



TEST REPORT

Applicant Name: Shenzhen Ysair Technology Co., LTD

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Shenzhen, Guangdong China

Report Number: RA230117-02733E-RF-00B

FCC ID: 2A3OORB67

Test Standard (s)

FCC PART 95

Sample Description

Product Type: Two Way Radio

Model No.: RB67
Multiple Model(s) No.: N/A
Trade Mark: RETEVIS
Date Received: 2023/01/17
Report Date: 2023/04/19

Test Result:	Pass*
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^{*} In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Approved By:

Nick Fang

EMC Engineer

Nick Fanc

Candy Li

EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "* ".

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230117-02733E-RF-00B	Original Report	2023-04-19

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Frequency Range	462.5500~462.7250MHz 467.5625~467.7125MHz
Transmit Power (ERP)	462.5500~462.7250MHz: 26.12dBm 467.5625~467.7125MHz: 26.72dBm
Channel Spacing	12.5kHz
Modulation Technique	FM
Antenna Specification*	2.15dBi(It is provided by the applicant)
Voltage Range*	DC 3.7V from battery Low Voltage(L.V):3.15V Normal\High Voltage(N.V\H.V): 3.7V
Sample serial number	1Z93-1 for RF Conducted Test 1Z94-2 for Radiated Emission Test (Assigned by ATC)
Sample/EUT Status	Good condition

Report No.: RA230117-02733E-RF-00B

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, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Cha	nnel Bandwidth	5%
RF output power, conducted		0.71dB
Unwanted Emission, conducted		1.6dB
Emissions,	30MHz - 1GHz	5.08dB
Radiated	1GHz - 18GHz	4.96dB
Temp	erature	1°C
Humidity		6%
Supply	voltages	0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

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Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, 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.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

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The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

FRS Channel List

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Channel No.	Channel Frequency (MHz)	Channel No.	Channel Frequency (MHz)
1	462.5625	12	467.6625
2	462.5875	13	467.6875
3	462.6125	14	467.7125
4	462.6375	15	462.5500
5	462.6625	16	462.5750
6	462.6875	17	462.6000
7	462.7125	18	462.6250
8	467.5625	19	462.6500
9	467.5875	20	462.6750
10	467.6125	21	462.7000
11	467.6375	22	462.7250

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

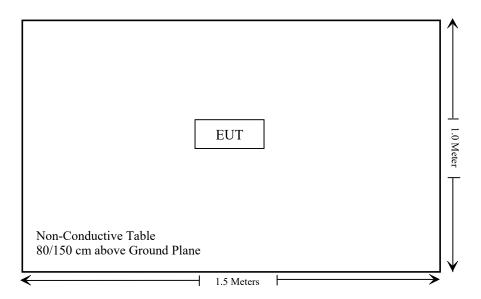
Manufacturer	nufacturer Description Model		Serial Number	
/	/	/	/	

External I/O Cable

Cable Description	Length (m)	From Port	То	
/	/	/	/	

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Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure	Compliant
§95.587(b)(1)(2)(3)	Antenna Requirement	Compliant
§2.1046, §95.567	RF Output Power	Compliant
§2.1047, §95.575	Modulation Characteristic	Compliant
§2.1049, §95.573, §95.579	Authorized Bandwidth & Emission Mask	Compliant
§2.1051, §95.579	Spurious Emission at Antenna Terminal	Compliant
§2.1053, §95.579	Spurious Radiated Emissions	Compliant
§2.1055(d), §95.565	Frequency Stability	Compliant

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TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
		Radiated Emi	ssion Test		
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2022/11/30	2025/11/29
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Mini-Circuits	High Pass Filter	NHP-600+	15542	2022/11/25	2023/11/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2022/11/30	2025/11/29
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2022/12/26	2025/12/25
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2022/11/30	2025/11/29
Unknown	RF Coaxial Cable	No.16	N200	2022/11/25	2023/11/24
Agilent	Signal Generator	N5183A	MY51040755	2022/11/25	2023/11/24

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^{*} Statement of Traceability: Shenzhen Accurate Technology Co., Ltd. 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

Report No.: RA230117-02733E-RF-00B

Applicable Standard

§2.1093.

Test Result

Compliance, please refer to the SAR report: CR230102734-SA.

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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.

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Antenna Description

The EUT has an integral vertically polarized antenna arrangement and the antenna gain is 2.15dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

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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.

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Test Procedure

ANSI/TIA-603-E-2016 clause 2.2.17

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:	26 °C
Relative Humidity:	63 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2023-04-11.

