



An IIA Company

FCC CFR 47 Part 15 B Class B Test Report

APPLICANT	Ecoviox LLC
MODEL NUMBER	Ev-o
PRODUCT DESCRIPTION	Air Purifier with Infrared Remote
DATE SAMPLE RECEIVED	7/29/2020
FINAL TEST DATE	7/29/2020
PREPARED BY	Tim Royer

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

UNDER ISO/IEC 17025, AND ISO/IEC 17065



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SIGNATURE PAGE

Timco Engineering, Inc. attests that:

<input checked="" type="checkbox"/>	The EUT tested herein fulfills all approval requirements and/or the customer requirements as identified in this test report.
<input type="checkbox"/>	The EUT tested herein does not fulfill all approval requirements and/or the customer requirements as identified in this test report.

This report relates only to the Equipment Under Test (EUT) sample(s) tested.

This report shall not be reproduced except in full without the written approval of Timco Engineering, Inc.

To the best of my knowledge and belief, this device has been tested in accordance with the standards identified in this test report, and these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669



Name and Title Franklin Rose, Project Manager / EMC Specialist



Name and Title Tim Royer, Project Manager / EMC Engineer

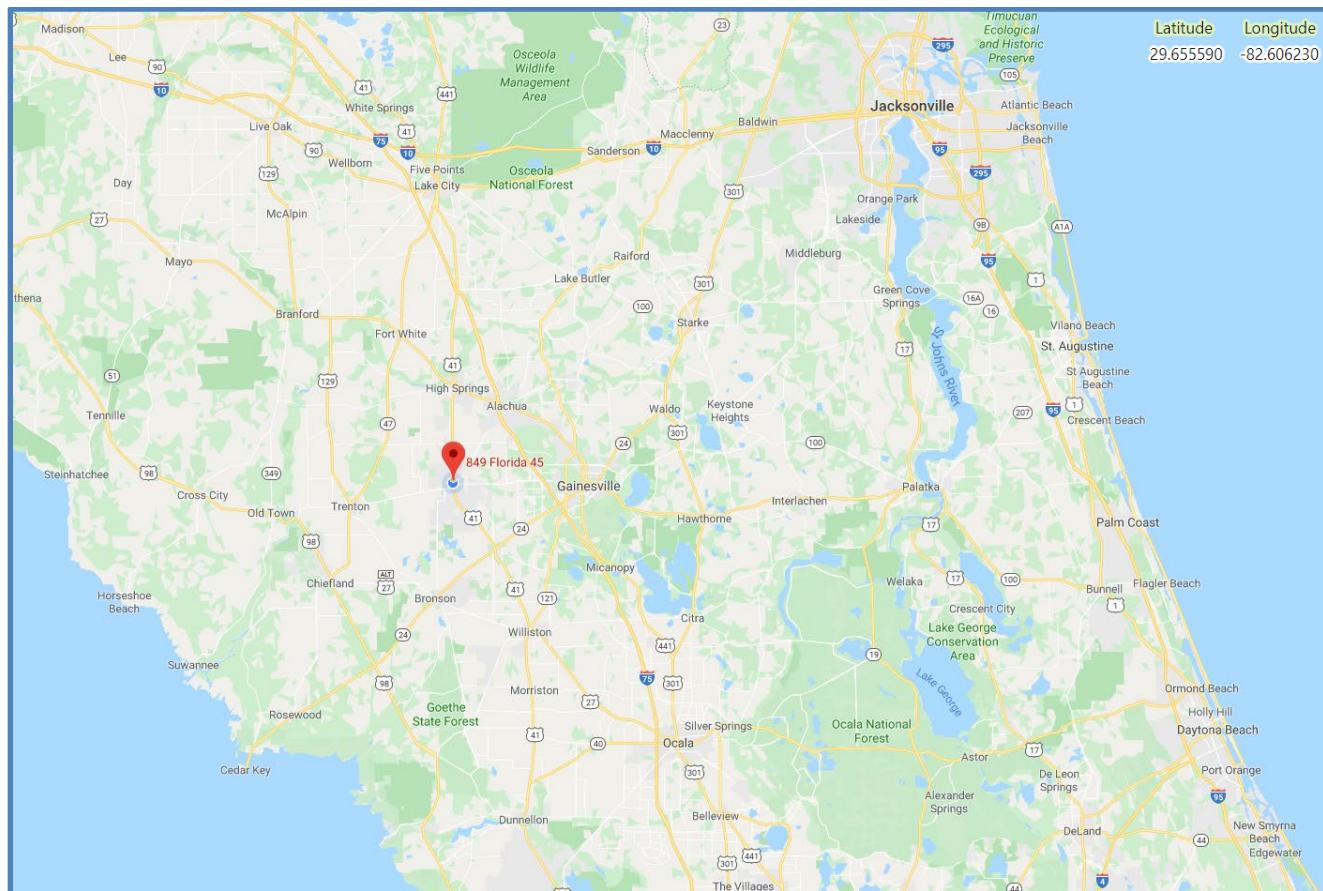


Name and Title Sharon Hoffman, Senior Marketing Director / Operations

Date 7/29/2020

TEST LABORATORY INFORMATION

**Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669, USA**



United States	FCC Accredited and Recognized Test Lab & TCB # US1070 DHS Recognized P25 CAP Test Facility # P25CAPTIMCO081016
Australia / New Zealand	U.S. CABs Recognized by Australia ACMA Under MRA
Canada	U.S. Lab & CB Recognized by Canada ISED, Designation # US0111, Test Site # 2056A
Chinese Taipei	U.S. CABs Recognized by Chinese Taipei BSMI/NCC Under MRA
European Union	U.S. EMC & RE Directive NB's, Designation # US0111, Notified Body # 1177
Hong Kong	U.S. Labs & CBs Recognized by Hong Kong OFCA Under MRA
Israel	U.S. CABs Recognized by Israel MOE/MOC Under MRA
Japan	U.S. RCBs Recognized by Japan MIC
Korea	U.S. CABs Recognized by Korea RRA Under MRA
Mexico	U.S. CABs Recognized by Mexico IFT Under MRA
Singapore	U.S. Labs & CBs Recognized by Singapore IMDA Under MRA
Vietnam	U.S. CABs Recognized by Vietnam MIC Under MRA

TEST INFORMATION

Report Version	Description	Issue Date
2630-20_FCC15B TestReport_	Initial Issue	7/29/2020

Test Conditions	Temperature during testing: 26°C, Humidity during testing: 50%
Test Exercise	The EUT was operated in accordance with the service manual using software supplied by the manufacturer.
Applicable Standards	ANSI C63.4-2014, June 13, 2014 FCC CFR 47 Part 15 B
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA

EUT INFORMATION

EUT Description	Air Purifier with Infrared Remote		
Model Number	Ev-o		
Modified for Testing	<input type="checkbox"/>		
Modification	n/a		
Antenna Connector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	UHF	BNC	N
EUT Power Source	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	AC Power (110-120 V)	DC Power (13.8 V)	DC Battery (7.4 V)
Test Item	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Engineering Prototype	Pre-Production	Post-Production	
Type of Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fixed	Mobile	Portable	

NOTES:**TEST RESULTS**

General Requirement (FCC PT 15)	Requirement	Complies	N/A
15.107	AC Powerline Conducted Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15.109	Unintentional Radiated Spurious Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2.909 RESPONSIBLE PARTY

(a) In the case of equipment that requires the issuance of a grant of certification, the party to whom that grant of certification is issued is responsible for the compliance of the equipment with the applicable standards. If the radio frequency equipment is modified by any party other than the grantee and that party is not working under the authorization of the grantee pursuant to §2.929(b), the party performing the modification is responsible for compliance of the product with the applicable administrative and technical provisions in this chapter.

