



# TEST REPORT

**Application No.:** FYCR2203000038ET(SGS SZ No.: T52210250079EM)  
**Applicant:** SHENZHEN LIANGZHIYUAN TECHNOLOGY CO.,LTD.  
**Address of Applicant:** 6TH FLOOR,NO.6,LANE 10,TIANMING STREET,TIANLIAO COMMUNITY,YUTANG,GUANGMING DISTRICT,SHENZHEN,CHINA  
**Manufacturer:** SHENZHEN LIANGZHIYUAN TECHNOLOGY CO.,LTD.  
**Address of Manufacturer:** 6TH FLOOR,NO.6,LANE 10,TIANMING STREET,TIANLIAO COMMUNITY,YUTANG,GUANGMING DISTRICT,SHENZHEN,CHINA  
**Equipment Under Test (EUT):**  
**EUT Name:** KIDS WALKIE TALKIE  
**Model No.:** GB-691  
**FCC ID:** 2A5XPLZYWT691  
**Standard(s) :** 47 CFR Part 95, Subpart B  
**Date of Receipt:** 2022-03-22  
**Date of Test:** 2022-03-24 to 2022-04-19  
**Date of Issue:** 2022-04-25

<b>Test Result:</b>	Pass*
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\* In the configuration tested, the EUT complied with the standards specified above.

Kidd Yang  
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022-04-25		Original

<b>Authorized for issue by:</b>			
		<i>Tree Zhan</i>	
		_____	
		<b>Tree Zhan/Project Engineer</b>	
		<i>Winkey Wang</i>	
		_____	
		<b>Winkey Wang/Reviewer</b>	



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## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 95, Subpart B	N/A	47 CFR Part 95, Subpart B 95.587(b)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Frequency Stability	47 CFR Part 95, Subpart B	ANSI/TIA-603-E:2016	47 CFR FCC Part95.565 & FCC Part2.1055;	Pass
Effective Radiated Power (ERP)	47 CFR Part 95, Subpart B	ANSI/TIA-603-E:2016	47 CFR FCC Part95.567 & FCC Part2.1046;	Pass
Occupied Bandwidth	47 CFR Part 95, Subpart B	ANSI/TIA-603-E:2016	47 CFR FCC Part 95.573 & FCC Part2.1049;	Pass
Modulation characteristics	47 CFR Part 95, Subpart B	ANSI/TIA-603-E:2016	47 CFR FCC Part 95.575 & FCC Part2.1047;	Pass
Radiated Spurious Emissions	47 CFR Part 95, Subpart B	ANSI/TIA-603-E:2016	47 CFR FCC Part 95.579 & FCC Part2.1053;	Pass

**Note:**

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	Charge Input 5Vdc via type-C port Rechargeable Battery 3.7Vdc, 600mAh Battery model: BL-5C
Frequency Range:	462.5500MHz to 467.7125MHz
Modulation Type:	FM
Emission Type:	F3E
Antenna Type:	Inseparable Helical Antenna
Antenna Gain:	-9.7dBi

#### Channel List:

Ch.	Frequency	Ch.	Frequency	Ch.	Frequency	Ch.	Frequency
1	462.5625	7	462.7125	13	467.6875	19	462.6500
2	462.5875	8	467.5625	14	467.7125	20	462.6750
3	462.6125	9	467.5875	15	462.5500	21	462.7000
4	462.6375	10	467.6125	16	462.5750	22	462.7250
5	462.6625	11	467.6375	17	462.6000		
6	462.6875	12	467.6625	18	462.6250		

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
---	---	---	---
Note: The EUT has been tested independent unit.			



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### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10 <sup>-8</sup>
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	3.1dB (below 1GHz)
		4.4dB (above 1GHz)
8	Radiated Spurious emission test	3.1dB (below 1GHz)
		4.4dB (above 1GHz)
9	Temperature test	1°C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



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#### 4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc. Shenzhen branch.

Fuyong lab. Xinlong TechnoPark, Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China

Tel: +86 755 8866 3988 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6606.01)**

Compliance Certification Services (Kunshan) Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 6606.01.

• **FCC –Designation Number: CN1322**

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• **Innovation, Science and Economic Development Canada**

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2021/7/13	2022/7/12
MXA Signal Analyzer(10Hz-26.5GHz)	Agilent	N9020A	SEM004-20	2021/7/13	2022/7/12
Signal Generator(9kHz-40GHz)	Agilent	N5173B	SEM006-05	2021/7/13	2022/7/12
ESG Vector Signal Generator(250kHz-6GHz)	Agilent	E4438C	SEM006-15	2021/7/13	2022/7/12
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2021/7/13	2022/7/12
Attenuator(18GHz, 20dB, 2W)	Huber+Suhner	6620_SMA-50-1	SEM021-09	2021/7/13	2022/7/12
Audio Analyzer	LW	TAG-101	SEM008-08	2021/9/23	2022/9/22

Radiated Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESG Vector Signal Generator(250kHz-6GHz)	Agilent	E4438C	SEM006-15	2021/7/13	2022/7/12
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2022/7/12
Trilog-Broadband Antenna(25MHz-2GHz)	Schwarzbeck	VULB9168	SEM003-33	2021/9/25	2024/9/24
Biconical Antenna(150MHz-1GHz)	Schwarzbeck	VUBA9117	SEM003-35	2021/12/26	2024/12/25
Loop Antenna(9kHz-30MHz)	ETS-LINDGREN	6502	SEM003-36	2021/9/26	2024/9/25
MXE EMI receiver(20Hz-8.4GHz)	Agilent	N9038A	SEM004-05	2021/7/13	2022/7/12
Pre-amplifier (0.1-1.3GHz)	HP	8447D	SEM005-02	2021/7/13	2022/7/12
Broad-Band Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2021/7/11	2024/7/10
Broad-Band Horn Antenna (1-18GHz)	Schwarzbeck	BBHA 9120D	SEM003-32	2021/9/26	2024/9/25
Double-ridged waveguide horn (1-18GHz)	ETS-LINDGREN	3117	SEM003-34	2021/9/25	2024/9/24
Spectrum Analyzer(20Hz-43GHz)	Rohde & Schwarz	101288	SEM004-08	2021/7/13	2022/7/12



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Low Noise Amplifier(100MHz-18GHz)	CLAVIIO	BDLNA-0118-352810	SEM005-05	2021/7/13	2022/7/12
Pre-amplifier(26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2021/7/13	2022/7/12
Pre-amplifier(18GHz-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2021/7/13	2022/7/12

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-22	2021-07-13	2022-07-12
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-23	2021-07-13	2022-07-12
Barometer	DUMAI	DYM3	SEM002-24	2021-07-13	2022-07-12



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 95, Subpart B 95.587(b)

#### 6.1.2 Conclusion

95.587(b) Requirement:

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.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The antenna gain is -9.7dBi (as compared to a half-wave dipole) and with vertically polarized.



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## 7 Radio Spectrum Matter Test Results

### 7.1 Frequency Stability

Test Requirement 47 CFR FCC Part 95.565  
 Test Method: ANSI/TIA-603-E:2016  
 Limit: For FCC Part 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.

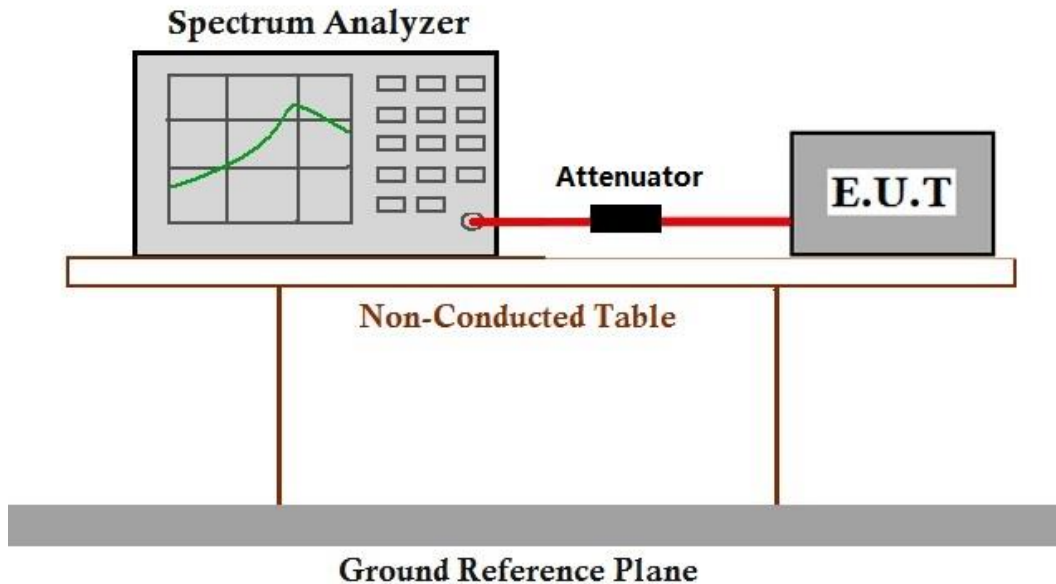
#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C Humidity: 48.9 % RH Atmospheric Pressure: 1010 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

