

TEST REPORT

Application No.: GZCR2108020816AT
Applicant: ASAP Technology (Jiangxi) Co., Ltd.
Address of Applicant: Ji'an Industrial Park Ji'an, Jiangxi, 343100 China
Manufacturer: ASAP Technology (Jiangxi) Co., Ltd.
Address of Manufacturer: Ji'an Industrial Park Ji'an, Jiangxi, 343100 China
Factory: LUXSHARE-ICT (NGHE AN) LIMITED
Address of Factory: No.18 Street 03, VSIP Nghe An Industrial Park, Hung Tay Commune, Hung Nguyen District, Nghe An Province, Vietnam

Equipment Under Test (EUT):

EUT Name: Walkie talkie

Model No.: 100070695

Trade Mark:



OZARK TRAIL®

Standard(s) : 47 CFR Part 95, Subpart B

Date of Receipt: 2021-08-12

Date of Test: 2021-08-13 to 2021-09-10

Date of Issue: 2021-09-11

| | |
|---------------------|-------|
| Test Result: | Pass* |
|---------------------|-------|

* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager



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| Revision Record | | | | |
|-----------------|---------|------------|----------|----------|
| Version | Chapter | Date | Modifier | Remark |
| 01 | | 2021-09-11 | | Original |
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|-------------------------|---|--|--|
| Authorized for issue by | | | |
| Tested By |  | | |
| | Curry Wu/Project Engineer | | |
| Reviewed By |  | | |
| | Ricky Liu/Reviewer | | |



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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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 Guangzhou Branch of SGS-CSTC Standards Technical Services Co., Ltd. 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com



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4 General Information

4.1 Details of E.U.T.

| | |
|---------------------|---|
| Power supply: | DC 4.5V by battery and recharged by DC 5V |
| Frequency Range: | 462.55MHz~467.7125MHz |
| Modulation Type: | FM |
| Channel Separation: | 12.5KHz |
| Number of Channels: | 22 |
| Emission Type: | F3E |
| Antenna Type: | Inseparable |
| Antenna Gain: | 2.0dBi |

4.2 Description of Support Units

The EUT has been tested independent unit.

4.3 Measurement Uncertainty

| No. | Item | Measurement Uncertainty |
|-----|---------------------------------|---------------------------|
| 1 | Radio Frequency | $\pm 7.25 \times 10^{-8}$ |
| 2 | Duty cycle | $\pm 0.37\%$ |
| 3 | Occupied Bandwidth | $\pm 3\%$ |
| 5 | RF conducted power | $\pm 0.75\text{dB}$ |
| 6 | RF power density | $\pm 2.84\text{dB}$ |
| 7 | Conducted Spurious emissions | $\pm 0.75\text{dB}$ |
| 8 | RF Radiated power | 5.14dB (below 1GHz) |
| | | 5.08dB (above 1GHz) |
| 9 | Radiated Spurious emission test | 5.14dB (below 1GHz) |
| | | 5.08dB (above 1GHz) |
| 10 | Temperature test | 1 °C |
| 11 | Humidity test | 3% |
| 12 | Supply voltages | 1.5% |
| 13 | Time | 3% |



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4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



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4.5 Test Facility

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

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 |
| 966 Anechoic Chamber | C.R.T | 9m x 6m x 6m | EMC2142 | 2020-12-20 | 2023-12-19 |
| EXA Signal Analyzer(10Hz-44GHz) | Agilent Technologies | N9010A | EMC2138 | 2020-09-17 | 2021-09-16 |
| Signal Generator (10MHz-20GHz) | Rohde & Schwarz | SMR20 | EMC0516 | 2021-01-11 | 2022-01-10 |
| Measurement Software | TST | TST PASS V1.0.5 | N/A | N/A | N/A |
| Signal Generator(9kHz-6GHz) | Rohde & Schwarz | SMB100A | EMC2093 | 2021-01-09 | 2022-01-08 |
| Audio Analyzer | Keysight | U8903B | EMC2180 | 2020-09-18 | 2020-09-17 |
| MI CABLE | SGS-EMC | 0.8M | EMC2136 | 2019-11-02 | 2021-11-01 |
| 6dB Attenuator | HP | 8491A | EMC2062 | 2020-04-15 | 2022-04-14 |

| Radiated Spurious Emissions | | | | | |
|--|-----------------------------|---------------|--------------|------------|--------------|
| Equipment | Manufacturer | Model No | Inventory No | Cal Date | Cal Due Date |
| Chamber cable | HangTianXing | N/A | EMC0542 | 2020-09-09 | 2022-09-08 |
| Trilog Broadband Antenna(25MHz-1GHz)-Lab | SCHWARZBECK MESS-ELEKTRONIK | VULB 9168 | SEM003-18 | 2019-02-22 | 2022-02-22 |
| Amplifier(9kHz-1.3GHz) | HP | 8447F | EMC2065 | 2021-05-19 | 2022-05-18 |
| Active Loop Antenna-RED | ETS-Lindgren | 6502 | EMC2190 | 2019-12-27 | 2021-12-26 |
| 10m Semi-Anechoic Chamber | ETS | N/A | EMC0530 | 2019-10-20 | 2022-10-19 |
| Test Software E3 | Audix | Ver.6.120110a | GZE100-61 | N/A | N/A |
| EMI Test Receiver(1Hz-8GHz) | Rohde & Schwarz | ESW8 | EMC2220 | 2021-05-26 | 2022-05-25 |
| EMI Test Receiver(20Hz-26.5GHz) | Rohde & Schwarz | ESIB26 | EMC0522 | 2021-01-08 | 2022-01-07 |
| Chamber cable(Above 1GHz) | Scoflex | KMKM-8.0m | EMC0545 | 2020-09-09 | 2022-09-08 |
| Horn Antenna(1GHz-18GHz) | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120D | EMC2026 | 2019-09-25 | 2022-09-24 |
| 1GHz-26.5 GHz Pre-Amplifier | Agilent | 8449B | EMC0521 | 2021-01-08 | 2022-01-07 |
| 2.4GHz Filter | Micro-Tronics | BRM 50702 | EMC2069 | 2021-01-08 | 2022-01-07 |
| 966 Anechoic Chamber | C.R.T | 9m x 6m x 6m | EMC2142 | 2020-12-20 | 2023-12-19 |



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| | | | | | |
|--|--------------|---------------|-----------|------------|------------|
| MXE EMI Receiver(10Hz-8.4GHz) | Keysight | N9038A | EMC2139 | 2020-11-13 | 2021-11-12 |
| EXA Signal Analyzer(10Hz-44GHz) | Keysight | N9010A | EMC2138 | 2020-09-17 | 2021-09-16 |
| Test Software E3 | Audix | Ver.6.120110a | GZE100-61 | N/A | N/A |
| Notch Filter (5150-5880) | Mico-Tronics | BRM50716 | EMC2168 | 2021-07-29 | 2022-07-28 |
| Horn Antenna(14-40GHz) | SCHWARZBECK | BBHA 9170 | EMC2041 | 2020-06-28 | 2023-06-27 |
| Microwave Broadband Pre-amplifier (18-40GHz) | SCHWARZBECK | BBV 9721 | EMC2172 | 2020-09-09 | 2021-09-08 |
| | | | | 2020-09-07 | 2021-09-06 |

| General used equipment | | | | | |
|------------------------|--------------|----------|--------------|------------|--------------|
| Equipment | Manufacturer | Model No | Inventory No | Cal Date | Cal Due Date |
| DMM | Fluke | 73 | EMC0006 | 2021-07-05 | 2022-07-05 |
| DMM | Fluke | 73 | EMC0007 | 2021-07-05 | 2022-07-05 |



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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 2.0dBi(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 ± 2.5 parts-per-million of the channel center frequencies

specified in §95.563 during normal operating conditions.

