2SA1190, 2SA1191

Silicon PNP Epitaxial

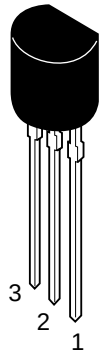
HITACHI

Application

- Low frequency low noise amplifier
- Complementary pair with 2SC2855 and 2SC2856

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	2SA1190	2SA1191	Unit
Collector to base voltage	V_{CBO}	–90	–120	V
Collector to emitter voltage	V_{CEO}	–90	–120	V
Emitter to base voltage	V_{EBO}	–5	–5	V
Collector current	I_C	–100	–100	mA
Emitter current	I_E	100	100	mA
Collector power dissipation	P_C	400	400	mW
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

Electrical Characteristics (Ta = 25°C)

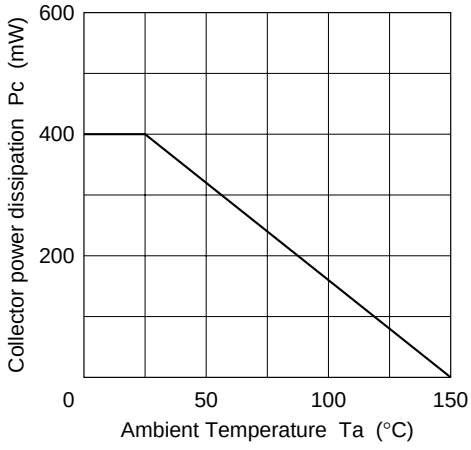
Item	Symbol	2SA1190 Min	2SA1190 Typ	2SA1190 Max	2SA1191 Min	2SA1191 Typ	2SA1191 Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	–90	—	—	–120	—	—	V	I_C = –10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	–90	—	—	–120	—	—	V	I_C = –1 mA, R_{BE} = ∞
Emitter to base breakdown voltage	$V_{(BR)EBO}$	–5	—	—	–5	—	—	V	I_E = –10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	–0.1	—	—	–0.1	µA	V_{CB} = –70 V, I_E = 0
Emitter cutoff current	I_{EBO}	—	—	–0.1	—	—	–0.1	µA	V_{EB} = –2 V, I_C = 0
DC current trnsfer ratio	h_{FE}*[1]	250	—	800	250	—	800		V_{CE} = –12 V, I_C = –2 mA*[2]
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	–0.05	–0.15	—	–0.05	–0.15	V	I_C = –10 mA, I_B = –1 mA*[2]
Base to emitter saturation voltage	$V_{BE(sat)}$	—	–0.7	–1.0	—	–0.7	–1.0	V	
Gain bandwidth product	f_T	—	130	—	—	130	—	MHz	V_{CE} = –6 V, I_C = –10 mA
Collector output capacitance	Cob	—	3.2	—	—	3.2	—	pF	V_{CB} = –10 V, I_E = 0, f = 1 MHz
Noise figure	NF	—	0.15	1.5	—	0.15	1.5	dB	V_{CE} = –6 V, I_C = –0.1 mA, R_g = 10 kΩ, f = 1 kHz
		—	0.2	2.0	—	0.2	2.0	dB	V_{CE} = –6 V, I_C = –0.1 mA, R_g = 10 kΩ, f = 10 Hz
Noise voltage reffered to input	e_n	—	0.7	—	—	0.7	—	nV/$\sqrt{Hz}$	V_{CB} = –6 V, I_C = –10 mA, Rg = 0, f = 1 kHz

Notes: 1. The 2SA1190 and 2SA1191 are grouped by h_{FE} as follows.

