Ordering number:EN3511A

2SA1785 : PNP Epitaxial Planar Silicon Transistor
2SC4645 : NPN Triple Diffused Planar Silicon Transistor

2SA1785/2SC4645

High Voltage Driver Applications

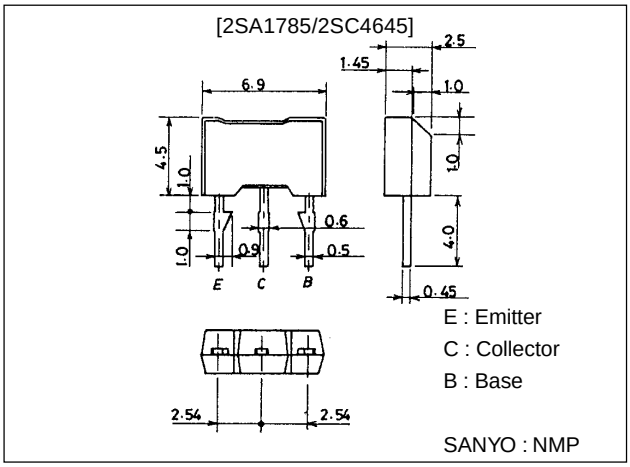
Features

- Large current capacity (I_C=1A).
- High breakdown voltage (V_{CEO}≥400V).

Package Dimensions

unit:mm

2064



( ) : 2SA1785

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)400	V
Collector-to-Emitter Voltage	V_{CEO}		(–)400	V
Emitter-to-Base Voltage	V_{EBO}		(–)5	V
Collector Current	I_C		(–)1	A
Colletor Current (Pulse)	I_{CP}		(–)2	A
Collector Dissipation	P_C		1	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}=(–)300V, I_E=0			(–)1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)1.0	μA
DC Current Gain	h_{FE}	V_{CE}=(–)10V, I_C=(–)100mA	40*		200*	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)50mA		(50)70		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)30V, f=1MHz		(12)8		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)200mA, I_B=(–)20mA			(–)1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)200mA, I_B=(–)20mA			(–)1.0	V

* : The 2SA1785/2SC4465 are classified by 100mA h_{FE} as follows :

40 C 80	60 D 120	100 E 200

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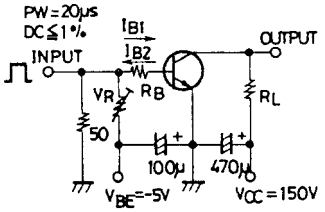
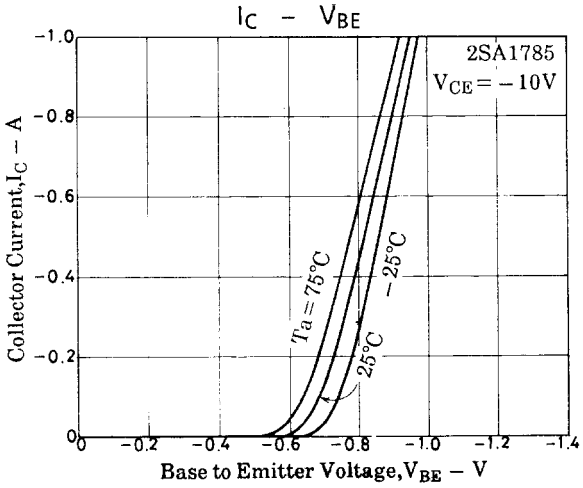
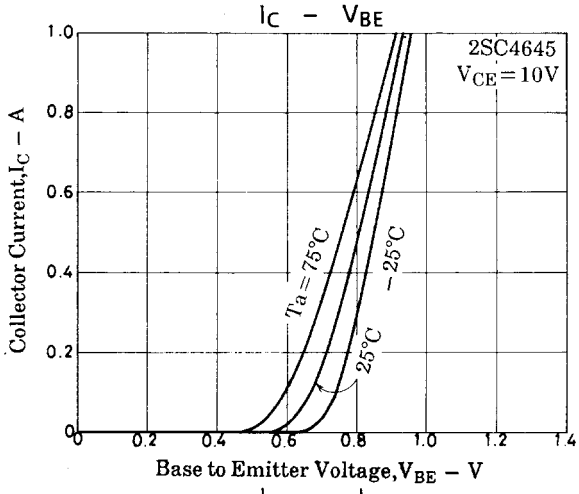
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)400			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)5			V
Turn-ON Time	t_{on}	See specified Test Circuit		(0.25)		μs
				0.11		μs
Storage Time	t_{stg}	See specified Test Circuit		(3.0)		μs
				4.0		μs
Fall Time	t_f	See specified Test Circuit		(0.3)		μs
				0.65		μs