#### 7.1.2 Test Setup Diagram



#### 7.1.3 Measurement Procedure and Data



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Assigned Frequency: 462.5500MHz					
Voltage(V)	Temperature (°C)	Measured Frequency(MHz)	Frequency Deviation(ppm)	FCC Limit (ppm)	Result
3.7	-30	462.5496	-0.86	±2.5	Pass
	-20	462.5492	-1.73		
	-10	462.5501	0.22		
	0	462.5510	2.16		
	10	462.5496	-0.86		
	20	462.5507	1.51		
	30	462.5508	1.73		
	40	462.5501	0.22		
4.07	25	462.5490	-2.16		
3.33	25	462.5504	0.86		

Assigned Frequency: 462.6625MHz					
Voltage(V)	Temperature (°C)	Measured Frequency(MHz)	Frequency Deviation(ppm)	FCC Limit (ppm)	Result
3.7	-30	462.6633	1.73	±2.5	Pass
	-20	462.6622	-0.65		
	-10	462.6625	0.00		
	0	462.6632	1.51		
	10	462.6617	-1.73		
	20	462.6635	2.16		
	30	462.6635	2.16		
	40	462.6622	-0.65		
4.07	25	462.6632	1.51		
3.33	25	462.6634	1.95		



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Assigned Frequency: 467.7125MHz					
Voltage(V)	Temperature (°C)	Measured Frequency(MHz)	Frequency Deviation(ppm)	FCC Limit (ppm)	Result
3.7	-30	467.7120	-1.07	±2.5	Pass
	-20	467.7122	-0.64		
	-10	467.7116	-1.92		
	0	467.7130	1.07		
	10	467.7127	0.43		
	20	467.7128	0.64		
	30	467.7117	-1.71		
	40	467.7132	1.50		
	50	467.7121	-0.86		
4.07	25	467.7126	0.21		
3.33	25	467.7129	0.86		



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## 7.2 Effective Radiated Power (ERP)

Test Requirement 47 CFR FCC Part95.567 & FCC Part2.1046;  
 Test Method: ANSI/TIA-603-E:2016  
 Measurement Distance: 3m  
 Test instrumentation resolution bandwidth 100 kHz (30 MHz – 1000 MHz)

Limit:

For FCC Part 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.

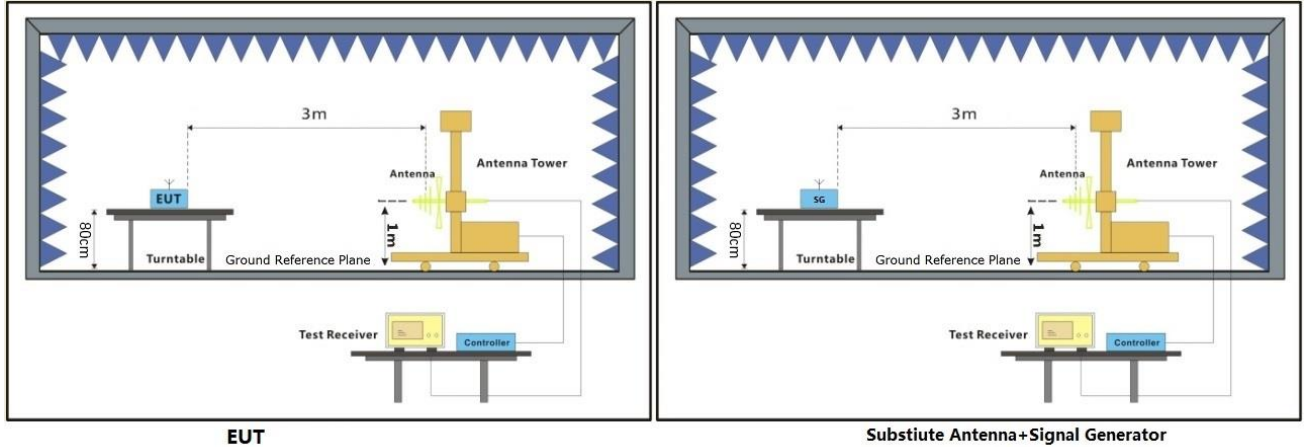
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 52.5 % RH Atmospheric Pressure: 1010 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

### 7.2.2 Test Setup Diagram



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### 7.2.3 Measurement Procedure and Data

The technique used to find the output power of the transmitter was the antenna substitution method. The following test procedure was followed:

- 1). The EUT was powered ON and placed on a 0.8m high table in the chamber. The antenna of the transmitter was extended to its maximum length.
- 2). The disturbance of the transmitter was maximized on the test receiver display by lowering 1m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- 4). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
- 6). The output power into the substitution antenna was then measured.
- 7). Steps 5) and 6) were repeated with both antennas polarized.
- 8). Calculate power in dBm by the following formula:

$$ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]$$

Where:

Pg is the generator output power into the substitution antenna.



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**Test result:**

**Effective Radiated Power of Transmitter (ERP)**

Polarization	Freq. (MHz)	SGP (dBm)	Substitution Gain(dBd)	Cable Loss (dB)	Substitution Level(ERP) / dBm	Substitution Level(ERP) / W	FCC Limit (W)	Result
H	462.5500	10.07	-5.1	0.8	4.17	0.0026	2.0	Pass
V		10.09	-5.1	0.8	4.19	0.0026	2.0	Pass
H	462.6625	10.15	-5.1	0.8	4.25	0.0027	2.0	Pass
V		10.05	-5.1	0.8	4.15	0.0026	2.0	Pass
H	467.7125	10.11	-5.2	0.8	4.11	0.0026	0.5	Pass
V		10.21	-5.2	0.8	4.21	0.0026	0.5	Pass

**Note:**

a: For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should be taken to calculate it:

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW, Detector: RMS



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**7.3 Occupied Bandwidth**

Test Requirement 47 CFR FCC Part 95.573 & FCC Part 2.1049;

Test Method: ANSI/TIA-603-E:2016

Limit: For FCC Part 95.573:

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

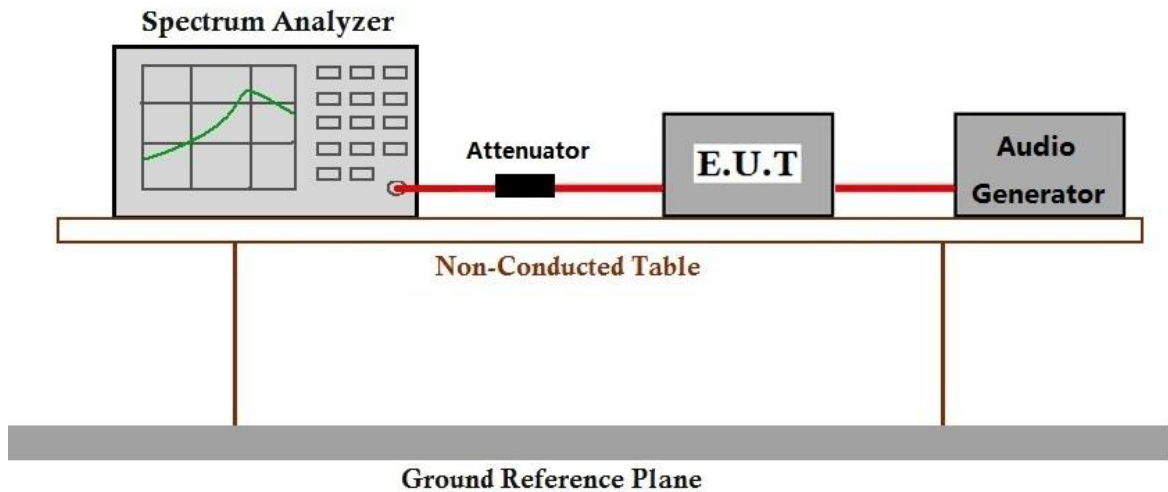
**7.3.1 E.U.T. Operation**

Operating Environment:

Temperature: 22.3 °C Humidity: 48.9 % RH Atmospheric Pressure: 1010 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

