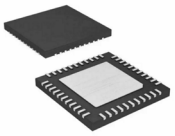
MML004XQ4B

V1.0.0

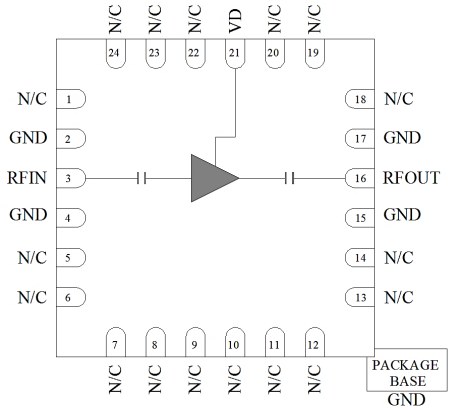
GaAs Plastic QFN 4x4mm Low Noise Amplifier 2-9GHz

Features

- Single Biasing Voltage (Self Biased)
- Frequency: 2-9GHz
- Small Signal Gain: 29dBTypical
- Gain Flatness: ±1.0dB Typical
- Noise Figure:0.6dB Typical
- P1dB: 19dBm Typical
- Power Supply: +5V/90mA
- Input/Output: 50Ω
- Package Size : 4 x 4 x 0.65mm



Functional Block Diagram



Typical Applications

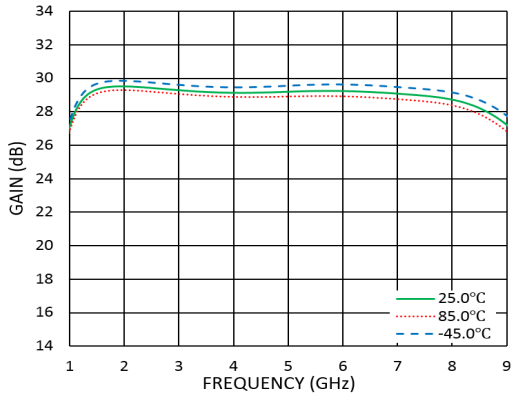
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

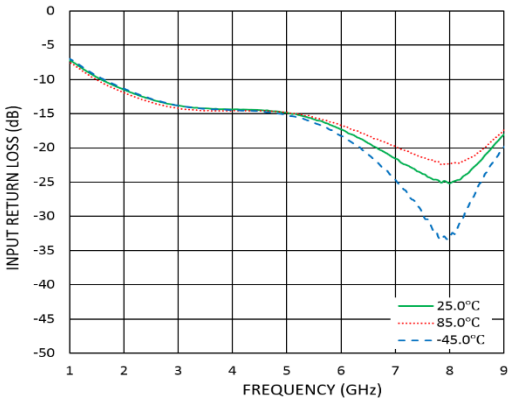
Electrical Specifications

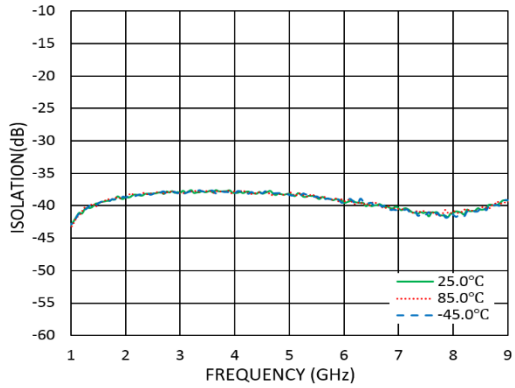
TA = +25°C, VD = +5V, IDD = 90mA Typical

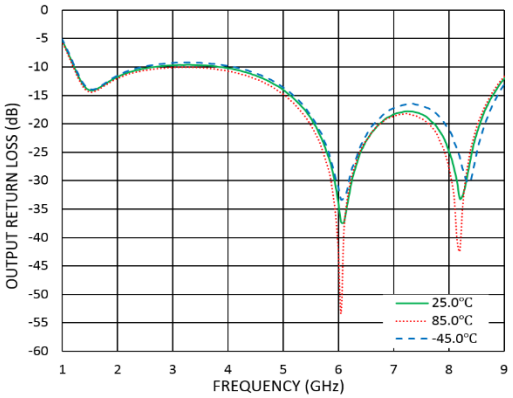
Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency	2		6	6		9	GHz
Small Signal Gain	28.0	29.0		26.0	28.5		dB
Gain Flatness		±0.5			±1.0		dB
Noise Figure		0.6	0.8		0.8	1.0	dB
P1dB - Output 1dB Compression	17.0	19.5		16.0	18.0		dBm
Psat - Saturated Output Power		20.0			19.5		dBm
OIP3 - Output Third Order Intercept		31.0			30.0		dBm
Input Return Loss		15.0			22.0		dB
Output Return Loss		12.0			20.0		dB

