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COM- POWER EMC Products Catalogue

Features

Broadband - 30 MHz to 300 MHz

Transmit and receive capability

Individual calibration

Two year warranty



Description

The AB-900 is a linearly polarized broadband Biconical antenna specifically designed for EMC testing. It has a frequency range of 30- 300 MHz. This antenna can be used for both emissions and immunity testing.

For immunity testing, the AB-900 antenna has a balun that is capable of accepting up to 50 Watts at its input terminals to generate electromagnetic fields.

These antennas are individually calibrated using procedures described in ANSI 63.4. The calibration data is shipped with the antenna to maximize measurement accuracy.

Both antenna models have the same mounting base, with a 1/4 inch x 20 threaded hole. It can be mounted on a Com-Power AT-100 tripod or any other antenna tripod with matching threads.

Application

Biconical antennas are used for emissions and immunity testing to meet various EMC standards specified by FCC, CISPR and EN. The broadband characteristics of the biconical antenna make it a good choice for making sweep measurements and for automated measurement systems.

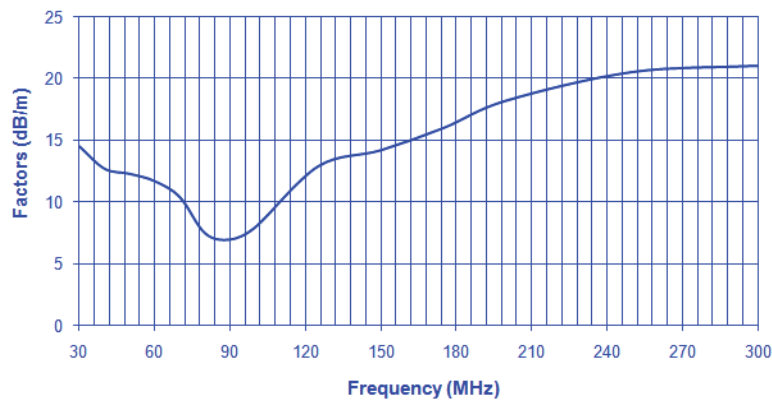
Normally, tuned dipole antennas are used for EMC site attenuation measurements for better accuracy. However, the biconical antenna is easier to use for vertical site attenuation measurements, because of the long dipole element lengths at lower frequencies (5 meters at 30 MHz). According to ANSI 63.4 specification, a calibrated biconical and a log periodic antenna can be used for site attenuation measurements.

The calibration data provided with each antenna is used to calculate field strength measured for the selected frequency. The antenna factor (dB/m) for the selected frequency is added to the measured output (dBV) displayed by the EMI meter to obtain field strength (dBV/m).

Specifications

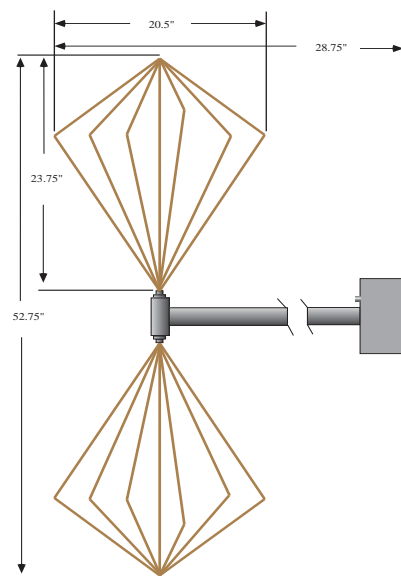
Frequency Range:	30 MHz-300 MHz
Polarization:	Linear
Power handling:	50 Watts continuous
Impedance:	50 Ω
Connector:	BNC (f)
Weight:	7 lbs. (3.5 kg) max.
Size: (L x W)	28.75" x 52.75" (73 cm x 134 cm)

Typical Antenna Factors:



Field strength (dBV/m) = Output measured (dBV) + Antenna Factor (dB/m)

Mechanical Outline:



Features

Frequency range: 30 MHz to 300 MHz

Collapsible antenna elements

Part of ANK series antenna kits

Individual Calibration

Three year warranty



Description

The ABF-900 is a linearly polarized broadband Biconical antenna. It has a frequency range of 30-300 MHz. It has the same performance as the AB-900, but it is shipped with a set of collapsible conical elements. This antenna is part of the ANK series antenna kits.

The ABF-900 antenna has a N type connector. The antenna is capable of handling up to 50 Watts of input to generate electromagnetic fields during EMC immunity testing.

These antennas are individually calibrated at 10 meter distance using procedures described in ANSI 63.4. This data is shipped with each antenna. Optional calibration at 1 meter or any user specified distance is available upon request. Accredited calibration services are also available.

The ABF-900 balun has a 1/4 inch x 20 threaded hole on the back. It can be mounted on Com-Power AT-120 tripod or any other antenna tripod with matching threads. It can be also mounted on a antenna mast with a similar mounting arrangement. As an alternate mounting method, ATC-001 clamp can be used. This clamp fits around the PVC tube on the balun to securely attach the antenna to a tripod or the antenna mast without the threaded mounting bolt.

Application

The ABF-900 Biconical antenna has collapsible antenna elements for easy storage and transport. It is good choice for off site EMC measurements. The broadband characteristics of the ABF-900 antenna make it ideal for making sweep measurements. It can be purchased separately or as part of the ANK-310, ANK-910L and ANK-910M antenna kits.

In addition to emc emission or immunity measurement, the biconical antenna can be used for site EMC site calibrations. The ABF-900 Biconical antenna has smaller elements and is easier to use. Especially for vertical site attenuation measurements at low frequencies. Dipole antennas which are typically recommended for site calibration have long element lengths at lower frequencies (5 meters at 30 MHz) According to ANSI 63.4 specification, a calibrated biconical antennas can be used for site attenuation measurements.

The calibration data provided with each antenna is used to calculate field strength measured for the selected frequency. The antenna factor (dB/m) for the selected frequency is added to the measured output (dBV) displayed by the EMI receiver to obtain field strength (dBV/m)

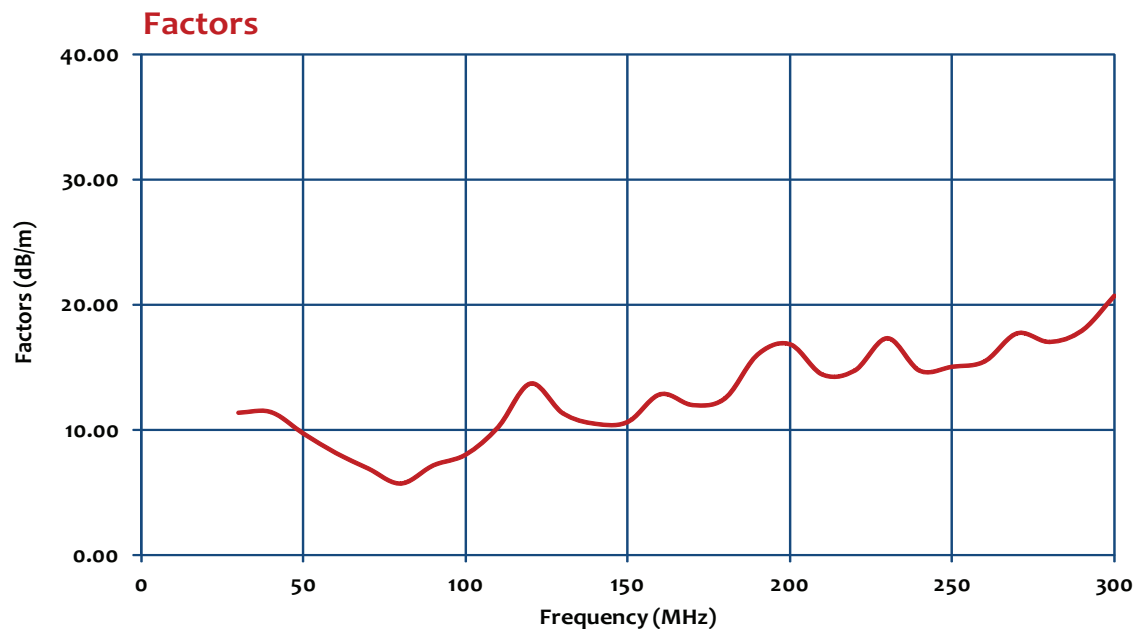
Specifications

Product Name	Biconical Antenna with collapsible elements
Frequency Range	30 to 300 MHz
Application	EMC measurements
Antenna factors	5.6 to 20.5 dB/m
Nominal Impedance	50 ohms
VSWR	3.0:1 (Average)
Connector Type	N type (female)
Power handling	50 Watts
Dimensions both elements (expanded)	52" x 21 inches 132 cm x 53 cm
Dimensions conical elements (Collapsed)	24 x 2 inches 60 x 5 cm
Weight	10 lbs. 4.5 kg



ABF-900 with fully collapsed elements

Typical Data



Features

Frequency Range: 1 GHz to 6 GHz

Dipole-like radiation pattern compliant with CISPR 16-1-4 requirements for >1 GHz site validation measurements

Transmit or receive capability

Three year warranty

Description

The ABM-6000 is a precisely tuned, linearly polarized, mini-biconical dipole antenna, operating at the low end of the microwave band over the frequency range of 1 to 6 GHz. It may be used as either a transmitting or receiving antenna.

The ABM-6000 was specifically designed to comply with radiation pattern specifications detailed in CISPR 16-1-4 (section 8.2.2.1), and is intended to be used as the transmit source antenna for site validations above 1 GHz for radiated emissions test sites, such as OATS (open area test sites), anechoic and semi-anechoic chambers.

Its lightweight, compact design makes the antenna easily portable, while its stainless steel housing and brass elements provide durability, enabling the antenna to be transported and used in almost any environment. The textured, powder-coated handle section of the shaft along with the supplied mounting clamp allow for easy mounting of the antenna on any tripod or antenna mast.

Each antenna is individually calibrated per ANSI C63.5: 2006 at 3 meters distance.

The antenna is supplied with a protective carrying case, mounting clamp, user's manual, calibration data and certificate. Com-Power also offers several non-conductive tripods.



Application

Until recently, radiated emission test site validation requirements and procedures existed only for frequencies between 30 MHz and 1 GHz. Validation requirements at higher frequencies remained "under consideration" literally for decades.

The eventual implementation of (>1GHz) requirements in CISPR 16-1-4 came in the form of the so-called site voltage standing-wave ratio (S_{VSWR}) procedure. In this procedure, a transmitting source antenna is placed in several positions within, and around the perimeter of, an imaginary cylindrical test volume, in which Equipment Under Test (EUT) would be located during testing. As the physical dimensions and types of radiating structures/apertures will vary depending on the EUT, it must be assumed that any EUT could potentially radiate energy in any given direction. Therefore, the transmit source antenna must have a relatively uniform radiation pattern in order to effectively "illuminate" the entire test volume and surrounding area equally, or else potential reflections that could occur during testing will be masked.

Since the ABM-6000 has a true "dipole-like" radiation pattern, as described in CISPR 16-1-4, it is the ideal choice as the transmit source antenna for test site validations using the S_{VSWR} procedure.

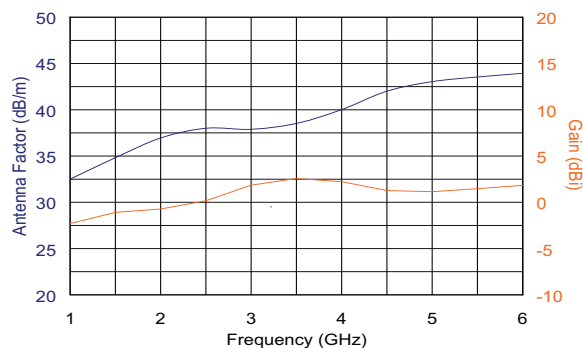
The ABM-6000 can also be used in a variety of applications such as, amplifier harmonic measurements per IEC 61000-4-3 or field surveys. It is ideal in almost any application necessitating measurements of high level signals with minimum field disruption.

Specifications

Antenna Type	Microwave Biconical
Frequency Range	1 to 6 GHz
Antenna Factor	32 to 46 dB/m
Isotropic Gain	-3 to 4.5 dBi
VSWR	3:1 (average)
3 dB beamwidth	75° to 95°
Impedance	50 ohms
Inversion Symmetry	< 1 dB
Cross-polarization	> 20 dB rejection
Overall Length	20.5 inches (52 cm)
Max. Width (elements)	2.5 inches (6.35 cm)
Connector Type	N-type (female)
Max. Input Power	50 Watts
Weight	13 oz. (0.368 kg)

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Antenna Factors / Gain (typical)

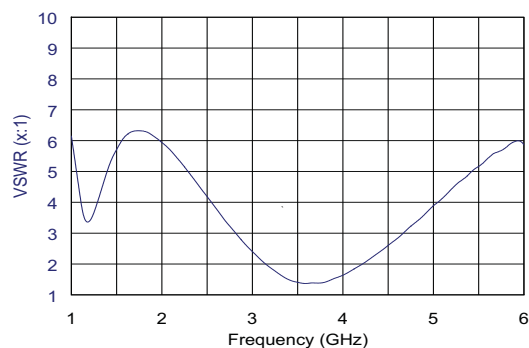


Traditional vs "in-line" dipoles

Some manufacturers have introduced unconventional "in-line" mini-biconical dipole antennas, in which the feed line is along a coincident plane with, and routed through, the center of the antenna elements, as opposed to the more traditional dipole arrangement employed by the ABM-6000, with the feed line perpendicular to the elements.

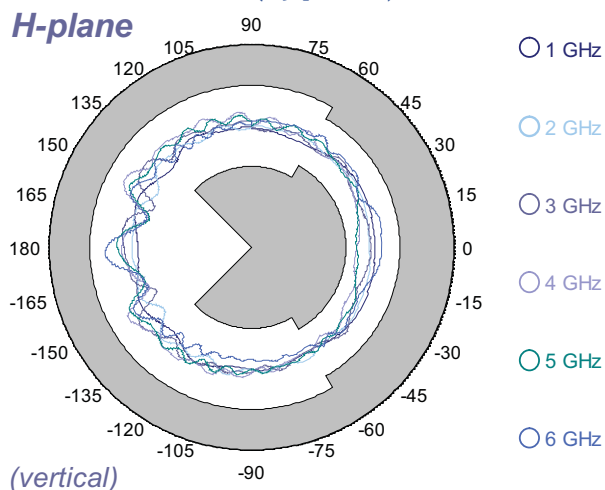
While the in-line arrangement does provide a more omnidirectional pattern in the H-plane (vertical axis), the E-plane (horizontal) performance is sacrificed. Horizontally, the antenna symmetry is offset by the feed line extending out along one side of the transmit plane, forming ripples and/or side lobes, which would not typically be present with the traditional dipole arrangement. These anomalies can often lead to unpredictable test results during site validation.

VSWR (typical)

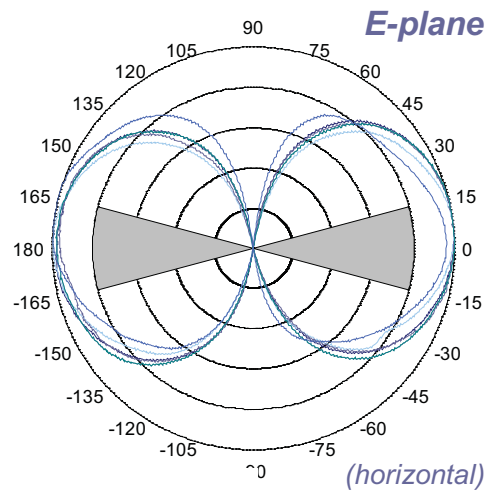


Antenna Patterns (typical)

H-plane



E-plane



Features

Broadband - 300 MHz - 1000 MHz

Transmitting and Receiving Applications

Individual Calibration

Three Year Warranty



Description

The Log Periodic antenna Model AL-100 is a broadband antenna for use in the 300-1000 MHz frequency band. This antenna can be used for EMC emissions measurements and also for immunity testing. The antenna is constructed with light weight aluminum with corrosion resistant conductive coating.

Each antenna is individually calibrated. The calibration data is provided with each antenna to maximize measurement accuracy. The AL-100 can transmit up to 50 W of continuous power for transmit applications.

The fiber glass mounting base allows the antenna to be mounted in vertical or horizontal polarizations. The mounting base also has a 1/4 inch x 20 threads. This enables the antenna to be attached to an antenna tripod such as model AT-100 tripod.

The AL-100 can also be mounted on an antenna mast. The antenna has a two year warranty.

Application

The AL-100 Log Periodic antenna is used for emission and immunity testing to verify compliance for FCC, CE and MIL-STD 461 specifications.

Log Periodic antennas allow quick sweep measurements without a band break. This feature makes it convenient to use the Log Periodic antenna with an automated emissions or immunity measurement system. The size of the antenna also allows it to be used in a small area like a shield room.

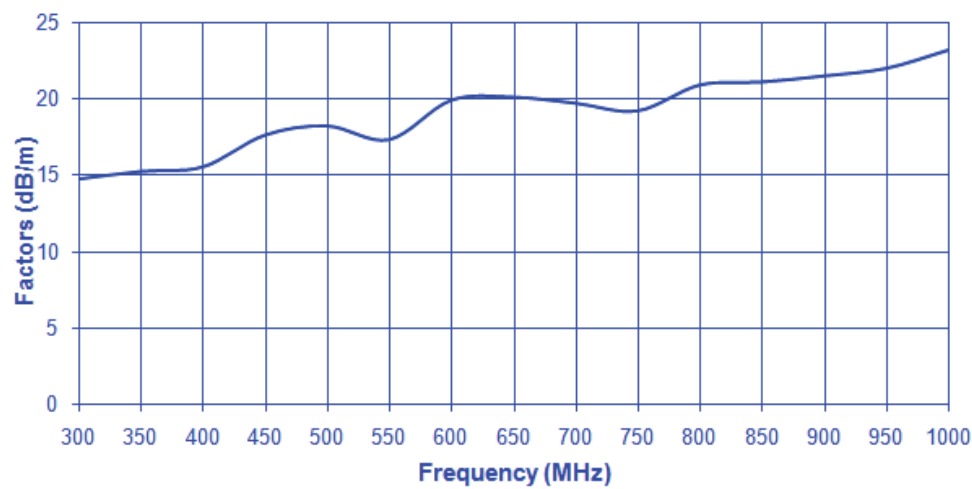
The Log Periodic antenna was designed to get a smooth response curve for the antenna factors to minimize measurement errors.

The calibration data provided with each antenna is used to calculate field strength measured for the selected frequency. The antenna factor (dB/m) for the selected frequency is added to the measured output (dBV) displayed by the EMI meter to obtain field strength (dBV/m).

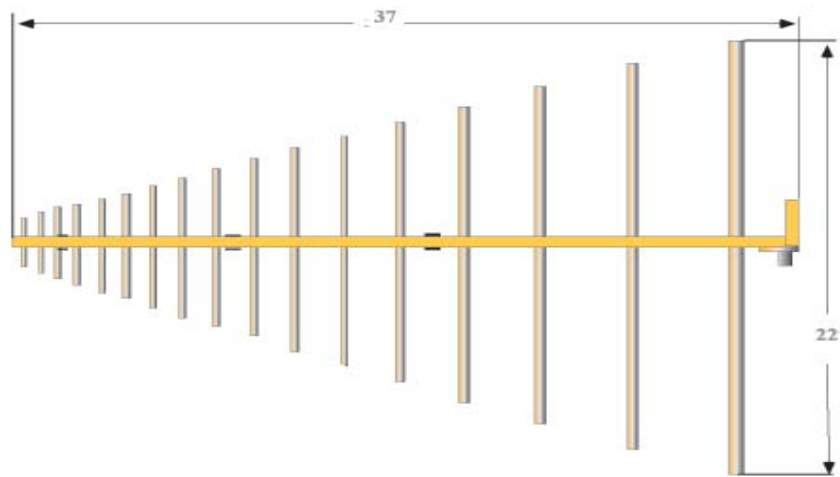
Specifications

Frequency Range:	300 MHz - 1000 MHz
Continuous input power (CW):	50 Watts
Polarization:	Linear
Impedance:	50 Ω
Connector:	BNC (f)
Width:	22 in / 55.8 cm
Length:	37 in / 93.9 cm
Weight:	4 lbs / 1.8 kg

Typical Antenna Factor:



Mechanical Outline:



Features

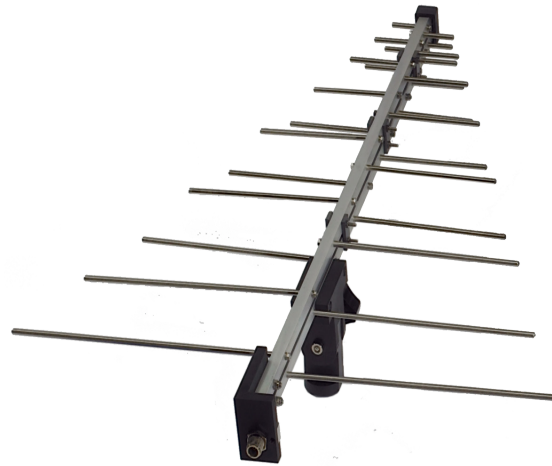
Frequency Range: 300 MHz to 1 GHz

Part of the ANK series antenna kits

Compact and light weight

Transmit or receive capability

Three year warranty



Description

The Compact Log Periodic antenna model ALC-100 is a broadband antenna with frequency range of 300 MHz to 1 GHz. This antenna can be used for EMC emissions or immunity measurements. It is smaller and lighter compared to the ALC-100 Log Periodic antenna and was designed for the Com-Power ANK series antenna kits.

These antennas are individually calibrated using procedures described in ANSI 63.4 at 10 meter distance using NIST traceable equipment. The calibration data is shipped with the antenna to maximize EMC measurement accuracy. User defined calibration distances or accredited calibration service is also available upon request. The ALC-100 has 50Ω N type connector and can handle up to 50W of continuous power input.

The ALC-100 can be mounted to a tripod or mast from the center using the attached mounting adapter. This adapter has pivoting joint that allows the antenna to be rotated to vertical or horizontal polarizations with ease. The bottom of the adapter has a 1/4 inch x 20 thread hole. This enables the antenna to be attached to the Com-Power AT-120 tripods. The AT-120 tripod can be purchased with a custom carrying case ATC-120.

Application

The ALC-100 Log Periodic antenna is suitable for EMC testing to verify compliance to various EMC standards such as FCC, EN/CE, CISPR, etc. The broadband characteristics of the log periodic antenna make it a good choice for making sweep measurements and for automated measurement systems. It also has low VSWR for efficient use of available power for generating electromagnetic field for immunity testing.

In addition, the ALC-100 can be used for EMC normalized site attenuation measurements. Normally, tuned dipole antennas are used for this purpose for better accuracy. However, a set of log periodic antennas are easier to use because it is compact in size and does not have to be tuned at each frequency. According to ANSI 63.4 specification, use of calibrated Log Periodic antennas is permitted as an alternative to dipole antennas.

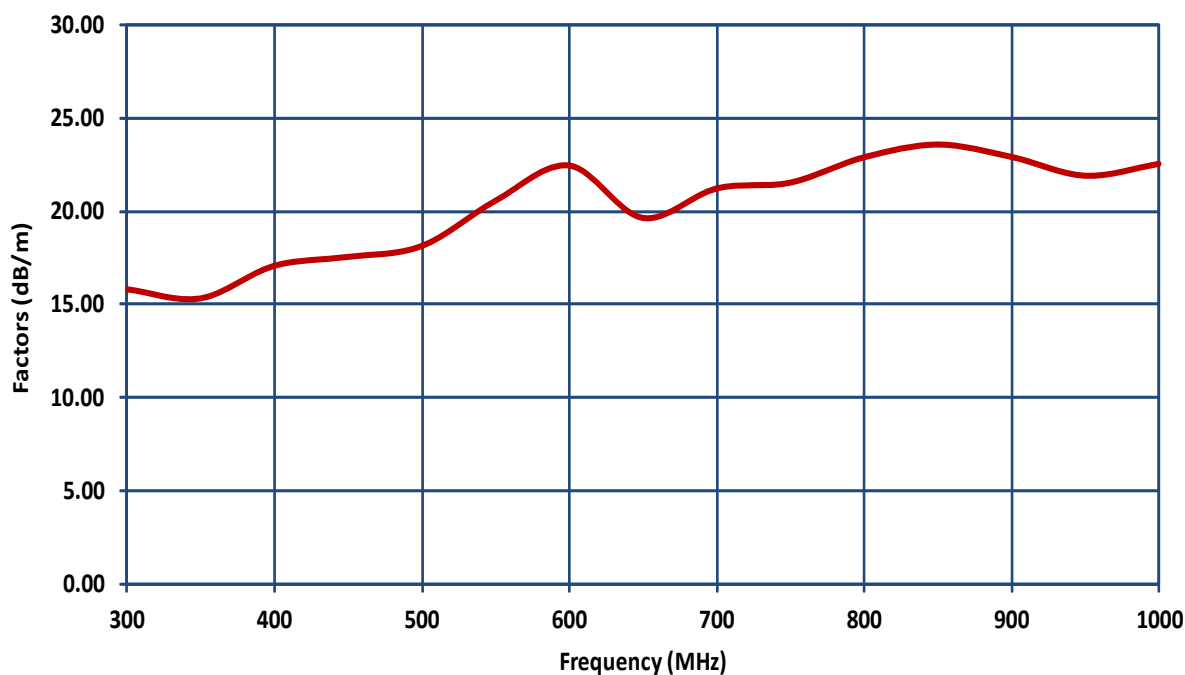
The individual calibration data shipped with each antenna includes antenna factor and isotropic gain. The antenna factors are used to calculate field strength for the selected frequency. The antenna factor (dB/m) for the selected frequency is added to the measured output (dBV) displayed by the receiver to obtain field strength (dBV/m). The gain data can be used to predict the required power needed to generate desired electromagnetic field for immunity testing using the ALC-100.

Specifications

Antenna Type	Log Periodic
Frequency Range	300 MHz to 1 GHz
Antenna Factor	15 to 22 dB/m
VSWR	2.5:1 (average)
Impedance	50 ohms
Power Handling	50 Watts CW
Overall Length	25.25 inches / 61.4 cm
Max. Width (elements)	21.5 inches / 55.8 cm
Connector Type	N-type (female)
Weight	2 lbs. / 0.9 kg

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Antenna Factors (typical)



Features

Broadband - 300 MHz - 1000 MHz

Transmitting and Receiving Applications

Individual Calibration

Three Year Warranty



Description

The Power Log Periodic antenna model ALP-100 is a broadband antenna for use in the 300-1000 MHz frequency band.

The ALP-100 antenna can be used for both emissions and high power immunity testing. For immunity measurement the ALP-100 can handle up to 500 Watts at the input. This antenna has low VSWR with good beamwidth pattern.