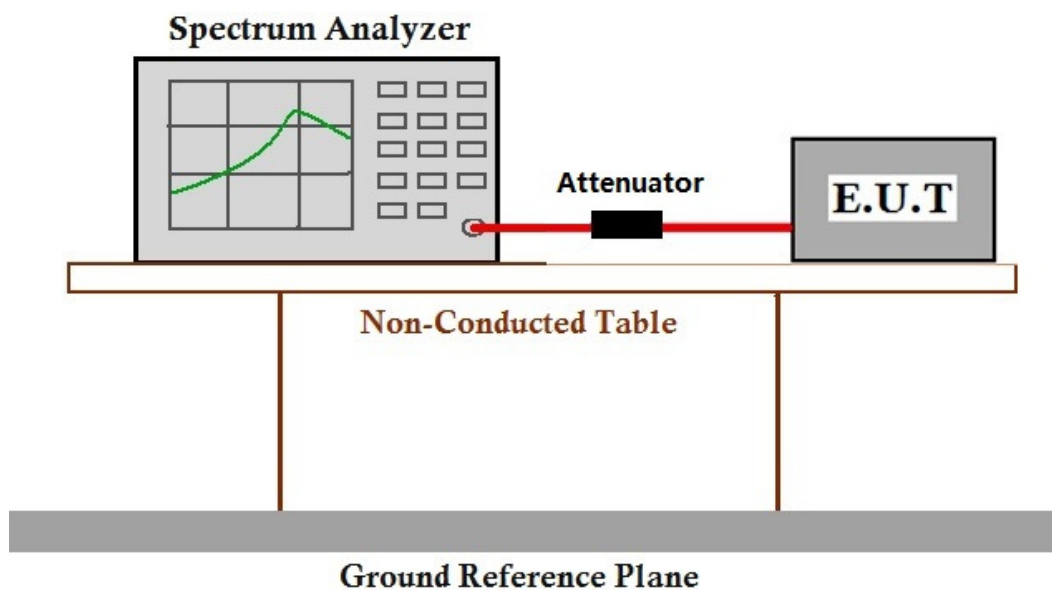
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 52.2 % 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:462.5625MHz | | | | | | |
|--------------------------------|------------------|-------------------------|--------------------------|-----------------|----------------|--------|
| Voltage(V _{DC}) | Temperature (°C) | Measured Frequency(MHz) | Frequency Deviation(ppm) | FCC Limit (ppm) | IC Limit (ppm) | Result |
| 4.5 | -30 | 462.5627 | 0.42 | ±2.5 | ±5 | Pass |
| | -20 | 462.5623 | -0.54 | | | |
| | -10 | 462.5618 | -1.46 | | | |
| | 0 | 462.5630 | 1.13 | | | |
| | 10 | 462.5624 | -0.21 | | | |
| | 20 | 462.5622 | -0.69 | | | |
| | 30 | 462.5622 | -0.63 | | | |
| | 40 | 462.5621 | -0.78 | | | |
| 4.3 | 20 | 462.5622 | -0.55 | | | |
| 4.7 | 20 | 462.5623 | -0.46 | | | |



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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.

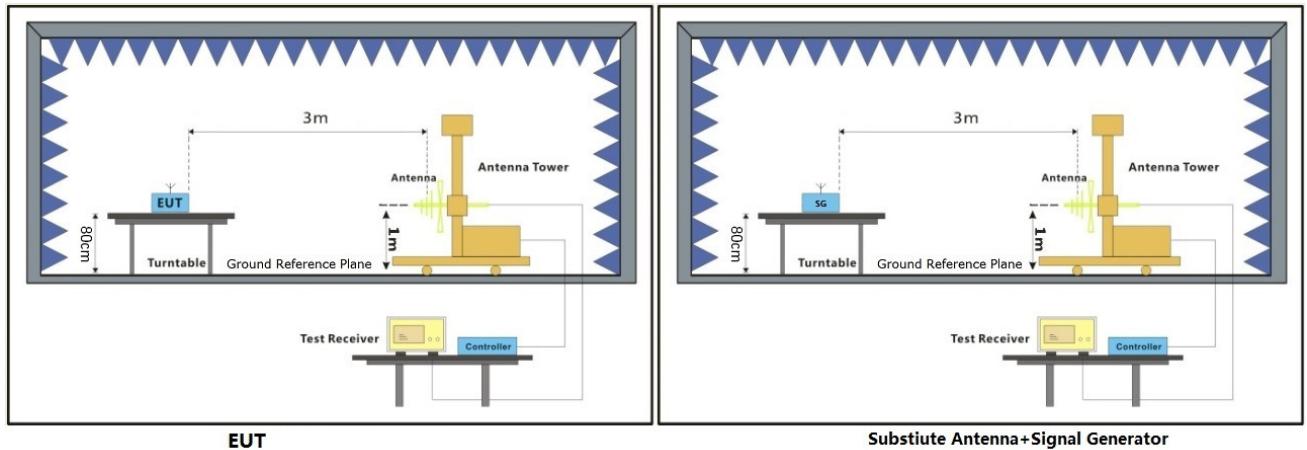
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C Humidity: 53.3 % 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:

$$\text{ERP (dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$

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 | 462.5625 | 33.34 | -4.9 | 0.6 | 27.84 | 0.608 | 2.0 | Pass |
| V | | 33.1 | -4.9 | 0.6 | 27.6 | 0.575 | 2.0 | Pass |
| H | 467.7125 | 32.27 | -4.9 | 0.6 | 26.77 | 0.475 | 0.5 | Pass |
| V | | 32.16 | -4.9 | 0.6 | 26.66 | 0.463 | 0.5 | Pass |
| H | 462.675 | 33.27 | -4.9 | 0.6 | 27.77 | 0.598 | 2.0 | Pass |
| V | | 33.36 | -4.9 | 0.6 | 27.86 | 0.611 | 2.0 | Pass |

Note:

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

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

b: SGP=Signal Generator Level

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

d: Per FCC part95.563 FRS channel 1 is 462.5625MHz, channel 14 is 467.7125MHz, channel 22 is 462.725.



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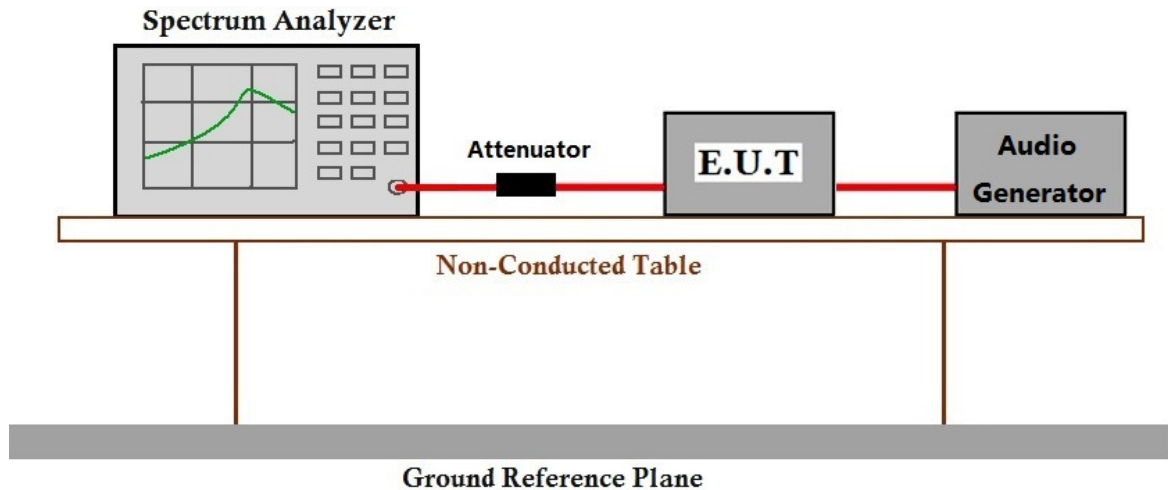
7.3 Occupied Bandwidth

Test Requirement 47 CFR FCC Part 95.573 & FCC Part 2.1049;
 Test Method: ANSI/TIA-603-E:2016
 Limit: For FCC Part 95.567:
 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: 24.5 °C Humidity: 52.2 % RH Atmospheric Pressure: 1010 mbar
 Test mode: a: Tx mode, Keep the EUT in transmitting mode.

