47 CFR FCC Part 15 Subpart C (Section 15.231)
&
Innovation, Science and Economic Development Canada RSS-210

TEST REPORT

Product： Wireless Remote

Trade Name： CHAMPION

Model Number： 40923

FCC ID： 2ALBZTZWR923

IC： 22547-TZWR923

Prepared for

Taiwan New Innovation Co., Ltd.

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Prepared by

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Remark:

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The test result in this report is only subjected to the test sample.

Table of Contents

Statement of Compliance

Applicant:	Taiwan New Innovation Co., Ltd.
Manufacturer:	TAIZHOU HSUEN LI CO., LTD.
Product:	Wireless Remote
Model No.:	40923
Tested Power Voltage:	TX: DC 12 V RX: DC 12 V
Date of Final Test:	Sep. 07, 2017
Revision of Report:	Rev. 03

Configuration of Measurements and Standards Used：

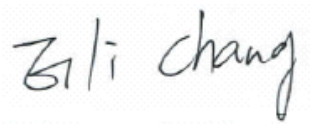
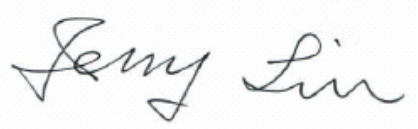
47 CFR FCC Part 15 Subpart C
Innovation, Science and Economic Development Canada RSS-Gen Issue 4
Innovation, Science and Economic Development Canada RSS-210 Issue 9

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.10, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.

2. The testing report shall not be reproduced expect in full, without the written approval of IETC

Report Issued: 2017/10/18

Project Engineer:  Approved: 

Elli Chang Jerry Liu

1 General Information

1.1 Description of Equipment Under Test

Product	:	Wireless Remote
Model Number	:	40923
Product SW Version	:	N/A
Product HW Version	:	1.0
Radio SW Version	:	N/A
Radio HW Version	:	N/A
Test SW Version	:	N/A, no test SW was used during testing.
RF Power Setting in Test SW	:	N/A, RF power setting was not able to alter during testing.
Applicant	:	**Taiwan New Innovation Co., Ltd.** 2F, NO.44, LANE 11, KWANG-FU NORTH ROAD, Taipei 105 Taiwan
Manufacturer	:	**TAIZHOU HSUEN LI CO., LTD.** NO. 18, CENTURY AVE., JIULONG TOWN, TAIZHOU CITY, JIANGSU PROVINCE, CHINA 225312
Power Supply	:	TX: DC 12 V RX: DC 12 V
Operating Frequency	:	433.92 MHz
Type of Modulation	:	ASK
Antenna Description	:	This device uses PCB antenna. The antenna is integral to the device, thereby meeting the requirement of FCC 15.203.
Measurement Software	:	e3; Ver: 8.120803a7-2
Date of Test	:	Mar. 28 ~ Sep. 07, 2017
Additional Description	:	1) The test model is “**40923**” and included in this report. 2) For more detail specification about EUT, please refer to the user’s manual.

1.2 Test Facility

Site Description : ☒Chamber 3

Name of Firm : Interocean EMC Technology Corp.

Company web : http://www.ietc.com.tw

Location : No. 5-2, Lin 1, Tin-Fu, Lin-Kou Dist., New Taipei City, Taiwan 244, R.O.C.

Site Filing :

- Federal Communication Commissions – USA
  Designation No.: TW1020 (Test Firm Registration #: 651092)
  Designation No.: TW1113 (Test Firm Registration #: 959554)
- Industry Canada (IC)
  OUR FILE: 46405-4437
  Registration No. (OATS 1): Site# 4437A-1
  Registration No. (OATS 3): Site# 4437A-3
  Registration No. (Chamber 3): Site# 4437A-5
  Registration No. (OATS 5): Site# 4437A-6
- Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan
  Member No.: 1349
  Registration No. (Conducted Room): C-1094
  Registration No. (Conducted Room): T-1562
  Registration No. (OATS 1): R-1040; G-10274

Site Accreditation :

- Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C.
  Accreditation No.:
  SL2-IN-E-0026 for CNS 13438 / CISPR 22
  SL2-R1-E-0026 for CNS 13439 / CISPR 13
  SL2-R2-E-0026 for CNS 13439 / CISPR 13
  SL2-L1-E-0026 for CNS 14115 / CISPR 15
- Taiwan Accreditation Foundation (TAF)
  Accreditation No.: 1113
- Vehicle Safety Certification Center (VSCC)
  Approval No.: TW16-11
- TüV NORD
  Certificate No: TNTW0801R

1.3 Test Equipment

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	R&S	ESI7	830154/002	2017/09/07
Pre-Amplifier	Burgeon	BPA-530	100216	2017/09/11
Spectrum Analyzer	R&S	FSP40	100478	2018/06/19
Horn Antenna	Schwarzbeck	BBHA9120	9120D-1051	2017/10/27
Pre-Amplifier	EMCI	EMC 051845	980110	2017/10/19
RF Cable	Jye Bao	A30N30-5005	CBL51	2018/07/31
RF Cable	Jye Bao	N30N30-5006	CBL53	2018/07/31
RF Cable	HARBOUR	27478LL142	CBL65	2018/07/31
Biconical Antenna	Schwarzbeck	VHBB 9124 & BBA 9106	9124-743	2018/07/26
Log Antenna	Schwarzbeck	VUSLP 9111B	911B-146	2018/07/26
Measurement Software	AUDIX-e3			

