

# General purpose amplification(−12V, −1.5A)

## 2SB1689

### ●Application

Low frequency amplifier  
Driver

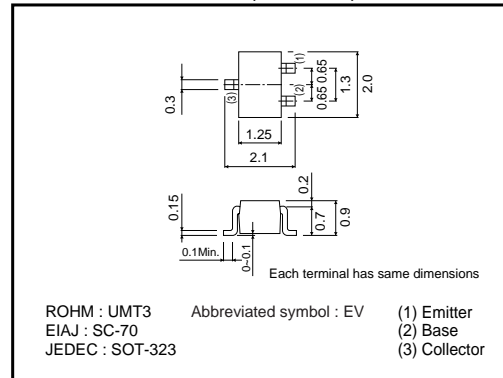
### ●Features

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

$$V_{CE(sat)} \leq -200\text{mV}$$

$$\text{at } I_C = -500\text{mA} / I_B = -25\text{mA}$$

### ●External dimensions (Unit : 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	$I_C$	−1.5	A
	$I_{CP}$	−3	A*1
Power dissipation	$P_C$	200	mW*2
Junction temperature	$T_j$	150	°C
Range of storage temperature	$T_{stg}$	−55 to +150	°C

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

\*2 Each terminal mounted on a recommended land pattern

### ●Packaging specifications

Type	Package	Taping
	Code	T106
	Basic ordering unit (pieces)	3000
2SB1689		○

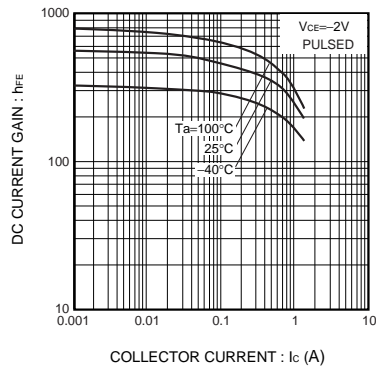
### ●Electrical characteristics (Ta=25°C)

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	$V_{CE(sat)}$	−	−110	−200	mV	$I_C = -500\text{mA}, I_B = -25\text{mA}$
DC current gain	$h_{FE}$	270	−	680	−	$V_{CE} = -2\text{V}, I_C = -200\text{mA}^*$
Transition frequency	$f_T$	−	400	−	MHz	$V_{CE} = -2\text{V}, I_E = 200\text{mA}, f = 100\text{MHz}^*$
Collector output capacitance	$C_{ob}$	−	12	−	pF	$V_{CB} = -10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$

\* Pulsed

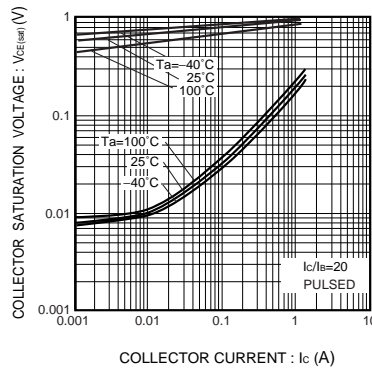
Transistors

●Electrical characteristic curves



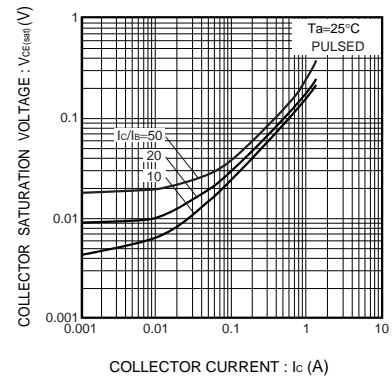
COLLECTOR CURRENT :  $I_c$  (A)

Fig.1 DC current gain vs. collector current



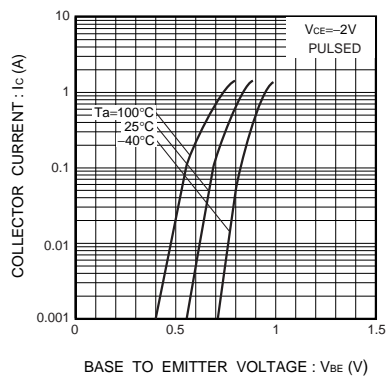
COLLECTOR CURRENT :  $I_c$  (A)

Fig.2 Collector-emitter saturation voltage vs. collector current  
Fig.3 Base-emitter saturation voltage vs. collector current



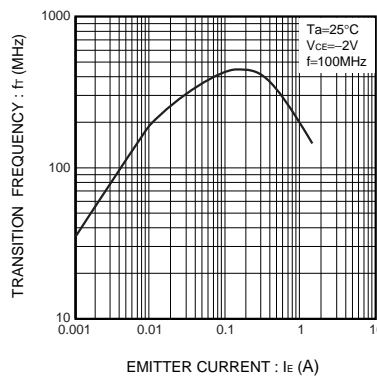
COLLECTOR CURRENT :  $I_c$  (A)

Fig.4 Collector-emitter saturation voltage vs. collector current



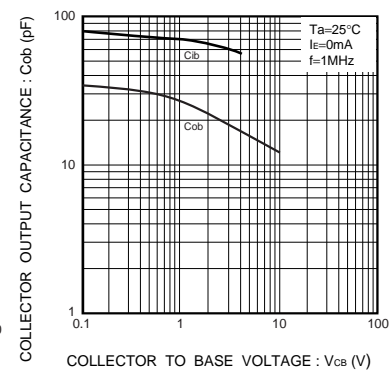
BASE TO EMITTER VOLTAGE :  $V_{BE}$  (V)

Fig.5 Grounded emitter propagation characteristics



EMITTER CURRENT :  $I_e$  (A)

Fig.6 Gain bandwidth product vs. emitter current



COLLECTOR TO BASE VOLTAGE :  $V_{CB}$  (V)

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

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