The antenna is mounted from the center using the attached pivoting fixture. This fixture allows quick polarization changes from vertical to horizontal. In addition it can be used to mount the antenna to a tripod or antenna mast.

This antenna is supplied with individual calibration data at 3 meters per ANSI C63.5 standard. However, Com-Power can calibrate the antenna to SAE ARP 958 at 1 meter distance at customer request.

Application

The ALP-100 Log Periodic antenna is used for emission and immunity testing to verify compliance for FCC, CE and MIL-STD 461 specifications.

Log Periodic antennas allow quick sweep measurements without a band break. This feature makes it convenient to use the Log Periodic antenna with an automated emissions or immunity measurement system. The size of the antenna also allows it to be used in a small area like a shield room.

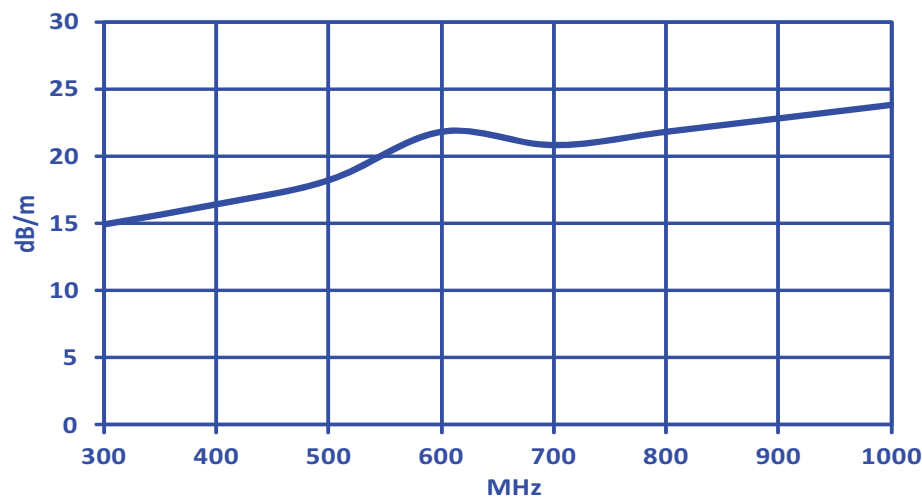
The Log Periodic antenna was designed to get a smooth response curve for the antenna factors to minimize measurement errors.

The calibration data provided with each antenna is used to calculate field strength measured for the selected frequency. The antenna factor (dB/m) for the selected frequency is added to the measured output (dBV) displayed by the EMI meter to obtain field strength (dBV/m).

Specifications

Frequency Range:	300 MHz - 1000 MHz
Continuous input power (CW):	500 Watts
Average Gain:	6 dBi
Average VSWR:	1.2: 1
Polarization:	Linear
Impedance:	50 Ω
Connector:	N type (f)
Width:	29 in / 75 cm
Length:	29 in / 75 cm
Weight:	5 lb / 2.2 kg

Typical Antenna Factor:



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

Features

Broadband: 30 MHz - 2000 MHz

Minimizes antenna switching

Transmit and receive capabilities

Individual calibration

Three year warranty



Description

The AC-220 Combilog antenna is broadband antennas designed to operate in the 30 MHz - 2000 MHz frequency range for electromagnetic compatibility testing. The Combilog antenna combines the electrical properties of a biconical antenna and a log periodic antenna.

The antenna can be mounted to mast using four 1/4 x20 threads mounting holes on the bottom. During automated EMC testing to minimize vertical displacement when changing polarity, an optional (ATC-400) fixture can be purchased with the antenna. This fixture can be mounted to the antenna mast cross boom.

For tripod mounting an optional adapter (ATC-100) is also available.

All elements are constructed using aluminum with corrosion resistant conductive coating. The rear triangle elements can be removed for storage and transportation.

Application

The Combilog antennas are designed for emissions and susceptibility testing to verify compliance to FCC, IEC, CISPR, FAA and MIL-STD specifications.

The main advantage of a Combilog antenna is that it covers the frequency range of the Biconical and Log Periodic antenna. This eliminates antenna switching (typically at 300 MHz) and allows continuous sweep measurement without a frequency band break. The broadband matching network located in the rear improves antenna response at the lower frequencies.

For susceptibility testing the Combilog antenna can be used in a shielded room for generating electromagnetic fields. It can handle up to 500 Watts input at its terminals.

Each Combilog antenna is individually calibrated. The calibration data will be shipped with each antenna.

During radiated emissions measurement, the field strength (dBV/m) is calculated for frequency selected, by adding the antenna factor dB/m to the output measurement (dBV) displayed by the EMI meter.

Specifications

- Frequency Range:

30 MHz - 2000 MHz (AC-220)
- Power handling:

500 Watt max.
- Gain:

5 dBi min. (200 MHz -2000 MHz)
- Impedance:

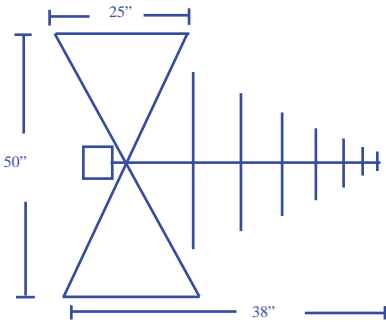
matched to 50 Ohm
- Connector:

Type N Female
- VSWR:

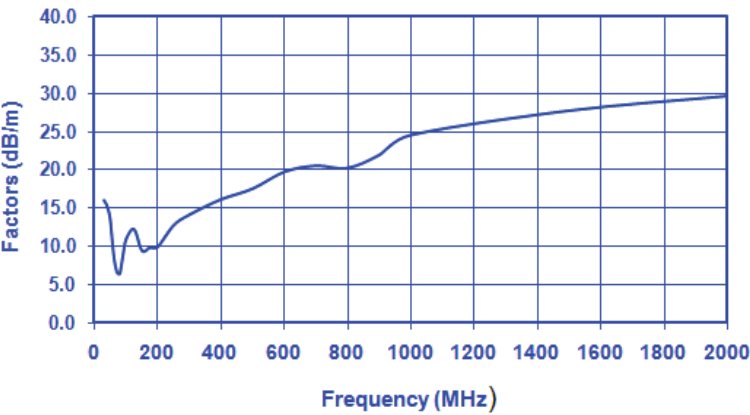
2:1 average
- Weight:

8 lbs. 3.6 kg
- Dimensions ((L x W x H):

38 x 50 x 25 inches , 96 x 127 x 63 cm



Typical Antenna Factors



Typical Input Power Requirement in (Watts) at 1 meter antenna spacing to achieve field (V/m)

Freq.	3 V/m	10 V/m	Freq.	3 V/m	10 V/m
80	0.67	29.7	600	0.02	1.08
90	0.70	31.2	700	0.02	1.00
100	0.60	26.5	800	0.02	0.88
125	0.55	24.5	900	0.02	0.76
150	0.16	7.10	1000	0.01	0.64
175	0.17	7.46	1500	0.01	0.29
200	0.10	4.24	2000	0.01	0.25
250	0.09	3.83			
300	0.07	2.92			
400	0.04	1.90			
500	0.03	1.43			

Features

Frequency range - 30 MHz - 1000 MHz

Low balun loss

Appropriate for EMI site calibration

Carrying case

Two year warranty



Description

The Tuned Dipole set model AD-100 is a standard antenna set which operates in the frequency range of 30 MHz to 1000 MHz for E-Field measurements. This set consists of four baluns and was designed according to American National Standard for Calibration of Antennas for Radiated Emissions in Electromagnetic Interference (EMI) Control C63.5.

The dipoles can be tuned to any frequency by selecting the balun for that frequency and adjusting the length of antenna elements to the half wavelength (calculated by $3 \times 10^8 / \text{frequency in MHz} / 2$). The length can be achieved by attaching together pairs of fixed and adjustable elements (lower frequencies) or a pair of adjustable elements (higher frequencies) to each side of the antenna balun. The fixed length elements were designed to minimize drooping, especially at low frequencies where the tuned dipole elements are long.

The dipoles are shipped with typical calibration data, which is included in the manual. However, the dipole set can be individually calibrated upon request. The antenna set includes a custom carrying case.

Application

Although broadband antennas such as biconical and log periodic antennas are used for day-to-day EMC measurement, tuned dipoles antennas are still considered the standard antenna. Dipole antennas are not considered the antennas of choice for sweep measurements, because it must be tuned at each frequency.

However, dipoles are preferable and in some cases required for site attenuation measurements. It is also considered the reference antenna that can be used to calibrate other antennas operating in the same frequency range.

Standard Configuration:

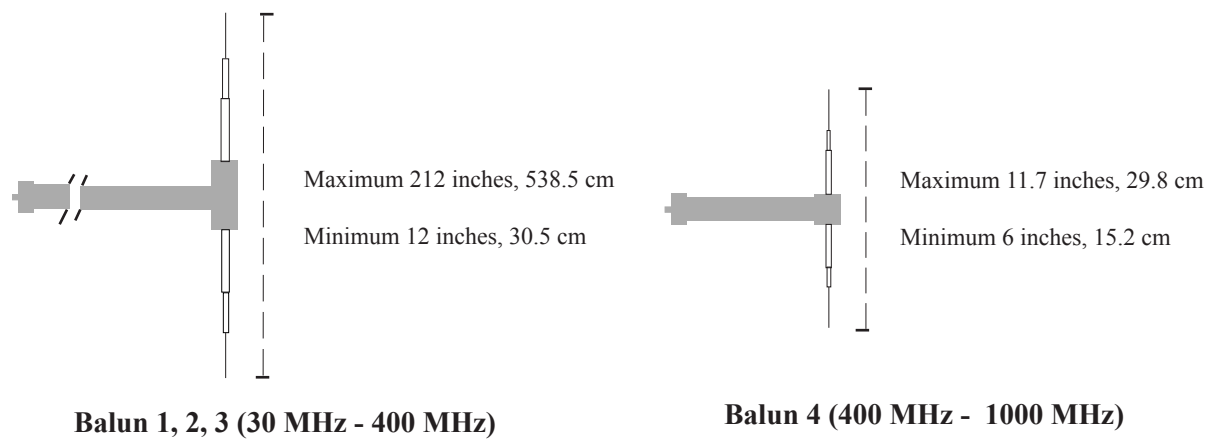
- Four antenna baluns
- Four fixed length extension rods
- Two low frequency adjustable elements
- Two medium frequency adjustable elements
- Balun 1 base drilled to accept 1/4" x 20 threads
- Typical calibration data in the manual

Optional items:

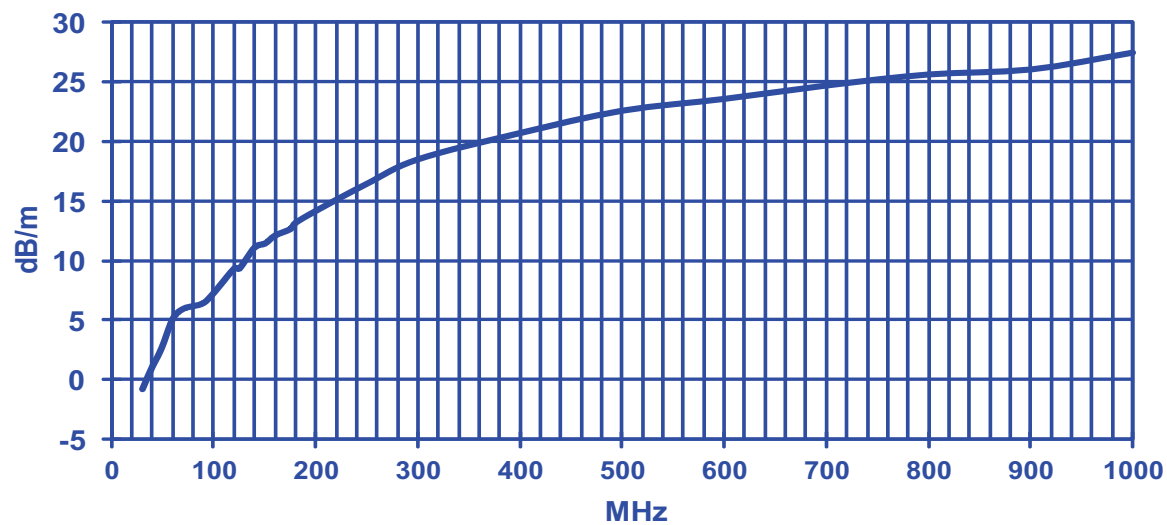
- Clamp block (ATC-001) for tripod mounting.
- Individual calibration data & certificate.

Specifications

Antenna Type:	Half wave tuned dipole
Frequency Range:	Balun 1 (dB1): 30 MHz - 65 MHz Balun 2 (dB2): 65 MHz - 175 MHz Balun 3 (dB3): 175 MHz - 400 MHz Balun 4 (dB4): 400 MHz - 1000 MHz
Impedance:	50 Ohm
Connector Type:	BNC female
Element length assembled:	min: 6 inches, 15 cm max: 212 inches, 538 cm
Weight:	8 lbs, 36 kg



Typical Antenna Factor



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

Horn Antenna

AH-118

Features

Broadband - For sweep measurements

High Gain - Lower Floor Noise for Emissions

Two year warranty

Individual calibration



Description

The Horn antenna Model AH-118 is a standard broadband double ridged waveguide horn antenna. This antenna is linearly polarized and is designed specifically for EMC measurements for the 1-18 GHz frequency range.

The AH-118 Horn antenna can be used for emissions and immunity testing. The gain of this Horn antenna is at least 6.1 dBi over the entire frequency range. Model AH-118 can accept up to 300 Watts input power in continuous mode.

This antenna is constructed using light weight aluminum with a corrosion resistant conductive coating. The mounting base of Model AH-118 has 1/4 inch x 20 threads. This allows the antenna to be mounted on a tripod (Model AT-100) or a tripod with matching threads.

Each antenna is individually calibrated at 3 meters. The calibration data and certificate will be shipped with each antenna.

Application

This antenna is suitable for ANSI 63.4, CISPR16, EN 55022, FAA and other EMC standards that require emissions and immunity testing.

The high gain reduces input power requirements to generate high electromagnetic field levels for immunity testing. High gain also increases antenna sensitivity to low level signals.

During emissions measurement, the field strength (dBV/m) is calculated by adding the antenna factor (dB/m) to the voltage measured (dBV) at the antenna terminals.

For immunity testing, the input power requirement **P** in Watts to generate **E** Electric Field Strength in V/m at a distance in **D** meters can be calculated by using the following formula:

$$P = E^2 \times D^2 / 30 \times \text{Numeric Gain}$$
$$G = 20 \log F - 29.79 - AF$$
$$G = 10 \log (\text{Numeric Gain})$$

Where

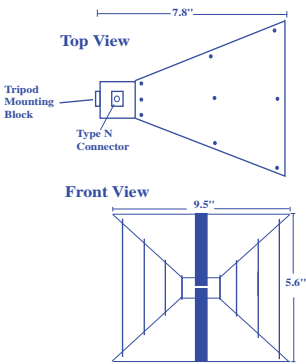
G= gain in dBi

F = Frequency in MHz

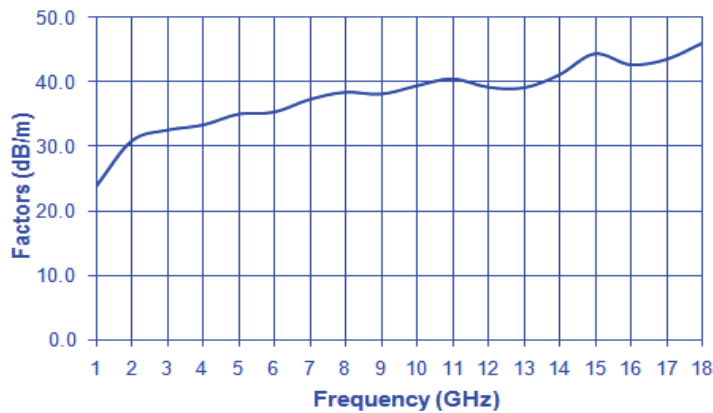
AF = antenna factor in dB

Specifications

Frequency Range: 1 GHz - 18 GHz
Input Power: 300 Watts continious
VSWR: 2.0 : 1
Polorization: Linear
Impedance: 50 Ω
Connector type: N Female
Weight: 4 lb. max.
Size: 7.8" X 9.5" X 5.6" max.



Typical Antenna Factors:



Field strength (dBV/m) = Output measured (dBV) + Antenna Factor (dB/m)

Typical Antenna Gain and Power Requirement at 1 meter antenna spacing:

Freq. GHz	Gain dBi	Power requirement (Watts)		
		10V/m	20 V/m	100 V/m
1	6.4	0.8	3.0	76.2
2	5.3	1.0	3.9	97.7
3	7.2	0.6	2.6	64.2
4	8.9	0.4	1.7	43.4
5	9.1	0.4	1.6	41.1
6	10.4	0.3	1.2	30.6
7	9.7	0.4	1.4	35.6
8	9.8	0.4	1.4	35.1
9	11.1	0.3	1.0	25.9
10	10.7	0.3	1.1	28.3
12	12.5	0.2	0.8	18.8
14	11.9	0.2	0.9	21.4
16	11.5	0.2	0.9	23.6
18	9.2	0.4	1.6	39.9

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

Features

Frequency Range – 1 to 18 GHz

Increased Sensitivity with a Built in Preamp

Two-year Warranty

Individual Calibration



Description

The model AHA-118 Active Horn Antenna is basically the AH-118 Horn Antenna with an integrated preamplifier. The preamplifier has a nominal gain of 20 dB for the entire frequency range. The preamplifier improves the effective system noise performance for emissions testing as explained below. The antenna AH-118 is linearly polarized and has a frequency range of 1-18 GHz.

The output of the antenna is connected to the preamplifier by a short low loss cable, which can be removed. This arrangement makes it possible to (1) insert a filter before the amplifier and (2) use the antenna alone for transmission. The filter insertion capability is important and is required in presence of a high-level signal (such as fundamental frequency), which possibly could saturate the amplifier if the filter is not used. The transmitted signal flow is in opposite direction and uses a higher power level. Both conditions could damage the preamplifier if not removed.

This antenna is constructed using lightweight aluminum with a corrosion resistant conductive coating. The rear mounting plate of the AHA-118 has 1/4 inch x 20 threads. These threads allow the antenna to be mounted on a model AT-100 antenna tripod or any tripod with similar mounting arrangement. The antenna is powered by an supplied external DC wall mount adapter.

Application

This antenna is suitable for accurately receiving low amplitude radiated emission signals. It is used during EMC testing for various standards such as FCC part 15, CISPR, and FAA for EMC emissions.

For obtaining valid data during the test, it is imperative to maintain signal level above the noise floor. In a typical setup, a receiving antenna is connected to a preamplifier that is located next the spectrum analyzer. The output of the preamplifier is then fed to the spectrum analyzer. In this arrangement, since the location of the preamplifier is far from the antenna, the interconnecting cable is long. A combination of factors such as a long cable, increasing cable loss (especially for frequencies above 1 GHz), and high antenna factors reduce the signal level to below the noise floor of the preamplifier; and that produces invalid readings. Boosting the signal at the antenna, prior to its attenuation by long cables keeps it from falling below the noise floor.

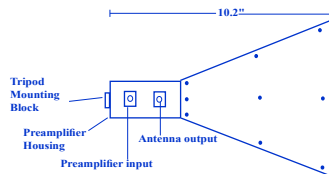
Each antenna is individually calibrated. The correction factors and certificate of calibration is shipped with the antenna. The data also includes separate antenna factors and amplifier gain.

Specifications

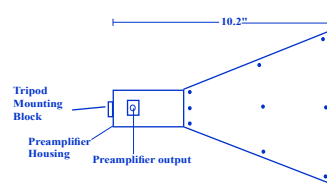
Frequency Range:	1 GHz - 18 GHz
Built-in preamp gain:	25 dB \pm 2
Output VSWR:	2.5 :1
Polarization:	Linear
Output Impedance:	50 Ω
Connector types	
Antenna output:	N (f)
Preamplifier input:	N (f)
Preamplifier output:	N (f)
Power input:	18 VDC, 500 mA
Weight:	7 lbs. (3.1 kg)
Size:	10.2" X 9.5" X 5.6" (25.9 cm x 24.1 cm x 14.2 cm)

Mechanical outline

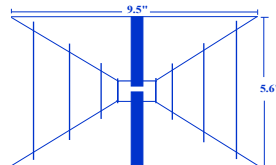
Antenna output to preamplifier input side view



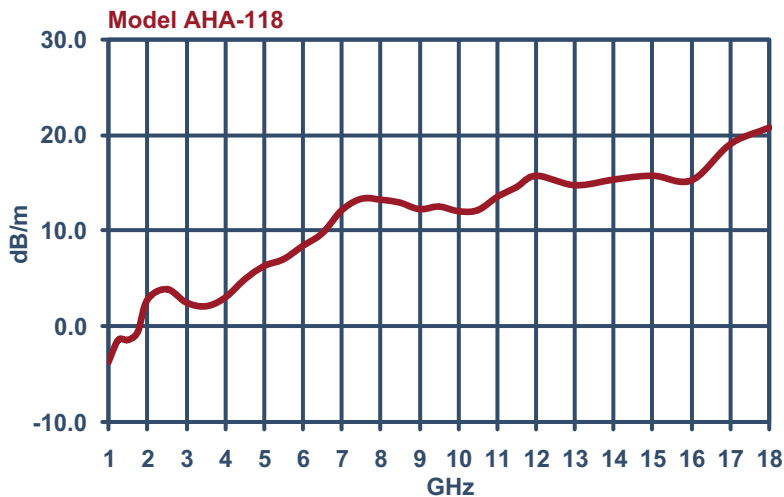
Preamplifier output side view



Front View



Typical Antenna Factors



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

Features

Broadband - 18 GHz to 26.5 GHz

High Gain - Lower Floor Noise for Emissions

Individual Calibration

Two Year Warranty

Description

Model AH-826 is a broadband linearly polarized double ridged waveguide horn antenna designed specifically for Electromagnetic Interference testing. This antenna can be used for receive as well as transmit applications for the frequency range of 18 GHz to 26.5 GHz.

This antenna has high gain, with at least 23 dBi over the entire frequency range. This antenna can accept up to 5 Watts of input power at its terminals in continuous mode in the applicable frequency range for generating electromagnetic fields for immunity testing.

The AH-826 Horn antenna has a K type connector which can mate with SMA type connector. The antenna is constructed using lightweight aluminum with a corrosion resistant finish. The oval rear plate has a 1/4" x 20 threaded hole for mounting it to the Com-Power AT-100 tripod.

The antenna is individually calibrated. The data and certificate of calibration will be shipped with the antenna. The data will include the antenna factors and antenna gain.



Application

The AH-826 was designed for EMC testing, but can also be used for antenna gain pattern measurements, surveillance, and other applications. The wide frequency band makes the AH-826 antenna suitable for sweep measurement, reducing the need for antenna switching during the test.

High gain reduces input power requirements to achieve the desired field strength levels for immunity testing and improves antenna sensitivity to low level signals during emissions testing. The measured field strength can be calculated by adding the antenna factor for the particular frequency to voltage measured at the antenna output terminal.

For immunity measurements, the input power requirement **P** in Watts to generate **E** electric field strength in V/m at a distance **D** in meters can be calculated by using the following formula:

$$P = E^2 \times D^2 / 30 \times N$$

$$N = 10^{(G/10)}$$

$$G = 20 \log F - 29.79 - AF$$

Where

N = Numeric Gain

G = gain in dBi

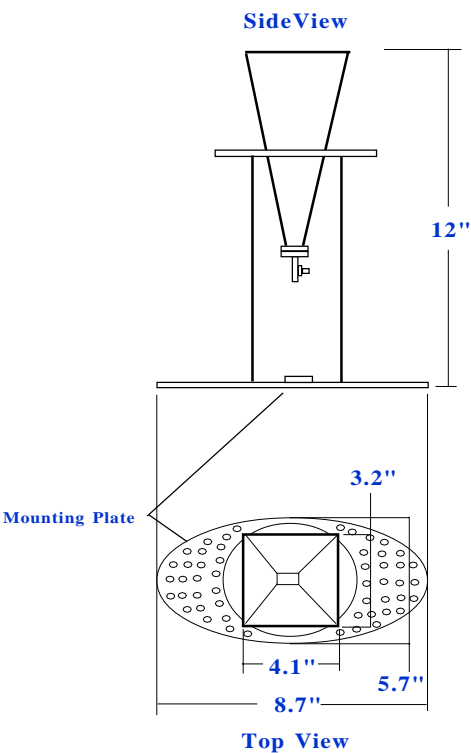
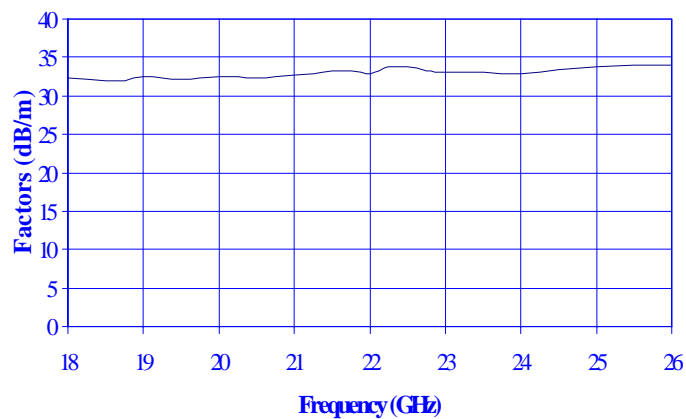
F = Frequency in MHz

AF = antenna factor in dB/m

Specifications

Frequency Range: 18 GHz - 26.5 GHz
Power handling: 5 Watts CW
VSWR: 2.0 :1.0
Polorization: Linear
Connector type: K type (will mate with SMA)
Impedance: 50 Ohms
Weight: 1.5 lbs. (0.68 kg) max.
Size (L x W x H): 8.7 x 5.7 x 12 inches max.
22 x 14.5 x 30.5 cm max.

Typical Antenna Factors:



Field strength (dBV/m) = Output measured (dBV) + Antenna Factor (dB/m)

Typical Antenna Gain & Power requirement inWatts at a one meter distance to obtain field strength in V/m:

Freq. GHz	Gain (dBi)	Freq. GHz	Field Strength		
			V/m 10	V/m 20	V/m 100
18	23.02	18	0.02	0.07	1.66
19	23.29	19	0.02	0.06	1.56
20	23.73	20	0.01	0.06	1.41
21	23.95	21	0.01	0.05	1.34
22	24.16	22	0.01	0.05	1.28
23	24.34	23	0.01	0.05	1.23
24	24.91	24	0.01	0.04	1.08
25	24.37	25	0.01	0.05	1.22
26.5	24.51	26.5	0.01	0.05	1.18

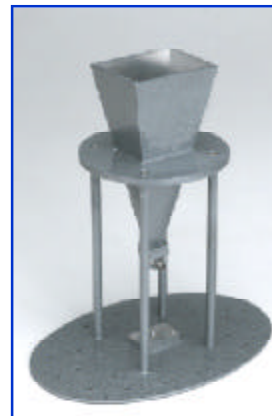
Features

Broadband - 26.5 GHz to 40 GHz

High Gain - Lower Floor Noise for Emissions

Individual Calibration

Two Year Warranty



Description

Model AH-640 is a broadband linearly polarized double ridged waveguide horn antenna designed specifically for Electromagnetic Interference testing. This antenna can be used for receive as well as transmit applications for the frequency range of 26.5 GHz - 40 GHz.

