

Advanced Receiver Research P432VDG 70cm preamplifier

Version 1.0
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Matthias DD1US

Hello,

at the Ham Radio fair 2022 in Friedrichshafen, I acquired a 70cm preamplifier from Advanced Receiver Research. The amplifier was apparently never used and was still in the sealed plastic bag.

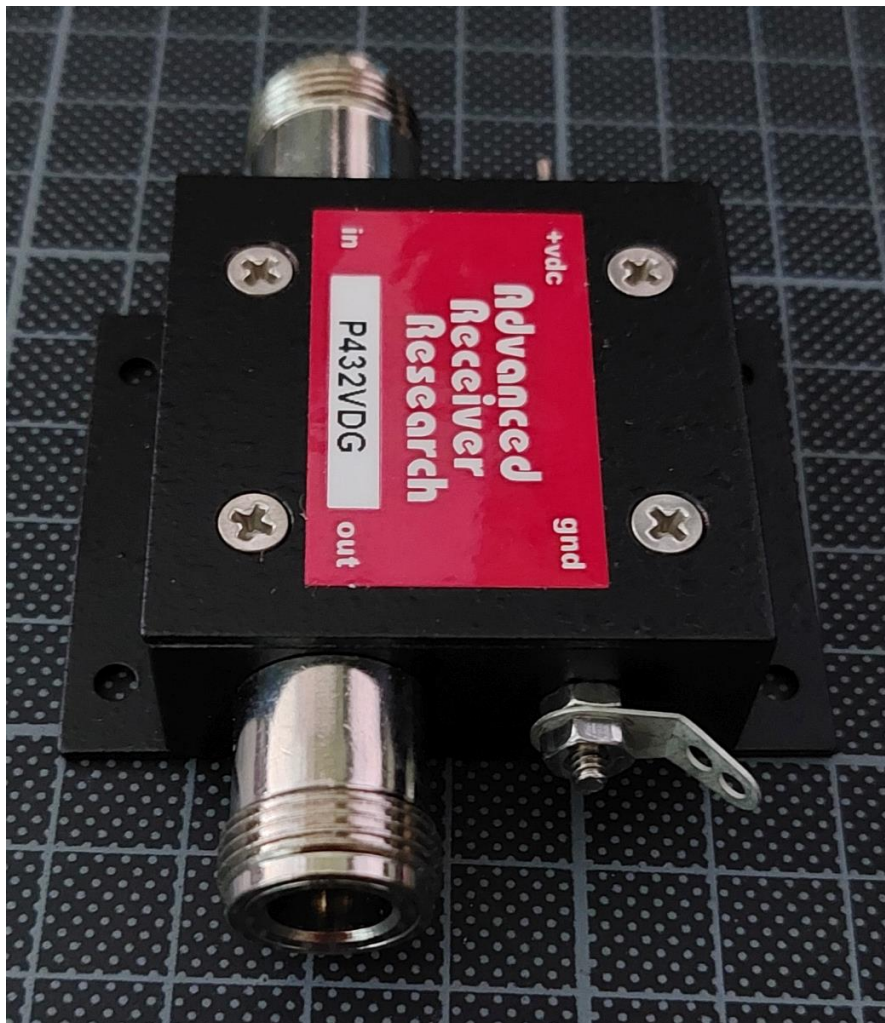
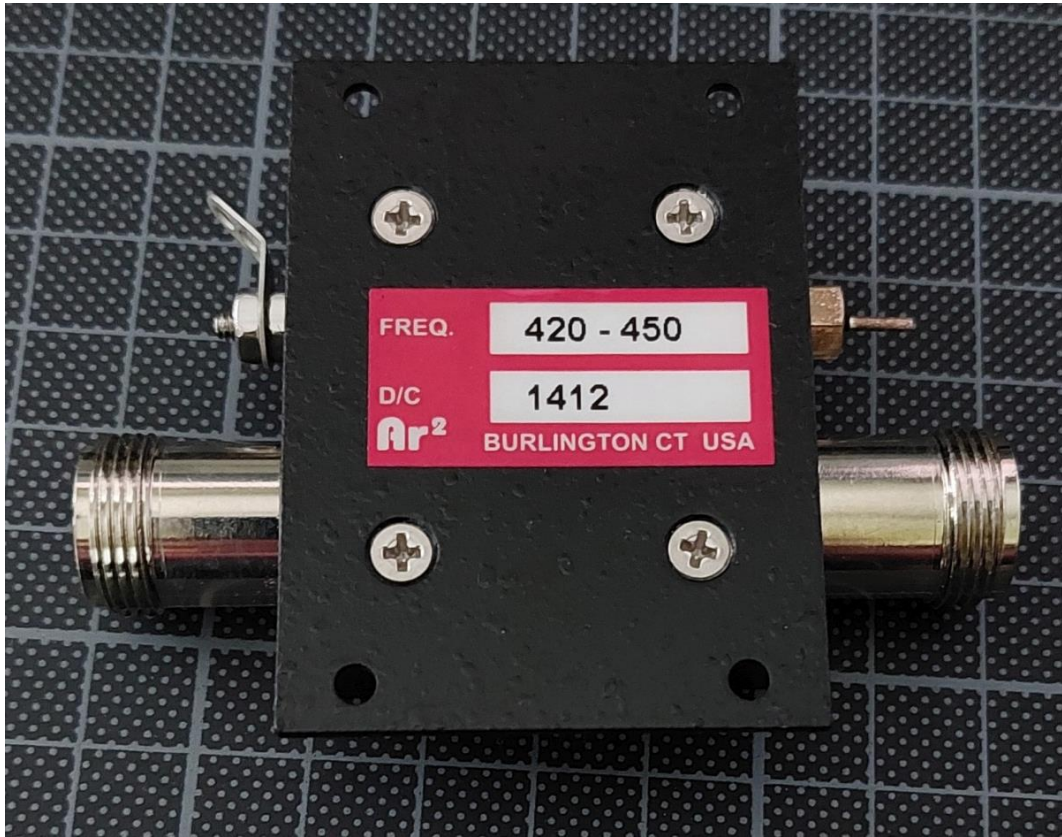
According to the Instruction Sheet this model P432VDG has the following data:

