



An IIA Company

EMC -TEST REPORT

[X] EMISSIONS
[X] IMMUNITY

APPLICANT	Ecoviox LLC
ADDRESS	1944 NE 147th Terrace North Miami, FL, 33181, US
MODEL NUMBER	Ev-o
PRODUCT DESCRIPTION	Air Purifier with Infrared Remote
DATE SAMPLE RECEIVED	7/27/2020
FINAL TEST DATE	7/29/2020
TESTED BY	Tim Royer
TEST RESULTS	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL
GENERIC STANDARDS	ETSI EN 301 489-1 V2.2.3 EN 55024 EN55032

Report Number	Report Version	Description	Issue Date
2633-20_EN 301 489 1 TestReport	---	Initial Issue	7/29/2020

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.

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

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GENERAL REMARKS

Summary

The device under test does:

- ☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.
- ☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, 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 the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Designation #: US1070

Tested by:



Name and Title	Tim Royer, Project Manager / EMC Testing Engineer
Date	7/29/2020

Description of Test Article

Regulatory Standards	ETSI EN 301-489-1 v2.2.3 (2019-11)
Deviation from Standard	NONE
EUT Description	Air Purifier with Infrared Remote
Model	Ev-o
EUT Power Source	<input checked="" type="checkbox"/> 120 Vac/ 60 Hz
	<input type="checkbox"/> 230 Vac/ 50 Hz
	<input type="checkbox"/> DC Power
	<input type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input type="checkbox"/> Pre-Production
	<input checked="" type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed
	<input checked="" type="checkbox"/> Mobile
	<input type="checkbox"/> Portable
Operating Frequencies	N/A
Software/Firmware Version	None
Ancillary Equipment Used during Testing	N/A

Conditions: Temperature: 26°C
 Relative Humidity Before Test: 21%
 Atmospheric Pressure: 1020 mb

Summary of Test Results

The following table is a breakdown of the tested items of the essential requirements of ETSI EN 301-489-1 v2.2.3

EMC Emissions				
Phenomenon	Application	Measurement Standard	Limits	Results
Radiated Emission	Enclosure of Ancillary Equipment	EN 61000-6-3	Class A	Pass
Conducted Emission	AC mains input/output port	EN 61000-6-3	Class A	Pass
Immunity				
Phenomenon	Application	Measurement Standard	Criteria	Results
RF electromagnetic field (80 – 1000 MHz & 1400 – 2700 MHz)	Enclosure	EN 61000-4-3 Test Level 3 V/m 80 -1000 MHz 3 V/m 1400 – 2700 MHz	A	Pass
Electrostatic discharge	Enclosure	EN 61000-4-2 Test Level ± 6 kV Contact ± 8 kV Air	B	Pass
Fast transients common mode	Signal, Telecommunication and control ports, DC and AC power ports	EN 61000-4-4	B	Pass
RF common mode .15 – 80 MHz	Signal, Telecommunication and control ports, DC and AC power ports	EN 61000-4-6	A	Pass
Voltage dips and interruptions	AC mains power input ports	EN 61000-4-29	C	Pass
Surges, line to line and line to ground	AC mains power input ports, telecommunication ports	EN 61000-4-5	B	Pass

Notes:

Performance Assessment

General Performance Criteria- EN 301-489-3 clause 6.2

The performance criteria for SRD equipment with different device types (see table 3) in combination with the different primary function types (see table 1) during and after immunity test are specified in this clause:

Performance criteria A for immunity tests with phenomena of a continuous nature;

Performance criteria B for immunity tests with phenomena of a transient nature;

Performance criteria for immunity tests with power interruptions exceeding a certain time are specified in clause 7.2.2, table 6.

The equipment shall meet the performance criteria as specified in the following clauses, for the appropriate device type.

Performance Criteria for this Device:

Device Type 3		
Criteria	During test	After test
A and B	May be loss of function (one or more) No unintentional responses	Operate as intended, for equipment with primary function type II the communication link may be lost, but shall be recoverable by user No degradation of performance Lost functions shall be self-recoverable

The Primary functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

Essential operational modes and states;

Tests of all Remote Functions – After each test sequence the control buttons are exercised to determine the proper operation.

Communication Link Status- During and after the test the error/status LEDs are monitored for the status of the system and the communication link.

Radiated Emissions

Requirement: EN 61000-6-4

7 Emission requirements

The emission requirements for apparatus covered by this standard are given on a port by port basis.

Measurements shall be conducted in a well-defined and reproducible manner.

The measurements may be performed in any order.

The description of the measurement, the measurement instrumentation, the measurement methods and the measurement set-up to be used are given in the standards, which are referred to in the Table 1.

The contents of the standards referenced in the tables are not repeated here, however modifications or additional information needed for the practical application of the measurements are given in this standard.

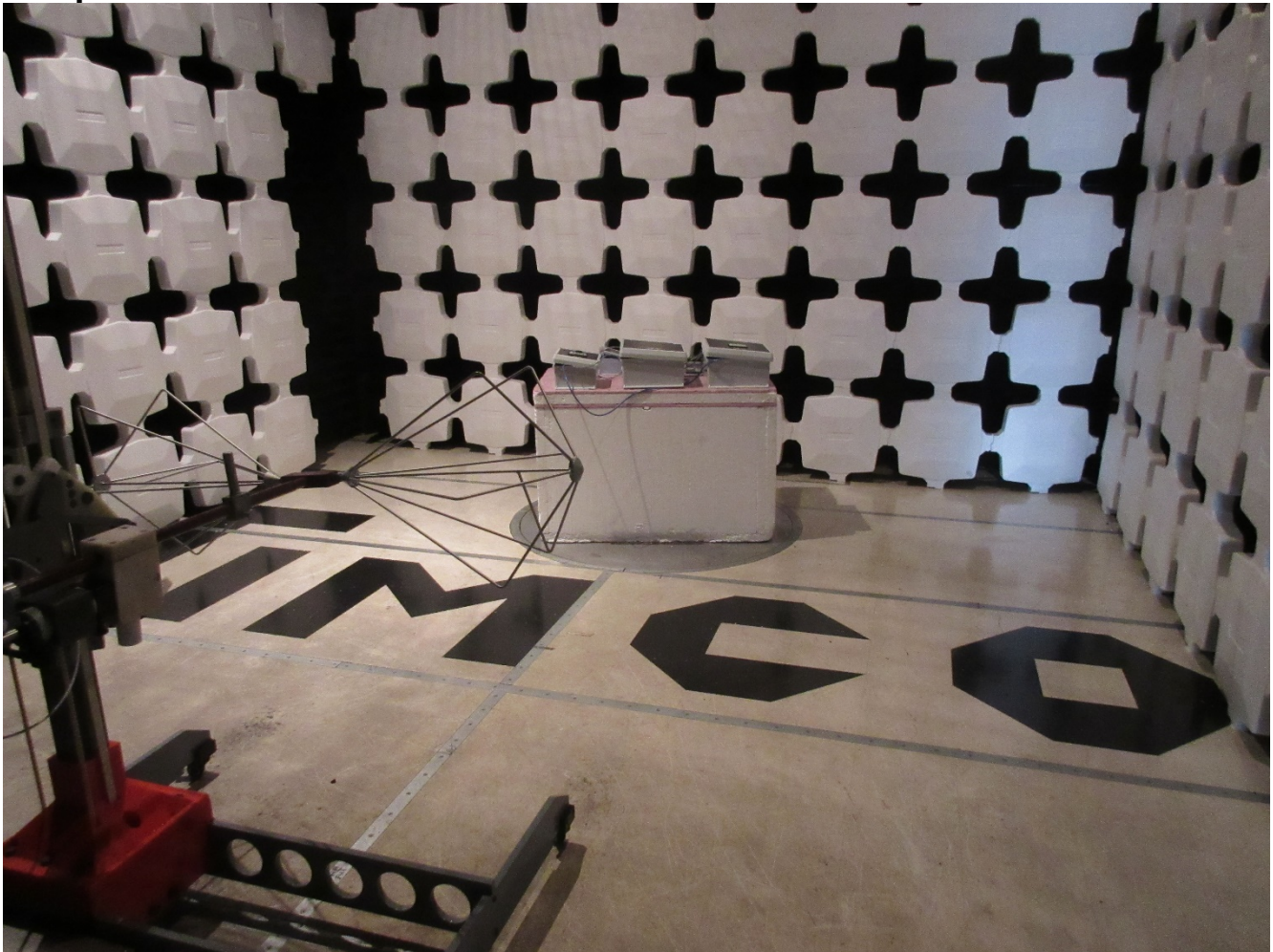
Class B Field Strength Limits			
Frequency Range (MHz)	Quasi-Peak limits (dB μ V/m)	Average limits (dB μ V/m)	Peak limits (dB μ V/m)
30 to 230	50 @ 3M	-	-
230 to 1000	57 @ 3M	-	-

