

# WP481P06200MH

## 200W RF GaN Power Transistor



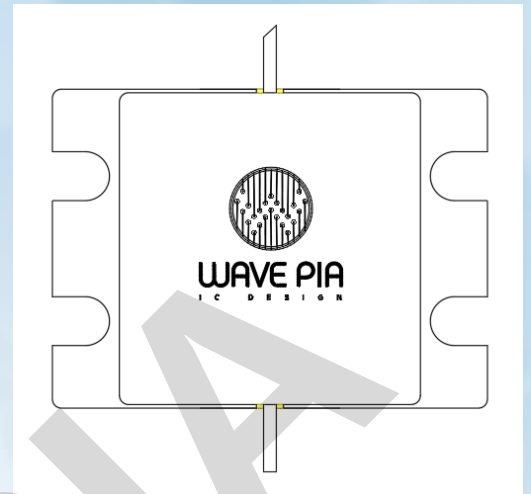
WAVEPIA  
I C D E S I G N

### Product Features

- 1.03 to 1.09 GHz Operation
- 17.8 dB Small Signal Gain at 1.06 GHz
- 260 W Psat at 1.09GHz
- 58.5 % Efficiency at 1.03GHz
- 48 V Operation

### Applications

- Broadband Amplifiers
- Cellular Infrastructure
- Test Instrumentation
- Radar application



### Absolute Maximum Ratings

| Parameter                                     | Symbol     | Rating    | Units | Conditions                  |
|---|------------|-----------|-------|-----------------------------|
| Drain-Source Voltage                          | $V_{DSS}$  | 160       | Volts | 25°C                        |
| Gate-to-Source Voltage <sup>3</sup>           | $V_{GS}$   | -10, +2   | Volts | 25°C                        |
| Storage Temperature <sup>3</sup>              | $T_{STG}$  | -65, +150 | °C    |                             |
| Operating Junction Temperature <sup>1,3</sup> | $T_J$      | 225       | °C    |                             |
| Maximum Forward Gate Current <sup>3</sup>     | $I_{GMAX}$ | 30        | mA    | 25°C                        |
| Maximum Drain Current <sup>2</sup>            | $I_{DMAX}$ | 1         | A     | $I_d @ V_d = 10V, V_g = 1V$ |
| Soldering Temperature <sup>3</sup>            | $T_s$      | 245       | °C    |                             |

Note:

1. Continuous use at maximum temperature will affect MTTF.
2. Current limit for long term, reliable operation
3. After additional updates

## DC Characteristics<sup>1</sup> (Ta = 25°C)

| Parameter                            | Symbol       | MIN | TYP   | MAX | Units    | Conditions                                  |
|--------------------------------------|--------------|-----|-------|-----|----------|---|
| Gate Threshold Voltage               | $V_{GS(th)}$ |     | -3.4  |     | $V_{DC}$ | $V_{DS} = 48\text{ V}, I_D = 1\text{ mA}$   |
| Gate Quiescent Voltage               | $V_{GS(Q)}$  |     | -2.96 |     | $V_{DC}$ | $V_{DS} = 48\text{ V}, I_D = 200\text{ mA}$ |
| Saturated Drain Current <sup>1</sup> | $I_{DS}$     |     | 1000  |     | mA/mm    | $V_{DS} = 10\text{ V}, V_{GS} = 1\text{ V}$ |
| Drain-Source Breakdown Voltage       | $V_{BR}$     | 160 |       |     | $V_{DC}$ | $I_D = 1\text{ mA/mm}$                      |

Note:

1. Scaled from PCM data.

## RF Characteristics (Ta = 25°C, F0 = 1.06 GHz unless otherwise noted)

| Parameter                     | Symbol     | MIN | TYP   | MAX | Units | Conditions   |
|-------------------------------|------------|-----|-------|-----|-------|--|
| Psat Gain                     | $G_{psat}$ |     | 17.53 |     | dB    | $V_{DD} = 48\text{ V}, I_{DQ} = 200\text{ mA}, \text{Pulse Width} = 100\text{ usec}, \text{Duty Cycle} = 10\%$           |
| Saturated Output Power        | $P_{sat}$  |     | 54.53 |     | dBm   | $V_{DD} = 48\text{ V}, I_{DQ} = 200\text{ mA}, \text{Pulse Width} = 100\text{ usec}, \text{Duty Cycle} = 10\%$           |
| Drain Efficiency <sup>1</sup> | $\eta$     |     | 62.76 |     | %     | $V_{DD} = 48\text{ V}, I_{DQ} = 200\text{ mA}, \text{Pulse Width} = 100\text{ usec}, \text{Duty Cycle} = 10\% @ P_{sat}$ |

