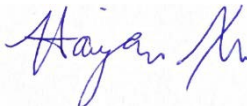
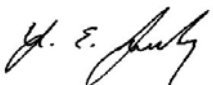




BUREAU
VERITAS

Test Report

Bureau Veritas Consumer Product Services

Report No	EW0235-3 Issue 3
Client	Hanchett Entry Systems, Inc.
Address	10027 S. 51st Street, Suite 102, Phoenix AZ 85044
Product Description	RFID Reader Module
FCC ID	VC3-DR100V3
IC	7160A-DR100V3
PMN	DR100-V3
Model/HVIN	DR100-V3
FVIN	N/A
HMN	DR100
Equipment Type	Part 15 Low Power Transmitter Below 1705kHz
Equipment Code	DCD
Standards	CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 10 Section 7.3
Test Dates	Jun 28, 2022 to Feb 22, 2023
FCC Test Firm DN	US1028
Canada CABID	US0106
Prepared by	 Haiyan Xu – Wireless Engineer
Authorized by	 Yunus Faziloglu – Wireless Manager
Issue Date	<u>Mar 16, 2023</u>

Bureau Veritas is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



Bureau Veritas Consumer Product Services
One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



Contents

Contents.....	2
Summary and Test Methodology.....	3
Compliance Statement	4
Modifications Required for Compliance	4
Testing Notes	4
Test Results	5
Fundamental.....	5
Radiated Spurious Emissions	6
AC Line Conducted Emissions.....	16
99% Occupied Bandwidth	20
Measurement Uncertainty.....	21
Document Revision History	22

Form Final Report REV 2-16-07 (DW)



Summary and Test Methodology

This test report supports a “Limited Modular Approval” certification application for the RFID Reader Module (Model: DR100-V3) operating pursuant to:

CFR Title 47 FCC Part 15.209, ISED Canada RSS-210 Issue 10 Section 7.3

This report contains test data for the 125kHz RFID radio portion of this EUT.

The EUT is the RFID Reader Module (Model: DR100-V3). It communicates reading activity to a remote unit over the 2.4GHz band. It was tested inside the Aperio V3 Wireless Door Relay (Host Model: DR100). The RFID Reader Module (Model: DR100-V3) also contains a 13.56MHz RFID radio and a Zigbee radio. 125kHz transmitter has an integral antenna. The Host Model DR100 operating voltage is 24VDC, and the RFID Reader Module (Model: DR100-V3) operating voltage is 3VDC.

In addition, DR100 host includes a previously certified Bluetooth Low Energy module with FCC ID: Y88-MBM1CC2640 and IC: 9504A-MBM1CC2640.

Lowest clock frequency in the device (used/generated): 32.768kHz

A support laptop was used to control the RFID transmitter. PuTTY (software) was used on this laptop to enable/disable transmitters and set transmission channels.

For spurious emissions, 125kHz RFID radio was tested with unmodulated carrier due to the fact that modulated mode had large mutes between pulses making it unsuitable for maximizing emissions. For fundamental field strength and 99% emission bandwidth measurements, unmodulated carrier was used to maximize the fundamental, but final measurements were performed with modulation enabled.

EUT was supplied with an “RFID windmill” test fixture to present RFID tags to the EUT during unintentional emissions testing in order to simulate normal operation of periodic tag reading. This fixture was not exercised during radio testing.

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

ANSI C63.10-2013 RSS-Gen Issue 5

Following bandwidths were used during 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

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

The environmental conditions during testing are documented on the associated data tables.

We found that the product complied with the requirements above without modification. Test sample was received in good condition.



Compliance Statement

RSS-GEN	RSP-100	RSS 210	Part 15	Comments
6.4			15.15(b)	There are no controls accessible to the user that varies the output power.
	3.1		15.19	The label is shown in the label exhibit.
	3.2		15.21	Information to the user is shown in the instruction manual exhibit.
			15.27	No special accessories are required for compliance.
3.2			15.31	The EUT was tested in accordance with the measurement standards in this section.
6.13.2			15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
6.13.1			15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
6.8			15.203	The antenna for this device is an integral antenna.
8.10 8.9		7.3	15.205 15.209	Fundamental is not in a restricted band and the spurious and harmonic emissions in the restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable.
8.8			15.207	Complies with applicable AC line conducted emission limits.
6.7				99% emission bandwidth plot is provided.

Modifications Required for Compliance

None.

Testing Notes

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.



Test Results

Fundamental

Test setup and procedures can be found on the next page.

Radiated Emissions Table												
Date: 28-Jun-22			Company: Assa Abloy						Work Order: W0235			
Engineer: Ryan M. Brown			EUT Desc: DR100 Door Relay						EUT Operating Voltage/Frequency: 24V DC			
Temp: 23.3			Humidity: 47%			Pressure: 1011						
Frequency Range: 125Khz Fundamental								Measurement Distance: 3 m				
Notes: Peak Readings								EUT Max Freq: 2480				
Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	---			FCC 15.209		
							Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBµV/m)	Margin (dB)	Result (Pass/Fail)
Para	0.125	51.4	29.4	50.1	0.3	72.4	---	---	---	105.6	-33.2	Pass
Perp	0.125	47.5	29.4	50.1	0.3	68.5	---	---	---	105.6	-37.1	Pass
Para to Floor	0.125	41.1	29.4	50.1	0.3	62.1	---	---	---	105.6	-43.5	Pass
Table Result: Pass by -33.2 dB							Worst Freq: 0.125 MHz					
Test Site: EMI Chamber 2			Cable 1: Asset #2682				Cable 2: Asset #2610			Cable 3: Asset # 2474		
Analyzer: 2093			Preamp: 8447F_2				Antenna: Lg Loop			Preselector: ---		
CSsoft Radiated Emissions Calculator v 1.017.222							Copyright Curtis-Straus LLC 2000					
Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor												

Throughout this report, 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).

$$\text{Limit}(3\text{m}) = \text{Limit}(30\text{m}) + 40 \cdot \log(30/3) = \text{Limit}(30\text{m}) + 40$$

$$\text{Limit}(3\text{m}) = \text{Limit}(300\text{m}) + 40 \cdot \log(300/3) = \text{Limit}(300\text{m}) + 80$$

Test Equipment Used

Rev. 6/20/2022

Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver		20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	3/7/2023	3/7/2022
Radiated Emissions Sites		FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 2		719150	2762A-7	A-0015	30-1000MHz	1686	I	12/5/2022	12/5/2020
Preamps /Couplers Attenuators / Filters		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
8447F Rental PA		9KHz-1.3GHz	84477F	HP	3113A05395		II	10/18/2022	10/18/2021
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Large Loop		20Hz-5MHz	6511	EMCO	9704-1154	67	I	8/21/2022	8/21/2020
Meteorological Meters/Chambers			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	11/23/2022	11/23/2020
Asset #2657			1235C97	Control Company	200435369	2657	I	7/23/2022	7/23/2020
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2474		9KHz-18GHz		MegaPhase			II	11/9/2022	11/9/2021
Asset #2610		9KHz-18GHz		Pasternack			II	3/16/2023	3/16/2022
Asset #2682		9KHz-18GHz		Pasternack			II	6/17/2023	6/17/2022

