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TEST REPORT

FCC/IC Test for NX-1200-K2

APPLICANT
JVCKENWOOD Corporation

REPORT NO.
HCT-RF-1907-FI024

DATE OF ISSUE
26 July 2019

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FCC ID/IC
K44501000/282F-501000

Applicant	**JVCKENWOOD Corporation** 1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan
Product Name	VHF TRANSCEIVER
Model(s)	NX-1200-K2
FCC Additional Model(s)	NX-1200-K, NX-1202-K
ISED Additional Model(s)	NX-1200-K
Test Standard Used	Part 2, 22, 74, 90 / RSS- Gen Issue 5, RSS-119 Issue 12
Frequency Range	FCC: 150 MHz - 174 MHz IC: 138 MHz - 144 MHz, 148 MHz - 174 MHz MHz

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

Tested by
Kwon Jeong

Technical Manager
Jong Seok Lee

HCT CO., LTD.
Soo Chan Lee
SooChan Lee / CEO

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	26 July 2019	Initial Release

The measurements shown in this report were made in accordance with the procedures specified in § 2.947. I assume full responsibility
for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.
HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

CONTENTS

1. GENERAL INFORMATION

Manufacturer:	JVCKENWOOD Corporation
Address:	1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan
FCC ID:	K44501000
ISED:	282F-501000
EUT Type:	VHF TRANSCEIVER
Model(s):	NX-1200-K2
FCC Additional Model(s):	NX-1200-K, NX-1202-K
ISED Additional Model(s):	NX-1200-K
Date(s) of Tests:	July 01, 2019 ~ July 26, 2019
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

2. EUT DESCRIPTION

Power Supply Voltage	DC 7.5V ± 20%
Output Power(FCC)	- 5 W (Power output continuously variable to 1 W) (Max : 5.2 W) - 16K0F3E : 2 W (Power output continuously variable to 1 W)
Output Power(IC)	- 5 W (Power output continuously variable to 1 W) (Max : 5.2 W)
Battery type	KNB-45L Li-Ion Battery Pack (2000mA) KNB-53N Ni-MH Battery Pack (1400mA) KNB-29N Ni-MH Battery Pack (1500mA) KNB-69L Li-ion Battery Pack (2450mA) KNB-82LC (Li-ion Battery Pack)
Antenna	KRA-22M VHF Low Profile Helical Antenna (146-162 MHz) KRA-22M2 VHF Low Profile Helical Antenna (162-174 MHz) KRA-22M3 VHF Low Profile Helical Antenna (135-150 MHz) KRA-26M VHF Helical Antenna (146-162 MHz) KRA-26M2 VHF Helical Antenna (162-174 MHz) KRA-26M3 VHF Helical Antenna (135-150MHz) KRA-41M VHF Stubby antenna (146-162 MHz) KRA-41M2 VHF Stubby antenna (162-174 MHz) KRA-41M3 VHF Stubby antenna (136-150 MHz)
Peak Antenna gain	KRA-22M VHF Low Profile Helical Antenna: 0 dBd KRA-22M2 VHF Low Profile Helical Antenna: 0 dBd KRA-22M3 VHF Low Profile Helical Antenna: 0 dBd KRA-26M VHF Helical Antenna: 0 dBd KRA-26M2 VHF Helical Antenna: 0 dBd KRA-26M3 VHF Helical Antenna: 0 dBd KRA-41M VHF Stubby antenna: 0 dBd KRA-41M2 VHF Stubby antenna: 0 dBd KRA-41M3 VHF Stubby antenna: 0 dBd
Type of Emission	16K0F3E: Analogue 11K0F3E: Analogue 8K30F1E, 8K30F1D, 8K30F7W: NXDN 7K60FXE, 7K60FXD: DMR 4K00F1E, 4K00F1D, 4K00F7W: NXDN 4K00F2D: CWID
Channel Bandwidth	25 kHz / 6.25 kHz / 12.5 kHz
Operating Temperature	-30 °C ~ +60 °C
Frequency Range	150 MHz - 174 MHz (FCC) 138 MHz - 144 MHz, 148 MHz - 174 MHz MHz (IC)
Test Frequency	138.05 MHz / 150.05 MHz / 162.05 MHz / 173.95 MHz

Maximum deviation	16K0F3E: ± 5 kHz 11K0F3E: ± 2.5 kHz
Frequency Stability	± 2.0 ppm
PMN	NX-1200-K, NX-1200-K2
HVIN	NX-1200-K, NX-1200-K2
FVIN	N/A
HMN	N/A

3. TEST METHODOLOGY

TIA-603-E dated March 2016 entitled "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards" were used in the measurement.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the FCC Rules Part 2, 22, 74 and Part 90.

3.3 GENERAL TEST PROCEDURES

Radiated Emissions
Radiated emission measurements are performed in the Fully-anechoic chamber. The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission. The level and position of the maximized emission is recorded with the spectrum analyzer using a positive peak detector.
A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
The power is calculated by the following formula;

$$P_{d(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dB)}$$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

The maximum EIRP is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. WORST CASE CONFIGURATION AND MODE

Radiated test

1. NX-1200-K2 & Additional Models were tested and the worst case results are reported.
   (Worst case : NX-1200-K2)
2. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + Microphone (High Power/ Low Power)
     Stand alone + Accessories (High Power/ Low Power)
     Stand alone + Microphone + Accessories (High Power/ Low Power)
   - Worstcase : Stand alone + Microphone (High Power)
3. All type of battery were investigated and the worst case configuration results are reported.
   - Battery type : KNB-45L, KNB-53N, KNB-29N, KNB-69L, KNB-82LC
   - Worstcase : KNB-69L
4. All Antenna were investigated and the worst case configuration results are reported.
   - Antenna type : KRA-22M, KRA-22M2, KRA-22M3, KRA-26M, KRA-26M2, KRA-26M3,
     KRA-41M, KRA-41M2, KRA-41M3
   - Worstcase : KRA-26M, KRA-26M2, KRA-26M3
5. Measurements value show only up to 8 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Conducted test

1. NX-1200-K2 & Additional Models were tested and the worst case results are reported.
   (Worst case : NX-1200-K2)
2. Conducted Spurious Emission :
   All Power of operation were investigated and the worst case configuration results are reported.
   - Power : High Power/ Low Power
   - Worstcase : High Power
3. Frequency Stability :
   All Type of Emission were investigated and the worst case Type results are reported.
   - Worstcase : 16K0F3E, 11K0F3E, 4K00F2D
4. Transient Frequency Behavior :
   All Type of Emission were investigated and the worst case Type results are reported.
   - Worstcase : 16K0F3E, 11K0F3E, 4K00F1E, 4K00F1D, 4K00F7W

7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	ISED Part Section(s)	Test Condition	Test Result
Carrier RF Output Power	§ 2.1046, § 22.565, § 74.461, § 90.205	RSS119 (5.4)	CONDUCTED	PASS
Unwanted Emissions	§ 2.1051 § 22.359, § 74.462, § 74.535, § 90.210	RSS119 (5.8)	CONDUCTED	PASS
99% Bandwidth(ISED)	NA	RSS119 (5.5)		PASS
Carrier Frequency Stability	§ 2.1055, § 22.355, § 74.464, § 90.213(a)	RSS119 (5.3)		PASS
Audio Frequency Response	§ 2.1047(a)	-		PASS
Audio Low Pass Filter	§ 2.1047(a)	-		PASS
Modulation Limiting	§ 2.1047(b)	-		PASS
Transient Frequency Behavior	§ 74.462, § 90.214	RSS119 (5.9)		PASS
Emission Mask	§ 2.1049, § 22.359, § 74.462, § 74.535, § 90.210	RSS119 (5.8)		PASS
Field Strength of Spurious Radiation	§ 2.1053 § 22.359, § 74.462, § 74.535, § 90.210	RSS119 (5.8)	RADIATED	PASS
Receiver Spurious Emissions	NA	RSS-Gen(7)		PASS
Necessary Bandwidth	§ 2.202(g)	-	-	-

Test Description	Test Limit(FCC)	Test Limit(IC)
Carrier RF Output Power	Varies	60W
Unwanted Emissions	6.25 kHz: 55+ 10 log (P)dB 12.5 kHz: 50 + 10 log (P)dB 25 kHz: 43 + 10 log (P)dB	6.25 kHz: 55+ 10 log (P)dB 12.5 kHz: 50 + 10 log (P)dB 25 kHz: 43 + 10 log (P)dB
99% Bandwidth(ISED)	N/A	6.25 kHz: 6 kHz 12.5 kHz: 11.25kHz 25 kHz: 20 kHz
Carrier Frequency Stability	6.25 kHz = 2 ppm 12.5 kHz = 5 ppm 25 kHz = 5 ppm	6.25 kHz = 2 ppm 12.5 kHz = 5 ppm 25 kHz = 5 ppm
Audio Frequency Response	Varies	N/A
Audio Low Pass Filter		
Modulation Limiting	25 kHz = 5 kHz 12.5 kHz = 2.5 kHz	N/A
Transient Frequency Behavior	See Note3	See Note3
Emission Mask	See Note2	See Note2
Field Strength of Spurious Radiation	6.25 kHz: 55+ 10 log (P)dB 12.5 kHz: 50 + 10 log (P)dB 25 kHz: 43 + 10 log (P)dB	6.25 kHz: 55+ 10 log (P)dB 12.5 kHz: 50 + 10 log (P)dB 25 kHz: 43 + 10 log (P)dB
Receiver Spurious Emissions	N/A	See Note1

