

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

## 2SB1690K

### ●Applications

Low frequency amplifier  
Driver

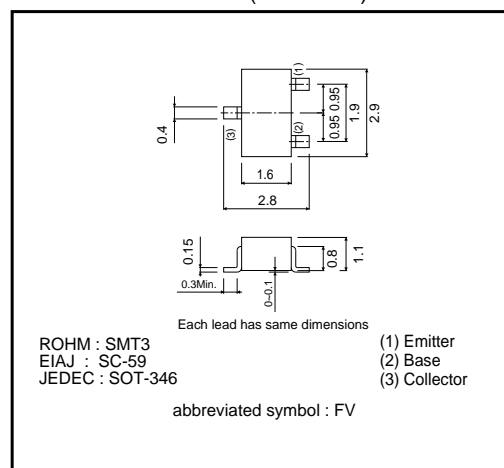
### ●Features

- 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	$V_{CB0}$	-15	V
Collector-emitter voltage	$V_{CE0}$	-12	V
Emitter-base voltage	$V_{EB0}$	-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	$BV_{CB0}$	-15	-	-	V	$I_C = -10\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CE0}$	-12	-	-	V	$I_C = -1\text{mA}$
Emitter-base breakdown voltage	$BV_{EB0}$	-6	-	-	V	$I_E = -10\mu\text{A}$
Collector cutoff current	$I_{CB0}$	-	-	-100	nA	$V_{CB} = -15\text{V}$
Emitter cutoff current	$I_{EB0}$	-	-	-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

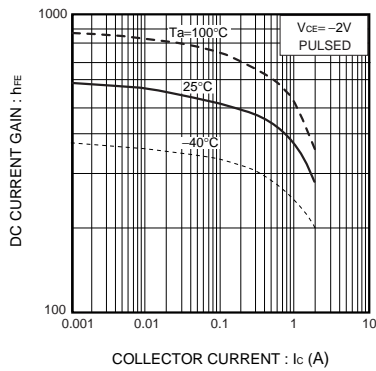


Fig.1 DC current gain vs. collector current

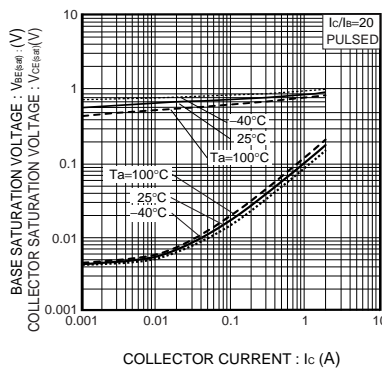


Fig.2 Collector-emitter saturation voltage base-emitter saturation voltage vs. collector current

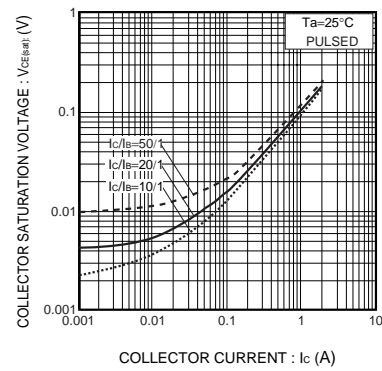


Fig.3 Collector-emitter saturation voltage vs. collector current

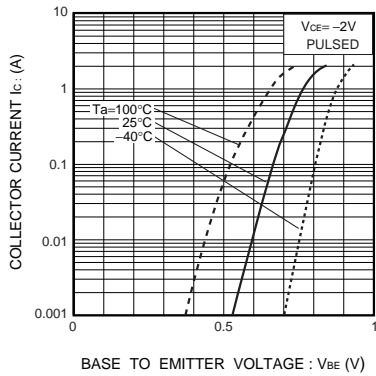


Fig.4 Grounded emitter propagation characteristics

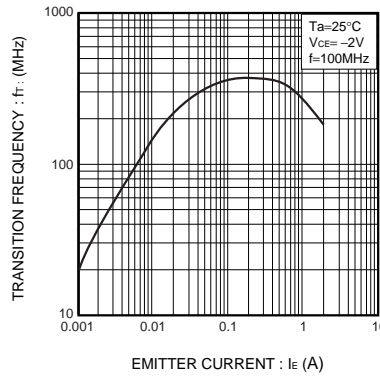


Fig.5 Gain bandwidth product vs. emitter current

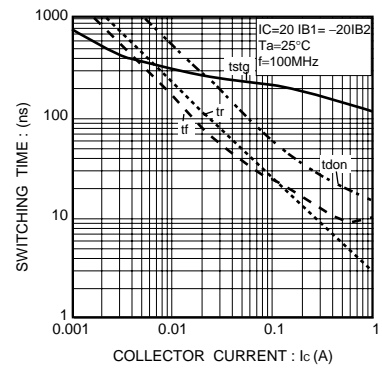


Fig.6 Switching time

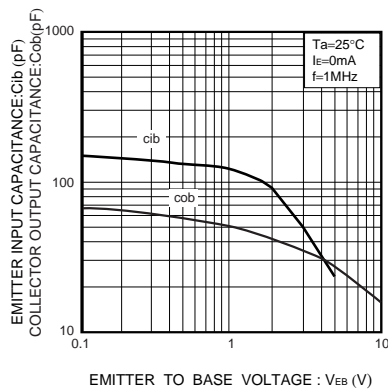


Fig.7 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.