1.4 Measurement Uncertainty

Item	Expended Uncertainty (k=2)
Conduction 1:	
Conducted Emission (9 kHz to 30 MHz)	2.98 dB
Chamber 3:	
Radiated Emission Test (30 MHz to 1 GHz)	4.86 dB
Radiated Emission Test (above 1 GHz)	5.12 dB
RF test:	
RF conducted measurement (9 kHz to 40GHz)	2.92 dB

1.5 Summary of Measurement

Report Clause	Test Parameter	Reference Document		Results
3	Timing Requirement	§FCC15.231 (a)	RSS-210 A1.1.1	Pass
3	Radiated Emission	§FCC15.231 (b), 15.209	RSS-210 A1.1.2	Pass
4	Emission Bandwidth	§FCC15.231 (c)	N/A	Pass
5	99 % Occupied Bandwidth	N/A	RSS-210 A1.1.3	Pass

2 Test Specifications

2.1 Test Standard

The EUT was performed according to FCC Part 15 Subpart C Section 15.231 and Industry Canada RSS-210 procedure and setup followed by ANSI C63.10, 2013 requirements.

2.2 Operation Mode

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

The EUT was operated in continuous transmission mode during all of the tests.

X axis mode

Y axis mode

Z axis mode

2.3 Test Step of EUT

2.3.1 Setup the fixture to EUT for power supplying.
2.3.2 Turn on the power of all equipment.
2.3.3 Let the EUT continuous transmission.
2.3.4 Executed the test.

3 Radiated Emission Test

3.1 Limits

According to FCC 15.231(b) and RSS-210 Annex 1 requirement:
In addition to the provisions of §15.205, the field strength of emissions from intentional radiator operated under this section shall not exceed the following:

Fundamental and harmonics emission limits

Frequency	Field Strength of Fundamental		Field Strength of Harmonics	
(MHz)	(μV/m@3 m)	(dBμV/m@3 m)	(μV/m@3 m)	(dBμV/m@3 m)
433.92	10996	80.8	1099.6	60.8

General Radiated Emission Limit

Spurious Emission tested through until 10th harmonic. Radiated emissions, which fall in the restricted bands, as defined in §15.205 (a), comply with the radiated emission limits specified in §15.209 (a) and defined in RSS-Gen Table 3, comply with the radiated emission limits specified in RSS-Gen 7.2.5.

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Frequency	15.209 Limits	
(MHz)	(μV/m@3 m)	(dBμV/m@3 m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remark ：

1. The table above tighter limit applies at the band edges.
2. The measurement distance in meters, which that between form closest point of EUT to instrument antenna.

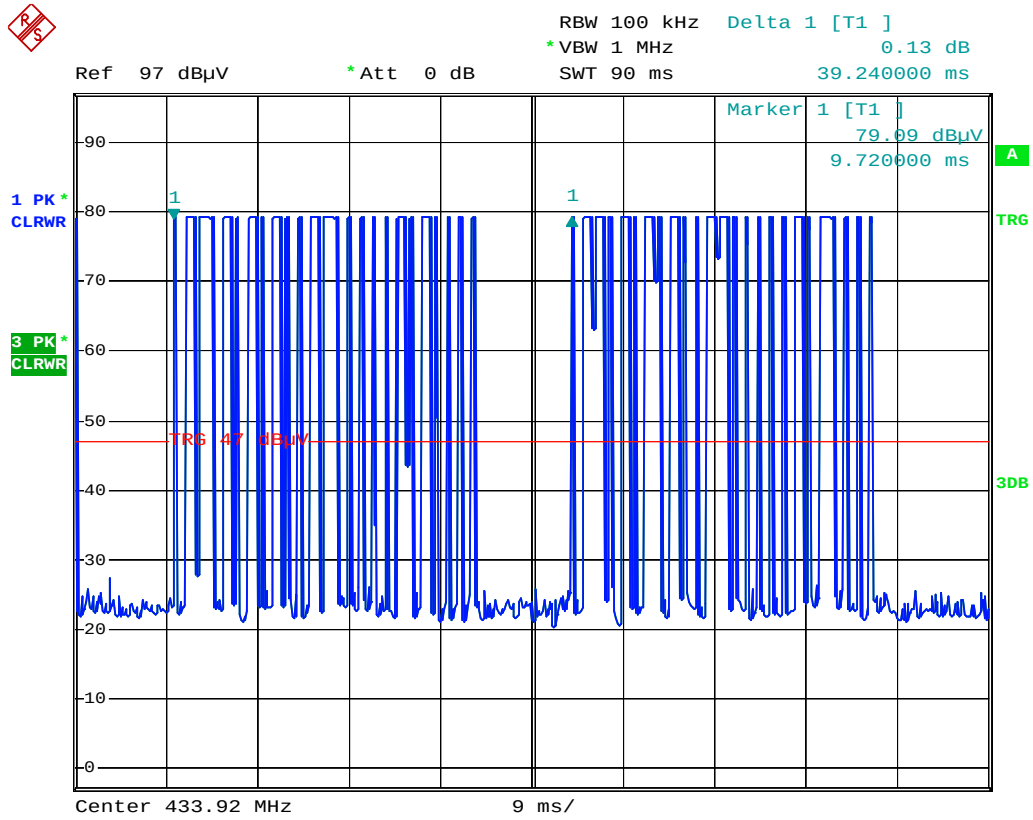
3.2 Calculation of Average Factor

The output field strengths of specification in accordance with the rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector. The duty cycle is measured in 100 ms or the repetition cycle period, whichever is a shorter time frame. The duty cycle is measured by placing the spectrum analyzer to set zero span at 100 kHz resolution bandwidth.

