



Rackmount Power Amplifier 1GHz-26.5GHz 2W

RMA-101-26G



Table of contents

1.	General description	3
2.	RF specifications	4
3.	Getting settings	6
3.1	Environment.....	6
3.2	Main power supply	6
4.	Front and rear.....	7
5.	Power on the instrument	8
6.	Power off the instrument.....	8
7.	States summary	8
8.	Defaults	9
9.	Programming.....	10
9.1	SCPI commands.....	10
9.2	Status register	10
9.3	Status register when used with Amcad control unit RMCTXXX series	11

1. General description

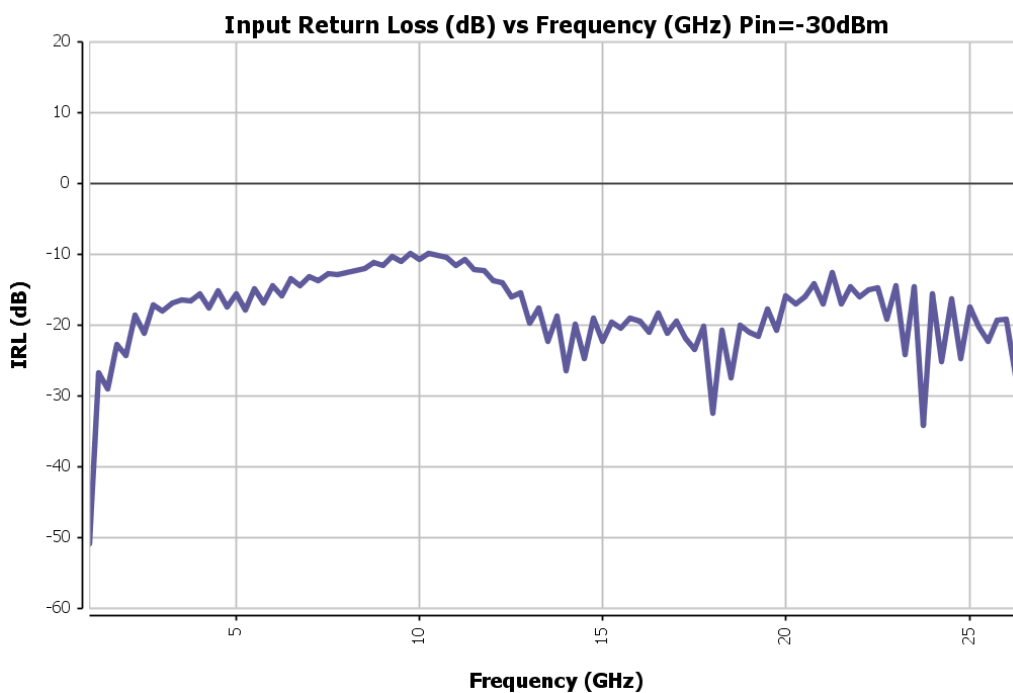
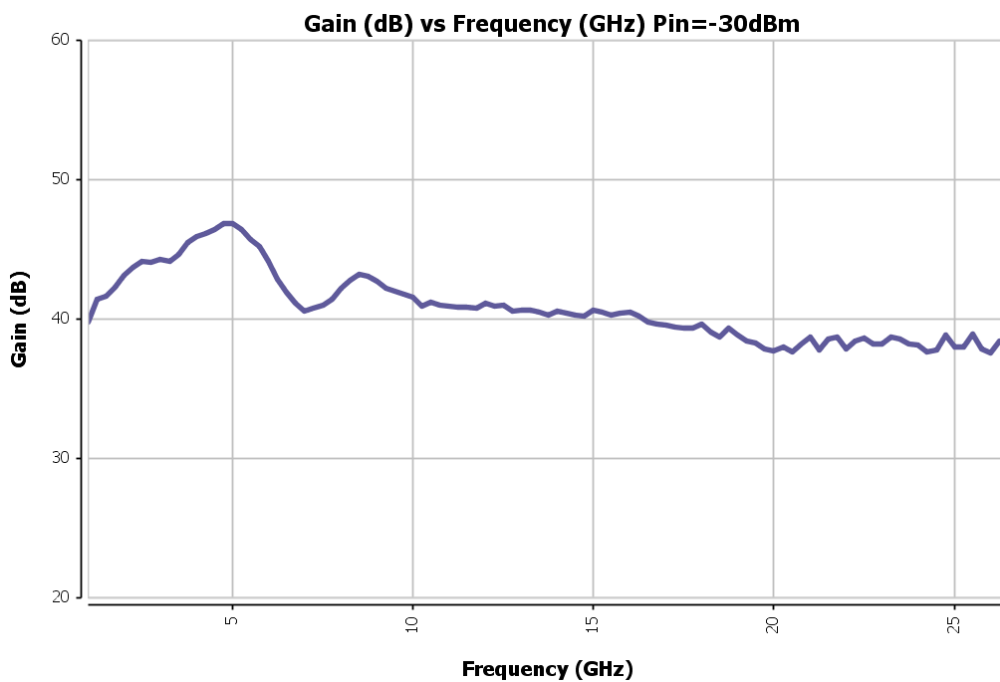
The rackmount amplifier RMA-101-26G is composed of 1 amplification path:

