TEST REPORT

Applicant	Dogwatch Inc.
Address	10 Michigan Drive Natick, MA 01760 USA

FCC ID	L66DWSFP2
ISED Canada IC	8187A-DWSFP2
Product Description	SmartFence Portal
PMN Model/HVIN	SmartFence Portal SF-P10-2
Additional Models	None
Date of tests	May 30, 2023 – Jun 6, 2023
FCC Test Firm DN Canada CABID	US1028 US0106

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.249**
☒ **ISED Canada RSS-210 Issue 10 Annex B.10**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by	Approved by
Matthew McCarthy EMC Engineer I	Yunus Faziloglu Wireless Manager
Report Issue Date: Jul-27-2023	Issue Number: 1

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
1	Original release	Jul-27-2023

1 SUMMARY OF TEST RESULTS

EUT was tested against the following requirements:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249), RSS-210				
STANDARD SECTION		TEST TYPE AND LIMIT	APPLICABLE	RESULT
47CFR15	RSS			
15.207	Gen 8.8	AC Power Line Conducted Emissions	Y	PASS
15.249 15.209	210 B.10 Gen 8.9	Radiated Spurious Emissions	Y	PASS
15.215(c)	--	20dB Bandwidth	Y	PASS
--	Gen 6.7	99% Occupied Bandwidth	Y	PASS
15.203	Gen 6.8	Antenna Requirement	Y	PASS

2 MEASUREMENT UNCERTAINTY

The listed uncertainties are the worst-case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results. Values for measurement uncertainty are calculated per ETSI TR 100 028 (2001).

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radio frequency (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation: Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

NOMINAL VOLTAGE	AC/DC Power Adapter (5VDC)
MODULATION TYPES	FSK
DATA RATES	3kbps
OPERATING FREQUENCY	922.9 – 924.1MHz
EUT Power Setting	Default (maximum)
FIELD STRENGTH	External Antenna: 91.1dBuV/m at 3m Internal Antenna: 88.6dBuV/m at 3m
ANTENNA TYPE **(Customer Supplied Information)**	External Antenna: ½ wave dipole with 1.2dBi peak gain Internal Antenna: ¼ wave surface mount patch with 1.4dBi peak gain

EUT Ports:									
Port Label	**Port Type**	**No. of ports**	**No. Populated**	**Cable Type**	**Shielded**	**Ferrites**	**Length**	**Max Length**	**In/Out Type**
DC Power	Power	1	1	DC Power	Yes	No	2m	2m	Indoor
Ethernet	CAT5	1	1	CAT5	No	No	3m	10m	Indoor

Lowest clock frequency in the device (used/generated): 4MHz

Highest clock frequency in the device (used/generated): 1.2GHz

AC/DC power adapter supplied with the EUT:

Manufacturer	**Model**	**Rating**
Delta Electronics	MDS-005AAS05 B	Input: 100-240VAC, 0.1-0.2A, 50/60Hz Output: 5VDC, 1A

NOTES:

1. For a more detailed description of the EUT, please refer to the manufacturer's specifications or the user's manual.
2. For photos of the EUT, please refer to External and Internal Photos exhibits.

3.2 DESCRIPTION OF TEST MODES

EUT channel list:

CHANNEL	FREQ. (MHZ)
1	922.9
2	923.1
3	923.5
4	924.1

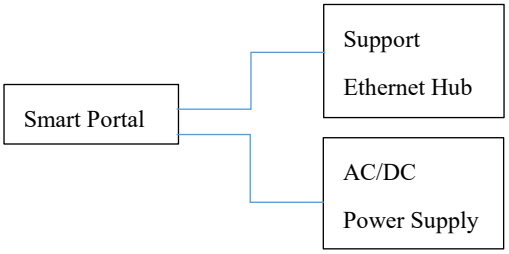
2 samples were provided for testing. One programmed for low channel (922.9MHz) and the other programmed for high channel (924.1MHz). Samples were powered by customer supplied AC/DC power adapter.

EUT configuration modes:

TEST MODE	DESCRIPTION
A	Continuous Transmit at 3kbps (Duty-cycle: 100%)

EUT SETUP BLOCK DIAGRAMS

Radiated and AC Line Conducted Emissions EUT Setup



Following channels/modes were selected for the applicable tests below.

TEST	TEST MODE	AVAILABLE CHANNELS	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)	Notes
FFS	A	1 to 4	1, 4	FSK	3kbps	0
20DB	A	1 to 4	1, 4	FSK	3kbps	1, 4
OBW	A	1 to 4	1, 4	FSK	3kbps	1
RSE<1G	A	1 to 4	1, 4	FSK	3kbps	1, 2
RSE≥1G	A	1 to 4	1, 4	FSK	3kbps	1
RBE	A	1 to 4	1, 4	FSK	3kbps	1
PLCE	A	1 to 4	1, 4	FSK	3kbps	3

Note 0: Only X and Y orientations of the EUT was tested per customer declared normal installation positions. Internal antenna cannot be maximized further. External swivel antenna was tested in both its vertical and horizontal positions.
Note 1: Testing was performed on Y axis of the EUT for internal antenna configuration. For external antenna configuration, EUT was in X axis and external antenna in horizontal configuration as seen in the test setup photos exhibit. These positions were identified based on fundamental field strength test results as the worst case positions.
Note 2: Testing below 30MHz was limited to 1 channel only since no emissions were detected in this range.
Note 3: Testing for AC power line conducted emissions was performed on low channel for external antenna and on high channel for internal antenna.
Note 4: For 20dB bandwidth test, 26dB bandwidth is reported. This is considered as worst case, since 26dB bandwidth is wider than the 20dB bandwidth by definition.
FFS: Fundamental Field Strength
20DB: 20dB Bandwidth
OBW: 99% Occupied Bandwidth
RSE<1G: Radiated Spurious Emissions Below 1GHz
RSE≥1G: Radiated Spurious Emissions Above 1GHz
RBE: Radiated Band-edge
PLCE: Power Line Conducted Emissions

TEST CONDITIONS:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY	DATE OF TEST
RE<1G	22.3°C, 42% RH, 1002 mbar	120VAC	RB	Jun 5, 2023
RE≥1G	22.3°C, 42% RH, 1002 mbar	120VAC	RB	Jun 5, 2023
PLCE	21.5°C, 47.7% RH, 995 mbar	120VAC	RB	Jun 6, 2023
FFS, RBE	22.3°C, 42% RH, 1002 mbar	120VAC	RB	May 30, 2023
OBW, 20DB	22.3°C, 42% RH, 1002 mbar	120VAC	RB	Jun 5, 2023

3.3 MEASUREMENT PROCEDURES USED

All tests were performed in accordance with the following measurement procedures:

ANSI C63.10-2013

3.4 DESCRIPTION OF SUPPORT EQUIPMENT

Support Equipment	Model #
Netgear Hub (lab supplied)	DS104

4 TEST RESULTS

4.1 AC LINE CONDUCTED EMISSIONS

4.1.1 LIMITS

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1. Lower limit applies at the transition frequencies.

2. Limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.1.2 TEST EQUIPMENT USED

Rev. 6/27/2023

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1168255)	20Hz-8.4GHz	N9038A	Agilent	MY53290009	1168255	I	8/12/2023	8/12/2022
LISNs/Measurement Probes	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
LISN Asset 2092	150KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-662	2092	I	10/31/2023	10/31/2022
Conducted Test Sites (Mains / Telco)	**FCC Code**		**VCCI Code**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI 1	719150		A-0015			III	NA	N/A
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	12/15/2025	12/15/2022
Asset #2657		1235C97	Control Company	200435369	2657	I	8/18/2025	8/18/2022
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
CEMI-15	9kHz - 2GHz		C-S			II	2/14/2024	2/14/2023
Attenuators	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
20dB Attenuator-64	9kHz-2GHz			N/A		II	8/3/2023	8/3/2022

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

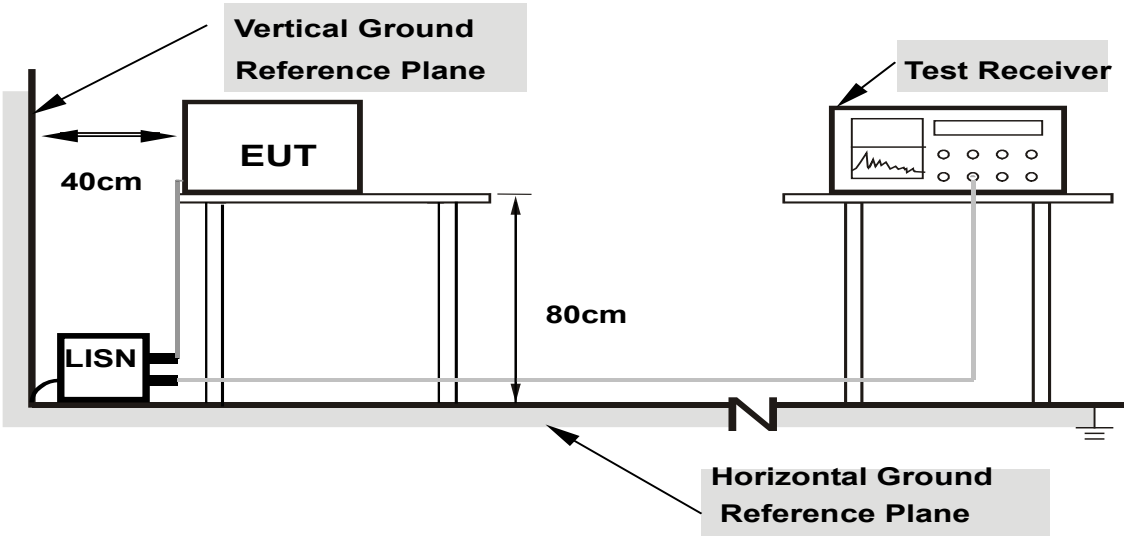
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded. RBW of 9kHz and VBW of 30kHz were used during measurement.

4.1.4 DEVIATIONS

No deviations from the standard.

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to Test Setup Photos exhibit.

4.1.6 EUT OPERATING CONDITIONS

EUT was operated according to manufacturer's specifications.

