

0.7 μ H Line Impedance Stabilisation Network

1 Introduction

The TBL00705-2 LISN is a two-paths $50\ \Omega // 0.7\mu\text{H}$ LISN characterized from 10Hz – 200 MHz. It is based on the standard ECSS-E-ST-20-07C Rev 1. The standard provides the general schematic of the LISN and allows for some flexibility in component values. The TBL00705-2 implementation aims for use in EMC measurements of satellites and spacecraft. The LISN does not have an output for conducted emission measurements; instead, it merely functions as a network for line impedance stabilisation. An RF current monitoring probe is used to measure conducted emissions, according to the standard.

The 0.7 μ H inductor mimics the typical inductance of the supply wire harness in spacecraft or satellites. The LISN is inserted into the power line and power return line of the EUT.



2 Parameters

LISN type: V-AMN, $50\ \Omega // 0.7\ \mu\text{H}$

Characterized frequency range: 10 Hz – 200 MHz

DC Resistance: 400 m Ω per path

Maximum current: 5 A continuous

Operating voltage range: 0 – 60V DC, polarized

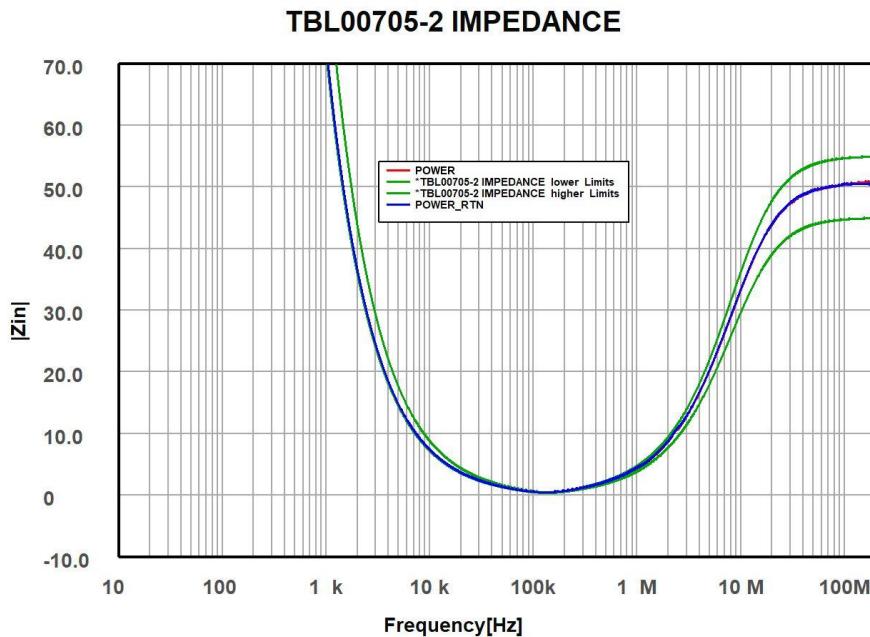
EUT / SOURCE terminals: 4 mm banana sockets; red – positive terminal; black – negative terminal

