

# PGA432, 70cm preamp technical description

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Version 0.1*

Following on from the successful PGA144 preamplifier the PGA432 uses the same techniques to deliver a low noise, high dynamic range preamplifier for the 70cm band. A deep notch at 144MHz is incorporated as protection against strong 144MHz (2m amateur band) signals such as might be experienced when operating on 70cm during a multiband contest or when using satellite Mode J with the user uplink on 144MHz. The notch is over 60dB down on the wanted 432/435MHz at the preamplifier output.

The use of combined high pass filtering and a parallel notch at the input ensures low insertion loss and hence minimal addition to the overall preamplifier noise figure. A simple bandpass filter at the output reduces response above the band by tailoring the gain to fall gradually with frequency. A variable attenuator allows the user to set the preamplifier gain to suit system requirements. Maximum gain is 18dB at 432MHz. Overall noise figure is below 0.7dB when correctly adjusted whilst input return loss is over 10dB at 432MHz. Although this is not important for achieving lowest noise figure it does ensure that if a filter is used ahead of the preamplifier its frequency response will be maintained, which would not be the case with many early GaAs FET preamplifiers.

Powering the PGA432 over the receiver coax is possible by incorporating the bias tee consisting of L5 and C13. Alternatively a direct supply of between 10 and 16V can be connected to the feed-through capacitor. A series diode ensures protection against supply polarity reversal or back-feeding from any supply on the coax cable.

Parameter	Measurement (typical figures)	Comments
Noise figure	0.68dB	@290k
Gain (max)	18dB	
Input return loss (match)	10.7dB @ 432MHz	Can be improved at the expense of noise figure
Loss at 144MHz	62dB (wrt output)	
Loss at 225MHz (DAB)	24dB (wrt output)	
Loss at 300MHz	5dB (wrt output)	
Current taken	84mA	+13.5V, internally regulated to +5V

***Measurements on a PGA432 preamplifier.***

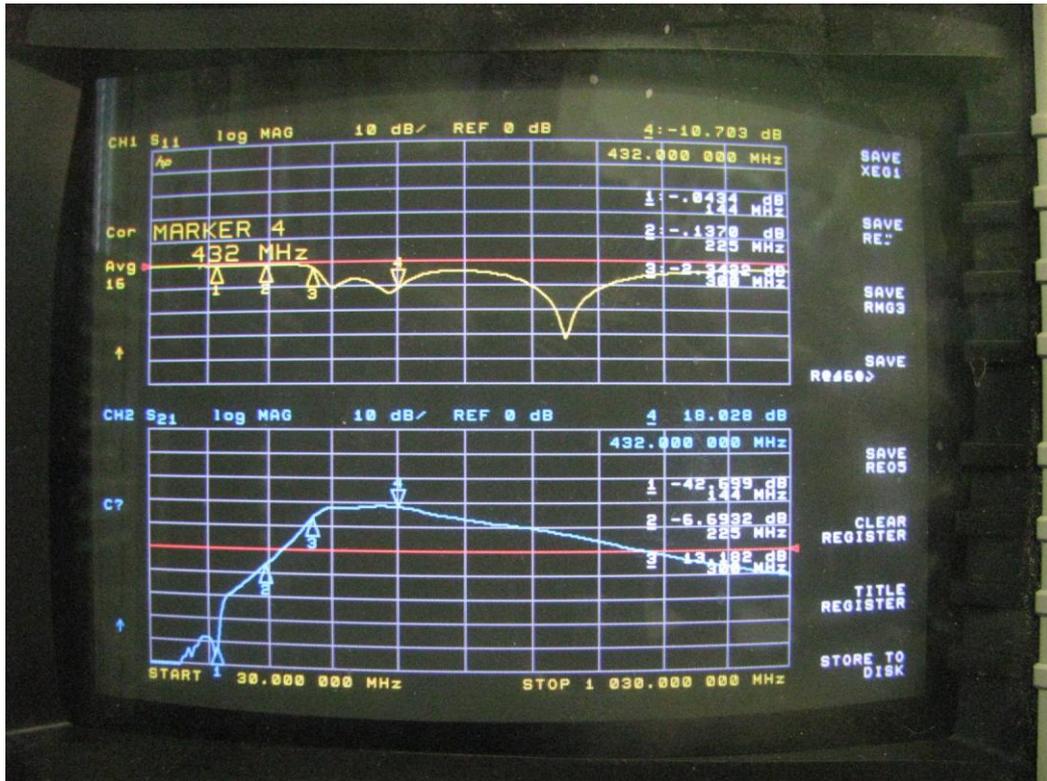
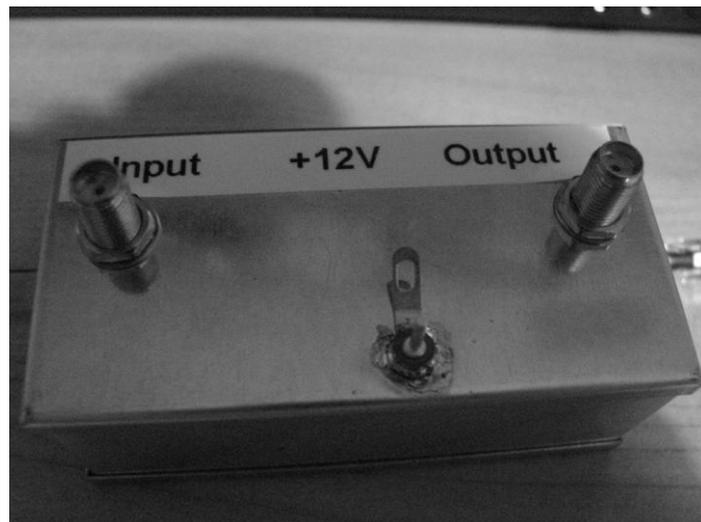


Photo 1

**Input return loss (yellow curve) Frequency response (blue curve) plots of the PGA432 preamplifier**

Marker 1 is 144MHz  
 Marker 2 is 225MHz  
 Marker 3 is 300MHz  
 Marker 4 is 432MHz



Document history

Date	Version	Initial info
17/11/16	Version 0.1	Initial info

