ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 15.249

TEST REPORT

For

Polygroup Trading Limited

Unit 606, Fairmont House, 8 Cotton Tree Drive, Central, Hong Kong, China

FCC ID: 2APJZ-200108

Report Type:	**Product Type:**
Original Report	Music Conductor Speaker

Report Number:	RSZ200225810-00
Report Date:	2020-05-20
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Music Conductor Speaker
Model	PDT-008
Frequency	915MHz
Antenna Specification	2 dBi
Voltage Range	DC 5V by adapter
Date of Test	2020/02/28~2020/04/29
Sample serial number	RSZ200225810-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020/02/25
Sample/EUT Status	Good condition
Adapter information	Model: TS-15WL5V Input: AC 120V, 60Hz, 0.34A Output: DC 5V, 3A

Objective

This type approval report is prepared on behalf of *Polygroup Trading Limited* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.207, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s).

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.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1℃
Humidity		±6%
Supply voltages		±0.4%

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing by manufacturer.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	915	/	/

EUT Exercise Software

No software was used.

Equipment Modifications

No modifications were made to the unit tested.

Support Equipment List and Details

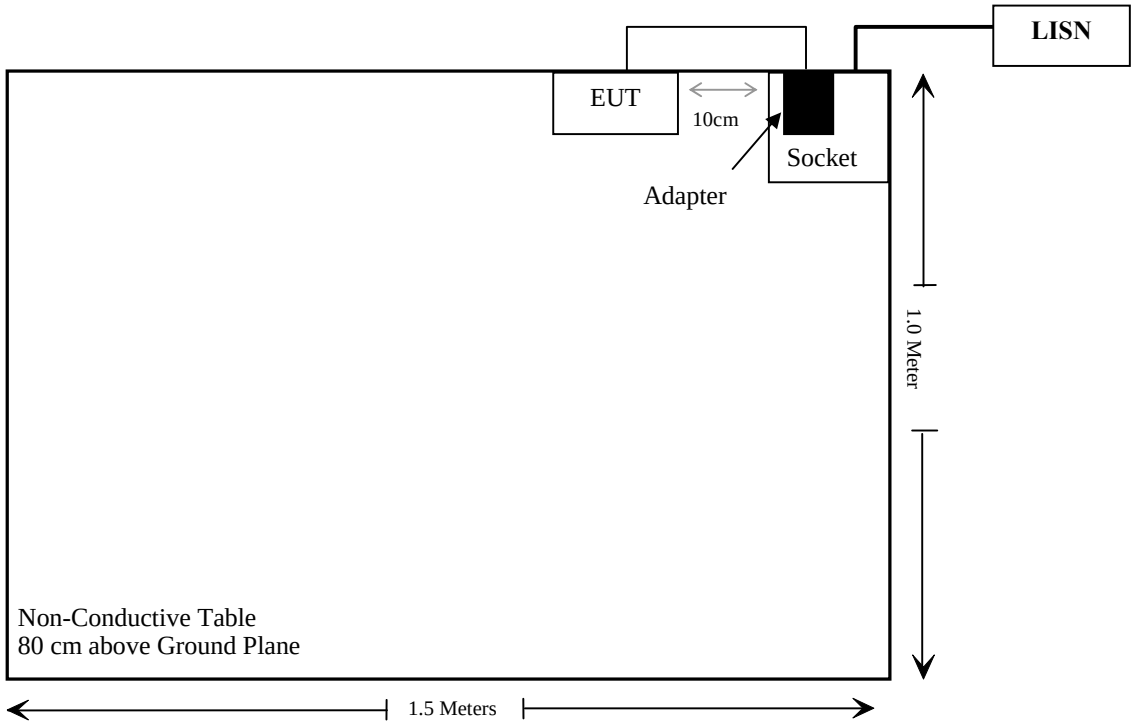
Manufacturer	Description	Model	Serial Number
BULL	Socket	GN-212	A37209315081183

Support Cable Descriptions

Cable Description	Length (m)	From/Port	To
Unshielded Un-Detachable AC Cable	1.0	Socket	LISN
Unshielded Un-Detachable DC Cable	3.5	EUT	Adapter

Block Diagram of Test Setup

For Conducted Emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Compliance
15.205, §15.209, §15.249(d)	Radiated Emissions& Outside of Band Emission	Compliance
§15.215 (c)	20 dB Bandwidth	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2019/7/9	2020/7/8
Rohde & Schwarz	LISN	ENV216	101613	2020/1/22	2021/1/21
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2019/11/29	2020/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2019/11/29	2020/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2019/4/20	2020/4/20
Sonoma instrument	Pre-amplifier	310 N	186238	2020/4/20	2021/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/07/21
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2019/11/29	2020/11/28

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

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 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 use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has one internal antenna which was permanently attached and the antenna gain is 2dBi, fulfill the requirement of this section. Please refer to the EUT photos.

