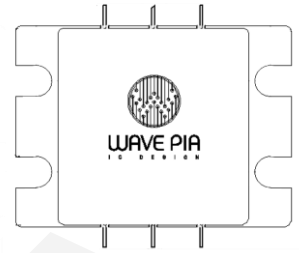


### Product Features

- High Power GaN HEMT for 5.3 to 5.8GHz
- 9.6dB Small Signal Gain at 5.55GHz
- 50.3dBm Typical  $P_{SAT}$  at 5.55GHz
- 41.3% Efficiency at  $P_{SAT}$  at 5.55GHz
- 48V Operation

### Applications

- Point to Point / Multipoint Radio
- Test Equipment & Industrial Controls
- SATCOM
- Military End-Use
- C-band Radar



Package Type: 680BH

### Absolute Maximum Rating

| 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    |                             |

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> ( $T_c = 25^\circ\text{C}$ )

| Parameter                            | Symbol       | MIN | TYP   | MAX | Units    | Conditions                  |
|--------------------------------------|--------------|-----|-------|-----|----------|-----------------------------|
| Gate Threshold Voltage               | $V_{GS(th)}$ |     | -3.5  |     | $V_{DC}$ | $V_{DS} = 10V, I_D = 1mA$   |
| Gate Quiescent Voltage               | $V_{GS(Q)}$  |     | -2.93 |     | $V_{DC}$ | $V_{DS} = 48V, I_D = 200mA$ |
| Saturated Drain Current <sup>2</sup> | $I_{DS}$     |     | 2000  |     | mA/mm    | $V_{DS} = 10V, V_{GS} = 1V$ |
| Drain-Source Breakdown Voltage       | $V_{BR}$     | 160 |       |     | $V_{DC}$ | $I_D = 1 mA/mm$             |

1. Measured on wafer prior to packaging.
2. Scaled from PCM data.

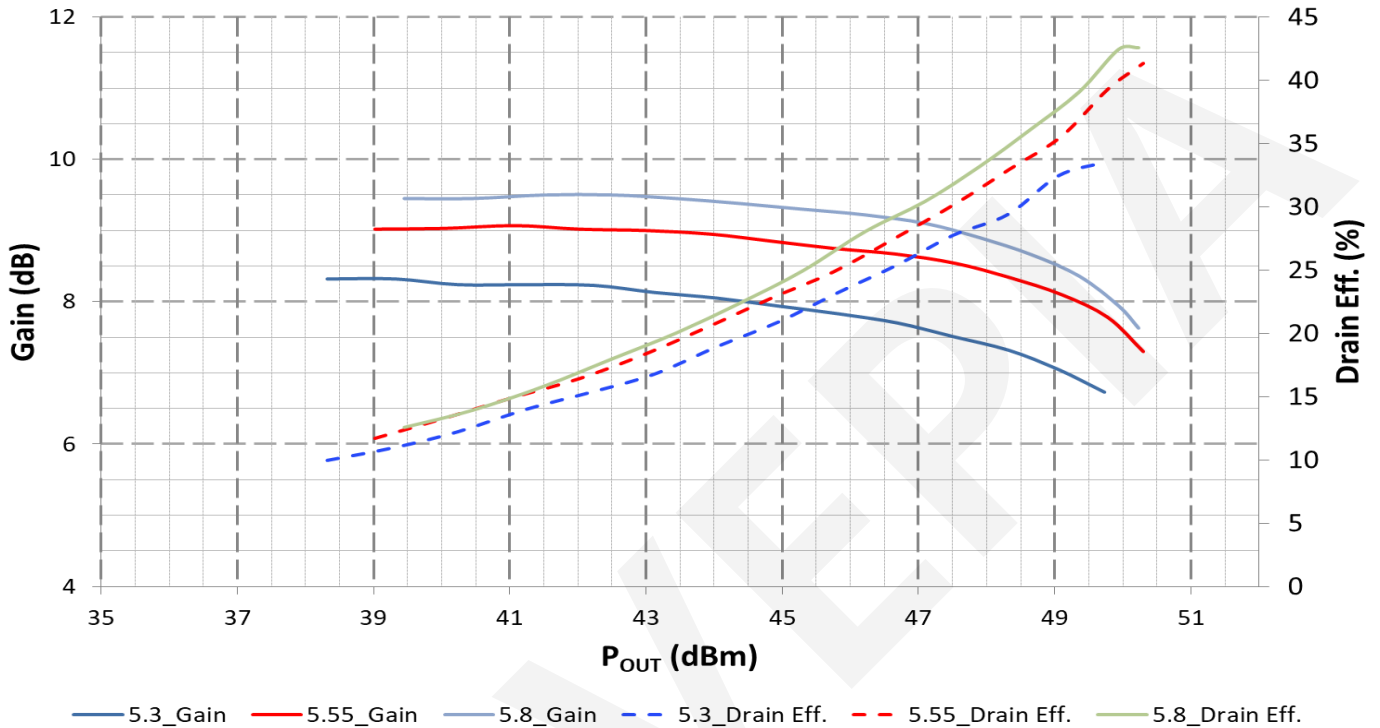
### RF Characteristics ( $T_c = 25^\circ\text{C}$ , $F_0 = 5.55\text{GHz}$ , Unless otherwise noted)

