CERTIFICATION TEST REPORT

Report Number. : 12366313-E1V3

Applicant	:	UTC FIRE & SECURITY AMERICAS CORPORATION, INC. 2955 REDHILL AVENUE, SUITE 100 COSTA MESA, CA 92626, U.S.A.
Model	:	60-886-95
FCC ID	:	B4Z-802A-SHOCK
IC	:	1175C-802ASHOCK
EUT Description	:	SHOCK SENSOR
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS - 210 ISSUE 9 INDUSTRY CANADA RSS - GEN ISSUE 5

Date Of Issue:
October 24, 2018

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP TESTING

NVLAP Lab code: 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	7/9/2018	Initial Issue	--
V2	10/10/2018	Updated Section 5.2 to address TCB's question	Tina Chu
V3	10/24/2018	Updated Section 1, 3, 5.2, 6, 8.1 to address TCB's question	Tina Chu

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: UTC FIRE & SECURITY AMERICAS CORPORATION, INC.
2955 REDHILL AVENUE, SUITE 100
COSTA MESA, CA 92626, U.S.A.

EUT DESCRIPTION: SHOCK SENSOR

MODEL: 60-886-95

SERIAL NUMBER: 09A1F02 (#29)

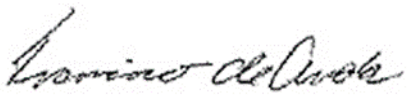
DATE TESTED: JUNE 29, 2018 TO JULY 06, 2018, OCTOBER 23, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	Complies
INDUSTRY CANADA RSS-210 Issue 9, Annex A	Complies
INDUSTRY CANADA 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, or any agency of the U.S. Government.

Approved & Released For
UL Verification Services Inc. By:



FRANCISCO DE ANDA
OPERATIONS LEAD
UL Verification Services Inc.

Prepared By:

JASON QIAN
TEST ENGINEER
UL Verification Services Inc.

Reviewed By:

TINA CHU
SENIOR PROJECT ENGINEER
UL Verification Services Inc.

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, and 47658 Kato Road, Fremont, California, USA. 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 (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☐ Chamber I (ISED: 2324A-5)
☒ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☒ Chamber J (ISED: 2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED: 2324A-1)
	☐ Chamber G (ISED:22541-4)	☐ Chamber L (ISED: 2324A-3)
	☐ Chamber H (ISED:22541-5)	

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
Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Radiated Disturbance,1000 to 18000 MHz	4.32 dB
Radiated Disturbance,18000 to 26000 MHz	4.45 dB
Radiated Disturbance,26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a shock sensor with a transmitter for use in a wireless security system. The unit is powered by one 3V battery. The transmitter's frequency is crystal controlled and is not adjustable by the user. The device measures approximately 5" in width, 1.5" in depth and 1.25″ in height. The unit weighs approximately 2.6 ounces without the battery.

5.2. MAXIMUM FIELD STRENGTH

The transmitter has the maximum field strengths as follows:

Frequency Range (MHz)	Mode	Field Strength Peak (dBuV/m)	Field Strength Average (dBuV/m)
319.5	Normal	86.37	64.35

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was LOADED DEVICE, SHOCK SENSOR ARITECH V2.0 REV. B (UTC part# 755-1261).

5.5. WORST-CASE CONFIGURATION AND MODE

All tests were performed with the EUT was set to transmit at the 319.5 MHz frequency with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Y orientation (Landscape)was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation (Landscape).

5.6. MODIFICATIONS

No modifications were made during testing.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

None.