(b) For equipment subject to Supplier's Declaration of Conformity the party responsible for the compliance of the equipment with the applicable standards, who must be located in the United States (see §2.1077), is set forth as follows:

(1) The manufacturer or, if the equipment is assembled from individual component parts and the resulting system is subject to authorization under Supplier's Declaration of Conformity, the assembler.

(2) If the equipment by itself, or, a system is assembled from individual parts and the resulting system is subject to Supplier's Declaration of Conformity and that equipment or system is imported, the importer.

(3) Retailers or original equipment manufacturers may enter into an agreement with the responsible party designated in paragraph (b)(1) or (b)(2) of this section to assume the responsibilities to ensure compliance of equipment and become the new responsible party.

(4) If the radio frequency equipment is modified by any party not working under the authority of the responsible party, the party performing the modifications, if located within the U.S., or the importer, if the equipment is imported subsequent to the modifications, becomes the new responsible party.

(c) If the end product or equipment is subject to both certification and Supplier's Declaration of Conformity (*i.e.*, composite system), all the requirements of paragraphs (a) and (b) of this section apply.

(d) If, because of modifications performed subsequent to authorization, a new party becomes responsible for ensuring that a product complies with the technical standards and the new party does not obtain a new equipment authorization, the equipment shall be labeled, following the specifications in §2.925(d), with the following: "This product has been modified by [insert name, address and telephone number or internet contact information of the party performing the modifications]."

(e) In the case of transfer of control of equipment, as in the case of sale or merger of the responsible party, the new entity shall bear the responsibility of continued compliance of the equipment.

2.1072 DECLARATION OF CONFORMITY

§2.1072 Limitation on Supplier's Declaration of Conformity.

(a) Supplier's Declaration of Conformity signifies that the responsible party, as defined in §2.909, has determined that the equipment has been shown to comply with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. Compliance with these standards shall not be construed to be a finding by the responsible party with respect to matters not encompassed by the Commission's rules.

(b) Supplier's Declaration of Conformity by the responsible party, as defined in §2.909, is effective until a termination date is otherwise established by the Commission.

(c) No person shall, in any advertising matter, brochure, etc., use or make reference to Supplier's Declaration of Conformity in a deceptive or misleading manner or convey the impression that such Supplier's Declaration of Conformity reflects more than a determination by the manufacturer, importer, integrator, or responsible party, as defined in §2.909, that the device or product has been shown to be capable of complying with the applicable technical standards of the Commission's rules.

2.1074 IDENTIFICATION

§2.1074 Identification.

(a) Devices subject only to Supplier's Declaration of Conformity shall be uniquely identified by the party responsible for marketing or importing the equipment within the United States. However, the identification shall not be of a format which could be confused with the FCC Identifier required on certified equipment. The responsible party shall maintain adequate identification records to facilitate positive identification for each device.

(b) Devices subject to authorization under Supplier's Declaration of Conformity may be labeled with the following logo on a voluntary basis as a visual indication that the product complies with the applicable FCC requirements. The use of the logo on the device does not alleviate the requirement to provide the compliance information required by §2.1077.

FCC Logo Example:



Please go to <https://www.fcc.gov/general/logos-fcc> to see all approved Part 15 & Part 18 FCC equipment labels.

2.1077 COMPLIANCE INFORMATION

(a) If a product must be tested and authorized under Supplier's Declaration of Conformity, a compliance information statement shall be supplied with the product at the time of marketing or importation, containing the following information:

Application Requirement	Requirement	Information
2.1077(a)(1)	The name and model number of the product	Ecoviox Ev-o
2.1077(a)(2)	A statement of compliance as applicable to the product	<input checked="" type="checkbox"/>
2.1077(a)(3)	Responsible Party Name	Ecoviox LLC
2.1077(a)(3)	Responsible Party Address (MUST be located in the United States)	1944 NE 147 th Terrace North Miami, FL 33181 USA
2.1077(a)(3)	Responsible Party Telephone Number or Internet Contact Information (MUST be located in the United States)	(786) 775-1083 jsiri@ecoviox.com.ar
2.1077(c)	Compliance statement in the manual, or as a supplemental document	<input checked="" type="checkbox"/>

(b) If a product is assembled from modular components (e.g., enclosures, power supplies and CPU boards) that, by themselves, are authorized under a Supplier's Declaration of Conformity and/or a grant of certification, and the assembled product is also subject to authorization under Supplier's Declaration of Conformity but, in accordance with the applicable regulations, does not require additional testing, the product shall be supplied, at the time of marketing or importation, with a compliance information statement containing the following information:

Application Requirement	Requirement	Information
2.1077(b)(2)	Name and model number of modular component(s)	N/A
2.1077(b)(2)	FCC ID of modular component(s)	N/A
2.1077(b)(5)	Copies of compliance statements for each modular component(s)	<input checked="" type="checkbox"/>



SUPPLIERS DECLARATION OF CONFORMITY

The responsible party declares that this device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party: Ecoviox LLC
Address: 1944 NE 147th Terrace
North Miami, FL, 33181, US

Product Description: Air Purifier with Infrared Remote
Model Name: Ev-o
Applicant: Ecoviox LLC
Address: 1944 NE 147th Terrace
North Miami, FL, 33181, US
Report Number: 2633-20_FCC15B TestReport
Printed Name/Title: _____
Signature: _____
Date: 7/29/2020



15.31 MEASUREMENT STANDARDS

(a) The following measurement procedures are used by the Commission to determine compliance with the technical requirements in this part. Except where noted, copies of these procedures are available from the Commission's current duplicating contractor whose name and address are available from the Commission's Consumer and Governmental Affairs Bureau at 1-888-CALL-FCC (1-888-225-5322).

(4) Unintentional radiators are to be measured for compliance using the following procedure excluding clauses 4.5.3, 4.6, 6.2.13, 8.2.2, 9, and 13: ANSI C63.4-2014 (incorporated by reference, see §15.38).

NOTE 1 TO PARAGRAPH (a)(4): Digital devices tested to show compliance with the provisions of §15.109(g)(2) must be tested following the ANSI C63.4-2014 procedure described in paragraph (a)(4) of this section.

15.33 FREQUENCY RANGE

(b) For unintentional radiators:

(1) Except as otherwise indicated in paragraphs (b)(2) or (b)(3) of this section, for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

(2) A unintentional radiator, excluding a digital device, in which the highest frequency generated in the device, the highest frequency used in the device and the highest frequency on which the device operates or tunes are less than 30 MHz and which, in accordance with §15.109, is required to comply with standards on the level of radiated emissions within the frequency range 9 kHz to 30 MHz, such as a CB receiver or a device designed to conduct its radio frequency emissions via connecting wires or cables, e.g., a carrier current system not intended to radiate, shall be investigated from the lowest radio frequency generated or used in the device, without going below 9 kHz (25 MHz for CB receivers), up to the frequency shown in the following table. If the unintentional radiator contains a digital device, the upper frequency to be investigated shall be that shown in the table below or in the table in paragraph (b)(1) of this section, as based on both the highest frequency generated and the highest frequency used in the digital device, whichever range is higher.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-10	400
10-30	500

Frequency Range of Measurements

(3) Except for a CB receiver, a receiver employing superheterodyne techniques shall be investigated from 30 MHz up to at least the second harmonic of the highest local oscillator frequency generated in the device. If such receiver is controlled by a digital device, the frequency range shall be investigated up to the higher of the second harmonic of the highest local oscillator frequency generated in the device or the upper frequency of the measurement range specified for the digital device in paragraph (b)(1) of this section.

