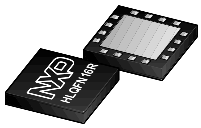


BGU7073

Analog controlled high linearity low noise variable gain amplifier

Rev. 6 — 15 February 2017 Product data sheet

1. Product profile

1.1 General description

The BGU7073 is, also known as the BTS5001M, a fully integrated analog-controlled variable gain amplifier module. Its low noise and high linearity performance makes it ideal for sensitive receivers in cellular base station applications. The BGU7073 is designed for the 1850 MHz to 2010 MHz frequency range. It has a gain control range of more than 35 dB. At maximum gain, the noise figure is 0.9 dB. The gain is analog-controlled having maximum gain at 0 V and minimum gain at 3.3 V. The LNA has two gain settings, extending the dynamic range. The BGU7073 is internally matched to 50 Ω, meaning no external matching is required, enabling ease of use. It is housed in a 16 pins 8 mm × 8 mm × 1.3 mm leadless HLQFN16R package SOT1301.

1.2 Features and benefits

- Input and output internally matched to 50 Ω
- Low noise figure of 0.9 dB
- High input IP3 of 1 dBm
- High $P_{i(1dB)}$ of –11.6 dBm
- LNA with 2 gain settings, giving high dynamic range
- Gain control range of 0 dB to 35 dB
- Single 5 V supply
- Single analog gain control of 0 V to 3.3 V
- Unconditionally stable up to 12.75 GHz
- Moisture sensitivity level 3
- ESD protection at all pins

1.3 Applications

- Cellular base stations, remote radio heads
- 3G, LTE infrastructure
- Low noise applications with variable gain and high linearity requirements
- Active antenna

1.4 Quick reference data

Table 1. Quick reference data

GS = LOW (see Table 9); V_{CC1} = 5 V; V_{CC2} = 5 V; T_{amb} = 25 °C; input and output 50 Ω; unless otherwise specified. All RF parameters have been characterized at the device RF input and RF output terminals.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f = 1950 MHz						
$I_{CC(tot)}$	total supply current	$V_{ctrl(Gp)}$ = 0 V	210	245	280	mA
NF	noise figure	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	0.9	-	dB
		G_p = 35 dB	-	1.1	1.2	dB
$IP3_I$	input third-order intercept point	G_p = 35 dB; 2-tone; tone-spacing = 1.0 MHz	0	1.0	-	dBm
$P_{i(1dB)}$	input power at 1 dB gain compression	G_p = 35 dB	−13.5	−11.6	-	dBm
f = 1880 MHz						
$I_{CC(tot)}$	total supply current	$V_{ctrl(Gp)}$ = 0 V	210	245	280	mA
NF	noise figure	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	0.8	-	dB
		G_p = 35 dB	-	1.0	1.2	dB
$IP3_I$	input third-order intercept point	G_p = 35 dB; 2-tone; tone-spacing = 1.0 MHz	0	1.1	-	dBm
$P_{i(1dB)}$	input power at 1 dB gain compression	G_p = 35 dB	−13.5	−11.4	-	dBm

2. Pinning information

2.1 Pinning

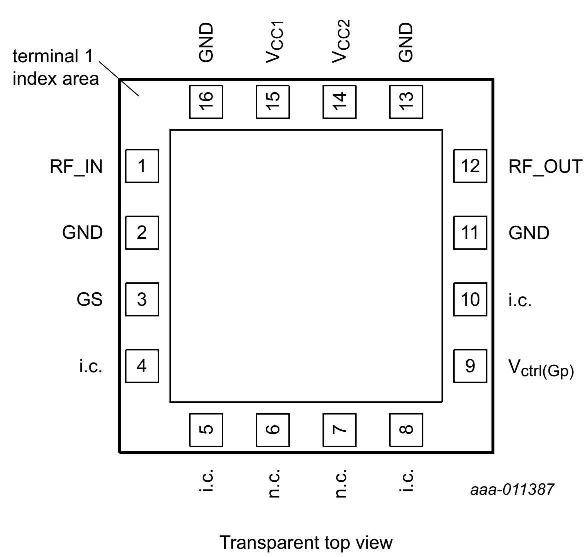


Fig 1. Pin configuration

2.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
RF_IN	1	RF input
GND	2, 11, 13, 16	ground
GS	3	gain switch control
i.c.	4, 5, 10	internally connected. Can either be left open or grounded
n.c.	6, 7	not connected. Internally left open
i.c.	8	internally connected to ground
$V_{ctrl(Gp)}$	9	power gain control voltage
RF_OUT	12	RF output
V_{CC2}	14	supply voltage 2
V_{CC1}	15	supply voltage 1

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BGU7073	HLQFN16R	plastic thermal enhanced low profile quad flat package; no leads; 16 terminals; body 8 × 8 × 1.3 mm	SOT1301-1

4. Functional diagram

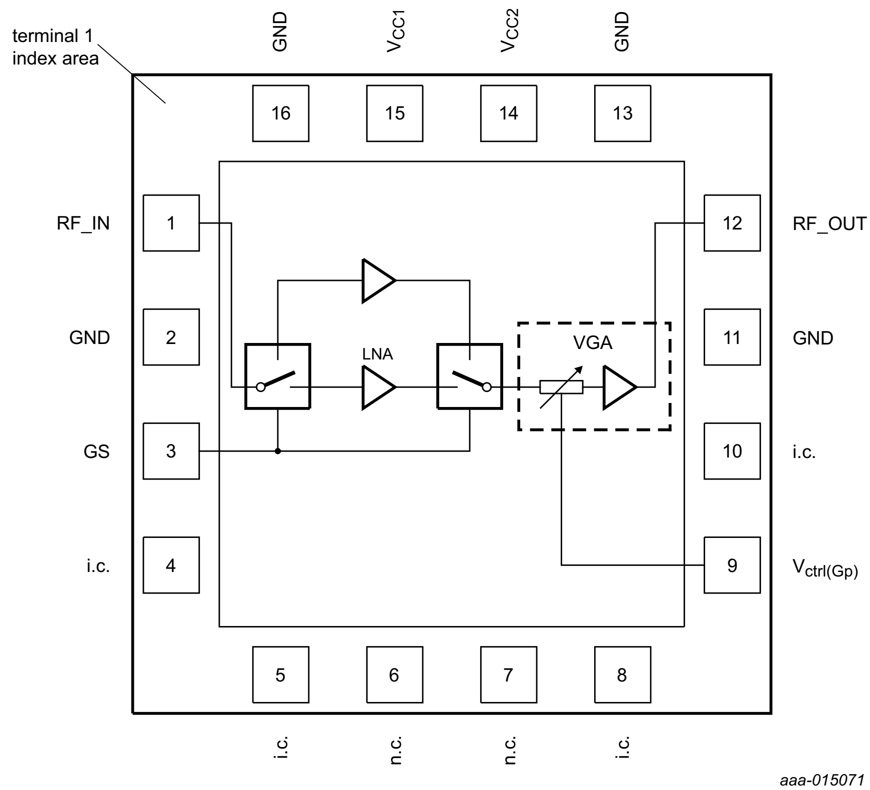


Fig 2. Functional diagram

5. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CC}	supply voltage			0	6	V
$V_{ctrl(Gp)}$	power gain control voltage			–1	+3.6	V
$V_{I(GS)}$	input voltage on pin GS			–1	+3.6	V
$P_{i(RF)CW}$	continuous waveform RF input power	$V_{ctrl(Gp)}$ = 0 V				
		high gain mode	[1]	-	10	dBm
		low gain mode	[2]	-	10	dBm
T_j	junction temperature			-	150	°C
T_{stg}	storage temperature			–40	+150	°C

Table 4. Limiting values *...continued*
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{ESD}	electrostatic discharge voltage	Human Body Model (HBM) According to ANSI/ESDA/JEDEC standard JS-001	-	±2	kV
		Charged Device Model (CDM) According to JEDEC standard JESD22-C101	-	±750	V

[1] high gain mode: GS = LOW (see Table 9).

