FCC PART 95

MEASUREMENT AND TEST REPORT

For

Kiddesigns Inc

1299 Main Street, Rahway New Jersey 07065-0901 United States

FCC ID: IAJ210A2

Report Type:	**Product Type:**
Original Report	XX-210 FRS 2-way Radio (Walkie Talkies)

Report Number:	RSZ170301K01-00A
Report Date:	2017-03-23
Reviewed By:	Oscar Ye Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu province, China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Kiddesigns Inc*'s product, model number: *PR-210MV (FCC ID: IAJ210A2)* or the "EUT" in this report was a *XX-210 FRS 2-way Radio (Walkie Talkies)*, which was measured approximately: 17.0 cm (L) x 7.0 cm (W) x 3.5 cm (H), rated input voltage: DC 1.5V AAA x4 battery.

Notes: This series products model: CR-210, MM-220, MK-220, JN-210, PL-210, SK-210, ST-210, MU-210, GD-210, SM-210, TD-210, BE-210, GG-210, FR-210, TF-210, IN-210, SW-210, SM-210H, TB-210, DP-210, DP210(V1), AV-210, BH-210, JW-210, MS-210, MS-210MM, EK-210, EK-210B, EK-210K, EK-210P, GG-210.EXv7M, MS-210.EXv7M, RI-210, RI-210BM, RI-210HP, RI-210JL, RI-210JL.FXV7M, RI-210SU, SM-210.EX7Mi, SM-210.FXv7i and PR-210MV are identical schematics and only are different for model name. Model PR-210MV was selected for fully testing, the detailed information can be referred to the attached declaration which was stated and guaranteed by the applicant.

** All measurement and test data in this report was gathered from production sample serial number: 170301K01 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2017-03-01.*

Objective

This report is prepared on behalf of *Kiddesigns Inc* in accordance with Part 2 and Part 95, Subpart B & Subpart E of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart B and Subpart E of the Federal Communication Commissions rules with TIA-603-D, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards.

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

Measurement Uncertainty

Item		Uncertainty
RF conducted test with spectrum		±0.9dB
Radiated emission	30MHz~1GHz	±5.91dB
	Above 1G	±4.92dB
Occupied Bandwidth		±0.5kHz
Temperature		±1.0℃
Humidity		±6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

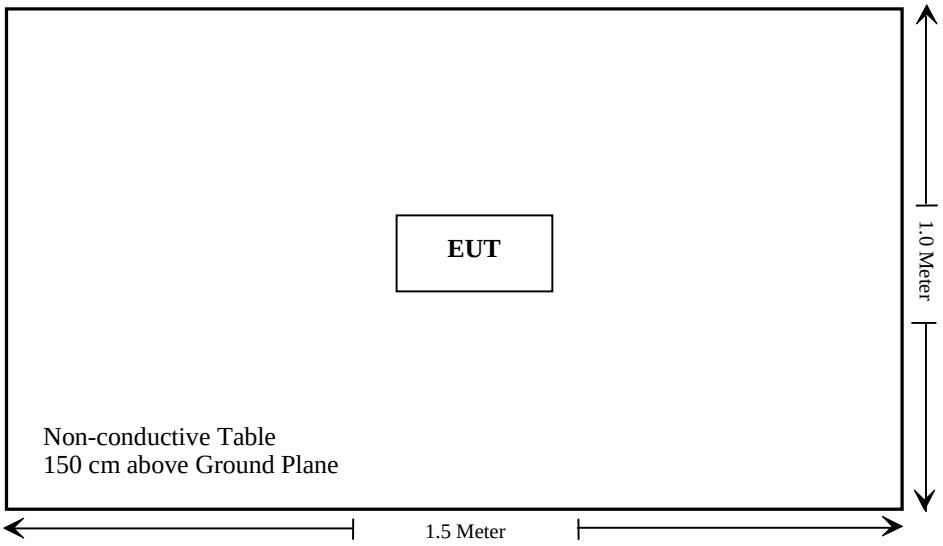
Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure	Compliance
§2.1046, §95.639(d)	RF Output Power	Compliance
§2.1047, §95.637(a)	Modulation Characteristic	Compliance
§2.1049, §95.633 (c), §95.635 (b) (1) (3) (7)	Authorized Bandwidth & Emission Mask	Compliance
§2.1053, §95.635(b) (7)	Spurious Radiated Emissions	Compliance
§2.1055(d), §95.626(b)	Frequency Stability	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sonoma Instrunent	Amplifier	330	171377	2016-12-12	2017-12-12
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25
Sunol Sciences	Broadband Antenna	JB3	A090314-2	2016-01-09	2019-01-08
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2016-01-09	2019-01-08
Narda	Pre-amplifier	AFS42-00101800	2001270	2016-09-08	2017-09-08
EMCO	Horn Antenna	3116	9510-2384	2015-11-07	2018-11-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25
ETS	Horn Antenna	3115	6229	2016-12-12	2019-12-12
ETS	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-12
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-12
MICRO-COAX	Coaxial Cable	Cable-7	007	2016-12-12	2017-12-12
HP	Signal Generator	8341B	2624A00116	2016-08-29	2017-08-29
RF Conducted test					
BACL	TS 8997 Cable-01	T-KS-EMC086	T-KS-EMC086	2016-12-09	2017-12-08
BACL	RF cable	KS-LAB-012	KS-LAB-012	2016-12-15	2017-12-14
WEINSCHEL	10dB Attenuator	5328	N/A	2016-06-18	2017-06-18
Rohde & Schwarz	OSP120 BASE UNIT	OSP120	101247	2016-07-04	2017-07-03
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-21
HEWLETT PACKARD	RF Communications Test SET	8920A	3438A05201	2016-09-21	2017-09-21
HONOVA	Power Splitter	ZFRSC-14-S+	019411452	2016-06-12	2017-06-12

