MILLER MMIC

MM3044

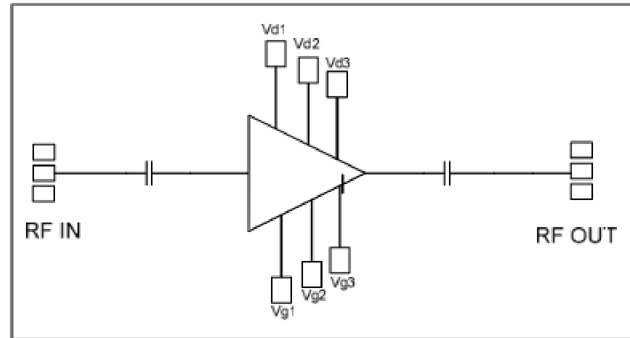
V1.0.0

GaAs pHEMT MMIC
Power Amplifier
8-12GHz

Features

- **Frequency:8-12GHz**
- **Small Signal Gain: 24.5dB**
- **Gain Flatness: ±1.0dB**
- **P1dB: 28dBm**
- **Psat: 28.5dBm**
- **Power Supply: +8V@135mA**
- **Input/Output: 50Ω**
- **Die Size: 2.53 x 1.52 x 0.1 mm**

Functional Block Diagram



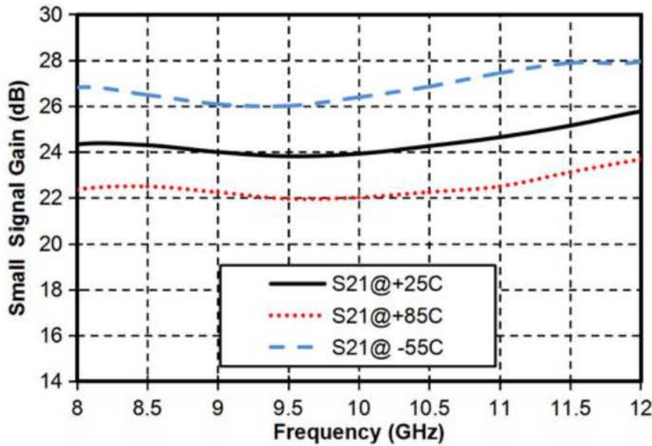
Typical Applications

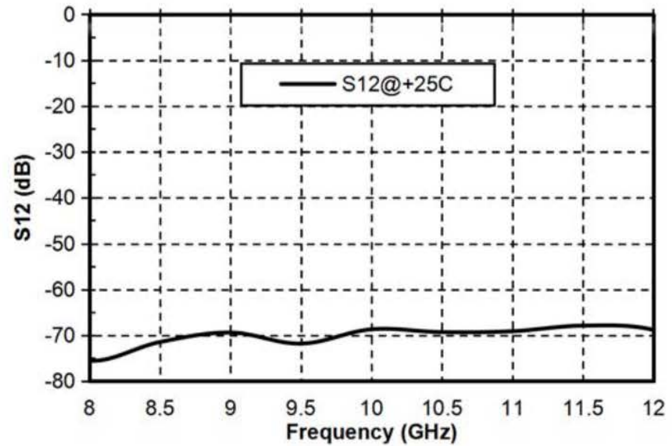
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

