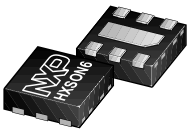



# BGU7258

## 5 GHz ISM SiGe:C low-noise amplifier MMIC with bypass

Rev. 2 — 30 October 2014 | Product data sheet

## 1. Product profile

### 1.1 General description

The BGU7258 is a fully integrated MMIC Low Noise Amplifier (LNA) for wireless receiver applications in the 5 GHz to 6 GHz ISM band. Manufactured in NXP's high performance SiGe:C technology, the BGU7258 couples best-in-class gain, noise figure, linearity and efficiency with the process stability and ruggedness that are the hallmarks of SiGe technology. The BGU7258 features a robust temperature-compensated internal bias network and an integral bypass / shutdown feature that stabilizes the DC operating point over temperature and enables operation in the presence of high input signals, while minimizing current consumption in bypass (standby) mode. The 1.6 mm × 1.6 mm footprint coupled with only two external components, makes the circuit board implementation of the BGU7258 LNA the smallest IEEE 802.11ac LNA with bypass solution on the market, ideal for space sensitive applications.

### 1.2 Features and benefits

- Fully integrated, high performance LNA with built-in bypass
- Integrated DC blocking at RF input and RF output, with only two external components needed.
- Low 1.6 dB noise figure with 13 mA current consumption
- Low bypass current of 1 μA (typical)
- Single supply 3.0 V to 3.6 V operation
- Integrated concurrent 2.4 GHz notch filter and temperature stabilized bias network
- High $IP3_i$ and low EVM
- High ESD protection of 2 kV (HBM) on all pins
- Small, 0.5 mm pitch, 1.6 × 1.6 × 0.5 mm QFN-style package, MSL 1 at 260 °C
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS) following NXP's RHF-2006 indicator D (dark green)

### 1.3 Applications

- IEEE 802.11a/n/ac WiFi, WLAN
- Smartphones, tablets, netbooks and other portable computing devices
- Access points, routers, gateways
- Wireless video
- LTE advanced in unlicensed spectrum (LTE-U)
- General purpose ISM applications

### 1.4 Quick reference data

**Table 1. Quick reference data**

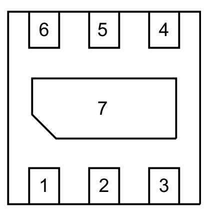
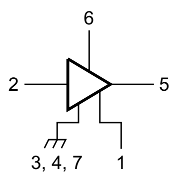
*$T_{amb}$ = 25 °C; $V_{CC}$ = 3.3 V; $Z_S$ = $Z_L$ = 50 Ω; $P_i$ = −30 dBm; f = 5.5 GHz unless otherwise specified. All measurements done on application board (with a DC-decoupling capacitor of 4.7 nF placed close to $V_{CC}$ [pin 6] and a 0.3 pF matching shunt capacitor at RF_IN) with SMA connectors as reference plane.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $I_{CC}$ | supply current | gain mode | - | 13 | - | mA |
| | | bypass mode | - | 1 | - | μA |
| $G_p$ | power gain | gain mode | | | | |
| | | f = 5.1 GHz [1] | 12 | 14 | 16 | dB |
| | | f = 5.9 GHz [1] | 11 | 13 | 15 | dB |
| | | bypass mode | | | | |
| | | f = 5.1 GHz [1] | - | −7 | - | dB |
| | | f = 5.9 GHz [1] | - | −7 | - | dB |
| $P_{i(1dB)}$ | input power at 1 dB gain compression | gain mode | - | −4 | - | dBm |
| NF | noise figure | gain mode [1] | - | 1.6 | - | dB |

[1] Printed-Circuit Board (PCB) and connector losses excluded.

## 2. Pinning information

**Table 2. Pinning**

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|---|---|---|---|---|
| 1 | CTRL | gain control, switch between gain and bypass mode |   Transparent top view |   aaa-015334 |
| 2 | RF_IN | RF in | | |
| 3 | GND | ground | | |
| 4 | GND | ground | | |
| 5 | RF_OUT | RF out | | |
| 6 | $V_{CC}$ | supply voltage | | |
| 7 | GND | ground pad | | |

## 3. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| BGU7258 | HXSON6 | plastic thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.6 x 1.6 x 0.5 mm | SOT1189-1 |
| OM7870 | - | 5 GHz WLAN evaluation board | - |

## 4. Marking

**Table 4. Marking**

| Type number | Marking |
|---|---|
| BGU7258 | 258 |

## 5. Block diagram

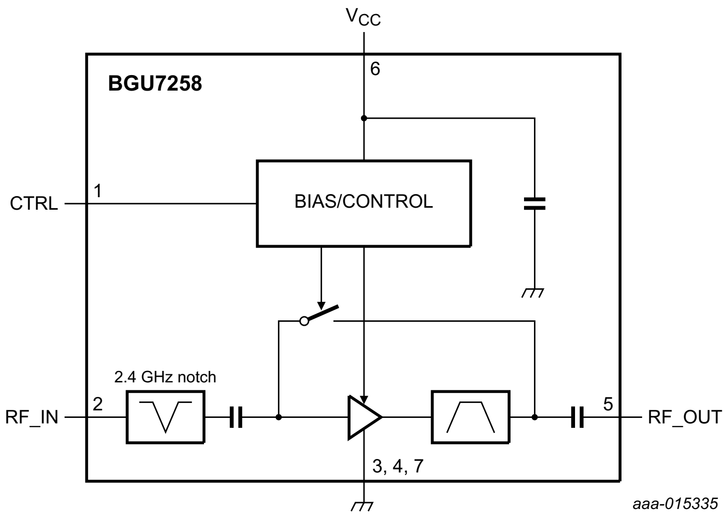



**Fig 1. Block diagram**

## 6. Limiting values

**Table 5. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134). Absolute Maximum Ratings are given as limiting values of stress conditions during operation, that must not be exceeded under the worst case conditions.*

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | RF input AC coupled [1] | –0.5 | +5.0 | V |
| $V_{I(RF\_IN)}$ | input voltage on pin RF_IN | DC [1][2][3] | –0.5 | +5.0 | V |
| $V_{I(RF\_OUT)}$ | input voltage on pin RF_OUT | DC [1][2][3] | –0.5 | +5.0 | V |
| $V_{I(CTRL)}$ | input voltage on pin CTRL | [1][2] | –0.5 | +5.0 | V |
| $T_{stg}$ | storage temperature | | –40 | +150 | °C |
| $T_j$ | junction temperature | | - | 150 | °C |
| $V_{ESD}$ | electrostatic discharge voltage | Human Body Model (HBM); according to the joint JEDEC/ESDA standard JS-001-2012 | - | ±2 | kV |
| | | Charged Device Model (CDM); according to JEDEC standard JESD22-C101 | - | ±1 | kV |

**Table 5. Limiting values** *...continued*

*In accordance with the Absolute Maximum Rating System (IEC 60134). Absolute Maximum Ratings are given as limiting values of stress conditions during operation, that must not be exceeded under the worst case conditions.*

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|---|---|---|---|---|---|---|
| $P_i$ | input power | f = 5500 MHz; CW | | | | |
| | | gain mode; $V_{CC}$ = 3.3 V | [1] | - | 10 | dBm |
| | | bypass mode; $V_{CC}$ = 3.3 V | [1] | - | 10 | dBm |

[1] Stressed with pulses of 200 ms in duration in an application circuit as depicted in Figure 34.