I/O CABLES

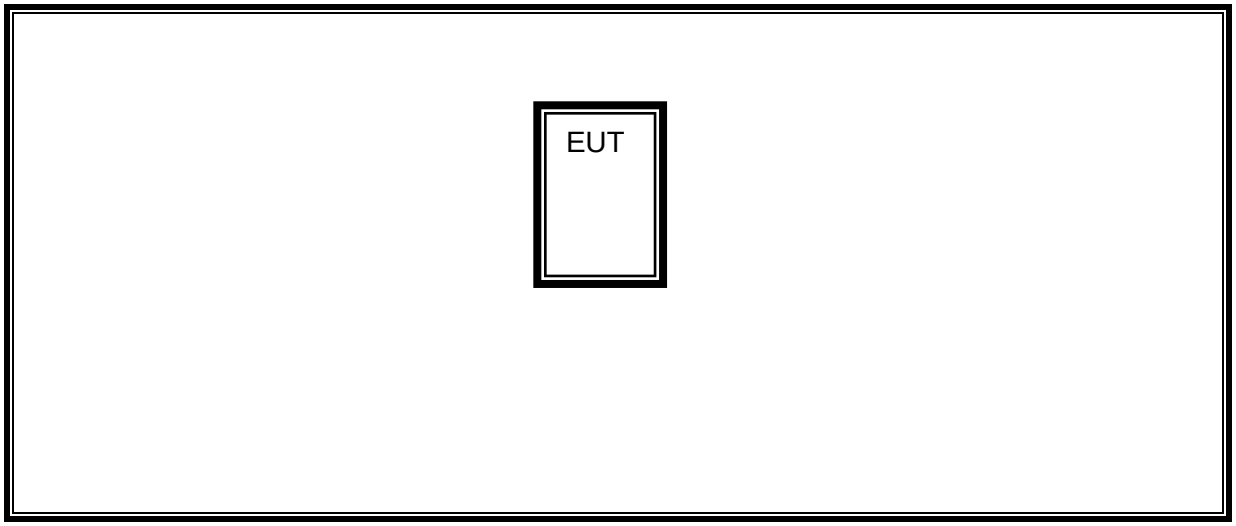
None.

TEST SETUP

The EUT was tested as a standalone device.

SETUP DIAGRAM FOR TESTS

The EUT was powered by battery and was tested as a standalone device.



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**	**Asset**	**Cal Due**
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T862	05/24/2019
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T493	04/03/2019
Antenna, Active Loop 9KHz to 30MHz	COM-POWER	AL-130R	PRE0165308	12/31/2018
Amplifier, 10KHz to 1GHz, 32dB	Keysight	8447D	T10	02/14/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T1454	01/08/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T905	02/03/2019
Hybrid Antenna, 30MHz to 3GHz	SunAR rf motion	JB3	PRE0181575	08/01/2019
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	PRE0180174	05/31/2019
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179372	05/04/2019
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016	
Radiated Software	UL	UL EMC	Ver 9.5, Jun 22, 2018	

NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

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 A1.3
For the purpose of Section A1.1, the 99% Bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 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.

RESULTS

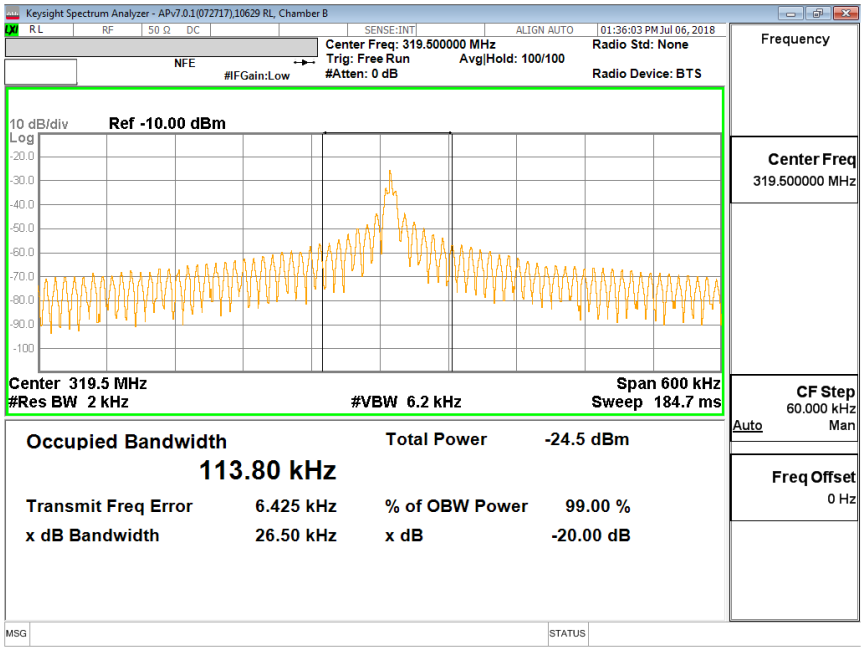
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
319.5	26.5	798.75	-772.25

99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
319.5	113.8	798.75	-684.95

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 100 kHz and the VBW is set to 100 kHz. 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.

