TEST REPORT

Report Number. : 13317290-E1V5

Applicant	:	Sidewalk Labs LLC 10 Hudson Yards New York, NY, 10001 US
Model	:	PS-001
FCC ID	:	2AWDXPS001
IC	:	26205-PS001
EUT Description	:	Parking Lot Sensor
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
October 07, 2020

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	8/16/2020	Initial Issue	--
V2	9/17/2020	Section 6.2 & 9.6 Updated	Henry Lau
V3	9/29/2020	Section 2, Section 9.5, & Section 9.7 Updated Test Method # added to respective Test Section	Henry Lau
V4	10/5/2020	Section 9.5 Updated	Henry Lau
V5	10/7/2020	Company name & Frequency Range updated	Henry Lau

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

TABLE OF CONTENTS

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Sidewalk Labs LLC
10 Hudson Yards
New York, NY, 10001
US

EUT DESCRIPTION: Parking Lot Sensor

MODEL: PS-001

SERIAL NUMBER: Proto 1 (Conducted, non Hopping), Proto 2 (Radiated), Proto 3 (Conducted, Hopping)

DATE TESTED: June 22 – September 29, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	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. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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.

Approved & Released For
UL Verification Services Inc. By:

Francisco deAnda
Operations Leader
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Henry Lau
Project Engineer
Consumer Technology Division
UL Verification Services Inc.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

2. TEST RESULTS SUMMARY

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 11.6.
See Comment	RSS-GEN 6.7	20dB BW/99% OBW	Reporting purposes only	ANSI C63.10 Sections 6.9.2 and 6.9.3
15.247 (a)(1)	RSS-247 (5.1) (b)	Hopping Frequency Separation	Compliant	None.
15.247 (a)(1)(i)	RSS-247 (5.1) (c)	Number of Hopping Channels	Compliant	None.
15.247 (f)	RSS-247 (5.3) (a)	Average Time of Occupancy	Compliant	None.
15.247 (b)(2) 15.247 (b)(3)	RSS-247 (5.4) (a) RSS-247 (5.4) (d)	Output Power	Compliant	Per ANSI C63.10, Section 11.9.2.3.2.
15.247 (e) 15.247 (f)	RSS-247 5.2 (b) RSS-247 (5.3) (b)	PSD	Compliant	None.
15.247 (d)	RSS-247 (5.5)	Conducted Spurious Emissions	Compliant	None.
15.209, 15.205	RSS-GEN 8.9, 8.10	Radiated Emissions	Compliant	None.
15.207	RSS-Gen 8.8	AC Mains Conducted Emissions	Not Applicable	None.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with
FCC CFR 47 Part 2,
FCC CFR 47 Part 15,
ANSI C63.10-2013,
KDB 558074 D01 15.247 Meas Guidance v05r02,
RSS-GEN Issue 5, and
RSS-247 Issue 2.

4. 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. 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	☒ Chamber M

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: 2324A.

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

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{Lab}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.39 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.07 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a battery powered Parking Lot Sensor.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
904-927.533	GFSK	12.12	16.29

6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an Loop antenna, with a maximum gain of 1.75 dBi.

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was v1.1.0.0c-tx-continuous.bin.

6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 30MHz was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emissions below 1GHz and above 1Ghz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The EUT has one intended orientations, X (flatbed); therefore, all final radiated testing was performed with the EUT in X(flatbed) orientation.

During normal operation, at worst case, the transmitter transmits every 30 seconds as declared by manufacturer.

For Hopping tests, duty cycle has been reduced to a minimum of ~2 second between transmission burst.

For Non-Hopping tests, duty cycle has been set to 100%.

Worst-case data rates as provided by the client were:

GFSK mode: 54000 symbols/sec

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

As per manufacturer declaration, the EUT only frequency hops across 4 channels. For any given system, the channels are pseudo-randomly chosen and ordered from list of 255 possible frequencies in the 904.000 – 927.533MHz range.

The list of channels (MHz) for all possible 63 systems:

0: [919.965	905.661	921.626	907.322]
1: [916.643	908.983	918.304	910.645]
2: [925.133	912.306	926.794	913.967]
3: [921.811	915.628	923.472	917.289]
4: [909.629	915.997	908.337	920.611]
5: [906.307	919.319	905.015	923.934]
6: [914.797	922.642	913.505	927.256]
7: [911.475	925.964	910.183	907.784]
8: [916.182	909.445	917.843	905.200]
9: [918.766	906.861	920.427	912.952]
10: [922.826	914.613	924.487	910.368]
11: [925.410	912.029	927.071	921.073]
12: [905.846	919.781	904.554	918.489]
13: [908.430	917.197	907.138	926.241]
14: [912.490	924.949	911.198	923.657]
15: [915.074	922.365	913.782	911.567]
16: [927.533	909.906	925.872	914.890]
17: [924.210	913.229	922.549	906.399]
18: [920.888	904.738	919.227	909.722]
19: [917.566	908.061	915.905	921.903]
20: [914.244	923.195	915.536	925.226]
21: [910.921	926.518	912.213	916.735]
22: [907.599	918.027	908.891	920.058]
23: [904.277	921.350	905.569	915.351]
24: [923.749	913.690	922.088	912.767]
25: [926.333	911.106	924.672	908.707]
26: [918.581	907.045	916.920	906.123]
27: [921.165	904.461	919.504	925.687]
28: [910.460	926.979	911.752	923.103]
29: [913.044	924.395	914.336	919.042]
30: [905.292	920.334	906.584	916.459]
31: [907.876	917.750	909.168	919.135]
32: [904.831	920.796	906.492	915.813]
33: [908.153	917.474	909.814	925.779]
34: [909.999	927.440	911.660	922.457]
35: [913.321	924.118	914.982	908.799]
36: [918.120	907.507	916.828	905.477]
37: [921.442	904.185	920.150	915.443]
38: [923.288	914.151	921.996	912.121]
39: [926.610	910.829	925.318	917.012]
40: [906.953	918.673	908.614	919.596]
41: [904.369	921.257	906.030	922.180]
42: [913.598	923.841	915.259	924.764]
43: [911.014	926.425	912.675	906.676]
44: [920.242	905.384	918.950	909.260]
45: [917.658	907.968	916.366	911.844]
46: [926.887	910.552	925.595	914.428]
47: [924.303	913.136	923.011	926.702]
48: [912.398	925.041	910.737	923.380]
50: [905.753	919.873	904.092	918.212]
51: [909.076	916.551	907.415	913.413]
52: [922.734	914.705	924.026	910.091]
53: [926.056	911.383	927.348	908.245]
54: [916.089	909.537	917.381	904.923]
55: [919.412	906.215	920.704	924.580]
56: [914.521	922.918	912.859	927.164]
57: [911.937	925.502	910.275	917.935]
58: [909.353	916.274	907.691	920.519]
59: [906.769	918.858	905.107	911.291]
60: [924.856	912.583	926.148	913.875]
61: [922.272	915.167	923.564	904.646]
62: [919.688	905.938	920.980	907.230]
63: [917.104	908.522	918.396	904.000]

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

6.6. DESCRIPTION OF TEST SETUP

I/O CABLES

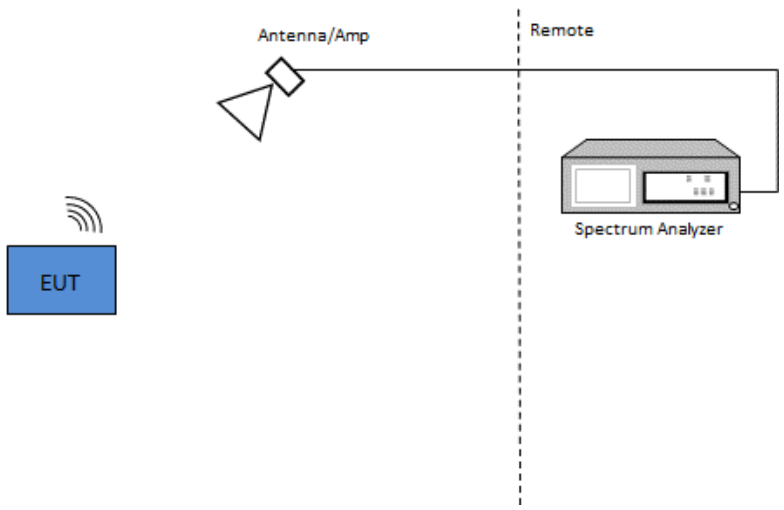
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	SMA	Un-Shielded	0.2	to Analyzer

TEST SETUP

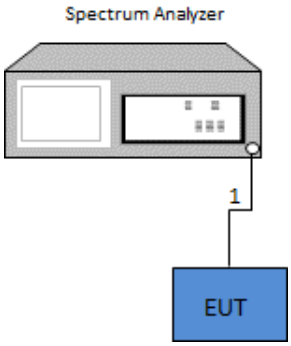
EUT tested standalone with batteries. Test software exercised the radio card.

SETUP DIAGRAMS

Radiated



Conducted



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

7. 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**
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE017375	02/24/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	05/19/2021
Amplifier, 100MHz-18GHz	AMPLICAL	AMP0.1G18-47-20	PRE0202123	06/07/2021
RF Filter Box, 1-18GHz	UL,FREMONT	-	PRE0211790	06/07/2021
Antenna, BroadBand Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	PRE0184970	12/11/2020
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	PRE0180177	16/4/2021
Antenna, Passive Loop 30Hz to 1MHz	ELETRO METRICS	EM-6871	PRE0179466	05/27/2021
Antenna, Passive Loop 100kHz to 30MHz	ELETRO METRICS	EM-6872	PRE0179468	05/27/2021
Filter, BRF 902 to 928MHz	MICRO-TRONICS	BRC50722	T1847	07/29/2020*
1GHz High Pass Filter	MICRO-TRONICS	HPM50115	PRE0182588	11/02/2020
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight Technologies Inc	E4446A	T906	1/23/2021
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	T1113	3/02/2021
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	T1269	1/21/2021
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	T1225	02/13/2021
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Apr 21, 2020	
Antenna Port Software	UL	UL RF	Ver 2020.1.8	

*Testing was performed before calibration due date.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

8. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10-2013 Section 11.6

Occupied BW (20dB): ANSI C63.10-2013 Section 6.9.2

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Carrier Frequency Separation: ANSI C63.10-2013 Section 7.8.2

Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10 Section 11.10.3 Method AVGPSD-1

