

**Product Features**

- Solid-state linear amplifier design
- GaN on SiC HEMT
- Small and light weight
- Wide Band Operation 500 ~ 2500MHz
- 50 Ohm Input/Output impedance matched
- Highly reliable and rugged design
- Harsh environmental condition
- High efficiency
- 50W typical Psat

**Applications**

- Broadband communication
- Broadcasting
- General purpose RF amplifier
- Linear applications in the L/S Frequency Bands

**Description**

RUP15050-10 has been designed for RF system application frequencies from 500 ~ 2500MHz.

This Pallet Amplifier uses GaN on SiC HEMT technology which performs high breakdown voltage, high linearity, wide bandwidth and high efficiency.

**Electrical Specifications @ VDD=28VDC, T=25°C, 50Ω System**

| PARAMETER                  | UNIT | MIN | TYP       | MAX       | SYMBOL       |
|----------------------------|------|-----|-----------|-----------|--------------|
| Operating Frequency        | MHz  | 500 | -         | 2500      | $f_O$        |
| Operating Bandwidth        | MHz  | -   | 2000      | -         | BW           |
| Output Power CW            | W    | -   | 50        | -         | $P_{SAT}$    |
| Output Power @ P3dB G.C.P  | W    | -   | 30        | -         | $P_{3dB}$    |
| Small Signal Gain          | dB   | -   | 13        | -         | $G_S$        |
| Small Signal Gain Flatness | dB   | -   | $\pm 1.5$ | $\pm 2.0$ | $\Delta G_S$ |
| Input VSWR                 | -    | -   | 2.0:1     | 2.5 : 1   | $S_{11}$     |
| Harmonics @ P1dB G.C.P     | dBc  | 10  | -         | -         | $H_{P1dB}$   |
| Spurious Signals           | dBc  | 60  | 70        | -         | Spur         |
| Operating Voltage          | V    | 27  | 28        | 30        | V            |
| Supply Current @ $P_{sat}$ | A    | -   | 5.5       | -         | $I_{DD}$     |
| Supply Current @ $P_{3dB}$ | A    | -   | 4.5       | -         | $I_{DD}$     |

\* Please DO NOT ENTER RF INPUT POWER OVER +39dBm. (to prevent the main transistor from damaging)

