

# Honeywell Home

## FCC / ISED Test Report

For

## Flycatcher Sensor

Report #: 43868-3

FCC ID: HS9-C7189R02

IC ID: 573R-C7189R02

Report Completion Date: 2018-12-06

*Prepared by and for:*

**Ademco Inc.**

**2 Corporate Center Dr.**

**Suite 100 PO Box 9040**

**Melville, NY 11747**



Testing

NVLAP Lab Code: 600110

### **Document Introduction**

Ademco Inc. tested the above equipment in accordance with the requirements set forth in the listed standards. All indications of Pass/Fail in the report are opinions expressed by Ademco 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.

This document is a record of the FCC/ISED Test Report for Ademco Inc. products. It demonstrates the data required to be analyzed to certify a product according to the requirements of the FCC & ISED.

The results in the report reflect only the model of the items under test unless noted otherwise. This document may not be altered or revised in any way unless done so by Ademco Inc. and all revisions are duly noted in the revisions section. Any alterations of this document not carried out by Ademco 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 any government.

Ademco Inc. is the legal entity name for Honeywell Home / Resideo. All three names can be used synonymously within this test report.

<b>Test Report Revision History</b>				
<b>Revision</b>	<b>Prepared By</b>	<b>Reviewed By</b>	<b>Revision Detail</b>	<b>Release Date</b>
---	<b>M. Antola</b>	<b>A. Roussin</b>	<b>Original Release</b>	<b>2018-11-30</b>
<b>A</b>	<b>M. Antola</b>	-	<b>Updated equipment list reference; description to output power test section</b>	<b>2018-12-06</b>

**Report Authorization**

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### Applicable Test Standards/Limits

Test Standards/Limits	Result	Dates Tested
ANSI C63.10: 2013	Compliant	11/15/18 – 11/30/18
RSS-247, Issue 2, Section 5	Compliant	11/15/18 – 11/30/18
RSS-GEN, Issue 4	Compliant	11/15/18 – 11/30/18
CFR 47 Pt 15 Subpart C, Section 15.207/209	Compliant	11/15/18 – 11/30/18
CFR 47 Pt 15 Subpart C, Section 15.247	Compliant	11/15/18 – 11/30/18

### Deviations from Test Methods

#	Deviation Description
0	None

### Facilities and Accreditation

The test site and measurement facility used to collect data are located at 2 Corporate Center Dr., Melville, NY 11747, USA. Ademco Inc. is accredited by NVLAP, Laboratory Code 600110-0. The full scope of accreditation can be viewed at the NVLAP website.

### Test Item Description

The C7189R2002 is a battery powered sensor intended for residential and light commercial applications. This product employs a single sub-gigahertz radio utilizing a proprietary protocol referred to as Redlink 3.0. This radio operates in the 900MHz ISM band.

Redlink 3.0 is enabled using a CC1312 radio manufacturer by Texas Instruments. This component consists of a sub-1 GHz radio and a microcontroller.

Power to the CC1312 module starts with 2 AA batteries which is regulated to 3.3VDC.

Redlink 3.0 implementation in this product consist of 1 antenna that exists as copper on the PCB layout and has a gain of -1.70dBi.

### Worse-Case Configuration & Mode

Radiated emissions was performed with the EUT set to transmit at the low/mid/high channels with the highest output power as worst-case scenario. The EUT was tested in all three orthogonal planes in order to determine the worst-case emissions. It was determined that the Z axis orientation (laying flat) was the worst-case orientation. Therefore, all final radiated test was performed with the EUT in the Z axis orientation. See setup photos for details.

### Test Sample Identification

Sample ID Number	Sample Serial Number	Date Received
MEL-636	Non-serialized production unit	2018-11-15
MEL-638	Non-serialized production unit	2018-11-15

## Calibration & Measurement Uncertainty

- Measuring Instrument Calibration – The measuring equipment utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer’s recommendations and is traceable to recognized national standards.
- Sample Calculation – Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

[i.e.]  $37 \text{ dBuV/m} = 30 \text{ dBuV} + 18.5 \text{ dB/m} + 0.5 \text{ dB} - 12 \text{ dB}$

- Uncertainty - Figures are valid to a confidence level of 95%.

Test	Standard Uncertainty
Radiated Emissions (30-200MHz Horizontal)	+/- 5.05 dB
Radiated Emissions (30-200MHz Vertical)	+/- 5.28 dB
Radiated Emissions (200-1000MHz Horizontal)	+/- 10.21 dB
Radiated Emissions (200-1000MHz Vertical)	+/- 10.36 dB
Radiated Emissions (Above 1GHz)	+/- 9.70 dB
Conducted Emissions (150KHz-30MHz)	+/- 4.36 dB

## Opinions / Interpretations

None

### Test Summary

All tests described below are required, unless otherwise noted. Notes should be described in detail in the "Additional notes" section.

#	Test Description	Status
1	20 dB Emission Bandwidth	PASS
2	99% Occupied Bandwidth	PASS
3	Maximum Conducted Output Power	PASS
4	Number of Hopping Frequencies	PASS
5	Channel Separation	PASS
6	Dwell Time	PASS
7	Out-of-Band Emissions	PASS
8	Radiated Emissions (Intentional)	PASS
9	Conducted Emissions (Mains)	PASS



## Test & Measurement Equipment

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

### Equipment List

Instrument Type	ID #	Serial #	Manufacturer	Model	Cal Date	Cal Due Date
RF Lab (RF Conducted & Power Tests)						
Spectrum Analyzer	11531	MY41000078	Agilent	E4440A	06/06/17	06/06/19
Power Sensor	11568	105317	Rohde & Schwarz	NRP-Z81	10/02/18	10/02/19
Attenuator	-	1624	Pasternack	PE7087-6	*	*
RF Chamber						
Spectrum Analyzer	11496	100303	Rohde & Schwarz	FSU26	04/11/18	04/11/19
Loop Antenna (9kHz-30MHz)	11535	121080	Com-Power	AL-130R	10/29/18	10/29/19
Bilog Antenna (30MHz-5GHz)	11311	A022406	Sunol	JB5	02/01/18	02/01/19
Horn Antenna (1-18GHz)	2319	2317	EMCO	3115	01/10/18	01/10/19
Horn Antenna (18-40GHz)	11472	151	EMCO	EM-6963	02/14/18	02/14/19
Preamp (10-4200MHz)	11537	1603006	Mini Circuits	TVA-11-422	*	*
Preamp (500MHz-18GHz)	11557	18040034	Com-Power	PAM-118A	*	*
Preamp (18-40GHz)	11541	160911	Amplical	AMP18G40-35	*	*
Band Reject Filter	11553	G041	Micro-tronics	BRM50702-01	*	*
RF Cable	-	-	Mini-Circuits	RDE#2	*	*
RF Cable	-	-	Insulated Wire	SMA#8	*	*
OATS						
Spectrum Analyzer	11545	103125	Rohde & Schwarz	FSW26	02/21/18	02/21/19
Bilog Antenna (30MHz-6GHz)	11534	A012816	Sunol	JB6	03/27/18	03/27/19
Horn Antenna (1-18GHz)	2973	3127	EMCO	RGA-60	01/22/18	01/22/19
Horn Antenna (18-40GHz)	11472	151	EMCO	EM-6963	02/14/18	02/14/19
Preamp (100kHz-1.3GHz)	11540	2443AUF555	HP	8447D	*	*
Preamp (1-18GHz)	11539	160362	Amplical	AMP1G18-35	*	*
Preamp	11541	160911	Amplical	AMP18G40-35	*	*

(18-40GHz)						
High Pass Filter	11552	G018	Micro-tronics	HPM50111-01	*	*
RF Cable	-	-	Pasternack	RDE#1	*	*
RF Cable	-	-	MegaPhase	EMC2-S1S1-360	*	*
Shield Room						
EMI Receiver	11566	102484	Rohde & Schwarz	ESR3	09/19/18	09/19/19
LISN	11527	241259	Com-Power	LIN-120A	01/10/18	01/10/19
Misc.						
Measurement Software	11543	Version 9.5	UL	UL EMC	N/A	N/A
Environmental Meter	11533	A070144	Extech Instruments	SD700	08/21/17	08/21/20

\*-Passive devices & Preamps are characterized in-house, not calibrated.

## On Time and Duty Cycle

### Test Description

Refer to KDB 558074 Zero-Span Analyzer Method.

### Test Criteria

Reference	Limit
KDB 558074, Section 6	None, for reporting only

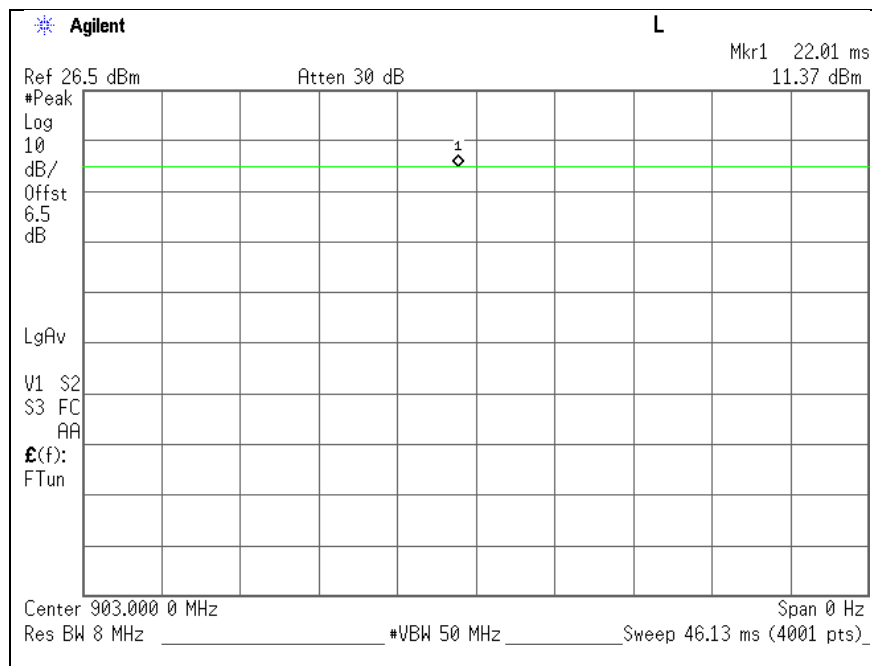
### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
MA	RF Lab	12/03/18	22.6	37.2	1014	P