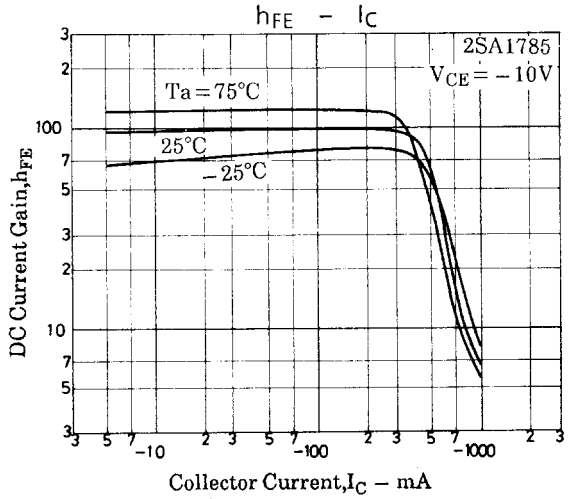
Switching Time Test Circuit

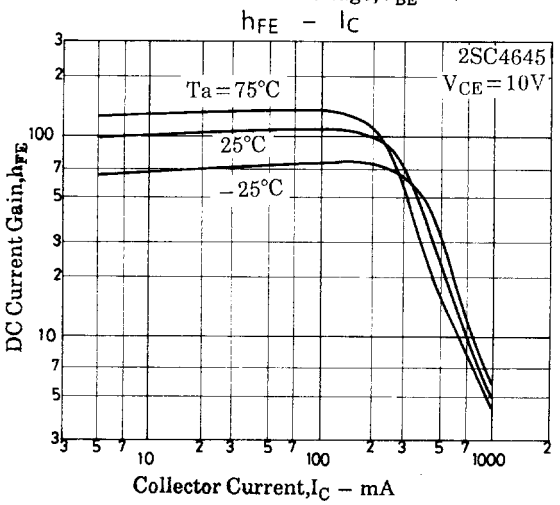


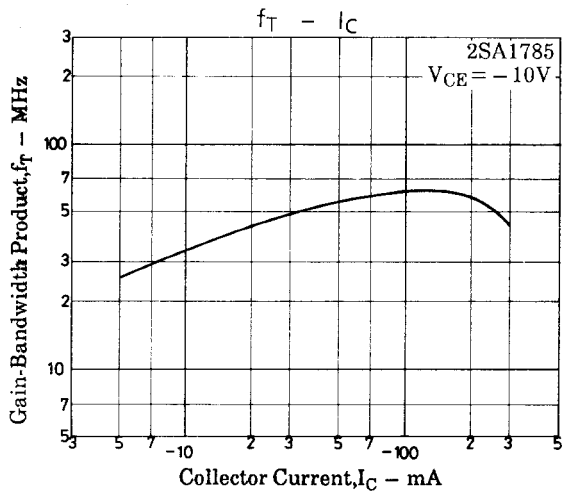
$10I_{B1} = -10I_{B2} = I_C = 200mA$
$R_L = 750\Omega$, $R_B = 50\Omega$, at $I_C = 200mA$
(For PNP, the polarity is reversed.)
Unit (resistance : Ω, capacitance : F)

