FCC PART 15C

TEST REPORT

For

AKUVOX (XIAMEN) NETWORKS CO., LTD.

10/F, No.56, Software Park II , Xiamen, China

FCC ID: 2AHCR-R29XV2

Report Type:	**Product Type:**
Original Report	Door Phone

Report Number:	RXM190628052-00D
Report Date:	2019-10-25
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

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:	Door Phone
EUT Model:	R29C
Multiple Models:	R29W
Operation Frequency:	125kHz; 13.56MHz;
Modulation Type:	ASK
Rated Input Voltage:	DC 12V from adapter or DC 48V from PoE
External Dimension:	130mm(L)*27mm(W)*324mm(H)
Serial Number:	190628052
EUT Received Date:	2019/8/9
EUT Received Status:	Good

Note: This series products model: R29C and R29W are electrically identical. Model R29C was selected for fully testing and the detailed information can be referred to the declaration.

Objective

This type approval report is prepared on behalf of ***AKUVOX (XIAMEN) NETWORKS CO., LTD.*** in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.215, 15.209 and 15.225.

Related Submittal(s)/Grant(s)

FCC Part 15C DSS submissions with FCC ID: 2AHCR-R29XV2
FCC Part 15C DTS submissions with FCC ID: 2AHCR-R29XV2

Test Methodology

All measurements detailed in this Test Report were performed in accordance with 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). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
radiated Emissions	9kHz~30MHz: 4.12dB 30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 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 an asterisk '*'. 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 a test mode.

The device operates in 125 kHz and 13.56 MHz simultaneously for RFID detection.

Test Mode	M1	Power supply by adapter & Transmitting
	M2	Power supply by PoE & Transmitting

EUT Exercise Software

No software used in test.

Equipment Modifications

No modification was made to the EUT.

Local Support Equipment List and Details

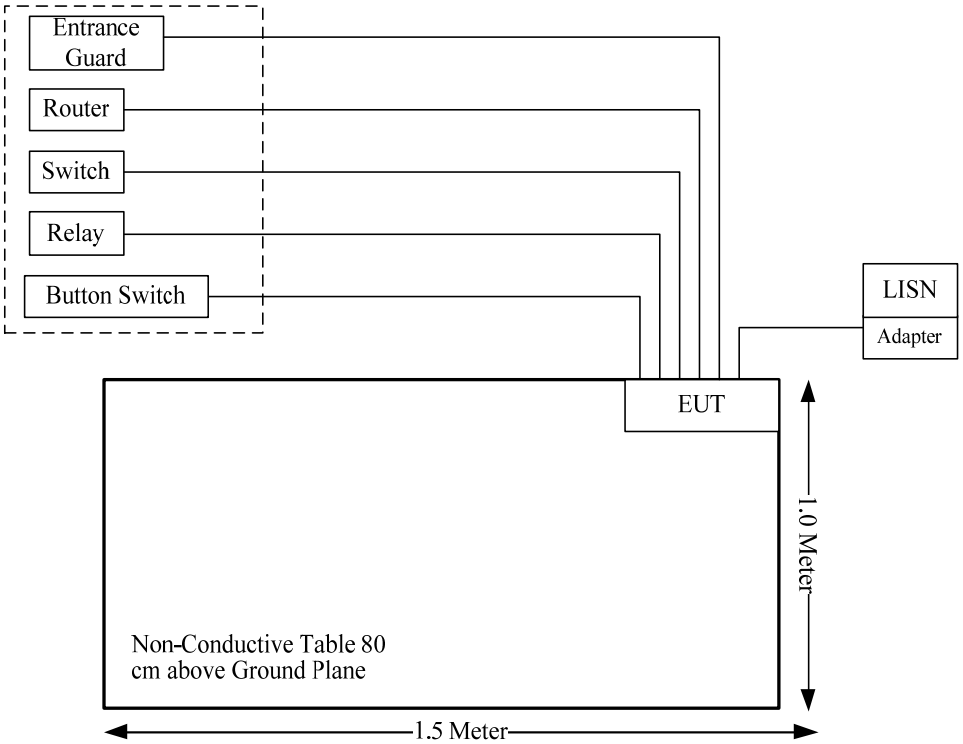
Manufacturer	Description	Model	Serial Number
Tenda	PoE	O2	/
HUAWEI	Adapter	HW-120200U6W	/
RSD	Button Switch	KCD1	/
Lotus	Entrance guard	L8MF-W	/
Schneider	Relay	RXM2LB2BD	/
TP-LINK	Switch	TL-SF1008P	114A297001782
Huawei	Router	WS5200	2017011608000660

