TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.249

RSS-GEN, ISSUE 5 MARCH 2019 AMENDMENT 1
RSS-210, ISSUE 10, DECEMBER 2019

TEST REPORT

For

Wyze Labs, Inc.

5808 Lake Washington Blvd NE Ste 300 Kirkland WA ,United States

FCC ID: 2AUIUWVDB1A
IC: 25466-WVDB1A

Report Type:	**Product Type:**
Original Report	WYZE VIDEO DOORBELL

Report Number:	RBJ210323050-00B
Report Date:	2021-04-28
Reviewed By:	Ivan Cao Assistant Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	WYZE VIDEO DOORBELL
EUT Model:	WVDB1
Operation Frequency:	906.2-906.8 MHz
Antenna Gain▲:	1.5 dBi
Modulation Type:	GFSK
Rated Input Voltage:	AC 16-24 V
Serial Number:	RBJ210323050-RF -S2
EUT Received Date:	2021.03.24
EUT Received Status:	Good

Objective

This type approval report is prepared on behalf of ***Wyze Labs, Inc.*** in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules and RSS-210, Issue 10, December 2019 of the Innovation, Science and Economic Development Canada.

The tests were performed in order to determine compliance with FCC Rules Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209, 15.215 and 15.249 rules and RSS-Gen Issue 5, March 2019, Amendment 1, General Requirements for Compliance of Radio Apparatus.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. and the RSS-210, Issue 10, December 2019. Applicable Standard: Licence-Exempt Radio Apparatus: Category I Equipment. And RSS-Gen Issue 5, March 2019, Amendment 1, General Requirements for Compliance of Radio Apparatus.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~26.5GHz: 5.23 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

The device employs total 4 channels as below:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	906.2	3	906.6
2	906.4	4	906.8

EUT was tested with channel 1,3 and 4.

EUT Exercise Software

No software was used in test, the device was configured to engineer mode by manufacturer, the channel was switched by keys.

Equipment Modifications

No modifications were made to the EUT.

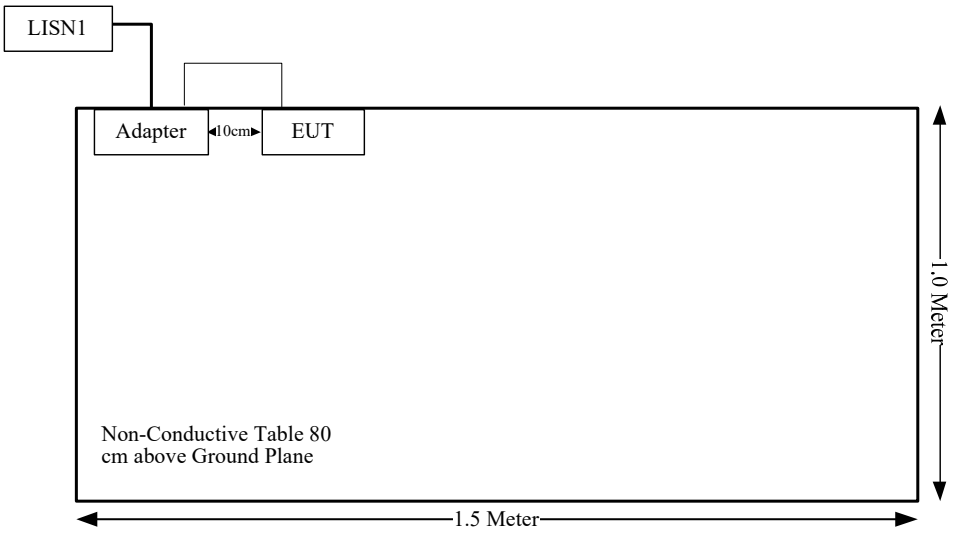
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dongguan Aohai Technology Co.,Ltd	Adapter	A138A-120150U-US2	AH2002105372

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	0.5	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
RSS-102 Clause 2.5.2	Exemption Limits For Routine Evaluation-RF Exposure Evaluation	Compliance
§15.203, RSS-GEN Clause 6.8	Antenna Requirement	Compliance
§15.207(a), RSS-Gen Clause 8.8	Conduction Emissions	Compliance
15.205, §15.209, §15.249, RSS-210 ANNEX B.10, RSS -GEN CLAUSE 8.10	Radiated Emissions	Compliance
§15.215 (c), RSS-GEN CLAUSE 6.7	20 dB Bandwidth	Compliance

RSS-102 § 2.5.2 - EXEMPTION LIMITS FOR ROUTINE EVALUATION – RF EXPOSURE EVALUATION

Applicable Standard

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Measurement Result:

The device is a low power device, the stand-alone RF exposure evaluation can be exempted.

FCC§15.203, RSS-GEN CLAUSE 6.8 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

According to RSS-Gen §6.8, the applicant for equipment certification shall provide a list of all antenna types that may be used with the Microphone, where applicable (i.e. for Microphones with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the Microphone with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the Microphone is equipped with any antenna type, selected from this list.
For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of Microphone and antenna type, with the Microphone output power set at the maximum level. However, the Microphone shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).
When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the Microphone being tested.
For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:
This radio Microphone [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the Microphone, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has internal PCB Antenna permanently attached to the unit, the antenna gain is 1.5 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

