



FCC PART 95 TEST REPORT

For

Acctron Company Limited

Workshop 11,6/F, Block C, Delya Industrial Centre No.7 Shek Pai Tau Road, Tuen Mew
Territories, H.K.

FCC ID: 2AAJZ-AC00020

Report Type: Original Report	Product Type: WK-3 Walkie Talkie
Test Engineer: Ares Liu 	
Report Number: R2DG140328004-00	
Report Date: 2014-04-28	
Reviewed By:	Ivan Cao  RF Leader
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Acctron Company Limited*'s product, model number: AC00020 (FCC ID: 2AAJZ-AC00020) or the "EUT" as referred to in this report is a *WK-3 Walkie Talkie*, which is measured approximately: 11.8 cm (L) x 5 cm (W) x 3.5 cm (H), rated input voltage: DC 4.5V from 3 x 1.5 V AAA alkaline batteries

** All measurement and test data in this report was gathered from production sample serial number: 140328004 (Assigned by BACL, Dongguan). The EUT was received on 2014-04-01..*

Objective

This Type approval report is prepared on behalf of *Acctron Company Limited* in accordance with Part 2-Subpart J, and Part 95 of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s)/grant(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart A, 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 and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.0 dB for 30M~200MHz, 6.2 dB for 200M~1GHz, 4.45 dB for 1G~6GHz, 5.23 dB for 6G~18GHz:, 3.46dB for conducted disturbance at mains port.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications 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 February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Channel information:

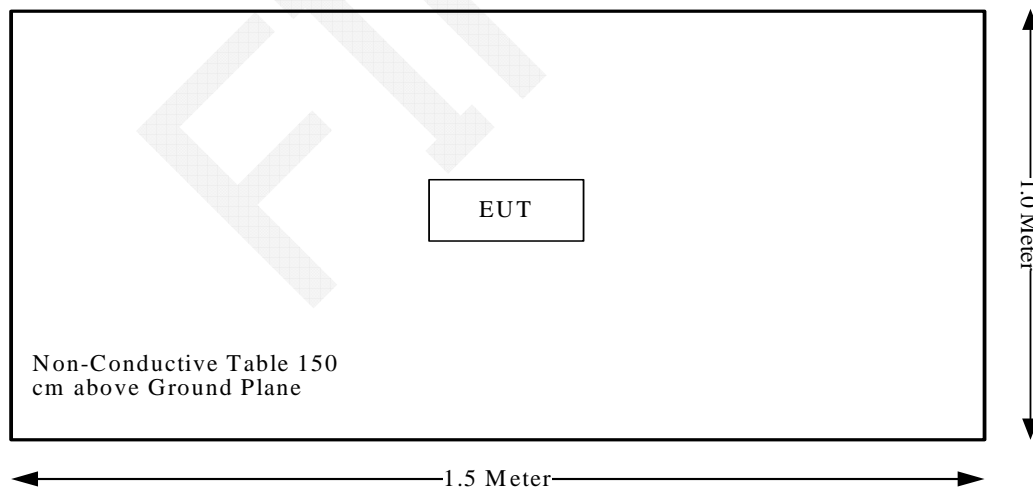
Channel	Frequency (MHz)	Channel	Frequency (MHz)
FRS			
1	462.6125	3	462.5625
2	462.5875	/	/

EUT was tested with channel 2.

Equipment Modifications

No modification was made to the EUT.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1307(b) (1), §2.1093	RF Exposure	Compliance*
§2.1046, §95.639(a), §95.639(d)	RF Output Power	Compliance
§2.1047, §95.637(a)	Modulation Characteristic	Compliance
§2.1049, §95.633&§95.635	Occupied Bandwidth and Emission Mask	Compliance
§2.1053 & §95.635(b) (7)	Radiated Spurious Emissions	Compliance
§2.1055 (d), §95.626(b) & §95.621(b)	Frequency Stability	Compliance

Note:

Compliance*: please refer to the separate SAR report: R1DG140328004-20.