Measurement Plots: S-parameters

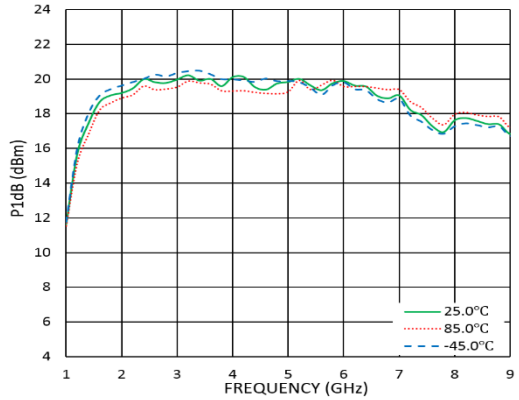




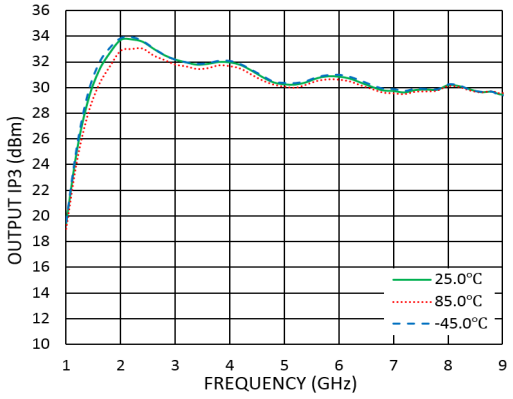




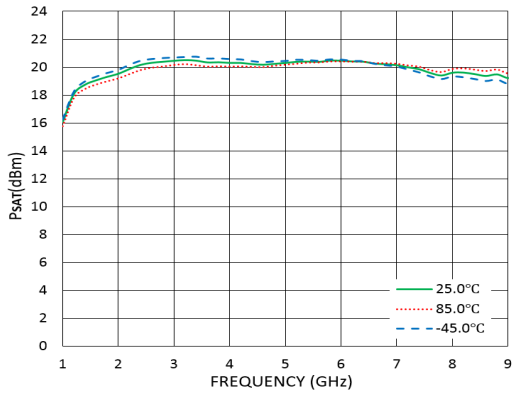
Measurement Plots: P1dB



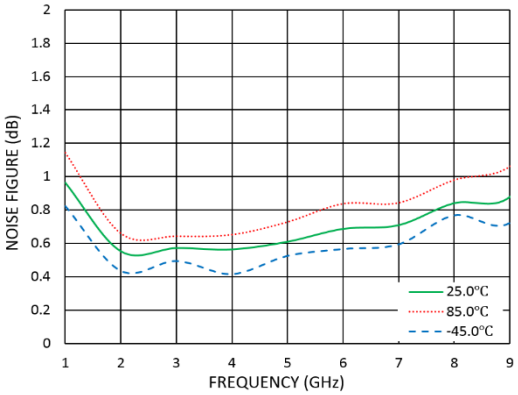
Measurement Plots: OIP3



Measurement Plots: PSAT



Measurement Plots: Noise Figure



Absolute Maximum Ratings

Drain Bias Voltage (VD)	+7V
RF Input Power (RFIN)(VD=+5V)	+20dBm
Channel Temperature	175°C
Continuous Pdiss (T = 85 °C) (derate 7.8mW/°C above 85 °C)	0.7W
Thermal Resistance (channel to die bottom)	50°C/W
Operating Temperature	-55°C to +85 °C
Storage Temperature	-65°C to +150 °C