(c) The above specified frequency ranges of measurements apply to the measurement of radiated emissions and, in the case of receivers, the measurement to demonstrate compliance with the antenna conduction limits specified in §15.111. The frequency range of measurements for AC power line conducted limits is specified in §§15.107 and 15.207 and applies to all equipment subject to those regulations. In some cases, depending on the frequency(ies) generated and used by the equipment, only signals conducted onto the AC power lines are required to be measured.

(d) Particular attention should be paid to harmonics and subharmonics of the fundamental frequency as well as to those frequencies removed from the fundamental by multiples of the oscillator frequency. Radiation at the frequencies of multiplier states should also be checked.

15.35 MEASUREMENT SETTINGS

The conducted and radiated emission limits shown in this part are based on the following, unless otherwise specified in this part:

(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrumentation using the CISPR quasi-peak detector can be found in ANSI C63.4-2014, clause 4 (incorporated by reference, see §15.38). As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function as long at the same bandwidth as indicated for CISPR quasi-peak measurements are employed.

(b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

(c) Unless otherwise specified, e.g., §§15.255(b), and 15.256(l)(5), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to Supplier's Declaration of Conformity.

Field Strength Correction Factor Conversion Example				
Frequency (MHz)	Meter Reading	+ Antenna Correction Factor	+ Cable Loss	= Field Strength
33 MHz	20 dB μ V	+ 10.36 dB/m	+0.40 dB	=30.76 dB μ V/m @ 3m

15.101 TEST SCOPE

Subpart B—Unintentional Radiators

(a) Except as otherwise exempted in §§15.23, 15.103, and 15.113, unintentional radiators shall be authorized prior to the initiation of marketing, pursuant to the procedures for certification or Supplier's Declaration of Conformity (SDoC) given in subpart J of part 2 of this chapter, as follows:

TABLE 1 TO PARAGRAPH (a)

Type of device	Equipment Authorization Required
<input type="checkbox"/> TV Broadcast Receiver	SDoC or Certification.
<input type="checkbox"/> FM Broadcast Receiver	SDoC or Certification.
<input type="checkbox"/> CB Receiver	SDoC or Certification.
<input type="checkbox"/> Superregenerative Receiver	SDoC or Certification.
<input type="checkbox"/> Scanning Receiver	Certification.
<input type="checkbox"/> Radar Detector	Certification.
<input type="checkbox"/> All other receivers subject to Part 15	SDoC or Certification.
<input type="checkbox"/> TV Interface Device	SDoC or Certification.
<input type="checkbox"/> Cable System Terminal Device	SDoC or Certification.
<input type="checkbox"/> Stand-alone Cable input selector switch	SDoC or Certification.
<input type="checkbox"/> Class B personal computers and peripherals	SDoC or Certification.
<input type="checkbox"/> CPU boards and internal power supplies used with Class B personal computers	SDoC or Certification.
<input type="checkbox"/> Class B personal computers assembled using authorized CPU boards or power supplies	SDoC or Certification.
<input type="checkbox"/> Class B external switching power supplies	SDoC or Certification.
<input type="checkbox"/> Other Class B digital devices & peripherals	SDoC or Certification.
<input type="checkbox"/> Class A digital devices, peripherals & external switching power supplies	SDoC or Certification.
<input type="checkbox"/> Access Broadband over Power Line (Access BPL)	Certification.
<input checked="" type="checkbox"/> All other devices	SDoC or Certification.

(b) Only those receivers that operate (tune) within the frequency range of 30-960 MHz, CB receivers and radar detectors are subject to the authorizations shown in paragraph (a) of this section. Receivers operating above 960 MHz or below 30 MHz, except for radar detectors and CB receivers, are exempt from complying with the technical provisions of this part but are subject to §15.5.

15.103 TEST EXEMPTIONS

The following devices are subject only to the general conditions of operation in §§15.5 and 15.29 and are exempt from the specific technical standards and other requirements contained in this part. The operator of the exempted device shall be required to stop operating the device upon a finding by the Commission or its representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected. Although not mandatory, it is strongly recommended that the manufacturer of an exempted device endeavor to have the device meet the specific technical standards in this part.

- (a) A digital device utilized exclusively in any transportation vehicle including motor vehicles and aircraft.
- (b) A digital device used exclusively as an electronic control or power system utilized by a public utility or in an industrial plant. The term *public utility* includes equipment only to the extent that it is in a dedicated building or large room owned or leased by the utility and does not extend to equipment installed in a subscriber's facility.
- (c) A digital device used exclusively as industrial, commercial, or medical test equipment.
- (d) A digital device utilized exclusively in an appliance, e.g., microwave oven, dishwasher, clothes dryer, air conditioner (central or window), etc.
- (e) Specialized medical digital devices (generally used at the direction of or under the supervision of a licensed health care practitioner) whether used in a patient's home or a health care facility. Non-specialized medical devices, *i.e.*, devices marketed through retail channels for use by the general public, are not exempted. This exemption also does not apply to digital devices used for record keeping or any purpose not directly connected with medical treatment.
- (f) Digital devices that have a power consumption not exceeding 6 nW.
- (g) Joystick controllers or similar devices, such as a mouse, used with digital devices but which contain only non-digital circuitry or a simple circuit to convert the signal to the format required (e.g., an integrated circuit for analog to digital conversion) are viewed as passive add-on devices, not themselves directly subject to the technical standards or the equipment authorization requirements.
- (h) Digital devices in which both the highest frequency generated and the highest frequency used are less than 1.705 MHz and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Digital devices that include, or make provision for the use of, battery eliminators, AC adaptors or battery chargers which permit operation while charging or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, do not fall under this exemption.
- (i) Responsible parties should note that equipment containing more than one device is not exempt from the technical standards in this part unless all of the devices in the equipment meet the criteria for exemption. If only one of the included devices qualifies for exemption, the remainder of the equipment must comply with any applicable regulations. If a device performs more than one function and all of those functions do not meet the criteria for exemption, the device does not qualify for inclusion under the exemptions.

15.107 AC CONDUCTED EMISSIONS

(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

(b) For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms LISN. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

(c) The limits shown in paragraphs (a) and (b) of this section shall not apply to carrier current systems operating as unintentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current systems containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μ V within the frequency band 535-1705 kHz, as measured using a 50 μ H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.109(e).

(d) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

15.109 RADIATED SPURIOUS EMISSIONS

- (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

- (b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	90
88-216	150
216-960	210
Above 960	300

(c) In the emission tables above, the tighter limit applies at the band edges. Sections 15.33 and 15.35 which specify the frequency range over which radiated emissions are to be measured and the detector functions and other measurement standards apply.

- (d) For CB receivers, the field strength of radiated emissions within the frequency range of 25-30 MHz shall not exceed 40 microvolts/meter at a distance of 3 meters. The field strength of radiated emissions above 30 MHz from such devices shall comply with the limits in paragraph (a) of this section.

