Ordering number:EN3520

PNP Epitaxial Planar Silicon Transistor
NPN Triple Diffused Planar Silicon Transistor

2SA1784/2SC4644

High Voltage Driver Applications

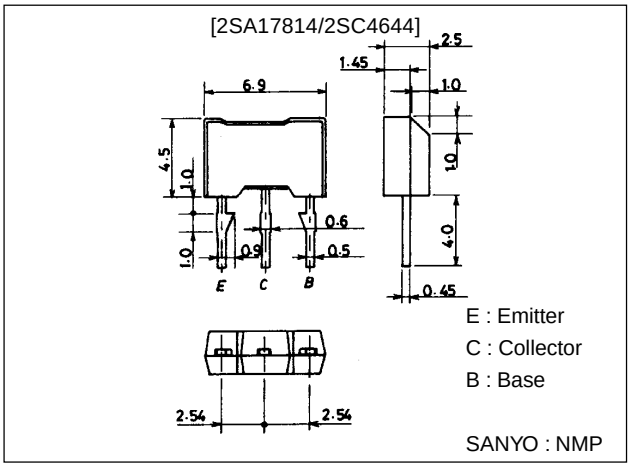
Features

- Adoption of MBIT process.
- High breakdown voltage (V_{CEO}≥400V).
- Excellent linearity of h_{FE}.

Package Dimensions

unit:mm

2064



( ) : 2SA1784

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		(–)200	mA
Colletor Current (Pulse)	I_{CP}		(–)400	mA
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			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)10V, I_C=(–)50mA	60*		200*	
Gain-Bandwidth Product	f_T	V_{CE}=(–)30V, I_C=(–)10mA		70		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)30V, f=1MHz		(5)4		pF
Reverse Transfer Capacitance	Cre	V_{CB}=(–)30V, f=1MHz		(4)3		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)50mA, I_B=(–)5mA			(–0.8)	V
					0.6	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)50mA, I_B=(–)5mA			(–)1.0	V

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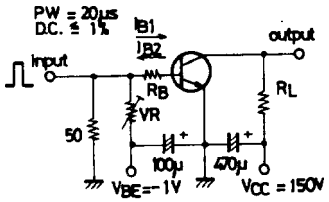
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)400			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)5			V
Turn-ON Time	t_{on}	See specified Test Circuit		0.25		μs
Turn-OFF Time	t_{off}	See specified Test Circuit		5.0		μs

* : The 2SA1784/2SC4644 are classified by 50mA h_{FE} as follows :