Conducted Spurious Emissions: ANSI C63.10-2013 Section 7.8.8

Conducted Band-Edge: ANSI C63.10-2013 Section 6.10.4

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

Radiated Spurious Emissions 30-1000MHz: ANSI C63.10-2013 Section 6.3 and 6.5

Radiated Spurious Emissions above 1GHz: ANSI C63.10-2013 Section 6.3 and 6.6

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

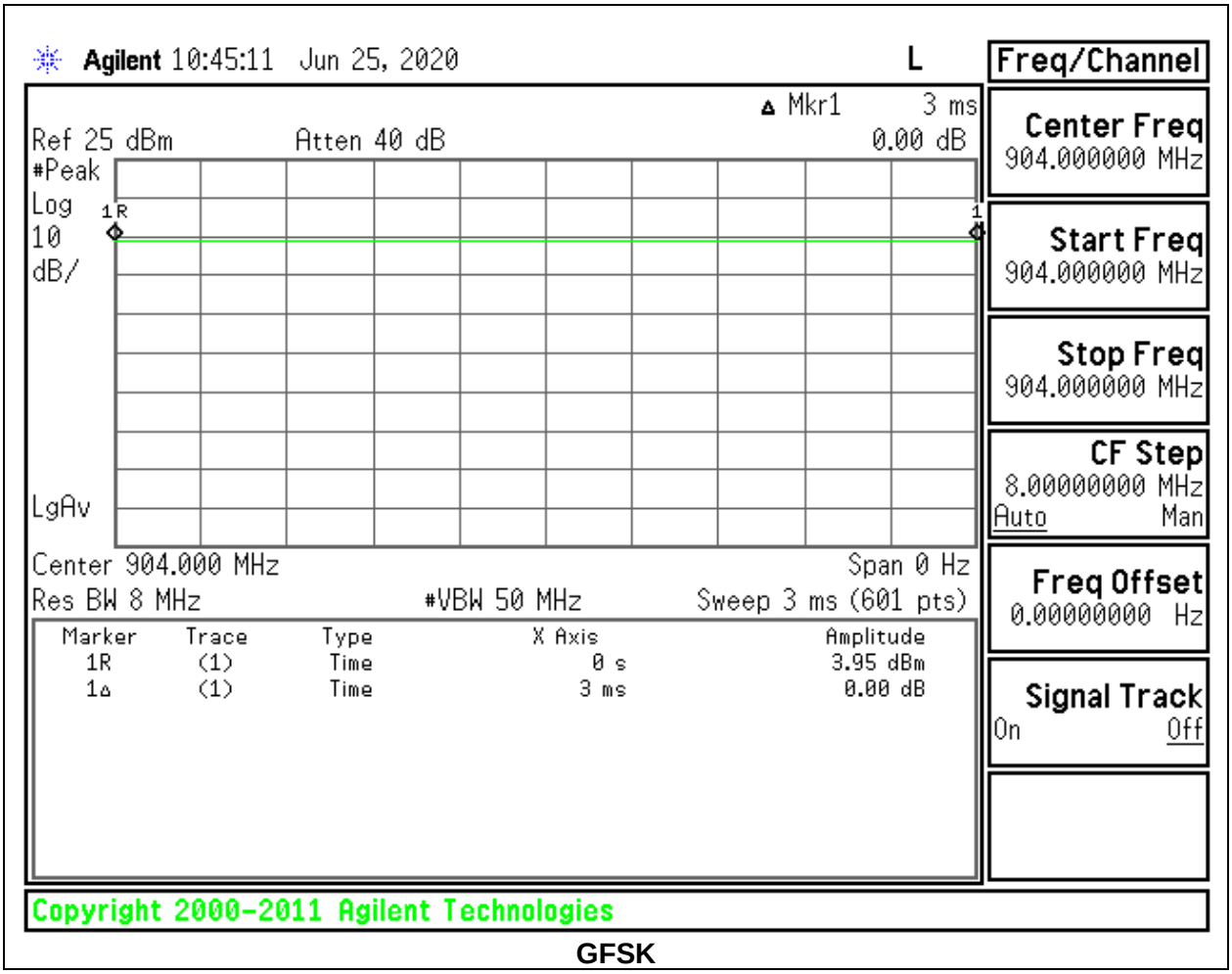
ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
GFSK	3.00	3.00	1.000	100.0%	0.00	0.010

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

DUTY CYCLE PLOTS

Tester: 16080 ZS



GFSK

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.2. 20 dB AND 99% BANDWIDTH

LIMITS

FCC §15.247 (a) (1)(i)

RSS-247 (5.1) (c)

(i) 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.

TEST PROCEDURE

Occupied BW (20dB): ANSI C63.10-2013 Section 6.9.2

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

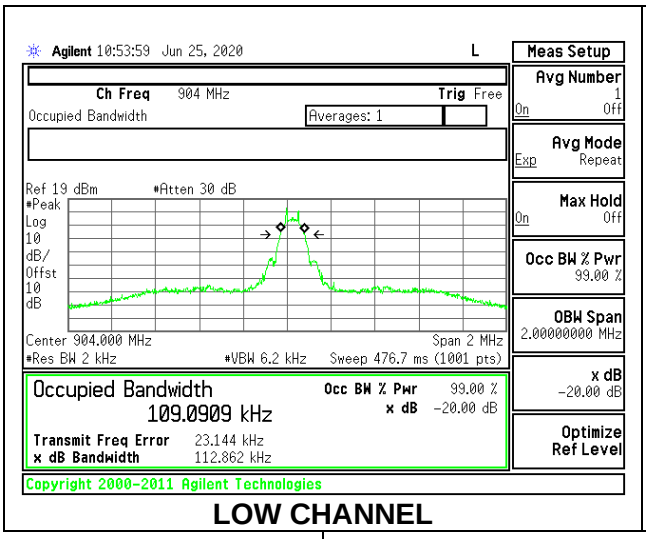
The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

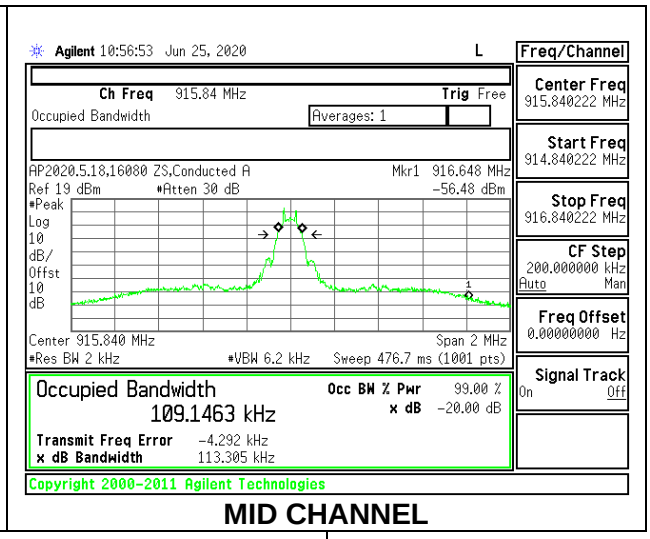
Tester: 16080 ZS

Channel	Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	904.02	112.862	109.0909
Mid	915.85	113.305	109.1463
High	927.53	113.033	109.2541

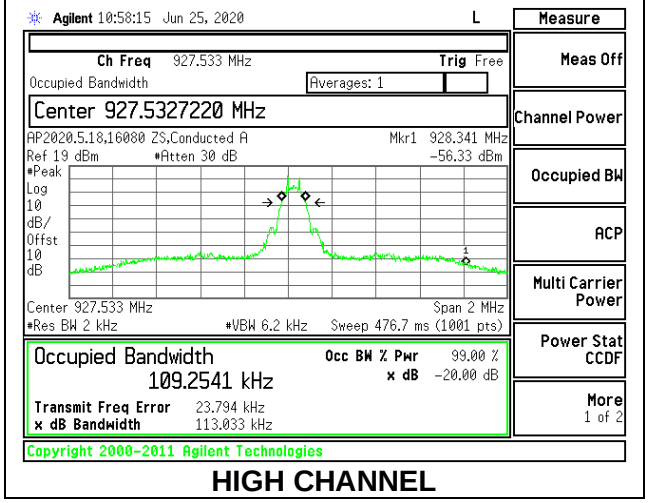
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.3. HOPPING FREQUENCY SEPARATION

LIMITS

FCC §15.247 (a) (1)

RSS-247 (5.1) (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

TEST PROCEDURE

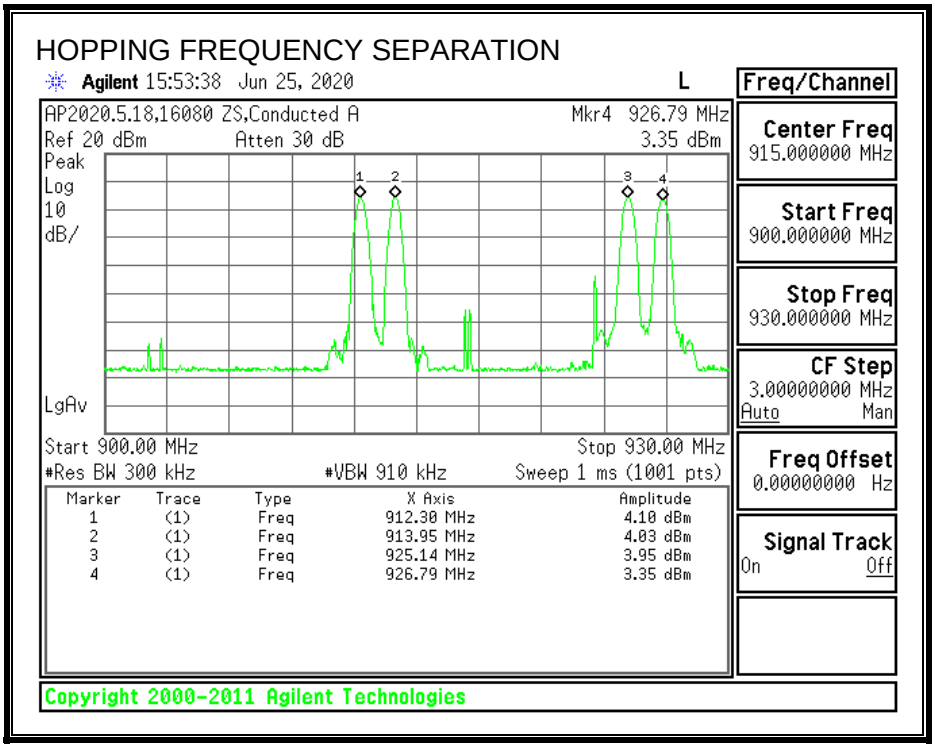
Carrier Frequency Separation: ANSI C63.10-2013 Section 7.8.2

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to VBW >= RBW. The sweep time is coupled.

RESULTS

As per Manufacturer declaration, the minimum separation between any two frequencies is 922 kHz.

The following Frequency group utilized is 2(see section 6.5 table): [925.133, 912.306, 926.794, 913.967]. The minimum separation in group 2 is 1.65MHz



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (i)

RSS-247 (5.1) (c)

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.