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

FCC §1.1307(b) & §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §1.1307(b) and §2.1093, protable device operates Part 95 should be subjected to rountine environmental evaluation for RF exposure prior or equipment authorization or use.

Result: Compliance.

Please refer to SAR Report Number: RSZ170301K01-20A.

FCC §2.1046 & §95.639(d) - RF OUTPUT POWER

Applicable Standard

Per FCC §2.1046, and §95.639(d), No FRS Unit, under any condition of modulation, shall exceed a 0.5 W effective radiated power (ERP).

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT .The test was performed by placing the EUT on 3-orthogonal axis.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the emissions were measured by the substitution.

Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Nefertari Xu on 2017-03-13.

Test Mode: Transmitting

Indicated		Table Angle Degree	Test Ant.		Substituted			Absolute Level (dBm)	FCC Part 95	
Frequency (MHz)	S.A. Reading (dBµV)		Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable Loss (dB)	Ant. Gain (dB)		ERP (mW)	Limit (Watt)
462.6625	88.15	69	1.4	H	7.7	0.23	4.05	11.52	14.19	0.5
462.6625	95.39	254	1.1	V	18.2	0.23	4.05	22.02	159.22	0.5

Test Result: Compliance.

FCC §2.1047 & §95.637(a) - MODULATION CHARACTERISTIC

Applicable Standard

Per FCC §2.1047 and §95.637(a): A GMRS transmitter that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A FRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz .

Each GMRS transmitter, except a mobile station transmitter with a power output of 2.5 W or less, must automatically prevent a greater than normal audio level from causing over-modulation. The transmitter also must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of § 95.631 (without filtering.) The filter must be between the modulation limiter and the modulated stage of the transmitter. At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least 60 log 10 (f/3) dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater than the attenuation at 1 kHz.

Test Procedure

Test Method: TIA/EIA-603-D

Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Nefertari Xu on 2017-03-13.

