




FCC PART 95  
MEASUREMENT AND TEST REPORT

For

**Kiddesigns Inc**

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

**FCC ID: IAJ212A**

<b>Report Type:</b> Original Report	<b>Product Type:</b> XX-212 WALKIE TALKIES
<b>Report Number:</b> <u>RSZ200508K09-00</u>	
<b>Report Date:</b> <u>2020-06-05</u>	
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## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

Product	XX-212 WALKIE TALKIES
Tested Model	MD-212.FEV0
Multiple Models	M <sub>1</sub> - 212 M <sub>2</sub> M <sub>3</sub> M <sub>4</sub> M <sub>5</sub> M <sub>6</sub> M <sub>7</sub> M <sub>8</sub> M <sub>9</sub> M <sub>10</sub>
Model Difference	Refer to the DoS letter
Frequency Range	462.5625MHz(The EUT only supports 462.5625MHz)
Transmit Power (ERP)	-2.22dBm
Channel Spacing	12.5kHz
Modulation Technique	FM
Antenna Specification	-2.14dBi
Voltage Range	DC 1.5V*3 from batteries
Date of Test	2020-05-14 to 2020-05-29
Sample serial number	RSZ200508K09-RF-S1(Assigned by BACL, Shenzhen)
Received date	2020-05-08
Sample/EUT Status	Good condition

Model: M<sub>1</sub>- 212 M<sub>2</sub>M<sub>3</sub>M<sub>4</sub>M<sub>5</sub>M<sub>6</sub>M<sub>7</sub>M<sub>8</sub>M<sub>9</sub>M<sub>10</sub> (M<sub>1</sub> - M<sub>10</sub>, please refer to model no. table)

**Model No. Table**

Part of model #	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	M <sub>8</sub>	M <sub>9</sub>	M <sub>10</sub>
Number of digit(s)	2 to 3	1 to 2	1	1	1 to 2	1	1 to 2	1	2	1 to 2
Description	2 to 3 digits alphabets combination by "a" - "Z" for brand	1 to 2 digits alphabets combination by "a" - "Z" special character version Or blank	"," Or blank	"U" for Europe version Or blank	"E" for English content Or "F" for English & French Or "3" for 3 language version Or "5" for 5 languages version Or "11" for Europe version with 11 languages	"E" for Sound chip with speech or sound effect Or Blank Remark: = configurati on same as EUT	"0"- "9" for year version Or "V0" - "V9" for year version	"M" for Movie version brand Or blank	"AK" for Walmart exclusive Or "AP" for Apple exclusive Or "KS" for Kohl's exclusive Or "TG" for Target exclusive Or blank	"i" for inner carton required Or "z" for direct to consumer on-line packaging Or "OL" for Amazon packaging Or blank

## Objective

This report is prepared on behalf of *Kiddesigns Inc* in accordance with Part 2 and Part 95, Subpart A & Subpart B 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 A, Subpart B of the Federal Communication Commissions rules with TIA-603-E, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards.

All 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
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1°C
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

### Description of Test Configuration

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

The EUT only supports 462.5625MHz.

