



REPORT No.: SZ15010117W01A

# FCC Part 95J RF TEST REPORT

**APPLICANT** : Qixiang Electron Science & Technology Co., Ltd  
**PRODUCT NAME** : FM HANDHELD TRANSCEIVER  
**MODEL NAME** : TERMN-8R,OBLTR-8R  
**TRADE NAME** : AnyTone  
**BRAND NAME** : N/A  
**FCC ID** : T4K-8RSERIES  
**STANDARD(S)** : 47 CFR Part 95  
**ISSUE DATE** : 2015-04-20



**SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.**

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Change History		
Issue	Date	Reason for change
1.0	2015-4-28	First edition

**TEST REPORT DECLARATION**

Applicant	Qixiang Electron Science & Technology Co., Ltd
Applicant Address	Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China
Manufacturer	Qixiang Electron Science & Technology Co., Ltd
Manufacturer Address	Qixiang Building, Tangxi Industrial Zone, Luojiang District, Quanzhou, Fujian, China
Product Name	FM HANDHELD TRANSCEIVER
Model Name	TERMN-8R,OBLTR-8R
Brand Name	AnyTone
HW Version	N/A
SW Version	N/A
Test Standards	47 CFR Part 95-Personal Radio Service (2015-01 Edition) Subpart J - Multi-Use Radio Service (MURS) Subpart E - Technical Regulations 47 CFR Part 2-Frequency Allocations and Radio Treaty Matters ; General Rules and Regulations (2015-01 Edition)
Test Date	2015-01-29 to 2015-02-09
Test Result	PASS

Tested by : Zhang Min  
Zhang Min

Reviewed by : Hou Yiyang  
Hou Yiyang

Approved by : Zeng Dexin  
Zeng Dexin



## 1. GENERAL INFORMATION

### 1.1 EUT Description

<b>EUT Type .....</b>	DUAL BAND FM TRANSCEIVER
<b>Serial No. ....</b>	N/A
<b>Hardware Version.....</b>	N/A
<b>Software Version.....</b>	N/A
<b>Applicant .....</b>	Qixiang Electron Science & Technology Co., Ltd
<b>Manufacturer .....</b>	Qixiang Electron Science & Technology Co., Ltd
<b>Operating Frequency Band.....</b>	151.8200MHz 151.8800MHz 151.9400MHz 154.5700MHz 154.6000MHz
<b>Sample tested frequency....</b>	151.8200MHz 151.9400MHz 154.6000MHz
<b>Number of RF-channels.....</b>	5
<b>Modulation Type.....</b>	FM
<b>Designation of emission.....</b>	15K2F3E
<b>Antenna Type .....</b>	VHF antenna, antenna gain 1.8dBi
<b>Connection of Antenna.....</b>	detachable
<b>Power supply.....</b>	DC 7.4V

**Note:**

1. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



## 1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 95 Subpart J and Subpart E for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR PART 95 (2015-01 Edition)	Personal Radio Service
2	47 CFR Part 2 (2015-01 Edition)	Frequency Allocations and Radio Treaty Matters ; General Rules and Regulations

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	2.1046; 95.639(h)	RF Output Power	<u>PASS</u>
2	2.1047(b); 95.637(j)	Modulation Deviation	<u>PASS</u>
3	2.1047 (a); 95.631 (j)	Audio Frequency Response	<u>PASS</u>
4	2.1049(c)(1); 95.633(f); 95.635(e)	Occupied Bandwidth /Emission Mask	<u>PASS</u>
5	2.1051; 95.635(e)	Radiated Spurious Emission Transmitter	<u>PASS</u>
6	2.1055(a); 2.1055 (d)(1); 95.632(c)	Frequency Stability	<u>PASS</u>

The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in TIA- 603 -D.

## 1.3 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106



## 2. 47 CFR PART 95 REQUIREMENTS

### 2.1 RF Output Power (conducted)

#### 2.1.1 Provisions Applicable

According to FCC §2.1046 and §95.639(h): No MURS unit, under any condition of modulation, shall exceed 2 Watts transmitter power output.

#### 2.1.2 Test Procedure

- 1) This transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer. Transmitter output was derived with the spectrum analyzer in dBm.
- 2) The power output at the transmitter antenna port was determined by assign the value of the attenuator to the spectrum analyzer reading.
- 3) Tests were performed with an un-modulated carrier at all channels and on all power levels, which can be set-up on the transmitters, if applicable.

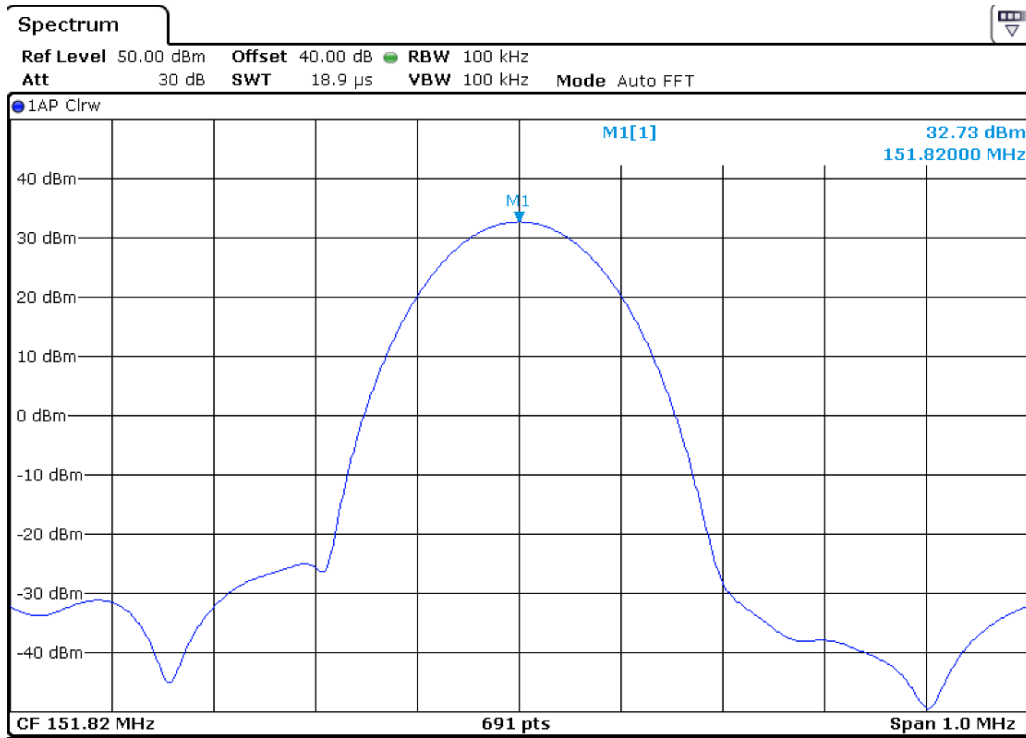
#### 2.1.3 Test Results for RF Output Power (conducted)

##### A. Test Verdict:

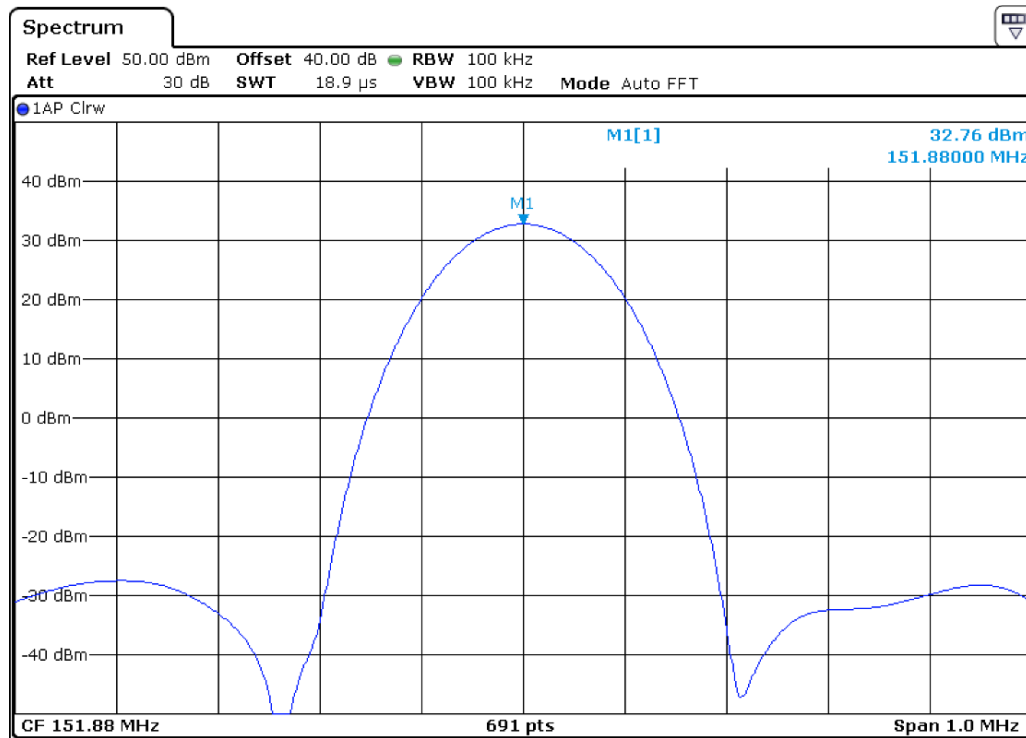
Channel	Frequency(MHz)	In dBm	In W
1	151.8200	32.73	1.87
2	151.8800	32.76	1.89
3	151.9400	32.74	1.88
4	154.5700	32.66	1.85
5	154.6000	32.72	1.87



