

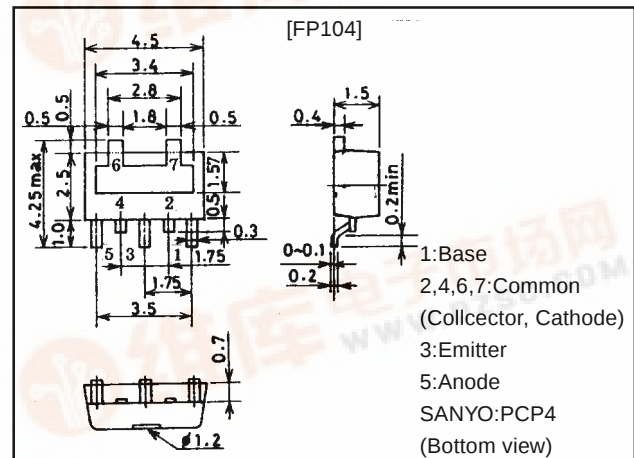
SANYO**FP104**TR:PNP Epitaxial Planar Silicon Transistor
SBD:Schottky Barrier Diode**DC-DC Converter Applications****Features**

- Composite type with 2 devices (PNP transistor and Schottky barrier diode) contained in one package, facilitating high-density mounting.
- The FP104 is formed with a chips, one being equivalent to the 2SA1729 and a chip being equivalent to the SB05-05CP placed in one package.

Package Dimensions

unit:mm

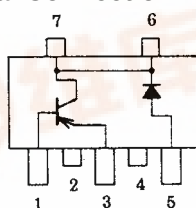
2088A

**Specifications****Absolute Maximum Ratings at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
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		-1.5	A
Collector Current (Pulse)	I_{CP}		-3	A
Base Current	I_B		-300	mA
Collector Dissipation	P_C	Mounted on ceramic board (250mm ² ×0.8mm)	1.3	W
Junction Temperature	T_J		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		50	V
Non-repetitive Peak Reverse Surge Voltage	V_{RSM}		55	V
Average Rectified Current	I_O		500	mA
Surge Forward Current	I_{FSM}	50Hz sine wave, 1cycle	5	A
Junction Temperature	T_J		-55 to +125	°C
Storage Temperature	T_{stg}		-55 to +125	°C

Marking:202

Continued on next page.

Electrical Connection

- 1: Base
- 2, 4, 6, 7: Common (Collector, Cathode)
- 3: Emitter
- 5: Anode

(Top view)

FP104

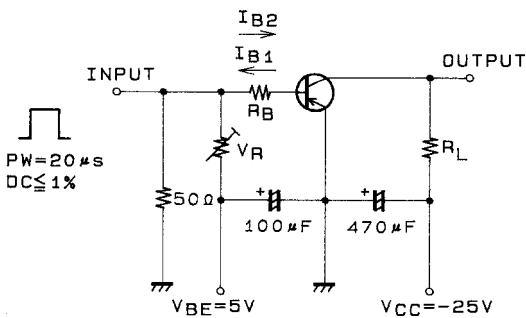
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Electrical Characteristics at Ta=25°C

.Parameter	Symbol	Conditons	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I _{CBO}	V _{CB} =−40V, I _E =0			−1.0	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} =−3V, I _C =0			−1.0	μA
DC Current Gain	h _{FE1}	V _{CE} =−2V, I _C =−100mA	100		280	
	h _{FE2}	V _{CE} =−2V, I _C =−1.5A	25			
Gain-Bandwidth Product	f _T	V _{CE} =−2V, I _C =−100mA		300		MHz
Output Capacitance	Cob	V _{CE} =−10V, f=1MHz		18		pF
C-E Saturation Voltage	V _{CE(sat)}	I _C =−800mA, I _B =−40mA		−0.3	−0.8	V
B-E Saturation Voltage	V _{BE(sat)}	I _C =−800mA, I _B =−40mA		−0.9	−1.3	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 _C =−10μA, I _C =0	−5			V
Turn-ON Time	t _{on}	See specified Test Circuit		50		ns
Storage Time	t _{stg}	See specified Test Circuit		120		ns
Fall Time	t _f	See specified Test Circuit		150		ns
[SBD]						
Reverse Voltage	V _R	I _R =200μA	50			V
Forward Voltage	V _F	I _F =500mA			0.55	V
Reverse Current	I _R	V _R =25V			50	μA
Interterminal Capacitance	C	V _R =10V, f=1MHz		22		pF
Reverse Recovery Time	t _{rr}	I _F =I _R =100mA, See specified Test Circuit			10	ns
Thermal Resistance	R _{thj-a}	Mounted on ceramic board (250mm²×0.8mm)		120		°C/W

