

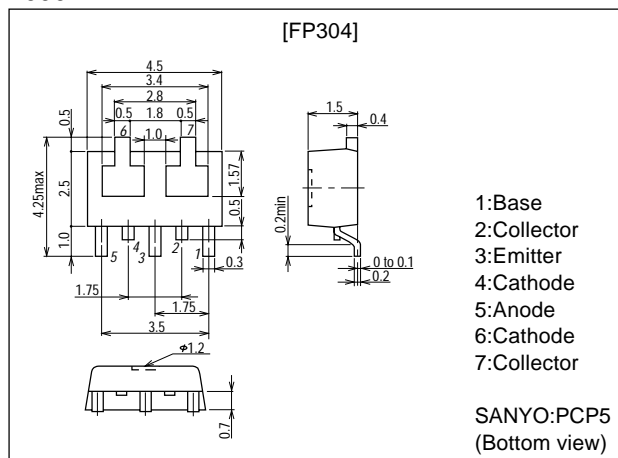
**FP304****DC-DC Converter****Features**

- Complex type with an NPN transistor and a Schottky barrier diode facilitating high-density mounting.
- The FP304 is composed of 2 chips, one being equivalent to the 2SD1620 and the other the SB07-03C, placed in one package.

**Package Dimensions**

unit:mm

2099A

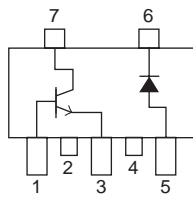
**Specifications****Absolute Maximum Ratings** at  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	$V_{CB0}$		30	V
Collector-to-Emitter Voltage	$V_{CEO}$		10	V
Emitter-to-Base Voltage	$V_{EBO}$		6	V
Collector Current	$I_C$		3	A
Collector Current (Pulse)	$I_{CP}$		5	A
Base Current	$I_B$		500	mA
Collector Dissipation	$P_C$	Mounted on ceramic board (250mm $\times$ 0.8mm)	0.8	W
Junction Temperature	$T_J$		150	$^\circ\text{C}$
[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	$T_J$		-55 to +125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +125	$^\circ\text{C}$

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## Electrical Connection



- 1:Base  
2:Collector  
3:Emitter  
4:Cathode  
5:Anode  
6:Cathode  
7:Collector

(Top view)

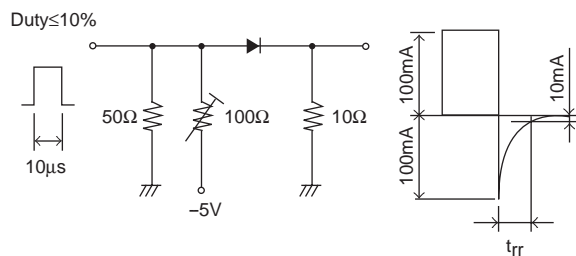
Electrical Characteristics at  $T_a=25^\circ\text{C}$ 