**7.3.2 Test Setup Diagram**



**7.3.3 Measurement Procedure and Data**



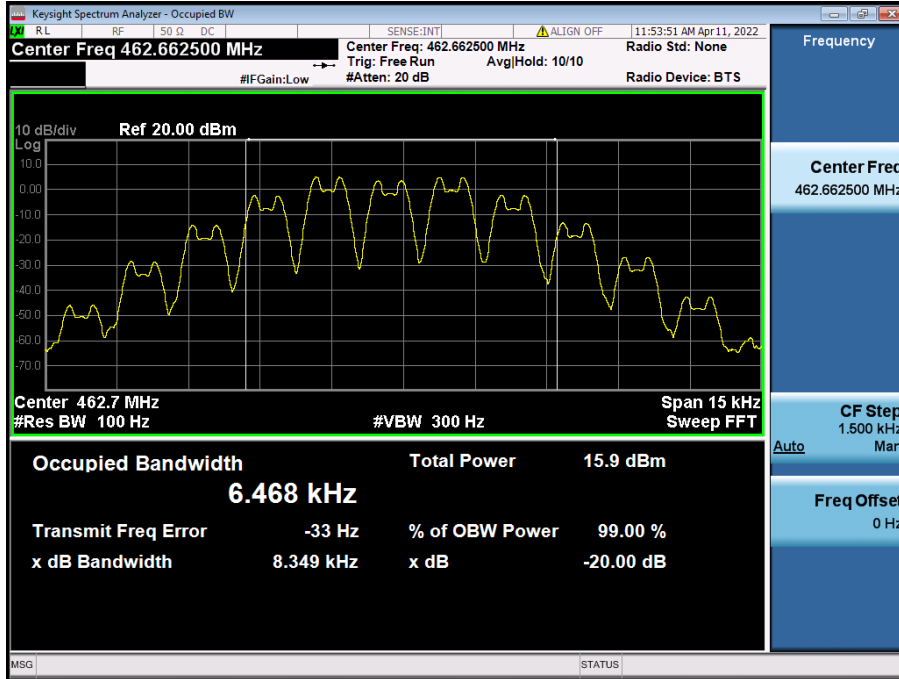
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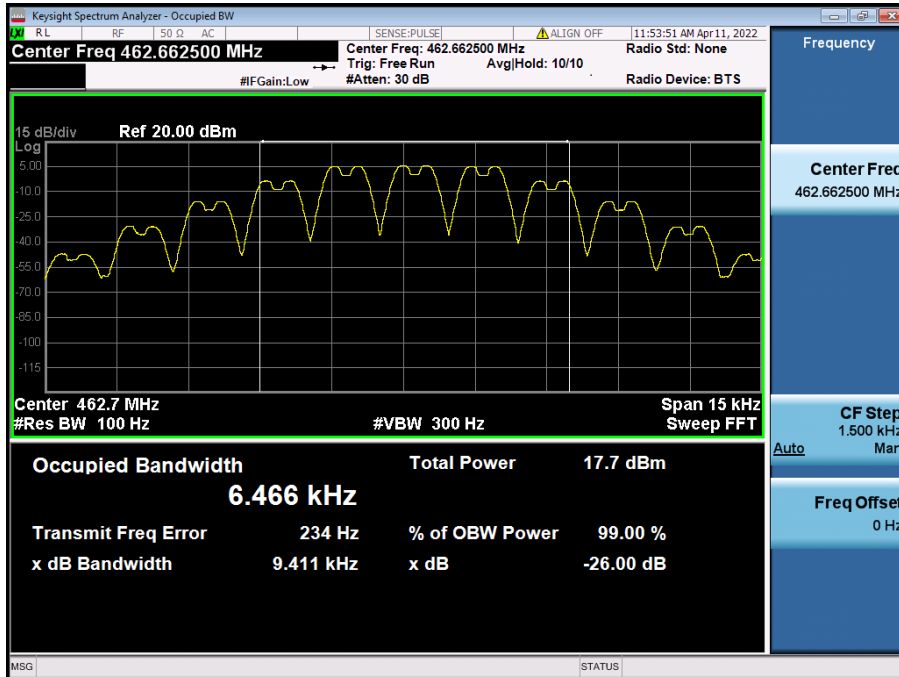


**Test result:**

The occupied Bandwidth is measured to be 6.468 kHz for Channel 5.



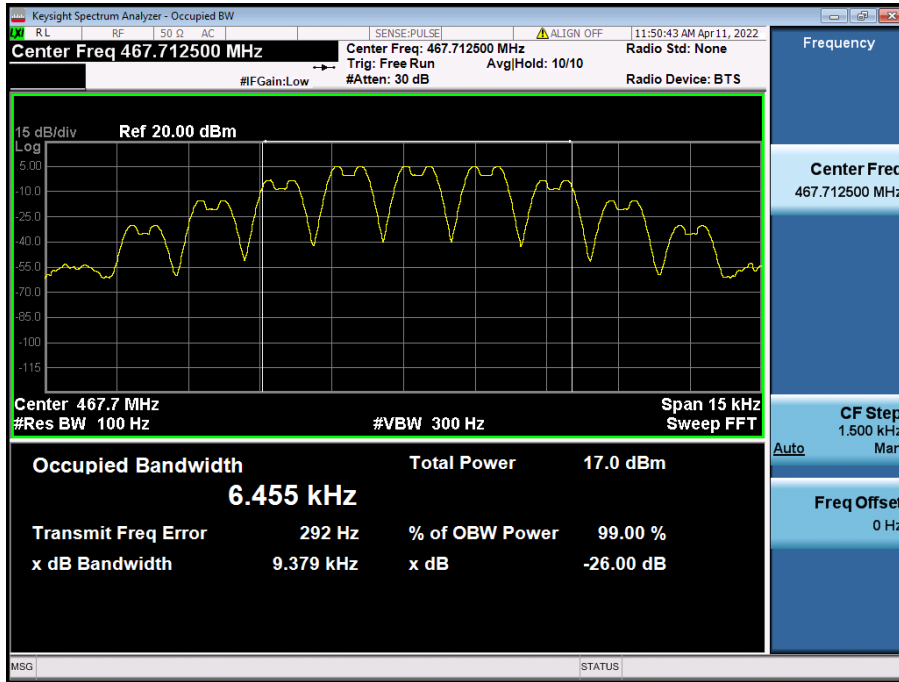
The 26dB Bandwidth is measured to be 9.411 kHz for Channel 5.



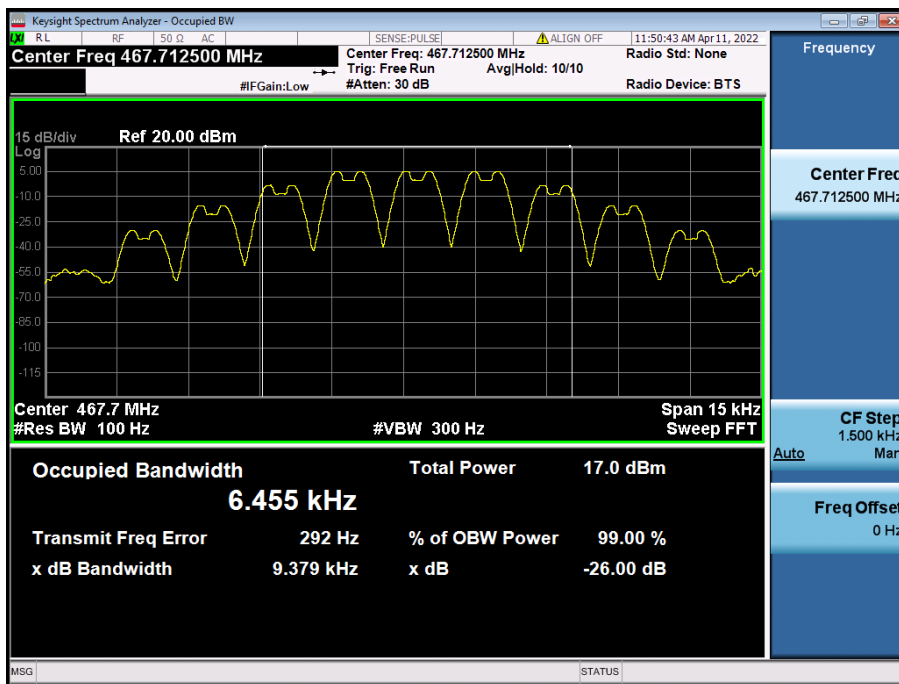
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The occupied Bandwidth is measured to be 6.455 kHz for channel 14.



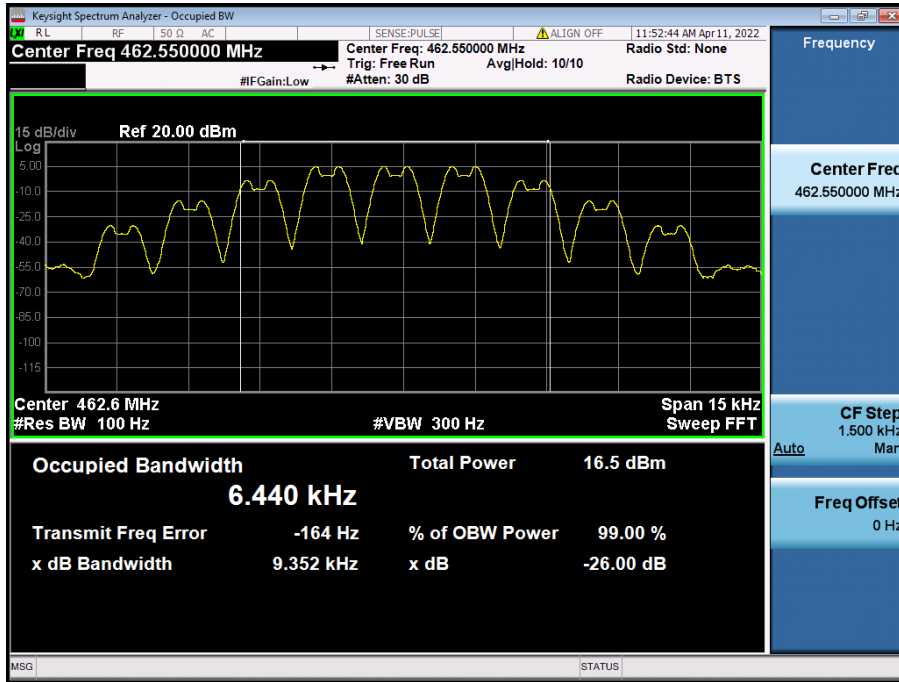
The 26dB Bandwidth is measured to be 9.379 kHz for channel 14.



