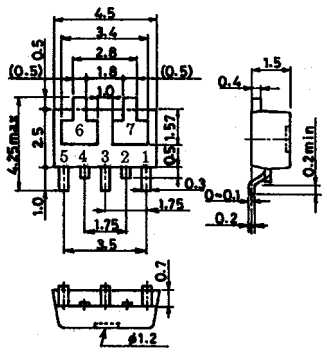

1:Base
2:Collector
3:Emitter Common
4:Collector
5:Base
6:Collector
7:Collector
(Top view)

## Package Dimensions

unit:mm

2097A

[FP206]




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 | $V_{CBO}$ | | (–)50 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | (–)40 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | (–)5 | V |
| Collector Current | $I_C$ | | (–)500 | mA |
| Collector Current (Pulse) | $I_{CP}$ | | (–)1 | A |
| Base Current | $I_B$ | | (–)100 | mA |
| Collector Dissipation | $P_C$ | Mounted on ceramic board (250mm²×0.8mm) 1unit | 0.75 | W |
| Total Power Dissipation | $P_T$ | Mounted on ceramic board (250mm²×0.8mm) | 1.0 | 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 | $I_{CBO}$ | $V_{CB}$=(–)40V, $I_E$=0 | | | (–)0.5 | μA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=(–)3V, $I_C$=0 | | | (–)0.5 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=(–)2V, $I_C$=(–)50mA | 100 | | 400 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=(–)2V, $I_C$=(–)50mA | | 350 | | MHz |
| Output Capacitance | Cob | $V_{CB}$=(–)10V, f=1MHz | | (6)4 | | pF |
| C-E Saturation Voltage | $V_{CE(sat)}$ | $I_C$=(–)200mA, $I_B$=(–)10mA | | (–0.2) | (–0.5) | mV |
| | | | | 0.15 | 0.45 | mV |
| B-E Saturation Voltage | $V_{BE(sat)}$ | $I_C$=(–)200mA, $I_B$=(–)10mA | | (–)0.8 | (–)1.2 | V |
| C-B Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=(–)10μA, $I_E$=0 | (–)50 | | | V |
| C-E Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=(–)1mA, $R_{BE}$=∞ | (–)40 | | | V |
| E-B Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$=(–)10μA, $I_C$=0 | (–)5 | | | V |
| Turn-ON Time | $t_{on}$ | See specified Test Circuit | | (60)60 | | ns |
| Storage Time | $t_{stg}$ | See specified Test Circuit | | (120)<br>150 | | ns |
| Fall Time | $t_f$ | See specified Test Circuit | | (50)50 | | ns |

Marking:206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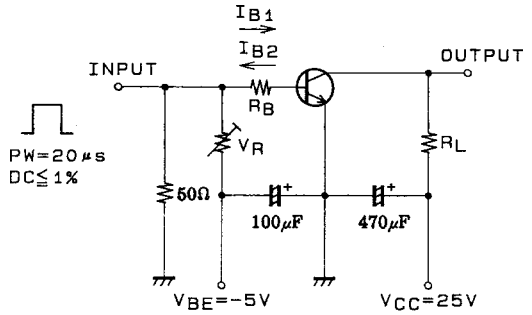
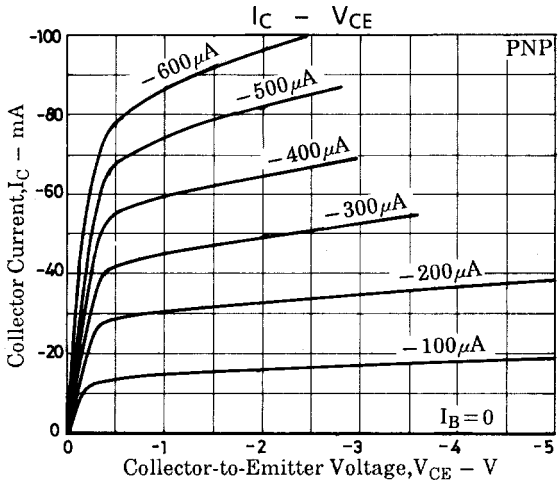
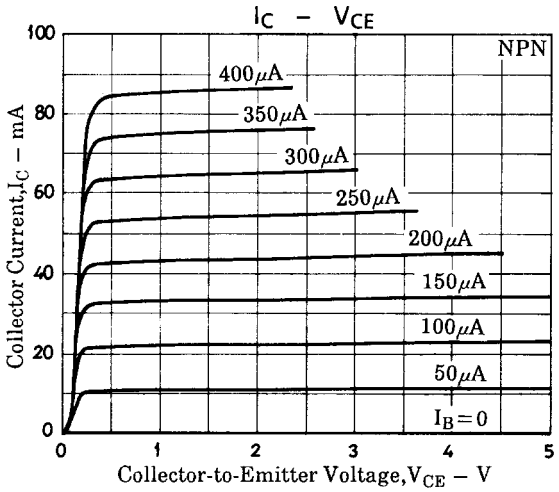
## Switching Time Test Circuit

