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.

3933 Lake Washington Blvd NE, Suite 350 Kirkland, Washington,United States

FCC ID: 2AUIUWVDB1
IC: 25466-WVDB1

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

Report Number:	RBJ200731050-00B
Report Date:	2020-10-12
Reviewed By:	Gavin Xu RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Type:	WYZE VIDEO DOORBELL
EUT Model:	WVDB1
Operation Frequency:	906.2-906.8MHz
Modulation Type:	GFSK
Rated Input Voltage:	AC 16V~24V
Serial Number:	RBJ200731050-RF-S2
EUT Received Date:	2020.08.04
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, and RSS-Gen Issue 5, March 2019 Amendment 1, General Requirements for Compliance of Radio Apparatus.

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 and 15.249 rules, and RSS-210, Issue 10, December 2019 of the Innovation, Science and Economic Development Canada, and RSS-Gen Issue 5, March 2019 Amendment 1, General Requirements for Compliance of Radio Apparatus.

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AUIUWVDB1
RSS-247 DTS submissions with IC: 25466-WVDB1
Part of system submittal with FCC ID: 2ANJHWDBC1, IC: 24984-WDBC1.

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 RSS-210, Issue 10, December 2019 of the Innovation, Science and Economic Development Canada, and RSS-Gen Issue 5, March 2019 Amendment 1, General Requirements for Compliance of Radio Apparatus. ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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.69 Pulongcun, Puxinhu Industry Area, Tangxia, 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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This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★".

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured in operating mode for testing which was provided by the manufacturer.

The device employs total 3 channels as below for test:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	906.2	3	906.8
2	906.6	/	/

EUT Exercise Software

The software: 'Engineering mode ' was used during test, which was provided by manufacturer. The maximum power level was configured by the software as below table:

Channel	Frequency (MHz)	Power level Setting
Low	906.2	default
Middle	906.6	default
High	906.8	default

Equipment Modifications

No modifications were made to the EUT.

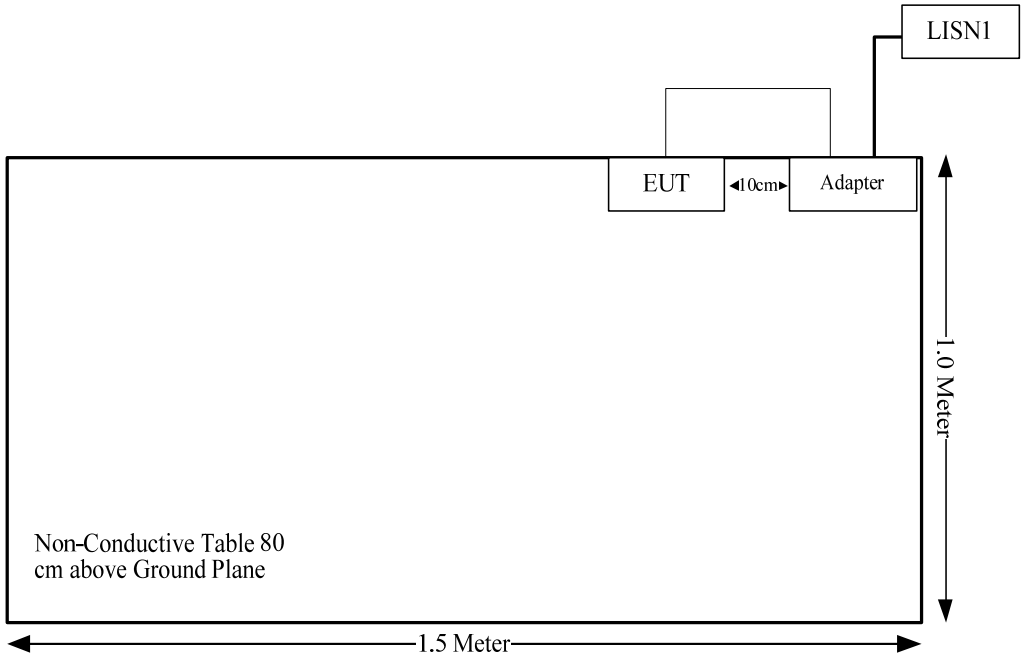
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
MaCable	AC Adapter	MKAC-66-24300M	MC220-24-3-72

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
AC Adapter Cable	Yes	No	1.2	LISN 1	Adapter
AC Adapter Cable	Yes	N0	1.2	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 99% Occupied 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.

Calculated Data:

The maximum EIRP including tune-up tolerance is -18dBm(0.02mW), which was declared by manufacturer.

