

TEST REPORT

FCC LTE B66 Test for SM-F766B
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2505-FC030-R1

DATE OF ISSUE
May 27, 2025

Tested by
Jae Mun Do



Technical Manager
Jong Seok Lee



HCT CO., LTD.
Bongjai Huh
BongJai Huh / CEO

**HCT CO.,LTD.**

2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea
Tel. +82 31 645 6300 Fax. +82 31 645 6401

TEST REPORT

REPORT NO.

HCT-RF-2505-FC030-R1

DATE OF ISSUE

May 27, 2025

Applicant

SAMSUNG Electronics Co., Ltd.

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

Product Name

Mobile Phone

Model Name

SM-F766B

Date of Test

February 24, 2025 ~ May 07, 2025

FCC ID

A3LSMF766B

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing

(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

Test Standard Used

FCC Rule Part: § 27

Test Results

PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	May 07, 2025	Initial Release
1	May 27, 2025	Revised the Power Supply Voltage. (DC 3.88 V → DC 3.90 V)

Notice

Content

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)

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

CONTENTS

1. GENERAL INFORMATION	5
1.1. MAXIMUM OUTPUT POWER	6
2. INTRODUCTION	8
2.1. DESCRIPTION OF EUT	8
2.2. MEASURING INSTRUMENT CALIBRATION	8
2.3. TEST FACILITY	8
3. DESCRIPTION OF TESTS	9
3.1 TEST PROCEDURE	9
3.2 RADIATED POWER.....	10
3.3 RADIATED SPURIOUS EMISSIONS.....	11
3.4 PEAK- TO- AVERAGE RATIO	12
3.5 OCCUPIED BANDWIDTH.....	14
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....	15
3.7 BAND EDGE	16
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	17
3.9 WORST CASE(RADIATED TEST)	18
3.10 WORST CASE(CONDUCTED TEST).....	19
4. LIST OF TEST EQUIPMENT.....	20
5. MEASUREMENT UNCERTAINTY.....	21
6. SUMMARY OF TEST RESULTS	22
7. SAMPLE CALCULATION	23
8. TEST DATA(Main 2 ANT).....	25
8.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	25
8.2 RADIATED SPURIOUS EMISSIONS.....	28
8.3 PEAK-TO-AVERAGE RATIO	29
8.4 OCCUPIED BANDWIDTH.....	30
8.5 CONDUCTED SPURIOUS EMISSIONS	31
8.6 BAND EDGE	31
8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	32
9. TEST DATA(Sub 5 ANT)	50
9.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	50
9.2 RADIATED SPURIOUS EMISSIONS.....	53
9.3 PEAK-TO-AVERAGE RATIO	54
9.4 OCCUPIED BANDWIDTH.....	55
9.5 CONDUCTED SPURIOUS EMISSIONS	56
9.6 BAND EDGE	56
9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	57
10. TEST DATA	75
10.1 UPLINK CARRIER AGGREGATION	75
10.1.1 RADIATED SPURIOUS EMISSIONS.....	75
11. TEST PLOTS(Main 2 ANT).....	76
12. TEST PLOTS(Sub 5 ANT)	197
13. ANNEX A_ TEST SETUP PHOTO	318

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMF766B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 27
EUT Type:	Mobile Phone
Model(s):	SM-F766B
Tx Frequency:	1710.7 MHz – 1779.3 MHz (LTE – Band 66 (1.4 MHz)) 1711.5 MHz – 1778.5 MHz (LTE – Band 66 (3 MHz)) 1712.5 MHz – 1777.5 MHz (LTE – Band 66 (5 MHz)) 1715.0 MHz – 1775.0 MHz (LTE – Band 66 (10 MHz)) 1717.5 MHz – 1772.5 MHz (LTE – Band 66 (15 MHz)) 1720.0 MHz – 1770.0 MHz (LTE – Band 66 (20 MHz))
Date(s) of Tests:	February 24, 2025 ~ May 07, 2025
Serial number:	Radiated : R3CY10XMT6Y(Main 2 ANT), R3CY30SAQMT(Sub 5 ANT) Conducted : R3CY209A7CH
Antenna Information	Please refer to the Antenna Specification document.

1.1. MAXIMUM OUTPUT POWER

Main 2 ANT

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band66 (1.4)	1710.7 – 1779.3	1M10G7D	QPSK	0.130	21.15
		1M10W7D	16-QAM	0.111	20.44
		1M10W7D	64-QAM	0.086	19.33
		1M10W7D	256-QAM	0.042	16.20
LTE – Band66 (3)	1711.5 – 1778.5	2M72G7D	QPSK	0.131	21.16
		2M70W7D	16-QAM	0.112	20.51
		2M71W7D	64-QAM	0.087	19.42
		2M71W7D	256-QAM	0.042	16.22
LTE – Band66 (5)	1712.5 – 1777.5	4M53G7D	QPSK	0.133	21.23
		4M51W7D	16-QAM	0.112	20.50
		4M53W7D	64-QAM	0.087	19.41
		4M56W7D	256-QAM	0.043	16.29
LTE – Band66 (10)	1715.0 – 1775.0	9M00G7D	QPSK	0.135	21.30
		9M00W7D	16-QAM	0.112	20.51
		9M01W7D	64-QAM	0.087	19.41
		9M03W7D	256-QAM	0.043	16.34
LTE – Band66 (15)	1717.5 – 1772.5	13M5G7D	QPSK	0.138	21.40
		13M5W7D	16-QAM	0.116	20.64
		13M5W7D	64-QAM	0.090	19.53
		13M5W7D	256-QAM	0.044	16.40
LTE – Band66 (20)	1720.0 – 1770.0	18M0G7D	QPSK	0.139	21.44
		17M9W7D	16-QAM	0.117	20.69
		18M0W7D	64-QAM	0.090	19.56
		18M0W7D	256-QAM	0.044	16.46

Sub 5 ANT

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band66 (1.4)	1710.7 – 1779.3	1M10G7D	QPSK	0.052	17.16
		1M09W7D	16-QAM	0.045	16.53
		1M09W7D	64-QAM	0.034	15.31
		1M09W7D	256-QAM	0.016	12.16
LTE – Band66 (3)	1711.5 – 1778.5	2M72G7D	QPSK	0.053	17.21
		2M70W7D	16-QAM	0.046	16.60
		2M71W7D	64-QAM	0.035	15.40
		2M71W7D	256-QAM	0.017	12.24
LTE – Band66 (5)	1712.5 – 1777.5	4M53G7D	QPSK	0.054	17.31
		4M51W7D	16-QAM	0.046	16.66
		4M53W7D	64-QAM	0.035	15.46
		4M56W7D	256-QAM	0.017	12.31
LTE – Band66 (10)	1715.0 – 1775.0	8M99G7D	QPSK	0.054	17.32
		9M01W7D	16-QAM	0.047	16.69
		9M02W7D	64-QAM	0.036	15.51
		9M02W7D	256-QAM	0.018	12.44
LTE – Band66 (15)	1717.5 – 1772.5	13M5G7D	QPSK	0.055	17.38
		13M5W7D	16-QAM	0.048	16.77
		13M5W7D	64-QAM	0.036	15.61
		13M5W7D	256-QAM	0.018	12.48
LTE – Band66 (20)	1720.0 – 1770.0	18M0G7D	QPSK	0.055	17.39
		18M0W7D	16-QAM	0.045	16.58
		18M0W7D	64-QAM	0.035	15.43
		18M0W7D	256-QAM	0.017	12.43

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

Please refer to the [2G3G] Test Report.

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, Republic 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
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Radiated Power	- ANSI C63.26-2015 – Section 5.2.4.4 - KDB 971168 D01 v03r01 – Section 5.8
Radiated Spurious and Harmonic Emissions	- ANSI C63.26-2015 – Section 5.5.3 - KDB 971168 D01 v03r01 – Section 5.8

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.

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.

Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW $\geq$ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $>$ 2 x 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 10th 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;

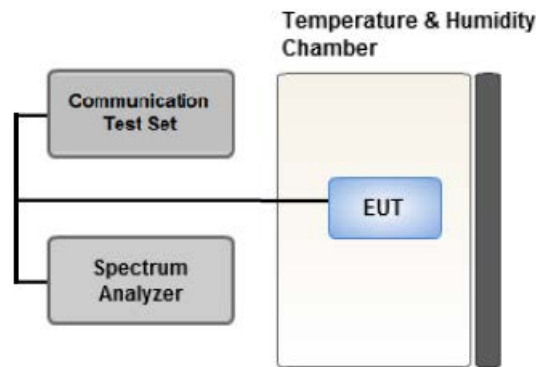
$$\text{Result}_{(\text{dBm})} = P_g_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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)

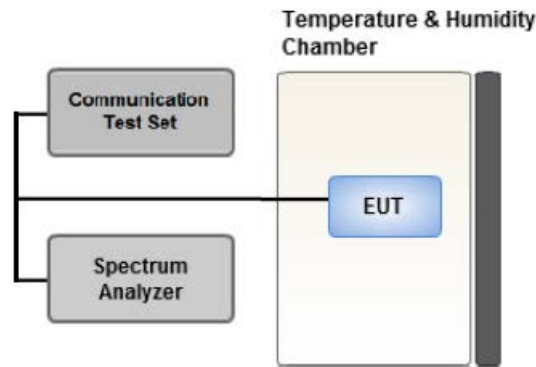
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

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 $[10 \log (1/0.25)] = 6 \text{ dB}$ 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.

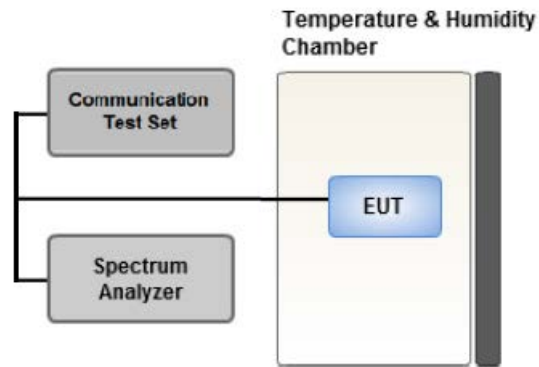
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

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 $\geq 3 \times$ 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

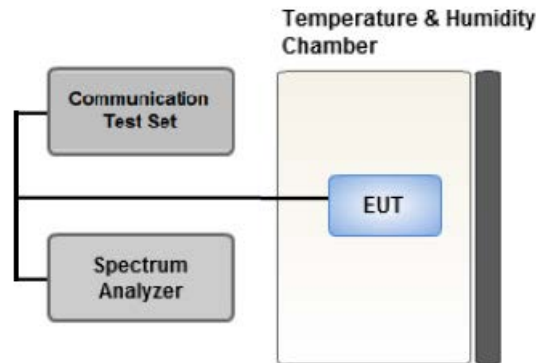
Test Overview

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 = Peak
4. Trace Mode = max hold
5. Sweep time = auto
6. Number of points in sweep $\geq 2 \times \text{Span} / \text{RBW}$

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

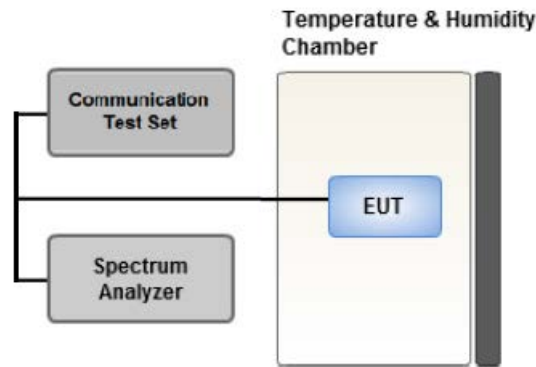
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block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

Where Margin < 1 dB the emission level is either corrected by $10 \log(1 \text{ MHz/ RB})$ or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.

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.
Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
Worst case : Stand alone
- All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.
Therefore, only the worst case(stand-alone) results were reported.
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 20 MHz(Main 2 ANT), 20 MHz(Sub 5 ANT))
- The EUT was tested in three modes(Open, Half-open, Closed), the worst case configuration results are reported. (Worst case: Open mode)
- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.

[Main 2 ANT Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 8.1		Z
Radiated Spurious and Harmonic Emissions	QPSK	See Section 8.2		Z

[Sub 5 ANT Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 9.1		X
Radiated Spurious and Harmonic Emissions	QPSK	See Section 9.2		X

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.

[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

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1.2 G HPF+LNA)	HCT CO., LTD.	F1L1	11/11/2025	Annual
RF Switching System	Switch box(3.3 G HPF+LNA)	HCT CO., LTD.	F1L2	11/11/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.	F1L4	11/11/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.	F1L7	11/11/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/07/2025	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/19/2026	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/10/2026	Annual
DC Power Supply	E3632A	Agilent	MY40010147	08/06/2025	Annual
Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Dipole Antenna	UHAP	Schwarzbeck	01288	08/07/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/11/2026	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/23/2027	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/14/2026	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/10/2026	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/06/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/28/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	08/19/2026	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/13/2025	Annual
Radio Communication Test Station	MT8000A	Anritsu Corp.	6272613402	08/28/2025	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
Signal & Spectrum Analyzer (2 Hz~67 GHz)	FSW67	REOHDE & SCHWARZ	101736	05/23/2025	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.	-	-	-

Note:

- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
- 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_{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 ($\pm$ kHz)
Occupied Bandwidth	95 (Confidence level about 95 %, $k=2$)
Frequency stability	28 (Confidence level about 95 %, $k=2$)
Parameter	Expanded Uncertainty ($\pm$ kHz)
Block Edge	0.70 (Confidence level about 95 %, $k=2$)
Conducted Spurious Emissions	1.18 (Confidence level about 95 %, $k=2$)
Peak- to- Average Ratio	0.68 (Confidence level about 95 %, $k=2$)
Radiated Power	4.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.68 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.75 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$)

6. SUMMARY OF TEST RESULTS

-. The decision rule applies 'simple acceptance'

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, § 27.53(h)	< 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	§ 27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 27.54	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	§ 27.50(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 27.53(h)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

6.3. Data Referencing

Rule Part	Test item	Data Referencing	Comments
§ 2.1049	Occupied Bandwidth	Y	-
§ 2.1051, § 27.53(h)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	Y	-
§ 27.50(d)(5)	Peak- to- Average Ratio	Y	-
§ 2.1055, § 27.54	Frequency stability / variation of ambient temperature	Y	-
§ 27.50(d)(4)	Equivalent Isotropic Radiated Power	Y	Spot-check
§ 2.1053, § 27.53(h)	Radiated Spurious and Harmonic Emissions	Y	Spot-check
§ 2.1046	Conducted Output Power	Y	-

Spot-Check Result

1. Data was leveraged from model SM-F766U for the certification of SM-F766B.
2. Please refer to the [FCC Evaluation] Report.

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

$$\text{ERP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 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

$$\text{EIRP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 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(Main 2 ANT)

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1710.7	LTE B66 (1.4 MHz)	QPSK	-21.21	12.16	10.04	2.06	V	<2.00	0.103	20.14	1	5
		16-QAM	-21.97	11.40	10.04	2.06	V		0.087	19.38		
		64-QAM	-23.05	10.32	10.04	2.06	V		0.068	18.30		
		256-QAM	-26.18	7.19	10.04	2.06	V		0.033	15.17		
1745		QPSK	-20.42	13.04	10.18	2.07	V		0.130	21.15	1	5
		16-QAM	-21.13	12.33	10.18	2.07	V		0.111	20.44		
		64-QAM	-22.24	11.22	10.18	2.07	V		0.086	19.33		
		256-QAM	-25.37	8.09	10.18	2.07	V		0.042	16.20		
1779.3		QPSK	-20.98	12.84	10.26	2.09	V		0.126	21.01	1	0
		16-QAM	-21.63	12.19	10.26	2.09	V		0.109	20.36		
		64-QAM	-22.74	11.08	10.26	2.09	V		0.084	19.25		
		256-QAM	-25.93	7.89	10.26	2.09	V		0.040	16.06		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1711.5	LTE B66 (3 MHz)	QPSK	-21.19	12.18	10.04	2.06	V	<2.00	0.104	20.16	1	0
		16-QAM	-21.96	11.41	10.04	2.06	V		0.087	19.39		
		64-QAM	-23.04	10.33	10.04	2.06	V		0.068	18.31		
		256-QAM	-26.14	7.23	10.04	2.06	V		0.033	15.21		
1745		QPSK	-20.41	13.05	10.18	2.07	V		0.131	21.16	1	14
		16-QAM	-21.06	12.40	10.18	2.07	V		0.113	20.51		
		64-QAM	-22.15	11.31	10.18	2.07	V		0.088	19.42		
		256-QAM	-25.35	8.11	10.18	2.07	V		0.042	16.22		
1778.5		QPSK	-20.87	12.95	10.26	2.09	V		0.129	21.12	1	0
		16-QAM	-21.56	12.26	10.26	2.09	V		0.110	20.43		
		64-QAM	-22.67	11.15	10.26	2.09	V		0.086	19.32		
		256-QAM	-25.81	8.01	10.26	2.09	V		0.042	16.18		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1712.5	LTE B66 (5 MHz)	QPSK	-21.19	12.20	10.06	2.06	V	<2.00	0.105	20.20	1	0
		16-QAM	-21.96	11.43	10.06	2.06	V		0.088	19.43		
		64-QAM	-23.03	10.36	10.06	2.06	V		0.069	18.36		
		256-QAM	-26.17	7.22	10.06	2.06	V		0.033	15.22		
1745		QPSK	-20.34	13.12	10.18	2.07	V		0.133	21.23	1	24
		16-QAM	-21.07	12.39	10.18	2.07	V		0.112	20.50		
		64-QAM	-22.16	11.30	10.18	2.07	V		0.087	19.41		
		256-QAM	-25.28	8.18	10.18	2.07	V		0.043	16.29		
1777.5		QPSK	-20.84	12.98	10.26	2.09	V		0.130	21.15	1	0
		16-QAM	-21.53	12.29	10.26	2.09	V		0.111	20.46		
		64-QAM	-22.61	11.21	10.26	2.09	V		0.087	19.38		
		256-QAM	-25.79	8.03	10.26	2.09	V		0.042	16.20		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1715	LTE B66 (10 MHz)	QPSK	-21.14	12.25	10.06	2.06	V	<2.00	0.106	20.25	1	0
		16-QAM	-21.97	11.42	10.06	2.06	V		0.088	19.42		
		64-QAM	-23.07	10.32	10.06	2.06	V		0.068	18.32		
		256-QAM	-26.12	7.27	10.06	2.06	V		0.034	15.27		
1745		QPSK	-20.31	13.15	10.18	2.07	V		0.134	21.26	1	49
		16-QAM	-21.06	12.40	10.18	2.07	V		0.113	20.51		
		64-QAM	-22.16	11.30	10.18	2.07	V		0.087	19.41		
		256-QAM	-25.29	8.17	10.18	2.07	V		0.043	16.28		
1775		QPSK	-20.62	13.14	10.25	2.09	V		0.135	21.30	1	0
		16-QAM	-21.41	12.35	10.25	2.09	V		0.113	20.51		
		64-QAM	-22.51	11.25	10.25	2.09	V		0.087	19.41		
		256-QAM	-25.58	8.18	10.25	2.09	V		0.043	16.34		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1717.5	LTE B66 (15 MHz)	QPSK	-21.14	12.28	10.08	2.06	V	<2.00	0.107	20.30	1	0
		16-QAM	-21.93	11.49	10.08	2.06	V		0.089	19.51		
		64-QAM	-23.02	10.40	10.08	2.06	V		0.070	18.42		
		256-QAM	-26.14	7.28	10.08	2.06	V		0.034	15.30		
1745		QPSK	-20.34	13.12	10.18	2.07	V		0.133	21.23	1	74
		16-QAM	-21.08	12.38	10.18	2.07	V		0.112	20.49		
		64-QAM	-22.21	11.25	10.18	2.07	V		0.086	19.36		
		256-QAM	-25.32	8.14	10.18	2.07	V		0.042	16.25		
1772.5		QPSK	-20.52	13.24	10.25	2.09	V		0.138	21.40	1	0
		16-QAM	-21.28	12.48	10.25	2.09	V		0.116	20.64		
		64-QAM	-22.39	11.37	10.25	2.09	V		0.090	19.53		
		256-QAM	-25.52	8.24	10.25	2.09	V		0.044	16.40		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1720	LTE B66 (20 MHz)	QPSK	-21.16	12.26	10.08	2.06	V	<2.00	0.107	20.28	1	0
		16-QAM	-21.94	11.48	10.08	2.06	V		0.089	19.50		
		64-QAM	-23.05	10.37	10.08	2.06	V		0.069	18.39		
		256-QAM	-26.13	7.29	10.08	2.06	V		0.034	15.31		
1745		QPSK	-20.38	13.08	10.18	2.07	V		0.132	21.19	1	99
		16-QAM	-21.13	12.33	10.18	2.07	V		0.111	20.44		
		64-QAM	-22.23	11.23	10.18	2.07	V		0.086	19.34		
		256-QAM	-25.37	8.09	10.18	2.07	V		0.042	16.20		
1770		QPSK	-20.41	13.29	10.24	2.09	V		0.139	21.44	1	0
		16-QAM	-21.16	12.54	10.24	2.09	V		0.117	20.69		
		64-QAM	-22.29	11.41	10.24	2.09	V		0.090	19.56		
		256-QAM	-25.39	8.31	10.24	2.09	V		0.044	16.46		

8.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE B66
 MODULATION SIGNAL: 20 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
132072 (1720)	3440.00	-39.67	12.40	-58.37	3.04	H	-49.01	1	0
	5160.00	-42.33	12.44	-54.97	3.76	H	-46.29		
	6880.00	-44.23	11.82	-51.24	4.44	V	-43.86		
132322 (1745)	3490.00	-41.38	12.34	-59.63	3.04	H	-50.33	1	99
	5235.00	-44.42	12.84	-57.00	3.78	V	-47.94		
	6980.00	-43.13	11.40	-49.45	4.48	V	-42.53		
132572 (1770)	3540.00	-42.38	12.34	-60.13	3.06	H	-50.85	1	0
	5310.00	-44.91	13.08	-58.29	3.82	H	-49.03		
	7080.00	-43.81	10.93	-48.46	4.49	V	-42.02		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
66	1.4 MHz	1745.0	QPSK	6	0	4.68
			16-QAM			5.69
			64-QAM			5.89
			256-QAM			5.79
	3 MHz		QPSK	15		5.03
			16-QAM			5.87
			64-QAM			5.92
			256-QAM			5.96
	5 MHz		QPSK	25		5.15
			16-QAM			5.92
			64-QAM			6.05
			256-QAM			6.04
	10 MHz		QPSK	50		5.34
			16-QAM			5.98
			64-QAM			6.17
			256-QAM			6.07
	15 MHz		QPSK	75		5.35
			16-QAM			6.06
			64-QAM			6.07
			256-QAM			6.02
	20 MHz		QPSK	100		5.32
			16-QAM			6.08
			64-QAM			6.13
			256-QAM			6.03

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 77 ~ 100.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
66	1.4 MHz	1745.0	QPSK	6	0	1.0979
			16-QAM			1.0950
			64-QAM			1.0945
			256-QAM			1.0960
	3 MHz		QPSK	15		2.7162
			16-QAM			2.7038
			64-QAM			2.7061
			256-QAM			2.7139
	5 MHz		QPSK	25		4.5320
			16-QAM			4.5140
			64-QAM			4.5293
			256-QAM			4.5586
	10 MHz		QPSK	50		8.9971
			16-QAM			9.0028
			64-QAM			9.0053
			256-QAM			9.0253
	15 MHz		QPSK	75		13.479
			16-QAM			13.471
			64-QAM			13.472
			256-QAM			13.502
	20 MHz		QPSK	100		18.010
			16-QAM			17.942
			64-QAM			17.981
			256-QAM			17.981

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 101 ~ 124.

8.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
66	1.4	1710.70	3.7987	27.976	-67.385	-39.409	-13.00
		1745.00	2.4029	27.976	-61.505	-33.529	
		1779.30	3.7688	27.976	-68.105	-40.129	
	3	1711.50	8.3151	28.591	-67.937	-39.346	
		1745.00	9.9103	28.591	-67.302	-38.711	
		1778.50	5.1546	28.591	-66.952	-38.361	
	5	1712.50	8.8634	28.591	-66.365	-37.774	
		1745.00	3.7688	27.976	-67.286	-39.310	
		1777.50	9.9502	28.591	-67.509	-38.918	
	10	1715.00	9.1426	28.591	-67.610	-39.019	
		1745.00	4.0878	27.976	-67.233	-39.257	
		1775.00	7.4377	28.591	-68.035	-39.444	
	15	1717.50	4.9053	27.976	-67.061	-39.085	
		1745.00	9.4716	28.591	-67.654	-39.063	
		1772.50	2.4029	27.976	-60.345	-32.369	
	20	1720.00	9.7208	28.591	-67.512	-38.921	
		1745.00	5.2244	28.591	-68.284	-39.693	
		1770.00	4.0280	27.976	-66.957	-38.981	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 125 ~ 160.
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

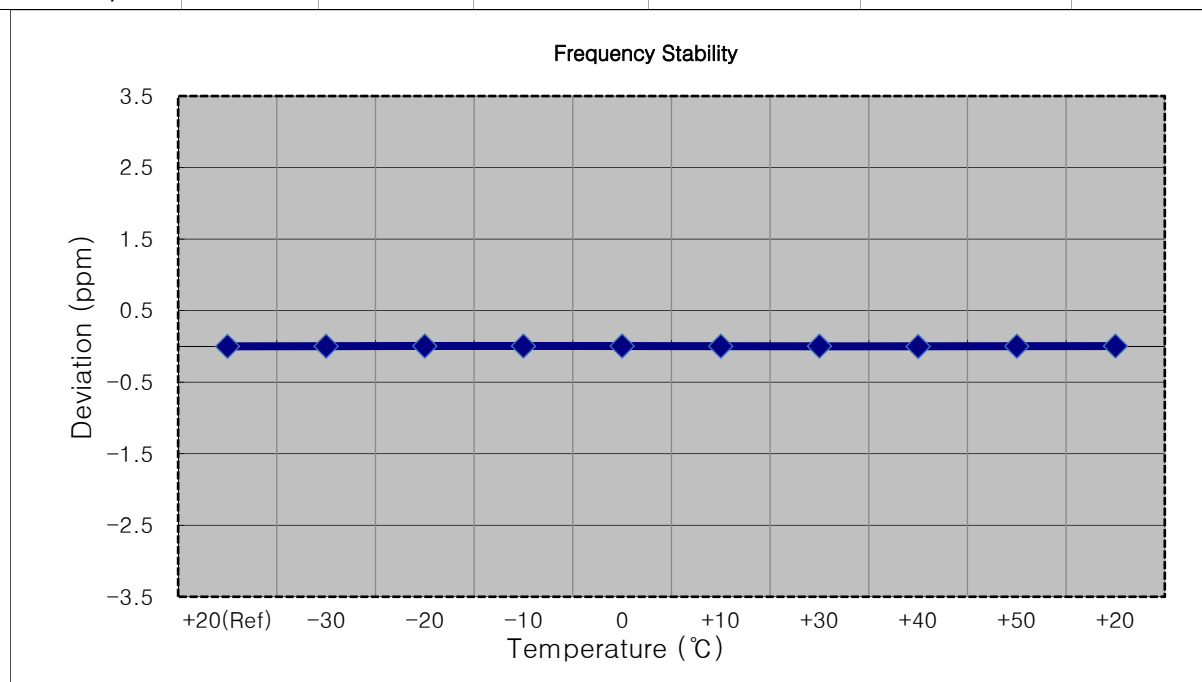
8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 161 ~ 196.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

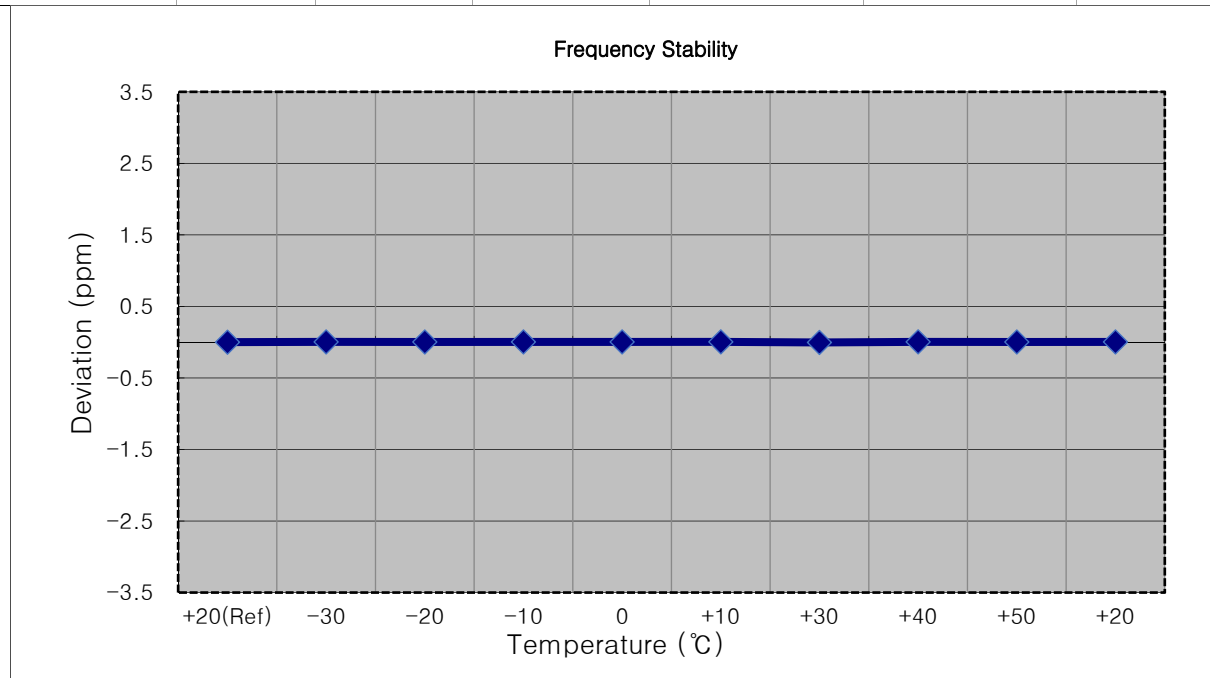
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1710,700,000 Hz</u>
CHANNEL:	<u>131979 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1710 700 008	0.0	0.000 000	0.000
100 %		-30	1710 700 011	3.8	0.000 000	0.002
100 %		-20	1710 700 016	8.0	0.000 000	0.005
100 %		-10	1710 700 016	8.2	0.000 000	0.005
100 %		0	1710 700 016	8.5	0.000 000	0.005
100 %		+10	1710 700 013	5.2	0.000 000	0.003
100 %		+30	1710 700 013	5.7	0.000 000	0.003
100 %		+40	1710 700 003	-4.4	0.000 000	-0.003
100 %		+50	1710 700 012	4.3	0.000 000	0.003
Batt. Endpoint	3.300	+20	1710 700 015	7.2	0.000 000	0.004



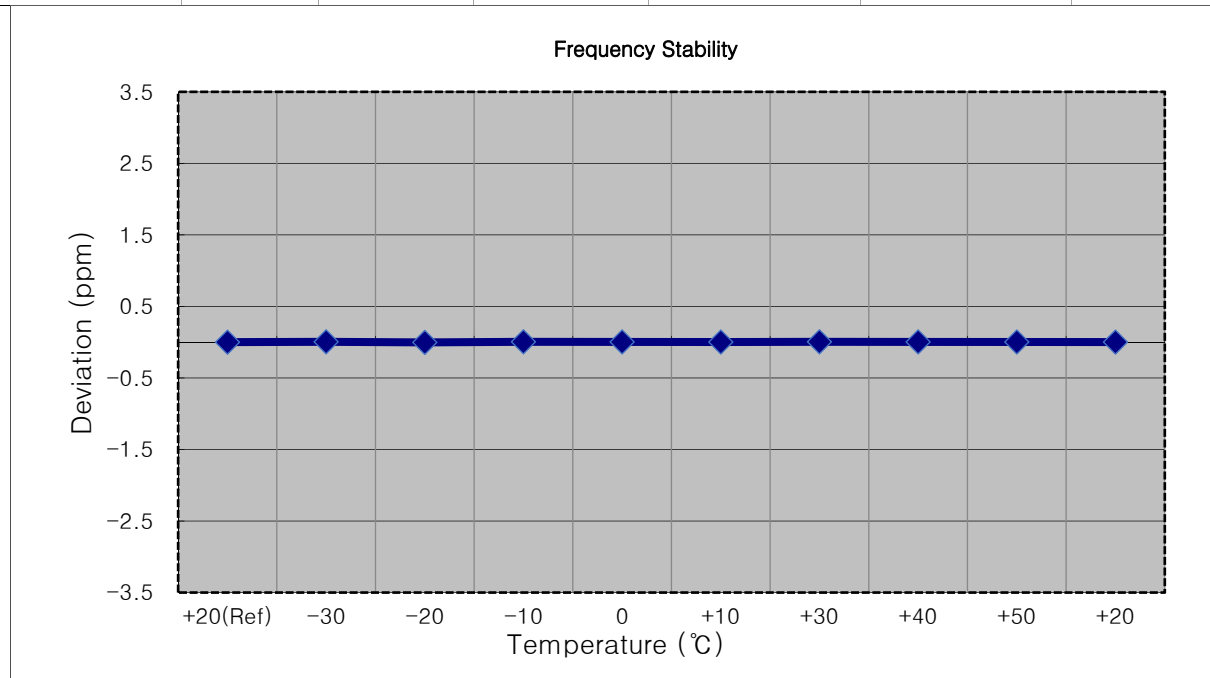
MODE: LTE 66
 OPERATING FREQUENCY: 1711,500,000 Hz
 CHANNEL: 131987 (3 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1711 500 007	0.0	0.000 000	0.000
100 %		-30	1711 500 014	6.5	0.000 000	0.004
100 %		-20	1711 500 012	4.5	0.000 000	0.003
100 %		-10	1711 500 014	6.3	0.000 000	0.004
100 %		0	1711 500 014	6.2	0.000 000	0.004
100 %		+10	1711 500 014	7.0	0.000 000	0.004
100 %		+30	1711 500 001	-6.2	0.000 000	-0.004
100 %		+40	1711 500 015	8.1	0.000 000	0.005
100 %		+50	1711 500 012	4.7	0.000 000	0.003
Batt. Endpoint	3.300	+20	1711 500 013	5.8	0.000 000	0.003



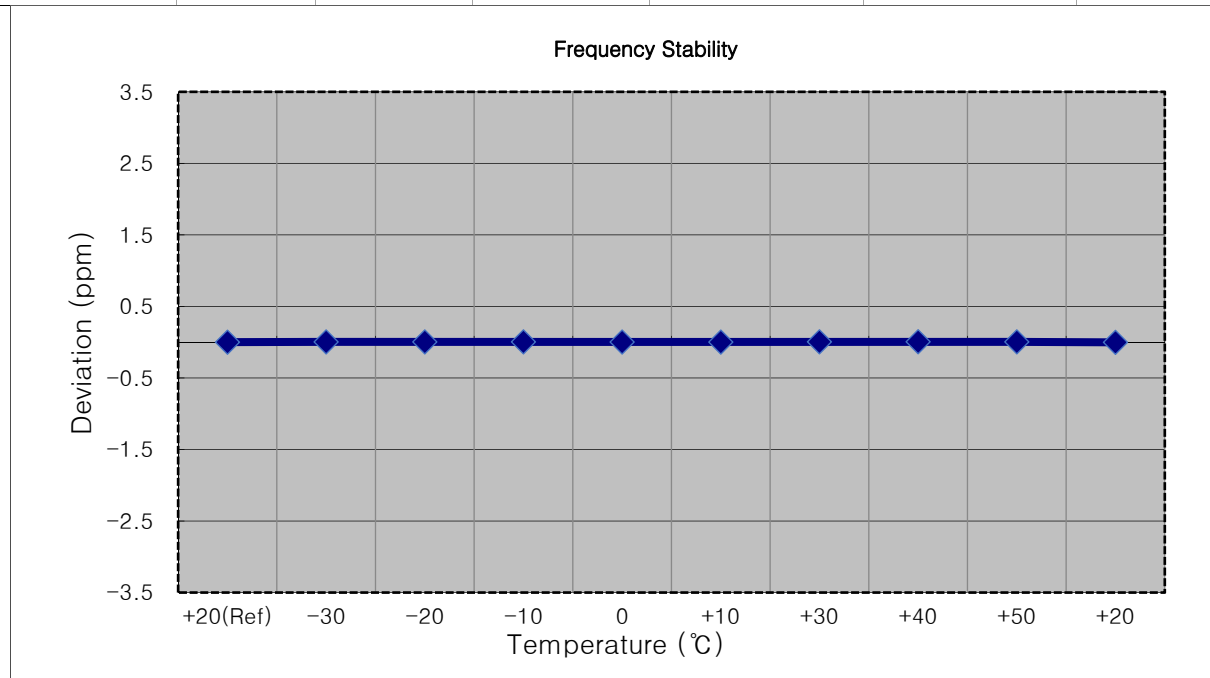
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1712,500,000 Hz</u>
CHANNEL:	<u>131997 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1712 500 006	0.0	0.000 000	0.000
100 %		-30	1712 500 014	8.8	0.000 001	0.005
100 %		-20	1712 500 001	-4.9	0.000 000	-0.003
100 %		-10	1712 500 014	8.4	0.000 000	0.005
100 %		0	1712 500 011	5.7	0.000 000	0.003
100 %		+10	1712 500 009	3.2	0.000 000	0.002
100 %		+30	1712 500 015	9.3	0.000 001	0.005
100 %		+40	1712 500 011	5.8	0.000 000	0.003
100 %		+50	1712 500 010	4.8	0.000 000	0.003
Batt. Endpoint	3.300	+20	1712 500 008	2.3	0.000 000	0.001



