



## 2SA1784/2SC4644

### High Voltage Driver Applications

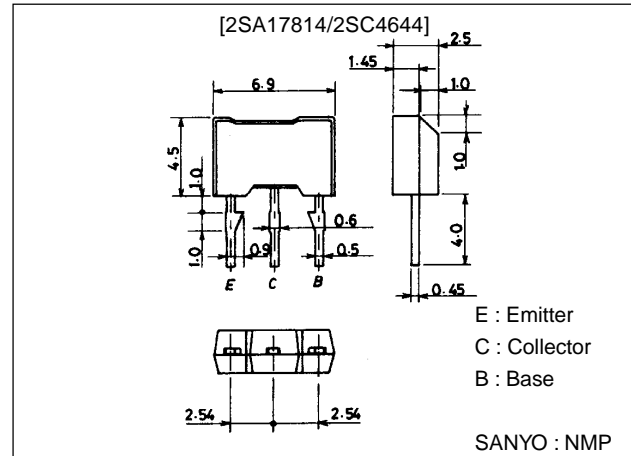
#### Features

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

#### Package Dimensions

unit:mm

2064



() : 2SA1784

#### Specifications

##### Absolute Maximum Ratings at $T_a = 25^\circ C$

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
Collector Current (Pulse)	$I_{CP}$		(-400)	mA
Collector Dissipation	$P_C$		1	W
Junction Temperature	$T_J$		150	$^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ C$

##### Electrical Characteristics at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = (-)300V, I_E = 0$			(-0.1)	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4V, I_C = 0$			(-0.1)	$\mu A$
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	$C_{re}$	$V_{CB} = (-)30V, f = 1MHz$		(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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83198HA (KT)/5170TA (KOTO) No.3520-1/4

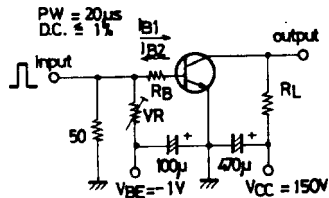
# 2SA1784/2SC4644

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

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

60	D	120	100	E	200
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## Switching Time Test Circuit

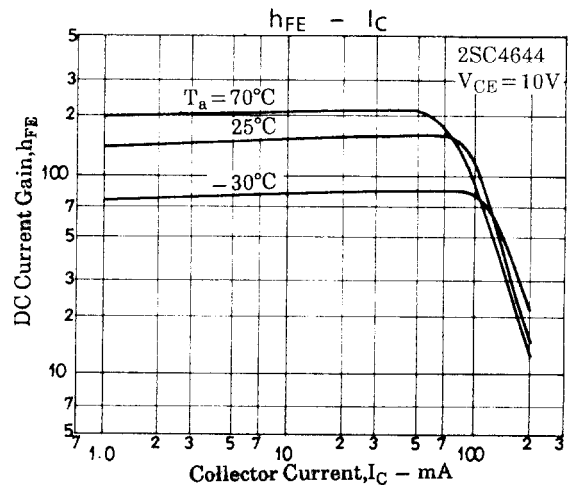
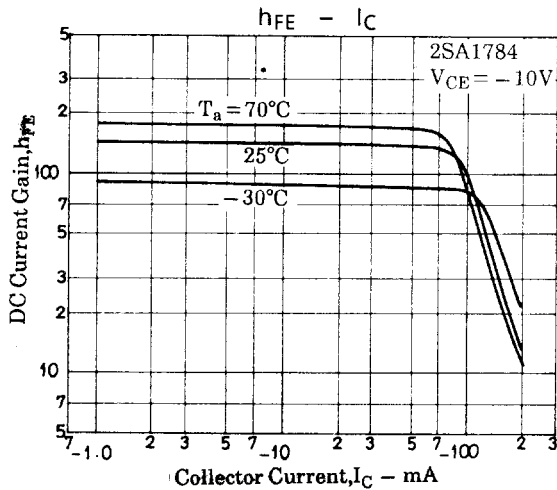
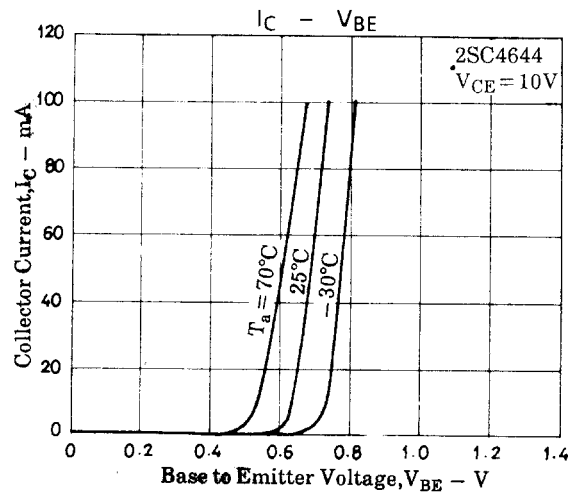
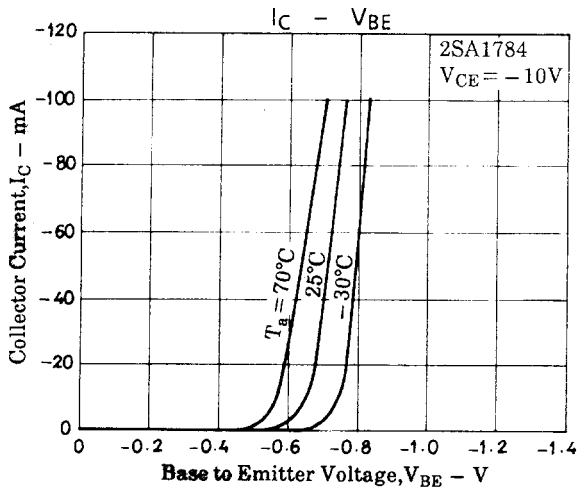


