

**Features**

- Single Biasing Voltage (Self Biased)
- Frequency: 1-20GHz
- Small Signal Gain: 16.5dB Typical
- Gain Flatness:  $\pm 0.3$ dB Typical
- Noise Figure: 1.5dB Typical
- P1dB: 18dBm Typical
- Power Supply: +5V@72mA
- Input/Output: 50 $\Omega$
- Chip Size: 1.58 x 0.98 x 0.1mm

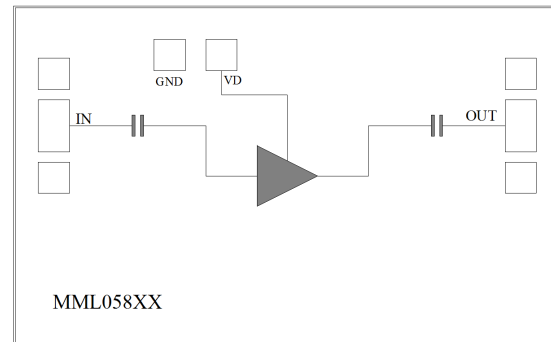
**Typical Applications**

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

**Electrical Specifications**

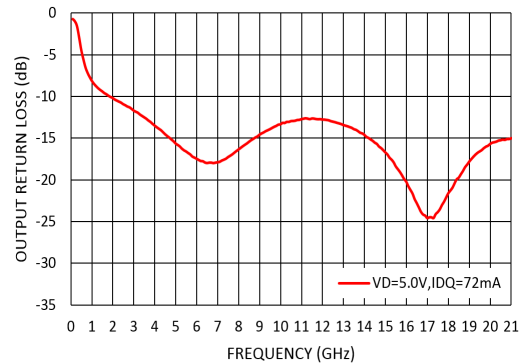
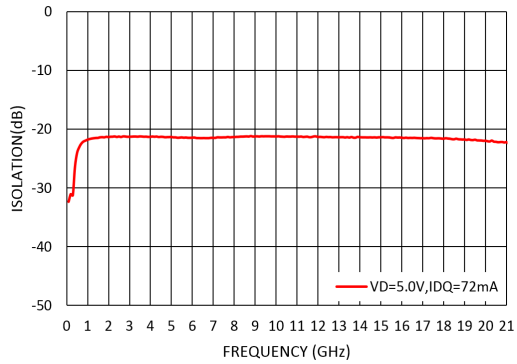
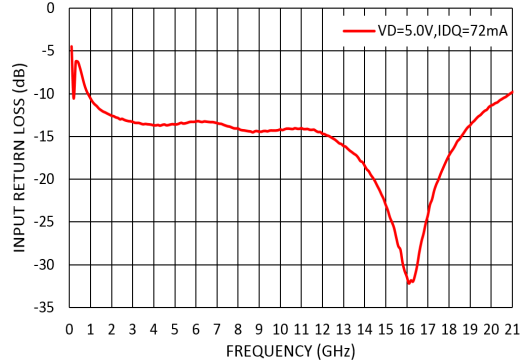
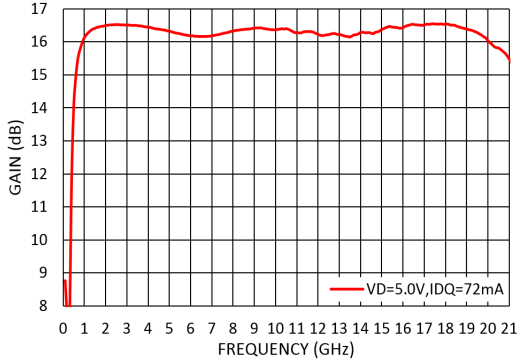
TA = +25°C, VD = +5V, IDD = 72mA Typical

Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency	1		12	12		20	GHz
Small Signal Gain	15	16.5		15	16.5		dB
Gain Flatness		$\pm 1.0$			$\pm 0.5$		dB
Noise Figure		1.5	1.8		1.8	2.3	dB
P1dB - Output 1dB Compression	17	18		17	18		dBm
Psat - Saturated Output Power		19			19		dBm
OIP3 - Output Third Order Intercept		28			28		dBm
Input Return Loss		-13			-14		dB
Output Return Loss		-12			-15		dB