B. Test Plots

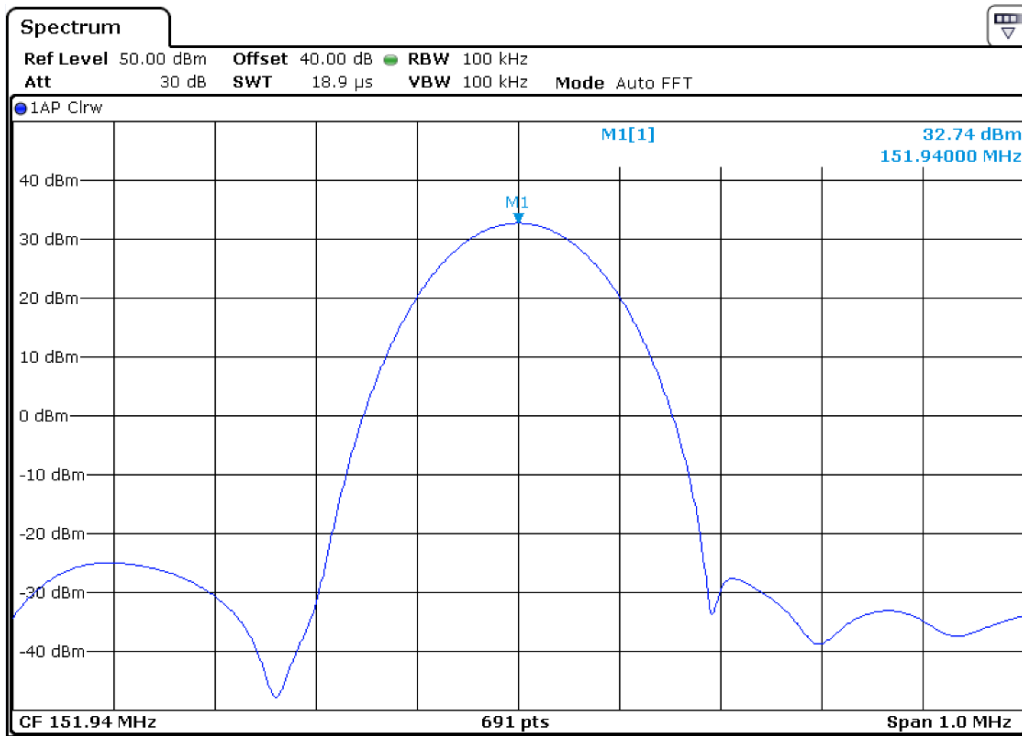


Channel 1@151.8200 MHz

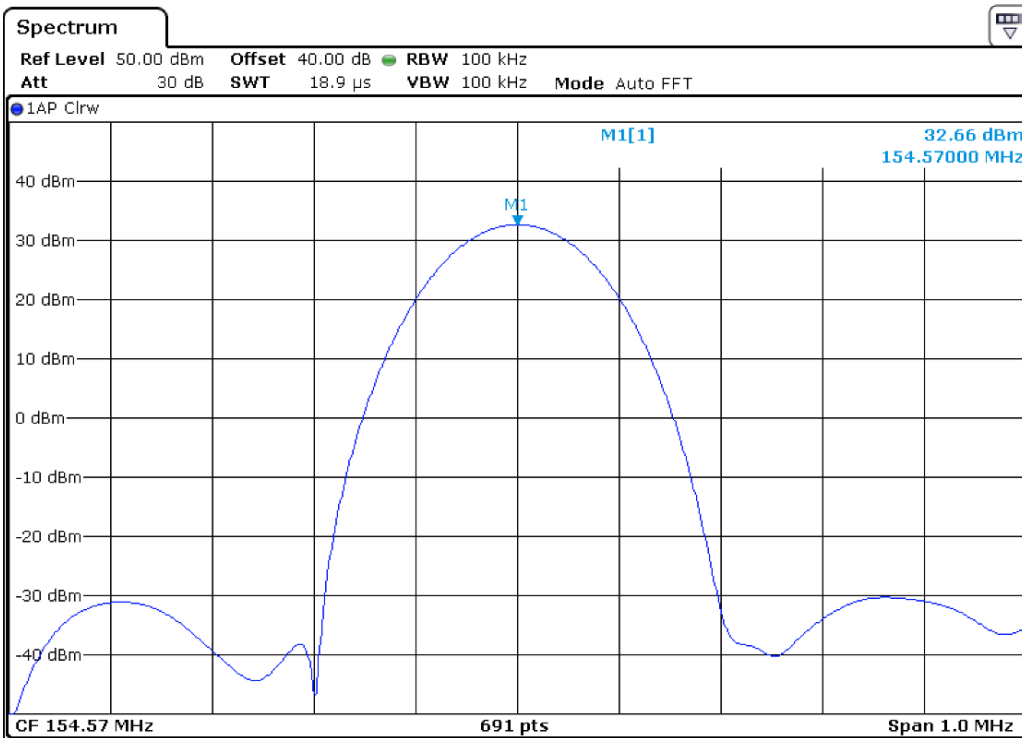


Channel 2@151.8800 MHz

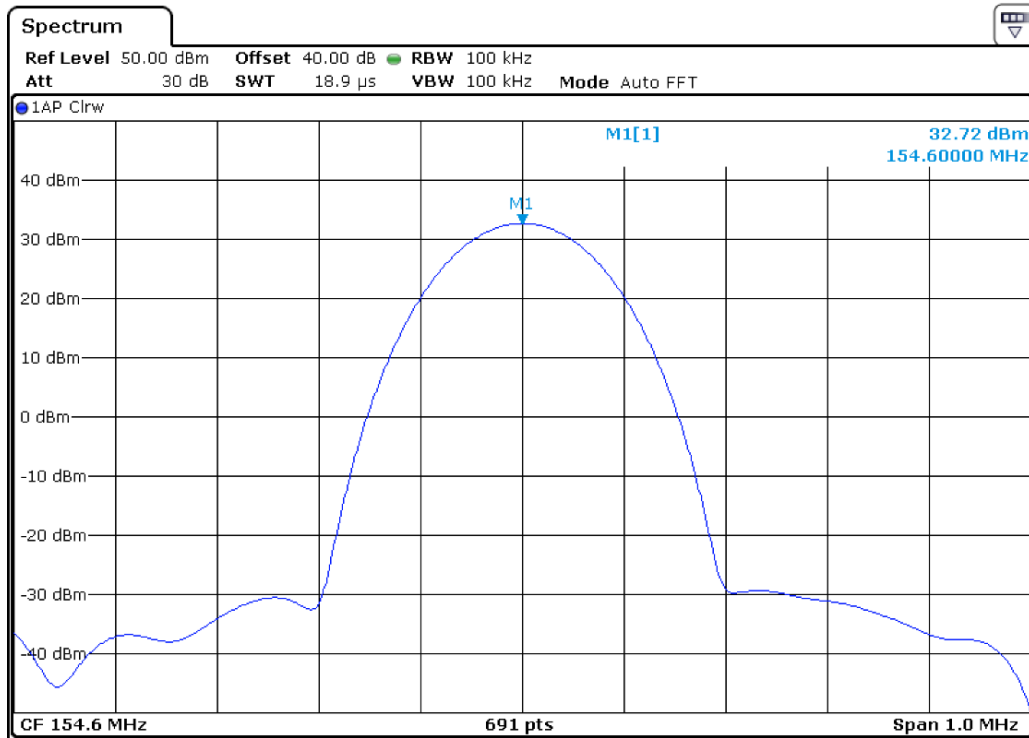




Channel 3@151.9400 MHz



Channel 1@154.5700 MHz



Channel 5@154.6000 MHz

## 2.2 RF Output Power (Radiated)

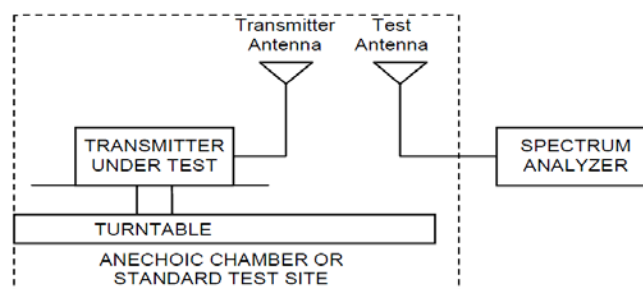
### 2.2.1 Provisions Applicable

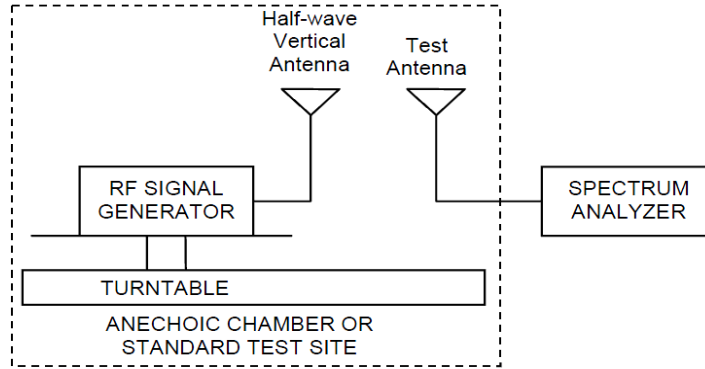
According to FCC §2.1046 and §95.639(h): No MURS unit, under any condition of modulation, shall exceed 2 Watts transmitter power output.

### 2.2.2 Test Procedure

- 1) On a test site, the EUT shall be placed at 1.55m height on a non-conductive turntable, and in the position closest to normal use as declared by the applicant.
- 2) The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
- 3) The output of the test antenna shall be connected to the measuring receiver and the max-peak detector is used for the measurement.
- 4) The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- 5) The transmitter shall then be rotated through 360° in the horizontal plane, until a maximum signal level is detected by the measuring receiver.
- 6) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 7) The test of radiated power has been carried out with the validated test software. The measurements were performed with a measurement bandwidth of 100 kHz.
- 8) The maximum signal level detected by the measuring receiver shall be noted.
- 9) The measurement shall be repeated with the test antenna orientated for horizontal polarization.
- 10) The measure of the ERP is the larger of the two levels recorded.