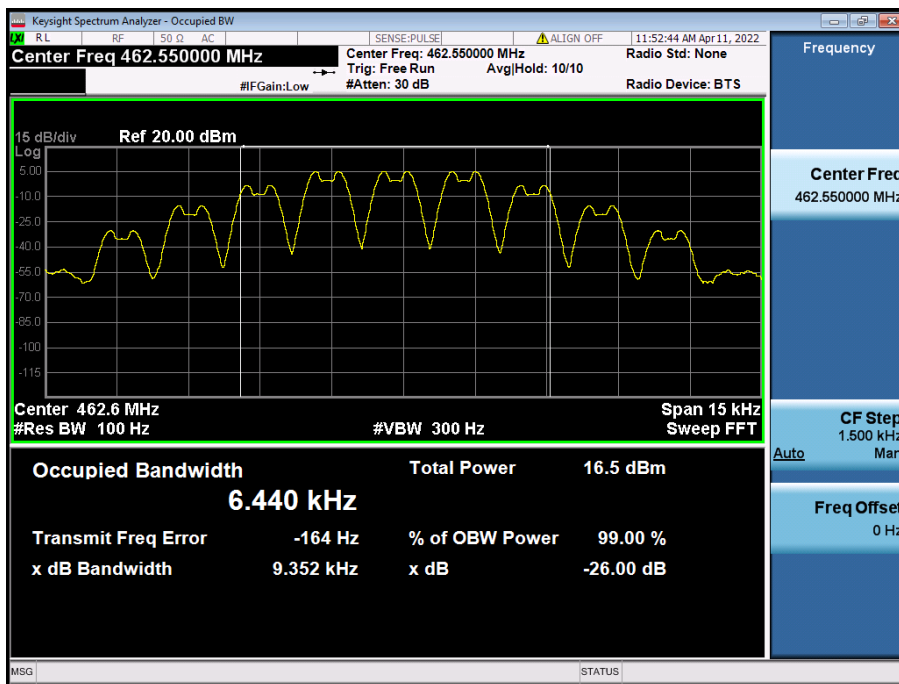
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The occupied Bandwidth is measured to be 6.440 kHz for channel 15.



The 26dB Bandwidth is measured to be 9.352 kHz for channel 15.



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**7.4 Modulation characteristics**

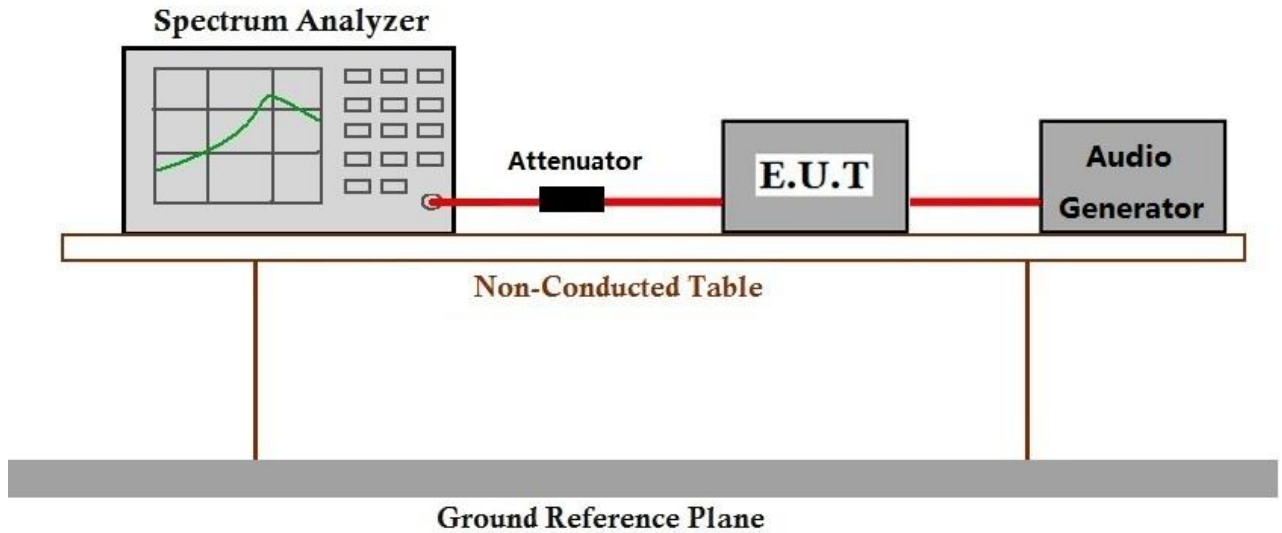
Test Requirement 47 CFR FCC Part 95.575 & FCC Part2.1047;  
 Test Method: ANSI/TIA-603-E:2016  
 Limit: For FCC Part 95.575:

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.

**7.4.1 E.U.T. Operation**

Operating Environment:  
 Temperature: 22.3 °C Humidity: 48.9 % RH Atmospheric Pressure: 1010 mbar  
 Test mode: a: Tx mode, Keep the EUT in transmitting mode.

**7.4.2 Test Setup Diagram**



**7.4.3 Measurement Procedure and Data**



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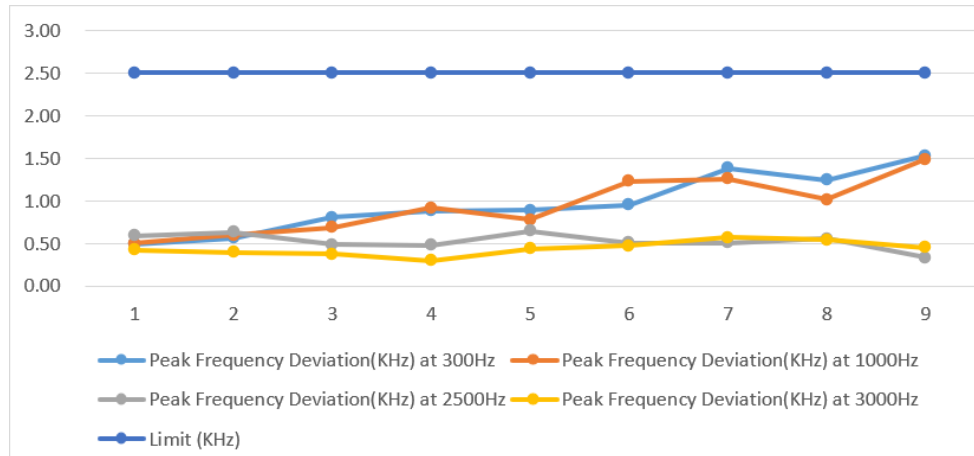
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**Test result:**

a. Frequency deviation:

Channel 15: 462.5500MHz FRS					
Modulation Input(dB)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 2500Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit (KHz)
-20	0.49	0.50	0.59	0.43	2.50
-15	0.57	0.60	0.63	0.40	2.50
-10	0.81	0.69	0.49	0.37	2.50
-5	0.88	0.92	0.48	0.30	2.50
0	0.89	0.78	0.65	0.44	2.50
5	0.96	1.23	0.51	0.47	2.50
10	1.38	1.26	0.51	0.57	2.50
15	1.25	1.02	0.56	0.54	2.50
20	1.53	1.48	0.34	0.45	2.50

