Phillips & Temro Industries, Inc.

Evocharge Pro

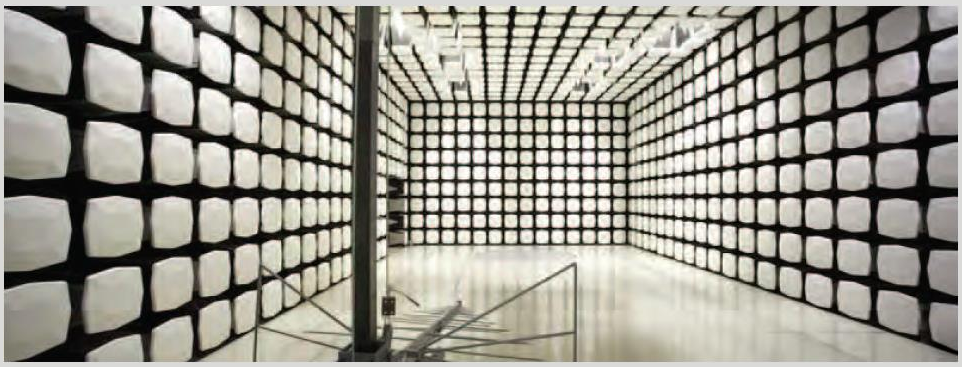
FCC 15.225:2025

RSS-210 Issue 11:2024

RSS-Gen Issue 5:2018+A1:2019+A2:2021

13.56 MHz Radio

Report: PLIP0013.0 Rev. 1, Issue Date: February 5, 2025



ACCREDITED
CERT #3310.02

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element
2023.04.17

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CERTIFICATE OF TEST

Last Date of Test: December 11, 2024
Phillips & Temro Industries, Inc.
EUT: Evocharge Pro

Radio Equipment Testing

Standards

Specification	Method
FCC 15.225:2025	ANSI C63.10:2013
FCC 15.207:2025	
RSS-210 Issue 11:2024	
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Note: FCC 15.247 and FCC 15.207 have been updated superseding prior issues. The changes between the specifications do not affect the results of the prior testing. The manufacturer attests that no changes have been made to the product.

Guidance

KDB 174176
Notice 2020 - DRS0023

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions	Pass	15.207	RSS-Gen 8.8	6.2	
Emissions Bandwidth (20 dB)	Pass	15.215(c)	N/A	6.9.2	
Field Strength of Fundamental	Pass	15.225(a)-(c)	RSS-210 B.6(a)(i-iv)	6.4	
Field Strength of Spurious Emissions (Less Than 30 MHz)	Pass	15.225(d), 15.209	RSS-210 B.6(a)(iv)	6.4	
Field Strength of Spurious Emissions (Greater Than 30 MHz)	Pass	15.225(d), 15.209	RSS-210 B.6(a)(iv)	6.5	
Frequency Stability	Pass	15.225(e), 15.31(e), 15.215(c), 2.1055	RSS-210 B.6(b)	6.8	
Occupied Bandwidth (99%)	Pass	N/A	RSS-Gen 6.7	6.9.3	

Deviations From Test Standards

None

Approved By:

Cole Ghizzone, Operations Manager
Signed for and on behalf of Element

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 FCC 15.225 specification year	2025-02-04	1
	Updated FCC 15.225 specification year added FCC 15.207:2025 and added gap analysis note of equivalency.		3
	Removed duplicate tabular data table.		29
	Added voltage values for extreme test conditions		41
	Updated data and test equipment. Updated modification log to reflect change in test date.		13, 45 - 48

ACCREDITATIONS AND AUTHORIZATIONS

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

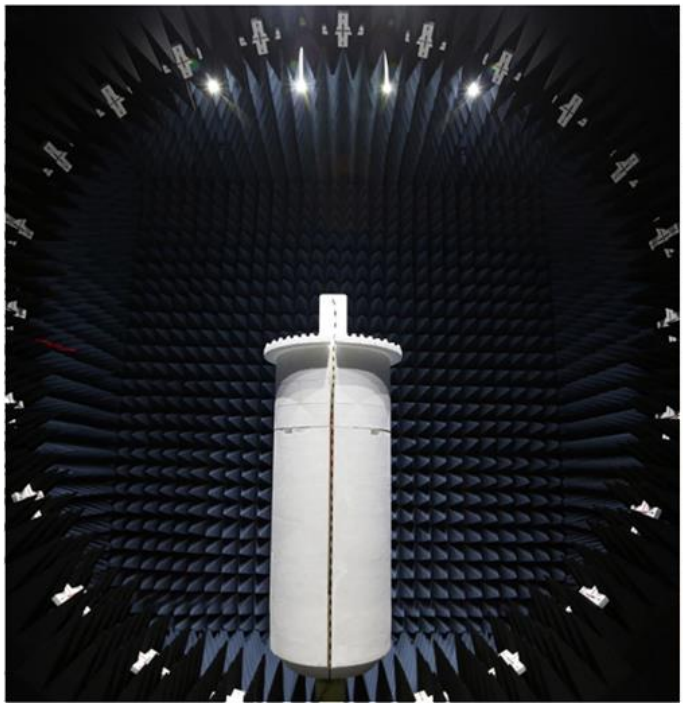
element
2025.01.03

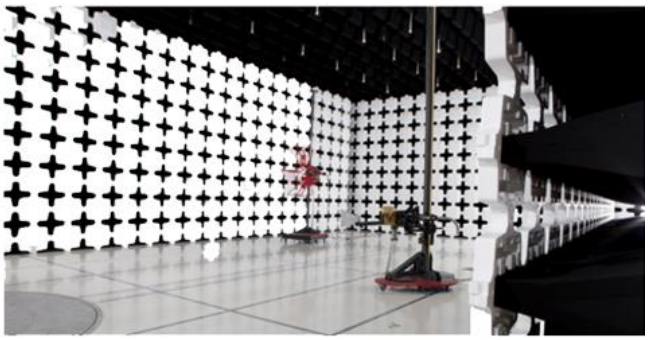
Testing was performed at the following location(s)

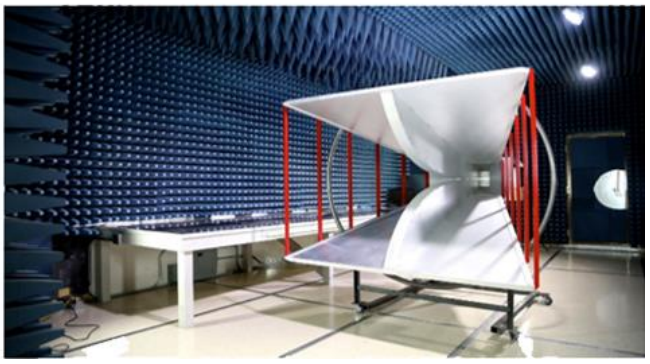
	Location	Labs (1)	Address	A2LA (2)	ISED (3)	BSMI (4)	VCCI (5)	CAB (6)	FDA (7)
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☐	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☒	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☐	Plano Texas	PT01-15	1701 E Plano Pkwy, Ste 150 Plano, TX 75074 (972) 509-2566	214.19	32637	SL2-IN-E-057R	A-0426	US0054	TL-137
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

(1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
(2) A2LA Certificate No.
(3) ISED Company No.
(4) BSMI No.
(5) VCCI Site Filing No.
(6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MOC, NCC, OFCA
(7) FDA ASCA No.







MEASUREMENT UNCERTAINTY

element
MU 2024-12-12

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 reported is based on statistical analysis that was performed by the laboratory. 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.

Various Measurements

Test	All Labs (+/-)
Frequency Accuracy (%)	0.0007
Amplitude Accuracy (dB)	1.2
Conducted Power (dB)	1.2
Radiated Power via Substitution (dB)	0.7
Temperature (degrees C)	0.7
Humidity (% RH)	2.5
Voltage (AC) (%)	1
Voltage (DC) (%)	0.7

Field Strength Measurements (dB)

Range	EV11 (+/-)
10kHz-30MHz	1.7
30MHz-1GHz 3m	4.8
30MHz-1GHz 10m	3.8
1GHz-6GHz	5.1
6GHz-40GHz	5.2

AC Powerline Conducted Emissions Measurements (dB)

Range	EV07 (+/-)
9kHz-150kHz LISN	3.6
150kHz-30MHz LISN	3.2
150kHz-30MHz CVP	3.2
150kHz-30MHz Telecom-ISN	4.4

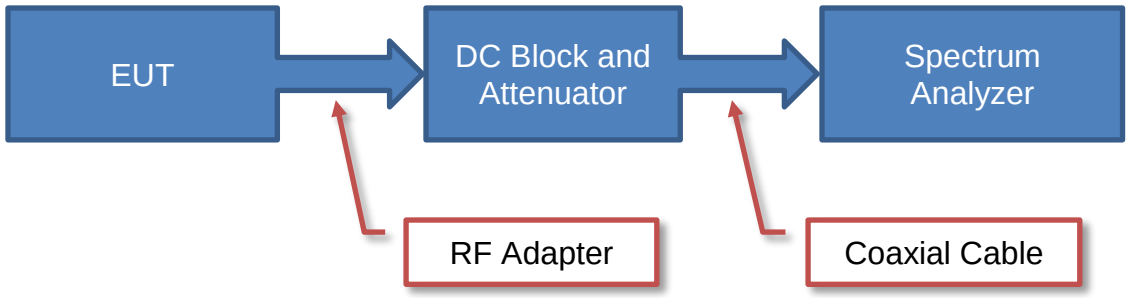
TEST SETUP BLOCK DIAGRAMS

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.

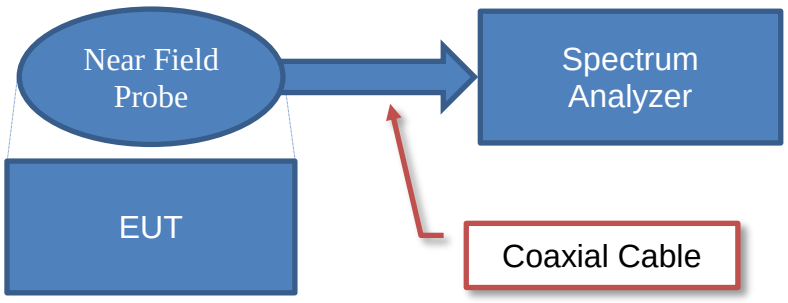
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