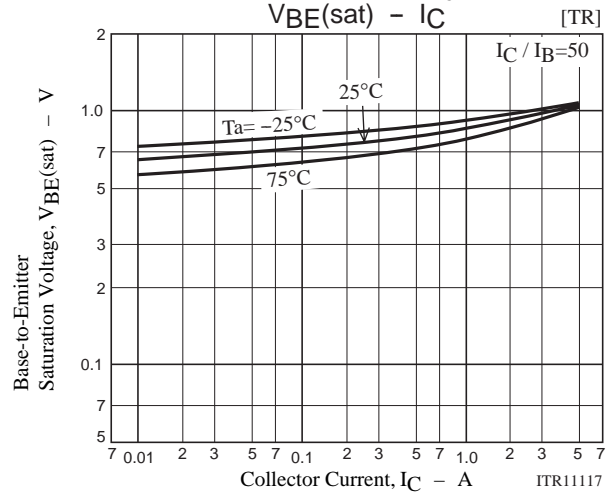
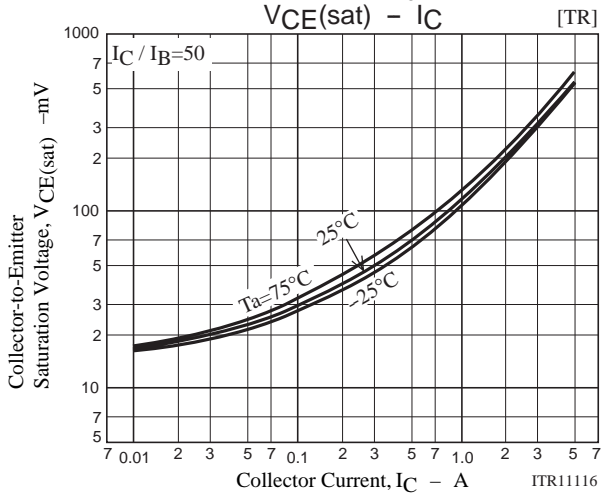
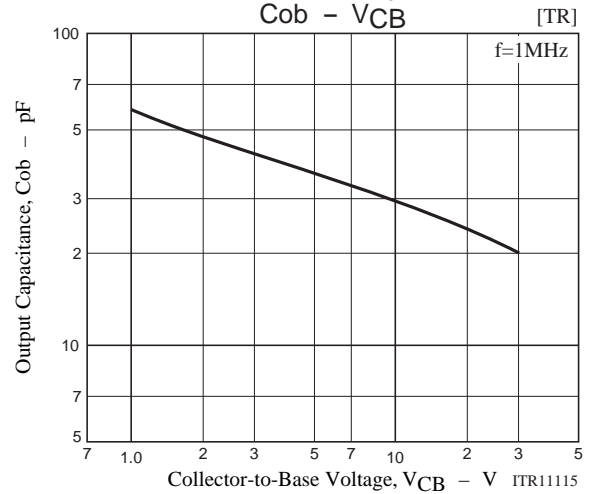
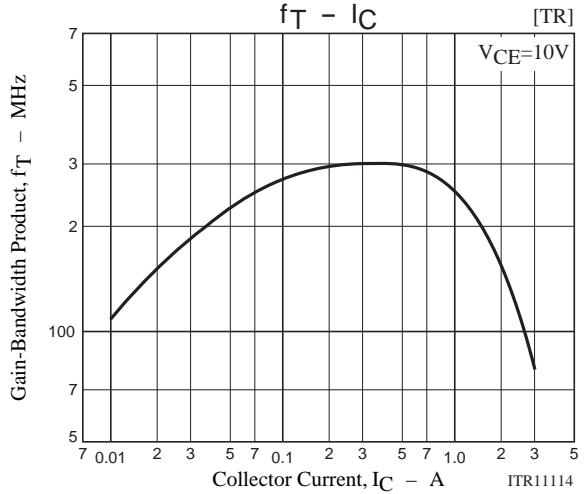
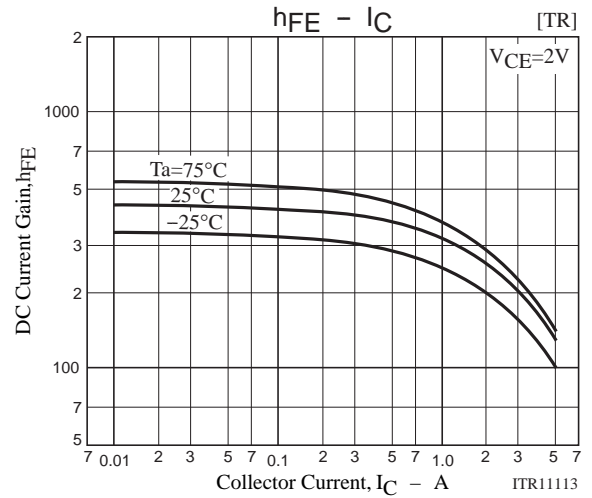
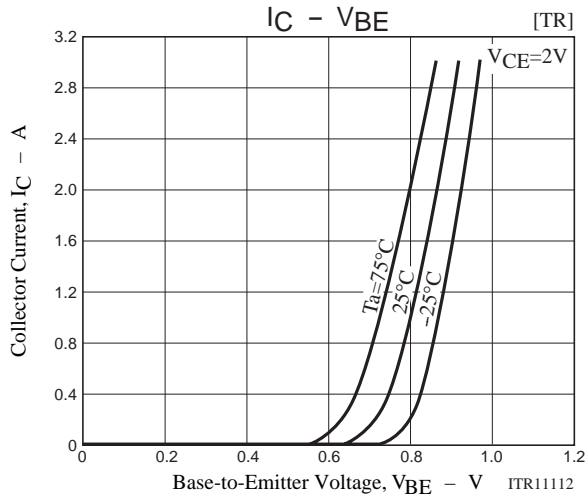
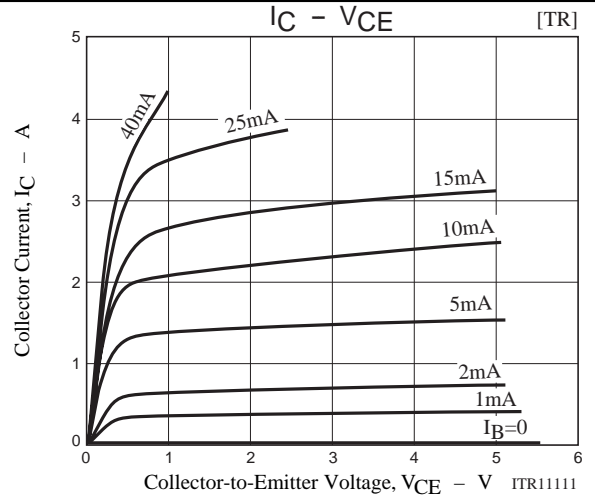
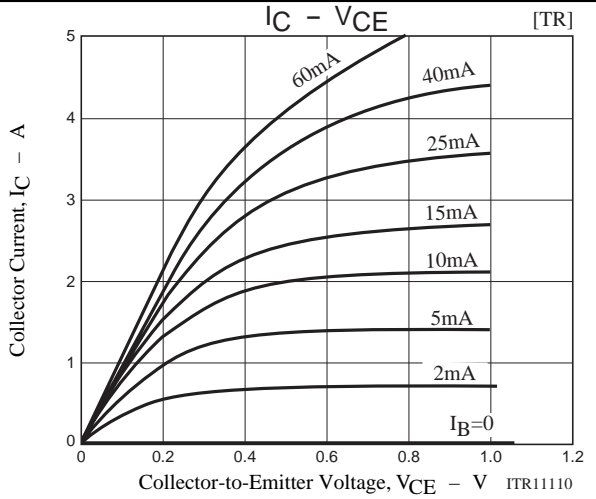
Parameter	Symbol	Conditons	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =20V, I <sub>E</sub> =0			0.1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =4V, I <sub>C</sub> =0			0.1	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA	200			
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =3A	140			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA		200		MHz
Output Capacitance	Cob	V <sub>CB</sub> =10V, f=1MHz		30		pF
C-E Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =60mA		0.3	0.4	V
B-E Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =60mA		0.95	1.35	V
C-B Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10μA, I <sub>E</sub> =0	30			V
C-E Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	10			V
E-B Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =10μA, I <sub>C</sub> =0	6			V
[SBD]						
Reverse Voltage	V <sub>R</sub>	I <sub>R</sub> =300μA	30			V
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =700mA			0.55	V
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =15V			80	μA
Interterminal Capacitance	C	V <sub>R</sub> =10V, f=1MHz		28		pF
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>R</sub> =100mA, See sepcified Test Circuit.			10	ns
Thermal Resistance	Rthj-a	Mounted on ceramic board (250mm²×0.8mm)		170		°C/W

