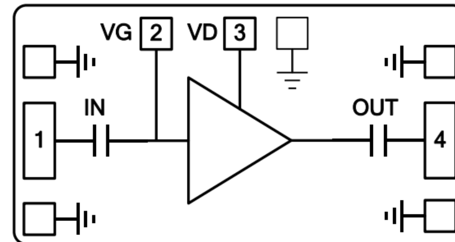
*GaAs MMIC*
*Low Noise Amplifier*
*6-18GHz*

## Features

- Two Working Modes: High power consumption
  Low power consumption
- Frequency: 6-18GHz
- Gain: 21 dB @ 53 mA；20 dB @ 33 mA
- Noise Figure: 1.3 dB
- P1dB: +16 dBm @ 53 mA；+13 dBm @ 33 mA
- Self Biasing: +5 V @ 53 mA VG is suspended
  +5 V @ 33 mA VG is grounded
- Input/Output: 50Ω
- Die Size: 1.5 x 0.8 x 0.1 mm

## Functional Block Diagram




## Typical Applications

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

## Electrical Specifications

**TA = +25ºC, VDD = +5V, IDD = 53mA**

| Parameters | VG is suspended | | | VG is grounded | | | |
|---|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. | Units |
| Frequency | | 6-18 | | | 6-18 | | GHz |
| Gain | | 21 | | | 20 | | dB |
| Gain Flatness | | ±0.2 | | | ±0.5 | | dB |
| Noise Figure | | 1.3 | | | 1.3 | | dB |
| Output 1dB Compression (P1dB) | | 16 | | | 13.5 | | dBm |
| Saturated Output Power (P sat) | | 17.5 | | | 15 | | dBm |
| Output IP3 | | 28 | | | 25 | | dBm |
| Input Return Loss | | 12 | | | 12 | | dB |
| Output Return Loss | | 12 | | | 12 | | dB |
| Operating current | 30 | 53 | 75 | 20 | 33 | 50 | mA |

MILLER MMIC

# MML096

V1.0.0

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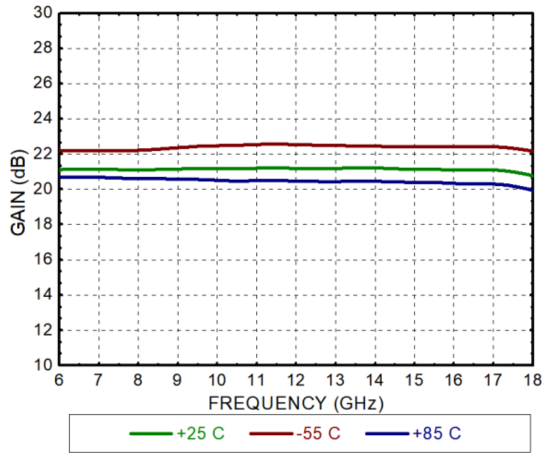
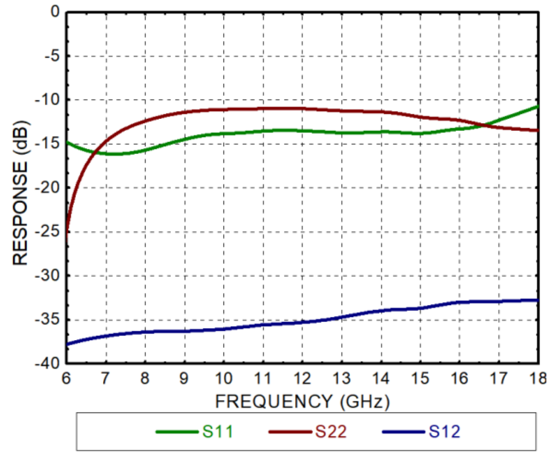
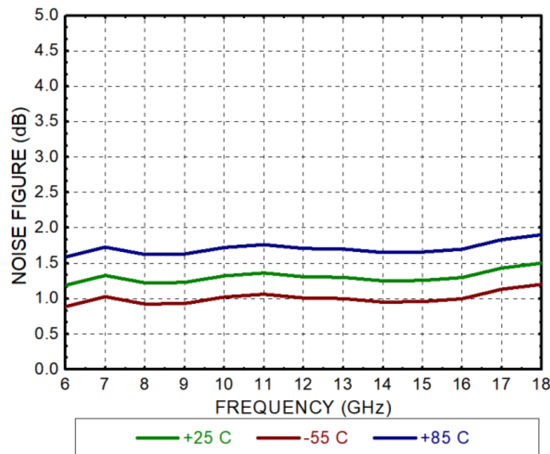
## Gain @ VG Suspended



