

# BIPMIC<sup>®</sup> – Cascadable Silicon Bipolar Amplifier

Electrostatic sensitive device.  
Observe precautions for handling.



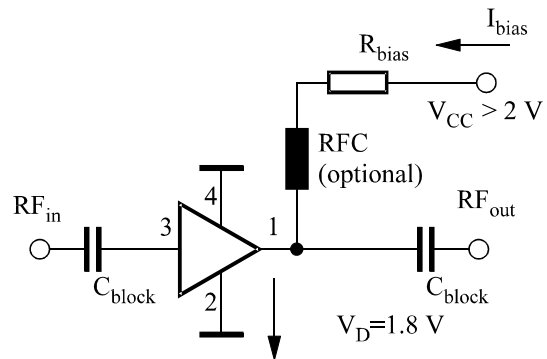
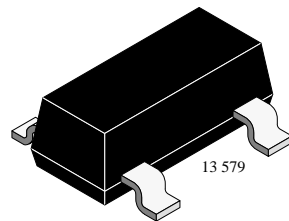
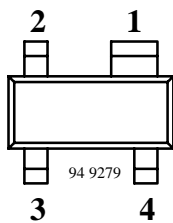
## Applications

General purpose for narrow and broad band IF and RF amplifiers in commercial and industrial applications with low power consumption. This allows to build am-

plifiers with minimal external circuitry, thus providing a simple, cost effective way to achieve low level amplification, for example in cordless phones.

## Features

- Broadband amplification
- Low operating voltage (3 V)
- Low operating current
- High gain (8.5 dB @900 MHz and 50 Ω)
- Low cost surface mount plastic package
- Few external components



$$R_{\text{bias}} = (V_{\text{CC}} - 1.8 \text{ V}) / I_{\text{bias}} \quad 13294$$

Typical biasing configuration

S860T Marking: 860

Plastic case (SOT 143)

1 = RF-output, 2 = Ground,

3 = RF-input, 4 = Ground

## Absolute Maximum Ratings

$T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                 | Test Conditions                         | Symbol            | Value       | Unit             |
|---------------------------|-----------------------------------------|-------------------|-------------|------------------|
| Device current            |                                         | $I_{\text{bias}}$ | 4           | mA               |
| RF input power            |                                         | $P_{\text{in}}$   | 0           | dBm              |
| Total power dissipation   | $T_{\text{amb}} \leq 146^\circ\text{C}$ | $P_{\text{tot}}$  | 8           | mW               |
| Junction temperature      |                                         | $T_j$             | 150         | $^\circ\text{C}$ |
| Storage temperature range |                                         | $T_{\text{stg}}$  | -65 to +150 | $^\circ\text{C}$ |

## Maximum Thermal Resistance

$T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified

| Parameter        | Test Conditions                                                                  | Symbol            | Value | Unit |
|------------------|----------------------------------------------------------------------------------|-------------------|-------|------|
| Junction ambient | on glass fibre printed board (25 x 20 x 1.5) mm <sup>3</sup> plated with 35μm Cu | $R_{\text{thJA}}$ | 450   | K/W  |

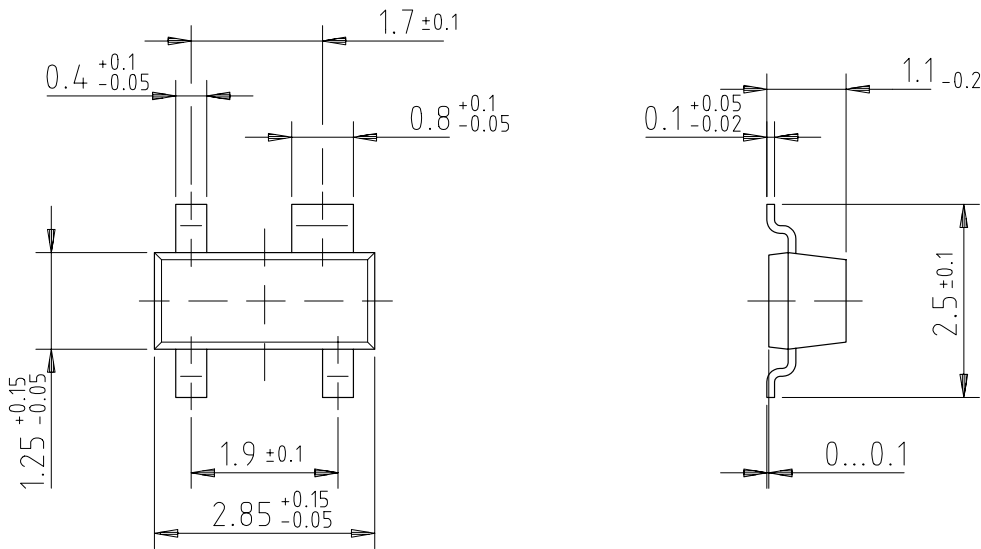
**Electrical AC Characteristics** $I_{\text{bias}} = 3 \text{ mA}$ ,  $Z_0 = 50 \Omega$ ,  $T_{\text{amb}} = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                  | Test Conditions                 | Symbol           | Min | Typ | Max | Unit |
|----------------------------|---------------------------------|------------------|-----|-----|-----|------|
| Power gain                 | f = 900 MHz                     | $G_p$            | 6   | 8.5 |     | dB   |
|                            | f = 1.9 GHz                     | $G_p$            | 5   | 7.5 |     | dB   |
| 3 dB bandwidth             |                                 | $f_{3\text{dB}}$ |     | 2.5 |     | GHz  |
| Noise figure               | f = 900 MHz                     | F                |     | 5.5 |     | dB   |
|                            | f = 1.9 GHz                     | F                |     | 6.5 |     | dB   |
| Intermodulation distortion | 7 mV input voltage, f = 900 MHz | $IM_3$           |     | 40  |     | dB   |
|                            | 7 mV input voltage, f = 1.9 GHz | $IM_3$           |     | 45  |     | dB   |
| Device voltage             |                                 | $V_d$            |     | 1.8 |     | V    |