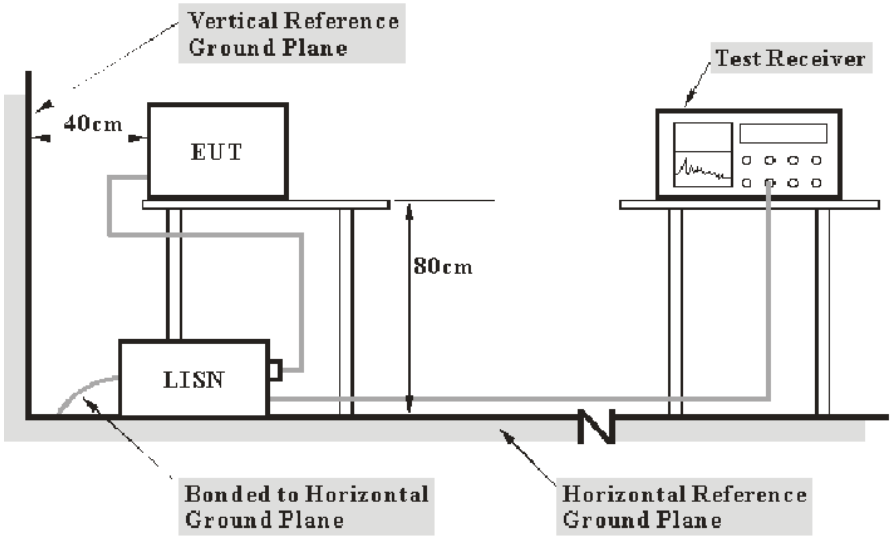
Result: Compliant.

FCC §15.207 (a) & RSS-GEN CLAUSE 8.8– AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a), RSS-GEN CLAUSE 8.8.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 and RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the EUT was connected to the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division factor of AMN
C_f: Correction Factor

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

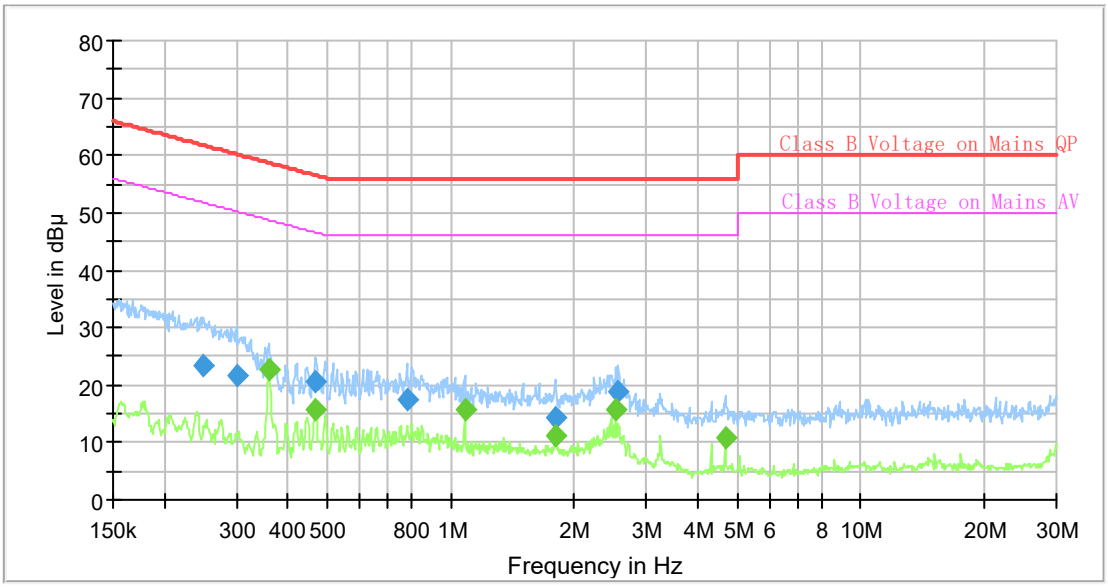
Test Data

Environmental Conditions

Temperature:	24.5℃
Relative Humidity:	67%
ATM Pressure:	101.2kPa
Tester:	Walker Chen
Test Date:	2021-04-12

Test Mode: *Transmitting*

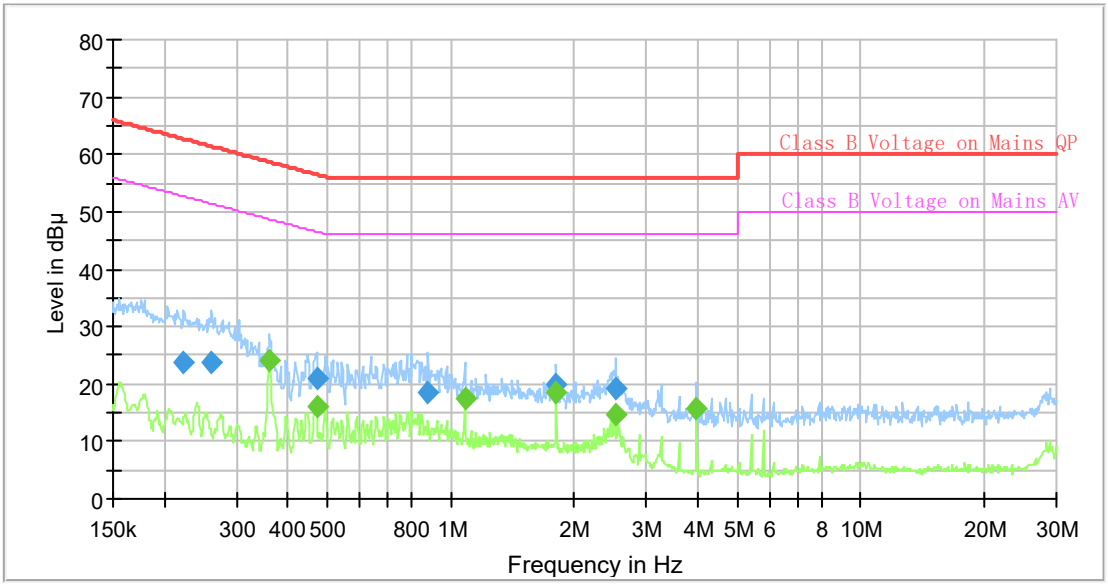
AC120V, 60 Hz, Line:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.249476	23.39	---	61.77	38.38	9.000	L1	9.6
0.300036	21.69	---	60.24	38.55	9.000	L1	9.6
0.360843	---	22.75	48.71	25.96	9.000	L1	9.6
0.467685	---	15.70	46.55	30.85	9.000	L1	9.6
0.467685	20.45	---	56.55	36.10	9.000	L1	9.6
0.781732	17.40	---	56.00	38.60	9.000	L1	9.7
1.081065	---	15.69	46.00	30.31	9.000	L1	9.7
1.798001	---	11.29	46.00	34.71	9.000	L1	9.7
1.798001	14.36	---	56.00	41.64	9.000	L1	9.7
2.523959	---	15.88	46.00	30.12	9.000	L1	9.7
2.562008	18.73	---	56.00	37.27	9.000	L1	9.7
4.684615	---	11.00	46.00	35.00	9.000	L1	9.7

