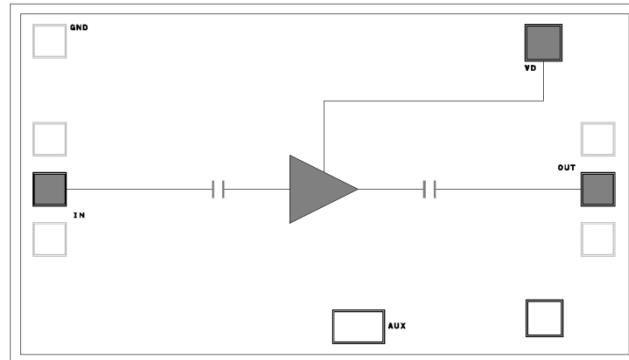


**Features**

- Single Biasing Voltage (Self Biased)
- Frequency: 20 - 40GHz
- Small Signal Gain:
  - 20.5dB@24GHz
  - 18.5dB@40GHz Typical
- Gain Flatness:  $\pm 1.0$ dB Typical
- Noise Figure: 2.7dB Typical
- P1dB: 14dBm Typical
- Power Supply: +5V/70mA
- Input/Output: 50 $\Omega$
- Chip Size: 1.85 x 1.05 x 0.1mm

**Typical Applications**

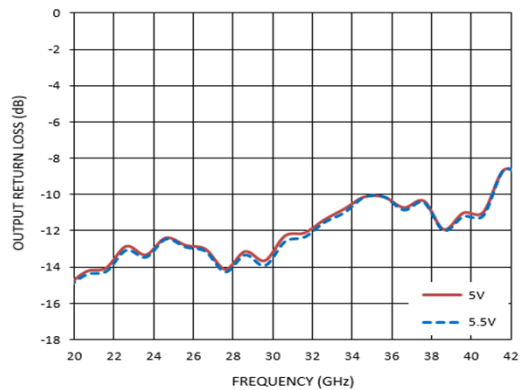
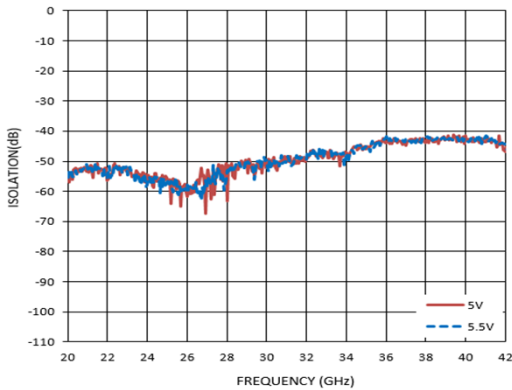
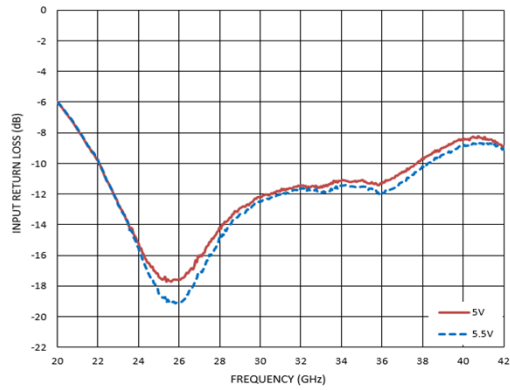
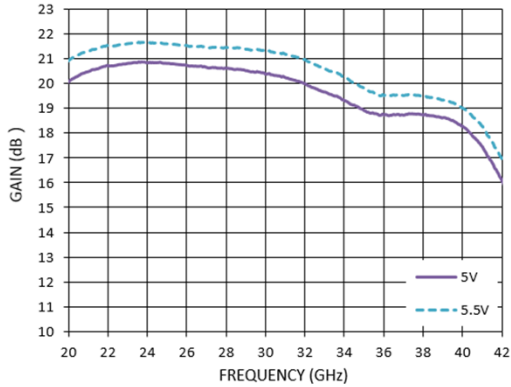
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

