

DATASHEET: Rev 1B, Issued March 2016

GAMP100W is solid state type high power amplifier for wide frequency range 700-2700MHz. The amplifier has wide supply range, over-temperature alarm and under- and over-voltage protections.

KEY FEATURES

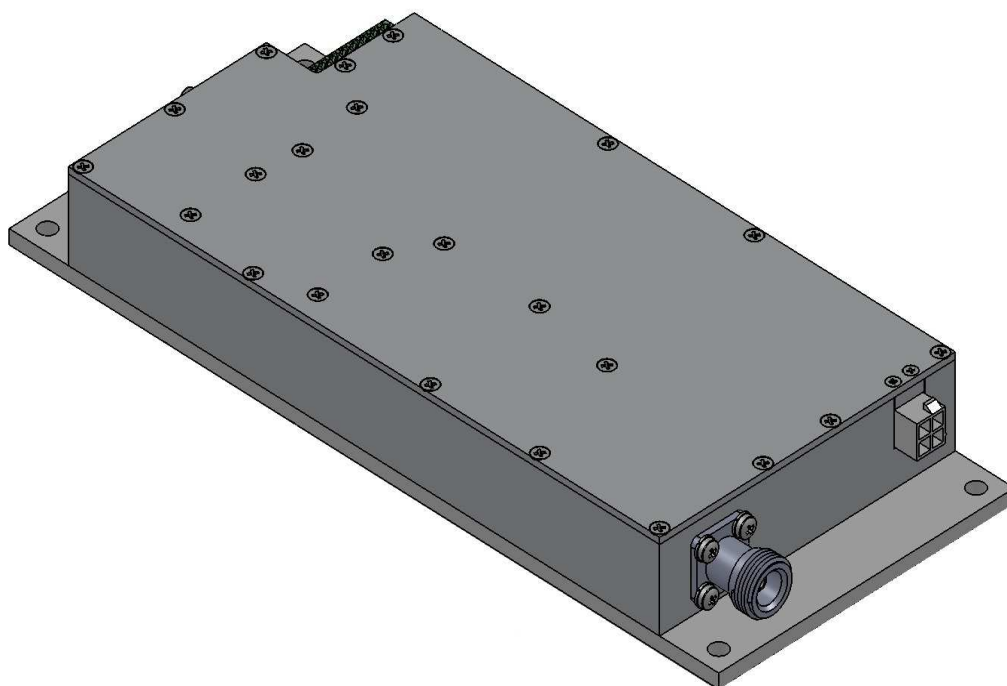
- High output power 100W
- High gain
- Flatness $\pm 2\text{dB}$
- Compact
- Wide supply range
- Built-in protections
- RoHS compliance

APPLICATIONS

- LTE 800/1800/2600
- Radio-transmitters
- Cellular networks
- High power RF drivers
- Laboratories
- Test equipment

GENERAL DESCRIPTION

The device is intended to amplify signals coming from RF input port. Maximum output power level is 100W. The amplifier is based on GaN technology. Supported frequency range is 700-2700MHz. For details please see technical specifications given below.



TECHNICAL SPECIFICATIONS

Absolute maximum ratings

Supply voltage maximum	+32	V
Supply voltage minimum	+20	V
CW RF input power	+17	dBm
Temperature of pallet	+75	°C
VSWR at maximum output power	1.2 : 1	
VSWR at 10W output power	3 : 1	

NB! The amplifier GAMP100W can be used only with heat sinking radiator in free air flow conditions. In case of need additional cooler can be used (recommended airflow 95m³/hour). Before switching GAMP100W read carefully all instructions for given product. Switching on make sure that device RF ports are loaded with 50Ω. Do not use the amplifier in deep compression (>2dB) for long time. Not observing the requirement, the device may be damaged.