This antenna has a high gain; at least 23 dBi over the entire frequency range. This antenna can accept up to 5 Watts of input power at its terminals in continuous mode in the applicable frequency range for generating electromagnetic fields.

The AH-640 Horn antenna has a K type connector which can mate with SMA type connectors. The antenna is constructed using lightweight aluminum with a corrosion resistant finish. The oval rear plate has a 1/4" x 20 threaded hole for mounting to the Com-Power AT-100 tripod.

The antenna is individually calibrated at 1 meter and data and certificate of calibration will be shipped with the antenna. The data will include the antenna factor and antenna gain.

Application

The AH-640 was designed for EMC testing, but it can also be used for antenna gain pattern measurements, surveillance, and other applications. The wide frequency band makes the AH-640 antenna suitable for sweep measurements, reducing the need for antenna switching during the test.

High gain reduces input power requirements to achieve the desired field levels for immunity testing and improves antenna sensitivity to low level signals. During emissions testing the measured field strength can be calculated by adding the antenna factor for the particular frequency to voltage measured at the antenna output terminal.

For immunity testing, the input power requirement **P** in Watts to generate **E** electric field strength in V/m at a distance **D** in meters can be calculated by using the following formula:

$$P = E^2 \times D^2 / 30 \times N$$

$$N = 10^{(G/10)}$$

$$G = 20 \log F - 29.79 - AF$$

Where

N = Numeric Gain

G = gain in dBi

F = Frequency in MHz

AF = antenna factor in dB/m

Specifications

- Frequency Range:

26.5 GHz - 40 GHz
- Power handling:

5 Watts CW
- VSWR:

2.0 :1.0
- Polarization:

Linear
- Connector type:

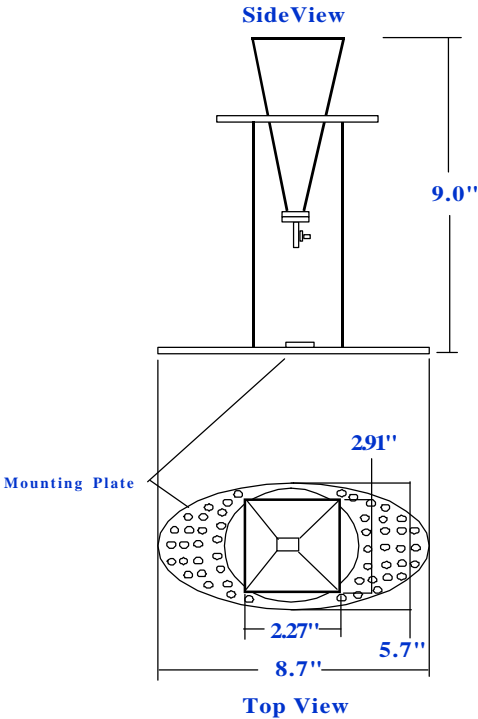
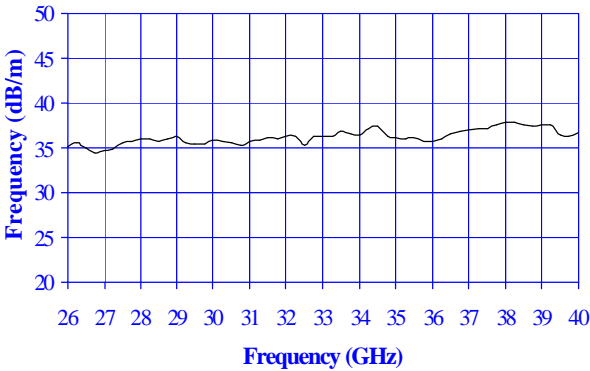
K type (will mate with SMA)
- Impedance:

50 Ohms
- Weight:

1.5 lbs. (0.68 kg) max.
- Size (L x W x H):

8.7 x 5.7 x 9 inches max.
22 x 14.5 x 22.8 cm max.

Typical Antenna Factors:



Field strength (dBV/m) = Output measured (dBV) + Antenna Factor (dB/m)

Typical Antenna Gain & Power requirement inWatts at a one meter distance to obtain field strength in V/m:

Freq. Ghz	Gain (dBi)	Freq. GHz	Field Strength		
			V/m	V/m	V/m
			10	20	100
26	23.41	26	0.02	0.06	1.52
27	24.24	27	0.01	0.05	1.26
28	23.25	28	0.02	0.06	1.58
29	23.26	29	0.02	0.06	1.57
30	23.95	30	0.01	0.05	1.34
31	24.44	31	0.01	0.05	1.20
32	24.11	32	0.01	0.05	1.29
33	24.28	33	0.01	0.05	1.24
34	24.44	34	0.01	0.05	1.20
35	24.99	35	0.01	0.04	1.06
36	25.64	36	0.01	0.04	0.91
37	24.57	37	0.01	0.05	1.16
38	24.01	38	0.01	0.05	1.33
39	24.53	39	0.01	0.05	1.17
40	25.55	40	0.01	0.04	0.93

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

Features

Broadband - 18 GHz to 40 GHz

High gain

Individual calibration

Two year warranty



Description

Model AH-840 is a broadband linearly polarized double ridged waveguide horn antenna designed specifically for Electromagnetic Interference testing. This antenna can be used for receiving as well as transmitting applications for the frequency range of 18 GHz to 40 GHz.

This antenna has a high gain; least 20 dBi over the entire frequency range. This antenna can accept up to 5 Watts of input power at its terminals in continuous mode for generating electromagnetic fields for immunity testing.

The AH-840 Horn antenna has a K type connector which can mate with SMA type connectors. The antenna is constructed using lightweight aluminum with corrosion resistant finish. The oval rear plate has a 1/4" x 20 threaded hole for mounting it to Com-Power AT-100 tripod.

The antenna is individually calibrated at 1 meter and data and certificate of calibration will be shipped with the antenna. The data will include the antenna factor and gain of the antenna.

Application

The AH-840 was designed for EMC testing, but it can also be used for antenna gain pattern measurements, surveillance, and other applications. The wide frequency band makes the AH-840 antenna suitable for sweep measurements, reducing the need for antenna switching during the tests.

High gain reduces the input power requirement to achieve the desired field levels for immunity testing and improves antenna sensitivity to low level signals. During emissions testing the measured field strength can be calculated by adding the antenna factor for the particular frequency to voltage measured at the antenna output terminal.

For immunity measurements, the input power requirement **P** in Watts to generate **E** Electric Field Strength in V/m at a distance **D** in meters can be calculated by using the following formula:

$$P = E^2 \times D^2 / 30 \times N$$

$$N = 10^{(G/10)}$$

$$G = 20 \log F - 29.79 - AF$$

Where

N = Numeric Gain

G = gain in dBi

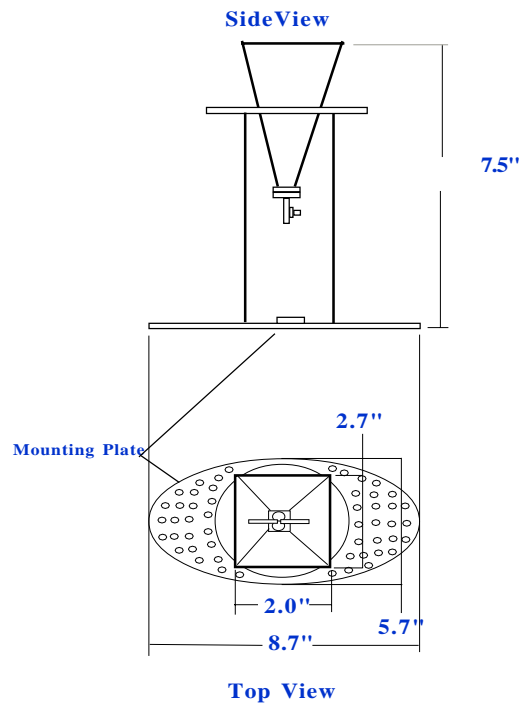
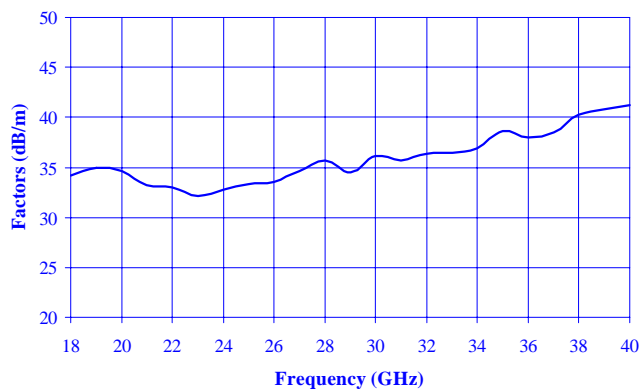
F = Frequency in MHz

AF = antenna factor in dB/m

Specifications

Frequency Range: 18 GHz - 40 GHz
 Power handling: 5 Watts CW
 VSWR: 2.0 :1.0
 Connector type: K type female
 Polarization: Linear
 Impedance: 50 Ohms
 Weight: 2 lbs. max. (0.9 kg)
 Size (L xW xH): 8.7 x 2.7 x 7.5" inches
 22 x 6.8 x 19.0 cm

Typical Antenna Factors:



$$\text{Field strength (dBV/m)} = \text{Output measured (dBV)} + \text{Antenna Factor (dB/m)}$$

Typical Antenna Gain & Power requirement in Watts at a one meter distance to obtain field strength in V/m:

Freq. GHz	Gain (dBi)	Freq. GHz	Field Strength		
			V/m 10	V/m 20	V/m 100
18	21.12	18	0.03	0.10	2.58
19	20.79	19	0.03	0.11	2.78
20	21.63	20	0.02	0.09	2.29
22	24.06	22	0.01	0.05	1.31
24	25.01	24	0.01	0.04	1.05
26	25.01	26	0.01	0.04	1.05
28	23.45	28	0.02	0.06	1.51
30	23.65	30	0.01	0.06	1.44
32	23.91	32	0.01	0.05	1.35
34	23.94	34	0.01	0.05	1.35
36	23.34	36	0.02	0.06	1.55
38	21.61	38	0.02	0.09	2.30
40	21.05	40	0.03	0.10	2.62

All values are typical values unless specified.
 Dimensions are given in inches unless specified
 Last update: 1/02

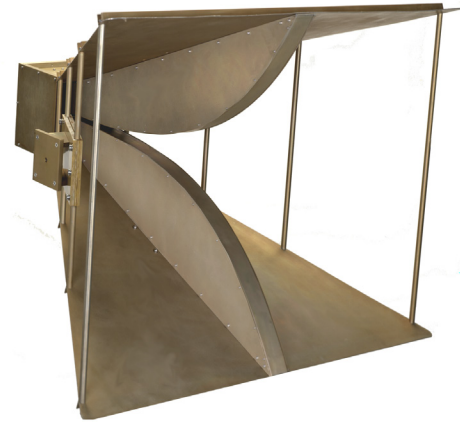
Features

Frequency Range: 200 MHz to 2 GHz

High Power Handling

Transmit or receive capability

Three year warranty



Description

The model AH-220 is a linearly polarized broadband double ridged horn antenna operating in the frequency range of 200 MHz - 2000 MHz.

The AH-220 Horn antenna is an alternative to bi-conicals and log periodic antennas operating in the same frequency range for emissions and immunity testing where high gain is needed and the large size of the antenna is not an important factor. For immunity measurements the AH-220 can accept up to 800 Watts input power in a continuous mode.

For easier handling, the AH-220 is constructed using light weight aluminum with a corrosion resistant conductive coating. The mounting bases of Model AH-220 are located near the antenna's center of gravity. Two mounting bases are provided for vertical and horizontal polarizations. Each mounting base has a 1/4 inch x 20 threaded hole. The antenna can be purchased with an optional Com-Power antenna tripod (Model AT-220) which has a mounting head with a matching screw.

Each antenna is individually calibrated before shipment. The test data will be shipped with the antenna.

Application

The AH-220 horn antenna was specifically designed to make EMC measurements. This antenna is suitable for making EMC measurements per EN 61000-4-3 and MIL-STD 461/462 test specifications.

The distinct advantage of the AH-220 horn antenna is its high gain. This reduces necessary power requirement for generating high field strengths for immunity testing. High gain also increases antenna sensitivity to low level signals during emissions testing. The gain of this horn antenna is at least 4.6 dBi over the entire frequency range.

For immunity testing, the input power requirement **P** in Watts to generate **E** Electric Field Strength in V/m at a distance in **D** meters can be calculated by using the following formula:

$$P = E^2 \times D^2 / 30 \times \text{Numeric Gain}$$

$$G = 20 \log F - 29.79 - AF$$

$$G = 10 \log (\text{Numeric Gain})$$

Where

G = gain in dBi

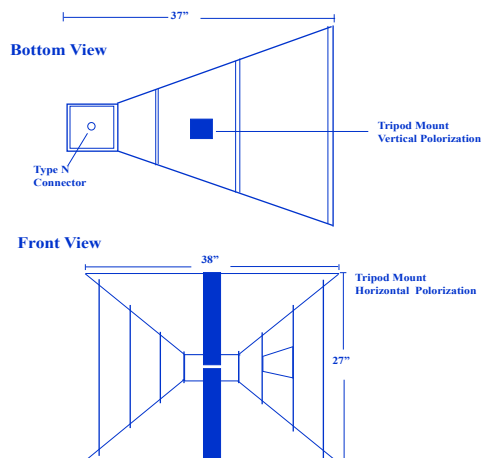
F = Frequency in MHz

AF = antenna factor in dB

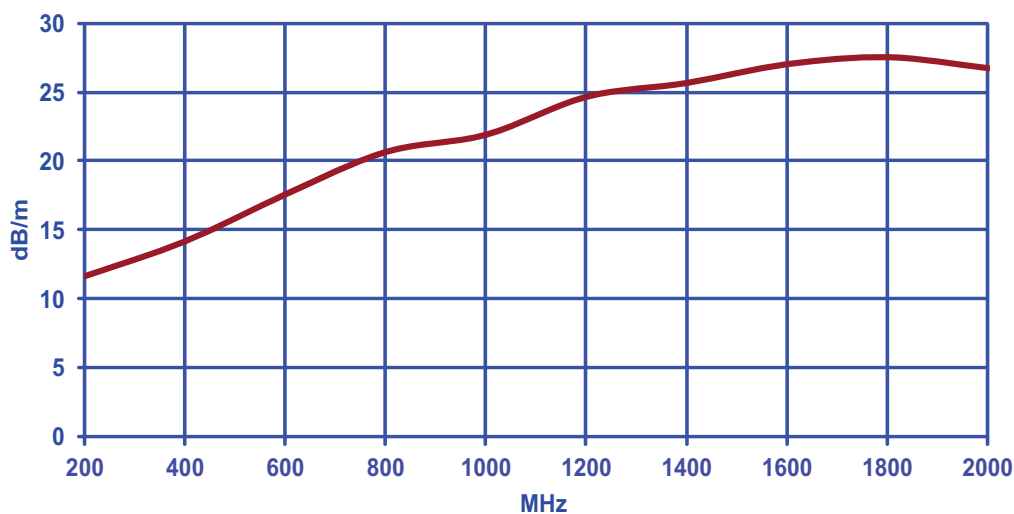
Specifications

Antenna Type	Horn Antenna
Frequency Range	200 to 2000 MHz
Antenna Factors	11 to 27 dB/m
Isotropic Gain	4.6 to to 9.5 dBi
VSWR	1.5:1 (average)
Impedance	50 ohms
Max. Input Power	800 Watts
Connector Type	N-type (female)
Tripod mouting	1/4 inch 20 threads
Dimensions	37 x 38 x 27.5 inches 94 x 96.5 x 68.5 cm
Weight	27.5 lbs. / 12.2 kg

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.



Antenna Factors (typical)



Features

Wide Frequency Range - 9 kHz to 30 MHz

Battery Powered

Built in Preamplifier

Saturation Indicator

Three Year Warranty



Description

The AL-130 is a broadband active receiving loop antenna for electromagnetic field measurements from 9 kHz - 30 MHz. This antenna uses a 19 inch shielded loop for magnetic field (H-Field) measurements.

The AL-130 has built in active electronics that provide impedance matching, linear antenna factors and higher antenna sensitivity. The output impedance is matched to 50 Ohms, so that it can be directly connected to any spectrum analyzer without an additional matching network.

The front panel has indicators for antenna saturation and battery status. The internal NimH batteries take about two hours to fully charge and can operate the antenna for 8 hours continuously. A charger is included with each antenna.

Application

The loop antenna is utilized for testing to meet the various EMC requirements specified by FCC, CISPR, MIL-STD and EN. This antenna is specified for open field emissions testing below 30 MHz. It is assumed that in the far field the ratio of E and H field will remain the same as the characteristic impedance of the medium.

The loop antenna is positioned with its plane vertical at the specified distance from the EUT. In addition to the EUT rotation, the loop antenna also has to be rotated about its vertical and horizontal axis to maximize emissions. This procedure is described in detail in ANSI C63.4.

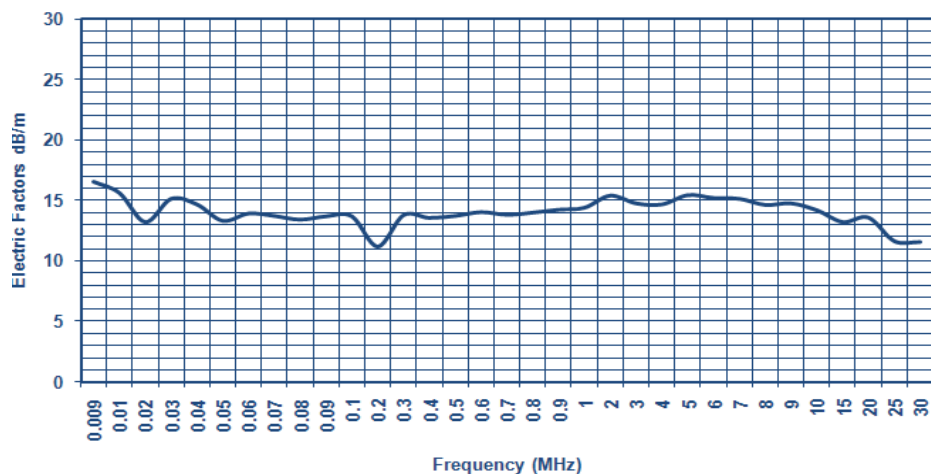
Monopole antennas (such as the AM-741) also operate in the same frequency range as a loop antenna, but are used for E-field measurements and require a counter poise.

Specifications

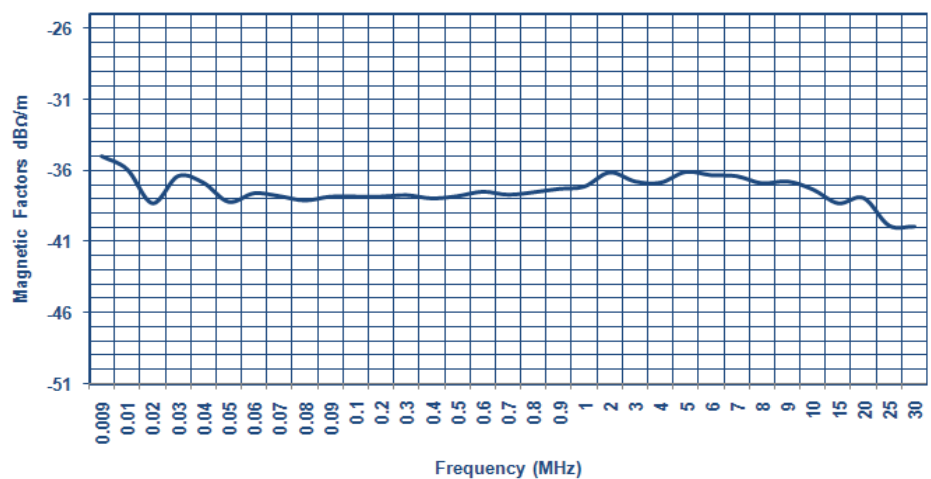
Frequency range:	9 kHz - 30 MHz
Dynamic range:	110 dB at 1 MHz
Sensitivity:	10 dB μ V/m at 1 MHz
1 dB compression point :	3 V/m
Output Impedance:	50 Ohm
Connector type:	BNC
Power:	6V, NimH battery pack
Charger output:	6 VDC, 500 mA
Weight:	6 lbs / 2.7 kgs
Loop diameter:	19 inches / 49 cm
Amplifier section:	10.25 x 7.25 x 2.5 inches. / 26 x 18.4 x 6.4 cm

Typical Antenna Factors

Electric



Magnetic



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

Features

Range - 9 kHz - 30 MHz

Built in Amplifier

Battery Powered

Individual Calibration



Description

The Active Monopole antenna Model AM-741 was designed to measure electric field strength in the frequency range from 9 kHz to 30 MHz. This antenna includes a built-in broadband amplifier covering the frequency range of operation. The built in preamplifier improves the sensitivity of the antenna and also provides a 50 Ω matched output.

The antenna amplifier is enclosed in an aluminum enclosure. The 41 inch collapsible rod element is connected to BNC connector located on the top the amplifier enclosure. The amplifier enclosure is mounted on the bottom of a 60 x 60 cm stainless steel plate. The front panel of the AM-741 Monopole antenna has battery status and saturation indicators. The saturation indicator will illuminate if the if the field measured is saturating the built in preamplifier.

The antenna can be used for 6-8 hours continuous with a fully charged battery. An external charger addapter is included with each antenna.

The antenna has 1/4 inch x 20 threaded hole which allows the AM-741 to be mounted on an antenna tripod with matching threads. The manual and certificate of calibration will be shipped with each unit.

Application

The 41 inch Monopole antenna is required for making electric field emission measurements below 30 MHz per Military standards (MIL-STD-461) and FAA (DO-160) specifications. This antenna is for emissions measurements only. It cannot be used for transmitting.

The Active Monopole antenna is generally used in a shielded room or in a screen room, with the equipment under test (EUT) placed on a metal ground plane. The 41 inch rod and the ground plane behave electrically as though a mirror image of the rod were located below the ground, and the ground removed. Since the stainless steel plate does not have enough surface area to mirror the entire 41 inch rod, it is bonded to the surrounding ground plane during use.

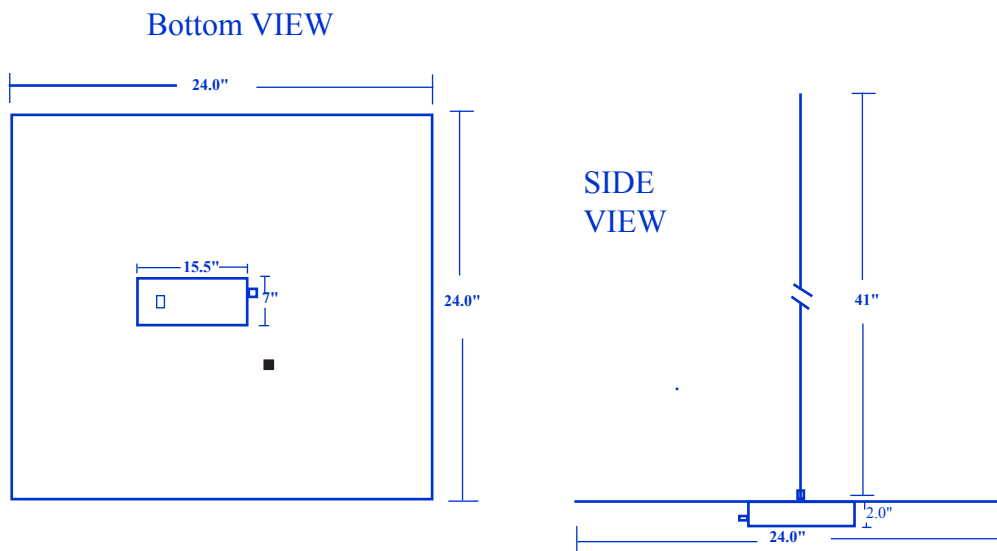
The AM-741 is battery powered to prevent measurement errors that maybe caused by external power cables.

The ANSI equivalent capacitance substitution (ECSM) method is the recommended method for calibrating AM-741 monopole antenna. The individual calibration data will be included with each antenna.

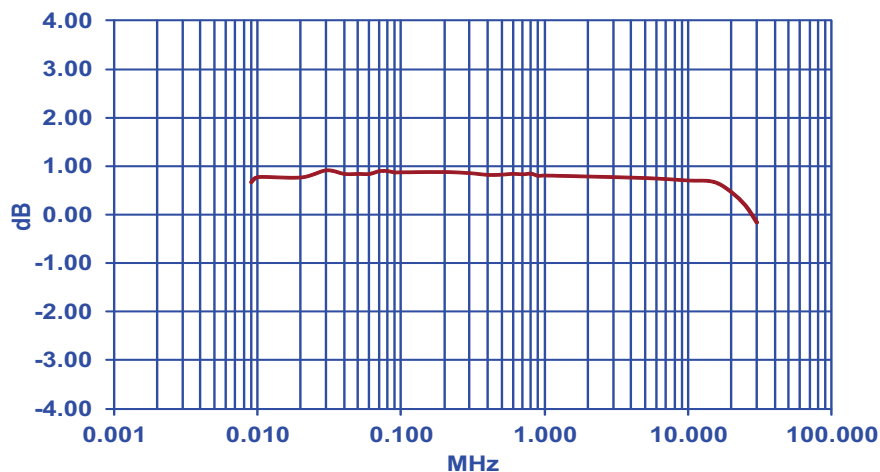
Specifications

Frequency Range:	9 kHz - 30 MHz
Flatness:	±1 dB
Output Impedance:	50 Ohm
Connector Type:	BNC (f)
Collapsible Element Length:	41 inches (fully extended)
Base Plate:	24 x 24 inches (60 x 60 cm)
Battery Type:	6 V NimH
Charger Input:	6 VDC 500, mA
Tripod mount:	1/4 x 20 inch threads hole
Size:	see below
Weight:	19 lbs. (8.6 kg)

Mechanical Outline



Typical AM-741 Characteristics using ANSI C63.5 ESCM Calibration Method



$$\text{Field strength (dBuV/m)} = \text{Output measured (dBuV)} + \text{Antenna factor (dB)}$$

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

Features

Broadband Antennas

High Gain Preamplifier

Near Field Probe kit

Comb Generator

Carrying case with wheels



Description

The ANK-310 is one of the five portable antenna kits offered by Com-Power. The ANK-310 was intended for EMI radiated emission testing from 30 MHz to 1 GHz. Therefore, it includes antennas, preamplifier and accessories for testing in this frequency range. As an added bonus a Comb Generator is included for reference noise measurements.

