

**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
- 20W typical Psat

**Applications**

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

**Description**

RUP15020-10 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 <sub>O</sub>
Operating Bandwidth	MHz	-	2000	-	BW
Output Power CW	W	-	20	-	P <sub>SAT</sub>
Output Power @ P3dB G.C.P	W	-	10	-	P <sub>3dB</sub>
Small Signal Gain	dB	13	15	-	G <sub>S</sub>
Small Signal Gain Flatness	dB	-	± 1.5	± 2.0	ΔG <sub>S</sub>
Input VSWR	-	-	-	8.5 : 1	S <sub>11</sub>
Harmonics @ P1dB G.C.P	dBc	10	-	-	H <sub>P1dB</sub>
Spurious Signals	dBc	60	70	-	Spur
Operating Voltage	V	27	28	30	V
Supply Current @ P <sub>sat</sub>	A	-	2.0	3.0	I <sub>DD</sub>
Supply Current @ P <sub>3dB</sub>	A	-	1.0	2.0	I <sub>DD</sub>

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

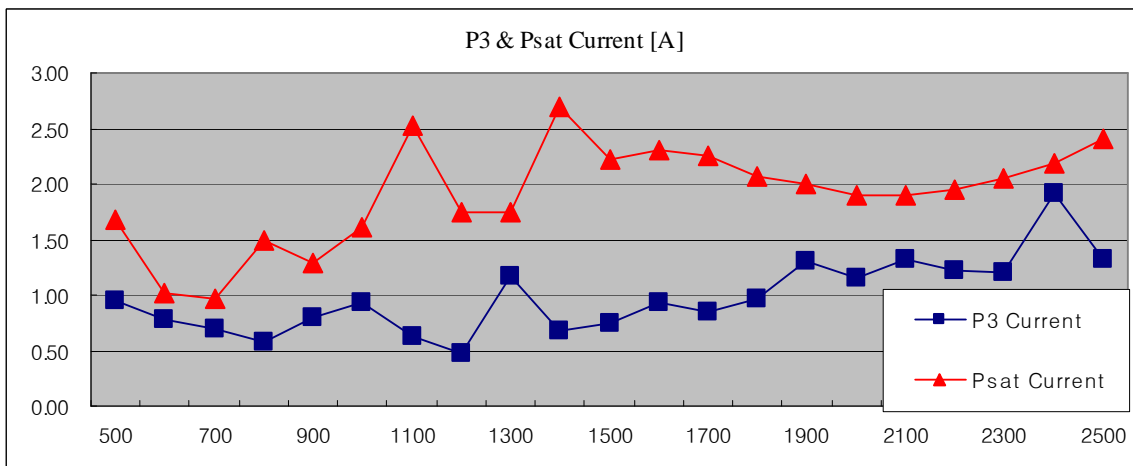
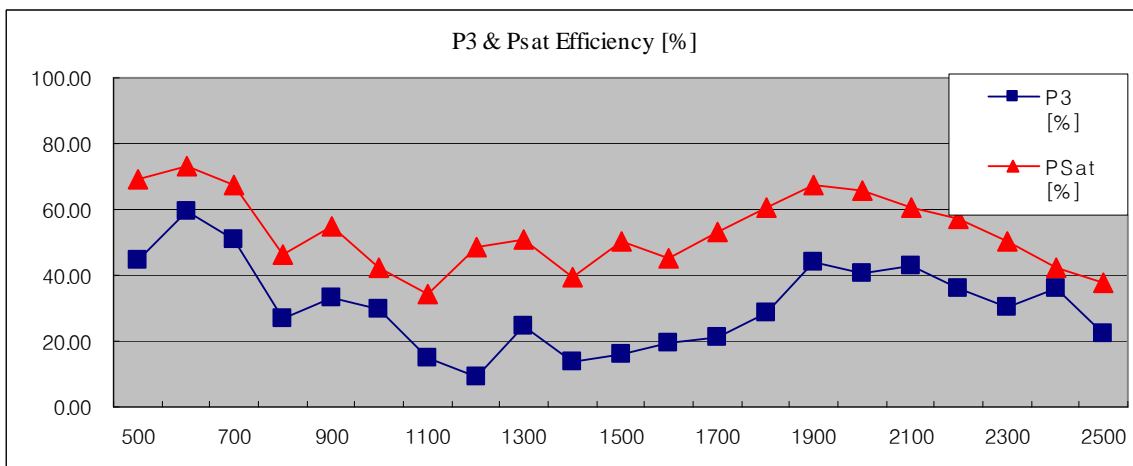
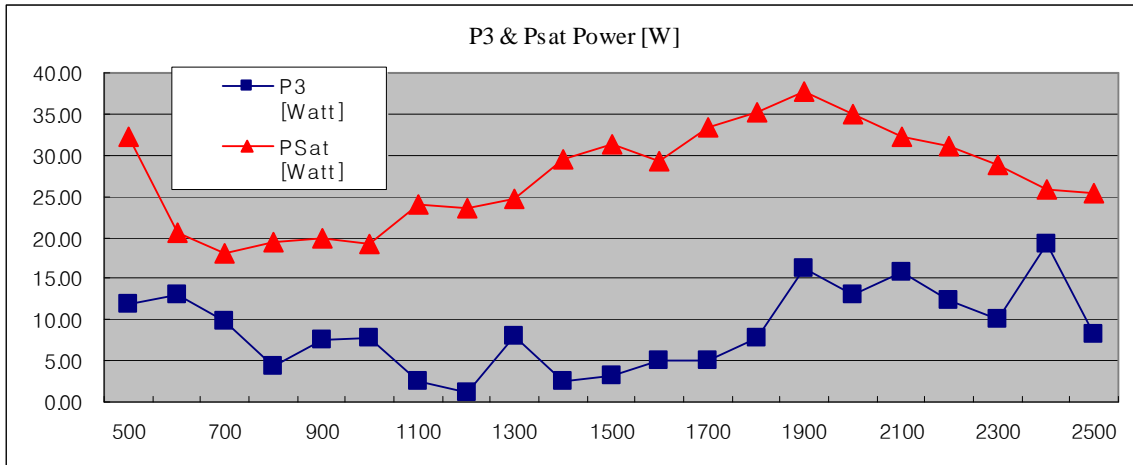
**Environmental Characteristics**