- (e) Carrier current systems used as unintentional radiators or other unintentional radiators that are designed to conduct their radio frequency emissions via connecting wires or cables and that operate in the frequency range of 9 kHz to 30 MHz, including devices that deliver the radio frequency energy to transducers, such as ultrasonic devices not covered under part 18 of this chapter, shall comply with the radiated emission limits for intentional radiators provided in §15.209 for the frequency range of 9 kHz to 30 MHz. As an alternative, carrier current systems used as unintentional radiators and operating in the frequency range of 525 kHz to 1705 kHz may comply with the radiated emission limits provided in §15.221(a). At frequencies above 30 MHz, the limits in paragraph (a), (b), or (g) of this section, as appropriate, apply.

- (f) For a receiver which employs terminals for the connection of an external receiving antenna, the receiver shall be tested to demonstrate compliance with the provisions of this section with an antenna connected to the antenna terminals unless the antenna conducted power is measured as specified in §15.111(a). If a permanently attached receiving antenna is used, the receiver shall be tested to demonstrate compliance with the provisions of this section.

- (h) Radar detectors shall comply with the emission limits in paragraph (a) of this section over the frequency range of 11.7-12.2 GHz.

TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconical 1057	Eaton	94455-1	1057	12/13/2017	12/13/20
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	7/26/2017	7/26/20
CHAMBER	Panashield	3M	N/A	3/15/2019	3/15/21
EMI Test Receiver R & S ESU 40 firmware v 4.43 SP 3 BIOS v5.1-24-3	Rohde & Schwarz	ESU 40	100320	08/28/18	08/28/21
Software: Field Strength Program	Timco	N/A	Version 4.10.7.0	N/A	N/A
Antenna: Double-Ridged Horn/ETS Horn 1	ETS-Lindgren	3117	00035923	02/25/20	02/25/23
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	N/A	N/A
Coaxial Cable - Chamber 3 cable set (Primary)	Micro-Coax	Chamber 3 cable set (Primary)	KMKM-0244-01 KMKM-0670-00 KFKF-0198-01	4/12/2019	4/12/21
Pre-amp	RF-LAMBDA	RLNA00M45GA	N/A	2/27/2019	2/27/21
LISN (Primary)	Electro-Metrics	ANS-25/2	225363	08/26/17	08/26/20

ANNEX I – MANUFACTURER-PROVIDED DATA

Note: The accuracy and precision of the following information provided by the manufacturer of the equipment under test has not been verified using test methods, cannot be verified, or is not necessary to verify.

ANNEX II – MEASUREMENT DATA
 Test Engineer: TDR _____
 Test Date: 7/29/20
Radiated Emissions 30 MHz to 200 MHz**Horizontal Polarity**

29.Jul.20 08:29

Test Spec CISPR 22 Radiated Disturbances

Polarity

Vertical

Stepped Scan (1 Range)

Scan Start: 30 MHz
 Scan Stop: 200 MHz
 Detector: Trace 1: MAX PEAK
 Transducer: TDS_01

Start Frequency	Stop Frequency	Step Size	Res BW	Meas Time	RF Atten	Preamp	Input
30.000000 MHz	200.000000 MHz	40.00 kHz	120.00 kHz	50 µs	Auto	20 dB	INPUT1



29.Jul 20 08:29

Test Spec CISPR 22 Radiated Disturbances**Polarity**

Vertical

Final Measurement

Meas Time: 1 s
Margin: 25 dB
Subranges: 6

Trace	Frequency	Level (dB μ V/m)	Detector	Delta Limit/dB
1	34.920000000 MHz	12.29	Quasi Peak	-27.71
1	55.640000000 MHz	12.83	Quasi Peak	-27.17
1	61.680000000 MHz	25.25	Quasi Peak	-14.75
1	106.160000000 MHz	22.15	Quasi Peak	-21.35
1	137.680000000 MHz	27.13	Quasi Peak	-16.37
1	188.600000000 MHz	26.33	Quasi Peak	-17.17

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Vertical Polarity



29.Jul 20 08:40

Test Spec

CISPR 22 Radiated Disturbances

Polarity

Vertical

Stepped Scan (1 Range)

Scan Start: 30 MHz
 Scan Stop: 200 MHz
 Detector: Trace 1: MAX PEAK
 Transducer: TDS_01

Start Frequency	Stop Frequency	Step Size	Res BW	Meas Time	RF Atten	Preamp	Input
30.000000 MHz	200.000000 MHz	40.00 kHz	120.00 kHz	50 µs	Auto	20 dB	INPUT1



Page 1 of 2

29.Jul 20 08:40

Test Spec CISPR 22 Radiated Disturbances**Polarity**

Vertical

Final Measurement

Meas Time: 1 s
Margin: 25 dB
Subranges: 6

Trace	Frequency	Level (dB μ V/m)	Detector	Delta Limit/dB
1	38.960000000 MHz	27.26	Quasi Peak	-12.74
1	45.160000000 MHz	25.88	Quasi Peak	-14.12
1	62.600000000 MHz	31.86	Quasi Peak	-8.14
1	104.560000000 MHz	26.47	Quasi Peak	-17.03
1	107.280000000 MHz	28.50	Quasi Peak	-15.00
1	150.040000000 MHz	26.31	Quasi Peak	-17.19

Page 2 of 2

Radiated Emissions 200 MHz to 1000 MHz**Horizontal Polarity**

29.Jul 20 09:02

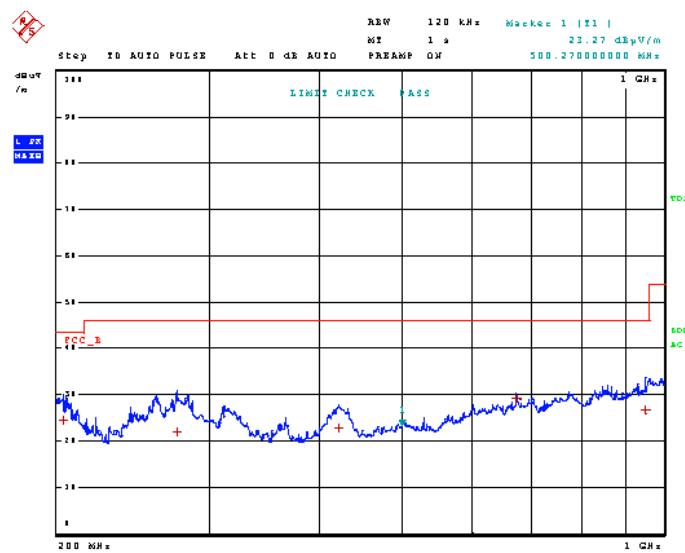
Test Spec CISPR 22 Radiated Disturbances**Polarity**

Horizontal

Time Domain Scan (1 Range)

Scan Start: 200 MHz
 Scan Stop: 1 GHz
 Detector: Trace 1: MAX PEAK
 Transducer: TDS_01

Start Frequency	Stop Frequency	Step Size	Res BW	Meas Time	RF Atten	Preamp	Input
200.000000 MHz	1.000000 GHz	30.00 kHz	120.00 kHz	50 µs	Auto	20 dB	INPUT1



29.Jul 20 09:02

Test Spec CISPR 22 Radiated Disturbances**Polarity**

Horizontal

Final Measurement

Meas Time: 1 s
Margin: 20 dB
Subranges: 5

Trace	Frequency	Level (dB μ V/m)	Detector	Delta Limit/dB
1	203.840000000 MHz	24.52	Quasi Peak	-18.98
1	274.370000000 MHz	21.90	Quasi Peak	-24.10
1	422.600000000 MHz	22.86	Quasi Peak	-23.14
1	674.990000000 MHz	29.05	Quasi Peak	-16.95
1	952.250000000 MHz	26.79	Quasi Peak	-19.21