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

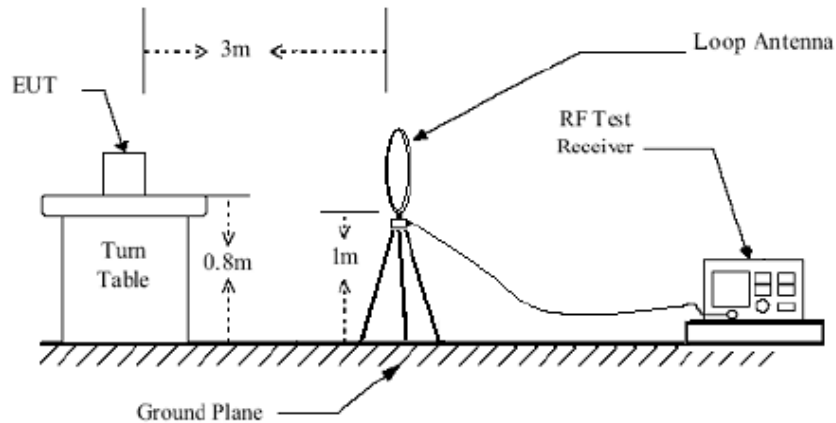


Radiated Spurious Emissions

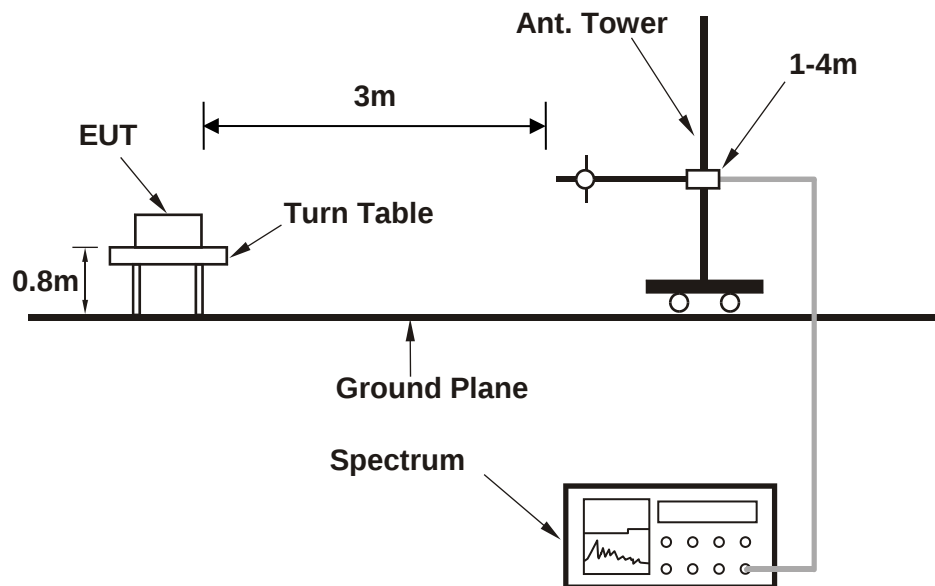
Test Procedures

- 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.
- 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.
- 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.

Setup below 30MHz



Setup for 30MHz - 1GHz

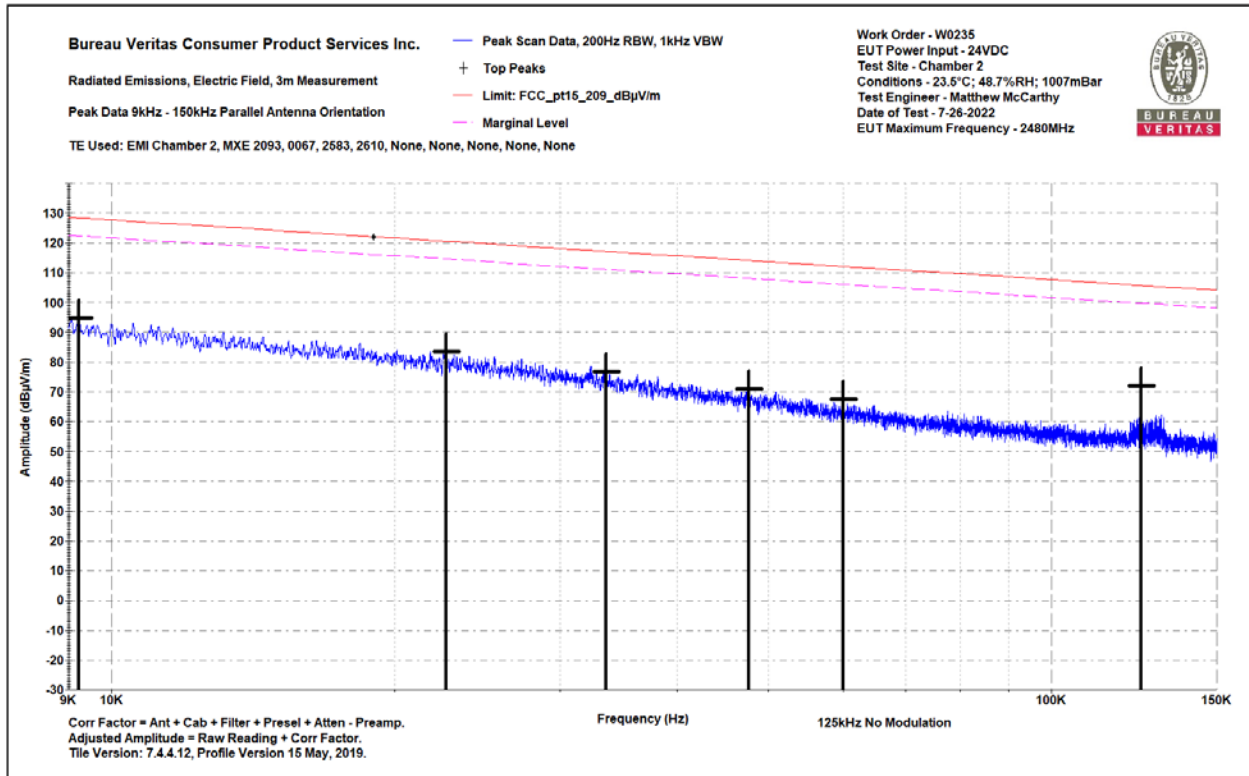


Bureau Veritas Consumer Product Services Inc.
Radiated Emissions, Electric Field, 3m Measurement
Top Peaks Parallel 9-150kHz
Notes:
125kHz No Modulation
0

Work Order - W0235
EUT Power Input - 24VDC
Test Site - Chamber 2
Conditions - 23.5°C; 48.7%RH; 1007mBar
Test Engineer - Matthew McCarthy
Date of Test - 7-26-2022

Frequency (MHz)	Raw Peak Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Lim: FCC_pt15_20 9_dBμV/m (dBμV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Margin (dB)	EUT Azimuth (degrees)
0.009222	27.9	66.9	94.8	128.3	-33.5	PASS	-33.5	315
0.022719	22.2	61.4	83.6	120.5	-36.9	PASS		30
0.033597	18.5	58.2	76.7	117.1	-40.4	PASS		285
0.04768	15.4	55.5	70.9	114.1	-43.1	PASS		150
0.060017	14.3	53.3	67.6	112	-44.5	PASS		0
0.124662	21.9	50.1	72	105.7	-33.7	PASS		345

