

# TEST REPORT

FCC/IC Test for NX-1300-K5

**APPLICANT**

JVCKENWOOD Corporation

**REPORT NO.**

HCT-RF-1907-FI025

**DATE OF ISSUE**

26 July 2019

**HCT Co., Ltd.**

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REPORT**  
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NX-1300-K5

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**FCC ID/IC**  
K44501100/282F-501100

|                     |                                                                                         |
|---------------------|-----------------------------------------------------------------------------------------|
| Applicant           | JVCKENWOOD Corporation<br>1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan |
| Product Name        | UHF TRANSCEIVER                                                                         |
| Model(s)            | NX-1300-K5                                                                              |
| Additional Model(s) | NX-1300-K4                                                                              |
| Test Standard Used  | Part 2, 22, 74, 90 / RSS- Gen Issue 5, RSS-119 Issue 12                                 |
| Frequency Range     | FCC: 406.1 MHz ~ 470.0 MHz<br>IC: 406.1 ~ 430.0 MHz, 450.0 ~ 470.0 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

(Signature)  
(Signature)

**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)

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**1. GENERAL INFORMATION**

|                      |                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------|
| Manufacturer:        | JVCKENWOOD Corporation                                                                                    |
| Address:             | 1-16-2 Hakusan Midori-ku Yokohama-shi Kanagawa 226-8525 Japan                                             |
| FCC ID:              | K44501100                                                                                                 |
| ISED:                | 282F-501100                                                                                               |
| EUT Type:            | UHF TRANSCEIVER                                                                                           |
| Model(s):            | NX-1300-K5                                                                                                |
| Additional Model(s): | NX-1300-K4                                                                                                |
| Date(s) of Tests:    | July 01, 2019 ~ July 26, 2019                                                                             |
| Place of Tests:      | HCT Co., Ltd.<br>74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA |

## 2. EUT DESCRIPTION

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Supply Voltage  | DC 7.5V $\pm$ 20%                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Output Power          | 5 W (Power output continuously variable to 0.25 W) (Max : 5.2 W)                                                                                                                                                                                                                                                                                                                                                                                |
| Battery type          | KNB-45L Li-Ion Battery Pack (2000mA)<br>KNB-53N Ni-MH Battery Pack (1400mA)<br>KNB-29N Ni-MH Battery Pack (1500mA)<br>KNB-69L Li-ion Battery Pack (2450mA)<br>KNB-82LC (Li-ion Battery Pack)                                                                                                                                                                                                                                                    |
| Antenna               | KRA-23M UHF Low Profile Helical Antenna (440-490 MHz)<br>KRA-23M2 UHF Low Profile Helical Antenna (470-520 MHz)<br>KRA-23M3 UHF Low Profile Helical Antenna (400-450 MHz)<br>KRA-27M UHF Whip Antenna (440-490 MHz)<br>KRA-27M2 UHF Whip Antenna (470-520 MHz)<br>KRA-27M3 UHF Whip Antenna (400-450 MHz)<br>KRA-42M UHF Stubby Antenna (440-490 MHz)<br>KRA-42M2 UHF Stubby Antenna (470-520 MHz)<br>KRA-42M3 UHF Stubby Antenna (400-450 MHz) |
| Peak Antenna gain     | KRA-23M UHF Low Profile Helical Antenna: 0 dBd<br>KRA-23M2 UHF Low Profile Helical Antenna: 0 dBd<br>KRA-23M3 UHF Low Profile Helical Antenna: 0 dBd<br>KRA-27M UHF Whip Antenna: 0 dBd<br>KRA-27M2 UHF Whip Antenna: 0 dBd<br>KRA-27M3 UHF Whip Antenna: 0 dBd<br>KRA-42M UHF Stubby Antenna: 0 dBd<br>KRA-42M2 UHF Stubby Antenna: 0 dBd<br>KRA-42M3 UHF Stubby Antenna: 0 dBd                                                                |
| Type of Emission      | 16K0F3E: Analogue (*16K0F3E is IC only)<br>11K0F3E: Analogue<br>8K30F1E, 8K30F1D, 8K30F7W: NXDN<br>7K60FXE, 7K60FXD: DMR<br>4K00F1E, 4K00F1D, 4K00F7W: NXDN<br>4K00F2D: CWID                                                                                                                                                                                                                                                                    |
| Channel Bandwidth     | 25 kHz* / 6.25 kHz / 12.5 kHz (*25kHz is IC only)                                                                                                                                                                                                                                                                                                                                                                                               |
| Operating Temperature | -30 °C ~ +60 °C                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Frequency Range       | 406.1 MHz ~ 470.0 MHz (FCC)<br>406.1 ~ 430.0 MHz, 450.0 ~ 470.0 MHz (IC)                                                                                                                                                                                                                                                                                                                                                                        |
| Test Frequency        | 406.15 MHz / 429.95 MHz / 450.05 MHz / 469.95 MHz                                                                                                                                                                                                                                                                                                                                                                                               |

|                     |                                                |
|---------------------|------------------------------------------------|
| Maximum deviation   | 16K0F3E: $\pm 5$ kHz<br>11K0F3E: $\pm 2.5$ kHz |
| Frequency Stability | $\pm 1.0$ ppm                                  |
| PMN                 | NX-1300-K4, NX-1300-K5                         |
| HVIN                | NX-1300-K4, NX-1300-K5                         |
| 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 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;

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dB})}$$

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-1300-K5 & Additional Models were tested and the worst case results are reported.  
(Worst case : NX-1300-K5)
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-23M, KRA-23M2, KRA-23M3, KRA-27M, KRA-27M2, KRA-27M3,  
KRA-42M, KRA-42M2, KRA-42M3
  - Worstcase : KRA-23M, KRA-23M3, KRA-27M, KRA-27M3
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-1300-K5 & Additional Models were tested and the worst case results are reported.  
(Worst case : NX-1300-K5)
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,<br>§ 22.565,<br>§ 74.461,<br>§ 90.205              | RSS119 (5.4)         | CONDUCTED      | PASS        |
| Unwanted Emissions                   | § 2.1051<br>§ 22.359,<br>§ 74.462,<br>§ 74.535,<br>§ 90.210  | RSS119 (5.8)         | CONDUCTED      | PASS        |
| 99% Bandwidth(ISED)                  | NA                                                           | RSS119 (5.5)         |                | PASS        |
| Carrier Frequency Stability          | § 2.1055,<br>§ 22.355,<br>§ 74.464,<br>§ 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,<br>§ 90.214                                        | RSS119 (5.9)         |                | PASS        |
| Emission Mask                        | § 2.1049,<br>§ 22.359,<br>§ 74.462,<br>§ 74.535,<br>§ 90.210 | RSS119 (5.8)         |                | PASS        |
| Field Strength of Spurious Radiation | § 2.1053<br>§ 22.359,<br>§ 74.462,<br>§ 74.535,<br>§ 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<br>12.5 kHz: 50 + 10 log (P)dB<br>25 kHz: 43 + 10 log (P)dB | 6.25 kHz: 55+ 10 log (P)dB<br>12.5 kHz: 50 + 10 log (P)dB<br>25 kHz: 43 + 10 log (P)dB |
| 99% Bandwidth(ISED)                  | N/A                                                                                    | 6.25 kHz: 6 kHz<br>12.5 kHz: 11.25kHz<br>25 kHz: 20 kHz                                |
| Carrier Frequency Stability          | 6.25 kHz = 1 ppm<br>12.5 kHz = 2.5 ppm<br>25 kHz = 5 ppm                               | 6.25 kHz = 1 ppm<br>12.5 kHz = 2.5 ppm<br>25 kHz = 5 ppm                               |
| Audio Frequency Response             | Varies                                                                                 | N/A                                                                                    |
| Audio Low Pass Filter                |                                                                                        |                                                                                        |
| Modulation Limiting                  | 25 kHz = 5 kHz<br>12.5 kHz = 2.5 kHz                                                   | N/A                                                                                    |
| Transient Frequency Behavior         | <u>See Note3</u>                                                                       | <u>See Note3</u>                                                                       |
| Emission Mask                        | <u>See Note2</u>                                                                       | <u>See Note2</u>                                                                       |
| Field Strength of Spurious Radiation | 6.25 kHz: 55+ 10 log (P)dB<br>12.5 kHz: 50 + 10 log (P)dB<br>25 kHz: 43 + 10 log (P)dB | 6.25 kHz: 55+ 10 log (P)dB<br>12.5 kHz: 50 + 10 log (P)dB<br>25 kHz: 43 + 10 log (P)dB |
| Receiver Spurious Emissions          | N/A                                                                                    | <u>See Note1</u>                                                                       |

### Note:

#### 1. Receiver Spurious Emissions Limit :

| Frequency<br>(MHz) | Field Strength<br>( $\mu\text{V}/\text{m}$ at 3 meters) |
|--------------------|---------------------------------------------------------|
| 30 – 88            | 100                                                     |
| 88 – 216           | 150                                                     |
| 216 – 960          | 200                                                     |
| Above 960          | 500                                                     |

#### 2. Emission Mask Limit :

Channel Bandwidth: 25kHz

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

Channel Bandwidth: 12.5kHz

| Channel Spacing<br>(kHz) | Displacement Frequency<br>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;<br>70<br>or<br>$50 + 10 \log_{10}(COP)$ |

Channel Bandwidth: 6.25kHz

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

### 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 <sub>1</sub>              | ±25                                | 5                             | 10            |
|                         | t <sub>2</sub>              | ±12.5                              | 20                            | 25            |
|                         | t <sub>3</sub>              | ±25                                | 5                             | 10            |
| 12.5                    | t <sub>1</sub>              | ±12.5                              | 5                             | 10            |
|                         | t <sub>2</sub>              | ±6.25                              | 20                            | 25            |
|                         | t <sub>3</sub>              | ±12.5                              | 5                             | 10            |
| 6.25                    | t <sub>1</sub>              | ±6.25                              | 5                             | 10            |
|                         | t <sub>2</sub>              | ±3.125                             | 20                            | 25            |
|                         | t <sub>3</sub>              | ±6.25                              | 5                             | 10            |