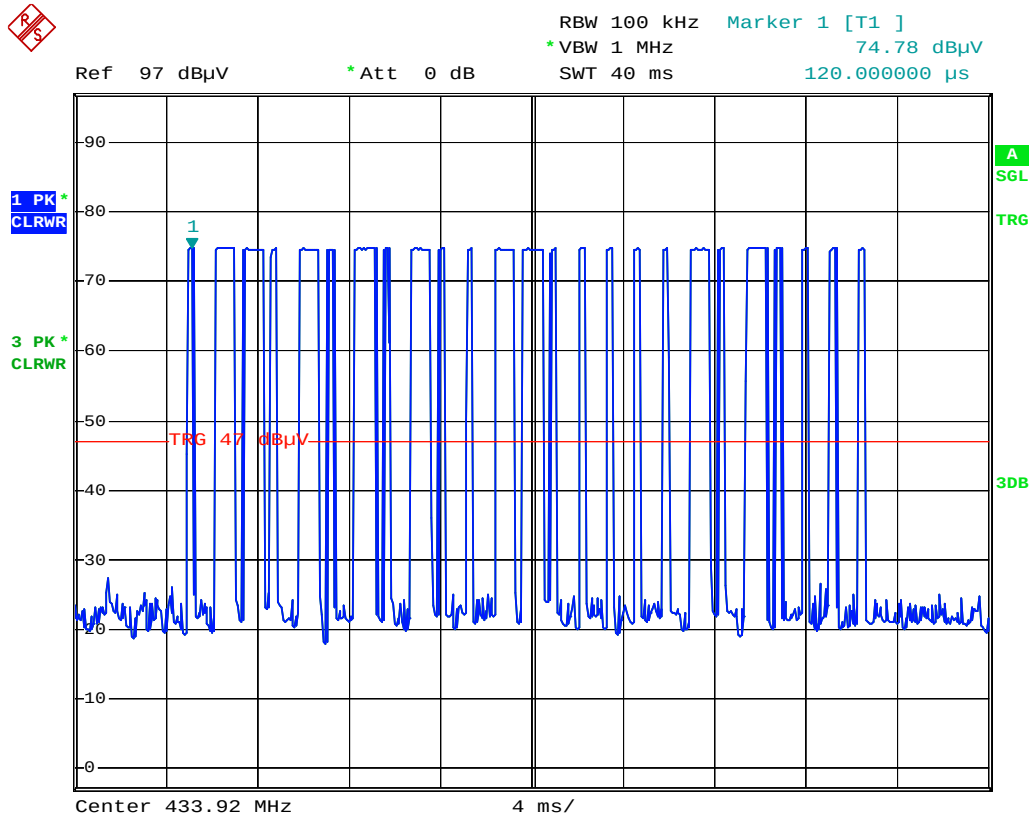
Averaging factor in dB =20 log (duty cycle)
The duration of one cycle = 39.24ms
The duty cycle is simply the on-time divided by 39.24ms
Duty Cycle = (0.94ms*9+0.32ms*16) / 39.24ms = 13.58 ms / 39.24ms
Therefore, the averaging factor is found by 20 log 0.3461= -9.22 dB

Please see the diagrams below.