### 2.2.3 Test Setup Block Diagram





### 2.2.4 Test Results for RF Output Power (Radiated)

Channel	Frequency (MHz)	Test Ant.		Effective Radiated Power		Limit (W)	Margin (W)
		Height (m)	Polar (H/V)	In dBm	In W		
1	151.82	1.55	H	21.07	0.13	2.00	1.87
			V	17.90	0.06		1.94
2	151.88	1.55	H	20.97	0.13		1.87
			V	18.03	0.06		1.94
3	151.94	1.55	H	21.08	0.13		1.87
			V	17.78	0.06		1.94
4	154.57	1.55	H	21.40	0.14		1.86
			V	22.58	0.18		1.82
5	154.6	1.55	H	21.71	0.15		1.85
			V	22.72	0.19		1.81

## 2.3 Modulation Deviation

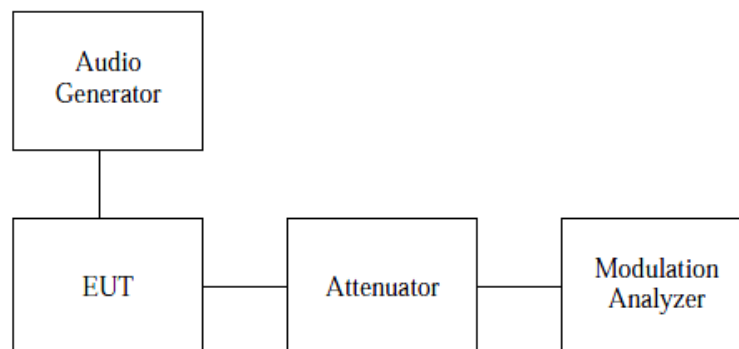
### 2.3.1 Provisions Applicable

According to FCC 2.1047 (b), 95.631(j), A MURS transmitter must transmit only emission types A1D, A2B, A2D, A3E, F2B, F1D, F2D, F3E, G3E. Emission types A3E, F3E and G3E include selective calling or tone-operated squelch tones to establish or continue voice communications. MURS transmitters are prohibited from transmitting in the continuous carrier mode.

### 2.3.2 Test Procedure

- 1) Modulation limiting is the transmitter circuit's ability to limit the transmitter from producing deviations in excess of rated system deviation.
- 2) The audio signal generator is connected to the audio input of the EUT with its full rating.
- 3) Configure the EUT as shown in figure 1, vary the input level from 10-50mV. Record the frequency deviation obtained as a function of the input level.
- (4). Repeat step (3) with input frequency changing to 500, 1000, 2500 and 3125Hz in sequence.

### 2.3.3 Test Setup Block Diagram



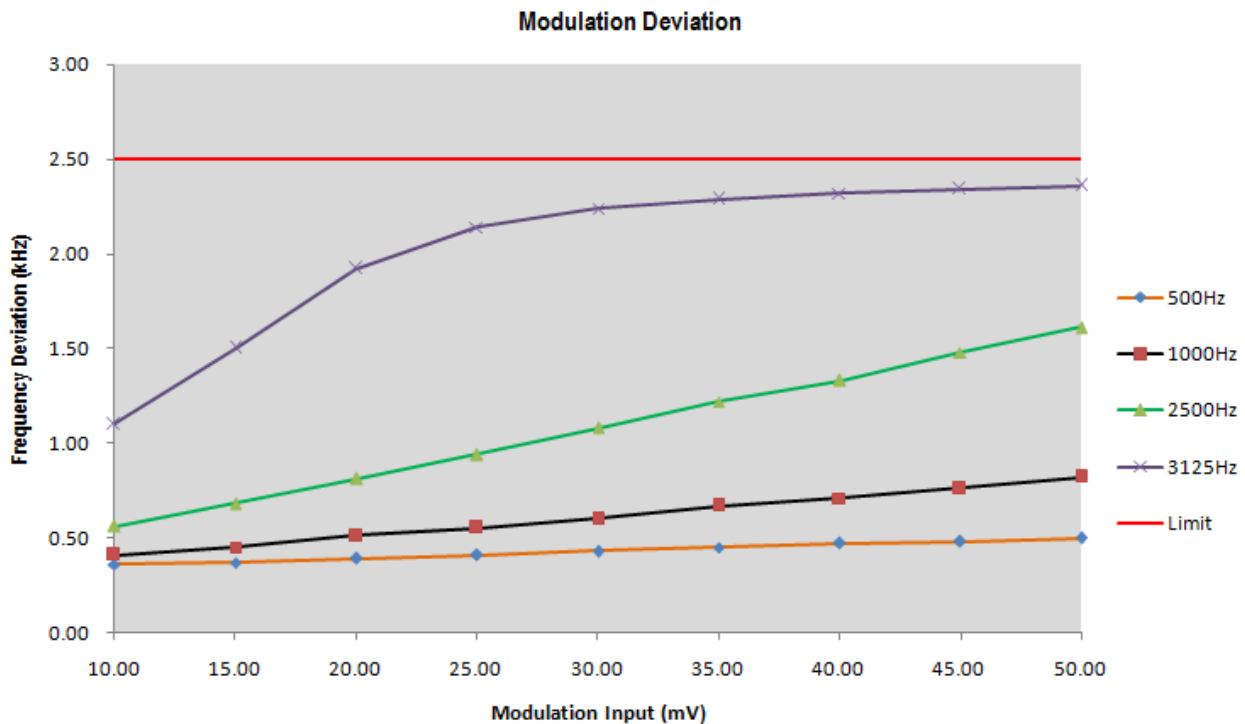


### 2.3.4 Test Results for Modulation Deviation

#### A. Test Verdict: Channel 1@151.8200 MHz

Channel 1 @ 151.8200 MHz					
Modulation Input(mv)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 500Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit
10.00	0.36	0.41	0.56	1.10	2.50
15.00	0.37	0.45	0.68	1.50	2.50
20.00	0.39	0.51	0.81	1.92	2.50
25.00	0.41	0.55	0.94	2.14	2.50
30.00	0.43	0.60	1.08	2.24	2.50
35.00	0.45	0.67	1.22	2.29	2.50
40.00	0.47	0.71	1.33	2.32	2.50
45.00	0.48	0.76	1.48	2.34	2.50
50.00	0.50	0.82	1.61	2.36	2.50

#### B. Test Plots: Channel 1@151.8200 MHz

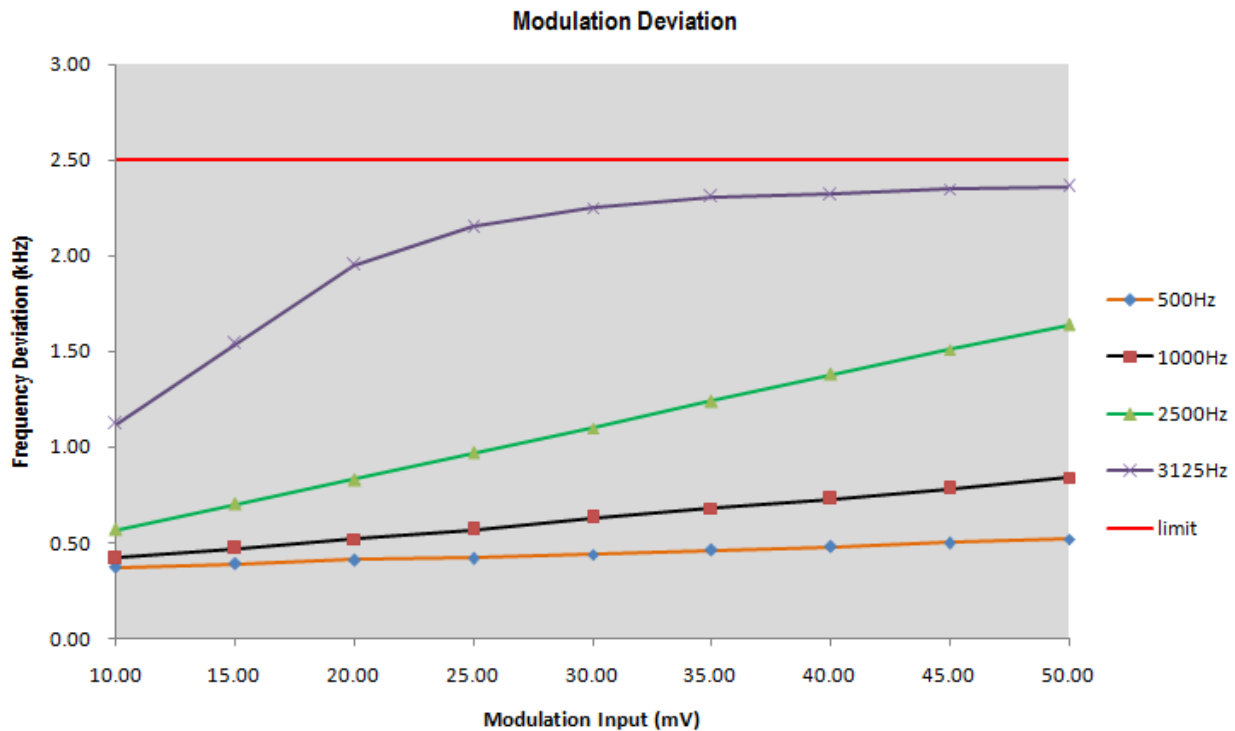




**A. Test Verdict: Channel 3@151.9400 MHz**

Channel 3 @ 151.9400 MHz					
Modulation Input(mv)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 500Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit
10.00	0.37	0.42	0.57	1.12	2.50
15.00	0.39	0.47	0.70	1.54	2.50
20.00	0.41	0.52	0.83	1.95	2.50
25.00	0.42	0.57	0.97	2.15	2.50
30.00	0.44	0.63	1.10	2.25	2.50
35.00	0.46	0.68	1.24	2.31	2.50
40.00	0.48	0.73	1.38	2.32	2.50
45.00	0.50	0.78	1.51	2.35	2.50
50.00	0.52	0.84	1.64	2.36	2.50