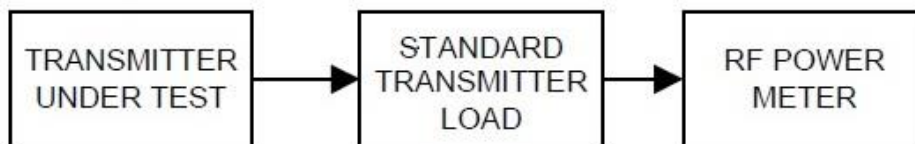
## 8. TEST RESULT

### 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    |
| IC            | 16K0F3E                         | 25                      | 406.15               | 36.08                | 4.06 | 23.38     | 0.22 |
|               |                                 |                         | 429.95               | 35.91                | 3.90 | 22.75     | 0.19 |
|               |                                 |                         | 450.05               | 36.26                | 4.23 | 24.27     | 0.27 |
|               |                                 |                         | 469.95               | 36.04                | 4.02 | 25.04     | 0.32 |
| FCC/IC        | 11K0F3E                         | 12.5                    | 406.15               | 36.09                | 4.06 | 23.36     | 0.22 |
|               |                                 |                         | 429.95               | 35.88                | 3.87 | 22.76     | 0.19 |
|               |                                 |                         | 450.05               | 36.27                | 4.23 | 24.27     | 0.27 |
|               |                                 |                         | 469.95               | 36.08                | 4.06 | 24.86     | 0.31 |
| FCC/IC        | 8K30F1E,<br>8K30F1D,<br>8K30F7W | 12.5                    | 406.15               | 36.34                | 4.30 | 23.21     | 0.21 |
|               |                                 |                         | 429.95               | 36.20                | 4.17 | 22.42     | 0.17 |
|               |                                 |                         | 450.05               | 36.39                | 4.35 | 23.95     | 0.25 |
|               |                                 |                         | 469.95               | 36.30                | 4.27 | 24.36     | 0.27 |
| FCC/IC        | 7K60FXD,<br>7K60FXE             | 12.5                    | 406.15               | 36.39                | 4.36 | 23.25     | 0.21 |
|               |                                 |                         | 429.95               | 36.26                | 4.23 | 22.73     | 0.19 |
|               |                                 |                         | 450.05               | 36.46                | 4.42 | 24.06     | 0.25 |
|               |                                 |                         | 469.95               | 36.33                | 4.30 | 24.41     | 0.28 |
| FCC/IC        | 4K00F1E,<br>4K00F1D,<br>4K00F7W | 6.25                    | 406.15               | 36.31                | 4.27 | 23.15     | 0.21 |
|               |                                 |                         | 429.95               | 36.16                | 4.13 | 22.86     | 0.19 |
|               |                                 |                         | 450.05               | 36.36                | 4.33 | 23.98     | 0.25 |
|               |                                 |                         | 469.95               | 36.28                | 4.24 | 24.38     | 0.27 |
| FCC/IC        | 4K00F2D                         | 6.25                    | 406.15               | 35.92                | 3.91 | 22.68     | 0.19 |
|               |                                 |                         | 429.95               | 35.92                | 3.91 | 22.89     | 0.19 |
|               |                                 |                         | 450.05               | 36.23                | 4.20 | 22.89     | 0.19 |
|               |                                 |                         | 469.95               | 35.92                | 3.91 | 22.78     | 0.19 |

# TEST RESULTS(ERP)

| Certification | Type of Emission                | Channel Bandwidth (kHz) | Test Frequency (MHz) | ERP        |      |           |      |
|---------------|---------------------------------|-------------------------|----------------------|------------|------|-----------|------|
|               |                                 |                         |                      | High Power |      | Low Power |      |
|               |                                 |                         |                      | dBm        | W    | dBm       | W    |
| IC            | 16K0F3E                         | 25                      | 406.15               | 36.08      | 4.06 | 23.38     | 0.22 |
|               |                                 |                         | 429.95               | 35.91      | 3.90 | 22.75     | 0.19 |
|               |                                 |                         | 450.05               | 36.26      | 4.23 | 24.27     | 0.27 |
|               |                                 |                         | 469.95               | 36.04      | 4.02 | 25.04     | 0.32 |
| FCC/IC        | 11K0F3E                         | 12.5                    | 406.15               | 36.09      | 4.06 | 23.36     | 0.22 |
|               |                                 |                         | 429.95               | 35.88      | 3.87 | 22.76     | 0.19 |
|               |                                 |                         | 450.05               | 36.27      | 4.23 | 24.27     | 0.27 |
|               |                                 |                         | 469.95               | 36.08      | 4.06 | 24.86     | 0.31 |
| FCC/IC        | 8K30F1E,<br>8K30F1D,<br>8K30F7W | 12.5                    | 406.15               | 36.34      | 4.30 | 23.21     | 0.21 |
|               |                                 |                         | 429.95               | 36.20      | 4.17 | 22.42     | 0.17 |
|               |                                 |                         | 450.05               | 36.39      | 4.35 | 23.95     | 0.25 |
|               |                                 |                         | 469.95               | 36.30      | 4.27 | 24.36     | 0.27 |
| FCC/IC        | 7K60FXD,<br>7K60FXE             | 12.5                    | 406.15               | 36.39      | 4.36 | 23.25     | 0.21 |
|               |                                 |                         | 429.95               | 36.26      | 4.23 | 22.73     | 0.19 |
|               |                                 |                         | 450.05               | 36.46      | 4.42 | 24.06     | 0.25 |
|               |                                 |                         | 469.95               | 36.33      | 4.30 | 24.41     | 0.28 |
| FCC/IC        | 4K00F1E,<br>4K00F1D,<br>4K00F7W | 6.25                    | 406.15               | 36.31      | 4.27 | 23.15     | 0.21 |
|               |                                 |                         | 429.95               | 36.16      | 4.13 | 22.86     | 0.19 |
|               |                                 |                         | 450.05               | 36.36      | 4.33 | 23.98     | 0.25 |
|               |                                 |                         | 469.95               | 36.28      | 4.24 | 24.38     | 0.27 |
| FCC/IC        | 4K00F2D                         | 6.25                    | 406.15               | 35.92      | 3.91 | 22.68     | 0.19 |
|               |                                 |                         | 429.95               | 35.92      | 3.91 | 22.89     | 0.19 |
|               |                                 |                         | 450.05               | 36.23      | 4.20 | 22.89     | 0.19 |
|               |                                 |                         | 469.95               | 35.92      | 3.91 | 22.78     | 0.19 |

Note:

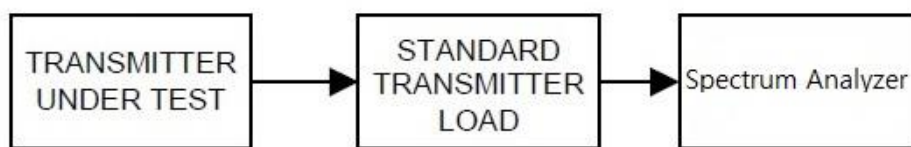
1. ERP = Carrier Output Power + Peak Antenna gain

## 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.

- Connect the equipment as illustrated.
- Operate the equipment in standby conditions for 15 minutes before proceeding.
- Record the carrier frequency of the transmitter as  $MCF_{MHz}$
- Calculate the ppm frequency error by the following:

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

where

$MCF_{MHz}$  is the Measured Carrier Frequency in MHz

$ACF_{MHz}$  is the Assigned Carrier Frequency in MHz

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

# TEST RESULTS

## (1) Frequency Stability (Temperature Variation)

406.15 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 16K0F3E          | High Power | +20(Ref)               | 406.150437931  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 406.150445492  | 0.0000076            | 0.0186                    |             |
|                  |            | -20                    | 406.150405048  | -0.0000329           | -0.0810                   |             |
|                  |            | -10                    | 406.150398950  | -0.0000390           | -0.0960                   |             |
|                  |            | 0                      | 406.150413563  | -0.0000244           | -0.0600                   |             |
|                  |            | +10                    | 406.150428699  | -0.0000092           | -0.0227                   |             |
|                  |            | +30                    | 406.150400557  | -0.0000374           | -0.0920                   |             |
|                  |            | +40                    | 406.150409086  | -0.0000288           | -0.0710                   |             |
|                  |            | +50                    | 406.150419233  | -0.0000187           | -0.0460                   |             |
|                  | Low Power  | +20(Ref)               | 406.150437280  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 406.150402378  | -0.0000349           | -0.0859                   |             |
|                  |            | -20                    | 406.150419918  | -0.0000174           | -0.0427                   |             |
|                  |            | -10                    | 406.150430370  | -0.0000069           | -0.0170                   |             |
|                  |            | 0                      | 406.150404010  | -0.0000333           | -0.0819                   |             |
|                  |            | +10                    | 406.150429889  | -0.0000074           | -0.0182                   |             |
|                  |            | +30                    | 406.150410621  | -0.0000267           | -0.0656                   |             |
|                  |            | +40                    | 406.150430736  | -0.0000065           | -0.0161                   |             |
|                  |            | +50                    | 406.150408031  | -0.0000292           | -0.0720                   |             |

429.95 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 16K0F3E          | High Power | +20(Ref)               | 429.950477448  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 429.950477578  | 0.0000001            | 0.0003                    |             |
|                  |            | -20                    | 429.950470364  | -0.0000071           | -0.0165                   |             |
|                  |            | -10                    | 429.950474385  | -0.0000031           | -0.0071                   |             |
|                  |            | 0                      | 429.950472426  | -0.0000050           | -0.0117                   |             |
|                  |            | +10                    | 429.950458504  | -0.0000189           | -0.0441                   |             |
|                  |            | +30                    | 429.950433281  | -0.0000442           | -0.1027                   |             |
|                  |            | +40                    | 429.950459254  | -0.0000182           | -0.0423                   |             |
|                  |            | +50                    | 429.950465843  | -0.0000116           | -0.0270                   |             |
|                  | Low Power  | +20(Ref)               | 429.950461640  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 429.950456106  | -0.0000055           | -0.0129                   |             |
|                  |            | -20                    | 429.950460004  | -0.0000016           | -0.0038                   |             |
|                  |            | -10                    | 429.950444020  | -0.0000176           | -0.0410                   |             |
|                  |            | 0                      | 429.950447500  | -0.0000141           | -0.0329                   |             |
|                  |            | +10                    | 429.950455486  | -0.0000062           | -0.0143                   |             |
|                  |            | +30                    | 429.950483191  | 0.0000216            | 0.0501                    |             |
|                  |            | +40                    | 429.950450506  | -0.0000111           | -0.0259                   |             |
|                  |            | +50                    | 429.950428954  | -0.0000327           | -0.0760                   |             |