FCC §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Test Result

Compliance, please refer to the separate SAR report: R1DG140328004-20.

FINAL

FCC §2.1046, §95.639(a) & §95.639(d) - RF OUTPUT POWER**Applicable Standard**

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

Per FCC §95.639 (a) (1), No GMRS transmitter, under any condition of modulation, shall exceed 50 W carrier power 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Giga	Signal Generator	1026	320408	2013-05-09	2014-05-08
R&S	EMI Test Receiver	ESCI	100224	2013-05-06	2014-05-05

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	25.3 °C
Relative Humidity:	54 %
ATM Pressure:	100.7 kPa

The testing was performed by Ares Liu on 2014-04-22.

Test Mode: Transmitting

Conducted Output Power:

Mode	Channel	Frequency (MHz)	Conducted Output Power (dBm)	Conducted Output Power (W)
FRS	1	462.5625	26.52	0.449
FRS	2	462.5875	26.41	0.438
FRS	3	462.6125	26.28	0.425

Note: The Maximum tune-up conducted output power: 27.0 dBm

ERP:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted			Absolute Level (dBm)	FCC Part 95B	
			SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Limit (W)
FRS CH 2								
462.5875	V	95.14	17.7	0.0	0.7	17.0	27.0	0.50
462.5875	H	93.25	12.4	0.0	0.7	11.7	27.0	0.50

Test Result: Compliance.

FCC §2.1047 & §95.637(a) (b)- MODULATION CHARACTERISTIC**Applicable Standard**

FCC §2.1047 & §95.637:

- (a) A GMRS transmitter that transmits emission types F1D, G1D, or G3E must not exceed a peak frequency deviation of plus or minus 5 kHz. 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.
- (b) 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 overmodulation. 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	8920A	00 235	2013-05-09	2014-05-08
R&S	Spectrum Analyzer	FSEM	DE31388	2013-05-07	2014-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Test Method: TIA/EIA-603-D

Test Data**Environmental Conditions**

Temperature:	25.3 °C
Relative Humidity:	54 %
ATM Pressure:	100.7 kPa

The testing was performed by Ares Liu on 2014-04-22.

Please refer to the following tables and plots.

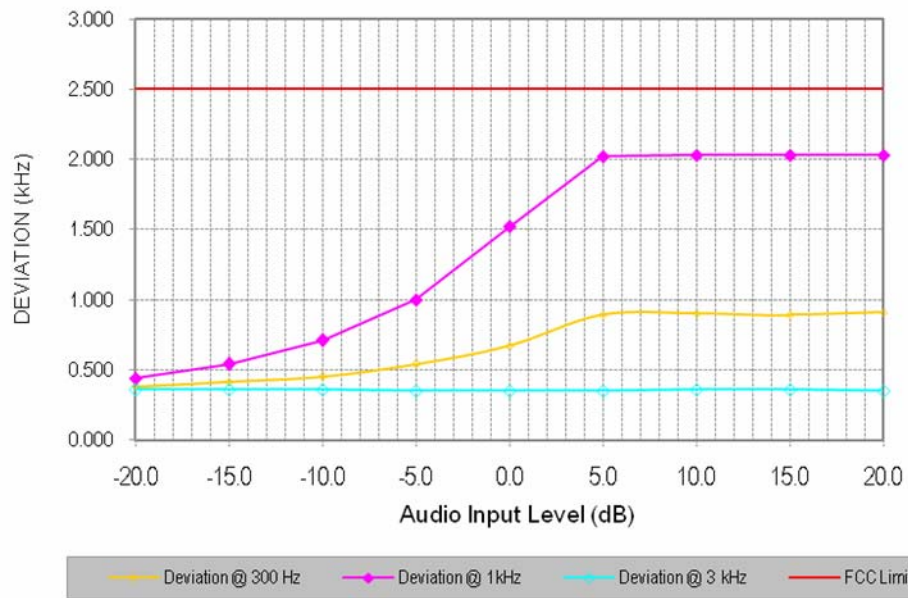
Test Mode: Transmitting

FREQUENCY DEVAIATION

FRS – CH 2 (462.5875 MHz)

