

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: 2AAR8RETEVISRT45

Report Type:
Original Report

Report Number: RSZ171101002-00

Report Date: 2017-11-28

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Reviewed By: RF Engineer

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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. (Shenzhen).

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The HENAN ESHOW ELECTRONIC COMMERCE CO., LTD's product, model number: RT45 (FCC ID: 2AAR8RETEVISRT45) or the "EUT" in this report was a Two Way Radio, which was measured approximately: 175 mm (L) x 55 mm (W) x 30 mm (H), rated input voltage: DC 4.5V Alkaline battery or NiMH battery 3.6V DC.

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* All measurement and test data in this report was gathered from production sample serial number: 1702388 (Assigned by BACL, Kunshan). The EUT supplied by the applicant was received on 2017-11-01.

Operating frequency band: 462.5500-462.7250 MHz

467.5625-467.7125 MHz

Modulation TYPE: FM

Channel Spacing: 12.5 kHz

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 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 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. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter	uncertainty
Occupied Channel Bandwidth	±5%
RF Output Power with Power meter	±0.5dB
RF conducted test with spectrum	±1.5dB
All emissions, radiated	±4.88dB
Temperature	±3℃
Humidity	±6%
Supply voltages	±0.4%

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Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

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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. : 382179,the FCC Designation No. : CN5001.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

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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).

Equipment Modifications

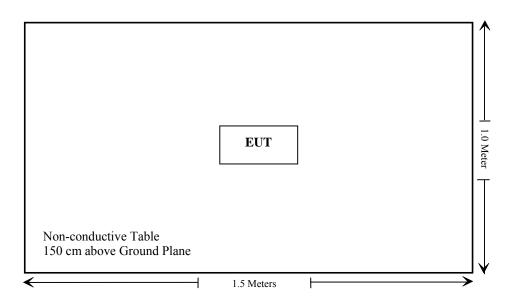
No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

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Block Diagram of Test Setup



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SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1093	RF Exposure	Compliance
§2.1046, §95.567	RF Output Power	Compliance
§2.1047, §95.575	Modulation Characteristic	Compliance
§2.1049, §95.573	Authorized Bandwidth & Emission Mask	Compliance
§2.1053, §95.579	Spurious Radiated Emissions	Compliance
§2.1055(d), §95.565	Frequency Stability	Compliance

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TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date		
	Radiated Emission Test						
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28		
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2017-04-24	2018-04-24		
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-02-14	2018-02-14		
НР	Amplifier	HP8447E	1937A01046	2017-05-21	2017-11-19		
Anritsu	Signal Generator	68369B	004114	2016-12-05	2017-12-05		
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-17	2017-12-16		
COM POWER	Dipole Antenna	AD-100	41000	NCR	NCR		
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17		
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2016-12-07	2017-12-07		
Ducommun technologies	RF Cable	UFA210A-1- 4724-30050U	MFR64369 223410-001	2017-05-21	2017-11-19		
Ducommun technologies	RF Cable	104PEA	218124002	2017-05-21	2017-11-19		
Ducommun technologies	RF Cable	RG-214	1	2017-05-21	2017-11-19		
Ducommun technologies	RF Cable	RG-214	2	2017-05-22	2017-11-22		
Ducommun technologies	Pre-amplifier	ALN- 22093530-01	991373-01	2017-08-03	2018-08-03		
		RF Conducted	test				
WEINSCHEL	30dB Attenuator	N/A	N/A	2017-05-23	2017-11-22		
HP	RF Communication Test Set	HP8920A	3438A05201	N/A	N/A		
N/A	notch filter	SKU 5G3	ATR0205-04- 13	N/A	N/A		
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03- 101746-zn	2017-08-19	2018-08-19		
Ducommun technologies	RF Cable	RG-214	3	2017-05-23	2017-11-22		

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^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

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

Applicable Standard

According to FCC $\S1.1307(b)$ and $\S2.1093$, protable device operates Part 95 should be subjected to rountine environmental evaluation for RF exposure prior or equipment authorization or use.

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Result: Compliance.

