Test Report

Curtis-Straus LLC, *a wholly owned subsidiary of BV CPS*

Report No	ES2787-1
Client	WaveMark, Incorporated
Address	300 Baker Avenue Suite 160 Concord, MA 01742
Phone	978-431-1633
Items tested	Labrador
FCC ID	UQYHF3000
IC	8182A-HF3000
FRN	0013630066
Equipment Type	Part 15 Low Power Communication Device Transmitter
Equipment Code	DXX
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.225, ISED Canada RSS-210 Issue 9 Annex B.6
Test Dates	October 8th to 11th, 2018
Results	As detailed within this report
Prepared by	Chris Hamel – EMC Engineer
Authorized by	Yunus Faziloglu – Sr. Engineer
Issue Date	2/11/2019
Conditions of Issue	This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 22 of this report.

Contents

Contents....2
Summary and Test Methodology....3
Product Tested - Configuration Documentation....4
Statement of Conformity....5
Modifications Required for Compliance....5
Test Results....6
Transmitter Fundamental....6
Frequency Mask....7
99% Occupied Bandwidth....9
Radiated Spurious Emissions....10
AC Line Conducted Emissions....14
Measurement Uncertainty....21
Conditions Of Testing....22

Form Final Report REV 12-07-15

Summary and Test Methodology

This test report supports an application for certification of a transmitter operating pursuant to: CFR Title 47 FCC Part 15.225, ISED Canada RSS-210 Issue 9 Annex B.6

The product is Labrador. It is an RFID cabinet that operates at 13.56MHz with loop antennas. Only one of the loop antennas in the cabinet can transmit at a time.

All testing was performed in accordance with ANSI C63.10 2013. Radiated emissions were maximized by rotating the device and varying the test antenna's height and polarity. EUT antennas are internal and therefore cannot be maximized separately. The loop antenna under test is labelled in the corresponding data tables.

Frequency stability test under extreme conditions was not performed due to the size of the EUT. Compliance claim for that requirement is based on the existing certification of the RFID module with **FCC ID: PJMLRM1002** and **IC: 6633A-LRM1002.**

EUT operating voltage is 100-240VAC.
For AC line conducted emissions 50Ω/50µH LISN was used.
Environmental conditions are shown in the associated data tables.
Following bandwidths were used during radiated spurious and line conducted emissions tests.

Frequency	RBW	VBW
9-150KHz	200Hz	1kHz
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz

We found that the product met the above requirements without modification. The test sample was received in good condition.

Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	February 11, 2019

Product Tested - Configuration Documentation

EUT Configuration			
Work Order:	S2787		
Company:	WaveMark, Incorporated		
Company Address:	300 Baker Avenue Suite 160		
	Concord, MA, 01742		
Contact:	Robert Quinn		
	MN	**PN**	**SN**
EUT:	Labrador		Sample 1
EUT Description:	RFID cabinet		
EUT Max Frequency:	13.56 MHz		
EUT Min Frequency:	13.56 MHz		

Support Equipment	**MN**	**SN**
Laptop computer		
Apple iPad		

Port Label	Port Type	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment
AC Mains	Power AC	1	1	Power AC	No	No	2	in	yes	
Ethernet	Ethernet	1	1	Ethernet	No	No	10	in	yes	

Software Operating Mode Description:

RFID antennas are active and transmitting.

Clock Frequencies	
frequencies (MHz)	13.56 **This clock list corresponds to the transmitter portion of the device

Statement of Conformity

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 to operate in violation of the regulatory requirements.
	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	EUT has an integral loop antenna
8.10			15.205 15.209	The 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	EUT meets the AC Line conducted emissions requirements of this section.
			15.225	The unit complies with the requirements of 15.225. For frequency stability under extreme conditions compliance claim is based on the existing certification of the RFID module with **FCC ID: PJMLRM1002**
		Annex B.6		The unit complies with the requirements of RSS-210 Annex B.6. For frequency stability under extreme conditions compliance claim is based on the existing certification of the RFID module with **IC: 6633A-LRM1002**
6.7				Occupied Bandwidth measurements were made.