### Test Results

EUT Mode	ON Time (ms)	Period (ms)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/ON Time Minimum VBW (kHz)
RedLINK	22.01	22.01	1.0	100%	0.00	0.01

### Duty Cycle Plot



## 20dB Emission Bandwidth

### Test Description

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

### Test Limit

Reference	Limit
CFR 47 Subpart C 15.247 (a)(1)(i)	< 0.25% of the Center Frequency

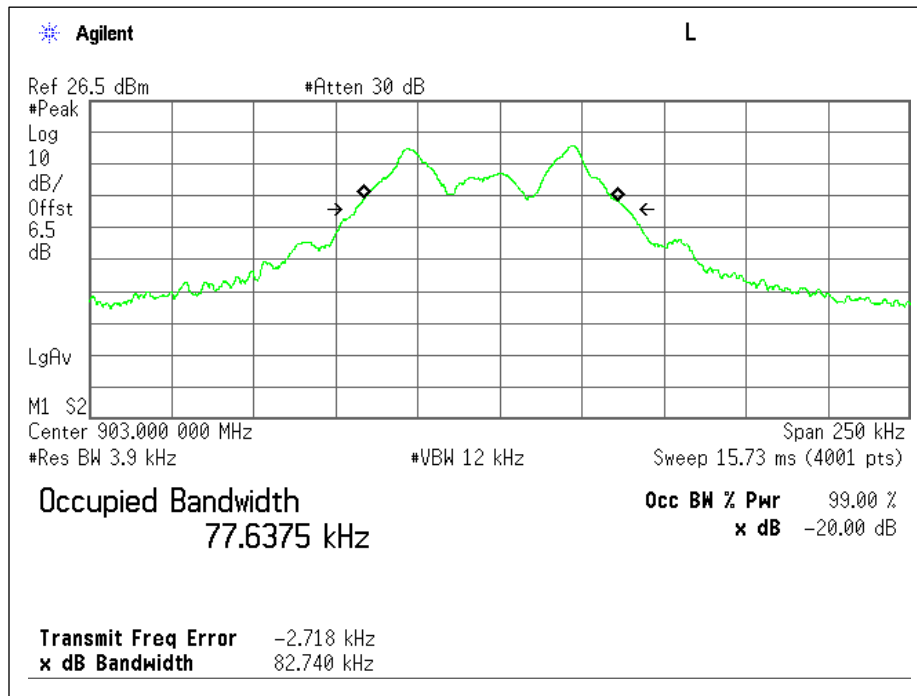
### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

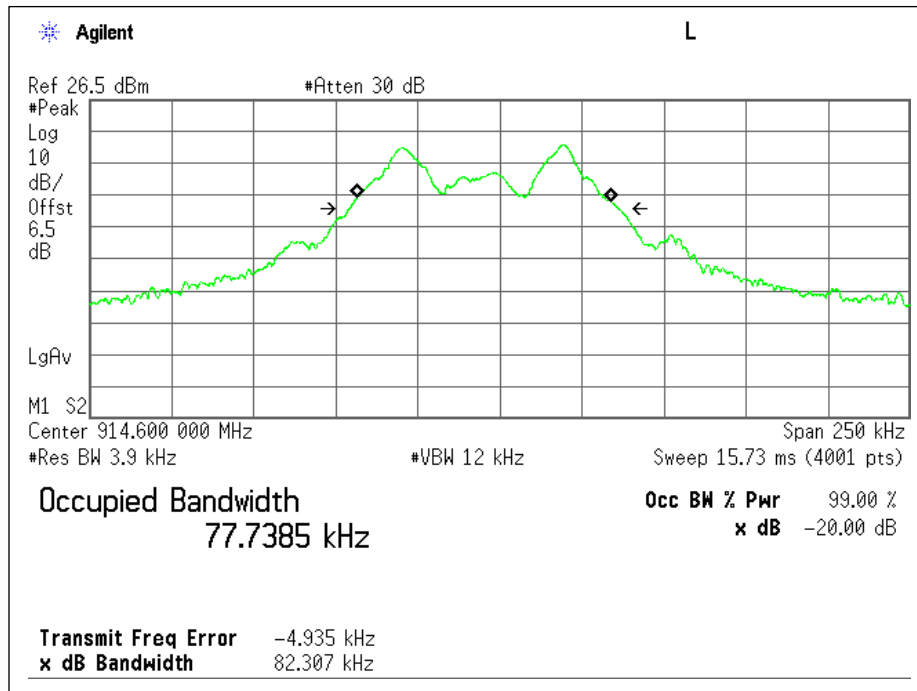
### Test Results

Channel	Frequency (MHz)	20dB Bandwidth (in kHz)
Low	903	82.740
Mid	914.6	82.307
High	926.4	83.344

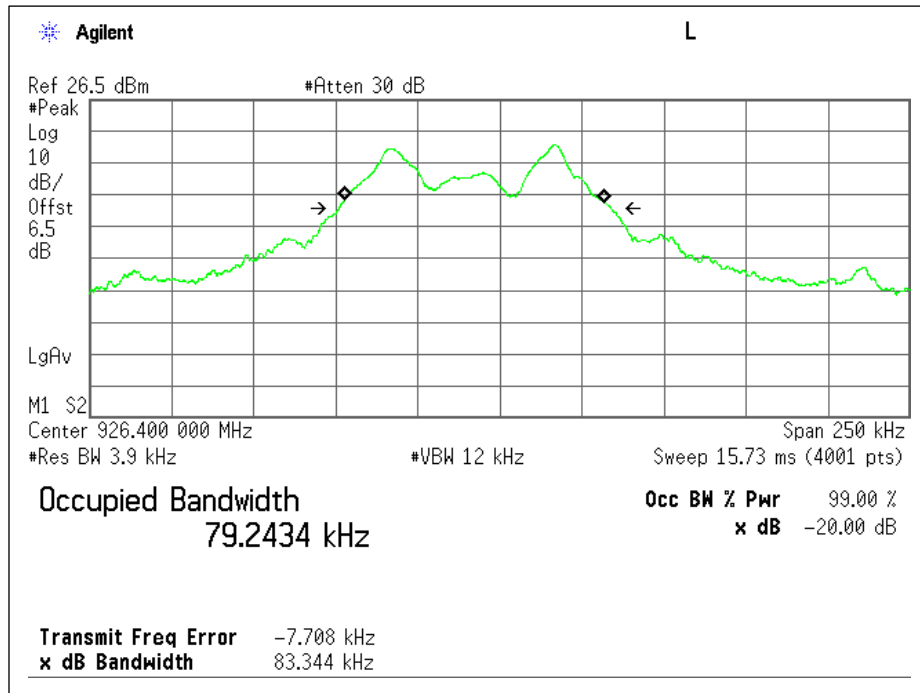
20dB Bandwidth



Low Channel - Plot



Mid Channel - Plot



High Channel - Plot

## 99% Occupied Bandwidth

### Test Description

The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

### Test Criteria

Reference	Limit
RSS-GEN, Section 6.6	N/A

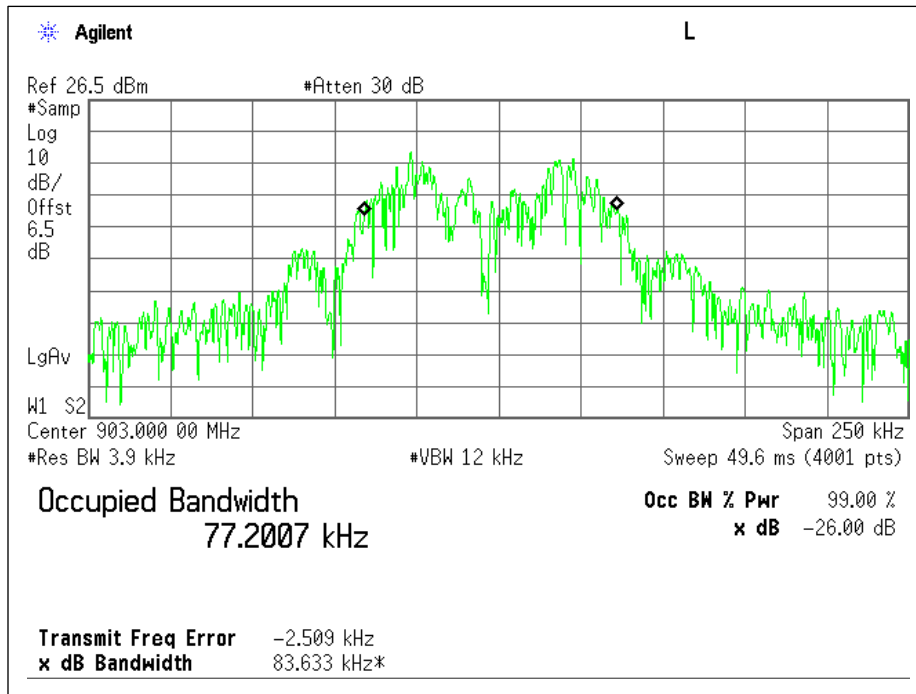
### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