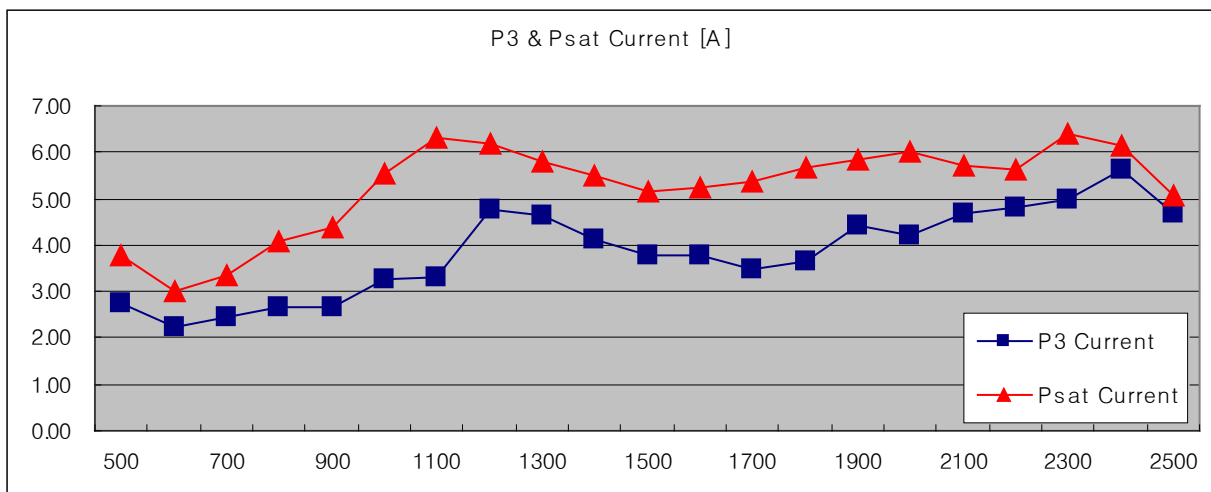
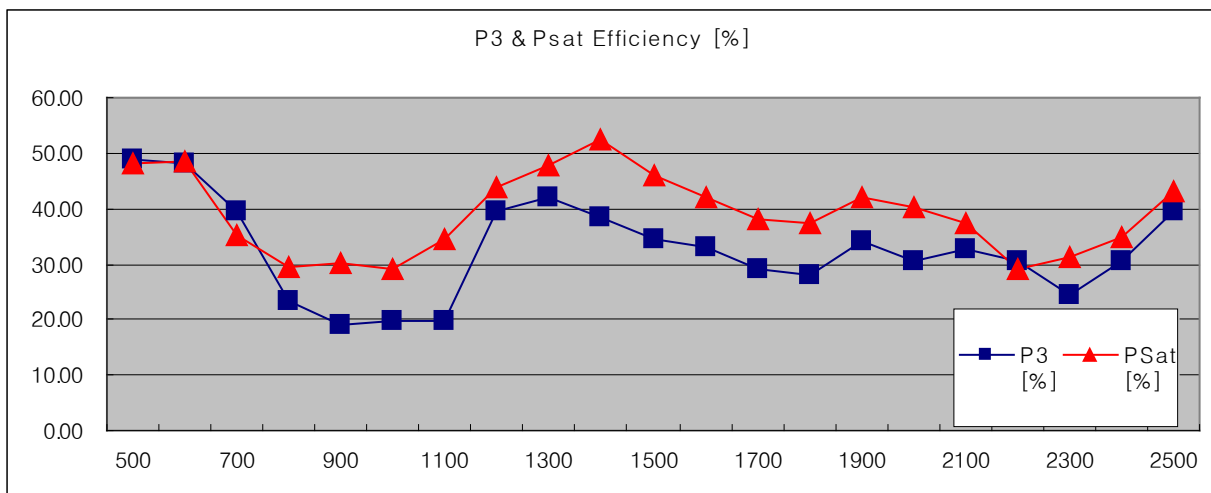
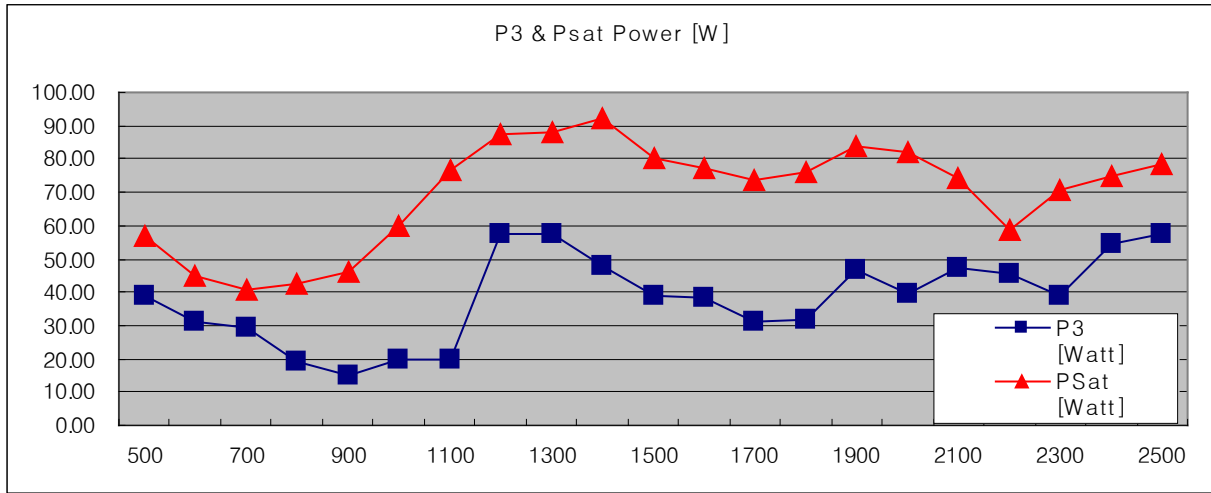
**Environmental Characteristics**

| PARAMETER                  | UNIT | MIN | TYP | MAX | SYMBOL |
|----------------------------|------|-----|-----|-----|--------|
| Operating Case Temperature | °C   | 0   | -   | 70  | $T_C$  |
| Storage Temperature        | °C   | -40 | -   | 85  | $T_S$  |