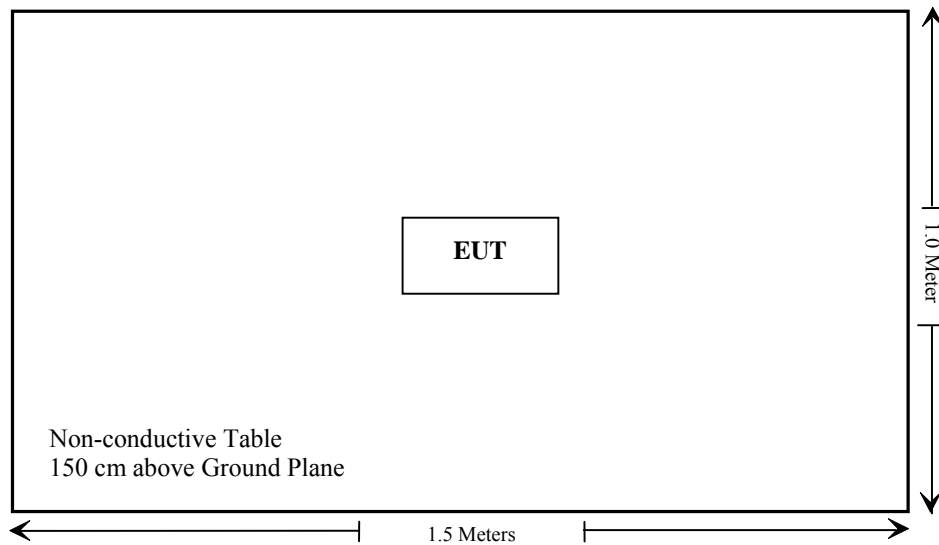
### Equipment Modifications

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**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§2.1093	RF Exposure	Compliance
§95.587(b)(1)	Antenna Requirement	Compliance
§2.1046, §95.567	RF Output Power	Compliance
§2.1047, §95.575	Modulation Characteristic	Compliance
§2.1049, §95.573	Authorized Bandwidth & Emission Mask	Compliance
§2.1053, §95.579	Spurious Radiated Emissions	Compliance
§2.1055(d), §95.565	Frequency Stability	Compliance

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test</b>					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2017/12/22	2020/12/21
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
Sonoma instrument	Pre-amplifier	310 N	186238	2020/4/20	2021/4/20
Agilent	MXG Vector Signal Generator	N5182B	MY53051503	2019/7/22	2020/7/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
A.H.System	Horn Antenna	SAS-200/571	135	2018/9/1	2021/8/31
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Unknown	Notch Filter	SKU 5G3	ATR0205-04-13	2020/3/2	2021/3/1
UTiFLEX MICRO-COAX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2019/11/12	2020/11/12
Ducommun Technologies	RF Cable	104PEA	218124002	2019/11/12	2020/11/12
Ducommun technologies	RF Cable	RG-214	1	2019/11/29	2020/11/28
Unknow	Signal Cable	RG-214	2	2019/11/29	2020/11/28
<b>RF Conducted test</b>					
HP Agilent	RF Communication test set	8920B	3325U00859	2020/1/15	2021/1/15
WEINSCHL	10dB Attenuator	5324	F-03-EM122	2019/11/29	2020/11/28
HP	Microwave frequency counter	5343A	2232A00827	2019/8/29	2022/8/29
Fluke	Digital Multimeter	287	19000011	2019/7/25	2020/7/24
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2019/12/25	2020/12/24
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2020/3/2	2021/3/1
Ducommun Technologies	RF Cable	RG-214	3	Each Time	

\* **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§2.1093 – RF EXPOSURE

### Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

1.  $f(\text{GHz})$  is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test Exclusion.

**For worst case:**

Frequency (MHz)	Maximum Tune-up power		Calculated Distance (mm)	Calculated Value	Threshold (1-g SAR)	SAR Test Exclusion
	(dBm)	(mW)				
462.5625	-2.0	0.63	5	0.09	3.0	Yes

**Result: No Standalone SAR test is required**



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## **FCC §95.587(b)(1) – ANTENNA REQUIREMENT**

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### **Applicable Standard**

According to FCC § 95.587, (b) Antenna. The antenna of each FRS transmitter type must meet the following requirements.

(1) The antenna must be a non-removable integral part of the FRS transmitter type.

### **Antenna Connector Construction**

The EUT has an integral antenna arrangement and the antenna gain is -2.14dBi, fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.

## FCC §2.1046 & §95.567 - RF OUTPUT POWER

### Applicable Standard

Per FCC §2.1046, and §95.567, Each FRS transmitter type must be designed such that the effective radiated power (ERP) on channels 8 through 14 does not exceed 0.5 Watts and the ERP on channels 1 through 7 and 15 through 22 does not exceed 2.0 Watts.

### 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

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

The testing was performed by Hams He on 2020-05-17.