Modifications Required for Compliance

None

Test Results

Transmitter Fundamental

LIMIT

15.225(a) Field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

MEASUREMENTS / RESULTS

***Tested Loops 1-12 on top, mid, and bottom shelves. Worst case fundamental was top shelf loop 1.*

Radiated Emissions Table

Date: 11-Oct-18 **Company:** Cardinal **Work Order:** S2787
Engineer: AKZ **EUT Desc:** Labrador **EUT Operating Voltage/Frequency:** 230Vac/50Hz
Temp: 22.2 **Humidity:** 48% **Pressure:** 1015mBar
Frequency Range: 13.56MHz **Measurement Distance:** 3 m
Notes: Worst Orientation: 0 degree

Antenna Polarization (0° - 90°)	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 15.225 Limit (dBµV/m)	FCC 15.225 Margin (dB)	FCC 15.225 Result (Pass/Fail)
Top Shelf Loop 1 0 degree	13.56	63.1	0.0	38.9	0.3	102.3	---	---	---	124.0	-21.7	Pass

Test Site: EMI Chamber 2 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054 **Cable 3:** Asset #2465
Analyzer: 2093 SA **Preamp:** None **Antenna:** Sm Loop (high) **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.208

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

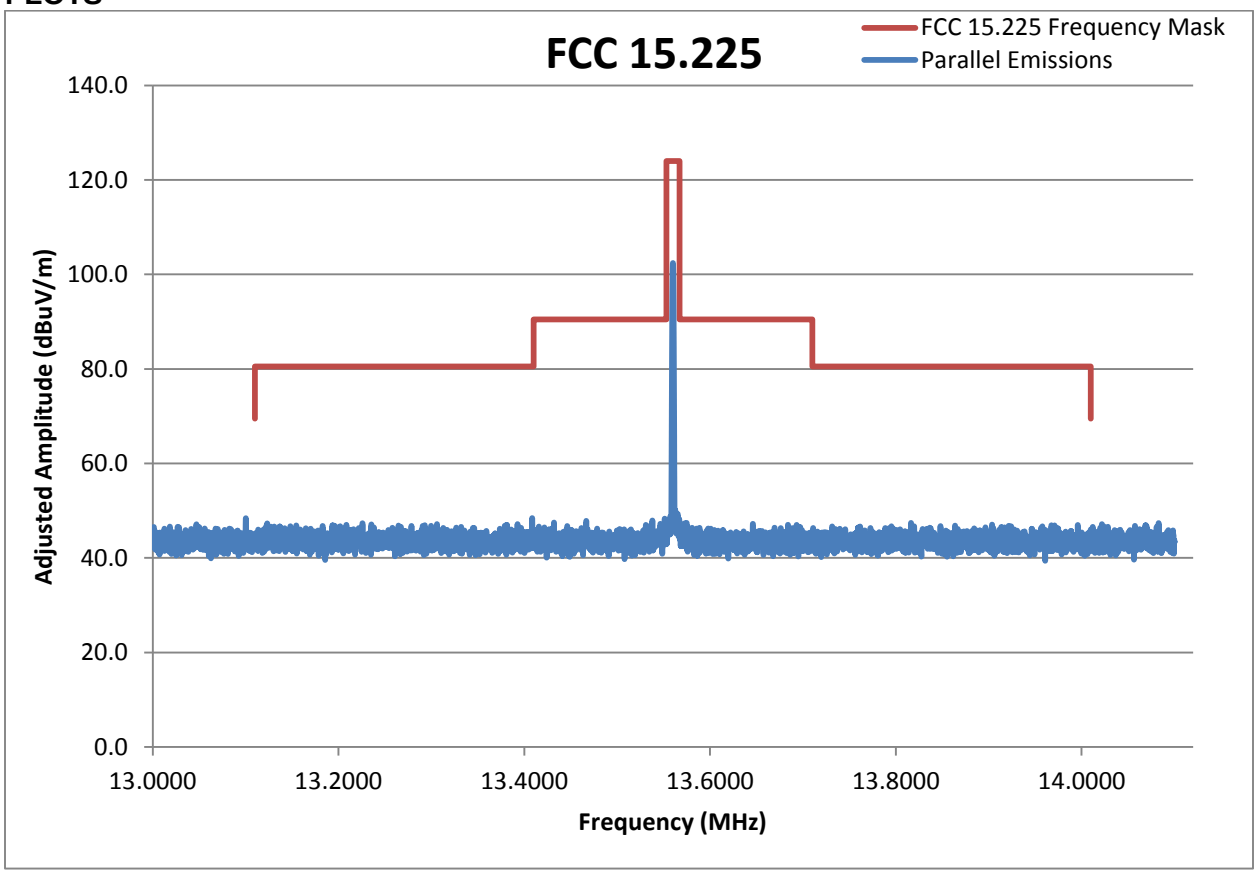
Frequency Mask

LIMIT

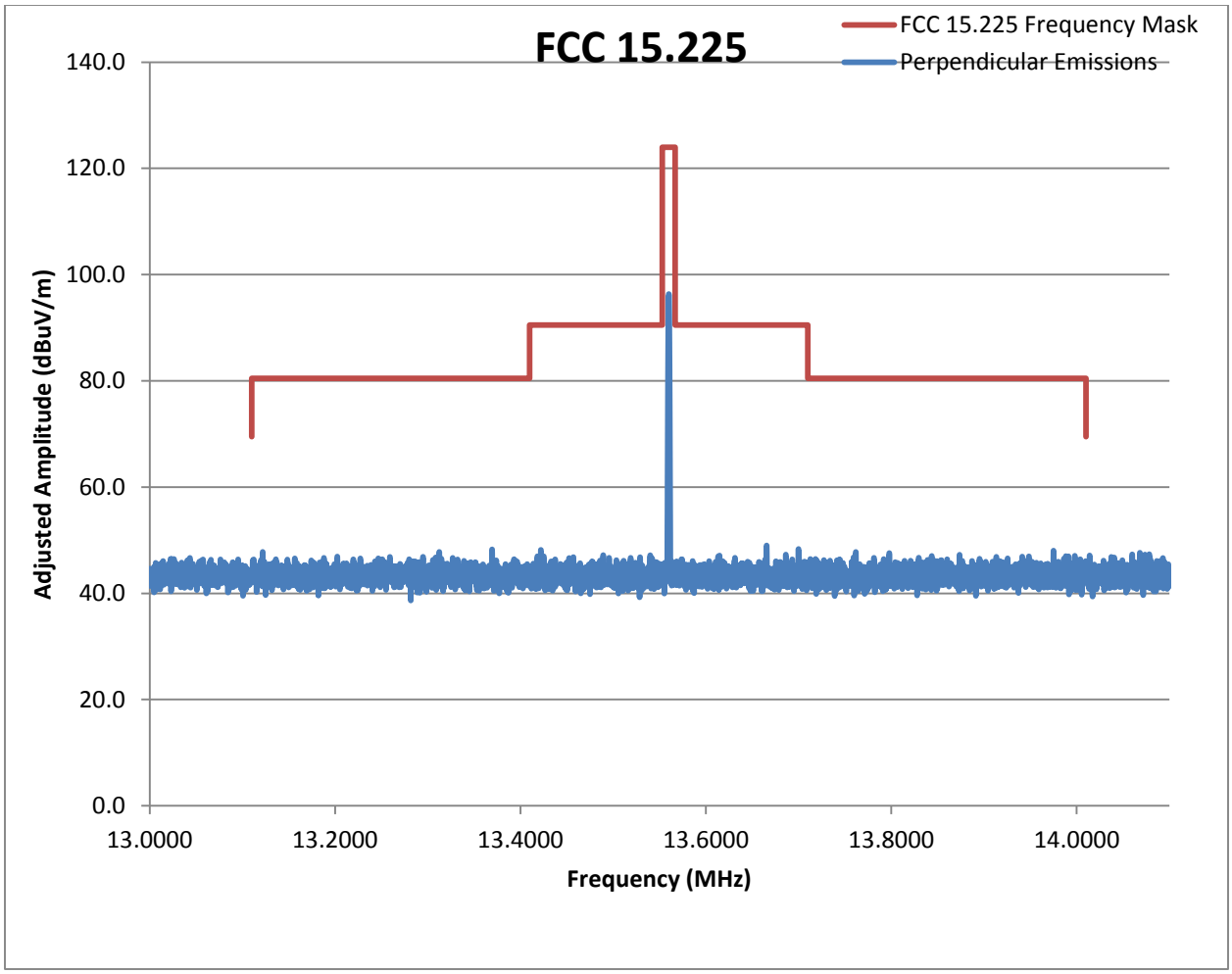
(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