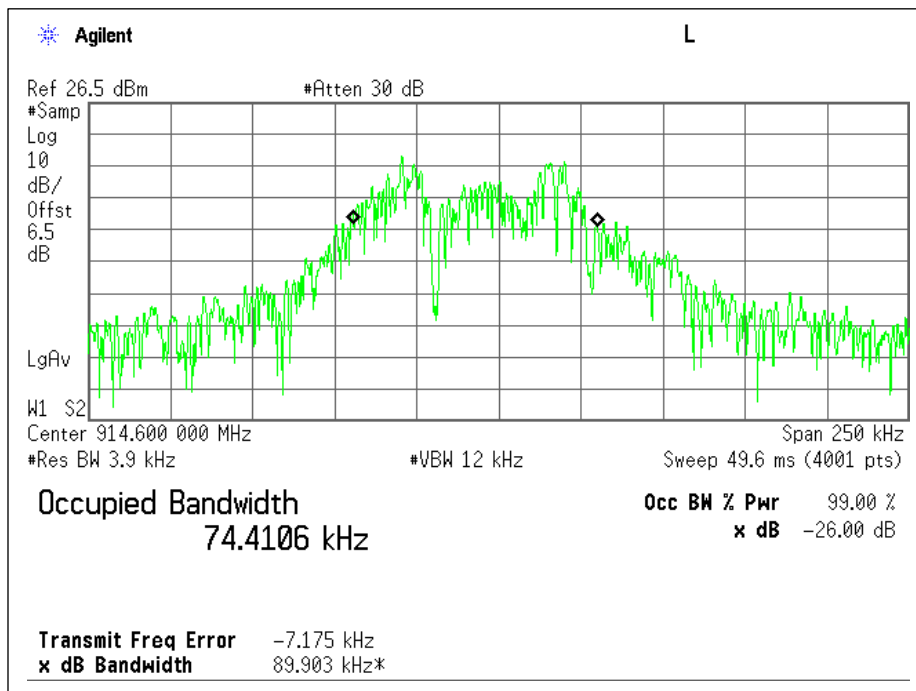
### Test Results

Channel	Frequency (MHz)	99% Bandwidth (in kHz)
Low	903	77.2007
Mid	914.6	74.4106
High	926.4	79.3555

**99% Occupied Bandwidth**

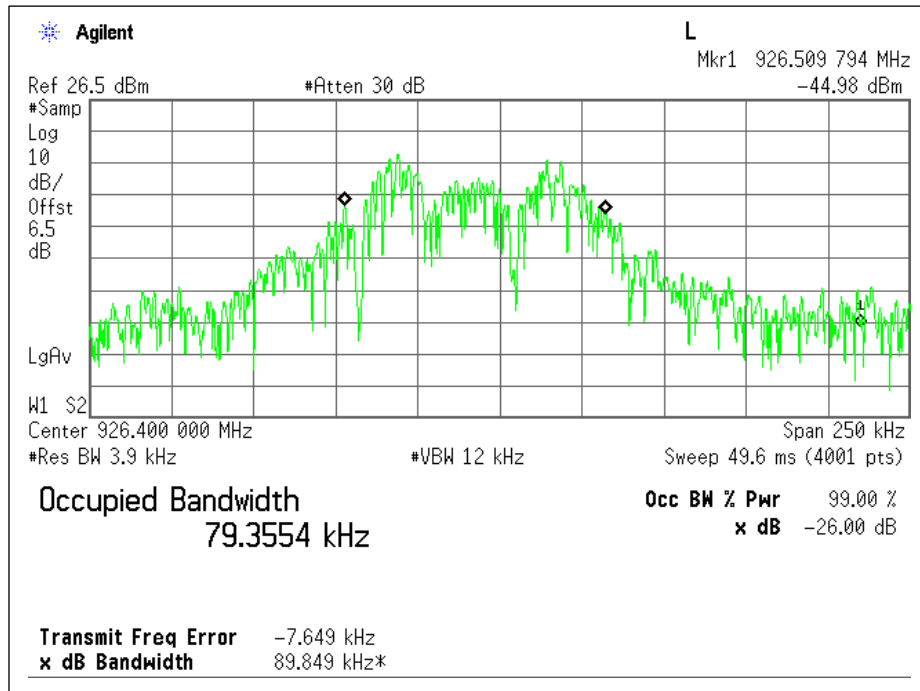


Low Channel - Plot



Mid Channel - Plot





High Channel - Plot

## Maximum Conducted Output Power

### Test Description

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels.

Maximum peak conducted output power was the method employed to determine fundamental emission output power. As allowed per Section 7.8.5 of C63.10, a peak power sensor was utilized for the measurements contained in this section.

### Test Criteria

Reference	Limit
CFR 47 Subpart C 15.247 (b)(2) RSS-247 Section 5.4 (a)	1W (30dBm)

### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

### Test Results

Channel	Frequency (MHz)	Tx Channel Power (dBm)
Low	903	11.99
Mid	914.6	11.86
High	926.4	11.71

## Number of Hopping Frequencies

### Test Description

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### Test Criteria

Reference	Limit
CFR 47 Subpart C 15.247 (a)(1) RSS-247 Section 5.1 (c)	≥ 50 Hopping Frequencies

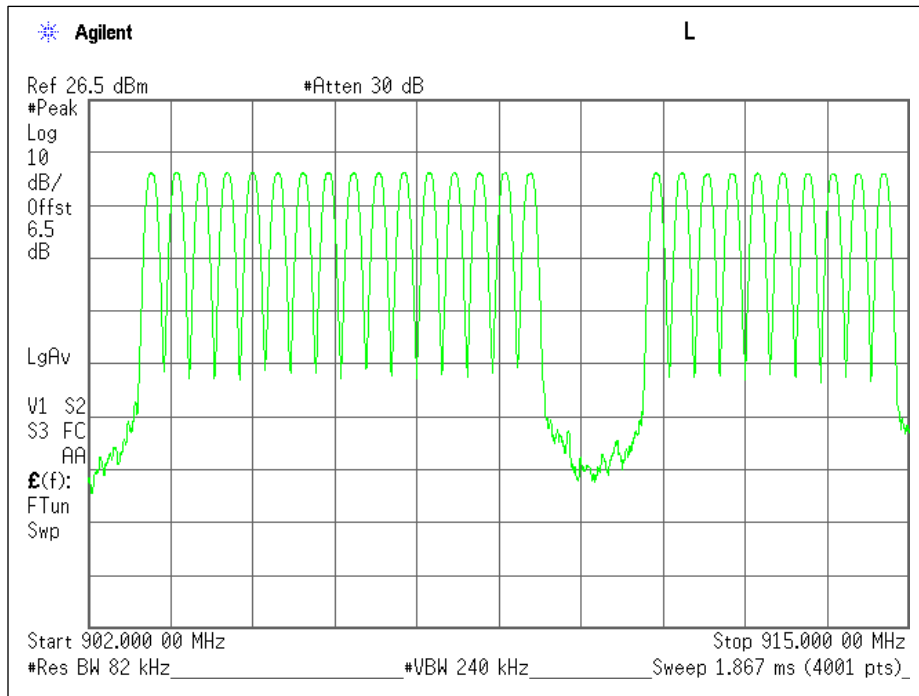
### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

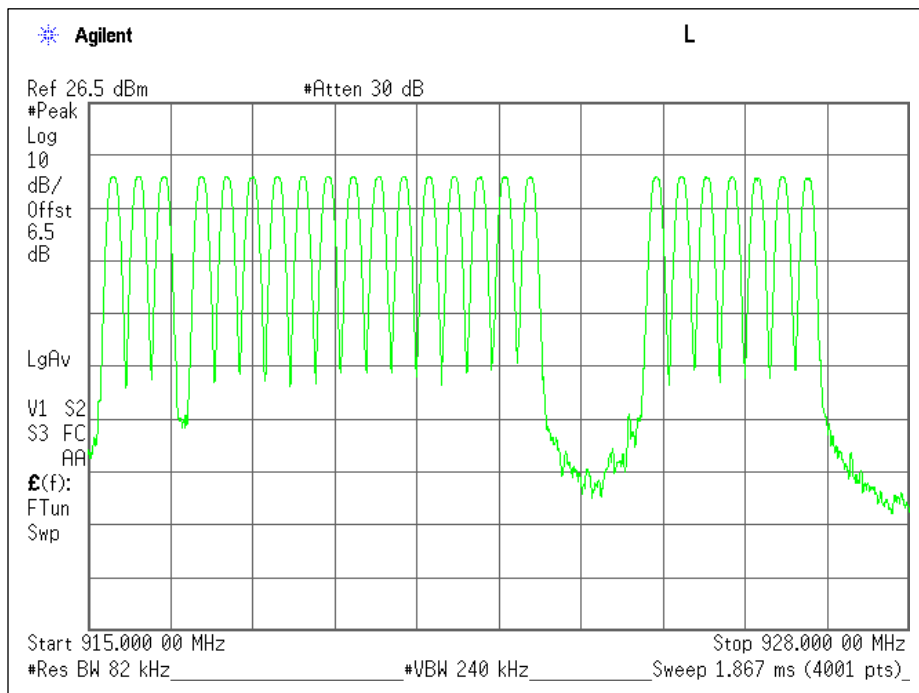
### Test Results

Number of Channels
50

Number of Hopping Frequencies



Number of Channels - Plot 1



Number of Channels - Plot 2

## Channel Separation

### Test Description

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

### Test Criteria

Reference	Limit
CFR 47 Subpart C 15.247 (a)(1) RSS-247 Section 5.1 (b)	25kHz or the 20dB Bandwidth, whichever is greater