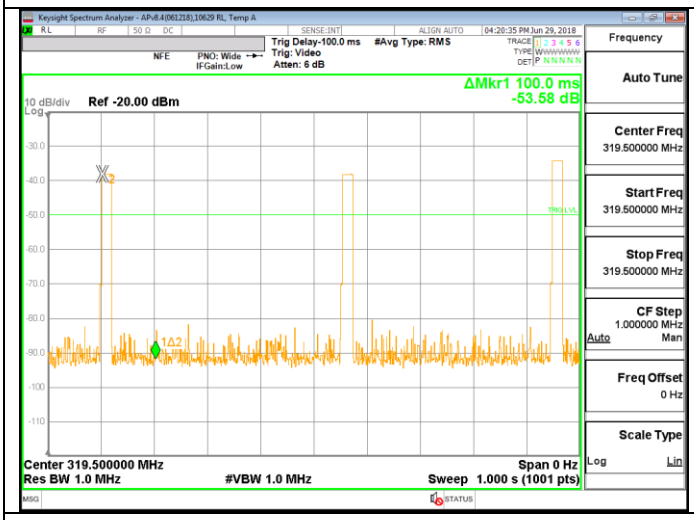
CALCULATION

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

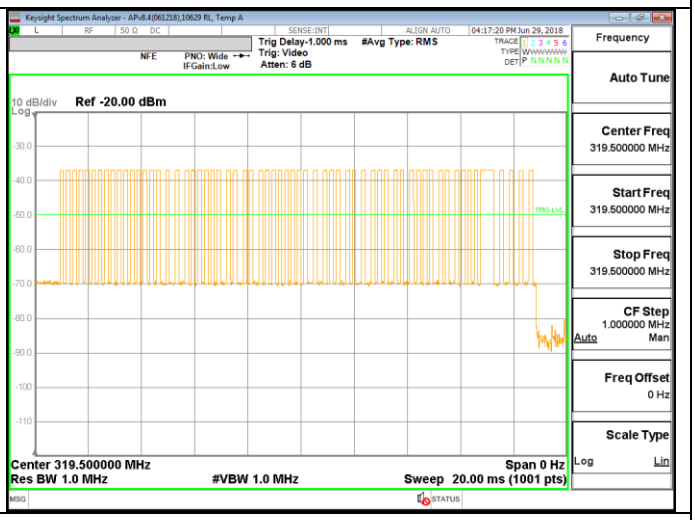
RESULTS

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	0.483	1	0.12	62	0.079	-22.02

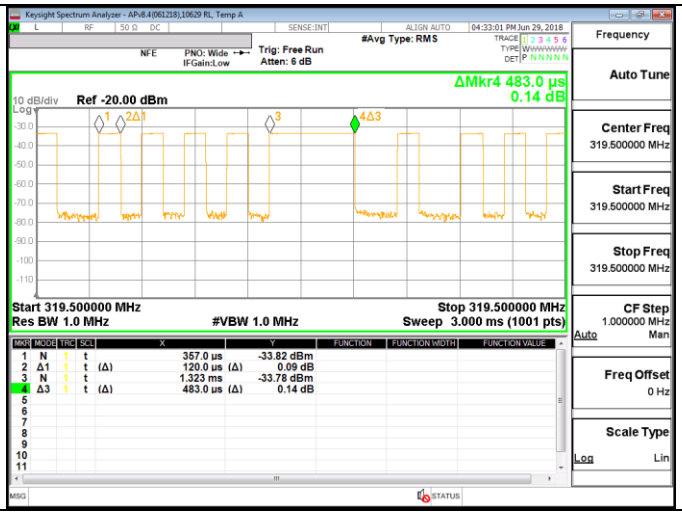
ONE PERIOD



NUMBER OF PULSES



PULSE WIDTH



7.3. SUPERVISION TRANSMISSIONS

LIMITS

FCC §15.231 (a) (3)
RSS-210 A1.1 (c)

Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour

Results

1. According to the manufacturer technical description, the device transmits brief supervisory signal at approximately 60 minutes intervals.

2. One pulse stream is 0.483ms*1 + 0.12ms*62 = 7.923ms. Based on section 7.4 test plot, one transition contain 8 pulse streams which is 7.912ms * 8 = 63.296ms.

7.4. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2) , (3)
RSS-210 A1.1 (b), (c)

(2) A transmitter that has been activated automatically shall cease transmission within 5 seconds of activation.