[2] Warning: due to internal ESD diode protection, the applied DC voltage should not exceed $V_{CC}$ + 0.6 V and shall not exceed 5.0 V in order to avoid excess current.

[3] The RF input and RF output are AC-coupled through an internal DC blocking capacitor.

## 7. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol | Parameter | Conditions | Typ | Unit |
|---|---|---|---|---|
| $R_{th(j\text{-}case)}$ | thermal resistance from junction to case | | 250 | K/W |

## 8. Static characteristics

**Table 7. Static characteristics**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | RF input, AC coupled | 3.0 | 3.3 | 3.6 | V |
| $I_{CC}$ | supply current | $P_i$ = –30 dBm | | | | |
| | | gain mode | - | 13 | - | mA |
| | | bypass mode | - | 1 | - | μA |
| $I_{I(CTRL)}$ | input current on pin CTRL | gain mode | - | 50 | - | μA |
| $T_{amb}$ | ambient temperature | | –40 | +25 | +85 | °C |

# 9. Dynamic characteristics

**Table 8. Dynamic characteristics**

*$T_{amb}$ = 25 °C; $V_{CC}$ = 3.3 V; $Z_S$ = $Z_L$ = 50 Ω; $P_i$ = –30 dBm; f = 5.5 GHz unless otherwise specified. All measurements done on application board (with a DC-decoupling capacitor of 4.7 nF placed close to $V_{CC}$ [pin 6] and a 0.3 pF matching shunt capacitor at RF_IN) with SMA connectors as reference plane.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| f | frequency | [1] | 4900 | - | 5925 | MHz |
| $G_p$ | power gain | gain mode [2] | | | | |
| | | f = 5.1 GHz | 12 | 14 | 16 | dB |
| | | f = 5.9 GHz | 11 | 13 | 15 | dB |
| | | bypass mode [2] | | | | |
| | | f = 5.1 GHz | - | –7 | - | dB |
| | | f = 5.9 GHz | - | –7 | - | dB |
| $RL_{in}$ | input return loss | gain mode | - | 17 | - | dB |
| | | bypass mode | - | 10 | - | dB |
| $RL_{out}$ | output return loss | gain mode | - | 18 | - | dB |
| | | bypass mode | - | 16 | - | dB |
| ISL | isolation | gain mode | - | 20 | - | dB |
| $G_{flat}$ | gain flatness | bandwidth across 80 MHz channel | | | | |
| | | gain mode | - | ±0.2 | - | dB |
| | | bypass mode | - | ±0.2 | - | dB |
| $P_{i(1dB)}$ | input power at 1 dB gain compression | gain mode | - | –4 | - | dBm |
| $IP3_I$ | input third-order intercept point | two-tone; 5 MHz spacing | | | | |
| | | $P_i$ = –20 dBm; gain mode | - | 8 | - | dBm |
| | | $P_i$ = –5 dBm; bypass mode | - | 27 | - | dBm |
| NF | noise figure | gain mode [2] | - | 1.6 | - | dB |
| $t_{sw(G)}$ | gain switch time | $V_{I(CTRL)}$ = 0 V to 3.3 V | | | | |
| | | gain mode [3] | - | 150 | - | ns |
| | | bypass mode [4] | - | 20 | - | ns |
| K | Rollett stability factor | 0 GHz ≤ f ≤ 20 GHz; gain mode | - | > 1 | - | |

[1] ISM 5 GHz (in band).

[2] Printed-Circuit Board (PCB) and connector losses excluded.

[3] measured from 50 % of $V_{I(CTRL)}$ control signal to 90% of maximum RF output signal.

[4] measured from 50 % of $V_{I(CTRL)}$ control signal to 10% of maximum RF output signal.

# 10. Gain control

**Table 9. Gain control (pin CTRL)**

*$T_{amb}$ = 25 °C; $V_{CC}$ = 3.3 V.*

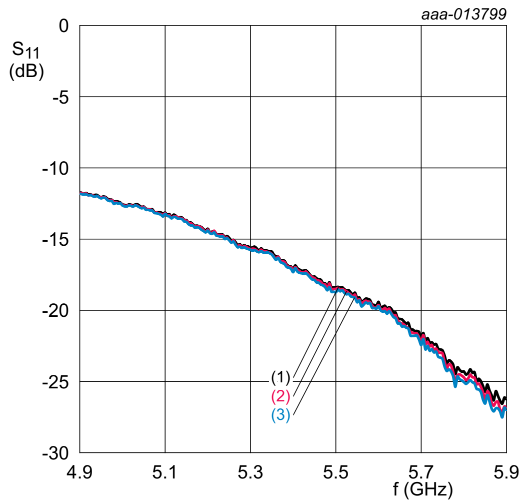
| $V_{I(CTRL)}$ (V) | Mode |
|---|---|
| ≤ 0.5 | bypass |
| ≥ 2.5 | gain |

# 11. Application information

Please contact your local sales representative for more information. Application note *AN11453* is available on the NXP website.

## 11.1 Graphs

Typical performance measured on the application board.



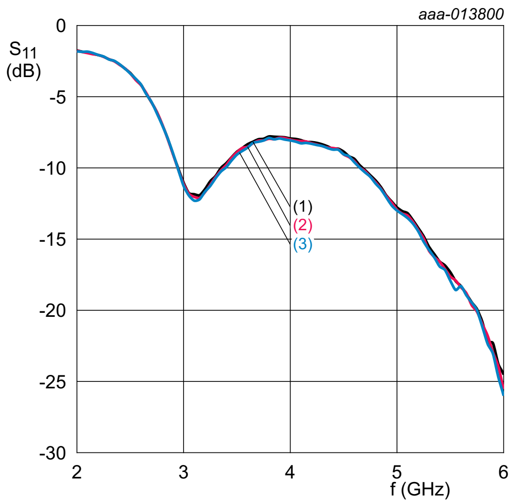

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 2. Input reflection coefficient as a function of frequency at different supply voltages**



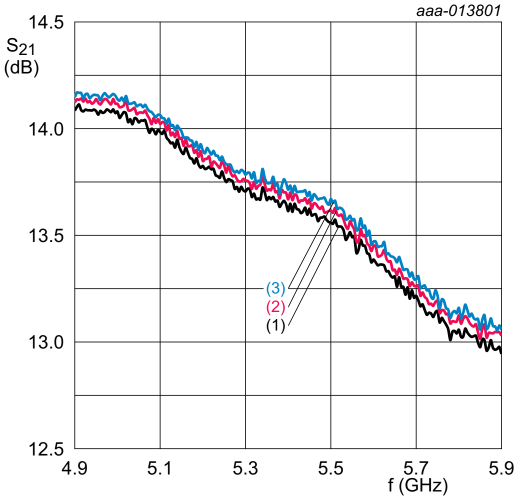

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 3. Input reflection coefficient as a function of frequency at different supply voltages**



