

TEST REPORT

FCC LTE B26(Part22) Test for SM-F766U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2504-FC010-R1

DATE OF ISSUE
May 23, 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-2504-FC010-R1

DATE OF ISSUE

May 23, 2025

Additional Model

SM-F766U1

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-F766U

Date of Test

February 24, 2025 ~ April 21, 2025

FCC ID

A3LSMF766U

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: § 22

Test Results

PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	April 22, 2025	Initial Release
1	May 23, 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	6
1.1 MAXIMUM OUTPUT POWER	7
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.....	13
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....	14
3.7 BAND EDGE	15
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 1 ANT).....	25
8.1 EFFECTIVE 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 1 ANT)	37
9.1 EFFECTIVE RADIATED POWER.....	37
9.2 RADIATED SPURIOUS EMISSIONS.....	40
9.3 PEAK-TO-AVERAGE RATIO	41
9.4 OCCUPIED BANDWIDTH.....	42
9.5 CONDUCTED SPURIOUS EMISSIONS	43
9.6 BAND EDGE	43

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	44
10. TEST PLOTS(Main 1 ANT).....	49
11. TEST PLOTS(Sub 1 ANT)	135
12. ANNEX A_ TEST SETUP PHOTO	221

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:	A3LSMF766U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 22
EUT Type:	Mobile Phone
Model(s):	SM-F766U
Additional Model(s)	SM-F766U1
Tx Frequency:	824.7 MHz – 848.3 MHz (LTE – Band 26 (1.4 MHz)) 825.5 MHz – 847.5 MHz (LTE – Band 26 (3 MHz)) 826.5 MHz – 846.5 MHz (LTE – Band 26 (5 MHz)) 829.0 MHz – 844.0 MHz (LTE – Band 26 (10 MHz)) 831.5 MHz – 841.5 MHz (LTE – Band 26 (15 MHz))
Date(s) of Tests:	February 24, 2025 ~ April 21, 2025
Serial number:	Radiated : R3CY209A7NT (Main 1 ANT), R3CY207MAGN(Sub 1 ANT) Conducted : R3CY209A7CH (Main 1 ANT), R3CY209A7FF (Sub 1 ANT)
Antenna Information	Please refer to the Antenna Specification document.

1.1 MAXIMUM OUTPUT POWER

Main 1 ANT

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	ERP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band 26 (1.4)	824.7 – 848.3	1M09G7D	QPSK	0.119	20.76
		1M09W7D	16QAM	0.099	19.94
		1M10W7D	64QAM	0.075	18.76
		1M09W7D	256QAM	0.037	15.68
LTE – Band 26 (3)	825.5 – 847.5	2M73G7D	QPSK	0.123	20.90
		2M70W7D	16QAM	0.101	20.04
		2M71W7D	64QAM	0.077	18.87
		2M72W7D	256QAM	0.039	15.86
LTE – Band 26 (5)	826.5 – 846.5	4M54G7D	QPSK	0.118	20.73
		4M52W7D	16QAM	0.099	19.96
		4M54W7D	64QAM	0.076	18.81
		4M56W7D	256QAM	0.037	15.71
LTE – Band 26 (10)	829.0 – 844.0	9M01G7D	QPSK	0.133	21.23
		8M99W7D	16QAM	0.110	20.41
		8M99W7D	64QAM	0.085	19.31
		9M02W7D	256QAM	0.042	16.22
LTE – Band 26 (15)	831.5 – 841.5	13M5G7D	QPSK	0.118	20.73
		13M5W7D	16QAM	0.099	19.95
		13M5W7D	64QAM	0.076	18.83
		13M5W7D	256QAM	0.038	15.75

Sub 1 ANT

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	ERP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band 26 (1.4)	824.7 – 848.3	1M10G7D	QPSK	0.045	16.53
		1M09W7D	16QAM	0.038	15.77
		1M10W7D	64QAM	0.029	14.63
		1M09W7D	256QAM	0.014	11.49
LTE – Band 26 (3)	825.5 – 847.5	2M72G7D	QPSK	0.045	16.53
		2M71W7D	16QAM	0.038	15.78
		2M71W7D	64QAM	0.029	14.65
		2M71W7D	256QAM	0.014	11.51
LTE – Band 26 (5)	826.5 – 846.5	4M54G7D	QPSK	0.045	16.55
		4M52W7D	16QAM	0.037	15.73
		4M53W7D	64QAM	0.029	14.61
		4M57W7D	256QAM	0.014	11.47
LTE – Band 26 (10)	829.0 – 844.0	9M00G7D	QPSK	0.045	16.49
		9M01W7D	16QAM	0.037	15.65
		9M02W7D	64QAM	0.028	14.54
		9M00W7D	256QAM	0.014	11.49
LTE – Band 26 (15)	831.5 – 841.5	13M5G7D	QPSK	0.042	16.28
		13M5W7D	16QAM	0.036	15.52
		13M5W7D	64QAM	0.027	14.39
		13M5W7D	256QAM	0.013	11.28

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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $> 2 \times$ span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 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;

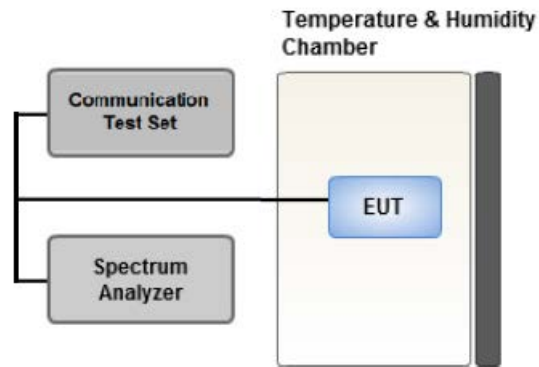
$$\text{Result}_{(\text{dBm})} = P_{\text{g}}_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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



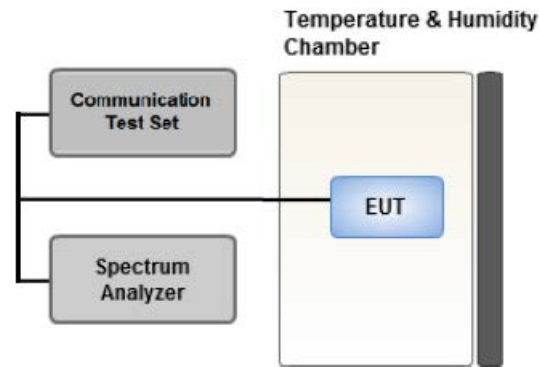
Test setup

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 %.

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.

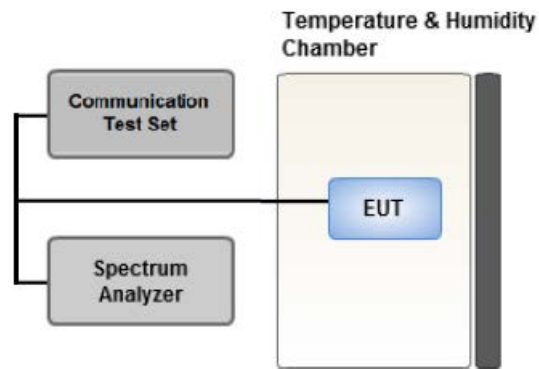
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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.

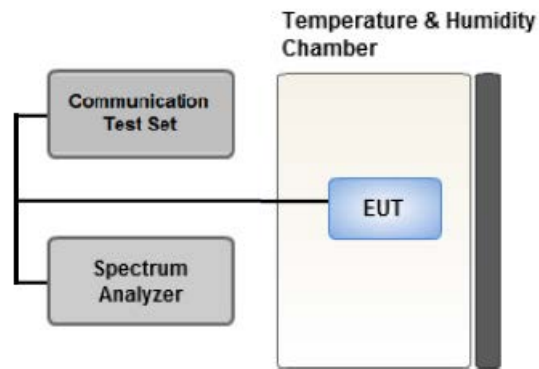
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 x Span / RBW

3.7 BAND EDGE



Test setup

Test Overview

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

Test Settings

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

Test Notes

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

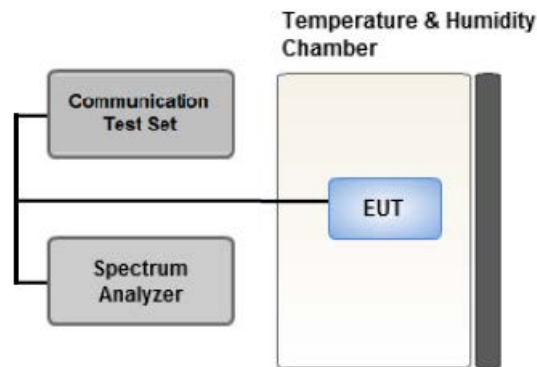
In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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

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

Where $\text{Margin} < 1$ dB the emission level is either corrected by $10 \log(1 \text{ MHz} / \text{RB})$ 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, Keyboard, 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 : 10 MHz(Main 1 ANT), 5 MHz(Sub 1 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, and paging service configurations shown in the test data
- Please refer to the table below.
- SM-F766U & additional models were tested and the worst case results are reported.
(Worst case : SM- SM-F766U)

[Main 1 ANT Worst case]

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

[Sub 1 ANT Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective 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.
 - SM-F766U & additional models were tested and the worst case results are reported.
- (Worst case : SM- SM-F766U)

[Worst case]

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

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacture	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	03197	11/28/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	03201	11/28/2025	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	ROHDE & SCHWARZ	101733	09/19/2025	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
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 Analyzer(2 Hz ~ 50.0 GHz)	N9040B	KEYSIGHT	US55230216	12/09/2025	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, § 22.917(a)	$< 43 + 10\log_{10} (P[\text{Watts}])$ 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	§ 22.913(d)	$< 13 \text{ dB}$	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 22.355	$< 2.5 \text{ ppm}$	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§ 22.913(a)(5)	$< 7 \text{ Watts max. ERP}$	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 22.917(a)	$< 43 + 10\log_{10} (P[\text{Watts}])$ for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

- 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 1 ANT)

8.1 EFFECTIVE RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.7	LTE 26 (1.4 MHz)	QPSK	-30.84	32.15	-9.95	1.44	H	< 7.00	0.119	20.76	1	0
		16-QAM	-31.66	31.33	-9.95	1.44	H		0.099	19.94		
		64-QAM	-32.84	30.15	-9.95	1.44	H		0.075	18.76		
		256-QAM	-35.92	27.07	-9.95	1.44	H		0.037	15.68		
836.5		QPSK	-31.83	31.03	-9.90	1.45	H		0.093	19.68	1	0
		16-QAM	-32.70	30.16	-9.90	1.45	H		0.076	18.81		
		64-QAM	-33.90	28.96	-9.90	1.45	H		0.058	17.61		
		256-QAM	-36.87	25.99	-9.90	1.45	H		0.029	14.64		
848.3		QPSK	-32.75	30.34	-9.85	1.45	H		0.080	19.04	1	0
		16-QAM	-33.57	29.52	-9.85	1.45	H		0.066	18.22		
		64-QAM	-34.72	28.37	-9.85	1.45	H		0.051	17.07		
		256-QAM	-37.83	25.26	-9.85	1.45	H		0.025	13.96		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
825.5	LTE 26 (3 MHz)	QPSK	-30.67	32.29	-9.95	1.44	H	< 7.00	0.123	20.90	1	0
		16-QAM	-31.53	31.43	-9.95	1.44	H		0.101	20.04		
		64-QAM	-32.70	30.26	-9.95	1.44	H		0.077	18.87		
		256-QAM	-35.71	27.25	-9.95	1.44	H		0.039	15.86		
836.5		QPSK	-31.78	31.08	-9.90	1.45	H		0.094	19.73	1	0
		16-QAM	-32.72	30.14	-9.90	1.45	H		0.076	18.79		
		64-QAM	-33.88	28.98	-9.90	1.45	H		0.058	17.63		
		256-QAM	-36.78	26.08	-9.90	1.45	H		0.030	14.73		
847.5		QPSK	-32.69	30.53	-9.85	1.45	H		0.084	19.23	1	0
		16-QAM	-33.46	29.76	-9.85	1.45	H		0.070	18.46		
		64-QAM	-34.58	28.64	-9.85	1.45	H		0.054	17.34		
		256-QAM	-37.68	25.54	-9.85	1.45	H		0.027	14.24		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
826.5	LTE 26 (5 MHz)	QPSK	-30.79	32.12	-9.95	1.44	H	< 7.00	0.118	20.73	1	0
		16-QAM	-31.56	31.35	-9.95	1.44	H		0.099	19.96		
		64-QAM	-32.71	30.20	-9.95	1.44	H		0.076	18.81		
		256-QAM	-35.81	27.10	-9.95	1.44	H		0.037	15.71		
836.5		QPSK	-31.82	31.04	-9.90	1.45	H		0.093	19.69	1	0
		16-QAM	-32.66	30.20	-9.90	1.45	H		0.077	18.85		
		64-QAM	-33.78	29.08	-9.90	1.45	H		0.059	17.73		
		256-QAM	-36.78	26.08	-9.90	1.45	H		0.030	14.73		
846.5		QPSK	-32.04	31.25	-9.85	1.45	H		0.099	19.95	1	0
		16-QAM	-32.85	30.44	-9.85	1.45	H		0.082	19.14		
		64-QAM	-34.05	29.24	-9.85	1.45	H		0.062	17.94		
		256-QAM	-37.07	26.22	-9.85	1.45	H		0.031	14.92		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
829.0	LTE 26 (10 MHz)	QPSK	-30.23	32.62	-9.95	1.44	H	< 7.00	0.133	21.23	1	0
		16-QAM	-31.05	31.80	-9.95	1.44	H		0.110	20.41		
		64-QAM	-32.15	30.70	-9.95	1.44	H		0.085	19.31		
		256-QAM	-35.24	27.61	-9.95	1.44	H		0.042	16.22		
836.5		QPSK	-30.90	31.96	-9.90	1.45	H		0.115	20.61	1	0
		16-QAM	-31.78	31.08	-9.90	1.45	H		0.094	19.73		
		64-QAM	-32.85	30.01	-9.90	1.45	H		0.074	18.66		
		256-QAM	-35.85	27.01	-9.90	1.45	H		0.037	15.66		
844.0		QPSK	-31.29	31.95	-9.85	1.45	H		0.116	20.65	1	0
		16-QAM	-32.13	31.11	-9.85	1.45	H		0.096	19.81		
		64-QAM	-33.24	30.00	-9.85	1.45	H		0.074	18.70		
		256-QAM	-36.31	26.93	-9.85	1.45	H		0.037	15.63		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
831.5	LTE 26 (15 MHz)	QPSK	-31.07	31.69	-9.95	1.45	H	< 7.00	0.107	20.29	1	0
		16-QAM	-31.83	30.93	-9.95	1.45	H		0.090	19.53		
		64-QAM	-32.95	29.81	-9.95	1.45	H		0.069	18.41		
		256-QAM	-36.12	26.64	-9.95	1.45	H		0.033	15.24		
836.5		QPSK	-31.15	31.71	-9.90	1.45	H		0.109	20.36	1	0
		16-QAM	-31.92	30.94	-9.90	1.45	H		0.091	19.59		
		64-QAM	-33.05	29.81	-9.90	1.45	H		0.070	18.46		
		256-QAM	-36.11	26.75	-9.90	1.45	H		0.035	15.40		
841.5		QPSK	-31.05	32.03	-9.85	1.45	H		0.118	20.73	1	0
		16-QAM	-31.83	31.25	-9.85	1.45	H		0.099	19.95		
		64-QAM	-32.95	30.13	-9.85	1.45	H		0.076	18.83		
		256-QAM	-36.03	27.05	-9.85	1.45	H		0.038	15.75		

8.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE 26
 MODULATION SIGNAL: 10 MHz QPSK
 DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit	RB	
									Size	Offset
26840 (829.0)	1 658.00	-47.19	9.51	-62.31	2.03	H	-54.83	-13.00	1	0
	2 487.00	-51.36	10.31	-62.54	2.53	V	-54.76	-13.00		
	3 316.00	-53.65	11.09	-62.02	2.99	H	-53.92	-13.00		
26915 (836.5)	1 673.00	-45.35	9.60	-60.62	2.05	H	-53.07	-13.00	1	0
	2 509.50	-51.43	10.26	-62.71	2.51	H	-54.96	-13.00		
	3 346.00	-52.76	11.10	-61.42	2.96	H	-53.28	-13.00		
26990 (844.0)	1 688.00	-46.70	9.70	-61.98	2.06	H	-54.34	-13.00	1	0
	2 532.00	-52.21	10.25	-63.48	2.54	H	-55.77	-13.00		
	3 376.00	-54.00	11.15	-62.97	2.98	H	-54.80	-13.00		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
26	1.4 MHz	836.5	QPSK	6	0	5.56
			16-QAM			6.42
			64-QAM			6.45
			256-QAM			6.49
	3 MHz		QPSK	15		5.65
			16-QAM			6.34
			64-QAM			6.46
			256-QAM			6.59
	5 MHz		QPSK	25		5.82
			16-QAM			6.51
			64-QAM			6.73
			256-QAM			6.59
	10 MHz		QPSK	50		5.80
			16-QAM			6.48
			64-QAM			6.61
			256-QAM			6.54
	15 MHz		QPSK	75		5.69
			16-QAM			6.34
			64-QAM			6.32
			256-QAM			6.58

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 70 ~ 89.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
26	1.4 MHz	836.5	QPSK	6	0	1.0942
			16-QAM			1.0941
			64-QAM			1.0946
			256-QAM			1.0938
	3 MHz		QPSK	15		2.7247
			16-QAM			2.7008
			64-QAM			2.7076
			256-QAM			2.7210
	5 MHz		QPSK	25		4.5355
			16-QAM			4.5150
			64-QAM			4.5405
			256-QAM			4.5641
	10 MHz		QPSK	50		9.0105
			16-QAM			8.9919
			64-QAM			8.9943
			256-QAM			9.0153
	15 MHz		QPSK	75		13.446
			16-QAM			13.474
			64-QAM			13.500
			256-QAM			13.476

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 50 ~ 69.

