Ordering number:EN4539

FP301

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

DC-DC Converter Applications

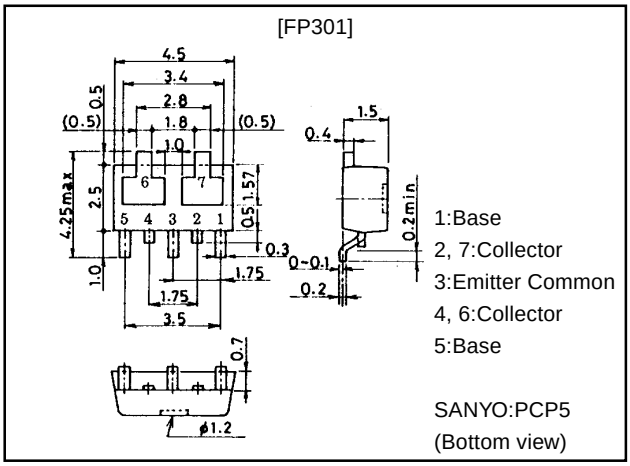
Features

- Composite type with 2 devices (NPN transistor and Schottoky barrier diode) contained in one package, facilitating high-density mounting.
- The FP301 is formed with a chip being equivalent to the 2SD1621 and a chip being equivalent to the SB07-03C placed in one package.

Package Dimensions

unit:mm

2099A



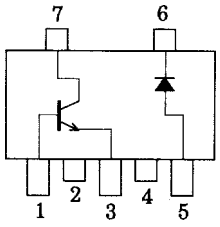
Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	V_{CBO}		30	V
Collector-to-Emitter Voltage	V_{CEO}		25	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		2	A
Collector Current (Pulse)	I_{CP}		5	A
Base Current	I_B		400	mA
Collector Dissipation	P_C	Mounted on ceramic board (250mm²×0.8mm)	0.8	W
Junction Temperature	Tj		150	˚C
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		30	V
Non-repetitive Peak Reverse Surge Voltage	V_{RSM}		35	V
Average Rectified Current	I_O		700	mA
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	5	A
Junction Temperature	Tj		–55 to +125	˚C
Storage Temperature	Tstg		–55 to +125	˚C

Electrical Connection

Continued on next page.



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

(Top view)

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Continued from preceding page.

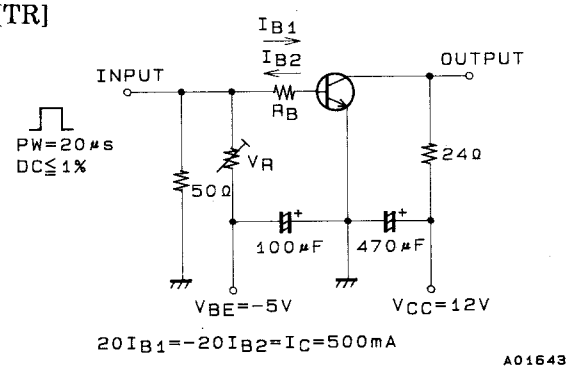
Electrical Characteristics at Ta=25˚C

Parameter	Symbol	Conditons	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I_{CBO}	V_{CB}=20V, I_E=0			0.1	µA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0			0.1	µA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=100mA	140		560	
	$h_{FE}2$	V_{CE}=2V, I_C=1.5A	65			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=50mA		150		MHz
Output Capacitance	Cob	V_{CE}=10V, f=1MHz		19		pF
C-E Saturation Voltage	$V_{CE(sat)}$	I_C=1.5A, I_B=75mA		0.18	0.4	V
B-E Saturation Voltage	$V_{BE(sat)}$	I_C=1.5A, I_B=75mA		0.85	1.2	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	I_C=10µA, I_E=0	30			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	25			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		500		ns
Fall Time	t_f	See specified Test Circuit		25		ns
[SBD]						
Reverse Voltage	V_R	I_R=300µA	30			V
Forward Voltage	V_F	I_F=700mA			0.55	V
Reverse Current	I_R	V_R=15V			80	µA
Interterminal Capacitance	C	V_R=10V, f=1MHz cycle		28		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See sepcified Test Circuit.			10	ns
Thermal Resistance	Rthj-a	Mounted on ceramic board (250mm²×0.8mm)		170		˚C/W