**Functional Block Diagram**

**Electrical Specifications**
**TA = +25°C, VD = +5V, IDD = 70mA Typical**

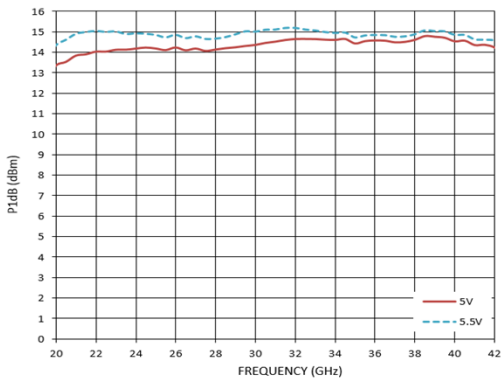
Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
<b>Frequency</b>	<b>20-30</b>			<b>30-40</b>			<b>GHz</b>
<b>Small Signal Gain</b>	<b>19</b>	<b>20.5</b>		<b>17.5</b>	<b>19.5</b>		<b>dB</b>
<b>Gain Flatness</b>		<b><math>\pm 0.3</math></b>			<b><math>\pm 1.0</math></b>		<b>dB</b>
<b>Noise Figure</b>		<b>2.7</b>	<b>3.0</b>		<b>2.7</b>	<b>3.0</b>	<b>dB</b>
<b>P1dB - Output 1dB Compression</b>	<b>12</b>	<b>14</b>		<b>12</b>	<b>14.5</b>		<b>dBm</b>
<b>Past - Saturated Output Power</b>		<b>16</b>			<b>16</b>		<b>dBm</b>
<b>OIP3 - Output Third Order Intercept</b>		<b>21</b>			<b>22</b>		<b>dBm</b>
<b>Input Return Loss</b>		<b>12</b>			<b>10</b>		<b>dB</b>
<b>Output Return Loss</b>		<b>12</b>			<b>10</b>		<b>dB</b>