450.05 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 16K0F3E          | High Power | +20(Ref)               | 450.050426857  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 450.050438040  | 0.0000112            | 0.0248                    |             |
|                  |            | -20                    | 450.050439015  | 0.0000122            | 0.0270                    |             |
|                  |            | -10                    | 450.050428140  | 0.0000013            | 0.0028                    |             |
|                  |            | 0                      | 450.050455368  | 0.0000285            | 0.0634                    |             |
|                  |            | +10                    | 450.050433562  | 0.0000067            | 0.0149                    |             |
|                  |            | +30                    | 450.050450339  | 0.0000235            | 0.0522                    |             |
|                  |            | +40                    | 450.050442041  | 0.0000152            | 0.0337                    |             |
|                  |            | +50                    | 450.050415519  | -0.0000113           | -0.0252                   |             |
|                  | Low Power  | +20(Ref)               | 450.050439643  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 450.050451600  | 0.0000120            | 0.0266                    |             |
|                  |            | -20                    | 450.050465992  | 0.0000263            | 0.0585                    |             |
|                  |            | -10                    | 450.050430967  | -0.0000087           | -0.0193                   |             |
|                  |            | 0                      | 450.050429927  | -0.0000097           | -0.0216                   |             |
|                  |            | +10                    | 450.050437051  | -0.0000026           | -0.0058                   |             |
|                  |            | +30                    | 450.050434963  | -0.0000047           | -0.0104                   |             |
|                  |            | +40                    | 450.050456820  | 0.0000172            | 0.0382                    |             |
|                  |            | +50                    | 450.050425136  | -0.0000145           | -0.0322                   |             |

469.95 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 16K0F3E          | High Power | +20(Ref)               | 469.950491829  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 469.950507984  | 0.0000162            | 0.0344                    |             |
|                  |            | -20                    | 469.950473261  | -0.0000186           | -0.0395                   |             |
|                  |            | -10                    | 469.950503474  | 0.0000116            | 0.0248                    |             |
|                  |            | 0                      | 469.950485700  | -0.0000061           | -0.0130                   |             |
|                  |            | +10                    | 469.950496363  | 0.0000045            | 0.0096                    |             |
|                  |            | +30                    | 469.950518732  | 0.0000269            | 0.0572                    |             |
|                  |            | +40                    | 469.950496045  | 0.0000042            | 0.0090                    |             |
|                  |            | +50                    | 469.950512254  | 0.0000204            | 0.0435                    |             |
|                  | Low Power  | +20(Ref)               | 469.950482537  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 469.950476217  | -0.0000063           | -0.0134                   |             |
|                  |            | -20                    | 469.950517447  | 0.0000349            | 0.0743                    |             |
|                  |            | -10                    | 469.950492627  | 0.0000101            | 0.0215                    |             |
|                  |            | 0                      | 469.950487849  | 0.0000053            | 0.0113                    |             |
|                  |            | +10                    | 469.950491808  | 0.0000093            | 0.0197                    |             |
|                  |            | +30                    | 469.950500381  | 0.0000178            | 0.0380                    |             |
|                  |            | +40                    | 469.950498076  | 0.0000155            | 0.0331                    |             |
|                  |            | +50                    | 469.950468160  | -0.0000144           | -0.0306                   |             |

406.15 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 11K0F3E          | High Power | +20(Ref)               | 406.150452904  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 406.150405774  | -0.0000471           | -0.1160                   |             |
|                  |            | -20                    | 406.150447584  | -0.0000053           | -0.0131                   |             |
|                  |            | -10                    | 406.150442384  | -0.0000105           | -0.0259                   |             |
|                  |            | 0                      | 406.150416953  | -0.0000360           | -0.0885                   |             |
|                  |            | +10                    | 406.150426136  | -0.0000268           | -0.0659                   |             |
|                  |            | +30                    | 406.150423732  | -0.0000292           | -0.0718                   |             |
|                  |            | +40                    | 406.150432691  | -0.0000202           | -0.0498                   |             |
|                  |            | +50                    | 406.150413824  | -0.0000391           | -0.0962                   |             |
|                  | Low Power  | +20(Ref)               | 406.150450182  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 406.150456094  | 0.0000059            | 0.0146                    |             |
|                  |            | -20                    | 406.150405223  | -0.0000450           | -0.1107                   |             |
|                  |            | -10                    | 406.150457206  | 0.0000070            | 0.0173                    |             |
|                  |            | 0                      | 406.150447852  | -0.0000023           | -0.0057                   |             |
|                  |            | +10                    | 406.150430734  | -0.0000194           | -0.0479                   |             |
|                  |            | +30                    | 406.150447405  | -0.0000028           | -0.0068                   |             |
|                  |            | +40                    | 406.150442535  | -0.0000076           | -0.0188                   |             |
|                  |            | +50                    | 406.150444650  | -0.0000055           | -0.0136                   |             |

429.95 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 11K0F3E          | High Power | +20(Ref)               | 429.950460534  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 429.950456041  | -0.0000045           | -0.0104                   |             |
|                  |            | -20                    | 429.950460246  | -0.0000003           | -0.0007                   |             |
|                  |            | -10                    | 429.950461457  | 0.0000009            | 0.0021                    |             |
|                  |            | 0                      | 429.950441094  | -0.0000194           | -0.0452                   |             |
|                  |            | +10                    | 429.950454309  | -0.0000062           | -0.0145                   |             |
|                  |            | +30                    | 429.950464436  | 0.0000039            | 0.0091                    |             |
|                  |            | +40                    | 429.950448116  | -0.0000124           | -0.0289                   |             |
|                  |            | +50                    | 429.950447085  | -0.0000134           | -0.0313                   |             |
|                  | Low Power  | +20(Ref)               | 429.950424141  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 429.950434224  | 0.0000101            | 0.0235                    |             |
|                  |            | -20                    | 429.950424475  | 0.0000003            | 0.0008                    |             |
|                  |            | -10                    | 429.950441563  | 0.0000174            | 0.0405                    |             |
|                  |            | 0                      | 429.950461120  | 0.0000370            | 0.0860                    |             |
|                  |            | +10                    | 429.950453555  | 0.0000294            | 0.0684                    |             |
|                  |            | +30                    | 429.950460495  | 0.0000364            | 0.0846                    |             |
|                  |            | +40                    | 429.950461768  | 0.0000376            | 0.0875                    |             |
|                  |            | +50                    | 429.950478601  | 0.0000545            | 0.1267                    |             |

450.05 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 11K0F3E          | High Power | +20(Ref)               | 450.050423501  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 450.050400734  | -0.0000228           | -0.0506                   |             |
|                  |            | -20                    | 450.050410182  | -0.0000133           | -0.0296                   |             |
|                  |            | -10                    | 450.050410068  | -0.0000134           | -0.0298                   |             |
|                  |            | 0                      | 450.050452127  | 0.0000286            | 0.0636                    |             |
|                  |            | +10                    | 450.050429797  | 0.0000063            | 0.0140                    |             |
|                  |            | +30                    | 450.050406577  | -0.0000169           | -0.0376                   |             |
|                  |            | +40                    | 450.050399919  | -0.0000236           | -0.0524                   |             |
|                  |            | +50                    | 450.050401080  | -0.0000224           | -0.0498                   |             |
|                  | Low Power  | +20(Ref)               | 450.050429832  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 450.050416406  | -0.0000134           | -0.0298                   |             |
|                  |            | -20                    | 450.050404710  | -0.0000251           | -0.0558                   |             |
|                  |            | -10                    | 450.050418959  | -0.0000109           | -0.0242                   |             |
|                  |            | 0                      | 450.050445687  | 0.0000159            | 0.0352                    |             |
|                  |            | +10                    | 450.050428295  | -0.0000015           | -0.0034                   |             |
|                  |            | +30                    | 450.050457319  | 0.0000275            | 0.0611                    |             |
|                  |            | +40                    | 450.050443457  | 0.0000136            | 0.0303                    |             |
|                  |            | +50                    | 450.050402897  | -0.0000269           | -0.0598                   |             |

469.95 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 11K0F3E          | High Power | +20(Ref)               | 469.950478864  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 469.950521482  | 0.0000426            | 0.0907                    |             |
|                  |            | -20                    | 469.950479518  | 0.0000007            | 0.0014                    |             |
|                  |            | -10                    | 469.950503134  | 0.0000243            | 0.0516                    |             |
|                  |            | 0                      | 469.950495756  | 0.0000169            | 0.0359                    |             |
|                  |            | +10                    | 469.950495610  | 0.0000167            | 0.0356                    |             |
|                  |            | +30                    | 469.950489006  | 0.0000101            | 0.0216                    |             |
|                  |            | +40                    | 469.950479801  | 0.0000009            | 0.0020                    |             |
|                  |            | +50                    | 469.950492324  | 0.0000135            | 0.0286                    |             |
|                  | Low Power  | +20(Ref)               | 469.950491757  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 469.950503647  | 0.0000119            | 0.0253                    |             |
|                  |            | -20                    | 469.950493178  | 0.0000014            | 0.0030                    |             |
|                  |            | -10                    | 469.950482987  | -0.0000088           | -0.0187                   |             |
|                  |            | 0                      | 469.950480888  | -0.0000109           | -0.0231                   |             |
|                  |            | +10                    | 469.950492004  | 0.0000002            | 0.0005                    |             |
|                  |            | +30                    | 469.950506360  | 0.0000146            | 0.0311                    |             |
|                  |            | +40                    | 469.950515938  | 0.0000242            | 0.0515                    |             |
|                  |            | +50                    | 469.950514190  | 0.0000224            | 0.0477                    |             |

406.15 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 4K00F2D          | High Power | +20(Ref)               | 406.150143319  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 406.150145132  | 0.0000018            | 0.0045                    |             |
|                  |            | -20                    | 406.150153678  | 0.0000104            | 0.0255                    |             |
|                  |            | -10                    | 406.150146477  | 0.0000032            | 0.0078                    |             |
|                  |            | 0                      | 406.150128109  | -0.0000152           | -0.0374                   |             |
|                  |            | +10                    | 406.150130429  | -0.0000129           | -0.0317                   |             |
|                  |            | +30                    | 406.150151458  | 0.0000081            | 0.0200                    |             |
|                  |            | +40                    | 406.150156851  | 0.0000135            | 0.0333                    |             |
|                  |            | +50                    | 406.150137911  | -0.0000054           | -0.0133                   |             |
|                  | Low Power  | +20(Ref)               | 406.150011919  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 406.150018514  | 0.0000066            | 0.0162                    |             |
|                  |            | -20                    | 406.150042121  | 0.0000302            | 0.0744                    |             |
|                  |            | -10                    | 406.150056247  | 0.0000443            | 0.1091                    |             |
|                  |            | 0                      | 406.150038913  | 0.0000270            | 0.0665                    |             |
|                  |            | +10                    | 406.150030824  | 0.0000189            | 0.0465                    |             |
|                  |            | +30                    | 406.150019184  | 0.0000073            | 0.0179                    |             |
|                  |            | +40                    | 406.150059248  | 0.0000473            | 0.1165                    |             |
|                  |            | +50                    | 406.150019094  | 0.0000072            | 0.0177                    |             |