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)
26	1.4	824.7	1.6451	27.976	-67.467	-39.491	-13.00
		836.5	1.6751	27.976	-63.935	-35.959	
		848.3	1.6950	27.976	-64.440	-36.464	
	3	826.5	3.8186	27.976	-65.795	-37.819	
		836.5	1.6651	27.976	-66.391	-38.415	
		846.5	1.6950	27.976	-66.308	-38.332	
	5	826.5	1.6451	27.976	-63.965	-35.989	
		836.5	1.6651	27.976	-64.781	-36.805	
		846.5	1.6950	27.976	-63.517	-35.541	
	10	829.0	1.6451	27.976	-63.352	-35.376	
		836.5	2.4926	27.976	-66.489	-38.513	
		844.0	1.6950	27.976	-64.384	-36.408	
	15	831.5	1.6451	27.976	-64.565	-36.589	
		836.5	1.6551	27.976	-66.439	-38.463	
		841.5	1.6950	27.976	-64.475	-36.499	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 120 ~ 134.
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 + Ext. 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

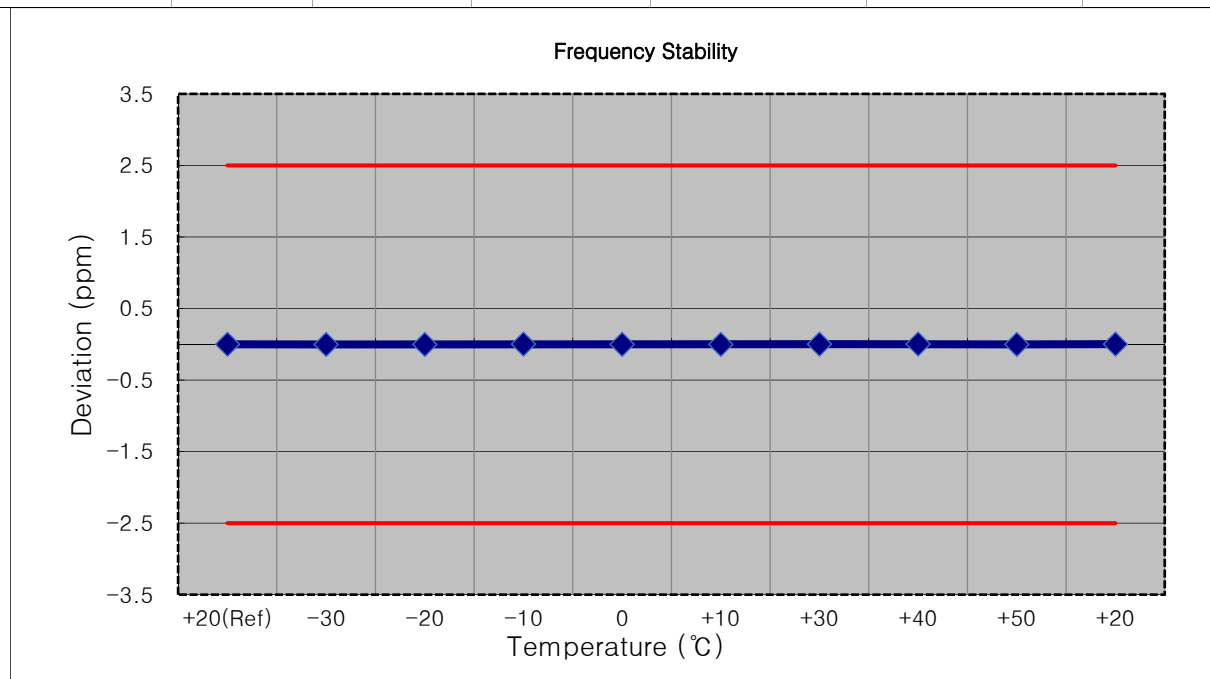
8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 90 ~ 119.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

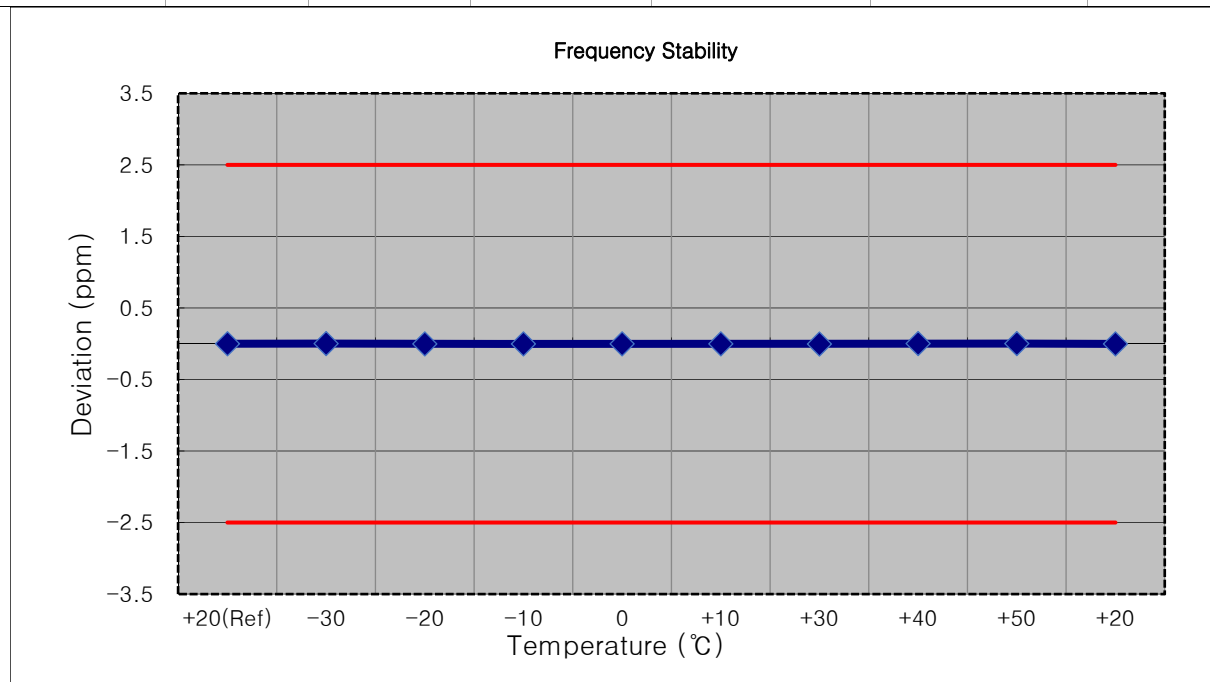
MODE:	LTE 26
OPERATING FREQUENCY:	836,500,000 Hz
CHANNEL:	26915 (1.4 MHz)
REFERENCE VOLTAGE:	3.900 VDC
DEVIATION LIMIT:	$\pm 0.000\ 25\ \%$ or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 999	0.0	0.000 000	0.000
100 %		-30	836 499 996	-2.1	0.000 000	-0.003
100 %		-20	836 499 996	-2.3	0.000 000	-0.003
100 %		-10	836 500 000	1.7	0.000 000	0.002
100 %		0	836 499 997	-1.2	0.000 000	-0.001
100 %		+10	836 499 997	-1.7	0.000 000	-0.002
100 %		+30	836 500 000	1.6	0.000 000	0.002
100 %		+40	836 500 001	2.5	0.000 000	0.003
100 %		+50	836 499 997	-1.7	0.000 000	-0.002
Batt. Endpoint	3.300	+20	836 500 000	1.5	0.000 000	0.002



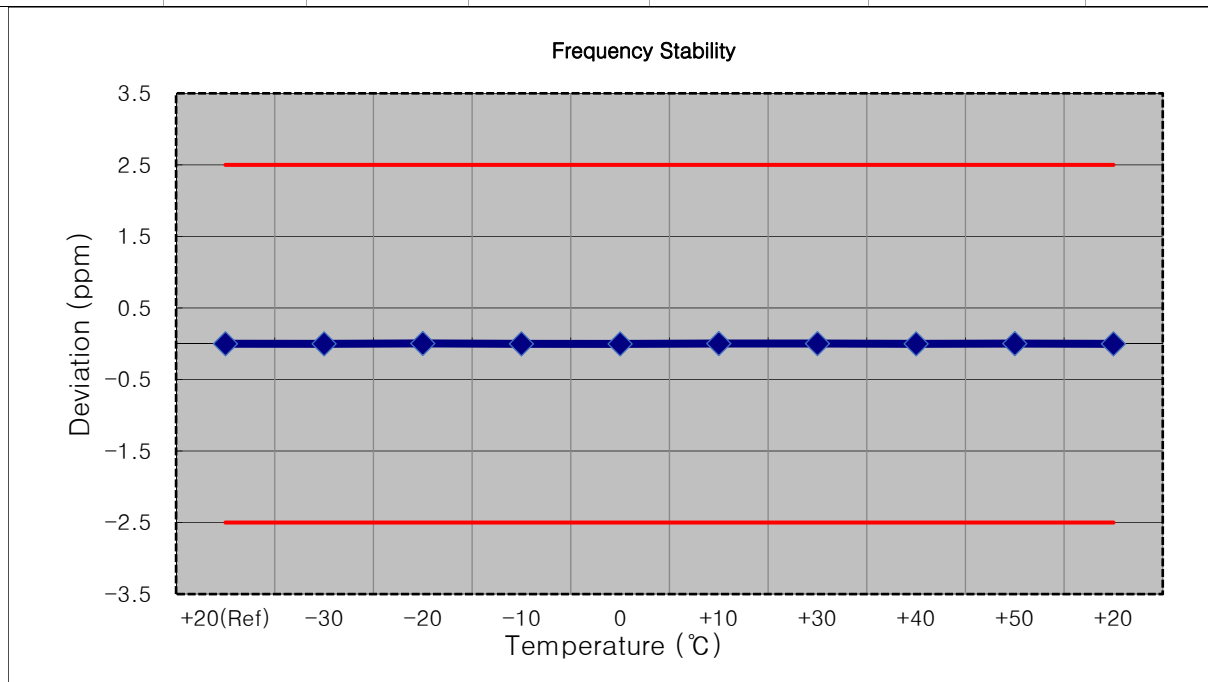
■ MODE: LTE 26
 ■ OPERATING FREQUENCY: 836,500,000 Hz
 ■ CHANNEL: 26915 (3 MHz)
 ■ REFERENCE VOLTAGE: 3.900 VDC
 ■ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 997	0.0	0.000 000	0.000
100 %		-30	836 499 999	1.8	0.000 000	0.002
100 %		-20	836 499 996	-1.9	0.000 000	-0.002
100 %		-10	836 499 996	-1.8	0.000 000	-0.002
100 %		0	836 499 996	-1.4	0.000 000	-0.002
100 %		+10	836 499 996	-1.4	0.000 000	-0.002
100 %		+30	836 499 995	-2.9	0.000 000	-0.003
100 %		+40	836 500 000	2.5	0.000 000	0.003
100 %		+50	836 499 999	1.6	0.000 000	0.002
Batt. Endpoint	3.300	+20	836 499 996	-1.9	0.000 000	-0.002



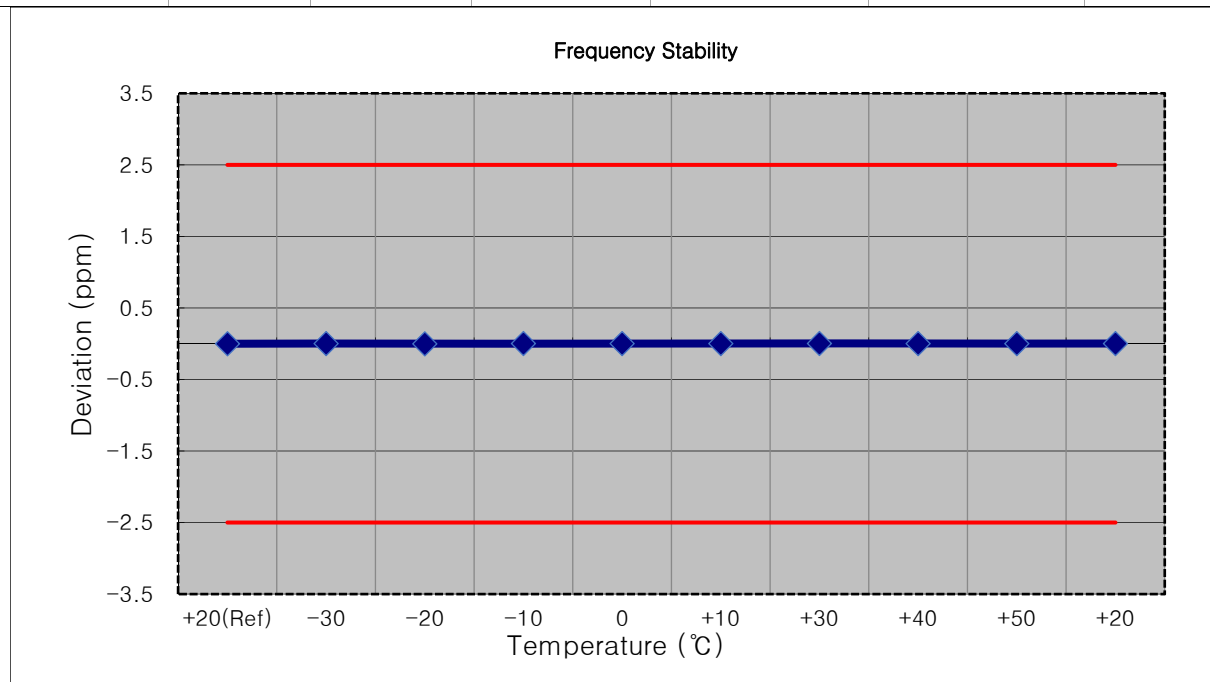
■ MODE: LTE 26
 ■ OPERATING FREQUENCY: 836,500,000 Hz
 ■ CHANNEL: 26915 (5 MHz)
 ■ REFERENCE VOLTAGE: 3.900 VDC
 ■ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 998	0.0	0.000 000	0.000
100 %		-30	836 499 996	-1.4	0.000 000	-0.002
100 %		-20	836 500 001	3.2	0.000 000	0.004
100 %		-10	836 499 996	-1.4	0.000 000	-0.002
100 %		0	836 499 996	-2.1	0.000 000	-0.003
100 %		+10	836 500 000	2.4	0.000 000	0.003
100 %		+30	836 500 000	2.0	0.000 000	0.002
100 %		+40	836 499 996	-1.5	0.000 000	-0.002
100 %		+50	836 499 999	1.7	0.000 000	0.002
Batt. Endpoint	3.300	+20	836 499 996	-1.3	0.000 000	-0.002