AC120V, 60 Hz, Neutral:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.223551	23.77	---	62.69	38.92	9.000	N	9.6
0.260930	23.79	---	61.40	37.61	9.000	N	9.6
0.360843	---	24.14	48.71	24.57	9.000	N	9.6
0.470023	---	16.22	46.51	30.29	9.000	N	9.6
0.470023	21.08	---	56.51	35.43	9.000	N	9.6
0.881136	18.35	---	56.00	37.65	9.000	N	9.6
1.081065	---	17.55	46.00	28.45	9.000	N	9.6
1.806991	---	18.38	46.00	27.62	9.000	N	9.6
1.806991	20.06	---	56.00	35.94	9.000	N	9.6
2.523959	---	14.55	46.00	31.45	9.000	N	9.6
2.523959	19.14	---	56.00	36.86	9.000	N	9.6
3.973689	---	15.73	46.00	30.27	9.000	N	9.6

FCC§15.205, §15.209&§15.249，RSS-210 ANNEX B.10,RSS -GEN CLAUSE 8.10- RADIATED EMISSIONS

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

As per RSS-210 Annex B.10

Devices shall comply with the following requirements:

(a) The field strength of fundamental and harmonic emissions measured at 3 m shall not exceed the limits in table B2.

Table B2 — Field strength limits at various frequencies

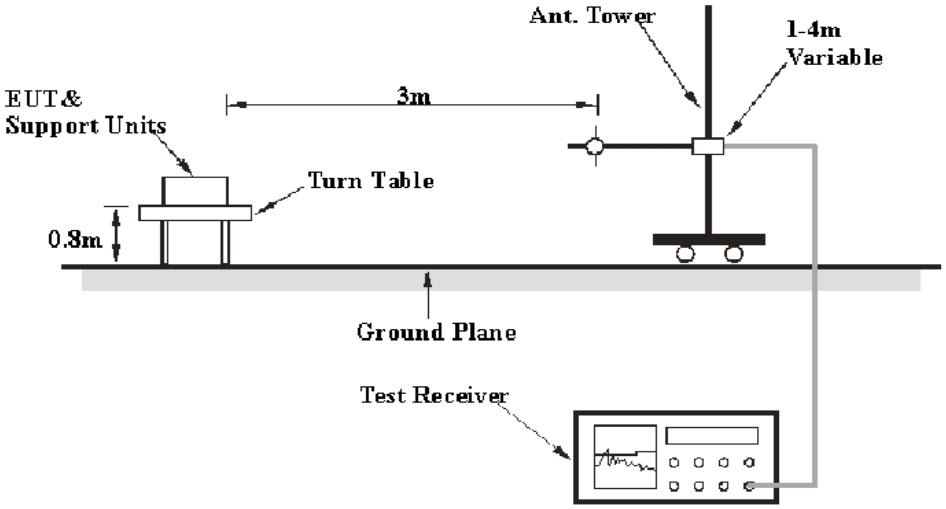
Frequency bands (MHz)	Field strength (mV/m)	
	Fundamental emissions	Harmonic emissions
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5
24000-24250	250	2.5

The field strength shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector.

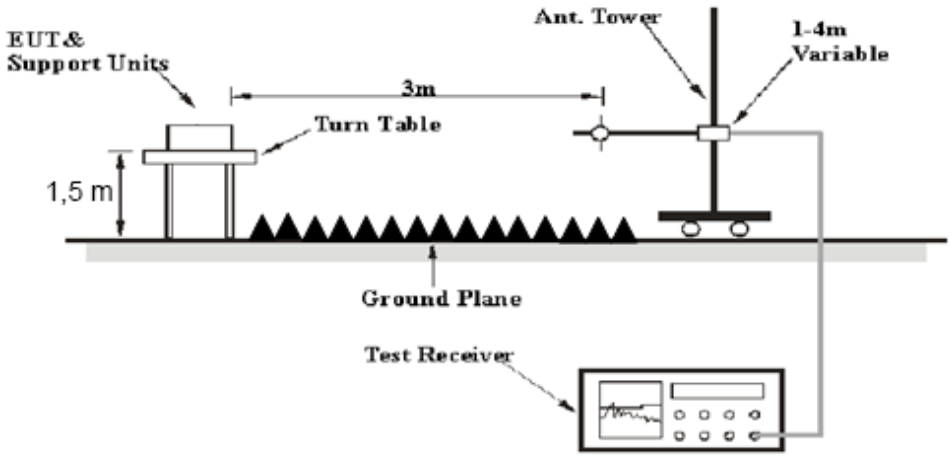
(b) Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

EUT Setup

Below 1 GHz:



1-10 GHz:



The radiated emission below 1GHz tests were performed in the 10 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.249 limits.