429.95 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 4K00F2D          | High Power | +20(Ref)               | 429.950175168  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 429.950160310  | -0.0000149           | -0.0346                   |             |
|                  |            | -20                    | 429.950119655  | -0.0000555           | -0.1291                   |             |
|                  |            | -10                    | 429.950136281  | -0.0000389           | -0.0904                   |             |
|                  |            | 0                      | 429.950173081  | -0.0000021           | -0.0049                   |             |
|                  |            | +10                    | 429.950148315  | -0.0000269           | -0.0625                   |             |
|                  |            | +30                    | 429.950133573  | -0.0000416           | -0.0967                   |             |
|                  |            | +40                    | 429.950136287  | -0.0000389           | -0.0904                   |             |
|                  |            | +50                    | 429.950153232  | -0.0000219           | -0.0510                   |             |
|                  | Low Power  | +20(Ref)               | 429.950045113  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 429.950052073  | 0.0000070            | 0.0162                    |             |
|                  |            | -20                    | 429.950016996  | -0.0000281           | -0.0654                   |             |
|                  |            | -10                    | 429.950039491  | -0.0000056           | -0.0131                   |             |
|                  |            | 0                      | 429.950049331  | 0.0000042            | 0.0098                    |             |
|                  |            | +10                    | 429.950030596  | -0.0000145           | -0.0338                   |             |
|                  |            | +30                    | 429.950011011  | -0.0000341           | -0.0793                   |             |
|                  |            | +40                    | 429.950013722  | -0.0000314           | -0.0730                   |             |
|                  |            | +50                    | 429.950007112  | -0.0000380           | -0.0884                   |             |

450.05 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 4K00F2D          | High Power | +20(Ref)               | 450.050148310  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 450.050149117  | 0.0000008            | 0.0018                    |             |
|                  |            | -20                    | 450.050124150  | -0.0000242           | -0.0537                   |             |
|                  |            | -10                    | 450.050125154  | -0.0000232           | -0.0515                   |             |
|                  |            | 0                      | 450.050134034  | -0.0000143           | -0.0317                   |             |
|                  |            | +10                    | 450.050127559  | -0.0000208           | -0.0461                   |             |
|                  |            | +30                    | 450.050121676  | -0.0000266           | -0.0592                   |             |
|                  |            | +40                    | 450.050145606  | -0.0000027           | -0.0060                   |             |
|                  |            | +50                    | 450.050113566  | -0.0000347           | -0.0772                   |             |
|                  | Low Power  | +20(Ref)               | 450.050000269  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 450.049984289  | -0.0000160           | -0.0355                   |             |
|                  |            | -20                    | 450.050002371  | 0.0000021            | 0.0047                    |             |
|                  |            | -10                    | 450.050014245  | 0.0000140            | 0.0311                    |             |
|                  |            | 0                      | 450.050009425  | 0.0000092            | 0.0203                    |             |
|                  |            | +10                    | 450.049999498  | -0.0000008           | -0.0017                   |             |
|                  |            | +30                    | 450.049973707  | -0.0000266           | -0.0590                   |             |
|                  |            | +40                    | 450.050005216  | 0.0000049            | 0.0110                    |             |
|                  |            | +50                    | 450.049978454  | -0.0000218           | -0.0485                   |             |

469.95 MHz

| Type of Emission | Power      | Temperature (Degree C) | Frequency (Hz) | Frequency Error (Hz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|------------------------|----------------|----------------------|---------------------------|-------------|
| 4K00F2D          | High Power | +20(Ref)               | 469.950164938  | 0.0000000            | 0.0000                    | 1.0         |
|                  |            | -30                    | 469.950196286  | 0.0000313            | 0.0667                    |             |
|                  |            | -20                    | 469.950187069  | 0.0000221            | 0.0471                    |             |
|                  |            | -10                    | 469.950156575  | -0.0000084           | -0.0178                   |             |
|                  |            | 0                      | 469.950197597  | 0.0000327            | 0.0695                    |             |
|                  |            | +10                    | 469.950169522  | 0.0000046            | 0.0098                    |             |
|                  |            | +30                    | 469.950190262  | 0.0000253            | 0.0539                    |             |
|                  |            | +40                    | 469.950142896  | -0.0000220           | -0.0469                   |             |
|                  |            | +50                    | 469.950175607  | 0.0000107            | 0.0227                    |             |
|                  | Low Power  | +20(Ref)               | 469.950008072  | 0.0000000            | 0.0000                    |             |
|                  |            | -30                    | 469.950007057  | -0.0000010           | -0.0022                   |             |
|                  |            | -20                    | 469.950057178  | 0.0000491            | 0.1045                    |             |
|                  |            | -10                    | 469.950008513  | 0.0000004            | 0.0009                    |             |
|                  |            | 0                      | 469.950004073  | -0.0000040           | -0.0085                   |             |
|                  |            | +10                    | 469.950032446  | 0.0000244            | 0.0519                    |             |
|                  |            | +30                    | 469.950049593  | 0.0000415            | 0.0884                    |             |
|                  |            | +40                    | 469.950006871  | -0.0000012           | -0.0026                   |             |
|                  |            | +50                    | 469.950056182  | 0.0000481            | 0.1024                    |             |

## (2) Frequency Stability (Voltage Variation)

406.15 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 16K0F3E          | High Power | 85            | 6.38        | 406.150388795   | 0.9573                    | 1.0         |
|                  |            | 100           | 7.50        | 406.150389047   | 0.9579                    |             |
|                  |            | 115           | 8.63        | 406.150388957   | 0.9577                    |             |
|                  | Low Power  | 85            | 6.38        | 406.150389556   | 0.9591                    |             |
|                  |            | 100           | 7.50        | 406.150390112   | 0.9605                    |             |
|                  |            | 115           | 8.63        | 406.150389956   | 0.9601                    |             |

429.95 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 16K0F3E          | High Power | 85            | 6.38        | 429.950418373   | 0.9731                    | 1.0         |
|                  |            | 100           | 7.50        | 429.950418110   | 0.9725                    |             |
|                  |            | 115           | 8.63        | 429.950416776   | 0.9694                    |             |
|                  | Low Power  | 85            | 6.38        | 429.950415412   | 0.9662                    |             |
|                  |            | 100           | 7.50        | 429.950415172   | 0.9656                    |             |
|                  |            | 115           | 8.63        | 429.950414444   | 0.9639                    |             |

450.05 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 16K0F3E          | High Power | 85            | 6.38        | 450.050394139   | 0.8758                    | 1.0         |
|                  |            | 100           | 7.50        | 450.050393840   | 0.8751                    |             |
|                  |            | 115           | 8.63        | 450.050393332   | 0.8740                    |             |
|                  | Low Power  | 85            | 6.38        | 450.050398033   | 0.8844                    |             |
|                  |            | 100           | 7.50        | 450.050397147   | 0.8825                    |             |
|                  |            | 115           | 8.63        | 450.050397092   | 0.8823                    |             |

469.95 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 16K0F3E          | High Power | 85            | 6.38        | 469.950456638   | 0.9717                    | 1.0         |
|                  |            | 100           | 7.50        | 469.950455455   | 0.9692                    |             |
|                  |            | 115           | 8.63        | 469.950455748   | 0.9698                    |             |
|                  | Low Power  | 85            | 6.38        | 469.950451997   | 0.9618                    |             |
|                  |            | 100           | 7.50        | 469.950450574   | 0.9588                    |             |
|                  |            | 115           | 8.63        | 469.950451312   | 0.9603                    |             |

406.15 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 11K0F3E          | High Power | 85            | 6.38        | 406.150386228   | 0.9510                    | 1.0         |
|                  |            | 100           | 7.50        | 406.150386775   | 0.9523                    |             |
|                  |            | 115           | 8.63        | 406.150386101   | 0.9506                    |             |
|                  | Low Power  | 85            | 6.38        | 406.150390856   | 0.9623                    |             |
|                  |            | 100           | 7.50        | 406.150390796   | 0.9622                    |             |
|                  |            | 115           | 8.63        | 406.150391155   | 0.9631                    |             |

429.95 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 11K0F3E          | High Power | 85            | 6.38        | 429.950414352   | 0.9637                    | 1.0         |
|                  |            | 100           | 7.50        | 429.950414440   | 0.9639                    |             |
|                  |            | 115           | 8.63        | 429.950414406   | 0.9638                    |             |
|                  | Low Power  | 85            | 6.38        | 429.950413851   | 0.9626                    |             |
|                  |            | 100           | 7.50        | 429.950413679   | 0.9622                    |             |
|                  |            | 115           | 8.63        | 429.950413500   | 0.9617                    |             |

450.05 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 11K0F3E          | High Power | 85            | 6.38        | 450.050390872   | 0.8685                    | 1.0         |
|                  |            | 100           | 7.50        | 450.050393536   | 0.8744                    |             |
|                  |            | 115           | 8.63        | 450.050391877   | 0.8707                    |             |
|                  | Low Power  | 85            | 6.38        | 450.050390163   | 0.8669                    |             |
|                  |            | 100           | 7.50        | 450.050390386   | 0.8674                    |             |
|                  |            | 115           | 8.63        | 450.050389586   | 0.8657                    |             |

469.95 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 11K0F3E          | High Power | 85            | 6.38        | 469.950455247   | 0.9687                    | 1.0         |
|                  |            | 100           | 7.50        | 469.950454677   | 0.9675                    |             |
|                  |            | 115           | 8.63        | 469.950455015   | 0.9682                    |             |
|                  | Low Power  | 85            | 6.38        | 469.950451224   | 0.9602                    |             |
|                  |            | 100           | 7.50        | 469.950450775   | 0.9592                    |             |
|                  |            | 115           | 8.63        | 469.950450953   | 0.9596                    |             |

406.15 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 4K00F2D          | High Power | 85            | 6.38        | 406.150131054   | 0.3227                    | 1.0         |
|                  |            | 100           | 7.50        | 406.150133104   | 0.3277                    |             |
|                  |            | 115           | 8.63        | 406.150131984   | 0.3250                    |             |
|                  | Low Power  | 85            | 6.38        | 406.150030224   | 0.0744                    |             |
|                  |            | 100           | 7.50        | 406.150029364   | 0.0723                    |             |
|                  |            | 115           | 8.63        | 406.150029333   | 0.0722                    |             |