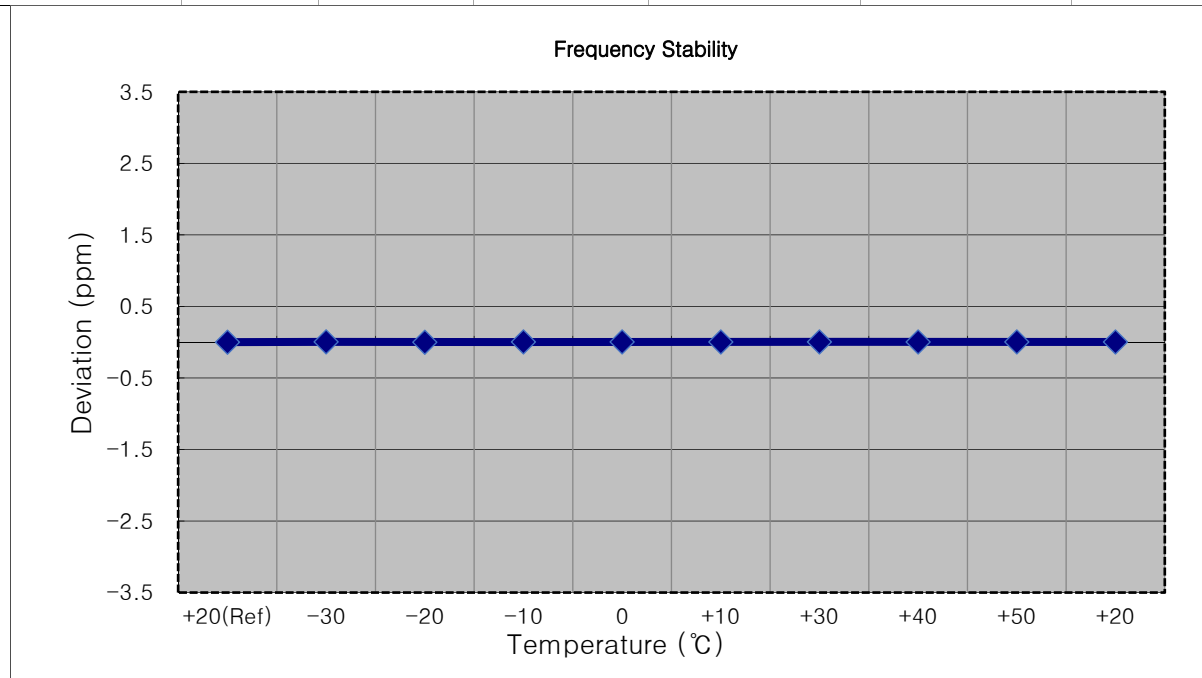
- ▣ MODE: LTE 66
- ▣ OPERATING FREQUENCY: 1715,000,000 Hz
- ▣ CHANNEL: 132022 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.900 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1714 999 996	0.0	0.000 000	0.000
100 %		-30	1715 000 002	6.7	0.000 000	0.004
100 %		-20	1715 000 002	6.2	0.000 000	0.004
100 %		-10	1715 000 004	8.1	0.000 000	0.005
100 %		0	1715 000 000	4.4	0.000 000	0.003
100 %		+10	1714 999 998	2.3	0.000 000	0.001
100 %		+30	1715 000 004	8.5	0.000 000	0.005
100 %		+40	1715 000 006	10.4	0.000 001	0.006
100 %		+50	1715 000 003	7.3	0.000 000	0.004
Batt. Endpoint	3.300	+20	1714 999 991	-4.4	0.000 000	-0.003



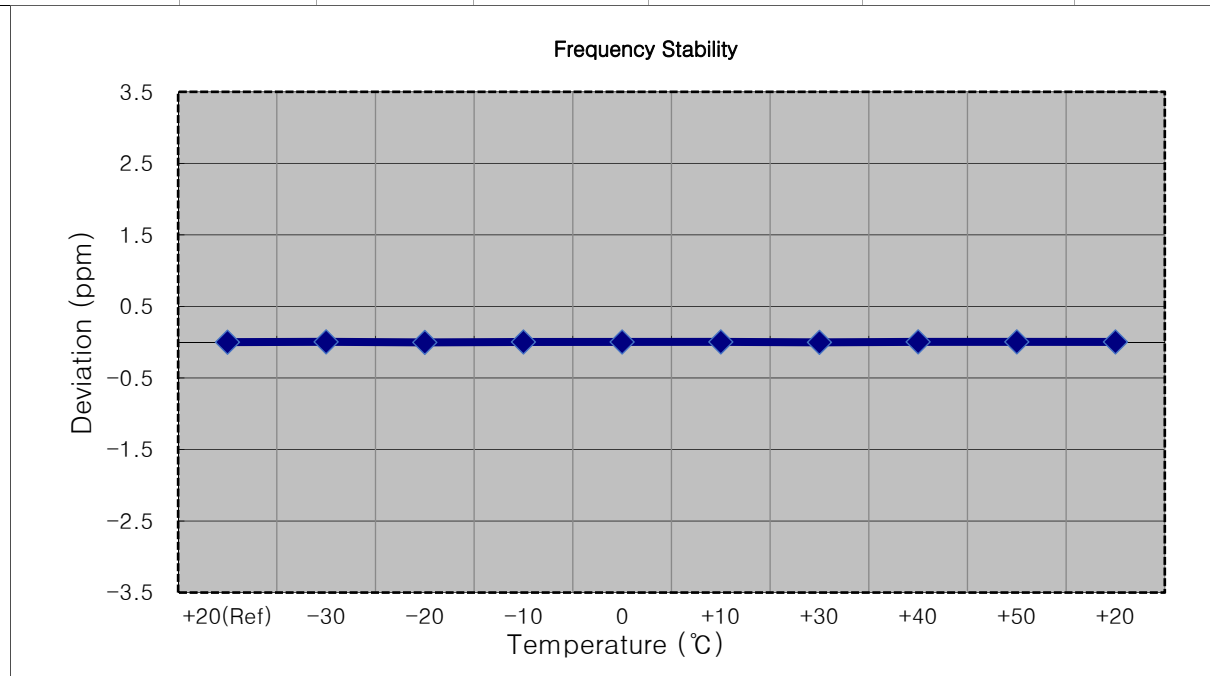
MODE: LTE 66
 OPERATING FREQUENCY: 1717,500,000 Hz
 CHANNEL: 132047 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1717 500 005	0.0	0.000 000	0.000
100 %		-30	1717 500 012	7.0	0.000 000	0.004
100 %		-20	1717 500 003	-1.6	0.000 000	-0.001
100 %		-10	1717 500 012	6.6	0.000 000	0.004
100 %		0	1717 500 011	6.3	0.000 000	0.004
100 %		+10	1717 500 011	5.7	0.000 000	0.003
100 %		+30	1717 500 011	6.4	0.000 000	0.004
100 %		+40	1717 500 010	5.3	0.000 000	0.003
100 %		+50	1717 500 011	6.1	0.000 000	0.004
Batt. Endpoint	3.300	+20	1717 500 010	4.6	0.000 000	0.003



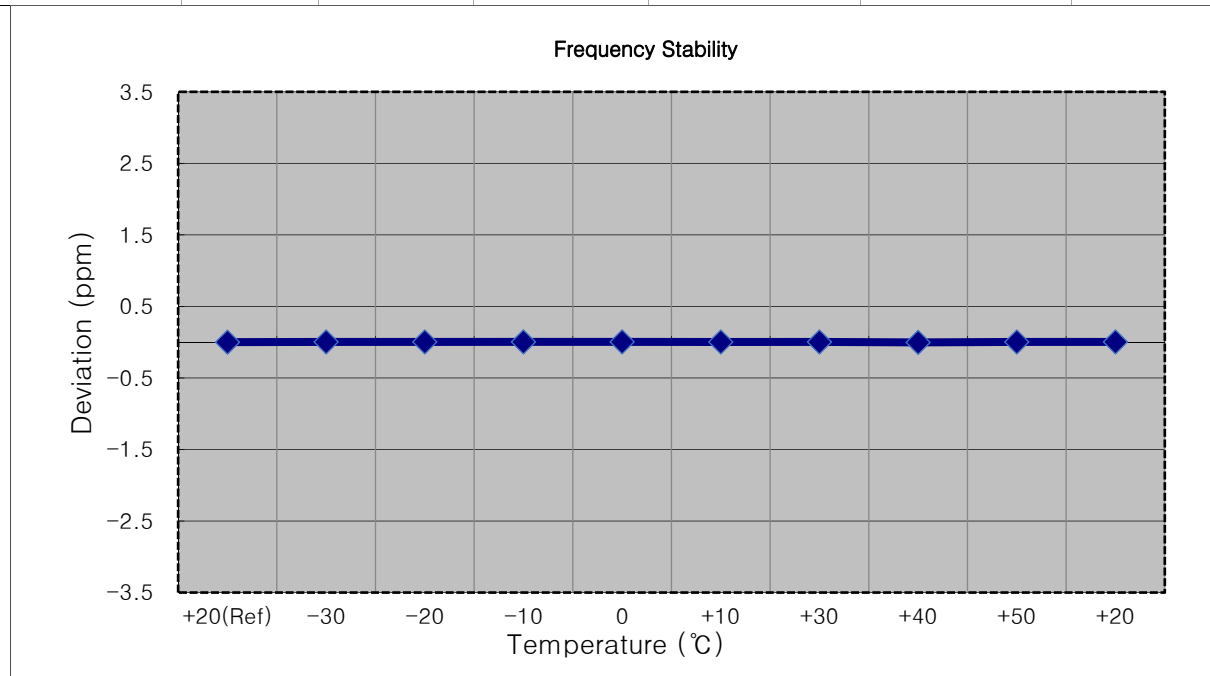
MODE: LTE 66
 OPERATING FREQUENCY: 1720,000,000 Hz
 CHANNEL: 132072 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1720 000 007	0.0	0.000 000	0.000
100 %		-30	1720 000 015	7.9	0.000 000	0.005
100 %		-20	1720 000 002	-5.5	0.000 000	-0.003
100 %		-10	1720 000 012	4.5	0.000 000	0.003
100 %		0	1720 000 013	5.2	0.000 000	0.003
100 %		+10	1720 000 014	6.7	0.000 000	0.004
100 %		+30	1720 000 003	-4.3	0.000 000	-0.002
100 %		+40	1720 000 015	7.6	0.000 000	0.004
100 %		+50	1720 000 015	8.1	0.000 000	0.005
Batt. Endpoint	3.300	+20	1720 000 014	6.3	0.000 000	0.004



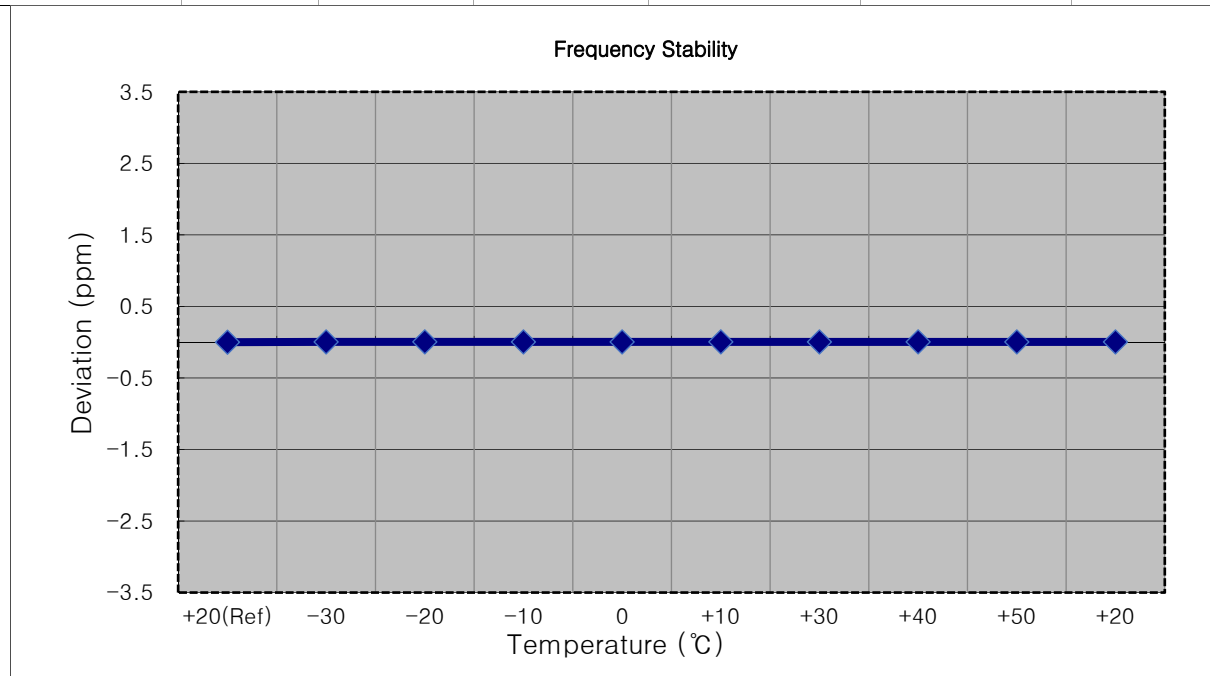
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (1.4 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 008	0.0	0.000 000	0.000
100 %		-30	1745 000 015	6.6	0.000 000	0.004
100 %		-20	1745 000 015	6.6	0.000 000	0.004
100 %		-10	1745 000 015	6.7	0.000 000	0.004
100 %		0	1745 000 016	7.9	0.000 000	0.005
100 %		+10	1745 000 013	4.8	0.000 000	0.003
100 %		+30	1745 000 014	5.5	0.000 000	0.003
100 %		+40	1745 000 003	-5.2	0.000 000	-0.003
100 %		+50	1745 000 014	5.6	0.000 000	0.003
Batt. Endpoint	3.300	+20	1745 000 015	6.4	0.000 000	0.004



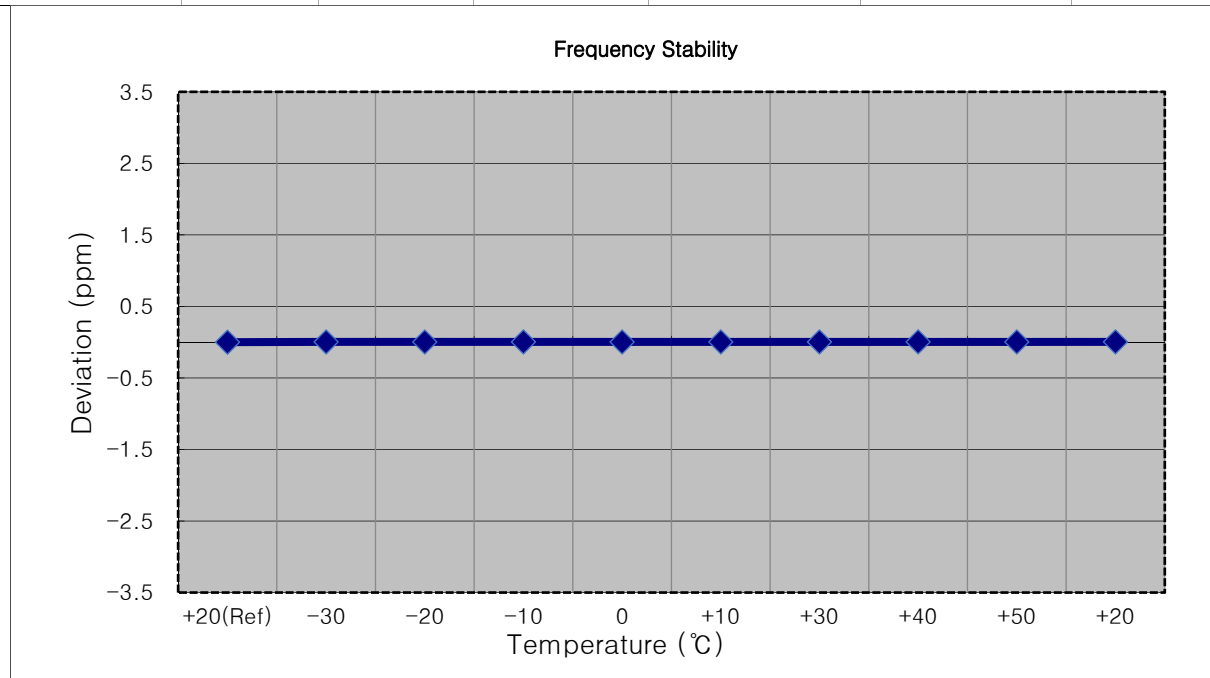
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (3 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 007	0.0	0.000 000	0.000
100 %		-30	1745 000 014	7.1	0.000 000	0.004
100 %		-20	1745 000 014	7.3	0.000 000	0.004
100 %		-10	1745 000 014	7.1	0.000 000	0.004
100 %		0	1745 000 013	6.2	0.000 000	0.004
100 %		+10	1745 000 014	7.4	0.000 000	0.004
100 %		+30	1745 000 013	6.3	0.000 000	0.004
100 %		+40	1745 000 015	7.9	0.000 000	0.005
100 %		+50	1745 000 013	6.1	0.000 000	0.003
Batt. Endpoint	3.300	+20	1745 000 013	6.3	0.000 000	0.004



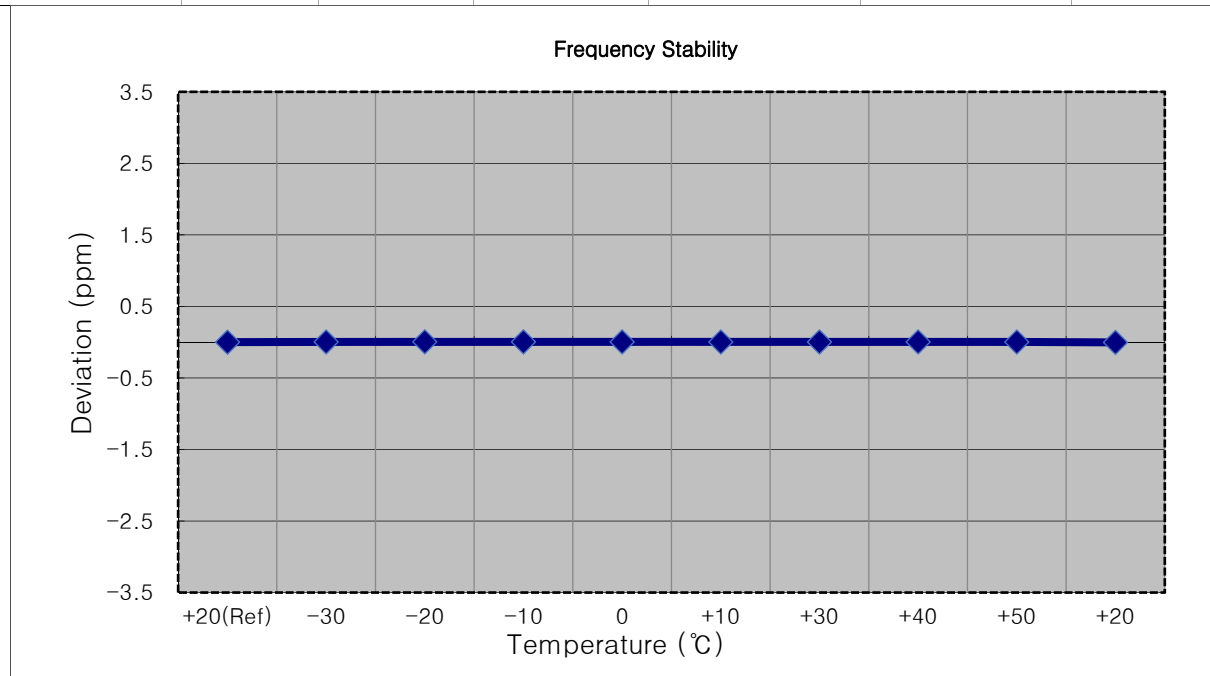
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (5 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 007	0.0	0.000 000	0.000
100 %		-30	1745 000 014	7.0	0.000 000	0.004
100 %		-20	1745 000 012	5.2	0.000 000	0.003
100 %		-10	1745 000 014	6.9	0.000 000	0.004
100 %		0	1745 000 012	4.8	0.000 000	0.003
100 %		+10	1745 000 014	6.7	0.000 000	0.004
100 %		+30	1745 000 014	6.7	0.000 000	0.004
100 %		+40	1745 000 015	8.1	0.000 000	0.005
100 %		+50	1745 000 013	6.0	0.000 000	0.003
Batt. Endpoint	3.300	+20	1745 000 015	7.4	0.000 000	0.004



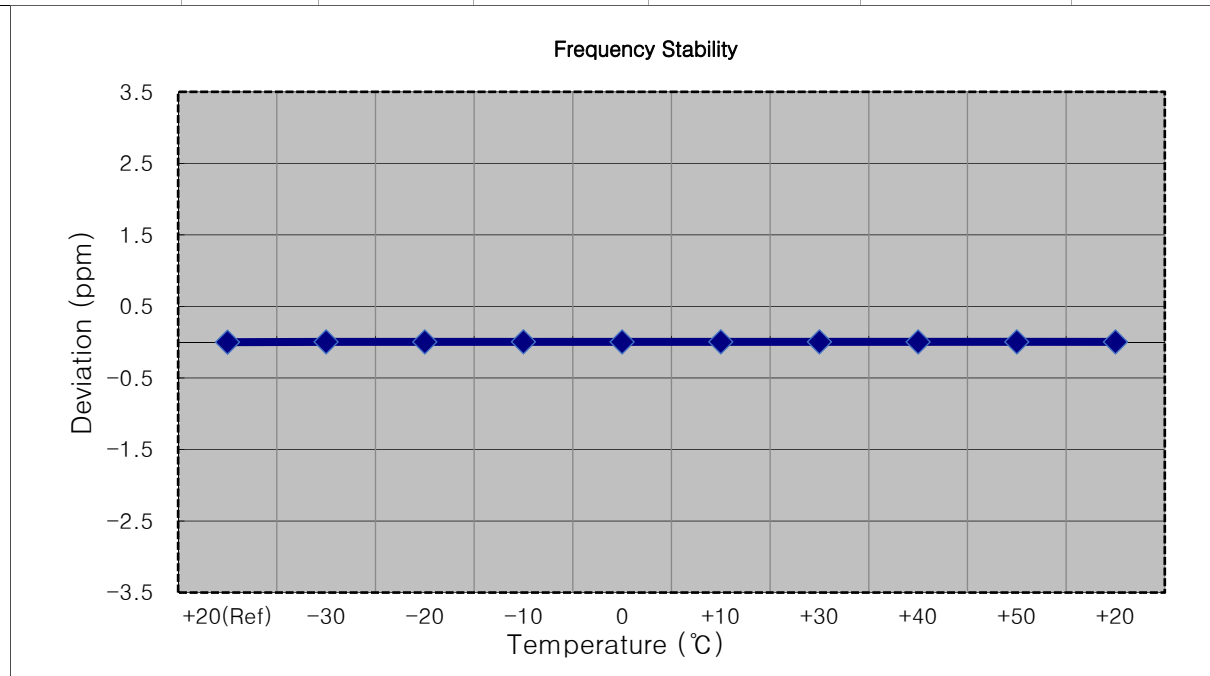
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 008	0.0	0.000 000	0.000
100 %		-30	1745 000 015	6.4	0.000 000	0.004
100 %		-20	1745 000 017	8.5	0.000 000	0.005
100 %		-10	1745 000 016	7.4	0.000 000	0.004
100 %		0	1745 000 015	7.1	0.000 000	0.004
100 %		+10	1745 000 014	5.8	0.000 000	0.003
100 %		+30	1745 000 014	5.5	0.000 000	0.003
100 %		+40	1745 000 015	6.7	0.000 000	0.004
100 %		+50	1745 000 013	5.2	0.000 000	0.003
Batt. Endpoint	3.300	+20	1745 000 003	-5.1	0.000 000	-0.003



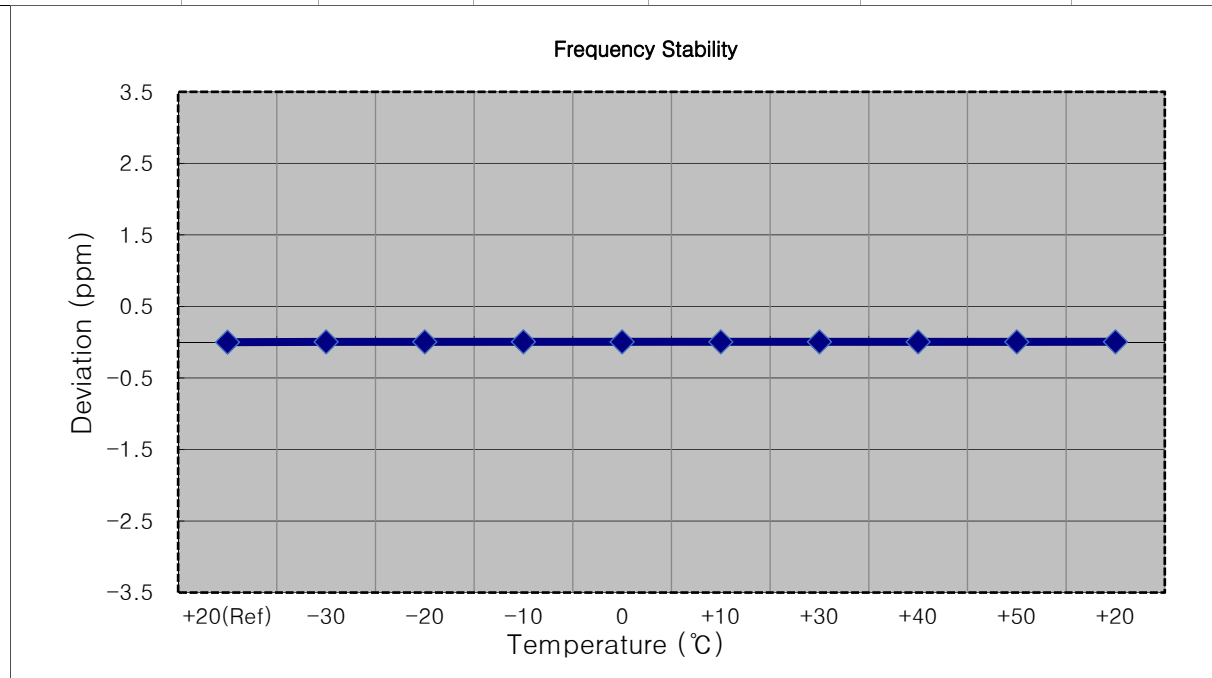
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 007	0.0	0.000 000	0.000
100 %		-30	1745 000 014	7.3	0.000 000	0.004
100 %		-20	1745 000 014	7.0	0.000 000	0.004
100 %		-10	1745 000 016	9.1	0.000 001	0.005
100 %		0	1745 000 013	6.2	0.000 000	0.004
100 %		+10	1745 000 016	9.1	0.000 001	0.005
100 %		+30	1745 000 014	7.3	0.000 000	0.004
100 %		+40	1745 000 014	6.5	0.000 000	0.004
100 %		+50	1745 000 015	7.9	0.000 000	0.005
Batt. Endpoint	3.300	+20	1745 000 014	7.1	0.000 000	0.004



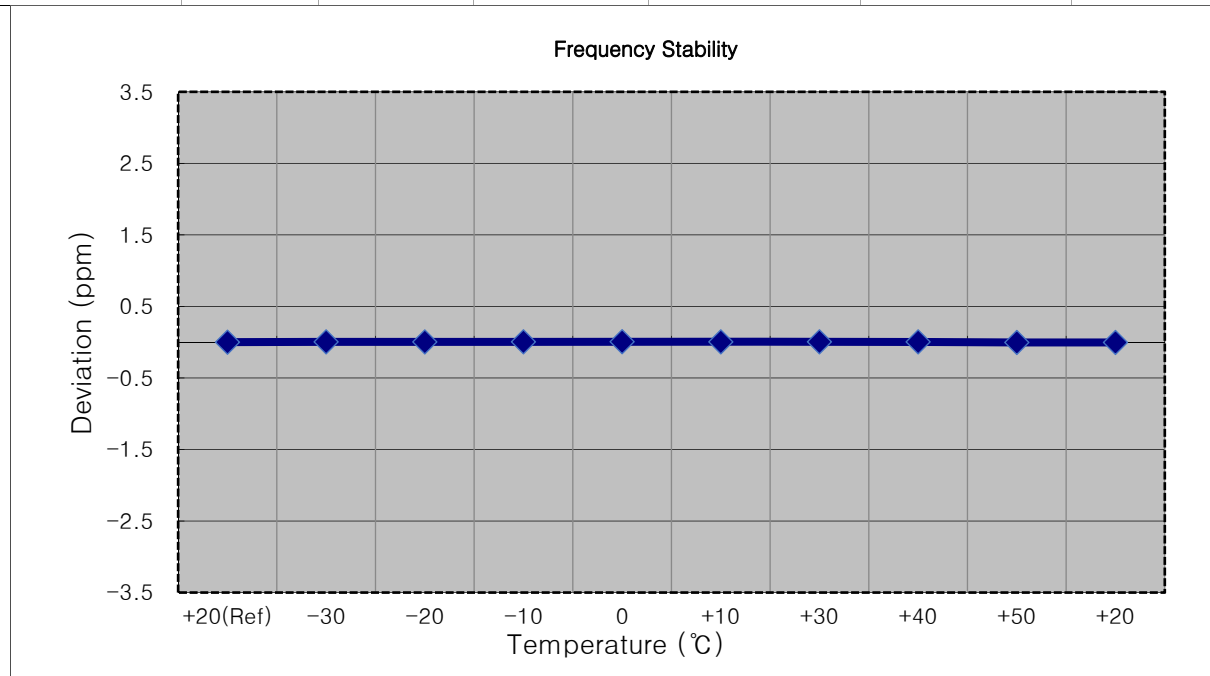
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 008	0.0	0.000 000	0.000
100 %		-30	1745 000 016	8.3	0.000 000	0.005
100 %		-20	1745 000 016	7.5	0.000 000	0.004
100 %		-10	1745 000 018	9.6	0.000 001	0.006
100 %		0	1745 000 016	8.1	0.000 000	0.005
100 %		+10	1745 000 016	8.3	0.000 000	0.005
100 %		+30	1745 000 017	9.2	0.000 001	0.005
100 %		+40	1745 000 016	8.1	0.000 000	0.005
100 %		+50	1745 000 016	7.7	0.000 000	0.004
Batt. Endpoint	3.300	+20	1745 000 017	9.3	0.000 001	0.005



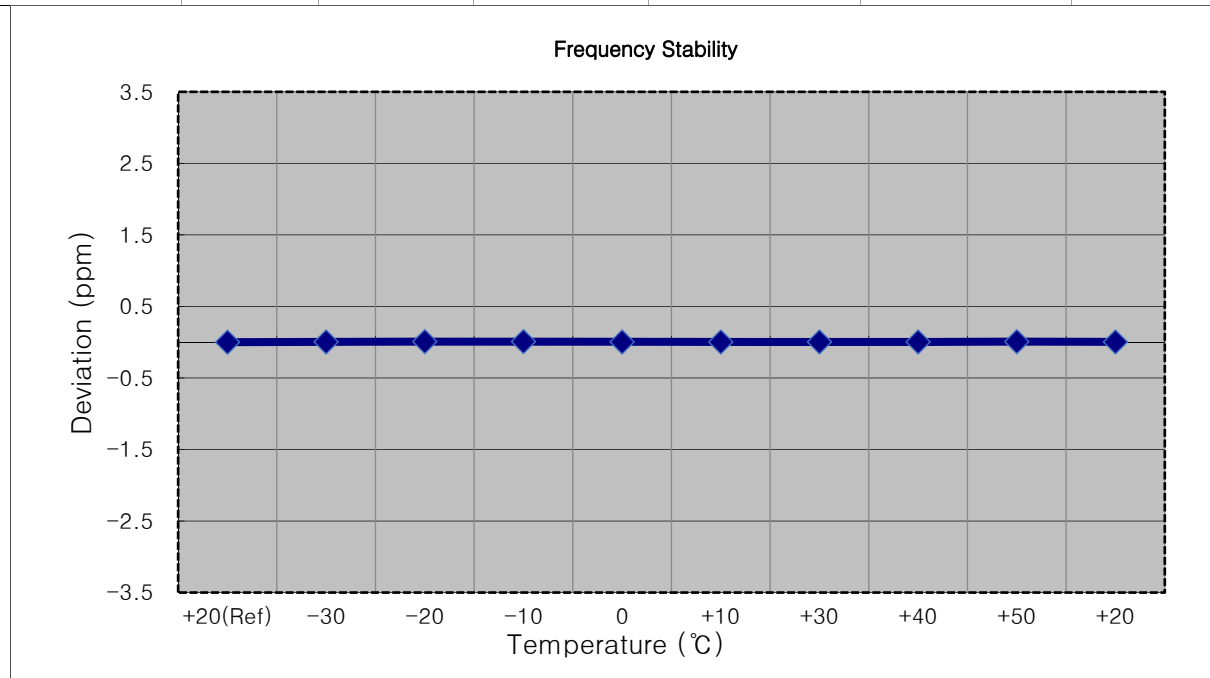
MODE: LTE 66
 OPERATING FREQUENCY: 1779,300,000 Hz
 CHANNEL: 132665 (1.4 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1779 300 006	0.0	0.000 000	0.000
100 %		-30	1779 300 013	7.5	0.000 000	0.004
100 %		-20	1779 300 012	6.4	0.000 000	0.004
100 %		-10	1779 300 015	9.2	0.000 001	0.005
100 %		0	1779 300 017	11.5	0.000 001	0.006
100 %		+10	1779 300 014	8.1	0.000 000	0.005
100 %		+30	1779 300 015	8.6	0.000 000	0.005
100 %		+40	1779 300 013	7.5	0.000 000	0.004
100 %		+50	1779 299 999	-7.0	0.000 000	-0.004
Batt. Endpoint	3.300	+20	1779 299 999	-6.7	0.000 000	-0.004



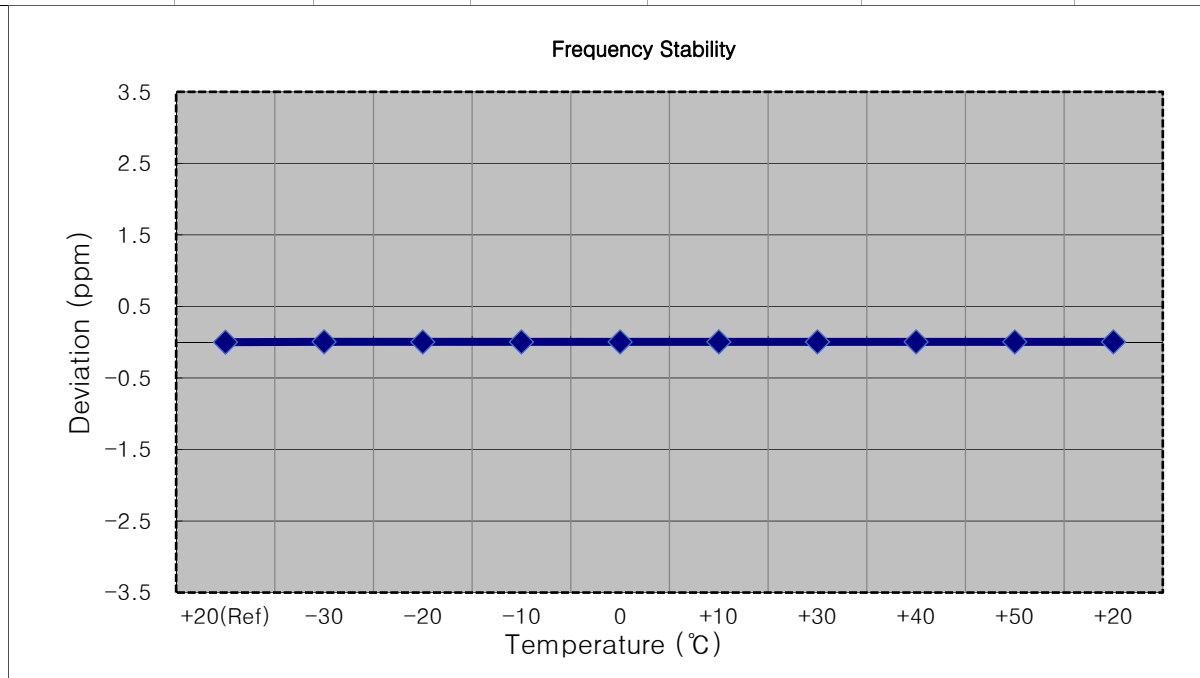
MODE: LTE 66
 OPERATING FREQUENCY: 1778,500,000 Hz
 CHANNEL: 132657 (3 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1778 500 016	0.0	0.000 000	0.000
100 %		-30	1778 500 023	6.7	0.000 000	0.004
100 %		-20	1778 500 031	14.5	0.000 001	0.008
100 %		-10	1778 500 032	15.4	0.000 001	0.009
100 %		0	1778 500 022	5.8	0.000 000	0.003
100 %		+10	1778 500 021	5.0	0.000 000	0.003
100 %		+30	1778 500 023	6.6	0.000 000	0.004
100 %		+40	1778 500 022	6.2	0.000 000	0.003
100 %		+50	1778 500 030	13.7	0.000 001	0.008
Batt. Endpoint	3.300	+20	1778 500 023	7.1	0.000 000	0.004