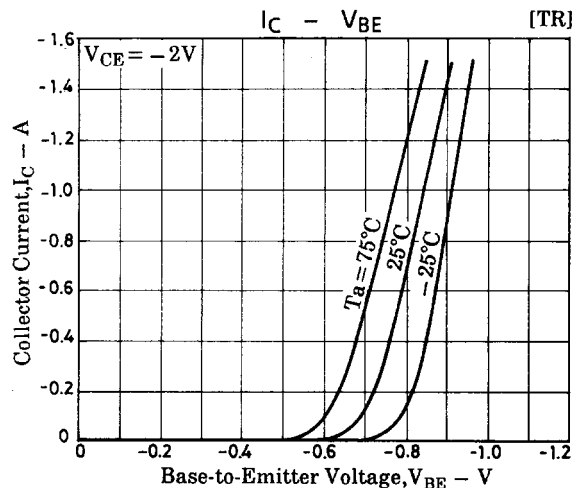
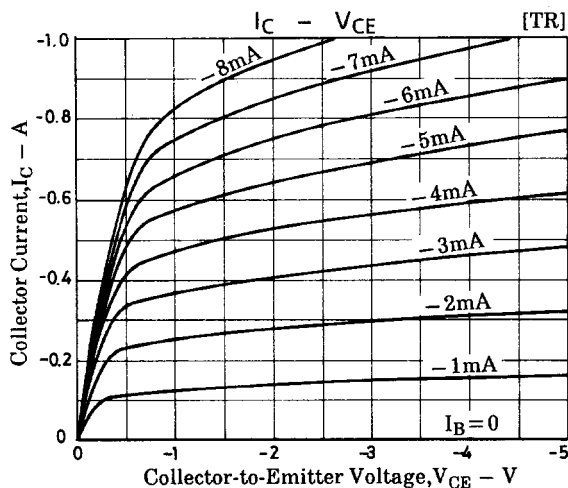
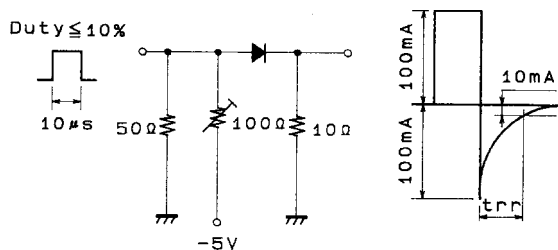
Switching Time Test Circuit

(TR)

