Ordering number:EN2042A

NPN Epitaxial Planar Silicon Transistor

2SD1685

20V/5A Switching Applications

An ON Semiconductor Company

Applications

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

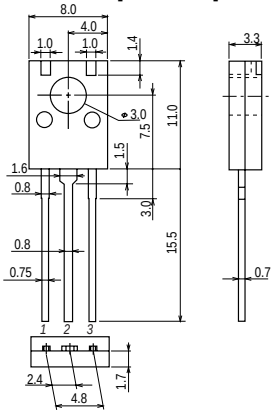
Features

· 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_{CBO}		60	V
Collector-to-Emitter Voltage	V_{CEO}		20	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		5	A
Collector Current (Pulse)	I_{CP}		8	A
Collector Dissipation	P_C		1.5	W
		Tc=25˚C	10	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=50V, I_E=0			100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			100	nA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=500mA	120*		560*	
	$h_{FE}2$	V_{CE}=2V, I_C=3A	95			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=50mA		120		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		45		pF

* The 2SD1685 is classified by 500mA h_{FE} as follows :

120	E	200	160	F	320	280	G	560

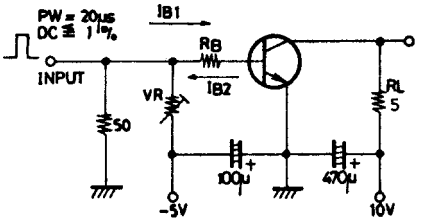
Continued on next page.

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Continued from preceding page.

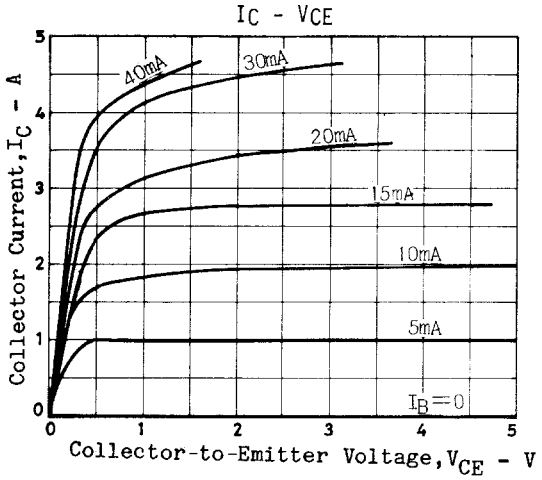
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=3A, I_B=60mA		220	500	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=3A, I_B=60mA			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μA, I_E=0	60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	20			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA, 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