Dimensions: W 120 mm x L 175 mm x H 85 mm

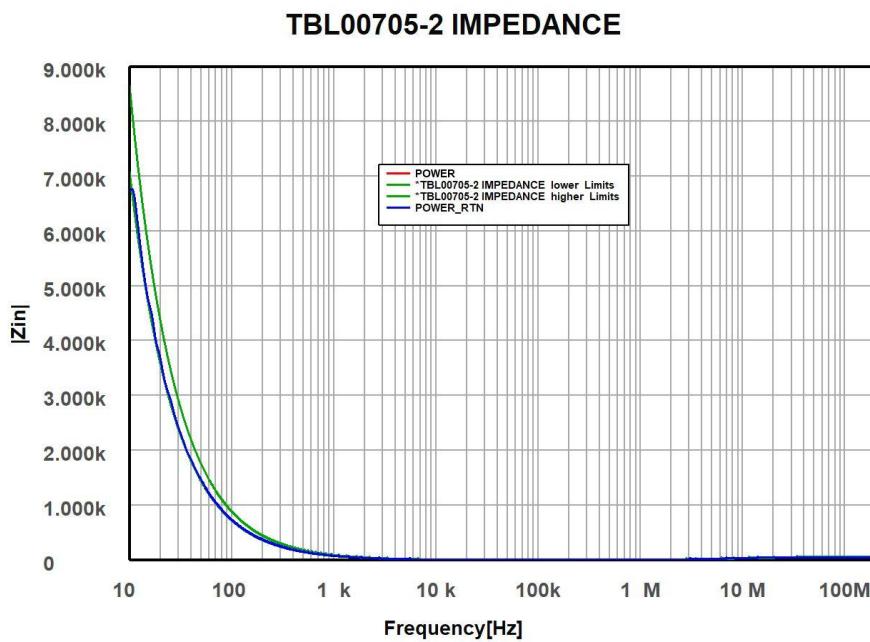
Weight: 0.9 kg

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3 Impedance

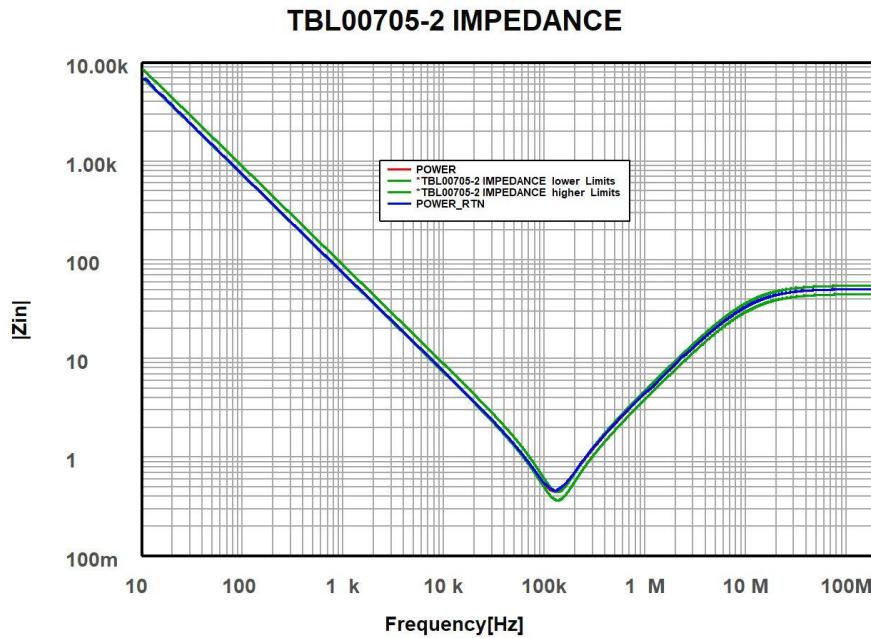


Impedance: 10Hz – 200 MHz; source terminals open, typical data



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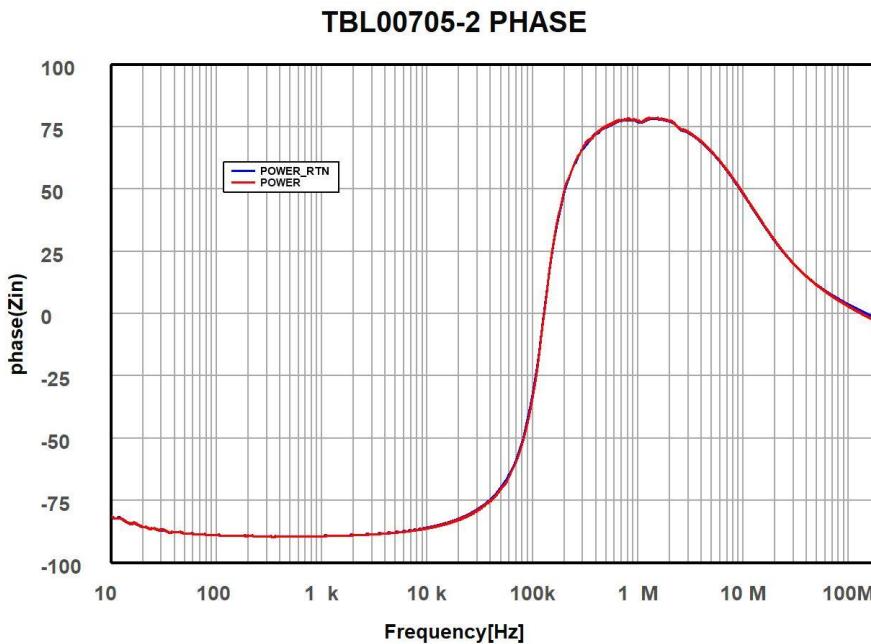
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Impedance: 10 Hz – 200 MHz; logarithmic impedance axis, source terminals open, typical data

The standard does not specify impedance limits. The green traces represent a $\pm 10\%$ tolerance band of the simulated impedance (ideal components/no parasitics);