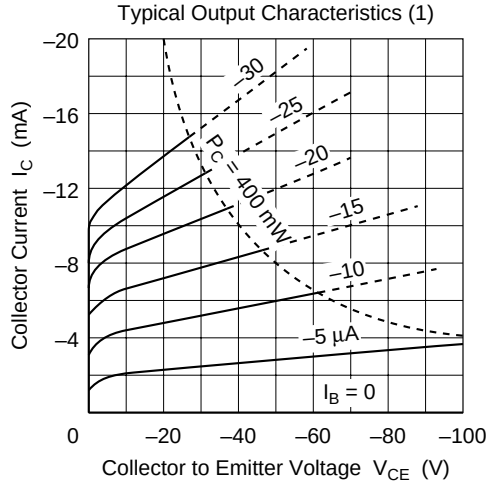
2. Pulse test

D	E
250 to 500	400 to 800

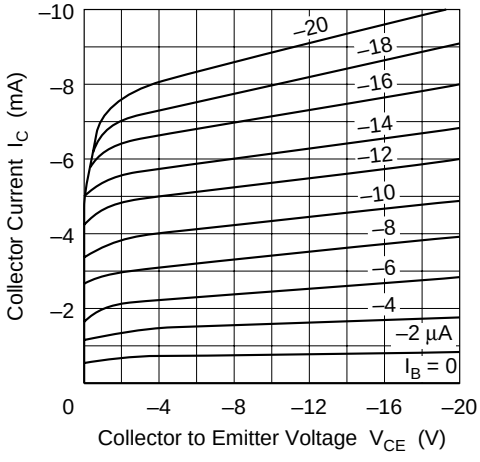
Maximum Collector Dissipation Curve



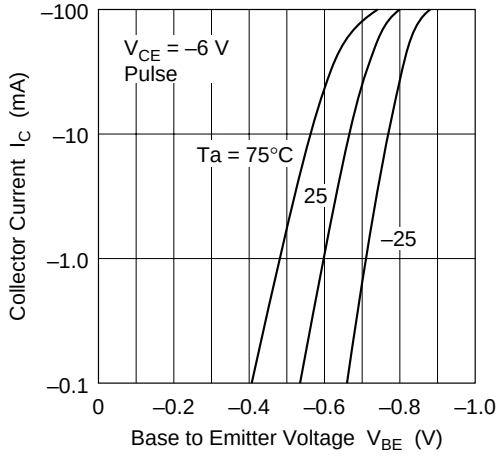
Typical Output Characteristics (1)



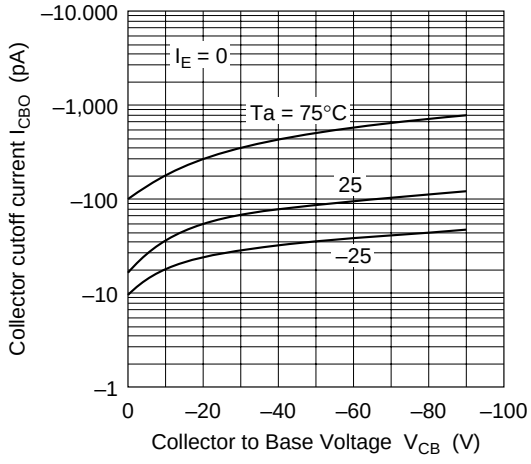
Typical Output Characteristics (2)