| Parameter                            | Symbol    | MIN | TYP  | MAX | Units | Conditions  |
|--------------------------------------|-----------|-----|------|-----|-------|---|
| Gain                                 | $G_{SS}$  |     | 9.0  |     | dB    | $V_{DD} = 48V, I_{DQ} = 200mA, RF \text{ Pulse Width} = 200\mu\text{sec}, \text{Duty Cycle} = 10\%$           |
| Saturated Output Power               | $P_{SAT}$ |     | 50.3 |     | dBm   | $V_{DD} = 48V, I_{DQ} = 200mA, RF \text{ Pulse Width} = 200\mu\text{sec}, \text{Duty Cycle} = 10\%$           |
| Pulsed Drain Efficiency <sup>1</sup> | $\eta$    |     | 41.3 |     | %     | $V_{DD} = 48V, I_{DQ} = 200mA, RF \text{ Pulse Width} = 200\mu\text{sec}, \text{Duty Cycle} = 10\% @ P_{SAT}$ |

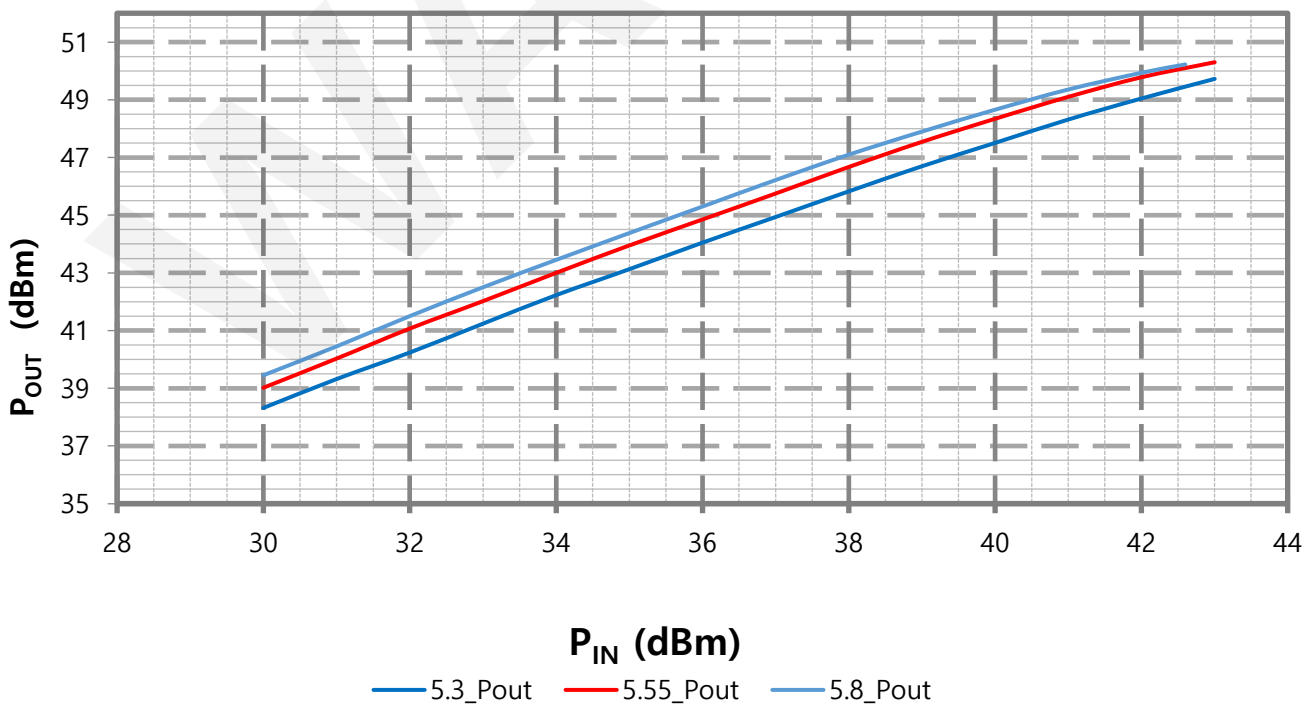
1. Drain Efficiency =  $P_{OUT} / P_{DC}$

**Pulse Signal Performance (Tc=25°C, Measured in the test board amplifier circuit)**  
 VDD=48V, IDQ=200mA, RF Pulse Width=200µsec, Duty Cycle=10%