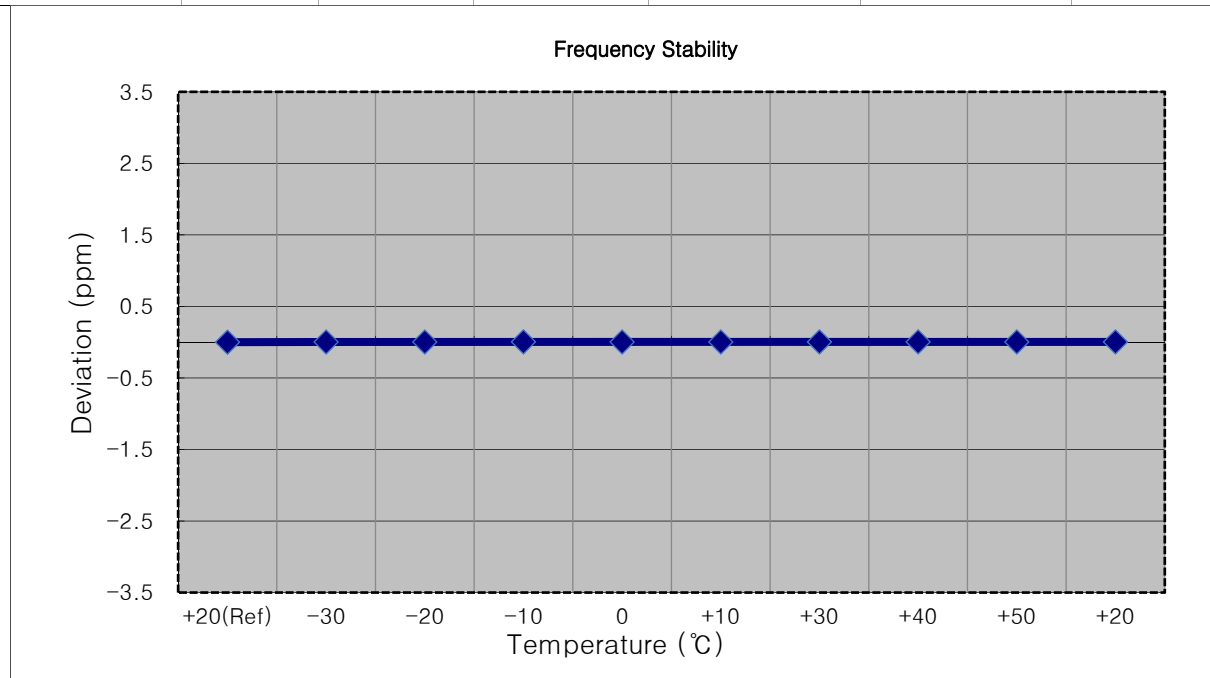
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1777,500,000 Hz</u>
CHANNEL:	<u>132647 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1777 500 007	0.0	0.000 000	0.000
100 %		-30	1777 500 016	8.7	0.000 000	0.005
100 %		-20	1777 500 013	5.8	0.000 000	0.003
100 %		-10	1777 500 014	6.9	0.000 000	0.004
100 %		0	1777 500 014	6.7	0.000 000	0.004
100 %		+10	1777 500 015	8.3	0.000 000	0.005
100 %		+30	1777 500 015	8.0	0.000 000	0.005
100 %		+40	1777 500 014	7.4	0.000 000	0.004
100 %		+50	1777 500 014	6.9	0.000 000	0.004
Batt. Endpoint	3.300	+20	1777 500 014	7.4	0.000 000	0.004



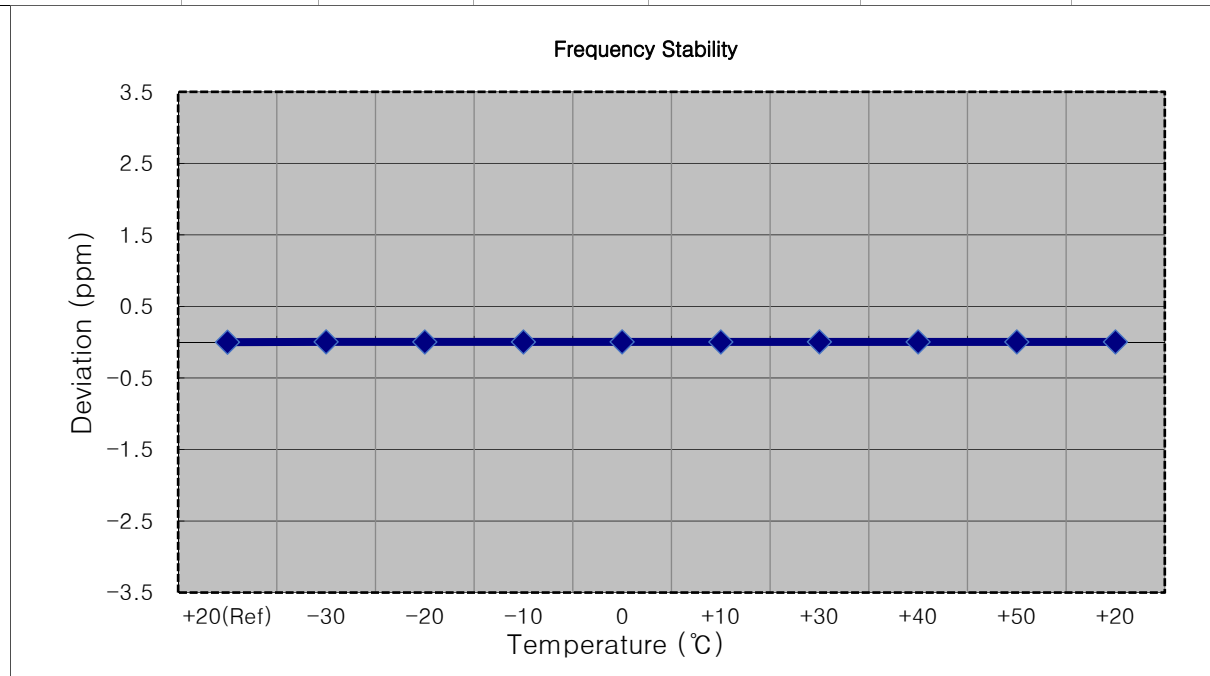
MODE: LTE 66
 OPERATING FREQUENCY: 1775,000,000 Hz
 CHANNEL: 132622 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1775 000 004	0.0	0.000 000	0.000
100 %		-30	1775 000 009	5.0	0.000 000	0.003
100 %		-20	1775 000 009	4.8	0.000 000	0.003
100 %		-10	1775 000 012	7.9	0.000 000	0.004
100 %		0	1775 000 009	5.2	0.000 000	0.003
100 %		+10	1775 000 009	5.3	0.000 000	0.003
100 %		+30	1775 000 011	6.6	0.000 000	0.004
100 %		+40	1775 000 012	7.5	0.000 000	0.004
100 %		+50	1775 000 010	6.4	0.000 000	0.004
Batt. Endpoint	3.300	+20	1775 000 010	6.3	0.000 000	0.004



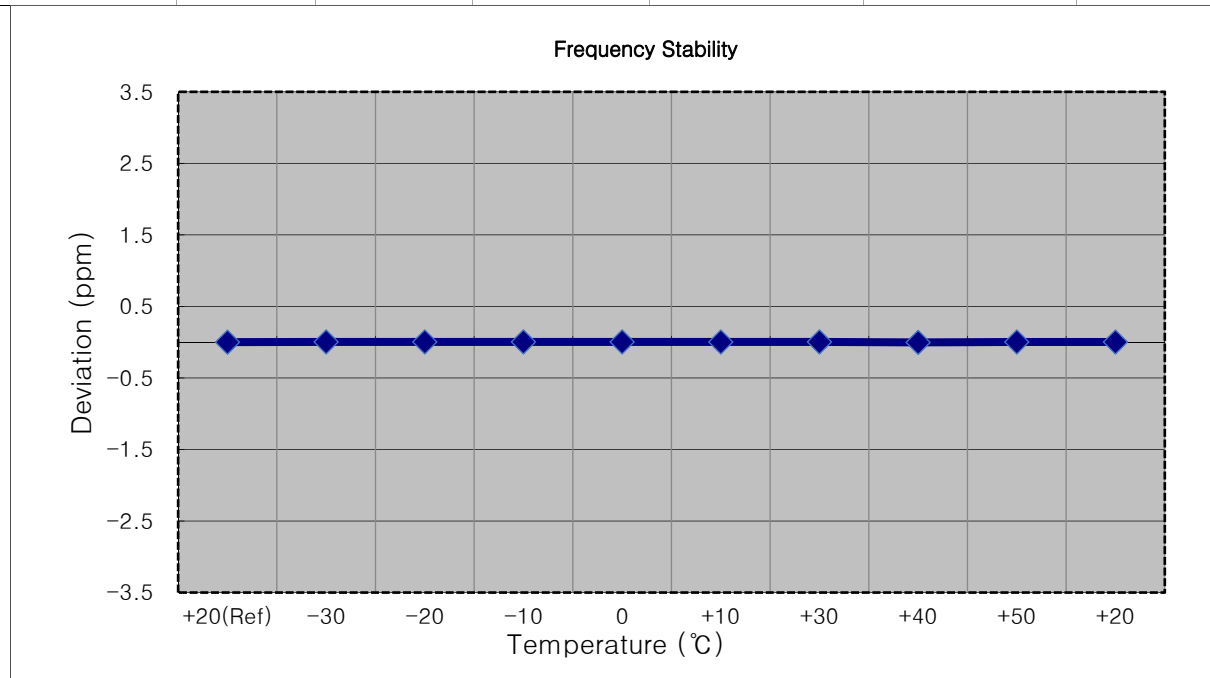
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1772,500,000 Hz</u>
CHANNEL:	<u>132597 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1772 500 005	0.0	0.000 000	0.000
100 %		-30	1772 500 013	7.9	0.000 000	0.004
100 %		-20	1772 500 010	5.7	0.000 000	0.003
100 %		-10	1772 500 010	5.3	0.000 000	0.003
100 %		0	1772 500 012	7.5	0.000 000	0.004
100 %		+10	1772 500 010	5.6	0.000 000	0.003
100 %		+30	1772 500 012	7.7	0.000 000	0.004
100 %		+40	1772 500 011	6.3	0.000 000	0.004
100 %		+50	1772 500 011	5.9	0.000 000	0.003
Batt. Endpoint	3.300	+20	1772 500 011	6.2	0.000 000	0.003



- ▣ MODE: LTE 66
- ▣ OPERATING FREQUENCY: 1770,000,000 Hz
- ▣ CHANNEL: 132572 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.900 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1770 000 005	0.0	0.000 000	0.000
100 %		-30	1770 000 011	6.0	0.000 000	0.003
100 %		-20	1770 000 011	5.9	0.000 000	0.003
100 %		-10	1770 000 012	6.6	0.000 000	0.004
100 %		0	1770 000 011	6.0	0.000 000	0.003
100 %		+10	1770 000 011	5.7	0.000 000	0.003
100 %		+30	1770 000 012	6.2	0.000 000	0.004
100 %		+40	1770 000 001	-4.8	0.000 000	-0.003
100 %		+50	1770 000 010	4.9	0.000 000	0.003
Batt. Endpoint	3.300	+20	1770 000 010	4.4	0.000 000	0.002



9. TEST DATA(Sub 5 ANT)

9.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1710.7	LTE B66 (1.4 MHz)	QPSK	-24.56	8.81	10.04	2.06	H	<2.00	0.048	16.79	1	5
		16-QAM	-25.31	8.06	10.04	2.06	H		0.040	16.04		
		64-QAM	-26.50	6.87	10.04	2.06	H		0.031	14.85		
		256-QAM	-29.42	3.95	10.04	2.06	H		0.016	11.93		
1745		QPSK	-24.41	9.05	10.18	2.07	H		0.052	17.16	1	0
		16-QAM	-25.04	8.42	10.18	2.07	H		0.045	16.53		
		64-QAM	-26.26	7.20	10.18	2.07	H		0.034	15.31		
		256-QAM	-29.41	4.05	10.18	2.07	H		0.016	12.16		
1779.3		QPSK	-26.34	7.48	10.26	2.09	H		0.037	15.65	1	0
		16-QAM	-27.01	6.81	10.26	2.09	H		0.031	14.98		
		64-QAM	-28.23	5.59	10.26	2.09	H		0.024	13.76		
		256-QAM	-31.32	2.50	10.26	2.09	H		0.012	10.67		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1711.5	LTE B66 (3 MHz)	QPSK	-24.52	8.85	10.04	2.06	H	<2.00	0.048	16.83	1	14
		16-QAM	-25.28	8.09	10.04	2.06	H		0.040	16.07		
		64-QAM	-26.46	6.91	10.04	2.06	H		0.031	14.89		
		256-QAM	-29.40	3.97	10.04	2.06	H		0.016	11.95		
1745		QPSK	-24.36	9.10	10.18	2.07	H		0.053	17.21	1	0
		16-QAM	-24.97	8.49	10.18	2.07	H		0.046	16.60		
		64-QAM	-26.17	7.29	10.18	2.07	H		0.035	15.40		
		256-QAM	-29.33	4.13	10.18	2.07	H		0.017	12.24		
1778.5		QPSK	-26.17	7.65	10.26	2.09	H		0.038	15.82	1	0
		16-QAM	-26.91	6.91	10.26	2.09	H		0.032	15.08		
		64-QAM	-28.12	5.70	10.26	2.09	H		0.024	13.87		
		256-QAM	-31.20	2.62	10.26	2.09	H		0.012	10.79		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1712.5	LTE B66 (5 MHz)	QPSK	-24.54	8.85	10.06	2.06	H	<2.00	0.048	16.85	1	24
		16-QAM	-25.34	8.05	10.06	2.06	H		0.040	16.05		
		64-QAM	-26.52	6.87	10.06	2.06	H		0.031	14.87		
		256-QAM	-29.40	3.99	10.06	2.06	H		0.016	11.99		
1745		QPSK	-24.26	9.20	10.18	2.07	H		0.054	17.31	1	0
		16-QAM	-24.91	8.55	10.18	2.07	H		0.046	16.66		
		64-QAM	-26.11	7.35	10.18	2.07	H		0.035	15.46		
		256-QAM	-29.26	4.20	10.18	2.07	H		0.017	12.31		
1777.5		QPSK	-26.03	7.79	10.26	2.09	H		0.039	15.96	1	0
		16-QAM	-26.75	7.07	10.26	2.09	H		0.033	15.24		
		64-QAM	-27.99	5.83	10.26	2.09	H		0.025	14.00		
		256-QAM	-31.05	2.77	10.26	2.09	H		0.012	10.94		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1715	LTE B66 (10 MHz)	QPSK	-24.52	8.87	10.06	2.06	H	<2.00	0.049	16.87	1	49
		16-QAM	-25.37	8.02	10.06	2.06	H		0.040	16.02		
		64-QAM	-26.54	6.85	10.06	2.06	H		0.031	14.85		
		256-QAM	-29.40	3.99	10.06	2.06	H		0.016	11.99		
1745		QPSK	-24.25	9.21	10.18	2.07	H		0.054	17.32	1	0
		16-QAM	-24.88	8.58	10.18	2.07	H		0.047	16.69		
		64-QAM	-26.06	7.40	10.18	2.07	H		0.036	15.51		
		256-QAM	-29.13	4.33	10.18	2.07	H		0.018	12.44		
1775		QPSK	-25.60	8.16	10.25	2.09	H		0.043	16.32	1	0
		16-QAM	-26.44	7.32	10.25	2.09	H		0.035	15.48		
		64-QAM	-27.64	6.12	10.25	2.09	H		0.027	14.28		
		256-QAM	-30.56	3.20	10.25	2.09	H		0.014	11.36		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1717.5	LTE B66 (15 MHz)	QPSK	-24.35	9.07	10.08	2.06	H	<2.00	0.051	17.09	1	74
		16-QAM	-25.19	8.23	10.08	2.06	H		0.042	16.25		
		64-QAM	-26.33	7.09	10.08	2.06	H		0.032	15.11		
		256-QAM	-29.23	4.19	10.08	2.06	H		0.017	12.21		
1745		QPSK	-24.19	9.27	10.18	2.07	H		0.055	17.38	1	0
		16-QAM	-24.80	8.66	10.18	2.07	H		0.048	16.77		
		64-QAM	-25.96	7.50	10.18	2.07	H		0.036	15.61		
		256-QAM	-29.09	4.37	10.18	2.07	H		0.018	12.48		
1772.5		QPSK	-25.17	8.59	10.25	2.09	H		0.047	16.75	1	0
		16-QAM	-25.97	7.79	10.25	2.09	H		0.039	15.95		
		64-QAM	-27.19	6.57	10.25	2.09	H		0.030	14.73		
		256-QAM	-30.16	3.60	10.25	2.09	H		0.015	11.76		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1720	LTE B66 (20 MHz)	QPSK	-24.22	9.20	10.08	2.06	H	<2.00	0.053	17.22	1	99
		16-QAM	-24.99	8.43	10.08	2.06	H		0.044	16.45		
		64-QAM	-26.16	7.26	10.08	2.06	H		0.034	15.28		
		256-QAM	-29.16	4.26	10.08	2.06	H		0.017	12.28		
1745		QPSK	-24.18	9.28	10.18	2.07	H		0.055	17.39	1	0
		16-QAM	-24.99	8.47	10.18	2.07	H		0.045	16.58		
		64-QAM	-26.14	7.32	10.18	2.07	H		0.035	15.43		
		256-QAM	-29.14	4.32	10.18	2.07	H		0.017	12.43		
1770		QPSK	-24.92	8.78	10.24	2.09	H		0.049	16.93	1	0
		16-QAM	-25.74	7.96	10.24	2.09	H		0.041	16.11		
		64-QAM	-26.88	6.82	10.24	2.09	H		0.031	14.97		
		256-QAM	-29.90	3.80	10.24	2.09	H		0.016	11.95		

9.2 RADIATED SPURIOUS EMISSIONS

■ MODE: LTE B66
 ■ MODULATION SIGNAL: 20 MHz QPSK
 ■ DISTANCE: 3 meters
 ■ LIMIT: -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
132072 (1720.0)	3 440.00	-32.59	12.40	-51.29	3.04	H	-41.93	1	99
	5 160.00	-40.50	12.44	-53.14	3.76	V	-44.46		
	6 880.00	-43.94	11.82	-50.95	4.44	H	-43.57		
132322 (1745.0)	3 490.00	-30.33	12.34	-48.58	3.04	H	-39.28	1	0
	5 235.00	-40.88	12.84	-53.46	3.78	H	-44.40		
	6 980.00	-42.04	11.40	-48.36	4.48	V	-41.44		
132572 (1770.0)	3 540.00	-33.93	12.34	-51.68	3.06	H	-42.40	1	0
	5 310.00	-42.08	13.08	-55.46	3.82	V	-46.20		
	7 080.00	-43.39	10.93	-48.04	4.49	V	-41.60		

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
66	1.4 MHz	1745.0	QPSK	6	0	5.26
			16-QAM			6.03
			64-QAM			6.35
			256-QAM			6.46
	3 MHz		QPSK	15		5.60
			16-QAM			6.24
			64-QAM			6.34
			256-QAM			6.53
	5 MHz		QPSK	25		5.58
			16-QAM			6.32
			64-QAM			6.36
			256-QAM			6.65
	10 MHz		QPSK	50		5.63
			16-QAM			6.29
			64-QAM			6.40
			256-QAM			6.59
	15 MHz		QPSK	75		5.64
			16-QAM			6.37
			64-QAM			6.45
			256-QAM			6.59
	20 MHz		QPSK	100		5.64
			16-QAM			6.37
			64-QAM			6.45
			256-QAM			6.64

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 198 ~ 221.

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
66	1.4 MHz	1745.0	QPSK	6	0	1.0967
			16-QAM			1.0941
			64-QAM			1.0944
			256-QAM			1.0920
	3 MHz		QPSK	15		2.7174
			16-QAM			2.7018
			64-QAM			2.7046
			256-QAM			2.7092
	5 MHz		QPSK	25		4.5337
			16-QAM			4.5122
			64-QAM			4.5324
			256-QAM			4.5554
	10 MHz		QPSK	50		8.9932
			16-QAM			9.0069
			64-QAM			9.0227
			256-QAM			9.0165
	15 MHz		QPSK	75		13.461
			16-QAM			13.452
			64-QAM			13.459
			256-QAM			13.472
	20 MHz		QPSK	100		18.003
			16-QAM			17.965
			64-QAM			17.985
			256-QAM			17.970

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 222 ~ 245.

9.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
66	1.4	1710.70	9.7208	28.591	-67.383	-38.792	-13.00
		1745.00	8.1954	28.591	-68.566	-39.975	
		1779.30	4.0379	27.976	-67.562	-39.586	
	3	1711.50	4.5963	27.976	-67.175	-39.199	
		1745.00	9.9202	28.591	-68.264	-39.673	
		1778.50	8.0858	28.591	-67.299	-38.708	
	5	1712.50	8.0160	28.591	-67.262	-38.671	
		1745.00	9.1526	28.591	-65.918	-37.327	
		1777.50	8.9232	28.591	-67.277	-38.686	
	10	1715.00	9.6909	28.591	-68.112	-39.521	
		1745.00	3.4796	27.976	-67.523	-39.547	
		1775.00	4.9452	27.976	-67.588	-39.612	
	15	1717.50	6.0220	28.591	-68.171	-39.580	
		1745.00	9.1426	28.591	-67.750	-39.159	
		1772.50	3.7787	27.976	-67.632	-39.656	
	20	1720.00	3.8086	27.976	-67.338	-39.362	
		1745.00	3.7388	27.976	-67.162	-39.186	
		1770.00	4.0280	27.976	-66.260	-38.284	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 246 ~ 281.
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

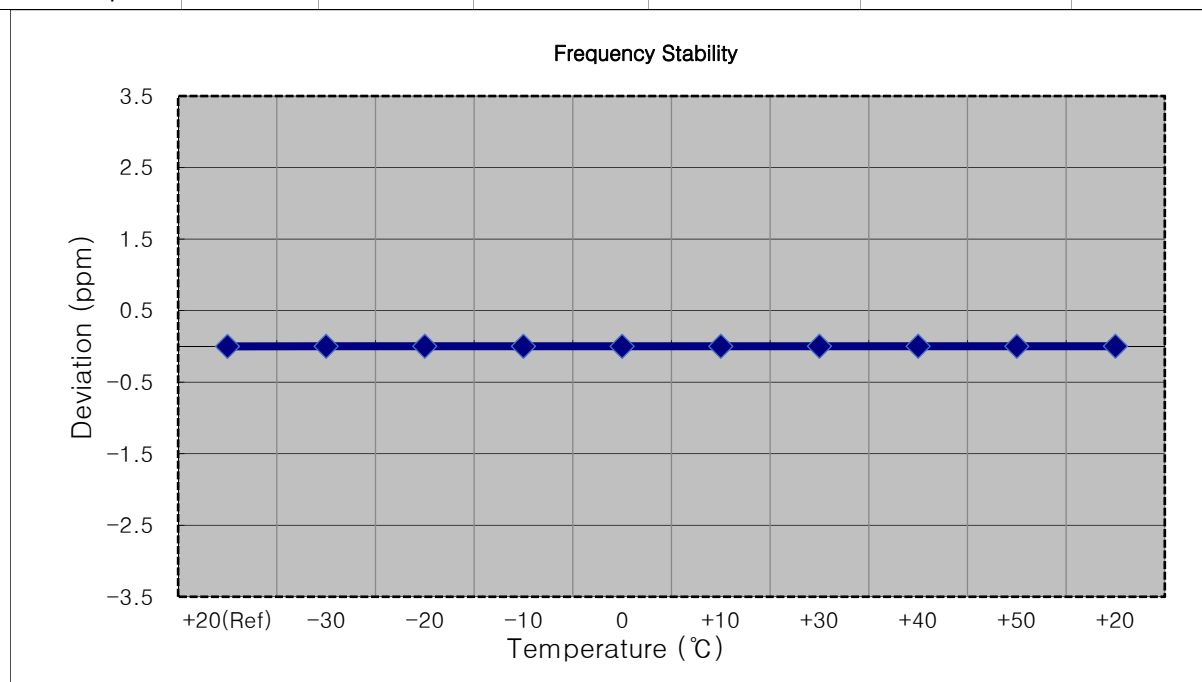
9.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 282 ~ 317.

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

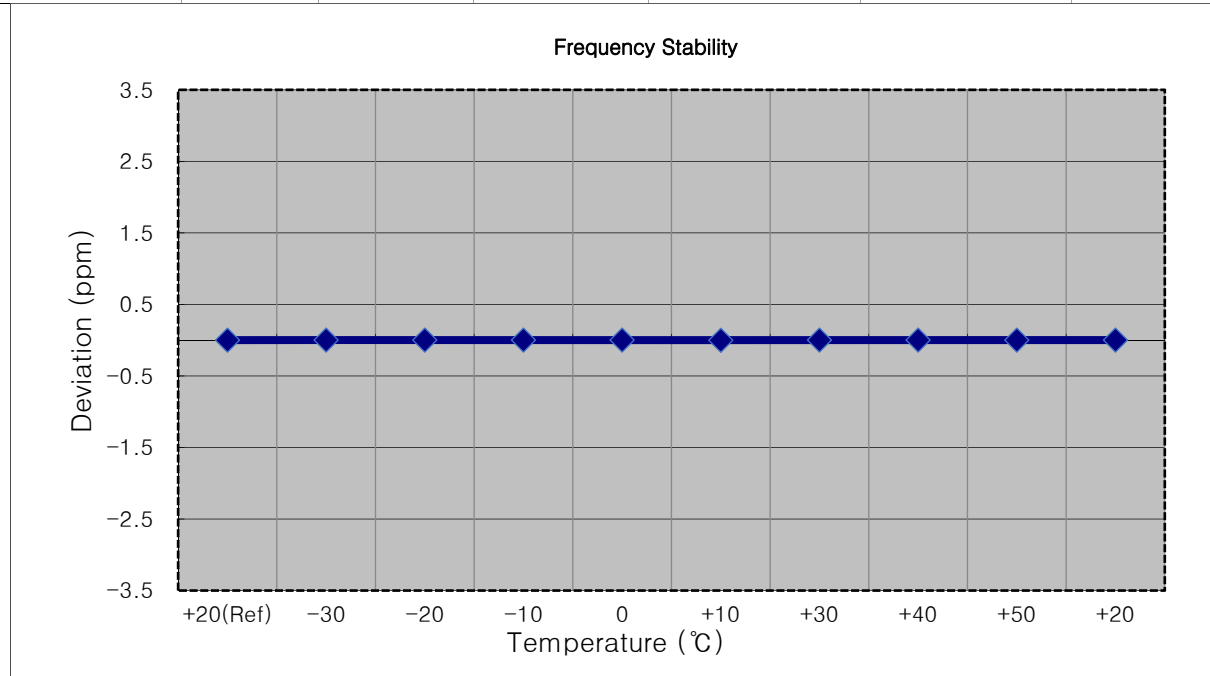
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1710,700,000 Hz</u>
CHANNEL:	<u>131979 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1710 700 003	0.0	0.000 000	0.000
100 %		-30	1710 700 006	3.1	0.000 000	0.002
100 %		-20	1710 700 007	3.7	0.000 000	0.002
100 %		-10	1710 700 006	2.6	0.000 000	0.002
100 %		0	1710 700 005	1.7	0.000 000	0.001
100 %		+10	1710 700 006	2.6	0.000 000	0.002
100 %		+30	1710 700 007	3.3	0.000 000	0.002
100 %		+40	1710 700 007	3.4	0.000 000	0.002
100 %		+50	1710 700 006	2.7	0.000 000	0.002
Batt. Endpoint	3.300	+20	1710 700 007	3.4	0.000 000	0.002



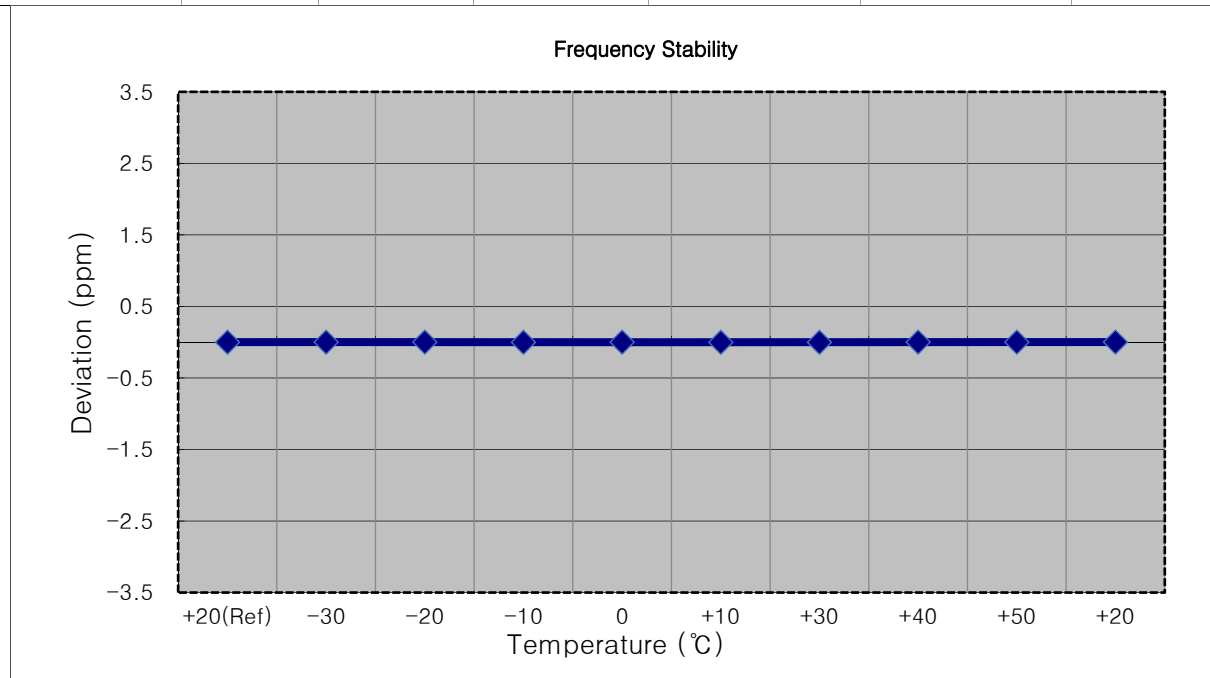
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1711,500,000 Hz</u>
CHANNEL:	<u>131987 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1711 500 003	0.0	0.000 000	0.000
100 %		-30	1711 500 006	3.1	0.000 000	0.002
100 %		-20	1711 500 005	2.6	0.000 000	0.002
100 %		-10	1711 500 006	2.7	0.000 000	0.002
100 %		0	1711 500 005	2.3	0.000 000	0.001
100 %		+10	1711 500 001	-2.1	0.000 000	-0.001
100 %		+30	1711 500 006	3.1	0.000 000	0.002
100 %		+40	1711 500 005	2.3	0.000 000	0.001
100 %		+50	1711 500 004	1.6	0.000 000	0.001
Batt. Endpoint	3.300	+20	1711 500 005	2.2	0.000 000	0.001



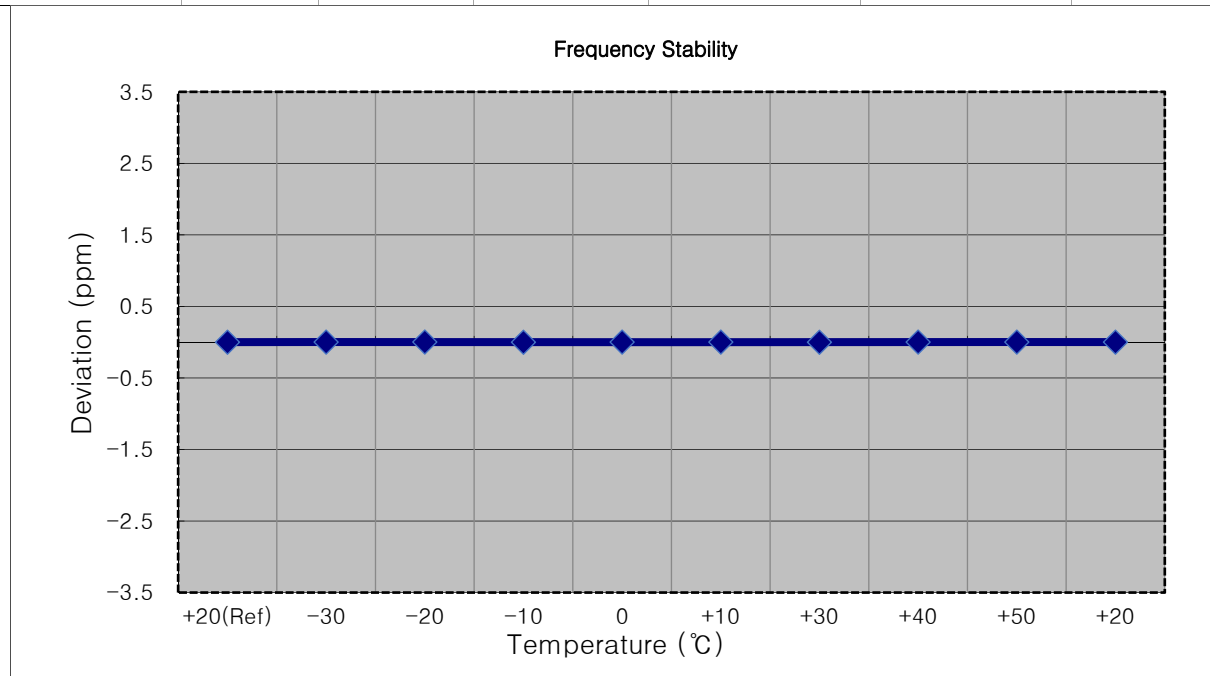
■ MODE: LTE 66
 ■ OPERATING FREQUENCY: 1712,500,000 Hz
 ■ CHANNEL: 131997 (5 MHz)
 ■ REFERENCE VOLTAGE: 3.900 VDC
 ■ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1712 500 002	0.0	0.000 000	0.000
100 %		-30	1712 500 004	1.7	0.000 000	0.001
100 %		-20	1712 500 004	2.2	0.000 000	0.001
100 %		-10	1712 499 999	-2.7	0.000 000	-0.002
100 %		0	1712 500 004	1.6	0.000 000	0.001
100 %		+10	1712 500 000	-2.3	0.000 000	-0.001
100 %		+30	1712 500 000	-2.2	0.000 000	-0.001
100 %		+40	1712 500 005	2.4	0.000 000	0.001
100 %		+50	1712 500 004	1.6	0.000 000	0.001
Batt. Endpoint	3.300	+20	1712 500 004	2.2	0.000 000	0.001



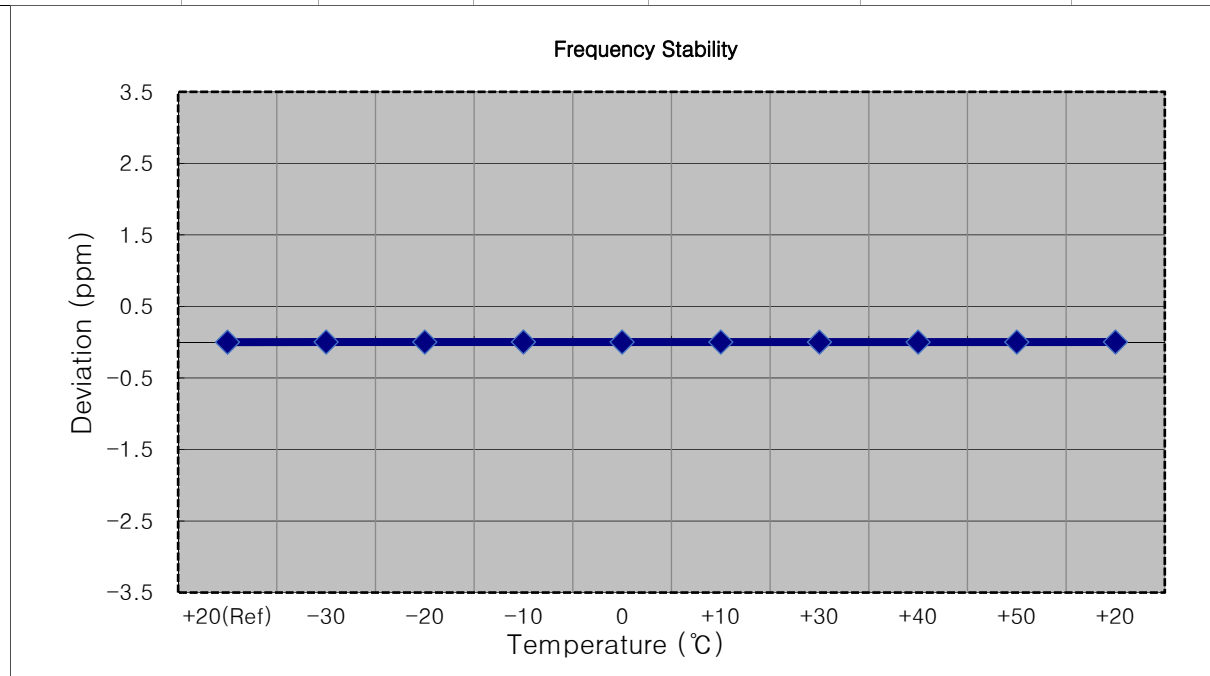
MODE: LTE 66
 OPERATING FREQUENCY: 1715,000,000 Hz
 CHANNEL: 132022 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1714 999 997	0.0	0.000 000	0.000
100 %		-30	1715 000 000	3.1	0.000 000	0.002
100 %		-20	1715 000 001	3.6	0.000 000	0.002
100 %		-10	1714 999 995	-1.9	0.000 000	-0.001
100 %		0	1715 000 000	2.5	0.000 000	0.001
100 %		+10	1715 000 000	2.4	0.000 000	0.001
100 %		+30	1714 999 996	-1.7	0.000 000	-0.001
100 %		+40	1714 999 999	2.0	0.000 000	0.001
100 %		+50	1715 000 000	2.9	0.000 000	0.002
Batt. Endpoint	3.300	+20	1714 999 999	1.7	0.000 000	0.001



