
ABSORBING CLAMP

Model CLA-050

Model CLA-150

Warranty

Com-Power warrants to its Customers that the products it manufactures will be free from defects in materials and workmanship for a *period of 2 years*. This warranty shall not apply to:

- a) transport damages during shipment from your plant.
- b) damages due to poor packaging.
- c) product operated outside their specification.
- d) improperly maintained or modified.
- e) consumable items, fuses, power cords, cables, etc.
- f) normal wear
- g) calibration
- h) product is shipped outside the United States without the prior knowledge of Com-Power.

In addition, Com-Power shall not be obliged to provide service under this warranty to repair damage resulting from attempts to install, repair, service or modify the instrument by personnel other than Com-Power service representative.

Under no circumstances does Com-Power recognize or assume liability for any loss, damage or expense arising, either directly or indirectly from the use or handling of this product, or any inability to use this product separately or in combination with other equipment.

When requesting warranty services, it is recommended that the original packaging material be used for shipping. Damage due to improper packaging will void warranty.

In the case of a complaint, a label should be attached to the housing of the instrument which describes briefly the faults observed. If at the same time the name and telephone number (dialing code and telephone or direct number or department designation) is stated for possible queries, this helps towards speeding up the processing of warranty claims. In order to obtain service under this warranty, Customers must contact the Com-Power factory.

Handling

This instrument is delicate must be handled with care. The wooden chassis and ferrite rings in the clamp might crack or break if dropped. Always carry the absorbing clamp with both hands.

About this this manual

This manual provides instructions on how to operate and maintain Model CLA-050 and CLA-150 Absorbing Clamp.

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If you need assistance:

Telephone: (949) 587-9800

Fax: (949) 587-9960

Email: Sales@Com-Power.com

Operating Environment

The instrument has been designed for indoor use only. It should not be used or stored in a damp or wet environment.

Maintenance

There are no user serviceable parts inside these units. If the unit does not operate or needs calibration, please return it to the factory. Do not attempt to replace or repair any of the ferrite rings. Any modifications or repairs performed on the unit by someone other than an authorized factory trained technician will void warranty.

The exterior surface may be cleaned with mild detergent and then be wiped with a dry clean lint-free cloth.

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General Information

1

This section includes the following

- Introduction
 - General Description
 - Specifications
 - Standard Accessories Supplied
-
-

1.0 Introduction

This section contains general description and performance information on the Com-Power model CLA-050 and CL-150 absorbing clamp. More detailed explanation on how to use absorbing clamp is given in sections 2 and 3 of this manual.

1.1 General Description

The CLA-050 and CLA-150 absorbing clamps meet the CISPR14 (EN55014) section 6.11 requirement for measuring radio frequency power generated and fed to the equipment under test by the power supply cables of household appliances, electrical tools and similar tools. The CLA-050 can accommodate supply cables up to 10 mm in diameter and CLA-150 up to 32 mm in diameter.

1.2 Specifications

Please see table 1-1 on page on next page.

1.3 Standard Accessories Supplied;

1. Absorbing Clamp
2. User's Guide
3. Calibration data- insertion loss & correction factor
4. Certificate of calibration

Table 1-1 Specifications

Model CLA-050

Frequency Range:	30 MHz - 1000 MHz
Maximum cable diameter:	10 mm (0.39 inches)
Aperture diameter:	12.7 mm (0.5 inches)
Connector type:	BNC (f)
Dimensions:	810 x76 x 84 mm
Weight :	5 kg.(11.5 lb)

Model CLA-150

Frequency Range:	30 MHz - 1000 MHz
Maximum cable diameter:	32 mm (1.26 inches)
Aperture diameter:	34.9 mm (1.37 inches)
Connector type:	BNC (f)
Dimensions:	590 x130 x136 mm
Weight :	11 kg.(24 lb)



