



FP204

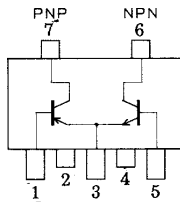
PNP/NPN Epitaxial Planar Silicon Transistors

## 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)

### Specifications

#### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

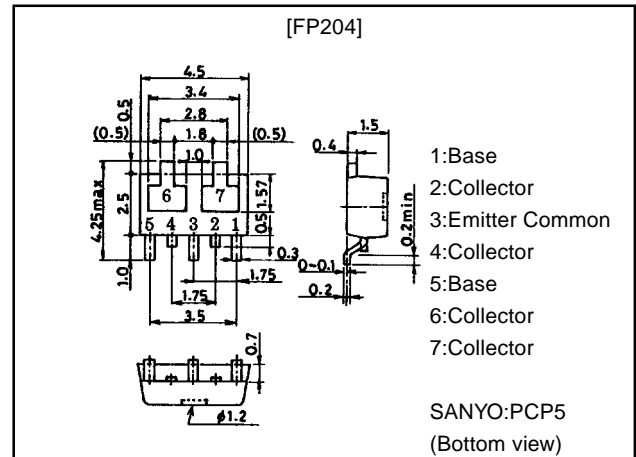
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)60	V
Collector-to-Emitter Voltage	$V_{CE0}$		(-)50	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)2	A
Collector Current (Pulse)	$I_{CP}$		(-)4	A
Base Current	$I_B$		(-)0.4	A
Collector Dissipation	$P_C$	Mounted on ceramic board (250mm <sup>2</sup> ×0.8mm) 1unit	0.8	W
Total Power Dissipation	$P_T$	Mounted on ceramic board (250mm <sup>2</sup> ×0.8mm)	1.1	W
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

( ) : PNP

### Package Dimensions

unit:mm

2097A



#### Electrical Characteristics at $T_a=25^\circ\text{C}$

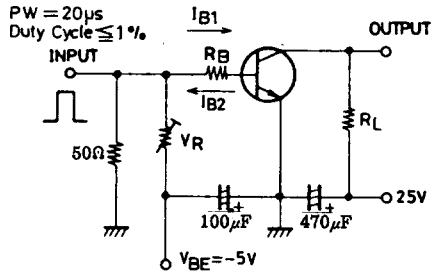
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CB0}$	$V_{CB} = (-)50\text{V}, I_E = 0$			(-)100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4\text{V}, I_C = 0$			(-)100	nA
DC Current Gain	$h_{FE}$	$V_{CE} = (-)2\text{V}, I_C = (-)100\text{mA}$	140		400	
Gain-Bandwidth Product	$f_T$	$V_{CE} = (-)10\text{V}, I_C = (-)50\text{mA}$		150		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = (-)10\text{V}, f = 1\text{MHz}$		(22)		pF
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)1.0\text{A}, I_B = (-)50\text{mA}$		(-250)	(-500)	mV
				150	300	mV
B-E Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)1.0\text{A}, I_B = (-)50\text{mA}$		(-)0.9	(-)1.2	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu\text{A}, I_E = 0$	(-)60			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1\text{mA}, R_{BE} = \infty$	(-)50			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu\text{A}, I_C = 0$	(-)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