RF and DC characteristics

Frequency	700	960	1800	2100	2700	MHz
Gain (note 1)	47.0	44.5	46.0	44.5	44.0	dB
Input return loss (note 1)	>10					dB
Flatness (note 1)	±2.3 typical					dB
Thermal stability	0.02 (gain drop)					dB/°C
1dB output compression (note 2,5)	44.0	42.0	43.0	43.0	43.5	dBm
Saturated output power (note 2,5)	51.0	51.0	50.0	49.5	49.5	dBm
Input RF power @ saturation	+15 approximately					dBm
ACPR @ +40dBm output (note 3)	44	40	39	39	36	dBc
ACPR @ +43dBm output (note 3)	38	35	33	33	31	dBc
OIP3 (note 6)	>52					dBm
Second harmonic (note 7)	13	16	32	24	50	dBc
Third harmonic (note 7)	22	25	50	-	-	dBc
Spurious	>70					dBc
Supply voltage	+20...+32					V DC
OFF state current (note 4)	10					mA
Current @ "no signal" (note 4)	1.7 (inrush up to 6A at start moment)					A
Current @ 1dB compression (note 2,4)	5.0	3.5	4.3	5.1	4.9	A
Current @ saturated output (note 2,4)	11.2	9.9	10.7	10.4	9.4	A
Current @ +40dBm mod. (note 3,4)	3.0	2.7	2.9	3.1	2.8	A
Current @ +43dBm mod. (note 3,4)	3.8	3.3	3.7	4.0	3.6	A

* Typical values measured at temperature T=+25°C.

NOTES:

- 1) Measured at small input signal
- 2) Measured at CW
- 3) Measured with wideband modulated input signal (3G downlink, crest factor 10.55dB)
- 4) Voltage supply +24Vdc
- 5) +33dBm output as 0dB compression reference
- 6) Measured with two input tones -10dBm each, frequency difference 1MHz
- 7) Measured at 10W CW output

Mechanical specifications

Enclosure type	Aluminium module for indoor environment (see first page)	
Heat sink option	Heat sinking radiator can be ordered as option	
Max dimensions	240x100x32 (see last page)	mm
Input RF connector	SMA-female	
Output RF connector	N-female	
DC supply connector	KWM4505-04R, 2x2pin 4.2mm (two pins for +V, two pins for ground, see last page)	
Control connector	8-way terminal block PTSA1.5/8-3,5Z (see description table for control terminal block)	

Gain responses at small signal



Description table of control terminal block

Pin №	Pin name	Direction (to or from PA)	Type	Description
1	GND	-	-	grounded
2	ON/OFF CONTROL	in	digital	This pin switch the amplifier on or off; OFF: high level +2V...+5V or leave open ON: low level 0V...+0.1V or tie to ground
3	GND	-	-	grounded
4	ON/OFF MONITOR	out	digital (open collector)	Monitor to see is the amplifier in ON or OFF state; OPEN: amplifier is off SHORT TO GND: amplifier is on
5	TEMPERATURE ALARM	out	digital (open collector)	Alarm shows state if temperature protection is applied; OPEN: alarm is off SHORT TO GND: alarm is on, temperature protection is applied (T>80deg of C)
6	GND	-	-	grounded
7	TEMPERATURE MONITOR	out	analog	Built-in temperature sensor (TC1047A) output: $V_{out}[V]=0.01 \cdot T[degC]+0.5$
8	GND	-	-	grounded

Description of over-temperature protection

Amplifier is equipped with over-temperature protection. This circuit does switch the device off if internal temperature is close to 80deg of C. Amplifier can start again if temperature drops below 75deg of C.

In case of using external temperature measurements (exmp. directly from radiator ribs) thermal resistance "Inside of Amplifier" to "Outside of Radiator" is about 0.1°C/W or less.

Description of under- and over-voltage protection

Functional mode	Supply Vmin	Supply Vmax	Hysteresis	Description
Device starts normally	+20.0V	+32.0V	-	-
Device is switched OFF	+18.5V	+33.3V	-	-
Over-voltage hysteresis	-	-	+31.1V	If supply voltage grows to more than +33.3V, device will be switched off and it starts again if the voltage drops to shown value.
Under-voltage hysteresis	-	-	+19.9V	If supply voltage drops to more than +18.5V, device will be switched off and it starts again if the voltage grows to shown value.

ACTIVATION SEQUENCE

Please follow next steps to switch the device on or off.