7.3.2 Test Setup Diagram



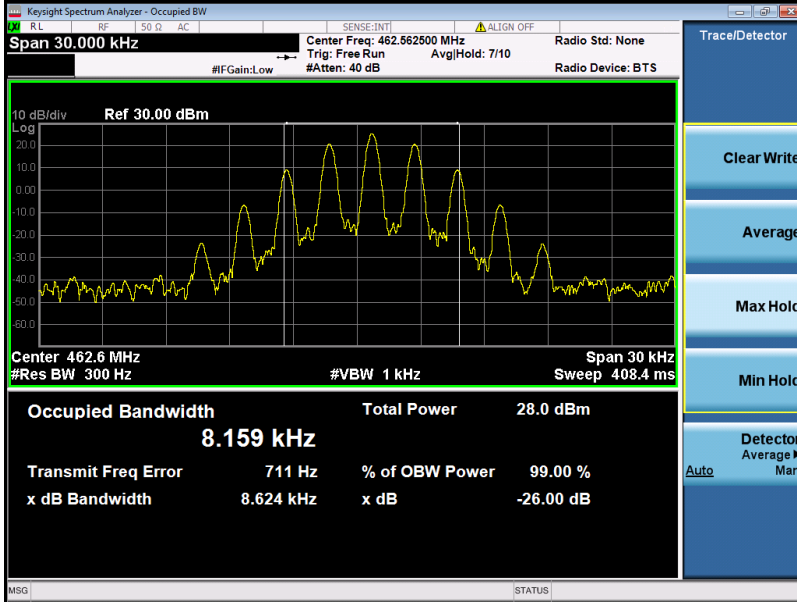
7.3.3 Measurement Procedure and Data



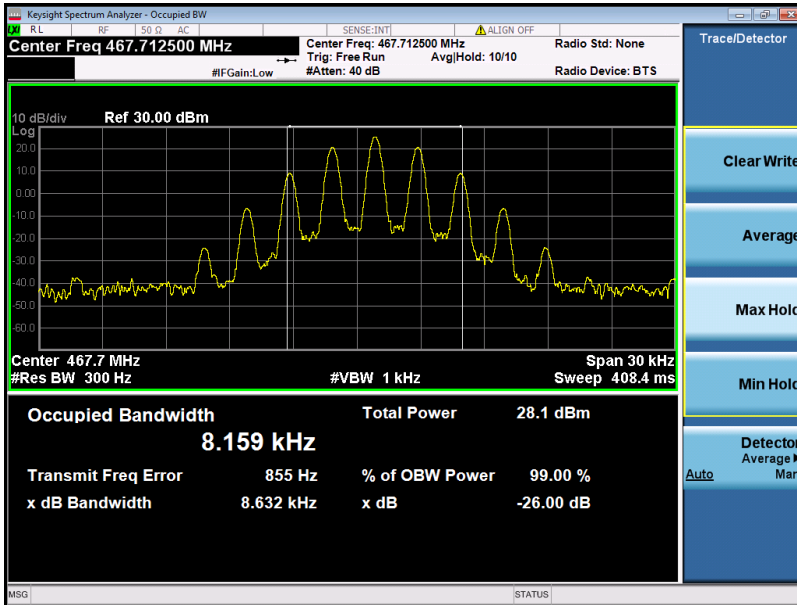
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Test result:

The occupied Bandwidth is measured to be 8.159 kHz for channel1.

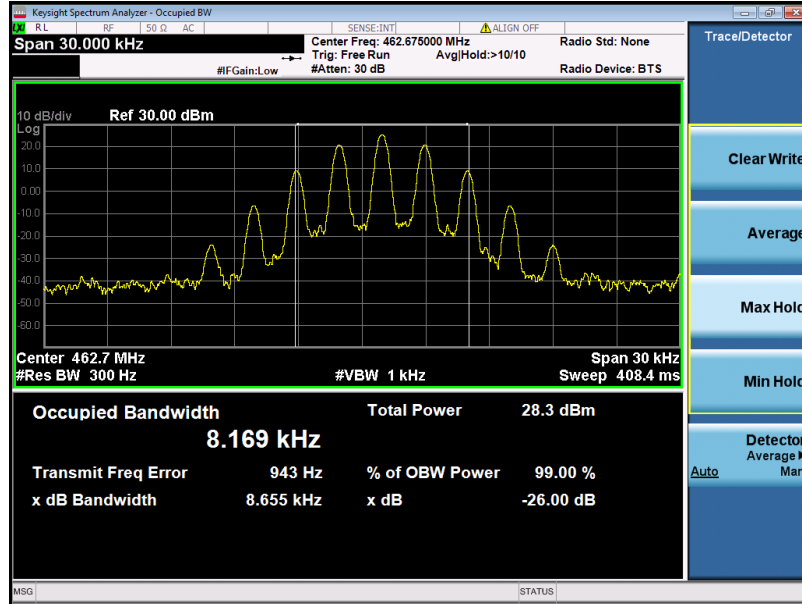


The occupied Bandwidth is measured to be 8.159 kHz for channel 14.



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The occupied Bandwidth is measured to be 8.169 kHz for channel 20.



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7.4 Modulation characteristics

Test Requirement 47 CFR FCC Part 95.575 & FCC Part 2.1047;

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.

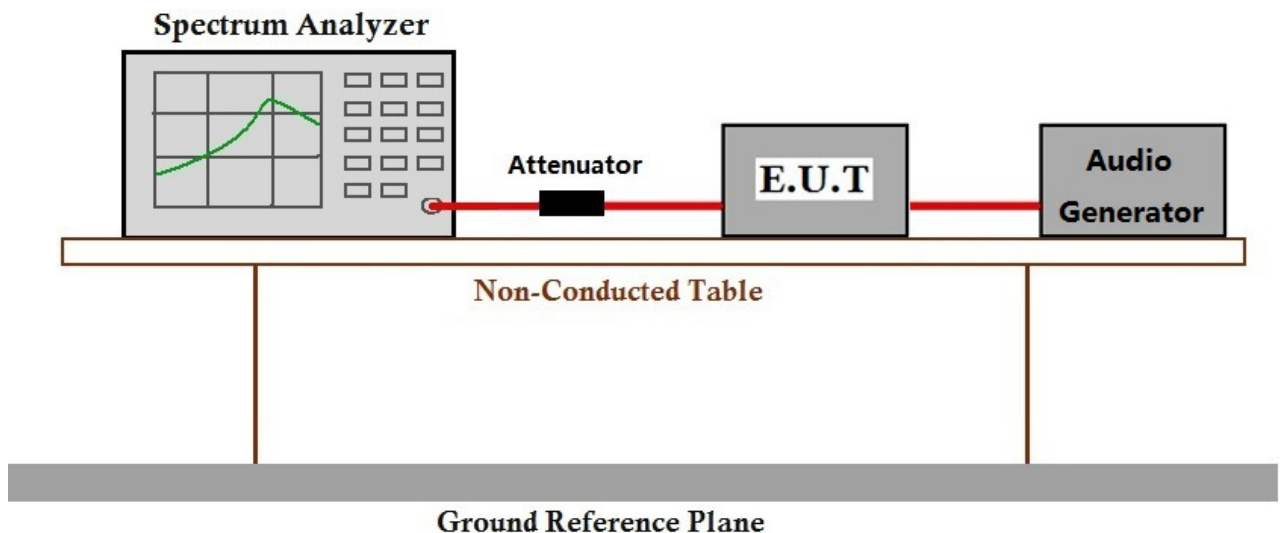
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 52.2 % 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

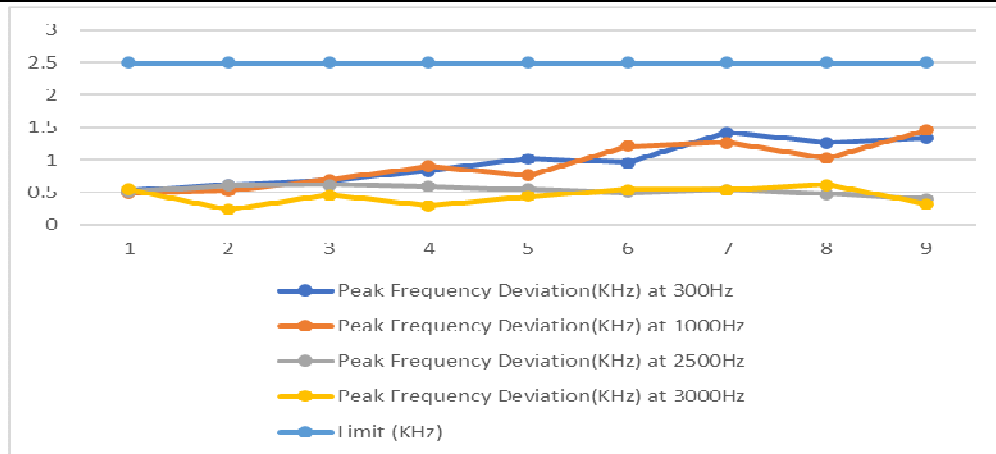


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Test result:

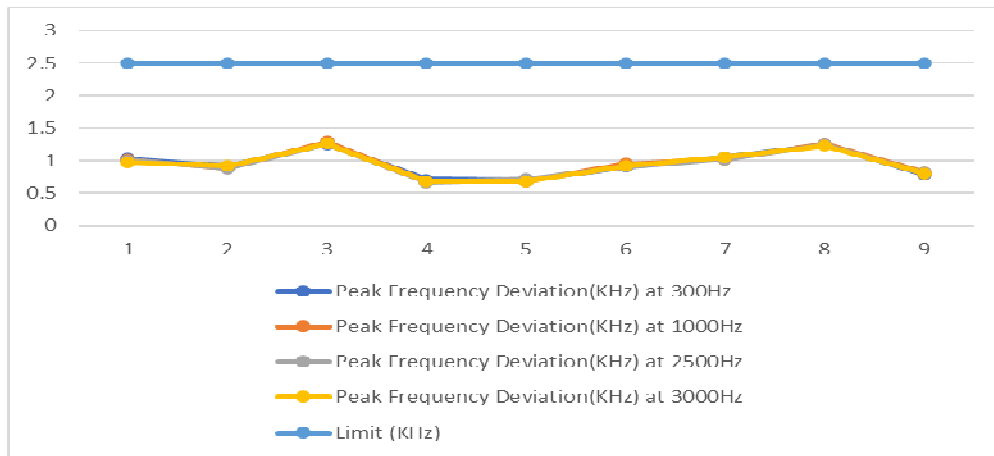
a. Frequency deviation:

| Channel 1: 462.5625MHz 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 | 0.52 | 0.49 | 0.51 | 0.55 | 2.50 |
| -15 | 0.62 | 0.52 | 0.61 | 0.24 | 2.50 |
| -10 | 0.68 | 0.69 | 0.62 | 0.46 | 2.50 |
| -5 | 0.83 | 0.90 | 0.59 | 0.29 | 2.50 |
| 0 | 1.02 | 0.76 | 0.55 | 0.44 | 2.50 |
| 5 | 0.96 | 1.21 | 0.50 | 0.54 | 2.50 |
| 10 | 1.42 | 1.27 | 0.54 | 0.54 | 2.50 |
| 15 | 1.27 | 1.03 | 0.48 | 0.62 | 2.50 |
| 20 | 1.34 | 1.46 | 0.40 | 0.32 | 2.50 |



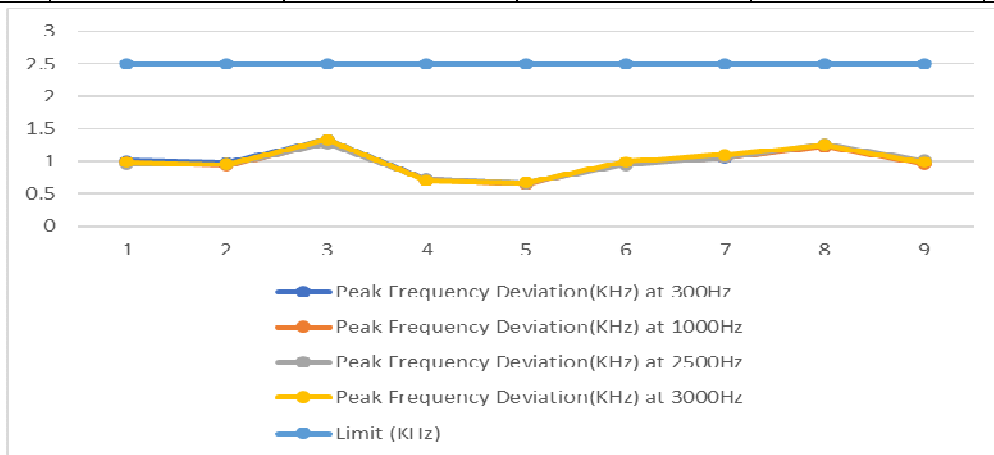
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| Channel 14: 467.7125MHz FRS | | | | | |
|-----------------------------|--|---|---|---|-------------|
| Modulation Input(dB) | Peak Frequency Deviation(KHz) at 300Hz | Peak Frequency Deviation(KHz) at 1000Hz | Peak Frequency Deviation(KHz) at 2500Hz | Peak Frequency Deviation(KHz) at 3000Hz | Limit (KHz) |
| -20 | 1.03 | 1.01 | 1.00 | 0.97 | 2.50 |
| -15 | 0.91 | 0.89 | 0.88 | 0.92 | 2.50 |
| -10 | 1.25 | 1.29 | 1.26 | 1.26 | 2.50 |
| -5 | 0.71 | 0.68 | 0.66 | 0.68 | 2.50 |
| 0 | 0.69 | 0.68 | 0.72 | 0.68 | 2.50 |
| 5 | 0.90 | 0.95 | 0.90 | 0.92 | 2.50 |
| 10 | 1.05 | 1.02 | 1.02 | 1.05 | 2.50 |
| 15 | 1.24 | 1.25 | 1.24 | 1.23 | 2.50 |
| 20 | 0.79 | 0.82 | 0.81 | 0.80 | 2.50 |



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| Channel 20: 462.6750MHz 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 | 1.00 | 0.98 | 0.96 | 0.98 | 2.50 |
| -15 | 0.97 | 0.93 | 0.95 | 0.95 | 2.50 |
| -10 | 1.33 | 1.28 | 1.27 | 1.33 | 2.50 |
| -5 | 0.72 | 0.71 | 0.72 | 0.70 | 2.50 |
| 0 | 0.66 | 0.65 | 0.66 | 0.67 | 2.50 |
| 5 | 0.97 | 0.97 | 0.94 | 0.99 | 2.50 |
| 10 | 1.05 | 1.06 | 1.06 | 1.10 | 2.50 |
| 15 | 1.24 | 1.22 | 1.25 | 1.24 | 2.50 |
| 20 | 0.98 | 0.96 | 1.01 | 0.98 | 2.50 |



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b. Audio Frequency Response

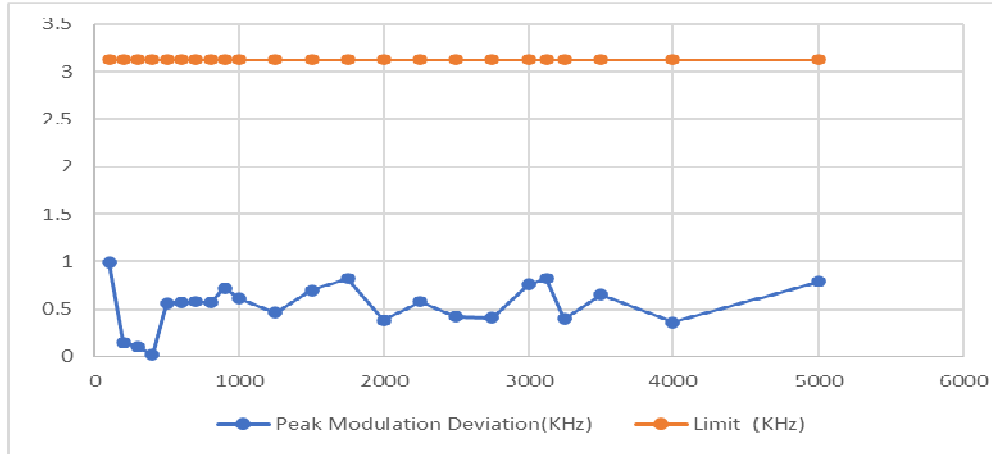
Channel 1 for FRS

| Modulation Frequency(Hz) | Peak Modulation Deviation(KHz) | Limit (KHz) |
|--------------------------|--------------------------------|-------------|
| 100 | 0.99 | 3.125 |
| 200 | 0.15 | 3.125 |
| 300 | 0.10 | 3.125 |
| 400 | 0.02 | 3.125 |
| 500 | 0.56 | 3.125 |
| 600 | 0.57 | 3.125 |
| 700 | 0.58 | 3.125 |
| 800 | 0.57 | 3.125 |
| 900 | 0.72 | 3.125 |
| 1000 | 0.61 | 3.125 |
| 1250 | 0.46 | 3.125 |
| 1500 | 0.70 | 3.125 |
| 1750 | 0.82 | 3.125 |
| 2000 | 0.38 | 3.125 |
| 2250 | 0.58 | 3.125 |
| 2500 | 0.42 | 3.125 |
| 2750 | 0.41 | 3.125 |
| 3000 | 0.76 | 3.125 |
| 3125 | 0.82 | 3.125 |
| 3250 | 0.40 | 3.125 |
| 3500 | 0.65 | 3.125 |
| 4000 | 0.36 | 3.125 |
| 5000 | 0.79 | 3.125 |