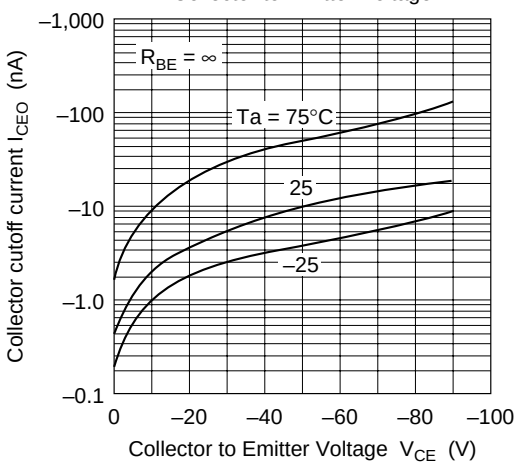
Typical Transfer Characteristics



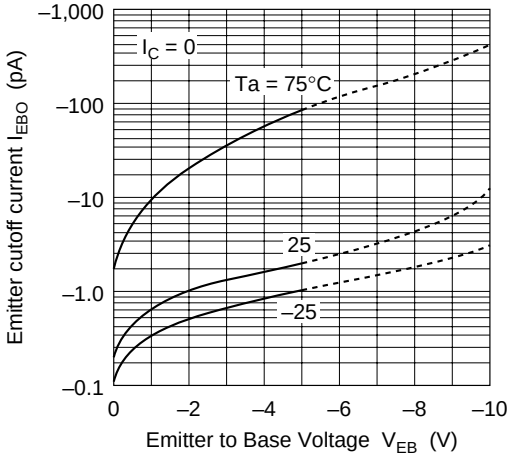
Collector Cutoff Current vs.
Collector to Base Voltage



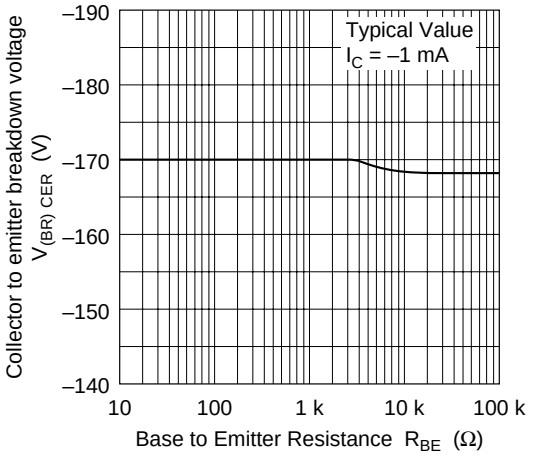
Collector Cutoff Current vs.
Collector to Emitter Voltage



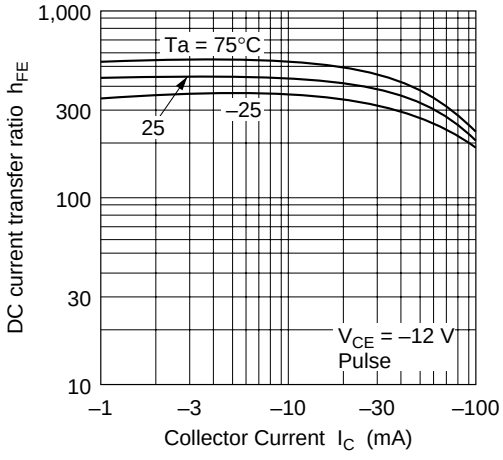
Emitter Cutoff Current vs.
Emitter to Base Voltage



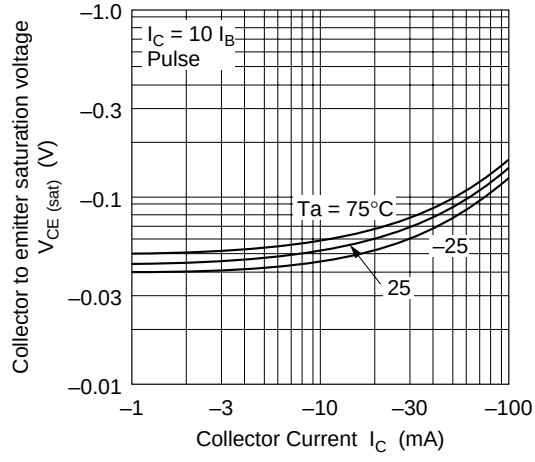
Collector to Emitter Breakdown Voltage vs.
Base to Emitter Resistance



