Application for FCC Certificate
On Behalf of
NFTZ Hangpack Int'l Trading Co., Ltd.

Digital Game Caller

Model No.: Jury MK2 (Transmitter)

FCC ID : 2ABWDJS1-MK2

Prepared For : NFTZ Hangpack Int'l Trading Co., Ltd.
722-1 Honghai Shangmao Mansion, Ningbo, China

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F14047
Date of Test : Feb. 12, 2014
Date of Report : Mar. 11, 2014

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TEST REPORT FOR FCC CERTIFICATION

Applicant : NFTZ Hangpack Int'l Trading Co., Ltd.

Manufacturer : Hangzhou Xiaoshan Jinwei Suliao Chang

EUT Description : Digital Game Caller

(A) Model No.	Jury MK2 (Transmitter)
(B) Power Supply	DC 12V (E23A battery*1)

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2013 AND ANSI C63.4:2003

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits radiated emission.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: Refer to Sec2.1; S/N: Refer to Sec2.1), which was tested in 3m anechoic chamber on Feb. 21, 2014 to be technically compliant with the FCC official limits also.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government by the client.

Date of Test : Feb. 21, 2014 Date of Report : Mar. 11, 2014

Producer : EMILY ZHU / Assistant

Review : DIO YANG / Deputy Manager

For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : SAMMY CHEN / Deputy Manager

Authorized Signature EMC

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Meets Limit	Results
Conducted Emission at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2013 AND ANSI C63.4:2003	15.207	N/A
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2013 AND ANSI C63.4:2003	15.209	Pass
Fundamental and Harmonics Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2013 AND ANSI C63.4:2003	15.249	Pass
Band-Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2013 AND ANSI C63.4:2003	15.249	Pass
Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2013 AND ANSI C63.4:2003	15.215 (c)	Pass
N/A is an abbreviation for Not Applicable.			

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description	:	Digital Game Caller
Type of EUT	:	☑ Production ☐ Pre-product ☐ Pro-type
Model No.	:	Jury MK2 (Transmitter)
Applicant	:	NFTZ Hangpack Int'l Trading Co., Ltd. 722-1 Honghai Shangmao Mansion, Ningbo, China
Manufacturer	:	Hangzhou Xiaoshan Jinwei Suliao Chang 267 Chaoyang Shequ Shushan Jiedao, Xiaoshan, Hangzhou, China
Modulation	:	GFSK 250kbps
Operation Frequency	:	2440 MHz
Frequency Channel	:	Total 1 Channel
Tested Frequency	:	2440 MHz
Antenna Type	:	metal antenna

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on Mar 16, 2012 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3F 34Bldg 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China
FCC registration Number	:	91789
Accredited by NVLAP, Lab Code	:	200371-0

2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty (30-200MHz):

U = 4.17 dB (Horizontal)

U = 4.02 dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):

U = 3.38 dB (Horizontal)

U = 3.28 dB (Vertical)

Radiated Emission Expanded Uncertainty (Above 1GHz):

U= 4.68 dB (Horizontal)

U= 4.87 dB (Vertical)