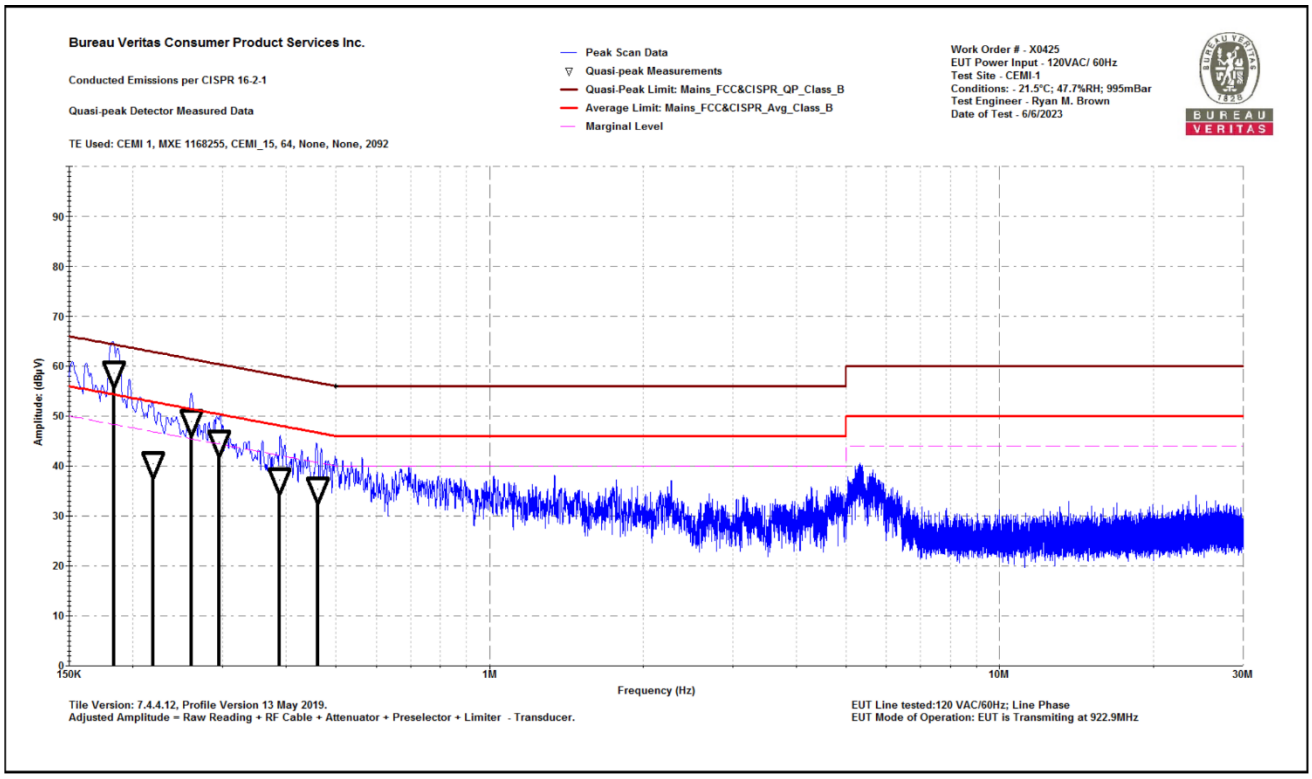
4.1.7 TEST RESULTS

External Antenna

Bureau Veritas Consumer Product Services Inc.	Work Order # - X0425
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Quasi-peak Detector Data	Test Site - CEMI-1
Notes:	Conditions: - 21.5°C; 47.7%RH; 995mBar
EUT Line tested:120 VAC/60Hz; Line Phase	Test Engineer - Ryan M. Brown
EUT Mode of Operation: EUT is Transmiting at 922.9MHz	Date of Test - 6/6/2023

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB)	Adjusted QP Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to QP Limit (dB)	QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)
0.184	38.189	20.4	58.6	64.3	-5.7	PASS	-5.7
0.219	20.062	20.4	40.5	62.9	-22.4	PASS	
0.26	28.429	20.5	48.9	61.4	-12.5	PASS	
0.295	24.272	20.5	44.8	60.4	-15.6	PASS	
0.388	16.629	20.6	37.2	58.1	-20.9	PASS	
0.461	14.67	20.7	35.4	56.7	-21.3	PASS	

Line Quasi-Peak



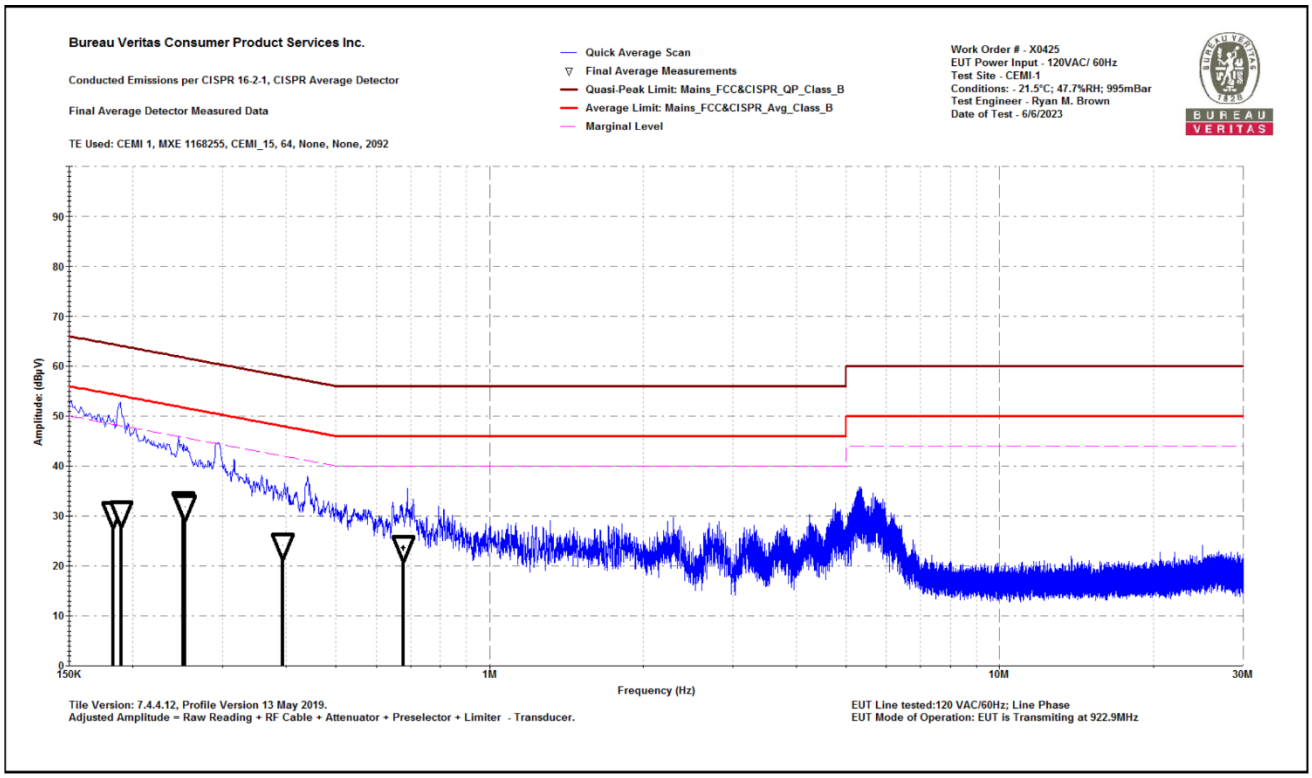
Line Quasi-Peak

Bureau Veritas Consumer Product Services Inc.
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested:120 VAC/60Hz; Line Phase
EUT Mode of Operation: EUT is Transmiting at 922.9MHz

Work Order # - X0425
EUT Power Input - 120VAC/ 60Hz
Test Site - CEMI-1
Conditions: - 21.5°C; 47.7%RH; 995mBar
Test Engineer - Ryan M. Brown
Date of Test - 6/6/2023

Frequency (MHz)	Raw Avg Reading (dBµV)	Correction Factor (dB)	Adjusted Avg Amplitude (dBµV)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
0.183	10	20.4	30.5	54.4	-23.9	PASS	
0.19	10.2	20.4	30.6	54	-23.4	PASS	
0.251	11.9	20.5	32.4	51.7	-19.3	PASS	-19.3
0.253	11.3	20.5	31.8	51.7	-19.9	PASS	
0.393	3.6	20.6	24.1	48	-23.9	PASS	
0.678	2.8	20.8	23.6	46	-22.4	PASS	

Line Final Average

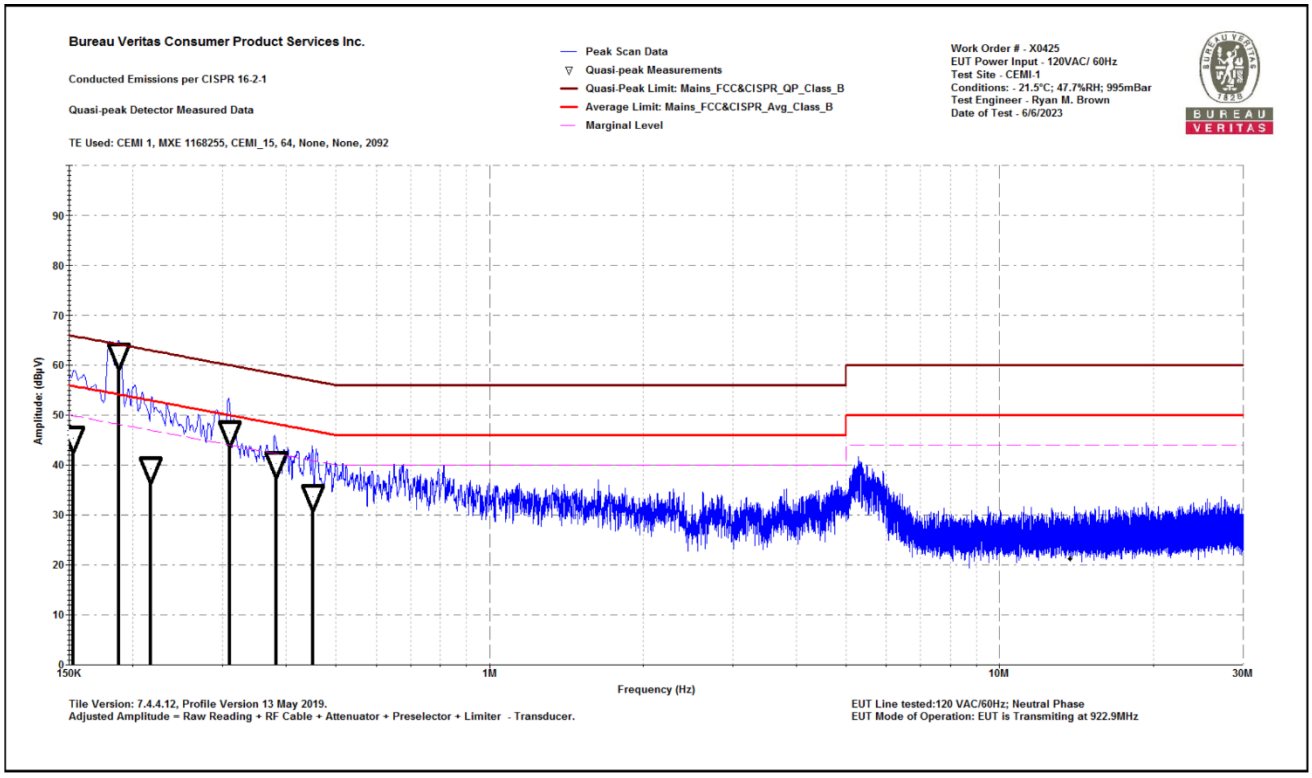


Line Final Average

Bureau Veritas Consumer Product Services Inc.	Work Order # - X0425
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Quasi-peak Detector Data	Test Site - CEMI-1
Notes:	Conditions: - 21.5°C; 47.7%RH; 995mBar
EUT Line tested:120 VAC/60Hz; Neutral Phase	Test Engineer - Ryan M. Brown
EUT Mode of Operation: EUT is Transmiting at 922.9MHz	Date of Test - 6/6/2023

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB)	Adjusted QP Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to QP Limit (dB)	QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)
0.153	24.981	20.4	45.4	65.9	-20.5	PASS	
0.188	41.646	20.4	62	64.1	-2.1	PASS	-2.1
0.217	18.783	20.4	39.2	62.9	-23.7	PASS	
0.309	25.879	20.5	46.4	60	-13.6	PASS	
0.382	19.746	20.5	40.3	58.2	-17.9	PASS	
0.451	12.949	20.7	33.6	56.8	-23.2	PASS	