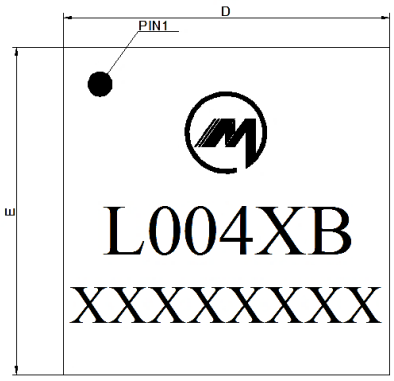
Typical Supply Current vs. VD

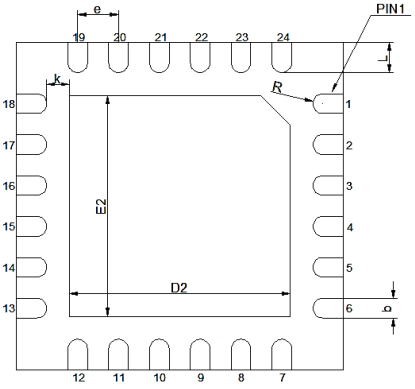
VD (V)	IDD (mA)
+5	90

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

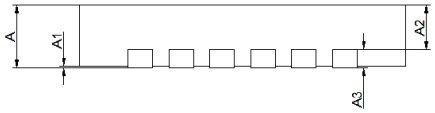
Outline Drawing:

All Dimensions in mm





Bottom perspective



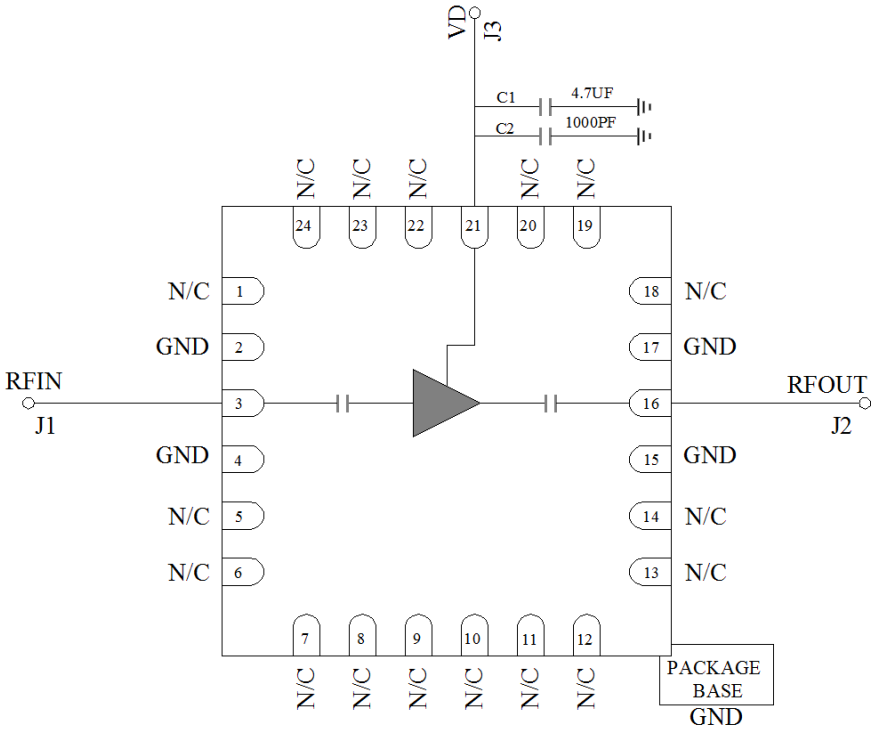
UNITS=MM

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:

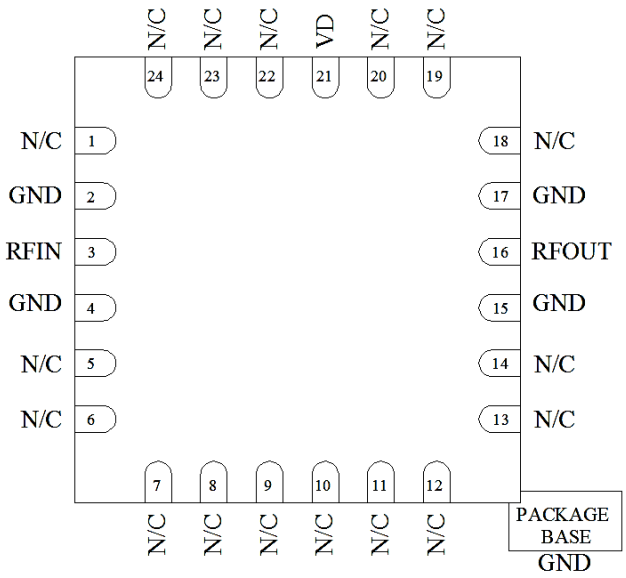
1. Package model : 24-Lead Lead Frame Chip Scale Package .
2. Dimensions are in millimeters.
3. Lead spacing tolerance is non-cumulative.

Assembly Drawing



Pin Description

No	Function	Description
1,5,6,7,8,9,10,11,12,13, 14,18,19,20,22,23,24	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.
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.