The ANK-310 carrying case has a specific storage compartment for each item included to minimize damage to items inside during transport. The carrying case made of rugged plastic material that can withstand impact during transport. It also has wheels and a pull out handle so that it can be easily moved during field use.

The ANK-310 antenna kit can be purchased with a AT-120 antenna tripod with a separate carrying case. The AT-120 tripod is easy to use and made of wood and nylon material to minimize interference with antenna pickup.

The antennas and preamplifiers included in the kit are individually calibrated and test data will be included. All our kits come with 3 year warranty.

Items included

- ABF-900 Biconical Antenna
- ALC-100 Compact Log Periodic Antenna
- PAM-103 Preamplifier
- PS-500 Near Field Probe kit
- CGO-505 Comb Generator
- ACK-310 Cable Kit
- Manuals and calibration data

Weight: 54 lbs / 24.5 kgs

Dimensions: 27 x 22 x 10 inches / 68.5 x 55.8 x 24.4 cm

Optional accessory

Model AT-120 Antenna tripod with carry case.

Weight: 28 lbs / 7.3 kgs

Dimensions:
42.5 x 12 inches / 108 x 30.5 cm



Features

Broadband Antennas

High Gain Preamplifier

Near Field Probe kit

Comb Generator

Carrying case



Description

The ANK-140 is one of the five portable antenna kits offered by Com-Power. The ANK-140 was intended for EMI radiated emission testing from 1 GHz to 40 GHz. This kit includes the antennas to measure down to 1 GHz. As an added bonus a 1 GHz Comb Generator is included for reference noise measurements.

The ANK-140 carrying case has a specific storage compartment for each item included to minimize damage to items inside during transport. The carrying case made of rugged plastic material that can withstand impact during transport and field use.

The ANK-140 antenna kit can be purchased with AT-120 antenna tripod with a separate carrying case. The AT-120 tripod is easy to use and made of wood and nylon material to minimize interference with antenna pickup.

The antennas and preamplifiers included in the kit are individually calibrated and test data will be included. All our kits come with 3 year warranty.

Items included

- AH-118 Horn Antenna
- AH-840 Horn Antenna
- PAM-118 Preamplifier
- PAM-840 Preamplifier
- PS-500 Near Field Probe kit
- CGO-51000 Comb Generator
- ACK-910M Cable Kit
- Manuals and calibration data.

Weight: 31 lbs / 14.6 kg

Dimensions: 24 x 19 x 12 inches / 60.9 x 48.2 x 30.5 cm

Optional accessory

Model AT-120 Antenna tripod with carry case.

Weight: 28 lbs / 7.3 kgs

Dimensions:

42.5 x 12 inches / 108 x 30.5 cm



Features

Broadband Antennas

High Gain Preamplifier

Near Field Probe kit

Comb Generator

Carrying case with wheels



Description

The ANK-910L is one of the five portable antenna kits offered by Com-Power. The ANK-910L was intended for EMI radiated emission testing from 9 kHz to 1 GHz. This kit includes the Active Loop antenna to measure down to 9 kHz. As an added bonus a Comb Generator is included for reference noise measurements.

The ANK-910L carrying case has a specific storage compartment for each item included to minimize damage to items inside during transport. The carrying case made of rugged plastic material that can withstand impact during transport. It also has wheels and a pull out handle so that it can be easily moved during field use.

The ANK-910L antenna kit can be purchased with AT-120 antenna tripod with a separate carrying case. The AT-120 tripod is easy to use and made of wood and nylon material to minimize interference with antenna pickup.

The antennas and preamplifiers included in the kit are individually calibrated and test data will be included. All our kits come with 3 year warranty.

Items included

- AL-130 Active Loop Antenna
- ABF-900 Biconical Antenna
- ALC-100 Compact Log Periodic Antenna
- PAM-103 Preamplifier
- PS-500 Near Field Probe kit
- CGO-505 Comb Generator
- ACK-910L - Cable Kit
- Manuals and calibration data.

Weight: 91 lbs / 41.2 kg

Dimensions: 27 x 27 x 12 inches / 68.5 x 68.5 x 30.5 cm

Optional accessory

Model AT-120 Antenna tripod with carry case.



Weight: 28 lbs / 7.3 kgs

Dimensions:
42.5 x 12 inches / 108 x 30.5 cm

Features

Broadband Antennas up to 18 GHz

High Gain Preamplifiers up to 18 GHz

Near Field Probe kit

Comb Generators

Carrying case with wheels



Description

The ANK-318 is one of the five portable antenna kits offered by Com-Power. The ANK-318 is intended for EMI radiated emission testing from 30 MHz to 18 GHz. As an added bonus a Comb Generator is included for reference noise measurements.

The ANK-318 carrying case has a specific storage compartment for each item included to minimize damage to items inside during transport. The carrying case made of rugged plastic material that can withstand impact during transport. It also has wheels and a pull out handle so that it can be easily moved during field use.

The ANK-318 antenna kit can be purchased with AT-120 antenna tripod with a separate carrying case. The AT-120 tripod is easy to use and made of wood and nylon material to minimize interference with antenna pickup.

The antennas and preamplifiers included in the kit are individually calibrated and test data will be included. All our kits come with 3 year warranty.

Items included

- ABF-900 Biconical Antenna
- ALC-100 Compact Log Periodic Antenna
- AH-118 Horn Antenna
- PAM-103 Preamplifier
- PAM-118A Preamplifier
- PS-500 Near Field Probe kit
- CGO-520 Comb Generator
- CGO-5100A Comb Generator
- ACK-318 - Cable Kit
- Manuals and calibration data.

Weight: 54 lbs / 24.5 kg

Dimensions: 27 x 27 x 12 inches / 68.5 x 68.5 x 30.5 cm

Optional accessory



Weight: 28 lbs / 7.3 kgs

Dimensions:
42.5 x 12 inches / 108 x 30.5 cm

Features

Broadband Antennas up to 40 GHz

High Gain Preamplifier

Near Field Probe kit

Comb Generator

Carrying case



Description

The ANK-140 is one of the five portable antenna kits offered by Com-Power. The ANK-140 was intended for EMI radiated emission testing from 1 GHz to 40 GHz. This kit includes the antennas to measure down to 1 GHz. As an added bonus a 1 GHz Comb Generator is included for reference noise measurements.

The ANK-140 carrying case has a specific storage compartment for each item included to minimize damage to items inside during transport. The carrying case made of rugged plastic material that can withstand impact during transport and field use.

The ANK-140 antenna kit can be purchased with AT-120 antenna tripod with a separate carrying case. The AT-120 tripod is easy to use and made of wood and nylon material to minimize interference with antenna pickup.

The antennas and preamplifiers included in the kit are individually calibrated and test data will be included. All our kits come with 3 year warranty.

Items included

- AH-118 Horn Antenna
- AH-840 Horn Antenna
- PAM-118 Preamplifier
- PAM-840 Preamplifier
- PS-500 Near Field Probe kit
- CGO-51000 Comb Generator
- ACK-140 Microwave Cable Kit
- Manuals and calibration data.

Weight: 31 lbs / 14.6 kg

Dimensions: 24 x 19 x 12 inches / 60.9 x 48.2 x 30.5 cm

Optional accessory

Model AT-120 Antenna tripod with carry case.

Weight: 28 lbs / 7.3 kgs

Dimensions:
42.5 x 12 inches / 108 x 30.5 cm



Features

Frequency Range - 30 - 1000 MHz

Test to CISPR 14 (EN 55014) requirements

Individual Calibration

Two Year Warranty



Description

The CLA-050 and CLA-150 absorbing clamps meet the CISPR 14 (EN 55014) section 6.11 requirement for measuring radio frequency power generated and fed to the EUT supply cable of household appliances, electrical tools and similar apparatus.

The absorbing clamp consists of a calibrated ferrite current transformer operating in the frequency range of 30-1000 MHz and two groups of ferrite rings. The ferrite rings act as absorbers of energy and stabilize impedance. One set of ferrite rings surrounds the lead from the transformer to the EMI meter to minimize standing waves. The second group of ferrite rings surrounds the supply cable from the equipment under test. These rings act as an absorber of energy and an impedance stabilizer to isolate the equipment under test from the mains. These rings are made up of two halves. Therefore, the supply cable from the EUT can be placed inside the aperture of the rings.

Two absorbing clamp models are available to accommodate the varying sizes of supply cables. The model CLA-050 can accommodate supply cable up to 10 mm (0.39 inches) in diameter and model CLA-150 can accept cables up to 32 mm (1.26 inches) diameter.

All absorbing clamps are individually calibrated before shipment. The insertion loss and correction factors will be supplied with each clamp.

Application

Use of an absorbing clamp is a practical alternative to measurement of direct field strength from EUT supply cables.

During the test, the equipment under test is placed on a nonconductive table at least 40 cm from the nearest reflecting object. The EUT mains conductor is placed horizontally in a straight line for a distance sufficient to permit movement of the absorbing clamp to obtain the highest readings. The mains conductor is placed in the clamp surrounded by absorbing rings and the current transformer.

The standard requires the measuring instrument having a 50 Ohm input impedance. The power (P) measured using a 50 Ohm load is equal to the square of the voltage measured divided by 50. This can be expressed in decibels (dB):

$P = \text{Power}$

$10 \log P = 10 \log V^2/50 = 20 \log V - 10 \log 50$

$10 \log P = 20 \log V - 10 \log 50$

$IL = \text{Insertion loss}$

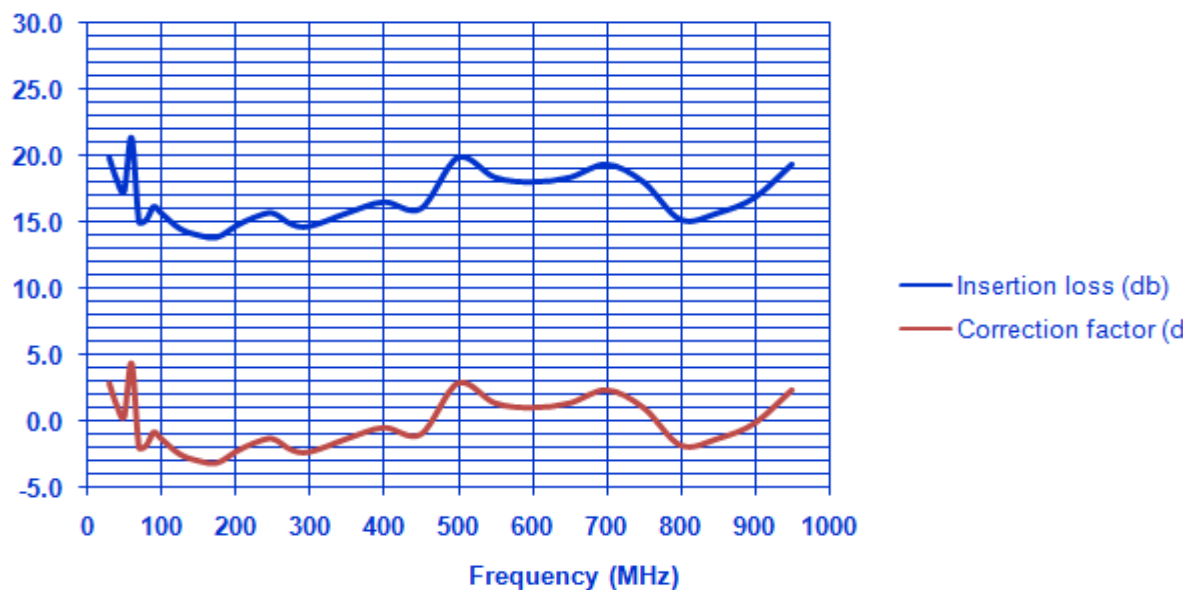
Corrected reading: $10 \log P = 20 \log V - 17 \text{ dB} + IL$

The numerical value of P (power) expressed in dB (picowatts across 50 Ohms) is found by subtracting 17 dB from the numerical value of V in dB.

Specifications

Model	CLA-050	CLA-150
Frequency range:	30 MHz - 1000 MHz	30 MHz - 1000 MHz
Maximum cable diameter:	10 mm (0.39 inches)	32 mm (1.26 inches)
Aperture diameter:	12.7 mm (0.5 inches)	34.9 mm (1.37 inches)
Connector:	BNC (f)	BNC(f)
Dimensions (L x W x H):	627 x 114 x 144 mm 24.7 x 4.5 x 5.7 inches	627 x 114 x 165 mm 24.7 x 4.5 x 6.5 inches
Weight	5 kg (11.5 lbs)	9.5 kg (21 lbs)

Typical insertion loss and correction factors for models CLA-050 & CLA-150



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

Features

Reference noise source - For site verification

Output upto 4.5 GHz

Stable frequency output

Auto RF shutoff when battery voltage is low

Three year warranty



Description

The CGO- Comb Generator is reference radiated or conducted signal source. The signal contains frequency harmonics at 1,5, 20 MHz intervals. These reference signals are used for validating EMC test sites. A reference signal source must have stable and precise output. Therefore, Comb Generator's internal circuit is built to meet this requirement.

Two antenna supplied with the Comb Generator for low and high frequency signal radiation. The radiated signals are generated by connecting one of the two antennas to the BNC or SMA connector. The circular chassis of Comb Generator helps radiate the signal more uniformly in all directions in the same plane. The conducted reference signals can be obtained by connecting a coax to the BNC or SMA connector.

The Comb Generator is powered by a rechargeable internal battery pack to eliminate any possibility of external cables effecting the radiated signal. When the battery voltage reaches below reliable operating levels the RF will shut off automatically to prevent further use. When fully charged, the battery allows continuous use of the Comb Generator up to 18 hours. The Comb Generator, charger and antennas are shipped in a custom wooden storage box.

Application

EMI measurement are usually conducted in Open Area Test site (OATS) or an Anechoic chamber. OATS and chambers must be calibrated before it is put into service using published calibration procedures at regular intervals. These calibration methods are too elaborate and time consuming to be performed before each test to ensure that the data taken is consistent and accurate.

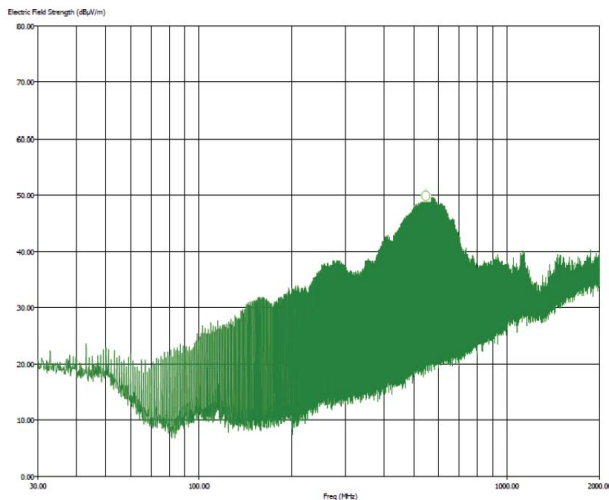
The Comb Generator is a quick site verification tool. The test engineer will be able detect potential problems with site by maintaining a log of the Comb Generator radiated readings prior to taking measurement from a product in the same setup. For instance, test engineer will be able to detect problems with antennas, cables, preamplifiers and receiver immediately by comparing previous Comb Generator data in the same setup. The same method can be utilized when EMC emissions measurements taken from the same products varies when the test is repeated. It is difficult to determine if it is the test site or the product is causing the variation. Using the same test setup, measurement can be taken with a Comb Generator in place of the product. This data can be compared with previous Comb Generator measurements to determine the problem. Other uses of the Comb Generator output include testing cables and filters.

Specifications

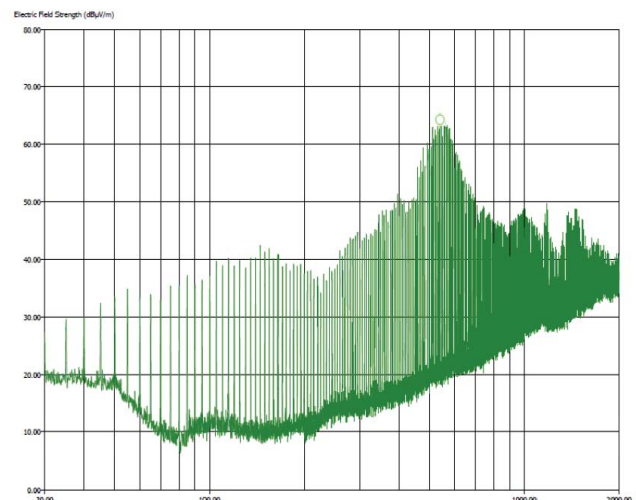
Model	Freq. range (MHz)	Step Size (MHz)	Internal Battery (NimH)	Charger Input (VDC)	Output Connector	Base dimensions dia × height in / cm	Weight lbs / kg
CGO-501	1-1000	1	6 V	7.5	BNC	7 × 0.75 / 17.7 × 1.9	2 / 0.9
CGO-505	5-1500	5	6 V	7.5	BNC	7 × 0.75 / 17.7 × 1.9	2 / 0.9
CG-515	1-1500	1 & 5	6 V	7.5	BNC	4 × 4 × 4/10 × 10 × 10*	2 / 0.9
CGO-515	1-1500	1 & 5	6 V	7.5	BNC	7 × 0.75 / 17.7 × 1.9	2 / 0.9
CGO-520	20-4500	20	6 V	7.5	SMA	7 × 1 / 17.7 × 2.5	2 / 0.9

* For Automotive EMC Lab Recognition Program - dimensions L × W × H

Typical radiated output at 3 meter distance (CGO-501, 505 and 515)

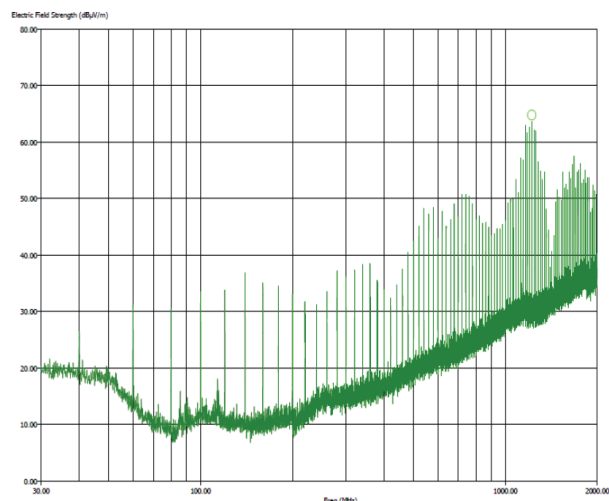


1 MHz step 1- 2000 MHz

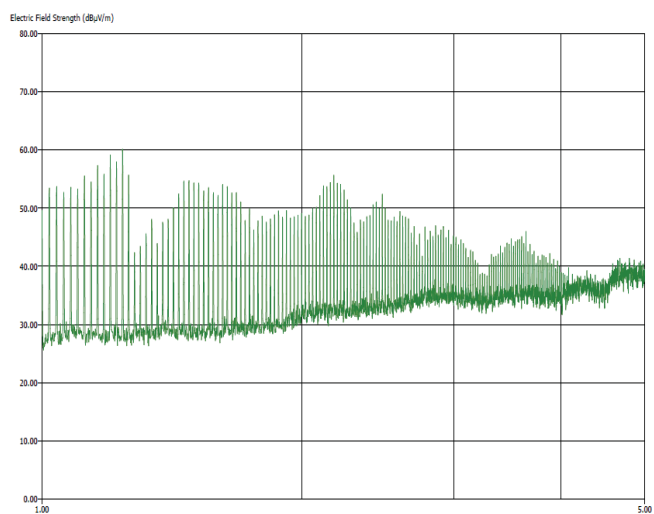


5 MHz step 5 -2000 MHz

Typical radiated output at 3 meter distance (CGO-520)



20 MHz step 20- 2000 MHz



20 MHz step 2 GHz - 5 GHz

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

Features

Reference noise source - For site verification

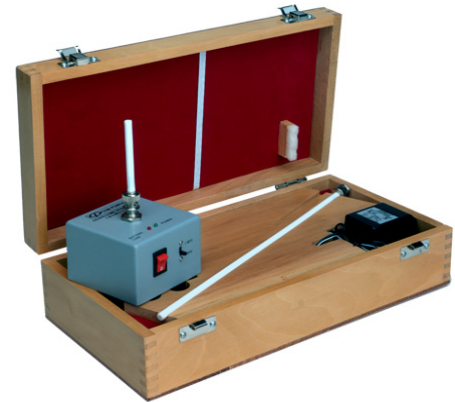
Wide frequency band

Conducted and radiated noise

Small Size - To test small enclosures

Battery Powered - For accuracy and convenience

Two Year Warranty



Description

The CG-515 Series Comb Generators are reference signal sources providing frequency harmonics at preset frequency intervals. The output signal of the Comb Generator is used as a conducted or a radiated signal source.

As a conducted signal source, the output is available directly from the connector. Two antennas are supplied with the Comb Generator for generating radiated reference signals.

The Comb Generator is powered by a rechargeable internal battery. Battery power eliminates any possible measurement variations that can be caused by an external power cable connection. When fully charged, the battery allows continuous operation for up to 18 hours. Internal control and monitoring circuits provide indications of valid output signals.

A battery charger is included with the Comb Generator. The Comb Generator and accessories are shipped in a wooden storage box.

Application

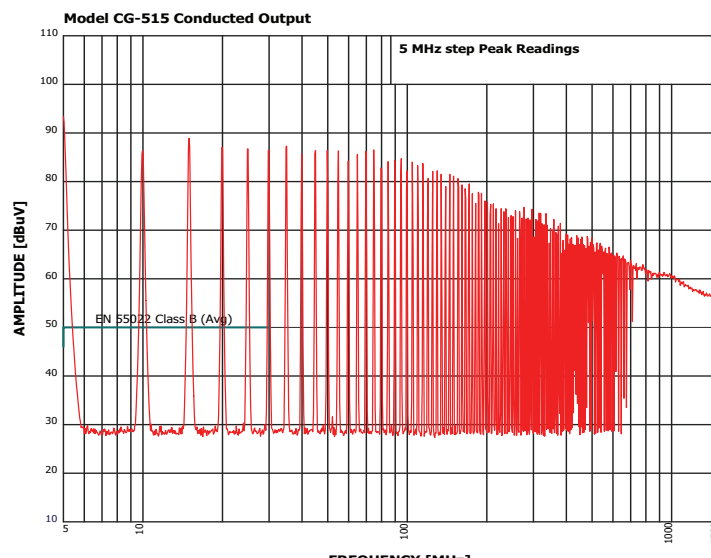
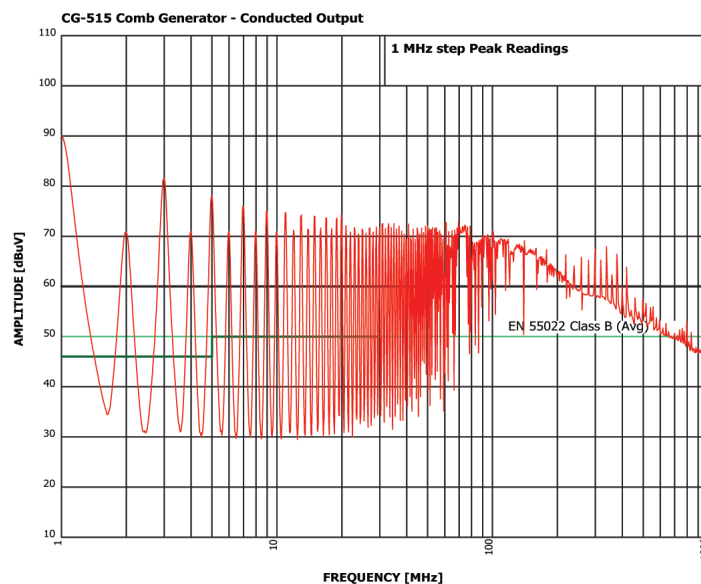
The most important application of a Comb Generator, is trouble shooting Open Area Test Sites (OATS). An OATS must be completely calibrated before it is put into service. When the validity of the test data taken at an OATS is in doubt after it is put into service, it is not always practical to perform complete site calibration. The Comb Generator is a quick calibration tool that can help identify potential problems with the site. For instance, emission measurements taken from a product at two different test sites can sometimes vary. It is very difficult to determine the cause of the variation. Using the same test setup, measurement can be taken with a Comb Generator in place of the product at both sites. The data can be compared to determine if variation is due to the product or the test site.

Other uses of the Comb Generator include evaluating shielding effectiveness and /or resonance performance of enclosures for electronic equipment. Shielding performance of an enclosure can be evaluated simply by comparing the noise with and without an enclosure. The Comb Generator can also be used for production evaluation of components, such as cables and filters.

Specifications

Frequency Range:	1 MHz - 1500 MHz
Step Size:	1 and 5 MHz.
Antennas:	12 inch (upto 540 MHz) and 3 inch (above 540 MHz)
Impedance:	50 Ohm
Connector:	BNC
Battery:	6 V NimH
Charger Input:	6 V DC, 500 mA
Weight:	4 lbs. 1.8 kg
Dimensions ((L x W x H):	3 x 3 x 3 inches , 96 x 127 x 63 cm

Typical conducted output 1 MHz and 5 MHz step



All values are typical values unless specified.

All specifications are subject to change without notice.

Features

Reference Signal Source for EMI Test Sites

100 MHz Frequency Steps

Usable Frequency Range up to 18 GHz

Battery Powered

Three Year Warranty



Description

The CGO-5100A and CGO-5100B Comb Generators are radiated reference signal sources with a 100 MHz frequency step size. Unlike a signal generator the Comb Generator radiates all the harmonics of preset frequency step size at the same time without tuning. The difference between this two models is the frequency stability. The CGO-5100B has a frequency stability of 5 ppm vs 20 ppm for CGO-5100A. They both can radiate signals up to 18 GHz.

Both Comb Generators have a built in antenna which is located on top of the circular chassis. The chassis shape helps the Comb Generator radiate the signal more uniformly in all directions in the horizontal plane. It can be turned on its side for vertical plane measurements, but is generally not recommended because the influence of the ground plane on the radiation pattern.

Both Comb Generators are powered by rechargeable internal NimH batteries. The battery power eliminates the need for an external cabling that may interfere with the radiated signals. When fully charged, the battery allows continuous use of the Comb Generator for up to 18 hours. The Comb Generator and the charger are shipped with a custom wooden storage box.

