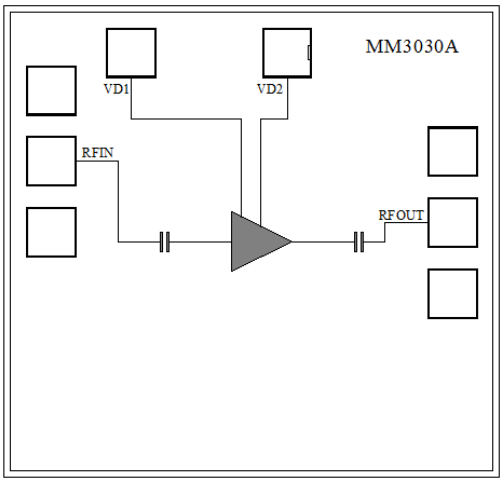
Features

- Frequency: 4-27GHz
- Small Signal Gain: 15dB Typical
- Gain Flatness: ± 0.3dB Typical
- Psat: 22dBm Typical
- Supply voltage: +5V@126mA
- Input/Output: 50Ω
- Die Size: 1.05 x 1.0 x 0.1mm

Functional Block Diagram



Typical Applications

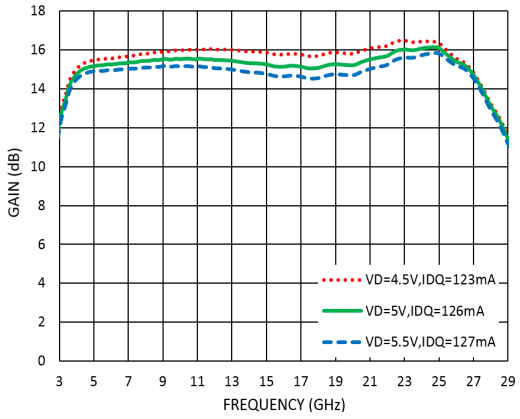
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

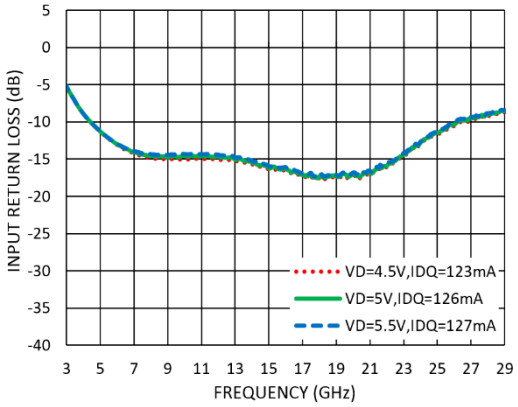
Electrical Specifications

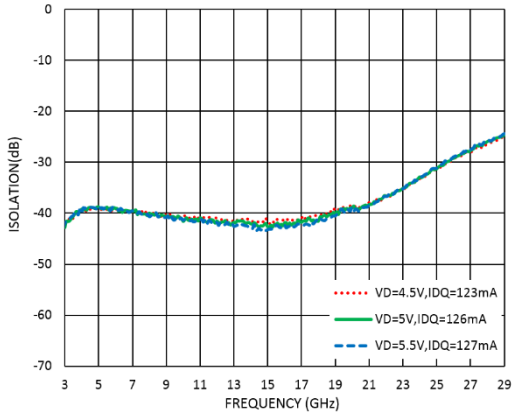
TA = +25°C, VD=+5V, IDQ = 126mA Typical

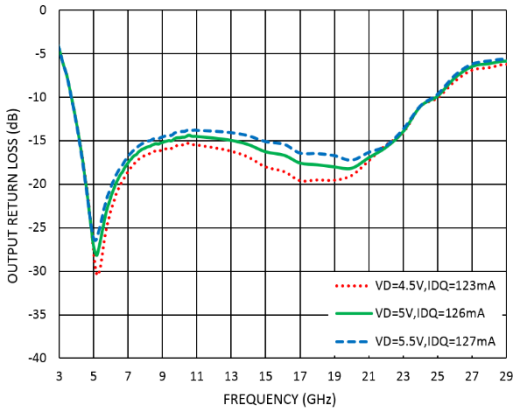
Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency		4 - 8			8 - 20			20 - 27		GHz
Small Signal Gain	14	15		14.5	15		13.5	15.5		dB
Gain Flatness		±0.5			±0.3			±1.0		dB
Noise Figure		6.5			6			5.5		dB
P1dB - Output 1dB Compression	18	20		19.5	21		15	18		dBm
Psat - Saturated Output Power		21			22			19		dBm
OIP3 - Output Third Order Intercept		30			31			28		dBm
Input Return Loss		-10			-15			-12		dB
Output Return Loss		-15			-15			-10		dB

