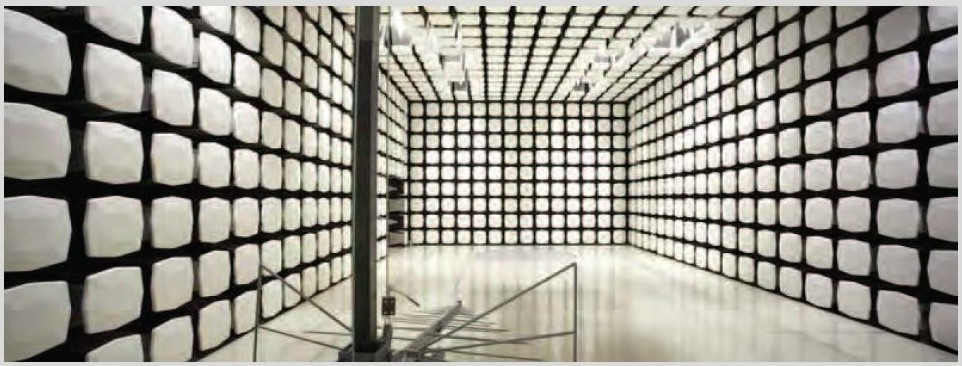
ConMed

PlumeSafe® X5 Smoke Management System

FCC 15.225:2023

13.56 MHz Radio

Report: COED0013.2 Rev. 1, Issue Date: July 24, 2023



ACCREDITED
CERT #3310.02

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CERTIFICATE OF TEST

Last Date of Test: February 10, 2023
ConMed
EUT: PlumeSafe® X5 Smoke Management System

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2023	ANSI C63.10:2013
FCC 15.225:2023	

Results

Test Description	Result	Specification Section(s)	Method Section(s)	Comments
Powerline Conducted Emissions	Pass	15.207	6.2	N/A
Field Strength of Fundamental	Pass	15.225(a)-(c)	6.4	N/A
Field Strength of Spurious Emissions (Less Than 30 MHz)	Pass	15.225(d), 15.209	6.4	N/A
Field Strength of Spurious Emissions (Greater Than 30 MHz)	Pass	15.225(d), 15.209	6.5	N/A
Frequency Stability	Pass	15.225(e), 15.31(e), 15.215(c), 2.1055	6.8	N/A
Emissions Bandwidth (20 dB)	Pass	15.215(c)	6.9.2	N/A

Deviations From Test Standards

None

Approved By:

Cole Ghizzone, Department Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Updated standard year to 2023 and the radio to 13.56 MHz RFID Radio.	2023-07-24	Cover Page
01	Updated to FCC 15.225:2023	2023-07-24	02
01	change the Conclusion to 'Evaluation'	2023-07-24	16, 18

ACCREDITATIONS AND AUTHORIZATIONS

element
2021.09.01

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

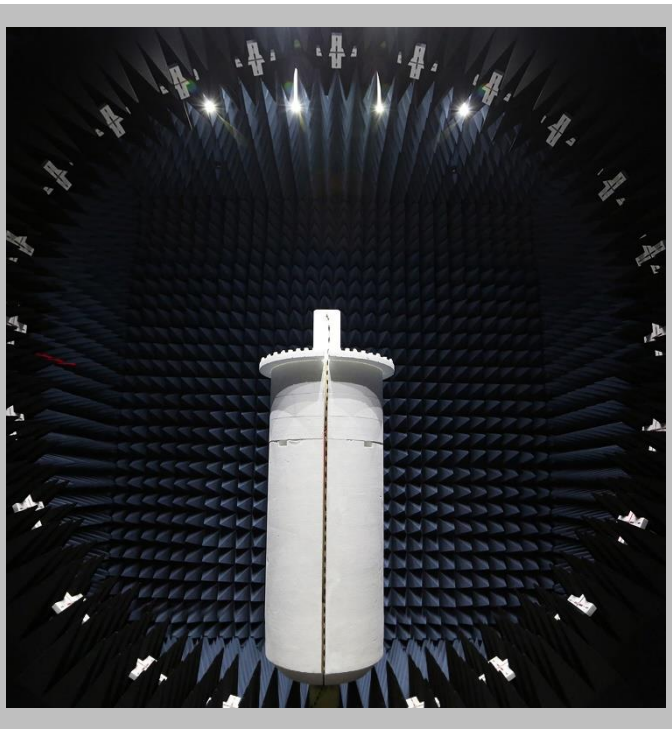
SCOPE

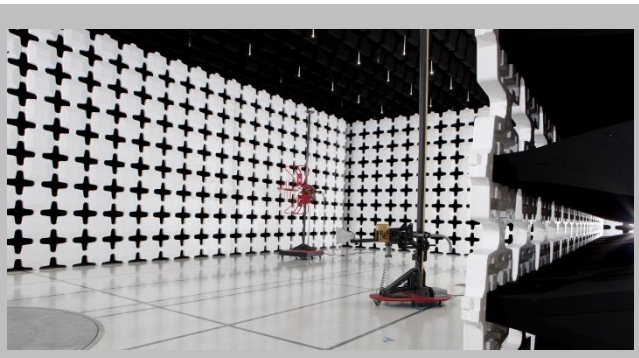
For details on the Scopes of our Accreditations, please visit:

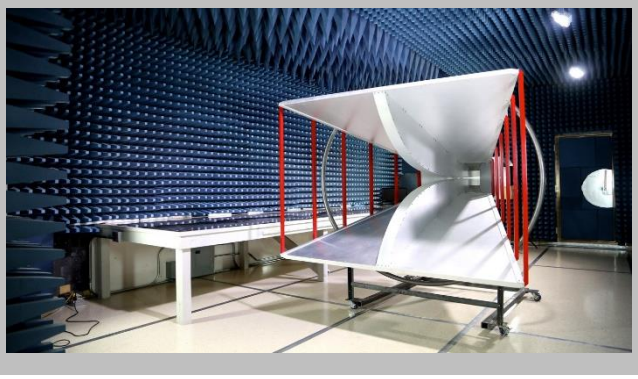
California Minnesota Oregon Texas Washington

FACILITIES

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	3.2 dB	-3.2 dB

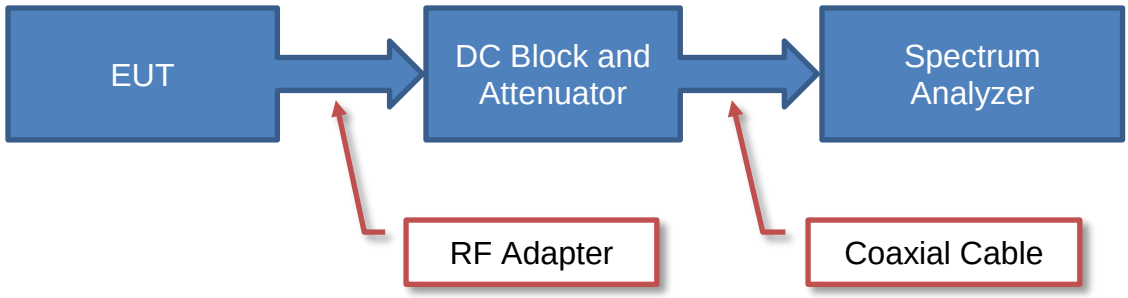
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

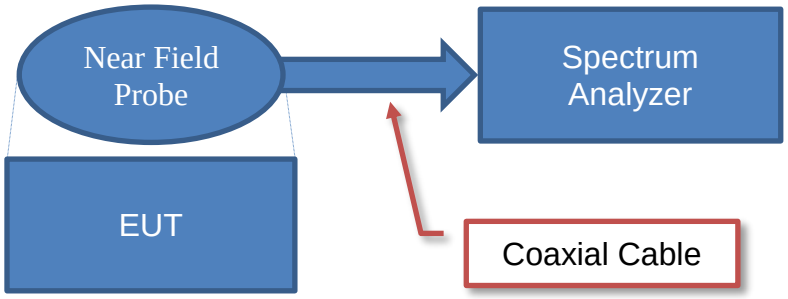
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

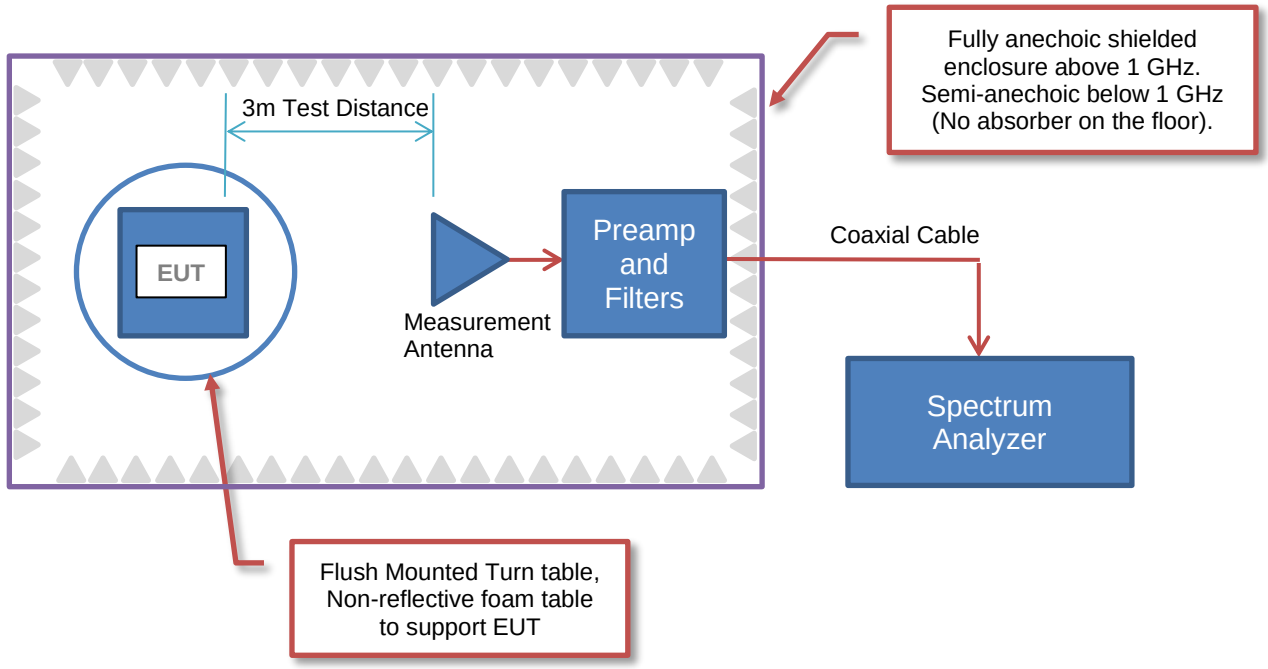


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)		Factor: Antenna Factor		Factor: Cable Factor		Factor: Amplifier Gain		Distance Adjustment Factor		External Attenuation		Field Strength
42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0	=	**33.5**

Conducted Emissions:

Measured Level (Amplitude)		Factor: Transducer Factor		Factor: Cable Factor		External Attenuation		Adjusted Level
26.7	+	0.3	+	0.1	+	20.0	=	**47.1**

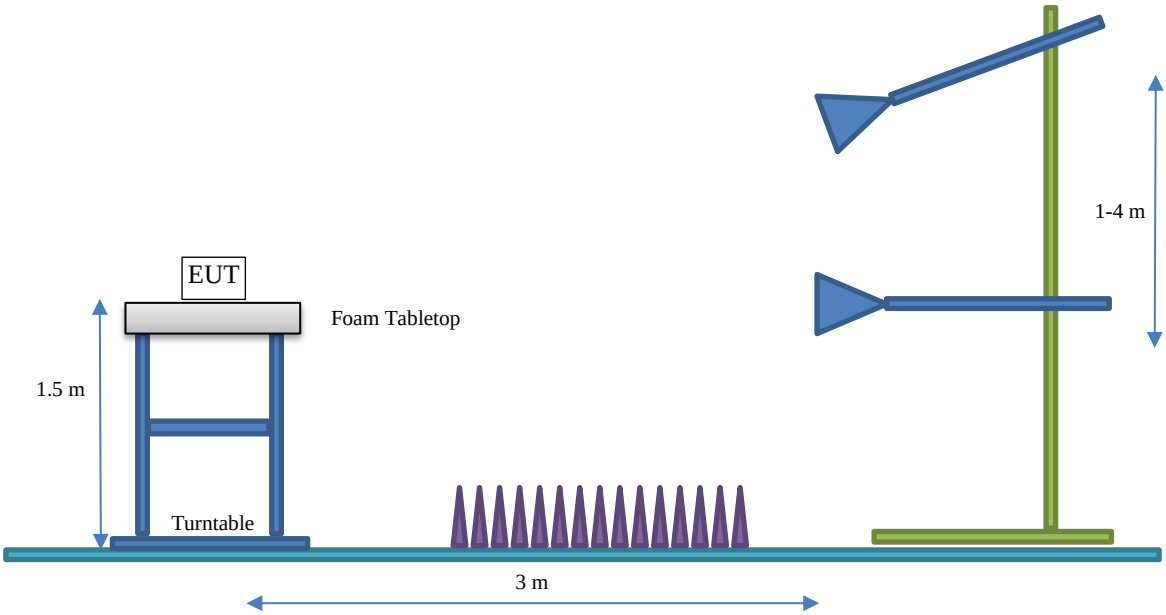
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)		Substitution Antenna Factor (dBi)		EIRP to ERP (if applicable)		Measured power (dBm ERP/EIRP)
10.0	+	6.0	-	2.15	=	**13.9/16.0**

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

Company Name:	ConMed
Address:	6455 S Yosemite St Ste 800
City, State, Zip:	Greenwood Village, CO 80111
Test Requested By:	Jared Parker
EUT:	PlumeSafe® X5 Smoke Management System
First Date of Test:	January 12, 2023
Last Date of Test:	February 10, 2023
Receipt Date of Samples:	January 12, 2023
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Smoke Evacuation System with 13.56MHz RFID

Testing Objective:
To demonstrate compliance to FCC Part 15.225 specifications.

POWER SETTINGS AND ANTENNAS

The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA INFORMATION

Type	Provided by:	Dimensions
Wire loop	ConMed	Square 2.18” x 2.25”

The EUT was tested using the power settings provided by the manufacturer which were based upon:

☐ Test software settings Test software/firmware installed on EUT:__Version C_____
x Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Radio	Modulation	Protocol	Data Rate (Kbps)	Frequency (MHz)	Power Setting (mW)
RFID	ASK	ISO/IEC 15693	26.48	13.56	70

CONFIGURATIONS

Configuration COED0013-1

Software/Firmware Running During Test	
Description	**Version**
EUT Software	C

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
PlumeSafe® X5 Smoke Management System	ConMed	PX5-120NF	SAMPLE 4...12
Filter	ConMed	PX5-125-22	SAMPLE 17

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	3.5 m	No	PlumeSafe® X5 Smoke Management System	AC Power
RSA	No	1.1 m	No	PlumeSafe® X5 Smoke Management System	Unterminated
RSA	No	1.5 m	No	PlumeSafe® X5 Smoke Management System	Unterminated

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-01-12	Emissions Bandwidth (20 dB)	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2023-01-12	Field Strength Of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2023-01-12	Field Strength Of Spurious Emissions Less than 30 Mhz)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2023-01-13	Field Strength Of Spurious Emissions (Greater than 30 MHz)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2023-01-16	Frequency Stability	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2023-02-10	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT.

The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10.

In the event that the operating frequency of 13.56 MHz is causing the product to fail the FCC 15.207 limits, the following guidance can be used:

FCC KDB 174176 D01 AC Conducted FAQ v01r01, June 3, 2015 Section Q5:

> For a device with a permanent or detachable antenna operating at or below 30 MHz, the FCC will accept measurements performed with a suitable dummy load in lieu of the antenna under the following conditions:
>
> (1) perform the AC power-line conducted tests with the antenna connected to determine compliance with Section 15.207 limits outside the transmitter's fundamental emission band;
>
> (2) retest with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network which simulates the antenna in the fundamental frequency band.
>
> All measurements must be performed as specified in clause 6.2 of ANSI C63.10-2013.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARN	2022-04-20	2023-04-20
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT	EVGA	2023-01-03	2024-01-03
LISN	Solar Electronics	9252-50-R-24-BNC	LIP	2022-09-08	2023-09-08

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

COED0013-1

MODES INVESTIGATED

13.56 MHz RFID, ISO/IEC 15693

POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-02-10
Customer:	ConMed	Temperature:	21.5°C
Attendees:	None	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	17	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

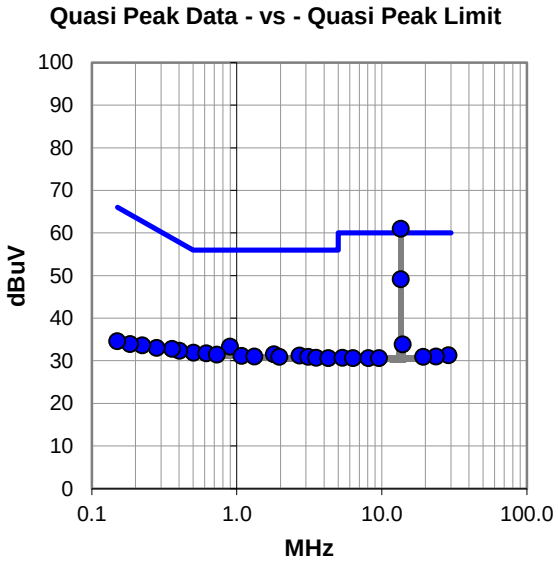
None

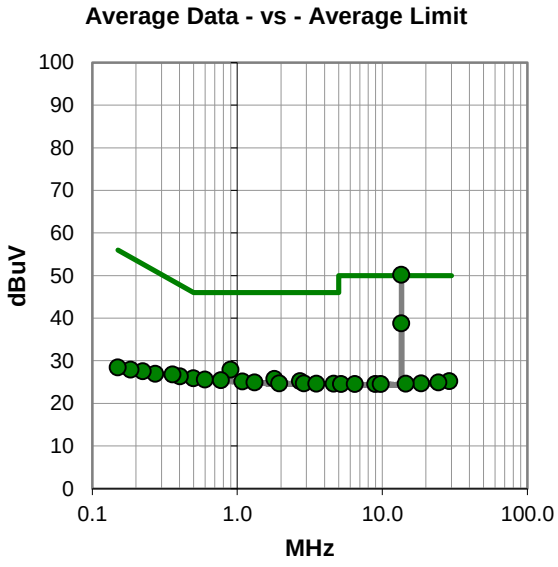
EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #17

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.562	40.6	20.4	61.0	60.0	1.0
13.566	28.7	20.4	49.1	60.0	-10.9
0.901	13.4	19.9	33.3	56.0	-22.7
0.504	12.1	19.8	31.9	56.0	-24.1
0.615	11.9	19.8	31.7	56.0	-24.3
1.802	11.5	20.0	31.5	56.0	-24.5
0.728	11.6	19.8	31.4	56.0	-24.6
2.704	11.1	20.1	31.2	56.0	-24.8
1.079	11.2	19.9	31.1	56.0	-24.9
1.322	11.1	19.9	31.0	56.0	-25.0
1.964	10.9	20.0	30.9	56.0	-25.1
3.104	10.8	20.1	30.9	56.0	-25.1
3.528	10.6	20.1	30.7	56.0	-25.3
4.277	10.5	20.1	30.6	56.0	-25.4
0.402	12.4	19.9	32.3	57.8	-25.5
0.358	12.9	19.9	32.8	58.8	-26.0
13.983	13.4	20.4	33.8	60.0	-26.2
0.280	13.1	19.9	33.0	60.8	-27.8
28.942	10.1	21.2	31.3	60.0	-28.7
23.679	10.1	20.9	31.0	60.0	-29.0
0.223	13.6	20.0	33.6	62.7	-29.1
19.342	10.2	20.7	30.9	60.0	-29.1
5.350	10.5	20.2	30.7	60.0	-29.3
6.351	10.4	20.2	30.6	60.0	-29.4
8.087	10.4	20.2	30.6	60.0	-29.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.562	29.8	20.4	50.2	50.0	0.2
13.566	18.4	20.4	38.8	50.0	-11.2
0.901	8.0	19.9	27.9	46.0	-18.1
0.498	6.1	19.8	25.9	46.0	-20.1
1.802	5.7	20.0	25.7	46.0	-20.3
0.597	5.8	19.8	25.6	46.0	-20.4
0.773	5.6	19.8	25.4	46.0	-20.6
2.704	5.1	20.1	25.2	46.0	-20.8
1.084	5.2	19.9	25.1	46.0	-20.9
1.317	5.0	19.9	24.9	46.0	-21.1
1.943	4.7	20.0	24.7	46.0	-21.3
2.881	4.6	20.1	24.7	46.0	-21.3
3.508	4.5	20.1	24.6	46.0	-21.4
4.622	4.5	20.1	24.6	46.0	-21.4
0.402	6.4	19.9	26.3	47.8	-21.5
0.358	6.9	19.9	26.8	48.8	-22.0
0.272	7.0	19.9	26.9	51.1	-24.2
29.009	4.0	21.2	25.2	50.0	-24.8
24.413	4.0	20.9	24.9	50.0	-25.1
0.223	7.5	20.0	27.5	52.7	-25.2
18.522	4.0	20.7	24.7	50.0	-25.3
14.543	4.1	20.5	24.6	50.0	-25.4
5.202	4.3	20.2	24.5	50.0	-25.5
6.470	4.3	20.2	24.5	50.0	-25.5
8.945	4.2	20.3	24.5	50.0	-25.5

CONCLUSION

Evaluation

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-02-10
Customer:	ConMed	Temperature:	21.5°C
Attendees:	None	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	18	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