Test Equipment Setup

The system was investigated from 30 MHz to 10 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz - 1 GHz, peak and average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiation Above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

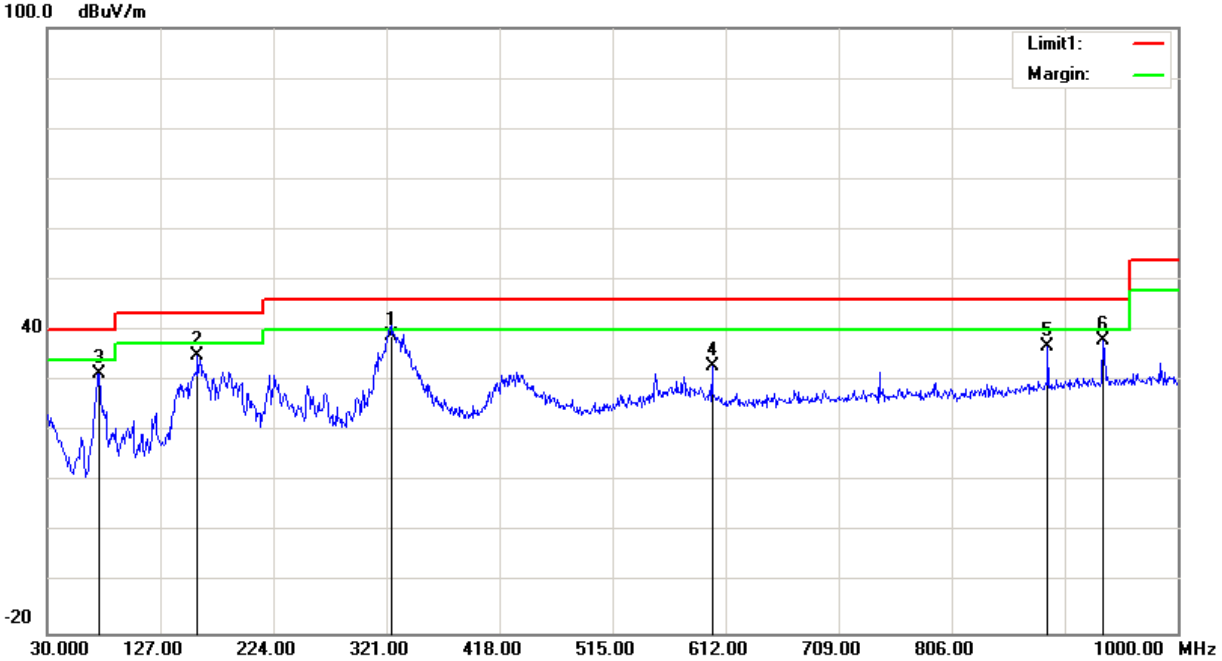
Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	21.4°C	26.8 °C
Relative Humidity:	53 %	47 %
ATM Pressure:	101.3 kPa	101.2 kPa
Tester:	Asa Chen	Lee Li
Test Date:	2021.04.20	2021.04.21

Test Mode: Transmitting

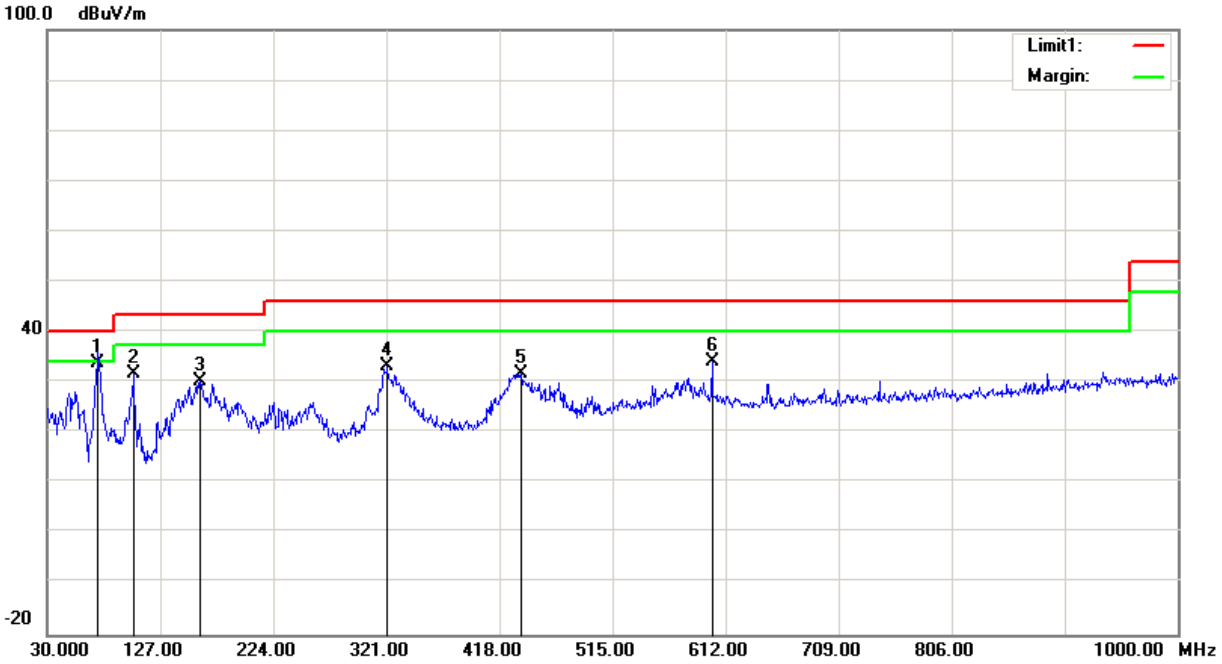
1) 30MHz-1GHz(Middle channel was the worst)