Measurement Plots: S-parameters
TA = +25°C

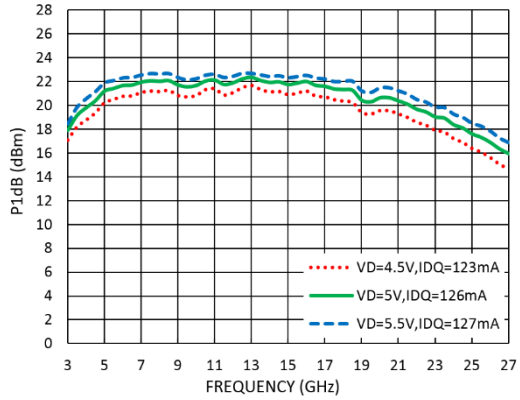




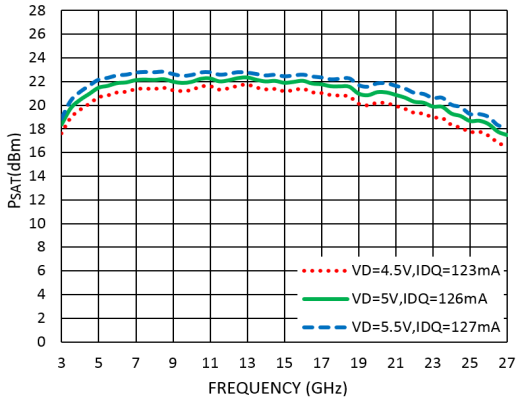




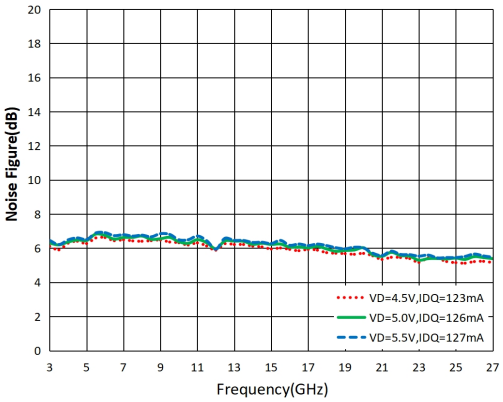
Measurement Plots: P1dB
TA = +25°C



Measurement Plots: PSAT
TA = +25°C



Measurement Plots:Noise Figure
T_A = +25°C



Absolute Maximum Ratings

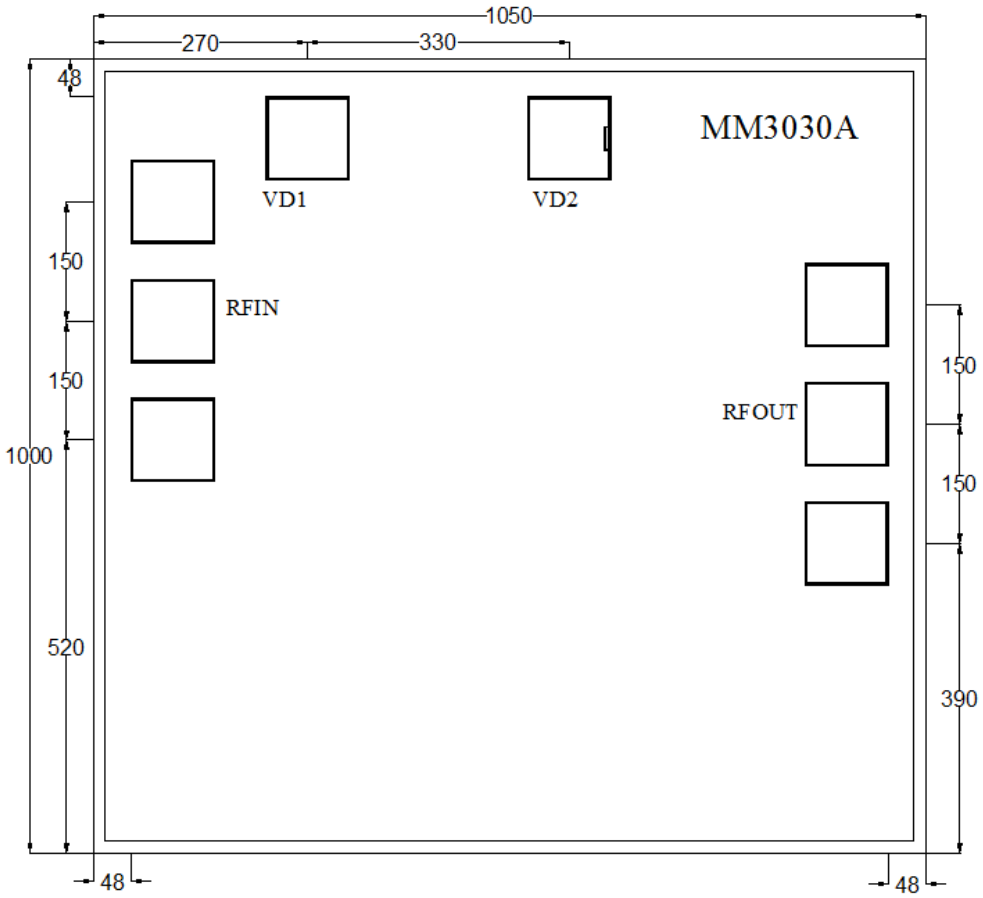
Drain Bias Voltage (VD)	+6V
RF Input Power (RFIN)	+15dBm