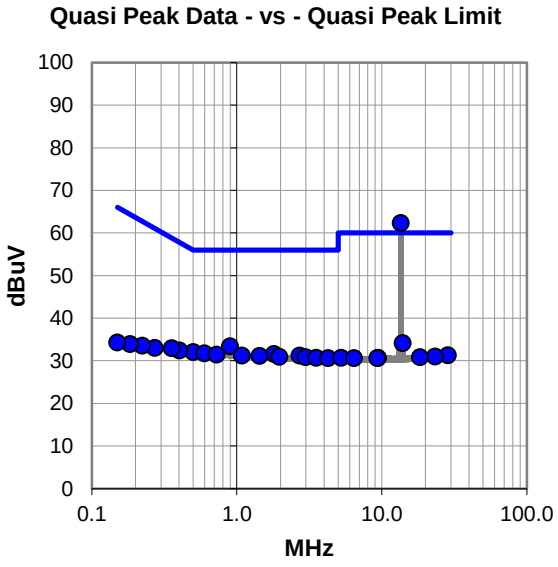
None

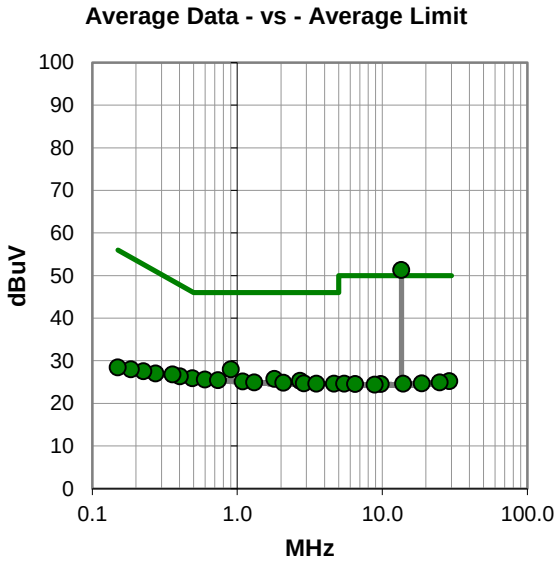
EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #18

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	41.9	20.4	62.3	60.0	2.3
0.901	13.5	19.9	33.4	56.0	-22.6
0.501	12.2	19.8	32.0	56.0	-24.0
0.597	11.9	19.8	31.7	56.0	-24.3
1.802	11.6	20.0	31.6	56.0	-24.4
0.727	11.6	19.8	31.4	56.0	-24.6
1.082	11.3	19.9	31.2	56.0	-24.8
2.704	11.1	20.1	31.2	56.0	-24.8
1.438	11.2	19.9	31.1	56.0	-24.9
1.967	10.9	20.0	30.9	56.0	-25.1
2.991	10.7	20.1	30.8	56.0	-25.2
3.534	10.6	20.1	30.7	56.0	-25.3
0.402	12.5	19.9	32.4	57.8	-25.4
4.274	10.5	20.1	30.6	56.0	-25.4
0.356	13.0	19.9	32.9	58.8	-25.9
13.983	13.7	20.4	34.1	60.0	-25.9
0.272	13.1	19.9	33.0	61.1	-28.1
28.655	10.2	21.1	31.3	60.0	-28.7
23.296	10.1	20.9	31.0	60.0	-29.0
18.379	10.1	20.7	30.8	60.0	-29.2
0.223	13.5	20.0	33.5	62.7	-29.2
5.243	10.5	20.2	30.7	60.0	-29.3
9.433	10.4	20.3	30.7	60.0	-29.3
6.423	10.4	20.2	30.6	60.0	-29.4
9.357	10.3	20.3	30.6	60.0	-29.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	30.9	20.4	51.3	50.0	1.3
0.902	8.1	19.9	28.0	46.0	-18.0
1.802	5.7	20.0	25.7	46.0	-20.3
0.490	6.1	19.8	25.9	46.2	-20.3
0.599	5.8	19.8	25.6	46.0	-20.4
0.736	5.6	19.8	25.4	46.0	-20.6
2.706	5.2	20.1	25.3	46.0	-20.7
1.091	5.2	19.9	25.1	46.0	-20.9
1.313	5.0	19.9	24.9	46.0	-21.1
2.076	4.8	20.0	24.8	46.0	-21.2
2.883	4.6	20.1	24.7	46.0	-21.3
3.516	4.5	20.1	24.6	46.0	-21.4
4.656	4.5	20.1	24.6	46.0	-21.4
0.402	6.4	19.9	26.3	47.8	-21.5
0.358	6.9	19.9	26.8	48.8	-22.0
0.274	7.1	19.9	27.0	51.0	-24.0
29.027	4.0	21.2	25.2	50.0	-24.8
0.225	7.5	20.0	27.5	52.6	-25.1
24.926	4.0	20.9	24.9	50.0	-25.1
18.719	4.0	20.7	24.7	50.0	-25.3
5.483	4.4	20.2	24.6	50.0	-25.4
13.983	4.2	20.4	24.6	50.0	-25.4
6.500	4.3	20.2	24.5	50.0	-25.5
9.790	4.1	20.4	24.5	50.0	-25.5
8.885	4.1	20.3	24.4	50.0	-25.6

CONCLUSION

Evaluation

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-02-10
Customer:	ConMed	Temperature:	21.5°C
Attendees:	None	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	19	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

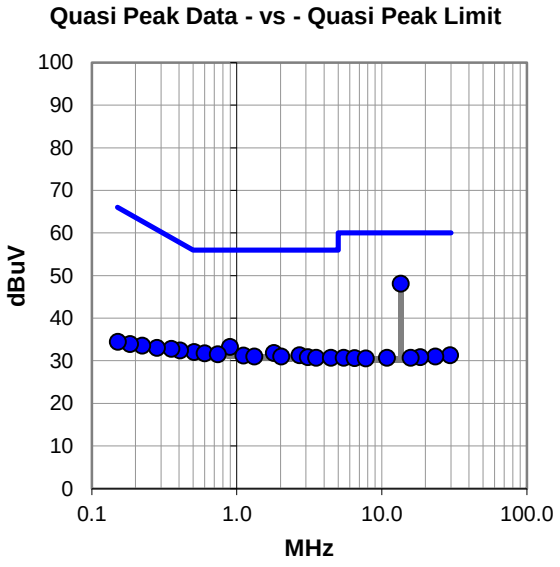
RFID antenna terminated with dummy load.

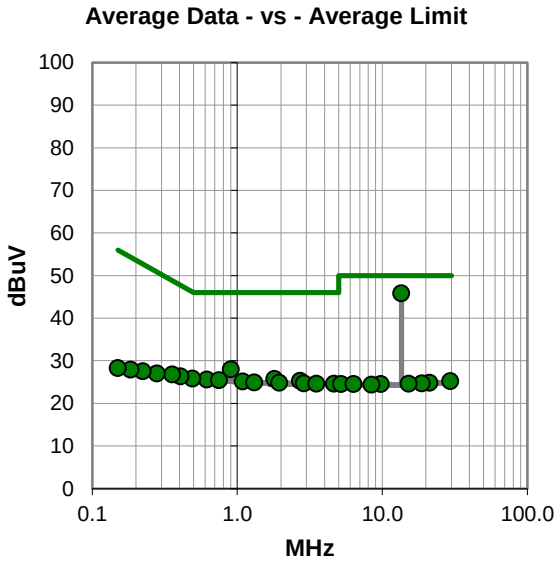
EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #19

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	27.7	20.4	48.1	60.0	-11.9
0.901	13.3	19.9	33.2	56.0	-22.8
0.509	12.2	19.8	32.0	56.0	-24.0
1.804	11.8	20.0	31.8	56.0	-24.2
0.600	11.9	19.8	31.7	56.0	-24.3
0.740	11.7	19.8	31.5	56.0	-24.5
2.706	11.2	20.1	31.3	56.0	-24.7
1.114	11.3	19.9	31.2	56.0	-24.8
1.320	11.1	19.9	31.0	56.0	-25.0
2.031	11.0	20.0	31.0	56.0	-25.0
3.087	10.7	20.1	30.8	56.0	-25.2
3.531	10.6	20.1	30.7	56.0	-25.3
4.473	10.6	20.1	30.7	56.0	-25.3
0.406	12.5	19.9	32.4	57.7	-25.3
0.354	12.9	19.9	32.8	58.9	-26.1
0.281	13.1	19.9	33.0	60.8	-27.8
29.615	10.1	21.2	31.3	60.0	-28.7
23.394	10.1	20.9	31.0	60.0	-29.0
18.484	10.1	20.7	30.8	60.0	-29.2
0.223	13.5	20.0	33.5	62.7	-29.2
5.469	10.5	20.2	30.7	60.0	-29.3
10.898	10.3	20.4	30.7	60.0	-29.3
15.814	10.1	20.6	30.7	60.0	-29.3
6.502	10.4	20.2	30.6	60.0	-29.4
7.774	10.3	20.2	30.5	60.0	-29.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	25.4	20.4	45.8	50.0	-4.2
0.902	8.1	19.9	28.0	46.0	-18.0
1.802	5.7	20.0	25.7	46.0	-20.3
0.615	5.8	19.8	25.6	46.0	-20.4
0.490	6.0	19.8	25.8	46.2	-20.4
0.750	5.6	19.8	25.4	46.0	-20.6
2.704	5.2	20.1	25.3	46.0	-20.7
1.090	5.2	19.9	25.1	46.0	-20.9
1.311	5.0	19.9	24.9	46.0	-21.1
1.943	4.8	20.0	24.8	46.0	-21.2
2.881	4.6	20.1	24.7	46.0	-21.3
3.510	4.5	20.1	24.6	46.0	-21.4
4.654	4.5	20.1	24.6	46.0	-21.4
0.406	6.4	19.9	26.3	47.7	-21.4
0.356	6.9	19.9	26.8	48.8	-22.0
0.278	7.1	19.9	27.0	50.9	-23.9
29.438	4.0	21.2	25.2	50.0	-24.8
21.192	4.0	20.8	24.8	50.0	-25.2
0.223	7.5	20.0	27.5	52.7	-25.2
18.699	4.0	20.7	24.7	50.0	-25.3
15.219	4.0	20.6	24.6	50.0	-25.4
5.202	4.3	20.2	24.5	50.0	-25.5
6.339	4.3	20.2	24.5	50.0	-25.5
9.793	4.1	20.4	24.5	50.0	-25.5
8.415	4.2	20.2	24.4	50.0	-25.6

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-02-10
Customer:	ConMed	Temperature:	21.5°C
Attendees:	None	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1025 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	20	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

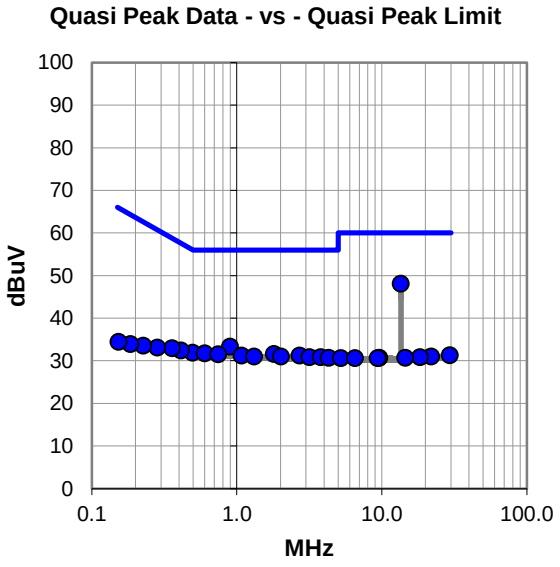
RFID antenna terminated with dummy load.

