

Parameters of an RF amplifier: A practical example

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EE160: Principles of Communication Systems

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A list of low-noise amplifiers (LNA)

Part#	RF Primary Function	Freq Response RF (min) (Hz)	Freq Response RF (max) (Hz)	Gain (typ) (dB)	OP1dB (typ) (dBm)	OIP3 (typ) (dBm)	NF (typ) (dB)	Device Match	Vs (typ) (V)	Is (typ) (A)	Price (100-499) (\$ US)
HMC8325	LNA	71G	86G	21	13	22	3.6	Internal	3	50m	\$61.89 (HMC8325)
ADL7003	LNA	50G	95G	14	14	21	5.5	Internal	3	120m	\$215.62 (ADL7003CHIPS)
HMC7950	LNA, Low Phase Noise	2G	28G	15	16	26	2	-	5	64m	\$137.68 (HMC7950LS6)
HMC392ALC4	LNA	3.5G	8G	17	19	34.5	1.8	Internal	5	61m	\$51.55 (HMC392ALC4)
HMC392A-Die	LNA	3.5G	7G	17.2	19	32.5	1.7	Internal	5	59m	\$43.20 (HMC392A)
HMC717A	LNA	4.8G	6G	14.5	18	29.5	1.3	Internal	5	73m	\$6.70 (HMC717ALP3E)
HMC8410LP2FE	LNA	10M	10G	18	21	31.5	1.4	Internal	5	65m	\$29.86 (HMC8410LP2FE)
HMC8410-Die	LNA	10M	10G	18	20.5	31.5	1.4	Internal	5	65m	\$32.85 (HMC8410CHIPS)
HMC8402-Die	LNA, Wideband Distributed Amps	2G	30G	13.5	20	24	2.5	Internal	7	68m	\$114.67 (HMC8402)
HMC8401-Die	LNA, Wideband Distributed Amps	10M	28G	14.5	16.5	26	1.5	Internal	7.5	60m	\$110.05 (HMC8401)
HMC8400-Die	LNA, Wideband Distributed Amps	2G	30G	14	14.5	25	2	Internal	5	67m	\$102.61 (HMC8400)
ADL5726	LNA	21.2G	23.6G	24.7	-9.5	1	3.3	Internal	3.3	92.4m	\$11.89 (ADL5726ACPZN-R7)
ADL5725	LNA	17.7G	19.7G	27.8	-14	-1.5	2.4	Internal	3.3	108m	\$11.89 (ADL5725ACPZN-R7)
ADL5724	LNA	12.7G	15.4G	26.4	-11	2	2.1	Internal	3.3	109.7m	\$11.89 (ADL5724ACPZN-R7)

Source: <http://www.analog.com/en/products/amplifiers/rf-amplifiers/low-noise-amplifiers.html>

Class exercise 1 (5 min)

- Which of the amplifiers shown in the previous table has best linear properties? Why?

ADL7003 amplifier (50-95 GHz, GaAs)

ADL7003

50 GHz to 95 GHz, GaAs,
pHEMT, MMIC, Wideband Low
Noise Amplifier



Data Sheet
Rev. 0



Recommended
for New Designs



Overview

Documentation

Tools & Simulations

Reference Materials

Design Resources

Discussions

Sample & Buy

Overview

Features and Benefits | Product Details

- Gain: 14 dB typical
- Noise figure: 5 dB typical
- Input return loss (S11): 15 dB typical
- Output return loss (S22): 20 dB typical
- Output power for 1 dB compression (P1dB): 14 dBm typical
- Saturated output power (P_{SAT}): 18 dBm typical
- Output third-order intercept (IP3): 21 dBm typical
- Supply voltage: 3 V at 120 mA
- 50 Ω matched input/output
- Die size: 1.9 mm \times 1.9 mm \times 0.05 mm

Product Categories

Amplifiers

- Low Noise Amplifiers

RF & Microwave

- Low Noise Amplifiers

Markets & Technology

Communications

Source: <http://www.analog.com/en/products/adl7003.html#product-overview>

Class exercise 2 (10 min)

- Sketch the input-output power characteristic of the ADL7003 amplifier

Noise figure? Later in the course

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