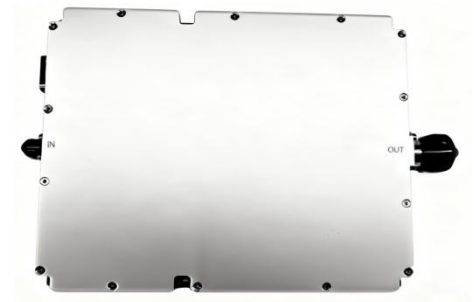


VMPA-2G/18G-28-60-N

FEATURES

- ◆ Frequency: 2GHz ~ 18GHz
- ◆ Gain: $\geq 47\text{dB}$
- ◆ Psat: $\geq 47\text{dBm}$ (CW)
- ◆ Quiescent Current: 12A @ +28V
- ◆ Size: 170mm $\times$ 125mm $\times$ 20mm



TYPICAL APPLICATIONS

- ◆ L, S, C, X, Ku band Radar
- ◆ Military Radio
- ◆ General Amplification

PRODUCT OVERVIEW

The VMPA-2G/18G-28-60-N is a high-performance broadband microwave solid-state power amplifier. It features miniaturization, high efficiency, and high reliability. The saturated output power across the entire frequency band is greater than 50W. It includes functions for power reporting, temperature reporting, current reporting, and over/under-voltage alarms. It also features protection against over-temperature, over-current, and over/under-voltage conditions. The module is equipped with an RS422 communication interface as an option. Status can be reported via RS422, or alternatively via analog voltage signals and high/low level signals for reporting and alarm purposes. This module is suitable for microwave test equipment, communications, radar, and electromagnetic interference testing.

ABSOLUTE MAXIMUM RATINGS

Parameter	Max. Rating
Input Power (CW, 50 Ω , 25°C)	+10dBm
Load VSWR	5:1
Operating Voltage (Vd)	+32V
Power Dissipation (Pdiss)	500W
Storage Temperature	-55°C ~ +85°C

Note: Exceeding any one or more of the maximum ratings may cause permanent damage to the module. Long-term operation near the maximum ratings may reduce module reliability.

OPERATING CONDITIONS

Parameter	Min.	Typ.	Max.	Unit
Input Power (CW)	-	0	-	dBm
Operating Voltage (Vd)	-	+28	-	VDC
Operating Temperature	-40	-	+60	°C
Quiescent Current (CW)	-	12	-	A

Note: Electrical parameters are measured under specified test conditions. Performance cannot be guaranteed if these conditions are exceeded.

ELECTRICAL SPECIFICATIONS

Parameter	Test Condition	Min.	Typ.	Max.	Unit
Frequency	-	6	-	18	GHz
Psat	Pin=0dBm, CW, 25°C	47	-	-	dBm
Power Gain	Pin=0dBm, CW, 25°C		47		dB
Small-Signal Gain	Pin=-35dBm, CW, 25°C	56	62	66	dB
Input VSWR	Pin=0dBm, CW, 25°C	-	-	2	-
2nd Harmonic Suppression	Pin=0dBm, CW, 25°C	10	-	-	dBc
Spurious Suppression	Pin=0dBm, CW, 25°C	-	-	-60	dBc
DC Power Consumption	Pin=0dBm, CW, 25°C	-	-	500	W

TEST DATA

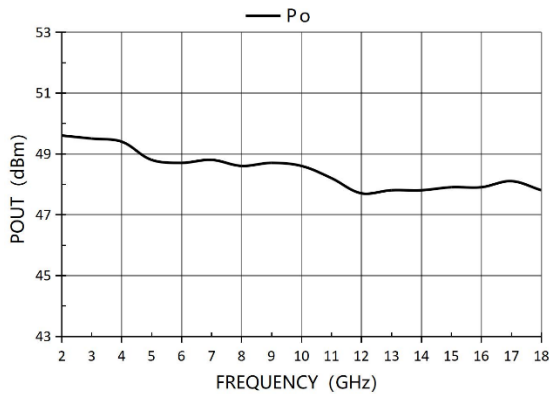
Freq (GHz)	Pout (dBm)	Current (A)	2nd Harmonic (dBc)	3rd Harmonic (dBc)	Small-Sig. Gain (dB)
-	Test Condition: CW, 25°C, PIN=0dBm				PIN=-35dBm
2	49.6	10	16.9	19.4	57
3	49.5	14	23.1	19.1	57.4
4	49.4	15.5	22.7	16.7	59.7
5	48.8	17.3	30.8	15.6	59.7
6	48.7	16.3	23.7	15.1	62.4
7	48.8	17.6	24.8	20	61.5
8	48.6	16.5	25.5	20.3	59.6
9	48.7	17	28.4		61.7
10	48.6	17.9	19.3		63.9
11	48.2	18.3	16.6		62.3
12	47.7	17.7	13.6		60.9
13	47.8	18.5	17.4		62.2
14	47.8	18.8			62.3