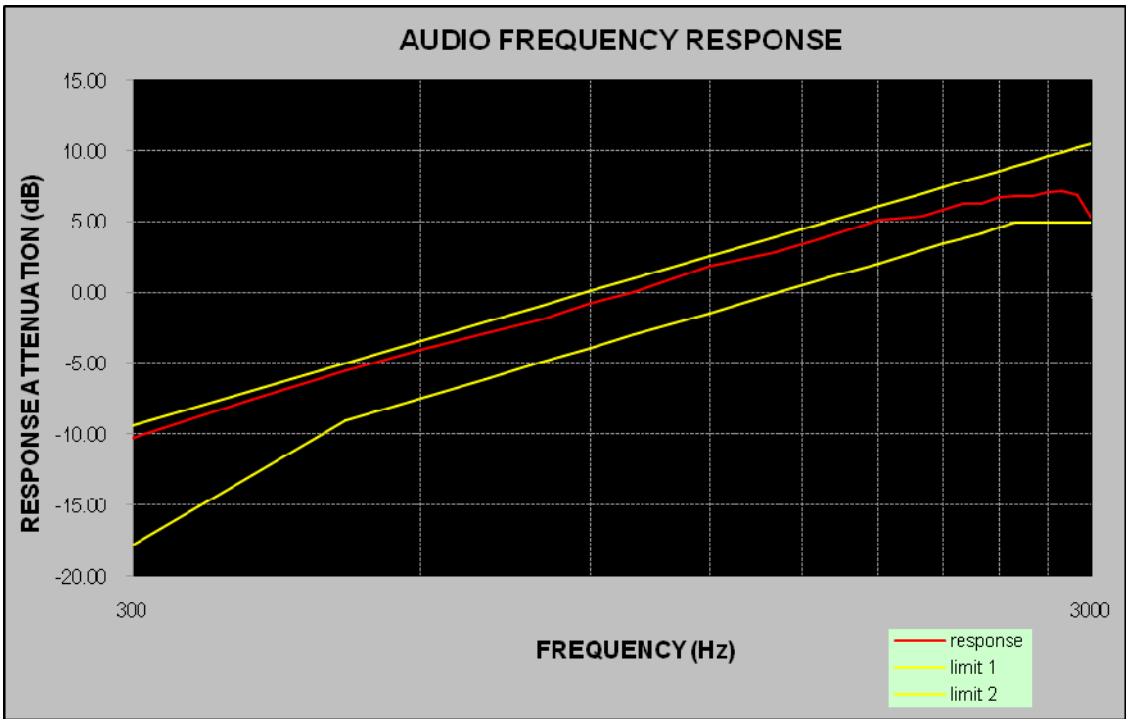
Please refer to the following tables and plots.

Test Mode: Transmitting

Audio Frequency Response

Carrier Frequency: 462.6625 MHz

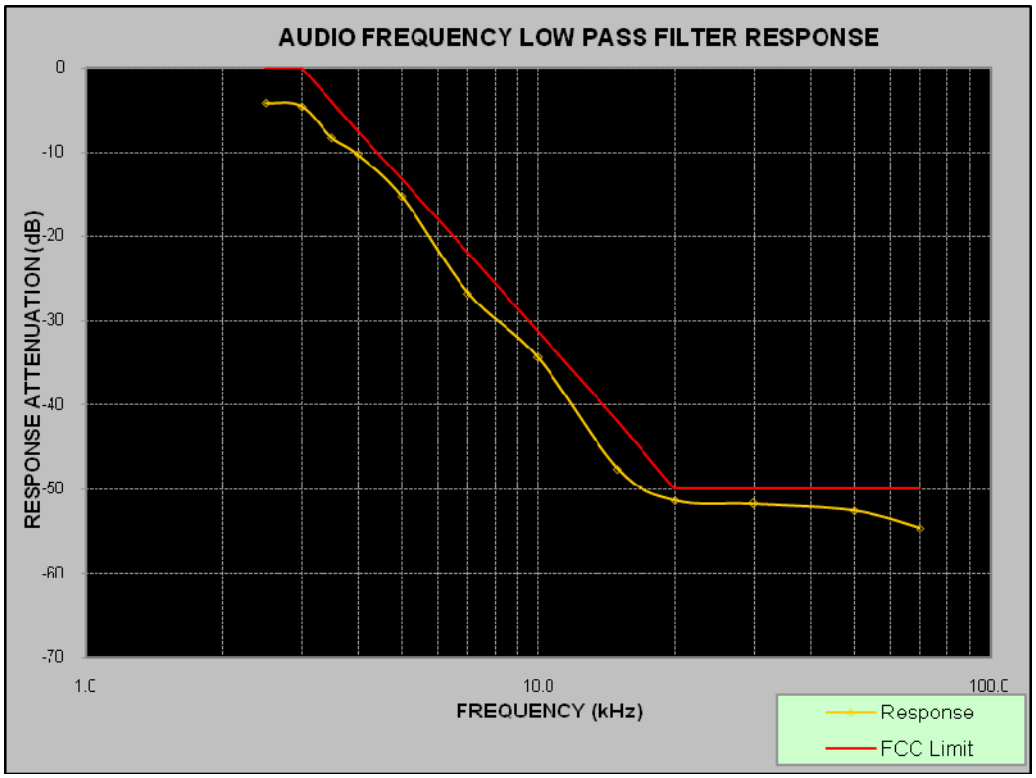
Audio Frequency (Hz)	Response Attenuation (dB)
300	-10.23
400	-7.54
500	-5.55
600	-3.99
700	-2.83
800	-1.89
900	-0.80
1000	0.00
1200	1.84
1400	2.84
1600	3.98
1800	5.12
2000	5.44
2100	5.83
2200	6.29
2300	6.26
2400	6.70
2500	6.80
2600	6.82
2700	7.05
2800	7.17
2900	6.86
3000	5.33


