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# MMA-020624-M4

2000-6000 MHz Fully Matched High Dynamic Range Amplifier  
Product Data Sheet

## Features:

- P1dB: +25 dBm
- OIP3: +40 dBm
- Pave: +18.5 dBm @ 2.5% EVM 802.16 / 64QAM
- Gain: 17 dB
- Single +8V Supply
- MTTF > 100 years @ 85°C ambient temperature
- RoHS Compliant Surface-Mount QFN 4x4mm Package

## Applications:

- WiMax
- Instrumentation
- Point-to-Point Microwave Radio

## Description:

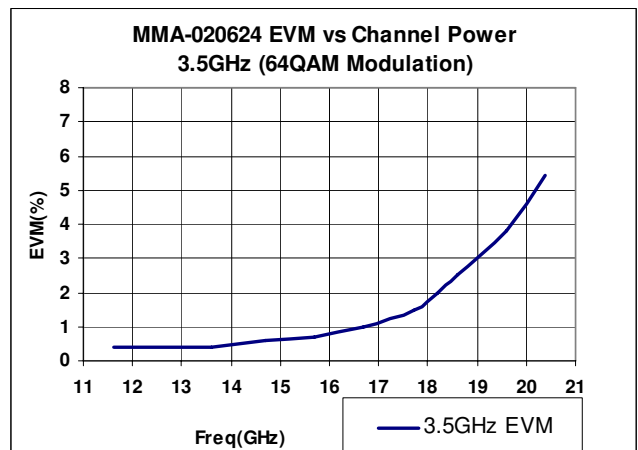
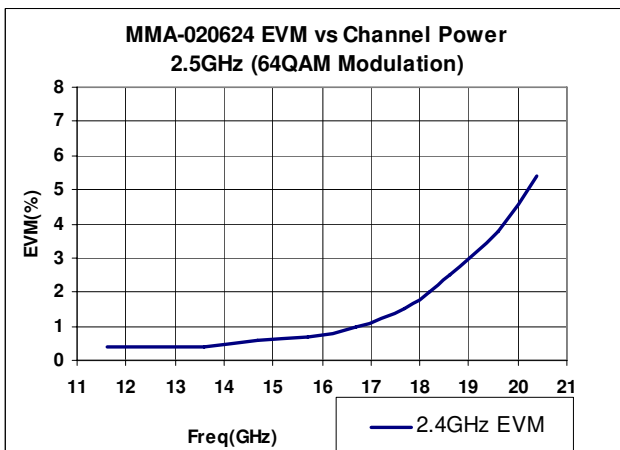
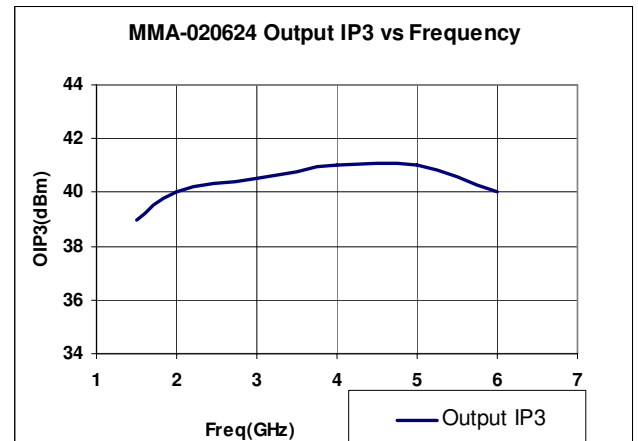
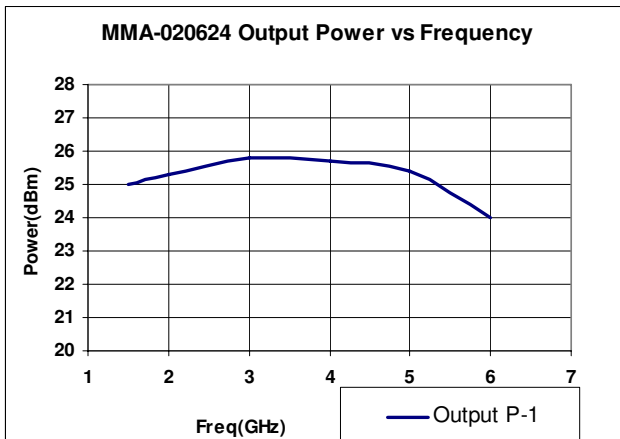
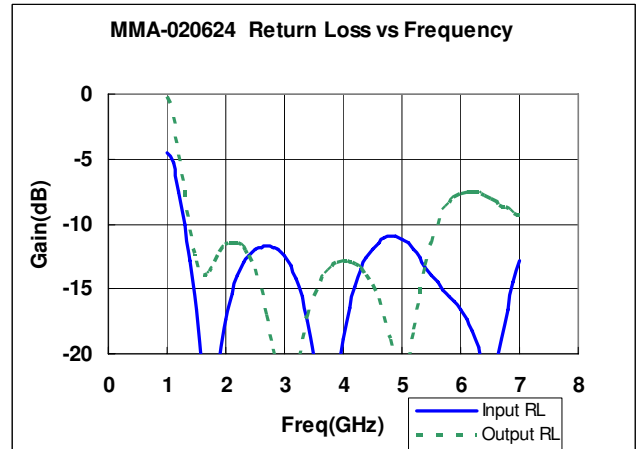
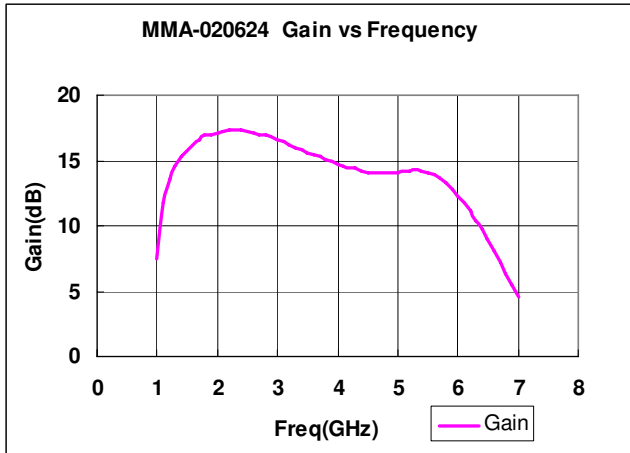
The MMA-020624-M4 is a high linearity GaAs MESFET MMIC amplifier utilizing MwT's proprietary linear device technology. It is in a LCC lead-frame package. Applications include the driver amplifiers in 3G cellular and WiMax/WLAN infrastructure base stations, access points and gain-block amplifiers in 2-6 GHz range. The third order intercept performance of the MMA-020624-M4 is excellent, typically 15 dB above the Output power at 1 dB gain compression point. It provides +25 dBm P1dB, +40 dBm OIP3, +18.5 dBm Pave @ 2.5% EVM under 802.16/64 QAM input signal and 17 dB gain.