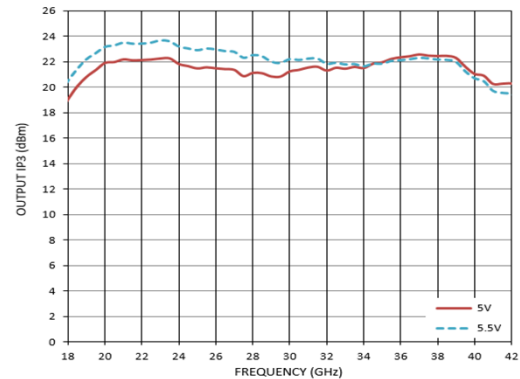
### Measurement Plots: S-parameters



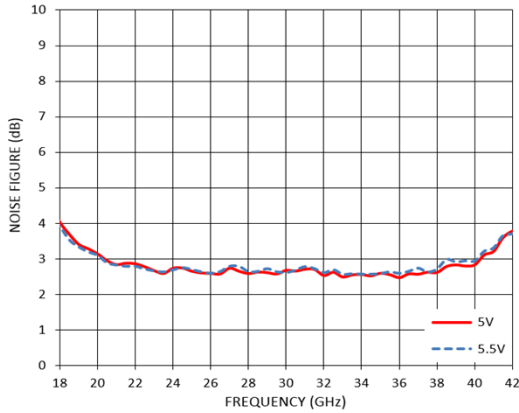
### Measurement Plots: P1dB



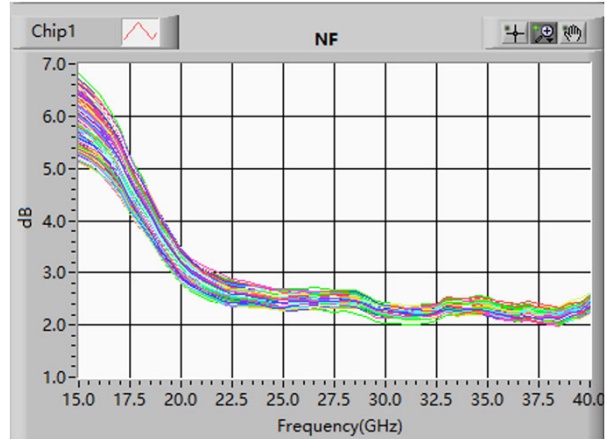
### Measurement Plots: OIP3



**Measurement Plots: Noise Figure  
(6 Sigma Worst Case)**



**Measurement Plots: Noise Figure  
(Statistic 6000pcs)**



**Absolute Maximum Ratings**

Drain Bias Voltage (VD)	+7V
RF Input Power (RFIN)(VDD=+5V)	+10 dBm
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C)(derate 24 mW/°C above 85 °C)	25dBm
Thermal Resistance (channel to die bottom)	50°C/W
Operating Temperature	-55 to +85 °C
Storage Temperature	-55 to +150 °C

