

# FCC LTE REPORT

## Certification

**Applicant Name:**  
SAMSUNG Electronics Co., Ltd.

**Date of Issue:**  
Devember 03, 2021

**Address:**  
129, Samsung-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

**Location:**  
HCT CO., LTD.,  
74, Seoicheon-ro 578beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

**Report No.:** HCT-RF-2111-FC023-R1

**FCC ID:** A3LSMX706B

**APPLICANT:** SAMSUNG Electronics Co., Ltd.

Model(s): SM-X706B  
 EUT Type: Tablet  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 FCC Rule Part(s): §24, §2

-Lower Ant-

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band2 (1.4)	1850.7 - 1909.3	1M12G7D	QPSK	0.039	15.90
		1M12W7D	16QAM	0.031	14.92
		1M12W7D	64QAM	0.026	14.10
		1M13W7D	256QAM	0.014	11.30
LTE – Band2 (3)	1851.5 - 1908.5	2M77G7D	QPSK	0.040	16.05
		2M78W7D	16QAM	0.032	15.00
		2M78W7D	64QAM	0.026	14.10
		2M73W7D	256QAM	0.015	11.62
LTE – Band2 (5)	1852.5 - 1907.5	4M51G7D	QPSK	0.037	15.70
		4M51W7D	16QAM	0.029	14.55
		4M52W7D	64QAM	0.023	13.62
		4M51W7D	256QAM	0.013	11.14
LTE – Band2 (10)	1855.0 - 1905.0	8M99G7D	QPSK	0.036	15.53
		8M99W7D	16QAM	0.028	14.50
		9M00W7D	64QAM	0.023	13.57
		8M97W7D	256QAM	0.013	11.20
LTE – Band2 (15)	1857.5 - 1902.5	13M5G7D	QPSK	0.035	15.44
		13M5W7D	16QAM	0.028	14.48
		13M5W7D	64QAM	0.023	13.59
		13M5W7D	256QAM	0.013	11.09
LTE – Band2 (20)	1860.0 - 1900.0	17M9G7D	QPSK	0.033	15.20
		17M9W7D	16QAM	0.026	14.15
		17M9W7D	64QAM	0.021	13.24
		17M9W7D	256QAM	0.012	10.73

-Upper Ant-

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band2 (1.4)	1850.7 - 1909.3	1M10G7D	QPSK	0.314	24.97
		1M10W7D	16QAM	0.265	24.24
		1M10W7D	64QAM	0.205	23.12
		1M10W7D	256QAM	0.103	20.11
LTE – Band2 (3)	1851.5 - 1908.5	2M71G7D	QPSK	0.320	25.06
		2M72W7D	16QAM	0.266	24.25
		2M71W7D	64QAM	0.209	23.20
		2M71W7D	256QAM	0.103	20.13
LTE – Band2 (5)	1852.5 - 1907.5	4M52G7D	QPSK	0.298	24.75
		4M53W7D	16QAM	0.248	23.95
		4M51W7D	64QAM	0.194	22.88
		4M50W7D	256QAM	0.095	19.77
LTE – Band2 (10)	1855.0 - 1905.0	8M99G7D	QPSK	0.310	24.91
		9M00W7D	16QAM	0.256	24.08
		9M00W7D	64QAM	0.199	23.00
		9M01W7D	256QAM	0.090	19.53
LTE – Band2 (15)	1857.5 - 1902.5	13M5G7D	QPSK	0.296	24.71
		13M5W7D	16QAM	0.249	23.96
		13M5W7D	64QAM	0.195	22.90
		13M5W7D	256QAM	0.091	19.60
LTE – Band2 (20)	1860.0 - 1900.0	18M0G7D	QPSK	0.287	24.57
		18M0W7D	16QAM	0.241	23.81
		18M0W7D	64QAM	0.188	22.75
		18M0W7D	256QAM	0.085	19.28

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §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)

Report No.: HCT-RF-2111-FC023-R1

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REVIEWED BY



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Report prepared by : Jae Mun Do  
Engineer of Telecommunication Testing Center

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Report approved by : Jong Seok Lee  
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked \*.

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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## Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2111-FC023	November 24, 2021	- First Approval Report
HCT-RF-2111-FC023-R1	December 03, 2021	- Revised the 18, 19 pages.

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

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# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

<b>Applicant Name:</b>	SAMSUNG Electronics Co., Ltd.
<b>Address:</b>	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
<b>FCC ID:</b>	A3LSMX706B
<b>Application Type:</b>	Certification
<b>FCC Classification:</b>	PCS Licensed Transmitter (PCB)
<b>FCC Rule Part(s):</b>	§24, §2
<b>EUT Type:</b>	Tablet
<b>Model(s):</b>	SM-X706B
<b>Tx Frequency:</b>	1850.7 MHz – 1909.3 MHz (LTE – Band2 (1.4 MHz)) 1851.5 MHz – 1908.5 MHz (LTE – Band2 (3 MHz)) 1852.5 MHz – 1907.5 MHz (LTE – Band2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (LTE – Band2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (LTE – Band2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (LTE – Band2 (20 MHz))
<b>Date(s) of Tests:</b>	October 13, 2021 ~ November 23, 2021
<b>Serial number:</b>	Radiated: R32R8004GXB (Upper Ant), R32R8004GSL (Lower Ant) Conducted: R32R800560N (Upper Ant), R3CR800560N (Lower Ant)

## **2. INTRODUCTION**

### **2.1. DESCRIPTION OF EUT**

The EUT was a Tablet with GSM/GPRS/EGPRS/UMTS and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160), WIFI 6E, Bluetooth, BT LE, WPC.

### **2.2. MEASURING 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 equipment, which is traceable to recognized national standards.

### **2.3. TEST FACILITY**

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, 17383, Rep. of KOREA.**

### 3. DESCRIPTION OF TESTS

#### 3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

## 3.2 RADIATED POWER

### Test Overview

Radiated tests 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 Clause 2.2.17.

### Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 1 MHz
3. VBW  $\geq$  3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $>$  2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

### Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1 GHz, 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;

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

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

3. The maximum value 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
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### 3.3 RADIATED SPURIOUS EMISSIONS

#### Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

#### Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW  $\geq 3 \times$  RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $> 2 \times$  span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10<sup>th</sup> harmonics from 9 kHz.

#### Test Note

1. Measurements value show only up to 3 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.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data
3. For spurious emissions above 1 GHz, 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 spurious emissions is calculated by the following formula;

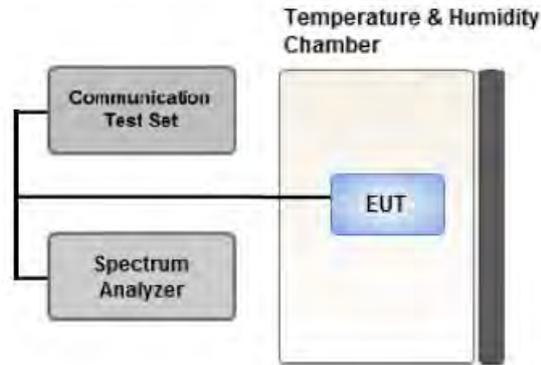
$$\text{Result}_{(\text{dBm})} = P_g_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

Where:  $P_g$  is the generator output power into the substitution antenna.

If the fundamental frequency is below 1 GHz, RF output power has been converted to EIRP.

$$\text{EIRP}_{(\text{dBm})} = \text{ERP}_{(\text{dBm})} + 2.15$$

### 3.4 PEAK- TO- AVERAGE RATIO



**Test setup**

#### ① CCDF Procedure for PAPR

##### **Test Settings**

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:
  - .- for continuous transmissions, set to 1 ms,
  - .- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1 %.

**② Alternate Procedure for PAPR**

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as  $P_{Pk}$ .  
Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and record as  $P_{Avg}$ . Determine the P.A.R. from:

$$P.A.R. (dB) = P_{Pk} (dBm) - P_{Avg} (dBm) \quad (P_{Avg} = \text{Average Power} + \text{Duty cycle Factor})$$

**Test Settings(Peak Power)**

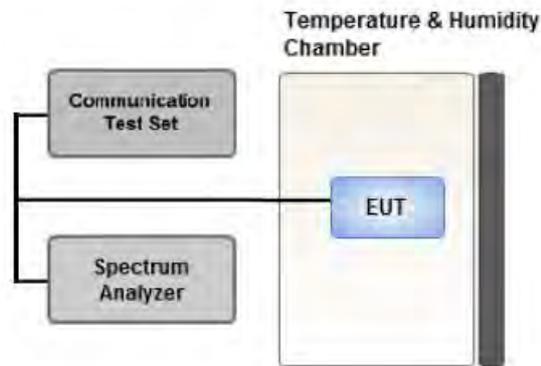
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq 3 \times$  RBW.

1. Set the RBW  $\geq$  OBW.
2. Set VBW  $\geq 3 \times$  RBW.
3. Set span  $\geq 2 \times$  OBW.
4. Sweep time  $\geq 10 \times$  (number of points in sweep)  $\times$  (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

**Test Settings(Average Power)**

1. Set span to  $2 \times$  to  $3 \times$  the OBW.
2. Set RBW  $\geq$  OBW.
3. Set VBW  $\geq 3 \times$  RBW.
4. Set number of measurement points in sweep  $\geq 2 \times$  span / RBW.
5. Sweep time:  
Set  $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$  for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to "free run."
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add  $[10 \log (1/\text{duty cycle})]$  to the measured maximum power level to compute the average power during continuous transmission. For example, add  $[10 \log (1/0.25)] = 6$  dB if the duty cycle is a constant 25 %.

### 3.5 OCCUPIED BANDWIDTH.



**Test setup**

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

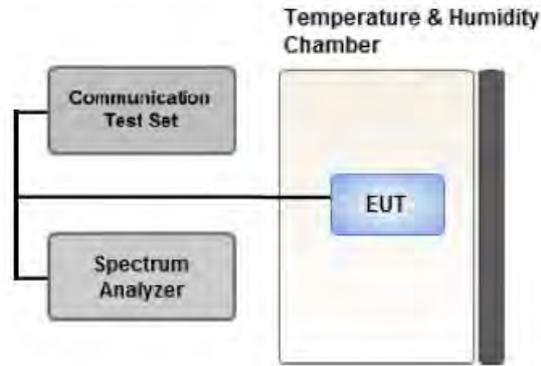
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

#### **Test Settings**

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW  $\geq$  3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

### 3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



**Test setup**

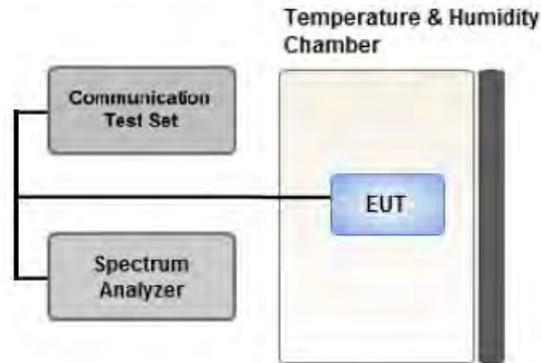
#### **Test Overview**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

#### **Test Settings**

1. RBW = 1 MHz
2. VBW  $\geq$  3 MHz
3. Detector = RMS
4. Trace Mode = Average
5. Sweep time = auto
6. Number of points in sweep  $\geq$  2 \* Span / RBW

### 3.7 BAND EDGE



#### Test setup

#### Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

#### Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

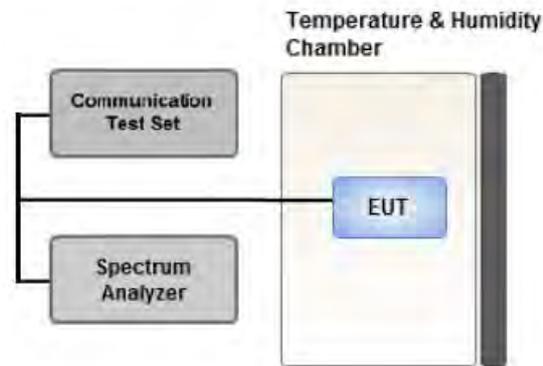
#### Test Notes

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

### 3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



**Test setup**

#### **Test Overview**

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015.

The frequency stability of the transmitter is measured by:

1. Temperature:

The temperature is varied from -30 °C to +50 °C in 10 °C increments using an environmental chamber.

2. Primary Supply Voltage:

- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.
- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

#### **Test Settings**

1. The carrier frequency of the transmitter is measured at room temperature (20 °C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

**3.9 WORST CASE(RADIATED TEST)**

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
  - All modes of operation were investigated and the worst case configuration results are reported.
  - In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 3 MHz(Lower Ant),3 MHz(Upper Ant))
  - The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
  - Please refer to the table below.
  - The test results below, the lower antenna is the Sub1 antenna, and the upper antenna is the Main 1 antenna.
  - All modes of operation were investigated and the worst case configuration results are reported.
- Mode : Stand alone, Stand alone + External accessories (Earphone, Keyboard, AC adapter, etc)  
Worst case : Stand alone

[ Lower Ant Worst case ]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	1	0	Z
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z

[ Upper Ant Worst case ]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	1	0	X
Radiated Spurious and Harmonic Emissions	QPSK	1	0	X

**3.10 WORST CASE(CONDUCTED TEST)**

[ Worst case ]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset		
Occupied Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0		
Peak-To-Average Ratio	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0		
Band Edge	QPSK	1.4	Low	1	0		
			High	1	5		
		3	Low	1	0		
			High	1	14		
		5	Low	1	0		
			High	1	24		
		10	Low	1	0		
			High	1	49		
		15	Low	1	0		
			High	1	74		
		20	Low	1	0		
			High	1	99		
				1.4, 3, 5, 10, 15, 20	Low, High	Full RB	0
		Spurious and Harmonic Emissions at Antenna Terminal	QPSK	1.4, 3, 5, 10, 15, 20	Low, Mid, High	1	0

- All modes of operation were investigated and the worst case configuration results are reported.
- The test results below, the lower antenna is the Sub1 antenna, and the upper antenna is the Main 1 antenna.

#### 4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/28/2022	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2022	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	02/11/2022	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/18/2022	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	09/29/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9168	Schwarzbeck	760	02/22/2023	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262116770	07/12/2022	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	01/07/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

**Note:**

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
2. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

## 5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ( $\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, $k=2$ )

## 6. SUMMARY OF TEST RESULTS

### 6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §24.238(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	<u>See Note1</u>
Peak- to- Average Ratio	§24.232(d)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§24.235	Emission must remain in band	PASS

**Note:**

1. See SAR Report

### 6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§24.232(c)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §24.238(a)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

## 7. SAMPLE CALCULATION

### 7.1 ERP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
128	824.20	-21.37	38.40	-10.61	0.95	H	0.483	26.84

**ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)**

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter’s level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter’s level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

### 7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	H	0.456	26.59

**EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)**

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter’s level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter’s level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

### 7.3. Emission Designator

#### GSM Emission Designator

**Emission Designator = 249KGXW**

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

#### EDGE Emission Designator

**Emission Designator = 249KG7W**

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

#### WCDMA Emission Designator

**Emission Designator = 4M17F9W**

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

#### QPSK Modulation

**Emission Designator = 4M48G7D**

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

#### QAM Modulation

**Emission Designator = 4M48W7D**

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

## 8. TEST DATA

### 8.1 EQUIVALENT ISOTROPIC RADIATED POWER

#### 8.1.1 Lower Ant

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
									W	W
1850.7	LTE B2/ 1.4 MHz	QPSK	-26.30	7.42	10.10	2.15	V	< 2.00	0.034	15.37
		16-QAM	-27.45	6.27	10.10	2.15	V		0.026	14.22
		64-QAM	-28.36	5.36	10.10	2.15	V		0.021	13.31
		256-QAM	-31.30	2.42	10.10	2.15	V		0.011	10.37
1880.0		QPSK	-26.35	6.84	9.98	2.25	V		0.029	14.57
		16-QAM	-27.33	5.86	9.98	2.25	V		0.023	13.59
		64-QAM	-28.18	5.01	9.98	2.25	V		0.019	12.74
		256-QAM	-31.07	2.12	9.98	2.25	V		0.010	9.85
1909.3		QPSK	-25.60	8.19	9.88	2.17	V		0.039	15.90
		16-QAM	-26.58	7.21	9.88	2.17	V		0.031	14.92
		64-QAM	-27.40	6.39	9.88	2.17	V		0.026	14.10
		256-QAM	-30.20	3.59	9.88	2.17	V		0.014	11.30

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
									W	W
1851.5	LTE B2/ 3 MHz	QPSK	-26.41	7.31	10.10	2.15	V	< 2.00	0.034	15.26
		16-QAM	-27.50	6.22	10.10	2.15	V		0.026	14.17
		64-QAM	-28.45	5.27	10.10	2.15	V		0.021	13.22
		256-QAM	-30.78	2.94	10.10	2.15	V		0.012	10.89
1880.0		QPSK	-26.32	6.87	9.98	2.25	V		0.029	14.60
		16-QAM	-27.32	5.87	9.98	2.25	V		0.023	13.60
		64-QAM	-28.23	4.96	9.98	2.25	V		0.019	12.69
		256-QAM	-31.14	2.05	9.98	2.25	V		0.010	9.78
1908.5		QPSK	-25.45	8.34	9.88	2.17	V		0.040	16.05
		16-QAM	-26.50	7.29	9.88	2.17	V		0.032	15.00
		64-QAM	-27.40	6.39	9.88	2.17	V		0.026	14.10
		256-QAM	-29.88	3.91	9.88	2.17	V		0.015	11.62

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	
1852.5	LTE B2/ 5 MHz	QPSK	-26.38	7.34	10.10	2.15	V	< 2.00	0.034	15.29	
		16-QAM	-27.44	6.28	10.10	2.15	V		0.027	14.23	
		64-QAM	-28.37	5.35	10.10	2.15	V		0.021	13.30	
		256-QAM	-30.91	2.81	10.10	2.15	V		0.012	10.76	
1880.0		QPSK	-26.30	6.89	9.98	2.25	V		0.029	14.62	
		16-QAM	-27.36	5.83	9.98	2.25	V		0.023	13.56	
		64-QAM	-28.25	4.94	9.98	2.25	V		0.019	12.67	
		256-QAM	-31.13	2.06	9.98	2.25	V		0.010	9.79	
1907.5		QPSK	-25.80	7.99	9.88	2.17	V		0.037	15.70	
		16-QAM	-26.95	6.84	9.88	2.17	V		0.029	14.55	
		64-QAM	-27.88	5.91	9.88	2.17	V		0.023	13.62	
		256-QAM	-30.36	3.43	9.88	2.17	V		0.013	11.14	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	
1855.0	LTE B2/ 10 MHz	QPSK	-26.70	6.71	10.08	2.17	V	< 2.00	0.029	14.62	
		16-QAM	-27.72	5.69	10.08	2.17	V		0.023	13.60	
		64-QAM	-28.67	4.74	10.08	2.17	V		0.018	12.65	
		256-QAM	-31.22	2.19	10.08	2.17	V		0.010	10.10	
1880.0		QPSK	-26.64	6.55	9.98	2.25	V		0.027	14.28	
		16-QAM	-27.69	5.50	9.98	2.25	V		0.021	13.23	
		64-QAM	-28.57	4.62	9.98	2.25	V		0.017	12.35	
		256-QAM	-31.51	1.68	9.98	2.25	V		0.009	9.41	
1905.0		QPSK	-25.89	7.83	9.89	2.19	V		0.036	15.53	
		16-QAM	-26.92	6.80	9.89	2.19	V		0.028	14.50	
		64-QAM	-27.85	5.87	9.89	2.19	V		0.023	13.57	
		256-QAM	-30.22	3.50	9.89	2.19	V		0.013	11.20	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	
1857.5	LTE B2/ 15 MHz	QPSK	-26.25	7.00	10.06	2.17	V	< 2.00	0.031	14.89	
		16-QAM	-27.29	5.96	10.06	2.17	V		0.024	13.85	
		64-QAM	-28.20	5.05	10.06	2.17	V		0.020	12.94	
		256-QAM	-31.01	2.24	10.06	2.17	V		0.010	10.13	
1880.0		QPSK	-26.29	6.90	9.98	2.25	V		0.029	14.63	
		16-QAM	-27.36	5.83	9.98	2.25	V		0.023	13.56	
		64-QAM	-28.27	4.92	9.98	2.25	V		0.018	12.65	
		256-QAM	-30.56	2.63	9.98	2.25	V		0.011	10.36	
1902.5		QPSK	-25.90	7.74	9.90	2.20	V		0.035	15.44	
		16-QAM	-26.86	6.78	9.90	2.20	V		0.028	14.48	
		64-QAM	-27.75	5.89	9.90	2.20	V		0.023	13.59	
		256-QAM	-30.25	3.39	9.90	2.20	V		0.013	11.09	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	
1860.0	LTE B2/ 20 MHz	QPSK	-26.05	7.04	10.06	2.19	V	< 2.00	0.031	14.91	
		16-QAM	-27.05	6.04	10.06	2.19	V		0.025	13.91	
		64-QAM	-28.00	5.09	10.06	2.19	V		0.020	12.96	
		256-QAM	-30.23	2.86	10.06	2.19	V		0.012	10.73	
1880.0		QPSK	-26.48	6.71	9.98	2.25	V		0.028	14.44	
		16-QAM	-27.56	5.63	9.98	2.25	V		0.022	13.36	
		64-QAM	-28.49	4.70	9.98	2.25	V		0.017	12.43	
		256-QAM	-31.00	2.19	9.98	2.25	V		0.010	9.92	
1900.0		QPSK	-26.14	7.50	9.90	2.20	V		0.033	15.20	
		16-QAM	-27.19	6.45	9.90	2.20	V		0.026	14.15	
		64-QAM	-28.10	5.54	9.90	2.20	V		0.021	13.24	
		256-QAM	-30.72	2.92	9.90	2.20	V		0.012	10.62	

8.1.2 Upper Ant

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1850.7	LTE B2/ 1.4 MHz	QPSK	-17.84	15.81	10.40	2.11	H	< 2.00	0.257	24.10	
		16-QAM	-18.63	15.02	10.40	2.11	H		0.214	23.31	
		64-QAM	-19.72	13.93	10.40	2.11	H		0.167	22.22	
		256-QAM	-22.74	10.91	10.40	2.11	H		0.083	19.20	
1880.0		QPSK	-17.93	16.15	10.40	2.15	H		0.276	24.40	
		16-QAM	-18.73	15.35	10.40	2.15	H		0.229	23.60	
		64-QAM	-19.82	14.26	10.40	2.15	H		0.178	22.51	
		256-QAM	-22.88	11.20	10.40	2.15	H		0.088	19.45	
1909.3		QPSK	-17.58	16.72	10.40	2.15	H		0.314	24.97	
		16-QAM	-18.31	15.99	10.40	2.15	H		0.265	24.24	
		64-QAM	-19.43	14.87	10.40	2.15	H		0.205	23.12	
		256-QAM	-22.44	11.86	10.40	2.15	H		0.103	20.11	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1851.5	LTE B2/ 3 MHz	QPSK	-17.95	15.70	10.40	2.11	H	< 2.00	0.251	23.99	
		16-QAM	-18.70	14.95	10.40	2.11	H		0.211	23.24	
		64-QAM	-19.77	13.88	10.40	2.11	H		0.165	22.17	
		256-QAM	-22.81	10.84	10.40	2.11	H		0.082	19.13	
1880.0		QPSK	-17.95	16.13	10.40	2.15	H		0.274	24.38	
		16-QAM	-18.77	15.31	10.40	2.15	H		0.227	23.56	
		64-QAM	-19.84	14.24	10.40	2.15	H		0.178	22.49	
		256-QAM	-22.88	11.20	10.40	2.15	H		0.088	19.45	
1908.5		QPSK	-17.49	16.81	10.40	2.15	H		0.320	25.06	
		16-QAM	-18.30	16.00	10.40	2.15	H		0.266	24.25	
		64-QAM	-19.35	14.95	10.40	2.15	H		0.209	23.20	
		256-QAM	-22.42	11.88	10.40	2.15	H		0.103	20.13	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1852.5	LTE B2/ 5 MHz	QPSK	-17.60	16.05	10.40	2.11	H	< 2.00	0.272	24.34	
		16-QAM	-18.40	15.25	10.40	2.11	H		0.226	23.54	
		64-QAM	-19.48	14.17	10.40	2.11	H		0.176	22.46	
		256-QAM	-22.53	11.12	10.40	2.11	H		0.087	19.41	
1880.0		QPSK	-17.84	16.24	10.40	2.15	H		0.281	24.49	
		16-QAM	-18.64	15.44	10.40	2.15	H		0.234	23.69	
		64-QAM	-19.71	14.37	10.40	2.15	H		0.183	22.62	
		256-QAM	-22.74	11.34	10.40	2.15	H		0.091	19.59	
1907.5		QPSK	-17.80	16.50	10.40	2.15	H		0.298	24.75	
		16-QAM	-18.60	15.70	10.40	2.15	H		0.248	23.95	
		64-QAM	-19.67	14.63	10.40	2.15	H		0.194	22.88	
		256-QAM	-22.78	11.52	10.40	2.15	H		0.095	19.77	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1855.0	LTE B2/ 10 MHz	QPSK	-17.92	15.85	10.40	2.12	H	< 2.00	0.259	24.14	
		16-QAM	-18.70	15.07	10.40	2.12	H		0.217	23.36	
		64-QAM	-19.79	13.98	10.40	2.12	H		0.169	22.27	
		256-QAM	-22.82	10.95	10.40	2.12	H		0.084	19.24	
1880.0		QPSK	-18.01	16.07	10.40	2.15	H		0.271	24.32	
		16-QAM	-18.77	15.31	10.40	2.15	H		0.227	23.56	
		64-QAM	-19.86	14.22	10.40	2.15	H		0.177	22.47	
		256-QAM	-22.88	11.20	10.40	2.15	H		0.088	19.45	
1905.0		QPSK	-17.57	16.66	10.40	2.15	H		0.310	24.91	
		16-QAM	-18.40	15.83	10.40	2.15	H		0.256	24.08	
		64-QAM	-19.48	14.75	10.40	2.15	H		0.199	23.00	
		256-QAM	-22.95	11.28	10.40	2.15	H		0.090	19.53	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1857.5	LTE B2/ 15 MHz	QPSK	-17.94	15.96	10.40	2.12	H	< 2.00	0.265	24.24	
		16-QAM	-18.75	15.15	10.40	2.12	H		0.220	23.43	
		64-QAM	-19.78	14.12	10.40	2.12	H		0.174	22.40	
		256-QAM	-22.83	11.07	10.40	2.12	H		0.086	19.35	
1880.0		QPSK	-18.00	16.08	10.40	2.15	H		0.271	24.33	
		16-QAM	-18.85	15.23	10.40	2.15	H		0.223	23.48	
		64-QAM	-19.88	14.20	10.40	2.15	H		0.176	22.45	
		256-QAM	-23.15	10.93	10.40	2.15	H		0.083	19.18	
1902.5		QPSK	-17.70	16.46	10.40	2.15	H		0.296	24.71	
		16-QAM	-18.45	15.71	10.40	2.15	H		0.249	23.96	
		64-QAM	-19.51	14.65	10.40	2.15	H		0.195	22.90	
		256-QAM	-22.81	11.35	10.40	2.15	H		0.091	19.60	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1860.0	LTE B2/ 20 MHz	QPSK	-17.74	16.16	10.40	2.12	H	< 2.00	0.278	24.44	
		16-QAM	-18.62	15.28	10.40	2.12	H		0.227	23.56	
		64-QAM	-19.64	14.26	10.40	2.12	H		0.179	22.54	
		256-QAM	-23.05	10.85	10.40	2.12	H		0.082	19.13	
1880.0		QPSK	-17.92	16.16	10.40	2.15	H		0.276	24.41	
		16-QAM	-18.79	15.29	10.40	2.15	H		0.226	23.54	
		64-QAM	-19.79	14.29	10.40	2.15	H		0.180	22.54	
		256-QAM	-23.21	10.87	10.40	2.15	H		0.082	19.12	
1900.0		QPSK	-17.84	16.32	10.40	2.15	H		0.287	24.57	
		16-QAM	-18.60	15.56	10.40	2.15	H		0.241	23.81	
		64-QAM	-19.66	14.50	10.40	2.15	H		0.188	22.75	
		256-QAM	-23.13	11.03	10.40	2.15	H		0.085	19.28	

## 8.2 RADIATED SPURIOUS EMISSIONS

### 8.2.1 Lower Ant

- ▣ OPERATING FREQUENCY: 1908.5 MHz
- ▣ MEASURED OUTPUT POWER: 16.05 dBm = 0.040 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 3 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  29.05 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18615 (1851.5)	3 703.00	-56.09	11.70	-57.24	3.12	V	-48.66	64.70
	5 554.50	-62.73	12.09	-57.65	3.86	V	-49.41	65.46
	7 406.00	-65.10	11.22	-49.93	4.43	V	-43.14	59.19
18900 (1880.0)	3 760.00	-57.58	11.64	-57.81	3.16	V	-49.33	65.38
	5 640.00	-62.45	12.00	-56.27	3.93	V	-48.20	64.25
	7 520.00	-64.51	11.54	-50.06	4.51	V	-43.03	59.07
19185 (1908.5)	3 817.00	-58.50	11.32	-58.17	3.17	H	-50.02	66.07
	5 725.50	-62.33	11.75	-56.58	3.91	V	-48.74	64.79
	7 634.00	-64.11	11.60	-50.05	4.55	V	-43.00	59.05

**8.2.2 Upper Ant**

- ▣ OPERATING FREQUENCY: 1908.5 MHz
- ▣ MEASURED OUTPUT POWER: 25.06 dBm = 0.320 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 3 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  38.06 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18615 (1851.5)	3 703.00	-51.16	12.30	-55.75	3.08	H	-46.53	71.59
	5 554.50	-54.83	13.10	-52.94	3.82	H	-43.66	68.71
	7 406.00	-53.11	10.80	-42.74	4.45	V	-36.38	61.44
18900 (1880.0)	3 760.00	-50.68	12.32	-55.00	3.10	H	-45.78	70.83
	5 640.00	-54.61	13.10	-52.42	3.85	V	-43.17	68.22
	7 520.00	-52.89	10.84	-42.04	4.46	V	-35.66	60.72
19185 (1908.5)	3 817.00	-50.17	12.40	-54.86	3.14	V	-45.60	70.66
	5 725.50	-54.58	13.05	-51.72	3.88	V	-42.54	67.60
	7 634.00	-54.24	11.24	-43.46	4.48	H	-36.70	61.76

### 8.3 PEAK-TO-AVERAGE RATIO

#### 8.3.1 Lower Ant

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
2	1.4 MHz	1880.0	QPSK	6	0	5.54
			16-QAM	6	0	6.33
			64-QAM	6	0	6.68
			256-QAM	6	0	7.15
	3 MHz		QPSK	15	0	5.45
			16-QAM	15	0	6.33
			64-QAM	15	0	6.68
			256-QAM	15	0	7.04
	5 MHz		QPSK	25	0	5.58
			16-QAM	25	0	6.46
			64-QAM	25	0	6.86
			256-QAM	25	0	7.03
	10 MHz		QPSK	50	0	5.66
			16-QAM	50	0	6.46
			64-QAM	50	0	6.84
			256-QAM	50	0	7.02
	15 MHz		QPSK	75	0	5.54
			16-QAM	75	0	6.42
			64-QAM	75	0	6.82
			256-QAM	75	0	7.00
20 MHz	QPSK	100	0	5.42		
	16-QAM	100	0	6.36		
	64-QAM	100	0	6.78		
	256-QAM	100	0	6.96		

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 197 ~ 220.

**8.3.2 Upper Ant**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
2	1.4 MHz	1880.0	QPSK	6	0	5.68
			16-QAM	6	0	6.45
			64-QAM	6	0	6.88
			256-QAM	6	0	6.97
	3 MHz		QPSK	15	0	5.54
			16-QAM	15	0	6.43
			64-QAM	15	0	6.82
			256-QAM	15	0	6.90
	5 MHz		QPSK	25	0	5.59
			16-QAM	25	0	6.43
			64-QAM	25	0	6.77
			256-QAM	25	0	6.90
	10 MHz		QPSK	50	0	5.68
			16-QAM	50	0	6.44
			64-QAM	50	0	6.76
			256-QAM	50	0	6.71
	15 MHz		QPSK	75	0	5.64
			16-QAM	75	0	6.44
			64-QAM	75	0	6.76
			256-QAM	75	0	6.74
20 MHz	QPSK	100	0	5.59		
	16-QAM	100	0	6.43		
	64-QAM	100	0	6.75		
	256-QAM	100	0	6.74		

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 221 ~ 244.

### 8.4 OCCUPIED BANDWIDTH

#### 8.4.1 Lower Ant

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
2	1.4 MHz	1880.0	QPSK	6	0	1.1173
			16-QAM	6	0	1.1193
			64-QAM	6	0	1.1213
			256-QAM	6	0	1.1260
	3 MHz		QPSK	15	0	2.7669
			16-QAM	15	0	2.7764
			64-QAM	15	0	2.7769
			256-QAM	15	0	2.7313
	5 MHz		QPSK	25	0	4.5119
			16-QAM	25	0	4.5127
			64-QAM	25	0	4.5160
			256-QAM	25	0	4.5124
	10 MHz		QPSK	50	0	8.9880
			16-QAM	50	0	8.9880
			64-QAM	50	0	8.9993
			256-QAM	50	0	8.9725
	15 MHz		QPSK	75	0	13.453
			16-QAM	75	0	13.449
			64-QAM	75	0	13.447
			256-QAM	75	0	13.469
20 MHz	QPSK	100	0	17.910		
	16-QAM	100	0	17.881		
	64-QAM	100	0	17.885		
	256-QAM	100	0	17.889		

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 149 ~ 172.

8.4.2 Upper Ant

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
2	1.4 MHz	1880.0	QPSK	6	0	1.0996
			16-QAM	6	0	1.0965
			64-QAM	6	0	1.0964
			256-QAM	6	0	1.0989
	3 MHz		QPSK	15	0	2.7094
			16-QAM	15	0	2.7202
			64-QAM	15	0	2.7117
			256-QAM	15	0	2.7140
	5 MHz		QPSK	25	0	4.5192
			16-QAM	25	0	4.5245
			64-QAM	25	0	4.5117
			256-QAM	25	0	4.5013
	10 MHz		QPSK	50	0	8.9942
			16-QAM	50	0	8.9980
			64-QAM	50	0	8.9974
			256-QAM	50	0	9.0132
	15 MHz		QPSK	75	0	13.503
			16-QAM	75	0	13.482
			64-QAM	75	0	13.504
			256-QAM	75	0	13.473
20 MHz	QPSK	100	0	17.997		
	16-QAM	100	0	17.949		
	64-QAM	100	0	17.969		
	256-QAM	100	0	17.963		

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 173 ~ 196.

**8.5 CONDUCTED SPURIOUS EMISSIONS**

**8.5.1 Lower Ant**

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
2	1.4	1850.7	1.7134	30.200	-76.787	-46.587	-13.00
		1880.0	1.7124	30.200	-77.080	-46.880	
		1909.3	1.7139	30.200	-77.427	-47.227	
	3	1851.5	3.7005	30.200	-75.567	-45.367	
		1880.0	1.7119	30.200	-76.967	-46.767	
		1908.5	3.8196	30.200	-75.067	-44.867	
	5	1852.5	1.7134	30.200	-77.544	-47.344	
		1880.0	1.7134	30.200	-78.585	-48.385	
		1907.5	1.7124	30.200	-76.926	-46.726	
	10	1855.0	1.7129	30.200	-77.740	-47.540	
		1880.0	1.7119	30.200	-77.313	-47.113	
		1905.0	1.7134	30.200	-76.916	-46.716	
	15	1857.5	3.7015	30.200	-75.930	-45.730	
		1880.0	1.7134	30.200	-76.157	-45.957	
		1902.5	3.8181	30.200	-74.467	-44.267	
	20	1860.0	3.7020	30.200	-73.486	-43.286	
		1880.0	1.7124	30.200	-76.921	-46.721	
		1900.0	3.8176	30.200	-75.286	-45.086	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 245 ~ 280.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor (dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	27.294
1 – 5	31.200
5 – 10	31.815
10 – 15	32.340
15 – 20	32.713
Above 20(26.5)	33.355

**8.5.2 Upper Ant**

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
2	1.4	1850.7	3.6795	27.976	-77.344	-49.368	-13.00
		1880.0	3.7034	27.976	-77.314	-49.338	
		1909.3	3.7005	27.976	-77.492	-49.516	
	3	1851.5	3.7054	27.976	-77.223	-49.247	
		1880.0	3.6865	27.976	-77.293	-49.317	
		1908.5	3.7084	27.976	-77.279	-49.303	
	5	1852.5	3.6975	27.976	-77.468	-49.492	
		1880.0	3.7229	27.976	-77.367	-49.391	
		1907.5	3.7069	27.976	-77.365	-49.389	
	10	1855.0	3.6810	27.976	-77.250	-49.274	
		1880.0	3.7089	27.976	-77.377	-49.401	
		1905.0	3.6750	27.976	-77.441	-49.465	
	15	1857.5	3.6920	27.976	-77.395	-49.419	
		1880.0	3.7179	27.976	-77.530	-49.554	
		1902.5	3.7020	27.976	-77.559	-49.583	
	20	1860.0	3.6975	27.976	-77.370	-49.394	
		1880.0	3.6910	27.976	-77.271	-49.295	
		1900.0	3.7020	27.976	-77.091	-49.115	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 281 ~ 316.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor (dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20(26.5)	30.131

## **8.6 BAND EDGE**

### **8.6.1 Lower Ant**

- Plots of the EUT's Band Edge are shown Page 77 ~ 112.

