# 2SA1190

## Silicon PNP Epitaxial

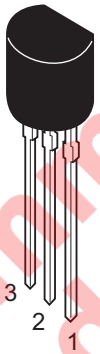
REJ03G0640-0200
(Previous ADE-208-1012)
Rev.2.00
Aug.10.2005

## Application

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

## Outline

RENESAS Package code: PRSS0003DA-A
(Package name: TO-92 (1))




1. Emitter
2. Collector
3. Base



## Absolute Maximum Ratings

(Ta = 25°C)

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

## Electrical Characteristics

(Ta = 25°C)

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

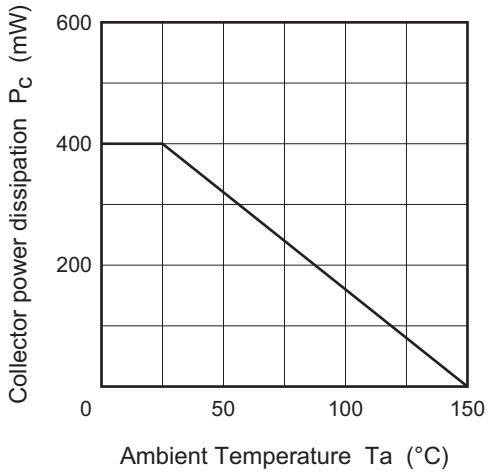
Notes: 1. The 2SA1190 and 2SA1191 are grouped by $h_{FE}$ as follows.

2. Pulse test

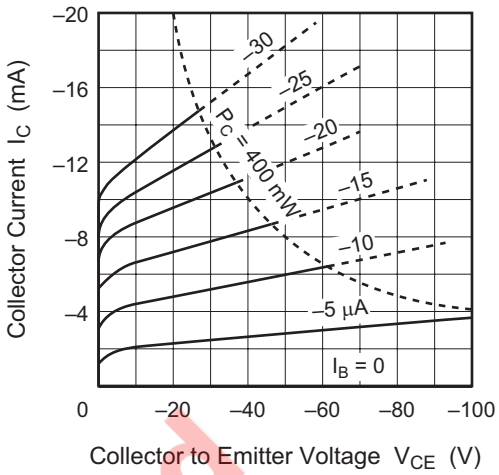
| D | E |
|---|---|
| 250 to 500 | 400 to 800 |

## Main Characteristics

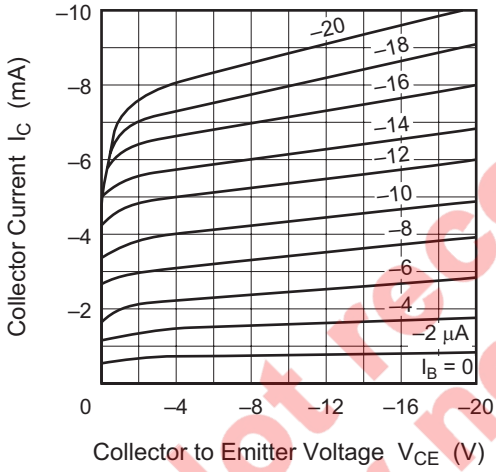
Maximum Collector Dissipation Curve



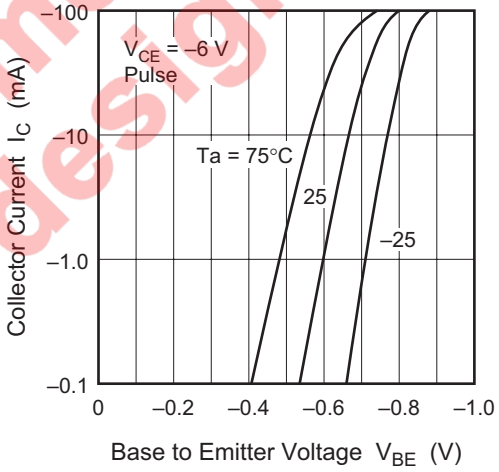

Typical Output Characteristics (1)