Horizontal:



Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
324.8800	45.93	QP	-7.03	38.90	46.00	7.10
159.0100	44.55	peak	-9.39	35.16	43.50	8.34
74.6200	47.75	peak	-16.16	31.59	40.00	8.41
600.3600	34.40	peak	-1.39	33.01	46.00	12.99
888.4500	33.60	peak	3.19	36.79	46.00	9.21
935.9800	33.79	peak	4.36	38.15	46.00	7.85

Vertical:



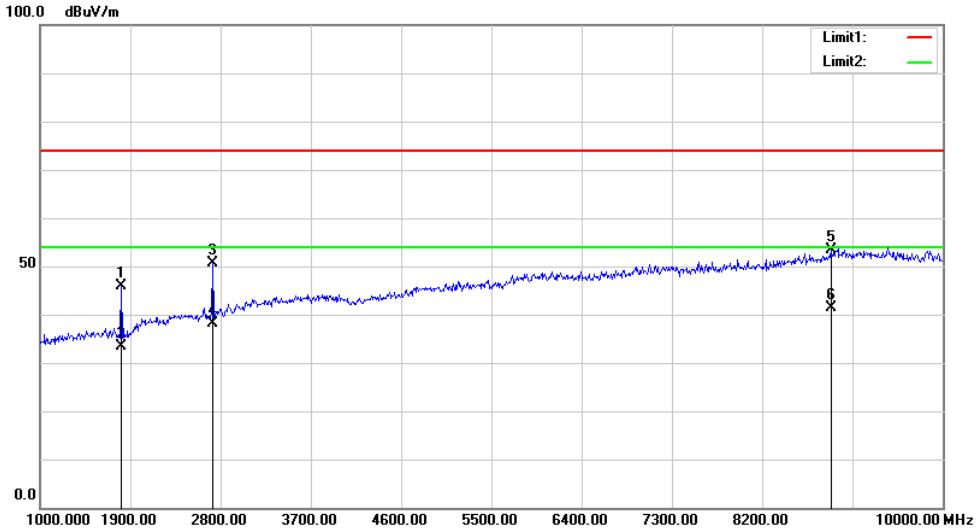
Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
73.6500	50.18	QP	-16.18	34.00	40.00	6.00
103.7200	45.57	peak	-13.69	31.88	43.50	11.62
160.9500	39.70	peak	-9.44	30.26	43.50	13.24
321.9700	40.25	peak	-7.02	33.23	46.00	12.77
436.4300	36.34	peak	-4.48	31.86	46.00	14.14
600.3600	35.62	peak	-1.39	34.23	46.00	11.77

2) 1GHz-10GHz:

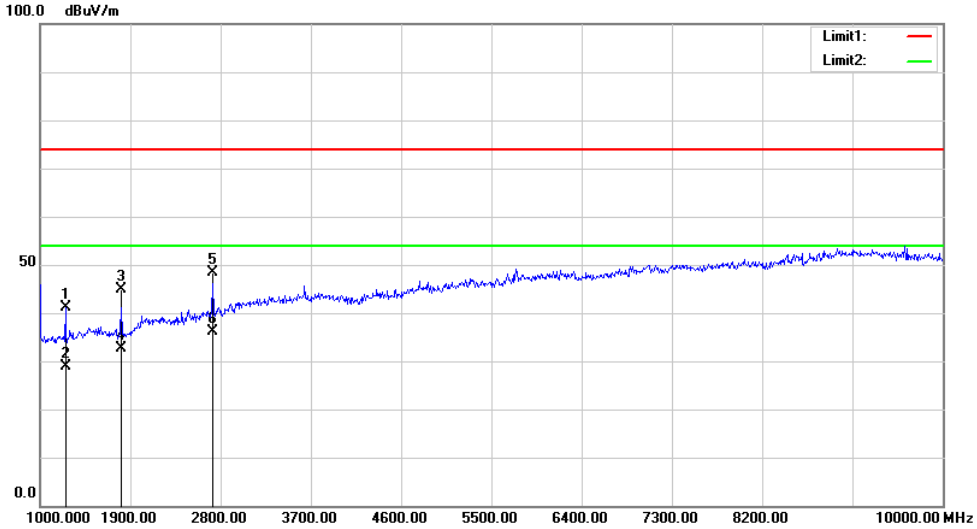
Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Detector	Polar	Factor					
MHz	dBµV	PK/QP/AV	H/V	dB/m	dB	dB	dBµV/m	dBµV/m	dB
Low Channel									
906.20	61.20	QP	H	22.74	5.28	0.00	89.22	93.98	4.76
906.20	64.50	QP	V	22.74	5.28	0.00	92.52	93.98	1.46
902.00	14.60	QP	V	22.71	5.27	0.00	42.58	46.00	3.42
1812.40	42.36	PK	V	26.51	1.66	25.83	44.70	74.00	29.30
1812.40	36.74	AV	V	26.51	1.66	25.83	39.08	54.00	14.92
2718.60	44.46	PK	V	29.09	1.88	26.11	49.32	74.00	24.68
2718.60	32.52	AV	V	29.09	1.88	26.11	37.38	54.00	16.62
3624.80	37.75	PK	V	31.57	2.44	25.94	45.82	74.00	28.18
3624.80	27.15	AV	V	31.57	2.44	25.94	35.22	54.00	18.78
4531.00	35.73	PK	V	32.36	3.04	25.73	45.40	74.00	28.60
4531.00	23.58	AV	V	32.36	3.04	25.73	33.25	54.00	20.75
5437.20	35.79	PK	V	34.00	3.59	25.37	48.01	74.00	25.99
5437.20	23.81	AV	V	34.00	3.59	25.37	36.03	54.00	17.97
6343.40	35.43	PK	V	34.23	4.46	24.92	49.20	74.00	24.80
6343.40	23.23	AV	V	34.23	4.46	24.92	37.00	54.00	17.00
7249.60	35.14	PK	V	35.85	4.75	25.65	50.09	74.00	23.91
7249.60	23.56	AV	V	35.85	4.75	25.65	38.51	54.00	15.49
8155.80	35.23	PK	V	36.99	4.89	26.05	51.06	74.00	22.94
8155.80	23.25	AV	V	36.99	4.89	26.05	39.08	54.00	14.92
9062.00	35.53	PK	V	37.72	5.52	25.77	53.00	74.00	21.00
9062.00	23.14	AV	V	37.72	5.52	25.77	40.61	54.00	13.39

