

# MMA-053223-M4 500-3200 MHz Fully Matched High Dynamic Range Amplifier

## Features:

- Ideal for 500 – 3200 MHz High Linearity / High Dynamic Range Applications
- Excellent RF Performance:
  - 42 dBm OIP3
  - 24 dBm P1dB
  - 68 dBc ACPR @ channel power 11dBm
  - 13 dB SSG @ 900 - 2700 MHz
  - 3 dB NF @ 900- 2700 MHz
- Single +6V Supply
- MTTF > 100 years @ 85°C ambient temperature
- Lead Free RoHS Compliant Surface-Mount QFN 4x4mm Package

## Description:

The MMA-053223-M4 is a high linearity broadband MMIC amplifier utilizing MWT's proprietary linear MESFET technology. Packaged in low cost QFN 4x4mm lead-free Green Package, the MMIC is ideally suited for high linearity driver and high dynamic range LNA applications. The applications include 2G, 2.5G, and 3G wireless infrastructure standards, such as GSM, TDMA, CDMA, EDGE, CDMA2000, WCDMA, TD-SCDMA, and UMTS base stations. The third order intercept point performance is excellent, typically 18 dB above the 1 dB gain compression point.

## Electrical Specifications: @ $V_{ds}=6.0V$ , $I_{ds}=150mA$ , $T_a=25\text{ }^\circ\text{C}$ $Z_0=50\text{ }ohm$

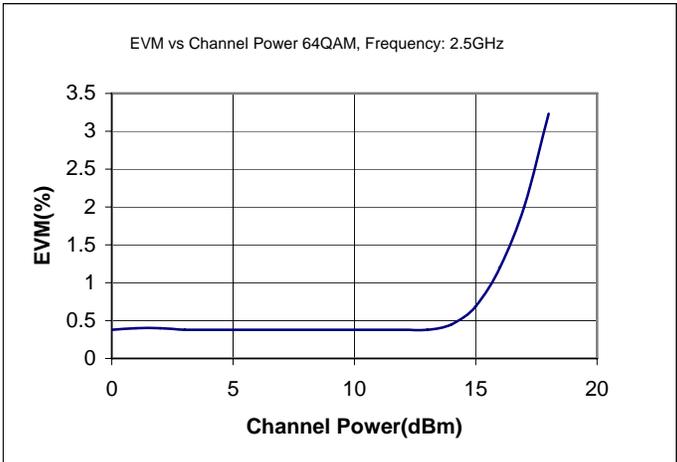
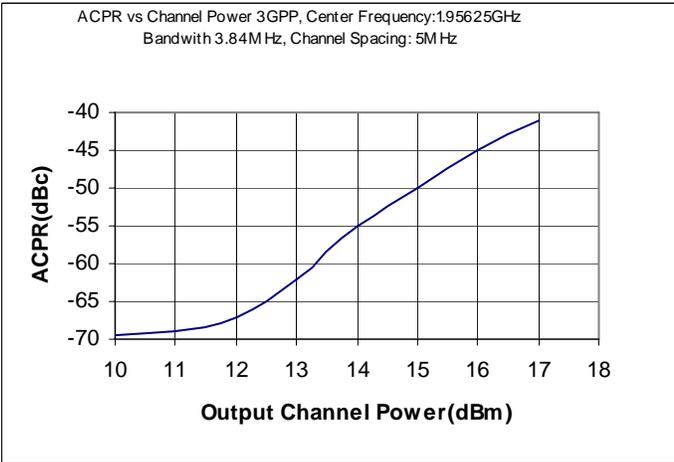
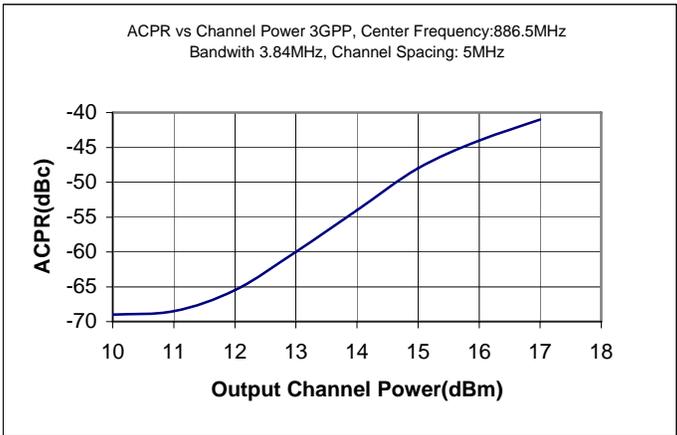
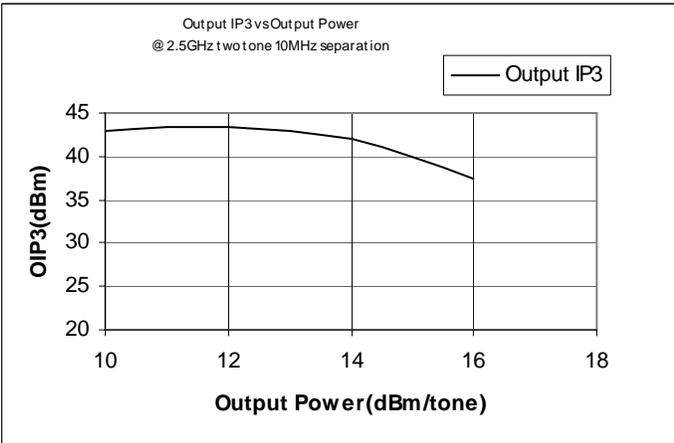
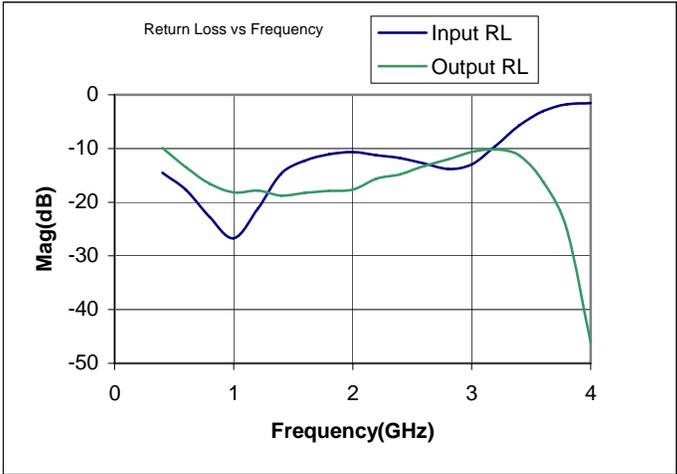
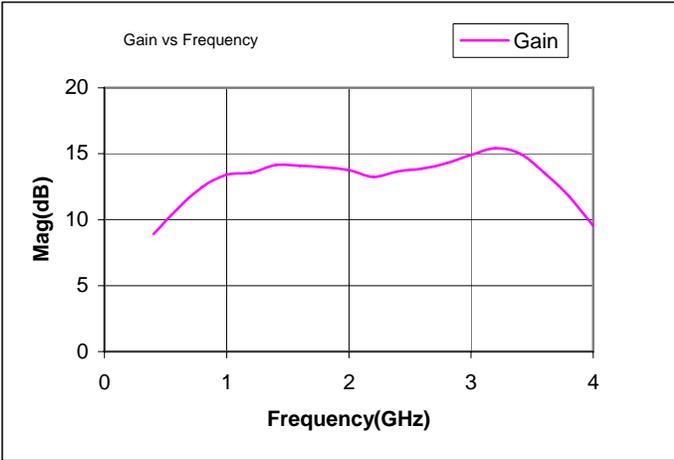
Parameter	Units	Typical Data	
Frequency Range	MHz	900-2700	500-3200
Gain (Typ / Min)	dB	13 / 11	12 / -
Gain Flatness (Typ / Min)	+/-dB	0.8 / 1.2	1.5 / -
Input Return Loss (Typ)	dB	10	10
Output Return Loss (Typ)	dB	10	10