Application

Most EMC regulatory agencies require EMI labs perform regular calibration test equipment and test site used for emi emission measurements. Most EMC labs calibrate there sites and test equipment annually to ensure this requirement is met. However, it is prudent to check site and test equipment more frequently to ensure the data taken on the site is accurate and consistent. The normal calibration methods are not practical for a quick check. The solution is to use a Comb Generator as reference signal source.

The test engineer can keep a regular log of Comb Generator radiated readings. This data can be used to detect potential problems with site or equipment by monitoring any significant changes. Using this method, potentially costly measurements error can be avoided. Without regular monitoring a broken antenna, a bad cable, blown preamplifier and poor RF connections may go undetected. The Comb Generator can be also used compare several sites to determine the impact of the site on the test data.

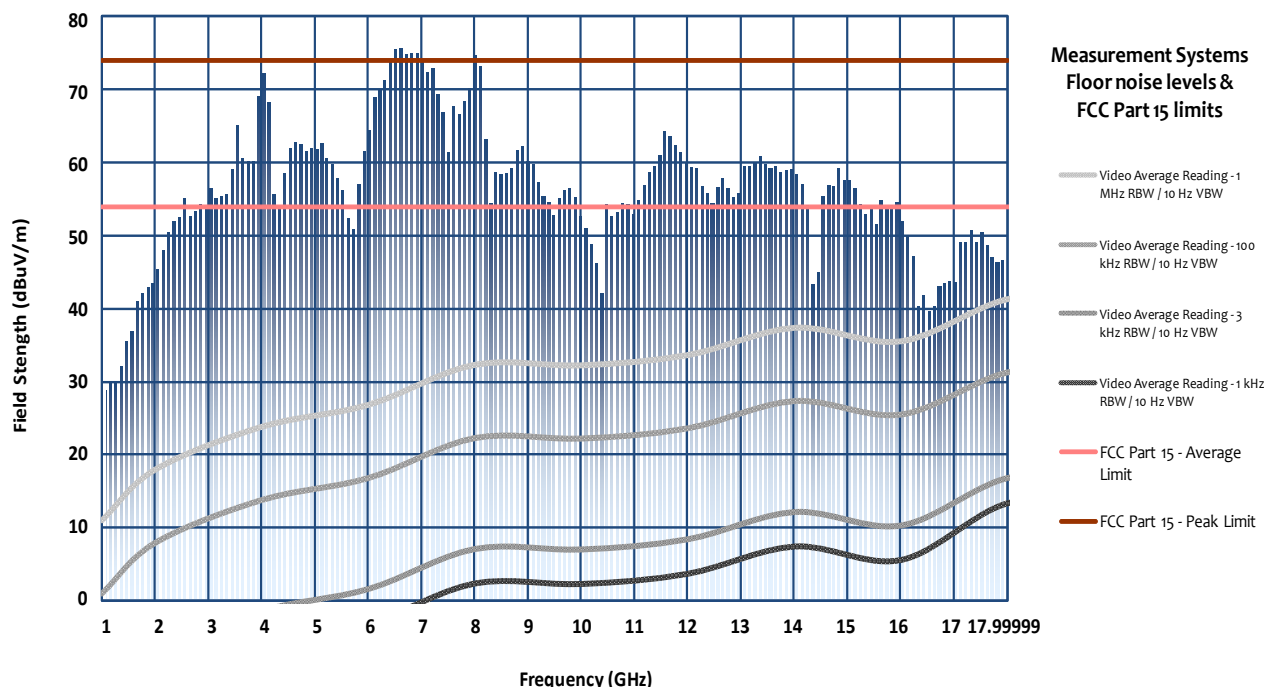
Other applications for the comb Generator include testing shielding effectiveness of an enclosure and materials.

Specifications

Model	CGO-5100A	CGO-5100B
Frequency Range	1 to 18 GHz	1 to 18 GHz
Intended Application	Reference EMC Site Measurements	Reference EMC Site Measurements
Frequency Step Size	100 MHz	100 MHz
Frequency Stability	20 ppm	5 ppm
Time Stability	<1 dB over 12 months	<1 dB over 12 months
Charger Input	6 VDC, 500A	6 VDC, 500A
Operating time	>18 Hours when fully charged	>18 Hours when fully charged
Battery Type	6 V, NimH	6 V, NimH
External Indicators	Battery Low Power On	Battery Low Power On
Antenna	Built in	Built in
Circular base dimensions	8 x 1 inches / 19.2 x 2.4 cm	8 x 1 inches / 19.2 x 2.4 cm
Weight	1 lbs / 0.5 kg	1 lbs / 0.5 kg

Typical Output

CGO-5100A or B Comb Generator Radiated Output Levels vs Typical Measurement System Noise Levels
Measurements performed at 3 meter distance, antenna height varied from 1 to 4 meters



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

Features

Reference Signal Source for LISNs

Frequency Steps of 50 kHz or 250 kHz

Battery Powered

Three Year Warranty



Description

The CGC-255 Comb Generator is a conducted reference signal source for testing Line Impedance Stabilization Networks (LISNs) used for EMI emissions testing. The Comb generator produces all the harmonics of the fundamental frequency determined by the frequency step size selected up to 30 MHz. The CGC-255 has two user selectable frequency step sizes of 50 kHz and 250 kHz.

The Comb Generator output signal is supplied to the LISN using the standard US NEMA 5-15P three blade plug. It can be plugged directly into any LISN that uses a US standard NEMA 5-15R socket to power the equipment under test. The Comb Generator can be used even if the LISN is connected to an external power source. The CGC-255 has high impedance output circuit that can handle supply line voltage up to 230V.

The CGC-255 is powered by the rechargeable internal 6 V NimH battery pack. This eliminates the possibility of external power sources and cables contributing to faulty test results. When fully charged, it can operate up to 18 hours continuously. The Comb Generator and the charger are shipped in a custom wooden storage box.

Application

The main application of the CGC-255 Comb Generators is to quickly verify conducted emissions test set-ups that uses a LISN. The conducted signal output level of the Comb Generators are close to or above the CISPR 22 limits as shown on the typical output plot on the back of this page.

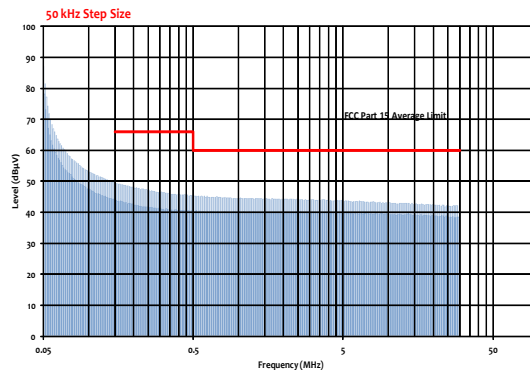
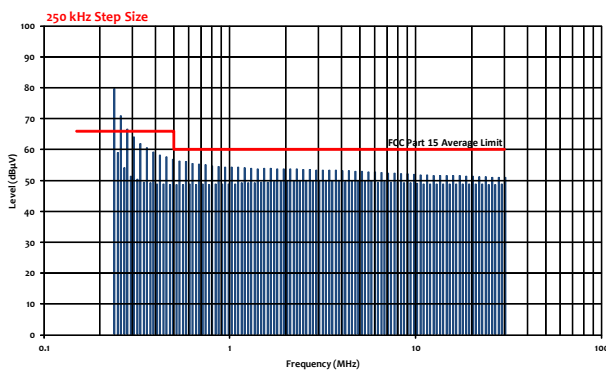
Most accredited EMI labs are required to calibrate LISNs and other equipment (spectrum analyzers, cables, connectors, etc.) at least once a year to ensure they are operating within tolerance. However, equipment malfunctions can occur anytime between calibrations and may go undetected by the user. In the meantime, these malfunctions may produce erroneous test results. Such problems can be avoided by using the Comb Generator as a reference noise source. With the Comb Generator, the test engineer will be able to quickly perform verification of the conducted test setup more frequently to assure accurate test results.

Other possible applications of the CGC-255 Comb Generator could include production evaluation of components, such as cable shields and filters.

Specifications

Model	CGC-255
Frequency Range	50 kHz to 30 MHz
Intended Application	Reference Signal Source for LISN Verification
Frequency Step Size	50 kHz or 250 kHz
Frequency Stability	20 ppm
Amplitude Stability	± 0.1 dB
Time Stability	<1 dB over 12 months
Charger Output	6 VDC, 500A (unregulated)
Charger Input	125 VAC, 60 Hz or 230 VAC, 60/50 Hz
Operating Time	>18 Hours when fully charged
Battery Type	6V, NimH
External Indicators	Battery Low and Power On
LISN Interface Plug	NEMA 5-15P type
Dimensions	5 x 2.2 x 2.2 inches 13.2 x 5.9 x 5.9 cm
Weight	1 lbs / 0.5 kg

Typical Output



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

Features

Reference Signal Source for LISNs

Frequency Steps of 100 kHz or 500 kHz

Usable Frequency Range up to 250 MHz

Battery Powered

Three Year Warranty



Description

The CGC-510 Comb Generator is a conducted reference signal source to test Line Impedance Stabilization Network (LISN). The Comb generator output has the harmonics of the fundamental frequency. It has two user selectable frequency step sizes of 100 kHz or 500 kHz.

This Comb Generator simulates an EUT generating conducted EMI noise. The CCG series Comb Generators have the standard NEMA three blade connector that can plug directly into any LISN with the matching EUT power socket. The CGC-510 has high impedance to the external line voltage, AC or DC up to 230 V. This feature allows the Comb Generator to be used while the LISNs are connected to external power source.

The CGC-510 is powered by rechargeable internal NimH batteries. The battery power eliminates the need for an external cabling that may interfere with the radiated signals. When fully charged, the battery allows continuous use of the Comb Generator for up to 18 hours. The Comb Generator and the charger are shipped with a custom wooden storage box.

Application

The main application of the CGC-510 Comb Generators is to quickly verify conducted emissions test setups. It is designed to plug directly into the EUT power socket of the LISN. The conducted noise output level of the Comb Generators are close to or above the CISPR 22 limits as shown on the typical output plot on the back of this page.

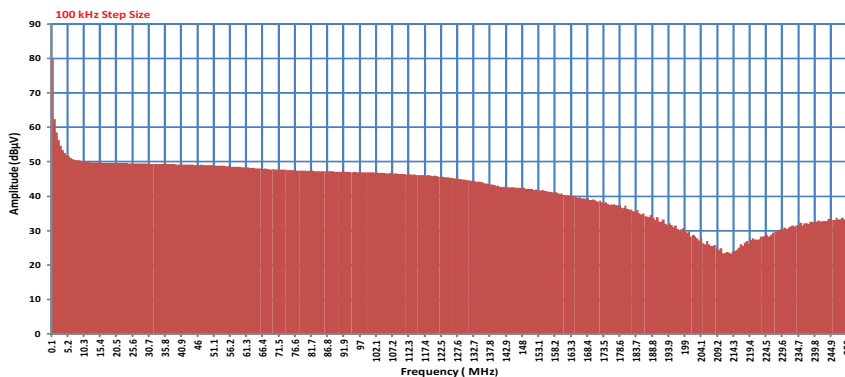
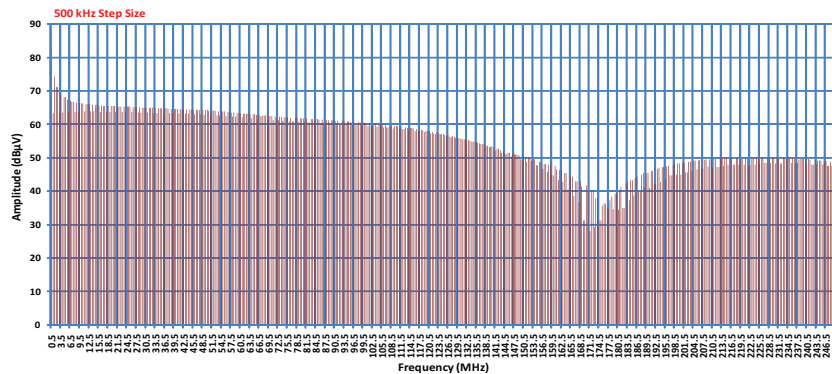
Most EMI labs typically calibrate LISNs and other equipment (spectrum analyzers, cables, connectors, etc.) in the conducted emissions test setup at regular intervals. However, test equipment malfunctions may occur between any calibration interval and may go undetected until the next calibration. In the meantime, these malfunctions may produce erroneous test results. This is unacceptable and can be avoided by using the Comb Generator as a reference noise source. With the Comb Generator, the test engineer will be able to quickly perform verification of the conducted test setup more frequently to assure accurate test results.

Other possible applications of the CGC-510 Comb Generator could include production evaluation of components, such as cable shields and filters

Specifications

Model	CGC-510
Frequency Range	100 kHz to 250 MHz
Intended Application	Reference Signal Source for LISN verification
Frequency Step Size	100 kHz or 500 kHz
Frequency Stability	20 ppm
Amplitude Stability	± 0.1 dB
Time Stability	<1 dB over 12 months
Charger Output	6 VDC, 500A
Charger Input	125 VAC, 60 Hz or 230 VAC, 50/60 Hz
Operating time	>18 Hours when fully charged
Battery Type	6 V, NimH
External Indicators	Battery Low and Power On
LISN interface plug	NEMA 15-P type
Dimensions	5 x 2.2 x 2.2 inches 13.2 x 5.9 x 5.9 cm
Weight	1 lbs / 0.5 kg

Typical Output



Features

Reference Source for OATS Verification

Usable Frequency Range to 36 GHz

Omni-directional

3 Year Warranty



Description

The CGO-51000 Comb Generator is a radiated reference signal source. It is a self-contained source of signals consisting of frequency harmonics at 1000 MHz intervals, and is usable from 1 GHz up to at least 36 GHz. The signals generated by CGO-51000 are stable and can be used as reference for validating high frequency test setups in open area test site or anechoic chamber.

The CGO- 51000 Comb Generator has an omni directional built-in antenna, which works in conjunction with the chassis of the unit. The circular chassis of the Comb Generator helps radiate the signal uniformly in all directions in the horizontal plane. The built-in antenna of the CGO 5100 provides improved signal stability, however it cannot provide conducted reference signals.

The CGO- 51000 Comb Generator is powered by a rechargeable internal battery pack. The internal power eliminates the need for an external power cable and its effect on the radiated signal pattern or level. When fully charged, the battery allows continuous use of the Comb Generator for up to 18 hours. The Comb Generator and its charger are shipped with a custom wooden storage box

Application

Radiated emissions measurements for EMC are usually conducted on an Open Area Test site (OATS) or an anechoic chamber. These require periodic calibration to ensure repeatable and accurate EMC measurements.

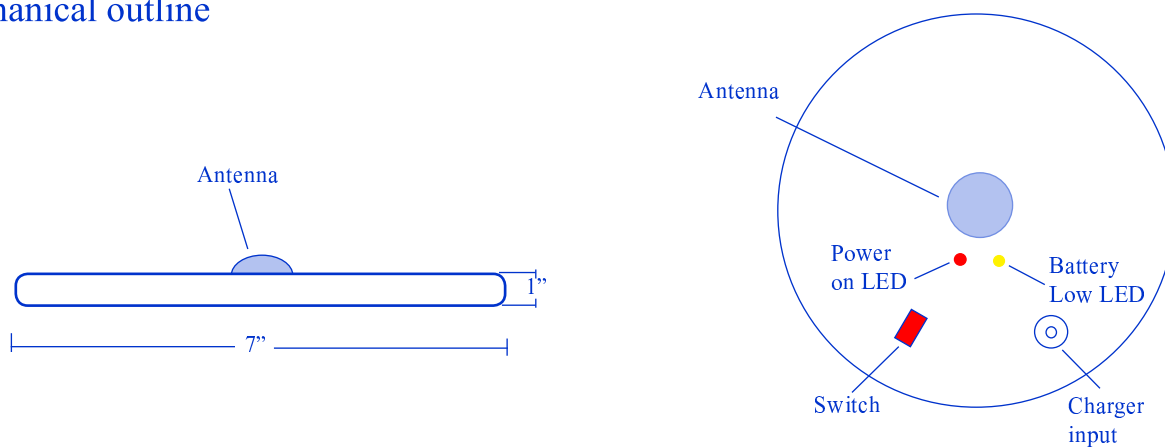
The Comb Generator is a tool to solve these problems. The test engineer should keep a daily log of a few Comb Generator radiated readings before starting his test. He is able detect potential problems with site by monitoring any change in the readings. For example, any problem or change with antenna, cables, preamplifier, attenuator or receiver will be reflected in the Comb Generator data with the same setup. The same method can be utilized when EMC emissions measurements for a product varies with sites. The Comb Generator can be used to determine if the test sites are causing the variation. Without such a reference source, it would be extremely difficult to compare several sites.

The comb Generator can also be used to check the shielding effectiveness of an enclosure.

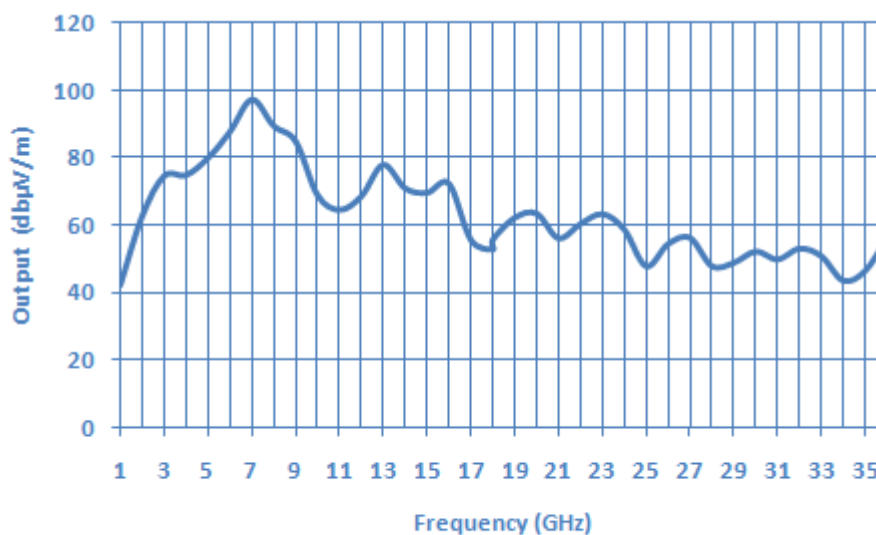
Specifications

Frequency Range:	1 GHz - 36 GHz
Frequency Step Size:	1000 MHz
Batteries:	6 V NimH
Battery Charger	
Input:	90-240 VAC, 50/60 Hz
Output:	7.5 VDC @ 500mA
Plug type:	2.5mm x 5.5mm (center pos.)
Dimensions:	7" circular x 0.75" (17.8 cm circular x 1.9 cm)
Weight:	2.5 lb. (1.1 kg)

Mechanical outline



Typical radiated output at 3 meter distance



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

Features

Frequency range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

For USB cables with type B connector

Individual calibration

Three Year Warranty



Description

Com-Power CDN-USB-BE is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-USB-BE series is for used for testing products that uses USB cables for communication, such as telecom cables. The CDN-USB-BE has a USB type B connector for both EUT and AE connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-USB-BE fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the shield of the USB cable. In addition, CDNs provide required common mode impedance between shield and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the signals from the auxiliary equipment to the EUT.

Before you begin testing with the CDN-USB-BE you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-USB-BE

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
Max Input Voltage	40 V
Application	USB cable with type B connector.
Current rating	500 mA
Voltage rating	100 VAC / 100 VDC
RF Input Connector	50 Ω BNC (female)
EUT Connection	USB Type B
AE Connection	USB Type A
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	8.5 x 4.5 x 3.5 inches 21.5 x 11.4 x 8.8 cm
Weight	2 lbs. 0.9 kg
Accessories available from Com-Power for setting test levels and running the test	ADA-USB-BE shorting adapter ADA-515-2 150 Ω to 50 Ω adapter ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



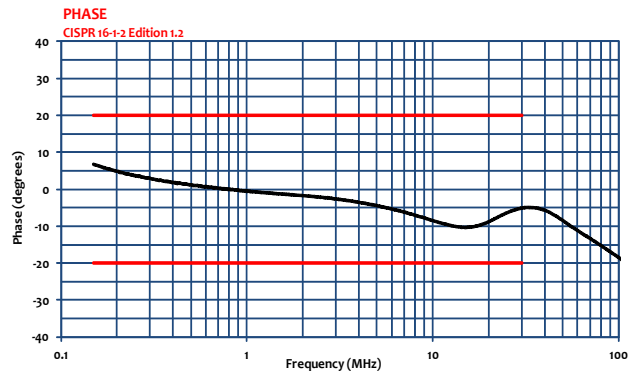
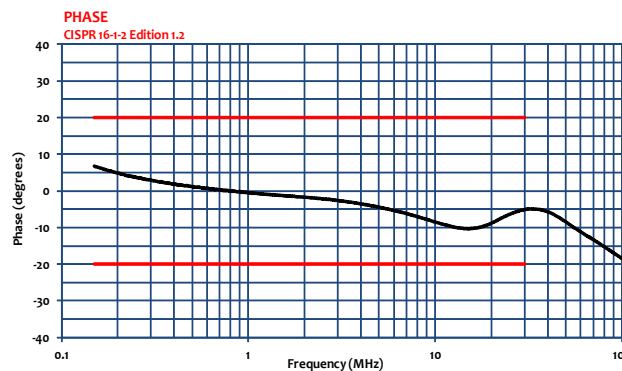
Shorting Adapter ADA-USB-BE
(Front and back view)



ADA-515-2 Adapter
(Front and back view)

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Coupling Decoupling Network

CDN-AF4E

Features

Test from 150 kHz to 230 MHz

Designed for IEC / EN 61000-4-6

For 4 wire unscreened unbalanced cables

Individual calibration Included

Three Year Warranty



Description

Com-Power CDN-AF4E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-AF4E series is for used for testing products uses four wire unscreened cables for data communication. It has four 2 mm shrouded banana sockets for both EUT and AE power connections. The CDN-AF4E can handle up to 5 A of current.

The RF disturbance signal is injected using a BNC connector which can handle up to 40 V of input. Also bottom surface of the CDN is not painted, so that the CDN can be grounded as required by the test.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. This is a pre-packaged solution that includes ACS series power amplifier and accessories required for the test.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-AF4E fully complies with the requirement contained in the IEC / EN 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to each line. In addition, CDNs provide required common mode impedance between each line and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted communication between the EUT and Auxiliary equipment.

Before you begin testing with the CDN-AF4E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the U_{mr} value given in table below. The ADA-515 and accessories that are needed for this calibration is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ U_{mr}
1	0.167
3	0.5
10	1.67

U_{mr} = Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-AF4E

Specifications

Product Name	Coupling Decoupling Network (CDN)
Applicable Test Standard	IEC / EN 61000-4-6
Frequency Range	150 kHz to 230 MHz
I/O rating for EUT/AE Ports	5 Amps
Max Input Voltage	40 V
Voltage Rating	311 V AC Line to Ground 440 V DC Line to Ground
Application	4 wire unscreened unbalanced cables
RF Input Connector	50 Ω BNC (female)
I/O Connection	2 mm shrouded banana sockets
Common mode impedance	550 kHz - 26 MHz: 150 Ω \pm 20 Ω 26 MHz - 80 MHz: 150 Ω + 60 Ω / - 45 Ω 80 MHz - 230 MHz: 150 Ω + 60 Ω / - 60 Ω
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	6 x 6 x 13 inches 15.2 x 15.2 x 33 cm
Weight	5 lbs. 2.3 kg
Accessories Available from Com-Power for setting test levels and running the test	ADA-AF4E shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



Shorting Adapter Set ADA-AF4E



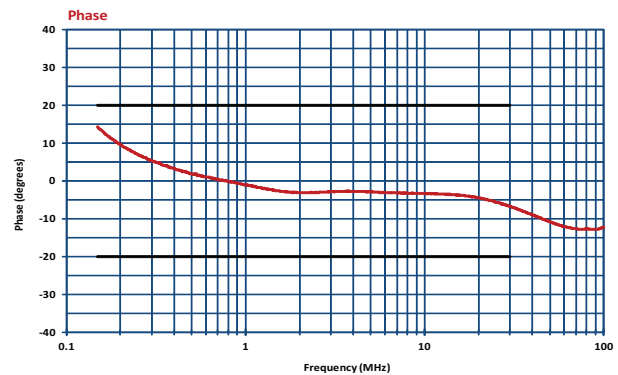
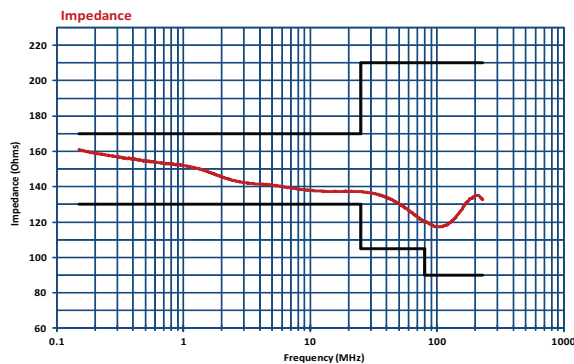
ADA-515-2 Adapter Set



TEP-050 Terminator

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Coupling Decoupling Network

CDN-AF8E

Features

Test From 150 MHz to 230 MHz

Designed for IEC / EN 61000-4-6

For 8 wire unscreened cables

Individual Calibration Included

Three Year Warranty



Description

Com-Power CDN-AF8E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC / EN 61000-4-6.

The CDN-AF8E series is for used for testing products uses eight wire unscreened cables for data communication. It has four 2 mm shrouded banana sockets for both EUT and AE power connection. The CDN-AF4E can handle up to 5 A of current.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded for safety as required by the test standard.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. This is a pre-packaged solution that includes ACS series power amplifier and accessories required for the test.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-AF8E fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to each line. In addition, CDNs provide required common mode impedance between each line and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted communication between the EUT and Auxiliary equipment.

