



FP104

TR:PNP Epitaxial Planar Silicon Transistor
SBD:Schottky Barrier Diode

DC-DC Converter Applications

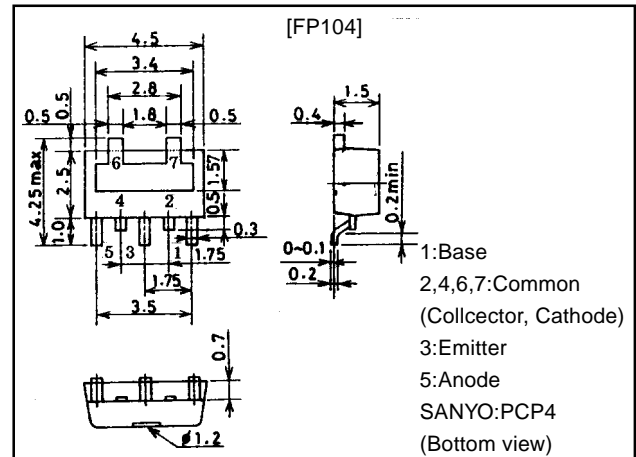
Features

- 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

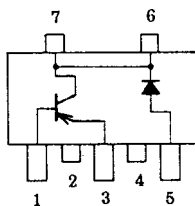
Absolute Maximum Ratings at Ta = 25°C

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)

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FP104

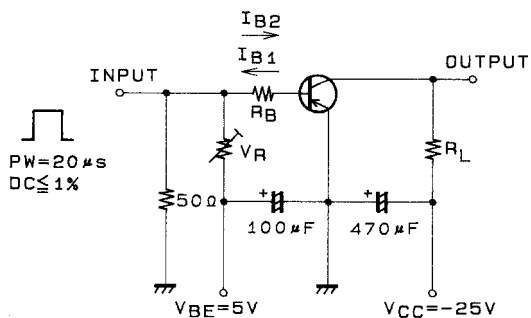
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Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	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	C_{ob}	$V_{CE}=-10V, f=1MHz$		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	$V_{(BR)CBO}$	$I_C=-10\mu A, I_E=0$	-50			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-1mA, R_{BE}=\infty$	-40			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	$I_C=-10\mu A, I_C=0$	-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	$I_R=200\mu A$	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 (250mm ² ×0.8mm)		120		°C/W

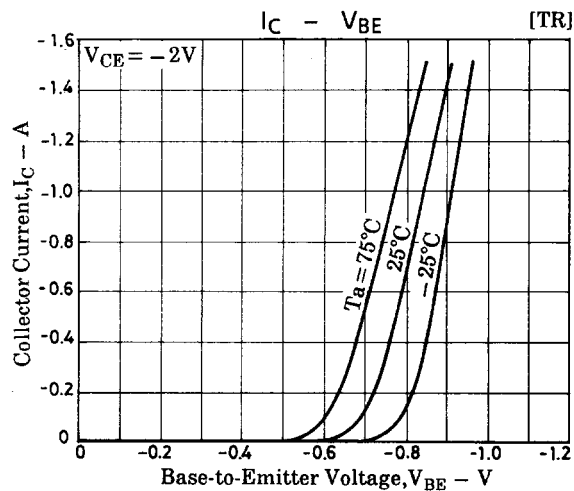
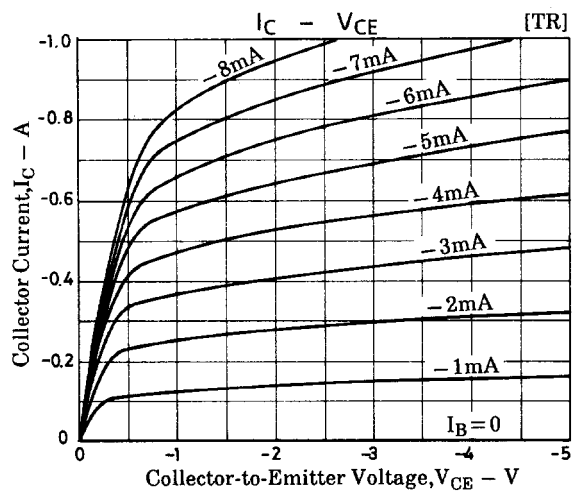
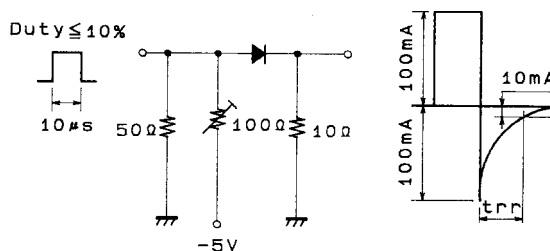
Switching Time Test Circuit