Output P1dB (Typ)	dBm	24	23
Output IP3 (Typ / Min) <sup>(1)</sup>	dBm	42 / 38	42 / -
Noise Figure	dB	3.0	3.5
Operating Current Range(Min / Max)	mA	120 / 200	
Thermal Resistance (Typ)	$^\circ\text{C} / \text{W}$	30	

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

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## Typical RF Performance: $V_{ds}=6V, I_{ds}=150mA, T_a=25^\circ C$ 50 Ohm system



### Typical Scattering Parameters:

(V<sub>ds</sub>=6.0V, I<sub>ds</sub>=150mA, T<sub>a</sub> =25°C Reference Planes at Leads)

F [GHz]	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
0.4	0.19	98.66	2.79	176.94	0.01	63.23	0.32	83.88
0.6	0.13	47.98	3.48	136.87	0.01	26.17	0.21	77.22
0.8	0.07	-2.92	4.21	98.46	0.02	-7.36	0.15	59.34
1.0	0.05	-127.00	4.69	59.73	0.02	-40.77	0.12	53.51
1.2	0.09	151.81	4.76	21.49	0.02	-75.24	0.13	35.24
1.4	0.18	109.75	5.09	-13.87	0.03	-106.14	0.11	26.45
1.6	0.24	66.92	5.06	-49.72	0.03	-138.13	0.12	1.20
1.8	0.28	27.21	4.99	-84.02	0.04	-170.03	0.13	-33.37
2.0	0.29	-11.18	4.86	-118.22	0.04	157.74	0.13	-71.80
2.2	0.27	-52.17	4.59	-146.97	0.04	130.96	0.17	-113.51
2.4	0.26	-92.11	4.82	-179.59	0.04	99.51	0.18	-152.37
2.6	0.23	-140.62	4.94	148.31	0.05	68.70	0.22	174.78
2.8	0.20	159.07	5.18	114.91	0.05	36.56	0.25	144.42
3.0	0.22	82.13	5.57	79.84	0.06	3.12	0.29	114.41
3.2	0.33	-3.09	5.90	38.94	0.07	-36.79	0.31	78.48
3.4	0.52	-76.15	5.62	-5.47	0.07	-81.39	0.27	36.78
3.6	0.70	-136.79	4.75	-48.16	0.06	-120.63	0.15	-11.94
3.8	0.81	170.37	3.89	-86.16	0.05	-165.18	0.06	-21.34
4.0	0.84	128.82	3.00	-119.64	0.04	160.57	0.00	119.74