Test Mode: Transmitting

Indicated		Table Angle Degree	Test Ant.		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV)		Height (m)	Polar (H/V)	Substituted level (dBm)	Cable Loss (dB)	Ant. Gain (dB)			
462.5625MHz										
462.5625	59.78	192	1.4	H	-15.0	1.32	0.0	-16.32	33	49.32
462.5625	69.61	211	1.6	V	-0.9	1.32	0.0	-2.22	33	35.22

**Test Result:** Compliance.

**FCC §2.1047 & §95.575 - MODULATION CHARACTERISTIC****Applicable Standard**

Per FCC §2.1047 and §95.575: Each FRS transmitter type must be designed such that the peak frequency deviation does not exceed 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

**Test Procedure**

Test Method: TIA/EIA-603-E

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Alan He on 2020-05-29.*

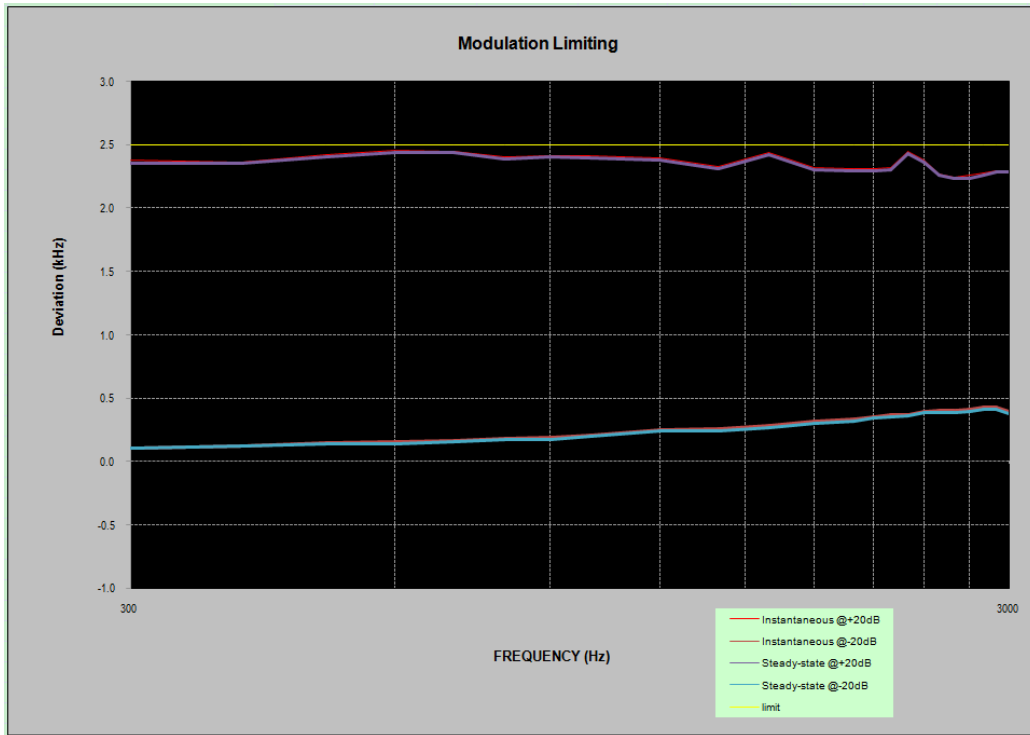
Please refer to the following tables and plots.