9KHz – 150KHz Parallel



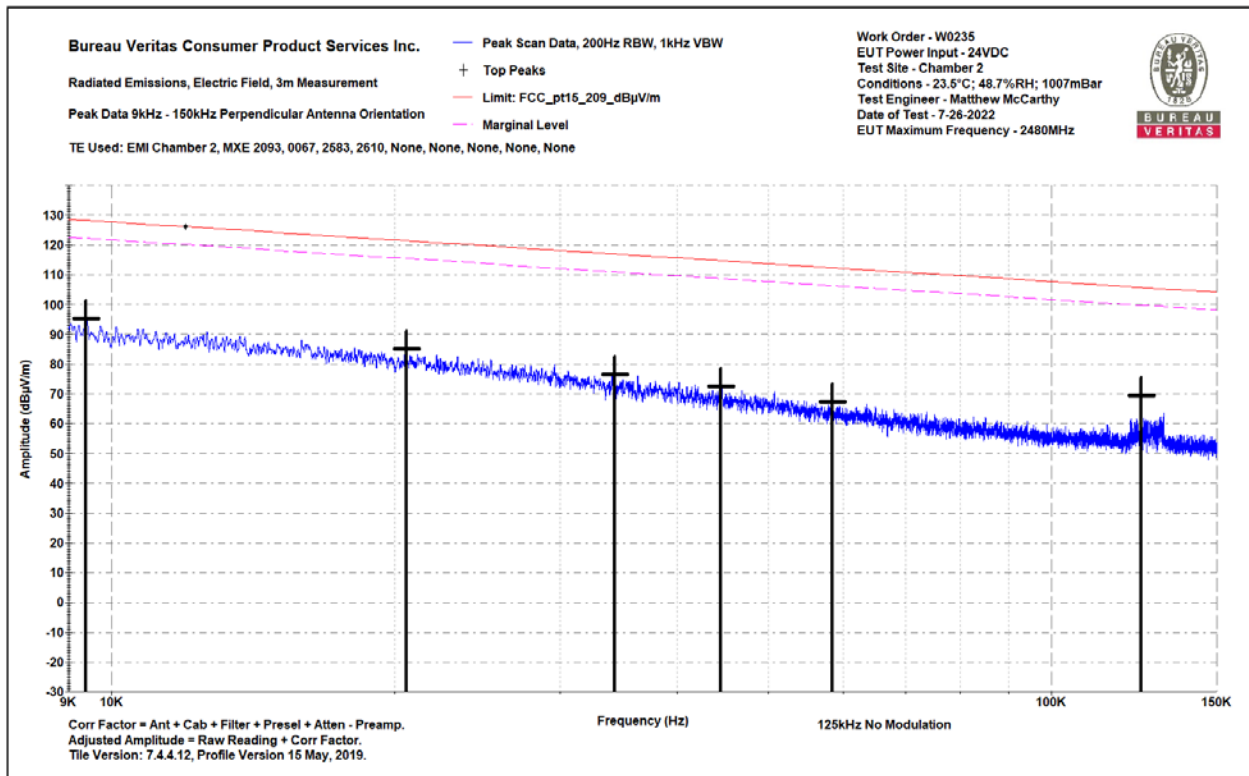
9KHz – 150KHz Parallel

Bureau Veritas Consumer Product Services Inc.
Radiated Emissions, Electric Field, 3m Measurement
Top Peaks Perpendicular 9-150kHz
Notes:
125kHz No Modulation
0

Work Order - W0235
EUT Power Input - 24VDC
Test Site - Chamber 2
Conditions - 23.5°C; 48.7%RH; 1007mBar
Test Engineer - Matthew McCarthy
Date of Test - 7-26-2022

Frequency (MHz)	Raw Peak Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Lim: FCC_pt15_20 9_dBμV/m (dBμV/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Margin (dB)	EUT Azimuth (degrees)
0.009395	28.7	66.6	95.4	128.2	-32.8	PASS	-32.8	135
0.020597	22.9	62	85	121.3	-36.4	PASS		315
0.034299	18.5	58	76.5	116.9	-40.4	PASS		255
0.044458	16.6	55.9	72.5	114.7	-42.2	PASS		330
0.058495	13.7	53.6	67.3	112.3	-45	PASS		315
0.124645	19.2	50.1	69.3	105.7	-36.4	PASS		60

9KHz – 150KHz Perpendicular



9KHz – 150KHz Perpendicular

Bureau Veritas Consumer Product Services Inc.
Radiated Emissions Magnetic Field 3m Distance
Top Peaks Parallel 150-1000kHz

Notes:

125kHz No Modulation

0

Work Order - W0235

EUT Power Input - 24VDC

Test Site - Chamber 2

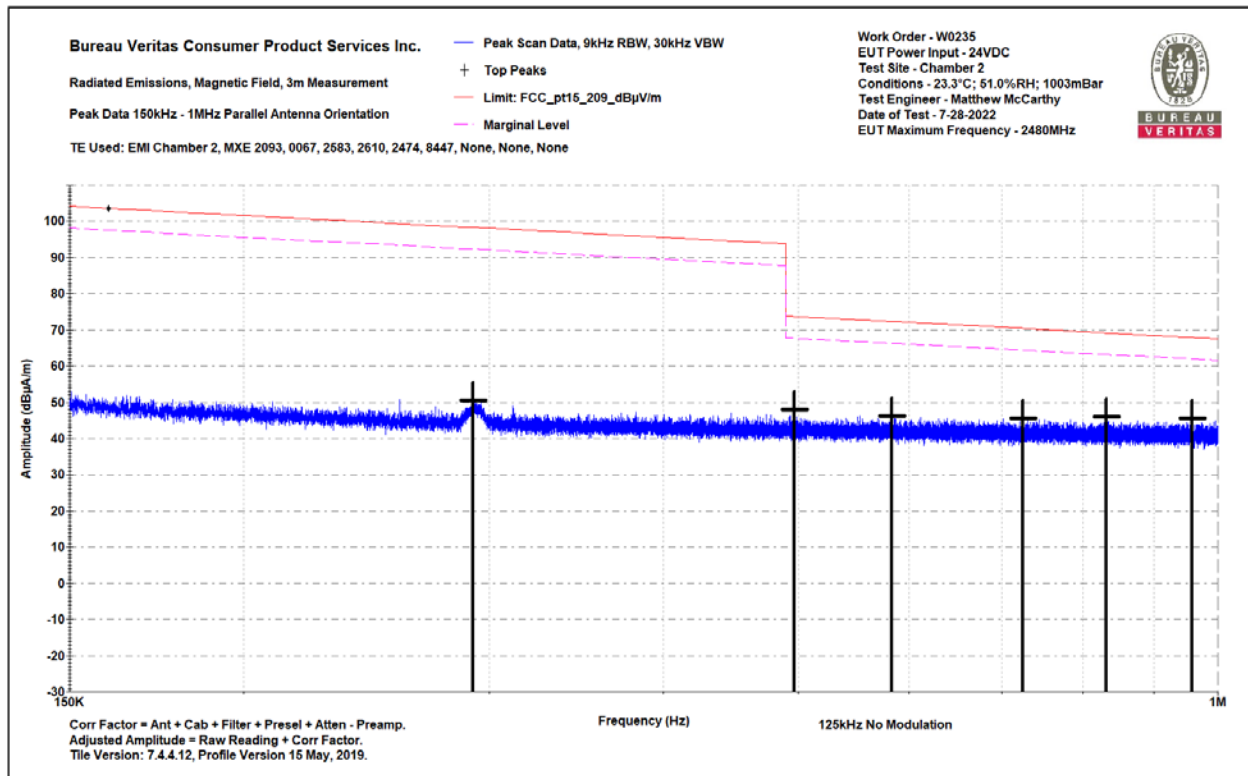
Conditions - 23.3°C; 51.0%RH; 1003mBar

Test Engineer - Matthew McCarthy

Date of Test - 7-28-2022

Frequency (MHz)	Raw Peak Reading (dBμV)	Correction Factor (dB/s)	Adjusted Peak Amplitude (dBμA/m)	Lim: FCC_pt15_20 9_dBμV/m (dBμA/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Margin (dB)	EUT Azimuth (degrees)
0.292	31.1	19.4	50.5	98.3	-47.8	PASS		105
0.497	28.8	19.1	47.9	73.7	-25.8	PASS		255
0.584	27.2	19.1	46.3	72.3	-26	PASS		135
0.725	26.4	19.2	45.5	70.4	-24.9	PASS		60
0.832	26.9	19.2	46.1	69.2	-23.1	PASS		180
0.958	26.3	19.2	45.5	68	-22.5	PASS	-22.5	255

0.15 - 1MHz Parallel



0.15 - 1MHz Parallel

Bureau Veritas Consumer Product Services Inc.
Radiated Emissions Magnetic Field 3m Distance
Top Peaks Perpendicular 150-1000kHz

Notes:

125kHz No Modulation

0

Work Order - W0235

EUT Power Input - 24VDC

Test Site - Chamber 2

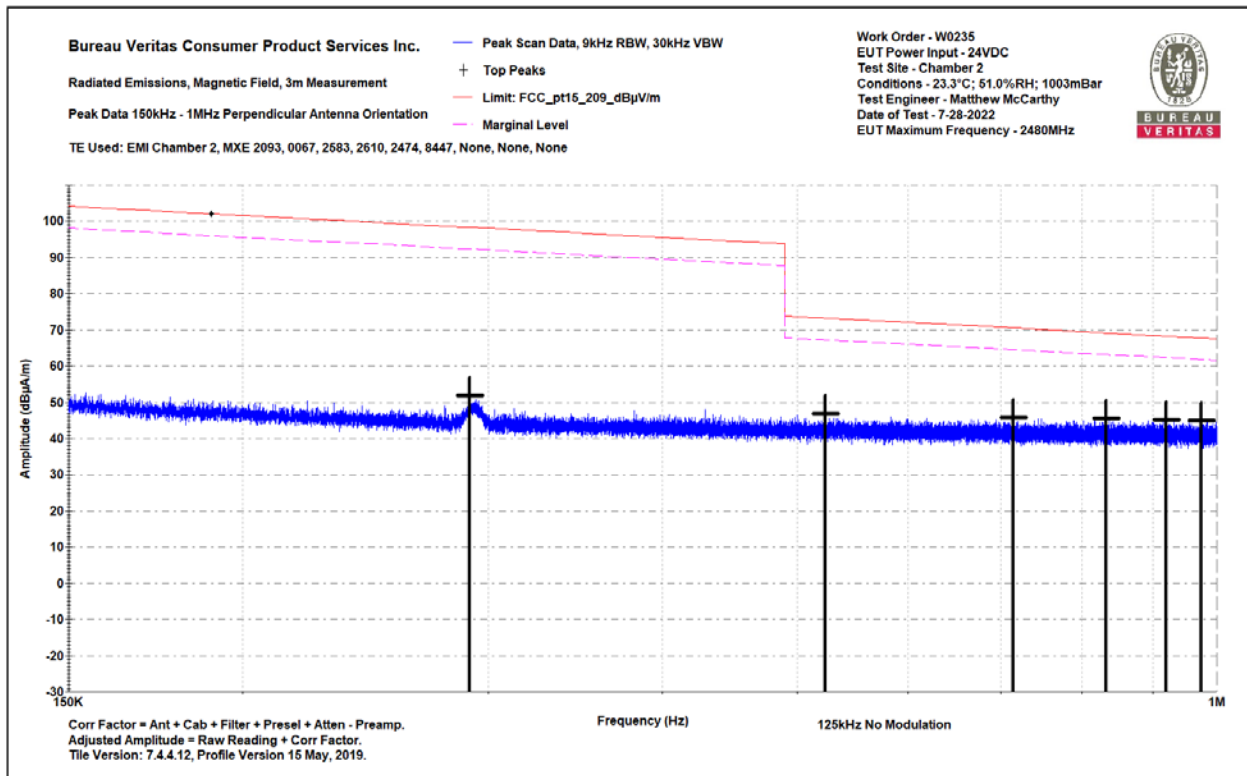
Conditions - 23.3°C; 51.0%RH; 1003mBar

Test Engineer - Matthew McCarthy

Date of Test - 7-28-2022

Frequency (MHz)	Raw Peak Reading (dBµV)	Correction Factor (dB/s)	Adjusted Peak Amplitude (dBµA/m)	Lim: FCC_pt15_20 9_dBµV/m (dBµA/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Margin (dB)	EUT Azimuth (degrees)
0.291	32.4	19.4	51.7	98.3	-46.6	PASS		225
0.524	27.8	19.1	46.9	73.3	-26.4	PASS		90
0.715	26.6	19.2	45.8	70.5	-24.7	PASS		225
0.833	26.3	19.2	45.5	69.2	-23.7	PASS		240
0.92	25.9	19.2	45.2	68.3	-23.2	PASS		300
0.975	25.7	19.2	45	67.8	-22.9	PASS	-22.9	225

0.15 – 1MHz Perpendicular



0.15 – 1MHz Perpendicular

Bureau Veritas Consumer Product Services Inc.
Radiated Emissions Magnetic Field 3m Distance
Top Peaks Parallel 1-30MHz

Notes:

125kHz No Modulation

0

Work Order - W0235

EUT Power Input - 24VDC

Test Site - Chamber 2

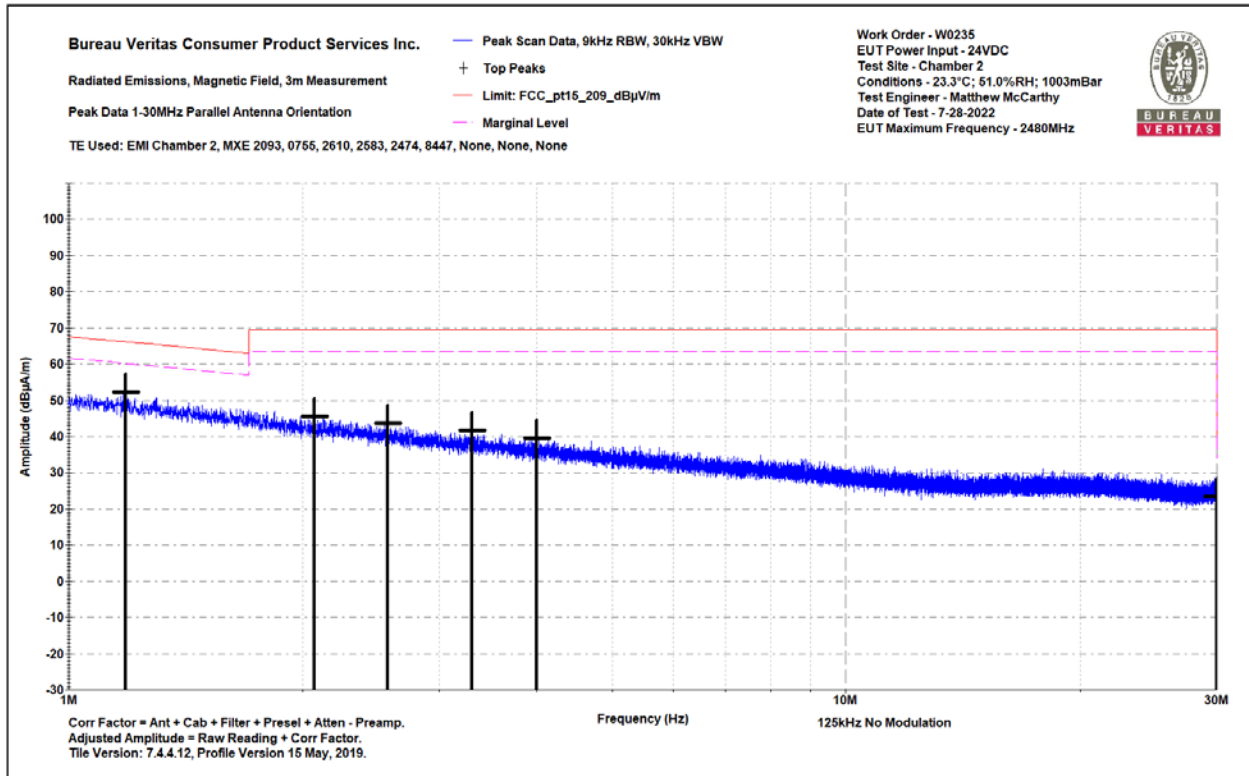
Conditions - 23.3°C; 51.0%RH; 1003mBar

Test Engineer - Matthew McCarthy

Date of Test - 7-28-2022

Frequency (MHz)	Raw Peak Reading (dBµV)	Correction Factor (dB/s)	Adjusted Peak Amplitude (dBµA/m)	Lim: FCC_pt15_20 9_dBµV/m (dBµA/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Margin (dB)	EUT Azimuth (degrees)
1.183	25.3	26.9	52.3	66.1	-13.9	PASS	-13.9	45
2.069	23.7	21.8	45.5	69.5	-24	PASS		300
2.575	23.6	20.1	43.7	69.5	-25.8	PASS		165
3.305	23.8	18	41.8	69.5	-27.8	PASS		30
3.999	23.2	16.4	39.6	69.5	-29.9	PASS		300
30	15.4	8	23.5	40	-16.5	PASS		345

1 - 30MHz Parallel



1 - 30MHz Parallel

Bureau Veritas Consumer Product Services Inc.
Radiated Emissions Magnetic Field 3m Distance
Top Peaks Perpendicular 1-30MHz

Notes:

125kHz No Modulation

0

Work Order - W0235

EUT Power Input - 24VDC

Test Site - Chamber 2

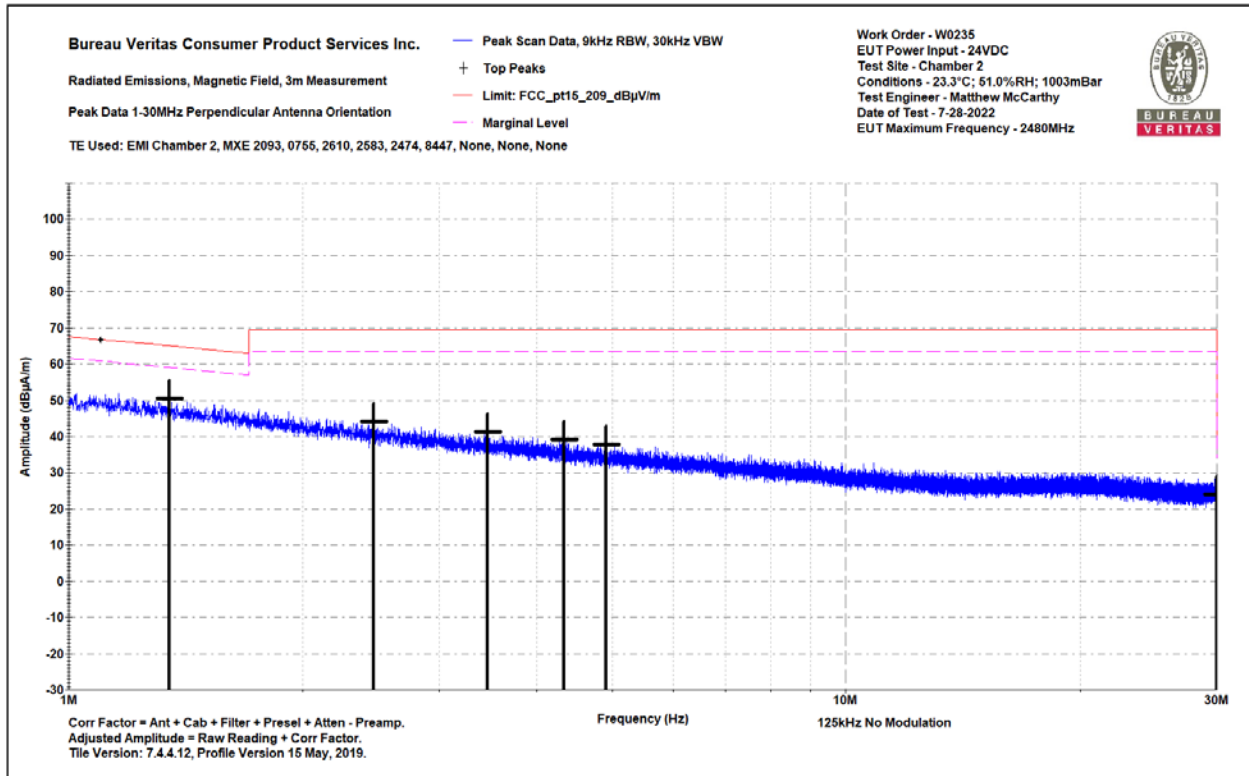
Conditions - 23.3°C; 51.0%RH; 1003mBar

Test Engineer - Matthew McCarthy

Date of Test - 7-28-2022

Frequency (MHz)	Raw Peak Reading (dBμV)	Correction Factor (dB/s)	Adjusted Peak Amplitude (dBμA/m)	Lim: FCC_pt15_20 9_dBμV/m (dBμA/m)	Peak Margin (dB)	Peak Test Results (Pass/Fail)	Worst Margin (dB)	EUT Azimuth (degrees)
1.348	24.6	25.9	50.6	65	-14.4	PASS	-14.4	225
2.468	23.7	20.4	44.2	69.5	-25.4	PASS		150
3.461	23.7	17.6	41.4	69.5	-28.2	PASS		0
4.339	23.2	15.8	39	69.5	-30.5	PASS		270
4.917	23	14.7	37.7	69.5	-31.8	PASS		270
30	15.9	8	24	40	-16	PASS		285

1 - 30MHz Perpendicular



1 - 30MHz Perpendicular

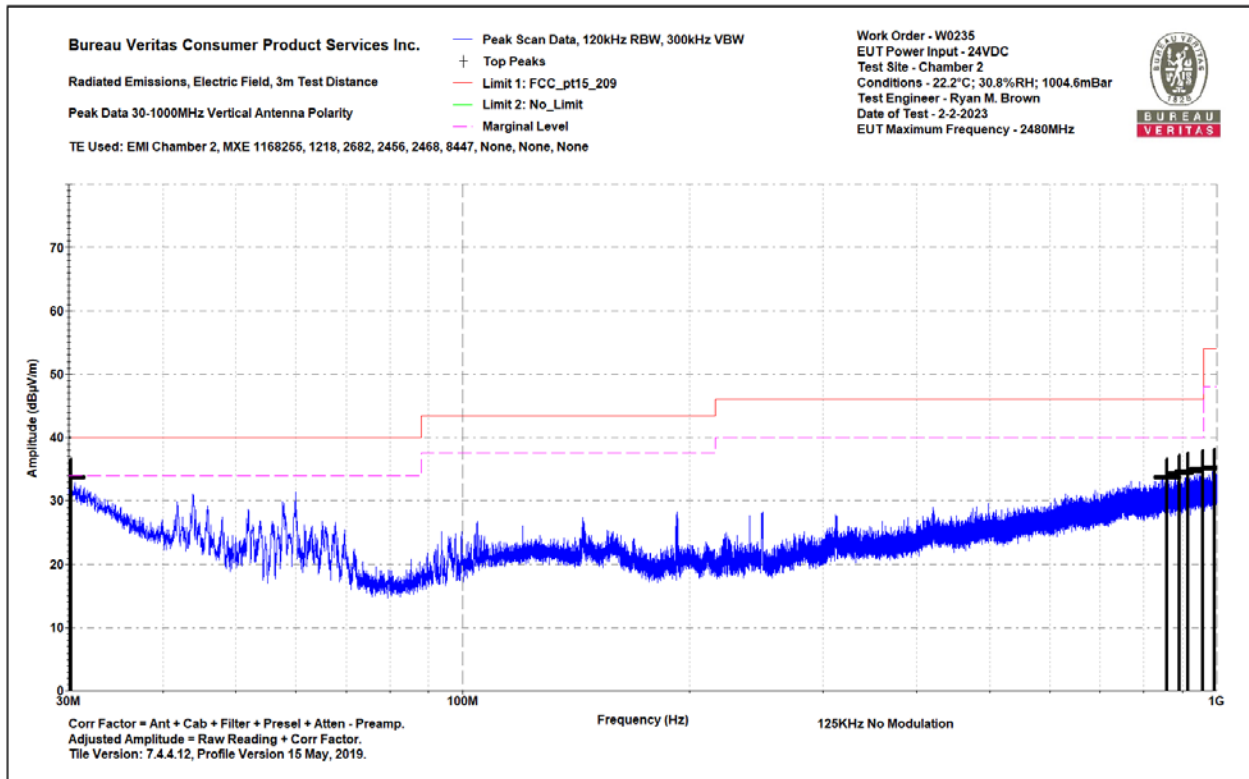
Test Report for Hanchett Entry Systems, Inc. • Report No. EW0235-3 Issue 3

Bureau Veritas Consumer Product Services Inc.
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 30-1000MHz
Notes:
125KHz No Modulation
0

Work Order - W0235
EUT Power Input - 24VDC
Test Site - Chamber 2
Conditions - 22.2°C; 30.8%RH; 1004.6mBar
Test Engineer - Ryan M. Brown
Date of Test - 2-2-2023

Frequency (MHz)	Peak Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Lim1: FCC_pt15_209 (dBμV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Antenna Height (cm)	Turntable Azimuth (degrees)
30.194	31.8	1.9	33.8	40	-6.2	PASS	-6.2	100	315
858.986	29.2	4.6	33.8	46	-12.2	PASS		150	0
892.645	29.4	4.9	34.3	46	-11.7	PASS		200	135
916.047	29.2	5.5	34.7	46	-11.3	PASS		200	315
959.066	29	6.1	35.1	46	-10.9	PASS		200	135
993.089	28.8	6.5	35.3	54	-18.7	PASS		250	315

30-1000MHz Vertical



30-1000MHz Vertical

Test Report for Hanchett Entry Systems, Inc. • Report No. EW0235-3 Issue 3

Bureau Veritas Consumer Product Services Inc.