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

Near Field Test Fixture Measurements

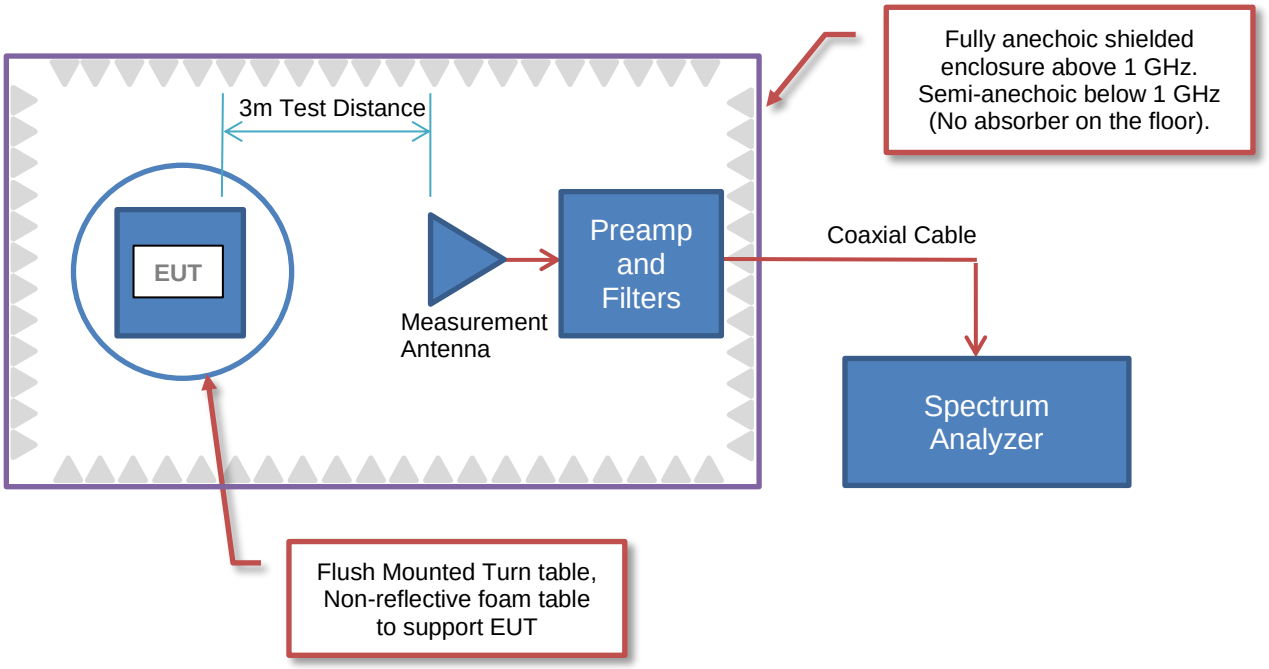


Sample Calculation (logarithmic units)

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**

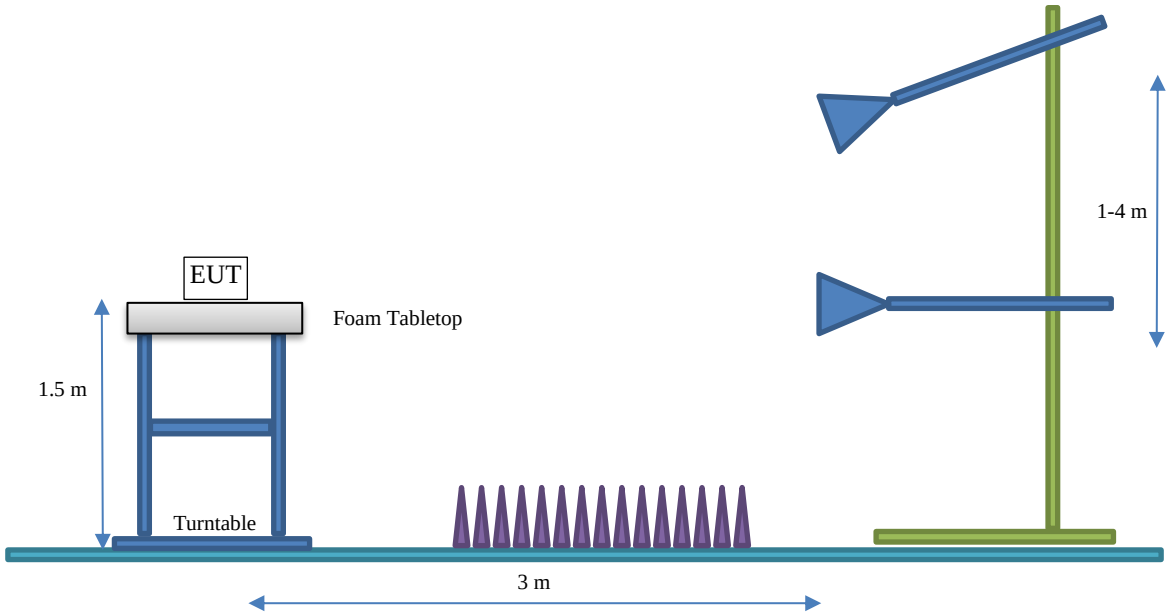
Radiated Power (ERP/EIRP) – Substitution Method:

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:	Phillips & Temro Industries, Inc.
Address:	9700 W 74th Street
City, State, Zip:	Eden Prairie, MN 55344
Test Requested By:	Jeff Martell
EUT:	Evocharge Pro
First Date of Test:	December 3, 2024
Last Date of Test:	December 11, 2024
Receipt Date of Samples:	December 3, 2024
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Electric vehicle charger with Wi-Fi/BT radio, cellular radio and 13.56 MHz NFC radio. Contains FCC ID 2BEYO-HEVSE50 (Wi-Fi/BT)

Testing Objective:
To demonstrate compliance of the 13.56 MHz radio to FCC 15.225 requirements. and RSS-210 Annex B.6 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 GAIN (dBi)

Type	Geometry (in)	Frequency Range (MHz)	Provided by:
Loop – Copper Trace	1.57 x 1.57 (4 Turns)	13.56	Phillips & Temro Industries, Inc.

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

☒ Test software settings Software / firmware used for testing: 7.8.214
☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Types	Power Setting (mA)
ISO/IEC 14443 ASK	15

CONFIGURATIONS

Configuration PLIP0013-2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wallmount EV Charger	Phillips & Temro Industries, Inc.	Evocharge Pro	ENG 598R

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	1.0	No	Wallmount EV Charger	AC Power
EV Charge Cable	No	5.3	No	Wallmount EV Charger	Untermintated
Cat 6	No	4.6	No	Wallmount EV Charger	Gigabit Switch

Configuration PLIP0013-3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wallmount EV Charger	Phillips & Temro Industries, Inc.	Evocharge Pro	ST0243020012

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	1.0	No	Wallmount EV Charger	AC Power
EV Charge Cable	No	5.3	No	Wallmount EV Charger	Untermintated
Cat 6	No	4.6	No	Wallmount EV Charger	Gigabit Switch

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2024-12-03	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.
2	2024-12-03	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	2024-12-05	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.
4	2024-12-09	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.
5	2024-12-11	Powerline Conducted Emissions	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	2024-12-05	Occupied Bandwidth (99%)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2024-12-11	Emissions Bandwidth (20 dB)	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.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

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 and RSS-Gen Table 4 limits, the following guidance can be used:

FCC KDB 174176 D01 AC Conducted FAQ v01r01, June 3, 2015 Section Q5 and RSS-Gen Clause 8.8:

> 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 and RSS-Gen Table 4 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 and RSS-Gen Table 4 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	2024-05-22	2025-05-22
Cable - Conducted Cable Assembly	Northwest EMC	EVG, HHD, RKT, VAB	EVGA	2024-04-19	2025-04-19
LISN	Solar Electronics	9252-50-R-24-BNC	LIR	2024-09-13	2025-09-13

CONFIGURATIONS INVESTIGATED

PLIP0013-2
PLIP0013-3

MODES INVESTIGATED

ISO/IEC 14443, 13.56 MHz RFID, ASK

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-11
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

TEST PARAMETERS

Run #:	5	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

Unable to bundle EV charge cable due to excessive stiffness and length.

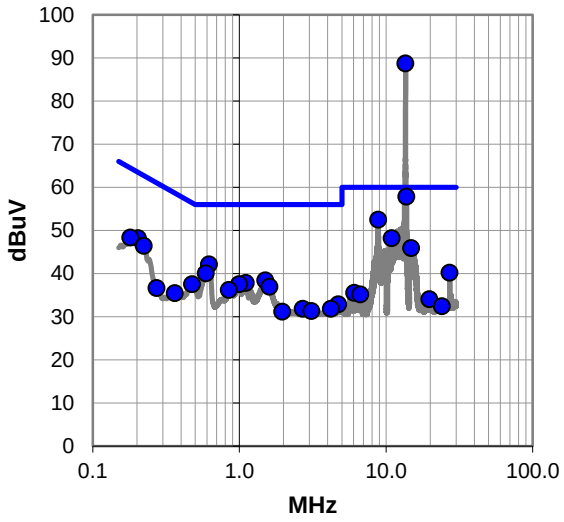
EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

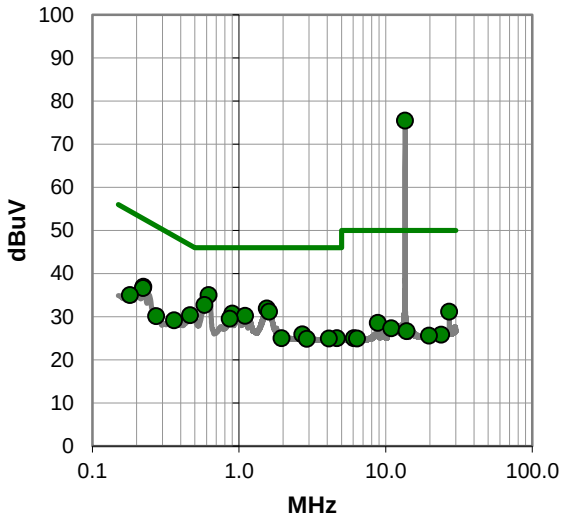
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	67.8	20.9	88.7	N/A	N/A
13.772	36.9	20.9	57.8	N/A	N/A
8.835	32.0	20.5	52.5	60.0	-7.5
10.915	27.5	20.7	48.2	60.0	-11.8
0.621	22.2	19.9	42.1	56.0	-13.9
14.818	24.9	21.0	45.9	60.0	-14.1
0.203	28.2	20.0	48.2	63.5	-15.3
0.589	20.1	19.9	40.0	56.0	-16.0
0.181	28.3	20.0	48.3	64.5	-16.2
0.223	26.4	20.0	46.4	62.7	-16.3
1.505	18.4	20.0	38.4	56.0	-17.6
1.104	17.8	20.0	37.8	56.0	-18.2
0.997	17.5	20.0	37.5	56.0	-18.5
0.475	17.6	19.9	37.5	56.4	-18.9
1.604	16.9	20.0	36.9	56.0	-19.1
27.120	18.2	22.0	40.2	60.0	-19.8
0.846	16.3	19.9	36.2	56.0	-19.8
4.712	12.5	20.3	32.8	56.0	-23.2
0.362	15.5	19.9	35.4	58.7	-23.3
2.706	11.7	20.1	31.8	56.0	-24.2
4.199	11.5	20.3	31.8	56.0	-24.2
0.272	16.7	19.9	36.6	61.1	-24.5
6.072	15.2	20.3	35.5	60.0	-24.5
3.096	11.2	20.1	31.3	56.0	-24.7
1.958	11.1	20.0	31.1	56.0	-24.9

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	54.5	20.9	75.4	N/A	N/A
0.621	15.1	19.9	35.0	46.0	-11.0
0.580	12.8	19.9	32.7	46.0	-13.3
1.549	11.9	20.0	31.9	46.0	-14.1
1.604	11.1	20.0	31.1	46.0	-14.9
0.902	10.7	20.0	30.7	46.0	-15.3
0.223	16.9	20.0	36.9	52.7	-15.8
1.102	10.2	20.0	30.2	46.0	-15.8
0.222	16.6	20.0	36.6	52.8	-16.2
0.464	10.4	19.9	30.3	46.6	-16.3
0.864	9.6	19.9	29.5	46.0	-16.5
27.120	9.1	22.0	31.1	50.0	-18.9
0.181	15.0	20.0	35.0	54.5	-19.5
0.361	9.2	19.9	29.1	48.7	-19.6
2.706	5.8	20.1	25.9	46.0	-20.1
0.272	10.2	19.9	30.1	51.1	-21.0
1.954	5.0	20.0	25.0	46.0	-21.0
4.654	4.7	20.3	25.0	46.0	-21.0
4.096	4.6	20.3	24.9	46.0	-21.1
2.907	4.7	20.1	24.8	46.0	-21.2
8.838	8.0	20.5	28.5	50.0	-21.5
10.915	6.6	20.7	27.3	50.0	-22.7
13.931	5.7	20.9	26.6	50.0	-23.4
23.914	4.1	21.7	25.8	50.0	-24.2
19.729	4.3	21.3	25.6	50.0	-24.4

CONCLUSION

N/A

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-11
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

TEST PARAMETERS

Run #:	6	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

Unable to bundle EV charge cable due to excessive stiffness and length.