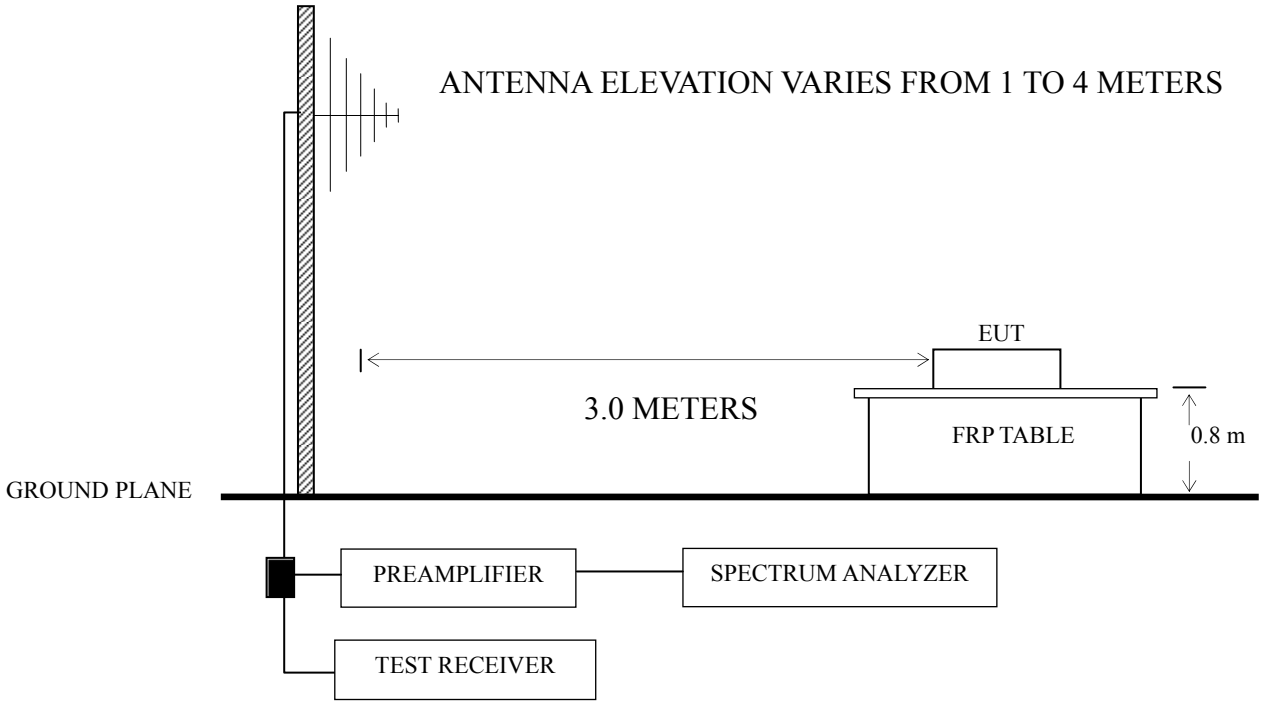
3 RADIATED EMISSION TEST

3.1 Test Equipment

The following test equipments are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	101302	Sep 03, 2013	Sep 02, 2014
2.	Preamplifier	Agilent	8447D	2944A10548	Sep 18, 2013	Mar 17, 2014
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2013	Mar 19, 2014
4.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2013	May 02, 2014
5.	Horn Antenna	EMCO	3115	9607-4878	May 11, 2013	May 10, 2014
6.	Horn Antenna	EMCO	3116	00062643	Jul 03, 2013	Jul 02, 2014
7.	Spectrum	Agilent	E7405A	MY45106600	Nov 11, 2013	Nov 10, 2014
8.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2013	Mar 17, 2014
9.	Software	Audix	E3	6.2007-9-10	--	--

3.2 Block Diagram of Test Setup



■ : 50 ohm Coaxial Switch

3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

Frequency (MHz)	Distance (m)	Field strength limits (μV/m)	
		(μV/m)	dB (μV/m)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB (μV/m) = 20 lg Emission Level (μV/m)
NOTE 2 - The tighter limit applies at the band edges.
NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.

3.4 Test Configuration

The EUT was installed as show on Sec. 3.2 in radiated emission test to meet FCC requirement and operating in a manner, which tend to maximize emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipment.

3.5.3 Set the EUT on the test mode (Transmitting) and then test.

3.6 Test Procedures

The EUT was placed on a FRP turntable that is 0.8 meter above ground. The FRP turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) and horn antenna was used as receiving antenna. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz for frequency range from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emission above 1GHz for Spectrum Agilent E7405A.

The frequency range from 30 MHz to 25 GHz (Up to 10^{th} harmonics from fundamental frequency) was checked.

The test mode (Transmitting) was done on radiated emission test.

Please refer to Sec.3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss (<1GHz)

NOTE 2 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor (>1GHz)

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The emission levels which not reported are too low against the official limit.

NOTE 5 – The emission levels recorded below is data of EUT configured in **Lying** direction, for Lying direction was the maximum emission direction during the test. The data of Side & Stand direction are too low against the official limit to be reported.

