

Federal Communications Commission
Office of Engineering and Technology
Laboratory Division

Draft Laboratory Division Publication

Title: Accredited Testing Laboratory FCC Technical Assessment Checklist

Short Title: Accredited Lab Checklist

Reason: Update of current checklist

Publication¹: 853844

Keyword: Accredited Testing Laboratory Checklist

First Category: Test Sites

Second Category: Accreditation

Third Category: Test Firm Accreditation

Question: What guidelines does the FCC provide to an accrediting body performing a technical assessment of a testing laboratory to determine the capability and competence of that laboratory to perform EMC tests to show compliance with the FCC regulatory requirements, under the FCC Regulations contained in Parts 2, 15, and 18?

Answer: The Attachment 853844 D01 Accredited Lab Checklist v01 below is intended to serve as a guide and provide a minimum list of items to be included in the technical evaluation of the test laboratory as part of the complete ISO/IEC 17025 assessment for an accredited testing laboratory. This checklist is not intended to replace the good engineering judgment of technical assessor(s), or a thorough evaluation of the facility.

Attachment List:

[853844 D01 Accredited Lab Checklist v01](#)

¹ Publication number when or if published.

Attachment

**Accredited Testing Laboratory
FCC Technical Assessment Checklist**

April 15, 2010

The following checklist identifies specific items to be evaluated during the technical assessment of a testing laboratory to determine the capability and competence of that laboratory to perform EMC tests to show compliance with FCC regulatory requirements under the FCC Regulations contained in Parts 2, 15, and 18. This checklist is intended to serve as a guide, and provide a minimum list of items to be included in the technical evaluation of the test laboratory as part of the complete ISO/IEC 17025 assessment. This checklist is not intended to replace good engineering judgment of the technical assessor(s) or a thorough evaluation of the facility. As such, other related items may be evaluated by the assessor(s). The accreditation body shall attest that all responses on this checklist are complete and accurate. The checklist may be provided to the FCC and be publicly available.

The applicable measurement procedures covered by this checklist for equipment subject to the technical requirements in Parts 15 and 18 include:

1. ANSI C63.4-2003 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*
2. ANSI C63.4-2009, *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*
3. FCC MP-5, (February 1986) *FCC Methods of Measurements of Radio Noise Emissions From Industrial, Scientific, and Medical Equipment*

At present, the FCC rules cross-reference the measurement procedures in ANSI C63.4-2003.² In a recent Public Notice the FCC announced that for the purposes of measurements to determine compliance of Part 15 radio-frequency devices, applicants can use the procedures of ANSI C63.4-2003, the revised ANSI C63.4-2009, or the new ANSI C63.10-2009, as applicable.³ References to both C63.4-2003 and C63.4-2009 are given in the following list to provide for the assessment of the testing laboratory to the standard covered by the accreditation. The version of C63.4 covered during the assessment shall be recorded under the scope of accreditation on the checklist.

The assessor(s) shall mark all items observed and verified at the laboratory. Circle the letter "Y", representing "yes" to show conformance with the criteria. **Circle the letter "N", representing "No", to show a deficiency.** If the item is "Not Applicable", circle "N/A". As necessary, record an explanation of any deficiency or comment in the space provided.

² See 47 C.F.R. §15.31(a)(3) regarding general compliance measurement procedures. See 47 C.F.R. §2.948(b)(8) regarding the site validation requirements. The FCC rules were updated to reference C63.4-2003 under ET Docket No. 03-201 (FCC 04-165). The continued reference to ANSI C63.1 in Section 2.948(b)(8) was an oversight when the rules were updated and the correct reference is ANSI C63.4-2003.

³ See Public Notice DA 09-2478. The Commission indicated therein that pending a future rulemaking to update the rules, it will accept test data for radiated emissions and NSA performed using the procedures in ANSI C63.4-2009.

Accreditation Body	
Date Completed	
Completed by (Assessor name(s))	
Scope of Accreditation C63.4 (C63.4-2003 or C63.4-2009) and MP-5	
Comments	
Laboratory Name:	
Laboratory Contact:	
Type of Assessment:	
Date of Assessment:	

I. DOCUMENTATION *(The laboratory shall have copies of appropriate FCC Rules, standards and measurement methods based on their scope of accreditation.)*

Y	N	N/A	<p>1. C63.4-2003: <i>American National Standard for Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz; or</i></p> <p>ANSI C63.4-2009, <i>American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz</i></p>	
Y	N	N/A	<p>2. FCC MP-5-1986: <i>Methods of measurement of radio noise emissions from Industrial, Scientific and Medical (ISM) equipment.</i></p> <p><i>Note: This procedure is only required when the prospective testing laboratory is being accredited for measuring ISM equipment. The special conditions and requirements in MP-5 must be taken into consideration, which do not always follow ANSI C63.4.</i></p>	
Y	N	N/A	<p>3. FCC Rules and Regulations, 47 CFR Parts 2, 15 and 18.</p>	

