FCC 47 CFR PART 15 SUBPART C
ISED RSS 210

CERTIFICATION TEST REPORT

FOR

433.92 MHZ TRANSCEIVER

MODEL NUMBERS: K138360, K138369, K138370, K138371, K138372

FCC ID: NATRXK138360
ISED ID: 3323A-K138360

REPORT NUMBER: 12934208-E1V3

ISSUE DATE: 11/06/2019

Prepared for
BENDIX COMMERCIAL VEHICLE SYSTEMS LLC
#2110 – 6900 GRAYBAR ROAD
RICHMOND, B. C. V6W 0A5 CANADA

Prepared by
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NVLAP Lab code: 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	9/17/2019	Initial Issue	--
V2	10/29/2019	Report revised based on reviewer's comments.	Bobby Bayani
V3	11/06/2019	Report revised based on reviewer's comments.	Bobby Bayani

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BENDIX COMMERCIAL VEHICLE SYSTEMS LLC
#2110 – 6900 GRAYBAR ROAD
RICHMOND, B. C. V6W 0A5 CANADA

EUT DESCRIPTION: 433.92 MHZ TRANSCEIVER

MODELS: K138360, K138369, K138370, K138371, K138372

SERIAL NUMBER: 0001023, 0001016

DATE TESTED: AUGUST 26 to SEPTEMBER 07, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	Complies
ISED RSS-210 Issue 9, Annex A	Complies
ISED RSS-GEN Issue 5	Complies

UL Verification Services Inc tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 5, and RSS-210 Issue 9.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
☐ Chamber A	☐ Chamber D	☒ Chamber I
☐ Chamber B	☐ Chamber E	☒ Chamber J
☐ Chamber C	☐ Chamber F	☐ Chamber K
	☐ Chamber G	☐ Chamber L
	☐ Chamber H	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Worst Case Radiated Disturbance, 9kHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 433.92MHz transceiver used for Tire Pressure Monitoring Systems.

Only Model K138360 was tested.

Model Differences:

Note: Hardware on all versions of these model variants are identical. The only differences are different CAN messages requested by different customers and the CAN Baud Rate. See below for details.

K138360: 250K CAN Communication
K138369: 250k CAN Communication for Customer 1: Only changes are specific CAN messages.
K138370: 500k CAN Communication
K138371: 500k CAN Communication for Customer 1: Only changes are specific CAN messages.
K138372: 250k CAN Communication for Customer 2: Only changes are specific CAN messages.

Other details regarding the EUT are documented in the applicable MFR product documentation.

5.2. MAXIMUM FIELD STRENGTH

The transmitter has the maximum peak and average radiated field strengths as follows:

Frequency Range (MHz)	Mode	Field Strength Average (dBuV/m)
433.9304	Normal	68.20

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Internal Antenna (For Receive Mode only) with a gain of -5.0 dBi and external PIFA Antenna with a gain of 0 dBi.

5.4. SOFTWARE AND FIRMWARE

The software used in the EUT during testing was CANRXTOOL Test Ver. 1.0.2449.19148.
The firmware installed in the EUT during testing was K119204B000V4.04.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated using the external antenna only in each of its three orthogonal axes. All radiated testing was performed in the worse-case axis, which was found to be the “X-axis”. See photos for details.

Based on our engineering evaluation for both 250K and 500K, we have verified that 250K is the worst case model due to the higher data rate. Testing was only performed on Model K138360.

For below 30MHz testing, investigation was done on three antenna orientations: RX antenna Face-on, Face-off and horizontal (parallel to ground). The worst-case configurations were determined on RX antenna Face-on and Face-off; therefore, all final tests were performed using these two orientations.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	**Manufacturer**	**Model**	**Serial Number**
Laptop PC	LENOVO	T460	PC0C3DUA
AC Adapter	LENOVO	ADLX66NCT2A	11S36200280ZZ10048KF26
DC Power Supply	SORENSEN	XT 15-4	1319A02780
USB-Link	NEXIQ	-	73726