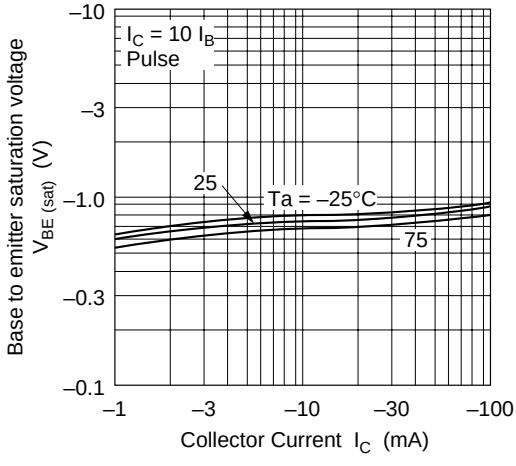
DC Current Transfer Ratio vs. Collector Current



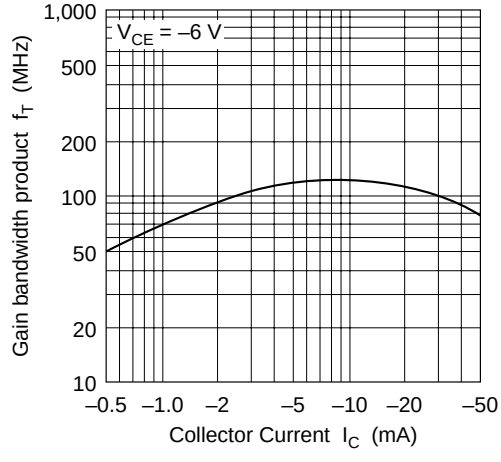
Collector to Emitter Saturation Voltage vs. Collector Current



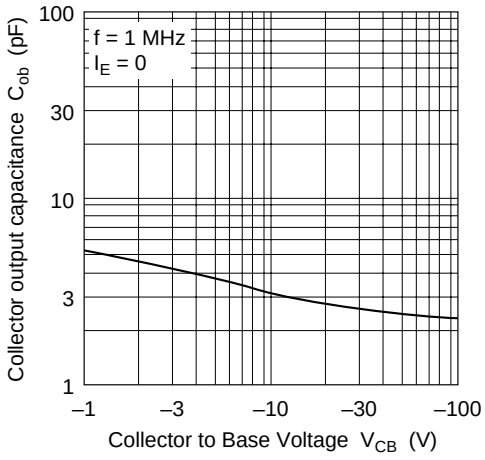
Base to Emitter Saturation Voltage vs. Collector Current



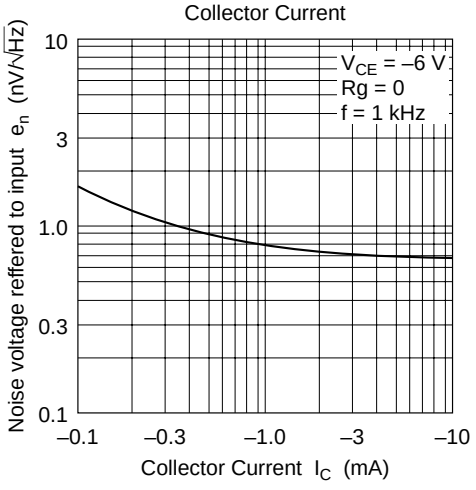
Gain Bandwidth Product vs. Collector Current



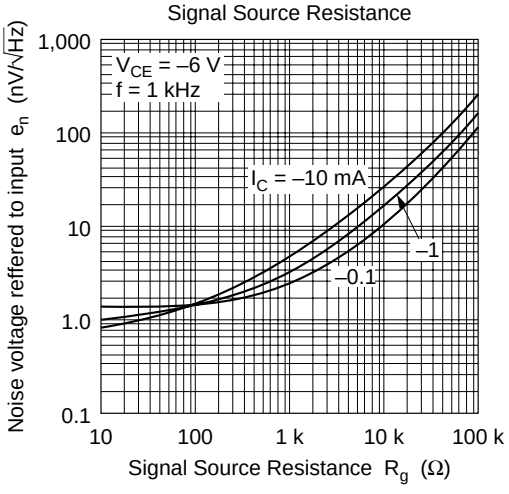
Collector Output Capacitance vs. Collector to Base Voltage