Support Cable List and Details

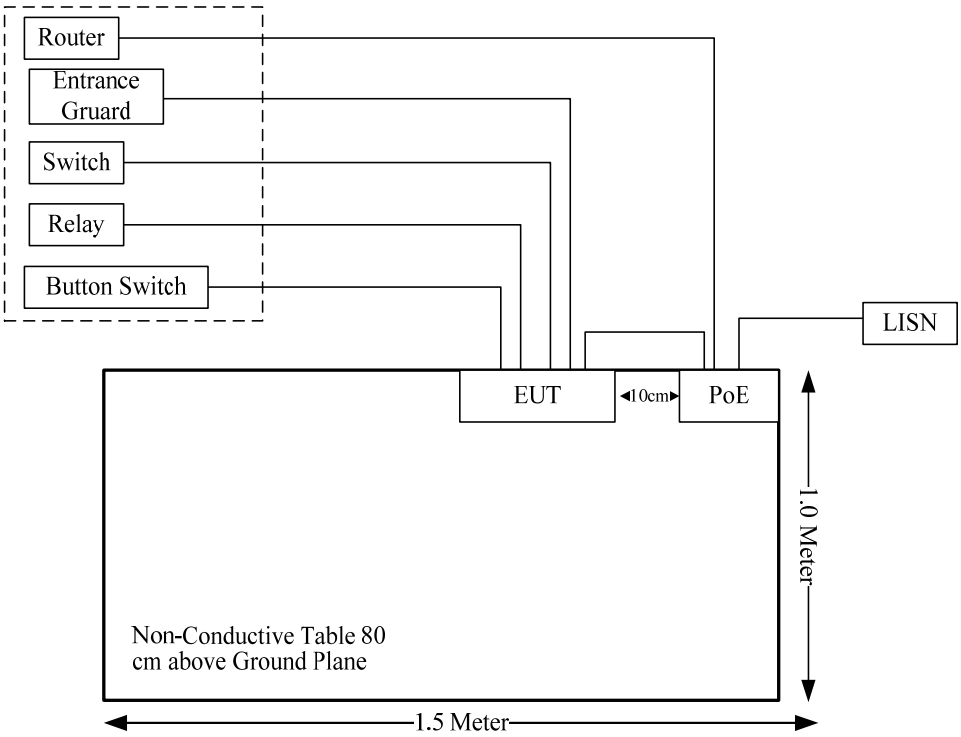
Cable Description	Shielding Type	Ferrite Core	Length (m)	From	To
RJ45 Cable	No	No	5.00	RJ45 Port of EUT or PoE	Router
Signal Cable	No	No	5.00	DOOR Port of EUT	Button Switch
Signal Cable	No	No	5.00	Wiegand Port of EUT	Entrance guard
Signal Cable	No	No	5.00	RS485 Port of EUT	Switch
Signal Cable	No	No	5.00	Relay Port of EUT	Relay
Power Cable	No	No	1.20	12V Port of EUT	Adapter
RJ45 Cable	No	No	1.00	RJ45 Port of EUT	PoE

Block Diagram of Test Setup

M1



M2



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207	AC Line Conducted Emission	Compliance
§15.225 §15.209 §15.205	Radiated Emission Test	Compliance
§15.225(e)	Frequency Stability	Compliance
§15.215(c)	20 dB Bandwidth	Compliance

FCC §15.203 - 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.

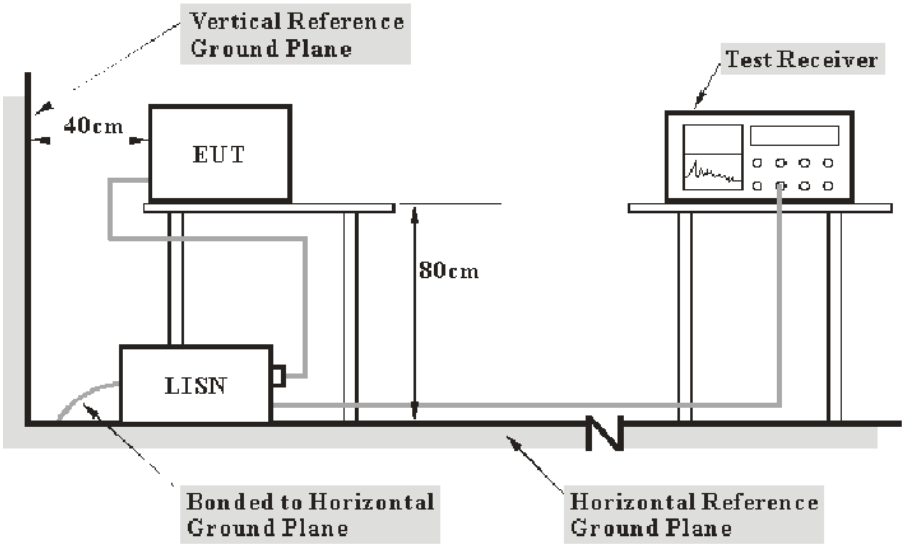
Antenna Connected Construction

The EUT has two integral antenna arrangement, one for 13.56MHz, one for 125kHz, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 – AC LINE CONDUCTED EMISSION

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 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter (or PoE) was connected to the main LISN with an AC 120V/60Hz 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2018-12-10	2019-12-10
R&S	EMI Test Receiver	ESPI	100120	2019-05-09	2020-05-09

*** 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 Procedure

During the conducted emission test, the adapter (or POE) was connected to the outlet of the 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.

According FCC publication number 174176,for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,
V_C: corrected voltage amplitude
V_R: reading voltage amplitude

A_c: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

Environmental Conditions

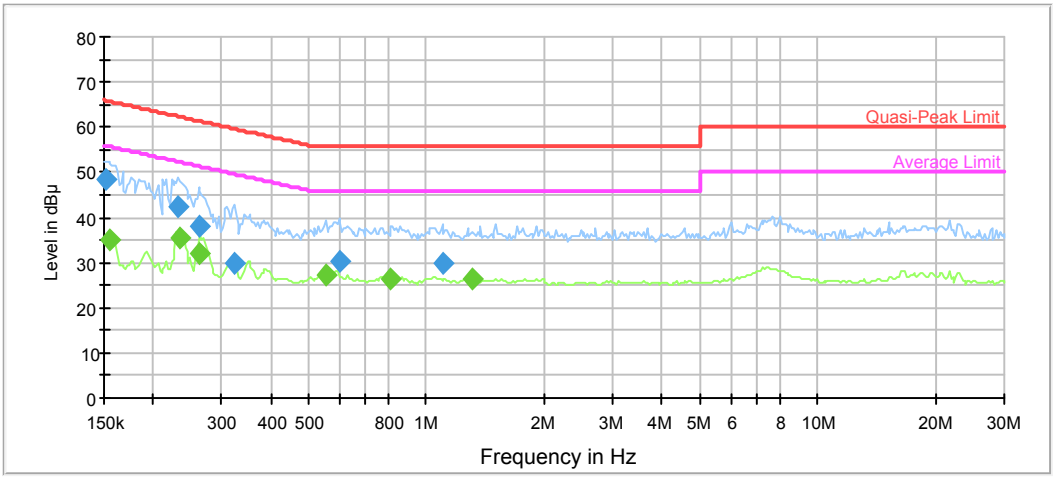
Temperature:	29℃
Relative Humidity:	66%
ATM Pressure:	100.1kPa
Test by:	Sem Xiang
Test Date:	2019-09-10

