

ALUM RF

Product Overview

June 2023

Technology
Partner



800.348.5580
630.208.2200



rellpower.com
rellpower@rell.com

Altum RF: Key Product Groups

- Distributed Amplifiers
- Power Amplifiers
- Low Noise / Driver Amplifiers
- Integrated Front-End
- Switches
- Attenuators (details on request)
- Phase Shifters (details on request)



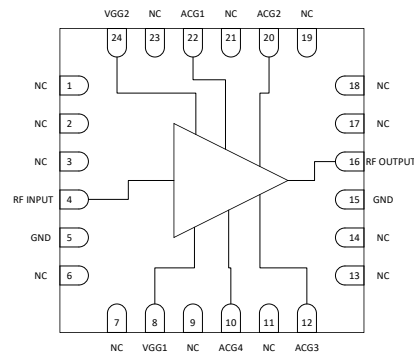
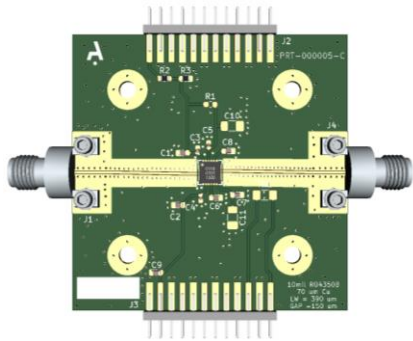
Distributed Amplifiers

Distributed Amplifiers	Min. Frequency (GHz)	Max. Frequency (GHz)	Gain (dB)	P1dB (dBm)	P _{SAT} (dBm)	OIP3 (dBm)	Bias Voltage (V)	Bias Current (mA)	Package	Sampling
ARF1300Q4	DC	24	13	21.5	23.6	30	10	130	4 × 4 QFN	NOW
ARF1301Q5	DC	18	12.5	28	30	37.5	12	310	5 × 5 QFN	NOW
ARF1303	DC	60	15	22	24	TBD	6	240	Bare Die	NOW
ARF1303Q6	DC	50	14	22	24	TBD	6	240	6 × 6 QFN	Q3 2023
ARF1304Q5	DC	26.5	15	23	25	33	10	150	5 × 5 QFN	NOW
ARF1306C5	2	18	15		34	38.5	24	450	5 × 5 Ceramic	NOW
ARF1306	2	20	16		34.5	TBD	24	450	Bare Die	NOW
ARF1307C7	2	20	18	35	40	42.5	28	950	7 × 7 Ceramic	NOW
ARF1307	2	20	18	35	40	TBD	28	950	Bare Die	NOW
ARF1312Q6	DC	26.5	15	29.5	32	TBD	20	450	6 × 6 QFN	NOW



ARF1300Q4

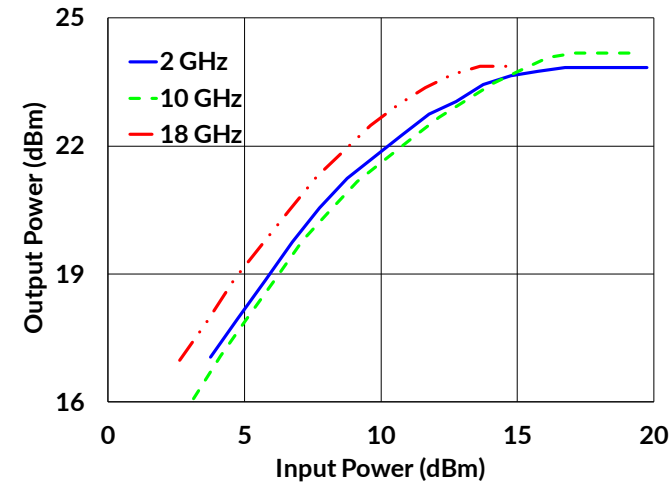
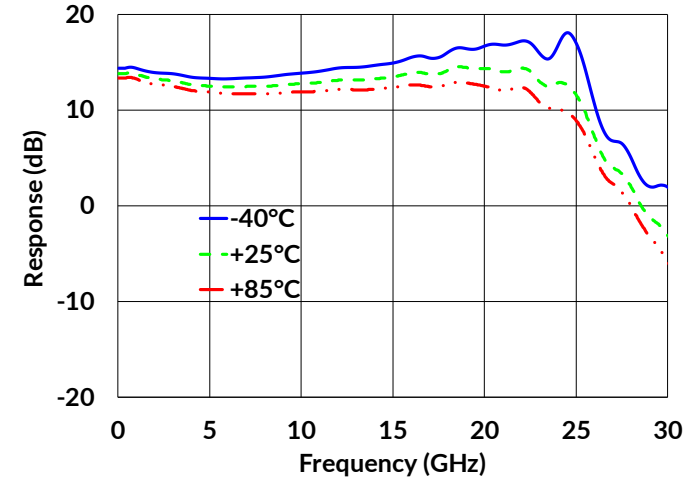
- DC - 24 GHz Distributed Amplifier
- 13 dB Gain
- 23.6 dBm Output P_{SAT}
- > 10 dB Input/Output Return Loss
- 30 dBm Output IP3
- 4 mm x 4 mm QFN Package



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Measured Gain at -40°, 25° and 85°C

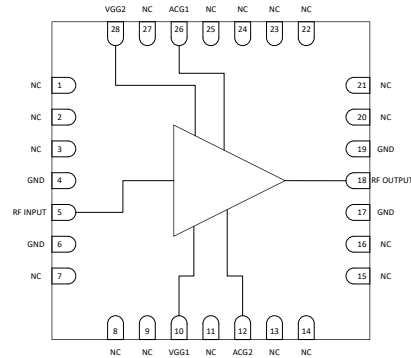
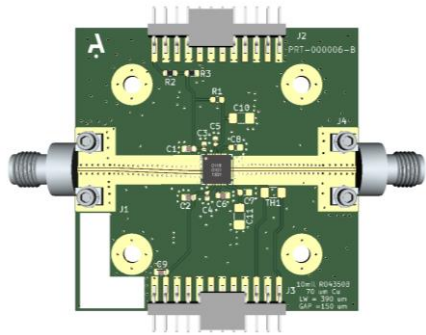


Output Power



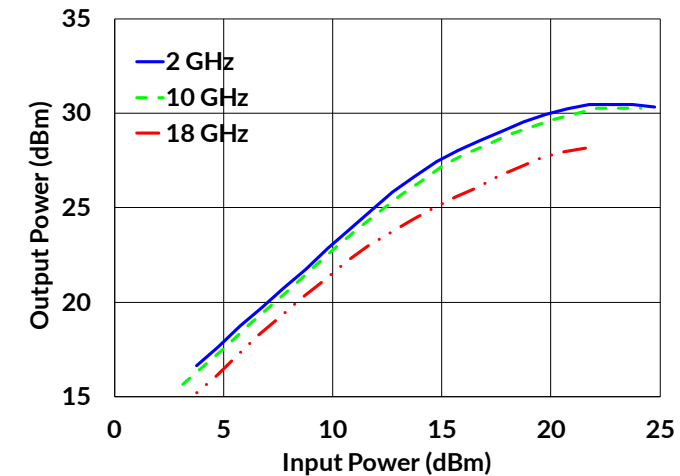
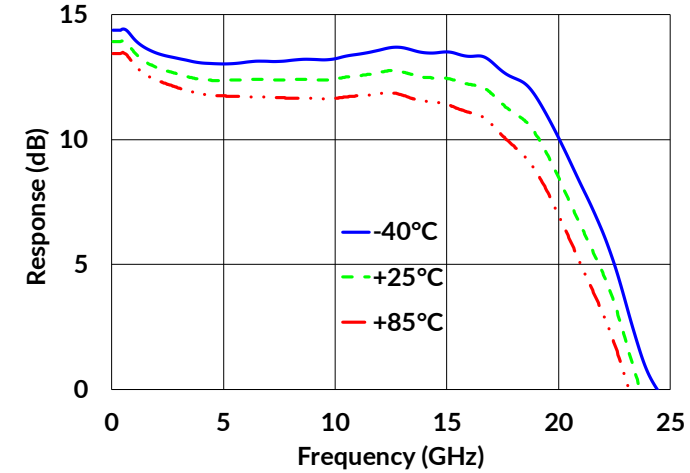
ARF1301Q5

- DC - 18 GHz Distributed Amplifier
- 12.5 dB Gain
- 30 dBm Output P_{SAT}
- > 10 dB Input/Output Return Loss
- 37.5 dBm Output IP3
- 5 mm x 5 mm QFN Package



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Measured Gain at -40°, 25° and 85°C



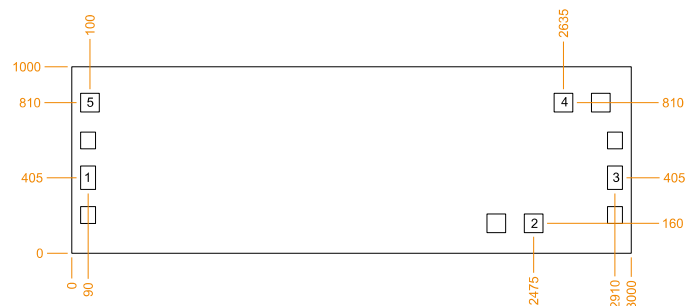
Output Power

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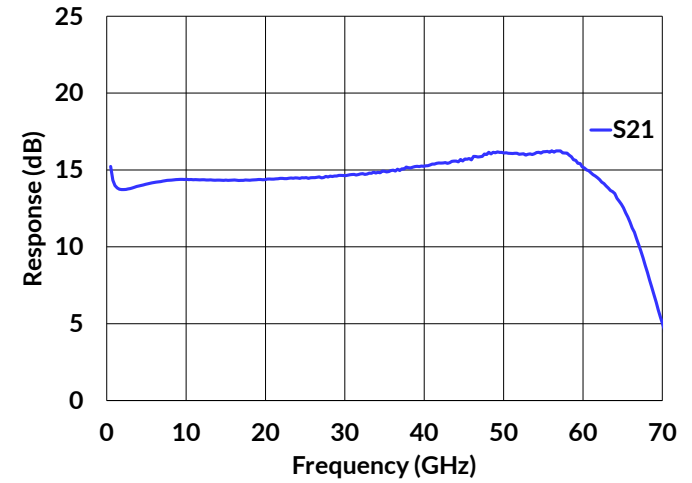
ARF1303

- DC - 60 GHz Distributed Amplifier
- 15 dB Gain
- 24 dBm Output power
- > 10 dB Input and Output Return Loss
- 3.5 dB Noise Figure
- 6V, 140 mA
- Bare die 3.00x1.40x0.05 mm

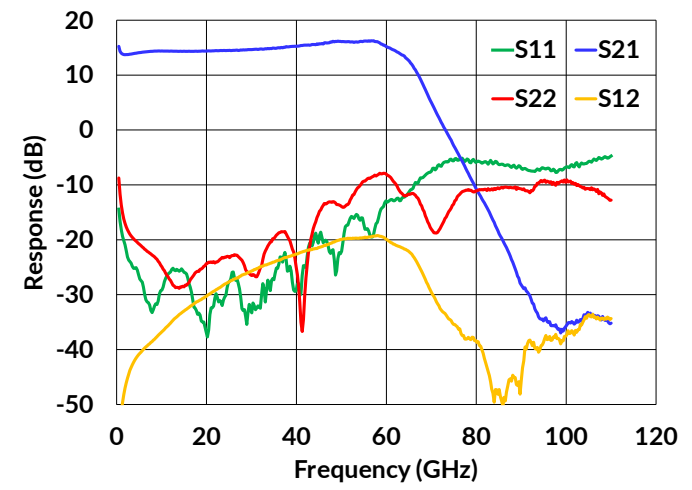


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Gain*



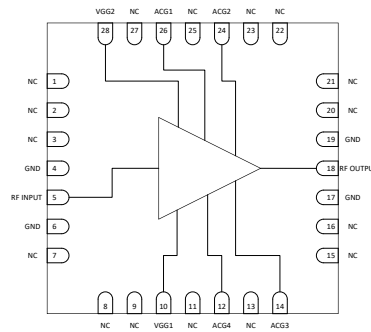
Broadband On-Wafer S-Parameters*

*uncompensated, on-wafer measurement



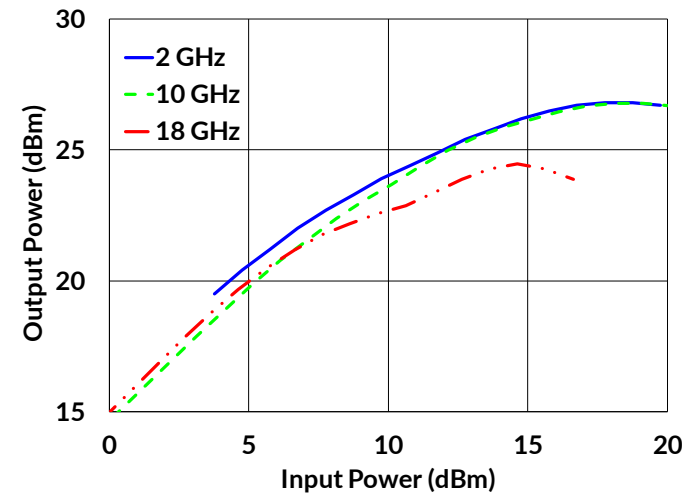
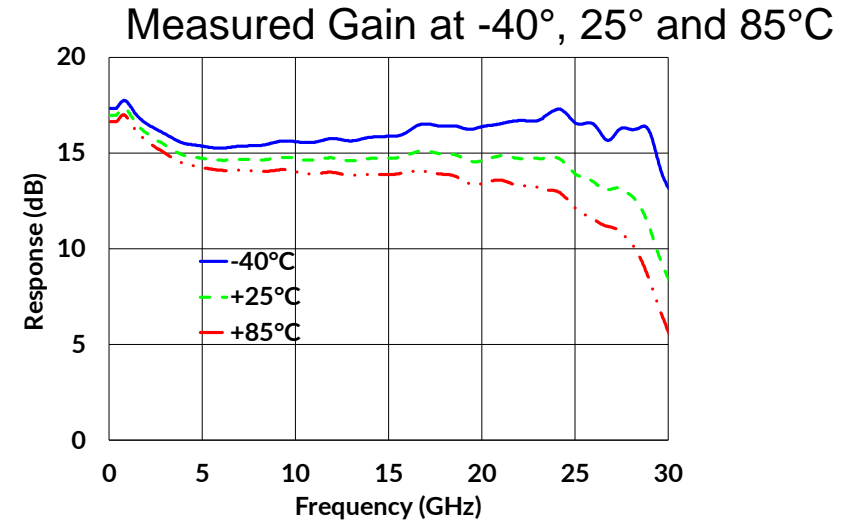
ARF1304Q5

- DC - 26.5 GHz Distributed Amplifier
- 15 dB Gain
- 25 dBm Output P_{SAT}
- > 12 dB Input/Output Return Loss
- 33 dBm Output IP3
- 5 mm x 5 mm QFN Package



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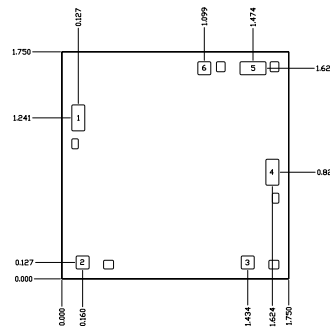
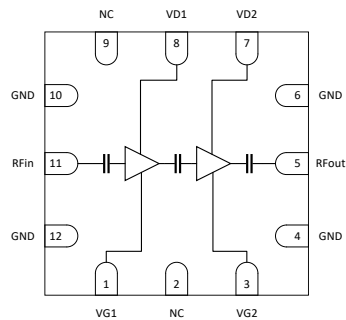
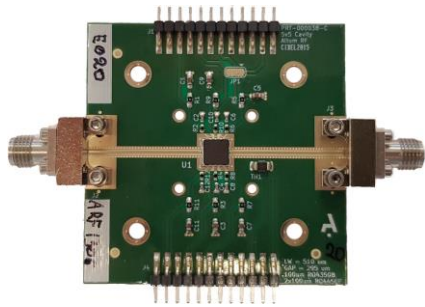


Output Power

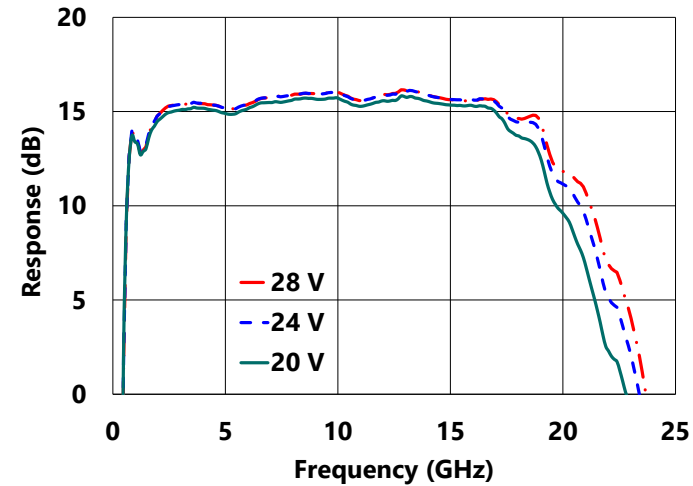


ARF1306(C5)

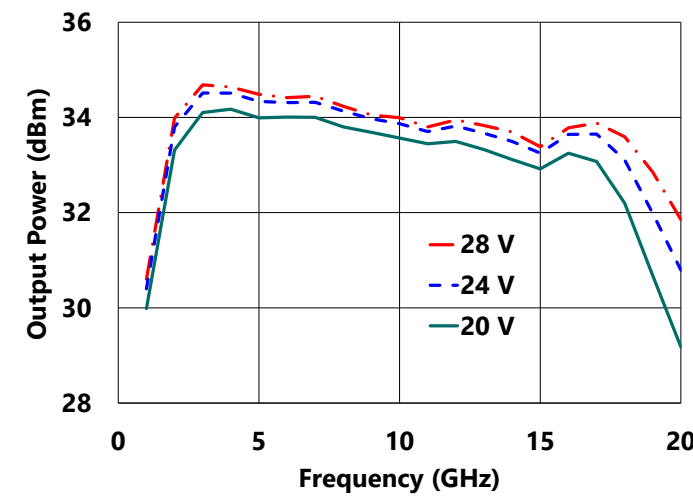
- 2 - 18 GHz Distributed Amplifier
- 15 dB Small-Signal Gain
- 34 dBm Output P_{SAT}
- 10 dB Power Gain
- >12 dB Input/Output Return Loss
- 5 mm x 5 mm Ceramic Package or Bare Die



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Gain



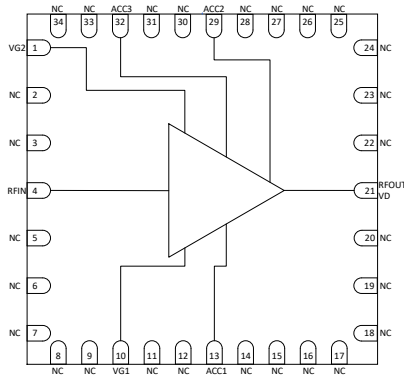
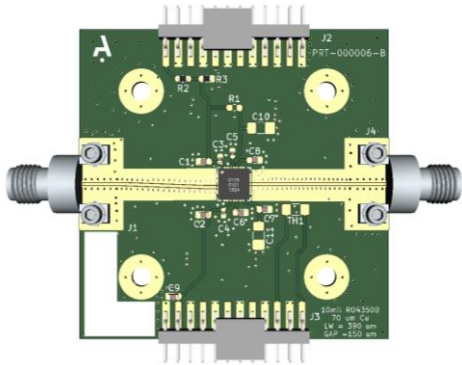
Output Power

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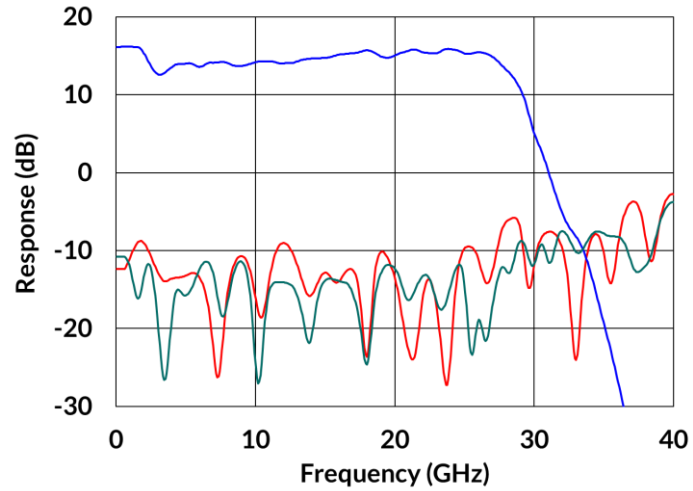


ARF1312Q6

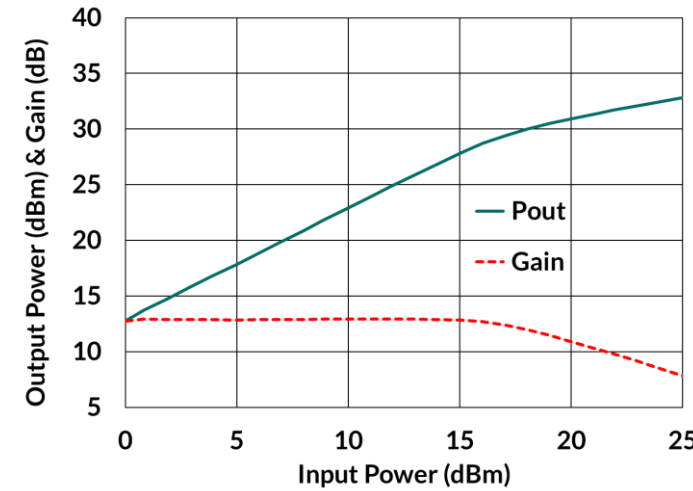
- DC – 26.5 GHz Distributed Amplifier
- 15 dB Small Signal Gain
- 32 dBm Output P_{SAT} at 10 GHz
- > 10 dB Input and Output Return Loss
- 6 mm x 6 mm QFN Package