### **8.6.2 Upper Ant**

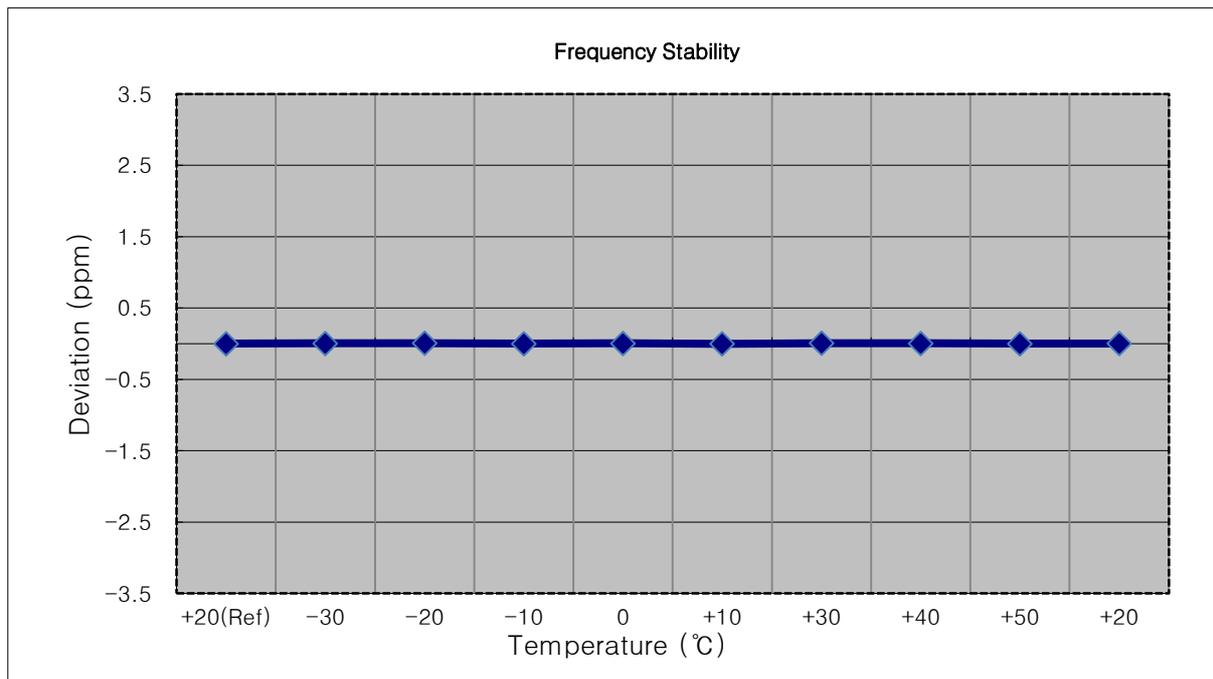
- Plots of the EUT's Band Edge are shown Page 113 ~ 148.

**8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE**

**8.7.1 Lower Ant**

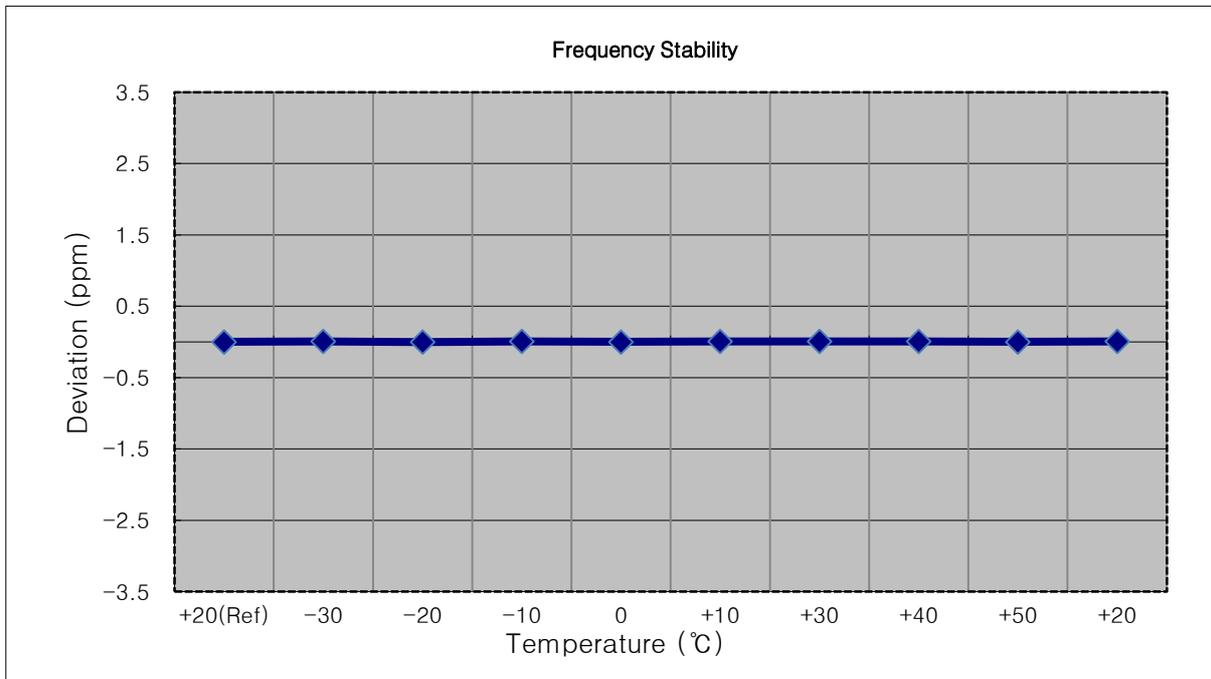
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1850,700,000 Hz
- ▣ CHANNEL: 18607 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1850 700 008	0.0	0.000 000	0.000
100 %		-30	1850 700 018	9.8	0.000 001	0.005
100 %		-20	1850 700 022	14.0	0.000 001	0.008
100 %		-10	1850 700 009	0.8	0.000 000	0.000
100 %		0	1850 700 018	9.7	0.000 001	0.005
100 %		+10	1850 700 006	-2.5	0.000 000	-0.001
100 %		+30	1850 700 020	12.0	0.000 001	0.006
100 %		+40	1850 700 016	8.4	0.000 000	0.005
100 %		+50	1850 700 008	0.2	0.000 000	0.000
Batt. Endpoint		3.400	+20	1850 700 012	4.3	0.000 000



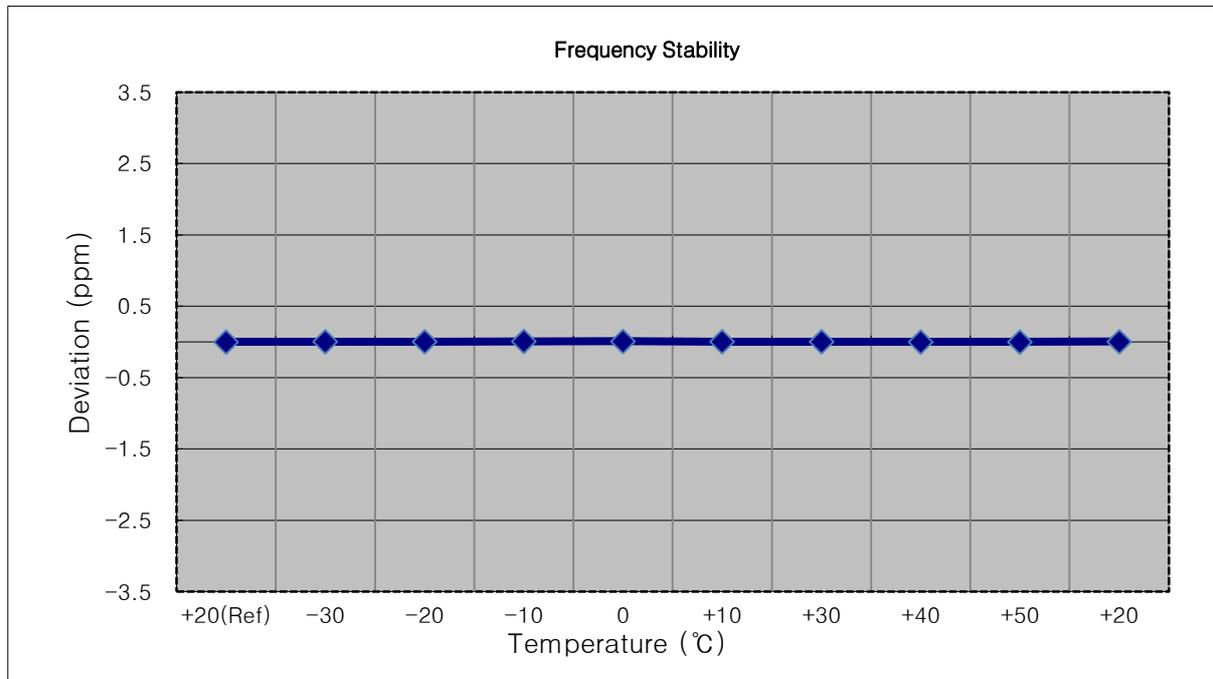
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1851,500,000 Hz
- ▣ CHANNEL: 18615 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1851 500 005	0.0	0.000 000	0.000
100 %		-30	1851 500 018	13.0	0.000 001	0.007
100 %		-20	1851 500 002	-2.7	0.000 000	-0.001
100 %		-10	1851 500 016	11.3	0.000 001	0.006
100 %		0	1851 500 007	2.5	0.000 000	0.001
100 %		+10	1851 500 016	11.5	0.000 001	0.006
100 %		+30	1851 500 019	14.4	0.000 001	0.008
100 %		+40	1851 500 018	13.5	0.000 001	0.007
100 %		+50	1851 500 004	-0.9	0.000 000	0.000
Batt. Endpoint	3.400	+20	1851 500 018	13.7	0.000 001	0.007



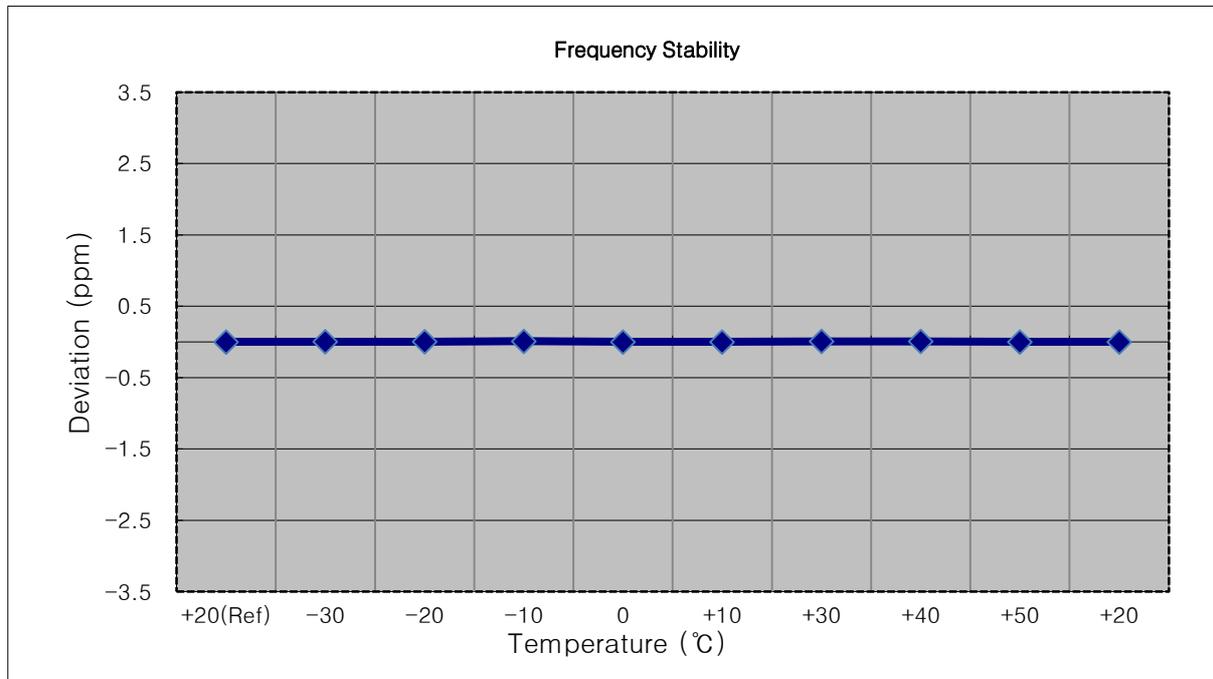
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1852,500,000 Hz
- ▣ CHANNEL: 18625 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1852 500 003	0.0	0.000 000	0.000
100 %		-30	1852 500 008	4.8	0.000 000	0.003
100 %		-20	1852 500 006	3.2	0.000 000	0.002
100 %		-10	1852 500 016	13.4	0.000 001	0.007
100 %		0	1852 500 019	15.5	0.000 001	0.008
100 %		+10	1852 500 006	3.3	0.000 000	0.002
100 %		+30	1852 500 010	6.8	0.000 000	0.004
100 %		+40	1852 500 002	-0.8	0.000 000	0.000
100 %		+50	1852 500 004	1.2	0.000 000	0.001
Batt. Endpoint	3.400	+20	1852 500 014	10.7	0.000 001	0.006



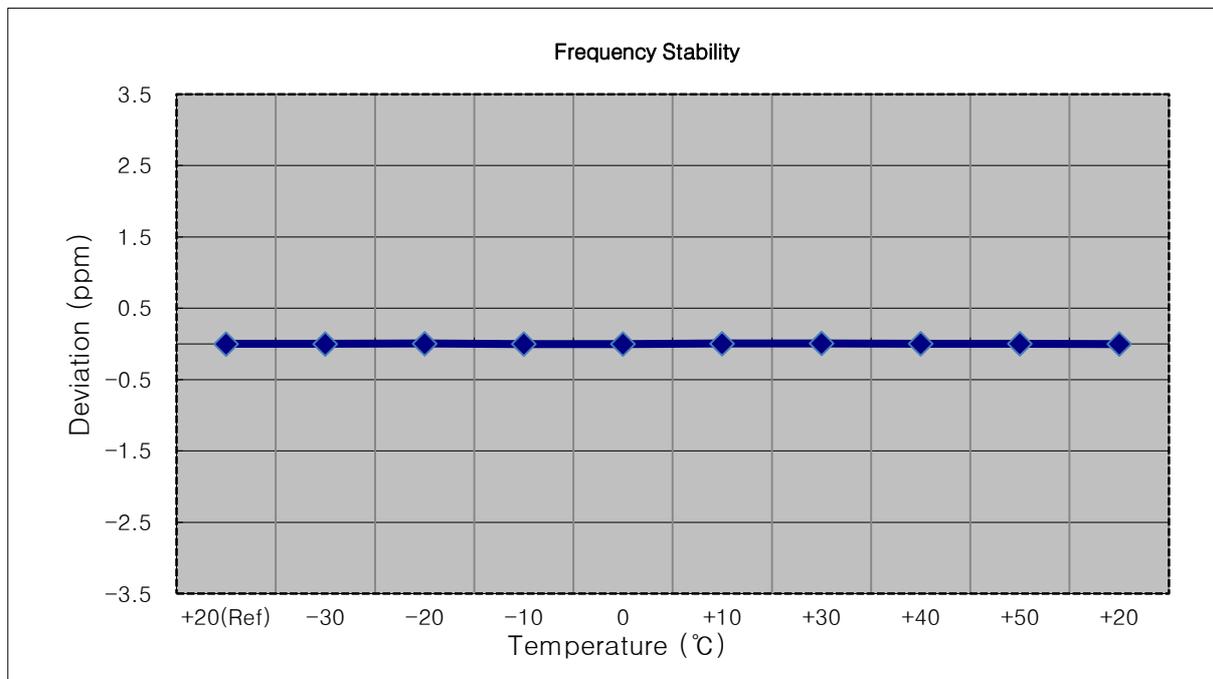
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1855,000,000 Hz
- ▣ CHANNEL: 18650 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1855 000 005	0.0	0.000 000	0.000
100 %		-30	1855 000 011	6.1	0.000 000	0.003
100 %		-20	1855 000 008	2.8	0.000 000	0.002
100 %		-10	1855 000 020	15.2	0.000 001	0.008
100 %		0	1855 000 007	2.2	0.000 000	0.001
100 %		+10	1855 000 007	1.9	0.000 000	0.001
100 %		+30	1855 000 020	14.7	0.000 001	0.008
100 %		+40	1855 000 017	11.8	0.000 001	0.006
100 %		+50	1855 000 006	0.7	0.000 000	0.000
Batt. Endpoint	3.400	+20	1855 000 004	-0.9	0.000 000	-0.001



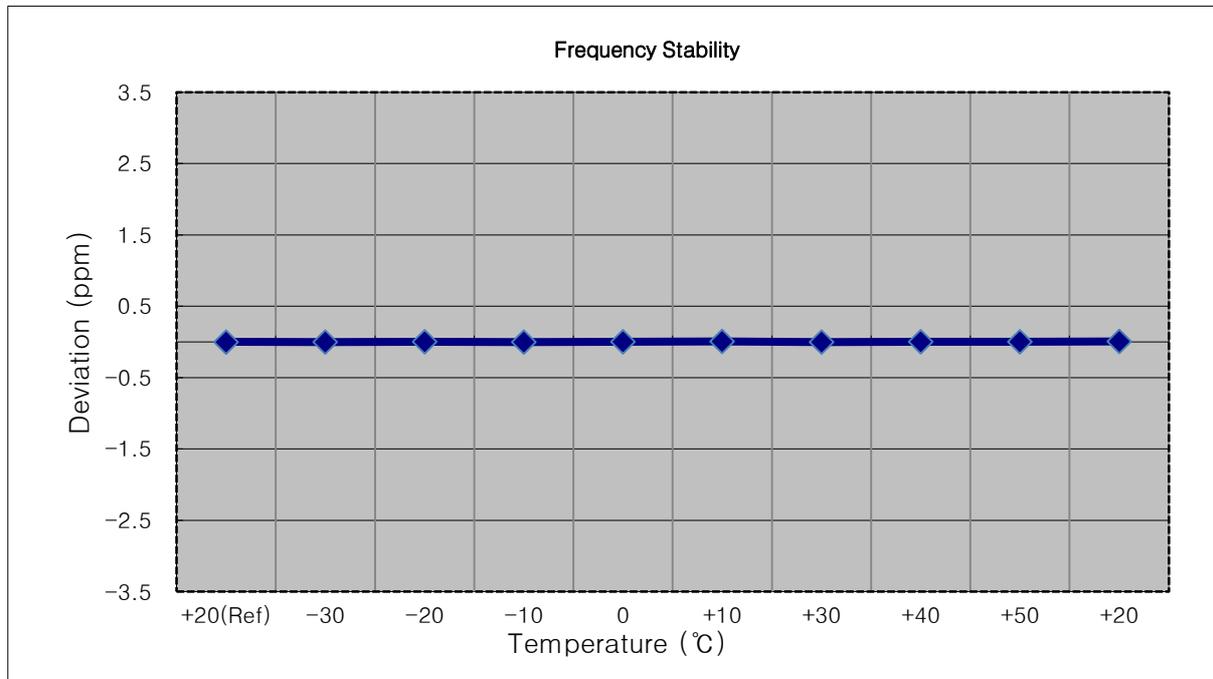
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1857,500,000 Hz
- ▣ CHANNEL: 18675 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1857 500 011	0.0	0.000 000	0.000
100 %		-30	1857 500 011	0.2	0.000 000	0.000
100 %		-20	1857 500 021	9.5	0.000 001	0.005
100 %		-10	1857 500 009	-2.3	0.000 000	-0.001
100 %		0	1857 500 010	-1.6	0.000 000	-0.001
100 %		+10	1857 500 019	8.1	0.000 000	0.004
100 %		+30	1857 500 024	12.3	0.000 001	0.007
100 %		+40	1857 500 018	6.5	0.000 000	0.004
100 %		+50	1857 500 016	4.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1857 500 009	-2.3	0.000 000	-0.001



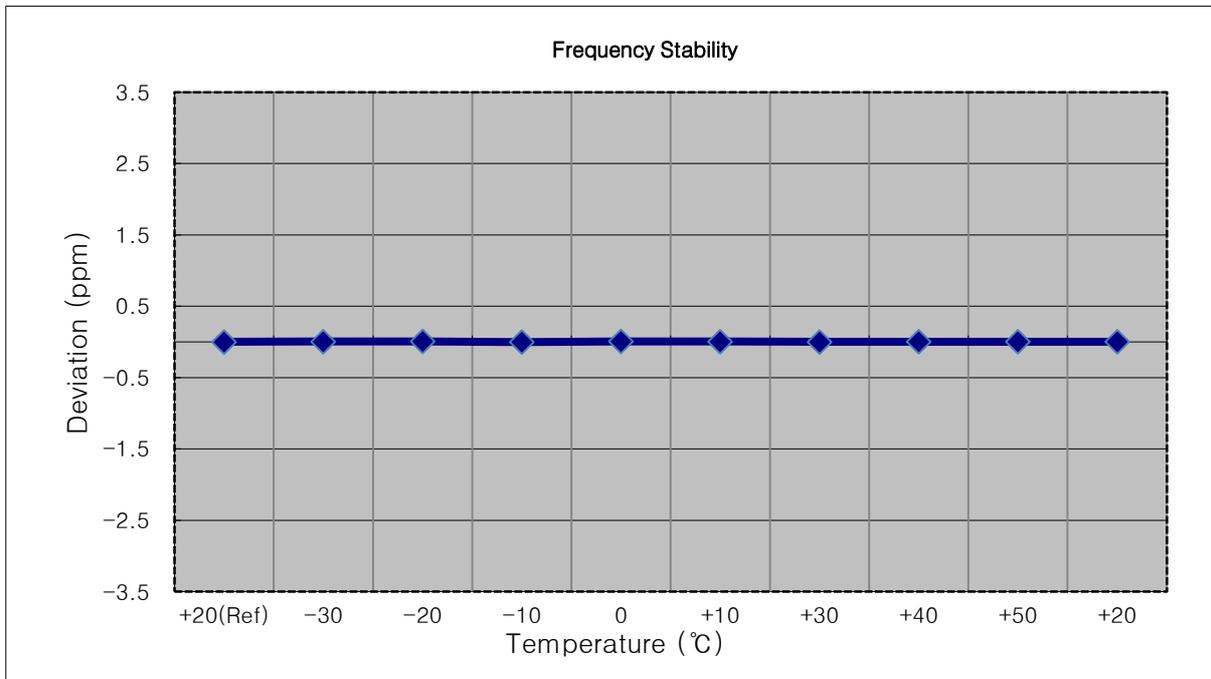
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1860,000,000 Hz
- ▣ CHANNEL: 18700 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1860 000 003	0.0	0.000 000	0.000
100 %		-30	1860 000 001	-1.7	0.000 000	-0.001
100 %		-20	1860 000 008	5.0	0.000 000	0.003
100 %		-10	1860 000 001	-1.5	0.000 000	-0.001
100 %		0	1860 000 009	6.4	0.000 000	0.003
100 %		+10	1860 000 017	14.5	0.000 001	0.008
100 %		+30	1860 000 001	-1.6	0.000 000	-0.001
100 %		+40	1860 000 009	6.4	0.000 000	0.003
100 %		+50	1860 000 007	4.3	0.000 000	0.002
Batt. Endpoint		3.400	+20	1860 000 016	13.7	0.000 001



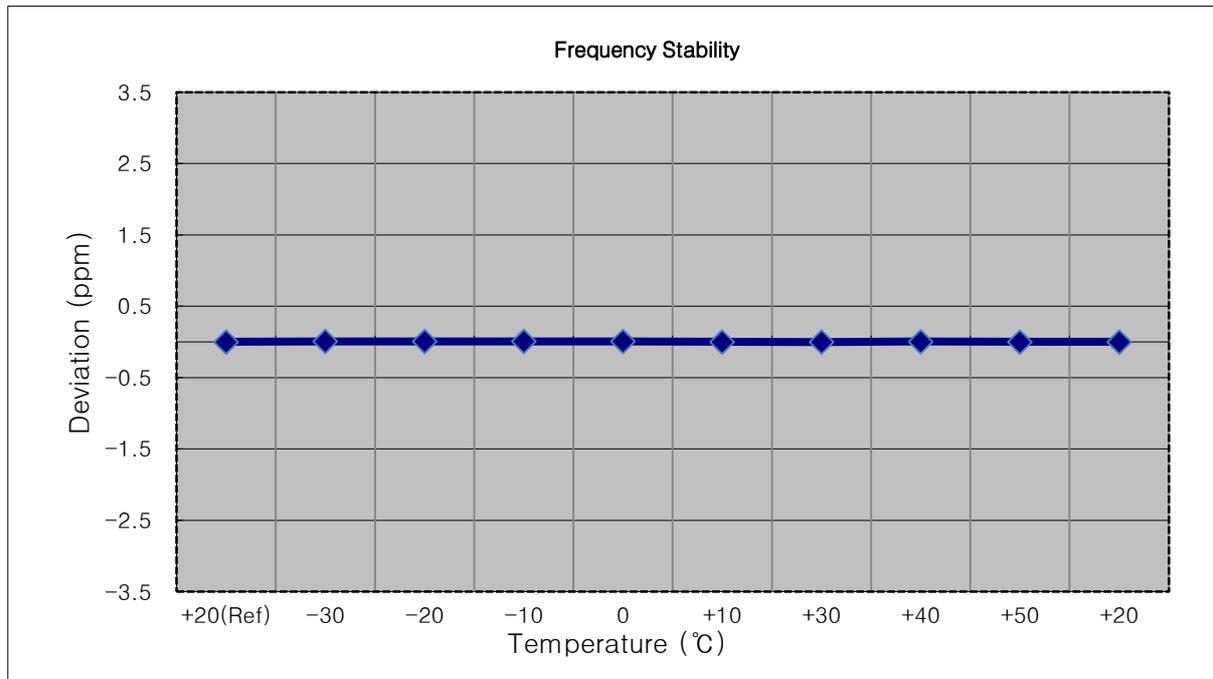
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1880 000 014	0.0	0.000 000	0.000
100 %		-30	1880 000 024	10.3	0.000 001	0.006
100 %		-20	1880 000 027	13.2	0.000 001	0.007
100 %		-10	1880 000 011	-3.0	0.000 000	-0.002
100 %		0	1880 000 026	12.4	0.000 001	0.007
100 %		+10	1880 000 024	9.9	0.000 001	0.005
100 %		+30	1880 000 016	2.6	0.000 000	0.001
100 %		+40	1880 000 018	4.3	0.000 000	0.002
100 %		+50	1880 000 018	4.4	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 019	5.4	0.000 000	0.003



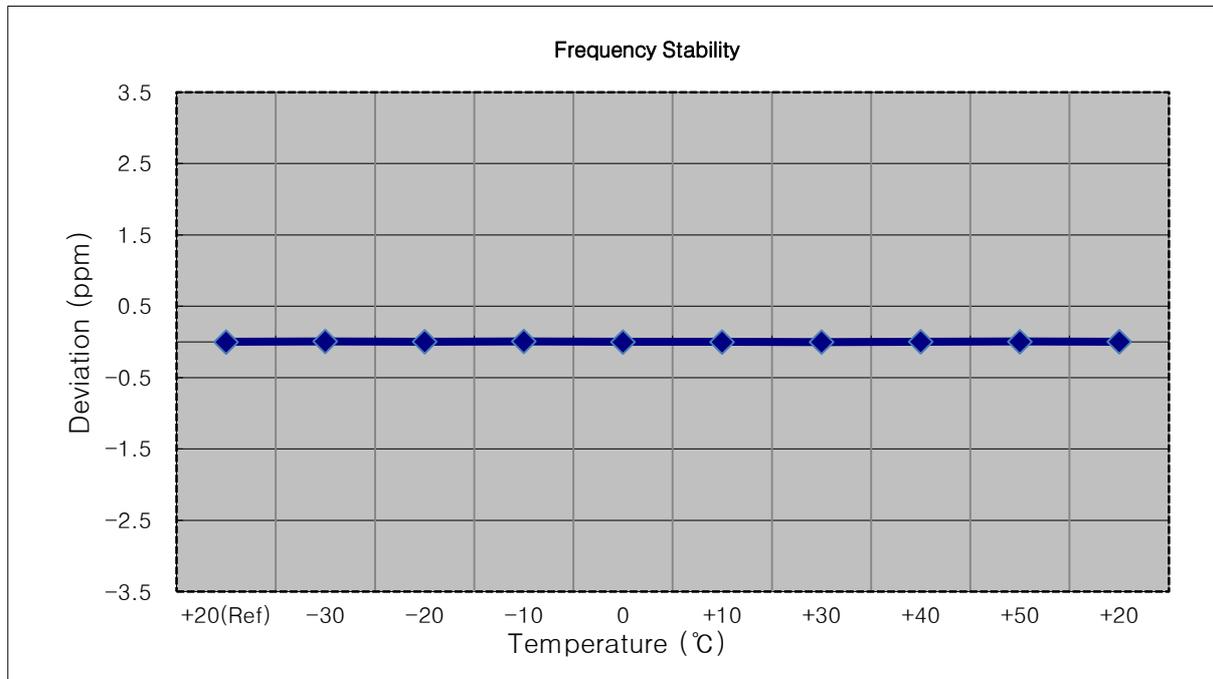
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1880 000 005	0.0	0.000 000	0.000
100 %		-30	1880 000 017	12.2	0.000 001	0.006
100 %		-20	1880 000 016	11.6	0.000 001	0.006
100 %		-10	1880 000 017	12.1	0.000 001	0.006
100 %		0	1880 000 017	12.0	0.000 001	0.006
100 %		+10	1880 000 007	2.6	0.000 000	0.001
100 %		+30	1880 000 003	-1.8	0.000 000	-0.001
100 %		+40	1880 000 012	7.4	0.000 000	0.004
100 %		+50	1880 000 005	0.1	0.000 000	0.000
Batt. Endpoint		3.400	+20	1880 000 005	-0.2	0.000 000



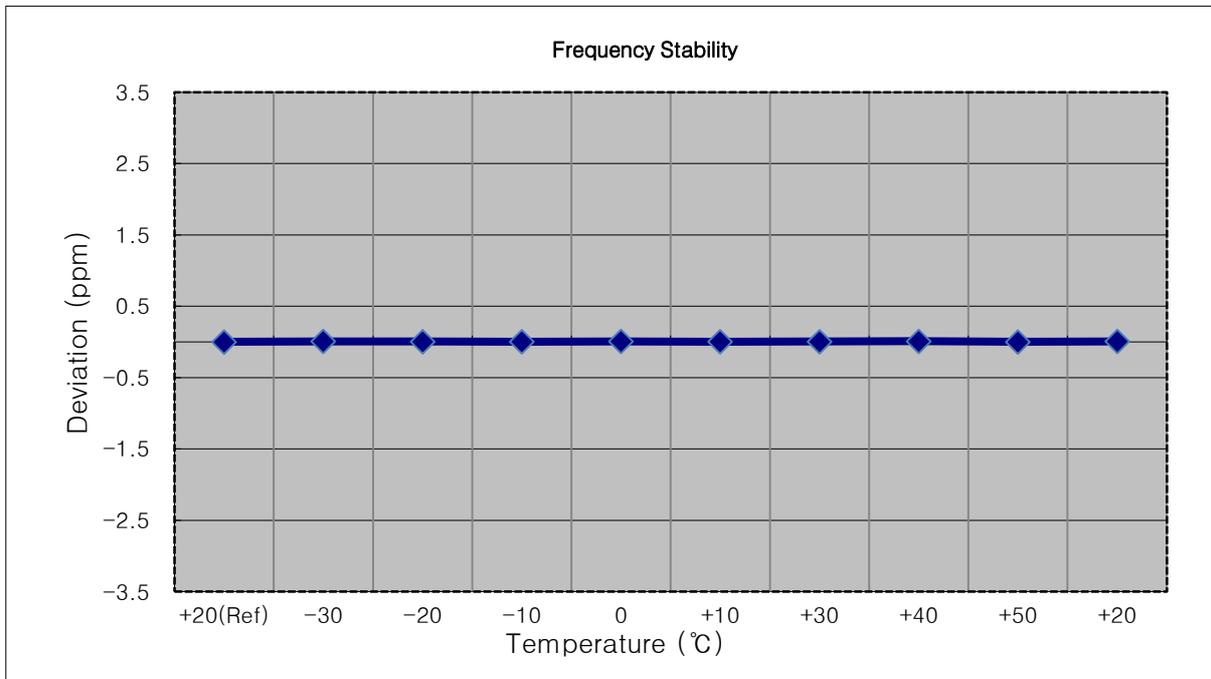
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1879 999 997	0.0	0.000 000	0.000
100 %		-30	1880 000 010	12.7	0.000 001	0.007
100 %		-20	1880 000 003	5.8	0.000 000	0.003
100 %		-10	1880 000 012	14.7	0.000 001	0.008
100 %		0	1879 999 997	-0.5	0.000 000	0.000
100 %		+10	1879 999 999	1.6	0.000 000	0.001
100 %		+30	1879 999 995	-1.7	0.000 000	-0.001
100 %		+40	1880 000 004	6.7	0.000 000	0.004
100 %		+50	1880 000 008	11.0	0.000 001	0.006
Batt. Endpoint	3.400	+20	1880 000 001	3.9	0.000 000	0.002



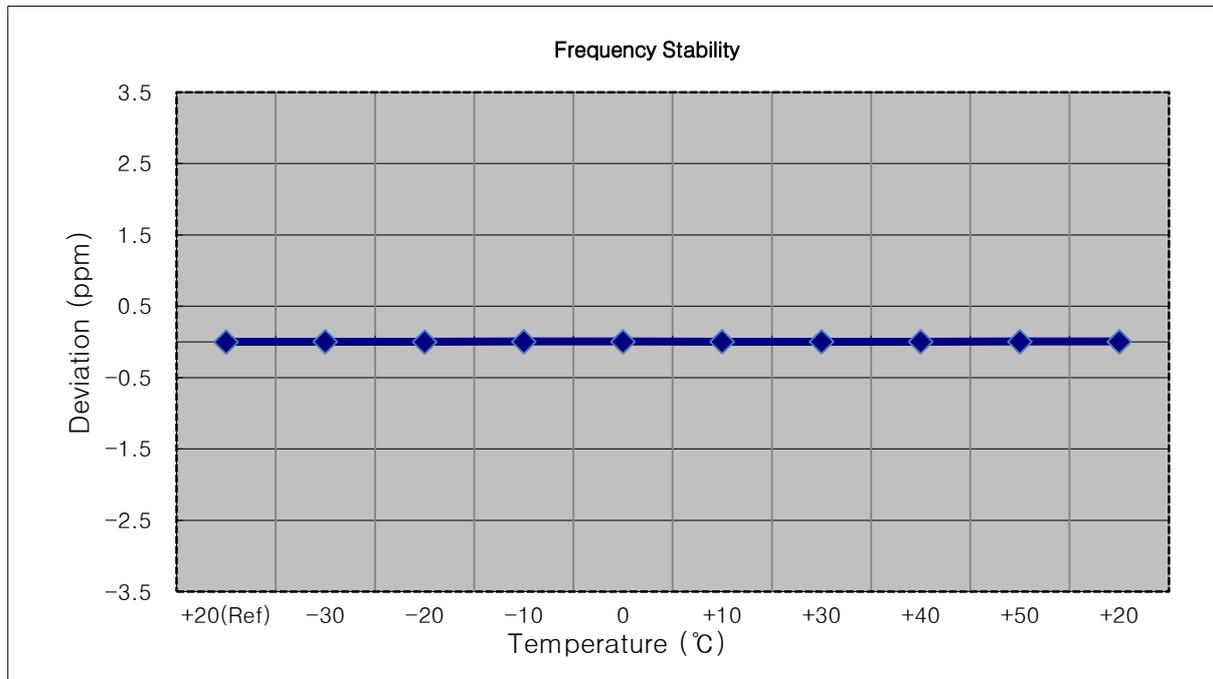
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm	
100 %	3.860	+20(Ref)	1880 000 003	0.0	0.000 000	0.000	
100 %		-30	1880 000 017	14.3	0.000 001	0.008	
100 %		-20	1880 000 010	7.0	0.000 000	0.004	
100 %		-10	1880 000 007	4.0	0.000 000	0.002	
100 %		0	1880 000 015	12.2	0.000 001	0.006	
100 %		+10	1880 000 009	6.6	0.000 000	0.004	
100 %		+30	1880 000 011	8.4	0.000 000	0.004	
100 %		+40	1880 000 019	16.7	0.000 001	0.009	
100 %		+50	1880 000 001	1880 000 001	-1.4	0.000 000	-0.001
Batt. Endpoint		3.400	+20	1880 000 017	14.5	0.000 001	0.008