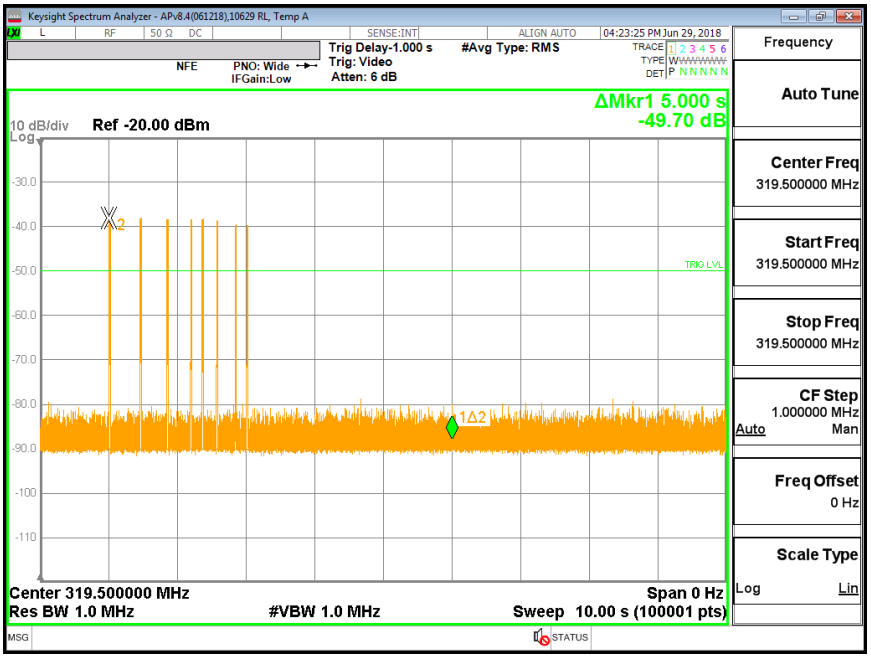
(3) Periodic transmissions at regular, predetermined intervals are not permitted. However, polling or supervision transmissions that determine system integrity of transmitters used in security or safety applications are permitted, provided the total duration of transmission does not exceed 2 seconds per hour for each transmitter.

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 set to 10 seconds and the span is set to 0 Hz.

RESULTS

LESS THAN 5 SECONDS



8. RADIATED EMISSION TEST RESULTS

LIMITS

FCC §15.231 (b)
RSS-210 A1.2

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 Frequency (µV/m at 3 m)	Field Strength of Spurious Emissions (µV/m at 3 m)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,750 [1]	125 to 375[1]
174 - 260	3,750	375
260 - 470	3,750 to 12,500[1]	375 to 1,250[1]
Above 470	12,500	1,250
[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		

[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
[1] Linear interpolation		

** 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.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement 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 pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

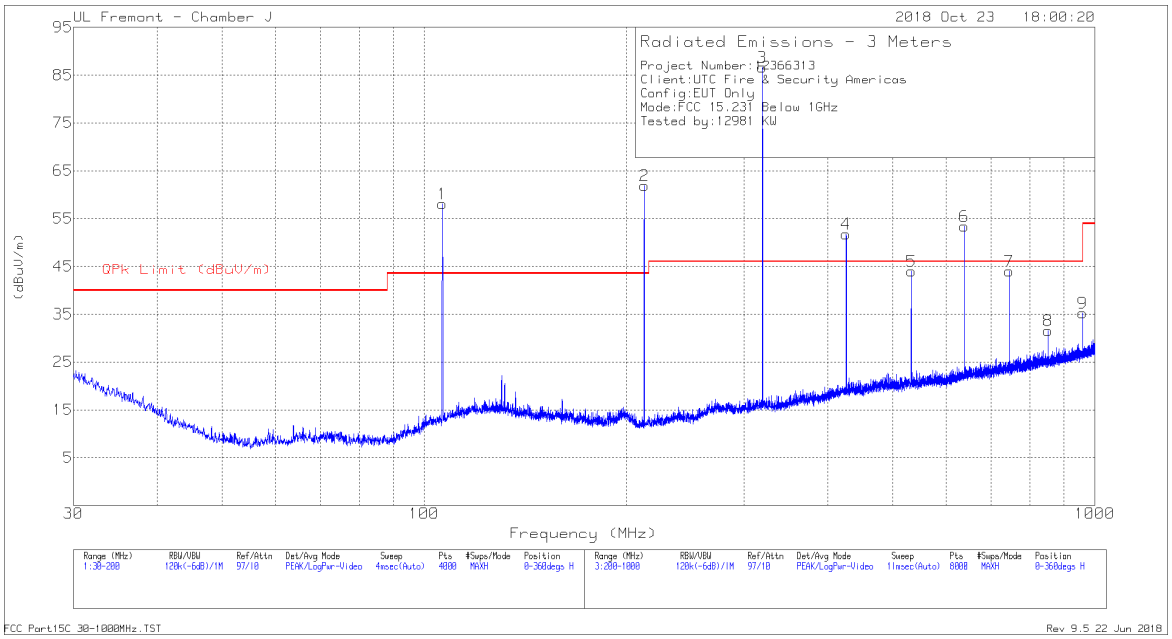
For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

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.

