

V1.0

KU PA BB 070270 - 80 B



Manual

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ALARIS
THE RF TECHNOLOGY GROUP



Important notes for setting up KU PA BB 070270 – 80 B

**This power amplifier generates a high power RF-signal.
Only skilled persons should operate the unit.**

**Kuhne electronic GmbH accepts no liability for damages caused by
improper usage.**

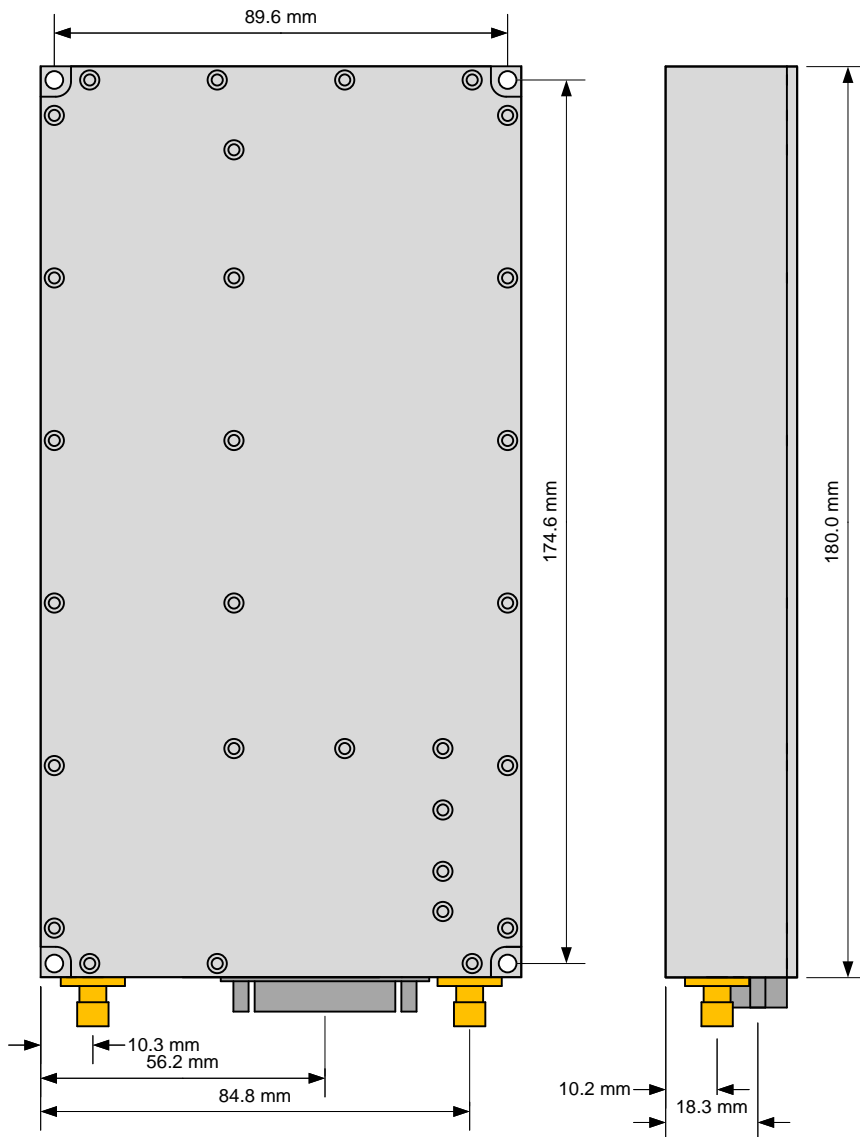
Specification

Specification measured at +32 V DC supply voltage

Frequency range	600 ... 2700 MHz
Input power	max. 10 dBm
Input return loss	typ. -10 dB
Small signal gain	typ. 52 dB
Saturation output power	min. 80 W CW
Harmonics (2)	min. 13 dBc
IM3 (1)	typ. 22 dBc @ 80 W PEP
Efficiency	typ. 25 % @ 80 W
Supply voltage	+28 ... +32 V DC
Current consumption	max. 15A, typ. 13 A
Quiescent current	typ. 2.8 A
Input connector / impedance	SMA-female / 50 ohms
Output connector / impedance	SMA-female / 50 ohms
DC connector	Filtered Sub-D connector (15 pins)
Case	milled aluminium
Dimensions (mm)	180 x 95 x 26
Weight	typ. 800 g
Operating case temperature range	-20 ... +55 °C
Case must be mounted on heatsink	
(1) Measured 2-tone, frequency spacing: 1 MHz	
(2) Measured at 80 W output power in	
- 10 MHz steps from 600 to 1500 MHz	
- 100 MHz steps from 1500 to 2700 MHz	
Features	<ul style="list-style-type: none"> GaN technology Wide bandwidth High gain Forward power detection (diode detector) Reflected power detection (diode detector) Undervoltage protection Over temperature protection Gate Current protection
Applications	<ul style="list-style-type: none"> General purpose Laboratory equipment Jamming Communication Broadcasting Telecommunication Heating
CE Konformität / CE Conformity	EMC directive 2014/30/EU Low voltage directive 2014/35/EU RoHS directive 2011/65/EU



Dimensions / Mounting holes



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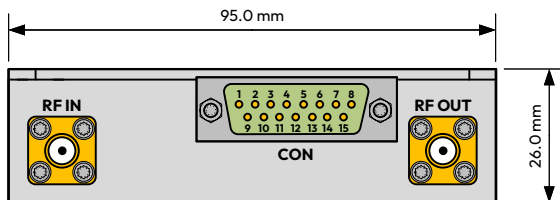
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Connectors



RF IN / RF input

Use the power amplifier only in the specified frequency range (600 ... 2700 MHz).
 Do not exceed the maximum input power of +10 dBm. Higher input power may damage the amplifier

RF OUT / RF output

The RF output is partly protected against reflected output power. If the reflected output power is more than 50 watts the amplifier reduces the forward power to protect the final stage transistors.

CON - 1/2/3/9/10 / +28 ... +32 V DC

