

BFP720

SiGe:C Heterojunction Wideband RF Bipolar Transistor

Data Sheet

Revision 1.0, 2009-01-20

Edition 2009-01-20

**Published by
Infineon Technologies AG
81726 Munich, Germany**

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BFP720 SiGe:C Heterojunction Wideband RF Bipolar Transistor

Revision History: 2009-01-20, Revision 1.0

Previous Revision:

| Page | Subjects (major changes since last revision) |
|------|---|
| | Converted to the new IFX Template. |
| | Business Unit, Infineon Logo and the Trademarks were changed. |
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Last Trademarks Update 2009-10-19

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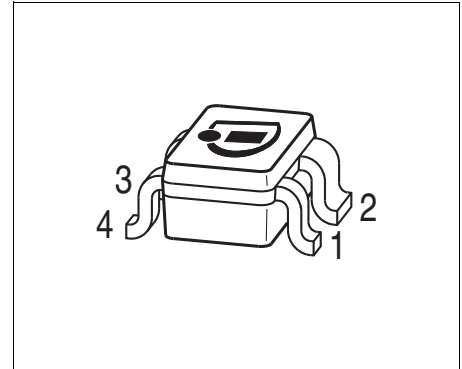
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1 Features

Main features:

- High performance general purpose wideband LNA transistor
- 150 GHz f_T -Silicon Germanium Carbon technology
- Enables Best-In-Class performance for wireless applications due to high dynamic range
- Transistor geometry optimized for low-current applications
- Operation voltage: 1.0 V to 4.0 V
- Very high gain at high frequencies and low current consumption
- 26 dB maximum stable gain at 1.9 GHz and only 13 mA
- 15 dB maximum available gain at 10 GHz and only 13 mA
- Ultra low noise figure from latest SiGe:C technology
- 0.7 dB minimum noise figure at 5.5 GHz and 0.95 dB at 10 GHz
- High linearity OP1dB = +8.5 dBm and OIP3 = +23 dBm at 5.5 GHz and low current consumption of 13 mA
- Pb-free (RoHS compliant) package



Application

FM Radio, Mobile TV, RKE, AMR, Cellular, ZigBee, GPS, WiMAX, SDARs, Bluetooth, WiFi, Cordless phone, UMTS, WLAN, UWB, LNB

Attention: ESD (Electrostatic discharge) sensitive device, observe handling precautions

| Product Name | Package | Pin Configuration | | | | Marking |
|--------------|---------|-------------------|-------|-------|-------|---------|
| BFP720 | SOT343 | 1 = B | 2 = E | 3 = C | 4 = E | R9s |

2 Product Brief

The BFP720 is a wideband Silicon Germanium Carbon (SiGe:C) NPN Heterojunction Bipolar Transistor (HBT) in a plastic 4-pin dual emitter SOT343 package. The device combines very high gain with lowest noise figure at low operating current for use in a wide range of wireless applications. The BFP720 is especially well-suited for portable battery-powered applications in which reduced power consumption is a key requirement. Collector design supports operation voltages from 1.0 V to 4.0 V.

Table 1 Quick Reference DC Characteristics at $T_A = 25^\circ\text{C}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|-------------------------------------|---------------|--------|------|------|------|---|
| | | Min. | Typ. | Max. | | |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | 4 | 4.7 | – | V | $I_C = 1 \text{ mA}, I_B = 0 \text{ mA}$ |
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | 13 | 15 | – | V | $I_E = 0 \text{ mA}$ |
| Collector current | I_C | – | – | 25 | mA | |
| Total power dissipation | P_{tot} | – | – | 100 | mW | $T_S \leq 108^\circ\text{C}$ |
| DC current gain | h_{FE} | 160 | 250 | 400 | | $V_{CE} = 3 \text{ V}, I_C = 13 \text{ mA}$ |

Table 2 Quick Reference AC Characteristics at $T_A = 25^\circ\text{C}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|--|------------|--------|------|------|------|--|
| | | Min. | Typ. | Max. | | |
| Transition frequency | f_T | – | 45 | – | GHz | $V_{CE} = 3\text{ V}, I_C = 13\text{ mA}$ |
| $f = 2.4\text{ GHz}$ | | | | | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 22 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 25 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | |
| Low Noise Operation Point | S_{21} | | 20.5 | | | $Z_S = Z_L = 50\ \Omega$ $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 23 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | |
| Minimum Noise Figure | NF_{min} | | 0.5 | | | $Z_S = Z_{opt}$ $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 21.5 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | |
| 1 dB Gain Compression Point | OP_{1dB} | | 6 | | | $Z_S = Z_L = 50\ \Omega$ $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 22 | | | $I_C = 13\text{ mA}$ |
| $f = 5.5\text{ GHz}$ | | | | | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 19 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ma} | | 19.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | |
| Low Noise Operation Point | S_{21} | | 15 | | | $Z_S = Z_L = 50\ \Omega$ $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 16 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | |
| Minimum Noise Figure | NF_{min} | | 0.7 | | | $Z_S = Z_{opt}$ $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 15 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | |
| 1 dB Gain Compression Point | OP_{1dB} | | 8.5 | | | $Z_S = Z_L = 50\ \Omega$ $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 23 | | | $I_C = 13\text{ mA}$ |

3 Maximum Ratings

Table 3 Maximum Ratings ($T_A = 25\text{ °C}$ unless otherwise specified)

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---|-----------|--------|------|------------|------|-----------------------|
| | | Min. | Typ. | Max. | | |
| Collector-emitter voltage $T_A = -55\text{ °C}$ | V_{CEO} | – | – | 4.0 3.5 | V | – |
| Collector-emitter voltage | V_{CES} | – | – | 13 | V | – |
| Collector-base voltage | V_{CBO} | – | – | 13 | V | – |
| Emitter-base voltage | V_{EBO} | – | – | 1.2 | V | – |
| Collector current | I_C | – | – | 25 | mA | – |
| Base current | I_B | – | – | 2 | mA | – |
| Total power dissipation ¹⁾ $T_S \leq 108\text{ °C}$ | P_{tot} | – | – | 100 | mW | – |
| Operation junction temperature | T_{JOp} | -55 | – | 150 | °C | – |
| Storage temperature | T_{Stg} | -55 | – | 150 | °C | – |

1) T_S measured on the emitter lead at the soldering point of the pcb

Note: Exceeding only one of the above maximum rating limits even for a short moment may cause permanent damage to the device. Even if the device continues to operate, its lifetime may be considerably shortened. Maximum ratings are stress ratings only and do not mean unaffected functional operation and lifetime at others than standard operation conditions.

4 Thermal Characteristics

Table 4 Thermal Resistance

| Parameter | Symbol | Value | Unit |
|--|------------|-------|------|
| Junction - soldering point ¹⁾ | R_{thJS} | 420 | K/W |

1)For calculation of R_{thJA} please refer to Application Note Thermal Resistance