TEST PROCEDURE

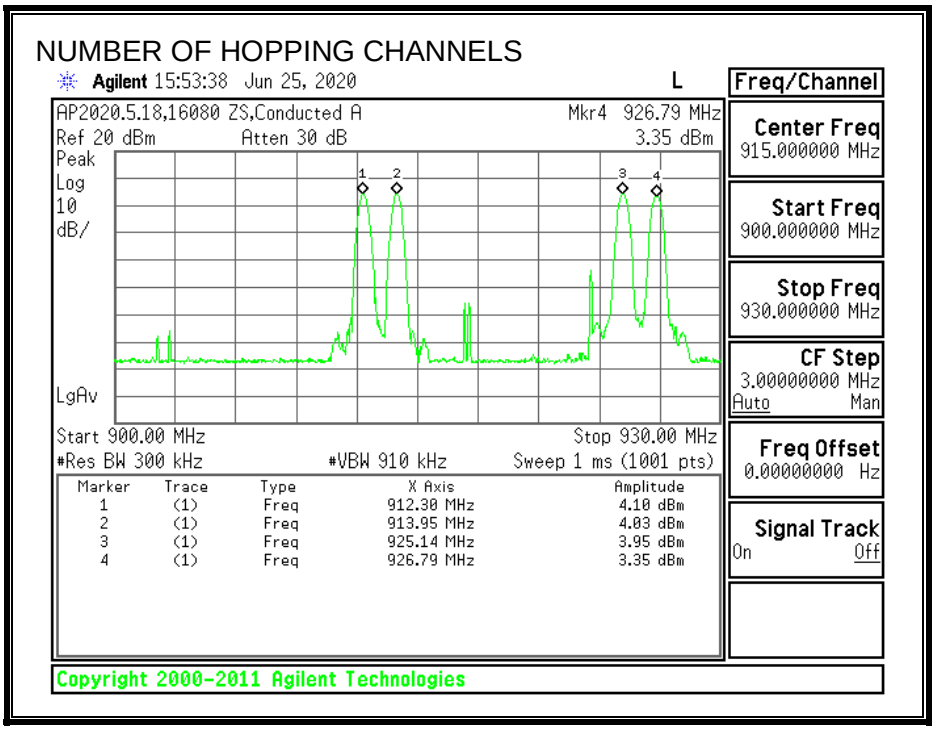
Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

As per manufacturer declaration, 4 channels are utilized from a list of 255 possible channels.

Normal Mode: 4 Channels Observed



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (f)

RSS-247 (5.3) (a)

For hybrid systems operating in the 902-928 MHz band: the frequency hopping operation of the hybrid system, with the direct sequence or digital modulation operation turned-off, shall have an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

TEST PROCEDURE

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

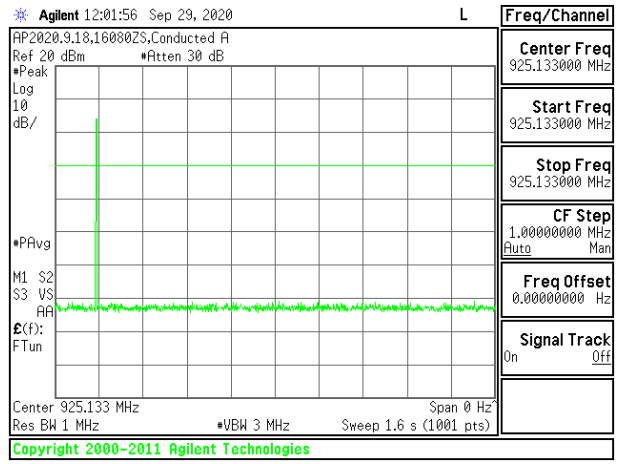
The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 1.6 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 1.6 second period is equal to
(# of pulses in 1.6 s) * (pulse width).

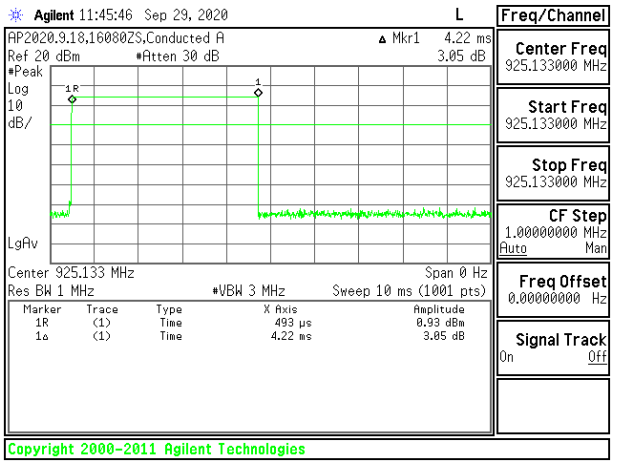
RESULTS

DH Packet	Pulse Width (msec)	Number of Pulses in 1.6 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
Normal	4.22	1	0.0042	0.4	-0.3958

PULSE NUMBER IN 20s



PULSE WIDTH



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.6. OUTPUT POWER

LIMITS

§15.247 (b) (2)
§15.247 (b) (3)
RSS-247 (5.4) (a)
RSS-247 (5.4) (d)

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels as permitted under paragraph (a)(1)(i) of this section. The e.i.r.p. shall not exceed 4 W if the hopset uses 50 or more hopping channels.

For systems using digital modulation in the 902–928 MHz band: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
The e.i.r.p. shall not exceed 4 W.

TEST PROCEDURE

Output Power: ANSI C63.10 Subclause -11.9.2.3.2

Measurements perform using a wideband gated RF power meter.

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

RESULTS

Tested By:	16080 ZC
Date:	7/6/2020
Antenna Gain (dBi)	1.75

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low	904.02	12.12	30	-17.88	13.87	36	-22.13
Middle	915.83	11.99	30	-18.01	13.74	36	-22.26
High	927.53	11.80	30	-18.2	13.55	36	-22.45

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.7. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)
FCC §15.247 (f)

RSS-247 (5.2) (b)
RSS-247 (5.3) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

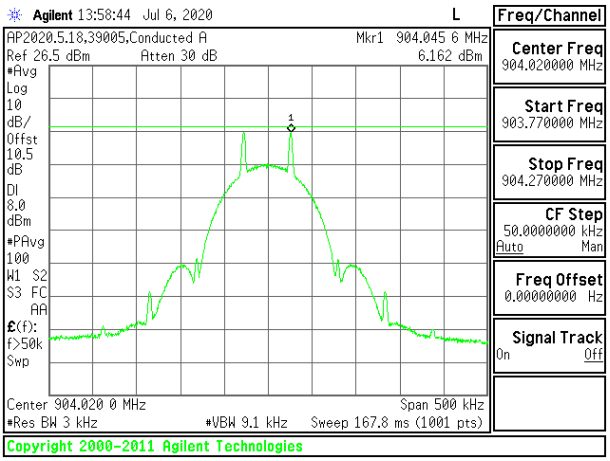
PSD: ANSI C63.10 Section 11.10.3

RESULTS

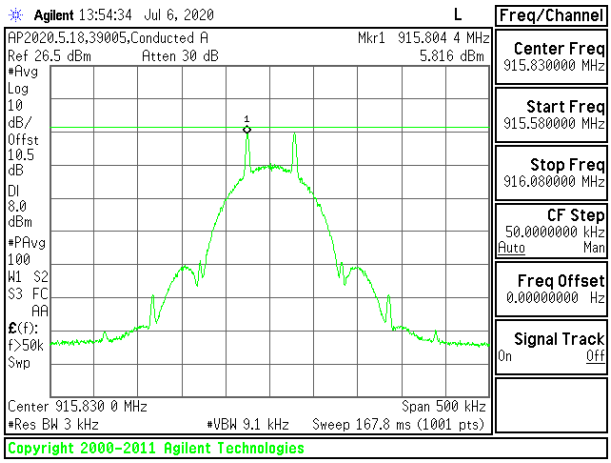
The frequency hopping function is turned off for this test.

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	904.02	6.162	8	-1.84
Middle	915.83	5.816	8	-2.18
High	927.53	6.448	8	-1.55

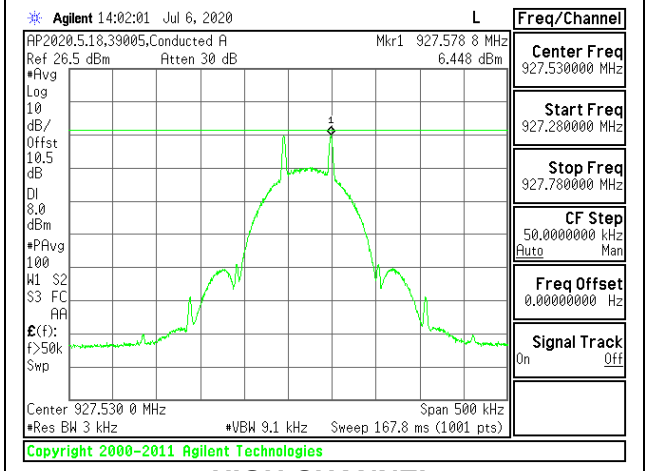
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

Limit = -30 dBc

TEST PROCEDURE

Conducted Spurious Emissions: ANSI C63.10-2013 Section 7.8.8

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz.The video bandwidth is set to 300 kHz.

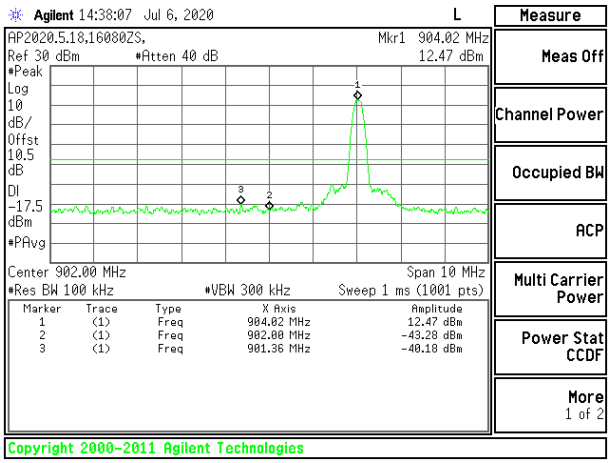
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The band edges at 902MHz and 928MHz are investigated with the transmitter set to the low and high channel.