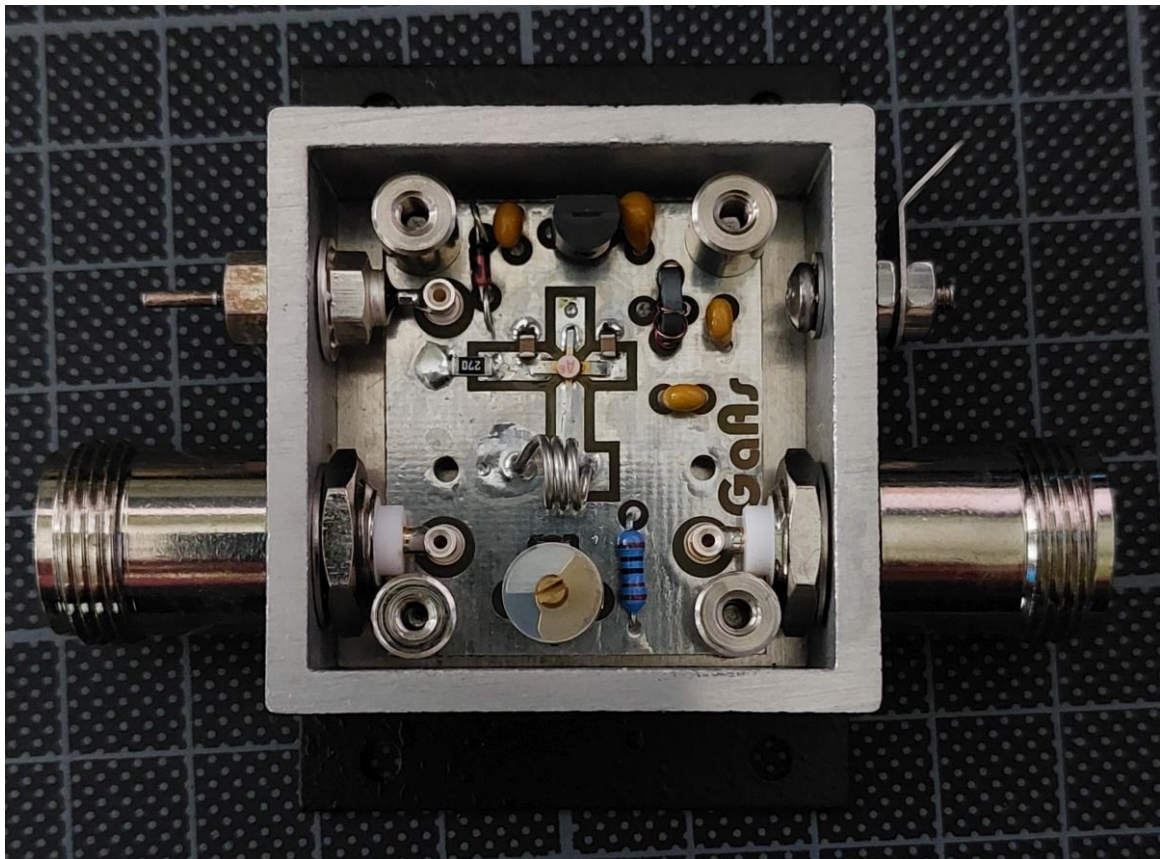
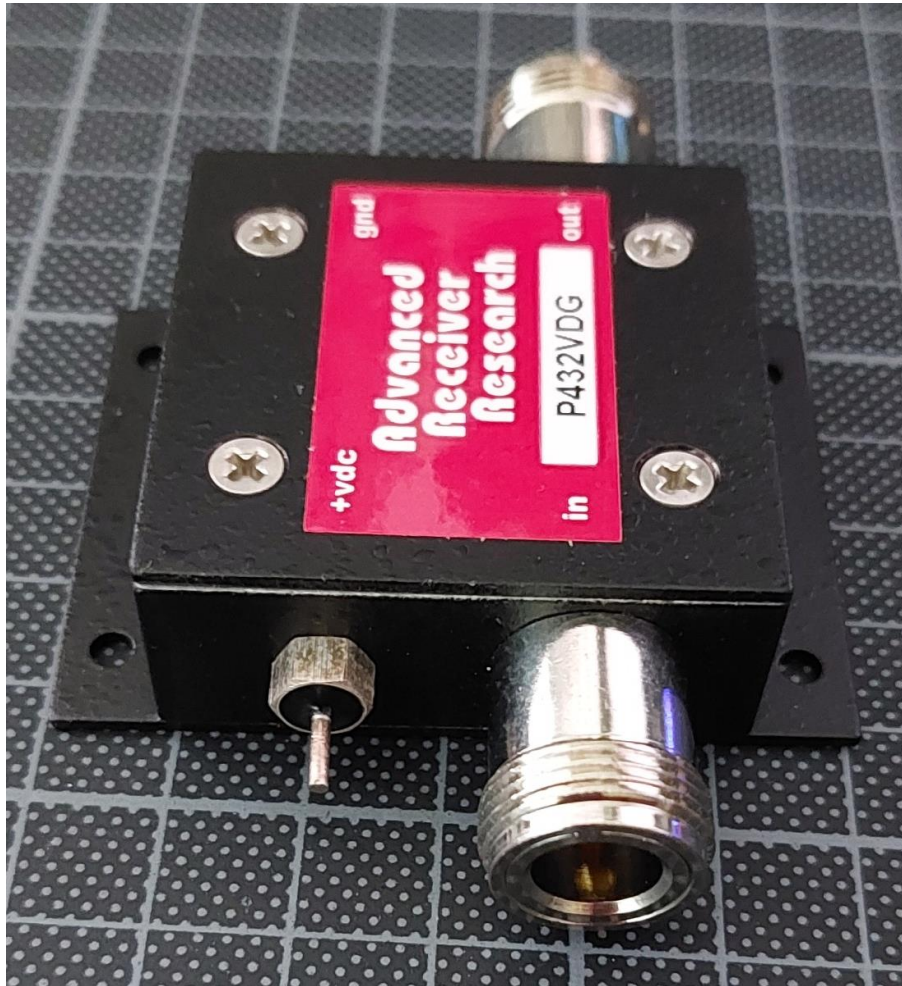
Frequency range	420-450MHz
Bandwidth 1dB	40MHz
Noise Figure	0.5dB
Gain	16dB
P1dB	+12dBm
Supply voltage	11-16V
Supply current	25mA