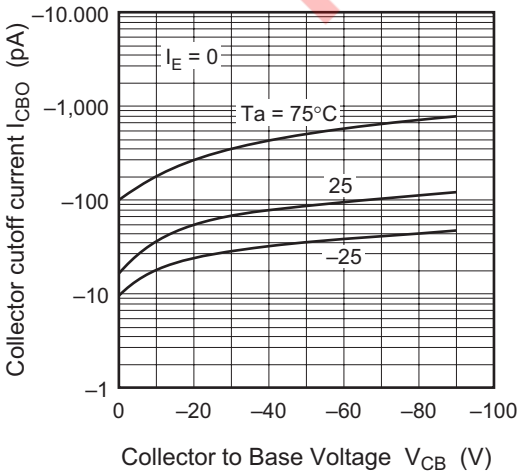

Typical Output Characteristics (2)



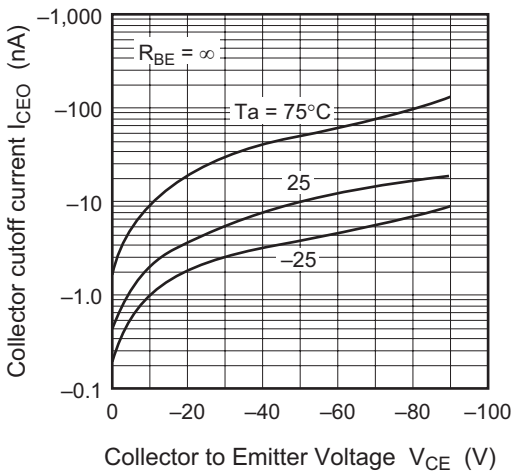

Typical Transfer Characteristics



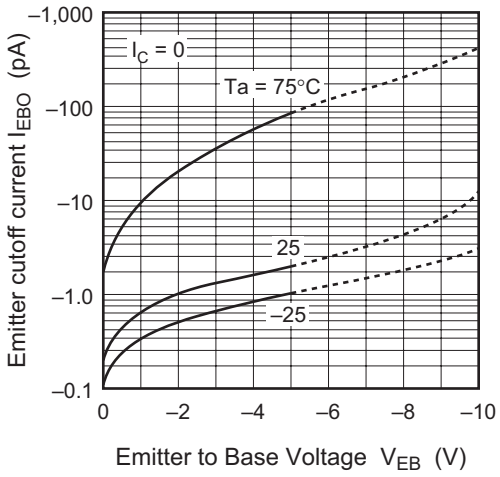

Collector Cutoff Current vs. Collector to Base Voltage



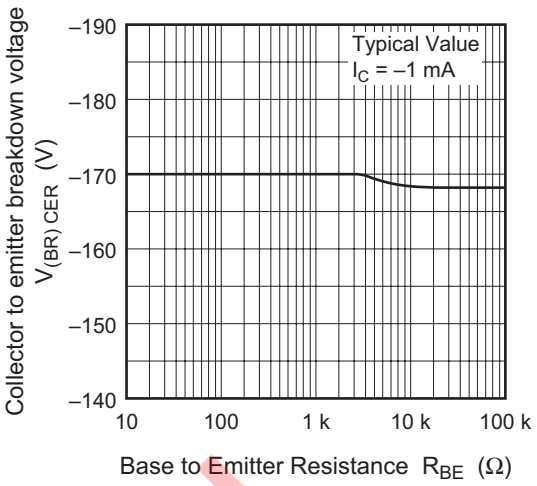

Collector Cutoff Current vs. Collector to Emitter Voltage



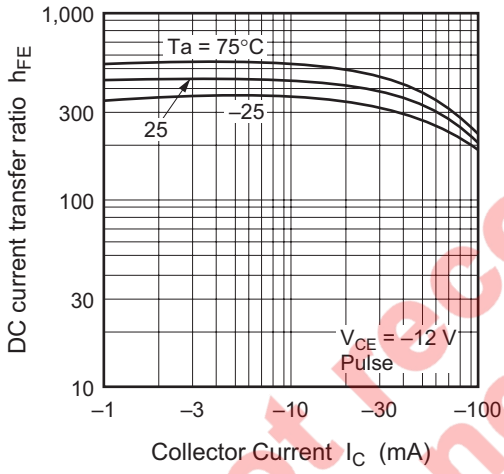
Emitter Cutoff Current vs.
Emitter to Base Voltage