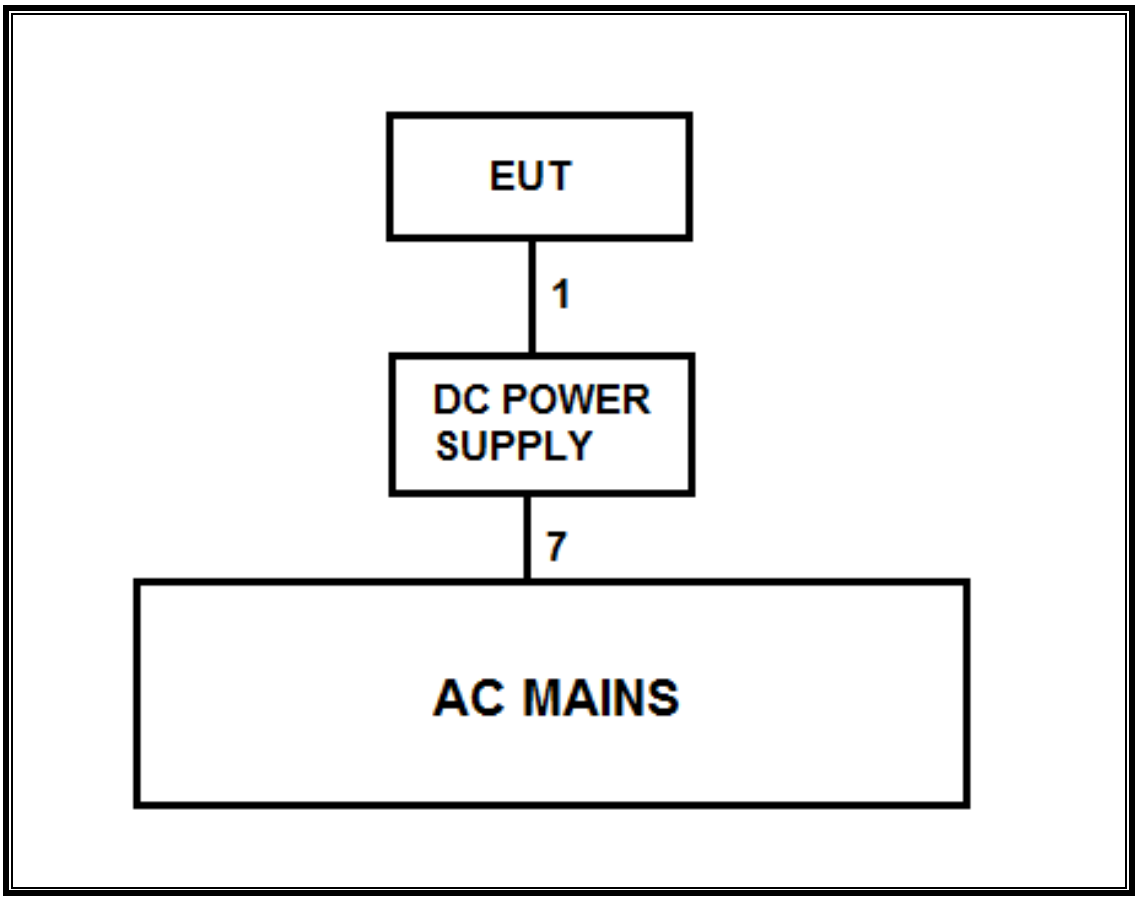
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC	1	DC	Unshielded	1.0m	N/A
2	SERIAL	1	SERIAL	Unshielded	1.5m	N/A
3	USB	1	USB	Unshielded	1.0m	N/A
4	SERIAL	1	SERIAL	Shielded	0.3m	N/A
5	DC	1	DC	Unshielded	1.2m	N/A
6	AC	1	AC	Unshielded	1.2m	N/A
7	AC	1	AC	Unshielded	1.2m	N/A

TEST SETUP

Test software exercised the EUT.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List					
Description	**Manufacturer**	**Model**	**ID No.**	**Cal Date**	**Cal Due**
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179367	05/16/2019	05/16/2020
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179376	02/14/2019	02/14/2020
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	T899	08/23/2019	08/23/2020
Antenna, Horn 1-18GHz	AR	AMPL-ATH1G18	PRE0189055	04/20/2019	04/20/2020
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB3	PRE0184971	11/13/2018	11/13/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	06/05/2019	06/05/2020
Amplifier, 9kHz to 1GHz, 32 dB	SONOMA INSTRUMENT	310	PRE0180174	06/01/2019	06/01/2020
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	PRE0181597	05/28/2019	05/28/2020
Amplifier, 9kHz to 1GHz, 32 dB	SONOMA INSTRUMENT	310	PRE0180175	06/29/2019	06/29/2020
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	PRE0180997	08/24/2019	08/24/2020
Antenna, Passive Loop 30Hz to 1MHz	ELETRO METRICS	EM-6871	PRE0179465	05/31/2019	05/31/2020
Antenna, Passive Loop 100kHz to 30MHz	ELETRO METRICS	EM-6872	PRE0179467	05/31/2019	05/31/2020

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Antenna Port Software	UL	UL RF	Ver 9.9, June 05, 2019
Radiated Software	UL	UL EMC	Ver 9.5, June 22, 2018

7. ANTENNA PORT TEST RESULTS

7.1. 20 dB AND 99% BW

LIMITS

FCC §15.231 (c)
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

RSS-210 A.1.3
The 99% bandwidth of monetarily operated devices shall be less or equal to 0.25% of the center frequency for devices operating between 70MHz and 900MHz. For devices operating above 900MHz, the 99% bandwidth shall be less or equal to 0.5% of the center frequency.