NOTE 6 – All reading are Quasi-Peak values below or equal to 1GHz and Peak values above 1GHz.
For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

EUT	:	Digital Game Caller	Temperature :		22℃
Model No.	:	Jury MK2 (Transmitter)	Humidity	:	40%RH
Test Mode	:	Transmitting 2440 MHz	Date of Test	:	Feb. 21, 2014

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	36.00	1.56	15.30	0.71	--	17.57	40.00	22.43	QP
	84.11	8.83	7.65	1.08	--	17.56	40.00	22.44	
	122.83	9.81	12.24	1.38	--	23.43	43.50	20.07	
	259.23	**12.79**	**12.50**	**2.22**	**--**	**27.51**	**46.00**	**18.49**	
	558.73	2.64	19.52	3.10	--	25.26	46.00	20.74	
	848.06	2.58	20.70	3.98	--	27.26	46.00	18.74	
	1396.00	50.73	25.94	3.70	36.53	43.84	54.00	10.16	PK
	3268.00	46.61	30.55	5.97	35.84	47.29	54.00	6.71	
	5257.00	45.21	31.95	6.82	35.75	48.23	54.00	5.77	
	6481.00	44.72	33.70	7.85	35.95	50.32	54.00	3.68	
Vertical	31.29	0.97	17.81	0.65	--	19.43	40.00	20.57	QP
	121.98	10.60	12.16	1.38	--	24.14	43.50	19.36	
	169.01	14.17	8.47	1.63	--	24.27	43.50	19.23	
	419.11	6.50	17.30	2.73	--	26.53	46.00	19.47	
	584.79	3.77	18.85	3.18	--	25.80	46.00	20.20	
	878.32	**3.07**	**20.27**	**4.30**	**--**	**27.64**	**46.00**	**18.36**	
	1900.00	46.90	30.26	4.28	35.97	45.47	54.00	8.53	PK
	2980.00	45.76	29.46	5.74	36.00	44.96	54.00	9.04	
	4762.00	45.38	30.86	6.45	35.64	47.05	54.00	6.95	
	6580.00	44.00	33.72	8.27	35.96	50.03	54.00	3.97	

TEST ENGINEER: NEAL WANG

4 FUNDAMENTAL AND HARMONICS EMISSIONS TEST

4.1 Test Equipment

The following test equipments are used during the fundamental and spurious emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2013	Mar 19, 2014
2.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Nov 11, 2013	Nov 10, 2014
3.	Horn Antenna	EMCO	3115	9607-4878	May 11, 2013	May 10, 2014
4.	Horn Antenna	EMCO	3116	00062643	Jul 03, 2013	Jul 02, 2014
5.	Software	Audix	E3	6.2007-9-10	--	--

4.2 Block Diagram of Test Setup

Same as Sec 3.2

4.3 Fundamental and Harmonics Emission Limit [FCC Part 15 Subpart C 15.249(a)]

Fundamental Frequency (MHz)	Distance (m)	Field Strength of Fundamental		Field Strength of Harmonics	
		(millivolts/meter)	dB (μV/m)	(microvolts/meter)	dB (μV/m)
2400 ~ 2483.5	3	50	94	500	54

NOTE 1 - Emission Level dB (μV/m) = 20 lg Emission Level (μV/m)
NOTE 2 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
NOTE 3 - The limits shown are based on Average value detector.

4.4 Test Configuration

The EUT was installed as show on Sec. 3.2 in fundamental and spurious emission test to meet ANSI C63.4:2003 requirements and operating in a manner that tend to maximize emission level in a normal application.

4.5 Operating Condition of EUT

4.5.1 Setup the EUT as shown in Sec. 3.2.

4.5.2 Turn on the power of all equipment.

4.5.3 Set the EUT on the test mode (Transmitting) and then test.

4.6 Test Procedures

The EUT was placed on a FRP turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to FCC PART 15 Subpart C and ANSI C63.4:2003 requirements during fundamental and harmonics emission test.

The frequency range from 2.4 GHz to 25 GHz (Up to 10^{th} harmonics from fundamental frequency) was checked.