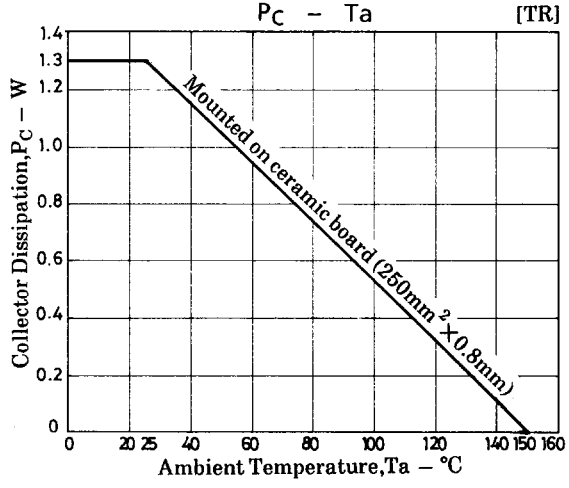
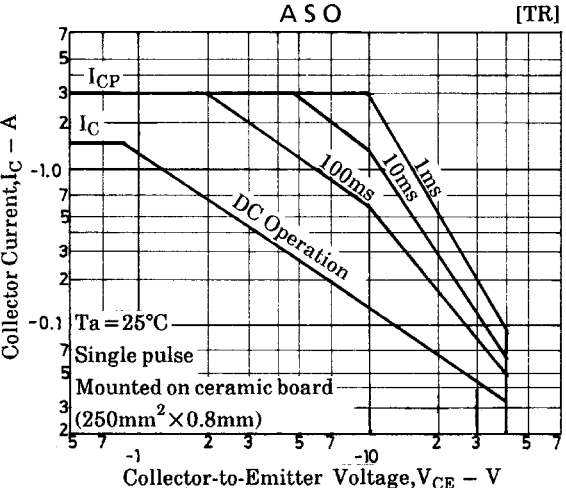
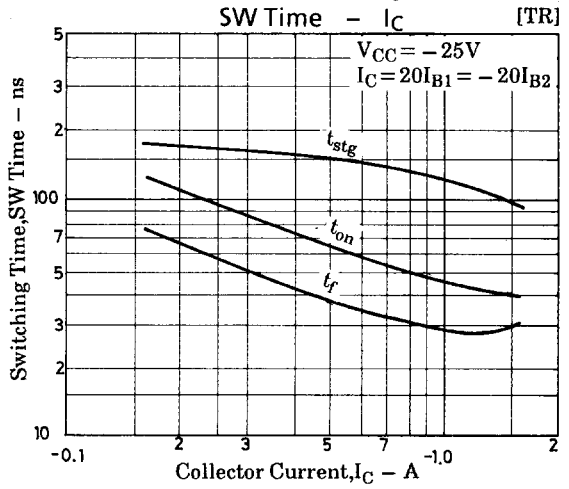
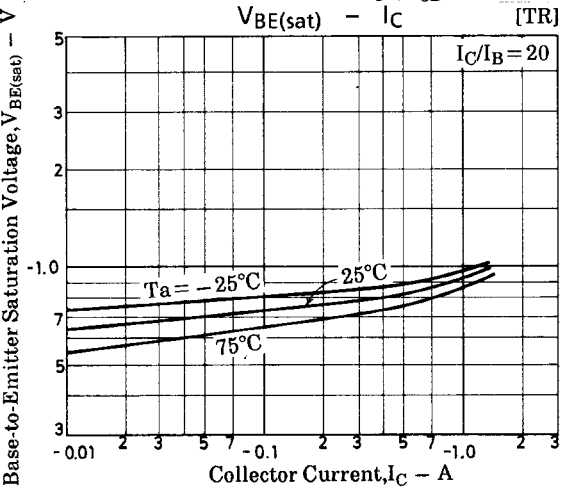
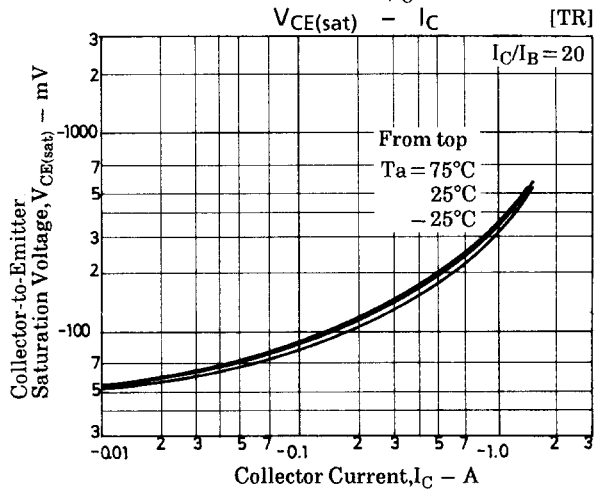