**Typical Supply Current vs. VD**

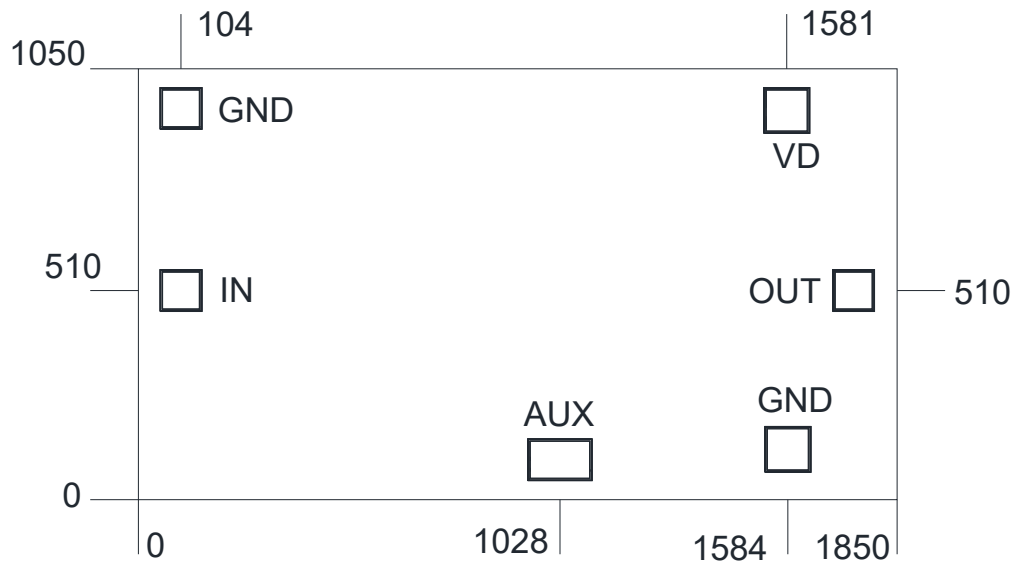
VD (V)	IDD (mA)
+5	70
+5.5	85
+6	105



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**



**Outline Drawing:**  
All Dimensions in  $\mu\text{m}$

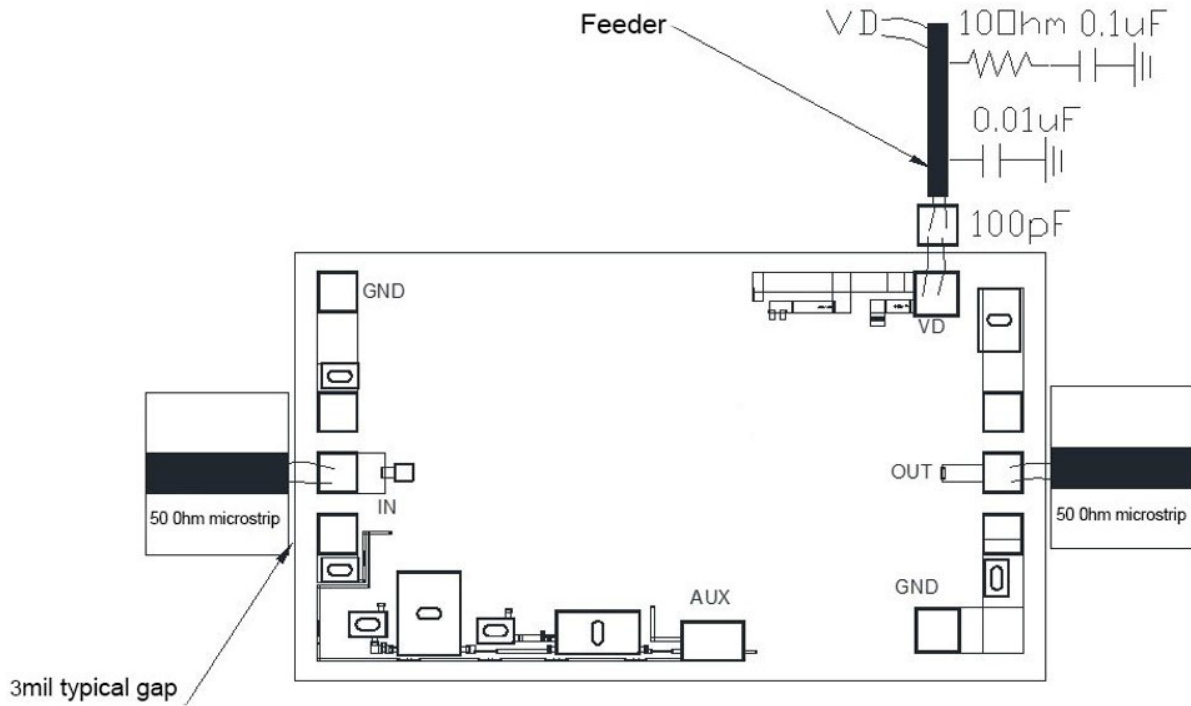


**Notes:**

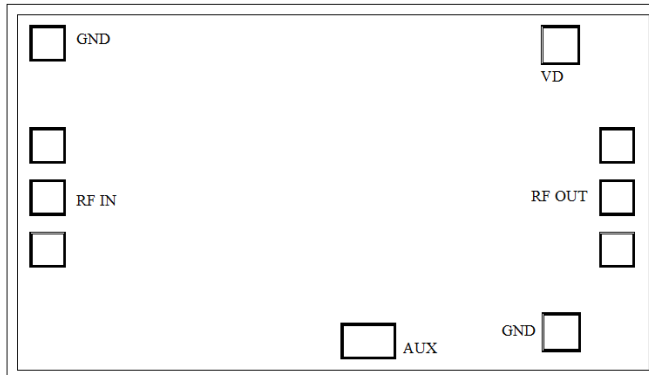
1. Die thickness: 100 $\mu\text{m}$
2. DC bond pad is 100 x 100  $\mu\text{m}^2$
3. RF IN/OUT bond pad is 100 x 100  $\mu\text{m}^2$
4. DC bond pad is 100 x 100  $\mu\text{m}^2$
5. No DC Blocking Capacitor needed for RF input & RF output
6. Bond pad metalization: Gold
7. Backside metalization: Gold
8. Backside of the die (GND)



### Assembly Drawing



No	Function	Description
1	RF IN	Signal input terminal, connected to 50Ω circuit
2	RF OUT	Signal output terminal, connected to 50Ω circuit
3	VD	Connect to external 100pF and 0.01uF bypass capacitors.
9	GND1	Ground pad.
10	GND2	Ground pad.



## Biasing and Operation

Performance is optimized when the drain voltage VD is set to +5 V.

### Turn ON procedure:

1. Connect Input and Output with 50 Ohm source/load.
2. Apply positive drain voltage VD and set to +5.0 V
3. Apply RF signal

### Turn OFF procedure:

1. Turn off RF signal
2. Turn off positive drain voltage VD

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