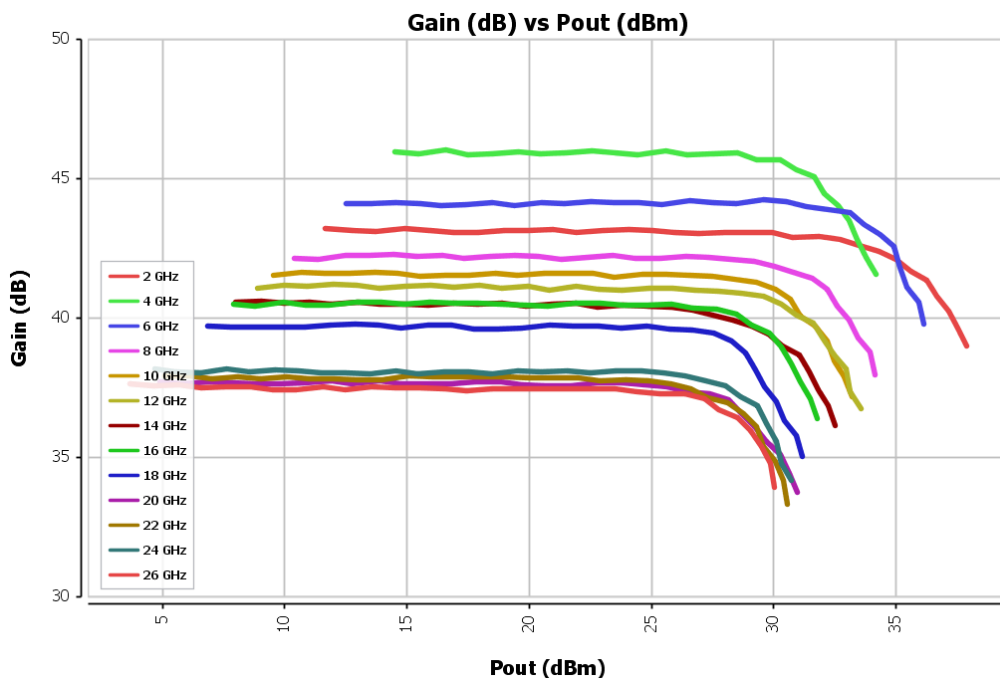
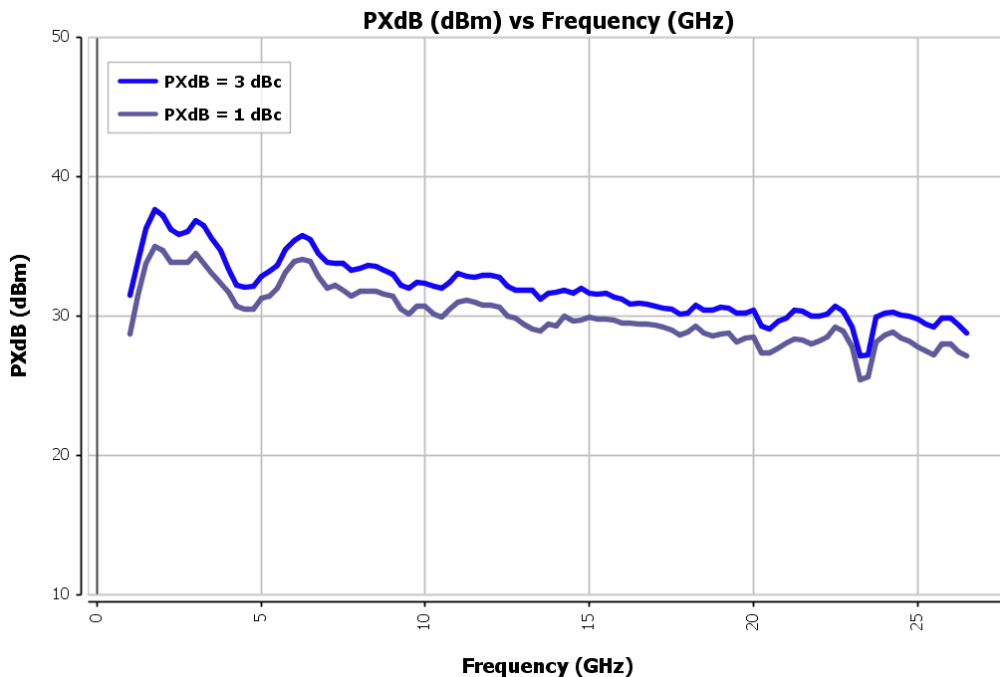
- Ultra wide-band power amplifier 1GHz-26.5GHz
- Power supply monitored
- Embedded protections monitored