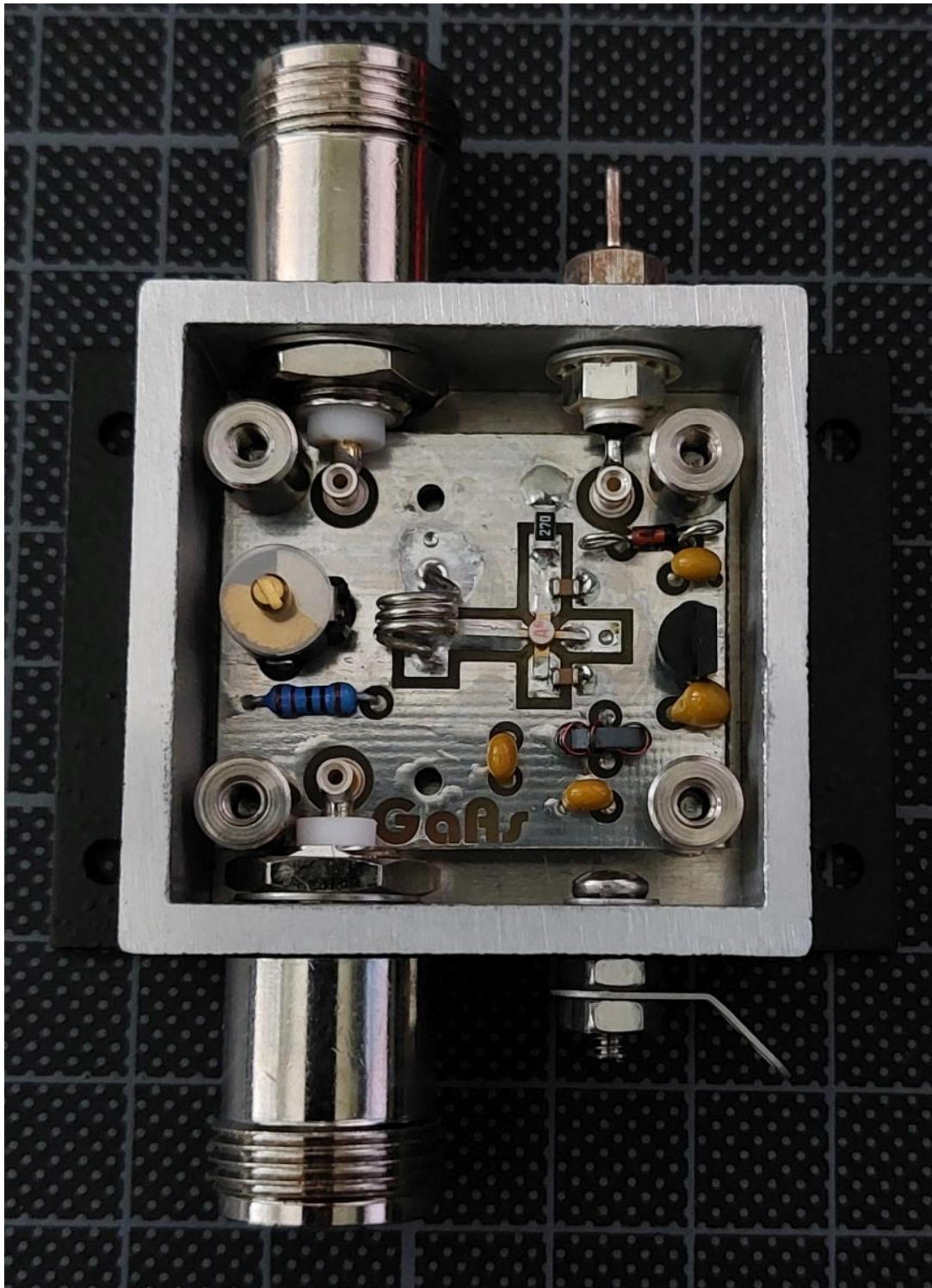
You can find a copy of the instruction sheet in the attachment. It includes also a schematic of the amplifier.