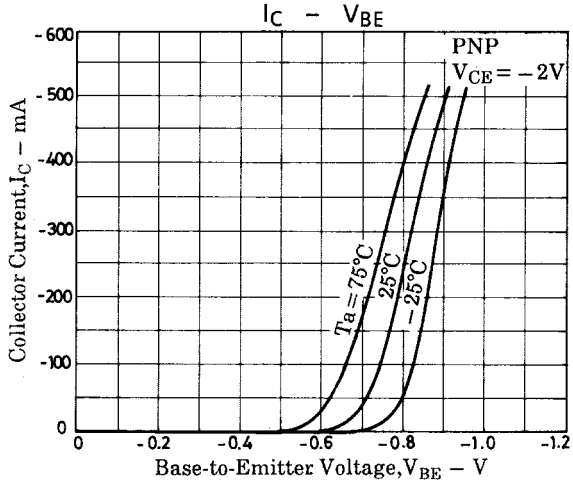


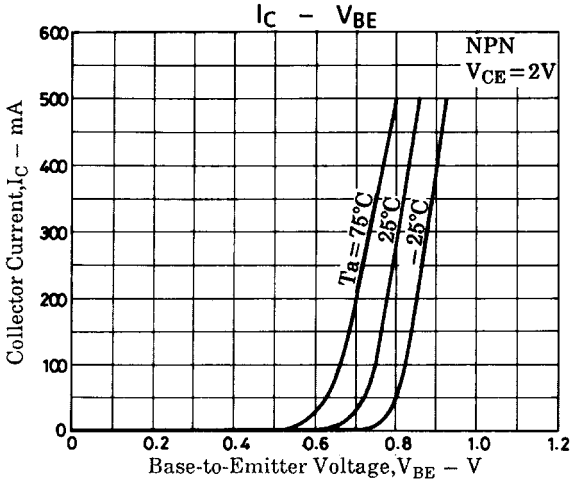

For PNP, the polarity is reversed.