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Detector	Polar	Factor					
MHz	dBµV	PK/QP/AV	H/V	dB/m	dB	dB	dBµV/m	dBµV/m	dB
Middle Channel									
906.60	61.00	QP	H	22.74	5.29	0.00	89.03	93.98	4.95
906.60	62.20	QP	V	22.74	5.29	0.00	90.23	93.98	3.75
902.00	14.60	QP	V	22.71	5.27	0.00	42.58	46.00	3.42
1813.20	42.17	PK	V	26.52	1.66	25.84	44.51	74.00	29.49
1813.20	36.55	AV	V	26.52	1.66	25.84	38.89	54.00	15.11
2719.80	43.24	PK	V	29.09	1.89	26.11	48.11	74.00	25.89
2719.80	32.33	AV	V	29.09	1.89	26.11	37.20	54.00	16.80
3626.40	37.56	PK	V	31.58	2.44	25.94	45.64	74.00	28.36
3626.40	26.93	AV	V	31.58	2.44	25.94	35.01	54.00	18.99
4533.00	35.54	PK	V	32.37	3.04	25.74	45.21	74.00	28.79
4533.00	23.39	AV	V	32.37	3.04	25.74	33.06	54.00	20.94
5439.60	35.63	PK	V	34.00	3.59	25.37	47.85	74.00	26.15
5439.60	23.62	AV	V	34.00	3.59	25.37	35.84	54.00	18.16
6346.20	35.24	PK	V	34.23	4.47	24.93	49.01	74.00	24.99
6346.20	23.01	AV	V	34.23	4.47	24.93	36.78	54.00	17.22
7252.80	34.95	PK	V	35.86	4.74	25.65	49.90	74.00	24.10
7252.80	23.39	AV	V	35.86	4.74	25.65	38.34	54.00	15.66
8159.40	35.04	PK	V	36.99	4.89	26.05	50.87	74.00	23.13
8159.40	23.06	AV	V	36.99	4.89	26.05	38.89	54.00	15.11
9066.00	35.34	PK	V	37.73	5.52	25.77	52.82	74.00	21.18
9066.00	22.95	AV	V	37.73	5.52	25.77	40.43	54.00	13.57
High Channel									
906.80	60.70	QP	H	22.74	5.29	0.00	88.73	93.98	5.25
906.80	62.10	QP	V	22.74	5.29	0.00	90.13	93.98	3.85
902.00	15.10	QP	V	22.71	5.27	0.00	43.08	46.00	2.92
1813.60	41.09	PK	V	26.52	1.66	25.84	43.43	74.00	30.57
1813.60	36.47	AV	V	26.52	1.66	25.84	38.81	54.00	15.19
2720.40	43.19	PK	V	29.09	1.89	26.11	48.06	74.00	25.94
2720.40	32.25	AV	V	29.09	1.89	26.11	37.12	54.00	16.88
3627.20	37.48	PK	V	31.58	2.44	25.94	45.56	74.00	28.44
3627.20	26.88	AV	V	31.58	2.44	25.94	34.96	54.00	19.04
4534.00	35.46	PK	V	32.37	3.04	25.74	45.13	74.00	28.87
4534.00	23.31	AV	V	32.37	3.04	25.74	32.98	54.00	21.02
5440.80	35.52	PK	V	34.01	3.59	25.37	47.75	74.00	26.25
5440.80	23.54	AV	V	34.01	3.59	25.37	35.77	54.00	18.23
6347.60	35.16	PK	V	34.23	4.47	24.93	48.93	74.00	25.07
6347.60	22.96	AV	V	34.23	4.47	24.93	36.73	54.00	17.27
7254.40	34.87	PK	V	35.86	4.74	25.65	49.82	74.00	24.18
7254.40	23.29	AV	V	35.86	4.74	25.65	38.24	54.00	15.76
8161.20	34.96	PK	V	36.99	4.89	26.05	50.79	74.00	23.21
8161.20	22.98	AV	V	36.99	4.89	26.05	38.81	54.00	15.19
9068.00	35.26	PK	V	37.73	5.52	25.77	52.74	74.00	21.26
9068.00	22.87	AV	V	37.73	5.52	25.77	40.35	54.00	13.65

Test plots(Low Channel was the worst):
Horizontal



Vertical:



FCC §15.215(c), RSS-GEN CLAUSE 6.7 – 20 dB BANDWIDTH TESTING&99% OCCUPIED BANDWIDTH

Applicable Standard

According to FCC §15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

According to RSS-Gen §6.7

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the "x dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The Microphone shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth)

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101589	2020-06-24	2021-06-23
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	2020-09-05	2021-09-05
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	2020-05-06	2021-05-06
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	2020-09-06	2021-09-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.9°C
Relative Humidity:	38 %
ATM Pressure:	101.1 kPa
Tester:	Rennes Guo
Test Date:	2021-03-28