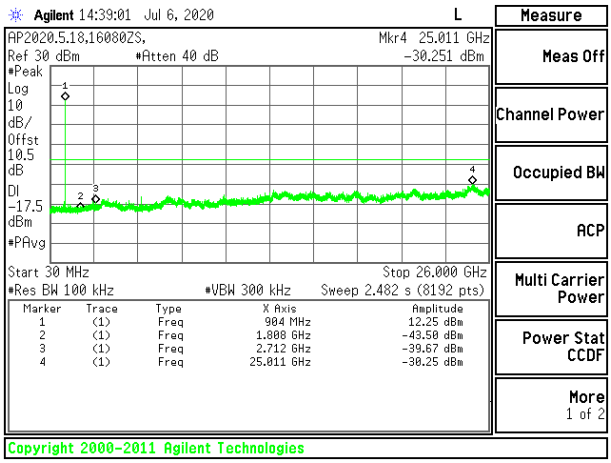
RESULTS

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

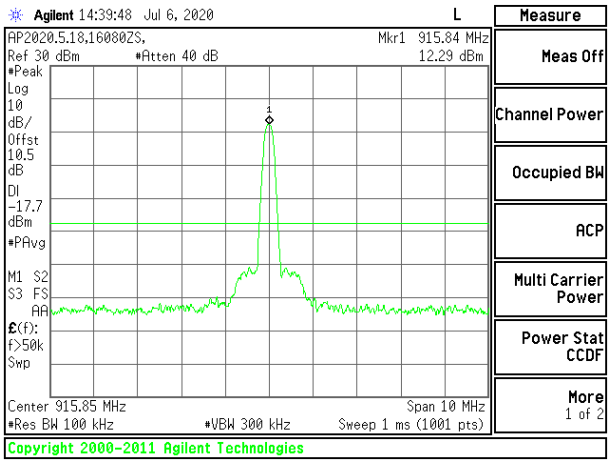
SPURIOUS EMISSIONS



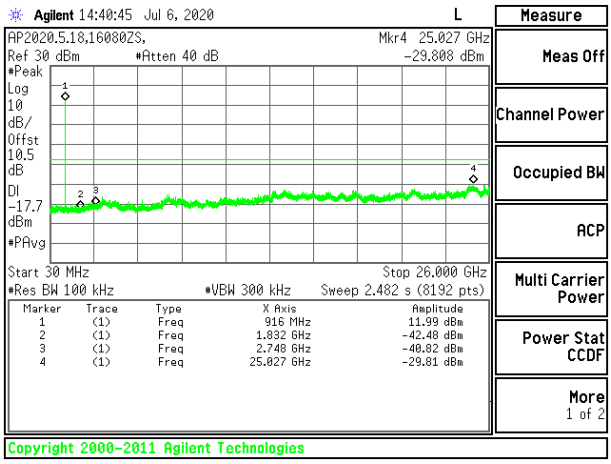
LOW CHANNEL BANDEDGE



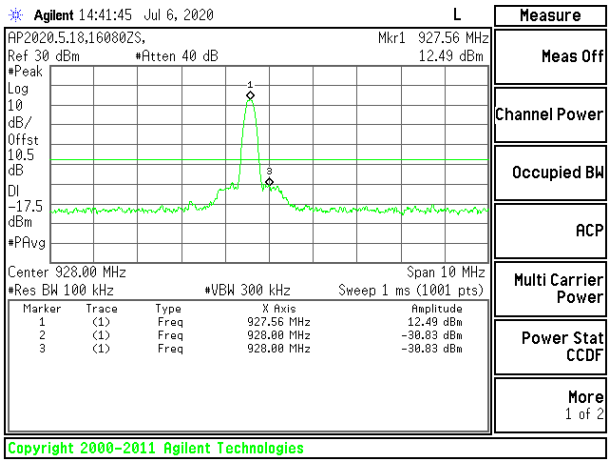
OUT-OF-BAND LOW CHANNEL



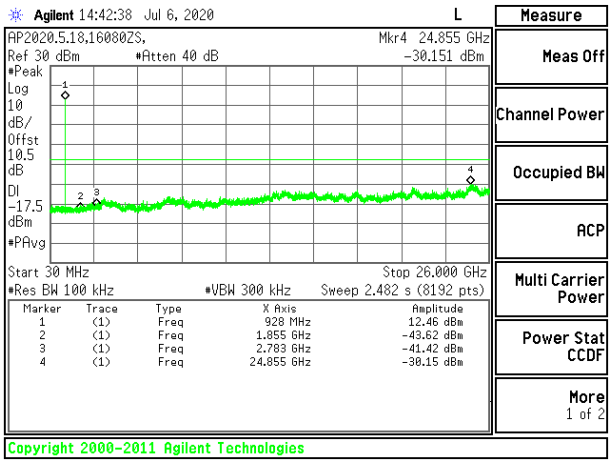
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

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 as quasi-peak.

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 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements.

The spectrum from 30MHz to 1GHz and 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 30MHz emissions, the channel with the highest output power was tested.

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.

2D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table), using the free space impdedance of 377 Ohms. For example the measurement at frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to Y – 51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

KDB 414788 Open Field Site(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.

KDB 558074 D01 15.247 Meas Guidance v05r02

Use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector. Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period.

Note – For this test program, Peak detection was used. The DCCF was then subtracted from the peak value. The DCCF was calculated based on the worst case on-time when the device transmits packets and operates on 4 channels (4.22ms per channel). In this mode, the device will have a maximum of 1 hops on a channel in 100ms or 1x 4.22 ms = 4.22 ms on any channel. Therefore, 20log (4.22 / 100) = - 27.49 dB.

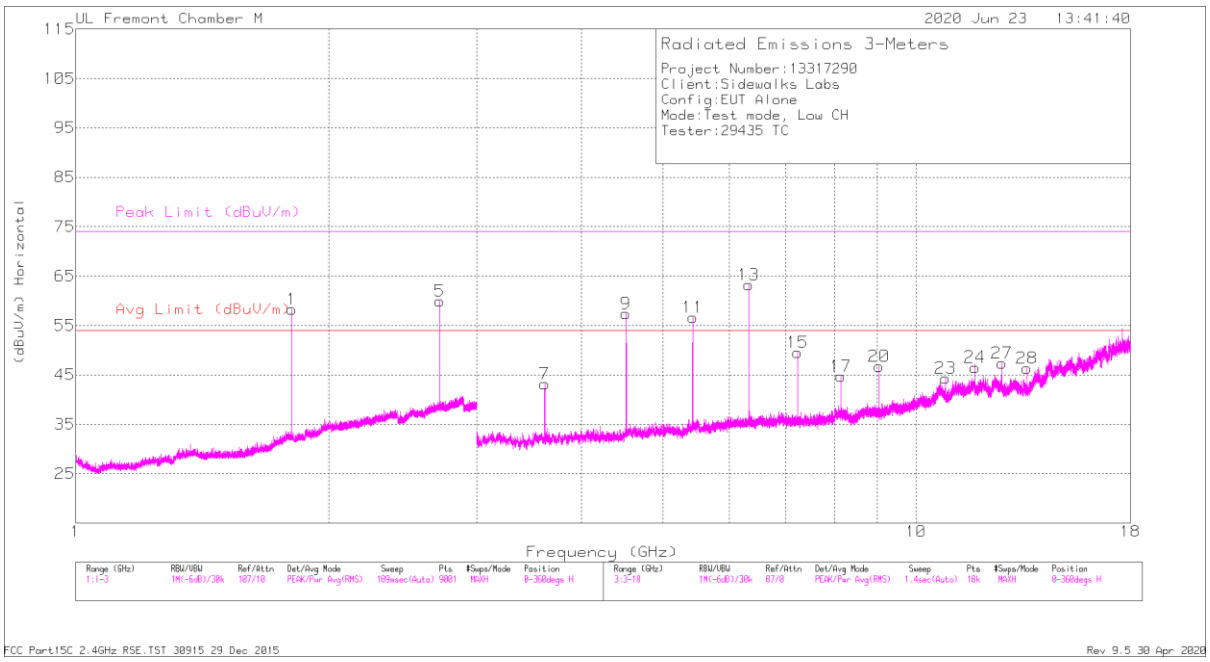
For below 1Ghz Harmonics and Spurious emissions notch filters were used for the fundamental. For above 1GHz a high pass filter was used.