60 D 120	100 E 200

Switching Time Test Circuit

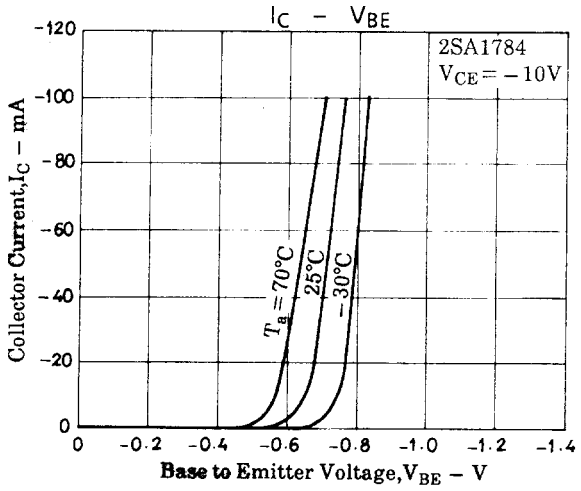


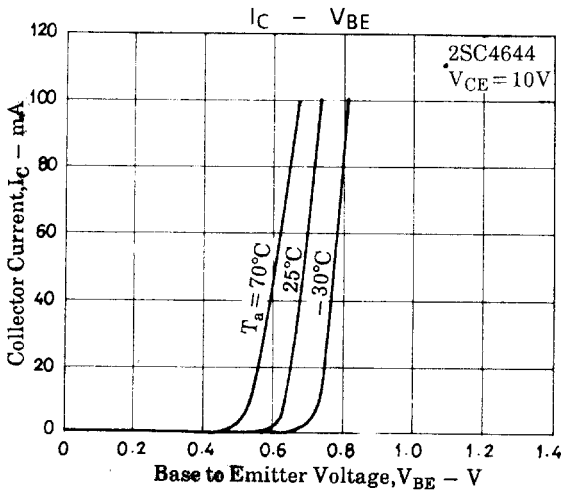
$10I_{B1} = -10I_{B2} = I_C = 50mA$

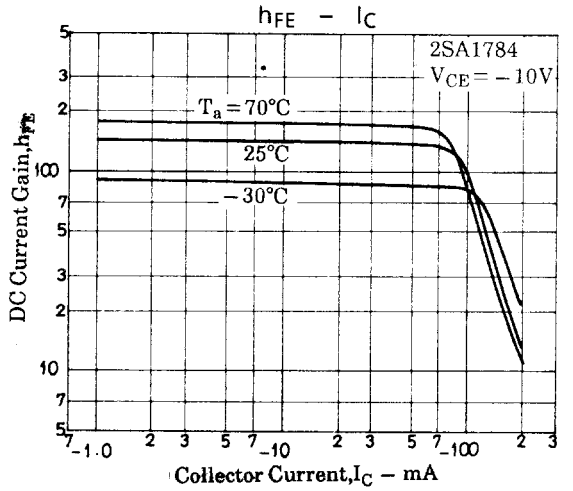
R_L=3kΩ, R_B=200Ω, at I_C=50mA

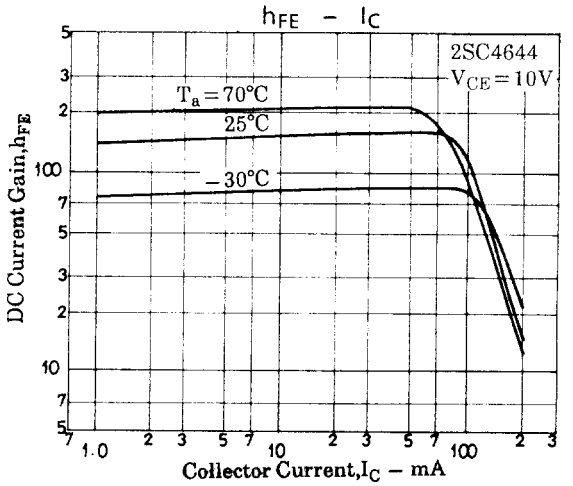
(For PNP, the polarity is reversed)

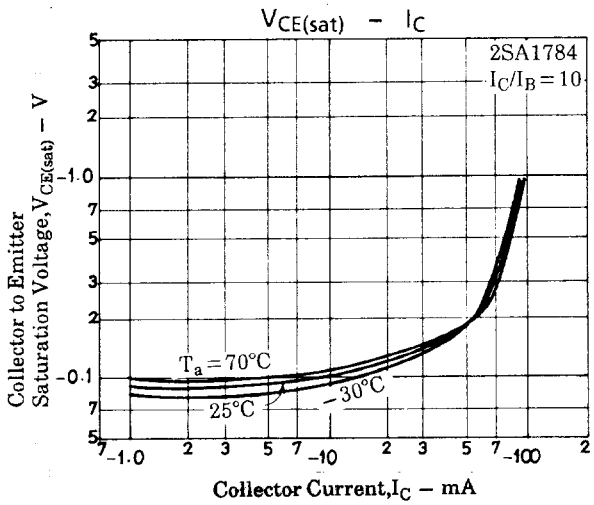
Unit (resistance : Ω, capacitance : F)