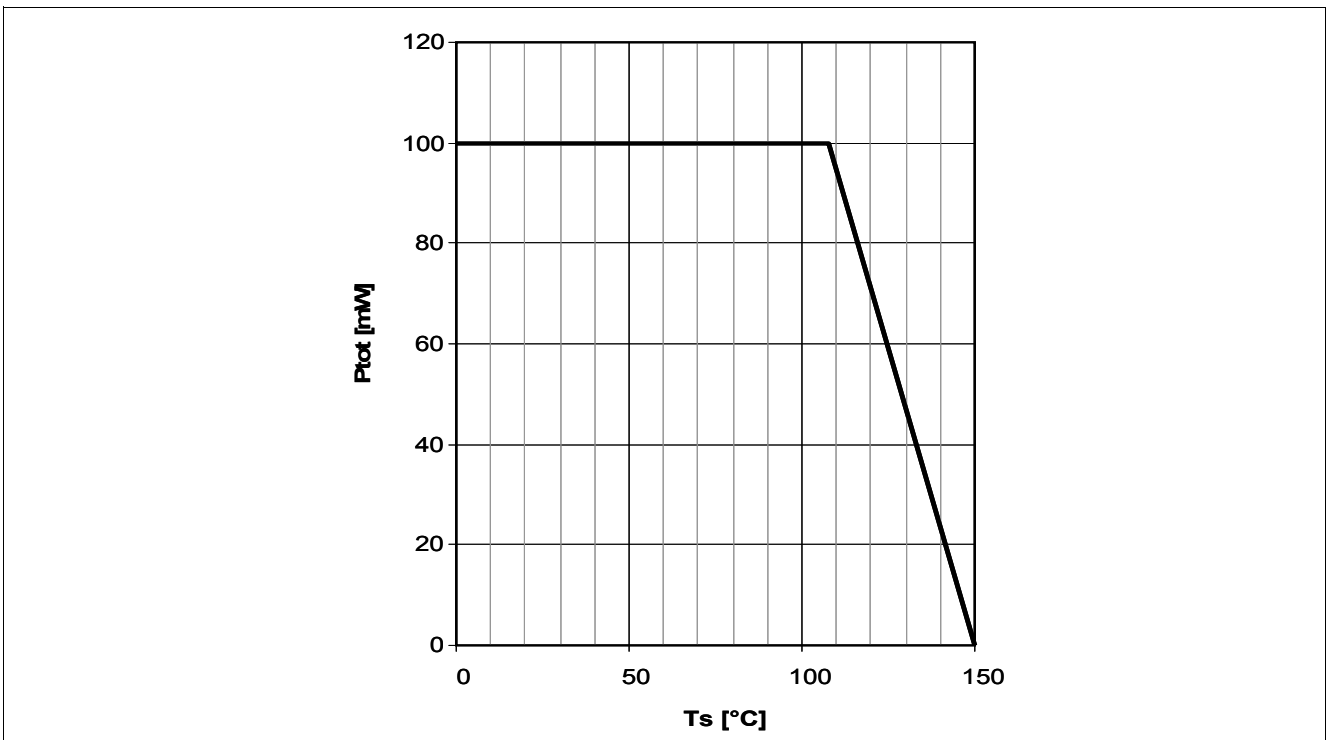


Figure 1 Total Power Dissipation $P_{tot} = f(T_s)$

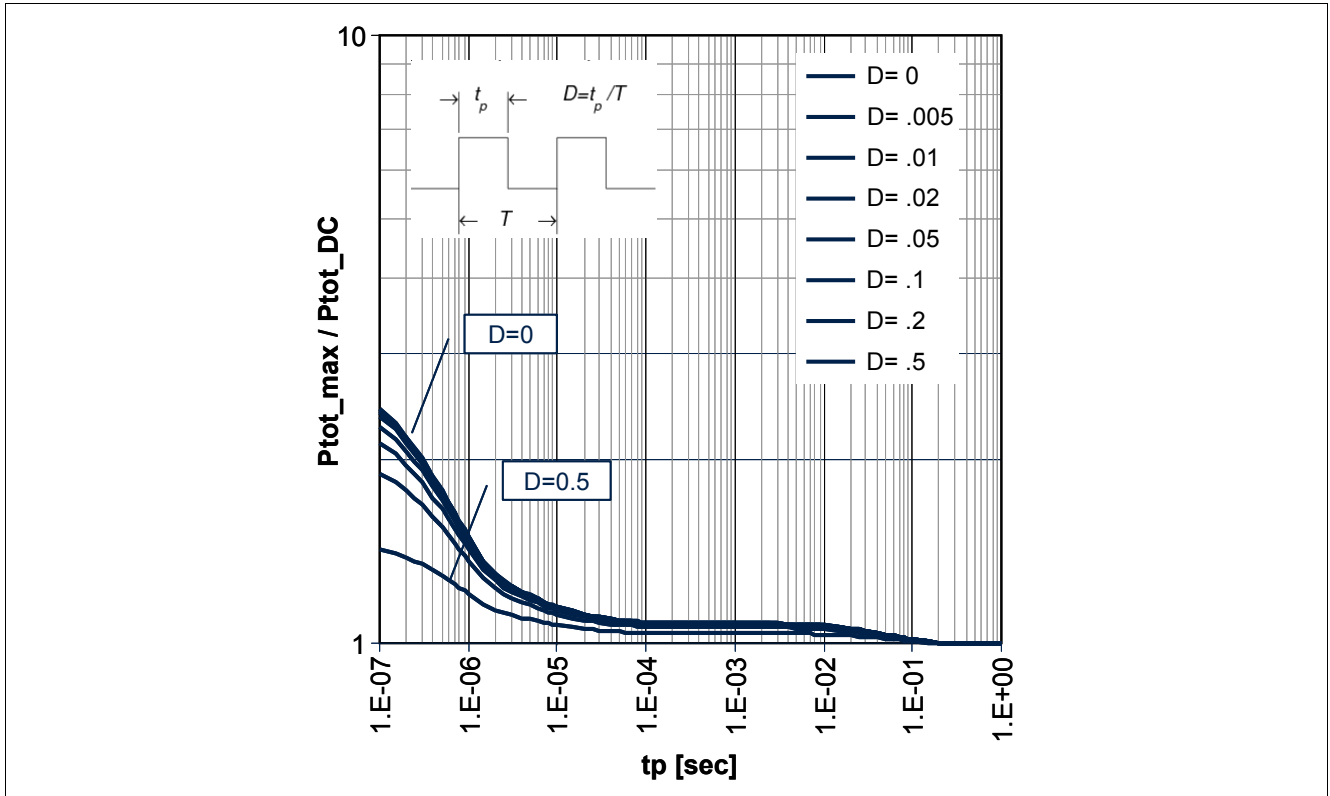


Figure 2 Permissible Pulse Load $P_{tot_max} / P_{tot_DC} = f(tp)$

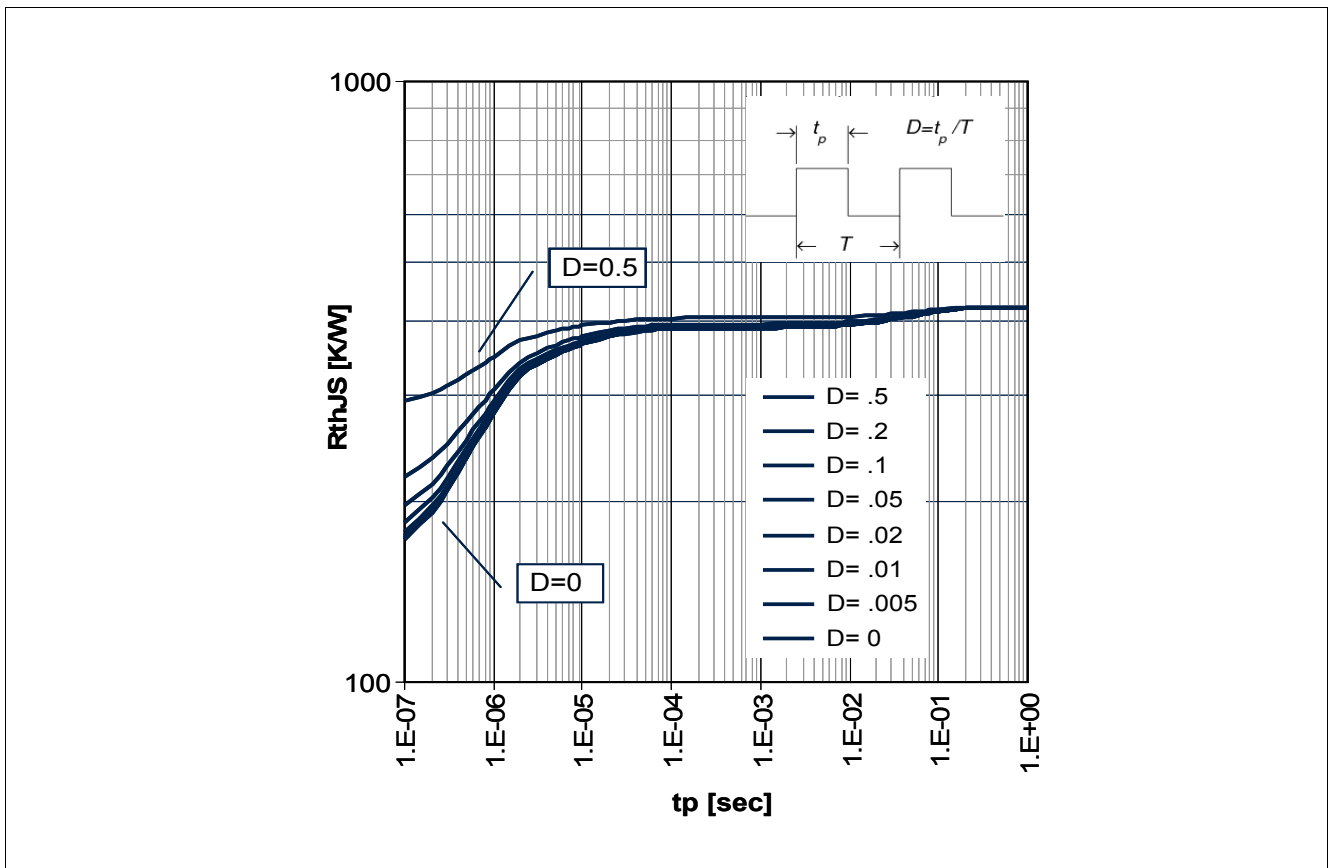


Figure 3 Permissible Pulse Load $R_{thJS} = f(tp)$

5 Electrical Characteristics

5.1 DC Characteristics

Table 5 DC Characteristics at $T_A = 25\text{ °C}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|-------------------------------------|---------------|--------|------|------|---------------|---|
| | | Min. | Typ. | Max. | | |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | 4 | 4.7 | – | V | $I_C = 1\text{ mA}, I_B = 0\text{ mA}$ |
| Collector-emitter cutoff current | I_{CES} | – | – | 30 | μA | $V_{CE} = 13\text{ V}, V_{BE} = 0\text{ V}$ |
| Collector-base cutoff current | I_{CBO} | – | – | 100 | nA | $V_{CB} = 5\text{ V}, I_E = 0\text{ mA}$ |
| Emitter-base cutoff current | I_{EBO} | – | – | 2 | μA | $V_{EB} = 0.5\text{ V}, I_C = 0\text{ mA}$ |
| DC current gain | h_{FE} | 160 | 250 | 400 | | $I_C = 13\text{ mA}, V_{CE} = 3\text{ V}$ pulse measured |

5.2 General AC Characteristics

Table 6 AC Characteristics at $T_A = 25\text{ °C}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|-------------------------------|----------|--------|------|------|------|--|
| | | Min. | Typ. | Max. | | |
| Transition frequency | f_T | – | 45 | – | GHz | $I_C = 13\text{ mA}, V_{CE} = 3\text{ V}$ $f = 1\text{ GHz}$ |
| Collector-base capacitance | C_{cb} | – | 0.06 | – | pF | $V_{CB} = 3\text{ V}, V_{BE} = 0\text{ V}$ $f = 1\text{ MHz}$ emitter grounded |
| Collector-emitter capacitance | C_{ce} | – | 0.35 | – | pF | $V_{CE} = 3\text{ V}, V_{BE} = 0\text{ V}$ $f = 1\text{ MHz}$ base grounded |
| Emitter-base capacitance | C_{eb} | – | 0.35 | – | pF | $V_{EB} = 0.5\text{ V}, V_{CB} = 0\text{ V}$ $f = 1\text{ MHz}$ collector grounded |

5.3 Frequency Dependent AC Characteristics

Measurement setup is a testfixture with Bias T's in a 50 Ω system, $T_A = 25\text{ }^\circ\text{C}$

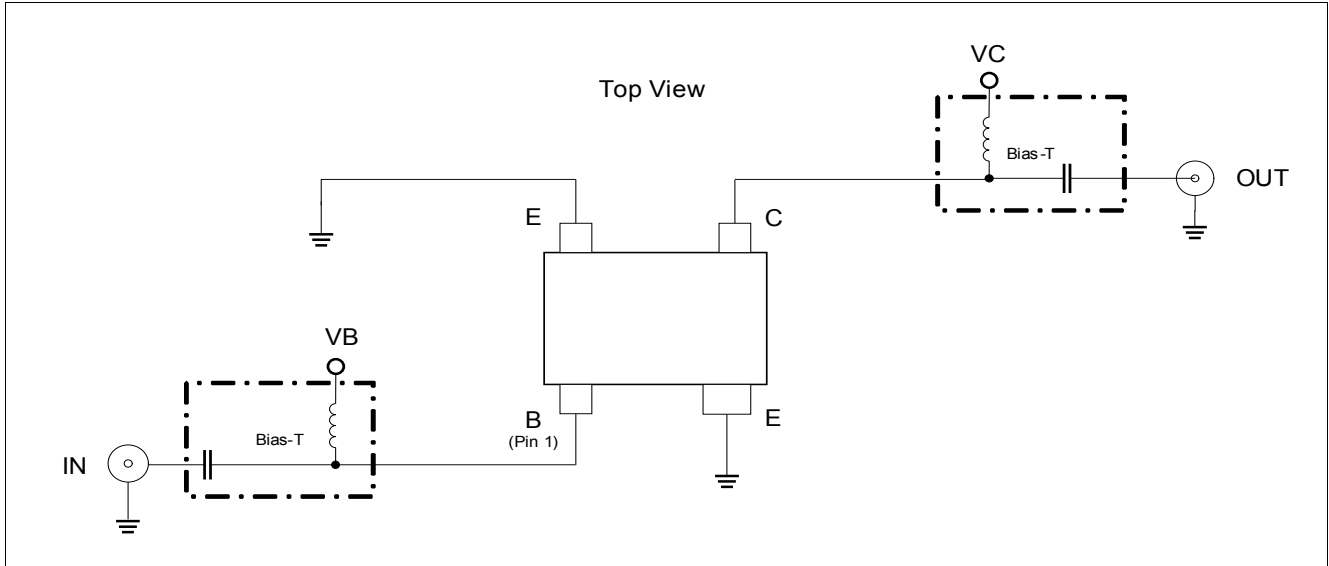


Figure 4 BFP720 Testing Circuit

Table 7 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 150\text{ MHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|--------------------------------|------------|--------|------|------|------|--|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | | | | | |
| Low Noise Operation Point | G_{ms} | – | 34 | – | dB | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 37.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | | | | | |
| Low Noise Operation Point | S_{21} | – | 23 | – | dB | $Z_S = Z_L = 50\ \Omega$ $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 29.5 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | | | | | |
| Minimum Noise Figure | NF_{min} | – | 0.4 | – | dB | $Z_S = Z_{opt}$ $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 28.5 | | | $I_C = 5\text{ mA}$ |
| Linearity | | | | | | |
| 1 dB Gain Compression Point | OP_{1dB} | – | 6 | – | dBm | $Z_S = Z_L = 50\ \Omega$ $I_C = 13\text{ mA}$ |
| 3rd Order Intercept Point | OIP_3 | | 22 | | | $I_C = 13\text{ mA}$ |

Table 8 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 450\text{ MHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 29 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 32.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 23 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 28.5 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.4 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 28 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 5.5 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 21.5 | | | $I_C = 13\text{ mA}$ |

 Table 9 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 900\text{ MHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 26.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 29.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 22.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 27.5 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.4 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 26 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 5.5 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 21 | | | $I_C = 13\text{ mA}$ |

Table 10 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 1500\text{ MHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 24 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 27.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 22 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 25.5 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.45 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 24 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 6 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 21.5 | | | $I_C = 13\text{ mA}$ |

 Table 11 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 1.9\text{ GHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 23 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 26 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 21.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 24.5 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.45 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 23 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 7 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 22 | | | $I_C = 13\text{ mA}$ |