MEASUREMENTS / RESULTS

PLOTS



Parallel (0 degree) Mask



Perpendicular (90 degree) Mask

Rev. 10/9/2018

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	11/16/2018	11/16/2017

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	12/21/2018	12/21/2016
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018	12/21/2016

Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	7/23/2020	7/23/2018

Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	5/15/2020	5/15/2018
TH A#2081		HTC-1	HDE		2081	II	3/22/2019	3/22/2018

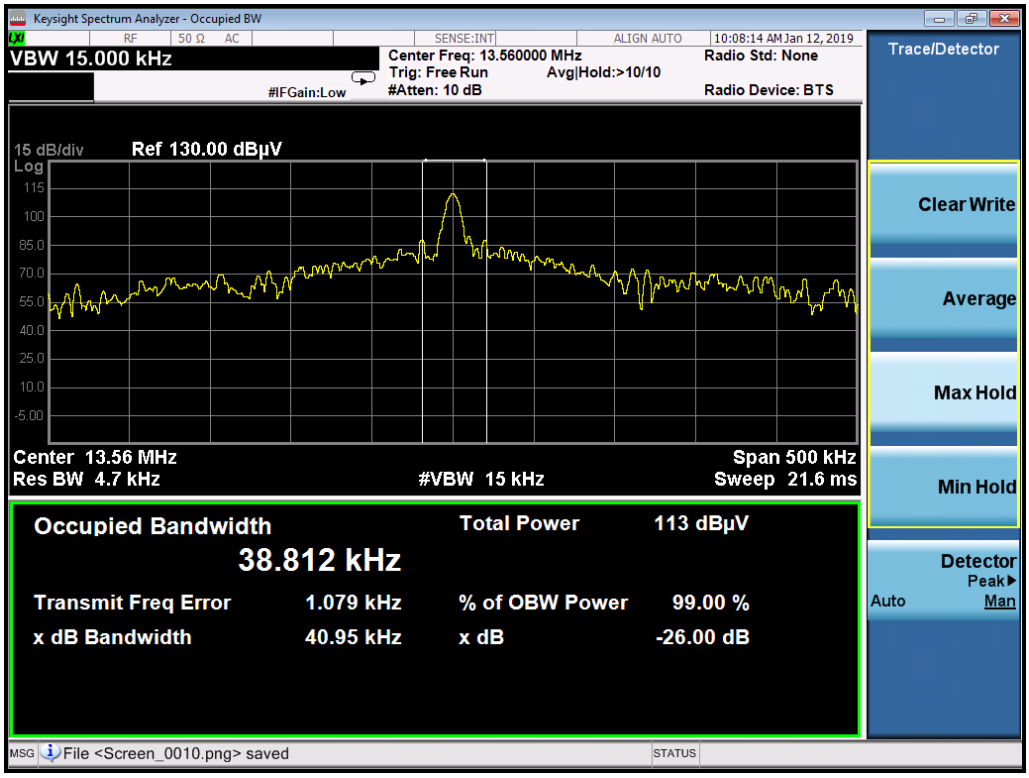
Cables	Range	Mfr	Cat	Calibration Due	Calibrated on
Asset #2051	9kHz - 18GHz	Florida RF	II	3/7/2019	3/7/2018
Asset #2054	9kHz - 18GHz	Florida RF	II	10/31/2018	10/31/2017

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]



Radiated Spurious Emissions

LIMITS

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.
[15.225(d)]

MEASUREMENTS / RESULTS

REMI 9kHz to 1MHz: No emissions above the measurement system noise floor were detected and noise floor was more than 20dB below the 15.209 limits.