Note:

1. Receiver Spurious Emissions Limit :

Frequency (MHz)	Field Strength (μv/m at 3 meters)
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500

2. Emission Mask Limit :

Channel Bandwidth: 25kHz

Displacement Frequency (% of Authorized Bandwidth)	**Minimum Attenuation (dB)**
50 to 100	25 dB
100 to 250	35 dB
>250	$43 + 10 \log_{10}(COP)$

Channel Bandwidth: 12.5kHz

Channel Spacing (kHz)	**Displacement Frequency Range**	**Minimum Attenuation (dB)**
12.5 & 15	>5.625 kHz to 12.5 kHz	$7.27(f_d - 2.88)$
	>12.5 kHz	Whichever is less attenuation; 70 or $50 + 10 \log_{10}(COP)$

Channel Bandwidth: 6.25kHz

Channel Spacing (kHz)	**Displacement Frequency Range**	**Minimum Attenuation (dB)**
6.25 & 7.5	>3.0 kHz to 4.6 kHz	Whichever is less attenuation; 65 or $30 + 16.67(f_d - 3)$ or $55 + 10 \log_{10}(COP)$
	Greater than 4.6 kHz	Whichever is less attenuation; 65 or $55 + 10 \log_{10}(COP)$

3. Transient Frequency Behavior Limit :

Channel Bandwidth (kHz)	Time Intervals (Notes 1, 2)	Maximum Frequency Difference (kHz)	Transient Duration Limit (ms)	
			138-174 MHz	406.1-512 MHz
25	t_1	±25	5	10
	t_2	±12.5	20	25
	t_3	±25	5	10
12.5	t_1	±12.5	5	10
	t_2	±6.25	20	25
	t_3	±12.5	5	10
6.25	t_1	±6.25	5	10
	t_2	±3.125	20	25
	t_3	±6.25	5	10

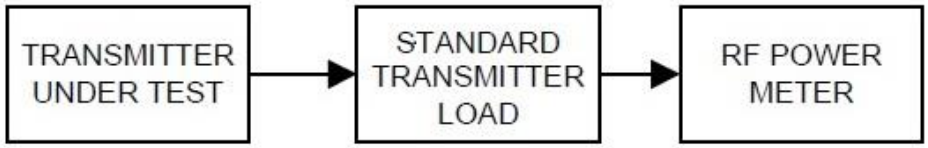
8. TEST RESULT

8.1 Carrier Output Power

▣ Definition

The conducted carrier power output rating for a transmitter is the power available at the output terminals of the transmitter when the output terminals are connected to the standard transmitter load.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to 2.2.1 in TIA-603-E Standard.

a) Connect the equipment as illustrated.
b) Measure the transmitter output power during the defined duty cycle(see 1.3.2).
Correct for all losses in the RF path.
c) The value recorded in step b) is the conducted carrier output power rating.

▣ TEST RESULTS(Carrier Output Power)

Certification	Type of Emission	Channel Bandwidth (kHz)	Test Frequency (MHz)	Carrier Output Power			
				High Power		Low Power	
				dBm	W	dBm	W
FCC	16K0F3E	25	150.05	32.69	1.86	29.86	0.97
			162.05	32.52	1.79	30.21	1.05
			173.95	32.73	1.87	29.68	0.93
IC	16K0F3E	25	138.05	36.63	4.61	29.97	0.99
			150.05	36.62	4.59	29.86	0.97
			162.05	36.60	4.57	30.21	1.05
			173.95	36.40	4.37	29.68	0.93
FCC/IC	11K0F3E	12.5	138.05	36.61	4.58	29.95	0.99
			150.05	36.62	4.59	29.83	0.96
			162.05	36.62	4.59	30.13	1.03
			173.95	36.48	4.45	29.67	0.93
FCC/IC	8K30F1E, 8K30F1D, 8K30F7W	12.5	138.05	36.99	5.00	30.33	1.08
			150.05	36.87	4.87	30.21	1.05
			162.05	36.72	4.70	30.01	1.00
			173.95	36.68	4.65	30.00	1.00
FCC/IC	7K60FXD, 7K60FXE	12.5	138.05	36.99	5.00	30.35	1.08
			150.05	36.84	4.83	30.20	1.05
			162.05	36.75	4.73	30.07	1.02
			173.95	36.75	4.73	30.02	1.00
FCC/IC	4K00F1E, 4K00F1D, 4K00F7W	6.25	138.05	36.95	4.95	30.30	1.07
			150.05	36.82	4.81	30.22	1.05
			162.05	36.72	4.70	29.99	1.00
			173.95	36.66	4.64	30.01	1.00
FCC/IC	4K00F2D	6.25	138.05	36.90	4.90	29.99	1.00
			150.05	36.68	4.66	29.91	0.98
			162.05	36.78	4.76	30.02	1.00
			173.95	36.64	4.61	30.24	1.06

▣ TEST RESULTS(ERP)

Certification	Type of Emission	Channel Bandwidth (kHz)	Test Frequency (MHz)	ERP			
				High Power		Low Power	
				dBm	W	dBm	W
FCC	16K0F3E	25	150.05	32.69	1.86	29.86	0.97
			162.05	32.52	1.79	30.21	1.05
			173.95	32.73	1.87	29.68	0.93
IC	16K0F3E	25	138.05	36.63	4.61	29.97	0.99
			150.05	36.62	4.59	29.86	0.97
			162.05	36.60	4.57	30.21	1.05
			173.95	36.40	4.37	29.68	0.93
FCC/IC	11K0F3E	12.5	138.05	36.61	4.58	29.95	0.99
			150.05	36.62	4.59	29.83	0.96
			162.05	36.62	4.59	30.13	1.03
			173.95	36.48	4.45	29.67	0.93
FCC/IC	8K30F1E, 8K30F1D, 8K30F7W	12.5	138.05	36.99	5.00	30.33	1.08
			150.05	36.87	4.87	30.21	1.05
			162.05	36.72	4.70	30.01	1.00
			173.95	36.68	4.65	30.00	1.00
FCC/IC	7K60FXD, 7K60FXE	12.5	138.05	36.99	5.00	30.35	1.08
			150.05	36.84	4.83	30.20	1.05
			162.05	36.75	4.73	30.07	1.02
			173.95	36.75	4.73	30.02	1.00
FCC/IC	4K00F1E, 4K00F1D, 4K00F7W	6.25	138.05	36.95	4.95	30.30	1.07
			150.05	36.82	4.81	30.22	1.05
			162.05	36.72	4.70	29.99	1.00
			173.95	36.66	4.64	30.01	1.00
FCC/IC	4K00F2D	6.25	138.05	36.90	4.90	29.99	1.00
			150.05	36.68	4.66	29.91	0.98
			162.05	36.78	4.76	30.02	1.00
			173.95	36.64	4.61	30.24	1.06

Note:

1. ERP = Carrier Output Power + Peak Antenna gain

8.2 Carrier Frequency Stability

▣ Definition

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

▣ TEST CONFIGURATION

▣ TEST PROCEDURE

According to 2.2.2 in TIA-603-E Standard.

a) Connect the equipment as illustrated.

b) Operate the equipment in standby conditions for 15 minutes before proceeding.

c) Record the carrier frequency of the transmitter as *MCF* MHz

d) Calculate the ppm frequency error by the following:

ppm error = ((MCF_{MHz} / ACF_{MHz})-1)*10^6

where

MCF_{MHz} is the Measured Carrier Frequency in MHz

ACF_{MHz} is the Assigned Carrier Frequency in MHz

e) The value recorded in step d) is the carrier frequency stability.

▣ TEST RESULTS

(1) Frequency Stability (Temperature Variation)

138.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	+20(Ref)	138.050172105	0.0000000	0.0000	2.0
		-30	138.050166903	-0.0000052	-0.0377	
		-20	138.050145446	-0.0000267	-0.1931	
		-10	138.050128254	-0.0000439	-0.3176	
		0	138.050178929	0.0000068	0.0494	
		+10	138.050150305	-0.0000218	-0.1579	
		+30	138.050150620	-0.0000215	-0.1556	
		+40	138.050177387	0.0000053	0.0383	
		+50	138.050167200	-0.0000049	-0.0355	
	Low Power	+20(Ref)	138.050176980	0.0000000	0.0000	
		-30	138.050158831	-0.0000181	-0.1315	
		-20	138.050143932	-0.0000330	-0.2394	
		-10	138.050129662	-0.0000473	-0.3428	
		0	138.050135016	-0.0000420	-0.3040	
		+10	138.050149263	-0.0000277	-0.2008	
		+30	138.050173163	-0.0000038	-0.0276	
		+40	138.050148096	-0.0000289	-0.2092	
		+50	138.050126089	-0.0000509	-0.3686	