Here are some pictures of the amplifier which is housed in an aluminium encasing with female N connectors at the input and output. The amplifier does not include a transmit / receive bypass path, thus it can be only used with a receiver or appropriate relays have to be added if a transmitter shall be used.

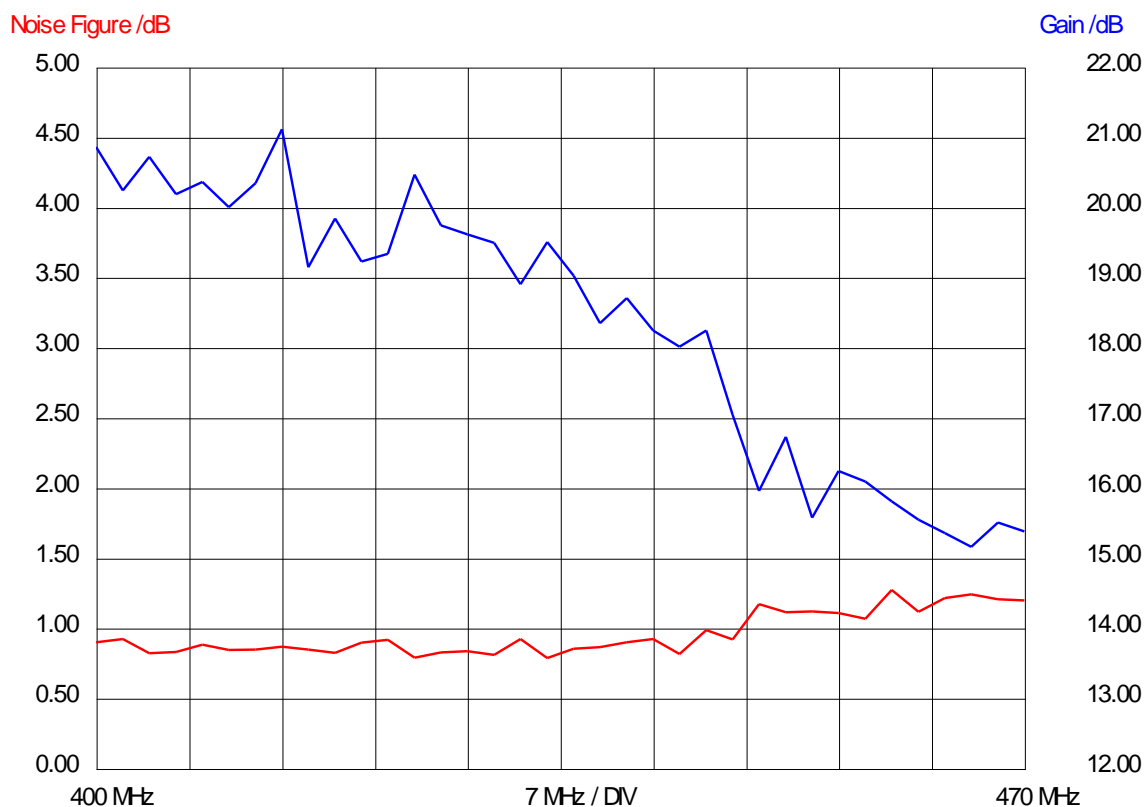








Finally, I found the time to test the amplifier. Gain and noise figure were measured in the frequency range 400 – 470MHz. The blue curve is the measured gain, the red curve is the noise figure.



Here is a table with the corresponding measurement results:

Frequency	Gain /dB	NF /dB	Frequency	Gain /dB	NF /dB
400 MHz	20.86	0.90	434 MHz	19.51	0.79
402 MHz	20.24	0.92	436 MHz	19.03	0.85
404 MHz	20.72	0.82	438 MHz	18.35	0.87
406 MHz	20.19	0.83	440 MHz	18.71	0.90
408 MHz	20.36	0.88	442 MHz	18.24	0.92
410 MHz	20.00	0.84	444 MHz	18.01	0.82
412 MHz	20.34	0.85	446 MHz	18.24	0.99
414 MHz	21.11	0.87	448 MHz	17.04	0.92
416 MHz	19.15	0.85	450 MHz	15.96	1.17
418 MHz	19.84	0.82	452 MHz	16.73	1.11
420 MHz	19.23	0.90	454 MHz	15.58	1.12
422 MHz	19.34	0.92	456 MHz	16.24	1.11
424 MHz	20.47	0.79	458 MHz	16.09	1.07
426 MHz	19.74	0.83	460 MHz	15.81	1.27
428 MHz	19.62	0.84	462 MHz	15.55	1.12
430 MHz	19.49	0.81	464 MHz	15.36	1.22
432 MHz	18.90	0.92	466 MHz	15.16	1.24
			468 MHz	15.51	1.21
			470 MHz	15.38	1.20

Noise figure in the specified frequency range 420-450 MHz is between 0.79 and 1.17dB. It never is as low as the specified noise figure of 0.5dB.

