

Ham band RFD 2305 / 2315 noise source Frequently Asked Questions.

Q. Is the RFD 2305 usable as a 15dB ENR source?

A. Yes. The product includes an external Mini-Circuits 10dB, 6GHz pad. The RFD 2305 calibration is provided for nominally 5dB ENR, but removing the external attenuator will give nominally 15dB ENR. The Mini-Circuits attenuator has a specified flatness of typically ± 0.13 dB DC to 3.5GHz, so the noise source calibration worst case uncertainty increases by approximately that amount. For higher noise figure measurement applications where 15dB ENR is desired, this additional uncertainty is perhaps not of major concern.

Q. How flat is the output?

A. RFD 2305 and RFD 2315 have a better than ± 1 dB flatness specification.

Q. What accuracy can I expect from the ENR calibration?

A. The ENR uncertainty at the factory calibration temperature is typically better than ± 0.25 dB.

Q. What is the RFD 2315 output VSWR and how does it change hot to cold?

A. The 15dB ENR source has a worst case VSWR of 1.4:1 up to 23cm and a reflection coefficient change of < 0.1 . This provides a good impedance match to amplifier inputs and in percentage terms doesn't significantly degrade the optimum tuning of stages with moderate noise figure values of > 4 dB. For high performance, very low noise figure amplifiers, we recommend the RFD 2305.

Q. How good is the RFD 2305 output VSWR and how does it change hot to cold?

A. The 5dB ENR source has a worst case VSWR of 1.25:1 and a reflection coefficient change of < 0.01 . This provides a good and consistent impedance match, hot or cold for tuning low noise amplifiers.

Q. How does ambient temperature influence the noise source performance?

A. Flatness and impedance match specifications are held for the calibration temperature supplied $\pm 5^\circ\text{C}$. The ENR value has a temperature coefficient of -0.03 dB / $^\circ\text{C}$. This translates in to a 0.3dB change in ENR for a 10°C temperature change. If you use the noise source at a variety of temperatures, factoring in this characteristic will improve measurement accuracy.

Q. How do the RFD noise sources compare in performance to the well known HP 346A and B?

A. Our sources operate over a narrower frequency range and with less ENR accuracy, delivering noise figure test results typically within a couple of tenths of dB of calibrated HP sources (RFD calibration temperature correction factored in).

To reduce gain error in the noise figure measurement of preamps, the hot / cold reflection coefficient change in the RFD 2305 5dB ENR noise source is < 0.01 . This allows a near optimum noise figure circuit condition to be established in your amplifier and then, a repeatable NF value to be measured.

If **you** have any questions please email martyn@rfdesignuk.com we would love to hear from you!