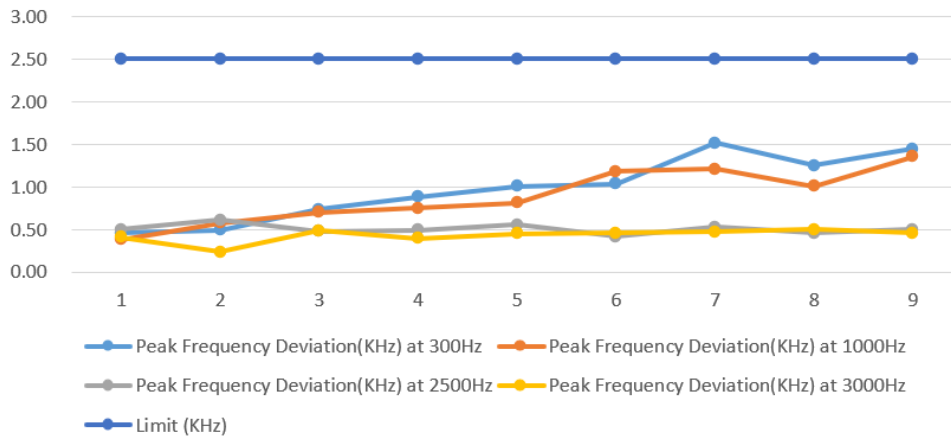


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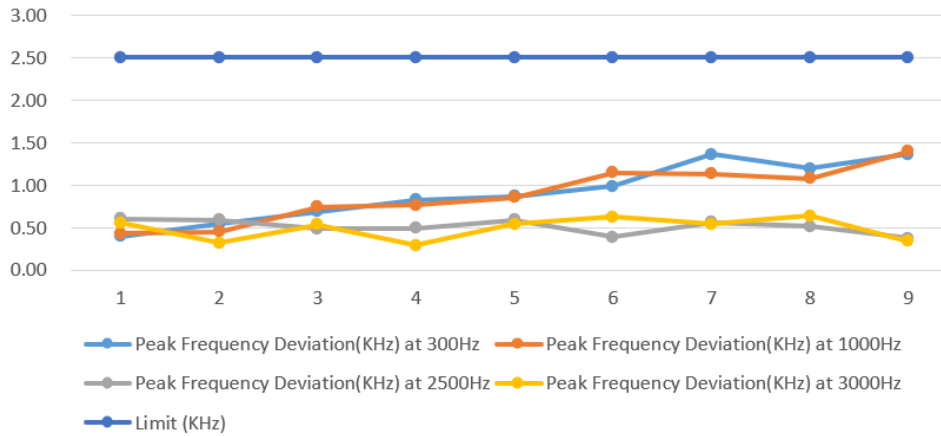
Channel 5: 462.6625MHz FRS					
Modulation Input(dB)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 2500Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit (KHz)
-20	0.46	0.38	0.50	0.41	2.50
-15	0.49	0.58	0.61	0.24	2.50
-10	0.73	0.70	0.48	0.48	2.50
-5	0.89	0.75	0.49	0.40	2.50
0	1.01	0.81	0.55	0.45	2.50
5	1.03	1.18	0.42	0.46	2.50
10	1.51	1.21	0.53	0.48	2.50
15	1.25	1.00	0.46	0.50	2.50
20	1.44	1.36	0.50	0.46	2.50



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Channel 14: 467.7125MHz FRS					
Modulation Input(dB)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 2500Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit (KHz)
-20	0.40	0.43	0.60	0.56	2.50
-15	0.54	0.45	0.59	0.32	2.50
-10	0.69	0.74	0.48	0.54	2.50
-5	0.83	0.77	0.49	0.29	2.50
0	0.87	0.86	0.59	0.54	2.50
5	0.99	1.15	0.39	0.63	2.50
10	1.37	1.13	0.56	0.54	2.50
15	1.20	1.08	0.52	0.64	2.50
20	1.36	1.40	0.38	0.34	2.50

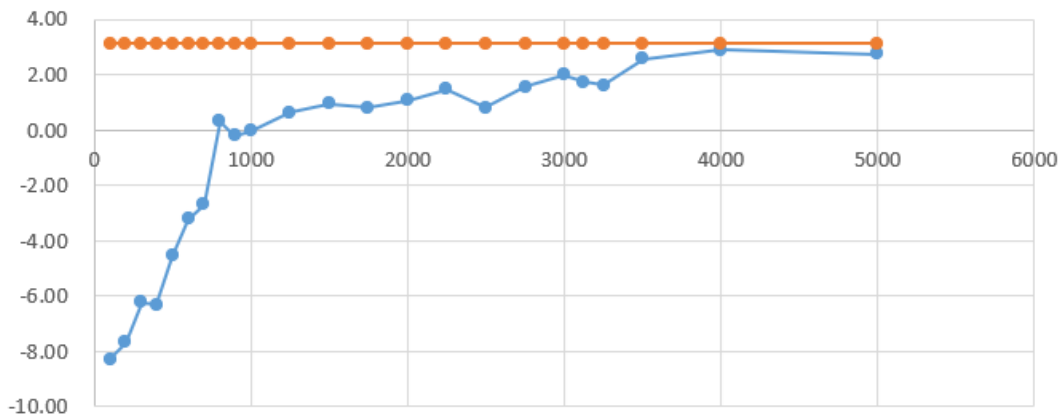


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**b. Audio Frequency Response**  
Channel 15 for FRS

Modulation Frequency(Hz)	Peak Modulation Deviation(KHz)	Limit (KHz)
100	-8.27	3.125
200	-7.67	3.125
300	-6.23	3.125
400	-6.32	3.125
500	-4.55	3.125
600	-3.22	3.125
700	-2.70	3.125
800	0.30	3.125
900	-0.21	3.125
1000	-0.03	3.125
1250	0.64	3.125
1500	0.95	3.125
1750	0.81	3.125
2000	1.05	3.125
2250	1.46	3.125
2500	0.79	3.125
2750	1.54	3.125
3000	1.98	3.125
3125	1.71	3.125
3250	1.63	3.125
3500	2.56	3.125
4000	2.89	3.125
5000	2.74	3.125

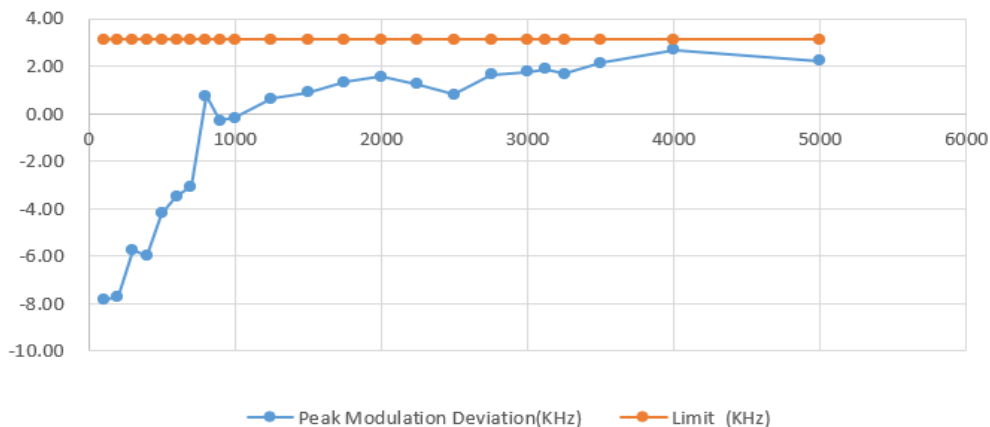


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Channel 5 for FRS

Modulation Frequency(Hz)	Peak Modulation Deviation(KHz)	Limit (KHz)
100	-7.86	3.125
200	-7.69	3.125
300	-5.74	3.125
400	-5.99	3.125
500	-4.22	3.125
600	-3.49	3.125
700	-3.06	3.125
800	0.73	3.125
900	-0.29	3.125
1000	-0.20	3.125
1250	0.64	3.125
1500	0.89	3.125
1750	1.32	3.125
2000	1.54	3.125
2250	1.23	3.125
2500	0.80	3.125
2750	1.64	3.125
3000	1.76	3.125
3125	1.87	3.125
3250	1.68	3.125
3500	2.12	3.125
4000	2.68	3.125
5000	2.21	3.125

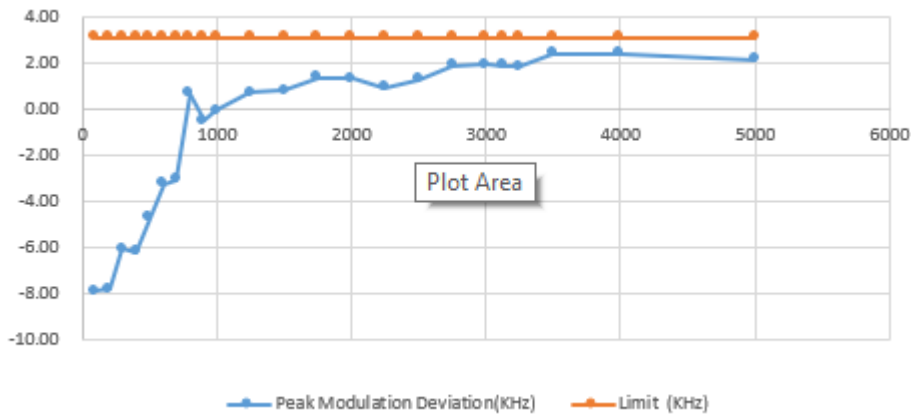


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Channel 14 for FRS

Modulation Frequency(Hz)	Peak Modulation Deviation(KHz)	Limit (KHz)
100	-7.86	3.125
200	-7.77	3.125
300	-6.05	3.125
400	-6.19	3.125
500	-4.68	3.125
600	-3.23	3.125
700	-3.05	3.125
800	0.68	3.125
900	-0.47	3.125
1000	-0.03	3.125
1250	0.72	3.125
1500	0.80	3.125
1750	1.40	3.125
2000	1.32	3.125
2250	0.97	3.125
2500	1.32	3.125
2750	1.92	3.125
3000	1.97	3.125
3125	1.90	3.125
3250	1.85	3.125
3500	2.41	3.125
4000	2.44	3.125
5000	2.18	3.125