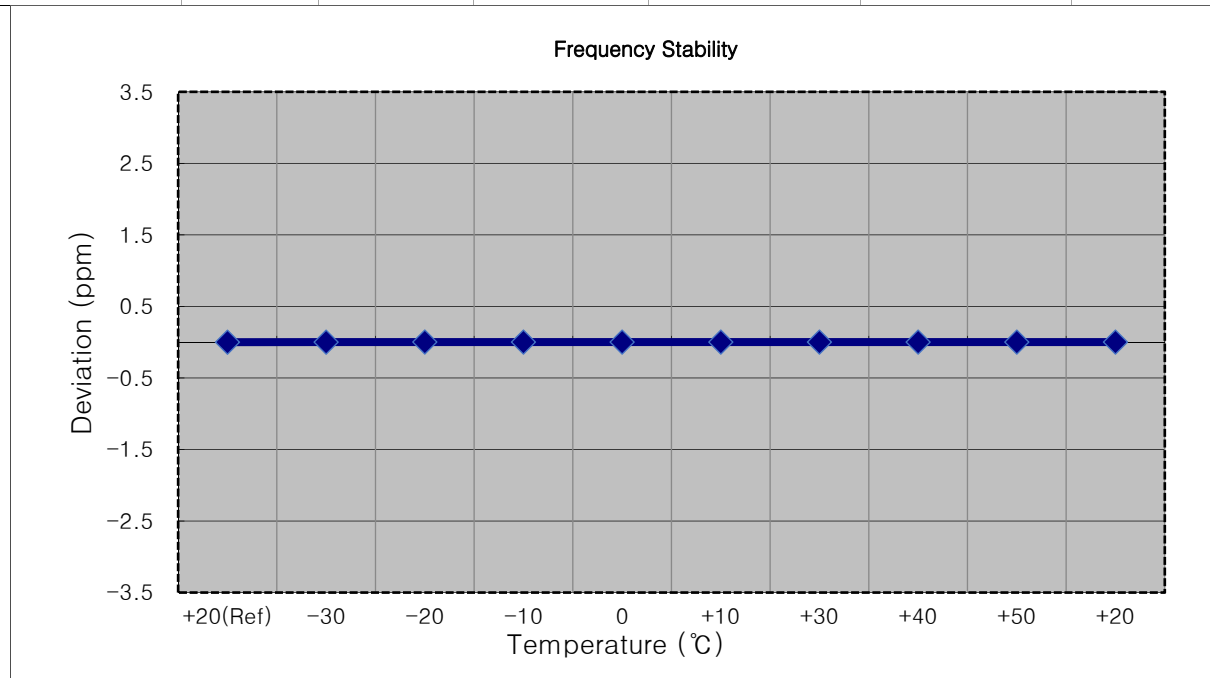
MODE: LTE 66
 OPERATING FREQUENCY: 1717,500,000 Hz
 CHANNEL: 132047 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1717 500 002	0.0	0.000 000	0.000
100 %		-30	1717 500 006	4.0	0.000 000	0.002
100 %		-20	1717 500 005	3.1	0.000 000	0.002
100 %		-10	1717 500 005	3.2	0.000 000	0.002
100 %		0	1717 500 005	2.5	0.000 000	0.001
100 %		+10	1717 500 005	2.8	0.000 000	0.002
100 %		+30	1717 500 004	1.4	0.000 000	0.001
100 %		+40	1717 500 004	1.8	0.000 000	0.001
100 %		+50	1717 500 005	2.4	0.000 000	0.001
Batt. Endpoint	3.300	+20	1717 500 006	3.4	0.000 000	0.002



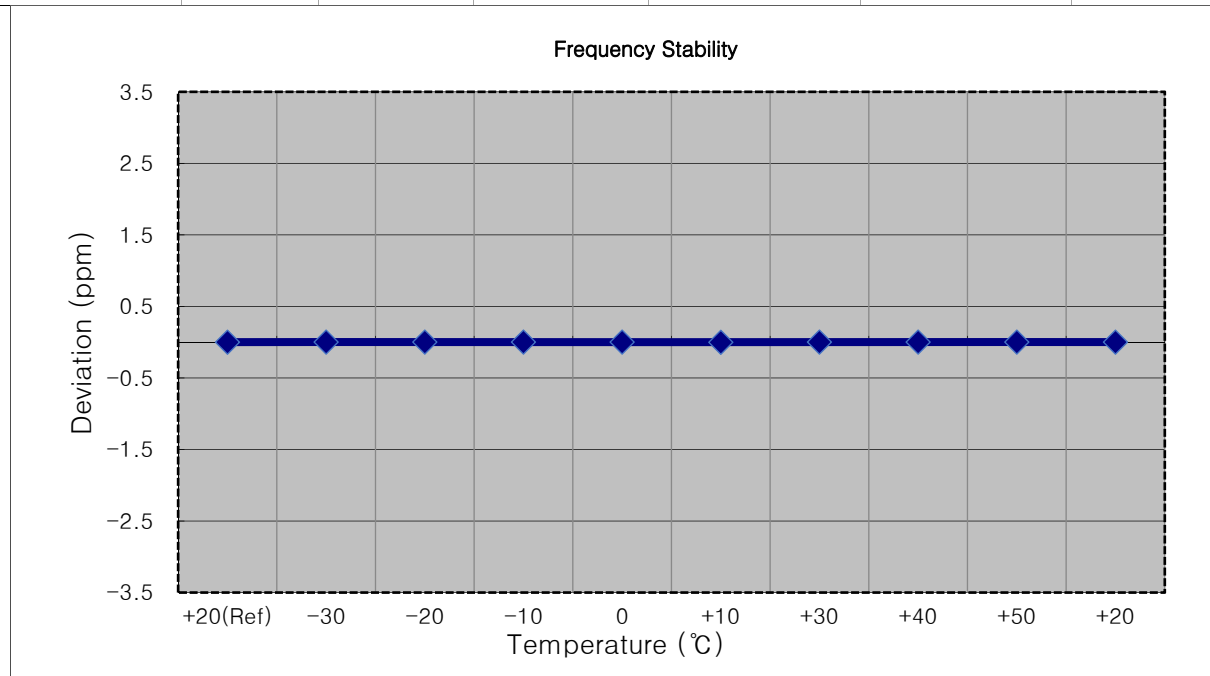
MODE: LTE 66
 OPERATING FREQUENCY: 1720,000,000 Hz
 CHANNEL: 132072 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1719 999 998	0.0	0.000 000	0.000
100 %		-30	1719 999 999	1.4	0.000 000	0.001
100 %		-20	1720 000 001	3.2	0.000 000	0.002
100 %		-10	1720 000 000	2.1	0.000 000	0.001
100 %		0	1720 000 000	2.3	0.000 000	0.001
100 %		+10	1720 000 000	2.2	0.000 000	0.001
100 %		+30	1720 000 000	2.4	0.000 000	0.001
100 %		+40	1720 000 000	2.9	0.000 000	0.002
100 %		+50	1720 000 000	2.5	0.000 000	0.001
Batt. Endpoint	3.300	+20	1720 000 000	2.0	0.000 000	0.001



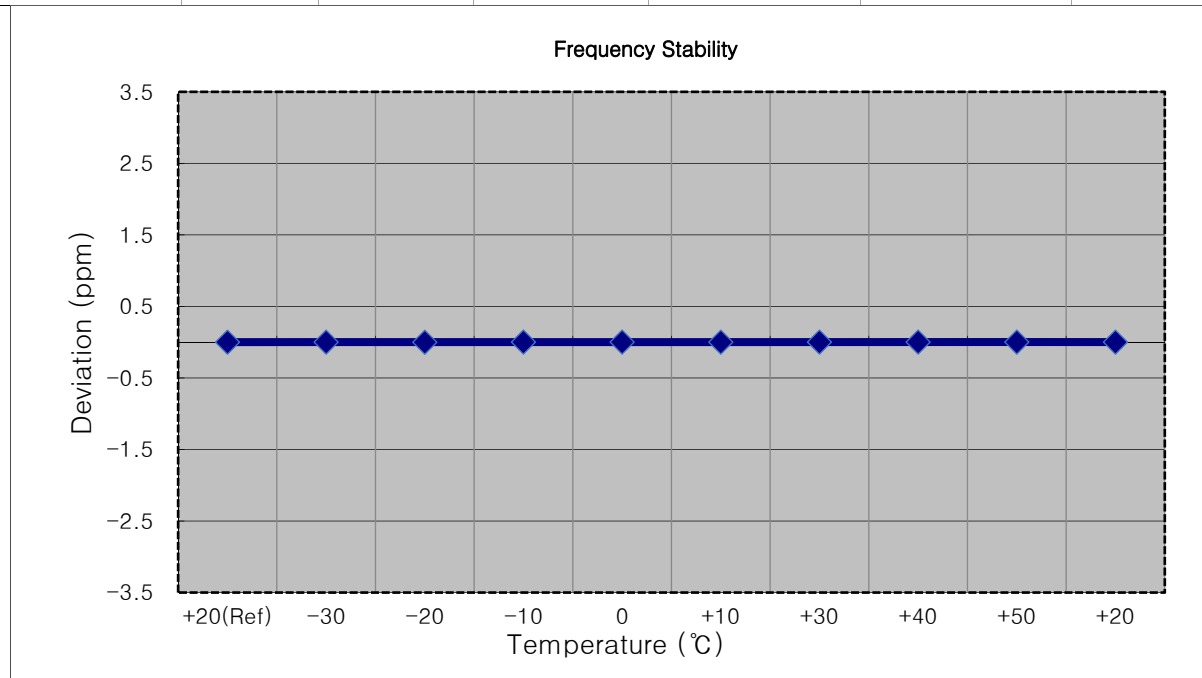
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (1.4 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 003	0.0	0.000 000	0.000
100 %		-30	1745 000 006	2.8	0.000 000	0.002
100 %		-20	1745 000 006	2.6	0.000 000	0.001
100 %		-10	1745 000 006	2.4	0.000 000	0.001
100 %		0	1745 000 006	3.1	0.000 000	0.002
100 %		+10	1745 000 001	-2.1	0.000 000	-0.001
100 %		+30	1745 000 006	2.9	0.000 000	0.002
100 %		+40	1745 000 006	2.7	0.000 000	0.002
100 %		+50	1745 000 006	3.0	0.000 000	0.002
Batt. Endpoint	3.300	+20	1745 000 005	1.6	0.000 000	0.001



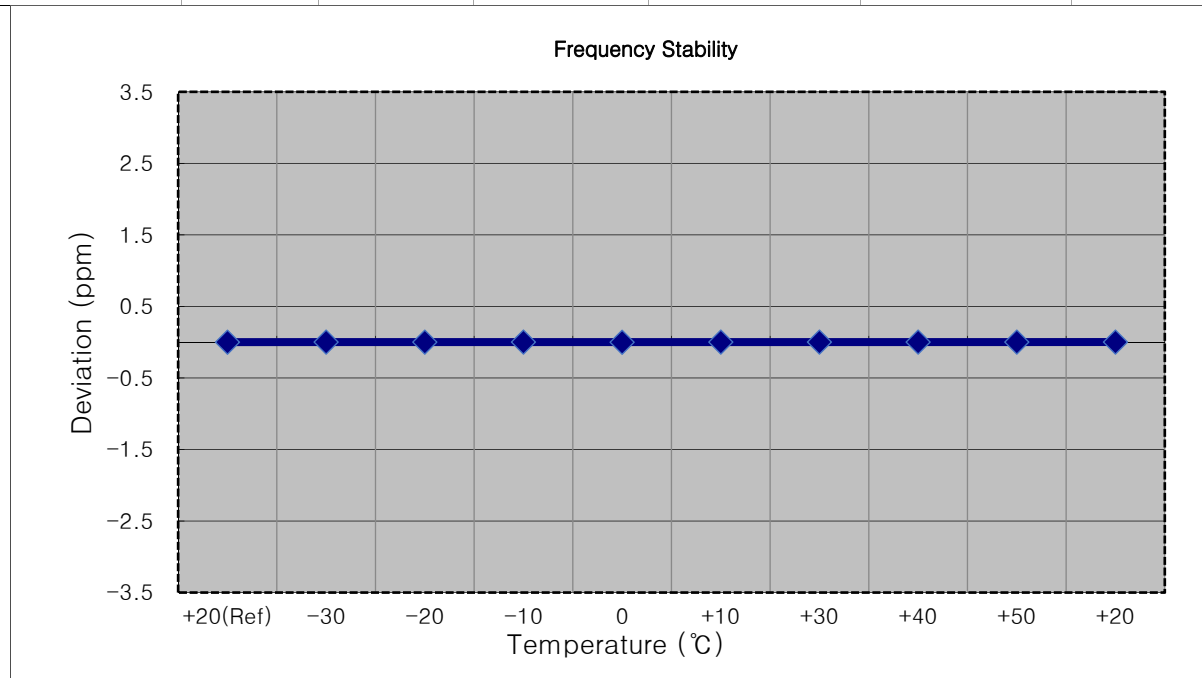
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (3 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1744 999 998	0.0	0.000 000	0.000
100 %		-30	1745 000 000	1.7	0.000 000	0.001
100 %		-20	1744 999 996	-1.7	0.000 000	-0.001
100 %		-10	1745 000 000	2.5	0.000 000	0.001
100 %		0	1745 000 000	2.4	0.000 000	0.001
100 %		+10	1745 000 000	1.7	0.000 000	0.001
100 %		+30	1745 000 000	2.0	0.000 000	0.001
100 %		+40	1745 000 001	2.6	0.000 000	0.001
100 %		+50	1745 000 001	3.2	0.000 000	0.002
Batt. Endpoint	3.300	+20	1745 000 000	1.7	0.000 000	0.001



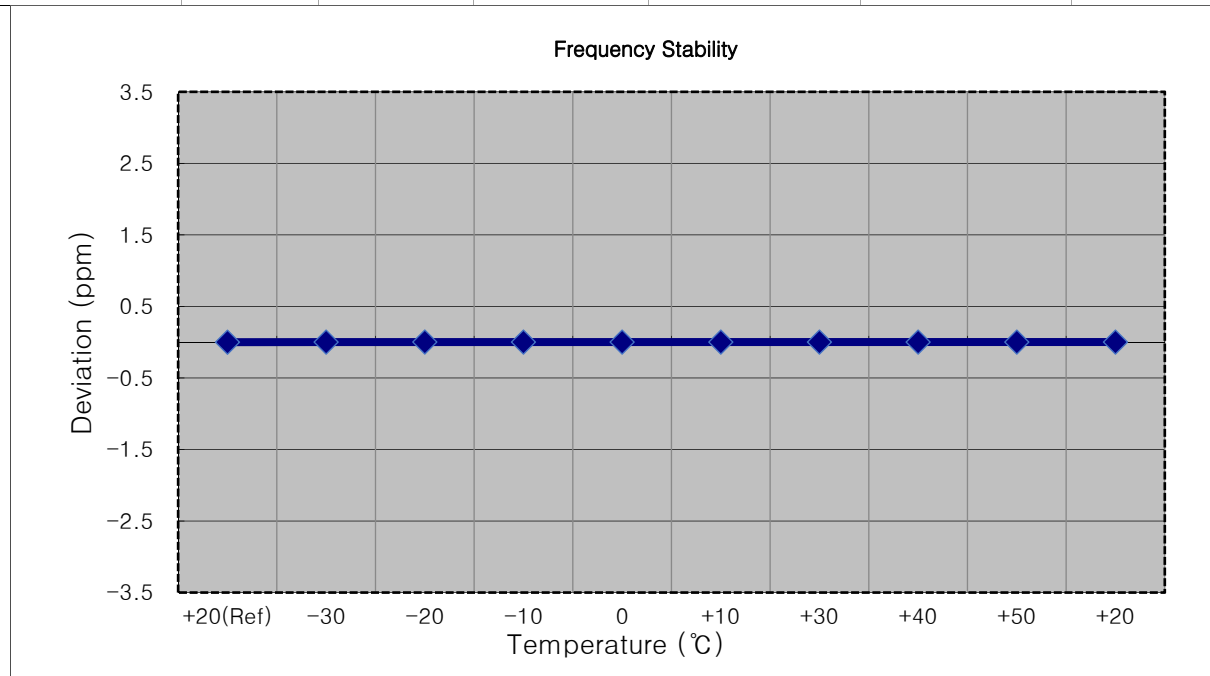
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1745,000,000 Hz</u>
CHANNEL:	<u>132322 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 002	0.0	0.000 000	0.000
100 %		-30	1745 000 004	2.1	0.000 000	0.001
100 %		-20	1745 000 004	1.9	0.000 000	0.001
100 %		-10	1745 000 005	2.6	0.000 000	0.001
100 %		0	1745 000 001	-1.6	0.000 000	-0.001
100 %		+10	1745 000 006	3.2	0.000 000	0.002
100 %		+30	1745 000 005	2.4	0.000 000	0.001
100 %		+40	1745 000 005	2.7	0.000 000	0.002
100 %		+50	1745 000 005	2.5	0.000 000	0.001
Batt. Endpoint	3.300	+20	1745 000 005	2.9	0.000 000	0.002



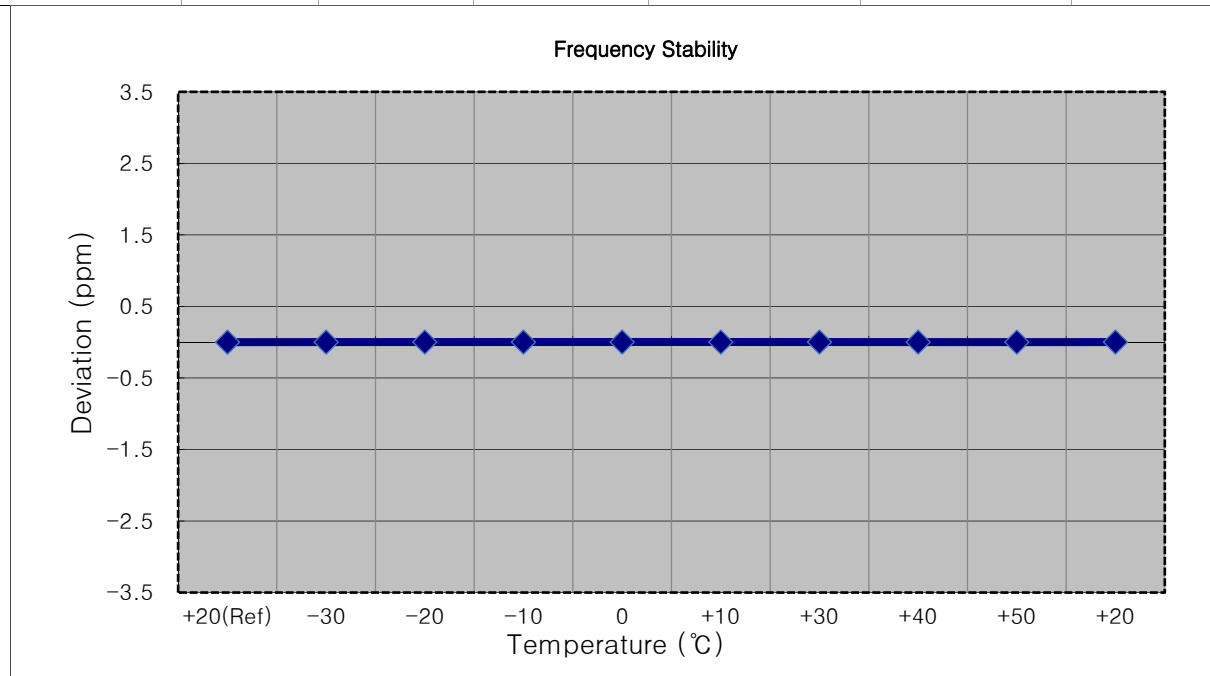
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 002	0.0	0.000 000	0.000
100 %		-30	1745 000 004	2.4	0.000 000	0.001
100 %		-20	1745 000 006	3.6	0.000 000	0.002
100 %		-10	1745 000 005	2.7	0.000 000	0.002
100 %		0	1745 000 004	2.0	0.000 000	0.001
100 %		+10	1745 000 005	2.8	0.000 000	0.002
100 %		+30	1745 000 004	2.2	0.000 000	0.001
100 %		+40	1745 000 004	2.4	0.000 000	0.001
100 %		+50	1745 000 005	3.1	0.000 000	0.002
Batt. Endpoint	3.300	+20	1745 000 005	2.8	0.000 000	0.002



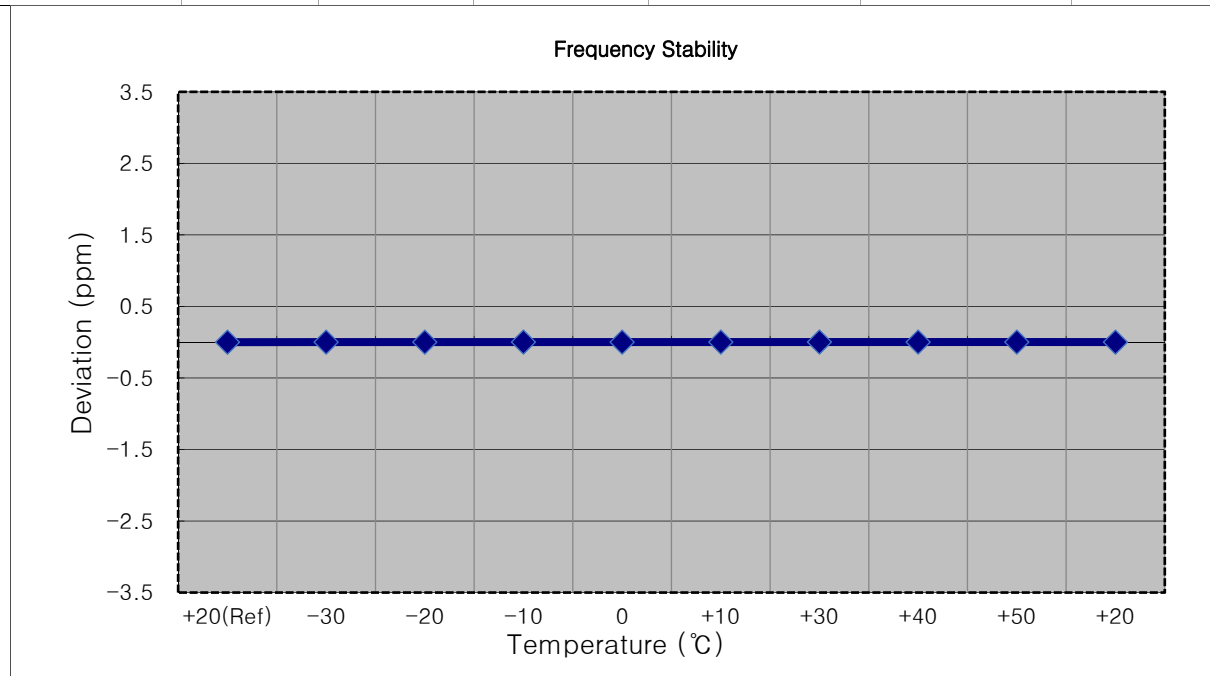
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 003	0.0	0.000 000	0.000
100 %		-30	1745 000 005	1.9	0.000 000	0.001
100 %		-20	1745 000 005	2.5	0.000 000	0.001
100 %		-10	1745 000 005	2.7	0.000 000	0.002
100 %		0	1745 000 006	3.7	0.000 000	0.002
100 %		+10	1745 000 005	2.7	0.000 000	0.002
100 %		+30	1745 000 006	3.4	0.000 000	0.002
100 %		+40	1745 000 006	2.8	0.000 000	0.002
100 %		+50	1745 000 004	1.3	0.000 000	0.001
Batt. Endpoint	3.300	+20	1745 000 005	2.5	0.000 000	0.001



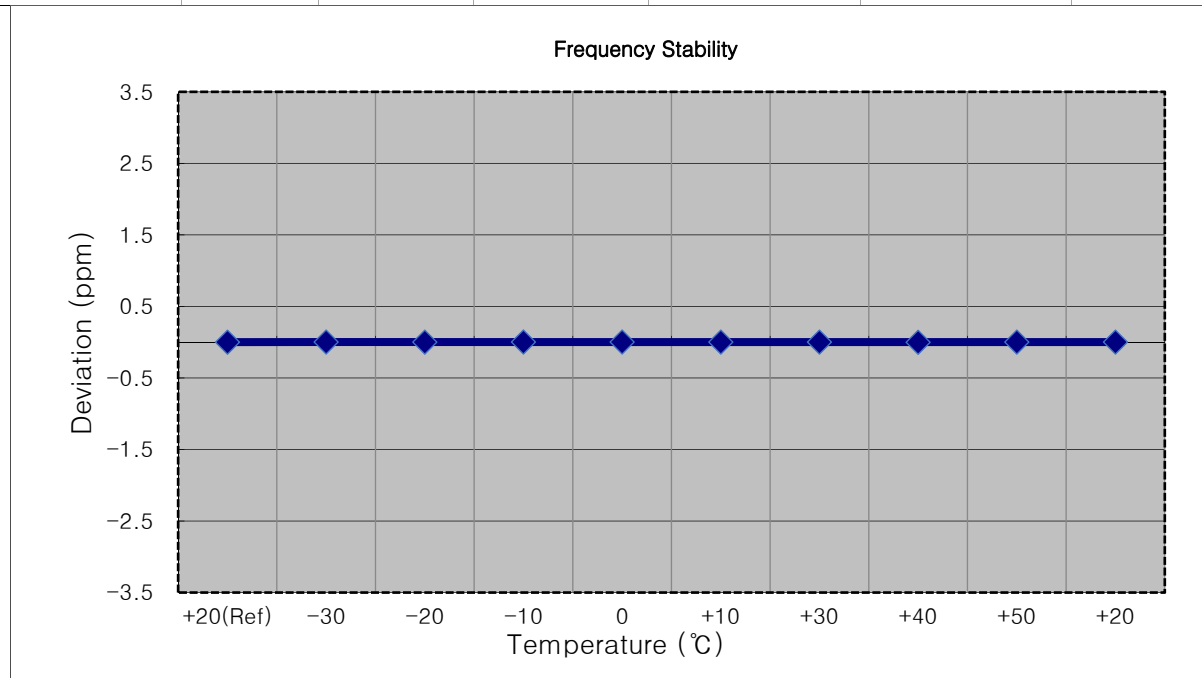
MODE: LTE 66
 OPERATING FREQUENCY: 1745,000,000 Hz
 CHANNEL: 132322 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1745 000 002	0.0	0.000 000	0.000
100 %		-30	1745 000 003	1.5	0.000 000	0.001
100 %		-20	1745 000 003	1.1	0.000 000	0.001
100 %		-10	1745 000 004	2.4	0.000 000	0.001
100 %		0	1745 000 004	1.9	0.000 000	0.001
100 %		+10	1745 000 005	3.0	0.000 000	0.002
100 %		+30	1745 000 005	3.5	0.000 000	0.002
100 %		+40	1745 000 004	2.6	0.000 000	0.001
100 %		+50	1745 000 004	2.6	0.000 000	0.001
Batt. Endpoint	3.300	+20	1745 000 004	1.8	0.000 000	0.001



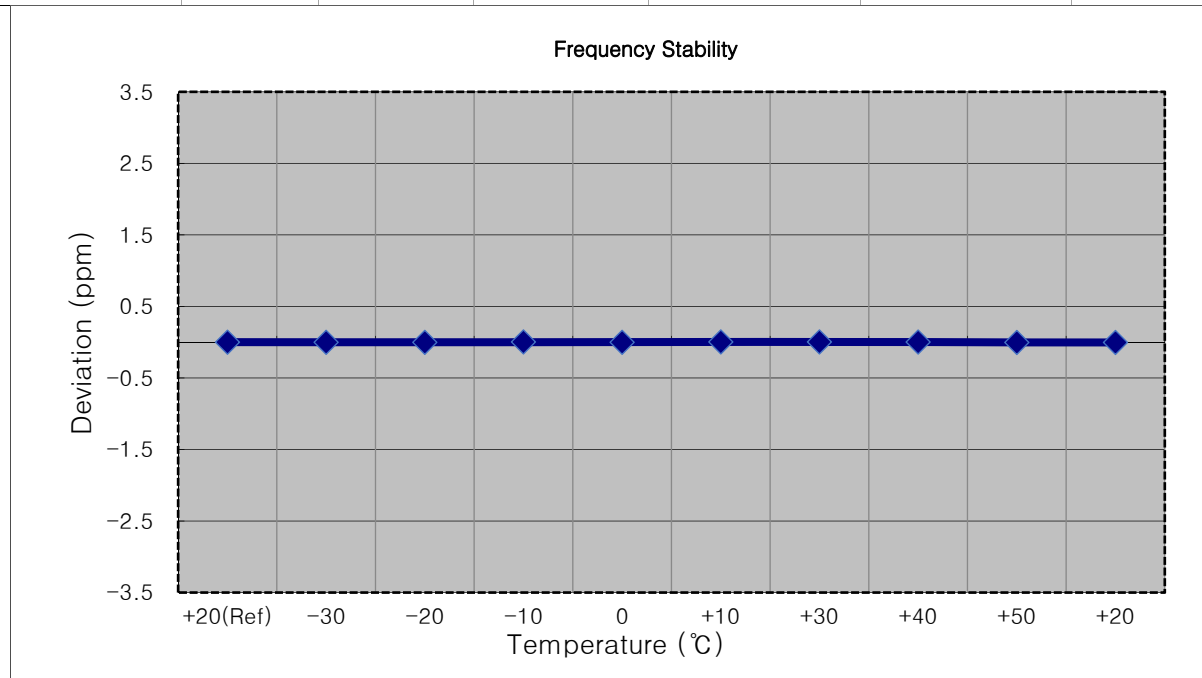
MODE: LTE 66
 OPERATING FREQUENCY: 1779,300,000 Hz
 CHANNEL: 132665 (1.4 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1779 299 998	0.0	0.000 000	0.000
100 %		-30	1779 300 002	4.0	0.000 000	0.002
100 %		-20	1779 299 999	1.8	0.000 000	0.001
100 %		-10	1779 300 002	4.0	0.000 000	0.002
100 %		0	1779 300 001	3.5	0.000 000	0.002
100 %		+10	1779 300 001	3.2	0.000 000	0.002
100 %		+30	1779 300 000	2.3	0.000 000	0.001
100 %		+40	1779 299 995	-2.3	0.000 000	-0.001
100 %		+50	1779 300 000	2.3	0.000 000	0.001
Batt. Endpoint	3.300	+20	1779 300 000	2.3	0.000 000	0.001



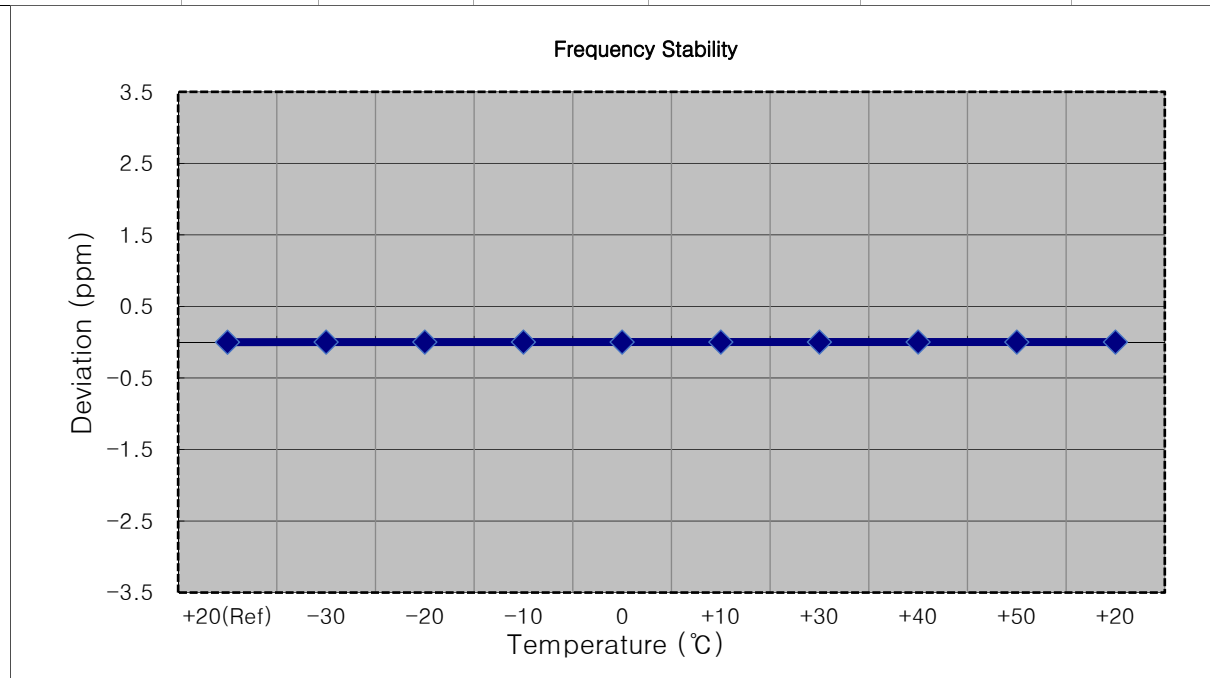
MODE:	<u>LTE 66</u>
OPERATING FREQUENCY:	<u>1778,500,000 Hz</u>
CHANNEL:	<u>132657 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1778 500 006	0.0	0.000 000	0.000
100 %		-30	1778 500 003	-2.5	0.000 000	-0.001
100 %		-20	1778 500 001	-4.6	0.000 000	-0.003
100 %		-10	1778 500 012	6.9	0.000 000	0.004
100 %		0	1778 500 003	-3.0	0.000 000	-0.002
100 %		+10	1778 500 012	6.2	0.000 000	0.003
100 %		+30	1778 500 012	6.0	0.000 000	0.003
100 %		+40	1778 500 009	3.7	0.000 000	0.002
100 %		+50	1778 499 999	-6.1	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1778 499 999	-6.7	0.000 000	-0.004



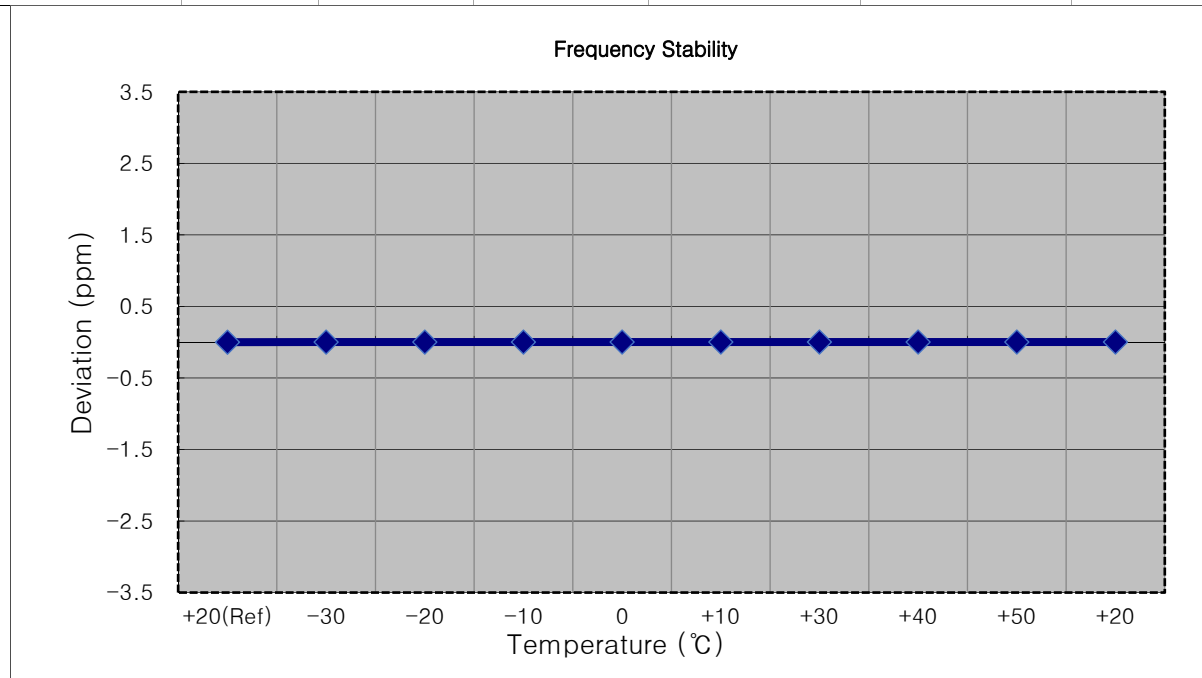
MODE: LTE 66
 OPERATING FREQUENCY: 1777,500,000 Hz
 CHANNEL: 132647 (5 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1777 499 998	0.0	0.000 000	0.000
100 %		-30	1777 500 000	2.0	0.000 000	0.001
100 %		-20	1777 500 001	2.5	0.000 000	0.001
100 %		-10	1777 500 001	2.8	0.000 000	0.002
100 %		0	1777 500 001	2.6	0.000 000	0.001
100 %		+10	1777 500 002	3.1	0.000 000	0.002
100 %		+30	1777 500 001	2.8	0.000 000	0.002
100 %		+40	1777 500 002	3.3	0.000 000	0.002
100 %		+50	1777 500 001	2.8	0.000 000	0.002
Batt. Endpoint	3.300	+20	1777 500 000	2.0	0.000 000	0.001



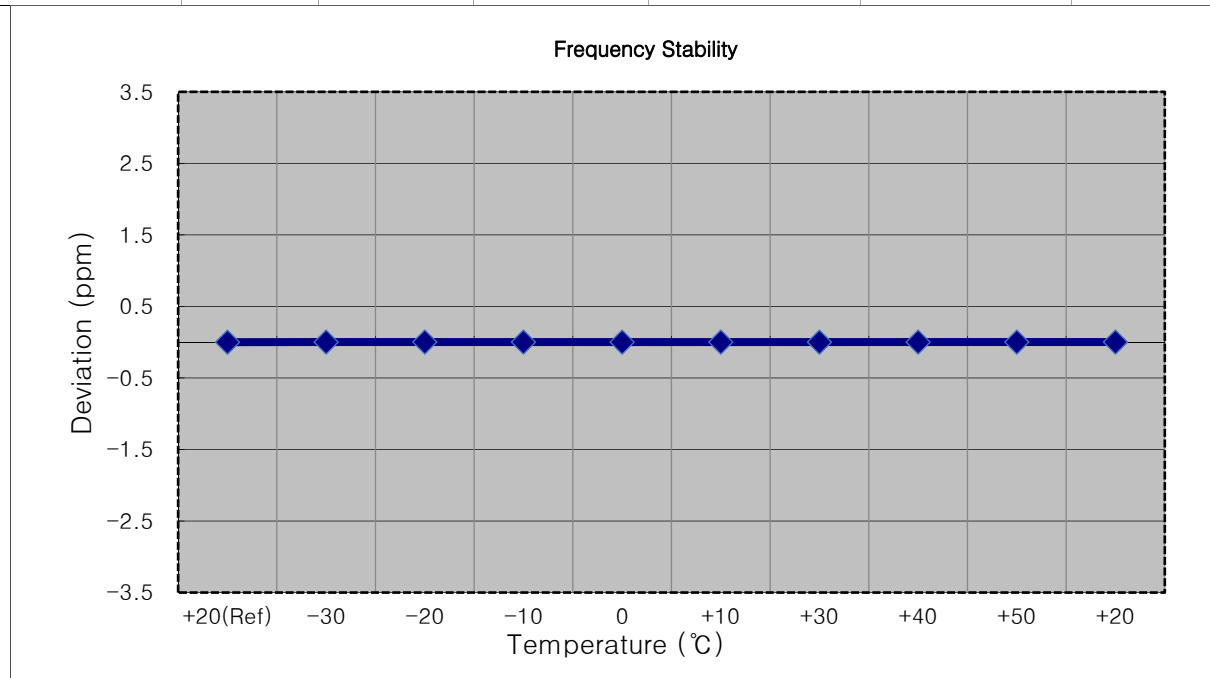
MODE: LTE 66
 OPERATING FREQUENCY: 1775,000,000 Hz
 CHANNEL: 132622 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1775 000 004	0.0	0.000 000	0.000
100 %		-30	1775 000 007	2.9	0.000 000	0.002
100 %		-20	1775 000 006	2.5	0.000 000	0.001
100 %		-10	1775 000 007	2.9	0.000 000	0.002
100 %		0	1775 000 007	3.5	0.000 000	0.002
100 %		+10	1775 000 007	3.3	0.000 000	0.002
100 %		+30	1775 000 007	3.7	0.000 000	0.002
100 %		+40	1775 000 007	3.3	0.000 000	0.002
100 %		+50	1775 000 007	3.3	0.000 000	0.002
Batt. Endpoint	3.300	+20	1775 000 007	3.7	0.000 000	0.002