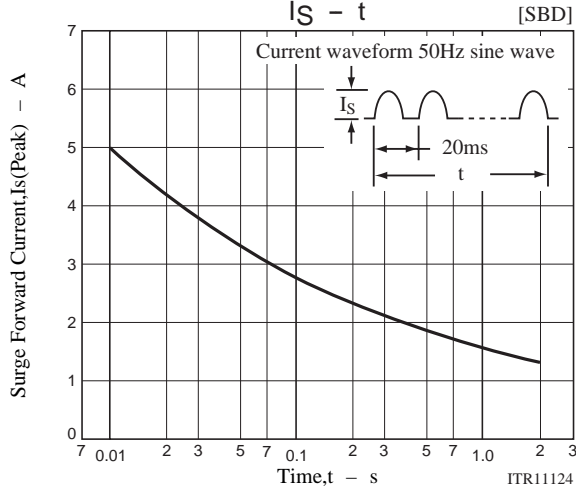
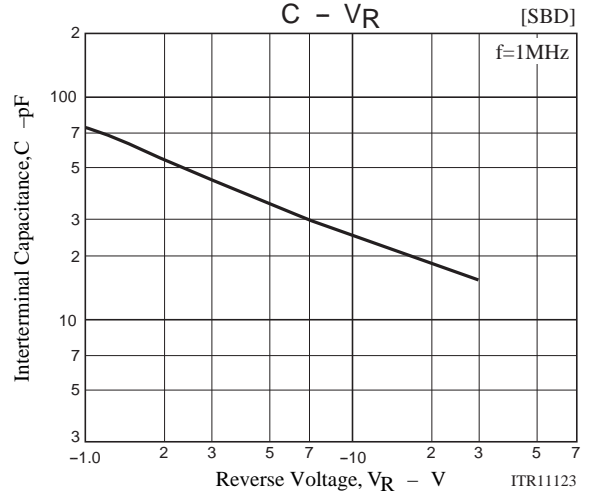
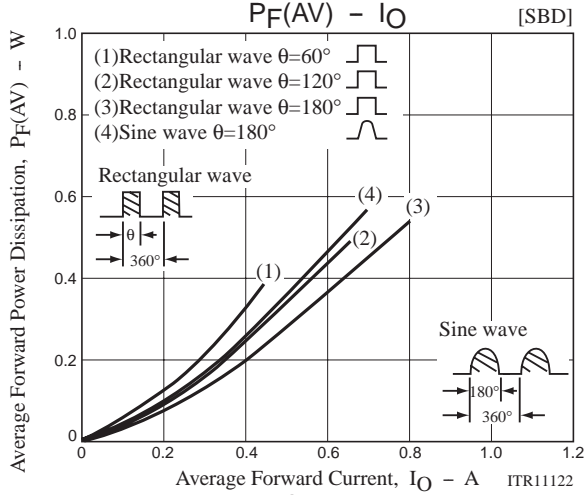
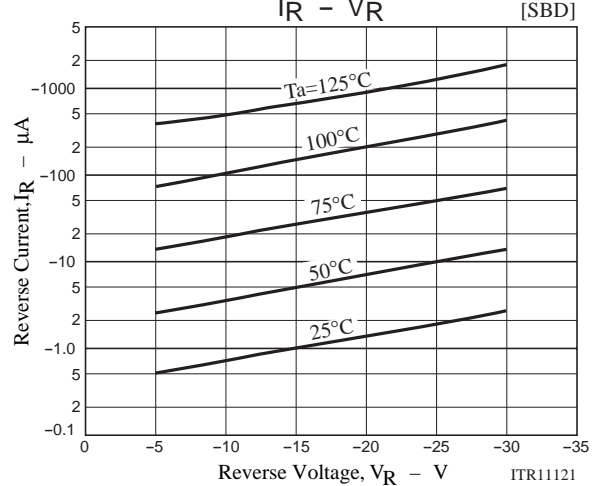
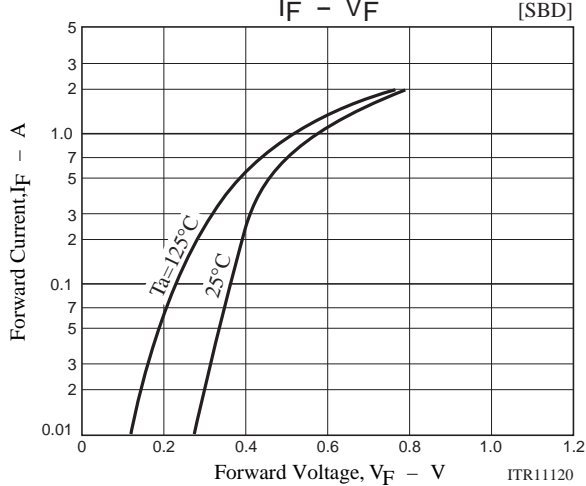
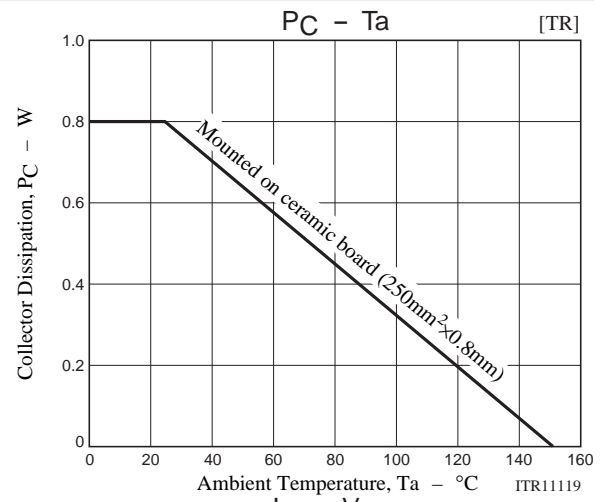
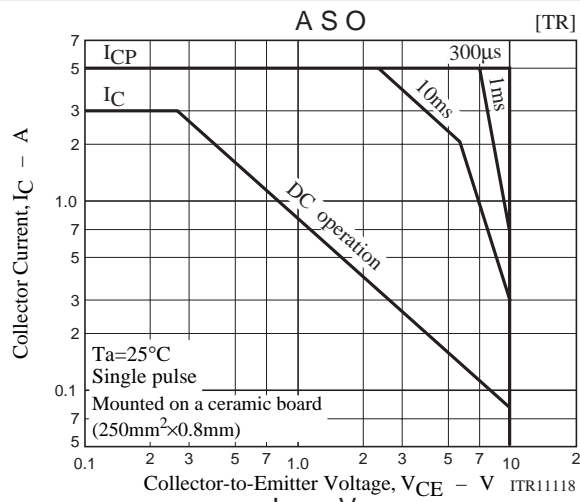
Marking:304

## Switching Time Test Circuit

[SBD]







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