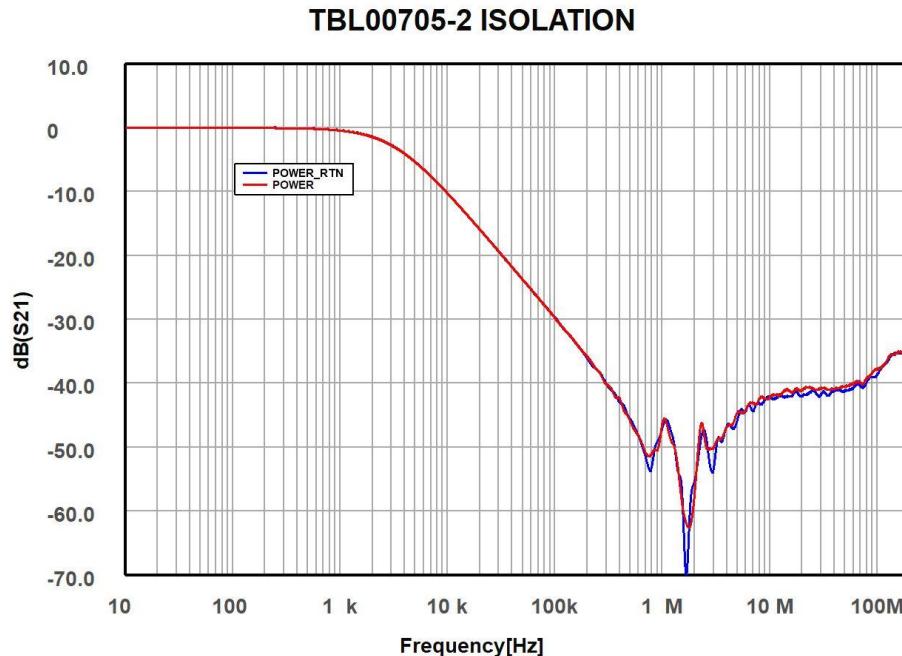
4 Phase



Input phase: 10 Hz – 200 MHz; source terminals open, typical data

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5 Isolation



Isolation from SOURCE terminals to EUT terminals: 10 Hz – 200 MHz, typical data

6 Principle Schematics

- $x = 0.7 \mu\text{H}$
- $y = 0.4 \text{ ohm}$
- DC current: 2A

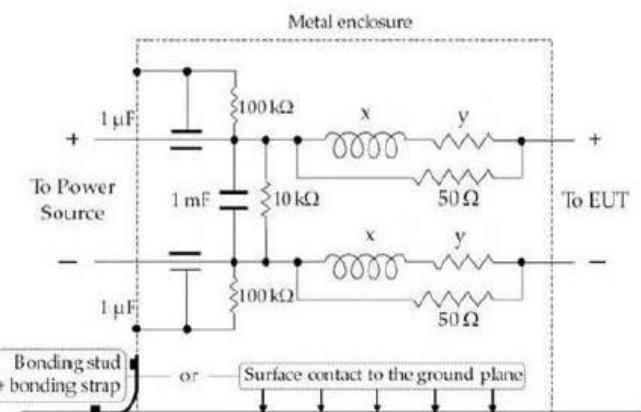


Figure 5.6.5-2: LISN schematic

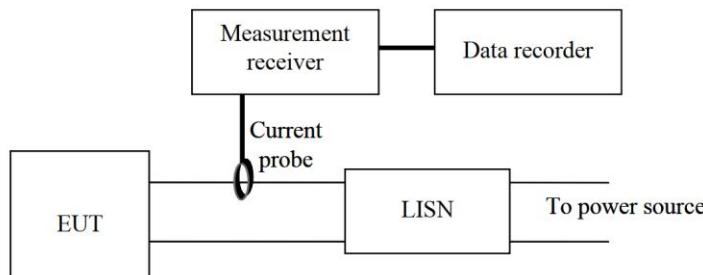
Warning: the 1mF (1000 μ F) capacitance is implemented using an electrolytic capacitor. Consequently, reversing the source voltage polarity will damage the capacitor.

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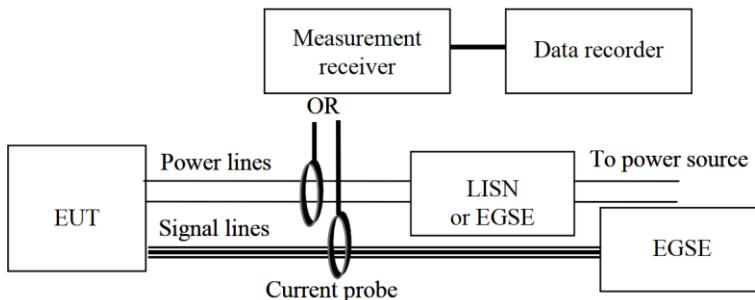
7 Measurement of conducted emissions

ECSSEST2007C specifies differential mode conducted emission measurements on power leads in the frequency range of 10 Hz to 200 MHz.

Furthermore, ECSSEST2007C specifies common mode and differential mode conducted emission measurements on power and signal leads in the frequency range of 10 Hz to 200 MHz.



Conducted emission, differential mode, measurement setup



Conducted emission, common mode, measurement setup

*) EGSE: electrical ground support equipment

Tekbox also provides suitable RF current monitoring probes, such as the TBCP2-30K400.

LISN are also required in other ECSSEST2007C measuring setups:

Radiated emission – electric field; inrush current; conducted susceptibility – signal injection; conducted susceptibility – bulk cable injection; conducted susceptibility – transients; conducted susceptibility – spike series / parallel injection; radiated susceptibility – magnetic field; radiated susceptibility – electric field;

8 References

ECSS-E-ST-20-07C Rev. 1

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9 Ordering Information

Part Number	Description
TBL00705-2	0.7μH LISN, two path
TBCP2-30K400	Optional accessory: RF current monitoring probe for CE measurements

10 History

Version	Date	Author	Changes
V1.0	21.03.2024	Mayerhofer	Creation of the document
V1.1	25.09.2024	Mayerhofer	Update of chapter 6

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