

Product Features

- Frequency from 4.4 ~ 5.9 GHz
- GaN HEMT
- 50 Ohm Input/Output impedance
- High efficiency

Applications

- Communication



Description

The RSP4459030-17A is designed for Communication system application frequencies from 4.4 ~ 5.9 GHz. This module uses GaN HEMT technology which performs high breakdown voltage, wide bandwidth and high efficiency.

Electrical Specifications @ $V_{DS}=40V$, $V_{GS}=-4V$, $I_{dq}=100mA$, $T=25^{\circ}C$, 50 Ω System

PARAMETER		UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency		MHz	4400	-	5875	f_o
Operating Bandwidth		MHz	-	1475	-	BW
Peak Output Power		dBm	44.5	45	-	P_p
Average Output Power		dBm	-	39	-	P_o
Power Gain @ $P_{out} = 39dBm$		dB	12.5	13	-	G_p
Gain Flatness @ $P_{out} = 39dBm$		dB	-	± 1	± 2	ΔG_p
Drain Efficiency @ $P_{out} = 39dBm$		%	25	30	-	E_{ff}
EVM (WiMAX, 10.2dB PAR) : PA only	$P_{out} = 32dBm$	dB	-	-33	-30	-
	$P_{out} = 39dBm$		-	-13	-11	
Spectral Mask @ $P_{out} = 39dBm$	1.1xBW	dBc	-20	-	-	-
	2.0xBW		-28	-	-	
	3.0xBW		-40	-	-	
Harmonics (2^{nd} / 3^{rd}) @ $P_{out} = 39dBm$		dBc	-20 / -40	-	-	Spur
Input Return Loss		dB	-	-	-10	RL
Operating Voltage V_{DS}		V	-	40	-	V_{DS}
Operating Voltage V_{GS}		V	-	-4	-	V_{GS}

* Peak Output Power Test Condition : Duty Cycle 10%, Pulse Width 100us

* EVM Test Condition : If you change the RF input level, you also need to change the IDQ.

* Modulations Supported OFDM PAR 10.2dB WiMAX(Source : QPSK 3/4)

* Above electrical specifications is measured by connecting electrolytic condenser 560uF to DC. Please make sure that electrolytic condenser is connected properly while testing the module.

Absolute Maximum Ratings

PARAMETER	UNIT	RATING	SYMBOL
Operating Junction Temperature	°C	225	T _J
Operating Flange Temperature	°C	-40 ~ 75	T _C
Storage Temperature	°C	-40 ~ 125	T _{STG}

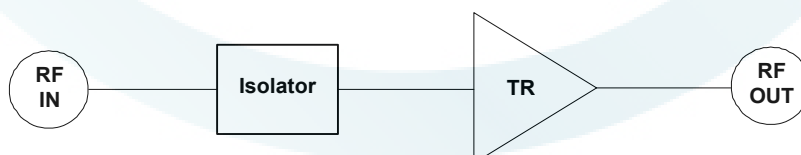
Operating Voltages

PARAMETER	UNIT	NOMINAL VOLTAGE	VOLTAGE ACCURACY	SYMBOL
Drain-Source Voltage	V	40	± 2%	V _{DS}
Gate-Source Voltage	V	-4(ON), -8(OFF)	± 2%	V _{GS}