Neutral Quasi-Peak



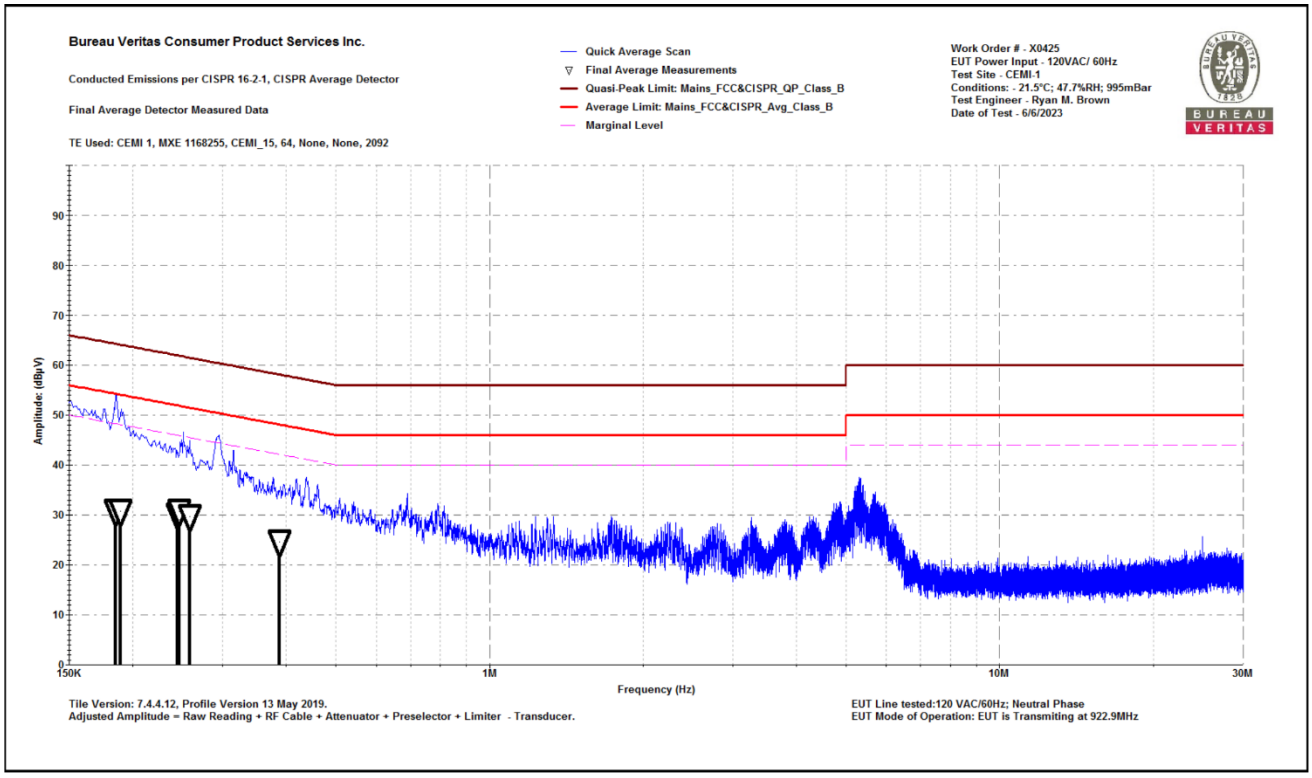
Neutral Quasi-Peak

Bureau Veritas Consumer Product Services Inc.
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested:120 VAC/60Hz; Neutral Phase
EUT Mode of Operation: EUT is Transmiting at 922.9MHz

Work Order # - X0425
EUT Power Input - 120VAC/ 60Hz
Test Site - CEMI-1
Conditions: - 21.5°C; 47.7%RH; 995mBar
Test Engineer - Ryan M. Brown
Date of Test - 6/6/2023

Frequency (MHz)	Raw Avg Reading (dBµV)	Correction Factor (dB)	Adjusted Avg Amplitude (dBµV)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
0.185	10.3	20.4	30.7	54.3	-23.6	PASS	
0.189	10.3	20.4	30.7	54.1	-23.4	PASS	
0.244	9.6	20.4	30	51.9	-21.9	PASS	
0.247	10.3	20.4	30.7	51.9	-21.1	PASS	-21.1
0.258	9.3	20.5	29.7	51.5	-21.7	PASS	
0.388	4.1	20.5	24.7	48.1	-23.5	PASS	

Neutral Final Average



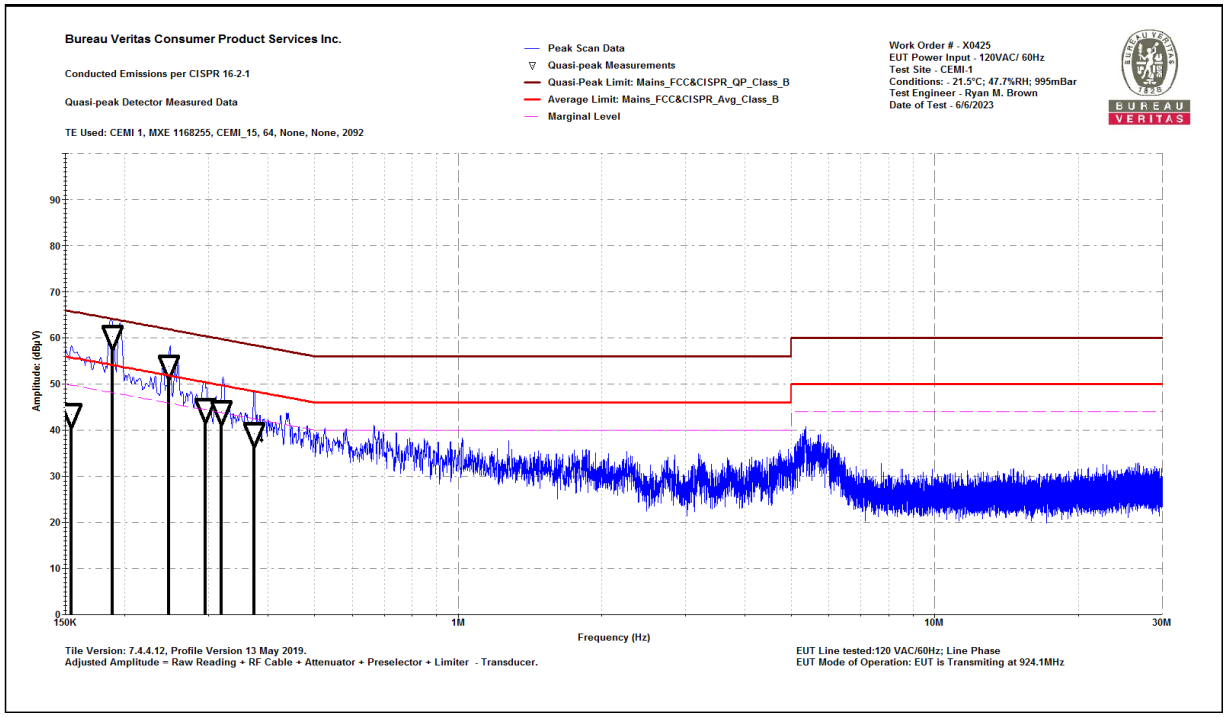
Neutral Final Average

Internal Antenna

Bureau Veritas Consumer Product Services Inc.	Work Order # - X0425
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Quasi-peak Detector Data	Test Site - CEMI-1
Notes:	Conditions: - 21.5°C; 47.7%RH; 995mBar
EUT Line tested:120 VAC/60Hz; Line Phase	Test Engineer - Ryan M. Brown
EUT Mode of Operation: EUT is Transmiting at 924.1MHz	Date of Test - 6/6/2023

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB)	Adjusted QP Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to QP Limit (dB)	QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)
0.154	23.056	20.4	43.4	65.8	-22.3	PASS	
0.188	39.796	20.4	60.2	64.1	-3.9	PASS	-3.9
0.248	33.336	20.5	53.8	61.8	-8	PASS	
0.295	23.987	20.5	44.5	60.4	-15.9	PASS	
0.319	23.468	20.5	44	59.7	-15.7	PASS	
0.374	18.725	20.5	39.3	58.4	-19.1	PASS	

Line Quasi-Peak

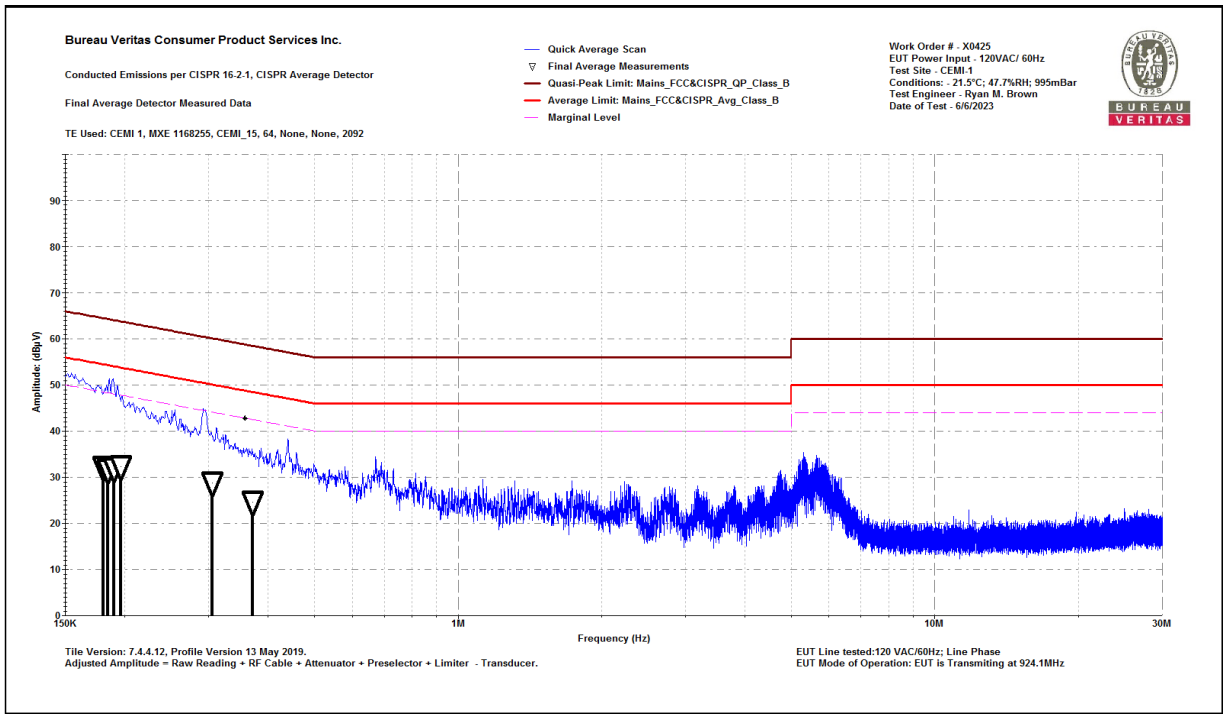


Line Quasi-Peak

Bureau Veritas Consumer Product Services Inc.	Work Order # - X0425
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector	EUT Power Input - 120VAC/ 60Hz
Final Average Detector Data	Test Site - CEMI-1
Notes:	Conditions: - 21.5°C; 47.7%RH; 995mBar
EUT Line tested:120 VAC/60Hz; Line Phase	Test Engineer - Ryan M. Brown
EUT Mode of Operation: EUT is Transmiting at 924.1MHz	Date of Test - 6/6/2023