Audio Input Level (dB)	FREQUENCY DEVAIATION (kHz)			Limit (kHz)
	@300Hz	@ 1kHz	@ 3kHz	
20.0	0.91	2.03	0.35	2.5
15.0	0.89	2.03	0.36	2.5
10.0	0.90	2.03	0.36	2.5
5.0	0.89	2.02	0.35	2.5
0.0	0.67	1.52	0.35	2.5
-5.0	0.54	1.00	0.35	2.5
-10.0	0.45	0.71	0.36	2.5
-15.0	0.41	0.54	0.36	2.5
-20.0	0.38	0.44	0.36	2.5

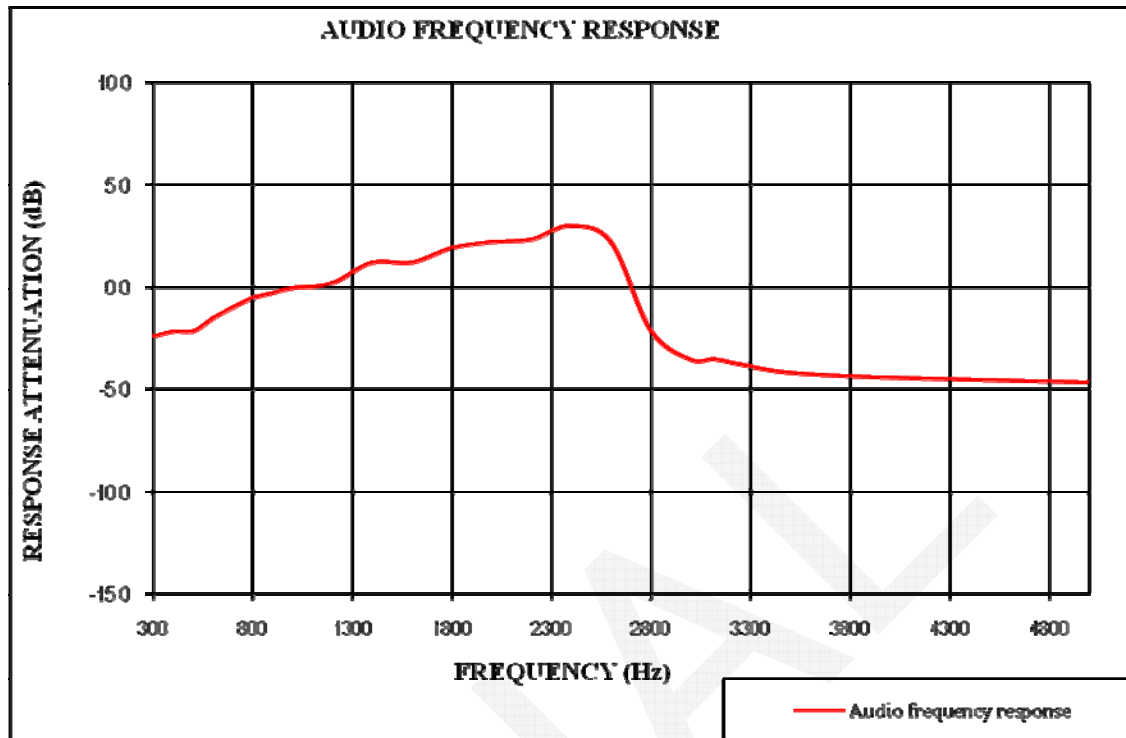
Modulation Limiting



Audio Frequency Response

FRS – CH 2 (462.5875 MHz)