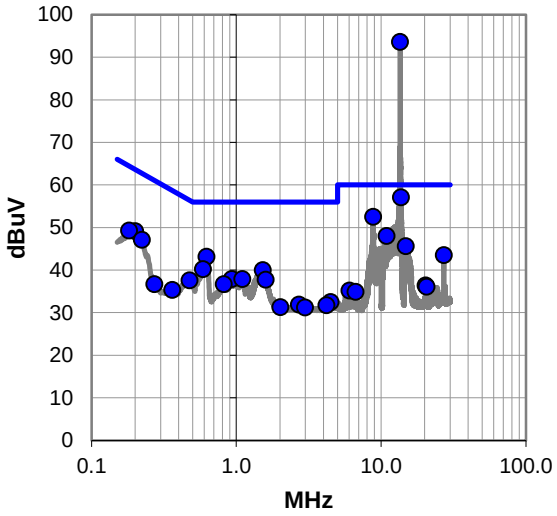
EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

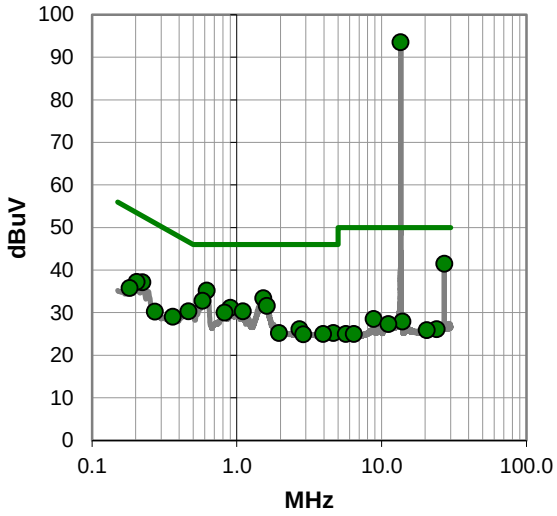
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	72.7	20.9	93.6	N/A	N/A
13.772	36.2	20.9	57.1	N/A	N/A
8.836	32.0	20.5	52.5	60.0	-7.5
10.915	27.3	20.7	48.0	60.0	-12.0
0.625	23.2	19.9	43.1	56.0	-12.9
14.818	24.6	21.0	45.6	60.0	-14.4
0.200	29.1	20.0	49.1	63.6	-14.5
0.182	29.3	20.0	49.3	64.4	-15.1
0.223	27.1	20.0	47.1	62.7	-15.6
0.589	20.3	19.9	40.2	56.0	-15.8
1.525	20.0	20.0	40.0	56.0	-16.0
27.120	21.5	22.0	43.5	60.0	-16.5
0.933	17.9	20.0	37.9	56.0	-18.1
1.102	17.9	20.0	37.9	56.0	-18.1
1.596	17.7	20.0	37.7	56.0	-18.3
0.475	17.7	19.9	37.6	56.4	-18.8
0.820	16.8	19.9	36.7	56.0	-19.3
0.361	15.4	19.9	35.3	58.7	-23.4
4.494	12.2	20.3	32.5	56.0	-23.5
20.310	15.1	21.3	36.4	60.0	-23.6
20.684	14.7	21.4	36.1	60.0	-23.9
2.706	11.8	20.1	31.9	56.0	-24.1
4.198	11.4	20.3	31.7	56.0	-24.3
0.272	16.8	19.9	36.7	61.1	-24.4
2.022	11.3	20.0	31.3	56.0	-24.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	72.6	20.9	93.5	N/A	N/A
27.120	19.5	22.0	41.5	50.0	-8.5
0.620	15.3	19.9	35.2	46.0	-10.8
1.526	13.4	20.0	33.4	46.0	-12.6
0.580	12.9	19.9	32.8	46.0	-13.2
1.613	11.6	20.0	31.6	46.0	-14.4
0.902	11.1	20.0	31.1	46.0	-14.9
0.223	17.1	20.0	37.1	52.7	-15.6
1.102	10.3	20.0	30.3	46.0	-15.7
0.824	10.1	19.9	30.0	46.0	-16.0
0.203	17.2	20.0	37.2	53.5	-16.3
0.464	10.4	19.9	30.3	46.6	-16.3
0.182	15.8	20.0	35.8	54.4	-18.6
0.361	9.1	19.9	29.0	48.7	-19.7
2.706	6.0	20.1	26.1	46.0	-19.9
1.955	5.2	20.0	25.2	46.0	-20.8
4.654	4.9	20.3	25.2	46.0	-20.8
0.272	10.3	19.9	30.2	51.1	-20.9
3.957	4.7	20.3	25.0	46.0	-21.0
2.881	4.8	20.1	24.9	46.0	-21.1
8.835	8.0	20.5	28.5	50.0	-21.5
13.933	7.0	20.9	27.9	50.0	-22.1
11.136	6.6	20.7	27.3	50.0	-22.7
24.021	4.4	21.7	26.1	50.0	-23.9
20.507	4.5	21.4	25.9	50.0	-24.1

CONCLUSION

N/A

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ST0243020012	Date:	2024-12-11
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	208VAC/60Hz	Configuration:	PLIP0013-3

TEST PARAMETERS

Run #:	7	Line:	Neutral	Add. Ext. Attenuation (dB):	0

COMMENTS

RFID antenna terminated with representative dummy load. Unable to bundle EV charge cable due to excessive stiffness and length.

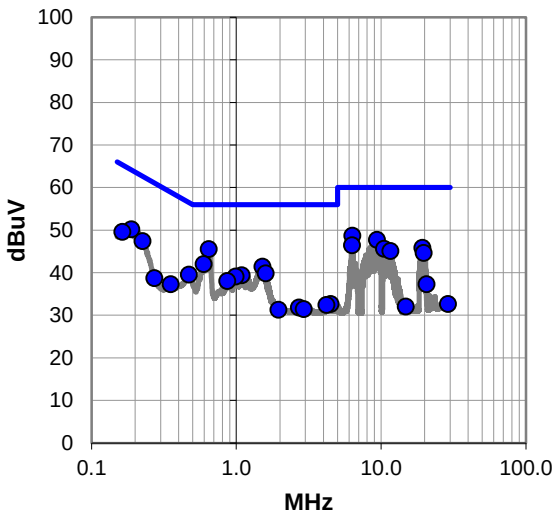
EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

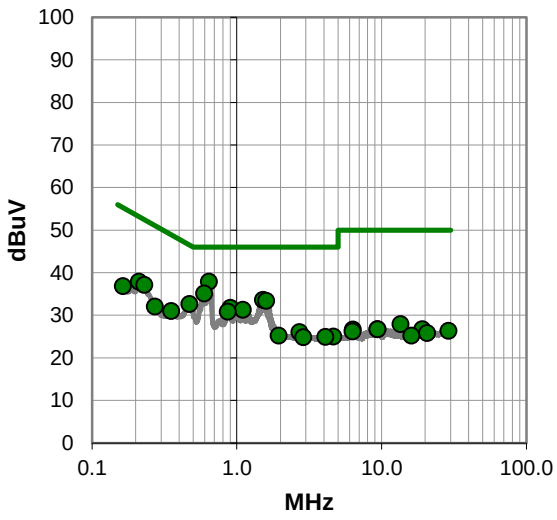
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #7

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.644	25.6	19.9	45.5	56.0	-10.5
6.349	28.4	20.3	48.7	60.0	-11.3
9.377	27.2	20.5	47.7	60.0	-12.3
6.319	26.1	20.3	46.4	60.0	-13.6
0.188	30.2	20.0	50.2	64.1	-13.9
0.596	22.1	19.9	42.0	56.0	-14.0
19.342	24.5	21.3	45.8	60.0	-14.2
10.498	24.9	20.7	45.6	60.0	-14.4
1.516	21.4	20.0	41.4	56.0	-14.6
11.619	24.4	20.7	45.1	60.0	-14.9
0.225	27.4	20.0	47.4	62.6	-15.2
19.728	23.3	21.3	44.6	60.0	-15.4
0.164	29.5	20.1	49.6	65.3	-15.7
1.598	19.8	20.0	39.8	56.0	-16.2
1.093	19.4	20.0	39.4	56.0	-16.6
0.989	19.1	20.0	39.1	56.0	-16.9
0.472	19.6	19.9	39.5	56.5	-17.0
0.866	18.1	19.9	38.0	56.0	-18.0
0.353	17.4	19.9	37.3	58.9	-21.6
0.272	18.8	19.9	38.7	61.1	-22.4
20.689	15.9	21.4	37.3	60.0	-22.7
4.492	12.3	20.3	32.6	56.0	-23.4
4.199	12.1	20.3	32.4	56.0	-23.6
2.706	11.7	20.1	31.8	56.0	-24.2
2.928	11.3	20.1	31.4	56.0	-24.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.641	18.0	19.9	37.9	46.0	-8.1
0.596	15.2	19.9	35.1	46.0	-10.9
1.516	13.6	20.0	33.6	46.0	-12.4
1.598	13.4	20.0	33.4	46.0	-12.6
0.472	12.7	19.9	32.6	46.5	-13.9
0.902	11.7	20.0	31.7	46.0	-14.3
1.104	11.3	20.0	31.3	46.0	-14.7
0.866	10.9	19.9	30.8	46.0	-15.2
0.211	17.9	20.0	37.9	53.2	-15.3
0.229	17.1	20.0	37.1	52.5	-15.4
0.353	11.1	19.9	31.0	48.9	-17.9
0.164	16.7	20.1	36.8	55.3	-18.5
0.272	12.1	19.9	32.0	51.1	-19.1
2.706	5.9	20.1	26.0	46.0	-20.0
1.952	5.2	20.0	25.2	46.0	-20.8
4.653	4.7	20.3	25.0	46.0	-21.0
4.097	4.6	20.3	24.9	46.0	-21.1
2.887	4.7	20.1	24.8	46.0	-21.2
13.560	7.0	20.9	27.9	50.0	-22.1
9.377	6.2	20.5	26.7	50.0	-23.3
9.398	6.2	20.5	26.7	50.0	-23.3
19.145	5.4	21.3	26.7	50.0	-23.3
6.349	6.3	20.3	26.6	50.0	-23.4
28.989	4.0	22.3	26.3	50.0	-23.7
6.317	5.9	20.3	26.2	50.0	-23.8

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ST0243020012	Date:	2024-12-11
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Jeff Alcoke	Job Site:	EV07
Power:	208VAC/60Hz	Configuration:	PLIP0013-3

TEST PARAMETERS

Run #:	8	Line:	High Line	Add. Ext. Attenuation (dB):	0

COMMENTS

RFID antenna terminated with representative dummy load. Unable to bundle EV charge cable due to excessive stiffness and length.

