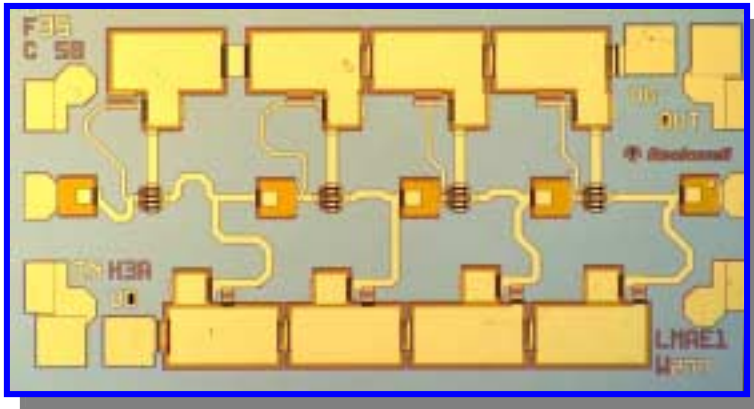


QLNA4S.01R***



MMIC Features

- ❑ Low Noise 2.5 dB N.F.
- ❑ High Gain 22 dB Gain (min)
- ❑ Frequency Range : 40-46 GHz
- ❑ 50 Ω Zin / Zout
- ❑ >10 dB Input / Output Return Loss
- ❑ > 8 dBm Output power at 1dB gain compression
- ❑ Chip size : 1.5 mm X 0.7 mm
- ❑ Substrate Thickness : 75 μ m
- ❑ Bond Pad dimensions 100 μ m x 100 μ m

Description

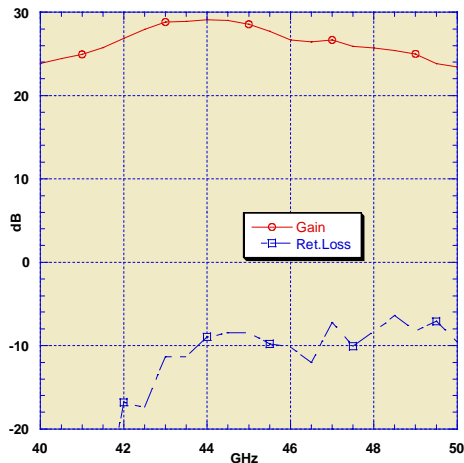
The Rockwell QLNA4S.01R is a PHEMT low noise amplifier that operates from 40 to 46 GHz. This 4 stage amplifier has 24 dB nominal gain with 3.0 dB nominal noise figure and 1 dB gain compression of 8 dBm output power minimum. This MMIC is unconditionally stable.

Absolute Maximum Ratings

Symbol	Parameters/Conditions	Min	Max	Units
V _d 1 2 3	Drain Supply Voltage		5	Volts
V _g 1 2 3	Gate Supply Voltage	-0.6	0.0	Volts
I _d total	Total drain current		90	mA
I _g total	Total gate current		0.1	mA
P _{in}	RF input power		30	dBm
T _{ch}	Operating channel temperature		150	° C
T _{max}	Max assembly temperature		300*	° C
T _{stg}	Max storage temperature	- 65	165	° C
T _{base}	Maximum base plate temperature		140	° C

- 30 minute maximum

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RF and Electrical Specifications
Conditions T base = 25 ° C, Z source = Z load 50 +/- 5 Ω

Symbol	Parameters/Conditions	Min	Typ	Max	Units
V _d 1 2 3	Drain Supply Voltage	2.5	3	5	Volts
V _g 1 2 3	Gate Supply Voltage	-0.6	-0.2	0.0	Volts
ID total	Total drain current (@ typ V _{gs})	30	50	90	mA
Frequency	Specified Bandwidth edges	40		46	GHz
Gain**	Small signal	22	24		dB
Δ Gain	Small signal gain flatness		<1	1.2	dB/GHz
P1dB(note 1)	Power output at 1dB gain compression	8	10		dBm
RL in	Input port return loss	8	10		dB
RL out	Output port return loss	8	10		dB
Isolation	Reverse isolation	30	40		dB
NF(note 1)	Noise figure		2.5	3.5	dB

(Note 1) These measurements will be carried out on a sampled basis. A random representative sample of dies is mounted and tested for noise figure and 1 dB gain compression.

- ❑ Each die is fully DC tested and RF S-parameters are measured. Full 2-port S-parameter data on individual die will be supplied.
- ❑ All dies will pass visual inspection as dictated by the rules contained in Section A of the General Notes on Rockwell PHEMT Products (applicable sections of MIL-I-45208)
- ❑ Every die has a unique identifier number on-chip for complete traceability.
- ❑ A conductive epoxy or a flux-less solder die attach is recommended. The die should be attached to an electrically conductive surface to complete DC and RF ground paths. The ground path inductance should be minimized (<10 pH) to assure stability.
- ❑ The front side metal is compatible with thermo-sonic 1 mil wire bonding. The backside metal is compatible with die attach methods not exceeding T_{max} .
- ❑ GaAs MMICs are ESD sensitive. Proper precautions should be used when handling these devices. Front and backside metal is Gold.
- ❑ In the event of performance verification, dies will be mounted and tested in a standard Rockwell approved test fixture for Q band. (See Section B of the General Notes on Rockwell PHEMT Products).

(***) Rockwell Science Center reserves the right to make improvements in this device, including die size reduction, while maintaining all RF & DC specifications. The General Notes on Rockwell PHEMT Products will be supplied upon user's request . In addition to inspection criteria it will contain descriptions, biasing instructions, reliability data.

(**) Within the temperature range -35° C to +85° C, Small Signal Gain shall not vary by more than +/- 2.0 dB and shall remain within the range 21 dB to 27.5 dB . Under the same conditions the Noise Figure shall not exceed 3.2 dB.