

***SHF0460-10W is solid state type high power amplifier for wide frequency range 400-6000MHz. The amplifier has +18..20V supply range, over-temperature alarm and protection.***

## KEY FEATURES

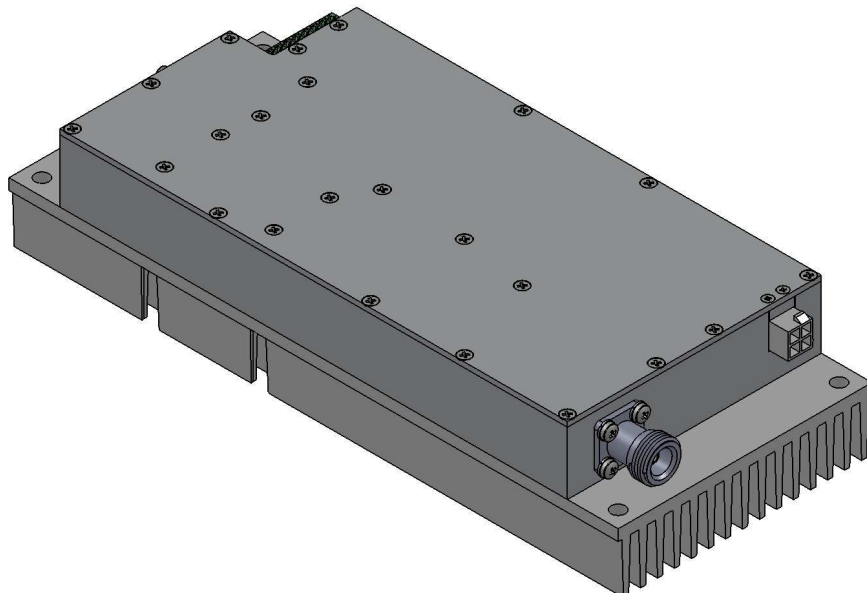
- High output power 10W
- High gain
- Good flatness
- Compact
- Built-in protections
- RoHS compliance

## APPLICATIONS

- LTE 800/1800/2600
- Radio-transmitters
- Cellular networks
- High power RF drivers
- Wi-Fi/WLAN
- Test equipment and laboratories

## GENERAL DESCRIPTION

The device is intended to amplify signals coming from RF input port. Maximum output power level is 10W. The amplifier is based on GaN technology. Supported frequency range is 400-6000MHz. For details please see technical specifications given below.



### TECHNICAL SPECIFICATIONS

#### Absolute maximum ratings

Supply voltage maximum	+20	V
Supply voltage minimum	+18	V
CW RF input power	0	dBm
Temperature of pallet	+75	°C
Maximum output VSWR	1.2 : 1	

**NB!** The amplifier SHF0460-10W can be used only with heat sinking radiator in free air flow conditions. In case of need additional cooler can be used (recommended airflow 95m<sup>3</sup>/hour). Before switching SHF0460-10W 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). Not observing the requirement, the device may be damaged.

#### RF and DC characteristics

Frequency	400	1000	3000	4500	6000	MHz
Gain (note 1)	50.0	50.0	49.0	51.5	46.5	dB
Input return loss (note 1)	typ 10					dB
Flatness (note 1)	typ ±2.5					dB
1dB output compression (note 2,4)	38.5	42.0	39.5	38.5	36.5	dBm
Saturated output power (note 2,4)	40.5	43.5	41.0	40.0	38.0	dBm
Input RF power @ saturation	apprx -5					dBm
OIP3 (note 5)	>45, typ 50					dBm
Supply voltage	+18...+20					V DC
OFF state current (note 3)	15					mA
Current @ "no signal" (note 3)	0.7 (inrush up to 3A at start moment)					A
Current @ 1dB compression (note 2,3)	1.6	2.1	1.8	2.0	2.2	A
Current @ saturated output (note 2,3)	1.9	2.4	2.2	2.4	2.8	A
Current @ +30dBm output (note 2,3)	0.9	0.9	0.9	1.0	1.3	A