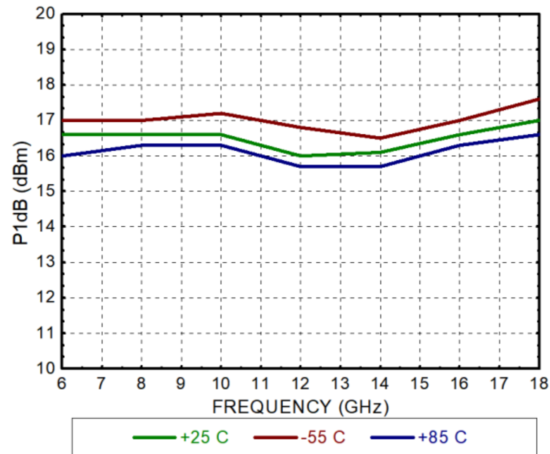

## Return Loss & Reverse Isolation @ VG Suspended



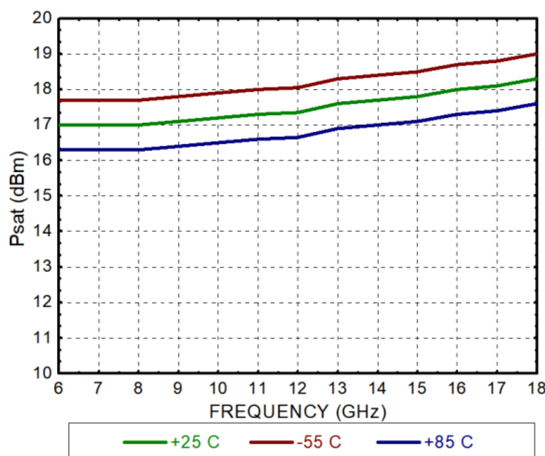

## Noise Figure @ VG Suspended



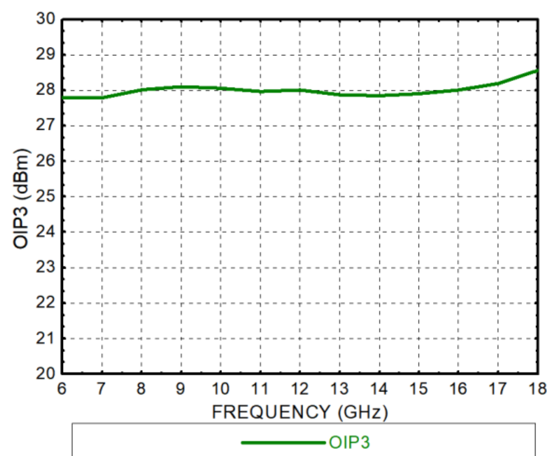

## Output Power $P_{-1}$ @ VG Suspended

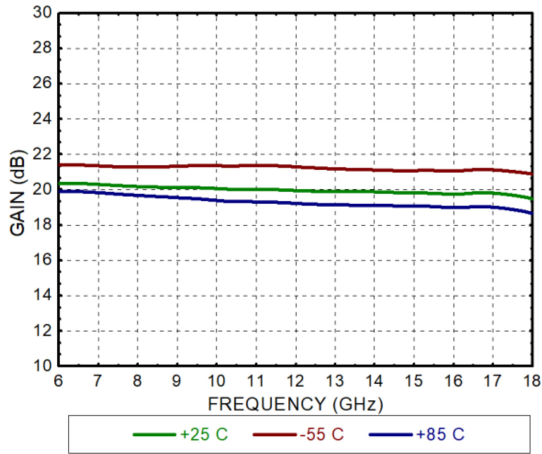



## Psat @ VG Suspended

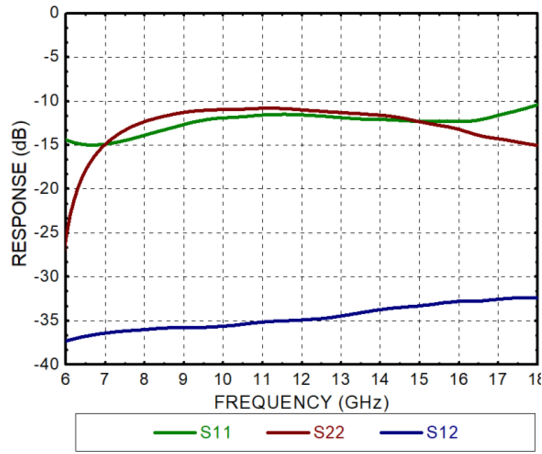



## OIP3 @ VG Suspended

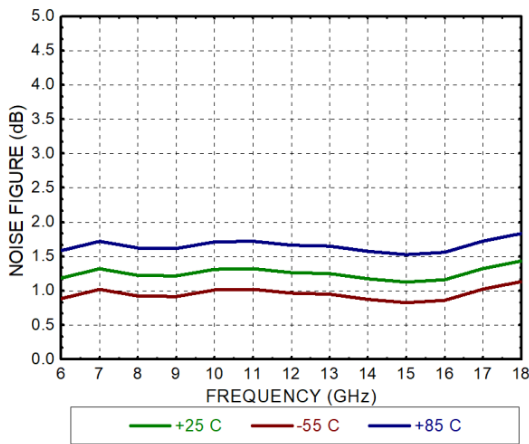




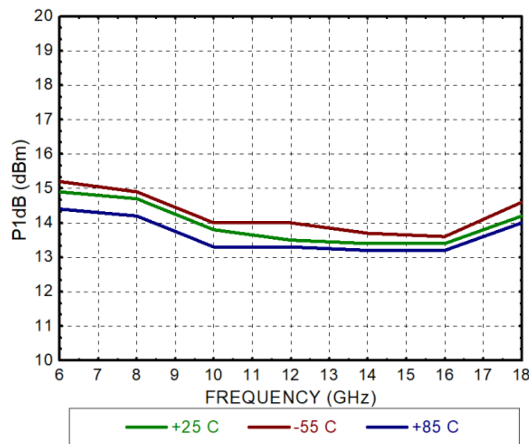
Gain @ VG Grounded