Test Mode: Transmitting

Receiver T		Receiver	Rx Ante	nna	Substituted	Absolute	T. 1.	
Frequency (MHz)	Reading (dBm)	Turntable Degree	Height (m)	Polar (H/V)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)
	462.6375 MHz							
462.6375	9.13	326	2.1	Н	9.1	18.23	33	-14.77
462.6375	21.12	34	2.2	V	5	26.12	33	-6.88
			467.	6375 ME	Iz			
467.6375	11.42	267	1.7	Н	8.3	19.72	27	-7.28
467.6375	21.32	338	1.1	V	5.4	26.72	27	-0.28

Note

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

Margin = Limit - Absolute Level

Test Result: Compliant.

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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.

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Test Procedure

ANSI/TIA-603-E-2016 clause 2.2.3, 2.2.6 and 2.2.15

Test Data

Environmental Conditions

Temperature:	28.2 °C	
Relative Humidity:	59 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Jason Liu on 2023-04-18..

Please refer to the following tables and plots.

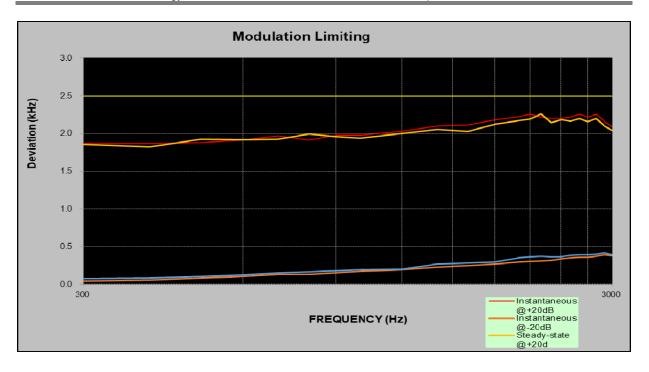
Test Mode: Transmitting

MODULATION LIMITING

Report No.: RA230117-02733E-RF-00B

Carrier Frequency: 462.6375MHz

	Instantaneous		Steady-state		
Audio Frequency (Hz)	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	FCC Limit [kHz]
300	1.874	0.045	1.856	0.076	2.500
400	1.868	0.060	1.823	0.084	2.500
500	1.880	0.088	1.926	0.105	2.500
600	1.914	0.103	1.914	0.123	2.500
700	1.968	0.130	1.923	0.154	2.500
800	1.914	0.134	1.995	0.168	2.500
900	1.979	0.154	1.955	0.179	2.500
1000	1.973	0.172	1.936	0.195	2.500
1200	2.031	0.195	2.001	0.204	2.500
1400	2.098	0.227	2.056	0.269	2.500
1600	2.113	0.250	2.026	0.286	2.500
1800	2.180	0.272	2.121	0.296	2.500
2000	2.226	0.300	2.169	0.352	2.500
2100	2.258	0.303	2.189	0.363	2.500
2200	2.213	0.313	2.262	0.372	2.500
2300	2.204	0.317	2.145	0.368	2.500
2400	2.203	0.337	2.185	0.369	2.500
2500	2.218	0.352	2.163	0.386	2.500
2600	2.255	0.359	2.201	0.396	2.500
2700	2.216	0.358	2.158	0.391	2.500
2800	2.259	0.371	2.201	0.401	2.500
2900	2.159	0.392	2.103	0.421	2.500
3000	2.092	0.378	2.044	0.392	2.500

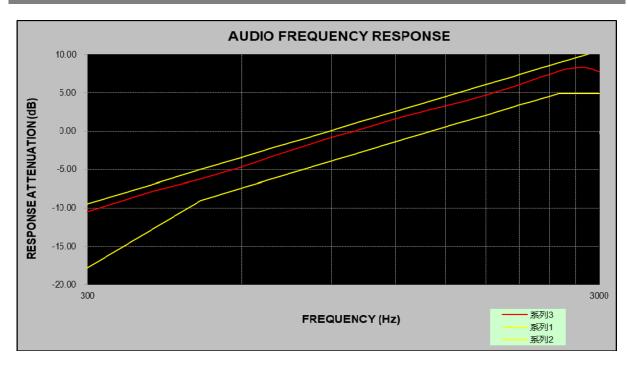


Audio Frequency Response

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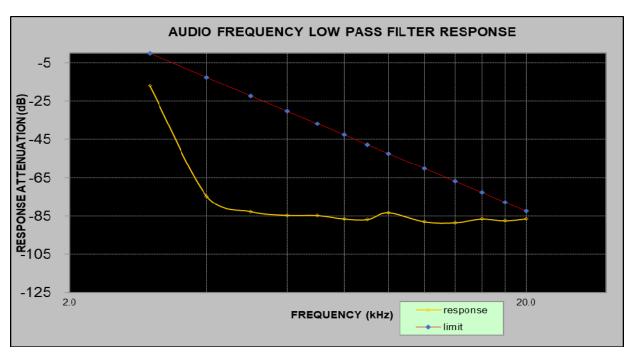
Carrier Frequency: 462.6375MHz