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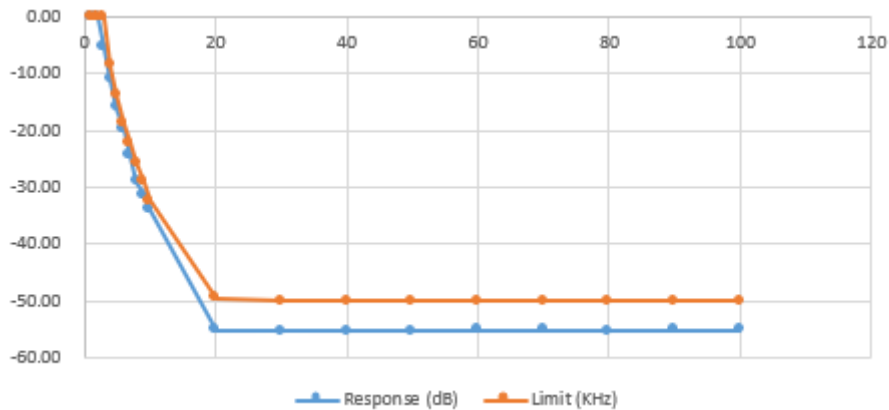
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c. Audio Low Pass Filter Frequency Response

Channel 15 for FRS

Frequency(KHz)	Response (dB)	Limit (KHz)
1	0	0
2	0	0
3	-5.37	0
4	-11.05	-8.52
5	-15.89	-13.64
6	-19.85	-18.75
7	-24.34	-22.16
8	-28.98	-25.57
9	-31.38	-28.98
10	-33.99	-32.29
20	-55.11	-49.43
30	-55.33	-50.00
40	-55.27	-50.00
50	-55.24	-50.00
60	-55.09	-50.00
70	-55.13	-50.00
80	-55.28	-50.00
90	-55.18	-50.00
100	-55.17	-50.00

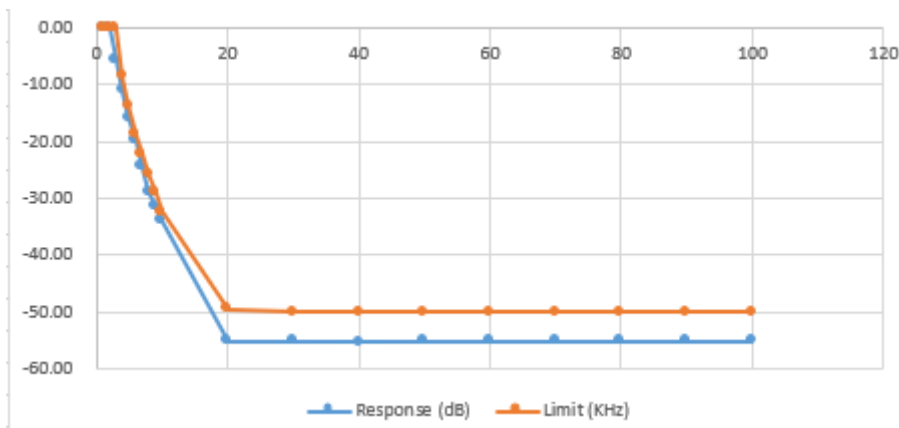


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Channel 5 for FRS

Frequency(KHz)	Response (dB)	Limit (KHz)
1	0.00	0
2	-0.10	0
3	-5.46	0
4	-10.99	-8.52
5	-15.86	-13.64
6	-19.81	-18.75
7	-24.47	-22.16
8	-28.82	-25.57
9	-31.42	-28.98
10	-34.03	-32.29
20	-55.12	-49.43
30	-55.18	-50.00
40	-55.25	-50.00
50	-55.18	-50.00
60	-55.19	-50.00
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80	-55.18	-50.00
90	-55.10	-50.00
100	-55.21	-50.00



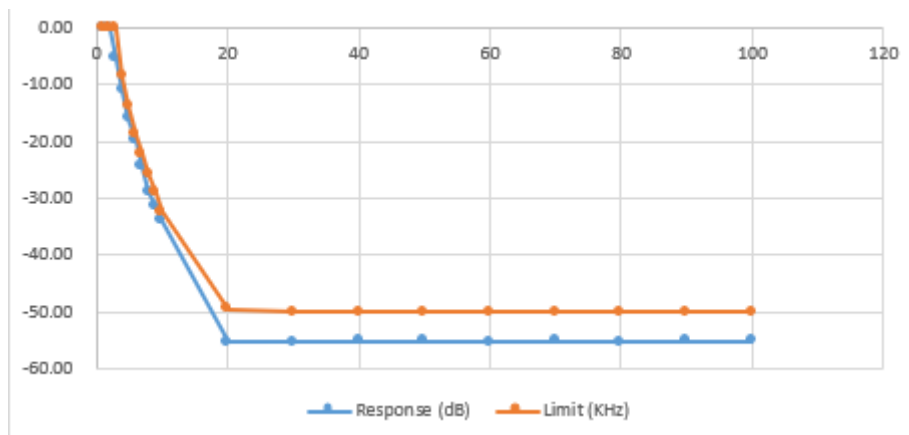
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Channel 14 for FRS

Frequency(KHz)	Response (dB)	Limit (KHz)
1	0.00	0
2	0.00	0
3	-5.45	0
4	-10.94	-8.52
5	-15.99	-13.64
6	-19.81	-18.75
7	-24.46	-22.16
8	-28.83	-25.57
9	-31.51	-28.98
10	-34.00	-32.29
20	-55.27	-49.43
30	-55.29	-50.00
40	-55.20	-50.00
50	-55.14	-50.00
60	-55.22	-50.00
70	-55.11	-50.00
80	-55.23	-50.00
90	-55.12	-50.00
100	-55.15	-50.00



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d. Modulation Limiting

Channel 15 for FRS

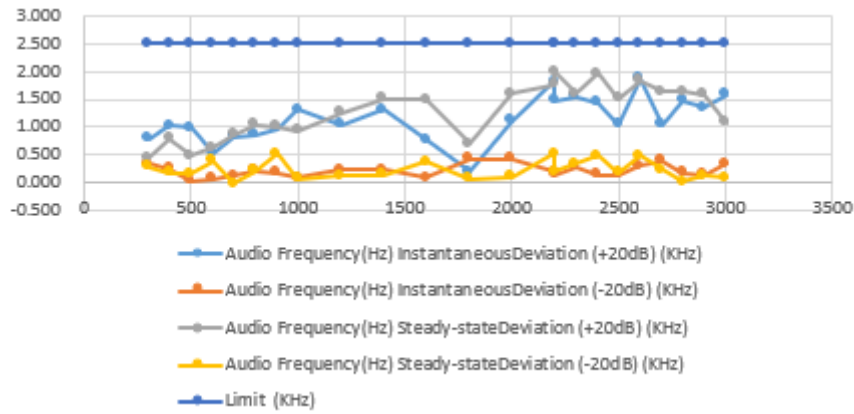
Audio Frequency(Hz)	Instantaneous		Steady-state		Limit (KHz)
	Deviation (+20dB) (KHz)	Deviation (-20dB) (KHz)	Deviation (+20dB) (KHz)	Deviation (-20dB) (KHz)	
300	0.802	0.356	0.463	0.297	2.5
400	1.029	0.264	0.802	0.182	2.5
500	0.989	0.049	0.484	0.167	2.5
600	0.543	0.087	0.633	0.399	2.5
700	0.828	0.138	0.870	-0.004	2.5
800	0.865	0.217	1.052	0.230	2.5
900	0.968	0.182	1.014	0.519	2.5
1000	1.321	0.092	0.942	0.078	2.5
1200	1.041	0.232	1.261	0.125	2.5
1400	1.312	0.234	1.511	0.149	2.5
1600	0.786	0.089	1.500	0.390	2.5
1800	0.196	0.444	0.703	0.076	2.5
2000	1.125	0.439	1.607	0.113	2.5
2200	1.813	0.195	1.767	0.524	2.5
2200	1.480	0.143	1.986	0.204	2.5
2300	1.539	0.297	1.598	0.344	2.5
2400	1.443	0.146	1.955	0.496	2.5
2500	1.041	0.156	1.506	0.188	2.5
2600	1.870	0.317	1.829	0.483	2.5
2700	1.040	0.408	1.640	0.245	2.5
2800	1.467	0.178	1.638	0.017	2.5
2900	1.355	0.155	1.584	0.138	2.5
3000	1.586	0.342	1.074	0.098	2.5