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Gain, S₁₁, S₂₂



Gain and Power at 10 GHz

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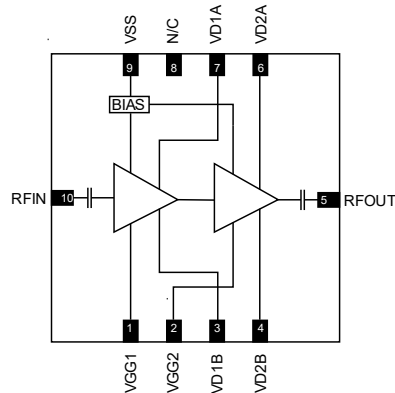
Power Amplifiers: X-, Ku- and K- band

Power Amplifier	Min. Frequency (GHz)	Max. Frequency (GHz)	Gain (dB)	P1dB (dBm)	P _{SAT} (dBm)	OIP3 (dBm)	Bias Voltage (V)	Bias Current (mA)	Package	Sampling
ARF1001C7	8	11	25	36	37	TBD	-5/8	1450	7 x 7 Ceramic	NOW
ARF1002C7	8	11	24	39	40	TBD	-5/8	2800	7 x 7 Ceramic	NOW
ARF1003C7	8.5	10.5	18	41	42	TBD	-5/8	4500	7 x 7 Ceramic	NOW
ARF1009Q5	9	11	40	38	40	45	-1.9/22	200	5 x 5 QFN	NOW
ARF1020Q5	9	11	27	39	40	45	-1.9/22	180	5 x 5 QFN	NOW
ARF1021Q5	9	12	29	34	37	TBD	-1.9/22	100	5 x 5 QFN	Q2 2023
ARF1022Q4	8	12	30	31	34	TBD	-1.9/22	80	4 x 4 QFN	Q2 2023
ARF1108Q4	8.5	12	23	26.5	27	TBD	-0.6/8	170	4 x 4 QFN	NOW
ARF1109Q4	8	12	25	29	30	TBD	-0.8/8	230	4 x 4 QFN	NOW
ARF1110Q4	8	12	25	31	33	TBD	-0.9/8	330	4 x 4 QFN	NOW
ARF1111Q4	13	17.5	22	27	28	TBD	-0.95/8	85	4 x 4 QFN	NOW
ARF1112Q4	13.5	17	24	29	30	TBD	-0.75/8	270	4 x 4 QFN	NOW
ARF1113Q4	13.5	17.5	19	31.5	33	TBD	-0.6/8	720	4 x 4 QFN	NOW
ARF1114Q4	17	23	24	25	26	TBD	-0.6/7	170	4 x 4 QFN	NOW



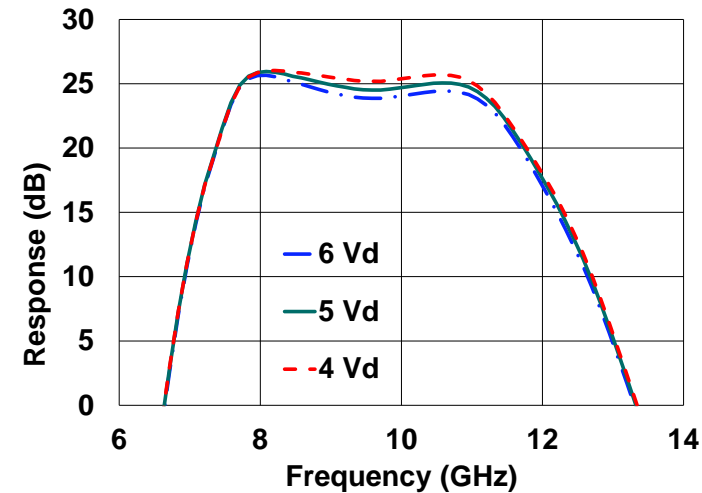
ARF1001C7

- 8 - 11 GHz Power Amplifier
- 37 dBm Output P_{SAT}
- 40% PAE
- 25 dB Small-Signal Gain
- >10 dB Input/Output Return Loss
- 7 mm x 7 mm Ceramic Package

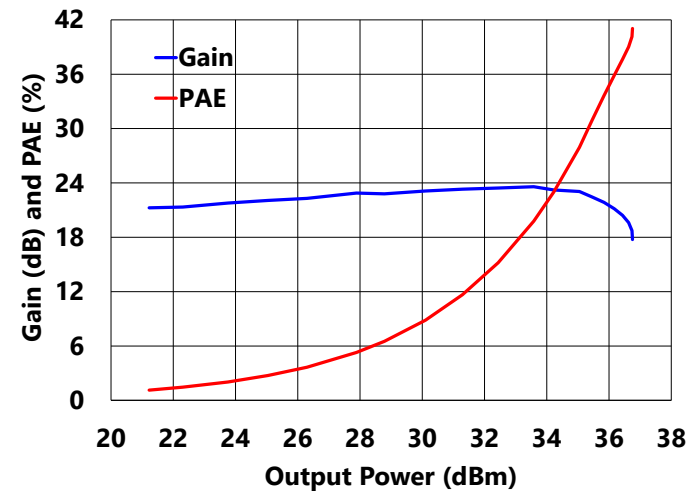


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Gain (CW)

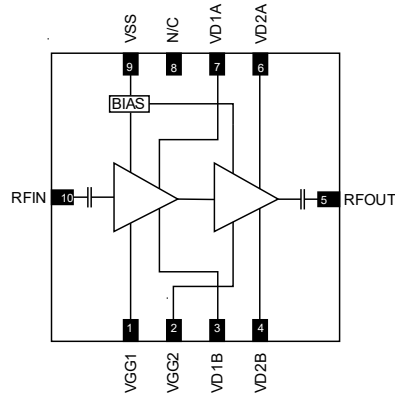


Power Gain
PAE at 10 GHz
(CW)



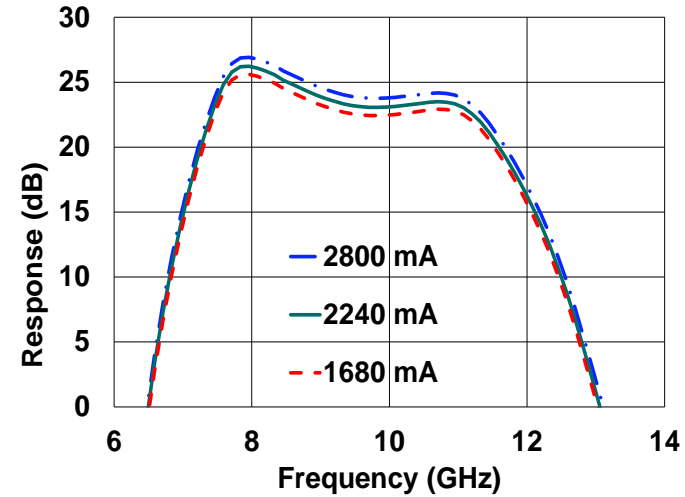
ARF1002C7

- 8 - 11 GHz Power Amplifier
- 40 dBm Output P_{SAT}
- 39% PAE
- 24 dB Small-Signal Gain
- >10 dB Input/Output Return Loss
- High-Performance 7 × 7 mm Ceramic Package

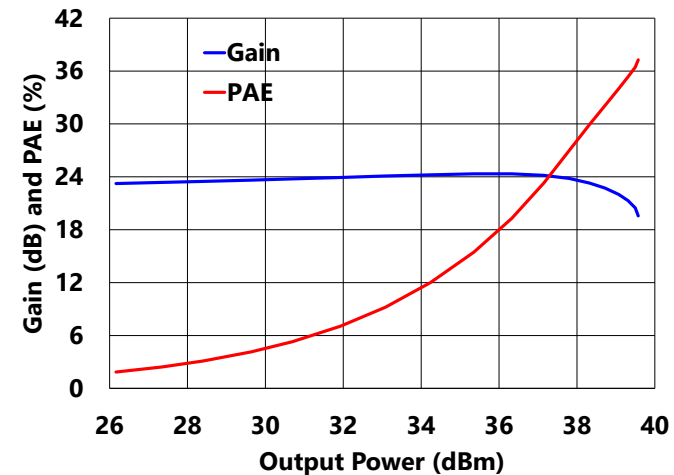


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Gain (CW)

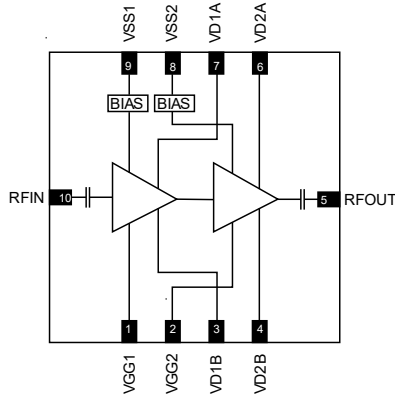


Power Gain
PAE at 10 GHz
(CW)



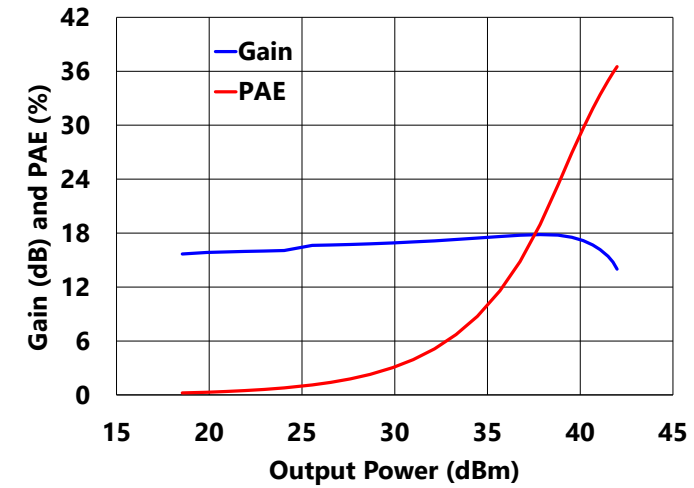
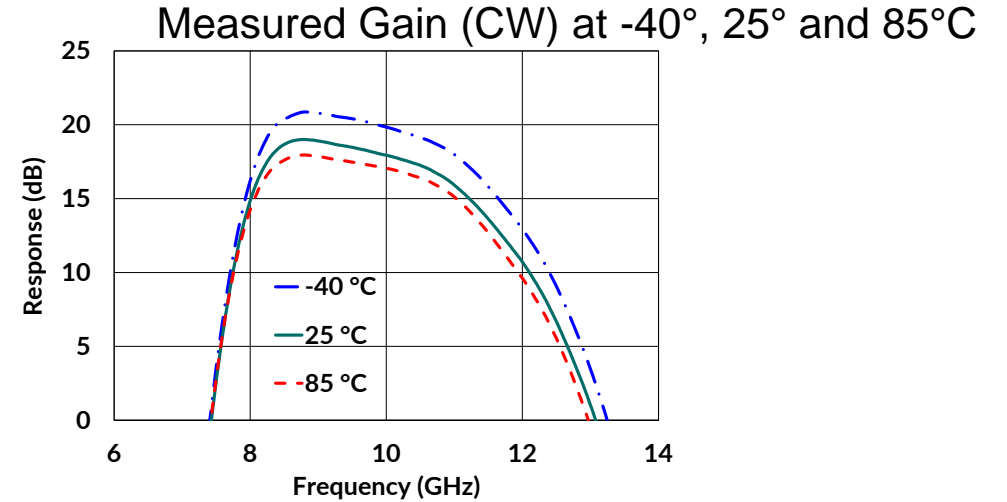
ARF1003C7

- 8.5 - 10.5 GHz Power Amplifier
- 42 dBm Output P_{SAT}
- 37% PAE
- 18 dB Small-Signal Gain
- >10 dB Input and Output Return Loss
- High-Performance 7 × 7 mm Ceramic Package



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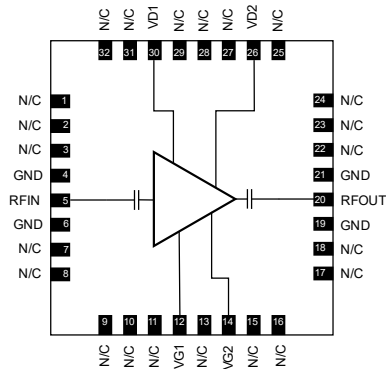


Power Gain
PAE at 10 GHz
(CW)



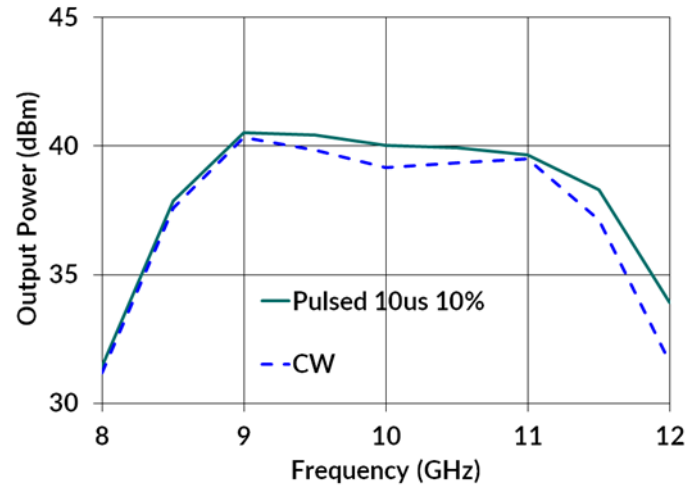
ARF1009Q5

- 9 – 11 GHz Power Amplifier
- 40 dBm Output PSAT at 30 dB Power Gain
- 40 % PAE (CW Operation)
- 5 mm x 5 mm 32L QFN Package
- 20 – 26 V Operation
- Also available as bare die

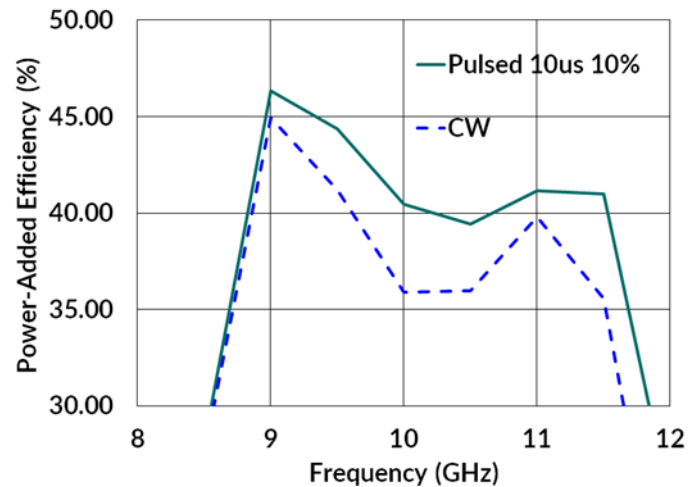


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Output power
 $P_{IN} = 10$ dBm
 $V_D = 22$ V,
 $I_{DQ} = 150$ mA

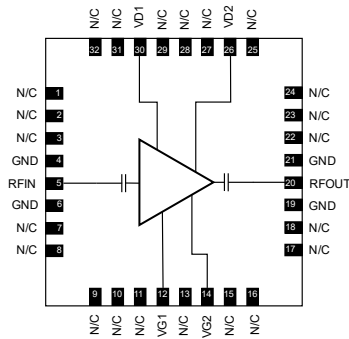


PAE
 $P_{IN} = 10$ dBm
 $V_D = 22$ V,
 $I_{DQ} = 150$ mA



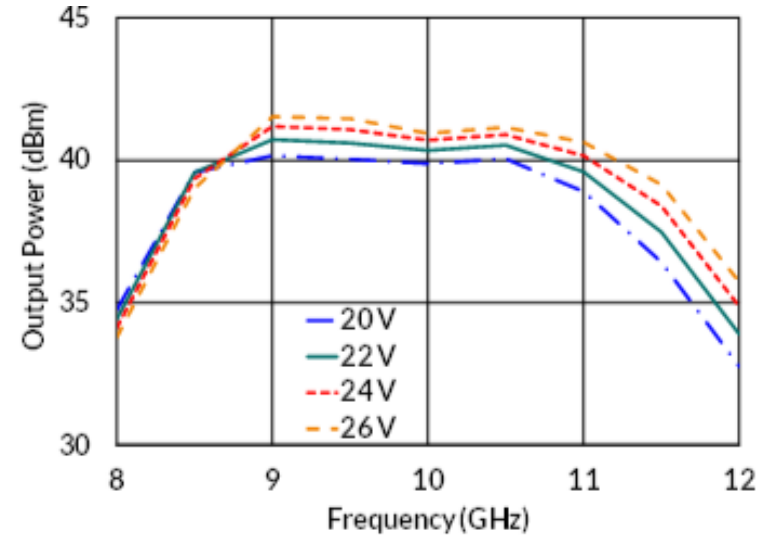
ARF1020Q5

- 9 – 11 GHz Power Amplifier
- 40 dBm Output PSAT at 20 dB Power Gain
- 42 % PAE (CW operation)
- 5 mm x 5 mm 32L QFN Package
- 20 – 26 V Operation
- Also available as bare die

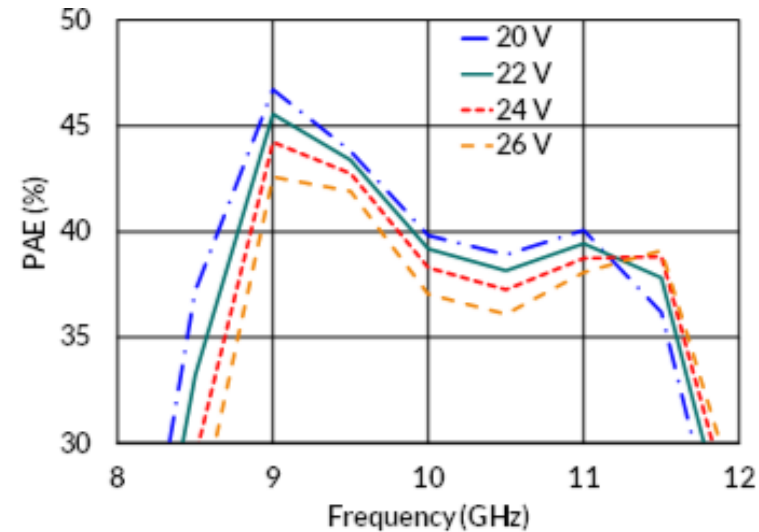


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Output power
 $P_{IN} = 20$ dBm
 VD = As indicated
 $IDQ = 144$ mA

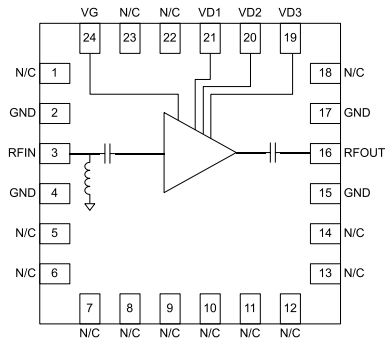


PAE
 $P_{IN} = 20$ dBm
 VD = As indicated
 $IDQ = 144$ mA



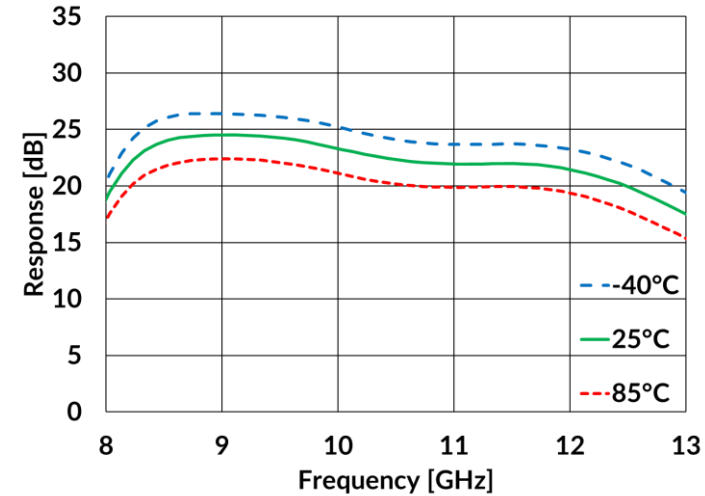
ARF1108Q4

- 8.5 – 12 GHz Driver Amplifier
- 27 dBm Saturated Output Power
- 23 dB Linear Gain
- > 10 dB Input and Output Return Loss
- 40 % PAE at 10 GHz
- 4 mm x 4 mm QFN Package



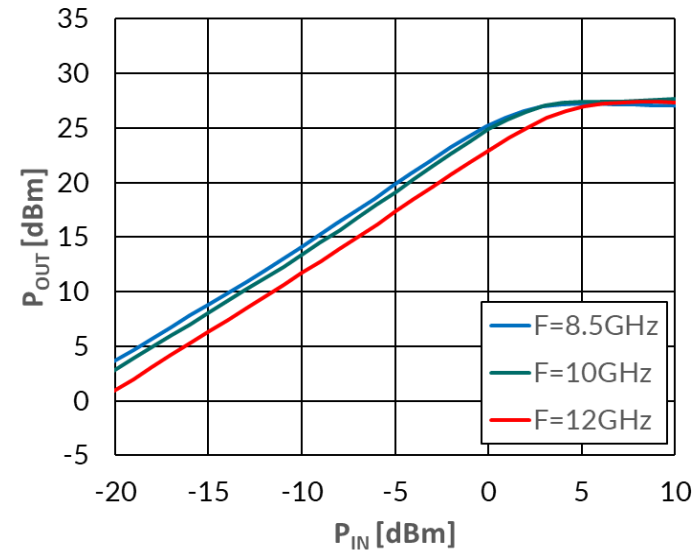
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Small Signal Gain