Exemption from Routine Evaluation Limit is:
$1.31 \times 10^{-2}\ f^{0.6834} = 1.31 \times 10^{-2} \times 906.2^{0.6834} = 1.37W > 0.02mW$

So the device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

Result: Compliance

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 transmitter, where applicable (i.e. for transmitters 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 transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter 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 transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter 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 transmitter being tested.
For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [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 transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal antenna arrangement for SRD, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	input impedance (Ohm)	Antenna Gain
FPC	50	1.5 dBi

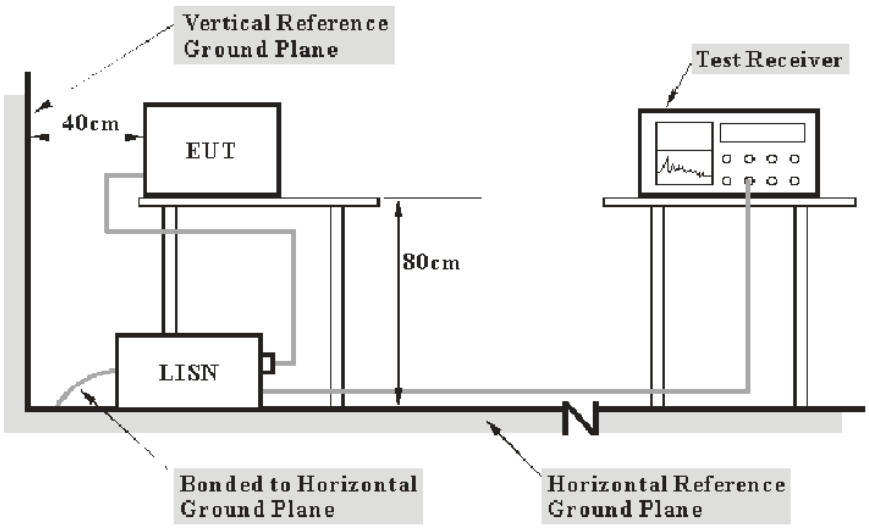
Result: Compliance.

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	2019-09-12	2020-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
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).

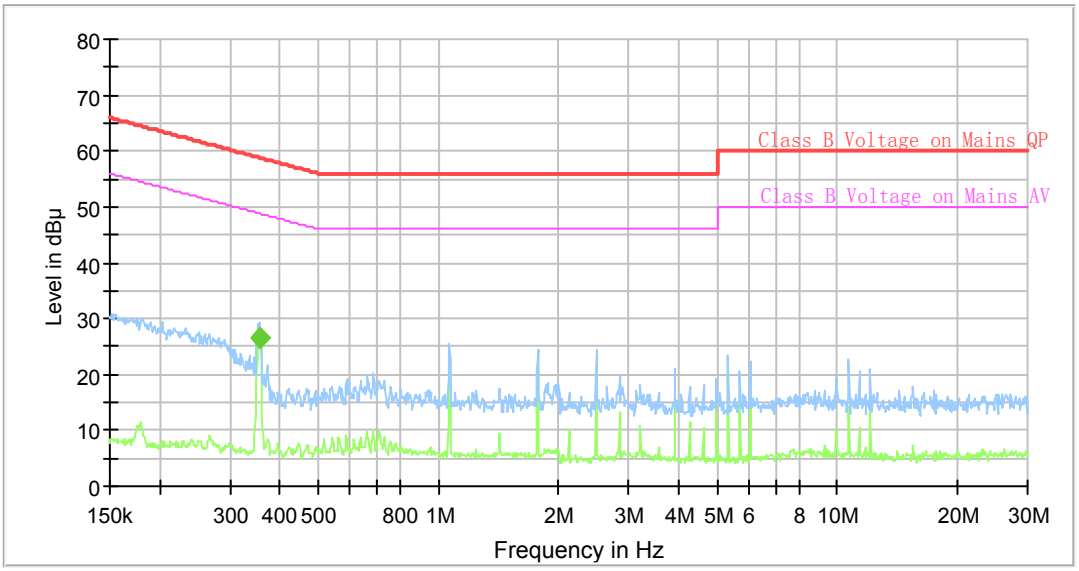
Test Data

Environmental Conditions

Temperature:	27.2℃
Relative Humidity:	73%
ATM Pressure:	101kPa
Tester:	Barry Yang
Test Date:	2020-08-20

Test Mode: *Transmitting*

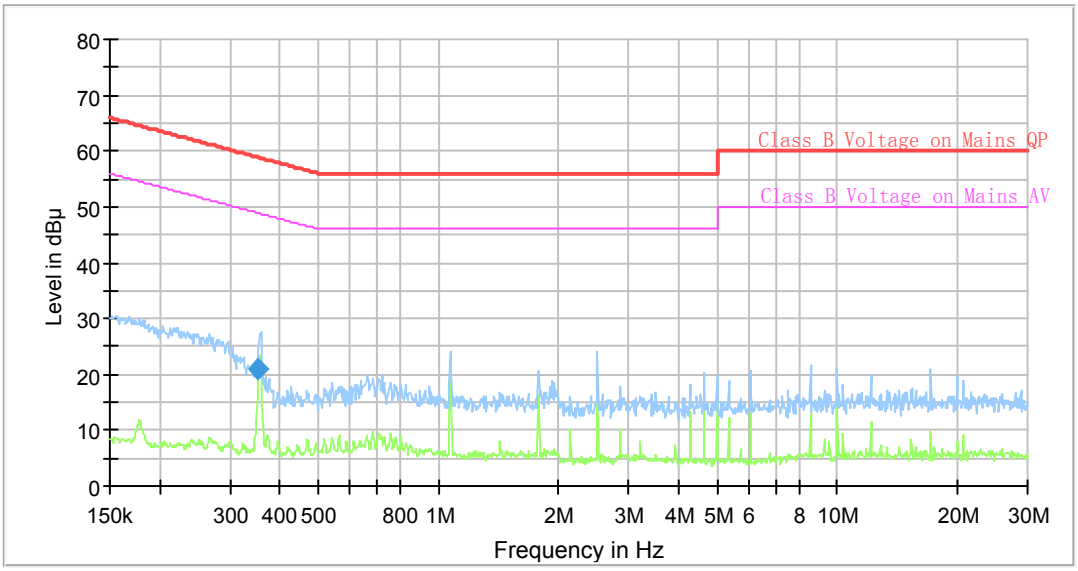
AC120V, 60 Hz, Line:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.355484	---	26.42	48.83	22.41	9.000	L1	9.6

