

# FCC PART 95 MEASUREMENT AND TEST REPORT

For

## HENAN ESHOW ELECTRONIC COMMERCE CO., LTD

Room 722, Sanjiang Building, No.170 Nanyang Road, Huiji District, Zhengzhou, Henan, China

FCC ID: 2AAR8RETEVISRT602

Report Type: Product Type:

Original Report Walkie Talkie

**Report Number:** RSZ161229008-00

**Report Date:** 2017-04-17

Oscar Ye

**Reviewed By:** Engineer

**Test Laboratory:** Bay Area Compliance Laboratories Corp. (Kunshan)

No.248 Chenghu Road, Kunshan, Jiangsu province, China

Gscar. Ye

Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn

**Note**: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

## TABLE OF CONTENTS

GENERAL INFORMATION	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
Objective	
RELATED SUBMITTAL(S)/GRANT(S)	3
TEST METHODOLOGY	
Measurement Uncertainty	3
TEST FACILITY	4
SYSTEM TEST CONFIGURATION	5
DESCRIPTION OF TEST CONFIGURATION	5
EQUIPMENT MODIFICATIONS	
SUPPORT EQUIPMENT LIST AND DETAILS	
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
TEST EQUIPMENT LIST	7
FCC §1.1307(b) & §2.1093 - RF EXPOSURE	8
APPLICABLE STANDARD	8
FCC §2.1046 & §95.639(a)(d) - RF OUTPUT POWER	9
APPLICABLE STANDARD	9
TEST PROCEDURE	9
TEST DATA	9
FCC §2.1047 & §95.637(a) - MODULATION CHARACTERISTIC	
APPLICABLE STANDARD	
TEST PROCEDURE	
TEST DATA	10
FCC $\$2.1049$ & $\$95.633(a)(c)$ & $\$95.635(b)(1)(3)(7)$ - AUTHOURIZED BANDWIDTH AND EMISSION OF AUTHOURIZED BANDWIDTH AUTHOUR	
MASK	
APPLICABLE STANDARD	
TEST PROCEDURE	
TEST DATA	21
FCC §2.1053 & §95.635(b) (7) - RADIATED SPURIOUS EMISSION	
APPLICABLE STANDARD	
TEST PROCEDURE	24
TEST DATA	24
FCC§2.1055 (d) & §95.621(b) & §95.626(b) - FREQUENCY STABILITY	
APPLICABLE STANDARD	
Test Procedure	
TERM LATA	76

Report No.: RSZ161229008-00

## **GENERAL INFORMATION**

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

The HENAN ESHOW ELECTRONIC COMMERCE CO., LTD's product, model number: RT602 (FCC ID: 2AAR8RETEVISRT602) or the "EUT" in this report was a Walkie Talkie, which was measured approximately:  $11.5 \text{ cm } (L) \times 5.5 \text{ cm } (W) \times 3.8 \text{ cm } (H)$ , rated input voltage: DC 3.6 battery.

Report No.: RSZ161229008-00

\* All measurement and test data in this report was gathered from production sample serial number: 1604016 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2016-12-29.

## **Objective**

This report is prepared on behalf of *HENAN ESHOW ELECTRONIC COMMERCE CO., LTD* in accordance with Part 2 and Part 95, Subpart A & Subpart B & Subpart E of the Federal Communication Commissions rules.

## **Related Submittal(s)/Grant(s)**

No related submittal(s).