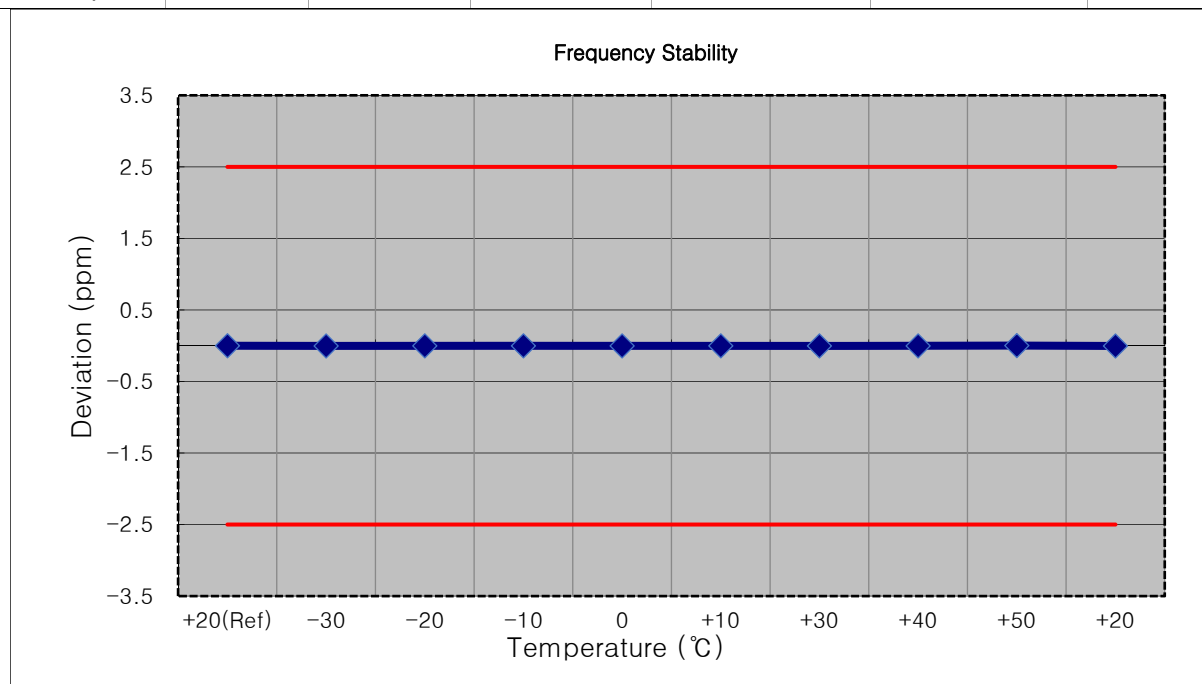
■ MODE: LTE 26
 ■ OPERATING FREQUENCY: 836,500,000 Hz
 ■ CHANNEL: 26915 (10 MHz)
 ■ REFERENCE VOLTAGE: 3.900 VDC
 ■ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 998	0.0	0.000 000	0.000
100 %		-30	836 500 000	2.1	0.000 000	0.003
100 %		-20	836 499 997	-1.4	0.000 000	-0.002
100 %		-10	836 500 001	2.3	0.000 000	0.003
100 %		0	836 500 000	1.6	0.000 000	0.002
100 %		+10	836 500 000	2.0	0.000 000	0.002
100 %		+30	836 500 002	3.3	0.000 000	0.004
100 %		+40	836 500 000	2.1	0.000 000	0.003
100 %		+50	836 500 000	1.3	0.000 000	0.002
Batt. Endpoint	3.300	+20	836 500 000	2.1	0.000 000	0.003



MODE:	<u>LTE 26</u>
OPERATING FREQUENCY:	<u>836,500,000 Hz</u>
CHANNEL:	<u>26915 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>± 0.000 25 % or 2.5 ppm</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 500 002	0.0	0.000 000	0.000
100 %		-30	836 499 996	-2.4	0.000 000	-0.003
100 %		-20	836 499 997	-1.1	0.000 000	-0.001
100 %		-10	836 499 997	-1.4	0.000 000	-0.002
100 %		0	836 499 996	-1.9	0.000 000	-0.002
100 %		+10	836 499 997	-1.4	0.000 000	-0.002
100 %		+30	836 499 997	-1.7	0.000 000	-0.002
100 %		+40	836 499 996	-1.8	0.000 000	-0.002
100 %		+50	836 500 000	1.7	0.000 000	0.002
Batt. Endpoint	3.300	+20	836 499 996	-2.6	0.000 000	-0.003



9. TEST DATA(Sub 1 ANT)

9.1 EFFECTIVE RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.7	LTE 26 (1.4 MHz)	QPSK	-35.07	27.92	-9.95	1.44	H	< 7.00	0.045	16.53	1	0
		16-QAM	-35.83	27.16	-9.95	1.44	H		0.038	15.77		
		64-QAM	-36.97	26.02	-9.95	1.44	H		0.029	14.63		
		256-QAM	-40.11	22.88	-9.95	1.44	H		0.014	11.49		
836.5		QPSK	-35.57	27.29	-9.90	1.45	H		0.039	15.94	1	0
		16-QAM	-36.33	26.53	-9.90	1.45	H		0.033	15.18		
		64-QAM	-37.50	25.36	-9.90	1.45	H		0.025	14.01		
		256-QAM	-40.61	22.25	-9.90	1.45	H		0.012	10.90		
848.3		QPSK	-36.70	26.39	-9.85	1.45	H		0.032	15.09	1	0
		16-QAM	-37.47	25.62	-9.85	1.45	H		0.027	14.32		
		64-QAM	-38.63	24.46	-9.85	1.45	H		0.021	13.16		
		256-QAM	-41.69	21.40	-9.85	1.45	H		0.010	10.10		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
825.5	LTE 26 (3 MHz)	QPSK	-35.04	27.92	-9.95	1.44	H	< 7.00	0.045	16.53	1	0
		16-QAM	-35.79	27.17	-9.95	1.44	H		0.038	15.78		
		64-QAM	-36.92	26.04	-9.95	1.44	H		0.029	14.65		
		256-QAM	-40.06	22.90	-9.95	1.44	H		0.014	11.51		
836.5		QPSK	-35.56	27.30	-9.90	1.45	H		0.039	15.95	1	0
		16-QAM	-36.32	26.54	-9.90	1.45	H		0.033	15.19		
		64-QAM	-37.46	25.40	-9.90	1.45	H		0.025	14.05		
		256-QAM	-40.54	22.32	-9.90	1.45	H		0.013	10.97		
847.5		QPSK	-36.67	26.55	-9.85	1.45	H		0.034	15.25	1	0
		16-QAM	-37.47	25.75	-9.85	1.45	H		0.028	14.45		
		64-QAM	-38.57	24.65	-9.85	1.45	H		0.022	13.35		
		256-QAM	-41.58	21.64	-9.85	1.45	H		0.011	10.34		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
826.5	LTE 26 (5 MHz)	QPSK	-34.97	27.94	-9.95	1.44	H	< 7.00	0.045	16.55	1	0
		16-QAM	-35.79	27.12	-9.95	1.44	H		0.037	15.73		
		64-QAM	-36.91	26.00	-9.95	1.44	H		0.029	14.61		
		256-QAM	-40.05	22.86	-9.95	1.44	H		0.014	11.47		
836.5		QPSK	-35.49	27.37	-9.90	1.45	H		0.040	16.02	1	0
		16-QAM	-36.32	26.54	-9.90	1.45	H		0.033	15.19		
		64-QAM	-37.45	25.41	-9.90	1.45	H		0.026	14.06		
		256-QAM	-40.49	22.37	-9.90	1.45	H		0.013	11.02		
846.5		QPSK	-36.34	26.95	-9.85	1.45	H		0.037	15.65	1	0
		16-QAM	-37.21	26.08	-9.85	1.45	H		0.030	14.78		
		64-QAM	-38.33	24.96	-9.85	1.45	H		0.023	13.66		
		256-QAM	-41.36	21.93	-9.85	1.45	H		0.012	10.63		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
829.0	LTE 26 (10 MHz)	QPSK	-34.97	27.88	-9.95	1.44	H	< 7.00	0.045	16.49	1	0
		16-QAM	-35.81	27.04	-9.95	1.44	H		0.037	15.65		
		64-QAM	-36.92	25.93	-9.95	1.44	H		0.028	14.54		
		256-QAM	-39.97	22.88	-9.95	1.44	H		0.014	11.49		
836.5		QPSK	-35.36	27.50	-9.90	1.45	H		0.041	16.15	1	0
		16-QAM	-36.24	26.62	-9.90	1.45	H		0.034	15.27		
		64-QAM	-37.35	25.51	-9.90	1.45	H		0.026	14.16		
		256-QAM	-40.25	22.61	-9.90	1.45	H		0.013	11.26		
844.0		QPSK	-35.79	27.45	-9.85	1.45	H		0.041	16.15	1	0
		16-QAM	-36.55	26.69	-9.85	1.45	H		0.035	15.39		
		64-QAM	-37.69	25.55	-9.85	1.45	H		0.027	14.25		
		256-QAM	-40.84	22.40	-9.85	1.45	H		0.013	11.10		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
831.5	LTE 26 (15 MHz)	QPSK	-35.08	27.68	-9.95	1.45	H	< 7.00	0.043	16.28	1	0
		16-QAM	-35.84	26.92	-9.95	1.45	H		0.036	15.52		
		64-QAM	-36.97	25.79	-9.95	1.45	H		0.028	14.39		
		256-QAM	-40.08	22.68	-9.95	1.45	H		0.013	11.28		
836.5		QPSK	-35.40	27.46	-9.90	1.45	H		0.041	16.11	1	0
		16-QAM	-36.29	26.57	-9.90	1.45	H		0.033	15.22		
		64-QAM	-37.43	25.43	-9.90	1.45	H		0.026	14.08		
		256-QAM	-40.33	22.53	-9.90	1.45	H		0.013	11.18		
841.5		QPSK	-35.68	27.40	-9.85	1.45	H		0.041	16.10	1	0
		16-QAM	-36.46	26.62	-9.85	1.45	H		0.034	15.32		
		64-QAM	-37.61	25.47	-9.85	1.45	H		0.026	14.17		
		256-QAM	-40.50	22.58	-9.85	1.45	H		0.013	11.28		

9.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE 26
 MODULATION SIGNAL: 5 MHz QPSK
 DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit	RB	
									Size	Offset
26815 (826.5)	1 653.00	-34.19	9.47	-49.22	2.02	H	-41.77	-13.00	1	0
	2 479.50	-35.72	10.32	-46.86	2.55	H	-39.09	-13.00		
	3 306.00	-54.20	11.09	-62.46	2.97	H	-54.34	-13.00		
26915 (836.5)	1 673.00	-37.81	9.60	-53.08	2.05	H	-45.53	-13.00	1	0
	2 509.50	-39.01	10.26	-50.29	2.51	H	-42.54	-13.00		
	3 346.00	-53.25	11.10	-61.91	2.96	H	-53.77	-13.00		
27015 (846.5)	1 693.00	-39.49	9.73	-54.71	2.07	H	-47.05	-13.00	1	0
	2 539.50	-35.25	10.25	-46.35	2.53	H	-38.63	-13.00		
	3 386.00	-52.97	11.18	-61.92	2.99	H	-53.73	-13.00		

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
26	1.4 MHz	836.5	QPSK	6	0	6.13
			16-QAM			6.88
			64-QAM			7.08
			256-QAM			6.75
	3 MHz		QPSK	15		6.07
			16-QAM			6.84
			64-QAM			6.98
			256-QAM			6.78
	5 MHz		QPSK	25		6.23
			16-QAM			6.92
			64-QAM			6.90
			256-QAM			6.83
	10 MHz		QPSK	50		6.07
			16-QAM			6.71
			64-QAM			6.85
			256-QAM			6.67
	15 MHz		QPSK	75		5.60
			16-QAM			6.38
			64-QAM			6.29
			256-QAM			6.64

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 156 ~ 175.

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
26	1.4 MHz	836.5	QPSK	6	0	1.0985
			16-QAM			1.0918
			64-QAM			1.0945
			256-QAM			1.0904
	3 MHz		QPSK	15		2.7209
			16-QAM			2.7078
			64-QAM			2.7059
			256-QAM			2.7123
	5 MHz		QPSK	25		4.5379
			16-QAM			4.5197
			64-QAM			4.5344
			256-QAM			4.5648
	10 MHz		QPSK	50		8.9968
			16-QAM			9.0134
			64-QAM			9.0231
			256-QAM			8.9996
	15 MHz		QPSK	75		13.4853
			16-QAM			13.4752
			64-QAM			13.509
			256-QAM			13.488

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 136 ~ 155.

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)
26	1.4	824.7	8.8734	28.591	-67.726	-39.135	-13.00
		836.5	1.6751	27.976	-66.646	-38.670	
		848.3	4.9652	27.976	-67.879	-39.903	
	3	826.5	1.6451	27.976	-65.101	-37.125	
		836.5	1.6751	27.976	-65.714	-37.738	
		846.5	2.5424	27.976	-65.664	-37.688	
	5	826.5	8.5244	28.591	-68.071	-39.480	
		836.5	1.6651	27.976	-64.066	-36.090	
		846.5	1.6950	27.976	-65.260	-37.284	
	10	829.0	1.6451	27.976	-66.512	-38.536	
		836.5	1.6651	27.976	-63.434	-35.458	
		844.0	1.6950	27.976	-67.384	-39.408	
	15	831.5	9.6810	28.591	-67.570	-38.979	
		836.5	1.6551	27.976	-67.494	-39.518	
		841.5	1.6950	27.976	-66.304	-38.328	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 206 ~ 220.
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 + Ext. 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

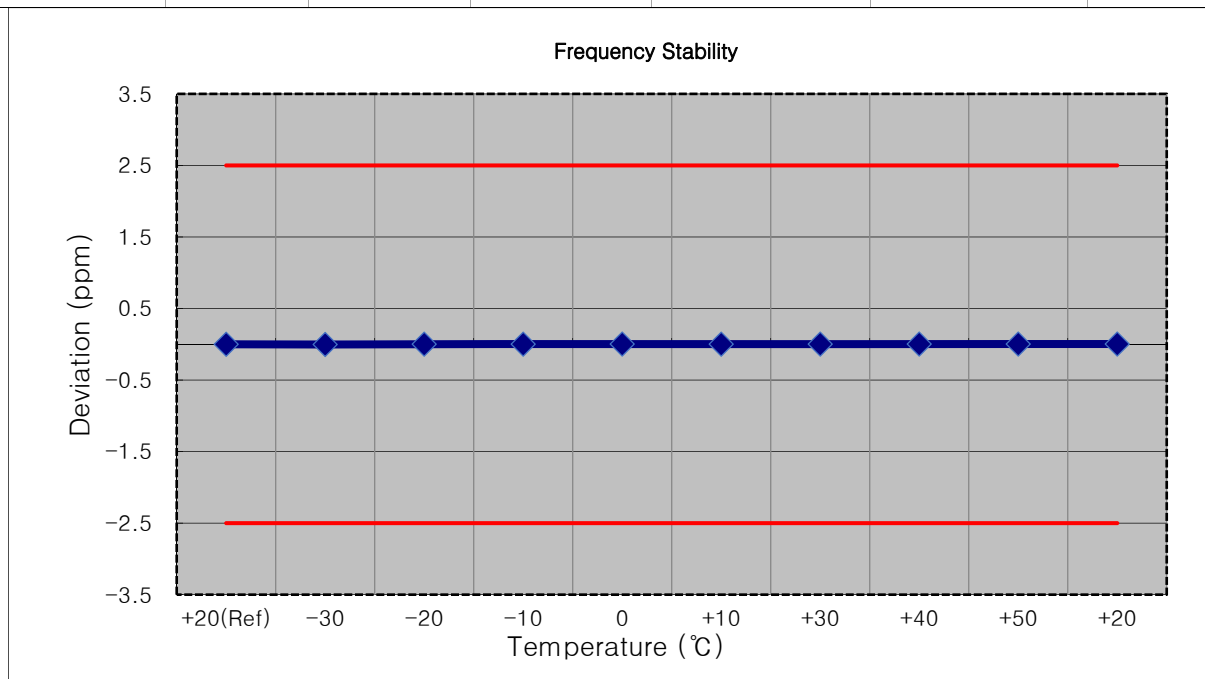
9.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 176 ~ 205.