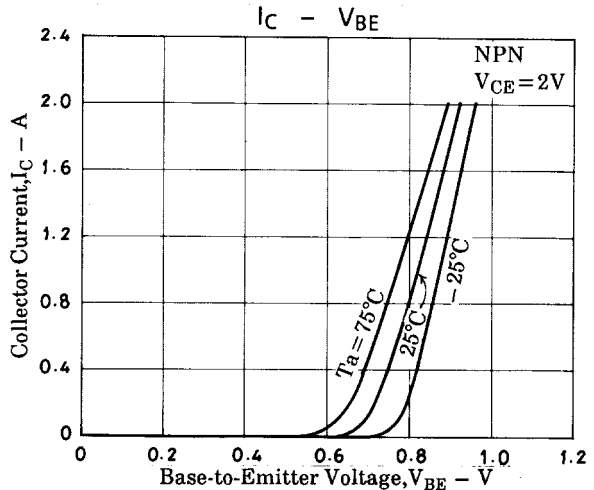
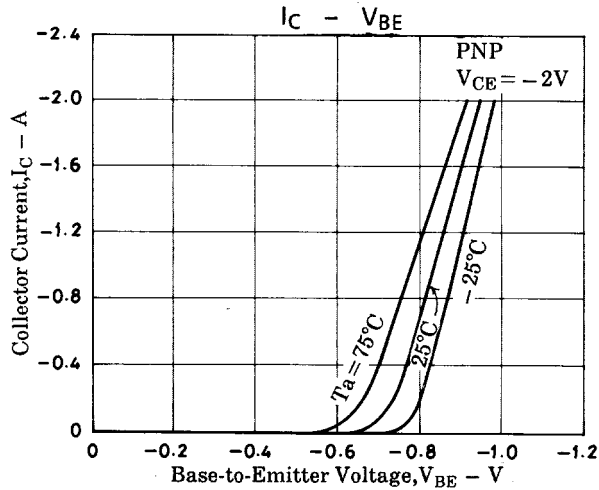
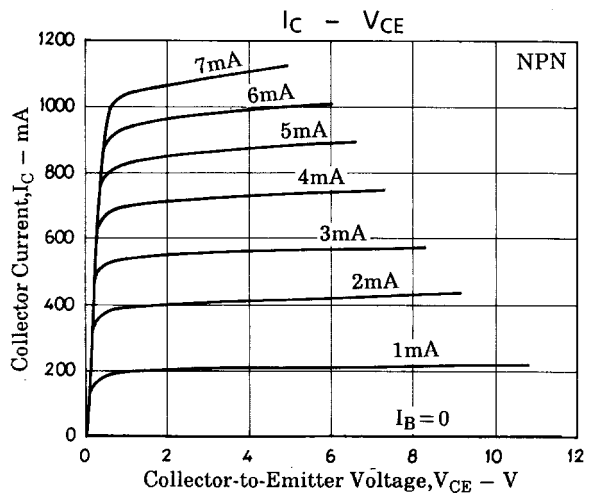
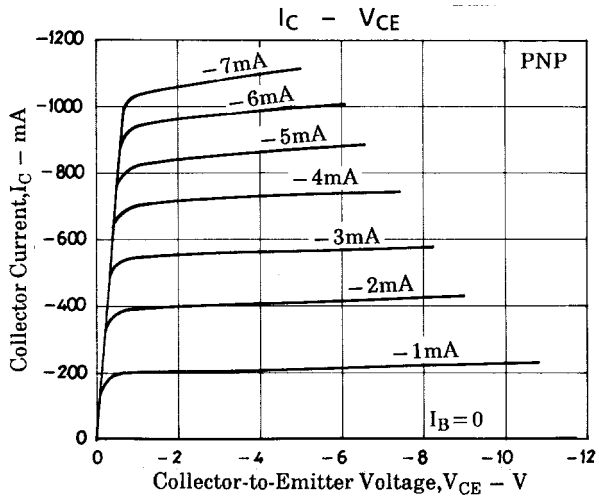
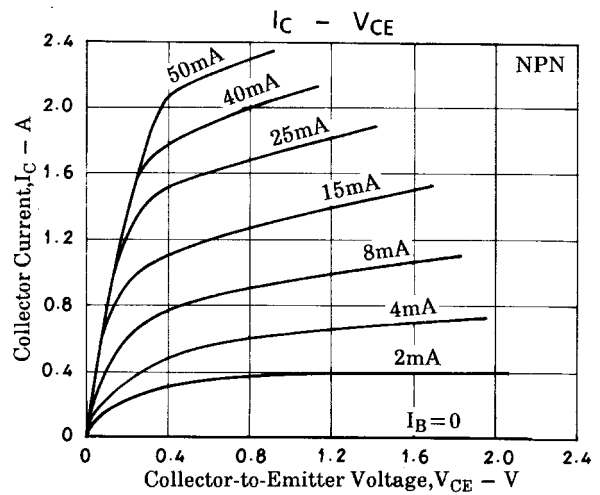