Please refer to SAR Report Number: RSZ171101002-20.

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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

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:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Jacob Kong on 2017-11-18.

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)		Cable Loss (dB)	Ant. Gain (dB)	Level (dBm)	ERP (mW)	Limit (mW)
	462.6375 MHz FRS									
462.6375	81.61	81	1.5	Н	12.6	0.47	0	12.13	16.33	2000
462.6375	91.08	168	1.4	V	22.1	0.47	0	21.63	145.55	2000
	467.6375 MHz FRS									
467.6375	83.22	161	1.6	Н	14.2	0.47	0	13.73	23.60	500
467.6375	92.15	1	1.0	V	23.2	0.47	0	22.73	187.50	500

Test Result: Compliance.

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FCC §2.1047 & §95.575 - MODULATION CHARACTERISTIC

Applicable Standard

Per FCC $\S 2.1047$ and $\S 95.575$: 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

Test Method: TIA/EIA-603-D

Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	50 %
ATM Pressure:	100.0 kPa

The testing was performed by Jacob Kong on 2017-11-21.

Please refer to the following tables and plots.

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Test Mode: Transmitting

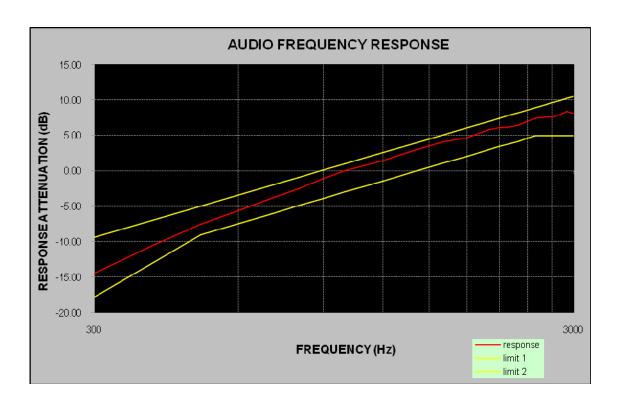
Audio Frequency Response

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Carrier Frequency: 462.6375 MHz

Audio Frequency (Hz)	Response Attenuation (dB)	
300	-14.52	
400	-10.46	
500	-7.58	
600	-5.61	
700	-3.96	
800	-2.55	
900	-1.07	
1000	0.00	
1200	1.45	
1400	2.93	
1600	4.09	
1800	4.70	
2000	5.85	
2100	6.12	
2200	6.17	
2300	6.48	
2400	7.00	
2500	7.44	
2600	7.58	
2700	7.56	
2800	7.87	
2900	8.37	
3000	8.09	

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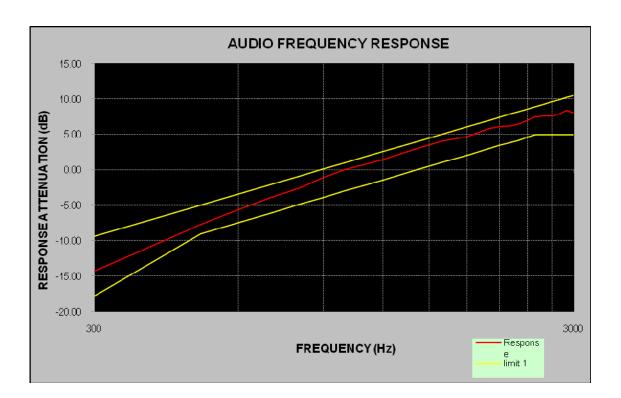
Audio Frequency Response

Report No.: RSZ171101002-00

Carrier Frequency: 467.6375 MHz

Audio Frequency (Hz)	Response Attenuation (dB)
300	-14.33
400	-10.57
500	-7.70
600	-5.58
700	-3.96
800	-2.57
900	-1.07
1000	0.00
1200	1.44
1400	2.93
1600	4.10
1800	4.68
2000	5.87
2100	6.13
2200	6.18
2300	6.47
2400	7.03
2500	7.47
2600	7.58
2700	7.56
2800	7.90
2900	8.38
3000	8.08