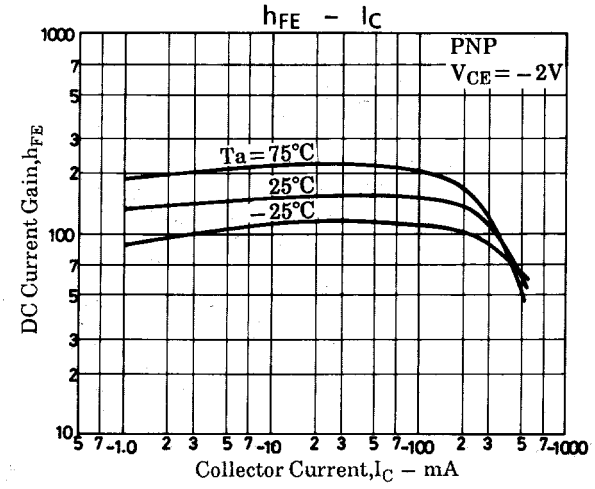
$10I_{B1}=-10I_{B2}=I_C=200mA$

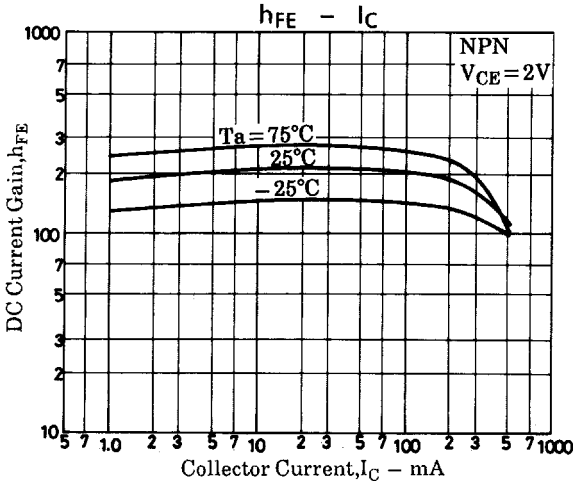


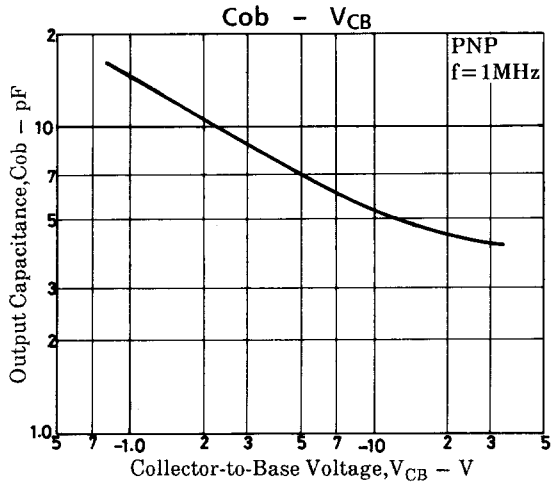



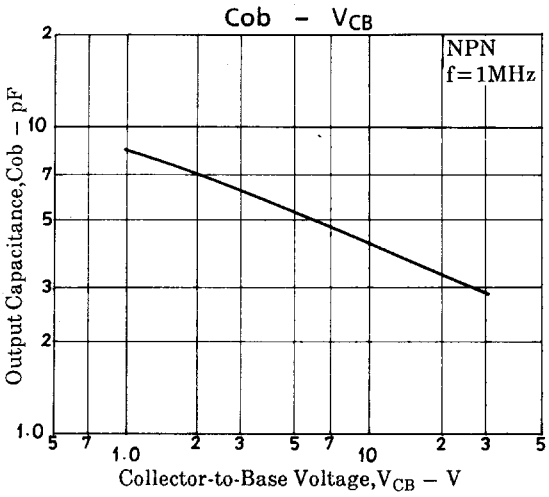



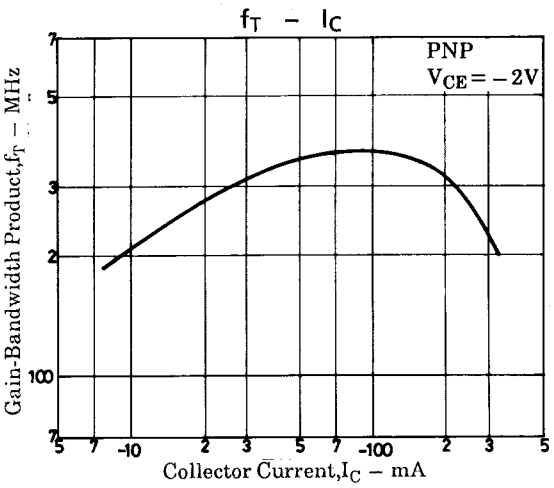



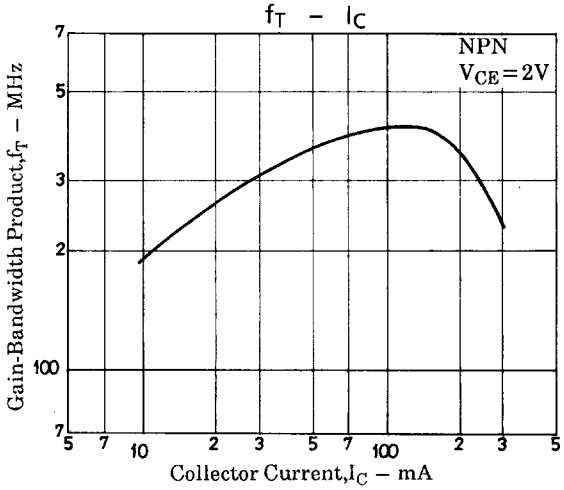



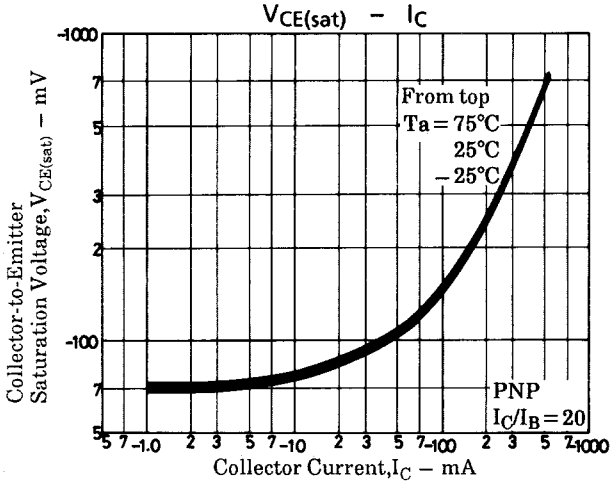



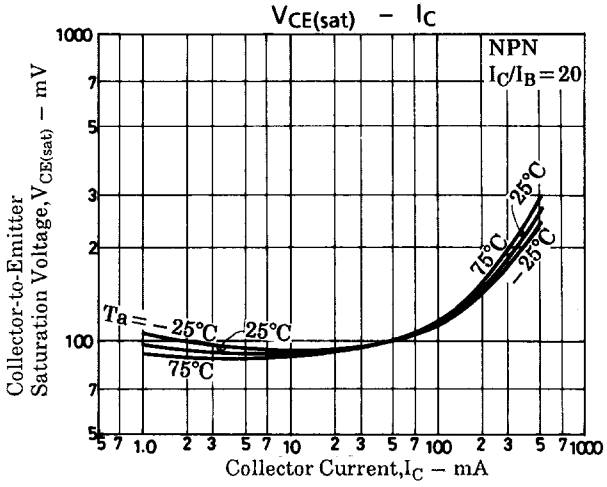

Cob – VCB
PNP
f=1MHz
Output Capacitance,Cob – pF
Collector-to-Base Voltage,VCB – V

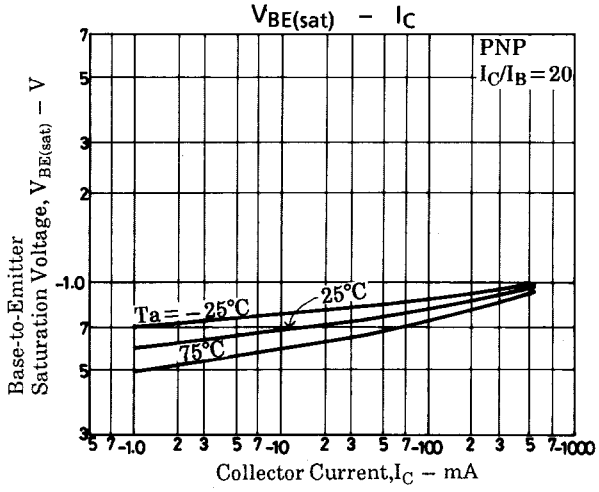

Cob – VCB
NPN
f=1MHz
Output Capacitance,Cob – pF