$V_D = 8 \text{ V}$,
 $V_G = -0.6 \text{ V}$,
 $I_{DQ} = 170 \text{ mA}$

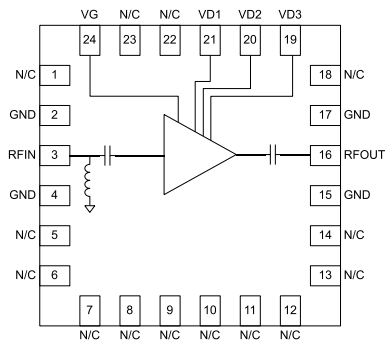


Output power

$V_D = 8 \text{ V}$,
 $V_G = -0.6 \text{ V}$,
 $I_{DQ} = 170 \text{ mA}$

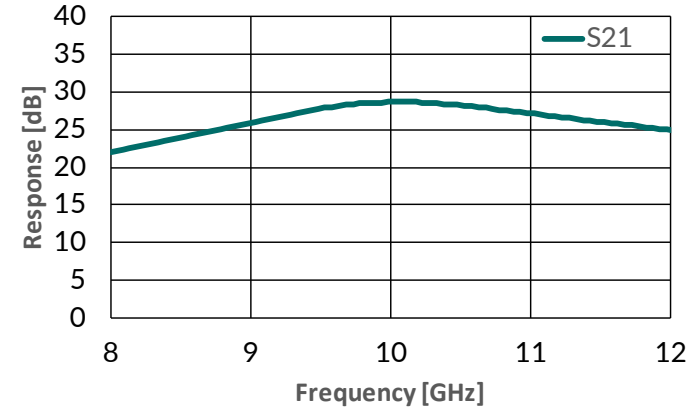
ARF1109Q4

- 8 – 12 GHz Driver Amplifier
- 30 dBm Saturated Output Power
- 25 dB Gain
- > 10 dB Input and Output Return Loss
- 42 % PAE at 10 GHz
- 4 mm x 4 mm QFN Package



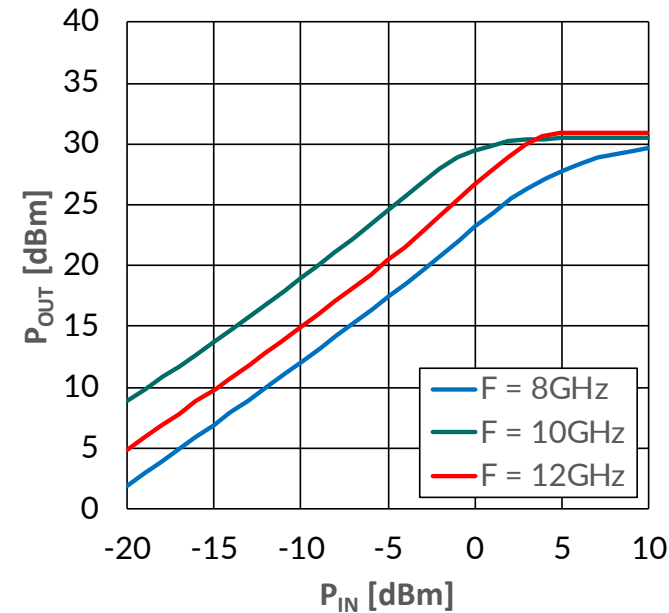
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Small Signal Gain

$V_D = 8 \text{ V}$,
 $V_G = -0.8 \text{ V}$,
 $I_{DQ} = 225 \text{ mA}$



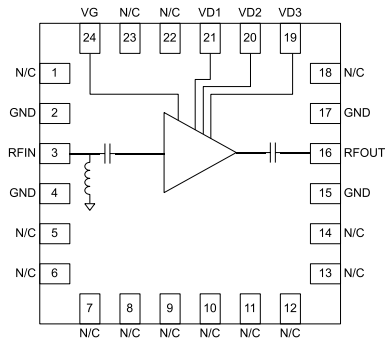
Output power

$V_D = 8 \text{ V}$,
 $V_G = -0.8 \text{ V}$,
 $I_{DQ} = 229 \text{ mA}$

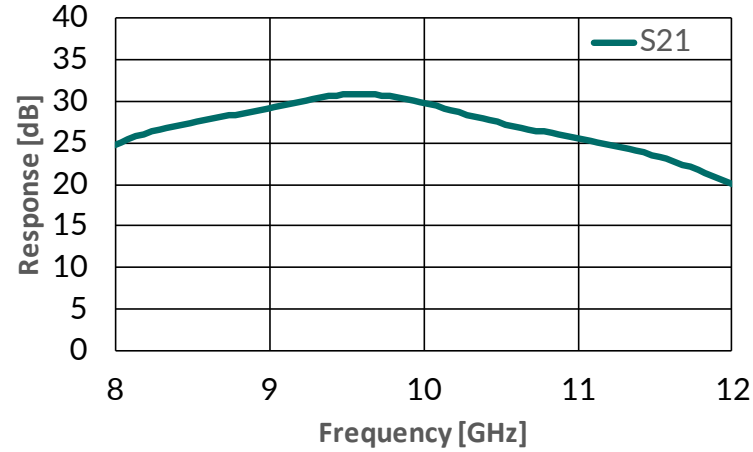


ARF1110Q4

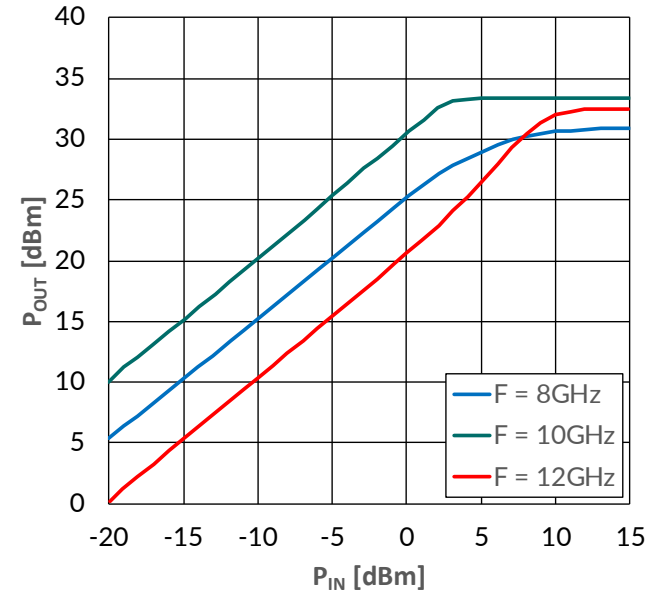
- 8 –12 GHz Driver Amplifier
- 33 dBm Saturated Output Power
- 25 dB Gain
- > 10 dB Input and Output Return Loss
- 38 % PAE at 10 GHz
- 4 mm x 4 mm QFN Package



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Small Signal Gain
 $V_D = 8\text{ V}$,
 $V_G = -0.9\text{ V}$,
 $I_{DQ} = 324\text{ mA}$



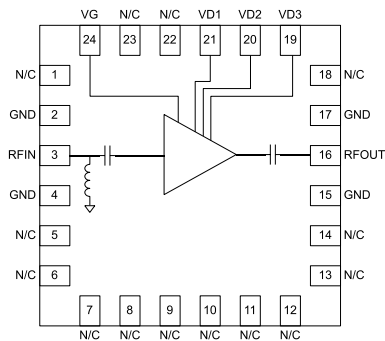
Output power
 $V_D = 8\text{ V}$,
 $V_G = -0.9\text{ V}$,
 $I_{DQ} = 336\text{ mA}$

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ARF1111Q4

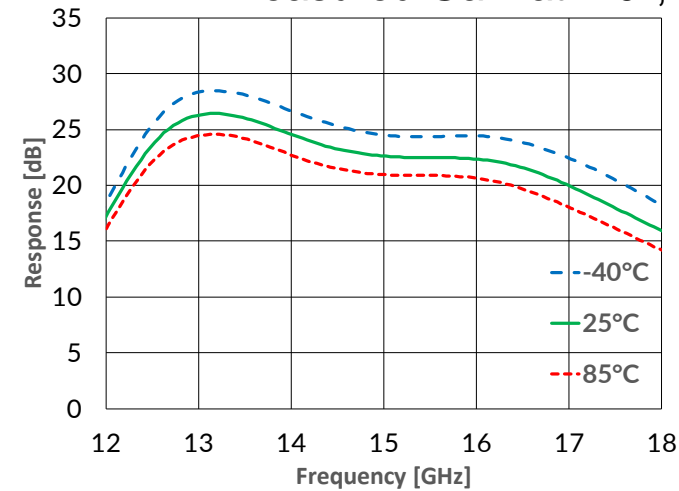
- 13 – 17.5 GHz Driver Amplifier
- 28 dBm Saturated Output Power
- 22 dB Linear Gain
- > 10 dB Output Return Loss, >8 dB IRL
- 40 % PAE at 15 GHz
- 4 mm x 4 mm QFN Package



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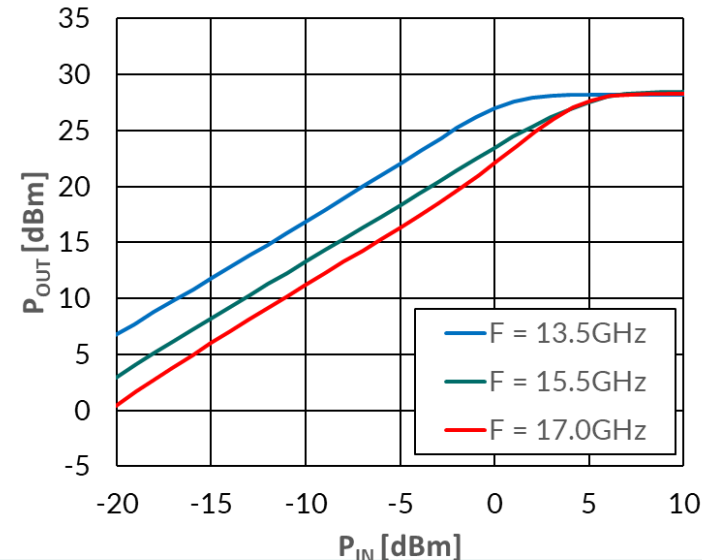
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Measured Gain at -40°, 25° and 85°C



Small Signal Gain

VD = 8 V,
VG = -0.95 V,
IDQ = 85 mA



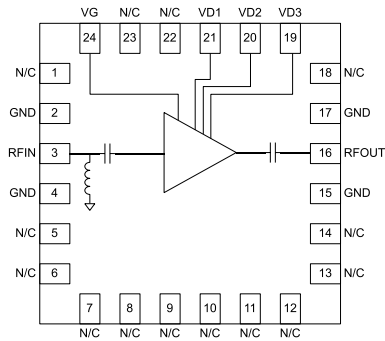
Output power

VD = 8 V,
VG = -0.95 V,
IDQ = 86 mA



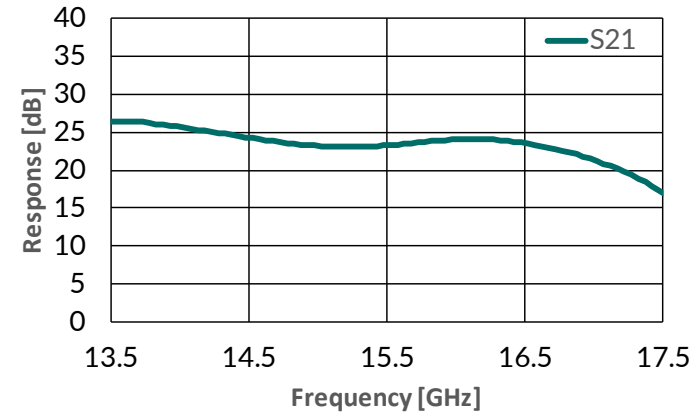
ARF1112Q4

- 13.5 – 17 GHz Driver Amplifier
- 30 dBm Saturated Output Power
- 24 dB Gain
- >10 dB Input Return Loss, >7 dB ORL
- 30 % PAE at 15 GHz
- 4 mm x 4 mm QFN Package



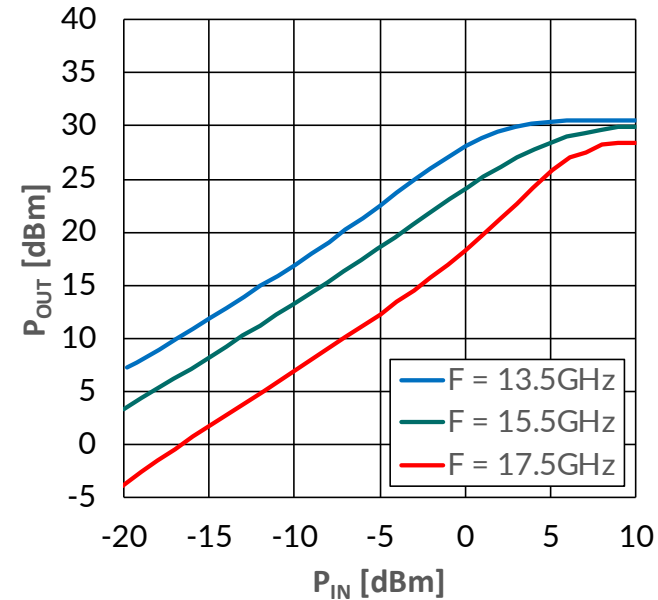
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Small Signal Gain

$V_D = 8 \text{ V}$,
 $V_G = -0.75 \text{ V}$,
 $I_{DQ} = 275 \text{ mA}$



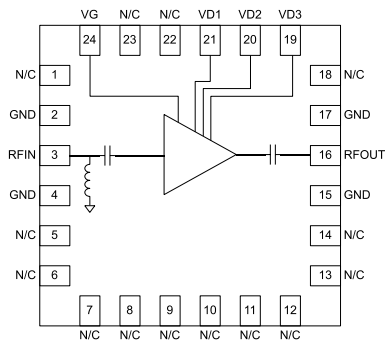
Output power

$V_D = 8 \text{ V}$,
 $V_G = -0.75 \text{ V}$,
 $I_{DQ} = 265 \text{ mA}$



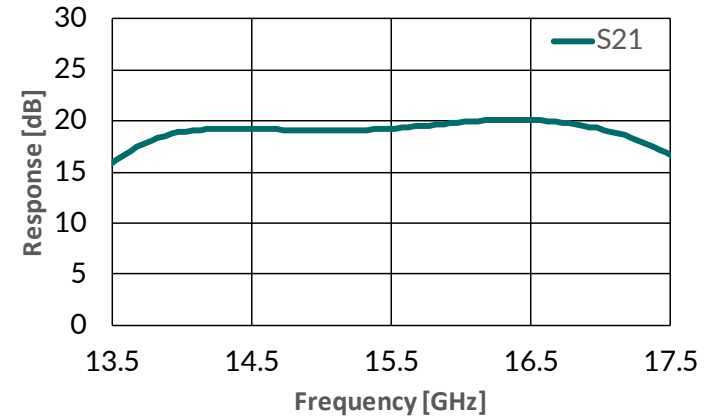
ARF1113Q4

- 13.5 – 17.5 GHz Driver Amplifier
- 33 dBm Saturated Output Power
- 19 dB Gain
- >10 dB Input Return Loss, >12 dB ORL
- 25 % PAE at 15.5 GHz
- 4 mm x 4 mm QFN Package

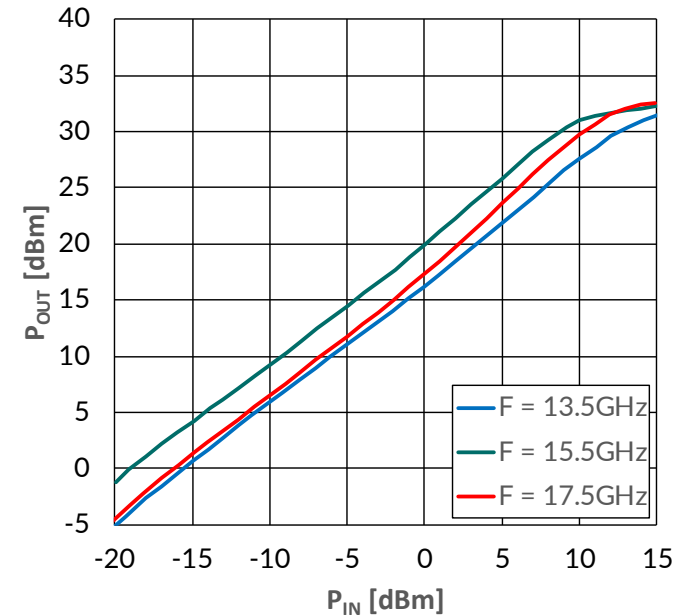


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Small Signal Gain
 $V_D = 8 \text{ V}$,
 $V_G = -0.6 \text{ V}$,
 $I_{DQ} = 720 \text{ mA}$

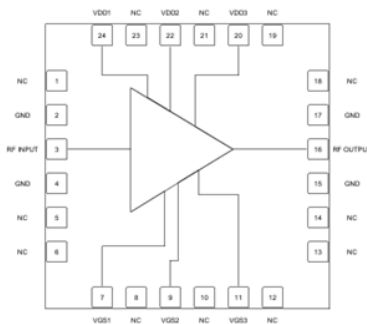


Output power
 $V_D = 8 \text{ V}$,
 $V_G = -0.6 \text{ V}$,
 $I_{DQ} = 715 \text{ mA}$



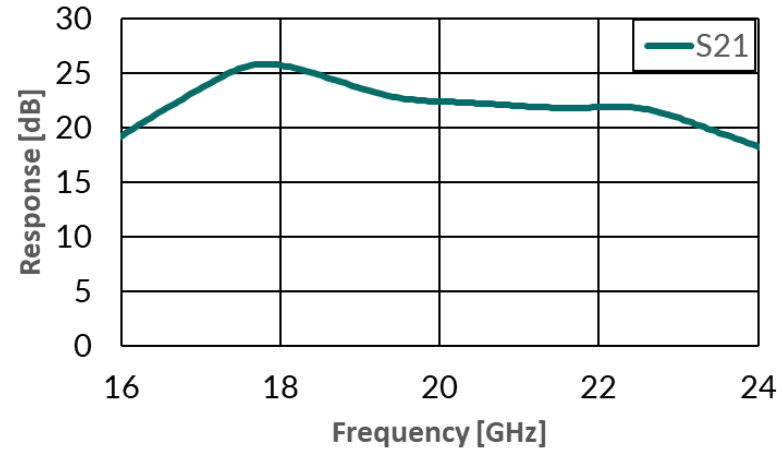
ARF1114Q4

- 17 - 23 GHz Driver Amplifier
- 24 dB Linear Gain
- 25 dBm P1dB
- 26 dBm Saturated Output Power
- > 25% PAE, 7 V, 170 mA Nominal Bias
- 4 mm x 4 mm QFN Package

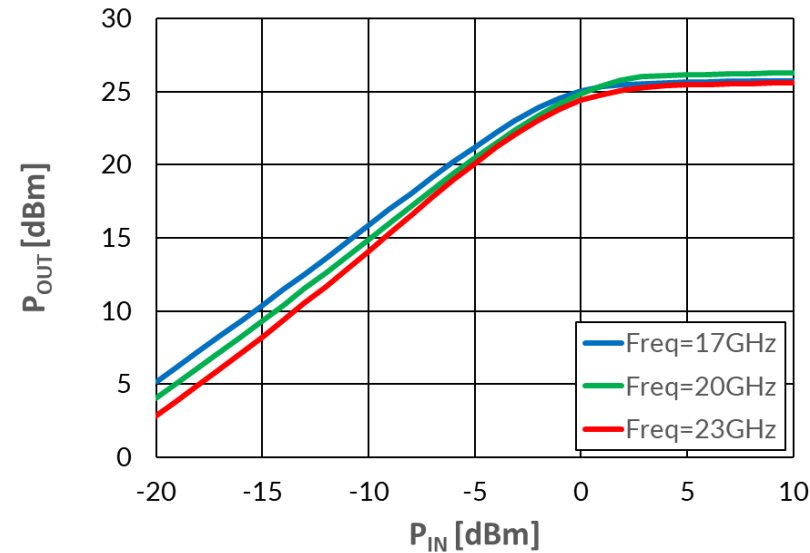


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Gain
VD = 7V,
VG = -0.6V,
IDQ = 170mA