Radiated Emissions Table

Date: 11-Oct-18 **Company:** Cardinal **Work Order:** S2787
Engineer: AKZ **EUT Desc:** Labrador **EUT Operating Voltage/Frequency:** 230Vac/50Hz
Temp: 22.2C **Humidity:** 48% **Pressure:** 1015mbar
Frequency Range: 1-30MHz **Measurement Distance:** 3 m
Notes: Top Shelf Loop 1

Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	15.209 Limit (dBµV/m)	15.209 Margin (dB)	15.209 Result (Pass/Fail)	--- Limit (dBµV/m)	--- Margin (dB)	--- Result (Pass/Fail)
0	27.12	16.0	0.0	37.3	0.5	53.8	69.5	-15.7	Pass	---	---	---
No other emissions in the 1-30MHz range, except the fundamental (see band mask)							---	---	---	---	---	---

Test Site: EMI Chamber 2 **Cable 1:** Asset #2051 **Cable 2:** Asset #2054 **Cable 3:** Asset #2465
Analyzer: --- **Preamp:** None **Antenna:** Sm Loop (high) **Preselector:** ---
CSsoft Radiated Emissions Calculator v 1.017.208

Adjusted Reading = Reading - Preamp Factor + Antenna Factor + Cable Factor

1-30MHz REMI

Rev. 10/9/2018

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	11/16/2018	11/16/2017
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	12/21/2018	12/21/2016
EMI Chamber 2	719150	2762A-7	A-0015	1-18GHz	1686	I	12/21/2018	12/21/2016
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Small Loop	10kHz-30MHz	PLA-130/A	ARA	1024	755	I	7/23/2020	7/23/2018
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	5/15/2020	5/15/2018
TH A#2081		HTC-1	HDE		2081	II	3/22/2019	3/22/2018
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/7/2019	3/7/2018
Asset #2054	9kHz - 18GHz		Florida RF			II	10/31/2018	10/31/2017

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

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
30-1000MHz Vertical Data
Operator: ZJ
Notes:
Top Shelf - Loop 1

Work Order - S2787
EUT Power Input - 230V / 50Hz
Test Site - CH-2
Conditions - 23.7°C; 40%RH; 1025mBar

EUT Maximum Frequency - 900MHz

Data Taken at 03:03:47 PM, Tuesday, October 09, 2018

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)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
31.813	36.5	-3.1	33.5	40	-6.5	PASS		40	-6.5	PASS		100	100
127.438	48.9	-8.4	40.5	43.5	-3	PASS	-3	43.5	-3	PASS	-3	219	160
163.104	29.9	-10.3	19.6	43.5	-23.9	PASS		43.5	-23.9	PASS		112	171
165.883	28.3	-10.5	17.8	43.5	-25.7	PASS		43.5	-25.7	PASS		127	155
499.967	42.1	-3.5	38.7	46	-7.3	PASS		46	-7.4	PASS		108	205

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
30-1000MHz Horizontal Data
Operator: ZJ
Notes:
Top Shelf - Loop 1

Work Order - S2787
EUT Power Input - 230V / 50Hz
Test Site - CH-2
Conditions - 23.7°C; 40%RH; 1025mBar

EUT Maximum Frequency - 900MHz

Data Taken at 02:45:02 PM, Tuesday, October 09, 2018

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)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Margin to Lim2 (dB)	Test Results Lim2 (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
127.473	47.4	-8.4	38.9	43.5	-4.6	PASS	-4.6	43.5	-4.6	PASS	-4.6	275	54
139.261	40	-8.9	31.1	43.5	-12.4	PASS		43.5	-12.4	PASS		225	274
141.225	43.1	-9.1	34	43.5	-9.5	PASS		43.5	-9.5	PASS		175	268
500.014	43.3	-3.5	39.8	46	-6.2	PASS		46	-6.2	PASS		195	155
875.004	38.6	2.1	40.7	46	-5.3	PASS		46	-5.3	PASS		141	130

30-1000MHz Top Shelf - Worst Case Loop 1

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 30-1000MHz
Operator: ZJ
Notes:
Mid Shelf - Loop 6

Work Order - S2787
EUT Power Input - 230V / 50Hz
Test Site - CH-2
Conditions - 23.7°C; 40%RH; 1025mBar

