

## MMA-011015-C3 1 - 10 GHz Fully Matched Driver Amplifier

### Features:

- Frequency Range: 1 – 10 GHz
- P-1dB: 16 dBm
- Gain: 15 dB
- Single Positive Bias: + 6V
- Fully Matched Input / Output to 50  $\Omega$
- Advanced 0.25  $\mu$ m AlGaAs / InGaAs PHEMT Technology with Excellent Reliability
- Surface Mount 3.0 x 3.0 x 0.8 mm Package

### Description:

The MMA-011015-C3 is a 1 - 10 GHz broadband MMIC driver amplifier fabricated with advanced 0.25  $\mu$ m AlGaAs / InGaAs PHEMT technology with excellent reliability. The fully matched MMIC amplifier is easy to cascade with other stages and is unconditionally stable. The typical applications include test instrumentation, and commercial wireless equipment, etc.

### Electrical Specifications: $V_{ds} = 6.0 V$ , $I_{ds} = 75 mA$ , $Z_o = 50 \Omega$ , $T_a = 25 ^\circ C$

| Parameter                   | Units          | Min. | Typ. | Max. |
|-----------------------------|----------------|------|------|------|
| Frequency Range (Min / Max) | GHz            | 1    |      | 10   |
| Small Signal Gain           | dB             | 10   | 15   |      |
| Gain Flatness               | $\pm$ dB       |      | 2.5  |      |
| Input Return Loss           | dB             |      | -10  |      |
| Output Return Loss          | dB             |      | -10  |      |
| Output P1dB                 | dBm            |      | +16  |      |
| Noise Figure                | dB             |      | 4.5  |      |
| Quiescent Current           | mA             |      | 75   |      |
| Thermal Resistance          | $^\circ C / W$ |      | 120  |      |

### ESD Caution

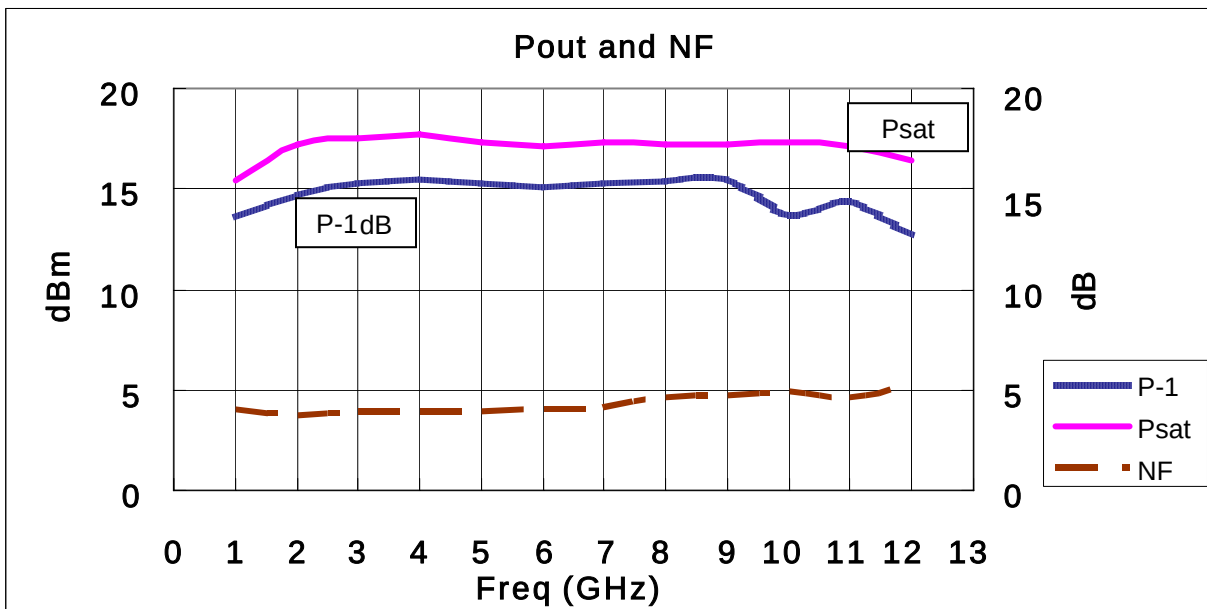
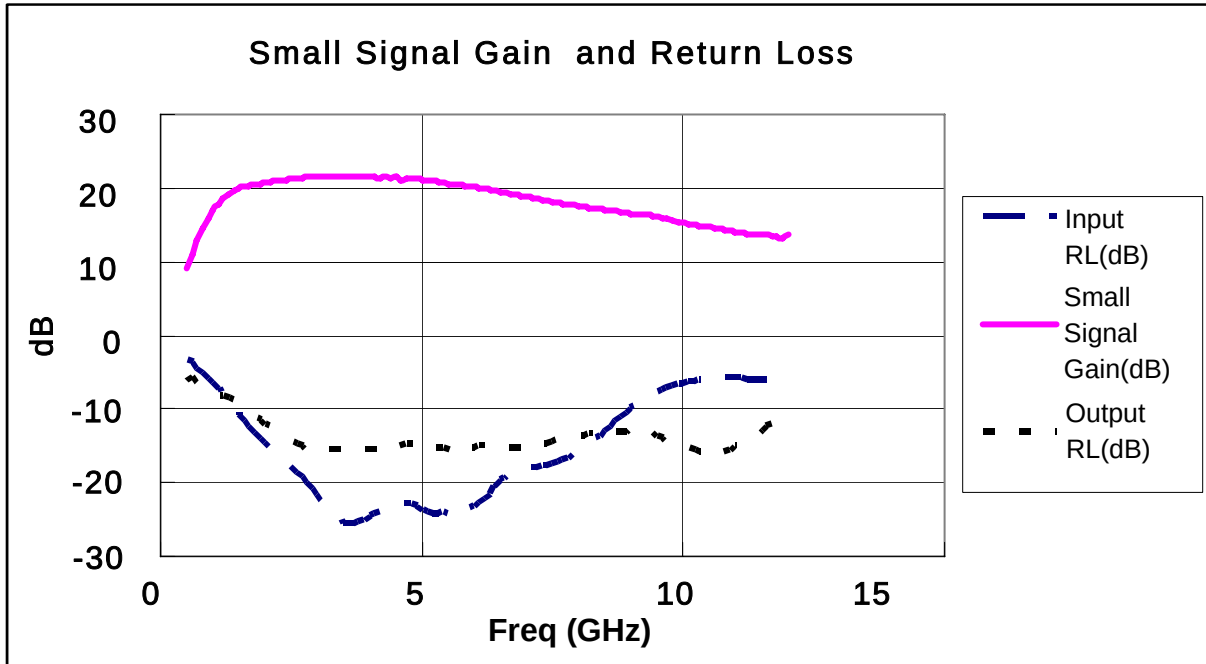