[2] low gain mode: GS = HIGH (see Table 9).

6. Recommended operating conditions

Table 5. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CC1}	supply voltage 1		4.75	5	5.25	V
V_{CC2}	supply voltage 2		4.75	5	5.25	V
$V_{ctrl(Gp)}$	power gain control voltage		0	-	3.3	V
$V_{I(GS)}$	input voltage on pin GS		0	-	3.3	V
Z_0	characteristic impedance		-	50	-	Ω
T_{case}	case temperature		–40	-	+85	°C

7. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-case)}$	thermal resistance from junction to case	[1]	43	K/W

[1] The case temperature is measured at the ground solder pad.

8. Characteristics

Table 7. Characteristics high gain mode
GS = LOW (see Table 9); V_{CC1} = 5 V; V_{CC2} = 5 V; T_{amb} = 25 °C; input and output 50 Ω; unless otherwise specified. All RF parameters have been characterized at the device RF input and RF output terminals.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f = 1950 MHz						
$I_{CC(tot)}$	total supply current	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	210	245	280	mA
$G_{p(min)}$	minimum power gain	$V_{ctrl(Gp)}$ = 3.3 V	-	8.5	-	dB
$G_{p(max)}$	maximum power gain	$V_{ctrl(Gp)}$ = 0 V	-	37.4	-	dB
$G_{p(flat)}$	power gain flatness	1920 MHz ≤ f ≤ 2010 MHz; 18 dB ≤ G_p ≤ 35 dB	-	0.6	-	dB
NF	noise figure	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	0.9	-	dB
		G_p = 35 dB	-	1.1	1.2	dB
		G_p = 18 dB	-	5.8	-	dB

Table 7. Characteristics high gain mode *...continued*

GS = LOW (see Table 9); V_{CC1} = 5 V; V_{CC2} = 5 V; T_{amb} = 25 °C; input and output 50 Ω; unless otherwise specified. All RF parameters have been characterized at the device RF input and RF output terminals.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$IP3_I$	input third-order intercept point	2-tone; tone-spacing = 1.0 MHz				
		G_p = 35 dB	0	1.0	-	dBm
		G_p = 30 dB	-	4.1	-	dBm
		G_p = 29 dB	-	4.5	-	dBm
		G_p = 18 dB	-	5.5	-	dBm
$P_{i(1dB)}$	input power at 1 dB gain compression	G_p = 35 dB	−13.5	−11.6	-	dBm
		G_p = 30 dB	-	−7.8	-	dBm
		G_p = 29 dB	-	−7.4	-	dBm
		G_p = 18 dB	-	−6.3	-	dBm
RL_{in}	input return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	33.7	-	dB
		G_p = 35 dB	-	27.8	-	dB
RL_{out}	output return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	19.5	-	dB
K	Rollett stability factor	0 GHz ≤ f ≤ 12.75 GHz	1	-	-	
f = 1880 MHz						
$I_{CC(tot)}$	total supply current	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	210	245	280	mA
$G_{p(min)}$	minimum power gain	$V_{ctrl(Gp)}$ = 3.3 V	-	7.9	-	dB
$G_{p(max)}$	maximum power gain	$V_{ctrl(Gp)}$ = 0 V	-	37.0	-	dB
$G_{p(flat)}$	power gain flatness	1850 MHz ≤ f ≤ 1910 MHz; 18 dB ≤ G_p ≤ 35 dB	-	0.3	-	dB
NF	noise figure	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	0.8	-	dB
		G_p = 35 dB	-	1.0	1.35	dB
		G_p = 18 dB	-	5.9	-	dB
$IP3_I$	input third-order intercept point	2-tone; tone-spacing = 1.0 MHz				
		G_p = 35 dB	0	1.1	-	dBm
		G_p = 30 dB	-	4.0	-	dBm
		G_p = 29 dB	-	4.3	-	dBm
		G_p = 18 dB	-	5.0	-	dBm
$P_{i(1dB)}$	input power at 1 dB gain compression	G_p = 35 dB	−13.5	−11.6	-	dBm
		G_p = 30 dB	-	−7.8	-	dBm
		G_p = 29 dB	-	−7.4	-	dBm
		G_p = 18 dB	-	−6.4	-	dBm
RL_{in}	input return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	33.7	-	dB
		G_p = 35 dB	-	28.5	-	dB
RL_{out}	output return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	19.4	-	dB
K	Rollett stability factor	0 GHz ≤ f ≤ 12.75 GHz	1	-	-	

Table 8. Characteristics low gain mode

GS = HIGH (see Table 9); V_{CC1} = 5 V; V_{CC2} = 5 V; T_{amb} = 25 °C; input and output 50 Ω; unless otherwise specified. All RF parameters have been characterized at the device RF input and RF output terminals.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f = 1950 MHz						
$I_{CC(tot)}$	total supply current	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	210	245	280	mA
$G_{p(min)}$	minimum power gain	$V_{ctrl(Gp)}$ = 3.3 V	-	–7.9	-	dB
$G_{p(max)}$	maximum power gain	$V_{ctrl(Gp)}$ = 0 V	-	20.5	-	dB
$G_{p(flat)}$	power gain flatness	1920 MHz ≤ f ≤ 2010 MHz; 3 dB ≤ G_p ≤ 17 dB	-	0.1	-	dB
NF	noise figure	G_p = 17 dB	-	9.7	-	dB
		G_p = 3 dB	-	19.7	-	dB
$IP3_I$	input third-order intercept point	2-tone; tone-spacing = 1.0 MHz				
		G_p = 17 dB	-	18.4	-	dBm
		G_p = 12 dB	-	20.0	-	dBm
		G_p = 11 dB	-	20.8	-	dBm
		G_p = 3 dB	-	18.1	-	dBm
$P_{i(1dB)}$	input power at 1 dB gain compression	G_p = 17 dB	-	5.7	-	dBm
		G_p = 12 dB	-	9.2	-	dBm
		G_p = 11 dB	-	9.0	-	dBm
		G_p = 3 dB	-	9.5	-	dBm
RL_{in}	input return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	34.0	-	dB
		G_p = 17 dB	-	31.6	-	dB
RL_{out}	output return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	14.8	-	dB
K	Rollett stability factor	0 GHz ≤ f ≤ 12.75 GHz	1	-	-	
f = 1880 MHz						
$I_{CC(tot)}$	total supply current	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	210	245	280	mA
$G_{p(min)}$	minimum power gain	$V_{ctrl(Gp)}$ = 3.3 V	-	–8.4	-	dB
$G_{p(max)}$	maximum power gain	$V_{ctrl(Gp)}$ = 0 V	-	20.4	-	dB
$G_{p(flat)}$	power gain flatness	1850 MHz ≤ f ≤ 1910 MHz; 3 dB ≤ G_p ≤ 17 dB	-	0.1	-	dB
NF	noise figure	G_p = 17 dB	-	9.9	-	dB
		G_p = 3 dB	-	19.8	-	dB
$IP3_I$	input third-order intercept point	2-tone; tone-spacing = 1.0 MHz				
		G_p = 17 dB	-	18.7	-	dBm
		G_p = 12 dB	-	19.7	-	dBm
		G_p = 11 dB	-	20.2	-	dBm
		G_p = 3 dB	-	18.6	-	dBm
$P_{i(1dB)}$	input power at 1 dB gain compression	G_p = 17 dB	-	5.8	-	dBm
		G_p = 12 dB	-	9.4	-	dBm
		G_p = 11 dB	-	9.3	-	dBm
		G_p = 3 dB	-	9.4	-	dBm

Table 8. Characteristics low gain mode *…continued*

GS = HIGH (see Table 9); V_{CC1} = 5 V; V_{CC2} = 5 V; T_{amb} = 25 °C; input and output 50 Ω; unless otherwise specified. All RF parameters have been characterized at the device RF input and RF output terminals.

