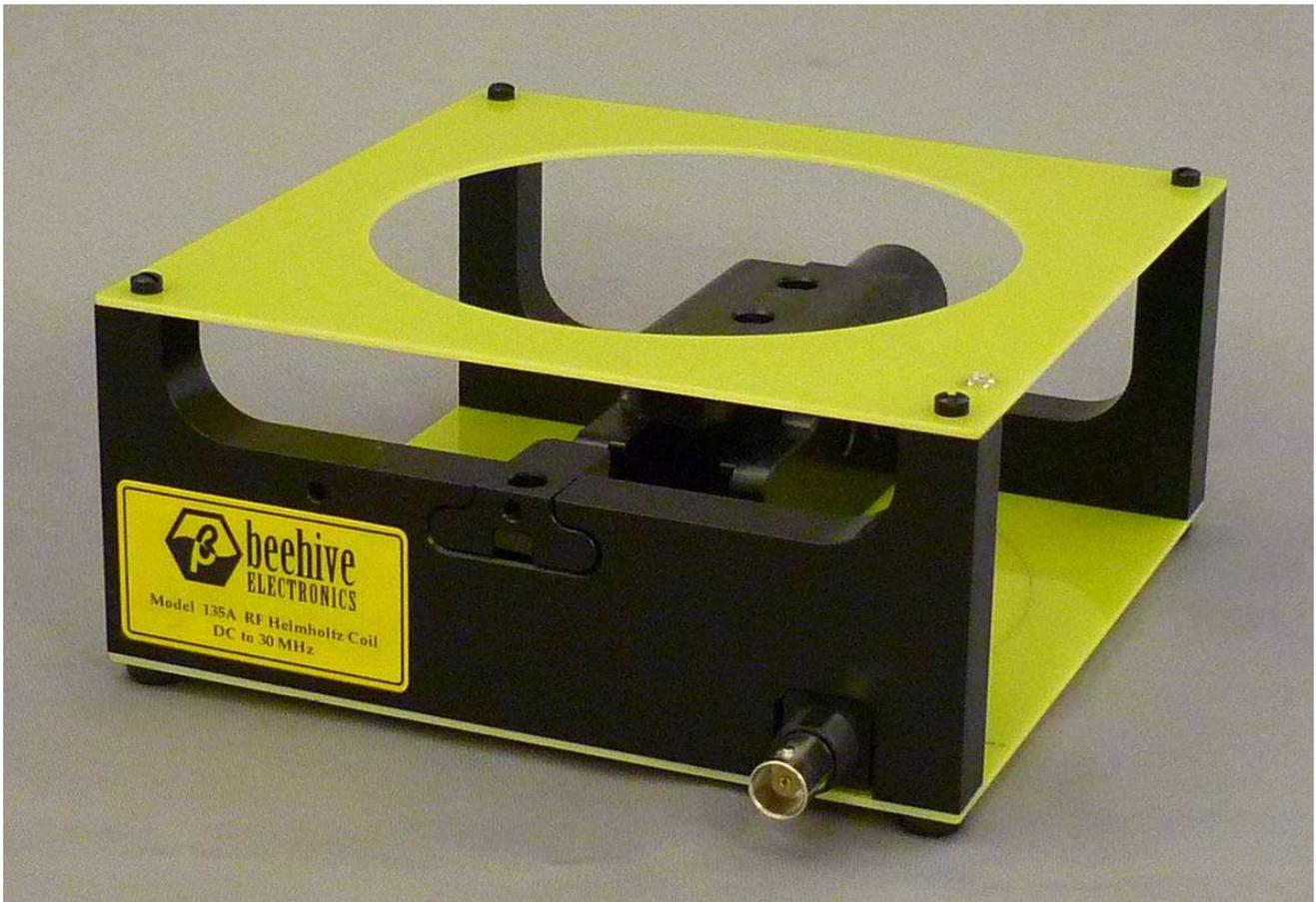




beehive
ELECTRONICS

135A RF Helmholtz Coil

Datasheet



Description

The 135A RF Helmholtz Coil generates a controlled, well-defined magnetic field between its coils. This magnetic field can be used to calibrate magnetic field probes, or to generate a controlled field for testing other devices.