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

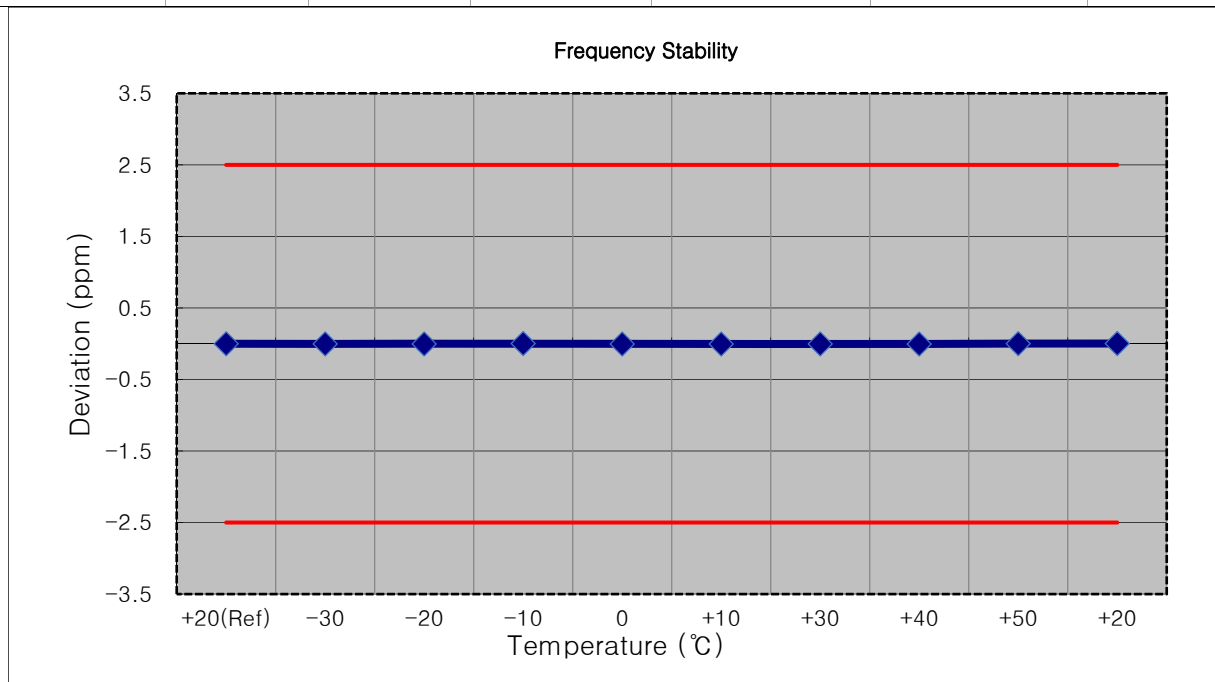
MODE:	LTE 26
OPERATING FREQUENCY:	836,500,000 Hz
CHANNEL:	26915 (1.4 MHz)
REFERENCE VOLTAGE:	3.900 VDC
DEVIATION LIMIT:	$\pm 0.000\ 25\ \%$ or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	836 500 002	0.0	0.000 000	0.000
100 %		-30	836 499 999	-2.6	0.000 000	-0.003
100 %		-20	836 500 003	1.4	0.000 000	0.002
100 %		-10	836 500 004	1.6	0.000 000	0.002
100 %		0	836 500 005	2.6	0.000 000	0.003
100 %		+10	836 500 004	1.6	0.000 000	0.002
100 %		+30	836 500 004	2.1	0.000 000	0.003
100 %		+40	836 500 005	2.6	0.000 000	0.003
100 %		+50	836 500 005	2.7	0.000 000	0.003
Batt. Endpoint	3.300	+20	836 500 005	2.7	0.000 000	0.003



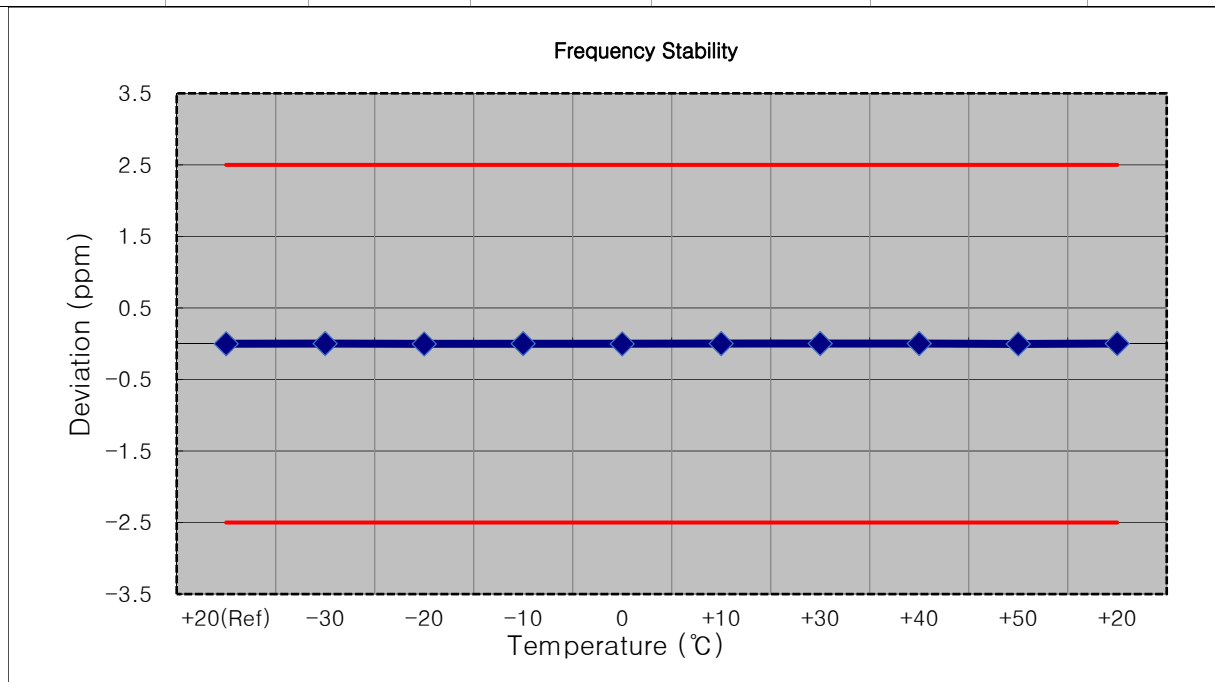
MODE: LTE 26
 OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 26915 (3 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 998	0.0	0.000 000	0.000
100 %		-30	836 499 996	-2.1	0.000 000	-0.003
100 %		-20	836 499 996	-2.3	0.000 000	-0.003
100 %		-10	836 500 001	2.7	0.000 000	0.003
100 %		0	836 499 995	-2.9	0.000 000	-0.003
100 %		+10	836 499 995	-3.0	0.000 000	-0.004
100 %		+30	836 499 996	-2.1	0.000 000	-0.003
100 %		+40	836 499 995	-3.2	0.000 000	-0.004
100 %		+50	836 499 999	1.3	0.000 000	0.002
Batt. Endpoint	3.300	+20	836 500 000	2.4	0.000 000	0.003



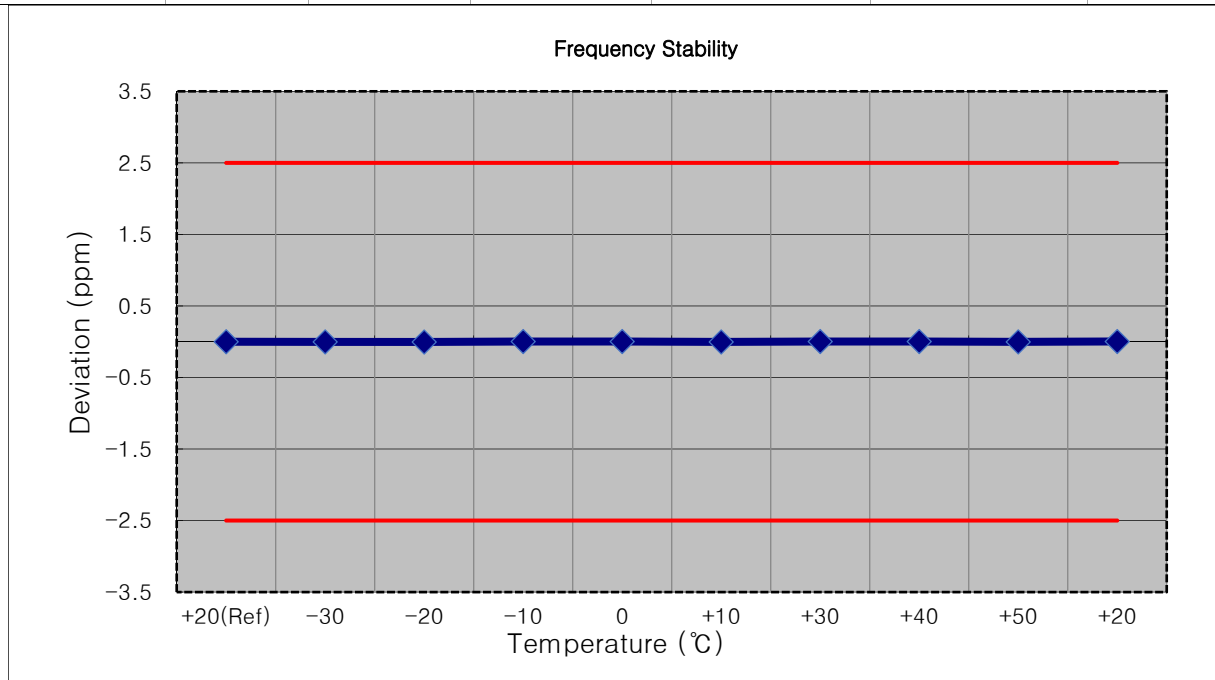
MODE: LTE 26
 OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 26915 (5 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: $\pm 0.000\ 25\ %$ or $2.5\ \text{ppm}$

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 998	0.0	0.000 000	0.000
100 %		-30	836 499 999	1.6	0.000 000	0.002
100 %		-20	836 499 996	-2.2	0.000 000	-0.003
100 %		-10	836 499 999	1.3	0.000 000	0.002
100 %		0	836 499 996	-2.0	0.000 000	-0.002
100 %		+10	836 500 000	2.0	0.000 000	0.002
100 %		+30	836 500 000	2.2	0.000 000	0.003
100 %		+40	836 500 000	2.3	0.000 000	0.003
100 %		+50	836 499 995	-2.5	0.000 000	-0.003
Batt. Endpoint	3.300	+20	836 500 000	2.1	0.000 000	0.003



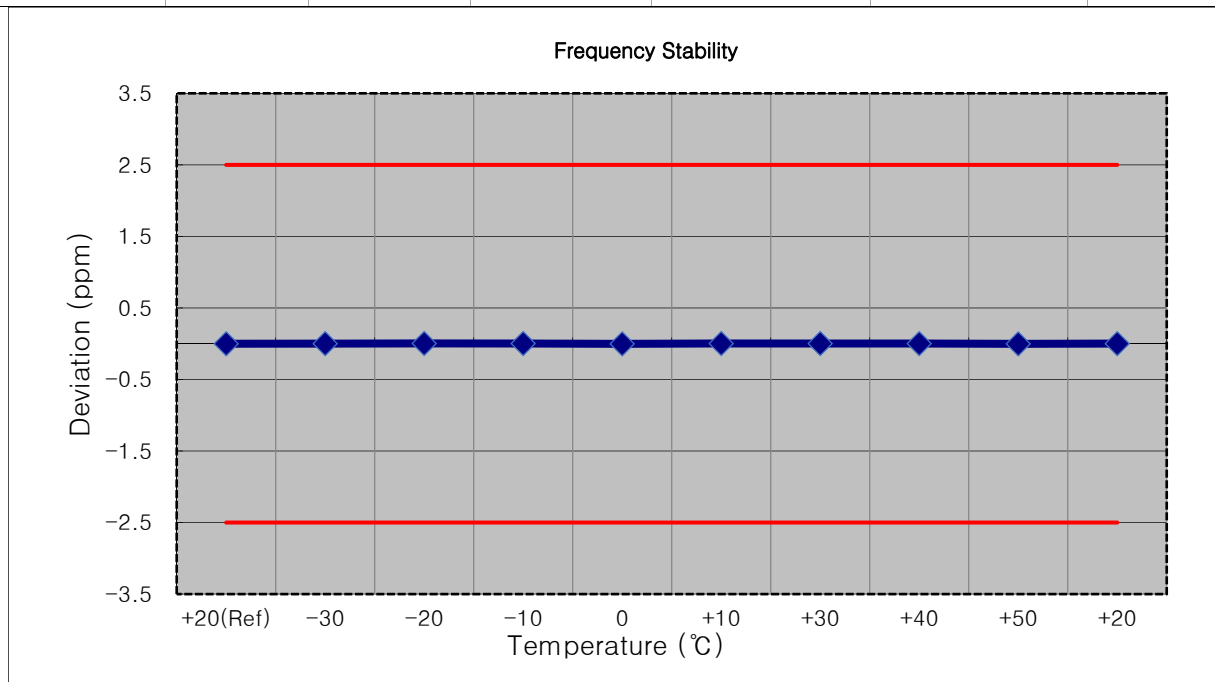
MODE: LTE 26
 OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 26915 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.900	+20(Ref)	836 500 002	0.0	0.000 000	0.000
100 %		-30	836 500 000	-2.1	0.000 000	-0.003
100 %		-20	836 499 999	-3.0	0.000 000	-0.004
100 %		-10	836 500 005	2.3	0.000 000	0.003
100 %		0	836 500 004	2.2	0.000 000	0.003
100 %		+10	836 500 000	-2.3	0.000 000	-0.003
100 %		+30	836 500 005	2.3	0.000 000	0.003
100 %		+40	836 500 005	2.3	0.000 000	0.003
100 %		+50	836 500 001	-1.7	0.000 000	-0.002
Batt. Endpoint	3.300	+20	836 500 005	2.7	0.000 000	0.003



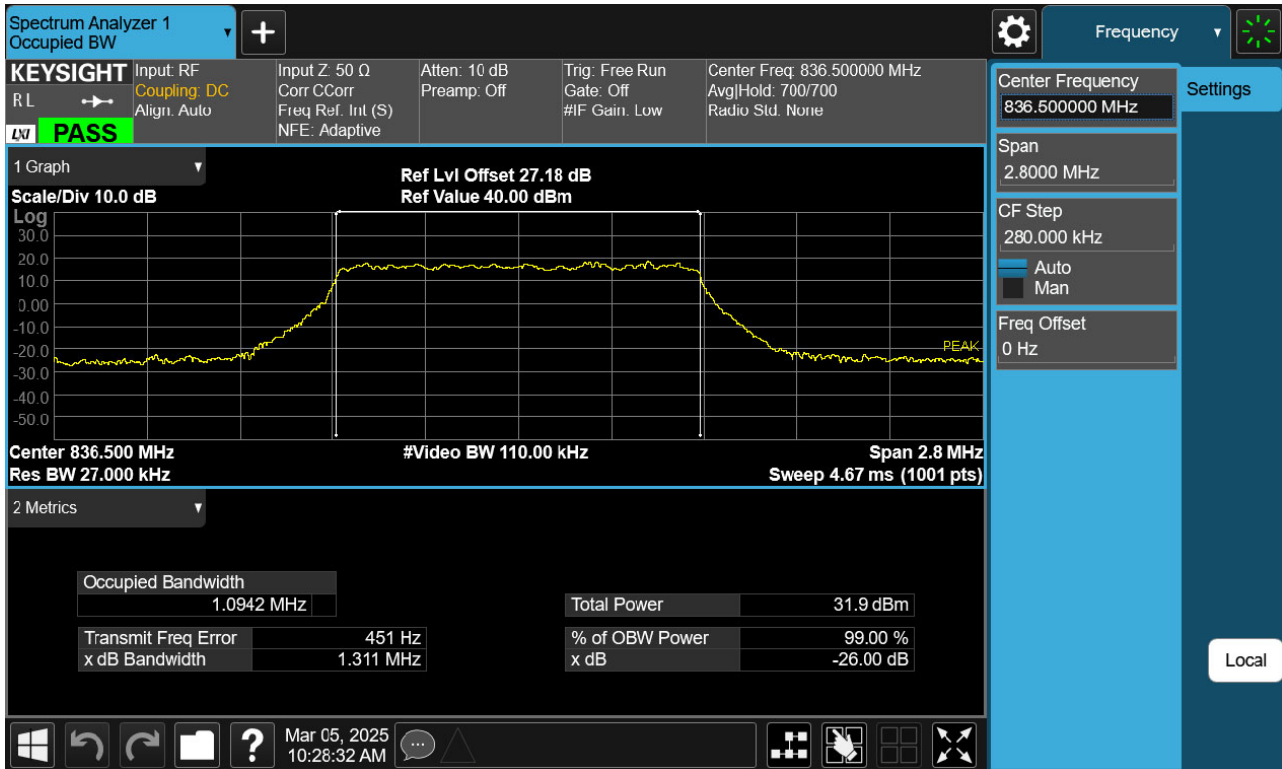
MODE: LTE 26
 OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 26915 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: $\pm 0.000\ 25\ %$ or $2.5\ \text{ppm}$

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	836 499 998	0.0	0.000 000	0.000
100 %		-30	836 500 003	1.2	0.000 000	0.001
100 %		-20	836 500 005	3.2	0.000 000	0.004
100 %		-10	836 500 004	2.2	0.000 000	0.003
100 %		0	836 500 001	-1.5	0.000 000	-0.002
100 %		+10	836 500 005	2.8	0.000 000	0.003
100 %		+30	836 500 005	2.4	0.000 000	0.003
100 %		+40	836 500 004	1.9	0.000 000	0.002
100 %		+50	836 500 001	-1.5	0.000 000	-0.002
Batt. Endpoint	3.300	+20	836 500 004	1.5	0.000 000	0.002