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

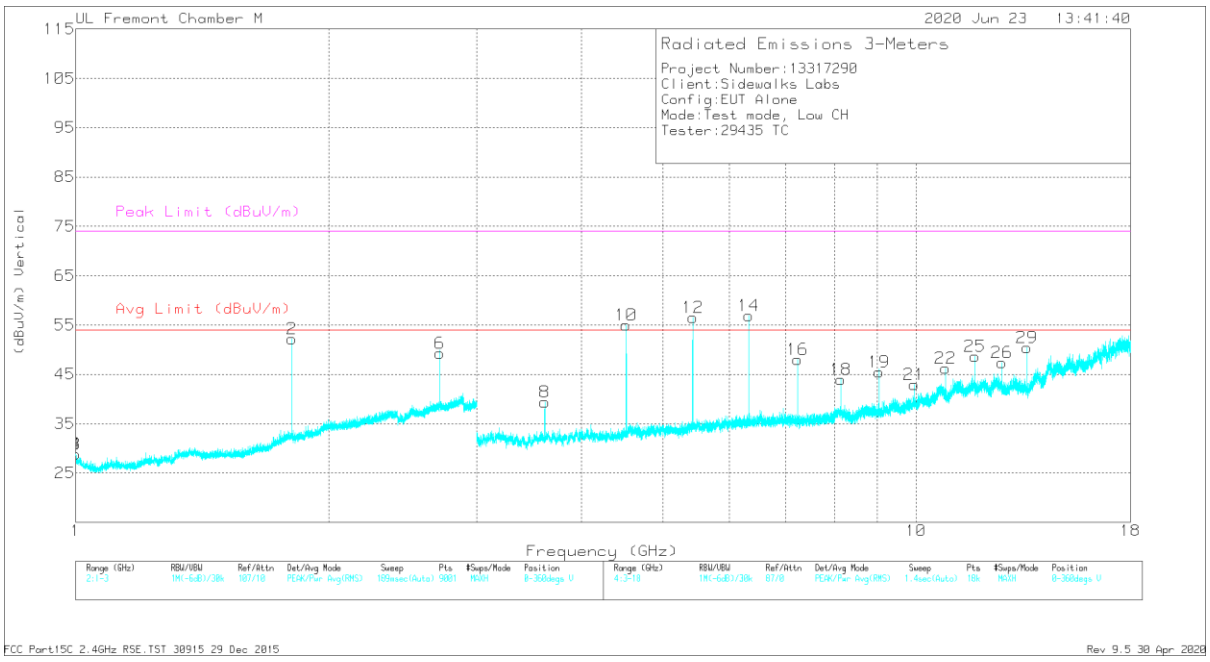
10.1. TRANSMITTER ABOVE 1 GHz

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

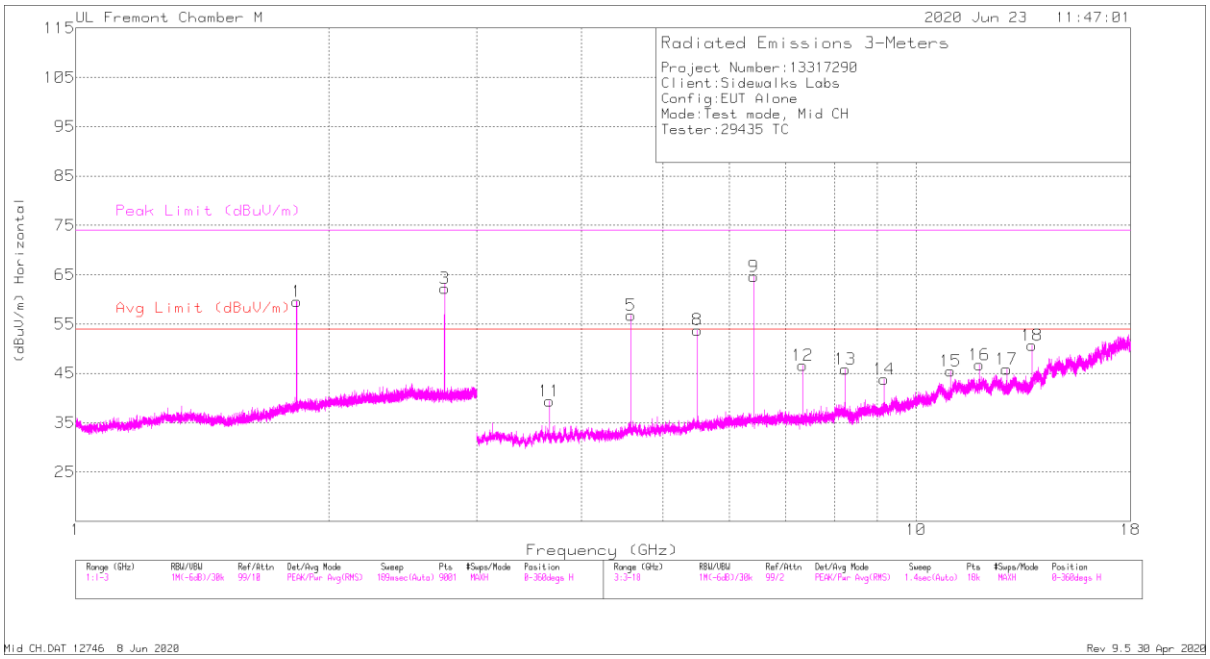
RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.808	47.47	Pk	30.2	-19.4	0.56	0	58.83	-	-	-	-	0-360	199	H
5	* 2.71199	47.68	PK2	32.3	-16.4	0.75	0	64.33	-	-	74	-9.67	350	309	H
	* 2.71206	47.68	PK2	32.3	-16.4	0.75	-27.49	36.84	54	-17.16	-	-	350	309	H
2	1.808	41.43	Pk	30.2	-19.4	0.56	0	52.79	-	-	-	-	0-360	199	V
3	* 1.00022	23.29	Pk	27.9	-22.4	1.77	0	30.56	-	-	74	-43.44	0-360	199	V
4	* 1.00022	23.29	Pk	27.9	-22.4	1.77	0	30.56	-	-	74	-43.44	0-360	199	V
6	* 2.71244	33.39	Pk	32.3	-16.4	0.76	0	50.05	-	-	74	-23.95	0-360	199	V
7	* 3.61587	53.18	Pk	33	-43	0.52	0	43.7	-	-	74	-30.3	0-360	101	H
9	* 4.52005	70.31	PK2	33.9	-42.5	0.42	0	62.13	-	-	74	-11.87	33	106	H
	* 4.52005	70.31	PK2	33.9	-42.5	0.42	-27.49	34.64	54	-19.36	-	-	33	106	H
11	* 5.42428	62.68	PK2	34.6	-40.6	0.64	0	57.32	-	-	74	-16.68	357	100	H
	* 5.42414	62.68	PK2	34.6	-40.6	0.64	-27.49	29.83	54	-24.17	-	-	357	100	H
13	6.32769	67.36	Pk	35.6	-39.7	0.53	0	63.79	-	-	-	-	0-360	101	H
15	7.2319	52.81	Pk	35.6	-38.9	0.5	0	50.01	-	-	-	-	0-360	101	H
17	* 8.13612	47.11	Pk	35.8	-38.2	0.48	0	45.19	-	-	74	-28.81	0-360	101	H
20	* 9.04049	51.31	PK2	36.1	-37.3	0.66	0	50.77	-	-	74	-23.23	265	274	H
	* 9.04017	51.31	PK2	36.1	-37.3	0.66	-27.49	23.28	54	-30.72	-	-	265	274	H
23	* 10.84877	43.07	Pk	38	-36.7	0.72	0	45.09	-	-	74	-28.91	0-360	200	H
24	* 11.75299	42.45	Pk	38.5	-34.4	0.7	0	47.25	-	-	74	-26.75	0-360	101	H
27	* 12.65637	42.22	Pk	39.2	-34	1.12	0	48.54	-	-	74	-25.46	0-360	101	H
28	13.56059	42.32	Pk	38.8	-34.8	0.95	0	47.27	-	-	-	-	0-360	101	H
8	* 3.61587	49.34	Pk	33	-43	0.52	0	39.86	-	-	74	-34.14	0-360	200	V
10	* 4.52024	66.29	PK2	33.9	-42.5	0.42	0	58.11	-	-	74	-15.89	144	251	V
	* 4.52014	66.29	PK2	33.9	-42.5	0.42	-27.49	30.62	54	-23.38	-	-	144	251	V
12	* 5.42424	64.51	PK2	34.6	-40.6	0.64	0	59.15	-	-	74	-14.85	143	151	V
	* 5.42411	64.51	PK2	34.6	-40.6	0.64	-27.49	31.66	54	-22.34	-	-	143	151	V
14	6.32769	60.96	Pk	35.6	-39.7	0.53	0	57.39	-	-	-	-	0-360	101	V
16	7.2319	51.37	Pk	35.6	-38.9	0.5	0	48.57	-	-	-	-	0-360	200	V
18	* 8.13529	46.36	Pk	35.8	-38.2	0.48	0	44.44	-	-	74	-29.56	0-360	200	V
19	* 9.0399	46.94	PK2	36.1	-37.3	0.66	0	46.4	-	-	74	-27.6	163	139	V
	* 9.03911	46.94	PK2	36.1	-37.3	0.66	-27.49	18.91	54	-35.09	-	-	163	139	V
21	9.94456	43.03	Pk	37	-37.1	0.63	0	43.56	-	-	-	-	0-360	101	V
22	* 10.84877	44.99	Pk	38	-36.7	0.72	0	47.01	-	-	74	-26.99	0-360	101	V
25	* 11.75216	44.58	Pk	38.5	-34.4	0.7	0	49.38	-	-	74	-24.62	0-360	101	V
26	* 12.65637	42.19	Pk	39.2	-34	1.12	0	48.51	-	-	74	-25.49	0-360	101	V
29	13.56059	46.38	Pk	38.8	-34.8	0.95	0	51.33	-	-	-	-	0-360	200	V

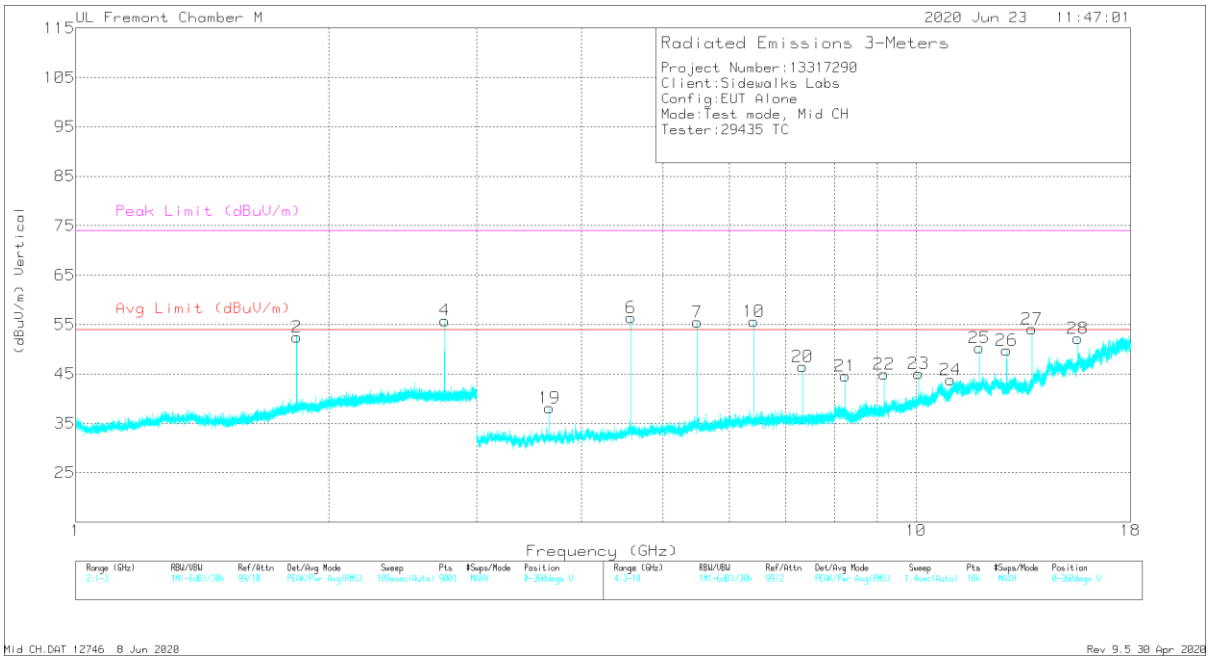
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - KDB558074 Method: Maximum Peak