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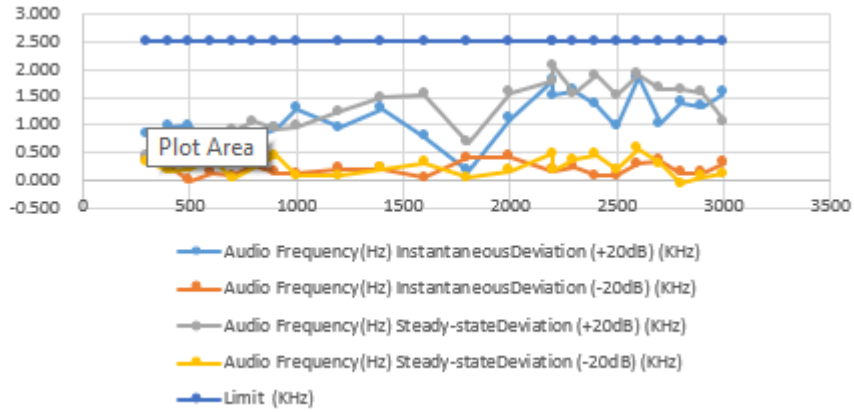
Channel 5 for FRS

Audio Frequency(Hz)	Instantaneous		Steady-state		Limit (KHz)
	Deviation (+20dB) (KHz)	Deviation (-20dB) (KHz)	Deviation (+20dB) (KHz)	Deviation (-20dB) (KHz)	
300	0.851	0.358	0.453	0.350	2.5
400	0.976	0.286	0.809	0.190	2.5
500	0.999	0.012	0.497	0.231	2.5
600	0.545	0.147	0.674	0.418	2.5
700	0.820	0.101	0.898	0.051	2.5
800	0.794	0.284	1.068	0.259	2.5
900	0.933	0.152	0.943	0.463	2.5
1000	1.293	0.133	0.979	0.104	2.5
1200	0.955	0.227	1.235	0.093	2.5
1400	1.295	0.220	1.488	0.215	2.5
1600	0.789	0.070	1.545	0.331	2.5
1800	0.185	0.420	0.696	0.058	2.5
2000	1.117	0.441	1.589	0.195	2.5
2200	1.803	0.194	1.782	0.498	2.5
2200	1.528	0.179	2.063	0.188	2.5
2300	1.621	0.258	1.567	0.389	2.5
2400	1.366	0.103	1.891	0.475	2.5
2500	0.980	0.088	1.533	0.199	2.5
2600	1.848	0.318	1.902	0.579	2.5
2700	1.027	0.359	1.654	0.320	2.5
2800	1.411	0.148	1.628	-0.039	2.5
2900	1.337	0.144	1.587	0.080	2.5
3000	1.582	0.337	1.068	0.126	2.5



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Channel 14 for FRS

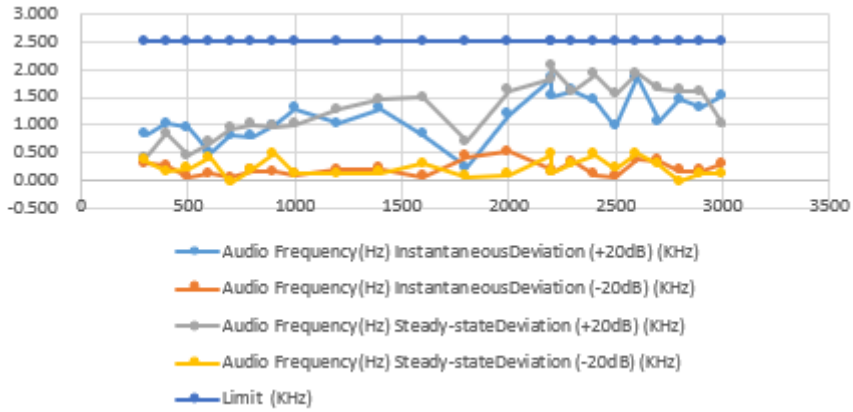
Audio Frequency(Hz)	Instantaneous		Steady-state		Limit (KHz)
	Deviation (+20dB) (KHz)	Deviation (-20dB) (KHz)	Deviation (+20dB) (KHz)	Deviation (-20dB) (KHz)	
300	0.832	0.321	0.427	0.363	2.5
400	1.032	0.279	0.848	0.168	2.5
500	0.964	0.080	0.461	0.219	2.5
600	0.503	0.136	0.693	0.416	2.5
700	0.813	0.064	0.929	-0.024	2.5
800	0.794	0.190	1.001	0.213	2.5
900	0.990	0.175	0.965	0.494	2.5
1000	1.299	0.118	1.004	0.125	2.5
1200	1.034	0.201	1.279	0.132	2.5
1400	1.303	0.229	1.450	0.150	2.5
1600	0.822	0.080	1.492	0.317	2.5
1800	0.232	0.441	0.711	0.077	2.5
2000	1.189	0.525	1.617	0.121	2.5
2200	1.829	0.196	1.819	0.476	2.5
2200	1.508	0.144	2.040	0.159	2.5
2300	1.609	0.345	1.607	0.318	2.5
2400	1.434	0.121	1.907	0.474	2.5
2500	0.974	0.086	1.553	0.222	2.5
2600	1.848	0.376	1.914	0.494	2.5
2700	1.059	0.363	1.646	0.297	2.5
2800	1.458	0.183	1.613	-0.002	2.5
2900	1.310	0.192	1.599	0.132	2.5
3000	1.536	0.311	1.017	0.138	2.5



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## 7.5 Radiated Unwanted Emissions

Test Requirement 47 CFR FCC Part 95.579 & FCC Part 2.1053;

Test Method: ANSI/TIA-603-E:2016

Measurement Distance: 3m

Resolution bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

Video Bandwidth = 300 kHz for spurious emissions below 1 GHz, and 3 MHz for spurious emissions above 1 GHz.

Limit:

For FCC Part 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.

### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 52.5 % RH Atmospheric Pressure: 1010 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

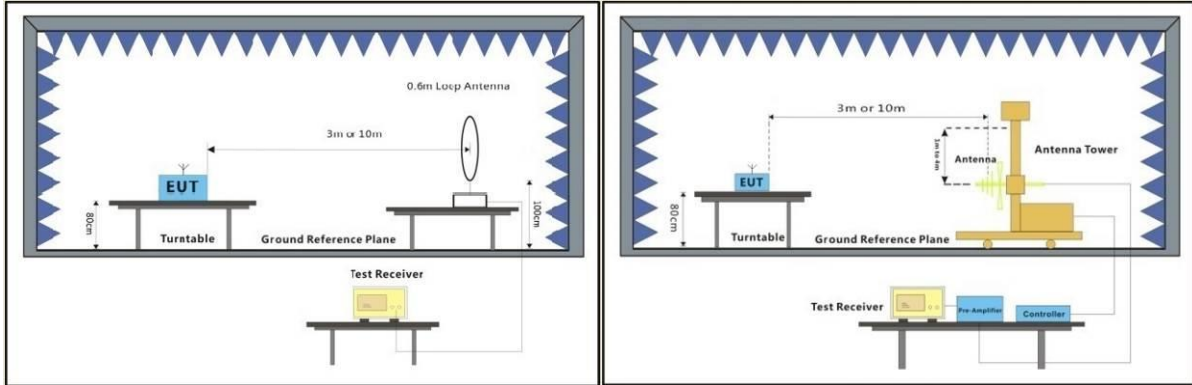


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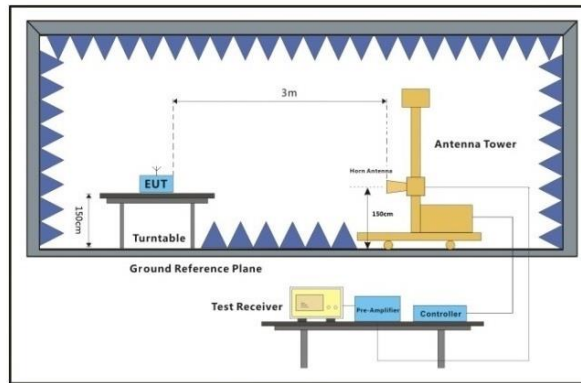


### 7.5.2 Test Setup Diagram



Below 30MHz

30MHz-1GHz



Above 1GHz



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### 7.5.3 Measurement Procedure and Data

#### Test Procedure:

- (1) On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- (2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- (3) The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- (4) The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- (5) The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- (6) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- (7) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- (8) The maximum signal level detected by the measuring receiver shall be noted.
- (9) The measurement shall be repeated with the test antenna set to horizontal polarization.
- (10) Replace the antenna with a proper Antenna (substitution antenna).
- (11) The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- (12) The substitution antenna shall be connected to a calibrated signal generator.
- (13) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- (14) The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- (15) The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- (16) The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- (17) The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