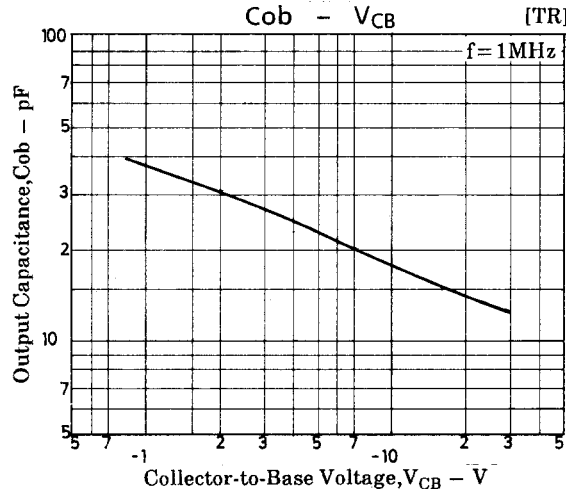
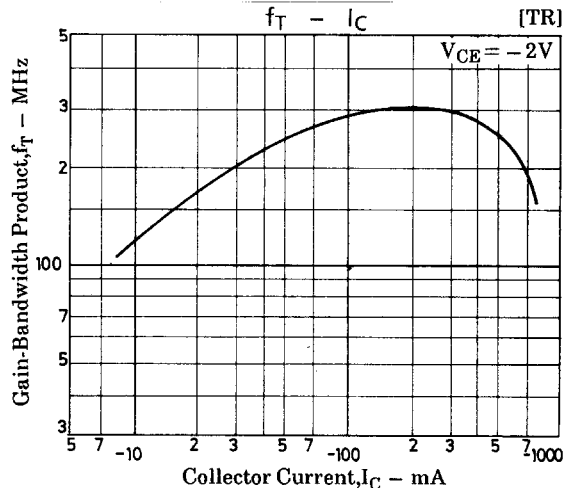
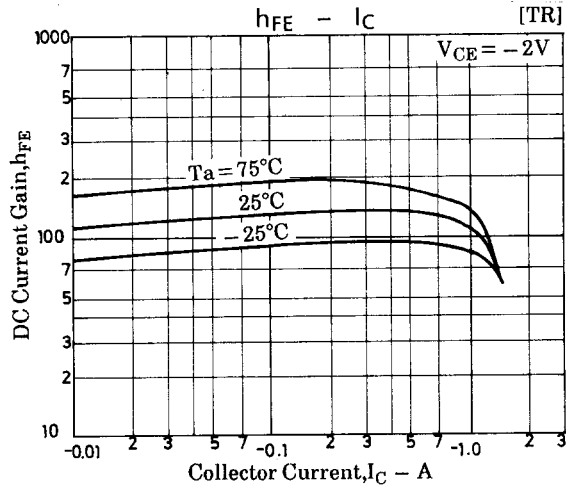
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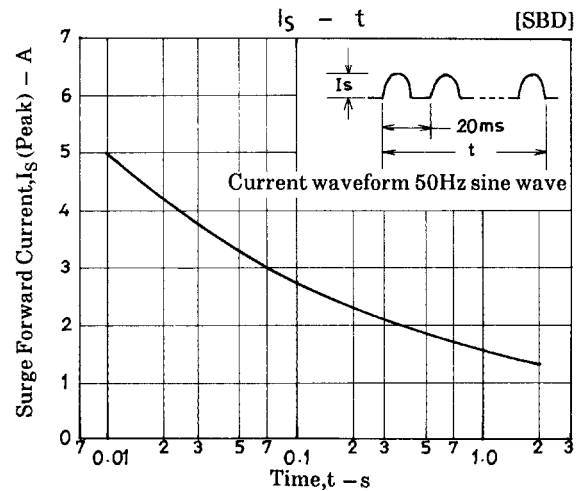