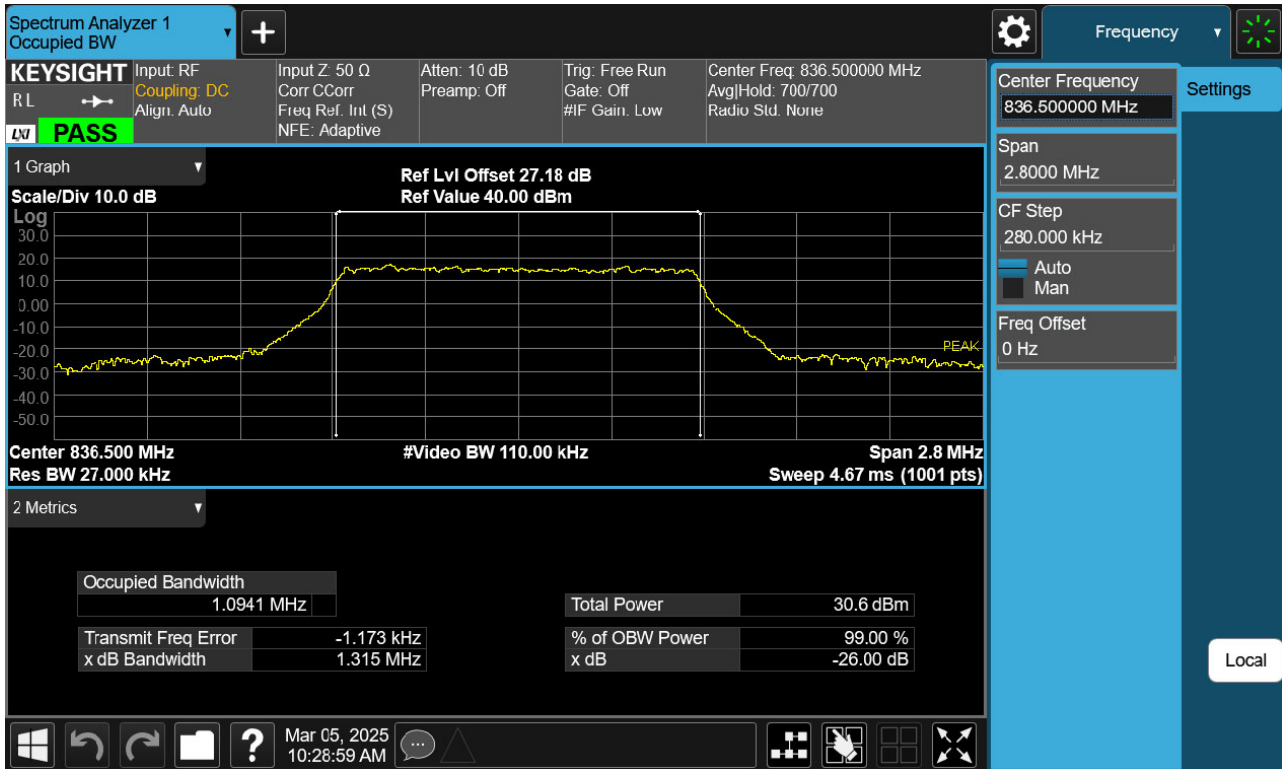


10. TEST PLOTS(Main 1 ANT)

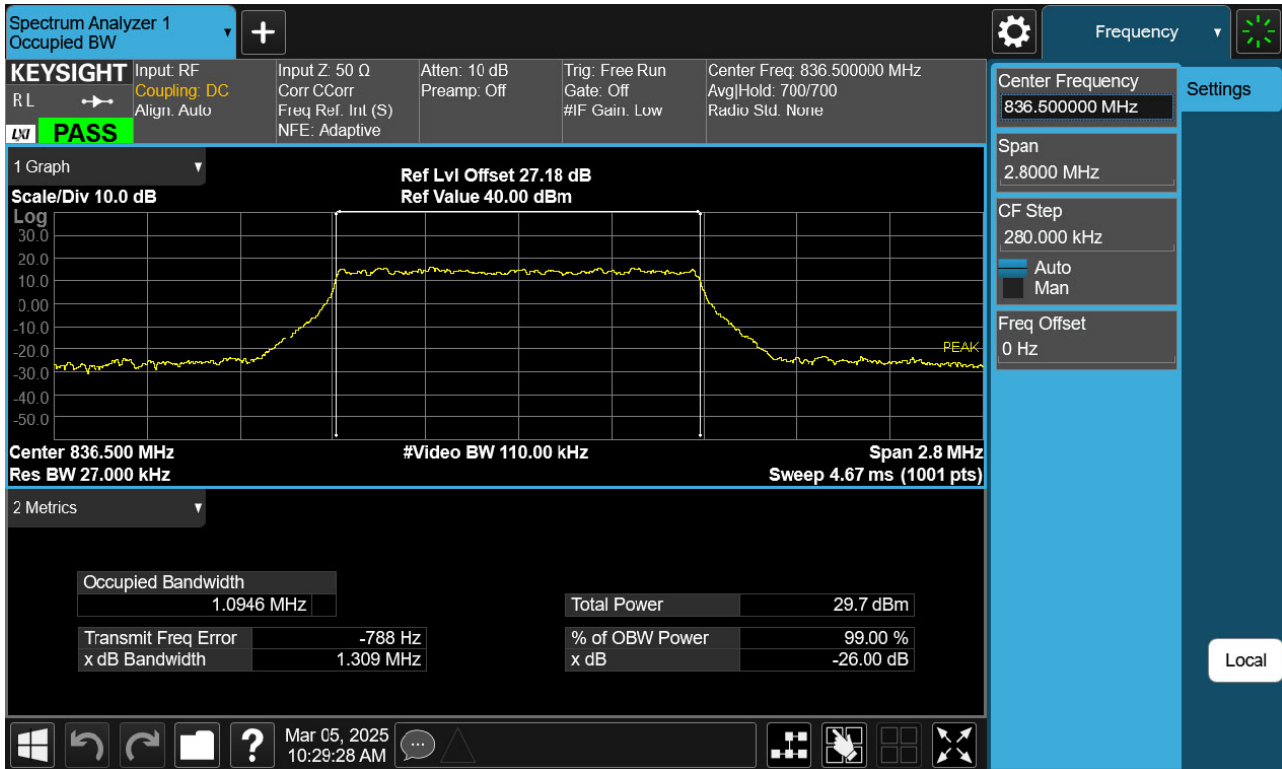
BAND 26. Occupied Bandwidth Plot(1.4 M BW Ch.26915 QPSK_RB6_0)



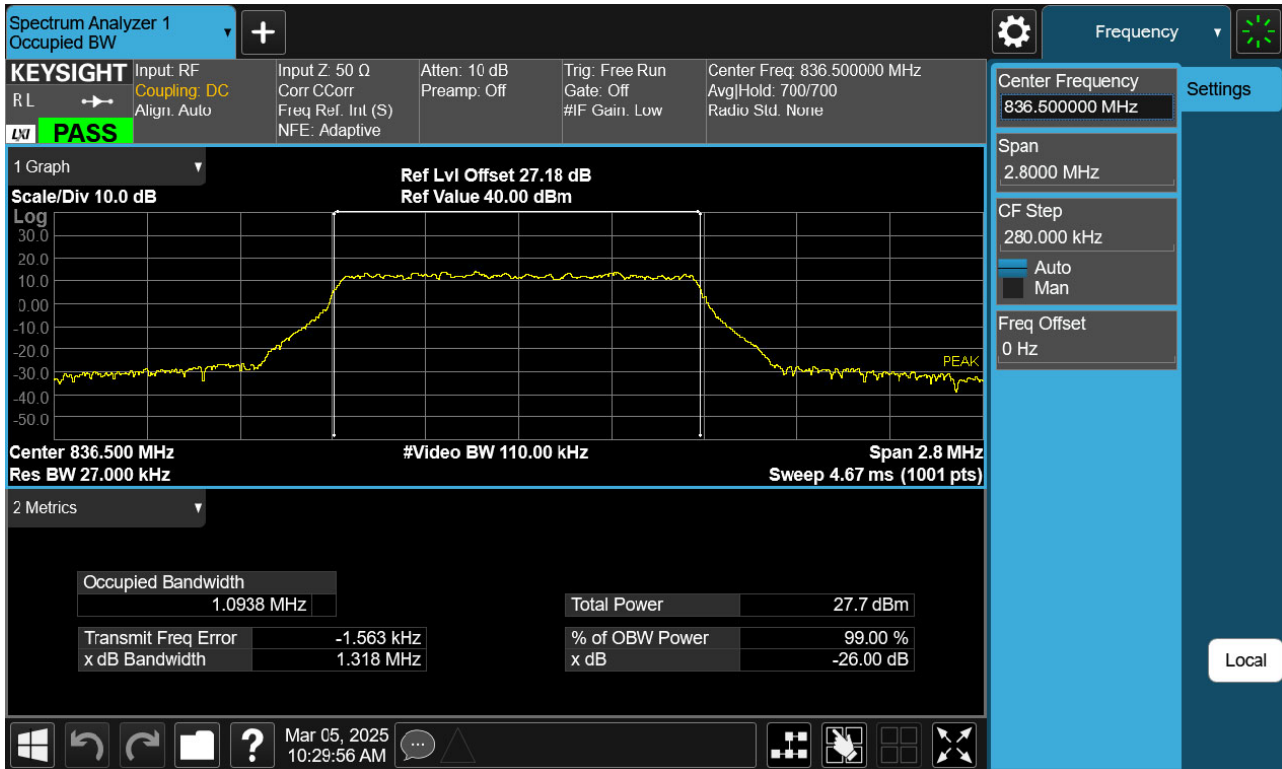
BAND 26. Occupied Bandwidth Plot(1.4 M BW Ch.26915 16QAM_RB6_0)



BAND 26. Occupied Bandwidth Plot(1.4 M BW Ch.26915 64QAM_RB6_0)



BAND 26. Occupied Bandwidth Plot(1.4 M BW Ch.26915 256QAM_RB6_0)



Spectrum Analyzer 1
Occupied BW

KEYSIGHT Input: RF
RL Coupling: DC
Align: Auto

Input Z: 50 Ω
Corr CCorr
Freq Ref. Int (S)
NFE: Adaptive

Atten: 10 dB
Preamp: Off

Trig: Free Run
Gate: Off
#IF Gain: Low

Center Freq: 836.500000 MHz
Avg/Hold: 700/700
Radio Std: None

Frequency

Center Frequency
836.500000 MHz

Span
6.0000 MHz

CF Step
600.000 kHz

☒ Auto
☐ Man

Freq Offset
0 Hz

Settings

1 Graph
Scale/Div 10.0 dB
Ref Lvl Offset 27.18 dB
Ref Value 40.00 dBm

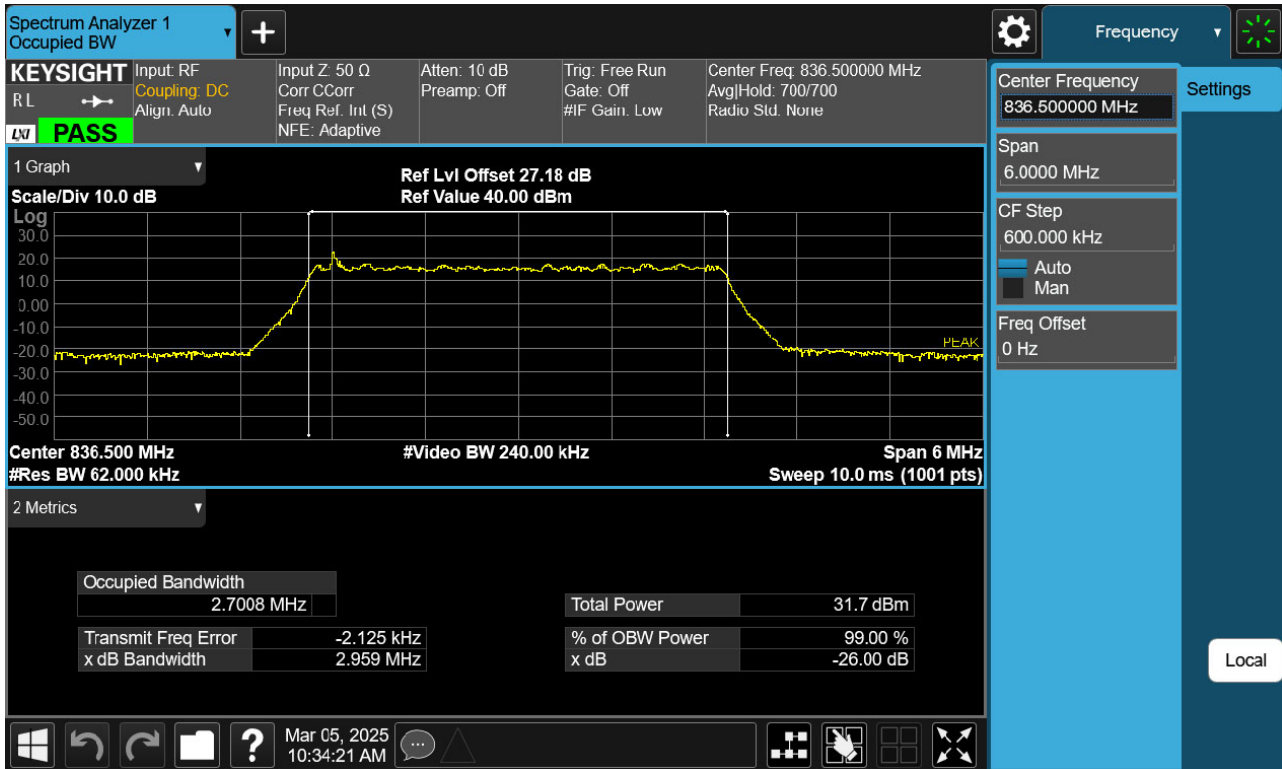
Center 836.500 MHz
#Res BW 62.000 kHz
#Video BW 240.00 kHz
Span 6 MHz
Sweep 10.0 ms (1001 pts)

2 Metrics

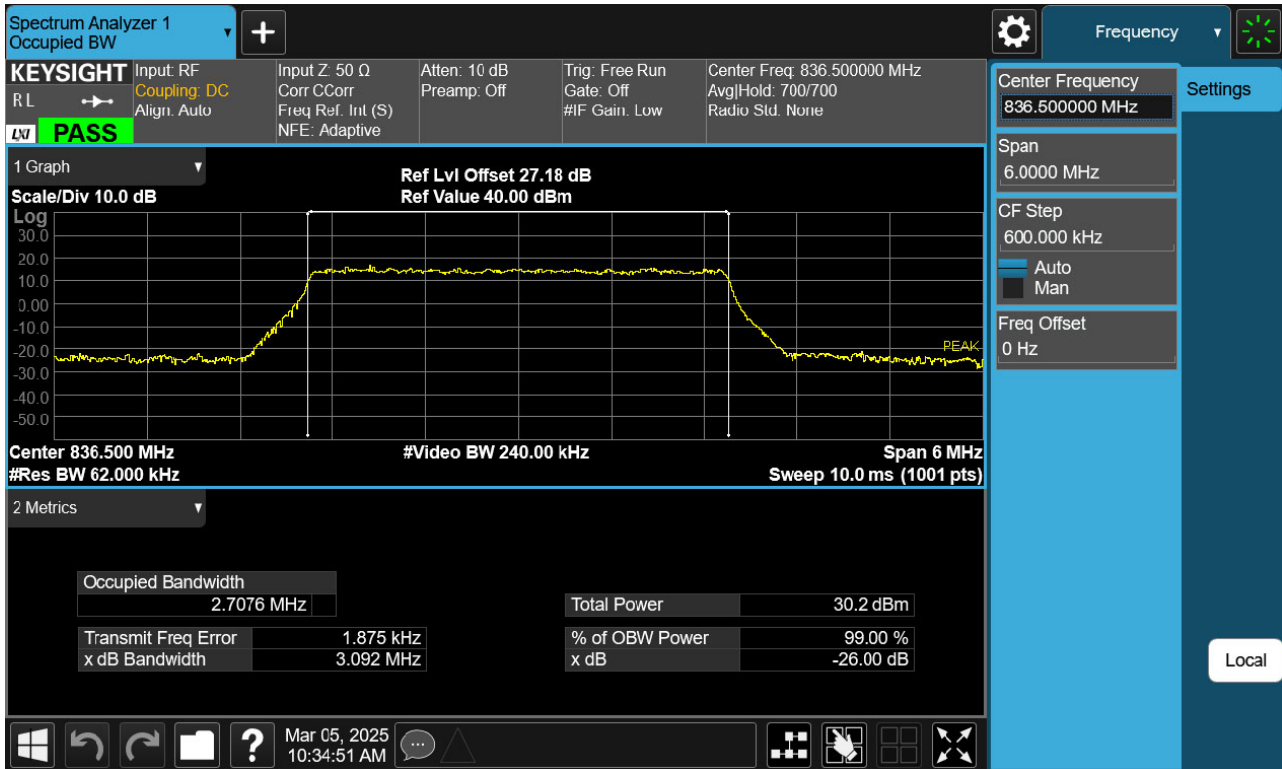
Occupied Bandwidth	2.7247 MHz	Total Power	32.9 dBm
Transmit Freq Error	7.390 kHz	% of OBW Power	99.00 %
x dB Bandwidth	2.953 MHz	x dB	-26.00 dB