## **Test Methodology**

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart A, Subpart B and Subpart E of the Federal Communication Commissions rules with TIA-603-D, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## **Measurement Uncertainty**

	Item	Uncertainty
RF conducted	d test with spectrum	±0.9dB
D. P. C. L. C.	30MHz~1GHz	±5.91dB
Radiated emission	Above 1G	±4.92dB
Occupi	ed Bandwidth	±0.5kHz
Tes	mperature	±1.0℃
Н	Iumidity	±6%

FCC Part 95 Page 3 of 27

## **Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Report No.: RSZ161229008-00

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

FCC Part 95 Page 4 of 27

## **SYSTEM TEST CONFIGURATION**

## **Description of Test Configuration**

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

Report No.: RSZ161229008-00

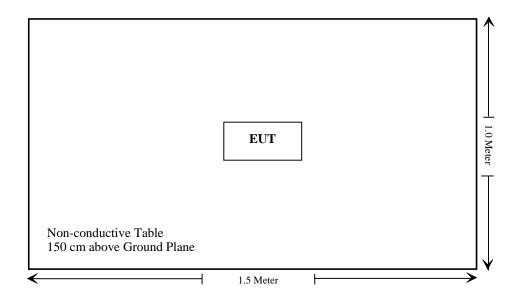
## **Equipment Modifications**

No modification was made to the EUT tested.

## **Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
/	/	/	/

## **Block Diagram of Test Setup**



FCC Part 95 Page 5 of 27

## SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure	Compliance
§2.1046, §95.639(a)(d)	RF Output Power	Compliance
§2.1047, §95.637(a)	Modulation Characteristic	Compliance
\$2.1049, \$95.633(a) (c), \$95.635 (b) (1) (3) (7)	Authorized Bandwidth & Emission Mask	Compliance
§2.1053, §95.635(b) (7)	Spurious Radiated Emissions	Compliance
\$2.1055(d), \$95.621(b);\$95.626(b)	Frequency Stability	Compliance

Report No.: RSZ161229008-00

FCC Part 95 Page 6 of 27

## TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	
	Radiated Emission Test					
Sonoma Instrunent	Amplifier	330	171377	2016-12-12	2017-12-12	
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2016-11-25	2017-11-25	
Sunol Sciences	Broadband Antenna	ЈВ3	A090314-2	2016-01-09	2019-01-08	
Sunol Sciences	Broadband Antenna	ЈВ3	A090314-1	2016-01-09	2019-01-08	
Narda	Pre-amplifier	AFS42- 00101800	2001270	2016-09-08	2017-09-08	
EMCO	Horn Antenna	3116	9510-2384	2015-11-07	2018-11-06	
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2016-11-25	2017-11-25	
ETS	Horn Antenna	3115	6229	2016-12-12	2019-12-12	
ETS	Horn Antenna	3115	9311-4159	2016-01-11	2019-01-10	
R&S	Auto test Software	EMC32	V 09.10.0	NCR	NCR	
haojintech	Coaxial Cable	Cable-1	001	2016-12-12	2017-12-12	
haojintech	Coaxial Cable	Cable-2	002	2016-12-12	2017-12-12	
haojintech	Coaxial Cable	Cable-3	003	2016-12-12	2017-12-12	
MICRO-COAX	Coaxial Cable	Cable-4	004	2016-12-12	2017-12-12	
MICRO-COAX	Coaxial Cable	Cable-5	005	2016-12-12	2017-12-12	
MICRO-COAX	Coaxial Cable	Cable-7	007	2016-12-12	2017-12-12	
HP	Signal Generator	8341B	2624A00116	2016-08-29	2017-08-29	
	,	RF Conducted	test			
BACL	TS 8997 Cable-01	T-KS-EMC086	T-KS-EMC086	2016-12-09	2017-12-08	
BACL	RF cable	KS-LAB-012	KS-LAB-012	2016-12-15	2017-12-14	
WEINSCHEL	10dB Attenuator	5328	N/A	2016-06-18	2017-06-18	
Rohde & Schwarz	OSP120 BASE UNIT	OSP120	101247	2016-07-04	2017-07-03	
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2016-09-21	2017-09-21	
HEWLETT PACKARD	RF Communications Test SET	8920A	3438A05201	2016-09-21	2017-09-21	
HONOVA	Power Splitter	ZFRSC-14-S+	019411452	2016-06-12	2017-06-12	

Report No.: RSZ161229008-00

FCC Part 95 Page 7 of 27

<sup>\*</sup> Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## FCC §1.1307(b) & §2.1093 - RF EXPOSURE

## **Applicable Standard**

According to FCC \$1.1307(b) and \$2.1093, protable device operates Part 95 should be subjected to rountine environmental evaluation for RF exposure prior or equipment authorization or use.