Frequency (MHz)	Raw Avg Reading (dBµV)	Correction Factor (dB)	Adjusted Avg Amplitude (dBµV)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
0.18	11.8	20.4	32.2	54.5	-22.3	PASS	
0.185	11.1	20.4	31.5	54.3	-22.8	PASS	
0.19	11.4	20.4	31.8	54	-22.2	PASS	
0.196	12	20.4	32.4	53.8	-21.4	PASS	
0.305	8.3	20.5	28.8	50.1	-21.3	PASS	-21.3
0.371	4.1	20.5	24.7	48.5	-23.8	PASS	

Line Final Average

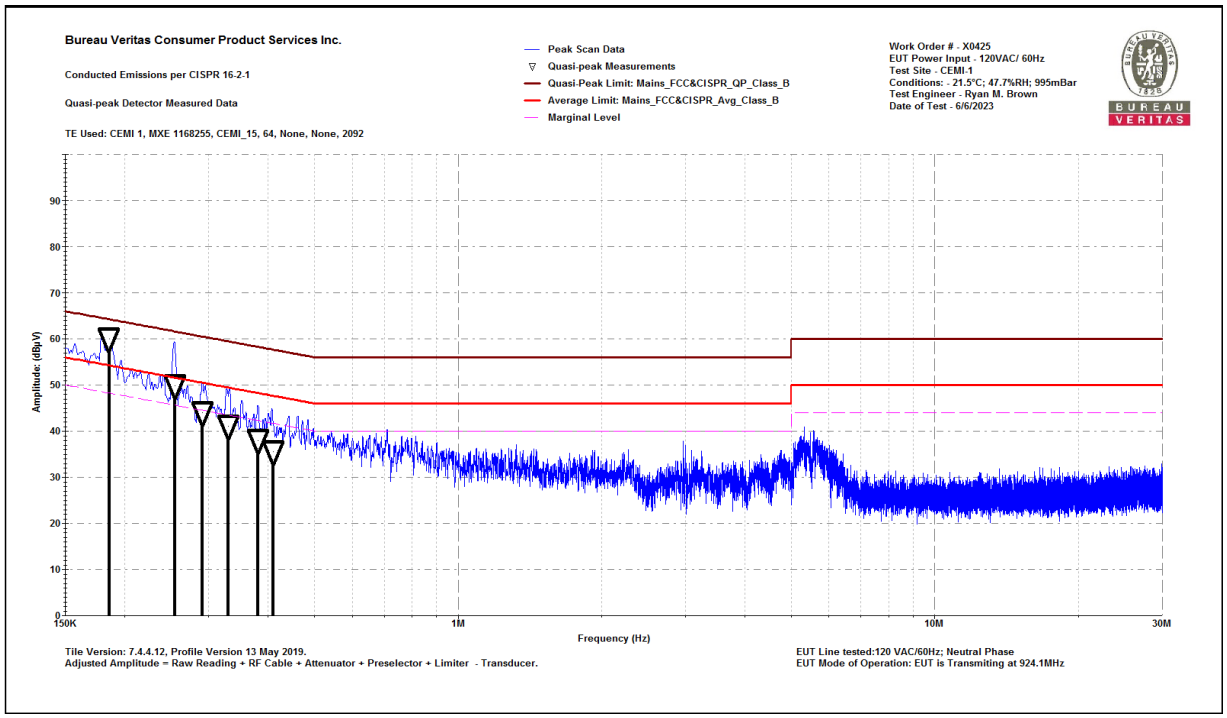


Line Final Average

Bureau Veritas Consumer Product Services Inc.	Work Order # - X0425
Conducted Emissions per CISPR 16-2-1	EUT Power Input - 120VAC/ 60Hz
Quasi-peak Detector Data	Test Site - CEMI-1
Notes:	Conditions: - 21.5°C; 47.7%RH; 995mBar
EUT Line tested:120 VAC/60Hz; Neutral Phase	Test Engineer - Ryan M. Brown
EUT Mode of Operation: EUT is Transmiting at 924.1MHz	Date of Test - 6/6/2023

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB)	Adjusted QP Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to QP Limit (dB)	QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)
0.185	39.618	20.4	60	64.2	-4.2	PASS	-4.2
0.255	29.317	20.5	49.8	61.6	-11.8	PASS	
0.291	23.465	20.5	44	60.5	-16.5	PASS	
0.33	20.505	20.5	41	59.5	-18.5	PASS	
0.381	17.504	20.5	38	58.3	-20.2	PASS	
0.409	14.998	20.6	35.6	57.7	-22.1	PASS	

Neutral Quasi-Peak



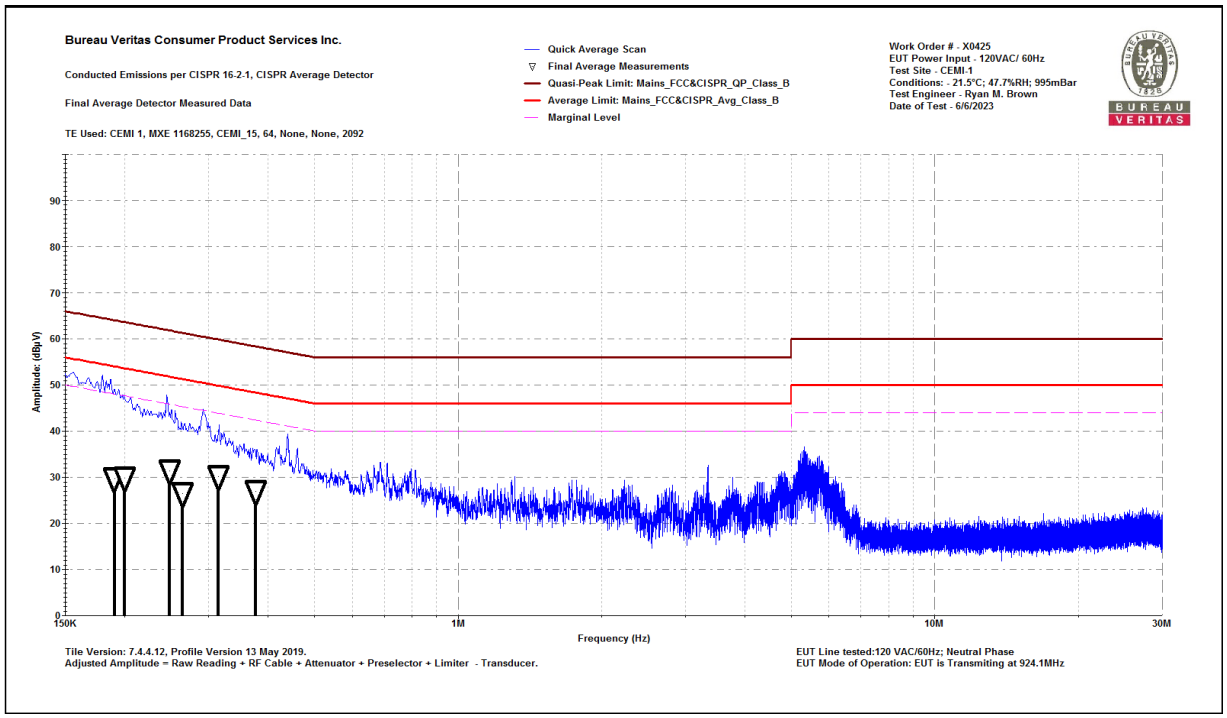
Neutral Quasi-Peak

Bureau Veritas Consumer Product Services Inc.
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested:120 VAC/60Hz; Neutral Phase
EUT Mode of Operation: EUT is Transmiting at 924.1MHz

Work Order # - X0425
EUT Power Input - 120VAC/ 60Hz
Test Site - CEMI-1
Conditions: - 21.5°C; 47.7%RH; 995mBar
Test Engineer - Ryan M. Brown
Date of Test - 6/6/2023

Frequency (MHz)	Raw Avg Reading (dBµV)	Correction Factor (dB)	Adjusted Avg Amplitude (dBµV)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
0.19	9.3	20.4	29.7	54	-24.4	PASS	
0.2	9.4	20.4	29.8	53.6	-23.8	PASS	
0.249	10.9	20.5	31.3	51.8	-20.5	PASS	
0.264	5.9	20.5	26.4	51.3	-24.9	PASS	
0.314	9.6	20.5	30.1	49.9	-19.7	PASS	-19.7
0.377	6.3	20.5	26.8	48.4	-21.5	PASS	

Neutral Final Average



Neutral Final Average

4.2 FUNDAMENTAL FIELD STRENGTH

4.2.1 LIMITS

Per 15.249(a) and RSS-210 Issue 10 Annex B.10 Table B2
902-928MHz: 50mW/m at 3m (equivalent to 94dBuV/m at 3m)

4.2.2 TEST SETUP

Same as radiated spurious emissions setup for 30MHz-1GHz (Section 4.3.5).

4.2.3 TEST EQUIPMENT USED

Rev. 6/6/2023

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	2/21/2024	2/21/2023
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	I	11/29/2024	11/29/2022
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
8447F Rental PA	9KHz-1.3GHz	84477F	HP	3113A05395		II	10/17/2023	10/17/2022
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	6/14/2023	6/14/2021
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Asset 2707		SD700	EXTECH	A.115171	2707	I	1/13/2025	1/13/2023
Asset #2656		1235C97	Control Company	200435359	2656	I	8/18/2025	8/18/2022
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2474	9KHz-18GHz		MegaPhase			II	11/1/2023	11/1/2022
Asset #2610	9KHz-18GHz		Pasternack			II	3/3/2024	3/3/2023
Asset #2681	9KHz-18GHz		Pasternack			II	12/13/2023	12/13/2022

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

4.2.4 TEST PROCEDURES

Same as Section 4.3.3.

4.2.5 DEVIATIONS

No deviations from the standard.

4.2.6 EUT OPERATING CONDITIONS

EUT was operated according to manufacturer's specifications.