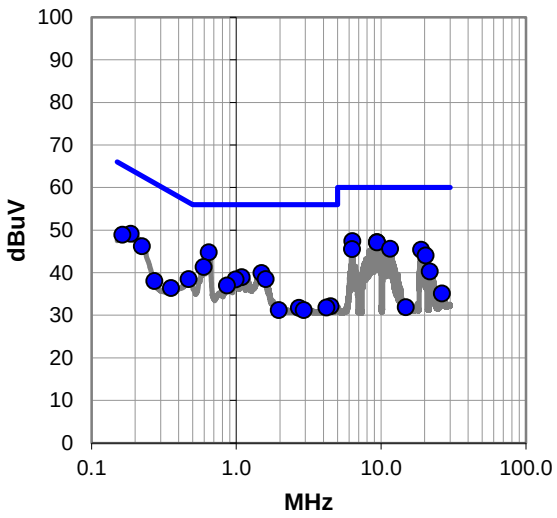
EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

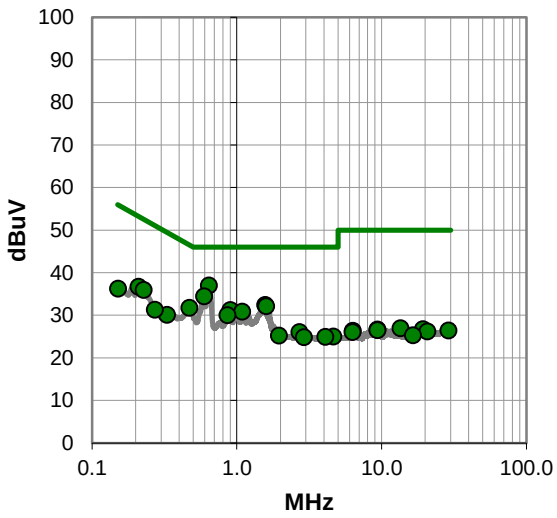
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #8

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.644	24.9	19.9	44.8	56.0	-11.2
6.346	27.1	20.3	47.4	60.0	-12.6
9.399	26.7	20.5	47.2	60.0	-12.8
9.377	26.6	20.5	47.1	60.0	-12.9
11.546	24.9	20.7	45.6	60.0	-14.4
6.319	25.2	20.3	45.5	60.0	-14.5
18.937	24.1	21.3	45.4	60.0	-14.6
0.596	21.4	19.9	41.3	56.0	-14.7
0.187	29.1	20.0	49.1	64.2	-15.1
20.310	22.7	21.3	44.0	60.0	-16.0
1.491	19.9	20.0	39.9	56.0	-16.1
0.164	28.8	20.1	48.9	65.3	-16.4
0.223	26.2	20.0	46.2	62.7	-16.5
1.093	18.9	20.0	38.9	56.0	-17.1
1.596	18.5	20.0	38.5	56.0	-17.5
0.991	18.4	20.0	38.4	56.0	-17.6
0.467	18.6	19.9	38.5	56.6	-18.1
0.864	17.1	19.9	37.0	56.0	-19.0
21.681	18.9	21.4	40.3	60.0	-19.7
0.354	16.5	19.9	36.4	58.9	-22.5
0.272	18.1	19.9	38.0	61.1	-23.1
4.492	11.8	20.3	32.1	56.0	-23.9
4.196	11.5	20.3	31.8	56.0	-24.2
2.706	11.6	20.1	31.7	56.0	-24.3
1.963	11.2	20.0	31.2	56.0	-24.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.643	17.1	19.9	37.0	46.0	-9.0
0.596	14.5	19.9	34.4	46.0	-11.6
1.577	12.4	20.0	32.4	46.0	-13.6
1.596	12.1	20.0	32.1	46.0	-13.9
0.470	11.8	19.9	31.7	46.5	-14.8
0.902	11.2	20.0	31.2	46.0	-14.8
1.093	10.8	20.0	30.8	46.0	-15.2
0.864	10.1	19.9	30.0	46.0	-16.0
0.210	16.7	20.0	36.7	53.2	-16.5
0.228	15.9	20.0	35.9	52.5	-16.6
0.330	10.2	19.9	30.1	49.5	-19.4
0.152	16.0	20.2	36.2	55.9	-19.7
0.272	11.4	19.9	31.3	51.1	-19.8
2.706	5.9	20.1	26.0	46.0	-20.0
1.955	5.2	20.0	25.2	46.0	-20.8
4.656	4.7	20.3	25.0	46.0	-21.0
4.094	4.6	20.3	24.9	46.0	-21.1
2.907	4.7	20.1	24.8	46.0	-21.2
13.560	6.0	20.9	26.9	50.0	-23.1
19.342	5.4	21.3	26.7	50.0	-23.3
9.399	6.1	20.5	26.6	50.0	-23.4
9.375	6.0	20.5	26.5	50.0	-23.5
29.072	4.1	22.3	26.4	50.0	-23.6
6.348	6.0	20.3	26.3	50.0	-23.7
20.704	4.8	21.4	26.2	50.0	-23.8

CONCLUSION

Pass

Tested By

EMISSIONS BANDWIDTH (20 DB)

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0

TEST DESCRIPTION

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.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer.

As defined in FCC 15.215 Part (c), intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise by specified in the specific rule section under which the equipment operates, is contained within the frequency band designed in the rule section under which the equipment is operated.

The 20 dB bandwidth must be contained within the band 13.110-14.010 MHz. 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 emissions bandwidth (EBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto and a peak detector was used.

The spectrum analyzer bandwidth measurement function was used to measure the 20 dB bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2024-11-06	2025-11-06
Attenuator	Pasternack	PE7049-20	AUK	2024-06-25	2025-06-25
Probe - Near Field Set	EMCO	7405	IPD	NCR	NCR
Meter - Multimeter	Fluke	77 III	MMG	2024-01-26	2025-01-26
Thermometer	Omega Engineering, Inc.	iTHx-SD-5	DVG	2024-04-15	2025-04-15
Probe - Temperature/Humidity	Omega Engineering, Inc.	iTHP-5-DB9	DVGA	2024-04-15	2025-04-15
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-1-1-H/AC	TBI	NCR	NCR
Power Supply	Pacific Power	360AFX-2AG	TJE	NCR	NCR

EMISSIONS BANDWIDTH (20 DB)

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-11
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	63%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

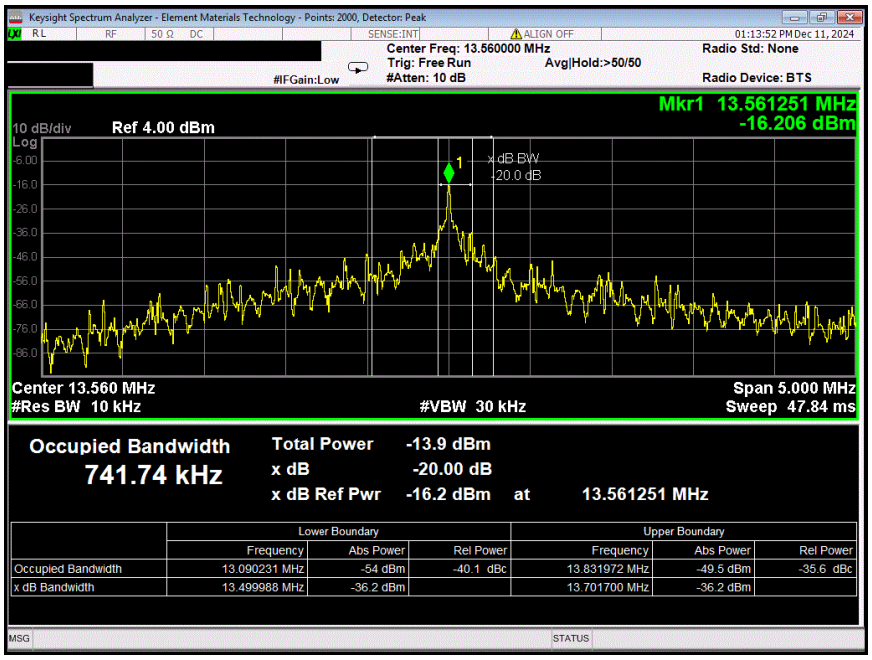
Tested By

TEST RESULTS

	20 dB BW F_low (MHz)	20 dB BW F_high (MHz)	Limit (MHz)	Result
13.56 MHz RFID, ISO/IEC 15693				
Normal Conditions	13.5	13.7	13.11 ≤ *f* ≤ *14.01*	Pass

EMISSIONS BANDWIDTH (20 DB)

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0



	Lower Boundary			Upper Boundary		
	Frequency	Abs Power	Rel Power	Frequency	Abs Power	Rel Power
Occupied Bandwidth	13.090231 MHz	-54 dBm	-40.1 dBc	13.831972 MHz	-49.5 dBm	-35.6 dBc
x dB Bandwidth	13.499988 MHz	-36.2 dBm		13.701700 MHz	-36.2 dBm	

13.56 MHz RFID, ISO/IEC 15693
Normal Conditions

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

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 axes, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test 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 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.

The limits in CFR 47, Part 15C 15.209(a) are identical to those is RSS-Gen section 8.9 Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, an E-Field measurement in dBuV/m can be converted to dBuA/m via the following formula: dBuV/m - 51.5 dB = dBuA/m. E-Field measurements have the same margin in dB to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limits

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AOA	2024-10-23	2026-10-23
Cable	None	10m Test Distance Cable	EVL	2024-01-17	2025-01-17
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	2024-06-17	2025-06-17

FREQUENCY RANGE INVESTIGATED

10.56 MHz TO 16.56 MHz

POWER INVESTIGATED

208VAC/60Hz

CONFIGURATIONS INVESTIGATED

PLIP0013-2

MODES INVESTIGATED

ISO/IEC 14443, 13.56 MHz RFID, ASK

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-03
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	30%
Customer Project:	None	Bar. Pressure (PMSL):	1026 mb
Tested By:	Jeff Alcoke	Job Site:	EV11
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

