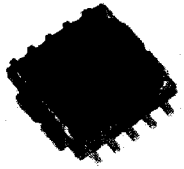
# SMM-210

## 1.5-2.5 GHz, 1 Watt GaAs MMIC Amplifier



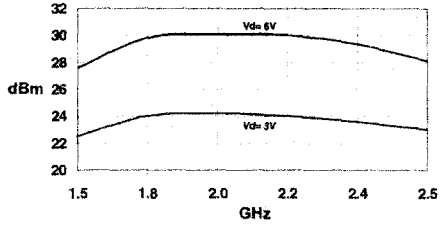
## Product Description

Stanford Microdevices' SMM-210 is a high performance gallium arsenide monolithic-microwave-integrated circuit (MMIC) housed in a low cost, surface-mount ceramic package. Designed for operation in wireless systems operating in the 1.5 to 2.5 GHz frequency range, this amplifier has 26dB of gain with 30dBm of output power at mid-band with proper heat sinking.

These amplifiers will operate with supply voltages as low as 3 volts, making it suitable for use in portables.

Also available in die form, its small size (2.0 x 1.5mm), makes it suitable for use on thin and thick film circuits. Proven gold-based metallization and die passivation add to the reliability and durability of this device.

**Output Power vs. Frequency**
**Vds=6.0V, Ids=600mA**




## Product Features

- **26dB Gain and 30dBm Output Power**
- **High Power Added Efficiency**
- **Characterized at 3 Volts**
- **Low Cost Surface Mount Package**

## Applications

- **PHS, INMARSAT**
- **Portable Applications**

**Electrical Specifications at Ta = 25C**

| Symbol | Parameters & Test Condition | | Units | Min. | Typ. | Max. |
|---|---|---|---|---|---|---|
| $P_{1dB}$ | Output Power at 1dB Compression:<br>Vds = 6.0V, Ids = 600mA | f = 2.0 GHz<br>f = 2.4 GHz | dBm | 29 | 30<br>28 | |
| $G_A$ | Associated Power Gain:<br>Vds = 6.0V, Ids = 600mA | f = 2.0 GHz<br>f = 2.4 GHz | dB | 25 | 27<br>24 | |
| $G_A$ | Associated Power Gain:<br>Vds = 3.0V, Ids = 400mA | f = 2.0 GHz<br>f = 2.4 GHz | dB | 22 | 24<br>21 | |
| $P_{SAT}$ | Saturated Output Power :<br>Vds = 6.0V, Ids = 600mA | f = 2.0 GHz<br>f = 2.4 GHz | dBm | 30 | 31 | |
| PAE | Power Added Efficiency:<br>Vds = 6.0V, Ids = 600mA | f = 2.0 GHz<br>f = 2.4 GHz | %<br>% | 20 | 25 | |
| VSWR | Input and Output | | - | | 2:1 | |
| $IP_3$ | Output 3rd Order Intermodulation Point:<br>Vds = 6.0V, Ids = 600mA | f = 2.0 GHz | dBm | 37 | 39 | |





522 Almanor Ave., Sunnyvale, CA 94086 Phone: (800) SMI-MMIC http://www.stanfordmicro.com

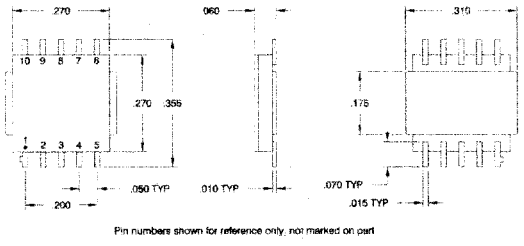
# SMM-210 1 Watt GaAs MMIC Amplifier

## Absolute Maximum Ratings

| Parameter | Absolute Maximum |
|---|---|
| Positive Supply Voltage (V+) | +10V |
| Positive Supply Current (I+) | 700mA |
| Negative Supply Voltage (V-) | -10V |
| RF Input Power (Pin) | 250mW |
| Operating Temperature | -45C to +85C |
| Storage Temperature | -65C to +150C |

**Notes:**

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Mounting Surface Temperature = 25° C

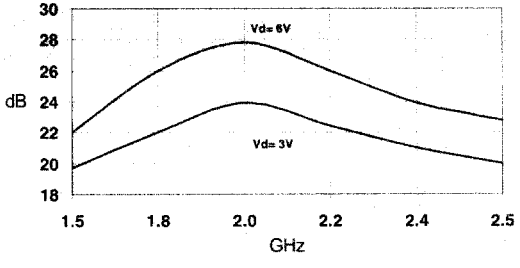



Pin numbers shown for reference only, not marked on part

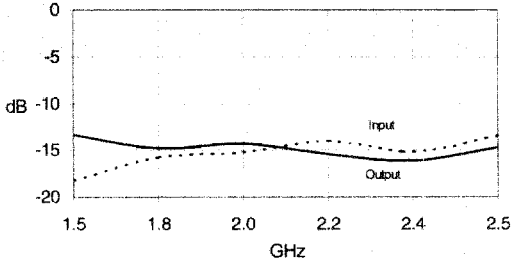
| Pin | Designation |
|---|---|
| 1 | Ground |
| 2 | Ground |
| 3 | RF in |
| 4 | Ground |
| 5 | Vg= -5V |
| 6 | Ground |
| 7 | Ground |
| 8 | RF out |
| 9 | Ground |
| 10 | Vd= +5V |

## *Typical Performance at 25° C (Ids = 600mA)*

**Gain vs. Frequency**




**Input and Output Return Loss vs. Frequency**




**TOIP vs. Frequency**