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ISN T4A
IMPEDANCE STABILIZATION NETWORK (ISN) FOR UNSCREENED BALANCED PAIRS

Impedance stabilization networks (ISN, or with CISPR 16-1-2 called AAN: asymmetric artificial network) are defined for measuring of conducted common mode disturbances at information technology equipment (ITE) as required in CISPR 22 and CISPR 32. The ISN is placed between the equipment under test (EUT) and auxiliary equipment (AE) or load which are necessary for the operation of the EUT. The ISN establishes the common-mode termination impedance for the EUT's telecommunications port during measurement and emulates the unsymmetrical contribution (longitudinal conversion loss, LCL) of the connected line. Different ISNs are available in relation to the line category, line numbers and pin-arrangement.

- **For use with one or two unscreened balanced pairs**
- **Refers schematic circuit example in CISPR 22/32 Figure D.2/G.2**
- **Intended for connection to cable category 3 and 5**
- **Changeable pin-arrangements with RJ11 and RJ45**
- **Can be used as CDN for IEC/EN 61000-4-6 immunity tests**

Standards:

- **CISPR 16-1-2**
- **CISPR 22**
- **CISPR 32**
- **IEC/EN 61000-4-6**
- **And others**

The ISN T4A is designed for measurements on one or two unscreened balanced pairs and consists of one basic network (ISN T400A) with D sub 25 connectors and special adapter sets. A set of adapters consists of LCL adapters to realize the longitudinal conversion loss (LCL)- requirements for the EUT-side in relation to the used cable category (cat. 3, cat. 5) and a connection adapter for the AE-side.

Technical specifications

Frequency range:	150 kHz to 80 MHz
Line parameters:	1 or 2 pairs
Power rating (EUT and AE port)	
AC max. voltage (line to ground):	63 V
DC max. voltage (line to ground):	100 V
Current max.:	600 mA (line), 1200 mA (pair)
Test voltage:	200 VDC, 2 sec
Common mode impedance (EUT port)	
150 kHz to 30 MHz:	150 Ω ±20 Ω
30 MHz to 80 MHz:	150 Ω ±40 Ω
Phase angle (EUT port) 150 kHz to 30 MHz:	0° ±20°
Coupling path (In/Out port/EUT)	
Connection:	BNC 50 Ω
RF voltage:	<15 V
Frequency range:	150 kHz to 80 MHz
Voltage division factor (RF input to EUT port)	
150 kHz to 30 MHz:	9.5 dB ±1 dB
30 MHz to 80 MHz:	9.5 dB ±2 dB
Transmission bandwidth* (wanted signal) EUT/AE B3 dB:	> 100 MHz sin.
LCL (EUT) *)	
Cat. 3 150 kHz to 30 MHz (corner frequency 2 MHz):	55 dB to 39.3 dB ±3 dB
Cat. 5 150 kHz to 2 MHz:	65 dB ±3 dB
Cat. 5 2 MHz to 30 MHz:	65 dB to 49.3 dB +4.5/-3 dB
Decoupling of common mode disturbances (EUT/AE)	
150 kHz to 1.5 MHz/30 MHz:	≥35 dB to ≥55 dB/≥55 dB
Crosstalk (PSELFEXT) (EUT/AE) 1 MHz to 100 MHz:	≥61 dB to ≥21 dB

*) all balanced parameters are in relation to a symmetrical load of 100 Ω

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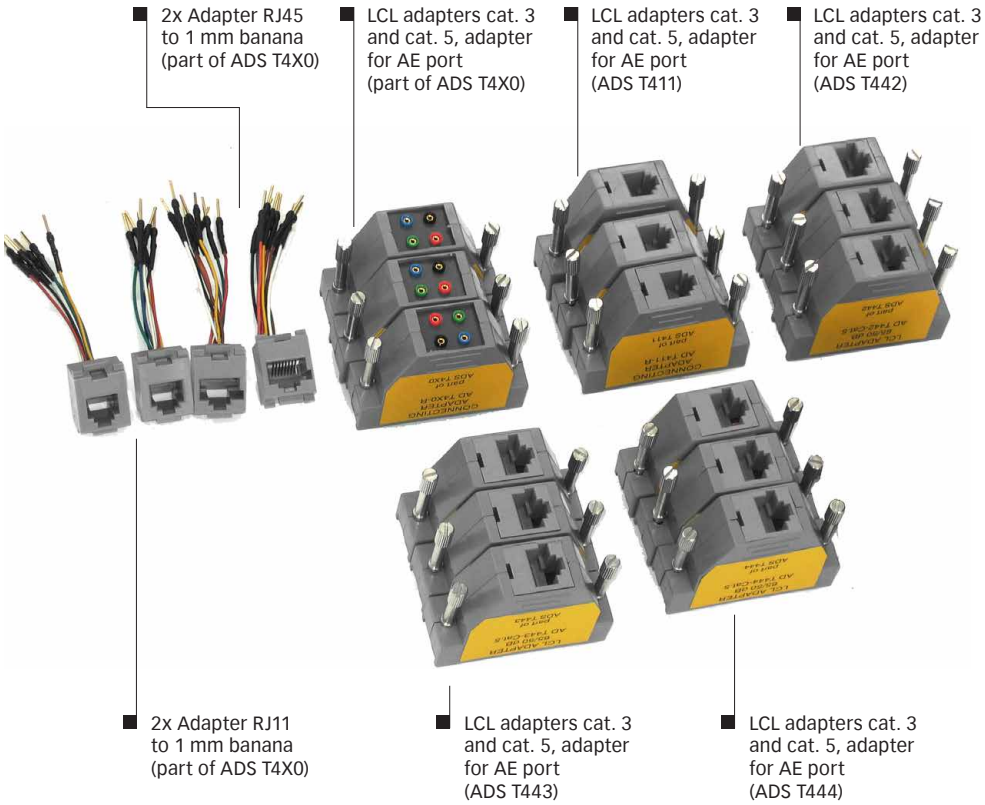
Basic network ISN T400A with connected LCL cat. 5 adapter with pin-arrangement T444 and adapter for arranging AE port (part of ISN T4A and ISN T444A)