429.95 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 4K00F2D          | High Power | 85            | 6.38        | 429.950147936   | 0.3441                    | 1.0         |
|                  |            | 100           | 7.50        | 429.950149955   | 0.3488                    |             |
|                  |            | 115           | 8.63        | 429.950149411   | 0.3475                    |             |
|                  | Low Power  | 85            | 6.38        | 429.950030064   | 0.0699                    |             |
|                  |            | 100           | 7.50        | 429.950030473   | 0.0709                    |             |
|                  |            | 115           | 8.63        | 429.950029613   | 0.0689                    |             |

450.05 MHz

| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 4K00F2D          | High Power | 85            | 6.38        | 450.050125845   | 0.2796                    | 1.0         |
|                  |            | 100           | 7.50        | 450.050126874   | 0.2819                    |             |
|                  |            | 115           | 8.63        | 450.050125879   | 0.2797                    |             |
|                  | Low Power  | 85            | 6.38        | 450.049999572   | -0.0010                   |             |
|                  |            | 100           | 7.50        | 450.050000225   | 0.0005                    |             |
|                  |            | 115           | 8.63        | 450.050000165   | 0.0004                    |             |

469.95 MHz

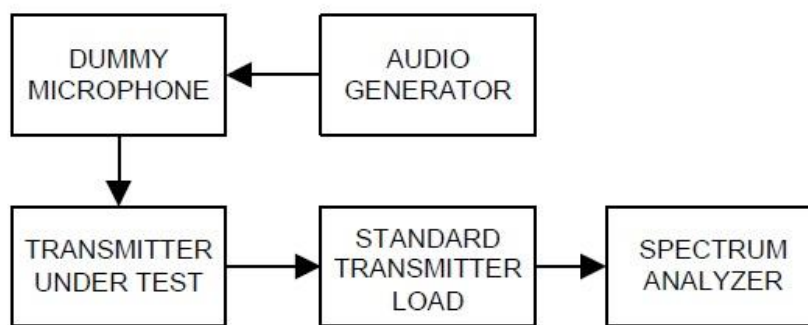
| Type of Emission | Power      | Diviation (%) | Voltage (V) | Frequency (MHz) | Frequency stability (ppm) | Limit (ppm) |
|------------------|------------|---------------|-------------|-----------------|---------------------------|-------------|
| 4K00F2D          | High Power | 85            | 6.38        | 469.950169731   | 0.3612                    | 1.0         |
|                  |            | 100           | 7.50        | 469.950169886   | 0.3615                    |             |
|                  |            | 115           | 8.63        | 469.950169174   | 0.3600                    |             |
|                  | Low Power  | 85            | 6.38        | 469.950032600   | 0.0694                    |             |
|                  |            | 100           | 7.50        | 469.950031653   | 0.0674                    |             |
|                  |            | 115           | 8.63        | 469.950031870   | 0.0678                    |             |

### 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

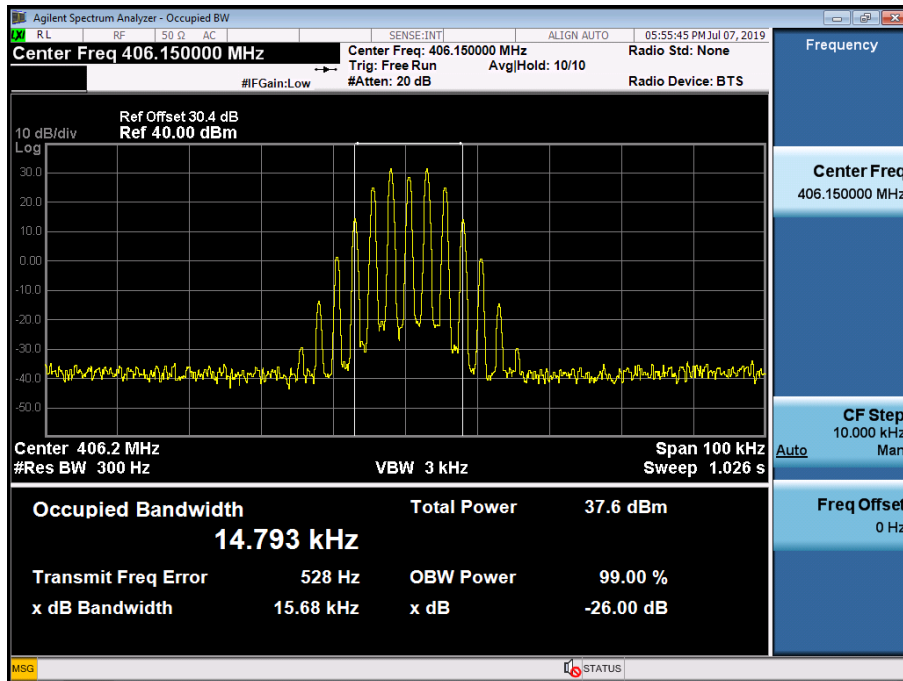
| Certification | Type of Emission          | Channel Bandwidth (kHz) | Power      | Test Frequency (MHz) | Measured 99% OBW at Maximum Freq. Deviation(kHz) | Limit (kHz) |
|---------------|---------------------------|-------------------------|------------|----------------------|--------------------------------------------------|-------------|
| IC            | 16K0F3E                   | 25                      | High Power | 406.15               | 14.793                                           | 20.00       |
|               |                           |                         |            | 429.95               | 14.873                                           |             |
|               |                           |                         |            | 450.05               | 14.791                                           |             |
|               |                           |                         |            | 469.95               | 14.765                                           |             |
|               |                           |                         | Low Power  | 406.15               | 14.791                                           |             |
|               |                           |                         |            | 429.95               | 14.876                                           |             |
|               |                           |                         |            | 450.05               | 14.787                                           |             |
|               |                           |                         |            | 469.95               | 14.775                                           |             |
| FCC/IC        | 11K0F3E                   | 12.5                    | High Power | 406.15               | 9.942                                            | 11.25       |
|               |                           |                         |            | 429.95               | 9.955                                            |             |
|               |                           |                         |            | 450.05               | 9.946                                            |             |
|               |                           |                         |            | 469.95               | 9.935                                            |             |
|               |                           |                         | Low Power  | 406.15               | 9.941                                            |             |
|               |                           |                         |            | 429.95               | 9.957                                            |             |
|               |                           |                         |            | 450.05               | 9.943                                            |             |
|               |                           |                         |            | 469.95               | 9.937                                            |             |
| FCC/IC        | 8K30F1E, 8K30F1D, 8K30F7W | 12.5                    | High Power | 406.15               | 7.789                                            | 11.25       |
|               |                           |                         |            | 429.95               | 7.981                                            |             |
|               |                           |                         |            | 450.05               | 7.761                                            |             |
|               |                           |                         |            | 469.95               | 7.715                                            |             |
|               |                           |                         | Low Power  | 406.15               | 7.776                                            |             |
|               |                           |                         |            | 429.95               | 7.981                                            |             |
|               |                           |                         |            | 450.05               | 7.778                                            |             |
|               |                           |                         |            | 469.95               | 7.737                                            |             |
| FCC/IC        | 7K60FXD, 7K60FXE          | 12.5                    | High Power | 406.15               | 7.562                                            | 11.25       |
|               |                           |                         |            | 429.95               | 7.771                                            |             |
|               |                           |                         |            | 450.05               | 7.470                                            |             |
|               |                           |                         |            | 469.95               | 7.491                                            |             |
|               |                           |                         | Low Power  | 406.15               | 7.562                                            |             |
|               |                           |                         |            | 429.95               | 7.716                                            |             |
|               |                           |                         |            | 450.05               | 7.530                                            |             |
|               |                           |                         |            | 469.95               | 7.450                                            |             |
| FCC/IC        | 4K00F1E, 4K00F1D, 4K00F7W | 6.25                    | High Power | 406.15               | 3.581                                            | 6.00        |
|               |                           |                         |            | 429.95               | 3.641                                            |             |
|               |                           |                         |            | 450.05               | 3.551                                            |             |
|               |                           |                         |            | 469.95               | 3.543                                            |             |
|               |                           |                         | Low Power  | 406.15               | 3.584                                            |             |
|               |                           |                         |            | 429.95               | 3.641                                            |             |
|               |                           |                         |            | 450.05               | 3.524                                            |             |
|               |                           |                         |            | 469.95               | 3.538                                            |             |
| FCC/IC        | 4K00F2D                   | 6.25                    | High Power | 406.15               | 4.036                                            | 6.00        |
|               |                           |                         |            | 429.95               | 4.038                                            |             |

| Certification | Type of Emission | Channel Bandwidth (kHz) | Power     | Test Frequency (MHz) | Measured 99% OBW at Maximum Freq. Deviation(kHz) | Limit (kHz) |
|---------------|------------------|-------------------------|-----------|----------------------|--------------------------------------------------|-------------|
|               |                  |                         |           | 450.05               | 4.038                                            |             |
|               |                  |                         |           | 469.95               | 4.032                                            |             |
|               |                  |                         | Low Power | 406.15               | 4.021                                            |             |
|               |                  |                         |           | 429.95               | 4.030                                            |             |
|               |                  |                         |           | 450.05               | 4.019                                            |             |
|               |                  |                         |           | 469.95               | 4.019                                            |             |