### Absolute Maximum Ratings: (T<sub>a</sub>= 25 °C)\*

SYMBOL	PARAMETERS	UNITS	ABSOLUTE MAXIMUM
V <sub>ds</sub>	Drain-Source Voltage	V	8
V <sub>gs</sub>	Gate-Source Voltage	V	-6 to +0.8
I <sub>ds</sub>	Drain Current	mA	300
I <sub>gs</sub>	Gate Current	mA	3
P <sub>diss</sub>	DC Power Dissipation	W	2.4
P <sub>in max</sub>	RF Input Power	dBm	+24
T <sub>oper</sub>	Operating Temperature	°C	-40 to +85
T <sub>ch</sub>	Channel Temperature	°C	150
T <sub>stg</sub>	Storage Temperature	°C	-60 to 150

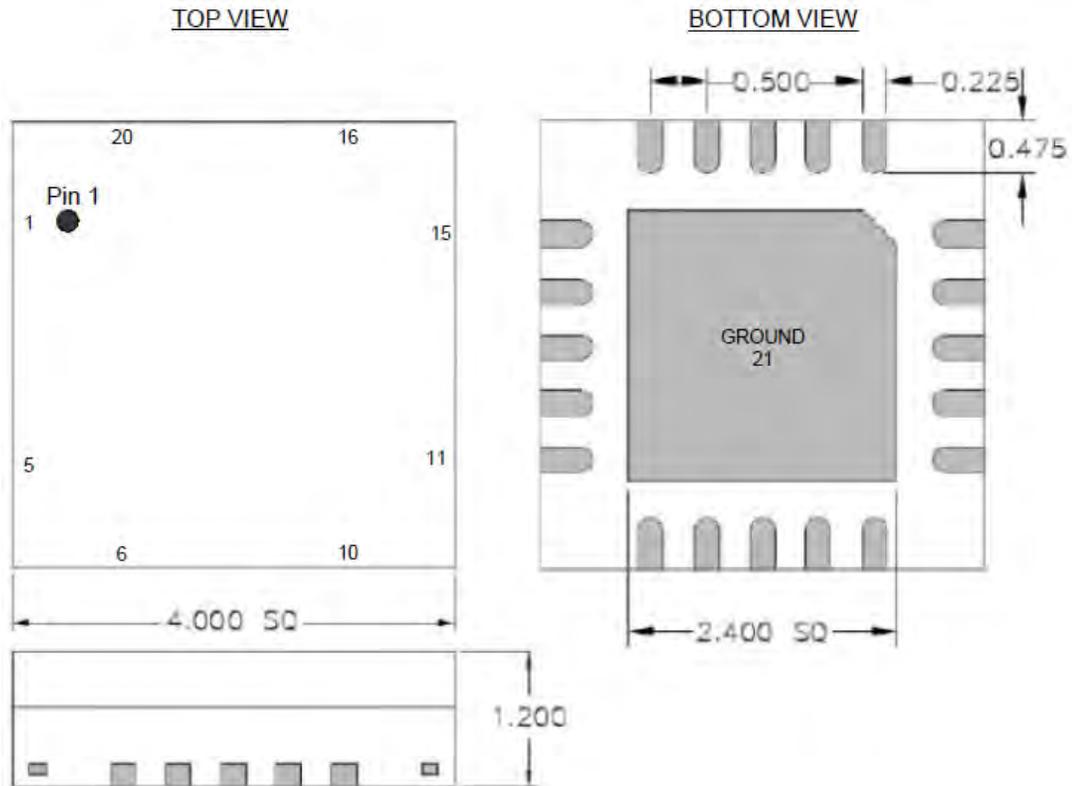
\*Operation of this device above any one of these parameters may cause permanent damage.

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## Mechanical Information:

This Package is RoHS-compliant lead free Green Package



The units are in [mm].

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

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### Contact Information

For additional information please visit [www.cmlmicro.com](http://www.cmlmicro.com) or contact a sales office.

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