*Test Mode: Transmitting*

**MODULATION LIMITING**

Carrier Frequency: 462.5625MHz

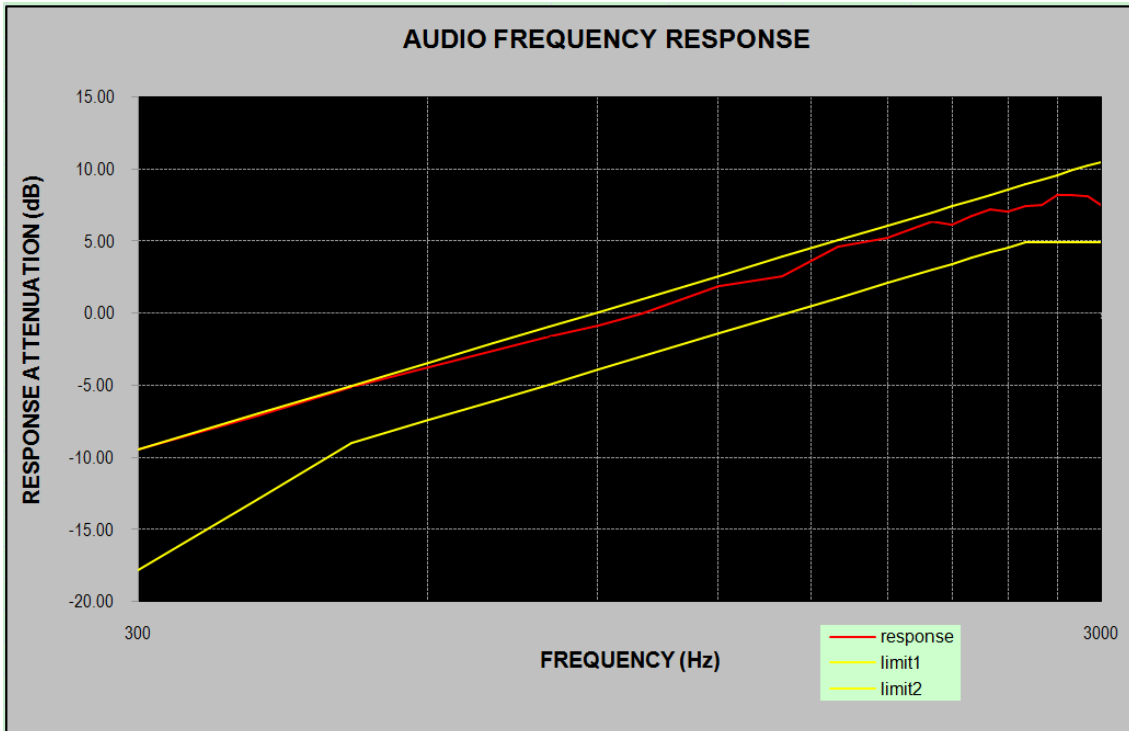
Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	2.376	0.107	2.354	0.102	2.500
400	2.362	0.125	2.353	0.118	2.500
500	2.417	0.145	2.404	0.136	2.500
600	2.452	0.154	2.439	0.142	2.500
700	2.445	0.165	2.436	0.157	2.500
800	2.403	0.183	2.387	0.169	2.500
900	2.411	0.188	2.402	0.172	2.500
1000	2.411	0.206	2.396	0.195	2.500
1200	2.394	0.253	2.375	0.241	2.500
1400	2.325	0.259	2.308	0.243	2.500
1600	2.442	0.287	2.425	0.266	2.500
1800	2.315	0.314	2.303	0.302	2.500
2000	2.309	0.335	2.291	0.318	2.500
2100	2.313	0.356	2.296	0.343	2.500
2200	2.319	0.367	2.302	0.351	2.500
2300	2.443	0.372	2.427	0.357	2.500
2400	2.381	0.397	2.363	0.384	2.500
2500	2.271	0.403	2.256	0.386	2.500
2600	2.244	0.401	2.232	0.384	2.500
2700	2.259	0.408	2.237	0.395	2.500
2800	2.274	0.426	2.261	0.408	2.500
2900	2.295	0.425	2.284	0.412	2.500
3000	2.294	0.392	2.283	0.377	2.500