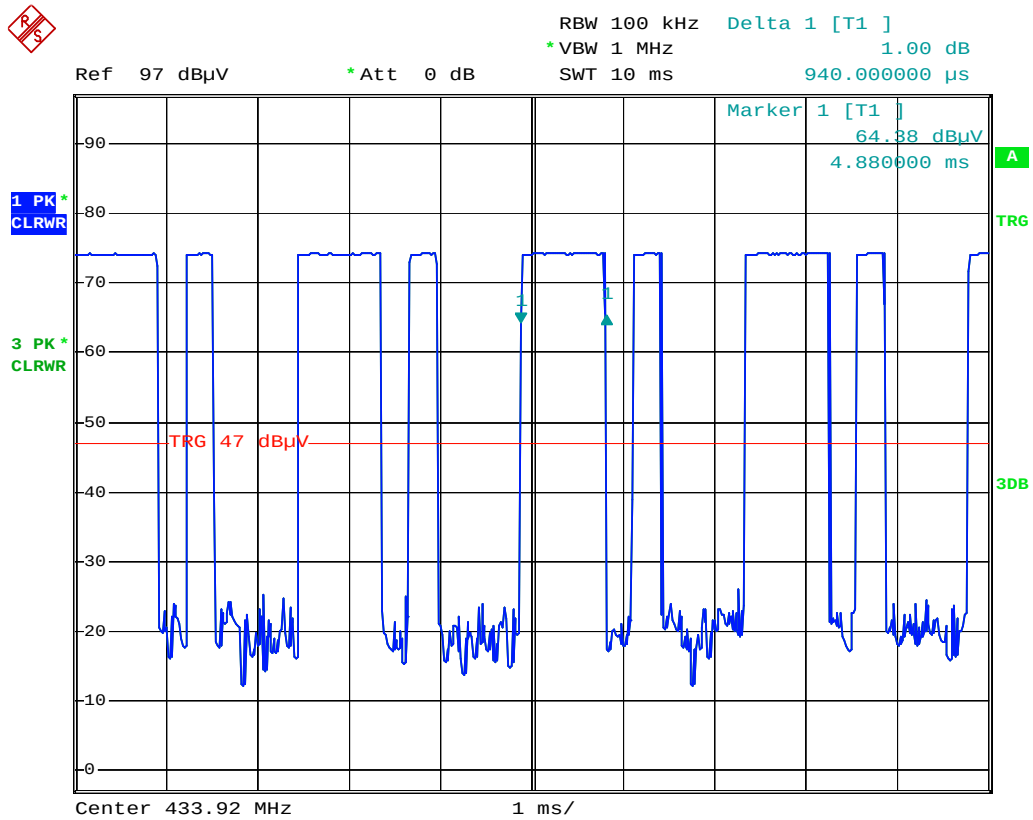
Duty Cycle


RBW 100 kHz
*VBW 1 MHz
SWT 90 ms
Delta 1 [T1]
0.13 dB
39.240000 ms
Ref 97 dBµV
*Att 0 dB
Marker 1 [T1]
79.09 dBµV
9.720000 ms
1 PK*
CLRWR
3 PK*
CLRWR
A
TRG
3DB
TRG 47 dBµV
90
80
70
60
50
40
30
20
10
0
Center 433.92 MHz
9 ms/