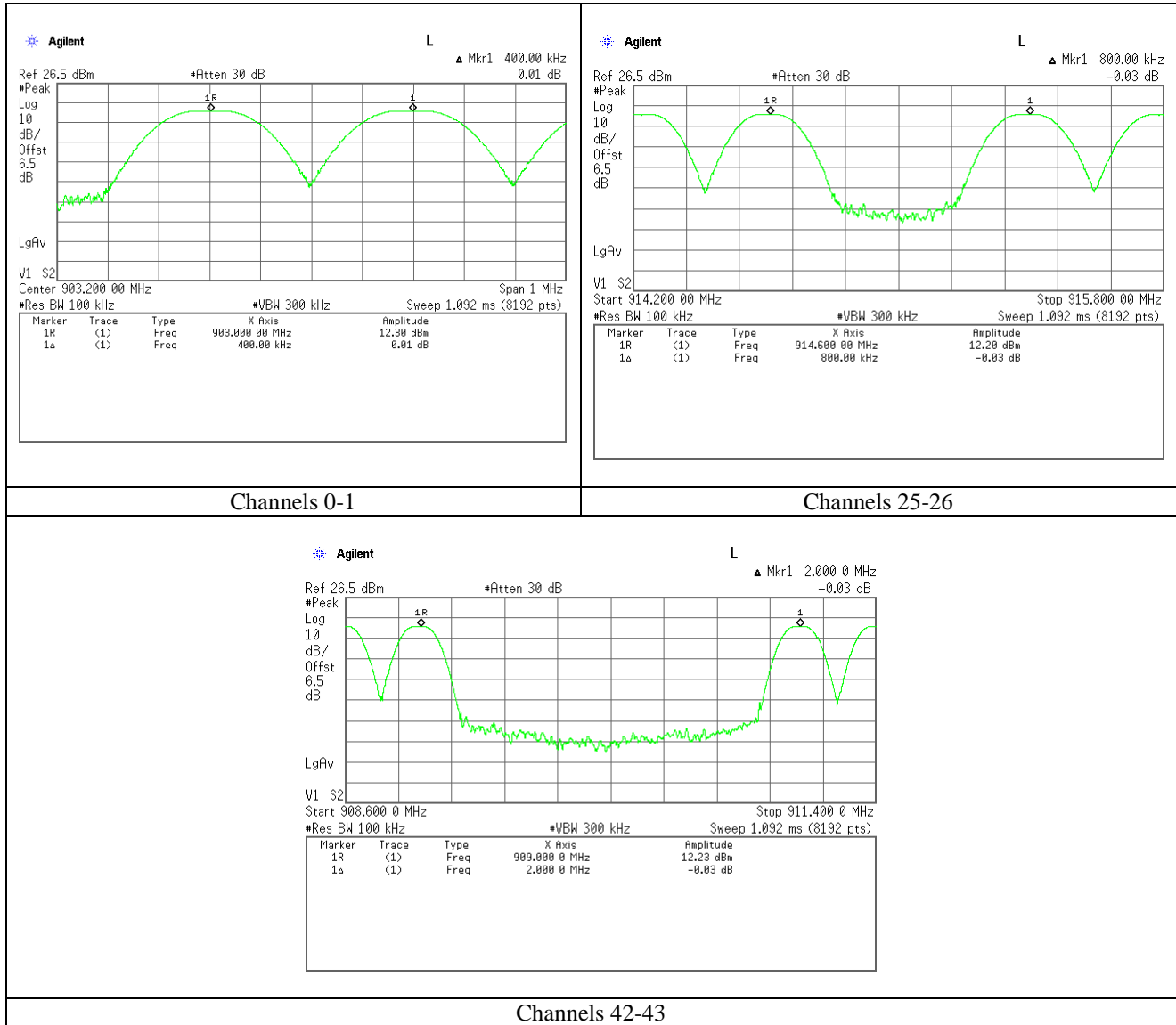
### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

### Test Results

Channel Separation
400kHz
800kHz
2MHz

**Channel Separation**



## Dwell Time

### Test Description

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### Test Criteria

Reference	Limit
CFR 47 Subpart C 15.247 (a)(1) RSS-247 Section 5.1 (c/d)	< 0.4s in a 20 Second Period

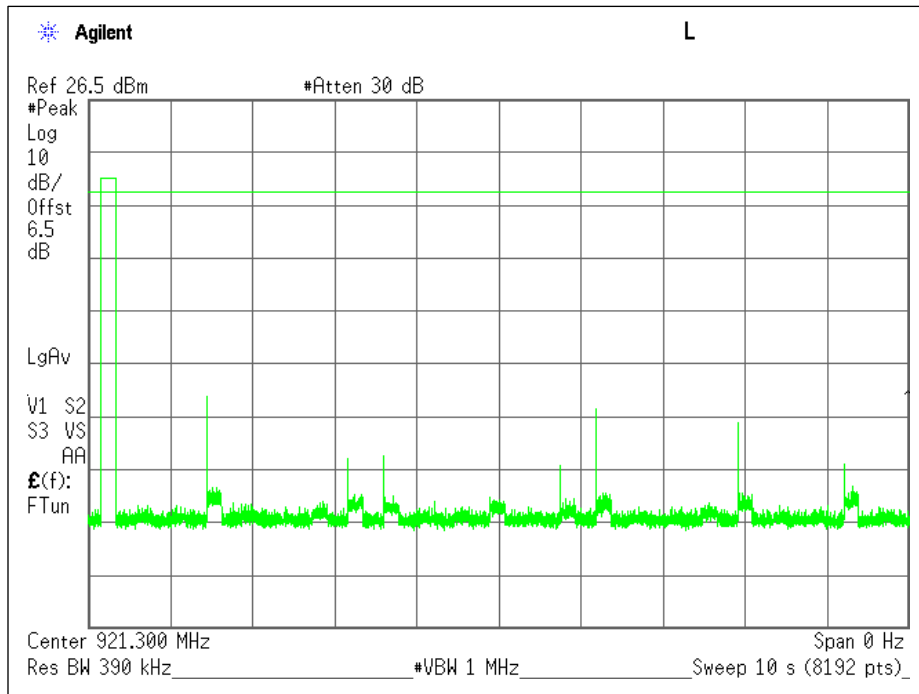
### Test Information

Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

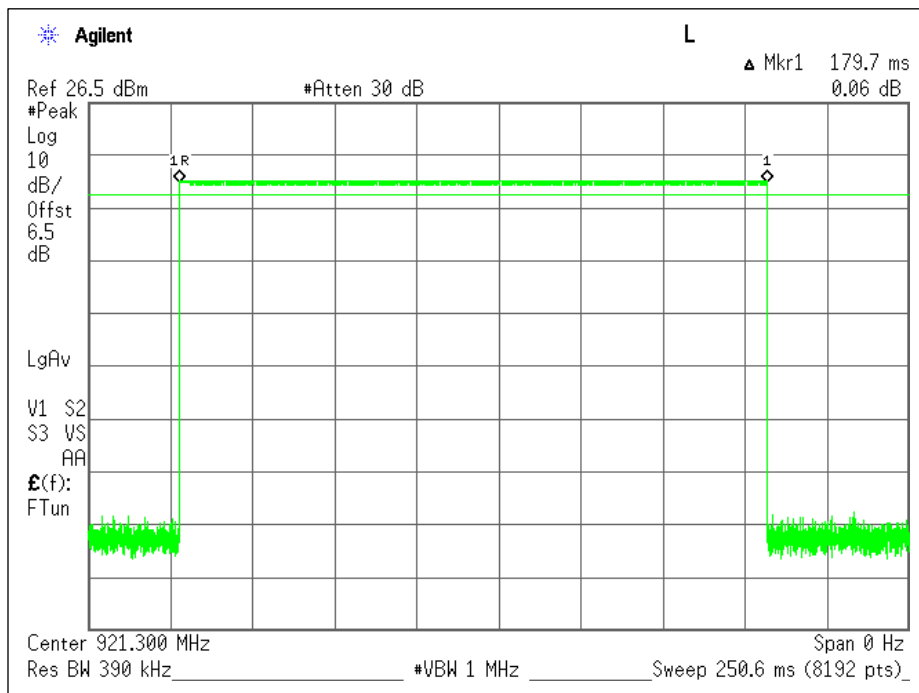
### Test Results

Number of transmission in 20 seconds	Length of transmission time (msec)	Results (msec)	Limit (msec)	Margin (msec)
1 (time) * 2 = 2 times	179.7	2 * 179.7 = 359.4	400	-40.6

Dwell Time



Number of Transmissions



Dwell Time per Channel



## Out-of-Band Emissions

### Test Description

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

### Test Criteria

Reference	Limit
CFR 47 Subpart C 15.247 (d) RSS-247, Section 5.5	20dB Below the Fundamental

### Test Information

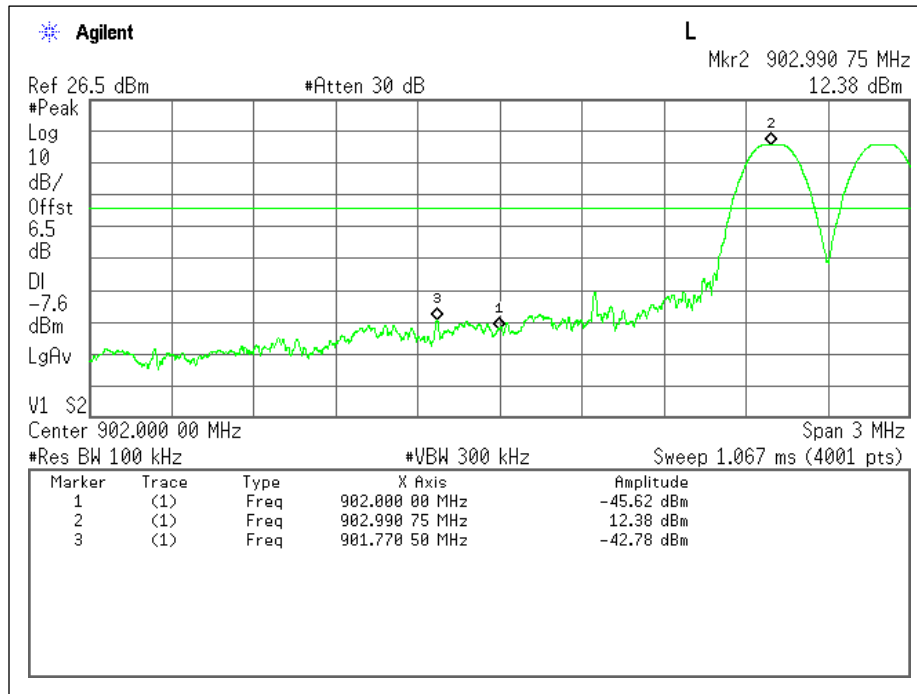
Tester	Test Location	Date	Temperature (°C)	Humidity (%RH)	Pressure (mbar)	Results (P/F)
CL	RF Lab	11/26/18	23	20.8	992	P