TEST PROCEDURE

ANSI C63.10

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 1% to 5% of OBW. The VBW is set to 3 times the RBW. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

99% Bandwidth: The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

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RESULTS

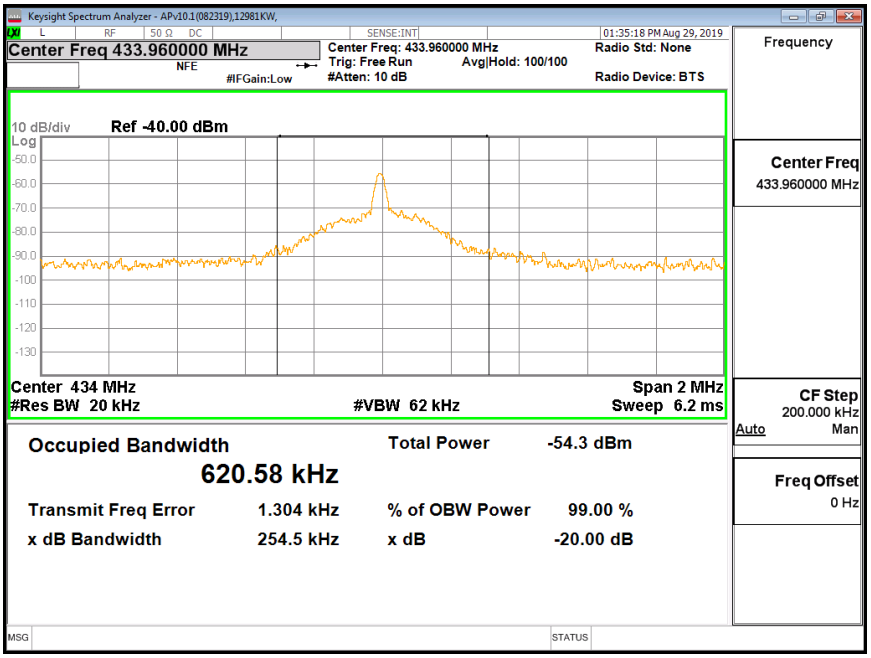
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.92	620.58	1084.8	-464.22

99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.92	254.5	1084.8	-830.3

20dB & 99% BANDWIDTH



7.2. DUTY CYCLE

LIMITS

FCC §15.35 (c)
The measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1MHz and the VBW is set to 1MHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

CALCULATION

Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is
(# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

No non-compliance noted:

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Medium Pulse Width (ms)	# of Medium Pulses	Short Pulse Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	0.456	1	0.336	9	0.171	77	0.166	-15.57

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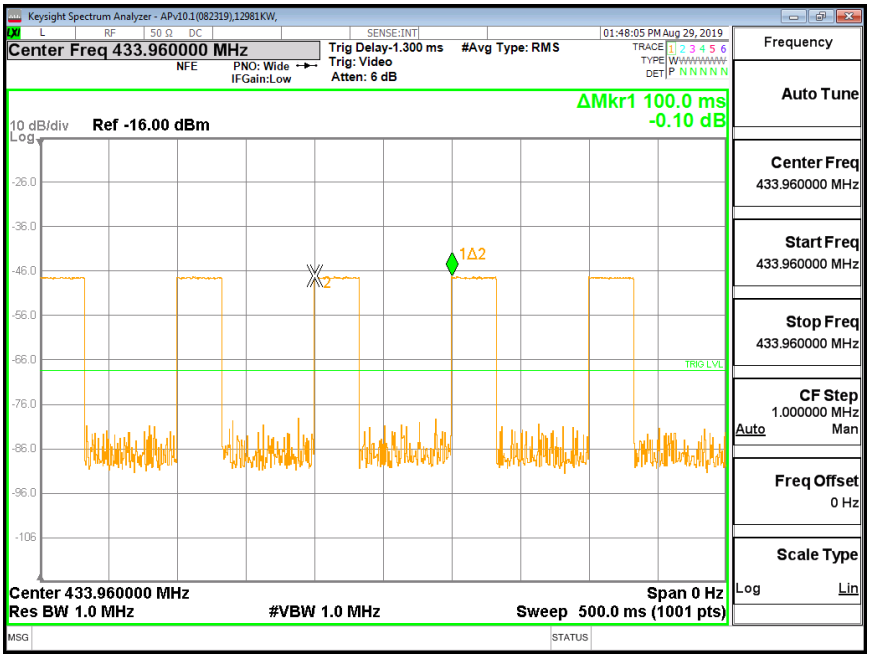
ONE PERIOD