II. MEASUREMENT INSTRUMENTATION

Y	N	N/A	<p>4. Are 50 ohm /50 μH LISNs used per C63.4-2003, clause 4.1.2 (C63.4-2009, clause 4.3)?</p>	
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Y	N	N/A	5. Is the insertion loss of the LISN taken into account when determining the test result? (C63.4-2003, Annex E/C63.4-2009, Annex B)	
Y	N	N/A	6. Are the LISN impedance measurements made at the point where the Equipment Under Test (EUT) is connected to the LISN with 50 ohm termination on the instrumentation monitoring port? Note: Connection of the EUT to the LISN socket or at the end of an extension cord may make a difference in line conducted measurements. (C63.4-2003, Annex E/C63.4-2009, Annex B)	
Y	N	N/A	7. Are all unused EUT ports on the LISN appropriately terminated? (C63.4-2003, Annex E/C63.4-2009, Annex B)	
Y	N	N/A	8. Are the LISNs installed and used in accordance with C63.4-2003, clauses 5, 6 and 7 (C63.4-2009, clauses 5, 6 and 7) and MP-5? <i>Note: The test personnel should be prepared to demonstrate how the LISNs are installed and used.</i>	
Y	N	N/A	9. Does each of the antennas used for compliance measurements comply with the criteria in C63.4-2003, clause 4.1.5 (C63.4-2009, clause 4.5) and MP-5? <i>Note: Rod and log-spiral antennas are not permitted for FCC type measurements (47 CFR §15.31(a)(3)).</i>	
Y	N	N/A	10. Are the measurement antennas calibrated in accordance with ANSI C63.5-2006? (C63.4-2003, clause 4.1.5/C63.4-2009, clause 4.5) <i>Note: The calibration procedure outlined in ANSI C63.5-2006 is based solely on horizontally polarized measurements performed at a standard antenna calibration site, with a measurement distance of 10 meters. The FCC has stated that ANSI C63.5-2006 should be used to calibrate measurement antennas (KDB Publication 822428).</i>	
Y	N	N/A	11. Are the measuring receiver(s) or spectrum analyzer(s) used for compliance measurements compliant with the requirements in C63.4-2003, clause 4.1.1 (C63.4-2009, clause 4.2)? <i>Note: Part 15 requires the use of measuring equipment in compliance with CISPR Publication 16</i>	

			(47 CFR §15.35). C63.4-2009 references the specification in C63.2 or CISPR 16-1-1:2007.	
Y	N	N/A	12. Is any measurement software used by the testing laboratory documented in the test report? (C63.4-2009, clause 10.2.7) <i>Note: The test personnel should be prepared to demonstrate any measurement software used. When parameters are entered by the user of the test instrumentation it is considered a data transfer and subject to appropriate checks, i.e., check that the correct calibration corrections factors are used.</i>	
Y	N	N/A	13. Have the RF cables, RF switches, terminators, attenuators and pre-amplifiers been characterized in accordance with C63.4-2003, clause 4.4.5 (C63.4-2009, clause 4.7.5)?	
III. TEST FACILITIES				
A. Facilities for Measuring Power-line Conducted Emissions				
Y	N	N/A	14. Are the power-line conducted ambient signal levels at least 6 dB below the limit per C63.4-2003, clause 5.1.2 (C63.4-2009, clause 5.1.2) or can it be demonstrated that the testing personnel are capable of using alternative methods?	
Y	N	N/A	15. Does each line conducted facility used by the testing laboratory comply with the conditions and requirements of C63.4-2003, clause 5.2 (C63.4-2009, clause 5.2) and MP-5 as appropriate? Is the LISN electrically bonded to the reference ground plane?	
Y	N	N/A	16. Is the vertical conducting plane, if used, installed and used in accordance with C63.4-2003, clause 5.2.2 (C63.4-2009, clause 5.2.2)? Is the vertical plane bonded (3 cm minimum strap width) properly to the horizontal reference ground plane (3 bonds minimum)?	
B. Facilities for Measuring Radiated Emissions in the frequency range of 30 MHz to 1 GHz				
Y	N	N/A	17. For each type and size of EUT to be measured, does each radiated emission test facility comply with the conditions and requirements of C63.4-2003, clause 5.4 (C63.4-2009, clause 5.4)?	