150.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	+20(Ref)	150.050179745	0.0000000	0.0000	2.0
		-30	150.050191391	0.0000116	0.0776	
		-20	150.050193038	0.0000133	0.0886	
		-10	150.050184227	0.0000045	0.0299	
		0	150.050173225	-0.0000065	-0.0435	
		+10	150.050171984	-0.0000078	-0.0517	
		+30	150.050144696	-0.0000350	-0.2336	
		+40	150.050157514	-0.0000222	-0.1482	
		+50	150.050167136	-0.0000126	-0.0840	
	Low Power	+20(Ref)	150.050149554	0.0000000	0.0000	
		-30	150.050179399	0.0000298	0.1989	
		-20	150.050152381	0.0000028	0.0188	
		-10	150.050146436	-0.0000031	-0.0208	
		0	150.050189745	0.0000402	0.2679	
		+10	150.050172302	0.0000227	0.1516	
		+30	150.050164322	0.0000148	0.0984	
		+40	150.050168711	0.0000192	0.1277	
		+50	150.050158522	0.0000090	0.0598	

162.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	+20(Ref)	162.050206308	0.0000000	0.0000	2.0
		-30	162.050175435	-0.0000309	-0.1905	
		-20	162.050175351	-0.0000310	-0.1910	
		-10	162.050209131	0.0000028	0.0174	
		0	162.050213205	0.0000069	0.0426	
		+10	162.050196231	-0.0000101	-0.0622	
		+30	162.050198112	-0.0000082	-0.0506	
		+40	162.050193318	-0.0000130	-0.0802	
		+50	162.050171634	-0.0000347	-0.2140	
	Low Power	+20(Ref)	162.050207490	0.0000000	0.0000	
		-30	162.050187453	-0.0000200	-0.1236	
		-20	162.050197603	-0.0000099	-0.0610	
		-10	162.050225663	0.0000182	0.1121	
		0	162.050171561	-0.0000359	-0.2217	
		+10	162.050196062	-0.0000114	-0.0705	
		+30	162.050225874	0.0000184	0.1134	
		+40	162.050215879	0.0000084	0.0518	
		+50	162.050200747	-0.0000067	-0.0416	

173.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	+20(Ref)	173.950216242	0.0000000	0.0000	2.0
		-30	173.950185351	-0.0000309	-0.1776	
		-20	173.950223499	0.0000073	0.0417	
		-10	173.950167780	-0.0000485	-0.2786	
		0	173.950216616	0.0000004	0.0022	
		+10	173.950194009	-0.0000222	-0.1278	
		+30	173.950190322	-0.0000259	-0.1490	
		+40	173.950214332	-0.0000019	-0.0110	
		+50	173.950186517	-0.0000297	-0.1709	
	Low Power	+20(Ref)	173.950166892	0.0000000	0.0000	
		-30	173.950160089	-0.0000068	-0.0391	
		-20	173.950189249	0.0000224	0.1285	
		-10	173.950153733	-0.0000132	-0.0756	
		0	173.950151995	-0.0000149	-0.0856	
		+10	173.950163885	-0.0000030	-0.0173	
		+30	173.950177816	0.0000109	0.0628	
		+40	173.950178543	0.0000117	0.0670	
		+50	173.950176017	0.0000091	0.0525	

138.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	+20(Ref)	138.050178894	0.0000000	0.0000	2.0
		-30	138.050147965	-0.0000309	-0.2240	
		-20	138.050171607	-0.0000073	-0.0528	
		-10	138.050134088	-0.0000448	-0.3246	
		0	138.050176224	-0.0000027	-0.0193	
		+10	138.050148944	-0.0000300	-0.2170	
		+30	138.050163621	-0.0000153	-0.1106	
		+40	138.050147529	-0.0000314	-0.2272	
		+50	138.050122681	-0.0000562	-0.4072	
	Low Power	+20(Ref)	138.050149485	0.0000000	0.0000	
		-30	138.050127225	-0.0000223	-0.1612	
		-20	138.050141537	-0.0000079	-0.0576	
		-10	138.050131781	-0.0000177	-0.1282	
		0	138.050124725	-0.0000248	-0.1794	
		+10	138.050148601	-0.0000009	-0.0064	
		+30	138.050134163	-0.0000153	-0.1110	
		+40	138.050167742	0.0000183	0.1322	
		+50	138.050125298	-0.0000242	-0.1752	

150.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	+20(Ref)	150.050184825	0.0000000	0.0000	2.0
		-30	150.050148028	-0.0000368	-0.2452	
		-20	150.050178036	-0.0000068	-0.0452	
		-10	150.050157692	-0.0000271	-0.1808	
		0	150.050159400	-0.0000254	-0.1694	
		+10	150.050172408	-0.0000124	-0.0828	
		+30	150.050176118	-0.0000087	-0.0580	
		+40	150.050184098	-0.0000007	-0.0048	
		+50	150.050168163	-0.0000167	-0.1110	
	Low Power	+20(Ref)	150.050143367	0.0000000	0.0000	
		-30	150.050168147	0.0000248	0.1651	
		-20	150.050163272	0.0000199	0.1327	
		-10	150.050191745	0.0000484	0.3224	
		0	150.050187233	0.0000439	0.2923	
		+10	150.050172790	0.0000294	0.1961	
		+30	150.050190675	0.0000473	0.3153	
		+40	150.050179737	0.0000364	0.2424	
		+50	150.050166130	0.0000228	0.1517	

162.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	+20(Ref)	162.050196494	0.0000000	0.0000	2.0
		-30	162.050193926	-0.0000026	-0.0158	
		-20	162.050204573	0.0000081	0.0499	
		-10	162.050224854	0.0000284	0.1750	
		0	162.050204490	0.0000080	0.0493	
		+10	162.050195992	-0.0000005	-0.0031	
		+30	162.050200801	0.0000043	0.0266	
		+40	162.050201437	0.0000049	0.0305	
		+50	162.050206321	0.0000098	0.0606	
	Low Power	+20(Ref)	162.050223985	0.0000000	0.0000	
		-30	162.050172267	-0.0000517	-0.3191	
		-20	162.050207135	-0.0000169	-0.1040	
		-10	162.050222154	-0.0000018	-0.0113	
		0	162.050176586	-0.0000474	-0.2925	
		+10	162.050196156	-0.0000278	-0.1717	
		+30	162.050224389	0.0000004	0.0025	
		+40	162.050218646	-0.0000053	-0.0329	
		+50	162.050219586	-0.0000044	-0.0271	

173.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	+20(Ref)	173.950154656	0.0000000	0.0000	2.0
		-30	173.950169673	0.0000150	0.0863	
		-20	173.950196233	0.0000416	0.2390	
		-10	173.950179467	0.0000248	0.1426	
		0	173.950170331	0.0000157	0.0901	
		+10	173.950170993	0.0000163	0.0939	
		+30	173.950180687	0.0000260	0.1496	
		+40	173.950146493	-0.0000082	-0.0469	
		+50	173.950148473	-0.0000062	-0.0355	
	Low Power	+20(Ref)	173.950185432	0.0000000	0.0000	
		-30	173.950202104	0.0000167	0.0958	
		-20	173.950189022	0.0000036	0.0206	
		-10	173.950177864	-0.0000076	-0.0435	
		0	173.950201341	0.0000159	0.0915	
		+10	173.950186640	0.0000012	0.0069	
		+30	173.950166394	-0.0000190	-0.1094	
		+40	173.950200112	0.0000147	0.0844	
		+50	173.950215839	0.0000304	0.1748	

138.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	+20(Ref)	138.050014890	0.0000000	0.0000	2.0
		-30	138.049990249	-0.0000246	-0.1785	
		-20	138.049998834	-0.0000161	-0.1163	
		-10	138.050019808	0.0000049	0.0356	
		0	138.050037197	0.0000223	0.1616	
		+10	138.050012308	-0.0000026	-0.0187	
		+30	138.050007588	-0.0000073	-0.0529	
		+40	138.049989385	-0.0000255	-0.1848	
		+50	138.050028586	0.0000137	0.0992	
	Low Power	+20(Ref)	138.050011443	0.0000000	0.0000	
		-30	138.050038144	0.0000267	0.1934	
		-20	138.050035421	0.0000240	0.1737	
		-10	138.050014265	0.0000028	0.0204	
		0	138.049994647	-0.0000168	-0.1217	
		+10	138.050015613	0.0000042	0.0302	
		+30	138.050001781	-0.0000097	-0.0700	
		+40	138.049998094	-0.0000133	-0.0967	
		+50	138.050013952	0.0000025	0.0182	

150.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	+20(Ref)	150.050010422	0.0000000	0.0000	2.0
		-30	150.050010625	0.0000002	0.0014	
		-20	150.050032064	0.0000216	0.1442	
		-10	150.050037560	0.0000271	0.1809	
		0	150.050000888	-0.0000095	-0.0635	
		+10	150.050029749	0.0000193	0.1288	
		+30	150.050044944	0.0000345	0.2301	
		+40	150.050059469	0.0000490	0.3269	
		+50	150.050056873	0.0000465	0.3096	
	Low Power	+20(Ref)	150.050015646	0.0000000	0.0000	
		-30	150.050010266	-0.0000054	-0.0359	
		-20	150.050040202	0.0000246	0.1637	
		-10	150.050037513	0.0000219	0.1457	
		0	150.050037142	0.0000215	0.1433	
		+10	150.050028338	0.0000127	0.0846	
		+30	150.050042879	0.0000272	0.1815	
		+40	150.050045980	0.0000303	0.2022	
		+50	150.050047543	0.0000319	0.2126	

