

## Silicon NPN Planar RF Transistor

Electrostatic sensitive device.  
Observe precautions for handling.

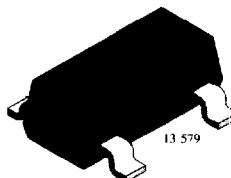
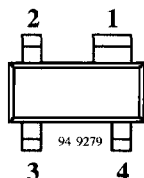


### Applications

For low-noise and high-gain broadband amplifiers at collector currents from 2 mA to 30 mA.

### Features

- Low power applications
- Low noise figure
- High transition frequency



Marking: 83 P

Plastic case (SOT 143)

1 = Collector; 2 = Emitter; 3 = Base; 4 = Emitter

### Absolute Maximum Ratings

| Parameters                                              | Symbol    | Value       | Unit             |
|---------------------------------------------------------|-----------|-------------|------------------|
| Collector-base voltage                                  | $V_{CBO}$ | 15          | V                |
| Collector-emitter voltage                               | $V_{CEO}$ | 10          | V                |
| Emitter-base voltage                                    | $V_{EBO}$ | 2           | V                |
| Collector current                                       | $I_C$     | 65          | mA               |
| Total power dissipation $T_{amb} \leq 60^\circ\text{C}$ | $P_{tot}$ | 200         | mW               |
| Junction temperature                                    | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature range                               | $T_{stg}$ | -65 to +150 | $^\circ\text{C}$ |

### Maximum Thermal Resistance

| Parameters                                                                                                       | Symbol     | Maximum | Unit |
|------------------------------------------------------------------------------------------------------------------|------------|---------|------|
| Junction ambient on glass fibre printed board<br>(25 x 20 x 1.5) mm <sup>3</sup> plated with 35 $\mu\text{m}$ Cu | $R_{thJA}$ | 450     | K/W  |

## Electrical DC Characteristics

$T_{amb} = 25^{\circ}\text{C}$

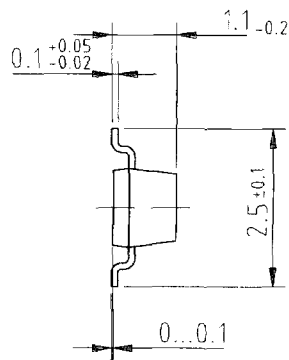
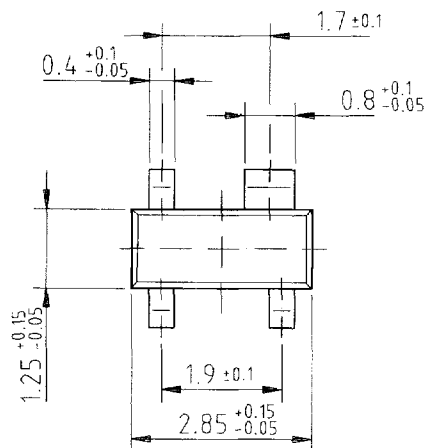
| Parameters / Test Conditions                                                                                               | Symbol               | Min.     | Typ.      | Max. | Unit          |
|----------------------------------------------------------------------------------------------------------------------------|----------------------|----------|-----------|------|---------------|
| Collector emitter cut-off current<br>$V_{CE} = 15\text{ V}, V_{BE} = 0$                                                    | $I_{CES}$            |          |           | 100  | $\mu\text{A}$ |
| Collector-base cut-off current<br>$V_{CB} = 10\text{ V}, I_E = 0$                                                          | $I_{CBO}$            |          |           | 100  | nA            |
| Emitter-base cut-off current<br>$V_{EB} = 1\text{ V}, I_C = 0$                                                             | $I_{EBO}$            |          |           | 1    | $\mu\text{A}$ |
| Collector-emitter breakdown voltage<br>$I_C = 1\text{ mA}, I_B = 0$                                                        | $V_{(BR)CEO}$        | 10       |           |      | V             |
| Collector-emitter saturation voltage<br>$I_C = 30\text{ mA}, I_B = 3\text{ mA}$                                            | $V_{CEsat}$          |          | 0.1       | 0.4  | V             |
| DC forward current transfer ratio<br>$V_{CE} = 6\text{ V}, I_C = 5\text{ mA}$<br>$V_{CE} = 8\text{ V}, I_C = 20\text{ mA}$ | $h_{FE}$<br>$h_{FE}$ | 50<br>50 | 90<br>110 | 150  |               |

## Electrical AC Characteristics

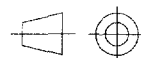
$T_{amb} = 25^{\circ}\text{C}$

| Parameters / Test Conditions                                                                                                                                                        | Symbol               | Min. | Typ.              | Max. | Unit           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|-------------------|------|----------------|
| Transition frequency<br>$V_{CE} = 8\text{ V}, I_C = 15\text{ mA}, f = 500\text{ MHz}$<br>$V_{CE} = 8\text{ V}, I_C = 30\text{ mA}, f = 500\text{ MHz}$                              | $f_T$<br>$f_T$       |      | 7.2<br>7.4        |      | GHz<br>GHz     |
| Collector-base capacitance<br>$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$                                                                                                              | $C_{cb}$             |      | 0.4               |      | pF             |
| Collector-emitter capacitance<br>$V_{CE} = 8\text{ V}, f = 1\text{ MHz}$                                                                                                            | $C_{ce}$             |      | 0.3               |      | pF             |
| Emitter-base capacitance<br>$V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$                                                                                                               | $C_{eb}$             |      | 0.9               |      | pF             |
| Noise figure<br>$V_{CE} = 6\text{ V}, I_C = 5\text{ mA},$<br>$f = 10\text{ MHz}, Z_S = 75\ \Omega$<br>$f = 900\text{ MHz}, Z_S = Z_{Sopt}$<br>$f = 1.75\text{ GHz}, Z_S = Z_{Sopt}$ | $F$<br>$F$<br>$F$    |      | 0.9<br>1.2<br>1.8 |      | dB<br>dB<br>dB |
| Power gain<br>$V_{CE} = 8\text{ V}, I_C = 30\text{ mA}, Z_S = 50\ \Omega, Z_L = Z_{Lopt}$<br>$f = 900\text{ MHz}$<br>$f = 1.75\text{ GHz}$                                          | $G_{pe}$<br>$G_{pe}$ |      | 17<br>12          |      | dB<br>dB       |
| Transducer gain<br>$V_{CE} = 8\text{ V}, I_C = 30\text{ mA}, f = 900\text{ MHz}, Z_0 = 50\ \Omega$                                                                                  | $ S_{21e} ^2$        |      | 15.5              |      | dB             |

## Dimensions in mm



96 12240



technical drawings  
according to DIN  
specifications