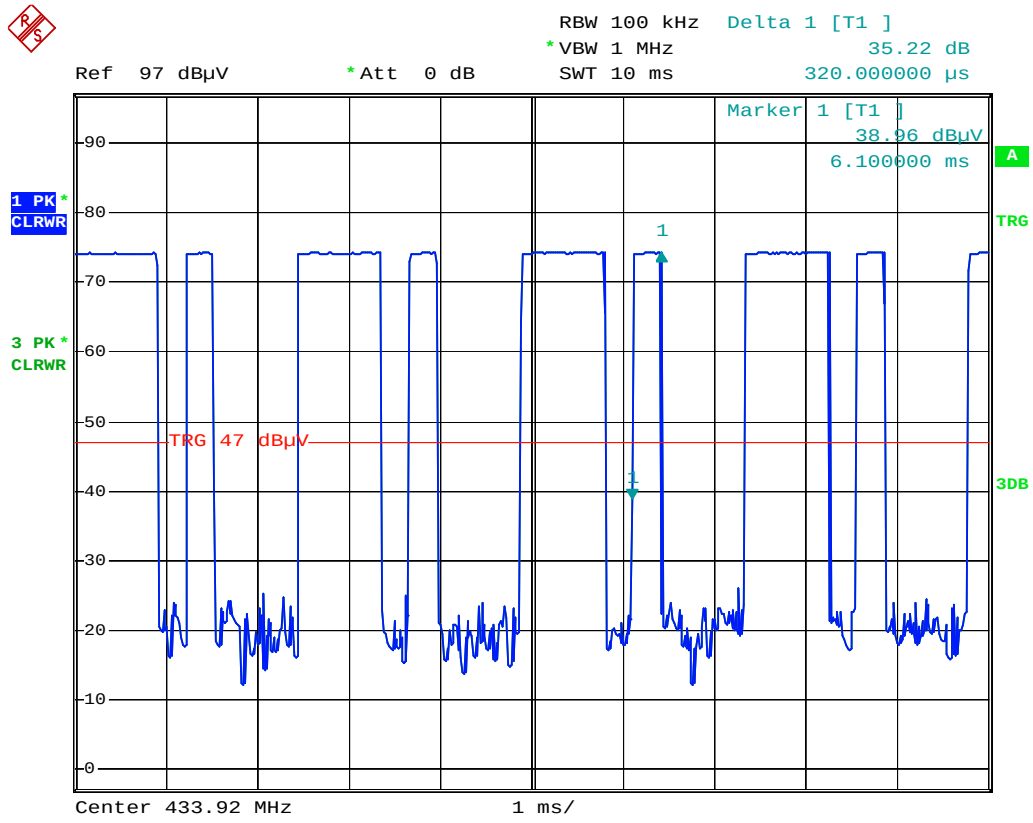
Time Slot



Time Slot

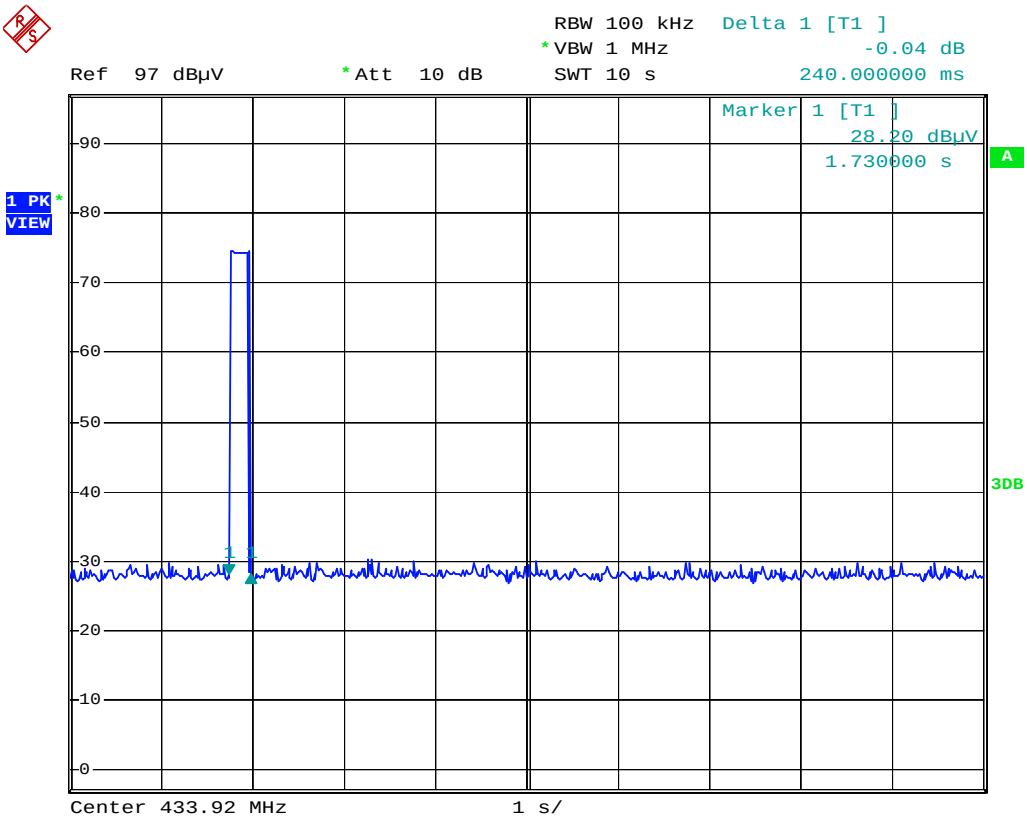


Time Slot 1


RBW 100 kHz
*VBW 1 MHz
SWT 10 ms
Delta 1 [T1]
35.22 dB
320.000000 µs
Ref 97 dBµV
*Att 0 dB
Marker 1 [T1]
38.96 dBµV
6.100000 ms
A
1 PK *
CLRWR
3 PK *
CLRWR
TRG
3DB
TRG 47 dBµV
90
80
70
60
50
40
30
20
10
0
Center 433.92 MHz
1 ms/

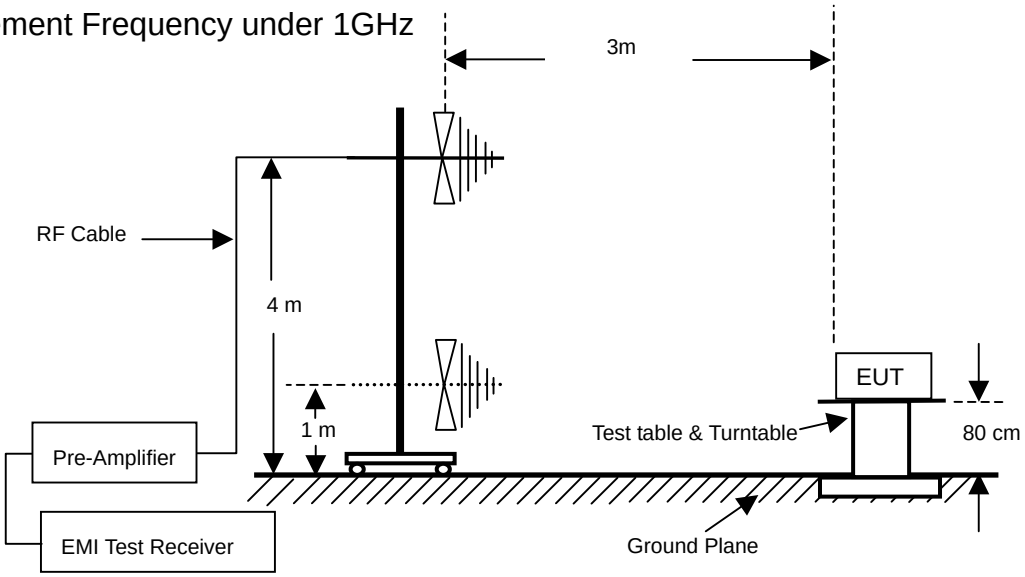
Time Slot 2

The EUT was complied with the requirement of FCC 15.231 (a)(1) and RSS-210 Annex 1, which employed a switch that will automatically deactivate the transmitter within less than 5 seconds of being released.