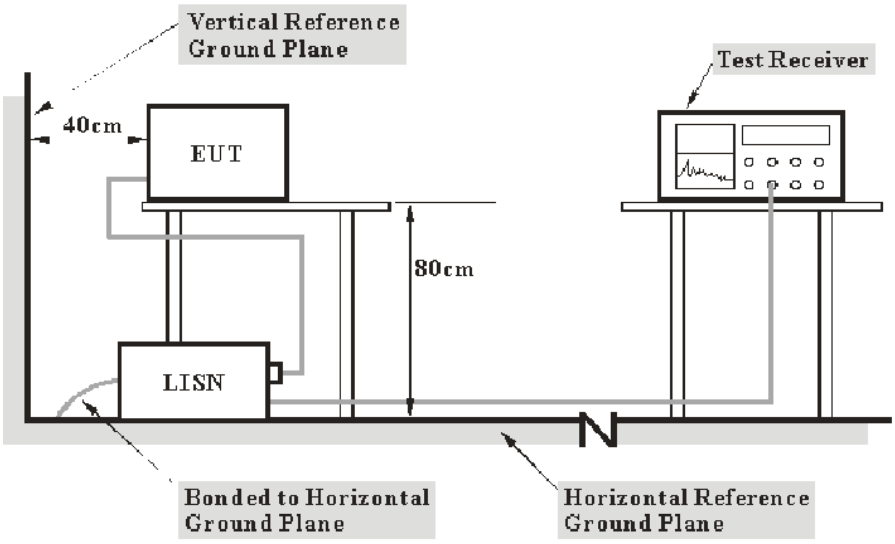
Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.207

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 measurement procedure of EUT setup is according with per ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

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

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

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

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107.

Test Data

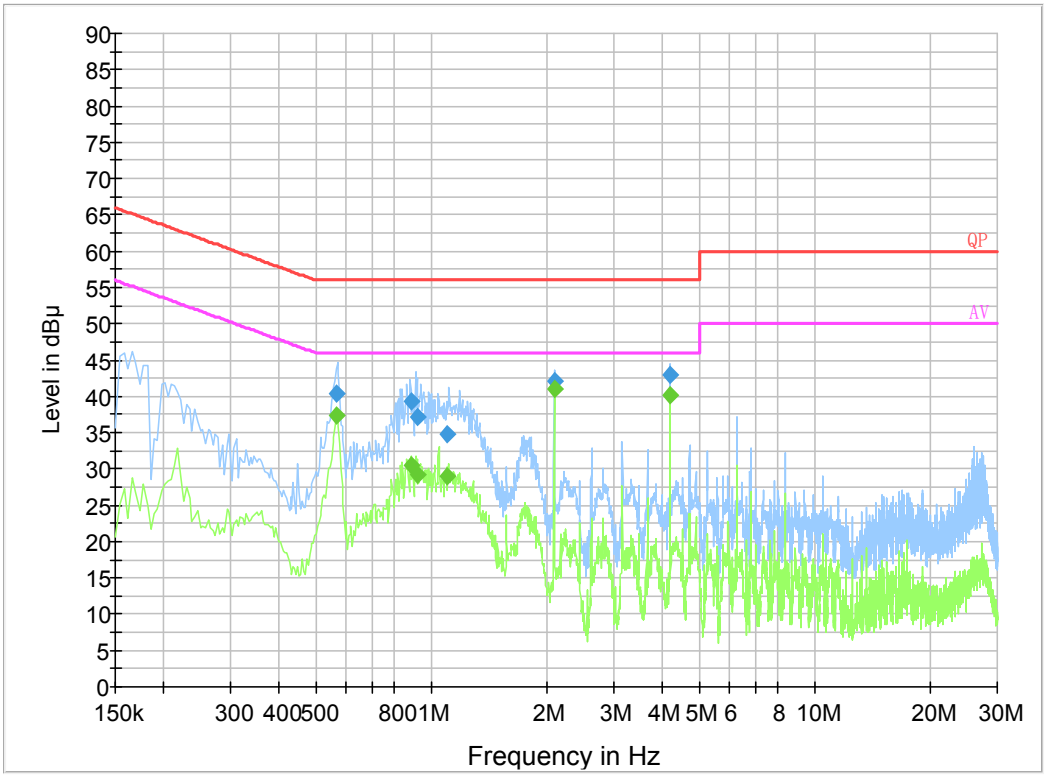
Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2020-03-02.

