

FEATURES

- 16/19 dBm P1dB/PSAT
- Full E-band coverage
- 27 dBm OIP3
- 23 dB gain

TYPICAL APPLICATIONS

- Point-to-point communication
- Instrumentation
- Fiber over radio
- 77 GHz radar

DESCRIPTION

gAPZ0033 is a Medium Power Amplifier (MPA) in the E-band suitable for point-to-point communication. The MPA features 16 dB P1dB and very flat frequency response. Furthermore, the MPA has high gain, high linearity and low input/output return loss.

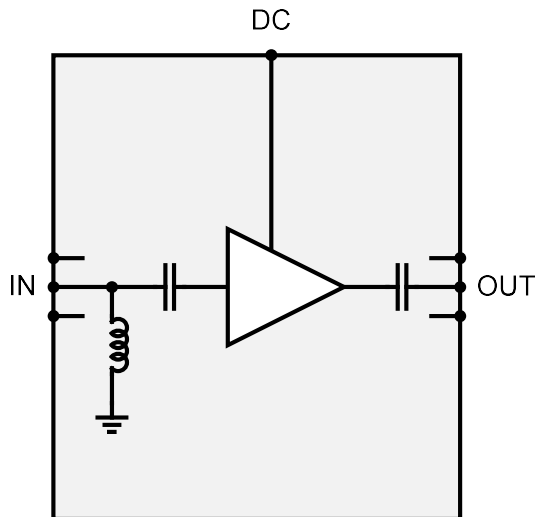


Figure 1. Block diagram of the LNA.

ELECTRICAL PERFORMANCE

Table 1. Electrical performance $T_A=25^\circ\text{C}$

Parameter	Min	Typ	Max	Unit
Frequency	71 (68)		86 (89)	GHz
Gain		25		dB
NF		-		dB
P1dB		17		dBm
PSAT		-		dBm
OIP3		27		dBm
PAE				%
Input return loss		10		dB
Output return loss		10		dB
Power consumption		700		mW

MEASURED PERFORMANCE

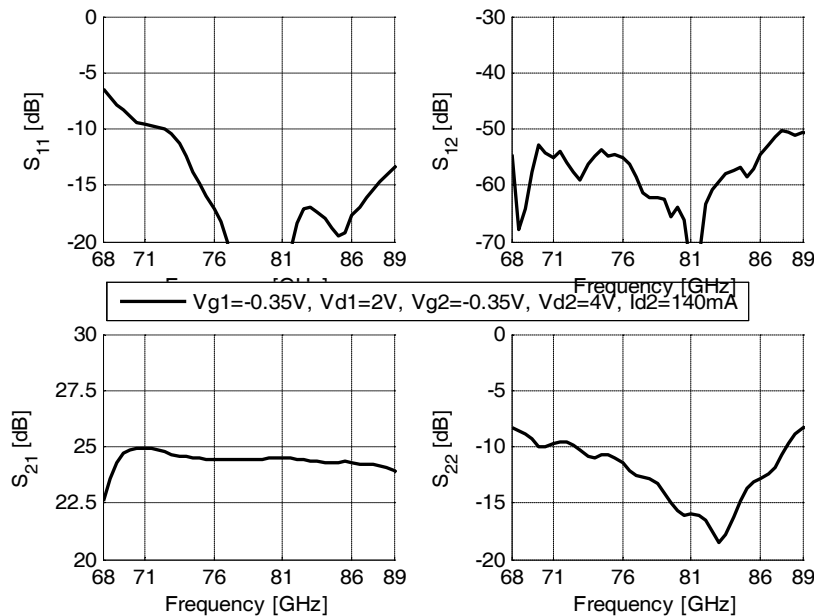


Figure 2. Small signal response within the E-band at nominal bias. (Upper left): Input matching. (Upper right): Reverse isolation. (Lower left): Small-signal gain. (Lower right): Output matching.

RECOMMENDED OPERATING CONDITIONS

Bias should first be applied to the gates (VG...) followed by the drains (VD...). The gate voltages must be adjusted within the min/max range indicated in Table 2-Table 4 to obtain the specified drain currents. The drain currents are stated with no input signal.