Output power
VD = 7V,
VG = -0.55V,
IDQ = 180mA



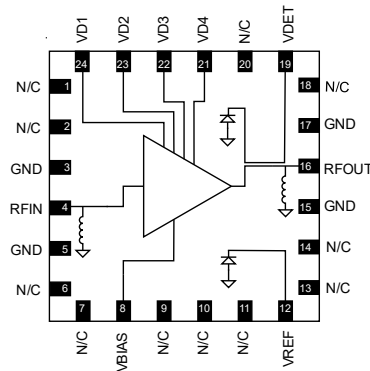
Power Amplifiers: K-, Ka-band

Power Amplifier	Min. Frequency (GHz)	Max. Frequency (GHz)	Gain (dB)	P1dB (dBm)	P _{SAT} (dBm)	OIP3 (dBm)	Bias Voltage (V)	Bias Current (mA)	Package	Sampling
ARF1010Q4	22	30	28	27	29.5	36	4	600	4 x 4 QFN	NOW
ARF1026Q4	27	31.5	28	26	29	36	4	600	4 x 4 QFN	NOW
ARF1106Q4	24	31	28	24	26	33	4	300	4 x 4 QFN	NOW
ARF1012Q4	37	41	26	24.5	27.5	32	4	550	4 x 4 QFN	NOW
ARF1107Q4	37	41	26.5	24.5	25	29.5	4	275	4 x 4 QFN	NOW
ARF1023Q4	34	38	29.5	26	28	33.5	4	550	4 x 4 QFN	NOW
ARF1013	27	31.5	28		38.9	44	-1.9/22	115	Bare Die	NOW
ARF1013Q6	27	31.5	27.5		38.5	43.5	-1.9/22	115	6 x 6 QFN	Q2 2023
ARF1014	27	31.5	24		41	49	-1.9/22	230	Bare Die	NOW
ARF1014Q6	27	31.5	27		39.5	48.5	-1.9/22	230	6 x 6 QFN	Q2 2023
ARF1103Q4	27	31.5	25	23.5	26	TBD	-1.5V/10V	150	4 x 4 QFN	NOW
ARF1104Q4	27	31.5	28	24.5	29	TBD	-1.5V/15V	150	4 x 4 QFN	NOW
ARF1105Q4	27	31.5	31	28	31.5	TBD	-1.5V/20V	250	4 x 4 QFN	NOW



ARF1010Q4

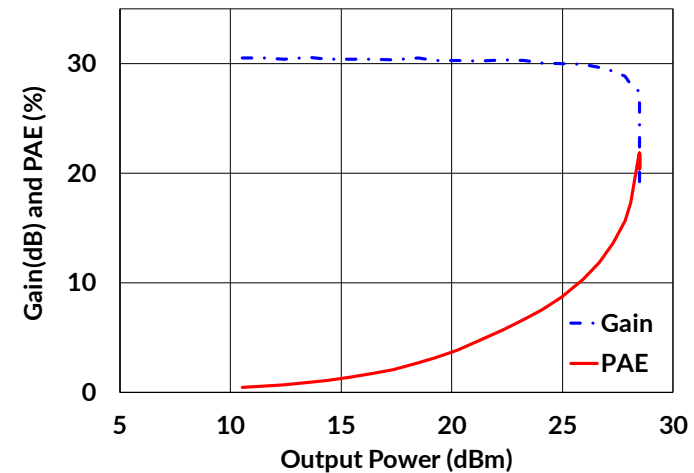
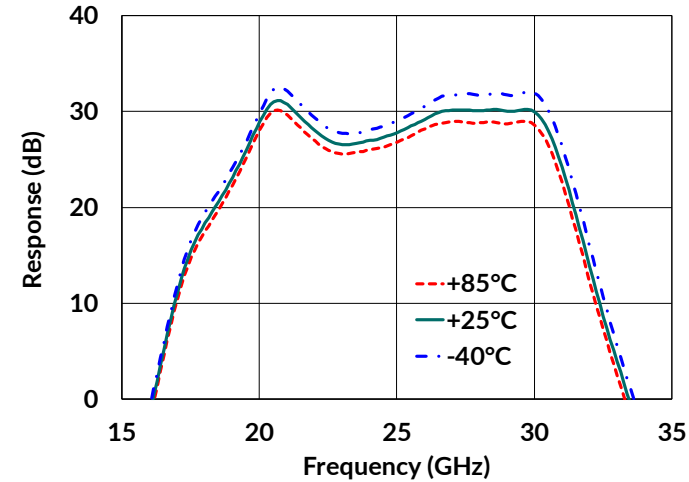
- 22 - 30 GHz Linear Amplifier
- 28 dB Gain
- 27 dBm Output P1dB
- > 13 dB Input and Output Return Loss
- 36 dBm Output IP3
- 4 mm x 4 mm QFN Package



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Measured Gain at -40°, 25° and 85°C



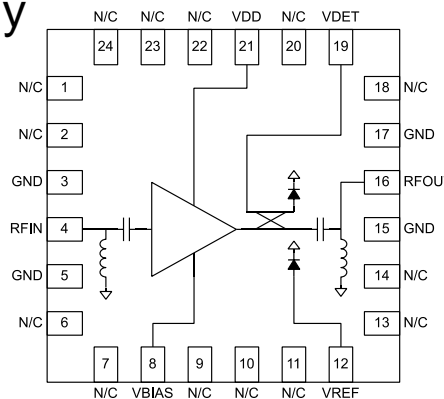
Power Gain
PAE at 28 GHz



ARF1026Q4

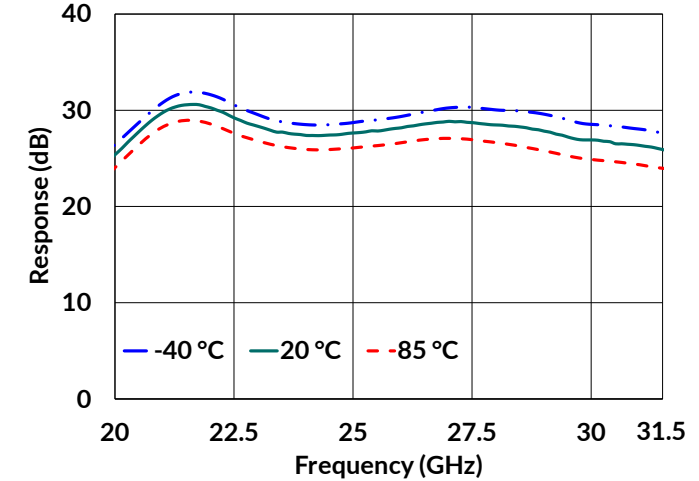
- 27 - 31.5 GHz Linear Amplifier
- 28 dB Gain
- 26 dBm Typical P1dB
- > 10 dB Return Loss Input/Output
- 36 dBm Output IP3
- 4 V Power Supply, 600 mA (Quiescent)
- Positive Supply and Control Voltages Only
- 4 mm × 4 mm QFN Package

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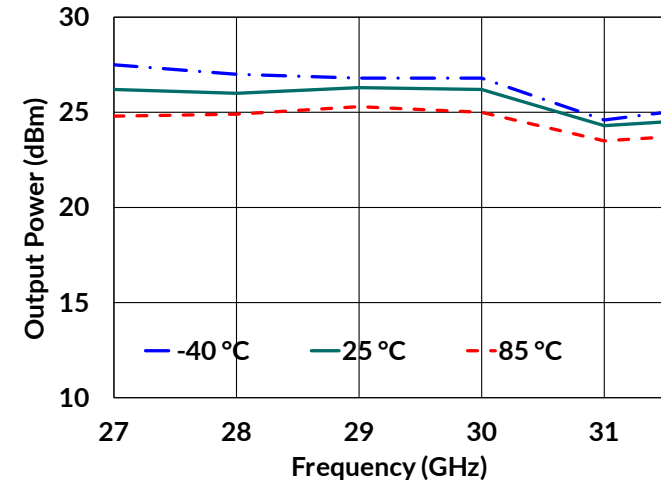


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Measured Gain at -40°, 25° and 85°C

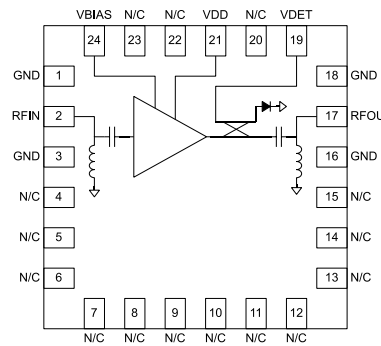
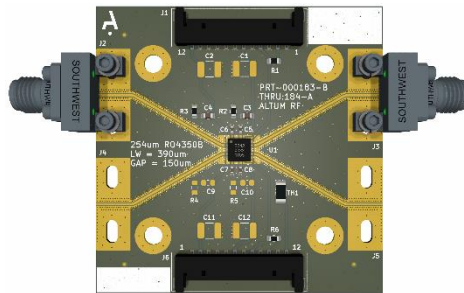


Measured P1dB at -40°, 25° and 85°C



ARF1106Q4

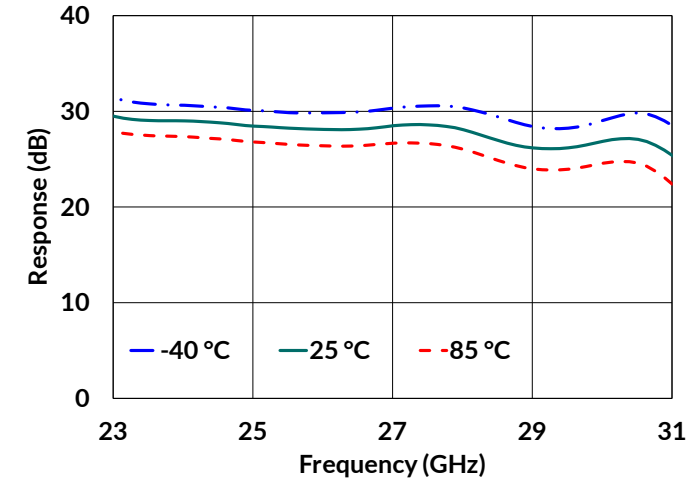
- 24–31 GHz Linear Amplifier
- 28 dB Gain
- 24 dBm Typical P1dB
- >10 dB Return Loss Input/Output
- 33 dBm Output IP3
- 4 V Power Supply, 300 mA (Quiescent)
- 4 mm x 4 mm QFN Package
- Positive Supply and Control Voltages Only



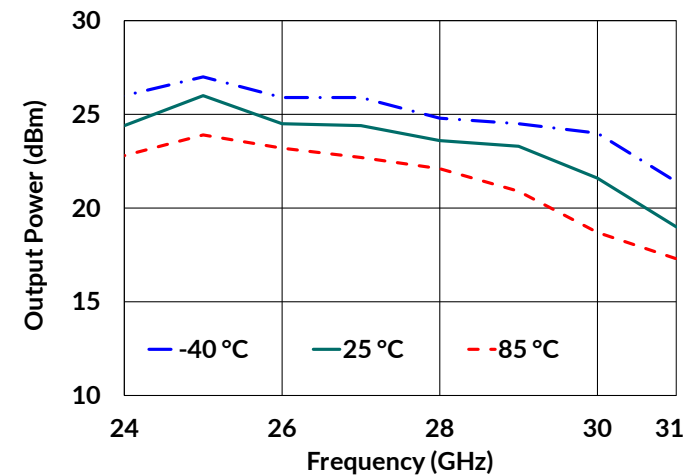
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Measured Gain at -40°, 25° and 85°C

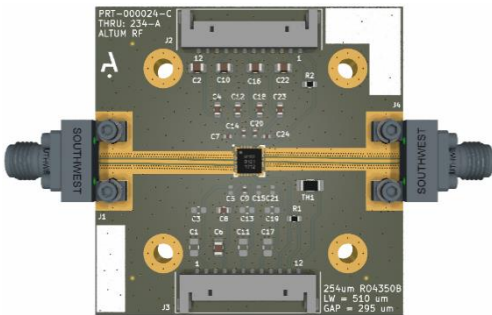


Measured P1dB at -40°, 25° and 85°C

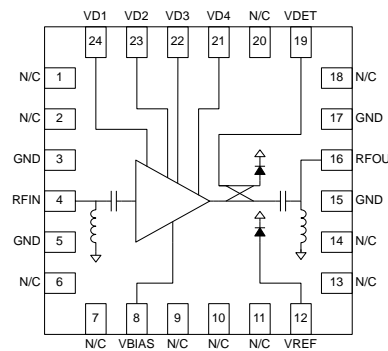


ARF1012Q4

- 37–41 GHz Linear Amplifier
- 26 dB Gain
- 24.5 dBm Typical P1dB
- > 12 dB Return Loss Input/Output
- 32 dBm Output IP3
- 4 V Power Supply, 550 mA (Quiescent)
- 4 mm x 4 mm QFN Package
- Positive Supply and Control Voltages Only

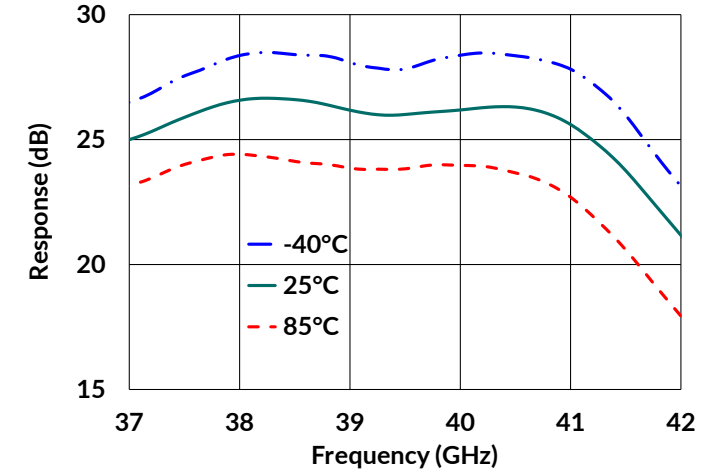


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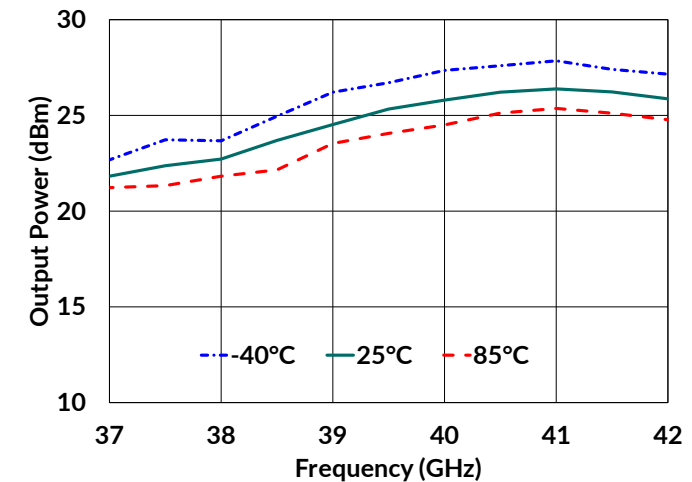


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Measured Gain at -40°, 25° and 85°C



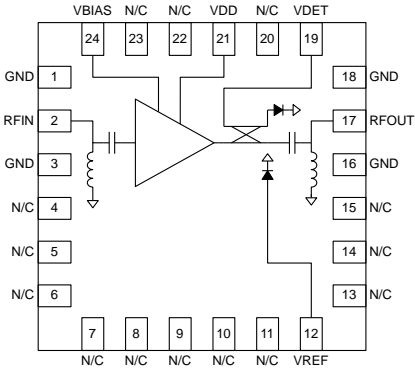
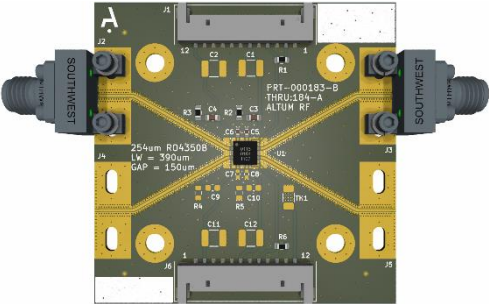
Measured P1dB at -40°, 25° and 85°C



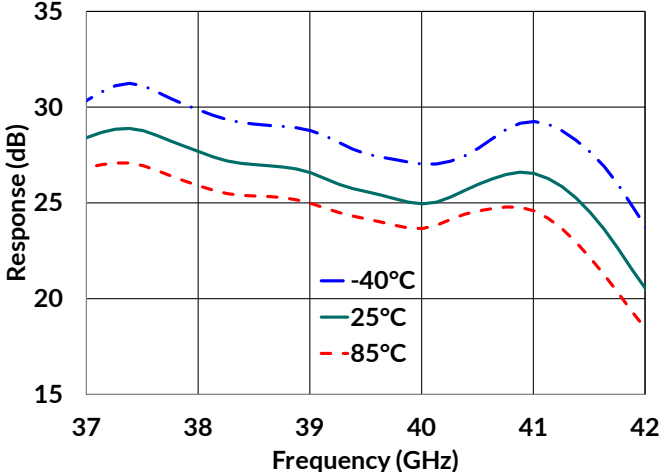
samples and eval boards available now

ARF1107Q4

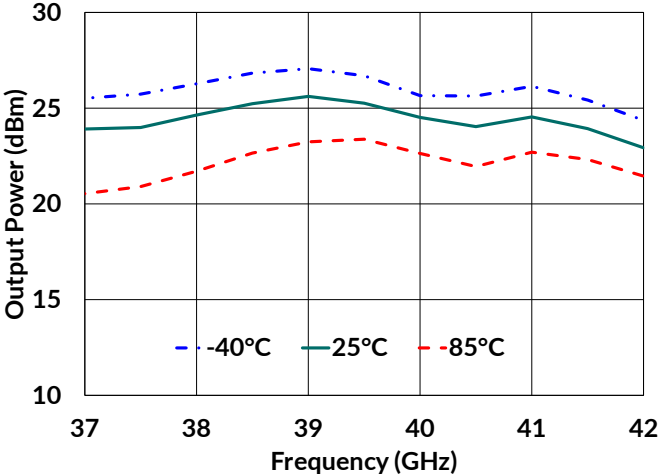
- 37–41 GHz Linear Amplifier
- 26.5 dB Gain
- 24.5 dBm Typical Output P1dB
- 29.5 dBm Output IP3
- 4 V Power Supply, 275 mA (Quiescent)
- 4 mm x 4 mm QFN Package
- Positive Supply and Control Voltages Only



Measured Gain at -40°, 25° and 85°C



Measured P1dB at -40°, 25° and 85°C

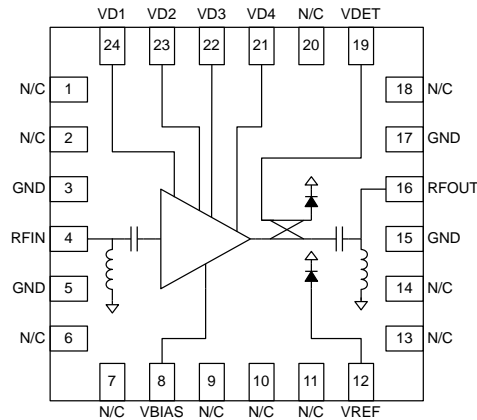
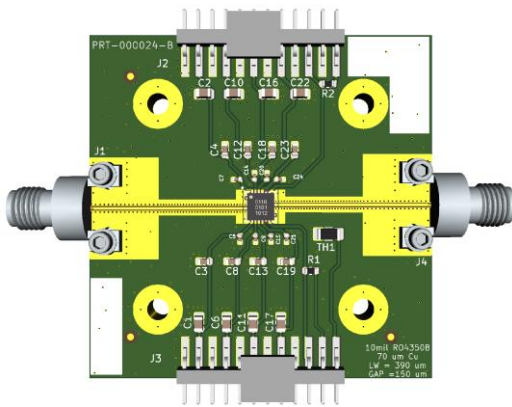


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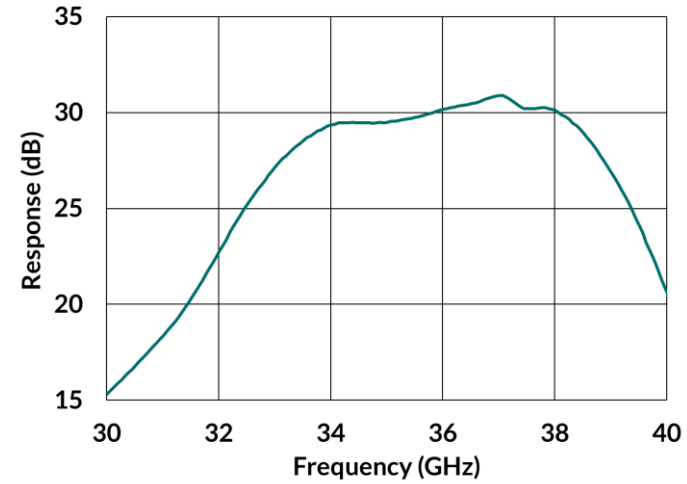


ARF1023Q4

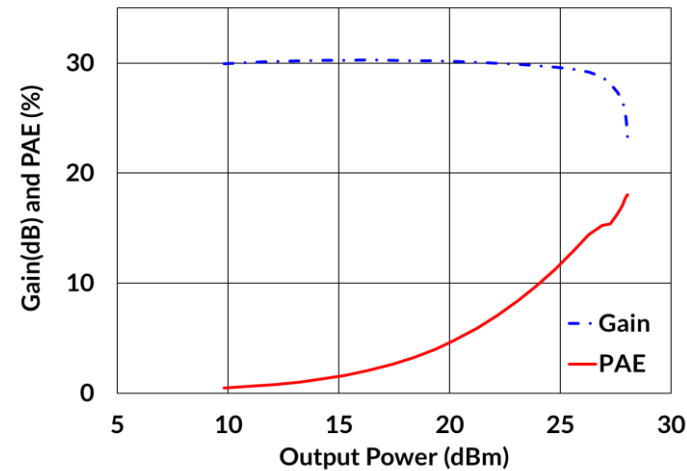
- 34 - 38 GHz Linear Amplifier
- 29.5 dB Gain
- 26 dBm Output P1dB
- > 13 dB Input and Output Return Loss
- 4 mm x 4 mm QFN Package



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Gain



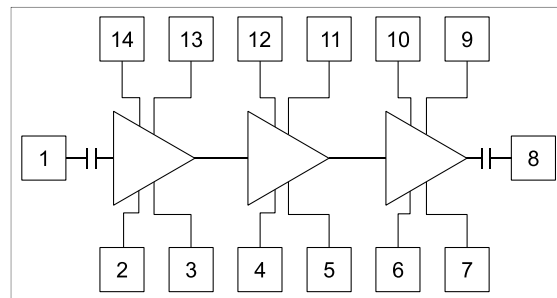
Power Gain
PAE at 37 GHz

Export from The Netherlands/EU, dual-use, end-use statement required.