These five pins must be connected to the +28 ... +32 V DC power supply. Use all of these pins in parallel.
 Use an appropriate power supply with an output voltage of +28 ... +32 V DC and an output current of min. 15 A.

CON - 6/7/8/14/15 / GND

These five pins must be connected to the ground connector of the power supply unit. Use all of these pins in parallel.

CON - 4 / Forward power detection (diode detector)

This output provides a DC voltage proportional to the forward output power of the amplifier.
 The voltage range of this output is 0 ... max. +5 V @ 80 W.

CON - 5 / Reflected power detection (diode detector)

This output provides a DC voltage proportional to the reflected power on the output of the amplifier.
 The voltage range of this output is 0 ... max. +5 V @ 80 W.

CON - 11 / DC OK

PIN 11 is an open collector output. Apply a maximum voltage of 24 V on this output. The maximum current is 10 mA.
 This output indicates the state of the amplifier. This output switches to ground if all internal protection circuits are inactive.

CON - 12 / Temp

This output provides a DC voltage proportional to the internal temperature of the power amplifier.
 The voltage range of this output is max. +3 V @ 60°C (measurement point near final transistor).

CON - 13 / ON

PIN 13 is an input. The input voltage range is +3 ... +5 V DC. The voltage on this pin activates the amplifier.
 After applying a voltage on this pin the amplifier goes active and without RF input power the current consumption of the power amplifier rises up to typ. 2.8 A (quiescent current). The power amplifier can only be activated if all protection circuits are inactive and the DC OK output is switched to ground.

Protection Circuits / Power up Sequence

Under voltage protection

If the supply voltage is below +20 V the power amplifier switches off.

As soon as the under voltage protection is activated the DC OK output becomes high impedance.

Gate current protection

This power amplifier uses GaN RF power transistors. If such transistors are used near saturation or in saturation the power transistors will begin to produce a gate current. Too high gate current damages the transistors. In the case of too high gate current the amplifier limits the input power, if the gate current rises furthermore the amplifier switches off until the input power will be reduced by customer.

As soon as the gate current protection is activated the DC OK output becomes high impedance.