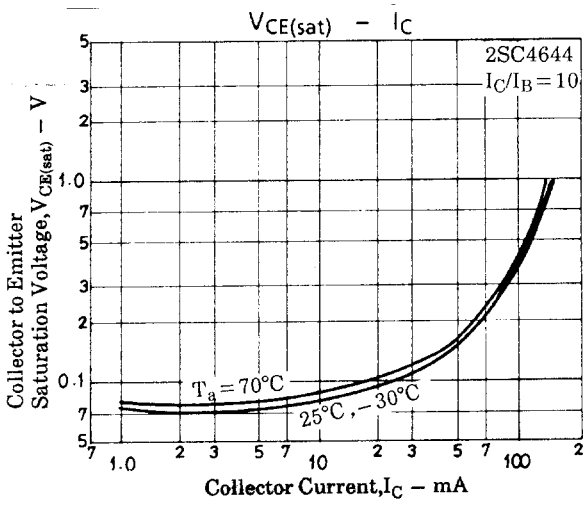


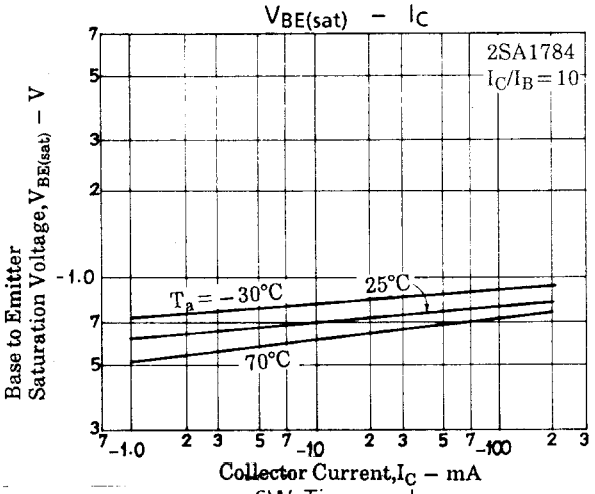


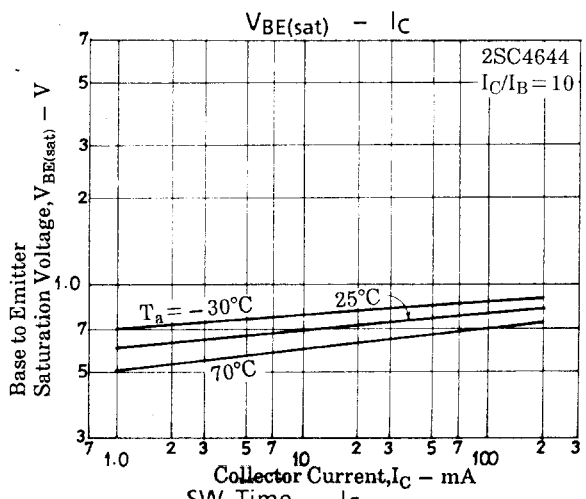


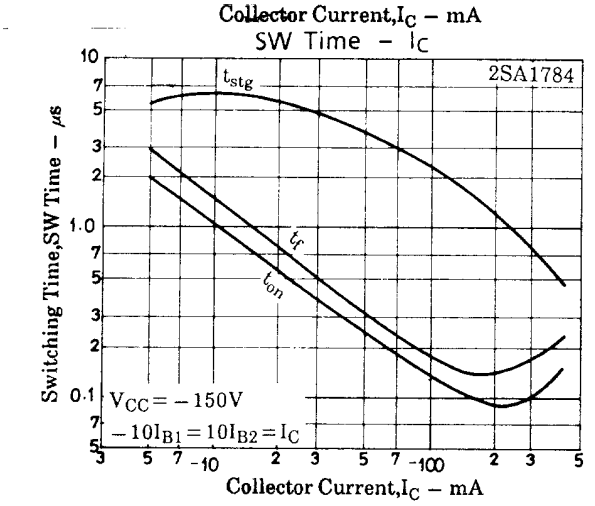


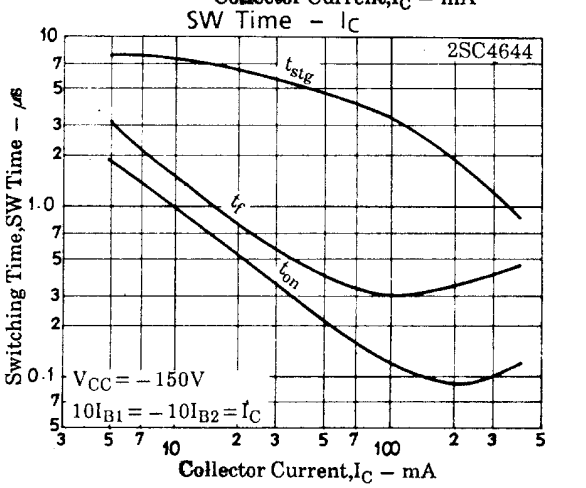

VCE(sat) – IC
2SA1784
IC/IB=10
Collector to Emitter Saturation Voltage,VCE(sat) – V
Ta=70°C
25°C
–30°C
Collector Current,IC – mA

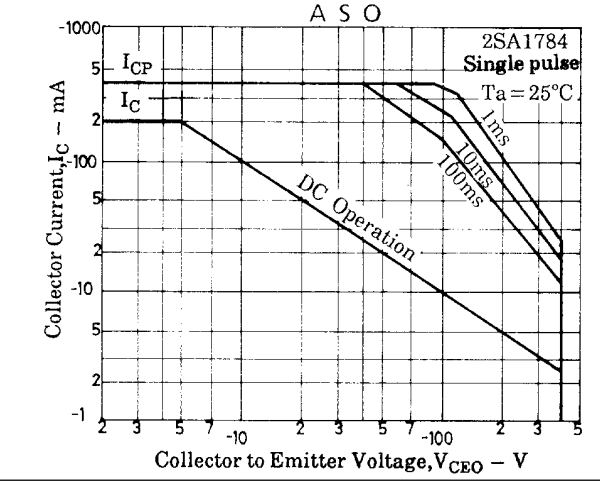

VCE(sat) – IC
2SC4644
IC/IB=10
Collector to Emitter Saturation Voltage,VCE(sat) – V
Ta=70°C
25°C , –30°C
Collector Current,IC – mA

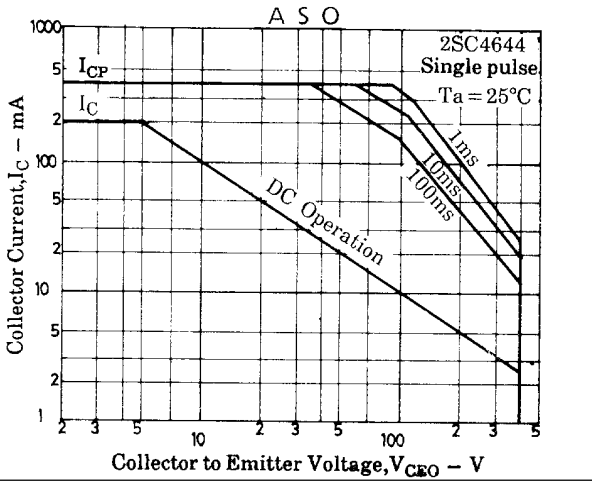

VBE(sat) – IC
2SA1784
IC/IB=10
Base to Emitter Saturation Voltage,VBE(sat) – V
Ta=–30°C
25°C
70°C
Collector Current,IC – mA


VBE(sat) – IC
2SC4644
IC/IB=10
Base to Emitter Saturation Voltage,VBE(sat) – V
Ta=–30°C
25°C
70°C
Collector Current,IC – mA


SW Time – IC
2SA1784
tstg
tf
ton
Switching Time,SW Time – μs
VCC=–150V
–10IB1=10IB2=IC
Collector Current,IC – mA


SW Time – IC
2SC4644
tstg
tf
ton
Switching Time,SW Time – μs
VCC=–150V
10IB1=–10IB2=IC
Collector Current,IC – mA


A S O
2SA1784
Single pulse
Ta=25°C
ICP
IC
1ms
10ms
100ms
DC Operation
Collector Current,IC – mA
Collector to Emitter Voltage,VCEO – V


A S O
2SC4644
Single pulse
Ta=25°C
ICP
IC
1ms
10ms
100ms
DC Operation
Collector Current,IC – mA
Collector to Emitter Voltage,VCEO – V