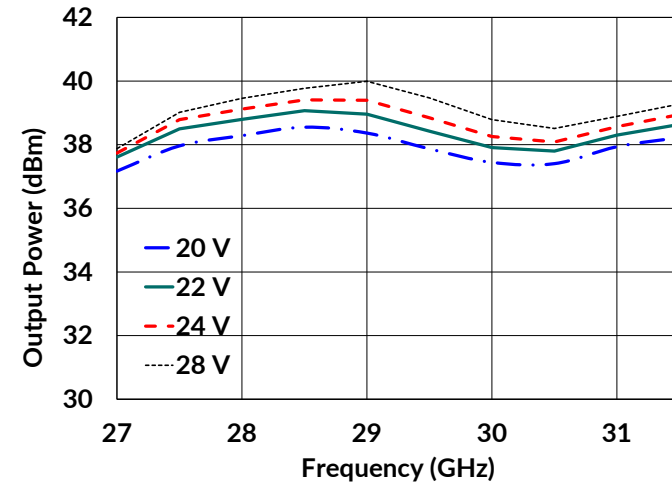
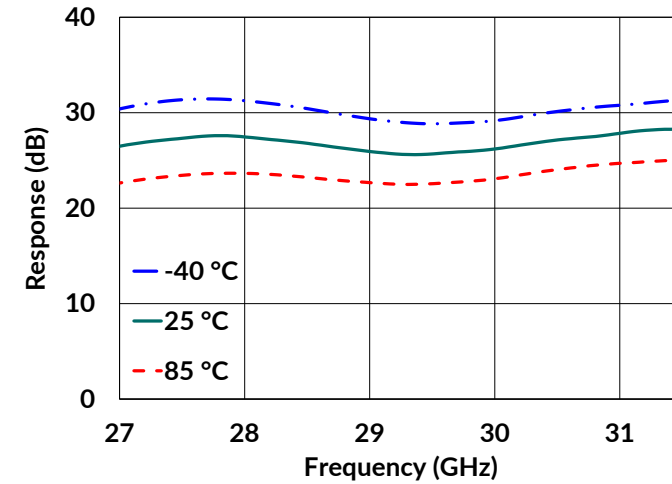
ARF1013

- 27 - 31.5 GHz GaN Power Amplifier MMC
- 28 dB Small-Signal Gain
- 18 dB Power Gain
- 6 W Output Power
- 30% PAE
- Die Size: 3.00 × 1.75 × 0.10 mm



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Measured Gain at -40°, 25° and 85°C



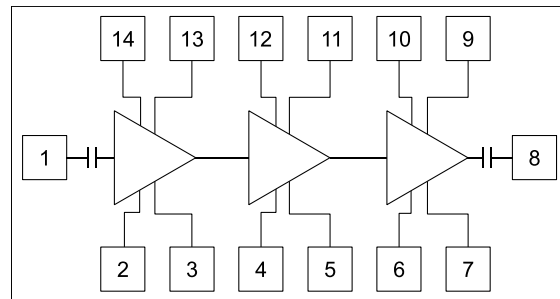
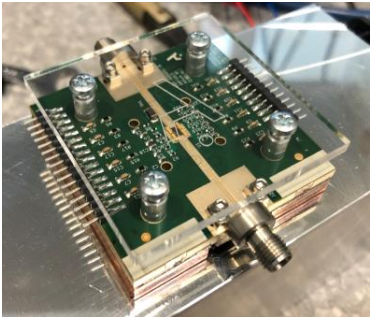
Power

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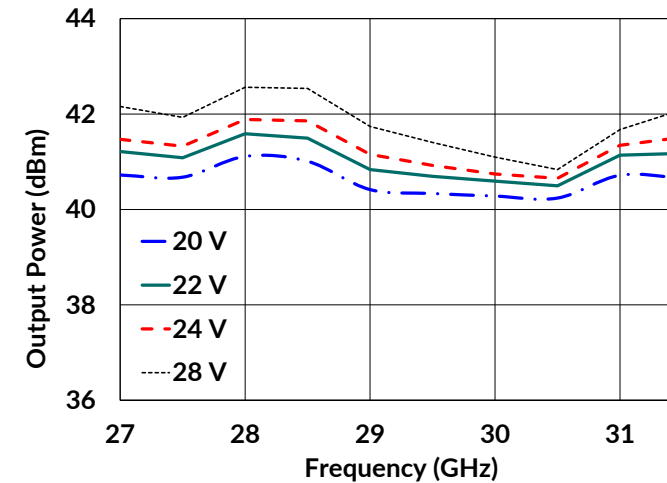
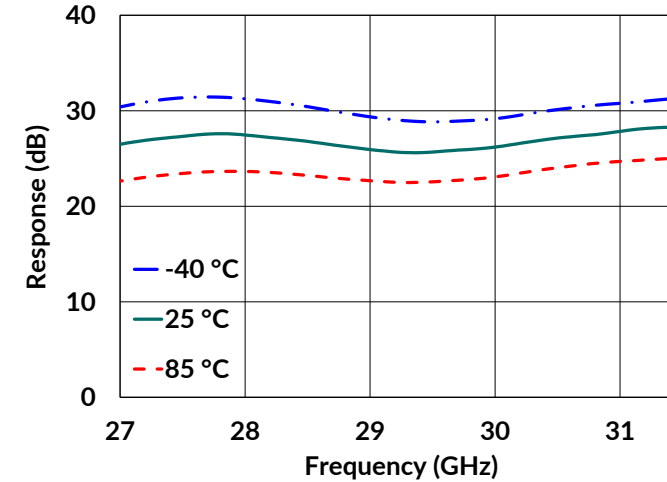
ARF1014

- 27 - 31.5 GHz GaN Power Amplifier MMC
- 24 dB Small-Signal Gain
- 17 dB Power Gain
- 12 W Output Power
- 25% PAE
- Die Size: 3.0 × 3.4 × 0.1 mm



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Measured Gain at -40°, 25° and 85°C



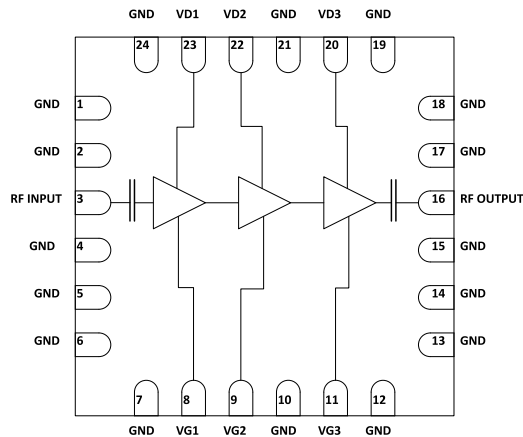
Output Power

Export from The Netherlands/EU, dual-use, end-use statement required.



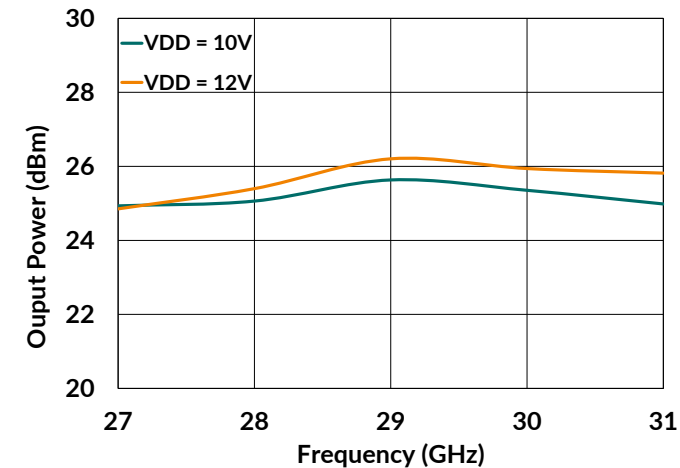
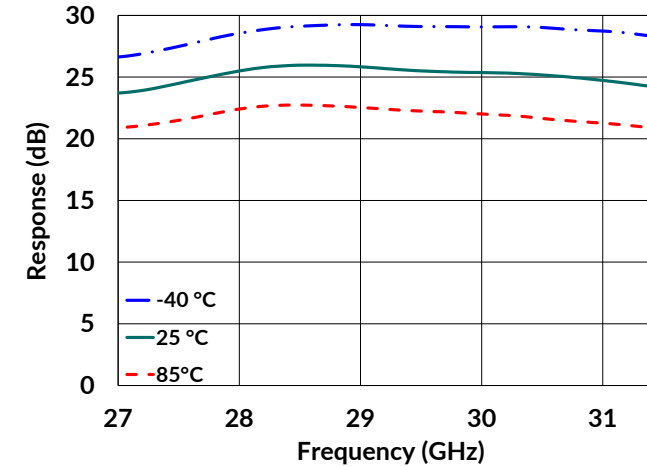
ARF1103Q4

- 27 - 31.5 GHz Power Amplifier
- 26 dBm P_{SAT}
- 25 dB Small Signal Gain
- 20 % PAE at P_{SAT}
- 4 mm x 4mm QFN Package



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Measured Gain at -40°, 25° and 85°C



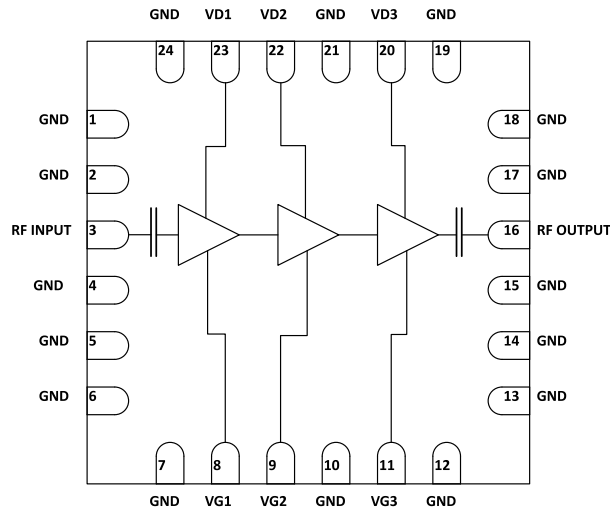
Output Power

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ARF1104Q4

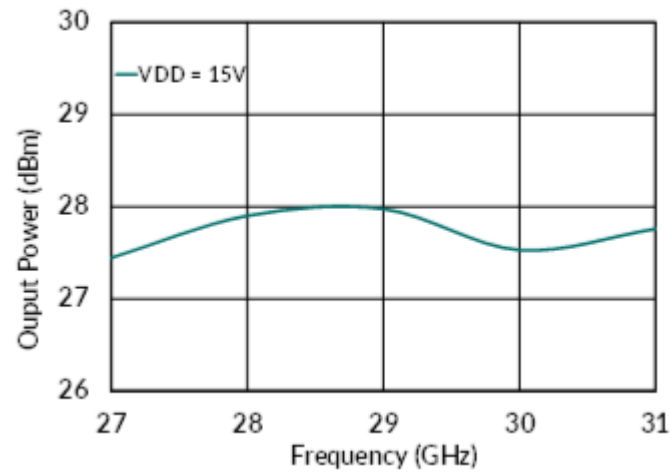
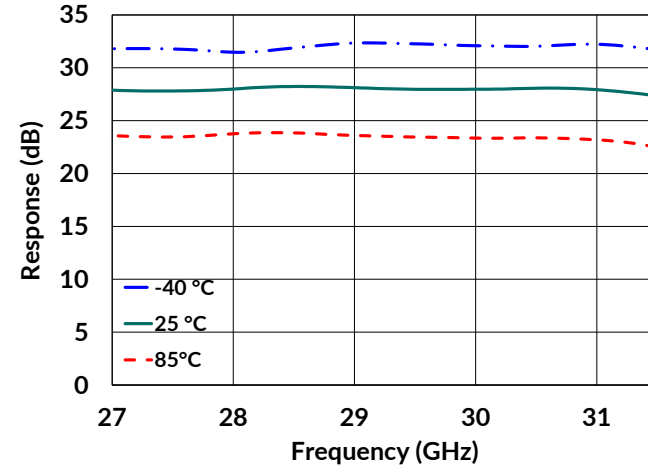
- 27 - 31.5 GHz Power Amplifier
- 28 dBm P_{SAT}
- 28 dB Small Signal Gain
- 20 % PAE at P_{SAT}
- 4 mm x 4mm QFN Package



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Measured Gain at -40°, 25° and 85°C

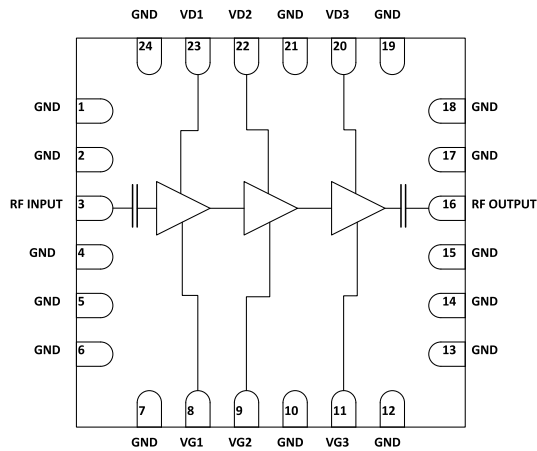


Output Power

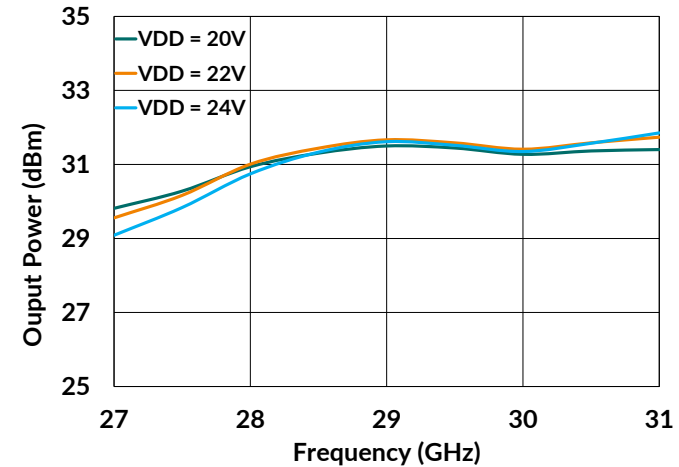
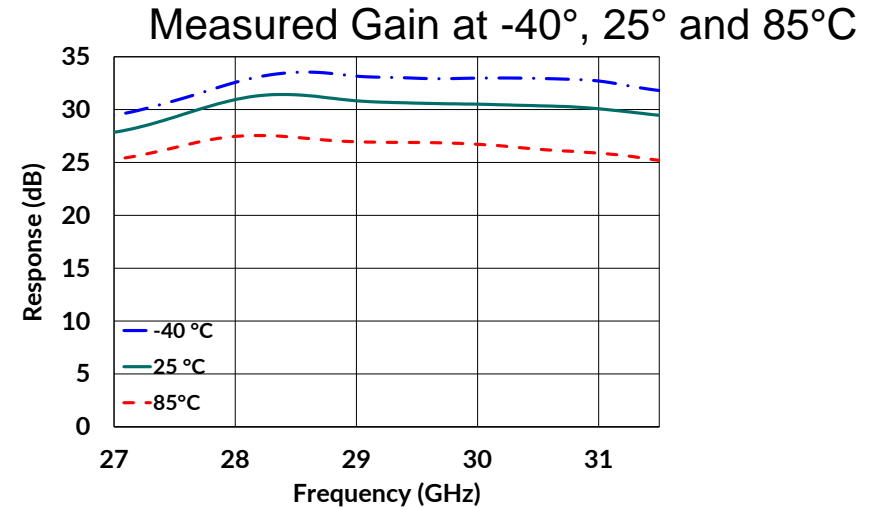


ARF1105Q4

- 27 - 31.5 GHz Power Amplifier
- 31.5 dBm P_{SAT}
- 31 dB Small Signal Gain
- 24 % PAE at P_{SAT}
- 4 mm x 4mm QFN Package



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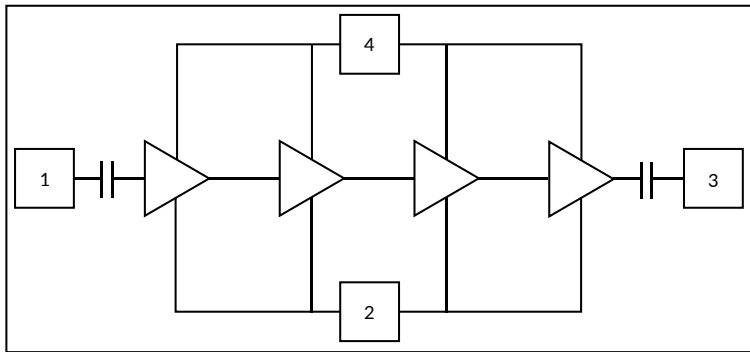
Q, V and E-band Amplifiers

Power Amplifier	Min. Frequency (GHz)	Max. Frequency (GHz)	Gain (dB)	P1dB (dBm)	P _{SAT} (dBm)	OIP3 (dBm)	Bias Voltage (V)	Bias Current (mA)	Package	Sampling
ARF1208	37	59	26.5	16.5	19	TBD	-0.4/2	55	Bare Die	NOW
ARF1207	57	71	20	21.5	22	TBD	-0.4/4	250	Bare Die	NOW
ARF1206	71	86	22.5	14	15	TBD	-0.25/3.5	55	Bare Die	NOW
ARF1006	71	76	30	28	30	35.5	-0.4/4	750	Bare Die	Q4 2023
ARF1007	81	86	27	28	30	35	-0.4/4	750	Bare Die	Q4 2023



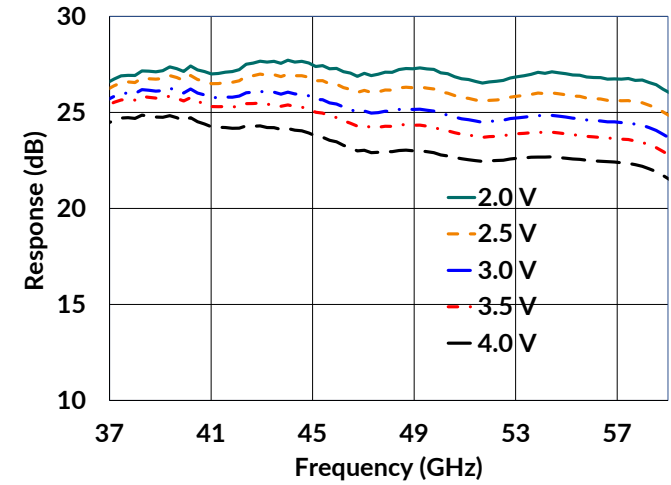
ARF1208

- 37 – 59 GHz Low Noise Amplifier
- 3 dB Noise Figure (LNA Bias)
- 26.5 dB Gain
- 19 dBm Saturated Output Power (Driver Bias)
- > 10 dB Input and Output Return Loss
- 2 V, 55 mA for LNA Bias
- 4V, 100 mA for Driver Bias

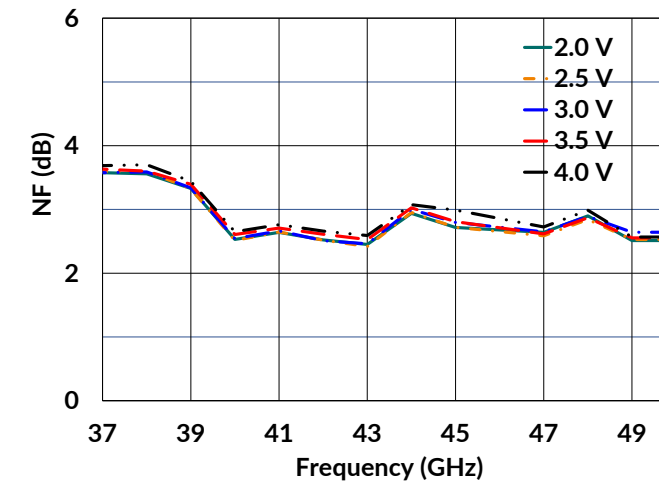


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Gain

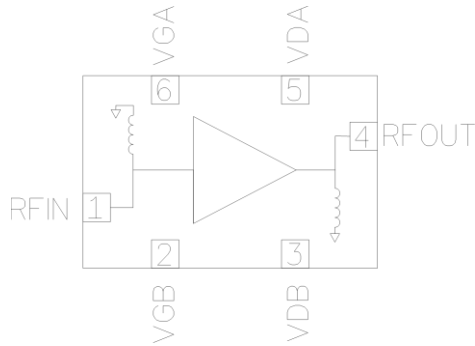


Noise Figure

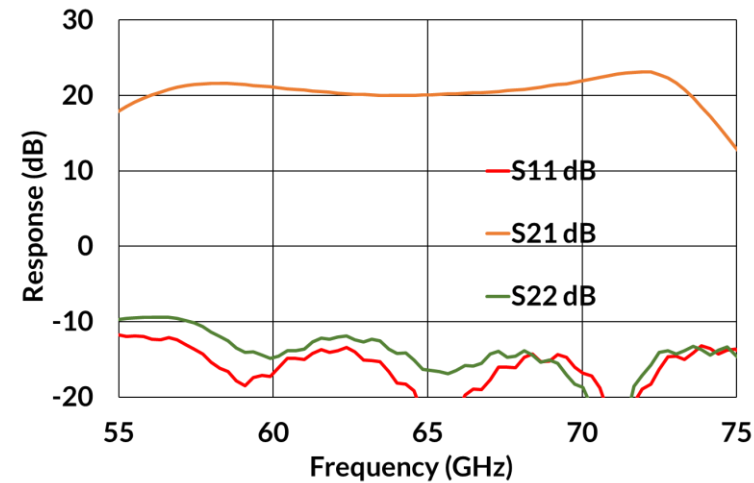


ARF1207

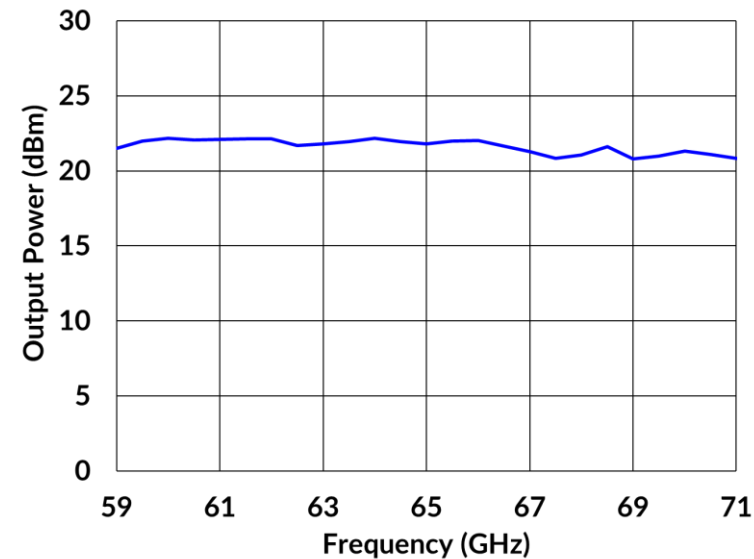
- 57–71 GHz
- LNA/Driver/Medium Power Amplifier
- > 20 dB Gain
- 22 dBm P_{SAT} Output Power
- > 10 dB Input and Output Return Loss
- 5 dB Noise Figure
- 4 V, 250 mA Nominal Bias
- Single gate and single drain supply, from either side



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Gain, S11, S22
(includes bond wires)



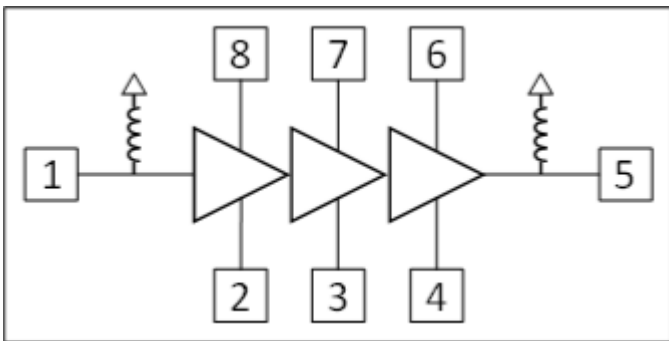
Psat vs. Frequency
(includes bond wires)

Export from The Netherlands/EU, dual-use, end-use statement required.