Configuration:

Conditions: Temperature: 26°C
 Relative Humidity Before Test: 21%
 Atmospheric Pressure: 1020 mb

Radiated Emissions

Setup Photo:



Radiated Emissions

Test Data: 30 MHz – 200 MHz Peak Vertical Table

29 Jul 20 08:44

Test Spec CISPR 22 Radiated Disturbances

Polarity

Vertical

Final Measurement

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

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	40.560000000 MHz	25.76	Quasi Peak	-14.24
1	45.040000000 MHz	22.74	Quasi Peak	-17.26
1	63.120000000 MHz	26.64	Quasi Peak	-13.36
1	100.600000000 MHz	24.62	Quasi Peak	-15.38
1	134.400000000 MHz	21.63	Quasi Peak	-18.37
1	147.280000000 MHz	23.89	Quasi Peak	-16.11

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Radiated Emissions

Test Data: 30 MHz – 200 MHz Peak Horizontal Plot



29.Jul 20 08:49

Test Spec: CISPR 22 Radiated Disturbances

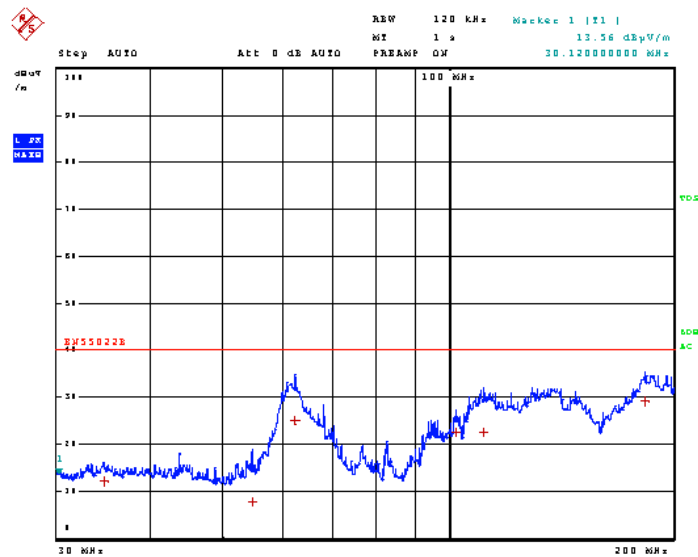
Polarity:

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



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Radiated Emissions

Test Data: 30 MHz – 200 MHz Peak Horizontal Table

29 Jul 20 08:49

Test Spec CISPR 22 Radiated Disturbances

Polarity

Vertical

Final Measurement

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

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	34.720000000 MHz	12.12	Quasi Peak	-27.88
1	54.800000000 MHz	7.58	Quasi Peak	-32.42
1	62.320000000 MHz	25.10	Quasi Peak	-14.90
1	102.400000000 MHz	22.67	Quasi Peak	-17.33
1	111.400000000 MHz	22.68	Quasi Peak	-17.32
1	183.040000000 MHz	29.17	Quasi Peak	-10.83

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Radiated Emissions

Test Data: 200 MHz – 1000 MHz Peak Vertical Plot



29.Jul 20 08:56

Test Spec: CISPR 22 Radiated Disturbances

Polarity

Horizontal

Time Domain Scan (1 Range)

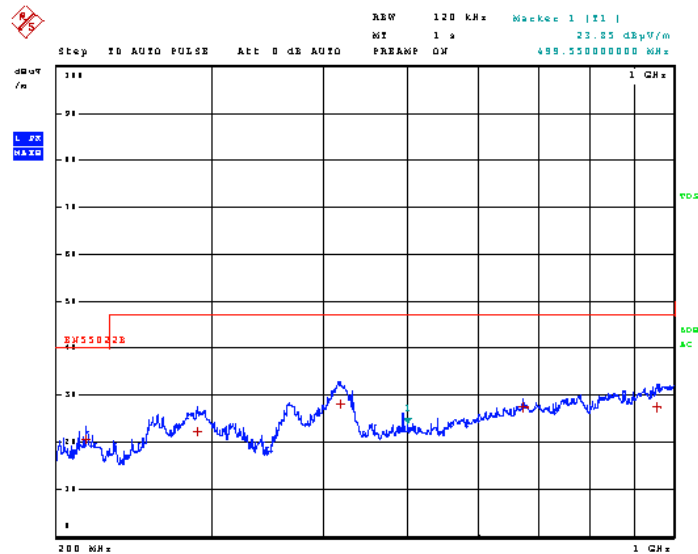
Scan Start: 200 MHz

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 μ s	Auto	20 dB	INPUT1



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APPLICANT: ECOVIOX LLC.

MODEL: Ev-o

REPORT: 2633-20_EN 301 489 1 TestReport_

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Radiated Emissions

Test Data: 200 MHz – 1000 MHz Peak Vertical Table

29 Jul 20 08:56

Test Spec CISPR 22 Radiated Disturbances

Polarity
Horizontal

Final Measurement

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

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	215.330000000 MHz	20.42	Quasi Peak	-19.58
1	288.350000000 MHz	22.24	Quasi Peak	-24.76
1	418.880000000 MHz	28.11	Quasi Peak	-18.89
1	675.020000000 MHz	27.36	Quasi Peak	-19.64
1	958.220000000 MHz	27.42	Quasi Peak	-19.58