162.05 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	+20(Ref)	162.050057824	0.0000000	0.0000	2.0
		-30	162.050058486	0.0000007	0.0041	
		-20	162.050015481	-0.0000423	-0.2613	
		-10	162.050061264	0.0000034	0.0212	
		0	162.050039834	-0.0000180	-0.1110	
		+10	162.050037402	-0.0000204	-0.1260	
		+30	162.050009699	-0.0000481	-0.2970	
		+40	162.050062676	0.0000049	0.0299	
		+50	162.050066700	0.0000089	0.0548	
	Low Power	+20(Ref)	162.050034190	0.0000000	0.0000	
		-30	162.050062598	0.0000284	0.1753	
		-20	162.050026428	-0.0000078	-0.0479	
		-10	162.050054081	0.0000199	0.1227	
		0	162.050046440	0.0000122	0.0756	
		+10	162.050040403	0.0000062	0.0383	
		+30	162.050032174	-0.0000020	-0.0124	
		+40	162.050014941	-0.0000192	-0.1188	
		+50	162.050024545	-0.0000096	-0.0595	

173.95 MHz

Type of Emission	Power	Temperature (Degree C)	Frequency (Hz)	Frequency Error (Hz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	+20(Ref)	173.950015903	0.0000000	0.0000	2.0
		-30	173.950017454	0.0000016	0.0089	
		-20	173.950000329	-0.0000156	-0.0895	
		-10	173.950007776	-0.0000081	-0.0467	
		0	173.950028440	0.0000125	0.0721	
		+10	173.950023050	0.0000071	0.0411	
		+30	173.950013964	-0.0000019	-0.0111	
		+40	173.950039586	0.0000237	0.1362	
		+50	173.949997349	-0.0000186	-0.1067	
	Low Power	+20(Ref)	173.950004534	0.0000000	0.0000	
		-30	173.950039112	0.0000346	0.1988	
		-20	173.950050588	0.0000461	0.2648	
		-10	173.950016884	0.0000123	0.0710	
		0	173.950028190	0.0000237	0.1360	
		+10	173.950024981	0.0000204	0.1175	
		+30	173.950005671	0.0000011	0.0065	
		+40	173.950001033	-0.0000035	-0.0201	
		+50	173.950035154	0.0000306	0.1760	

(2) Frequency Stability (Voltage Variation)

138.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	85	6.38	138.050110543	0.8007	2.0
		100	7.50	138.050109662	0.7944	
		115	8.63	138.050109315	0.7918	
	Low Power	85	6.38	138.050108498	0.7859	
		100	7.50	138.050108444	0.7855	
		115	8.63	138.050110433	0.7999	

150.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	85	6.38	150.050133366	0.8888	2.0
		100	7.50	150.050133761	0.8914	
		115	8.63	150.050132328	0.8819	
	Low Power	85	6.38	150.050132711	0.8844	
		100	7.50	150.050132492	0.8830	
		115	8.63	150.050133622	0.8905	

162.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	85	6.38	162.050157396	0.9713	2.0
		100	7.50	162.050157453	0.9716	
		115	8.63	162.050156365	0.9649	
	Low Power	85	6.38	162.050155871	0.9619	
		100	7.50	162.050157069	0.9693	
		115	8.63	162.050156658	0.9667	

173.95 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
16K0F3E	High Power	85	6.38	173.950154225	0.8866	2.0
		100	7.50	173.950154123	0.8860	
		115	8.63	173.950154406	0.8876	
	Low Power	85	6.38	173.950124743	0.7171	
		100	7.50	173.950125917	0.7239	
		115	8.63	173.950125012	0.7187	

138.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	85	6.38	138.050109513	0.7933	2.0
		100	7.50	138.050108970	0.7894	
		115	8.63	138.050108588	0.7866	
	Low Power	85	6.38	138.050109242	0.7913	
		100	7.50	138.050110324	0.7992	
		115	8.63	138.050108714	0.7875	

150.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	85	6.38	150.050132241	0.8813	2.0
		100	7.50	150.050132058	0.8801	
		115	8.63	150.050131909	0.8791	
	Low Power	85	6.38	150.050132138	0.8806	
		100	7.50	150.050132946	0.8860	
		115	8.63	150.050133360	0.8888	

162.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	85	6.38	162.050156109	0.9633	2.0
		100	7.50	162.050156282	0.9644	
		115	8.63	162.050155654	0.9605	
	Low Power	85	6.38	162.050156932	0.9684	
		100	7.50	162.050156311	0.9646	
		115	8.63	162.050156040	0.9629	

173.95 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
11K0F3E	High Power	85	6.38	173.950132304	0.7606	2.0
		100	7.50	173.950134194	0.7715	
		115	8.63	173.950132878	0.7639	
	Low Power	85	6.38	173.950147523	0.8481	
		100	7.50	173.950147931	0.8504	
		115	8.63	173.950146922	0.8446	

138.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	85	6.38	138.050013537	0.0981	2.0
		100	7.50	138.050013901	0.1007	
		115	8.63	138.050013671	0.0990	
	Low Power	85	6.38	138.050014637	0.1060	
		100	7.50	138.050015977	0.1157	
		115	8.63	138.050016526	0.1197	

150.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	85	6.38	150.050029009	0.1933	2.0
		100	7.50	150.050029358	0.1957	
		115	8.63	150.050029039	0.1935	
	Low Power	85	6.38	150.050028733	0.1915	
		100	7.50	150.050028701	0.1913	
		115	8.63	150.050027646	0.1842	

162.05 MHz

Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	85	6.38	162.050036648	0.2261	2.0
		100	7.50	162.050036943	0.2280	
		115	8.63	162.050036574	0.2257	
	Low Power	85	6.38	162.050040481	0.2498	
		100	7.50	162.050040898	0.2524	
		115	8.63	162.050039887	0.2461	

173.95 MHz

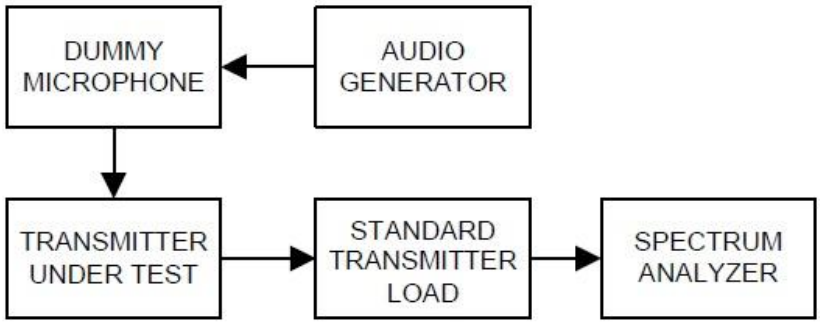
Type of Emission	Power	Diviation (%)	Voltage (V)	Frequency (MHz)	Frequency stability (ppm)	Limit (ppm)
4K00F2D	High Power	85	6.38	173.950022103	0.1271	2.0
		100	7.50	173.950022239	0.1278	
		115	8.63	173.950022013	0.1265	
	Low Power	85	6.38	173.950025471	0.1464	
		100	7.50	173.950026519	0.1525	
		115	8.63	173.950025413	0.1461	

8.3 Occupied Bandwidth

▣ Definition

The transmitter sideband spectrum denotes the sideband power produced at a discrete frequency separation from the carrier up to the test bandwidth (see TIA-603-E Section 1.3.4.4) due to all sources of unwanted noise within the transmitter in a modulated condition.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

According to TIA-603-E Section 2.2.11.2 / RSS-119 Section 5.5

a) For EUT supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for +/- 2.5 kHz deviation (or 50 % modulation). (FM modulation).

b) With level constant, the signal level was increased 16 dB.

c) For EUT supporting digital modulation, the digital modulation mode was operated to its maximum extent.

d) Adjust the spectrum analyzer for the following setting:

1) RBW : 100Hz (Authorized Band 6 kHz),
100Hz (Authorized Band 11.25 kHz),
300Hz (Authorized Band 20 kHz)

2) VBW : Video Bandwidth at least 10 times the resolution bandwidth.

4) Sweep Speed : Sweep Speed slow enough to maintain measurement calibration.