**Audio Frequency Response**

Carrier Frequency: 462.5625 MHz

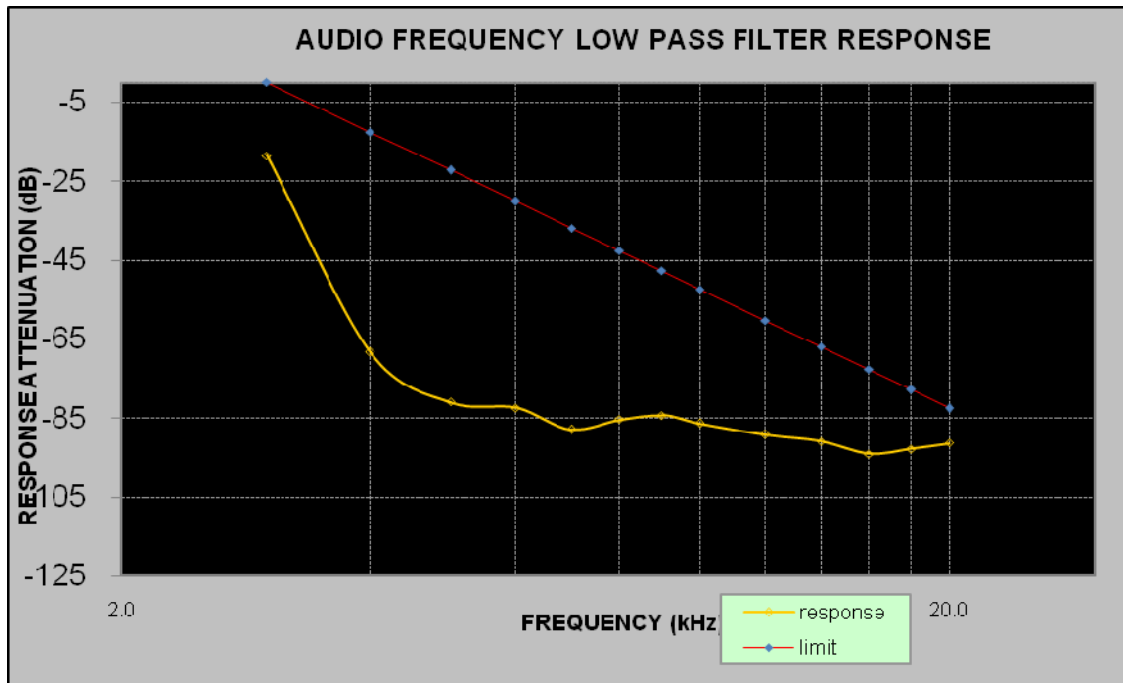
<b>Audio Frequency (Hz)</b>	<b>Response Attenuation (dB)</b>
300	-9.47
400	-7.09
500	-5.13
600	-3.74
700	-2.59
800	-1.62
900	-0.86
1000	0.00
1200	1.87
1400	2.61
1600	4.61
1800	5.23
2000	6.39
2100	6.11
2200	6.73
2300	7.23
2400	7.08
2500	7.41
2600	7.55
2700	8.17
2800	8.23
2900	8.09
3000	7.51



**Audio frequency lows pass filter response**

Carrier Frequency: 462.5625 MHz, Channel Separation=12.5 kHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1.0	0.0	/
3.0	-18.6	0.0
4.0	-68.3	-12.5
5.0	-80.9	-22.2
6.0	-82.3	-30.1
7.0	-87.9	-36.8
8.0	-85.3	-42.6
9.0	-84.3	-47.7
10.0	-86.3	-52.3
12.0	-89.2	-60.2
14.0	-90.8	-66.9
16.0	-94.0	-72.7
18.0	-92.8	-77.8
20.0	-91.3	-82.5





## FCC §2.1049 & §95.573 - AUTHORIZED BANDWIDTH AND EMISSION MASK

### Applicable Standard

According to §95.573. Each FRS transmitter type must be designed such that the occupied bandwidth does not exceed 12.5 kHz.

### Test Procedure

TIA-603-E, section 2.2.11

### Test Data

#### Environmental Conditions

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

The testing was performed by Alan He on 2020-05-27.