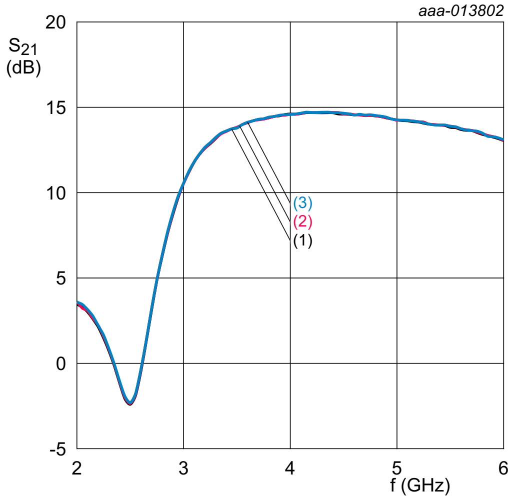

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 4. Forward transmission coefficient as a function of frequency at different supply voltages**



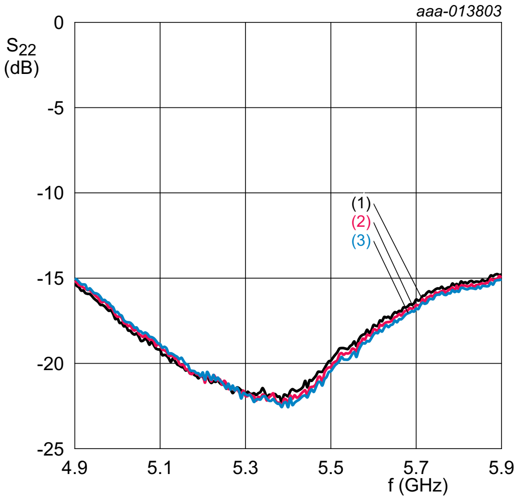

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 5. Forward transmission coefficient as a function of frequency at different supply voltages**



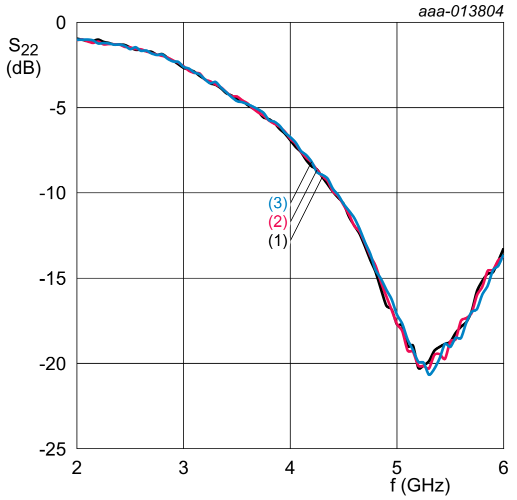

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 6. Output reflection coefficient as a function of frequency at different supply voltages**



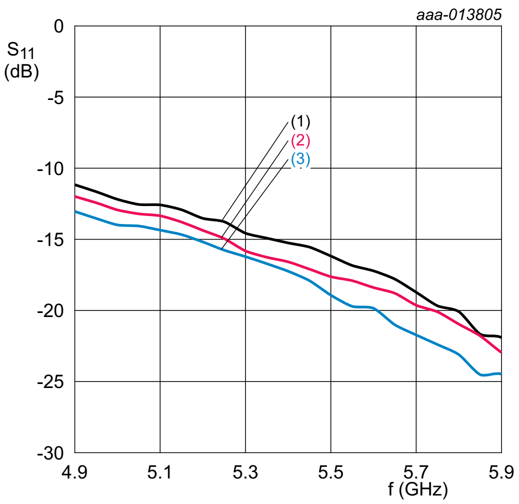

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 7. Output reflection coefficient as a function of frequency at different supply voltages**