Switching on:

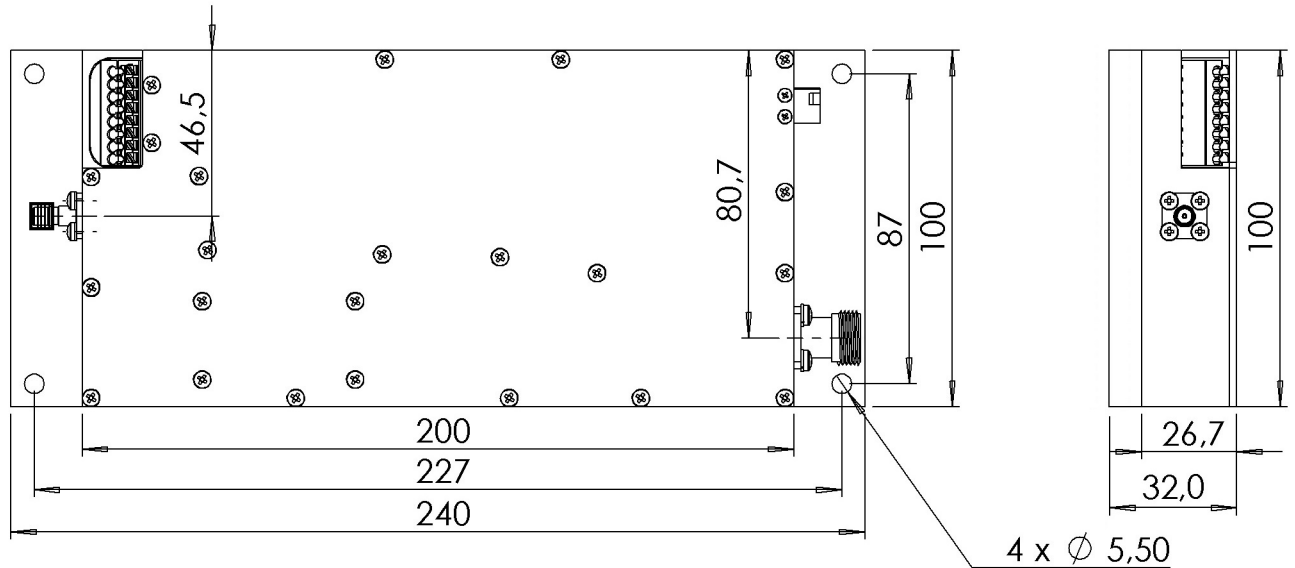
- 1) ensure that amplifier is switched off;
- 2) ensure that RF signal is not presented on the input of amplifier;
- 3) ensure that RF ports are properly loaded with 50ohm, output load must be at least 150W rated;
- 4) ensure that all necessary connections are done;
- 5) connect proper DC supply, apply voltage;
- 6) switch amplifier on using corresponding ON/OFF control pin;
- 7) apply RF input;
- 8) watch that working temperature was within specified limits.

Switching off:

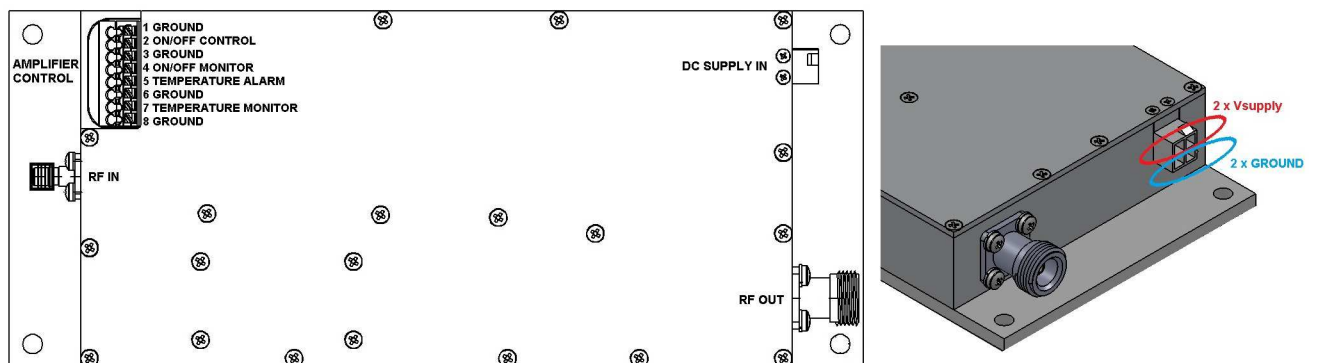
- 1) switch off RF input signal;
- 2) switch amplifier off using corresponding ON/OFF control pin;
- 3) switch DC supply off.

A lot of thermal energy can be dissipated at PA case. Because of that reason watch carefully for temperature of PA. If it is critically high, use additional cooling or switch amplifier off.

Mechanical view and dimensions (mm)



Description of connectors



Rantelon reserves the right to change the specification without notice.