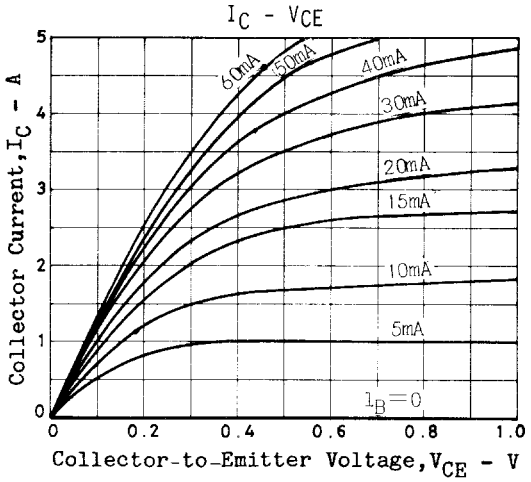
Switching Time Test Circuit

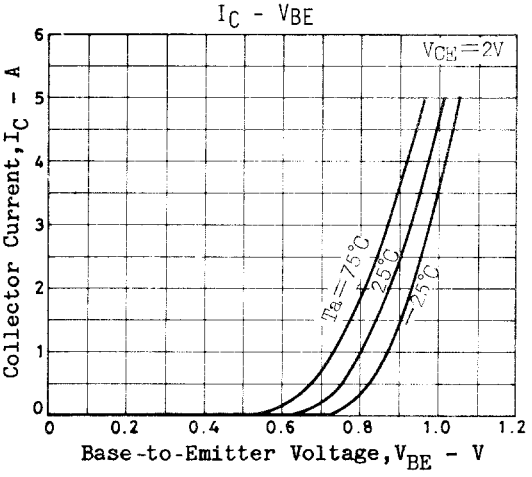


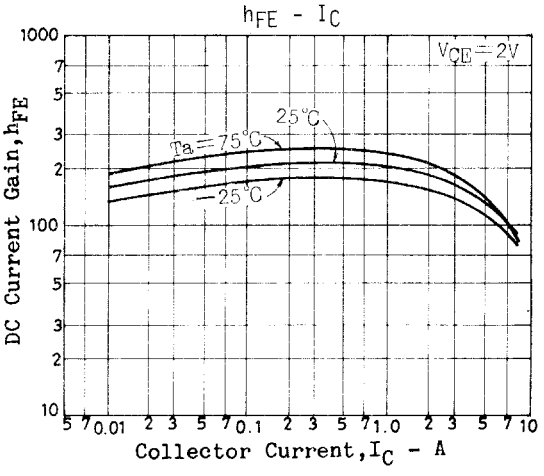
I C=10 I B1=-10 I B2=2A

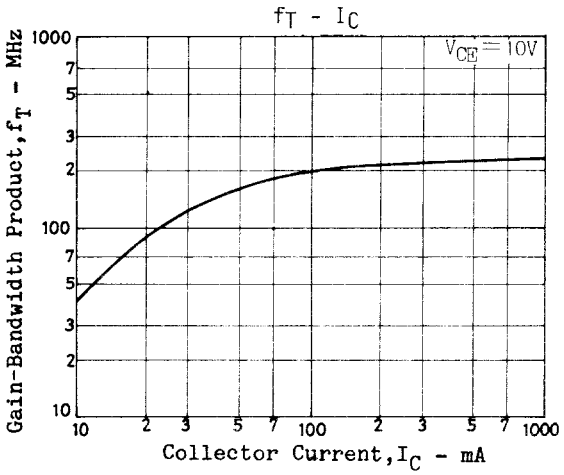
Unit (resistance : Ω, capacitance : F)

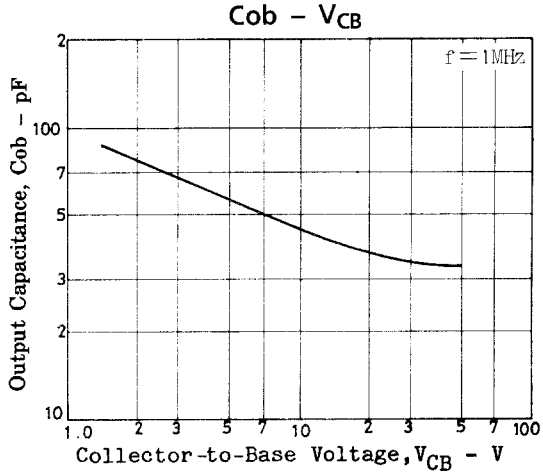


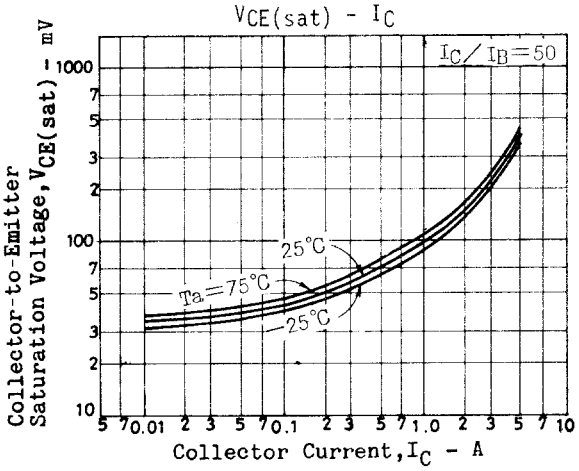


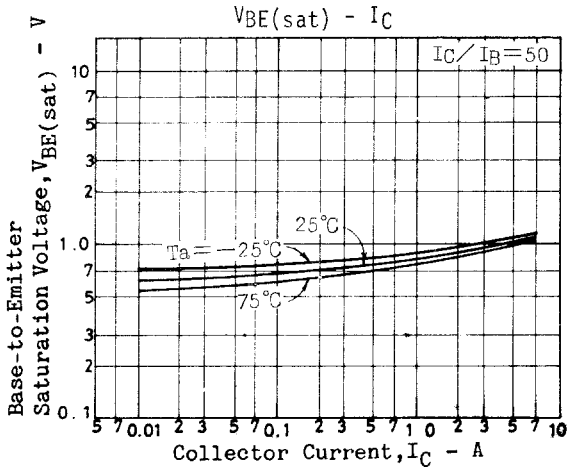


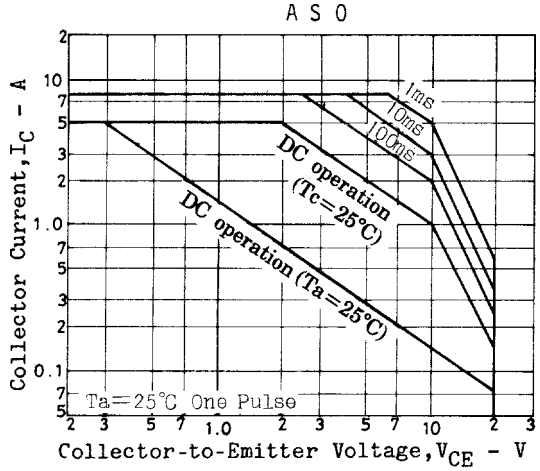



fT - IC
VCE=10V
Gain-Bandwidth Product, fT - MHz
Collector Current, IC - mA


Cob - VCB
f=1MHz
Output Capacitance, Cob - pF
Collector-to-Base Voltage, VCB - V


VCE(sat) - IC
IC/IB=50
Collector-to-Emitter Saturation Voltage, VCE(sat) - mV
Ta=75°C
25°C
-25°C
Collector Current, IC - A


VBE(sat) - IC
IC/IB=50
Base-to-Emitter Saturation Voltage, VBE(sat) - V
25°C
Ta=-25°C
75°C
Collector Current, IC - A


A S O
Collector Current, IC - A
1ms
10ms
100ms
DC operation (Tc=25°C)
DC operation (Ta=25°C)
Ta=25°C One Pulse
Collector-to-Emitter Voltage, VCE - V