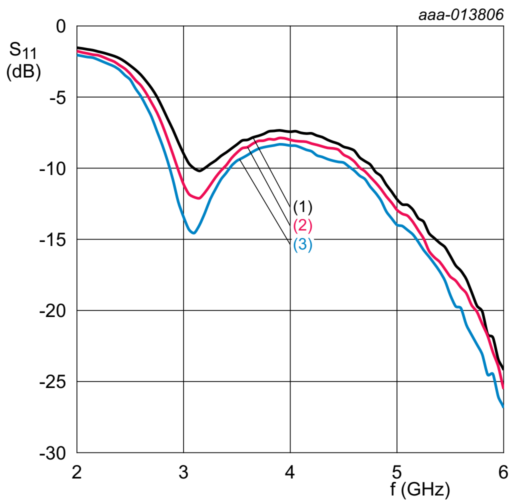

$V_{CC} = V_{I(CTRL)} = 3.3$ V; gain mode

(1) $T_{amb} = -40$ °C

(2) $T_{amb} = +25$ °C

(3) $T_{amb} = +85$ °C

**Fig 8. Input reflection coefficient as a function of frequency at different ambient temperatures**



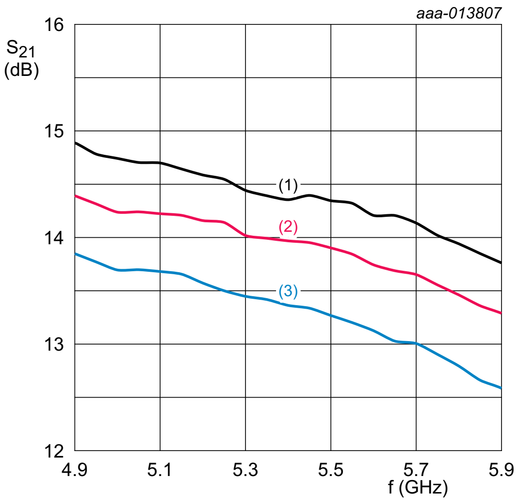

$V_{CC} = V_{I(CTRL)} = 3.3$ V; gain mode

(1) $T_{amb} = -40$ °C

(2) $T_{amb} = +25$ °C

(3) $T_{amb} = +85$ °C

**Fig 9. Input reflection coefficient as a function of frequency at different ambient temperatures**



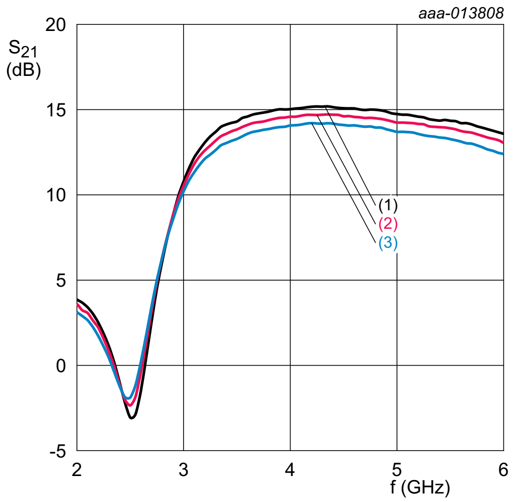

$V_{CC} = V_{I(CTRL)} = 3.3$ V; gain mode

(1) $T_{amb} = -40$ °C

(2) $T_{amb} = +25$ °C

(3) $T_{amb} = +85$ °C

**Fig 10. Forward transmission coefficient as a function of frequency at different ambient temperatures**



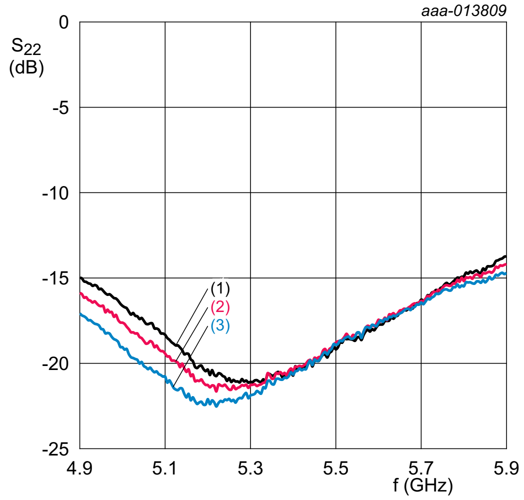

$V_{CC} = V_{I(CTRL)} = 3.3$ V; gain mode

(1) $T_{amb} = -40$ °C

(2) $T_{amb} = +25$ °C

(3) $T_{amb} = +85$ °C

**Fig 11. Forward transmission coefficient as a function of frequency at different ambient temperatures**



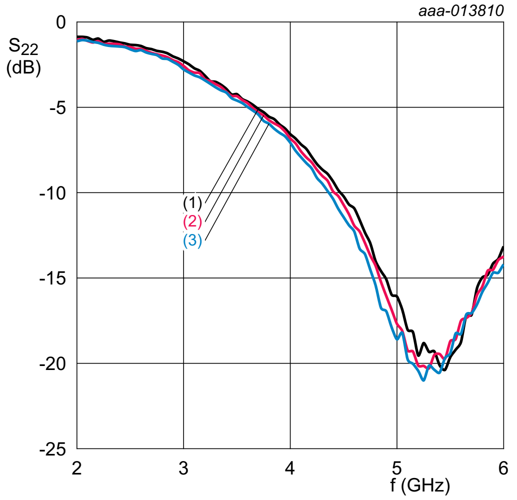

$V_{CC} = V_{I(CTRL)} = 3.3$ V; gain mode

(1) $T_{amb} = -40$ °C

(2) $T_{amb} = +25$ °C

(3) $T_{amb} = +85$ °C

**Fig 12. Output reflection coefficient as a function of frequency at different ambient temperatures**



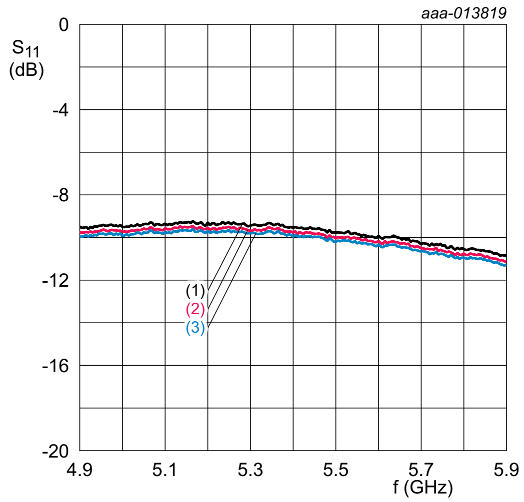

$V_{CC} = V_{I(CTRL)} = 3.3$ V; gain mode

(1) $T_{amb} = -40$ °C

(2) $T_{amb} = +25$ °C

(3) $T_{amb} = +85$ °C

**Fig 13. Output reflection coefficient as a function of frequency at different ambient temperatures**



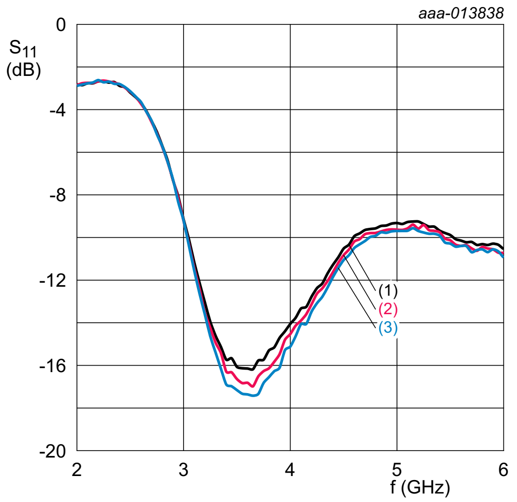

$T_{amb} = 25$ °C; $V_{I(CTRL)} = 0$ V; bypass mode

(1) $V_{CC} = 3.0$ V

(2) $V_{CC} = 3.3$ V

(3) $V_{CC} = 3.6$ V

**Fig 14. Input reflection coefficient as a function of frequency at different supply voltages**



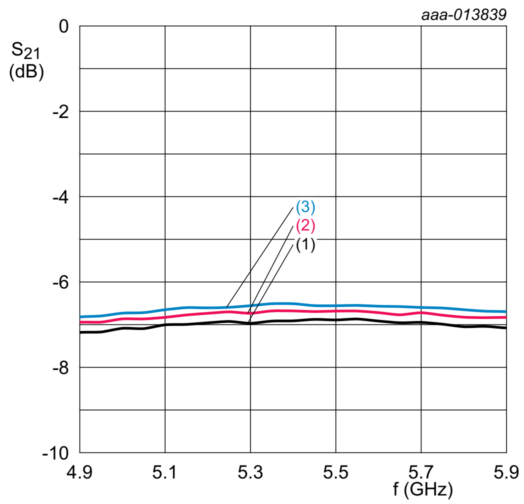

$T_{amb} = 25$ °C; $V_{I(CTRL)} = 0$ V; bypass mode

(1) $V_{CC} = 3.0$ V

(2) $V_{CC} = 3.3$ V

(3) $V_{CC} = 3.6$ V

**Fig 15. Input reflection coefficient as a function of frequency at different supply voltages**



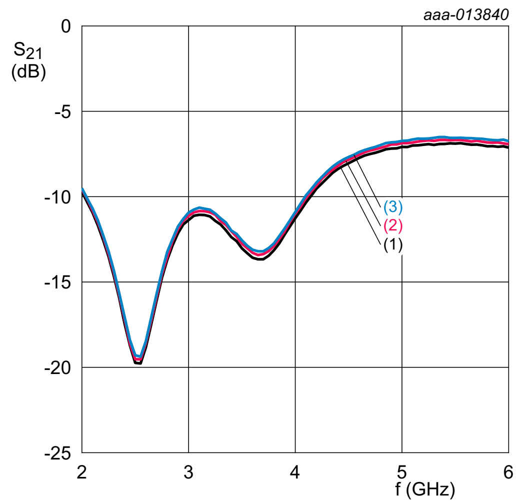

$T_{amb}$ = 25 °C; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $V_{CC}$ = 3.0 V