The test mode (Transmitting) was done on Fundamental and Harmonics Emission test.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

NOTE 1 – The harmonics emission levels which not reported are too low against the official limit.
NOTE 2 – PK Level = Read Level + Factor
AV Level = PK Level – Correction Factor.
NOTE 3 – Factor = Antenna Factor + Cable Loss - Preamp Factor
NOTE 4 – Correction factor is measured as follows:

Duty Cycle x = Tx on / 100ms = 0.3169*22 / 100 = 0.07
Correction Factor = |20log(Duty Cycle)| = 23.13 dB

NOTE 5 – The emission levels recorded below is data of EUT configured in **Lying** direction, for Lying direction was the maximum emission direction during the test. The data of Side & Stand direction are too low against the official limit to be reported.
NOTE 6 – The duty cycle was calculated according to the plot in Appendix I

EUT	:	Digital Game Caller	Temperature :	22℃
Model No.	:	Jury MK2 (Transmitter)	Humidity :	40% RH
Test Mode		Transmitting 2440 MHz	Date of Test :	Feb. 21, 2014

Polarization	Frequency (MHz)	Read Level dB (μV)	Factor (dB/m)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2440.00	83.31	-2.74	--	80.57	--	--	PK
	4880.00	44.21	0.90	--	45.11	--	--	
	7320.00	43.12	8.94	--	52.06	--	--	
	9760.00	43.28	12.65	--	55.93	--	--	
	2440.00	--	--	23.13	57.44	94.00	36.56	AV
	4880.00	--	--	23.13	21.98	54.00	32.02	
	7320.00	--	--	23.13	28.93	54.00	25.07	
	9760.00	**--**	**--**	**23.13**	**32.80**	**54.00**	**21.20**	
Vertical	2440.00	101.70	-2.71	--	98.99	--	--	PK
	4880.00	43.65	0.90	--	44.55	--	--	
	7320.00	42.44	8.94	--	51.38	--	--	
	9760.00	42.29	12.65	--	54.94	--	--	
	2440.00	**--**	**--**	**23.13**	**75.86**	**94.00**	**18.14**	AV
	4880.00	--	--	23.13	21.42	54.00	32.58	
	7320.00	--	--	23.13	28.25	54.00	25.75	
	9760.00	--	--	23.13	31.81	54.00	22.19	

TEST ENGINEER: NEAL WANG

5 BAND-EDGE MEASUREMENT

5.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Nov 11, 2013	Nov 10, 2014
2.	Horn Antenna	EMCO	3115	9607-4878	May 11, 2013	May 10, 2014
3.	Preamplifier	HP	8449B	3008A00864	Mar 20, 2013	Mar 19, 2014
4.	Software	Audix	E3	6.2007-9-10	--	--

5.2 Band-Edge Limit [FCC Part 15 Subpart C 15.249(d)]

Emissions radiated outside of the specified frequency bands, except for harmonic, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 whichever is the lesser attenuation.

For peak value, The RBW of Spectrum Analyzer Agilent E7405A was set at 1MHz and the VBW was set at 3MHz.

5.3 Test Results

<PASS>

All the test results are attached in next pages.

Radiated Band Edge measurement:

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Factor (dB/m)	Correction Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2390.00	45.96	-2.48	--	43.48	74.00	30.52	PK
	2483.50	42.75	-2.90	--	39.85	74.00	34.15	
	2390.00	--	--	23.13	20.35	54.00	33.65	AV
	2483.50	--	--	23.13	16.72	54.00	37.28	
Vertical	2390.00	56.86	-2.48	--	54.38	74.00	19.62	PK
	2483.50	56.59	-2.90	--	53.69	74.00	20.31	
	2390.00	--	--	23.13	31.25	54.00	22.75	AV
	2483.50	--	--	23.13	30.56	54.00	23.44	