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Radiated Emissions

Test Data: 200 MHz – 1000 MHz Peak Horizontal Plot



29.Jul 20 09:00

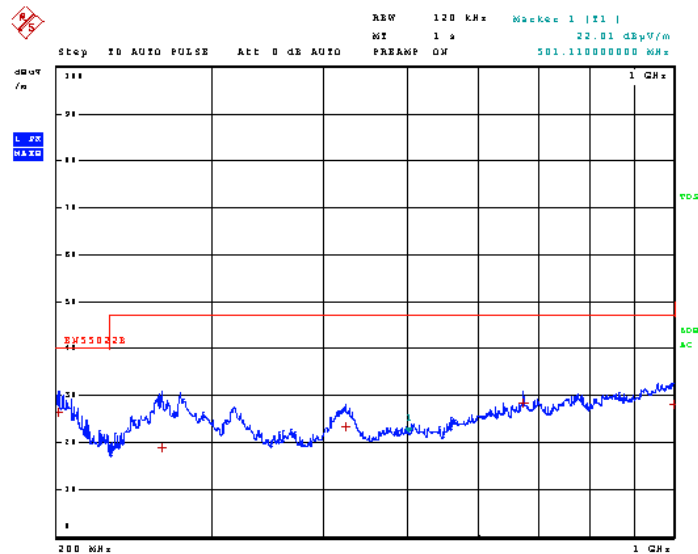
Test Spec CISPR 22 Radiated Disturbances

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 μ s	Auto	20 dB	INPUT1



Radiated Emissions

Test Data: 200 MHz – 1000 MHz Peak Horizontal Table

29 Jul 20 09:00

Test Spec CISPR 22 Radiated Disturbances
Polarity
Horizontal

Final Measurement

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

Trace	Frequency	Level (dBμV/m)	Detector	Delta Limit/dB
1	200.450000000 MHz	26.44	Quasi Peak	-13.56
1	263.150000000 MHz	19.01	Quasi Peak	-27.99
1	425.030000000 MHz	23.50	Quasi Peak	-23.50
1	675.020000000 MHz	28.52	Quasi Peak	-18.48
1	999.650000000 MHz	28.10	Quasi Peak	-18.90

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Radiated Emissions

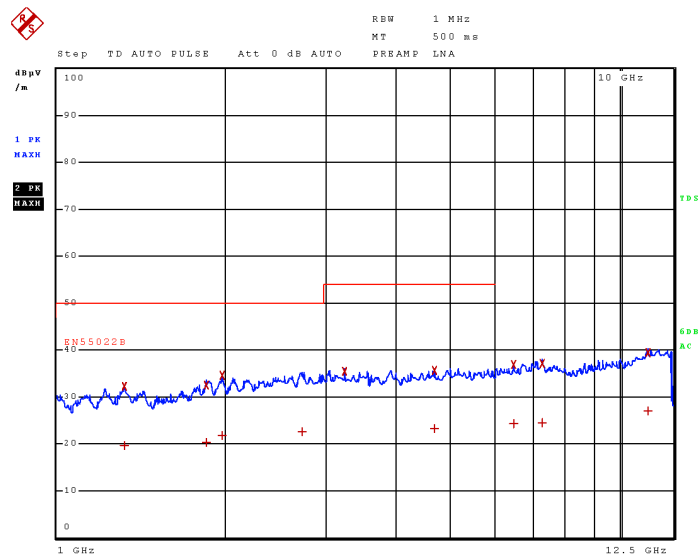
Test Data: 1GHz – 6 GHz Peak Vertical Plot

29 Jul 20 10:39

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 μ s	Auto	35 dB	INPUT1



Radiated Emissions

Test Data: 1GHz – 6 GHz Peak Vertical Table

29 Jul 20 10:39

Final Measurement

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

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	1.318250000 GHz	19.70	CISPR Averag	-30.30
2	1.318250000 GHz	32.28	Max Peak	
1	1.839250000 GHz	20.19	CISPR Averag	-29.81
2	1.839250000 GHz	32.55	Max Peak	
1	1.967250000 GHz	21.83	CISPR Averag	-28.17
2	1.967250000 GHz	34.47	Max Peak	
1	2.726000000 GHz	22.65	CISPR Averag	-27.35
2	3.249250000 GHz	35.37	Max Peak	
1	4.693750000 GHz	23.16	CISPR Averag	-30.84
2	4.693750000 GHz	35.63	Max Peak	
1	6.477500000 GHz	24.28	CISPR Averag	
2	6.477500000 GHz	36.83	Max Peak	
1	7.283750000 GHz	24.51	CISPR Averag	
2	7.283750000 GHz	37.00	Max Peak	
1	11.248500000 GHz	26.89	CISPR Averag	
2	11.248500000 GHz	39.40	Max Peak	

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Radiated Emissions

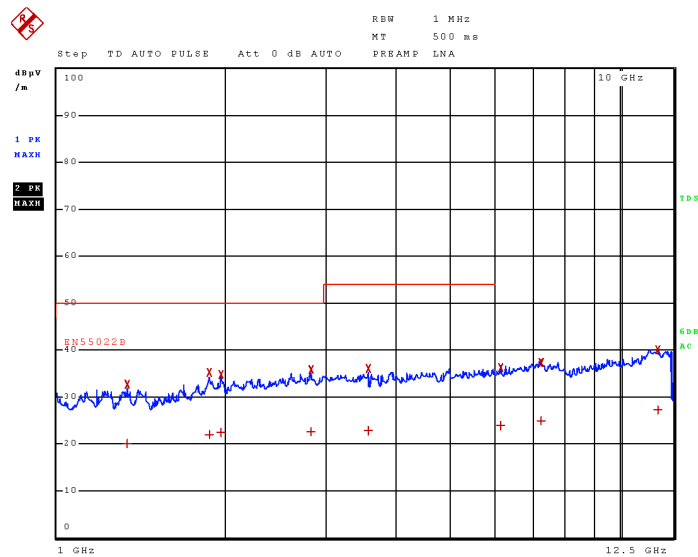
Test Data: 1GHz – 6 GHz Peak Horizontal Plot

29 Jul 20 10:37

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 μ s	Auto	35 dB	INPUT1



Page 1 of 2

Radiated Emissions

Test Data: 1GHz – 6 GHz Peak Horizontal Table

29 Jul 20 10:37

Final Measurement

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

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	1.333750000 GHz	20.10	CISPR Averag	-29.90
2	1.333750000 GHz	32.61	Max Peak	
1	1.864250000 GHz	22.05	CISPR Averag	-27.95
2	1.864250000 GHz	35.13	Max Peak	
1	1.959750000 GHz	22.44	CISPR Averag	-27.56
2	1.959750000 GHz	34.69	Max Peak	
1	2.834750000 GHz	22.53	CISPR Averag	-27.47
2	2.834750000 GHz	35.83	Max Peak	
1	3.592750000 GHz	22.87	CISPR Averag	-31.13
2	3.592750000 GHz	35.96	Max Peak	
1	6.148000000 GHz	23.85	CISPR Averag	
2	6.148000000 GHz	36.23	Max Peak	
1	7.272750000 GHz	24.99	CISPR Averag	
2	7.272750000 GHz	37.36	Max Peak	
1	11.731000000 GHz	27.22	CISPR Averag	
2	11.731000000 GHz	40.00	Max Peak	

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Conducted Emissions

Requirement: EN 61000-6-4

7 Emission requirements

The emission requirements for apparatus covered by this standard are given on a port by port basis.

Measurements shall be conducted in a well-defined and reproducible manner.

The measurements may be performed in any order.

The description of the measurement, the measurement instrumentation, the measurement methods and the measurement set-up to be used are given in the standards, which are referred to in the Table 1.

The contents of the standards referenced in the tables are not repeated here, however modifications or additional information needed for the practical application of the measurements are given in this standard.