(2) $V_{CC}$ = 3.3 V

(3) $V_{CC}$ = 3.6 V

**Fig 16. Forward transmission coefficient as a function of frequency at different supply voltages**



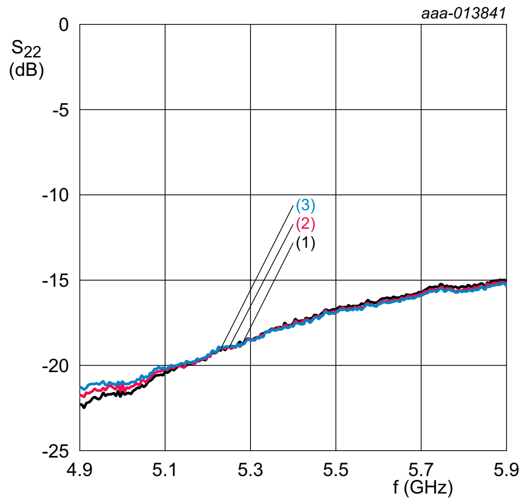

$T_{amb}$ = 25 °C; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $V_{CC}$ = 3.0 V

(2) $V_{CC}$ = 3.3 V

(3) $V_{CC}$ = 3.6 V

**Fig 17. Forward transmission coefficient as a function of frequency at different supply voltages**



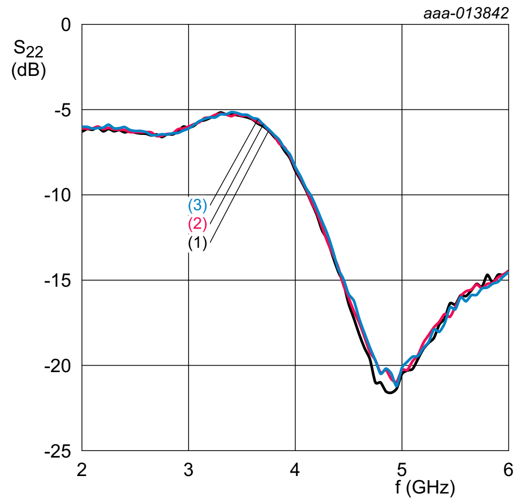

$T_{amb}$ = 25 °C; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $V_{CC}$ = 3.0 V

(2) $V_{CC}$ = 3.3 V

(3) $V_{CC}$ = 3.6 V

**Fig 18. Output reflection coefficient as a function of frequency at different supply voltages**



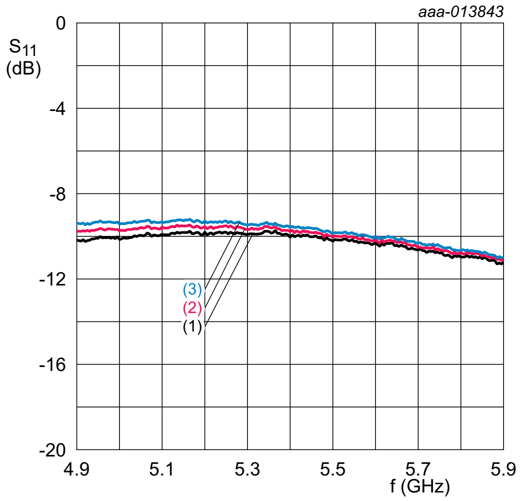

$T_{amb}$ = 25 °C; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $V_{CC}$ = 3.0 V

(2) $V_{CC}$ = 3.3 V

(3) $V_{CC}$ = 3.6 V

**Fig 19. Output reflection coefficient as a function of frequency at different supply voltages**



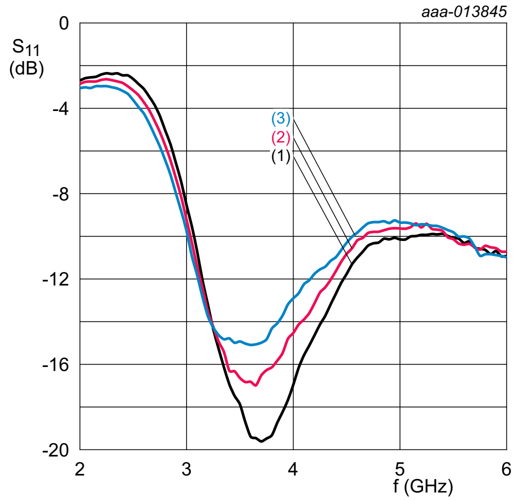

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 20. Input reflection coefficient as a function of frequency at different ambient temperatures**



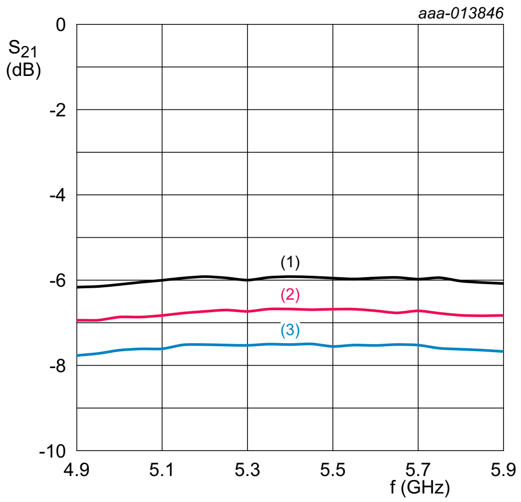

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 21. Input reflection coefficient as a function of frequency at different ambient temperatures**



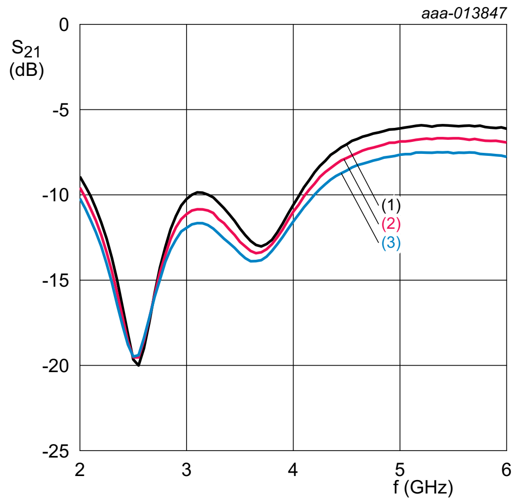

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 22. Forward transmission coefficient as a function of frequency at different ambient temperatures**



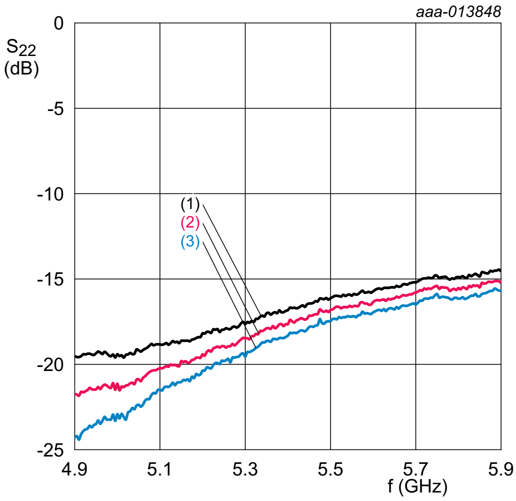

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 23. Forward transmission coefficient as a function of frequency at different ambient temperatures**