Table 12 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 2.4\text{ GHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 22 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 25 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 20.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 23 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.5 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 21.5 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 6 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 22 | | | $I_C = 13\text{ mA}$ |

Table 13 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 3.5\text{ GHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 20.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ms} | | 23.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 18.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 20 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.55 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 19 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 7.5 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 22.5 | | | $I_C = 13\text{ mA}$ |

Table 14 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 5.5\text{ GHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ms} | | 19 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ma} | | 19.5 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 15 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 16 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.7 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 15 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 8.5 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 23 | | | $I_C = 13\text{ mA}$ |

 Table 15 AC Characteristics, $V_{CE} = 3\text{ V}$, $f = 10\text{ GHz}$

| Parameter | Symbol | Values | | | Unit | Note / Test Condition |
|---------------------------------------|------------|--------|------|------|------|--------------------------|
| | | Min. | Typ. | Max. | | |
| Maximum Power Gain | | – | | – | dB | |
| Low Noise Operation Point | G_{ma} | | 13.5 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | G_{ma} | | 15 | | | $I_C = 13\text{ mA}$ |
| Transducer Gain | | – | | – | dB | $Z_S = Z_L = 50\ \Omega$ |
| Low Noise Operation Point | S_{21} | | 9 | | | $I_C = 5\text{ mA}$ |
| High Linearity Operation Point | S_{21} | | 10 | | | $I_C = 13\text{ mA}$ |
| Minimum Noise Figure | | – | | – | dB | $Z_S = Z_{opt}$ |
| Minimum Noise Figure | NF_{min} | | 0.95 | | | $I_C = 5\text{ mA}$ |
| Associated Gain | G_{ass} | | 10.5 | | | $I_C = 5\text{ mA}$ |
| Linearity | | – | | – | dBm | $Z_S = Z_L = 50\ \Omega$ |
| 1 dB Gain Compression Point | OP_{1dB} | | 8 | | | $I_C = 13\text{ mA}$ |
| 3 rd Order Intercept Point | OIP_3 | | 19.5 | | | $I_C = 13\text{ mA}$ |

Notes

- $G_{ms} = |S_{21} / S_{12}|$ for $k < 1$; $G_{ma} = |S_{21} / S_{12}|(k - (k^2 - 1)^{1/2})$ for $k > 1$
- In order to get the NF_{min} values stated in this chapter the test fixture losses have been subtracted from all measured results

5.4 Characteristic Curves

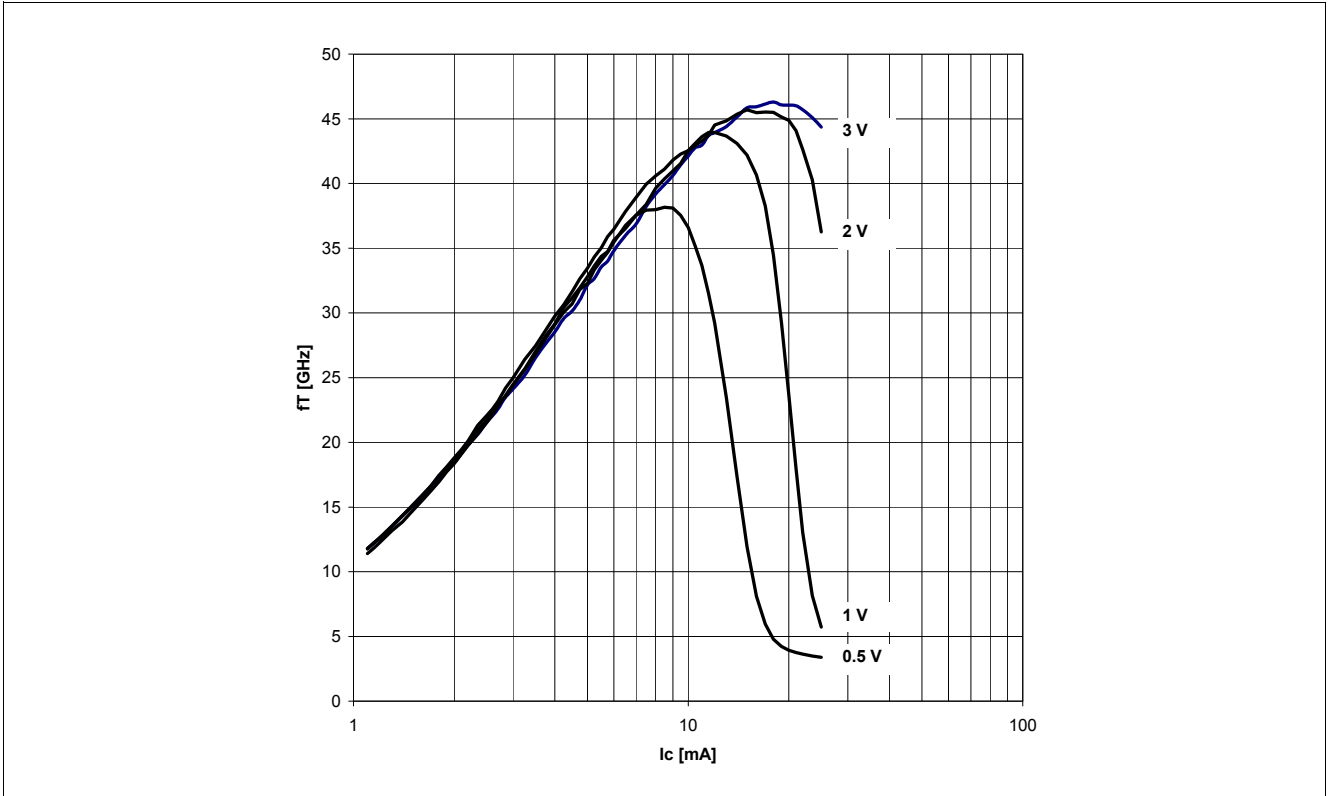


Figure 5 Transition Frequency $f_T = f(I_C, V_{CE})$ $f = 1 \text{ GHz}$, V_{CE} Parameter in V