### Test Results

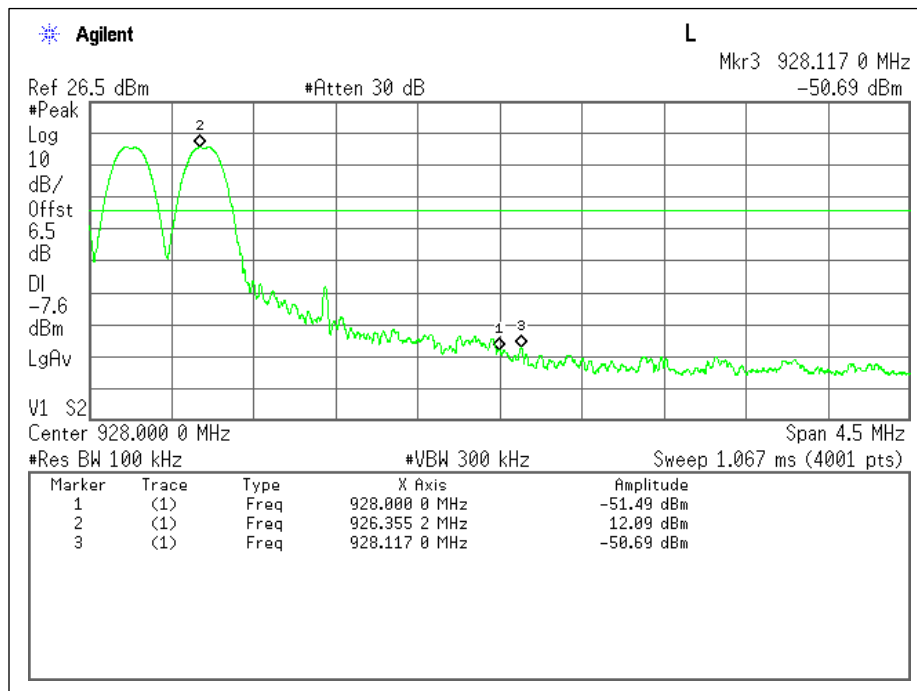
Authorized Band Edge					
Mode	Channel	Frequency (MHz)	Delta from Peak to Bandedge (dB)	Limit (dB)	Margin (dB)
Hopping Enabled	Low	903	58	20	-38
	High	926.4	63.58	20	-43.58
Hopping Disabled	Low	903	54.01	20	-34.01
	High	926.4	60.15	20	-40.15

Conducted Spurious		
Channel	Frequency (MHz)	Highest Spurious Emission Delta from the -20dB down Limit (dB)
Low	903	-24.33
Mid	914.6	-24.94
High	926.4	-25.80