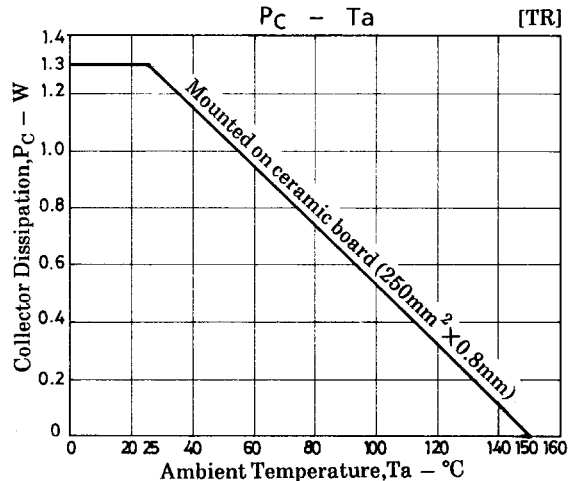
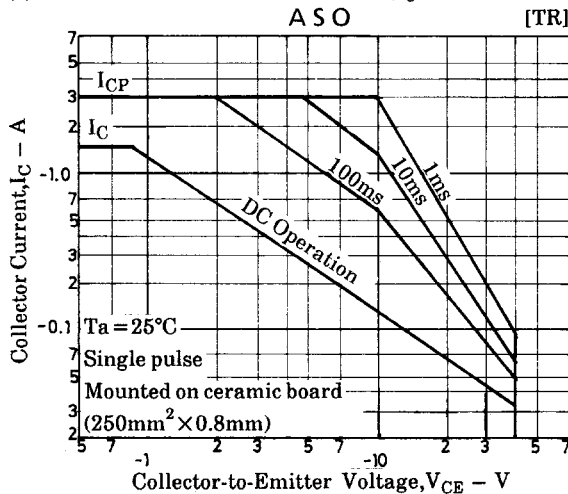
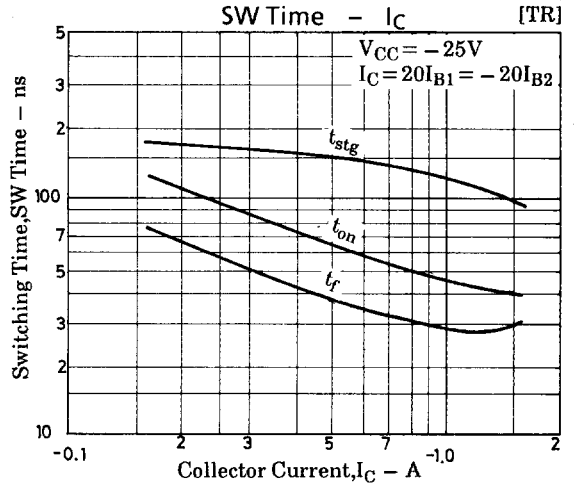
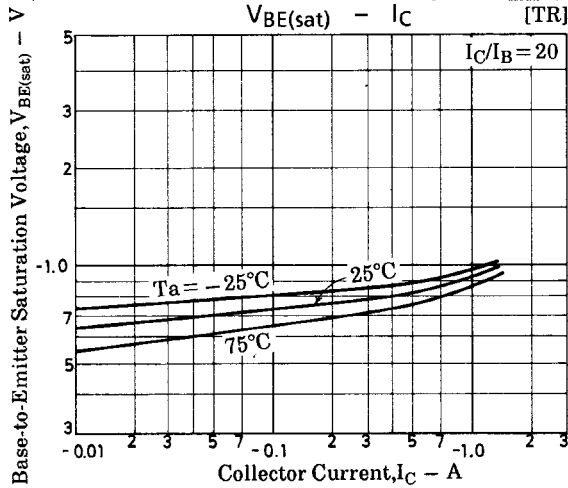
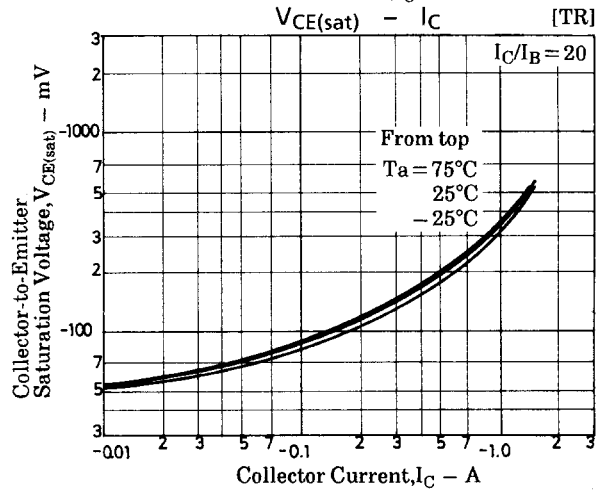
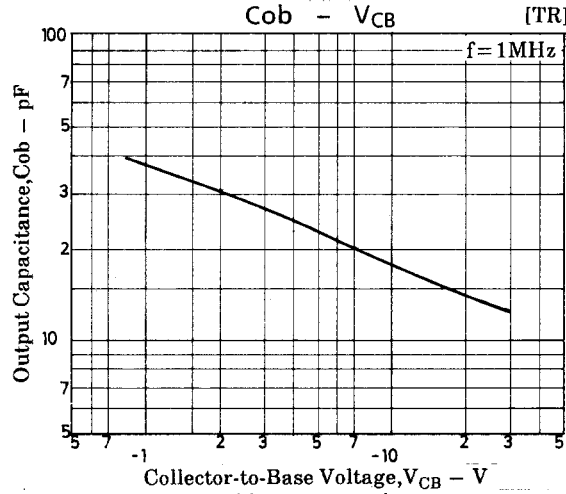
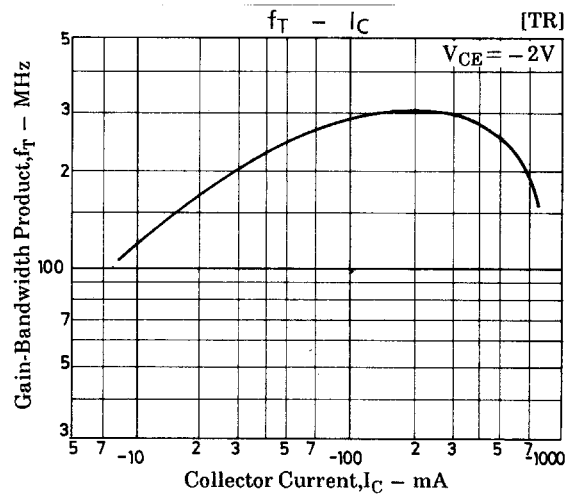
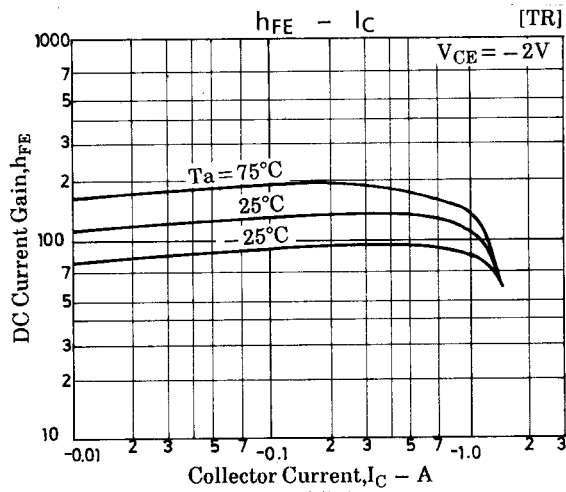