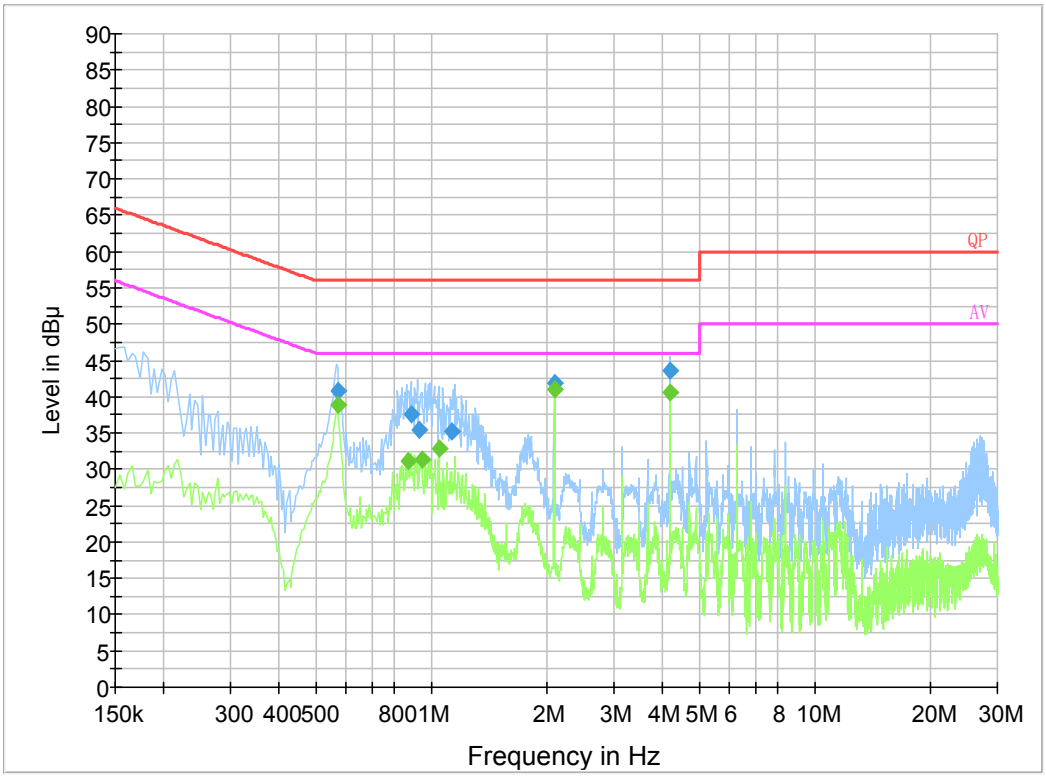
EUT Operation Mode: Transmitting

AC 120V/60 Hz, Line



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
0.565450	40.3	19.8	56.0	15.7	QP
0.884770	39.4	19.8	56.0	16.6	QP
0.923650	37.1	19.8	56.0	18.9	QP
1.101290	34.9	19.8	56.0	21.1	QP
2.098530	42.2	19.9	56.0	13.8	QP
4.195030	43.0	19.9	56.0	13.0	QP
0.565450	37.3	19.8	46.0	8.7	Ave.
0.884770	30.6	19.8	46.0	15.4	Ave.
0.923650	29.2	19.8	46.0	16.8	Ave.
1.101290	28.9	19.8	46.0	17.1	Ave.
2.098530	41.1	19.9	46.0	4.9	Ave.
4.195030	40.2	19.9	46.0	5.8	Ave.

AC 120V/60 Hz, Neutral



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
0.569510	40.8	19.8	56.0	15.2	QP
0.888710	37.6	19.7	56.0	18.4	QP
0.928170	35.5	19.8	56.0	20.5	QP
1.132750	35.2	19.8	56.0	20.8	QP
2.098530	41.9	19.9	56.0	14.1	QP
4.195090	43.6	19.9	56.0	12.4	QP
0.570000	38.8	19.8	46.0	7.2	Ave.
0.870000	31.1	19.7	46.0	14.9	Ave.
0.946000	31.3	19.8	46.0	14.7	Ave.
1.050000	33.0	19.8	46.0	13.0	Ave.
2.098000	41.1	19.9	46.0	4.9	Ave.
4.194000	40.6	19.9	46.0	5.4	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

FCC§15.205, §15.209 & §15.249(d) - 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.

As per FCC§15.249 (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.