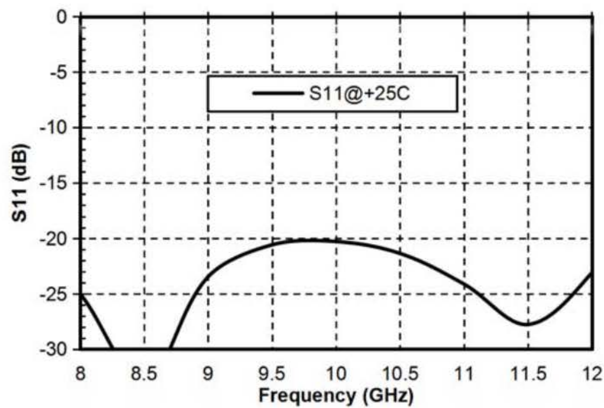
Electrical Specifications

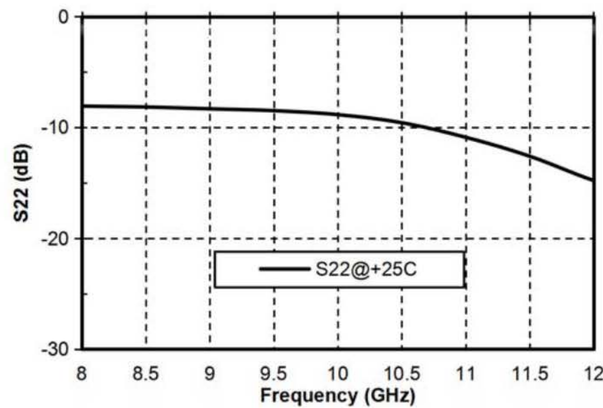
TA = +25ºC, Vd = +5V，Ids=135mA

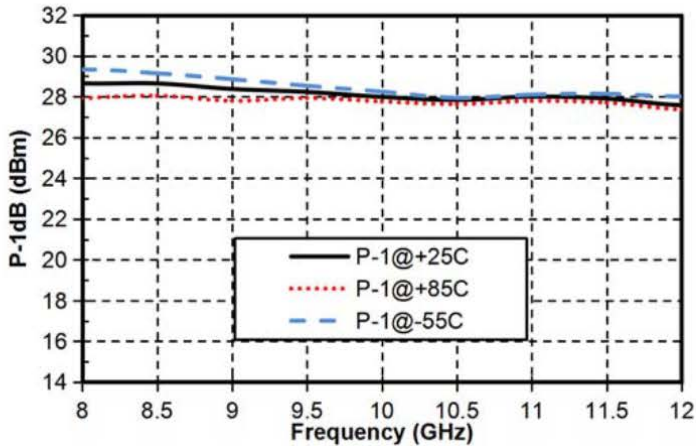
Parameters	Min.	Typ.	Max.	Units
Frequency		8-12		GHz
Small Signal Gain	23.5	24.5	25.5	dB
Gain Flatness		±1.0		dB
P1dB		28		dBm
Psat		28.5		dBm
Input Return Loss		24		dB
Output Return Loss		10		dB
Quiescent Current		135		mA
Efficiency		34~40		%
By tuning Vg terminal voltage -2V~0V, Vg terminal voltage recommended -0.9V.				

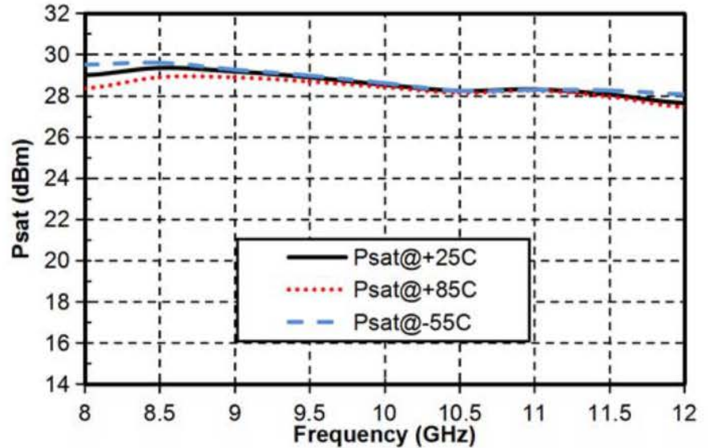

Gain vs. Frequency
Small Signal Gain (dB)
30
28
26
24
22
20
18
16
14
S21@+25C
S21@+85C
S21@ -55C
8
8.5
9
9.5
10
10.5
11
11.5
12
Frequency (GHz)


Reverse Isolation vs. Frequency
S12 (dB)
0
-10
-20
-30
-40
-50
-60
-70
-80
S12@+25C
8
8.5
9
9.5
10
10.5
11
11.5
12
Frequency (GHz)


Input Return Loss vs. Frequency
S11 (dB)
0
-5
-10
-15
-20
-25
-30
S11@+25C
8
8.5
9
9.5
10
10.5
11
11.5
12
Frequency (GHz)

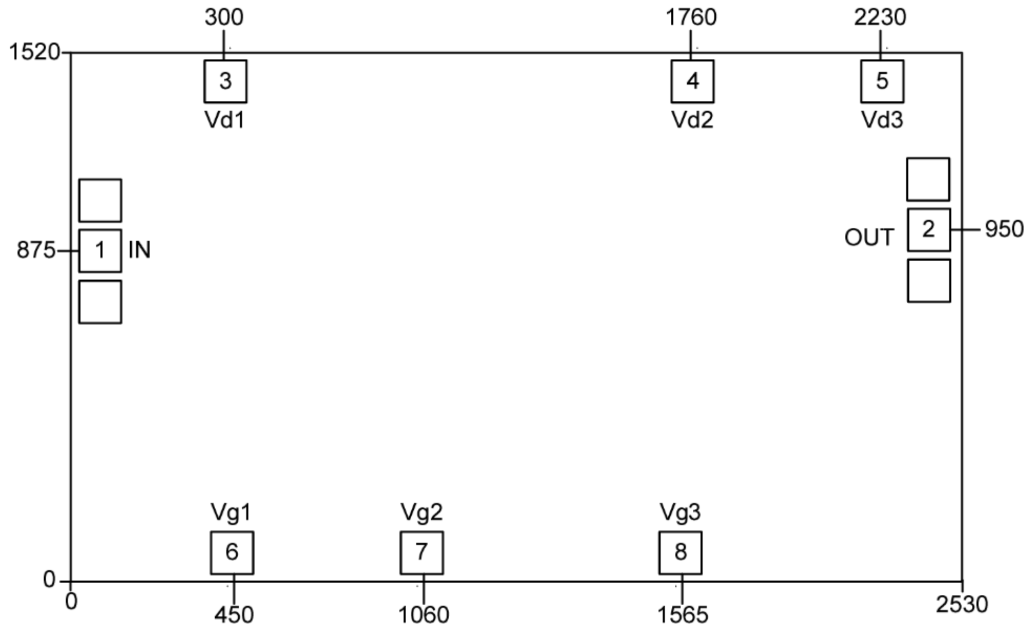

Output Return Loss vs. Frequency
S22 (dB)
0
-10
-20
-30
S22@+25C
8
8.5
9
9.5
10
10.5
11
11.5
12
Frequency (GHz)