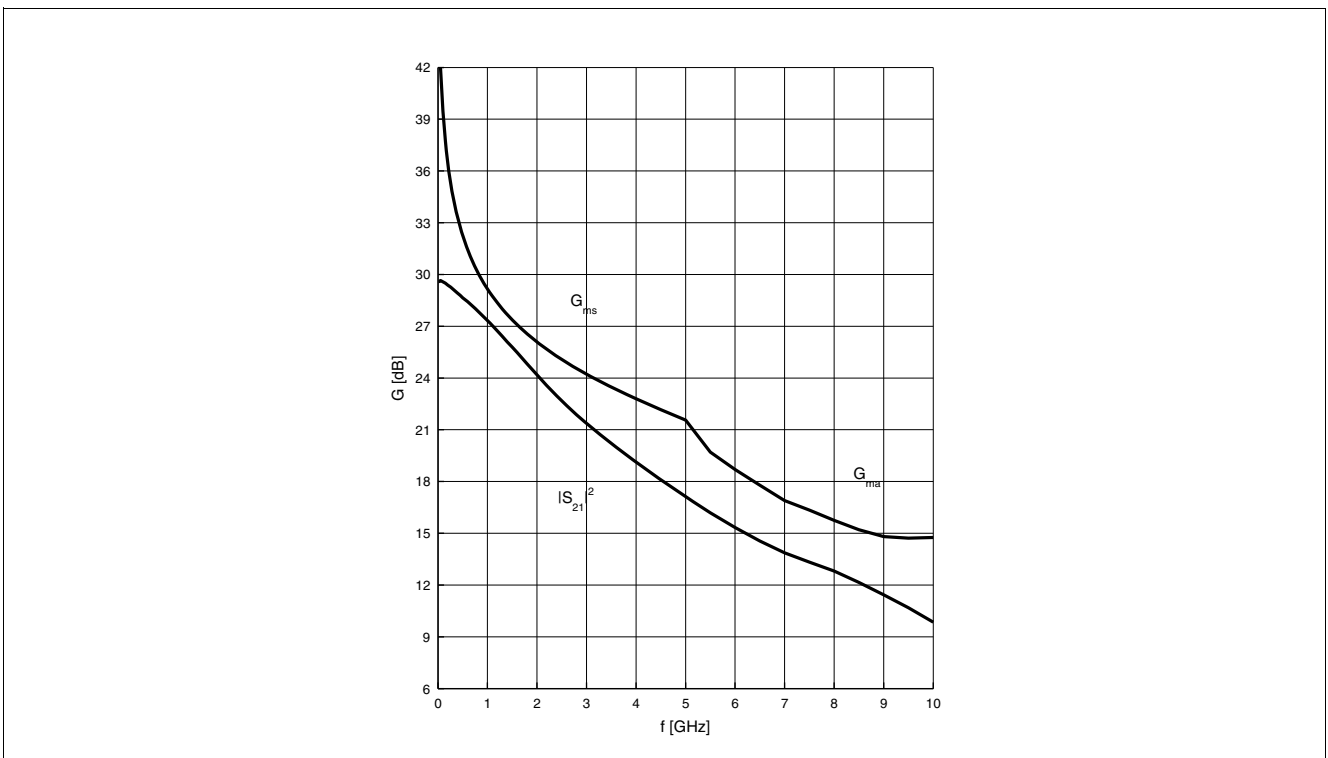


Figure 6 Power Gain G_{mat} , G_{ms} , $IS_{21}^2 = f(f)$ $V_{CE} = 3 \text{ V}$, $I_C = 13 \text{ mA}$

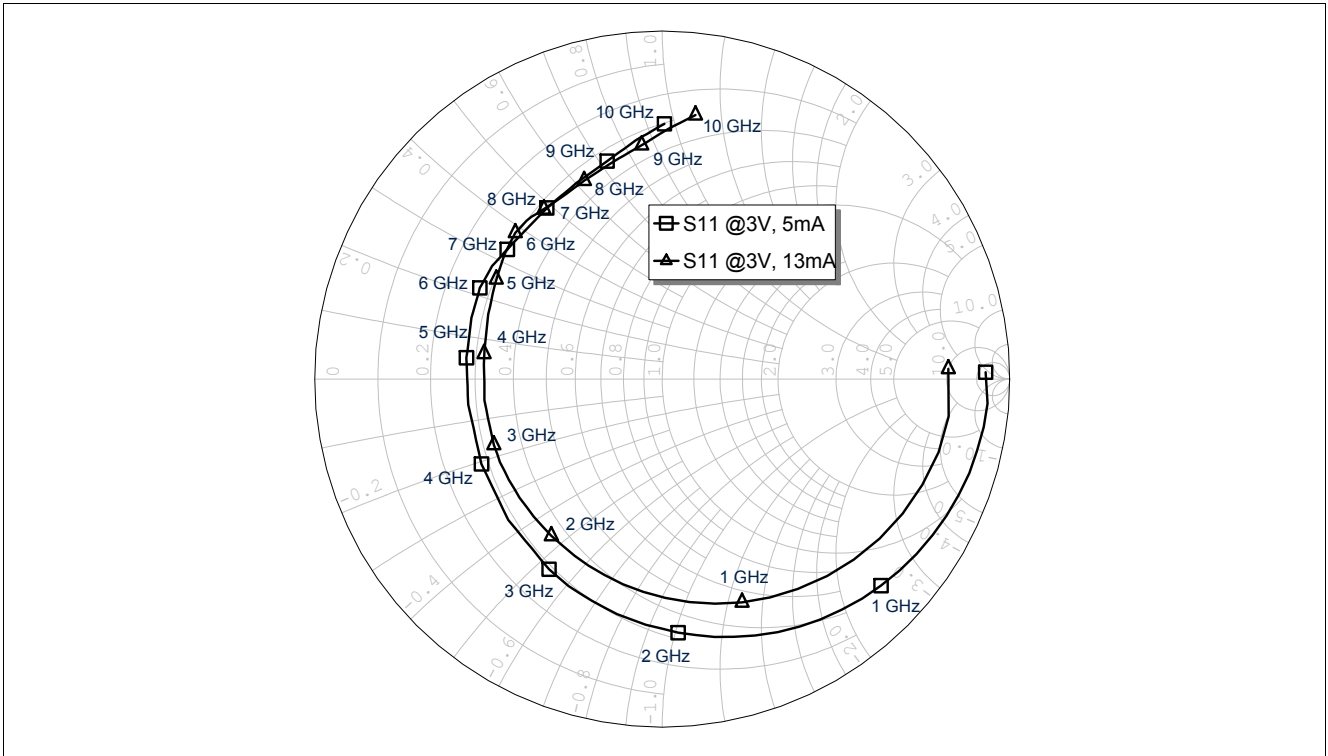


Figure 7 Input Matching S_{11} vs. Frequency $V_{CE} = 3\text{ V}$, $I_C = 5\text{ mA} / 13\text{ mA}$

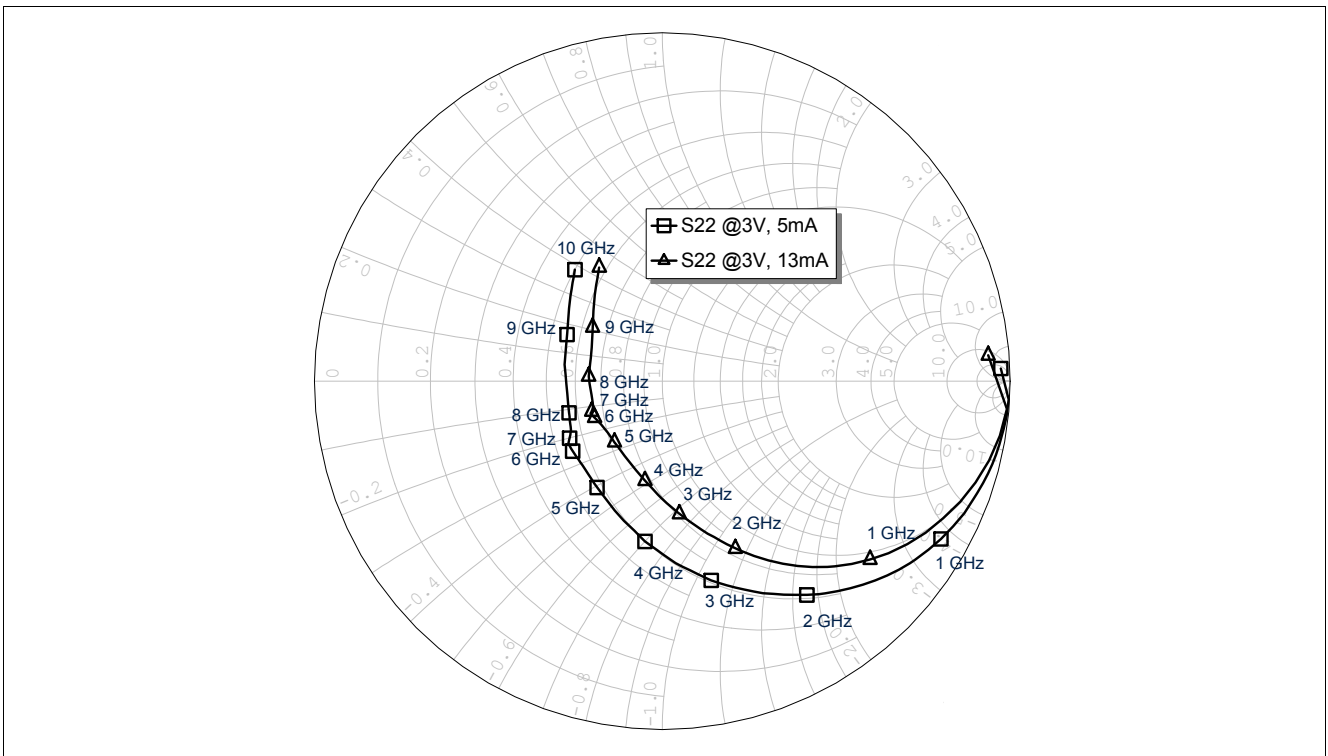


Figure 8 Output Matching S_{22} vs. Frequency $V_{CE} = 3\text{ V}$, $I_C = 5\text{ mA} / 13\text{ mA}$