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)
0.353715	21.01	---	58.87	37.86	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

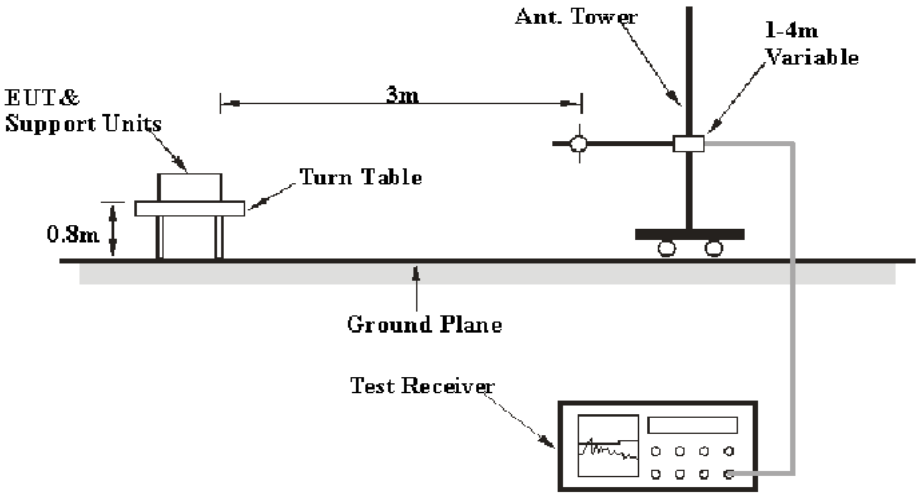
Frequency bands (MHz)	Field strength (mV/m)	
	Fundamental emissions	Harmonic emissions
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5
24000-24250	250	2.5

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.

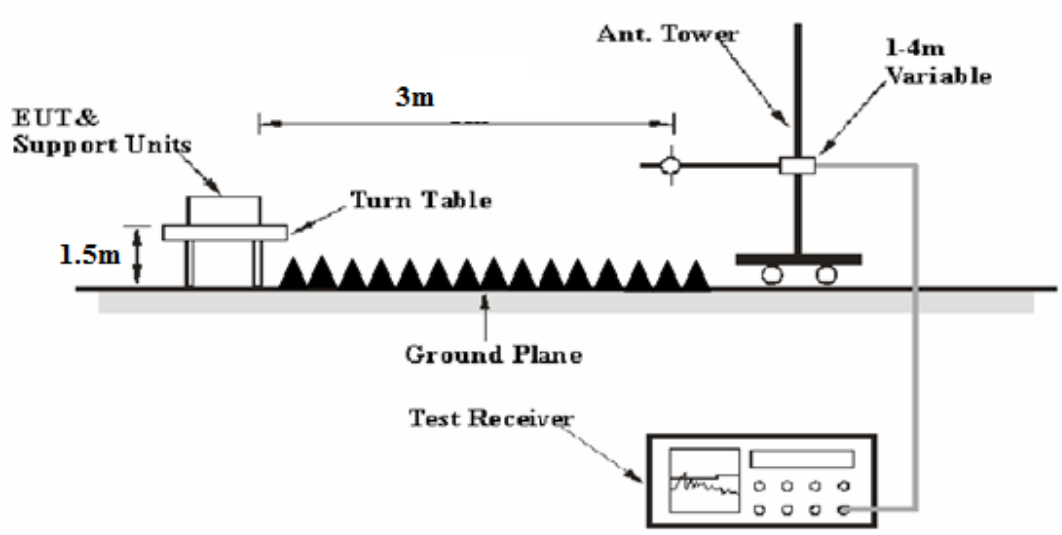
(b) Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission below 1GHz tests were performed in the 3 meters chamber test site A, 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 and the RSS-Gen, and RSS-210 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.

