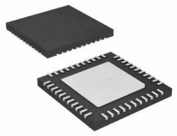
MML081Q4B

V2.0.0

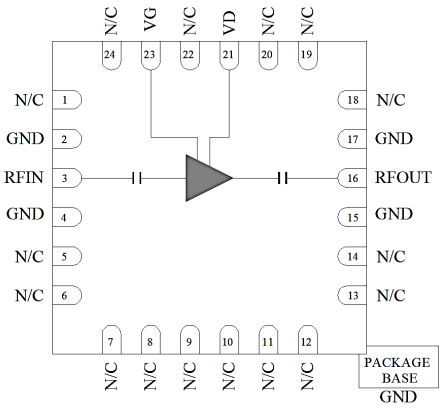
GaAs Plastic QFN 4x4mm
Low Noise Amplifier 2-18GHz

Features

- Single Biasing Voltage (Self Biased)
- Frequency: 2-18GHz
- Small Signal Gain: 23dB@42mA, 22dB@28mA
- Gain Flatness: ±1.0dB Typical
- Noise Figure:1.2dB Typical
- P1dB: 14dBm@42mA, 11dBm@28mA
- Power Supply:
  - +5V/42mA @VG is floating
  - +5V/28mA@VG connected to GND
- Input/Output: 50Ω
- Package Size : 4 x 4 x 0.65mm



Functional Block Diagram



Typical Applications

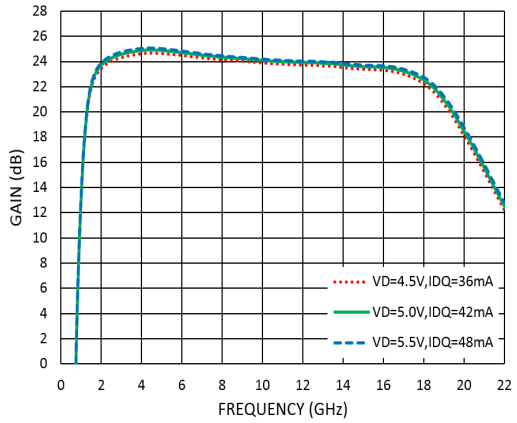
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

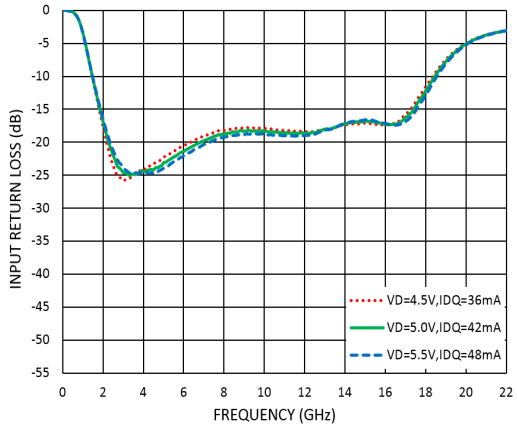
Electrical Specifications

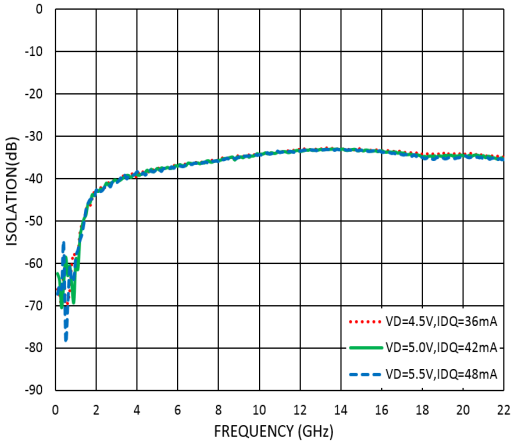
TA = +25°C, VD = +5V, IDD = 42mA/28mA Typical