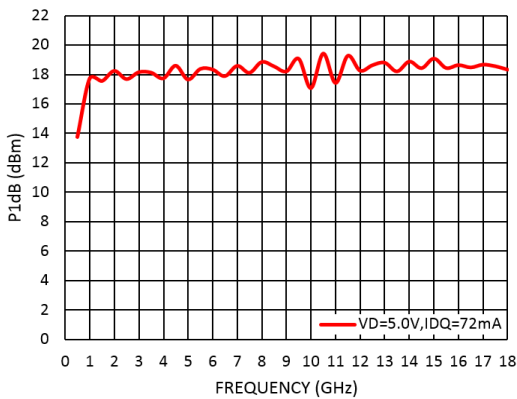
**Functional Block Diagram**




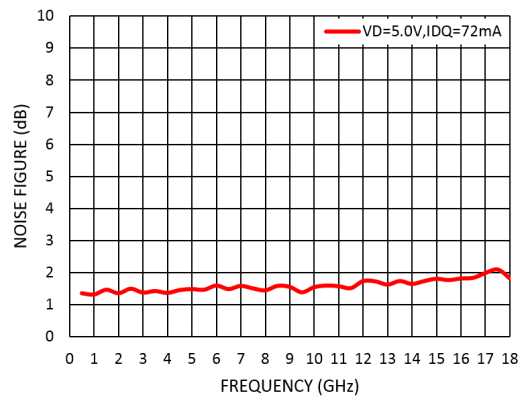
### Measurement Plots: S-parameters



### Measurement Plots: P1dB



### Measurement Plots: Noise Figure





### Absolute Maximum Ratings

Drain Bias Voltage (VD)	+7V
RF Input Power (RFIN)	+18dBm
Channel Temperature	165°C
Continuous Pdiss (T = 85 °C) (derate 6.2mW/°C above 85 °C)	0.56W
Thermal Resistance (channel to die bottom)	50°C/W
Operating Temperature	-55°C to +85 °C
Storage Temperature	-65°C to +150 °C