Radiated Emissions Electric Field 3m Distance

Top Peaks Horizontal 30-1000MHz

Notes:

125KHz No Modulation

0

Work Order - W0235

EUT Power Input - 24VDC

Test Site - Chamber 2

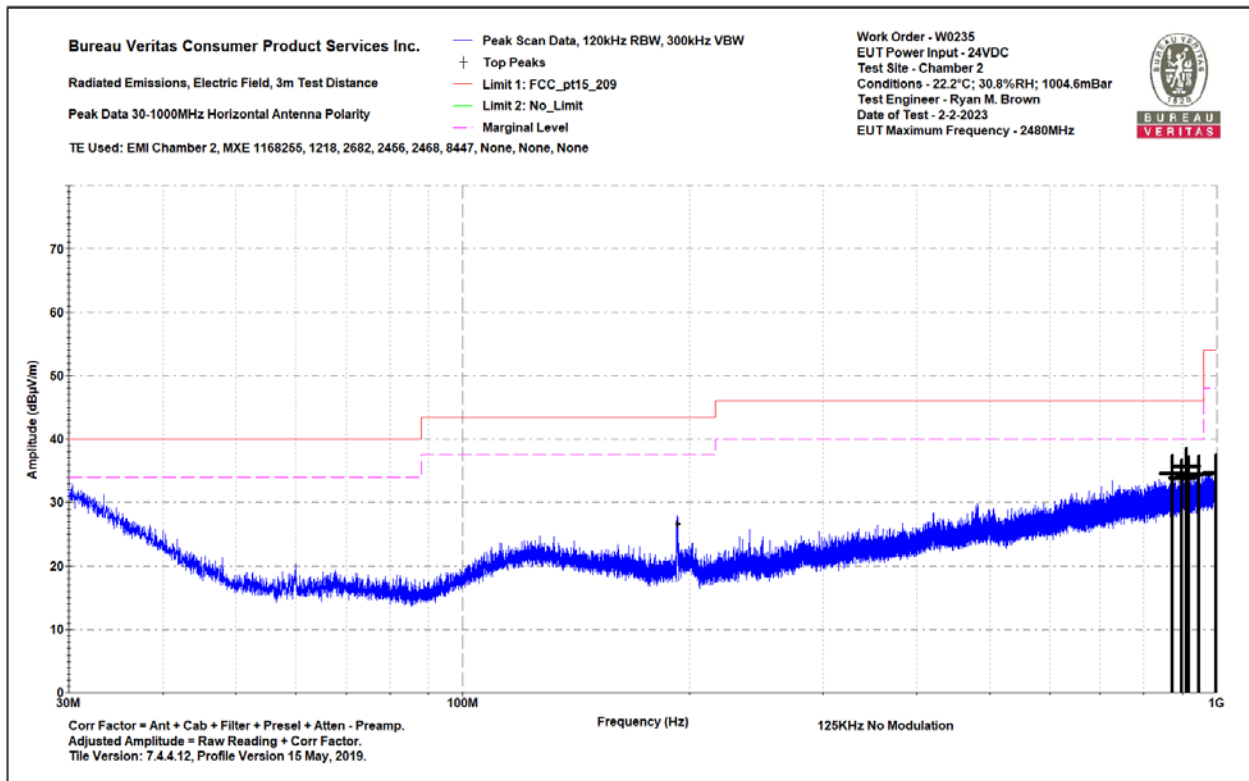
Conditions - 22.2°C; 30.8%RH; 1004.6mBar

Test Engineer - Ryan M. Brown

Date of Test - 2-2-2023

Frequency (MHz)	Peak Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Lim1: FCC_pt15_209 (dBμV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
872.106	29.9	4.7	34.6	46	-11.4	PASS		150	0
898.538	28.8	5	33.9	46	-12.1	PASS		150	225
911.124	30.4	5.3	35.7	46	-10.3	PASS	-10.3	200	45
917.647	28.8	5.5	34.3	46	-11.7	PASS		100	225
947.087	28.5	6	34.5	46	-11.5	PASS		250	90
997.696	28.1	6.6	34.7	54	-19.3	PASS		150	135

30-1000MHz Horizontal



30-1000MHz Horizontal



Bureau Veritas Consumer Product Services

One Distribution Center Circle, #1 • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



page 14 of 22

Test Equipment Used (0.009-30MHz)

Rev. 8/17/2022

Spectrum Analyzers / Receivers /Preselectors 2093 MXE EMI Receiver	Range 20Hz-26.5GHz	MN N9038A	Mfr Agilent	SN MY51210181	Asset 2093	Cat I	Calibration Due 3/7/2023	Calibrated on 3/7/2022
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz	Asset 1686	Cat I	Calibration Due 12/5/2022	Calibrated on 12/5/2020
Preamps /Couplers Attenuators / Filters 8447F Rental PA	Range 9KHz-1.3GHz	MN 84477F	Mfr HP	SN 3113A05395	Asset	Cat II	Calibration Due 10/18/2022	Calibrated on 10/18/2021
Antennas Small Loop	Range 10kHz-30MHz	MN PLA-130/A	Mfr ARA	SN 1024	Asset 755	Cat I	Calibration Due 8/25/2022	Calibrated on 8/25/2020
Large Loop	20Hz-5MHz	6511	EMCO	9704-1154	67	I	8/21/2022	8/21/2020
Meteorological Meters/Chambers Weather Clock (Pressure Only)		MN BA928	Mfr Oregon Scientific	SN C3166-1	Asset 831	Cat I	Calibration Due 11/23/2022	Calibrated on 11/23/2020
Asset #2656		1235C97	Control Company	200435359	2656	I	8/23/2022	7/23/2020
Cables Asset #2474	Range 9KHz-18GHz		Mfr MegaPhase			Cat II	Calibration Due 11/9/2022	Calibrated on 11/9/2021
Asset #2610	9KHz-18GHz		Pasternack			II	3/16/2023	3/16/2022
Asset #2583	9KHz-18GHz		Pasternack			II	2/17/2023	2/17/2022

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

Test Equipment Used (30-1000MHz)

Rev. 1/30/2023

Spectrum Analyzers / Receivers /Preselectors Rental MXE EMI Receiver(1168255)	Range 20Hz-8.4GHz	MN N9038A	Mfr Agilent	SN MY53290009	Asset 1168255	Cat I	Calibration Due 8/12/2023	Calibrated on 8/12/2022
Radiated Emissions Sites EMI Chamber 2	FCC Code 719150	IC Code 2762A-7	VCCI Code A-0015	Range 30-1000MHz	Asset 1686	Cat I	Calibration Due 12/28/2024	Calibrated on 12/28/2022
Preamps /Couplers Attenuators / Filters 8447F Rental PA	Range 9KHz-1.3GHz	MN 84477F	Mfr HP	SN 3113A05395	Asset	Cat II	Calibration Due 10/17/2023	Calibrated on 10/17/2022
Antennas Red-Brown Bilog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A0032406	Asset 1218	Cat I	Calibration Due 4/28/2023	Calibrated on 4/28/2021
Meteorological Meters/Chambers Weather Clock (Pressure Only)		MN BA928	Mfr Oregon Scientific	SN C3166-1	Asset 831	Cat I	Calibration Due 12/15/2025	Calibrated on 12/15/2022
Asset 2707		SD700	EXTECH	A.115171	2707	I	1/13/2025	1/13/2023
Cables Asset #2456	Range 9KHz-18GHz		Mfr MegaPhase			Cat II	Calibration Due 11/1/2023	Calibrated on 11/1/2022
Asset #2468	9KHz-18GHz		MegaPhase			II	11/1/2023	11/1/2022
Asset #2682	9KHz-18GHz		Pasternack			II	10/6/2023	10/6/2022

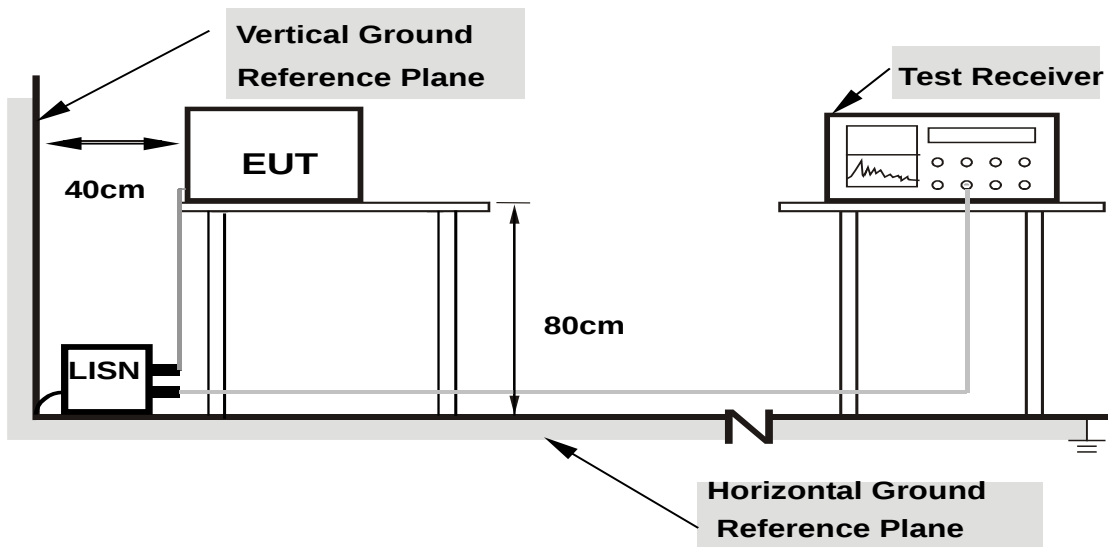


AC Line Conducted Emissions

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.