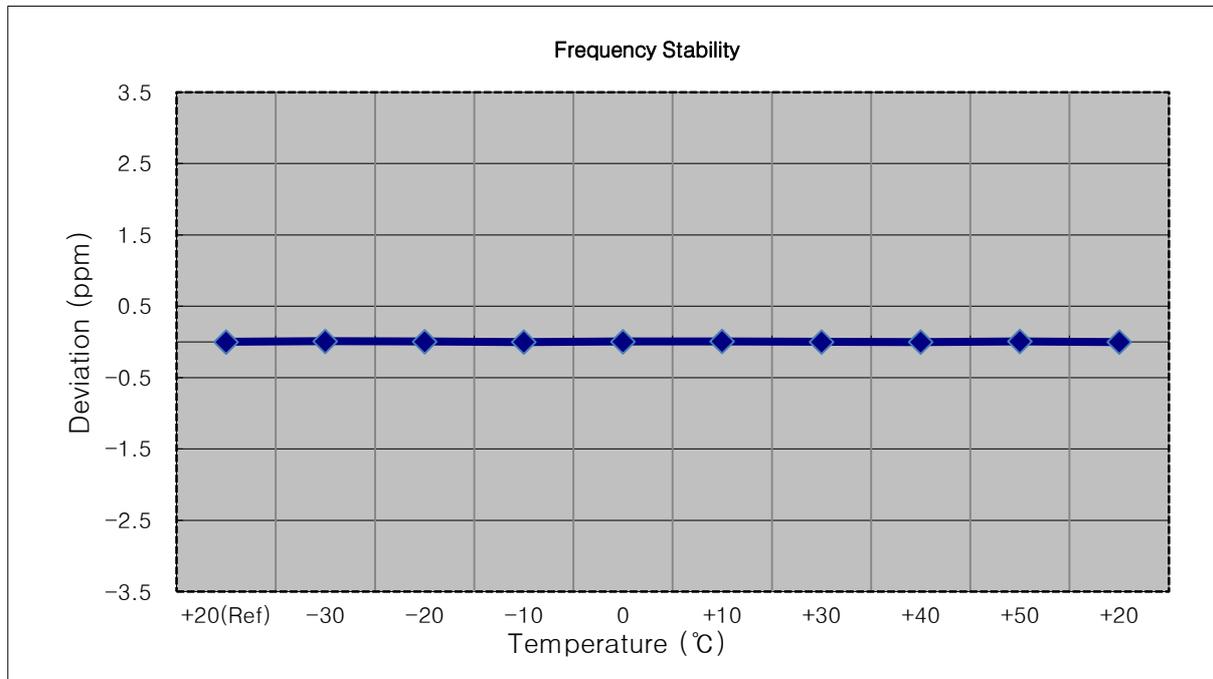
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1880 000 008	0.0	0.000 000	0.000
100 %		-30	1880 000 011	3.4	0.000 000	0.002
100 %		-20	1880 000 006	-1.2	0.000 000	-0.001
100 %		-10	1880 000 017	9.6	0.000 001	0.005
100 %		0	1880 000 019	11.1	0.000 001	0.006
100 %		+10	1880 000 012	4.2	0.000 000	0.002
100 %		+30	1880 000 011	3.1	0.000 000	0.002
100 %		+40	1880 000 011	3.2	0.000 000	0.002
100 %		+50	1880 000 016	8.2	0.000 000	0.004
Batt. Endpoint	3.400	+20	1880 000 017	9.6	0.000 001	0.005



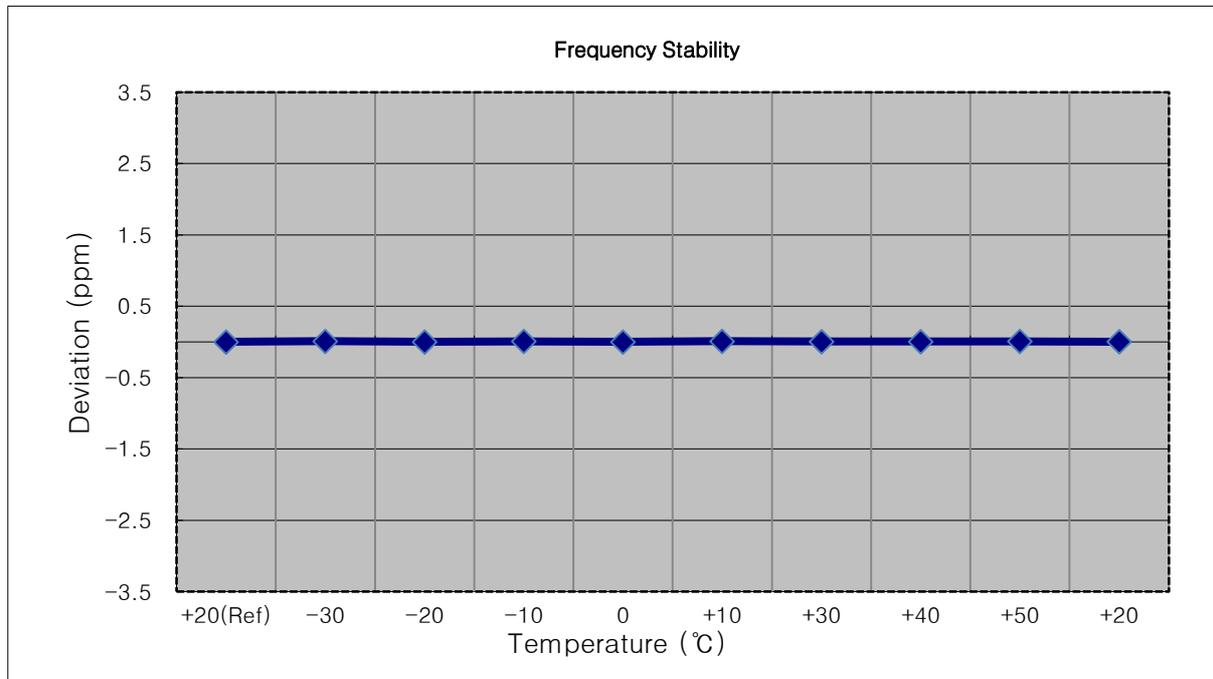
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1880 000 011	0.0	0.000 000	0.000
100 %		-30	1880 000 028	16.2	0.000 001	0.009
100 %		-20	1880 000 019	8.1	0.000 000	0.004
100 %		-10	1880 000 008	-2.9	0.000 000	-0.002
100 %		0	1880 000 022	10.7	0.000 001	0.006
100 %		+10	1880 000 025	14.0	0.000 001	0.007
100 %		+30	1880 000 013	1.8	0.000 000	0.001
100 %		+40	1880 000 009	-2.6	0.000 000	-0.001
100 %		+50	1880 000 023	11.4	0.000 001	0.006
Batt. Endpoint	3.400	+20	1880 000 009	-2.5	0.000 000	-0.001



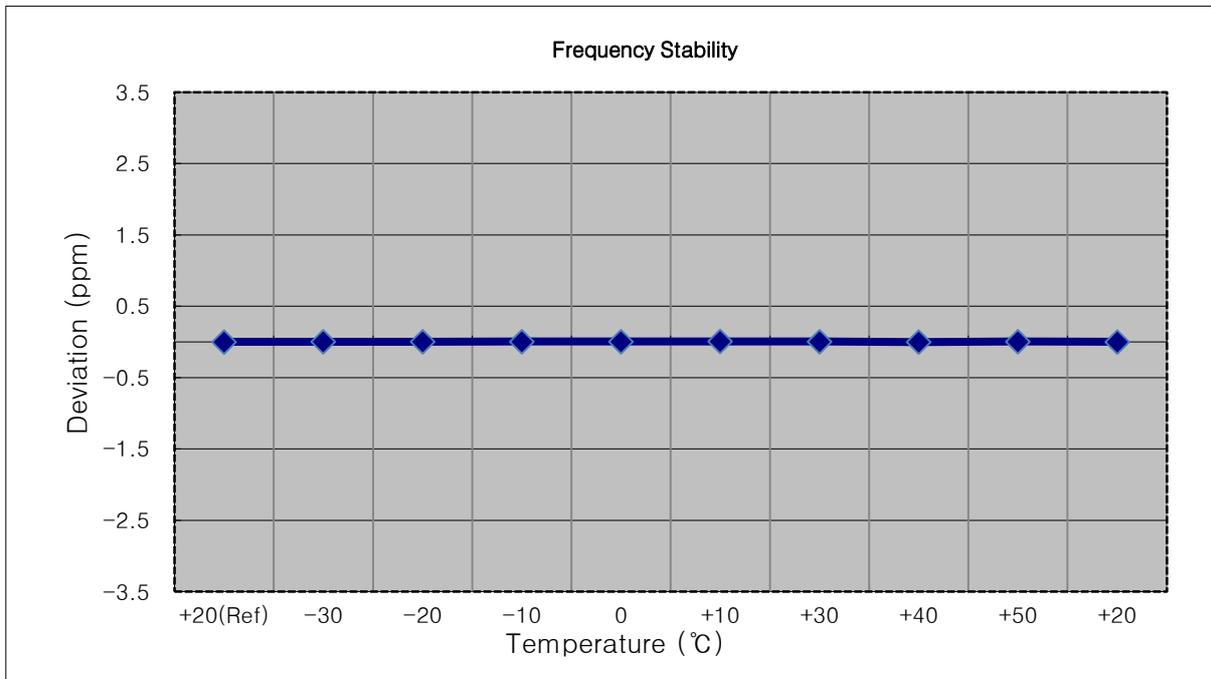
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1909,300,000 Hz
- ▣ CHANNEL: 19193 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1909 300 003	0.0	0.000 000	0.000
100 %		-30	1909 300 019	15.7	0.000 001	0.008
100 %		-20	1909 300 005	2.0	0.000 000	0.001
100 %		-10	1909 300 018	15.2	0.000 001	0.008
100 %		0	1909 300 005	2.0	0.000 000	0.001
100 %		+10	1909 300 019	15.8	0.000 001	0.008
100 %		+30	1909 300 014	10.6	0.000 001	0.006
100 %		+40	1909 300 012	8.6	0.000 000	0.005
100 %		+50	1909 300 017	13.6	0.000 001	0.007
Batt. Endpoint	3.400	+20	1909 300 008	5.0	0.000 000	0.003



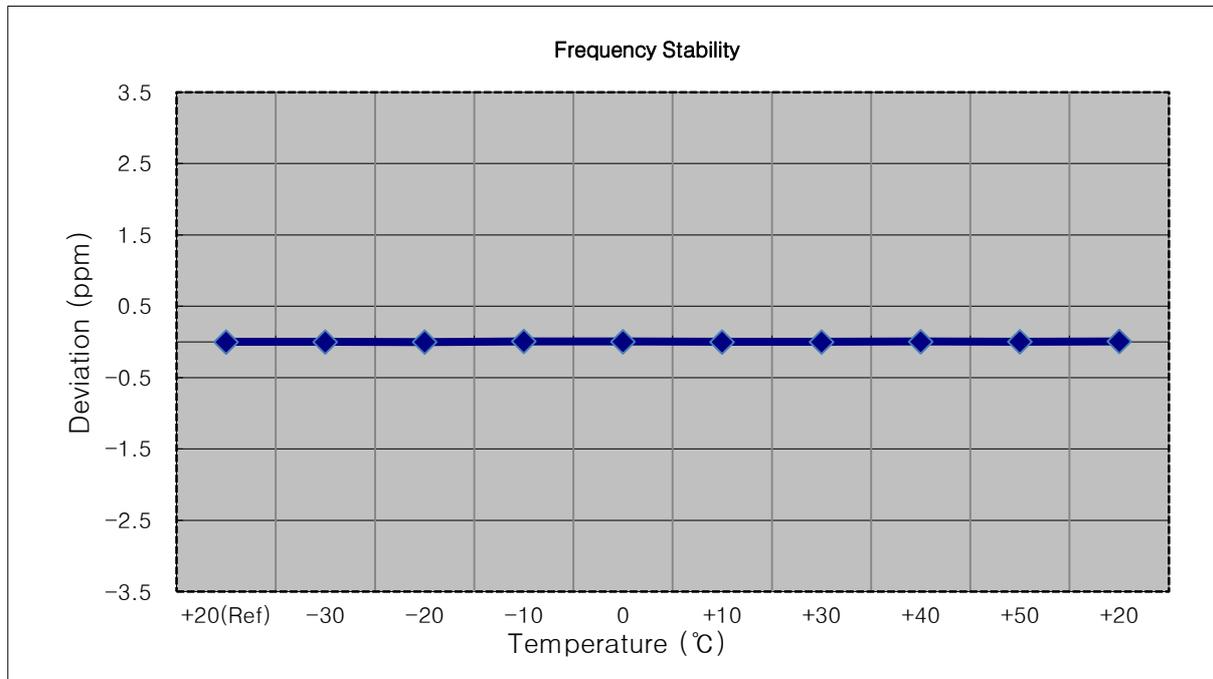
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1908,500,000 Hz
- ▣ CHANNEL: 19185 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1908 499 999	0.0	0.000 000	0.000
100 %		-30	1908 500 002	2.9	0.000 000	0.002
100 %		-20	1908 500 004	4.7	0.000 000	0.002
100 %		-10	1908 500 009	9.9	0.000 001	0.005
100 %		0	1908 500 008	8.4	0.000 000	0.004
100 %		+10	1908 500 014	14.7	0.000 001	0.008
100 %		+30	1908 500 007	7.3	0.000 000	0.004
100 %		+40	1908 499 996	-3.0	0.000 000	-0.002
100 %		+50	1908 500 006	7.2	0.000 000	0.004
Batt. Endpoint	3.400	+20	1908 500 001	2.0	0.000 000	0.001



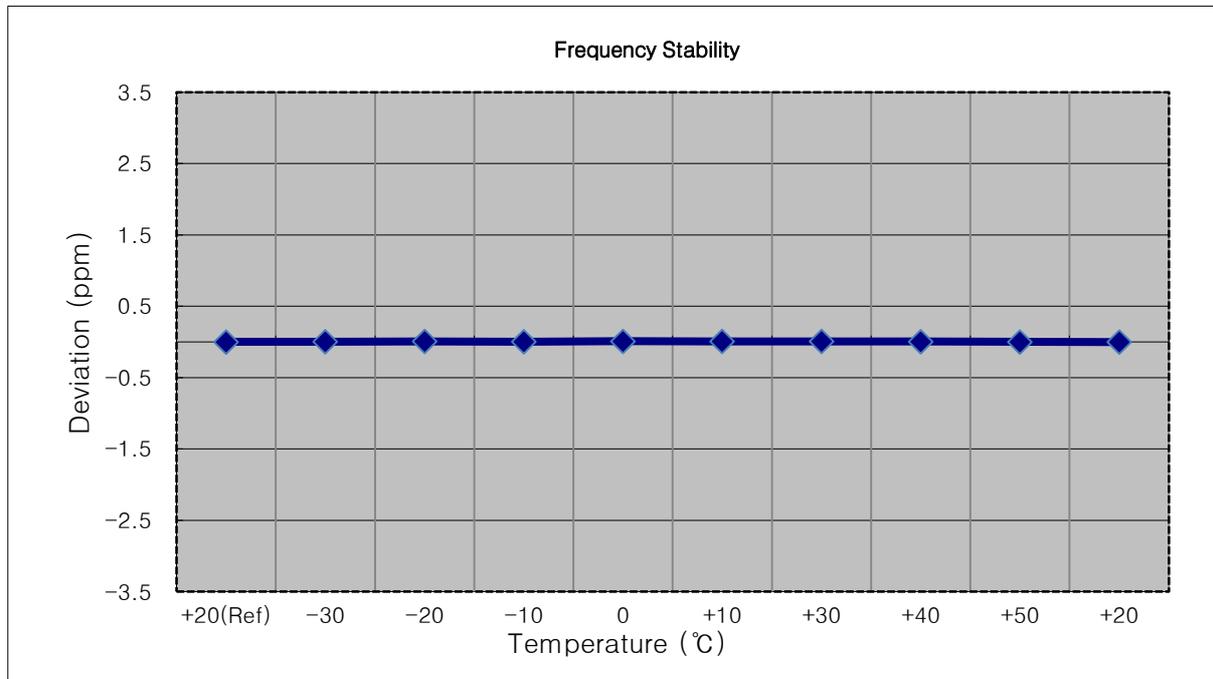
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1907,500,000 Hz
- ▣ CHANNEL: 19175 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1907 500 005	0.0	0.000 000	0.000
100 %		-30	1907 500 004	-0.7	0.000 000	0.000
100 %		-20	1907 500 002	-3.2	0.000 000	-0.002
100 %		-10	1907 500 018	12.8	0.000 001	0.007
100 %		0	1907 500 013	8.1	0.000 000	0.004
100 %		+10	1907 500 004	-1.1	0.000 000	-0.001
100 %		+30	1907 500 005	0.5	0.000 000	0.000
100 %		+40	1907 500 012	7.2	0.000 000	0.004
100 %		+50	1907 500 009	4.4	0.000 000	0.002
Batt. Endpoint	3.400	+20	1907 500 020	15.5	0.000 001	0.008



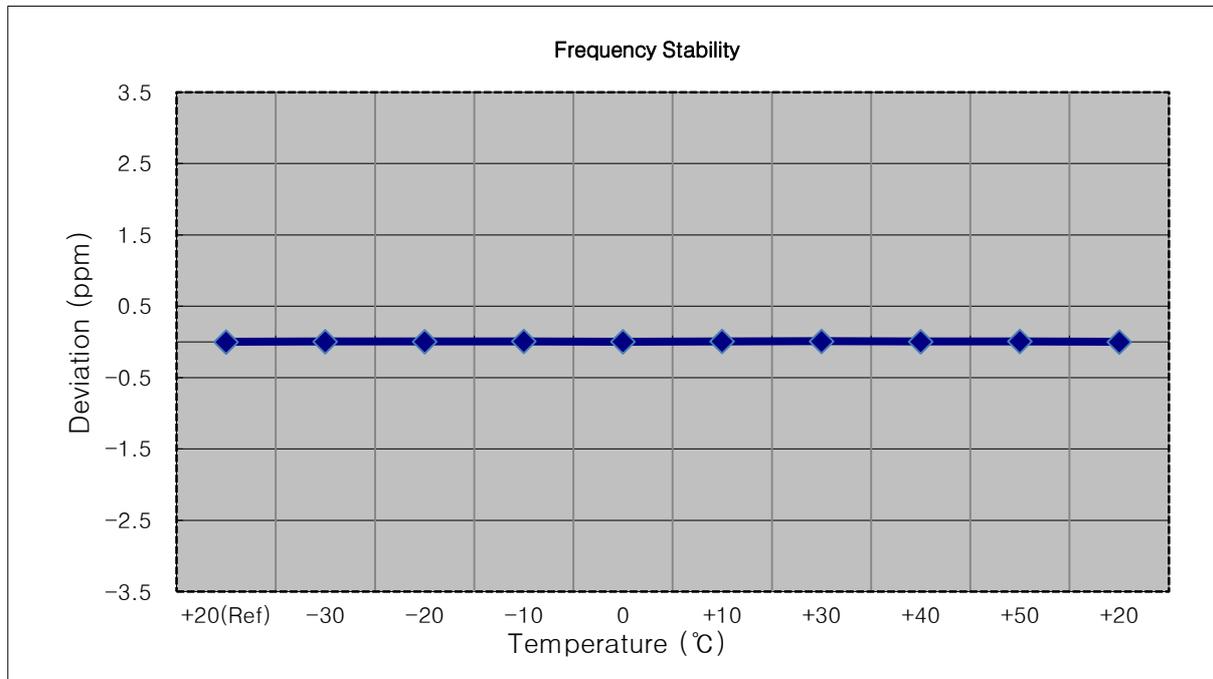
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1905,000,000 Hz
- ▣ CHANNEL: 19150 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1905 000 015	0.0	0.000 000	0.000
100 %		-30	1905 000 021	6.1	0.000 000	0.003
100 %		-20	1905 000 028	13.5	0.000 001	0.007
100 %		-10	1905 000 020	4.8	0.000 000	0.002
100 %		0	1905 000 031	16.4	0.000 001	0.009
100 %		+10	1905 000 030	15.4	0.000 001	0.008
100 %		+30	1905 000 028	13.1	0.000 001	0.007
100 %		+40	1905 000 022	7.3	0.000 000	0.004
100 %		+50	1905 000 017	1.9	0.000 000	0.001
Batt. Endpoint		3.400	+20	1905 000 013	-1.5	0.000 000



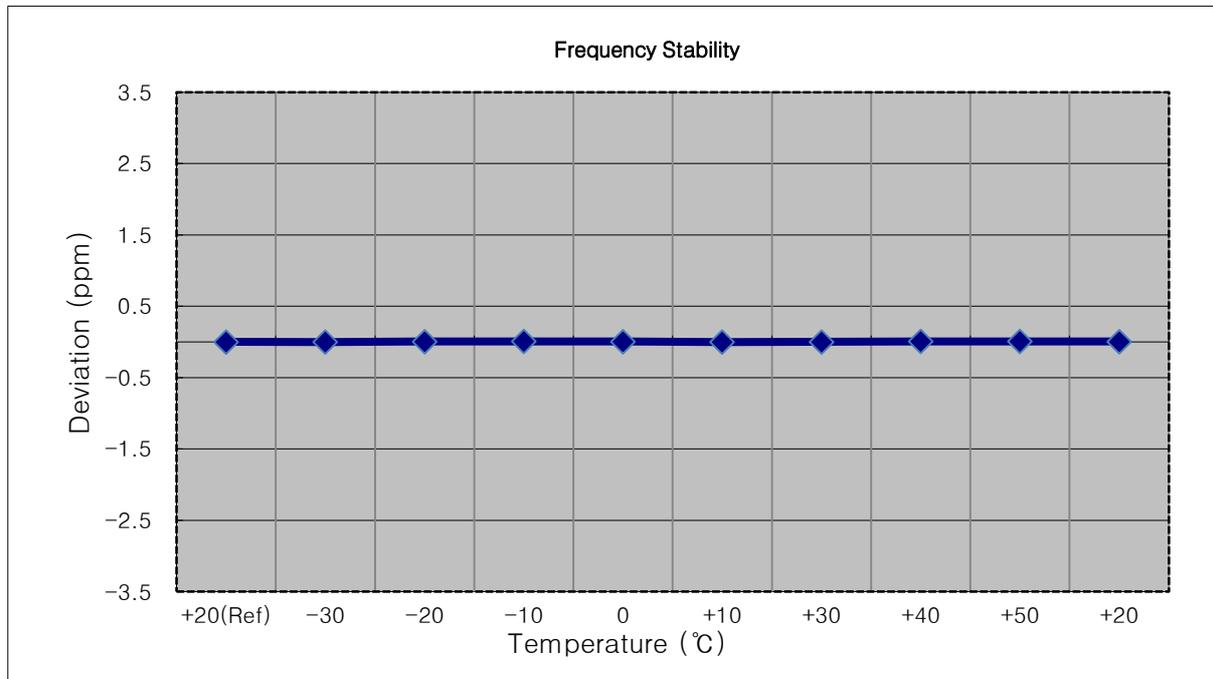
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1902,500,000 Hz
- ▣ CHANNEL: 19125 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1902 500 014	0.0	0.000 000	0.000
100 %		-30	1902 500 025	10.6	0.000 001	0.006
100 %		-20	1902 500 022	7.6	0.000 000	0.004
100 %		-10	1902 500 027	12.9	0.000 001	0.007
100 %		0	1902 500 021	6.8	0.000 000	0.004
100 %		+10	1902 500 028	14.3	0.000 001	0.008
100 %		+30	1902 500 030	15.6	0.000 001	0.008
100 %		+40	1902 500 023	9.4	0.000 000	0.005
100 %		+50	1902 500 029	15.5	0.000 001	0.008
Batt. Endpoint	3.400	+20	1902 500 015	0.6	0.000 000	0.000



- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1900,000,000 Hz
- ▣ CHANNEL: 19100 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

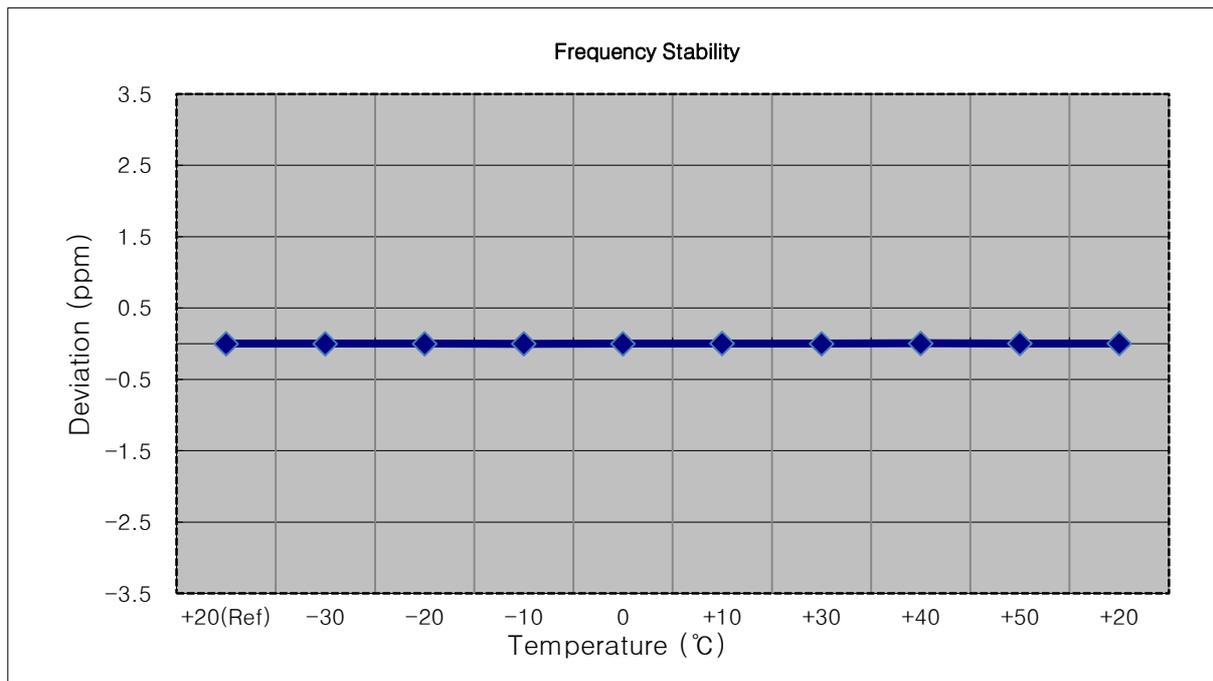
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1900 000 009	0.0	0.000 000	0.000
100 %		-30	1900 000 006	-2.9	0.000 000	-0.002
100 %		-20	1900 000 020	10.5	0.000 001	0.006
100 %		-10	1900 000 023	13.5	0.000 001	0.007
100 %		0	1900 000 017	7.6	0.000 000	0.004
100 %		+10	1900 000 007	-2.8	0.000 000	-0.001
100 %		+30	1900 000 010	1.1	0.000 000	0.001
100 %		+40	1900 000 023	13.4	0.000 001	0.007
100 %		+50	1900 000 021	12.1	0.000 001	0.006
Batt. Endpoint		3.400	+20	1900 000 020	10.7	0.000 001



**8.7.2 Upper Ant**

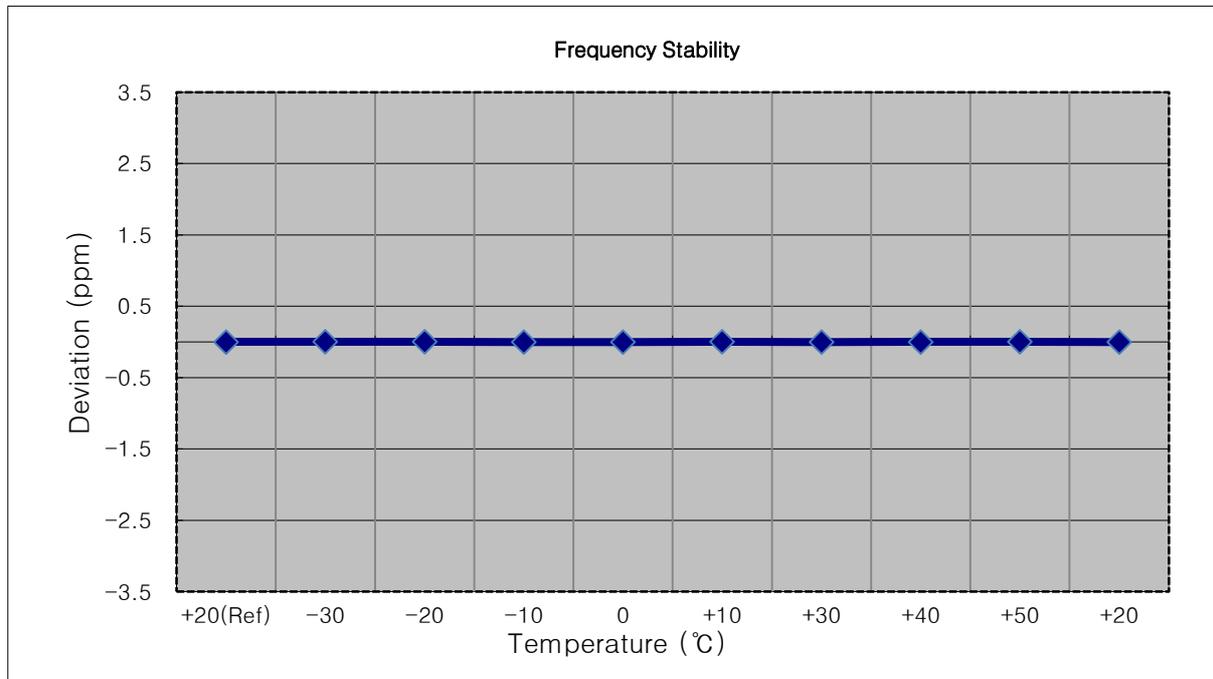
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1850,700,000 Hz
- ▣ CHANNEL: 18607 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1850 700 003	0.0	0.000 000	0.000
100 %		-30	1850 700 006	2.3	0.000 000	0.001
100 %		-20	1850 700 006	2.2	0.000 000	0.001
100 %		-10	1850 700 000	-3.1	0.000 000	-0.002
100 %		0	1850 700 005	2.0	0.000 000	0.001
100 %		+10	1850 700 007	3.2	0.000 000	0.002
100 %		+30	1850 700 006	2.2	0.000 000	0.001
100 %		+40	1850 700 011	7.6	0.000 000	0.004
100 %		+50	1850 700 007	3.8	0.000 000	0.002
Batt. Endpoint	3.400	+20	1850 700 008	4.6	0.000 000	0.002



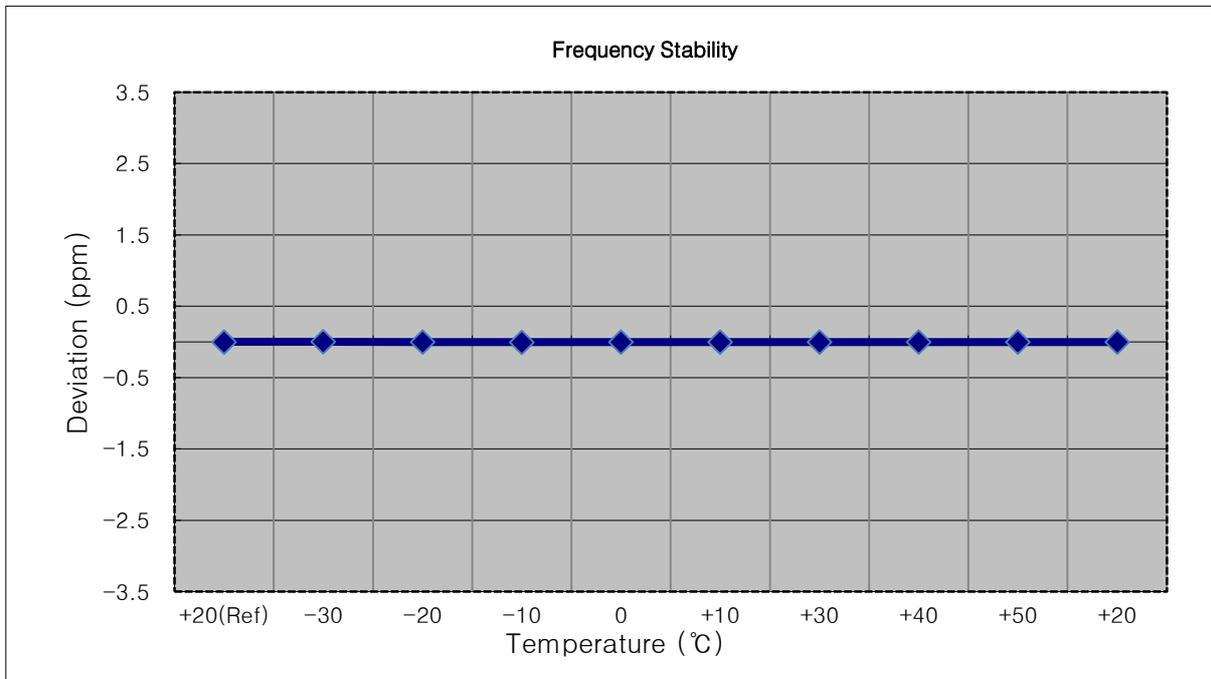
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1851,500,000 Hz
- ▣ CHANNEL: 18615 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1851 500 005	0.0	0.000 000	0.000
100 %		-30	1851 500 009	4.8	0.000 000	0.003
100 %		-20	1851 500 010	5.3	0.000 000	0.003
100 %		-10	1851 500 001	-3.6	0.000 000	-0.002
100 %		0	1851 500 000	-4.5	0.000 000	-0.002
100 %		+10	1851 500 008	3.4	0.000 000	0.002
100 %		+30	1851 500 000	-4.9	0.000 000	-0.003
100 %		+40	1851 500 007	2.6	0.000 000	0.001
100 %		+50	1851 500 009	4.6	0.000 000	0.002
Batt. Endpoint	3.400	+20	1851 500 001	-3.2	0.000 000	-0.002



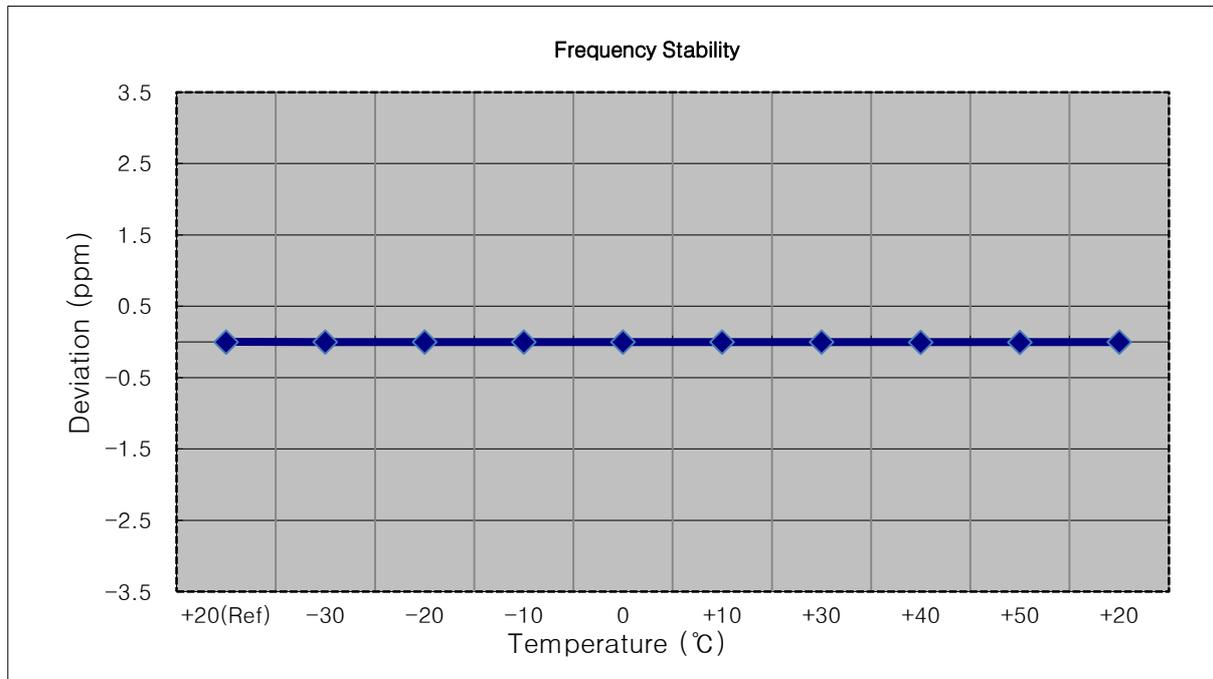
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1852,500,000 Hz
- ▣ CHANNEL: 18625 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1852 499 996	0.0	0.000 000	0.000
100 %		-30	1852 499 999	3.2	0.000 000	0.002
100 %		-20	1852 499 993	-2.5	0.000 000	-0.001
100 %		-10	1852 499 989	-6.5	0.000 000	-0.004
100 %		0	1852 499 992	-4.3	0.000 000	-0.002
100 %		+10	1852 499 991	-5.2	0.000 000	-0.003
100 %		+30	1852 499 992	-3.7	0.000 000	-0.002
100 %		+40	1852 499 991	-5.2	0.000 000	-0.003
100 %		+50	1852 499 993	-3.0	0.000 000	-0.002
Batt. Endpoint		3.400	+20	1852 499 993	-3.1	0.000 000



