ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 95

MEASUREMENT AND TEST REPORT

For

Kiddesigns Inc

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

FCC ID: IAJ212C7A

Report Type:	**Product Type:**
Original Report	XX-212 WALKIE TALKIES

Report Number:	SZKA210125-03047E-00
Report Date:	2021-03-01
Reviewed By:	Jacob Kong Jacob Gong 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	XX-212 WALKIE TALKIES
Tested Model	MD-212.FEv0
Multiple Model	M_1 - 212$M_2M_3M_4M_5M_6M_7M_8M_9M_{10}$ (M_1-M_{10}, please refer to model no. table)
Model Differences	Refer to the DoS letter
Frequency Range	462.7125MHz
Transmit Power (ERP)	8.62dBm
Channel Spacing	12.5kHz
Modulation Technique	FM
Antenna Specification*	-4dBi (It is provided by the applicant)
Voltage Range	DC 3*1.5V AAA battery or LR44 button battery
Date of Test	2021-02-18 to 2021-02-20
Sample serial number	SZKA210125-03047E-RF-S1(Assigned by BACL, Shenzhen)
Received date	2021-01-25
Sample/EUT Status	Good condition

Model: M_1-212$M_2M_3M_4M_5M_6M_7M_8M_9M_{10}$ (M_1-M_{10}, please refer to model no. table)

Model no. table

Part of model #	**M_1**	**M_2**	**M_3**	**M_4**	**M_5**	**M_6**	**M_7**	**M_8**	**M_9**	**M_{10}**
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:= configuration 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 test report is in accordance with Part 2 and Part 95, Subpart A & Subpart B of the Federal Communication Commissions rules.

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-2016, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards and ANSI C63.26-2015, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.

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℃
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 462.7125MHz.

Equipment Modifications

No modification was made to the EUT tested.

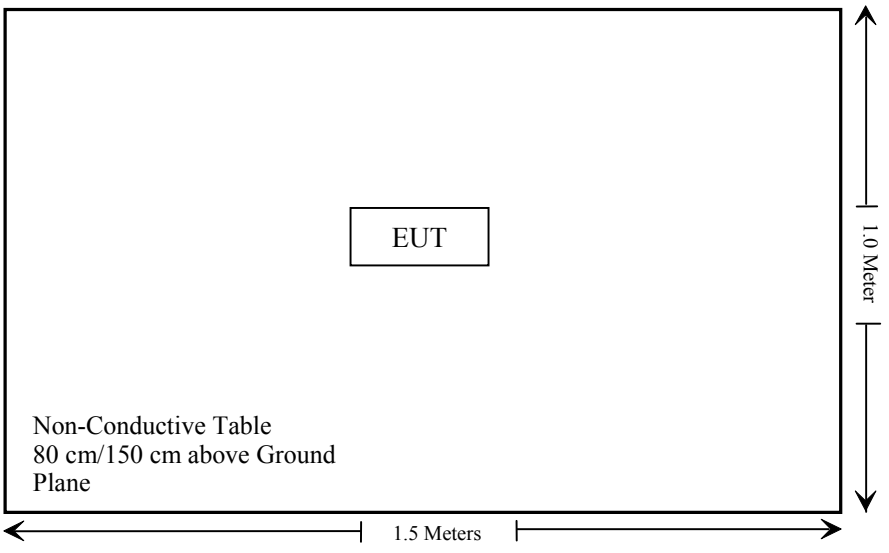
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

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
§95.587(b)(1)(2)(3)	Antenna Requirement	Compliance
§2.1046, §95.567	RF Output Power	Compliance
§2.1047, §95.575	Modulation Characteristic	Compliance
§2.1049, §95.573, §95.579	Authorized Bandwidth & Emission Mask	Compliance
§2.1053, §95.579	Radiated Spurious Emission	Compliance
§2.1055(d), §95.565	Frequency Stability	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 4	EC-007	2020/11/29	2021/11/28
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2020/08/04	2021/08/03
Sunol Sciences	Horn Antenna	DRH-118	A052604	2020/12/22	2023/12/21
A.H.System	Horn Antenna	SAS-200/571	135	2018/09/01	2021/08/31
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2020/11/29	2021/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
Unknown	notch filter	SKU 5G3	ATR0205-04-13	2020/04/20	2021/04/20
Agilent	Signal Generator	N5183A	MY51040755	2020/12/29	2021/12/28
RF Conducted test					
WEINSCHEL	10dB Attenuator	5324	AU3842	2020/11/29	2021/11/28
HP Agilent	RF Communication test set	8920A	3325UC0859	2020/08/04	2021/08/03
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2020/04/03	2021/04/02
Unknown	RF Cable	Unknown	DLO J5/W6102	2020/11/29	2021/11/28
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2020/12/21	2021/12/21
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2020/07/23	2021/07/22

*** 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).

§2.1093 - RF EXPOSURE INFORMATION

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 ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
1. f(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)				
462.7125	9.0	7.94	5	1.1	3.0	**Yes**

Result: No Standalone SAR test is required

FCC §95.587(b)(1)(2)(3) – ANTENNA REQUIREMENT

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.

