

## 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
- 30W typical Psat

## Applications

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



## Description

RUP15030-10 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	20	30	-	$P_{SAT}$
Output Power @ P3dB G.C.P	W	5	15	-	$P_{3dB}$
Small Signal Gain	dB	10	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	-	4.0	5.0	$I_{DD}$
Supply Current @ $P_{3dB}$	A	-	2.5	3.5	$I_{DD}$

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

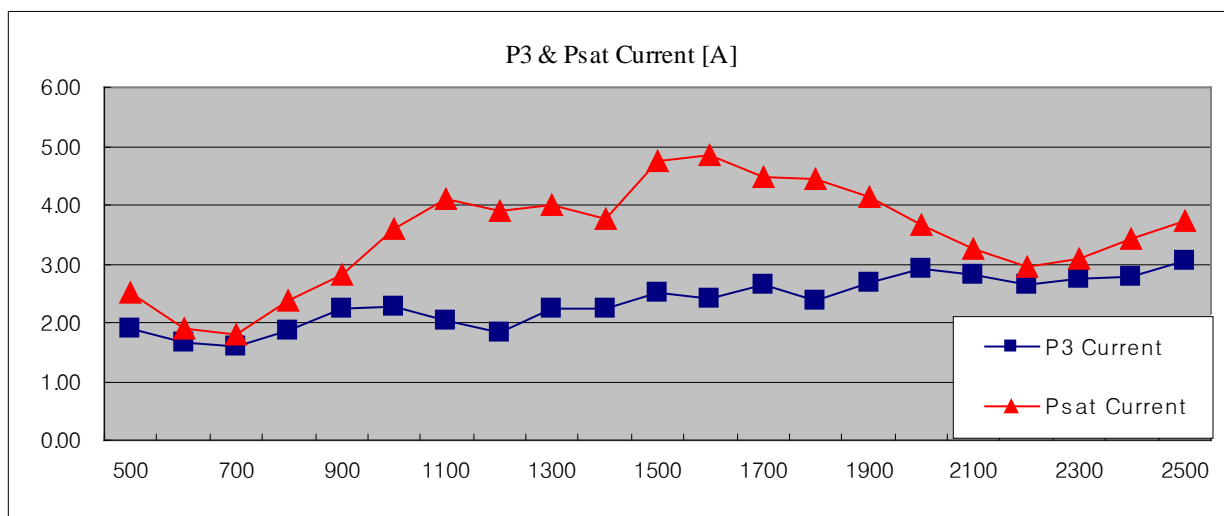
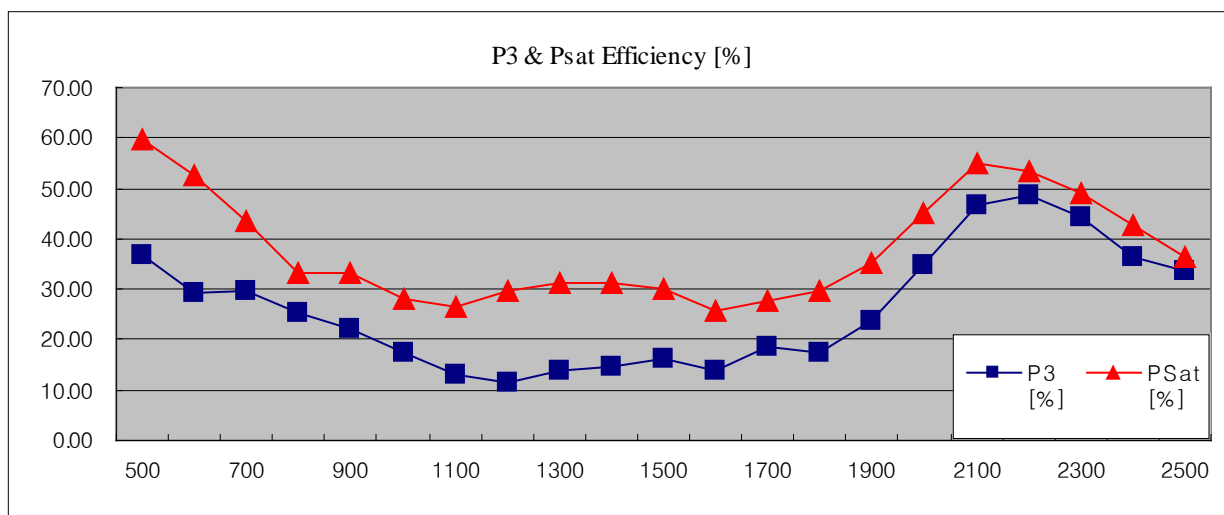
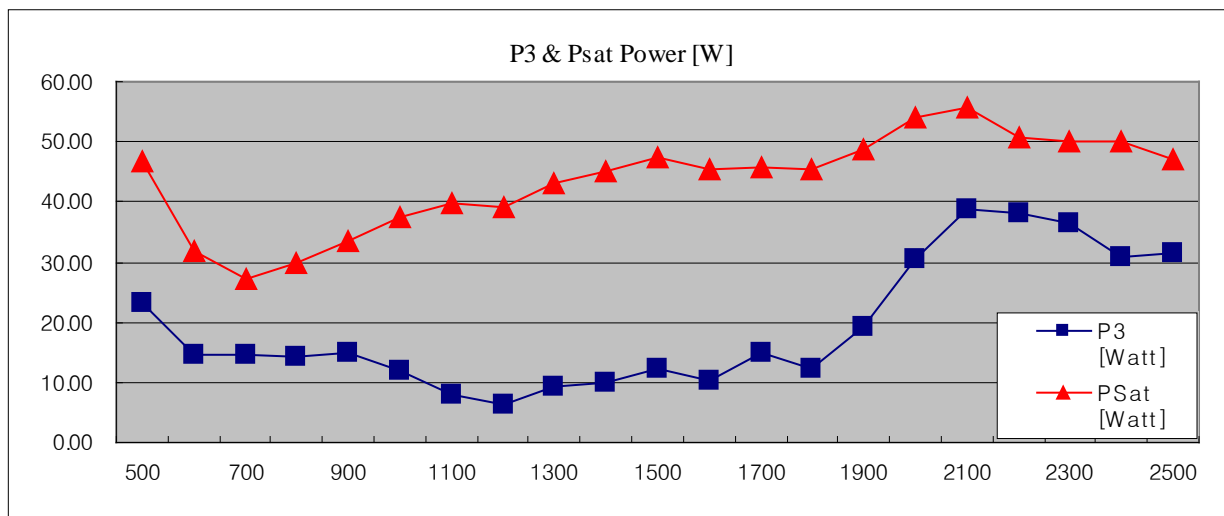
## Environmental Characteristics

