COM-POWER CORPORATION

Impedance Stabilization Network (ISN)

ISN T8

Features

- **Frequency Range**
  150 kHz to 30 MHz
- **For Unshielded Telecommunication Lines**
  1 to 4 balanced pairs
- **Complies with CISPR 16-1-2, CISPR 22/32**
- **Individual Calibration Included**

ISN Concept & Advantages

The ISN T8 Impedance Stabilization Network provides a means by which common mode disturbance voltages (conducted emissions) can be made on unshielded, balanced telecommunication ports with up to four, unshielded, balanced pairs.

The concept of the ISN is similar to that of the LISN, (used on power lines), insofar as they both:

a) *connect in series with, and impose a defined impedance on, the lines under test; thereby providing a distinct advantage over current or voltage probe measurements, where the impedance of the lines is largely uncontrolled;*

b) *provide a coaxial RF measurement port for connection to the measurement equipment, to which the disturbance voltages present at the EUT port are coupled for measurement; and,*

c) *isolate the AE (ancilliary equipment) port from the EUT and RF ports, which:*

   1) *minimizes the influence of the AE-connected equipment/ cabling on the impedance (and voltage division factor) of the network; and,*

   2) *reduces the amplitude of any ambient signals, as well as spurious disturbance voltages generated by the AE-connected equipment, thereby minimizing their potential impact on the measurement results.*

The main difference between an ISN and an LISN is the coupling method utilized. Most LISNs are used to measure each current-carrying conductor separately, with reference to ground. Consequently, both differential and common mode voltages are measured.

ISNs are used on telecommunication lines hosting high speed, symmetric (differential-mode) communications, often operating at frequencies within the measurement range. As the intent of the test is to limit only the spurious voltages, the ISN measures all conductors of the line simultaneously with respect to ground, thereby measuring only the common-mode disturbance voltages, while effectively ignoring the intended, symmetrical (differential) voltages.

Application

The ISN T8 design is based on the circuit illustrated in Figure D.3 of CISPR 22 and Figure F8 of CISPR 32.

The RF Port is a 50Ω female BNC connector, located on the top of the ISN. The ISN is equipped with two D-sub 25 pin female connectors located on the front panel (EUT Port) and rear panel (AE Port), providing the interface to the LCL Adapter and Connecting Adapter, respectively.

The Cat. 3 and Cat. 5 LCL adapters are tuned to provide the appropriate Longitudinal Conversion Loss (LCL) for the given cable categories, and also provide the interface to the Equipment Under Test (EUT). The Connecting Adapter provides the interface to the AE.

Adapter sets include one Cat. 3 and one Cat. 5 LCL Adapter, along with one Connecting Adapter. The ISN T8 is provided with an adapter set equipped with RJ45 receptacles wired per ANSI/TIA/EIA-568-B. Adapter sets are also available with 4-pin RJ11 receptacles.

For non-standard arrangements, adapter sets are also available with (8) 1mm banana jacks. This set also includes two RJ45 (or RJ11) to 1mm banana plug wiring adapters, allowing the user to adapt to virtually any pin/ wiring arrangement.

Calibration

The ISN and LCL adapters are individually tuned and calibrated to meet the applicable requirements of CISPR 22/32 and CISPR 16-1-2. The calibration data and certificate are provided, with NIST traceability. Recognized ISO 17025 accredited calibration is also available upon request.

Also available from Com-Power is our ISN Calibration Kit, which includes all of the necessary accessories for complete calibration of the ISN and LCL adapters. A step-by-step procedure, including test setup diagrams is provided with the calibration kit.

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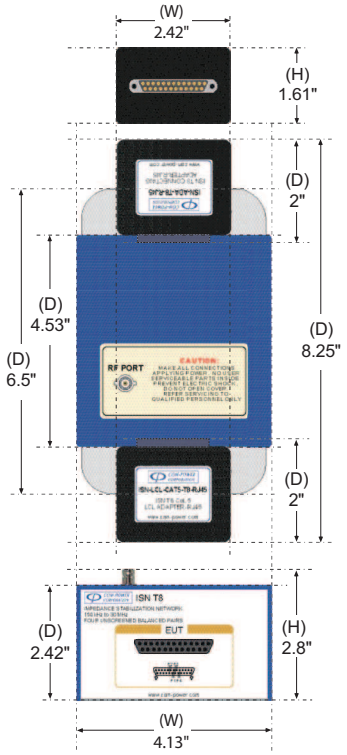
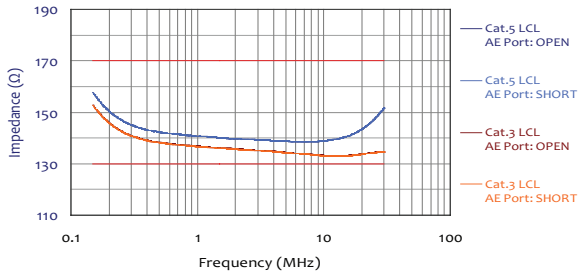
ISN T8