All data was recorded in the Quasi-peak detection mode from 30 MHz to 1GHz, peak and average detection mode 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
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	EMI Test Receiver	ESR3	102453	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2020-05-06	2021-05-06
HP	Amplifier	8447D	2727A05902	2020-09-05	2021-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-01-04	2021-01-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
E-Microwave	Band Rejector Filters	OBSF-900-928-S	OE01601744	2020-06-16	2021-06-16
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2020-09-05	2021-09-05

*** 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

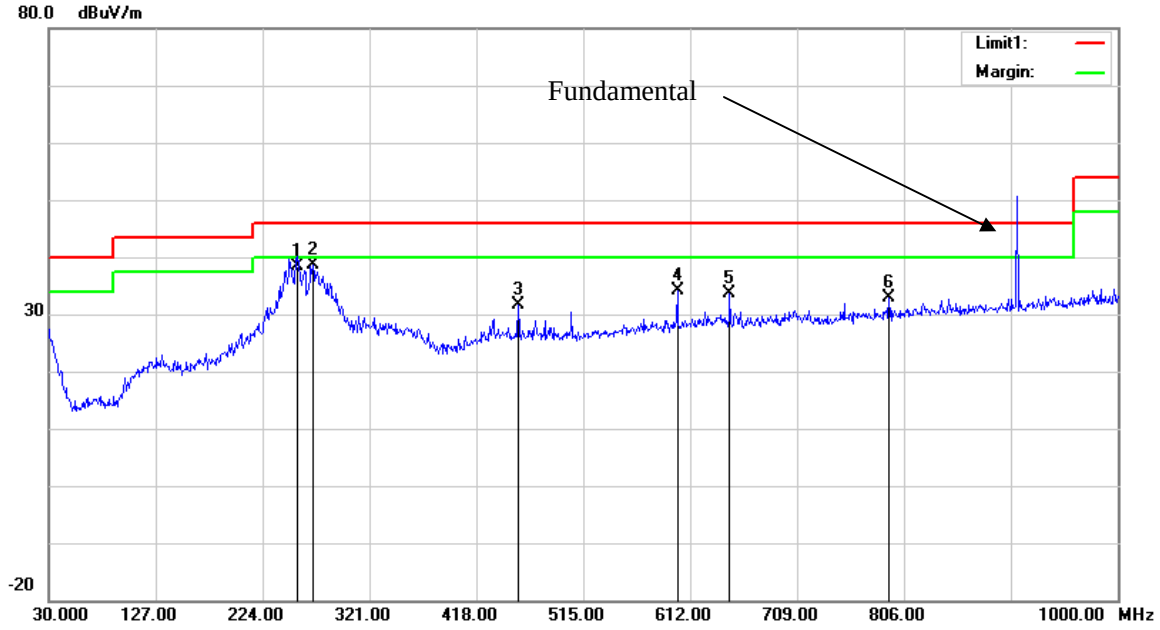
Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	28.4°C	28.4°C
Relative Humidity:	52%	52%
ATM Pressure:	100.8 kPa	100.8 kPa
Tester:	Hanson Li	Bond Qin
Test Date:	2020-09-14	2020-09-14

Test Mode: Transmitting

1) 30MHz-1GHz (Low channel was the worst case)

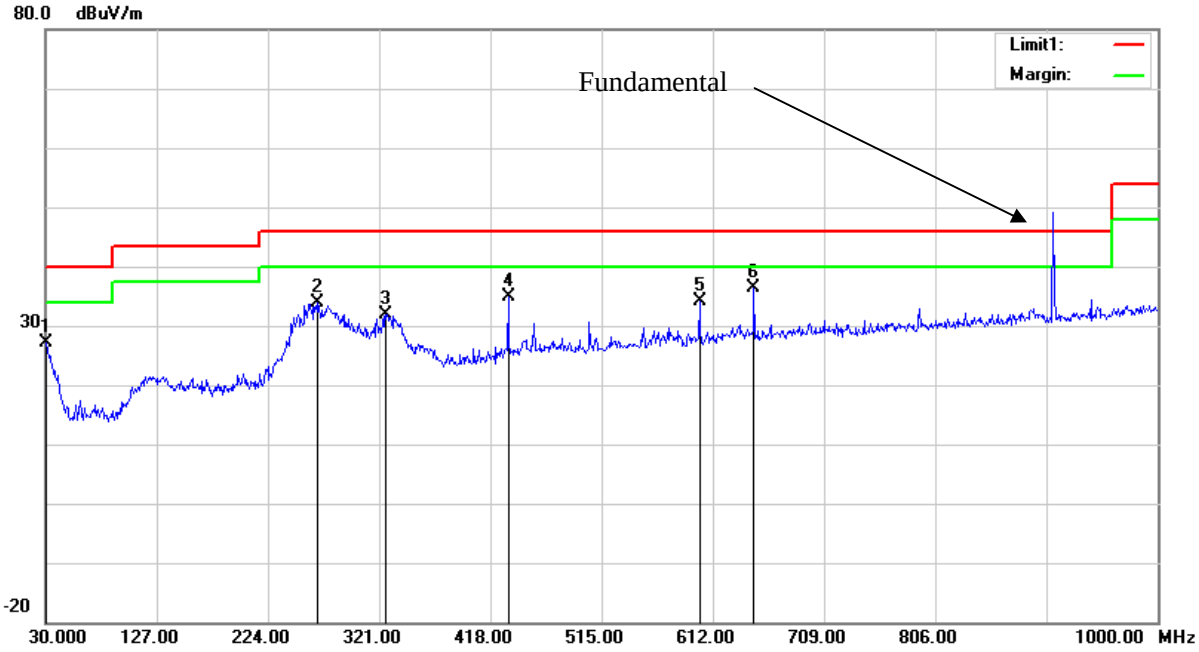
Horizontal:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
256.0100	44.25	QP	-5.80	38.45	46.00	7.55
269.5900	42.82	peak	-4.29	38.53	46.00	7.47
455.8300	32.64	peak	-1.06	31.58	46.00	14.42
600.3600	33.47	peak	0.76	34.23	46.00	11.77
647.8900	31.83	peak	1.70	33.53	46.00	12.47
792.4200	29.07	peak	3.76	32.83	46.00	13.17