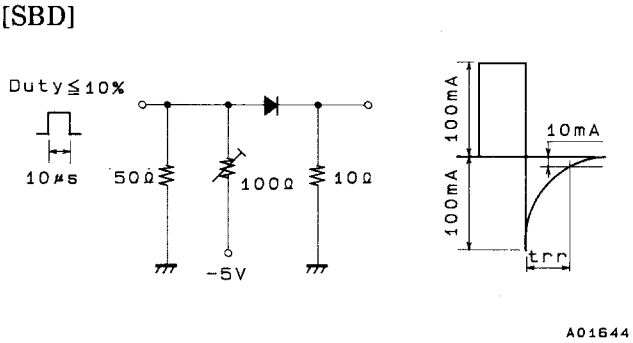
Marking:301

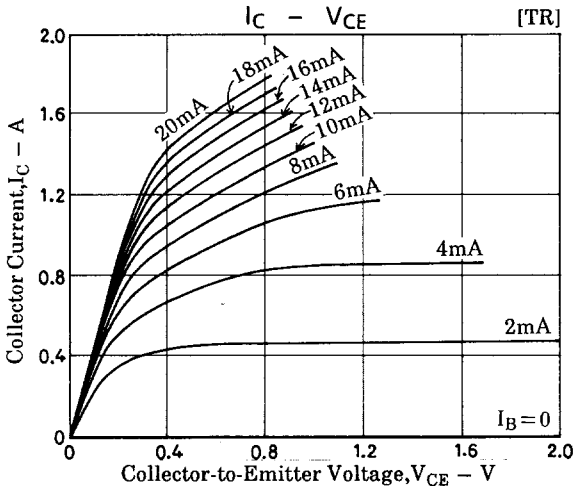
Switching Time Test Circuit

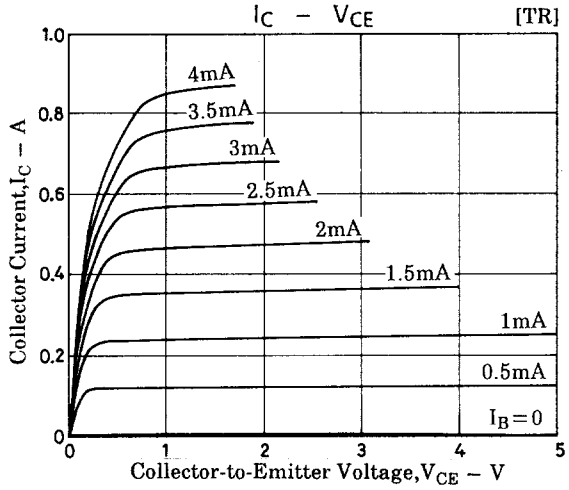
[TR]



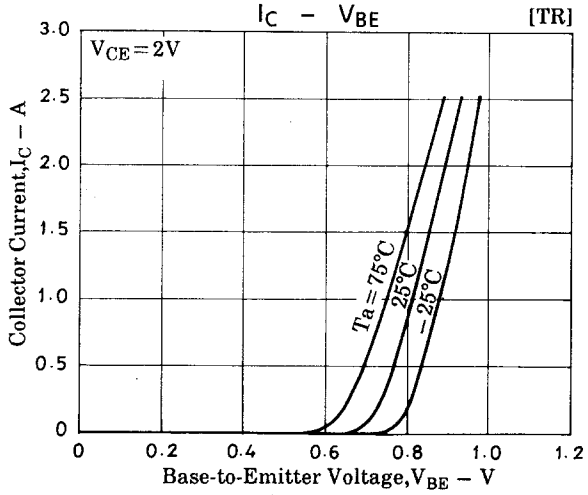
[SBD]



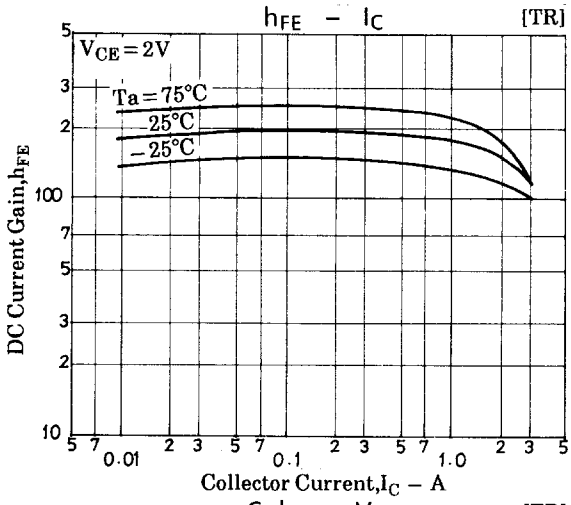




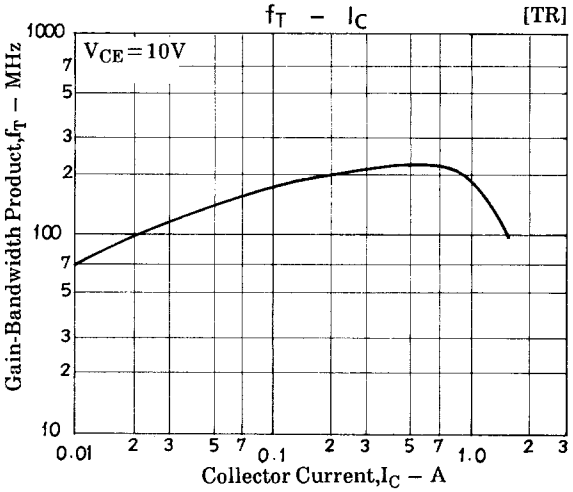
I_C – V_{BE} [TR]