High-performance RF integrated circuits are highly sensitive to electrostatic discharge (ESD) and may contain unprotected inputs and outputs. Handling and assembly should be conducted in an ESD-controlled environment. It is recommended that ESD precautions and protocols are adopted to minimise the risk of electrostatic discharge and protect product integrity.

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1 - 10 GHz Fully Matched Driver Amplifier

**Typical RF Performance:**  $V_{ds} = 6.0\text{ V}$ ,  $I_{ds} = 75\text{ mA}$ ,  $T_a = 25\text{ }^{\circ}\text{C}$ ,  $Z_o = 50\text{ }\Omega$  (unless stated otherwise)



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**S-parameters:**  $V_{ds} = 6.0\text{ V}$ ,  $I_{ds} = 75\text{ mA}$ ,  $T_a = 25\text{ }^{\circ}\text{C}$ ,  $Z_o = 50\text{ }\Omega$

| Freq(GHz) | magS11 | angS11 | magS21 | angS21  | magS12 | angS12  | magS22 | angS22  |
|-----------|--------|--------|--------|---------|--------|---------|--------|---------|
| 1.0       | 0.47   | -174.2 | 7.00   | -9.38   | 0.006  | 84.91   | 0.42   | 18.93   |
| 1.5       | 0.29   | 120.5  | 9.87   | -74.03  | 0.014  | -18.02  | 0.33   | -81.20  |
| 2.0       | 0.19   | 71.2   | 10.91  | -131.30 | 0.018  | -85.27  | 0.25   | -156.30 |
| 2.5       | 0.13   | 25.7   | 11.51  | 178.00  | 0.018  | -138.30 | 0.19   | 148.70  |
| 3.0       | 0.08   | -11.0  | 11.88  | 127.60  | 0.017  | 175.00  | 0.17   | 102.60  |
| 3.5       | 0.05   | -27.3  | 11.83  | 78.99   | 0.016  | 129.50  | 0.17   | 65.33   |
| 4.0       | 0.06   | -41.8  | 11.93  | 31.65   | 0.014  | 84.32   | 0.17   | 29.09   |
| 4.5       | 0.07   | -82.0  | 11.89  | -16.77  | 0.013  | 40.10   | 0.18   | -12.11  |
| 5.0       | 0.07   | -145.3 | 11.31  | -64.18  | 0.013  | -5.37   | 0.18   | -52.05  |
| 5.5       | 0.06   | 131.8  | 10.74  | -111.10 | 0.012  | -55.78  | 0.17   | -90.80  |
| 6.0       | 0.07   | 56.8   | 10.14  | -157.80 | 0.011  | -104.80 | 0.17   | -135.70 |
| 6.5       | 0.10   | -6.0   | 9.38   | 157.10  | 0.010  | -147.40 | 0.17   | 175.70  |
| 7.0       | 0.13   | -61.6  | 8.76   | 113.00  | 0.010  | 166.90  | 0.17   | 127.50  |
| 7.5       | 0.13   | -123.2 | 8.07   | 68.80   | 0.010  | 122.90  | 0.19   | 82.03   |
| 8.0       | 0.16   | 168.8  | 7.53   | 26.25   | 0.009  | 80.10   | 0.21   | 39.85   |
| 8.5       | 0.23   | 104.8  | 7.09   | -17.00  | 0.009  | 39.33   | 0.21   | 0.17    |
| 9.0       | 0.32   | 48.0   | 6.61   | -60.04  | 0.007  | 3.40    | 0.23   | -35.98  |
| 9.5       | 0.41   | -1.4   | 6.33   | -104.30 | 0.008  | -33.67  | 0.21   | -84.15  |
| 10.0      | 0.47   | -46.7  | 5.84   | -147.80 | 0.007  | -72.67  | 0.17   | -139.60 |