### Gain, Drain Eff. vs. P<sub>OUT</sub>

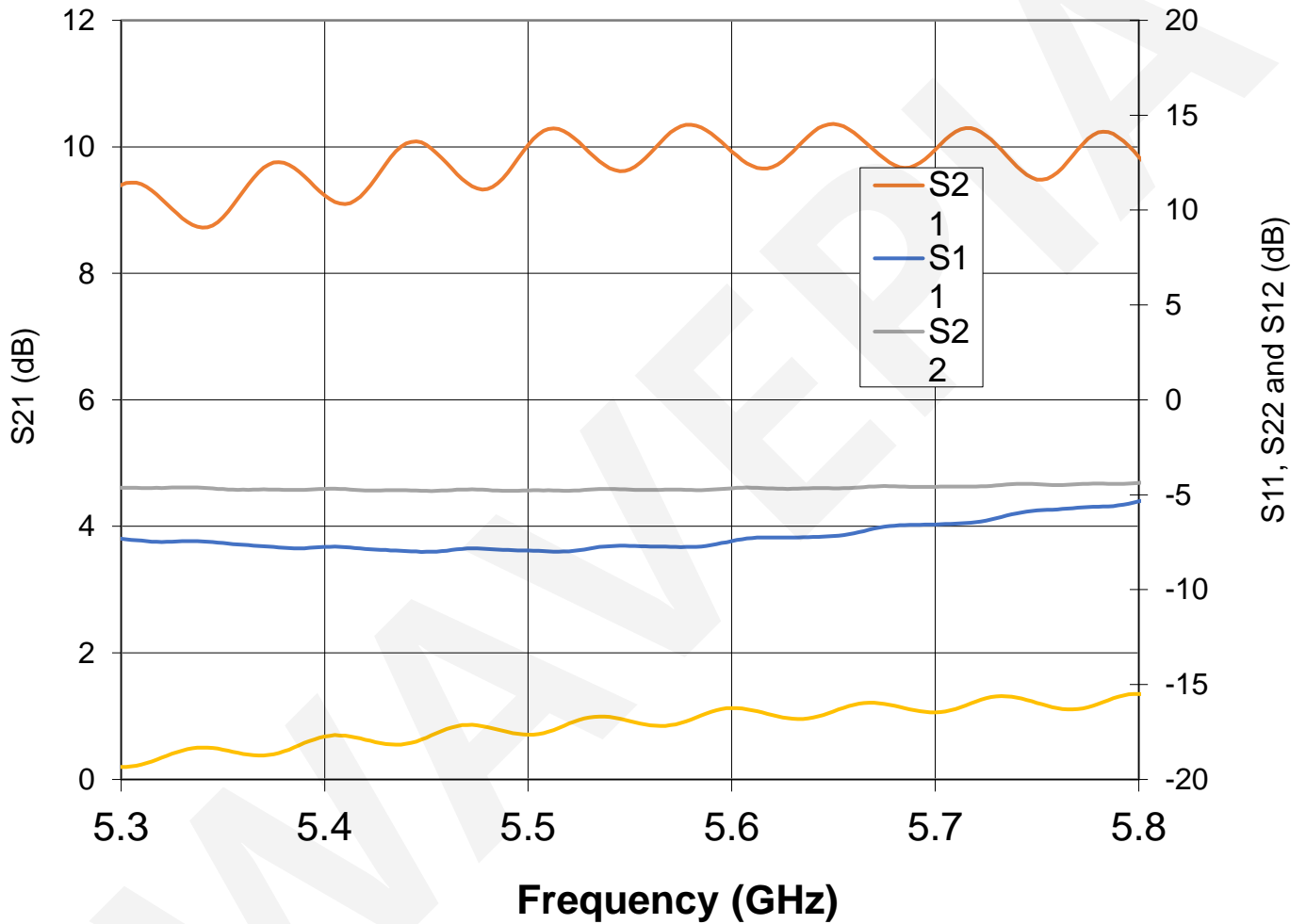


### P<sub>OUT</sub> vs. P<sub>IN</sub>