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Case Temperature	°C	0	-	70	T <sub>C</sub>
Storage Temperature	°C	-40	-	85	T <sub>S</sub>

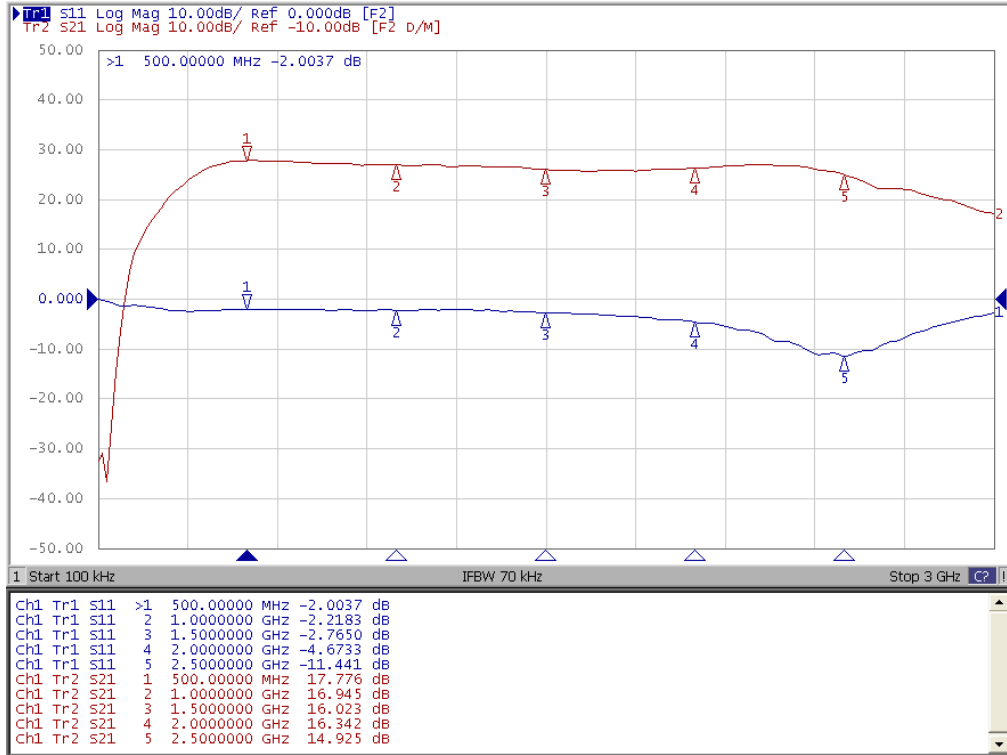
## Typical Performance @ 25°C

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	40.76	11.91	0.95	40.80	45.06	32.06	1.68	51.58
600	41.84	15.28	0.86	60.54	43.01	20.00	0.99	51.62
700	40.00	10.00	0.69	49.21	42.49	17.74	0.95	51.38
800	36.18	4.15	0.56	22.98	42.71	18.66	1.47	26.40
900	38.65	7.33	0.79	30.50	42.75	18.84	1.25	31.54
1000	37.93	6.21	0.86	23.10	41.90	15.49	1.49	14.70
1100	34.01	2.52	0.63	12.91	43.27	21.23	2.45	16.27
1200	33.63	2.31	0.54	12.95	43.32	21.48	1.64	25.49
1300	37.91	6.18	1.10	19.21	42.70	18.62	1.47	24.75
1400	34.92	3.10	0.76	13.06	44.46	27.93	2.47	27.96
1500	35.99	3.97	0.81	15.42	44.89	30.83	2.15	34.83
1600	37.06	5.08	0.94	17.92	44.30	26.92	2.25	21.94
1700	37.95	6.24	0.93	21.75	45.41	34.75	2.23	36.23
1800	38.86	7.69	0.97	25.66	44.86	30.62	2.00	35.85
1900	41.12	12.94	1.20	35.92	45.38	34.51	1.95	43.50
2000	41.07	12.79	1.17	35.37	45.35	34.28	1.92	48.04
2100	40.98	112.53	1.19	33.48	44.90	30.90	1.86	44.12
2200	40.07	10.16	1.14	26.02	44.63	29.04	1.91	38.46
2300	40.95	12.45	1.37	26.58	44.23	26.49	2.00	30.24
2400	41.11	12.91	1.60	24.61	43.88	24.43	2.21	23.44
2500	40.05	10.12	1.54	17.71	43.48	22.28	2.33	19.98

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.

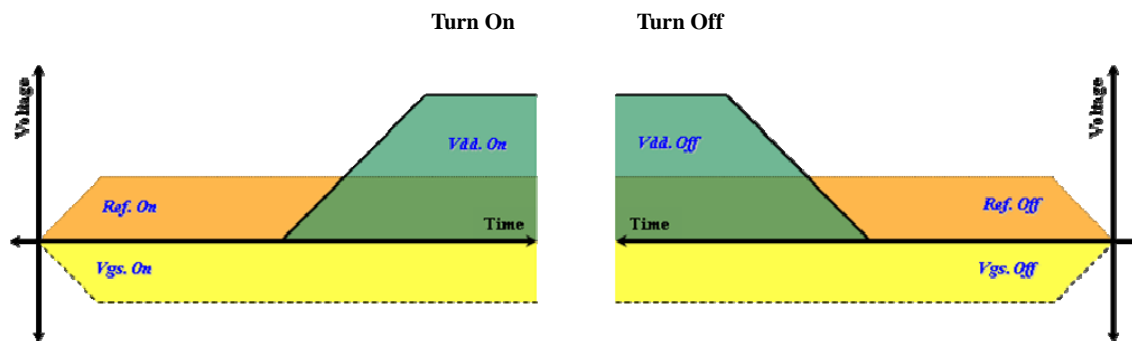
The required sequence for power supply is as follows.

### 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.



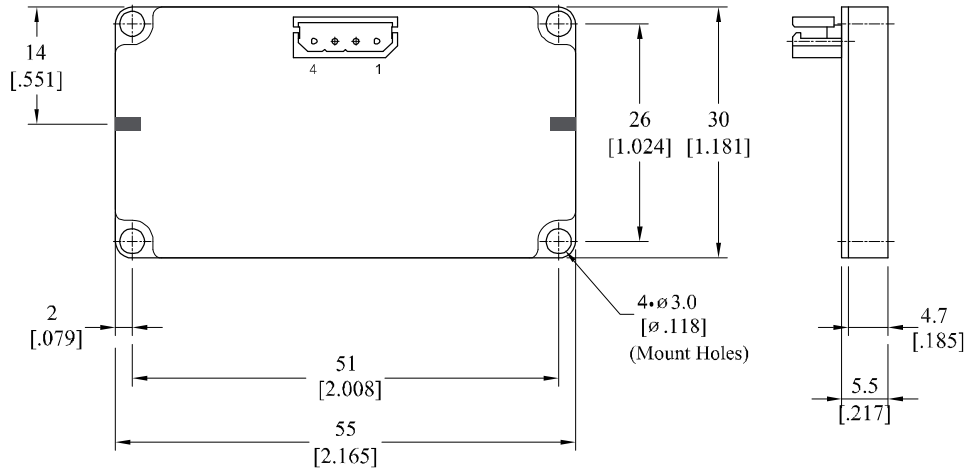
Sequence Timing Diagram

## Mechanical Specifications

PARAMETER	UNIT	VALUE	LIMIT
Dimensions ( L x W x H )	mm	55.0 x 30.0 x 16.0	Max
RF Connectors In/Out	-	Available SMA Female	-
Cooling	-	External Heat sink + airflow	-

**Outline Drawing**

\* Unit: mm[inch] | Tolerance ±0.15[.006]



**Pin Description**

Pin No	Description	Specifications
1	V <sub>DD</sub>	+28 Drain Voltage
2	Ref.	+5V Op-Amp Operate Voltage
3	V <sub>GS</sub>	-5V Gate Voltage
4	GND	Ground

**Revision History**

<b>Part Number</b>	<b>Release Date</b>	<b>Version</b>	<b>Modification</b>	<b>Data Sheet Status</b>
RUP15020-10	2012.02.18	2.0	TR Package Change	-
RUP15020-10	2010.09.07	1.0	-	-

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