P-1dB vs. Frequency
P-1dB (dBm)
32
30
28
26
24
22
20
18
16
14
P-1@+25C
P-1@+85C
P-1@-55C
8
8.5
9
9.5
10
10.5
11
11.5
12
Frequency (GHz)


Psat vs. Frequency
Psat (dBm)
32
30
28
26
24
22
20
18
16
14
Psat@+25C
Psat@+85C
Psat@-55C
8
8.5
9
9.5
10
10.5
11
11.5
12
Frequency (GHz)

Outline Drawing:

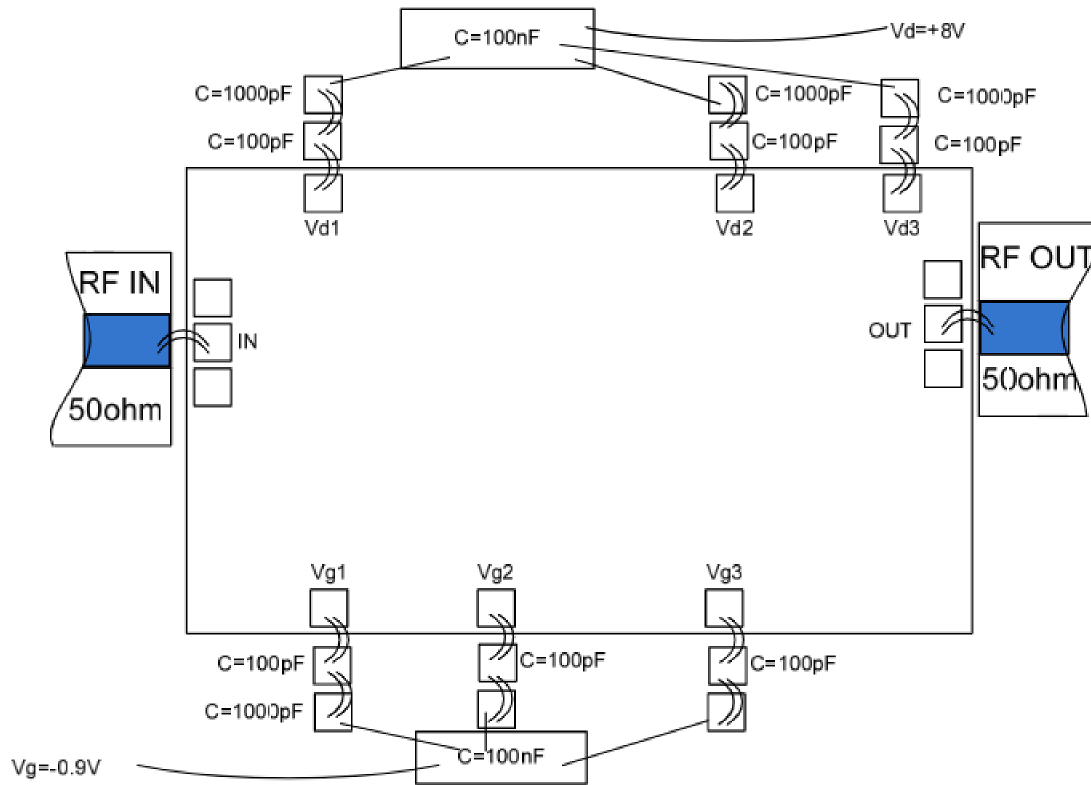
All Dimensions in um



Pad Description

PAD	Function	Description
1	RF IN	RF signal input terminal, no blocking capacitor required
2	RF OUT	RF signal output terminal, no blocking capacitor required
3,4,5	Vd1,Vd2,Vd3	Amplifier drain bias, connected to external 100pF 1000pF 100nF bypass capacitor.
6,7,8	Vg1,Vg2,Vg3	Amplifier gate bias, connected to external 100pF 1000pF 100nF bypass capacitor.
Die Bottom	GND	Die bottom must be connected to RF/DC ground

Assembly Drawing



Notes:
1. **Die thickness: 100um**
2. **Typical bond pad is 100*100 µm²**
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. **Maximum drain voltage: +12V**
2. **Maximum input power: +25dBm**
3. **Operating temperature: -55℃ to +85℃**
4. **Storage temperature: -65℃ to +150℃**