(2) The gain of the antenna must not exceed that of a half-wave dipole antenna.

(3) The antenna must be designed such that the electric field of the emitted waves is vertically polarized when the unit is operated in the normal orientation.

Antenna Description

The EUT has an integral vertically ploarized antenna arrangement and the antenna gain is -4dBi, 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

Temperature:	21 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Harris He on 2021-02-20.

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 (dBd)			
462.7125MHz										
462.7125	64.31	227	1.9	H	-9.8	1.08	0.0	-10.88	33	43.88
462.7125	79.49	263	2.4	V	9.7	1.08	0.0	8.62	33	24.38

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: ANSI C63.26-2015

Test Data

Environmental Conditions

Temperature:	27.2~28 °C
Relative Humidity:	41~58 %
ATM Pressure:	101.0~101.1 kPa

The testing was performed by Black Chen on 2021-02-19.

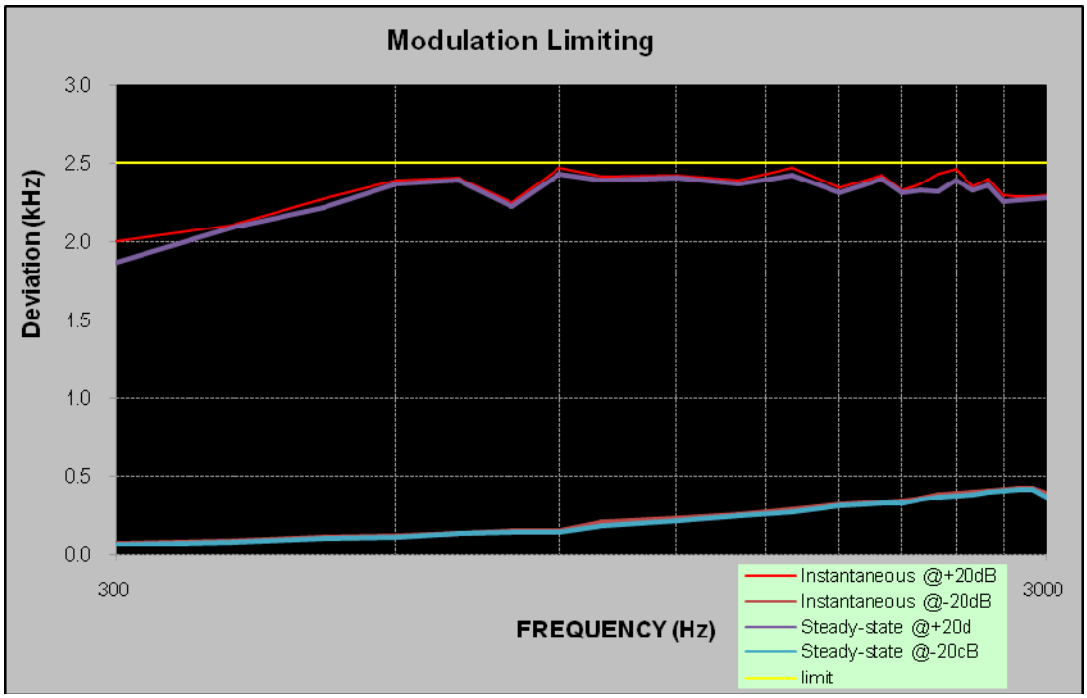
Please refer to the following tables and plots.

