

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

2SB1689

●Application

Low frequency amplifier
Driver

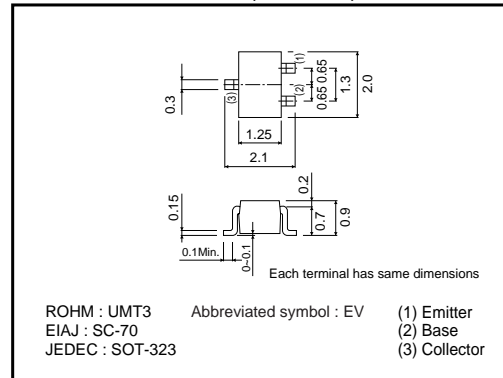
●Features

- 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_{CB0}	−15	V
Collector-emitter voltage	V_{CE0}	−12	V
Emitter-base voltage	V_{EB0}	−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		○

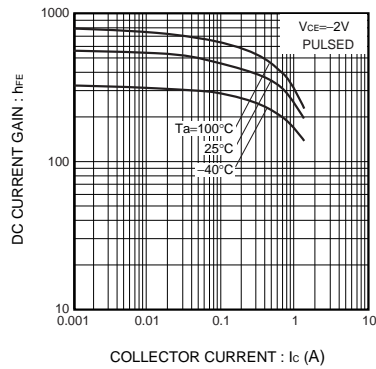
●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{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_{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

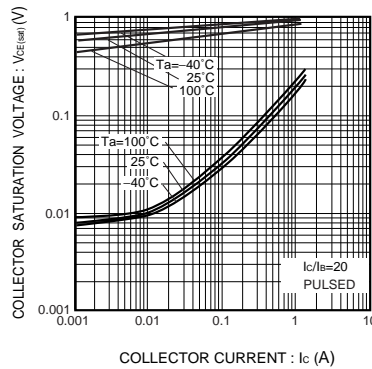
Transistors

●Electrical characteristic curves



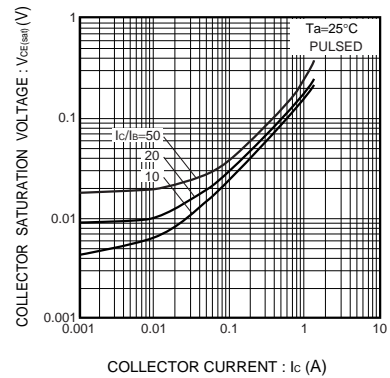
COLLECTOR CURRENT : I_c (A)

Fig.1 DC current gain vs. collector current



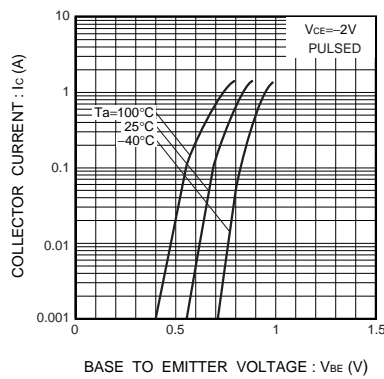
COLLECTOR CURRENT : I_c (A)

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



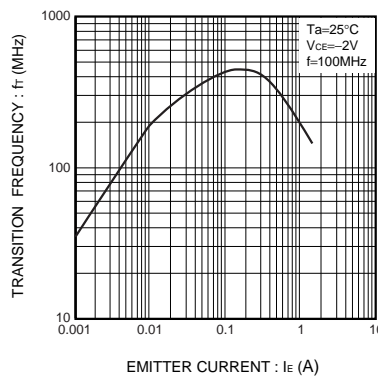
COLLECTOR CURRENT : I_c (A)

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



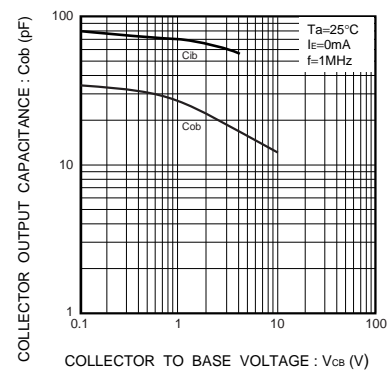
BASE TO EMITTER VOLTAGE : V_{BE} (V)

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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