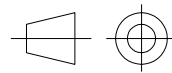
**Common Emitter S-Parameters** $V_{CC} = 2.4 \text{ V}$  ,  $R_{bias} = 200 \ \Omega$  ,  $Z_0 = 50 \ \Omega$  ,  $T_{amb} = 25^\circ\text{C}$  , unless otherwise specified

| f/MHz | S11     |       | S21     |       | S12     |      | S22     |       |
|-------|---------|-------|---------|-------|---------|------|---------|-------|
|       | LOG MAG | ANG   | LOG MAG | ANG   | LOG MAG | ANG  | LOG MAG | ANG   |
|       | dB      | deg   | dB      | deg   | dB      | deg  | dB      | deg   |
| 100   | -2.28   | -2.7  | 7.78    | 174.9 | -20.37  | 19.2 | -2.06   | -11.3 |
| 200   | -2.34   | -5.4  | 7.72    | 170.2 | -20.00  | 15.3 | -2.54   | -10.6 |
| 300   | -2.40   | -8.1  | 7.69    | 165.6 | -19.49  | 16.1 | -2.86   | -12.4 |
| 400   | -2.46   | -10.3 | 7.64    | 160.4 | -19.28  | 18.9 | -2.88   | -14.5 |
| 500   | -2.57   | -13.0 | 7.63    | 155.7 | -18.93  | 22.0 | -2.84   | -17.6 |
| 600   | -2.66   | -15.5 | 7.59    | 150.7 | -18.39  | 25.4 | -2.84   | -21.4 |
| 700   | -2.71   | -17.7 | 7.49    | 146.6 | -17.63  | 27.0 | -3.01   | -25.7 |
| 800   | -2.75   | -20.2 | 7.41    | 141.9 | -16.93  | 27.1 | -3.40   | -29.7 |
| 900   | -2.85   | -22.5 | 7.38    | 137.2 | -17.21  | 26.0 | -3.45   | -26.4 |
| 1000  | -2.93   | -24.9 | 7.33    | 132.9 | -16.42  | 27.6 | -3.62   | -32.3 |
| 1100  | -3.05   | -27.1 | 7.24    | 128.6 | -15.89  | 29.2 | -3.55   | -36.3 |
| 1200  | -3.18   | -29.7 | 7.10    | 124.4 | -15.36  | 29.2 | -3.67   | -39.9 |
| 1300  | -3.28   | -32.6 | 7.08    | 120.1 | -14.63  | 30.4 | -3.53   | -45.5 |
| 1400  | -3.37   | -35.0 | 7.03    | 116.4 | -14.18  | 27.5 | -4.22   | -49.1 |
| 1500  | -3.54   | -37.4 | 6.87    | 112.1 | -13.88  | 26.0 | -4.62   | -51.5 |
| 1600  | -3.63   | -40.4 | 6.91    | 108.2 | -13.64  | 24.4 | -5.03   | -53.6 |
| 1700  | -3.75   | -43.1 | 6.82    | 104.5 | -13.36  | 23.4 | -5.24   | -55.4 |
| 1800  | -3.90   | -46.1 | 6.76    | 100.8 | -13.03  | 23.0 | -5.26   | -58.0 |
| 1900  | -4.10   | -49.0 | 6.78    | 96.5  | -12.66  | 22.3 | -5.40   | -61.9 |
| 2000  | -4.24   | -52.2 | 6.73    | 93.0  | -12.35  | 20.6 | -5.75   | -65.3 |
| 2100  | -4.35   | -55.7 | 6.65    | 89.1  | -12.14  | 19.0 | -6.09   | -67.7 |
| 2200  | -4.54   | -59.1 | 6.64    | 85.4  | -11.98  | 17.7 | -6.34   | -69.9 |
| 2300  | -4.81   | -62.2 | 6.46    | 81.8  | -11.79  | 17.1 | -6.40   | -72.0 |
| 2400  | -4.75   | -65.7 | 6.61    | 78.5  | -11.35  | 16.6 | -6.31   | -76.7 |
| 2400  | -5.02   | -72.4 | 6.74    | 74.4  | -10.86  | 13.3 | -6.69   | -82.9 |
| 2600  | -5.61   | -75.7 | 6.61    | 69.5  | -10.64  | 10.7 | -7.13   | -87.0 |
| 2700  | -6.05   | -80.4 | 6.54    | 65.3  | -10.54  | 8.6  | -7.60   | -89.9 |
| 2800  | -6.50   | -84.4 | 6.56    | 61.8  | -10.48  | 6.3  | -8.10   | -92.8 |
| 2900  | -7.02   | -89.6 | 6.33    | 57.3  | -10.42  | 3.9  | -8.60   | -96.0 |
| 3000  | -7.45   | -94.6 | 6.31    | 53.0  | -10.38  | 1.8  | -9.11   | -99.0 |

### Dimensions of S860T in mm



96 12240



technical drawings  
according to DIN  
specifications



## Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay-Telefunken products for any unintended or unauthorized application, the buyer shall indemnify Vishay-Telefunken against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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