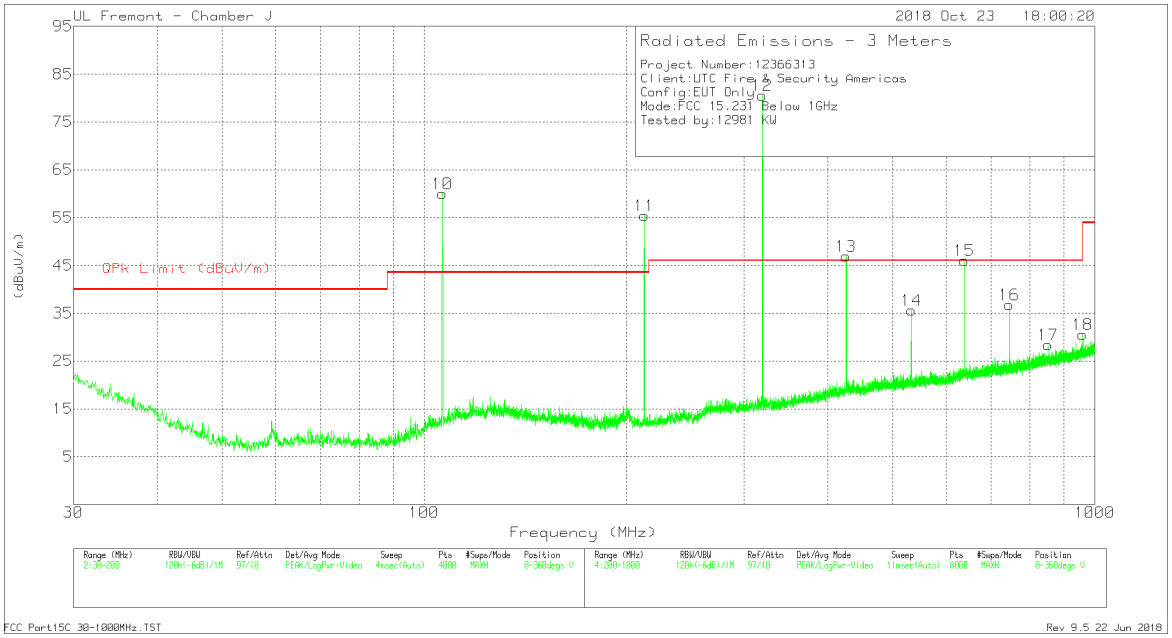
RESULTS

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

HORIZONTAL



VERTICAL



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181575 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	319.5105	96.57	Pk	19.8	-30	86.37	95.89	-9.52	7	101	H
			AV			64.35	75.89	-11.54	7	101	H
12	319.5109	90.42	Pk	19.8	-30	80.22	95.89	-15.67	303	193	V
			AV			58.2	75.89	-17.69	303	193	V
*6	639.0242	60.06	Pk	25.6	-29	56.66	75.89	-19.23	195	136	H
			AV			34.64	55.89	-21.25	195	136	H
*15	639.0214	50.23	Pk	25.6	-29	46.83	75.89	-29.06	302	148	V
			AV			24.81	55.89	-31.08	302	148	V
*9	958.5219	35.06	Pk	28.9	-26.6	37.36	75.89	-38.53	171	157	H
*18	958.5204	30.06	Pk	28.9	-26.6	32.36	75.89	-43.53	38	181	V
*1	106.5032	71.76	Pk	18	-30.9	58.86	75.89	-17.03	4	156	H
*2	213.0067	76.02	Pk	16.3	-30.3	62.02	75.89	-13.87	30	137	H
*4	426.0133	58.26	Pk	22.3	-29.6	50.96	75.89	-24.93	345	101	H
*5	532.5171	50.58	Pk	23.9	-29.3	45.18	75.89	-30.71	194	168	H
*7	745.5222	46.25	Pk	26.5	-28.6	44.15	75.89	-31.74	23	111	H
*8	852.0307	33.49	Pk	27.8	-27.8	33.49	75.89	-42.4	1	101	H
*10	106.5046	72.58	Pk	18	-30.9	59.68	75.89	-16.21	104	107	V
*11	213.0082	69.19	Pk	16.3	-30.3	55.19	75.89	-20.7	308	101	V
*13	426.0162	54.59	Pk	22.3	-29.6	47.29	75.89	-28.6	112	157	V
*14	532.5218	41.22	Pk	23.9	-29.3	35.82	75.89	-40.07	100	177	V
*16	745.5297	38.94	Pk	26.5	-28.6	36.84	75.89	-39.05	120	104	V
*17	852.0231	33.29	Pk	27.8	-27.8	33.29	75.89	-42.6	242	138	V