5) Sampling Time : 10 times

6) Detector Mode = Positive Peak.

e) The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

▣ TEST RESULTS

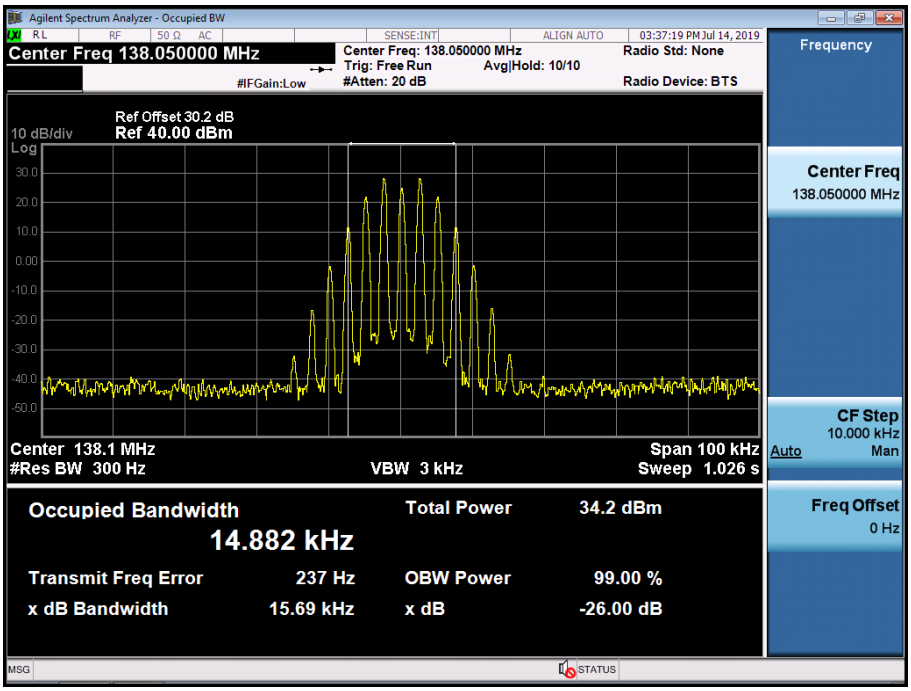
Certification	Type of Emission	Channel Bandwidth (kHz)	Power	Test Frequency (MHz)	Measured 99% OBW at Maximum Freq. Deviation(kHz)	Limit (kHz)
FCC	16K0F3E	25	High Power	138.05	14.882	20.00
				150.05	14.931	
				162.05	15.017	
				173.95	15.038	
			Low Power	138.05	14.705	
				150.05	14.646	
				162.05	14.685	
				173.95	14.764	
IC	16K0F3E	25	High Power	138.05	14.712	
				150.05	14.638	
				162.05	14.663	
				173.95	14.638	
			Low Power	138.05	14.705	
				150.05	14.646	
				162.05	14.685	
				173.95	14.764	
FCC/IC	11K0F3E	12.5	High Power	138.05	9.910	11.25
				150.05	9.878	
				162.05	9.914	
				173.95	9.927	
			Low Power	138.05	9.912	
				150.05	9.910	
				162.05	9.916	
				173.95	9.917	
FCC/IC	8K30F1E, 8K30F1D, 8K30F7W	12.5	High Power	138.05	7.719	
				150.05	7.702	
				162.05	7.678	
				173.95	7.579	
			Low Power	138.05	7.642	
				150.05	7.643	
				162.05	7.732	
				173.95	7.562	
FCC/IC	7K60FXD, 7K60FXE	12.5	High Power	138.05	7.490	
				150.05	7.333	
				162.05	7.424	
				173.95	7.264	
			Low Power	138.05	7.466	
				150.05	7.414	
				162.05	7.426	
				173.95	7.421	

Certification	Type of Emission	Channel Bandwidth (kHz)	Power	Test Frequency (MHz)	Measured 99% OBW at Maximum Freq. Deviation(kHz)	Limit (kHz)
FCC/IC	4K00F1E, 4K00F1D, 4K00F7W	6.25	High Power	138.05	3.524	6.00
				150.05	3.521	
				162.05	3.521	
				173.95	3.491	
			Low Power	138.05	3.529	
				150.05	3.523	
				162.05	3.514	
				173.95	3.492	
FCC/IC	4K00F2D	6.25	High Power	138.05	4.058	
				150.05	4.058	
				162.05	4.067	
				173.95	4.065	
			Low Power	138.05	4.058	
				150.05	4.058	
				162.05	4.069	
				173.95	4.065	