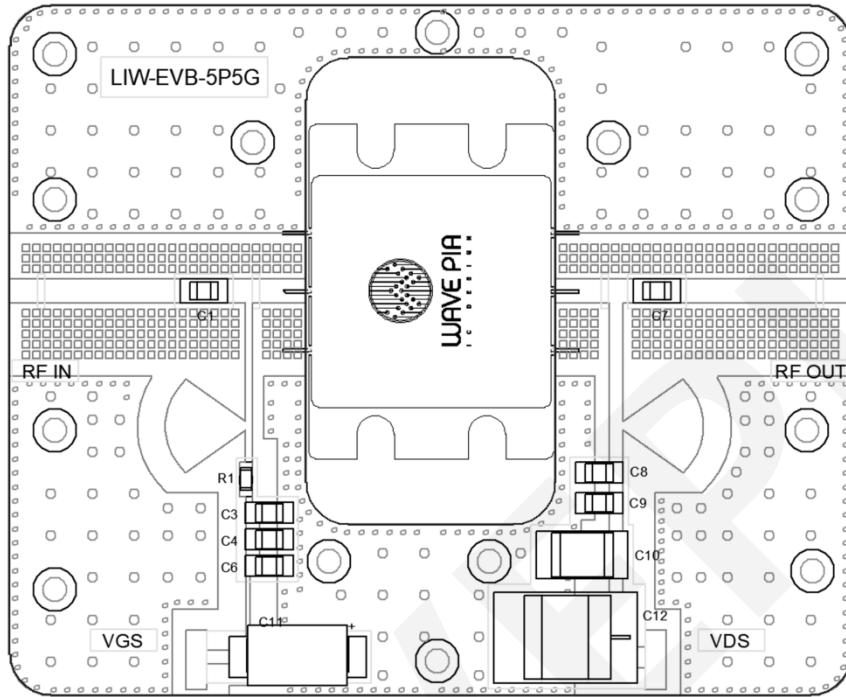


Small Signal Performance (Tc=25°C, Measured in the test board amplifier circuit)  
 VDD=48V, IDQ=200mA