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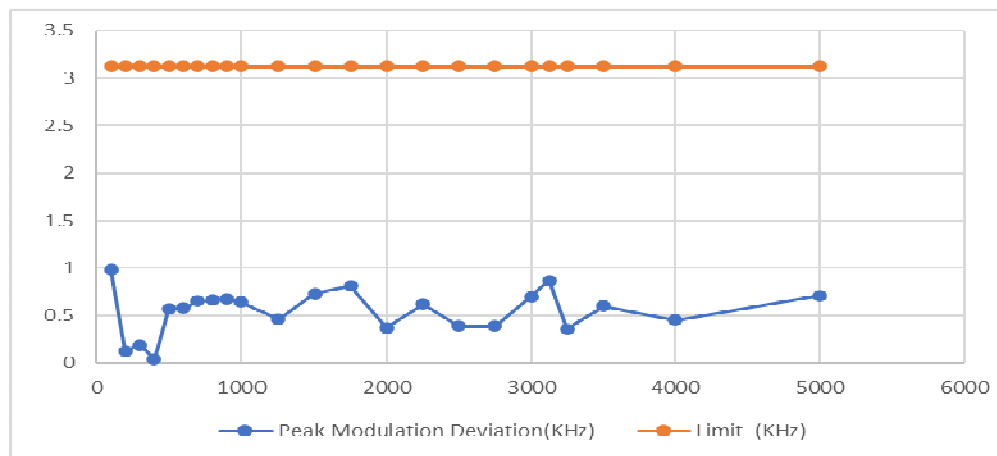
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 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com



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Channel 14 for FRS

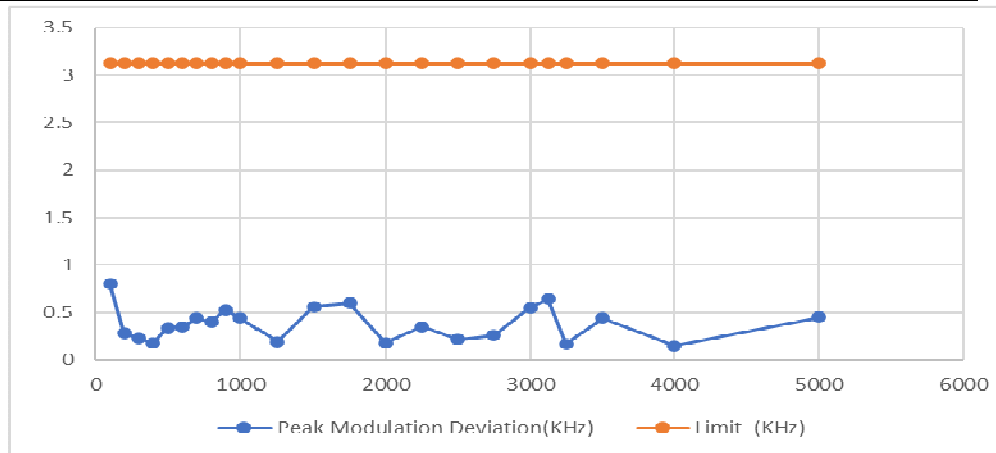
| Modulation Frequency(Hz) | Peak Modulation Deviation(KHz) | Limit (KHz) |
|--------------------------|--------------------------------|-------------|
| 100 | 0.98 | 3.125 |
| 200 | 0.13 | 3.125 |
| 300 | 0.19 | 3.125 |
| 400 | 0.04 | 3.125 |
| 500 | 0.57 | 3.125 |
| 600 | 0.58 | 3.125 |
| 700 | 0.65 | 3.125 |
| 800 | 0.66 | 3.125 |
| 900 | 0.68 | 3.125 |
| 1000 | 0.64 | 3.125 |
| 1250 | 0.46 | 3.125 |
| 1500 | 0.73 | 3.125 |
| 1750 | 0.81 | 3.125 |
| 2000 | 0.37 | 3.125 |
| 2250 | 0.62 | 3.125 |
| 2500 | 0.39 | 3.125 |
| 2750 | 0.39 | 3.125 |
| 3000 | 0.70 | 3.125 |
| 3125 | 0.87 | 3.125 |
| 3250 | 0.36 | 3.125 |
| 3500 | 0.60 | 3.125 |
| 4000 | 0.45 | 3.125 |
| 5000 | 0.71 | 3.125 |



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Channel 22 for FRS

| Modulation Frequency(Hz) | Peak Modulation Deviation(KHz) | Limit (KHz) |
|--------------------------|--------------------------------|-------------|
| 100 | 0.80 | 3.125 |
| 200 | 0.28 | 3.125 |
| 300 | 0.23 | 3.125 |
| 400 | 0.18 | 3.125 |
| 500 | 0.34 | 3.125 |
| 600 | 0.35 | 3.125 |
| 700 | 0.44 | 3.125 |
| 800 | 0.40 | 3.125 |
| 900 | 0.53 | 3.125 |
| 1000 | 0.44 | 3.125 |
| 1250 | 0.19 | 3.125 |
| 1500 | 0.56 | 3.125 |
| 1750 | 0.60 | 3.125 |
| 2000 | 0.18 | 3.125 |
| 2250 | 0.35 | 3.125 |
| 2500 | 0.22 | 3.125 |
| 2750 | 0.26 | 3.125 |
| 3000 | 0.55 | 3.125 |
| 3125 | 0.64 | 3.125 |
| 3250 | 0.17 | 3.125 |
| 3500 | 0.44 | 3.125 |
| 4000 | 0.15 | 3.125 |
| 5000 | 0.45 | 3.125 |

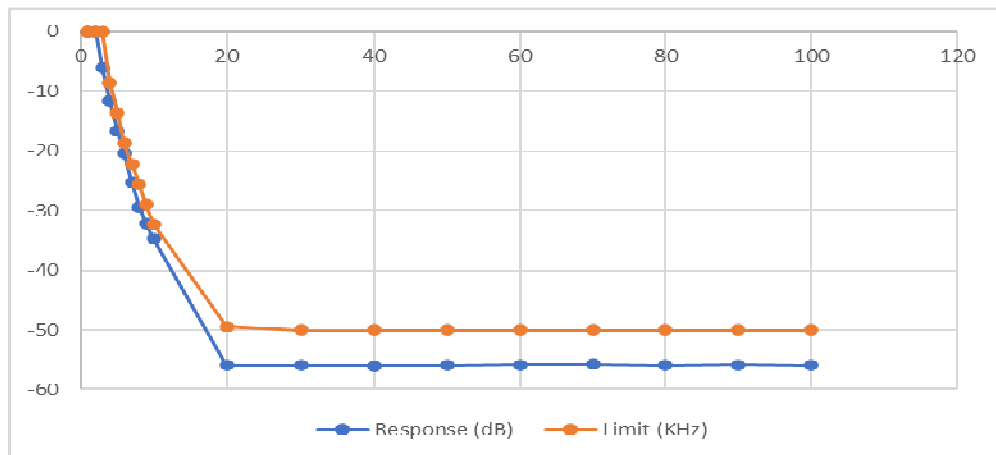


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c. Audio Low Pass Filter Frequency Response