## Absolute Maximum Ratings (\*):

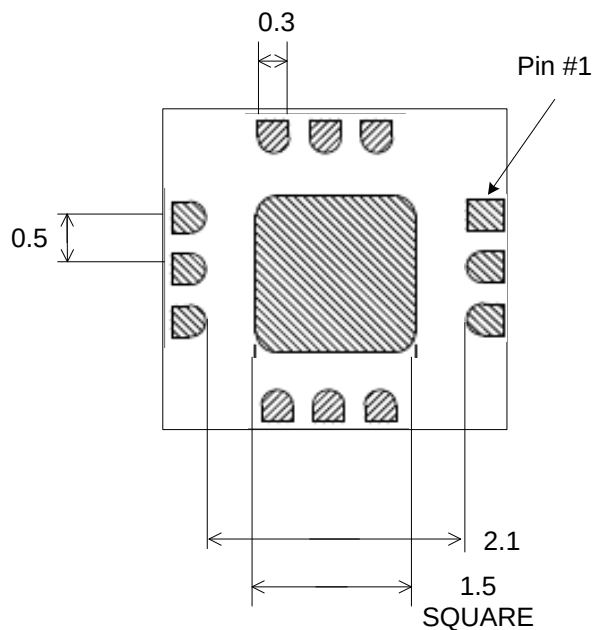
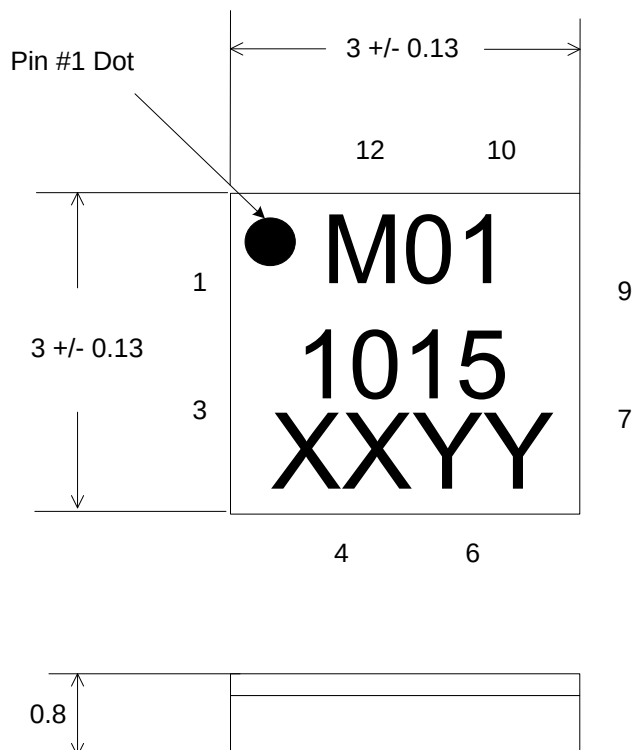
| SYMBOL              | PARAMETER             | UNITS | ABSOLUTE MAXIMUM |
|---------------------|-----------------------|-------|------------------|
| V <sub>ds</sub>     | Drain-Source Voltage  | V     | 8.0              |
| I <sub>ds</sub>     | Drain Current         | mA    | 150              |
| P <sub>in max</sub> | RF Input Power        | dBm   | +12              |
| T <sub>oper</sub>   | Operating Temperature | °C    | -40 to +85       |
| T <sub>ch</sub>     | Channel Temperature   | °C    | 175              |
| 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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## 1 - 10 GHz Fully Matched Driver Amplifier