TEST PARAMETERS

Run #:	7	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

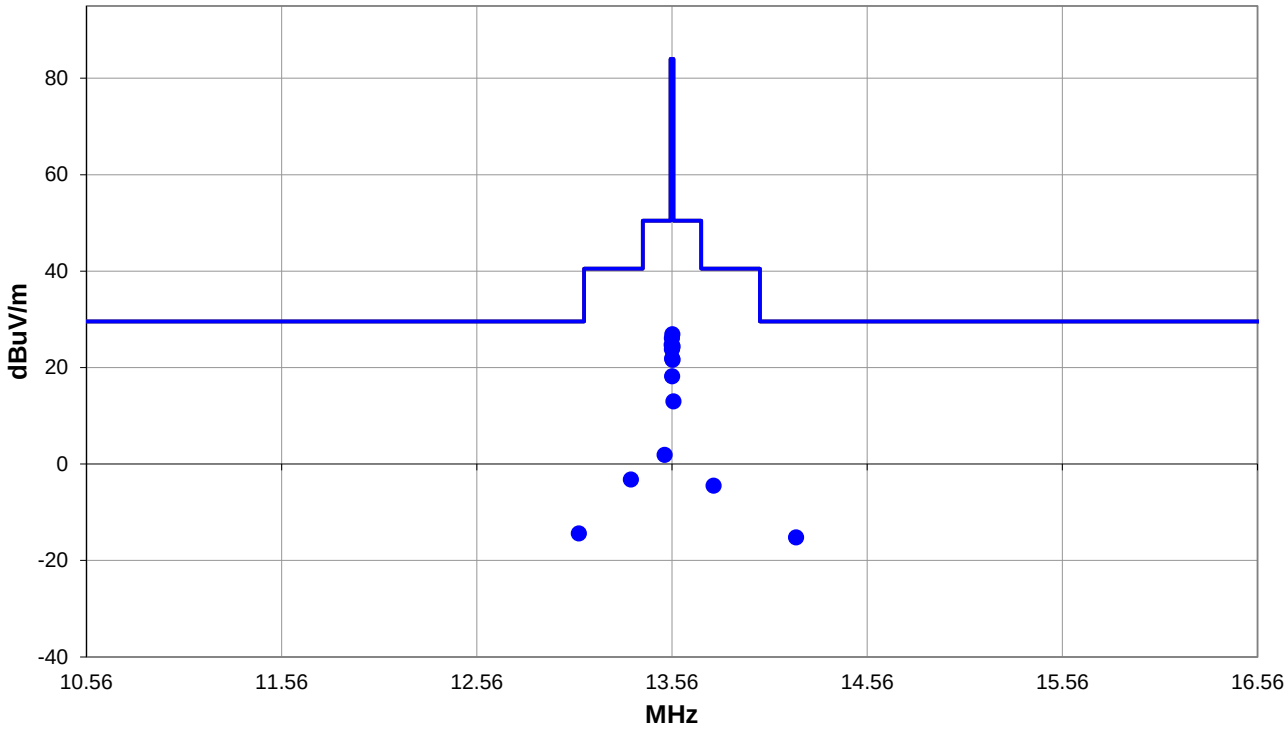
Please refer to the data comments below for EUT orientation.

EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

DEVIATIONS FROM TEST STANDARD

None



Run #: 7 ■ PK ◆ AV ● QP

FIELD STRENGTH OF FUNDAMENTAL

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #7

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
13.567	42.2	10.8	1.0	96.0	3.0	0.0	Perp EUT	QP	-40.0	13.0	50.5	-37.5	EUT Upright
13.349	26.0	10.8	1.0	96.0	3.0	0.0	Perp EUT	QP	-40.0	-3.2	40.5	-43.7	EUT Upright
13.083	14.8	10.8	1.0	96.0	3.0	0.0	Perp EUT	QP	-40.0	-14.4	29.5	-43.9	EUT Upright
14.196	14.1	10.7	1.0	96.0	3.0	0.0	Perp EUT	QP	-40.0	-15.2	29.5	-44.7	EUT Upright
13.772	24.7	10.8	1.0	96.0	3.0	0.0	Perp EUT	QP	-40.0	-4.5	40.5	-45.0	EUT Upright
13.522	31.1	10.8	1.0	96.0	3.0	0.0	Perp EUT	QP	-40.0	1.9	50.5	-48.6	EUT Upright
13.561	**56.1**	**10.8**	**1.0**	**113.0**	**3.0**	**0.0**	**Perp EUT**	**QP**	**-40.0**	**26.9**	**84.0**	**-57.1**	**EUT Upright**
13.560	55.3	10.8	1.0	198.0	3.0	0.0	Par EUT	QP	-40.0	26.1	84.0	-57.9	EUT on Side
13.558	53.9	10.8	1.0	94.0	3.0	0.0	Perp EUT	QP	-40.0	24.7	84.0	-59.3	EUT on Side
13.562	53.6	10.8	1.0	195.0	3.0	0.0	Par EUT	QP	-40.0	24.4	84.0	-59.6	EUT Upright
13.560	53.2	10.8	1.54	198.0	3.0	0.0	Par GND	QP	-40.0	24.0	84.0	-60.0	EUT Upright
13.560	53.0	10.8	1.49	198.0	3.0	0.0	Par GND	QP	-40.0	23.8	84.0	-60.2	EUT on Side
13.561	51.1	10.8	1.0	185.0	3.0	0.0	Perp EUT	QP	-40.0	21.9	84.0	-62.1	EUT Horz
13.563	50.8	10.8	1.66	159.0	3.0	0.0	Par GND	QP	-40.0	21.6	84.0	-62.4	EUT Horz
13.561	47.4	10.8	1.0	249.0	3.0	0.0	Par EUT	QP	-40.0	18.2	84.0	-65.8	EUT Horz

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

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. A reference preview scan (pre-scan) is 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 axes if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). An active loop antenna was used for this test 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 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.

The limits in CFR 47, Part 15C 15.209(a) are identical to those is RSS-Gen section 8.9 Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, an E-Field measurement in dBuV/m can be converted to dBuA/m via the following formula: dBuV/m - 51.5 dB = dBuA/m. E-Field measurements have the same margin in dB to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limits.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AOA	2024-10-23	2026-10-23
Cable	None	10m Test Distance Cable	EVL	2024-01-17	2025-01-17
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	2024-06-17	2025-06-17

FREQUENCY RANGE INVESTIGATED

0.009 MHz TO 30 MHz

POWER INVESTIGATED

208VAC/60Hz

CONFIGURATIONS INVESTIGATED

PLIP0013-2

MODES INVESTIGATED

ISO/IEC 14443, 13.56 MHz RFID, ASK

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-03
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	30%
Customer Project:	None	Bar. Pressure (PMSL):	1026 mb
Tested By:	Jeff Alcoke	Job Site:	EV11
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

TEST PARAMETERS

Run #:	7	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

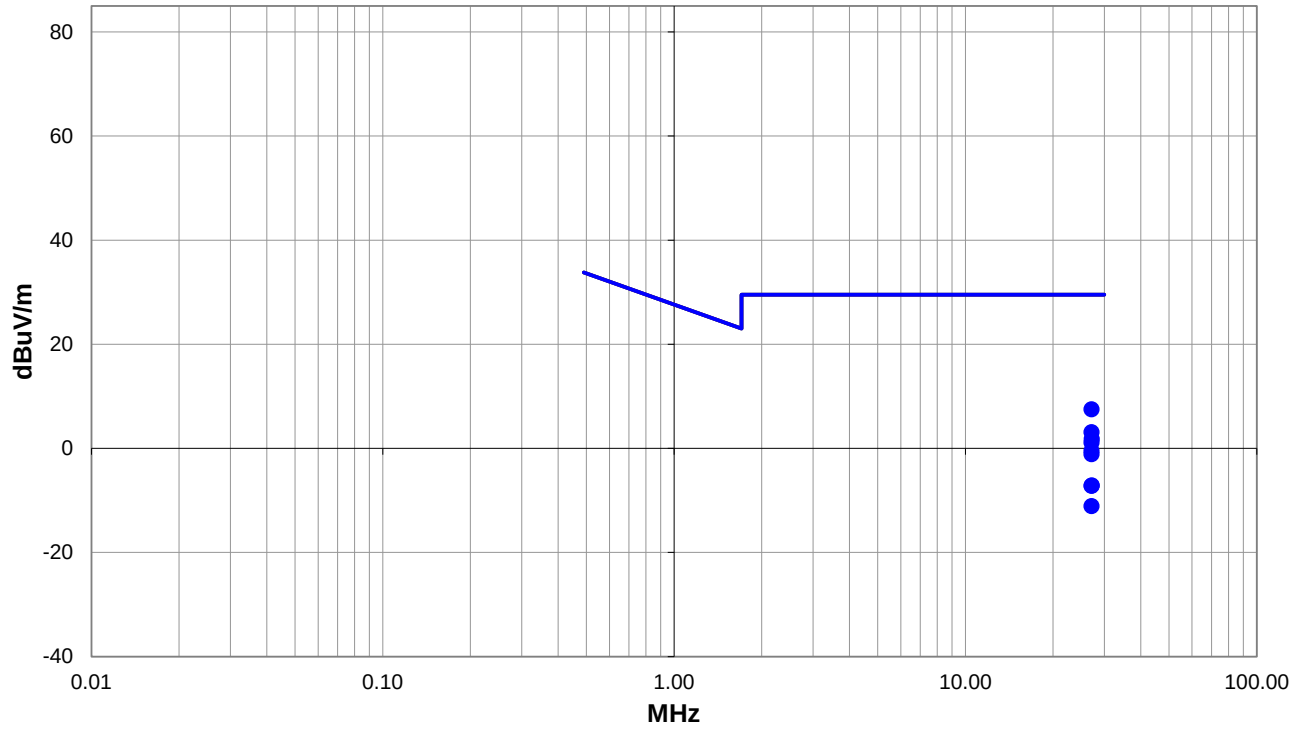
Please refer to the data comments below for EUT orientation.

EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

DEVIATIONS FROM TEST STANDARD

None



Run #: 7 ■ PK ◆ AV ● QP

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #7

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
27.121	38.8	8.7	1.0	112.0	3.0	0.0	Par GND	QP	-40.0	7.5	29.5	-22.0	EUT Horz
27.121	34.4	8.7	1.0	45.0	3.0	0.0	Par GND	QP	-40.0	3.1	29.5	-26.4	EUT on Side
27.128	33.1	8.7	1.0	358.0	3.0	0.0	Perp EUT	QP	-40.0	1.8	29.5	-27.7	EUT Horz
27.121	32.4	8.7	1.0	111.0	3.0	0.0	Perp EUT	QP	-40.0	1.1	29.5	-28.4	EUT on Side
27.120	30.8	8.7	1.0	45.0	3.0	0.0	Par GND	QP	-40.0	-0.5	29.5	-30.0	EUT Upright
27.121	30.2	8.7	1.0	60.0	3.0	0.0	Perp EUT	QP	-40.0	-1.1	29.5	-30.6	EUT Upright
27.126	24.2	8.7	1.0	60.0	3.0	0.0	Par EUT	QP	-40.0	-7.1	29.5	-36.6	EUT on Side
27.120	24.1	8.7	1.0	315.0	3.0	0.0	Par EUT	QP	-40.0	-7.2	29.5	-36.7	EUT Horz
27.121	20.2	8.7	1.0	334.0	3.0	0.0	Par EUT	QP	-40.0	-11.1	29.5	-40.6	EUT Upright

CONCLUSION

Pass

Tested By

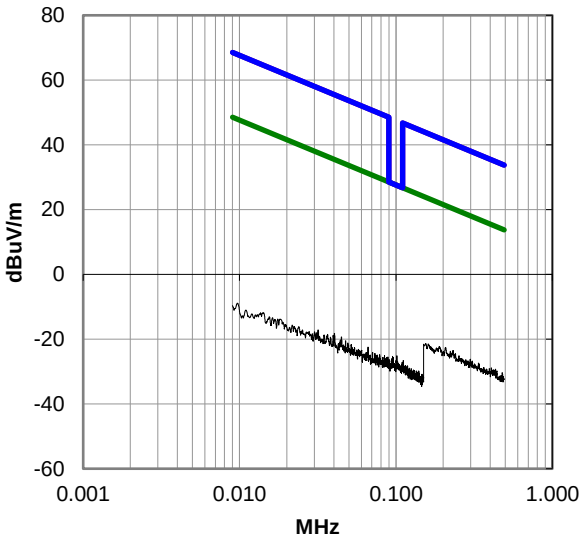
FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