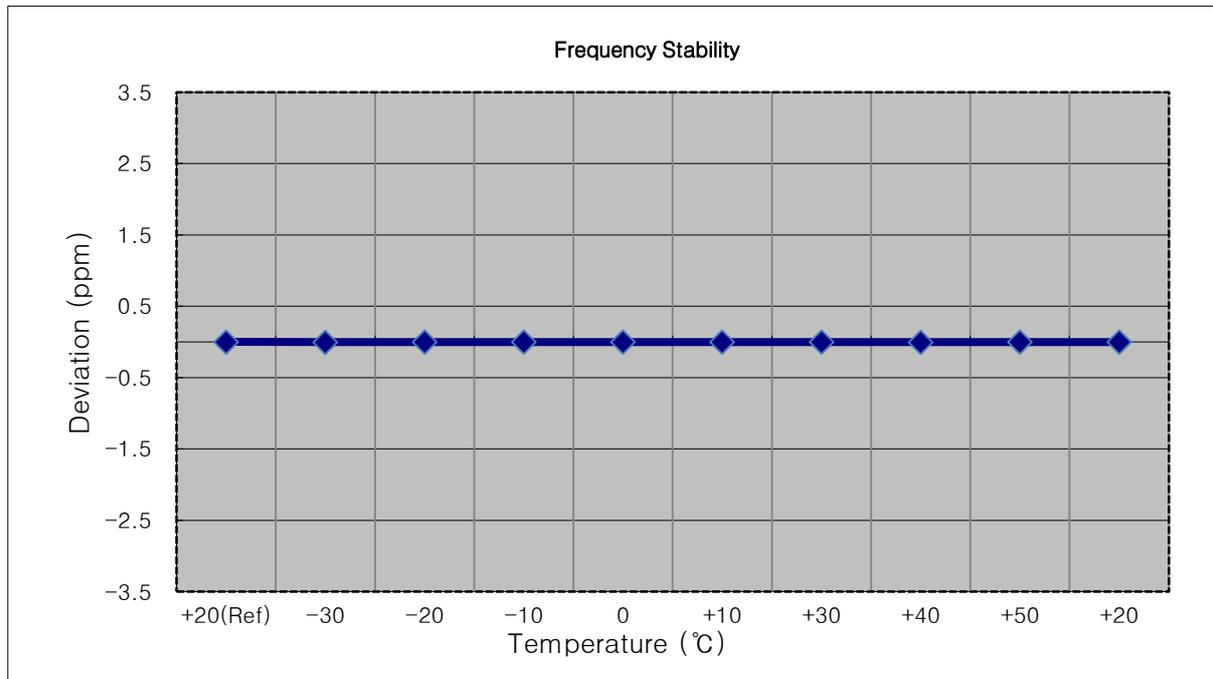
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1855,000,000 Hz
- ▣ CHANNEL: 18650 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1854 999 998	0.0	0.000 000	0.000
100 %		-30	1854 999 996	-2.5	0.000 000	-0.001
100 %		-20	1854 999 996	-2.4	0.000 000	-0.001
100 %		-10	1854 999 994	-4.0	0.000 000	-0.002
100 %		0	1854 999 996	-2.6	0.000 000	-0.001
100 %		+10	1854 999 994	-4.2	0.000 000	-0.002
100 %		+30	1854 999 993	-4.9	0.000 000	-0.003
100 %		+40	1854 999 989	-9.2	0.000 000	-0.005
100 %		+50	1854 999 993	-5.6	0.000 000	-0.003
Batt. Endpoint	3.400	+20	1854 999 995	-3.2	0.000 000	-0.002



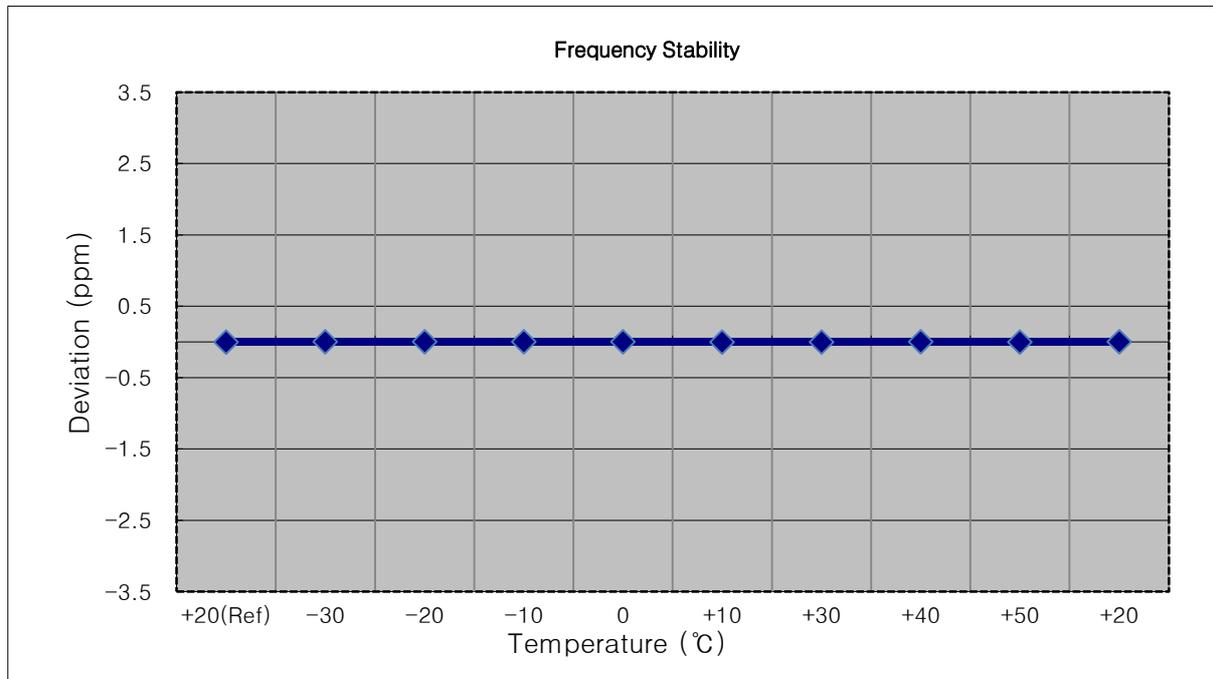
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1857,500,000 Hz
- ▣ CHANNEL: 18675 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1857 499 997	0.0	0.000 000	0.000
100 %		-30	1857 499 991	-5.8	0.000 000	-0.003
100 %		-20	1857 499 993	-3.5	0.000 000	-0.002
100 %		-10	1857 499 994	-2.7	0.000 000	-0.001
100 %		0	1857 499 993	-3.7	0.000 000	-0.002
100 %		+10	1857 499 991	-5.5	0.000 000	-0.003
100 %		+30	1857 499 993	-4.1	0.000 000	-0.002
100 %		+40	1857 499 990	-6.6	0.000 000	-0.004
100 %		+50	1857 499 994	-3.2	0.000 000	-0.002
Batt. Endpoint	3.400	+20	1857 499 993	-3.9	0.000 000	-0.002



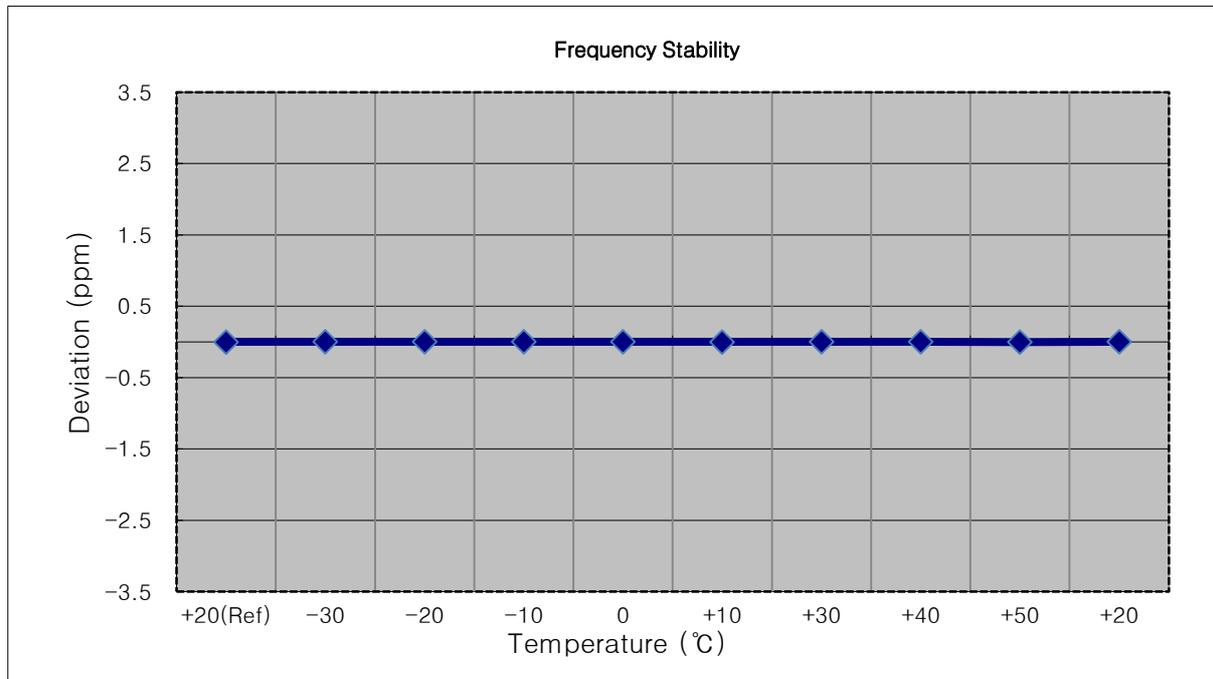
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1860,000,000 Hz
- ▣ CHANNEL: 18700 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1860 000 003	0.0	0.000 000	0.000
100 %		-30	1860 000 007	3.9	0.000 000	0.002
100 %		-20	1860 000 007	4.1	0.000 000	0.002
100 %		-10	1860 000 007	3.4	0.000 000	0.002
100 %		0	1860 000 007	3.7	0.000 000	0.002
100 %		+10	1860 000 005	2.0	0.000 000	0.001
100 %		+30	1860 000 006	2.2	0.000 000	0.001
100 %		+40	1860 000 009	5.2	0.000 000	0.003
100 %		+50	1860 000 006	2.5	0.000 000	0.001
Batt. Endpoint		3.400	+20	1860 000 007	3.6	0.000 000



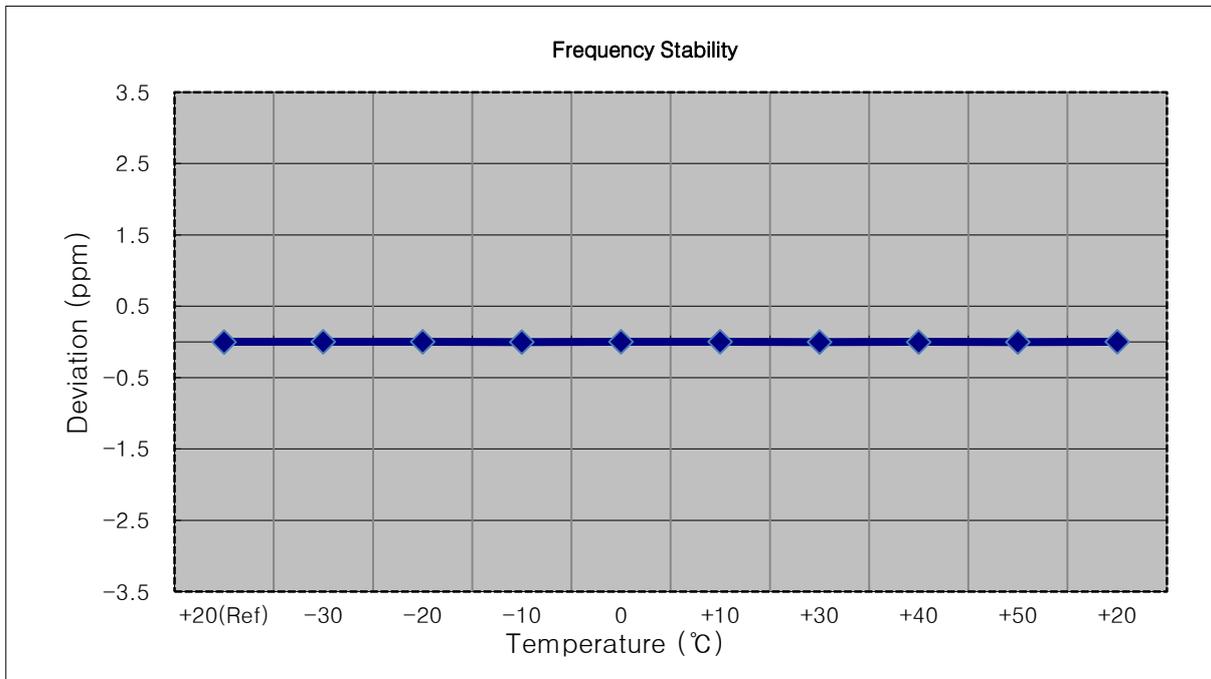
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1879 999 997	0.0	0.000 000	0.000
100 %		-30	1880 000 002	4.5	0.000 000	0.002
100 %		-20	1880 000 001	4.1	0.000 000	0.002
100 %		-10	1880 000 001	4.3	0.000 000	0.002
100 %		0	1880 000 001	4.3	0.000 000	0.002
100 %		+10	1879 999 999	1.9	0.000 000	0.001
100 %		+30	1880 000 001	3.7	0.000 000	0.002
100 %		+40	1880 000 001	3.8	0.000 000	0.002
100 %		+50	1879 999 994	-2.9	0.000 000	-0.002
Batt. Endpoint		3.400	+20	1880 000 002	4.8	0.000 000



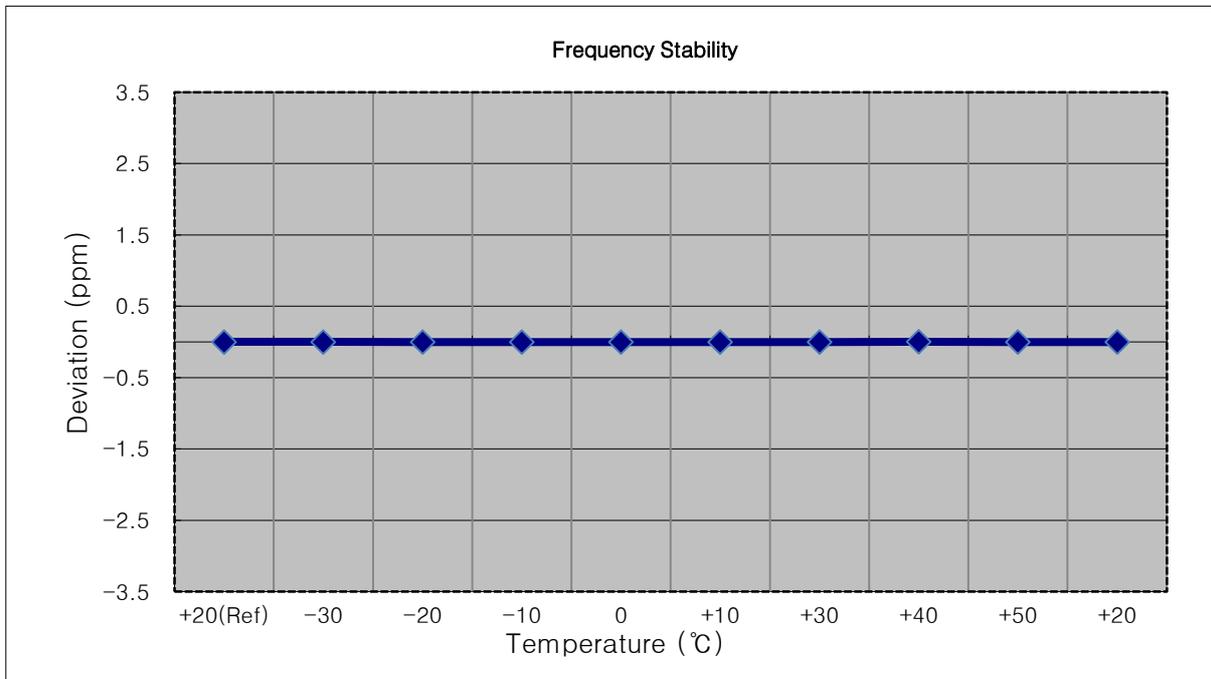
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1879 999 997	0.0	0.000 000	0.000
100 %		-30	1880 000 003	6.3	0.000 000	0.003
100 %		-20	1880 000 003	6.5	0.000 000	0.003
100 %		-10	1879 999 993	-3.9	0.000 000	-0.002
100 %		0	1880 000 003	5.9	0.000 000	0.003
100 %		+10	1880 000 000	3.1	0.000 000	0.002
100 %		+30	1879 999 994	-3.0	0.000 000	-0.002
100 %		+40	1880 000 000	2.6	0.000 000	0.001
100 %		+50	1879 999 993	-3.5	0.000 000	-0.002
Batt. Endpoint		3.400	+20	1880 000 004	6.7	0.000 000



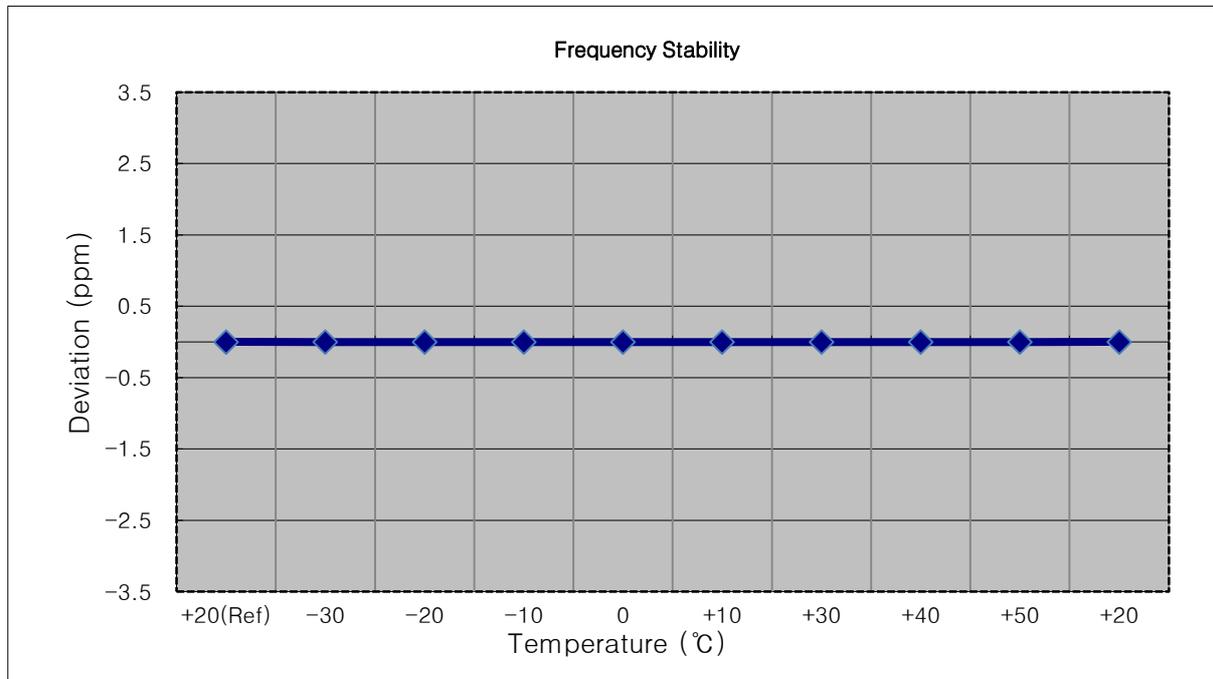
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1879 999 951	0.0	0.000 000	0.000
100 %		-30	1879 999 953	1.9	0.000 000	0.001
100 %		-20	1879 999 948	-2.9	0.000 000	-0.002
100 %		-10	1879 999 947	-3.7	0.000 000	-0.002
100 %		0	1879 999 947	-3.9	0.000 000	-0.002
100 %		+10	1879 999 948	-2.6	0.000 000	-0.001
100 %		+30	1879 999 948	-3.3	0.000 000	-0.002
100 %		+40	1879 999 955	4.3	0.000 000	0.002
100 %		+50	1879 999 948	-2.7	0.000 000	-0.001
Batt. Endpoint		3.400	+20	1879 999 948	-2.6	0.000 000



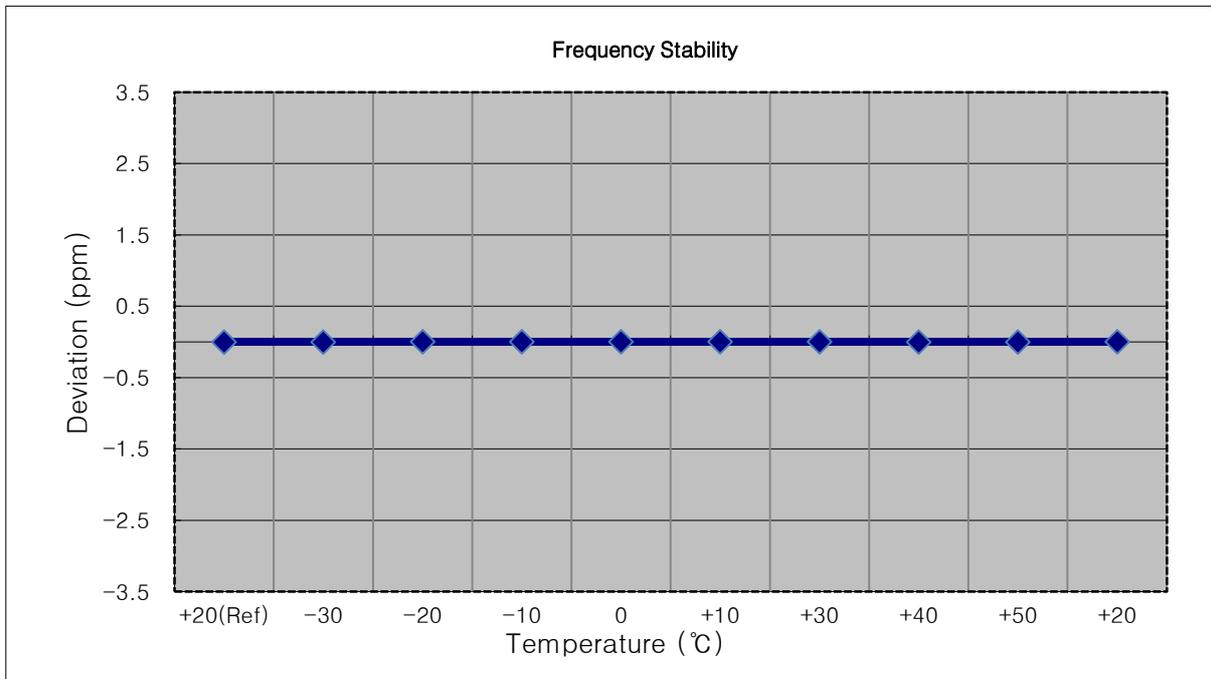
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1879 999 997	0.0	0.000 000	0.000
100 %		-30	1879 999 992	-5.4	0.000 000	-0.003
100 %		-20	1879 999 993	-4.7	0.000 000	-0.003
100 %		-10	1879 999 993	-4.5	0.000 000	-0.002
100 %		0	1879 999 995	-2.1	0.000 000	-0.001
100 %		+10	1879 999 996	-1.7	0.000 000	-0.001
100 %		+30	1879 999 995	-2.3	0.000 000	-0.001
100 %		+40	1879 999 993	-4.9	0.000 000	-0.003
100 %		+50	1879 999 993	-4.8	0.000 000	-0.003
Batt. Endpoint	3.400	+20	1880 000 000	2.6	0.000 000	0.001



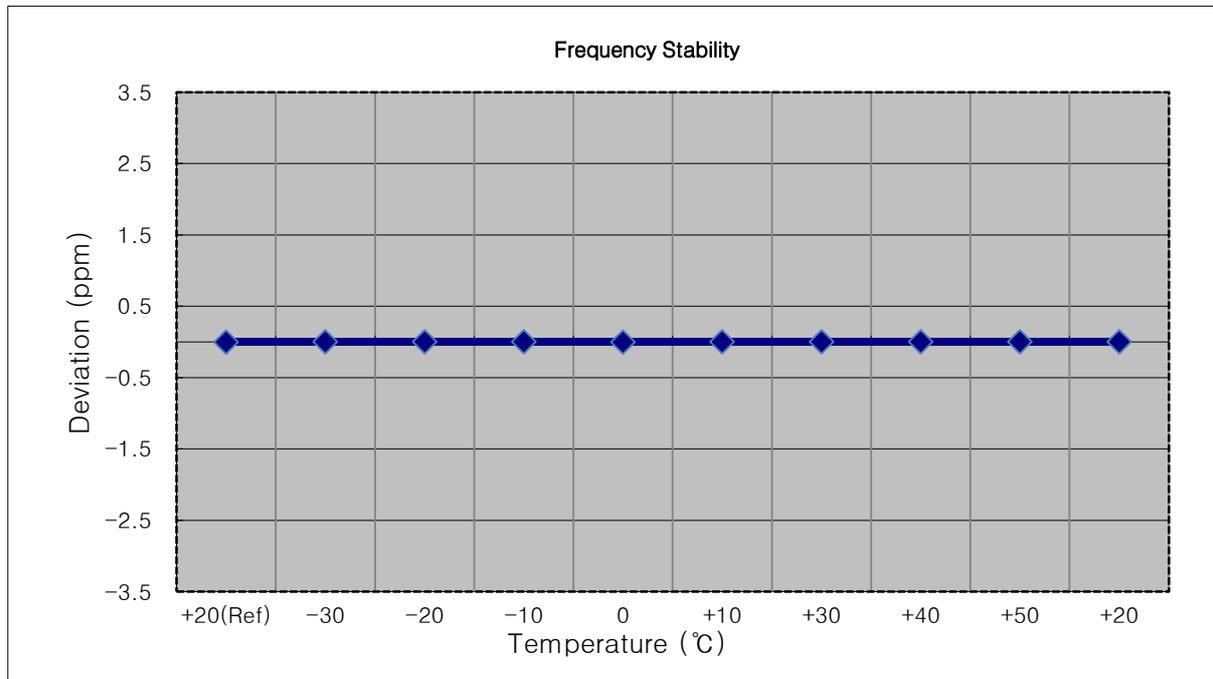
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1880 000 003	0.0	0.000 000	0.000
100 %		-30	1880 000 005	2.2	0.000 000	0.001
100 %		-20	1880 000 006	2.9	0.000 000	0.002
100 %		-10	1880 000 009	6.3	0.000 000	0.003
100 %		0	1880 000 008	5.4	0.000 000	0.003
100 %		+10	1880 000 006	3.3	0.000 000	0.002
100 %		+30	1880 000 008	4.5	0.000 000	0.002
100 %		+40	1880 000 005	2.4	0.000 000	0.001
100 %		+50	1880 000 006	2.5	0.000 000	0.001
Batt. Endpoint		3.400	+20	1880 000 007	4.0	0.000 000



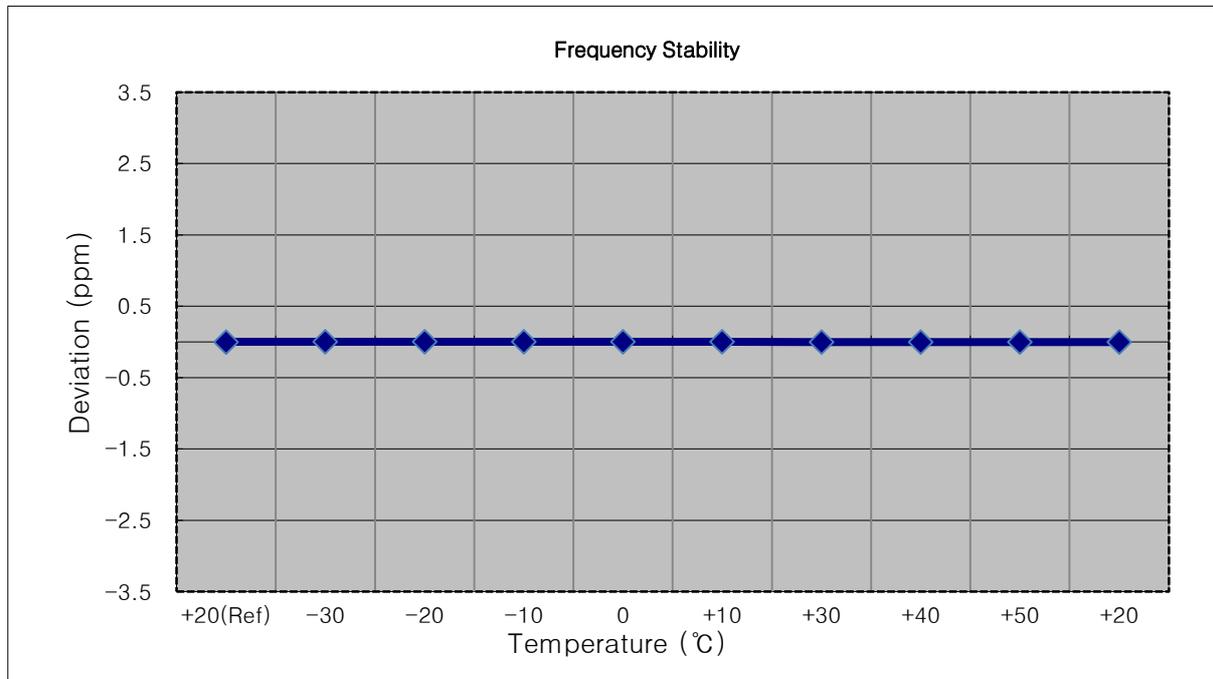
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1880 000 005	0.0	0.000 000	0.000
100 %		-30	1880 000 011	5.9	0.000 000	0.003
100 %		-20	1880 000 011	5.9	0.000 000	0.003
100 %		-10	1880 000 011	5.8	0.000 000	0.003
100 %		0	1880 000 008	2.7	0.000 000	0.001
100 %		+10	1880 000 010	4.8	0.000 000	0.003
100 %		+30	1880 000 012	6.7	0.000 000	0.004
100 %		+40	1880 000 010	4.7	0.000 000	0.002
100 %		+50	1880 000 010	5.5	0.000 000	0.003
Batt. Endpoint	3.400	+20	1880 000 009	3.6	0.000 000	0.002



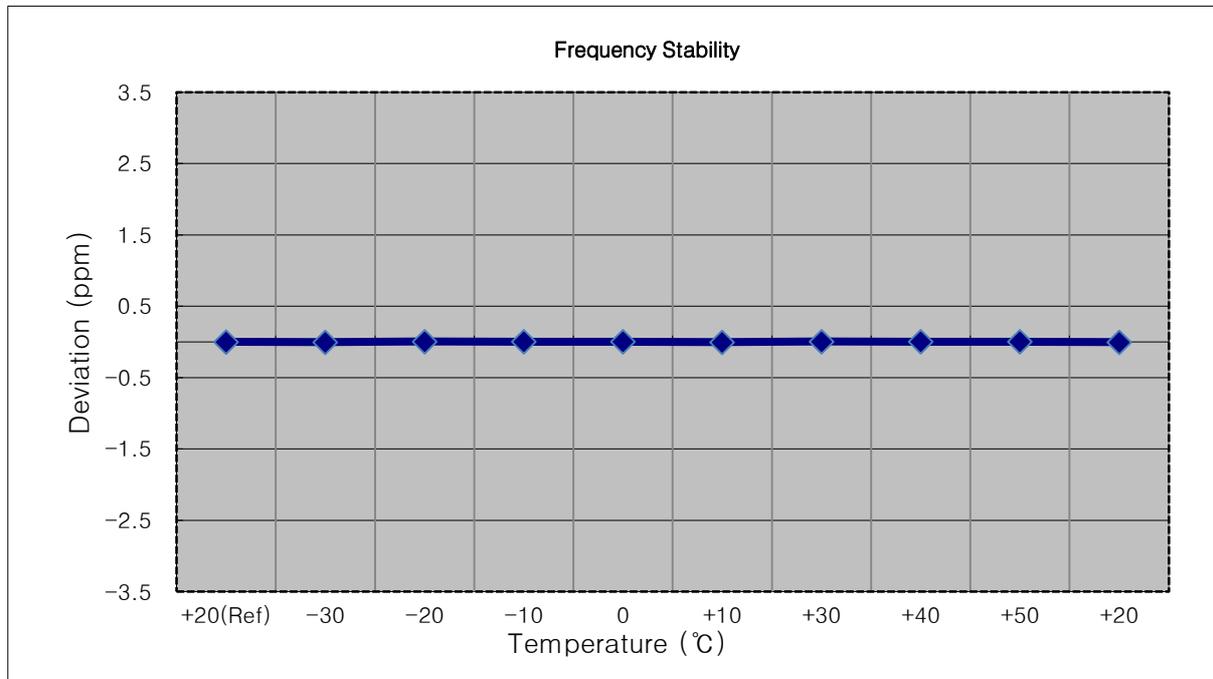
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1909,300,000 Hz
- ▣ CHANNEL: 19193 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1909 300 004	0.0	0.000 000	0.000
100 %		-30	1909 300 008	3.9	0.000 000	0.002
100 %		-20	1909 300 008	3.5	0.000 000	0.002
100 %		-10	1909 300 009	4.3	0.000 000	0.002
100 %		0	1909 300 009	4.6	0.000 000	0.002
100 %		+10	1909 300 009	4.5	0.000 000	0.002
100 %		+30	1909 300 002	-2.7	0.000 000	-0.001
100 %		+40	1909 300 002	-2.0	0.000 000	-0.001
100 %		+50	1909 300 001	-3.1	0.000 000	-0.002
Batt. Endpoint		3.400	+20	1909 300 000	-4.4	0.000 000



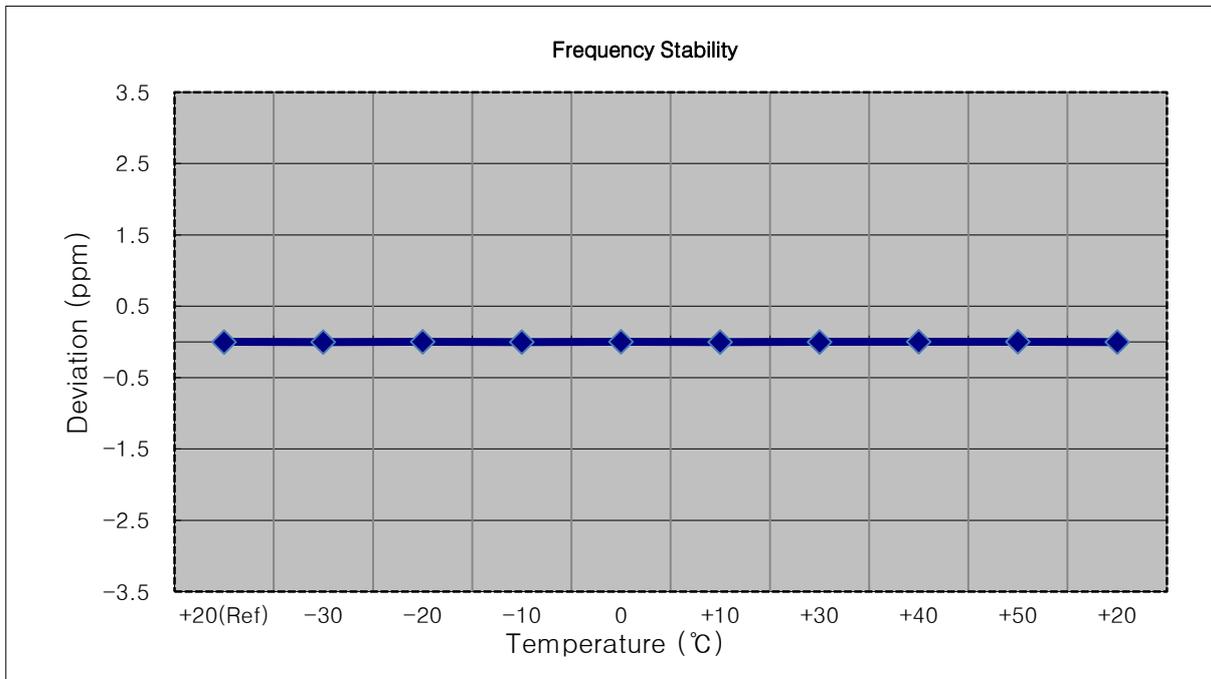
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1908,500,000 Hz
- ▣ CHANNEL: 19185 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1908 500 008	0.0	0.000 000	0.000
100 %		-30	1908 500 000	-8.5	0.000 000	-0.004
100 %		-20	1908 500 017	9.0	0.000 000	0.005
100 %		-10	1908 500 012	4.2	0.000 000	0.002
100 %		0	1908 500 015	6.7	0.000 000	0.004
100 %		+10	1908 499 999	-9.4	0.000 000	-0.005
100 %		+30	1908 500 015	7.3	0.000 000	0.004
100 %		+40	1908 500 012	4.2	0.000 000	0.002
100 %		+50	1908 500 014	5.4	0.000 000	0.003
Batt. Endpoint	3.400	+20	1908 500 002	-6.4	0.000 000	-0.003