The 135A is optimized for high-frequency performance, and is usable up to 30 MHz.

The 135A includes fixturing to precisely hold the Beehive Electronics 100A, 100B, and 100C EMC probes so that the user may measure the sensitivity of the probes and calculate their calibration factors. Mounting holes are provided to allow the user to fixture other devices inside the Helmholtz coil.

Features

- Allows the user to calibrate magnetic fields sensors or to subject test samples to controlled, repeatable magnetic fields.
- Wide bandwidth allows operation up to 30 MHz.
- Includes fixtures for use in calibration 100A, 100B, 100C probes.
- Mounting features provided for user-supplied fixtures allow calibration or measurement of many devices.
- Designed for use with standard 50 ohm signal sources.

Specifications

Gain

Expressed as flux density/current

$$1.45 \cdot 10^{-5} \text{ tesla/ampere}$$

Expressed as magnetic field strength/current

$$11.54 \text{ ((amperes/meter)/amperes) or } 11.54 \text{ m}^{-1}$$

Frequency Response

The frequency response of the 135A, expressed as a ratio of output magnetic flux to input current, shows less than 1 dB of variation from DC to 30 MHz:

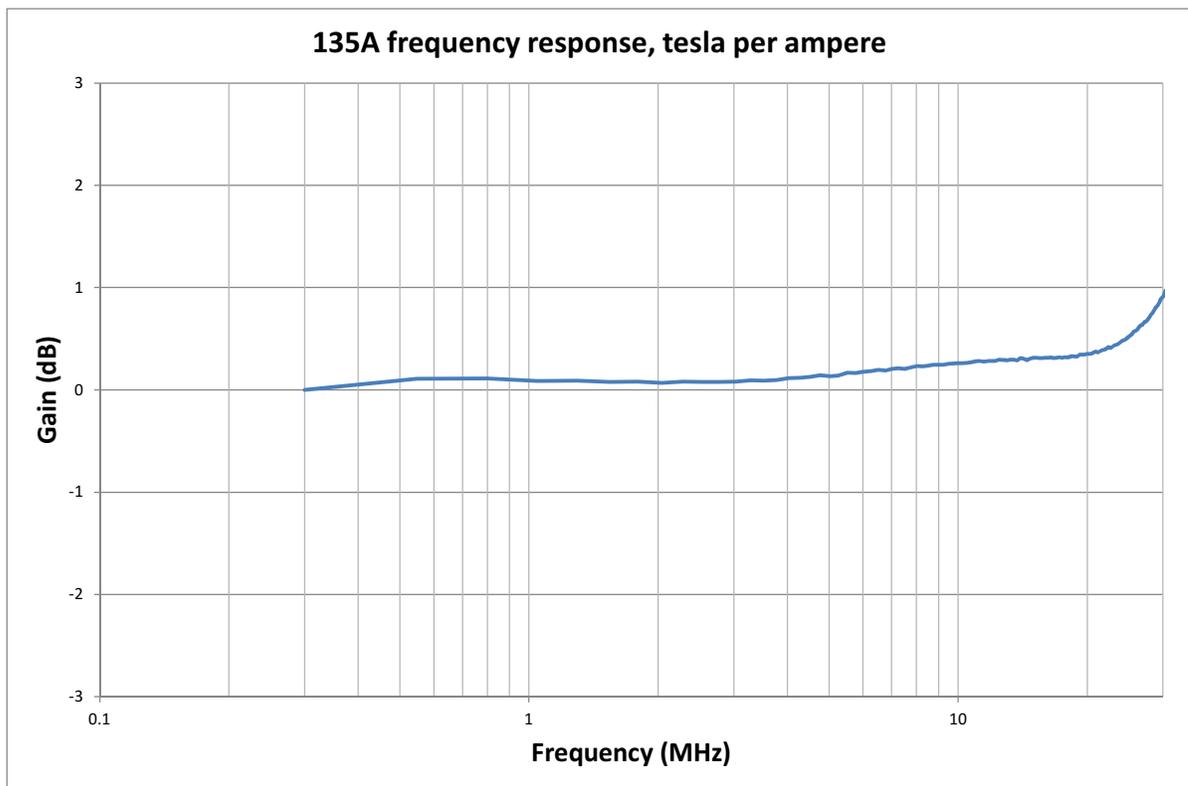


Figure 1

When driven from a 50 ohm source, more frequency response rolloff will be observed because the Helmholtz coil's input impedance increases with frequency, reducing the current drawn from the 50 ohm source. When driven from 50 ohms, this effect results in the frequency response shown below in figure 2. This effect can be easily compensated for, if desired, as shown later in this manual.