Y	N	N/A	18. Are LISN(s), filters, and isolation transformers, if used, installed in accordance with C63.4-2003, clause 5.2.3 (C63.4-2009, clause 5.2.3)? Is the LISN bonded to the ground reference plane?	
Y	N	N/A	19. Is the reflecting ground plane in accordance with C63.4-2003, clause 5.4.3 (C63.4-2009, clause 5.4.3)?	
Y	N	N/A	20. Is the EUT turntable installed and used in accordance with C63.4-2003, clause 5.4.4 (C63.4-2009, clause 5.1.3)?	
Y	N	N/A	21. Is the antenna positioner installed in accordance with C63.4-2003, clause 5.4.5 (C63.4-2009, clause 5.1.5)?	
Y	N	N/A	22. Does the radiated emission test site(s) meet the site validation requirements of C63.4-2003, clause 5.4.6 (C63.4-2009, clause 5.4.4) for the frequency range of 30 MHz to 1 GHz?	
C. Facilities for Measuring Radiated Emissions in the frequency range of 1 GHz to 40 GHz				
Y	N	N/A	23. Has the sensitivity of the complete measurement system been determined and have any preamplifiers used to attain this sensitivity been checked to ensure that they do not cause distortion, spurious signals or overload (C63.4-2003, clause 4.1.5.4/C63.4-2009, clause 8.2.4)?	
Y	N	N/A	24. Are the beamwidths of the measurement antennas known so that the beamwidth versus size of the EUT can be taken into account (C63.4-2003, clauses 4.1.5.4, 8.2.4 and 8.3.1.2/C63.4-2009, clauses 4.5.4 and 8.2.4)? Has the antenna beamwidth been considered over the full frequency range of the test?	
Y	N	N/A	25. Does the EMI receiver or spectrum analyzer cover the required frequency range per (47 CFR §15.33)?	
Y	N	N/A	26. Does the radiated emission test site(s) meet the site validation requirements for measurements above 1 GHz? (C63.4-2003, clause 5.5/C63.4-2009, clause 5.5)	
<i>Note: C63.4-2009 provides two options for test</i>				

			<p><i>facilities used to make radiated emission measurements above 1 GHz, and clarifies that the use of RF absorbers on the top of the ground plane is permitted. (KDB Publication 704992)</i></p>	
IV. EMISSION TESTS				
A. Power-line conducted emission tests				
Y	N	N/A	<p>27. Are the AC power-line conducted emission tests performed in accordance with the applicable parts of C63.4-2003, clauses 6 and 7 (C63.4-2009, clauses 6 and 7), and 47 CFR §§15.31-15.35 and 15.107?</p> <p><i>Note: The test personnel should be prepared to demonstrate how the power-line conducted emission measurements are performed.</i></p>	
Y	N	N/A	<p>28. Do the test personnel know when and how to use a voltage probe and do they follow the requirements of C63.4-2003, clause 4.1.3 (C63.4-2009, clause 4.4)?</p>	
Y	N	N/A	<p>29. Are all surfaces of the EUT (both floor-standing and tabletop systems) at least 80 cm from any other conducting surfaces, including all LISNs per C63.4-2003, clauses 6 and 7 (C63.4-2009, clauses 6 and 7)?</p>	
Y	N	N/A	<p>30. Is the conducted emission test setup in accordance with C63.4-2003 Figure 10a for a tabletop EUT, Figure 10b for a floor-standing EUT and clauses 6 and 7 (C63.4-2009 Figure 7 for tabletop EUT, Figure 8 for a floor standing EUT and clauses 6 and 7)?</p>	
Y	N	N/A	<p>31. Is the excess power cord length between the EUT and the LISN folded back and forth in a serpentine bundle, located in the center of the power cord, not to exceed 40 cm? (C63.4-2003, clause 7.2.1/C63.4-2009, clause 7.3.1)</p>	
Y	N	N/A	<p>32. Is the EUT connected to one LISN and all the peripherals connected to at least one other LISN? (C63.4-2003, clause 7.2.1/C63.4-2009, clause 7.3.1)</p>	