Test Equipment Setup

The spectrum analyzer or receiver is set as:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP/PK
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Average

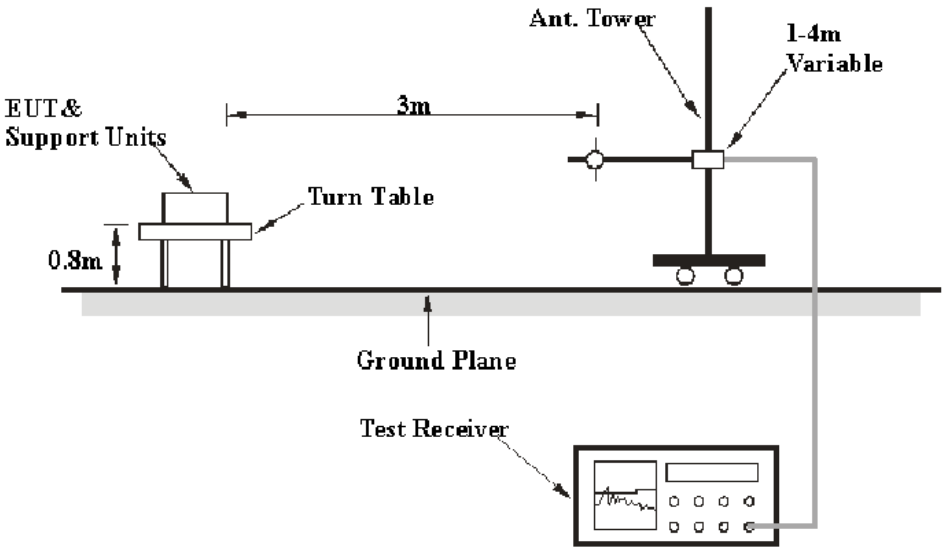
Test Procedure

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

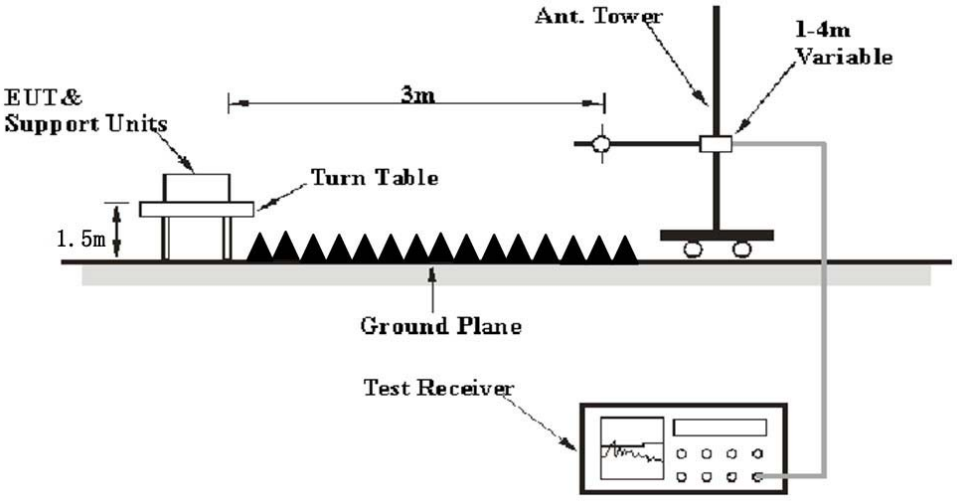
All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

Test Procedure

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

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane for below 1GHz or 1.5 meter for above 1GHz, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.205, 15.209 & §15.249