Figure 1-1 Model CLA-050



Figure 1-2 Model CLA-150

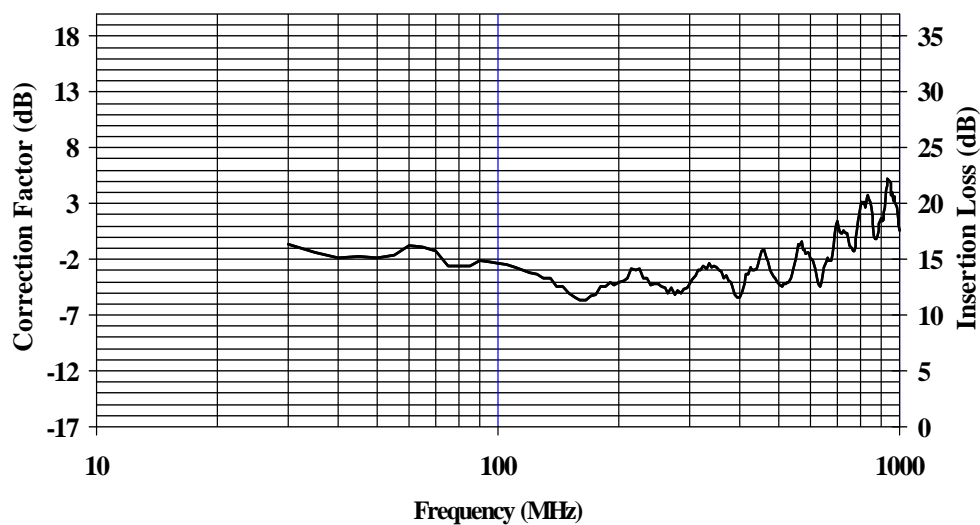


Figure1-3 Model CLA-050

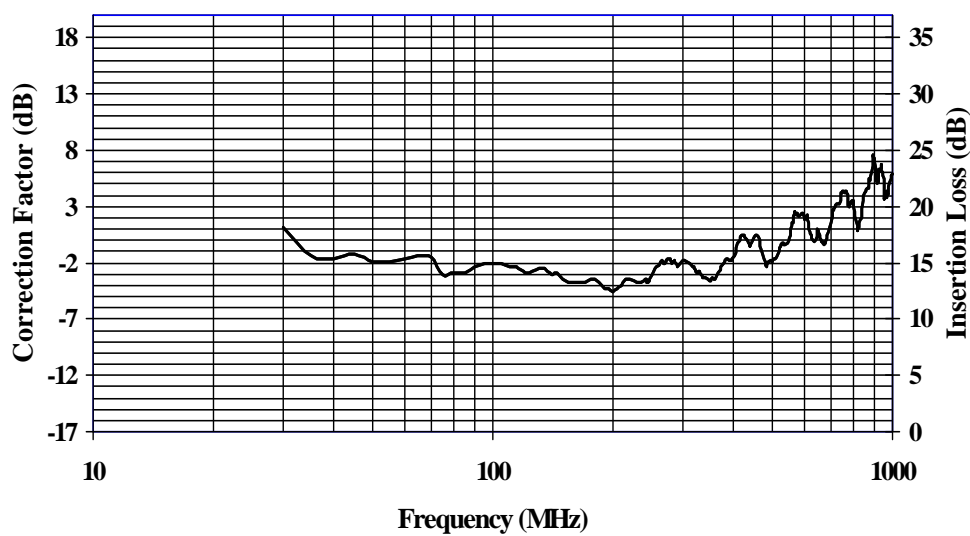


Figure1-4 Model CLA-150

Making Measurements

2

This section includes the following

- Overview
- Test Setup
- Taking Measurements

2.0 Overview

The Absorbing clamps allow measurement of radio frequency power generated and fed to the equipment under test by the power supply cable from 30 MHz -1000 MHz. The sections below describe how to setup and make measurements using the clamps.

2.1 Test Setup

During measurement equipment under test (EUT) is placed on an insulated surface or test platform of at least 70 cm from the nearest conductive surface. The power cord of the EUT is extended to the half wave length of the lowest frequency to be measured. At 30 MHz the cable length is 5 meters. Add 1 meter to this length to make it 6 meters. This is the minimum cable length for making complete measurement from 30 MHz - 1000 MHz. The additional 1 meters is added so that the absorbing clamps current transformer portion can sense the entire 5 meter cable length and also to accommodate another clamp for additional isolation if necessary.

If original power cord is not sufficiently long enough, it should be extended to achieve this length, An extension cord may be used. However if the plug or socket will not pass through absorbing clamp due to its size. It should be removed. In the case of controversy with regard to the banning of sales or withdrawal of a type approval the lead may be replaced by a lead of similar quality with the necessary length.

The current transformer portion is located on the end opposite the output BNC coaxial connector. The current transformer portion of the absorbing clamp is placed pointing towards the equipment under test. The extended power cord placed inside the clamp aperture by opening the clamp.