Report No.: RSZ161229008-00

**Result:** Compliance.

Please refer to SAR Report Number: RSZ161229008-20.

FCC Part 95 Page 8 of 27

## FCC §2.1046 & §95.639(a)(d) - RF OUTPUT POWER

## **Applicable Standard**

Per FCC §2.1046, and §95.639(d), No FRS Unit, under any condition of modulation, shall exceed a 0.5 W effective radiated power (ERP).

Report No.: RSZ161229008-00

Per FCC §95.639(a) (1), No GMRS transmitter, under any condition of modulation, shall exceed 50 W Carrier power (average TP during one unmodulated RF cycle) when transmitting emission type A1D, F1D, G1D, A3E, F3E or G3E.

#### **Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the emissions were measured by the substitution.

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Poboo Li on 2017-04-15.

Test Mode: Transmitting

Indica	ated	Table	Test .	Ant.	Sub	stituted		Absolute	FCC I	Part 95
Frequency (MHz)	S.A. Reading (dBµV)	Angle Degree	Height (m)	Polar (H/V)	evel	Cable Loss (dB)	Ant. Gain (dB)	Level (dBm)	ERP (mW)	Limit (Watt)
	462.6250MHz GMRS									
462.625	79.56	16	1.3	Н	-0.9	0.23	4.05	2.92	1.96	50
462.625	90.90	18	1.4	V	13.7	0.23	4.05	17.52	56.49	50
	467.6375MHz FRS									
467.6375	84.36	100	1.3	Н	3.9	0.23	4.05	7.72	5.92	0.5
467.6375	90.70	286	1.2	V	13.5	0.23	4.05	17.32	53.95	0.5

Test Result: Compliance.

FCC Part 95 Page 9 of 27

## FCC §2.1047 & §95.637(a) - MODULATION CHARACTERISTIC

## **Applicable Standard**

Per FCC §2.1047 and §95.637(a): A GMRS transmitter that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A FRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz.

Report No.: RSZ161229008-00

Each GMRS transmitter, except a mobile station transmitter with a power output of 2.5 W or less, must automatically prevent a greater than normal audio level from causing over-modulation. The transmitter also must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of § 95.631 (without filtering.) The filter must be between the modulation limiter and the modulated stage of the transmitter. At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least 60 log 10 (f/3) dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater than the attenuation at 1 kHz.

#### **Test Procedure**

Test Method: TIA/EIA-603-D

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Poboo Li on 2017-04-15.

Please refer to the following tables and plots.

FCC Part 95 Page 10 of 27

Test Mode: Transmitting

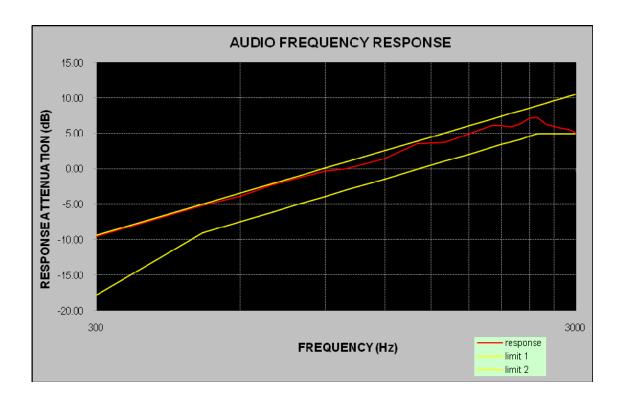
## **Audio Frequency Response**

Report No.: RSZ161229008-00

Carrier Frequency: 462.6250 MHz

Audio Frequency (Hz)	Response Attenuation (dB)
300	-9.58
400	-7.09
500	-5.16
600	-3.88
700	-2.29
800	-1.17
900	-0.30
1000	0.00
1200	1.48
1400	3.56
1600	3.76
1800	4.92
2000	6.08
2100	6.10
2200	5.96
2300	6.37
2400	7.15
2500	7.24
2600	6.26
2700	6.00
2800	5.73
2900	5.61
3000	5.12