### S-parameters (dB) vs. frequency



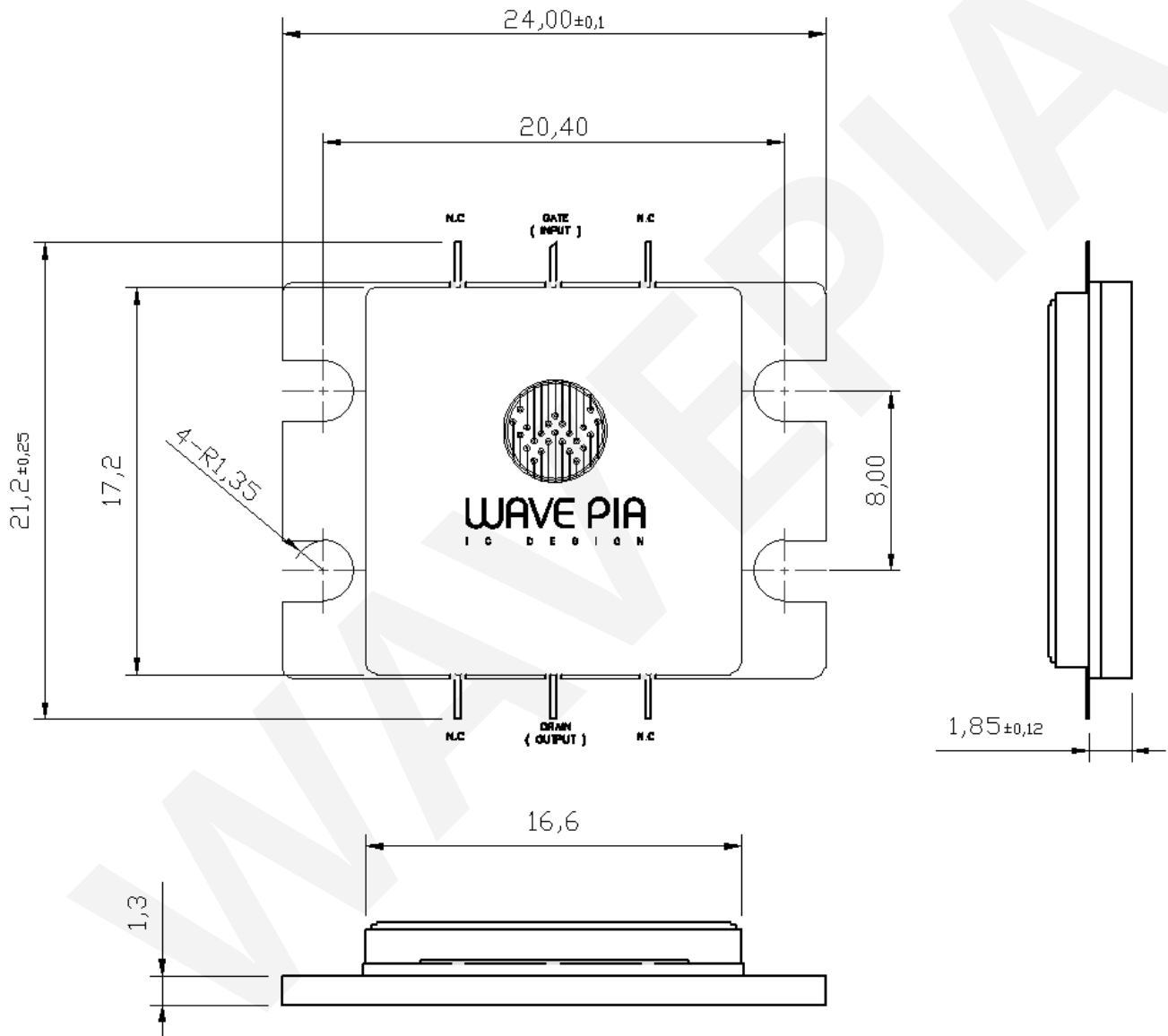
### Evaluation Board



| Reference Number | Value             | Items                  | Package | Manufacturer         |
|------------------|-------------------|------------------------|---------|----------------------|
| C1               | 1pF               | High Q Capacitor       | 2012    | Johanson             |
| C3               | 10pF              | Ceramic Capacitor      | 2012    | Samsung              |
| C4               | 150pF             | Ceramic Capacitor      | 2012    | Samsung              |
| C6               | 1nF               | Ceramic Capacitor      | 2012    | Samsung              |
| C8               | 150pF             | High Q Capacitor       | 2012    | Johanson             |
| C7               | 1pF               | High Q Capacitor       | 2012    | Johanson             |
| C9               | 220pF             | High Q Capacitor       | 2012    | Johanson             |
| C10              | 470nF             | High Voltage Capacitor | 4532    | Johanson Dielectrics |