Mechanical specifications

Dimensions in mm (W x H x D) (basic network):	105 x 65 x 110
Dimensions in mm (W x H x D) (basic network with adaptors):	105 x 65 x 190
Dimensions in mm (W x H x D) (storage case):	400 x 300 x 110
Weight:	approx. 550 g
Weight (storage case with ISN):	approx. 1800 g

Adapter sets for ISN T4A



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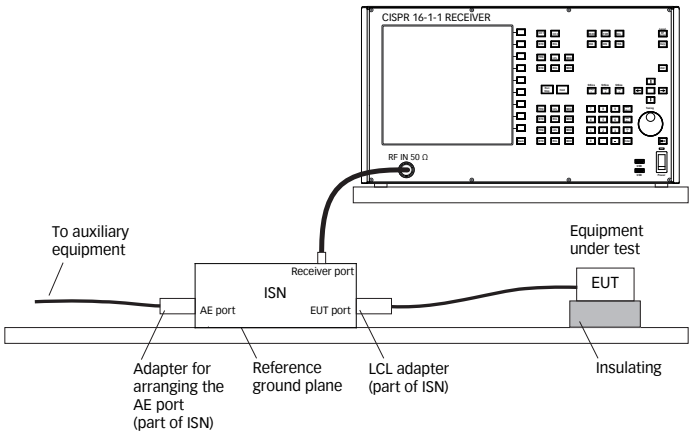
Application

Pin-arrangement					
	Connector	a1	b1	a2	b2
ADS T411 German Telecom, US standard	RJ11-6	5	2	4	3
ADS T442 ISDN basic rate access, (S0)	RJ45	4	5	3	6
ADS T443 ISDN primary rate access (2Mbps)	RJ45	4	5	1	2
ADS T444 10BaseT, 100BaseT	RJ45	1	2	3	6
ADS T4X0 Changeable adaptor wiring	RJ11-6, RJ45 and 1 mm				

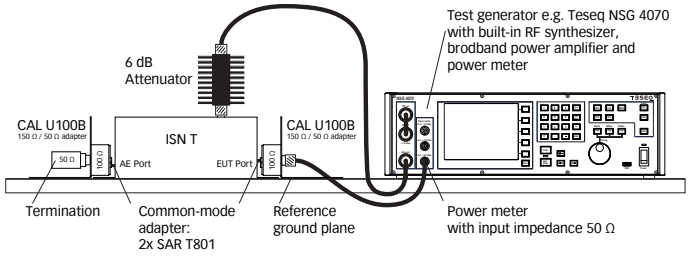
Typical measuring setup



Application for immunity testing

The described ISN T4A is appropriate for immunity tests of IEC/EN 61000-4-6. Optional available are the parts for the level setting (test setup calibration) 2 x CAL U100B (150 Ω/50 Ω adapter), 2 x SAR T801 (common mode adapter for D sub 25 pin) and A 50-N (50 Ω termination, N type).

Typical setup for stress level setting according IEC/EN 61000-4-6



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Model No. and options

Part number	Description
248707	ISN T4A ISN* with adapter sets ADS T411, 442, 443, 444 and 4X0 in storage case, cable cat. 3 and 5
97-248707	ISN T4A-TC Traceable calibration (ISO17025), order only with ISN T4A
248706	ISN T4X0A (changeable adaptor wiring, RJ11 and RJ45) ISN* with adapter set ADS T4X0 in storage case, cable cat. 3 and 5
248704	ISN T444A (10BaseT, 100BaseT, RJ45) ISN* with adapter set ADS T444 in storage case, cable cat. 3 and 5
248703	ISN T443A (ISDN primary rate access, RJ45) ISN* with adapter set ADS T443 in storage case, cable cat. 3 and 5
248702	ISN T442A (ISDN basic rate access, S0, RJ45) ISN* with adapter set ADS T442 in storage case, cable cat. 3 and 5
248701	ISN T411A (German Telecom, US standard, RJ11) ISN* with adapter set ADS T411 in storage case, cable cat. 3 and 5
97-248701	ISN T4xxA-TC Traceable calibration (ISO17025), order only with ISN T4xxA
242047	ADS T4X0 Adapter set ADS T4X0, order only with ISN T4xxA
248580	CAS ISN Calibration kit for ISN T8 and ISN T4A, measuring parameters: CM impedance, phase angle, voltage division factor and LCL, traceable calibration and certificate included
247825	CAL U100B** Universal calibration unit (150 Ω / 50 Ω adapter)
242430	SAR T801** Common mode adapter for Sub-D
AX-000452	A 50-N Termination 50 Ω, N type, male, 1 Watt, 2.5 GHz

*) Impedance Stabilization Network (AAN) for CISPR 22/32/16-1-2 for one or two unscreened balanced pairs

**) The IEC/EN 61000-4-6 setup for stress level setting requires the adapters two times each.

Teseq GmbH
Landsberger Str. 255 · 12623 Berlin · Germany
T +49 30 56 59 88 35 F +49 30 56 59 88 34
desales@teseq.com **www.teseq.com**

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