Class B Field Strength Limits			
Frequency Range (MHz)	Quasi-Peak limits (dB μ V/m)	Average limits (dB μ V/m)	Peak limits (dB μ V/m)
0.15 to 0.5	79	66	-
0.5 to 30	73	60	-

Configuration:

Conditions: Temperature: 26°C
 Relative Humidity Before Test: 21%
 Atmospheric Pressure: 1020 mb

Radiated Emissions

Setup Photo:



Radiated Emissions

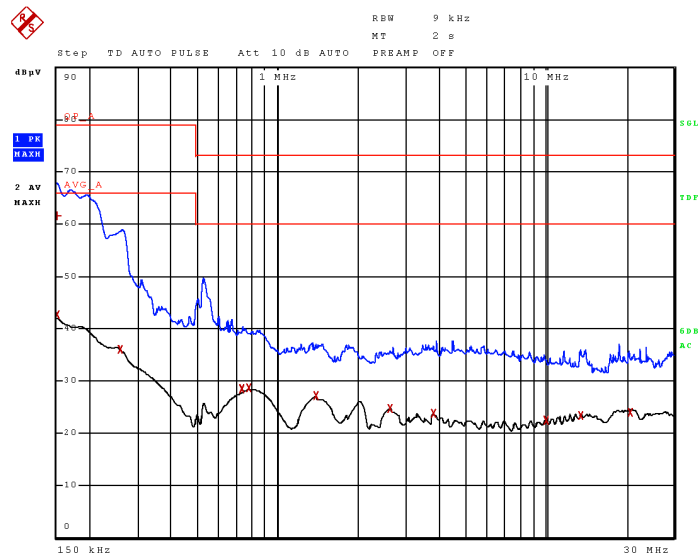
Test Data: Line 1 Plot

28.Jul.20 15:22

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



Radiated Emissions

Test Data: Line 1 Table

28 Jul 20 15:22

Final Measurement

Meas Time: 2 s
Margin: 20 dB
Subranges: 11

Trace	Frequency	Level (dBμV)	Detector	Delta Limit/dB
1	150.000000000 kHz	61.54	Quasi Peak	-17.46
2	150.000000000 kHz	42.56	Average	
2	255.750000000 kHz	35.97	Average	
2	732.750000000 kHz	28.51	Average	
2	777.750000000 kHz	28.67	Average	
2	1.389750000 MHz	27.18	Average	
2	2.625000000 MHz	24.66	Average	
2	3.792750000 MHz	23.64	Average	
2	10.005000000 MHz	22.43	Average	
2	13.512750000 MHz	23.40	Average	
2	20.616000000 MHz	23.98	Average	

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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Radiated Emissions

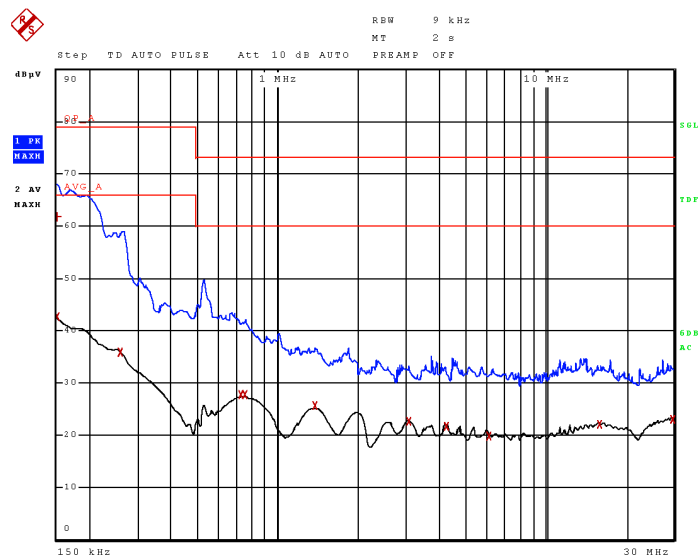
Test Data: Line 2 Plot

28.Jul 20 15:34

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



Radiated Emissions

Test Data: Line 2 Table

28.Jul 20 15:34

Final Measurement

Meas Time: 2 s
Margin: 20 dB
Subranges: 11

Trace	Frequency	Level (dBμV)	Detector	Delta Limit/dB
1	150.000000000 kHz	61.72	Quasi Peak	-17.28
2	150.000000000 kHz	42.61	Average	
2	255.750000000 kHz	35.90	Average	
2	728.250000000 kHz	27.65	Average	
2	750.750000000 kHz	27.67	Average	
2	1.374000000 MHz	25.66	Average	
2	3.079500000 MHz	22.67	Average	
2	4.249500000 MHz	21.56	Average	
2	6.121500000 MHz	19.82	Average	
2	15.832500000 MHz	21.99	Average	
2	29.681250000 MHz	22.98	Average	

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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RF Radiated Immunity

Requirement: EN 61000-6-2

8 Immunity test requirements

The immunity test requirements for apparatus covered by this standard are given on a port by port basis.

Tests shall be conducted in a well-defined and reproducible manner.

The tests shall be carried out individually as single tests in sequence. The tests may be performed in any order.

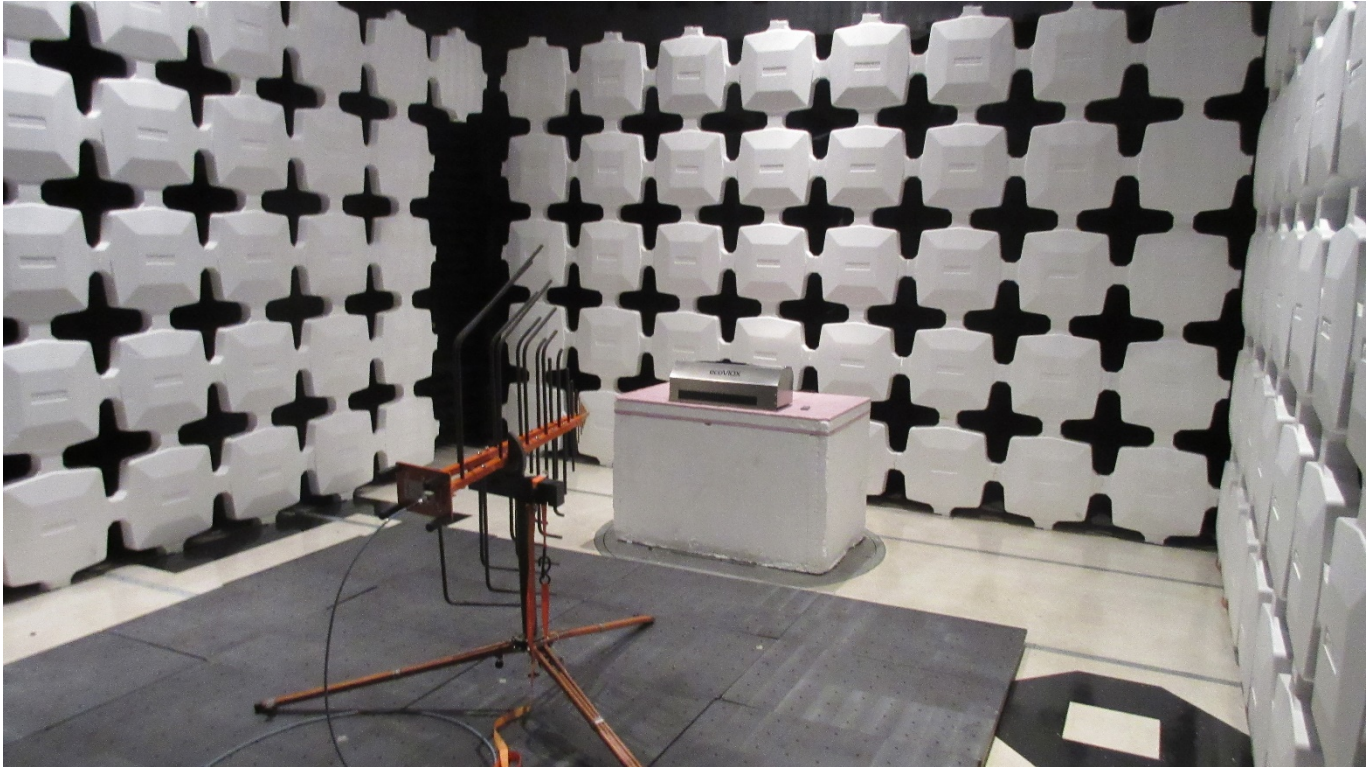
The description of the test, relevant generator, appropriate methods, and the set-up to be used are given in basic standards, which are referred to in the following tables.

