

## 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 3X3mm Package



## Description:

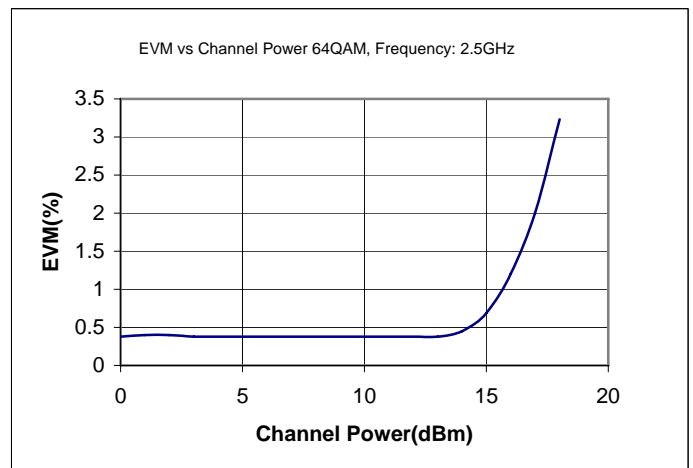
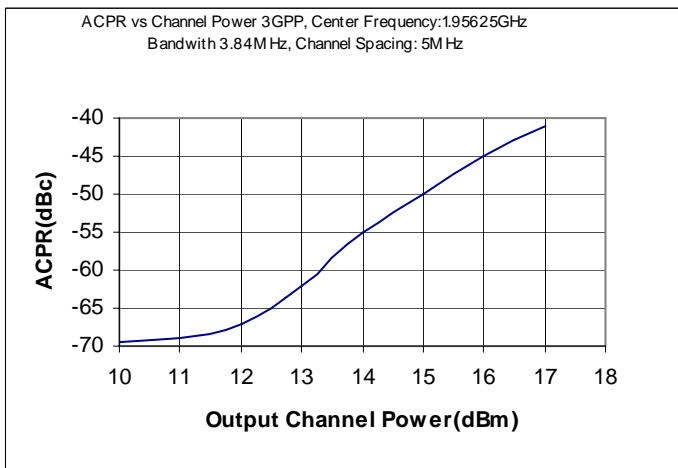
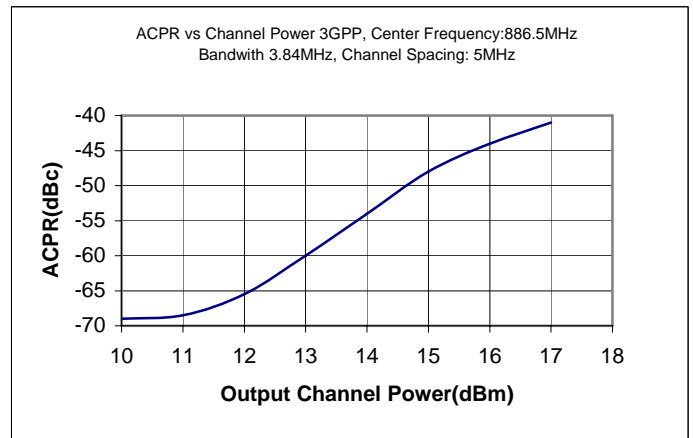
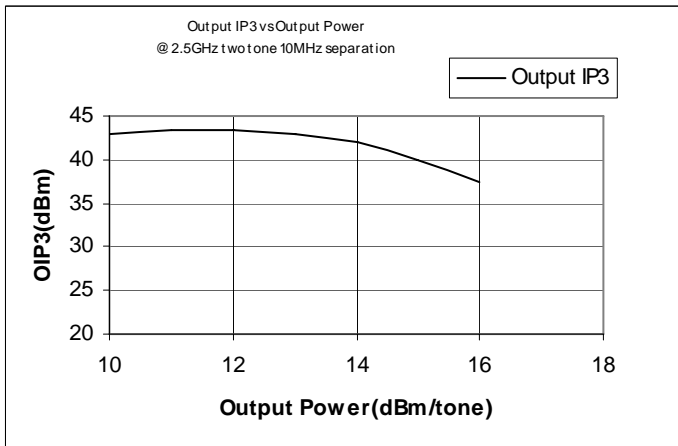
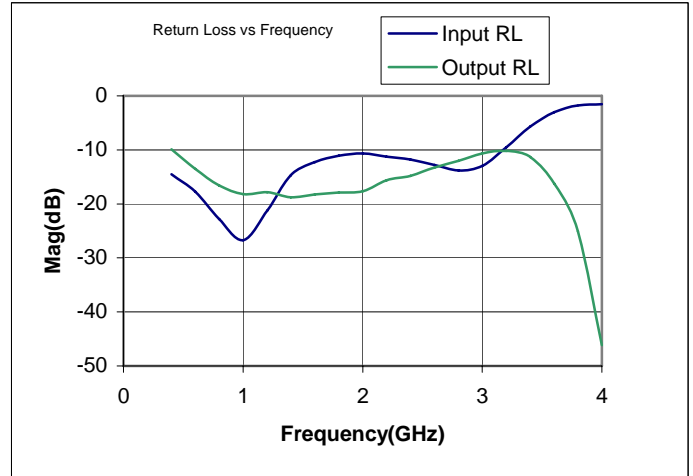
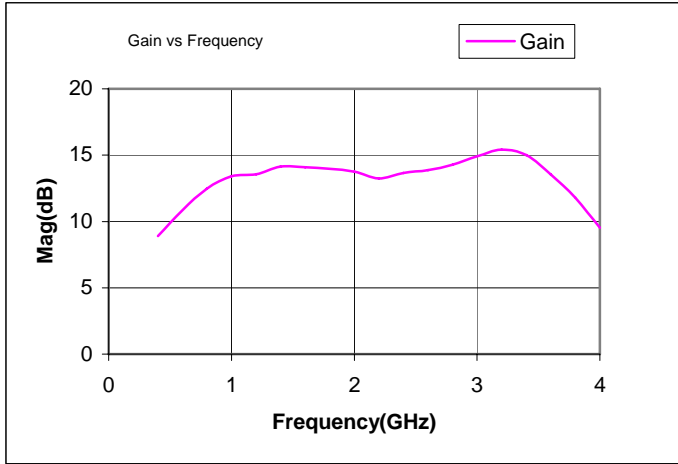
The MMA-053223-Q3 is a high linearity broadband MMIC amplifier utilizing MwT's proprietary linear MESFET technology. Packaged in low cost QFN 3X3mm lead-free Green Package, the MMIC is ideally suited for high linearity driver and high dynamic range LNA applications. The applications include 2G, 2.5G, 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: @ $V_{ds}=6.0V$ , $I_{ds}=150mA$ , $T_a=25^\circ C$ $Z_0=50\ ohm$