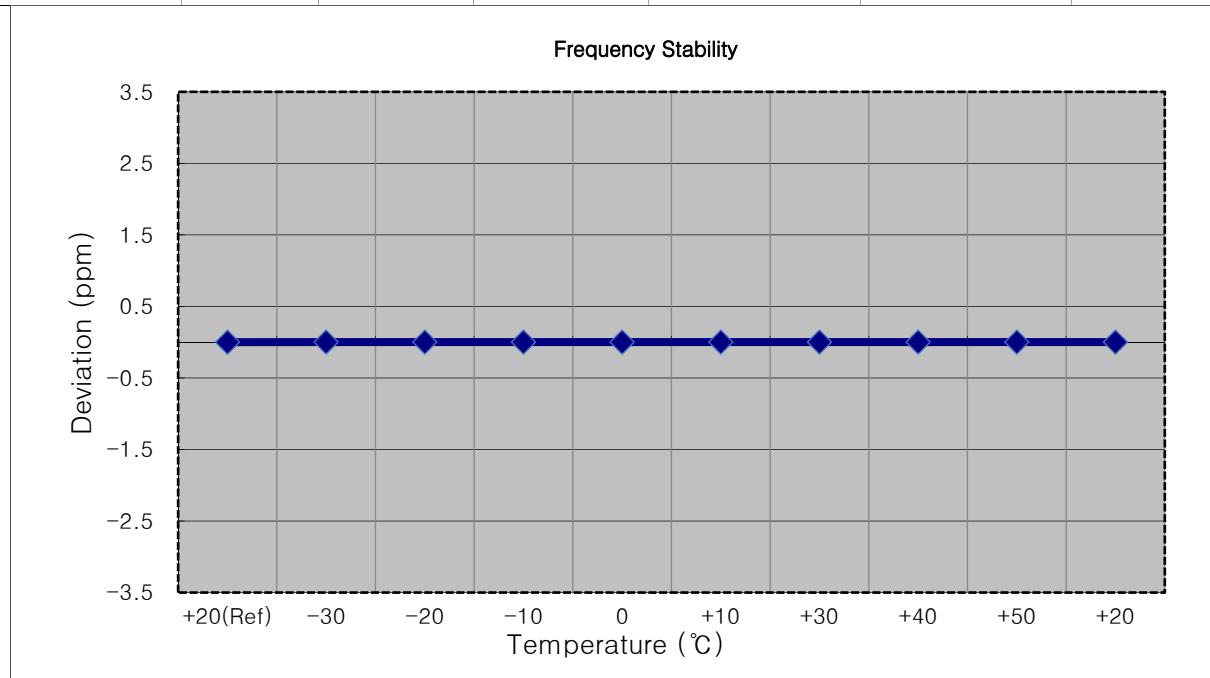
MODE: LTE 66
 OPERATING FREQUENCY: 1772,500,000 Hz
 CHANNEL: 132597 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1772 500 003	0.0	0.000 000	0.000
100 %		-30	1772 500 006	2.8	0.000 000	0.002
100 %		-20	1772 500 007	3.8	0.000 000	0.002
100 %		-10	1772 500 005	2.2	0.000 000	0.001
100 %		0	1772 500 004	1.6	0.000 000	0.001
100 %		+10	1772 500 006	2.9	0.000 000	0.002
100 %		+30	1772 500 005	1.7	0.000 000	0.001
100 %		+40	1772 500 005	2.1	0.000 000	0.001
100 %		+50	1772 500 006	2.8	0.000 000	0.002
Batt. Endpoint	3.300	+20	1772 500 006	3.0	0.000 000	0.002



MODE: LTE 66
 OPERATING FREQUENCY: 1770,000,000 Hz
 CHANNEL: 132572 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	1770 000 003	0.0	0.000 000	0.000
100 %		-30	1770 000 005	2.5	0.000 000	0.001
100 %		-20	1770 000 005	2.3	0.000 000	0.001
100 %		-10	1770 000 005	2.5	0.000 000	0.001
100 %		0	1770 000 005	1.9	0.000 000	0.001
100 %		+10	1770 000 005	2.0	0.000 000	0.001
100 %		+30	1770 000 006	3.2	0.000 000	0.002
100 %		+40	1770 000 006	3.1	0.000 000	0.002
100 %		+50	1770 000 005	2.4	0.000 000	0.001
Batt. Endpoint	3.300	+20	1770 000 006	3.2	0.000 000	0.002



10. TEST DATA

10.1 UPLINK CARRIER AGGREGATION

Test Note

1. All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.
2. All modes of operation were investigated and the worst case configuration results are reported in this section. Please refer to the table below.
3. The worst case is reported with the modulations, RB sizes and offsets.
 - 66A(Main2)-5A(Main1)
(PCC - Modulation: QPSK, RB: 1, RB Offset: 99, SCC - Modulation: QPSK, RB: 1, RB Offset: 0)
 - 66A(Main2)-12A(Main1)
(PCC - Modulation: QPSK, RB: 1, RB Offset: 99, SCC - Modulation: QPSK, RB: 1, RB Offset: 0)

Radiated Spurious Emissions

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
66A(Main2)	5A(Main1)	20	132572	10	20600
66A(Main2)	12A(Main1)	20	132572	3	23165

10.1.1 RADIATED SPURIOUS EMISSIONS

66A(Main2)(PCC)-5A(Main1)(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 540.00	-41.29	12.34	-59.04	3.06	H	-49.76	-13.00
5 310.00	-43.74	13.08	-57.12	3.82	H	-47.86	-13.00
7 080.00	-43.40	10.93	-48.05	4.49	H	-41.61	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 688.00	-42.14	9.82	-67.03	2.06	H	-59.27	-13.00
2 532.00	-43.11	10.67	-63.76	2.54	H	-55.63	-13.00
3 376.00	-43.72	12.52	-63.74	2.98	H	-54.20	-13.00

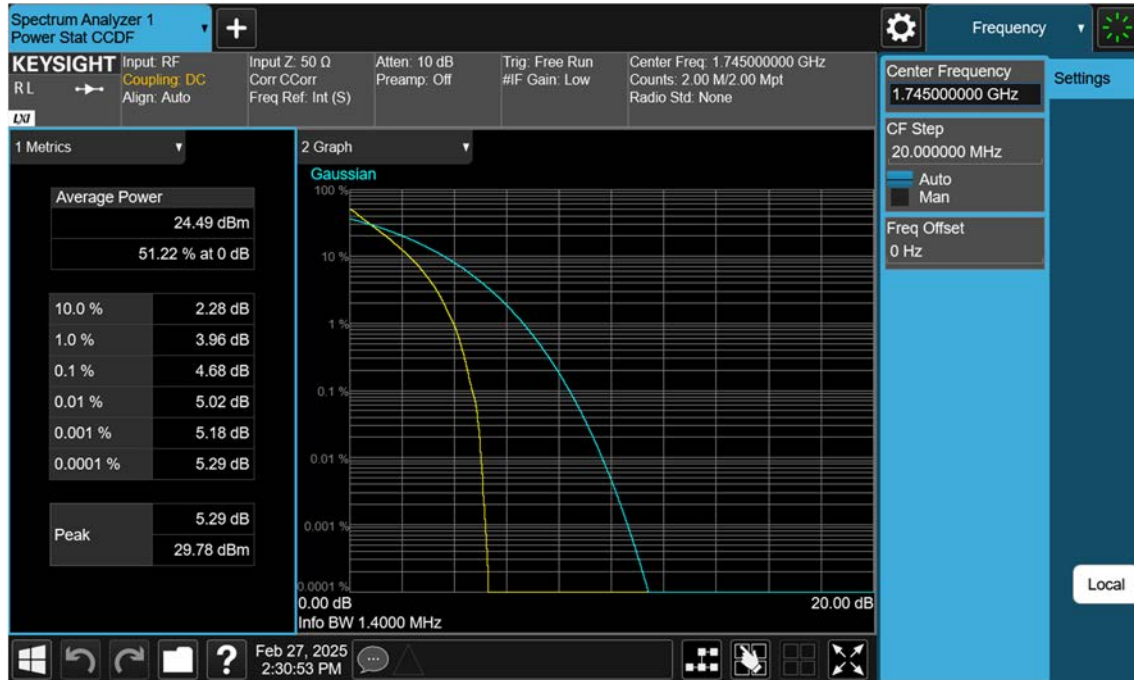
66A(Main2)(PCC)-12A(Main1)(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 540.00	-37.57	12.34	-55.32	3.06	H	-46.04	-13.00
5 310.00	-43.60	13.08	-56.98	3.82	H	-47.72	-13.00
7 080.00	-44.26	10.93	-48.91	4.49	H	-42.47	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 429.00	-42.45	7.81	-64.91	1.87	H	-58.97	-13.00
2 143.50	-43.61	9.30	-63.70	2.27	H	-56.67	-13.00
2 858.00	-43.91	10.77	-63.22	2.76	H	-55.21	-13.00