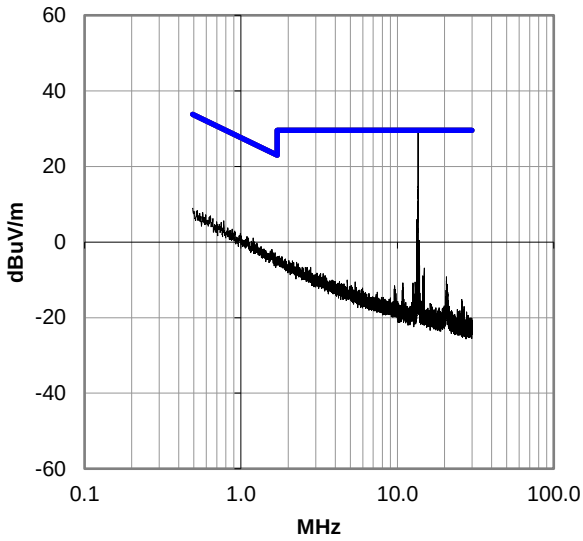
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

0.009-0.49 MHz, Run 6



0.49-30 MHz, Run 7



FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

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 axes, 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 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	EMCO	3141	AXG	2023-09-14	2025-09-14
Cable	None	10m Test Distance Cable	EVL	2024-01-17	2025-01-17
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAY	2024-01-17	2025-01-17
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	2024-06-17	2025-06-17
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2024-11-06	2025-11-06
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	2024-03-08	2026-03-08
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-10	AIW	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	2024-10-28	2025-10-28
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	2024-10-28	2025-10-28
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2024-10-28	2025-10-28
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	2024-07-09	2025-07-09
Amplifier - Pre-Amplifier	Miteq	JSW45-26004000-40-5P	PAE	2024-04-04	2025-04-04
Cable	N/A	Double Ridge Horn Cables	EVB	2024-10-28	2025-10-28
Cable	None	Standard Gain Horn Cables	EVF	2024-10-28	2025-10-28
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	EVY	2024-07-09	2025-07-09
Cable	ESM Cable Corp.	KNKN-72 SMA Cable	EVZ	2024-04-04	2025-04-04
Filter - High Pass	Micro-Tronics	HPM50111	HFO	2024-10-28	2025-10-28
Attenuator	Coaxicom	3910-10	AWX	2024-10-28	2025-10-28

FREQUENCY RANGE INVESTIGATED

30 MHz TO 40000 MHz

POWER INVESTIGATED

208VAC/60Hz

FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

CONFIGURATIONS INVESTIGATED

PLIP0013-2

MODES INVESTIGATED 30 – 1000 MHz

ISO/IEC 14443, 13.56 MHz RFID, ASK

MODES INVESTIGATED 1 GHz – 40 GHz

ISO/IEC 14443, 13.56 MHz RFID, ASK, 802.11bgn beaconing on 2412 MHz, BLE in advertising mode

FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-05
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	30%
Customer Project:	None	Bar. Pressure (PMSL):	1026 mb
Tested By:	Jeff Alcoke	Job Site:	EV11
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

TEST PARAMETERS

Run #:	8	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

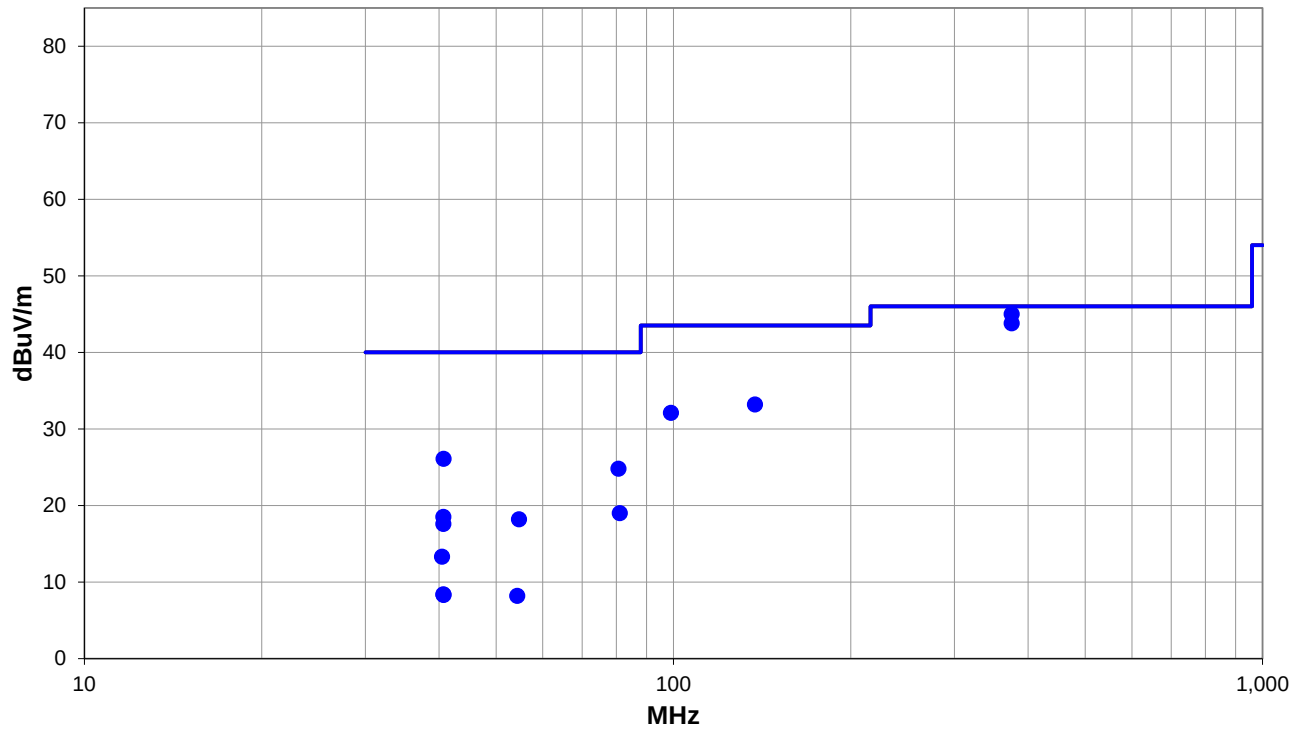
None

EUT OPERATING MODES

ISO/IEC 14443, 13.56 MHz RFID, ASK

DEVIATIONS FROM TEST STANDARD

None



Run #: 8 ■ PK ◆ AV ● QP

FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

RESULTS - Run #8

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
375.000	62.5	-17.5	2.14	220.0	3.0	0.0	Horz	QP	0.0	45.0	46.0	-1.0	EUT Vert
375.000	61.3	-17.5	2.75	31.0	3.0	0.0	Vert	QP	0.0	43.8	46.0	-2.2	EUT Vert
137.498	60.7	-27.5	1.0	82.0	3.0	0.0	Vert	QP	0.0	33.2	43.5	-10.3	EUT Vert
99.000	59.4	-27.3	1.01	7.0	3.0	0.0	Vert	QP	0.0	32.1	43.5	-11.4	EUT Vert
40.698	50.1	-24.0	1.0	38.0	3.0	0.0	Vert	QP	0.0	26.1	40.0	-13.9	EUT Vert
80.626	53.9	-29.1	1.33	26.0	3.0	0.0	Vert	QP	0.0	24.8	40.0	-15.2	EUT Vert
81.051	48.1	-29.1	3.91	20.0	3.0	0.0	Horz	QP	0.0	19.0	40.0	-21.0	EUT Vert
40.676	42.5	-24.0	4.0	143.0	3.0	0.0	Horz	QP	0.0	18.5	40.0	-21.5	EUT Vert
54.688	45.9	-27.7	1.0	333.0	3.0	0.0	Vert	QP	0.0	18.2	40.0	-21.8	EUT Vert
40.681	41.6	-24.0	1.01	38.0	3.0	0.0	Vert	QP	0.0	17.6	40.0	-22.4	EUT Horz
40.471	37.2	-23.9	1.0	168.0	3.0	0.0	Vert	QP	0.0	13.3	40.0	-26.7	EUT on Side
40.678	32.4	-24.0	1.0	270.0	3.0	0.0	Horz	QP	0.0	8.4	40.0	-31.6	EUT Horz
40.710	32.3	-24.0	1.0	188.0	3.0	0.0	Horz	QP	0.0	8.3	40.0	-31.7	EUT on Side
54.285	35.9	-27.7	3.6	107.0	3.0	0.0	Horz	QP	0.0	8.2	40.0	-31.8	EUT Vert

CONCLUSION

Pass

Tested By

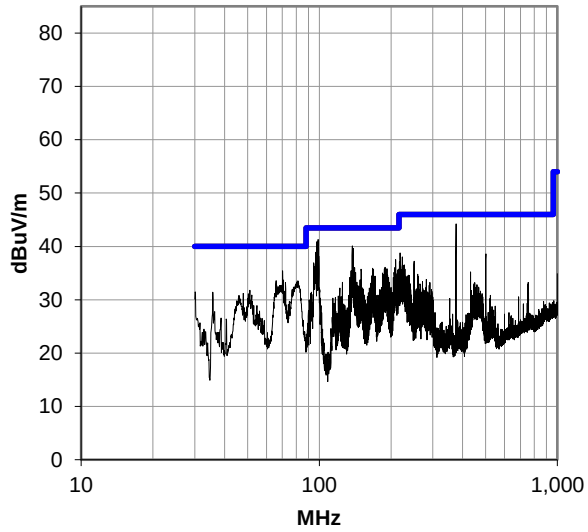
FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

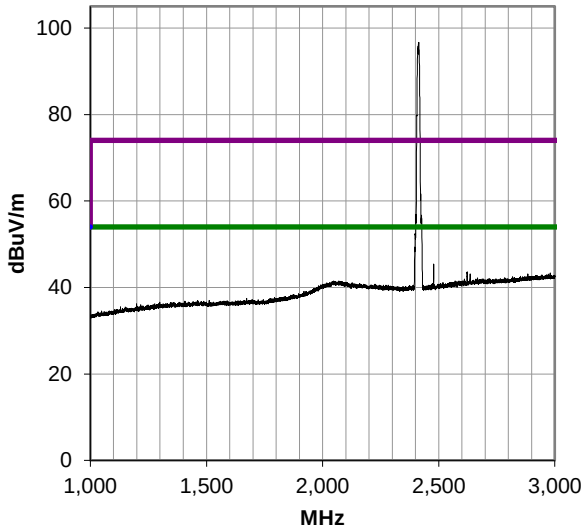
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