AUDIO FREQUENCY RESPONSE
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
RESPONSE ATTENUATION (dB)
300
3000
FREQUENCY (Hz)
response
limit 1
limit 2

Audio frequency lows pass filter response

Carrier Frequency: 462.6625 MHz

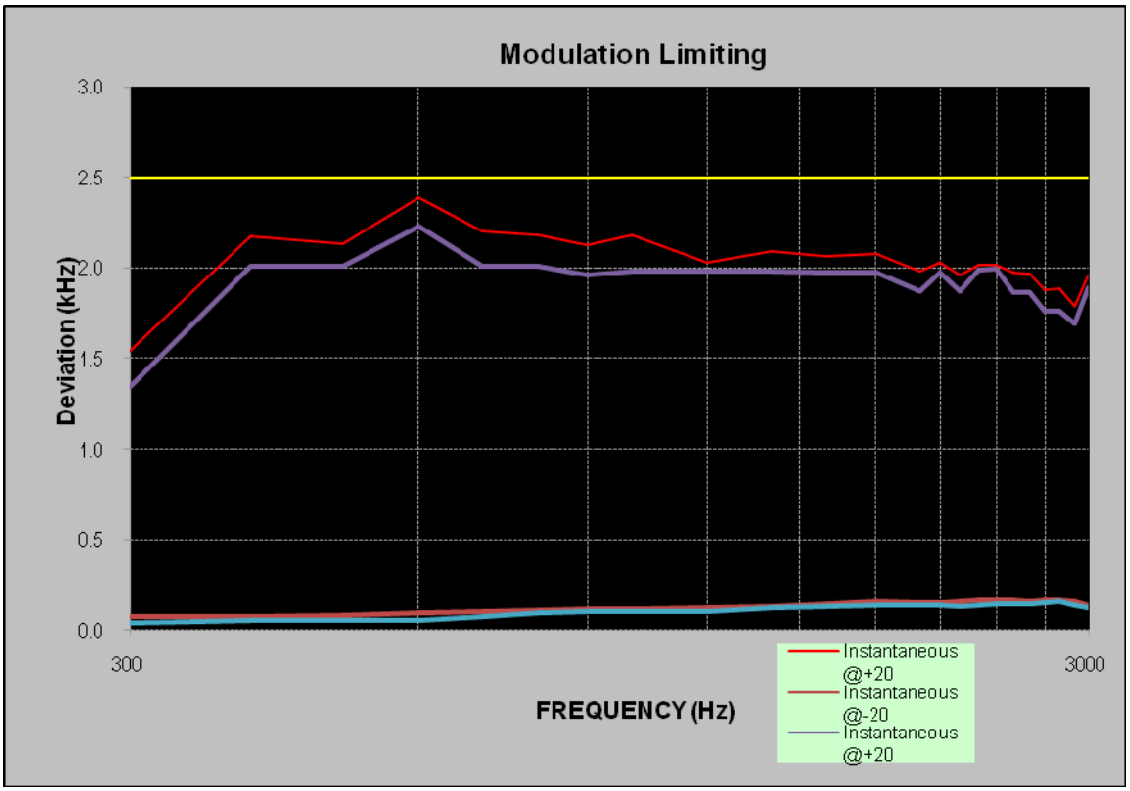
Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
2.5	-4.22	0.0
3.0	-4.57	0.0
3.5	-8.32	-4.0
4.0	-10.29	-7.5
5.0	-15.31	-13.3
7.0	-26.77	-22.1
10.0	-34.42	-31.4
15.0	-47.68	-42.0
20.0	-51.36	-50.0
30.0	-51.77	-50.0
50.0	-52.54	-50.0
70.0	-54.61	-50.0