## Typical RF Performance: *V<sub>ds</sub>=8.0V, I<sub>ds</sub>=250mA, T<sub>a</sub>=25 °C Z<sub>0</sub>=50 ohm*

Parameter	Units	Typical Data	
Frequency Range	MHz	2000-4000	4000-6000
Gain (Typ / Min)	dB	17 / 15	13 / 11.5
Gain Flatness (Typ / Max)	+/-dB	1.0 / 1.5	1.3 / 1.5
Input Return Loss	dB	12	12
Output Return Loss	dB	12	10
Output P1dB	dBm	25	24
Output IP3 <sup>(1)</sup>	dBm	40	40
P <sub>out</sub> @ 2.0% EVM	dBm		18
Noise Figure	dB		3.5
Operating Current Range (Typ / Max)	mA	250 / 300	
Thermal Resistance	°C / W	30	

(1) Output IP3 is measured with two tones at output power of 13 dBm/tone separated by 10 MHz.

## Typical RF Performance: $V_{ds}=8V, I_{ds}=250mA, Z_0=50\text{ ohm}, T_a=25\text{ }^\circ\text{C}$



## Absolute Maximum Ratings: $(T_a = 25\text{ }^\circ\text{C})^*$

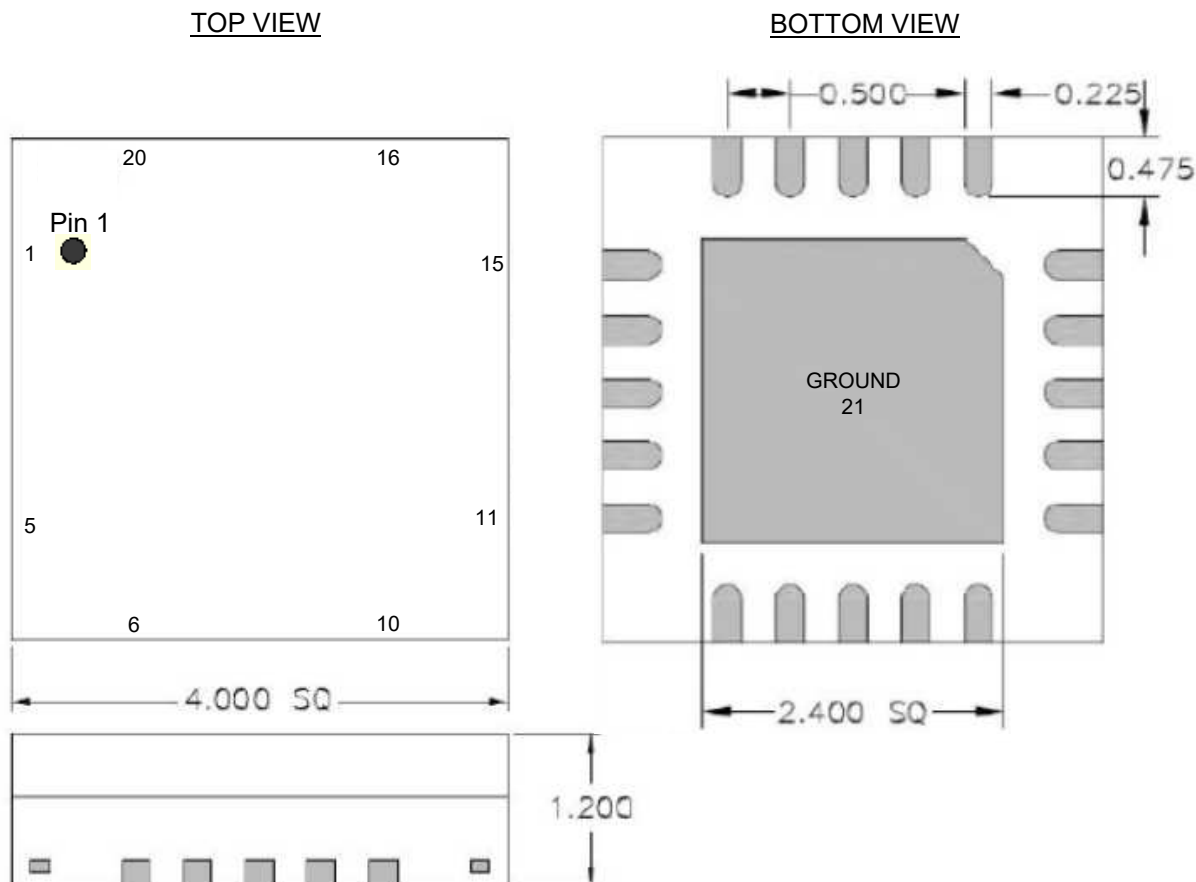
SYMBOL	PARAMETERS	UNITS	ABSOLUTE MAXIMUM
Vds	Drain-Source Voltage Drain	V	9.0
Ids	Current	mA	300.0
Pdiss	DC Power Dissipation RF	W	2.7
Pin max	Input Power	dBm	+24.0
Toper	Operating Temperature	$^\circ\text{C}$	-40 to +85
Tch	Channel Temperature	$^\circ\text{C}$	150
Tstg	Storage Temperature	$^\circ\text{C}$	-60 to 150

\*Operation of this device above any one of these parameters may cause permanent damage.