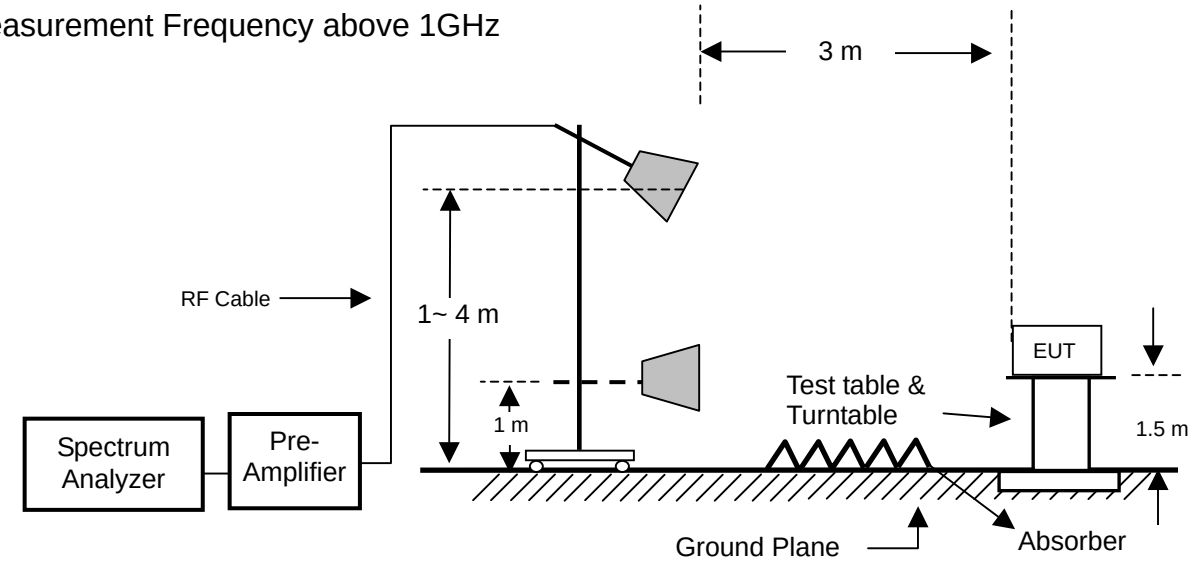


3.3 Configuration of Measurement

Measurement Frequency under 1GHz



Measurement Frequency above 1GHz



3.4 Test Procedure

Radiated emission measurements frequency range were performed from 9kHz to 5GHz. Spectrum Analyzer Resolution Bandwidth set to 9kHz for frequencies below 30MHz, set 100kHz or greater for frequencies from 30MHz to 1GHz, and set 1MHz Resolution Bandwidth for frequencies above 1GHz.

The EUT is place on non-conductive turntable for the test. If peripheral devices apply to the EUT, the peripheral devices will be connected to EUT and whole system. During the emission test, the signal is maximized through rotation and all cables were present worst-case emissions. The height of antenna and polarization is constantly changed for exploring maximum signal reading. The height of antenna can be up form reference ground to 4 meter and down to 1 meter.

3.5 Test Result

PASS.

The final test emission data is shown as following tables.

TX Radiated Emission Below 1 GHz

Worse case X axis

Frequency	Antenna	Reading	Preamp	Correction Factor	Corrected Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
154.23	H	36.23	31.32	16.28	21.19	43.52	-22.33	QP
291.02	H	34.68	31.33	22.52	25.87	46.02	-20.15	QP
347.60	H	38.42	31.31	17.76	24.87	46.02	-21.15	QP
483.09	H	36.00	31.31	20.90	25.59	46.02	-20.43	QP
541.23	H	34.73	31.36	22.02	25.39	46.02	-20.63	QP
645.20	H	33.69	31.35	23.72	26.06	46.02	-19.96	QP
78.29	V	41.25	31.57	7.58	17.26	40.00	-22.74	QP
168.78	V	35.92	31.28	16.84	21.48	43.52	-22.04	QP
269.37	V	35.33	31.30	21.05	25.08	46.02	-20.94	QP
365.80	V	37.10	31.30	18.47	24.27	46.02	-21.75	QP
415.72	V	37.67	31.29	20.07	26.45	46.02	-19.57	QP
610.32	V	35.12	31.40	23.09	26.81	46.02	-19.21	QP

Remark ： Corrected Level = Reading + Correction Factor – Preamp

Correction Factor = Antenna Factor + Cable Loss

Margin = Corrected Level – Limits

“ * ” Mark indicated Background Noise Level

The frequency range from 9 kHz to 30 MHz was pre-scanned and the results were 20 dB lower than the limit line which according to FCC 15.31(o) needs not be recorded.