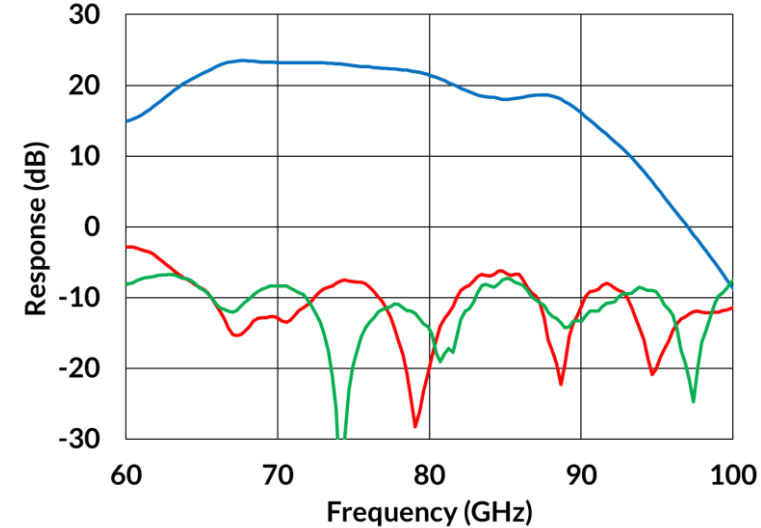
ARF1206

- 71-86 GHz Low Noise Amplifier
- 22.5 dB Gain
- Noise Figure 3.2 dB at 77 GHz
- 14 dBm Typical Output P1dB
- Die Size 1.40 × 1.00 × 0.05 mm

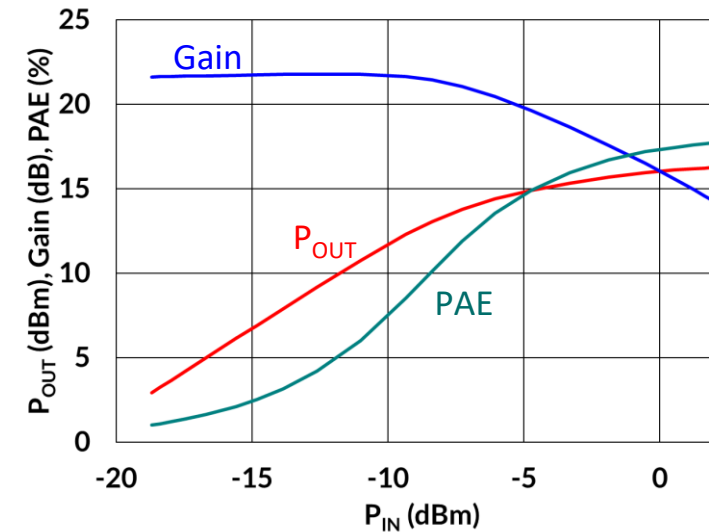


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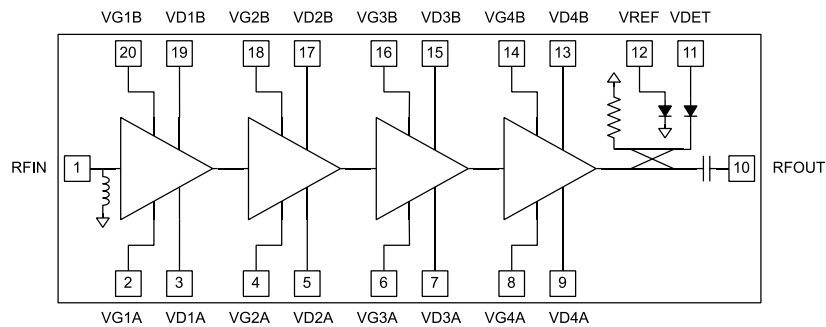
Small signal
Measured
S-parameters



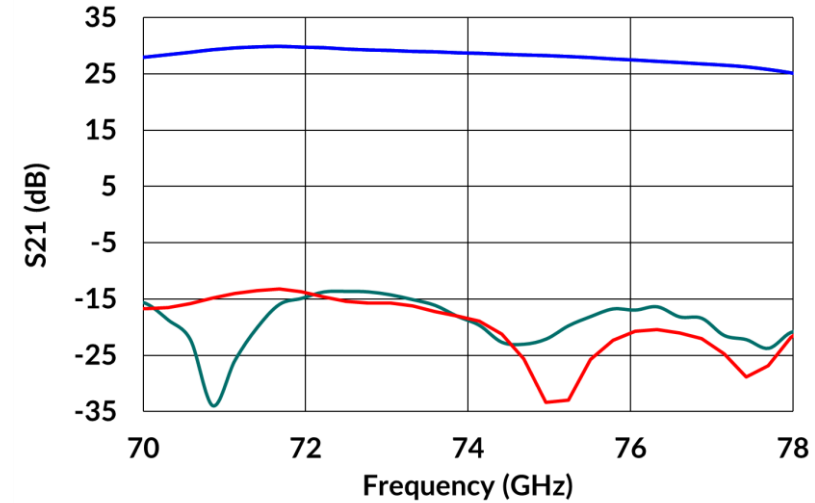
Output Power
Power Gain
PAE at 77 GHz

ARF1006

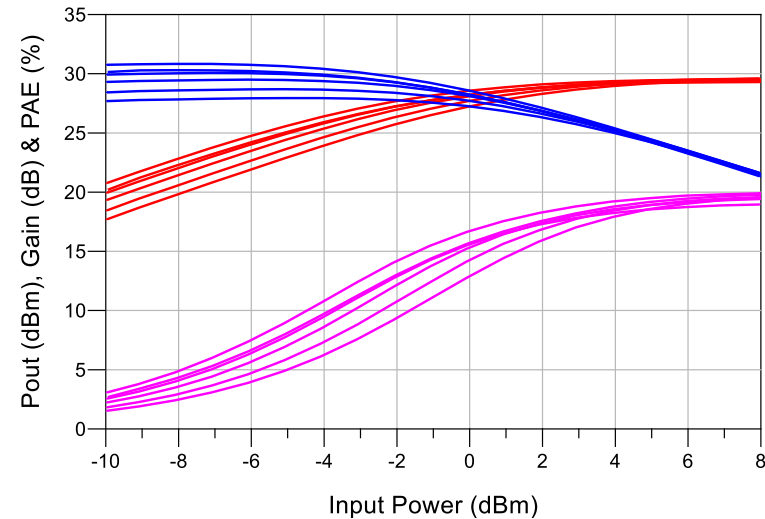
- 71 - 76 GHz Power Amplifier
- 28 dB Small-Signal Gain
- 30 dBm Output P_{SAT}
- > 15 dB Input and Output Return Loss
- 20 % PAE
- Bare die 3.5 × 2.3 × 0.05 mm



samples and eval boards available Q4 2023



Measured*
Small signal
S-parameters



Measured*
Output Power
Power Gain
PAE

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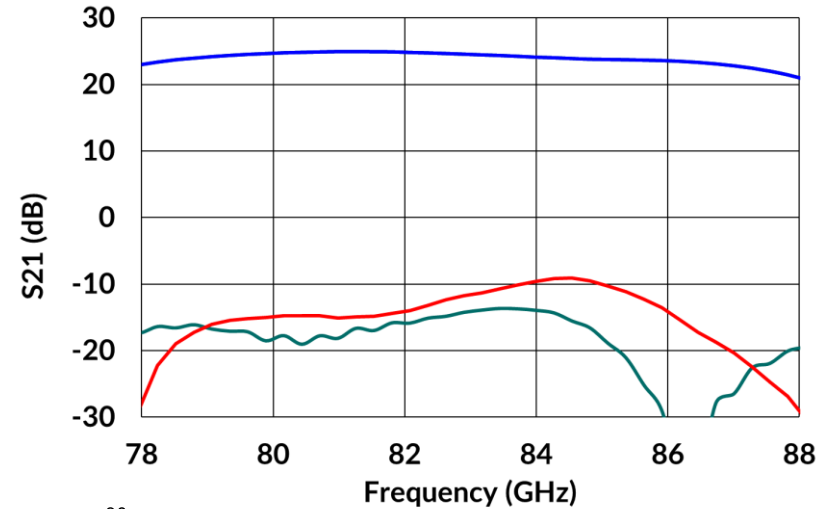
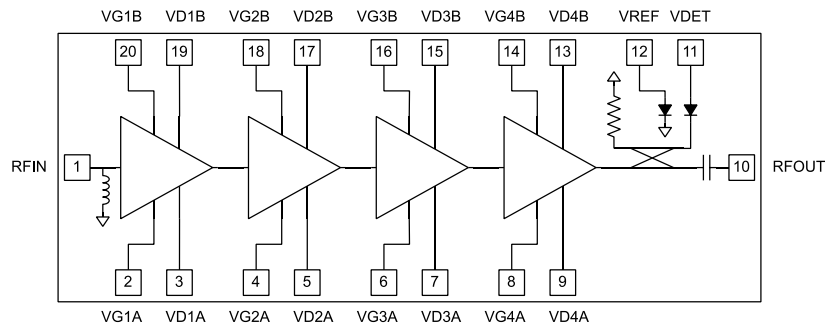
*Includes RF Ribbon transition



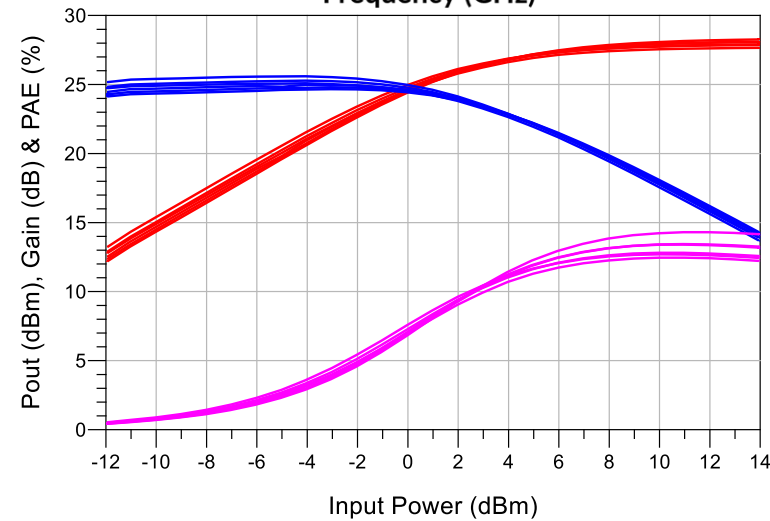
ARF1007

samples and eval boards available Q4 2023

- 81 - 86 GHz Power Amplifier
- 25 dB Small-Signal Gain
- 28 dBm Output P_{SAT}
- 15 dB Input and Output Return Loss
- 15 % PAE
- Bare die 3.5 × 2.3 × 0.05 mm



Measured*
Small signal
S-parameters



Measured*
Output Power
Power Gain
PAE

Export from The Netherlands/EU, dual-use, end-use statement required.

*Includes RF Ribbon transition



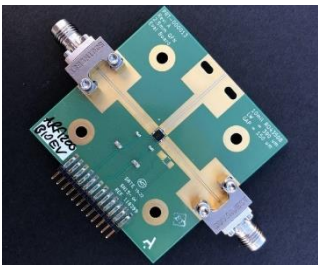
Low Noise / Driver Amplifiers

Low Noise/ Driver Amplifiers	Min. Frequency (GHz)	Max. Frequency (GHz)	Gain (dB)	NF (dB)	P1dB (dBm)	Bias Voltage (V)	Bias Current (mA)	Package	Sampling
ARF1200Q2	20	31.5	20	3.5	1	3.3	15	2.5 × 2.5 QFN	NOW
ARF1201Q2	17	31.5	21	2.6	7	3.3	40	2.5 × 2.5 QFN	NOW
ARF1202Q2	37	42	17	4.0	8.5	3.3	15	2.5 × 2.5 QFN	NOW
ARF1203Q2	37	40	20.5	4.0	13	3.3	40	2.5 × 2.5 QFN	NOW
ARF1205Q2	13	24	23	2.5	16	3.3	50	2.5 × 2.5 QFN	NOW
ARF1204Q4	7.5	12	21	2	16	8/-1.5	65	4 × 4 QFN	Q2 2023
ARF1210Q2	32	37	18	3.8	10	3.3	40	2.5 × 2.5 QFN	NOW
ARF1211Q3	6	14	25	1.7	18	4~8	60	3 × 3 QFN	NOW

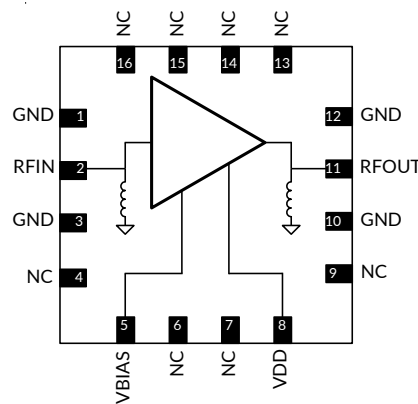


ARF1200Q2

- 20 - 31.5 GHz Low Noise / Driver Amplifier
- 20 dB Gain
- 3.5 dB Noise Figure
- 6.5 dBm Output P4dB
- > 12 dB Input and Output Return Loss
- 3.3 V, 15 mA
- 2.5 mm × 2.5 mm QFN Package

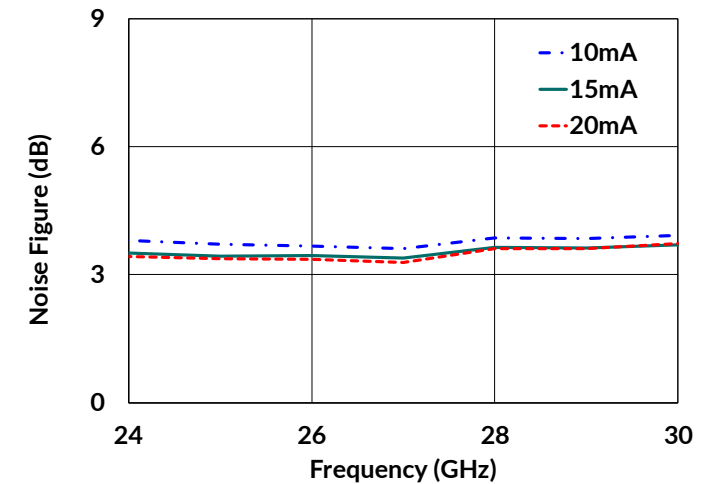
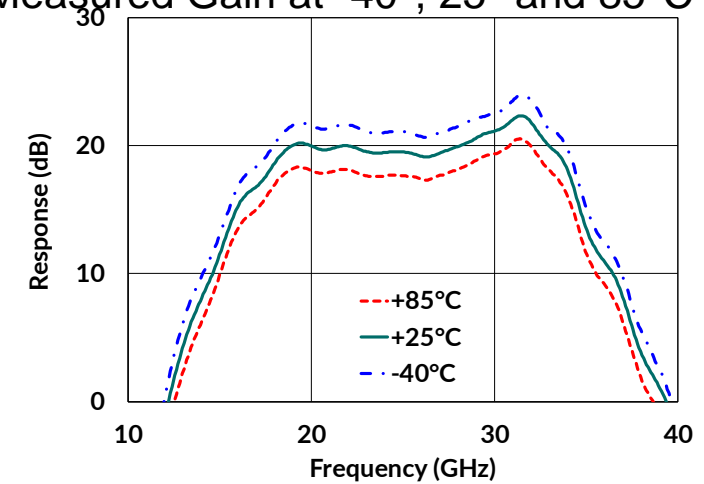


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Measured Gain at -40°, 25° and 85°C



NF

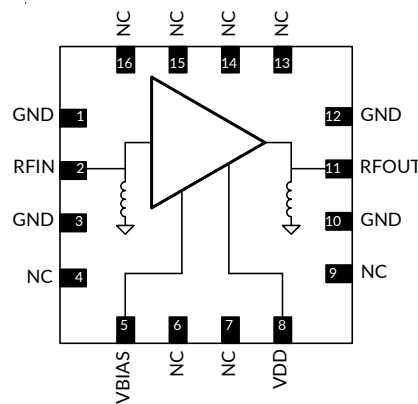


ARF1201Q2

- 17 - 31.5 GHz Low Noise / Driver Amplifier
- 21 dB Gain
- 2.6 dB Noise Figure
- 16 dBm Output P4dB
- > 10 dB Input and Output Return Loss
- 3.3 V, 40 mA
- 2.5 mm × 2.5 mm QFN Package

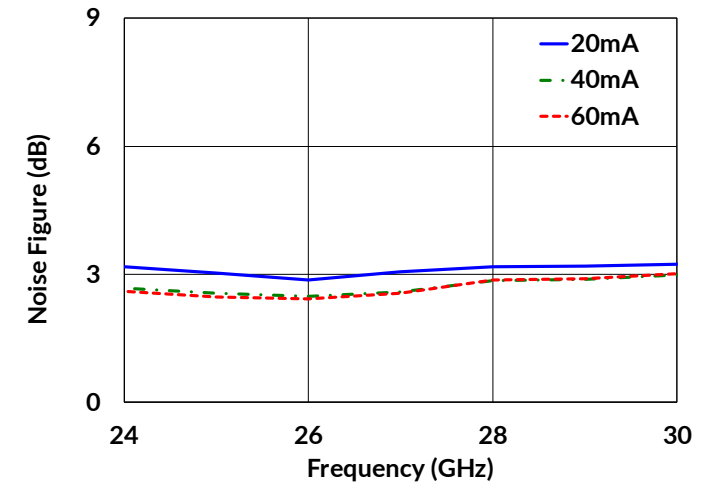
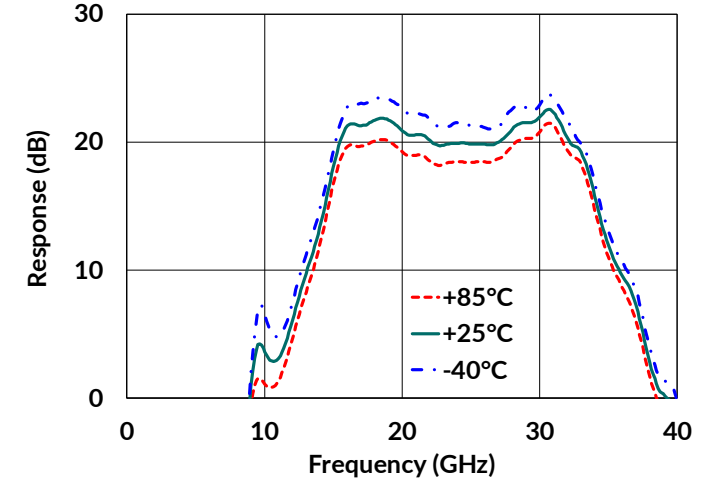


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Measured Gain at -40°, 25° and 85°C