Test mode: Transmitting

Pre-scan all models and the worst case is model R29C.

Test Mode: M1

AC 120V, 60 Hz, Line:



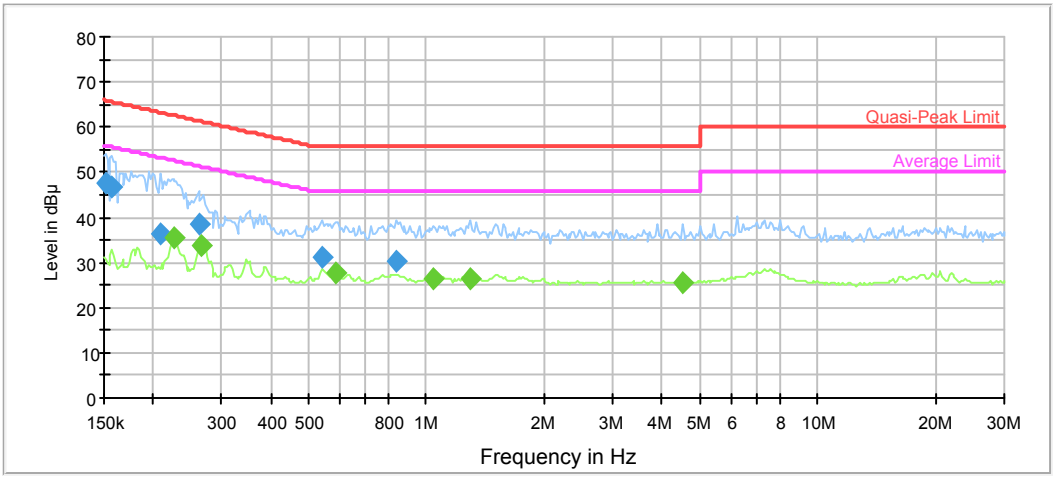
Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.151500	48.5	9.000	L1	11.2	17.4	65.9
0.232398	42.6	9.000	L1	10.4	19.8	62.4
0.261872	37.9	9.000	L1	10.3	23.5	61.4
0.322729	29.6	9.000	L1	10.1	30.0	59.6
0.598084	30.2	9.000	L1	9.8	25.8	56.0
1.097403	29.8	9.000	L1	9.8	26.2	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.154545	35.2	9.000	L1	11.1	20.6	55.8
0.234722	35.5	9.000	L1	10.4	16.8	52.3
0.264490	32.0	9.000	L1	10.3	19.3	51.3
0.552321	27.1	9.000	L1	9.8	18.9	46.0
0.814189	26.4	9.000	L1	9.8	19.6	46.0
1.312656	26.5	9.000	L1	9.8	19.5	46.0

AC120 V, 60 Hz, Neutral:



Final Result 1

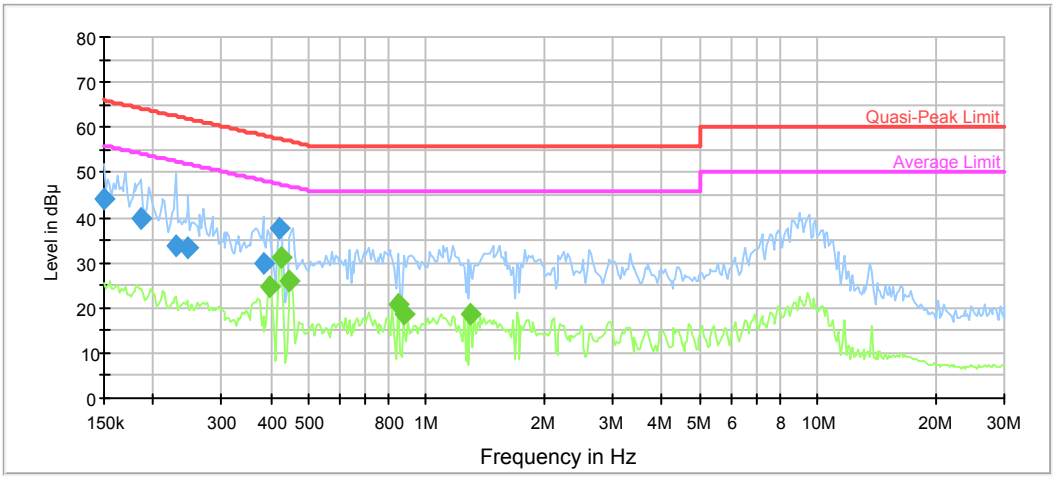
Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.151500	47.5	9.000	N	11.1	18.4	65.9
0.157652	46.7	9.000	N	11.1	18.9	65.6
0.208304	36.3	9.000	N	10.6	27.0	63.3
0.261872	38.6	9.000	N	10.3	22.8	61.4
0.541438	31.0	9.000	N	9.8	25.0	56.0
0.838859	30.2	9.000	N	9.8	25.8	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.225563	35.6	9.000	N	10.5	17.0	52.6
0.267135	33.8	9.000	N	10.3	17.4	51.2
0.586300	27.5	9.000	N	9.8	18.5	46.0
1.044142	26.5	9.000	N	9.8	19.5	46.0
1.299660	26.5	9.000	N	9.8	19.5	46.0
4.508181	25.5	9.000	N	9.8	20.5	46.0

