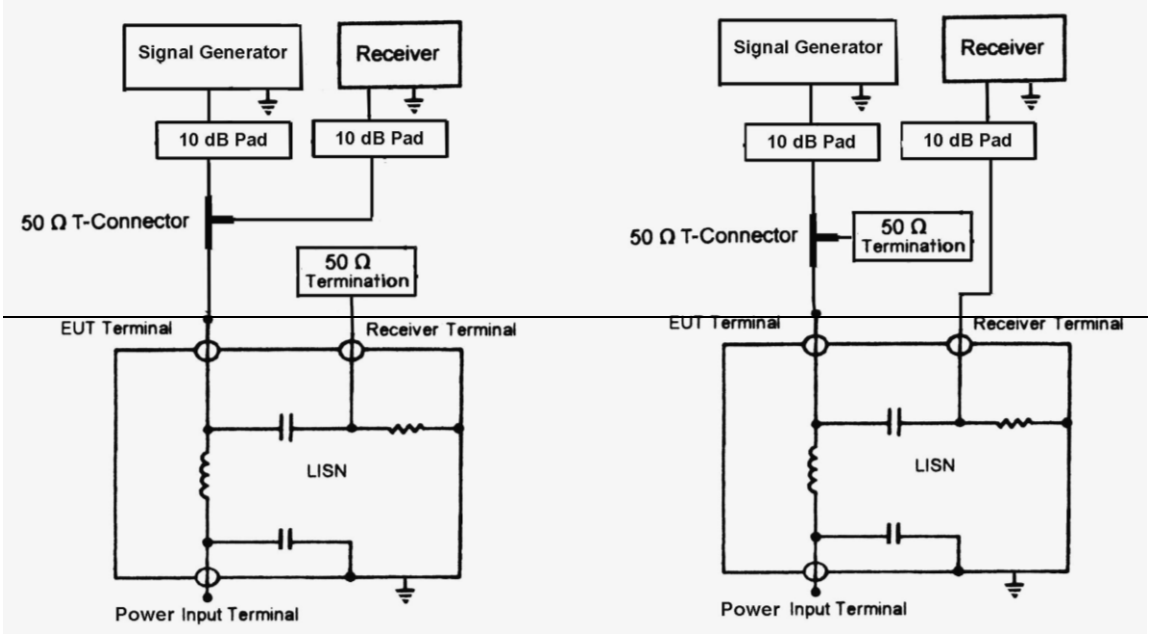
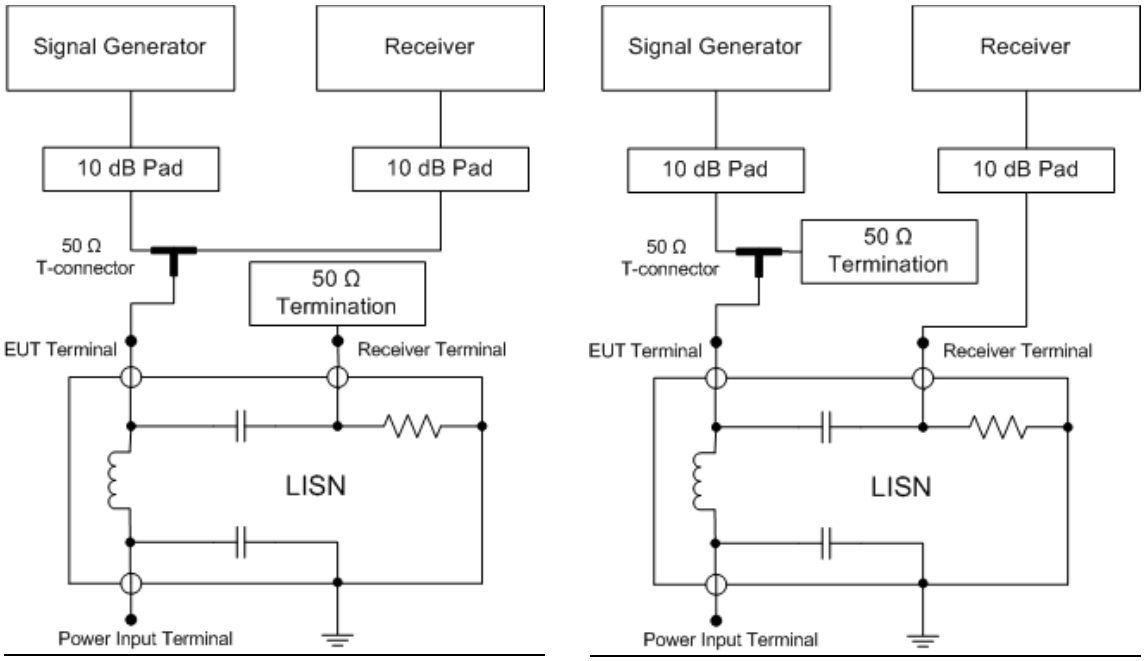
Date	Document
03/02/2010	C63.4-2009