NF

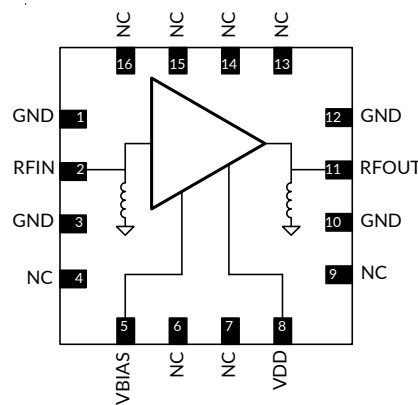


ARF1202Q2

- 37 - 42 GHz Low Noise / Driver Amplifier
- 17 dB Gain
- 4 dB Noise Figure
- 8.5 dBm Output P1dB
- > 10 dB Input and Output Return Loss
- 3.3 V, 15 mA
- 2.5 mm × 2.5 mm QFN Package

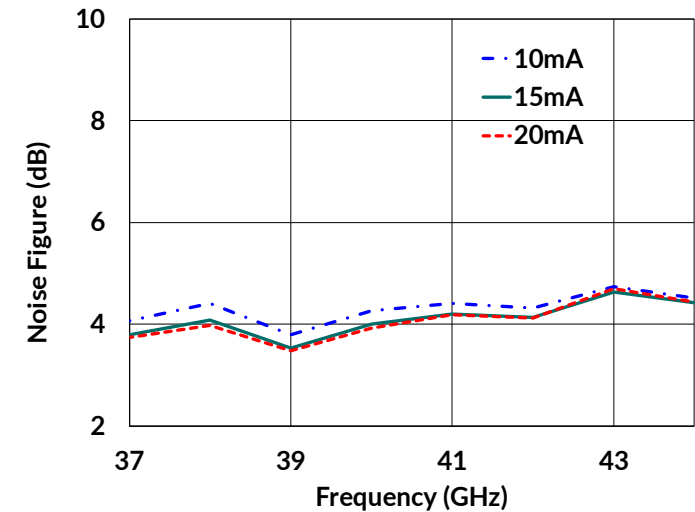
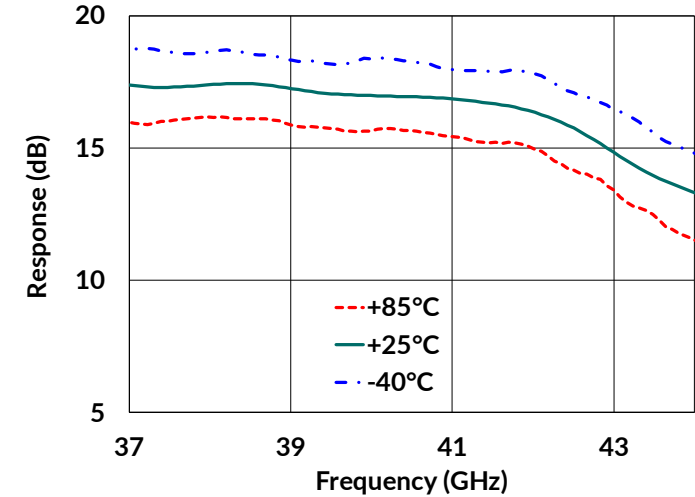


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Measured Gain at -40°, 25° and 85°C



NF

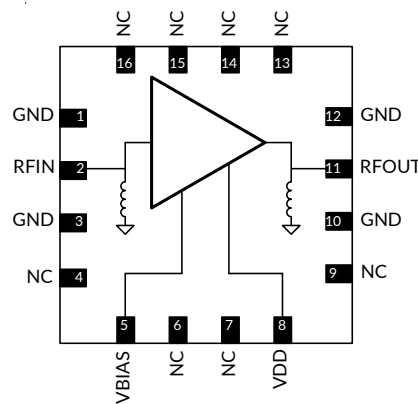


ARF1203Q2

- 37 - 40 GHz Low Noise / Driver Amplifier
- 20.5 dB Gain
- 4 dB Noise Figure
- 13 dBm Output P1dB
- > 10 dB Input and Output Return Loss
- 3.3 V, 40 mA
- 2.5 mm × 2.5 mm QFN Package

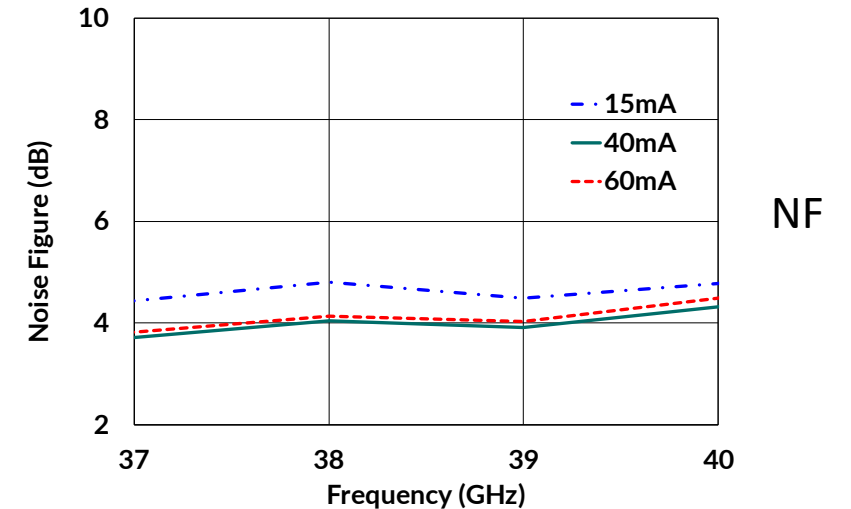
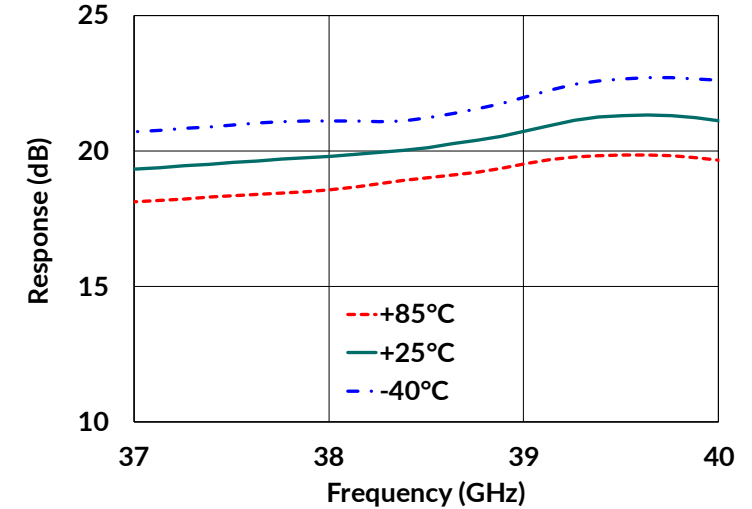


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Measured Gain at -40°, 25° and 85°C

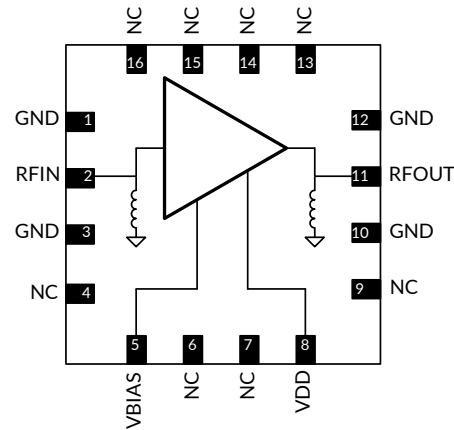


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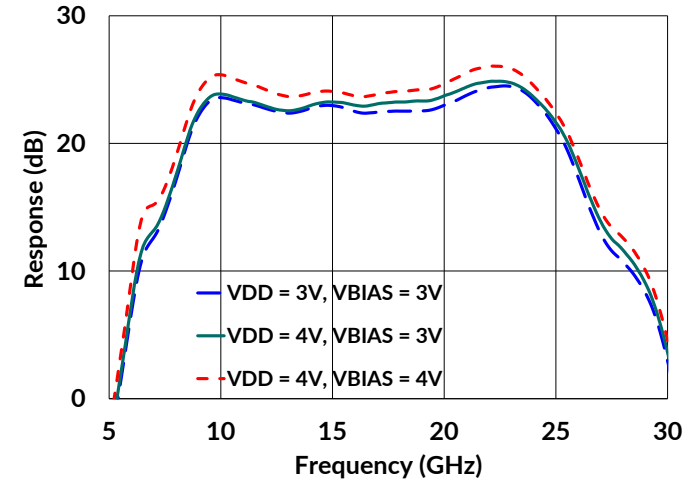
ARF1205Q2

- 13 - 24 GHz Low Noise / Driver Amplifier
- 23 dB Gain
- 2.5 dB Noise Figure
- > 16 dBm Output P1dB
- > 10 dB Input and Output Return Loss
- 3.3 V, 40-60 mA, 2.5 mm x 2.5 mm QFN Package

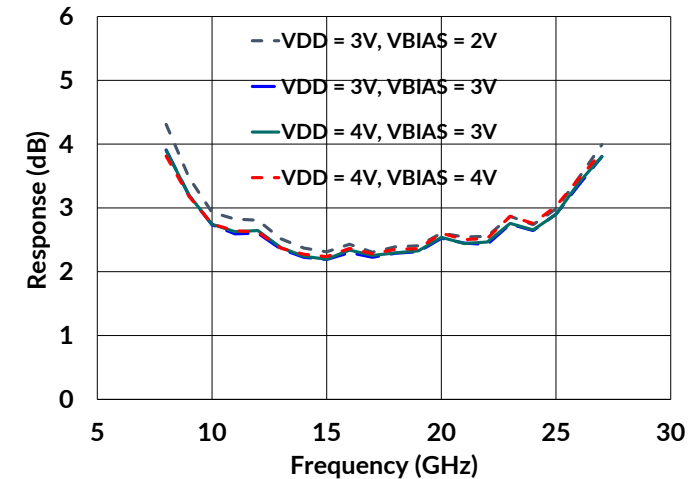


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Gain

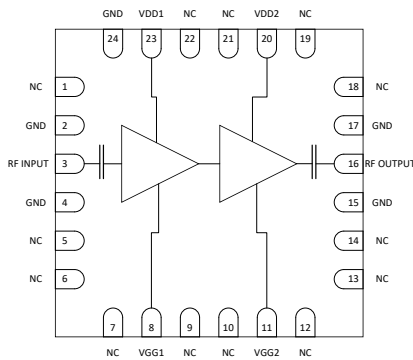


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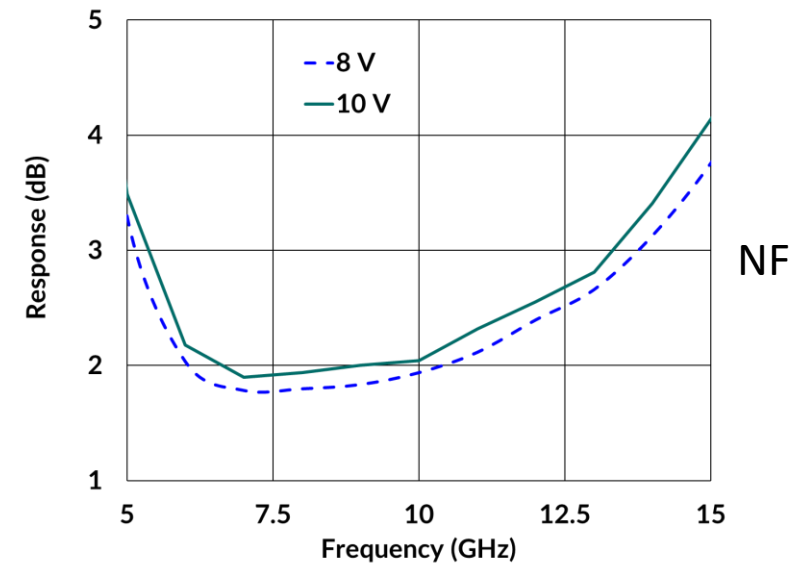
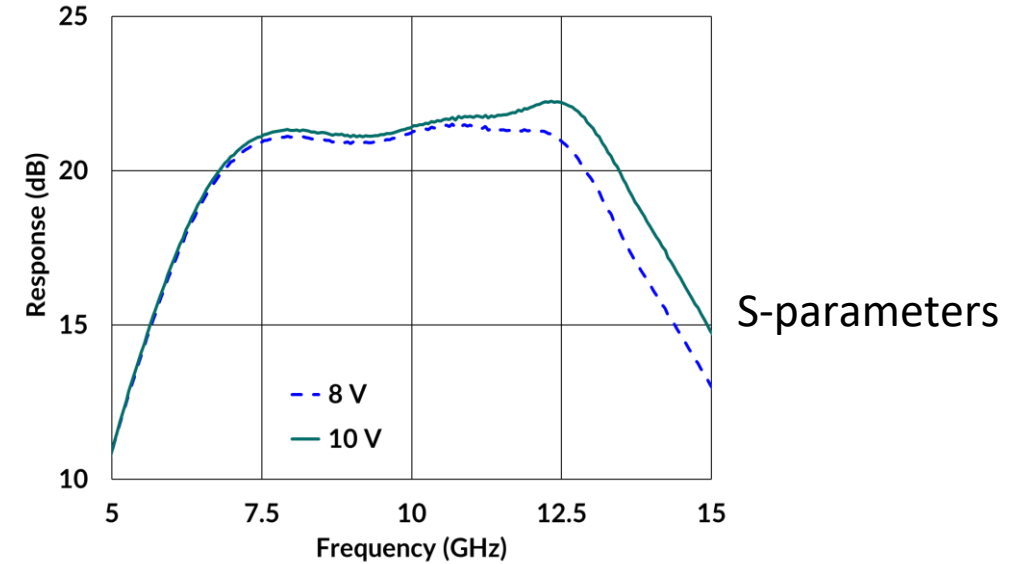


ARF1204Q4

- 7.5 - 12 GHz Low Noise / Driver GaN Amplifier
- 21 dB Gain, 16 dBm P1dB
- 2 dB Noise Figure
- 5 W Maximum Input Power Survivability
- > 10 dB Input and Output Return Loss
- 8 V/-1.5V, 65 mA, 4 mm x 4 mm QFN Package

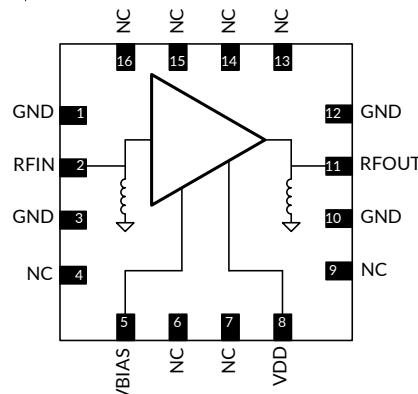
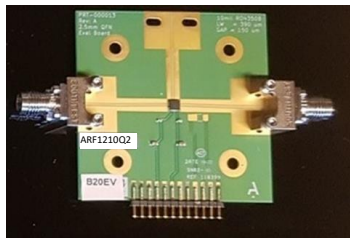


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ARF1210Q2

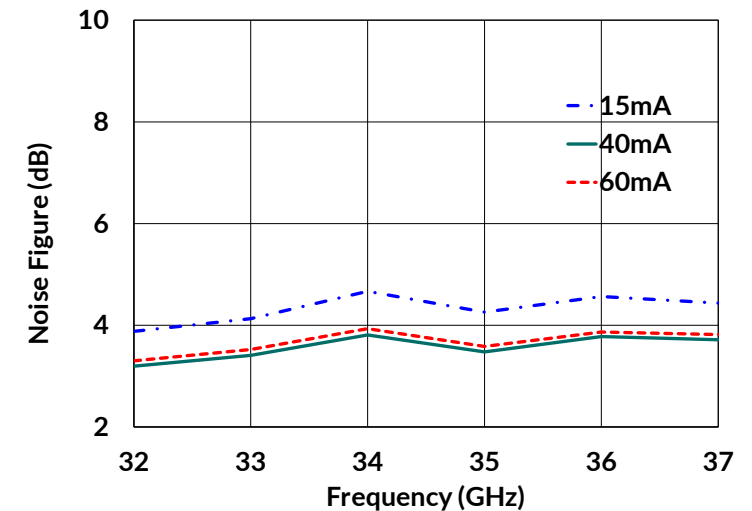
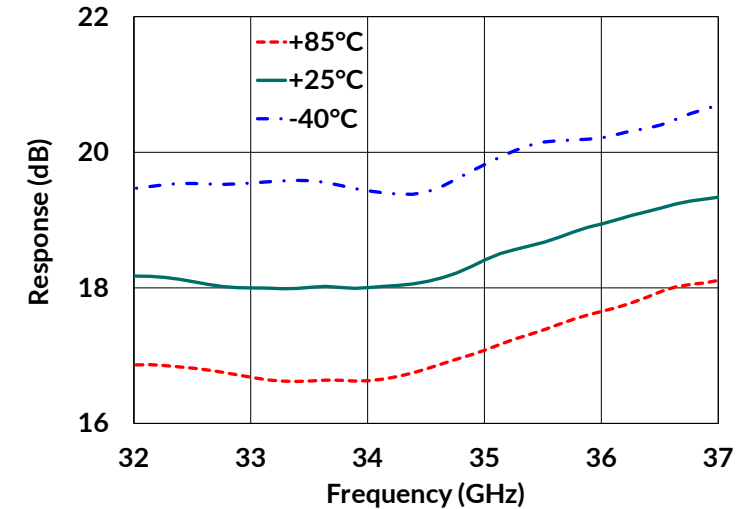
- 32 - 37 GHz Low Noise / Driver Amplifier
- 18 dB Gain
- 3.8 dB Noise Figure
- 10 dBm Output P1dB
- > 10 dB Input and Output Return Loss
- 3.3 V, 40 mA
- 2.5 mm x 2.5 mm QFN Package



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Measured Gain at -40°, 25° and 85°C

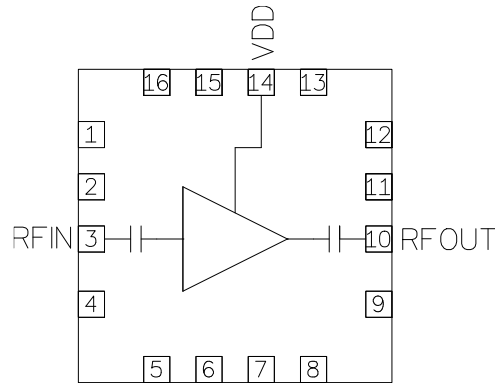


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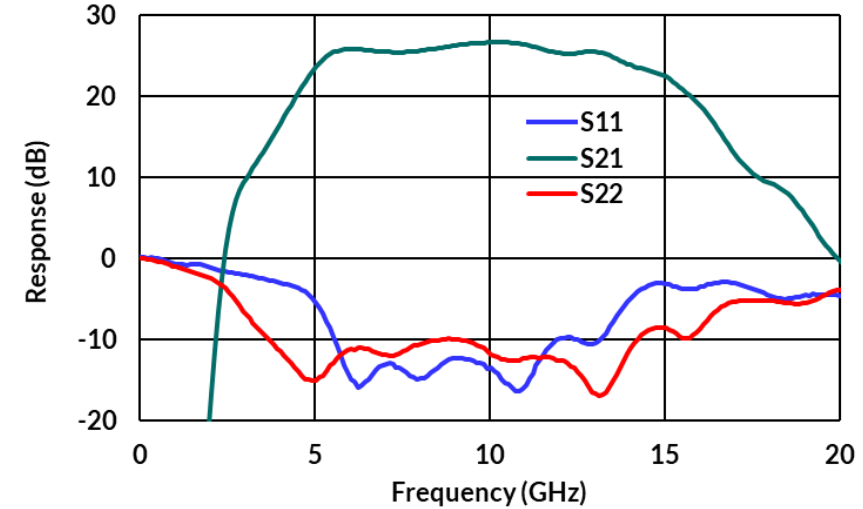


ARF1211Q3

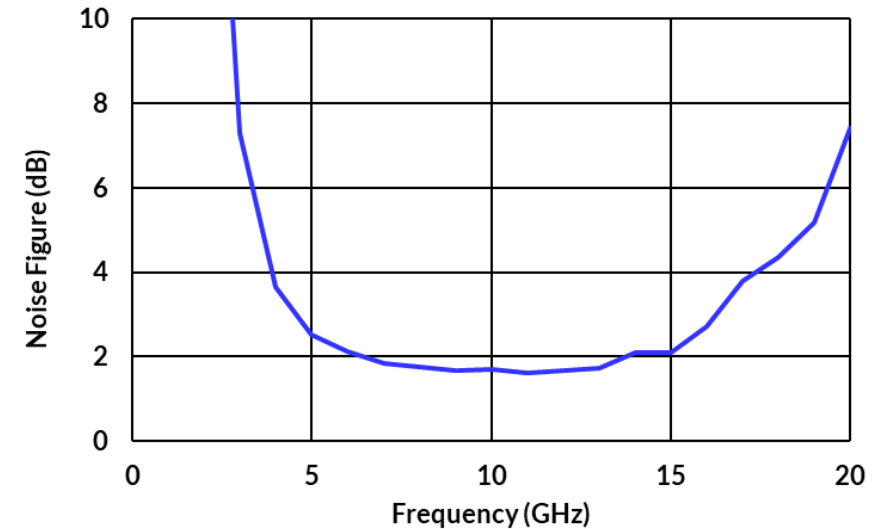
- 6–14 GHz Low Noise Amplifier
- 25 dB Gain
- 10 dB Input and Output Return Loss
- 1.7 dB Noise Figure
- 4~8 V, 60 mA Nominal Bias from Single Supply
- 3 mm x 3 mm QFN Package