Page 2 of 2

Vertical Polarity



29.Jul 20 09:08

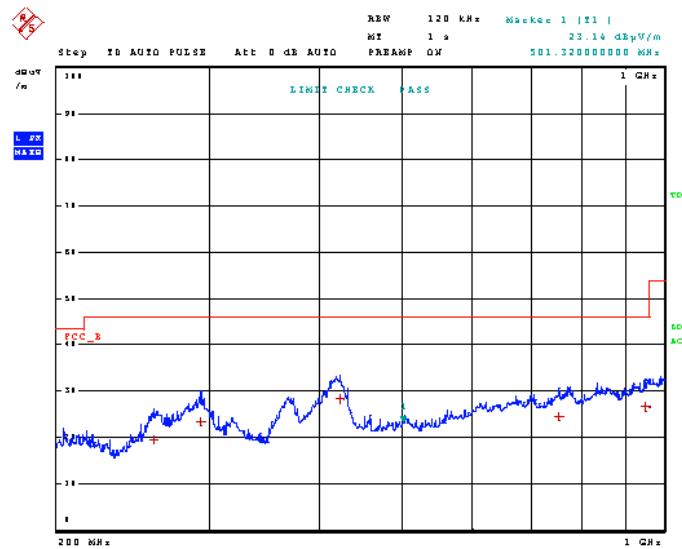
Test Spec CISPR 22 Radiated Disturbances**Polarity**

Horizontal

Time Domain Scan (1 Range)

Scan Start: 200 MHz
 Scan Stop: 1 GHz
 Detector: Trace 1: MAX PEAK
 Transducer: TDS_01

Start Frequency	Stop Frequency	Step Size	Res BW	Meas Time	RF Atten	Preamp	Input
200.000000 MHz	1.000000 GHz	30.00 kHz	120.00 kHz	50 μs	Auto	20 dB	INPUT1



Page 1 of 2

29.Jul 20 09:08

Test Spec CISPR 22 Radiated Disturbances**Polarity**

Horizontal

Final Measurement

Meas Time: 1 s
Margin: 20 dB
Subranges: 5

Trace	Frequency	Level (dB μ V/m)	Detector	Delta Limit/dB
1	257.840000000 MHz	19.37	Quasi Peak	-26.63
1	293.030000000 MHz	23.38	Quasi Peak	-22.62
1	423.680000000 MHz	28.29	Quasi Peak	-17.71
1	757.400000000 MHz	24.41	Quasi Peak	-21.59
1	951.560000000 MHz	26.65	Quasi Peak	-19.35

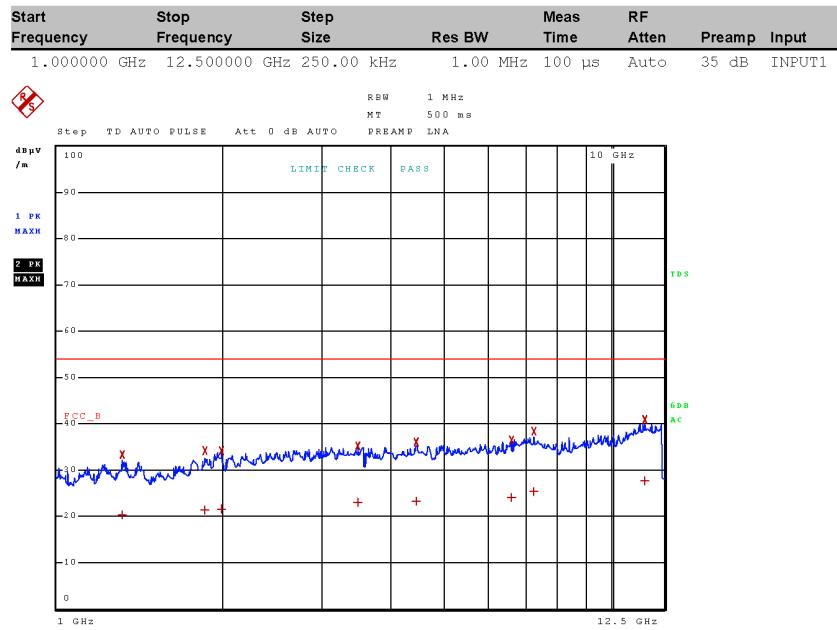
Page 2 of 2

Radiated Emissions Above 1000 MHz**Horizontal Polarity**

29.Jul 20 10:48

Time Domain Scan (1 Range)

Scan Start: 1 GHz
 Scan Stop: 12.5 GHz
 Detector: Trace 1: MAX PEAK Trace 2: MAX PEAK
 Transducer: TDS_05



Page 1 of 2

29.Jul 20 10:48

Final Measurement

Meas Time: 500 ms
 Margin: 40 dB
 Subranges: 16

Trace	Frequency	Level (dB μ V/m)	Detector	Delta Limit/dB
1	1.312750000 GHz	20.26	CISPR Averag	-33.74
2	1.312750000 GHz	33.39	Max Peak	
1	1.851750000 GHz	21.39	CISPR Averag	-32.61
2	1.851750000 GHz	34.11	Max Peak	
1	1.981500000 GHz	21.64	CISPR Averag	-32.36
2	1.981500000 GHz	34.11	Max Peak	
1	3.490250000 GHz	23.00	CISPR Averag	-31.00
2	3.490250000 GHz	35.24	Max Peak	
1	4.461000000 GHz	23.11	CISPR Averag	-30.89
2	4.461000000 GHz	36.09	Max Peak	
1	6.613750000 GHz	24.08	CISPR Averag	-29.92
2	6.613750000 GHz	36.45	Max Peak	
1	7.252750000 GHz	25.34	CISPR Averag	-28.66
2	7.252750000 GHz	38.36	Max Peak	
1	11.528750000 GHz	27.70	CISPR Averag	-26.30
2	11.528750000 GHz	40.81	Max Peak	

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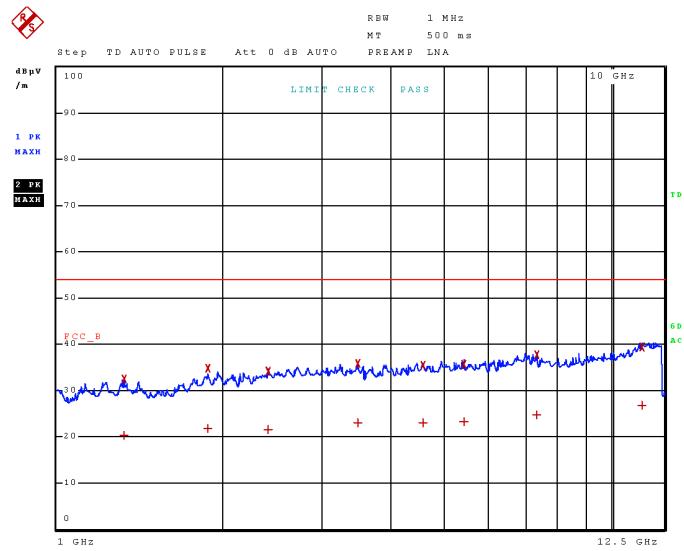
Vertical Polarity