**B. Test Plots: Channel 3@151.9400 MHz**

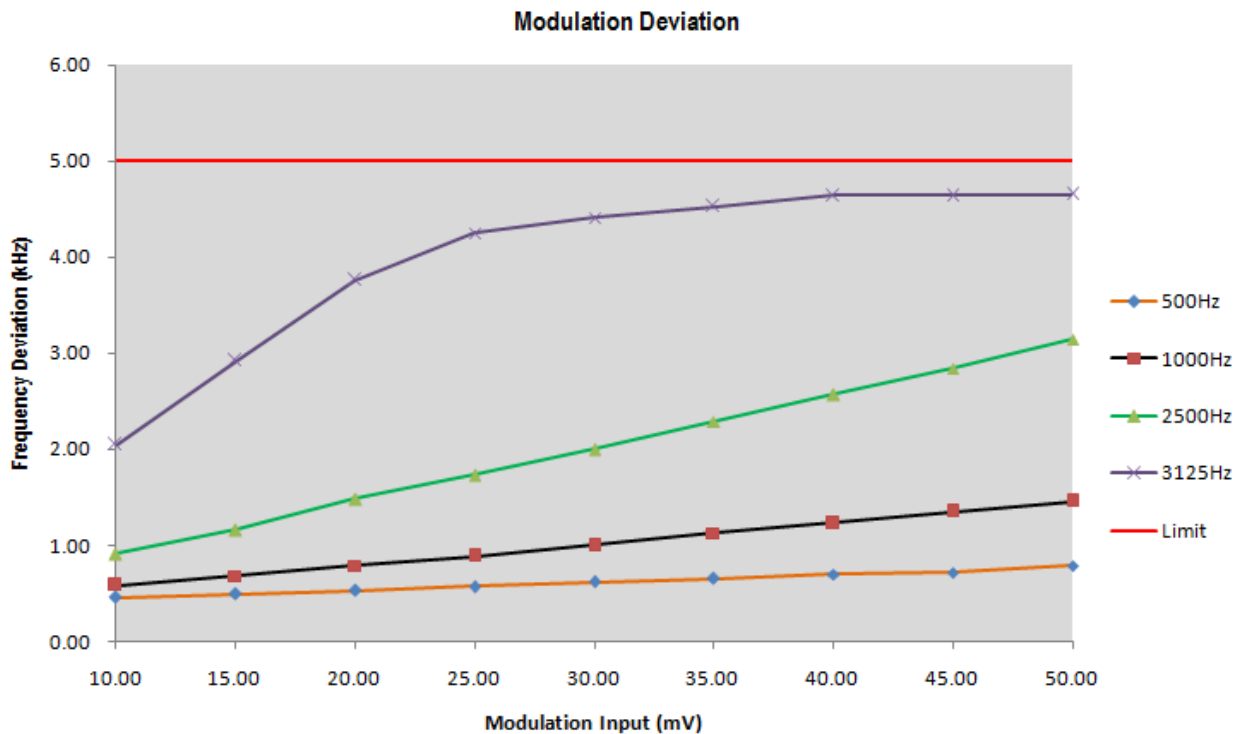




**A. Test Verdict: Channel 5@154.6000 MHz**

Channel 5 @ 154.6000 MHz					
Modulation Input(mv)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 500Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit
10.00	0.46	0.58	0.91	2.05	5.00
15.00	0.49	0.68	1.16	2.92	5.00
20.00	0.53	0.79	1.48	3.76	5.00
25.00	0.57	0.89	1.73	4.25	5.00
30.00	0.62	1.00	2.00	4.41	5.00
35.00	0.65	1.13	2.29	4.53	5.00
40.00	0.70	1.23	2.57	4.64	5.00
45.00	0.72	1.35	2.84	4.64	5.00
50.00	0.79	1.46	3.14	4.65	5.00

**B. Test Plots: Channel 3@154.6000 MHz**





## 2.4 Audio Frequency Response

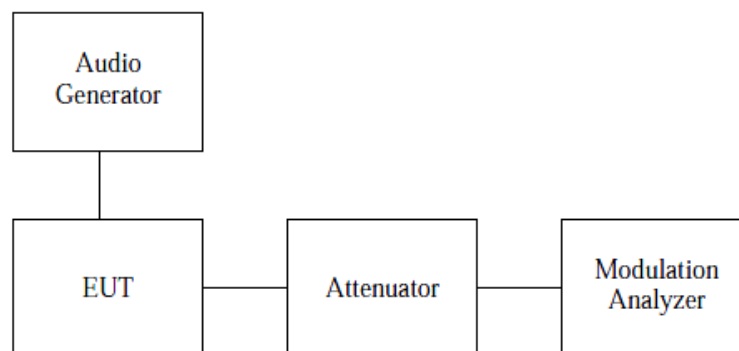
### 2.4.1 Provisions Applicable

According to FCC 2.1047 (a) A MURS transmitter must transmit only emission types A1D, A2B, A2D, A3E, F2B, F1D, F2D, F3E, G3E. Emission types A3E, F3E and G3E include selective calling or tone-operated squelch tones to establish or continue voice communications. MURS transmitters are prohibited from transmitting in the continuous carrier mode.

### 2.4.2 Test Procedure

- 1) The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.
- 2) The frequency response of the audio modulation part is measured over a frequency range of 100 Hz to 5000Hz.
- 3) For 1000Hz tone reference signal the audio generator level is adjusted to get 20% of the rated system deviation.
- 4) The deviations obtained over the frequency range from 100Hz to 5000Hz are recorded and compared with the reference deviation as follows:
- 5) Audio Frequency Response =  $20 \log [ \text{DEV}_{\text{Freq}} / \text{DEV}_{\text{ref}} ]$ .

### 2.4.3 Test Setup Block Diagram

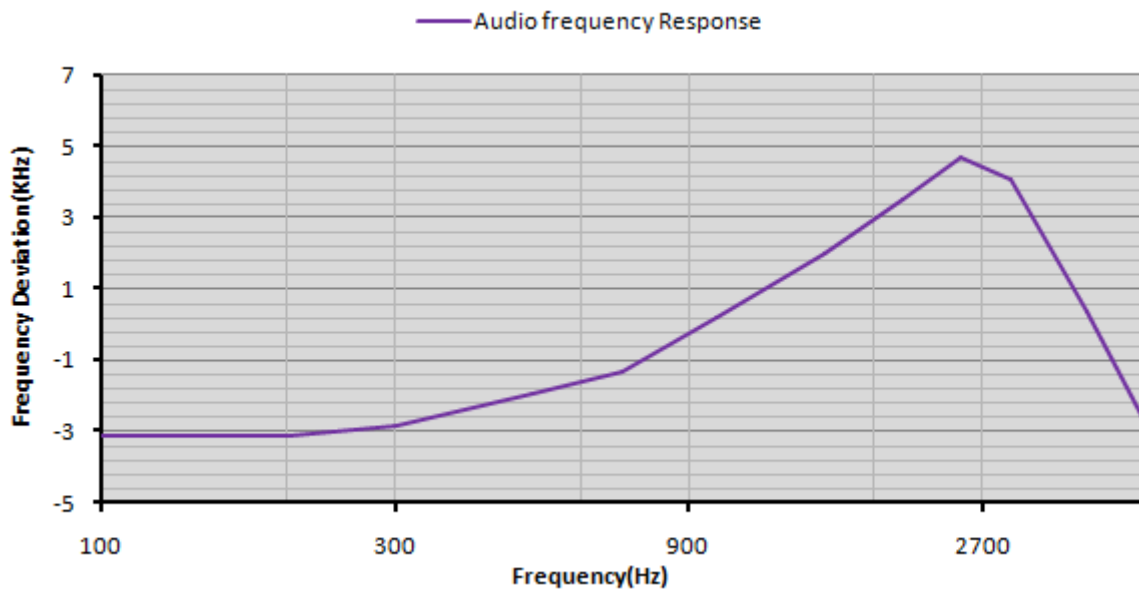


### 2.4.4 Test Results for Audio Frequency Response

#### A. Test Verdict: Channel 1@151.8200 MHz

Frequency	Deviation	Audio Frequency Response
100	0.35	-3.10
200	0.35	-3.10
300	0.36	-2.85
500	0.4	-1.94
700	0.43	-1.31
1000	0.51	0.17
1500	0.63	2.01
2000	0.75	3.52
2500	0.86	4.71
3000	0.8	4.08
4000	0.52	0.34
5000	0.36	-2.85