GAIN (dB)
FREQUENCY (GHz)
+25 C
-55 C
+85 C

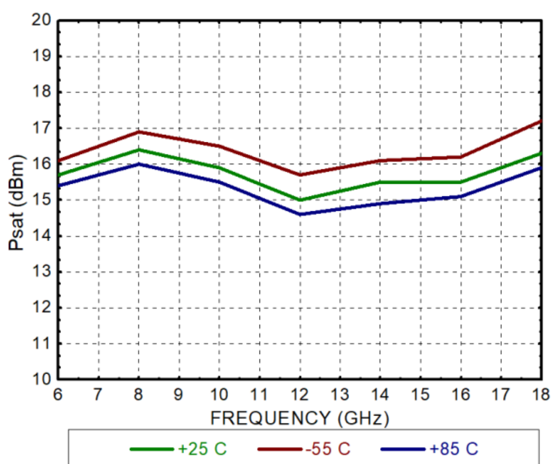
Return Loss & Reverse Isolation @ VG Grounded
RESPONSE (dB)
FREQUENCY (GHz)
S11
S22
S12

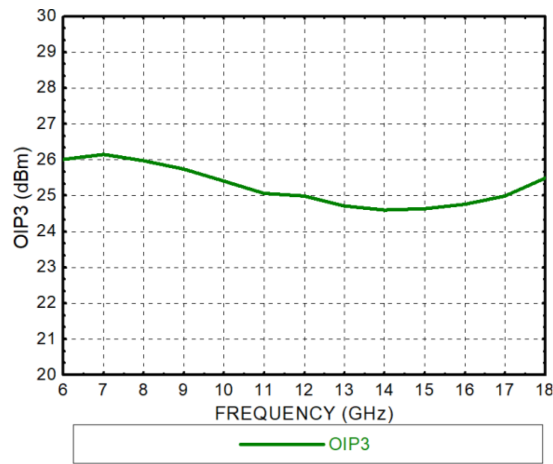
Noise Figure @ VG Grounded
NOISE FIGURE (dB)
FREQUENCY (GHz)
+25 C
-55 C
+85 C

Output Power P-1 @ VG Grounded
P1dB (dBm)
FREQUENCY (GHz)
+25 C
-55 C
+85 C

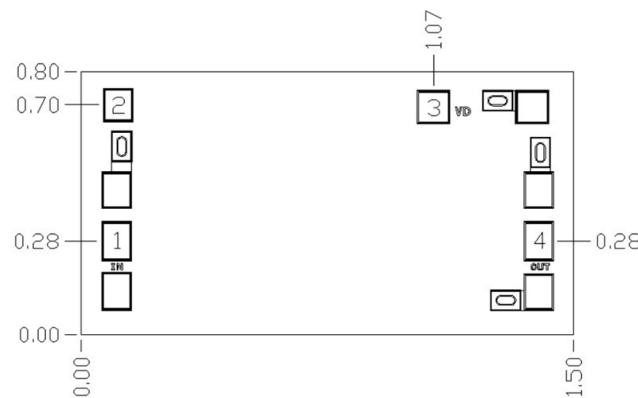
Psat @ VG Grounded
Psat (dBm)
FREQUENCY (GHz)
+25 C
-55 C
+85 C