Note: test with Band Rejector Filter.

Vertical:



Frequency (MHz)	Receiver Reading (dBuV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.0000	25.68	peak	1.46	27.14	40.00	12.86
266.6800	38.29	peak	-4.39	33.90	46.00	12.10
326.8200	35.30	peak	-3.33	31.97	46.00	14.03
433.5200	36.28	peak	-1.35	34.93	46.00	11.07
600.3600	33.31	peak	0.76	34.07	46.00	11.93
647.8900	34.69	peak	1.70	36.39	46.00	9.61

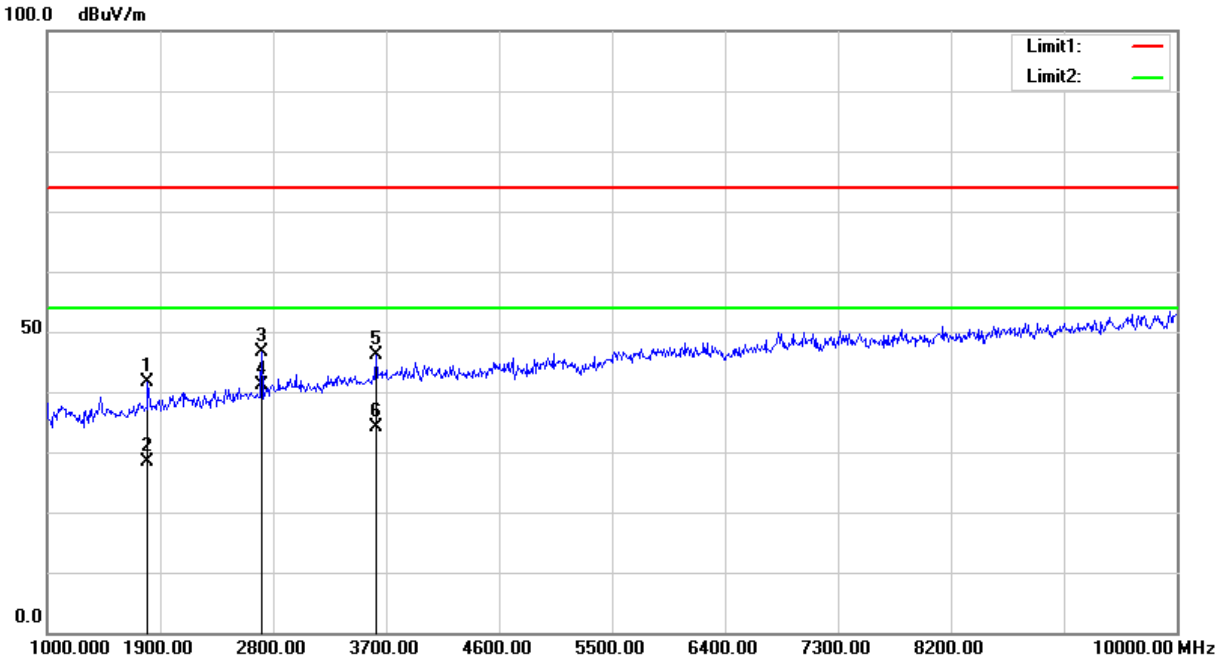
Note: test with Band Rejector Filter.

2) Fundamental, Band edge and 1GHz-10GHz:

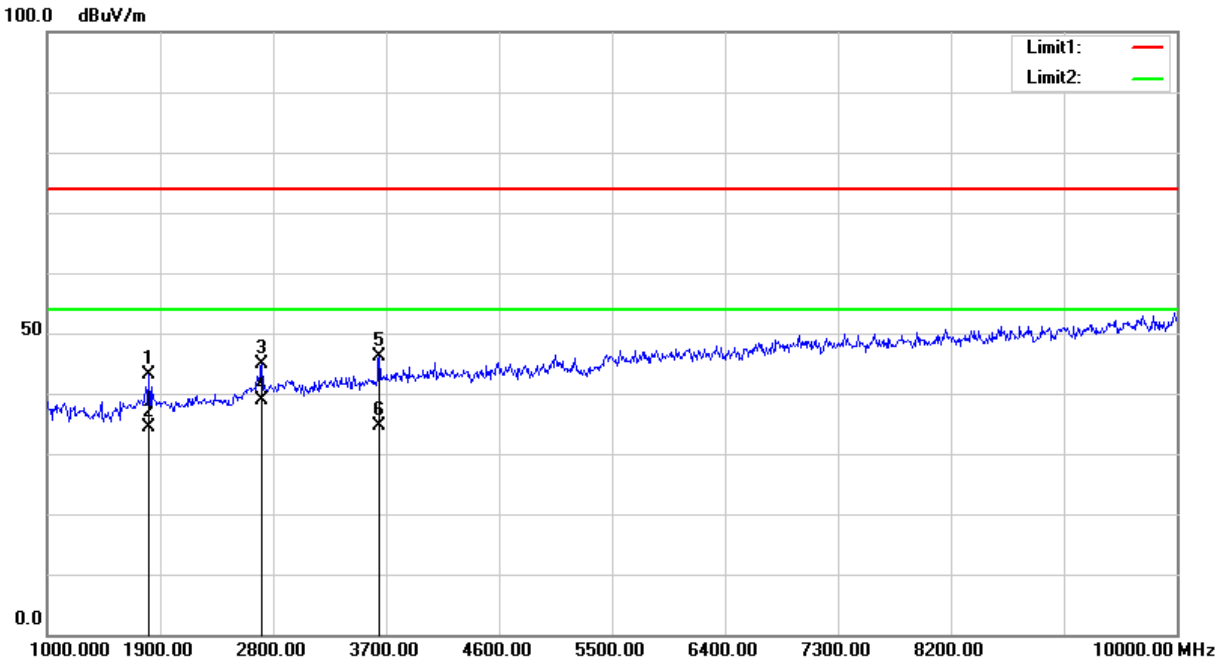
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Factor (dB/m)					
Low Channel: 906.20 MHz									
906.20	49.80	QP	H	22.40	4.26	0.00	76.46	93.98	17.52
906.20	44.30	QP	V	22.40	4.26	0.00	70.96	93.98	23.02
902.00	12.10	QP	H	22.34	4.29	0.00	38.73	46.00	7.27
1812.40	42.35	PK	H	26.51	1.66	25.83	44.69	74.00	29.31
1812.40	31.41	AV	H	26.51	1.66	25.83	33.75	54.00	20.25
2718.60	45.25	PK	H	29.09	1.88	26.11	50.11	74.00	23.89
2718.60	40.70	AV	H	29.09	1.88	26.11	45.56	54.00	8.44
3624.80	39.51	PK	H	31.57	2.44	25.94	47.58	74.00	26.42
3624.80	30.47	AV	H	31.57	2.44	25.94	38.54	54.00	15.46
Middle Channel: 906.60 MHz									
906.60	48.70	QP	H	22.40	4.25	0.00	75.35	93.98	18.63
906.60	44.10	QP	V	22.40	4.25	0.00	70.75	93.98	23.23
1813.20	39.70	PK	H	26.52	1.66	25.84	42.04	74.00	31.96
1813.20	30.14	AV	H	26.52	1.66	25.84	32.48	54.00	21.52
2719.80	43.40	PK	H	29.09	1.89	26.11	48.27	74.00	25.73
2719.80	37.81	AV	H	29.09	1.89	26.11	42.68	54.00	11.32
3626.40	36.32	PK	H	31.58	2.44	25.94	44.40	74.00	29.60
3626.40	24.59	AV	H	31.58	2.44	25.94	32.67	54.00	21.33
High Channel: 906.80 MHz									
906.80	48.20	QP	H	22.40	4.25	0.00	74.85	93.98	19.13
906.80	45.10	QP	V	22.40	4.25	0.00	71.75	93.98	22.23
928.00	10.80	QP	H	22.56	4.34	0.00	37.70	46.00	8.30
1813.60	38.47	PK	H	26.52	1.66	25.84	40.81	74.00	33.19
1813.60	28.02	AV	H	26.52	1.66	25.84	30.36	54.00	23.64
2720.40	43.51	PK	H	29.09	1.89	26.11	48.38	74.00	25.62
2720.40	38.14	AV	H	29.09	1.89	26.11	43.01	54.00	10.99
3627.20	36.84	PK	H	31.58	2.44	25.94	44.92	74.00	29.08
3627.20	25.94	AV	H	31.58	2.44	25.94	34.02	54.00	19.98

Test plots (Test channel: 906.2MHz, worst case)

Horizontal



Vertical:



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

Applicable Standard

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 Clause 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 transmitter 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. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
2. 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	EMI Test Receiver	ESCI	100035	2019-09-19	2020-09-19
R&S	Spectrum Analyzer	FSU 26	200256	2020-07-07	2021-07-07
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	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:	27.3~27.6 °C
Relative Humidity:	48~65%
ATM Pressure:	100.8 kPa
Tester:	Leo Long
Test Date:	2020-09-14~2020-10-10

Test Result: Compliant.