MODULATION LIMITING

Carrier Frequency: 462.6625MHz

Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	1.542	0.071	1.345	0.043	2.500
400	2.173	0.075	2.012	0.053	2.500
500	2.132	0.081	2.012	0.053	2.500
600	2.390	0.095	2.230	0.054	2.500
700	2.206	0.101	2.014	0.075	2.500
800	2.180	0.106	2.010	0.095	2.500
900	2.125	0.113	1.965	0.104	2.500
1000	2.183	0.114	1.986	0.102	2.500
1200	2.035	0.125	1.985	0.100	2.500
1400	2.097	0.130	1.986	0.121	2.500
1600	2.063	0.142	1.975	0.127	2.500
1800	2.081	0.155	1.974	0.139	2.500
2000	1.981	0.150	1.876	0.134	2.500
2100	2.033	0.153	1.976	0.136	2.500
2200	1.965	0.160	1.875	0.131	2.500
2300	2.020	0.166	1.987	0.136	2.500
2400	2.021	0.165	1.998	0.141	2.500
2500	1.979	0.164	1.864	0.141	2.500
2600	1.972	0.160	1.865	0.145	2.500
2700	1.882	0.161	1.765	0.152	2.500
2800	1.890	0.165	1.765	0.156	2.500
2900	1.791	0.158	1.692	0.135	2.500
3000	1.961	0.136	1.896	0.125	2.500


Modulation Limiting
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Deviation (kHz)
300
3000
FREQUENCY (Hz)
Instantaneous @+20
Instantaneous @-20
Instantaneous @+20

FCC §2.1049 & §95.633(c) & §95.635 (b) (1) (3) (7) - AUTHOURIZED BANDWIDTH AND EMISSION MASK

Applicable Standard

According to §95.633(c), the authorized bandwidth for emission type F3E or F2D transmitted by a FRS unit is 12.5 kHz.

According to §95.635(b) (1) (3) (7), the power of each unwanted emission shall be less than TP as specified in the applicable paragraphs listed in the following :

1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

7) At least 43 + 10 log $_{10}$ (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

Test Procedure

TIA-603-D, section 2.2.11

Test Data

Environmental Conditions

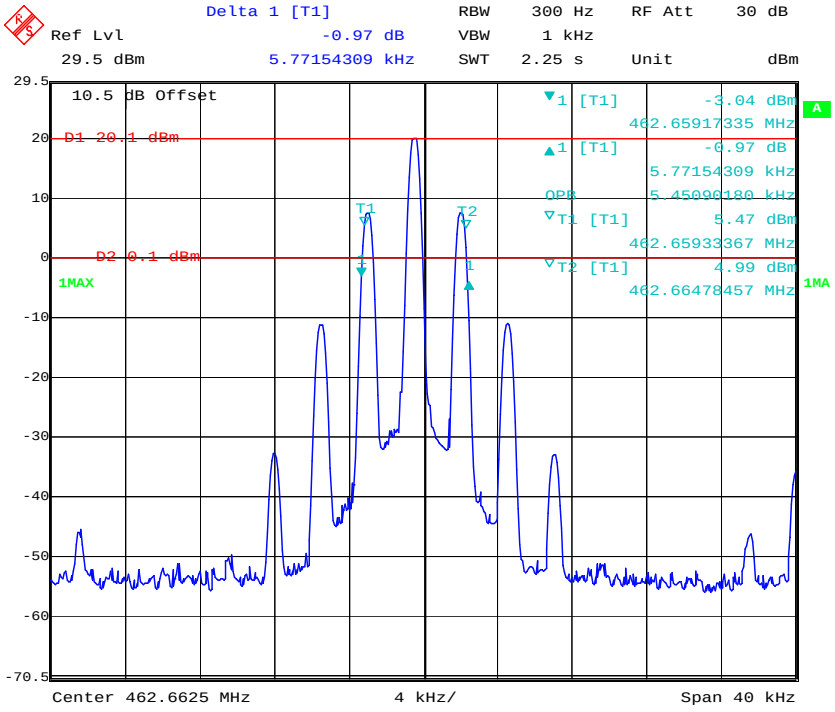
Temperature:	23~25 °C
Relative Humidity:	47~52 %
ATM Pressure:	100.0 kPa

The testing was performed by Nefertari Xu on 2017-03-13 and 2017-03-22.