### Package Pin-out:

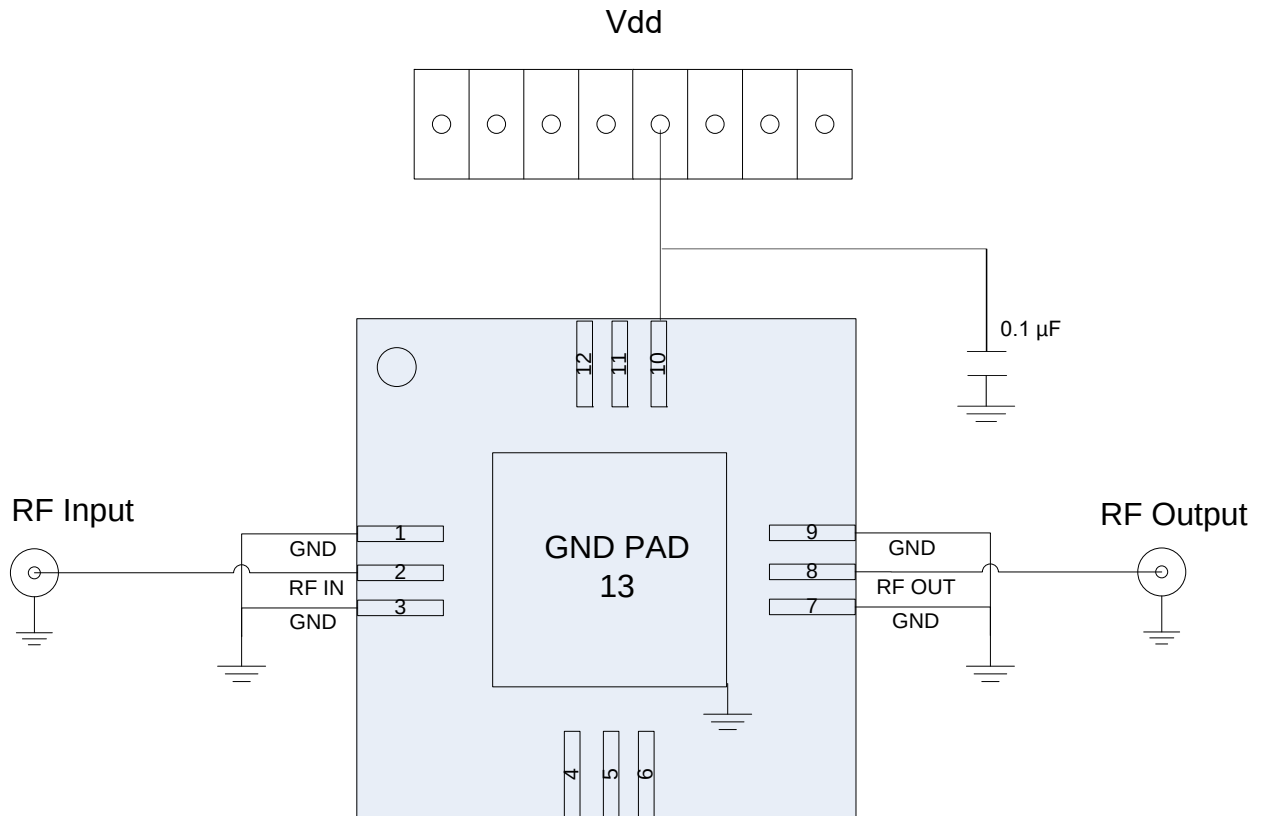


| Pin                         | Description |
|-----------------------------|-------------|
| 2                           | RF Input    |
| 8                           | RF Output   |
| 10                          | Vd          |
| 1, 3, 7, 9, 13 (center pad) | Ground      |
| 4, 5, 6, 11, 12             | N/C         |

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## Application Circuit:



### RoHS Compliance



CML Micro certifies, to the best of our knowledge, that its products comply with RoHS directive (2011/65/EU), as amended by Directive (EU) 2015/863.

### REACH Compliance



CML Micro certifies, to the best of our knowledge, that its products do not contain any of the banned substances specified in the SVHC list at <https://echa.europa.eu/candidate-list-table>. CML Micro are committed to ensuring the safety of products and the compliance with regulations. Publications will be updated in the event that REACH control is compromised.

### Contact Information

For further information please contact your local CML sales representative.  
Contact details can be found at [www.cmlmicro.com](http://www.cmlmicro.com).

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