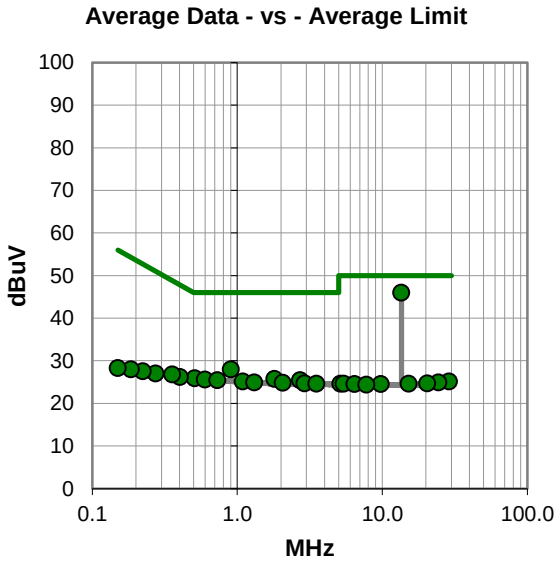
EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None





POWERLINE CONDUCTED EMISSIONS

element
WTD.2022.12.01.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #20

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	27.7	20.4	48.1	60.0	-11.9
0.901	13.4	19.9	33.3	56.0	-22.7
0.496	12.1	19.8	31.9	56.1	-24.2
0.602	11.9	19.8	31.7	56.0	-24.3
1.804	11.6	20.0	31.6	56.0	-24.4
0.744	11.7	19.8	31.5	56.0	-24.5
1.081	11.3	19.9	31.2	56.0	-24.8
2.706	11.1	20.1	31.2	56.0	-24.8
1.317	11.1	19.9	31.0	56.0	-25.0
2.015	11.0	20.0	31.0	56.0	-25.0
3.177	10.7	20.1	30.8	56.0	-25.2
3.792	10.7	20.1	30.8	56.0	-25.2
0.412	12.5	19.9	32.4	57.6	-25.2
4.306	10.6	20.1	30.7	56.0	-25.3
0.358	13.0	19.9	32.9	58.8	-25.9
0.283	13.2	19.9	33.1	60.7	-27.6
29.449	10.1	21.2	31.3	60.0	-28.7
21.981	10.2	20.8	31.0	60.0	-29.0
0.226	13.5	20.0	33.5	62.6	-29.1
18.393	10.1	20.7	30.8	60.0	-29.2
9.639	10.4	20.3	30.7	60.0	-29.3
14.531	10.2	20.5	30.7	60.0	-29.3
5.219	10.4	20.2	30.6	60.0	-29.4
6.523	10.4	20.2	30.6	60.0	-29.4
9.364	10.3	20.3	30.6	60.0	-29.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	25.6	20.4	46.0	50.0	-4.0
0.902	8.1	19.9	28.0	46.0	-18.0
0.507	6.1	19.8	25.9	46.0	-20.1
1.802	5.7	20.0	25.7	46.0	-20.3
0.597	5.8	19.8	25.6	46.0	-20.4
0.728	5.6	19.8	25.4	46.0	-20.6
2.706	5.3	20.1	25.4	46.0	-20.6
1.090	5.2	19.9	25.1	46.0	-20.9
1.313	5.0	19.9	24.9	46.0	-21.1
2.059	4.8	20.0	24.8	46.0	-21.2
2.906	4.6	20.1	24.7	46.0	-21.3
3.508	4.5	20.1	24.6	46.0	-21.4
0.402	6.3	19.9	26.2	47.8	-21.6
0.356	6.9	19.9	26.8	48.8	-22.0
0.274	7.1	19.9	27.0	51.0	-24.0
28.934	3.9	21.2	25.1	50.0	-24.9
24.468	4.0	20.9	24.9	50.0	-25.1
0.223	7.5	20.0	27.5	52.7	-25.2
20.458	4.0	20.7	24.7	50.0	-25.3
5.136	4.4	20.2	24.6	50.0	-25.4
5.409	4.4	20.2	24.6	50.0	-25.4
15.197	4.0	20.6	24.6	50.0	-25.4
6.449	4.3	20.2	24.5	50.0	-25.5
9.789	4.1	20.4	24.5	50.0	-25.5
7.764	4.2	20.2	24.4	50.0	-25.6

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AOA	2022-07-13	2024-07-13
Cable	None	10m Test Distance Cable	EVL	2022-11-28	2023-11-28
Analyzer - Spectrum Analyzer	Agilent	E4443A	AFB	2022-08-12	2023-08-12

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.7 dB	-1.7 dB

FREQUENCY RANGE INVESTIGATED

12 MHz TO 15 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

COED0013-1

MODES INVESTIGATED

13.56 MHz RFID, ISO/IEC 15693

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-01-12
Customer:	ConMed	Temperature:	21.2°C
Attendees:	None	Relative Humidity:	44.6%
Customer Project:	None	Bar. Pressure (PMSL):	1014 mb
Tested By:	Jeff Alcoke	Job Site:	EV11
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	4	Test Distance (m):	10	Ant. Height(s) (m):	1(m)

COMMENTS

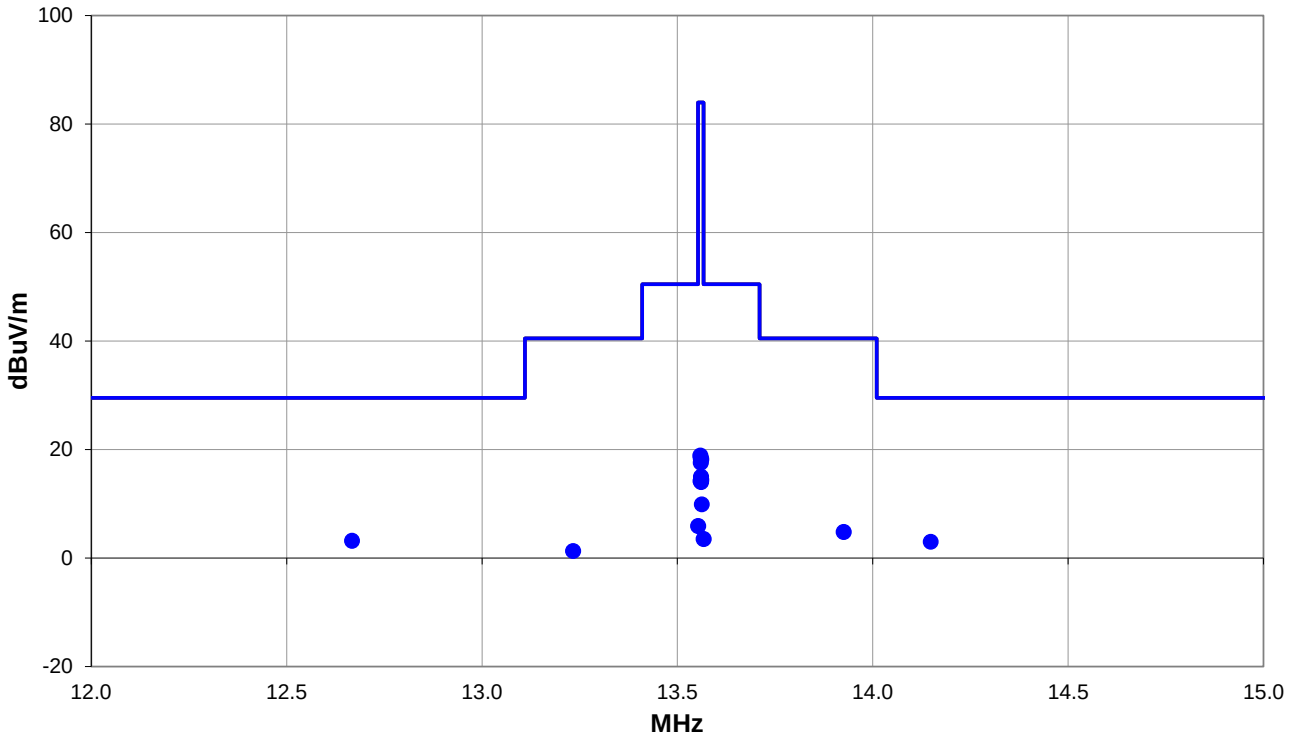
None

EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None



Run #: 4 ■ PK ◆ AV ● QP

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #4

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12.667	10.3	12.0	1.0	-3.0	10.0	0.0	Par GND	QP	-19.1	3.2	29.5	-26.3	EUT Horz
14.148	10.0	12.1	1.0	-3.0	10.0	0.0	Par GND	QP	-19.1	3.0	29.5	-26.5	EUT Horz
13.926	11.8	12.1	1.0	-3.0	10.0	0.0	Par GND	QP	-19.1	4.8	40.5	-35.7	EUT Horz
13.233	8.4	12.0	1.0	-3.0	10.0	0.0	Par GND	QP	-19.1	1.3	40.5	-39.2	EUT Horz
13.553	12.9	12.1	1.0	-3.0	10.0	0.0	Par GND	QP	-19.1	5.9	50.5	-44.6	EUT Horz
13.567	10.5	12.1	1.0	-3.0	10.0	0.0	Par GND	QP	-19.1	3.5	50.5	-47.0	EUT Horz
13.559	25.9	12.1	1.0	345.0	10.0	0.0	Par GND	QP	-19.1	18.9	84.0	-65.1	EUT Horz
13.560	25.4	12.1	1.0	-5.0	10.0	0.0	Perp EUT	QP	-19.1	18.4	84.0	-65.6	EUT Horz
13.561	25.2	12.1	1.0	364.0	10.0	0.0	Par GND	QP	-19.1	18.2	84.0	-65.8	EUT Vert
13.560	24.6	12.1	1.0	0.0	10.0	0.0	Perp EUT	QP	-19.1	17.6	84.0	-66.4	EUT Vert
13.561	22.0	12.1	1.0	145.0	10.0	0.0	Par GND	QP	-19.1	15.0	84.0	-69.0	EUT on Side
13.561	21.4	12.1	1.0	360.0	10.0	0.0	Par EUT	QP	-19.1	14.4	84.0	-69.6	EUT Horz
13.559	21.2	12.1	1.0	0.0	10.0	0.0	Par EUT	QP	-19.1	14.2	84.0	-69.8	EUT Vert
13.561	21.0	12.1	1.0	165.0	10.0	0.0	Perp EUT	QP	-19.1	14.0	84.0	-70.0	EUT on Side
13.562	16.9	12.1	1.0	145.0	10.0	0.0	Par EUT	QP	-19.1	9.9	84.0	-74.1	EUT on Side