Test Data

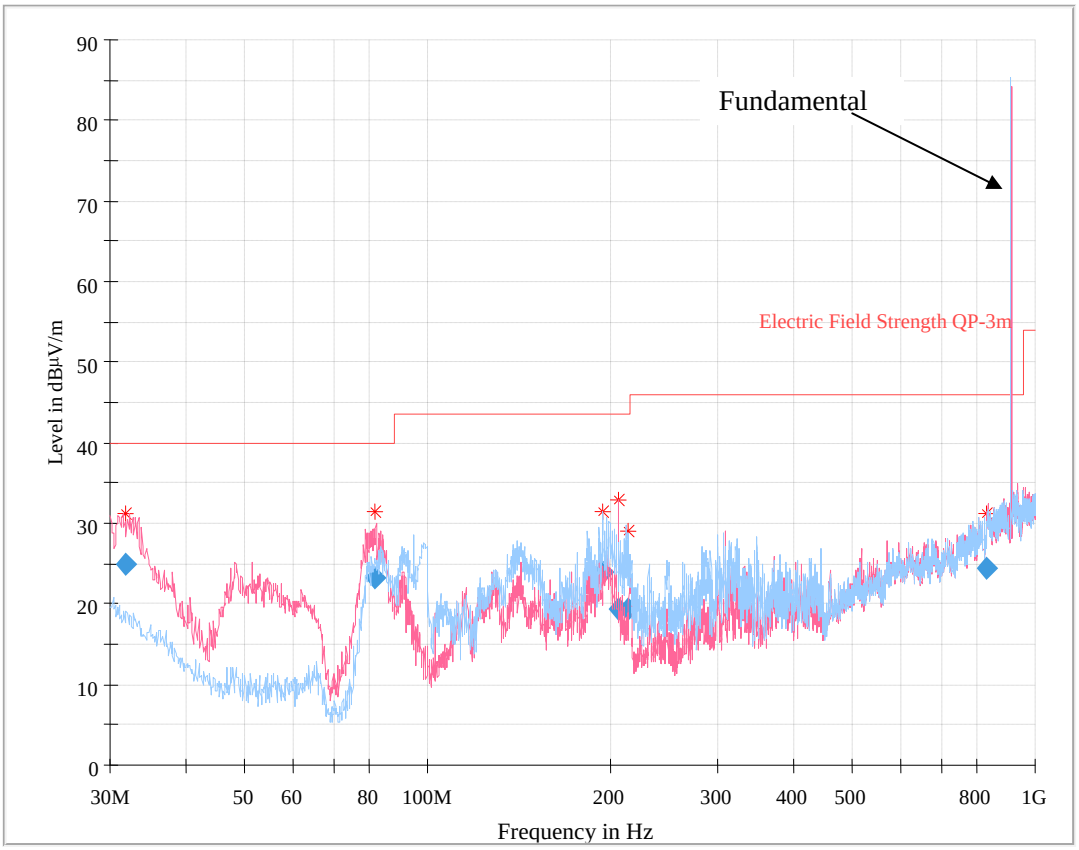
Environmental Conditions

Temperature:	23~25 ℃
Relative Humidity:	50~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan on 2020-03-02 & 2020-03-03 for below 1GHz and by Charlie Cha on 2020-02-28 & 2020-03-02 for above 1GHz.

Test Mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case X-axis of orientation was record)

30MHz – 1 GHz:



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
31.870250	24.87	169.0	V	13.0	-8.8	40.00	15.13
81.945375	23.14	160.0	V	157.0	-19.8	40.00	16.86
193.858125	23.98	164.0	H	340.0	-14.7	43.50	19.52
205.610750	19.32	171.0	V	101.0	-13.9	43.50	24.18
213.339750	19.32	155.0	H	15.0	-13.9	43.50	24.18
834.359000	24.39	173.0	V	251.0	2.7	46.00	21.61

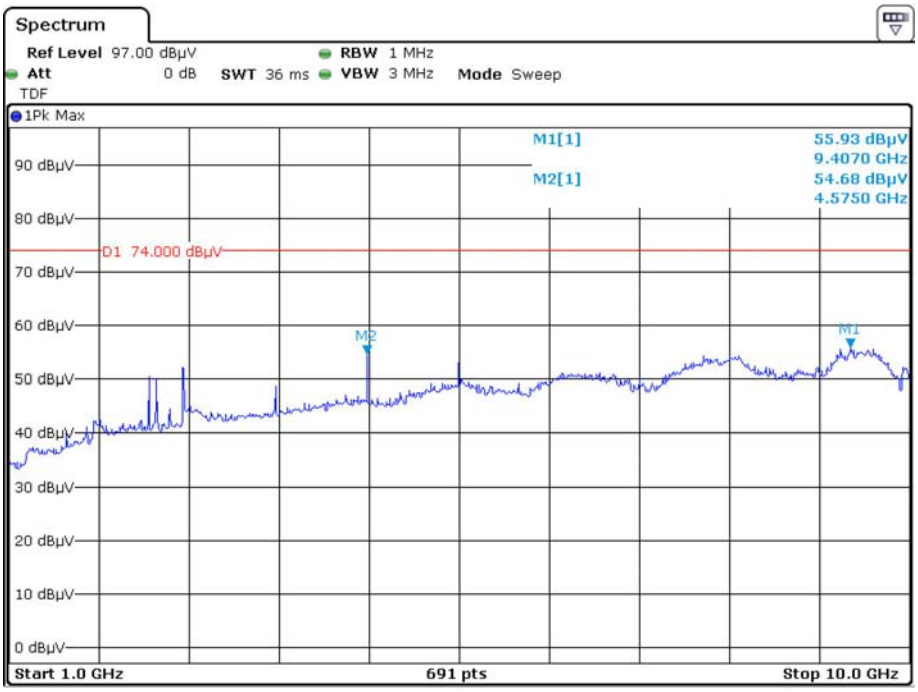
Above 1 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.249&15.209	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
915 MHz									
915	80.62	PK	134	1.4	H	5.9	86.52	94*	7.48
915	80.19	PK	68	1.4	V	5.9	86.09	94*	7.91
902	23.64	PK	134	1.4	H	4.4	28.04	46*	17.96
928	27.81	PK	134	1.4	H	7.4	35.21	46*	10.79
1830.00	52.38	PK	75	2.4	H	-1.55	50.83	74	23.17
1830.00	47.41	Ave.	75	2.4	H	-1.55	45.86	54	8.14
2745.00	54.05	PK	4	2.2	H	1.19	55.24	74	18.76
2745.00	49.23	Ave.	4	2.2	H	1.19	50.42	54	3.58
3660.00	49.14	PK	40	2.1	H	3.06	52.20	74	21.80
3660.00	41.85	Ave.	40	2.1	H	3.06	44.91	54	9.09
4575.00	49.84	PK	45	1.2	H	7.10	56.94	74	17.06
4575.00	43.26	Ave.	287	2.4	H	7.10	50.36	54	3.64
5490.00	47.42	PK	51	2.5	H	10.68	58.10	74	15.90
5490.00	39.56	Ave.	51	2.5	H	10.68	50.24	54	3.76