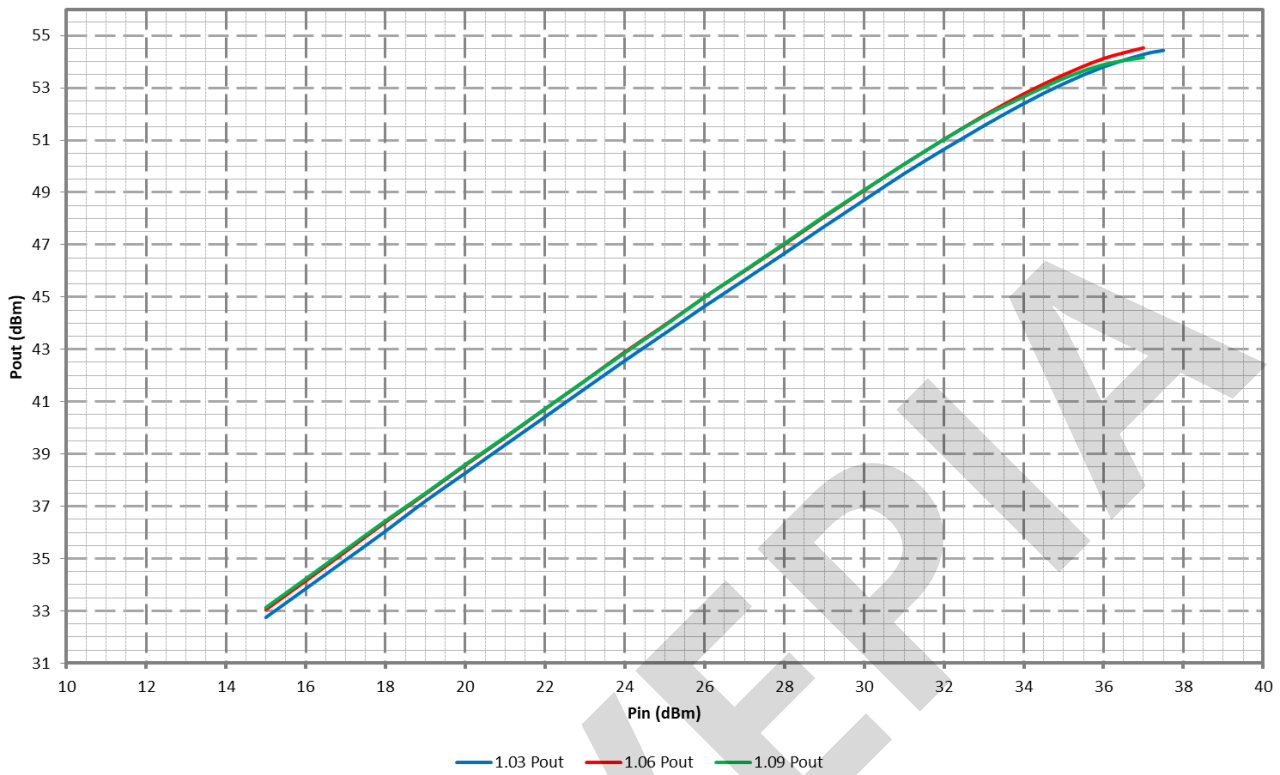
Note:

1. Drain Efficiency =  $P_{OUT}/P_{DC}$

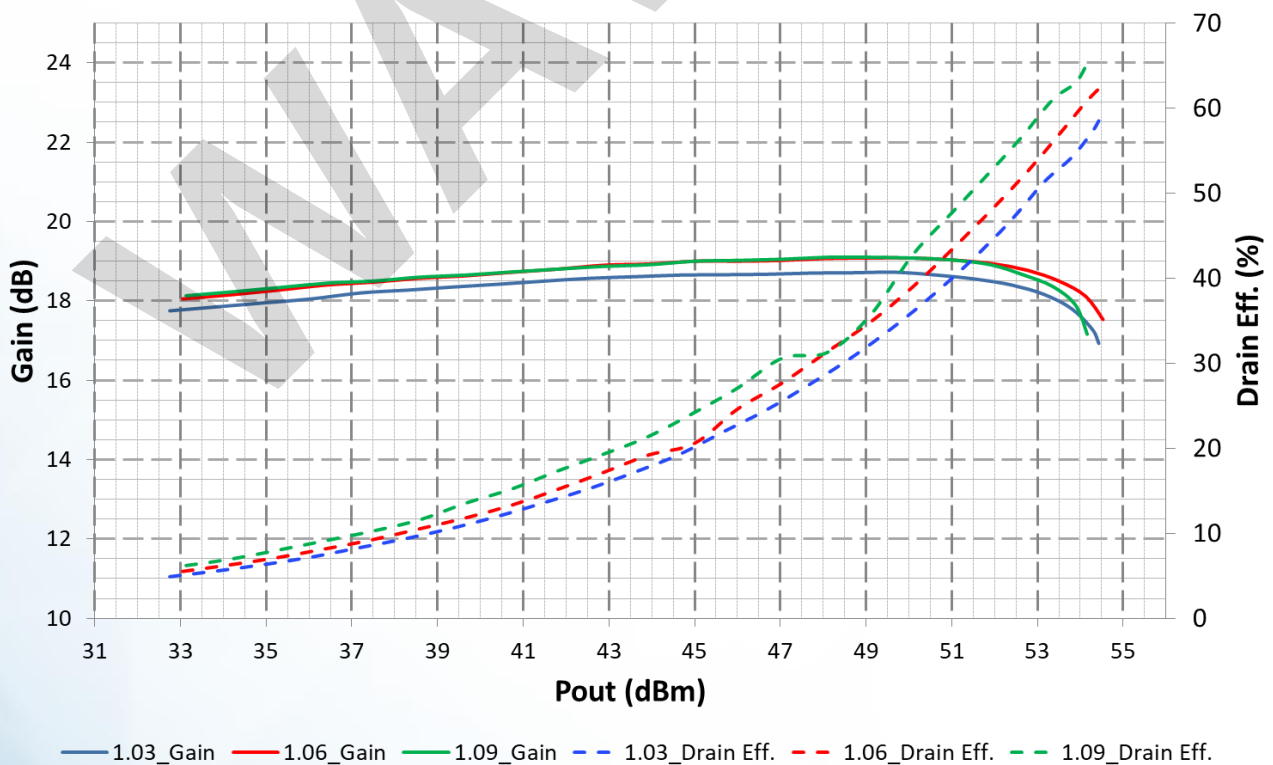
## Pulse Signal Performance (Ta=25°C, Measured in the test board amplifier circuit)