Before you begin testing with the CDN-AF8E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-AF8E

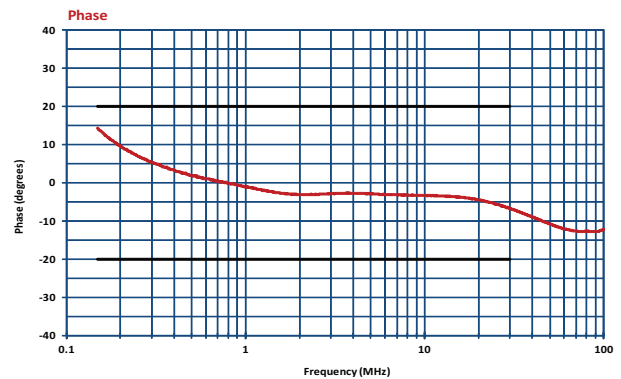
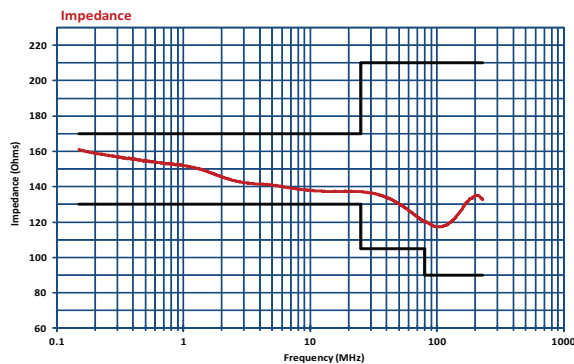
Specifications

Product Name	Coupling Decoupling Network (CDN)
Applicable Test Standards	IEC / EN 61000-4-6
Frequency Range	150 kHz to 230 MHz
I/O rating for EUT/AE Ports	5 Amps
Max Input Voltage	40 V
Voltage Rating	311 V AC Line to Ground 440 V DC Line to Ground
Application	8 wire unscreened Unbalanced cables
RF Input Connector	50 Ω BNC (female)
I/O Connection	2 mm shrouded banana sockets
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	6 x 6 x 13 inches 15.2 x 15.2 x 33 cm
Weight	5 lbs. 2.3 kg
Accessories Available from Com-Power for setting test levels and running the test	ADA-AF8E shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Coupling Decoupling Network

CDN-M125E

Features

Frequency Range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

Up to 25 A AC current handling

Individual Calibration

Three Year Warranty



Description

Com-Power CDN-M125E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-M125E series is for used for testing products with single power supply line. It can handle up to 25 A (AC) or 17.5 DC power source. It has 4 mm shrouded banana socket for both EUT and AE power connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-M125E fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the power supply lines. In addition, CDNs provide required common mode impedance between the power supply lines and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the power to the EUT.

Before you begin testing with the CDN-M125E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the U_{mr} value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ U_{mr}
1	0.167
3	0.5
10	1.67

U_{mr} = Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-M125E

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
I/O rating for EUT/AE Ports	250 VAC, 350 VDC
Max Input Voltage	40 V
Application	Single conductor power cable
Current rating	25 Amp (AC), 17.5 (DC)
RF Input Connector	50 Ω BNC (female)
I/O Connection	4 mm banana socket with shrouded Sheath
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	6 x 6 x 13 inches 15.2 x 15.2 x 33 cm
Weight	5 lbs. 2.3 kg
Accessories Available from Com-Power for setting test levels and running the test	ADA-M125E shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.



Shorting Adapter Set ADA-M125E

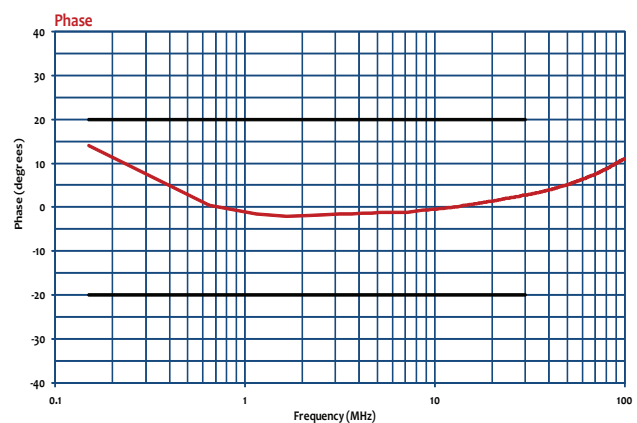
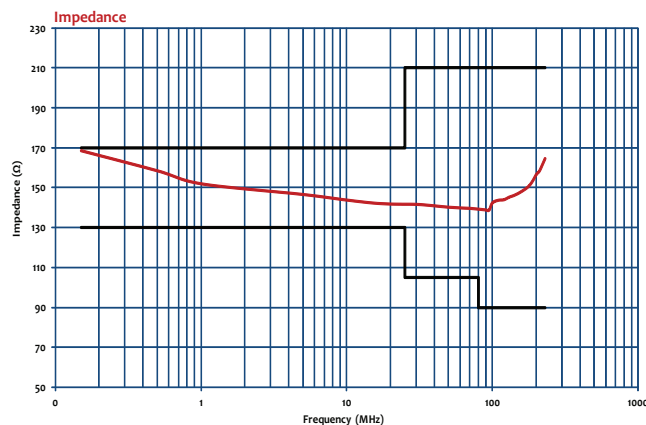


ADA-515-2 Adapter Set



TEP-050 Terminator

Typical data



Features

Frequency range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

Up to 25 A AC current handling

Individual calibration

Three Year Warranty



Description

Com-Power CDN-M225E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-M225E series is for used for testing products with two wire power supply lines. It can handle up to 25 A (AC) or 17.5 DC power source. It has 4 mm shrouded banana socket for both EUT and AE power connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-M225E fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the power supply lines. In addition, CDNs provide required common mode impedance between the power supply lines and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the power to the EUT.

Before you begin testing with the CDN-M225E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and accessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-M225E

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
I/O rating for EUT/AE Ports	250 VAC, 350 VDC
Max Input Voltage	40 V
Application	Two wire power cables
Current rating	25 Amp (AC), 17.5 (DC)
RF Input Connector	50 Ω BNC (female)
I/O Connection	4 mm banana socket with shrouded Sheath
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	6 x 6 x 13 inches 15.2 x 15.2 x 33 cm
Weight	5 lbs. 2.3 kg
Accessories Available from Com-Power for setting test levels and running the test	ADA-M225E shorting adapters ADA-515-2 150 Ω to 50 Ω adapter TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



Shorting Adapter Set ADA-M225E



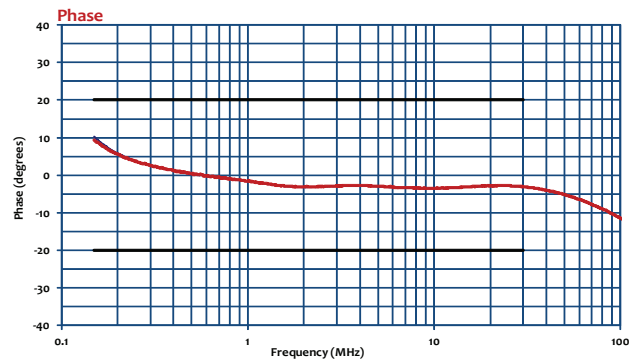
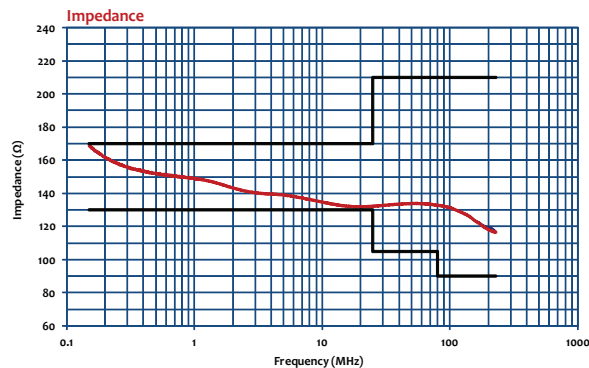
ADA-515-2 Adapter Set



TEP-050 Terminator

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Features

Frequency range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

Up to 25 A AC current handling

Individual calibration

Three Year Warranty



Description

Com-Power CDN-M325E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-M325E series is for used for testing products with three wire power supply lines (L + N + PE). It can handle up to 25 A (AC) or 17.5 DC power source. It has 4 mm shrouded banana socket for both EUT and AE power connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-M325E fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the power supply lines. In addition, CDNs provide required common mode impedance between the power supply lines and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the power to the EUT.

Before you begin testing with the CDN-M325E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the U_{mr} value given in table below. The ADA-515 and accessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ U_{mr}
1	0.167
3	0.5
10	1.67

U_{mr} = Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-M325E

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
I/O rating for EUT/AE Ports	250 VAC, 350 VDC
Max Input Voltage	40 V
Application	Three wire power cables
Current rating	25 Amp (AC), 17.5 (DC)
RF Input Connector	50 Ω BNC (female)
I/O Connection	4 mm banana sockets with shrouded sheath
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	6 x 6 x 13 inches 15.2 x 15.2 x 33 cm
Weight	5 lbs. 2.3 kg
Accessories Available from Com-Power for setting test levels and running the test	ADA-M325E shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



Shorting Adapter Set ADA-M325E



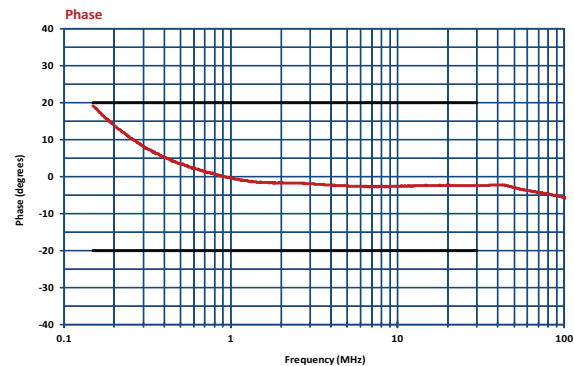
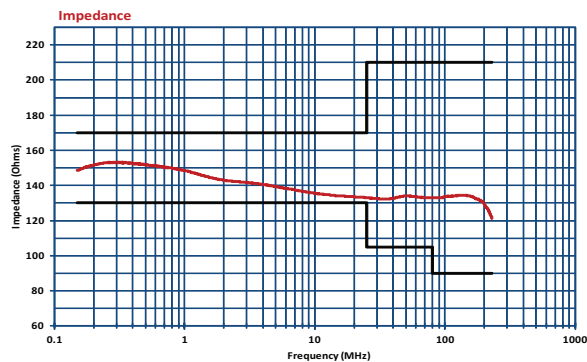
ADA-515-2 Adapter Set



TEP-050 Terminator

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Coupling Decoupling Network

CDN-T2E

Features

- Test From 150 MHz to 230 MHz
- Designed for IEC / EN 61000-4-6
- For unscreened balanced lines
- Individual calibration included
- Three Year Warranty



Description

Com-Power CDN-T2E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-T2E series is for used for testing products that uses a cable with a pair of unscreened balanced lines for communication, such as telecom cables. The CDN-T2E has a RJ11 connector for both EUT and AE connection. The CDN-T2E can handle up to 2 A of current.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded for safety as required by the test standard.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. This is a pre-packaged solution that includes ACS series power amplifier and accessories required for the test.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-T2E fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the unscreened conductor pair. In addition, CDNs provide required common mode impedance between each pair of conductors and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the signals from the auxiliary equipment to the EUT.

Before you begin testing with the CDN-T2E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network CDN-T2E

Specifications

Product Name	Coupling Decoupling Network (CDN)
Applicable Test Standard	IEC -61000-4-6
Frequency Range	150 kHz to 230 MHz
Max Input Voltage	40 V
Application	Cable with pair of unscreened balanced conductors.
Current rating	2 Amps
Voltage rating	160 VAC
RF Input Connector	50 Ω BNC (female)
I/O Connections	RJ 11
Common mode impedance	550 kHz - 26 MHz: 150 Ω \pm 20 Ω 26 MHz - 80 MHz: 150 Ω + 60 Ω / - 45 Ω 80 MHz - 230 MHz: 150 Ω + 60 Ω / - 60 Ω
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	8.5 x 4.5 x 3.5 inches 21.5 x 11.4 x 8.8 cm
Weight	2 lbs. 0.9 kg
Accessories available from Com-Power for setting test levels and running the test	ADA-T2 shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.



Shorting Adapter Set ADA-T2

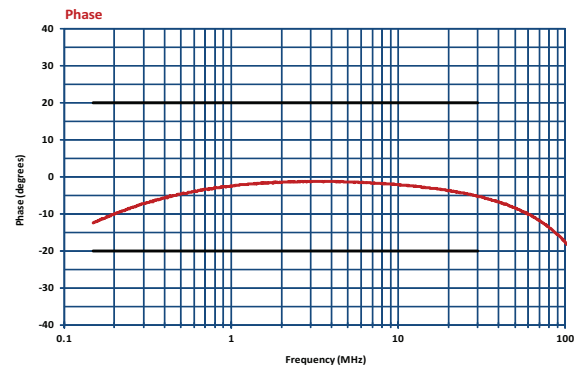
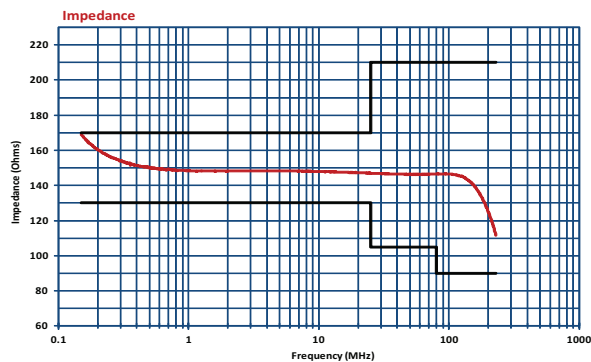


ADA-515-2 Adapter Set



TEP-050 Terminator

Typical Data



Coupling Decoupling Network

CDN-T4E

Features

Frequency range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

For testing unscreened balanced lines

Individual calibration

Three Year Warranty



Description

Com-Power CDN-T4E is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-T4E series is for used for testing products that uses a cable with 2 pairs unscreened balanced conductors for communication, such as ethernet. The CDN-T4E has a RJ45 connector for both EUT and AE connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased seperately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-T4E fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to each pair of unscreened lines within the cable. In addition, CDNs provide required common mode impedance between each pair of lines and ground, minimize interference to the auxillary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the signalst from the auxillary equipment to the EUT.

Before you begin testing with the CDN-T4E you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-T4E

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
Max Input Voltage	40 V
Application	Cable with 2 pairs unscreened balanced conductors
Current rating	2 Amps
Voltage rating	160 VAC
RF Input Connector	50 Ω BNC (female)
I/O Connections	RJ 45
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	8.5 x 4.5 x 3.5 inches 21.5 x 11.4 x 8.8 cm
Weight	2 lbs. 0.9 kg
Accessories Available from Com-Power for setting test levels and running the test	ADA-T4/T8 shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



Shorting Adapter Set ADA-T4/T8



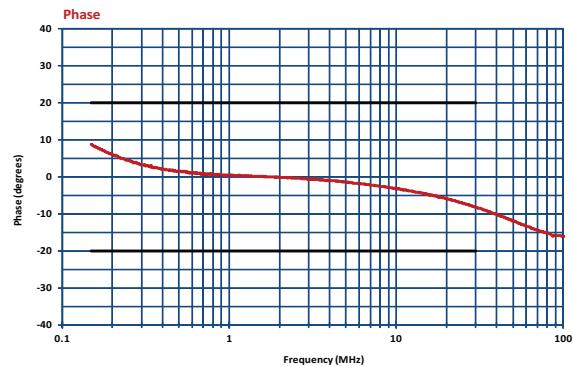
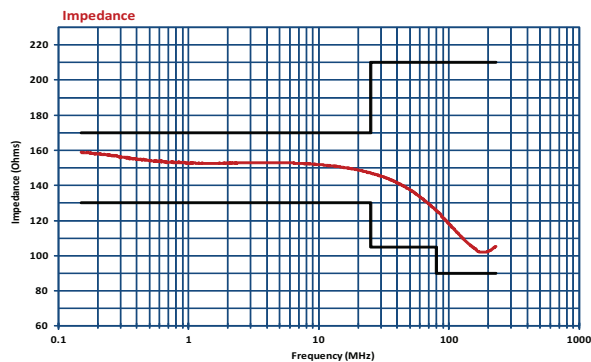
ADA-515-2 Adapter Set



TEP-050 Terminator

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Coupling Decoupling Network

CDN-T8SE

Features

Frequency range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

For testing screened balanced lines

Individual calibration

Three Year Warranty



Description

Com-Power CDN-T8SE is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-T8SE series is for used for testing products that uses screened cable containing 4 pairs of balanced conductors for communication, such as high speed ethernet lines. The CDN-T8SE has a shielded RJ45 connectors for both EUT and AE connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased seperately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-T8SE fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the screen of the cable. In addition, CDNs provide required common mode impedance between the cable screen and ground, minimize interference to the auxillary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the signalst from the auxillary equipment to the EUT.

Before you begin testing with the CDN-T8SE you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150 Ω to 50 Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150 Ω to 50 Ω adapter (ADA-515)

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
Max Input Voltage	40 V
Application	Screened cable with 4 pairs of balanced conductors
Current rating	2 Amps
Voltage rating	160 VAC
RF Input Connector	50 Ω BNC (female)
I/O Connections	Shielded RJ 45
Common mode impedance	550 kHz - 26 MHz: 150 Ω \pm 20 Ω 26 MHz - 80 MHz: 150 Ω + 60 Ω / - 45 Ω 80 MHz - 230 MHz: 150 Ω + 60 Ω / - 60 Ω
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	8.5 x 4.5 x 3.5 inches 21.5 x 11.4 x 8.8 cm
Weight	2.1 lbs. 1 kg
Accessories available from Com-Power for setting test levels and running the test	ADA-T8SE shorting adapters ADA-515-2 150 Ω to 50 Ω adapters TEP-050 50 Ω Terminator ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



Shorting Adapter Set ADA-T8SE



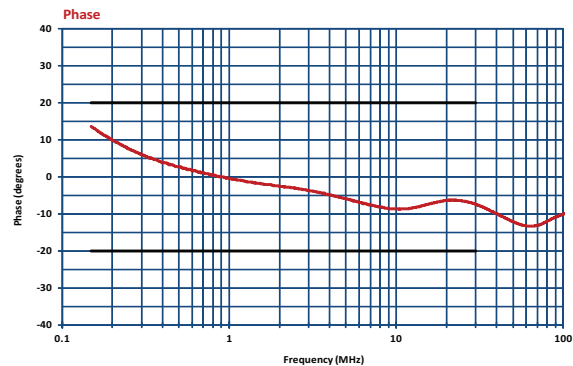
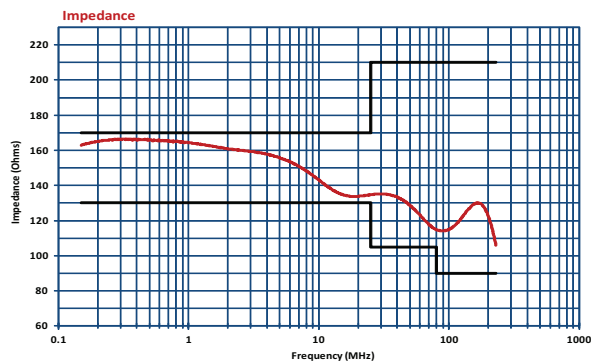
ADA-515-2 Adapter Set



TEP-050 Terminator

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Features

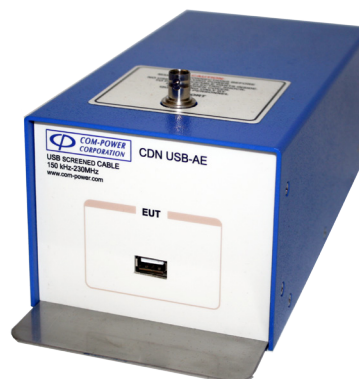
Frequency range: 150 MHz to 230 MHz

Meets CISPR 16-1-2 requirements

For USB cables with type A connector

Individual calibration

Three Year Warranty



Description

Com-Power CDN-USB-AE is part of a series of Coupling/Decoupling Networks designed specifically for testing product for conducted immunity per IEC 61000-4-6.

The CDN-USB-AE series is for used for testing products that uses USB cables for communication, such as telecom cables. The CDN-USB-AE has a USB type A connector for both EUT and AE connection.

The RF disturbance signal is injected using a BNC-connector which can handle up to 40 V of input. The bottom surface of the CDN is not painted, so that it be properly grounded during the test.

All Com-Power CDNs can be purchased separately or part of the CIS series conducted immunity test system. The test system includes the ACS series power amplifier and accessories required to conduct the immunity testing.

All Com-Power CDNs are individually calibrated. The Com-Power CDN-USB-AE fully complies with the requirement contained in the IEC 61000-4-6 and CISPR 16-1-2.

Application

During conducted Immunity testing, CDNs are utilized to provide a means of coupling RF common mode signals to the shield of the USB cable. In addition, CDNs provide required common mode impedance between shield and ground, minimize interference to the auxiliary equipment via common mode decoupling of the disturbing signals and provide uninterrupted path for the signals from the auxiliary equipment to the EUT.

Before you begin testing with the CDN-USB-AE you will need to establish a calibrated drive levels corresponding to your desired test levels. During drive level calibration the RF signal level being injected to the CDN is adjusted incrementally until the voltage level measured at the 150Ω to 50Ω adapter (ADA-515) connected to the EUT port is approximately equal to the Umr value given in table below. The ADA-515 and ccessories that are needed for this test is also available from Com-Power.

Test Levels Open Circuit Voltage	Open Circuit Voltage @ Umr
1	0.167
3	0.5
10	1.67

Umr= Voltage level measured at the output of the 150Ω to 50Ω adapter (ADA-515)

Coupling Decoupling Network

CDN-USB-AE

Specifications

Product Name	Coupling Decoupling Network (CDN)
Compliant Test Standards	IEC -61000-4-6, CISPR 16-1-2
Frequency Range	150 kHz to 230 MHz
Max Input Voltage	40 V
Application	USB cable with type A connector.
Max Current rating	500 mA
Voltage rating	100 VAC / 100 VDC
RF Input Connector	50 Ω BNC (female)
AE and EUT Connections	USB Type A
Common mode impedance	550 kHz - 26 MHz: $150\Omega \pm 20\Omega$ 26 MHz - 80 MHz: $150\Omega + 60\Omega / - 45\Omega$ 80 MHz - 230 MHz: $150\Omega + 60\Omega / - 60\Omega$
Voltage Division Factor	9.5 dB +4 / -1 dB
Dimensions	8.5 x 4.5 x 3.5 inches 21.5 x 11.4 x 8.8 cm
Weight	2 lbs. 0.9 kg
Accessories available from Com-Power for setting test levels and running the test	ADA-USB-AE shorting adapter ADA-515-2 150 Ω to 50 Ω adapter ATTN-6-100W Power Attenuator DCU-300-100W Directional Coupler ASC series Power Amplifiers



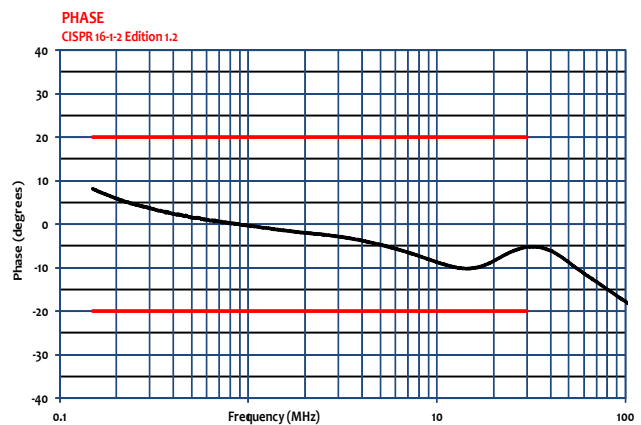
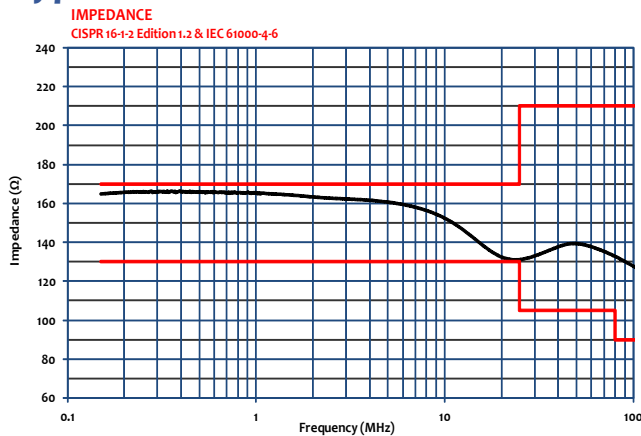
Shorting Adapter ADA-USB-AE
(Front and back view)



ADA-515-2 Adapter
(Front and back view)

All values are typical values unless otherwise specified.
Specifications are subject to change without notice.

Typical Data



Coupling / Decoupling Networks

C, S, AF, T Series

Features

For Signal Lines

Frequency Range - 150 kHz - 80 MHz

Meets EN 61000-4-6 Requirements

Individual Calibration

Two Year Warranty



Description

The signal line Coupling / Decoupling Networks (CDN) are for testing from 150 kHz - 80 MHz according to the EN 61000-4-6 standard for immunity to conducted disturbance induced by radio frequency fields.

As the name implies, the CDNs has both coupling and decoupling networks. The coupling network delivers injected RF common mode current disturbance signals through the various signal conductors to the equipment under test (EUT). The decoupling networks are used to insure that the disturbing signals injected on the signal line of the EUT by the coupling networks does not interfere with any the auxiliary equipment (AE) connected to the EUT. Each CDN contains integrated direct capacitive coupling along with a high impedance choke for inductive decoupling.

The disturbing signal is injected on signal lines by using a series of coupling networks represented by series C, S, AF and T.

Individual calibration data will be provided with each CDN. However, test level calibration must be performed on site to determine the minimum required test signal needed to achieve the required voltage levels specified by EN 61000-4-6. The appropriate calibration accessories for conducting the level test is available from Com-Power.

Application

During the test the CDN is connected to the signal cables between the equipment under test (EUT) and auxiliary equipment (AE). The type of cables will determine which CDN to use for the test.

The **C series** CDNs are for injecting disturbing signals onto 50 Ohm (CDN-C50) and 75 Ohm (CDN-C75) coax cables. These CDNs have BNC EUT and AE connections.

The **S series** CDNs are for shielded cables with single or multiple conductors. These CDNs are available for testing 1, 2, 4, 9, 15, 25, 36 and 50 conductor cables. These CDNs have D type or BNC connectors for EUT and AE connections.

The **AF series** CDNs are for unshielded cables with single or multiple conductors carrying low current. Available in 2 conductor (AF2), 4 conductor (AF4) and 8 conductor (AF8). AF series CDNs are supplied with RCA connectors.

The **T series** CDNs are for cables with unshielded balanced conductor pairs typically found in ISDN, DSL and 10/100 based T data transfer applications. These CDNs can be used at voltages up to 100 VAC and currents up to 2 Amps.