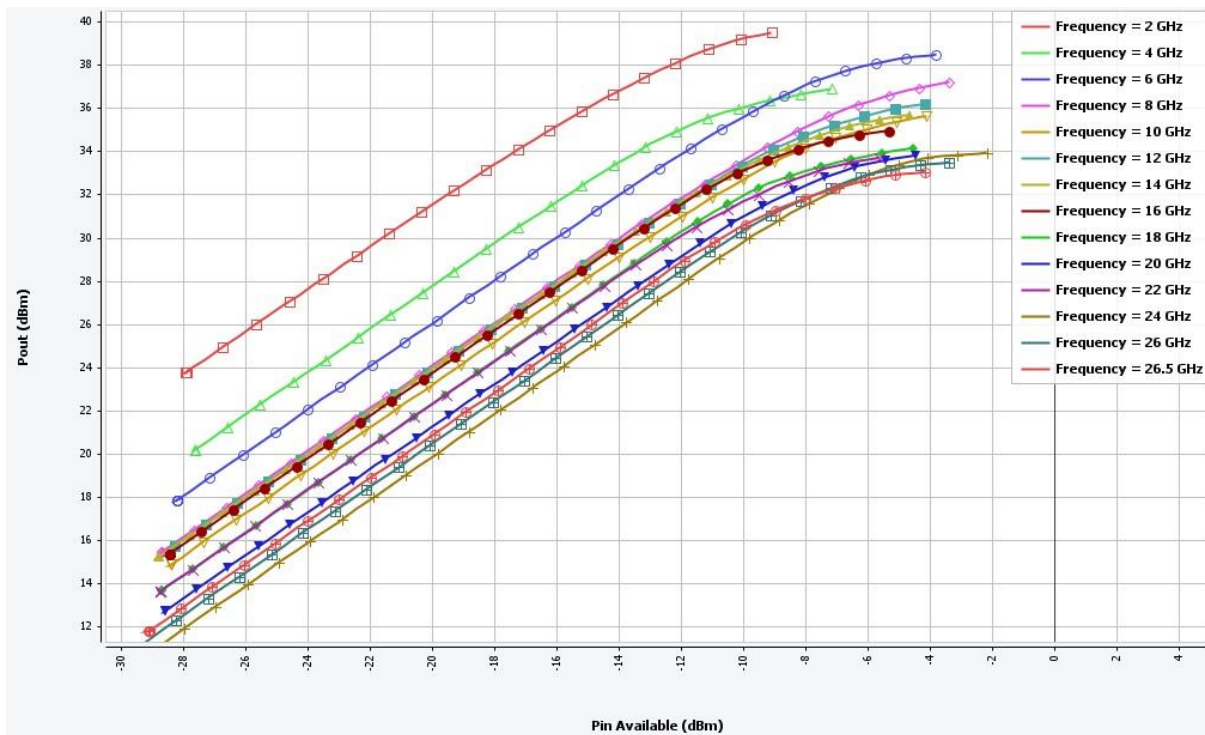
Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	1-10			10-15			15-22			22-26.5			GHz
Gain	39.8	43.35	46.89	40.24	40.77	41.6	39.08	39.64	40.63	37.55	38.23	39	dB
Gain Flatness (+/-)	3.545			0.68			0.775			0.7			dB
Input Return Loss	-50.85	-16.78	-9.9	-26.5	-16.1	-9.88	-32.4	-19.6	-12.6	-34.1	-19.8	-14	dB
P1dB	32.13	34.76	38.27	28.94	30.09	31.14	27.33	28.75	29.95	25.39	27.99	31.1	dBm
P3dB	28.69	32.24	35.04	31.74	32.66	33.47	29.6	30.99	32.2	27.54	29.99	31.1	dBm
Input Max Power (NoDamage)	-5												dBm
Weight	14 Kg												
Input/Output Connector	SSMA - Female												

The rack is 3U high. A primary AC/DC convert the main power supply into a 24V DC which powers heat sink fans and internal electronic. A secondary AC/DC convert the main power supply into a 12V DC to power up the amplifier. Voltage, current, temperature and embedded protections are monitored to improve the reliability.