ONE PERIOD

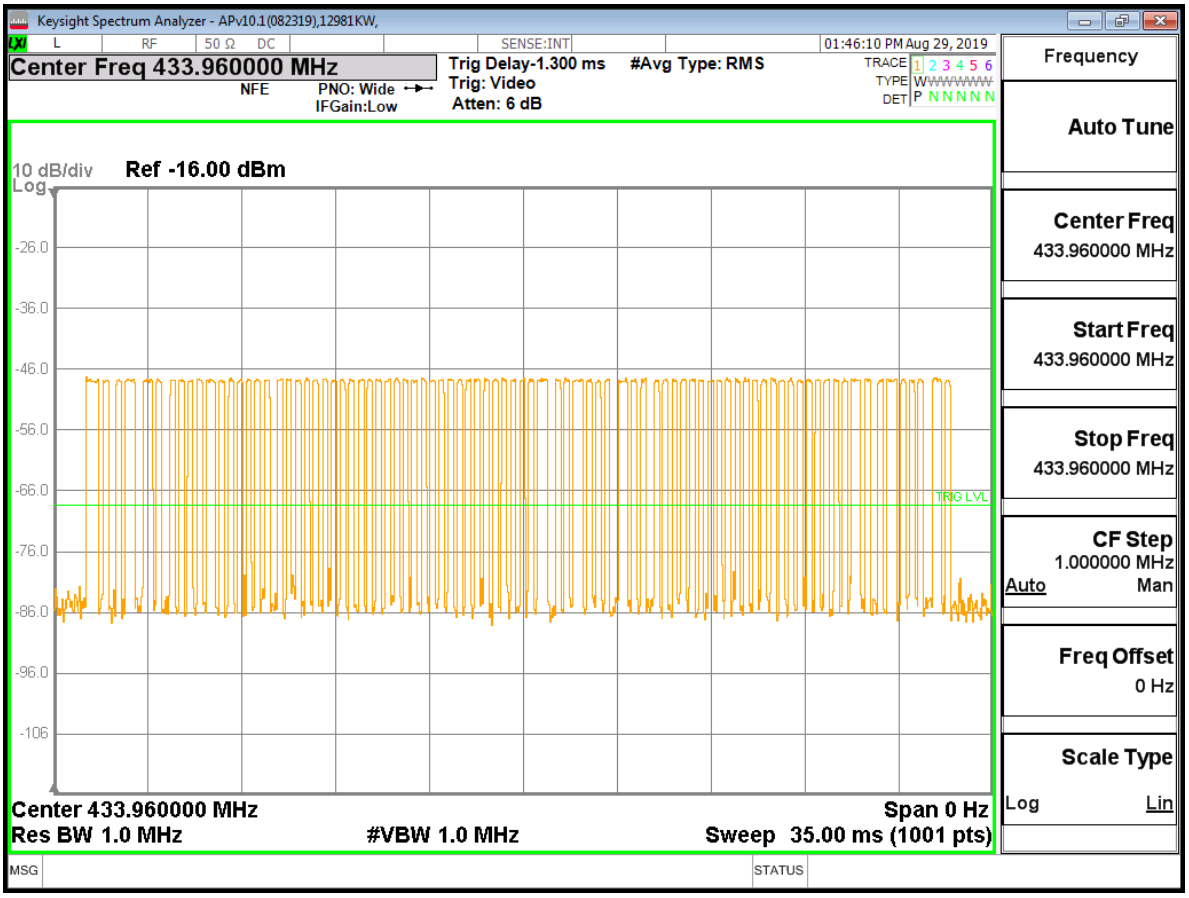


PULSE WIDTHS

PULSE WIDTHS

NUMBER OF PULSES

NUMBER OF PULSES



7.3. TRANSMISSIONS PLOT

LIMITS

FCC §15.231 (e) In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

RSS210 A1.1.5 In addition, devices operated under the provisions of this section (A1.1.5) shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than 1 second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds. However, devices that are designed for limited use for the purpose of initial programming, reprogramming or installation, and not for regular operations, may operate up to 5 seconds, provided that such devices are to be used only occasionally in connection with each unit being programmed or installed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 100 KHz and the VBW is set to 100 KHz. The sweep time is set to 10 & 30 seconds and the span is set to 0 Hz.

RESULTS

Transmission begins approximately 0.8 second after activation and transmission ceases approximately 1.28 seconds after activation. The Transmitting Interval every 3 - 5 minutes.

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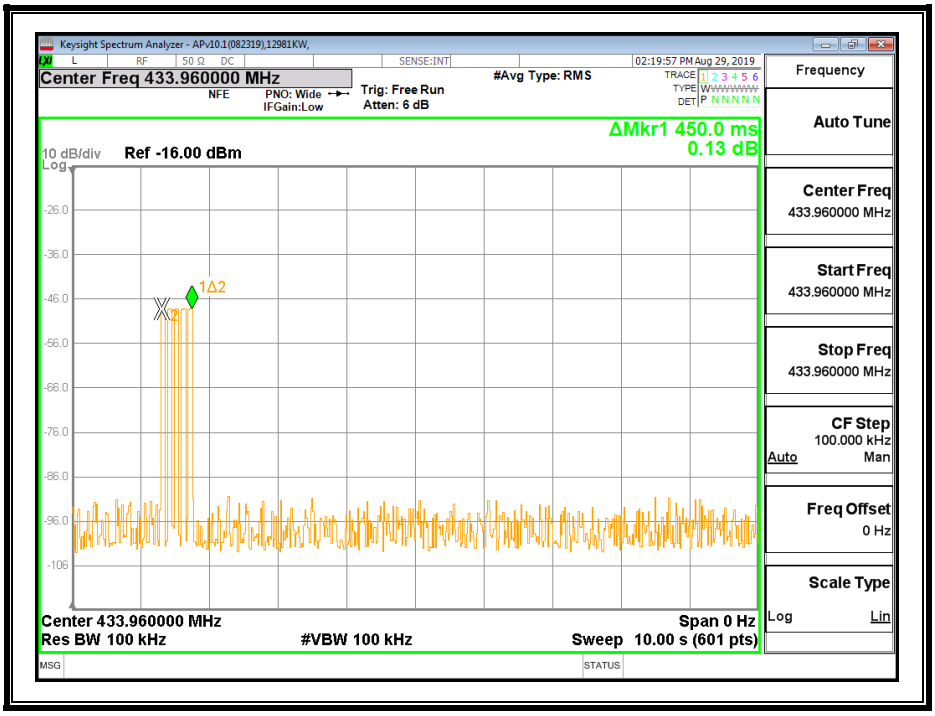

