

NPN Epitaxial Planar Silicon Transistor



**2SD1685**

**20V/5A Switching Applications**

**Applications**

- Strobe, voltage regulators, relay drivers, lamp drivers.

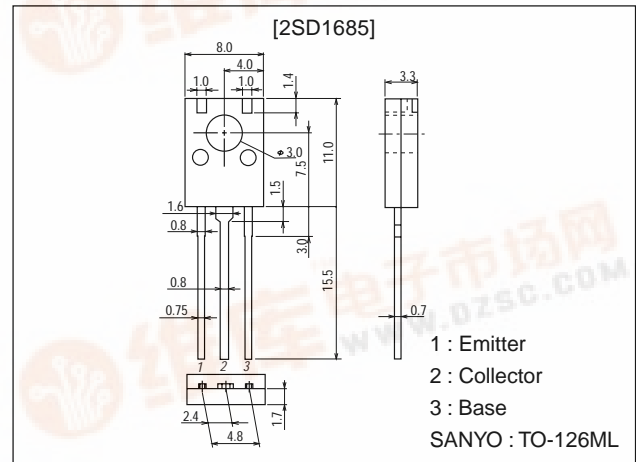
**Features**

- Low saturation voltage.
- Large current capacity.
- Fast switching time.
- No insulator required when mounting because the leadframe of the chip is covered with plastic.

**Package Dimensions**

unit:mm

2042B



**Specifications**

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		60	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		20	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		6	V
Collector Current	I <sub>C</sub>		5	A
Collector Current (Pulse)	I <sub>CP</sub>		8	A
Collector Dissipation	P <sub>C</sub>		1.5	W
		T <sub>c</sub> =25°C	10	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

**Electrical Characteristics at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =50V, I <sub>E</sub> =0			100	nA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0			100	nA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA	120*		560*	
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =3A	95			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA		120		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		45		pF

\* The 2SD1685 is classified by 500mA h<sub>FE</sub> as follows :

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120	E	200	160	F	320	280	G	560
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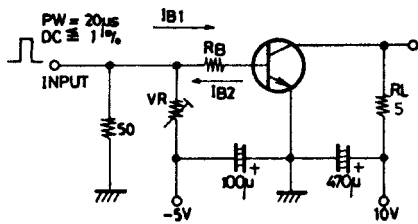


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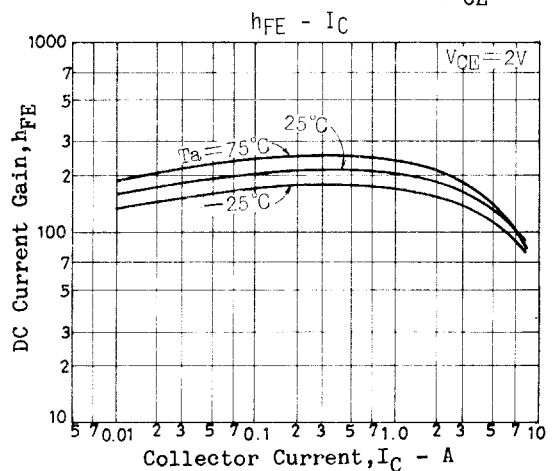
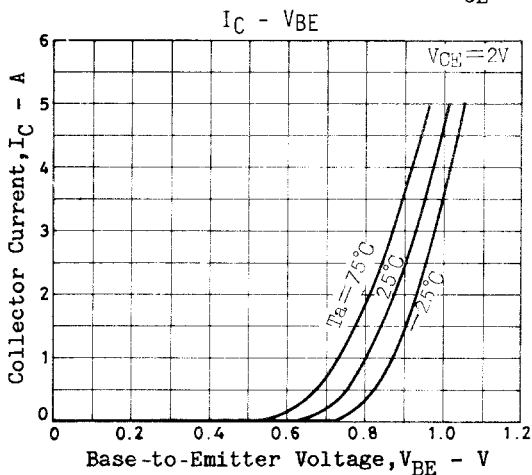
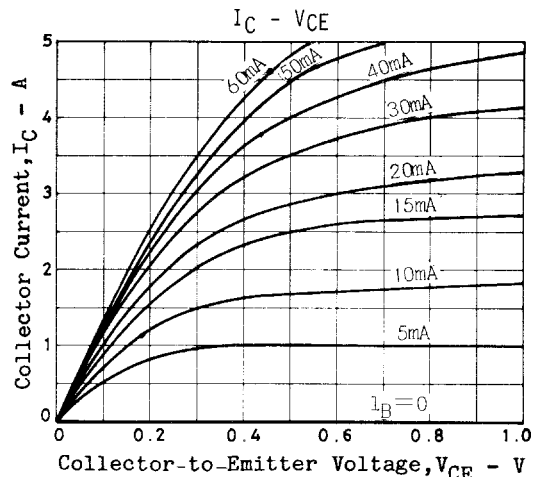
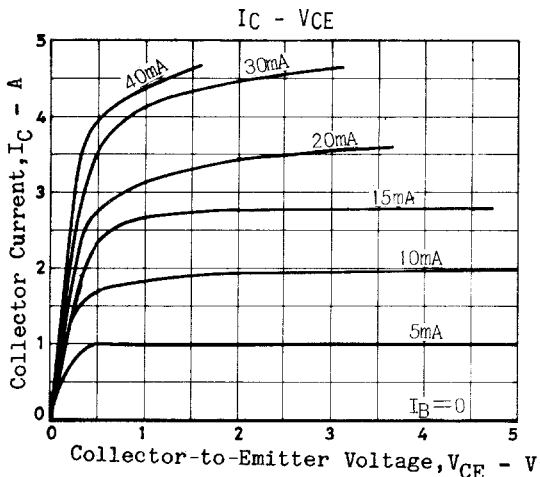
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=3A, I_B=60mA$		220	500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=3A, I_B=60mA$			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA, R_{BE}=\infty$	20			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	6			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		30		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		300		ns
Fall Time	$t_f$	See specified Test Circuit.		40		ns