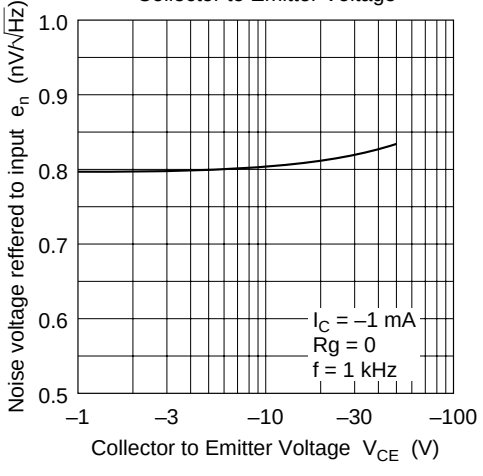
Noise Voltage Reffered to Input vs. Collector Current



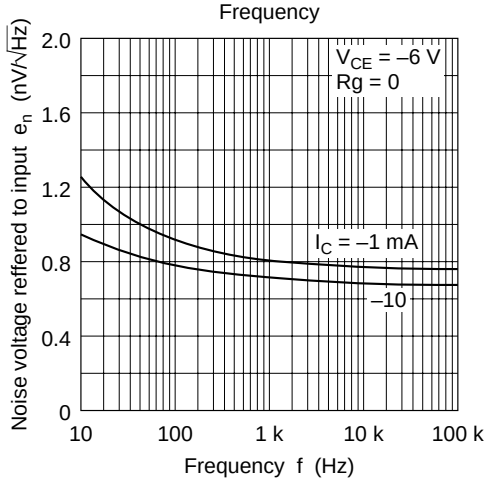
Noise Voltage Reffered to Input vs. Signal Source Resistance



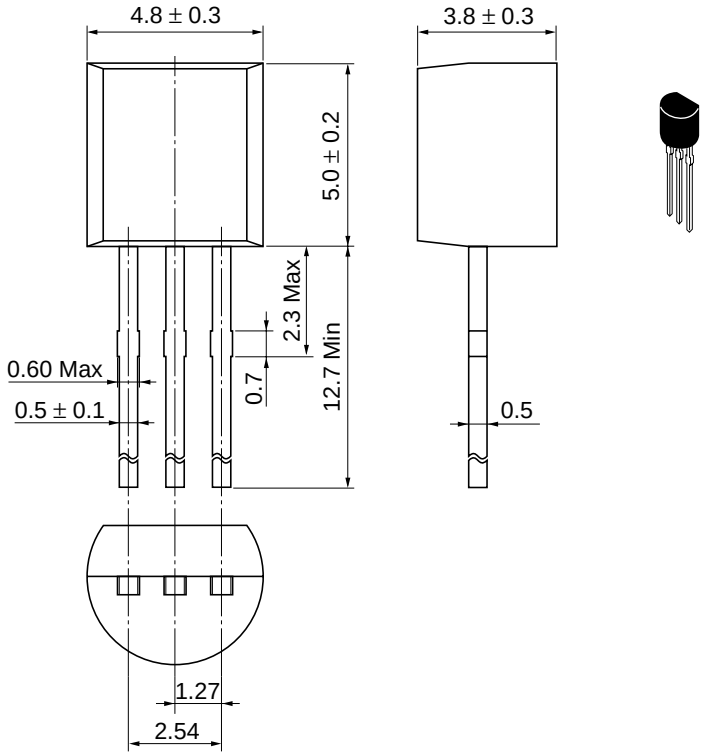
Noise Voltage Reffered to Input vs. Collector to Emitter Voltage



Noise Voltage Reffered to Input vs. Frequency



Unit: mm



Hitachi Code	TO-92 (1)
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.25 g

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