Power Supply

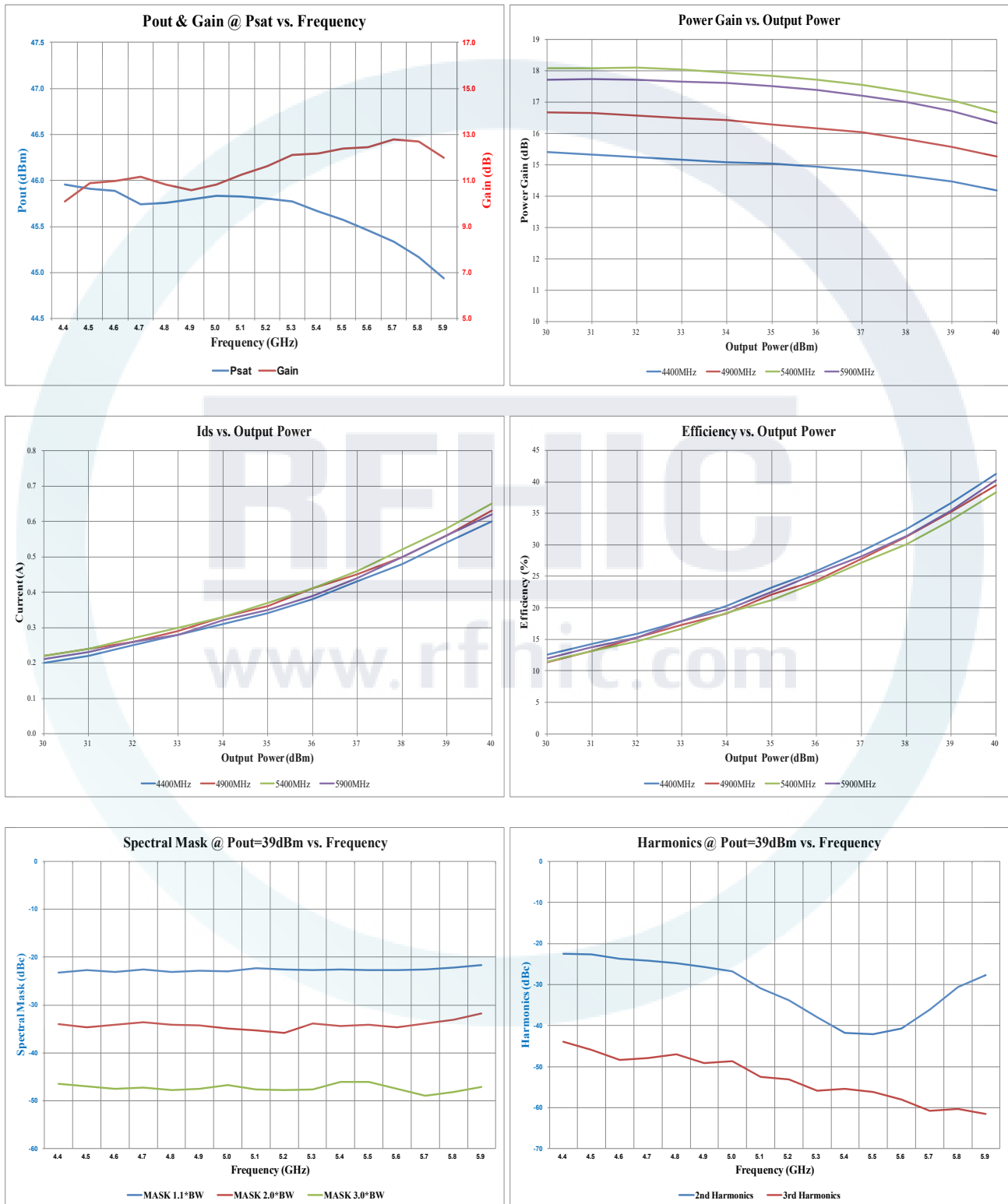
PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Drain-Source Current(AVG)	A	-	1.5	1.65	I _{DS}
Gate-Source Current(AVG)	mA	-	3	4.8	I _{GS}

* Peak Output Power @I_{dq}=100mA(Duty Cycle 10%, Pulse Width 100us)