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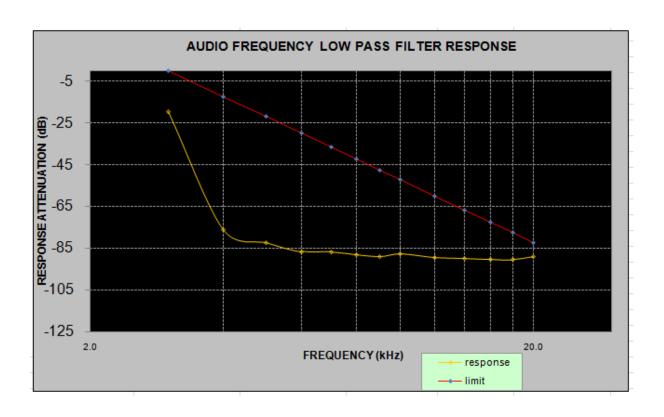
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Audio frequency lows pass filter response

Report No.: RSZ171101002-00

Carrier Frequency: 462.6375 MHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1.0	0	/
3.0	-19.6	0
4.0	-76.2	-12.5
5.0	-82.6	-22.2
6.0	-86.8	-30.1
7.0	-87.0	-36.8
8.0	-88.4	-42.6
9.0	-89.3	-47.7
10.0	-88.0	-52.3
12.0	-89.5	-60.2
14.0	-90.2	-66.9
16.0	-90.5	-72.7
18.0	-90.7	-77.8
20.0	-89.4	-82.5



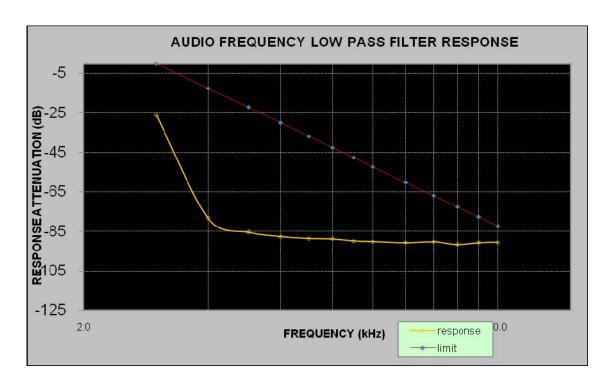
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Audio frequency lows pass filter response

Report No.: RSZ171101002-00

Carrier Frequency: 467.6375 MHz

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1.0	0	/
3.0	-26.2	0
4.0	-78.4	-12.5
5.0	-85.4	-22.2
6.0	-87.7	-30.1
7.0	-88.6	-36.8
8.0	-88.8	-42.6
9.0	-89.9	-47.7
10.0	-90.2	-52.3
12.0	-90.7	-60.2
14.0	-90.3	-66.9
16.0	-91.7	-72.7
18.0	-90.7	-77.8
20.0	-90.5	-82.5



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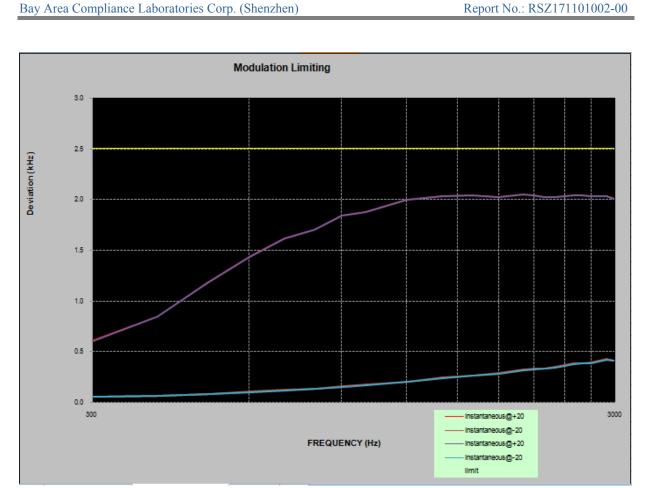
MODULATION LIMITING