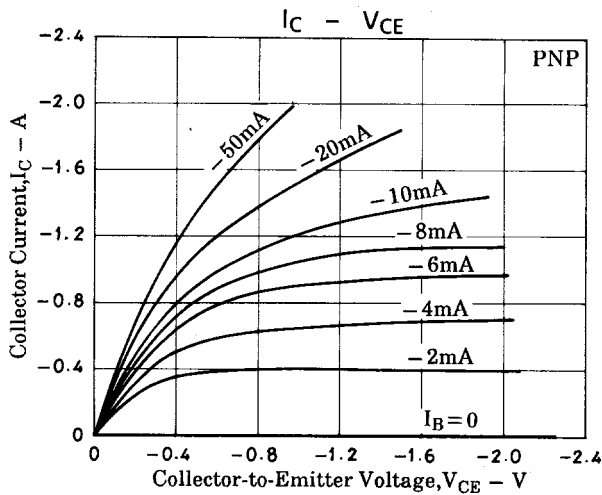
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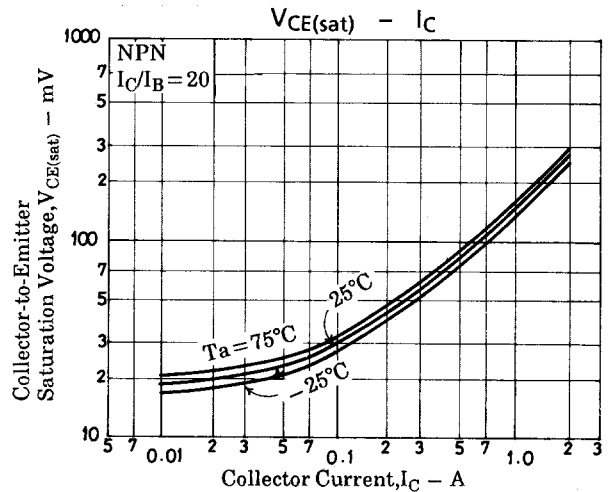
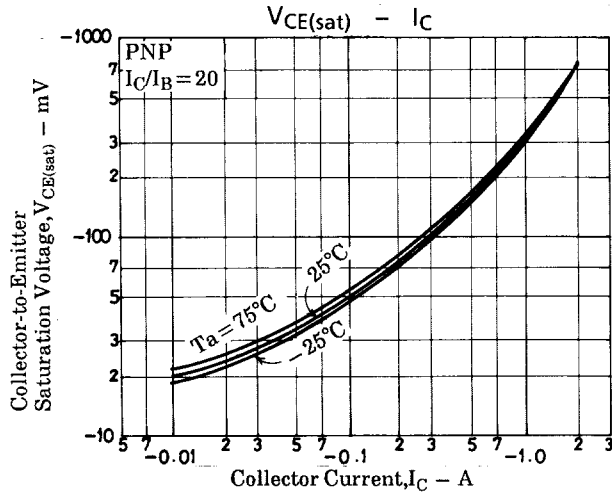
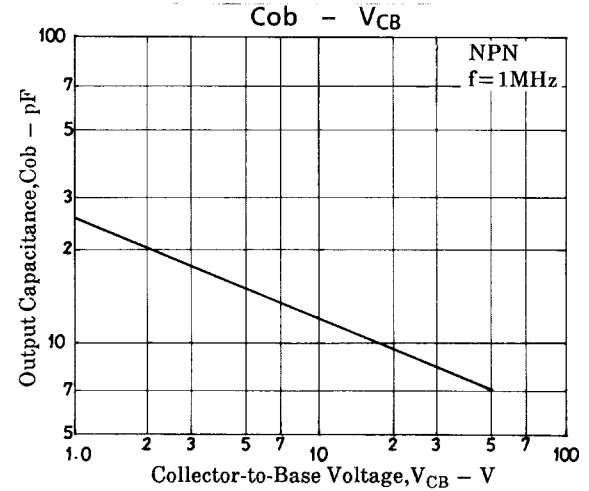