Test Mode: Transmitting

MODULATION LIMITING

Carrier Frequency: 462.7125MHz

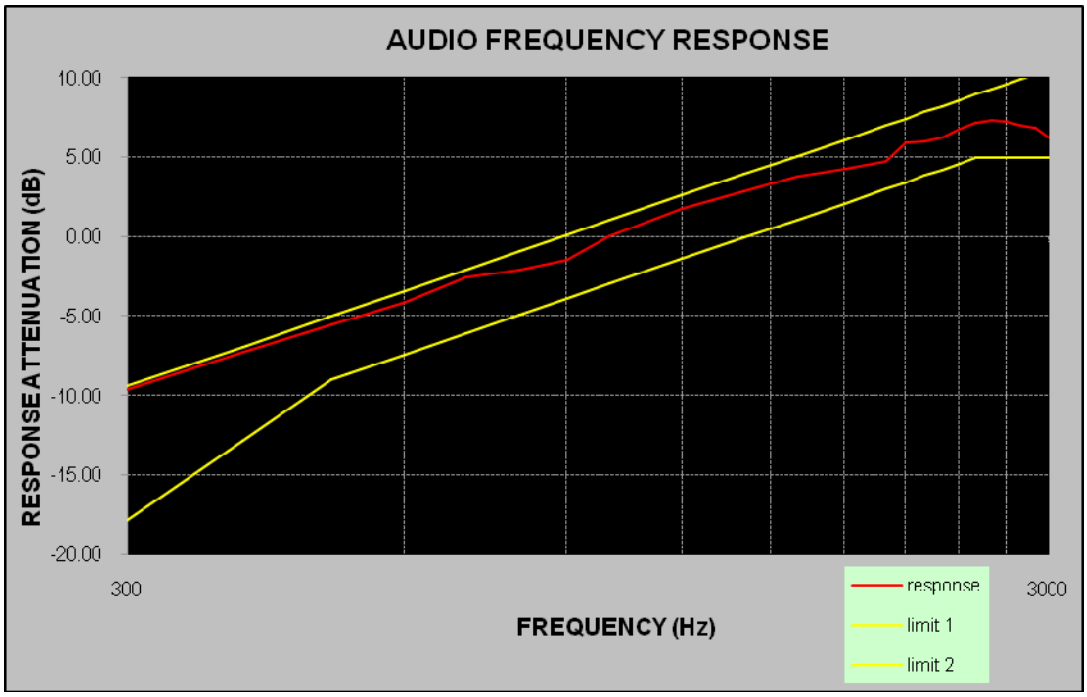
Audio Frequency (Hz)	Instantaneous		Steady-state		Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	2.001	0.075	1.867	0.063	2.500
400	2.103	0.091	2.089	0.084	2.500
500	2.270	0.110	2.216	0.102	2.500
600	2.391	0.122	2.364	0.114	2.500
700	2.402	0.141	2.386	0.134	2.500
800	2.242	0.151	2.218	0.145	2.500
900	2.471	0.156	2.429	0.146	2.500
1000	2.415	0.208	2.389	0.184	2.500
1200	2.419	0.236	2.401	0.217	2.500
1400	2.385	0.260	2.364	0.248	2.500
1600	2.466	0.291	2.418	0.274	2.500
1800	2.337	0.322	2.311	0.315	2.500
2000	2.417	0.340	2.394	0.327	2.500
2100	2.328	0.345	2.309	0.329	2.500
2200	2.366	0.362	2.328	0.354	2.500
2300	2.432	0.384	2.319	0.371	2.500
2400	2.460	0.391	2.387	0.375	2.500
2500	2.345	0.396	2.328	0.386	2.500
2600	2.398	0.406	2.354	0.401	2.500
2700	2.291	0.418	2.257	0.408	2.500
2800	2.285	0.425	2.261	0.416	2.500
2900	2.288	0.427	2.265	0.418	2.500
3000	2.296	0.390	2.274	0.369	2.500


Modulation Limiting
Deviation (kHz)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
300
3000
FREQUENCY (Hz)
Instantaneous @+20dB
Instantaneous @-20dB
Steady-state @+20d
Steady-state @-20cB
limit