FCC Part 95 Page 11 of 27



Report No.: RSZ161229008-00

FCC Part 95 Page 12 of 27

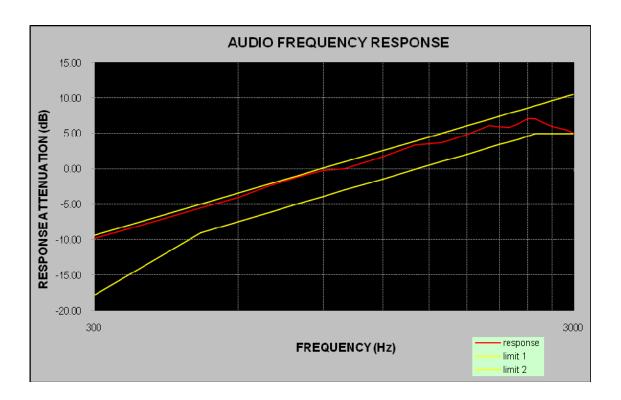
## **Audio Frequency Response**

Report No.: RSZ161229008-00

Carrier Frequency: 467.6375 MHz

Audio Frequency (Hz)	Response Attenuation (dB)
300	-9.84
400	-7.41
500	-5.55
600	-4.04
700	-2.34
800	-1.07
900	-0.25
1000	0.00
1200	1.68
1400	3.38
1600	3.69
1800	4.83
2000	6.09
2100	5.93
2200	5.81
2300	6.38
2400	7.08
2500	7.11
2600	6.47
2700	5.99
2800	5.76
2900	5.53
3000	5.04

FCC Part 95 Page 13 of 27



Report No.: RSZ161229008-00

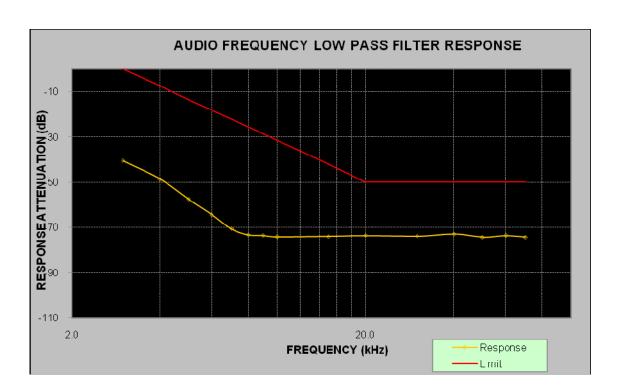
FCC Part 95 Page 14 of 27

## Audio frequency lows pass filter response

Report No.: RSZ161229008-00

Carrier Frequency: 462.6250 MHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
2.5	0.0	0.0
3.0	-40.4	0.0
3.5	-48.5	-4.0
4.0	-57.4	-7.5
5.0	-64.3	-13.3
7.0	-70.5	-22.1
10.0	-73.2	-31.4
15.0	-73.5	-42.0
20.0	-74.1	-50.0
30.0	-73.9	-50.0
50.0	-73.5	-50.0
70.0	-73.8	-50.0