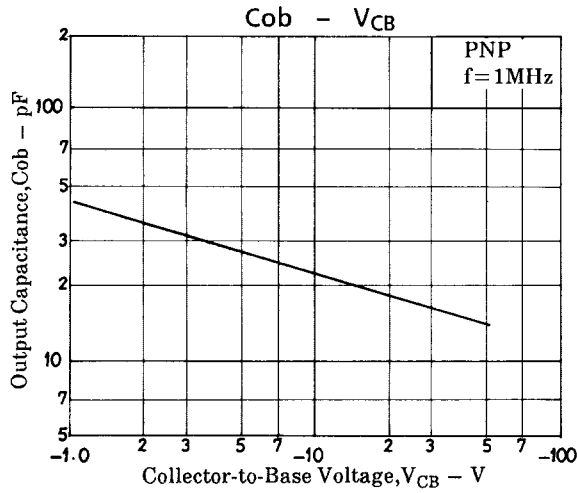
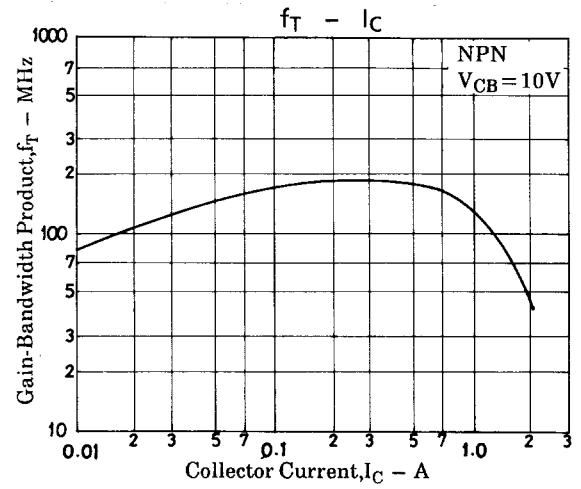
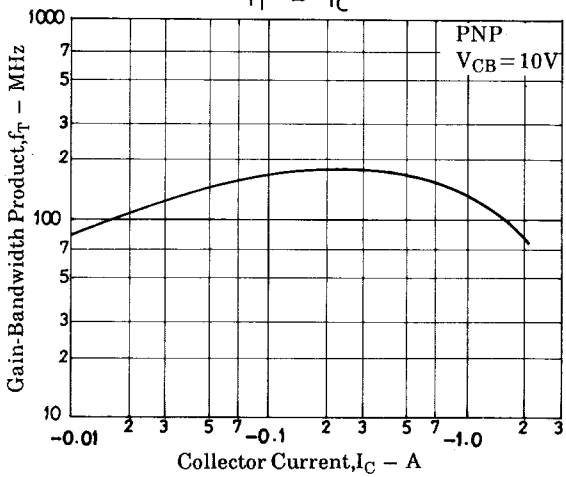
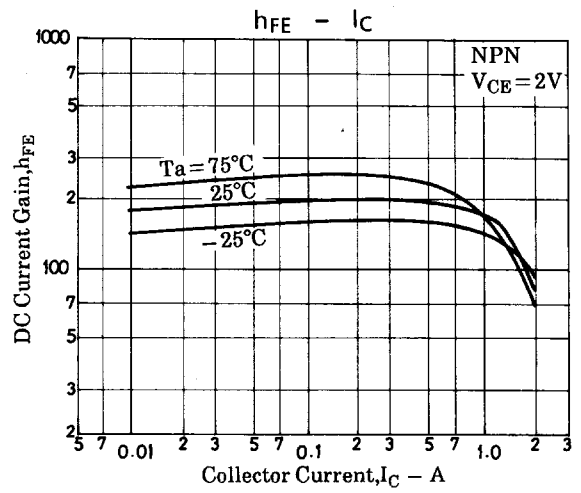
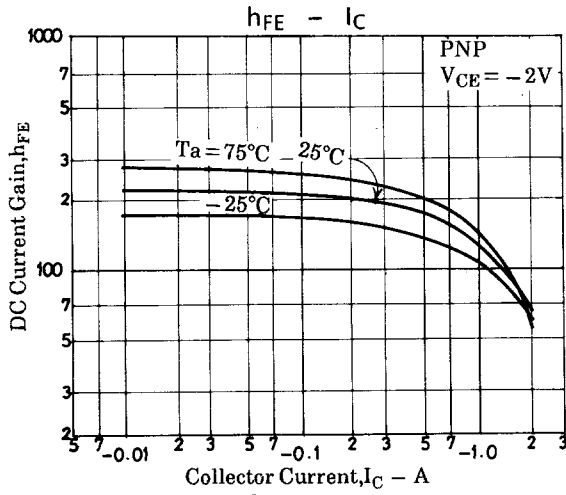
Switching Time Test Circuit