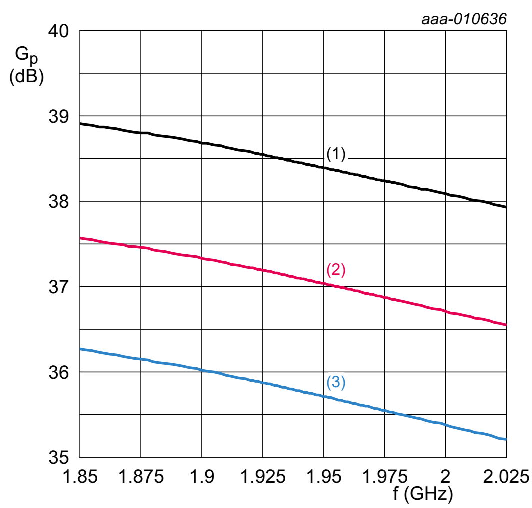
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
RL_{in}	input return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	26.9	-	dB
		G_p = 17 dB	-	27.3	-	dB
RL_{out}	output return loss	$V_{ctrl(Gp)}$ = 0 V (maximum power gain)	-	14.3	-	dB
K	Rollett stability factor	0 GHz ≤ f ≤ 12.75 GHz	1	-	-	

Table 9. Gain switch truth table

V_{CC1} = 5 V; V_{CC2} = 5 V; T_{amb} = 25 °C

Gain mode	GS	
	logic	$V_{I(GS)}$
high gain mode	LOW	0 V to 0.5 V
low gain mode	HIGH	2 V to 3.3 V

8.1 Graphs



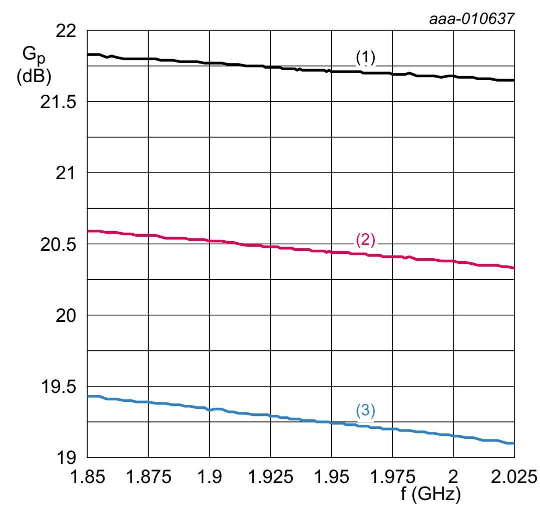
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 3. Power gain as a function of frequency in high gain mode; typical values



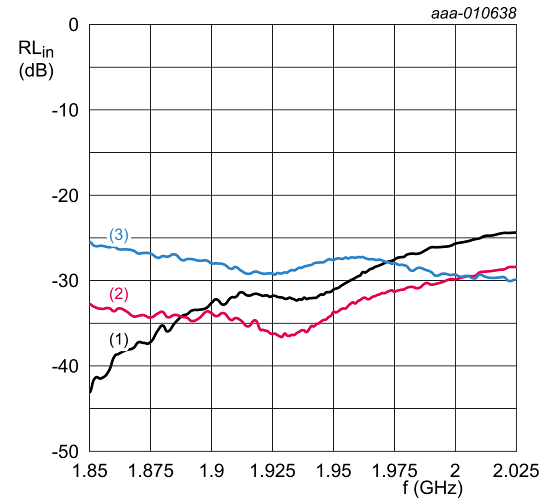
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 4. Power gain as a function of frequency in low gain mode; typical values



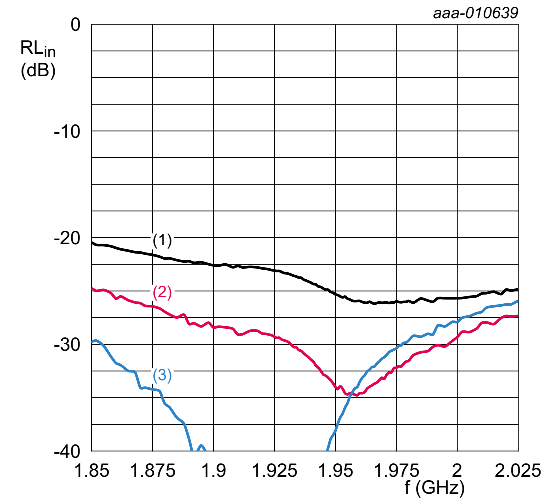
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 5. Input return loss as a function of frequency in high gain mode; typical values



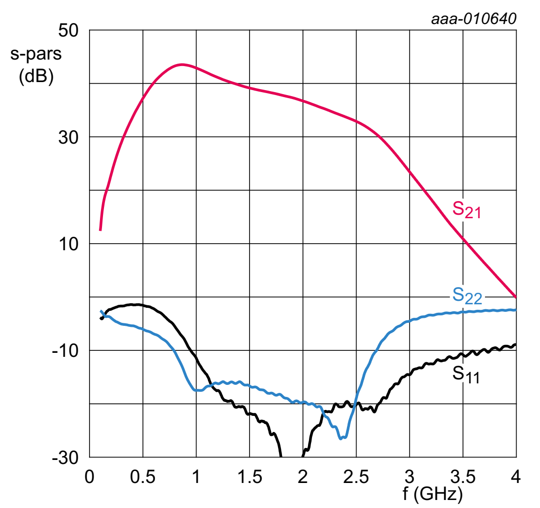
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

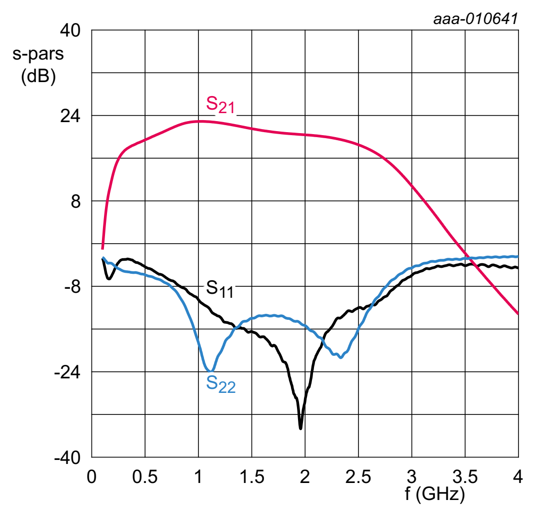
(3) T_{amb} = +85 °C

Fig 6. Input return loss as a function of frequency in low gain mode; typical values