TEST ENGINEER: NEAL WANG

6 BANDWIDTH MEASUREMENT

6.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 14, 2013	Jun 14, 2014

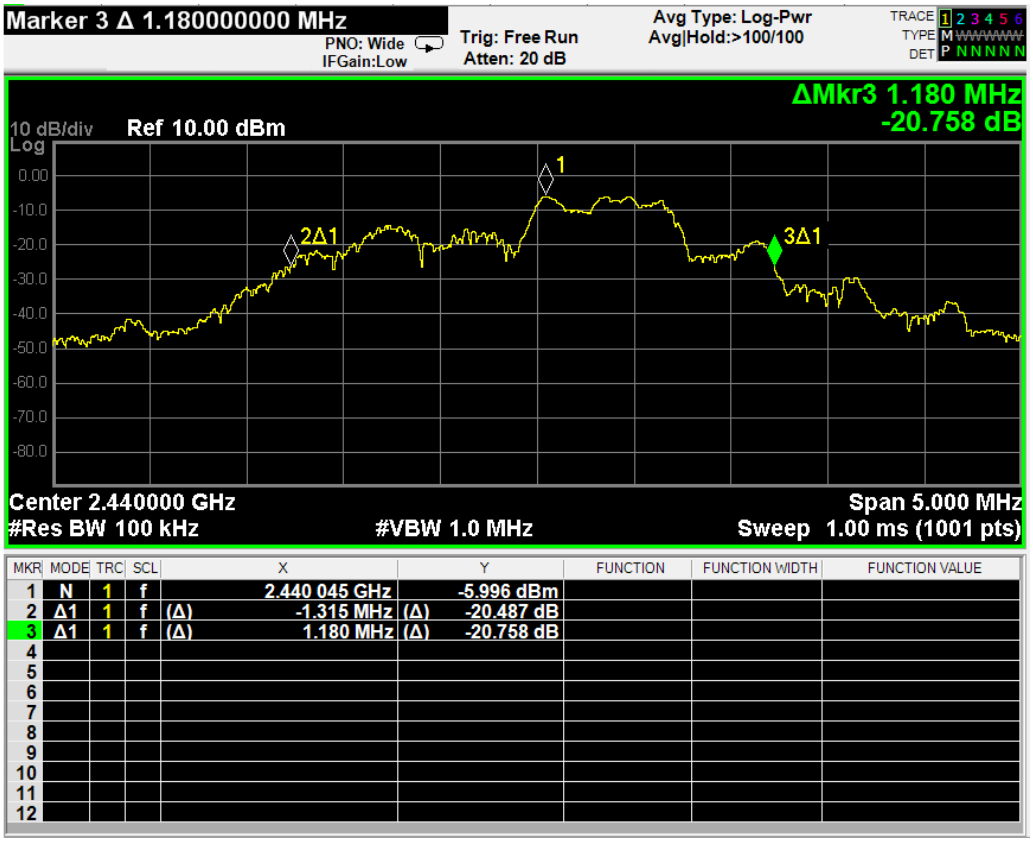
6.2 Bandwidth Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