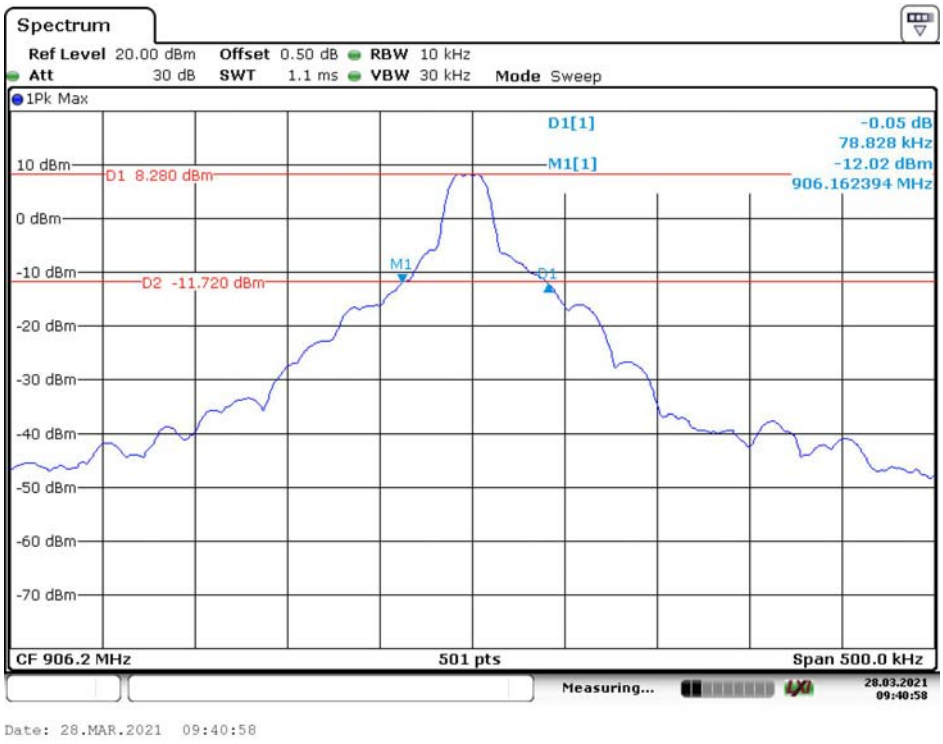
Test Result: Compliant. Please refer to following tables and plots

Test Mode: Transmitting

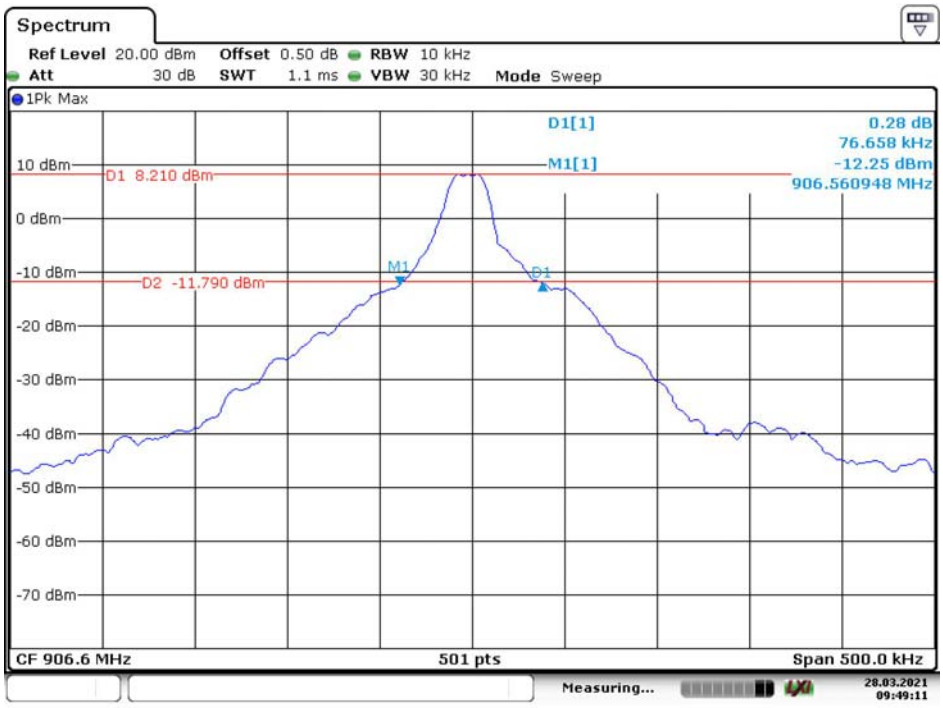
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	906.2	78.828	91.816
Middle	906.6	76.658	93.812
High	906.8	80.997	83.832

20dB Bandwidth:

906.2 MHz



906.6 MHz



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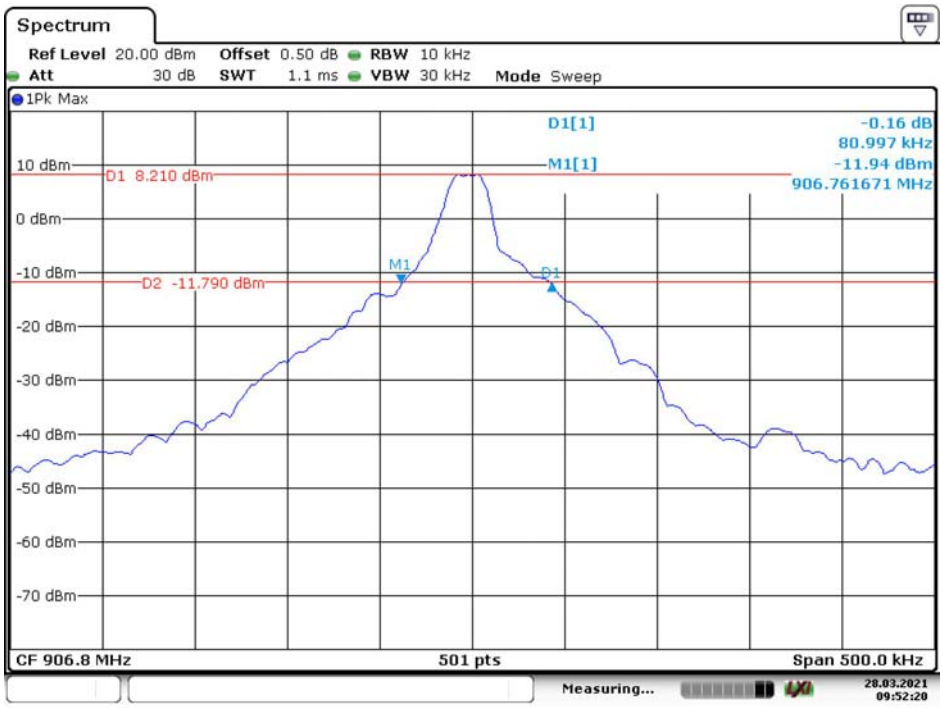
906.8 MHz



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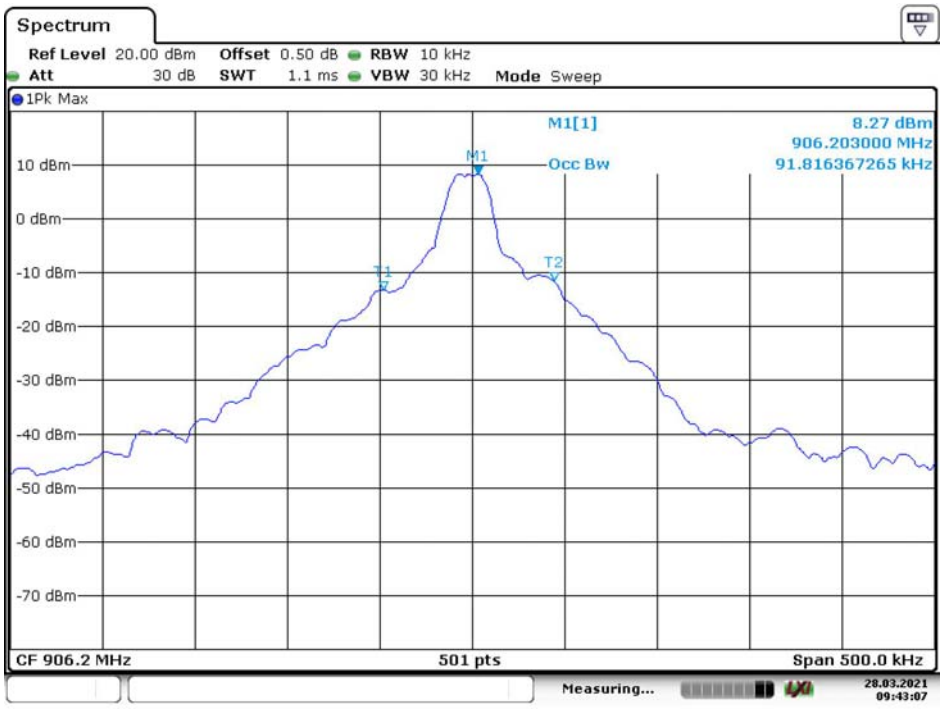
99% Occupied Bandwidth:

906.2 MHz



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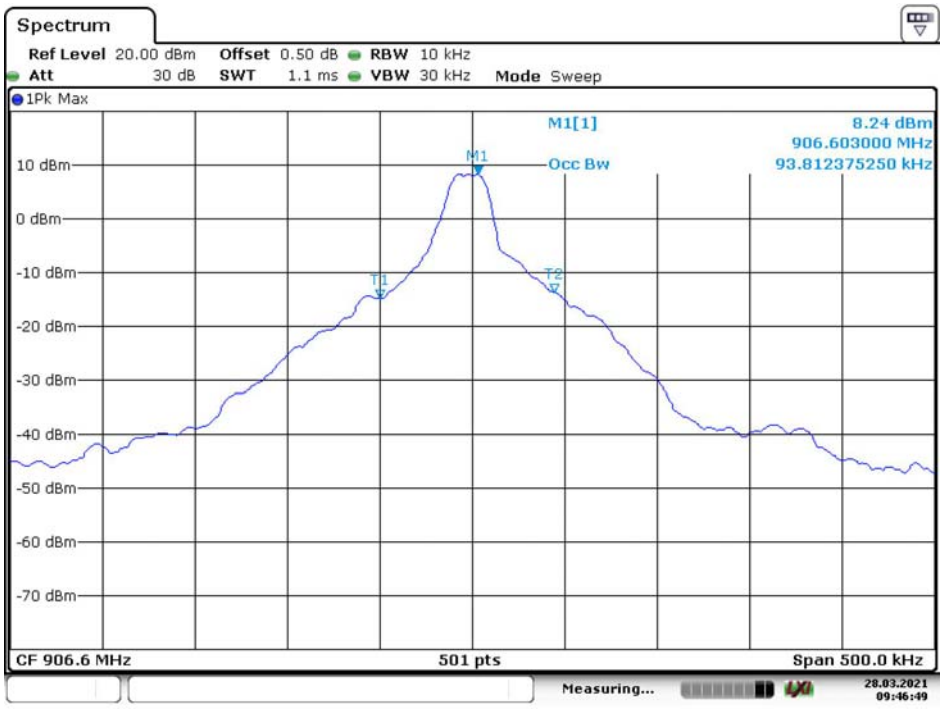
906.6 MHz



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906.8 MHz

******* END OF REPORT *******