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Carrier Frequency: 462.6375MHz

	Instant	aneous	Stead		
Audio Frequency (Hz)	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	FCC Limit [kHz]
300	0.608	0.052	0.601	0.049	2.5
400	0.850	0.064	0.842	0.059	2.5
500	1.183	0.082	1.178	0.076	2.5
600	1.432	0.104	1.435	0.096	2.5
700	1.614	0.118	1.609	0.112	2.5
800	1.702	0.134	1.698	0.130	2.5
900	1.843	0.154	1.837	0.151	2.5
1000	1.876	0.172	1.870	0.168	2.5
1200	2.002	0.202	1.996	0.197	2.5
1400	2.034	0.240	2.029	0.231	2.5
1600	2.042	0.263	2.039	0.262	2.5
1800	2.025	0.283	2.021	0.277	2.5
2000	2.051	0.321	2.044	0.315	2.5
2100	2.041	0.329	2.035	0.324	2.5
2200	2.027	0.334	2.023	0.327	2.5
2300	2.023	0.344	2.019	0.337	2.5
2400	2.030	0.362	2.029	0.358	2.5
2500	2.040	0.382	2.036	0.377	2.5
2600	2.043	0.385	2.037	0.382	2.5
2700	2.030	0.391	2.027	0.386	2.5
2800	2.031	0.404	2.026	0.397	2.5
2900	2.032	0.426	2.027	0.420	2.5
3000	2.012	0.412	2.007	0.407	2.5

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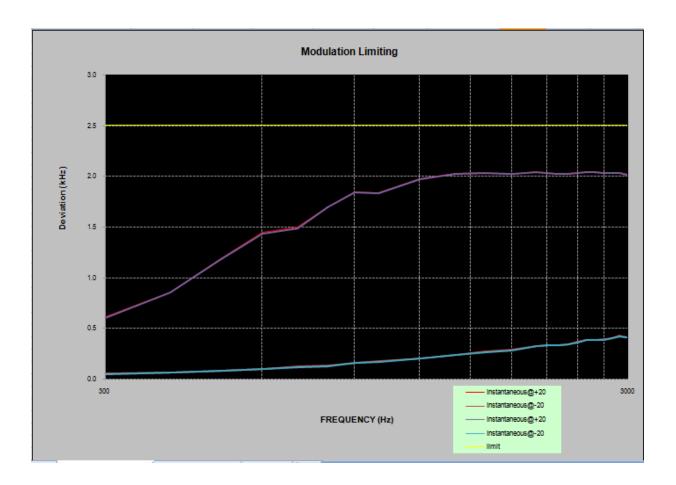
MODULATION LIMITING

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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	0.609	0.053	0.602	0.043	2.500
400	0.854	0.063	0.847	0.060	2.500
500	1.186	0.080	1.178	0.078	2.500
600	1.440	0.097	1.432	0.092	2.500
700	1.493	0.118	1.487	0.111	2.500
800	1.698	0.133	1.691	0.126	2.500
900	1.842	0.159	1.837	0.153	2.500
1000	1.830	0.175	1.827	0.169	2.500
1200	1.972	0.203	1.967	0.196	2.500
1400	2.024	0.234	2.019	0.231	2.500
1600	2.032	0.270	2.026	0.264	2.500
1800	2.020	0.284	2.017	0.279	2.500
2000	2.044	0.320	2.039	0.317	2.500
2100	2.038	0.332	2.032	0.327	2.500
2200	2.024	0.331	2.021	0.327	2.500
2300	2.024	0.341	2.018	0.337	2.500
2400	2.038	0.363	2.032	0.359	2.500
2500	2.041	0.382	2.037	0.378	2.500
2600	2.046	0.385	2.035	0.383	2.500
2700	2.031	0.389	2.028	0.383	2.500
2800	2.032	0.401	2.028	0.395	2.500
2900	2.035	0.423	2.031	0.420	2.500
3000	2.015	0.411	2.009	0.406	2.500

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FCC §2.1049 & §95.573 - 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.