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AOA	2022-07-13	2024-07-13
Cable	None	10m Test Distance Cable	EVL	2022-11-28	2023-11-28
Analyzer - Spectrum Analyzer	Agilent	E4443A	AFB	2022-08-12	2023-08-12

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.7 dB	-1.7 dB

FREQUENCY RANGE INVESTIGATED

9 kHz TO 30 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

COED0013-1

MODES INVESTIGATED

13.56 MHz RFID, ISO/IEC 15693

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-01-12
Customer:	ConMed	Temperature:	21.2°C
Attendees:	None	Relative Humidity:	44.6%
Customer Project:	None	Bar. Pressure (PMSL):	1014 mb
Tested By:	Jeff Alcoke	Job Site:	EV11
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	4	Test Distance (m):	10	Ant. Height(s) (m):	1(m)

COMMENTS

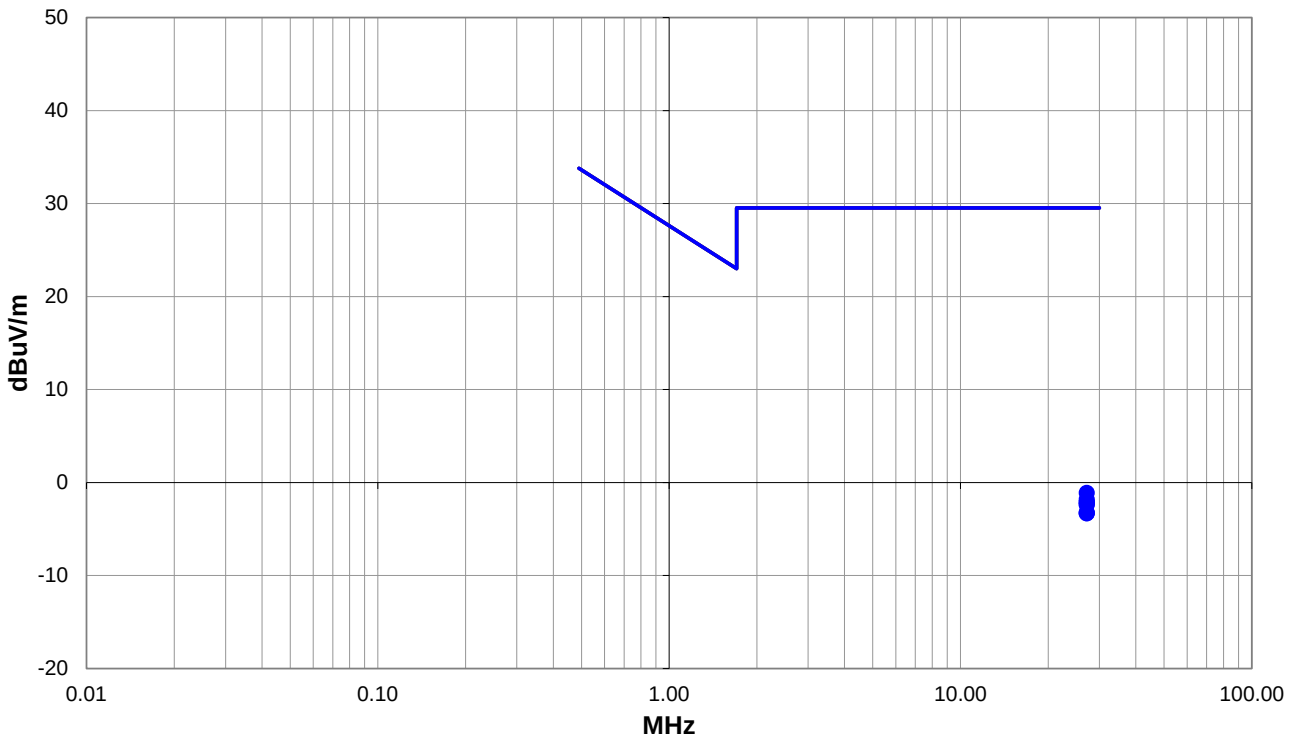
None

EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None



Run #: 4 ■ PK ◆ AV ● QP

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #4

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
27.110	7.8	10.2	1.0	360.0	10.0	0.0	Perp EUT	QP	-19.1	-1.1	29.5	-30.6	EUT Vert
27.118	7.1	10.2	1.0	363.0	10.0	0.0	Perp EUT	QP	-19.1	-1.8	29.5	-31.3	EUT on Side
27.120	6.8	10.2	1.0	245.0	10.0	0.0	Par GND	QP	-19.1	-2.1	29.5	-31.6	EUT Horz
27.120	6.8	10.2	1.0	65.0	10.0	0.0	Par GND	QP	-19.1	-2.1	29.5	-31.6	EUT on Side
27.121	6.6	10.2	1.0	166.0	10.0	0.0	Par GND	QP	-19.1	-2.3	29.5	-31.8	EUT Vert
27.118	6.5	10.2	1.0	133.0	10.0	0.0	Perp EUT	QP	-19.1	-2.4	29.5	-31.9	EUT Horz
27.124	5.7	10.2	1.0	15.0	10.0	0.0	Par EUT	QP	-19.1	-3.2	29.5	-32.7	EUT Horz
27.121	5.6	10.2	1.0	195.0	10.0	0.0	Par EUT	QP	-19.1	-3.3	29.5	-32.8	EUT on Side
27.123	5.6	10.2	1.0	213.0	10.0	0.0	Par EUT	QP	-19.1	-3.3	29.5	-32.8	EUT Vert

CONCLUSION

Pass

Tested By

SPURIOUS RADIATED EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Biconilog	Teseq	CBL 6141B	AXR	2022-11-01	2024-11-01
Cable	N/A	Bilog Cables	EVA	2022-11-03	2023-11-03
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	2022-11-03	2023-11-03
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	2022-12-19	2023-12-19

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	4.6 dB	-4.6 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

COED0013-1

MODES INVESTIGATED

13.56 MHz RFID, ISO/IEC 15693

SPURIOUS RADIATED EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	2023-01-13
Customer:	ConMed	Temperature:	19.6°C
Attendees:	None	Relative Humidity:	48.6%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mb
Tested By:	Jeff Alcoke	Job Site:	EV01
Power:	110VAC/60Hz	Configuration:	COED0013-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	6	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

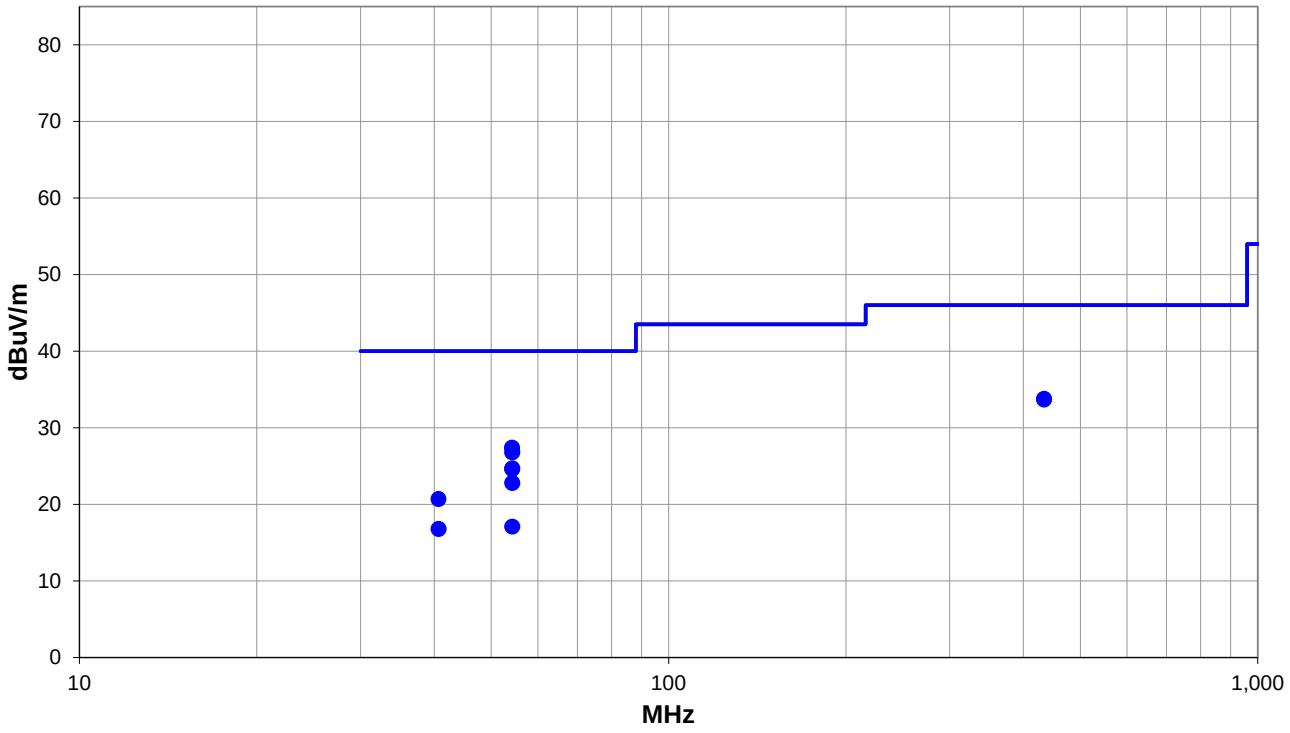
None

EUT OPERATING MODES

13.56 MHz RFID, ISO/IEC 15693

DEVIATIONS FROM TEST STANDARD

None



Run #: 6 ■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2022.07.28.0
EmiR5 2022.07.06.0
PSA-ESCI 2022.08.23.0

RESULTS - Run #6

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
433.912	30.6	3.2	0.99	147.0	3.0	0.0	Horz	QP	0.0	33.8	46.0	-12.2	EUT Horz
433.910	30.5	3.2	1.23	355.0	3.0	0.0	Vert	QP	0.0	33.7	46.0	-12.3	EUT Horz
54.233	32.4	-5.0	1.0	45.0	3.0	0.0	Vert	QP	0.0	27.4	40.0	-12.6	EUT Horz
54.261	31.8	-5.0	1.0	90.0	3.0	0.0	Vert	QP	0.0	26.8	40.0	-13.2	EUT on Side
54.277	29.7	-5.0	1.01	45.0	3.0	0.0	Vert	QP	0.0	24.7	40.0	-15.3	EUT Vert
54.241	29.6	-5.0	3.99	180.0	3.0	0.0	Horz	QP	0.0	24.6	40.0	-15.4	EUT Horz
54.258	27.8	-5.0	4.0	315.0	3.0	0.0	Horz	QP	0.0	22.8	40.0	-17.2	EUT on Side
40.675	19.4	1.3	0.99	154.0	3.0	0.0	Vert	QP	0.0	20.7	40.0	-19.3	EUT Horz
54.278	22.1	-5.0	4.0	308.0	3.0	0.0	Horz	QP	0.0	17.1	40.0	-22.9	EUT Vert
40.688	15.5	1.3	1.89	270.0	3.0	0.0	Horz	QP	0.0	16.8	40.0	-23.2	EUT Horz

CONCLUSION

Pass

Tested By

FREQUENCY STABILITY

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Transformer	Powerstat	236B	XFG	NCR	NCR
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-1-1-H/AC	TBI	NCR	NCR
Meter - Multimeter	Tektronix	DMM912	MMH	2022-03-02	2025-03-02
Thermometer	Omegaette	HH311	DTY	2021-02-04	2024-02-04
Probe - Near Field Set	EMCO	7405	IPD	NCR	NCR
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAW	2022-01-26	2023-01-26

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made on the single transmit frequency as called out on the data sheets. Testing was done while the EUT was continuously polling.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage while at ambient temperature. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range of -20 ° to +50° C and at 10°C intervals.