Table 2. Electrical settings on connector P1

Connector P1	Pad No.	Interface	I/O
GND	1		Ground
RF_IN	2	$Z_0 = 50 \text{ Ohm}$, AC coupled	Input
GND	3		Ground

Table 3. Electrical settings on connector P2

Connector P2	Pad No.	Bias settings (V/mA)			I/O
		Min	Typ	Max	
VD2	1	3.2	3.3 / 100	3.4	Input
VG2	2	-0.7	-0.5	-0.3	Input
GND	3				Ground
VG1	4	-0.7	-0.5	-0.3	Input
VD1	5	2.4	2.5 / 138	2.6	Input

Table 4. Electrical settings on connector P3

Connector P3	Pad No.	Interface	I/O
GND	1		Ground
RF_OUT	2	$Z_0 = 50 \text{ Ohm}$, AC coupled	Output
GND	3		Ground

ABSOLUTE MAXIMUM RATINGS

Table 5. Absolute maximum ratings

Gate-source voltage	-2 to +0.7 V
Drain-source voltage	4.5 V
Gate-drain breakdown voltage	8 V
ID2	240 mA
ID1	240 mA
RF input power	+15 dBm
Operating temperature	-40 to + 85°C
Storage temperature	-65 to +150°C

OUTLINE DRAWING

Mechanical drawing with pad locations is also available in dxf-file format on the web. The substrate thickness is 50 µm (GaAs).

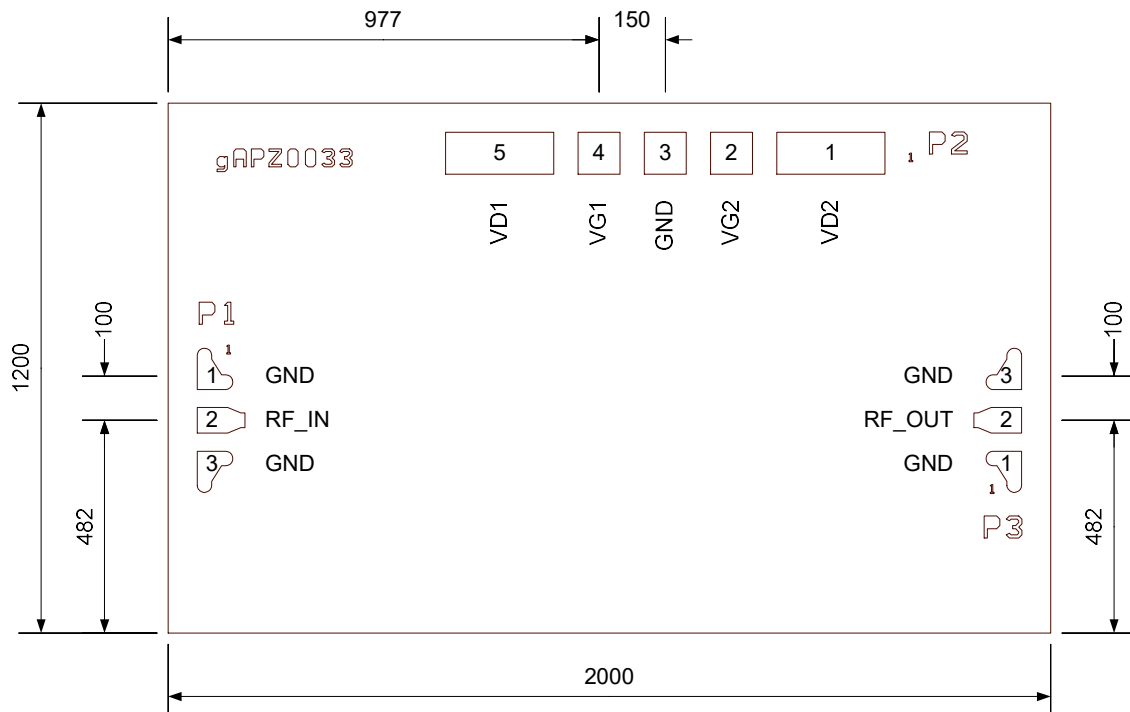


Figure 3. Outline drawing of the MMIC. Dimensions are in µm.