Channel 1 for FRS

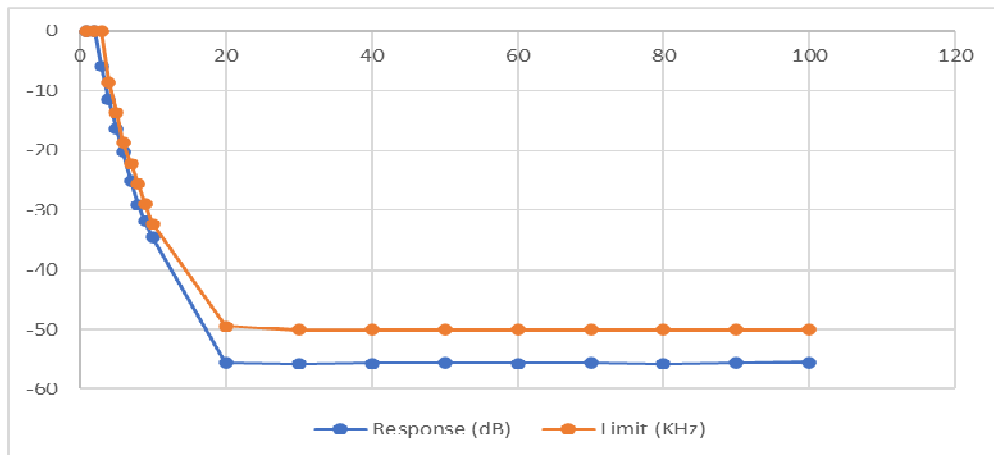
| Frequency(KHz) | Response (dB) | Limit (KHz) |
|----------------|---------------|-------------|
| 1 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 |
| 3 | -6.05 | 0.00 |
| 4 | -11.67 | -8.52 |
| 5 | -16.61 | -13.64 |
| 6 | -20.39 | -18.75 |
| 7 | -25.21 | -22.16 |
| 8 | -29.39 | -25.57 |
| 9 | -32.12 | -28.98 |
| 10 | -34.71 | -32.29 |
| 20 | -55.89 | -49.43 |
| 30 | -55.91 | -50.00 |
| 40 | -55.98 | -50.00 |
| 50 | -55.89 | -50.00 |
| 60 | -55.87 | -50.00 |
| 70 | -55.80 | -50.00 |
| 80 | -55.93 | -50.00 |
| 90 | -55.84 | -50.00 |
| 100 | -55.95 | -50.00 |



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Channel 14 for FRS

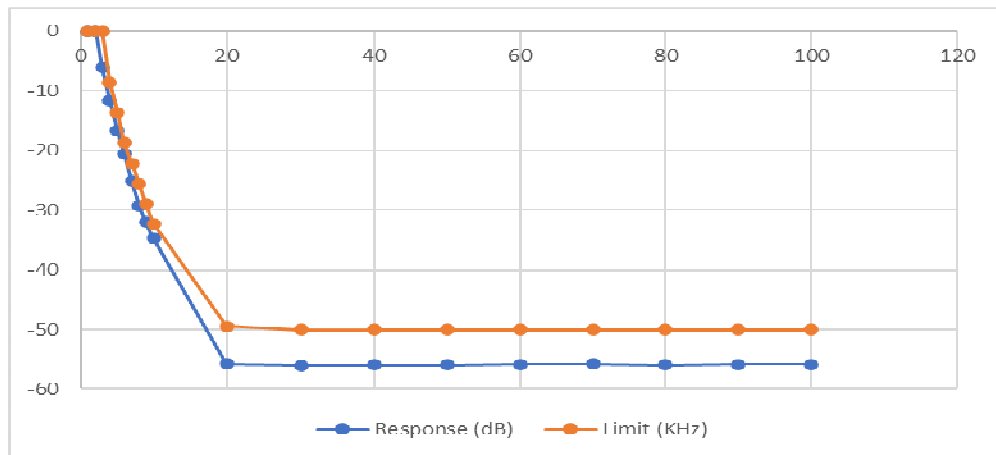
| Frequency(KHz) | Response (dB) | Limit (KHz) |
|----------------|---------------|-------------|
| 1 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 |
| 3 | -5.89 | 0.00 |
| 4 | -11.48 | -8.52 |
| 5 | -16.38 | -13.64 |
| 6 | -20.21 | -18.75 |
| 7 | -25.02 | -22.16 |
| 8 | -29.19 | -25.57 |
| 9 | -31.86 | -28.98 |
| 10 | -34.52 | -32.29 |
| 20 | -55.63 | -49.43 |
| 30 | -55.73 | -50.00 |
| 40 | -55.70 | -50.00 |
| 50 | -55.63 | -50.00 |
| 60 | -55.64 | -50.00 |
| 70 | -55.63 | -50.00 |
| 80 | -55.78 | -50.00 |
| 90 | -55.61 | -50.00 |
| 100 | -55.47 | -50.00 |



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Channel 22 for FRS

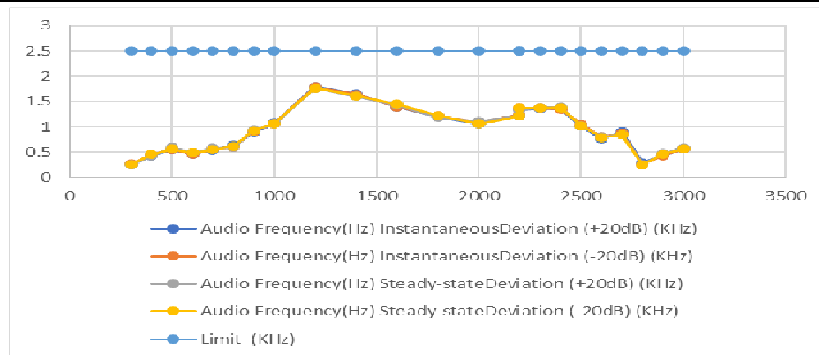
| Frequency(KHz) | Response (dB) | Limit (KHz) |
|----------------|---------------|-------------|
| 1 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 |
| 3 | -6.11 | 0.00 |
| 4 | -11.57 | -8.52 |
| 5 | -16.71 | -13.64 |
| 6 | -20.48 | -18.75 |
| 7 | -25.17 | -22.16 |
| 8 | -29.37 | -25.57 |
| 9 | -32.07 | -28.98 |
| 10 | -34.75 | -32.29 |
| 20 | -55.80 | -49.43 |
| 30 | -55.98 | -50.00 |
| 40 | -55.93 | -50.00 |
| 50 | -55.92 | -50.00 |
| 60 | -55.84 | -50.00 |
| 70 | -55.79 | -50.00 |
| 80 | -55.92 | -50.00 |
| 90 | -55.85 | -50.00 |
| 100 | -55.87 | -50.00 |



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d. Modulation Limiting
 Channel 1 for FRS