National Committee	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (General/ Technical/Editorial)	COMMENTS	Proposed change	OBSERVATIONS OF THE SECRETARIAT on each comment submitted
C63®	B.4 b)	Figure B.1 (b.1) and (b.2)	Technical	The LISN insertion loss measurement procedure documented in Clause B.4 (b) using the test setup diagram shown in Figure B.1 (b.1) and (b.2) will give very different results than the historical procedure documented in Clause B.4 (a) using the test setup diagram shown in Figure B.1 (a.1) and (a.2). The historical procedure will measure the insertion loss based on a system model with a voltage source (0 ohm source impedance) and a 50 ohm receiving load impedance. The new procedure in C63.4-2009 will measure the insertion loss based on a system model with a 50 ohm source impedance and a 50 ohm receiving load impedance. The historical procedure can be seen to have roots at least as early as the VDE days, in that the VDE correction factor below 150 kHz was based on the 0 ohm source impedance model. The difference in theoretical insertion loss between these two models is somewhere around 15 to 20 dB at 9 kHz and 1.5 dB at 150 kHz; variations will arise depending on the actual LISN circuit and which LISN components (caps, resistors and additional coils) are included in the calculations. The major impact is from the 50 uH coil.	To fix this, the TEE that is used in the signal generator / receiver procedure must also be used in the network analyzer procedure.	**Response:** It is agreed that the diagrams needs to be changed for the two setups to produce the same result. A TEE is added similar to the diagram of figures B.1 (a.1) and B.1 (a.2). In fact, all four diagrams in that figure needed some adjustment; see below for the final figure set. Changes in the text are needed to reflect the change in the diagram. An erratum will have to be issued.

NOTE—The editing instructions contained in this corrigendum define how to merge the material contained therein into the existing base standard and its amendments to form the comprehensive standard.

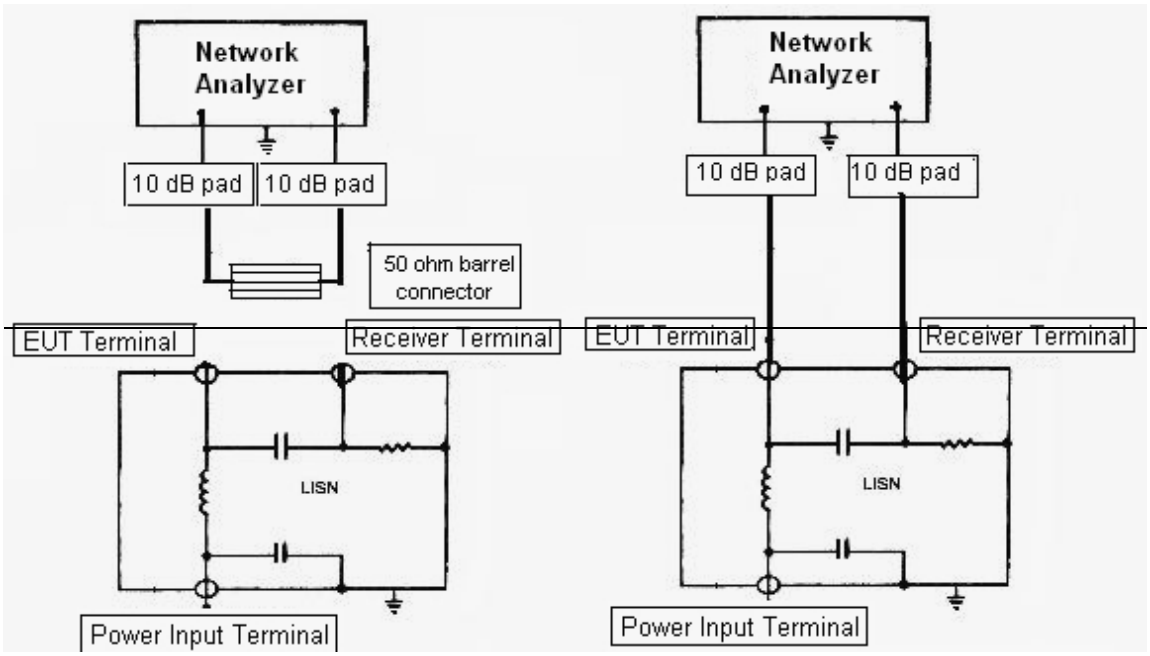
The editing instructions are shown in ***bold italic***.[PENDING] Four editing instructions are used: change, delete, insert, and replace. ***Change*** is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by using ~~strikethrough~~ (to remove old material) and underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. ***Replace*** is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editing instructions, change markings, and this NOTE will not be carried over into future editions because the changes will be incorporated into the base standard.