#### B. Test Plots: Channel 1@151.8200 MHz

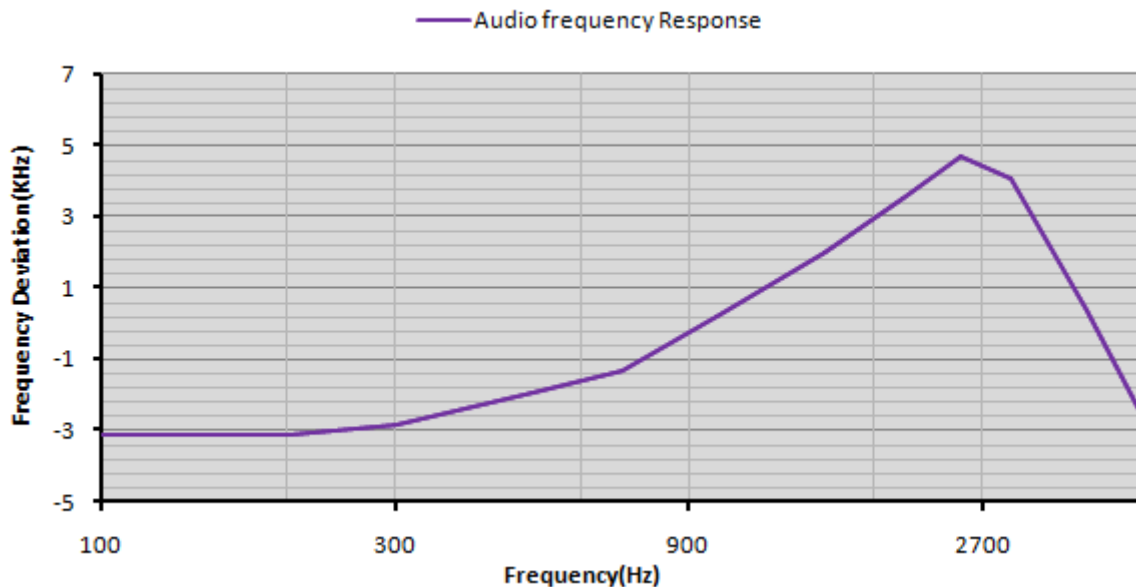




**A. Test Verdict: Channel 3@151.9400 MHz**

Frequency	Deviation	Audio Frequency Response
100	0.36	-2.85
200	0.36	-2.85
300	0.37	-2.62
500	0.39	-2.16
700	0.43	-1.31
1000	0.5	0.00
1500	0.6	1.58
2000	0.72	3.17
2500	0.8	4.08
3000	0.87	4.81
4000	0.51	0.17
5000	0.37	-2.62

**B. Test Plots: Channel 3@151.9400 MHz**

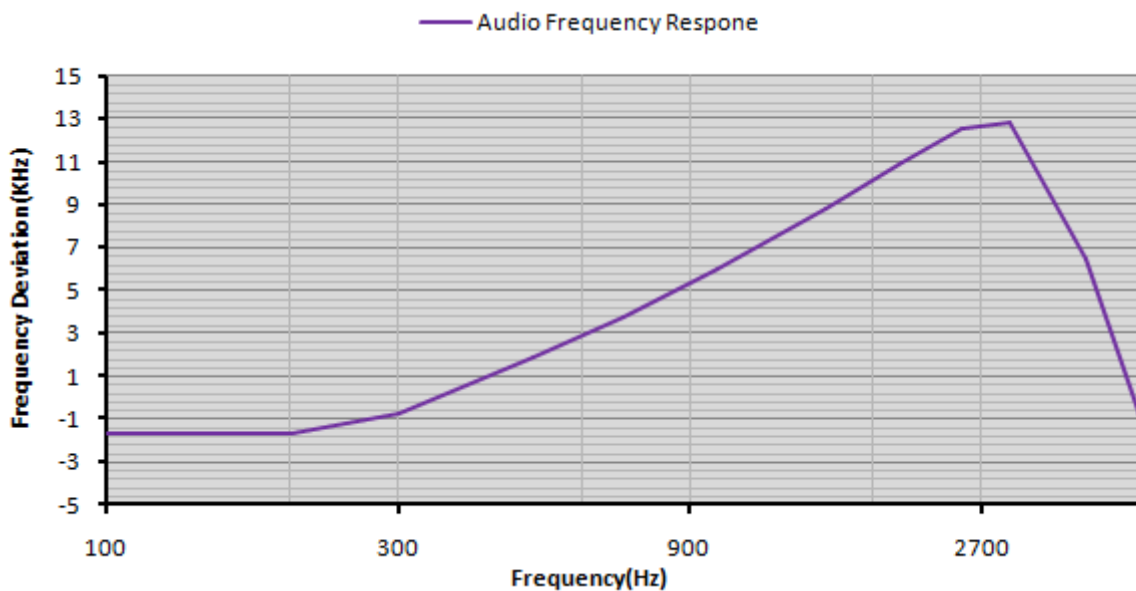




**A. Test Verdict: Channel 5@154.6000 MHz**

Frequency	Deviation	Audio Frequency Response
100	0.41	-1.72
200	0.41	-1.72
300	0.46	-0.72
500	0.62	1.87
700	0.77	3.75
1000	1	6.02
1500	1.38	8.82
2000	1.77	10.98
2500	2.13	12.59
3000	2.2	12.87
4000	1.05	6.44
5000	0.41	-1.72

**B. Test Plots: Channel 5@154.6000 MHz**





## 2.5 Occupied Bandwidth and Emission Mask

### 2.5.1 Provisions Applicable

(1) According to FCC 2.1049(c)(1), 95.633(f), The authorized bandwidth for any emission type transmitted by a MURS transmitter is specified as follows:

1) Emissions on frequencies 151.820 MHz, 151.880 MHz, and 151.940 MHz are limited to 11.25 kHz.

2) Emissions on frequencies 154.570 and 154.600 MHz are limited to 20.0 kHz.

(2) According to FCC 95.633(e), For transmitters designed to operate in the MURS, transmitters shall comply with the following:

1) Emission Mask 1—For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(i) On any frequency from the center of the authorized bandwidth  $f_0$  to 5.625 kHz removed from  $f_0$ : Zero dB.

(ii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 5.625 kHz but no more than 12.5 kHz: at least  $7.27(f_d - 2.88 \text{ kHz})$  dB.

(iii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5 kHz: at least  $50 + 10 \log (P)$  dB or 70 dB, whichever is the lesser attenuation.

2) Emission Mask 2—For transmitters designed to operate with a 25 kHz channel bandwidth that are equipped with an audio low-pass filter, the power of any emission must be below the unmodulated carrier power (P) as follows:

i) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: at least 25 dB.

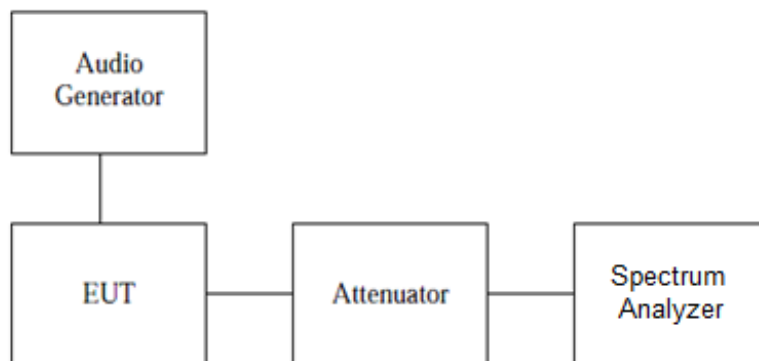
ii) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: at least 35 dB.

iii) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: at least  $43 + 10 \log (P)$  dB.

### 2.5.2 Test Procedure

- 1) The set-up test equipment in the following configuration:
- 2) The EUT was modulated by 2.5 KHz Sine wave audio signal, The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing).
- 3) Set SPA Center Frequency = fundamental frequency, RBW=VBW= 300 Hz, Span =20 KHz.
- 4) Set SPA Max hold. Mark peak, -20 dB.

### 2.5.3 Test Setup Block Diagram



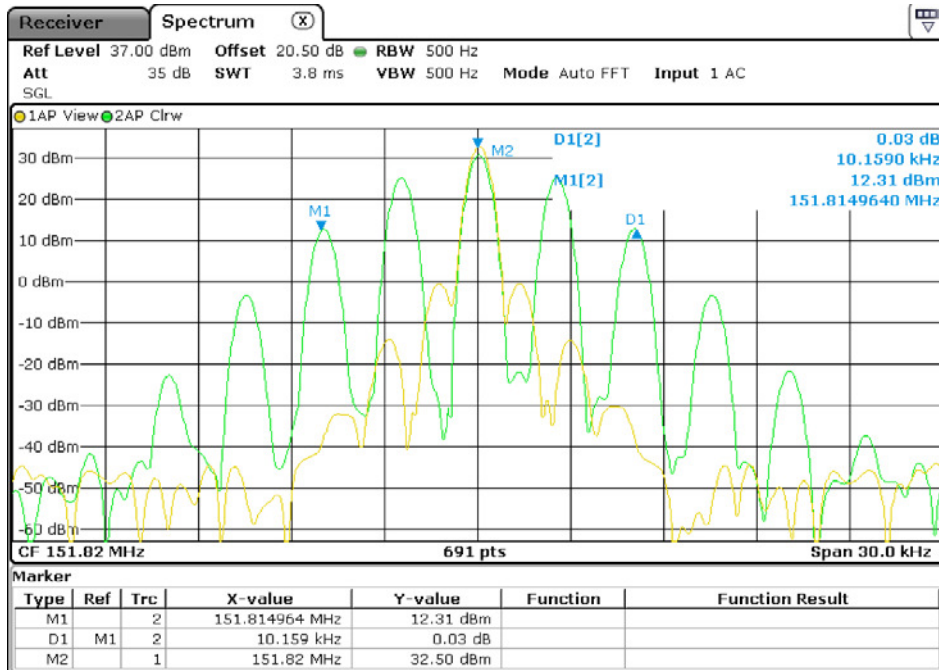
### 2.5.4 Test Results for Occupied Bandwidth

