

# General purpose amplification(−12V, −2A)

## 2SB1690K

### ●Applications

Low frequency amplifier  
Driver

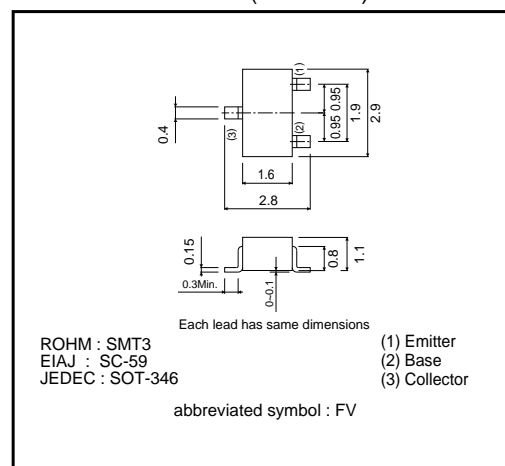
### ●Features

- 1) A collector current is large.
- 2) Collector saturation voltage is low.

$$V_{CE(sat)} \leq -180\text{mV}$$

$$\text{at } I_C = -1\text{A} / I_B = -50\text{mA}$$

### ●External dimensions (Units : mm)



### ●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-base voltage	$V_{CBO}$	−15	V
Collector-emitter voltage	$V_{CEO}$	−12	V
Emitter-base voltage	$V_{EBO}$	−6	V
Collector current	$I_C$	−2	A
		−4	A*
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{stg}$	−55 to +150	°C

\* Single pulse  $P_W=1\text{ms}$

### ●Packaging specifications

Type	Package	Taping
	Code	T146
	Basic ordering unit (pieces)	3000

### ●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	−15	—	—	V	$I_C = -10\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CEO}$	−12	—	—	V	$I_C = -1\text{mA}$
Emitter-base breakdown voltage	$BV_{EBO}$	−6	—	—	V	$I_E = -10\mu\text{A}$
Collector cutoff current	$I_{CBO}$	—	—	−100	nA	$V_{CB} = -15\text{V}$
Emitter cutoff current	$I_{EBO}$	—	—	−100	nA	$V_{EB} = -6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	−120	−180	mV	$I_C = -1\text{A}, I_B = -50\text{mA}$
DC current transfer ratio	$h_{FE}$	270	—	680	—	$V_{CE} = -2\text{V}, I_C = -200\text{mA}^*$
Transition frequency	$f_T$	—	360	—	MHz	$V_{CE} = -2\text{V}, I_E = -200\text{mA}, f = 100\text{MHz}^*$
Output capacitance	$C_{ob}$	—	15	—	pF	$V_{CB} = -10\text{V}, I_E = 0\text{mA}, f = 1\text{MHz}$

\* Pulsed

## Transistors

## ●Electrical characteristic curves

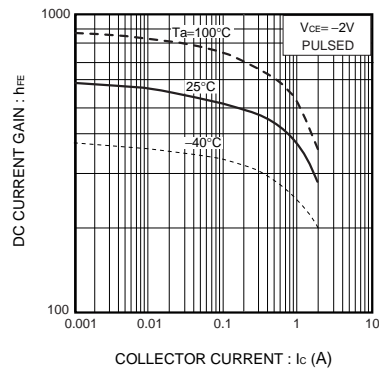


Fig.1 DC current gain vs. collector current

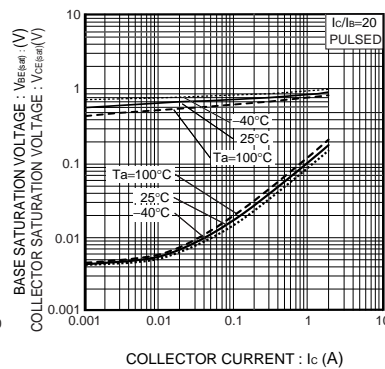


Fig.2 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

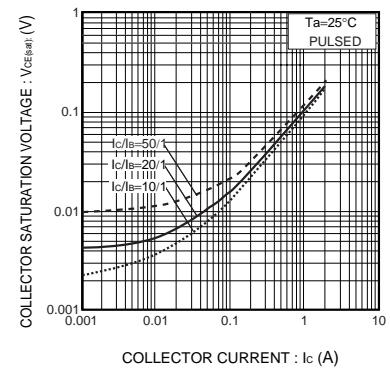


Fig.3 Collector-emitter saturation voltage vs. collector current

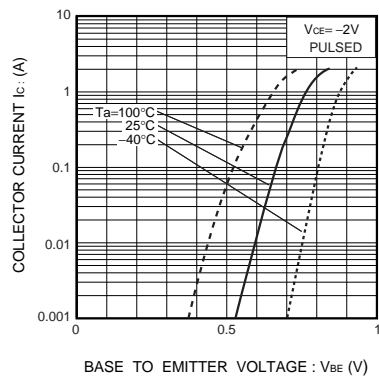


Fig.4 Grounded emitter propagation characteristics

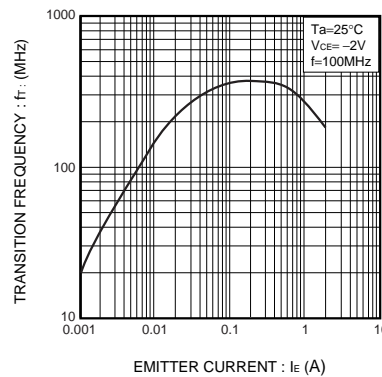


Fig.5 Gain bandwidth product vs. emitter current

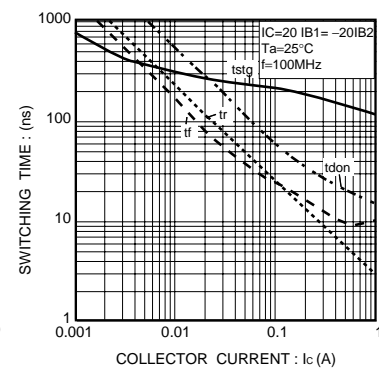
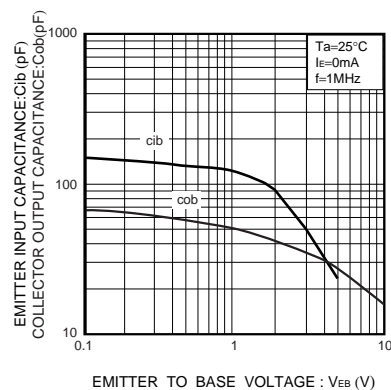


Fig.6 Switching time

Fig.7 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

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