

---

# 2SA1188, 2SA1189

Silicon PNP Epitaxial

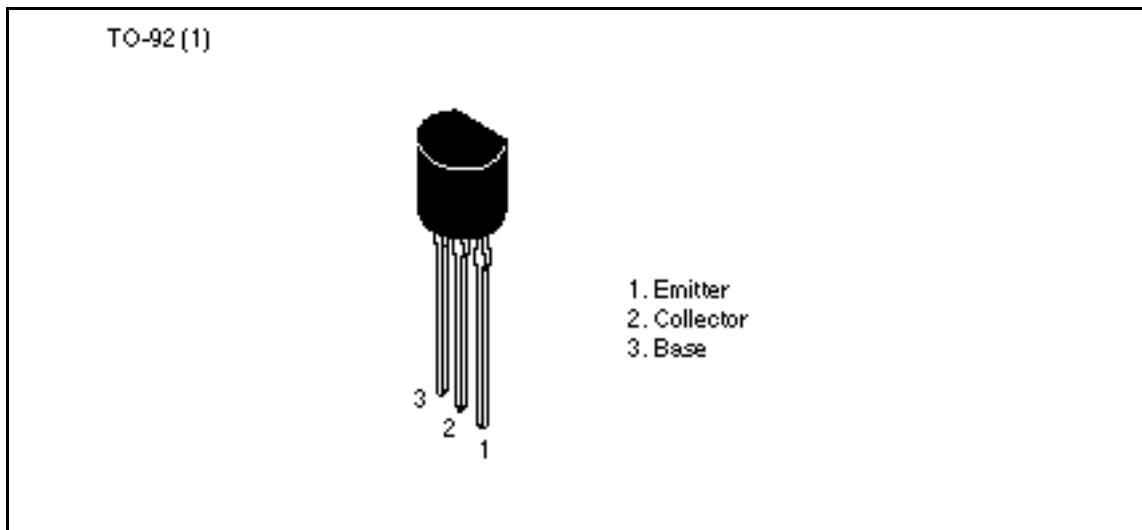
# HITACHI

---

## Application

- Low frequency amplifier
- Complementary pair with 2SC2853 and 2SC2854

## Outline



## 2SA1188, 2SA1189

### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	2SA1188	2SA1189	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	$T_j$	150	150	°C
Storage temperature	$T_{stg}$	-55 to +150	-55 to +150	°C

### Electrical Characteristics (Ta = 25°C)

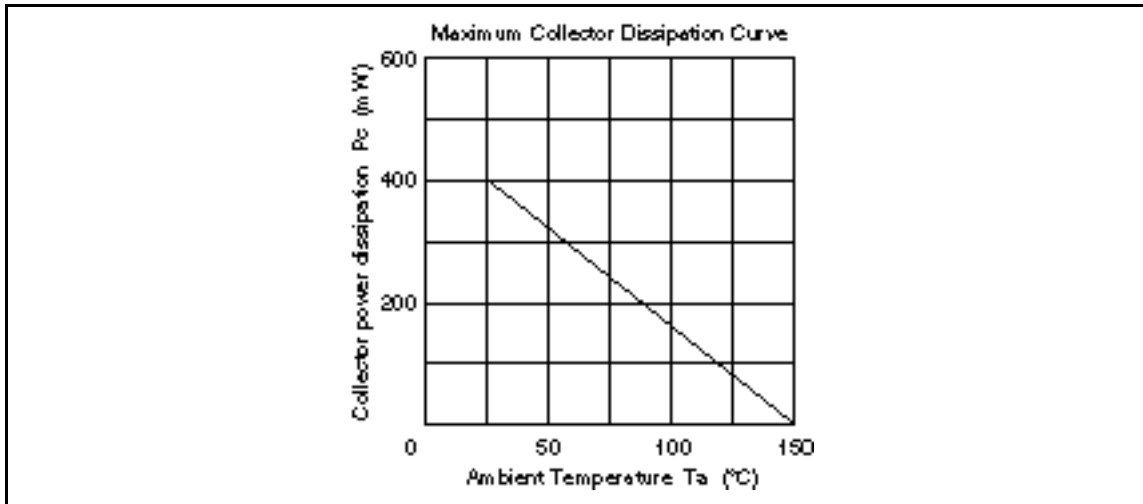
Item	Symbol	2SA1188			2SA1189			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	-90	—	—	-120	—	—	V	$I_C = -10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	-90	—	—	-120	—	—	V	$I_C = -1 \text{ mA}, R_{BE} =$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	-5	—	—	-5	—	—	V	$I_E = -10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	-0.1	—	—	-0.1	$\mu A$	$V_{CB} = -70 \text{ V}, I_E = 0$
Emitter cutoff current	$I_{EBO}$	—	—	-0.1	—	—	-0.1	$\mu A$	$V_{EB} = -2 \text{ V}, I_C = 0$
DC current transfer ratio	$h_{FE}^{*1}$	250	—	800	250	—	800		$V_{CE} = -12 \text{ V},$ $I_C = -2 \text{ mA}^{*2}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	-0.05	-0.15	—	-0.05	-0.15	V	$I_C = -10 \text{ mA},$ $I_B = -1 \text{ mA}^{*2}$
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	$V_{CE} = -6 \text{ V},$ $I_C = -10 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	3.2	—	—	3.2	—	pF	$V_{CB} = -10 \text{ V}, I_E = 0,$ $f = 1 \text{ MHz}$