15	47.9	18.8			61.4
16	47.9	18.7			61.5
17	48.1	18.6			62.3
18	47.8	17			60.9

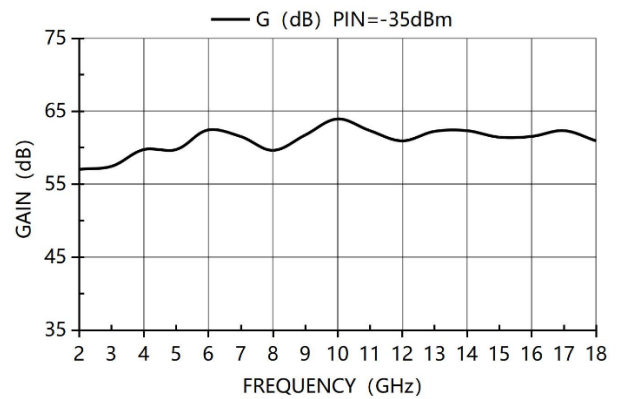
Note: This data is for reference only. There are slight variations between individual products. The 2nd harmonic at 2GHz appears at 4GHz, and the 3rd harmonic at 6GHz. The default maximum measurement frequency is 26.5GHz.

TYPICAL PERFORMANCE CURVES

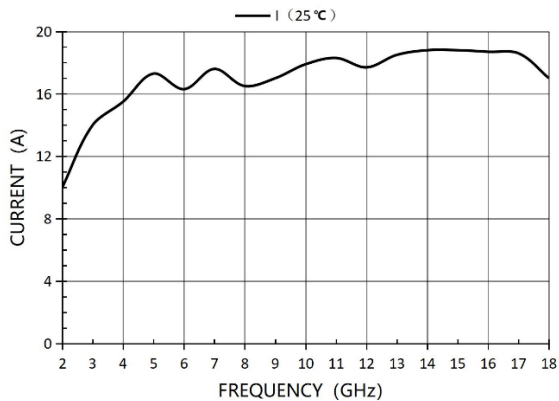
Output Power @ Pin=0dBm



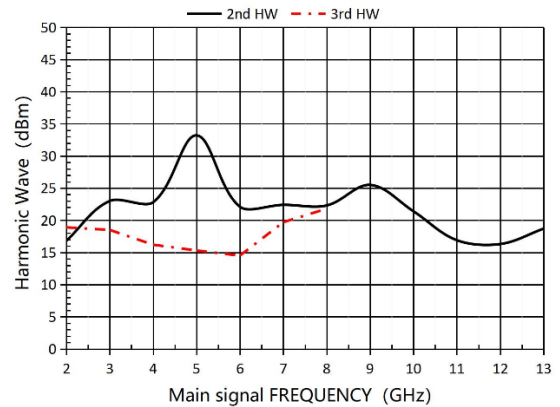
Gain



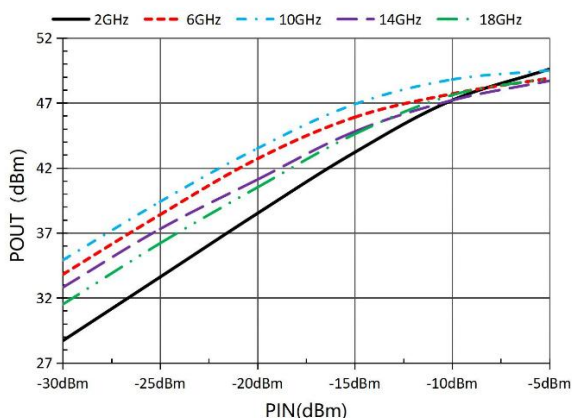
Current @ Pin=0dBm



Harmonic Wave @Pin=0dBm



PIN VS. POUT



INTERFACE DEFINITIONS

Label	Name	Function
IN	SMA-K	RF Input
OUT	N-K	RF Output
J0	J30J-21ZKP	Power Supply, Control and Alarm

J30J-21ZKP PIN CONFIGURATION

The communication mode of the signal can be selected according to the requirements.