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8. RADIATED EMISSION TEST RESULTS

LIMITS

FCC §15.231 (e)
RSS-210 A.1.2

In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,5000[1]	50 to 150
174-260	1,500	150
260-470	1,500 to 5,000[1]	150 to 500[1]
Above 470	5,000	500

[1]Linear interpolation

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 – 13.41	322 - 335.4		

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1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

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TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Please refer to test report section 7.2 for duty cycle factor information. Note: The pre-scan measurements above 1GHz the VBW is set to 30 kHz.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

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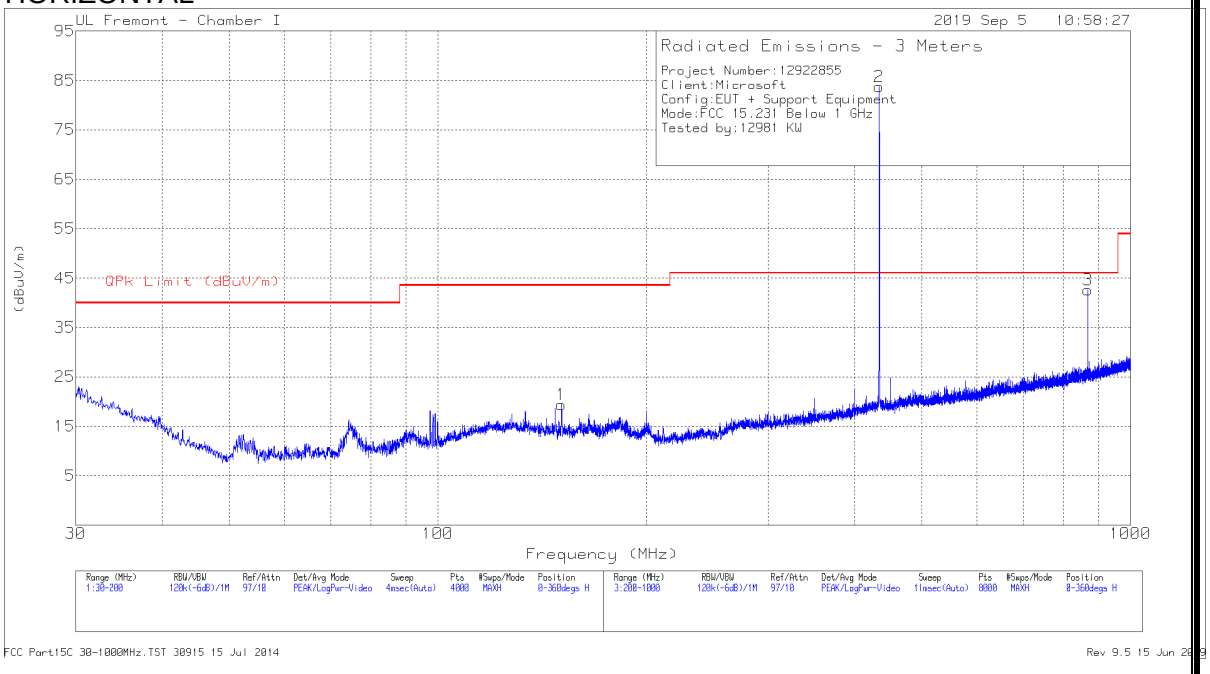
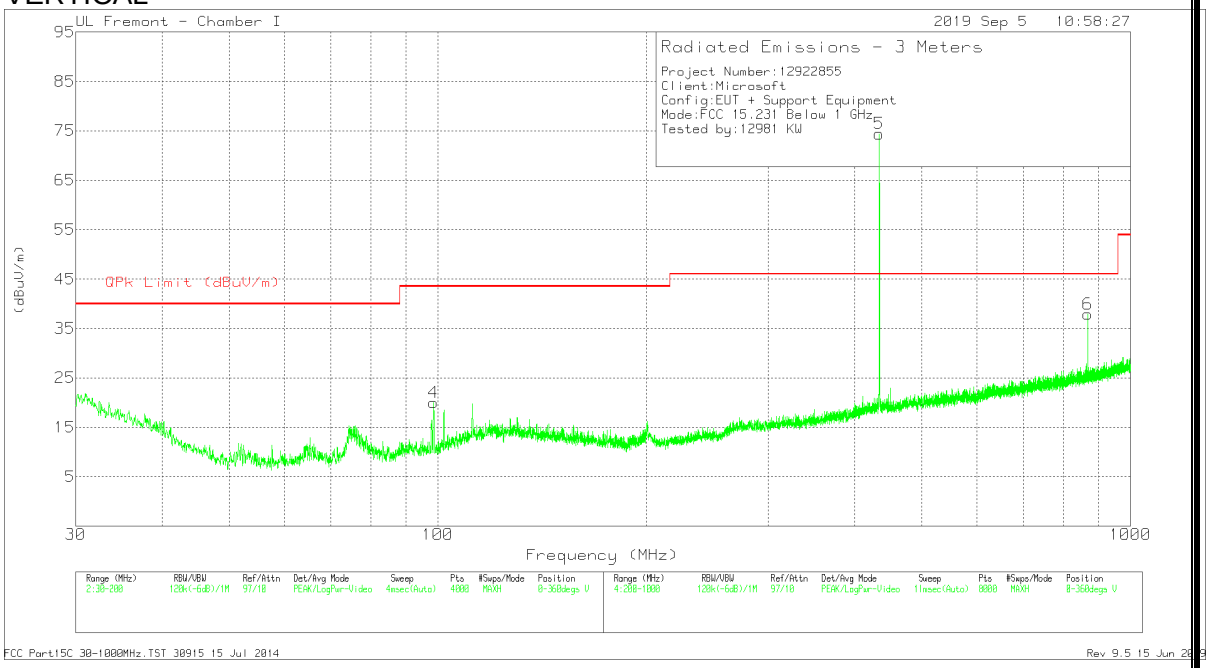
FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz)