Audio Frequency (Hz)	Response (dB)
300	-10.46
400	-7.87
500	-6.20
600	-4.70
700	-3.17
800	-1.92
900	-0.84
1000	0.00
1200	1.60
1400	2.81
1600	3.76
1800	4.66
2000	5.62
2100	6.10
2200	6.58
2300	7.02
2400	7.44
2500	7.86
2600	8.12
2700	8.31
2800	8.34
2900	8.15
3000	7.77



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Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
1.0	0.0	/
3.0	-16.95	0.0
4.0	-74.51	-12.5
5.0	-82.65	-22.2
6.0	-84.58	-30.1
7.0	-84.69	-36.8
8.0	-86.48	-42.6
9.0	-86.77	-47.7
10.0	-83.24	-52.3
12.0	-87.95	-60.2
14.0	-88.42	-66.9
16.0	-86.49	-72.7
18.0	-87.45	-77.8
20.0	-86.40	-82.4



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FCC §2.1049 & §95.573 & §95.579 - AUTHOURIZED BANDWIDTH AND EMISSION MASK

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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/TIA-603-E-2016 clause 2.2.11

Test Data

Environmental Conditions

Temperature:	28.2 °C	
Relative Humidity:	59 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Jason Liu on 2023-04-18..

Test Mode: Transmitting

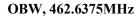
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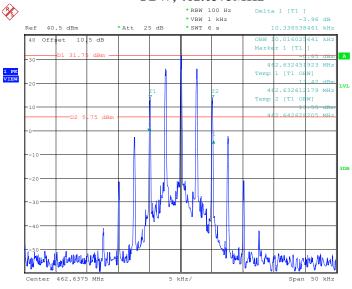
Emission Designator Per CFR 47 $\S 2.201\& \S 2.202\&$, Bn = 2M + 2D :

Emission Designator 11K0F3E In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation. BW = $2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} \rightarrow 11K0$

F3E portion of the designator represents an FM voice transmission Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

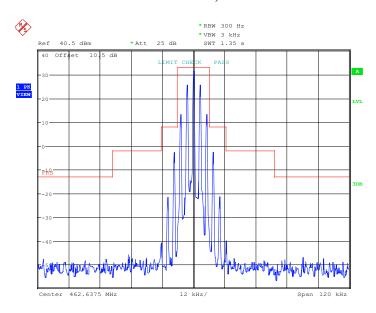
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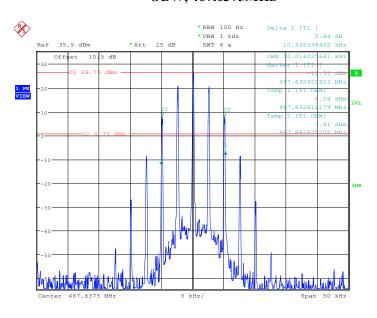
Date: 18.APR.2023 10:51:39

Emission Mask, 462.6375MHz



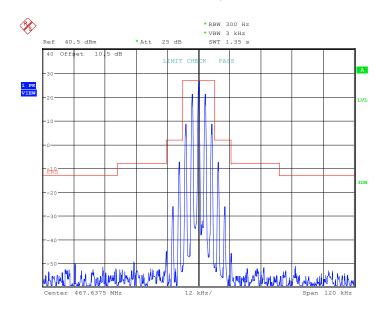
Date: 18.APR.2023 10:55:56

OBW, 467.6375MHz



Date: 18.APR.2023 13:27:51

Emission Mask, 467.6375MHz



Date: 18.APR.2023 13:24:34

FCC §2.1053 & §95.579- RADIATED SPURIOUS EMISSION

Applicable Standard

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

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- (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

ANSI/TIA-603-E-2016 clause 2.2.12

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)

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Test Data

Environmental Conditions

Temperature:	26 °C	
Relative Humidity:	63 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Jason Liu on 2023-04-11 and 2023-04-17.

Test Mode: Transmitting (worst case)

Note: Pre-scan in the X, Y and Z axes of orientation, the worst case Y-axis of orientation was recorded.