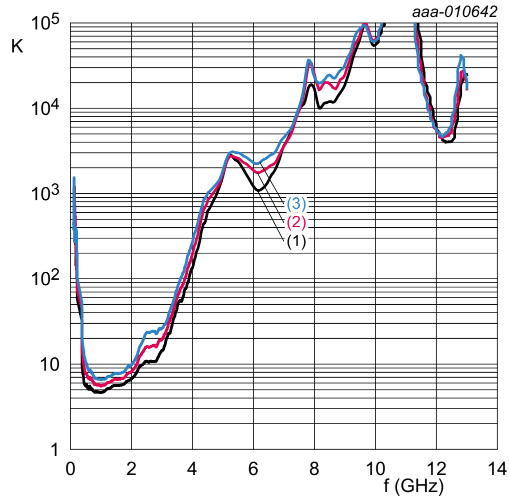
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V; T_{amb} = 25 °C.

Fig 7. S-parameters as a function of frequency in high gain mode; typical values



GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V; T_{amb} = 25 °C.

Fig 8. S-parameters as a function of frequency in low gain mode; typical values



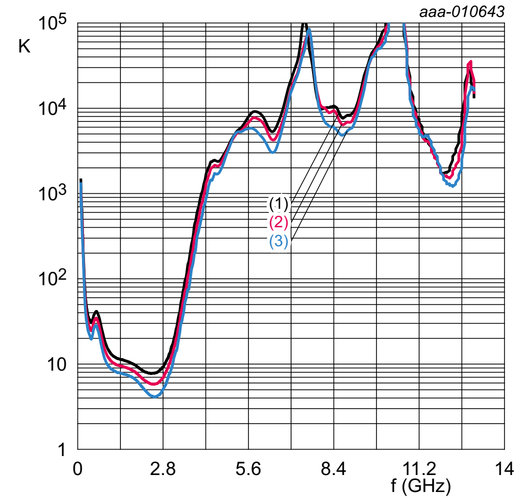
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V.

(1) T_{amb} = –40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 9. Rollett stability factor as a function of frequency in high gain mode; typical values



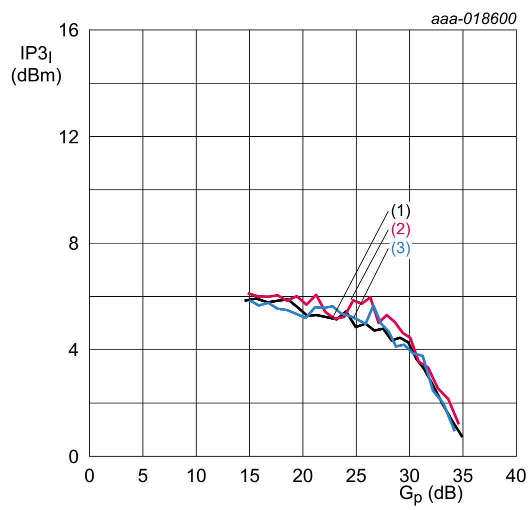
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; $V_{ctrl(Gp)}$ = 0 V.

(1) T_{amb} = –40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 10. Rollett stability factor as a function of frequency in low gain mode; typical values



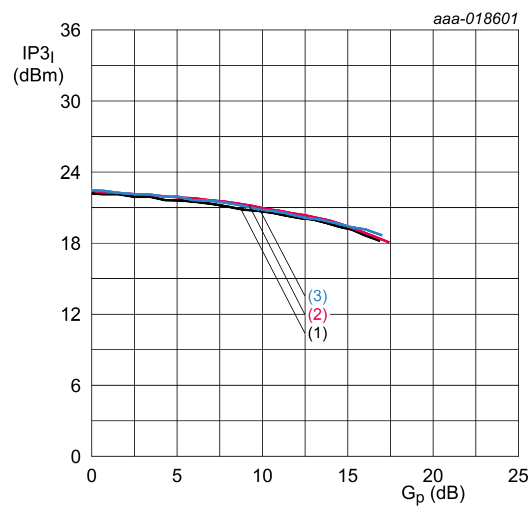
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1995 MHz.

(1) T_{amb} = –40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 11. Input third-order intercept point as a function of power gain in high gain mode; typical values



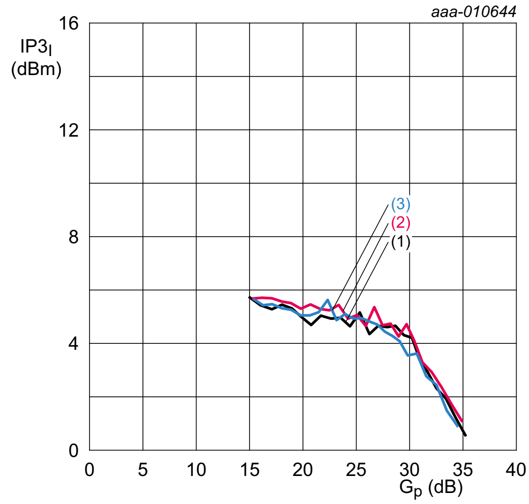
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1995 MHz.

(1) T_{amb} = –40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 12. Input third-order intercept point as a function of power gain in low gain mode; typical values



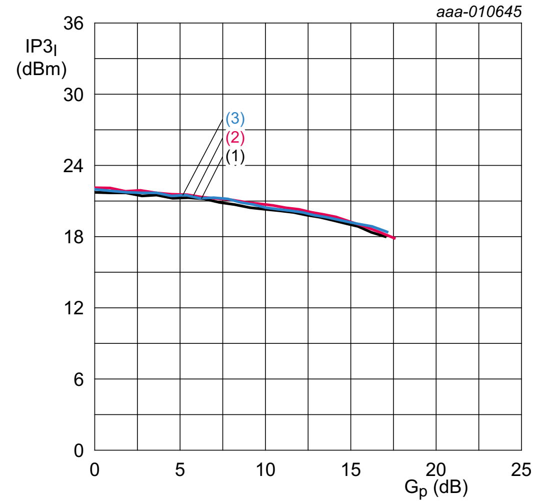
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 13. Input third-order intercept point as a function of power gain in high gain mode; typical values



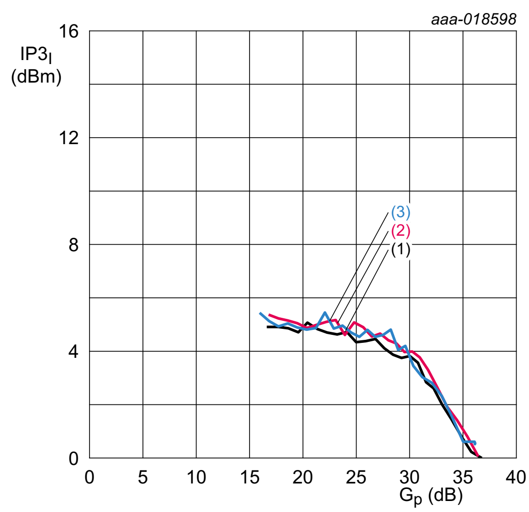
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 14. Input third-order intercept point as a function of power gain in low gain mode; typical values