2. RF specifications







3. Getting settings

3.1 Environment

Description	Min	Max
Operating temperature range	5°C	45°C
Humidity non-condensing	30%	70%
Protection	IP20	

During storage and transport, the temperature must be kept between -5° et 70°C. In case of condensation during transportation or storage, the instrument requires to reach the appropriate temperature before use. The instrument is designed for use in an indoor laboratory environment.

The heat is extracted to the rear of the front. Pay attention that there is sufficient space around the instrument. All specifications apply after a warm-up period of 15 min.

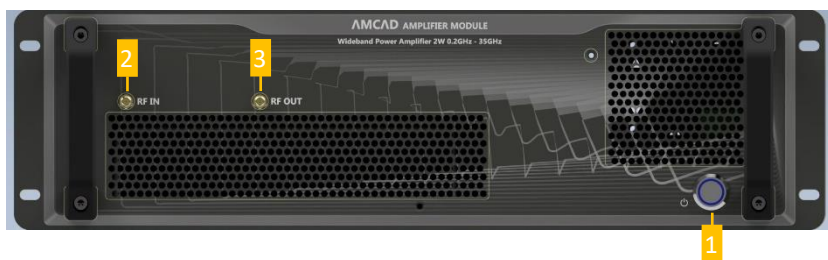
3.2 Main power supply

Description	Min	Max
AC input	115Vac	230Vac
Frequency	50Hz	60Hz
Input power	200W	

The fuse, installed in the socket outlet, must be adapted to the main power sector voltage. By default a 250VAC 2A fuse is installed. The AC socket outlet integrates a rocker switch which must be OFF and the main power cable unplugged before changing the fuse.

It is forbidden to open the instrument without manufacturer’s agreement.

4. Front and rear



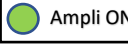




1 = Amplifier power supply push button(Standby button).

2 = SMA connector "RF IN".

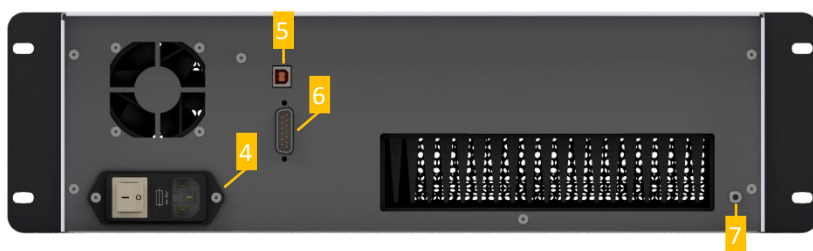
3 = SMA connector "RF OUT".

Standby button (1)

 Standby	The light ring around the front push button is blue. Internal circuits are operating but the amplifier and the fan are not powered.
 Ampli ON  Ampli ON	The light ring around the front push button is green or cyan. The amplifier is powered and normally operates. The fan is powered too.
 Default  Default	The light ring around the front push button is purple or red. the amplifier and the fan are not powered. A default triggered.

SMA connectors (2&3)

RF IN	RF Input signal.
RF OUT	RF output signal.



4 = AC socket outlet with integrated rocker switches and fuse.

5 = USB connector.

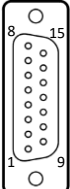
6 =Digital I/O control.

7 = rack ground terminal (4mm socket).

USB connector (5)

USB type B connectors used to control the instrument remotely.

Digital I/O control (6)

Pin	I/O	Description	Applicable	
1		reserved	X	
2	Input	3.3V Input (powers digital I/O circuitry)	X	
3	Output	Trigger Out		
4	Input	Trigger Input		

Rackmount Amplifier RMA-101-26G				
5	Output	Ready (high when initialization phase has ended)	X	Connector female SUB-D15
6	Output	Default (high when a default has triggered)	X	
7	Input	ON/OFF		
8	Input	Inhibit (rising edge shut down the amplifier)	X	
9,10,11,12,13,14,15		ground	X	

5. Power on the instrument

1. Before use, check if the fusible is compliant with the voltage line. Connect power cable.
2. Switch ON the rocker switch.

The light ring around the front push button must be blue. If it is purple, a default triggered during initialization (see chapter concerning defaults). When the instrument is in standby mode, Amplifier and heatsink fan are not powered.