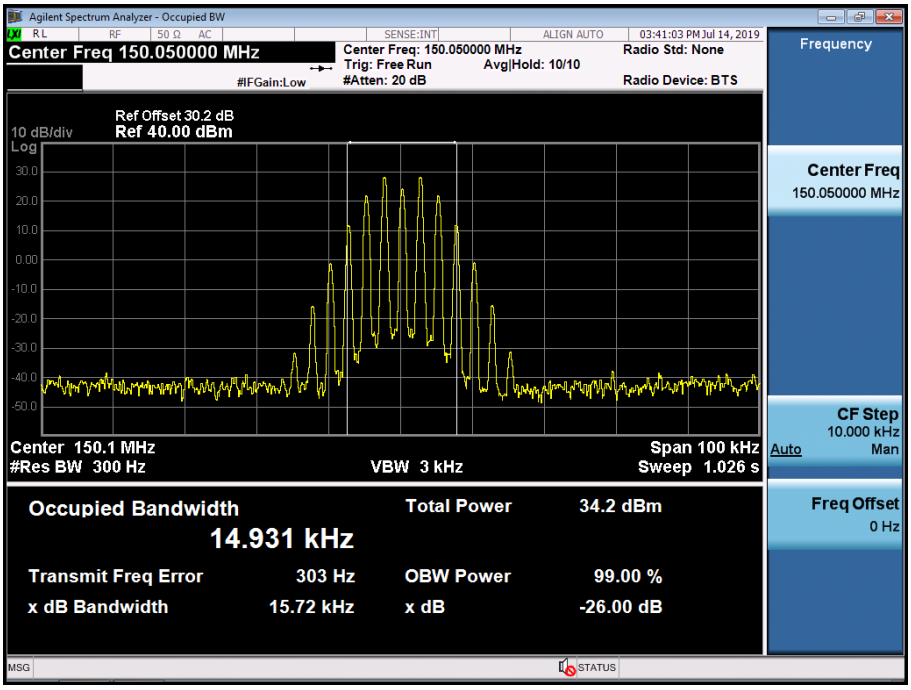
▣ Plots of 99% Bandwidth

16K0F3E_FCC

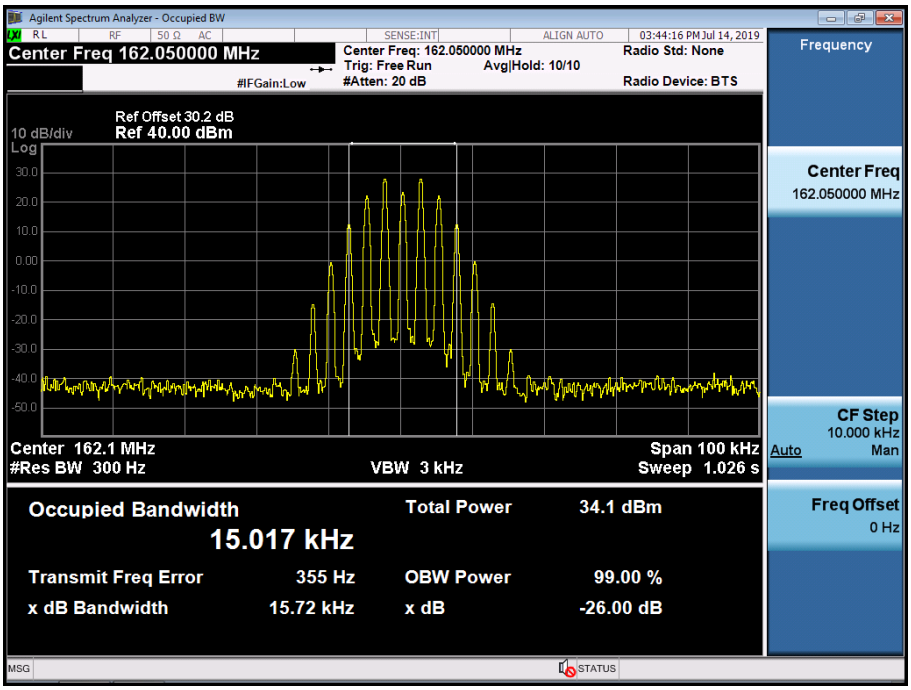
(138.05 MHz)_High



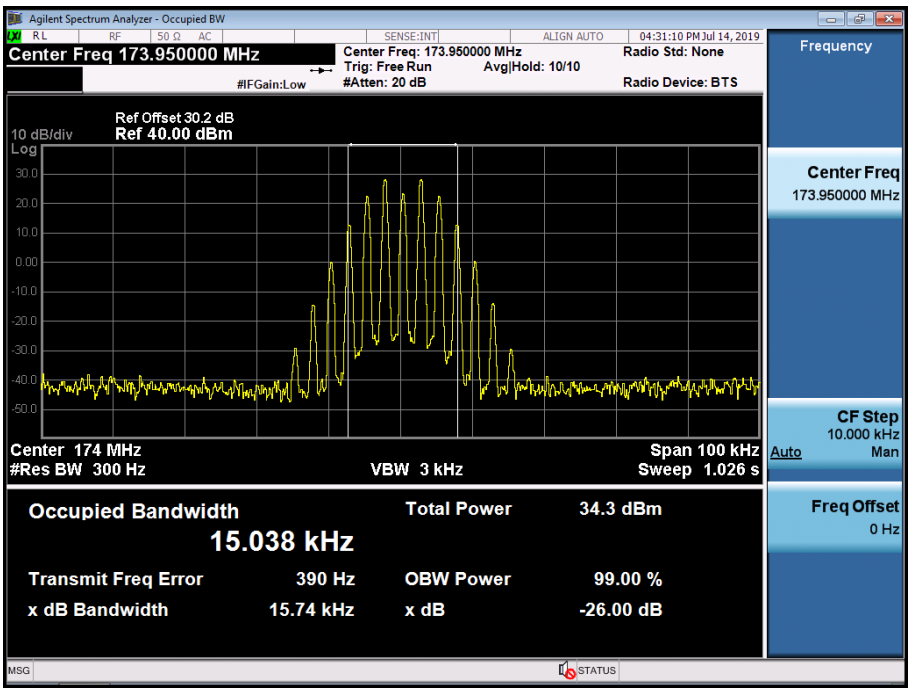
(150.05 MHz)_High



(162.05 MHz)_High

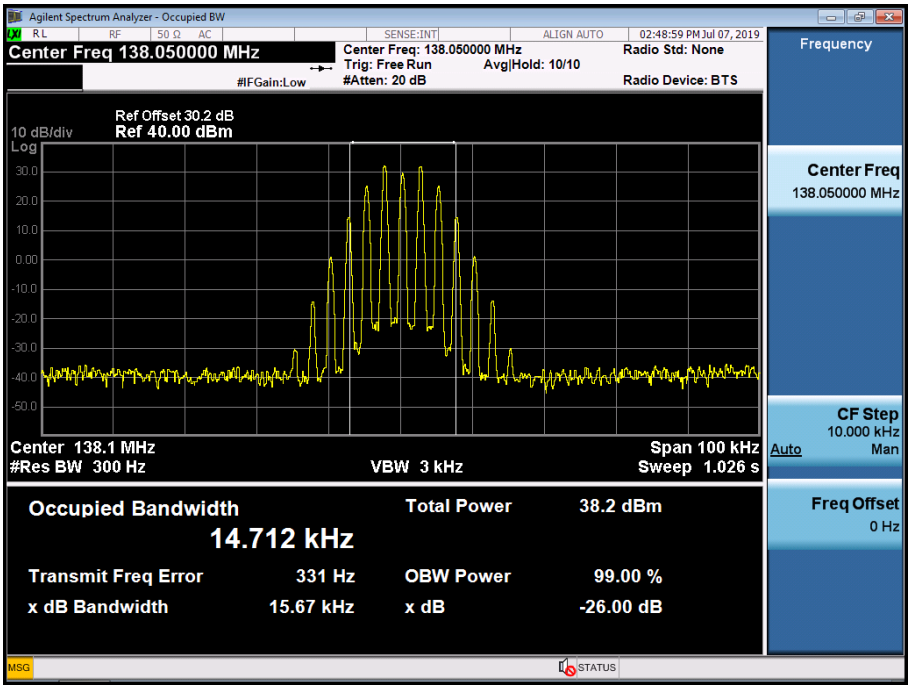


(173.95 MHz)_High

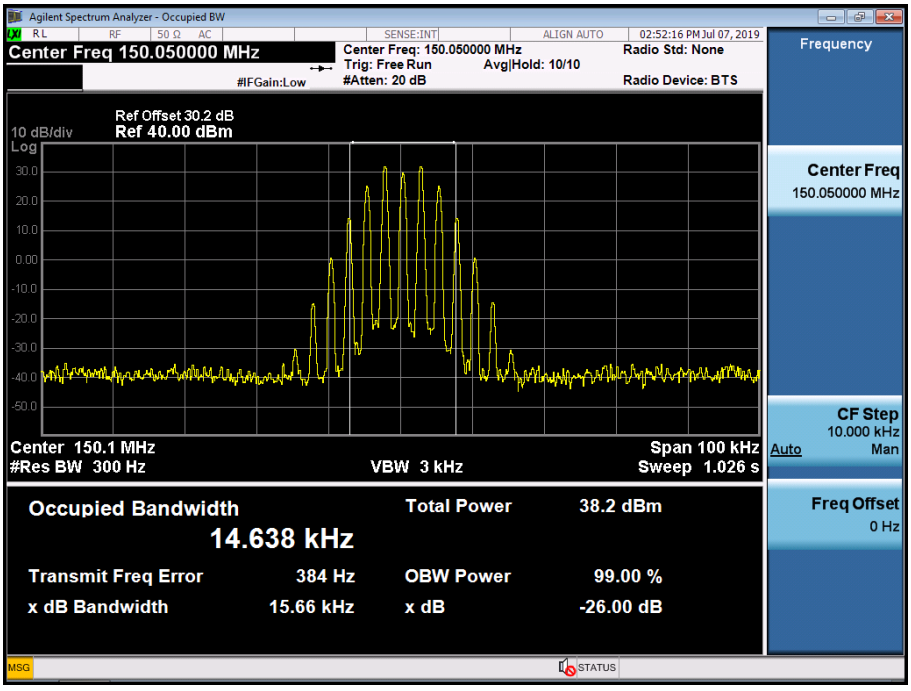


16K0F3E_IC

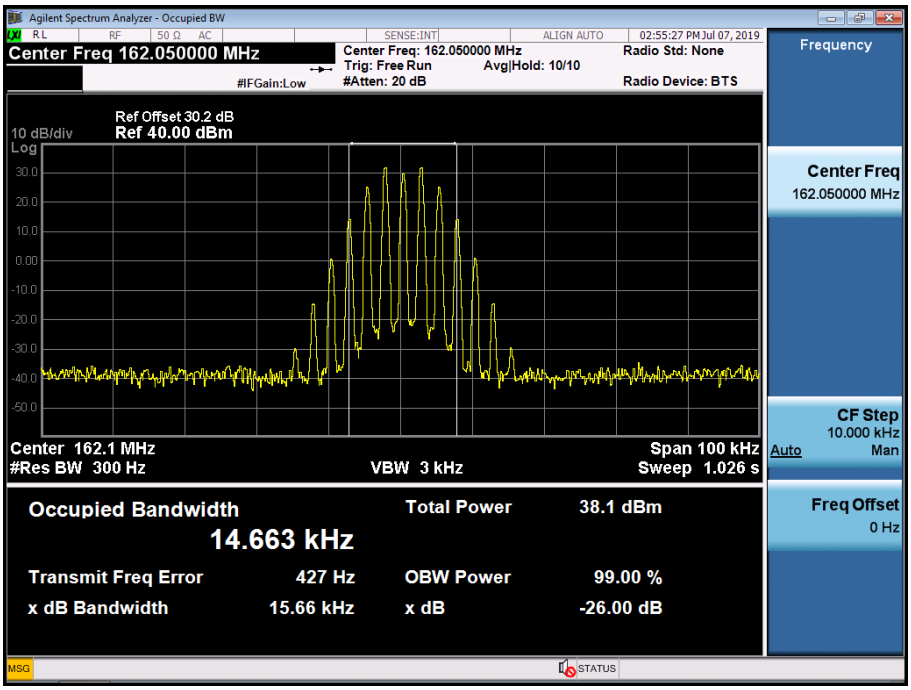