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

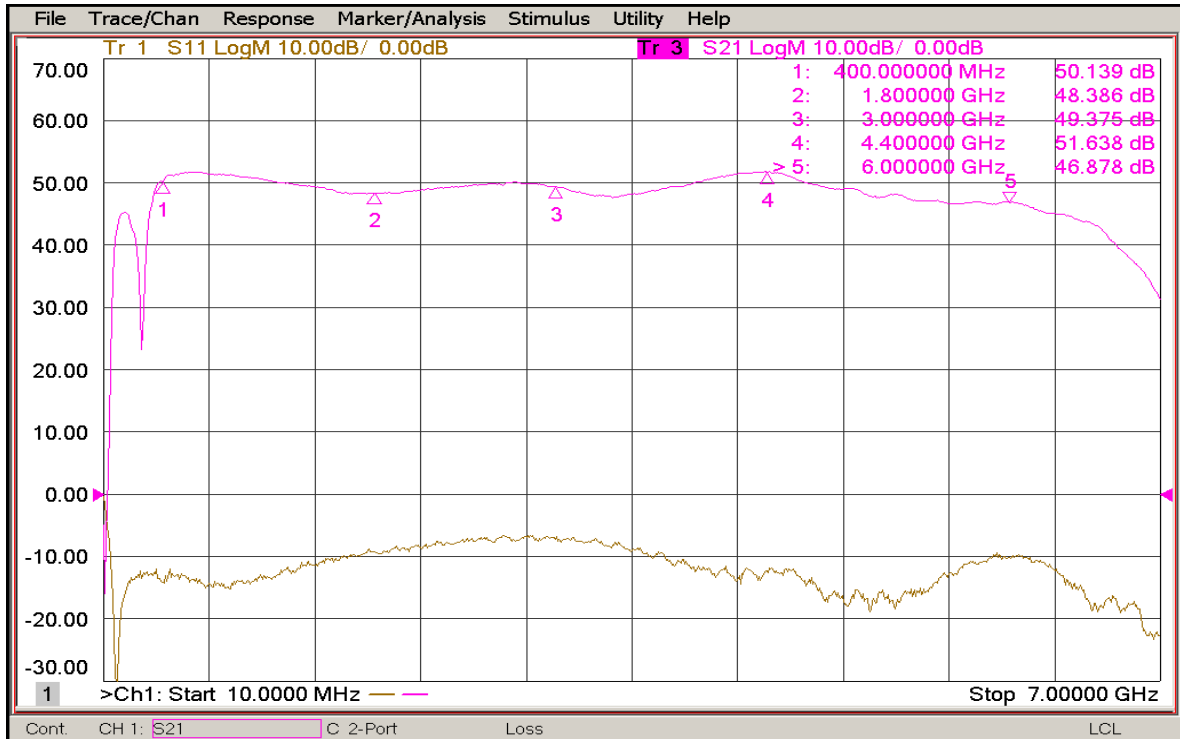
#### NOTES:

- 1) Measured at small input signal
- 2) Measured at CW
- 3) Voltage supply +20Vdc
- 4) +28dBm output as 0dB compression reference
- 5) Measured with two input tones -16dBm each, frequency difference 1MHz