HORIZONTAL



VERTICAL



BELOW 1GHZ RADIATED EMISSIONS

FUNDAMENTAL FIELD STRENGTH AND HARMONICS SPURIOUS EMISSIONS

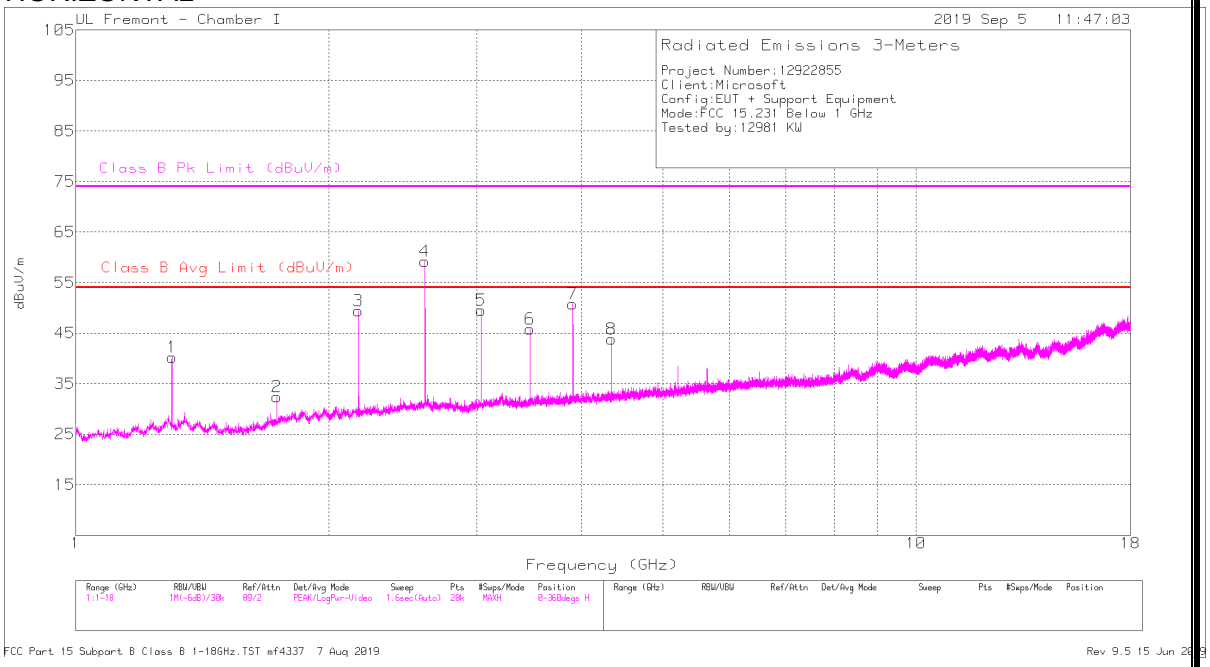
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T899 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	150.8588	31.72	Pk	18.3	-30.6	19.42	43.52	-24.1	112	139	H
4	98.5915	35.23	Pk	15.7	-30.9	20.03	43.52	-23.49	145	153	V
2	433.9304	90.87	Pk	22.5	-29.6	83.77	92.87	-9.1	101	102	H
			Av			68.2	72.87	-4.67	101	102	H
3	**867.8868	42.76	Pk	27.6	-27.8	42.56	72.87	-30.31	149	103	H
			Av			26.99	52.87	-25.88	149	103	H
5	433.9304	81.51	Pk	22.5	-29.6	74.41	92.87	-18.46	192	238	V
			Av			58.84	72.87	-14.03	192	238	V
6	**867.8868	38.06	Pk	27.6	-27.8	37.86	72.87	-35.01	273	122	V
			Av			22.29	52.87	-30.58	273	122	V