EUT Maximum Frequency - 900MHz

Data Taken at 03:42:18 PM, Tuesday, October 09, 2018

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)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	Turntable Azimuth (degrees)
31.867	38.1	-3.2	35	40	-5	PASS		40	-5	PASS		100	270
127.485	50.2	-8.5	41.7	43.5	-1.8	PASS	-1.8	43.5	-1.8	-1.8		200	135
500.014	43.6	-3.5	40.2	46	-5.8	PASS		46	-5.9	PASS		100	180
749.982	36.7	0.3	37	46	-9	PASS		46	-9	PASS		100	135
874.991	36.3	2.1	38.5	46	-7.5	PASS		46	-7.6	PASS		200	180

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 30-1000MHz
Operator: ZJ
Notes:
Mid Shelf - Loop 6

Work Order - S2787
EUT Power Input - 230V / 50Hz
Test Site - CH-2
Conditions - 23.7°C; 40%RH; 1025mBar

EUT Maximum Frequency - 900MHz

Data Taken at 03:42:18 PM, Tuesday, October 09, 2018

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)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
127.243	47.6	-8.3	39.3	43.5	-4.2	PASS	-4.2	43.5	-4.2	PASS	-4.2	250	45
139.634	48	-9.2	38.7	43.5	-4.8	PASS		43.5	-4.8	PASS		200	90
145.333	45.3	-9.6	35.7	43.5	-7.8	PASS		43.5	-7.8	PASS		250	90
500.014	43.4	-3.5	40	46	-6	PASS		46	-6.1	PASS		200	180
875.015	38.3	2.1	40.4	46	-5.6	PASS		46	-5.6	PASS		150	225

30-1000MHz Mid Shelf - Worst Case Loop 6

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Vertical 30-1000MHz
Operator: ZJ
Notes:
Bottom Shelf - Loop 2

Work Order - S2787
EUT Power Input - 230V / 50Hz
Test Site - CH-2
Conditions - 23.7°C; 40%RH; 1025mBar

EUT Maximum Frequency - 900MHz

Data Taken at 03:22:38 PM, Tuesday, October 09, 2018

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)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	Turntable Azimuth (degrees)
31.843	37	-3.1	33.8	40	-6.2	PASS		40	-6.2	PASS		100	90
127.485	49.5	-8.5	41.1	43.5	-2.4	PASS	-2.4	43.5	-2.5	PASS	-2.4	200	135
499.989	43.7	-3.5	40.2	46	-5.8	PASS		46	-5.8	PASS		100	180
750.007	37.2	0.3	37.5	46	-8.5	PASS		46	-8.5	PASS		100	135
874.991	36.8	2.1	38.9	46	-7.1	PASS		46	-7.1	PASS		200	180

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 30-1000MHz
Operator: ZJ
Notes:
Bottom Shelf - Loop 2

Work Order - S2787
EUT Power Input - 230V / 50Hz
Test Site - CH-2
Conditions - 23.7°C; 40%RH; 1025mBar

EUT Maximum Frequency - 900MHz

Data Taken at 03:22:39 PM, Tuesday, October 09, 2018

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)	Lim2: FCC_pt15_109_Class_B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
127.485	48.3	-8.5	39.8	43.5	-3.7	PASS	-3.7	43.5	-3.7	PASS	-3.7	200	45
141.21	43.6	-9.1	34.5	43.5	-9	PASS		43.5	-9	PASS		250	270
499.989	42.9	-3.5	39.5	46	-6.5	PASS		46	-6.6	PASS		200	180
875.015	38.9	2.1	41	46	-5	PASS		46	-5	PASS		150	135
881.393	35.4	2.3	37.7	46	-8.3	PASS		46	-8.3	PASS		150	225