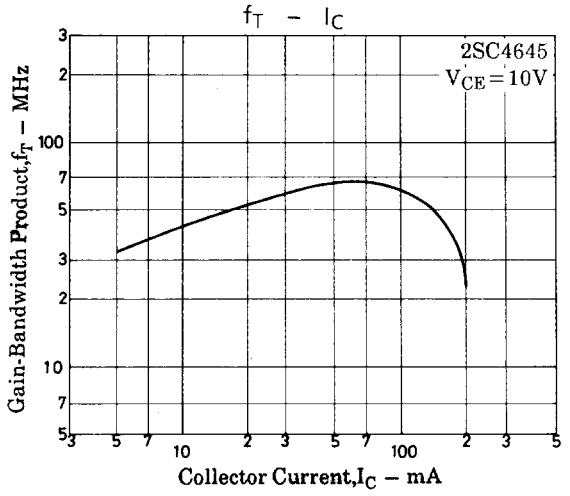


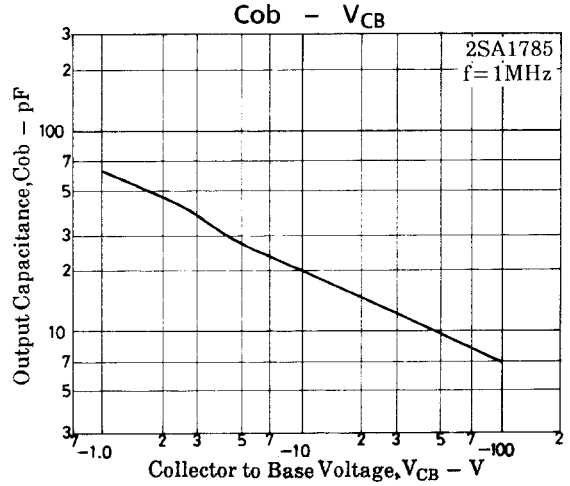


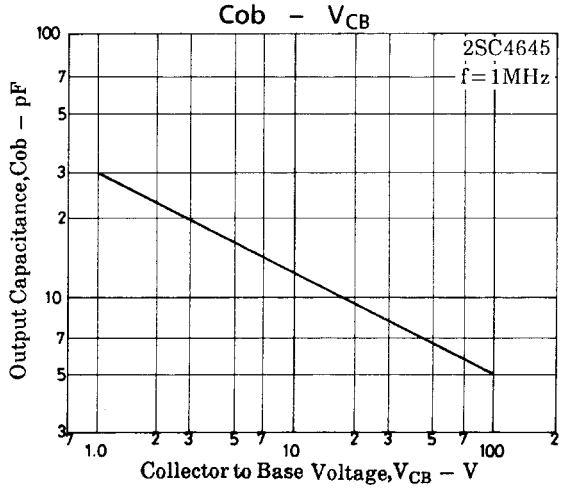


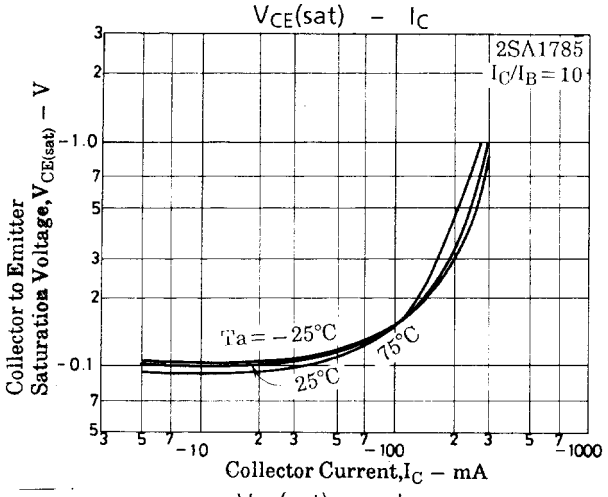


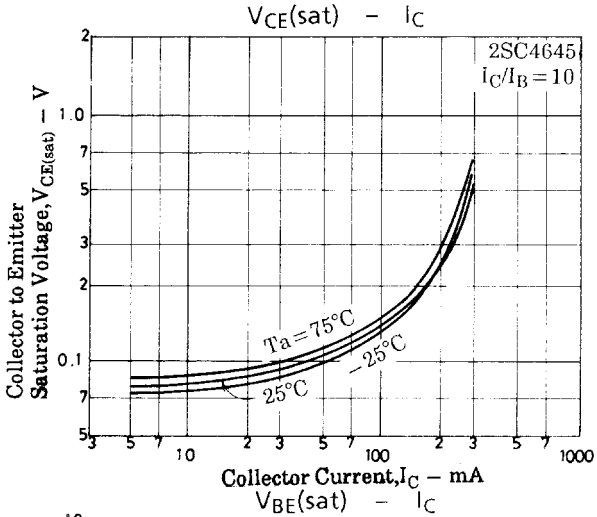

f_T – I_C
2SA1785
V_{CE} = –10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – mA