OIP3 @ VG Grounded
OIP3 (dBm)
FREQUENCY (GHz)
OIP3

## Outline Drawing:

All Dimensions in mm

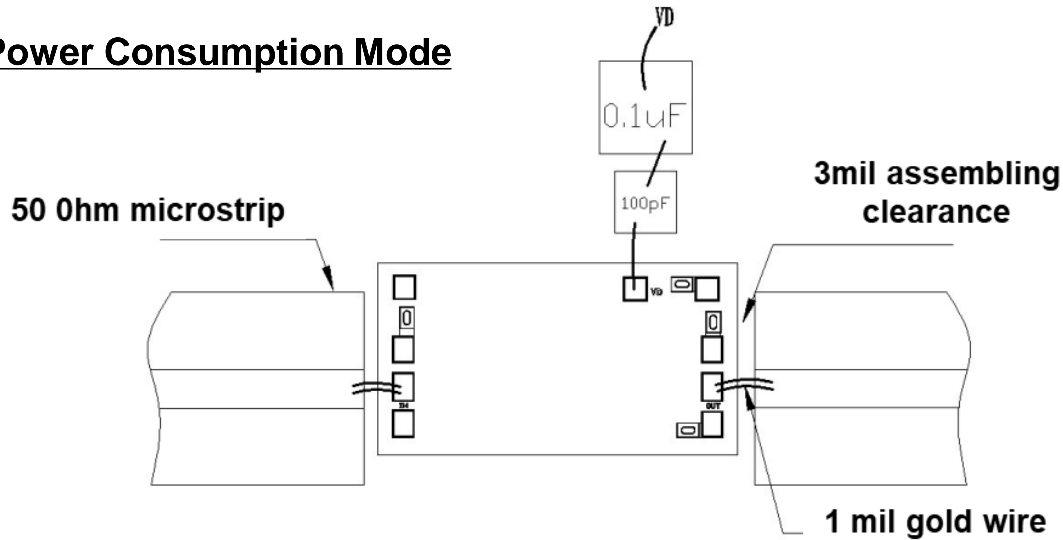



### Pad Description

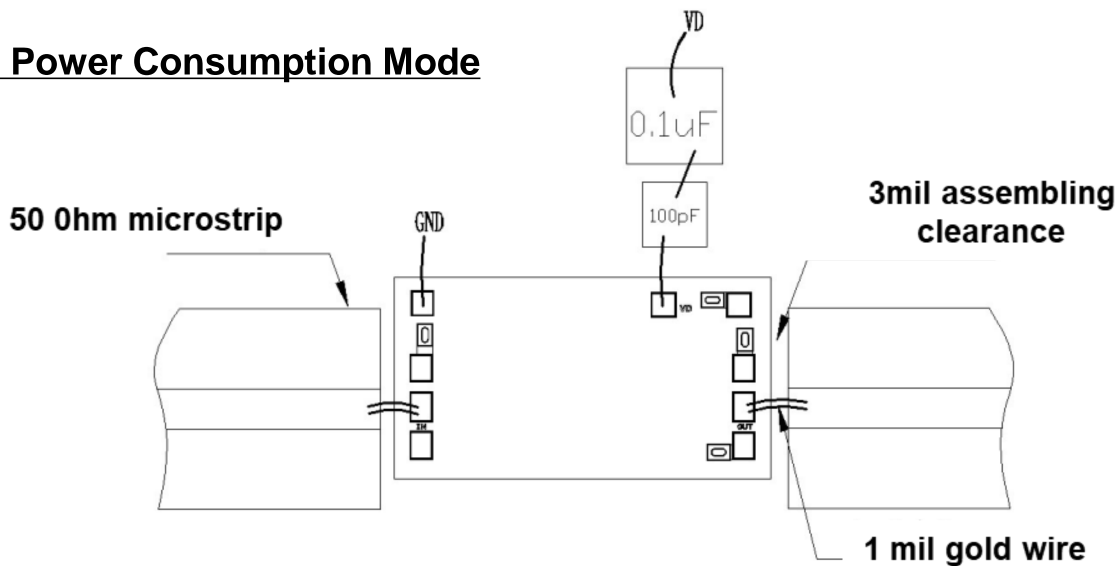
| Pad | Function | Description |
|---|---|---|
| 1 | IN | This pad is AC coupling, 50 ohm matched |
| 2 | VG | This pad can adjust working mode; Work in high power mode when VG is suspended , work in low power mode when VG is grounded |
| 3 | VD | This pad provides the power supply voltage of the amplifier and needs to be externally connected with the 100pF bypass capacitor. . |
| 4 | OUT | This pad is AC coupling, 50 ohm matched |
| Die bottom | GND | Die bottom must be connected to RF/DC ground. |

## Assembly Drawing

### High Power Consumption Mode




### Low Power Consumption Mode




**Notes:**
1. Die thickness: 100um
2. Typical bond pad is 100*100 $\mu m^2$
3. Bond pad metalization: Gold
4. Backside metalization: Gold
5. Backside of the die (GND)
6. No connection required for unlabeled bond pads

**Maximum Ratings:**
1. Power supply voltage (VD): +6V
2. RF input power: +18dBm
3. Storage temperature: -65℃ to +150℃
4. Operating temperature: -55℃ to +85℃