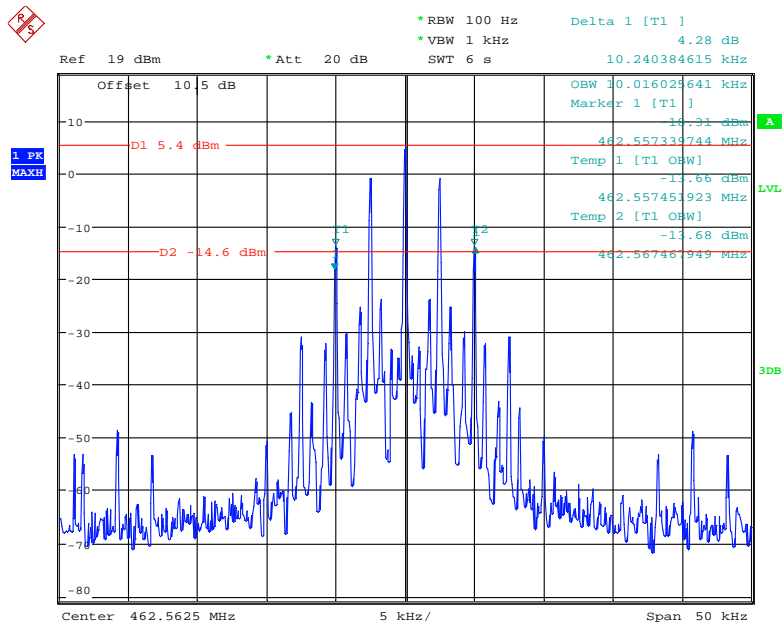
Test Mode: Transmitting

Item	Frequency (MHz)	99% Occupied Bandwidth (kHz)	20 dB Bandwidth (kHz)	Limit (kHz)	Result
FRS	462.5625	10.016	10.240	12.5	Pass

Emission Designator Per CFR 47 §2.201& §2.202&,  $B_n = 2M + 2D$  :

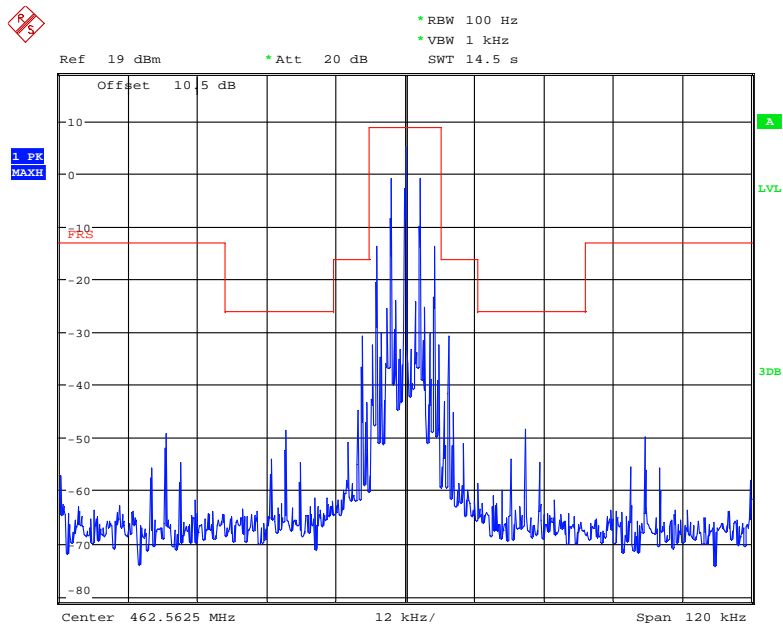
Emission Designator 11K0F3E In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation.  $BW = 2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} \rightarrow 11K0$   
F3E portion of the designator represents an FM voice transmission Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

### OBW, 462.5625 MHz



Date: 27.MAY.2020 17:15:51

### Emission Mask, 462.5625 MHz



Date: 27.MAY.2020 17:17:34

## FCC §2.1053 & §95.579- RADIATED SPURIOUS EMISSION

### Applicable Standard

FCC §2.1053 and §95.579. Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits in this paragraph.

(a) *Attenuation requirements.* The power of unwanted emissions must be attenuated below the carrier power output in Watts (P) by at least:

- (1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.
- (2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.
- (3)  $43 + 10 \log (P)$  dB in any frequency band removed from the channel center frequency by more than 31.25 kHz.