30-1000MHz Bottom Shelf - Worst Case Loop 2

Rev. 10/8/2018

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	11/16/2018	11/16/2017
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	12/21/2018	12/21/2016
Preamps /Couplers Attenuators / Filters	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
2444 PA	9KHz-6GHz	BBV9744	SCWARZBECK	67	2444	I	2/5/2019	2/5/2018
Antennas	**Range**	**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Red-Brown Bilog	30-2000MHz	JB1	Sunol	A0032406	1218	I	1/13/2019	1/13/2017
Meteorological Meters/Chambers		**MN**	**Mfr**	**SN**	**Asset**	**Cat**	**Calibration Due**	**Calibrated on**
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I	5/15/2020	5/15/2018
TH A#2080		HTC-1	HDE		2080	II	3/22/2019	3/22/2018
Cables	**Range**		**Mfr**			**Cat**	**Calibration Due**	**Calibrated on**
Asset #2051	9kHz - 18GHz		Florida RF			II	3/7/2019	3/7/2018
Asset #2054	9kHz - 18GHz		Florida RF			II	10/31/2018	10/31/2017

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

AC Line Conducted Emissions

LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

MEASUREMENTS / RESULTS

***3 sets of data are presented; the worst case loop from the bottom shelf, the worst case loop from the top shelf, and no loop with RF terminated. 13.56MHz was removed from the top and bottom loop data tables, and compliance is shown at this frequency in the RF terminated tables.**

Conducted Emissions Data Table(s):

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Hot Lead
EUT Mode of Operation: Loop 1 Shelf 1

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 11:20:16 AM, Wednesday, October 10, 2018

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)
0.154	44.9	20	64.9	65.8	-0.9	PASS	-0.9
0.201	36.3	20	56.3	63.6	-7.2	PASS	
0.238	33.9	19.9	53.7	62.2	-8.4	PASS	
0.264	32.3	19.9	52.2	61.3	-9.1	PASS	
0.327	29.4	19.9	49.3	59.5	-10.2	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Hot Lead
EUT Mode of Operation: Loop 1 Shelf 1

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 11:20:16 AM, Wednesday, October 10, 2018

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)
0.15	15.8	20	35.9	56	-20.1	PASS	
0.153	15.8	20	35.8	55.9	-20	PASS	
0.174	15.8	20	35.9	54.8	-18.9	PASS	
1.196	13.9	19.8	33.7	46	-12.3	PASS	
1.344	11.4	19.8	31.3	46	-14.7	PASS	

Hot Lead - Top Shelf

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Neutral Lead
EUT Mode of Operation: Loop 1 Shelf 1

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 11:38:23 AM, Wednesday, October 10, 2018

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)
1.354	26	19.8	45.8	56	-10.2	PASS	-10.2
1.516	25.8	19.9	45.6	56	-10.4	PASS	
1.672	25.4	19.9	45.3	56	-10.7	PASS	
1.832	26	19.9	45.8	56	-10.2	PASS	
2.448	25.9	19.9	45.8	56	-10.2	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Neutral Lead
EUT Mode of Operation: Loop 1 Shelf 1

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 11:38:23 AM, Wednesday, October 10, 2018

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)
1.037	14.7	19.8	34.5	46	-11.5	PASS	
1.197	15	19.8	34.8	46	-11.2	PASS	
1.356	15.1	19.8	34.9	46	-11.1	PASS	-11.1
1.515	14.8	19.9	34.6	46	-11.4	PASS	
1.517	14.8	19.9	34.6	46	-11.4	PASS	

Neutral Lead - Top Shelf

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Hot Lead
EUT Mode of Operation: Loop 2 Shelf

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 01:20:29 PM, Wednesday, October 10, 2018

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)
0.166	42.4	20	62.4	65.1	-2.7	PASS	-2.7
0.209	40.2	19.9	60.2	63.2	-3.1	PASS	
0.243	33.1	19.9	53	62	-9	PASS	
1.36	27.6	19.8	47.5	56	-8.5	PASS	
2.453	28	19.9	47.8	56	-8.2	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Hot Lead
EUT Mode of Operation: Loop 2 Shelf

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 01:20:29 PM, Wednesday, October 10, 2018

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)
0.156	15.9	20	35.9	55.7	-19.8	PASS	
1.03	15.2	19.8	35.1	46	-10.9	PASS	
1.188	14.8	19.8	34.6	46	-11.4	PASS	
1.346	14.2	19.8	34	46	-12	PASS	
1.519	16	19.9	35.9	46	-10.1	PASS	-10.1

Hot Lead – Bottom Shelf

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Neutral Lead
EUT Mode of Operation: Loop 2 Shelf