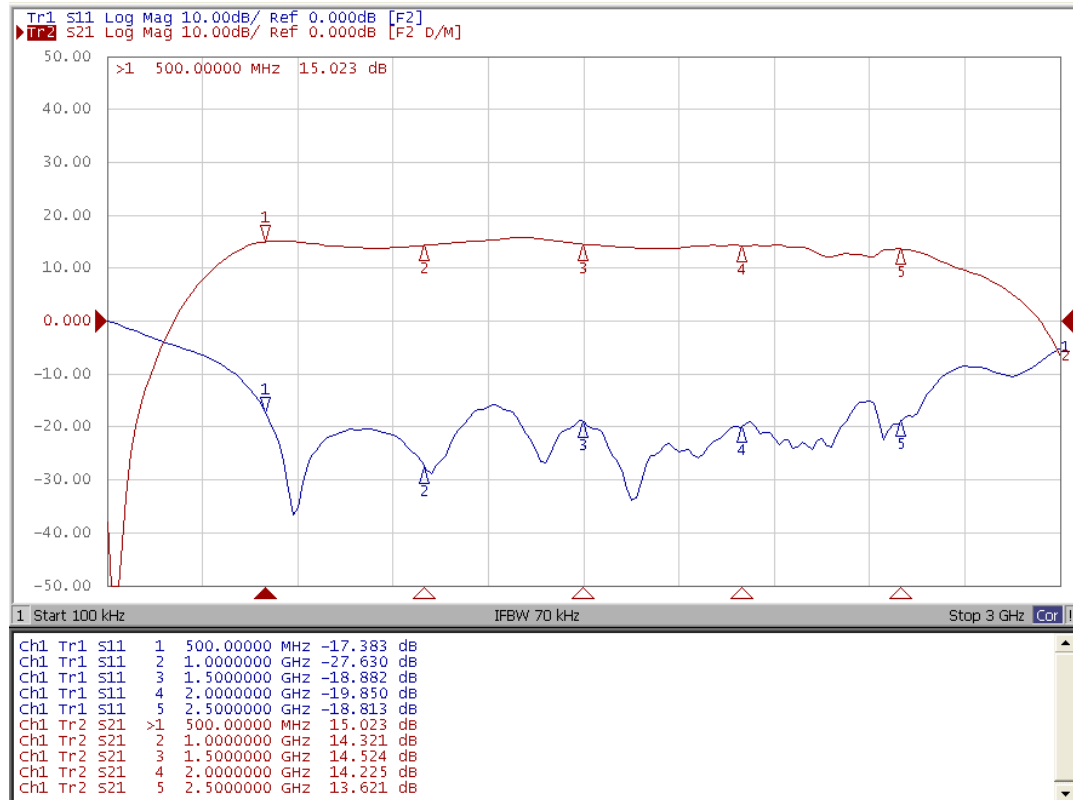
## Typical Performance @ 25°C

| Freq. | P3 Output Power, Current, Efficiency |        |         |            | Psat Output Power, Current, Efficiency |        |         |            |
|-------|--------------------------------------|--------|---------|------------|--|--------|---------|------------|
|       | Output                               | Output | Current | Efficiency | Output                                 | Output | Current | Efficiency |
| MHz   | dBm                                  | W      | A       | %          | dBm                                    | W      | A       | %          |
| 500   | 45.87                                | 38.64  | 2.73    | 48.74      | 47.54                                  | 56.75  | 3.80    | 48.29      |
| 600   | 44.93                                | 31.12  | 2.24    | 48.04      | 46.54                                  | 45.08  | 2.99    | 48.34      |
| 700   | 44.66                                | 29.24  | 2.45    | 39.64      | 46.11                                  | 40.83  | 3.33    | 35.03      |
| 800   | 42.76                                | 18.88  | 2.65    | 23.25      | 46.29                                  | 42.56  | 4.06    | 29.40      |
| 900   | 41.81                                | 15.17  | 2.67    | 18.92      | 46.65                                  | 46.24  | 4.37    | 30.32      |
| 1000  | 42.97                                | 19.82  | 3.27    | 19.63      | 47.77                                  | 59.84  | 5.53    | 29.09      |
| 1100  | 42.97                                | 19.82  | 3.29    | 19.73      | 48.85                                  | 76.74  | 6.33    | 34.66      |
| 1200  | 47.60                                | 57.54  | 4.75    | 39.57      | 49.42                                  | 87.50  | 6.20    | 43.91      |
| 1300  | 47.61                                | 57.68  | 4.65    | 41.86      | 49.45                                  | 88.10  | 5.78    | 47.76      |
| 1400  | 46.82                                | 48.08  | 4.14    | 38.54      | 49.64                                  | 92.04  | 5.49    | 52.31      |
| 1500  | 45.93                                | 39.17  | 3.77    | 34.34      | 49.06                                  | 80.54  | 5.16    | 45.94      |
| 1600  | 45.85                                | 38.46  | 3.79    | 33.06      | 48.88                                  | 77.27  | 5.26    | 42.16      |
| 1700  | 44.96                                | 31.33  | 3.50    | 28.98      | 48.66                                  | 73.45  | 5.38    | 37.92      |
| 1800  | 45.03                                | 31.84  | 3.65    | 28.20      | 48.81                                  | 76.03  | 5.65    | 37.33      |
| 1900  | 46.69                                | 46.67  | 4.43    | 34.26      | 49.22                                  | 83.56  | 5.84    | 42.08      |
| 2000  | 45.97                                | 39.54  | 4.20    | 30.72      | 49.15                                  | 82.22  | 6.02    | 40.07      |
| 2100  | 46.73                                | 47.10  | 4.68    | 32.78      | 48.70                                  | 74.13  | 5.72    | 37.47      |
| 2200  | 46.58                                | 45.50  | 4.79    | 30.52      | 47.70                                  | 58.88  | 5.62    | 29.16      |
| 2300  | 45.89                                | 38.82  | 4.98    | 24.57      | 48.48                                  | 70.47  | 6.42    | 31.33      |
| 2400  | 47.38                                | 54.70  | 5.62    | 30.64      | 48.73                                  | 74.64  | 6.13    | 34.85      |
| 2500  | 47.60                                | 57.54  | 4.67    | 39.68      | 48.94                                  | 78.34  | 5.05    | 43.26      |

## Typical Performance @ 25°C



Small Signal Gain @ Input Power : -10dBm, 25°C



## Precautions

This product is a Wideband Pallet Amplifier based on a Gallium Nitride Transistor.

The Gallium Nitride Transistor requires a Negative Voltage Bias which operates alongside a Positive Voltage Bias. These Biases are applied in accordance to the Sequence during Turn-On and Turn-Off.

The Pallet Amplifier does not have a built-in Bias Sequence Circuit. Therefore, users need to either apply positive voltages and negative voltages in the required sequence, or add an external Bias Circuit to this Amplifier.

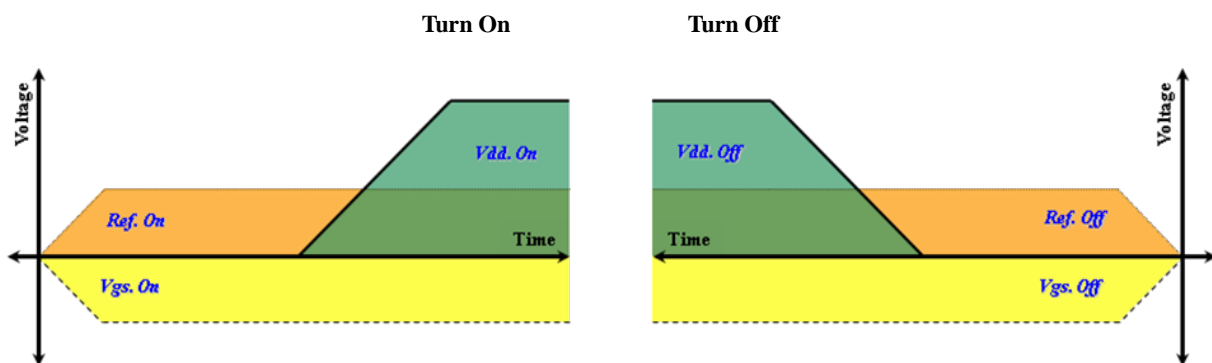
The required sequence for power supply is as follows.

### During Turn-On

1. Connect GND to Pin 4(GND).
2. Apply +5V to Pin 2(Ref.).
3. Apply -5V to Pin 3( $V_{GS}$ ).
4. Apply +28V to Pin 1( $V_{DD}$ ).
5. Turn on the pin 2 and pin 3, then turn on the pin 1.
6. Apply the RF Power.

### During Turn-Off

1. Turn off RF power.
2. Turn off pin 1, then turn off the pin 3 and pin 2.
3. Remove all connections.



Sequence Timing Diagram

## Mechanical Specifications

| PARAMETER                | UNIT | VALUE                        | LIMIT |
|--------------------------|------|------------------------------|-------|
| Dimensions ( L x W x H ) | mm   | 100.0 x 50.0 x 16.0          | Max   |
| RF Connectors In/Out     | -    | Available SMA Female         | -     |
| Cooling                  | -    | External Heat sink + airflow | -     |



**Revision History**

| Part Number | Release Date | Version | Modification      | Data Sheet Status |
|-------------|--------------|---------|-------------------|-------------------|
| RUP15050-10 | 2012.02.18   | 2.0     | TR Package Change | -                 |
| RUP15050-10 | 2010.09.07   | 1.0     | -                 | -                 |
|             |              |         |                   |                   |

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