Pk - Peak detector
Av – Average detector

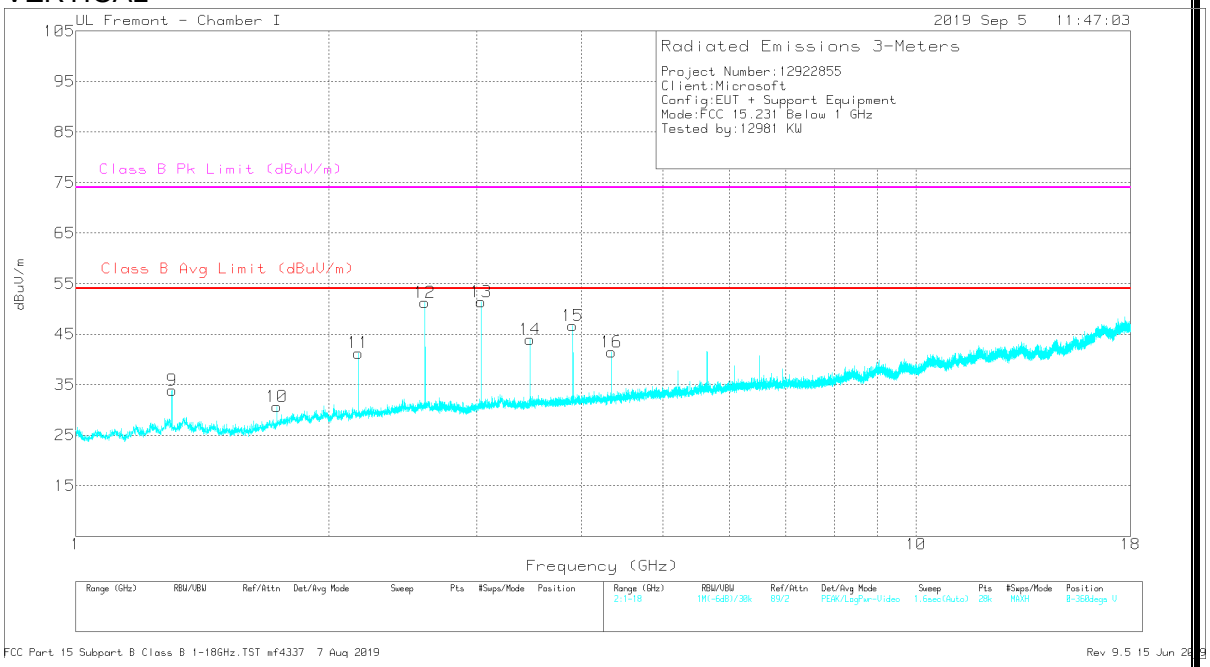
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -15.57dB
(# of long pulses * long pulse width) + (# of ,medium pulses * medium pulse width) + (# of short pulses * short pulse width) / 100 or T
Refer to section 7.2 for duty cycle factor calculation (-15.57dB)
Note: Radiated peak result is based on 100% duty cycle sample; average reading = peak reading + DCCF
** Harmonics of fundamental 433.92MHz
*** Indicates frequency in CFR15.205/RSS-Gen 8.10 -Restricted Band