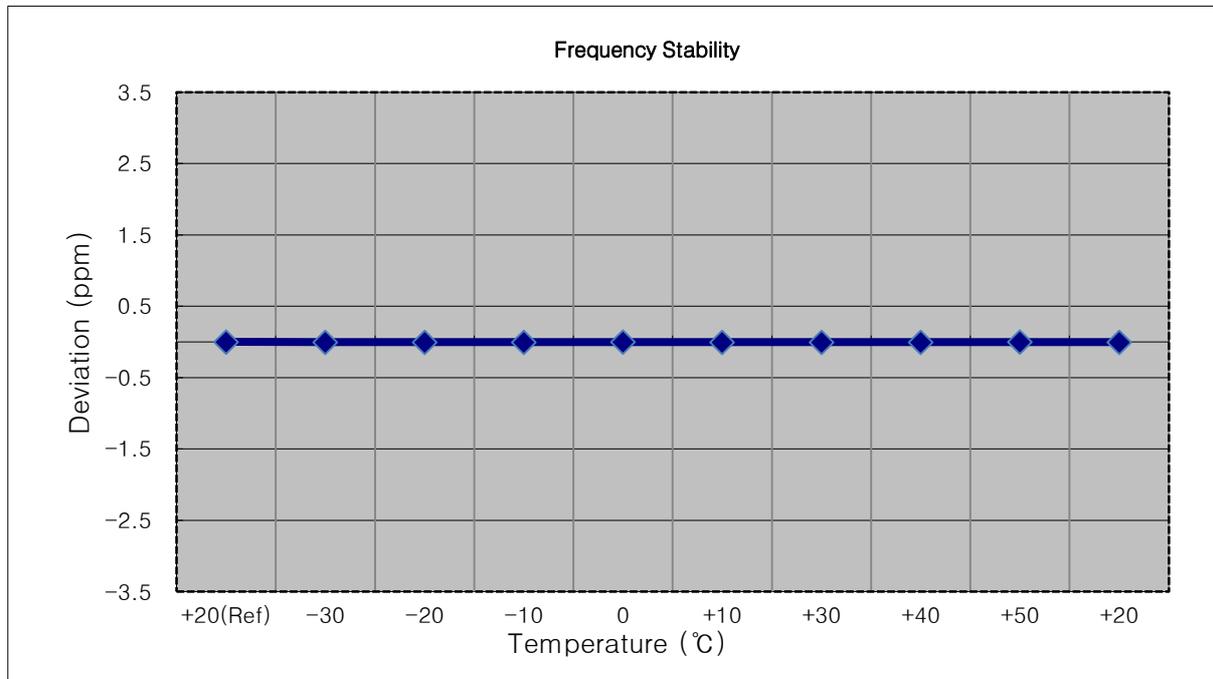
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1907,500,000 Hz
- ▣ CHANNEL: 19175 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1907 499 999	0.0	0.000 000	0.000
100 %		-30	1907 499 995	-3.8	0.000 000	-0.002
100 %		-20	1907 500 004	5.7	0.000 000	0.003
100 %		-10	1907 499 996	-2.8	0.000 000	-0.001
100 %		0	1907 500 002	3.3	0.000 000	0.002
100 %		+10	1907 499 996	-2.9	0.000 000	-0.002
100 %		+30	1907 500 001	2.5	0.000 000	0.001
100 %		+40	1907 500 002	3.9	0.000 000	0.002
100 %		+50	1907 500 003	4.8	0.000 000	0.003
Batt. Endpoint	3.400	+20	1907 499 994	-5.0	0.000 000	-0.003



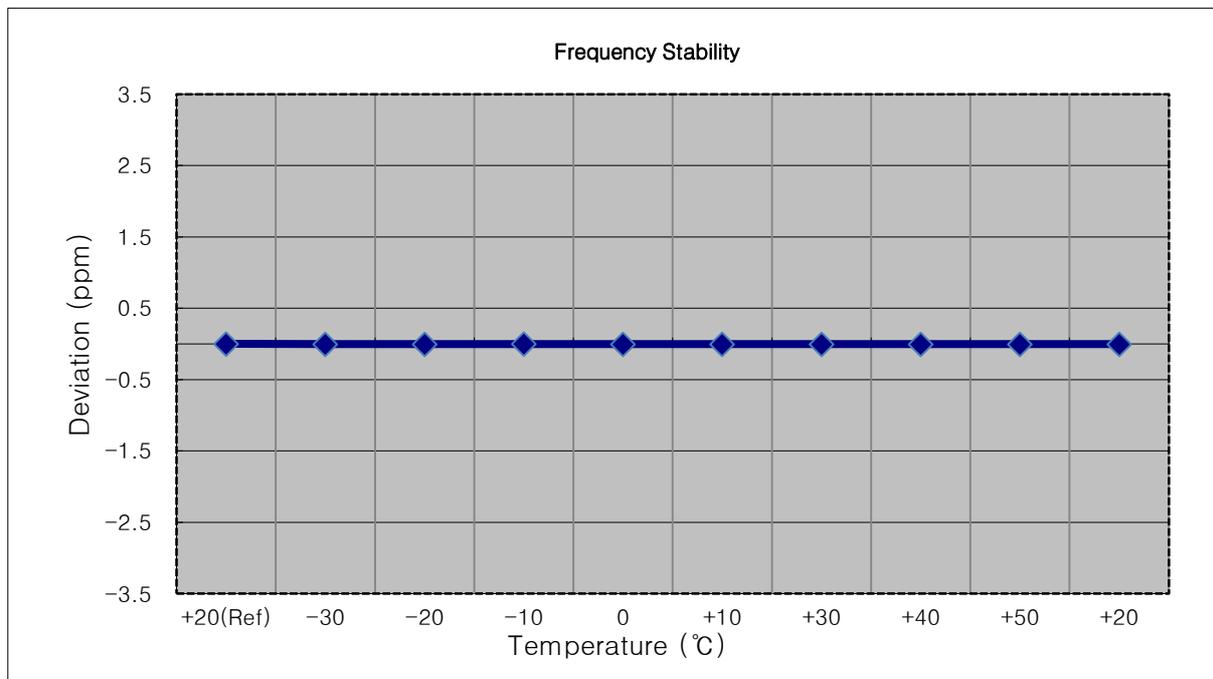
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1905,000,000 Hz
- ▣ CHANNEL: 19150 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1904 999 993	0.0	0.000 000	0.000
100 %		-30	1904 999 985	-7.7	0.000 000	-0.004
100 %		-20	1904 999 985	-8.2	0.000 000	-0.004
100 %		-10	1904 999 985	-7.5	0.000 000	-0.004
100 %		0	1904 999 988	-4.7	0.000 000	-0.002
100 %		+10	1904 999 984	-9.3	0.000 000	-0.005
100 %		+30	1904 999 985	-7.4	0.000 000	-0.004
100 %		+40	1904 999 985	-7.9	0.000 000	-0.004
100 %		+50	1904 999 987	-5.4	0.000 000	-0.003
Batt. Endpoint		3.400	+20	1904 999 985	-8.0	0.000 000



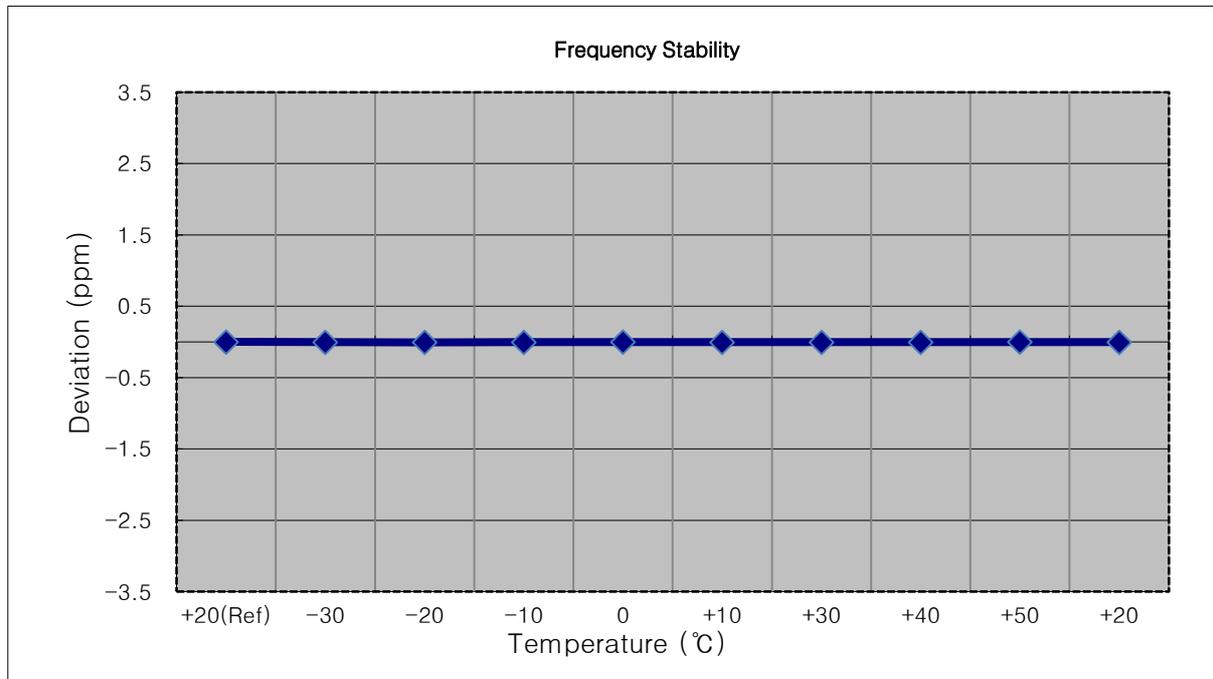
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1902,500,000 Hz
- ▣ CHANNEL: 19125 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1902 499 992	0.0	0.000 000	0.000
100 %		-30	1902 499 985	-7.4	0.000 000	-0.004
100 %		-20	1902 499 986	-6.3	0.000 000	-0.003
100 %		-10	1902 499 986	-5.5	0.000 000	-0.003
100 %		0	1902 499 984	-8.3	0.000 000	-0.004
100 %		+10	1902 499 983	-9.4	0.000 000	-0.005
100 %		+30	1902 499 984	-7.9	0.000 000	-0.004
100 %		+40	1902 499 985	-6.9	0.000 000	-0.004
100 %		+50	1902 499 985	-6.9	0.000 000	-0.004
Batt. Endpoint		3.400	+20	1902 499 985	-7.0	0.000 000



- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1900,000,000 Hz
- ▣ CHANNEL: 19100 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.860 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	1899 999 991	0.0	0.000 000	0.000
100 %		-30	1899 999 983	-8.1	0.000 000	-0.004
100 %		-20	1899 999 980	-11.0	-0.000 001	-0.006
100 %		-10	1899 999 983	-8.4	0.000 000	-0.004
100 %		0	1899 999 986	-5.6	0.000 000	-0.003
100 %		+10	1899 999 982	-9.4	0.000 000	-0.005
100 %		+30	1899 999 984	-7.5	0.000 000	-0.004
100 %		+40	1899 999 984	-7.5	0.000 000	-0.004
100 %		+50	1899 999 986	-5.5	0.000 000	-0.003
Batt. Endpoint	3.400	+20	1899 999 984	-7.0	0.000 000	-0.004



## 9. TEST PLOTS

BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1) (Lower Ant)



BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2) (Lower Ant)



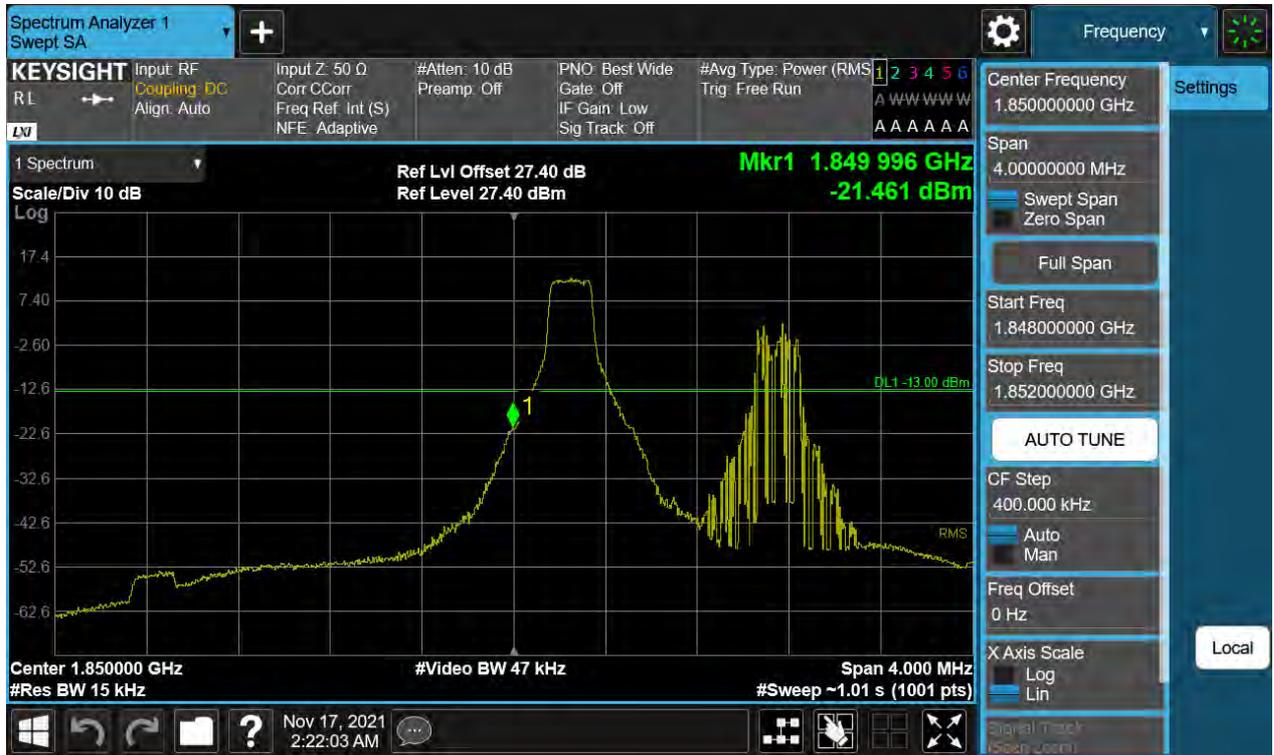
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Lower Ant)



BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Lower Ant)



BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Lower Ant)



BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Lower Ant)



BW3 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1) (Lower Ant)

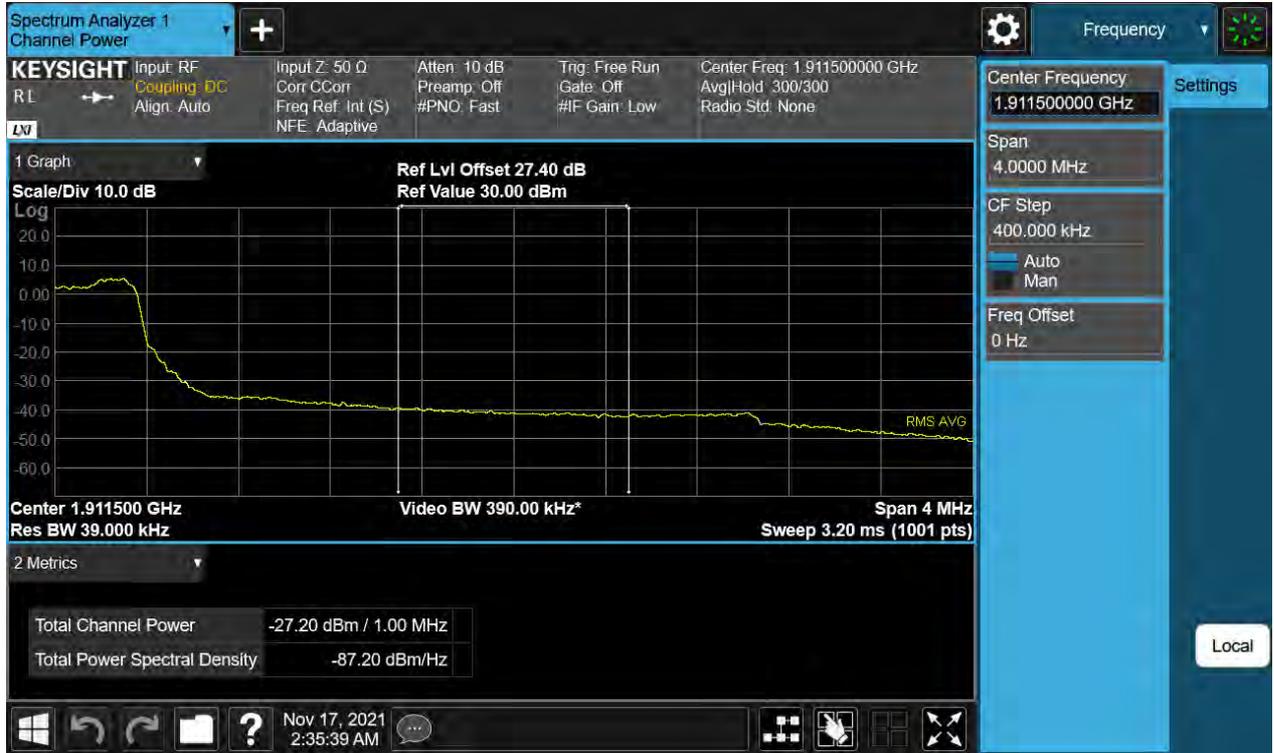


BW3 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2) (Lower Ant)





BW3 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2) (Lower Ant)



BW3 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Lower Ant)



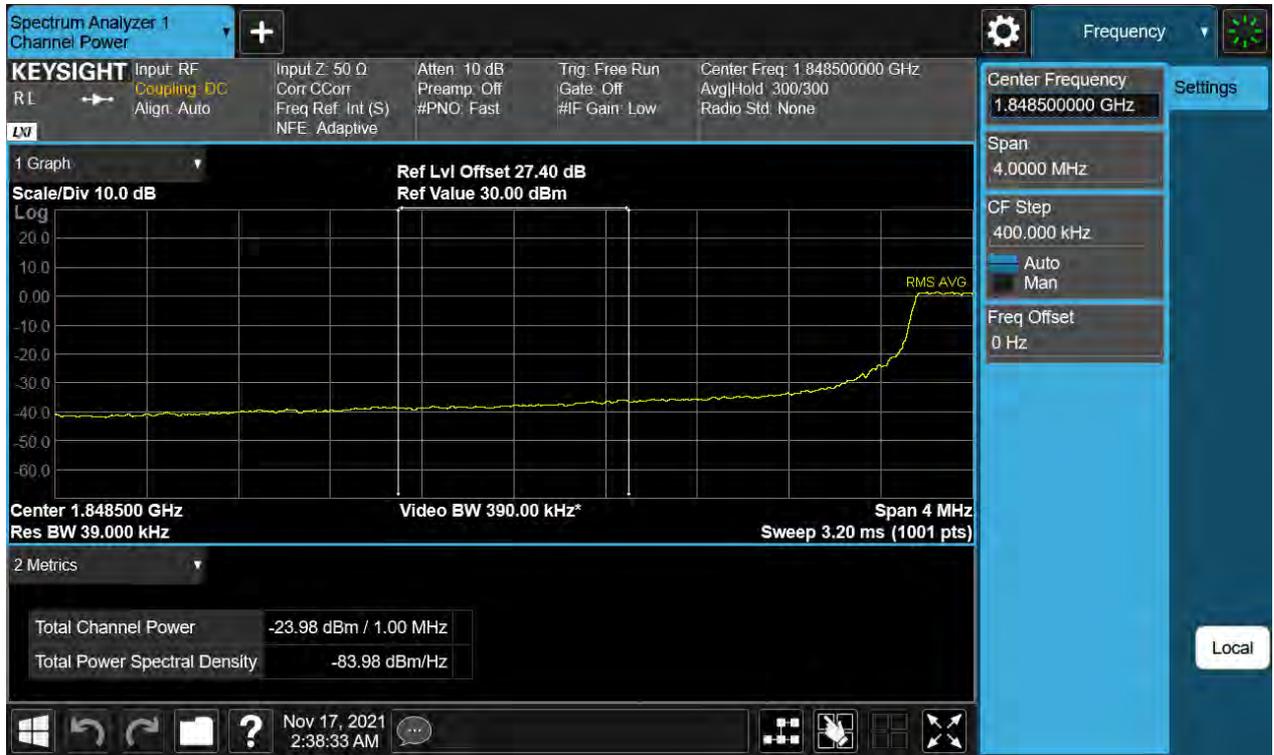
BW3 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Lower Ant)



BW5 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1) (Lower Ant)



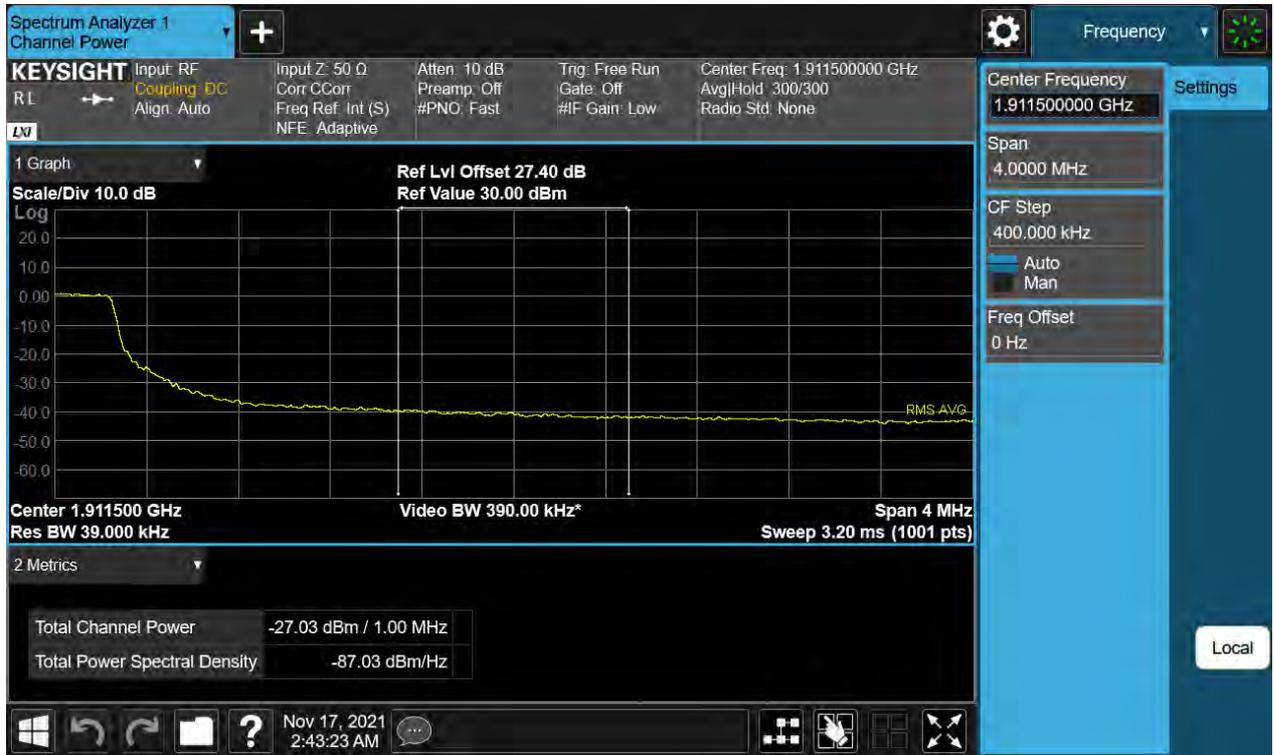
BW5 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2) (Lower Ant)



BW5 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(1) (Lower Ant)



BW5 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2) (Lower Ant)



BW5 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Lower Ant)

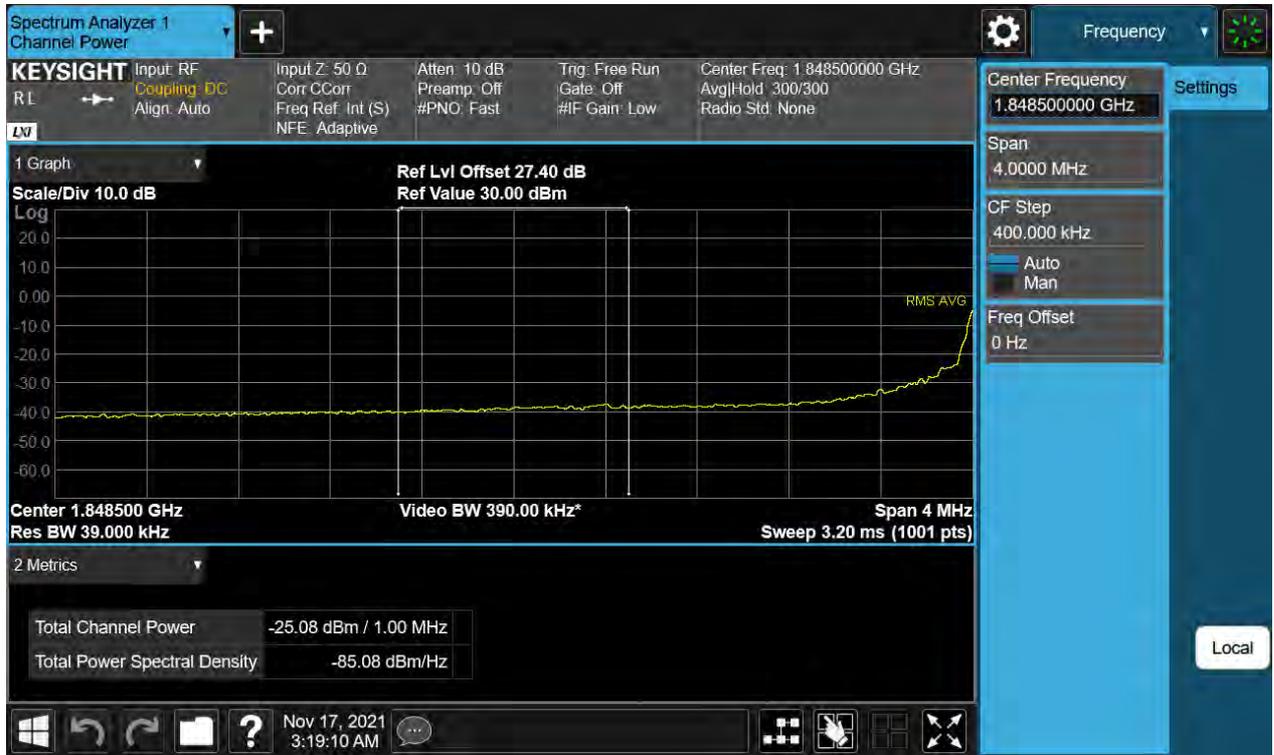




BW10 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1) (Lower Ant)



BW10 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2) (Lower Ant)



BW10 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Lower Ant)



BW10 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Lower Ant)



BW10 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Lower Ant)

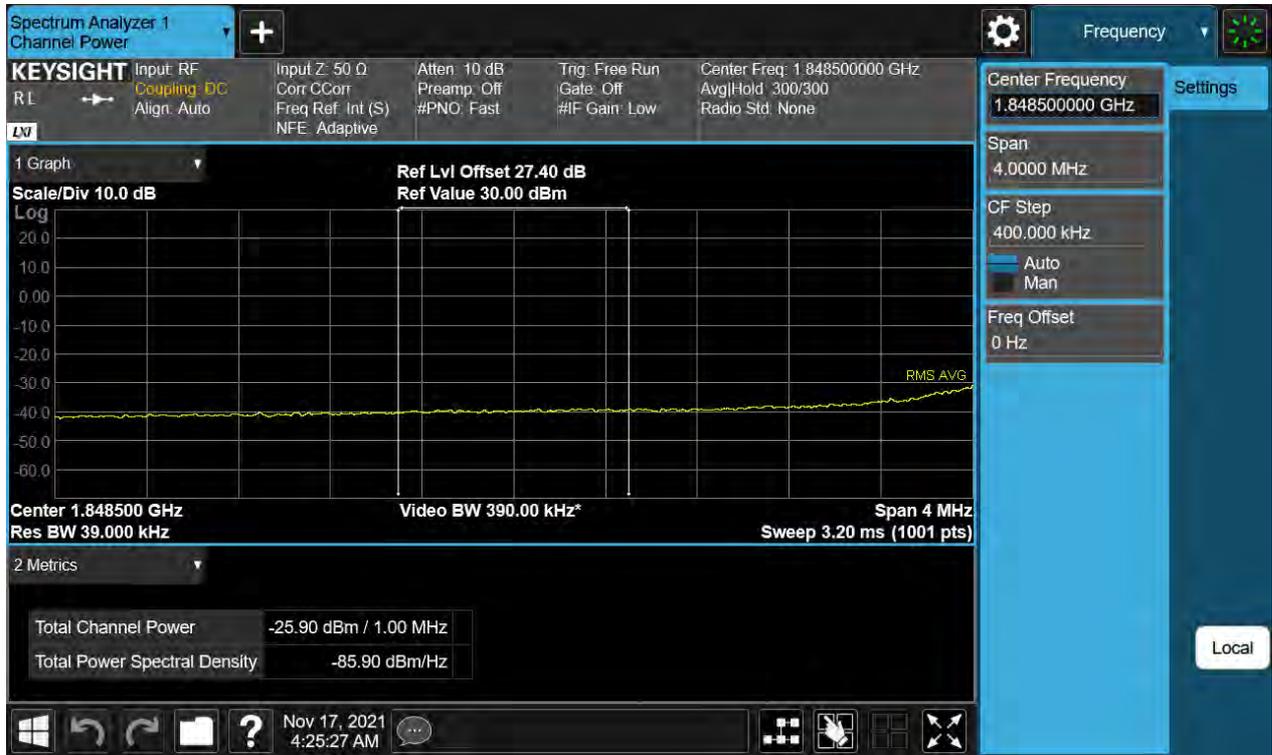


BW10 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Lower Ant)





BW15 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2) (Lower Ant)



BW15 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Lower Ant)



BW15 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Lower Ant)



BW15 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Lower Ant)



BW15 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Lower Ant)



BW20 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1) (Lower Ant)



BW20 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2) (Lower Ant)



BW20 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Lower Ant)



BW20 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Lower Ant)



BW20 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Lower Ant)



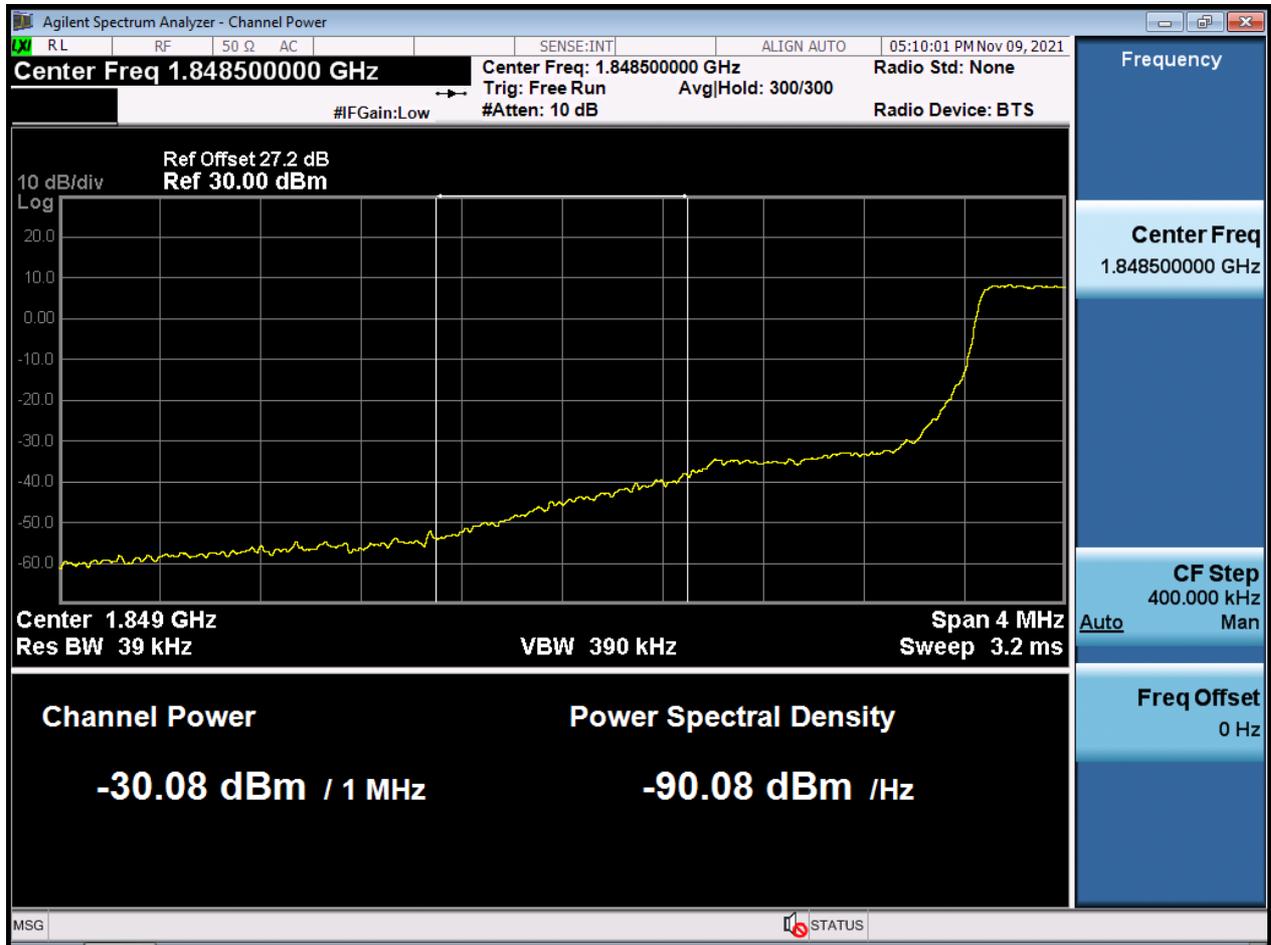
BW20 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Lower Ant)



BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1) (Upper Ant)