#### A. Test Verdict:

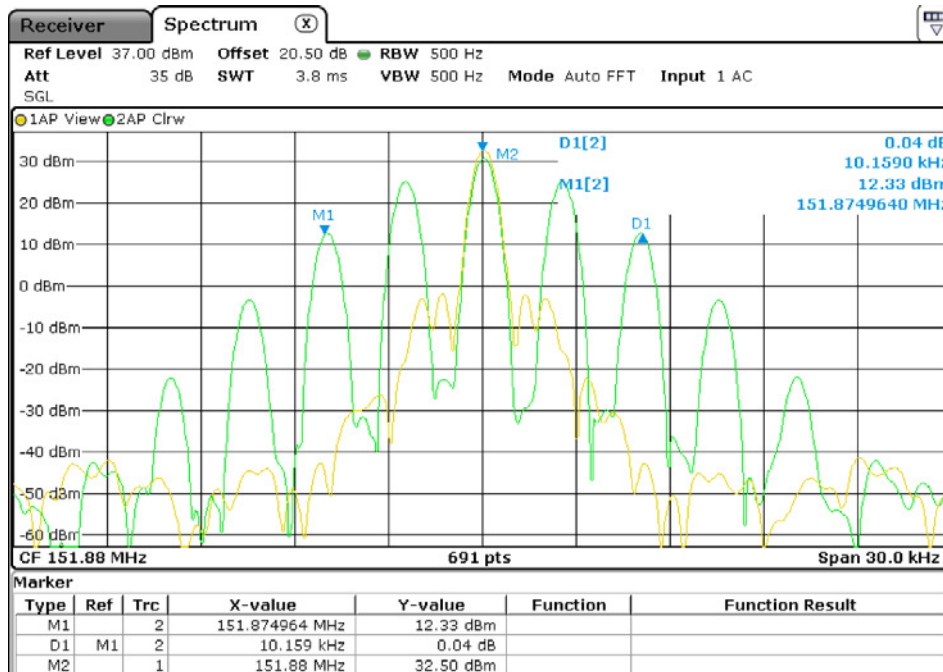
Channel	Frequency(MHz)	Occupied Bandwidth (kHz)	Limited (kHz)
1	151.8200	10.1590	11.2500
2	151.8800	10.1590	11.2500
3	151.9400	10.2030	11.2500
4	154.5700	15.1950	20.0000
5	154.6000	15.1950	20.0000



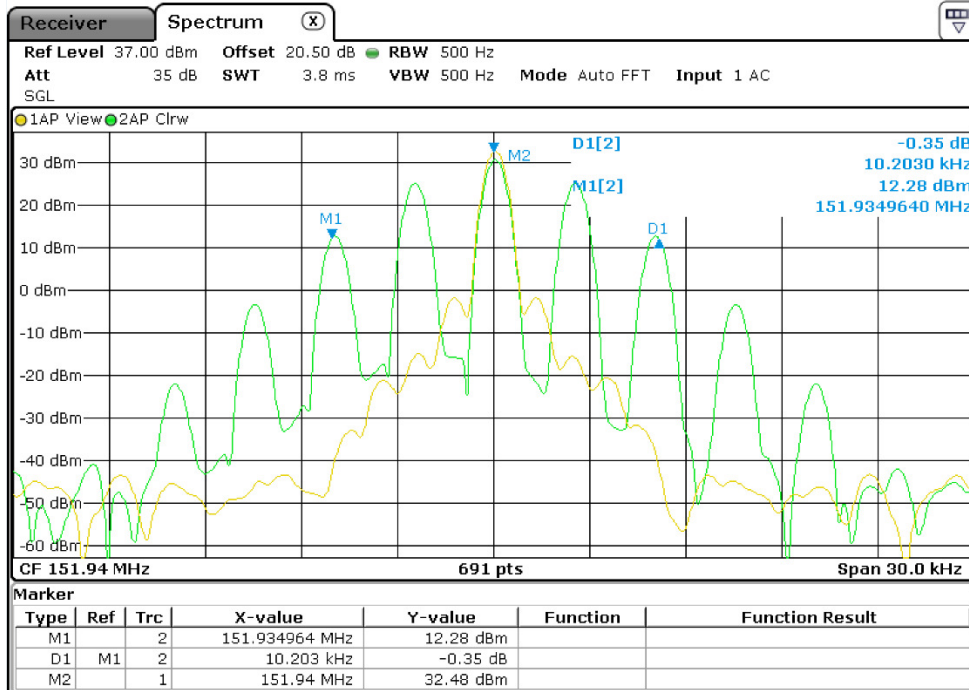
B. Test Plots:



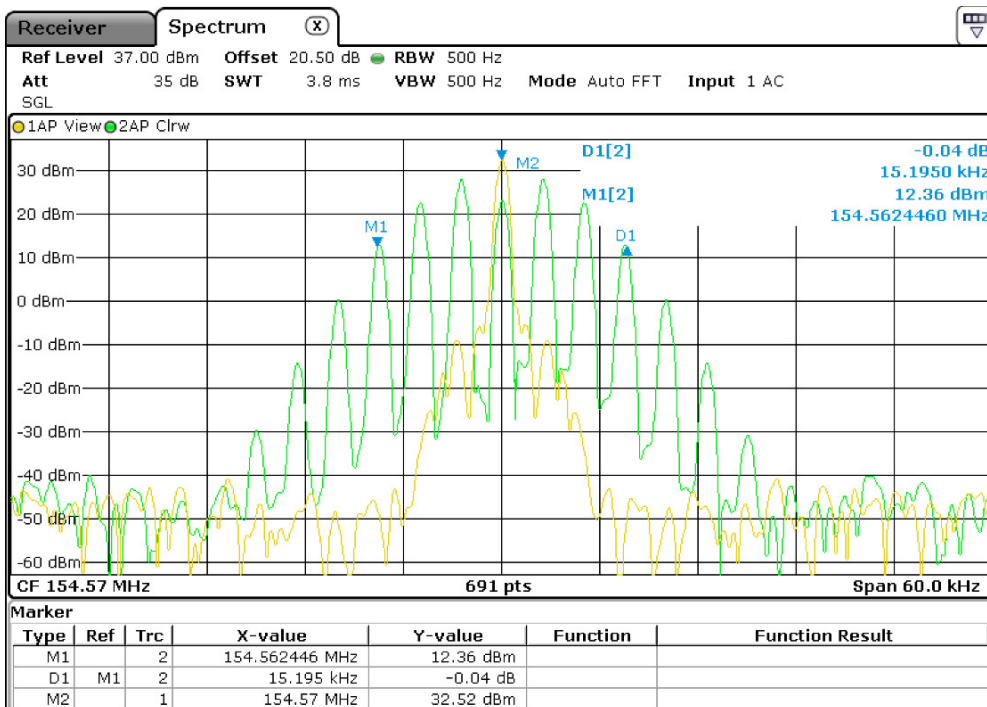
Channel 1@151.8200Mhz



Channel 2@151.8800MHz

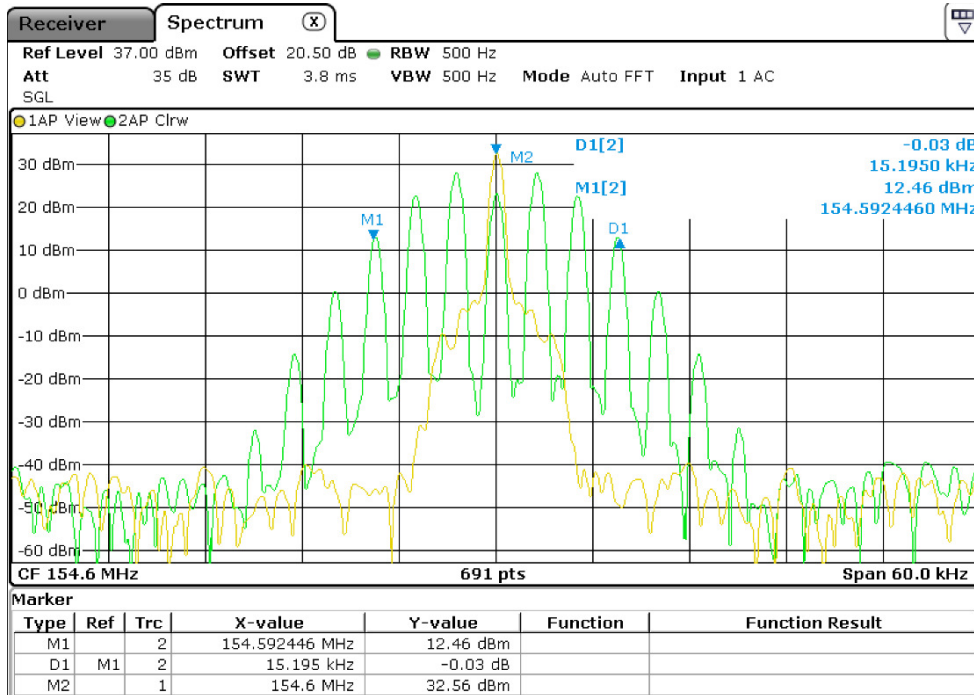


Channel 3@151.9400Mhz



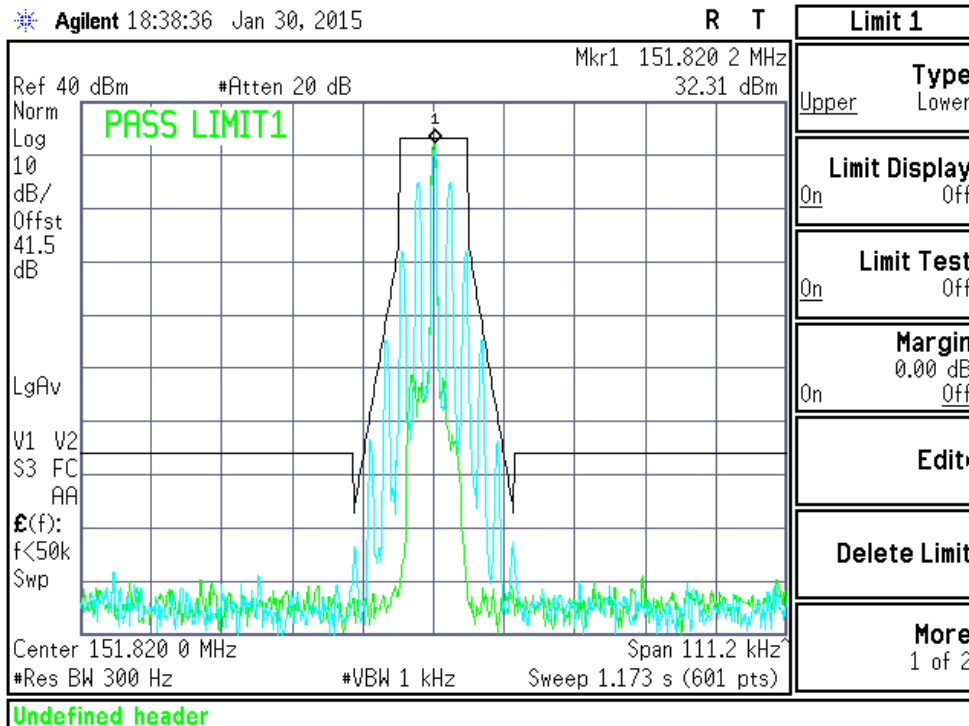
Channel 4@154.5700Mhz



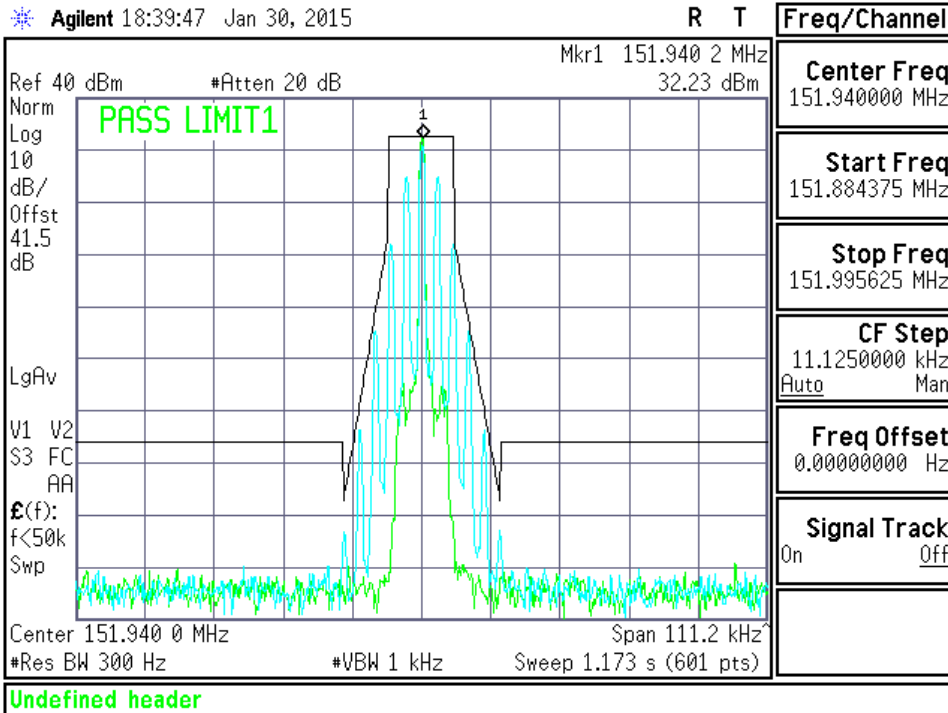


Channel 5@154.6000Mhz

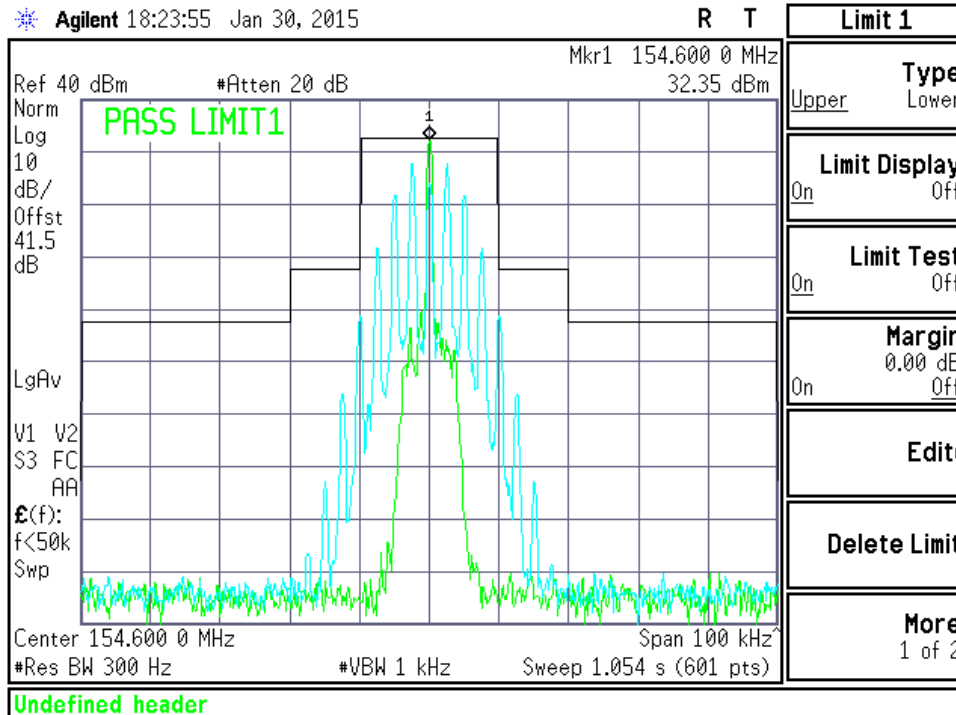
### 2.5.5 Test Results for Emission Mask



Channel 1@151.8200MHz



Channel 3@151.9400MHz



Channel 5@154.6000MHz



## 2.6 Radiated Spurious Emission Transmitter

### 2.6.1 Provisions Applicable

1) According to FCC section 95.635(e) (1). For transmitters designed to operate in the MURS, On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5 kHz: at least  $50 + 10 \log (P)$  dB or 70 dB, whichever is the lesser attenuation.

2) According to FCC section 95.635(e) (3). For transmitters designed to operate in the MURS, On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: at least  $43 + 10 \log (P)$  dB.

### 2.6.2 Test Procedure

1) On a test site, the EUT shall be placed on a non-conductive 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 the max-peak detector was used for the measurement as indicated on the report.

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 transmitter shall than be rotated through  $360^\circ$  in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

6) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

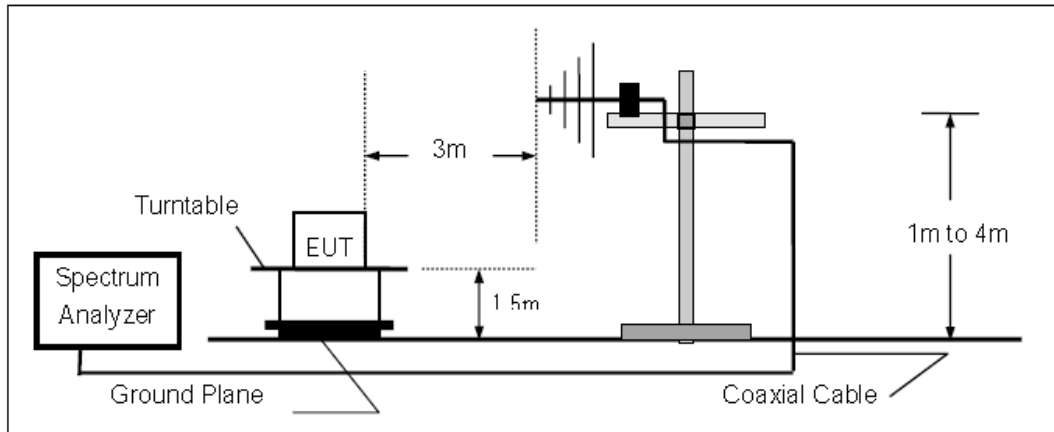
7) The test of spurious radiated emission has been carried out with the validated test software. The measurements below 1GHz were performed with a measurement bandwidth of 100 kHz, above 1GHz with a bandwidth of 1MHz.

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) Spurious emission limits near the carrier are defined by a emission mask.

### 2.6.3 Test Setup Block Diagram



### 2.6.4 Test Result for Radiated Spurious Emission Transmitter

Channel 1@151.8200MHz						
Frequency	Polar	Level	Azimuth	Loss	Limit	Margin
MHz	H / V	dBm	deg	dB	dBm	dB
303.62	H	-38.37	99.0	-81.4	-20.00	18.37
455.43	H	-34.80	282.0	-77.4	-20.00	14.80
607.28	H	-45.29	65.0	-74.2	-20.00	25.29
759.08	H	-51.60	71.0	-73.0	-20.00	31.60
910.93	H	-42.35	59.0	-71.6	-20.00	22.35
1214.50	H	-42.30	333.0	-99.1	-20.00	22.30
1366.50	H	-39.04	226.0	-98.3	-20.00	19.04
1518.50	H	-46.91	349.0	-99.5	-20.00	26.91
1670.50	H	-47.52	211.0	-101.1	-20.00	27.52
1822.00	H	-42.42	359.0	-99.4	-20.00	22.42
1974.00	H	-39.50	2.0	-99.9	-20.00	19.50
2126.00	H	-48.24	214.0	-98.1	-20.00	28.24
2277.50	H	-47.80	7.0	-98.0	-20.00	27.80
3340.00	H	-52.67	340.0	-96.1	-20.00	32.67
3644.00	H	-45.98	333.0	-93.5	-20.00	25.98
303.62	V	-43.12	8.0	-80.3	-20.00	23.12
455.47	V	-34.48	8.0	-78.1	-20.00	14.48
607.28	V	-42.20	348.0	-75.7	-20.00	22.20



Channel 1@151.8200MHz						
Frequency	Polar	Level	Azimuth	Loss	Limit	Margin
MHz	H / V	dBm	deg	dB	dBm	dB
759.13	V	-49.89	353.0	-73.6	-20.00	29.89
910.93	V	-47.56	4.0	-71.6	-20.00	27.56
1214.50	V	-39.72	100.0	-100.2	-20.00	19.72
1366.50	V	-49.76	87.0	-99.3	-20.00	29.76
1518.00	V	-45.08	0.0	-100.7	-20.00	25.08
1669.50	V	-53.75	106.0	-100.2	-20.00	33.75
1822.00	V	-44.21	100.0	-101.3	-20.00	24.21
1973.50	V	-37.43	0.0	-99.9	-20.00	17.43
2125.50	V	-48.15	109.0	-99.0	-20.00	28.15
2277.50	V	-50.87	2.0	-97.5	-20.00	30.87
3188.50	V	-52.91	14.0	-95.5	-20.00	32.91
3644.00	V	-48.05	172.0	-94.1	-20.00	28.05