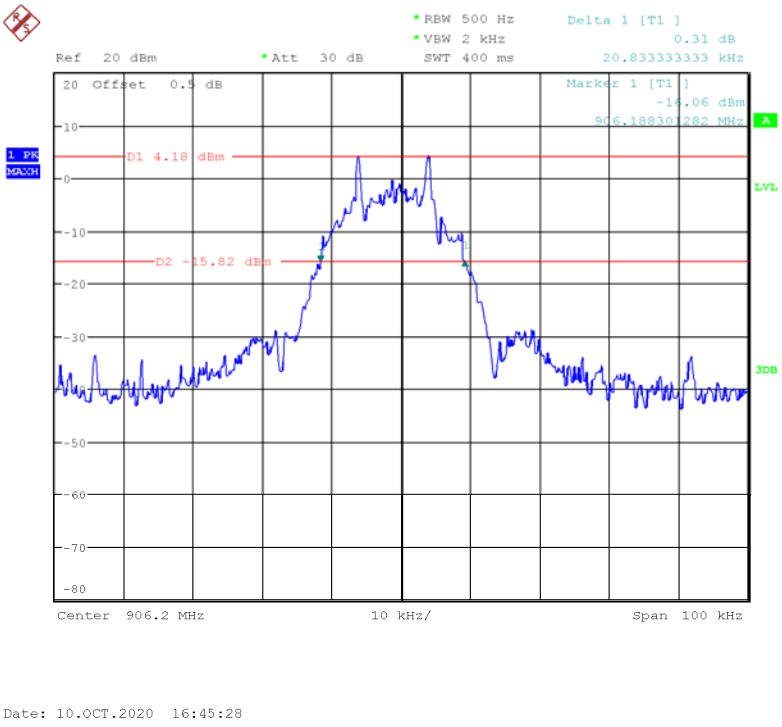
Please refer to following tables and plots

Test Mode: Transmitting

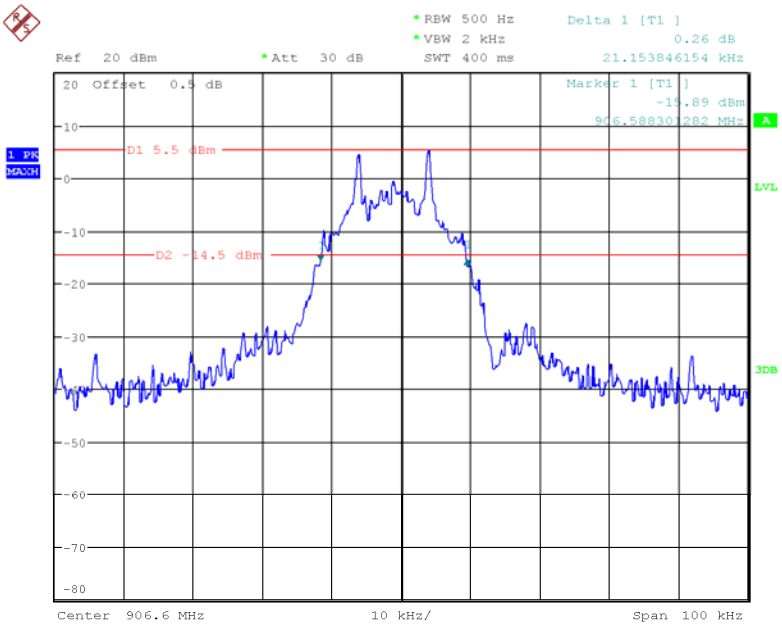
Channel	Frequency (MHz)	20 dB Emission Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
Low	906.2	20.833	21.47
Middle	906.6	21.153	21.63
High	906.8	21.314	21.79

20 dB Emission Bandwidth

906.2MHz



906.6MHz



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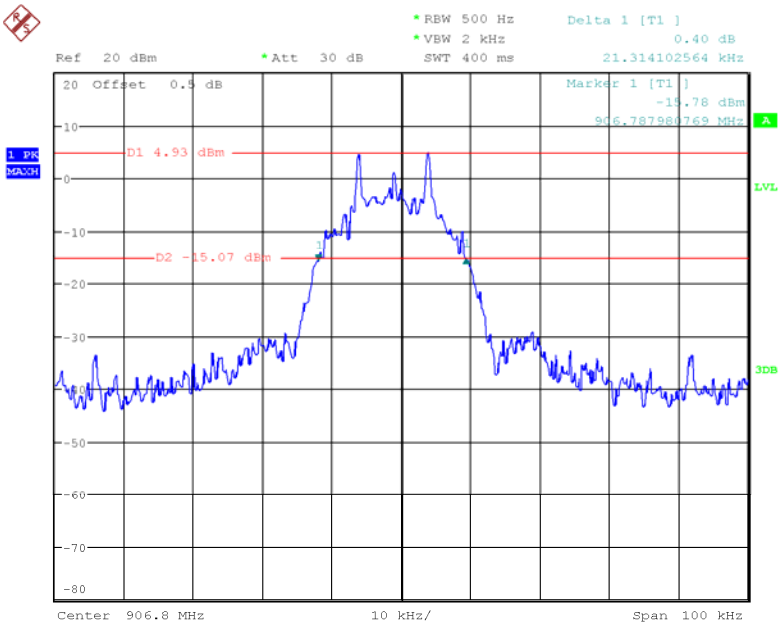
906.8MHz