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S-parameters



NF



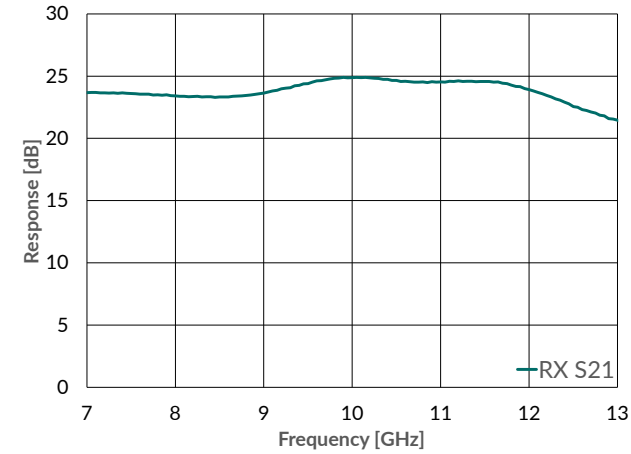
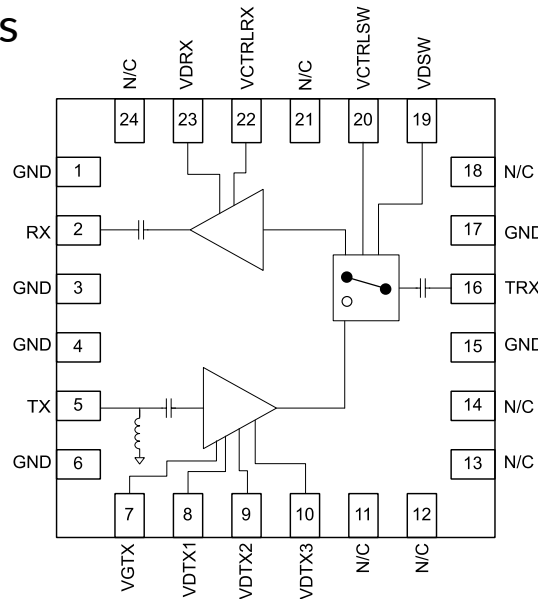
Front-End IC (LNA + PA + Switch)

FEIC	Frequency	Tx Gain	Tx P _{SAT}	Rx NF	Rx Gain	Package	Sampling
ARF1502Q4	8-12 GHz	26 dB	31 dBm	3 dB	24 dB	4 x 4 QFN	NOW



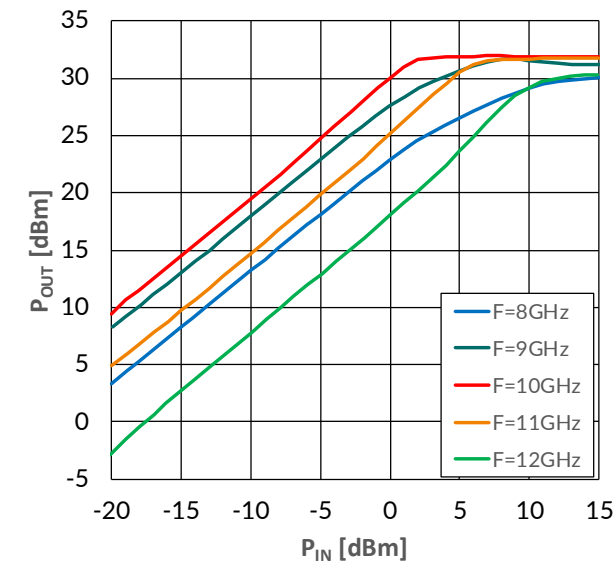
ARF1502Q4

- 8 -12 GHz Integrated Front-End IC
- 31 dBm Transmitted Saturated Output Power
- 3 dB RX Noise Figure (LNA + Switch)
- 24 dB RX Linear Gain
- 3.3V, 30mA LNA Quiescent Bias
- 8V, 316mA PA Quiescent Bias
- 5V Switch Supply Voltage
- 4 mm x 4 mm QFN Package



Rx
Small Signal Gain

Vd, Rx = 3.3 V
Id, Rx = 30 mA



Tx
Output Power

Vd, Tx = 8 V
Vg, Tx = -0.9 V
Idq, Tx = 308 mA

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SPDT Switches

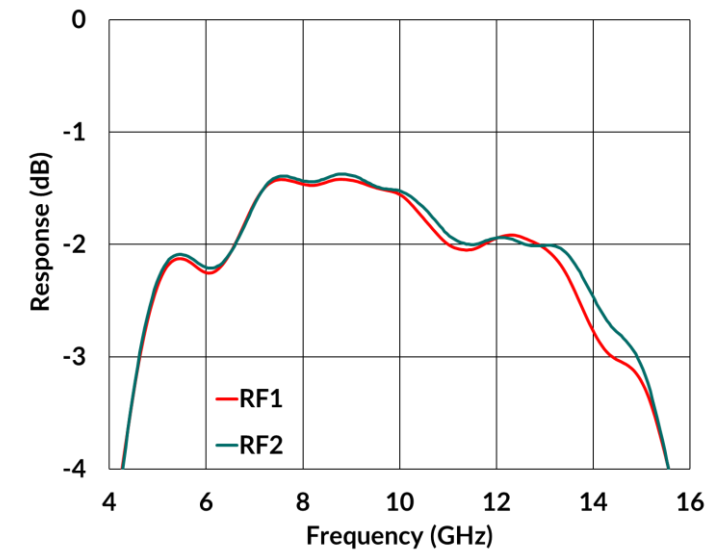
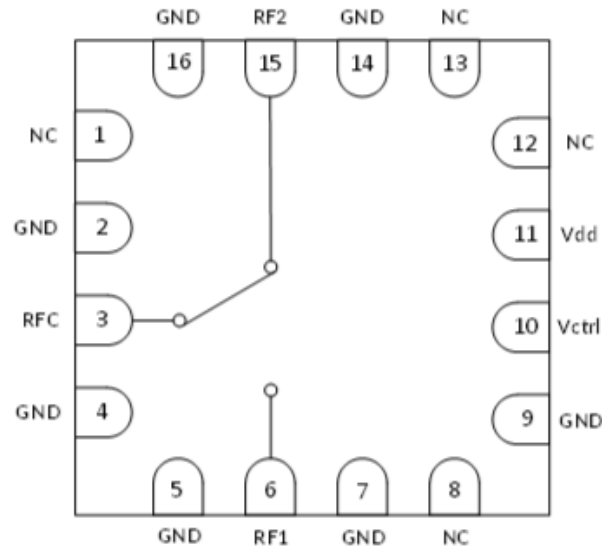
Switches	Min. Frequency (GHz)	Max. Frequency (GHz)	IL (dB)	Isolation (dB)	IP0.1dB (dBm)	IP1dB (dBm)	Vctrl (V)	Package	Sampling
ARF2002Q3	7	11	1.5	30	33.5	35	0/+5	3 × 3 QFN	Q2 2023
ARF2004Q3	6	12	1.1	30	33.5	35	-5/0	3 × 3 QFN	Q2 2023
ARF2001	55	96	< 2	>35	>22	>24	0/-5	Bare Die	NOW
ARF2003	DC	100	1.4 @ 50 GHz 2.5 @ 77 GHz	>30	>22	>24	0/-5	Bare Die	NOW



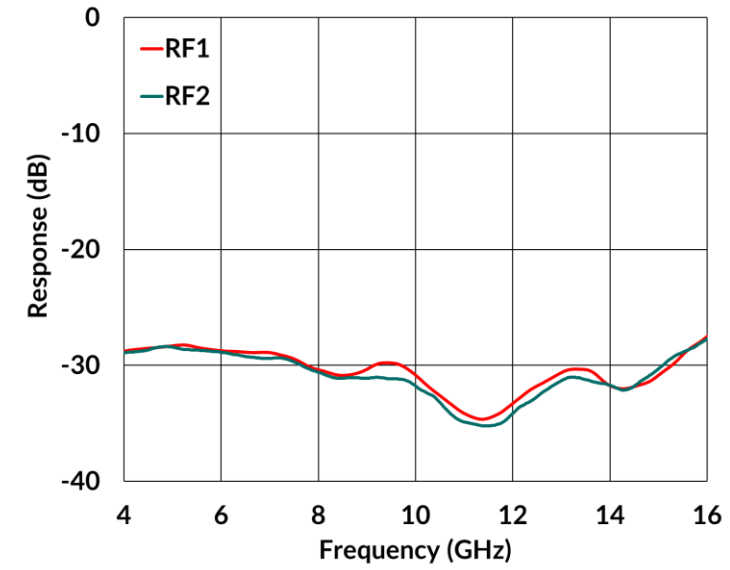
ARF2002Q3

- 7-11 GHz SPDT switch
- 1.5 dB Insertion loss
- 30 dB Isolation
- > 15 dB Input and Output Return Loss
- 33.5 dBm IP0.1dB
- 37 dBm Power handling
- 0/5V Non-complimentary voltage
- 3 mm x 3 mm QFN Package

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Insertion Loss



Isolation

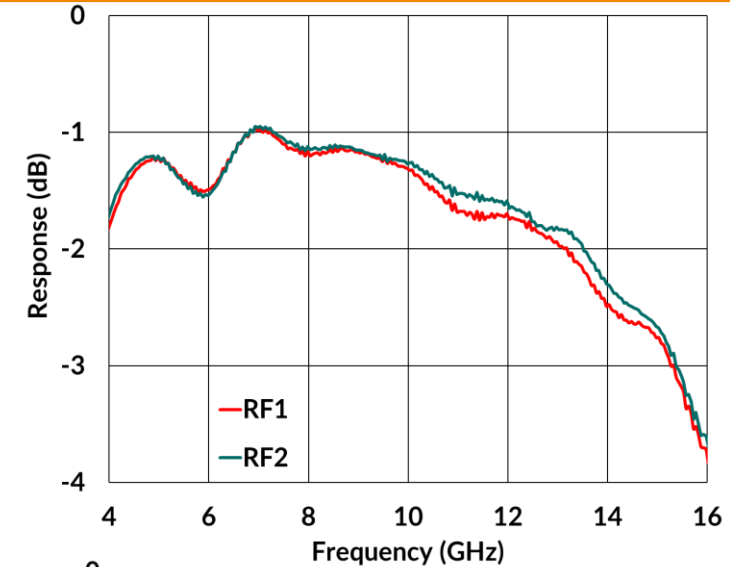
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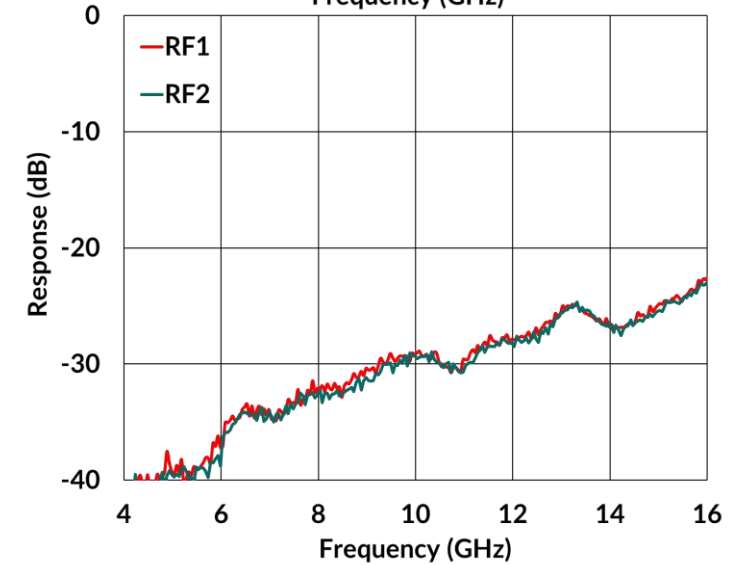
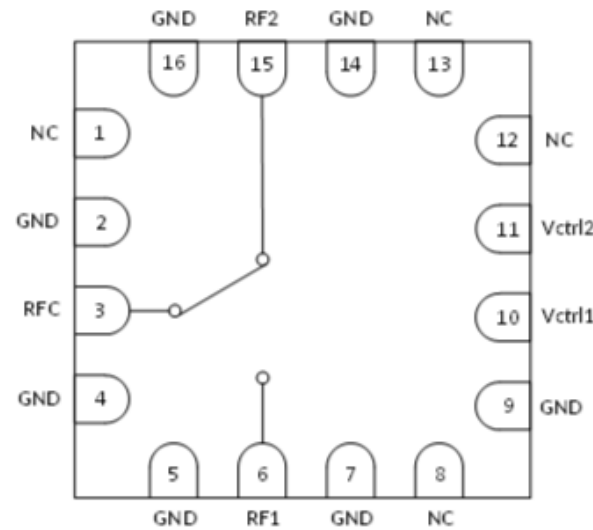
ARF2004Q3

- 6-12 GHz SPDT switch
- 1.1 dB Insertion loss
- 30 dB Isolation
- > 15 dB Input and Output Return Loss
- 33.5 dBm IP0.1dB
- 37 dBm Power handling
- -5/0V Complimentary voltage
- 3 mm x 3 mm QFN Package

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Insertion Loss



Isolation

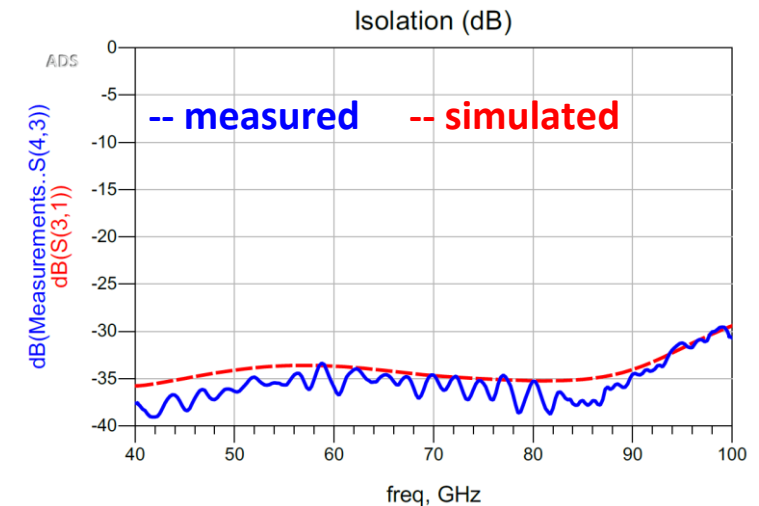
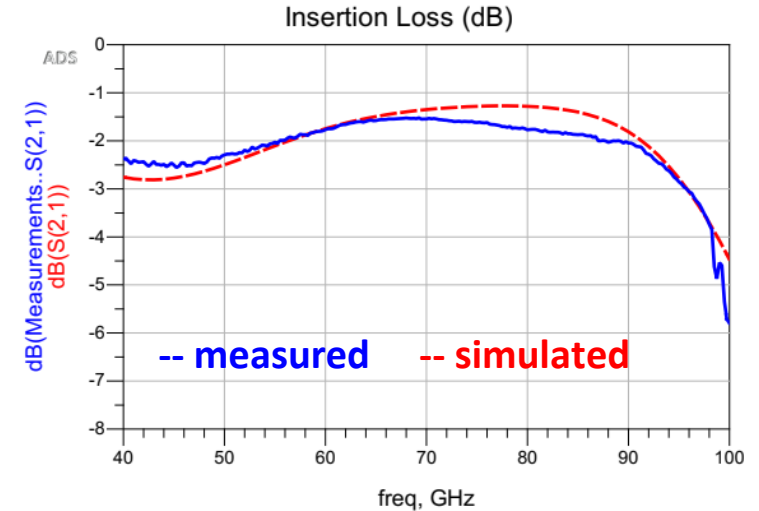
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ARF2001

- 55 - 96 GHz SPDT Switch
- 55-71 GHz typical 1.8 dB IL
- 71-86 GHz typical 1.6 dB IL
- 86-96 GHz typical 2.5 dB IL
- 35 dB Isolation
- Typical 15 dB Input and Output Return Loss
- 0/-5 V Control Voltages

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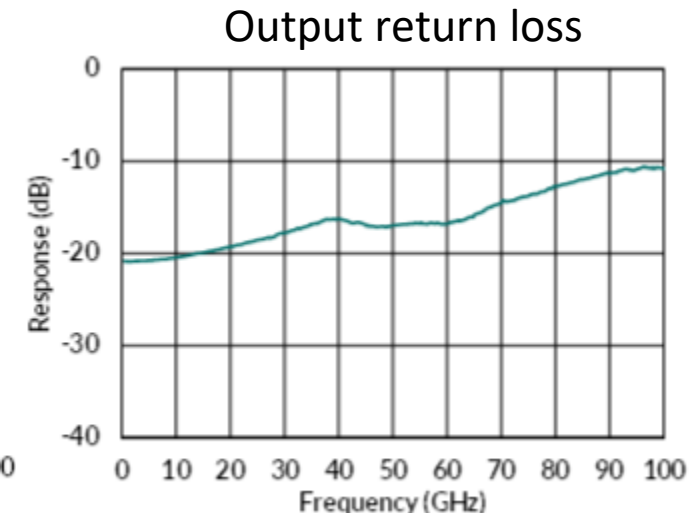
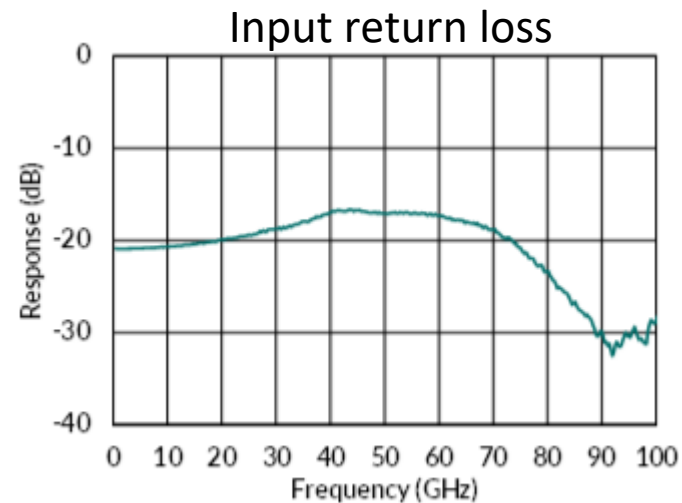
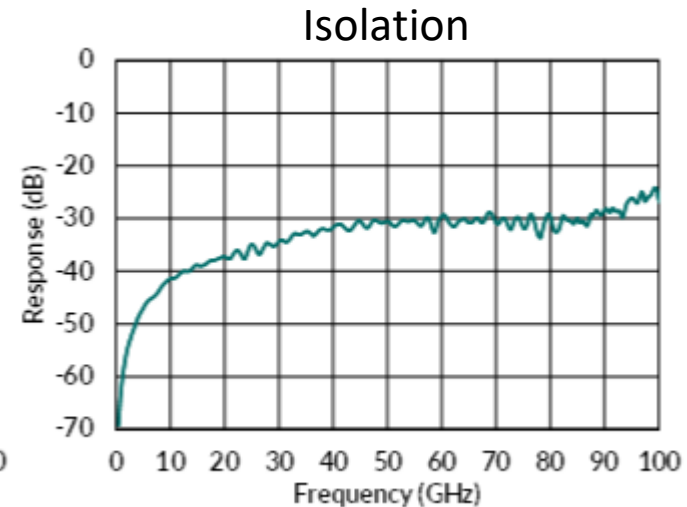
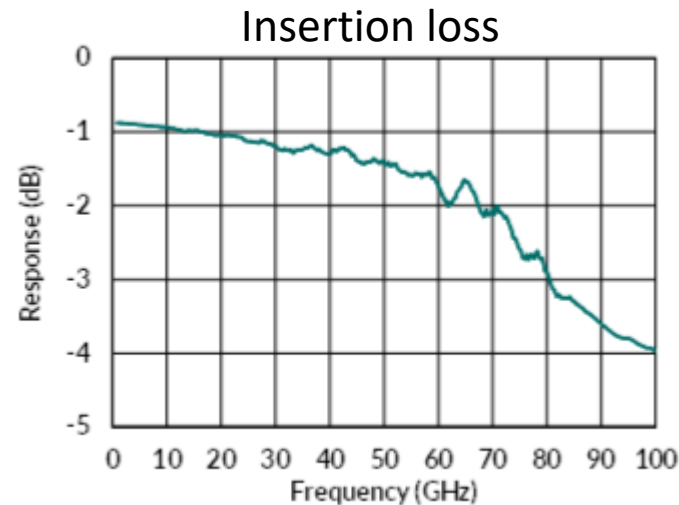
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ARF2003

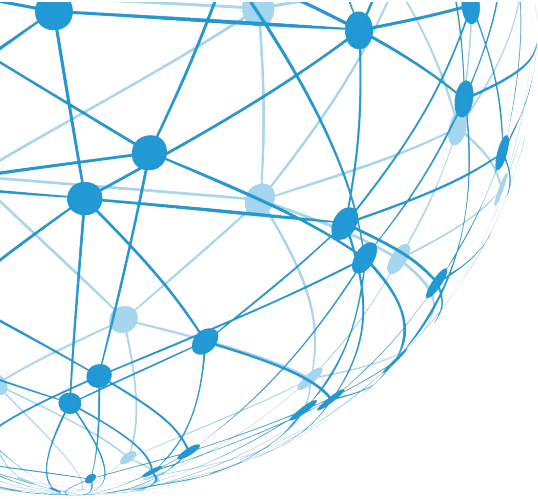
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- DC - 100 GHz SPDT Switch
- 50 GHz typical 1.4 dB IL
- 77 GHz typical 2.5 dB IL
- 100 GHz typical 4 dB IL
- 30 dB Isolation
- DC-70 GHz >15 dB Input and Output Return Loss
- 70-100 GHz >10 dB Input and Output Return Loss
- 0/-5 V Control Voltages



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