Audio Frequency Response

Carrier Frequency: 462.7125 MHz

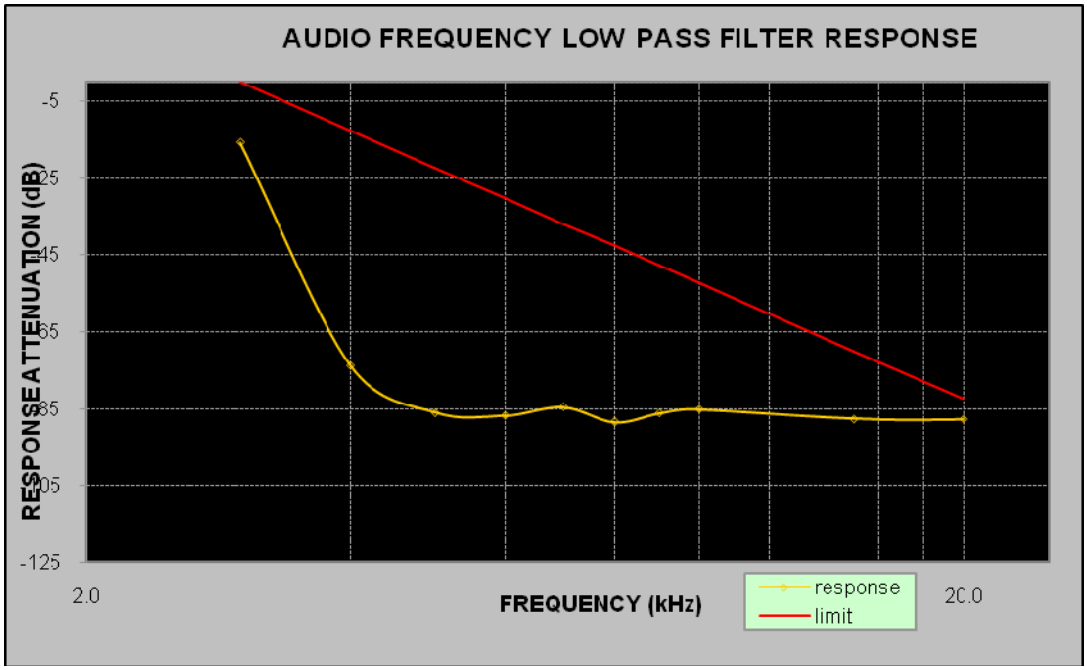
Audio Frequency (Hz)	Response Attenuation (dB)
300	-9.63
400	-7.25
500	-5.55
600	-4.15
700	-2.57
800	-2.14
900	-1.47
1000	0.00
1200	1.74
1400	2.85
1600	3.80
1800	4.23
2000	4.73
2100	5.87
2200	5.99
2300	6.20
2400	6.75
2500	7.18
2600	7.27
2700	7.26
2800	7.03
2900	6.80
3000	6.22


AUDIO FREQUENCY RESPONSE
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: 462.7125 MHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1.0	0.0	/
3.0	-15.75	0.0
4.0	-73.65	-12.5
5.0	-85.95	-22.2
6.0	-86.75	-30.1
7.0	-84.54	-36.8
8.0	-88.46	-42.6
9.0	-86.15	-47.7
10.0	-85.13	-52.3
12.0	-87.61	-60.2
14.0	-87.77	-66.9
16.0	-88.7	-72.7
18.0	-89.2	-77.8
20.0	-87.3	-82.5



FCC §2.1049 & §95.573 & §95.579 - AUTHOURIZED 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.

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.

Test Procedure

ANSI C63.26-2015

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Chen on 2021-02-19.

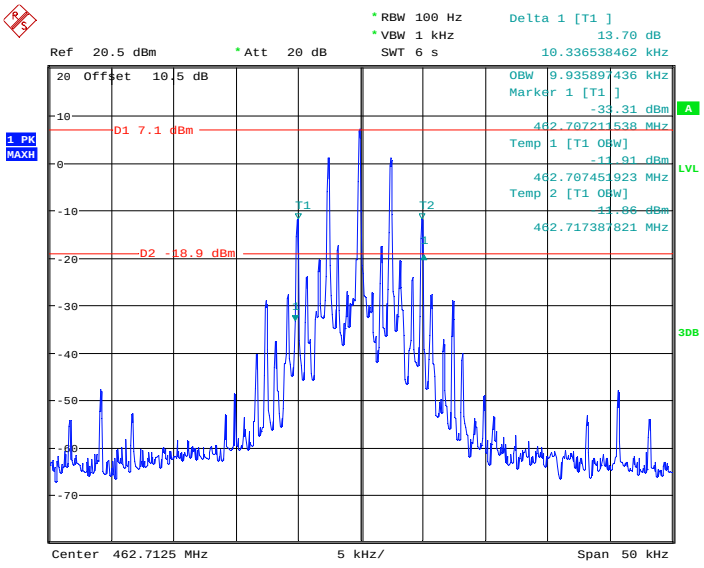
Test Mode: Transmitting

Modulation	Channel Separation (kHz)	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26dB Emissions Bandwidth (kHz)
Analog	12.5	462.7125	9.936	10.337

Emission Designator Per CFR 47 §2.201& §2.202&, Bn = 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 kHz + 2.5 kHz) = 11 kHz → 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, 462.7125 MHz