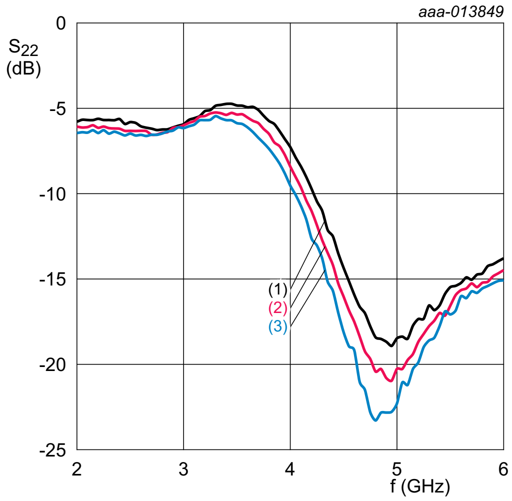

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 24. Output reflection coefficient as a function of frequency at different ambient temperatures**



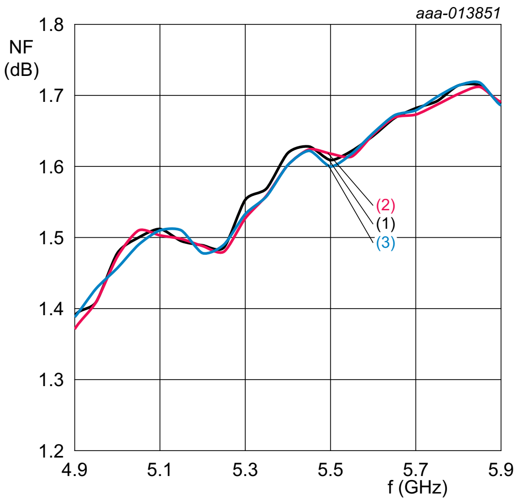

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 25. Output reflection coefficient as a function of frequency at different ambient temperatures**



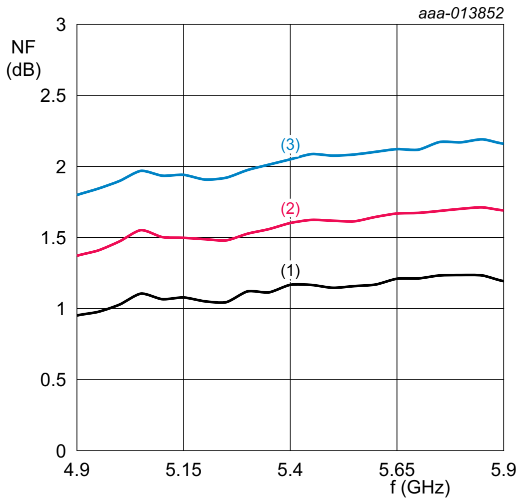

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC}$ = $V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC}$ = $V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC}$ = $V_{I(CTRL)}$ = 3.6 V

**Fig 26. Noise figure as a function of frequency at different supply voltages**



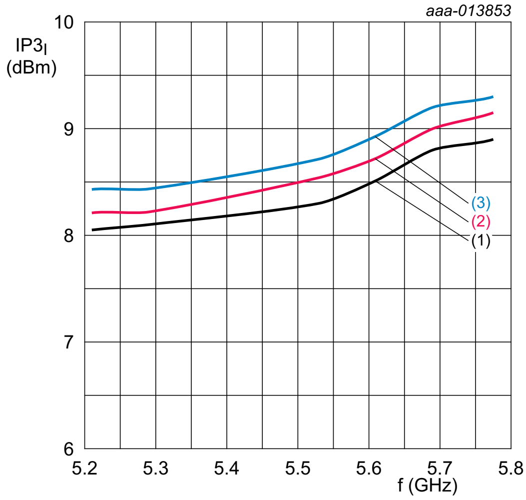

$V_{CC}$ = $V_{I(CTRL)}$ = 3.3 V; gain mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 27. Noise figure as a function of frequency at different ambient temperatures**



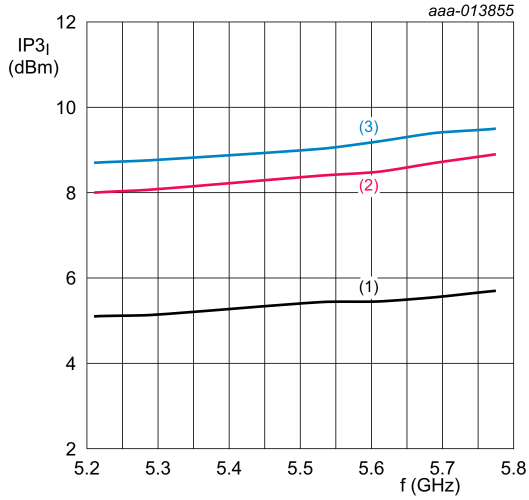

$T_{amb}$ = 25 °C; two tone; 5 MHz spacing; $P_i$ = −20 dBm; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 28. Input third-order intercept point as a function of frequency at different supply voltages**



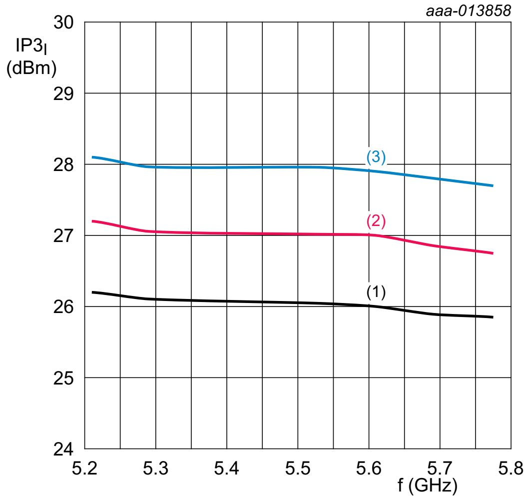

$V_{CC} = V_{I(CTRL)}$ = 3.3 V; two tone; 5 MHz spacing; $P_i$ = −20 dBm; gain mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 29. Input third-order intercept point as a function of frequency at different ambient temperatures**



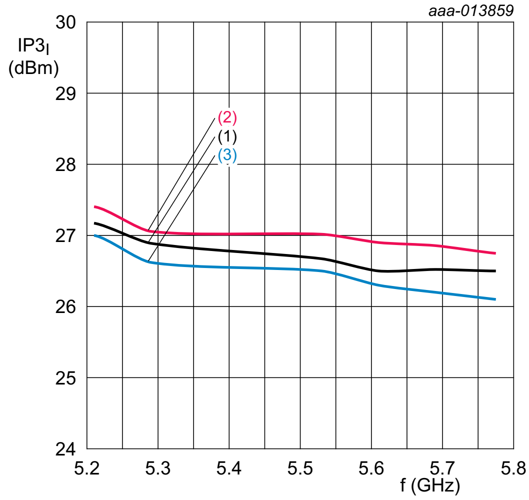

$T_{amb}$ = 25 °C; $V_{I(CTRL)}$ = 0 V; two tone; 5 MHz spacing; $P_i$ = −5 dBm; bypass mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 30. Input third-order intercept point as a function of frequency at different supply voltages**