**Band Edge – Hopping Enabled**

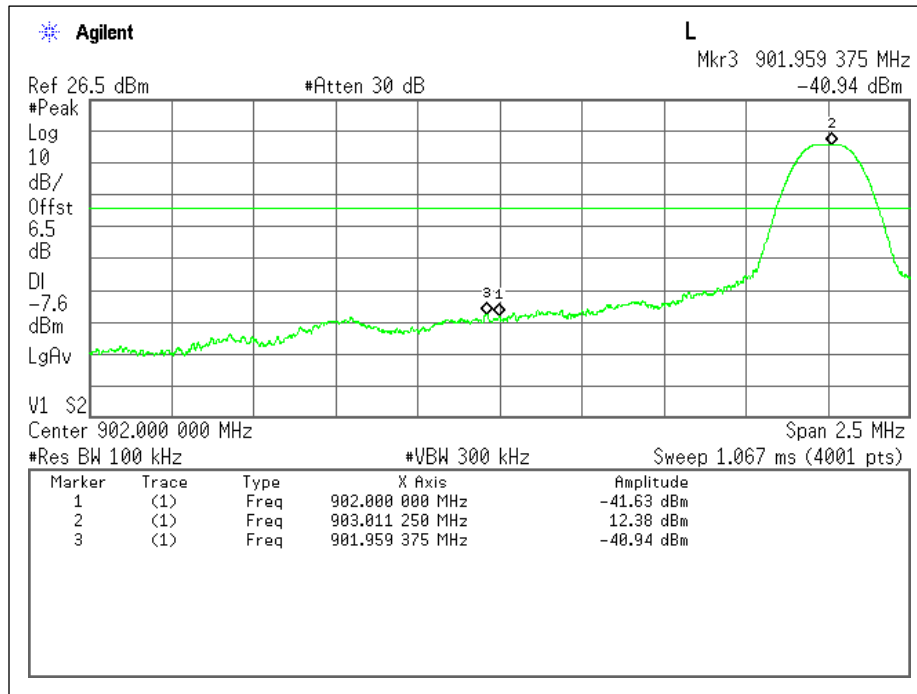


Low Channel - Plot

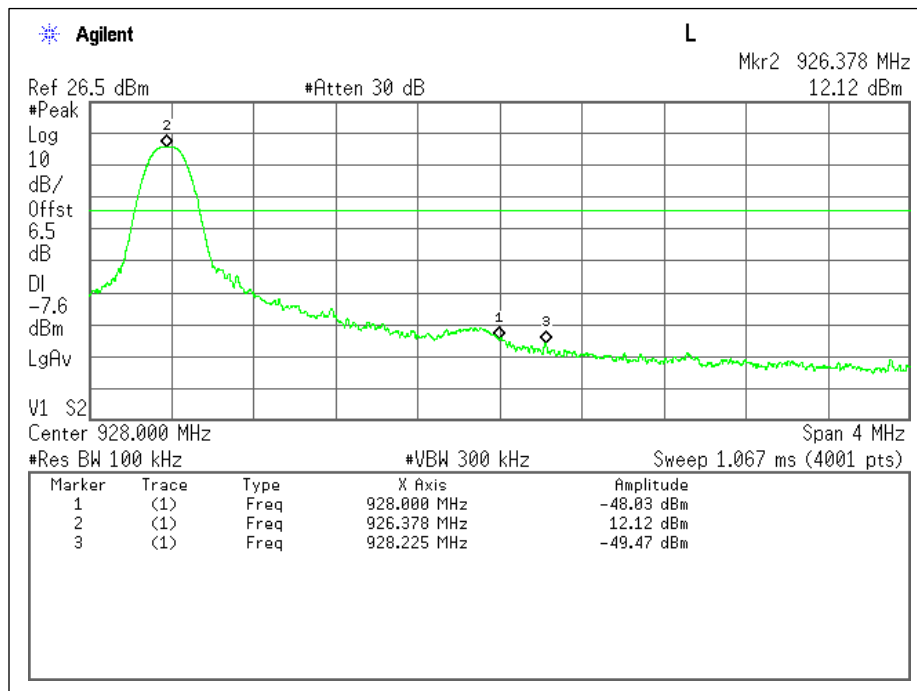


High Channel – Plot

**Band Edge – Hopping Disabled**

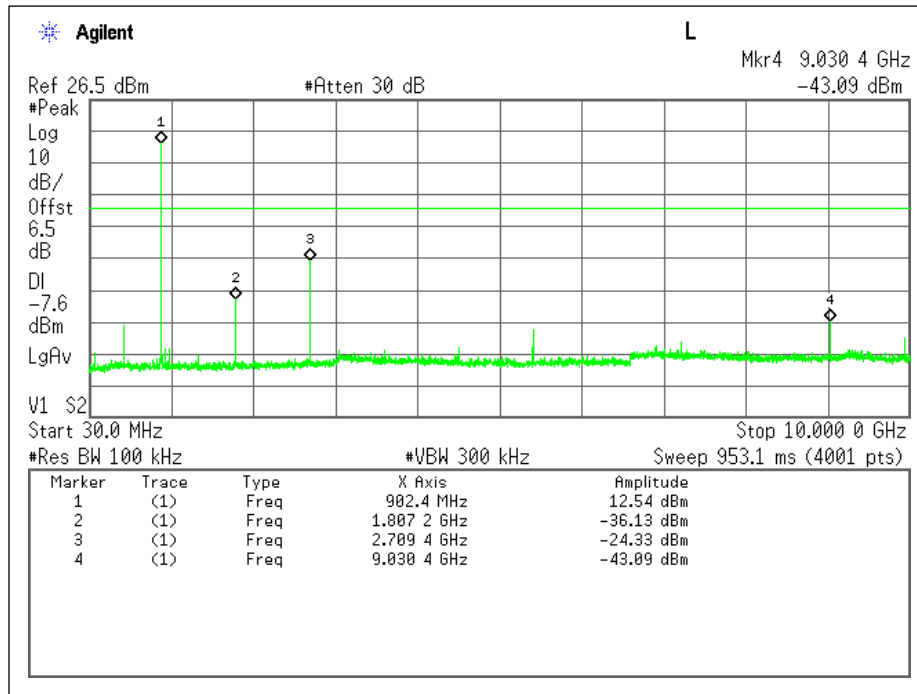


Low Channel - Plot

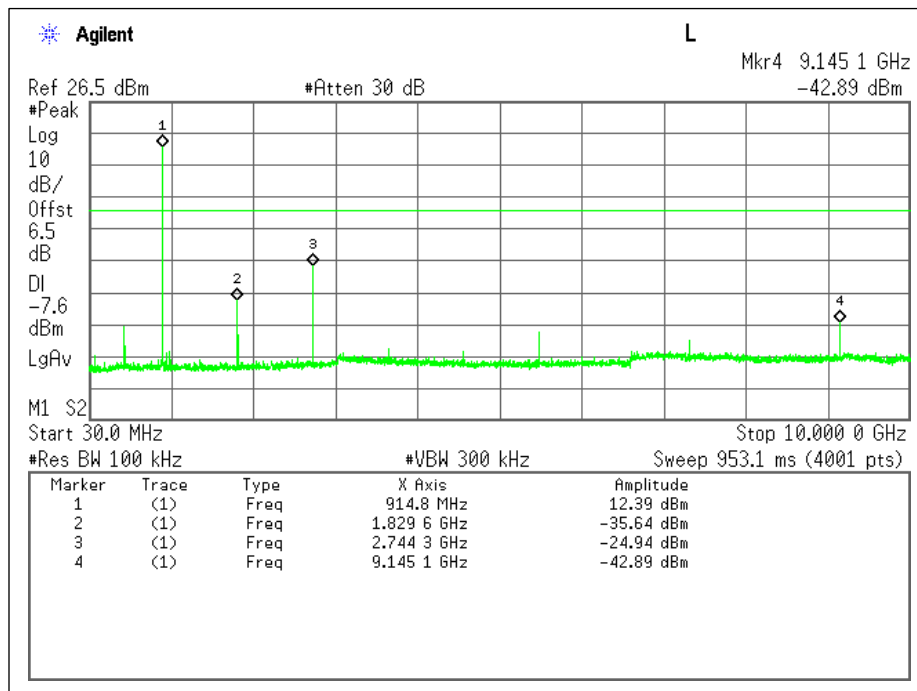


High Channel – Plot

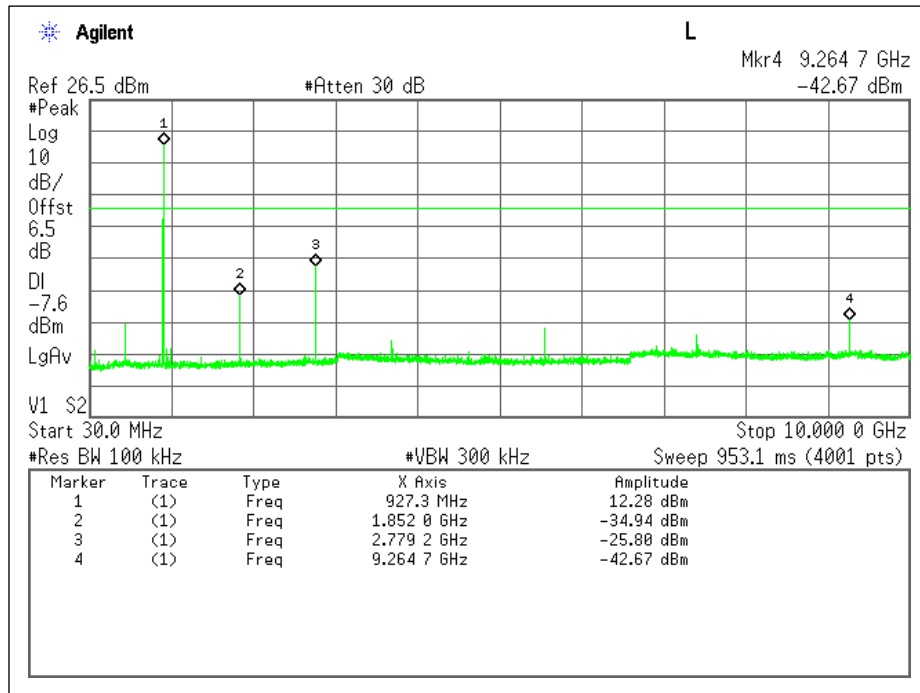
**Conducted Spurious**



Low Channel - Plot



Mid Channel - Plot



High Channel - Plot

## **Radiated Emissions (Intentional)**

### **Test Description**

Intentional Radiator Radiated Emissions are a test of the emissions, and harmonics on the EUT. The EUT is positioned to get the maximum emissions after a series of prescan measurements. The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1 GHz measurements and 1.5 m above the ground plane for above 1 GHz measurements. The antenna to EUT distance is 3 meters. For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements. The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. 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.

### **Test Criteria**

<b>Reference</b>	<b>Limit</b>		
	<b>Frequency Range (MHz)</b>	<b>Field Strength Limit (uV/m)</b>	<b>Measurement distance (meters)</b>
CFR 47 Subpart C, 15.205 CFR 47 Subpart C, 15.209 RSS-GEN	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., §§15.231 and 15.241.

### **Test Information**

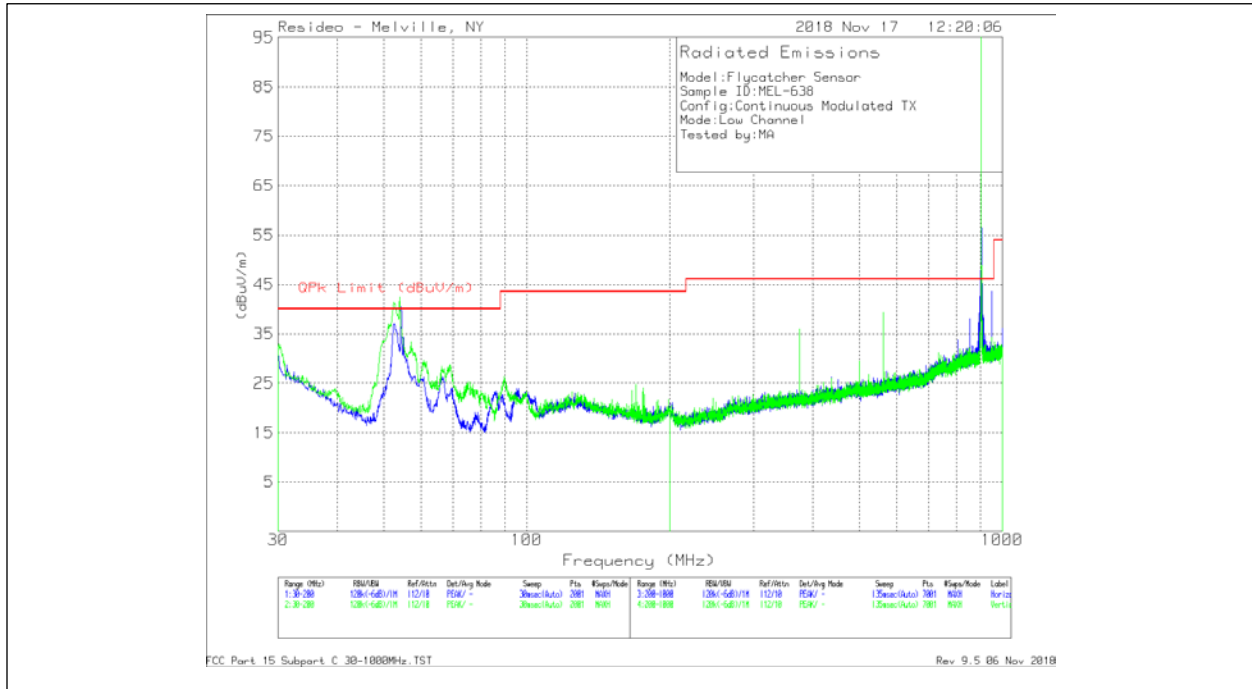
<b>Tester</b>	<b>Test Location</b>	<b>Date</b>	<b>Temperature (°C)</b>	<b>Humidity (%RH)</b>	<b>Pressure (mbar)</b>	<b>Results (P/F)</b>
MA/JB/CL	RF Chamber / OATS	11/17/18- 11/30/18	6.7	43.0	1011	P

Note: Below 30MHz, pretesting showed that no emissions as a product of the EUT were detected within 20dB of the regulatory limit. Prescans performed in an RF chamber, final measurements performed on an OATS.

**Test Results**

**Spurious Emissions**

**Below 1GHz**



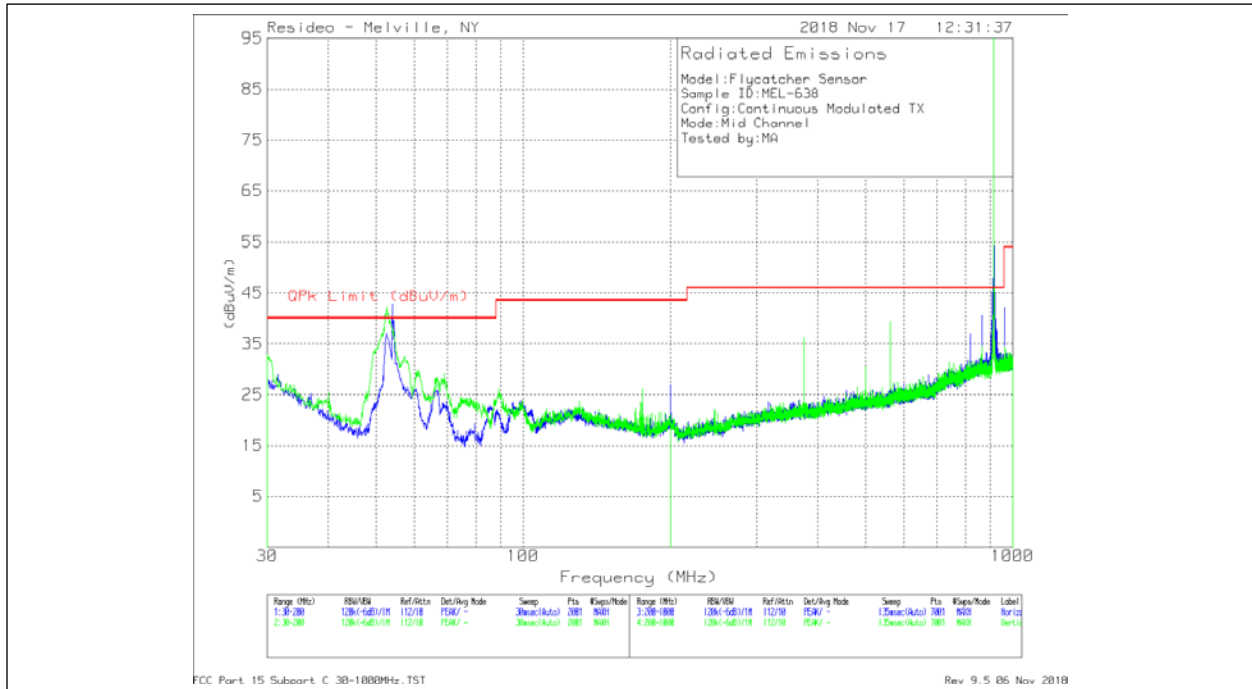
Low Channel - Plot

Frequency (MHz)	Meter Reading (dBuV)	Det	AF_JB6 [dB/m]	Cable 1 [dB]	Corrected Reading (dBuV/m)	Fundamental-20dBc Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
53.6729	10.35	Pk	12.1	1.1	23.55	90.38	-66.83	53	386	H
52.8368	21.16	Pk	12.2	1.1	34.46	90.38	-55.92	281	358	V
53.8315	18.18	Pk	12.1	1.1	31.38	90.38	-59	242	264	V
951.003	9.84	Pk	27.7	9.2	46.74	90.38	-43.64	74	102	H
562.8062	3.79	Pk	23	5.9	32.69	90.38	-57.69	4	322	V
374.9892	8.08	Pk	19.1	3.8	30.98	90.38	-59.4	72	255	V
*903.0277	74.98	Pk	27.1	8.3	110.38	-	-	291	101	H
*902.978	65.43	Pk	27.1	8.3	100.83	-	-	188	103	V