The requirement of a frequency tolerance of ±0.01% is equivalent to 100 ppm
The formula to check for compliance is:

ppm = (Measured Frequency / Measured Nominal Frequency - 1) * 1,000,000

FREQUENCY STABILITY

TbtTx 2022.06.03.0 XMit 2022.02.07.0

EUT:	PX5-120NF	Work Order:	COED0013
Serial Number:	SAMPLE 4...12	Date:	16-Jan-23
Customer:	ConMed	Temperature:	21.1 °C
Attendees:	None	Humidity:	41.1% RH
Project:	None	Barometric Pres.:	1011 mbar
Tested by:	Jeff Alcoke	Power: 110VAC/60Hz	Job Site: EV06

TEST SPECIFICATIONS	Test Method
FCC 15.225:2023	ANSI C63.10:2013

COMMENTS

None

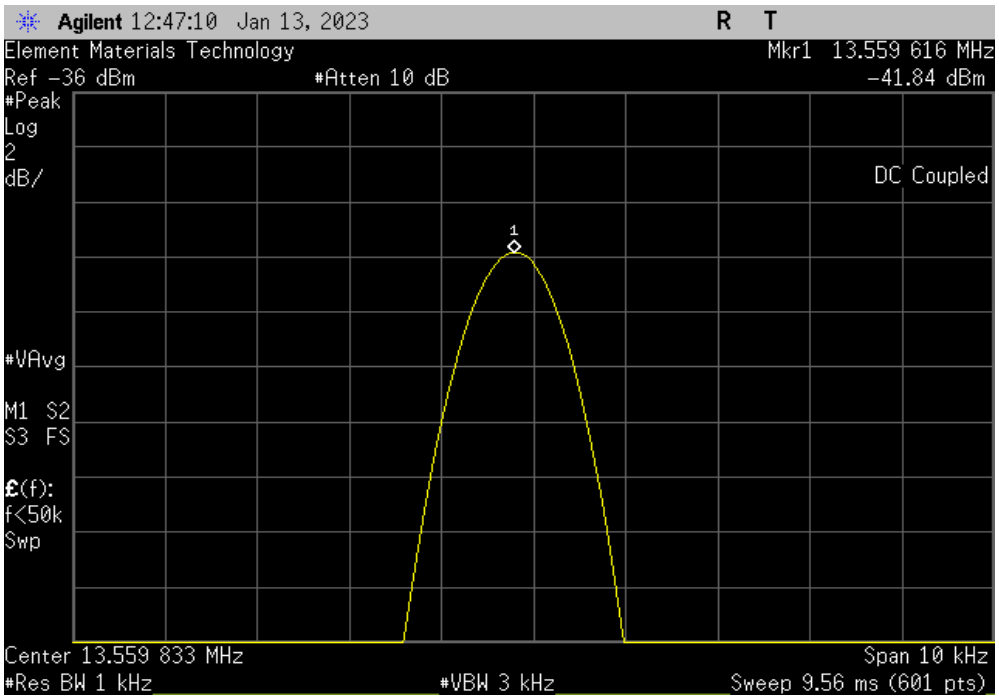
DEVIATIONS FROM TEST STANDARD

None

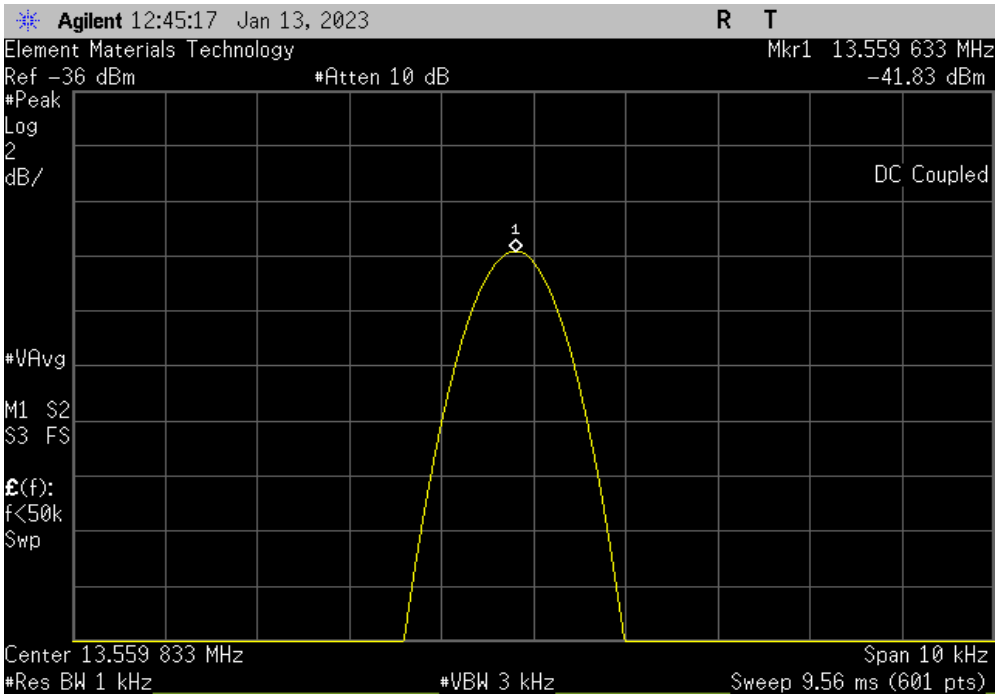
Configuration #	1	Signature

	Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.56 MHz RFID, ISO/IEC 15693					
Voltage: 115%	13.559616	13.559633	1	100	Pass
Voltage: 100%	13.559633	13.559633	0	100	Pass
Voltage: 85%	13.559633	13.559633	0	100	Pass
Temperature: +50°	13.55945	13.559633	13	100	Pass
Temperature: +40°	13.559483	13.559633	11	100	Pass
Temperature: +30°	13.559533	13.559633	7	100	Pass
Temperature: +20°	13.5596	13.559633	2	100	Pass
Temperature: +10°	13.559666	13.559633	2	100	Pass
Temperature: 0°	13.559733	13.559633	7	100	Pass
Temperature: -10°	13.5598	13.559633	12	100	Pass
Temperature: -20°	13.55985	13.559633	16	100	Pass
Temperature: -30°	13.559833	13.559633	15	100	Pass

13.56 MHz RFID, ISO/IEC 15693, Voltage: 115%						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559616	13.559633	1.25	100	Pass



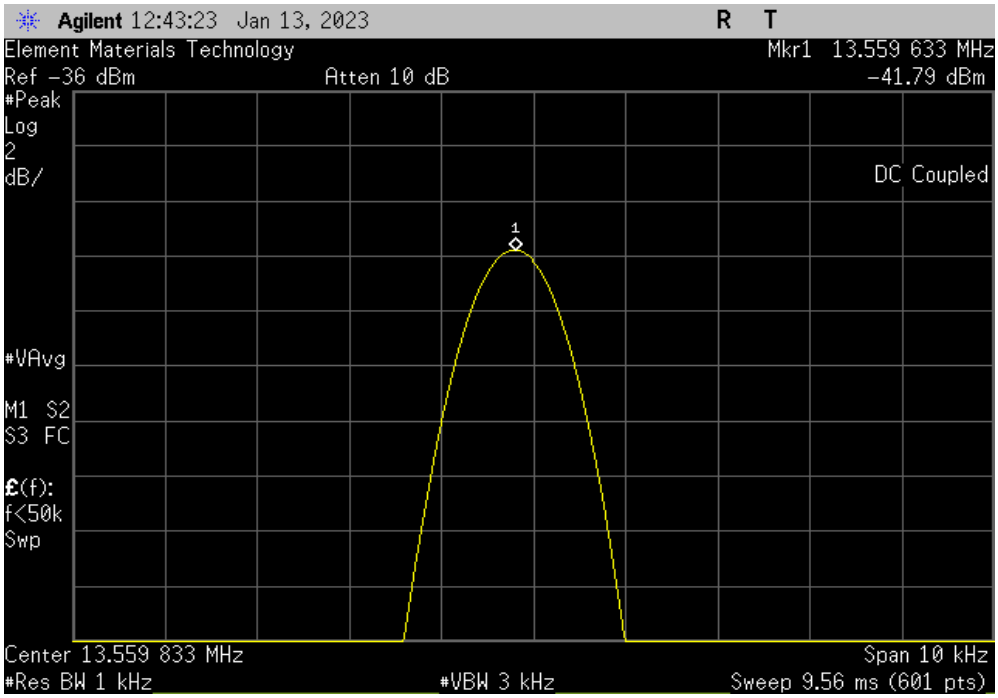
13.56 MHz RFID, ISO/IEC 15693, Voltage: 100%						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559633	13.559633	0.00	100	Pass