6.3 Test Results

<PASS>

The 20dB bandwidth of the Fundament is **2.50MHz**



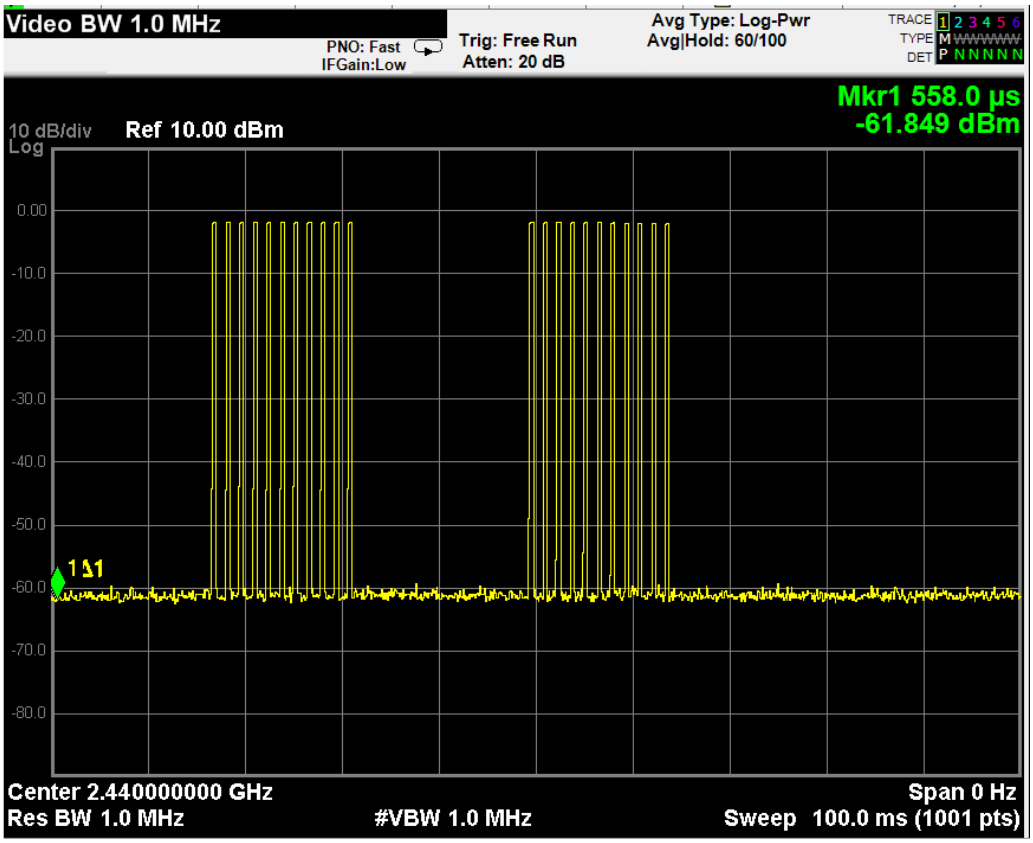
7 DEVIATION TO TEST SPECIFICATIONS

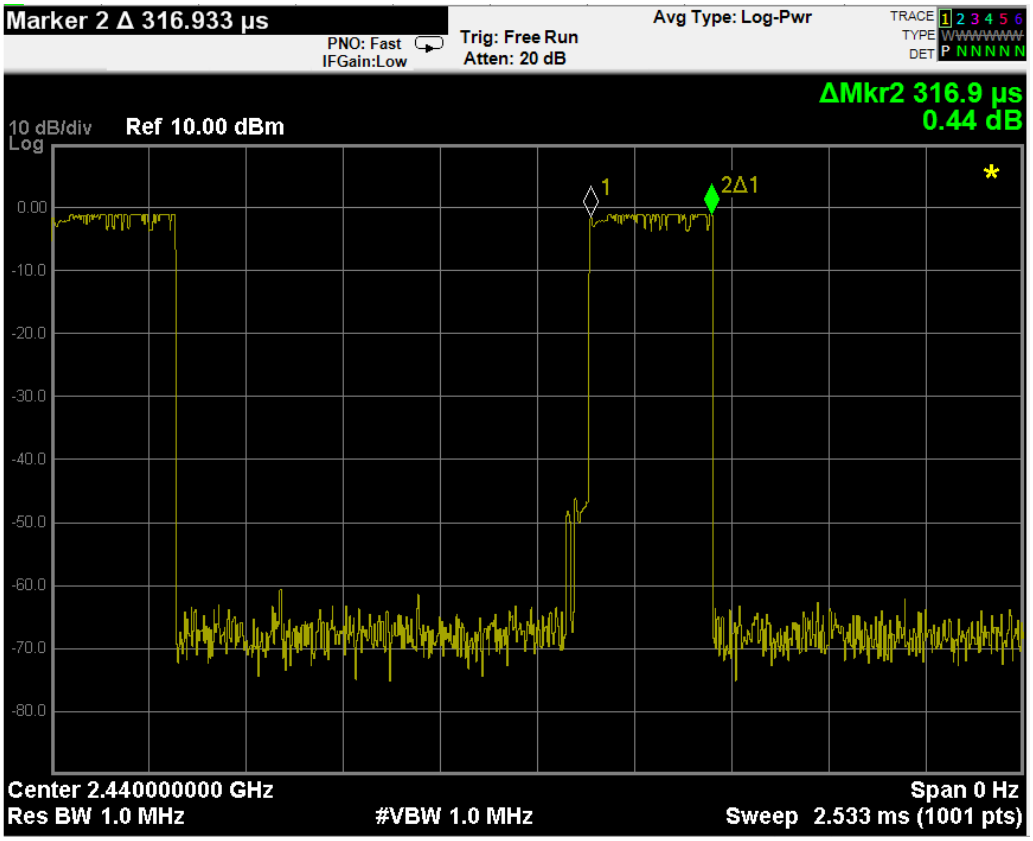
None.

APPENDIX I

PLOT OF DUTY CYCLE

Note: The 12 keys were all checked and the worst duty cycle condition was recorded.





DUTY CYCLE