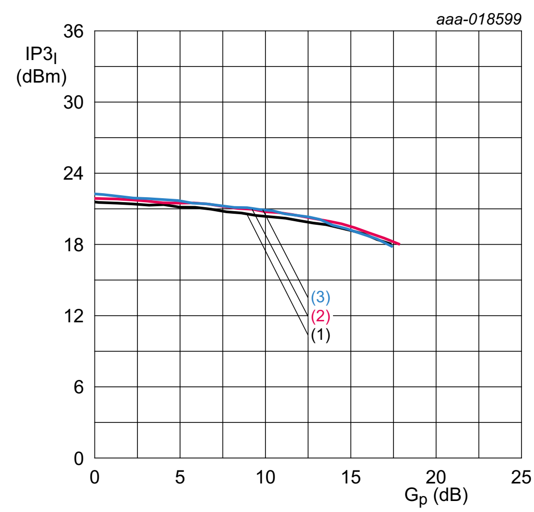
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 15. Input third-order intercept point as a function of power gain in high gain mode; typical values



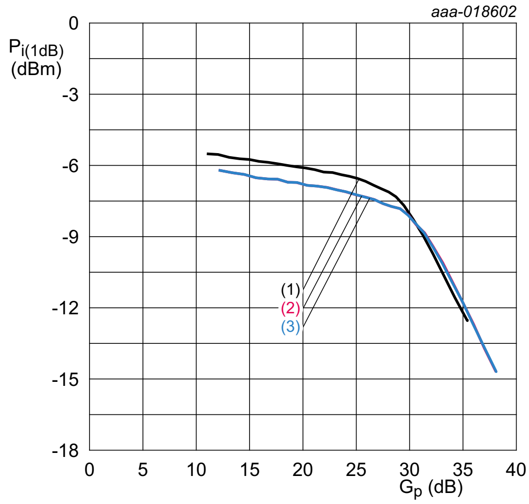
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 16. Input third-order intercept point as a function of power gain in low gain mode; typical values



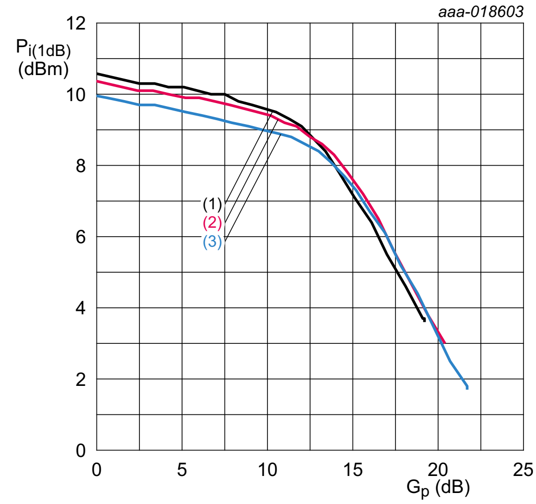
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1955 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 17. Input power at 1 dB gain compression as a function of power gain in high gain mode; typical values



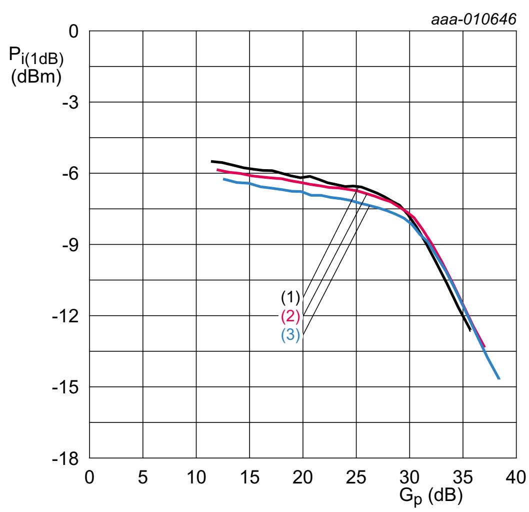
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1955 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 18. Input power at 1 dB gain compression as a function of power gain in low gain mode; typical values



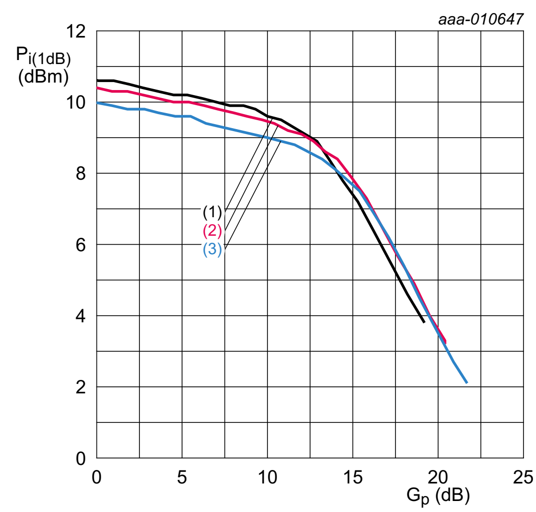
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 19. Input power at 1 dB gain compression as a function of power gain in high gain mode; typical values



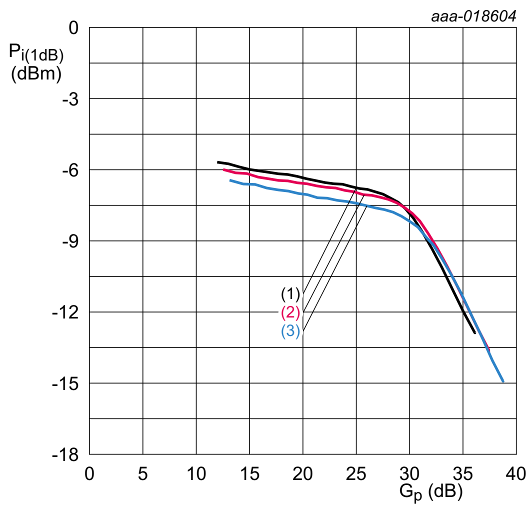
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 20. Input power at 1 dB gain compression as a function of power gain in low gain mode; typical values



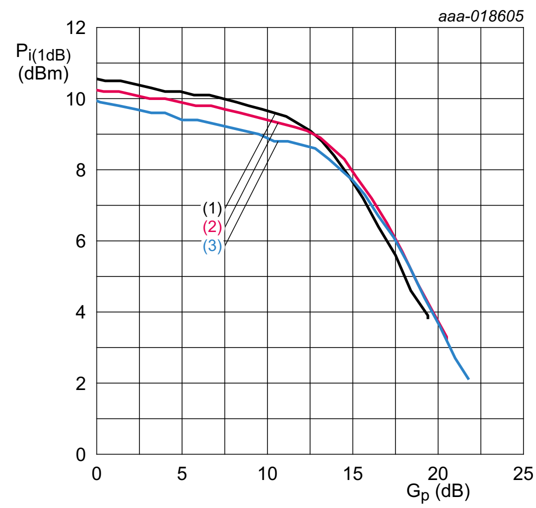
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 21. Input power at 1 dB gain compression as a function of power gain in high gain mode; typical values