Note: *: The peak value can pass the limit of the average and QP detector.
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) +cable loss – amplifier factor
Margin = Limit- Corr. Amplitude
The emission more than20dB below the limit was not required to be recorded.

Pre-scan with Peak

Horizontal



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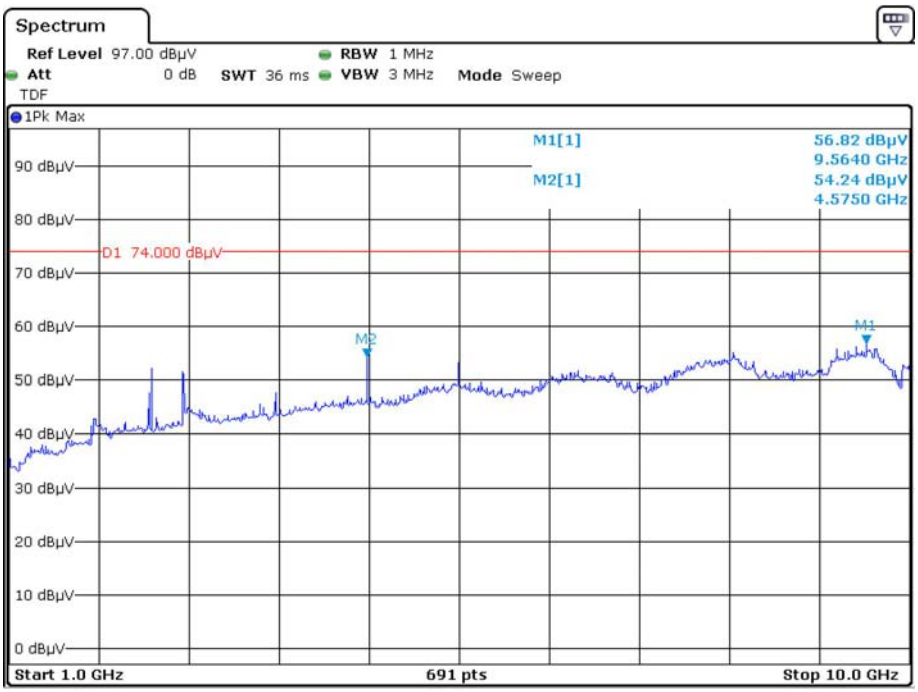
Vertical



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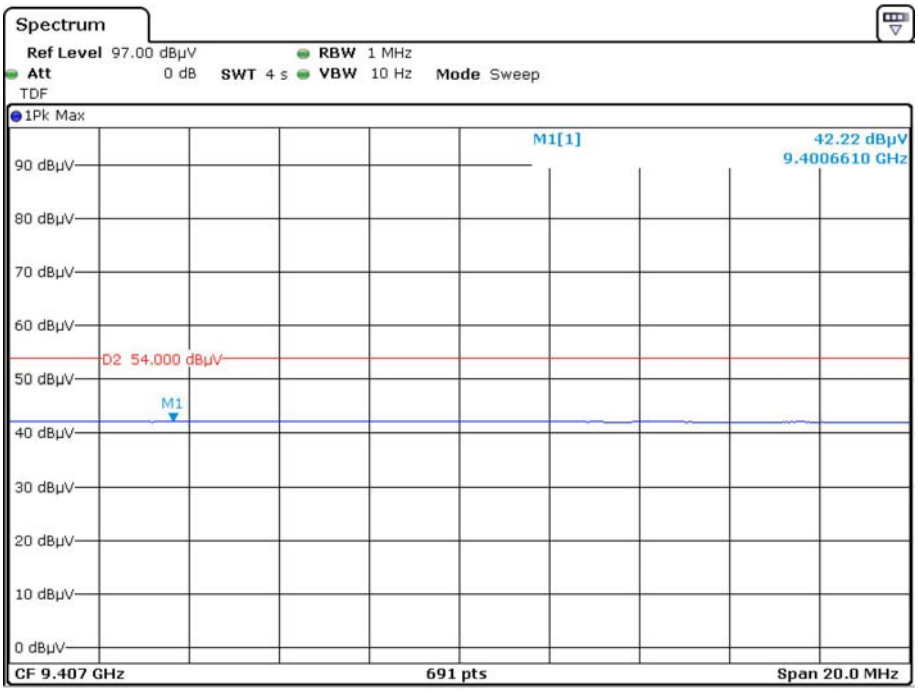
Average value for the peak point at pre-scan