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

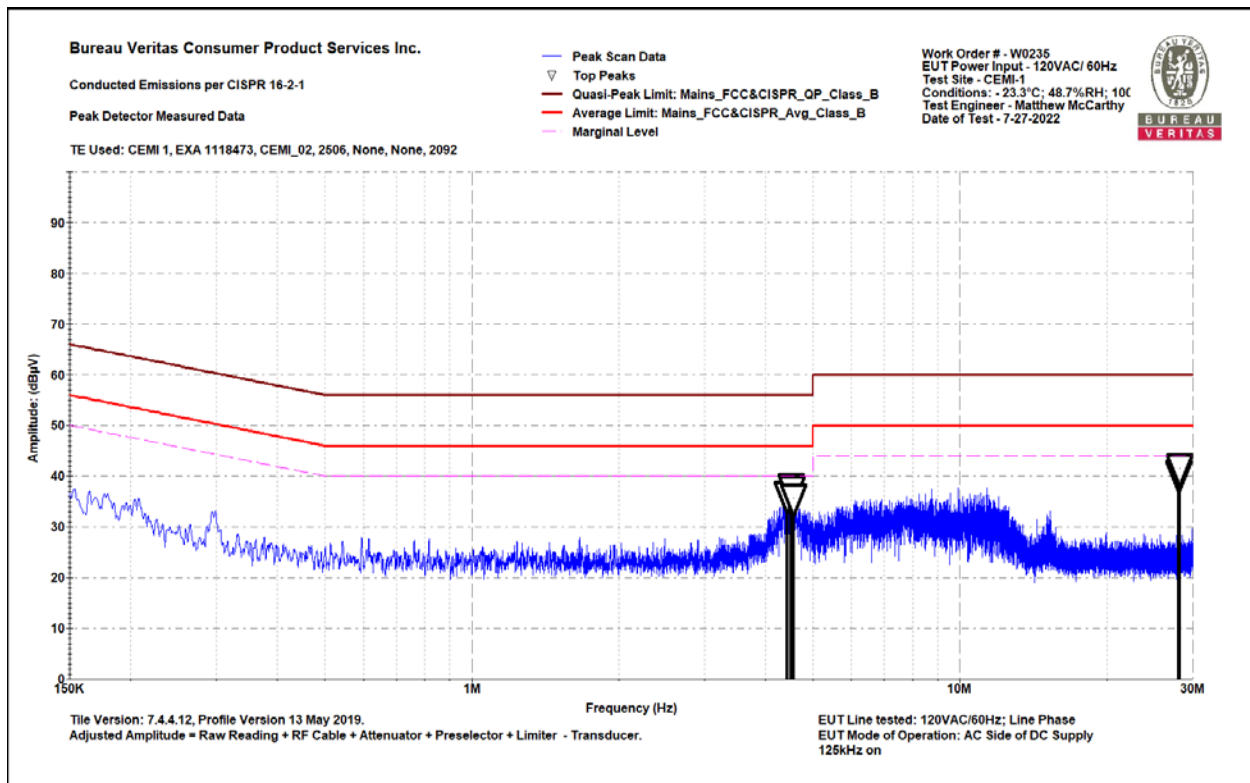
Test Report for Hanchett Entry Systems, Inc. • Report No. EW0235-3 Issue 3

Bureau Veritas Consumer Product Services Inc.
 Conducted Emissions per CISPR 16-2-1
 Peak Detector Data
 Notes:
 EUT Line tested: 120VAC/60Hz; Line Phase
 EUT Mode of Operation: AC Side of DC Supply
 125kHz on

Work Order # - W0235
 EUT Power Input - 120VAC/ 60Hz
 Test Site - CEMI-1
 Conditions: - 23.3°C; 48.7%RH; 1006mBar
 Test Engineer - Matthew McCarthy
 Date of Test - 7-27-2022

Frequency (MHz)	Raw Pk Reading (dBµV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Margin to Avg Limit (dB)	Pk to Avg Limit Results (Pass/Fail)	Worst Margin (Avg Limit) (dB)
4.434	15.6	20.4	36.1	56	-19.9	PASS		46	-9.9	PASS	
4.505	17.2	20.4	37.7	56	-18.3	PASS	-18.3	46	-8.3	PASS	-8.3
4.533	16.8	20.4	37.2	56	-18.8	PASS		46	-8.8	PASS	
4.56	15.2	20.4	35.7	56	-20.3	PASS		46	-10.3	PASS	
28.041	19.5	20.7	40.2	60	-19.8	PASS		50	-9.8	PASS	
28.134	20.7	20.7	41.5	60	-18.5	PASS		50	-8.5	PASS	

0.15-30MHz Line



0.15-30MHz Line

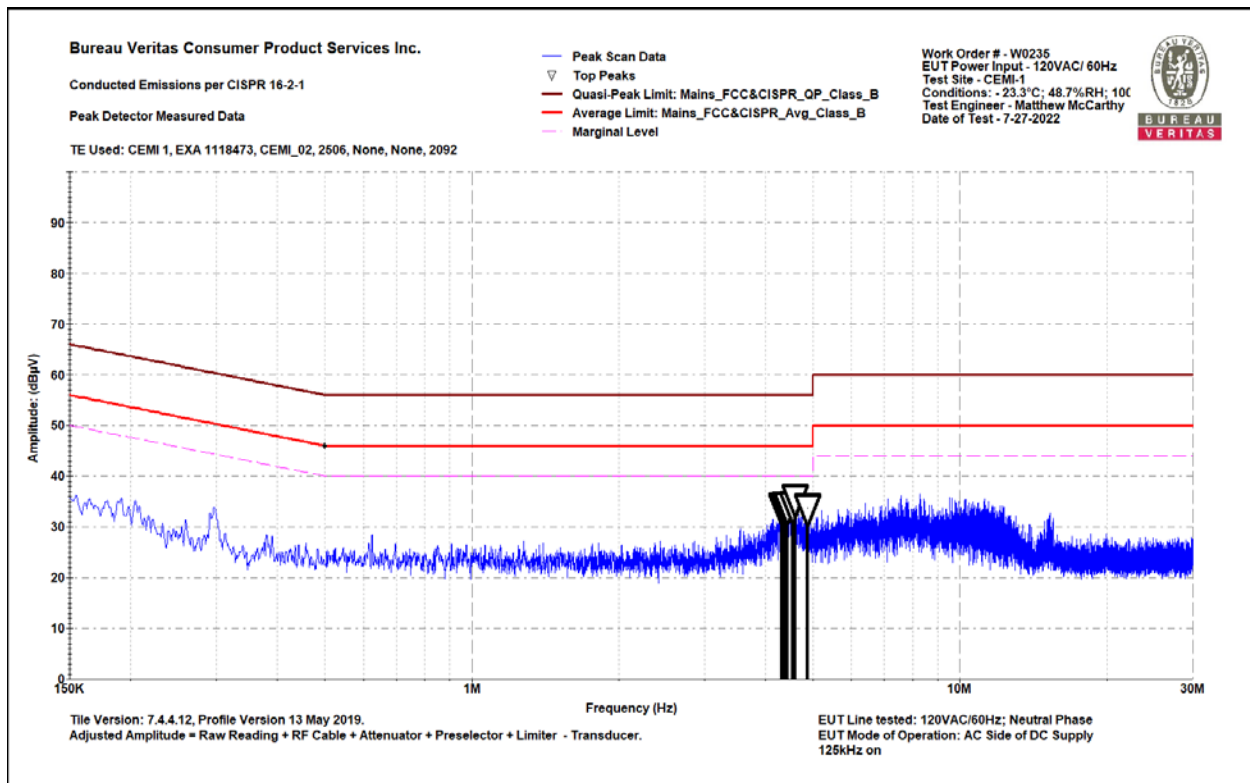
Test Report for Hanchett Entry Systems, Inc. • Report No. EW0235-3 Issue 3