$$10I_{B1} = -10I_{B2} = I_C = 50mA$$

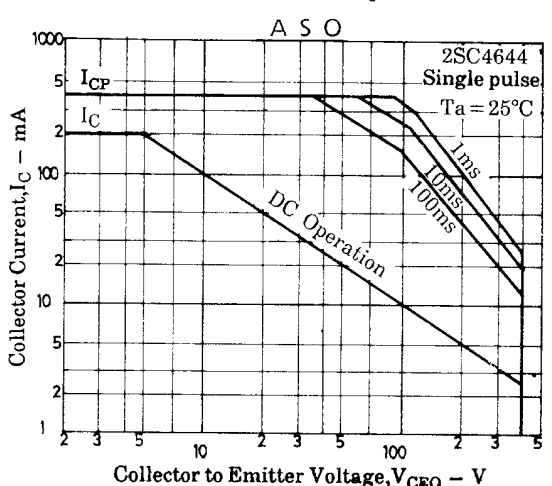
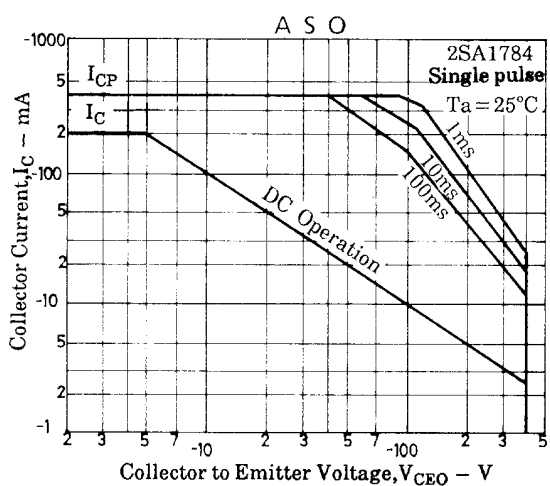
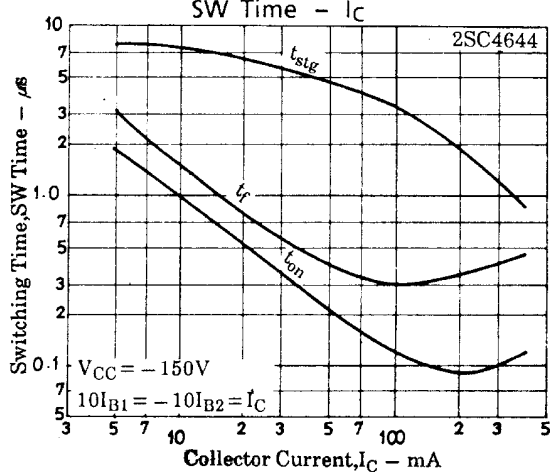
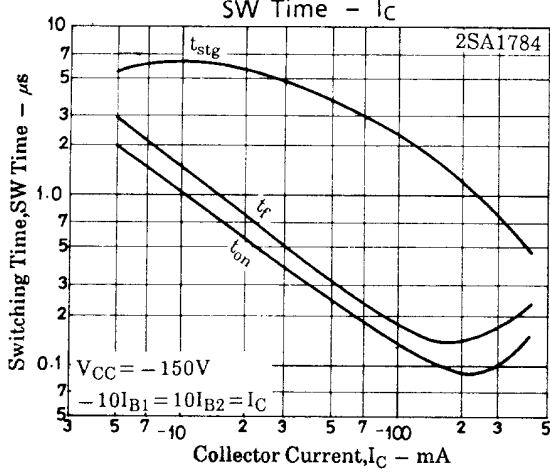
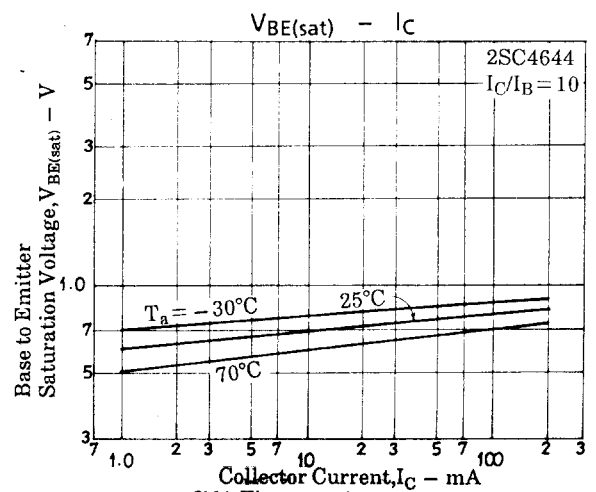
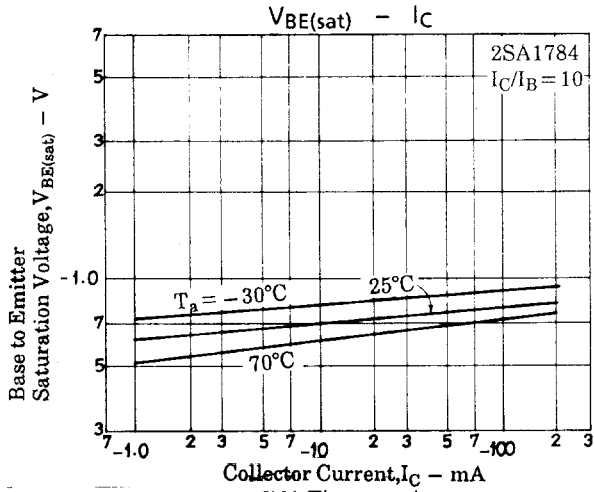
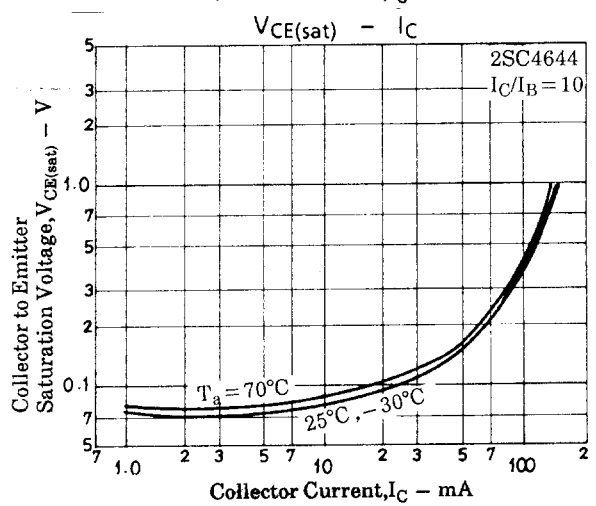