Fundamental and Harmonics Emissions

Freq.	Antenna	Reading	Preamp	Correction Factor	Average Factor	Corrected Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB)	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
433.92 (X Axis)	H	58.51	0.00	20.27	--	78.78	100.8	-22.02	PK
433.92 (X Axis)	H	58.51	0.00	20.27	-9.22	69.56	80.8	-11.24	AV
433.92 (Y Axis)	H	65.12	0.00	20.27	--	85.39	100.8	-15.41	PK
433.92 (Y Axis)	H	65.12	0.00	20.27	-9.22	76.17	80.8	-4.63	AV
433.92 (Z Axis)	H	65.96	0.00	20.27	--	86.23	100.8	-14.57	PK
433.92 (Z Axis)	H	65.96	0.00	20.27	-9.22	77.01	80.8	-3.79	AV
867.84	H	44.63	31.32	26.89	--	40.20	80.8	-40.60	PK
867.84	H	44.63	31.32	26.89	-9.22	30.98	60.8	-29.82	AV
1301.76	H	61.76	51.62	30.35	--	40.49	74.0	-33.51	PK
1301.76	H	61.76	51.62	30.35	-9.22	31.27	54.0	-22.73	AV
1735.68	H	56.85	51.65	32.01	--	37.21	80.8	-43.59	PK
1735.68	H	56.85	51.65	32.01	-9.22	27.99	60.8	-32.81	AV
2169.60	H	61.42	51.63	33.46	--	43.25	80.8	-37.55	PK
2169.60	H	61.42	51.63	33.46	-9.22	34.03	60.8	-26.77	AV
2603.52	H	60.41	51.72	34.92	--	43.61	80.8	-37.19	PK
2603.52	H	60.41	51.72	34.92	-9.22	34.39	60.8	-26.41	AV
3037.44	H	59.49	51.81	36.12	--	43.80	80.8	-37.00	PK
3037.44	H	59.49	51.81	36.12	-9.22	34.58	60.8	-26.22	AV
3471.36	H	59.76	51.89	36.68	--	44.55	80.8	-36.25	PK
3471.36	H	59.76	51.89	36.68	-9.22	35.33	60.8	-25.47	AV
3905.28	H	61.79	51.90	37.84	--	47.73	74.0	-26.27	PK
3905.28	H	61.79	51.90	37.84	-9.22	38.51	54.0	-15.49	AV
4339.20	H	61.01	51.97	39.25	--	48.29	74.0	-25.71	PK
4339.20	H	61.01	51.97	39.25	-9.22	39.07	54.0	-14.93	AV
433.92 (X Axis)	V	66.14	0.00	20.27	--	86.41	100.8	-14.39	PK
433.92 (X Axis)	V	66.14	0.00	20.27	-9.22	77.19	80.8	-3.61	AV
433.92 (Y Axis)	V	59.36	0.00	20.27	--	79.63	100.8	-21.17	PK
433.92 (Y Axis)	V	59.36	0.00	20.27	-9.22	70.41	80.8	-10.39	AV
433.92 (Z Axis)	V	53.24	0.00	20.27	--	73.51	100.8	-27.29	PK
433.92 (Z Axis)	V	53.24	0.00	20.27	-9.22	64.29	80.8	-16.51	AV
867.84	V	53.43	31.32	26.89	--	49.00	80.8	-31.80	PK
867.84	V	53.43	31.32	26.89	-9.22	39.78	60.8	-21.02	AV
1301.76	V	67.95	51.62	30.35	--	46.68	74.0	-27.32	PK
1301.76	V	67.95	51.62	30.35	-9.22	37.46	54.0	-16.54	AV
1735.68	V	57.38	51.65	32.01	--	37.74	80.8	-43.06	PK
1735.68	V	57.38	51.65	32.01	-9.22	28.52	60.8	-32.28	AV
2169.60	V	60.32	51.63	33.46	--	42.15	80.8	-38.65	PK
2169.60	V	60.32	51.63	33.46	-9.22	32.93	60.8	-27.87	AV
2603.52	V	60.33	51.72	34.92	--	43.53	80.8	-37.27	PK
2603.52	V	60.33	51.72	34.92	-9.22	34.31	60.8	-26.49	AV
3037.44	V	61.37	51.81	36.12	--	45.68	80.8	-35.12	PK
3037.44	V	61.37	51.81	36.12	-9.22	36.46	60.8	-24.34	AV
3471.36	V	58.45	51.89	36.68	--	43.24	80.8	-37.56	PK
3471.36	V	58.45	51.89	36.68	-9.22	34.02	60.8	-26.78	AV
3905.28	V	61.91	51.90	37.84	--	47.85	74.0	-26.15	PK
3905.28	V	61.91	51.90	37.84	-9.22	38.63	54.0	-15.37	AV
4339.20	V	61.50	51.97	39.25	--	48.78	74.0	-25.22	PK
4339.20	V	61.50	51.97	39.25	-9.22	39.56	54.0	-14.44	AV

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
Margin = Corrected Level – Limits
“ * ” Mark indicated Background Noise Level

Receiver spurious emissions below 1 GHz

Frequency	Antenna	Reading	Preamp	Correction Factor	Corrected Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
61.23	H	40.24	31.63	9.17	17.78	40.00	-22.22	QP
105.20	H	39.88	31.50	11.91	20.29	43.52	-23.23	QP
159.33	H	35.37	31.30	16.46	20.53	43.52	-22.99	QP
264.30	H	35.03	31.30	20.77	24.50	46.02	-21.52	QP
378.20	H	37.47	31.29	18.99	25.17	46.02	-20.85	QP
410.78	H	37.68	31.28	20.01	26.41	46.02	-19.61	QP
90.32	V	41.90	31.54	9.34	19.70	43.52	-23.82	QP
166.30	V	36.45	31.29	16.74	21.90	43.52	-21.62	QP
197.83	V	35.95	31.21	18.58	23.32	43.52	-20.20	QP
299.20	V	32.30	31.34	23.19	24.15	46.02	-21.87	QP
345.29	V	39.09	31.31	17.71	25.49	46.02	-20.53	QP
487.77	V	37.14	31.32	20.97	26.79	46.02	-19.23	QP