| C11              | 10uF/25V          | Tantalum Capacitor     | 6032    | Samsung              |
| C12              | 10uF/75V          | Tantalum Capacitor     | R       | Vishay               |
| R1               | 50 ohm            | Chip Resistor          | 1608    | Samsung              |
| C13,C14          | N.C               |                        |         |                      |
| TR1              |                   | WP485P55100MH          | 680MH   | WAVEPIA              |
| PCB              | RO4350B 30mil 1oz |                        |         | Rogers               |

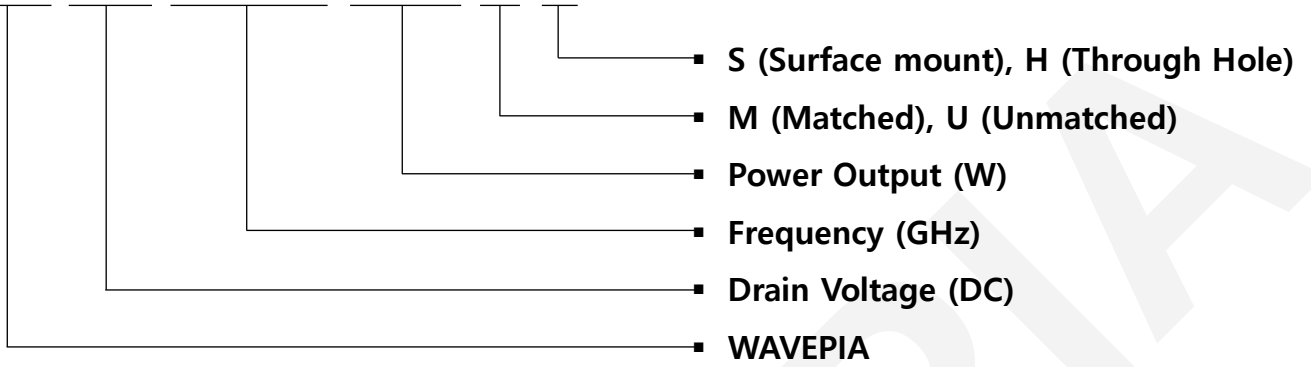
### Product Dimension

- Package Type: 680MH (Through hole)
- Unit: mm



### Part Number System

**W P 4 8 5 P 5 5 1 0 0 M H**



| Parameter       | Value           | Units |
|-----------------|-----------------|-------|
| Drain Voltage   | 48              | V     |
| Lower Frequency | 5.3             | GHz   |
| Upper Frequency | 5.8             | GHz   |
| Output Power    | 100             | W     |
| Transistor Type | Matched         | -     |
| Package         | H: Through hole | -     |