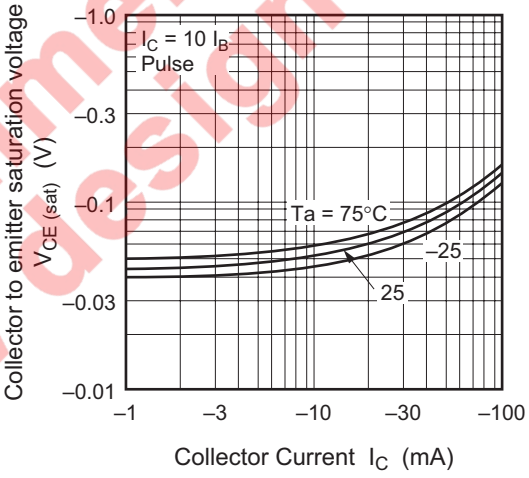

Collector to Emitter Breakdown Voltage vs.
Base to Emitter Resistance



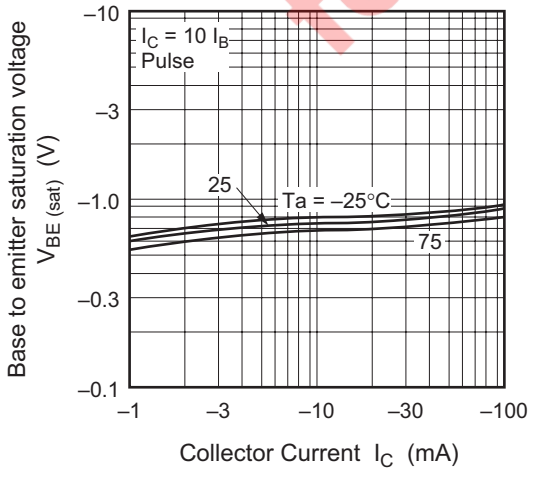

DC Current Transfer Ratio vs.
Collector Current



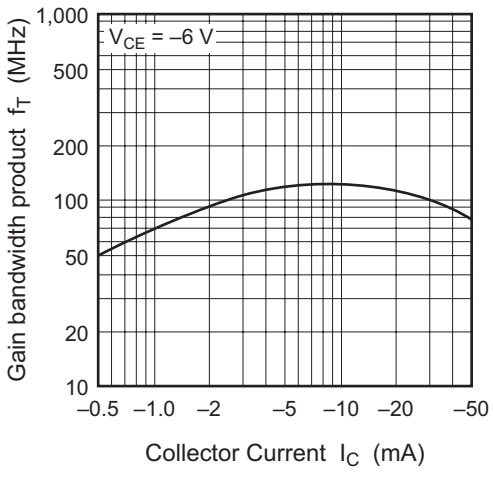

Collector to Emitter Saturation Voltage vs.
Collector Current



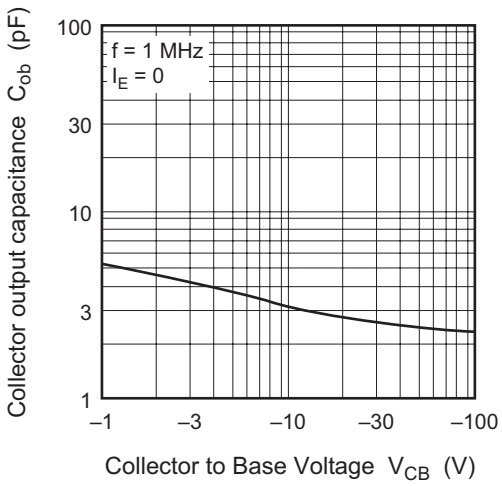

Base to Emitter Saturation Voltage vs.
Collector Current



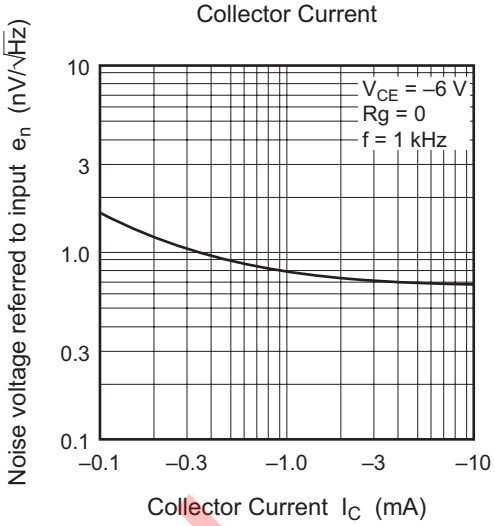

Gain Bandwidth Product vs.
Collector Current



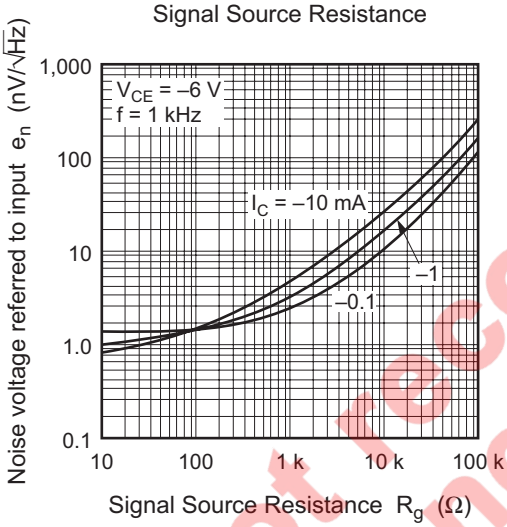
Collector Output Capacitance vs. Collector to Base Voltage



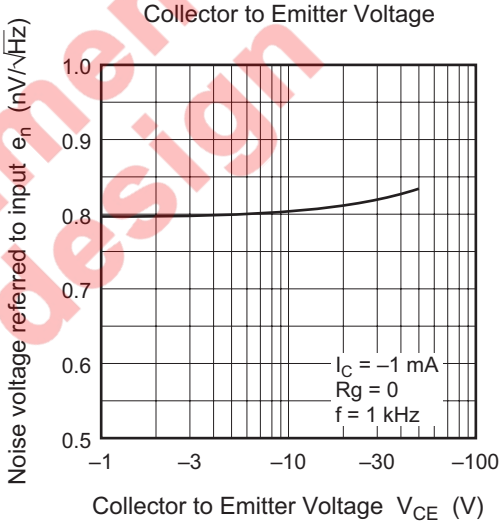

Noise Voltage referred to Input vs. Collector Current



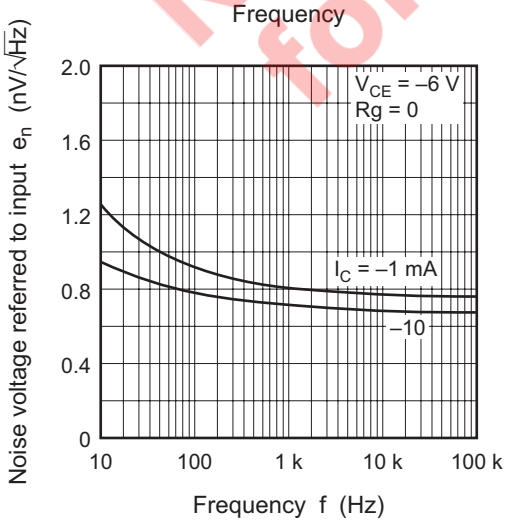