(b) *Measurement bandwidths.* The power of unwanted emissions in the frequency bands specified in paragraphs (a)(1) and (2) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (a)(3) is measured with a reference bandwidth of at least 30 kHz.

(c) *Measurement conditions.* The requirements in this section apply to each FRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone and/or power cord.

### 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 =  $10 \lg (\text{TXpwr in Watts}/0.001)$ -the absolute level  
Spurious attenuation limit in dB =  $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

### Test Data

#### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

*The testing was performed by Leven Gan and Hams He on 2020-05-14 and 2020-05-17.*

*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 (dBd/dBi)			
462.5625MHz										
925.13	60.72	58	2.0	H	-36.5	1.24	0.0	-37.74	-13	24.74
925.13	79.84	335	1.5	V	-16.9	1.24	0.0	-18.14	-13	5.14
1387.69	47.87	338	1.5	H	-60.3	1.60	7.90	-54.00	-13	41.00
1387.69	47.20	350	2.5	V	-61.2	1.60	7.90	-54.90	-13	41.90
1850.25	42.51	77	2.5	H	-60.6	1.30	9.40	-52.50	-13	39.50
1850.25	41.99	266	2.4	V	-61.3	1.30	9.40	-53.20	-13	40.20
2312.81	43.05	70	1.6	H	-62.2	1.30	10.00	-53.50	-13	40.50
2312.81	43.75	153	1.3	V	-61.4	1.30	10.00	-52.70	-13	39.70
2775.38	42.14	37	1.1	H	-61.8	1.80	10.50	-53.10	-13	40.10
2775.38	41.87	163	2.0	V	-61.7	1.80	10.50	-53.00	-13	40.00
3237.94	43.01	325	2.3	H	-57.6	1.60	11.50	-47.70	-13	34.70
3237.94	42.74	187	2.4	V	-58.1	1.60	11.50	-48.20	-13	35.20
3700.50	42.34	22	2.0	H	-59.7	1.60	11.90	-49.40	-13	36.40
3700.50	41.92	176	1.1	V	-59.6	1.60	11.90	-49.30	-13	36.30
4163.06	49.82	338	1.6	H	-52.1	1.50	11.80	-41.80	-13	28.80
4163.06	47.85	170	1.2	V	-53.3	1.50	11.80	-43.00	-13	30.00
4625.63	48.98	200	2.3	H	-52.0	1.60	12.00	-41.60	-13	28.60
4625.63	49.33	324	1.6	V	-50.4	1.60	12.00	-40.00	-13	27.00

**Note 1:** The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

**Note 2:** Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

## **FCC§2.1055 (d) & §95.565 - FREQUENCY STABILITY**

### **Applicable Standard**

According to FCC §2.1055(a) (1), the frequency stability shall be measured with variation of ambient temperature from  $-30\text{ }^{\circ}\text{C}$  to  $+50\text{ }^{\circ}\text{C}$ , 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 §95.565, Each FRS transmitter type must be designed such that the carrier frequencies remain within  $\pm 2.5$  parts-per-million of the channel center frequencies specified in §95.563 during normal operating conditions.

### **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 1 or 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**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Alan He on 2020-05-29.*

*Test Mode: Transmitting*

**FRS**

<b>Reference Frequency: 462.5625 MHz, Limit: ±2.5 ppm</b>			
<b>Environment Temperature (°C)</b>	<b>Power Supplied (V<sub>DC</sub>)</b>	<b>Measurement Frequency (MHz)</b>	<b>Frequency Error (ppm)</b>
Frequency Stability Ver. Temperature			
50	4.5	462.562509	0.019
40	4.5	462.562524	0.052
30	4.5	462.562536	0.078
20	4.5	462.562518	0.039
10	4.5	462.562524	0.052
0	4.5	462.562511	0.024
-10	4.5	462.562532	0.069
-20	4.5	462.562508	0.017
-30	4.5	462.562524	0.052
Frequency Stability Ver. Input Voltage			
20	3.8	462.562528	0.061
20	5.2	462.562431	-0.149

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