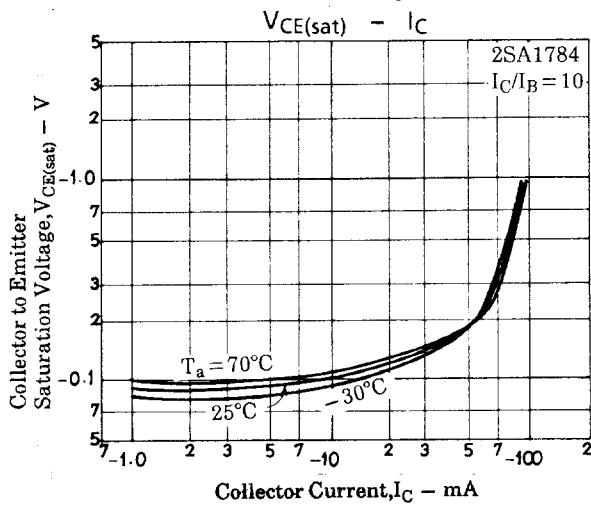
$R_L = 3k\Omega, R_B = 200\Omega$ , at  $I_C = 50mA$

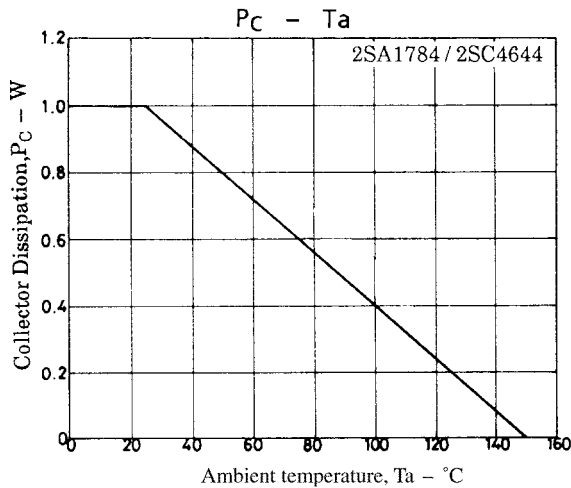
(For PNP, the polarity is reversed)

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



# 2SA1784/2SC4644





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