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C) (derate 10.9mW/°C above 85 °C)	0.71W
Thermal Resistance (channel to die bottom)	92.1°C/W
Operating Temperature	-55°C to +85 °C
Storage Temperature	-65°C to +125 °C

Typical Supply Current vs. VD

VD (V)	IDQ (mA)
+4.5	123
+5.0	126
+5.5	127

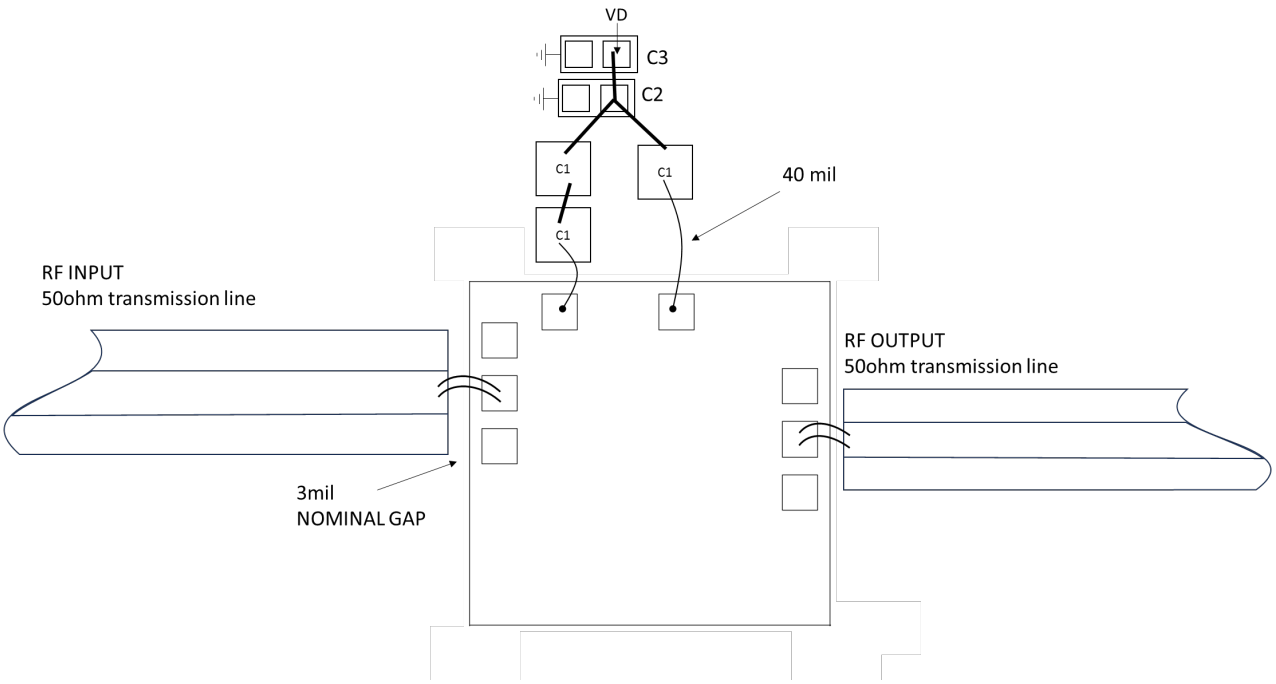
ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing:
All Dimensions in µm