Specifications

Frequency:	150 kHz - 80 MHz
Voltage (maximum):	100 VAC (CDN series C & S) 160 VAC (CDN series AF & T)
Current (Maximum)	2 Amps
Maximum RF input:	40 V max
Common mode impedance:	150 kHz - 26 MHz: 150 Ohms \pm 20 Ohms 26 MHz - 80 MHz: 150 Ohms + 60 Ohms and - 45.5 Ohms
RF (Disturbance coupling) connector:	BNC (f) 50 Ohms
Common mode adapters:	150 Ohm to 50 Ohm (model ADA-515) 50 Ohm Terminator (model TEP-050)

Test level calibration components selection table:

Model	AE & EUT Connector Type	Calibration Adapter Input (AE)	Calibration Adapter Output (EUT)	Common Mode Adapters for Input (AE)	Common Mode Adapters for Output (EUT)
CDN-C50	BNC (f)	ADA-C50	ADA-C50	ADA-515 & TEP-050	ADA-515
CDN-C75	BNC (f)	ADA-C75	ADA-C75	ADA-515 & TEP-050	ADA-515
CDN-S1	BNC (f)	ADA-S1	*	*	ADA-515
CDN-S4	BNC (f)	ADA-S4	*	*	ADA-515
CDN-S9	DB-9	ADA-S9	*	*	ADA-515
CDN-S15	DB-15	ADA-S15	*	*	ADA-515
CDN-S25	DB-25	ADA-S25	*	*	ADA-515
CDN-S36	Centronics	ADA-S36	*	*	ADA-515
CDN-S50	DB-50	ADA-S50	*	*	ADA-515
CDN-AF2	RCA	ADA-AF2	ADA-AF2	ADA-515 & TEP-050	ADA-515
CDN-AF4	RCA	ADA-AF4	ADA-AF4	ADA-515 & TEP-050	ADA-515
CDN-AF8	RCA	ADA-AF8	ADA-AF8	ADA-515 & TEP-050	ADA-515
CDN-T2	RJ11	ADA-T2	ADA-T2	ADA-515 & TEP-050	ADA-515
CDN-T4	RJ45	ADA-T4	ADA-T4	ADA-515 & TEP-050	ADA-515
CDN-T8	RJ45	ADA-T8	ADA-T8	ADA-515 & TEP-050	ADA-515

* The C & S Type CDNs are designed to inject noise to the screen of the cable (IEC-61000-4-6). Since the connector at the input (AE) of the CDN is connected to ground, no calibration adaptor or common mode adaptor is required on the AE side of the CDN during test level calibration.

All values are typical unless specified.

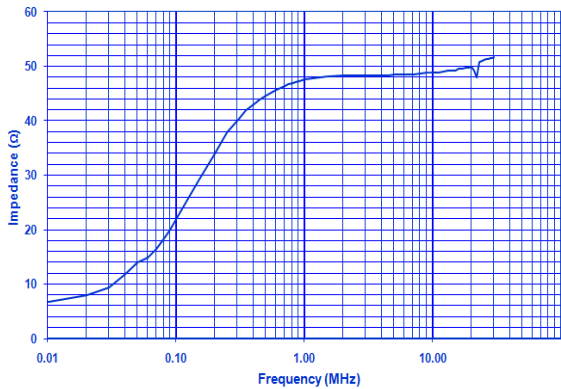
All specifications are subject to change without notice.

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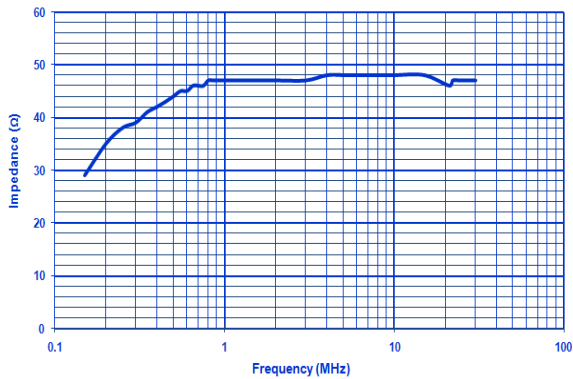
Specifications

Model	LIN-115A	LI-215A
Frequency	150 kHz - 30 MHz	9 kHz - 30 MHz
Lines + Ground	2	2
Max Current (Amp)	15	15
Voltage (line to ground)	270 VAC	270 VAC
Inductor (μH)	50	50 & 250
Output impedance (Ω)	50	50
Output Connector	N type	N type
Power source frequency	DC-60 Hz	DC - 60 Hz
Transient limiter	Built in	Optional
Power in	IEC Power inlet	IEC Power inlet
Power out	Euro type	NEMA
Weight	17 lbs. / 8 kg	21 lbs./ 9.5 kgs
Size	14 x 7 x 13 inches 35.5 x 17.7 x 33 cm	17 x 16 x 7 inches 43 x 40 x 18 cm

Impedance characteristics



LI-215A



LIN-115A

Single-line LISNs

LI-125,150,325,400,550

Features

Single line design for flexibility

Coils matched to application

RF Shielding to minimize external interference

Individually Calibrated

Three Year Warranty



Description

Line impedance stabilization networks (LISNs) are utilized during conducted emissions as well as susceptibility testing. They are specified in the EMI test requirements of various regulatory agencies, such as FCC, CISPR, FAA and DOD. Com-Power manufactures a line of LISNs which meet most specifications required by these agencies.

One LISN is required for each line. Therefore, each line is separated by an aluminum enclosure which minimizes RF interference, facilitates line isolation and provides user flexibility to choose any number of lines depending on number of phases. The standard models are supplied as a pair of LISNs for two wire applications.

All LISNs manufactured by Com-Power use air-core coils to prevent saturation and permeability variation. Therefore, they provide stable performance over time. The bottom mounting plate of the LISNs has an unpainted, conductive surface. This allows the LISNs to be electrically bonded to the ground plane during the test. Each LISN is individually calibrated to verify correct impedance.

Application

The most important function of a LISN is to provide input power impedance to the EUT that is constant and independent of the line impedance. As a result, the test engineer will be able to gather consistent test data. In addition, the LISNs prevent the EMI receiver from detecting the noise emanating from other equipment on the power line.

Standard Configuration

- Two LISNs (separate assembly for each line)
- 4 Superior ® connectors
- Individual calibration data
- Manual & certification of calibration

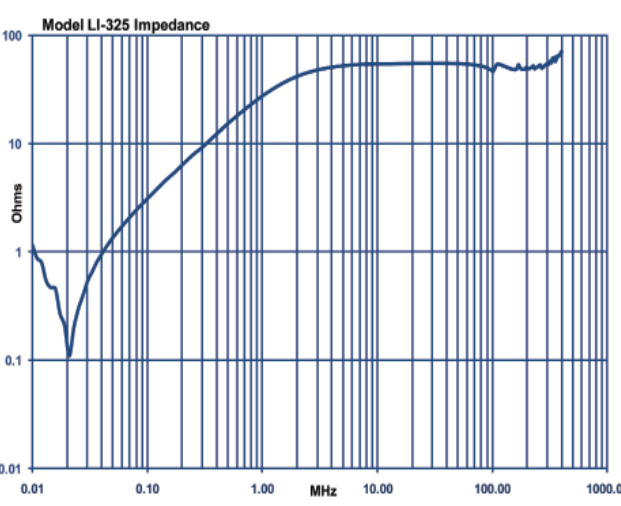
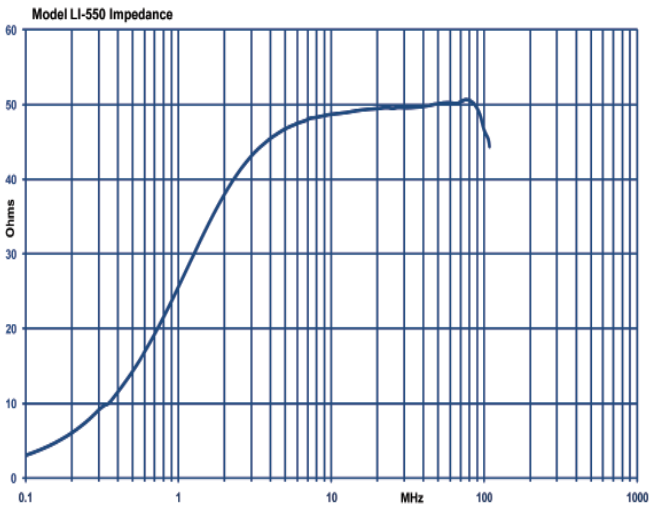
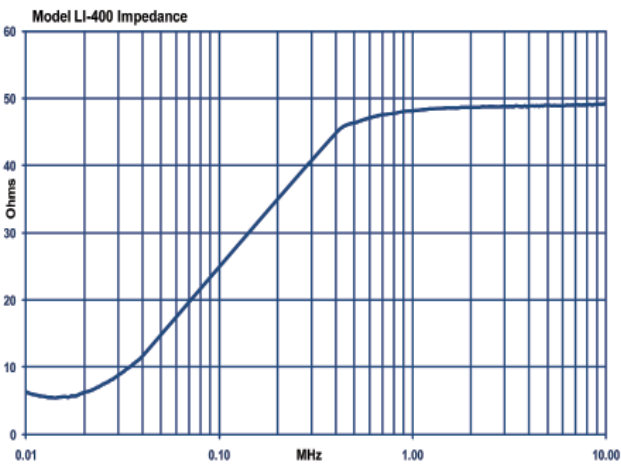
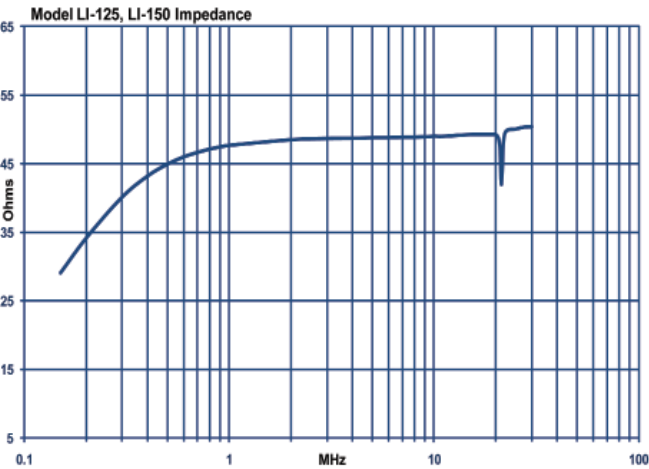
Application Table

Model	LI-125	LI-150	LI-325	LI-400	LI-550
FCC	x	x			
CISPR	x	x			
CE/EN/IEC	x	x			
VCCI	x	x			
AUSTEL	x	x			
MIL-STD			x	x	
FAA			x		
CISPR 25					x

Specification

Model	LI-125	LI-150	LI-325	LI-400	LI-550
Frequency	150 kHz - 30 MHz	150 kHz - 30 MHz	10 kHz - 400 MHz	10 kHz - 10 MHz	100 kHz - 108 MHz
Lines	2	2	2	2	2
Max (current)	25 A	50 A	25 A	25 A	50 A
Max (voltage)	270 VAC / 380 VDC	270 VAC / 380 VDC	270 VAC / 380 VDC	270 VAC / 380 VDC	270 VAC / 380 VDC
Power Frequency	60 / 50 Hz	60 / 50 Hz	DC- 400 Hz	DC-400 Hz	50 / 60 Hz
Inductor	50μH Air Core	50μH Air Core	5μH Air Core	50μH Air Core	5μH Air Core
RF connector	50Ω N (f)	50Ω N (f)	50Ω N (f)	50Ω N (f)	50Ω N (f)
I/O Connectors	Superior © Plug	Superior © Plug	Superior © Plug	Superior © Plug	Superior © Plug
Weight	25 lbs / 11.3 kg	14 lbs / 6.3 kg	5 lbs / 2.2 kg	14 lbs / 6.3 kg	14 lbs. / 6.3 kg
Size	13 x 7 x 7 inches 33 x 17.7 x 17.7 cm	15 x 10 x 10 inches 38 x 25.4 x 25.4 cm	13 x7.5 x 8 inches 33 x 19 x 20 cm	13 x 7 x 7 inches 33 x 17.7 x 17.7 cm	13 x 7 x 7 inches 33 x 17.7 x 17.7 cm

Typical Impedance



Near Field Probe Set

PS-400

Features

- Complete Solution** - Includes E and H field probes
- Locate Noise Source** - Down to a pin with the fine tip
- Lightweight** - Easy to use and handle
- Small Size** - Allows easy access to corners
- Sensitive to Tip Position** - Ease of pinpointing source
- Immune to Hand Position** - For repeatable results
- Optional preamplifier**



Description

The PS-400 is a Near Field Probe set consisting of a tip probe, a broadband probe, a H-field probe and a custom storage case. Performance and ease of use were designed into this product. The unique design allows easy access for tight or hard to reach places while reducing the effect of hand position or cable placement.

The tip probe is a precision E-field probe that features the ability to singularly identify a problem trace or pin. It is designed to be extremely sensitive to distance from the source which allows easy discrimination between traces on a PCB. The unique patented design allows measurement on individual traces as narrow as 3 mils.

The broadband probe is designed to identify E-fields over a broad frequency range. In addition, it has more amplitude sensitivity than the tip probe. Therefore, it offers a quick and efficient diagnosis of an emission source allowing the designer to discover and isolate trouble areas quickly.

The H-field probe's magnetic loop design makes it ideal for isolating sources of magnetic noise. The shielded loop construction allows measurement to minimize the effect of electrical fields.

Application

The PS-400 Near Field Probe Set is designed to assist in troubleshooting EMI problems both at the board level and at the component level. It is used to detect radiation from cables, cases, traces and ICs.

Typically the broadband probe is used to locate the general area of emission. Then the tip probe is used to isolate the source to a specific trace or pin. Further analysis can be done by following the noisy trace to find the cause of emissions such as a broken transmission line or impedance mismatch.

A typical use for the H-field probe is to verify the integrity of the chassis of your computer. This is done by moving the probe along the seams of the chassis which may be acting as slot antennas. This probe is also very useful for detecting magnetic noise sources such as large current switching circuits or transformers.

By utilizing these probes, potential certification problems can be discovered and addressed before expensive compliance testing is done. This saves both money and valuable time. The net result is a reduction in testing costs and a decreased time to market.

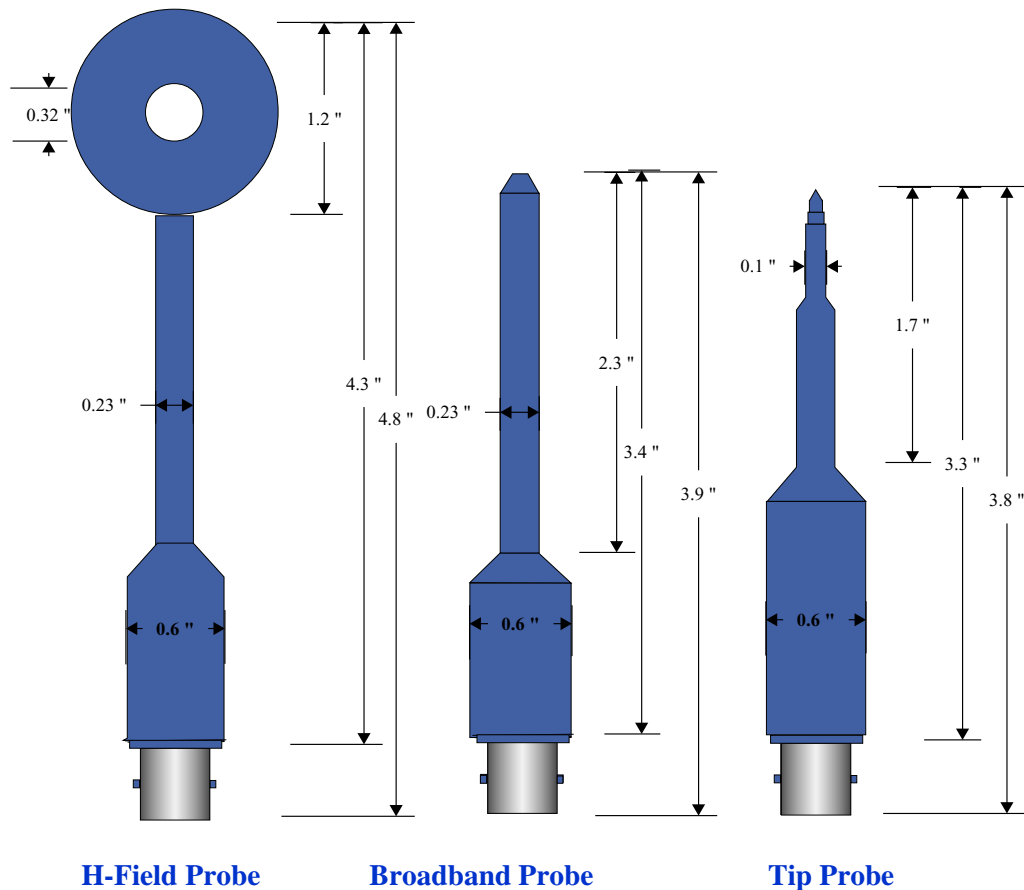
Specifications

Probe	H-Field Loop	E- Field Broadband	E- Field- Tip
Frequency Range:	0.3 - 100 MHz	20 - 1000 MHz	30 - 600 MHz
Dielectric Breakdown:	1kV typical	1kV typical	1kV typical
Operating Temperature:	0 to 40°C	0 to 40°C	0 to 40°C
Connector Type:	BNC(f)	BNC(f)	BNC (f)

Optional Preamplifier

Model:	PAP-501
Frequency Range:	10 MHz -1000 MHz
Nominal Gain:	20 dB \pm 1
Pout @ 1 dB comp:	+ 6 dBm
Typical Noise Figure	6 dB
Output Impedance:	50 Ohm
I / O Connection:	BNC (f) input, BNC (m) Output
Power Input:	12 VDC, 200 mA
Power input plug type:	2.1 (ID) x 5.5 (OD) center pin positive.
Weight:	1 lb. (0.45 kg)
Dimensions (L x W x H):	83 mm x 42 mm x 25 mm (3.27 " x 1.65" x 0.985")

Mechanical Outline



U.S. Patent # 5,132,607
 Dimensions are given in inches
 All values are typical unless specified
 Specification are subject to change without notice

Near Field Probe Set

PS-500

Features

- Complete Solution - Includes E and H field probes
- Contact tip probe - Make contact with the circuit
- Locate Noise Source - Down to a pin with the fine tip
- Lightweight - Easy to use and handle
- Small Size - Allows easy access to corners
- Sensitive to Tip Position - Ease of pinpointing source
- Immune to Hand Position - For repeatable results
- Optional preamplifier



Description

The PS-500 is a Near Field Probe set consist four probes and a custom storage case. Performance and ease of use were designed into this product. The unique design allows easy access for tight or hard to reach places while reducing the effect of hand position or cable placement.

The fine tip and the contact tip probe are a precision E-field probes that features the ability to singularly identify a problem trace or pin. The fine tip probe is designed to be extremely sensitive to distance from the source which allows easy discrimination between traces on a PCB. The unique patented design allows measurement on individual traces as narrow as 3 mils.

The contact tip probe allows direct electrical contact with the circuit. It has wider frequency range than the fine tip probe. Just like the fine tip probe the contact tip probe allow finding noise source to a trace or pin. The broadband probe is designed to identify E-fields over a broad frequency range.

The H-field probe's magnetic loop design makes it ideal for isolating sources of magnetic noise. The shielded loop construction allows measurement to minimize the effect of electrical fields.

Application

The PS-500 Near Field Probe Set is designed to assist in troubleshooting EMI problems both at the board level and at the component level. It is used to detect radiation from cables, cases, traces and ICs.

Typically the broadband probe is used to locate the general area of emission. Then the tip probe is used to isolate the source to a specific trace or pin. Further analysis can be done using the contact tip probe by making direct contact with the circuit and then following the noisy trace to find the cause of emissions such as a broken transmission line or impedance mismatch.

A typical use for the H-field probe is to verify the integrity of the chassis of your computer. This is done by moving the probe along the seams of the chassis which may be acting as slot antennas. This probe is also very useful for detecting magnetic noise sources such as large current switching circuits or transformers.

By utilizing the appropriate probes, potential certification problems can be discovered and addressed before expensive compliance testing is done. This saves both money and valuable time. The net result is a reduction in testing costs and a decreased time to market.

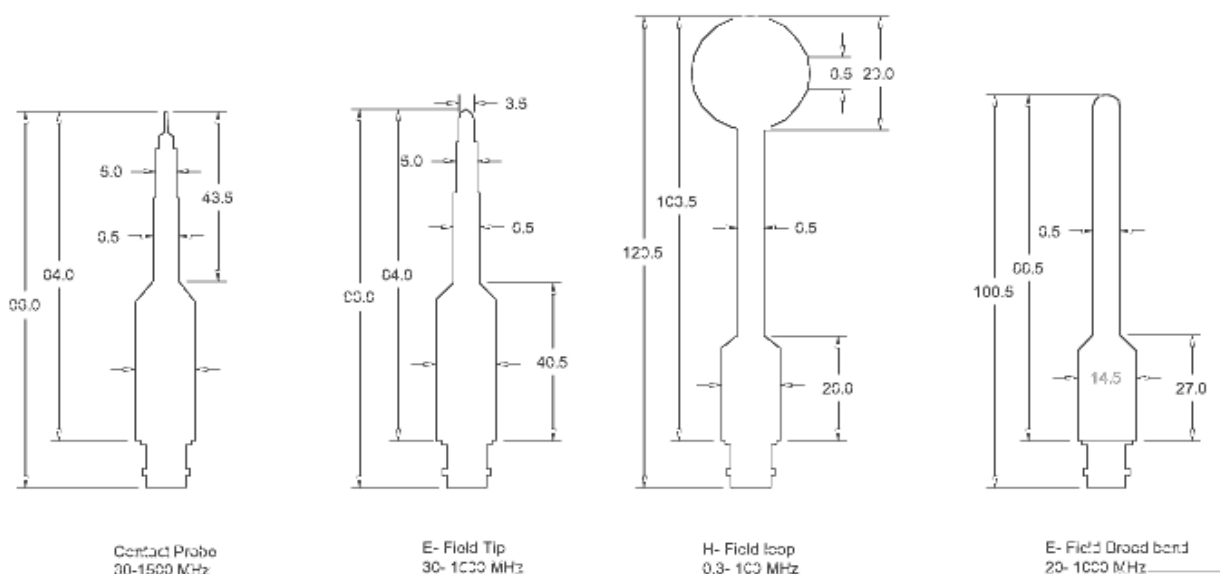
Specifications

Probe	Loop	Broadband	Fine Tip	Contact Tip
Frequency (MHz)	0.3-100	20 -1000	30-600	300-1500
Type	H-field	E-field	E-field	E-field
Connector	BNC (f)	BNC (f)	BNC (f)	BNC (f)
Dielectric breakdown	1 kV	1 kV	1 kV	1 kV
DC input at the tip	N/A	N/A	N/A	50 VDC
Dimensions	see below	see below	see below	see below
Weight	4 oz / 113 g	4 oz / 113 g	4 oz / 113 g	4 / 113 g

Optional Preamplifier

Model: PAP-501
 Frequency Range: 10 MHz -1000 MHz
 Nominal Gain: 21 dB \pm 2
 Pout @ 1 dB comp: + 10 dBm
 Typical Noise Figure: 6 dB
 Output Impedance: 50 Ohm
 I / O Connection: BNC (f) input, BNC (m) Output
 Power Input: 6 VDC, 500 mA
 Power input plug type: 2.1 (ID) x 5.5 (OD) center pin positive.
 Weight: 1 lb. (0.45 kg)
 Dimensions (L x W x H): 83 mm x 42 mm x 25 mm (3.27 " x 1.65" x 0.985")

Mechanical Outline



Preamplifier

PAL-010

Features

Broadband - 100 Hz - 30 MHz

High Gain: 28 dB

Flat Response: ± 2 dB

Individual Calibration

Three Year Warranty



Description

The model PAL-010 are general purpose, broadband, high gain, bench top preamplifiers. These preamplifiers reduce floor noise and increase system sensitivity to low level signals during Electromagnetic Interference (EMC) testing. They also provide input isolation to your expensive test equipment. The PAL-010 has a frequency range of 100 Hz to 30 MHz.

The simple front panel consists of two 50 Ω matched BNC connectors for input and output. The preamplifiers were designed to have minimal gain variation for the entire frequency range to reduce EMC measurement errors.

Each preamplifier is individually calibrated and the gain data is shipped with the unit. Power to the model PAL-010 is supplied by a 12 VDC, 500 mA external wall mount adapter. The preamplifier can also be powered by batteries for field use. The same adapter charges the internal re-chargeable battery pack.

Application

The PAL-010 is primarily used for EMC radiated emissions testing. These preamplifiers can be used during EMC testing for FCC, CISPR, EN, FAA and MIL-STD. This preamplifier could also be used in other applications that require a high gain preamplifier.

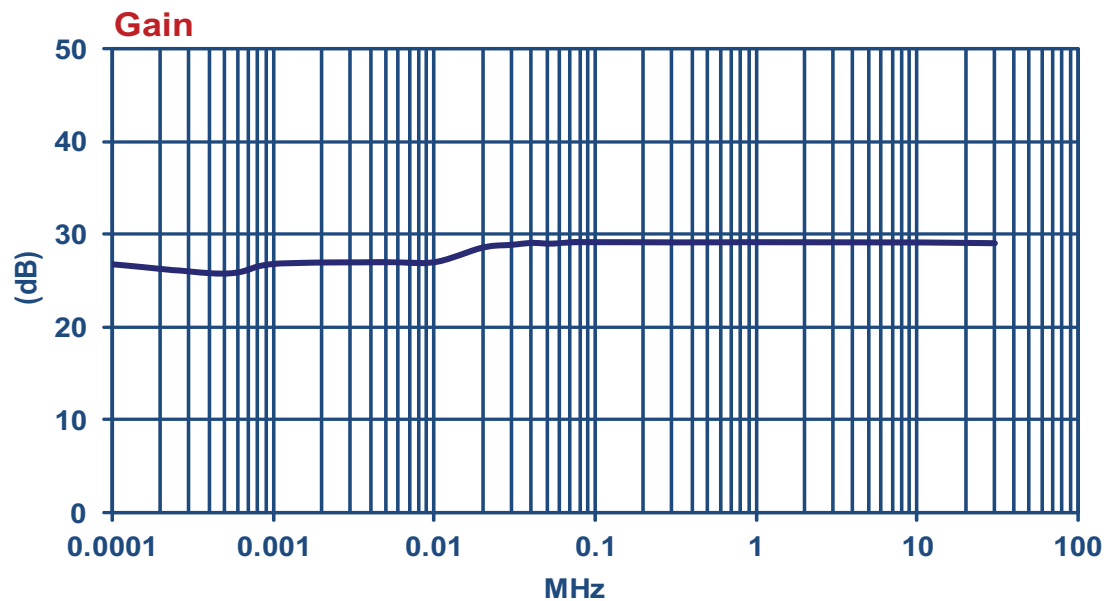
The enhanced system sensitivity due to high gain is very helpful when making EMC measurements using antennas on an Open Area Test Site (OATS) or probing a printed circuit board using Near Field Probes. This allows measurements of those frequencies from the equipment under test, that are not visible on the spectrum analyzer display unless amplified. The preamplifier gain will cause peaks to be visible above the background noise of the analyzer. These frequencies may go undetected if a preamplifier with a high gain was not used.