11. TEST PLOTS(Main 2 ANT)

LTE B66_1.4M_PAR_Mid_QPSK_FullRB



LTE B66_1.4M_PAR_Mid_16QAM_FullRB



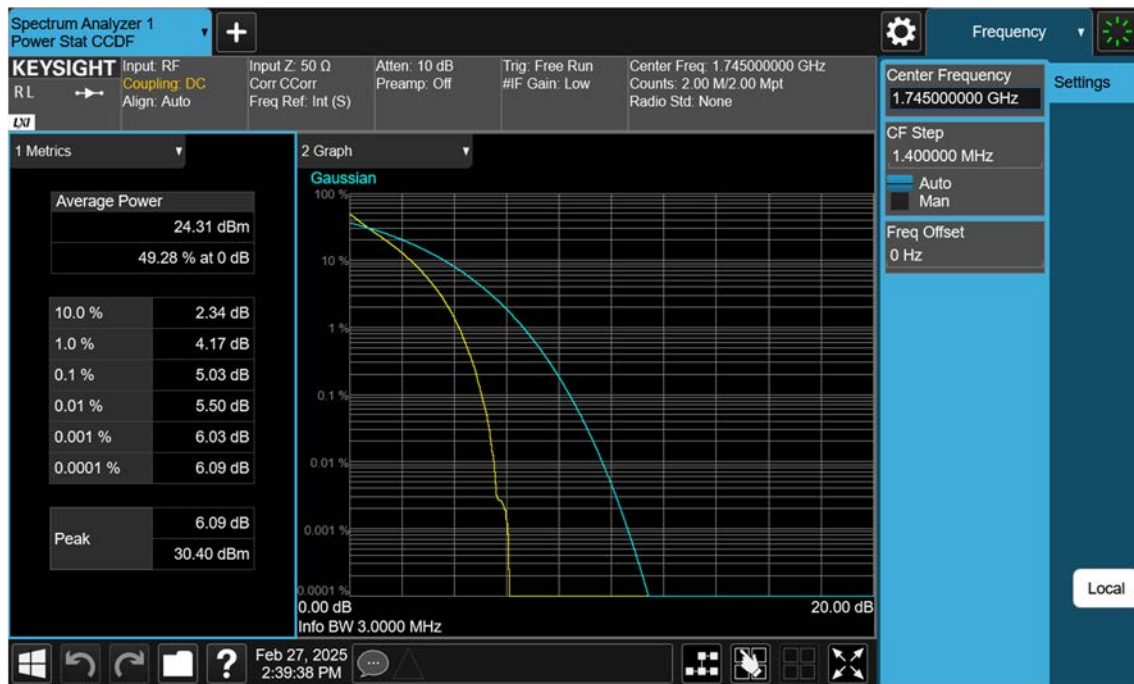
LTE B66_1.4M_PAR_Mid_64QAM_FullRB



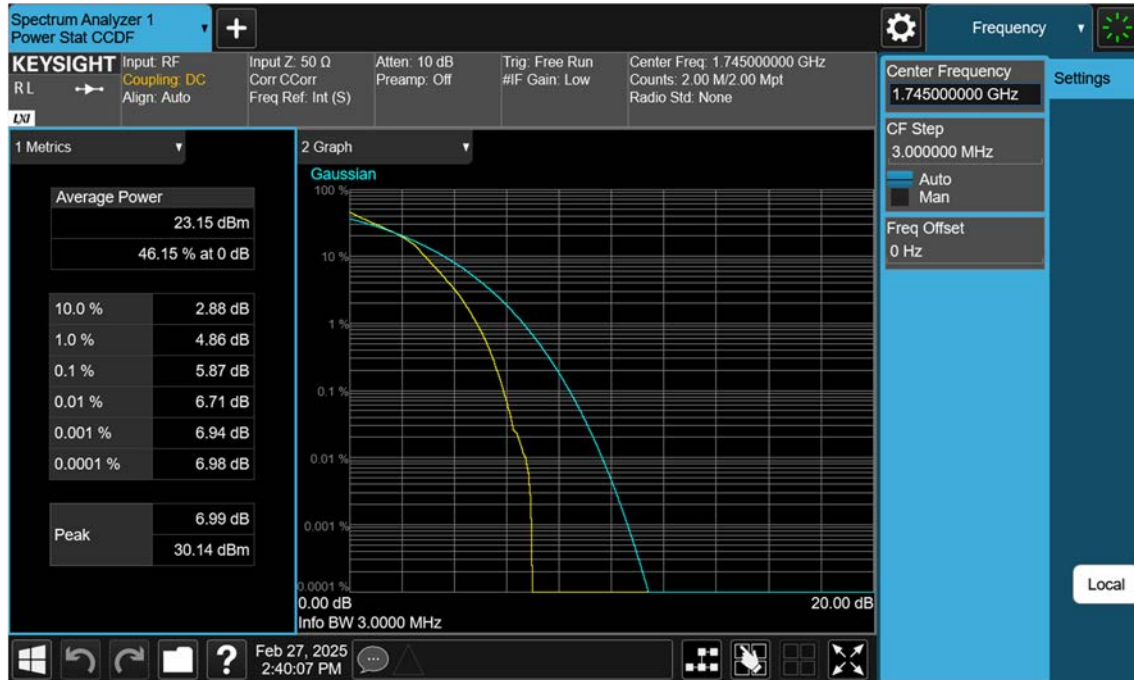
LTE B66_1.4M_PAR_Mid_256QAM_FullRB



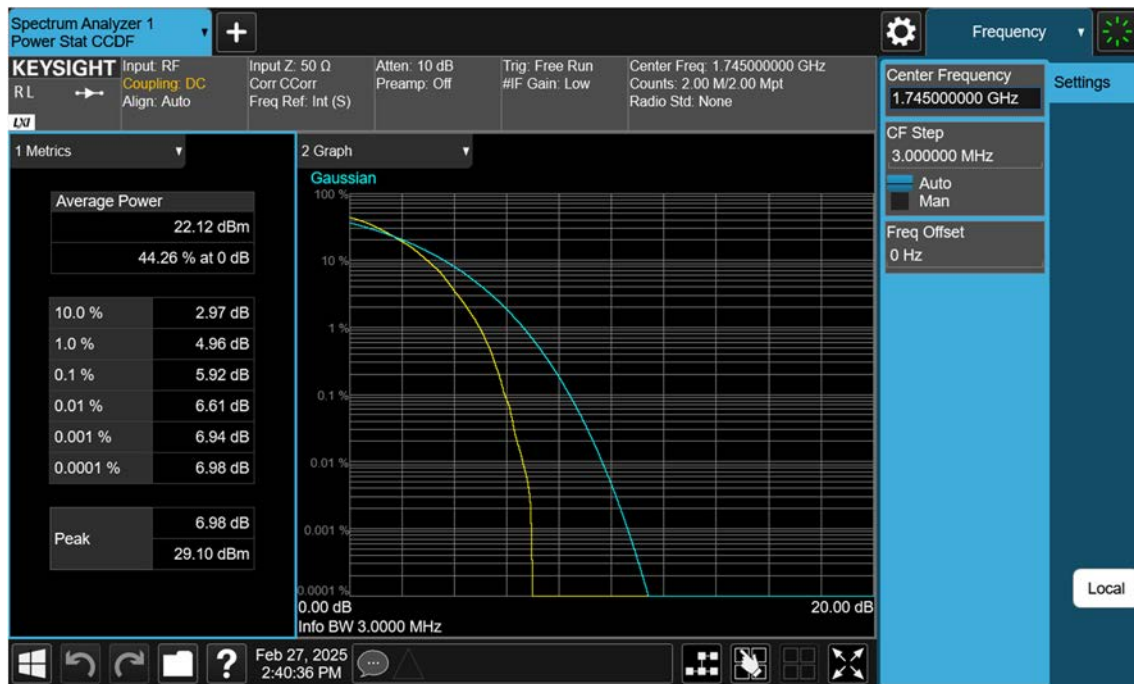
LTE B66_3 M_PAR_Mid_QPSK_FullRB



LTE B66_3 M_PAR_Mid_16QAM_FullRB



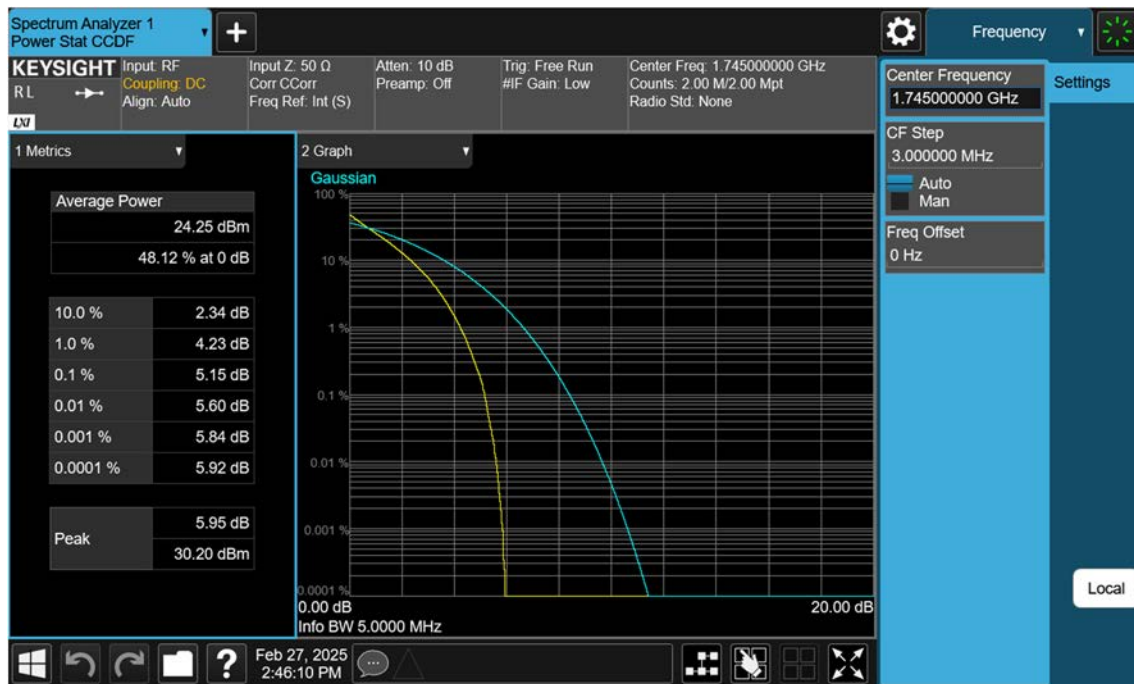
LTE B66_3 M_PAR_Mid_64QAM_FullRB



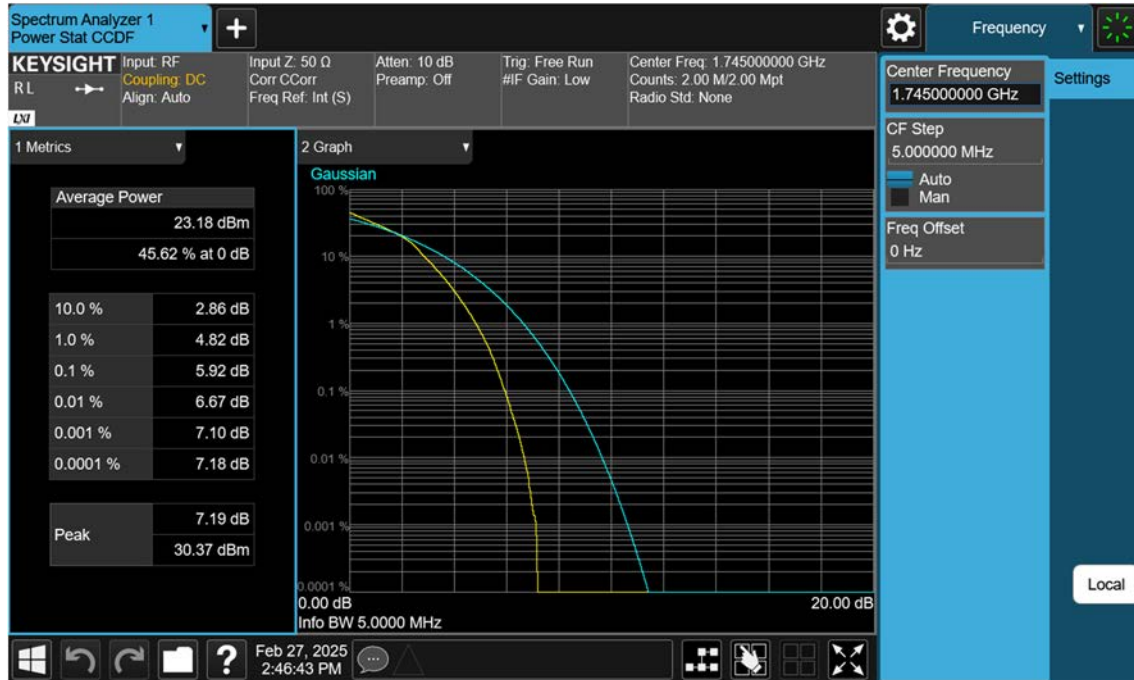
LTE B66_3 M_PAR_Mid_256QAM_FullRB



LTE B66_5 M_PAR_Mid_QPSK_FullRB



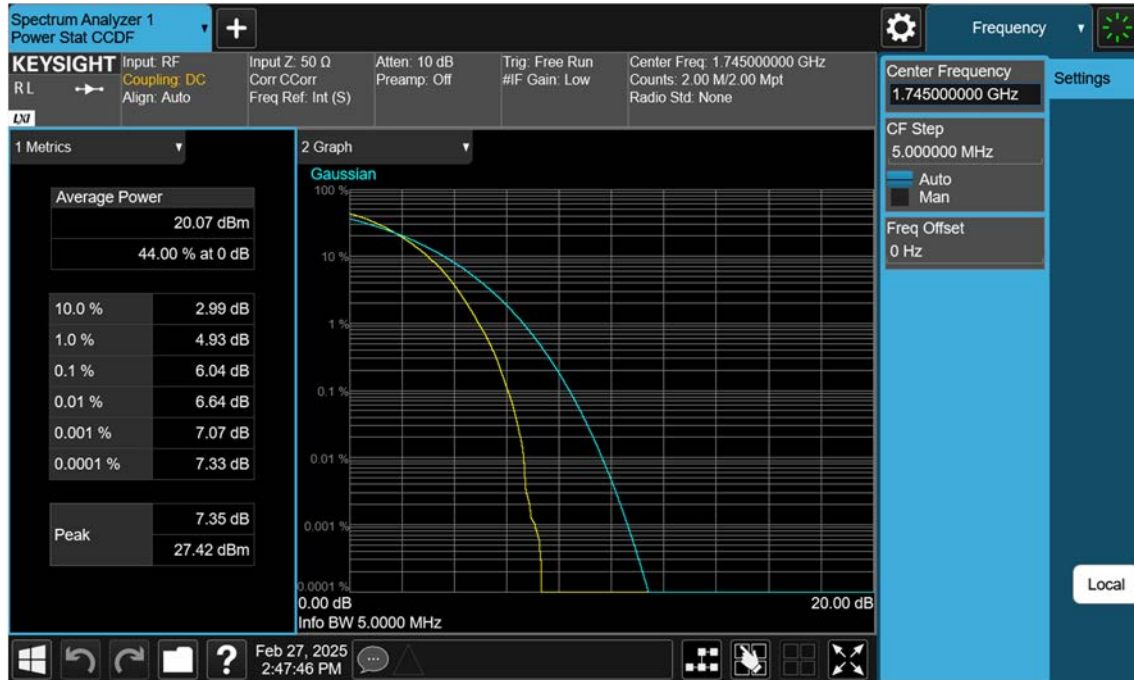
LTE B66_5 M_PAR_Mid_16QAM_FullRB



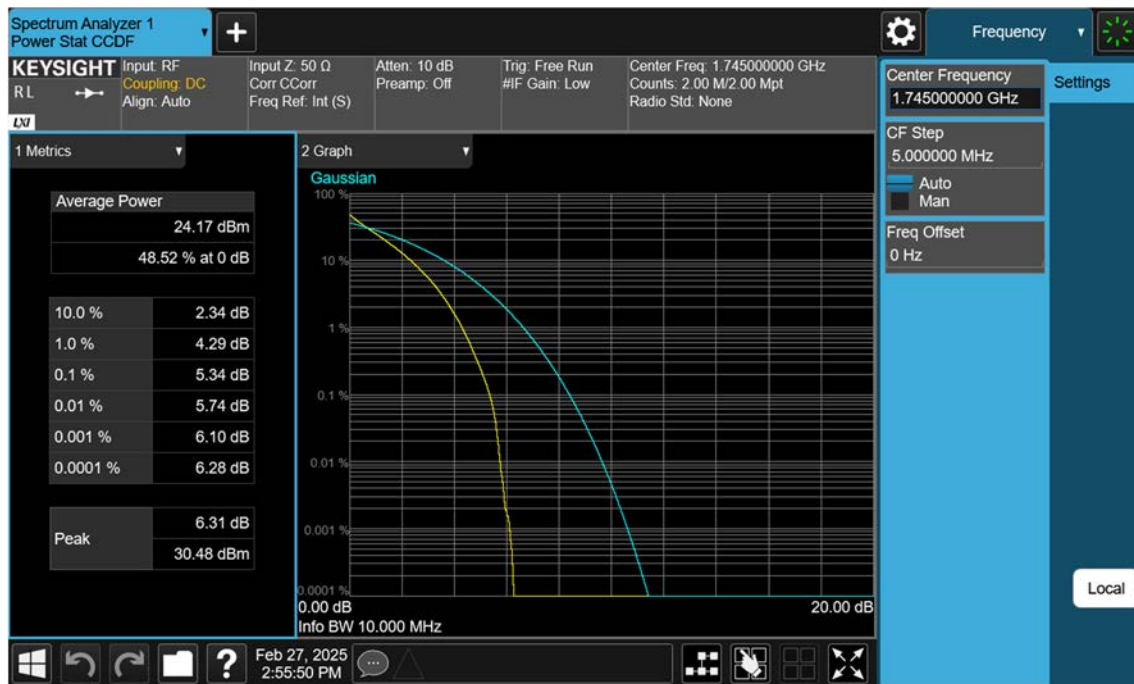
LTE B66_5 M_PAR_Mid_64QAM_FullRB



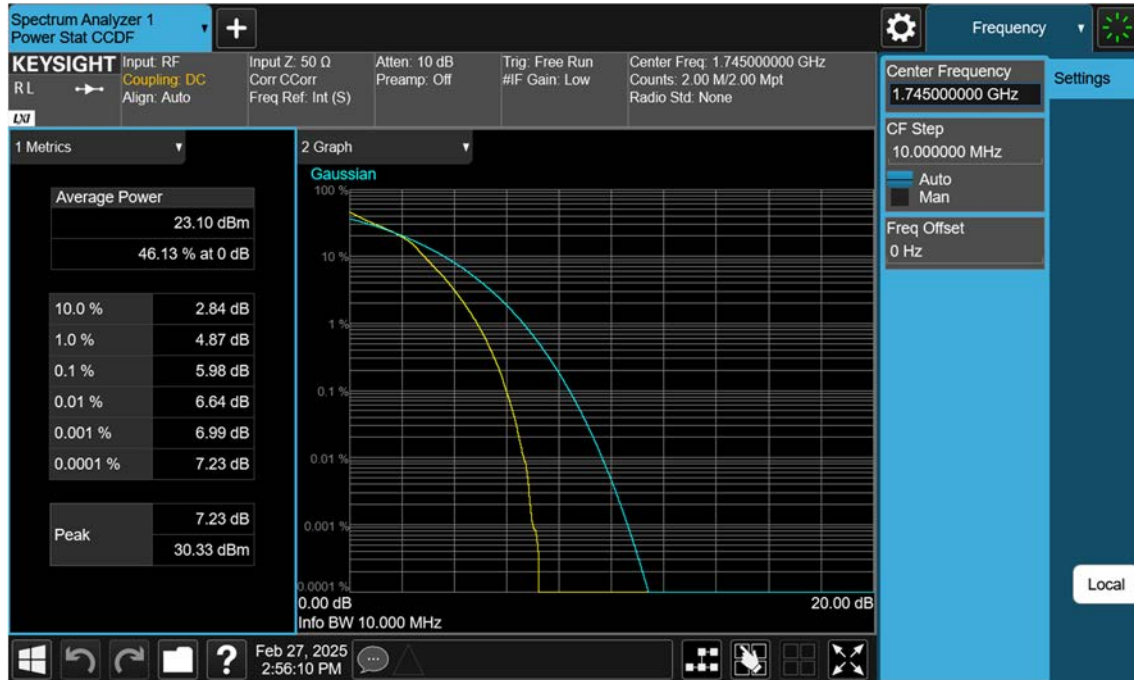
LTE B66_5 M_PAR_Mid_256QAM_FullRB



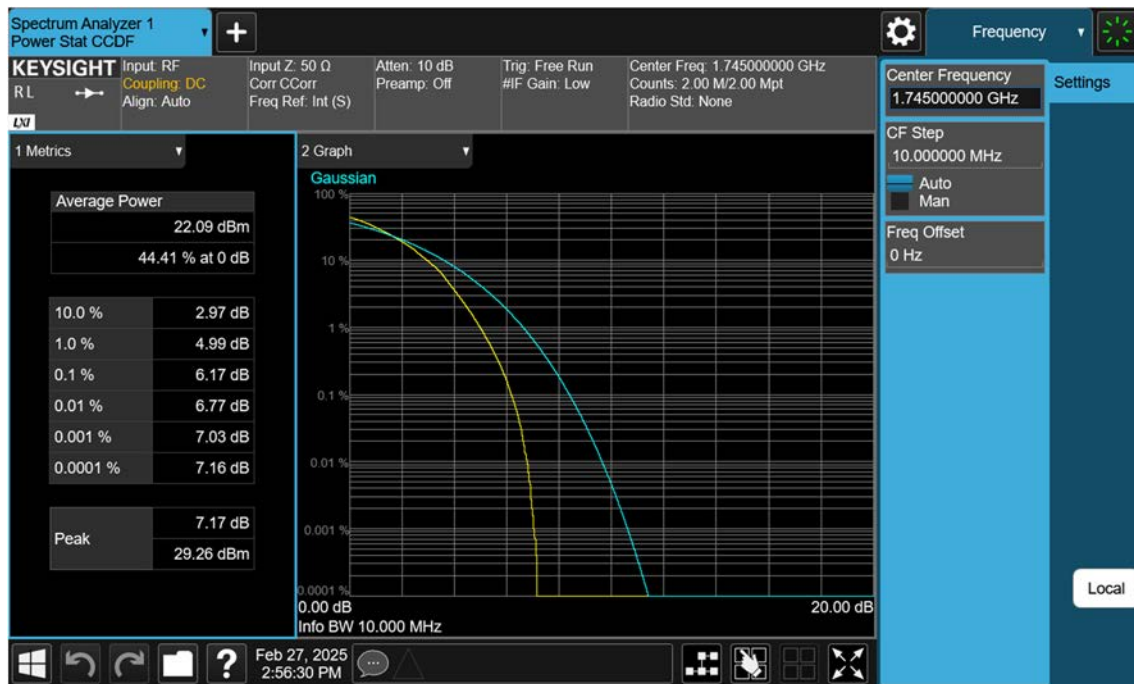
LTE B66_10 M_PAR_Mid_QPSK_FullRB



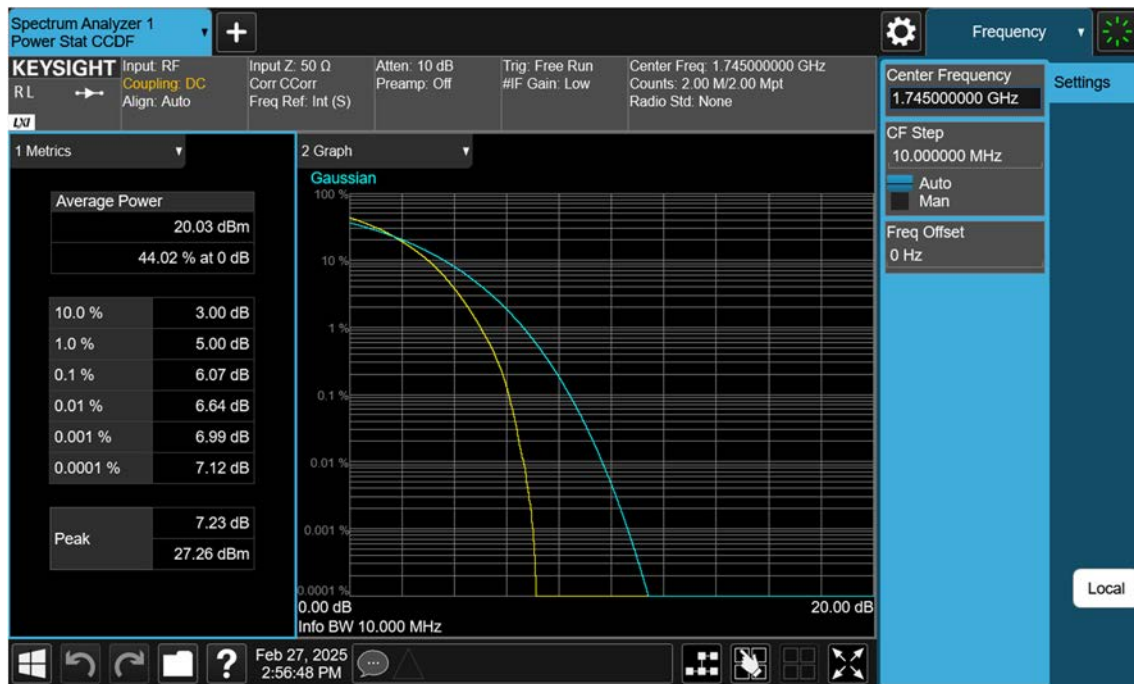
LTE B66_10 M_PAR_Mid_16QAM_FullRB



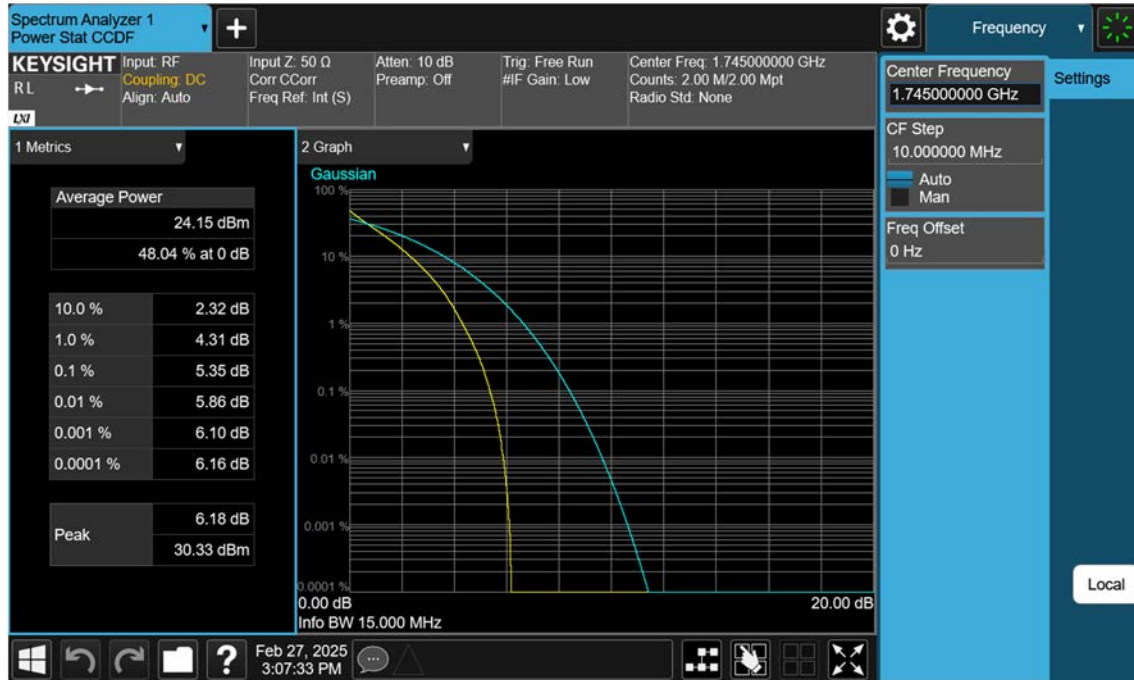
LTE B66_10 M_PAR_Mid_64QAM_FullRB



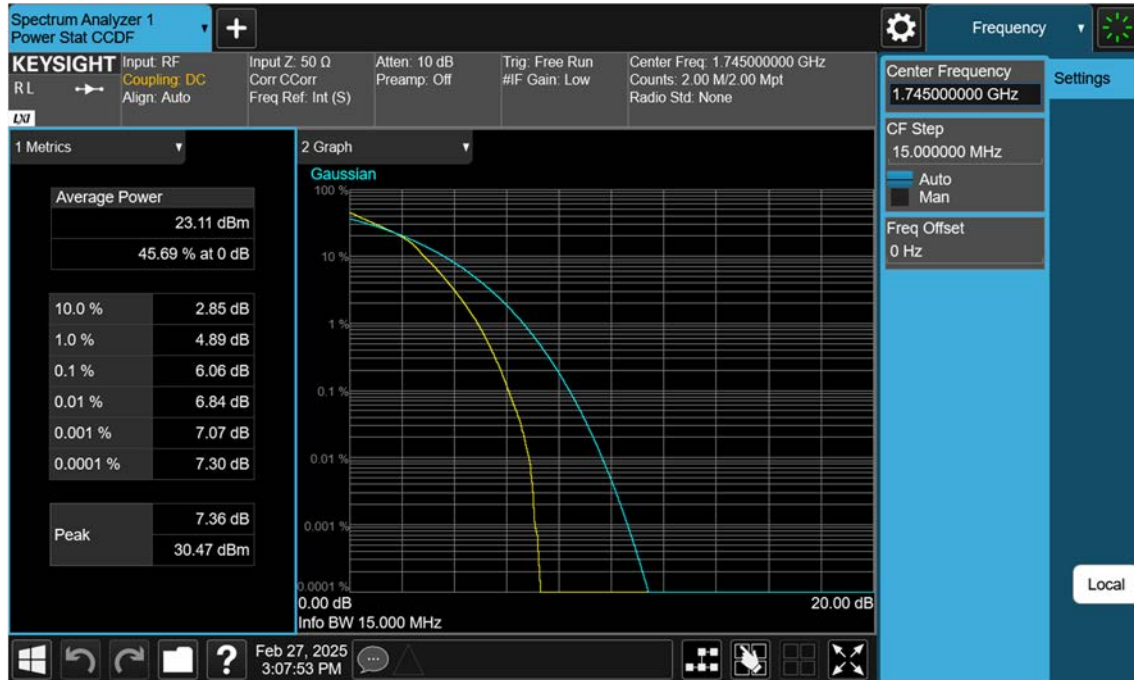
LTE B66_10 M_PAR_Mid_256QAM_FullRB



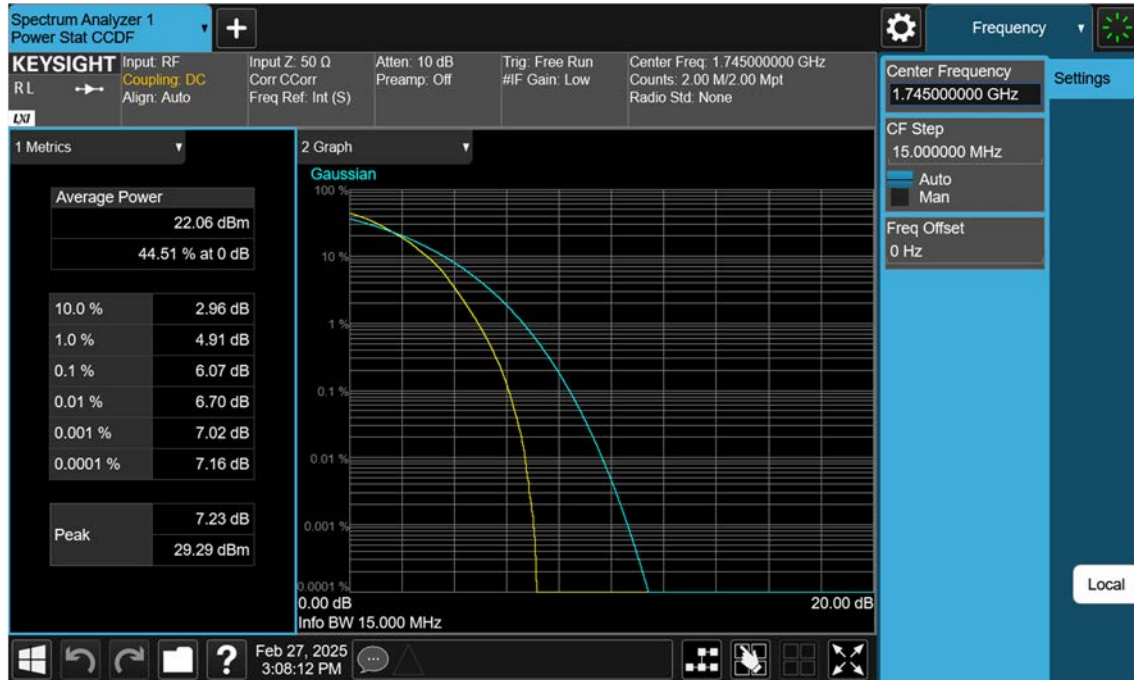
LTE B66_15 M_PAR_Mid_QPSK_FullRB



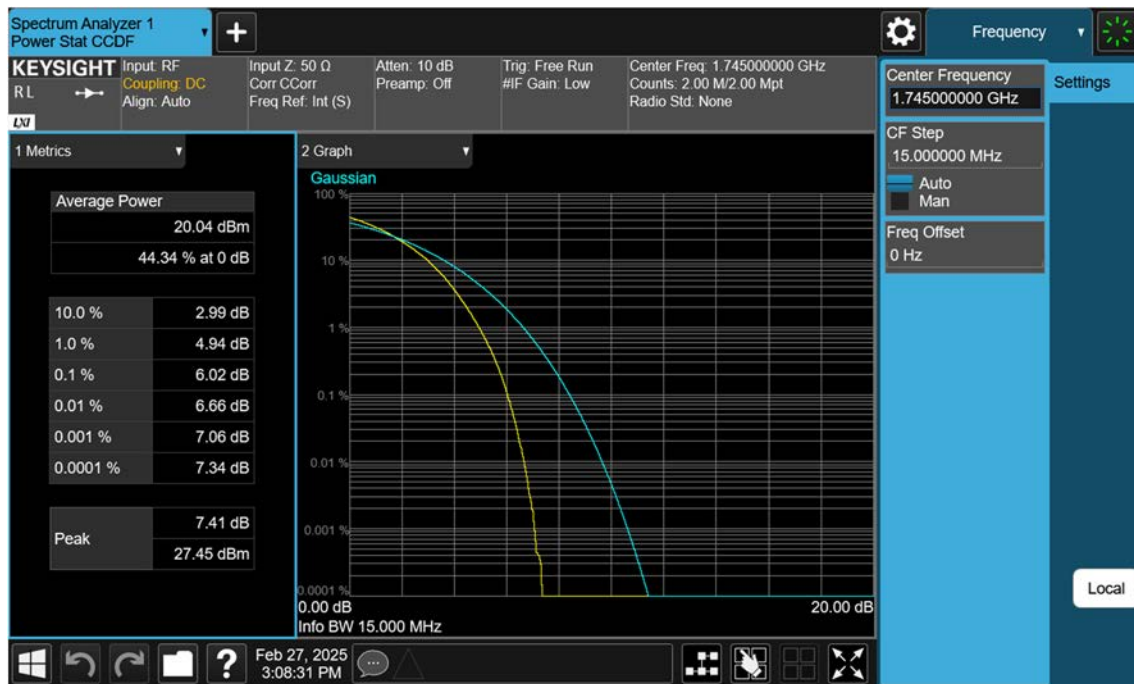
LTE B66_15 M_PAR_Mid_16QAM_FullRB



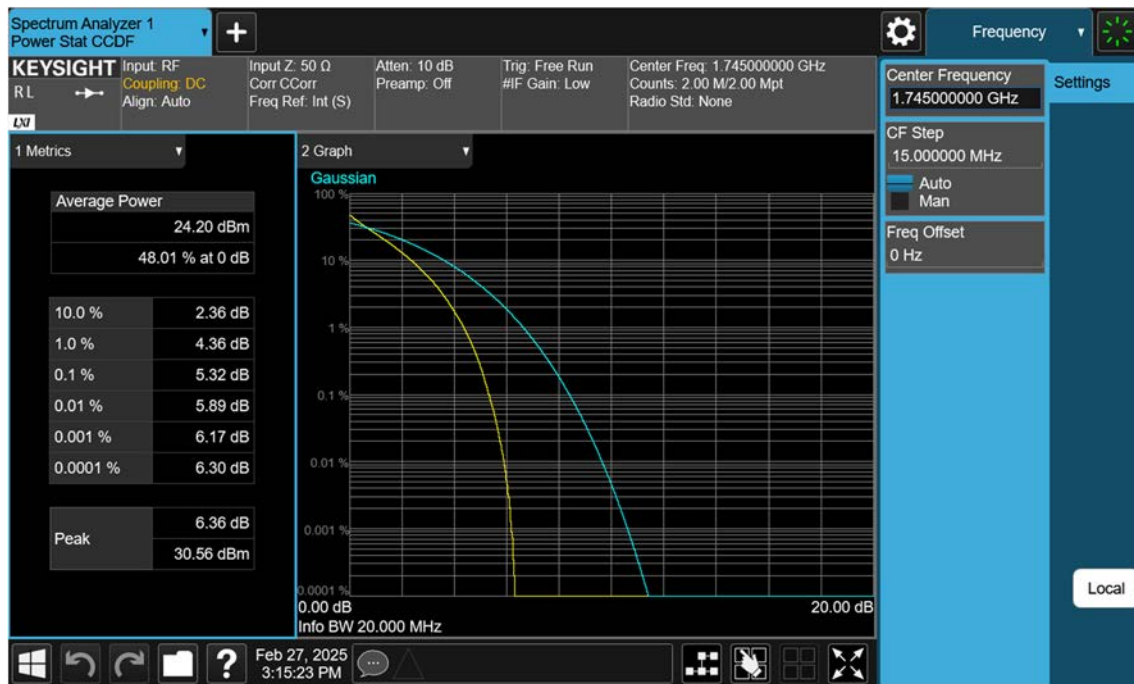
LTE B66_15 M_PAR_Mid_64QAM_FullRB



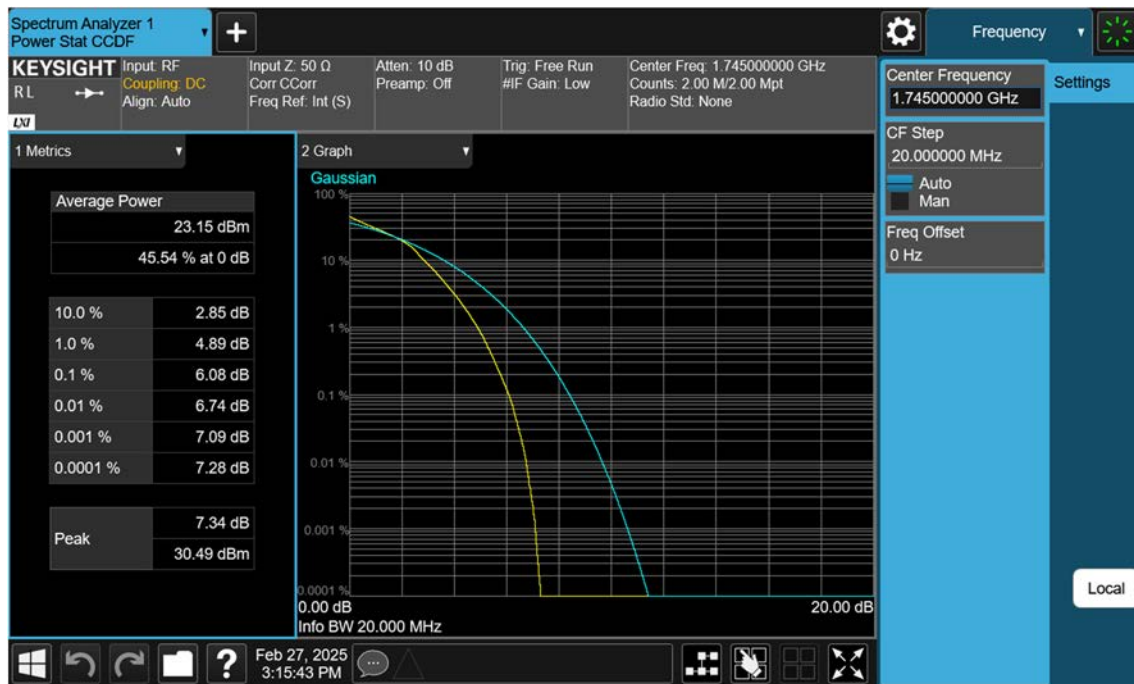
LTE B66_15 M_PAR_Mid_256QAM_FullRB



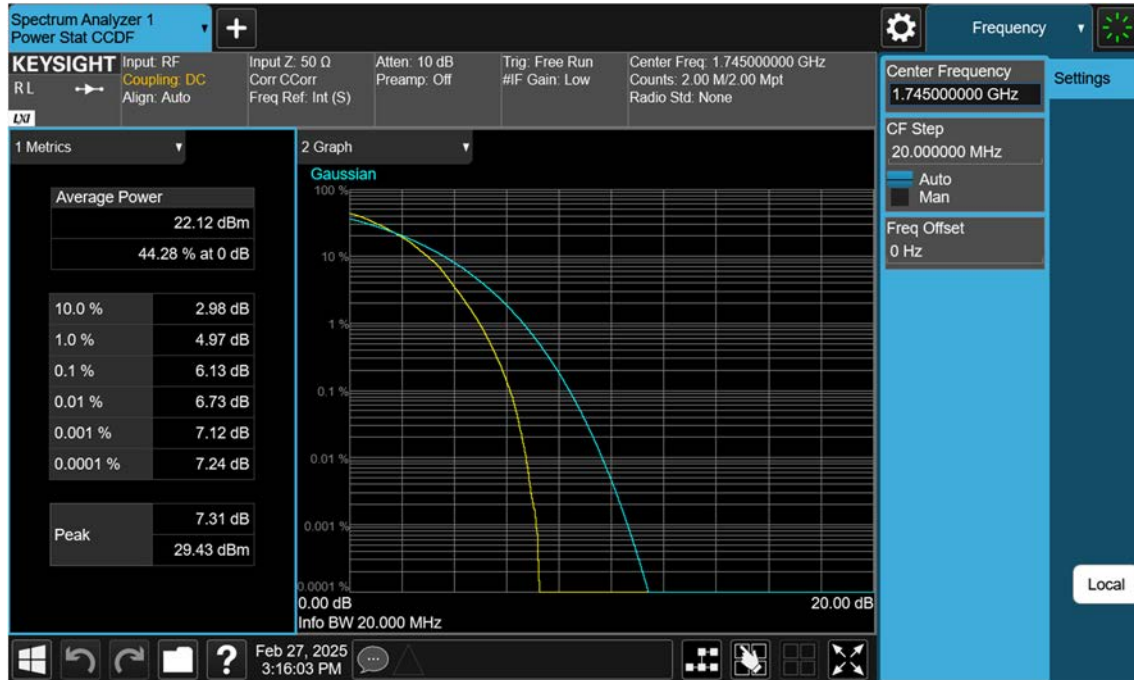
LTE B66_20 M_PAR_Mid_QPSK_FullRB



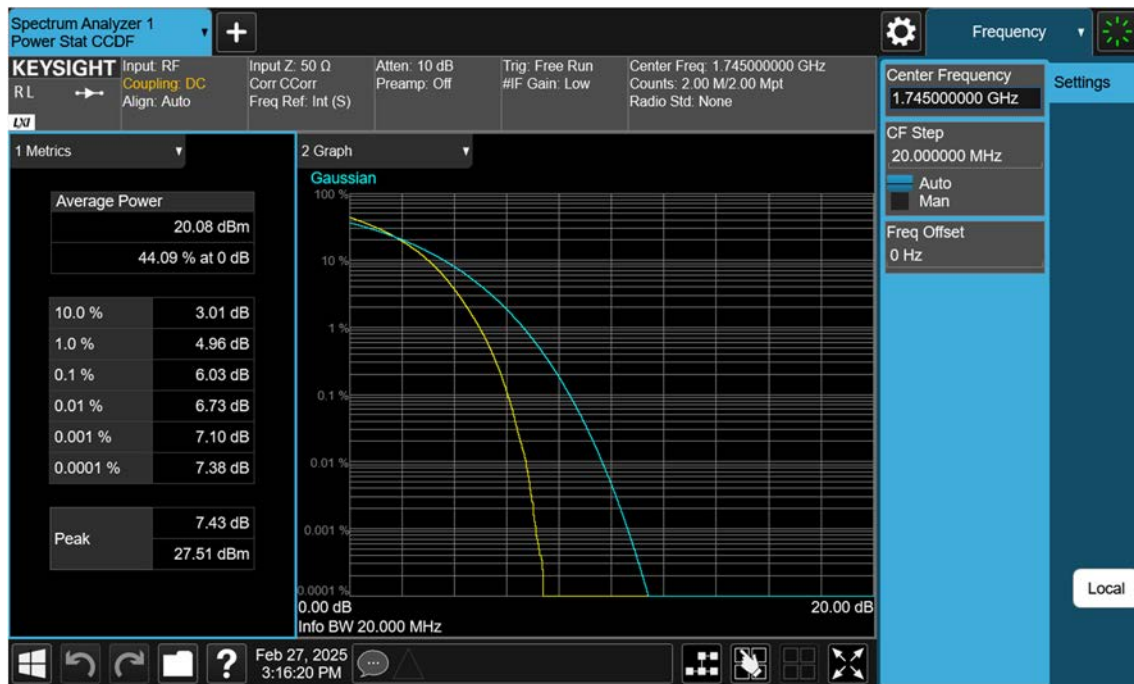
LTE B66_20 M_PAR_Mid_16QAM_FullRB



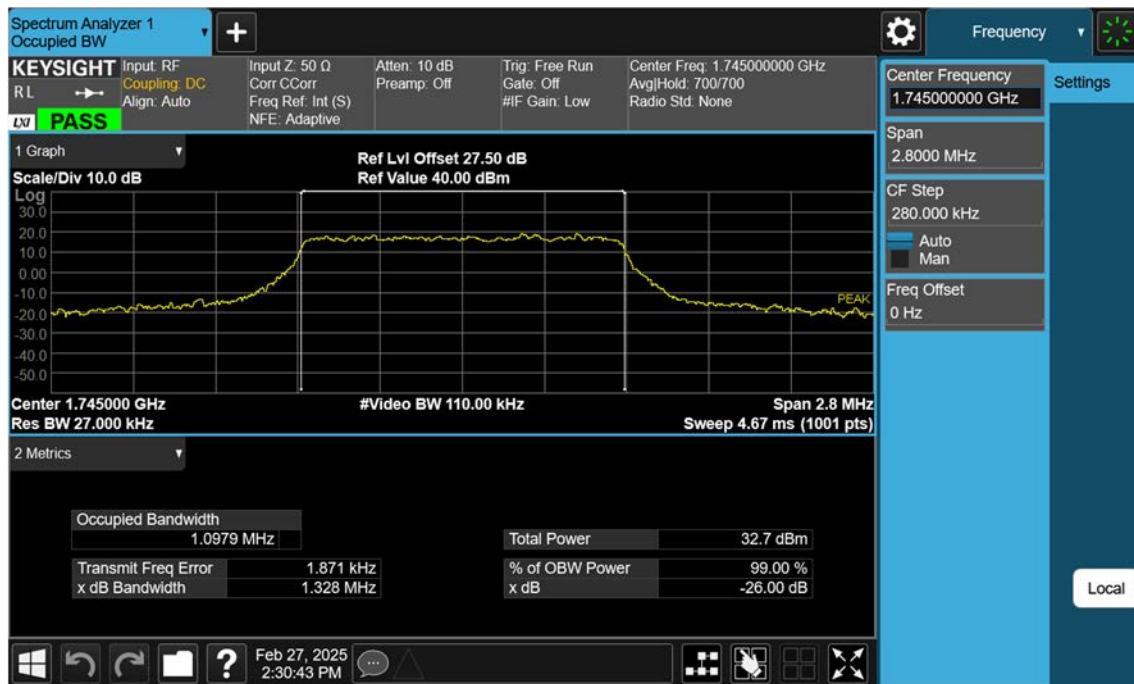
LTE B66_20 M_PAR_Mid_64QAM_FullRB



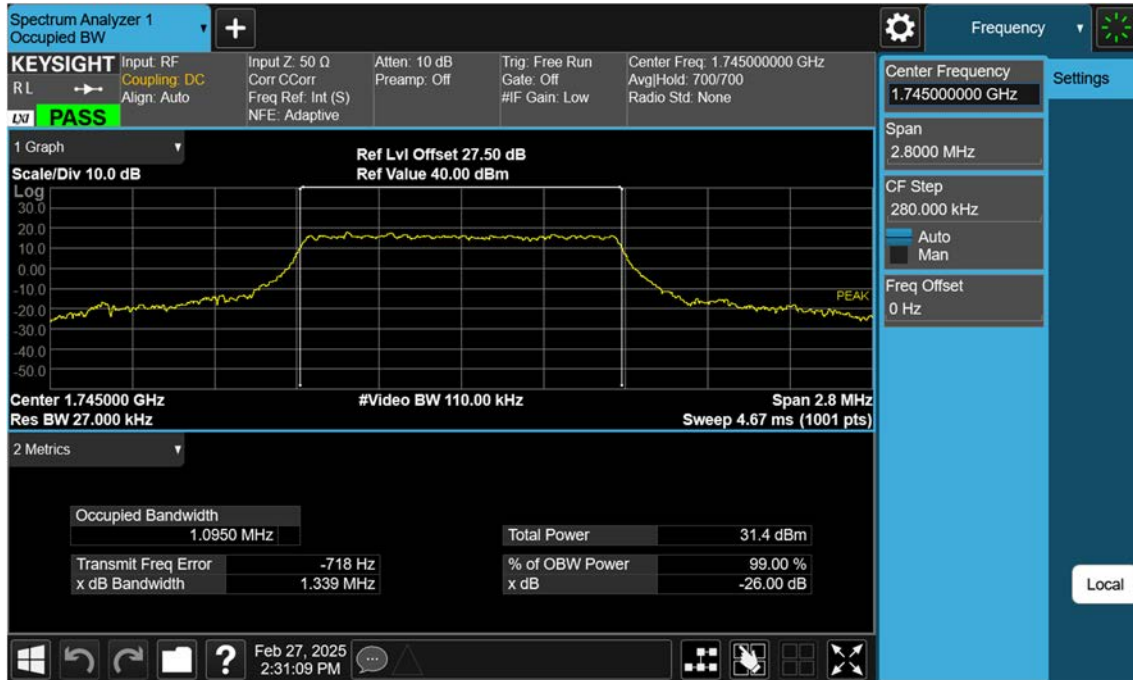
LTE B66_20 M_PAR_Mid_256QAM_FullRB



