

FEATURES

- 50-170 GHz coverage
- 3000 V/W responsivity
- -10 dBm max linear input power (@ 81 GHz)

TYPICAL APPLICATIONS

- Point-to-point communication
- Radiometers, imaging
- 77 GHz automotive radar

DESCRIPTION

The gDPZ0011 is a broadband active power detector. It features very high responsivity over a wide bandwidth, up to and beyond 170 GHz.

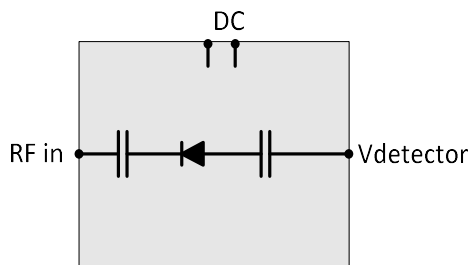


Figure 1. Block diagram of gDPZ0011 B

ELECTRICAL PERFORMANCE

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

Parameter	Min	Typ	Max	Unit
Frequency	50		170	GHz
Responsivity	500	3000	5000	V/W
Input return loss, 50-170 GHz	3		7	dB
Input return loss, 71-86 GHz	6			dB
Input power (linear response) @ 81 GHz			-10	dBm
Power consumption		50		mW

MEASURED PERFORMANCE

Measurements have been performed on-wafer with $T_A = 25^\circ\text{C}$ and typical bias settings if not specified differently.

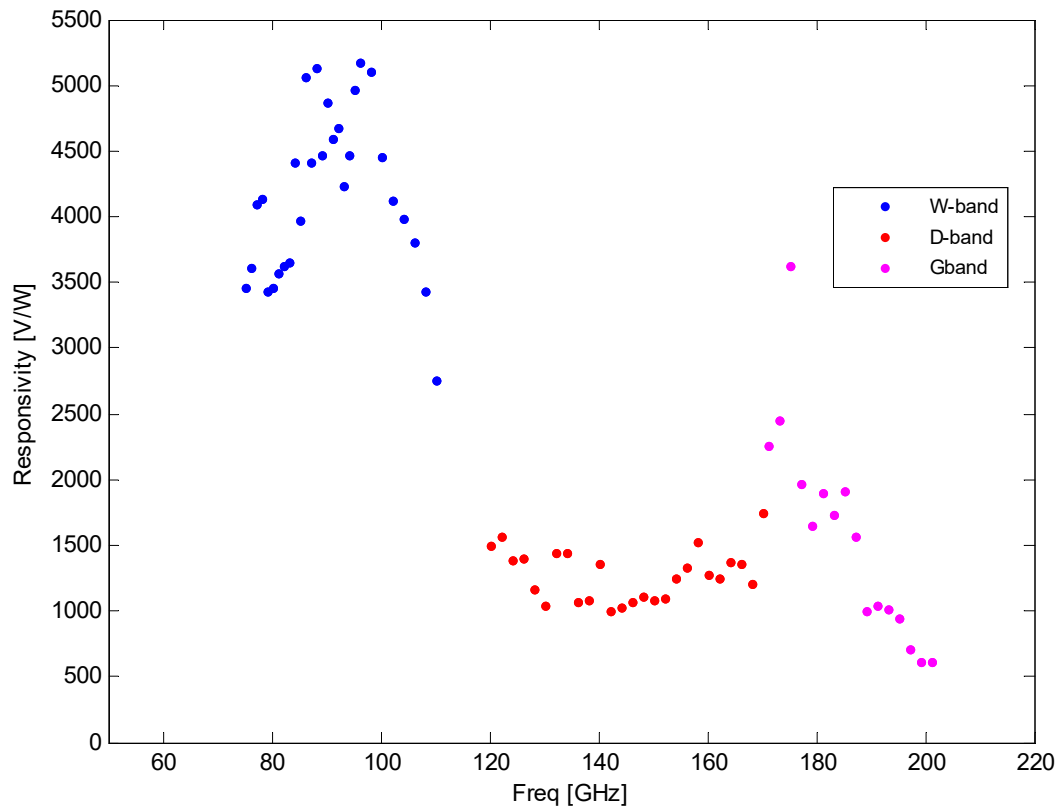


Figure 2. Responsivity vs. input frequency in linear operation.

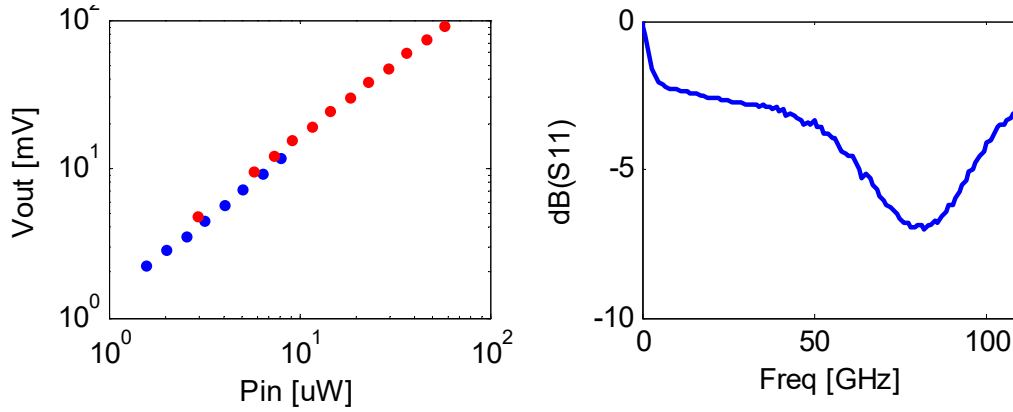


Figure 3. Detector voltage versus input power at 81 GHz (left). S-parameter measurements of RF input port from 0 to 110 GHz (right)

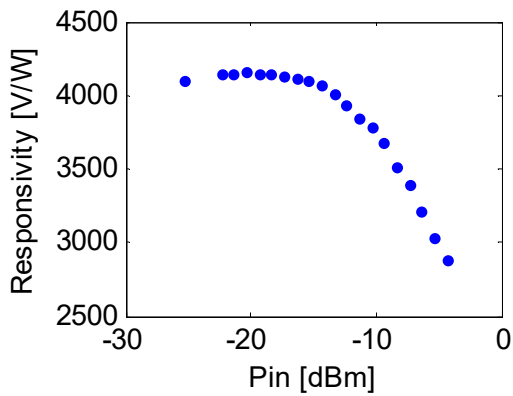


Figure 4. Responsivity vs input power at 81 GHz.