Bureau Veritas Consumer Product Services Inc.
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 120VAC/60Hz; Neutral Phase
EUT Mode of Operation: AC Side of DC Supply
125kHz on

Work Order # - W0235
EUT Power Input - 120VAC/ 60Hz
Test Site - CEMI-1
Conditions: - 23.3°C; 48.7%RH; 1006mBar
Test Engineer - Matthew McCarthy
Date of Test - 7-27-2022

Frequency (MHz)	Raw Pk Reading (dBµV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBµV)	QP Lim: Mains_FCC&CISPR_QP_Class_B (dBµV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)	Av Lim: Mains_FCC&CISPR_Avg_Class_B (dBµV)	Margin to Avg Limit (dB)	Pk to Avg Limit Results (Pass/Fail)	Worst Margin (Avg Limit) (dB)
4.311	13.4	20.4	33.8	56	-22.2	PASS		46	-12.2	PASS	
4.379	13.6	20.4	34	56	-22	PASS		46	-12	PASS	
4.425	13.5	20.4	33.9	56	-22.1	PASS		46	-12.1	PASS	
4.547	13.7	20.4	34.1	56	-21.9	PASS		46	-11.9	PASS	
4.599	15	20.4	35.5	56	-20.5	PASS	-20.5	46	-10.5	PASS	-10.5
4.877	13.3	20.4	33.7	56	-22.3	PASS		46	-12.3	PASS	

0.15 – 30MHz Neutral



0.15 – 30MHz Neutral

Test Equipment Used

Rev. 8/26/2022

Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental EXA Signal Analyzer(1118472)		9KHz-26.5GHz	N9010A-526;K	AT	MY51170010	1118472	I	10/27/2022	10/27/2021
Rental EXA Signal Analyzer(1118473)		9KHz-26.5GHz	N9010A-526;N	AT	MY51170076	1118473	I	8/5/2022	8/5/2021
LISNs/Measurement Probes		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
LISN Asset 2092		9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-662	2092	I	10/25/2022	10/25/2021
Conducted Test Sites (Mains / Telco)		FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 1		719150		A-0015			III	NA	NA
CEMI 5		719150		A-0015			III	NA	NA
Meteorological Meters/Chambers			MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)			BA928	Oregon Scientific	C3166-1	831	I	11/23/2022	11/23/2020
Asset #2657			1235C97	Control Company	200435369	2657	I	8/18/2025	8/18/2022
Asset #2657			1235C97	Control Company	200435369	2657	I	8/23/2022	7/23/2020
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
CEMI-02		9kHz - 2GHz		C-S			II	2/17/2023	2/17/2022
CEMI-15		9kHz - 2GHz		C-S			II	2/17/2023	2/17/2022
Attenuators		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
20dB ATT(A#2506)		9kHz-2GHz	PE7014-20	Pasternack	2016	2506	II	8/3/2023	8/3/2022
20dB ATT(A#2506)		9kHz-2GHz	PE7014-20	Pasternack	2016	2506	II	8/4/2022	8/4/2021

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



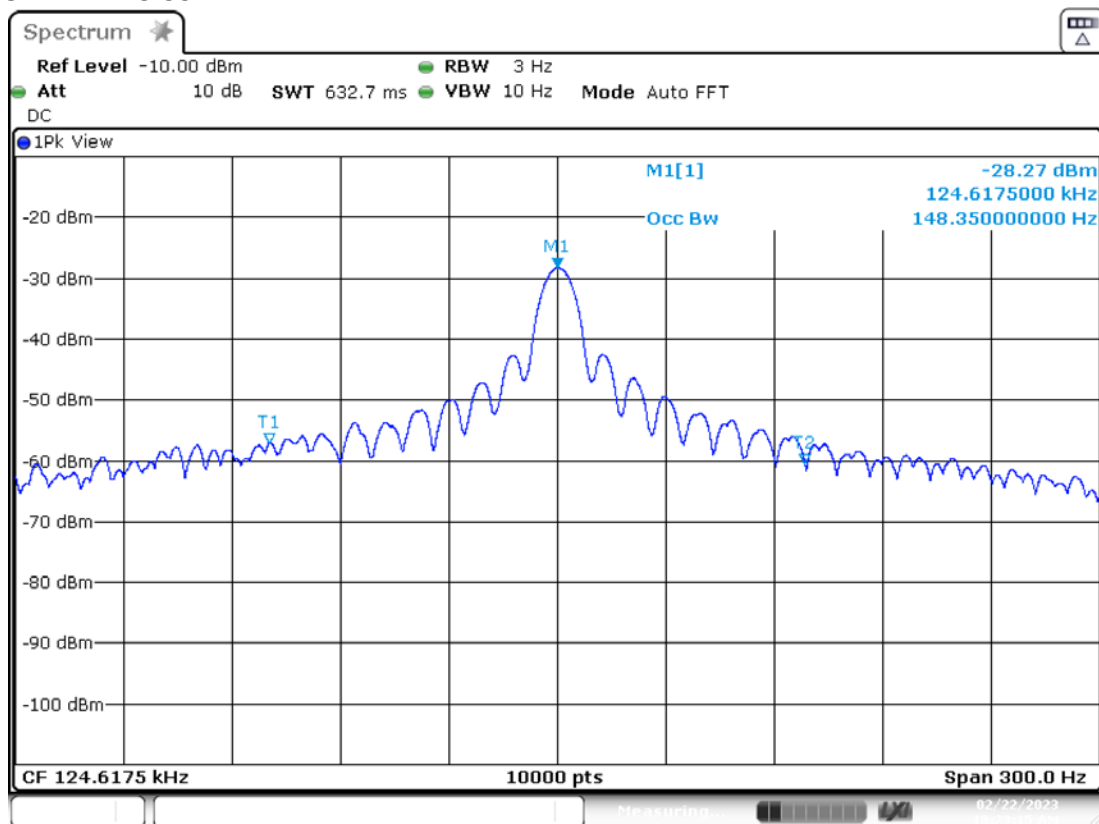
99% Occupied Bandwidth**REQUIREMENT**

When an occupied bandwidth is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is its 99% emission bandwidth, as calculated or measured.
[RSS-GEN Issue 5 Section 6.7].

RESULT:

The plot below was generated using a peak max hold detector.

99% OBW = 148.35Hz



Date: 22.FEB.2023 10:23:16

Test Equipment Used

Rev. 2/17/2023									
Spectrum Analyzers / Receivers /Preselectors		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
FSV40 Spectrum Analyzer		10Hz-40GHz	FSV40	ROHDE & SCHWARZ	101551	2200	I	10/11/2023	10/11/2022
Antennas		Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2615 Active Loop Antenna		9KHz-30MHz	6502	EMCO	2049	2615	I	1/18/2025	1/18/2023
Cables		Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2594		9KHz-40GHz		Carlisle			II	1/17/2024	1/17/2023
All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.									

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 $k = 2$.

Document Revision History

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED	ISSUED BY	APPROVED BY
1	Original release	Jan 3, 2023	HX	YF
2	Added Radiated and Conducted Emissions Data Revised 99% OBW Data	Feb 22, 2023	RMB	YF
3	Updates to address TCB comments: Measurement procedures listed on Pg 3 Limit conversion definitions below 30MHz added to Pg 5 RSE procedure and setup details added to Pg 6 PLCE procedure and setup details added to Pg 16	Mar 16, 2023	RMB	YF

END OF REPORT