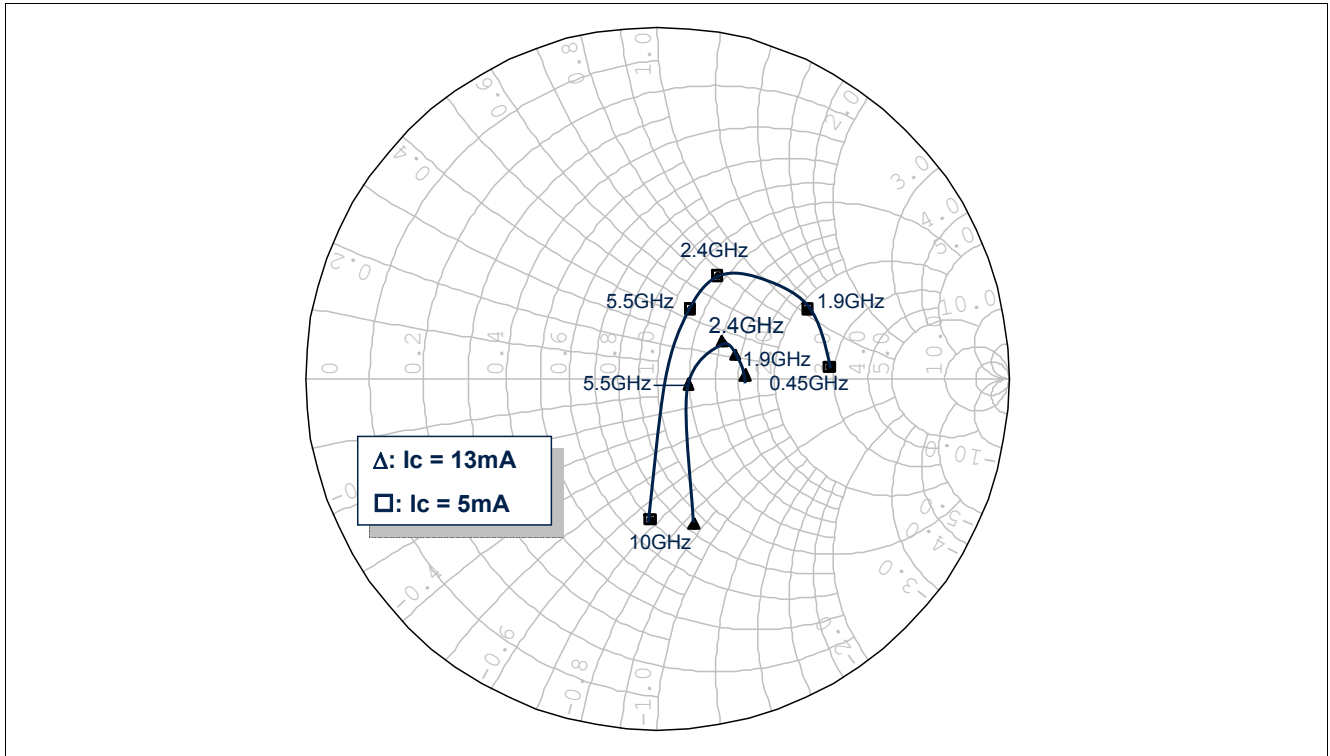


Figure 9 Source Impedance Z_{opt} for NF_{min} vs. Frequency $V_{CE} = 3\text{V}$, $I_C = 5\text{mA} / 13\text{mA}$