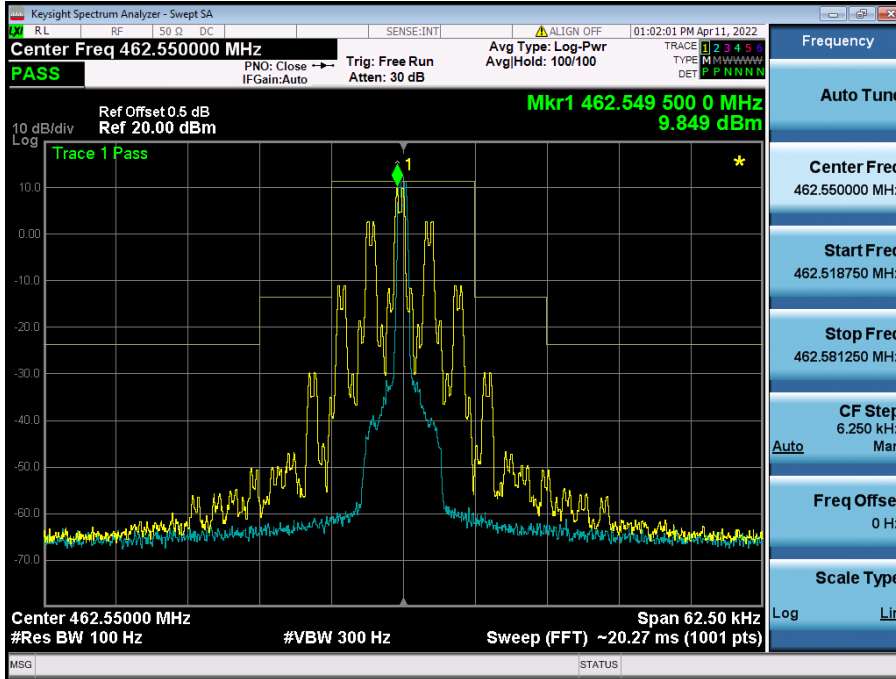


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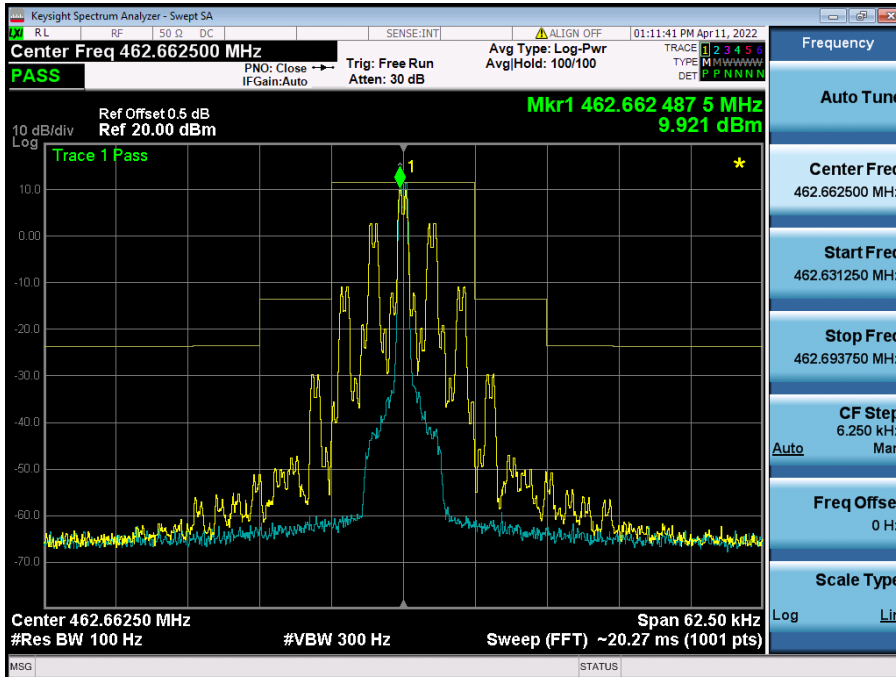
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### Emission Mask

#### Channel 15



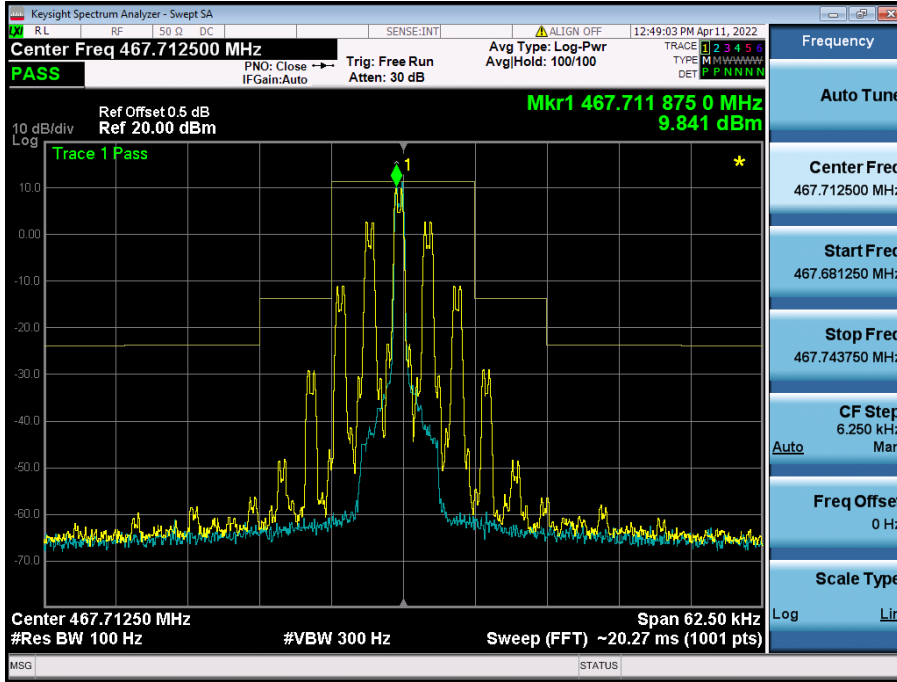
#### Channel 5



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Channel 14



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Channel 15

Frequency MHz	Polarity H/V	Emission Level dBm	Limit dBm	Margin dBm
1387.6500	V	-43.74	-13.00	-30.74
1850.2000	V	-43.57	-13.00	-30.57
2312.7500	V	-38.33	-13.00	-25.33
2775.3000	V	-44.69	-13.00	-31.69
3237.8500	V	-41.30	-13.00	-28.30
3700.4000	V	-35.44	-13.00	-22.44
1387.6500	H	-48.74	-13.00	-35.74
1850.2000	H	-42.62	-13.00	-29.62
2312.7500	H	-33.70	-13.00	-20.70
2775.3000	H	-39.81	-13.00	-26.81
3237.8500	H	-39.93	-13.00	-26.93
3700.4000	H	-35.99	-13.00	-22.99

Channel 5

Frequency MHz	Polarity H/V	Emission Level dBm	Limit dBm	Margin dBm
1387.9875	V	-43.07	-13.00	-30.07
1850.6500	V	-43.41	-13.00	-30.41
2313.3125	V	-36.40	-13.00	-23.40
2775.9750	V	-43.09	-13.00	-30.09
3238.6375	V	-41.71	-13.00	-28.71
3701.3000	V	-36.75	-13.00	-23.75
1387.9875	H	-47.34	-13.00	-34.34
1850.6500	H	-43.34	-13.00	-30.34
2313.3125	H	-33.79	-13.00	-20.79
2775.9750	H	-40.67	-13.00	-27.67
3238.6375	H	-40.69	-13.00	-27.69
3701.3000	H	-33.94	-13.00	-20.94



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Channel 14

Frequency MHz	Polarity H/V	Emission Level dBm	Limit dBm	Margin dBm
1403.1375	V	-44.32	-13.00	-31.32
1870.8500	V	-44.13	-13.00	-31.13
2338.5625	V	-35.38	-13.00	-22.38
2806.2750	V	-42.46	-13.00	-29.46
3273.9875	V	-42.19	-13.00	-29.19
3741.7000	V	-37.10	-13.00	-24.10
1403.1375	H	-48.70	-13.00	-35.70
1870.8500	H	-43.60	-13.00	-30.60
2338.5625	H	-33.03	-13.00	-20.03
2806.2750	H	-39.13	-13.00	-26.13
3273.9875	H	-40.67	-13.00	-27.67
3741.7000	H	-33.89	-13.00	-20.89

Note: Margin = Emission level – Limit.

Remark:

- 1) Only record the worst case in the report.
- 2) The disturbance above below 1GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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## 8 Photographs

### 8.1 Test Setup

Refer to Appendix - Test Setup Photo for FYCR2203000038ET

### 8.2 EUT Constructional Details

Refer to Appendix – External and Internal Photos for FYCR2203000038ET

- End of the Report -



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