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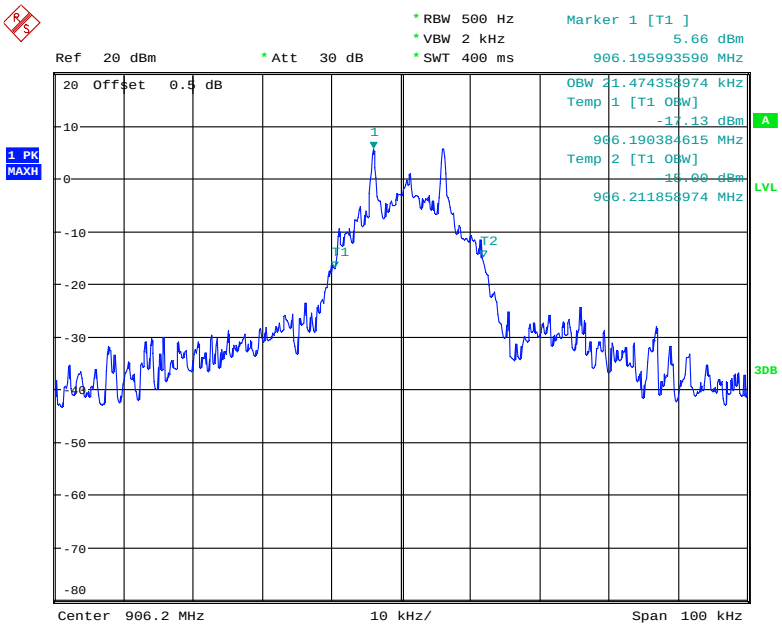
99% Occupied Bandwidth

906.2MHz



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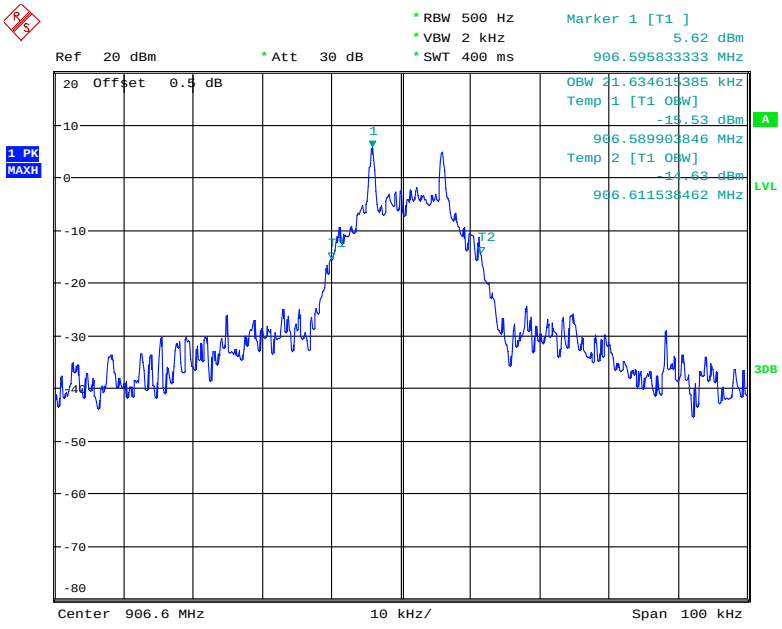
906.6MHz



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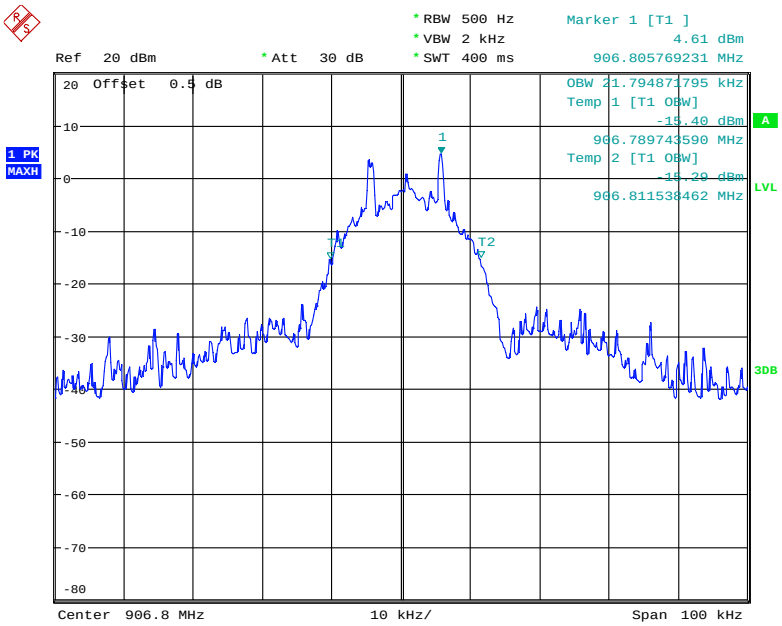
906.8MHz



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