Y	N	N/A	33. Does the final conducted emission test represent the maximized cable configuration and worst case mode of EUT operation as based on the configuration from the exploratory tests? (C63.4-2003, clause 7.2.4/C63.4-2009, clause 7.3.4)	
Y	N	N/A	34. For each type of EUT, are measurements made over the correct frequency ranges and the correct detectors and bandwidth as required by 47 CFR §§15.33, 15.35 and 18.309?	
B. Radiated emission tests				
Y	N	N/A	35. Are the radiated emission tests performed in accordance with C63.4-2003 clauses 6, 8, and 11 (C63.4-2009, clauses 6, 8 and 11)? <i>Note: The test personnel should be prepared to demonstrate how the radiated emission measurements are performed.</i>	
Y	N	N/A	36. Do the procedures for handling ambient emissions follow C63.4-2003, clause 5.1.2 (C63.4-2009, clause 5.1.2)?	
Y	N	N/A	37. Are exploratory and final radiated measurements made in accordance with C63.4-2003, clauses 8.3, 11 and Annex C (C63.4-2009, clauses 8.3, 11 and Annex E)?	
Y	N	N/A	38. Is the radiated emission test setup in accordance with C63.4-2003, Figure 11a for a tabletop EUT and Figures 11b, 12a, and 12b for a floor-standing EUT (C63.4-2009, Figure 9 for a tabletop EUT and Figures 10, 11, and 12 for a floor-standing EUT)?	
Y	N	N/A	39. For Information Technology Equipment (ITE), is the EUT operated and tested in accordance with the procedures in C63.4-2003, clause 11 (C63.4-2009, clause 11)?	
Y	N	N/A	40. Are unintentional radiators, other than ITE, tested in accordance with the requirements in 47 CFR §15.31 and the procedures in C63.4-2003, clause 12 and Annex G (C63.4-2009, clause 12) and MP-5?	

Y	N	N/A	41. Are intentional radiators tested in accordance with the requirements in 47 CFR §15.31 and the procedures in C63.4-2003, clause 13 and Annex H (C63.4-2009, clause 13)?	
Y	N	N/A	42. Does the radiated emission measurement represent the maximized cable configuration and worst case mode of EUT operation as based on exploratory testing configuration? (C63.4-2003, clause 8/C63.4-2009, clause 8)	
Y	N	N/A	43. For each type of EUT, are the correct frequency ranges investigated and the correct measurement detectors and bandwidth used per 47 CFR §§15.33 and 15.35?	
Y	N	N/A	44. For products in which the limits from CISPR 22 are used to demonstrate compliance with 47 CFR Part 15, are the measurements made in accordance with 47 CFR §15.109(g)? <i>Note: The test procedures in C63.4-2003 or C63.4-2009 shall be used to determine compliance to the radiated emission limits below 1 GHz. The EUT is required to comply with the FCC radiated emission limits above 1 GHz.</i>	
V. TEST REPORTS (<i>Assessor should request to review several sample test reports for various types of products.</i>)				
Y	N	N/A	45. Does each of the test reports contain all the information requested in C63.4-2003, clause 10 (C63.4-2009, clause 10), and 47 CFR Part 2?	
Y	N	N/A	46. Does the test report reference the standard used and define any deviations? (FCC Public Notice DA 09-2478)	
Y	N	N/A	47. Is the rationale for selecting and arranging the EUT clearly stated and are the components of the EUT system clearly identified per C63.4-2003, clause 10.1.2 (C63.4-2009, clause 10.2.2)?	
Y	N	N/A	48. Does the test report include photographs or detailed sketches of the EUT configuration per C63.4-2003, clause 10.1.12 (C63.4-2009, clause 10.2.12)?	
Y	N	N/A	49. Does the measurement report include a sample calculation with all conversion and correction factors used? (C63.4-2003, clauses 10.1.4 and	

			10.1.5/C63.4-2009 clauses 10.2.4 and 10.2.5)	
VI. PERSONNEL COMPETENCY <i>(The following is a list of general or lead-in questions, which are intended to be used as a guide to assess competency of laboratory personnel. Additional specific questions should be used to determine the technical competency of the personnel performing the measurement.)</i>				
Y	N	N/A	50. Are laboratory personnel able to obtain recent and appropriate interpretations of the FCC Rules?	
Y	N	N/A	51. Do the test personnel know how to determine if an emission is from the EUT or is an ambient signal? Do the test personnel know how to handle an emission that is close to, or coincident with, an ambient signal? (C63.4-2003, clause 5.1.2/C63.4-2009, clause 5.1.2)?	
Y	N	N/A	52. Do the test personnel know how to identify and avoid potential overload conditions of the test instrumentation? (C63.4-2003, clause 4.1.1.2/C63.4-2009, clause 4.2 and annex H)	
Y	N	N/A	53. For measurement of ISM equipment, are the test personnel knowledgeable of the intricacies and special procedures in MP-5 and the rules in 47 CFR Part 18?	
Y	N	N/A	54. Can the test personnel explain the FCC requirements for testing a product in accordance with the requirements in 47 CFR §§15.31-15.37? Are the test personnel knowledgeable of the FCC testing conditions for different types of products?	
Y	N	N/A	55. For a testing laboratory providing <i>in-situ</i> testing services, can the test personnel satisfactorily describe how measurements would be performed at the user's location?	