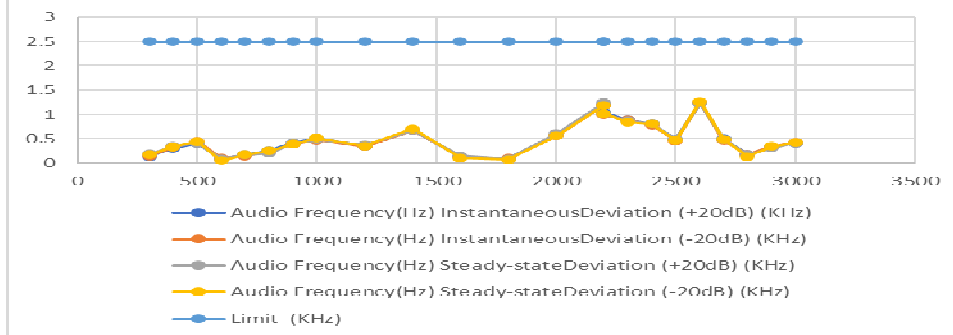
| Audio Frequency(Hz) | Instantaneous | | Steady-state | | Limit (KHz) |
|---------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------|
| | Deviation (+20dB) (KHz) | Deviation (-20dB) (KHz) | Deviation (+20dB) (KHz) | Deviation (-20dB) (KHz) | |
| 300 | 0.254 | 0.264 | 0.253 | 0.260 | 2.5 |
| 400 | 0.433 | 0.442 | 0.423 | 0.456 | 2.5 |
| 500 | 0.544 | 0.555 | 0.590 | 0.564 | 2.5 |
| 600 | 0.459 | 0.452 | 0.481 | 0.483 | 2.5 |
| 700 | 0.537 | 0.562 | 0.574 | 0.546 | 2.5 |
| 800 | 0.639 | 0.598 | 0.591 | 0.616 | 2.5 |
| 900 | 0.890 | 0.914 | 0.937 | 0.925 | 2.5 |
| 1000 | 1.073 | 1.063 | 1.054 | 1.063 | 2.5 |
| 1200 | 1.792 | 1.790 | 1.760 | 1.763 | 2.5 |
| 1400 | 1.646 | 1.642 | 1.602 | 1.609 | 2.5 |
| 1600 | 1.389 | 1.389 | 1.427 | 1.447 | 2.5 |
| 1800 | 1.201 | 1.210 | 1.182 | 1.217 | 2.5 |
| 2000 | 1.058 | 1.084 | 1.102 | 1.061 | 2.5 |
| 2200 | 1.222 | 1.241 | 1.223 | 1.216 | 2.5 |
| 2200 | 1.339 | 1.369 | 1.327 | 1.365 | 2.5 |
| 2300 | 1.358 | 1.364 | 1.379 | 1.371 | 2.5 |
| 2400 | 1.353 | 1.342 | 1.382 | 1.378 | 2.5 |
| 2500 | 1.013 | 1.048 | 1.019 | 1.016 | 2.5 |
| 2600 | 0.757 | 0.795 | 0.795 | 0.784 | 2.5 |
| 2700 | 0.901 | 0.875 | 0.845 | 0.843 | 2.5 |
| 2800 | 0.288 | 0.261 | 0.257 | 0.241 | 2.5 |
| 2900 | 0.435 | 0.431 | 0.471 | 0.462 | 2.5 |
| 3000 | 0.559 | 0.562 | 0.587 | 0.560 | 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 | 0.132 | 0.141 | 0.190 | 0.176 | 2.5 |
| 400 | 0.303 | 0.326 | 0.344 | 0.339 | 2.5 |
| 500 | 0.406 | 0.449 | 0.415 | 0.449 | 2.5 |
| 600 | 0.092 | 0.102 | 0.093 | 0.051 | 2.5 |
| 700 | 0.163 | 0.153 | 0.173 | 0.174 | 2.5 |
| 800 | 0.260 | 0.229 | 0.205 | 0.249 | 2.5 |
| 900 | 0.412 | 0.395 | 0.410 | 0.388 | 2.5 |
| 1000 | 0.506 | 0.473 | 0.483 | 0.513 | 2.5 |
| 1200 | 0.355 | 0.342 | 0.375 | 0.354 | 2.5 |
| 1400 | 0.676 | 0.668 | 0.669 | 0.710 | 2.5 |
| 1600 | 0.125 | 0.136 | 0.155 | 0.102 | 2.5 |
| 1800 | 0.087 | 0.097 | 0.086 | 0.073 | 2.5 |
| 2000 | 0.586 | 0.562 | 0.608 | 0.564 | 2.5 |
| 2200 | 1.208 | 1.193 | 1.245 | 1.189 | 2.5 |
| 2200 | 1.040 | 0.996 | 1.015 | 1.018 | 2.5 |
| 2300 | 0.885 | 0.885 | 0.868 | 0.841 | 2.5 |
| 2400 | 0.808 | 0.788 | 0.812 | 0.810 | 2.5 |
| 2500 | 0.491 | 0.464 | 0.493 | 0.470 | 2.5 |
| 2600 | 1.237 | 1.249 | 1.233 | 1.264 | 2.5 |
| 2700 | 0.498 | 0.467 | 0.496 | 0.493 | 2.5 |
| 2800 | 0.180 | 0.180 | 0.176 | 0.136 | 2.5 |
| 2900 | 0.330 | 0.339 | 0.315 | 0.345 | 2.5 |
| 3000 | 0.416 | 0.429 | 0.413 | 0.425 | 2.5 |

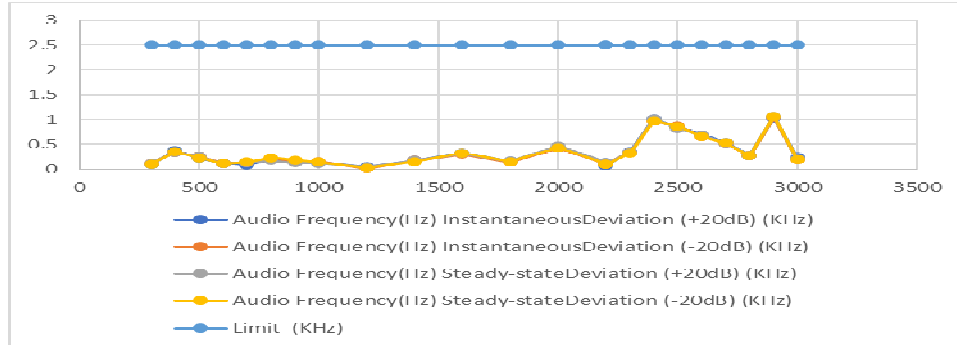


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Channel 22 for FRS

| Audio Frequency(Hz) | Instantaneous | | Steady-state | | Limit (KHz) |
|---------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------|
| | Deviation (+20dB) (KHz) | Deviation (-20dB) (KHz) | Deviation (+20dB) (KHz) | Deviation (-20dB) (KHz) | |
| 300 | 0.099 | 0.123 | 0.119 | 0.106 | 2.5 |
| 400 | 0.373 | 0.337 | 0.334 | 0.348 | 2.5 |
| 500 | 0.224 | 0.253 | 0.255 | 0.228 | 2.5 |
| 600 | 0.119 | 0.121 | 0.112 | 0.110 | 2.5 |
| 700 | 0.091 | 0.128 | 0.135 | 0.144 | 2.5 |
| 800 | 0.188 | 0.214 | 0.177 | 0.231 | 2.5 |
| 900 | 0.157 | 0.160 | 0.127 | 0.180 | 2.5 |
| 1000 | 0.137 | 0.152 | 0.124 | 0.143 | 2.5 |
| 1200 | 0.047 | 0.023 | 0.044 | 0.030 | 2.5 |
| 1400 | 0.178 | 0.175 | 0.172 | 0.148 | 2.5 |
| 1600 | 0.325 | 0.296 | 0.314 | 0.319 | 2.5 |
| 1800 | 0.156 | 0.141 | 0.159 | 0.153 | 2.5 |
| 2000 | 0.434 | 0.426 | 0.471 | 0.433 | 2.5 |
| 2200 | 0.136 | 0.108 | 0.132 | 0.105 | 2.5 |
| 2200 | 0.071 | 0.110 | 0.112 | 0.097 | 2.5 |
| 2300 | 0.350 | 0.334 | 0.334 | 0.321 | 2.5 |
| 2400 | 1.009 | 0.973 | 1.018 | 0.974 | 2.5 |
| 2500 | 0.849 | 0.869 | 0.816 | 0.861 | 2.5 |
| 2600 | 0.693 | 0.662 | 0.683 | 0.654 | 2.5 |
| 2700 | 0.539 | 0.521 | 0.521 | 0.528 | 2.5 |
| 2800 | 0.276 | 0.267 | 0.275 | 0.266 | 2.5 |
| 2900 | 1.035 | 1.045 | 1.067 | 1.062 | 2.5 |
| 3000 | 0.235 | 0.196 | 0.209 | 0.198 | 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:

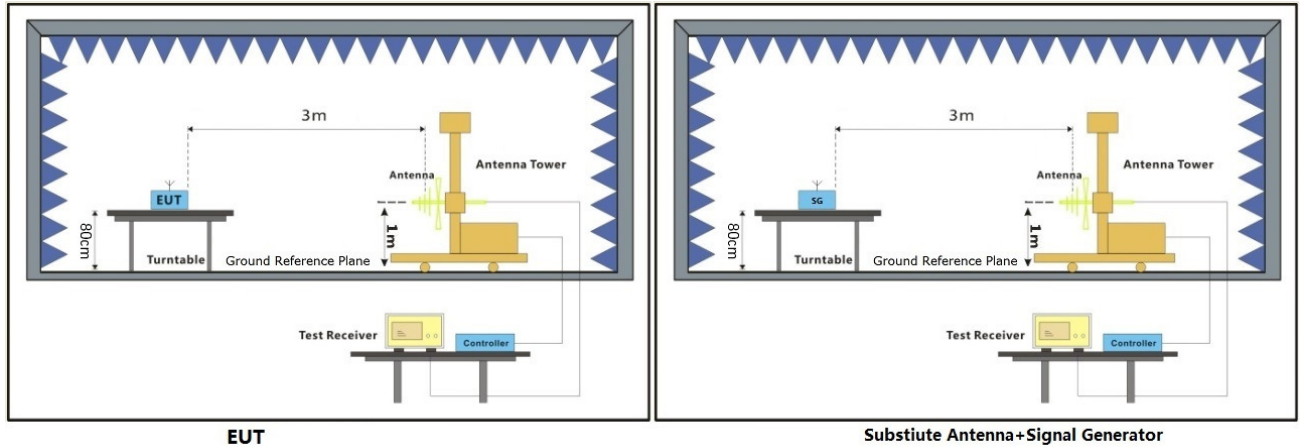
Temperature: 24.1 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar

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



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7.5.2 Test Setup Diagram



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.