Horizontal



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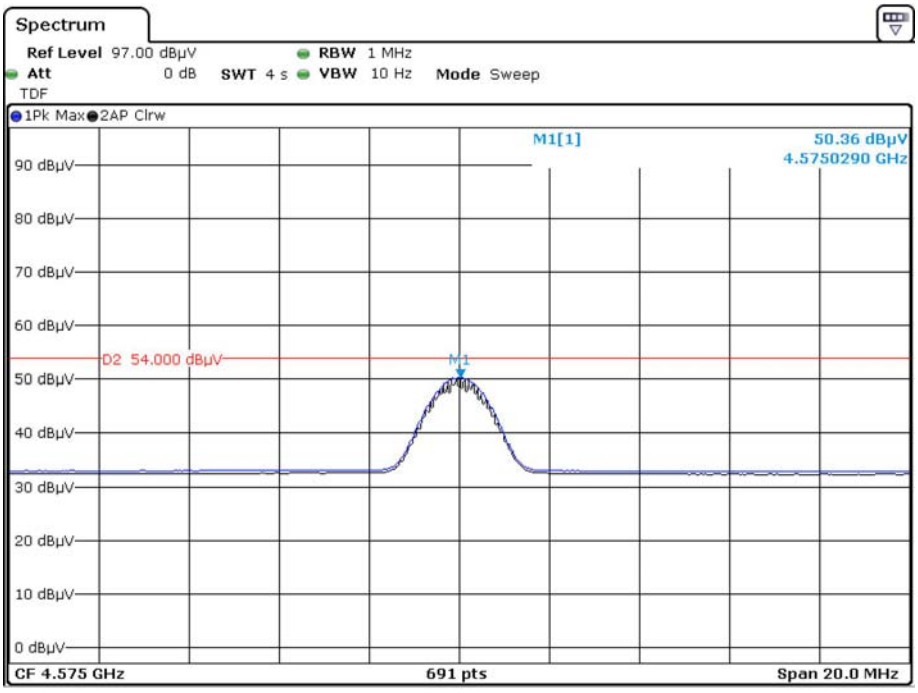

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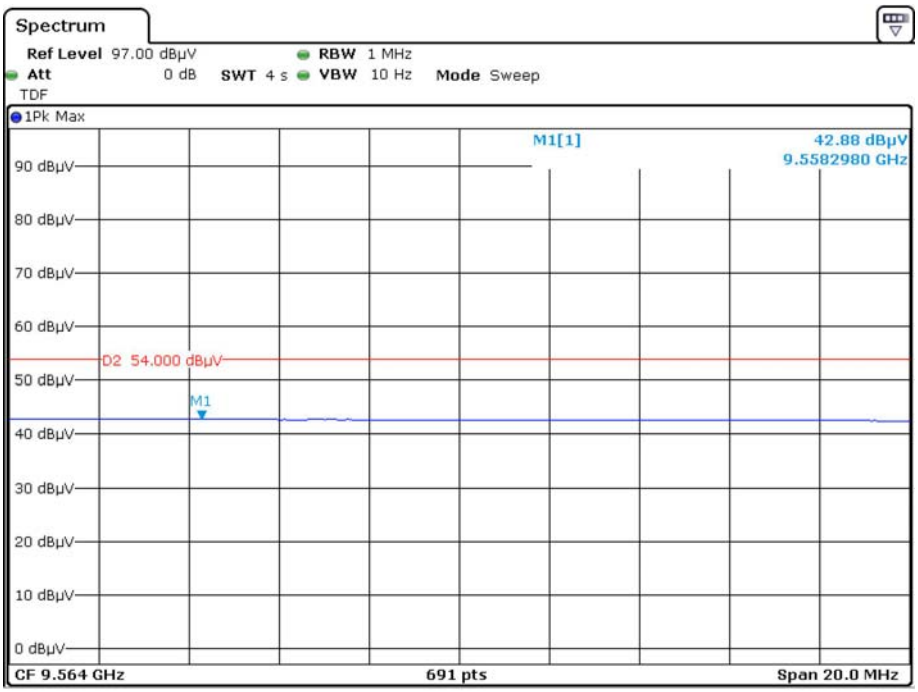