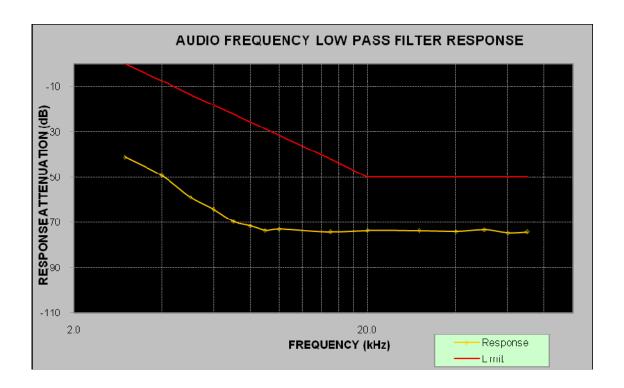
FCC Part 95 Page 15 of 27

## Audio frequency lows pass filter response

Report No.: RSZ161229008-00

Carrier Frequency: 467.6375 MHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
2.5	0.0	0.0
3.0	-41.1	0.0
3.5	-49.3	-4.0
4.0	-58.8	-7.5
5.0	-64.2	-13.3
7.0	-69.5	-22.1
10.0	-71.5	-31.4
15.0	-73.4	-42.0
20.0	-72.9	-50.0
30.0	-74.1	-50.0
50.0	-73.5	-50.0
70.0	-73.6	-50.0



FCC Part 95 Page 16 of 27

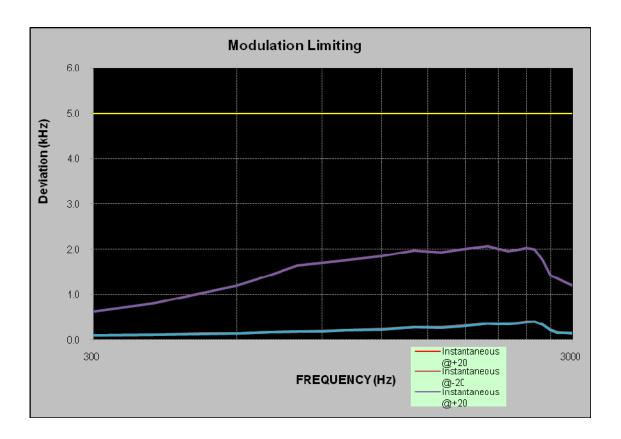
## MODULATION LIMITING

Report No.: RSZ161229008-00

Carrier Frequency: 462.6250MHz

	Instant	aneous	Steady		
Audio Frequency (Hz)	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	FCC Limit [kHz]
300	0.621	0.091	0.611	0.087	5
400	0.807	0.107	0.800	0.103	5
500	1.027	0.132	1.019	0.123	5
600	1.196	0.137	1.191	0.129	5
700	1.425	0.163	1.414	0.156	5
800	1.647	0.179	1.638	0.171	5
900	1.707	0.189	1.699	0.181	5
1000	1.762	0.203	1.753	0.197	5
1200	1.852	0.232	1.841	0.222	5
1400	1.983	0.279	1.971	0.271	5
1600	1.935	0.268	1.933	0.261	5
1800	2.025	0.314	2.011	0.305	5
2000	2.075	0.357	2.071	0.351	5
2100	2.012	0.345	2.003	0.339	5
2200	1.965	0.352	1.961	0.341	5
2300	1.992	0.369	1.981	0.355	5
2400	2.042	0.391	2.029	0.377	5
2500	2.003	0.403	1.997	0.392	5
2600	1.756	0.332	1.751	0.322	5
2700	1.422	0.211	1.414	0.203	5
2800	1.356	0.166	1.348	0.149	5
2900	1.272	0.151	1.261	0.143	5
3000	1.206	0.149	1.193	0.141	5