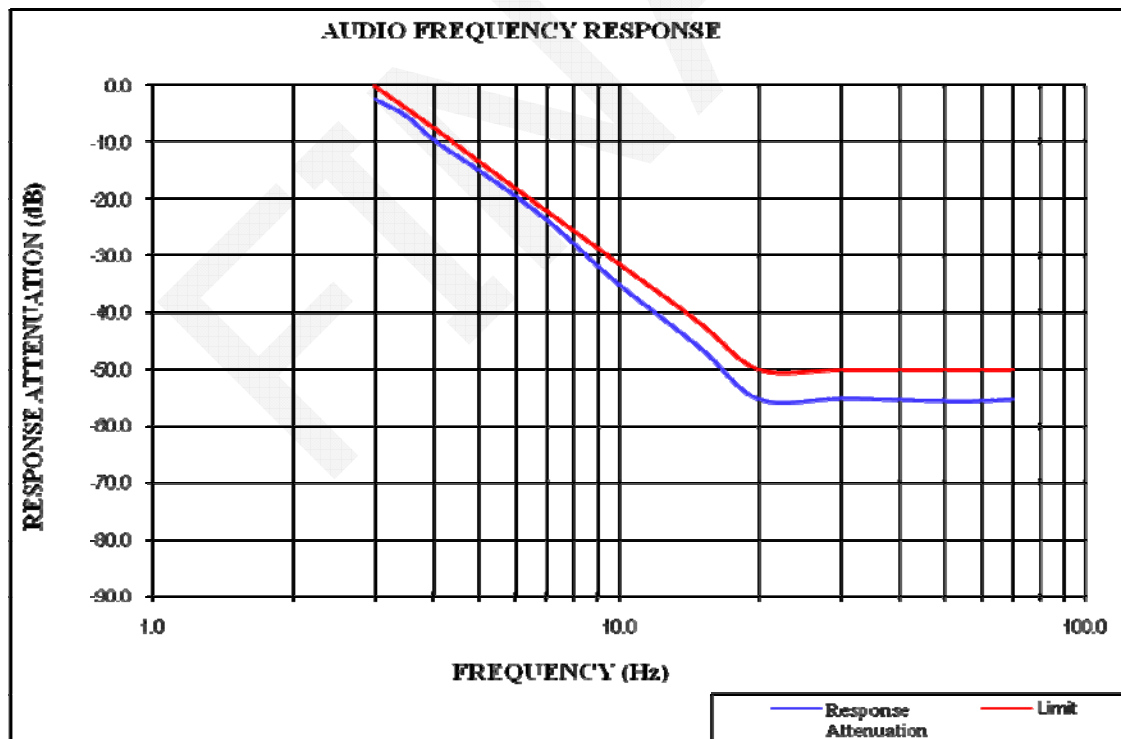
Audio Frequency (Hz)	Response Attenuation (dB)
300	-2.41
400	-2.16
500	-2.14
600	-1.52
700	-0.98
800	-0.53
900	-0.23
1000	0.00
1200	0.19
1400	1.22
1600	1.23
1800	1.92
2000	2.22
2200	2.36
2400	3.01
2600	2.23
2800	-2.11
3000	-3.55
3125	-3.52
3250	-3.76
3500	-4.16
4000	-4.41
5000	-4.65



Audio Low Pass Filter Response

FRS – CH 2 (462.5875 MHz)

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
3.0	-2.3	0.0
3.5	-5.2	-4.0
4.0	-9.6	-7.5
5.0	-14.8	-13.3
7.0	-23.5	-22.1
10.0	-35.1	-31.4
15.0	-46.3	-42.0
20.0	-55.3	-50.0
30.0	-55.2	-50.0
50.0	-55.6	-50.0
70.0	-55.4	-50.0

**Test result:** Compliance.

FCC §2.1049, §95.633&§95.635- Occupied Bandwidth and Emission Mask

Applicable Standard

Per FCC §2.1049 and FCC §95.633(a) (c)

(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.

(c) The authorized bandwidth for emission type F3E or F2D transmitted by a FRS unit is 12.5 kHz.