## Switching Time Test Circuit

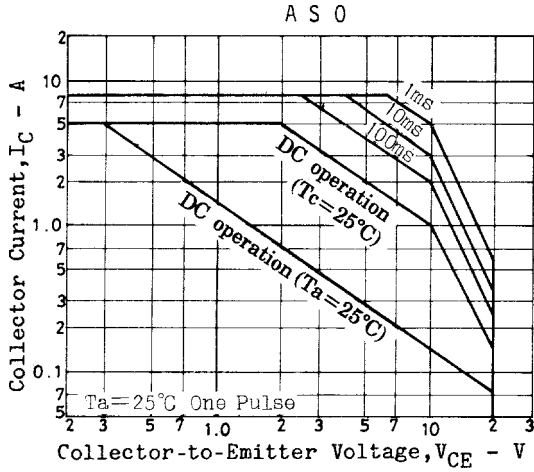
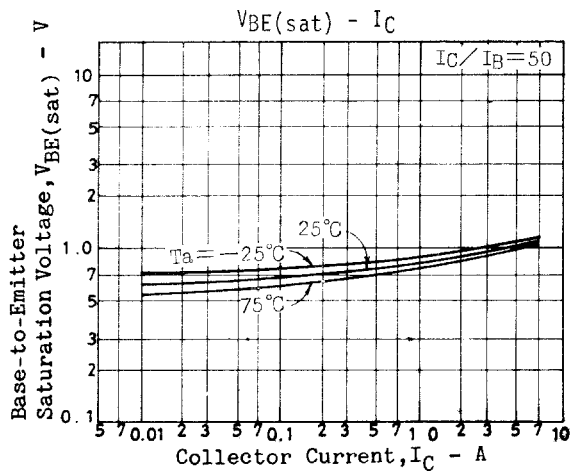
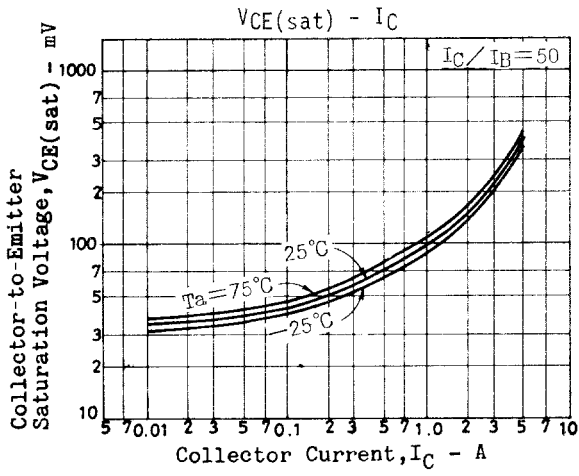
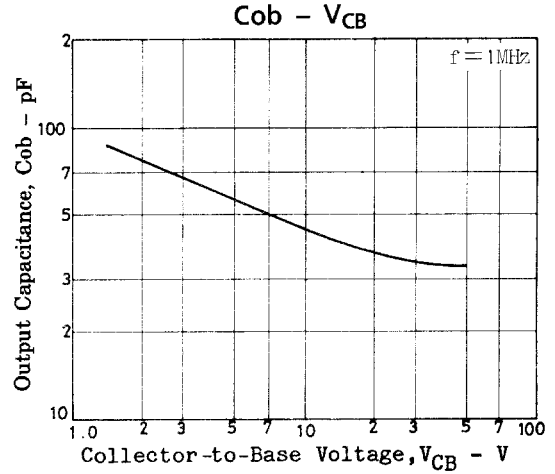
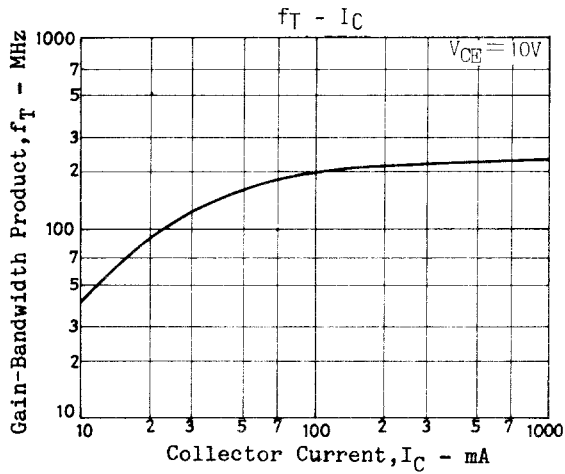


$$I_C = 10 \quad I_{B1} = -10 \quad I_{B2} = 2A$$

Unit (resistance :  $\Omega$ , capacitance : F)



## 2SD1685



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