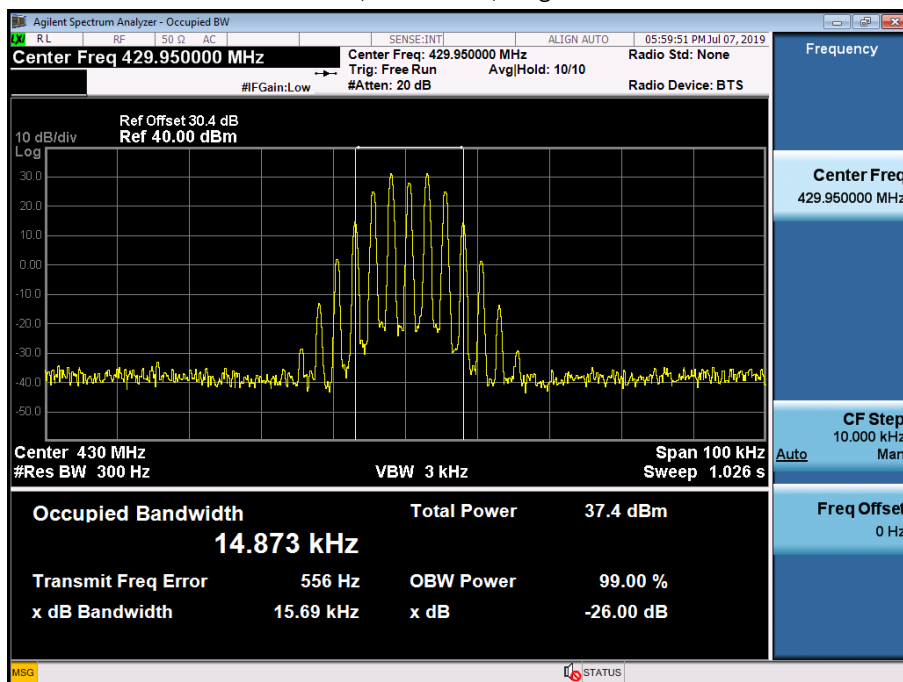
Plots of 99% Bandwidth

16K0F3E\_IC

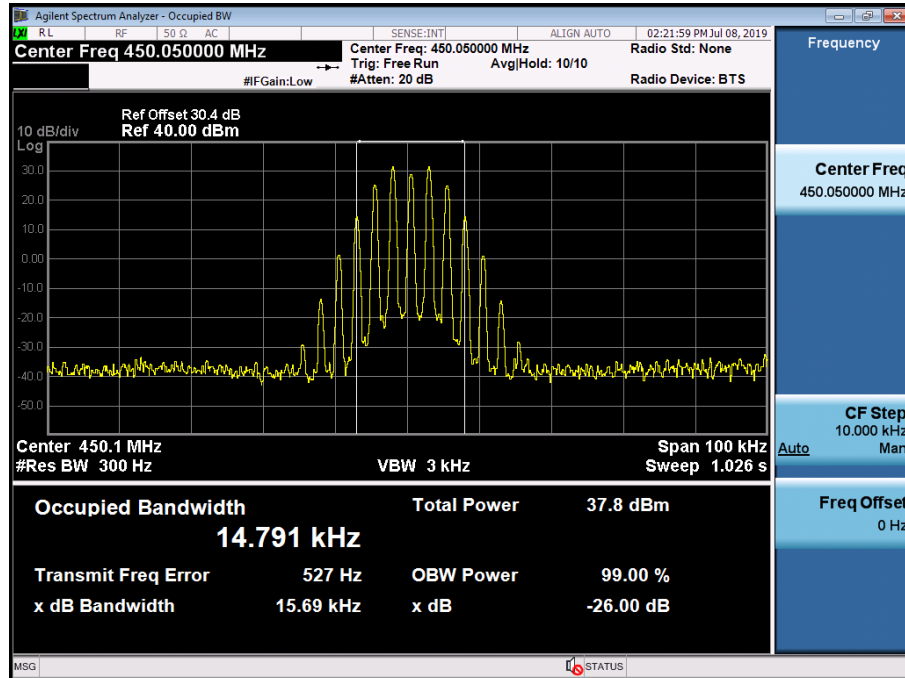
(406.15 MHz)\_High



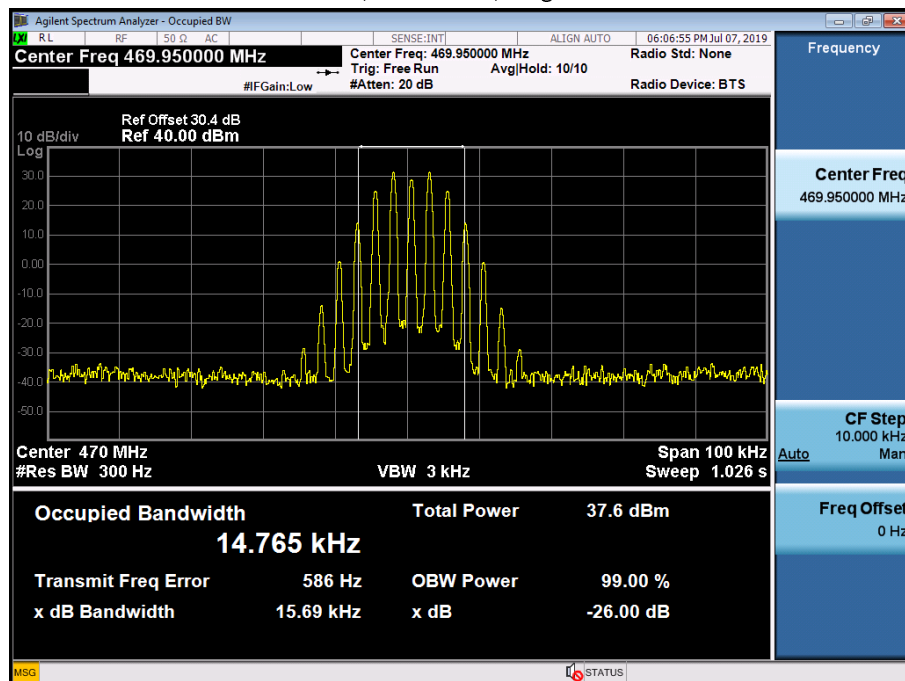
(429.95 MHz)\_High



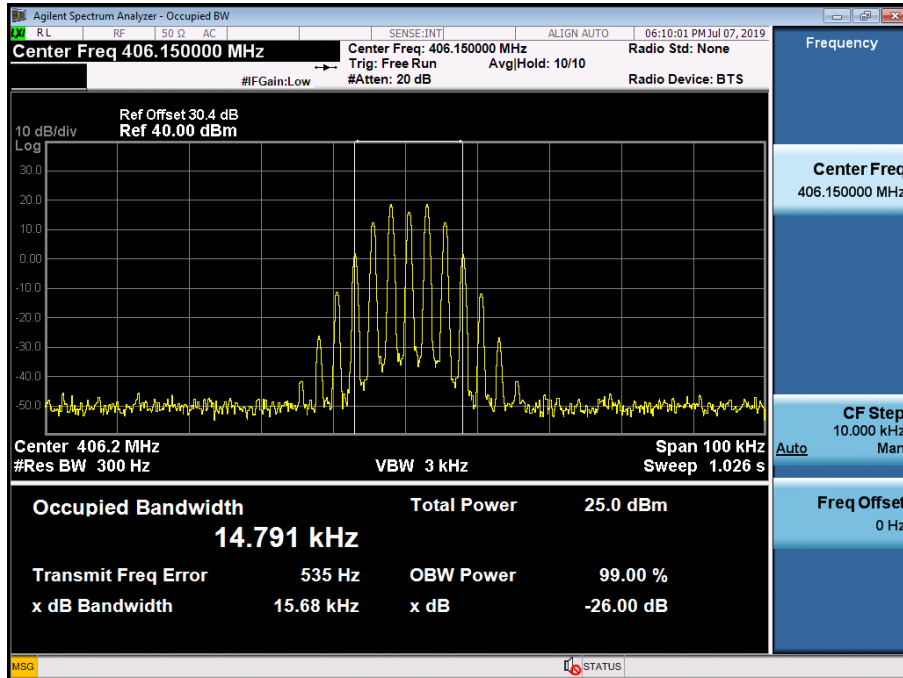
(450.05 MHz)\_High



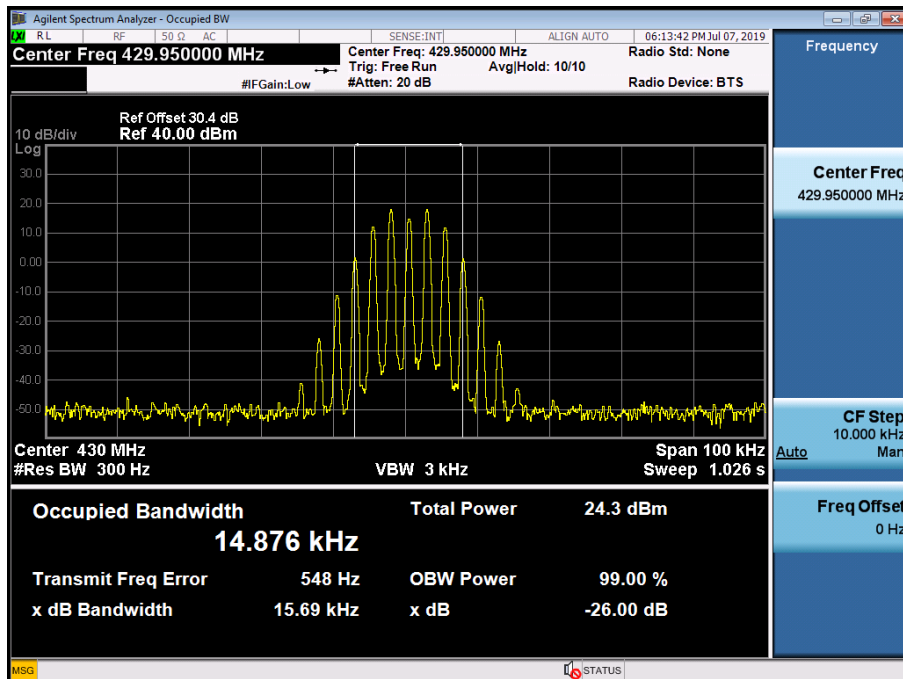
(469.95 MHz)\_High



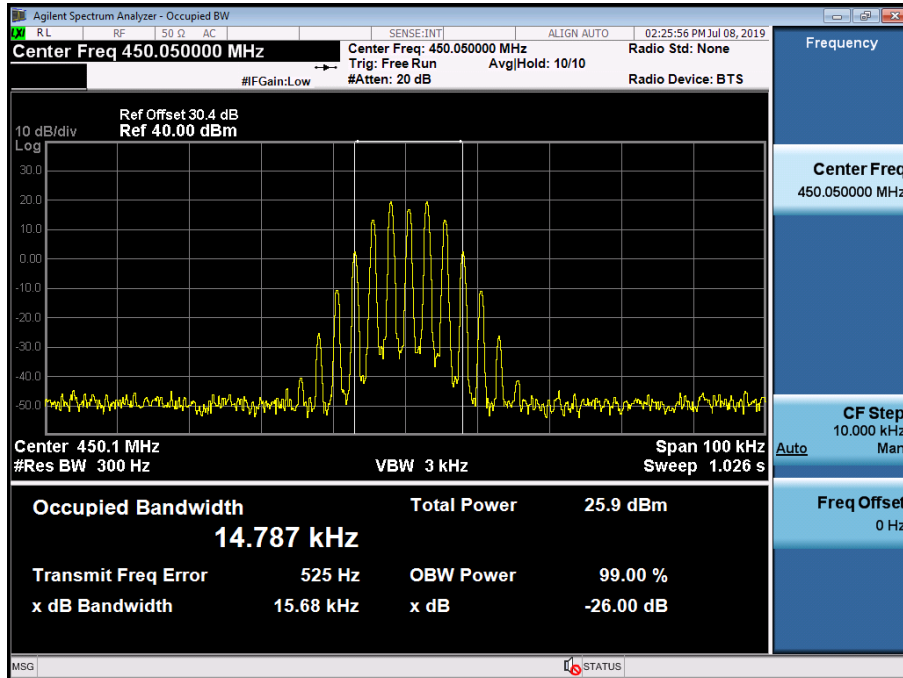
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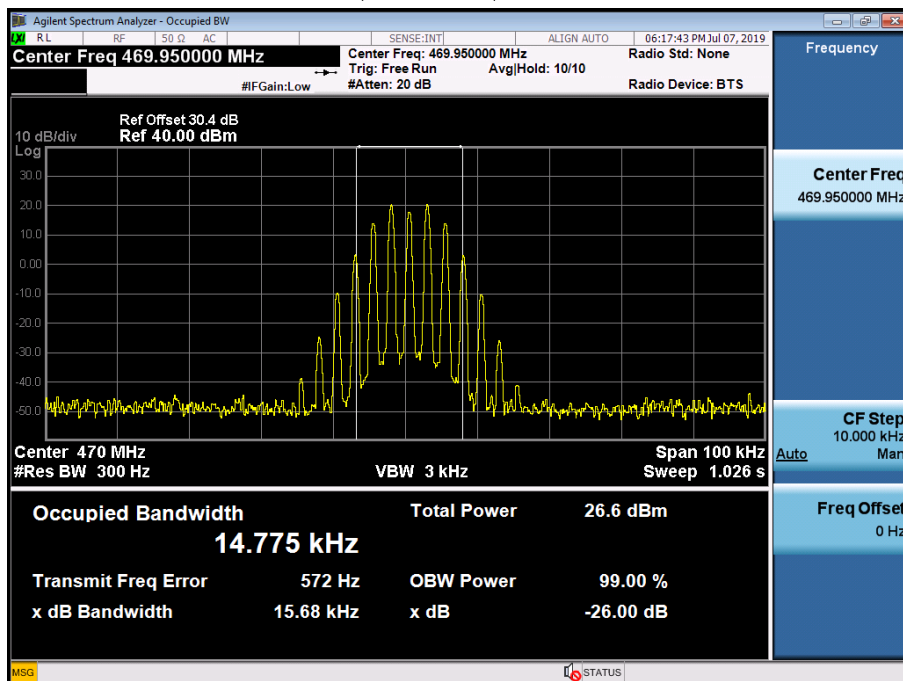
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(450.05 MHz)\_ Low