FCC Part 95 Page 17 of 27



Report No.: RSZ161229008-00

FCC Part 95 Page 18 of 27

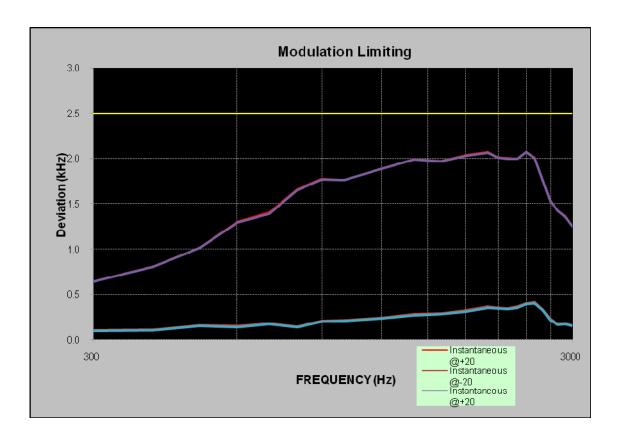
## MODULATION LIMITING

Report No.: RSZ161229008-00

Carrier Frequency: 467.6375MHz

	Instant	aneous	Steady		
Audio Frequency (Hz)	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	FCC Limit [kHz]
300	0.643	0.104	0.638	0.098	2.500
400	0.810	0.112	0.802	0.105	2.500
500	1.021	0.159	1.009	0.151	2.500
600	1.305	0.148	1.296	0.139	2.500
700	1.408	0.181	1.391	0.168	2.500
800	1.666	0.140	1.653	0.135	2.500
900	1.782	0.204	1.769	0.196	2.500
1000	1.766	0.212	1.761	0.202	2.500
1200	1.895	0.237	1.886	0.231	2.500
1400	1.999	0.278	1.993	0.269	2.500
1600	1.977	0.285	1.971	0.283	2.500
1800	2.047	0.321	2.033	0.308	2.500
2000	2.082	0.362	2.069	0.349	2.500
2100	2.017	0.347	2.008	0.341	2.500
2200	2.013	0.344	2.000	0.336	2.500
2300	2.005	0.365	1.998	0.353	2.500
2400	2.079	0.398	2.071	0.393	2.500
2500	2.015	0.410	2.003	0.399	2.500
2600	1.761	0.329	1.755	0.321	2.500
2700	1.534	0.223	1.529	0.212	2.500
2800	1.431	0.172	1.426	0.166	2.500
2900	1.368	0.181	1.359	0.173	2.500
3000	1.259	0.156	1.251	0.153	2.500

FCC Part 95 Page 19 of 27



Report No.: RSZ161229008-00

FCC Part 95 Page 20 of 27

## FCC §2.1049 & §95.633(a)(c) & §95.635 (b) (1) (3) (7) - AUTHOURIZED BANDWIDTH AND EMISSION MASK

Report No.: RSZ161229008-00

## **Applicable Standard**

According to §95.633 (a) The authorized bandwidth (maximum permissible bandwidth of a transmission) for emission type H1D, J1D, R1D, H3E, J3E or R3E is 4 kHz. The authorized bandwidth for emission type A1D or A3E is 8 kHz. The authorized bandwidth for emission type F1D, G1D, F3E or G3E is 20 kHz.

According to §95.633(c), the authorized bandwidth for emission type F3E or F2D transmitted by a FRS unit is 12.5 kHz.

According to §95.635(b) (1) (3) (7), the power of each unwanted emission shall be less than TP as specified in the applicable paragraphs listed in the following :

- 1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.
- 3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.
- 7) At least  $43 + 10 \log_{10}(T) dB$  on any frequency removed from the center of the authorized bandwidth by more than 250%.

#### **Test Procedure**

TIA-603-D, section 2.2.11

#### **Test Data**

#### **Environmental Conditions**

Temperature:	23 °C	
Relative Humidity:	50 %	
ATM Pressure:	100.0 kPa	

The testing was performed by Poboo Li on 2017-04-15.