Collector-to-Base Voltage,VCB – V

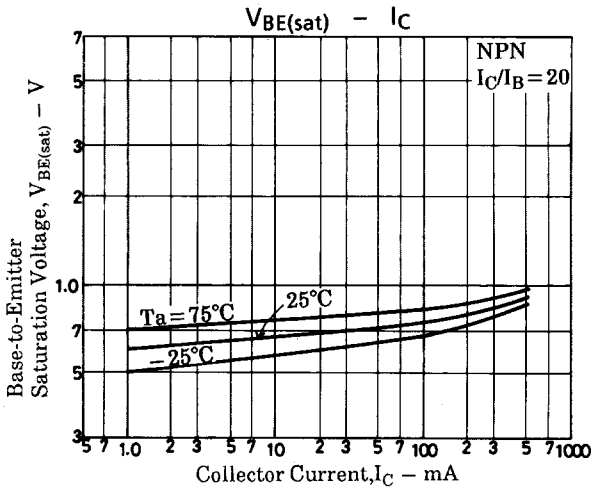

fT – IC
PNP
VCE=–2V
Gain-Bandwidth Product,fT – MHz
Collector Current,IC – mA


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


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


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


VBE(sat) – IC
PNP
IC/IB=20
Ta=–25°C
25°C
75°C
Base-to-Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – mA


VBE(sat) – IC
NPN
IC/IB=20
Ta=75°C
25°C
–25°C
Base-to-Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – mA