Test Mode: M2

Model Number:	R29C
Port:	L
Test Mode:	M2
Power Source:	AC 120V/60Hz
Note:	



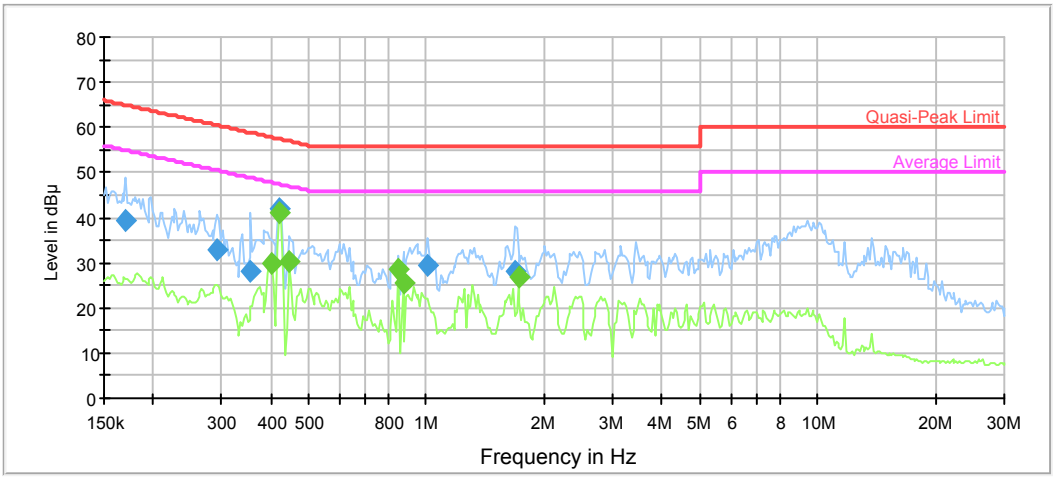
Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150000	44.1	9.000	L1	11.2	21.9	66.0
0.186708	39.7	9.000	L1	10.7	24.5	64.2
0.230097	33.7	9.000	L1	10.4	28.6	62.4
0.246695	33.2	9.000	L1	10.3	28.7	61.9
0.382209	29.9	9.000	L1	10.0	28.3	58.2
0.422196	37.7	9.000	L1	9.9	19.7	57.4

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.397728	24.4	9.000	L1	10.0	23.5	47.9
0.426418	31.0	9.000	L1	9.9	16.3	47.3
0.448170	25.8	9.000	L1	9.9	21.1	46.9
0.847248	20.9	9.000	L1	9.8	25.1	46.0
0.872921	18.5	9.000	L1	9.8	27.5	46.0
1.299660	18.5	9.000	L1	9.8	27.5	46.0

Model Number: R29C
Port: N
Test Mode: M2
Power Source: AC 120V/60Hz
Note:



Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.170714	39.2	9.000	N	10.9	25.7	64.9
0.292162	33.0	9.000	N	10.2	27.5	60.5
0.356493	28.2	9.000	N	10.0	30.6	58.8
0.422196	42.0	9.000	N	9.9	15.4	57.4
1.003400	29.6	9.000	N	9.8	26.4	56.0
1.683392	28.3	9.000	N	9.8	27.7	56.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.401705	30.0	9.000	N	10.0	17.8	47.8
0.422196	41.3	9.000	N	9.9	6.1	47.4
0.448170	30.3	9.000	N	9.9	16.7	46.9
0.847248	28.5	9.000	N	9.8	17.5	46.0
0.872921	25.6	9.000	N	9.8	20.4	46.0
1.717229	26.9	9.000	N	9.8	19.1	46.0

FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

FCC Part 15.205, 15.209, 15.225

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

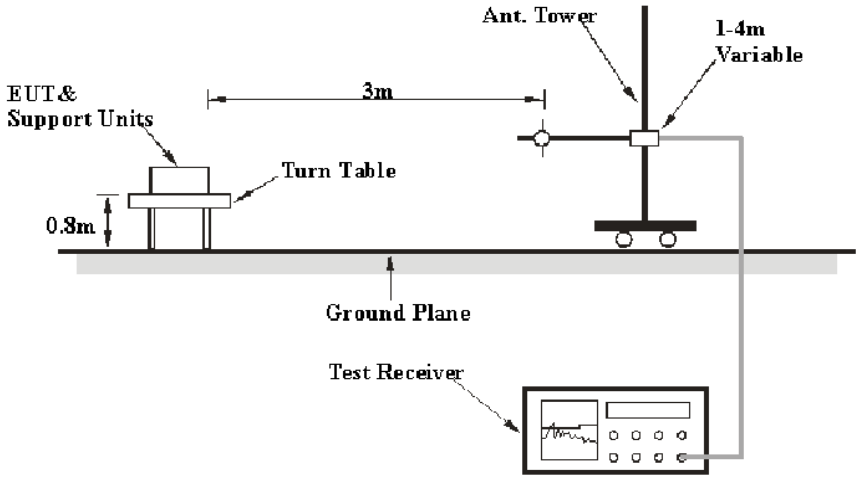
As per FCC Part 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permItted under other sections of this part, e.g., §§15.231 and 15.241.

EUT Setup



The radiated emission tests were performed in the 10-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	QP/Average
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = 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 - Corr. Ampl.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05

*** 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 Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209&15.225.