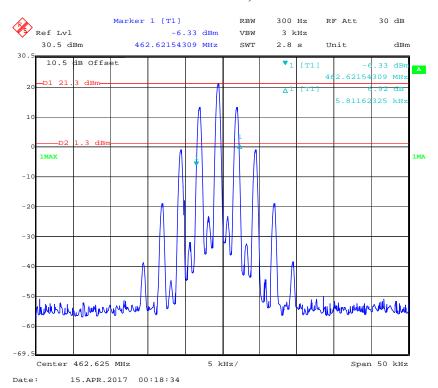
Test Mode: Transmitting

Item	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
GMRS	462.6250	5.812	20.0	Pass
FRS	467.6375	5.812	12.5	Pass

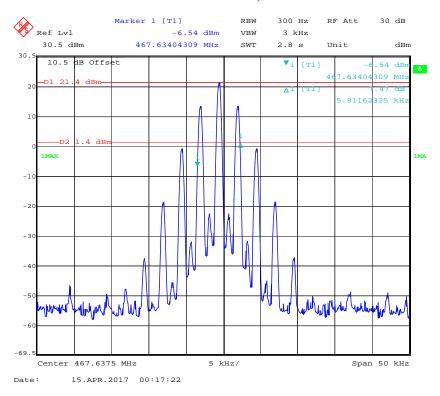
FCC Part 95 Page 21 of 27

## 20dB Bandwidth, GMRS

Report No.: RSZ161229008-00



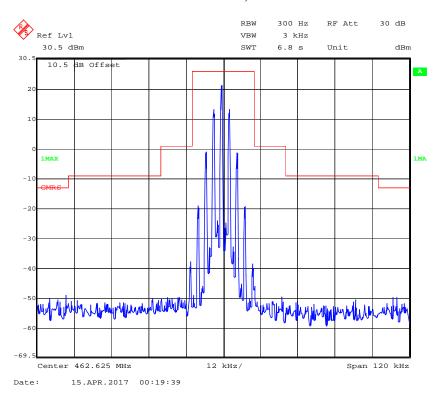
## 20dB Bandwidth, FRS



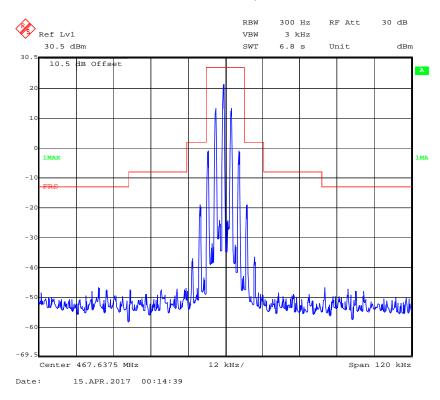
FCC Part 95 Page 22 of 27

## **Emission Mask, GMRS**

Report No.: RSZ161229008-00



## **Emission Mask, FRS**



FCC Part 95 Page 23 of 27

## FCC §2.1053 & §95.635(b) (7) - RADIATED SPURIOUS EMISSION

## **Applicable Standard**

FCC §2.1053 and §95.635(b) (7)

## **Test Procedure**

The transmitter was placed on a wooden turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

Report No.: RSZ161229008-00

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 1g (TXpwr in Watts/0.001)-the absolute level Spurious attenuation limit in dB =  $43+10 Log_{10}$  (power out in Watts)

#### **Test Data**

## **Environmental Conditions**

Temperature:	24 °C		
Relative Humidity:	49 %		
ATM Pressure:	100.0 kPa		

The testing was performed by Layne Li on 2017-04-13.