(138.05 MHz)_High



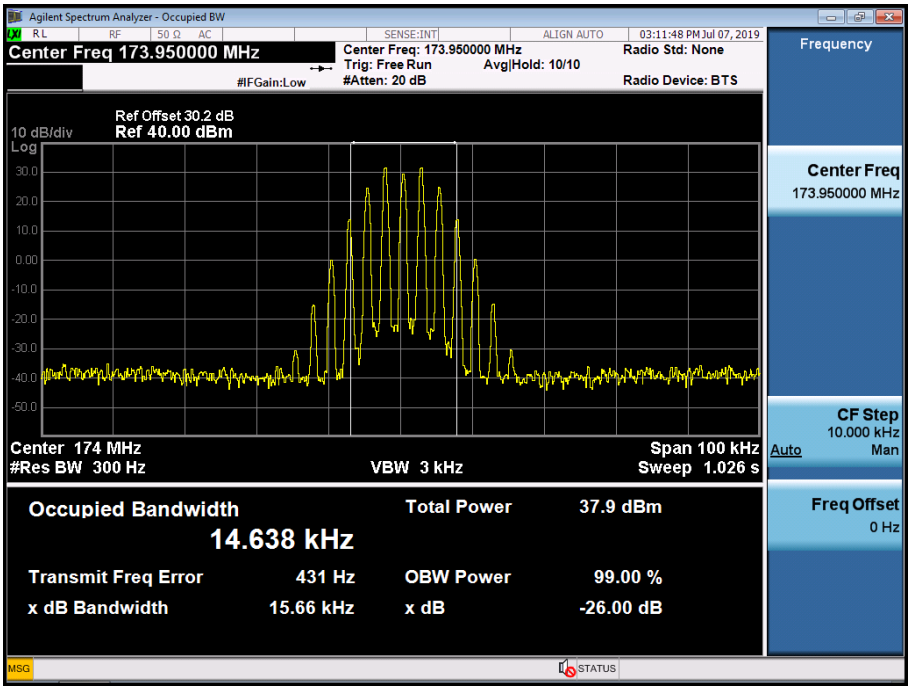
(150.05 MHz)_High



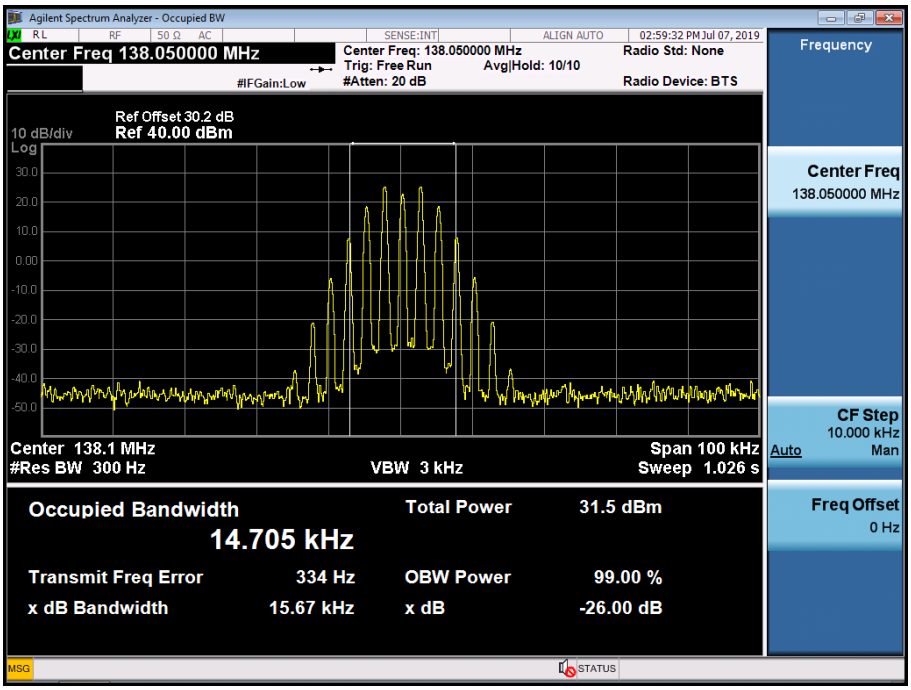
(162.05 MHz)_High



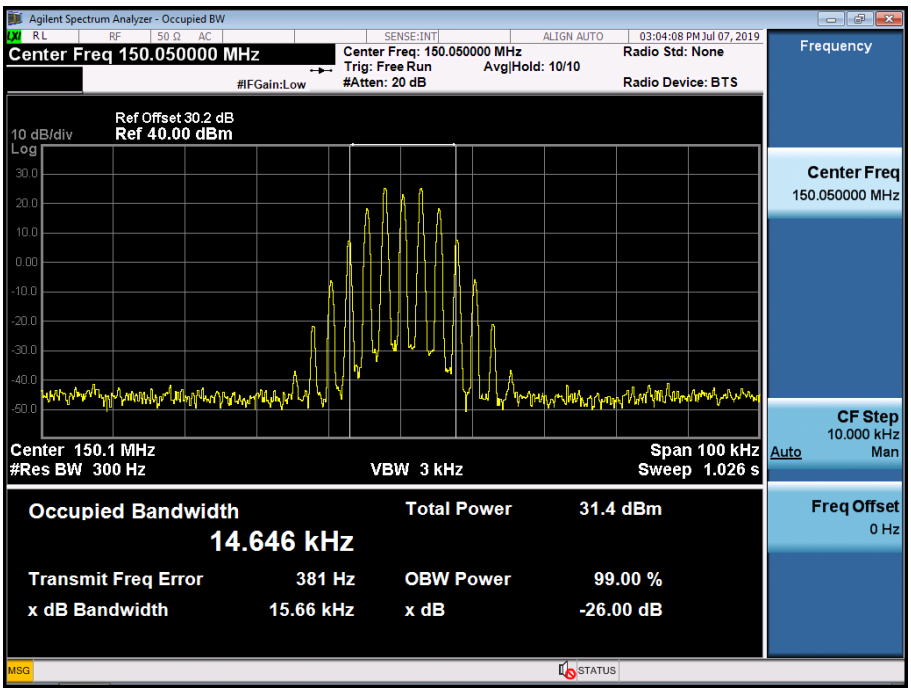
(173.95 MHz)_High



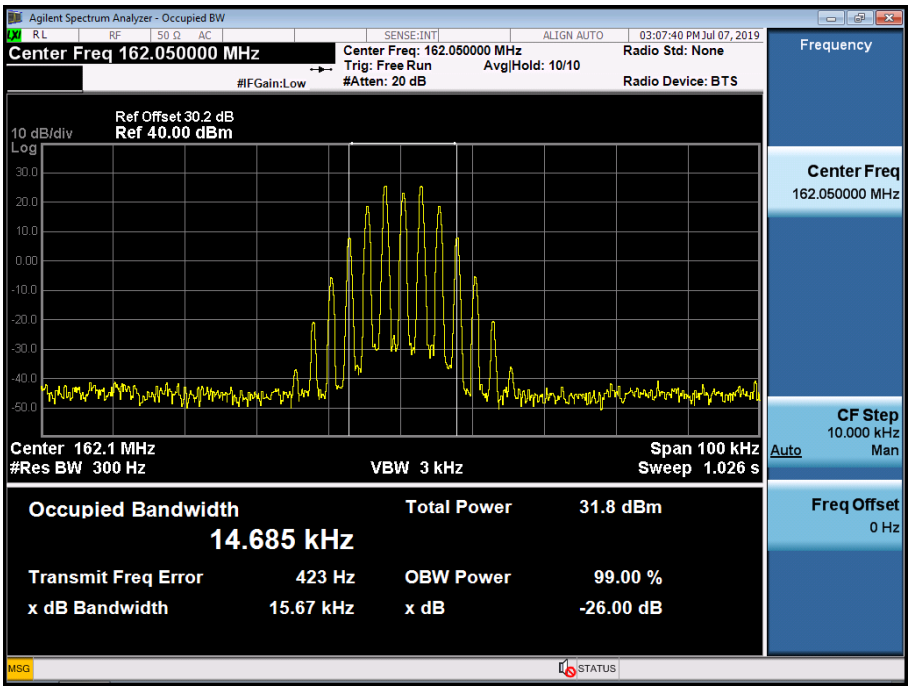
(138.05 MHz)_Low



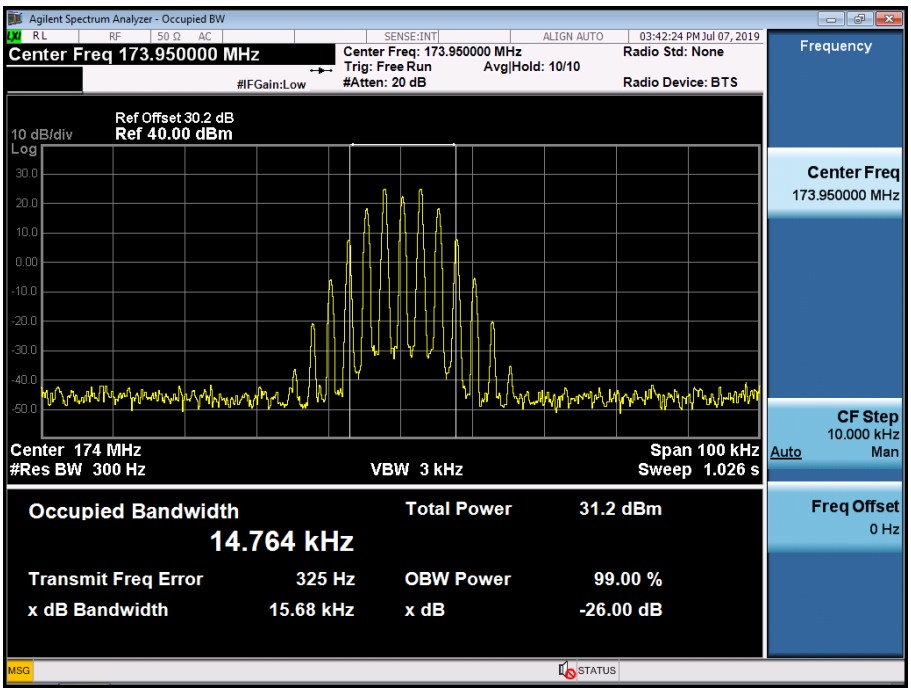
(150.05 MHz)_ Low



(162.05 MHz)_ Low