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	Receiver		Rx Ante	nna	Substituted	Absolute		
Frequency (MHz)	Reading (dBm)	Turntable Degree	Height (m)	Polar (H/V)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)
			462.	6375 MH	[z			
925.28	-43.03	173	1.3	Н	9.3	-33.73	-13	-20.73
925.28	-54.03	33	1	V	11.5	-42.53	-13	-29.53
1387.91	-51.99	196	1.2	Н	5.79	-46.20	-13	-33.20
1387.91	-41.67	239	2.5	V	6.17	-35.50	-13	-22.50
1850.55	-41.43	30	1.5	Н	4.63	-36.80	-13	-23.80
1850.55	-47.72	33	1.1	V	4.32	-43.40	-13	-30.40
2313.19	-50.16	102	1.9	Н	7.76	-42.40	-13	-29.40
2313.19	-52.93	207	2.2	V	6.73	-46.20	-13	-33.20
2775.83	-56.10	153	2.2	Н	6.40	-49.70	-13	-36.70
2775.83	-56.01	338	1.9	V	6.41	-49.60	-13	-36.60
3238.46	-50.93	55	2.4	Н	7.33	-43.60	-13	-30.60
3238.46	-50.50	170	2	V	6.90	-43.60	-13	-30.60
3701.10	-53.60	240	2.3	Н	8.20	-45.40	-13	-32.40
3701.10	-51.66	203	1.8	V	6.86	-44.80	-13	-31.80
			467.	6375 ME	[z			
935.28	-54.33	292	1.5	Н	9.3	-45.03	-13	-32.03
935.28	-46.13	236	1.4	V	11.5	-34.63	-13	-21.63
1402.91	-48.43	290	1.4	Н	5.43	-43.00	-13	-30.00
1402.91	-47.41	296	1.3	V	6.21	-41.20	-13	-28.20
1870.55	-46.19	26	1.4	Н	4.49	-41.70	-13	-28.70
1870.55	-43.18	203	2.3	V	3.58	-39.60	-13	-26.60
2338.19	-51.12	27	1.1	Н	7.12	-44.00	-13	-31.00
2338.19	-52.76	309	1.6	V	5.86	-46.90	-13	-33.90
2805.83	-53.69	24	2.1	Н	5.89	-47.80	-13	-34.80
2805.83	-54.75	173	1.4	V	6.85	-47.90	-13	-34.90
3273.46	-51.22	288	1.4	Н	6.92	-44.30	-13	-31.30
3273.46	-50.54	68	1.7	V	6.54	-44.00	-13	-31.00
3741.10	-53.24	251	2.2	Н	8.24	-45.00	-13	-32.00
3741.10	-52.32	231	1.4	V	7.62	-44.70	-13	-31.70

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: Substituted Level - Cable loss+ Antenna Gain

Margin = Absolute Level - Limit

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 °C to +50 °C, and according to FCC 2.1055(d) (2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

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According to FCC $\S95.565$, 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 $\S95.563$ during normal operating conditions.

Test Procedure

ANSI/TIA-603-E-2016 clause 2.2.2

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

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

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

- □1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- ⊠2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The output frequency was recorded for each voltage.

Test Data

Environmental Conditions

Temperature:	28.2°C
Relative Humidity:	59%
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2023-04-18.

Test Mode: Transmitting

Reference Frequency:462.6375MHz, Limit:2.5 ppm, 12.5kHz				
Environment Temperature (°C)	Power Supplied (V _{DC})	Measurement Frequency (MHz)	Frequency Error (ppm)	
	Frequency Stability vo	ersus Input Temperature		
50	NV	462.637275	-0.49	
40	NV	462.637265	-0.51	
30	NV	462.637238	-0.57	
20	NV	462.637285	-0.46	
10	NV	462.637375	-0.27	
0	NV	462.637228	-0.59	
-10	NV	462.637235	-0.57	
-20	NV	462.637275	-0.49	
-30	NV	462.637248	-0.54	
Frequency Stability versus Input Voltage				
20	LV	462.637297	-0.44	
20	HV	462.637269	-0.50	

Reference Frequency:467.6375MHz, Limit:2.5 ppm, 12.5kHz				
Environment Temperature (°C)	Power Supplied (V _{DC})	Measurement Frequency (MHz)	Frequency Error (ppm)	
	Frequency Stability v	ersus Input Temperature		
50	NV	467.637252	-0.53	
40	NV	467.637236	-0.56	
30	NV	467.637244	-0.55	
20	NV	467.637283	-0.46	
10	NV	467.637247	-0.54	
0	NV	467.637265	-0.50	
-10	NV	467.637263	-0.51	
-20	NV	467.637265	-0.50	
-30	NV	467.637267	-0.50	
Frequency Stability versus Input Voltage				
20	LV	467.637265	-0.50	
20	HV	467.637267	-0.50	

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