Default:

Pin No.	Name	Function	Pin No.	Name	Function
1-8	+28VDC	Power Supply	19	T_T	Temp Alarm
9-16	GND	Ground	20	T_V	Over/Under-Voltage Alarm
17	EN	Enable (Active High)	21	V_P	Power Report
18	T_I	Current Alarm			

RS422 Communication:

Pin No.	Name	Function	Pin No.	Name	Function
1-8	+28VDC	Power Supply	19	RS422	RS422-TX-
9-16	GND	Ground	20	RS422	RS422-RX+
17	EN	Enable (Active High)	21	RS422	RS422-RX-
18	RS422	RS422-TX+			

RS422 communication can report current value, current alarm, temperature value, temperature alarm, over/under-voltage alarm, power monitoring value, etc. The RS422 communication interface must be specified when ordering.

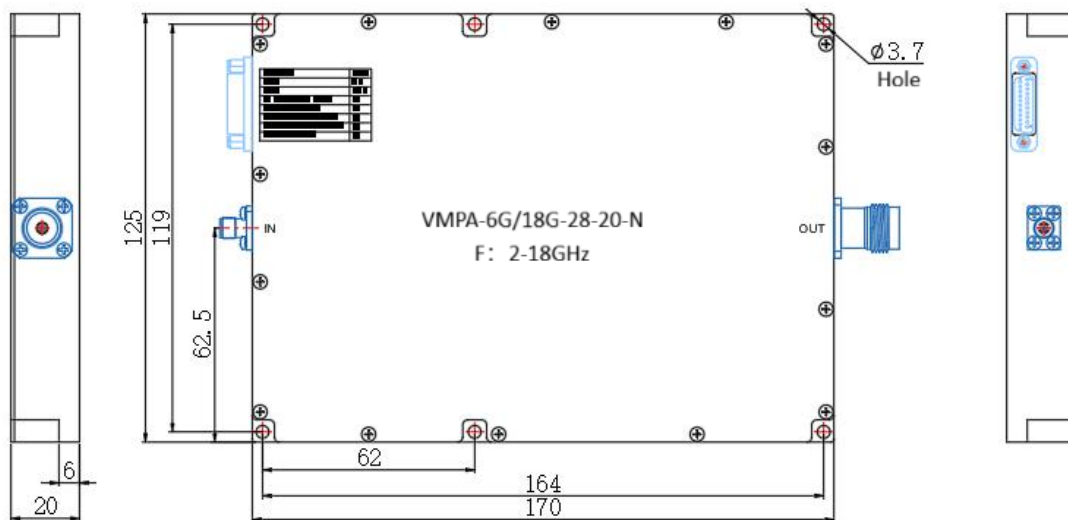
OTHER PARAMETERS & NOTES

Parameter	Function	Range	Notes
Modulation Enable	Controls amplifier operation (High/Low)	0-0.8V (Low) 2-5V (High) Avoid 0.8-2V range.	Min. on/off time >500ns. Turn-on delay 250ns, turn-off delay 400ns.
Power Supply	DC supply, standard +28V	Operating range: +26V ~ +30V	Use stable voltage with low ripple. The amplifier will not turn on if voltage is <24V or >32V.
Temperature	Operating temp: -40~65°C (Ambient)	Module cavity temp: -40~+85°C	Module shuts down if cavity temp exceeds ~90° C, resumes when cooled. Ensure adequate heat sinking.
Power Report(V_P)	Monitors output power	0 ~ 3.3V	Voltage increases with output power. Variation exists between

			frequencies due to coupling/detection differences.
Over-Current	Supply current	About 0.2A (Off) About 12A (Quiescent) 16.5A avg. (Full Pout) Max 20A	Amplifier shuts down automatically if current exceeds ~22A.
RF Input	RF input power	< +10 dBm	0dBm input achieves saturated output. Max input must be less than +10dBm.
RF Output	RF output power	47.5~50dBm (CW, 25°C)	Never leave output open circuit. Do not connect to loads with VSWR > 5:1. Always use an attenuator to protect test instruments.