VDD = 48 V, IDQ = 200mA, Pulse Width = 100µsec, Duty Cycle = 10%

**Pout vs. Pin**

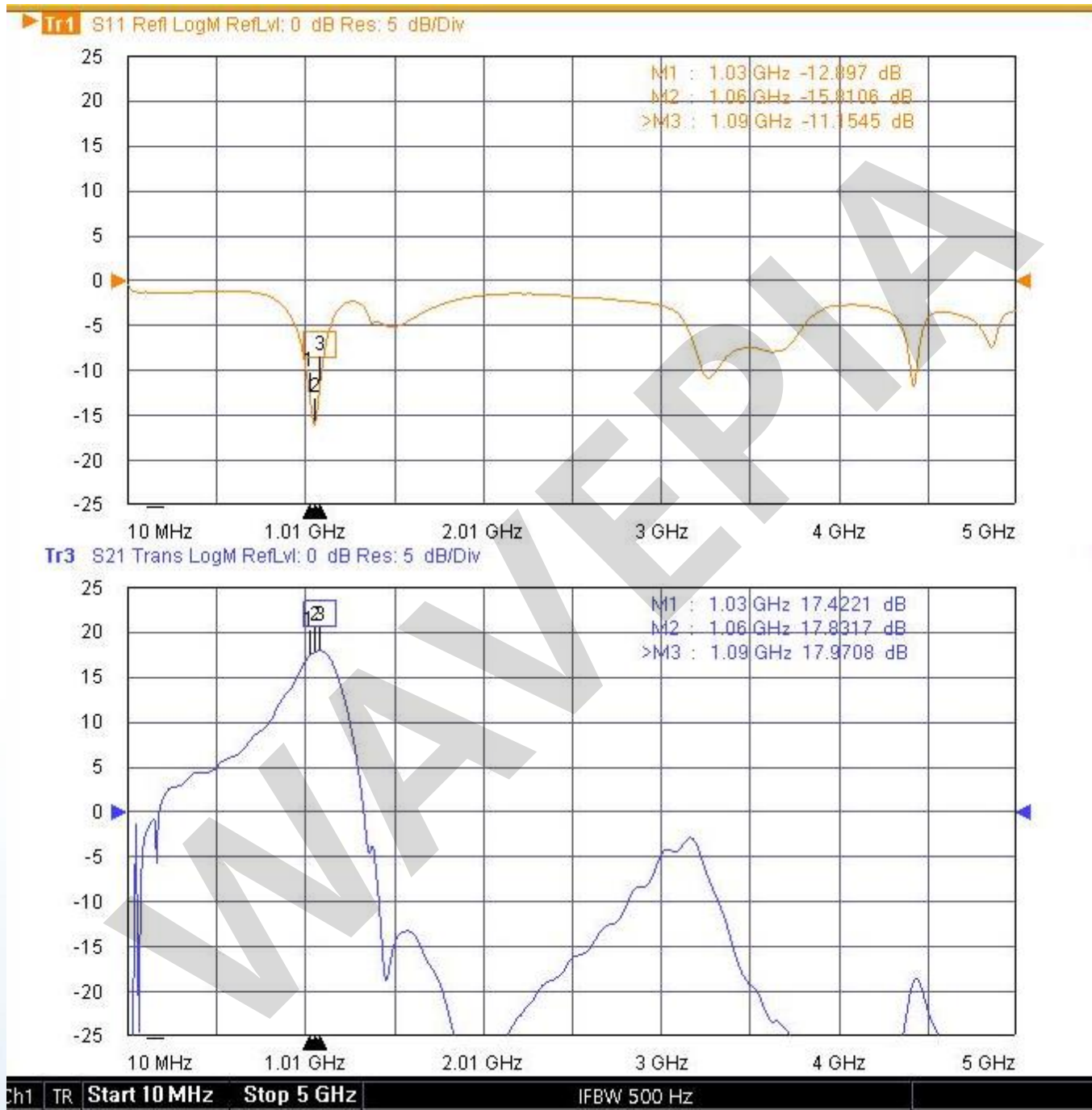


**Gain, Drain Eff. vs. Pout**

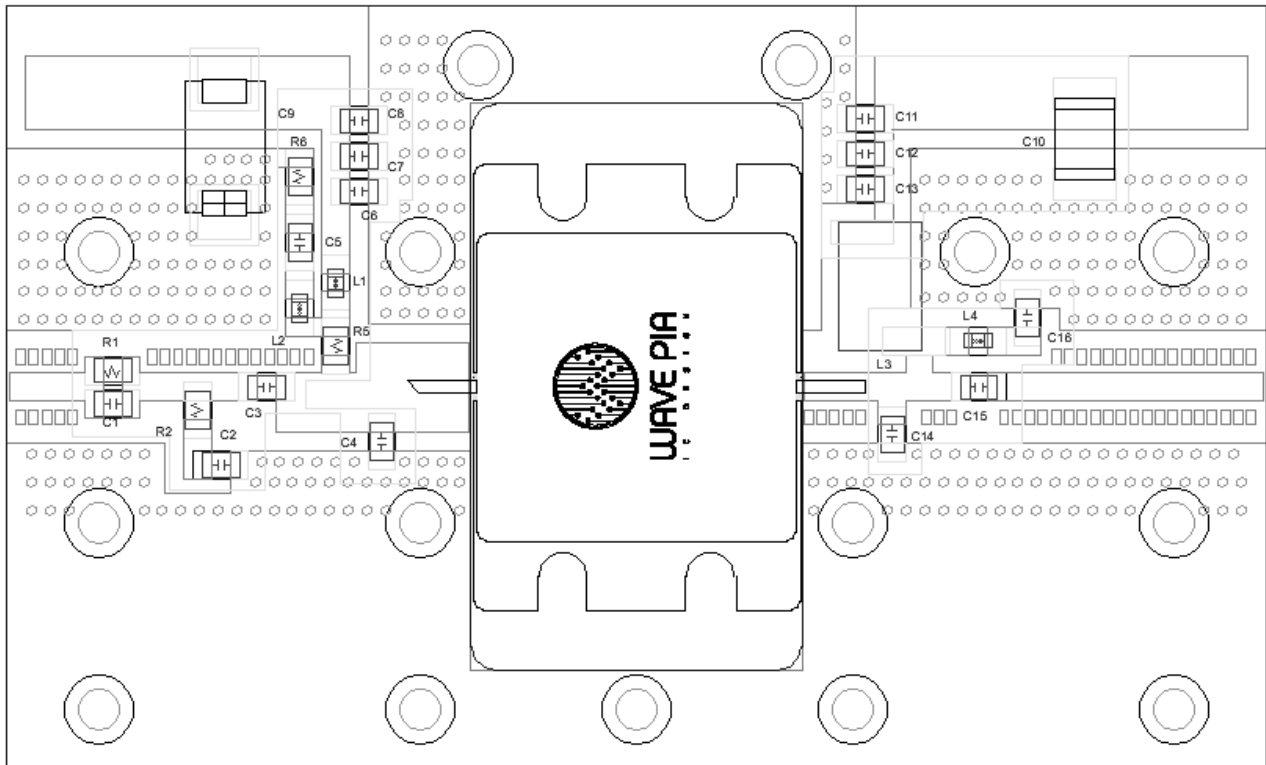


### Pulse Signal Performance (Ta=25°C, Measured in the test board amplifier circuit)

VDD = 48 V, IDQ = 200 mA



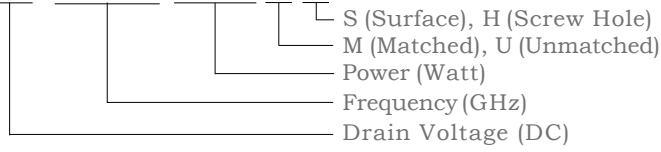
## Demonstration board



| Reference | Value | Description         | Package | Manufacturer |
|-----------|-------|---------------------|---------|--------------|
| C1,C2,C12 | 10pF  | High Q Capacitor    | 2012    | Johanson     |
| C13,C16   | 100pF | High Q Capacitor    | 2012    | Johanson     |
| C3        | 8.2pF | High Q Capacitor    | 2012    | Johanson     |
| C4        | 1pF   | High Q Capacitor    | 2012    | Johanson     |
| C5,C6     | 100pF | Ceramic Capacitor   | 2012    | SAMSUNG      |
| C7        | 10nF  | Ceramic Capacitor   | 2012    | SAMSUNG      |
| C8        | 1uF   | Ceramic Capacitor   | 2012    | SAMSUNG      |
| C11       | 220pF | High Q Capacitor    | 2012    | Johanson     |
| C14,C15   | 6.2pF | High Q Capacitor    | 2012    | Johanson     |
| C10       | 470nF | High V Capacitor    | 4532    | Johanson     |
| C9        | 47uF  | Tantalium Capacitor | D-type  | Vishay       |
| L1,L2,L4  | 47nH  | Core Inductor       | 2010    | Coilcraft    |
| L3        | 28nH  | Air Core Inductor   | B08T    | Coilcraft    |
| R1,R2     | 300Ω  | Chip Resistor       | 2012    | SAMSUNG      |
| R5        | 10Ω   | Chip Resistor       | 2012    | SAMSUNG      |
| R6        | 50Ω   | Chip Resistor       | 2012    | SAMSUNG      |
| PCB       |       | FR-4 0.8T 1oz       |         |              |

## Part numbercode

W P 4 8 1 P 0 6 2 0 0 M H



## PackageDimensions