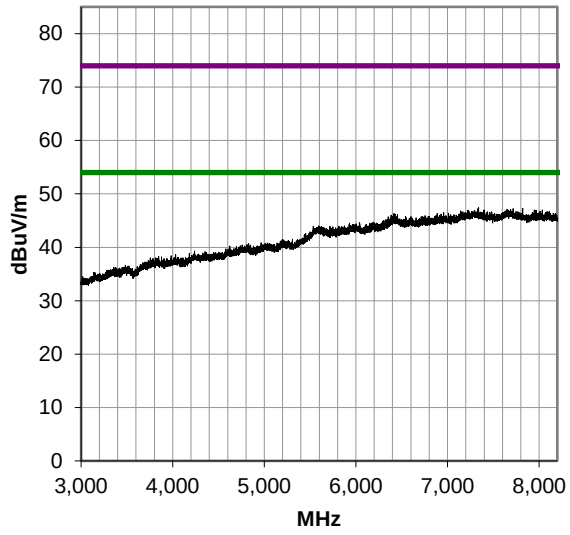
30-1000 MHz, Run 8



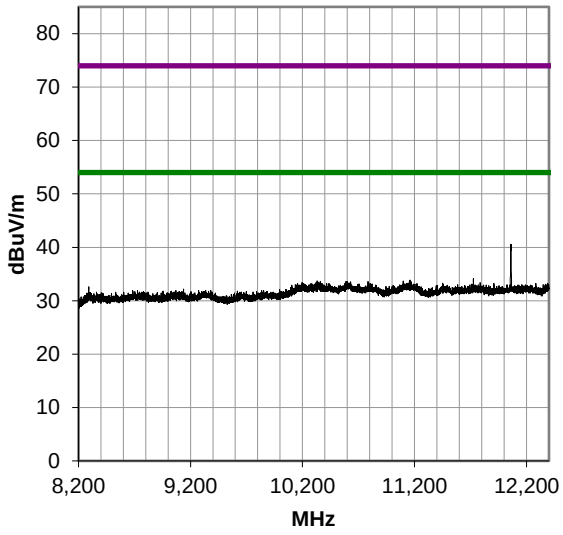
1000-3000 MHz, Run 4



3000-8200 MHz, Run 5



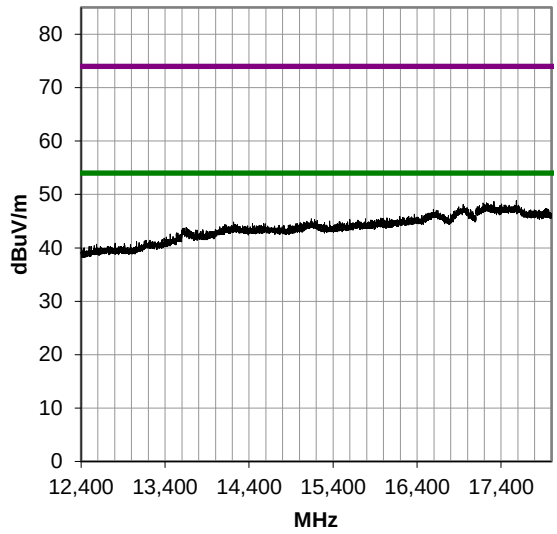
8200-12400 MHz, Run 6



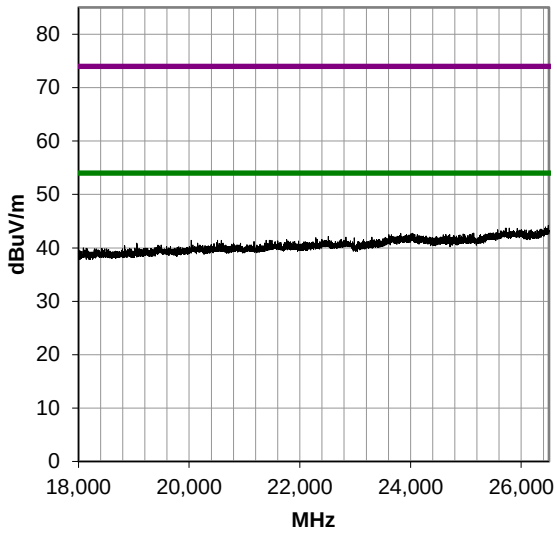
FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

element
WTD.2024.10.30.0
EmiR5 2023.08.29.0
PSA-ESCI 2024.10.24.0

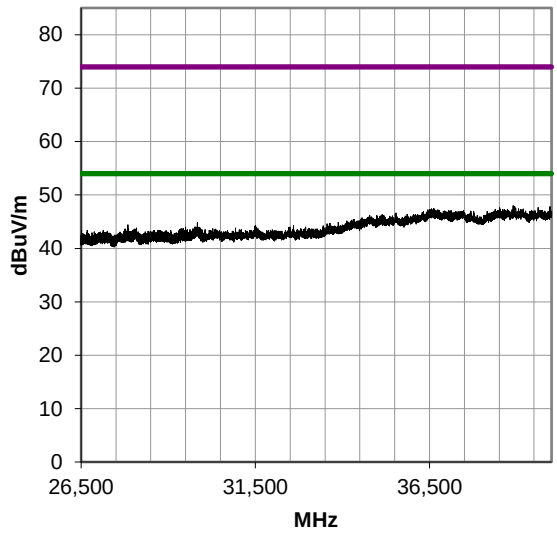
12400-18000 MHz, Run 7



18000-26500 MHz, Run 8



26500-40000 MHz, Run 9



FREQUENCY STABILITY

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0

TEST DESCRIPTION

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.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the 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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2024-11-06	2025-11-06
Attenuator	Pasternack	PE7049-20	AUK	2024-06-25	2025-06-25
Probe - Near Field Set	EMCO	7405	IPD	NCR	NCR
Meter - Multimeter	Fluke	77 III	MMG	2024-01-26	2025-01-26
Thermometer	Omega Engineering, Inc.	iTHx-SD-5	DVG	2024-04-15	2025-04-15
Probe - Temperature/Humidity	Omega Engineering, Inc.	iTHP-5-DB9	DVGA	2024-04-15	2025-04-15
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-1-1-H/AC	TBI	NCR	NCR
Power Supply	Pacific Power	360AFX-2AG	TJE	NCR	NCR

FREQUENCY STABILITY

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-09
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	40%
Customer Project:	None	Bar. Pressure (PMSL):	1028 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

COMMENTS

Normal Conditions = 208 VAC / 60 Hz
Extreme Voltage 115% = 239.2 VAC / 60 Hz
Extreme Voltage 85% = 176.8 VAC / 60 Hz

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

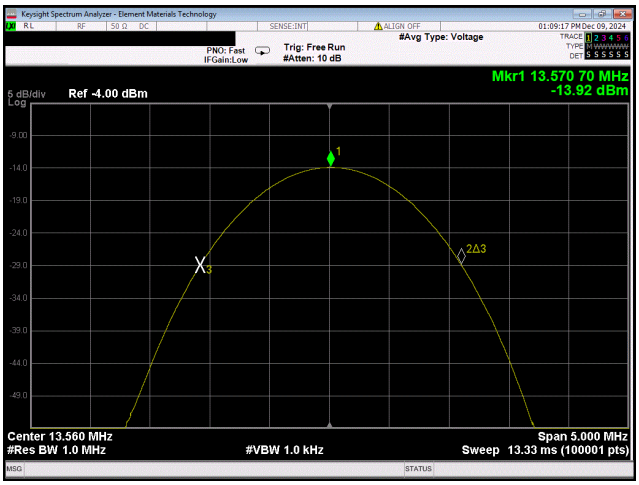
Tested By

TEST RESULTS

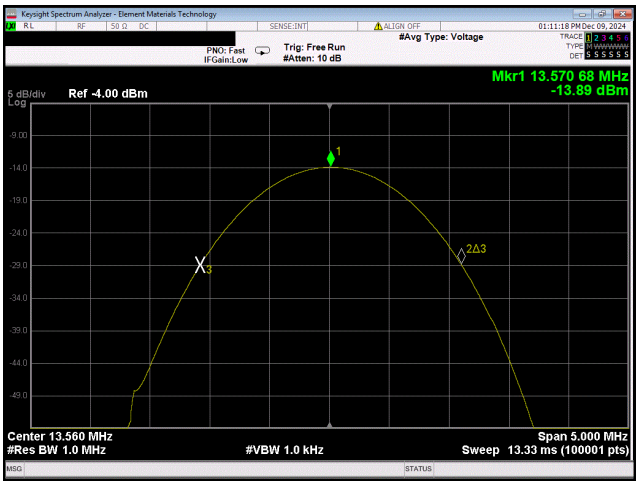
	Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.56 MHz RFID, ISO/IEC 15693					
Normal Conditions	13.570700	13.570700	0	100	Pass
Extreme Voltage 115%	13.570675	13.570700	1.84	100	Pass
Extreme Voltage 85%	13.570700	13.570700	0	100	Pass
Extreme Temperature +50°C	13.570825	13.570700	9.21	100	Pass
Extreme Temperature +40°C	13.570575	13.570700	9.21	100	Pass
Extreme Temperature +30°C	13.570600	13.570700	7.37	100	Pass
Extreme Temperature +20°C	13.570625	13.570700	5.53	100	Pass
Extreme Temperature +10°C	13.570575	13.570700	9.21	100	Pass
Extreme Temperature +0°C	13.570800	13.570700	7.37	100	Pass
Extreme Temperature -10°C	13.570750	13.570700	3.68	100	Pass
Extreme Temperature -20°C	13.570650	13.570700	3.68	100	Pass

FREQUENCY STABILITY

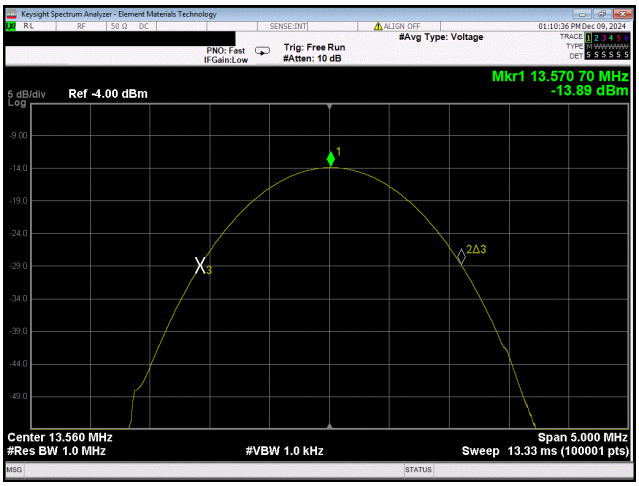
element
TbtTx 2024.05.24.1
WTD.2024.10.30.0



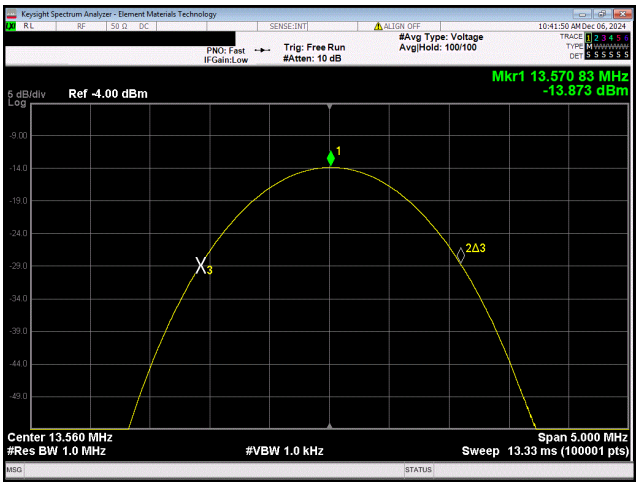
13.56 MHz RFID, ISO/IEC 15693
Normal Conditions