The power of each unwanted emission shall be less than TP as specified in the applicable paragraphs listed in the following table:

Transmitter	Emission type	Applicable paragraphs(b)
GMRS	A1D, A3E, F1D, G1D, F3E, G3E with filtering	(1), (3), (7).
	A1D, A3E, F1D, G1D, F3E, G3E without filtering	(5), (6), (7).
	H1D, J1D, R1D, H3E, J3E, R3E	(2), (4), (7).
FRS	F3E with filtering	(1), (3), (7).

(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.

(2) 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.

(3) 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	8920A	00 235	2013-05-09	2014-05-08
R&S	Spectrum Analyzer	FSEM	DE31388	2013-05-07	2014-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	22.2 °C
Relative Humidity:	63 %
ATM Pressure:	100.9 kPa

The testing was performed by Ares Liu on 2014-04-30.

Test Mode: Transmitting

Emission Designator:

$B_n = 2M + 2DK$

$M = 3 \text{ KHz}, D = 2.5 \text{ kHz}, K = 1$

$B_n = 2*3 + 2*2.5 = 11 \text{ kHz}$

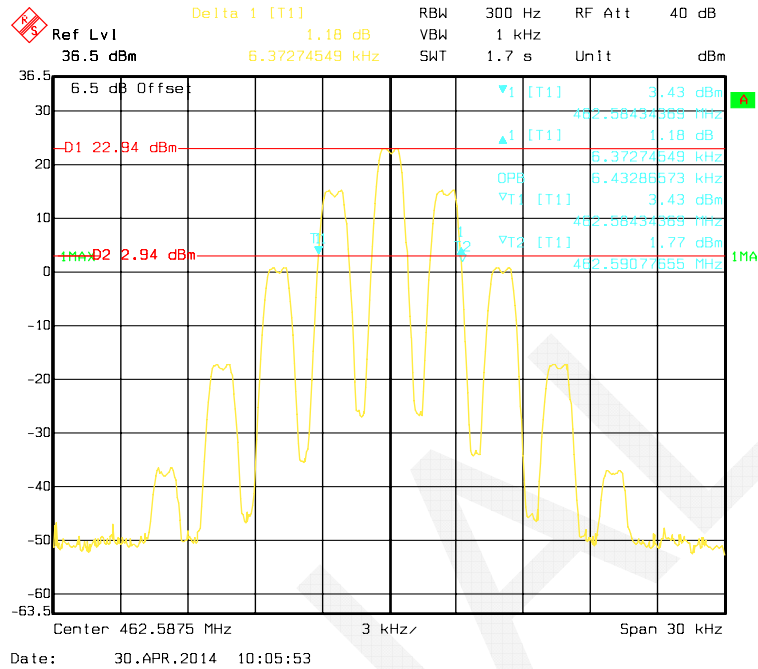
Type of emission: 11K0F3E

Mode	Frequency (MHz)	Modulation Type	99% Occupied Bandwidth (kHz)	20 dB Bandwidth (kHz)	Authorized Bandwidth (kHz)
FRS	462.5875	F3E	6.43	6.37	12.5