3. Plug RF cables.
4. Push front panel button.

The light ring around the button must be cyan. If it is purple, a default triggered during initialization (see chapter concerning defaults).

5. Wait for the 15min warm-up.
6. Generate RF signals.

6. Power off the instrument

7. Stop generating RF signals.
8. Press the front panel push button.






The light ring around the front push button must be blue. Amplifiers are no more powered but the FAN remains ON during 40s.

9. Unplug the RF cables.
10. Switch off at the rocker switch.

The light ring around the front push button is off.

11. Unplug the main power cable.

7. States summary

Action	State	Amplifier state
Unlock the front panel button	 standby ok	not powered
Lock the front panel button	 Ampli ON	powered
Alarm has triggered	 Default	not powered
Inhibit signal has triggered.	 Default	reset state(blank RF signal) and unpowered
Send *CLS command after default and the front panel button is locked	 Ampli ON	powered

8. Defaults

The instrument monitors 4 parameters : voltage, current, temperature and embedded protections. If a Threshold triggers, the instrument changes to default state. The measurement update rate is 100ms.

Mode	Condition	Default
AC ON (Standby)	Main control voltage < 21V Main control voltage > 24V	The button's purple LED is lighted. Switching ON amplifier is impossible.
Amplifier powered	Amplifier voltage measurement > 13V	Stop amplifier . The button's purple LED is lighted.
	Amplifier current measurement > 4.5A	
	Amplifier power supply temperature > 70°C	
	Amplifier voltage measurement < 11V (after delay 500ms)	
	Amplifier current measurement < 0.2A (after delay 500ms)	
	No auxiliary 5V from Amplifier	
	Amplifier ID balance has triggered	
	Amplifier over current has triggered	
Amplifier temperature has triggered		
Fan amplifier unplugged or broken		
All the time	Main control voltage < 21V Main control voltage > 24V	The button's purple LED is lighted and if amplifiers are ON, turn all off.

9. Programming

This instrument uses USBTMC protocol to communicate remotely with a USB host. It is compatible with the SCPI standard.

9.1 SCPI commands

SCPI	Description	Default
*IDN?	Returns identification "AMCAD ENGINEERING,RMA-101-26G V1.1,01-001,V2.2"	
*OPC?	Returns always 1	1
*RST	Reset the instrument	
*CLS	Clears status register	
SYSTem:ERRor?	Returns last SCPI error	
STATus:QUESTionable?	Returns status register (see below)	
MDATA?	Returns : Status register, State, amplifier voltage measurement, amplifier current measurement, amplifier power supply temperature, amplifier power supply power fail, amplifier AC fail, amplifier mask embedded alarms	
DDATA?	Returns: state	
STATE?	Returns the state of the amplifier: 0 = OFF / 2 = ON / -1 = DEFAULT	0
OUTPut[?][0/1]	Start or Stop the amplifier if the front button is locked and the instrument is not in default. When unlocking the button, OUTPut? Return 0 When locking the button, OUTPut? Return 1	1
BLANKing[?][0/1]	No output RF signal when BLANKing is ON(1)	0

9.2 Status register

Bit	Description
0	Bad primary voltage measurement
1	Error internal communication with the amplifier power supply
2	Amplifier over temperature
3	Amplifier over current
4	Amplifier current balance error
5	Amplifier auxiliary 5V error
6	Amplifier power supply AC fail
7	Amplifier power supply power fail
8	Amplifier power supply bad measurement: - voltage < 11V or voltage > 13V - current > 4.5A or current < 0.2A - temperature > 70°C
9	Amplifier fan unplugged or broken
10	
11	

Rackmount Amplifier RMA-101-26G	
12	Inhibit has triggered
13	
14	
15	

9.3 Status register when used with Amcad control unit RMCTXXX series

STATUS:QUESTIONABLE:INSTRUMENT:ISUMmary chan?

Bit	Description
0	Bad primary voltage measurement
1	Internal error communication with the amplifier power supply
2	Amplifier over temperature
3	Amplifier over current
4	Amplifier current balance error
5	Amplifier auxiliary 5V error
6	Amplifier power supply AC fail
7	Amplifier power supply power fail
8	Amplifier power supply bad measurement: <ul style="list-style-type: none"> - voltage < 11V or voltage > 13V - current > 4.5A or current < 0.2A - temperature > 70°C
9	Amplifier fan unplugged or broken
10	
11	
12	Inhibit has triggered
13	USB communication error
14	Server has been shut down
15	Fault error (bad channel status)