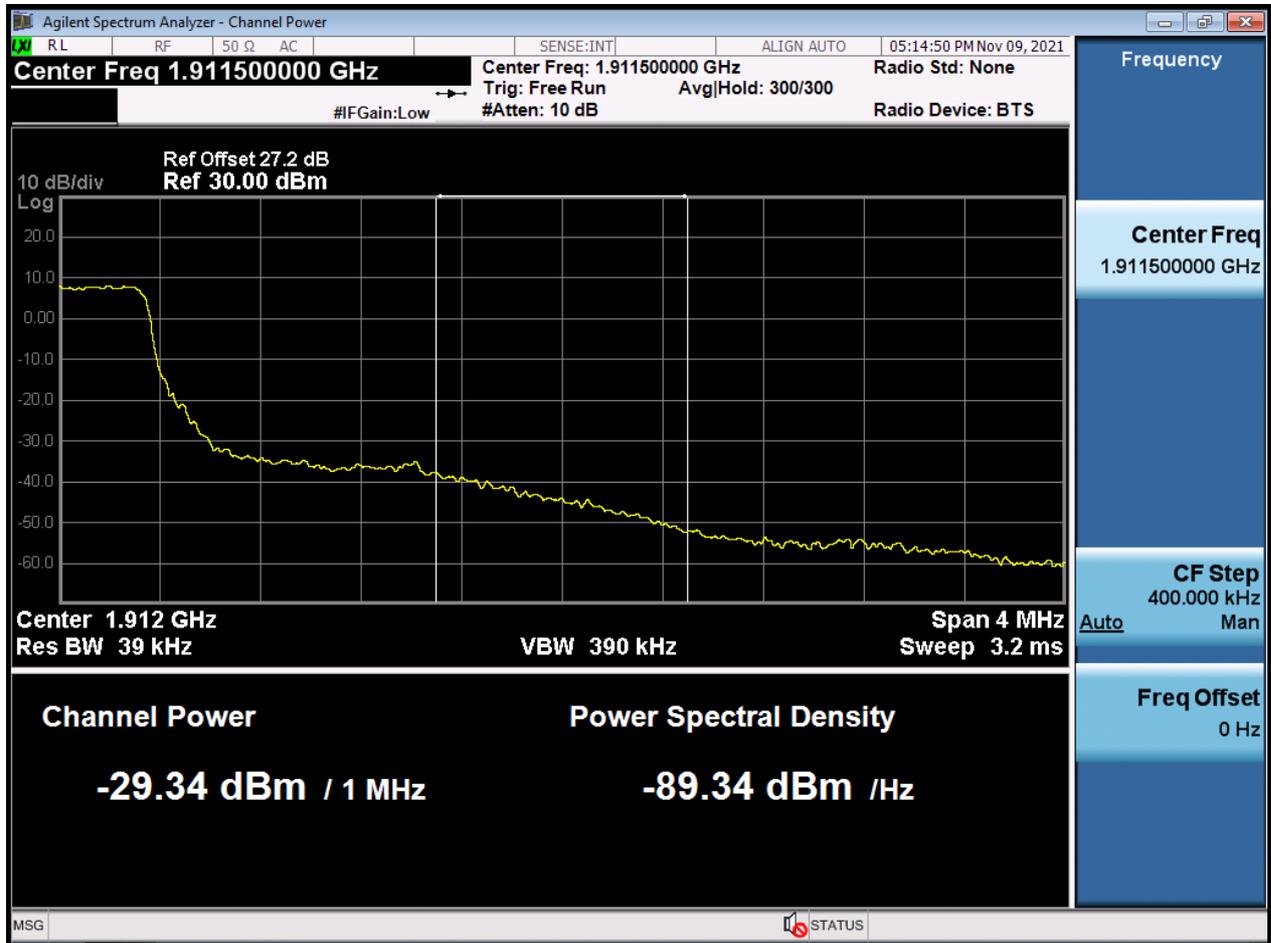
BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2) (Upper Ant)



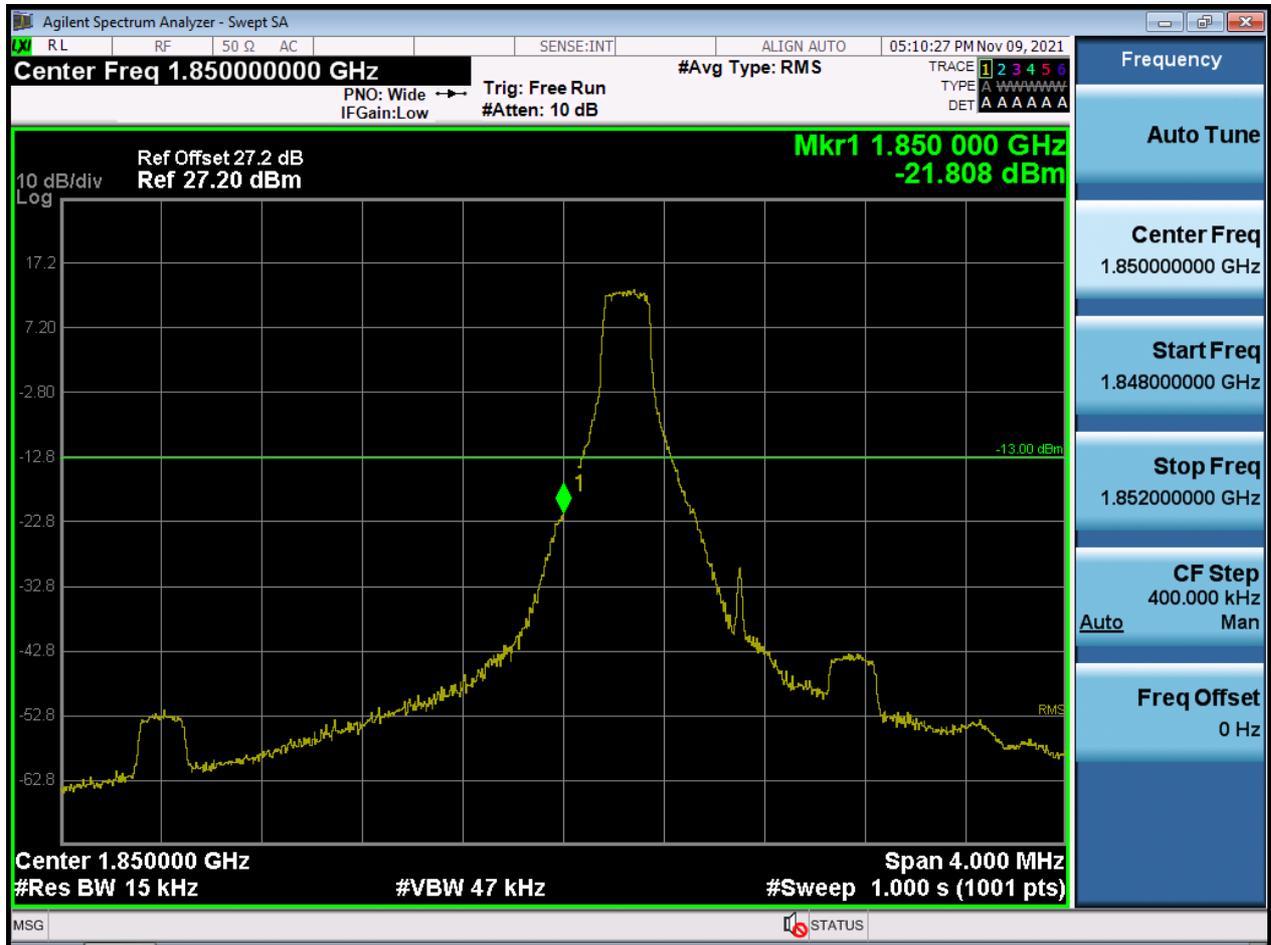
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Upper Ant)



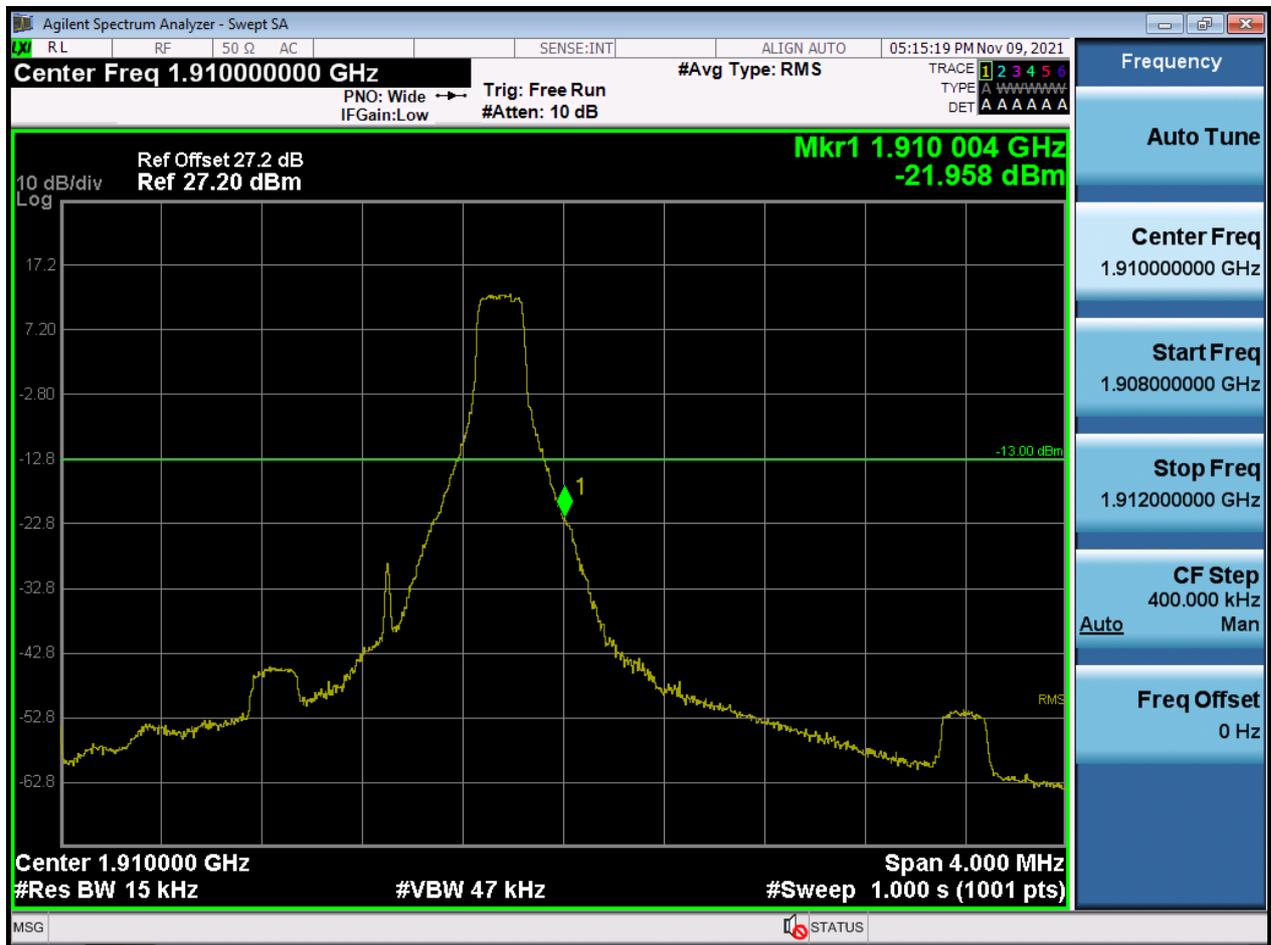
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Upper Ant)



BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Upper Ant)



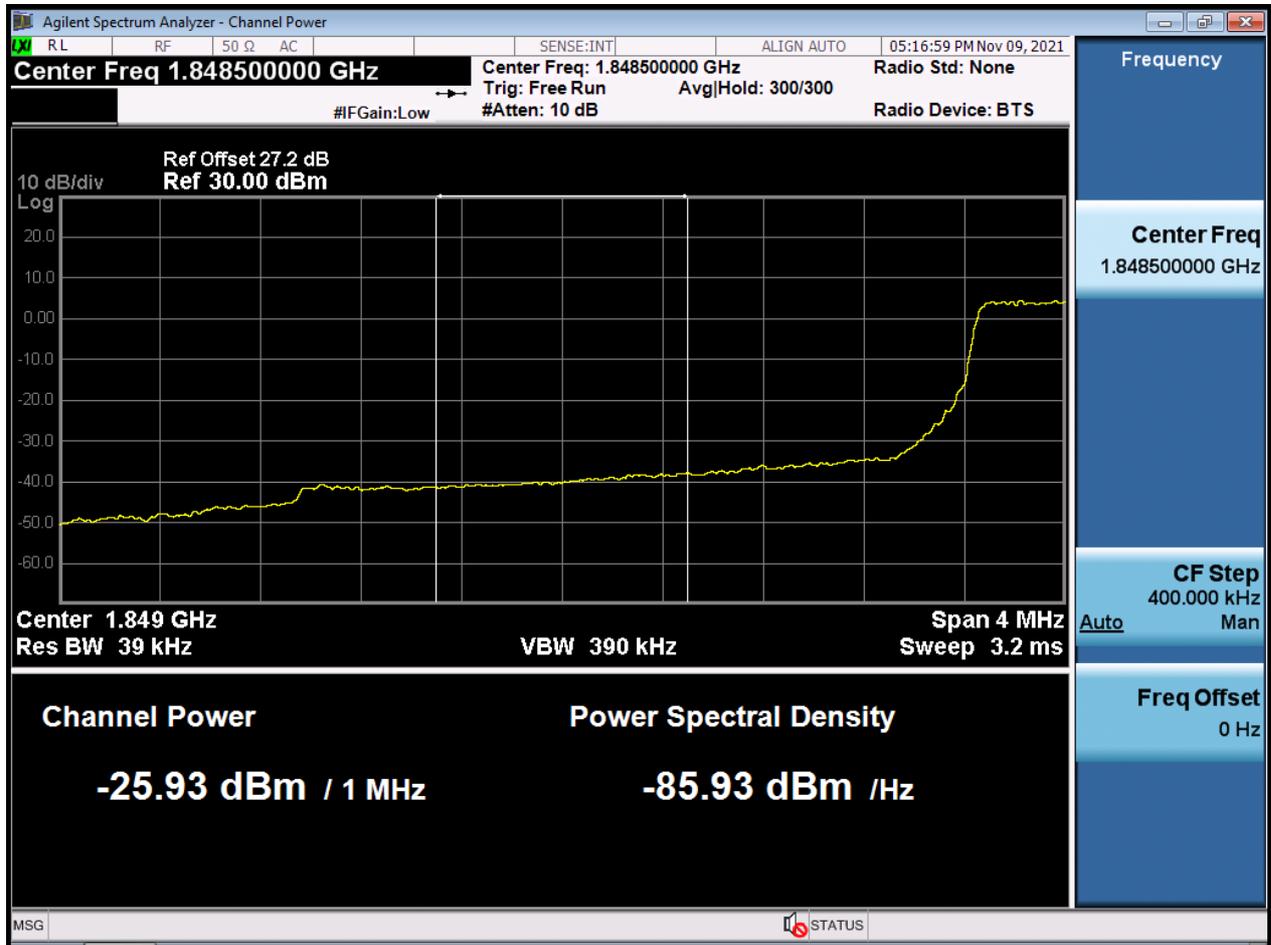
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Upper Ant)



BW3 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1) (Upper Ant)



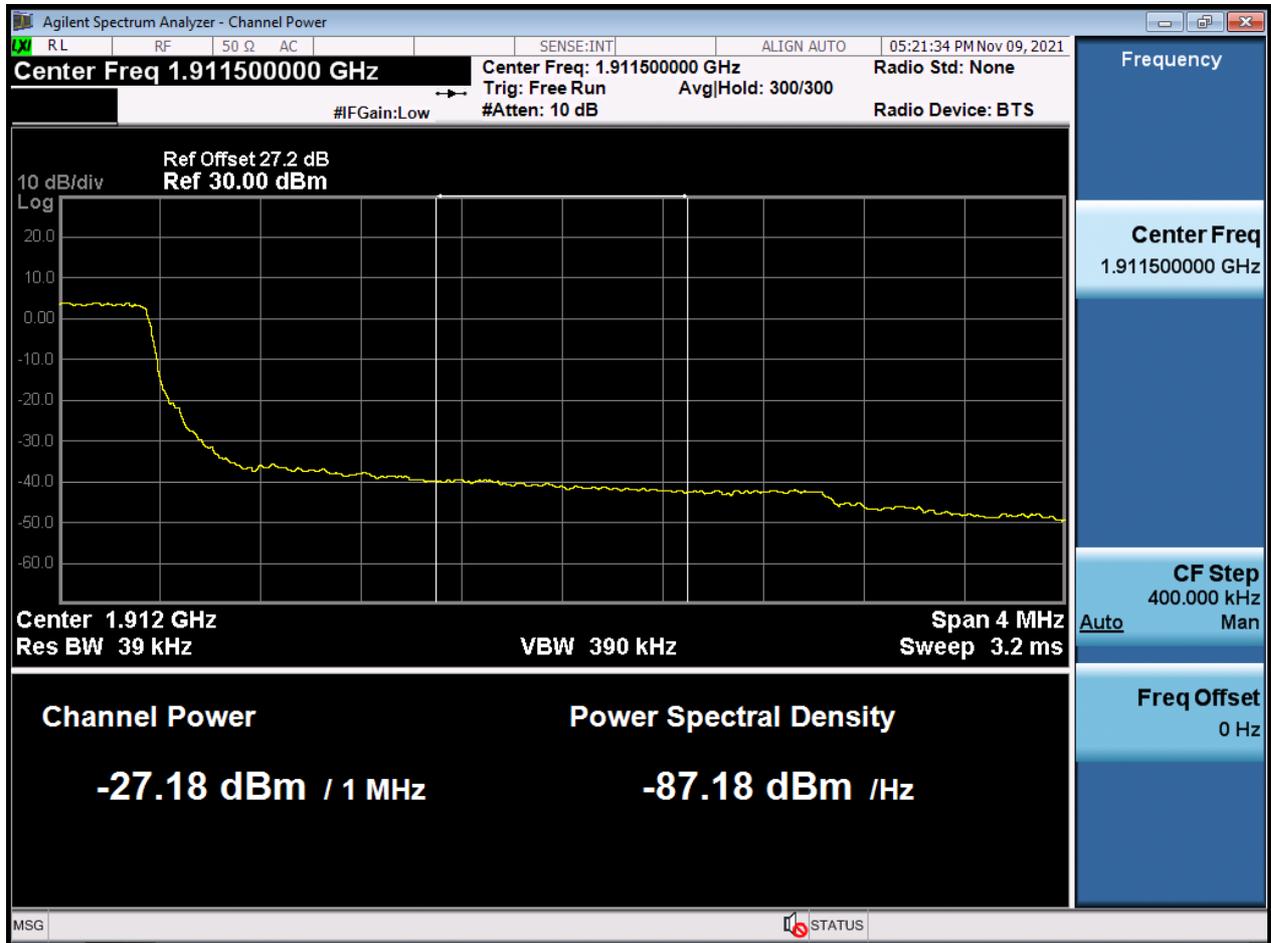
BW3 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2) (Upper Ant)



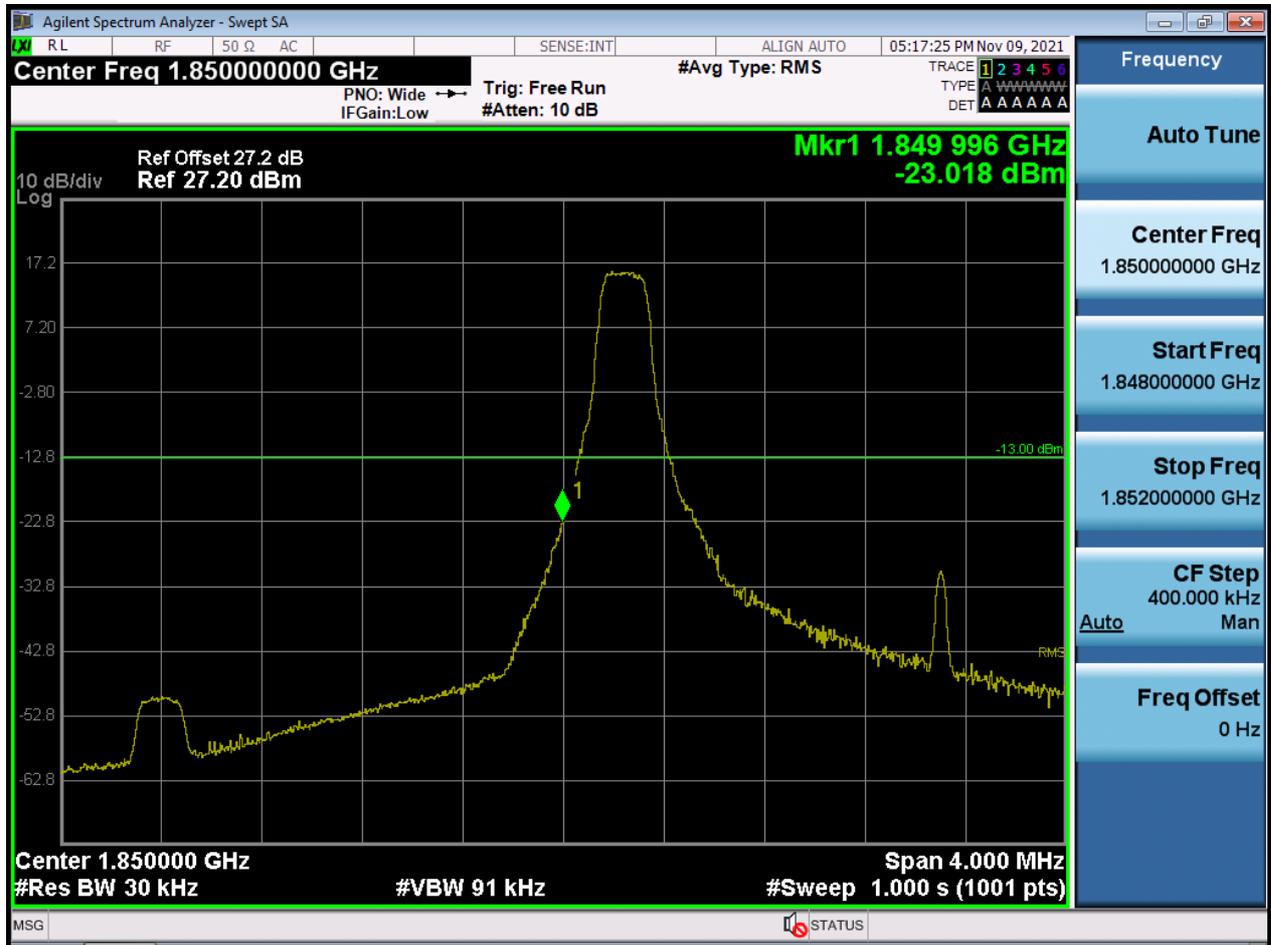
BW3 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(1) (Upper Ant)



BW3 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2) (Upper Ant)



BW3 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Upper Ant)



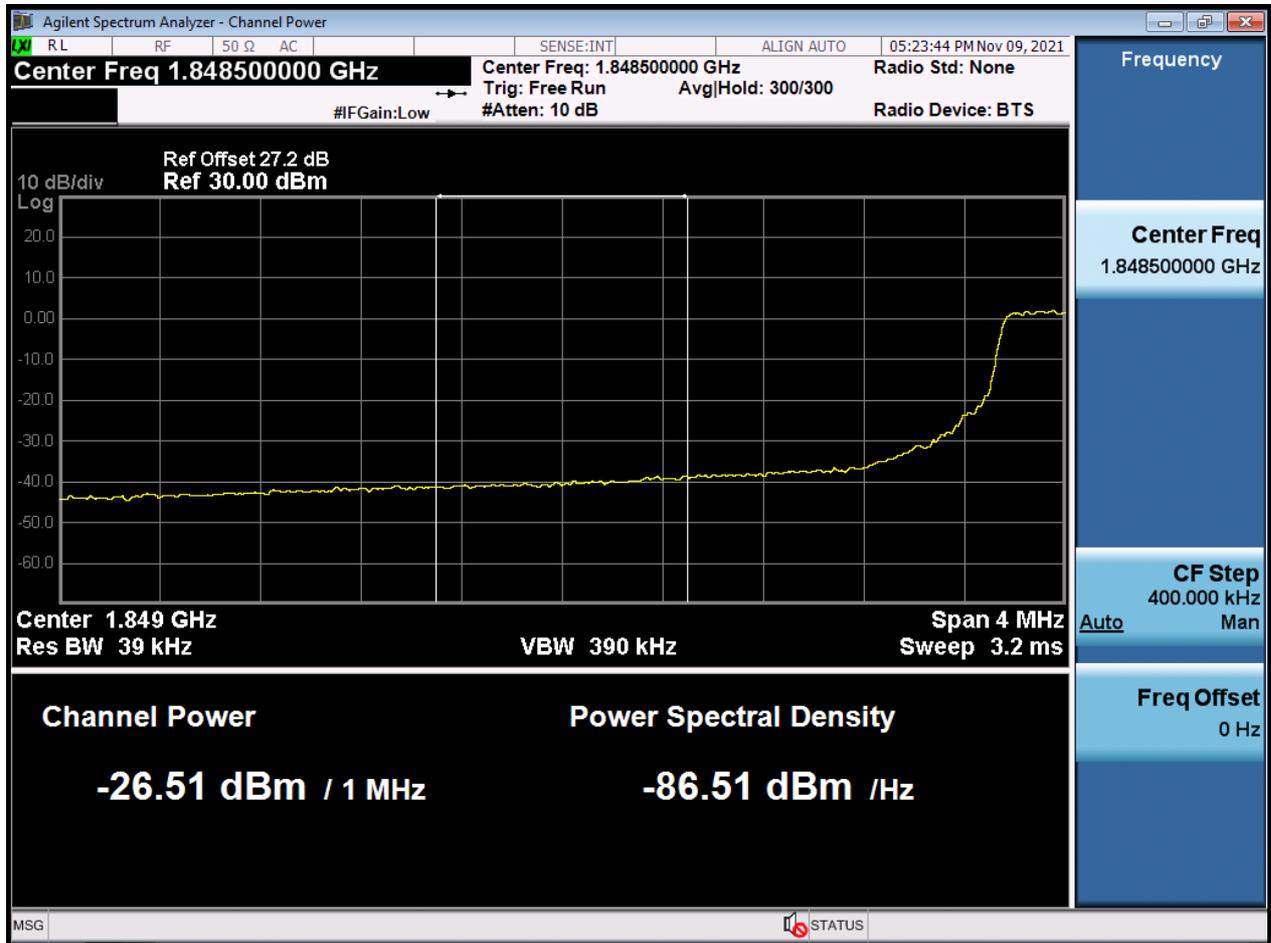
BW3 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Upper Ant)



BW5 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1) (Upper Ant)



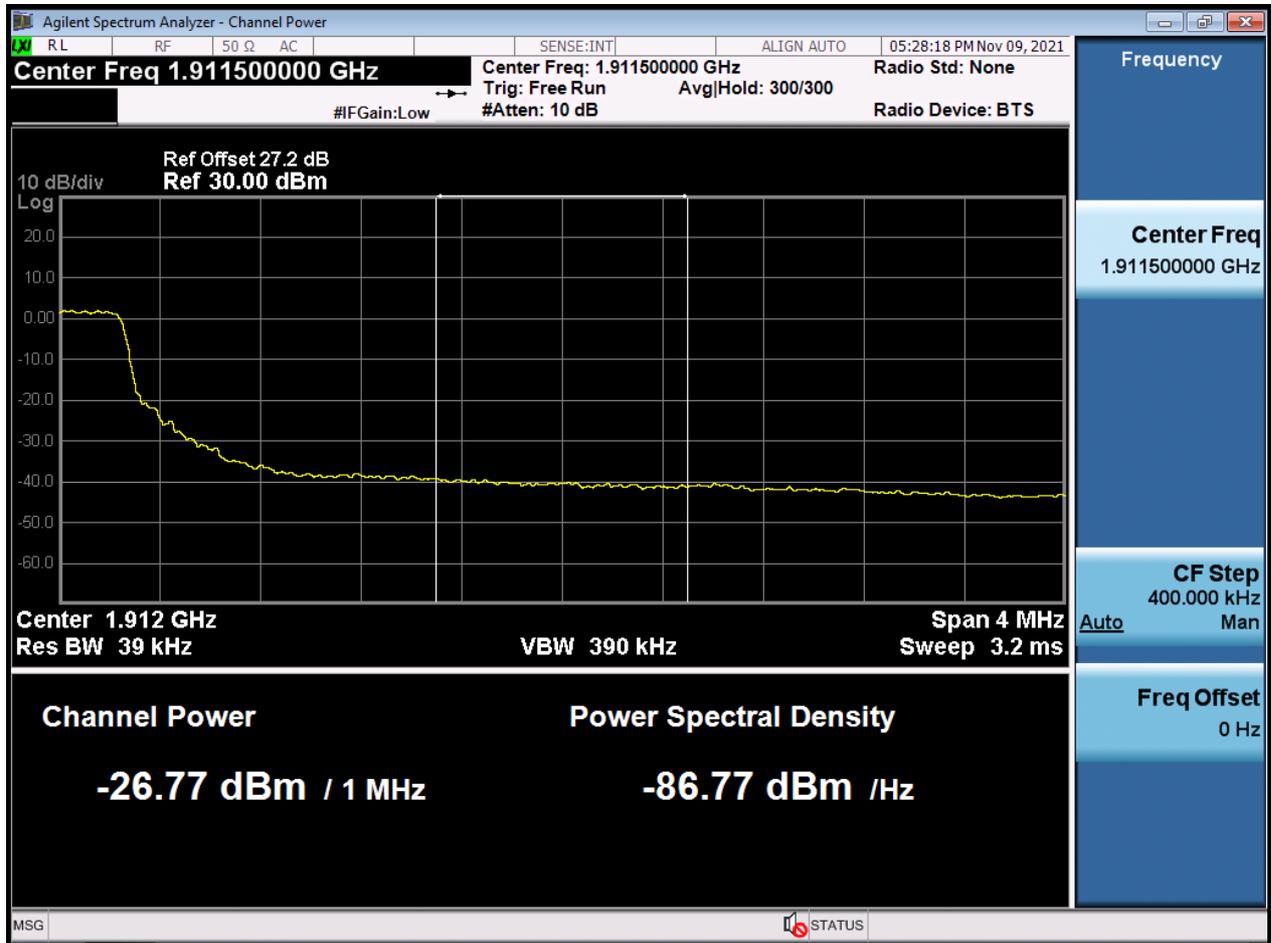
BW5 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2) (Upper Ant)



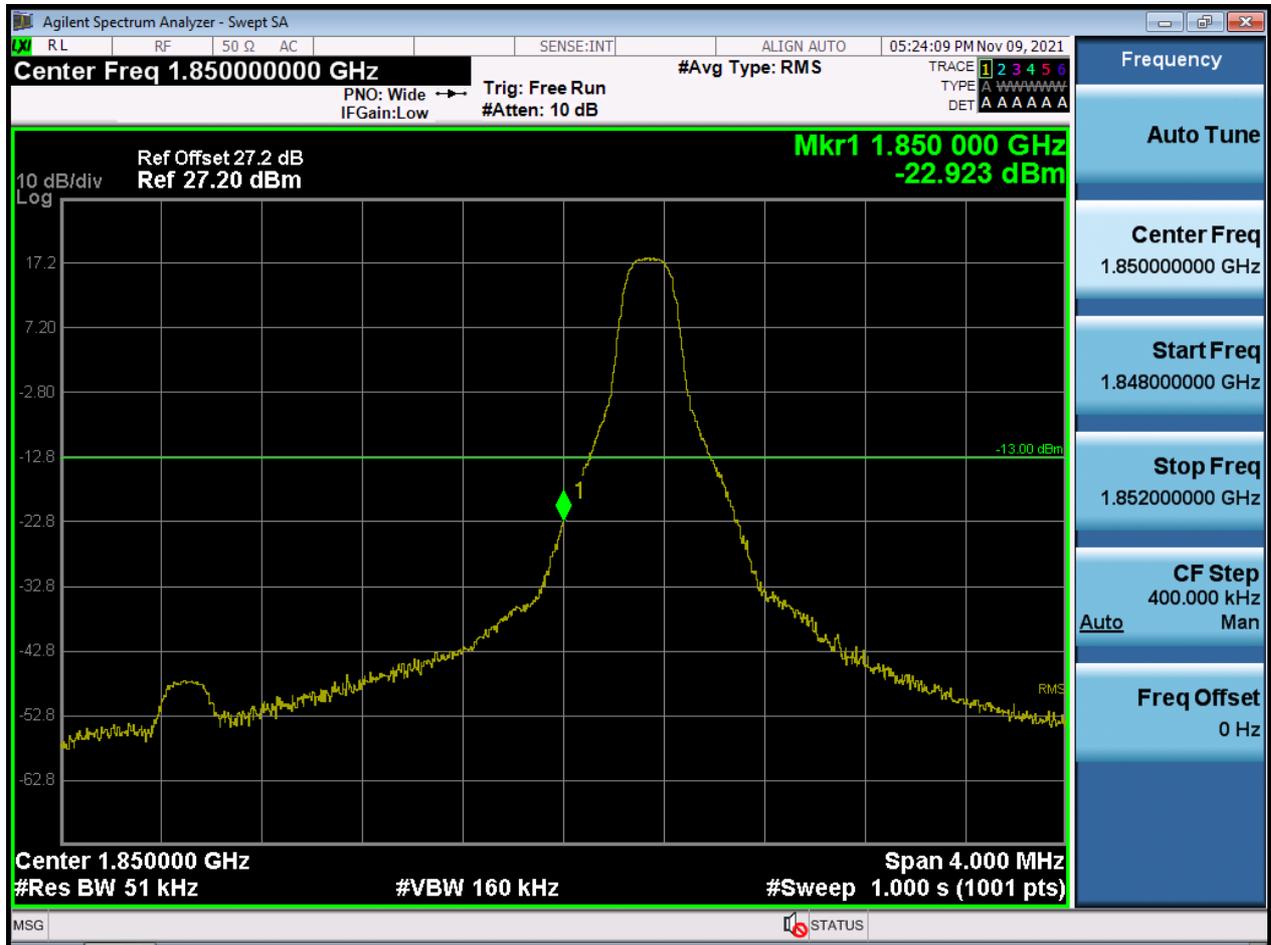
BW5 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Upper Ant)



BW5 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2) (Upper Ant)

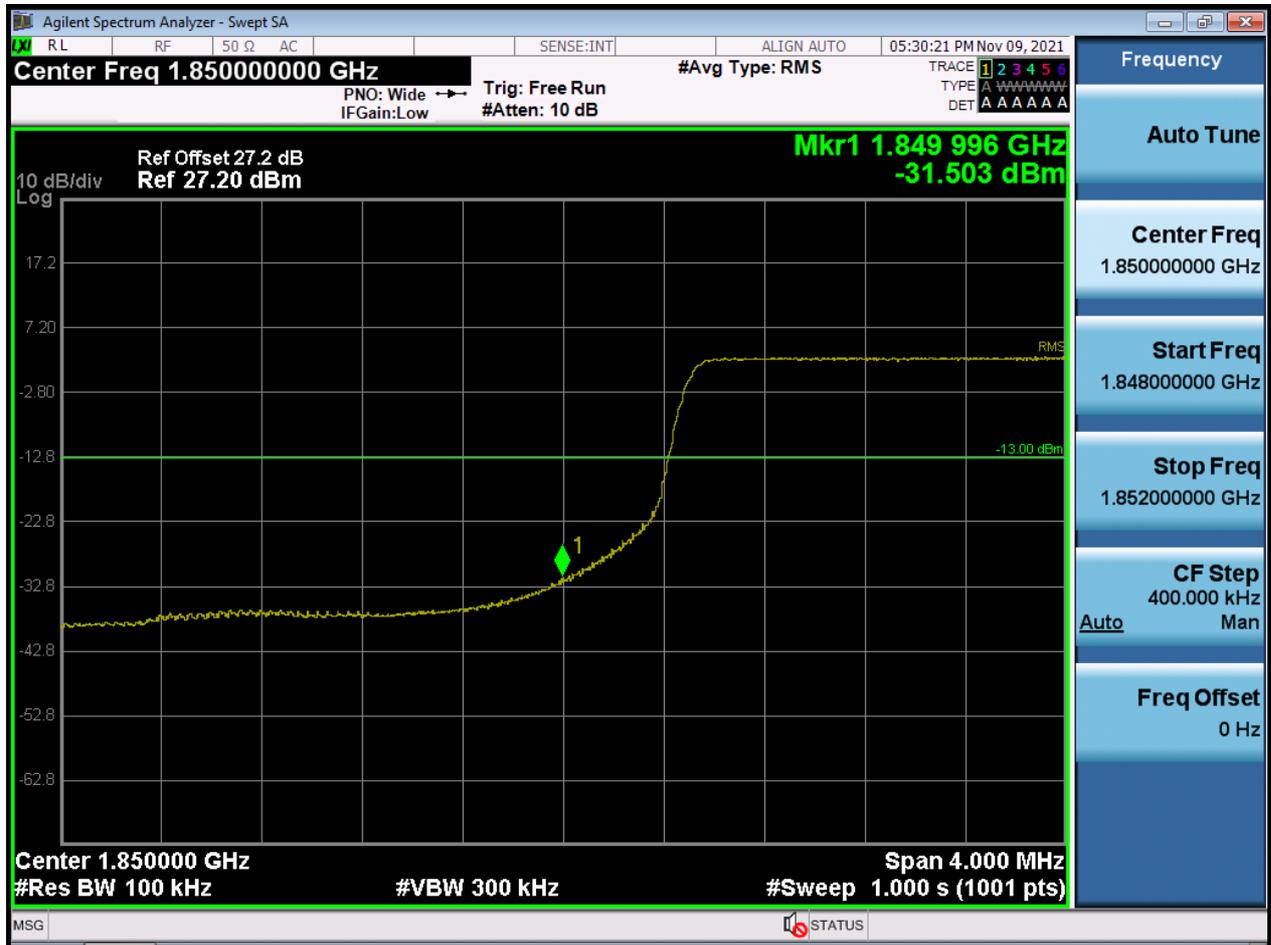


BW5 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Upper Ant)