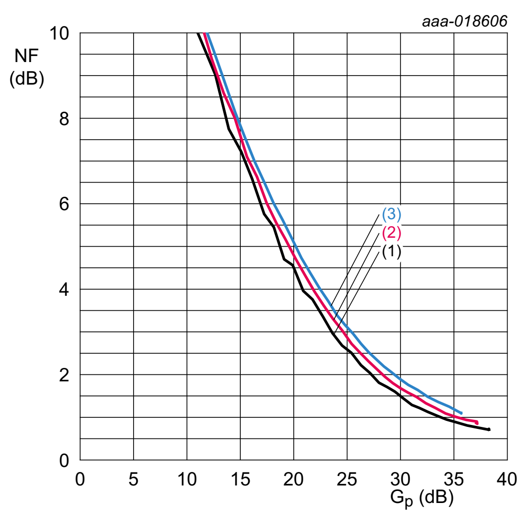
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 22. Input power at 1 dB gain compression as a function of power gain in low gain mode; typical values



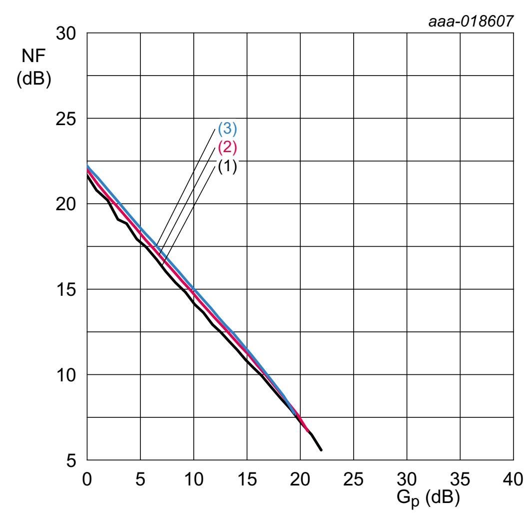
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1995 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 23. Noise figure as a function of power gain in high gain mode; typical values



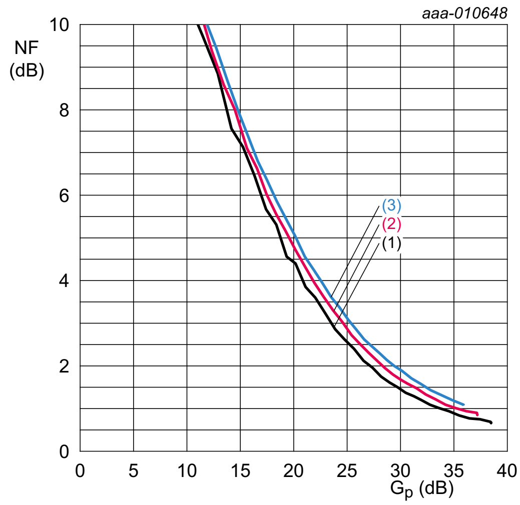
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1995 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 24. Noise figure as a function of power gain in low gain mode; typical values



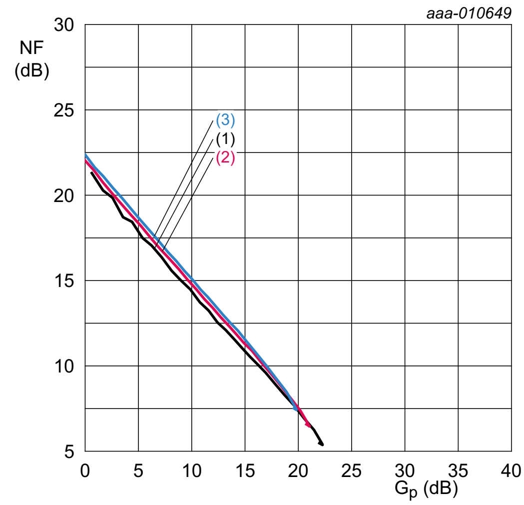
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 25. Noise figure as a function of power gain in high gain mode; typical values



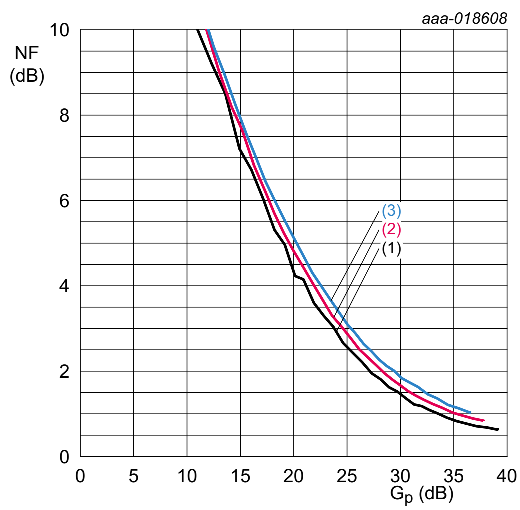
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 26. Noise figure as a function of power gain in low gain mode; typical values



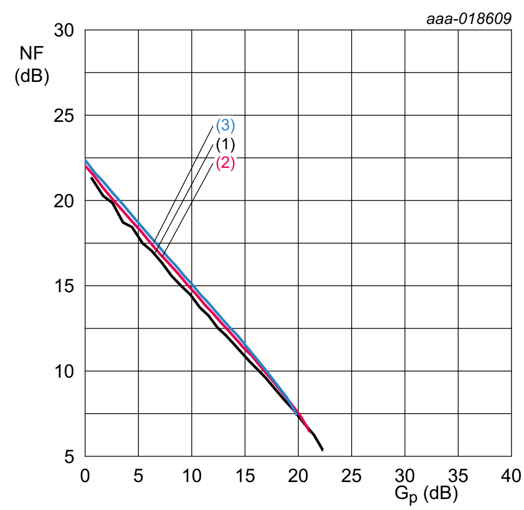
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 27. Noise figure as a function of power gain in high gain mode; typical values



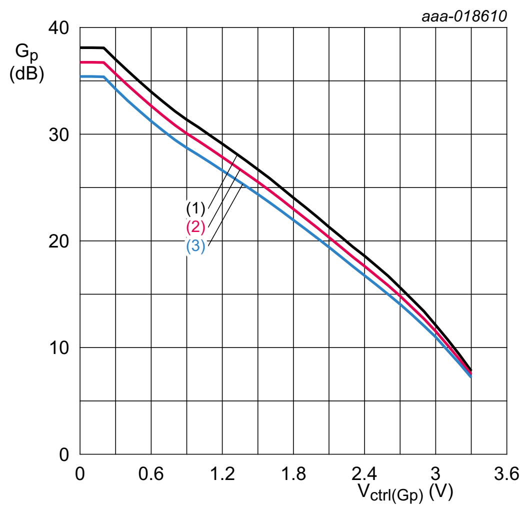
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 28. Noise figure as a function of power gain in low gain mode; typical values



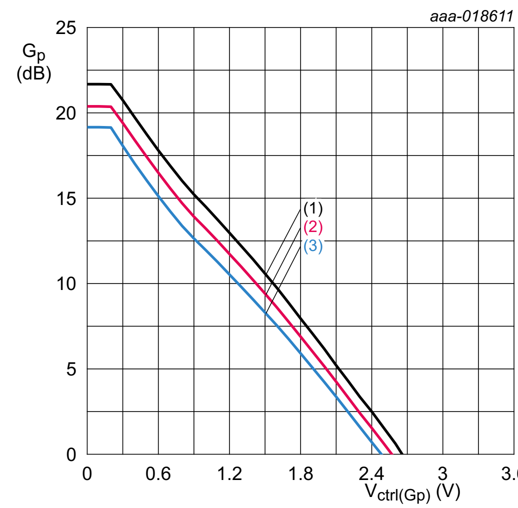
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1995 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 29. Power gain as a function of power gain control voltage in high gain mode; typical values