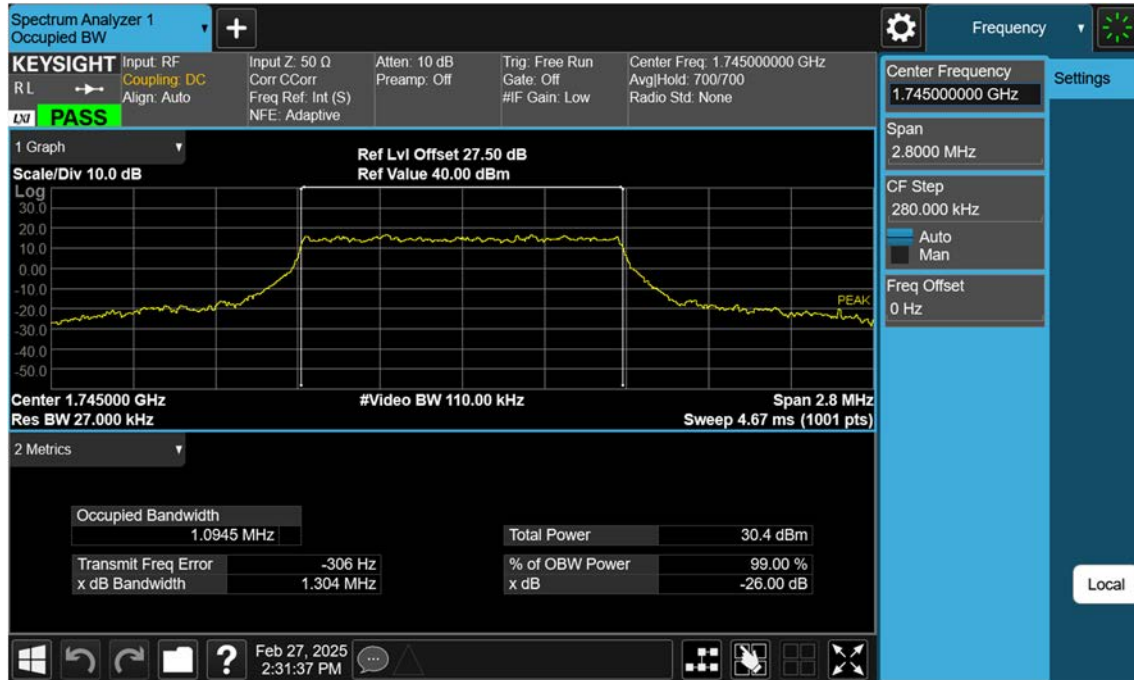
LTE B66_1.4M_OBW_Mid_QPSK_FullRB



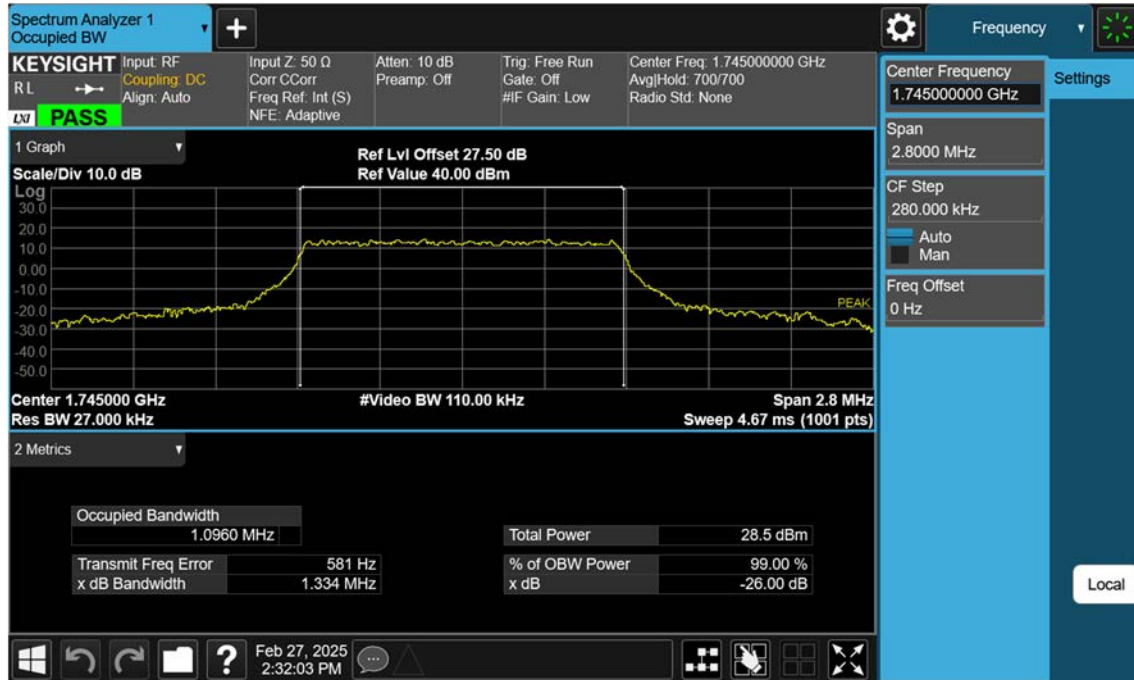
LTE B66_1.4M_OBW_Mid_16QAM_FullRB



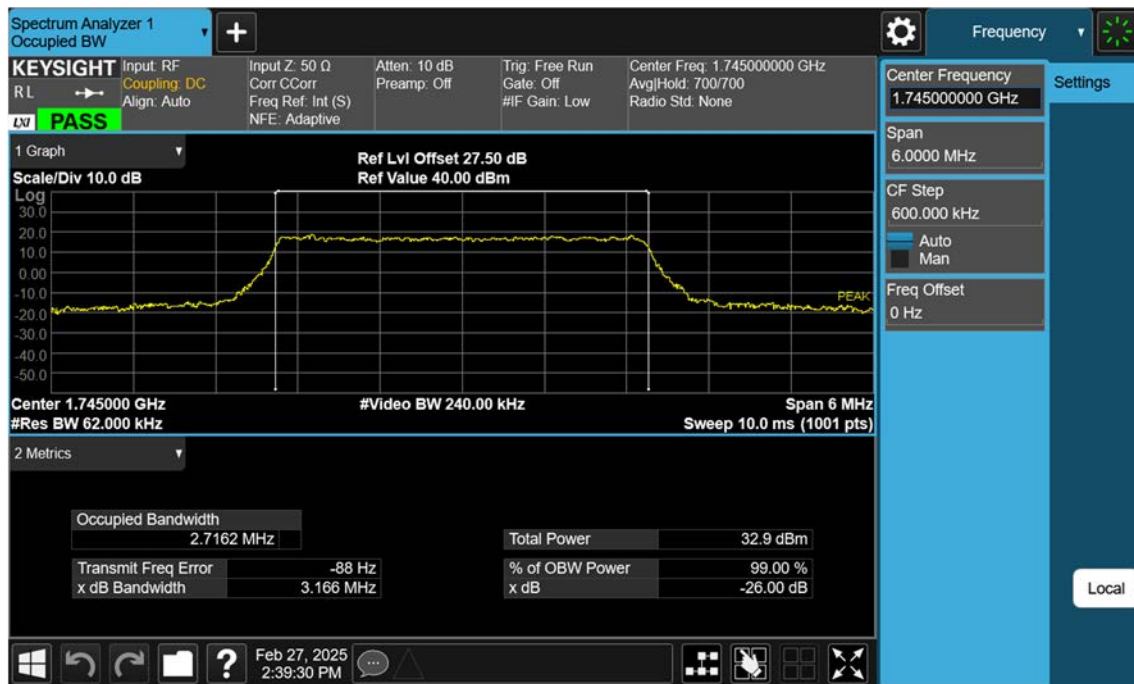
LTE B66_1.4M_OBW_Mid_64QAM_FullRB



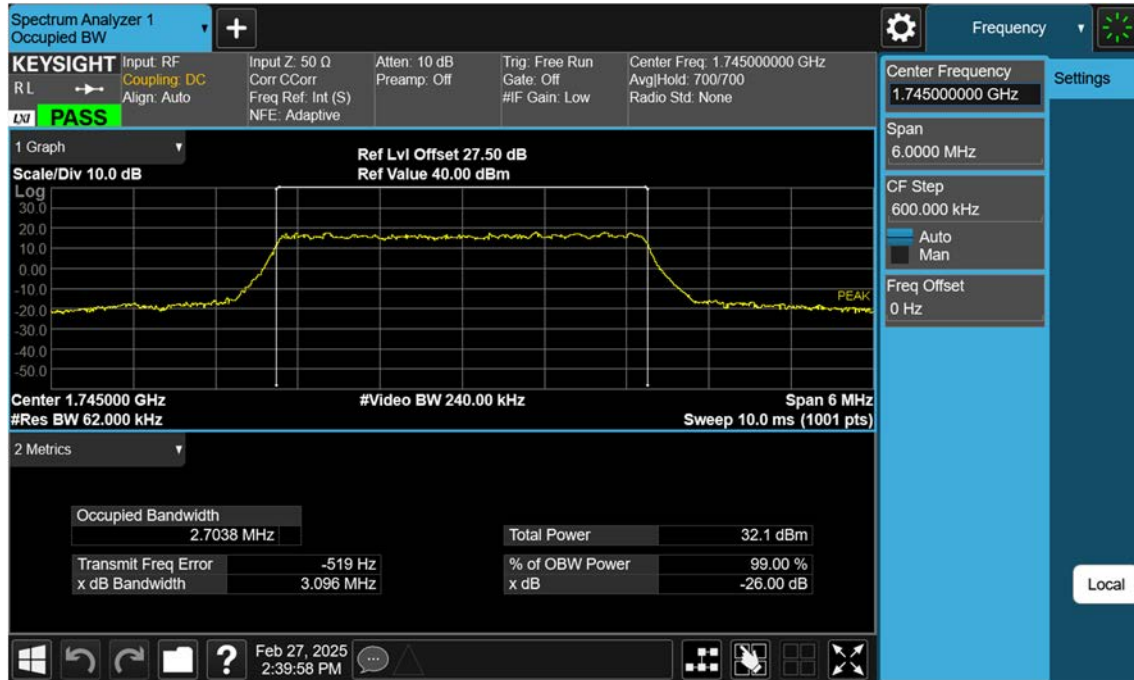
LTE B66_1.4M_OBW_Mid_256QAM_FullRB



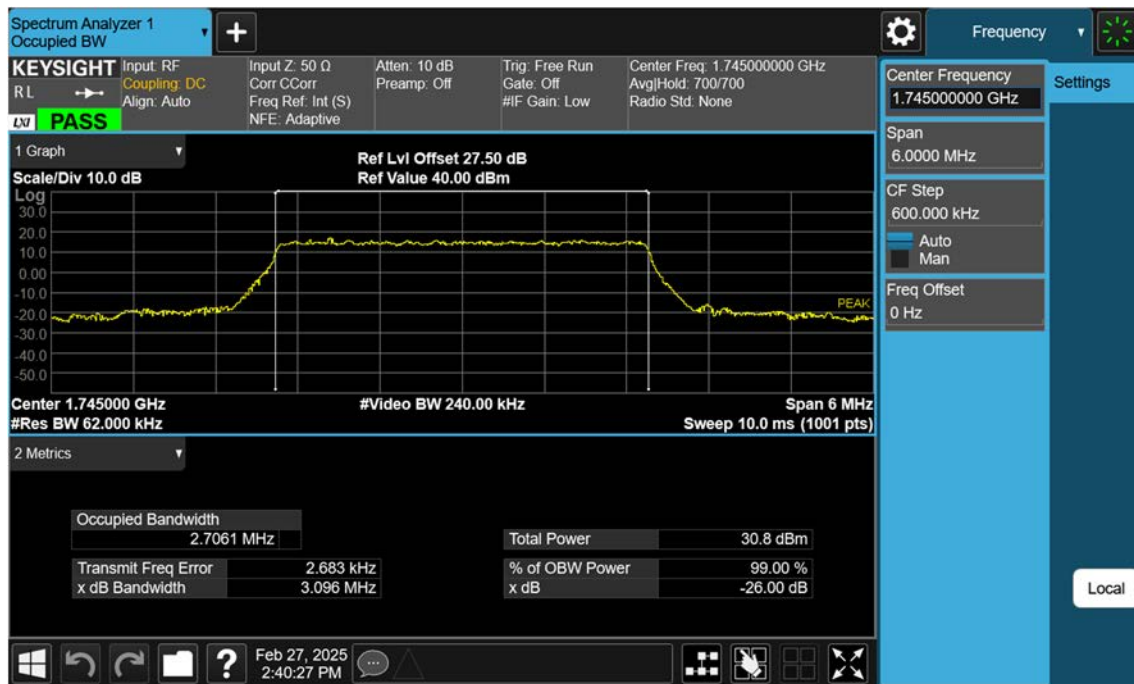
LTE B66_3 M_OBW_Mid_QPSK_FullRB



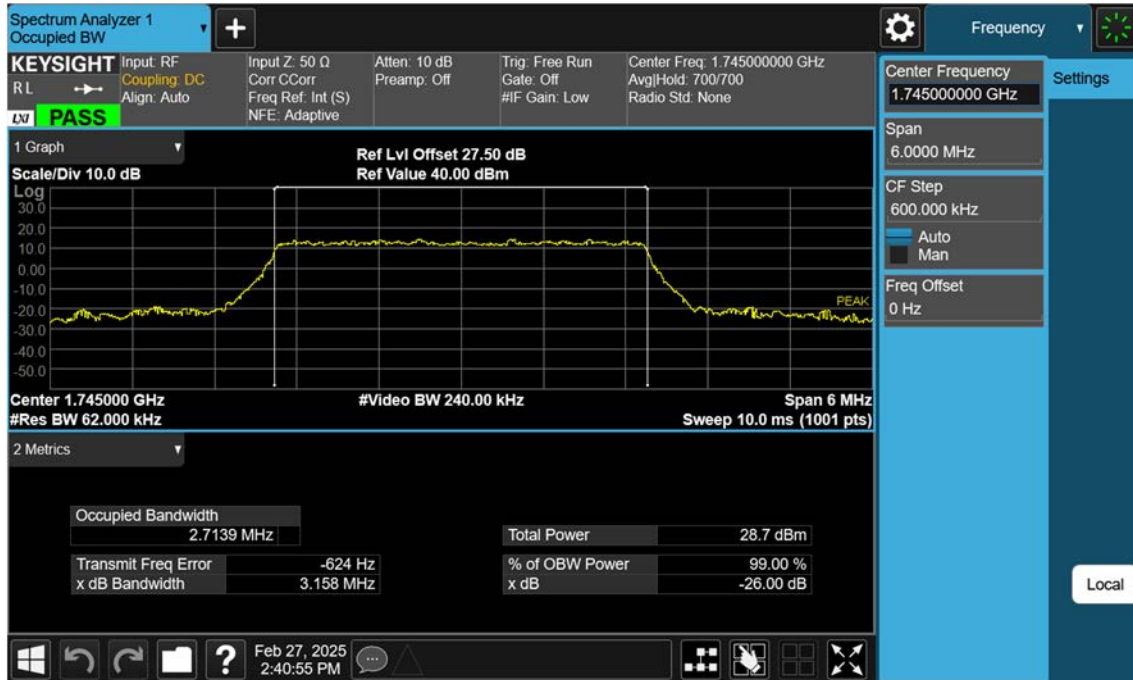
LTE B66_3 M_OBW_Mid_16QAM_FullRB



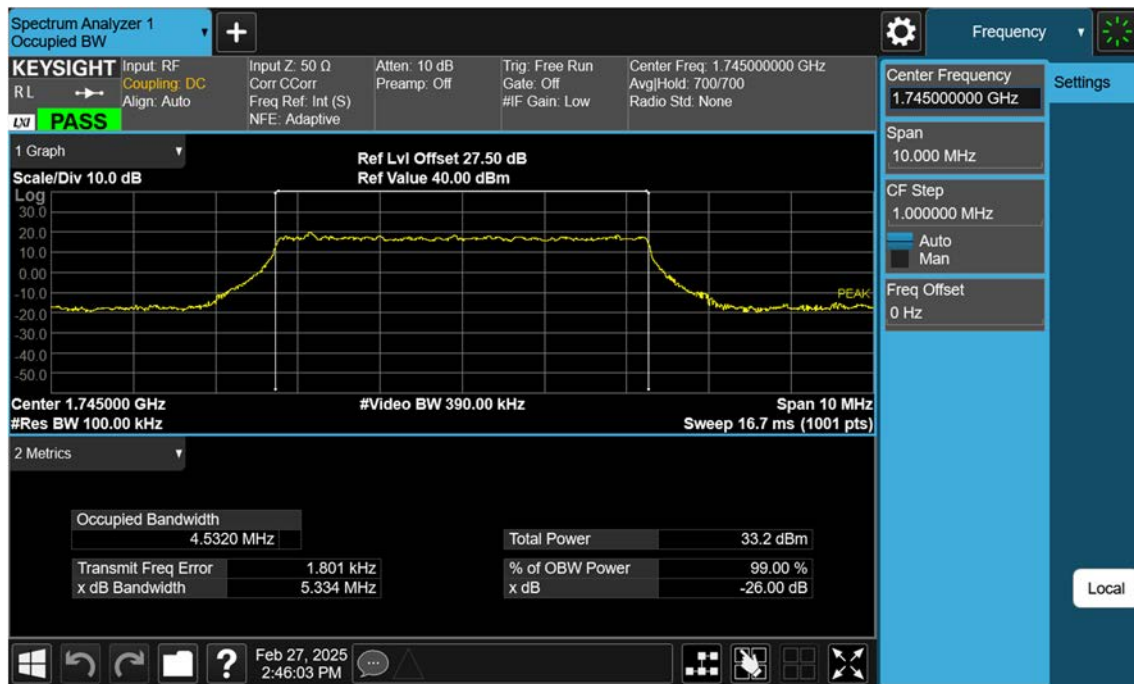
LTE B66_3 M_OBW_Mid_64QAM_FullRB



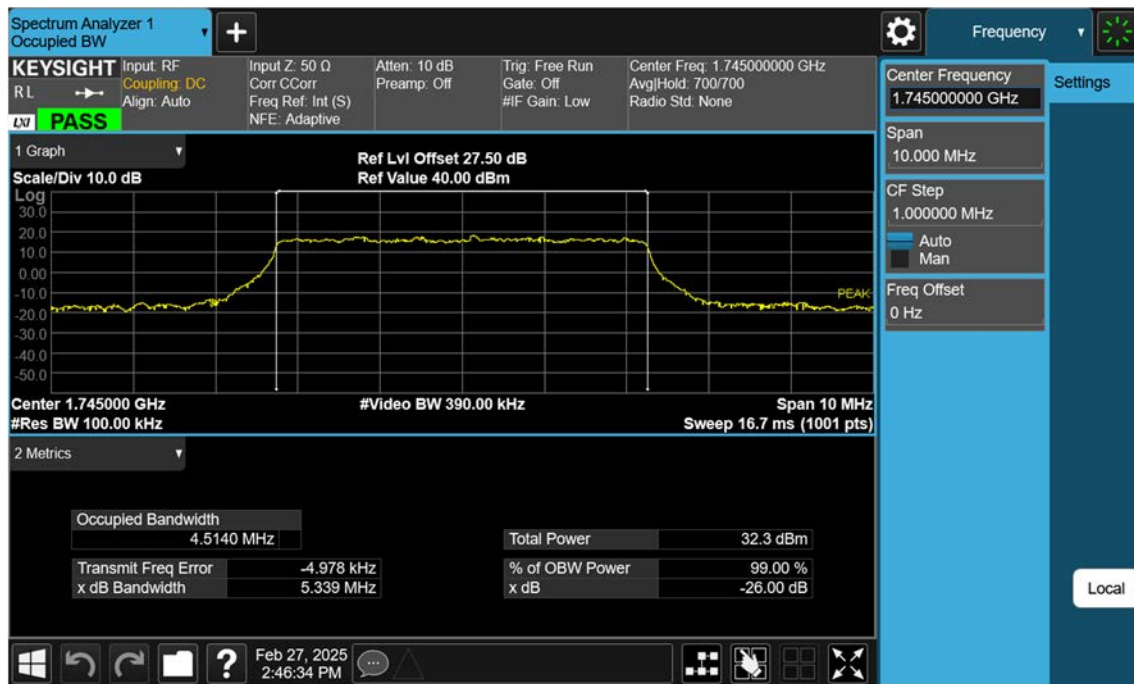
LTE B66_3 M_OBW_Mid_256QAM_FullRB



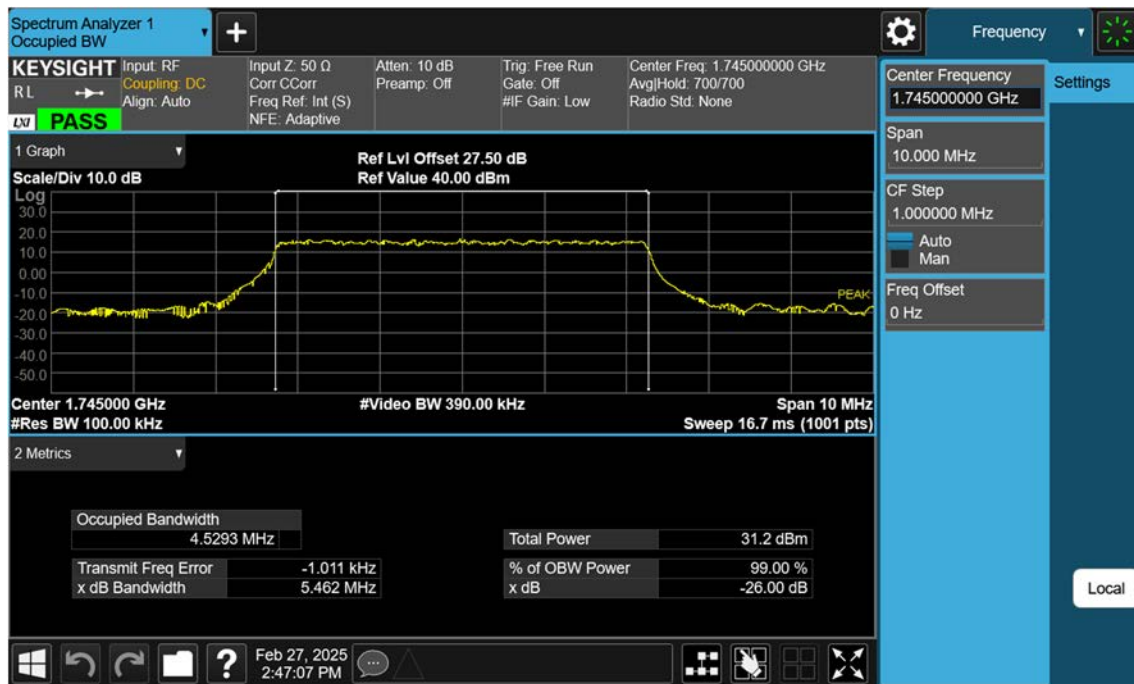
LTE B66_5 M_OBW_Mid_QPSK_FullRB



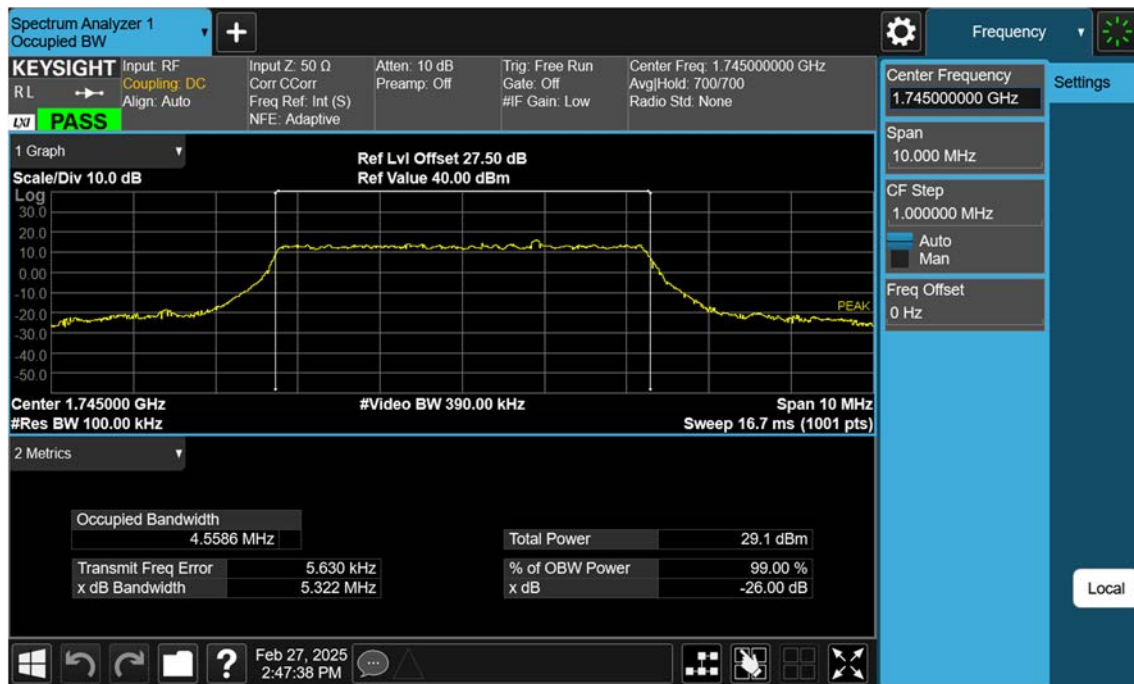
LTE B66_5 M_OBW_Mid_16QAM_FullRB



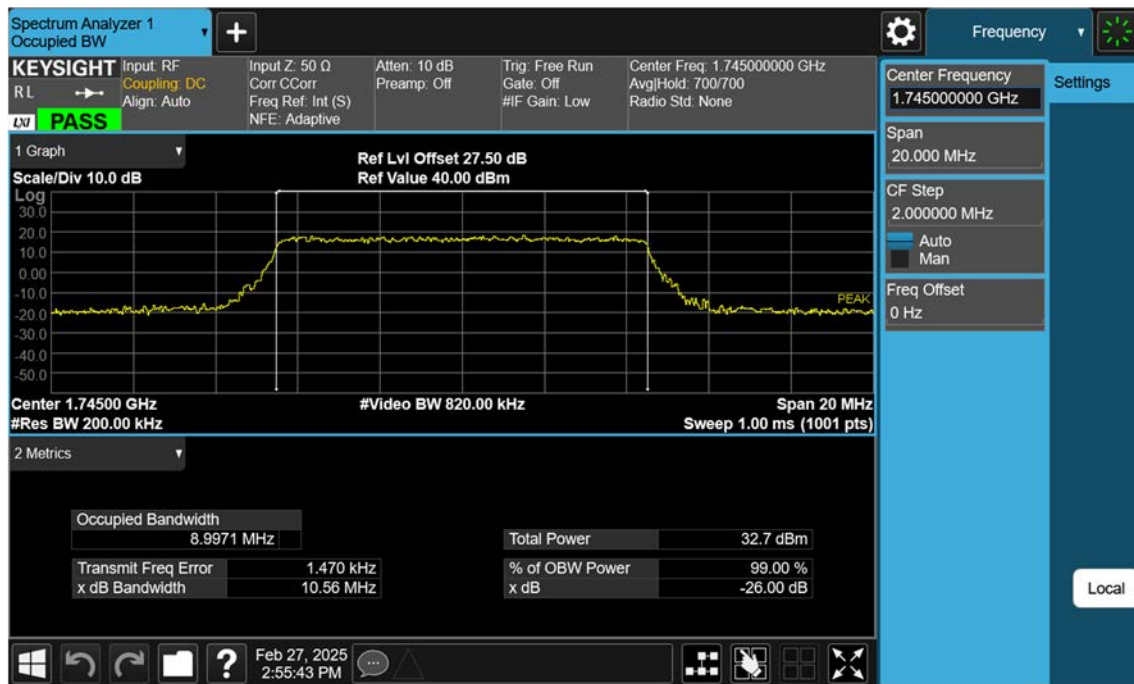
LTE B66_5 M_OBW_Mid_64QAM_FullRB



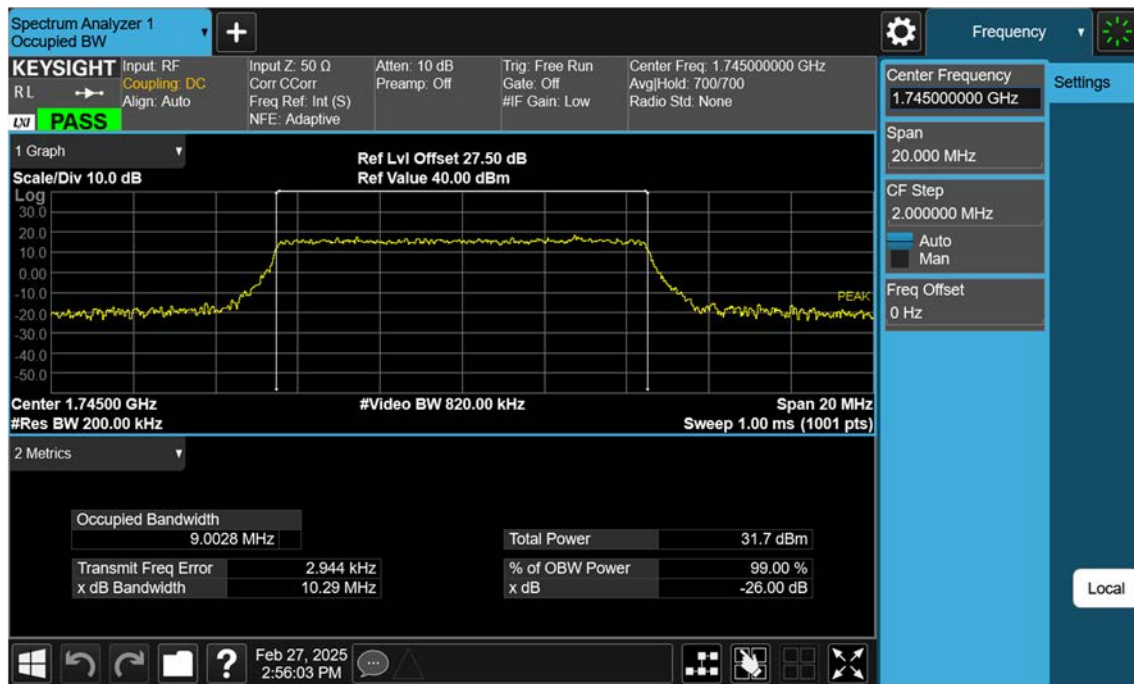
LTE B66_5 M_OBW_Mid_256QAM_FullRB



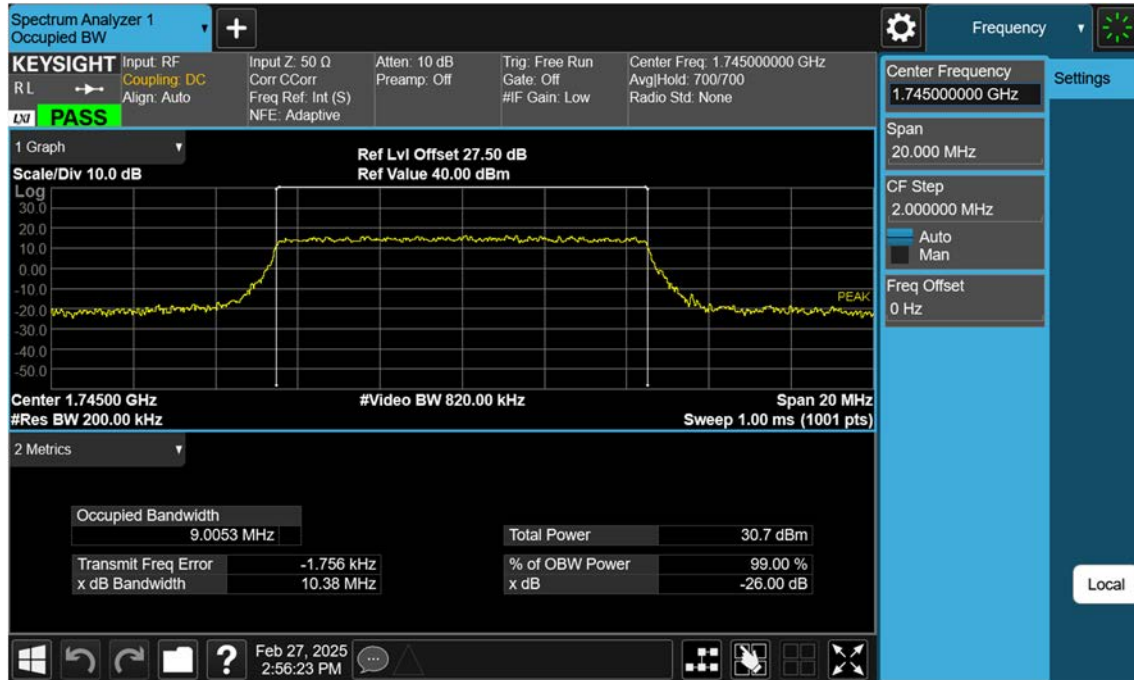
LTE B66_10 M_OBW_Mid_QPSK_FullRB



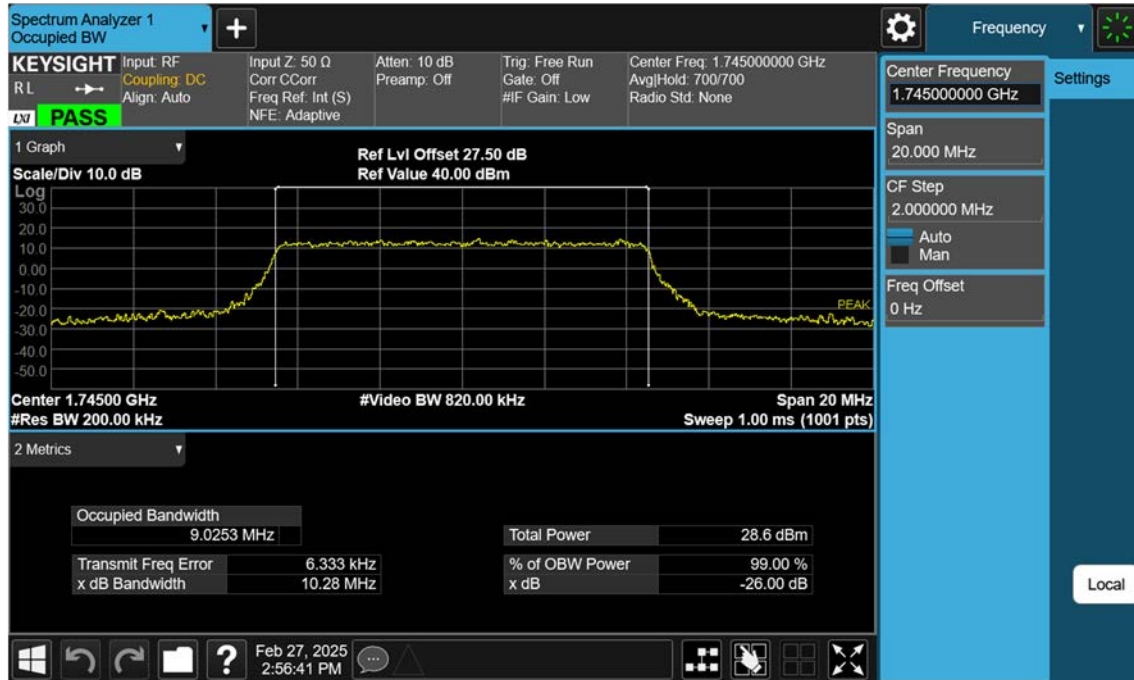
LTE B66_10 M_OBW_Mid_16QAM_FullRB



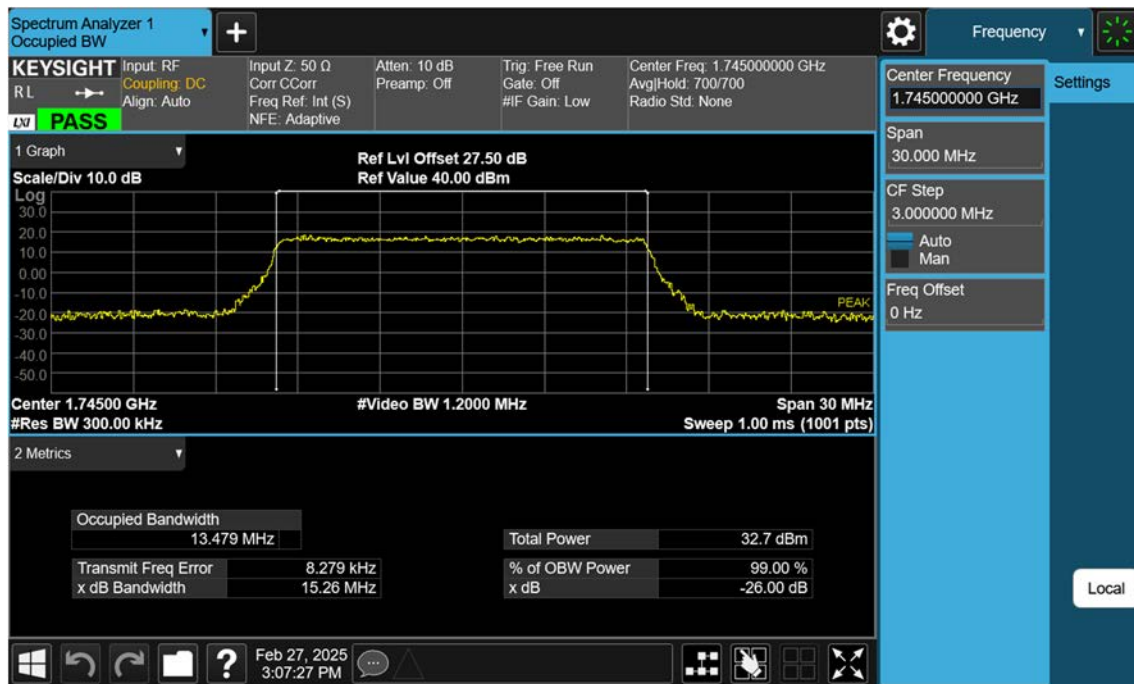
LTE B66_10 M_OBW_Mid_64QAM_FullRB



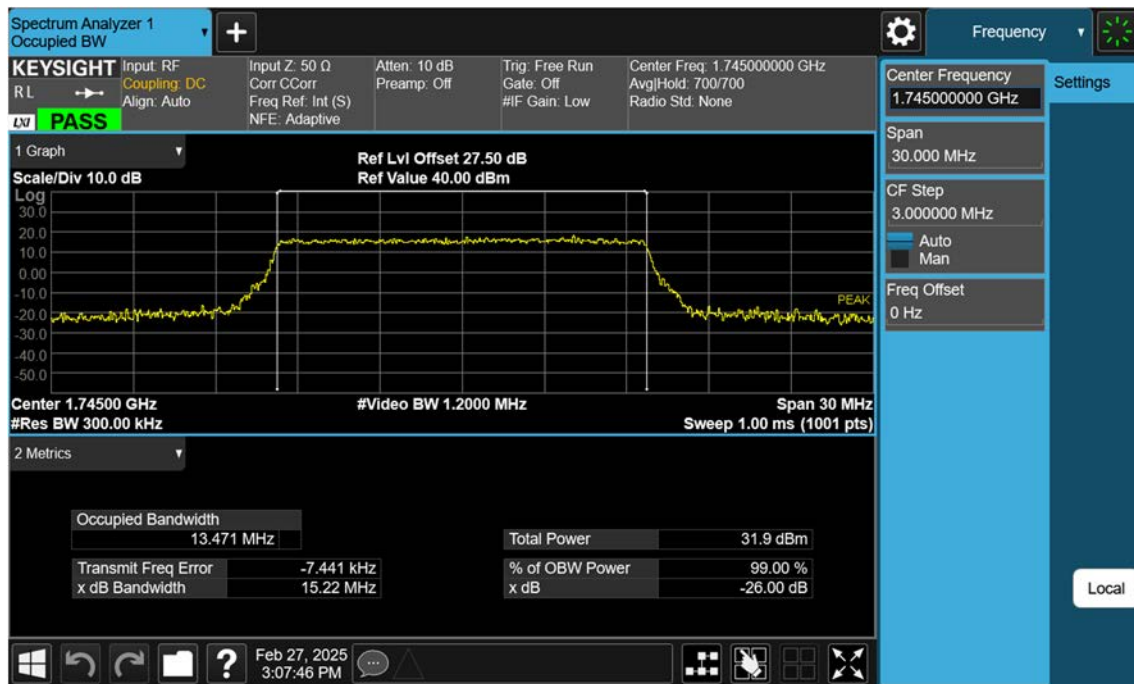
LTE B66_10 M_OBW_Mid_256QAM_FullRB



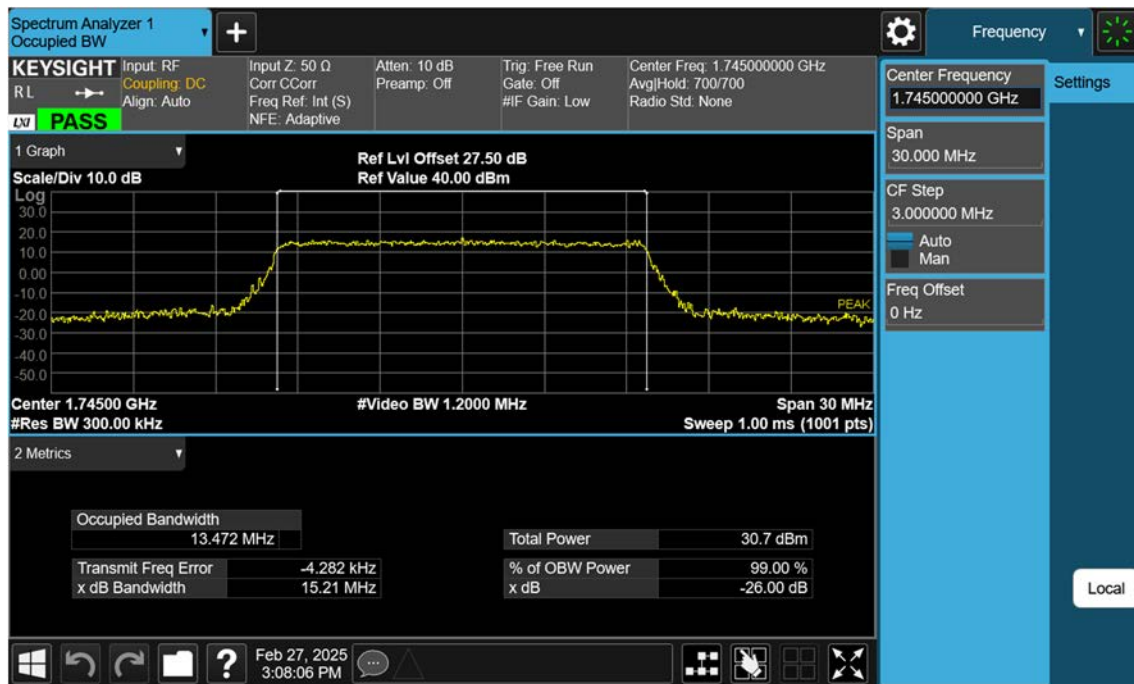
LTE B66_15 M_OBW_Mid_QPSK_FullRB



LTE B66_15 M_OBW_Mid_16QAM_FullRB



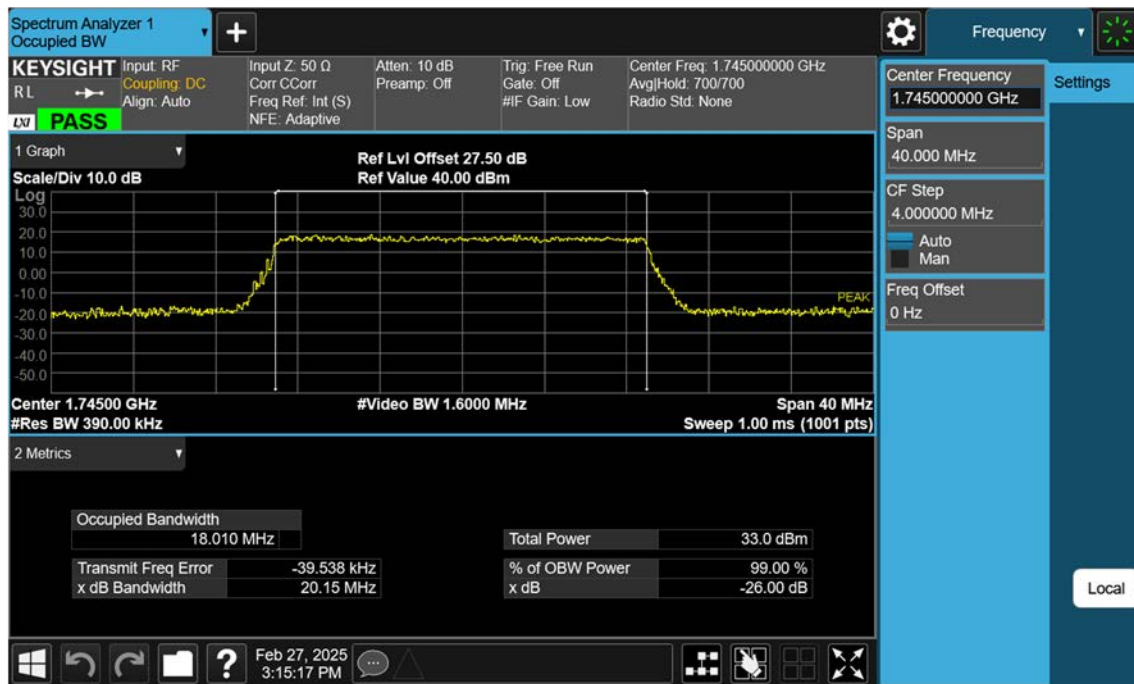
LTE B66_15 M_OBW_Mid_64QAM_FullRB



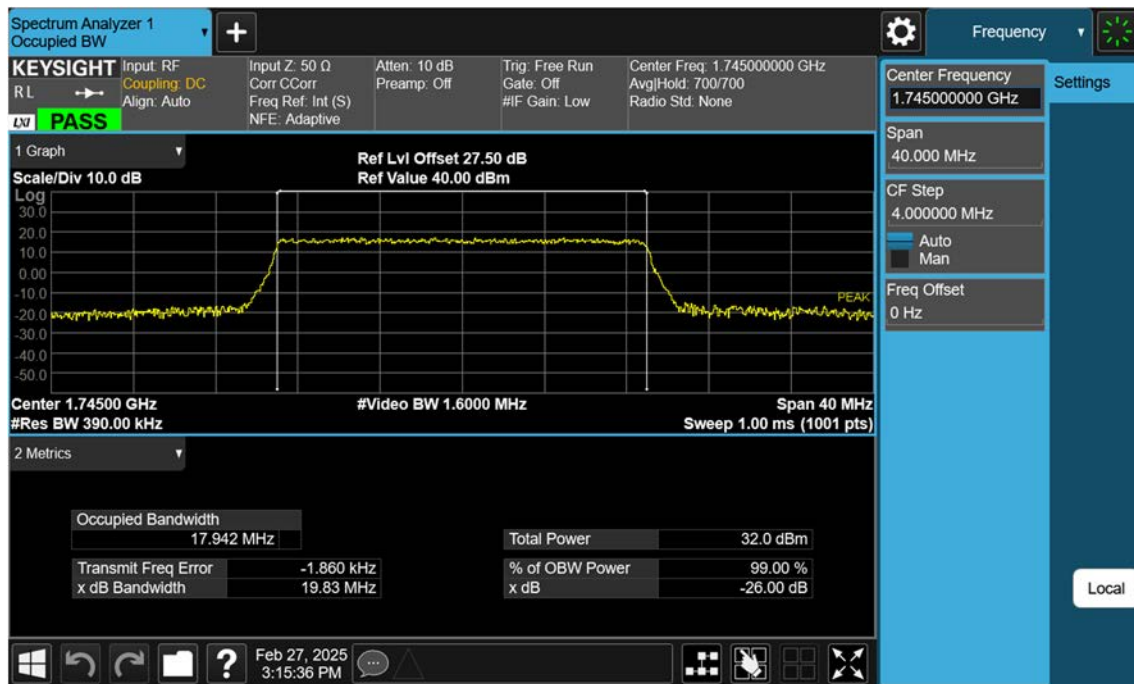
LTE B66_15 M_OBW_Mid_256QAM_FullRB



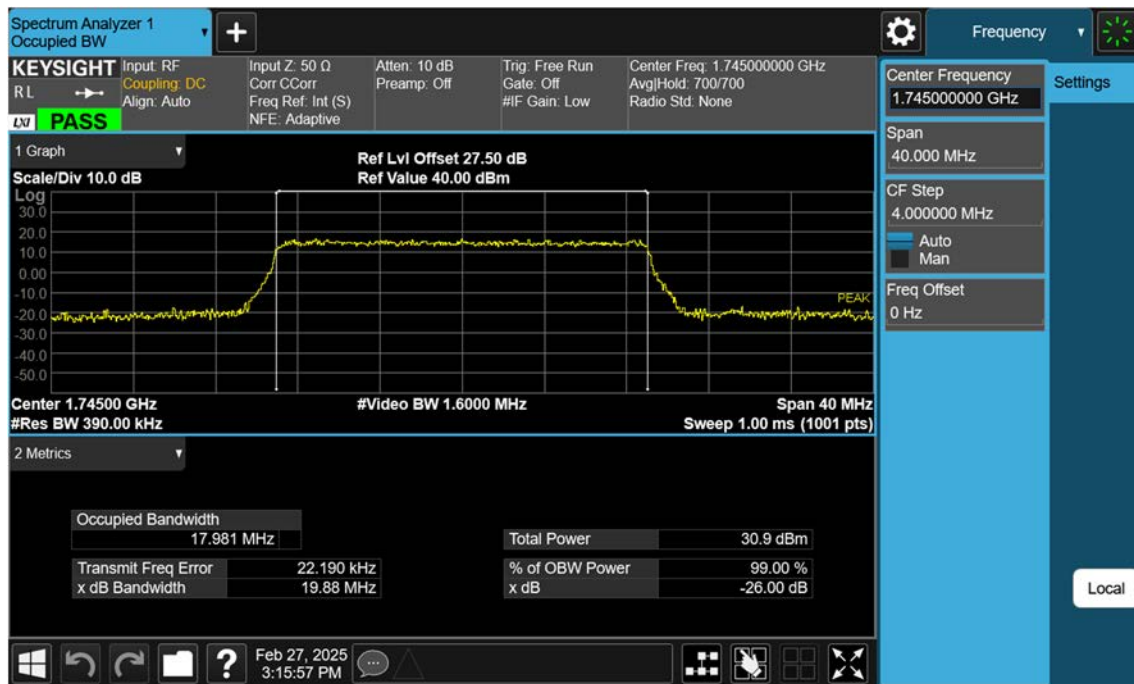
LTE B66_20 M_OBW_Mid_QPSK_FullRB



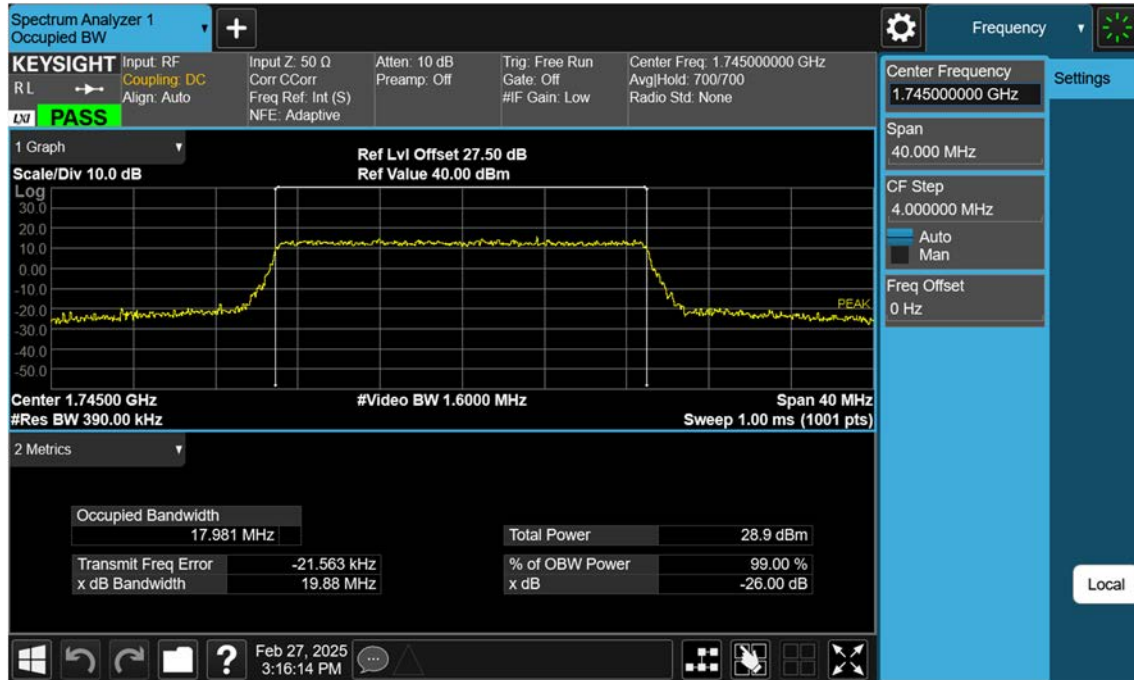
LTE B66_20 M_OBW_Mid_16QAM_FullRB



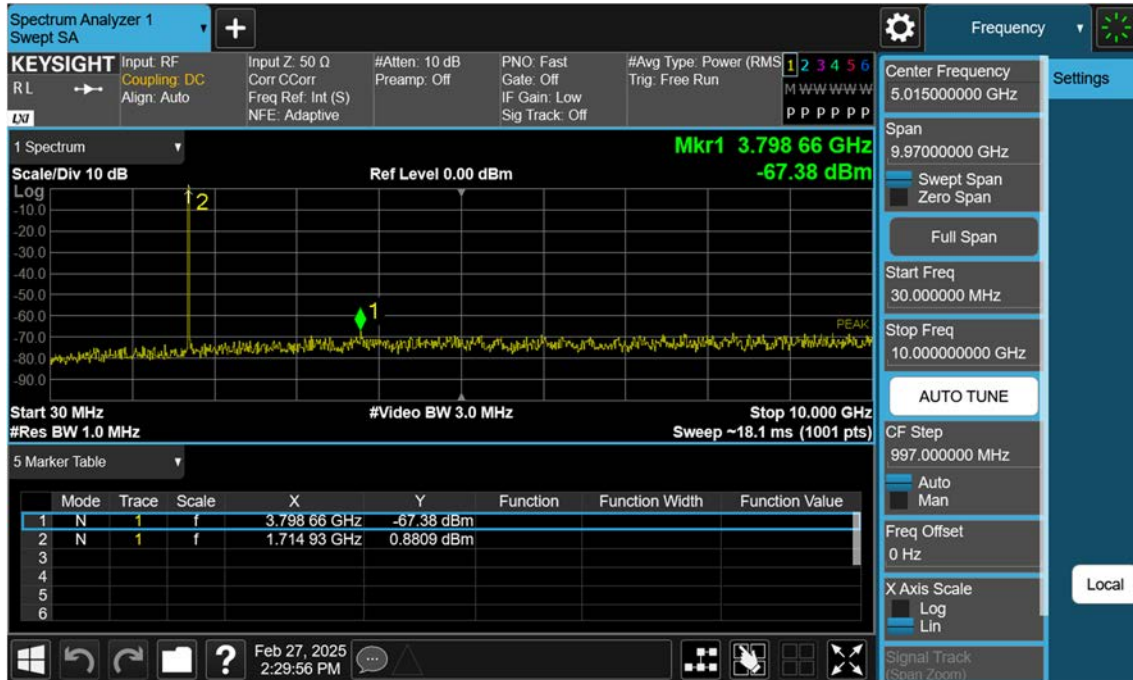