Windows taskbar: Mar 05, 2025 10:33:53 AM

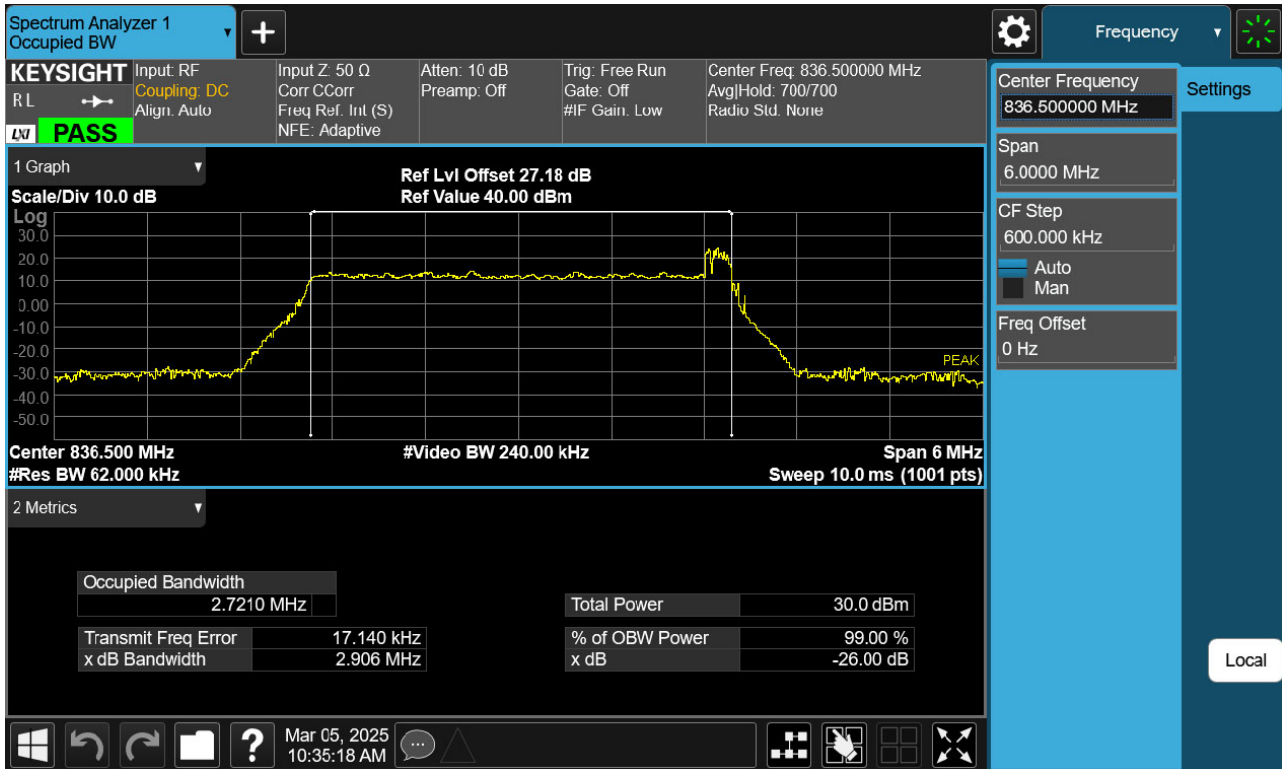
BAND 26 Occupied Bandwidth Plot(3 M BW Ch.26915 16QAM_RB15_0)



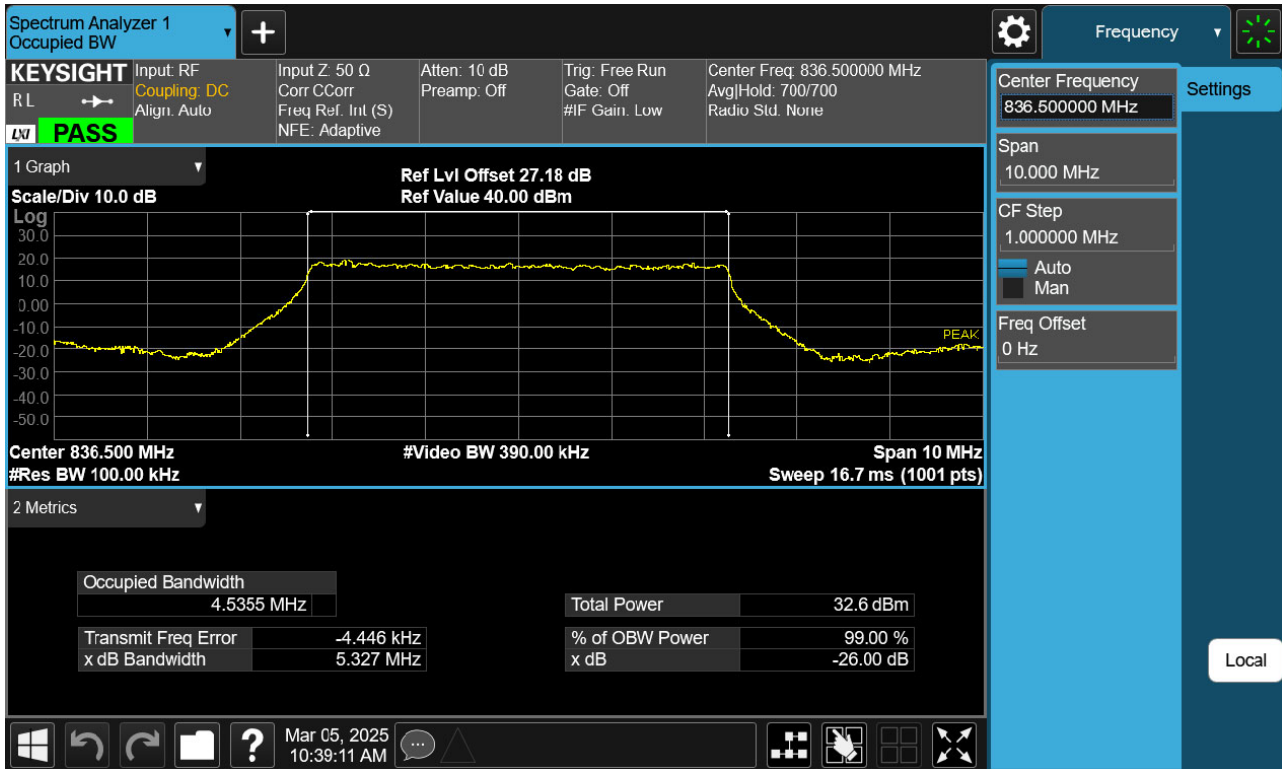
BAND 26. Occupied Bandwidth Plot(3 M BW Ch.26915 64QAM_RB15_0)



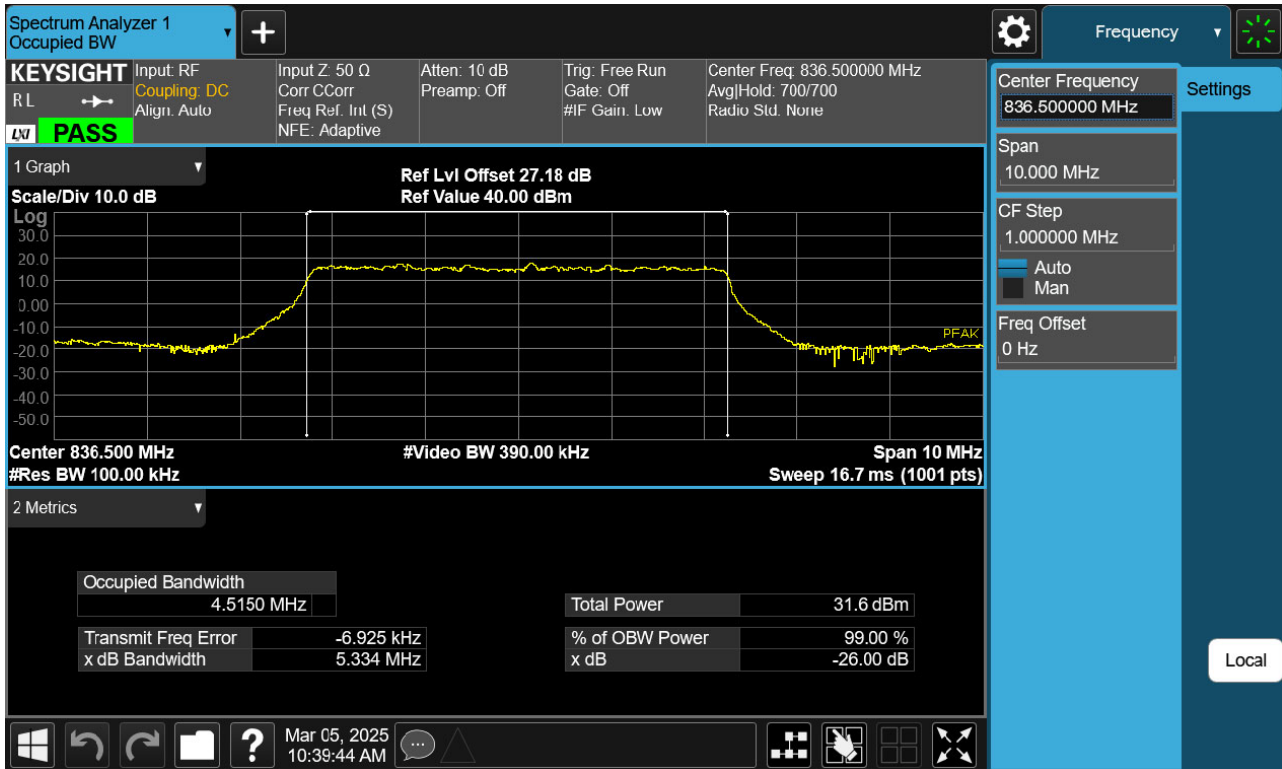
BAND 26. Occupied Bandwidth Plot(3 M BW Ch.26915 256QAM_RB15_0)



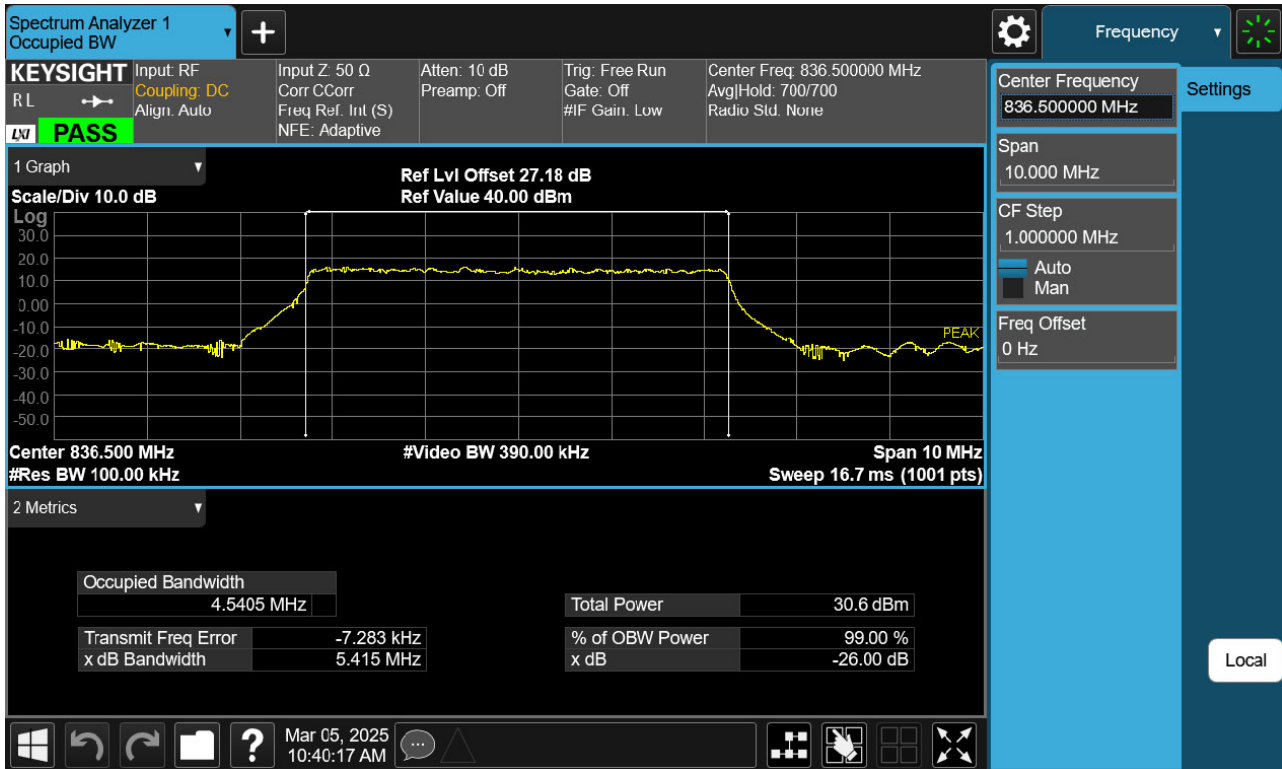
BAND 26. Occupied Bandwidth Plot(5 M BW Ch.26915 QPSK_RB25_0)



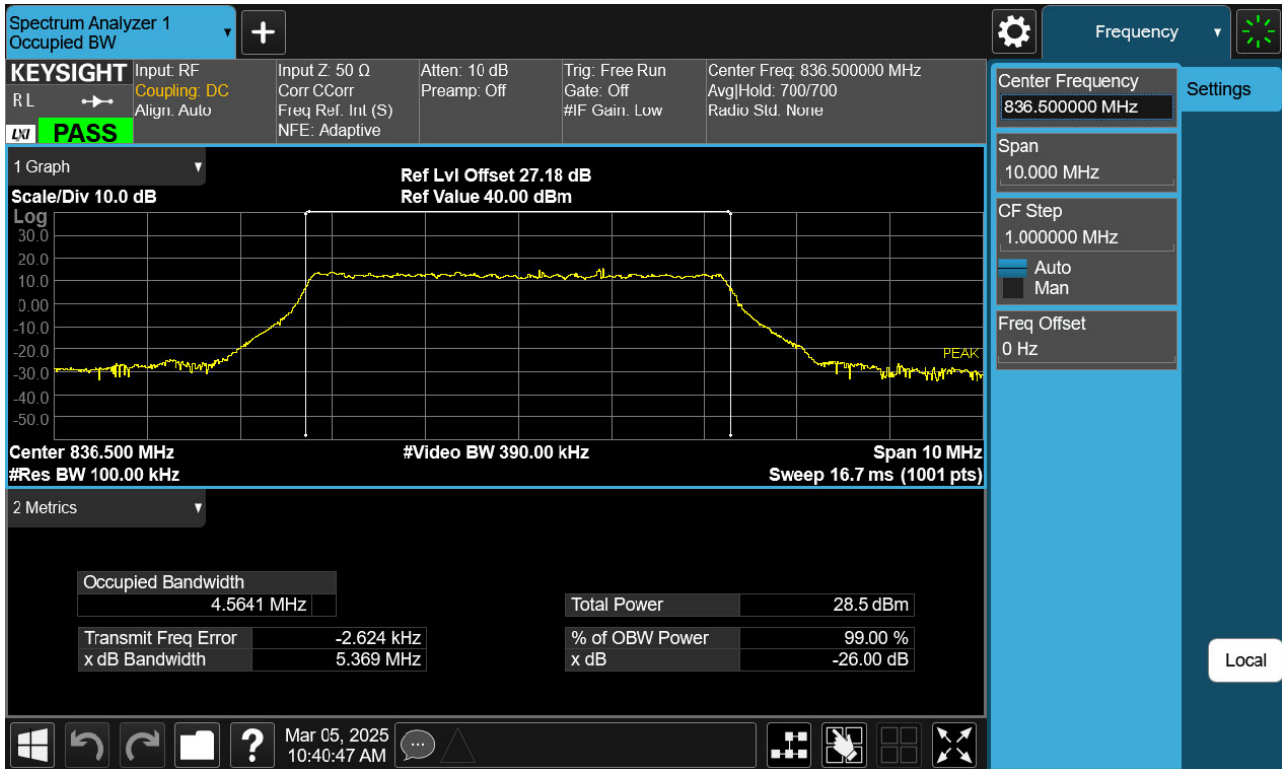
BAND 26. Occupied Bandwidth Plot(5 M BW Ch.26915 16QAM_RB25_0)