Test Procedure

TIA-603-D, section 2.2.11

Test Data

Environmental Conditions

Temperature:	25 °C	
Relative Humidity:	50 %	
ATM Pressure:	100.0 kPa	

The testing was performed by Jacob Kong on 2017-11-19.

Test Mode: Transmitting

Item	Frequency (MHz)	OBW (kHz)	Limit (kHz)	Result
FRS	462.6375	5.789	12.5	Pass
FRS	467.6375	5.716	12.5	Pass

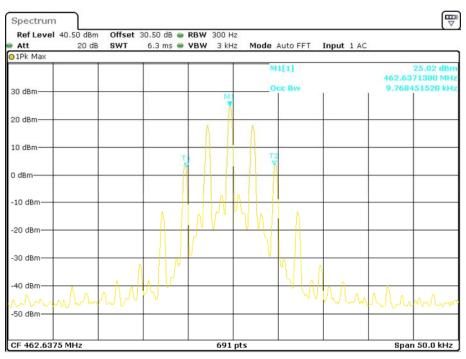
Emission Designator Per CFR 47 §2.201& §2.202&, Bn = 2M + 2D:

Emission Designator 11K0F3E In this case, the maximum modulating frequency is 3.0 kHz with a 2.5 kHz deviation. BW = $2(M+D) = 2*(3.0 \text{ kHz} + 2.5 \text{ kHz}) = 11 \text{ kHz} \rightarrow 11K0$ 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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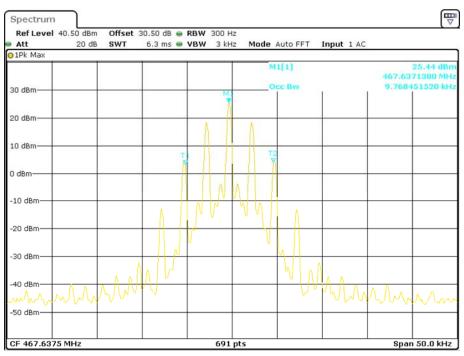
OBW, 462.6375 MHz

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Date: 19.NOV.2017 13:25:27

OBW, 467.6375 MHz

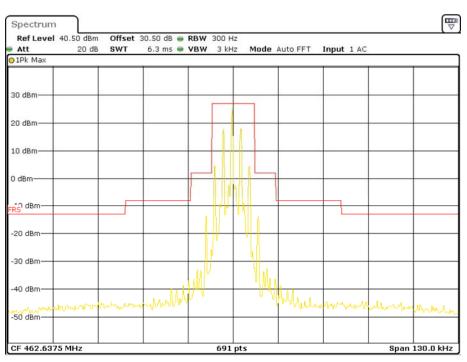


Date: 19.NOV.2017 13:24:14

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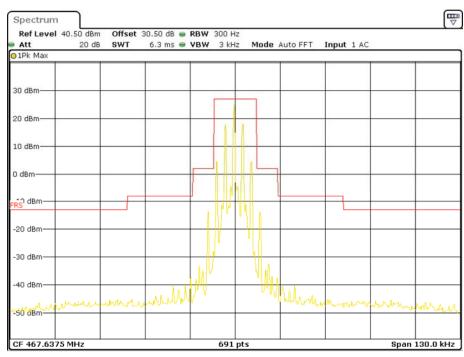
Emission Mask, 462.6375 MHz

Report No.: RSZ171101002-00



Date: 19.NOV.2017 14:07:20

Emission Mask, 467.6375 MHz



Date: 19.NOV.2017 14:11:05

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FCC §2.1053 & §95.579- RADIATED SPURIOUS EMISSION

Applicable Standard

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

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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
- (b) *Measurement bandwidths*. The power of unwanted emissions in the frequency bands specified in paragraphs (a)(1) and (2) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (a)(3) is measured with a reference bandwidth of at least 30 kHz.
- (c) *Measurement conditions*. The requirements in this section apply to each FRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone and/or power cord.

Test Procedure

The transmitter was placed on a wooden turntable.