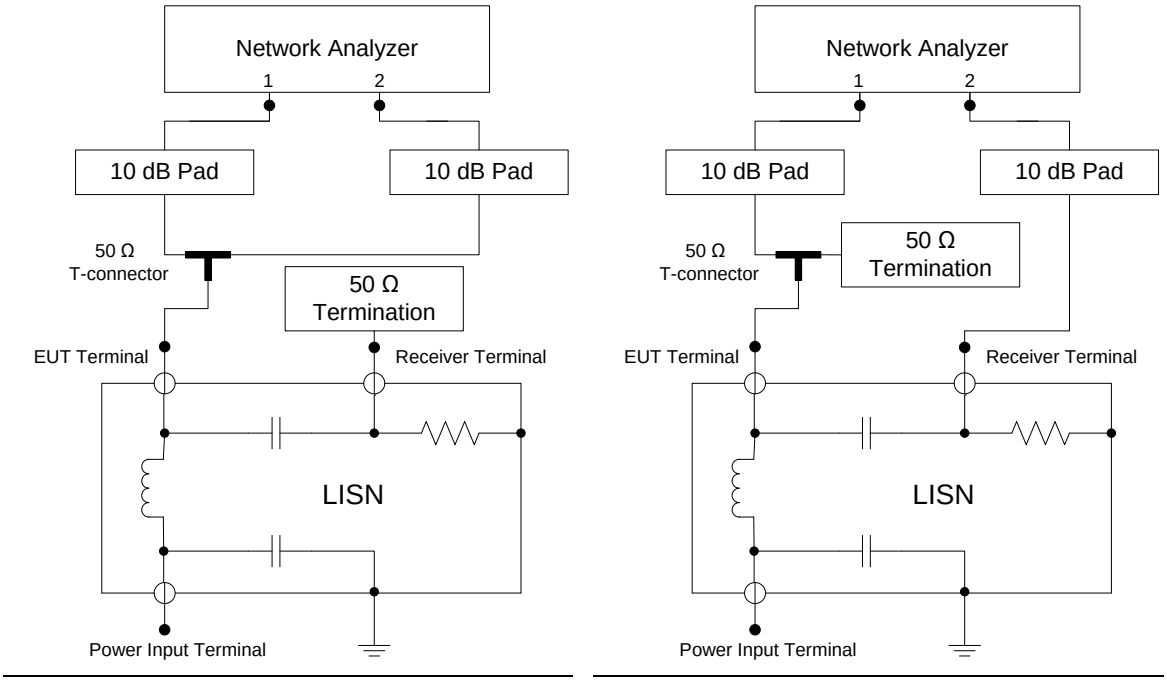




(a.1) ~~Transmitted signal measurement~~ Reference measurement setup using signal generator & receiver.

(a.2) ~~Received signal measurement~~ Transmission measurement setup using signal generator & receiver.





(b.1) ~~**Reference transmission measurement**~~ **Reference measurement setup using network analyzer.**

(b.2) ~~**LISN transmission measurement**~~ **Transmission measurement setup using network analyzer.**

Figure B.1—Measurement of LISN insertion loss

B.4 Measuring the insertion loss of a LISN

The following requirements shall be applied to the measurement of LISN insertion loss.

a) The following procedure applies when using a signal generator and an EMI receiver:

1) Terminate the measurement-port outputs of all unused sections of a multi-section LISN into 50 Ω loads.

2) Set up the signal generator, LISN, receiver, 10 dB pads, 50 Ω termination, T-connector, and cables as shown in Figure B.1 (a.1).

3) Measure the received signal voltage V_{Direct} in dBμV over the frequency range of interest. If the signal source frequency is changed in discrete increments, the frequency step size should be smaller than or equal to 50% of the resolution bandwidth setting on the receiver or spectrum analyzer.

4) Without changing settings on either the signal generator or receiver, set up the signal generator, LISN, receiver, 10 dB pads, 50 Ω termination, T-connector, and cables as shown in Figure B.1 (a.2).

5) Measure the received signal voltage V_{LISN} in dBμV.

6) Subtract V_{LISN} from V_{Direct} to obtain the insertion loss (in dB) of the LISN.

b) The following procedure applies when using a network analyzer:

1) Terminate the measurement-port outputs of all unused sections of a multi-section LISN into 50 Ω loads.

2) Set up the network analyzer, LISN, 10 dB pads, 50 Ω termination, T-connector, ~~barrel connector (female-to-female adaptor),~~ and cables as shown in Figure B.1 (b.1).

3) Follow network analyzer manufacturer's instructions to measure the received signal over the frequency range of interest.

4) Next, set up the network analyzer, LISN, 10 dB pads, 50 Ω termination, and cables as shown in Figure B.1 (b.2). Do not change any of the settings on the network analyzer.

5) ~~Set the network analyzer to measure the insertion loss in dB.~~ Follow network analyzer manufacturer's instructions to measure the received signal over the frequency range of interest.

6) ~~Set the network analyzer to measure S_{12} to obtain the insertion loss (in dB) of the LISN.~~ Subtract results from step B.4 b) 5) from the results of step B.4 b) 3) to obtain the LISN insertion loss (in dB).

NOTE 1— ~~The insertion loss, electrical length, and mismatch of the barrel connector needs to be known and used during the reference measurement.~~ If using the network analyzer the internal calibration routine cannot be used, otherwise a systematic error is introduced that is directly related to the actual impedance of the LISN.

NOTE 2—In this standard, when the term *LISN* is used, it means a LISN set with one, two, or more sections internal to one physical case (enclosure), as necessary.