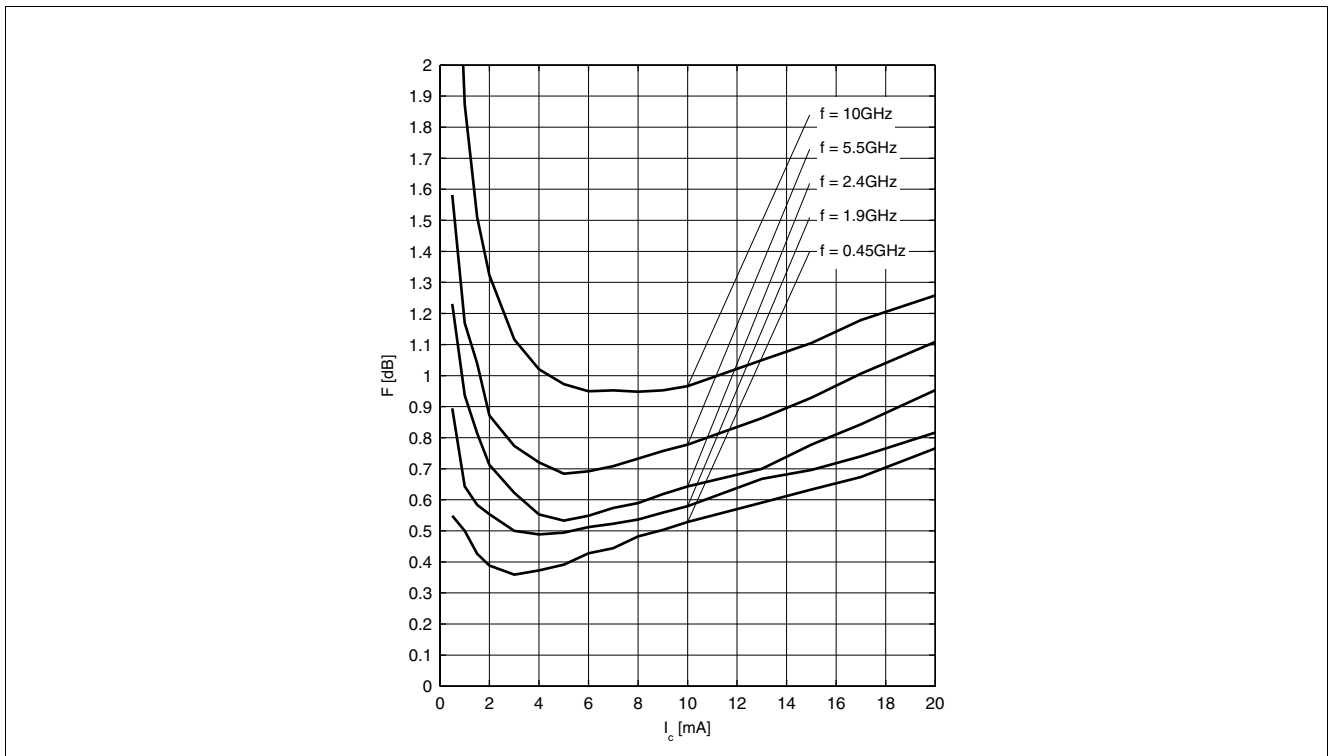


Figure 10 Noise Figure $NF_{min} = f(I_C)$ $V_{CE} = 3\text{V}$, $Z_S = Z_{opt}$

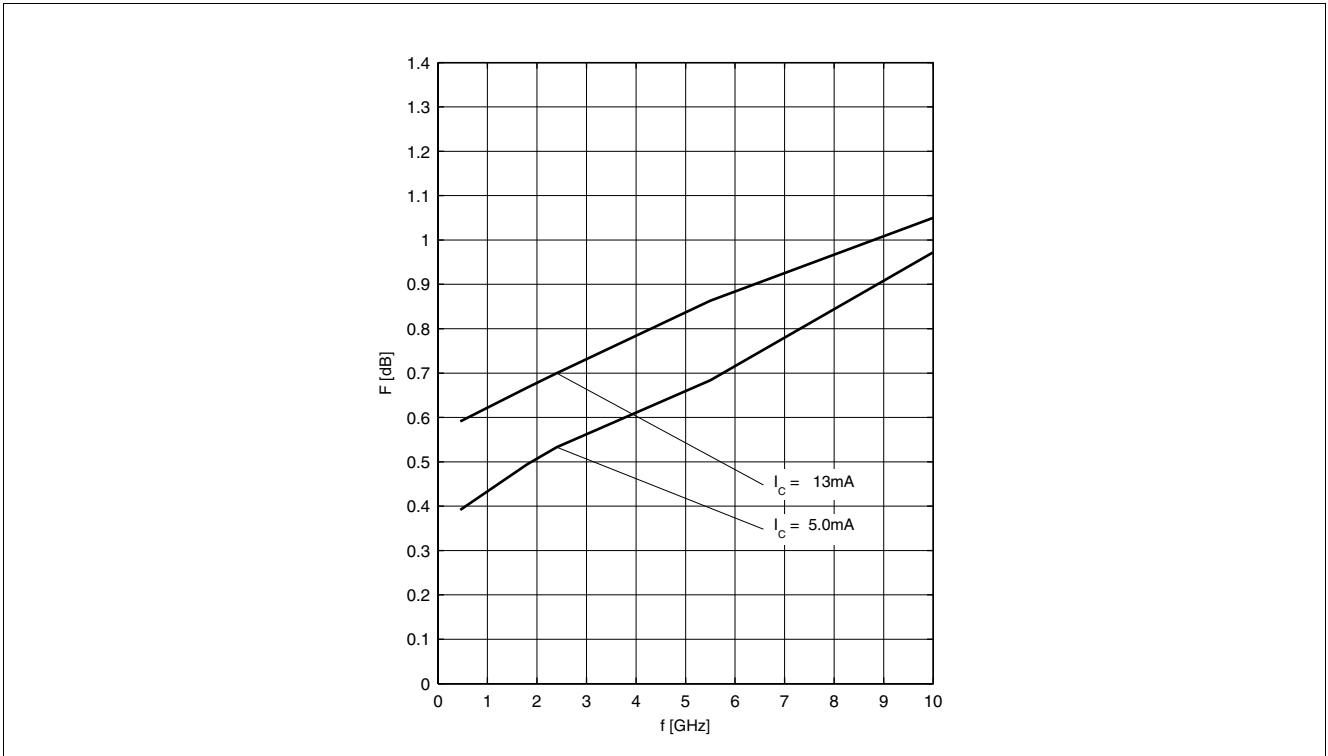


Figure 11 Noise Figure $NF_{min} = f(f)$ $V_{CE} = 3\text{ V}$, $Z_S = Z_{op}$

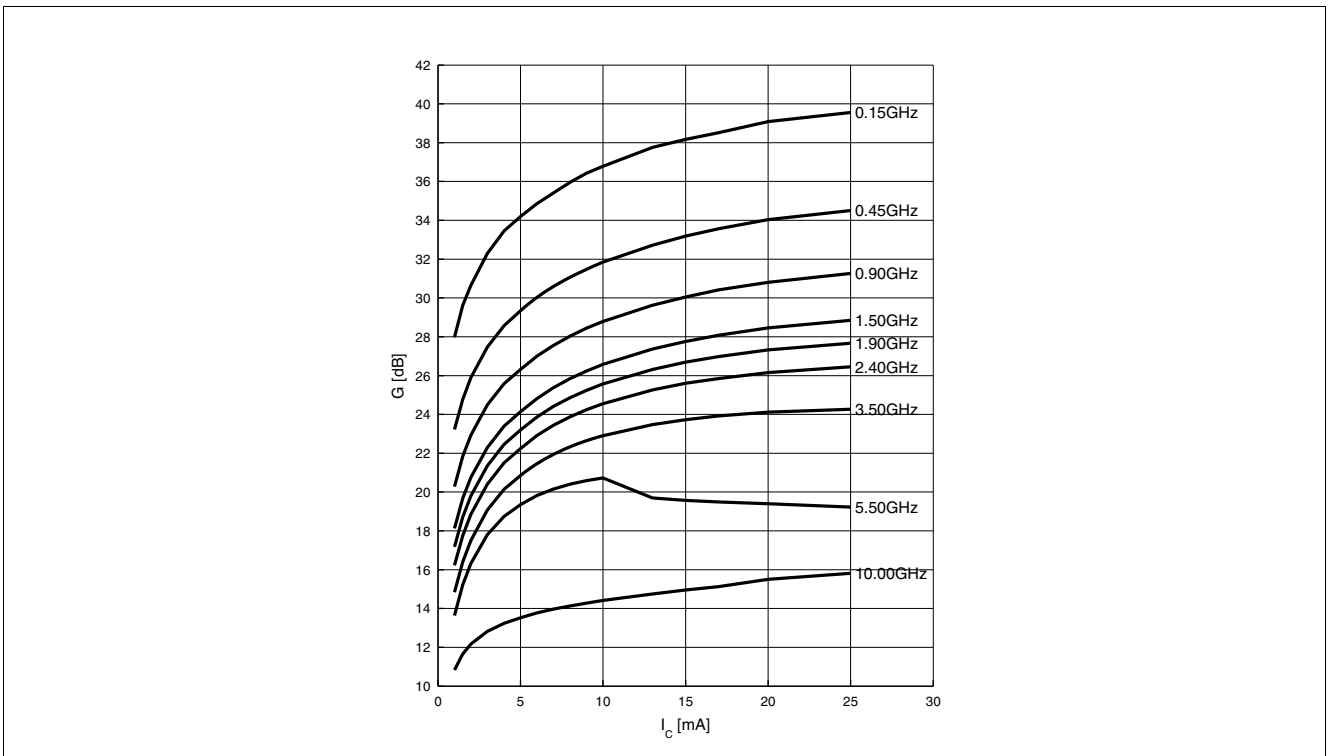


Figure 12 Power Gain G_{ma} , $G_{ms} = f(I_c)$ $V_{CE} = 3\text{ V}$, $f = \text{Parameter in GHz}$