The contents of these basic standards are not repeated here, however modifications or additional information needed for the practical application of the tests are given in this standard.

Conditions:	Temperature:	<u>25°C</u>
	Relative Humidity Before Test:	<u>33%</u>
	Atmospheric Pressure:	<u>1020 mb</u>

RF Radiated Immunity

Setup Photo: 80 – 2700 MHz



RF Radiated Immunity

Test Instruments:

- ☒ Field Strength Monitoring System
- ☒ Isotropic Field Probe
- ☒ Power Amplifier (80 MHz – 1000 MHz)
- ☒ Power Amplifier (1000 MHz – 3000 MHz)
- ☒ Signal Generator
- ☒ RF Immunity Test Software
- ☐ Not applicable

Test Verification Equipment:

- ☐ Not applicable
- ☒ Field calibrated using EN 61000-4-3 procedure

Test Specification:

Radiated EM Fields

- | | |
|------------------|---|
| Frequency range: | <input checked="" type="checkbox"/> 80 MHz - 1000 MHz |
| Field strength: | <input checked="" type="checkbox"/> 3 V/m |
| | <input checked="" type="checkbox"/> 1400 MHz - 2000 MHz |
| | <input checked="" type="checkbox"/> 3 V/m |
| | <input checked="" type="checkbox"/> 2000 MHz - 2700 MHz |
| | <input checked="" type="checkbox"/> 1 V/m |

- | | |
|-----------------------|---|
| Distance antenna/EUT: | <input checked="" type="checkbox"/> 2 m < 1GHz |
| | <input checked="" type="checkbox"/> 2 m > 1 GHz |

- | | |
|-------------|---|
| Modulation: | <input checked="" type="checkbox"/> AM: 80 %, 1 kHz |
| | <input checked="" type="checkbox"/> sine wave |

- | | |
|-------|--|
| Step: | <input checked="" type="checkbox"/> 1 % step |
|-------|--|

- | | |
|--------|--|
| Dwell: | <input checked="" type="checkbox"/> <u>1.5</u> s |
|--------|--|

- | | | |
|-----------------------|--|--|
| Polarization of ant.: | <input checked="" type="checkbox"/> Horizontal | <input checked="" type="checkbox"/> Vertical |
|-----------------------|--|--|

- | | |
|------------------|--|
| EUT Positioning: | <input checked="" type="checkbox"/> Front |
| | <input checked="" type="checkbox"/> Left Side |
| | <input checked="" type="checkbox"/> Right Side |
| | <input checked="" type="checkbox"/> Back |

RF Radiated Immunity

Test Data: Radiated Immunity Results

Freq Range 1% Step Size (MHz)	Voltage (V/m)	Dwell Times (ms)	Modulation Freq. & %	Ant Polarity	EUT Face	Result	Performance Criteria
80 - 1000	3	1500	1 kHz 80	H	Front Side	Pass	A
80 - 1000	3	1500	1 kHz 80	V	Front Side	Pass	A
80 - 1000	3	1500	1 kHz 80	H	Right Side	Pass	A
80 - 1000	3	1500	1 kHz 80	V	Right Side	Pass	A
80 - 1000	3	1500	1 kHz 80	H	Left Side	Pass	A
80 - 1000	3	1500	1 kHz 80	V	Left Side	Pass	A
80 - 1000	3	1500	1 kHz 80	H	Back Side	Pass	A
80 - 1000	3	1500	1 kHz 80	V	Back Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	H	Front Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	V	Front Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	H	Right Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	V	Right Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	H	Left Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	V	Left Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	H	Back Side	Pass	A
1400 - 2000	3	1500	1 kHz 80	V	Back Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	H	Front Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	V	Front Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	H	Right Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	V	Right Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	H	Left Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	V	Left Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	H	Back Side	Pass	A
2000 - 2700	1	1500	1 kHz 80	V	Back Side	Pass	A

Notes:

Result: Meets Requirements

ESD Immunity

Requirement: EN 61000-4-2

8 Immunity test requirements

The immunity test requirements for apparatus covered by this standard are given on a port by port basis.

Tests shall be conducted in a well-defined and reproducible manner.

The tests shall be carried out individually as single tests in sequence. The tests may be performed in any order.

The description of the test, relevant generator, appropriate methods, and the set-up to be used are given in basic standards, which are referred to in the following tables.

The contents of these basic standards are not repeated here, however modifications or additional information needed for the practical application of the tests are given in this standard.

Conditions:	Temperature:	24°C
	Relative Humidity Before Test:	<u>33%</u>
	Atmospheric Pressure:	<u>1020</u> mb

ESD Immunity

Test Data: Indirect Discharge into Coupling Planes

Test Point		Discharge Attempt														
VCP		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Left Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Right Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Front Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Back Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Left Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
Right Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
Front Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
Back Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
HCP		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Left Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Right Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Front Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Bottom Side	+4 kV	2	2	2	2	2	2	2	2	2	2					
Left Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
Right Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
Front Side	-4 kV	2	2	2	2	2	2	2	2	2	2					
Bottom Side	-4 kV	2	2	2	2	2	2	2	2	2	2					

Observations

1. No perceived discharge, no observed response.
2. Discharge observed, but no observed response.

Results meets requirements of performance Criterion A

ESD Immunity

Test Data: Direct Discharge to EUT through Contact

Test Point	Discharge Attempt														
Left Side	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4kV	2	2	2	2	2	2	2	2	2	2					
-4kV	2	2	2	2	2	2	2	2	2	2					
Right Side	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4kV	2	2	2	2	2	2	2	2	2	2					
-4kV	2	2	2	2	2	2	2	2	2	2					
Top	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4kV	2	2	2	2	2	2	2	2	2	2					
-4kV	2	2	2	2	2	2	2	2	2	2					
Bottom	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4kV	2	2	2	2	2	2	2	2	2	2					
-4kV	2	2	2	2	2	2	2	2	2	2					
Display	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
4kV	2	2	2	2	2	2	2	2	2	2					
-4kV	2	2	2	2	2	2	2	2	2	2					

Observations

1. No perceived discharge, no observed response.

Results meets requirements of performance Criterion A

ESD Immunity

Test Data: Direct Discharge to EUT through Air

Test Point	Discharge Attempt														
Left Side	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8kV	2	2	2	2	2	2	2	2	2	2					
-8kV	2	2	2	2	2	2	2	2	2	2					
Right Side	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8kV	2	2	2	2	2	2	2	2	2	2					
-8kV	2	2	2	2	2	2	2	2	2	2					
Top	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8kV	2	2	2	2	2	2	2	2	2	2					
-8kV	2	2	2	2	2	2	2	2	2	2					
Bottom	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8kV	2	2	2	2	2	2	2	2	2	2					
-8kV	2	2	2	2	2	2	2	2	2	2					
Display	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8kV	2	2	2	2	2	2	2	2	2	2					
-8kV	2	2	2	2	2	2	2	2	2	2					

Observations

1. No perceived discharge, no observed response.

Results meets requirements of performance Criterion B

Fast transients common mode

Requirement: EN 61000-4-4

4 General

The repetitive fast transient test is a test with bursts consisting of a number of fast transients, coupled into power, control, signal and earth ports of electrical and electronic equipment. Significant for the test are the high amplitude, the short rise time, the high repetition frequency, and the low energy of the transients.