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz

HORIZONTAL



VERTICAL

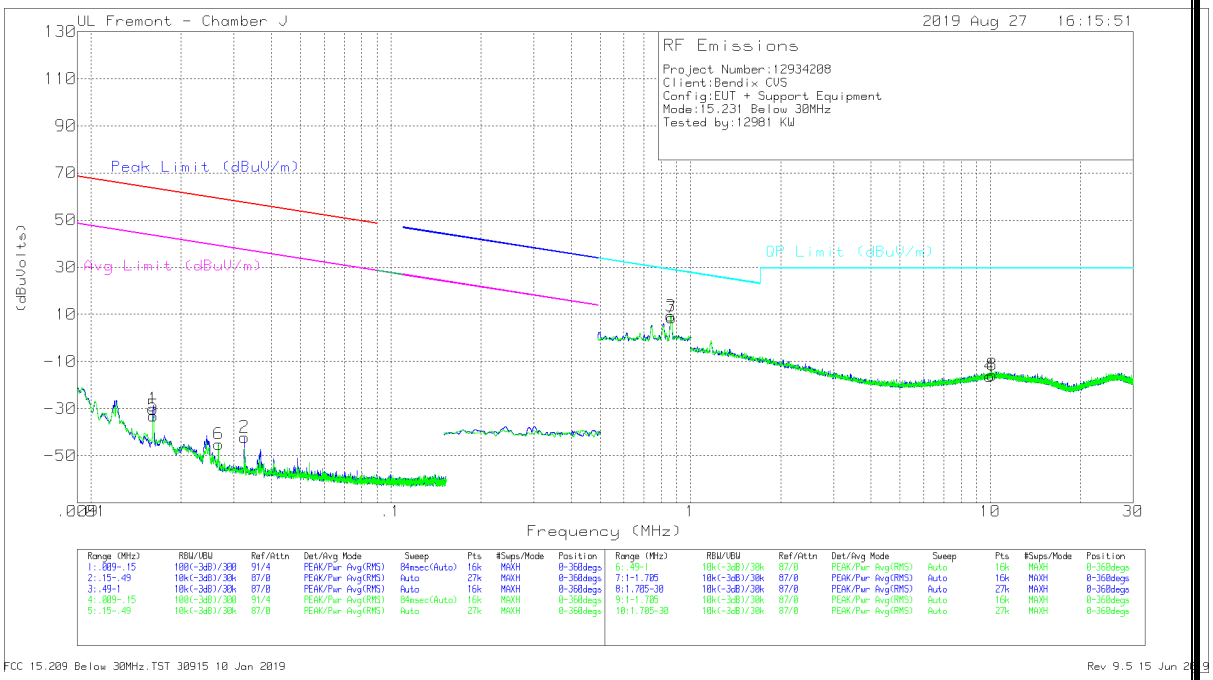


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Av Limit (dBuV/m)	Av Margin (dB)	Peak Limit (dBuV/m)	Peak Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	***1.30169	49.59	Pk	29.2	-32.3	46.49	-	-	74	-27.51	29	127	H
			Av			30.92	54	-23.08	-	-	29	127	H
2	1.7356	42.75	Pk	29.7	-31.6	40.85	-	-	72.87	-32.02	235	236	H
			Av			25.28	52.87	-27.59	-	-	235	236	H
3	2.16937	52.11	Pk	31.2	-30.8	52.51	-	-	72.87	-20.36	285	127	H
			Av			36.94	52.87	-15.93	-	-	285	127	H
4	2.60328	58.45	Pk	32.5	-29.8	61.15	-	-	72.87	-11.72	342	130	H
			Av			45.58	52.87	-7.29	-	-	342	130	H
5	3.03725	48.54	Pk	32.6	-29.6	51.54	-	-	72.87	-21.33	12	166	H
			Av			35.97	52.87	-16.9	-	-	12	166	H
6	3.47169	47.86	Pk	32.8	-29	51.66	-	-	72.87	-21.21	170	198	H
			Av			36.09	52.87	-16.78	-	-	170	198	H
7	***3.90482	49.42	Pk	33.2	-28.2	54.42	-	-	74	-19.58	148	198	H
			Av			38.85	54	-15.15	-	-	148	198	H
8	***4.33942	43.47	Pk	33.5	-27.7	49.27	-	-	74	-24.73	164	250	H
			Av			33.7	54	-20.3	-	-	164	250	H
9	***1.30177	39.96	Pk	29.2	-32.3	36.86	-	-	74	-37.14	47	159	V
			Av			21.29	54	-32.71	-	-	47	159	V
10	1.73527	39.94	Pk	29.7	-31.6	38.04	-	-	72.87	-34.83	39	121	V
			Av			22.47	52.87	-30.4	-	-	39	121	V
11	2.16995	42.99	Pk	31.2	-30.8	43.39	-	-	72.87	-29.48	196	147	V
			Av			27.82	52.87	-25.05	-	-	196	147	V
12	2.60344	51.34	Pk	32.5	-29.8	54.04	-	-	72.87	-18.83	174	193	V
			Av			38.47	52.87	-14.4	-	-	174	193	V
13	3.03752	53.47	Pk	32.6	-29.6	56.47	-	-	72.87	-16.4	123	234	V
			Av			40.9	52.87	-11.97	-	-	123	234	V
14	3.47169	44.56	Pk	32.8	-29	48.36	-	-	72.87	-24.51	241	135	V
			Av			32.79	52.87	-20.08	-	-	241	135	V
15	***3.90516	44.69	Pk	33.2	-28.2	49.69	-	-	74	-24.31	215	134	V
			Av			34.12	54	-19.88	-	-	215	134	V
16	***4.33927	41.59	Pk	33.5	-27.7	47.39	-	-	74	-26.61	169	167	V
			Av			31.82	54	-22.18	-	-	169	167	V

Pk - Peak detector
Av – Average detector

* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -15.57dB
(# of long pulses * long pulse width) +(# of ,medium pulses * medium pulse width) + (# of short pulses * short pulse width) / 100 or T
Refer to section 7.2 for duty cycle factor calculation (-15.57dB)
Note: Radiated peak result is based on 100% duty cycle sample; average reading = peak reading + DCCF
** Harmonics of fundamental 433.92 MHz
*** Indicates frequency in CFR15.205/RSS-Gen 8.10 -Restricted Band

BELOW 30MHz



KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

BELOW 30MHz RADIATED EMISSIONS

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Amp/Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0161	19.18	Pk	59.3	-28.5	-80	-30.02	63.45	-93.47	43.45	-73.47	0-360
2	.03248	8.84	Pk	57.5	-28.5	-80	-42.16	57.35	-99.51	37.35	-79.51	0-360
5	.01614	16.13	Pk	59.3	-28.5	-80	-33.07	63.43	-96.5	43.43	-76.5	0-360
6	.02662	5.37	Pk	58.1	-28.5	-80	-45.03	59.08	-104.11	39.08	-84.11	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Amp/Cbl (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
6	.86043	21.61	Pk	56.1	-28.4	-40	9.31	28.92	-19.61	0-360
7	.86427	20.77	Pk	56.1	-28.4	-40	8.47	28.88	-20.41	0-360
4	9.95905	17.37	Pk	34.4	-28	-40	-16.23	29.5	-45.73	0-360
8	10.16236	17.88	Pk	34.4	-28	-40	-15.72	29.5	-45.22	0-360

Pk - Peak detector

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