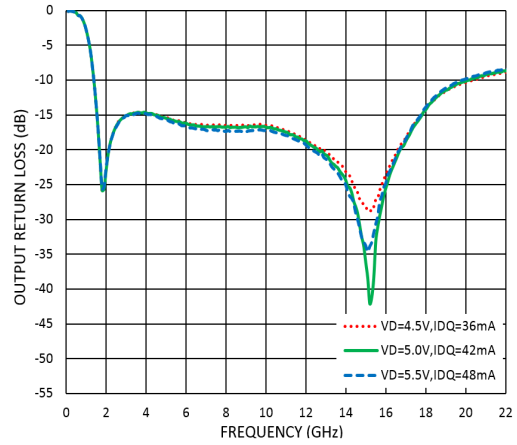
Parameters	VG- FLOATING			VG - GROUNDING			
	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency	2		18	2		18	GHz
Small Signal Gain	21.5	23		20.5	22		dB
Gain Flatness		±1.0			±1.0		dB
Noise Figure		1.2	2.0		1.2	1.8	dB
P1dB - Output 1dB Compression	12	14		9	11		dBm
Psat - Saturated Output Power		15			13		dBm
OIP3 - Output Third Order Intercept		26			22		dBm
Input Return Loss		-17			-17		dB
Output Return Loss		-15			-15		dB

Measurement Plots: S-parameters
VG is floating

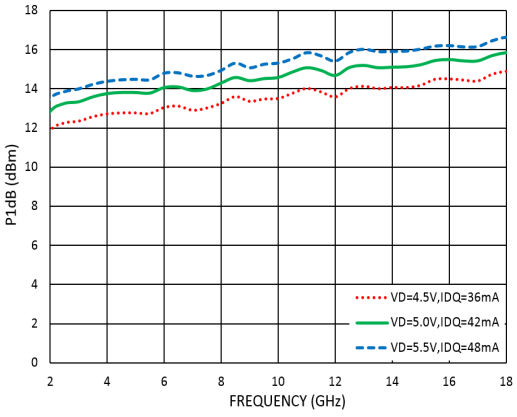




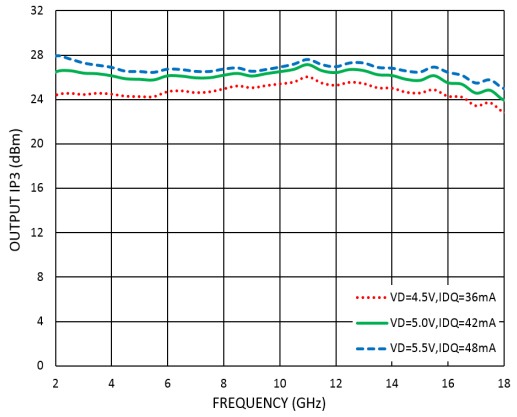




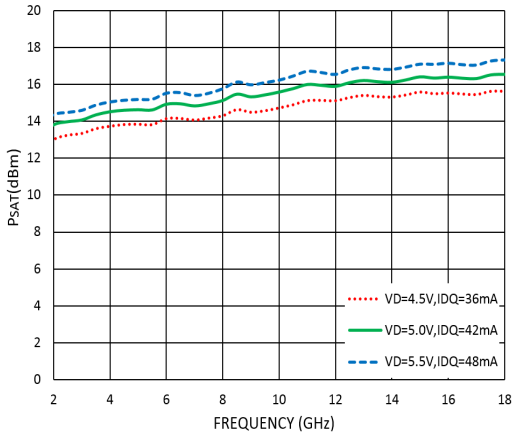
Measurement Plots: P1dB
VG is floating



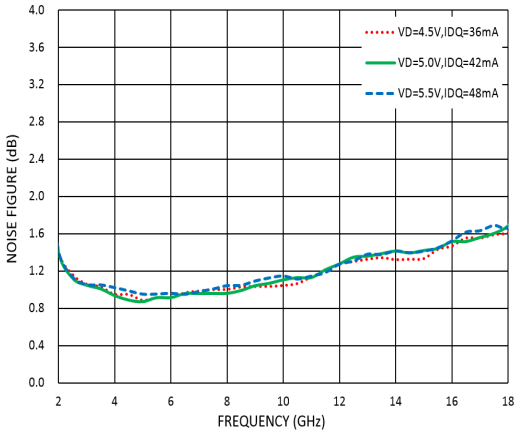
Measurement Plots: OIP3
VG is floating



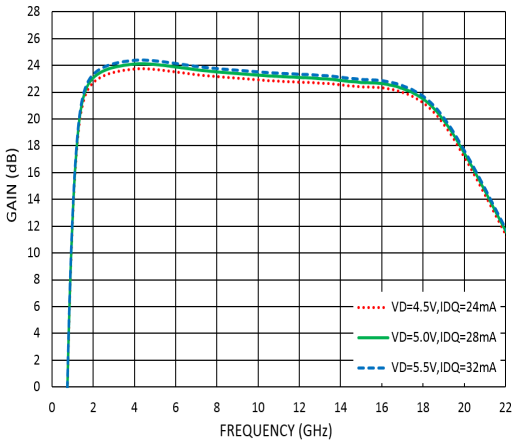
Measurement Plots: P_{SAT} VG is floating