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

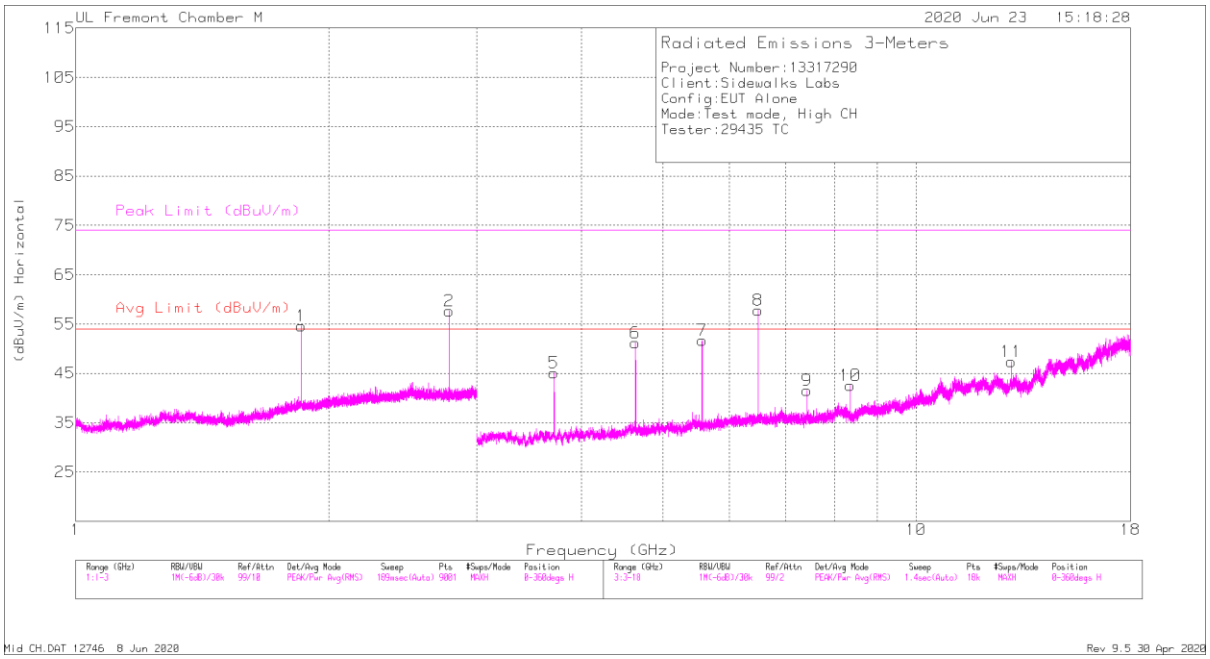
RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.83178	67.72	Pk	30.5	-38.6	0.56	0	60.18	-	-	-	-	0-360	200	H
3	* 2.74745	68.84	PK2	32.2	-35.5	0.75	0	66.29	-	-	74	-7.71	202	371	H
	* 2.74751	68.84	PK2	32.2	-35.5	0.75	-27.49	38.8	54	-15.2	-	-	202	371	H
2	1.83178	60.56	Pk	30.5	-38.6	0.56	0	53.02	-	-	-	-	0-360	200	V
4	* 2.74748	67.63	PK2	32.2	-35.5	0.75	0	65.08	-	-	74	-8.92	132	372	V
	* 2.7475	67.63	PK2	32.2	-35.5	0.75	-27.49	37.59	54	-16.41	-	-	132	372	V
5	* 4.57929	69.71	PK2	34.1	-42.4	0.42	0	61.83	-	-	74	-12.17	52	110	H
	* 4.57922	69.71	PK2	34.1	-42.4	0.42	-27.49	34.34	54	-19.66	-	-	52	110	H
8	5.49514	59.59	Pk	34.8	-40.6	0.64	0	54.43	-	-	-	-	0-360	100	H
9	6.41102	68.62	Pk	35.7	-39.7	0.53	0	65.15	-	-	-	-	0-360	100	H
11	* 3.66337	49.13	Pk	33.1	-42.9	0.52	0	39.85	-	-	74	-34.15	0-360	100	H
12	* 7.32691	49.97	Pk	35.6	-38.9	0.5	0	47.17	-	-	74	-26.83	0-360	200	H
13	* 8.24279	48.51	Pk	35.8	-38.4	0.48	0	46.39	-	-	74	-27.61	0-360	100	H
14	* 9.15868	45.06	Pk	36.2	-37.4	0.66	0	44.52	-	-	74	-29.48	0-360	100	H
15	* 10.98961	44.12	Pk	37.9	-36.6	0.72	0	46.14	-	-	74	-27.86	0-360	100	H
16	* 11.90633	43.34	Pk	38.7	-35.3	0.7	0	47.44	-	-	74	-26.56	0-360	200	H
17	12.82138	41.3	Pk	39.2	-34.7	1.12	0	46.92	-	-	-	-	0-360	100	H
18	13.7381	46.43	Pk	38.6	-34.4	0.95	0	51.58	-	-	-	-	0-360	100	H
6	* 4.57916	67.59	PK2	34.1	-42.4	0.42	0	59.71	-	-	74	-14.29	146	302	V
	* 4.57917	67.59	PK2	34.1	-42.4	0.42	-27.49	32.22	54	-21.78	-	-	146	302	V
7	5.49514	61.34	Pk	34.8	-40.6	0.64	0	56.18	-	-	-	-	0-360	100	V
10	6.41102	59.61	Pk	35.7	-39.7	0.53	0	56.14	-	-	-	-	0-360	200	V
19	* 3.66254	47.87	Pk	33.1	-42.9	0.52	0	38.59	-	-	74	-35.41	0-360	200	V
20	* 7.32608	49.83	Pk	35.6	-38.9	0.5	0	47.03	-	-	74	-26.97	0-360	200	V
21	* 8.24196	47.15	Pk	35.8	-38.4	0.48	0	45.03	-	-	74	-28.97	0-360	100	V
22	* 9.15868	46.14	Pk	36.2	-37.4	0.66	0	45.6	-	-	74	-28.4	0-360	100	V
23	10.07373	45.39	Pk	37	-37.3	0.74	0	45.83	-	-	-	-	0-360	100	V
24	* 10.99045	42.54	Pk	37.9	-36.6	0.72	0	44.56	-	-	74	-29.44	0-360	100	V
25	* 11.90605	51.34	PK2	38.7	-35.3	0.7	0	55.44	-	-	74	-18.56	153	115	V
	* 11.90535	51.34	PK2	38.7	-35.3	0.7	-27.49	27.95	54	-26.05	-	-	153	115	V
26	12.82138	45.3	Pk	39.2	-34.7	1.12	0	50.92	-	-	-	-	0-360	100	V
27	13.7381	49.85	Pk	38.6	-34.4	0.95	0	55	-	-	-	-	0-360	100	V
28	* 15.56892	50.54	PK2	40.4	-32.6	0.79	0	59.13	-	-	74	-14.87	322	107	V
	* 15.57055	50.54	PK2	40.4	-32.6	0.79	-27.49	31.64	54	-22.36	-	-	322	107	V

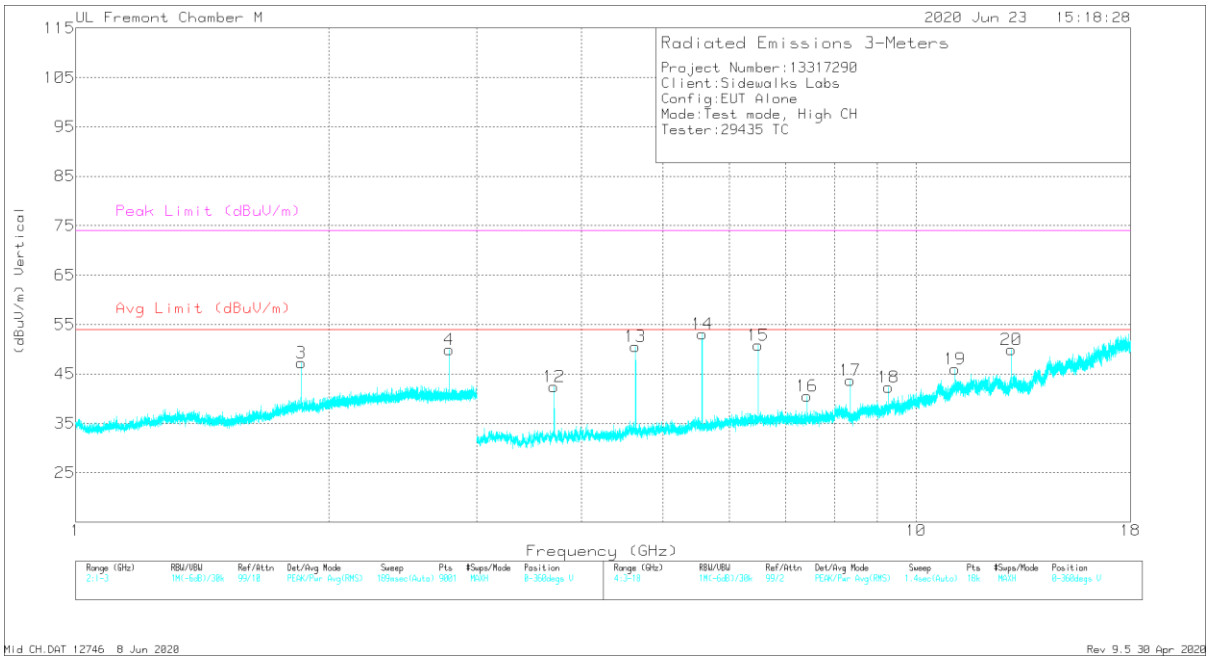
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - KDB558074 Method: Maximum Peak

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

RADIATED EMISSIONS

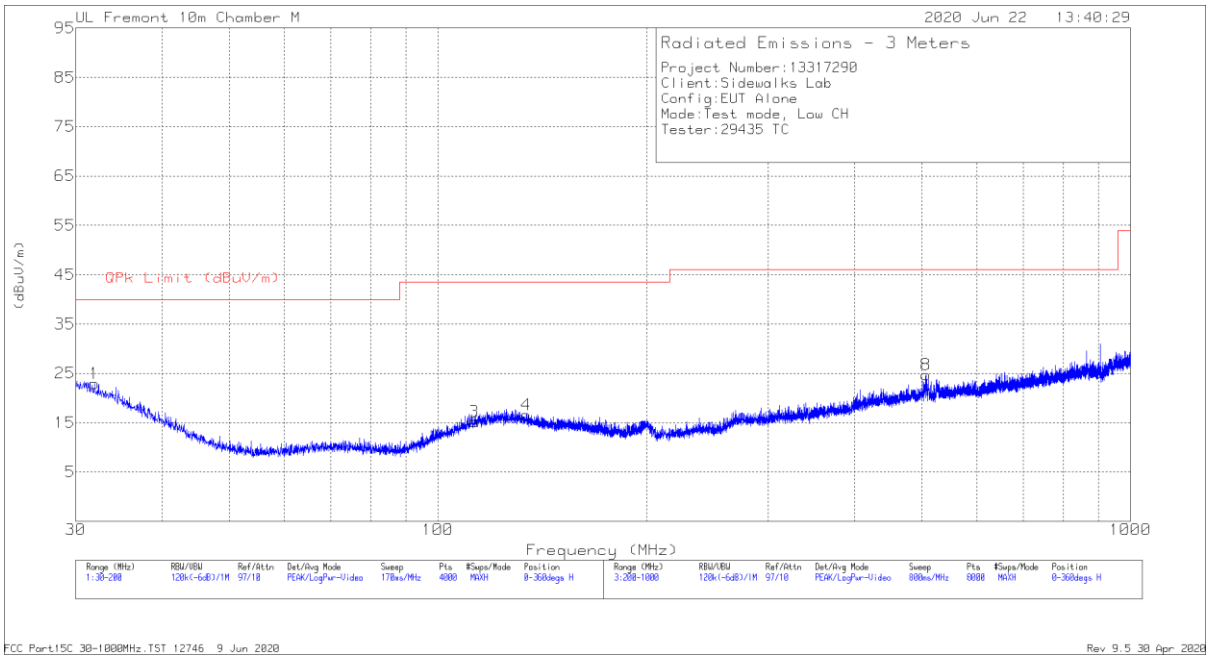
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Filter (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.85511	62.36	Pk	30.7	-38.5	0.56	0	55.12	-	-	-	-	0-360	98	H
2	* 2.78258	60.57	PK2	32.2	-35.4	0.75	0	58.12	-	-	74	-15.88	348	325	H
	* 2.78263	60.57	PK2	32.2	-35.4	0.75	-27.49	30.63	54	-23.37	-	-	348	325	H
3	1.85533	55.02	Pk	30.7	-38.5	0.56	0	47.78	-	-	-	-	0-360	199	V
4	* 2.7827	58.75	PK2	32.2	-35.4	0.75	0	56.3	-	-	74	-17.7	24	363	V
	* 2.78267	58.75	PK2	32.2	-35.4	0.75	-27.49	28.81	54	-25.19	-	-	24	363	V
5	* 3.71027	60.05	PK2	33.2	-42.7	0.52	0	51.07	-	-	74	-22.93	282	326	H
	* 3.71022	60.05	PK2	33.2	-42.7	0.52	-27.49	23.58	54	-30.42	-	-	282	326	H
6	* 4.63776	59.99	PK2	34.1	-42.2	0.42	0	52.31	-	-	74	-21.69	306	108	H
	* 4.63779	59.99	PK2	34.1	-42.2	0.42	-27.49	24.82	54	-29.18	-	-	307	108	H
7	5.56514	57.55	Pk	34.9	-40.8	0.64	0	52.29	-	-	-	-	0-360	200	H
8	6.4927	61.43	Pk	35.7	-39.4	0.53	0	58.26	-	-	-	-	0-360	101	H
9	* 7.42025	44.44	Pk	35.6	-38.5	0.5	0	42.04	-	-	74	-31.96	0-360	101	H
10	* 8.3478	45.02	Pk	35.8	-38.3	0.48	0	43	-	-	74	-31	0-360	101	H
11	12.98556	42.04	Pk	39.3	-34	1.12	0	48.46	-	-	-	-	0-360	101	H
12	* 3.71014	55.37	PK2	33.2	-42.7	0.52	0	46.39	-	-	74	-27.61	243	318	V
	* 3.71026	55.37	PK2	33.2	-42.7	0.52	-27.49	18.9	54	-35.1	-	-	243	318	V
13	* 4.63788	56.44	PK2	34.1	-42.2	0.42	0	48.76	-	-	74	-25.24	57	105	V
	* 4.63772	56.44	PK2	34.1	-42.2	0.42	-27.49	21.27	54	-32.73	-	-	57	105	V
14	5.56514	59.03	Pk	34.9	-40.8	0.64	0	53.77	-	-	-	-	0-360	200	V
15	6.4927	54.54	Pk	35.7	-39.4	0.53	0	51.37	-	-	-	-	0-360	200	V
16	* 7.42025	43.43	Pk	35.6	-38.5	0.5	0	41.03	-	-	74	-32.97	0-360	200	V
17	* 8.3478	46.2	Pk	35.8	-38.3	0.48	0	44.18	-	-	74	-29.82	0-360	101	V
18	9.27618	43.82	Pk	36.2	-37.7	0.66	0	42.98	-	-	-	-	0-360	200	V
19	* 11.13046	44.34	Pk	37.9	-36.2	0.7	0	46.74	-	-	74	-27.26	0-360	101	V
20	12.98639	44.65	Pk	39.3	-34	1.12	0	51.07	-	-	-	-	0-360	101	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - KDB558074 Method: Maximum Peak