Channel 3@151.9400MHz						
Frequency	Polar	Level	Azimuth	Loss	Limit	Margin
MHz	H / V	dBm	deg	dB	dBm	dB
303.84	H	-38.47	100.0	-81.4	-20.00	18.47
455.78	H	-35.14	282.0	-77.4	-20.00	15.14
607.76	H	-45.61	69.0	-74.2	-20.00	25.61
759.70	H	-51.29	56.0	-73.0	-20.00	31.29
911.68	H	-42.92	56.0	-71.5	-20.00	22.92
1215.50	H	-38.92	126.0	-99.2	-20.00	18.92
1367.00	H	-41.60	145.0	-98.3	-20.00	21.60
1519.50	H	-49.04	154.0	-99.5	-20.00	29.04
1671.50	H	-52.00	126.0	-101.1	-20.00	32.00
1823.00	H	-44.38	0.0	-99.4	-20.00	24.38
1975.00	H	-39.69	2.0	-99.9	-20.00	19.69
2127.00	H	-49.39	129.0	-98.1	-20.00	29.39
2279.00	H	-48.61	30.0	-98.1	-20.00	28.61
3342.50	H	-52.74	2.0	-96.1	-20.00	32.74
3647.00	H	-44.59	332.0	-93.3	-20.00	22.59



Channel 3@151.9400MHz						
Frequency	Polar	Level	Azimuth	Loss	Limit	Margin
MHz	H / V	dBm	deg	dB	dBm	dB
303.84	V	-44.99	177.0	-80.3	-20.00	24.99
455.83	V	-35.26	4.0	-78.0	-20.00	15.26
607.76	V	-42.17	352.0	-75.7	-20.00	22.17
759.70	V	-50.03	4.0	-73.6	-20.00	30.03
911.64	V	-47.89	166.0	-71.6	-20.00	27.89
1215.50	V	-40.26	343.0	-100.2	-20.00	20.26
1367.50	V	-48.65	191.0	-99.3	-20.00	28.65
1519.50	V	-45.23	356.0	-100.7	-20.00	25.23
1671.00	V	-49.66	213.0	-100.3	-20.00	29.66
1823.00	V	-46.90	41.0	-101.2	-20.00	26.90
1975.50	V	-37.48	353.0	-99.9	-20.00	17.48
2127.50	V	-49.66	343.0	-98.9	-20.00	29.66
2279.00	V	-50.58	2.0	-97.5	-20.00	30.58
2735.00	V	-52.03	359.0	-97.1	-20.00	32.03
3647.00	V	-47.45	162.0	-94.0	-20.00	27.45

Channel 5@154.6000MHz						
Frequency	Polar	Level	Azimuth	Loss	Limit	Margin
MHz	H / V	dBm	deg	dB	dBm	dB
309.227	H	-38.41	106.0	-81.6	-20.00	25.41
463.81	H	-38.34	283.0	-77.3	-20.00	25.34
618.39	H	-43.11	78.0	-74.4	-20.00	30.11
773.02	H	-52.06	106.0	-72.7	-20.00	39.06
927.60	H	-44.00	141.0	-71.3	-20.00	31.00
1236.50	H	-43.74	161.0	-100.4	-20.00	30.74
1391.50	H	-42.92	356.0	-98.5	-20.00	29.92
1546.00	H	-52.30	203.0	-100.6	-20.00	39.30
1700.50	H	-52.22	225.0	-101.9	-20.00	39.22
1855.00	H	-44.08	31.0	-100.6	-20.00	31.08
2010.00	H	-40.63	296.0	-98.8	-20.00	27.63
2164.50	H	-47.03	8.0	-97.4	-20.00	34.03



Channel 5@154.6000MHz						
Frequency	Polar	Level	Azimuth	Loss	Limit	Margin
MHz	H / V	dBm	deg	dB	dBm	dB
2319.00	H	-49.76	2.0	-98.5	-20.00	36.76
3092.50	H	-51.45	10.0	-96.3	-20.00	38.45
3710.50	H	-46.40	334.0	-95.9	-20.00	33.40
309.18	V	-42.88	8.0	-80.2	-20.00	29.88
463.76	V	-39.50	8.0	-77.8	-20.00	26.50
618.43	V	-40.60	343.0	-75.5	-20.00	27.60
773.02	V	-48.31	56.0	-73.3	-20.00	35.31
927.60	V	-48.01	20.0	-71.4	-20.00	35.01
1236.50	V	-44.00	189.0	-99.8	-20.00	31.00
1391.00	V	-50.22	356.0	-99.5	-20.00	37.22
1546.00	V	-47.86	356.0	-100.8	-20.00	34.86
1701.00	V	-51.97	123.0	-101.4	-20.00	38.97
1855.00	V	-40.94	10.0	-100.3	-20.00	27.94
2009.50	V	-35.94	332.0	-98.6	-20.00	22.94
2164.50	V	-47.26	352.0	-98.0	-20.00	34.26
2319.00	V	-49.26	16.0	-97.5	-20.00	36.26
2628.00	V	-53.44	352.0	-98.2	-20.00	40.44
3710.50	V	-49.02	183.0	-95.9	-20.00	36.02



## 2.7 Frequency Stability

### 2.7.1 Provisions Applicable

According to FCC § 2.1055 the frequency stability shall be measured with variation of ambient temperature from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  .

According to FCC § 2.1055 the frequency stability shall be measured with variation of primary supply voltage, For hand carried, battery powered equipment primary supply voltage was reduced to the battery operating end point as specified by the manufacturer. The output frequency was recorded for each battery voltage.

According to FCC Section 95.632 (c) the MURS transmitters must maintain a frequency stability of 5.0 ppm, or 2.0 ppm if designed to operate with a 6.25 kHz bandwidth.

### 2.7.2 Test procedure

1) 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 that purpose.

2) After the temperature stabilized the frequency output was recorded from the counter.

### 2.7.3 Test Results for Frequency Stability

#### A. Test Verdict: Temperature

Channel 1@151.8200MHz			
Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (ppm)
-30	151.8200	151.820262	1.73
-20	151.8200	151.820162	1.07
-10	151.8200	151.820015	0.10
0	151.8200	151.820098	0.65
10	151.8200	151.820042	0.28
20	151.8200	151.820009	0.06
30	151.8200	151.820001	0.01
40	151.8200	151.820026	0.17
50	151.8200	151.820082	0.54





Channel 3@151.9400MHz			
Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (ppm)
-30	151.9400	151.940220	1.45
-20	151.9400	151.940120	0.79
-10	151.9400	151.940095	0.63
0	151.9400	151.940055	0.36
10	151.9400	151.940010	0.07
20	151.9400	151.940000	0.00
30	151.9400	151.940009	0.06
40	151.9400	151.940021	0.14
50	151.9400	151.940037	0.24

Channel 5@154.6000MHz			
Temperature (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (ppm)
-30	154.6000	154.600312	2.02
-20	154.6000	154.600225	1.46
-10	154.6000	154.600126	0.82
0	154.6000	154.600088	0.57
10	154.6000	154.600150	0.97
20	154.6000	154.600010	0.06
30	154.6000	154.600003	0.02
40	154.6000	154.600010	0.07
50	154.6000	154.600070	0.45

**B. Test Verdict: Voltage**

Channel 3@151.9400MHz			
Voltage (V)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (ppm)
Norm	151.940000	151.940011	N/A
6.3	151.940011	151.940021	0.07
7.8	151.940011	151.940021	0.07

Channel 1@151.8200MHz			
Voltage (V)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (ppm)
Norm	151.820000	151.820009	N/A
6.3	151.820009	151.820014	0.03
7.8	151.820009	151.820014	0.03

Channel 5@154.6000MHz			
Voltage (V)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (ppm)
Norm	154.600000	154.600015	N/A
6.3	154.600015	154.600015	0.00
7.8	154.600015	154.600015	0.00



## ANNEX A GENERAL INFORMATION

### 1.1 Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

### 1.2 Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China

### 1.3 Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10 2009, ANSI C63.4 2009 and CISPR Publication 22; the FCC registration number is 695796.



## 1.4 Test Equipments Utilized

### 1.4.1 Conducted Test Equipments

Conducted Test Equipment						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due Date
1	Spectrum Analyzer	MY45101810	E4407B	Agilent	2014.07.07	2015.07.05
2	Audio Signal Generator	17-253527	UPV	R&S	2014.07.07	2015.07.05
3	Modulation Analyzer	2920A02186	8901B	Agilent	2014.07.07	2015.07.05
4	Attenuator	N.A	DC-13	SHX	N/A	N/A
5	RF cable	CB01	RF01	Morlab	N/A	N/A
6	Coaxial cable	CB02	RF02	Morlab	N/A	N/A

### 1.4.2 Radiated Test Equipments

Radiated Test Equipments						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due Date
1	Test Antenna	706	VULB9163	Schwarzbeck	2014.07.01	2015.06.30
2	Test Antenna	1267	BBHA 9120D	Schwarzbeck	2014.07.01	2015.06.30
3	Spectrum Analyzer	1321.3008K30 -101453-1G	FSV30	R&S	2014.07.01	2015.06.30
4	Semi-Anechoic Chamber	000001	9m*6m*6m	SAEMC	2014.07.01	2015.06.30

### 1.4.3 Climate Chamber

Climate Chamber						
No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Climate Chamber	14010209	PL-1KP	ESPEC	2014.07.16	2015.07.15

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