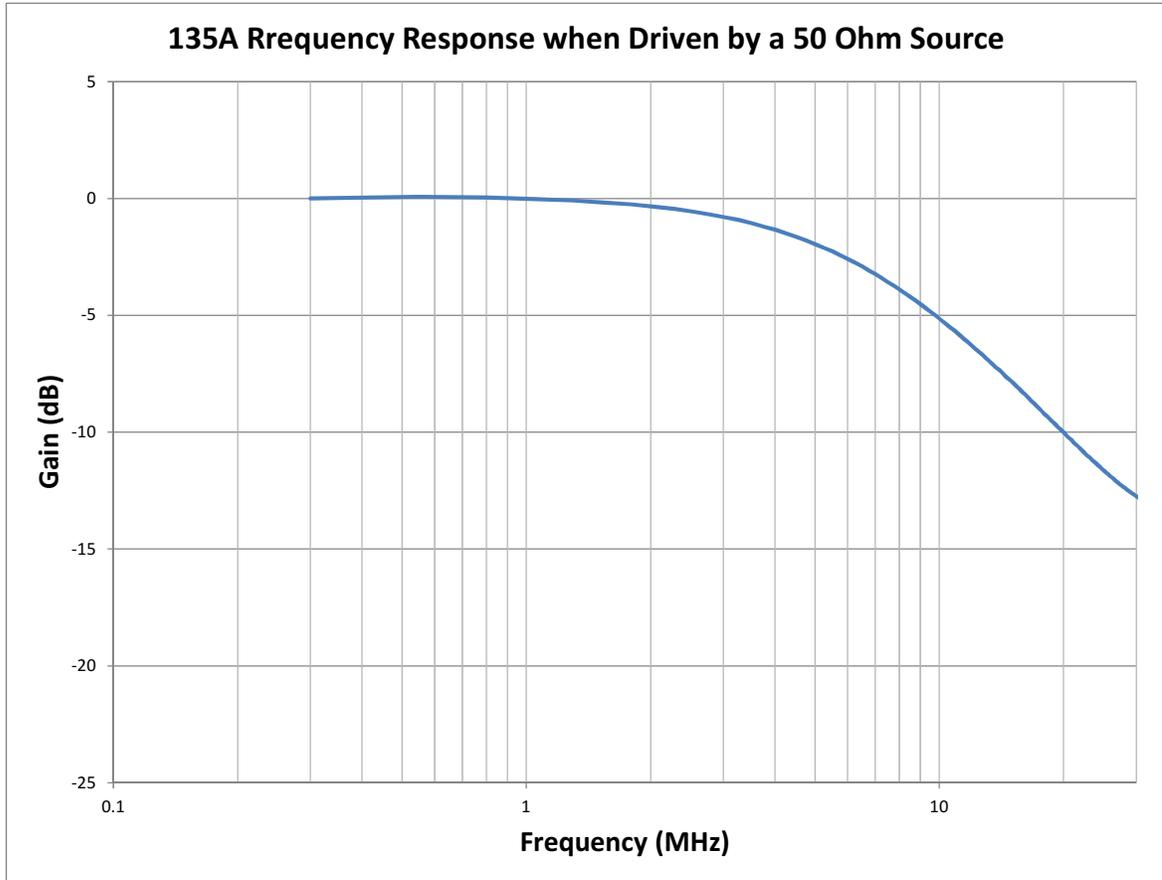


Figure 2

Maximum Input Current

0.5 amperes peak, 0.35 amperes rms

Maximum Input Voltage

240 volts peak, 170 volts rms

Maximum Input Power

When using a 50 ohm source to drive the Helmholtz coil, the power limits shown in figure 3 below