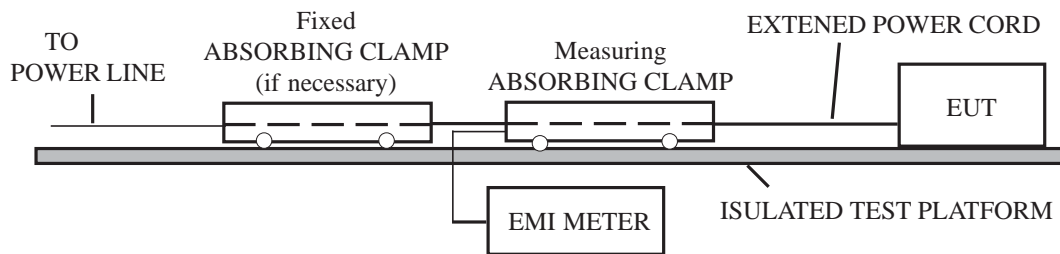


Figure 2-1 Measurement Setup

2.2 Taking measurements

After you make all the connections according to figure 2.1. Turn on EUT and EMI meter. The EMI meter should have a input impedance of 50 Ohm and set to measure in dBuV.

Prepare a table of frequencies between 30-1000 MHz to be measured. The absorbing clamp is equipped with rollers so that the movement along the power cord can be easily accomplished. At each frequency recorded on the table, move the absorbing clamp along the lead starting from a position adjacent to the EUT to a distance of half wave length of the test frequency. The maximum reading displayed by the EMI meter should be recorded between these two points. The maximum reading may occur close to equipment under test.

The measurement interference power is calculated using the supplied insertion loss calibration curve.

The power measured using a 50 Ohm load is equal to the square of the voltage measured divided 50. Expressing the above in dB is:

$$\begin{aligned} \text{Power} &= 10 \log V^2 / 50 = 20 \log V \text{ (measured)} - 10 \log 50 \\ \text{Power} &= 20 \log V - 17 \text{ dB} \end{aligned}$$

To calculate the actual power measured.

$$\text{Power} = 20 \log V \text{ (measured)} - 17 \text{ dB} + \text{Insertion loss in dB.}$$

Theory of Operations

3

This section includes the following

- Overview
 - Theory of operation
-

3.0 Overview

This section describes absorbing clamp theory of operation.

3.1 Theory of operation

These absorbing clamps consist of a ferrite current transformer operating in the frequency range of 30 MHz -1000 MHz and two groups of ferrite rings. The one group of ferrite rings surround the power supply cable of the equipment under test. The second group of ferrite rings surrounds the lead from current transformer to the spectrum analyzer or EMI meter. The group of rings that surround the power conductor from the current transformer to the measuring device minimizes standing waves. The other group stabilizes the impedance of the power line and act as an absorber of energy to isolate the equipment under test from the external power line noise.

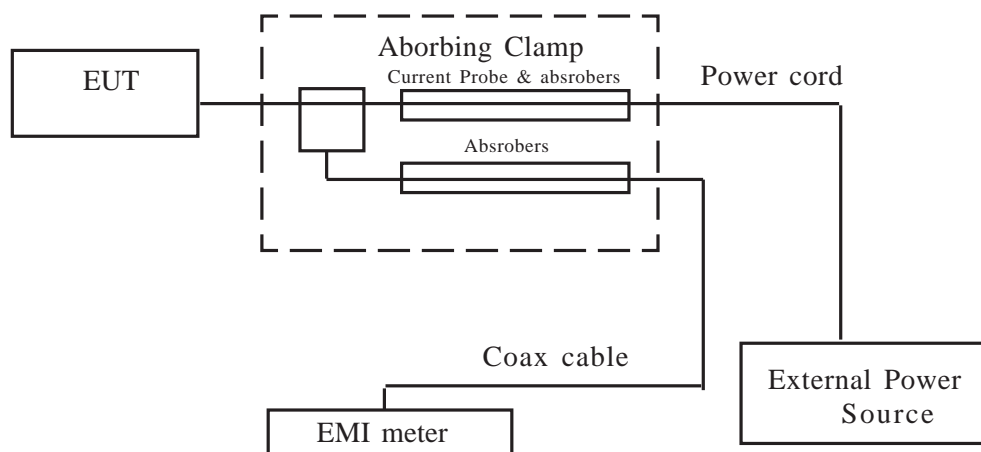


Figure 3-1 Absorbing Clamp theory