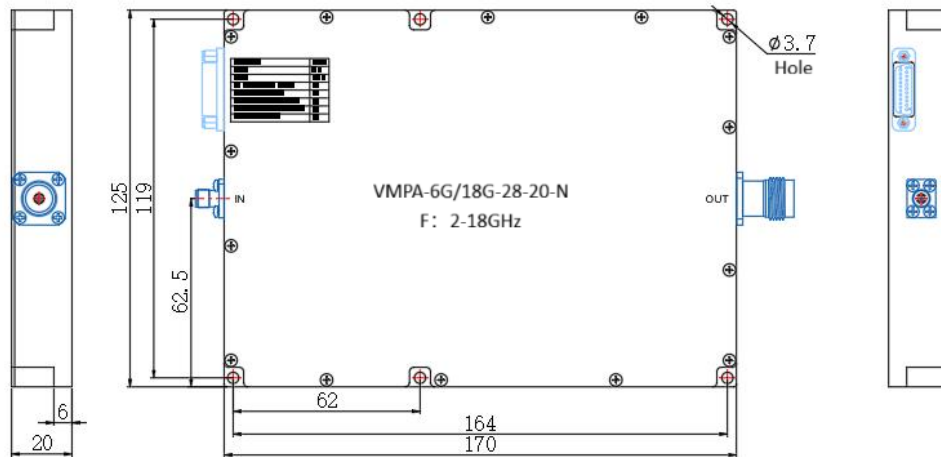
OUTLINE DRAWING

All Dimensions in mm



USER MANUAL

1. OUTLINE AND SIZE



2. INTERFACE DEFINITIONS

2.1 Main Interface

Label	Name	Function
IN	SMA-K	RF Input
OUT	O-K	RF Output
J0	J30J-21ZKP	Power Supply, Control and Alarm

2.2 J30J-21ZKP PIN CONFIGURATION

Pin No.	Name	Function	Pin No.	Name	Function
1-8	+28VDC	Power Supply	19	T_T	Temp Alarm
9-16	GND	Ground	20	T_V	Over/Under-Voltage Alarm
17	EN	Enable (Active High)	21	V_P	Power Report
18	T_I	Current Alarm			

3. PREPARATION FOR USE

The following items are required to operate the VMPA-2G/18G-28-60-N:

No.	Equipment	Description
1	Power Supply	Capable of providing DC +28V, current greater than 22A, with low voltage ripple.
2	Enable Signal Source	Active high signal, range +2V to +5V.
3	Signal Source	RF signal source covering 2-18GHz, output power $\geq$ 0dBm.
4	Load & Equipment	Load (e.g., high-power attenuator >200W, antenna) with VSWR better than 5:1. Use attenuator before test equipment.
5	Heat Sink	Effective cooling system (forced air or liquid) to maintain normal operating temperature.

4. OPERATING PROCEDURE

4.1 Amplifier Power-On Sequence:

- 1). Mount the module onto the heat sinking device to ensure good thermal contact.
- 2). Connect a suitable high-power load to the RF output.
- 3). Correctly connect the power supply and enable signal source. Keep them powered OFF.
- 4). Connect reporting signals to a monitor (optional).
- 5). Connect the RF input signal source. Keep it powered OFF.
- 6). Double-check all connections and equipment status.
- 7). Turn ON the heat sinking system.
- 8). Turn ON the DC power supply.
- 9). Apply the Enable signal (High) to turn on the amplifier.
- 10). Turn ON the RF input signal source.

4.2 Amplifier Power-Off Sequence:

- 1). Turn OFF the RF input signal source.
- 2). Deactivate the Enable signal (Low).
- 3). Turn OFF the DC power supply.
- 4). After the module cools down to room temperature ($\sim 25^{\circ}\text{C}$ or below), turn OFF the heat sinking system.
- 5). Disconnect all cables if for storage.

5. NOTES

5.1 Grounding

The module ground, power supply ground, signal ground, and equipment ground must be connected together.

5.2 Heat Sinking:

The module dissipates approximately 500W under CW operation. Proper heat sinking is critical for performance and longevity.

5.3 Attenuator

Always use a high-power attenuator (e.g., 40dB, 50W minimum) between the amplifier output and any test instrument (e.g., spectrum analyzer).

5.4 RF Ports

Recommended input power is 0dBm. Do not exceed +10dBm input. The output must never be open circuit and must be connected to a load with VSWR better than 5:1.

6. TEMPERATURE

Operating Temperature: $-40^{\circ}\text{C} \sim +60^{\circ}\text{C}$

Storage Temperature: $-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$