| 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)              | °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: $V_{ds}=6V, I_{ds}=150mA, T_a=25\text{ }^\circ\text{C}$ 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  |

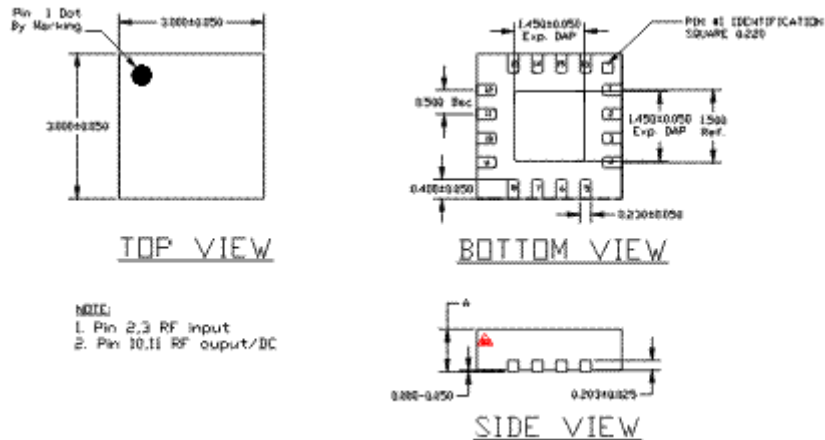
## Absolute Maximum Ratings: (T<sub>a</sub>= 25 °C)\*

| 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>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.

## Mechanical Information:

This Package is RoHS-compliant lead free Green Package



(all units are mm)

## ORDERING INFORMATION:

The MMA-053223-Q3 is available in both military and commercial versions.

**Part Number**

MMA-053223-Q3  
MMA-053223-Q3M

**Version**

Commercial  
Military