guarantee that neither the maximum input current or maximum input power will be exceeded.

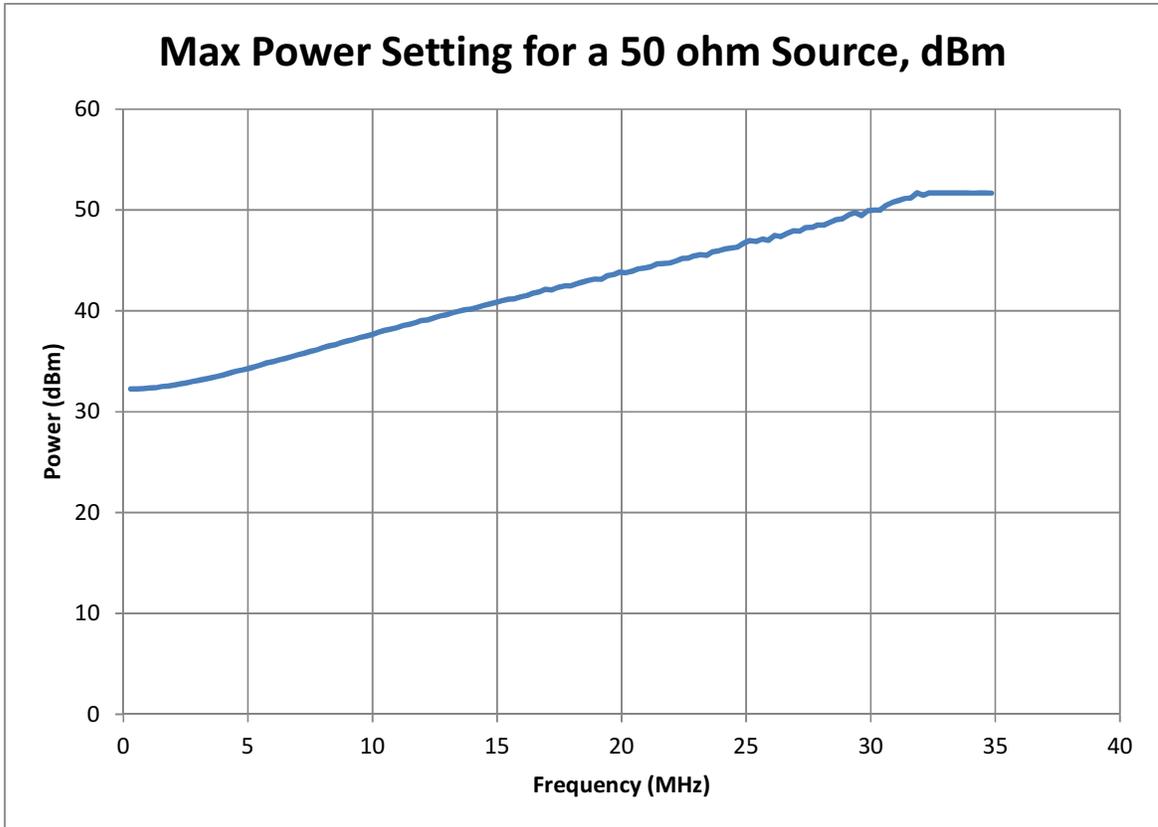


Figure 3

Port Characteristics

Impedance

Inductance: 1.25 uH +/- 10%, test frequency 1 MHz

Typical impedance versus frequency is shown in figure 4 below:

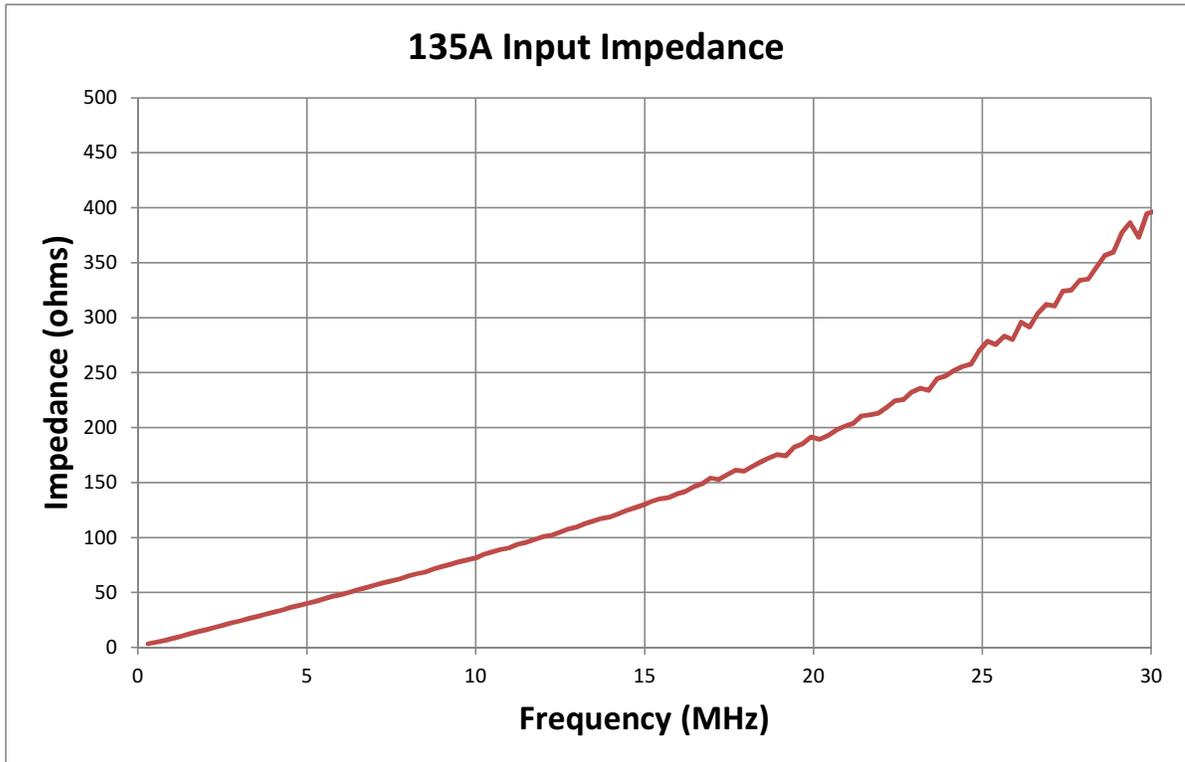


Figure 4

Connector

BNC female

Environmental

Operating temperature: 0C to 55C

Storage temperature: -20C to 70C

Dimensions

Loop dimensions

Loop diameter	4.88" (123.9 mm)
Loop spacing	2.44" (62.0 mm)

Overall dimensions

Height:	2.5" (63 mm)
Width:	6" (152 mm)
Depth:	6" (152 mm)

Warranty

- 1 year warranty
- 30 day unconditional return policy

For further information

Visit our web site for applications notes and the latest versions of the 135A's documentation.