Notes: 1. The 2SA1188 and 2SA1189 are grouped by  $h_{FE}$  as follows.

2. Pulse test

D	E
250 to 500	400 to 800

See characteristic curves of 2SA1190 and 2SA1191.



---

## 2SA1188, 2SA1189

---

When using this document, keep the following in mind:

1. This document may, wholly or partially, be subject to change without notice.
2. All rights are reserved: No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without Hitachi's permission.
3. Hitachi will not be held responsible for any damage to the user that may result from accidents or any other reasons during operation of the user's unit according to this document.
4. Circuitry and other examples described herein are meant merely to indicate the characteristics and performance of Hitachi's semiconductor products. Hitachi assumes no responsibility for any intellectual property claims or other problems that may result from applications based on the examples described herein.
5. No license is granted by implication or otherwise under any patents or other rights of any third party or Hitachi, Ltd.
6. **MEDICAL APPLICATIONS:** Hitachi's products are not authorized for use in **MEDICAL APPLICATIONS** without the written consent of the appropriate officer of Hitachi's sales company. Such use includes, but is not limited to, use in life support systems. Buyers of Hitachi's products are requested to notify the relevant Hitachi sales offices when planning to use the products in **MEDICAL APPLICATIONS**.

---

# HITACHI

## Hitachi, Ltd.

Semiconductor & IC Div.

Nippon Bldg., 2-5-2, Ohite-machi, Chiyoda-ku, Tokyo 100, Japan

Tel Tokyo (03) 3270-2111

Fax (03) 3270-5109

For further information write to:

Hitachi America, Ltd.

Semiconductor & IC Div.

2000 Sierra Point Parkway

Folsom, CA 94005-4835

U.S.A.

Tel 415-589-8300

Fax 415-589-4207

Hitachi Europe GmbH

Electronic Components Group

Continental Europe

Darnecker Straße 3

D-85622 Feldkirchen

München

Tel 089-9 91 80-0

Fax 089-9 29 30 00

Hitachi Europe Ltd.

Electronic Components Div.

Northern Europe Headquarters

Whitebrook Park

Lower Cookham Road

High Wycombe

Berkshire SL6 6YU

United Kingdom

Tel 0628-885000

Fax 0628-778322

Hitachi Asia Pte. Ltd.

45 Collyer Quay #20-00

Hitachi Tower

Singapore 0104

Tel 535-2100

Fax 535-1533

Hitachi Asia (Hong Kong) Ltd.

Unit 705, North Tower,

World Finance Centre

Harbour City, Canton Road

Tsim Sha Tsui, Kowloon

Hong Kong

Tel 27359218

Fax 27308074

**HITACHI**