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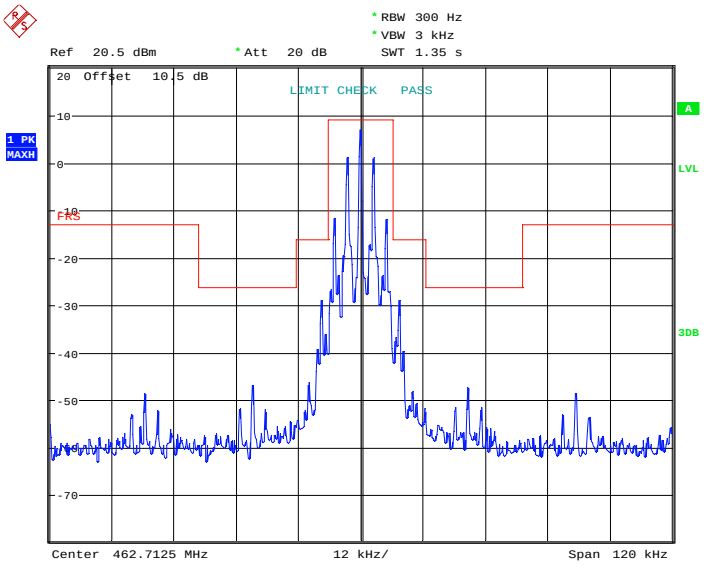
Emission Mask, 462.7125 MHz



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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 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:	21~22.6 °C
Relative Humidity:	50~52 %
ATM Pressure:	101.1 kPa

The testing was performed by Harris He on 2021-02-20 for below 1GHz and Tory Wang on 2021-02-18 for above 1GHz.

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)			
462.7125MHz										
925.425	36.13	234	1.0	H	-60.2	1.33	0.0	-61.53	-13	48.53
925.425	39.09	21	1.4	V	-57.0	1.33	0.0	-58.33	-13	45.33
1388.14	49.79	287	1.6	H	-58.4	1.60	7.90	-52.10	-13	39.10
1388.14	48.58	322	1.2	V	-59.9	1.60	7.90	-53.60	-13	40.60
1850.85	43.53	306	1.2	H	-59.6	1.30	9.40	-51.50	-13	38.50
1850.85	43.38	97	1.2	V	-59.9	1.30	9.40	-51.80	-13	38.80
2313.56	45.70	312	1.0	H	-59.6	1.30	10.00	-50.90	-13	37.90
2313.56	45.42	257	1.1	V	-59.7	1.30	10.00	-51.00	-13	38.00
2776.28	45.12	14	2.2	H	-58.8	1.80	10.50	-50.10	-13	37.10
2776.28	44.86	224	1.5	V	-58.8	1.80	10.50	-50.10	-13	37.10
3238.99	45.84	228	1.6	H	-54.8	1.60	11.50	-44.90	-13	31.90
3238.99	45.37	228	1.4	V	-55.5	1.60	11.50	-45.60	-13	32.60
3701.70	44.82	206	1.7	H	-57.3	1.60	11.90	-47.00	-13	34.00
3701.70	44.46	129	1.9	V	-57.0	1.60	11.90	-46.70	-13	33.70
4164.41	54.79	7	1.7	H	-47.2	1.50	11.80	-36.90	-13	23.90
4164.41	53.27	345	2.0	V	-47.9	1.50	11.80	-37.60	-13	24.60
4627.13	46.74	10	2.1	H	-54.2	1.60	12.00	-43.80	-13	30.80
4627.13	46.15	357	2.3	V	-53.6	1.60	12.00	-43.20	-13	30.20

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 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 §95.565, Each FRS transmitter type must be designed such that the carrier frequencies remain within ±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 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:	24 °C
Relative Humidity:	54 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Chen on 2021-02-19.

Test Mode: Transmitting

Reference Frequency: 462.7125MHz, Limit:2.5 ppm, 12.5kHz			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	PPM Error
50	4.5	462.712524	0.05
40	4.5	462.712541	0.09
30	4.5	462.712514	0.03
20	4.5	462.712511	0.02
10	4.5	462.712536	0.08
0	4.5	462.712551	0.11
-10	4.5	462.712527	0.06
-20	4.5	462.712534	0.07
-30	4.5	462.712528	0.06
Frequency Stability Versus Input Voltage			
20	3.8	462.712525	0.05
20	5.2	462.712554	0.12

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