4.2.7 TEST RESULTS

Fundamental Field Strength

Date: 30-May-23 **Company:** DogWatch **Work Order:** X0425
Engineer: Ryan M. Brown **EUT Desc:** Smart Portal **EUT Operating Voltage/Frequency:** 120VAC 60Hz
Temp: 22.3C **Humidity:** 42% **Pressure:** 1002mbar
Frequency Range: Fundamental **Measurement Distance:** 3 m
Notes: Peak max-hold measurements

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)	FCC 15.249 Limit (dBµV/m)	FCC 15.249 Margin (dB)	FCC 15.249 Result (Pass/Fail)
EUT in X-Axis, External Antenna Vertical			---	---	---	---	---	---	---	---	---	---
V	922.9	82.2	25.2	29.0	1.9	87.9	---	---	---	93.9	-6.0	Pass
H	922.9	74.7	25.2	29.0	1.9	80.4	---	---	---	93.9	-13.5	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in X-Axis, External Antenna Horizontal			---	---	---	---	---	---	---	---	---	---
V	922.9	75.5	25.2	29.0	1.9	81.2	---	---	---	93.9	-12.7	Pass
H	922.9	82.8	25.2	29.0	1.9	88.5	---	---	---	93.9	-5.4	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in Y-Axis, External Antenna Vertical			---	---	---	---	---	---	---	---	---	---
V	922.9	82.8	25.2	29.0	1.9	88.5	---	---	---	93.9	-5.4	Pass
H	922.9	78.2	25.2	29.0	1.9	83.9	---	---	---	93.9	-10.0	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in Y-Axis, External Antenna Horizontal			---	---	---	---	---	---	---	---	---	---
V	922.9	75.3	25.2	29.0	1.9	81.0	---	---	---	93.9	-12.9	Pass
H	922.9	81.6	25.2	29.0	1.9	87.3	---	---	---	93.9	-6.6	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in X-Axis, Internal Antenna			---	---	---	---	---	---	---	---	---	---
V	922.9	75.6	25.2	29.0	1.9	81.3	---	---	---	93.9	-12.6	Pass
H	922.9	80.9	25.2	29.0	1.9	86.6	---	---	---	93.9	-7.3	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in Y-Axis, Internal Antenna			---	---	---	---	---	---	---	---	---	---
V	922.9	80.4	25.2	29.0	1.9	86.1	---	---	---	93.9	-7.8	Pass
H	922.9	82.9	25.2	29.0	1.9	**88.6**	---	---	---	93.9	-5.3	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in X-Axis, External Antenna Vertical			---	---	---	---	---	---	---	---	---	---
V	924.1	84.0	25.2	28.9	1.9	89.6	---	---	---	93.9	-4.3	Pass
H	924.1	74.9	25.2	28.9	1.9	80.5	---	---	---	93.9	-13.4	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in X-Axis, External Antenna Horizontal			---	---	---	---	---	---	---	---	---	---
V	924.1	78.8	25.2	28.9	1.9	84.4	---	---	---	93.9	-9.5	Pass
H	924.1	85.5	25.2	28.9	1.9	**91.1**	---	---	---	93.9	-2.8	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in Y-Axis, External Antenna Vertical			---	---	---	---	---	---	---	---	---	---
V	924.1	85.2	25.2	28.9	1.9	90.8	---	---	---	93.9	-3.1	Pass
H	924.1	79.4	25.2	28.9	1.9	85.0	---	---	---	93.9	-8.9	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in Y-Axis, External Antenna Horizontal			---	---	---	---	---	---	---	---	---	---
V	924.1	77.8	25.2	28.9	1.9	83.4	---	---	---	93.9	-10.5	Pass
H	924.1	83.1	25.2	28.9	1.9	88.7	---	---	---	93.9	-5.2	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in X-Axis, Internal Antenna			---	---	---	---	---	---	---	---	---	---
V	924.1	75.4	25.2	28.9	1.9	81.0	---	---	---	93.9	-12.9	Pass
H	924.1	82.5	25.2	28.9	1.9	88.1	---	---	---	93.9	-5.8	Pass
			---	---	---	---	---	---	---	---	---	---
EUT in Y-Axis, Internal Antenna			---	---	---	---	---	---	---	---	---	---
V	924.1	80.2	25.2	28.9	1.9	85.8	---	---	---	93.9	-8.1	Pass
H	924.1	82.5	25.2	28.9	1.9	88.1	---	---	---	93.9	-5.8	Pass
			---	---	---	---	---	---	---	---	---	---

Table Result: Pass by -2.8 dB ***Worst Freq:*** 924.1 MHz

Test Site: EMI Chamber 1 **Cable 1:** Asset #2681 **Cable 2:** Asset #2610 **Cable 3:** Asset #2474
Analyzer: 1170725 **Preamp:** 8447F **Antenna:** Red-Black **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.225
Copyright Curtis-Straus LLC 2000
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

4.3 RADIATED SPURIOUS EMISSIONS

4.3.1 LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emissions limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. Lower limit applies at the transition frequencies.
2. dBμV/m = 20*log(μV/m).
3. As specified in 15.35(b), for frequencies above 1000MHz, field strength limits are based on the use of measurement instrumentation employing an average detector function. However, there is also a limit on the peak level of the emissions that is 20 dB above the maximum permitted average emission limit.
4. Limit conversion below 30MHz is done by using the square of an inverse linear distance extrapolation factor (40 dB/decade) as allowed in FCC 15.31(f)(2).

   Limit(3m) = Limit(30m) + 40*log(30/3) = Limit(30m) + 40

   Limit(3m) = Limit(300m) + 40*log(300/3) = Limit(300m) + 80
5. RSS-GEN Table 6 H-field limits are 51.5dB lower than FCC 15.209(a) E-field limits. Measurements are performed in terms of magnetic field and converted to electric field using the free space impedance of 377Ω (E-field = H-field + 51.5). Therefore resulting pass/fail margin would be the same if an E-field reading is compared to an E-field limit or an H-field reading is compared to an H-field limit.

4.3.2 TEST EQUIPMENT USED

Rev. 6/6/2023

Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1170725)	20Hz-26.5GHz	N9038A	Agilent	MY51210151	1170725	I	2/21/2024	2/21/2023
Radiated Emissions Sites	**FCC Code**	**IC Code**	**VCCI Code**	**Range**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
EMI Chamber 1	719150	2762A-6	A-0015	0.009-40000MHz	1685	I	11/29/2024	11/29/2022
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
8447F Rental PA	9KHz-1.3GHz	84477F	HP	3113A05395		II	10/17/2023	10/17/2022
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-Black Bilog	30-2000MHz	JB1	Sunol	A091604-2	1106	I	6/14/2023	6/14/2021
Rental Horn/PA	1-18Hz	3117-PB	ETS	237459	3117	I	9/28/2023	9/28/2022
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	9/12/2024	9/12/2022
Large Loop	20Hz-5MHz	6511	EMCO	9704-1154	67	I	8/22/2024	8/22/2022
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Asset 2707		SD700	EXTECH	A.115171	2707	I	1/13/2025	1/13/2023
Asset #2656		1235C97	Control Company	200435359	2656	I	8/18/2025	8/18/2022
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2474	9KHz-18GHz		MegaPhase			II	11/1/2023	11/1/2022
Asset #2610	9KHz-18GHz		Pasternack			II	3/3/2024	3/3/2023
Asset #2681	9KHz-18GHz		Pasternack			II	12/13/2023	12/13/2022

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

4.3.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber.

b. For below 30MHz, a loop antenna with its lowest point 1m above the ground was placed 3m away from the EUT and it was rotated 0 and 90 degrees around its vertical axis.

c. In 30MHz-1GHz range, a biconilog antenna was mounted on a variable-height antenna tower and placed 3m away from the EUT. Antenna height was varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were investigated. The table was rotated 360 degrees to determine the position of the highest radiation.

d. In 1GHz-10GHz range, a horn antenna was mounted on a variable-height antenna tower and placed 3m away from the EUT. Antenna height was varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were investigated. The table was rotated 360 degrees to determine the position of the highest radiation.

e. For battery operated equipment, tests were performed using fresh batteries.

f. Following bandwidths were used during emissions testing:

Freq. (MHz)	RBW	VBW	Pre-scan	Final
0.009-0.15	200Hz	1kHz	Peak	Quasi Peak
0.15-30	9kHz	30kHz	Peak	Quasi Peak
30-1000	120kHz	300kHz	Peak	Quasi Peak
>1000	1MHz	3MHz	Peak	Peak Max Hold and RMS Power Avg Trace Avg

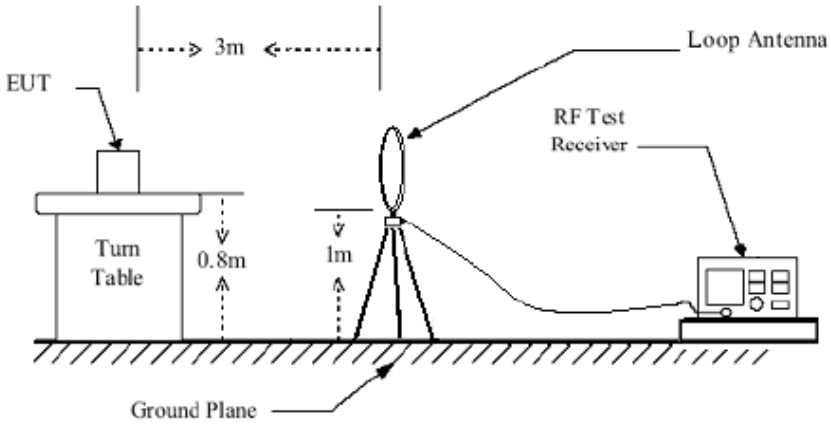
If peak measurements were below the applicable limit, QPk and RMS measurements were not performed.

4.3.4 DEVIATIONS

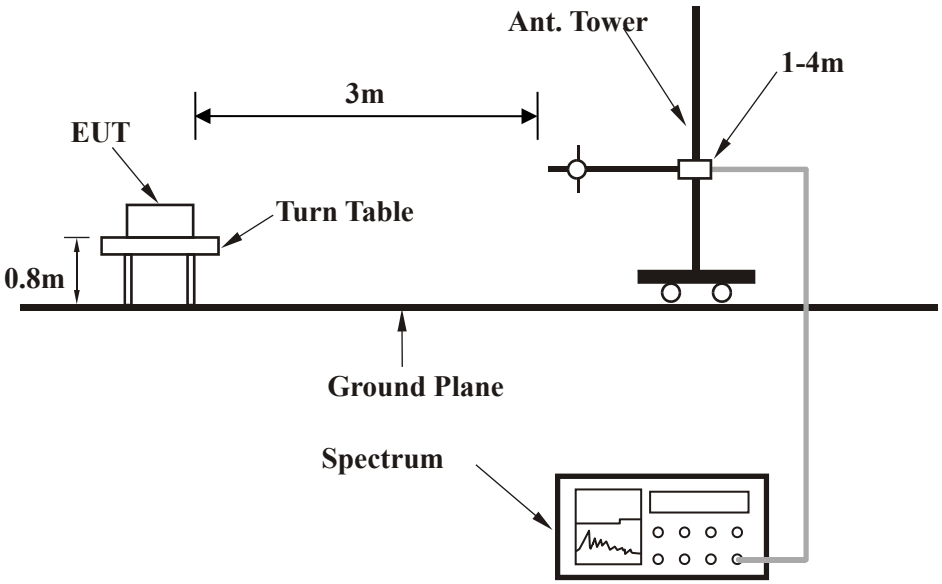
No deviations from the standard.