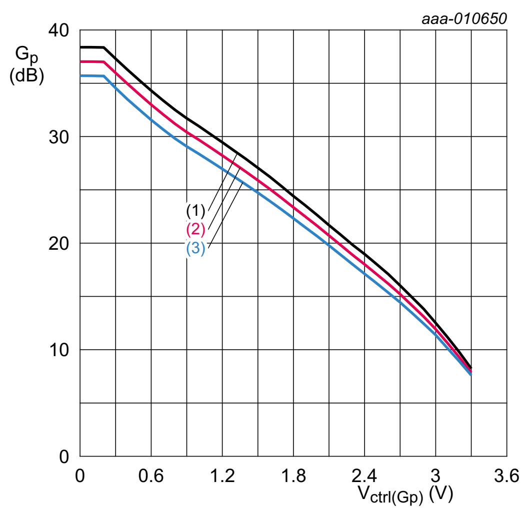
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1995 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 30. Power gain as a function of power gain control voltage in low gain mode; typical values



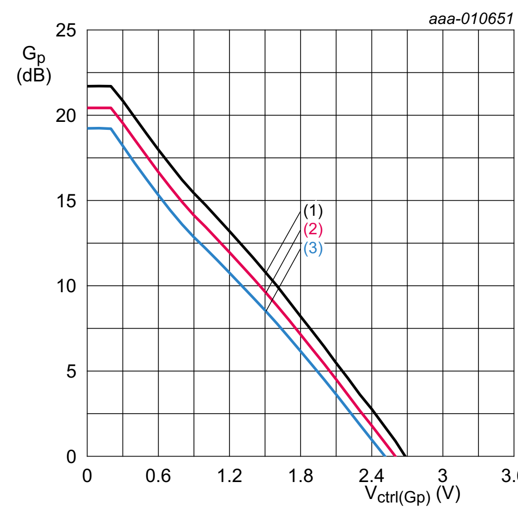
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 31. Power gain as a function of power gain control voltage in high gain mode; typical values



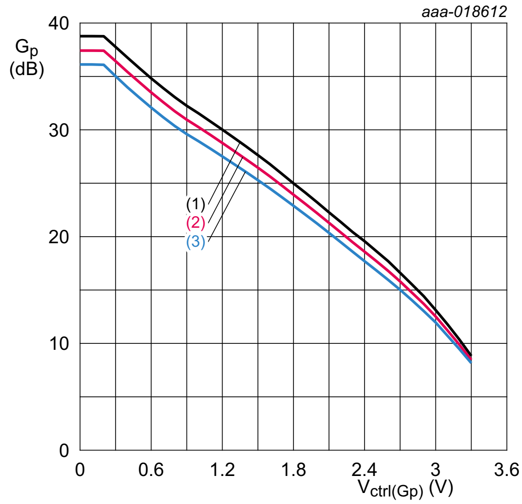
GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1950 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 32. Power gain as a function of power gain control voltage in low gain mode; typical values



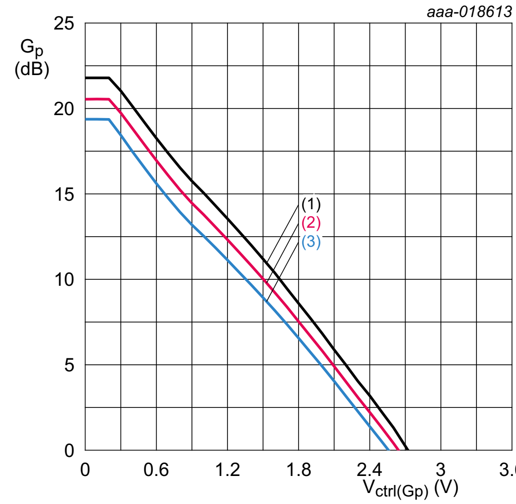
GS = LOW; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 33. Power gain as a function of power gain control voltage in high gain mode; typical values



GS = HIGH; V_{CC1} = 5 V; V_{CC2} = 5 V; f = 1880 MHz.

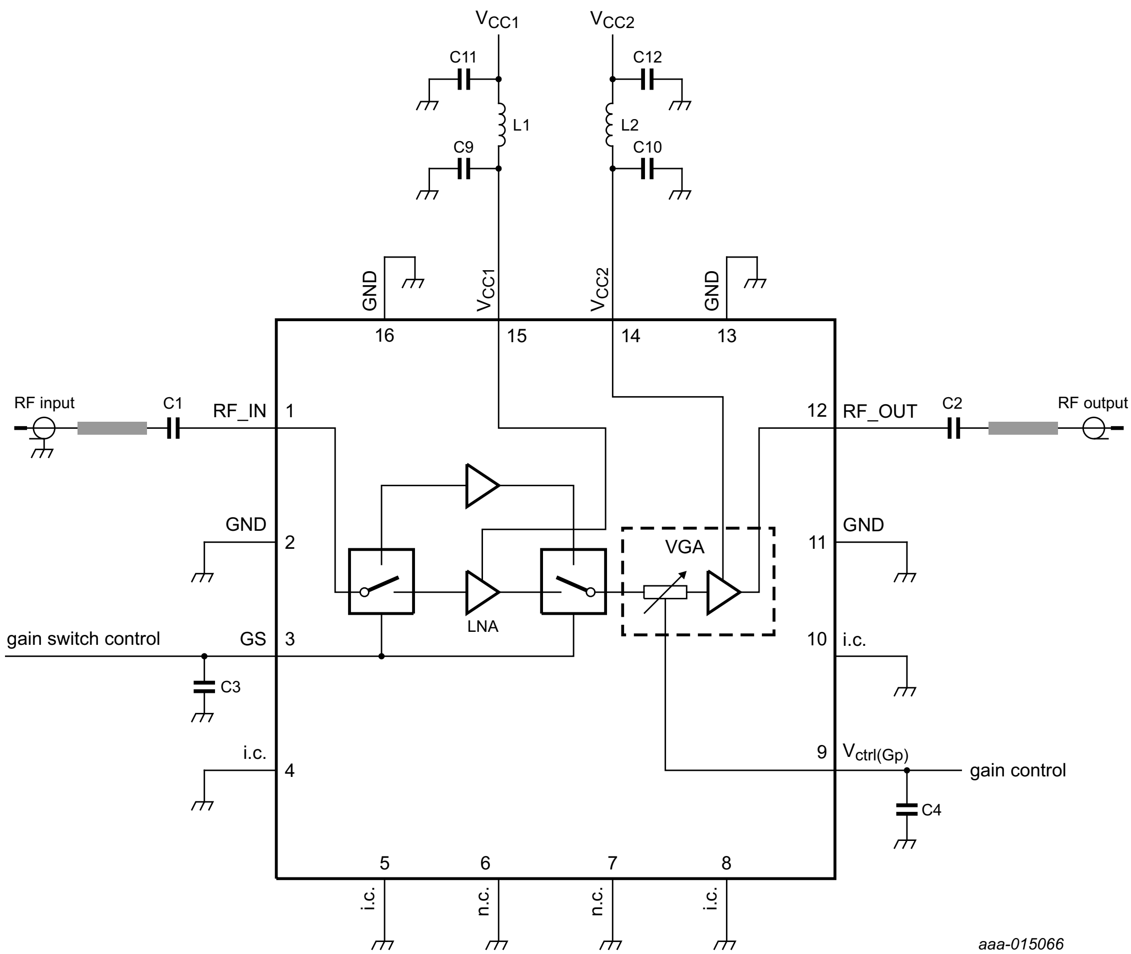
(1) T_{amb} = −40 °C

(2) T_{amb} = +25 °C

(3) T_{amb} = +85 °C

Fig 34. Power gain as a function of power gain control voltage in low gain mode; typical values

9. Application information



See Table 10 for a list of components.