Test Mode: Transmitting

FCC Part 95 Page 24 of 27

Indicat	ed	Table	Test A	ntenna	\$	Substituted		Absolute		
Frequency (MHz)	Receiver Reading (dBuV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Level (dBm)	Limit (dBm)	Margin (dB)
				GM	IRS 462.625	0MHz				
925.25	70.95	120	1.3	Н	-29.2	0.27	5.05	-24.42	-13	11.42
925.25	75.30	318	1.7	V	-21.4	0.27	5.05	-16.62	-13	3.62
1387.88	49.17	359	1.7	Н	-54.9	0.34	7.92	-47.32	-13	34.32
1387.88	58.80	146	2.3	V	-47.0	0.34	7.92	-39.42	-13	26.42
1850.50	45.40	253	2.3	Н	-54.5	0.45	8.84	-46.11	-13	33.11
1850.50	58.83	130	1.8	V	-43.3	0.45	8.84	-34.91	-13	21.91
				FR	S 467.6375	MHz				
935.28	66.35	82	1.7	Н	-33.8	0.27	5.05	-29.02	-13	16.02
935.28	74.40	328	1.5	V	-22.3	0.27	5.05	-17.52	-13	4.52
1870.55	41.60	24	2.2	Н	-58.3	0.45	8.84	-49.91	-13	36.91
1870.55	58.93	334	1.3	V	-43.2	0.45	8.84	-34.81	-13	21.81
2338.19	45.30	256	1.1	Н	-55.1	0.48	9.66	-45.92	-13	32.92
2338.19	42.07	178	1.2	V	-59.7	0.48	9.66	-50.52	-13	37.52

Report No.: RSZ161229008-00

## Note:

Absolute Level = SG Level - Cable loss + Antenna Gain
 Margin = Limit- Absolute Level

FCC Part 95 Page 25 of 27

## FCC§2.1055 (d) & §95.621(b) & §95.626(b) - 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.

Report No.: RSZ161229008-00

According to FCC §95.626(b), Each FRS unit must be maintained within a frequency tolerance of 0.00025%( 2.5 ppm).

According to FCC §95.621(b) Each GMRS transmitter for mobile station, small base station and control station operation must be maintained within a frequency tolerance of 0.0005%. Each GMRS transmitter for base station (except small base), mobile relay station or fixed station operation must be maintained within a frequency tolerance of 0.00025%.

## **Test Procedure**

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

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

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

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

The output frequency was recorded for each voltage.

#### **Test Data**

#### **Environmental Conditions**

Temperature:	24 °C	
Relative Humidity:	49 %	
ATM Pressure:	100.0 kPa	

The testing was performed by Layne Li on 2017-04-13.

Test Mode: Transmitting

FCC Part 95 Page 26 of 27

## **GMRS**

Report No.: RSZ161229008-00

Reference Frequency: 462.6250 MHz, Limit: ±5 ppm						
Environment Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Measurement Frequency (MHz)	Frequency Error (ppm)			
	Frequency Stability	ty Ver. Temperature				
50	3.6	462.624075	-1.9995			
40	3.6	462.624068	-2.0146			
30	3.6	462.624061	-2.0297			
20	3.6	462.624066	-2.0189			
10	3.6	462.624072	-2.0059			
0	3.6	462.624065	-2.0211			
-10	3.6	462.624079	-1.9908			
-20	3.6	462.624073	-2.0038			
-30	3.6	462.624081	-1.9865			
Frequency Stability Ver. Input Voltage						
20	3.0	462.624064	-2.0232			

## **FRS**

Reference Frequency: 467.6375 MHz, Limit: ±2.5 ppm						
Environment Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Measurement Frequency (MHz)	Frequency Error (ppm)			
	Frequency Stability	ty Ver. Temperature				
50	3.6	467.636871	-1.3451			
40	3.6	467.636875	-1.3365			
30	3.6	467.636879	-1.3280			
20	3.6	467.636865	-1.3579			
10	3.6	467.636861	-1.3664			
0	3.6	467.636877	-1.3322			
-10	3.6	467.636869	-1.3493			
-20	3.6	467.636872	-1.3429			
-30	3.6	467.636866	-1.3558			
Frequency Stability Ver. Input Voltage						
20	3.0	467.636877	-1.3322			

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

FCC Part 95 Page 27 of 27