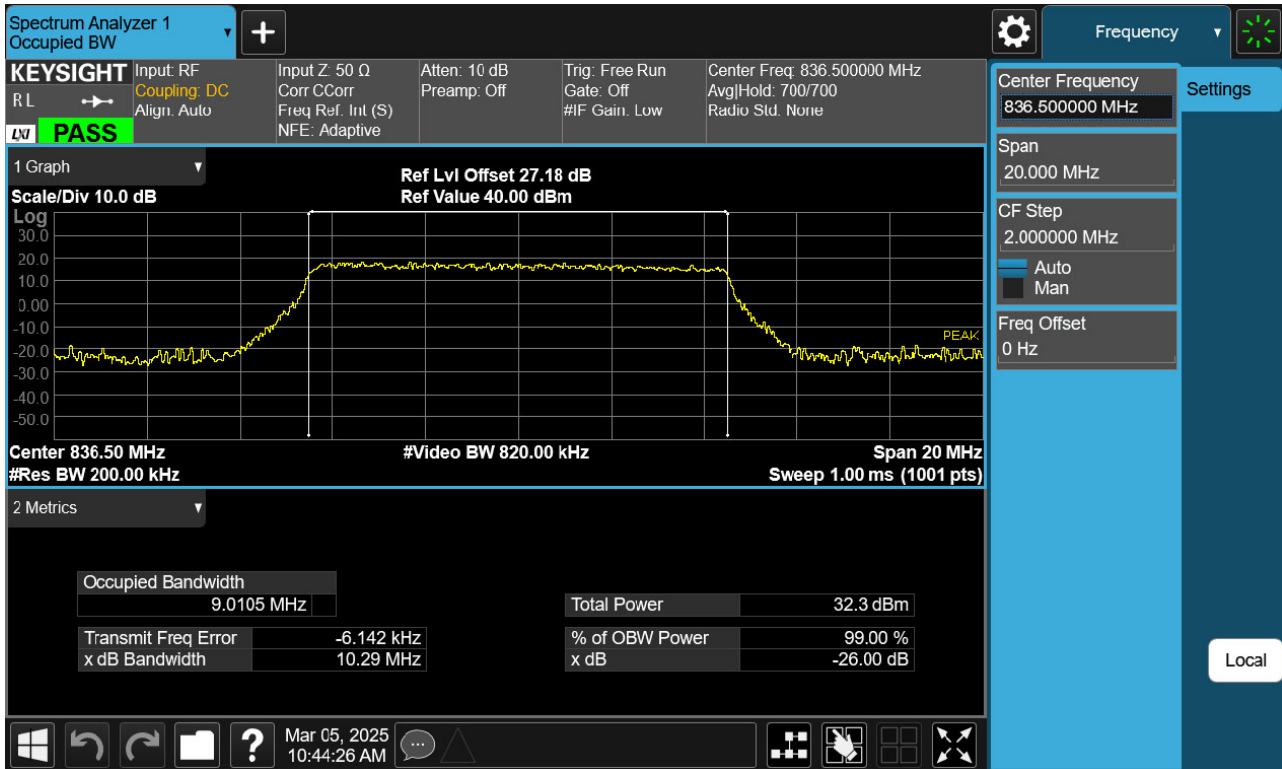
BAND 26. Occupied Bandwidth Plot(5 M BW Ch.26915 64QAM_RB25_0)



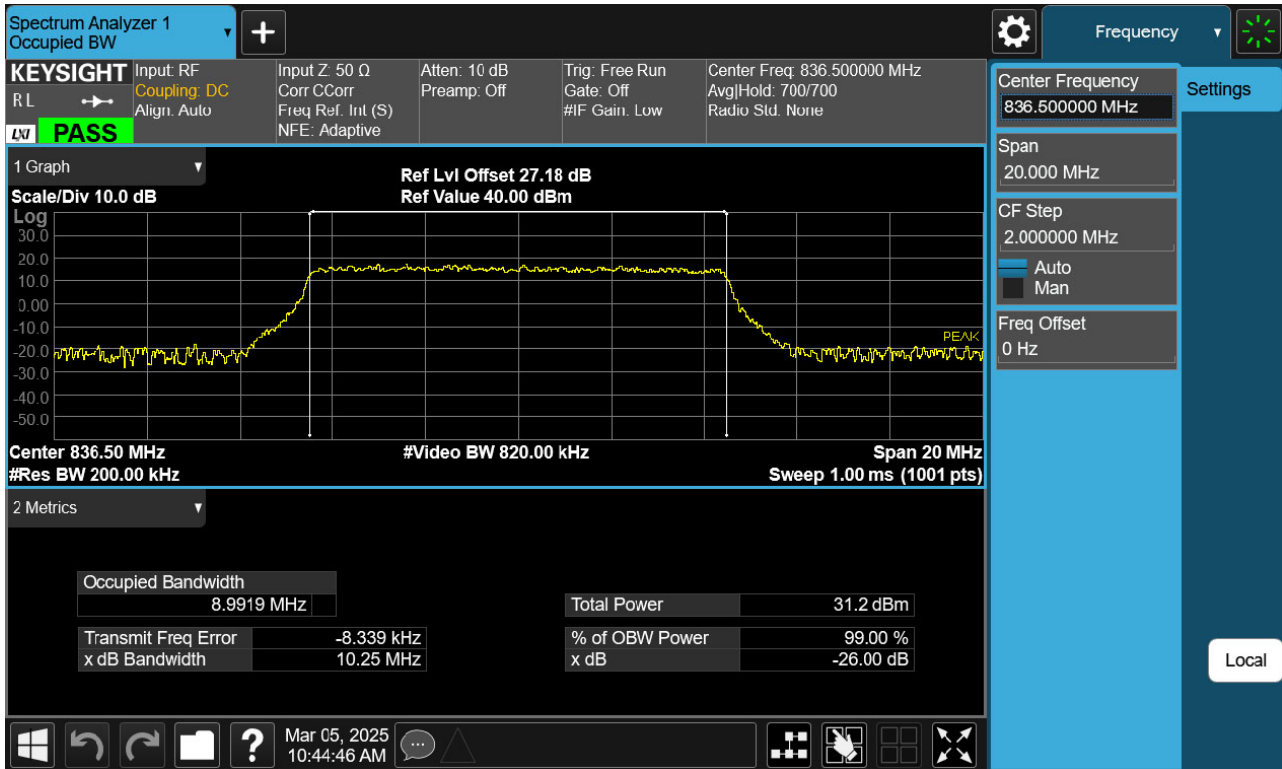
BAND 26. Occupied Bandwidth Plot(5 M BW Ch.26915 256QAM_RB25_0)



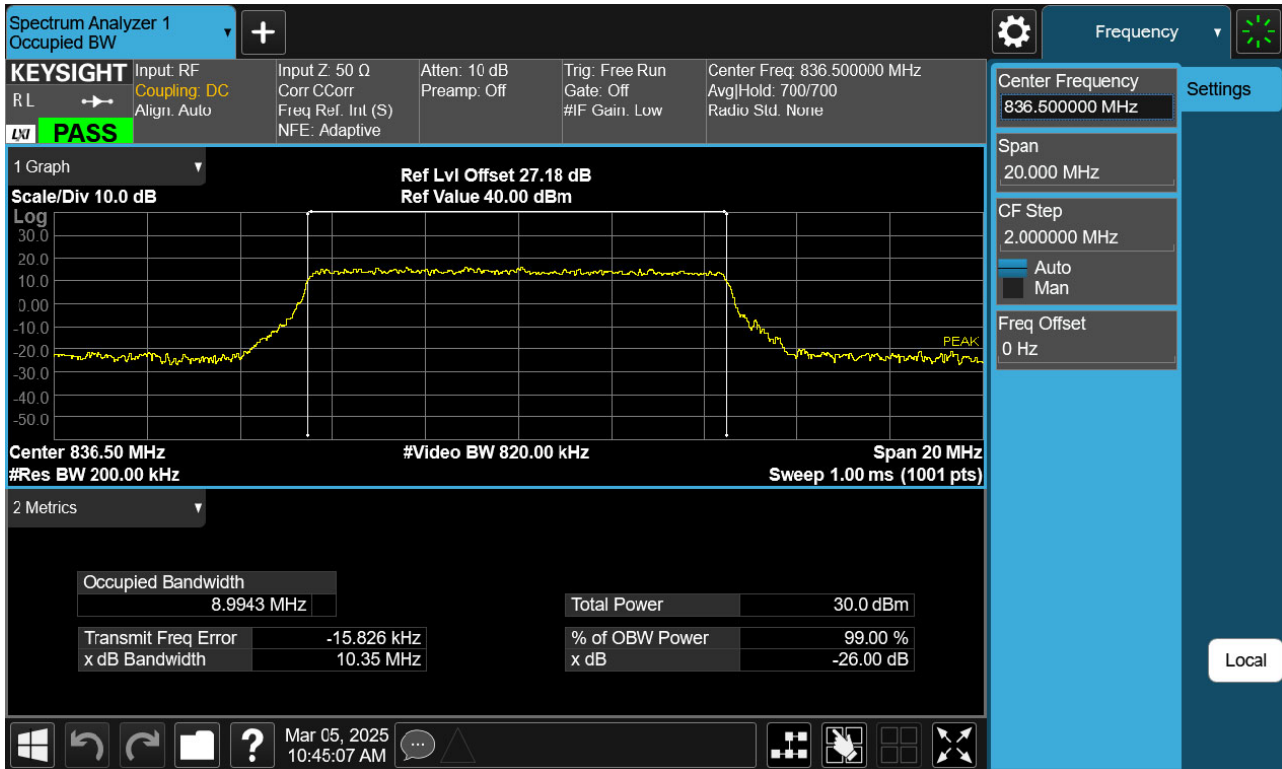
BAND 26. Occupied Bandwidth Plot(10 M BW Ch.26915 QPSK_RB50_0)



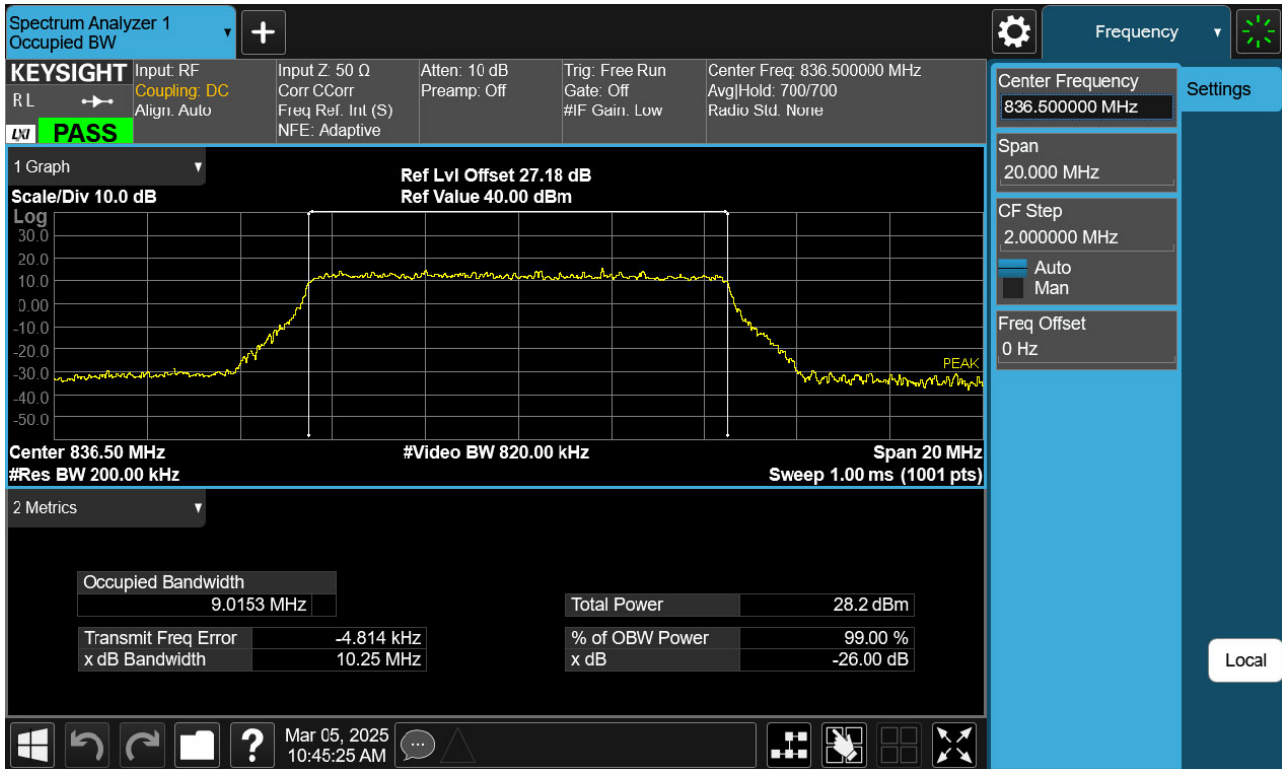
BAND 26. Occupied Bandwidth Plot(10 M BW Ch.26915 16QAM_RB50_0)



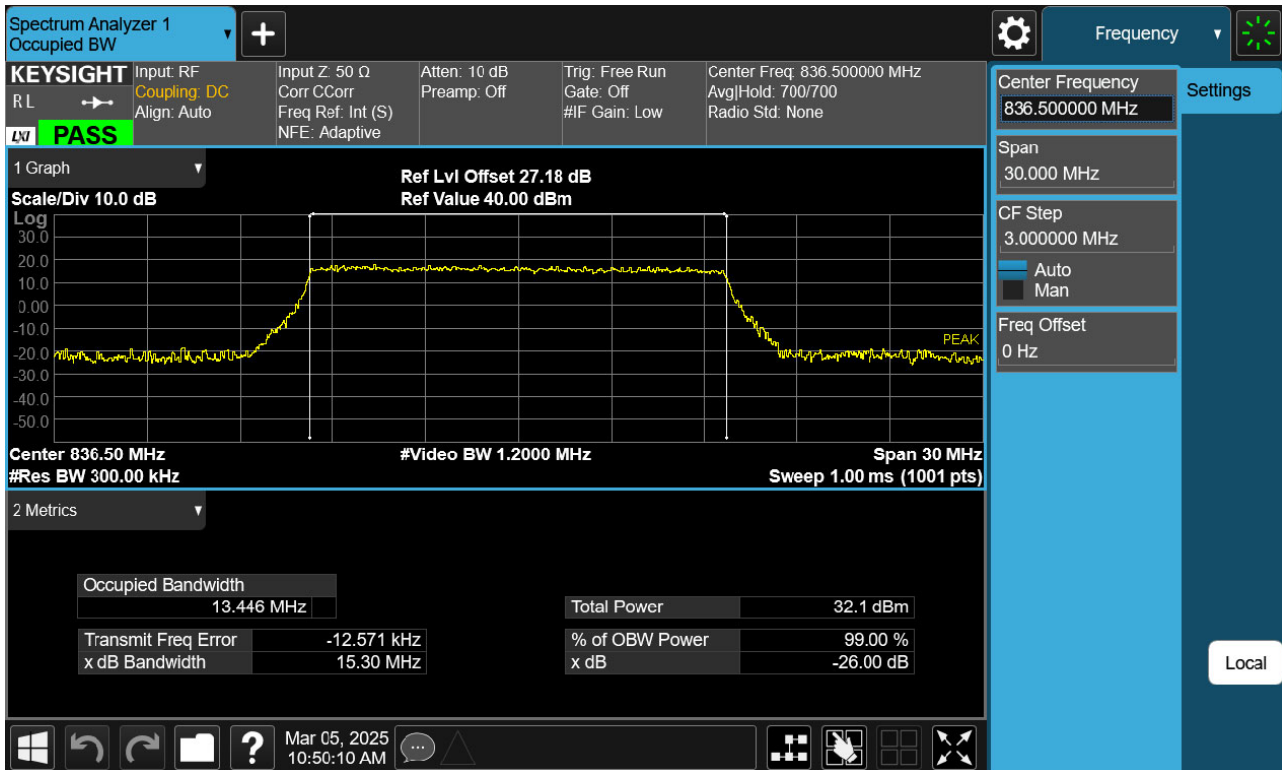
BAND 26. Occupied Bandwidth Plot(10 M BW Ch.26915 64QAM_RB50_0)