LTE B66_20 M_OBW_Mid_64QAM_FullRB



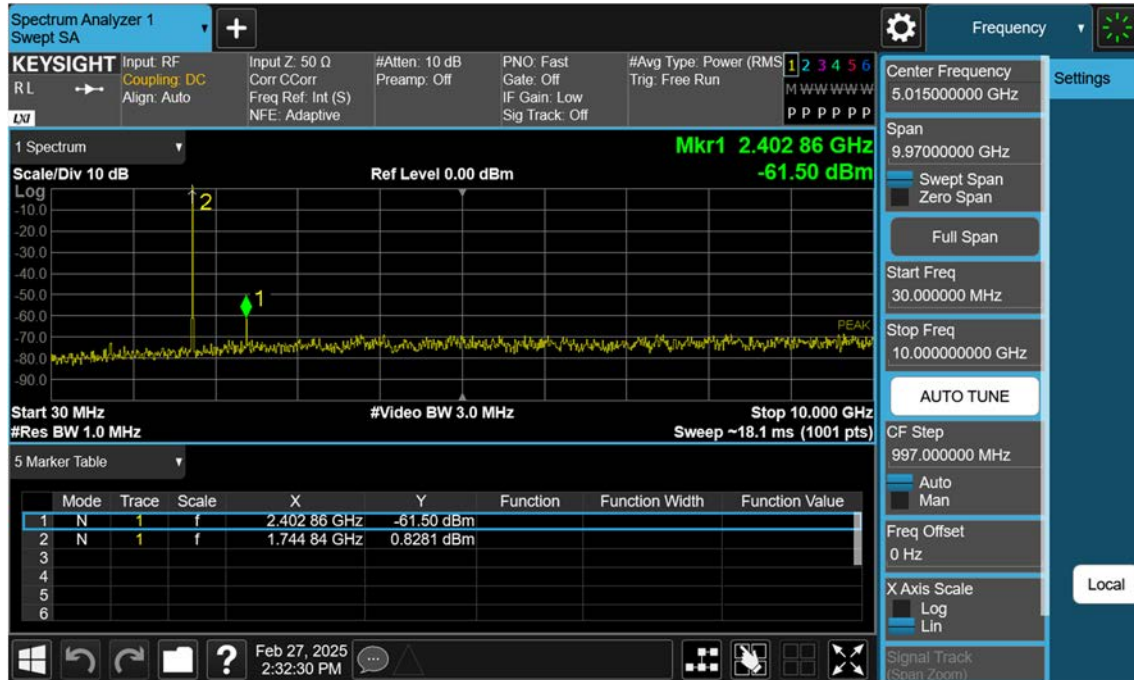
LTE B66_20 M_OBW_Mid_256QAM_FullRB



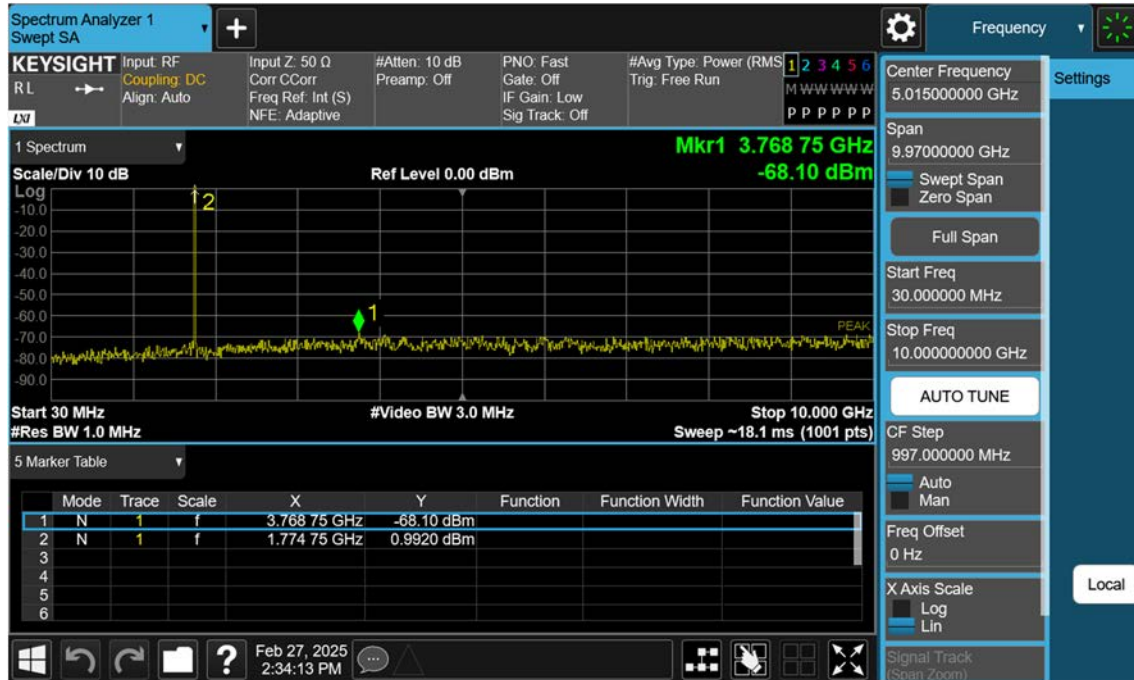
LTE B66_1.4M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



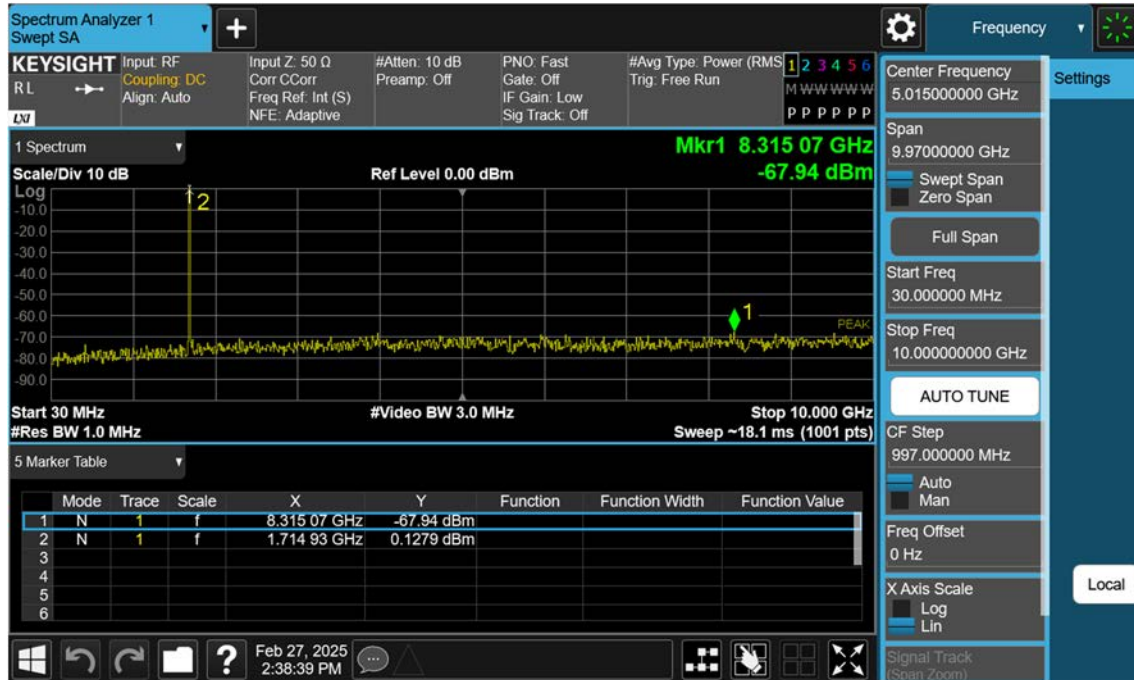
LTE B66_1.4M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



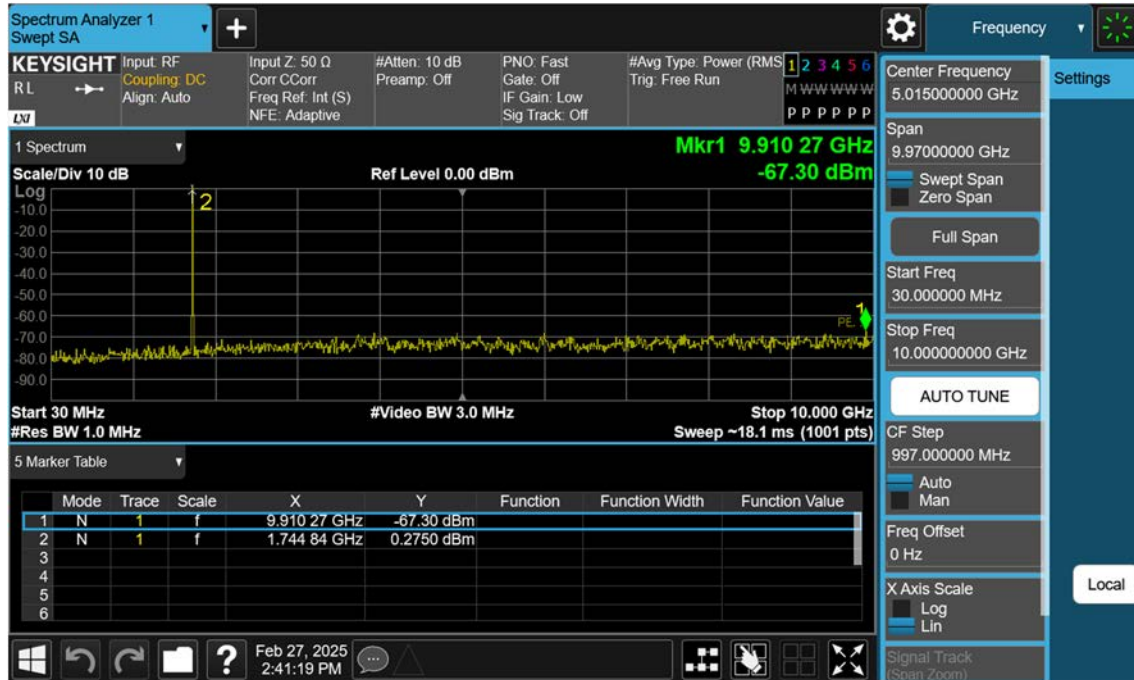
LTE B66_1.4M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB



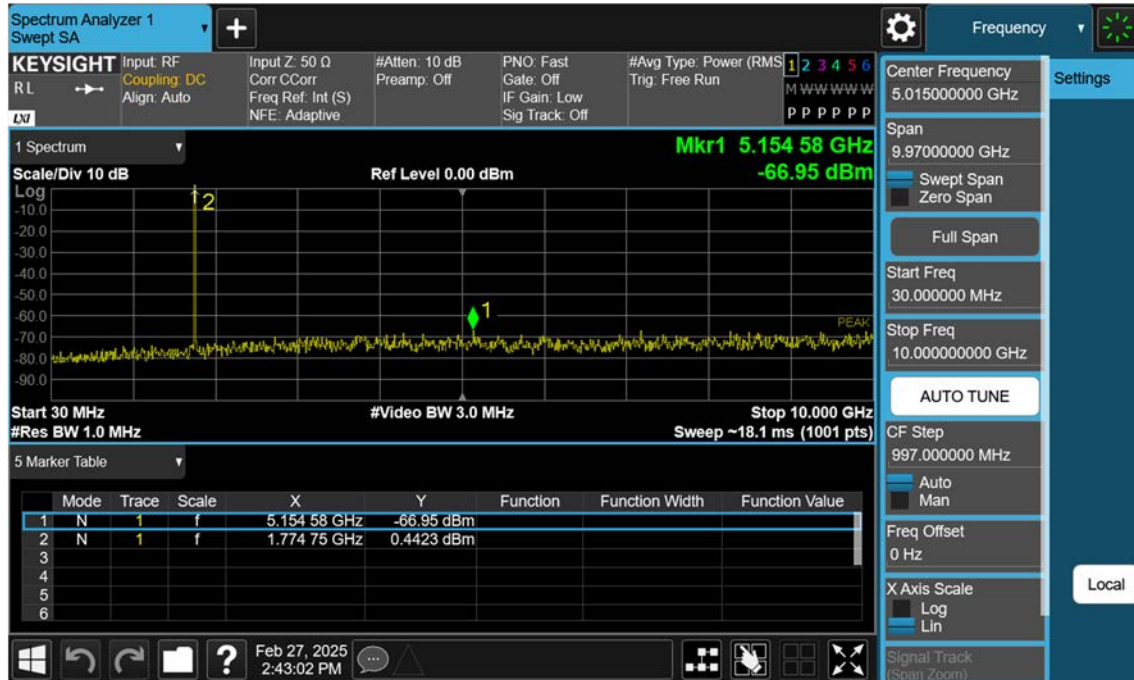
LTE B66_3 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



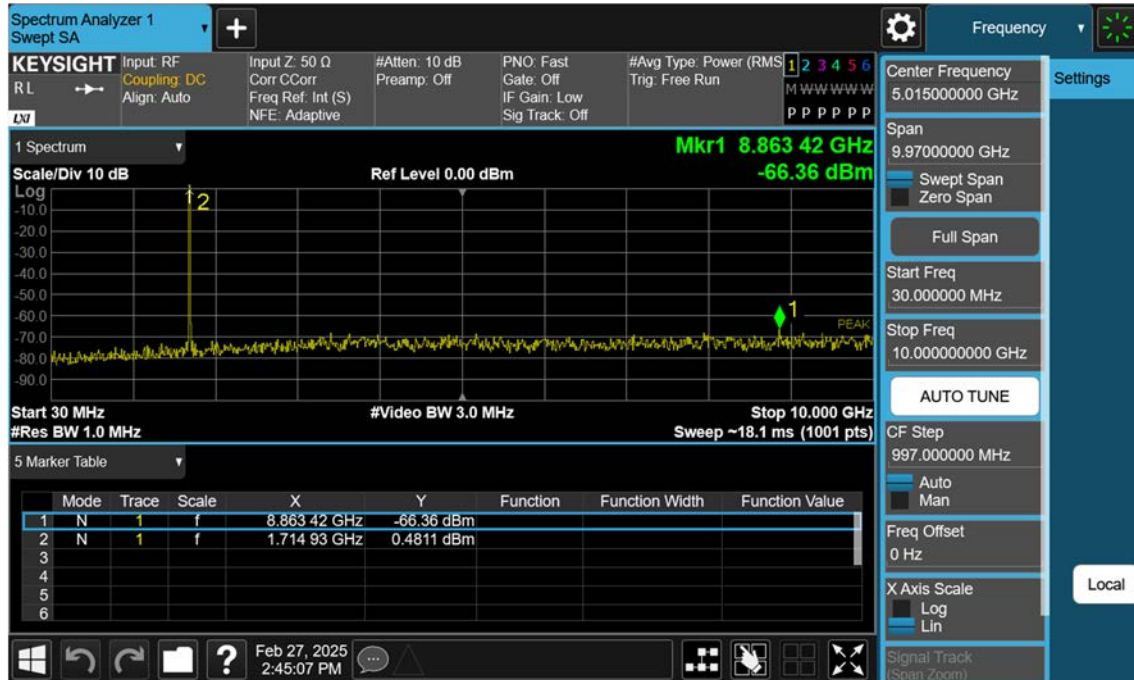
LTE B66_3 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



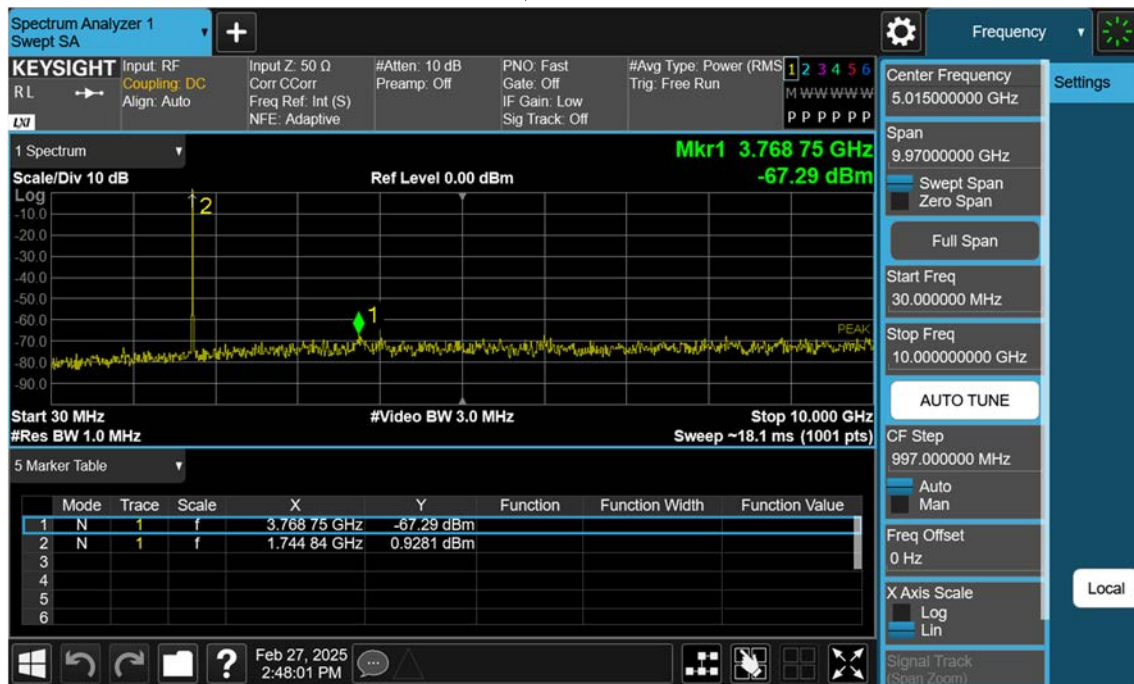
LTE B66_3 M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB



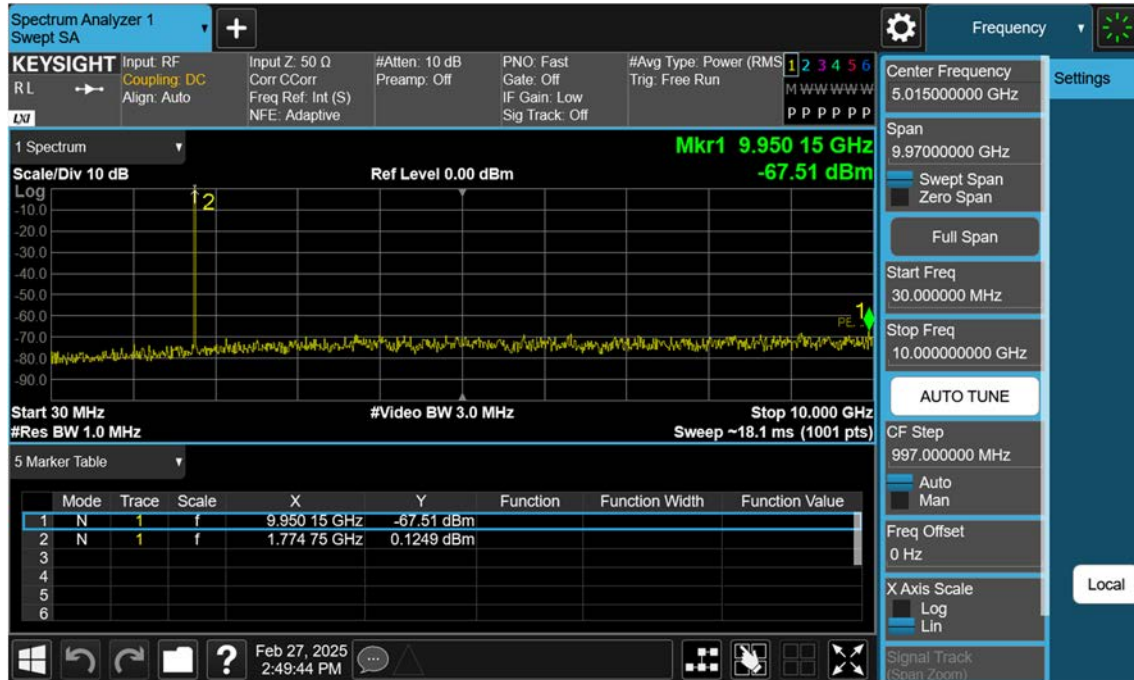
LTE B66_5 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



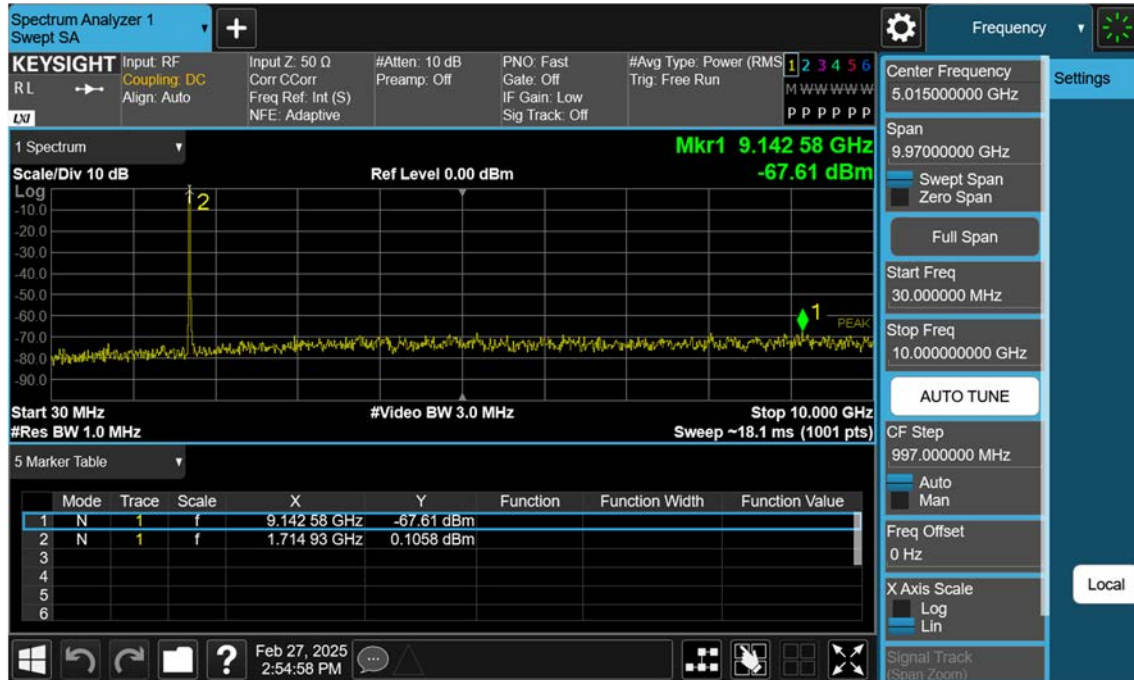
LTE B66_5 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



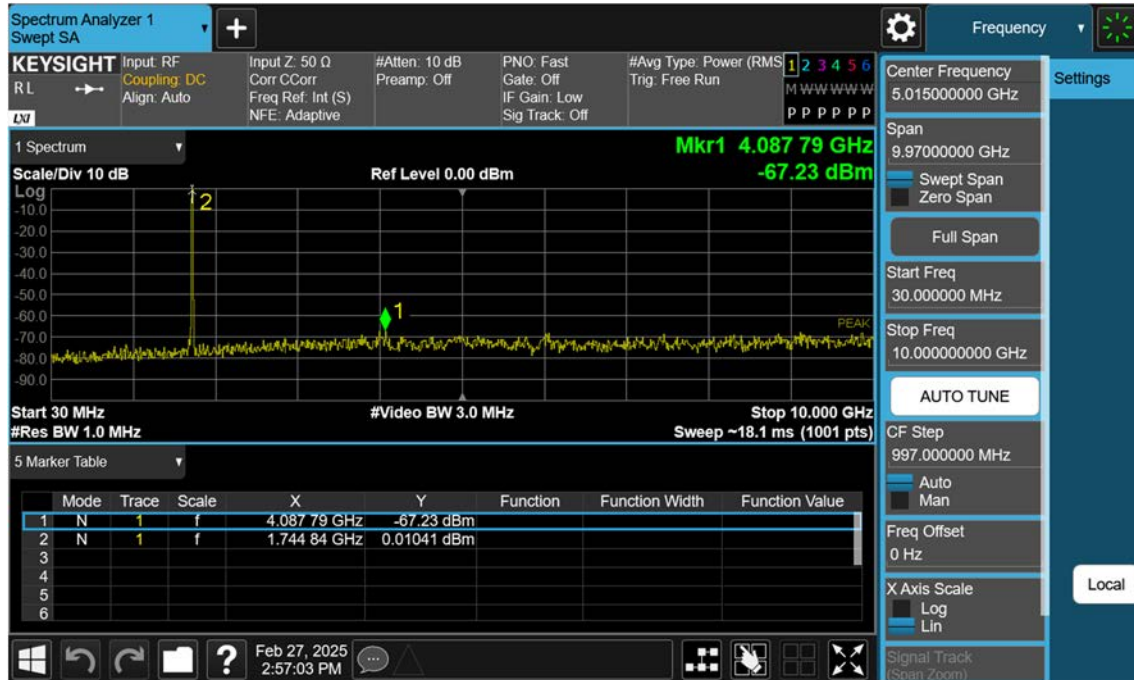
LTE B66_5 M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB



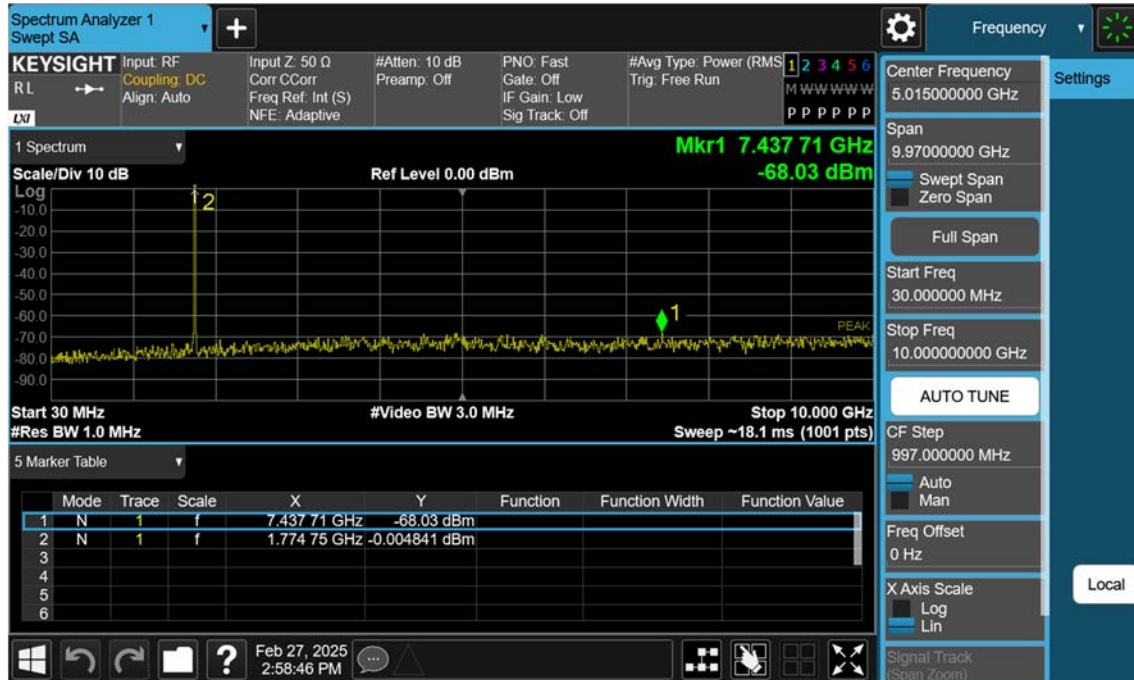
LTE B66_10 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



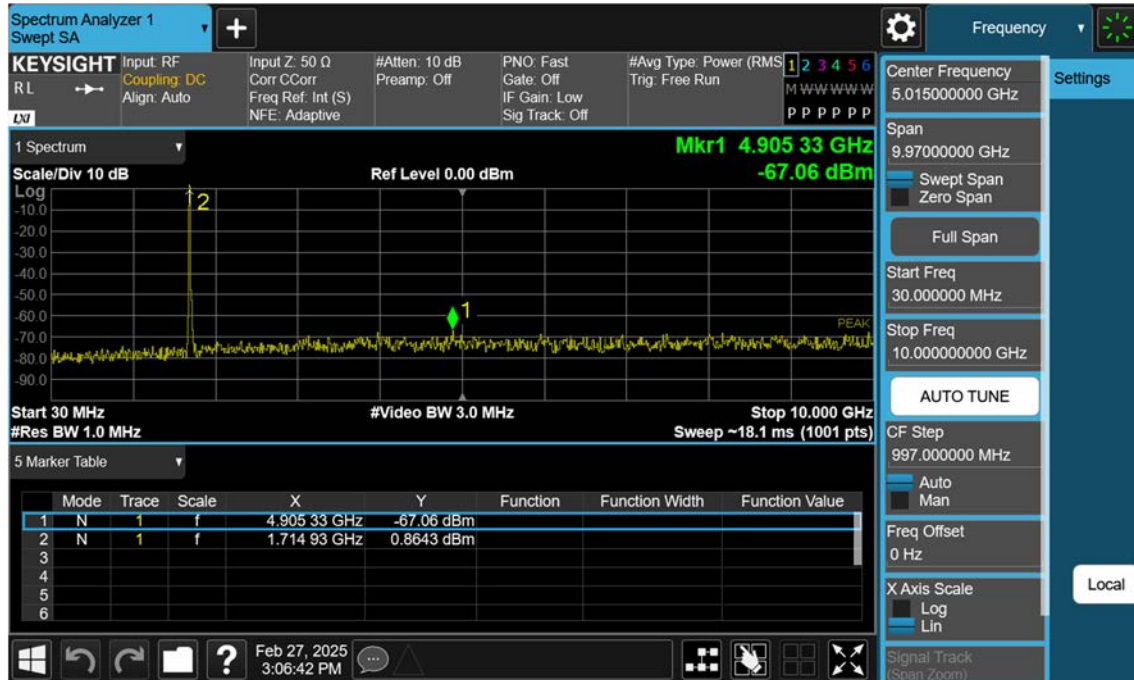
LTE B66_10 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



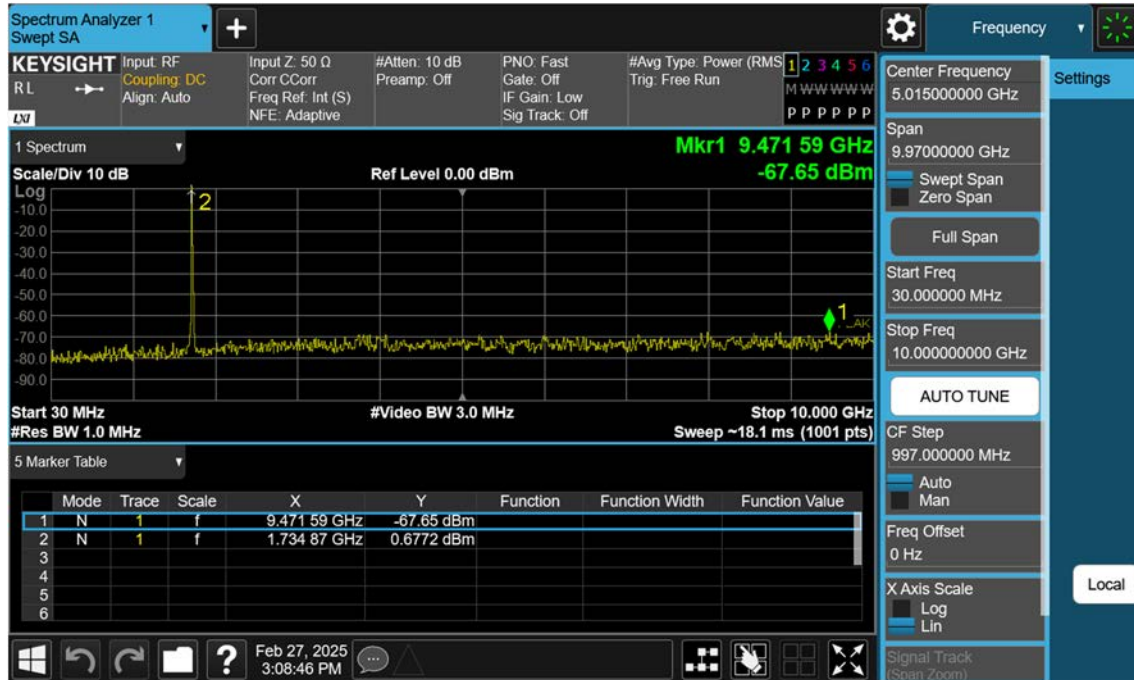
LTE B66_10 M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB



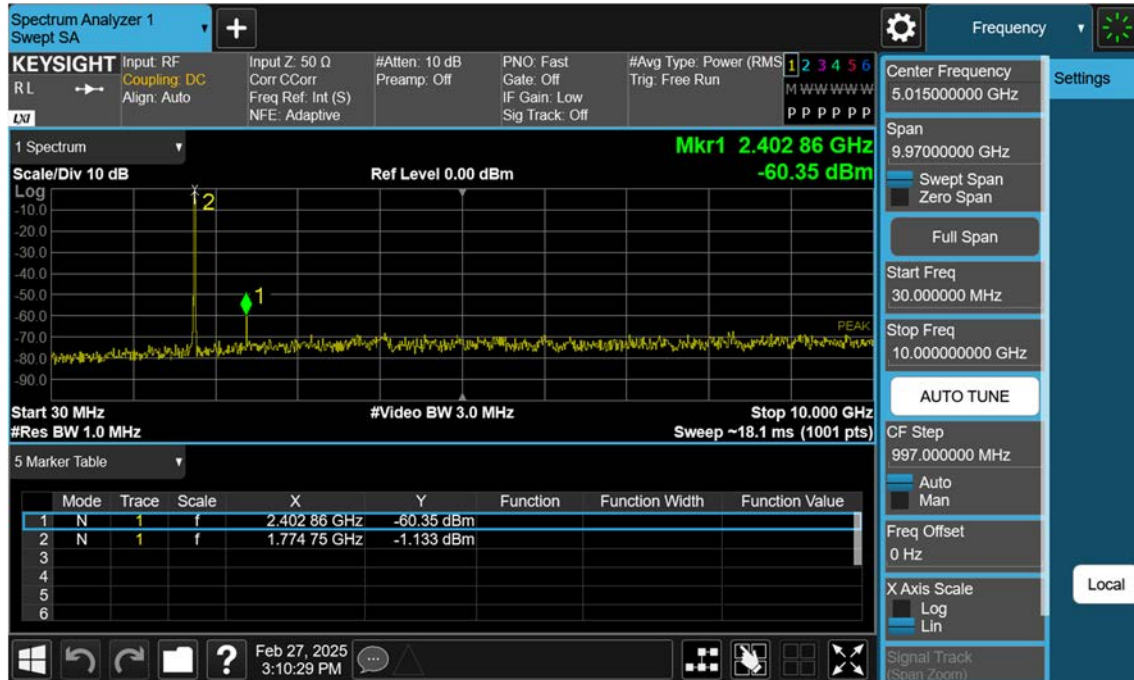
LTE B66_15 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



LTE B66_15 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



LTE B66_15 M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB



LTE B66_20 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB