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

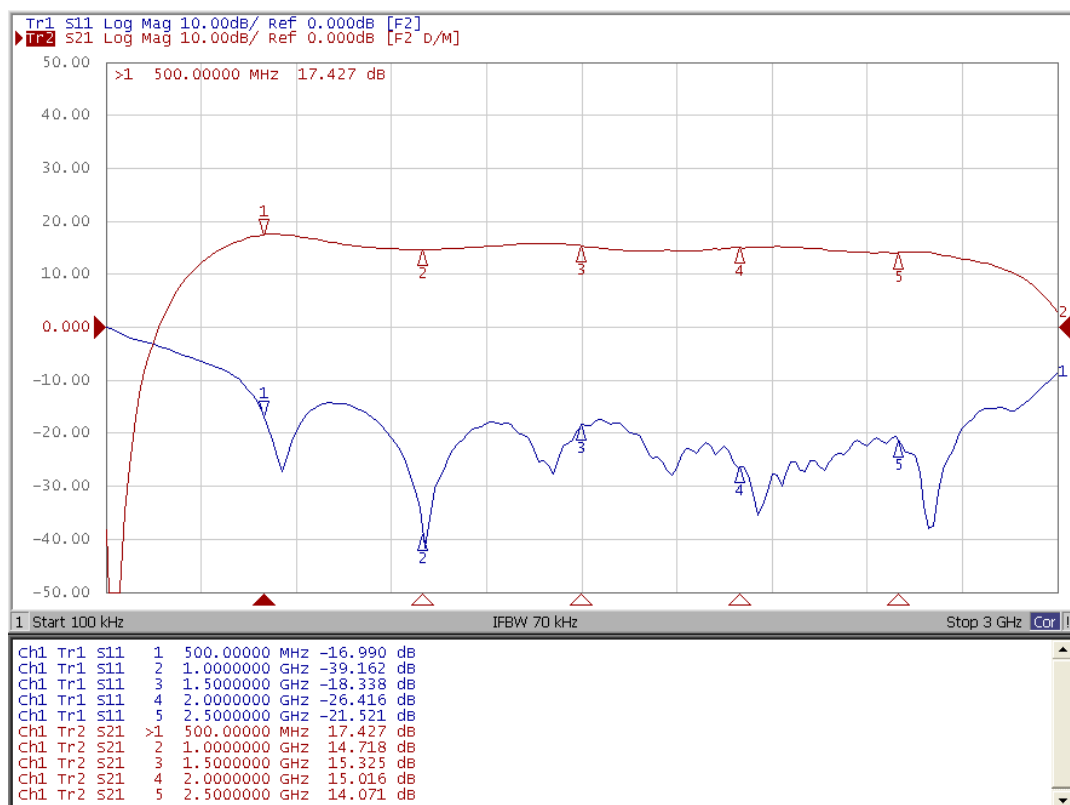
## Typical Performance @ 25°C

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	43.68	23.33	1.89	36.83	46.69	46.67	2.51	59.79
600	41.59	14.42	1.65	29.20	45.02	31.77	1.89	52.46
700	41.60	14.45	1.61	29.61	44.36	27.29	1.81	43.66
800	41.56	14.32	1.86	25.25	44.74	29.79	2.38	33.39
900	41.74	14.93	2.23	22.00	45.26	33.57	2.81	33.10
1000	40.81	12.05	2.27	17.38	45.74	37.50	3.58	28.14
1100	39.00	7.94	2.03	13.01	46.01	39.90	4.09	26.41
1200	37.95	6.24	1.83	11.54	45.93	39.17	3.91	29.48
1300	39.73	9.40	2.24	14.02	46.36	43.25	4.00	31.07
1400	39.96	9.91	2.25	14.74	46.54	45.08	3.76	31.16
1500	40.83	12.11	2.51	16.06	46.77	47.53	4.76	30.01
1600	40.08	10.19	2.39	14.03	46.56	45.29	4.85	25.73
1700	41.78	15.07	2.64	18.78	46.61	45.81	4.47	27.62
1800	40.94	12.42	2.37	17.34	46.56	45.29	4.45	29.63
1900	42.82	19.14	2.67	23.75	46.87	48.64	4.12	35.02
2000	44.82	30.34	2.92	34.75	47.33	54.08	3.67	44.91
2100	45.90	38.90	2.82	46.53	47.47	55.85	3.24	54.84
2200	45.83	38.28	2.64	48.60	47.05	50.70	2.96	53.35
2300	45.61	36.39	2.73	44.19	47.00	50.12	3.10	48.88
2400	44.87	30.69	2.78	36.49	47.00	50.12	3.42	42.75
2500	44.98	31.48	3.04	33.70	46.74	47.21	3.74	36.19