4.3.5 TEST SETUP

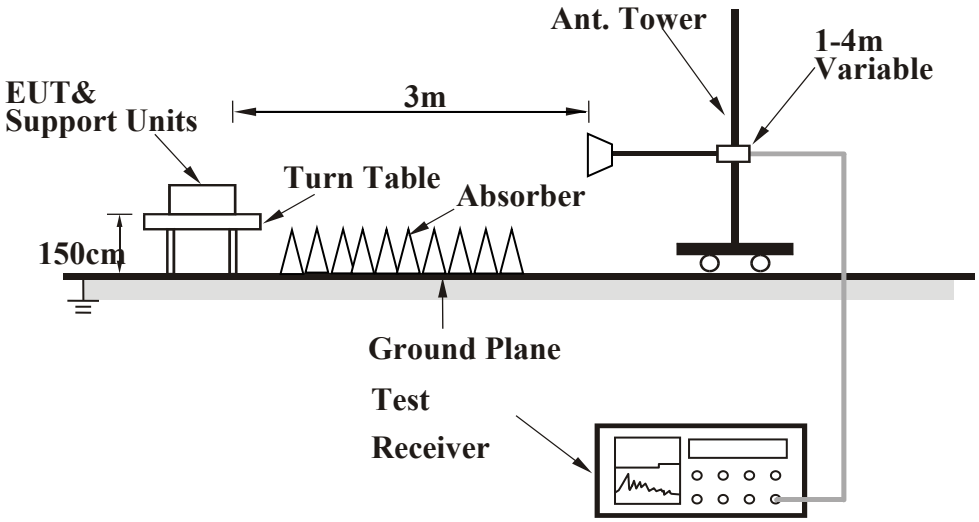
Below 30MHz Test Setup



30MHz - 1GHz Test Setup



1GHz – 10GHz Test Setup



Note: For the actual test configuration, please refer to the Test Setup Photos exhibit.

4.3.6 EUT OPERATING CONDITIONS

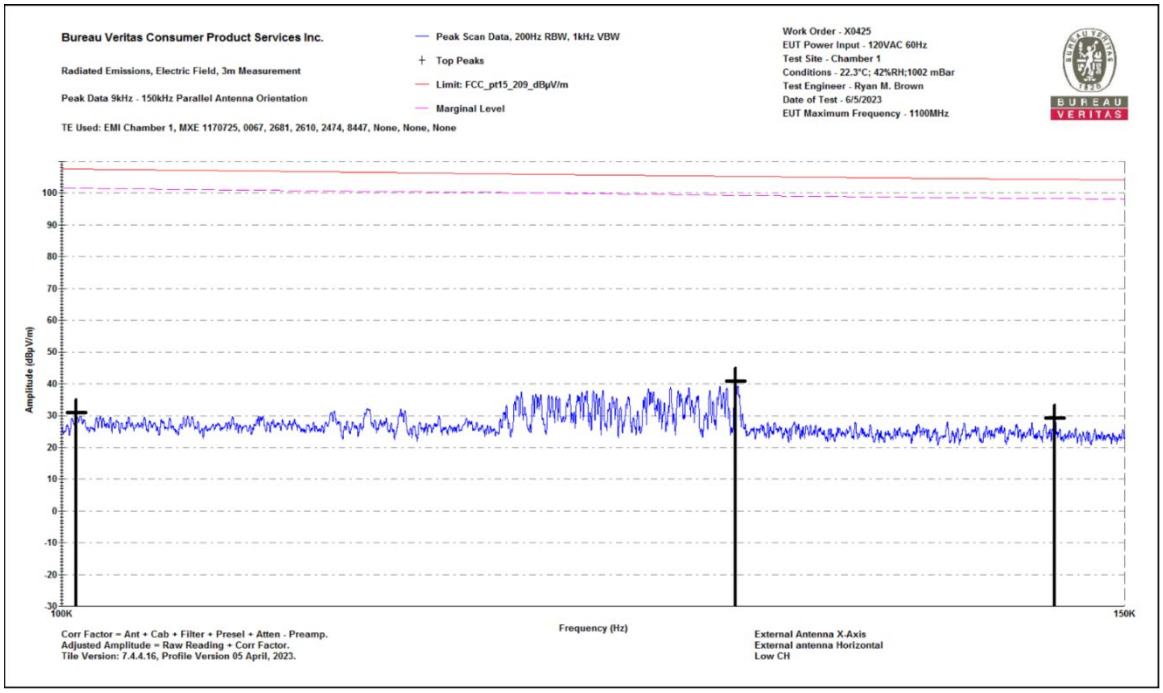
EUT was operated according to the manufacturer's specifications.

4.3.7 TEST RESULTS

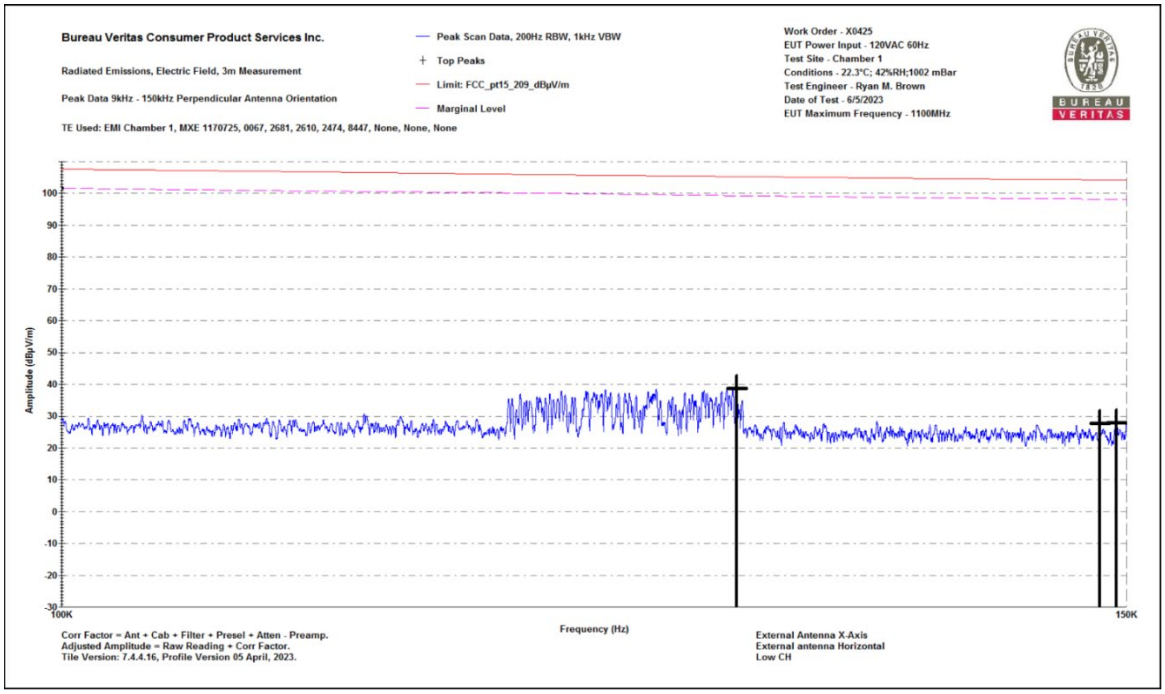
Emissions below 1GHz External Antenna

Results for low channel

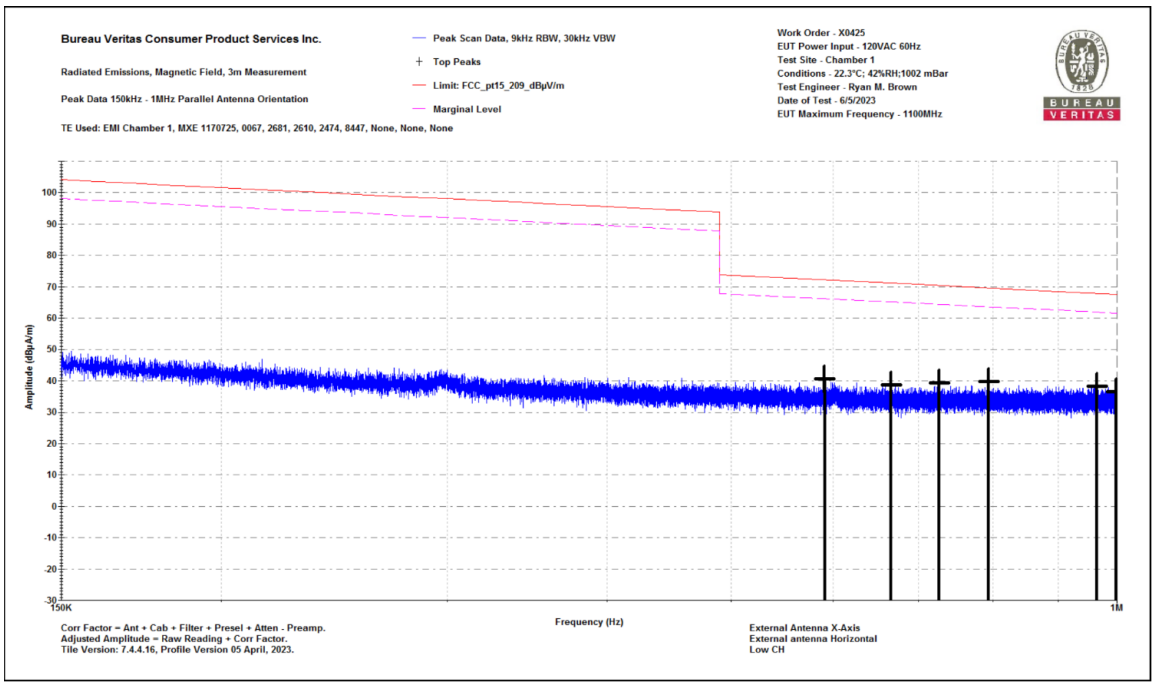
No emissions within 10dB of the limit were identified below 30MHz. Only plots shown below.