29.Jul 20 10:41

Time Domain Scan (1 Range)

Scan Start: 1 GHz
Scan Stop: 12.5 GHz
Detector: Trace 1: MAX PEAK Trace 2: MAX PEAK
Transducer: TDS_05

Start Frequency	Stop Frequency	Step Size	Res BW	Meas Time	RF Atten	Preamp	Input
1.000000 GHz	12.500000 GHz	250.00 kHz	1.00 MHz	100 µs	Auto	35 dB	INPUT1



Page 1 of 2

29.Jul 20 10:41

Final Measurement

Meas Time: 500 ms
 Margin: 40 dB
 Subranges: 16

Trace	Frequency	Level (dB μ V/m)	Detector	Delta Limit/dB
1	1.322500000 GHz	20.26	CISPR Averag	-33.74
2	1.322500000 GHz	32.41	Max Peak	
1	1.874500000 GHz	21.66	CISPR Averag	-32.34
2	1.874500000 GHz	34.77	Max Peak	
1	2.407250000 GHz	21.60	CISPR Averag	-32.40
2	2.407250000 GHz	34.16	Max Peak	
1	3.490750000 GHz	23.02	CISPR Averag	-30.98
2	3.490750000 GHz	35.79	Max Peak	
1	4.571500000 GHz	23.05	CISPR Averag	-30.95
2	4.571500000 GHz	35.45	Max Peak	
1	5.437500000 GHz	23.17	CISPR Averag	-30.83
2	5.437500000 GHz	35.66	Max Peak	
1	7.369000000 GHz	24.73	CISPR Averag	-29.27
2	7.369000000 GHz	37.67	Max Peak	
1	11.402500000 GHz	26.87	CISPR Averag	-27.13
2	11.402500000 GHz	39.38	Max Peak	

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POWER LINE CONDUCTED EMISSIONS

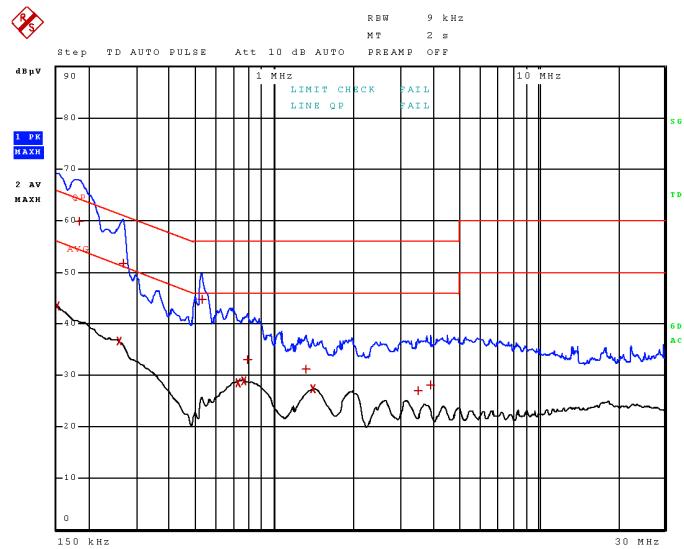
Line 1

27.Jul 20 20:24

Time Domain Scan (1 Range)

Scan Start: 150 kHz
 Scan Stop: 30 MHz
 Detector: Trace 1: MAX PEAK Trace 2: Average
 Transducer: tdf_20

Start Frequency	Stop Frequency	Step Size	Res BW	Meas Time	RF Atten	Preamp	Input
150.000000 kHz	30.000000 MHz	2.25 kHz	9.00 kHz	500 ms	Auto	0 dB	INPUT2



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27.Jul 20 20:24

Final Measurement

Meas Time: 2 s
 Margin: 20 dB
 Subranges: 12

Trace	Frequency	Level (dB μ V)	Detector	Delta Limit/dB
2	150.000000000 kHz	43.30	Average	-12.70
1	181.500000000 kHz	59.79	Quasi Peak	-4.62
2	255.750000000 kHz	36.61	Average	-14.96
1	264.750000000 kHz	51.81	Quasi Peak	-9.48
1	528.000000000 kHz	44.77	Quasi Peak	-11.23
2	728.250000000 kHz	28.54	Average	-17.46
2	766.500000000 kHz	28.89	Average	-17.11
1	789.000000000 kHz	32.98	Quasi Peak	-23.02
1	1.315500000 MHz	31.17	Quasi Peak	-24.83
2	1.392000000 MHz	27.29	Average	-18.71
1	3.500250000 MHz	26.85	Quasi Peak	-29.15
1	3.907500000 MHz	28.13	Quasi Peak	-27.87

Transducer Table

Name: tdf_20
 Interpolation: LIN
 Comment: ANS 25/2 Primary LISN IL Line 1 + Coax Cable IL

Frequency	Factor (dB)
150.00 kHz	0.19
170.00 kHz	0.17
200.00 kHz	0.16
250.00 kHz	0.13
300.00 kHz	0.12
350.00 kHz	0.12
400.00 kHz	0.11
500.00 kHz	0.12
600.00 kHz	0.12
700.00 kHz	0.11
800.00 kHz	0.13
900.00 kHz	0.12
1.00 MHz	0.21
1.20 MHz	0.22
1.50 MHz	0.28
2.00 MHz	0.37
2.50 MHz	0.41
3.00 MHz	0.59
4.00 MHz	0.40
5.00 MHz	0.47
7.00 MHz	0.63
10.00 MHz	0.88
15.00 MHz	1.08
20.00 MHz	1.01
30.00 MHz	1.80

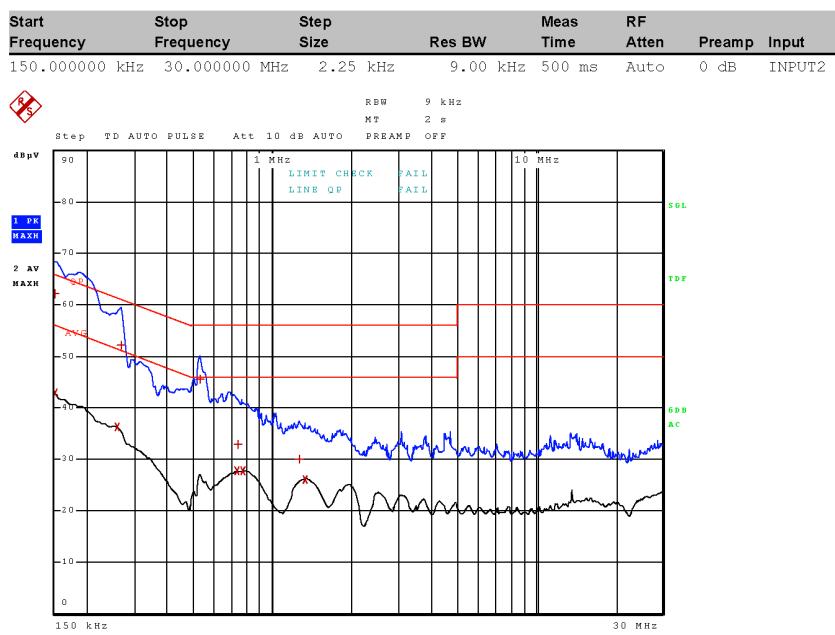
Page 2 of 2

Line 2

27.Jul 20 20:27

Time Domain Scan (1 Range)