### Typical Supply Current vs. VD

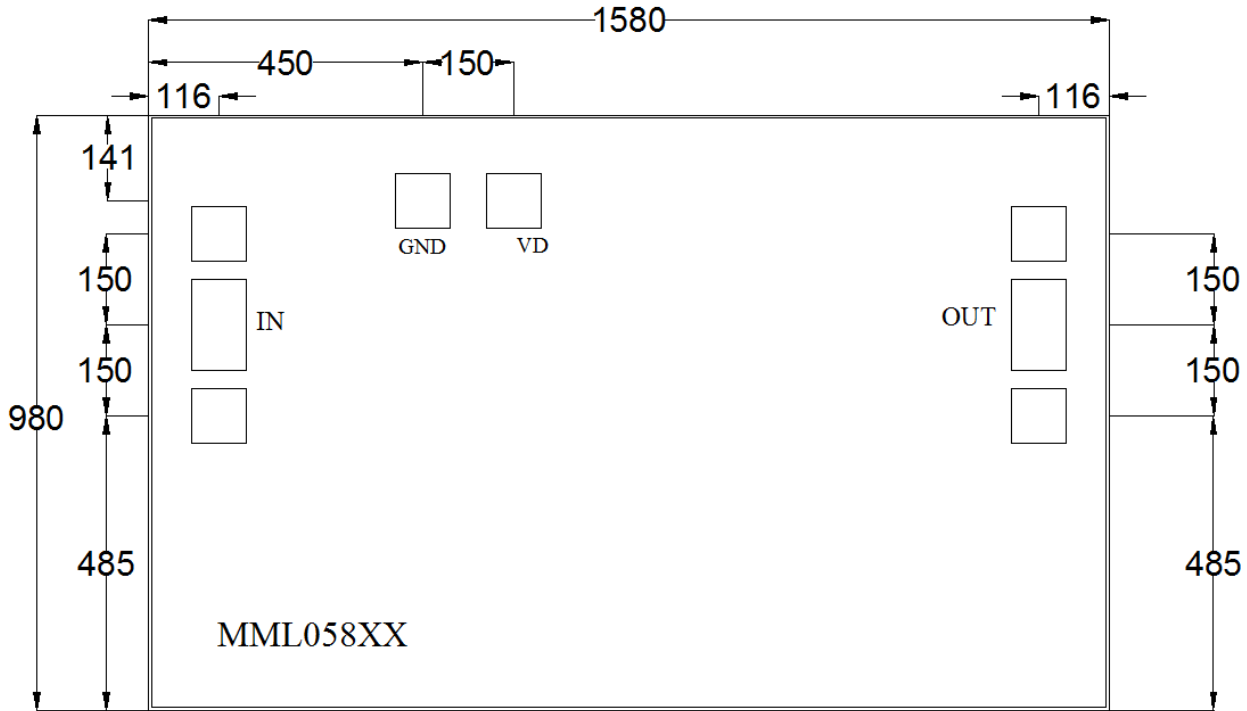
VD (V)	IDD (mA)
+5	72



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS



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

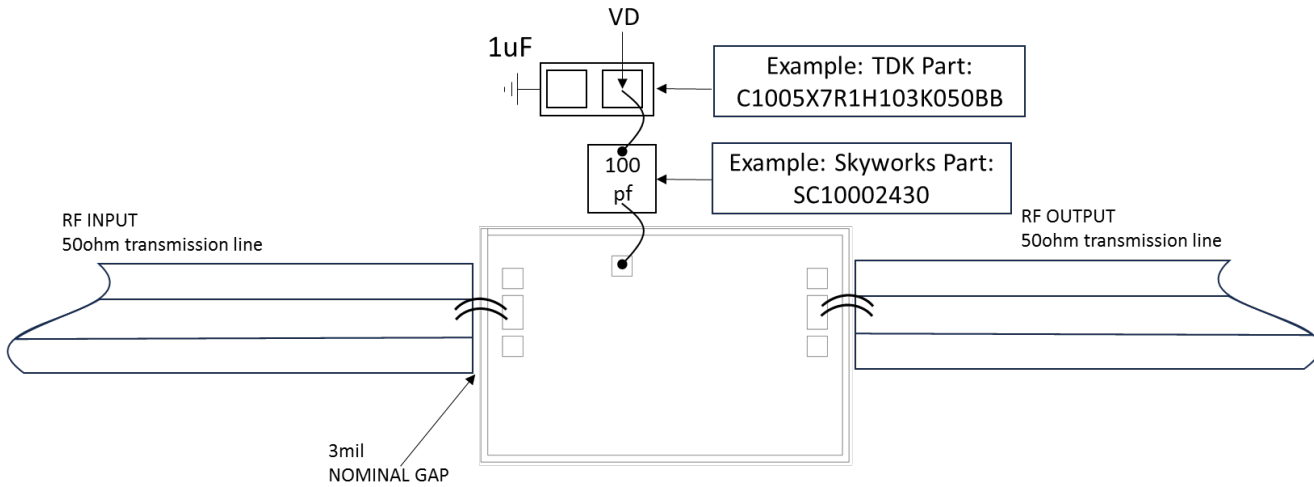


**Notes:**

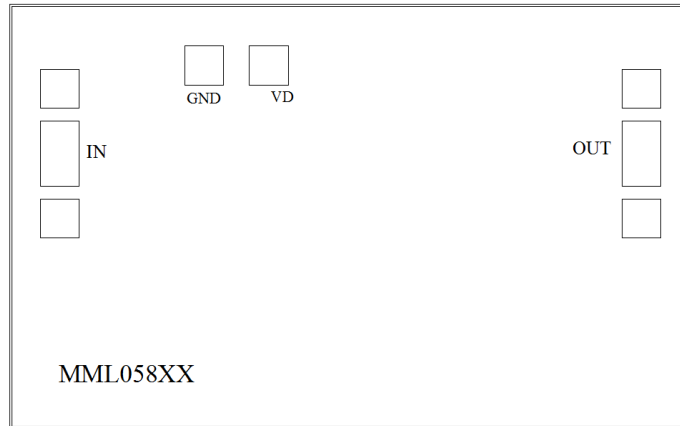
1. Die thickness: 100 $\mu\text{m}$
2. DC bond pad is 90\*90 $\mu\text{m}^2$
3. RF IN/OUT bond pad is 90\*150 $\mu\text{m}^2$
4. Bond pad metalization: Gold
5. Backside metalization: Gold



### Assembly Drawing



No	Function	Description
1	RF IN	RF Signal Input. This pad is ac-coupled and matched to 50 Ω.
2	RF OUT	RF Signal Output. This pad is ac-coupled and matched to 50 Ω.
3	VD	Drain Biases for the Amplifier. Connect to external 100pf and 1uf bypass capacitors.
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.

### Miller MMIC Inc. All rights reserved

Miller MMIC, Inc. holds exclusive rights to the information presented in its Data Sheet and any accompanying materials. As a premier supplier of cutting-edge RF solutions, Miller MMIC has made this information easily accessible to its clients.

Although Miller MMIC believes the information provided in its Data Sheet to be trustworthy, the company does not offer any guarantees as to its accuracy. Therefore, Miller MMIC bears no responsibility for the use of this information. It is worth mentioning that the information within the Data Sheet may be altered without prior notification.

Customers are encouraged to obtain and verify the most recent and pertinent information before placing any orders for Miller MMIC products. The information in the Data Sheet does not confer, either explicitly or implicitly, any rights or licenses with regards to patents or other forms of intellectual property to any third party.

The information provided in the Data Sheet, or its utilization, does not bestow any patent rights, licenses, or other forms of intellectual property rights to any individual or entity, whether in regards to the information itself or anything described by such information. Furthermore, Miller MMIC products are not intended for use as critical components in applications where failure could result in severe injury or death, such as medical or life-saving equipment, or life-sustaining applications, or in any situation where failure could cause serious personal injury or death.