Specifications

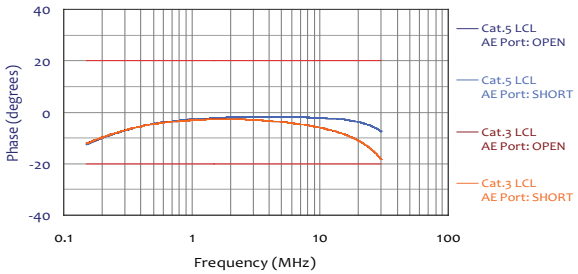
Standards	**CISPR 16-1-2, CISPR 22, CISPR 32**
Frequency Range	**150 kHz to 30 MHz**
Application	**Unscreened lines w/up to 4 balanced pairs**
Max. Current rating	**800 mA** (per line), **1.6 Amps** (per pair)
Voltage rating	**50 V_{DC} / 32 V_{AC}** (line to ground @ 50/60 Hz)
RF Port Connector	**50Ω BNC** (female)
EUT/AE Port Connections	**RJ45** (RJ11 also available)
Common mode Impedance	**150Ω** ±20Ω
Phase	**0°** ±20°
Voltage Division Factor	**10.5 dB** ±1 dB
Decoupling Attenuation (minimum Isolation)	150 kHz to 1.5 MHz: **35 to 55 dB** 1.5 MHz to 30 MHz: **55 dB**
Symmetric Insertion Loss	**Max: 3 dB** ±0.25 dB
Symmetric Load Impedance	**100Ω**
Transmission Bandwidth	**>100 MHz**
Weight	**1.4 lbs.** (0.6 kg) *[ISN + LCL Adapter + Connecting Adapter]*



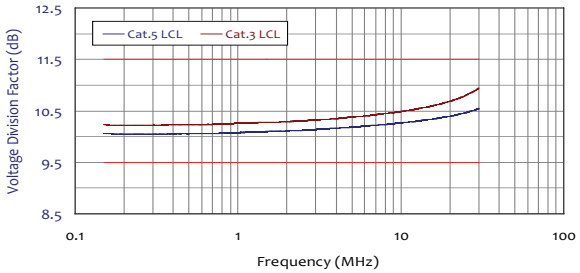
Impedance



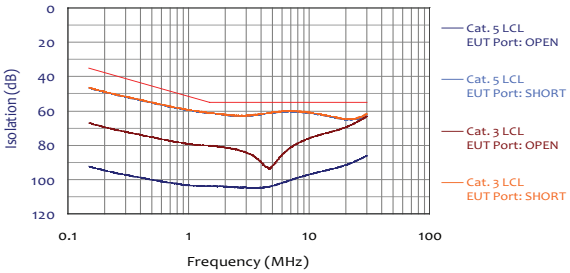
Phase



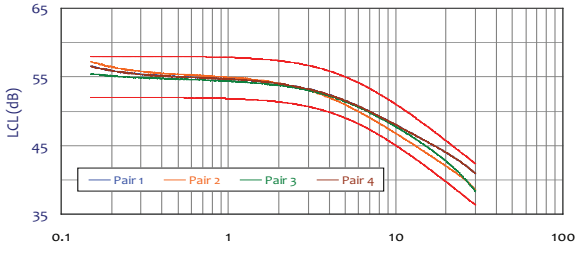
Voltage Division Factor (VDF)



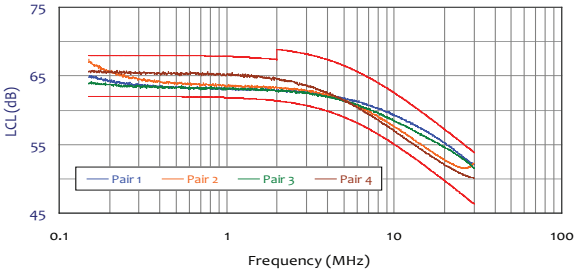
Decoupling Attenuation (Isolation)



Cat. 3 Longitudinal Conversion Loss (LCL)



Cat. 5 Longitudinal Conversion Loss (LCL)



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