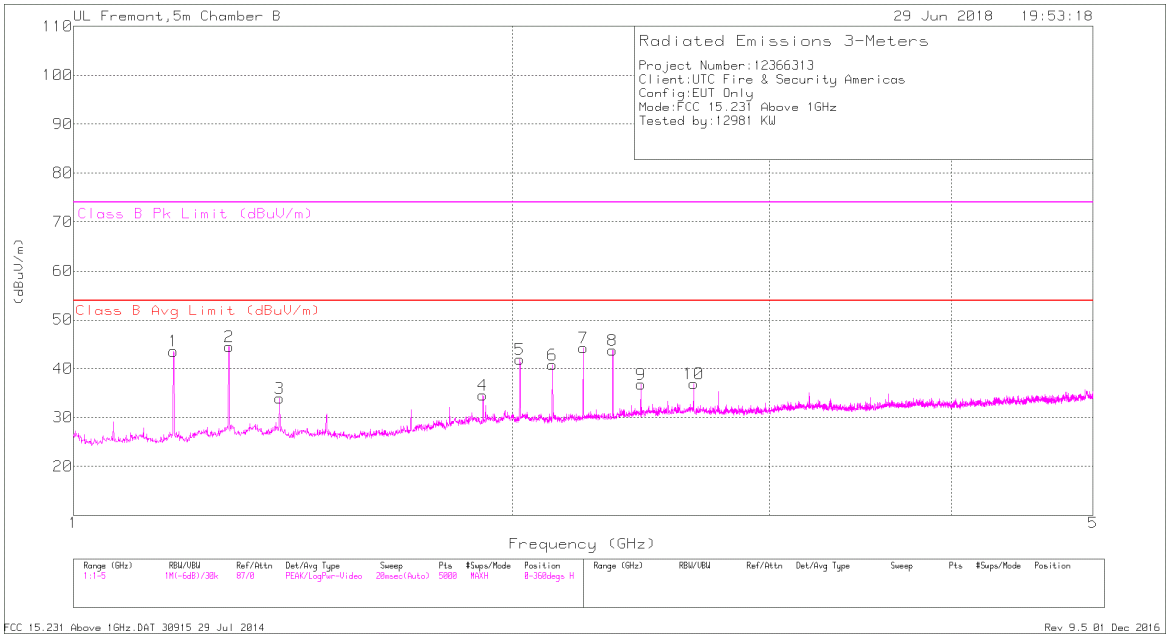
Pk - Peak detector
Av – Average detector

NOTE:

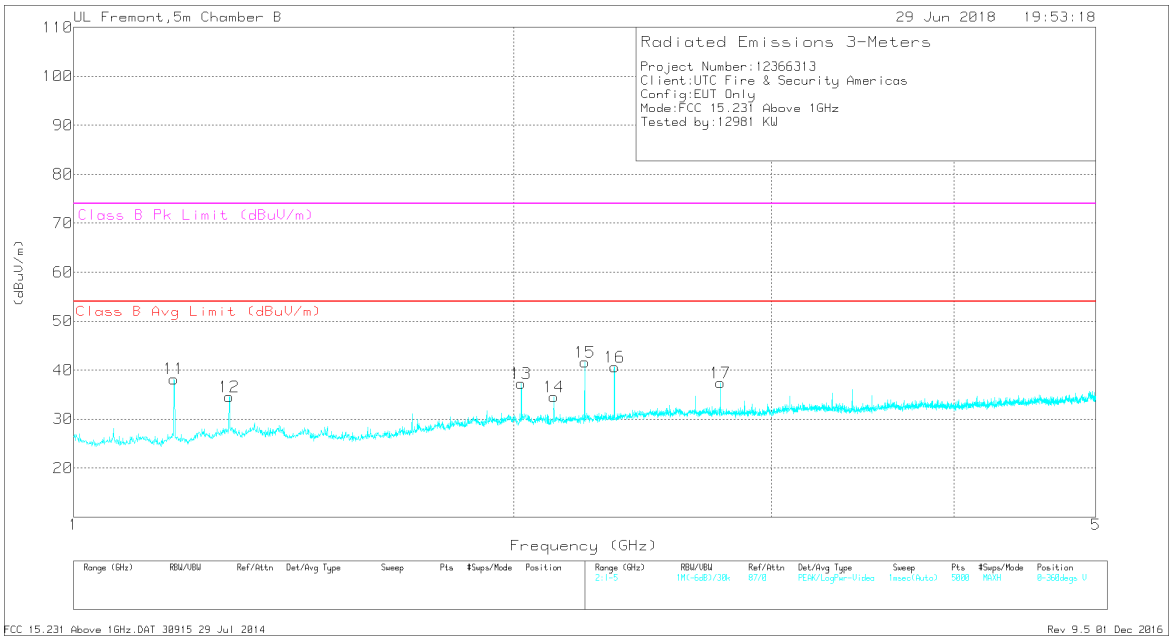
1. Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -22.02dB
   (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T
   Refer to section 7.2 for duty cycle factor calculation (-22.02dB)
2. Radiated peak result is based on 100% duty cycle sample; average reading = peak reading + DCCF
3. Markers 3 & 12 are fundamental 319.5MHz signals
4. Markers 6, 15, 9 & 18 are harmonics spurious emissions of 319.5MHz
5. Markers with * are non-restricted bands

8.2. HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz

HORIZONTAL



VERTICAL



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Avg Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.172	51.31	Pk	27.9	-32.3	46.91	-	-	74	-27.09	191	289	H
			AV			24.89	54	-29.11	-	-	191	289	H
2	1.278	50.81	Pk	29.3	-32	48.11	-	-	74	-25.89	14	104	H
			AV			26.09	54	-27.91	-	-	14	104	H
3	1.384	45.36	Pk	28.9	-31.8	42.46	-	-	74	-31.54	210	264	H
			AV			20.44	54	-33.56	-	-	210	264	H
4	1.911	40.38	Pk	31.1	-31.1	40.38	-	-	74	-33.62	203	373	H
			AV			18.36	54	-35.64	-	-	203	373	H
5	2.024	47.8	Pk	31.4	-30.8	48.4	-	-	74	-25.6	341	138	H
			AV			26.38	54	-27.62	-	-	341	138	H
6	2.13	47.7	Pk	31.1	-30.7	48.1	-	-	74	-25.9	344	127	H
			AV			26.08	54	-27.92	-	-	344	127	H
7	2.237	49.28	Pk	31.4	-30.7	49.98	-	-	74	-24.02	333	102	H
			AV			27.96	54	-26.04	-	-	333	102	H
8	2.343	47.94	Pk	31.6	-30.5	49.04	-	-	74	-24.96	231	157	H
			AV			27.02	54	-26.98	-	-	231	157	H
9	2.45	41.97	Pk	32.1	-30.5	43.57	-	-	74	-30.43	355	212	H
			AV			21.55	54	-32.45	-	-	355	212	H
10	2.663	42.89	Pk	32.5	-29.9	45.49	-	-	74	-28.51	199	159	H
			AV			23.47	54	-30.53	-	-	199	159	H
11	1.172	45.97	Pk	27.9	-32.3	41.57	-	-	74	-32.43	335	357	V
			AV			19.55	54	-34.45	-	-	335	357	V
12	1.278	46.32	Pk	29.3	-32	43.62	-	-	74	-30.38	120	400	V
			AV			21.6	54	-32.4	-	-	120	400	V
13	2.024	44.28	Pk	31.4	-30.8	44.88	-	-	74	-29.12	209	207	V
			AV			22.86	54	-31.14	-	-	209	207	V
14	2.13	45.16	Pk	31.1	-30.7	45.56	-	-	74	-28.44	104	134	V
			AV			23.54	54	-30.46	-	-	104	134	V
15	2.237	48.29	Pk	31.4	-30.7	48.99	-	-	74	-25.01	256	387	V
			AV			26.97	54	-27.03	-	-	256	387	V
16	2.343	44.21	Pk	31.6	-30.5	45.31	-	-	74	-28.69	120	163	V
			AV			23.29	54	-30.71	-	-	120	163	V
17	2.769	43.84	Pk	32.3	-30	46.14	-	-	74	-27.86	134	114	V
			AV			24.12	54	-29.88	-	-	134	114	V