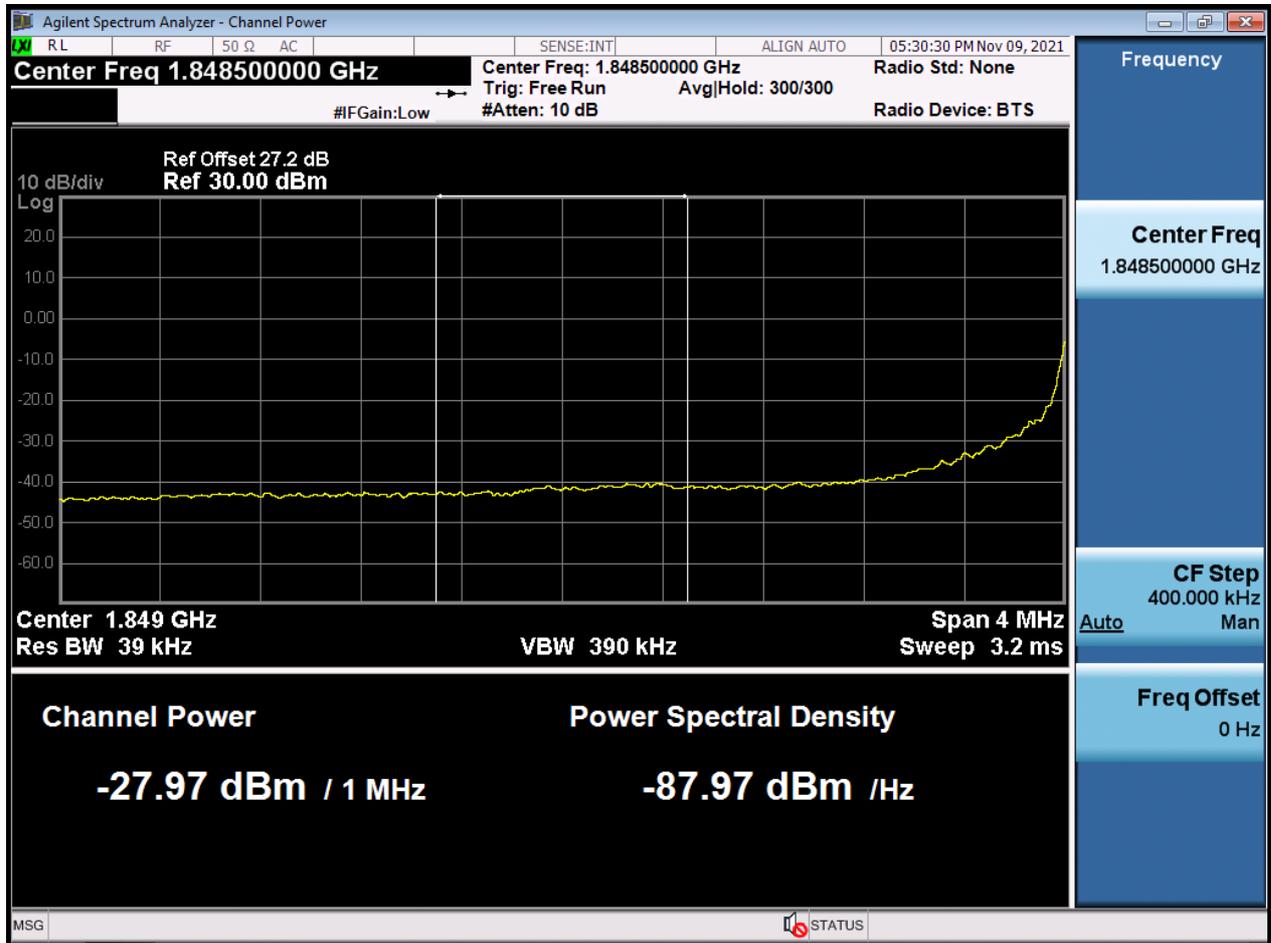




BW10 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1) (Upper Ant)



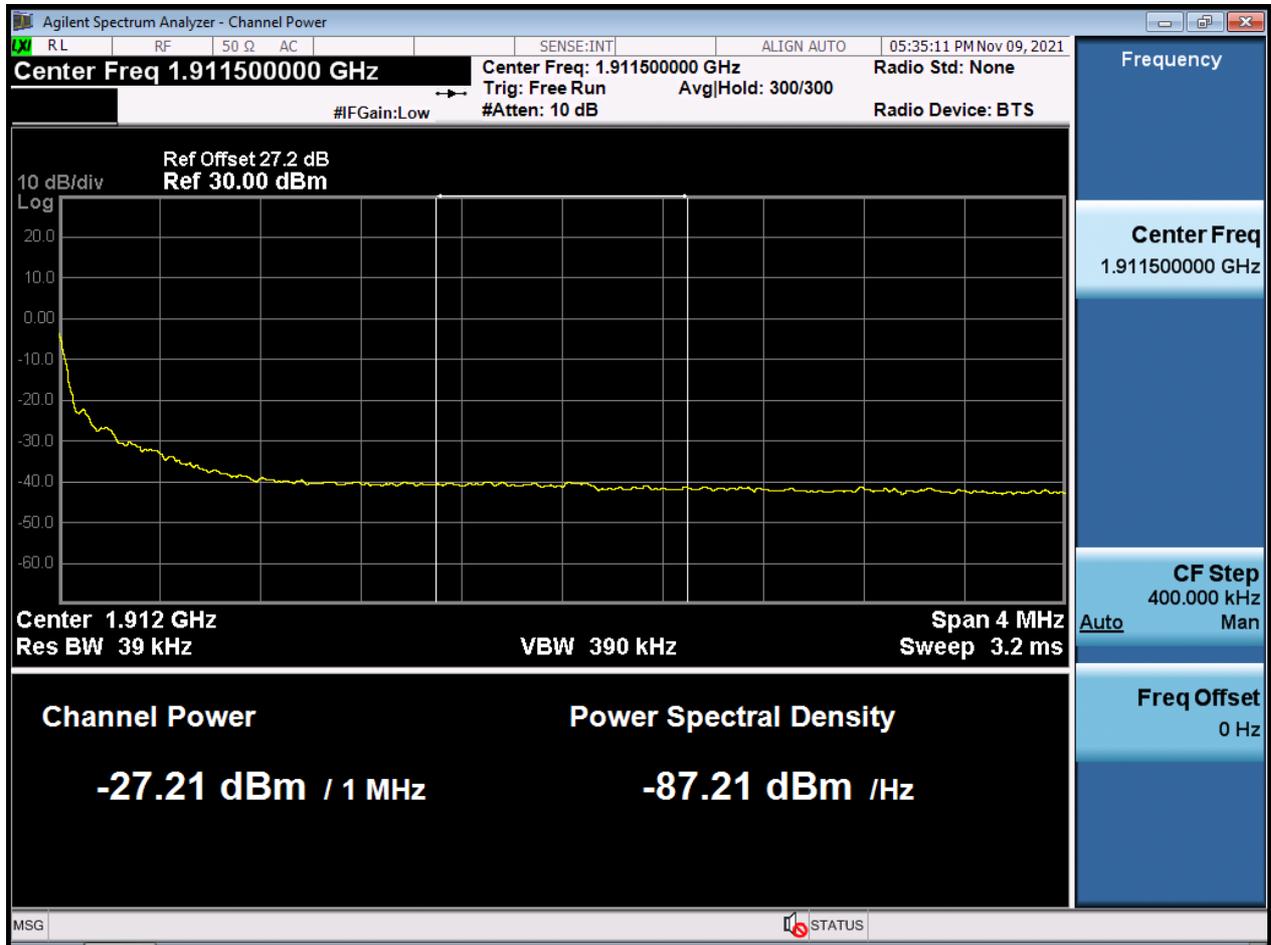
BW10 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2) (Upper Ant)



BW10 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Upper Ant)

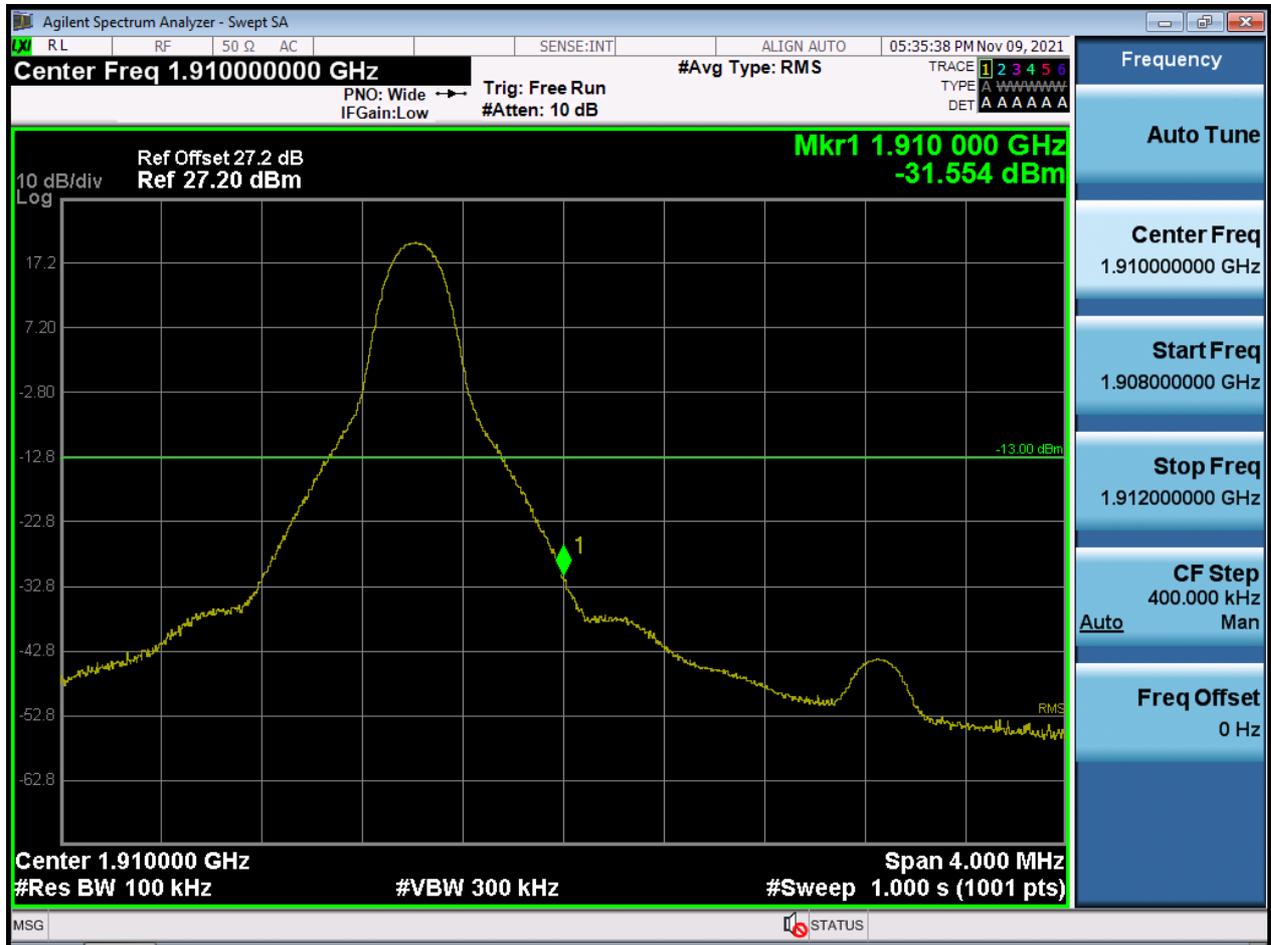


BW10 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Upper Ant)

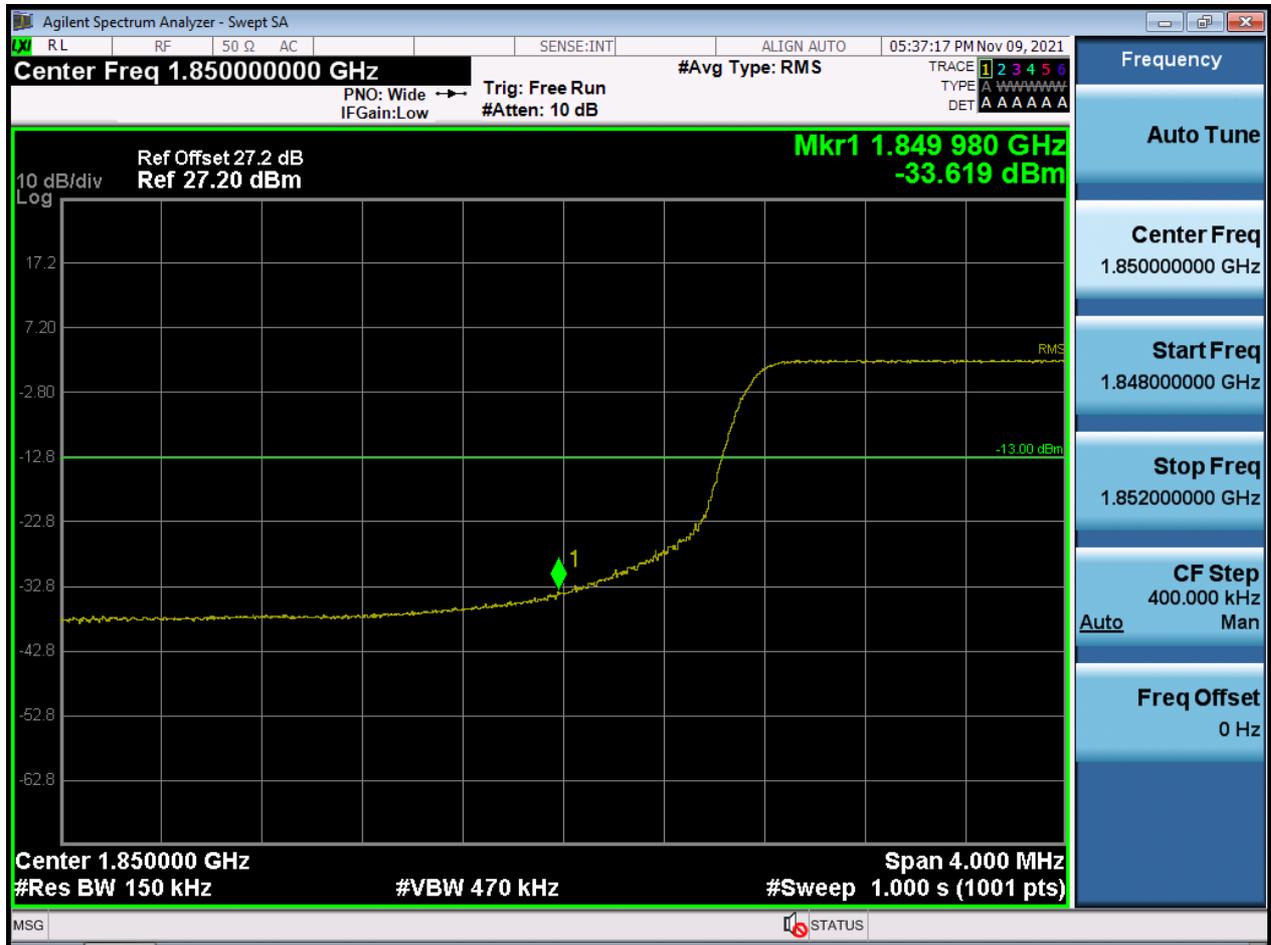




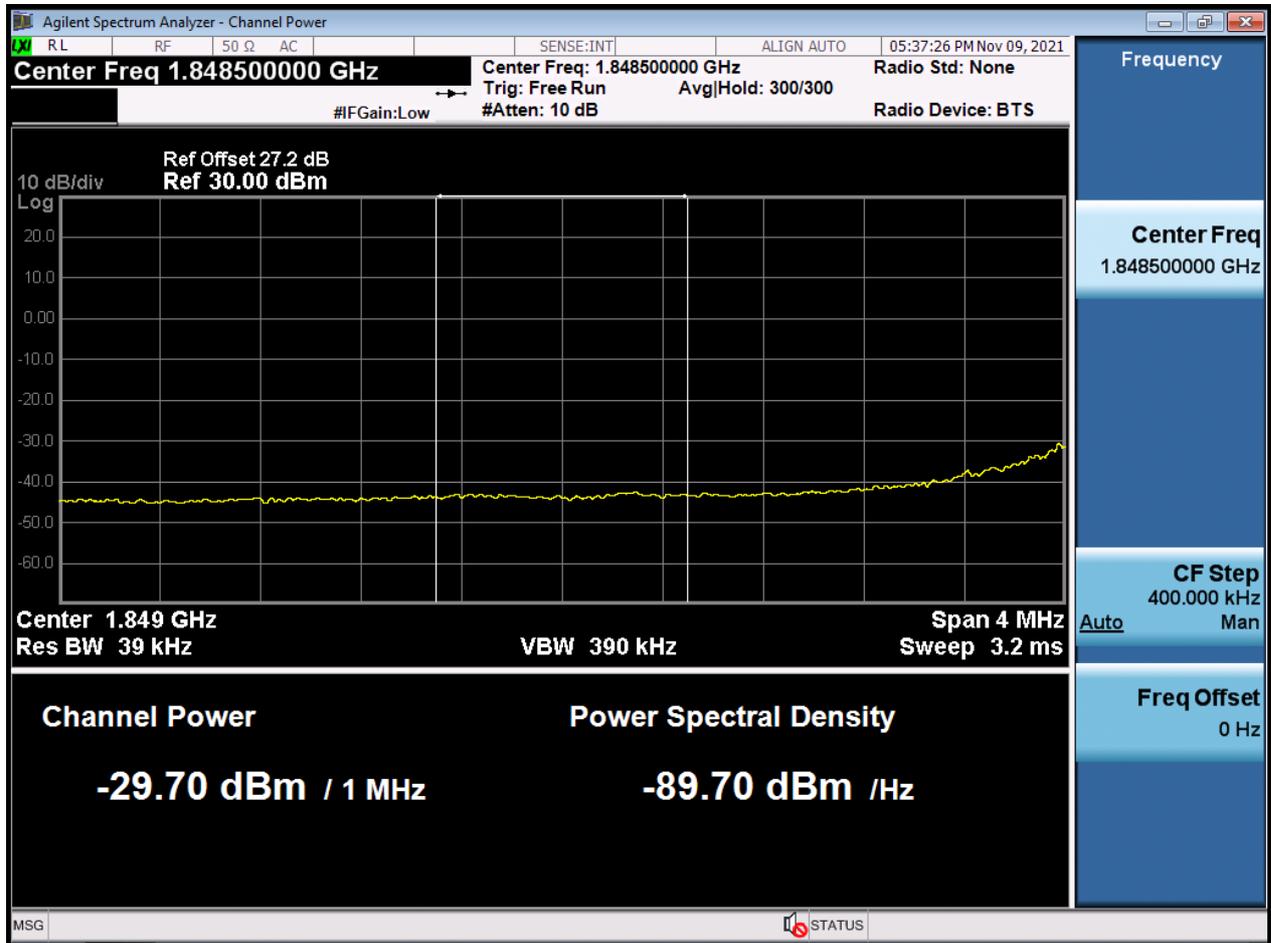
BW10 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Upper Ant)



BW15 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1) (Upper Ant)



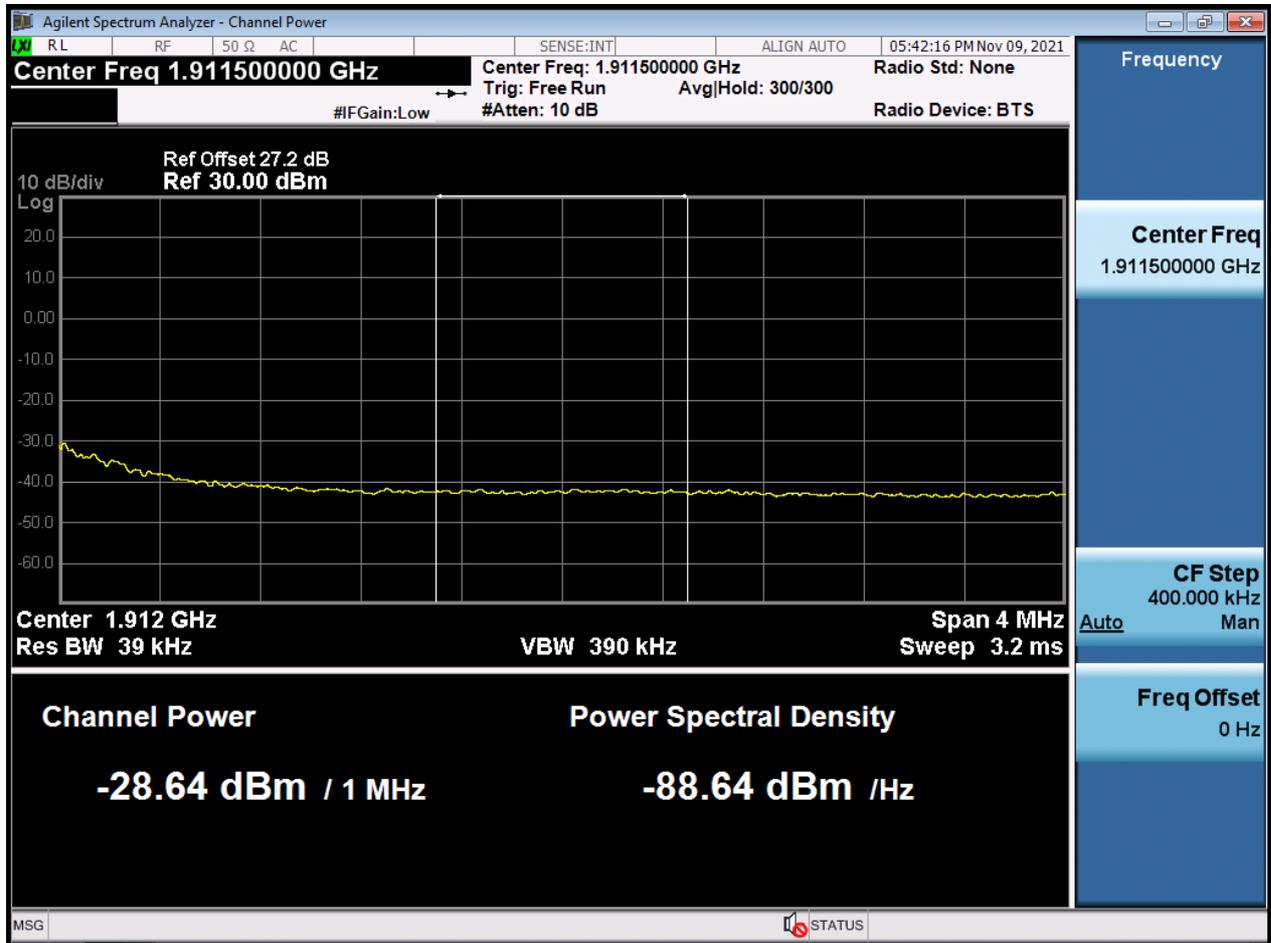
BW15 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2) (Upper Ant)



BW15 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Upper Ant)



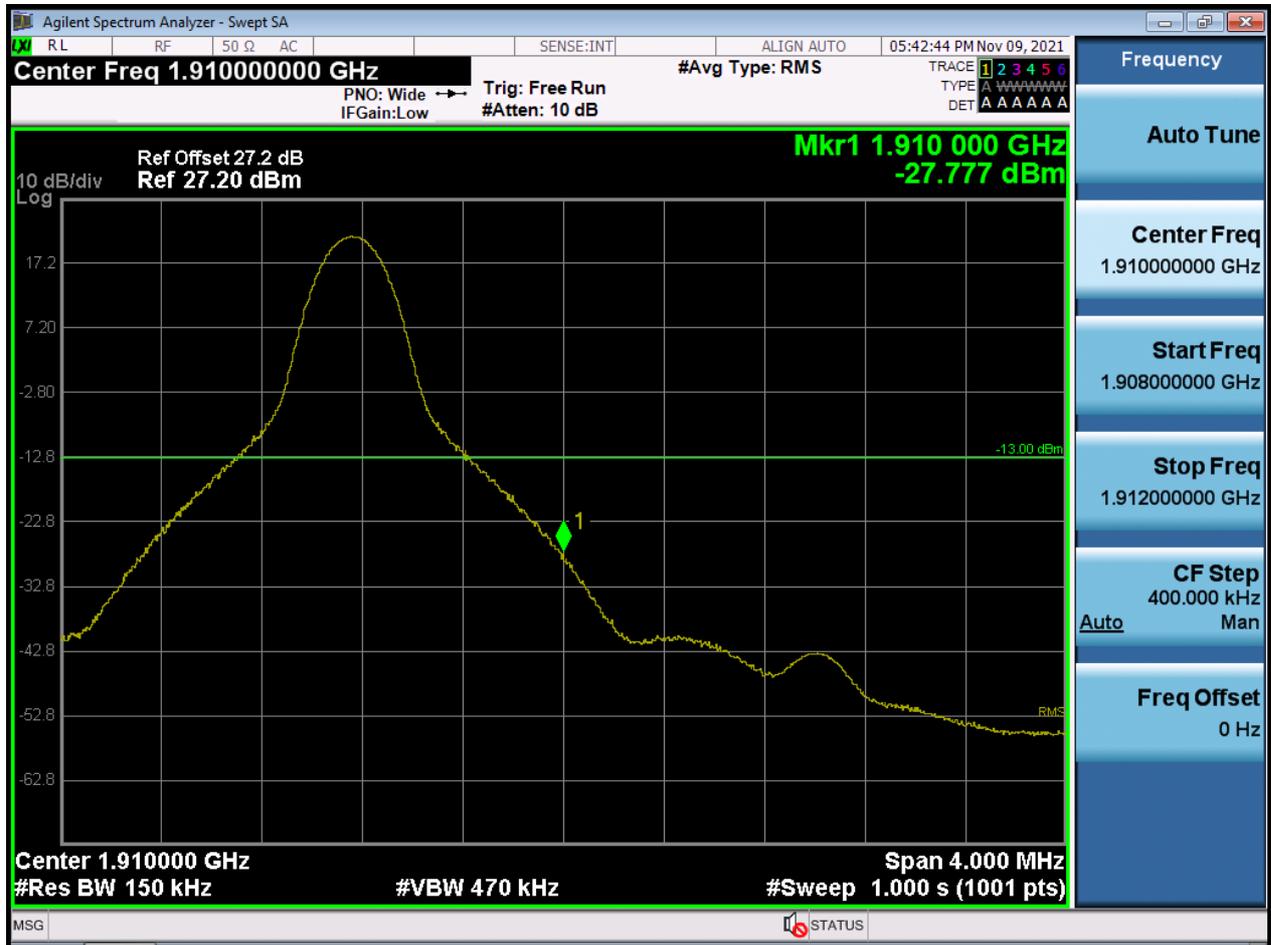
BW15 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Upper Ant)



BW15 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Upper Ant)



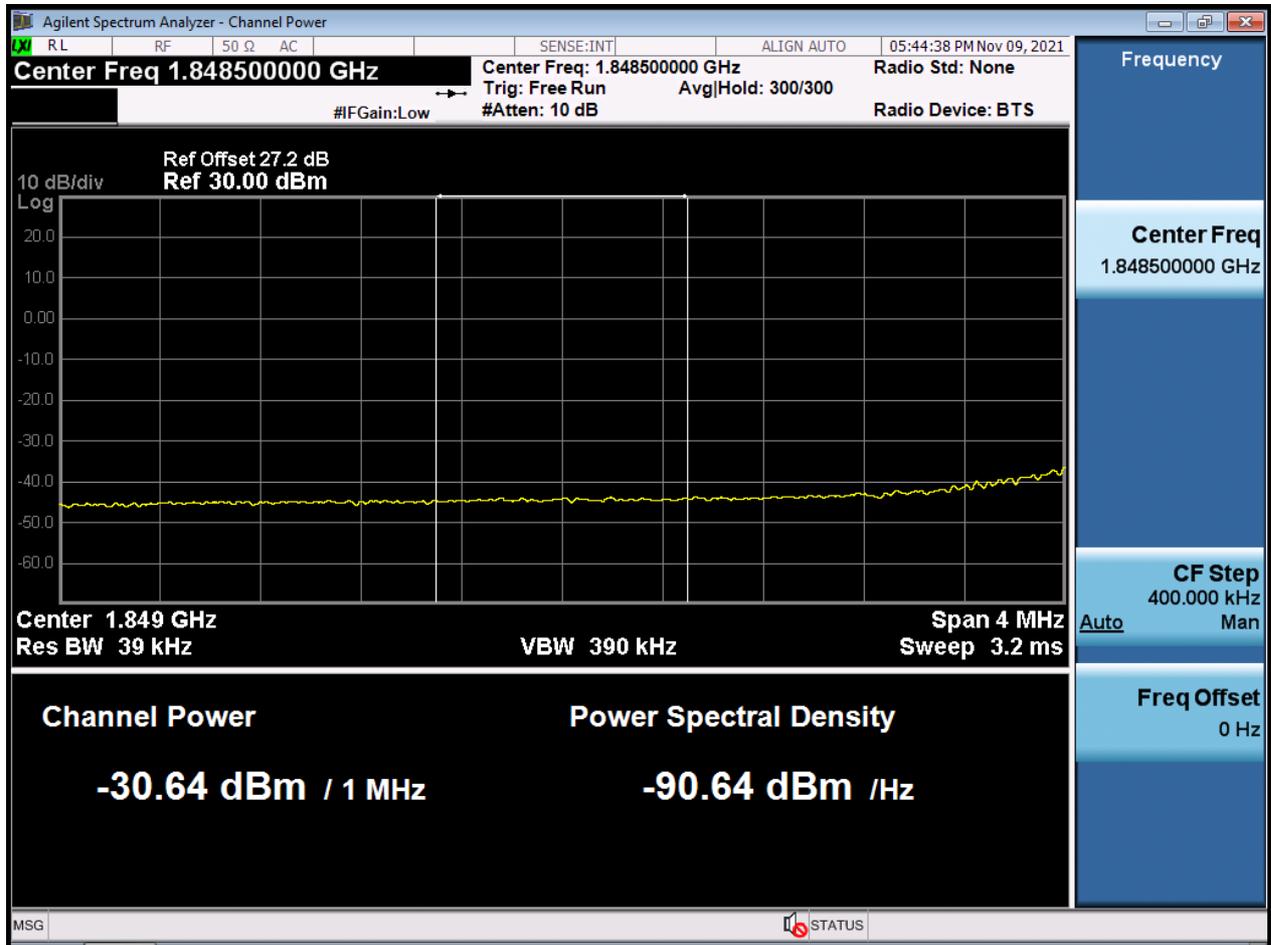
BW15 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Upper Ant)



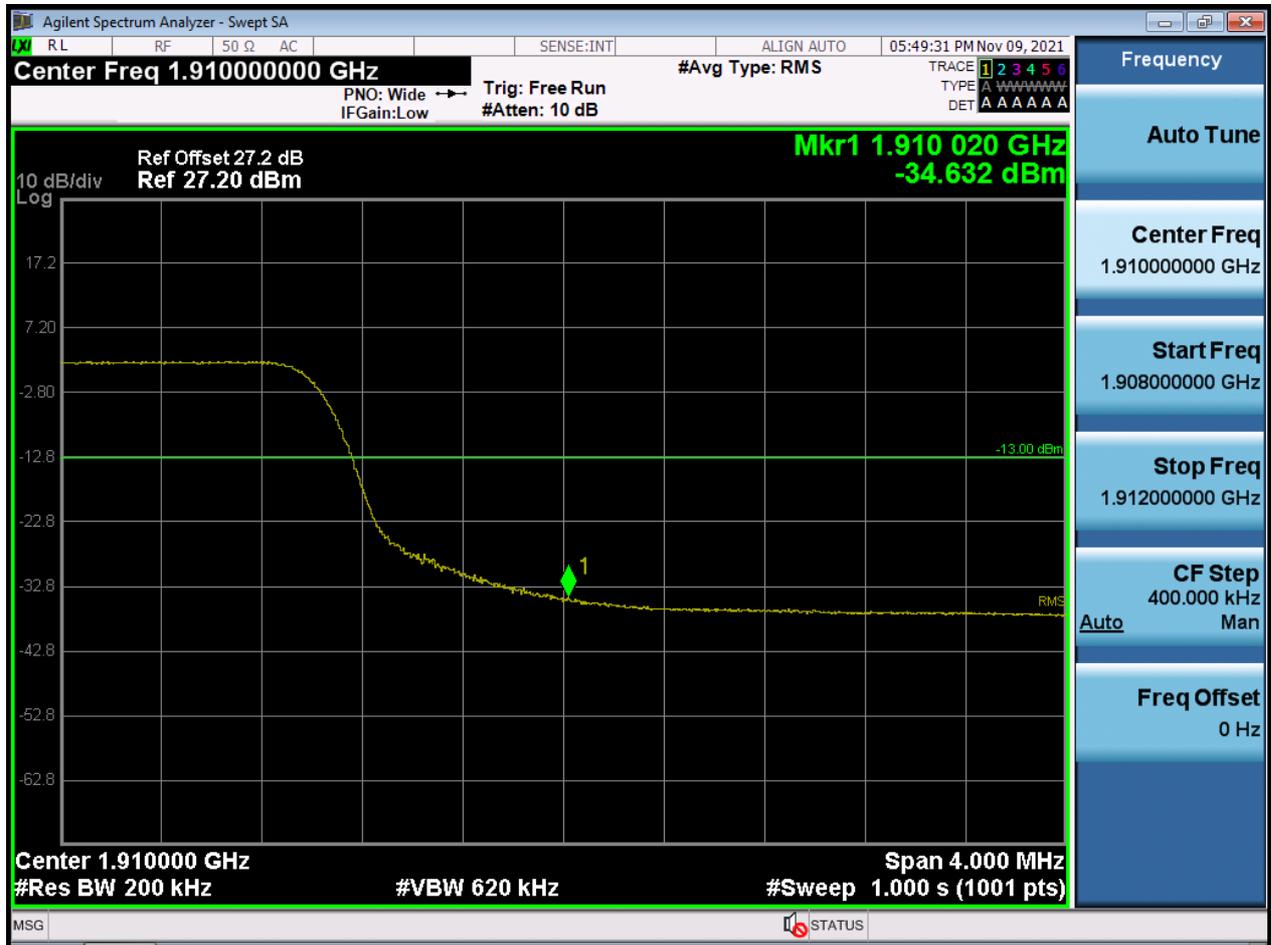
BW20 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1) (Upper Ant)



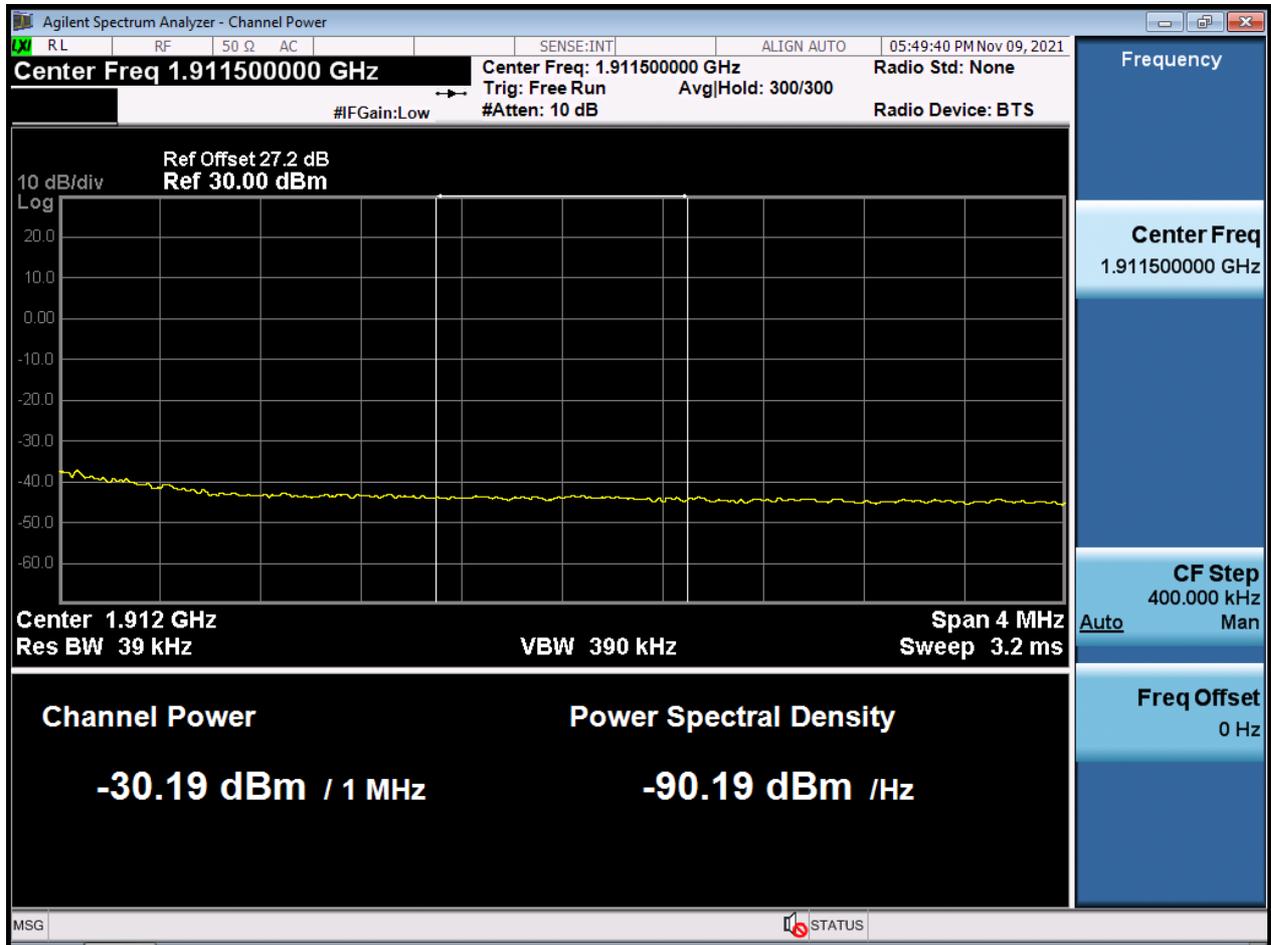
BW20 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2) (Upper Ant)