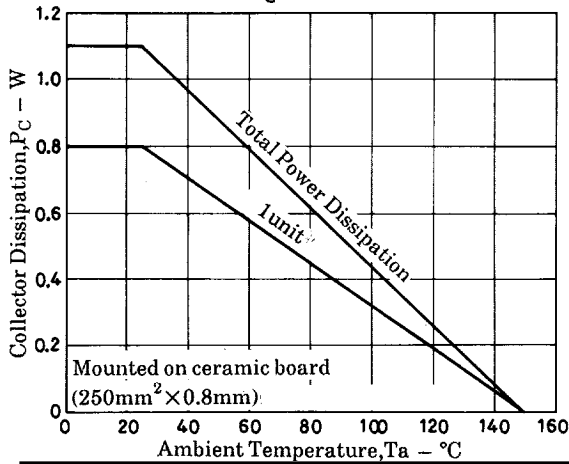
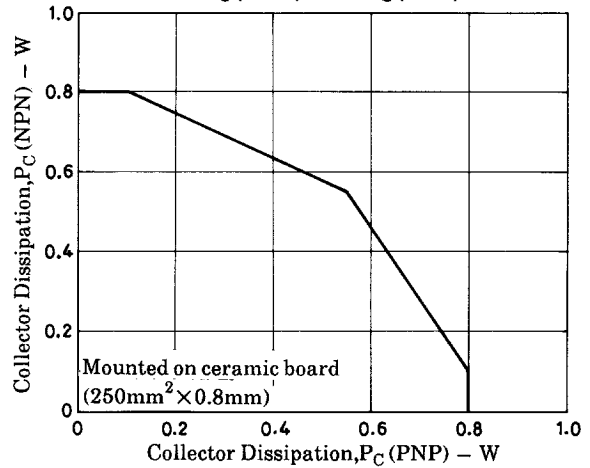
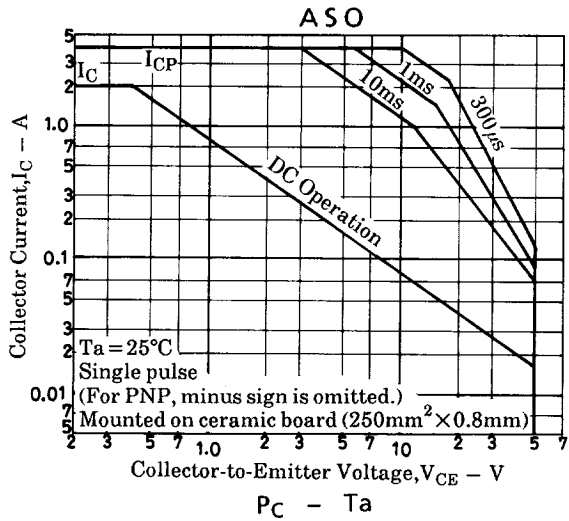
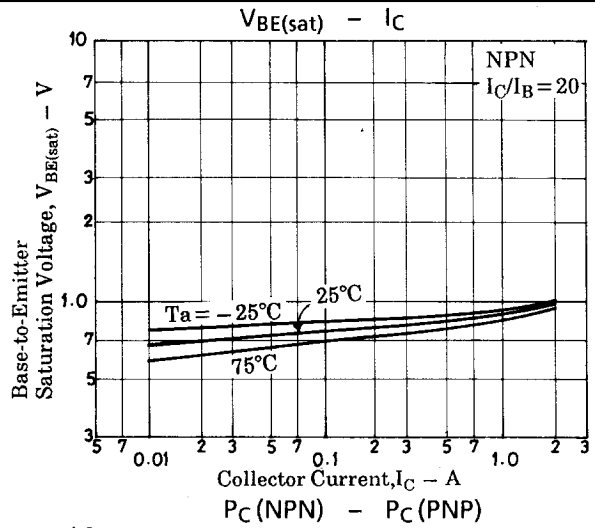
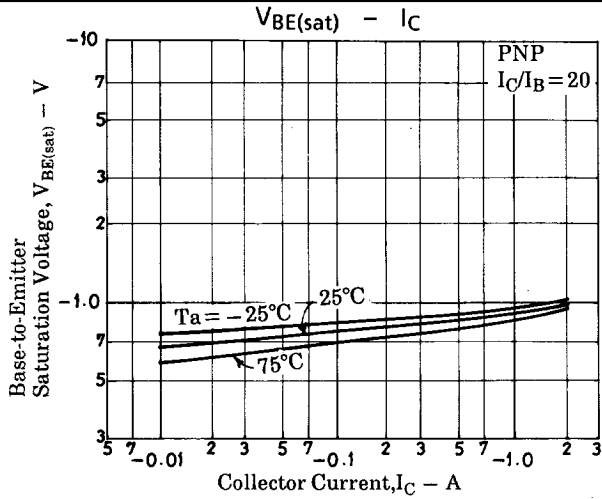


$I_C = 10I_{B1} = -10I_{B2} = 500\text{mA}$ ,  $V_{CC} = 25\text{V}$   
 For PNP, the polarity is reversed.



# FP204





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