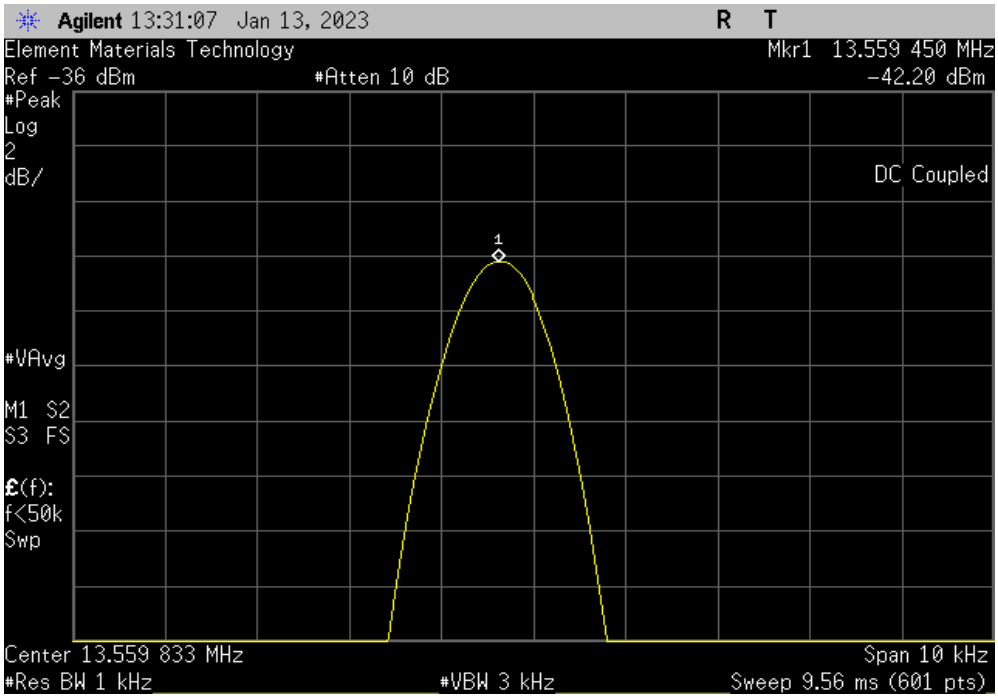
FREQUENCY STABILITY

TbtTx 2022.06.03.0 XMit 2022.02.07.0

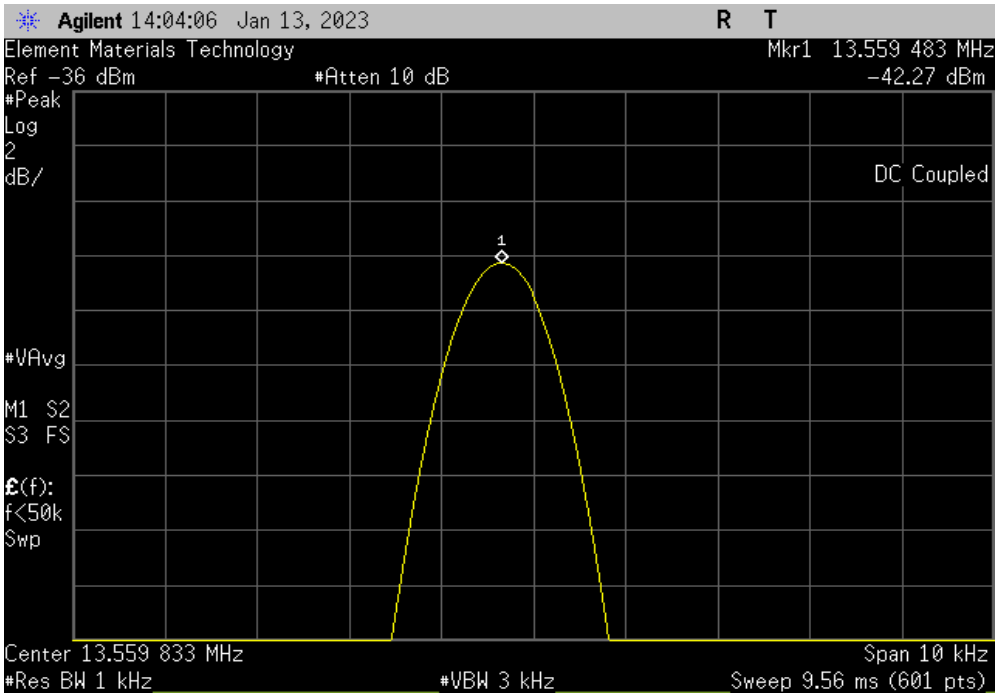
13.56 MHz RFID, ISO/IEC 15693, Voltage: 85%						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559633	13.559633	0.00	100	Pass



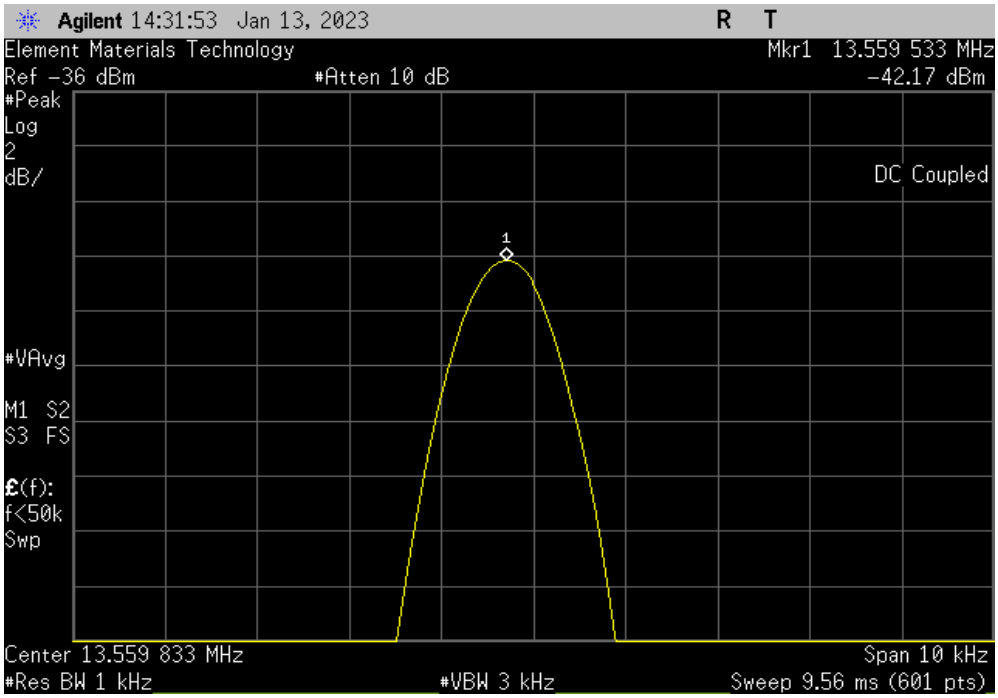
13.56 MHz RFID, ISO/IEC 15693, Temperature: +50°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.55945	13.559633	13.50	100	Pass



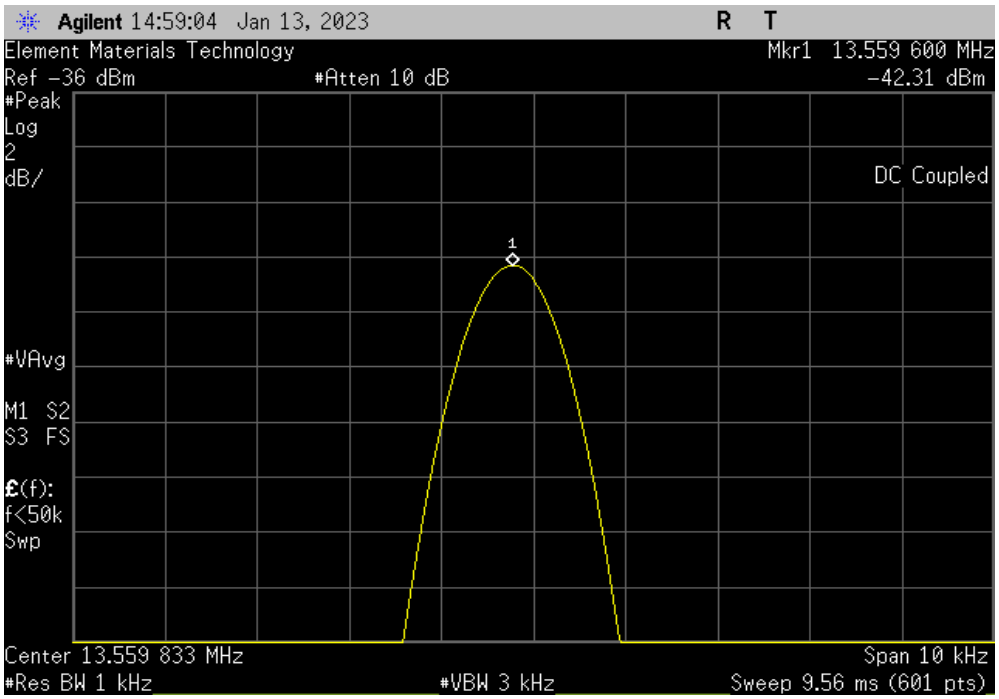
13.56 MHz RFID, ISO/IEC 15693, Temperature: +40°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559483	13.559633	11.06	100	Pass



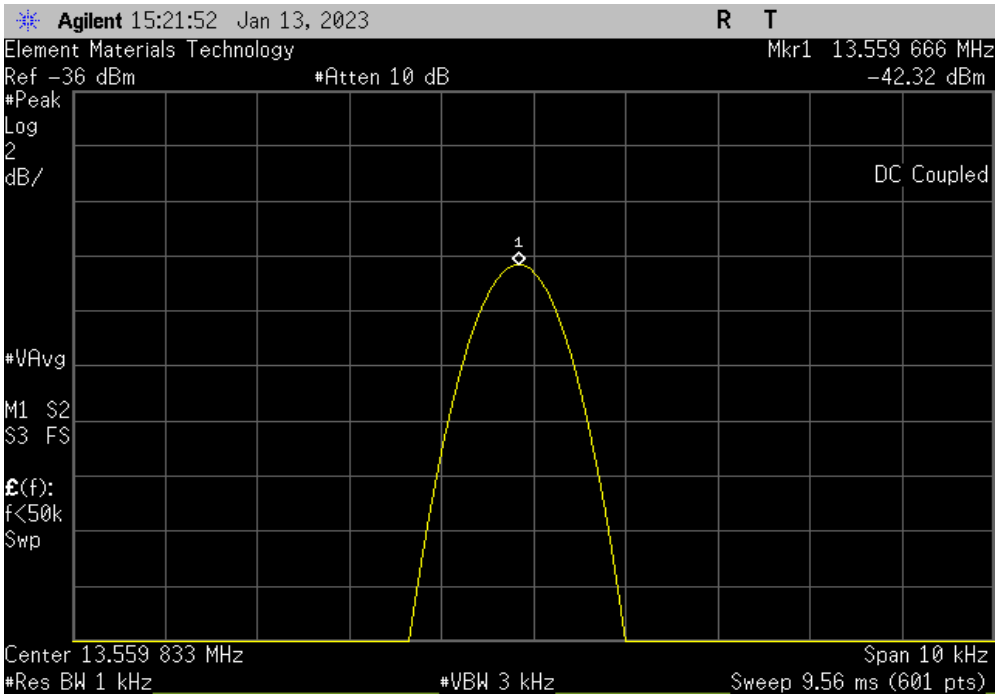
13.56 MHz RFID, ISO/IEC 15693, Temperature: +30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559533	13.559633	7.37	100	Pass