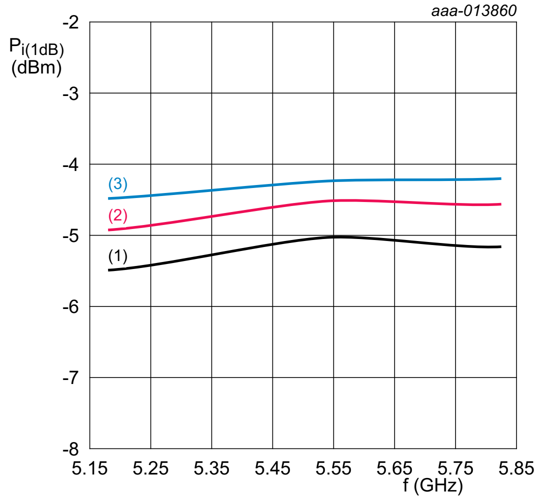

$V_{CC}$ = 3.3 V; $V_{I(CTRL)}$ = 0 V; two tone; 5 MHz spacing; $P_i$ = −5 dBm; bypass mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 31. Input third-order intercept point as a function of frequency at different ambient temperatures**



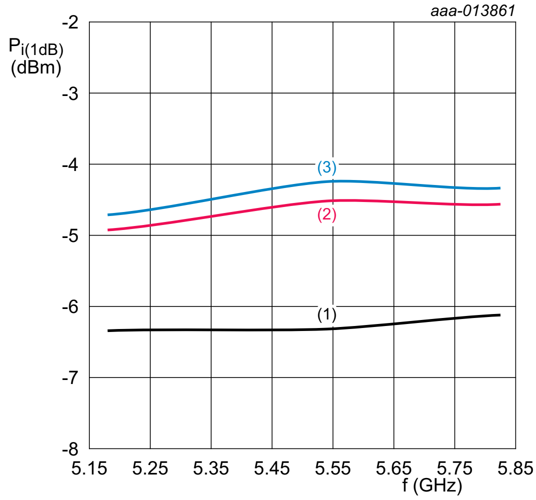

$T_{amb}$ = 25 °C; gain mode

(1) $V_{CC} = V_{I(CTRL)}$ = 3.0 V

(2) $V_{CC} = V_{I(CTRL)}$ = 3.3 V

(3) $V_{CC} = V_{I(CTRL)}$ = 3.6 V

**Fig 32. Input power at 1 dB gain compression as a function of frequency at different supply voltages**




$V_{CC} = V_{I(CTRL)}$ = 3.3 V; gain mode

(1) $T_{amb}$ = −40 °C

(2) $T_{amb}$ = +25 °C

(3) $T_{amb}$ = +85 °C

**Fig 33. input power at 1 dB gain compression as a function of frequency at different ambient temperatures**

## 11.2 Application circuit

In Figure 34 the application diagram as supplied on the evaluation board is given.

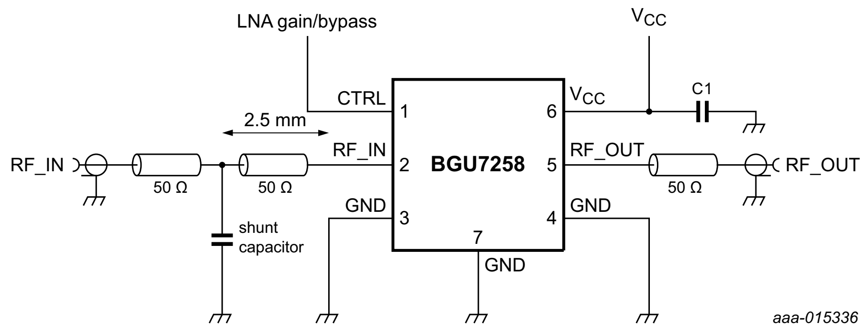



**Fig 34. Evaluation board schematic**

Note that in Figure 34 the schematic for the BGU7258 evaluation board is shown using only two external components. A DC-decoupling capacitor placed close to $V_{CC}$ (pin 6) and a matching shunt capacitor at RF_IN.

The BGU7258 can also be used without the matching capacitor at RF_IN. However, in this case the gain will be 0.5 dB lower, the noise figure 0.1 dB higher and the input return loss less than 10 dB (approximately 8 dB) over the whole 5 GHz ISM band (5 GHz to 6 GHz).

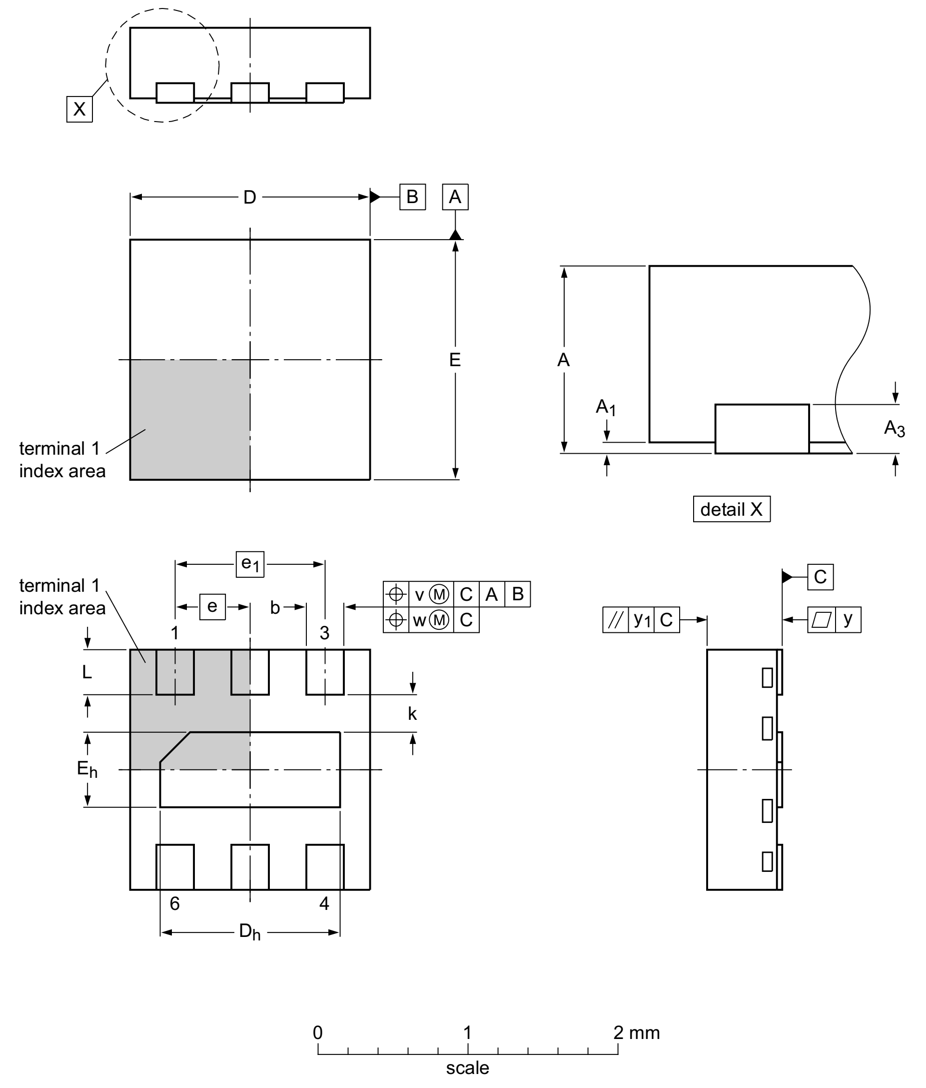
**Table 10. List of components**
*See Figure 34 for evaluation board schematic.*
*Preferred vendors different from the ones listed can be chosen, but be aware that the performance could be affected.*

| Component | Description | Value | Remarks |
|---|---|---|---|
| C1 | capacitor | 4.7 nF | Murata GRM155 series |
| shunt capacitor | capacitor | 0.3 pF | Murata GJM155 series |
| RF_IN, RF_OUT | SMA connector | - | Emerson Network Power |
| $V_{CC}$, LNA gain/bypass | 3-pin connector | - | Molex |

For more details or information please see application note *AN11453*.