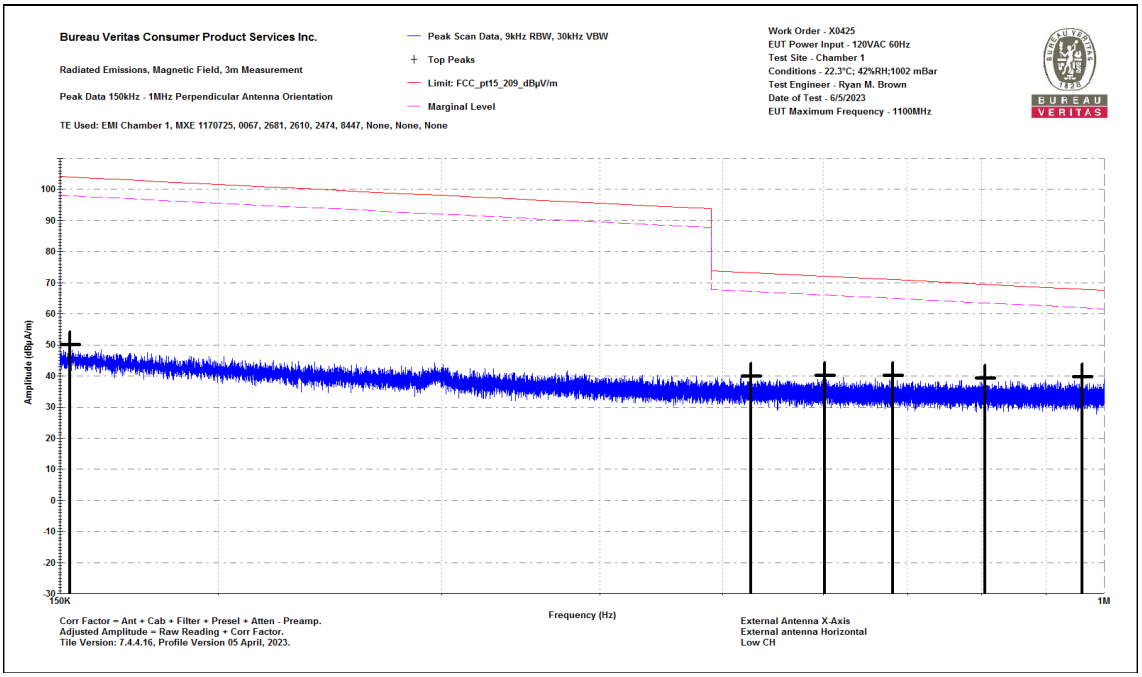
0.1-0.15MHz Parallel



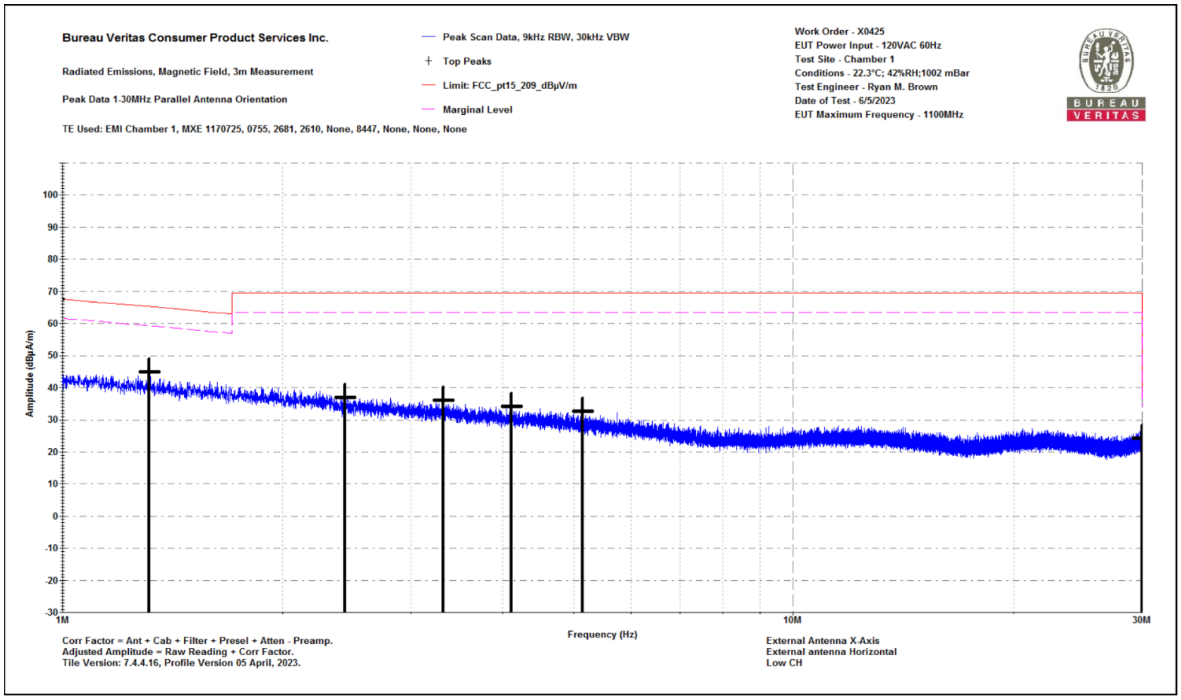
0.1-0.15MHz Perpendicular



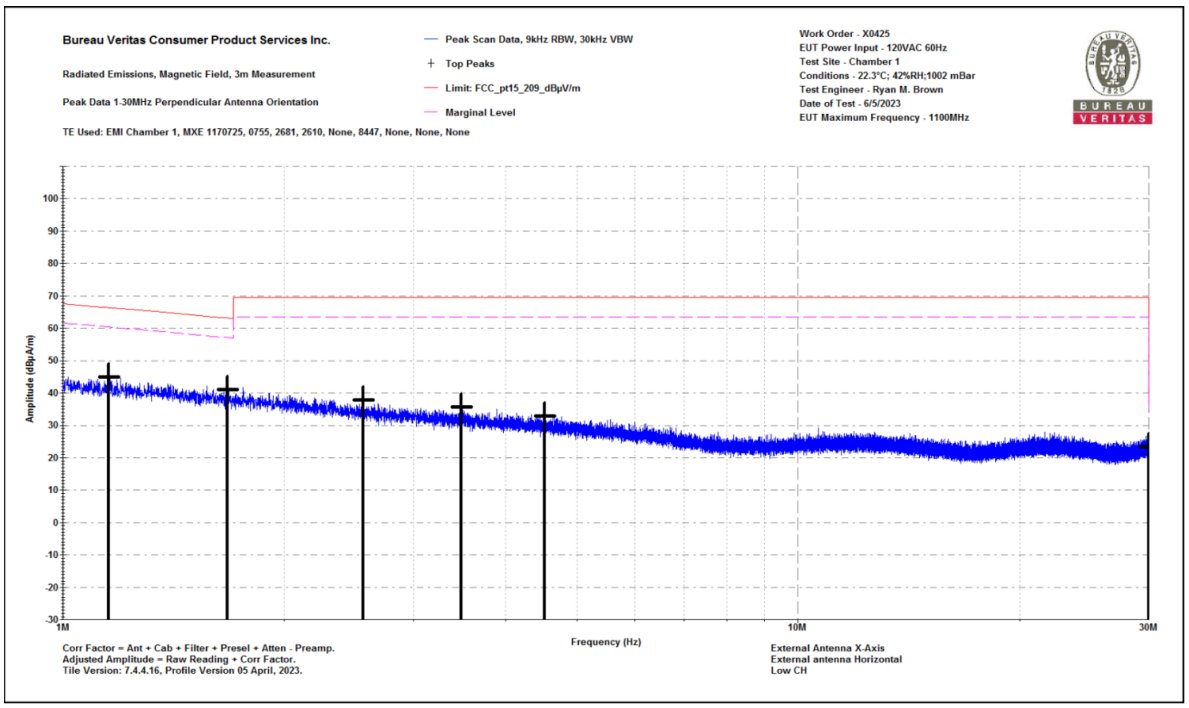
0.15-1MHz Parallel



0.15-1MHz Perpendicular



1-30MHz Parallel

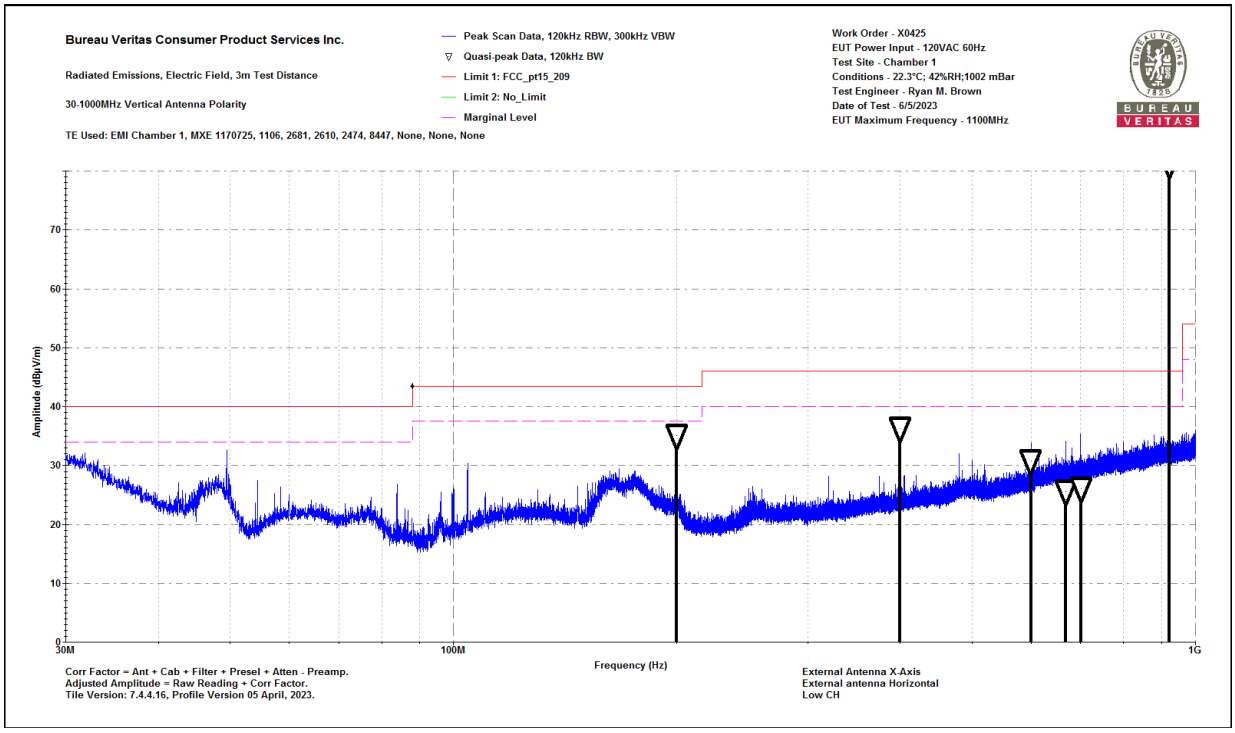


1-30MHz Perpendicular

Bureau Veritas Consumer Product Services Inc.	Work Order - X0425
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 120VAC 60Hz
30-1000MHz Vertical Data	Test Site - Chamber 1
Notes:	Conditions - 22.3°C; 42%RH;1002 mBar
External Antenna X-Axis	Test Engineer - Ryan M. Brown
External antenna Horizontal	Date of Test - 6/5/2023
Low CH	

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dBµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
199.991	40.4	-5.3	35.1	43.5	-8.4	PASS	-8.4	105	139
400.023	39.3	-2.9	36.3	46	-9.7	PASS		125	84
599.999	30.4	0.3	30.7	46	-15.3	PASS		125	85
669.331	24.2	1.5	25.7	46	-20.3	PASS		175	65
701.122	24.1	2	26.1	46	-19.9	PASS		262	205
922.903	Fundamental							105	15