Please refer to the following plots

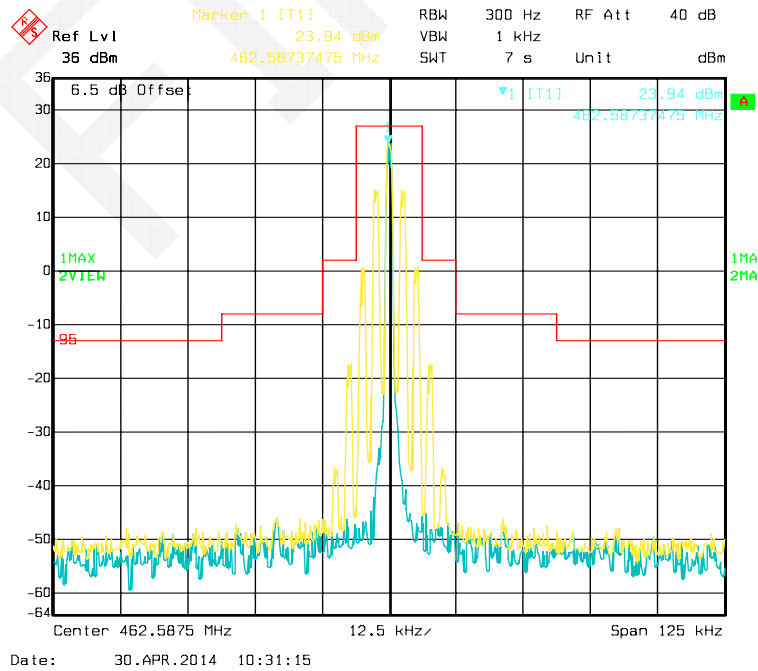
Occupied Bandwidth

FRS-CH 2 (462.5875MHz)



Emission Mask

FRS-CH 2 (462.5875MHz)



FCC §2.1053 & §95.635(b) (7) - RADIATED SPURIOUS EMISSION**Applicable Standard**

FCC §2.1053 and §95.635

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.

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 lg (TXpwr in Watts/0.001)-the absolute level
Spurious attenuation limit in dB = 43+10 Log₁₀ (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-1	2011-09-06	2014-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
R&S	EMI Test Receiver	ESCI	100224	2013-05-06	2014-05-05
Giga	Signal Generator	1026	320408	2013-05-09	2014-05-08
TDK RF	Horn Antenna	HRN-0118	130 084	2012-09-06	2015-09-05
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-05
R&S	Spectrum Analyzer	FSEM	DE31388	2013-05-07	2014-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	22.6 °C
Relative Humidity:	64 %
ATM Pressure:	100.7 kPa

The testing was performed by Ares Liu on 2014-04-22.

Test Mode: Transmitting

30 MHz-5 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted			Absolute Level (dBm)	FCC Part 95B	
			SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
FRS CH 2: 462.5875 MHz								
925.175	H	30.24	-43.5	0.0	1.0	-44.5	-13.0	31.5
925.175	V	38.54	-31.9	0.0	1.0	-32.9	-13.0	19.9
1387.763	H	34.65	-38.2	8.9	1.2	-30.5	-13.0	17.5
1387.763	V	38.27	-34.4	8.9	1.2	-26.7	-13.0	13.7

Note:

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

FCC§2.1055 (d), §95.626(b) & §95.621(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.

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

Per FCC §95.621(b), (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:

- (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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSEM	DE31388	2013-05-07	2014-05-06
HP	RF Communications Test Set	8920A	00 235	2013-05-09	2014-05-08
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-3	2013-08-01	2014-07-31
GWINSTEK	DC Power Supply	GPS-303000	EM832164	/	/

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

Temperature:	25.3 °C
Relative Humidity:	54 %
ATM Pressure:	100.7 kPa

The testing was performed by Ares Liu on 2014-04-22.

Test Mode: Transmitting

FRS, CH 2 (462.5875 MHz)

Reference Frequency: 462.5875 MHz; Limit: 0.00025% or 2.5 ppm			
Environment Temperature (°C)	Power Supplied (V _{DC})	Measurement Frequency (MHz)	Frequency Error (ppm)
Frequency Stability vs. Temperature			
-30	4.5	462.587512	0.242
-20	4.5	462.587645	0.313
-10	4.5	462.587627	0.275
0	4.5	462.587837	0.729
10	4.5	462.587543	0.309
20	4.5	462.587703	0.439
30	4.5	462.587639	0.300
40	4.5	462.587651	0.326
50	4.5	462.587614	0.246
Frequency Stability vs. Voltage			
20	5.2	462.587612	0.242
20	3.6	462.587705	0.443

Note: the battery operating end point is 3.6V which specified by the manufacturer.

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