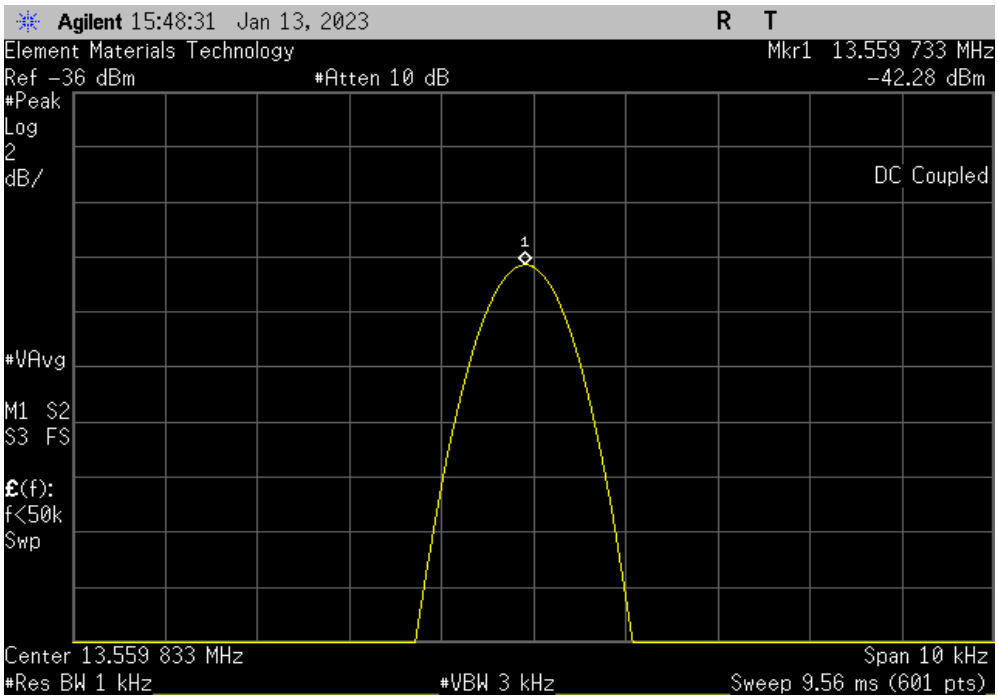
13.56 MHz RFID, ISO/IEC 15693, Temperature: +20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.5596	13.559633	2.43	100	Pass



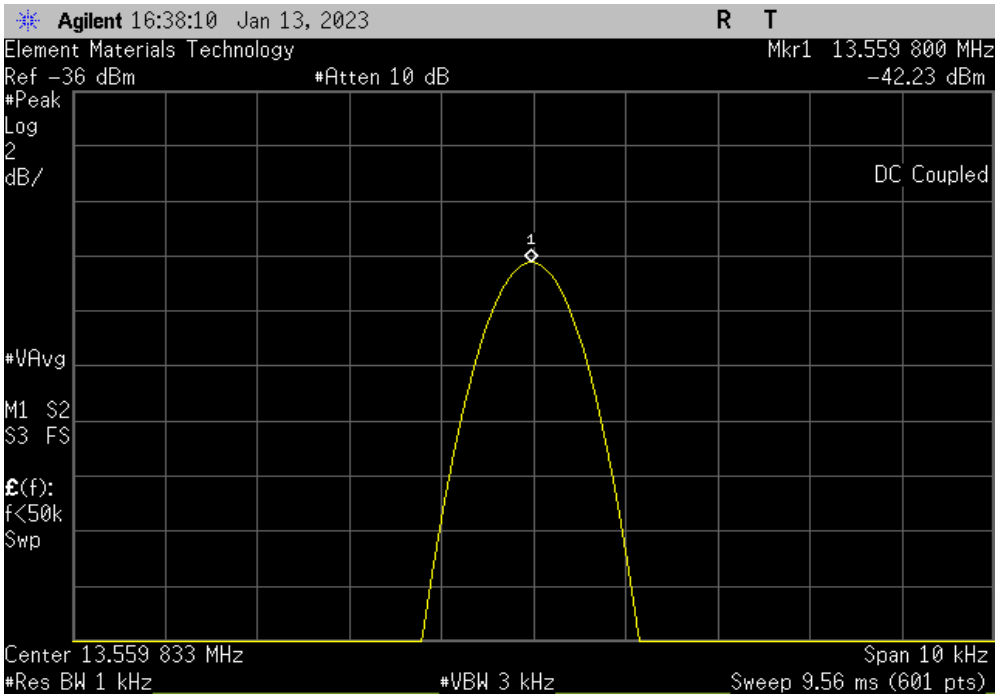
13.56 MHz RFID, ISO/IEC 15693, Temperature: +10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559666	13.559633	2.43	100	Pass



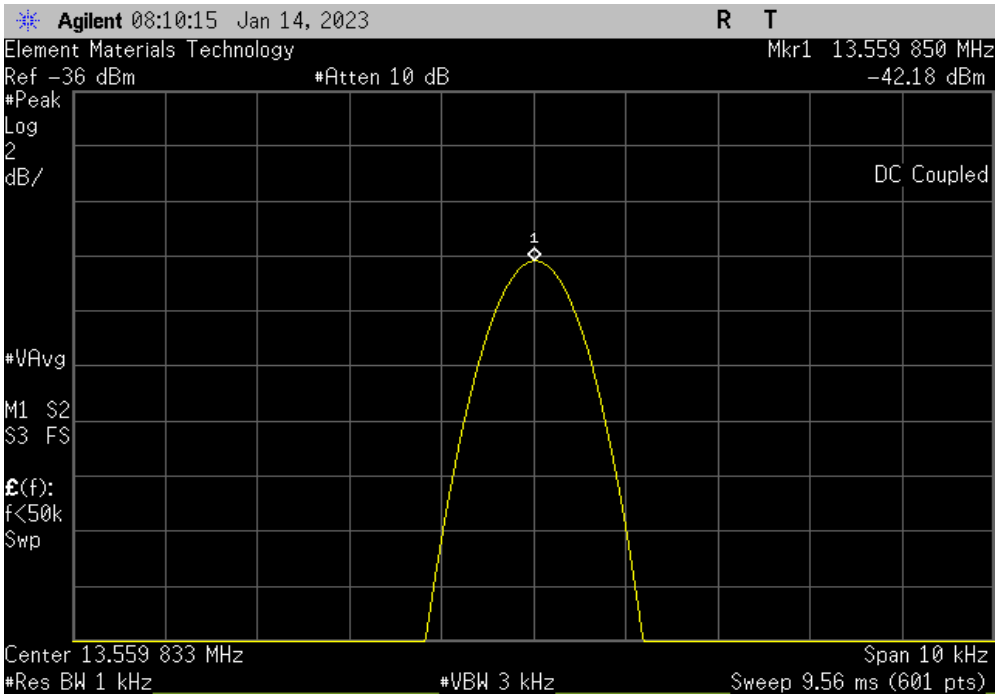
13.56 MHz RFID, ISO/IEC 15693, Temperature: 0°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559733	13.559633	7.37	100	Pass



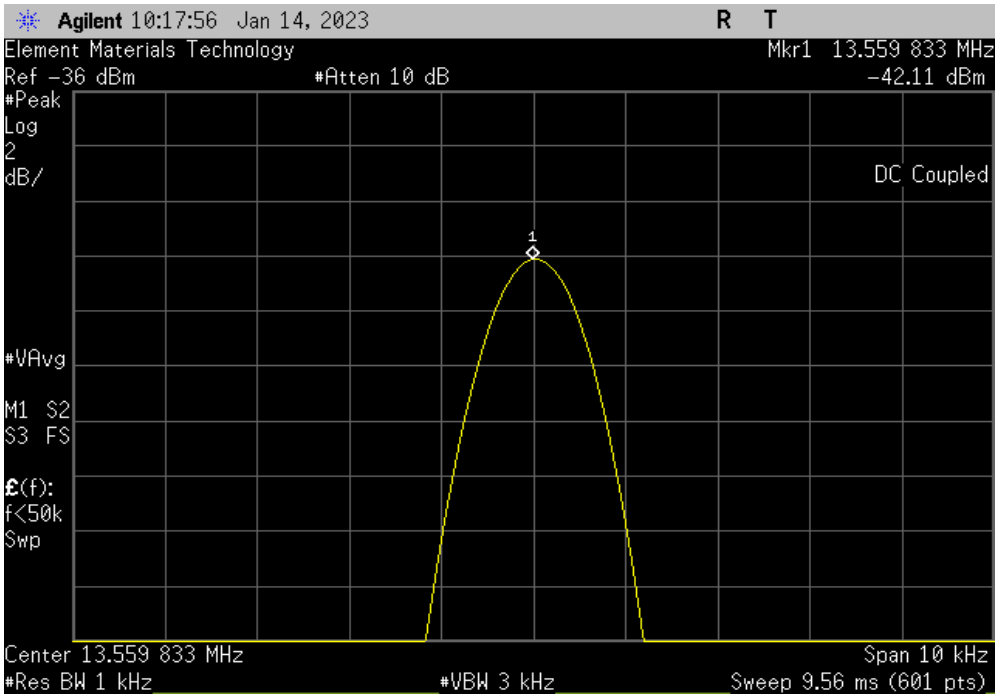
13.56 MHz RFID, ISO/IEC 15693, Temperature: -10°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.5598	13.559633	12.32	100	Pass



13.56 MHz RFID, ISO/IEC 15693, Temperature: -20°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.55985	13.559633	16.00	100	Pass



13.56 MHz RFID, ISO/IEC 15693, Temperature: -30°						
		Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
		13.559833	13.559633	14.75	100	Pass



EMISSIONS BANDWIDTH (20 dB)

XMit 2022.02.07.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	None	10m Test Distance Cable	EVL	2022-11-28	2023-11-28
Antenna - Loop	EMCO	6502	AOA	2022-07-13	2024-07-13
Analyzer - Spectrum Analyzer	Agilent	E4443A	AFB	2022-08-12	2023-08-12

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging.

Due to the amplitude of the carrier with respect to the modulated signal, the EUT was unable to meet the 1-5% RBW requirements when based off of the 20dB bandwidth. Therefore the 99% bandwidth was used to determine the RBW settings for the 20 dB bandwidth. This is considered worst case.

EMISSIONS BANDWIDTH (20 dB)

XMit 2022.02.07.0

EUT:	PX5-120NF			Work Order:	COED0013
Serial Number:	SAMPLE 4...12			Date:	12-Jan-23
Customer:	ConMed			Temperature:	20.6 °C
Attendees:	None			Humidity:	46.5% RH
Project:	None			Barometric Pres.:	1014 mbar
Tested by:	Jeff Alcoke	Power:	110VAC/60Hz	Job Site:	EV11

TEST SPECIFICATIONS	Test Method
FCC 15.225:2023	ANSI C63.10:2013

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

	20dB BW Value (kHz)	Limit	Result
13.56 MHz RFID, ISO/IEC 15693	122.8	N/A	Pass

EMISSIONS BANDWIDTH (20 dB)

XMit 2022.02.07.0

13.56 MHz RFID, ISO/IEC 15693						
				20dB BW Value (kHz)	Limit	Result
				122.8	N/A	Pass

End of Test Report