Noise Voltage referred to Input vs. Signal Source Resistance




Noise Voltage referred to Input vs. Collector to Emitter Voltage



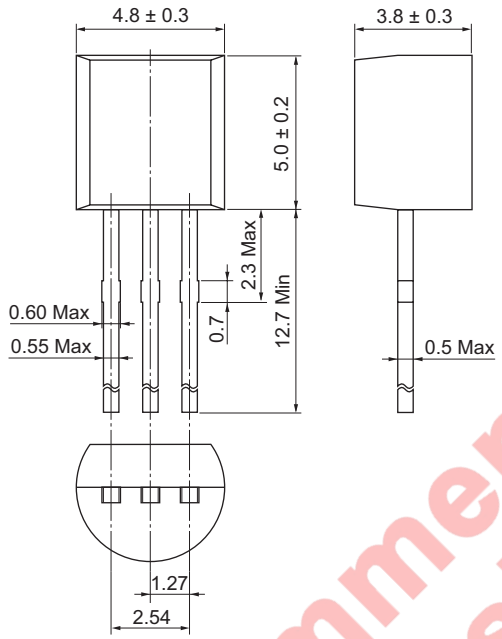

Noise Voltage referred to Input vs. Frequency



## Package Dimensions

| JEITA Package Code | RENESAS Code | Package Name | MASS[Typ.] |
|---|---|---|---|
| SC-43A | PRSS0003DA-A | TO-92(1) / TO-92(1)V | 0.25g |

Unit: mm






## Ordering Information

| Part Name | Quantity | Shipping Container |
|---|---|---|
| 2SA1190DTZ-E<br>2SA1190ETZ-E | 2500 | Hold Box, Radial Taping |

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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http://www.renesas.com

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