Fig 35. Schematic layout for application circuit

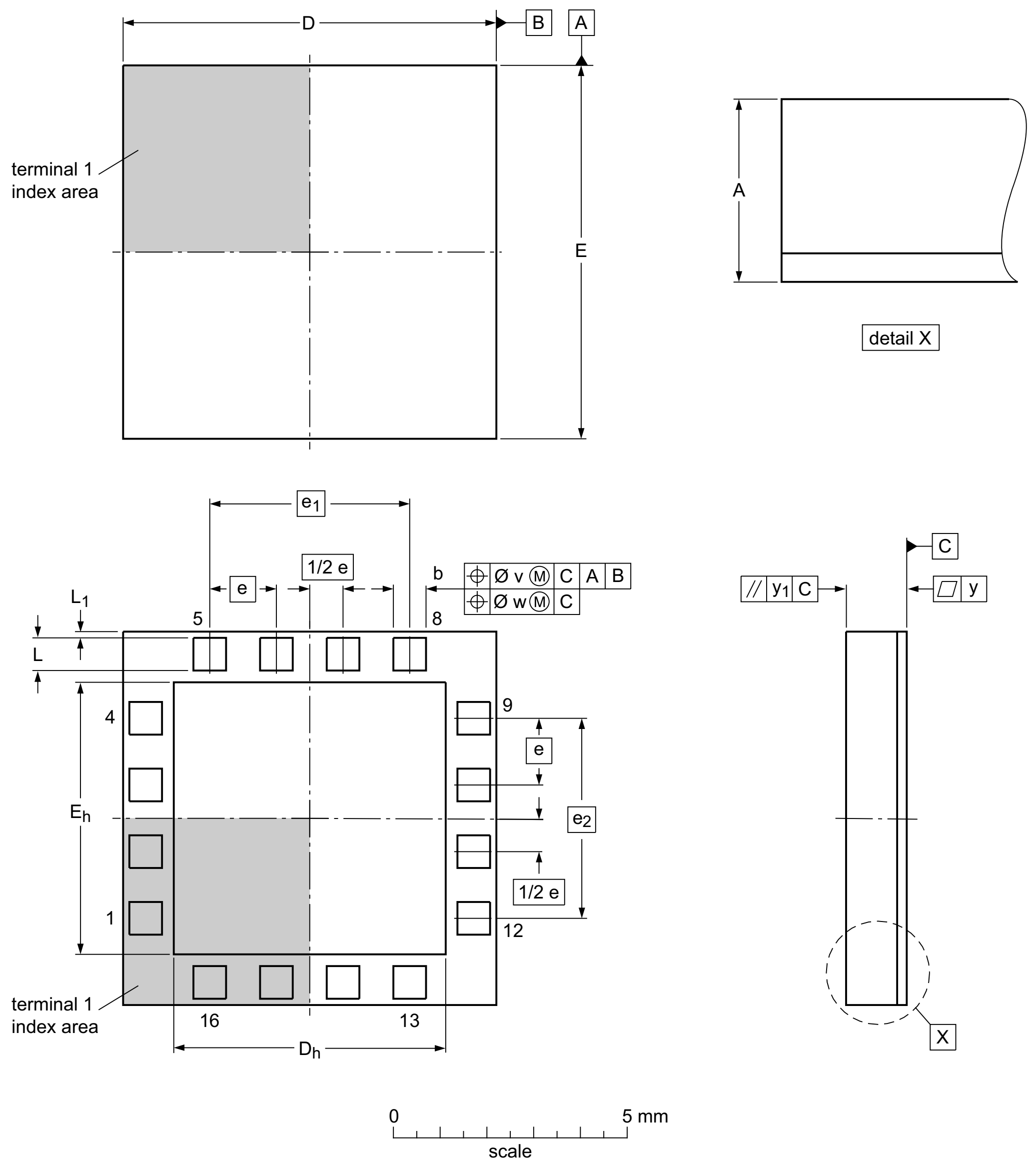
Table 10. List of components

For application circuit, see Figure 35.

Component	Description	Value	Remarks
C1, C2	capacitor	1 nF	SMD 0402; Murata GRM1555 series
C3, C4, C9, C10	capacitor	100 pF	SMD 0402; Murata GRM1555 series
C11, C12	capacitor	100 nF	SMD 0402; Murata GRM1555 series
L1, L2	inductor	10 nH	SMD 0402; Murata LQG15 series

10. Package outline

HLQFN16R: plastic thermal enhanced low profile quad flat package; no leads; 16 terminals; body 8 x 8 x 1.3 mm **SOT1301-1**



Dimensions

Unit		A	b	D	D_h	E	E_h	e	e_1	e_2	L	L_1	v	w	y	y_1
	max	1.40	0.75	8.1	5.85	8.1	5.85				0.75	0.15				
mm	nom	1.30	0.70	8.0	5.80	8.0	5.80	1.42	4.26	4.26	0.70	0.10	0.1	0.05	0.08	0.1
	min	1.25	0.65	7.9	5.75	7.9	5.75				0.65	0.05				

sot1301-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1301-1						~~11-08-23~~ 11-08-29

Fig 36. Package outline SOT1301-1 (HLQFN16R)

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11. Abbreviations

Table 11. Abbreviations

Acronym	Description
3G	Third Generation
ESD	ElectroStatic Discharge
LNA	Low Noise Amplifier
LTE	Long-Term Evolution

12. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BGU7073 v.6	20170215	Product data sheet	-	BGU7073 v.5
Modifications:	• Table 1 on page 2: updated the values for $I_{CC(tot)}$ • Table 7 on page 5: updated the values for $I_{CC(tot)}$ • Table 8 on page 7: updated the values for $I_{CC(tot)}$			
BGU7073 v.5	20170120	Product data sheet	-	BGU7073 v.4
Modifications:	• Section 1 on page 1: added BTS5001M according to our new naming convention			
BGU7073 v.4	20161215	Product data sheet	-	BGU7073 v.3
Modifications:	• Table 6 on page 5: The value for $R_{th(j-case)}$ has been updated.			
BGU7073 v.3	20151109	Product data sheet	-	BGU7073 v.2
Modifications:	• Section 1.1 on page 1: The value of the noise figure has been updated. • Section 1.2 on page 1: Several values have been updated. • Table 1 on page 2: Several values have been updated. • Table 6 on page 5: The value for $R_{th(j-case)}$ has been updated. • Figure 2 on page 4: The functional diagram has been updated. • Table 7 on page 5: Several values have been updated. • Table 8 on page 7: Several values have been updated. • Section 8.1 on page 8: The graphs have been updated. • Section 9 on page 17: The application information has been updated.			
BGU7073 v.2	20150319	Product data sheet	-	BGU7073 v.1
BGU7073 v.1	20140128	Product data sheet	-	-

13. Legal information

13.1 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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Date of release: 15 February 2017

Document identifier: BGU7073