## 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.

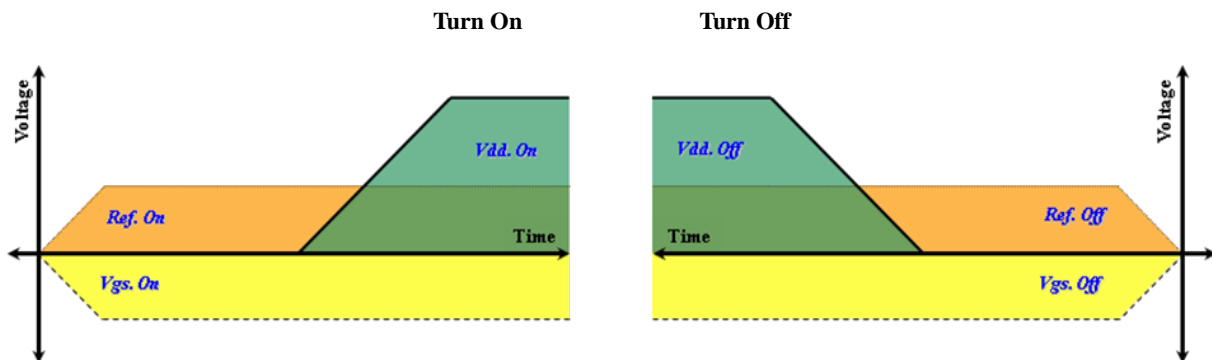
The required sequence for power supply is as follows.

### 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.

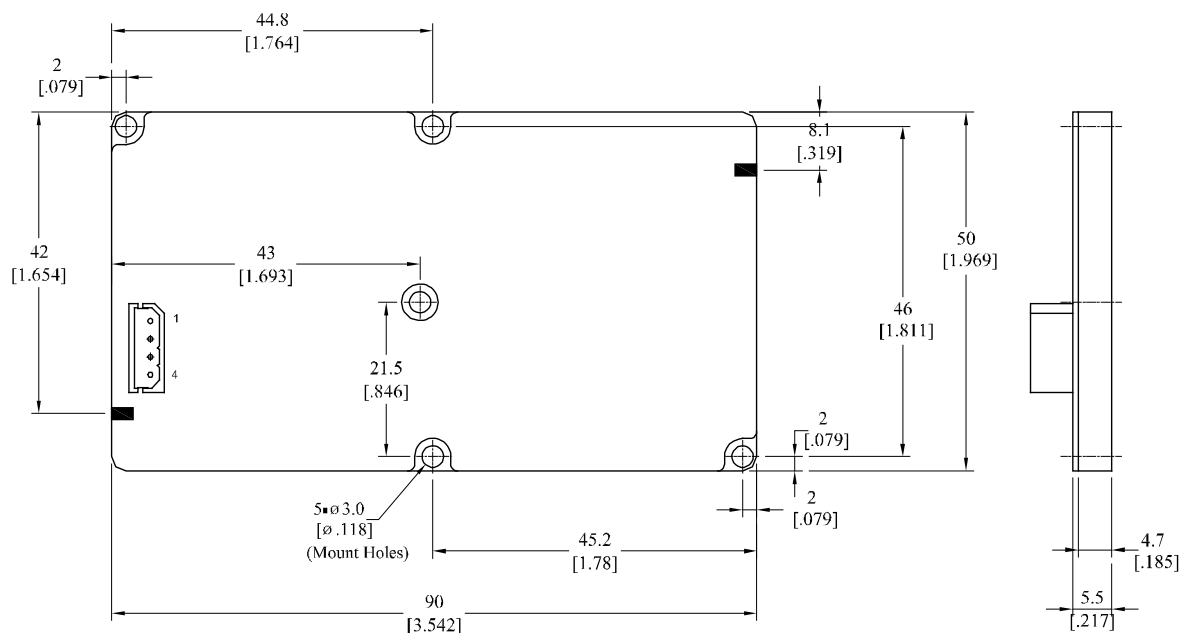


Sequence Timing Diagram

## Mechanical Specifications

PARAMETER	UNIT	VALUE	LIMIT
Dimensions ( L x W x H )	mm	90.0 x 50.0 x 16.0	Max
RF Connectors In/Out	-	Available SMA Female	-
Cooling	-	External Heat sink + airflow	-

## Outline Drawing

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

## Pin Description

Pin No	Description	Specifications
1	$V_{DD}$	+28 Drain Voltage
2	Ref.	+5V Op-Amp Operate Voltage
3	$V_{GS}$	-5V Gate Voltage
4	GND	Ground

**Revision History**

Part Number	Release Date	Version	Modification	Data Sheet Status
RUP15030-10	2012.02.18	2.0	TR Package Change	-
RUP15030-10	2010.09.07	1.0	-	-

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