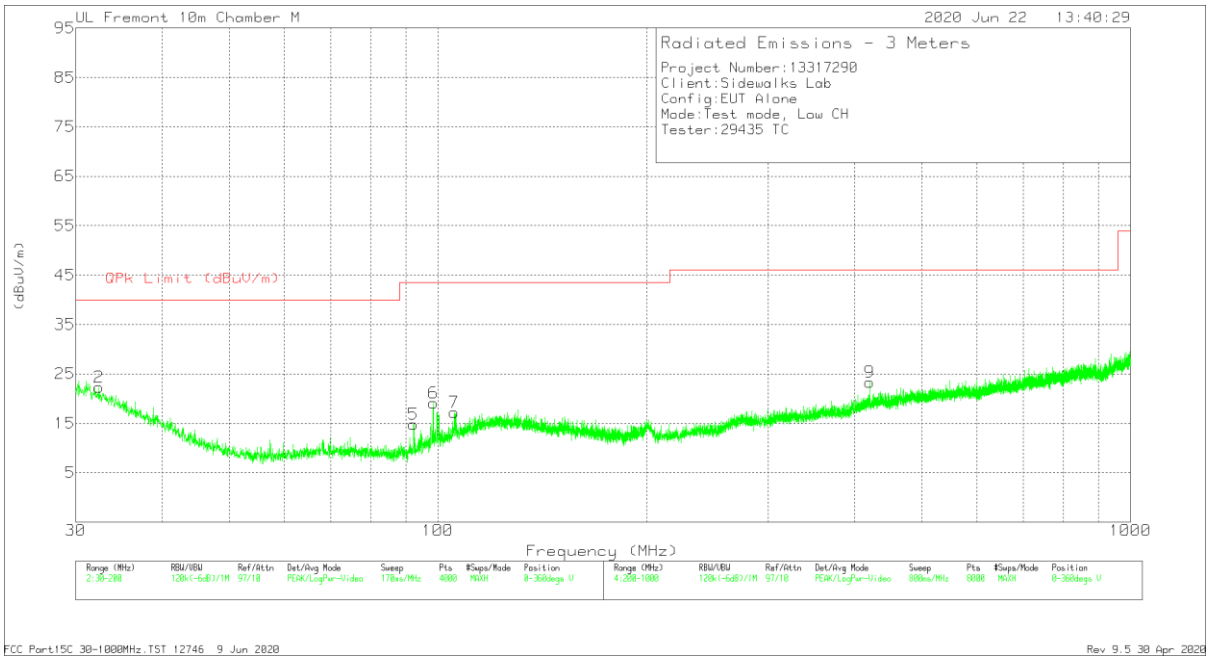
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

10.2. TRANSMITTER BELOW 1 GHz

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

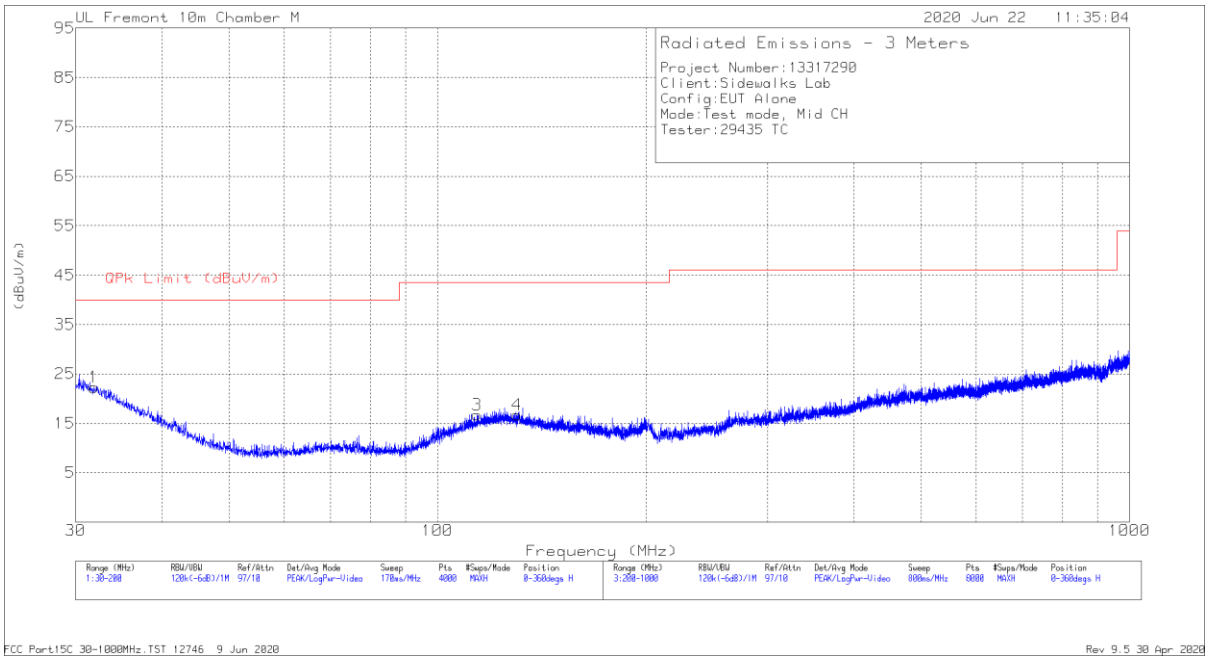
RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184970 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.7399	27.33	Pk	25.7	-28.9	0.04	24.17	40	-15.83	322	123	H
	31.7399	19.84	Qp	25.7	-28.9	0.04	16.68	40	-23.32	322	123	H
3	112.8539	24.8	Pk	18.8	-28.4	0.12	15.32	43.52	-28.2	0-360	299	H
4	134.1094	25.6	Pk	19.2	-28.2	0.13	16.73	43.52	-26.79	0-360	299	H
2	32.4231	26.12	Pk	25.1	-28.9	0.04	22.36	40	-17.64	0-360	100	V
5	92.2786	29.42	Pk	13.9	-28.5	0.11	14.93	43.52	-28.59	0-360	100	V
6	98.5277	32.1	Pk	15.5	-28.5	0.11	19.21	43.52	-24.31	0-360	100	V
7	105.6696	28.33	Pk	17.4	-28.5	0.12	17.35	43.52	-26.17	0-360	100	V
8	506.6399	28.48	Pk	23.4	-27.2	0.21	24.89	46.02	-21.13	0-360	299	H
9	419.9286	28.46	Pk	22.1	-27.3	0.22	23.48	46.02	-22.54	0-360	100	V

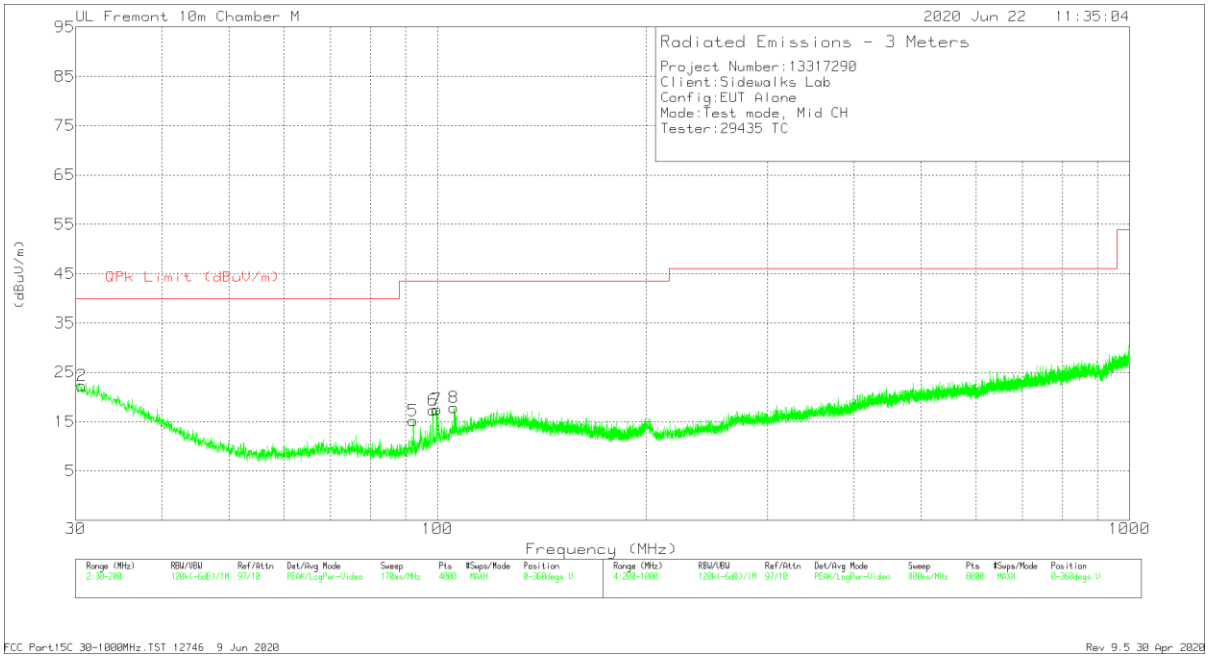
Pk - Peak detector
Qp - Quasi-Peak detector