## Typical Scattering Parameters: $V_{ds}=8.0\text{V}$ , $I_{ds}=250\text{mA}$ , $Z_0=50\text{ ohm}$ , $T_a=25\text{ }^\circ\text{C}$

Freq (GHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
2.0	0.842	17.6	0.775	39.5	0.0179	-40.5	0.747	-1.97
2.2	0.805	-13.8	0.918	14.7	0.0198	-68.5	0.654	-38.9
2.4	0.758	-45.4	1.07	-6.5	0.0216	-94.2	0.542	-78.8
2.6	0.675	-76.6	1.38	-26.2	0.0241	-117	0.384	-122
2.8	0.579	-105	2.04	-53.7	0.0303	-139	0.202	-176
3.0	0.483	-127	2.82	-91.9	0.0407	-168	0.0817	65.2
3.2	0.459	-145	3.39	-135	0.0506	154	0.179	-29.5
3.4	0.471	-169	3.61	-175	0.0567	116	0.248	-70.2
3.6	0.467	163	3.71	147	0.0596	79.4	0.286	-99.8
3.8	0.442	131	3.8	111	0.0619	43.7	0.319	-127
4.0	0.396	96.8	3.88	75.8	0.0633	8.36	0.345	-156
4.2	0.328	56.9	3.9	40.4	0.0659	-25.8	0.354	173
4.4	0.25	5.93	3.81	5.06	0.0694	-61.5	0.342	142
4.6	0.206	-66.2	3.76	-30.6	0.0719	-98.3	0.294	111
4.8	0.26	-144	3.6	-67.5	0.0683	-136	0.21	81.2
5.0	0.384	160	3.35	-105	0.0657	-173	0.114	53
5.2	0.499	114	2.98	-142	0.0628	152	0.0246	62.6
5.4	0.584	72.7	2.59	-177	0.0593	118	0.0718	140
5.6	0.646	33.8	2.22	150	0.0559	85.3	0.132	116
5.8	0.69	-3.61	1.89	118	0.0507	53.1	0.177	85.3
6.0	0.732	-39.7	1.61	85.3	0.0458	22.7	0.213	52.4

**Mechanical Information:** *This Package is RoHS compliant*



The units are in [mm].

Pin	Description
3	RF Input
13	RF Output
17, 18	Vd, DC input
2, 4, 12, 14, 21	GND
1,5,6,7,8,9,10, 11,15,16,19,20	Floating