Test Data

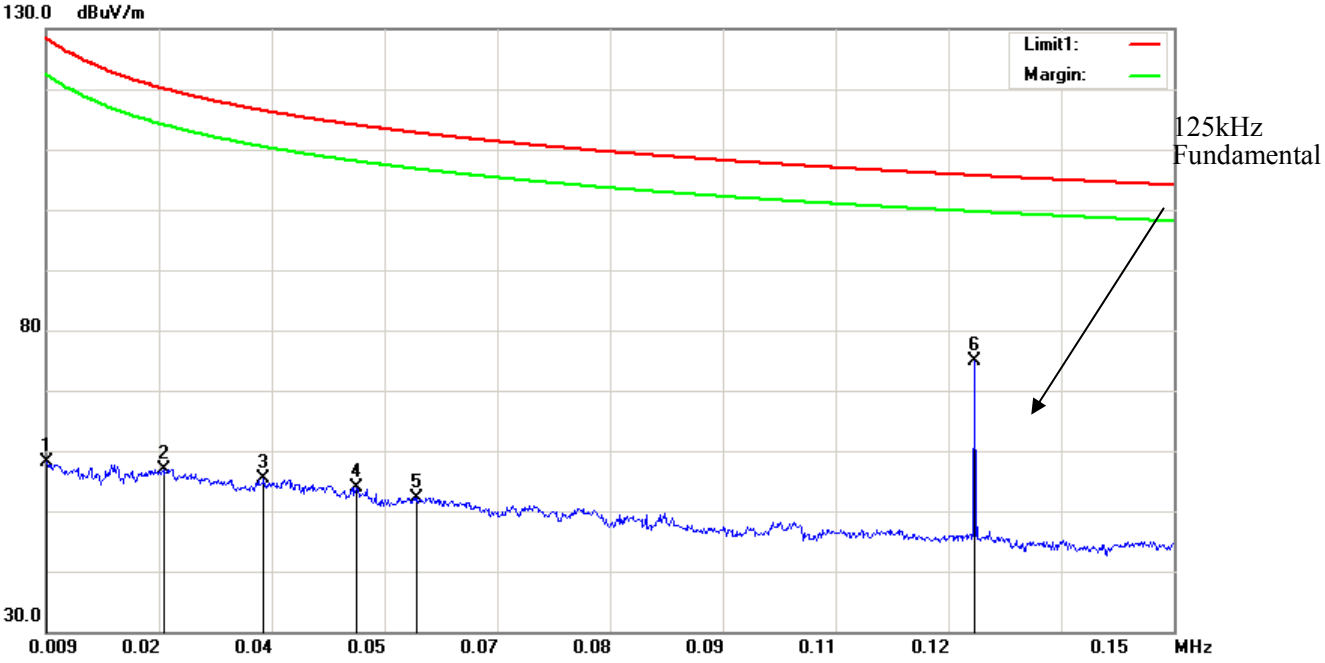
Environmental Conditions

Temperature:	27.6 °C
Relative Humidity:	54 %
ATM Pressure:	101.5 kPa
Tester:	Neil Liao
Test Date:	2019-09-27

Test mode: Transmitting

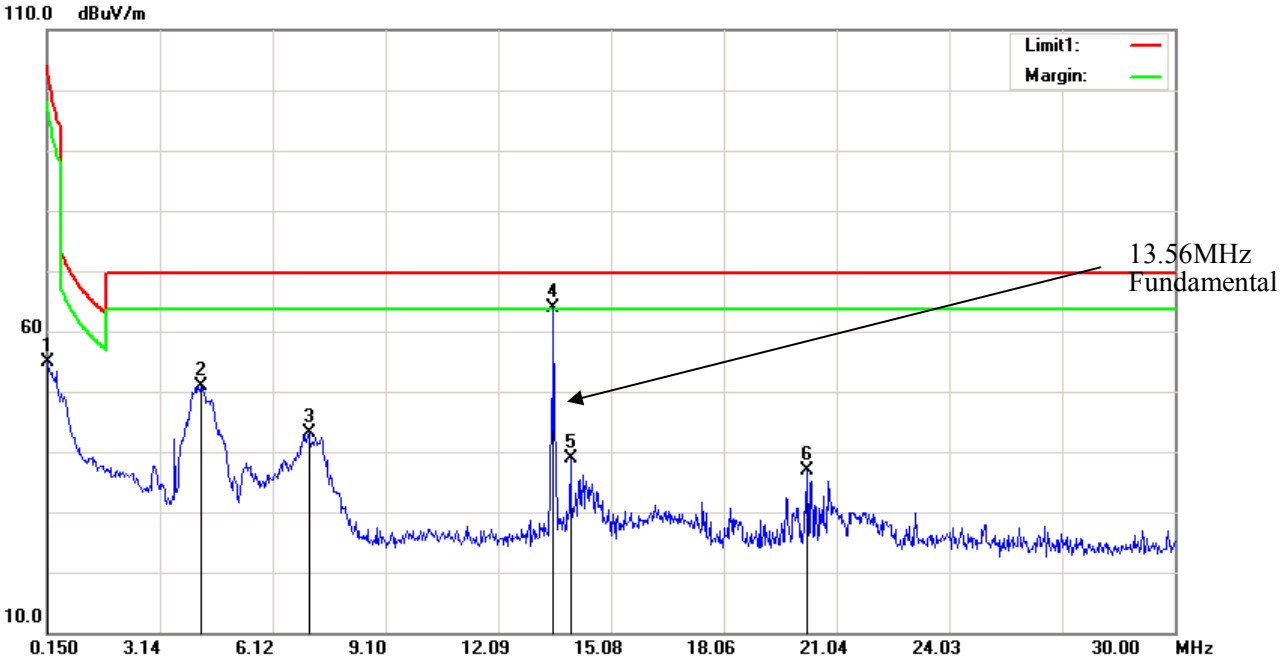
Pre-scan two models and two test modes, the worst case is model R29C with M1.