The test is intended to demonstrate the immunity of electrical and electronic equipment when subjected to types of transient disturbances such as those originating from switching transients (interruption of inductive loads, relay contact bounce, etc.).

5 Test levels

The preferred test levels for the electrical fast transient test, applicable to power, control, signal and earth ports of the equipment are given in Table 1.

Table 1 – Test levels

Open circuit output test voltage and repetition frequency of the impulses				
Level	Power ports, earth port (PE)		Signal and control ports	
	Voltage peak kV	Repetition frequency kHz	Voltage peak kV	Repetition frequency kHz
1	0,5	5 or 100	0,25	5 or 100
2	1	5 or 100	0,5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X ^a	Special	Special	Special	Special
<p>The use of 5 kHz repetition frequency is traditional, however, 100 kHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.</p> <p>With some products, there may be no clear distinction between power ports and signal ports, in which case it is up to product committees to make this determination for test purposes.</p>				
<p>^a "X" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification.</p>				

Conditions: Temperature: 24°C
Relative Humidity Before Test: 33%
Atmospheric Pressure: 1020 mb

APPLICANT: ECOVIOX LLC.
MODEL: Ev-o
REPORT: 2633-20_EN 301 489 1 TestReport_

Immunity to Electrical Fast Transients (EFT/Burst)

Test Instruments:

- ☒ EFT Generator
☒ Thermometer/Humidity Monitor
☒ Capacitor Clamp
☐ Not applicable

Test Verification Equipment:

- ☒ EFT Attenuator
☒ Oscilloscope
☒ Characterize EFT target & save.
☐ Not applicable

Test Specification

Pulse amplitude:

Port	AC	DC	I/O, Signal, Data & Control Ports
Level 1	<input type="checkbox"/> 0.5 kV	<input type="checkbox"/> 0.5 kV	<input type="checkbox"/> 0.25 kV
Level 2	<input checked="" type="checkbox"/> 1.0 kV	<input type="checkbox"/> 1.0 kV	<input checked="" type="checkbox"/> 0.5 kV
Level 3	<input type="checkbox"/> 2.0 kV	<input type="checkbox"/> 2.0 kV	<input type="checkbox"/> 1.0 kV
Level 4	<input type="checkbox"/> 4.0 kV	<input type="checkbox"/> 4.0 kV	<input type="checkbox"/> 2.0 kV
	<input type="checkbox"/> N/A No AC Port	<input checked="" type="checkbox"/> N/A No DC Port	<input checked="" type="checkbox"/> N/A cables < 3 meters

- Burst frequency: ☐ 2.5 kHz ☒ 5.0 kHz ☐ 100 MHz
 Time of coupling: ☐ _ minutes ☒ > 60 seconds
 Coupling method: ☒ coupling network ☐ coupling clamp
 Polarity: ☒ positive ☒ negative

Signal Line Coupling:

- Name of lines:
 Type of lines: ☐ shielded ☒ unshielded ☐ AC ☐ DC
 Status of lines: ☒ passive ☐ active
 Kind of transmission: ☒ analog ☐ digital ☐ N/A

Immunity to Electrical Fast Transients (EFT/Burst)

Test Data:

Environmental conditions in the lab:

Temperature: 25°C
 Relative Humidity Before Test: 55%
 Atmospheric Pressure: 763 mm

Application Point	Voltage (kV)	Rep. Rate	Tr/Th (ns)	Pass	Fail	Comments
110V lines	1	5 kHz	5/50	X		

Test Results: EUT OPERATED NORMALLY DURING AND AFTER TEST

- ☒ Kept Criterion A - Performance to product specifications
- ☐ Kept Criterion B - Distortion of performance allowable during test
- ☐ Kept Criterion C - Product operation affected during test, but operation restorable
- ☐ Not applicable

Remarks:

- ☐ See test setup photograph
- ☒ See EFT data sheets
- ☐ See product setup and operational information
- ☐ Not applicable.

Notes: EUT OPERATED NORMALLY DURING AND AFTER TEST.

Immunity to Electrical Fast Transients (EFT/Burst)

Setup Photo:



Immunity to Conducted Disturbances, Induced by RF fields above 150 kHz

Test instruments:

- ☒ Signal Generator
☒ Power Amplifier (0.15 MHz – 80 MHz)
☐ Not applicable

Test Verification Equipment:

- ☒ Spectrum Analyzer
☒ Characterize & save.
☐ Not applicable

Coupling Networks:

- ☐ Power Line Coupling/Decoupling Network
☒ Signal Line Coupling/Decoupling Network
☐ Passive Impedance Adapter
☐ 6dB/25W Attenuator
☐ Bulk Current Injection Probe
☐ Other,
☐ Not applicable

Test Specification:

Frequency - range	<input checked="" type="checkbox"/>	0.15 MHz - 80 MHz				
Voltage level (EMF)	<input type="checkbox"/>	1 V	<input checked="" type="checkbox"/>	3 V		
	<input type="checkbox"/>	10 V	<input type="checkbox"/>	_ V		
Modulation	<input checked="" type="checkbox"/>	AM: 80%, 1 kHz				
	<input type="checkbox"/>	FM: 1 kHz				
	<input checked="" type="checkbox"/>	sine wave				
	<input type="checkbox"/>	unmodulated				
Step	<input checked="" type="checkbox"/>	1 % sweep				
Dwell	<input type="checkbox"/>	<u>1500 ms</u>				
Power Port	<input checked="" type="checkbox"/>	AC	<input type="checkbox"/>	DC		
Other Ports	<input type="checkbox"/>	I/O Signal/Control				
	<input type="checkbox"/>	Not applicable. Port cable <3 m in length				
Location of coupling:	<u>AC mains</u>					
Type of lines	<input type="checkbox"/>	shielded	<input checked="" type="checkbox"/>	unshielded	<input type="checkbox"/>	AC <input type="checkbox"/> DC
Status of lines	<input type="checkbox"/>	passive	<input type="checkbox"/>	active		
Kind of transmission	<input type="checkbox"/>	analog	<input type="checkbox"/>	digital	<input type="checkbox"/>	N/A
Location of coupling:	<u>N/A</u>					
Type of lines	<input type="checkbox"/>	shielded	<input type="checkbox"/>	unshielded	<input checked="" type="checkbox"/>	AC <input type="checkbox"/> DC
Status of lines	<input type="checkbox"/>	passive	<input type="checkbox"/>	active		
Kind of transmission	<input type="checkbox"/>	analog	<input type="checkbox"/>	digital	<input type="checkbox"/>	N/A

APPLICANT: ECOVIOX LLC.