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

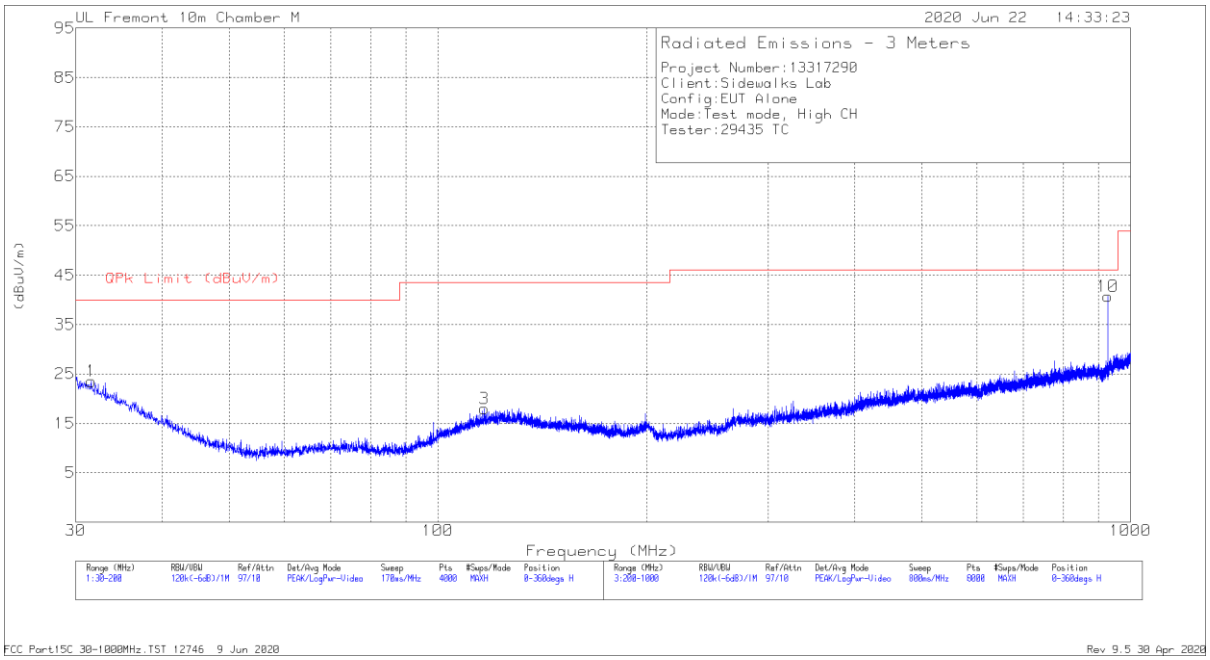
RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184970 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.105	26.75	Pk	25.4	-28.9	0.04	23.29	40	-16.71	68	219	H
	32.105	19.78	Qp	25.4	-28.9	0.04	16.32	40	-23.68	68	219	H
3	114.0442	26.27	Pk	18.9	-28.4	0.12	16.89	43.52	-26.63	0-360	399	H
4	130.1984	25.52	Pk	19.5	-28.3	0.13	16.85	43.52	-26.67	0-360	199	H
2	30.6377	24.86	Pk	26.3	-28.9	0.04	22.3	40	-17.7	0-360	97	V
5	92.2786	29.74	Pk	13.9	-28.5	0.11	15.25	43.52	-28.27	0-360	97	V
6	98.5277	30.31	Pk	15.5	-28.5	0.11	17.42	43.52	-26.1	0-360	97	V
7	99.7606	30.07	Pk	15.8	-28.4	0.11	17.58	43.52	-25.94	0-360	97	V
8	105.6696	28.9	Pk	17.4	-28.5	0.12	17.92	43.52	-25.6	0-360	97	V

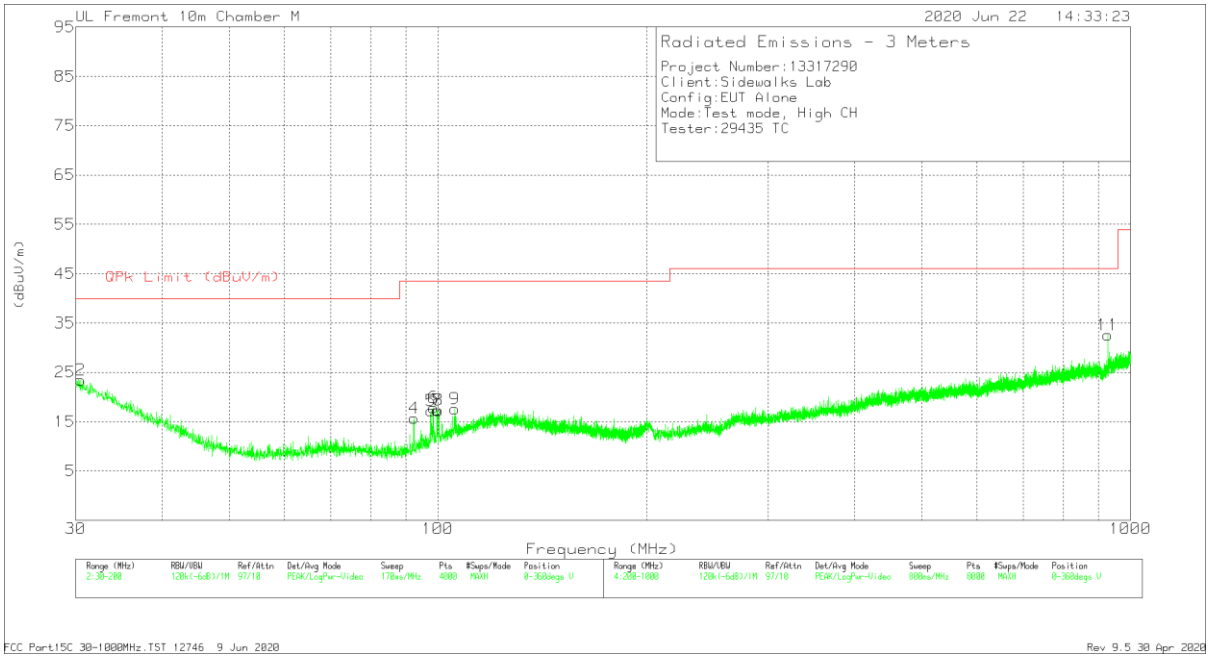
Pk - Peak detector
Qp - Quasi-Peak detector

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

RADIATED EMISSIONS

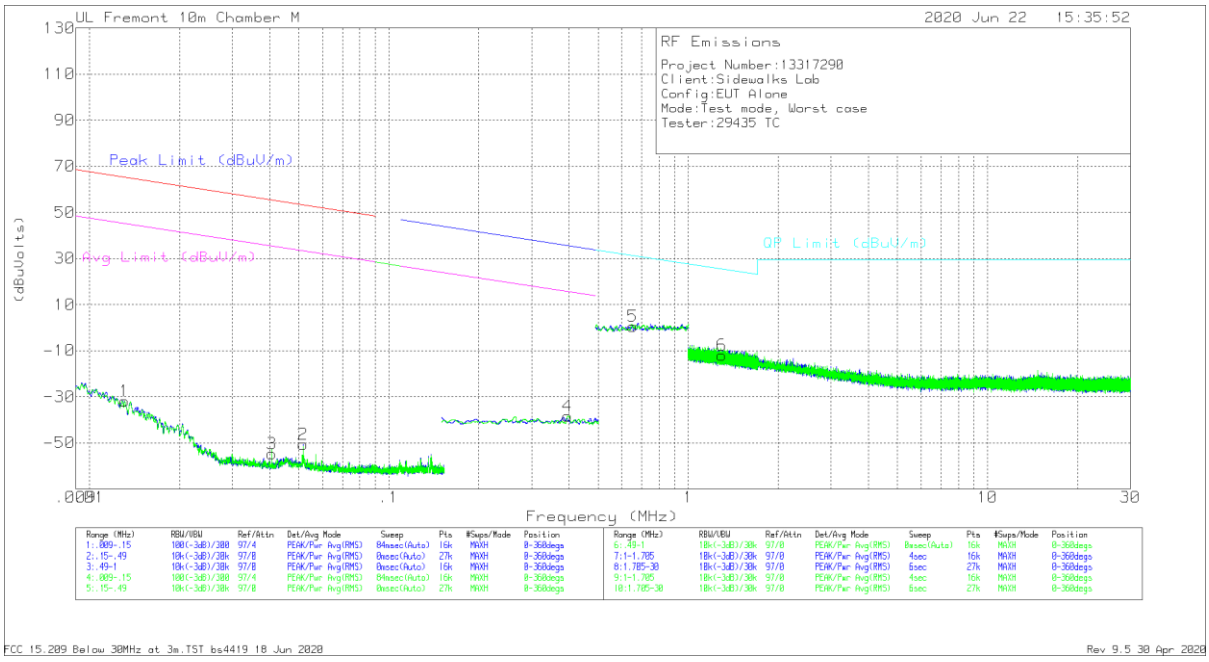
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184970 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.4688	27.9	Pk	25.9	-28.9	0.04	24.94	40	-15.06	120	106	H
	31.4688	19.8	Qp	25.9	-28.9	0.04	16.84	40	-23.16	120	106	H
3	116.5949	27.02	Pk	19.3	-28.3	0.12	18.14	43.52	-25.38	0-360	199	H
2	30.4676	25.99	Pk	26.4	-28.9	0.04	23.53	40	-16.47	0-360	97	V
4	92.3211	30.28	Pk	13.9	-28.5	0.11	15.79	43.52	-27.73	0-360	97	V
5	97.6775	30.44	Pk	15.3	-28.5	0.11	17.35	43.52	-26.17	0-360	97	V
6	98.4852	30.81	Pk	15.5	-28.5	0.11	17.92	43.52	-25.6	0-360	97	V
7	99.718	29.98	Pk	15.8	-28.4	0.11	17.49	43.52	-26.03	0-360	97	V
8	100.2707	29.69	Pk	16	-28.4	0.12	17.41	43.52	-26.11	0-360	97	V
9	105.7546	28.56	Pk	17.5	-28.5	0.12	17.68	43.52	-25.84	0-360	97	V
10*	927.5946	37.23	Pk	28.2	-24.7	--	40.73	46.02	-5.29	0-360	99	H
11*	927.6946	29.06	Pk	28.2	-24.7	--	32.56	46.02	-13.46	0-360	100	V

*Marker 10 & 11 are fundamental signal from EUT.
Pk - Peak detector
Qp - Quasi-Peak detector

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

10.3. WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- TWO ORIENTATIONS FACE ON/FACE OFF

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (E ACF)	Cables with PRE0180177 (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0131	17.42	Pk	59.9	-29.2	-80	-31.88	65.24	-97.12	45.24	-77.12	0-360
2	.05173	2.68	Pk	56.9	-30.2	-80	-50.62	53.31	-103.93	33.31	-83.93	0-360
3	.04067	-1.77	Pk	57.2	-30.2	-80	-54.77	55.4	-110.17	35.4	-90.17	0-360
4	.3965	15.68	Pk	56.2	-30.2	-80	-38.32	35.64	-73.96	15.64	-53.96	0-360

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (E ACF)	Cables with PRE0180177 (dB)	Dist Corr 30m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	.65261	14.48	Pk	56.2	-30.2	-40	.48	-	-	-	-	31.32	-30.84	0-360
6	1.29533	12.91	Pk	45.3	-30.1	-40	-11.89	-	-	-	-	25.38	-37.27	0-360

Pk - Peak detector

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888