Pk - Peak detector

\*-Fundamental frequency

Low Channel - Data



Mid Channel - Plot

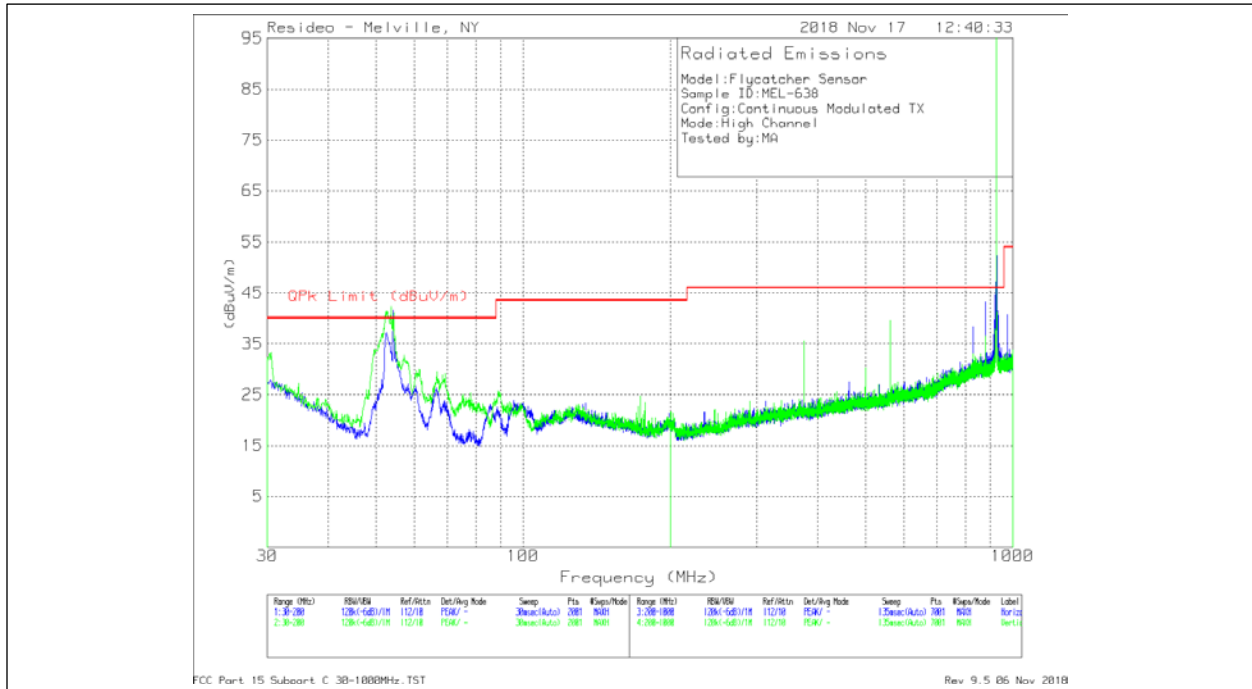
Frequency (MHz)	Meter Reading (dBuV)	Det	AF_JB6 [dB/m]	Cable 1 [dB]	Corrected Reading (dBuV/m)	Fundamental -20dBc Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
54.3117	18.13	Pk	12.1	1.1	31.33	91.45	-60.12	293	385	H
52.6834	9.22	Pk	12.2	1.1	22.52	91.45	-68.93	340	390	H
53.0317	19.98	Pk	12.1	1.1	33.18	91.45	-58.27	12	196	V
868.666	8.64	Pk	26.4	8.8	43.84	91.45	-47.61	255	374	H
562.4855	3.9	Pk	23	5.8	32.7	91.45	-58.75	236	295	V
375.0108	6.29	Pk	19.1	3.8	29.19	91.45	-62.26	356	203	V
*914.6259	75.75	Pk	27.4	8.3	111.45	-	-	290	101	H
*914.6258	63.89	Pk	27.4	8.3	99.59	-	-	28	247	V

Pk - Peak detector

\*-Fundamental frequency

Mid Channel - Data





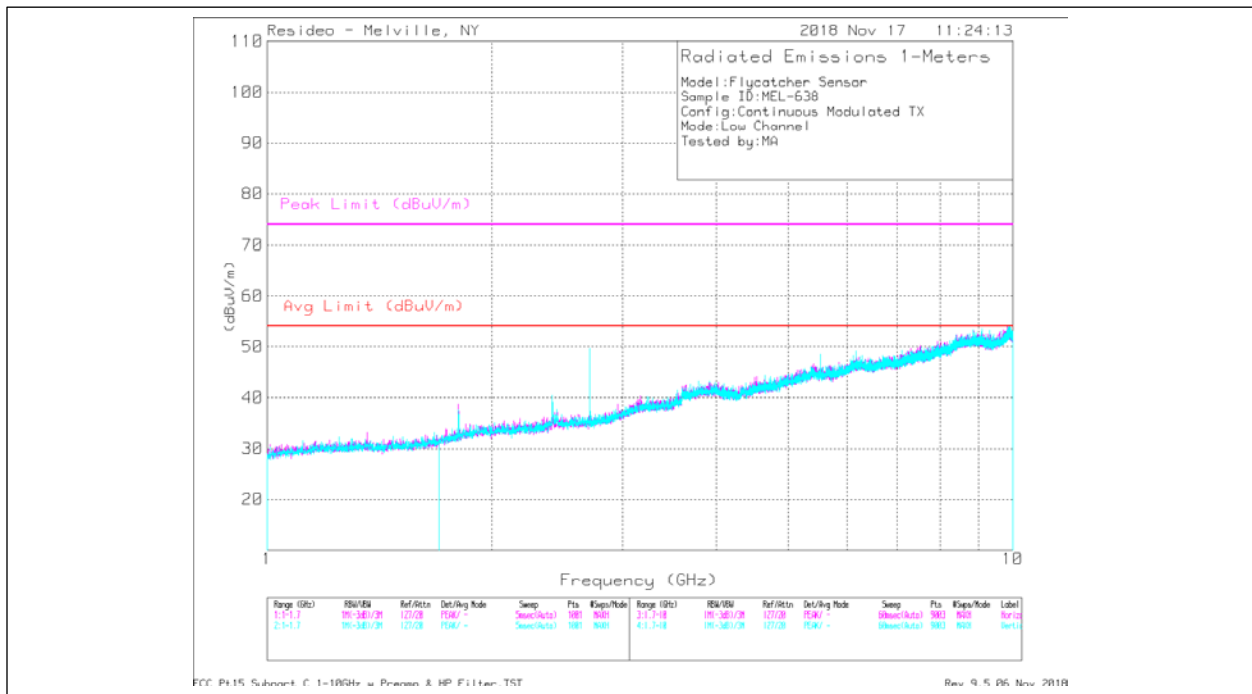
High Channel - Plot

Frequency (MHz)	Meter Reading (dBUV)	Det	AF_JB6 [dB/m]	Cable 1 [dB]	Corrected Reading (dBUV/m)	QPk Limit (dBUV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
54.3232	8.25	Qp	12.1	1.1	21.45	40	-18.55	208	107	H
51.9163	8.31	Qp	12.2	1.1	21.61	40	-18.39	198	353	H
53.4869	8.19	Qp	12.1	1.1	21.39	40	-18.61	207	133	V
878.2431	4.24	Qp	26.4	9	39.64	46.02	-6.38	203	157	H
562.194	4.47	Qp	23	5.8	33.27	46.02	-12.75	239	233	V
375.3769	4.36	Qp	19.1	3.8	27.26	46.02	-18.76	43	212	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Qp - Quasi-Peak detector