Pk - Peak detector

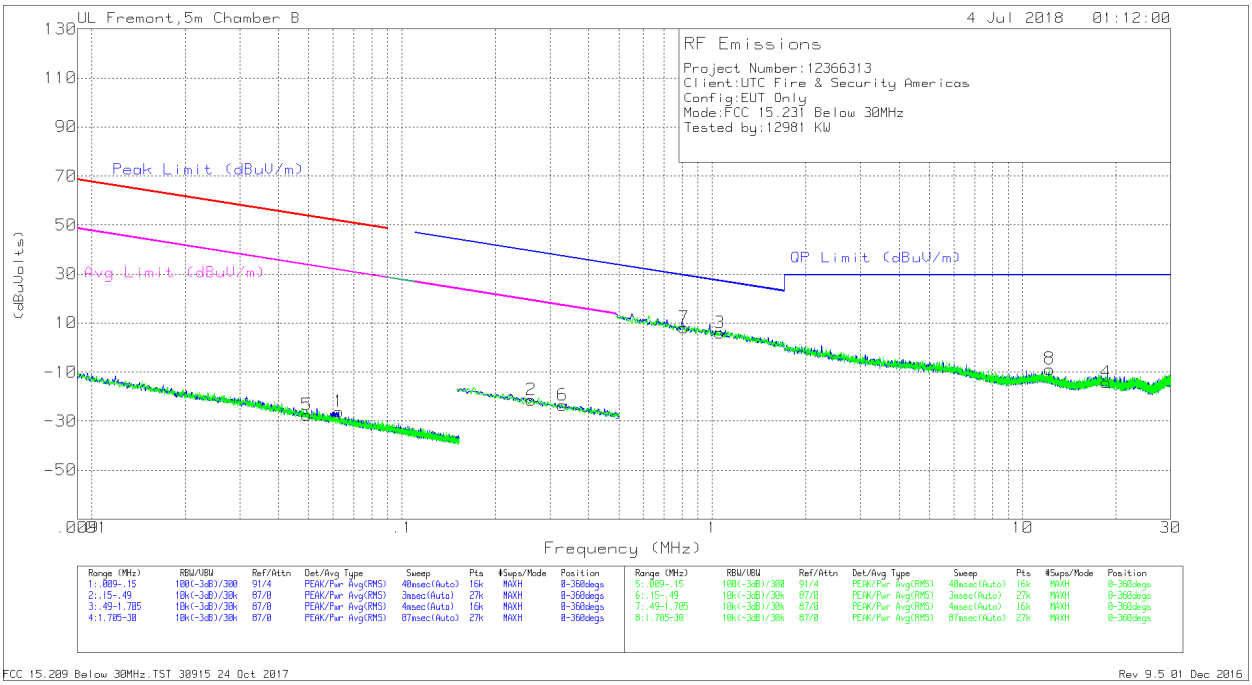
NOTE:

1. Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -22.02dB
   (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T
   Refer to section 7.2 for duty cycle factor calculation (-22.02dB)
2. Radiated peak result is based on 100% duty cycle sample; average reading = peak reading + DCCF

8.3. WORST-CASE BELOW 30MHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

ANTENNA LOOP FACE ON AND FACE OFF



NOTE: KDB 414788 OATS and Chamber Correlation Justification

- Based 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.

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

DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	.04942	36.8	Pk	14.3	1.4	-80	-27.5	53.71	-81.21	33.71	-61.21	0-360
1	.06255	37.9	Pk	14.4	1.4	-80	-26.3	51.66	-77.96	31.66	-57.96	0-360
2	.26116	43.34	Pk	13.8	1.5	-80	-21.36	39.28	-60.64	19.28	-40.64	0-360
6	.32912	41.09	Pk	13.8	1.5	-80	-23.61	37.26	-60.87	17.26	-40.87	0-360

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr (dB) 40Log, 30m	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
7	.81152	32.57	Pk	14	1.5	-40	8.07	29.43	-21.36	0-360
3	1.05848	30.09	Pk	14.3	1.5	-40	5.89	27.13	-21.24	0-360
8	12.19862	14.91	Pk	14.7	1.6	-40	-8.79	29.5	-38.29	0-360
4	18.59666	9.42	Pk	14.7	1.6	-40	-14.28	29.5	-43.78	0-360

Pk - Peak detector