Block diagram

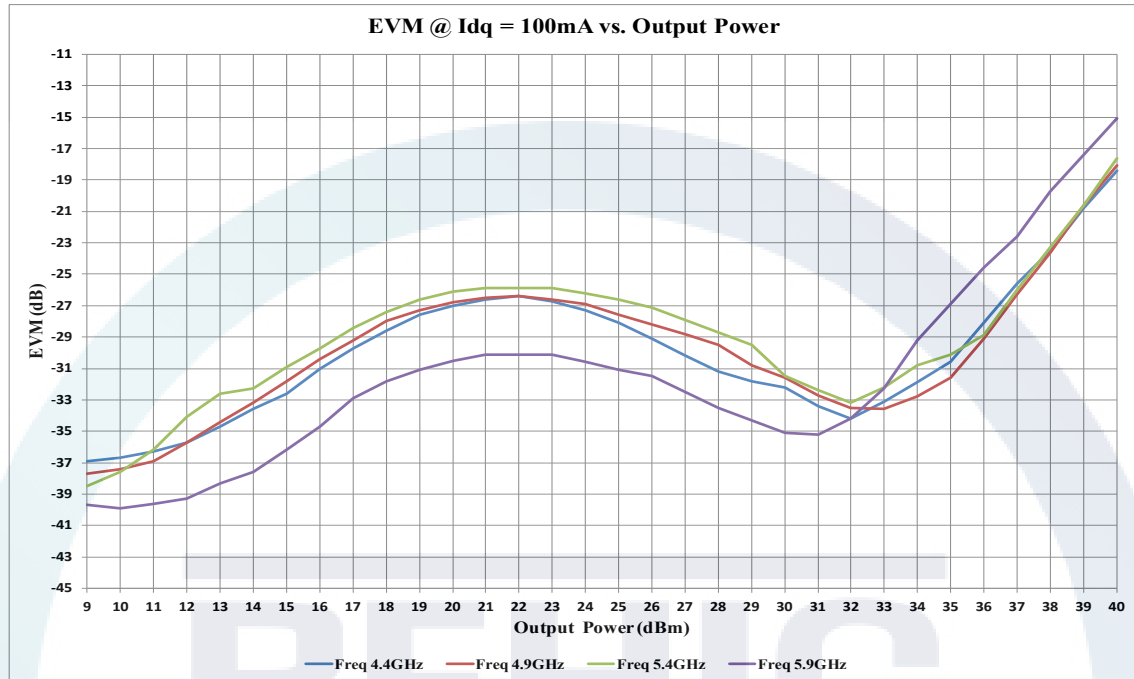
Performance Charts

* Test condition 1 : Test Frequency = 4.4 ~ 5.9GHz, $V_{gs}@I_{dq}=100mA$, $V_{ds}=+40V$, $T_a=25^{\circ}C$

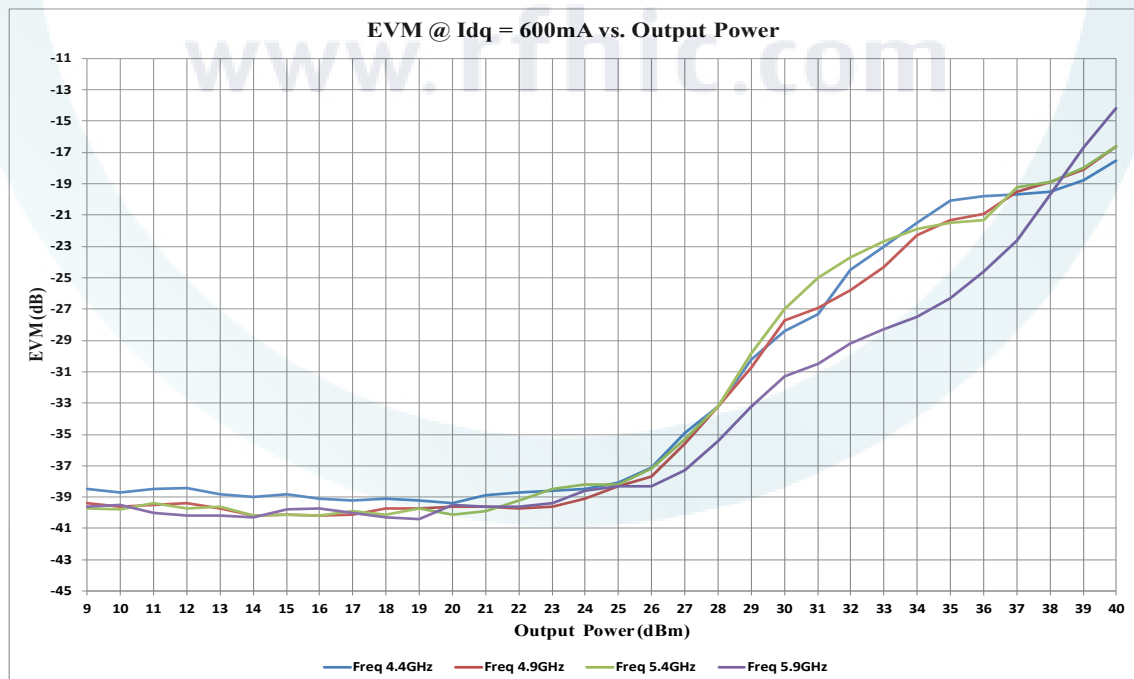


Performance Charts

* **Test condition 2** : Test Frequency = 4.4 ~ 5.9GHz, $V_{gs}@I_{dq}=100\text{mA}$, $V_{ds}=+40\text{V}$, $T_a=25^\circ\text{C}$