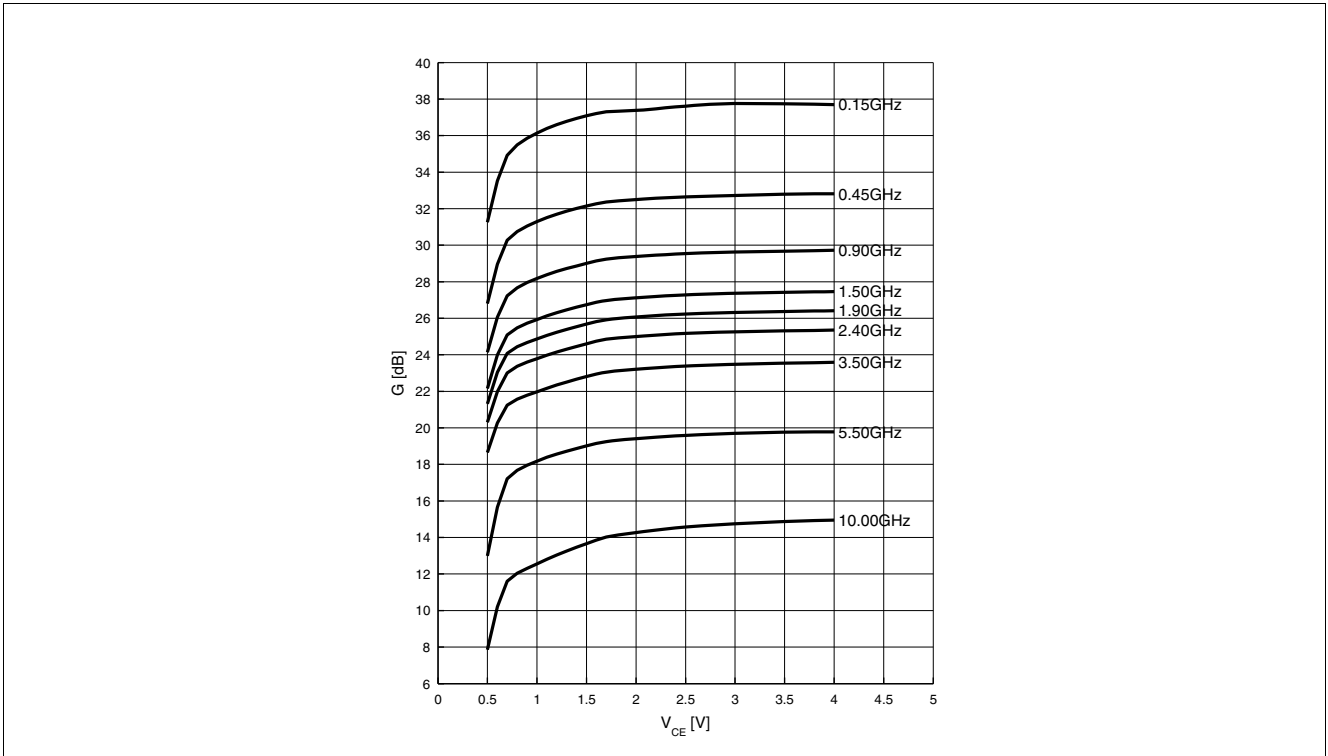


Figure 13 Power Gain G_{ma} , $G_{ms} = f(V_{CE}) I_C = 13 \text{ mA}$, $f = \text{Parameter in GHz}$

Note: The curves shown in this chapter have been generated using typical devices but shall not be considered as a guarantee that all devices have identical characteristic curves.

6 Simulation Data

For SPICE-model as well as for S-parameters including noise parameters please refer to our internet website: www.infineon.com/rf.models. Please consult our website and download the latest versions before actually starting your design.

The simulation data have been generated and verified using typical devices. The BFP720 nonlinear SPICE-model reflects the typical DC- and RF-device performance with high accuracy.

7 Package Information

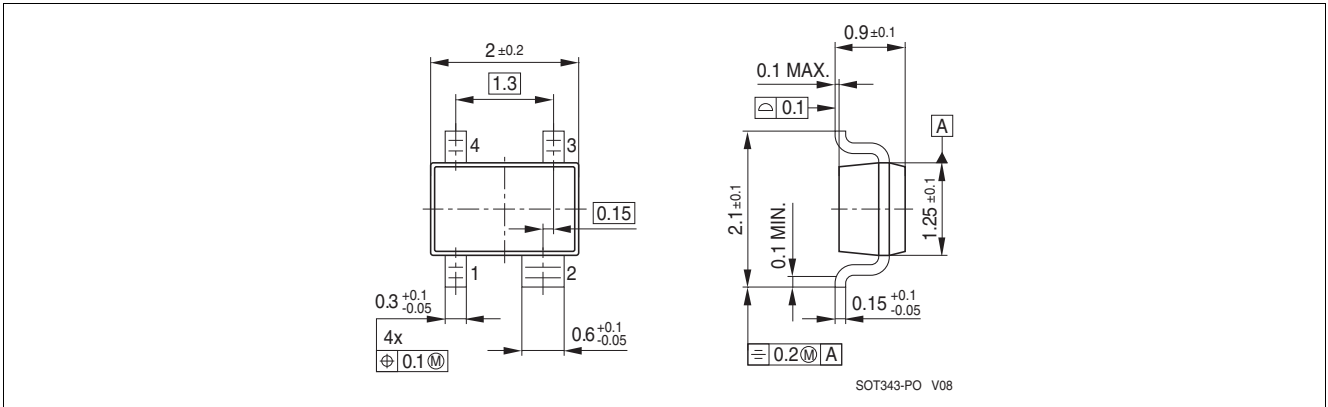


Figure 14 Package Outline SOT343 (top / side view)

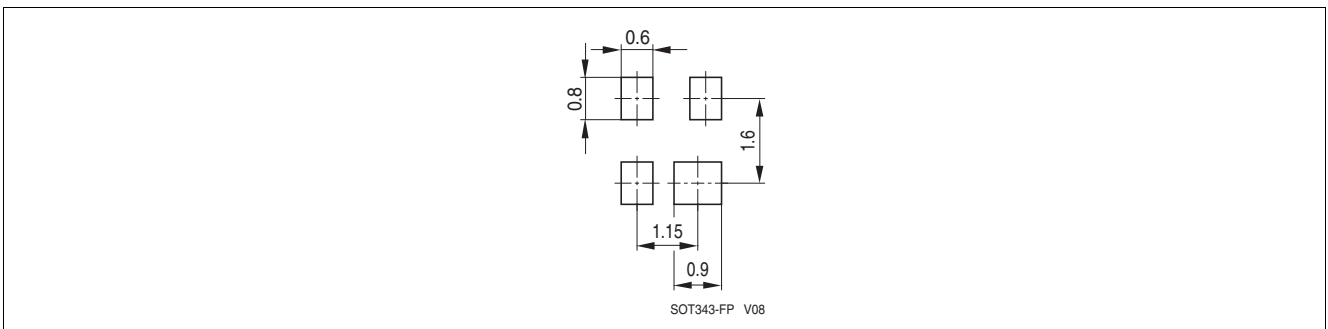


Figure 15 Footprint

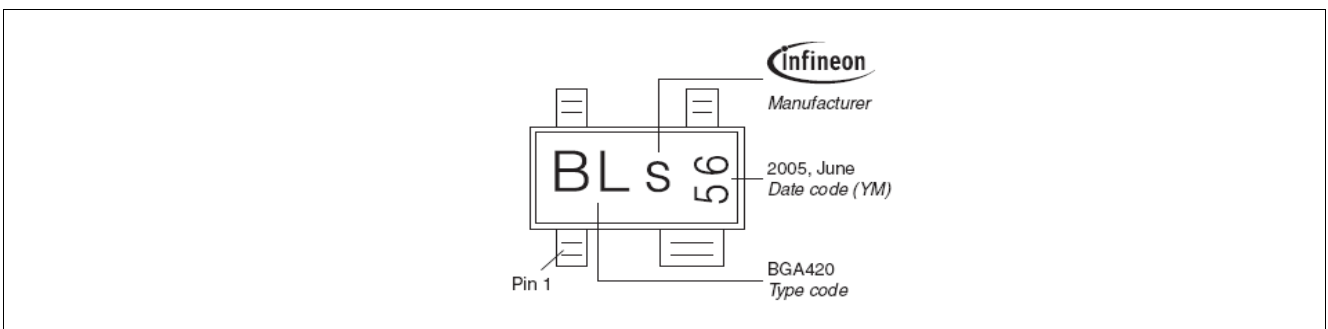


Figure 16 Marking Example (Marking BFP720: R9s)

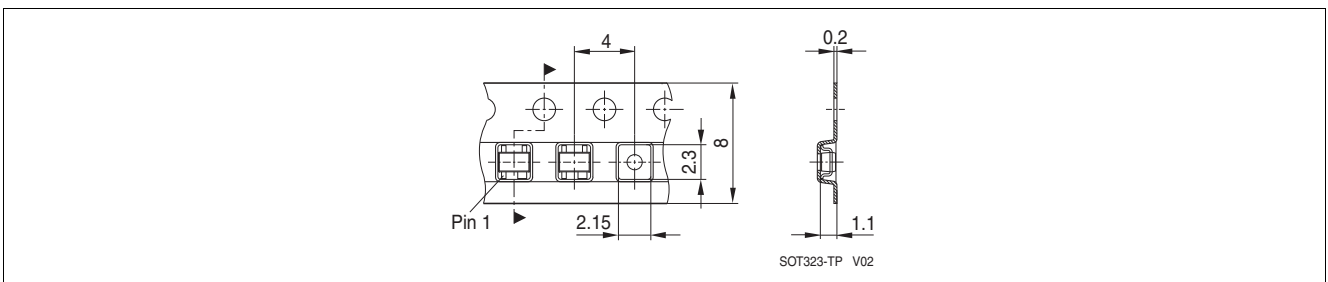


Figure 17 Tape Dimensions

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