1) 9 kHz~150 kHz:



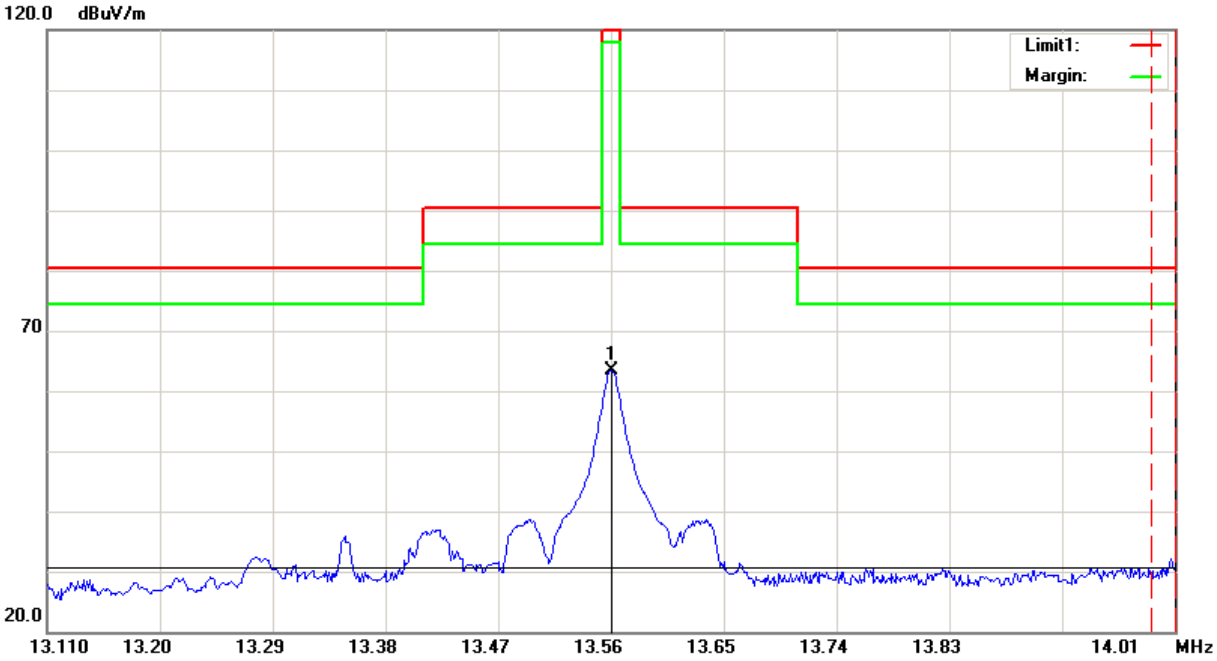
Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.0091	-30.63	peak	88.67	58.04	128.42	70.38
0.0236	-22.27	peak	79.16	56.89	120.15	63.26
0.0362	-20.53	peak	75.80	55.27	116.43	61.16
0.0478	-20.21	peak	74.08	53.87	114.01	60.14
0.0553	-20.39	peak	72.62	52.23	112.75	60.52
0.1250	9.58	peak	65.39	74.97	105.66	30.69

150 kHz~30 MHz:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
0.1500	16.24	peak	38.62	54.86	104.08	49.22
4.2096	39.26	peak	11.67	50.93	69.54	18.61
7.0752	32.81	peak	10.21	43.02	69.54	26.52
13.5527	54.45	peak	9.36	63.81	69.54	5.73
14.0004	29.65	peak	9.34	38.99	69.54	30.55

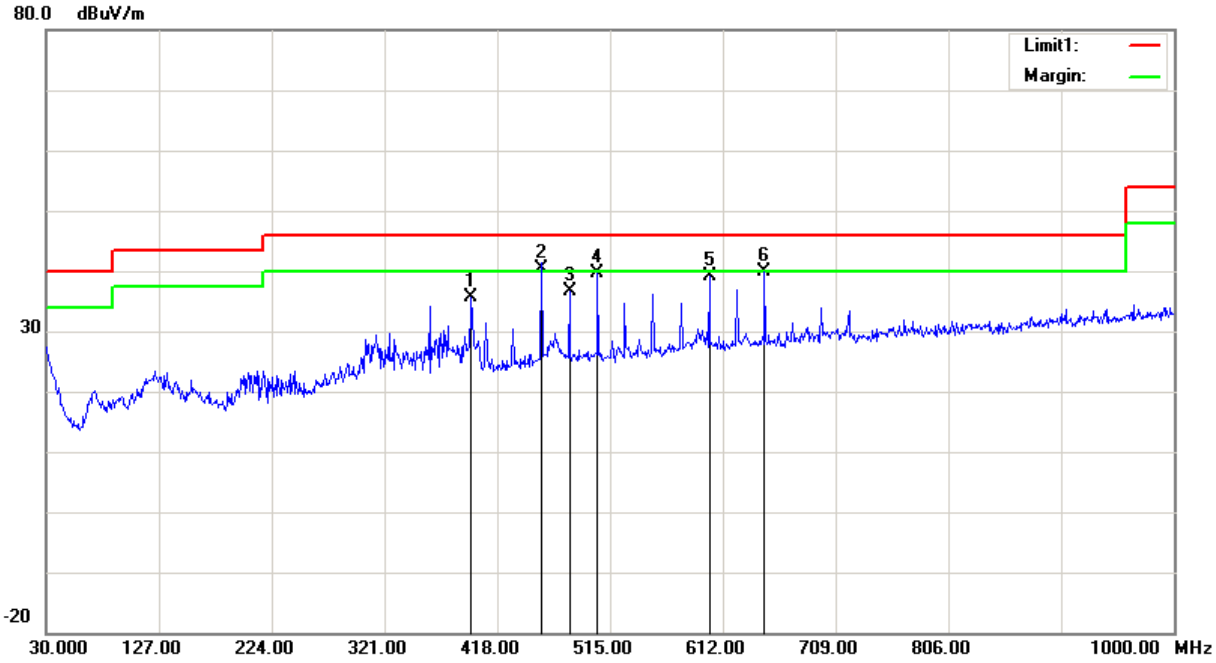
Fundamental:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
13.5600	54.07	peak	9.36	63.43	124.00	60.57