30-1000MHz Vertical Data Table

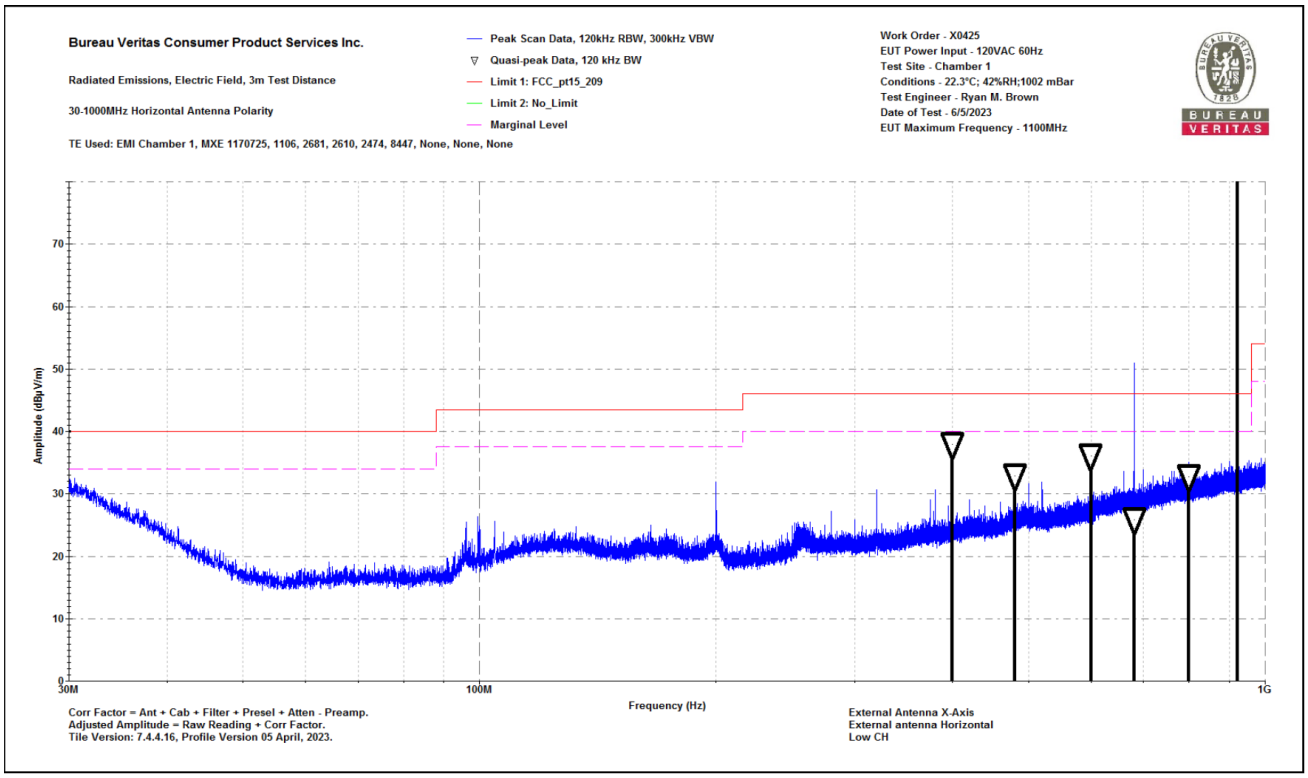


30-1000MHz Vertical Plot

Bureau Veritas Consumer Product Services Inc.	Work Order - X0425
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 120VAC 60Hz
30-1000MHz Horizontal Data	Test Site - Chamber 1
Notes:	Conditions - 22.3°C; 42%RH;1002 mBar
External Antenna X-Axis	Test Engineer - Ryan M. Brown
External antenna Horizontal	Date of Test - 6/5/2023
Low CH	

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dbµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
400.016	40.8	-2.9	37.8	46	-8.2	PASS		100	81
480.03	34.1	-1.2	32.9	46	-13.1	PASS		199	65
600.019	35.7	0.3	36	46	-10	PASS		149	47
681.329	24.2	1.7	25.8	46	-20.2	PASS		175	292
800.01	29	3.7	32.7	46	-13.3	PASS		175	179
922.908	Fundamental							100	78

30-1000MHz Horizontal Data Table



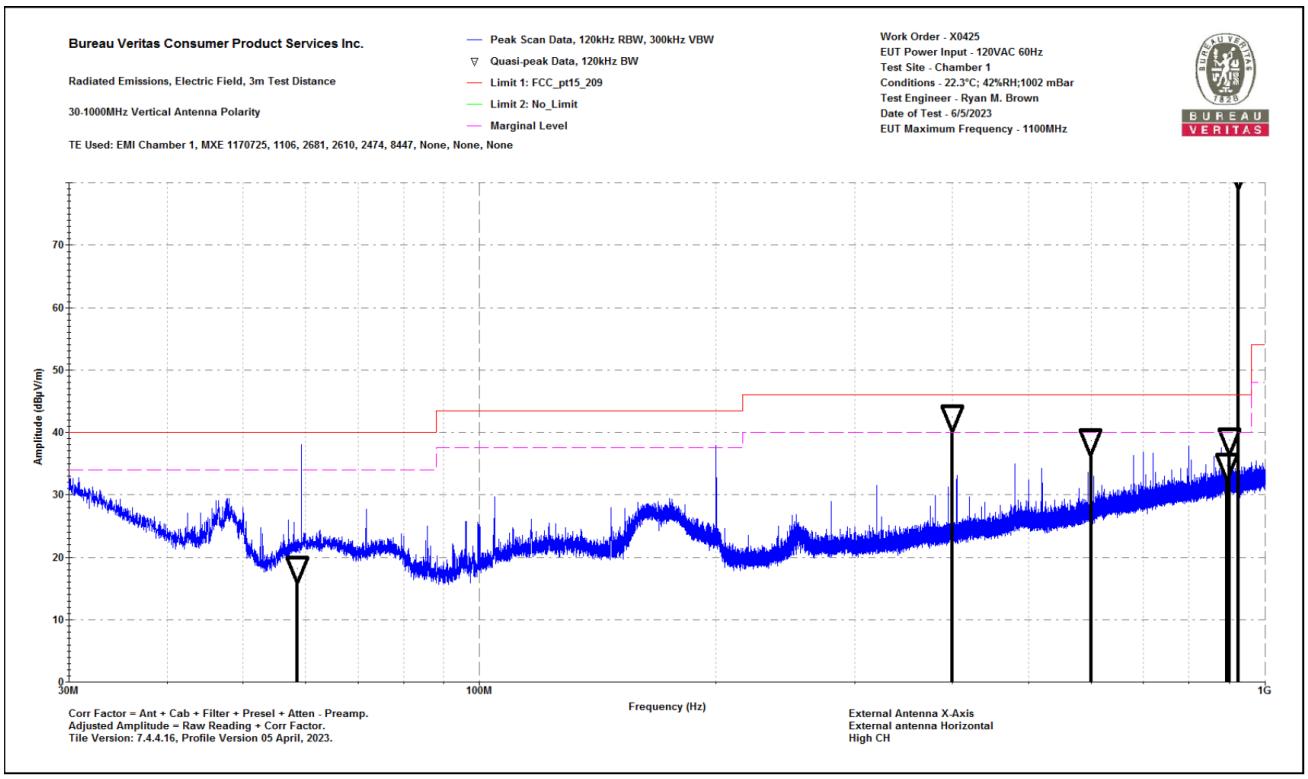
30-1000MHz Horizontal Plot

Results for high channel

Bureau Veritas Consumer Product Services Inc.	Work Order - X0425
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 120VAC 60Hz
30-1000MHz Vertical Data	Test Site - Chamber 1
Notes:	Conditions - 22.3°C; 42%RH;1002 mBar
External Antenna X-Axis	Test Engineer - Ryan M. Brown
External antenna Horizontal	Date of Test - 6/5/2023
High Ch	

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dBµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
58.641	30.4	-12.3	18.2	40	-21.8	PASS		197	144
400.006	45.4	-2.9	42.5	46	-3.5	PASS	-3.5	131	71
599.99	38.3	0.3	38.6	46	-7.4	PASS		104	89
895.031	29.2	5.5	34.7	46	-11.3	PASS		175	165
900.027	33.2	5.6	38.7	46	-7.3	PASS		158	174
924.094	Fundamental							167	0

30-1000MHz Vertical Data Table

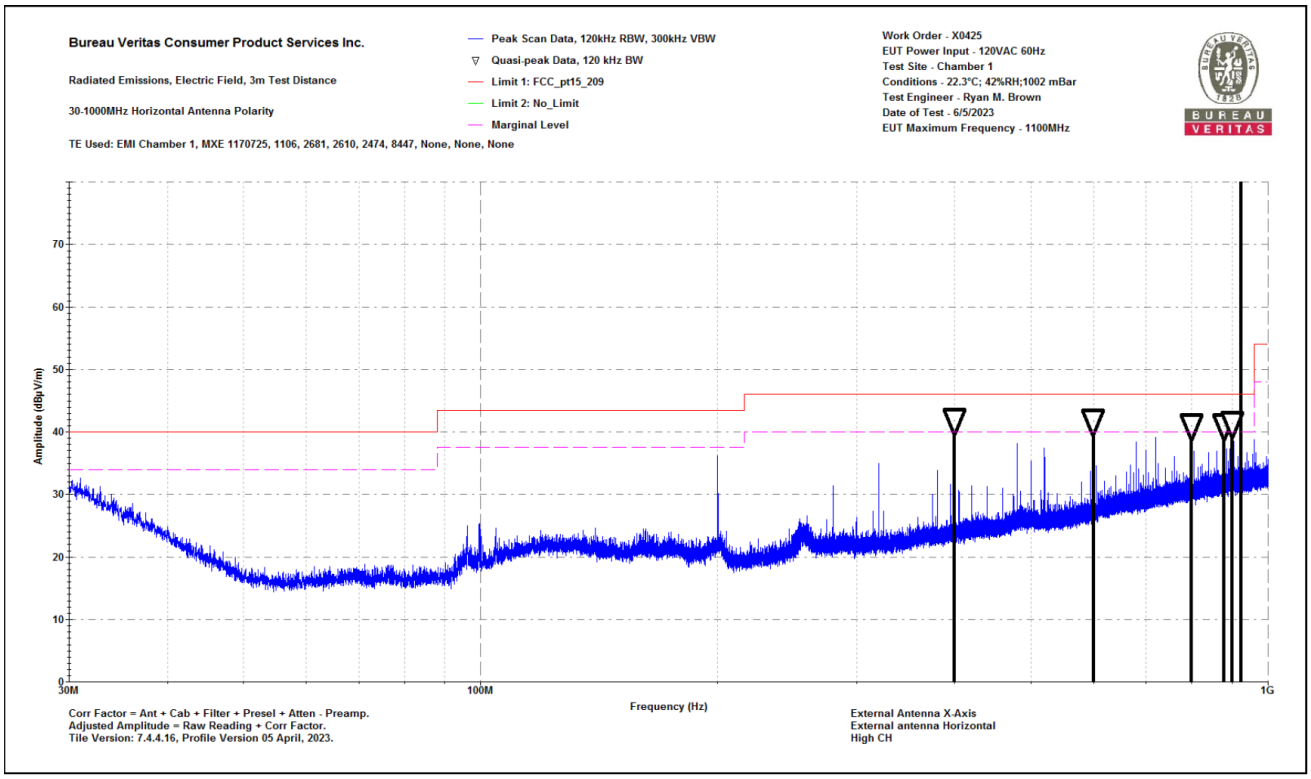


30-1000MHz Vertical Plot

Bureau Veritas Consumer Product Services Inc.	Work Order - X0425
Radiated Emissions Electric Field 3m Distance	EUT Power Input - 120VAC 60Hz
30-1000MHz Horizontal Data	Test Site - Chamber 1
Notes:	Conditions - 22.3°C; 42%RH;1002 mBar
External Antenna X-Axis	Test Engineer - Ryan M. Brown
External antenna Horizontal	Date of Test - 6/5/2023
High Ch	

Frequency (MHz)	Raw QP Reading (dBµV)	Correction Factor (dB/m)	Adjusted QP Amplitude (dBµV/m)	Lim1: FCC_pt15_209 (dbµV/m)	Margin to Lim1 (dB)	Test Results Lim1 (Pass/Fail)	Worst Margin Lim1 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
400.02	44.7	-2.9	41.8	46	-4.2	PASS		105	80
600.013	41.5	0.3	41.8	46	-4.2	PASS	-4.2	151	272
800.026	37.3	3.7	41	46	-5	PASS		175	3
880.017	35.9	5.2	41	46	-5	PASS		100	271
900.019	35.8	5.6	41.4	46	-4.6	PASS		100	0
924.098	Fundamental							100	86

30-1000MHz Horizontal Data Table



30-1000MHz Horizontal Plot