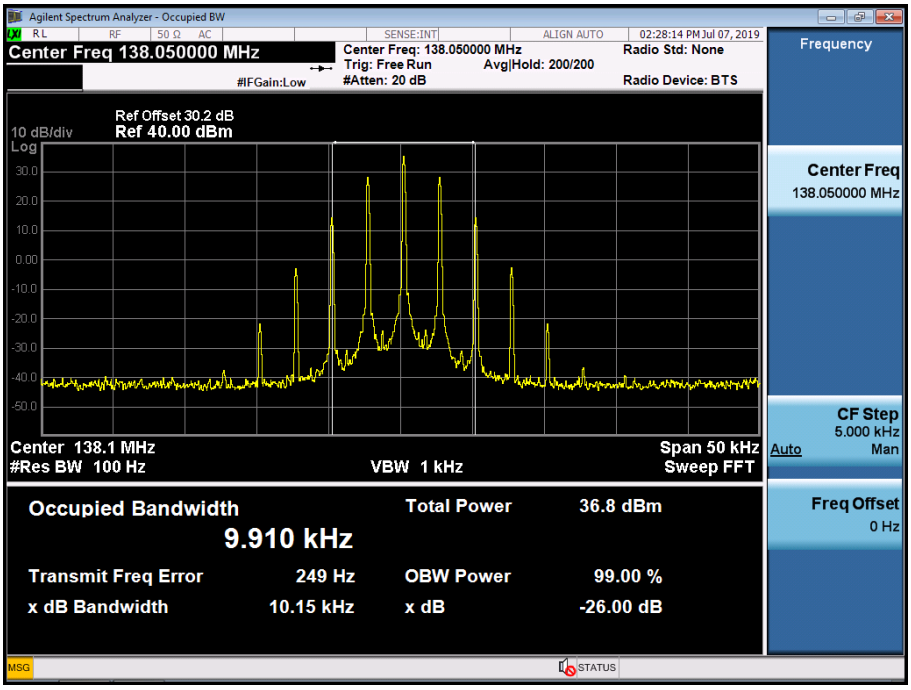


(173.95 MHz)_ Low

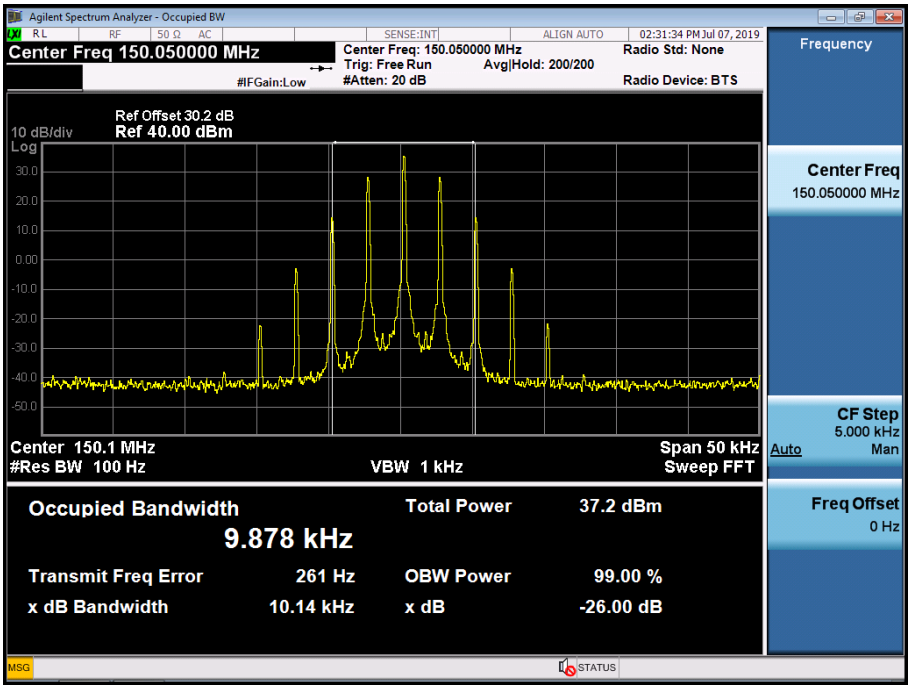


11K0F3E_FCC/IC

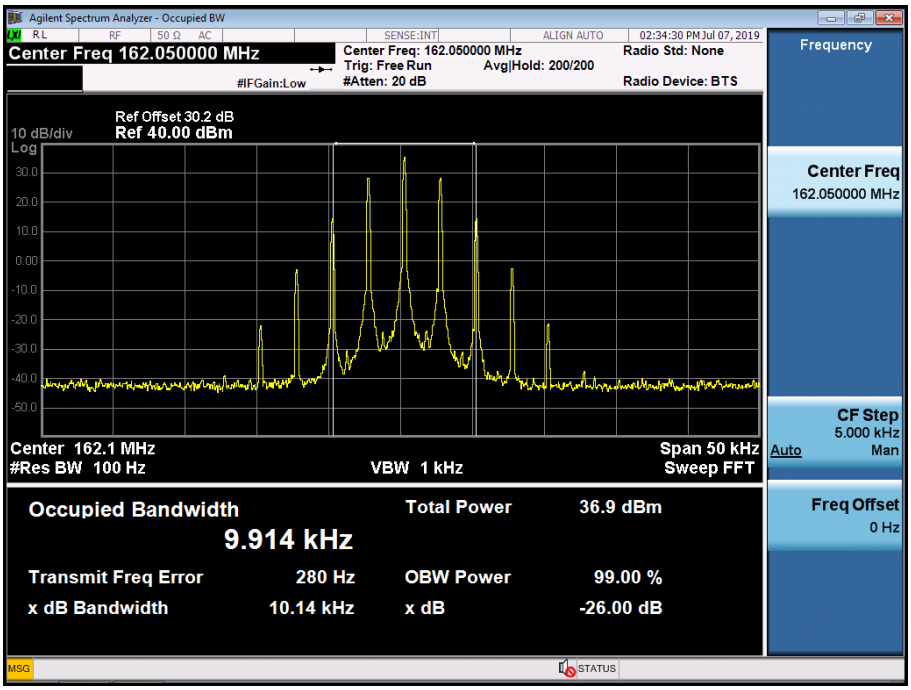
(138.05 MHz)_High



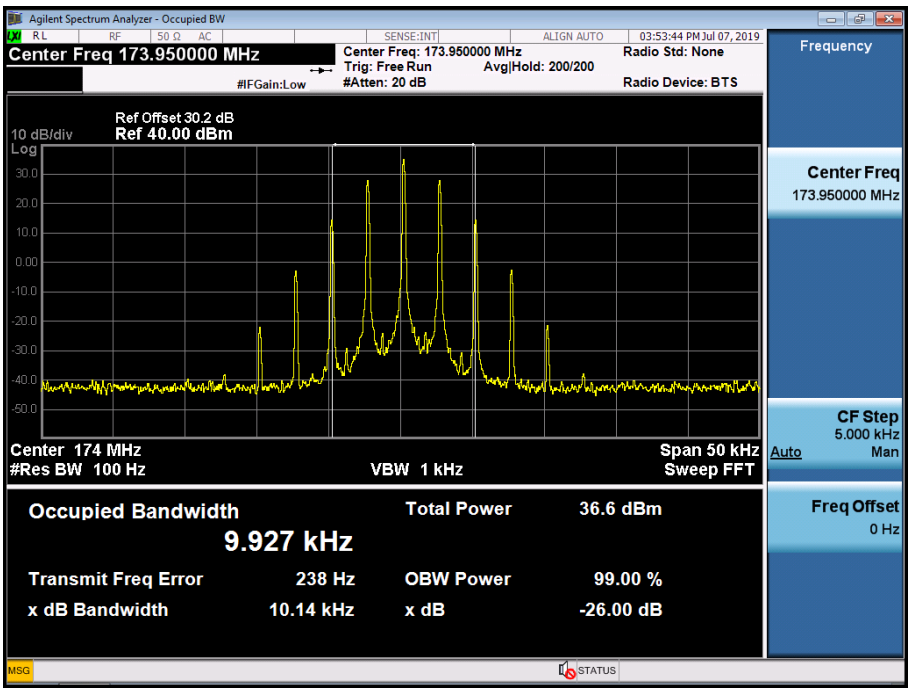
(150.05 MHz)_High



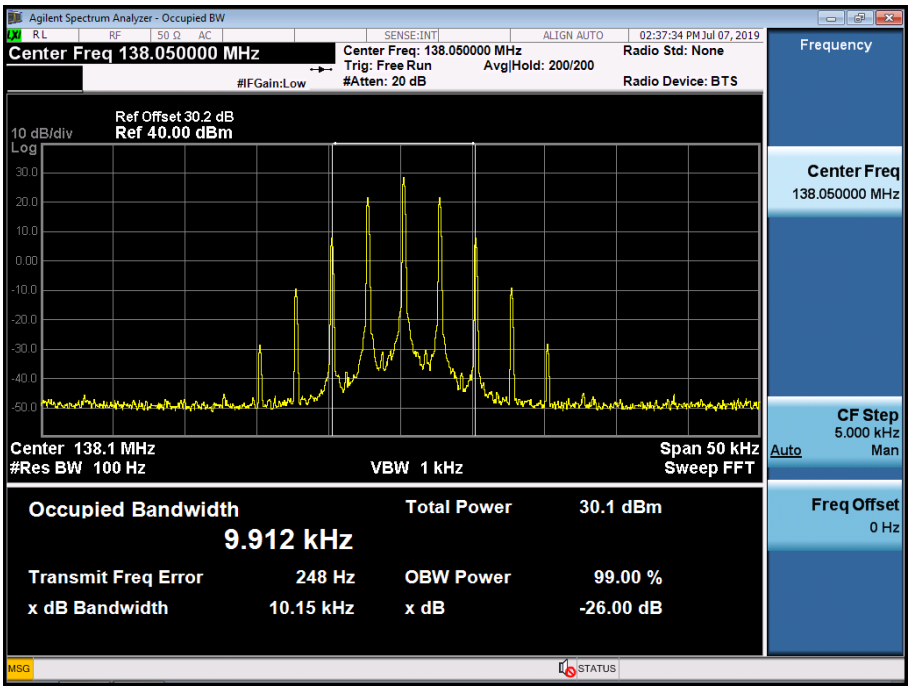
(162.05 MHz)_High



(173.95 MHz)_High



(138.05 MHz)_Low



(150.05 MHz)_ Low