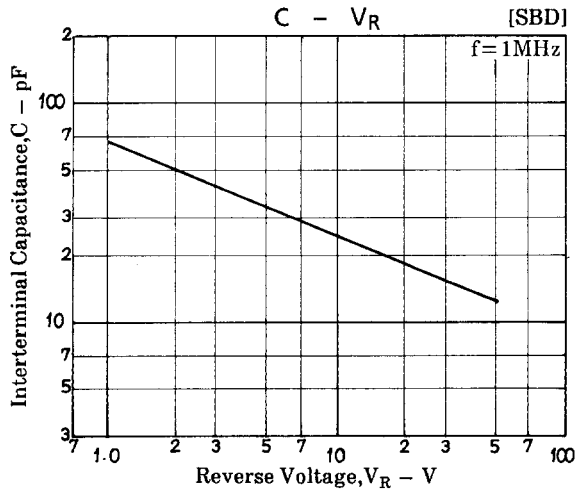
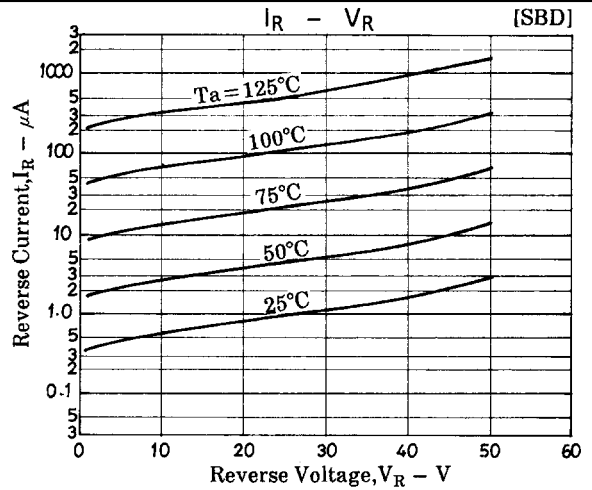
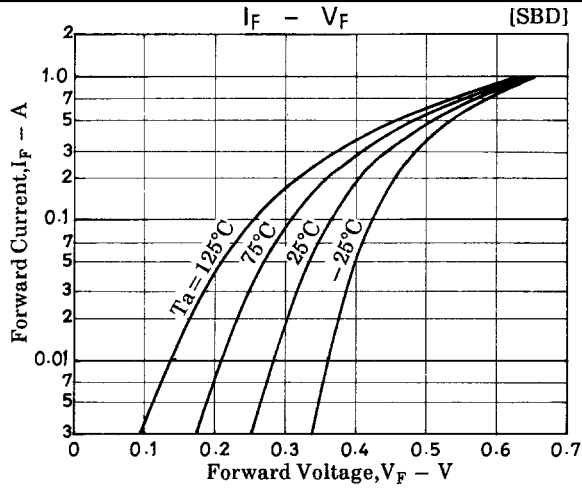
$$-20I_{B1} = 20I_{B2} = I_C = -800mA$$

(SBD)





FP104



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