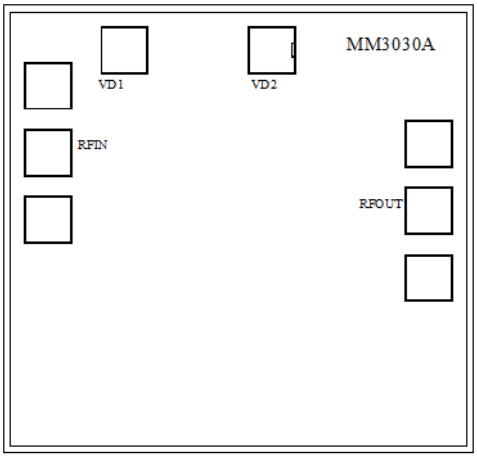
Notes:
1. **Die thickness: 100µm**
2. **DC bond pad is 98*98µm^2**
3. **RF IN/OUT bond pad is 98*98µm^2**
4. **Bond pad metalization: Gold**
5. **Backside metalization: Gold**

Assembly Drawing



Item	Description
C1	100 pF Example: Knowles Dielectric Labs Part: CSM-140-15X15X4-G-101-K
C2	0.01 µF Example: Presidio Part: MBB0502X103MLT5C8C
C3	4.7 µF Example: KYOCERA AVX Part: F951C475MPAAQ2

No	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	VD	Drain Biases for the Amplifier.
4	Die Bottom	Die bottom must be connected to RF and dc ground.



Biasing and Operation

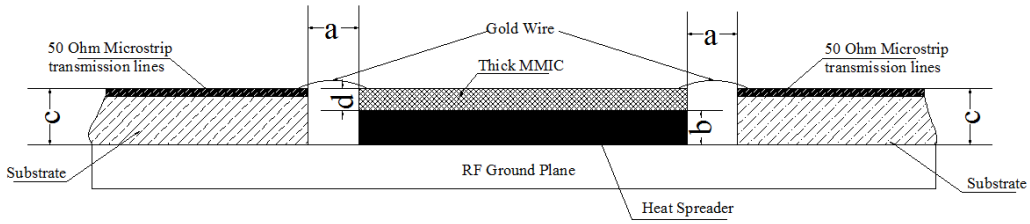
Turn ON procedure:

1. Connect GND to RF and dc ground.
2. Apply positive drain voltage VD and set to +5V .
3. Apply RF signal.

Turn OFF procedure:

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

Mounting & Bonding Techniques for MMICs



Direct Mounting

1.Typically, the die is mounted directly on the ground plane.
2.If the thickness difference between the substrate (thickness c) and the die (thickness d) exceeds 0.05 mm (i.e., c – d > 0.05 mm), it is recommended to first mount the die on a heat spreader, then attach the heat spreader to the ground plane.
3.Heat Spreader Material: Molybdenum-copper (MoCu) alloy is commonly used.
4.Heat Sink Thickness (b): Should be within the range of (c – d – 0.05 mm) to (c – d + 0.05 mm).
5.Spacing (a): The gap between the bare die and the 50Ω transmission line should typically be 0.05 mm to 0.1 mm. If the application frequency is higher than 40GHz, then this gap is recommended to be 0.05mm

Wire Bonding Interconnection

The connection between the die and the 50Ω transmission line is usually made using 25 µm diameter gold (Au) wires, bonded via wedge bonding or ball bonding processes.

Die Attachment Methods

1.Conductive Epoxy:

After adhesive application, cure according to the manufacturer's recommended temperature profile.

2.Au-Sn80/20 Eutectic Bonding:

Use preformed Au-Sn80/20 solder preforms.
Perform bonding in an inert atmosphere (N_2 or forming gas: 90% N_2 + 10% H_2).
Keep the time above 320°C to less than 20 seconds to prevent excessive intermetallic formation.