Over temperature protection

If the internal temperature of the power amplifier exceeds +60 °C the power amplifier switches off. After cooling down below 55 °C the amplifier returns to normal operation. Make sure that your cooling system is sufficient.

As soon as the over temperature protection is activated the DC OK output becomes high impedance.

Reflected power protection

The RF output is partly protected against reflected output power. If the reflected output power is higher than 50 watts the amplifier reduces the forward power to protect the final stage transistors.

Power up sequence

- Use a power supply with an output voltage of +28 ... +32 V DC and an output current of min. 15 A.
- Apply the supply voltage to the power amplifier.
- The amplifier generates internal voltages and checks the internal protection circuits. This takes about 1 second.
- If all is correct the „DC OK“ pin switches to ground.

Now the amplifier is ready for activation.

- Apply a voltage of +3 ... +5 V DC to the „ON“ pin of the power amplifier.
- The current consumption rises up to typ. 2.8 A (quiescent current).
- Switch on the your external RF source.

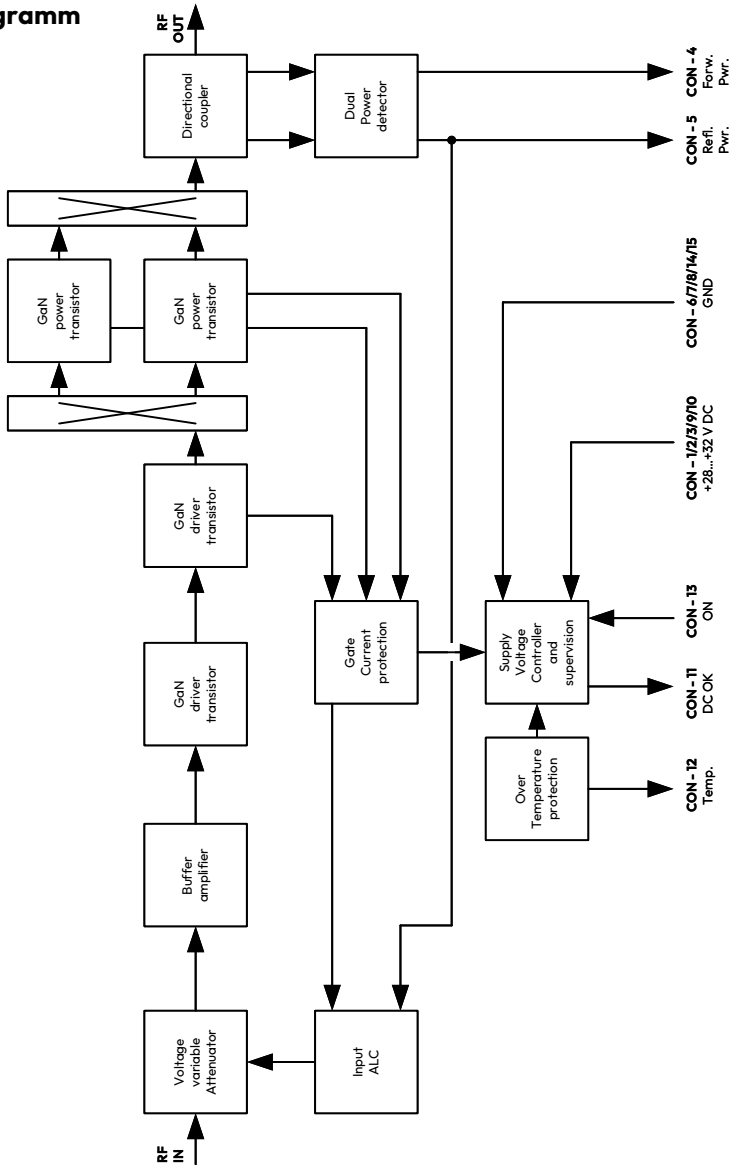


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Blockdiagramm



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Details

CON - 12 / Temp

This output provides a DC voltage proportional to the internal temperature of the power amplifier.

$$V_{out} = 3,3 * \left[8V * \frac{R_{kty}}{R_{kty} + 4.56k\Omega} \right] - 2,15V \approx T[^\circ C] * 0,0424V - 0,1549V$$