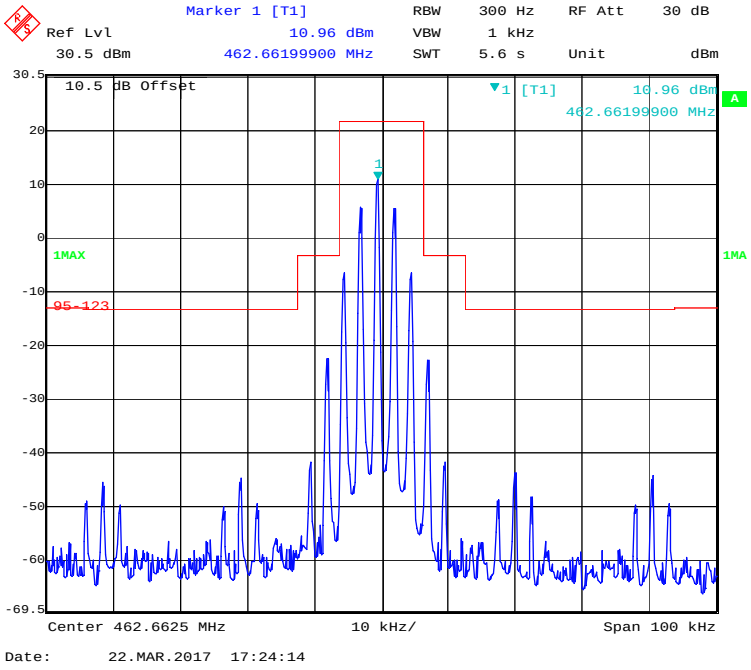
Test Mode: Transmitting

Item	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
FRS	462.6625	5.77	12.5	Pass

20dB Bandwidth



Emission Mask



FCC §2.1053 & §95.635(b) (7) - RADIATED SPURIOUS EMISSION

Applicable Standard

FCC §2.1053 and §95.635(b) (7)

Test Procedure

The transmitter was placed on a wooden turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT .The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =10 1g (TXpwr in Watts/0.001)-the absolute level
Spurious attenuation limit in dB = 43+10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	49 %
ATM Pressure:	100.0 kPa

The testing was performed by Layne Li on 2017-03-14.

Test Mode: Transmitting

Indicated		Table Angle Degree	Test Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Receiver Reading (dBuV)		Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Analog 462.6625MHz										
925.33	51.35	92	1.4	H	-48.8	0.27	5.05	-44.02	-13	31.02
925.33	48.60	7	1.6	V	-48.1	0.27	5.05	-43.32	-13	30.32
1387.99	50.07	347	1.3	H	-54.0	0.34	7.92	-46.42	-13	33.42
1387.99	55.20	288	1.6	V	-50.6	0.34	7.92	-43.02	-13	30.02
1850.65	54.40	141	1.6	H	-45.5	0.45	8.84	-37.11	-13	24.11
1850.65	58.73	115	1.3	V	-43.4	0.45	8.84	-35.01	-13	22.01

Note:
1) Absolute Level = SG Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

FCC§2.1055 (d) & §95.626(b) - FREQUENCY STABILITY

Applicable Standard

According to FCC §2.1055(a) (1), the frequency stability shall be measured with variation of ambient temperature from –30 ºC to +50 ºC, and according to FCC 2.1055(d) (2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §95.626(b), Each FRS unit must be maintained within a frequency tolerance of 0.00025%(2.5 ppm).

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Frequency Counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Frequency Counter.

Frequency Stability vs. Voltage (item 1or item 2 will be chosen according to different condition) :

☐1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

☒2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The output frequency was recorded for each voltage.

Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Nefertari Xu on 2017-03-13.

Test Mode: Transmitting

FRS

Reference Frequency: 462.6625 MHz, Limit: ±2.5 ppm			
Environment Temperature (℃)	**Power Supplied (V_{DC})**	**Measurement Frequency (MHz)**	**Frequency Error (ppm)**
Frequency Stability Ver. Temperature			
50	6.0	462.662493	-0.01513
40	6.0	462.662451	-0.10591
30	6.0	462.662454	-0.09942
20	6.0	462.662422	-0.16859
10	6.0	462.662451	-0.10591
0	6.0	462.662414	-0.18588
-10	6.0	462.662414	-0.18588
-20	6.0	462.662415	-0.18372
-30	6.0	462.662419	-0.17507
Frequency Stability Ver. Input Voltage			
20	5.1	462.6624894	-0.02291

Note: DC 5.1V is the battery end point that specified by the manufacturer

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