MODEL: Ev-o

REPORT: 2633-20_EN 301 489 1 TestReport_

Immunity to Conducted Disturbances, Induced by RF fields above 150 kHz

Test Data

Environmental conditions in the lab:

Temperature: 25°C
 Relative Humidity Before Test: 55%
 Atmospheric Pressure: 763 mm

Power Requirements: 110v AC

Comment/s:

Test Freq (MHz)	Voltage (Volts)	Modulation Freq %	Cable Tested	Pass	Fail	Comments
0.15 - 80	3	1 kHz 80	AC Mains	P		None

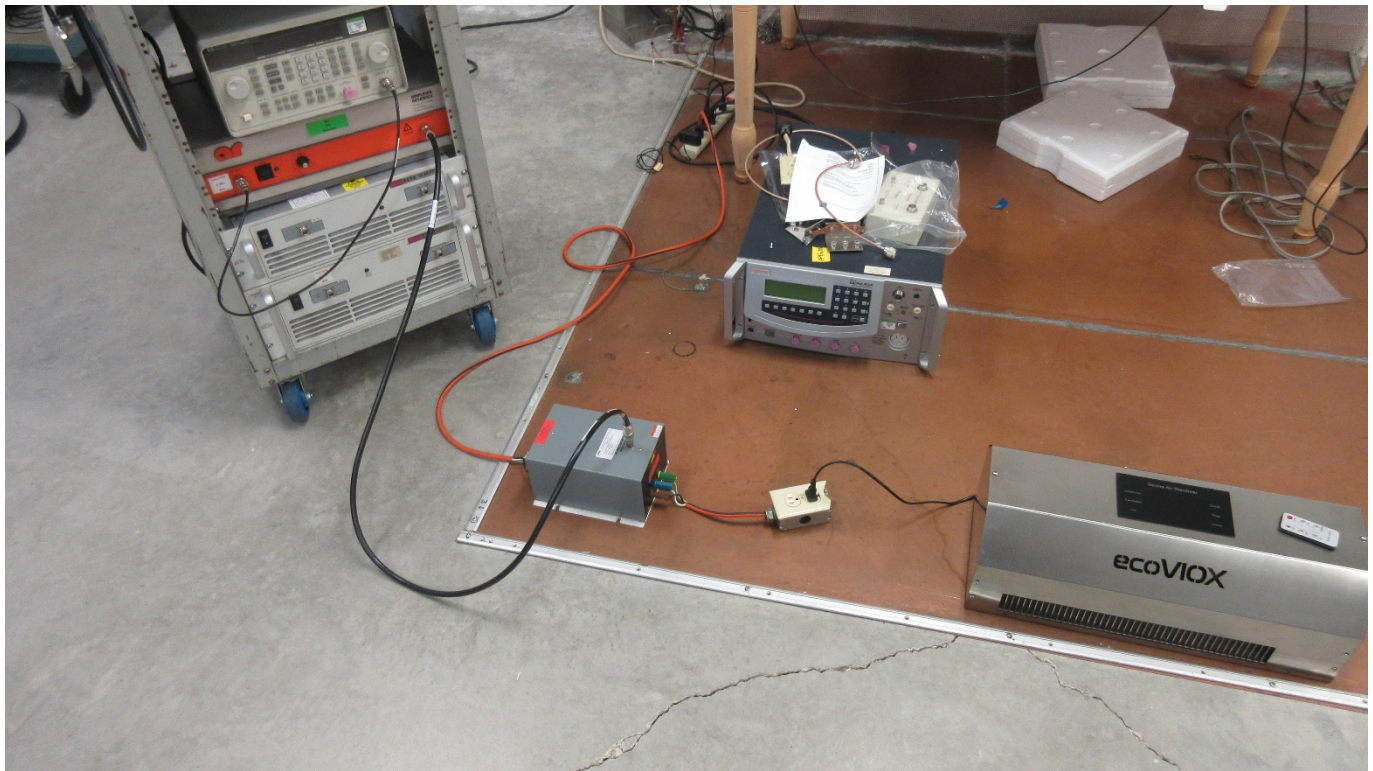
Test Results: PASS

- ☒ Kept Criterion A - Performance to product specifications
- ☐ Kept Criterion B - Distortion of performance allowable during test
- ☐ Kept Criterion C - Product operation affected during test, but operation restorable
- ☐ Not applicable

Notes: EUT OPERATED NORMALLY DURING AND AFTER TEST

Immunity to Conducted Disturbances, Induced by RF fields above 150 kHz

Setup Photo:



Surge Immunity Test

Requirement: EN 61000-4-5

4 General

The repetitive fast transient test is a test with bursts consisting of a number of fast transients, coupled into power, control, signal and earth ports of electrical and electronic equipment. Significant for the test are the high amplitude, the short rise time, the high repetition frequency, and the low energy of the transients.

The test is intended to demonstrate the immunity of electrical and electronic equipment when subjected to types of transient disturbances such as those originating from switching transients (interruption of inductive loads, relay contact bounce, etc.).

5 Test levels

The preferred test levels for the electrical fast transient test, applicable to power, control, signal and earth ports of the equipment are given in Table 1.

Table 1 – Test levels

Level	Open-circuit test voltage	
	kV	
	Line-to-line	Line-to-ground ^b
1	---	0,5
2	0,5	1
3	1	2
4	2	4
X ^a	Special	Special
^a "X" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification. ^b For symmetrical interconnection lines the test can be applied to multiple lines simultaneously with respect to ground, i.e. "lines to ground".		

Conditions: Temperature: 24°C
 Relative Humidity Before Test: 33%
 Atmospheric Pressure: 1020 mb

APPLICANT: ECOVIOX LLC.
 MODEL: Ev-o
 REPORT: 2633-20_EN 301 489 1 TestReport_

Surge Immunity

Setup Photo:



Surge Immunity Test

Test Instruments:

- ☒ Surge Generator
☒ Thermometer/Humidity Monitor
☐ Not applicable

Test Verification Equipment:

- ☒ Oscilloscope
☒ Characterize EFT target & save.
☐ Not applicable

Test Specification

Pulse amplitude:

<u>Port</u>	<u>Line-Line</u>	<u>Line-Ground</u>
Level 1	<input type="checkbox"/> --- kV	<input type="checkbox"/> 0.5 kV
Level 2	<input checked="" type="checkbox"/> 0.5 kV	<input type="checkbox"/> 1.0 kV
Level 3	<input type="checkbox"/> 1.0 kV	<input type="checkbox"/> 2.0 kV
Level 4	<input type="checkbox"/> 2.0 kV	<input type="checkbox"/> 4.0 kV

Wave Combination

Time of coupling:

Coupling method:

Polarity:

- ☒ 10/700 us
☐ _ minutes
☒ coupling network
☒ positive

- ☐ Other
☒ > 60 seconds
☐ coupling clamp
☒ negative

Signal Line Coupling:

Name of lines:

Type of lines: ☐ shielded ☒ unshielded ☒ AC ☐ DC

Status of lines: ☒ passive ☐ active

Kind of transmission: ☒ analog ☐ digital ☐ N/A

Surge Immunity Test

Test Data:

Environmental conditions in the lab:

Temperature: 25°C
 Relative Humidity Before Test: 55%
 Atmospheric Pressure: 763 mm

Application Point	Voltage (kV)	Pass	Fail	Comments
110V lines	Level 2	X		

Test Results: EUT OPERATED NORMALLY DURING AND AFTER TEST

- ☐ Kept Criterion A - Performance to product specifications
- ☒ Kept Criterion B - Distortion of performance allowable during test
- ☐ Kept Criterion C - Product operation affected during test, but operation restorable
- ☐ Not applicable

Remarks:

- ☐ See test setup photograph
- ☐ See product setup and operational information
- ☐ Not applicable.