Gain at 434 MHz is 19.5dB. In the specified 1dB Bandwidth the gain variation is actually 5.5dB.

I am very interested to hear from others their measurement results.

I am always happy to receive feedback and will be happy to answer questions.

Matthias DD1US

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Appendix: Instruction Sheet P432VDG

P28VDG
P50VDG
P136VDG
P144VDG
P220VDG
P432VDG

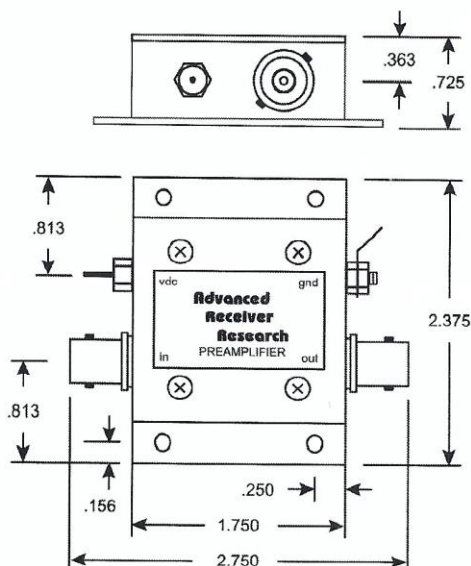
Series PXXXVDG preamplifiers have been specifically designed for commercial use. Each preamplifier is housed in a completely shielded, rugged custom aluminum enclosure. To maintain a high degree of rf shielding a feedthrough-type capacitor is used for the positive dc connection. A solder-lug terminal opposite the feedthrough capacitor is provided for the dc ground connection. Every preamplifier has been precision aligned on our Hewlett-Packard HP8970B/HP346A noise-figure measuring equipment and should not require further adjustment.

The PXXXVDG preamplifiers are suitable for fixed, mobile or portable operation. Power supply requirements are a regulated 11 - 16 VDC at 25 mA current draw. Small size, low power consumption and rugged construction make these preamplifiers ideal for installation within existing equipment or remote mounting at the antenna.

Theory and Operation

Signals arriving at the input terminal are routed to the gate of the GaAsFET through an L network comprised of C1 and L1. The source of the device is held above ground by R1 which develops the appropriate gate-source voltage. The .01 uF capacitors ground the source for rf. A broadband ferrite transformer is used to match the drain circuit and provide a low impedance load for the GaAsFET. The positive supply line is passed through a .001 uF feedthrough capacitor to maintain effective shielding. A series diode protects the preamplifier against accidental application of reverse polarity voltage. A 78L05 provides a regulated 5-volt supply for the GaAsFET and protects the device from power supply transients.

Interconnection to a receiver is quite straightforward. The antenna is connected to the the preamplifier input terminal (labeled **IN**). A coaxial cable is used to connect the output of the preamplifier (labeled **OUT**) to the receiver antenna terminal. A power supply capable of delivering the proper voltage and current is connected to the lugs marked **VDC** and **GND**. Vdc is positive and gnd is negative. Each preamplifier is specified for operation over the temperature range of -25 to +65 degrees C.



Specifications

Model	Bandwidth 1 dB	Noise Figure	Gain	Compression 1 dB
P28VDG	2.0 MHz	0.5 dB	26 dB	+12 dBm
P50VDG	4.0 MHz	0.5 dB	24 dB	+12 dBm
P136VDG	7 MHz	0.5 dB	24 dB	+12 dBm
P144VDG	7 MHz	0.5 dB	24 dB	+12 dBm
P220VDG	12 MHz	0.5 dB	20 dB	+12 dBm
P432VDG	40 MHz	0.5 dB	16 dB	+12 dBm

Supply Voltage: 11-16 Vdc
Supply Current: 25 mA
Weight: 2.0 oz.

Box 1242 Burlington CT 06013 (860)485-0310 www.advancedreceiver.com

All Advanced Receiver Research products are warranted against defects in materials and workmanship. This applies for one year from the date of delivery. We will repair or replace products which prove to be defective during the warranty period provided they are returned to Advanced Receiver Research. Shipments should not be made without prior authorization by Advanced Receiver Research. No other warranties are expressed or implied. We are not liable for consequential damages.

All Models

P28VDGINS 01/06