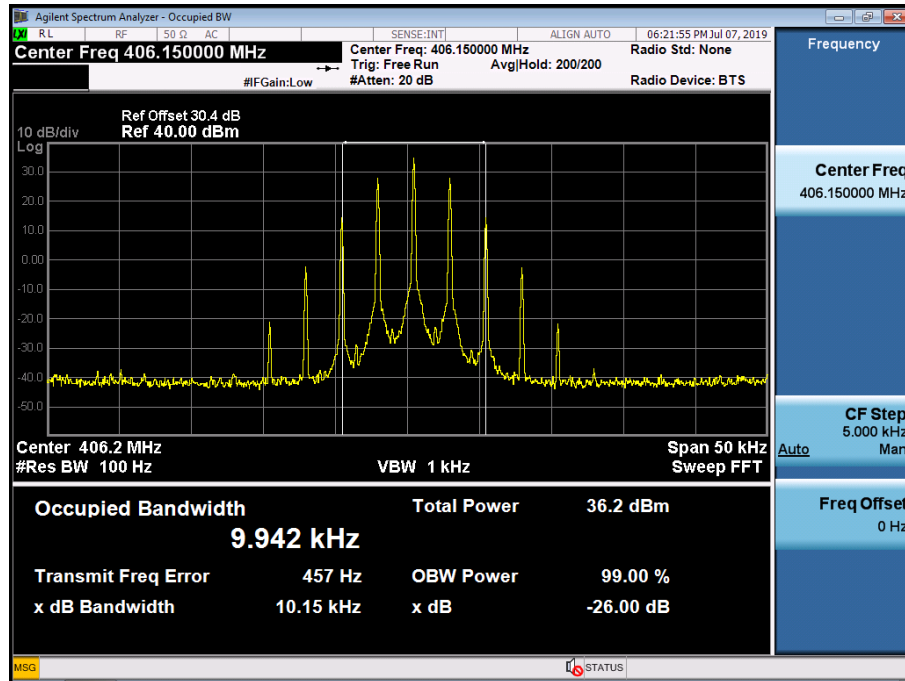


(469.95 MHz)\_ Low

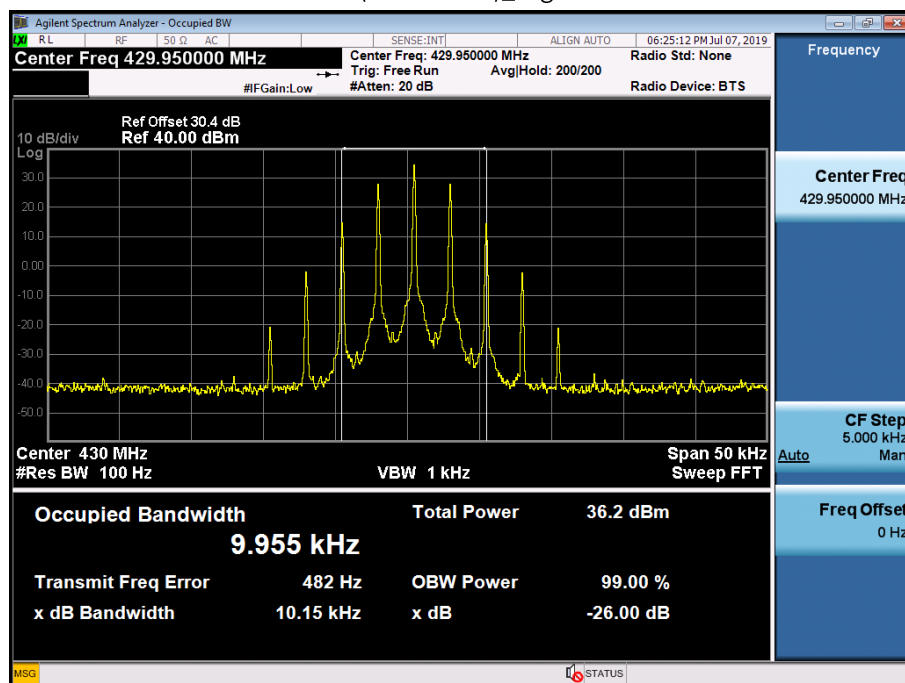


11K0F3E\_FCC/IC

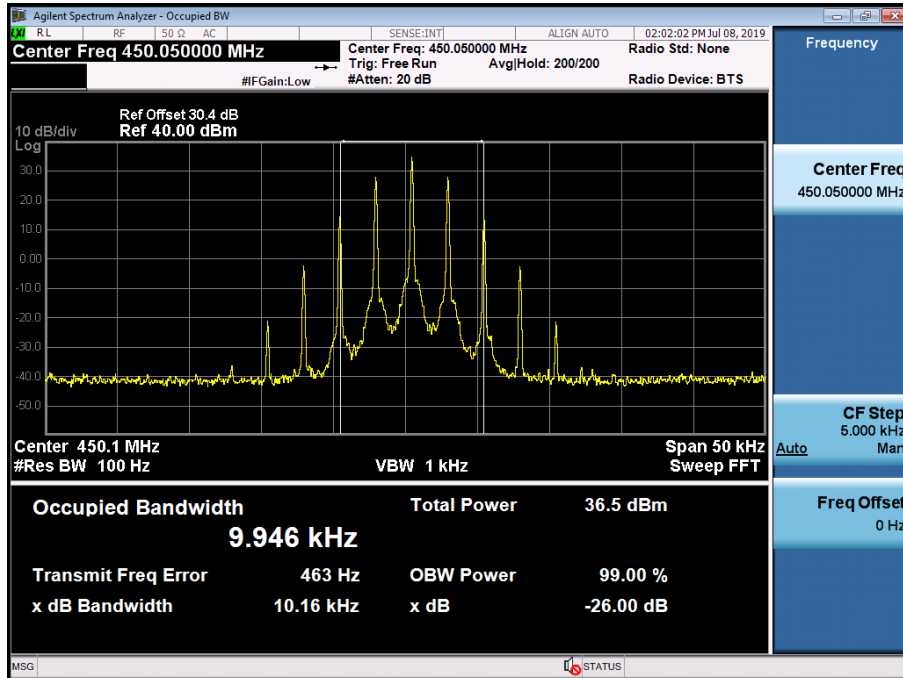
(406.15 MHz)\_High



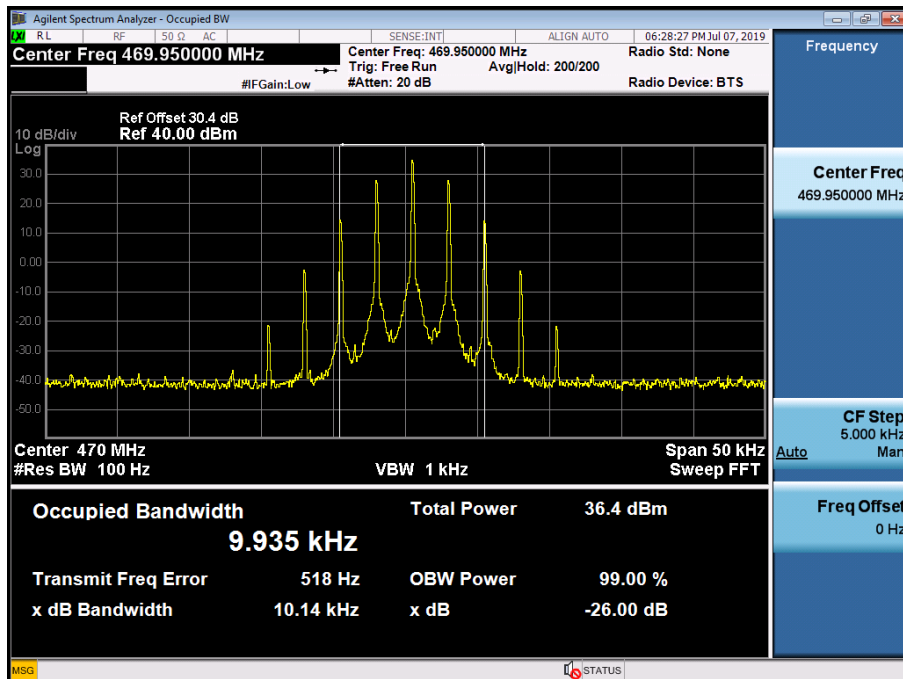
(429.95 MHz)\_High



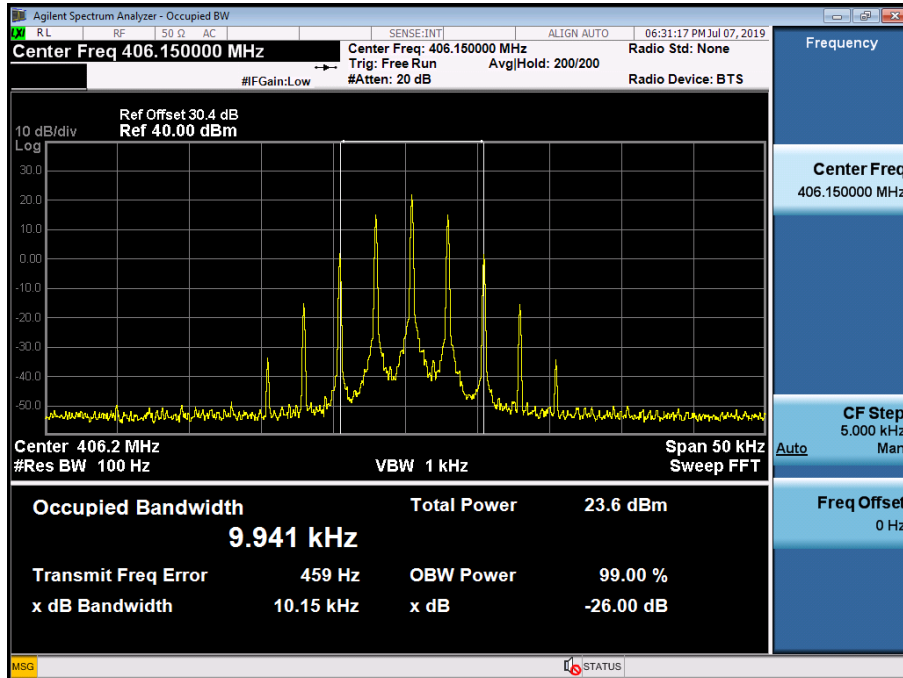
(450.05 MHz)\_High