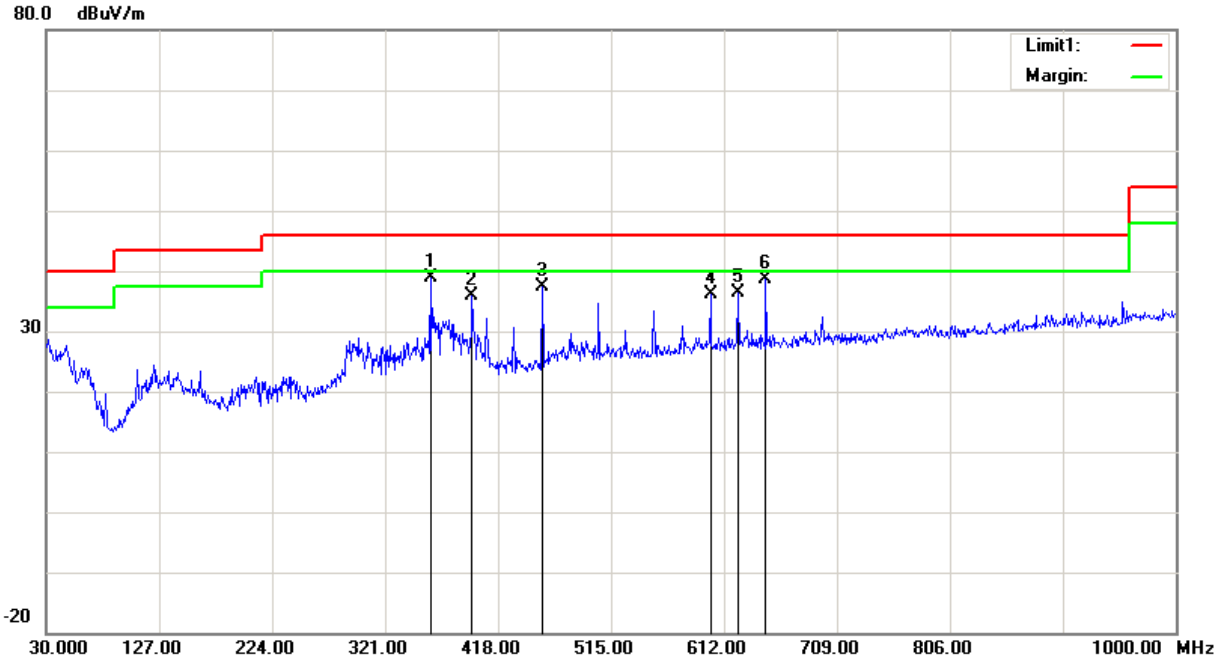
2) Above 30 MHz

Horizontal



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
395.6900	37.70	peak	-2.07	35.63	46.00	10.37
455.8300	41.30	QP	-0.97	40.33	46.00	5.67
480.0800	36.86	peak	-0.27	36.59	46.00	9.41
504.3300	39.80	peak	-0.28	39.52	46.00	6.48
600.3600	37.99	peak	1.03	39.02	46.00	6.98
647.8900	37.78	peak	2.15	39.93	46.00	6.07

Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
359.8000	41.77	peak	-2.80	38.97	46.00	7.03
395.6900	38.00	peak	-2.07	35.93	46.00	10.07
455.8300	38.42	peak	-0.97	37.45	46.00	8.55
600.3600	35.01	peak	1.03	36.04	46.00	9.96
623.6400	34.61	peak	1.68	36.29	46.00	9.71
647.8900	36.46	peak	2.15	38.61	46.00	7.39

FCC§15.225(e) - FREQUENCY STABILITY

Applicable Standard

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

Frequency Stability vs. Temperature: The adapter under test was connected to an external power.

The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable power supply Source connected to the EUT or EUT adapter. Test the frequency output in the extremity voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
UNI-T	Multimeter	UT39A	M130199938	2019-07-24	2020-07-24
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2019-03-26	2020-03-26
Schneider	AC Power Supply	YF6005	005	N/A	N/A
Pro instrument	DC Power Supply	pps3300	N/A	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:	27.6 °C
Relative Humidity:	54 %
ATM Pressure:	101.5 kPa
Tester:	Neil Liao
Test Date:	2019-09-27

Test Mode: Transmitting

Test Result: Pass

Power supply by adapter:

f_o = 13.56 MHz				
Temperature	**Voltage**	**Measured frequency**	**Frequency Error**	**Limit**
℃	**V_{AC}**	**MHz**	**Hz**	**Hz**
-20	120	13.56014	140	±1356
-10		13.56026	260	±1356
0		13.56011	110	±1356
10		13.56039	390	±1356
20		13.56022	220	±1356
25		13.56033	330	±1356
35		13.56029	290	±1356
45		13.56034	340	±1356
55		13.56037	370	±1356
25	108	13.56026	260	±1356
25	132	13.56022	220	±1356