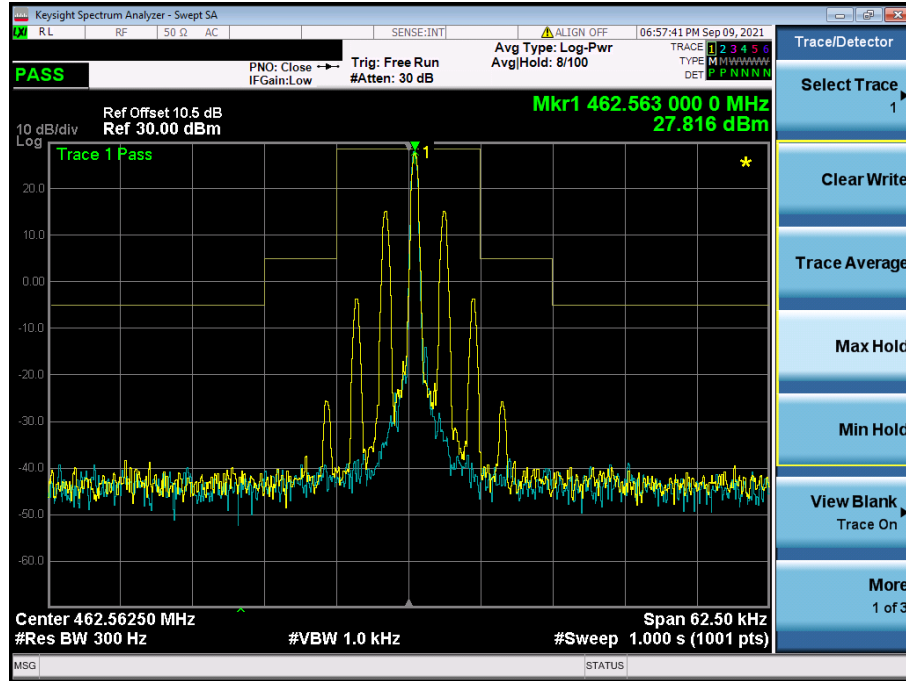


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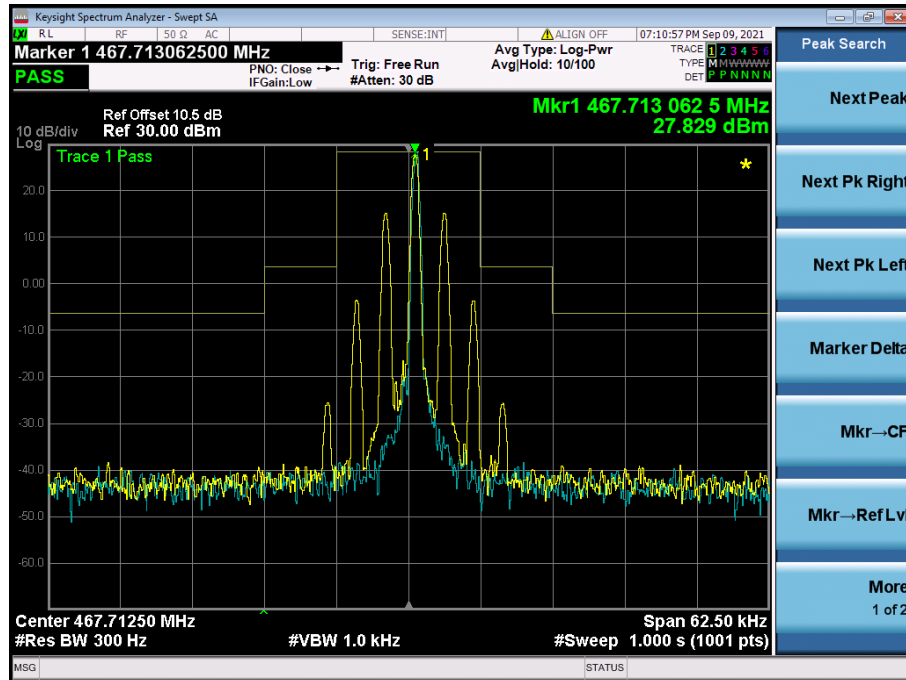
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Emission Mask

Channel 1

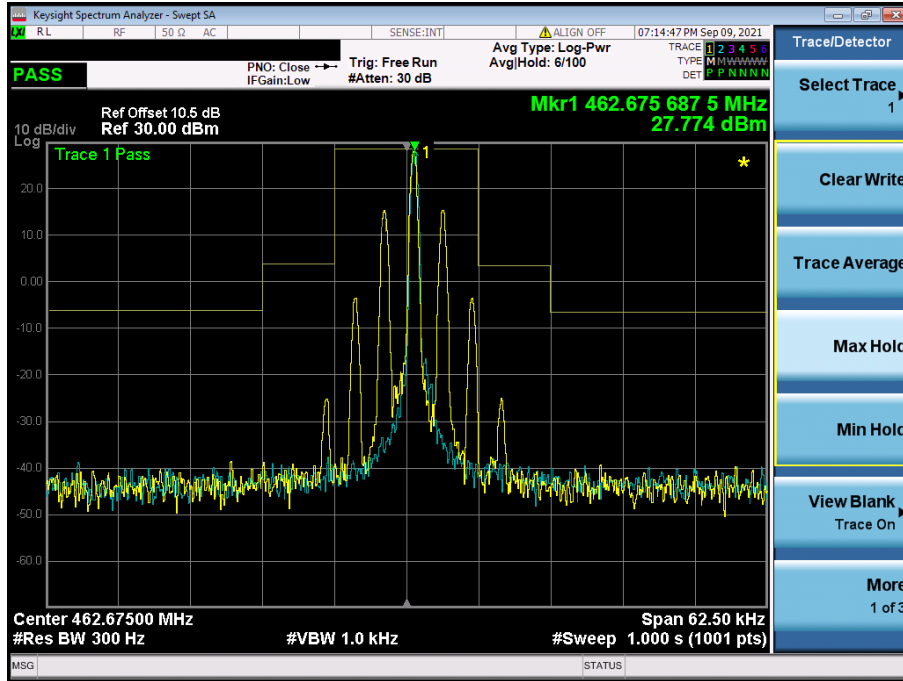


Channel 14



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Channel 20



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| Frequency MHz | Polarity H/V | Emission Level dBm | Limit dBm | Margin dBm |
|------------------|-----------------|-----------------------|--------------|---------------|
| 1388.35 | V | -42.97 | -13.00 | -29.97 |
| 1851.15 | V | -44.90 | -13.00 | -31.9 |
| 2310.14 | V | -49.71 | -13.00 | -36.71 |
| 2774.90 | V | -49.14 | -13.00 | -36.14 |
| 3232.86 | V | -47.41 | -13.00 | -34.41 |
| 3699.88 | V | -46.96 | -13.00 | -33.96 |
| 1388.35 | H | -40.22 | -13.00 | -27.22 |
| 1851.15 | H | -41.30 | -13.00 | -28.3 |
| 2310.15 | H | -51.04 | -13.00 | -38.04 |
| 2774.89 | H | -46.83 | -13.00 | -33.83 |
| 3232.83 | H | -42.85 | -13.00 | -29.85 |
| 3699.84 | H | -43.21 | -13.00 | -30.21 |

Note: Margin = Emission level – Limit.

Remark:

- 1) Only record the worst case(Channel 1) 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 test setup photos for GZCR21080208161AT.

8.2 EUT Constructional Details

Refer to external and internal photos for GZCR21080208161AT.

- End of the Report -



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