Scan Start: 150 kHz
 Scan Stop: 30 MHz
 Detector: Trace 1: MAX PEAK Trace 2: Average
 Transducer: tdf_20



Page 1 of 2

27.Jul 20 20:27

Final Measurement

Meas Time: 2 s
 Margin: 20 dB
 Subranges: 10

Trace	Frequency	Level (dB μ V)	Detector	Delta Limit/dB
1	150.000000000 kHz	62.08	Quasi Peak	-3.92
2	150.000000000 kHz	42.78	Average	-13.22
2	255.750000000 kHz	36.27	Average	-15.30
1	264.750000000 kHz	52.10	Quasi Peak	-9.18
1	530.250000000 kHz	45.50	Quasi Peak	-10.50
2	732.750000000 kHz	27.70	Average	-18.30
1	737.250000000 kHz	32.84	Quasi Peak	-23.16
2	771.000000000 kHz	27.72	Average	-18.28
1	1.266000000 MHz	30.02	Quasi Peak	-25.98
2	1.324500000 MHz	25.97	Average	-20.03

Transducer Table

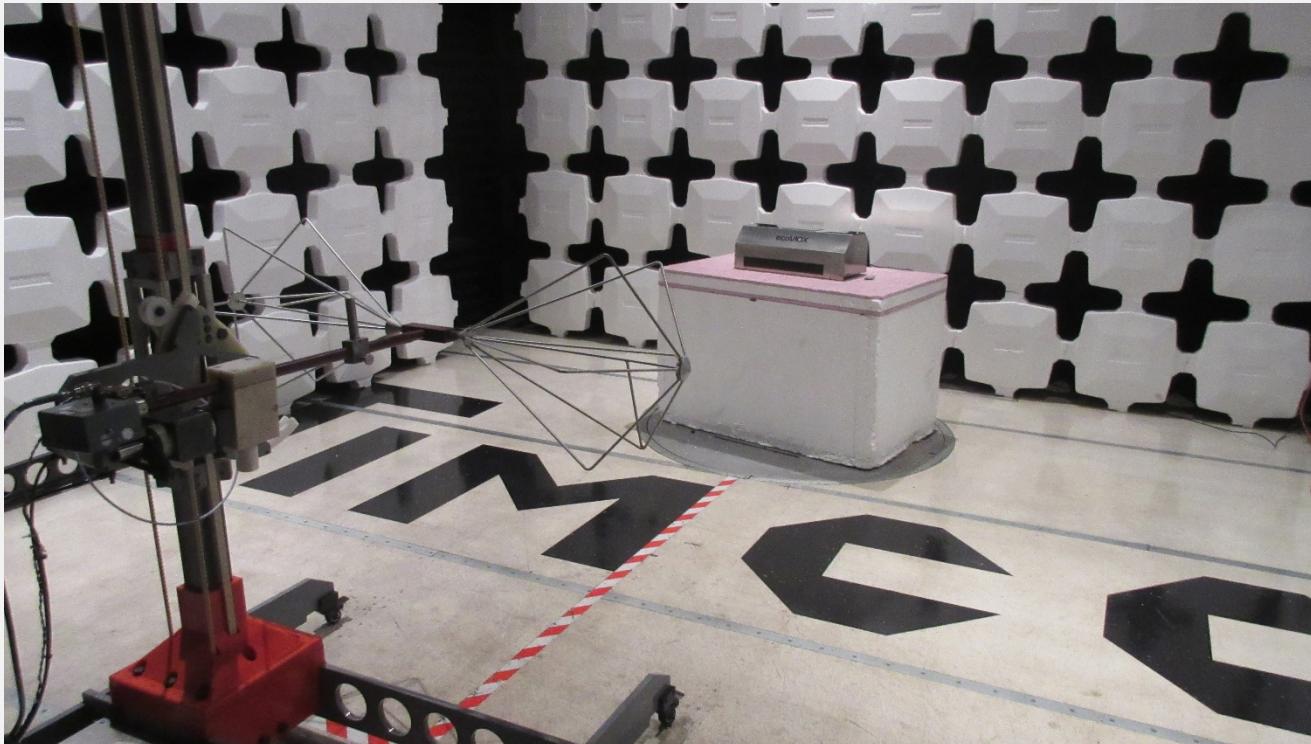
Name: tdf_20
 Interpolation: LIN
 Comment: ANS 25/2 Primary LISN IL Line 1 + Coax Cable IL

Frequency	Factor (dB)
150.00 kHz	0.19
170.00 kHz	0.17
200.00 kHz	0.16
250.00 kHz	0.13
300.00 kHz	0.12
350.00 kHz	0.12
400.00 kHz	0.11
500.00 kHz	0.12
600.00 kHz	0.12
700.00 kHz	0.11
800.00 kHz	0.13
900.00 kHz	0.12
1.00 MHz	0.21
1.20 MHz	0.22
1.50 MHz	0.28
2.00 MHz	0.37
2.50 MHz	0.41
3.00 MHz	0.59
4.00 MHz	0.40
5.00 MHz	0.47
7.00 MHz	0.63
10.00 MHz	0.88
15.00 MHz	1.08
20.00 MHz	1.01
30.00 MHz	1.80

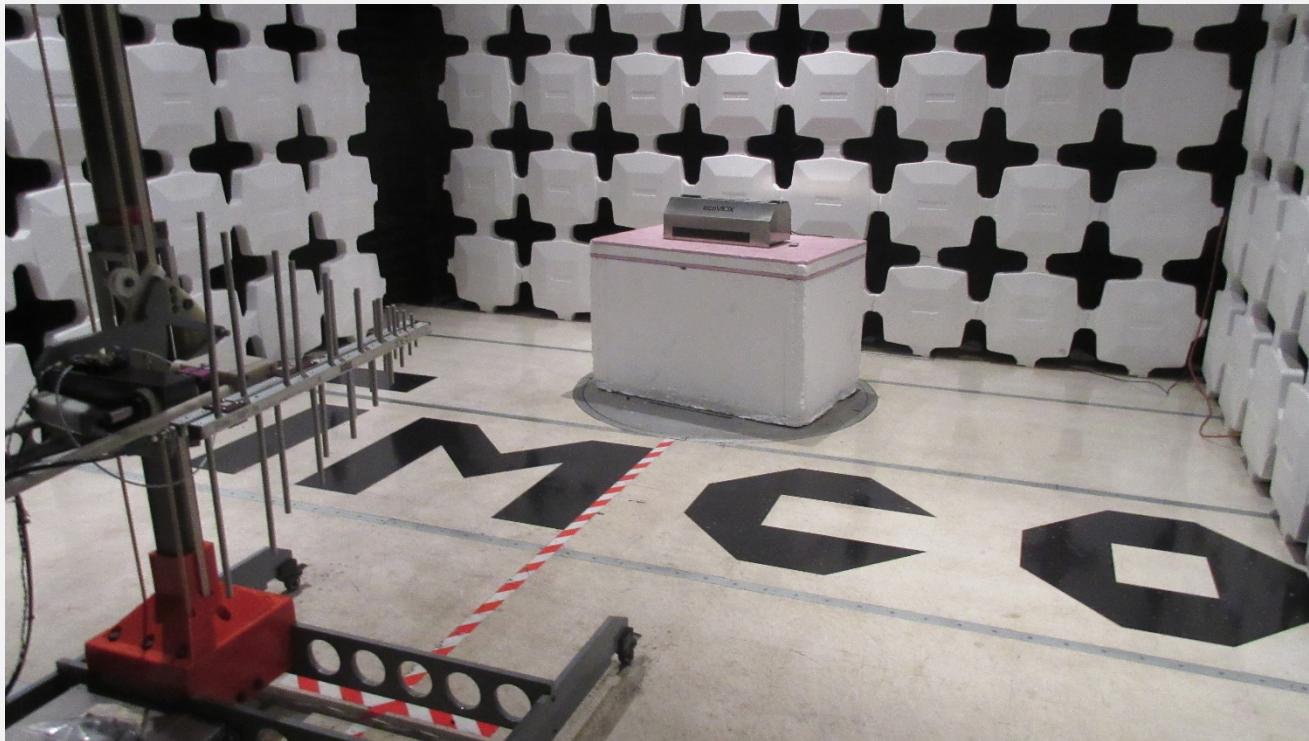
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ANNEX III TEST SETUP PHOTOGRAPHS