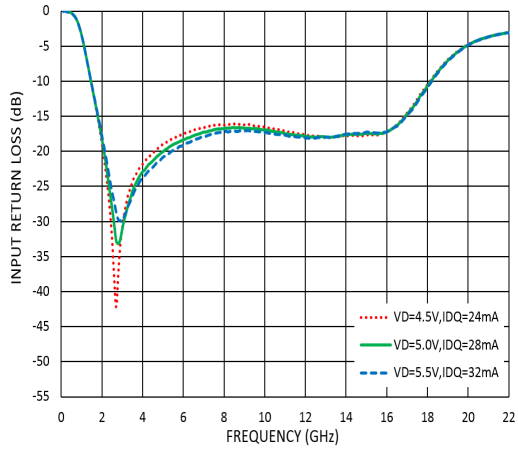


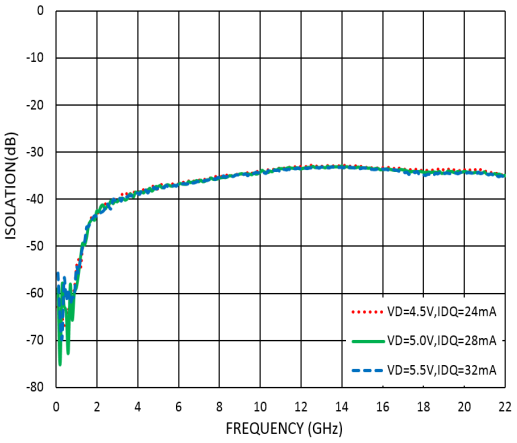
Measurement Plots: Noise Figure VG is floating