BW20 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1) (Upper Ant)



BW20 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2) (Upper Ant)



BW20 M\_BandEdge\_Lowest Channel\_QPSK\_1RB(Upper Ant)



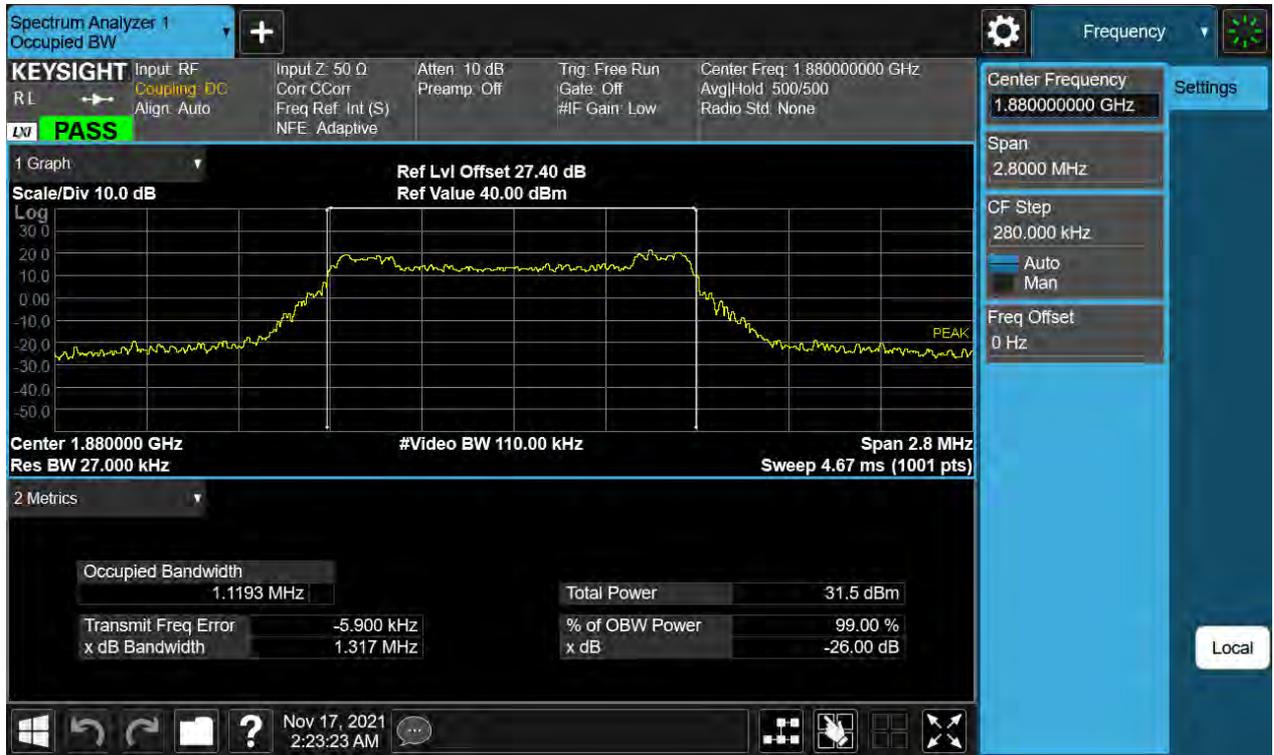
BW20 M\_BandEdge\_Highest Channel\_QPSK\_1RB(Upper Ant)



BW1.4 M\_OBW\_Middle Channel\_QPSK\_FullIRB(Lower Ant)



BW1.4 M\_OBW\_Middle Channel\_16QAM\_FullRB(Lower Ant)



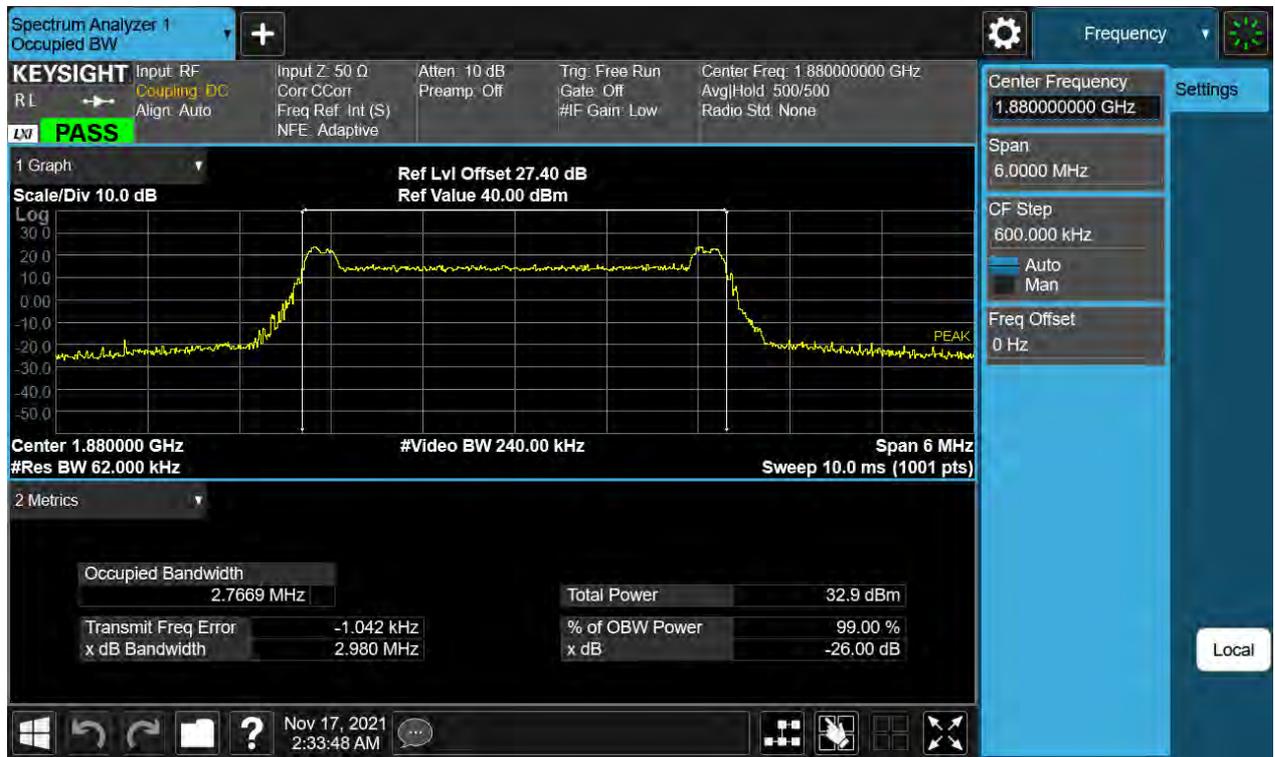
BW1.4 M\_OBW\_Middle Channel\_64QAM\_FullRB(Lower Ant)



BW1.4 M\_OBW\_Middle Channel\_256QAM\_FullIRB(Lower Ant)



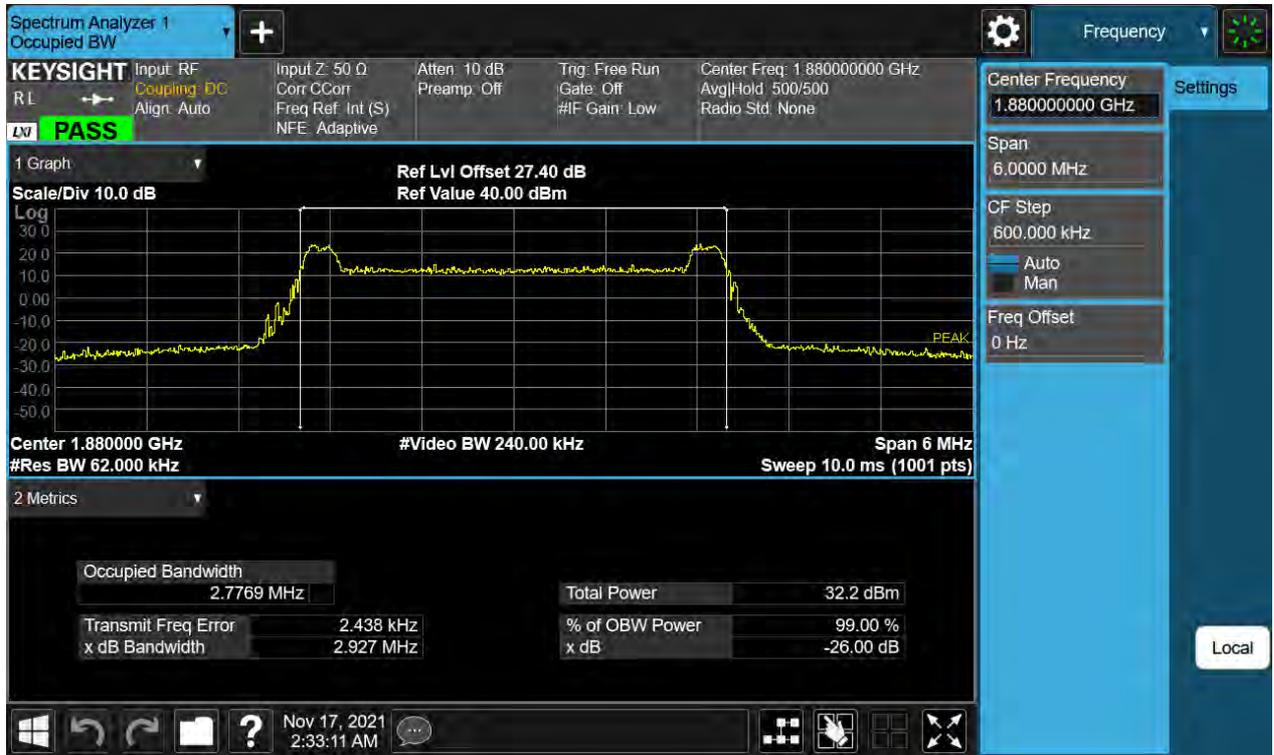
BW3 M\_OBW\_Middle Channel\_QPSK\_FullRB(Lower Ant)



BW3 M\_OBW\_Middle Channel\_16QAM\_FullRB(Lower Ant)



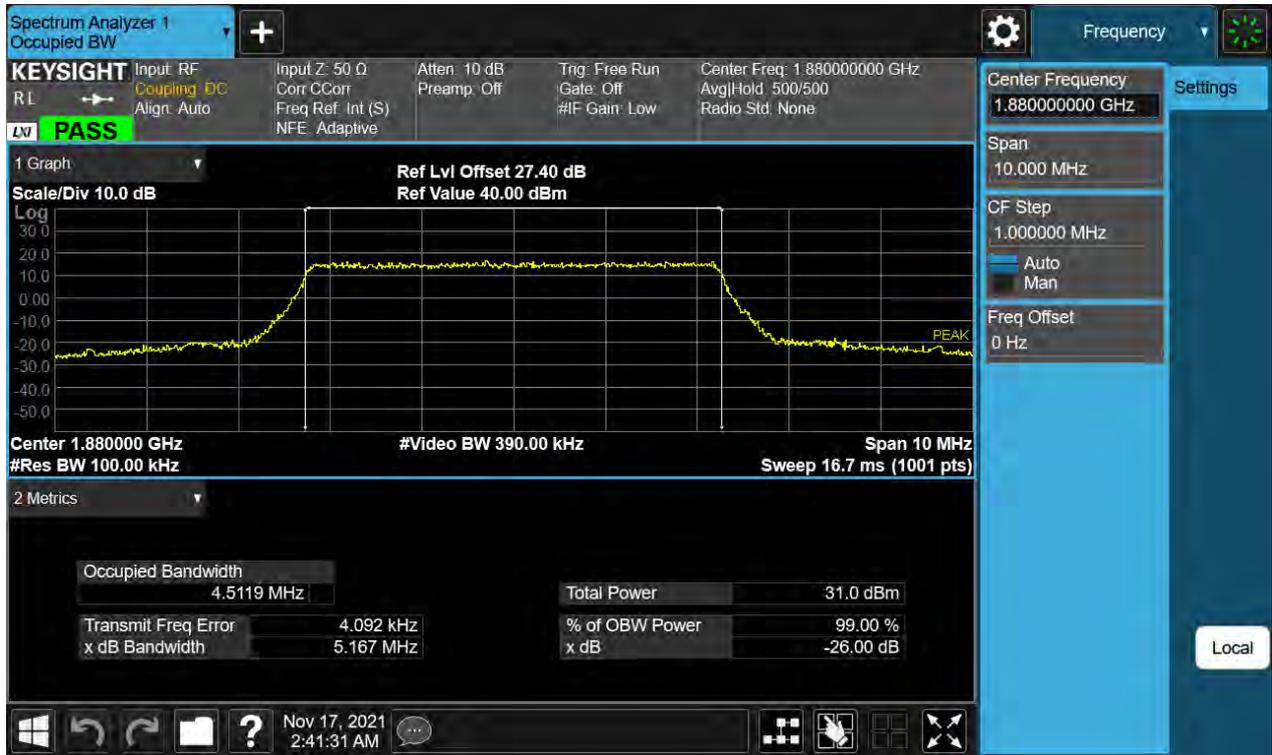
BW3 M\_OBW\_Middle Channel\_64QAM\_FullRB(Lower Ant)



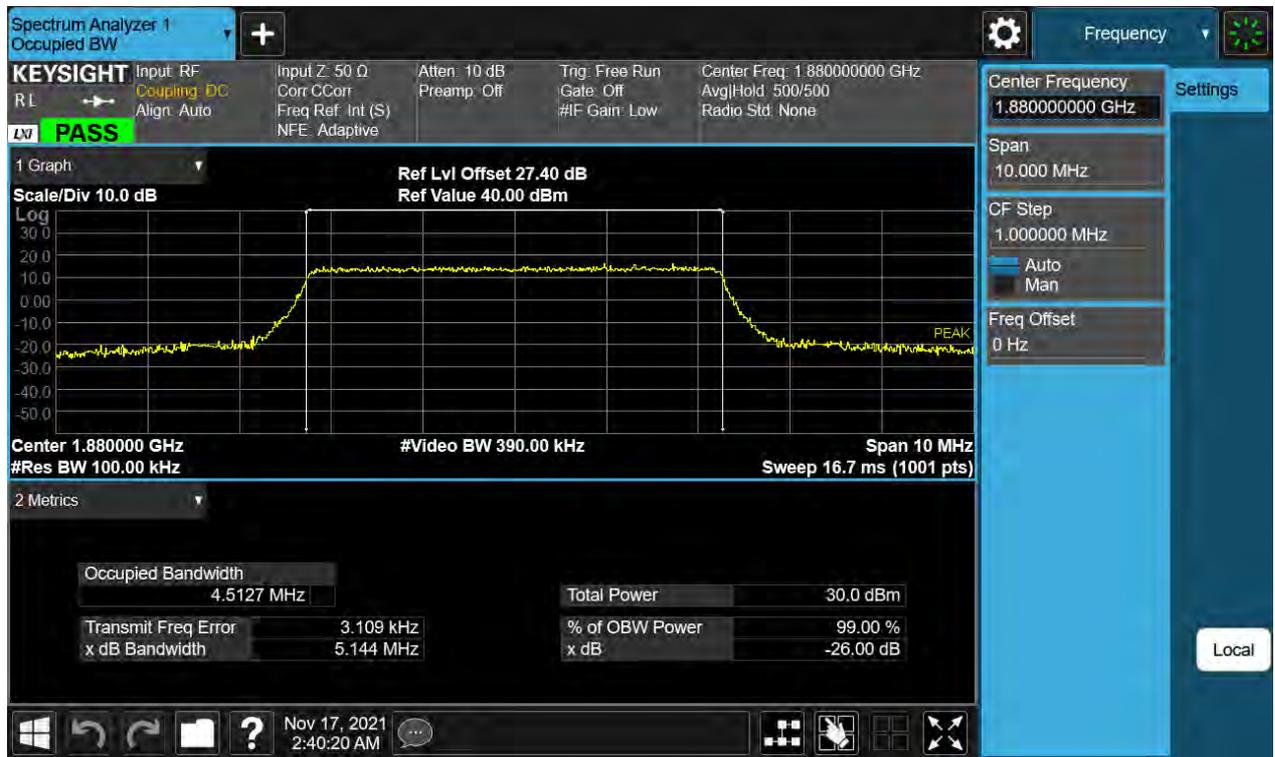
BW3 M\_OBW\_Middle Channel\_256QAM\_FullRB(Lower Ant)



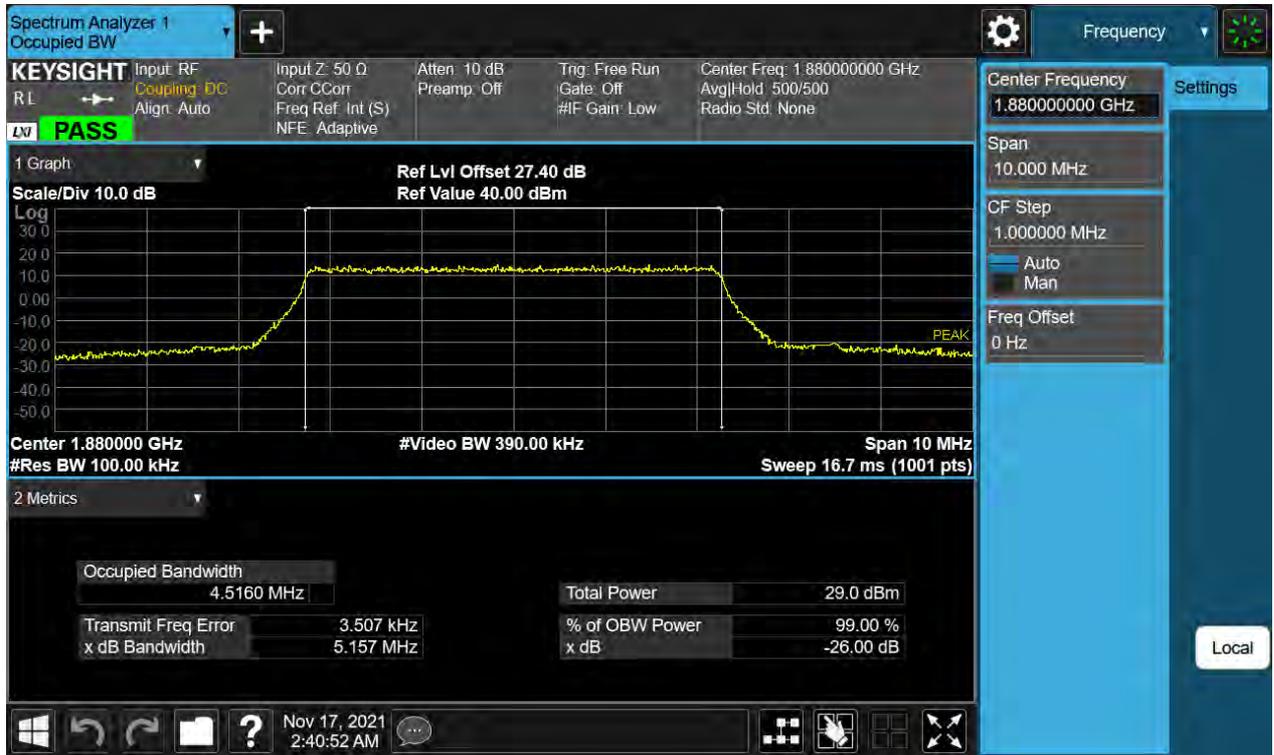
BW5 M\_OBW\_Middle Channel\_QPSK\_FullIRB(Lower Ant)



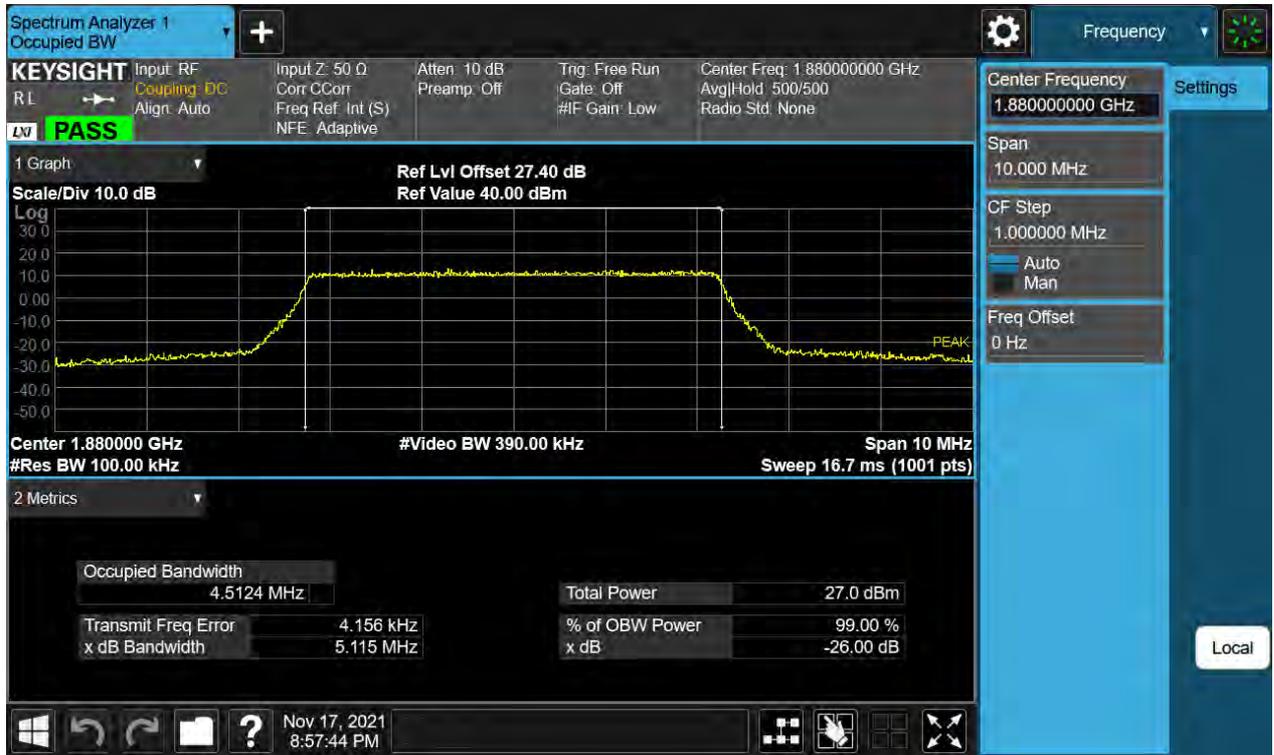
BW5 M\_OBW\_Middle Channel\_16QAM\_FullRB(Lower Ant)



BW5 M\_OBW\_Middle Channel\_64QAM\_FullRB(Lower Ant)



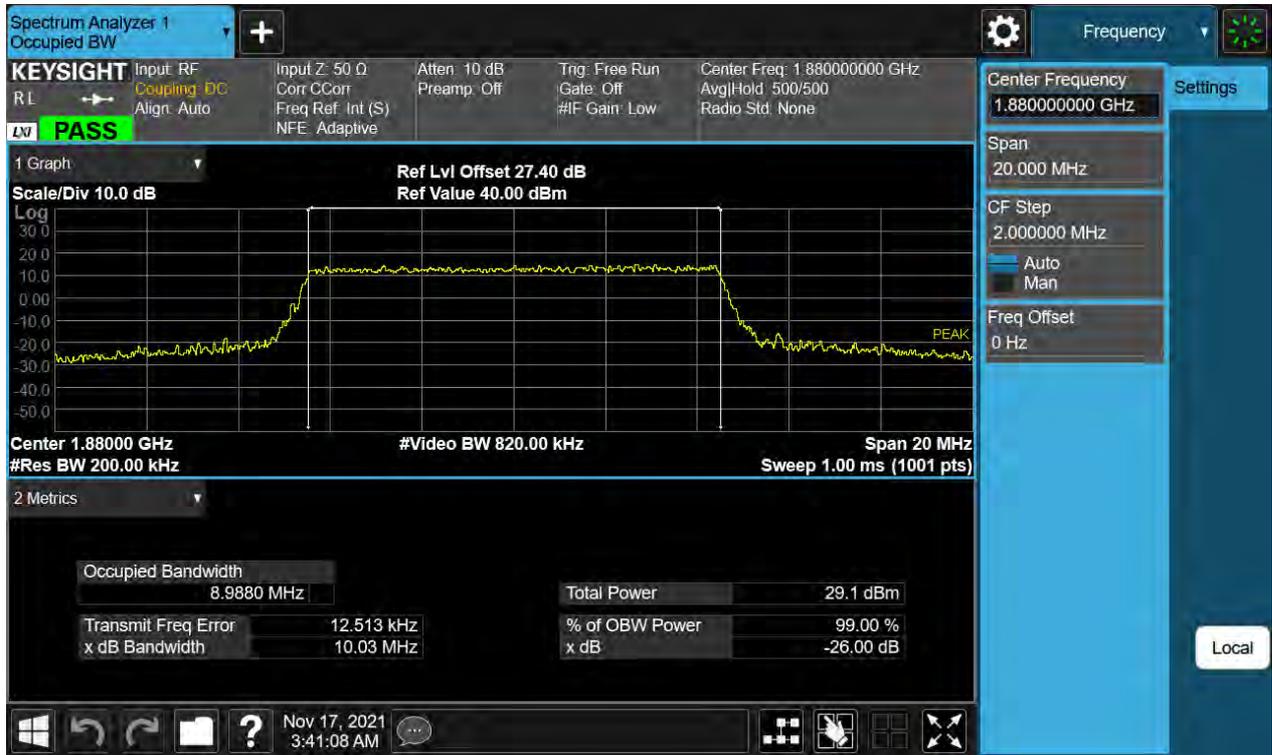
BW5 M\_OBW\_Middle Channel\_256QAM\_FullIRB(Lower Ant)



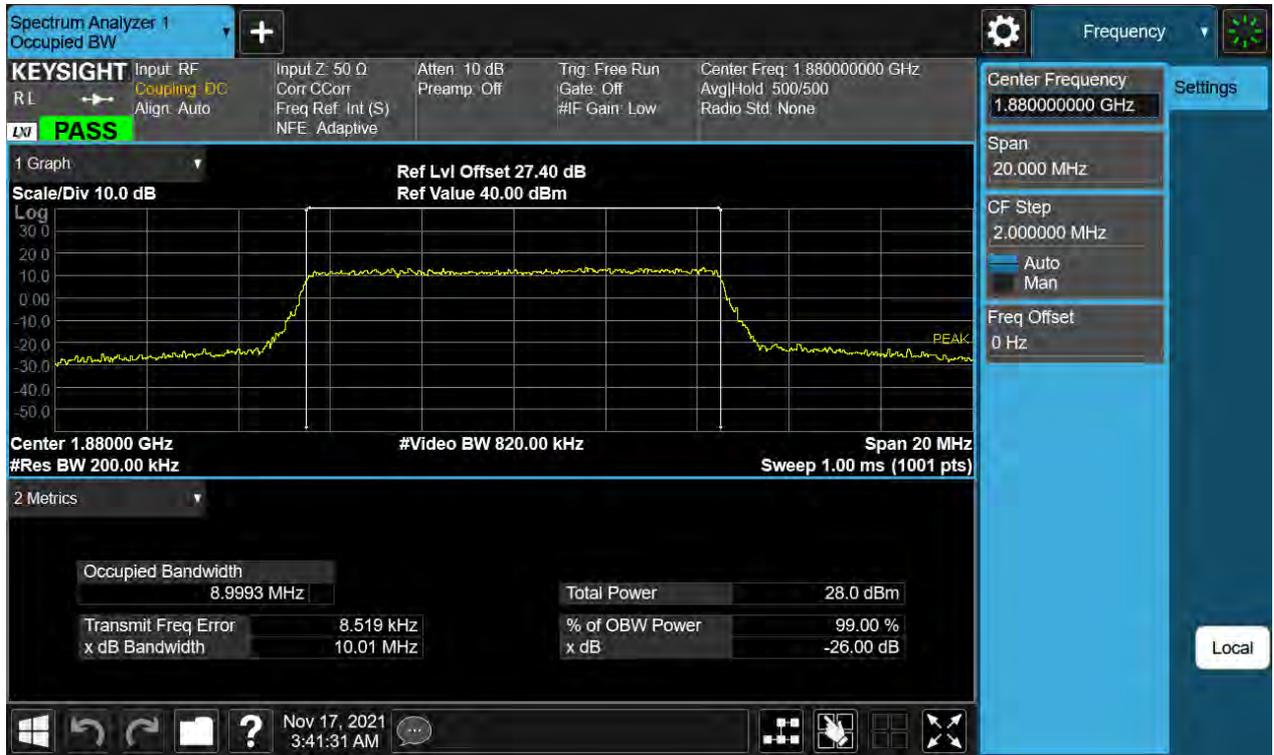
BW10 M\_OBW\_Middle Channel\_QPSK\_FullRB(Lower Ant)



BW10 M\_OBW\_Middle Channel\_16QAM\_FullIRB(Lower Ant)



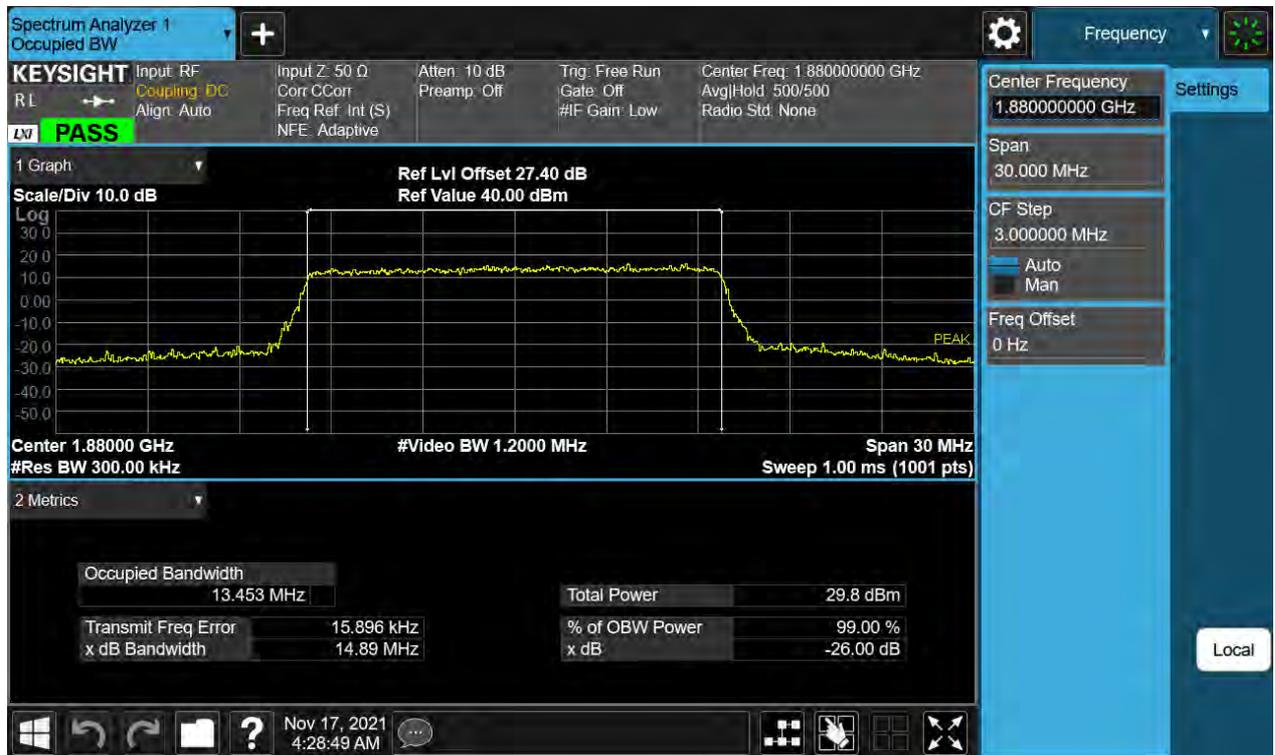
BW10 M\_OBW\_Middle Channel\_64QAM\_FullIRB(Lower Ant)



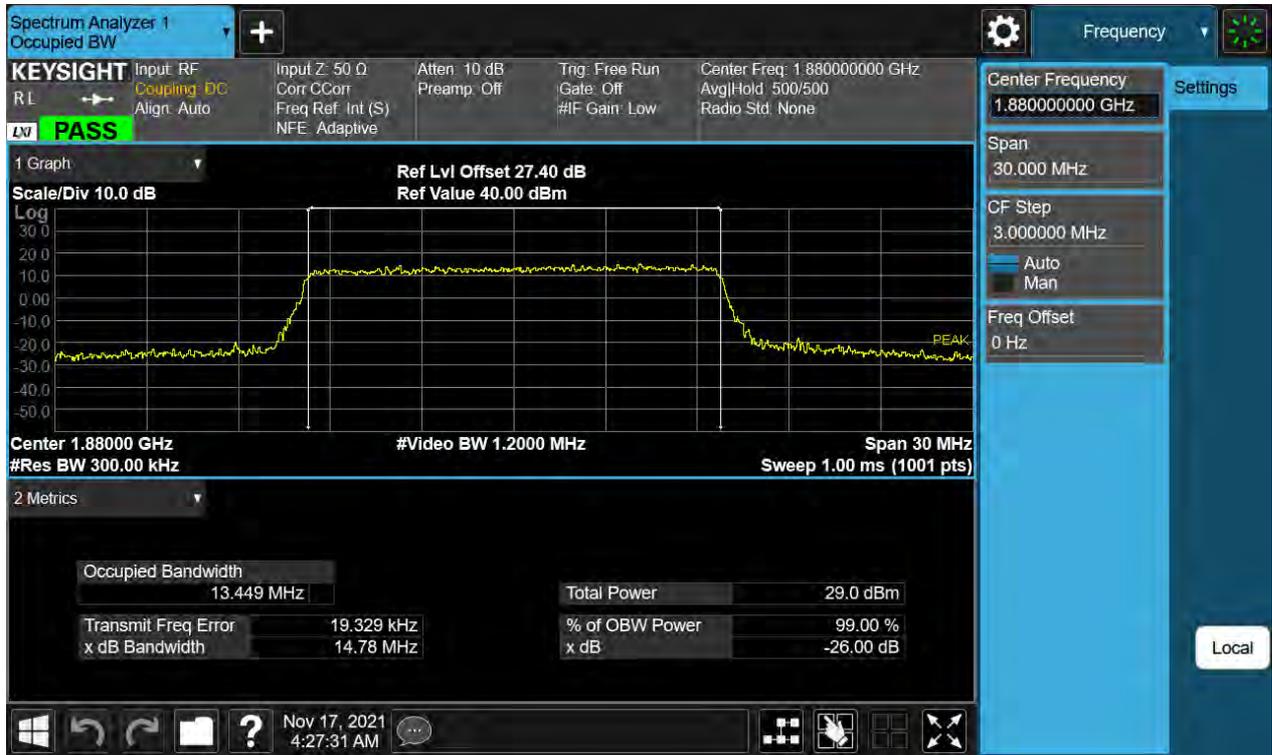
BW10 M\_OBW\_Middle Channel\_256QAM\_FullRB(Lower Ant)



BW15 M\_OBW\_Middle Channel\_QPSK\_FullRB(Lower Ant)



BW15 M\_OBW\_Middle Channel\_16QAM\_FullIRB(Lower Ant)



BW15 M\_OBW\_Middle Channel\_64QAM\_FullIRB(Lower Ant)