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

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

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

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

Test Data

Environmental Conditions

Temperature:	25 °C		
Relative Humidity:	50 %		
ATM Pressure:	100.0 kPa		

The testing was performed by Jacob Kong on 2017-11-17.

Test Mode: Transmitting

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Indica	ted	Table	Test A	ntenna	S	ubstituted		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)
				FF	RS 462.6375	MHz				
925.28	61.22	237	1.5	Н	-35.8	0.70	0	-36.50	-13	23.50
925.28	50.07	159	2.4	V	-46.9	0.70	0	-47.60	-13	34.60
1386.00	43.4	138	2.0	Н	-64.6	1.60	8.30	-57.90	-13	44.90
1386.00	48.7	81	1.4	V	-59.5	1.60	8.30	-52.80	-13	39.80
1848.00	43.12	23	2.5	Н	-63.3	1.30	8.50	-56.10	-13	43.10
1848.00	47.48	263	2.4	V	-58.6	1.30	8.50	-51.40	-13	38.40
				FR	S 467.6375	MHz				
935.28	64.75	108	1.4	Н	-32.2	0.70	0	-32.90	-13	19.90
935.28	50.91	89	2.5	V	-46.1	0.70	0	-46.80	-13	33.80
1401.00	42.63	38	1.6	Н	-65.3	1.60	8.30	-58.60	-13	45.60
1401.00	50.49	97	2.2	V	-57.7	1.60	8.30	-51.00	-13	38.00
1868.00	43.92	346	1.6	Н	-60.5	1.30	8.50	-53.30	-13	40.30
1868.00	47.03	176	1.7	V	-57.6	1.30	8.50	-50.40	-13	37.40
2335.00	62.57	85	2.0	Н	-42.7	1.30	9.10	-34.90	-13	21.90
2335.00	53.46	178	1.2	V	-51.6	1.30	9.10	-43.80	-13	30.80
2802.00	54.23	167	2.3	Н	-50.1	1.80	9.70	-42.20	-13	29.20
2802.00	53.51	42	2.1	V	-50.5	1.80	9.70	-42.60	-13	29.60

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

FCC§2.1055 (d) & §95.565 - FREQUENCY STABILITY

Applicable Standard

According to FCC §2.1055(a) (1), the frequency stability shall be measured with variation of ambient temperature from –30 °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

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:	25 °C		
Relative Humidity:	50 %		
ATM Pressure:	100.0 kPa		

The testing was performed by Jacob Kong on 2017-11-19.

Test Mode: Transmitting

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Reference Frequency: 462.6375 MHz, Limit: ±2.5 ppm						
Environment Temperature (°C)	Power Supplied (V _{DC})	Measurement Frequency (MHz)	Frequency Error (ppm)			
	Frequency Stabili	ty Ver. Temperature				
50	4.5	462.637247	-0.5469			
40	4.5	462.637262	-0.5144			
30	4.5	462.637259	-0.5209			
20	4.5	462.637250	-0.5404			
10	4.5	462.637263	-0.5123			
0	4.5	462.637258	-0.5231			
-10	4.5	462.637241	-0.5598			
-20	4.5	462.637269	-0.4993			
-30	4.5	462.637251	-0.5382			
Frequency Stability Ver. Input Voltage						
20	3.1	462.637246	-0.5490			

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Reference Frequency: 467.6375 MHz, Limit: ±2.5 ppm						
Environment Temperature (°C)	Power Supplied (V _{DC})	Measurement Frequency (MHz)	Frequency Error (ppm)			
	Frequency Stabili	ty Ver. Temperature				
50	4.5	467.637253	-0.5282			
40	4.5	467.637267	-0.4982			
30	4.5	467.637245	-0.5453			
20	4.5	467.637257	-0.5196			
10	4.5	467.637233	-0.5710			
0	4.5	467.637249	-0.5367			
-10	4.5	467.637254	-0.5260			
-20	4.5	467.637238	-0.5603			
-30	4.5	467.637245	-0.5453			
Frequency Stability Ver. Input Voltage						
20	3.1	467.637271	-0.4897			

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

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