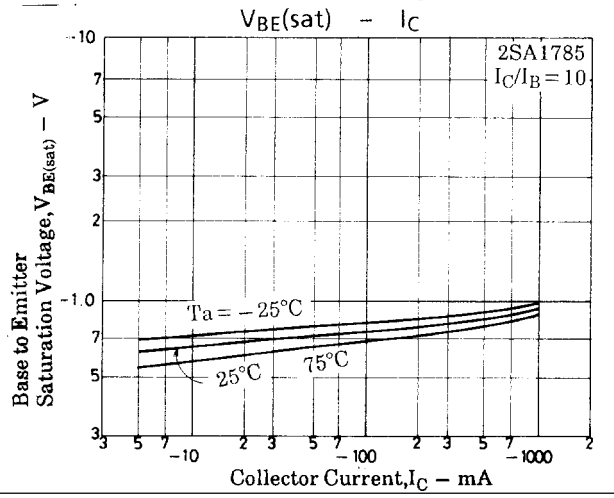

f_T – I_C
2SC4645
V_{CE} = 10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – mA

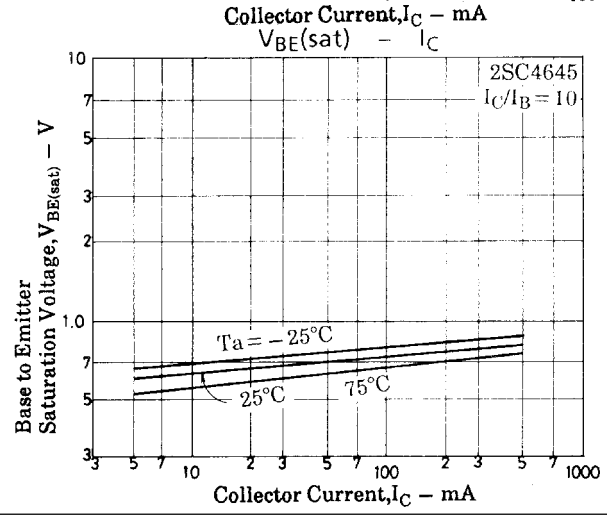

Cob – V_{CB}
2SA1785
f = 1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, V_{CB} – V

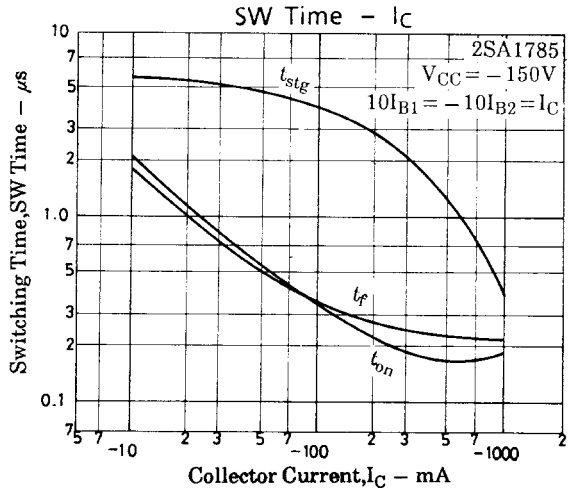

Cob – V_{CB}
2SC4645
f = 1MHz
Output Capacitance, Cob – pF
Collector to Base Voltage, V_{CB} – V

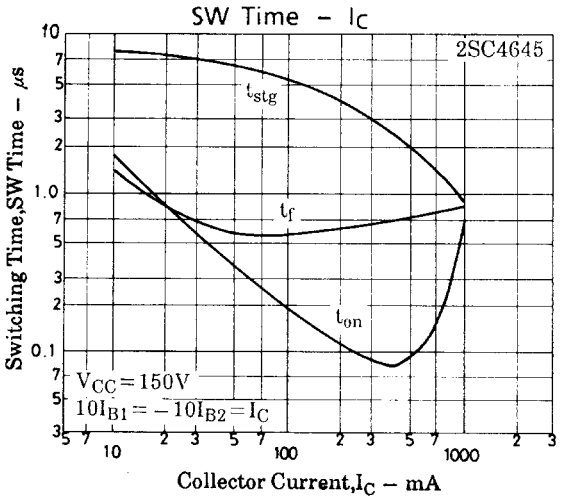

V_{CE}(sat) – I_C
2SA1785
I_C/I_B = 10
Collector to Emitter Saturation Voltage, $V_{CE(sat)}$ – V
Ta = –25°C
25°C
75°C
Collector Current, I_C – mA