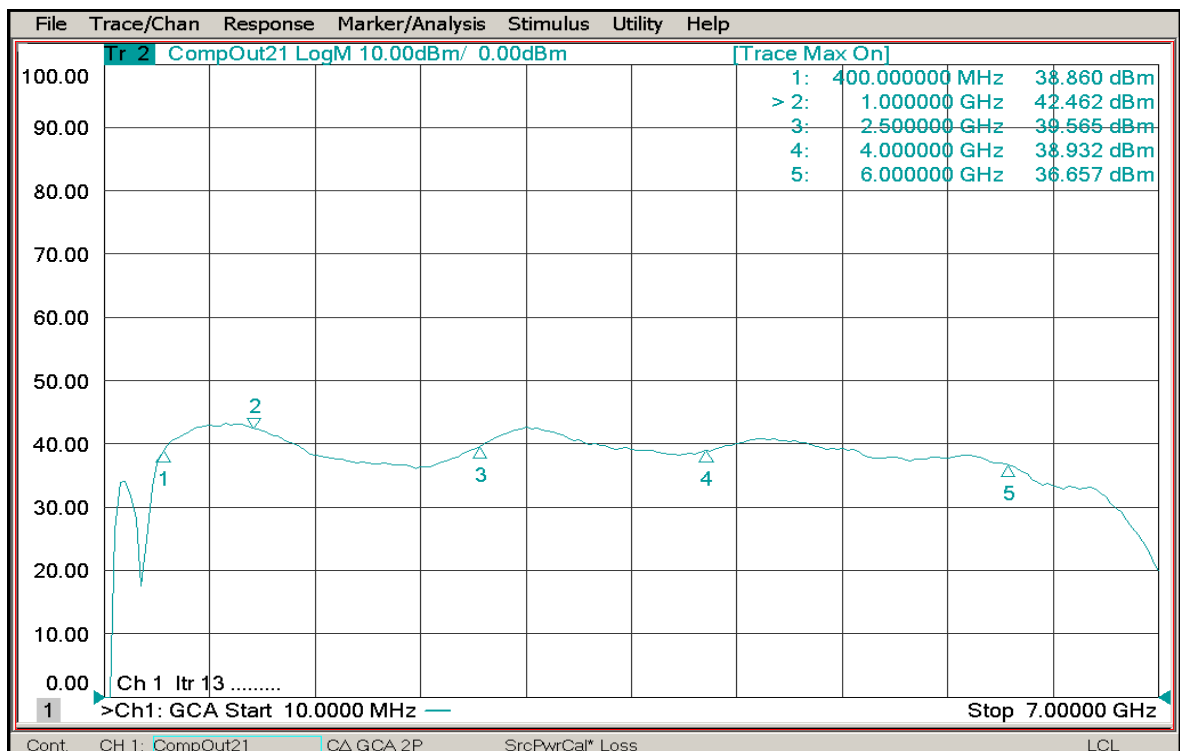
#### Mechanical specifications

Enclosure type	Amplifier with heat sinking radiator (see first page)	
Max dimensions	240x100x52 (see last page)	mm
Input RF connector	SMA-female	
Output RF connector	SMA-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)	

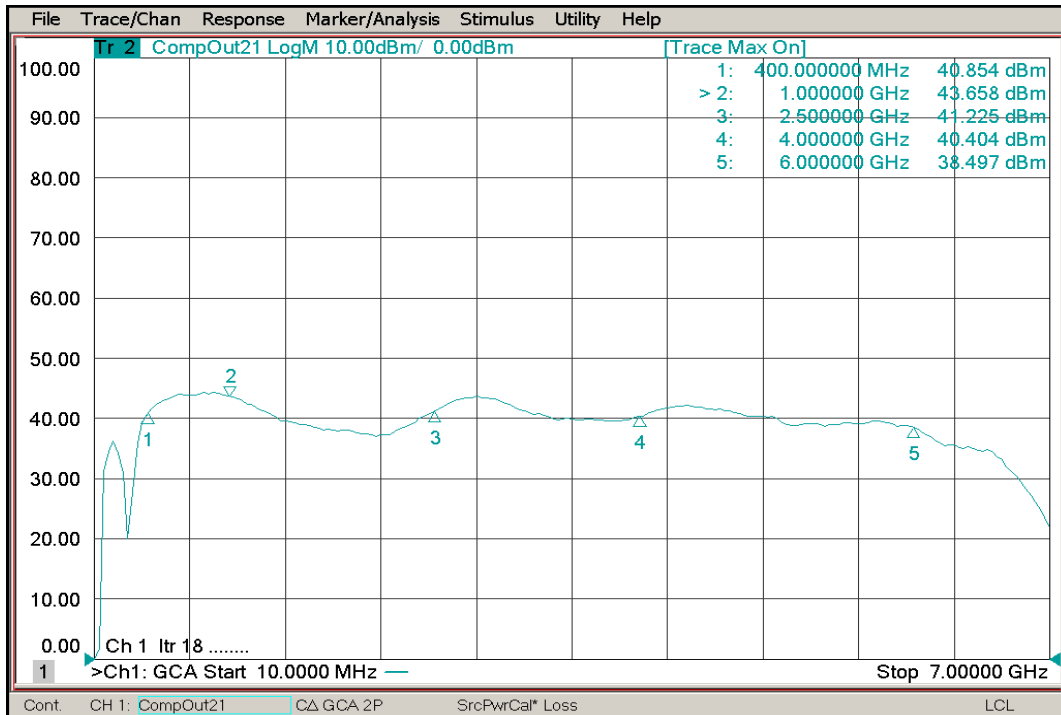
### Gain and input matching responses at small signal



### Output power at 1dB gain compression



### Saturated output power



### 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.

## ACTIVATION SEQUENCE

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

Switching on:

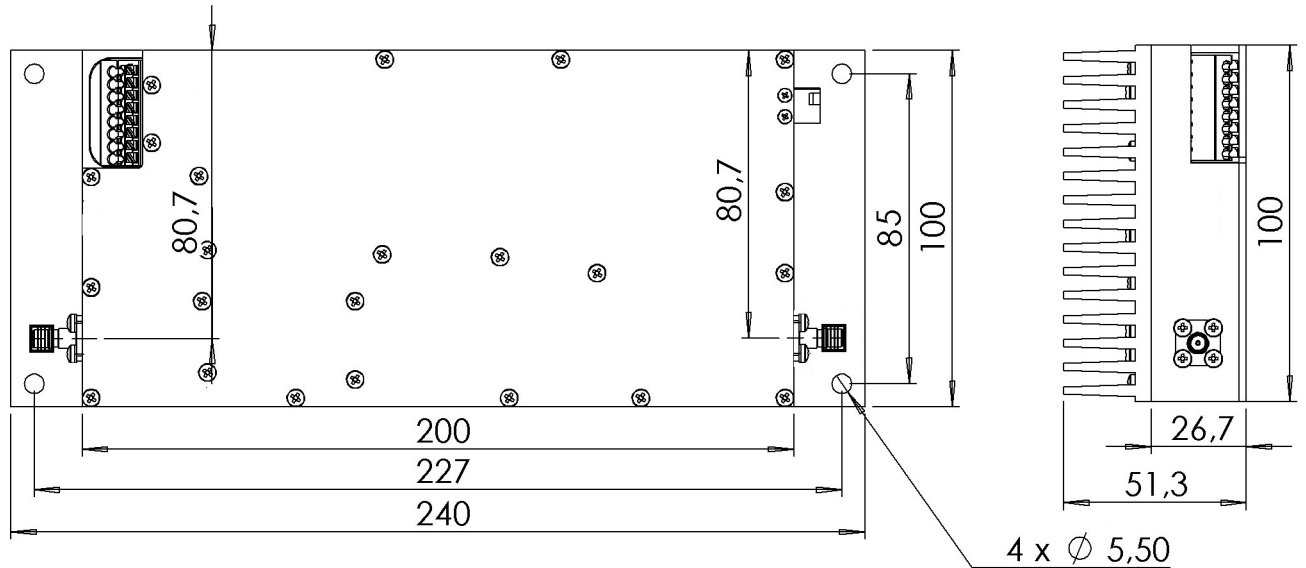
- 1) ensure that amplifier is switched off;
- 2) ensure that RF signal is not presented on the input of amplifier;
- 3) ensure that RF ports are properly loaded with 50ohm, output load must be at least 50W rated;
- 4) ensure that all necessary connections are done;
- 5) connect proper DC supply, apply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

Switching off:

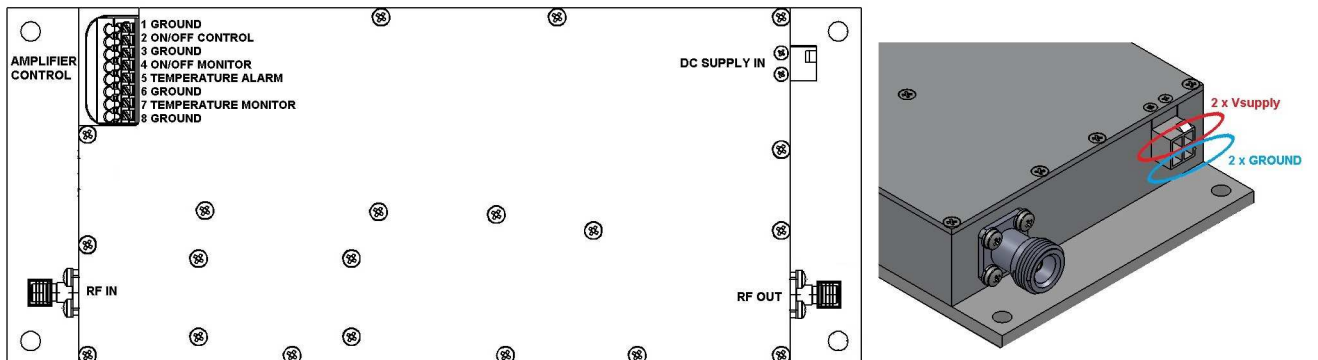
- 1) switch off RF input signal;
- 2) switch amplifier off using corresponding ON/OFF control pin;
- 3) switch DC supply off.

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.