Power supply by PoE:

f_o = 13.56 MHz				
Temperature	**Voltage**	**Measured frequency**	**Frequency Error**	**Limit**
℃	**V_{AC}**	**MHz**	**Hz**	**Hz**
-20	120	13.56015	150	±1356
-10		13.56023	230	±1356
0		13.56015	150	±1356
10		13.56042	420	±1356
20		13.56025	250	±1356
25		13.56031	310	±1356
35		13.56028	280	±1356
45		13.56043	430	±1356
55		13.56042	420	±1356
25	108	13.56019	190	±1356
25	132	13.56035	350	±1356

FCC §15.215(c) – 20 dB EMISSION BANDWIDTH

Applicable Standard

Per 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. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of - band operation.

Test Procedure

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
EMCO	Passive Loop	6512	9706-1206	2017-03-05	2020-03-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05

*** 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

Temperature:	27.6 °C
Relative Humidity:	54 %
ATM Pressure:	101.5 kPa
Tester:	Neil Liao
Test Date:	2019-09-27

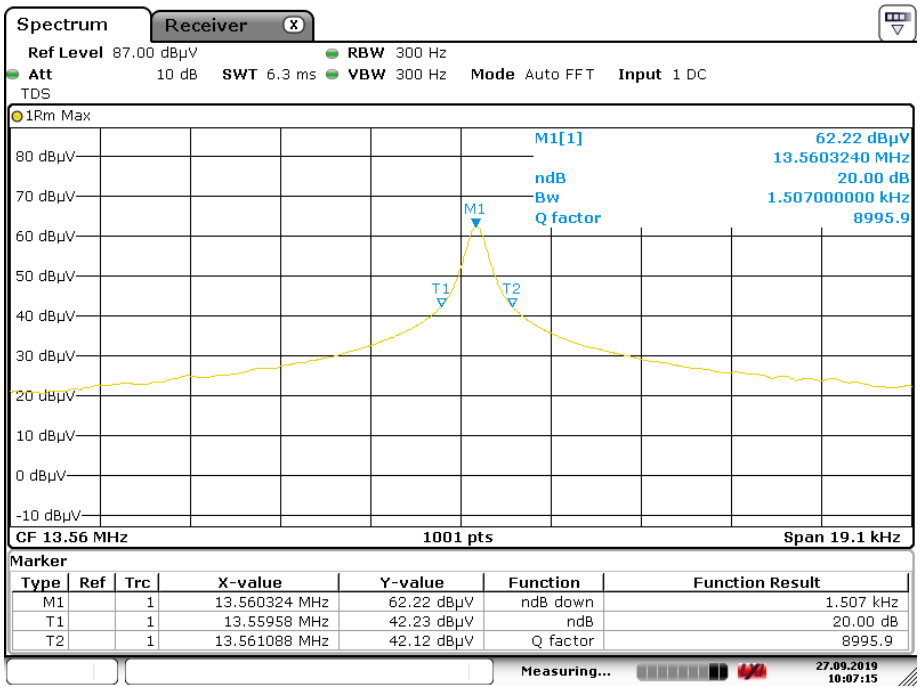
Test Result: Compliance.

Please refer to following tables and plots

Test Frequency (MHz)	20 dB Bandwidth (kHz)
0.125	2.347
13.56	1.507

Test Mode: Transmitting

20 dB Emission Bandwidth-13.56 MHz



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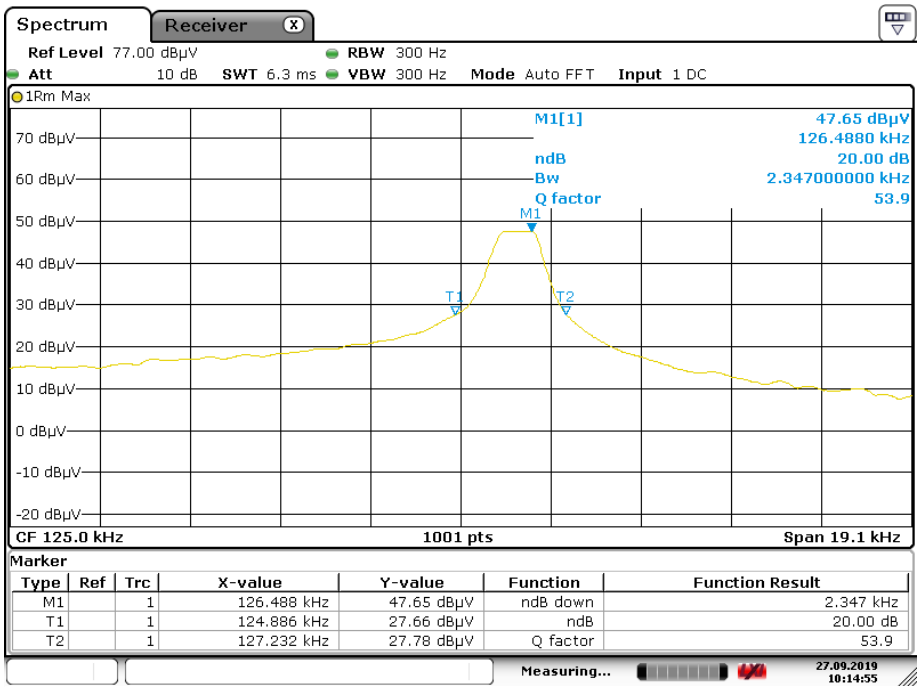
20 dB Emission Bandwidth-125 kHz



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