Notes: EUT OPERATED NORMALLY DURING AND AFTER TEST.

PQF

Requirement: EN 61000-4-29

8.2.1 Voltage dips and short interruptions

The EUT shall be tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested.

For voltage dips, changes in supply voltage shall occur at zero crossings of the voltage, and at additional angles considered critical by product committees or individual product specifications preferably selected from 45°, 90°, 135°, 180°, 225°, 270° and 315° on each phase.

For short interruptions, the angle shall be defined by the product committee as the worst case. In the absence of definition, it is recommended to use 0° for one of the phases.

For the short interruption test of three-phase systems, all the three phases shall be simultaneously tested as per 5.1.

For the voltage dips test of single-phase systems, the voltage shall be tested as per 5.1. This implies one series of tests.

For the voltage dips test of three-phase systems with neutral, each individual voltage (phase-to-neutral and phase-to-phase) shall be tested, one at a time, as per 5.1. This implies six different series of tests. See Figure 4b).

For the voltage dips test of three-phase systems without neutral, each phase-to-phase voltage shall be tested, one at a time, as per 5.1. This implies three different series of tests. See Figure 4b).

NOTE For three-phase systems, during a dip on a phase-to-phase voltage a change will occur on one or two of the other voltages as well.

For EUTs with more than one power cord, each power cord should be tested individually.

Table 1 – Preferred test level and durations for voltage dips

Class ^a	Test level and durations for voltage dips (t_g) (50 Hz/60 Hz)				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0 % during ½ cycle	0 % during 1 cycle	70 % during 25/30 ^c cycles		
Class 3	0 % during ½ cycle	0 % during 1 cycle	40 % during 10/12 ^c cycles	70 % during 25/30 ^c cycles	80 % during 250/300 ^c cycles
Class X ^b	X	X	X	X	X
^a Classes as per IEC 61000-2-4; see Annex B. ^b To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2. ^c "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test".					

Table 2 – Preferred test level and durations for short interruptions

Class ^a	Test level and durations for short interruptions (t_g) (50 Hz/60 Hz)
Class 1	Case-by-case according to the equipment requirements
Class 2	0 % during 250/300 ^c cycles
Class 3	0 % during 250/300 ^c cycles
Class X ^b	X
^a Classes as per IEC 61000-2-4; see Annex B. ^b To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2. ^c "250/300 cycles" means "250 cycles for 50 Hz test" and "300 cycles for 60 Hz test".	

Conditions: Temperature: 24°C
 Relative Humidity Before Test: 33%
 Atmospheric Pressure: 1020 mb

PQF

Setup Photo:



PQF

Test Instruments:

- ☒ Generator
☒ Thermometer/Humidity Monitor
☐ Not applicable

Test Verification Equipment:

- ☒ Oscilloscope
☒ Characterize EFT target & save.
☐ Not applicable

Signal Line Coupling:

Name of lines:

Type of lines: ☐ shielded ☒ unshielded ☒ AC ☐ DC

Status of lines: ☒ passive ☐ active

Kind of transmission: ☒ analog ☐ digital ☐ N/A

PQF

Test Data:

Environmental conditions in the lab:

Temperature: 25°C
Relative Humidity Before Test: 55%
Atmospheric Pressure: 763 mm

Test Results: EUT OPERATED NORMALLY DURING AND AFTER TEST

- ☐ Kept Criterion A - Performance to product specifications
- ☐ Kept Criterion B - Distortion of performance allowable during test
- ☒ Kept Criterion C - Product operation affected during test, but operation restorable
- ☐ Not applicable

Remarks:

- ☐ See test setup photograph
- ☐ See product setup and operational information
- ☐ Not applicable.

Notes: EUT OPERATED NORMALLY DURING AND AFTER TEST.

Measurement Uncertainty

EN 301 489-1v1.9.2

The data and results referenced in this document are true and accurate. The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4 or ENTR 100-028 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: “Uncertainty in EMC Measurements” and is documented in the Timco Engineering, Inc. quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Timco Engineering, Inc. is reported:

BS EN 61000

Standard	Test Items	Measurement Uncertainty	Notes
BS EN 61000-4-2	Electrostatic Discharge	$\pm 9.6 \%$	(1)
BS EN 61000-4-3	Radio Frequency EM Field Immunity 80 MHz to 1 GHz, and 1.4 GHz to 2.7 GHz	$\pm 1.6 \text{ dB}$	(1)
Valid up to 1 GHz for the RF parameters unless otherwise stated			

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

CISPR 16-4-2, as referenced by BS EN 55022

Test Items	Measurement Uncertainty	CISPR 16-4-2 Limits	Notes
Conducted Disturbance at Mains Port using AMN, 150 kHz to 30 MHz	$\pm 3.9 \text{ dB}$	$\pm 3.4 \text{ dB}$	(1)
Disturbance Power, 30 MHz to 300 MHz	$\pm 4.3 \text{ dB}$	$\pm 4.5 \text{ dB}$	(1)
Radiated Disturbance (electric field strength at an OATS or in a SAC), 30 MHz to 1000 MHz	\pm	$\pm 6.3 \text{ dB}$	(1)
Radiated Disturbance (electric field strength in a FAR), 30 MHz to 1000 MHz	\pm	$\pm 5.3 \text{ dB}$	(1)
Radiated Disturbance (electric field strength in a FAR), 1 GHz to 6 GHz	$\pm 4.4 \text{ dB}$	$\pm 5.2 \text{ dB}$	(1)
Valid up to 1 GHz for the RF parameters unless otherwise stated			

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

Test Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Amplifier	Amplifier Research	10W1000B	23117	NA	NA
Field Monitor	Amplifier Research	FM5004	22288	NA	NA
CHAMBER	Panashield	3M	N/A	N/A	N/A
Signal Generator HP 8648C	HP	8648C	3537A01679	03/29/19	03/29/21
Coaxial Cable - Immunity 3 cable set	Semflex	Immunity 3 cable set	Immunity 3 cable set	NA	NA
Software: Field Strength Program	Timco	N/A	Version 4.0	NA	NA
RF Power Amplifier	Ophir RF 120W	5126F	1015	NA	NA
RF Power Amplifier OPHIR	Ophir RF	5172F	1064	NA	NA
Antenna: Active Loop	ETS-Lindgren	6502	62529	12/11/2017	12/11/2020
Antenna: Biconical 1057	Eaton	94455-1	1057	12/13/2017	12/13/2020
Antenna: Log- Periodic 1122	Electro-Metrics	LPA-25	1122	7/26/2017	7/26/2020
CHAMBER	Panashield	3M	N/A	3/15/2019	3/15/2021
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	08/28/18	08/28/2021
Software: Field Strength Program	Timco	N/A	Version 4.10.7.0	N/A	N/A
Antenna: Double- Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	35923	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	4/12/2021
Band Reject Filter 2.4 GHz	Micro-Tronics	BRM50702-02	0	4/12/2019	4/12/2021
Pre-amp	RF-LAMBDA	RLNA00M45GA	N/A	2/27/2019	2/27/2021

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

END OF REPORT