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 01:43:43 PM, Wednesday, October 10, 2018

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)
1.347	27.1	19.8	46.9	56	-9.1	PASS	
1.506	27.5	19.9	47.4	56	-8.6	PASS	
1.678	27.2	19.9	47.1	56	-8.9	PASS	
1.998	27	19.9	46.9	56	-9.1	PASS	
2.157	27.7	19.9	47.6	56	-8.4	PASS	-8.4

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Neutral Lead
EUT Mode of Operation: Loop 2 Shelf

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 01:43:43 PM, Wednesday, October 10, 2018

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)
1.03	15.4	19.8	35.2	46	-10.8	PASS	
1.197	16.5	19.8	36.3	46	-9.7	PASS	-9.7
1.358	16.2	19.8	36.1	46	-9.9	PASS	
1.507	12.8	19.9	32.6	46	-13.4	PASS	
1.679	15.1	19.9	35	46	-11	PASS	

Neutral Lead – Bottom Shelf

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Hot Lead
EUT Mode of Operation: Loop 1 Shelf 1 RFI into Termination

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 12:01:29 PM, Wednesday, October 10, 2018

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)
0.15	41.8	20	61.9	66	-4.1	PASS	
0.161	44.2	20	64.2	65.4	-1.2	PASS	-1.2
0.201	34.9	20	54.9	63.6	-8.7	PASS	
0.229	35	19.9	54.9	62.5	-7.6	PASS	
0.263	33.3	19.9	53.1	61.3	-8.2	PASS	
0.424	28.3	19.8	48.1	57.4	-9.3	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Hot Lead
EUT Mode of Operation: Loop 1 Shelf 1 RFI into Termination

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 12:01:28 PM, Wednesday, October 10, 2018

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)
1.04	14.1	19.8	33.9	46	-12.1	PASS	
1.193	15	19.8	34.8	46	-11.2	PASS	
1.348	13	19.8	32.8	46	-13.2	PASS	
1.503	12.6	19.9	32.4	46	-13.6	PASS	
1.676	14.4	19.9	34.3	46	-11.7	PASS	
13.561	28.8	20	48.7	50	-1.3	PASS	-1.3

Hot Lead – RF Terminated

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1
Peak Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Neutral Lead
EUT Mode of Operation: Loop 1 Shelf 1 RFI into Termination

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 11:53:33 AM, Wednesday, October 10, 2018

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)
1.185	25.9	19.8	45.7	56	-10.3	PASS	
1.352	26.1	19.8	45.9	56	-10.1	PASS	
1.515	26.5	19.9	46.4	56	-9.6	PASS	
1.677	26.4	19.9	46.3	56	-9.7	PASS	
1.837	26.5	19.9	46.4	56	-9.6	PASS	-9.6
13.56	30.2	20	50.2	60	-9.8	PASS	

Curtis Straus - a Bureau Veritas Company
Conducted Emissions per CISPR 16-2-1, CISPR Average Detector
Final Average Detector Data
Notes:
EUT Line tested: 230VAC/50Hz; Neutral Lead
EUT Mode of Operation: Loop 1 Shelf 1 RFI into Termination

Work Order # - S2787
EUT Power Input - 230VAC/ 50Hz
Test Site - CEMI-5
Conditions: - 22.3°C; 60%RH; 1012mBar
Test Engineer - Zac Johnson

Data Taken at 11:53:33 AM, Wednesday, October 10, 2018

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)
1.04	14.1	19.8	33.9	46	-12.1	PASS	
1.193	15	19.8	34.8	46	-11.2	PASS	
1.348	13	19.8	32.8	46	-13.2	PASS	
1.503	12.6	19.9	32.4	46	-13.6	PASS	
1.676	14.4	19.9	34.3	46	-11.7	PASS	
13.561	28.8	20	48.7	50	-1.3	PASS	-1.3

Neutral Lead – RF Terminated

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.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz) NIST CISPR	 5.6dB 4.6dB	 N/A 5.2dB (Ucispr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions NIST CISPR	 3.9dB 3.6dB	 N/A 3.6dB (Ucispr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
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		

Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS** (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.
14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request.
Rev.160009121(2)_#684340 v14CS