COM-POWER CORPORATION

Active Horn Antenna
AHA-840

Features

- Broadband - 18 GHz to 40 GHz
- Built-in Preamplifier Increases Sensitivity
- Low Antenna Factors
- Emissions & Immunity Capability
- Individual Calibration Included

Low Noise Figure

The high gain and low noise figure of the built-in preamplifier increase overall measurement system sensitivity by amplifying low-level signals before the cable loss between the antenna and the spectrum analyzer / receiver, making it easier to distinguish weak EMI signals from the receiver noise floor.

Description

The AHA-840 Active Horn Antenna is part of Com-Power's extensive line of EMC test antennas. The AHA-840 smartly incorporates a broadband, double ridged waveguide horn antenna with precision waveguide to coaxial adapter (meticulously tuned as a set for optimum VSWR performance and impedance matching) and a broadband, high-gain, low-noise preamplifier; integrated into a single, well-built, durable, custom designed assembly which facilitates the flexibility to be configured for almost any application.

Application

There are many challenges associated with radiated emissions testing in the 18 to 40 GHz frequency range. Most will agree that, after the investment of necessary capital (which is really more of an obstacle than a challenge), the next highest on the list is achieving an acceptable signal to noise ratio to be able to perform the testing accurately.

Although, if the initial investment of capital is used wisely, the second challenge can be made to be much less challenging. The AHA-840 Active Horn Antenna can go a long way in this regard. By employing the AHA-840 Active Horn Antenna in conjunction with a set of high-quality, low-loss microwave cables (kept as short as possible), you'll be able to alleviate most of the challenges others face, and be able to start testing.

Calibration

The AHA-840 is individually calibrated at 3 meters distance per the procedures described in ANSI C63.5, with NIST traceability. In addition to individual calibration of the antenna and preamp/cable, it is also calibrated as a single unit (antenna/preamplifier/cable combined), thereby accounting for any mismatch between components, increasing overall measurement accuracy and decreasing the associated measurement uncertainty. The calibration data and certificate is shipped with each antenna. Recognized ISO 17025 accredited calibration is also available upon request.

Advantages

The RF connection between the antenna output connector and preamplifier input is made externally via a short, high quality coaxial cable assembly. The accessibility of these connection points allows the insertion of attenuation pads, band pass filters, notch filters, etc., as needed, between the antenna and preamplifier, which is not possible with other antennas of this type available on the market.

This test equipment arrangement, with the placement of the preamplifier near the antenna, rather than next to (or embedded into) the test receiver, increases measurement accuracy by amplifying the received signals prior to being significantly attenuated by the long cable run between the test site and test equipment area.

The gain of the preamplifier intentionally increases with frequency at about the same slope as the antenna factor of the horn vs frequency, resulting in a relatively flat active antenna factor over the frequency range.

Flexibility

The AHA-840 can also be easily configured for other applications as well. By adding attenuation between the antenna and preamplifier, or simply bypassing the preamplifier altogether, the antenna can be used for measurements of higher-amplitude signals, where preamplifier saturation becomes more of a concern than signal to noise ratio. This capability gives the AHA-840 an unrivaled dynamic range over which measurements are able to be performed.

The antenna can also be used for immunity testing. By removing the waveguide to coaxial adapter and connecting directly, or with a length of flexible waveguide, to your amplifier's waveguide output, field strengths up to 1100 V/m @ 1 meter can be achieved with 200 watts input power.

With the waveguide to coaxial adapter left in place, field strengths up to 250 V/m @ 1 meter can be achieved with 10 watts input power.

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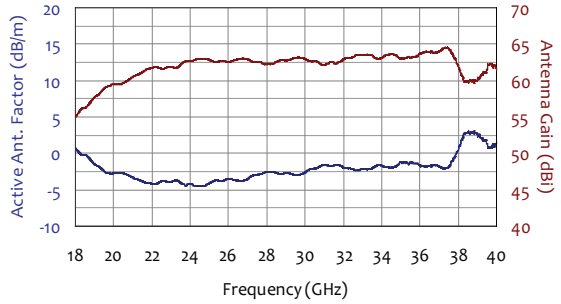
Specifications

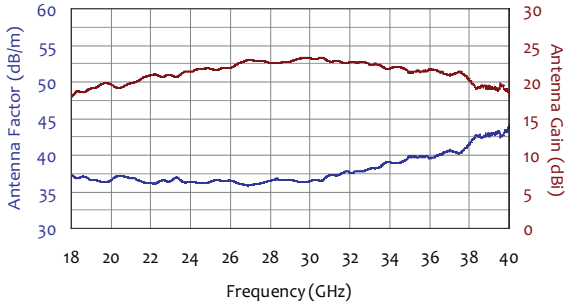
All values are typical, unless specified.
All specifications are subject to change without notice.

Product Name	Active Horn Antenna
Frequency Range	18 GHz to 40 GHz
Polarization	Linear
VSWR - Antenna Port	1.4:1 *(average)*
P_{OUT} @ 1 dB Compression	>10 dBm
P_{OUT} @ Third Order Intercept	17 dBm
Noise Figure	< 5 dB (@ 25°C)
AC Adapter Output (for preamplifier power)	6 V_{DC} *(unregulated)*, 500 mA
Preamplifier Gain	37 to 43 dB *(see graph below)*
Dimensions	10.2" x 8.5" x 5.9" (26 cm x 21.7 cm x 15 cm)
Weight	1.5 lbs (0.68 kg)
Connector Types	50Ω *[2.92mm]* "K type" female (for all RF connections)

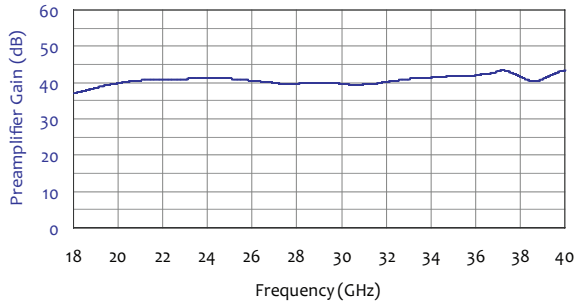
Typical Active Antenna Factors / Gain



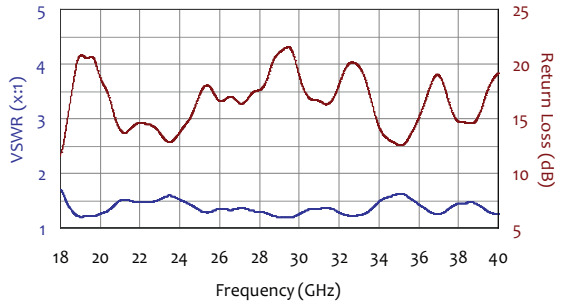
Typical Antenna Factors / Gain
(not including preamplifier gain)



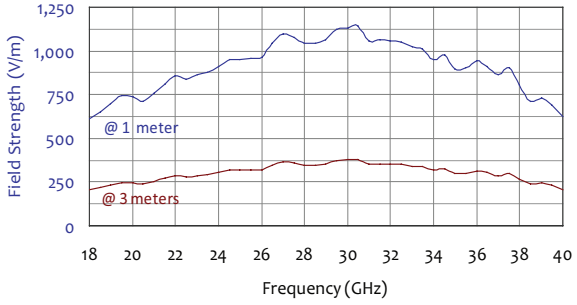
Typical Preamplifier Gain



Typical VSWR / Return Loss



Typical Field Strength - 200W input power
(directly to waveguide input - waveguide to coaxial adapter removed)



Typical Field Strength - 10W input power
(to 2.92mm input of waveguide to coaxial adapter)