RECOMMENDED OPERATING CONDITIONS

Bias should first be applied to the gates (VG...) followed by the drains (VD...).

Table 2. Electrical settings on connector P1

Connector P1	Pad No.	Bias settings (V / mA)			Function
		Min	Typ	Max	
NC	1				NC
VD	2	2.4	2.5	2.6	Input
GND	3				Ground
NC	4				NC
VG	5	-1.2	-1	-0.8	Input

Table 3. Electrical settings on connector P2

Connector P1	Pad No.	Bias settings (V / mA)			Function
		Min	Typ	Max	
GND	1				Ground
VDET_OUT	2	0		0.2	Output
GND	3				Ground

Table 4. Electrical settings on connector P3

Connector P4	Pad No.	Settings	Function
GND	1		Ground
RF_IN	2	$Z_0 = 50 \text{ Ohm}$, AC coupled	Input
GND	3		Ground

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
RF in	0 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. Substrate thickness is 50 μm (GaAs).

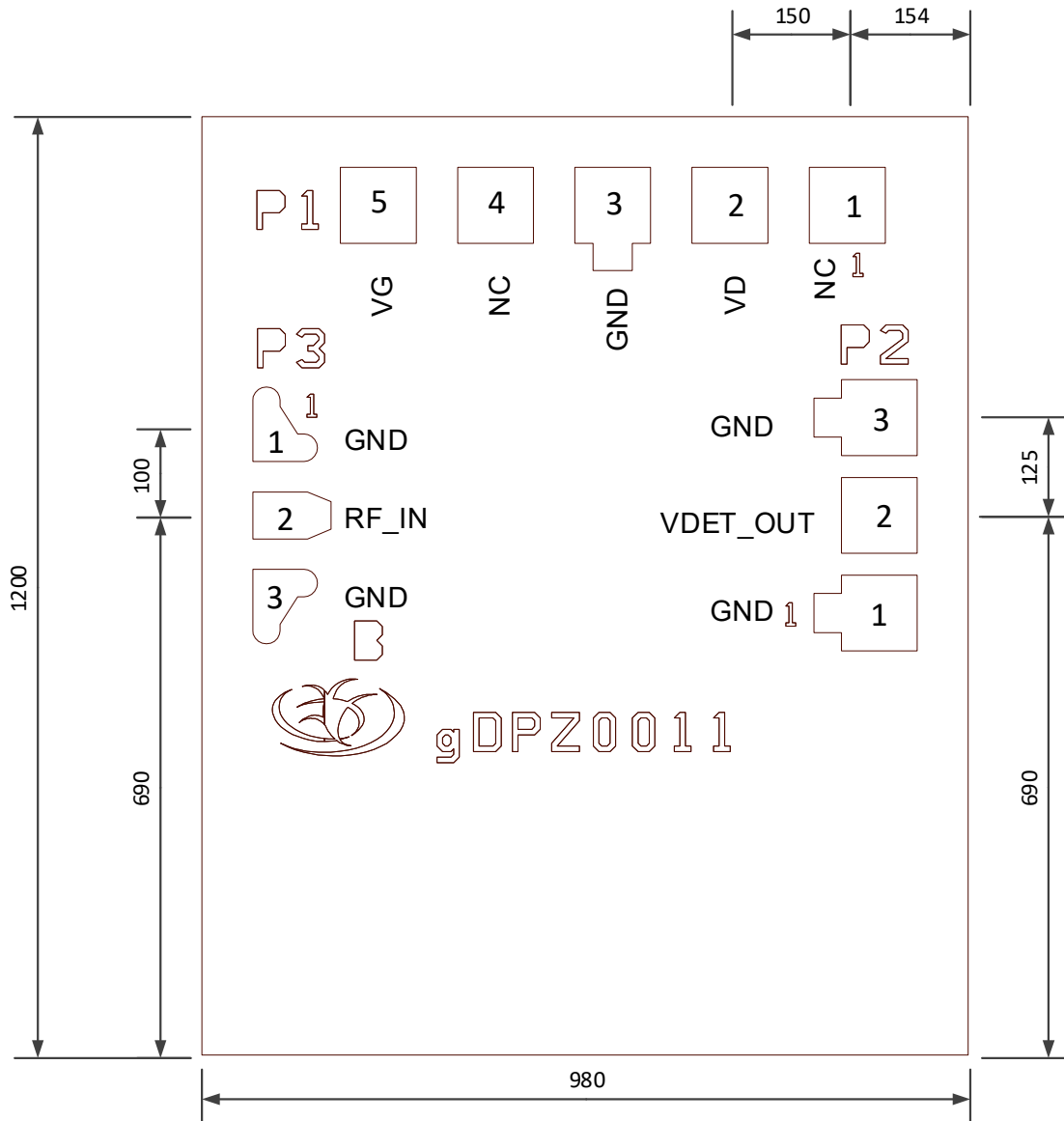


Figure 5. Outline drawing of the MMIC. Dimensions are in μm .