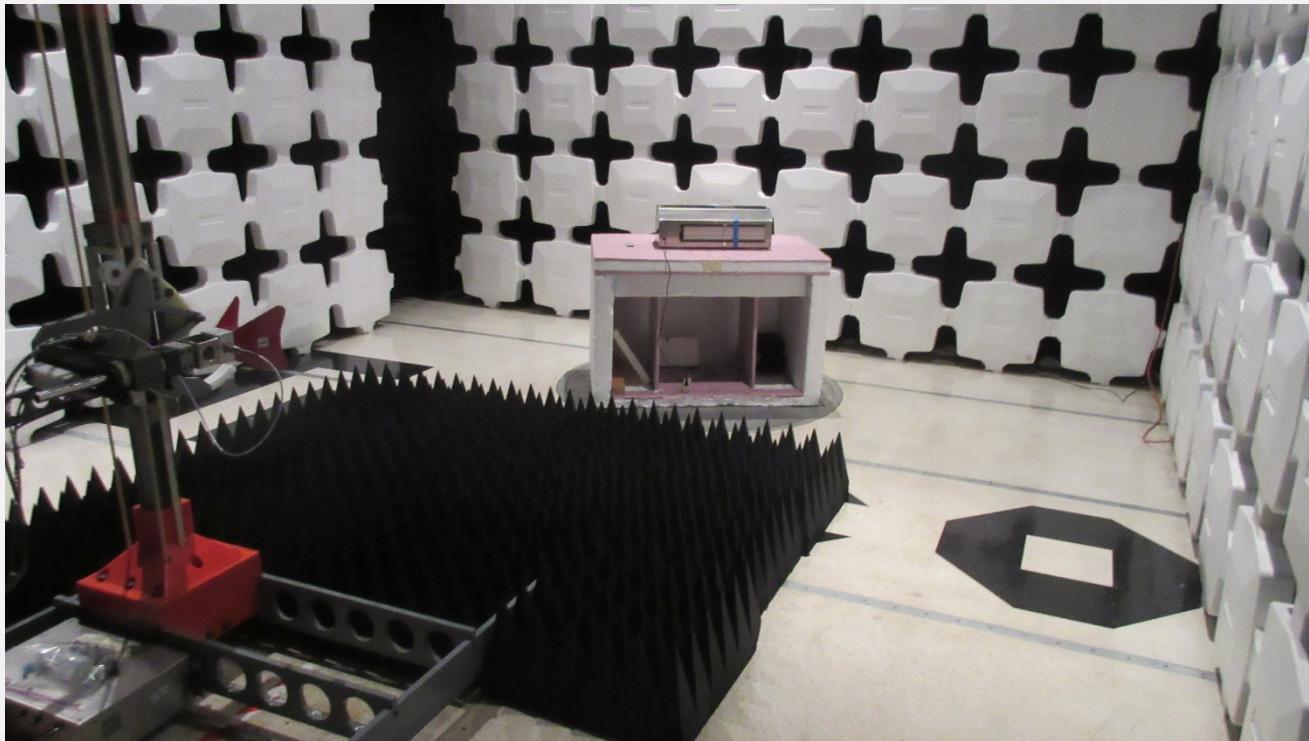
Radiated Emissions Scan Below 1 GHz



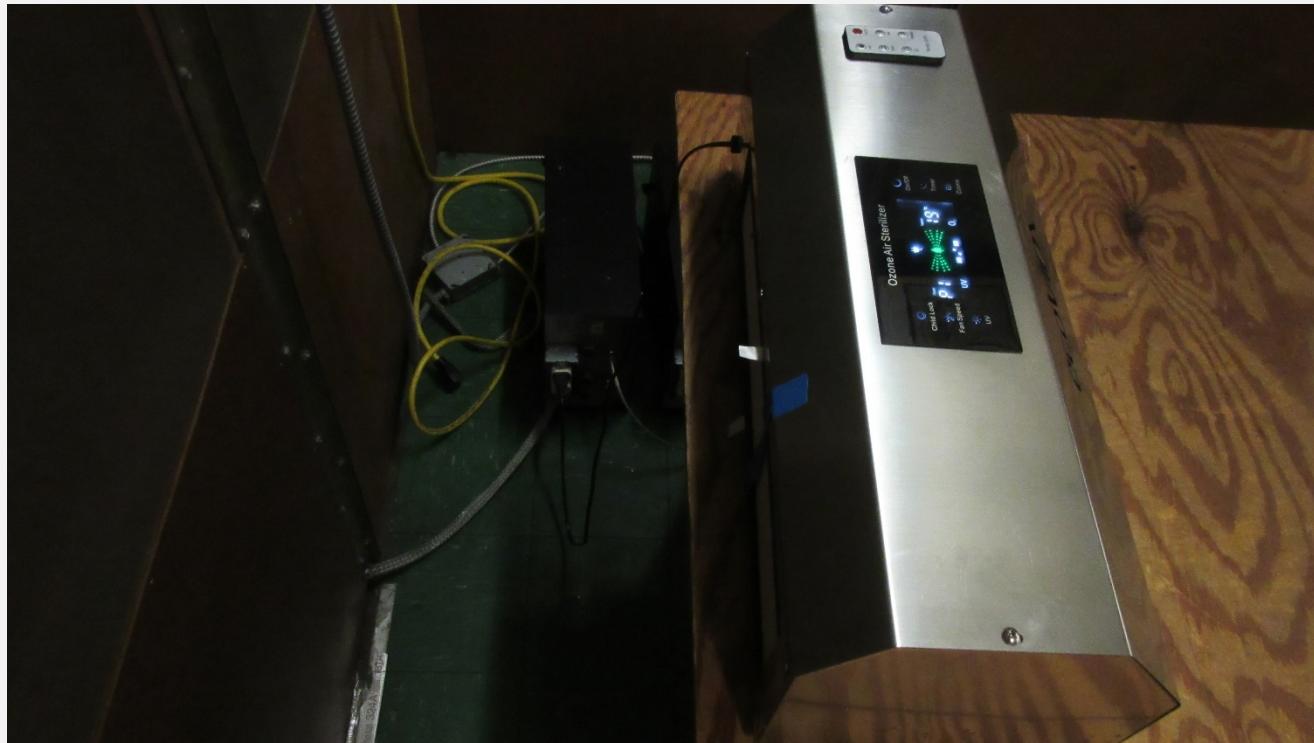
Radiated Emissions Scan Below 1 GHz, 2



Radiated Emissions Scan Above 1 GHz



Conducted Emissions Table Setup



END OF TEST REPORT