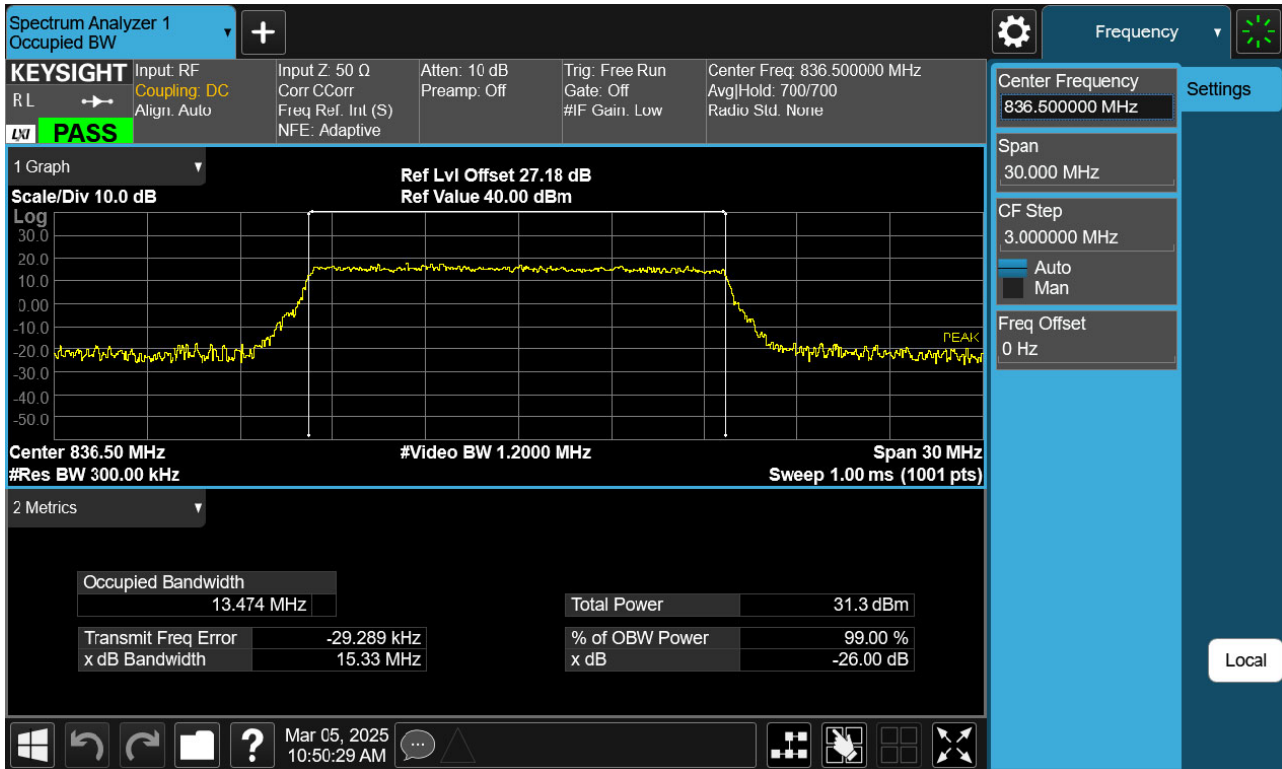
BAND 26. Occupied Bandwidth Plot(10 M BW Ch. 26915 256QAM_RB50_0)



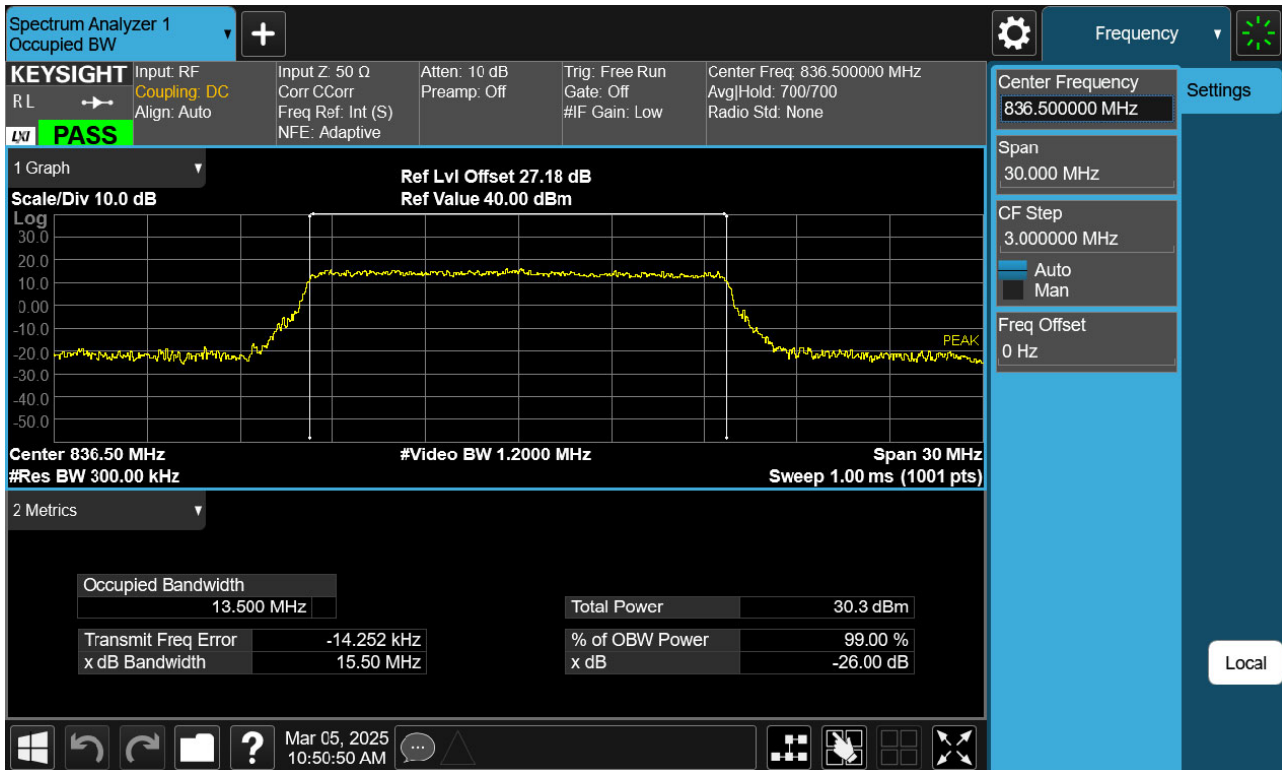
BAND 26. Occupied Bandwidth Plot(15 M BW Ch.26915 QPSK RB 75_0)



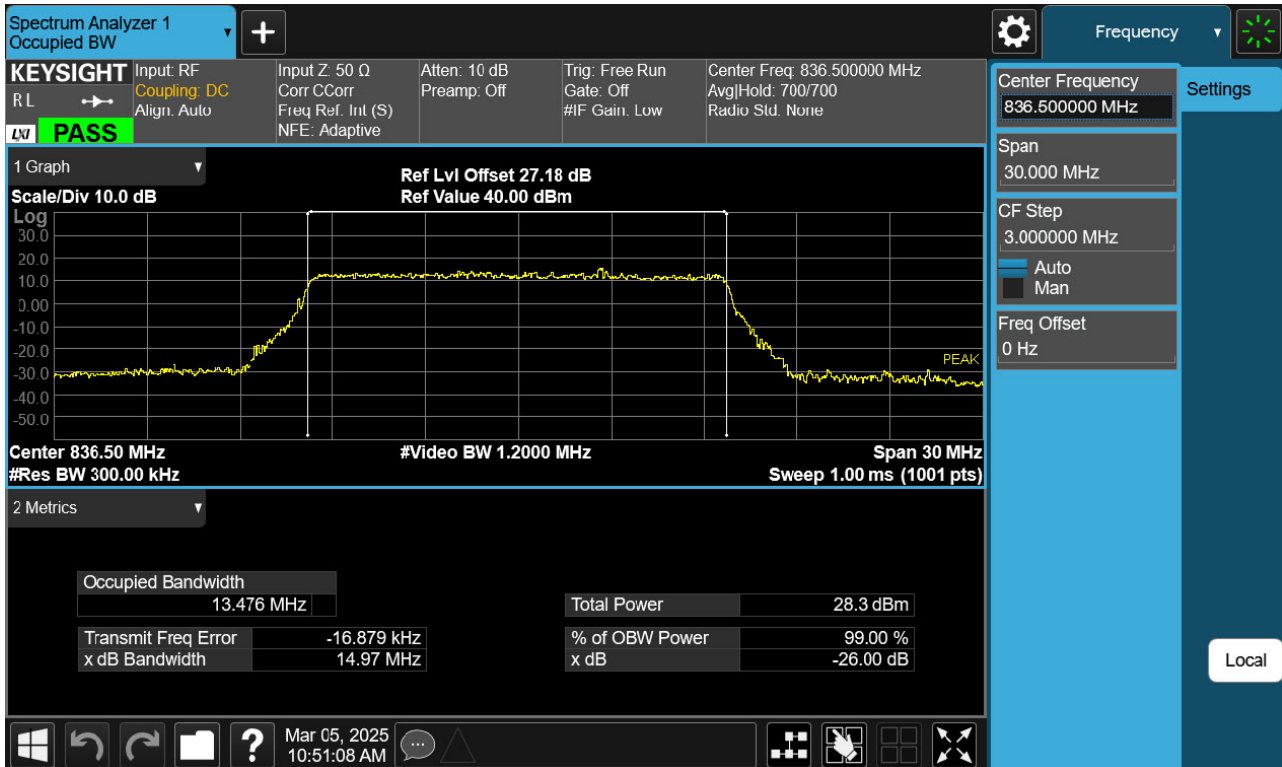
BAND 26. Occupied Bandwidth Plot(15 M BW Ch.26915 16QAM RB 75_0)



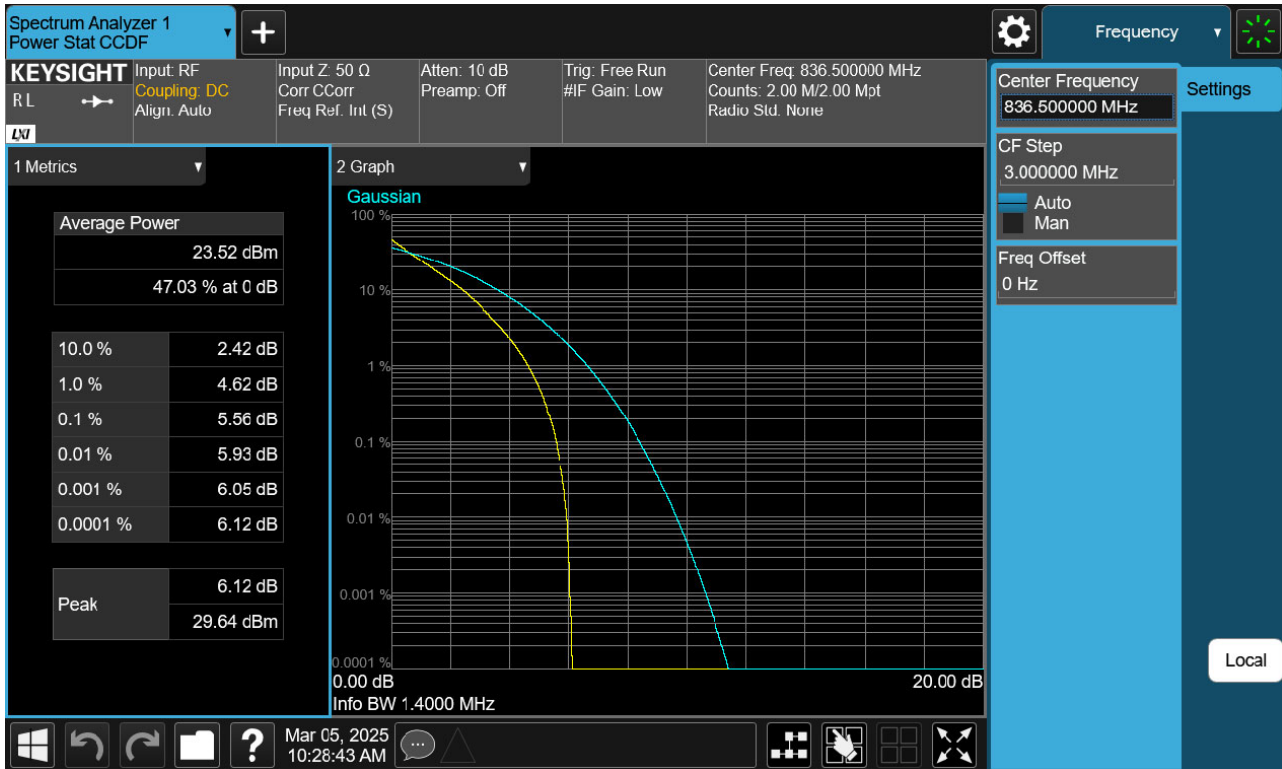
BAND 26. Occupied Bandwidth Plot(15 M BW Ch.26915 64QAM RB 75_0)



BAND 26. Occupied Bandwidth Plot(15 M BW Ch.26915 256QAM RB 75_0)



BAND 26. PAR Plot (1.4 M BW Ch.26915 QPSK_RB6_0)



BAND 26. PAR Plot (1.4 M BW Ch.26915 16QAM_RB6_0)



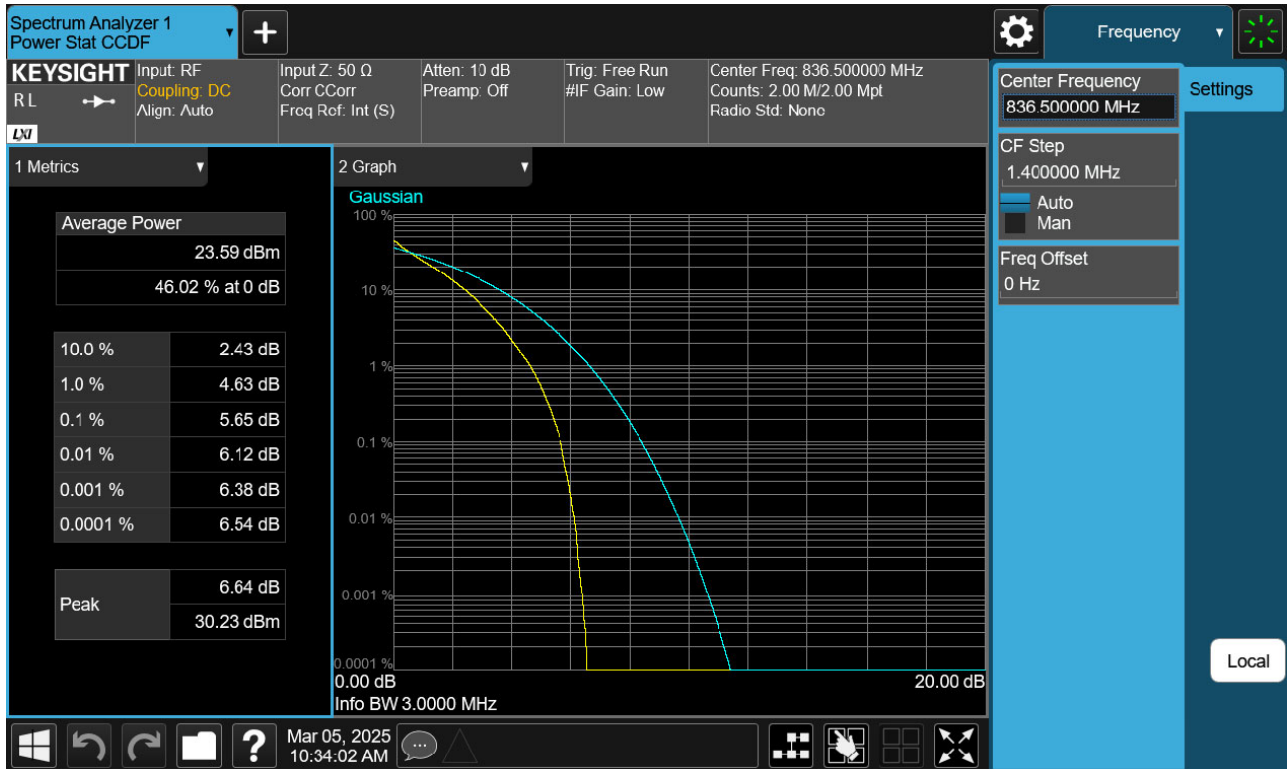
BAND 26. PAR Plot (1.4 M BW Ch.26915 64QAM_RB6_0)



BAND 26. PAR Plot (1.4 M BW Ch.26915 256QAM_RB6_0)



BAND 26. PAR Plot (3 M BW Ch.26915 QPSK_RB15_0)



BAND 26. PAR Plot (3 M BW Ch.26915 16QAM_RB15_0)



BAND 26. PAR Plot (3 M BW Ch.26915 64QAM_RB15_0)