Receiver spurious emissions above 1 GHz

Frequency	Antenna	Reading	Preamp	Correction Factor	Corrected Level	Limits	Margin	Det
(MHz)	Polarization	(dBuV)	(dB)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1301.76	H	56.82	51.62	30.35	35.55	54.00	-18.45	PK
1735.68	H	57.39	51.65	32.01	37.75	54.00	-16.25	PK
2678.20	H	56.60	51.74	35.14	40.00	54.00	-14.00	PK
1301.76	V	57.91	51.62	30.35	36.64	54.00	-17.36	PK
1735.68	V	57.35	51.65	32.01	37.71	54.00	-16.29	PK
3598.30	V	56.42	51.90	37.00	41.52	54.00	-12.48	PK

Remark ： Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss
Margin = Corrected Level – Limits
“ * ” Mark indicated Background Noise Level

The frequency range from 9 kHz to 30 MHz was pre-scanned and the results were 20 dB lower than the limit line which according to FCC 15.31(o) needs not be recorded.

4 Emission Bandwidth

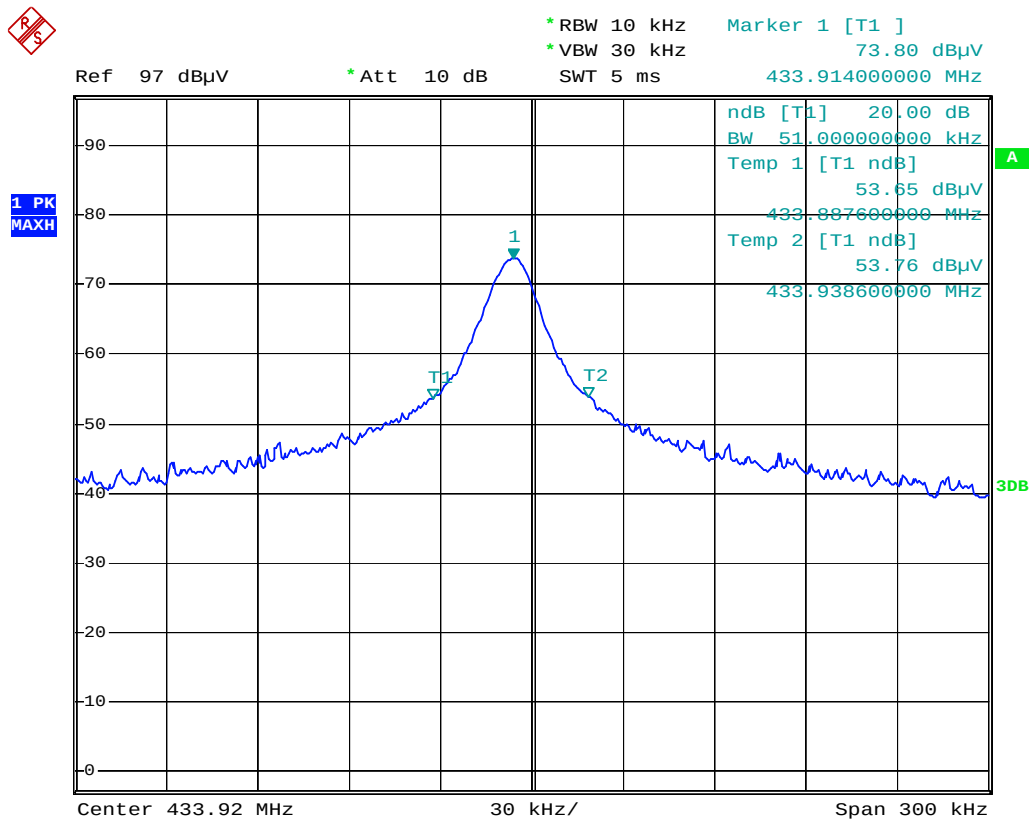
4.1 Limits

According to FCC 15.231(c) requirement:
The bandwidth of the emission shall be no wider than 0.25 % of the center frequency for devices operating between 70 MHz to 900 MHz. Those devices operating above 900 MHz, the emission spurious shall be no wider than 0.5 % of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
B.W (20 dBc) Limit = 0.25 % * f(MHz) = 0.25 % * 433.92 MHz = 1084.8 kHz

4.2 Test Result

PASS.
The final test data is shown as following.

Channel Frequency (MHz)	Measured 20dB Bandwidth (kHz)	Limit (kHz)	Result
433.92	51.0	1084.8	PASS



5 99 % Occupied Bandwidth

5.1 Limits

According to RSS-210 Annex 1 requirement:
The 99 % bandwidth shall be no wider than 0.25 % of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5 % of the centre frequency.
99 % OBW Limit = 0.25 % * f(MHz) = 0.25 % * 433.92 MHz = 1084.8 kHz

5.2 Test Result

PASS.
The final test data is shown as following.

Channel Frequency (MHz)	Measured 99% Bandwidth (kHz)	Limit (kHz)	Result
433.92	246.0	1084.8	PASS