## 12. Package outline

**HXSON6: plastic, thermal enhanced extremely thin small outline package; no leads; 6 terminals; body 1.6 x 1.6 x 0.5 mm** **SOT1189-1**




Dimensions

| Unit(1) | | A | $A_1$ | $A_3$ | b | D | $D_h$ | E | $E_h$ | e | $e_1$ | k | L | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | max | 0.5 | 0.05 | | 0.30 | 1.7 | 1.3 | 1.7 | 0.6 | | | | 0.35 | | | | |
| mm | nom | | | 0.127 | 0.25 | 1.6 | 1.2 | 1.6 | 0.5 | 0.5 | 1 | | 0.30 | 0.1 | 0.05 | 0.05 | 0.05 |
| | min | | 0.00 | | 0.20 | 1.5 | 1.1 | 1.5 | 0.4 | | | 0.2 | 0.25 | | | | |

Note

1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

*sot1189-1_po*

| Outline version | References | | | | European projection | Issue date |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT1189-1 | - - - | - - - | - - - | | | ~~10-08-02~~ 10-10-11 |

**Fig 35. Package outline SOT1189-1 (HXSON6)**

## 13. Soldering

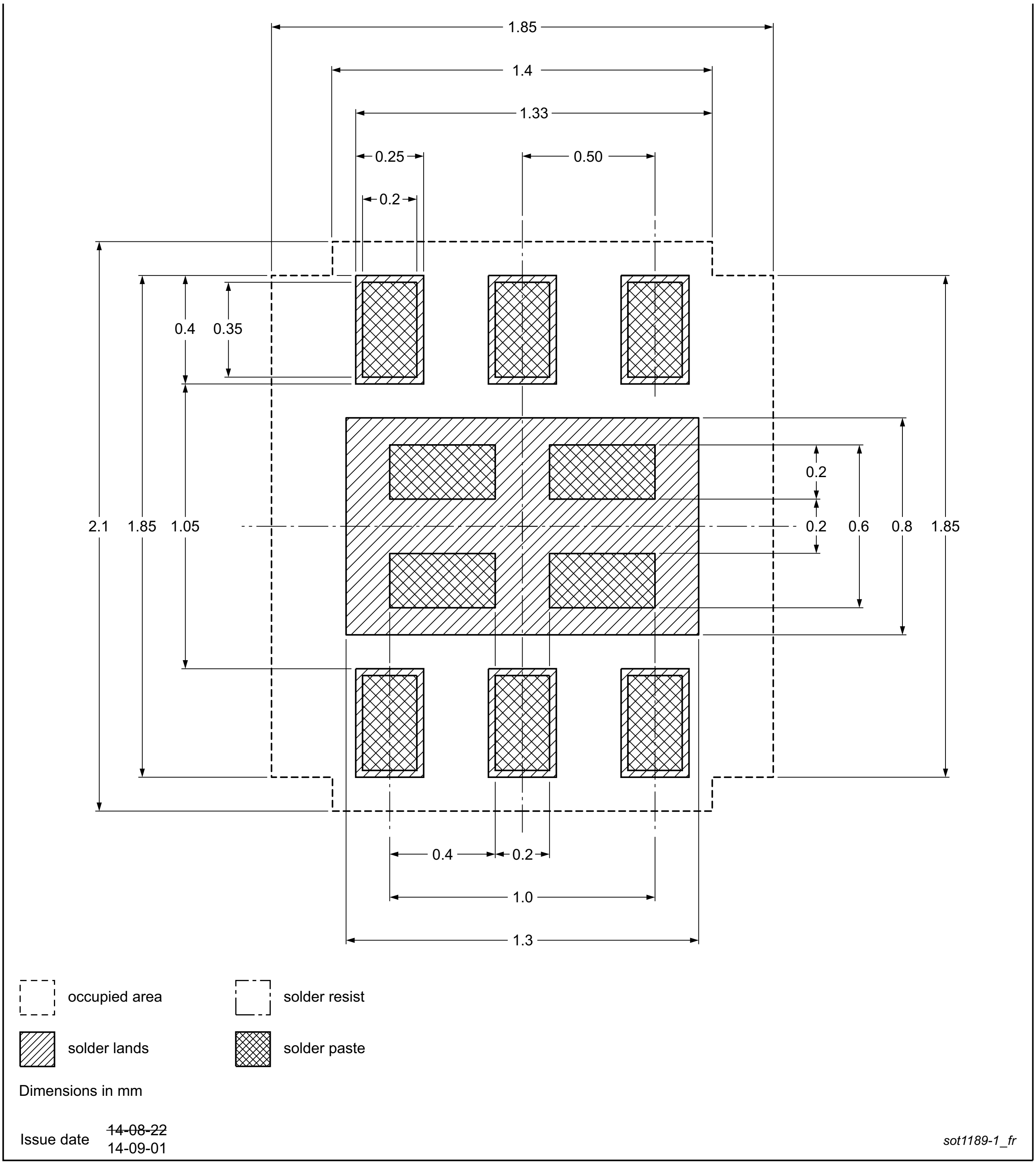



**Fig 36. Reflow soldering footprint**

## 14. Abbreviations

**Table 11. Abbreviations**

| Acronym | Description |
|---|---|
| CW | Continuous Wave |
| ESD | ElectroStatic Discharge |
| EVM | Error Vector Magnitude |
| HBM | Human Body Model |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISM | Industrial Scientific Medical |
| LTE | Long Term Evolution |
| LTE-U | Long Term Evolution Unlicensed |
| MMIC | Monolithic Microwave Integrated Circuit |
| MSL | Moisture Sensitivity Level |
| RHF | RoHS Halogen Free |
| QFN | Quad-Flat No-leads |
| SiGe:C | Silicon Germanium Carbon |
| SMA | SubMiniature version A |
| WLAN | Wireless Local Area Network |

## 15. Revision history

**Table 12. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| BGU7258 v.2 | 20141030 | Product data sheet | - | BGU7258 v.1 |
| Modifications: | • The status of this document has been changed to Product data sheet. | | | |
| BGU7258 v.1 | 20141023 | Preliminary data sheet | - | - |

# 16. Legal information

## 16.1 Data sheet status

| Document status[1][2] | Product status[3] | Definition |
|---|---|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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## 18. Contents





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**Date of release: 30 October 2014**

**Document identifier: BGU7258**