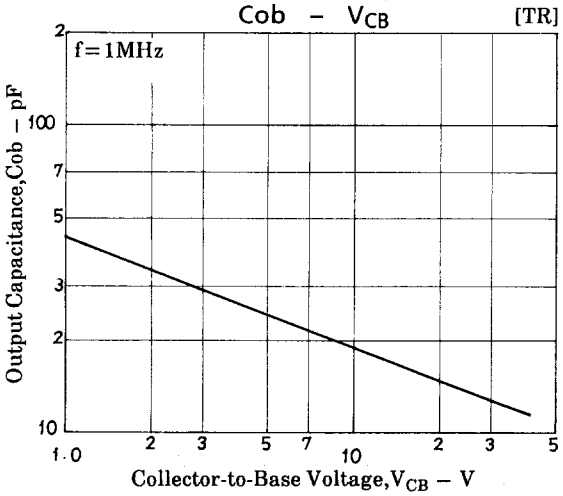
h_{FE} – I_C [TR]



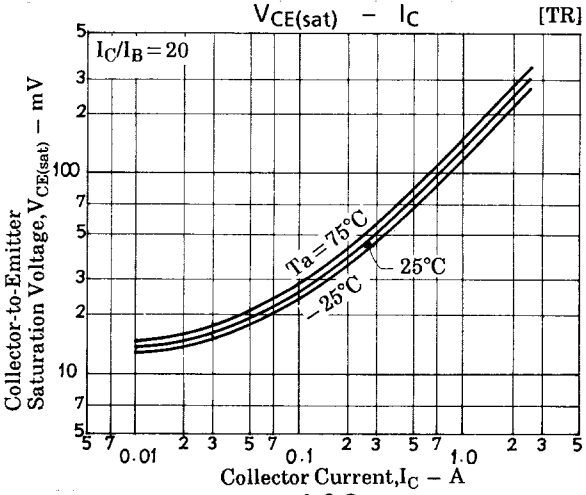
f_T – I_C [TR]



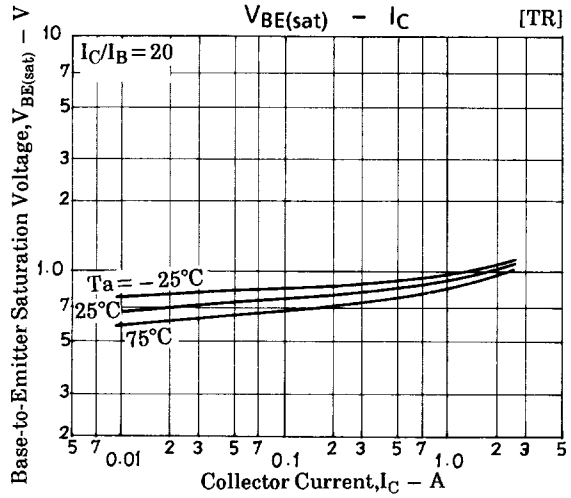
Cob – V_{CB} [TR]



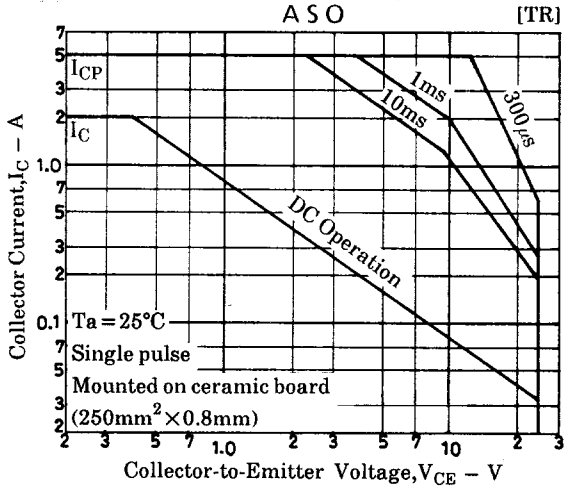
$V_{CE(sat)}$ – I_C [TR]



$V_{BE(sat)}$ – I_C [TR]



ASO [TR]



P_C – Ta [TR]