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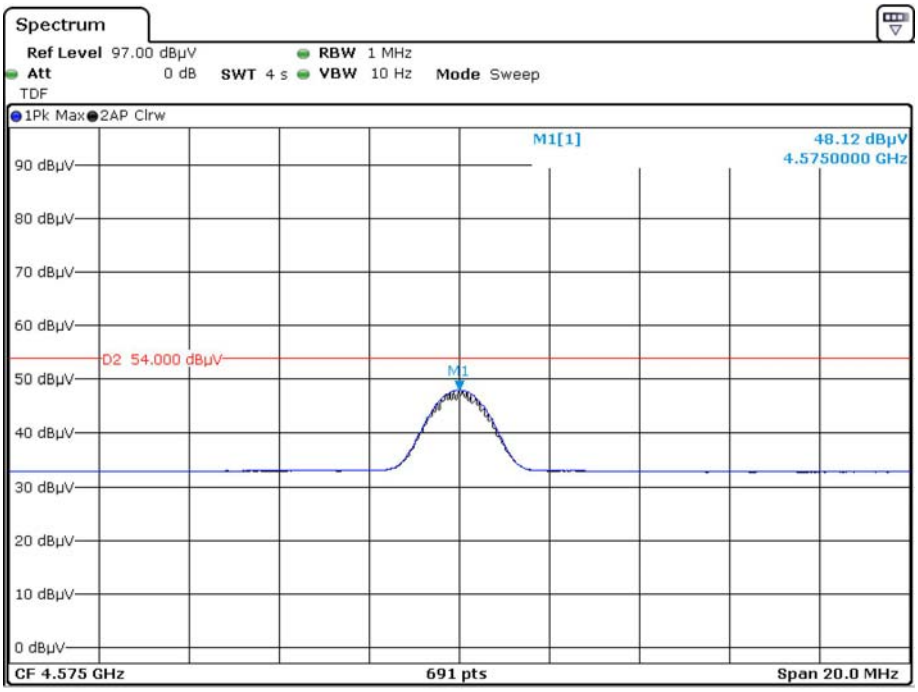

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FCC§15.215(c) - 20dB EMISSION BANDWIDTH

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.

Test Procedure

Per ANSI C63.10-2013 §6.4 & §6.9.

Test Data

Environmental Conditions

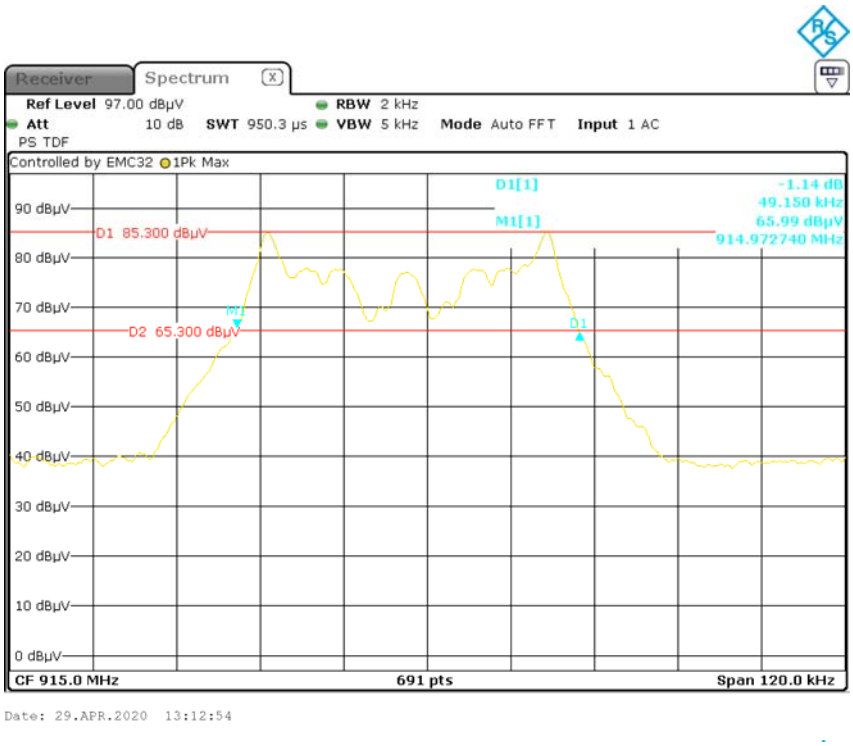
Temperature:	23 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan on 2020-04-29.

Test Mode: Transmitting

Please refer to the following table and plots.

Frequency (MHz)	20dB Bandwidth (kHz)
915	49.15



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