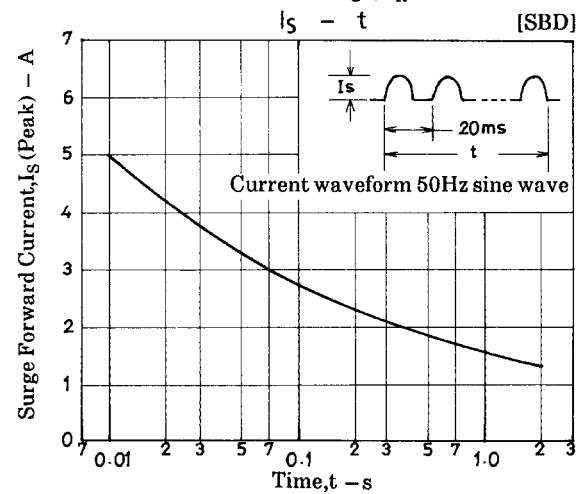
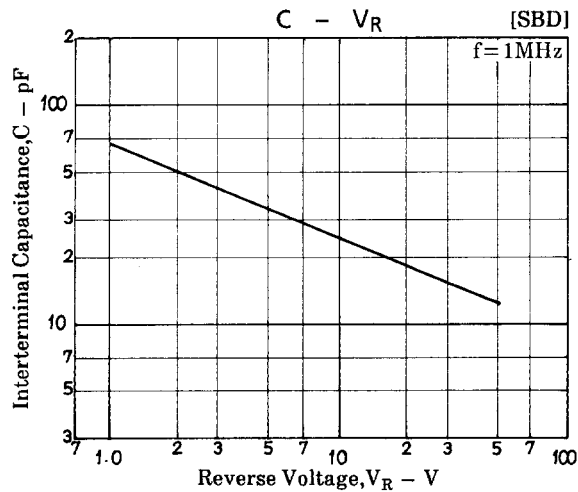
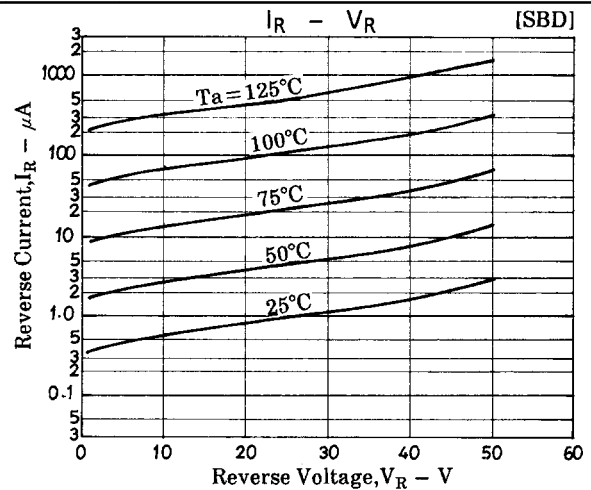
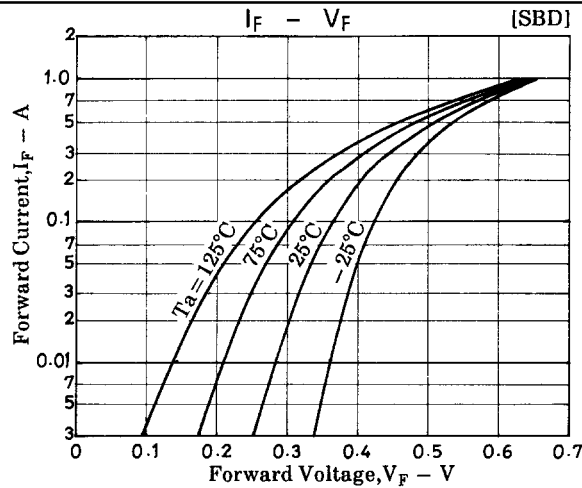
$$-20I_{B1}=20I_{B2}=I_C=-800mA$$

(SBD)



FP104





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