In addition, preamplifiers could improve sensitivity of counters and power meters. The PAL-010 can also be used to increase the available power from your sweeper or signal generator.

Specifications

Model	PAM-010
Frequency	100 Hz - 30 MHz
Gain	28 dB
Flatness	± 2. dB
Impedance	50 Ω
Max. DC Input	10 VDC, 2 dBm
Connector Type	BNC (f)
Input Power	12 VDC, 500 mA
Battery Pack:	Two 6 V, 0.7 A NimH
Dimensions (L x W x H)	7.5 x 5 x 3 Inch (9 x 13 x 7.6 cm)
Weight	3.3 lbs. (1.5 kg)

Typical Gain



Preamplifier

PAM-103

Features

Broadband - 1 MHz - 1000 MHz

High Gain: 33 dB

Flat Response: ± 3 dB

Individual Calibration

Three Year Warranty



Description

The model PAM-103 are general purpose, broadband, high gain, bench top preamplifiers. These preamplifiers reduce floor noise and increase system sensitivity to low level signals during Electromagnetic Interference (EMC) testing. They also provide input isolation to your expensive test equipment. The PAM-103 has a frequency range of 1 MHz to 1000 MHz.

The simple front panel consists of two 50 Ω matched BNC connectors for input and output. The preamplifiers were designed to have minimal gain variation for the entire frequency range to reduce EMC measurement errors.

Each preamplifier is individually calibrated and the gain data is shipped with the unit. Power to the model PAM-103 is supplied by a 12 VDC, 500 mA with external wall mount adapter. The preamplifier can also be powered by batteries for field use. The same adapter charges the internal rechargeable battery pack.

Application

The PAM-103 is primarily used for EMC radiated emissions testing. These preamplifiers can be used during EMC testing for FCC, CISPR, EN, FAA and MIL-STD. This preamplifier could also be used in other applications that require a high gain preamplifier.

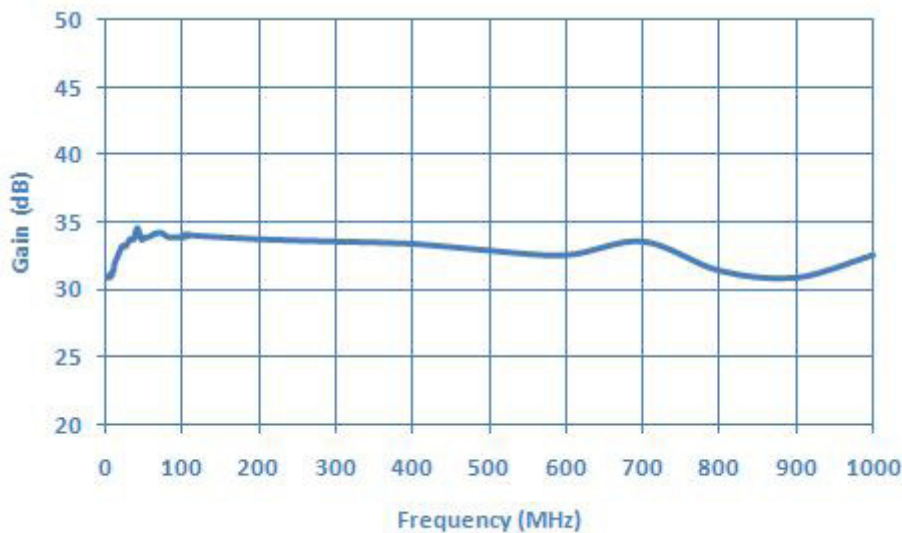
The enhanced system sensitivity due to high gain is very helpful when making EMC measurements using antennas on an Open Area Test Site (OATS) or probing a printed circuit board using Near Field Probes. This allows measurements of those frequencies from the equipment under test, that are not visible on the spectrum analyzer display unless amplified. The preamplifier gain will cause peaks to be visible above the background noise of the analyzer. These frequencies may go undetected if a preamplifier with a high gain was not used.

In addition, preamplifiers could improve sensitivity of counters and power meters. The PAM-103 can also be used to increase the available power from your sweeper or signal generator.

Specifications

Model	PAM-103
Frequency	1 MHz - 1000 MHz
Gain	33 dB
Flatness	± 3 dB
3 dB Bandwidth	500 kHz, 1200 MHz
Noise Figure	< 6 dB
P1dB	+4 dBm
VSWR	1.3:1
Reverse Isolation	>30 dB
Impedance	50 Ohms
Temperature Range	0° - 40° C
Max. DC Input	2 VDC, 0 dBm
Connector Type	BNC (f)
Input Power	12 VDC, 500 mA
Battery Pack:	6 V, 0.7 A NimH
Dimensions (L x W x H)	7.5" x 5" x 3" (9 x13 x 7.6 cm)
Weight	3.3 lbs. (1.5 kg)

Typical Gain model PAM-103



Preamplifier

PAM-6000

Features

Broadband: 1 - 6 GHz

High Gain: 30 dB

Flat Response: ± 1.5 dB

Individual Calibration

Three Year Warranty



Description

The model PAM-6000 is a broadband, high gain, bench top RF and microwave preamplifier. It increases measurement sensitivity of the spectrum analyzer or an EMC receiver to low amplitude signals during emi emissions testing. The PAM-6000 operates from 1 to 6 GHz and has a gain flatness ± 1.5 dB for the entire frequency range.

The preamplifier can powered by the supplied wall mount DC adapter or the internal rechargeable batteries. The same DC adapter also used to charge the batteries. With fully charged batteries the preamplifier can operate up to 6 hours. If the batteries need to be replaced it can be easily accessed from the rear panel.

The simple front panel consists of two 50 Ω type N connectors for RF input and output, power switch and a battery low indicator.

Each preamplifier is individually calibrated and the gain data and certificate of calibration is shipped with the unit.

Application

The PAM-6000 is primarily used for EMC radiated emissions testing. Some EMC standards that may need a preamplifier during the test are FCC Part 15, CISPR 22, DO-160 and Mil-Std 461. This preamplifier could also be used in other applications that require a high gain preamplifier in its operating range.

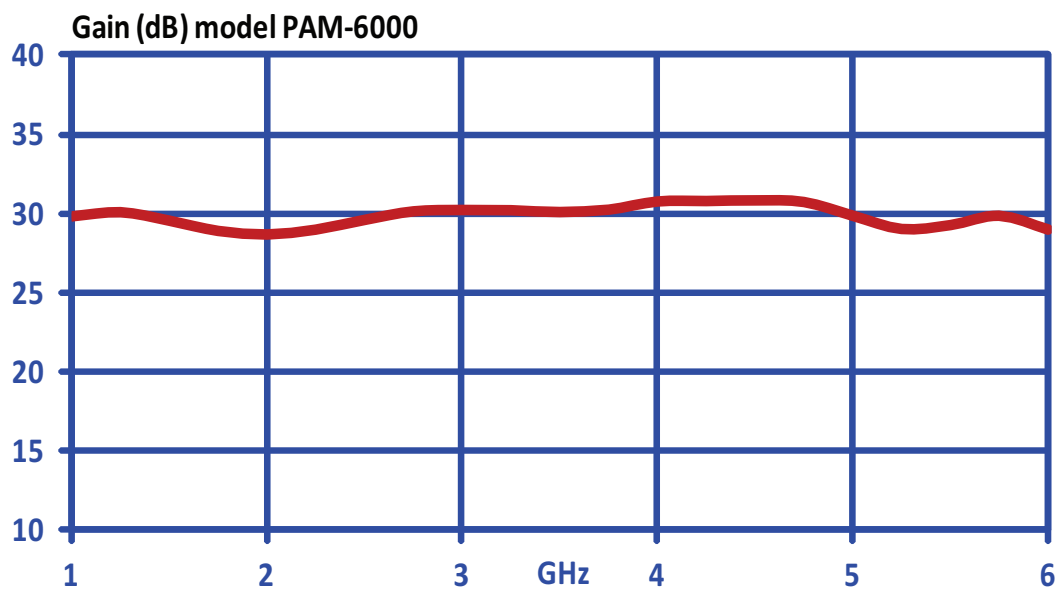
The enhanced system sensitivity due to high gain is very helpful when making EMC measurements using antennas on an EMI test site or for locating EMI emissions on a printed circuit board using near field probes. This allows measurements of those frequencies that are not visible on the spectrum analyzer or Receiver display unless amplified. The preamplifier gain will cause peaks to be visible above the background noise of the analyzer. These frequencies may go undetected if a preamplifier with a high gain was not used.

In addition, preamplifiers could improve sensitivity of counters and power meters. The PAM-6000 can also be used to increase the available power from your sweeper or signal generator.

Specifications

Model:	PAM-6000
Frequency:	1 GHz - 6 GHz
Gain:	30 dB
Flatness:	± 1.5 dB
P1dB:	+13 dBm
VSWR Input /Output:	2:1 /1.8:1
Noise Figure:	4 dB typical
Impedance:	50 Ω
Max. Input:	10 VDC, 2 dBm
Connector Type:	N type (f)
Input Power:	6 VDC, 500 mA
Battery Pack:	6 V, 0.7 A NimH
Dimensions (L x W x H):	7.5 x 5 x 3 inches / 9 x 13 x 7.6 cm
Weight:	3.3 lbs. /1.5 kg

Typical Gain



Preamplifier

PAM-118

Features

Ultra Wideband - 500 MHz - 18 GHz

High Gain - 24 dB minimum

Flat Response - ± 1.25 dB.

Low Noise Figure - 3 dB max.

Power @1 dB Gain Compression - +17 dBm



Description

The model PAM-118 is a broadband, high gain, bench top microwave preamplifier. The PA-118 has a frequency range of 500 MHz to 18 GHz. This preamplifier is primarily intended for EMC applications. However, it can be used for other application that require signal amplification. The PAM-118 reduces floor noise and increases system sensitivity to low level signals during Electromagnetic Interference (EMC) testing.

The simple front panel consists of two 50 Ohm matched SMAconnectors for input and output. The preamplifier was designed to have minimal gain variation for the entire frequency range. The consistent gain reduces EMC measurement errors. It also has low VSWR and noise figure.

Each preamplifier is individually calibrated using equipment traceable to National Institute of Standards and Technology. The data and certificate of calibration is shipped with the unit. The PAM-118 is powered by 18 VDC, 1 Amp wall plug adapter.

Application

The PAM-118 preamplifier increases system sensitivity to low level signals from equipment under test during EMC testing. It also provides input isolation to your spectrum analyzer or receiver.

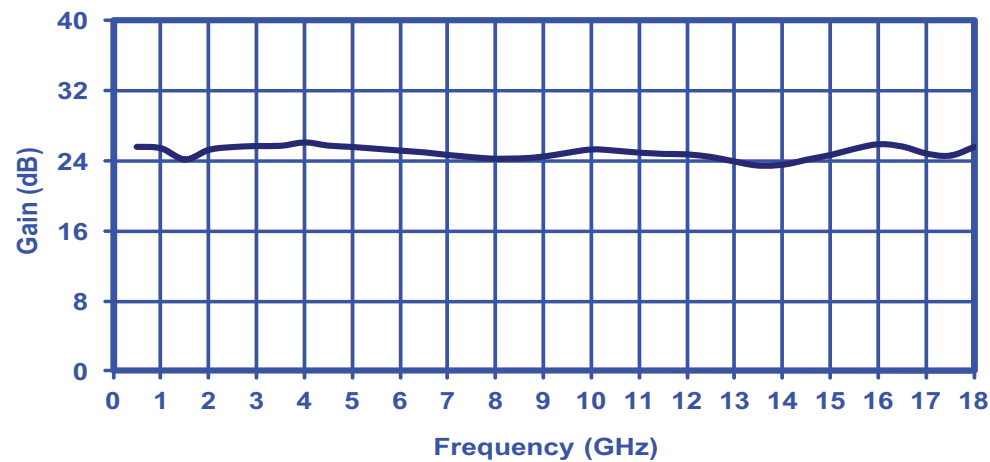
During EMC measurements the antennas are usually placed at a distance of 1 -10 meters from the equipment under test. Most antennas operating above 1 GHz typically have high antenna factors. In addition, long interconnecting cables operating in the microwave frequencies usually have high cable losses. These factors make it difficult to see the radiation from the equipment under test above the floor noise of the spectrum analyzer. The preamplifier improves system sensitivity by amplifying the signals picked by the antenna before it reaches the spectrum analyzer.

The system sensitivity can be further improved by connecting the PAM-118 preamplifier right at the antenna output. Placing the preamplifier close to the receiving antenna will reduce the effects of high cable loss associated with long cables.

Specifications

Frequency:	500 MHz - 18000 MHz
Gain:	24 dB
Flatness:	± 1.25 dB
Noise Figure:	3 dB, max.
VSWR (Input / Output):	2.5: 1 / 2.5: 1
P _{out} @1dB Comp:	+17 dBm, minimum
DC Input:	0 VDC, max.
Input power handling:	+10 dBm, CW
Reverse Isolation:	40 dB, typical
Power:	18 VDC, 1 Amp
Impedance:	50 Ohm
Connector type:	SMA
Size:	7.7" x 6.5" x 3.2" (18.4 cm x 15.6 cm x 7.7 cm)
Weight :	2.5 lbs. (5.5 kg)
Operating Temperature	+ 25° C

Typical Amplifier Gain



PREAMPLIFIER

PAM-840

Features

Frequency Range: 18 to 40 GHz

Gain: 28 dB \pm 3 dB

Noise Figure: + 4.5 dB max

P_{out} @ 1 dB Gain Compression: +10 dBm

Three Year Warranty



Description

The model PAM-840 is a broadband, high gain, bench top microwave preamplifier. The PAM-840 has a frequency range of 18 to 40 GHz. It is primarily intended for microwave EMI emission testing. However, it can be used for other application that require signal amplification. The PAM-840 increases the measurement system sensitivity to low amplitude signals. The PAM-840 is part of the Com-Power ANK-140 antenna kit.

The simple front panel consists of power switch and two 50Ω 2.9 mm (K type) input and output connectors. The preamplifier has minimal gain variation for the entire frequency range for convenience and to reduces EMI measurement errors. The PAM-840 by powered by the supplied 6 VDC, 500 mA adapter.

Each preamplifier is individually calibrated using equipment traceable to NIST. The data and certificate of calibration is shipped with each preamplifier. Optional accredited calibration service is available upon request.

Application

The PAM-840 preamplifier increases system sensitivity to low amplitude signals from equipment under test during EMI emissions testing above 18 GHz. It also provides input isolation to the spectrum analyzer or receiver.

During EMI emissions measurements the receiving antennas are typically placed at distance of 1 to 10 meters from the equipment under test. High gain preamplifier is almost an indispensable part of the measurement system when performing emissions measurement at these test distances, because it requires the use of long interconnecting cables and microwave horn antennas. Longer cable lengths contribute to higher signal losses. In addition, horn antennas operating above 18 GHz have typical antenna that can reach as high as 40 dB/m at 40 GHz. The combination of higher cable losses and antenna factors and reduces ability of the EMI receiver to detect the signal and display it above the noise floor. This makes it difficult and sometimes impossible perform valid EMI measurements without a high gain preamplifier in-line.

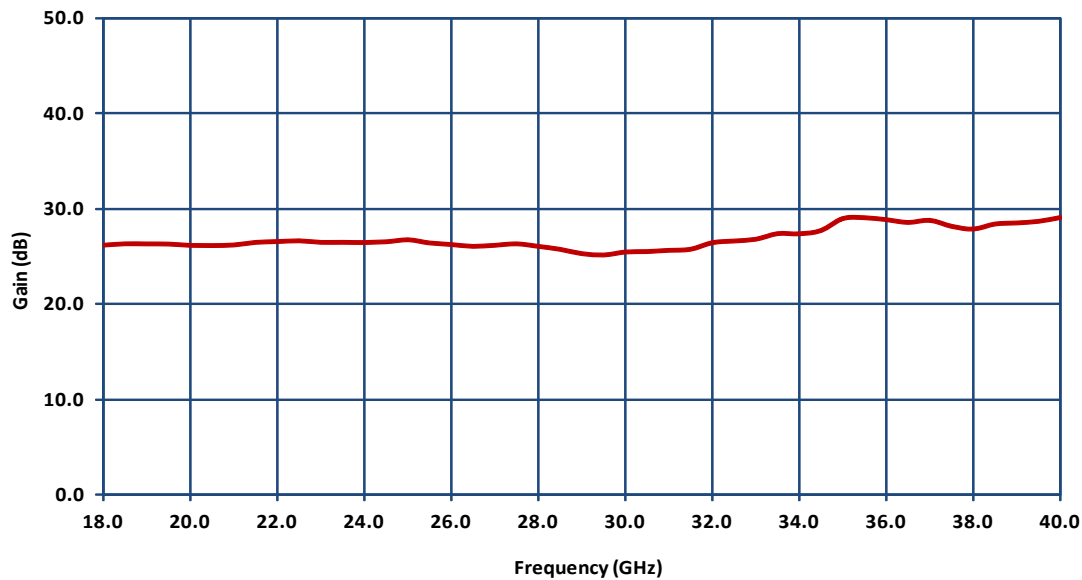
Preamplifier

PAM-840

Specifications

Frequency Range	18 to 40 GHz
Intended Application	EMC measurements
Gain	28 dB \pm 3 dB
Noise Figure	4.5 dB max
P _{out} @ 1 dB compression	+ 6 dBm min
Max Input	+10 dBm
VSWR	2.5 : 1 (Average)
Connector Type	50 Ω , 2.9 mm (female)
Power Input	6 VDC, 500A
Dimensions	7.5 x 5 x 3 inches 9 x 13 x 7.6 cm
Weight	3.3 lbs. / 1.5 kg

Typical Amplifier Gain



Transient Limiters

LIT-153, 930

Features

Frequency Range: 9 kHz - 30 MHz

For conducted emissions testing with LISN

Protects spectrum analyzer input

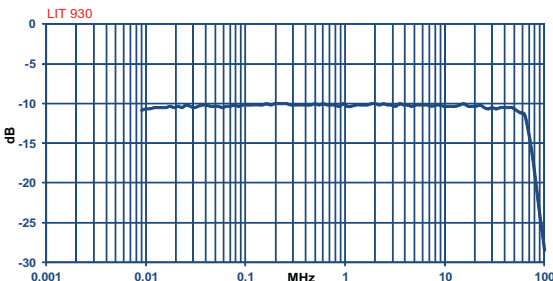
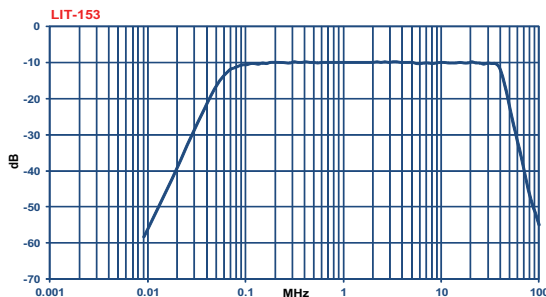


Description

Transient limiter LIT-153 and LIT-930 protects a spectrum analyzer input from high-level transients from the line impedance stabilization networks during EMC conducted emissions testing.

It has a combined frequency range of 9 kHz -30 MHz. The built in high pass filter helps reduce 50/60 Hz line feed through.

Typical Attenuation:



Specifications

LIT-153

Frequency range: 150 kHz - 30 MHz

Insertion loss: 10 dB +1.5 / -0.5 dB*

Max. Input level: 2 Watts CW (+33 dBm average)**

DC-voltage +/- 50 V DC

VSWR: 1.5:1 better

Connectors: N type (input and output)

Dimensions: L 3.0" (75 mm)

W 1.25" (32 mm)

H 1.25" (32 mm)

LIT-930

Frequency range: 9 kHz - 30 MHz

Insertion loss: 10 dB +1.5 / -0.5 dB*

Max. Input level:

4 Watts CW (+36 dBm Average)**

DC-voltage +/- 50 V DC

VSWR: 1.5:1 better

Connectors: N type (input and output)

Dimensions: L 4.3" (100 mm)

W 2.0" (50 mm)

H 1.5" (35 mm)

Note:

* This is inband attenuation level with maximum 120 dBμV input.

** This is the maximum inband input level that will not damage the unit.

Antenna Tripod

AT-110

Features

Made with mostly nylon material

Specifically made for AH-220 Horn antenna

Center rod height range: 0.6 to 1.2 meters

Stable and easy to install

Three year warranty



Description

The AT-110 collapsible tripod has been designed for indoor or outdoor EMI testing. The height of the antenna can be easily adjusted using the center rod. It also has a tension adjustment mechanism to counter balance the antenna weight not centered with the tripod to minimize drooping.

The tripod can accommodate various Com-Power antennas listed below.

Application

Height range for antennas: see below

Material: Nylon with minimal metallic parts

Tripod load: up to 22.6 kg / 50 lb.

Tripod weight: 30 lb. / 13.6 kg

Compatible Com-Power antennas

Combilog (shown in photo)

AC-220: 1 to 1.5 meters

Biconicals

AB-900, AFB-900: 1 to 1.5 meters

Log Periodics

AL-100, ALP-100: 1 to 1.5. meters

Horns

AH-118, AHA-118: 0.9 to 1.5 meters

AH-826, AH-640, AH-840 : 0.9 to 1.5 meters



Antenna Tripod

AT-120

Features

Made with mostly wood and nylon material

Center rod height range: 0.8 to 1.5 meters

Stable and easy to install

Optional carrying case available

Three year warranty



Description

The AT-120 collapsible tripod has been designed for indoor or outdoor EMI testing. It is constructed using wood and nylon parts. The height of the antenna can be easily adjusted using the wooden center rod. It has a mounting head that has a 1/4 inch x 20 threads bolt to mount antenna with compatible threaded hole. The tilt head can be rotated 90 degrees to accommodate various antenna mounting requirements.

The tripod can accommodate various Com-Power antennas listed below.

Application

Height range for antennas: see below

Material: Nylon and wood with minimal metallic parts

Tripod load: up to 10 kg / 22 lb.

Tripod weight: 16 lb. / 7.3 kg

Optional carrying case model: ATC-120

Compatible Com-Power antennas:

Biconicals

AB-900: 1 to 1.5 meters (shown on photo)

ABF-900: 1 to 1.5 meters

Log Periodics

AL-100, ALP-100, ALC-100: 1 to 1.5. meters

Horns

AH-118, AHA-118: 0.9 to 1.5 meters

AH-826, AH-640, AH-840 : 0.9 to 1.5 meters



Antenna Tripod

AT-220

Features

Made with mostly nylon material

Specifically made for AH-220 Horn antenna

Center rod height range: 0.6 to 1.2 meters

Stable and easy to install

Three year warranty



Description

AT-220 collapsible tripod has been designed for indoor and outdoor EMI testing. The height of the antenna can be easily adjusted using the center rod. The antenna was specifically designed for AH-220 Horn antenna, but it can also be used for mounting Monopole and Loop antennas.

The tripod can accommodate various Com-Power antennas listed below.

Application

Height range for antennas: see below

Material: Nylon with minimal metallic parts

Mounting: 1/4 inch x 20 threads bolt

Tripod load: up to 22.6 kg / 50 lb.

Tripod weight: 19 lb. / 8.6 kg

Compatible with the following Com-Power antennas

Monopole

AM-741: 0.8 to 1.2 meters

Loop Antenna

AL-130: 0.9 to 1.3 meters

Horns (shown in photo)

AH-220: 1 to 1.2 meters



Conducted Immunity System

CIS-25, CIS-50, CIS-100

Features

Frequency range of 150 kHz to 250 MHz

Suitable for IEC-61000-4-6 testing

Automated test software

Test level calibration accessories included

CISPR 16 compliant CDNs



Description

The Com-Power CIS series of Conducted immunity system specifically geared for use in IEC 61000-4-6 immunity testing using coupling decoupling networks (CDN). The system can be customized include the CDNs to fit your application at the time of purchase.

The CIS-series systems test systems are configured to perform conducted immunity testing according to IEC 61000-4-6. The system includes ACS series power amplifier, Coupling Decoupling Network (CDN), directional couplers, attenuators, cables and CSAT software. These systems when properly configured are capable of testing your products to the all levels given in IEC 61000-4-6 up to 230 MHz.

Before you begin testing with the CDN you will need to establish a calibrated drive levels corresponding to the test levels. Accessories such as ADA-515, TEP-050 and ADA-xx shorting adapters are needed for calibration is included with each system. When used with compatible signal generator and spectrum analyzer and the CSAT test software can fully automate this calibration and also perform the test. All Com-Power CDNs are calibrated to meet the latest CISPR 16 test standards.

Application

The required test levels per IEC 61000-4-6 (given in the table below) that can be achieved using the ASC series power when properly configured with a compliant coupling decoupling network from Com-Power or another manufacturer. Please refer to IEC 61000-4-6 for information on test setup, procedures and test accessories needed.

Test Level Volts (V_o)	umr (150) Volts	umr (150) Volts (dBm)
1	0.167	-2.5
2	0.5	7
3	1.67	17.5

V_o = Open circuit voltage in 150 Ω system.

umr = Voltage level measured at the output of the 150 Ω to 50 Ω adapter (ADA-515).

The IEC-61000-4-6 requires that an appropriate coupling decoupling networks (CDN) with defined common mode impedance be used for coupling and/or decoupling purposes on any type of power or I/O interface for which a CDN is suitable and available. Com-Power has a wide selection of CDNs. Please call Com-Power if you need assistance.

Conducted Immunity System

CIS-25, CIS-50, CIS-100

Specifications

Description	CIS-25	CIS-50	CIS-100
RF Power Amplifier	ACS-230-25W	ACS-230-50W	ACS-250-100W
Coupling Decoupling Networks (CDN)*	CDN-xx	CDN-xx	CDN-xx
Directional Coupler	DCD-300-100W	DCD-300-100W	DCD-300-100W
Shorting Adapter*	ADA-xx	ADA-xx	ADA-xx
Attenuator	ATTN-6-100W	ATTN-6-100W	ATTN-6-100W
Attenuator	ATTN-30-100W	ATTN-30-100W	ATTN-30-100W
Software	CSAT 2.xx	CSAT 2. xx	CSAT 2.xx
Cable set	CIS-CB4	CIS-CB4	CIS-CB4

*These are items (models) will determined at the time of purchase. System can be customized to fit individual requirement. The system price will vary based on the final configuration.

Below is a list of optional items not included, but can be packaged with system using third party equipment at end user's request. Please call us if you need assistance.

- Signal Generator
- Power Meter
- Spectrum Analyzer
- GPIB to USB adapter for PC connection

Typical Test Setup