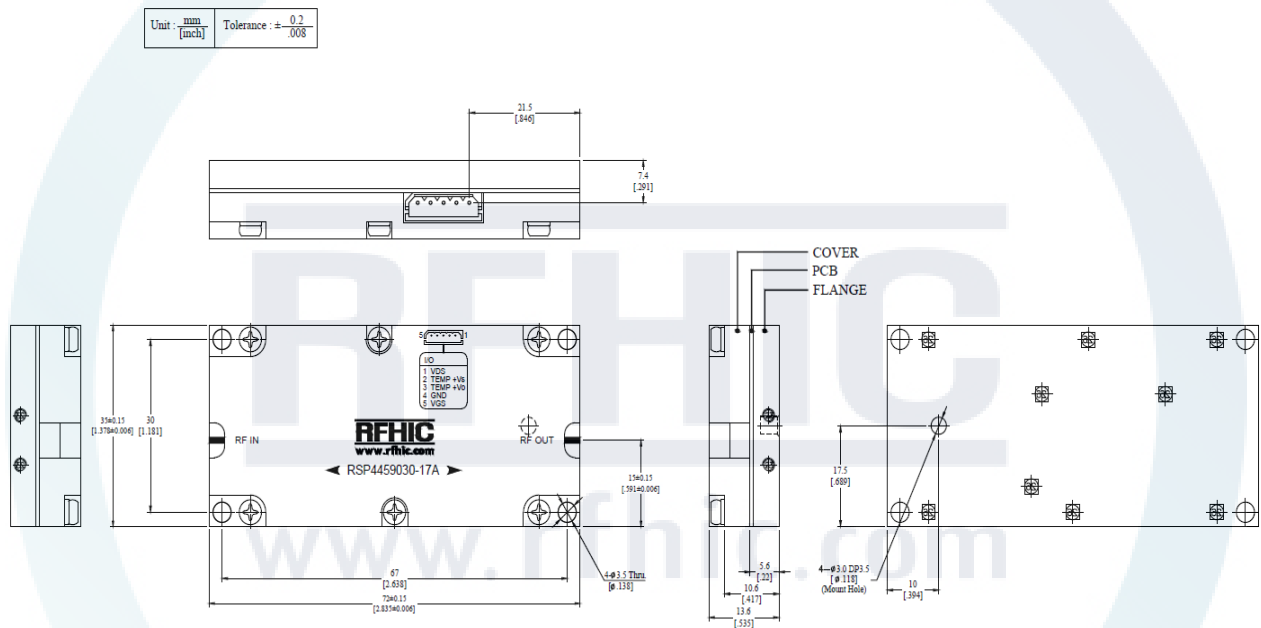


* **Test condition 3** : Test Frequency = 4.4 ~ 5.9GHz, $V_{gs}@I_{dq}=600\text{mA}$, $V_{ds}=+40\text{V}$, $T_a=25^\circ\text{C}$



Mechanical Specifications

PARAMETER	UNIT	TYP
Dimension	mm	72 x 35 x 13.6 (W x L x H)
RF Connector	-	50 ohm Pad : RF Input
		50 ohm Pad : RF Output
DC Connector	-	5pin Molex Connector (Male) : Supply



Pin No	Function	Description
1	VDD	+40V
2	TEMP +Vs	+3.3V
3	TEMP +Vo	Temp Monitor
4	GND	GND
5	VGS	ON -4V / OFF: -8V

Precautions

This product is 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.

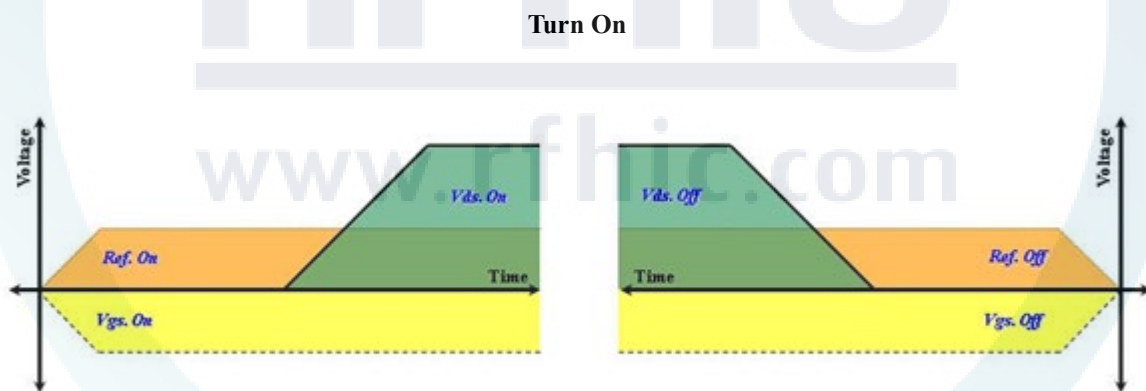
The required sequence for power supply is as follows.

During Turn-On

1. Connect GND.
2. Apply V_{GS} .
3. Apply V_{DS} .
4. Turn on the V_{GS} , and then, turn on the V_{DS} .
5. Apply the RF Power.

During Turn-Off

1. Turn off RF power.
2. Turn off V_{DS} , and then, turn off the V_{GS} .
3. Remove all connections.



- Sequence Timing Diagram -

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RSP4459030-17A	2016.12.15	1.1	Absolute Maximum Ratings, Power Supply	-
RSP4459030-17A	2016.10.12	1.0	-	-



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