13.56 MHz RFID, ISO/IEC 15693
Extreme Voltage 115%



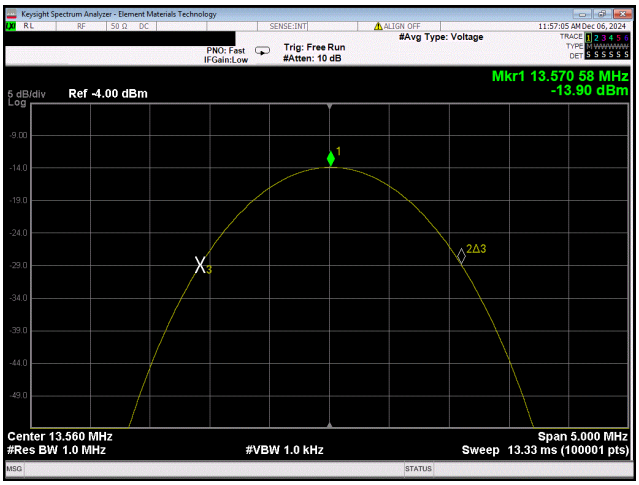
13.56 MHz RFID, ISO/IEC 15693
Extreme Voltage 85%



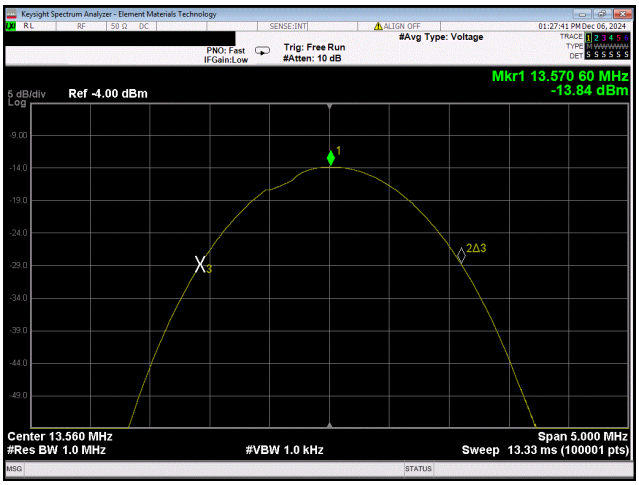
13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature +50°C

FREQUENCY STABILITY

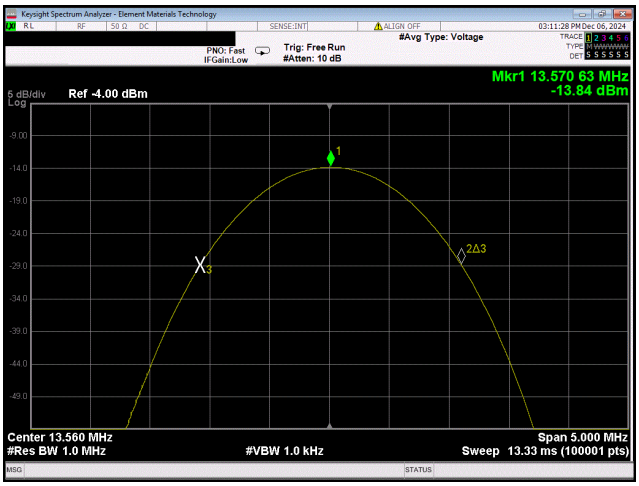
element
TbtTx 2024.05.24.1
WTD.2024.10.30.0



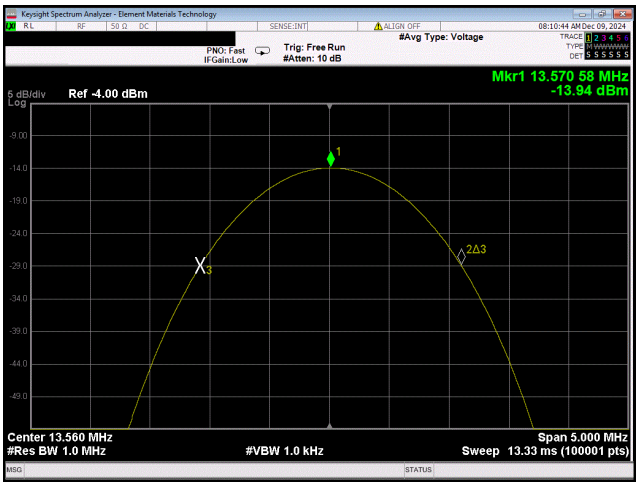
13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature +40°C



13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature +30°C

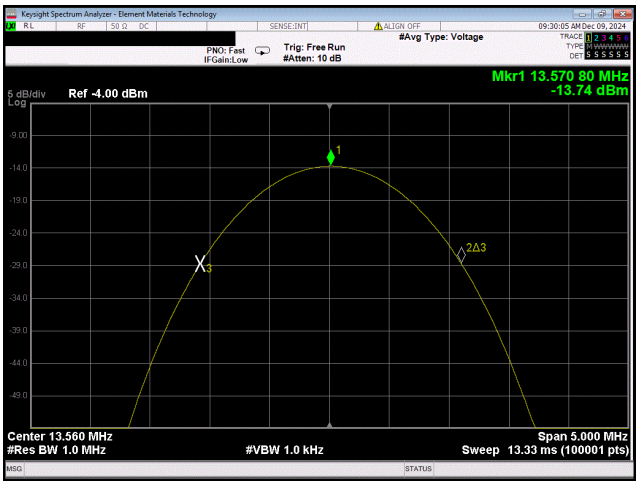


13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature +20°C

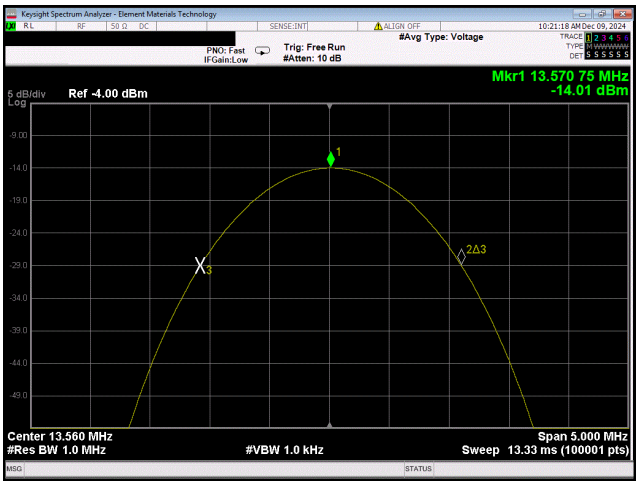


13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature +10°C

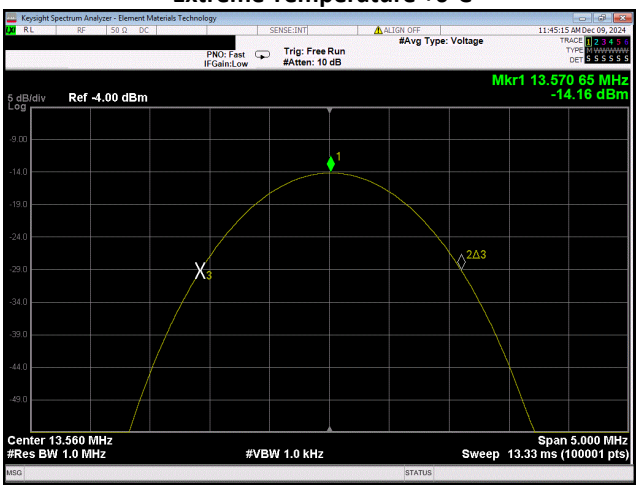
FREQUENCY STABILITY



13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature +0°C



13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature -10°C



13.56 MHz RFID, ISO/IEC 15693
Extreme Temperature -20°C

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0

TEST DESCRIPTION

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.

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

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth as defined in RSS-Gen.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

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. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	2024-11-06	2025-11-06
Attenuator	Pasternack	PE7049-20	AUK	2024-06-25	2025-06-25
Probe - Near Field Set	EMCO	7405	IPD	NCR	NCR
Meter - Multimeter	Fluke	77 III	MMG	2024-01-26	2025-01-26
Thermometer	Omega Engineering, Inc.	iTHx-SD-5	DVG	2024-04-15	2025-04-15
Probe - Temperature/Humidity	Omega Engineering, Inc.	iTHP-5-DB9	DVGA	2024-04-15	2025-04-15
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-1-1-H/AC	TBI	NCR	NCR
Power Supply	Pacific Power	360AFX-2AG	TJE	NCR	NCR

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0

EUT:	Evocharge Pro	Work Order:	PLIP0013
Serial Number:	ENG 598R	Date:	2024-12-11
Customer:	Phillips & Temro Industries, Inc.	Temperature:	23°C
Attendees:	None	Relative Humidity:	63%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jeff Alcoke	Job Site:	EV06
Power:	208VAC/60Hz	Configuration:	PLIP0013-2

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

N/A

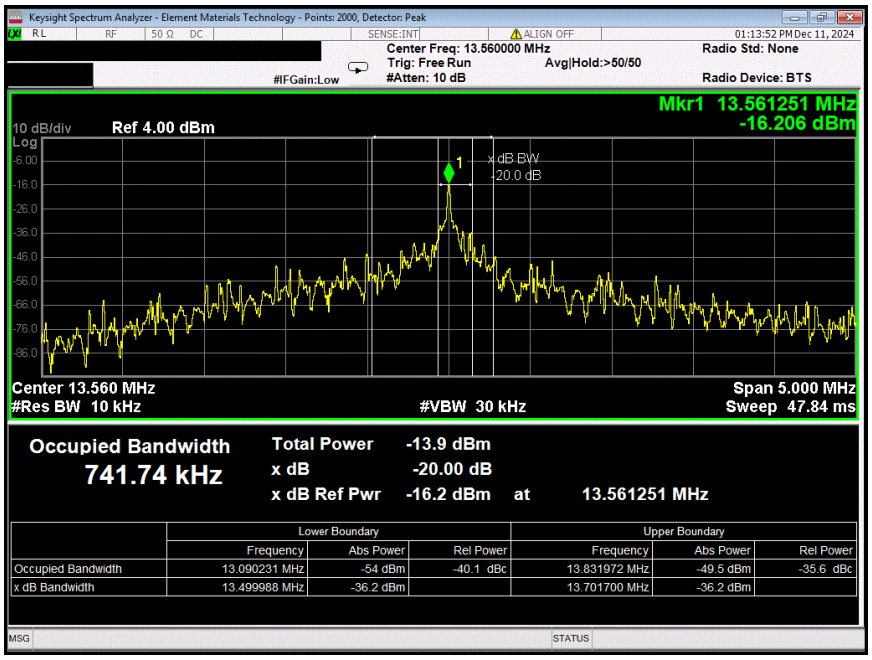
Tested By

TEST RESULTS

	Value (kHz)	Limit	Result
13.56 MHz RFID, ISO/IEC 14443, ASK	741.7	N/A	N/A

OCCUPIED BANDWIDTH (99%)

element
TbtTx 2024.05.24.1
WTD.2024.10.30.0



	Lower Boundary			Upper Boundary		
	Frequency	Abs Power	Rel Power	Frequency	Abs Power	Rel Power
Occupied Bandwidth	13.090231 MHz	-54 dBm	-40.1 dBc	13.831972 MHz	-49.5 dBm	-35.6 dBc
x dB Bandwidth	13.499988 MHz	-36.2 dBm		13.701700 MHz	-36.2 dBm	

13.56 MHz RFID, ISO/IEC 14443, ASK

End of Test Report