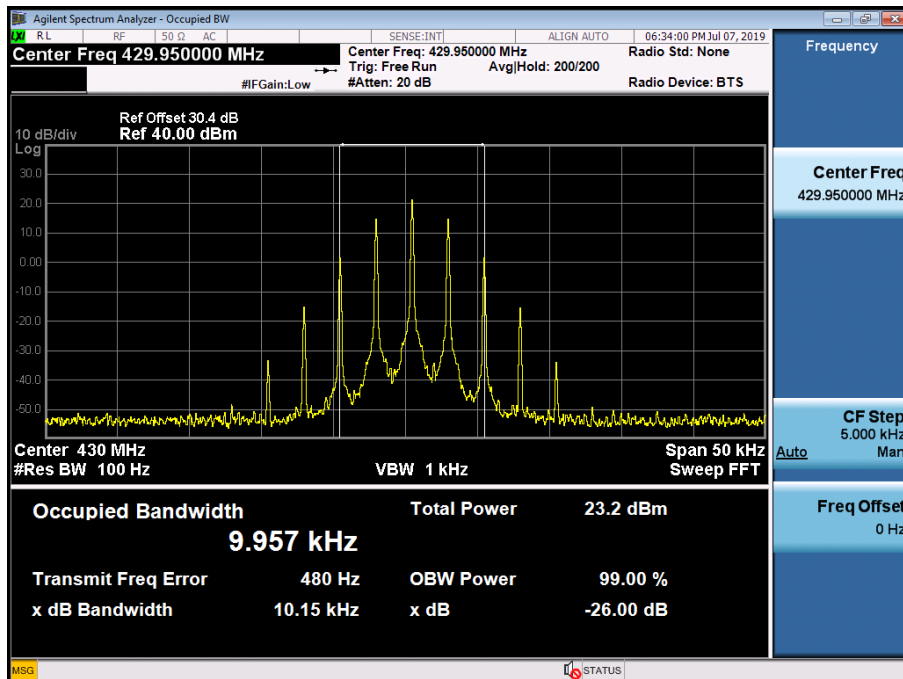
(469.95 MHz)\_High



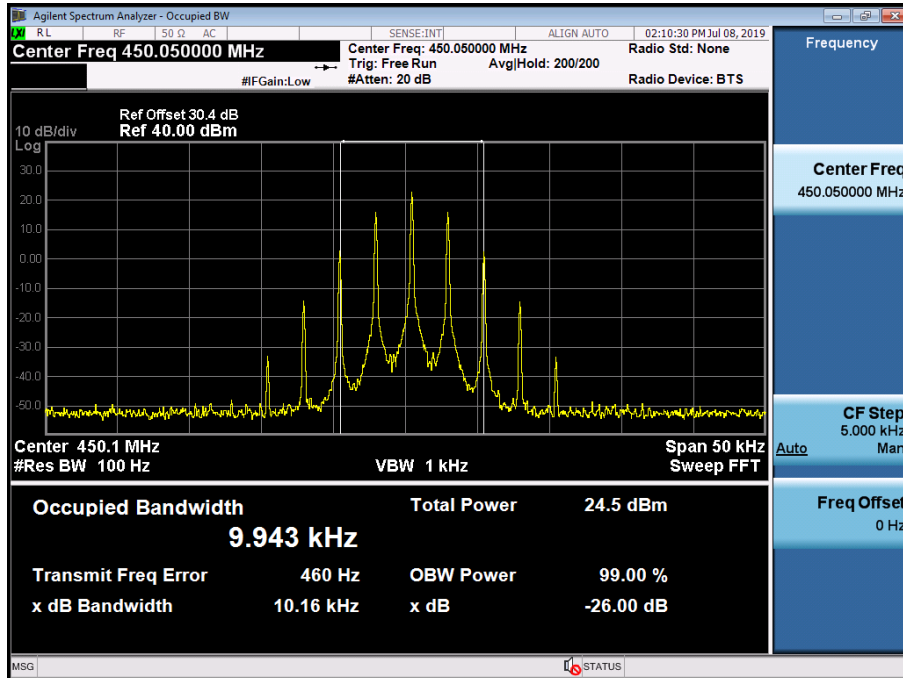
(406.15 MHz)\_Low



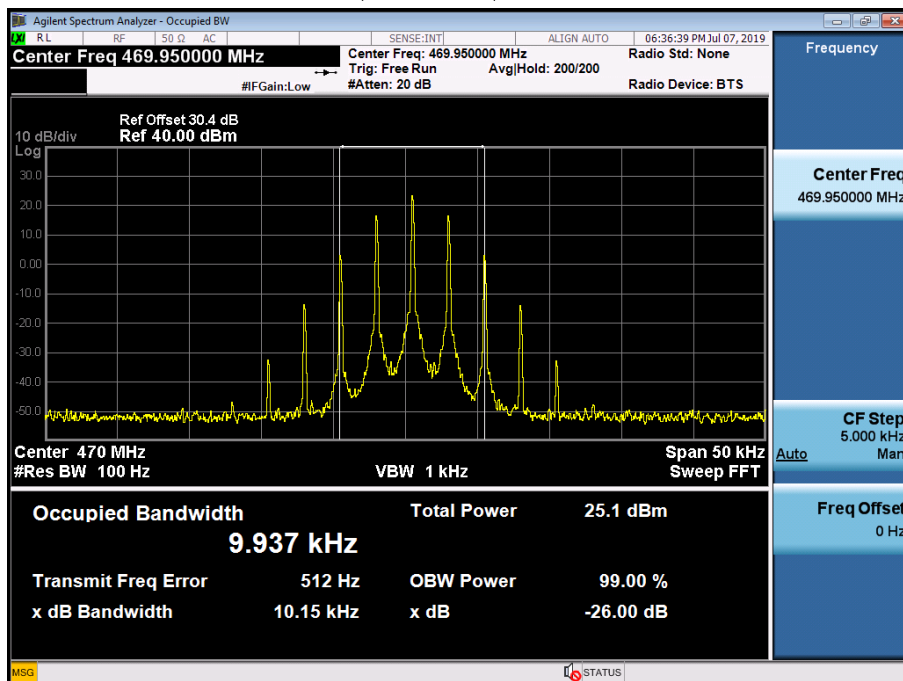
(429.95 MHz)\_Low



(450.05 MHz)\_Low

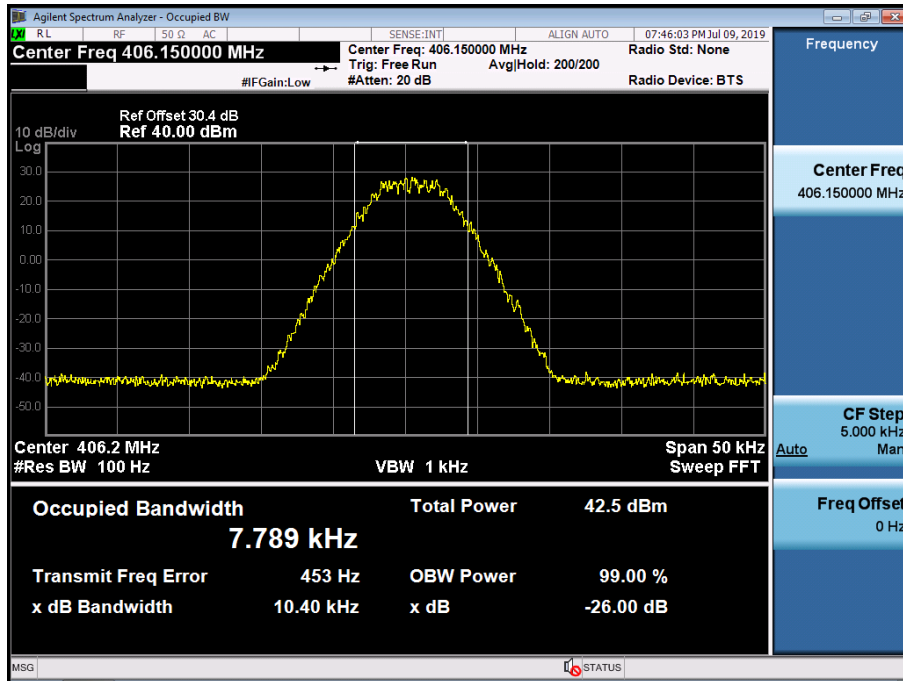


(469.95 MHz)\_Low



8K30F1E, 8K30F1D, 8K30F7W\_FCC/IC

(406.15 MHz)\_High



(429.95 MHz)\_High