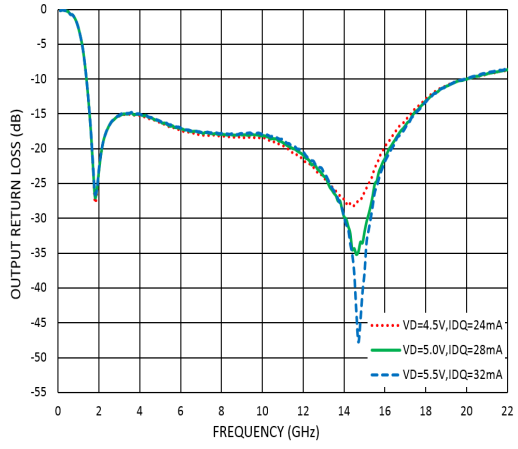


Measurement Plots: S-parameters VG connected to GND

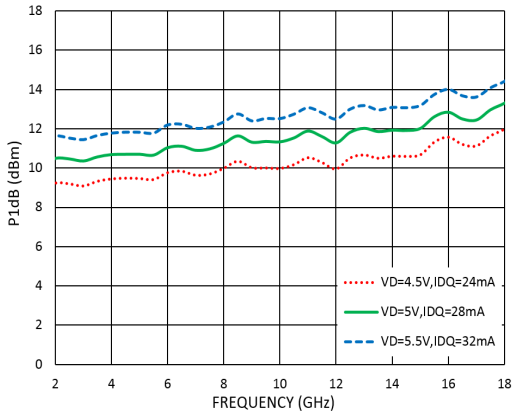




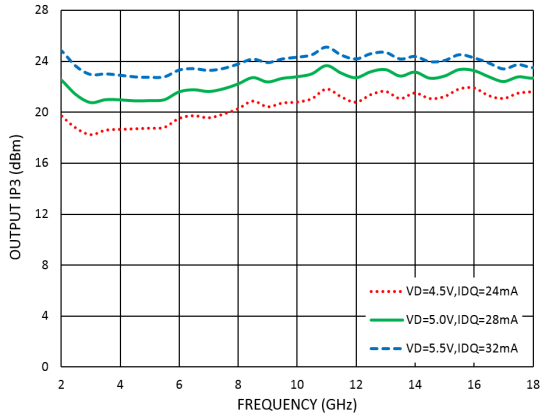




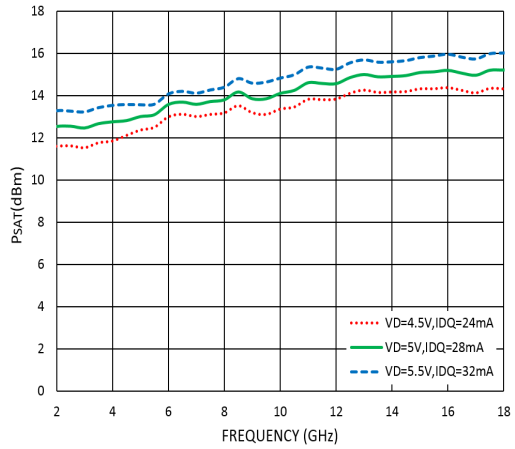
Measurement Plots: P1dB
VG connected to GND



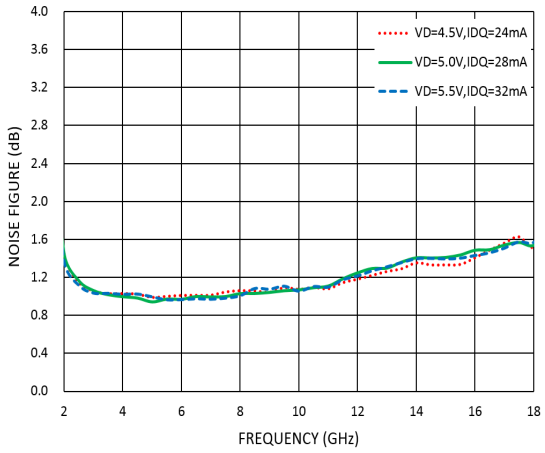
Measurement Plots: OIP3
VG connected to GND



Measurement Plots: P_{SAT}
VG connected to GND



Measurement Plots: Noise Figure
VG connected to GND



Absolute Maximum Ratings

Drain Bias Voltage (VD)	+6V
Gate Bias Voltages(VG)	−1.5 to 0 V
RF Input Power (RFIN)	+18dBm
Channel Temperature	175°C
Continuous Pdiss (T = 85 °C) (derate 3.3mW/°C above 85 °C)	0.3W
Thermal Resistance (channel to die bottom)	50°C/W
Operating Temperature	-55°C to +85 °C
Storage Temperature	-65°C to +150 °C

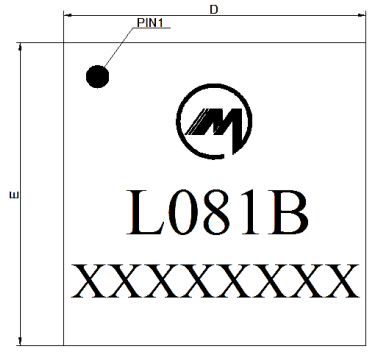
Typical Supply Current vs. VD

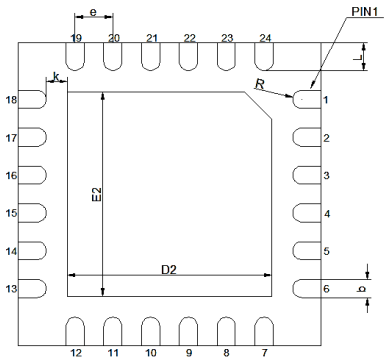
VD (V)	VG	IDD (mA)
+4.5	FLOATING	36
+5		42
+5.5		48
+4.5	GROUNDING	24
+5		28
+5.5		32

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

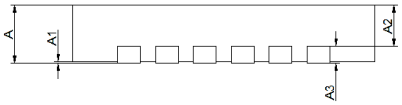
Outline Drawing:

All Dimensions in mm





Bottom perspective



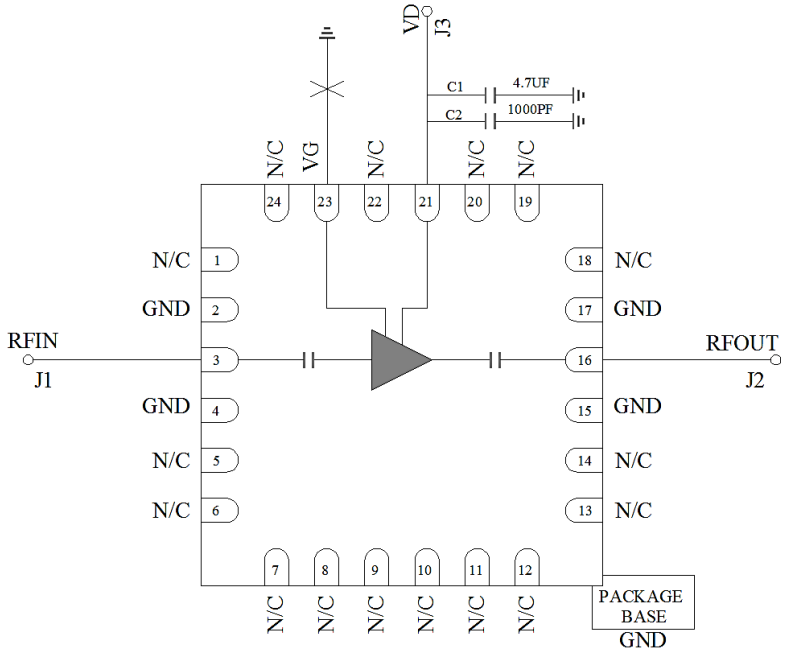
UNITS=MM

SYMBOL	MIN	NOM	MAX
A	0.55	0.65	0.75
A1	0	0.02	0.05
A2	0.36	0.45	0.54
A3	0.19	0.20	0.21
D	3.90	4.00	4.10
E	3.90	4.00	4.10
b	0.19	0.24	0.29
D2	2.60	2.70	2.80
E2	2.60	2.70	2.80
e		0.50	
K	0.20		
L	0.35	0.40	0.45
R	0.10		

Notes:

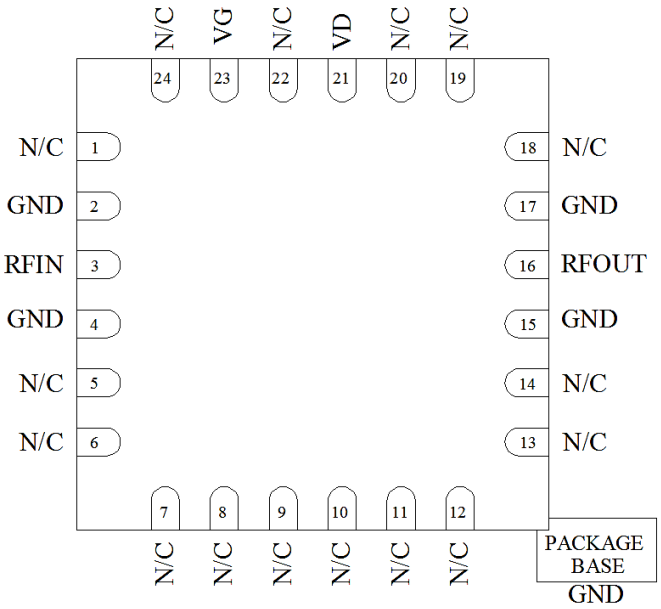
1. Package model : 24-Lead Lead Frame Chip Scale Package .
2. Dimensions are in millimeters.
3. Lead spacing tolerance is non-cumulative.

Assembly Drawing



Pin Descriptions

No	Function	Description
1,5,6,7,8,9,10,11,12,13, 14,18,19,20,22,24	NC	No connection. These pins may be connected to RF ground. Performance will not be affected.
3	RF IN	RF Signal Input. This pad is ac-coupled and matched to 50 Ω.
16	RF OUT	RF Signal Output. This pad is ac-coupled and matched to 50 Ω.
21	VD	Connect to external 1000pF and 4.7uF bypass capacitors.
23	VG	This pad is floating or connected to GND.
2,4,15,17	GND	These pins & exposed ground paddle must be connected to RF/DC ground
25	GND	Package bottom must be connected to RF/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 +5.0 V .
3. Apply RF signal.

Turn OFF procedure:

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