High Channel - Data

**Above 1GHz**



Low Channel - Plot

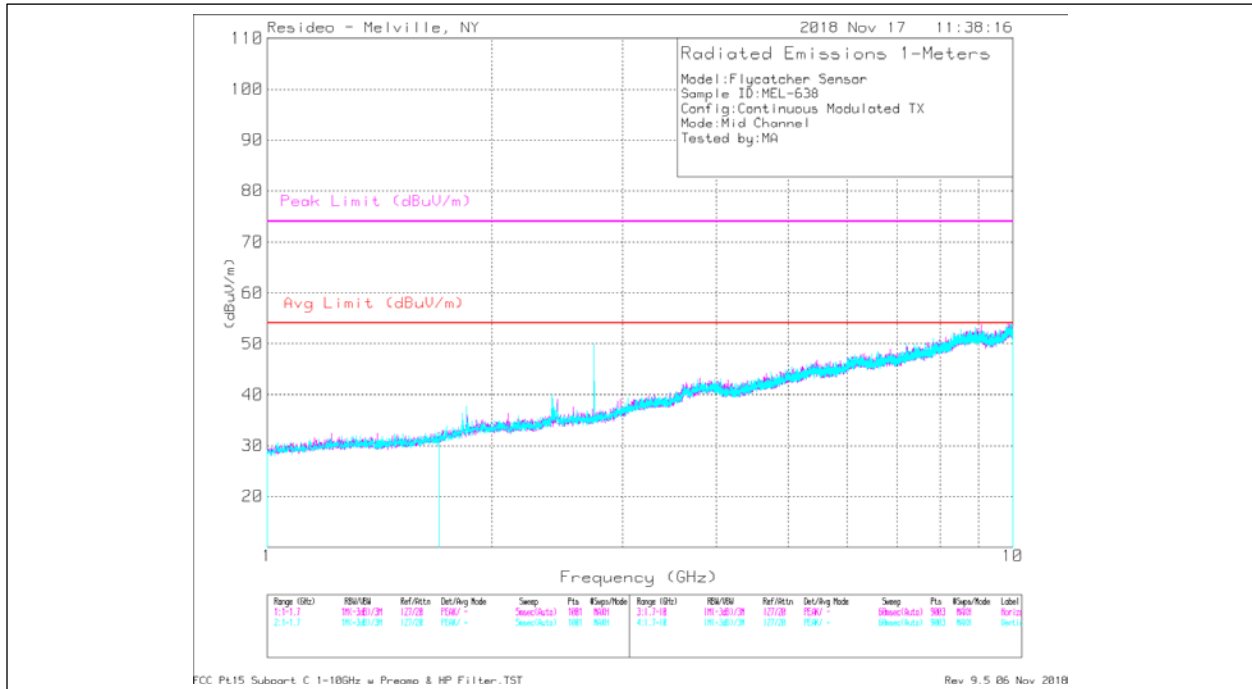
Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	SWBOX1 [dB]	SMA7 [dB]	SMA5 [dB]	HPF [dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.806	50.77	PKFH	26.8	-42.4	2.2	2.2	.6	40.17	-	-	74	-33.83	184	105	H
1.806	47.33	VA1T	26.8	-42.4	2.2	2.2	.6	36.73	54	-17.27	-	-	184	105	H
* 2.709	60.29	PKFH	29	-43.6	2.8	2.7	.2	51.39	-	-	74	-22.61	274	158	H
* 2.709	59.35	VA1T	29	-43.6	2.8	2.7	.2	50.45	54	-3.55	-	-	274	158	H
9.867	34.9	PKFH	38.2	-39.8	5.6	5.1	.6	44.6	-	-	74	-29.4	134	365	H
9.87	21.54	VA1T	38.2	-39.8	5.6	5.1	.6	31.24	54	-22.76	-	-	134	365	H
1.806	46.81	PKFH	26.8	-42.4	2.2	2.2	.6	36.21	-	-	74	-37.79	53	382	V
1.806	39.71	VA1T	26.8	-42.4	2.2	2.2	.6	29.11	54	-24.89	-	-	53	382	V
* 2.709	49.58	PKFH	29	-43.6	2.8	2.7	.2	40.68	-	-	74	-33.32	333	389	V
* 2.709	45.37	VA1T	29	-43.6	2.8	2.7	.2	36.47	54	-17.53	-	-	333	389	V
5.522	39.43	PKFH	34.4	-41	4	3.9	.3	41.03	-	-	74	-32.97	336	291	V
5.522	24.44	VA1T	34.4	-41	4	3.9	.3	26.04	54	-27.96	-	-	336	291	V
9.891	34.82	PKFH	38.2	-39.8	5.5	5.2	.6	44.52	-	-	74	-29.48	323	178	V
9.892	21.9	VA1T	38.2	-39.8	5.5	5.2	.6	31.6	54	-22.4	-	-	323	178	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

Low Channel - Data



Mid Channel - Plot

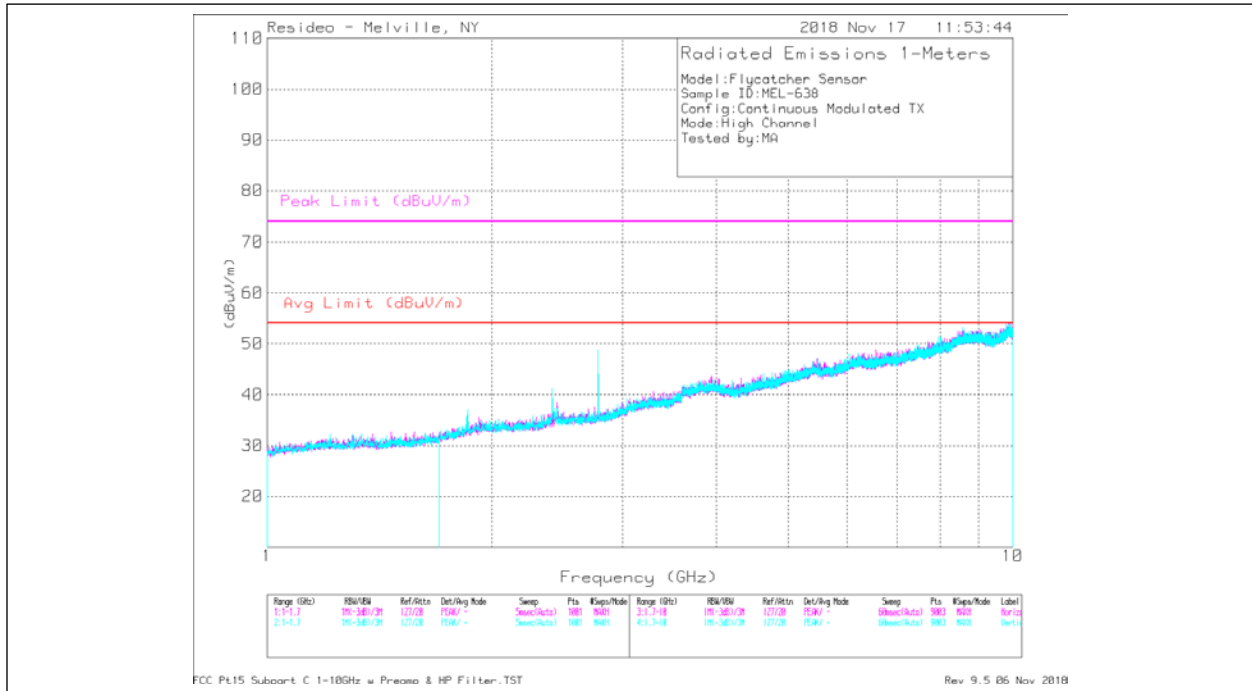
Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	SWBOX1 [dB]	SMA7 [dB]	SMA5 [dB]	HPF [dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.744	62.99	PKFH	29	-43.6	2.8	2.7	.3	54.19	-	-	74	-19.81	96	105	H
* 2.744	62.21	VA1T	29	-43.6	2.8	2.7	.3	53.41	54	-.59	-	-	96	105	H
* 9.073	35.6	PKFH	37.7	-39.4	5.4	5.1	.1	44.5	-	-	74	-29.5	300	244	H
* 9.074	22.22	VA1T	37.7	-39.4	5.4	5.1	.1	31.12	54	-22.88	-	-	300	244	H
9.914	35.16	PKFH	38.2	-39.8	5.5	5.3	.7	45.06	-	-	74	-28.94	354	370	H
9.916	21.92	VA1T	38.2	-39.8	5.5	5.3	.7	31.82	54	-22.18	-	-	354	370	H
* 2.744	54.87	PKFH	29	-43.6	2.8	2.7	.3	46.07	-	-	74	-27.93	148	389	V
* 2.744	52.65	VA1T	29	-43.6	2.8	2.7	.3	43.85	54	-10.15	-	-	148	389	V
8.507	36.54	PKFH	37.5	-39.2	5.1	4.9	.3	45.14	-	-	74	-28.86	37	163	V
8.51	23.19	VA1T	37.5	-39.2	5.1	4.9	.3	31.79	54	-22.21	-	-	37	163	V
9.902	35.06	PKFH	38.2	-39.8	5.5	5.3	.7	44.96	-	-	74	-29.04	162	310	V
9.902	21.92	VA1T	38.2	-39.8	5.5	5.3	.7	31.82	54	-22.18	-	-	162	310	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

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VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

Mid Channel - Data



High Channel - Plot

Frequency (GHz)	Meter Reading (dBuV)	Det	AF [dB/m]	SWBOX1 [dB]	SMA7 [dB]	SMA5 [dB]	HPF [dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.779	59.16	PKFH	29.1	-43.6	2.8	2.7	.3	50.46	-	-	74	-23.54	194	158	H
* 2.779	57.82	VA1T	29.1	-43.6	2.8	2.7	.3	49.12	54	-4.88	-	-	194	158	H
* 8.478	35.81	PKFH	37.4	-39.2	5.1	4.9	.3	44.31	-	-	74	-29.69	219	247	H
* 8.48	22.85	VA1T	37.4	-39.2	5.1	4.9	.3	31.35	54	-22.65	-	-	219	247	H
9.83	35.49	PKFH	38.1	-39.8	5.6	5.2	.5	45.09	-	-	74	-28.91	311	151	H
9.831	21.82	VA1T	38.1	-39.8	5.6	5.2	.5	31.42	54	-22.58	-	-	311	151	H
* 2.779	53.92	PKFH	29.1	-43.6	2.8	2.7	.3	45.22	-	-	74	-28.78	174	146	V
* 2.779	51.82	VA1T	29.1	-43.6	2.8	2.7	.3	43.12	54	-10.88	-	-	174	146	V
8.541	36.13	PKFH	37.5	-39.1	5.2	4.9	.3	44.93	-	-	74	-29.07	130	189	V
8.542	23.02	VA1T	37.5	-39.1	5.2	4.9	.3	31.82	54	-22.18	-	-	130	189	V
9.851	35.11	PKFH	38.2	-39.8	5.6	5.1	.6	44.81	-	-	74	-29.19	221	144	V
9.853	21.75	VA1T	38.2	-39.8	5.6	5.1	.6	31.45	54	-22.55	-	-	221	144	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

High Channel - Data

**END OF REPORT**