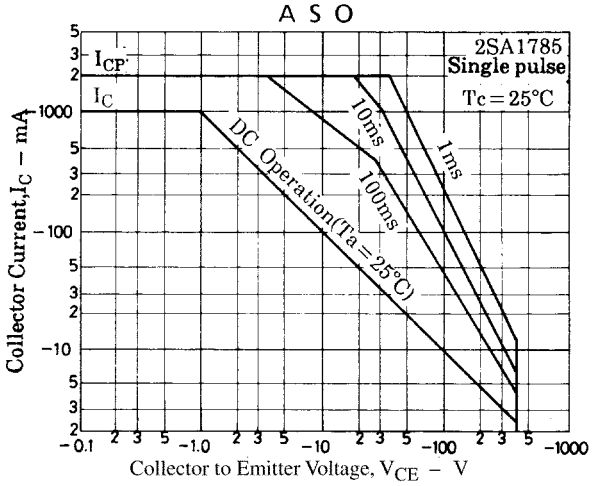

V_{CE}(sat) – I_C
2SC4645
I_C/I_B = 10
Collector to Emitter Saturation Voltage, $V_{CE(sat)}$ – V
Ta = 75°C
25°C
–25°C
Collector Current, I_C – mA

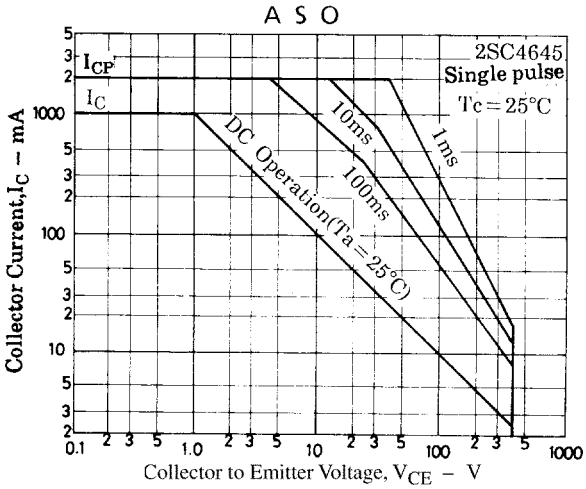

V_{BE}(sat) – I_C
2SA1785
I_C/I_B = 10
Base to Emitter Saturation Voltage, $V_{BE(sat)}$ – V
Ta = –25°C
25°C
75°C
Collector Current, I_C – mA

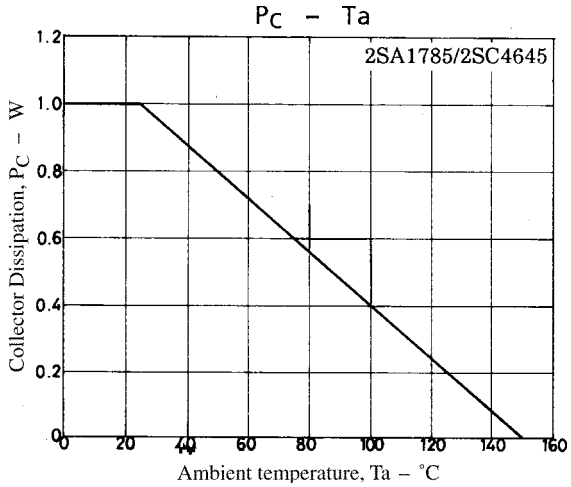

V_{BE}(sat) – I_C
2SC4645
I_C/I_B = 10
Base to Emitter Saturation Voltage, $V_{BE(sat)}$ – V
Ta = –25°C
25°C
75°C
Collector Current, I_C – mA


SW Time – I_C
2SA1785
V_{CC} = –150V
$10I_{B1}$ = –$10I_{B2}$ = I_C
t_{stg}
t_f
t_{on}
Switching Time,SW Time – μs
Collector Current,I_C – mA


SW Time – I_C
2SC4645
t_{stg}
t_f
t_{on}
V_{CC} = 150V
$10I_{B1}$ = –$10I_{B2}$ = I_C
Switching Time,SW Time – μs
Collector Current,I_C – mA


A S O
2SA1785
Single pulse
Tc = 25°C
I_{CP}
I_C
10ms
100ms
1ms
DC Operation(Ta = 25°C)
Collector Current,I_C – mA
Collector to Emitter Voltage, V_{CE} – V


A S O
2SC4645
Single pulse
Tc = 25°C
I_{CP}
I_C
10ms
100ms
1ms
DC Operation(Ta = 25°C)
Collector Current,I_C – mA
Collector to Emitter Voltage, V_{CE} – V


P_C – Ta
2SA1785/2SC4645
Collector Dissipation, P_C – W
Ambient temperature, Ta – °C