TEST REPORT

FCC LTE B26(Part90) Test for TM15FNEUJL1
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2502-FC108-R1

DATE OF ISSUE
April 8, 2025

Tested by
Beom Jin Cho

Technical Manager
Jong Seok Lee

Accredited by KOLAS, Republic of KOREA

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Applicant	**LG Electronics Inc.** 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
Product Name Model Name	Telematics TM15FNEUJL1
Date of Test	December 9, 2024 ~ February 24, 2025
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 ID	BEJTM15FNEUJL1
FCC Classification:	PCS Licensed Transmitter (PCB)
Test Standard Used	FCC Rule Part: § 90, § 22
Test Results	PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	February 24, 2025	Initial Release
1	April 08, 2025	Revised the Product Name.

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

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics Inc.
Address:	128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
FCC ID:	BEJTM15FNEUJL1
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 90, § 22
EUT Type:	Telematics
Model(s):	TM15FNEUJL1
Tx Frequency:	814.7 MHz – 824.0 MHz (LTE – Band 26 (1.4 MHz)) 815.5 MHz – 824.0 MHz (LTE – Band 26 (3 MHz)) 816.5 MHz – 824.0 MHz (LTE – Band 26 (5 MHz)) 819.0 MHz – 824.0 MHz (LTE – Band 26 (10 MHz)) 821.5 MHz (LTE – Band 26 (15 MHz))
Date(s) of Tests:	December 9, 2024 ~ February 24, 2025
EUT Serial number:	Radiated : 410VIXV000304(NAD) Conducted : 410VIXV000305(NAD)
Antenna Information	Please refer to the Antenna Specification document.

1.1 MAXIMUM OUTPUT POWER

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Output Power	
				Max. Power (W)	Max. Power (dBm)
LTE – Band26 (1.4)	814.7 – 824.0	1M09G7D	QPSK	0.230	23.62
		1M09W7D	16QAM	0.204	23.09
		1M09W7D	64QAM	0.156	21.92
		1M09W7D	256QAM	0.076	18.81
LTE – Band26 (3)	815.5 – 824.0	2M70G7D	QPSK	0.237	23.75
		2M69W7D	16QAM	0.209	23.20
		2M70W7D	64QAM	0.156	21.93
		2M70W7D	256QAM	0.077	18.87
LTE – Band26 (5)	816.5 – 824.0	4M50G7D	QPSK	0.233	23.68
		4M48W7D	16QAM	0.208	23.18
		4M50W7D	64QAM	0.160	22.05
		4M51W7D	256QAM	0.077	18.85
LTE – Band26 (10)	819.0 – 824.0	8M97G7D	QPSK	0.225	23.53
		8M96W7D	16QAM	0.197	22.94
		8M97W7D	64QAM	0.150	21.77
		8M97W7D	256QAM	0.077	18.84
LTE – Band26 (15)	821.5	13M5G7D	QPSK	0.229	23.59
		13M5W7D	16QAM	0.199	22.98
		13M5W7D	64QAM	0.146	21.65
		13M5W7D	256QAM	0.076	18.78

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
Channel 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	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
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 CONDUCTED OUTPUT POWER

Test Overview

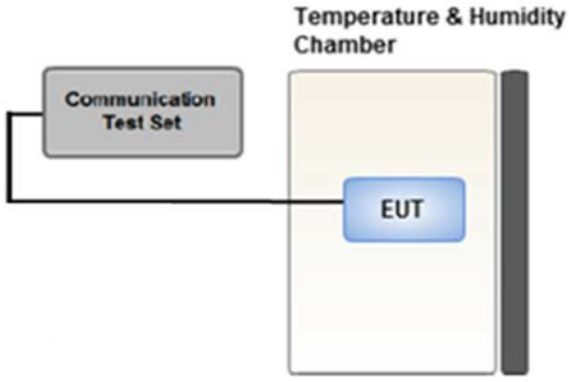
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

Test setup



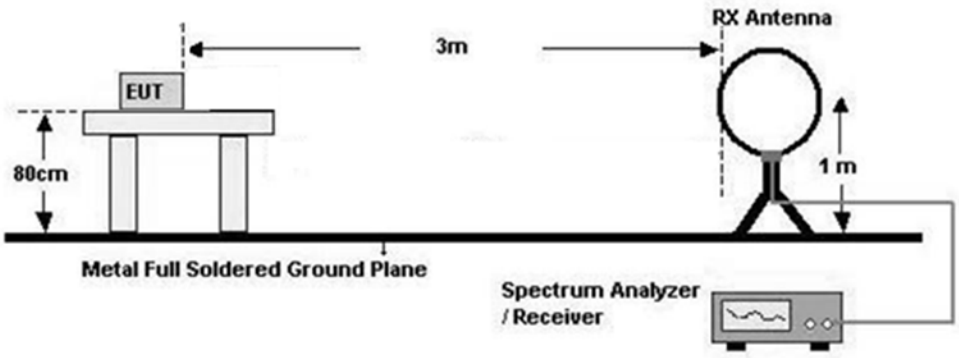
3.3 RADIATED POWER

Test Overview

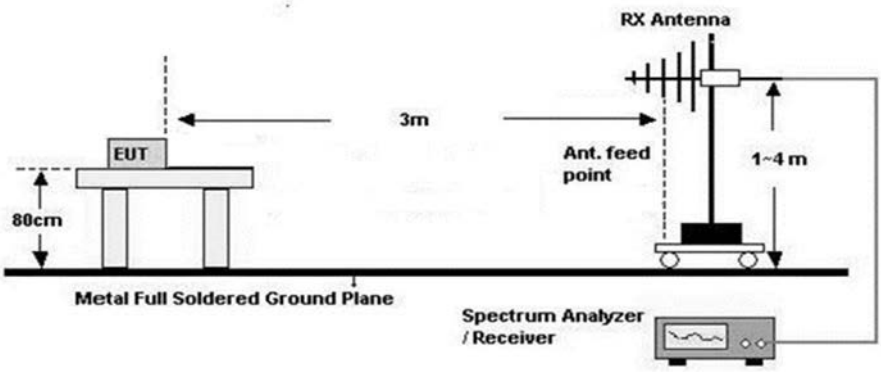
Radiated tests are performed in the semi-anechoic chamber. The equipment under test is placed on a non-conductive table on semi-anechoic chamber.

Test Configuration

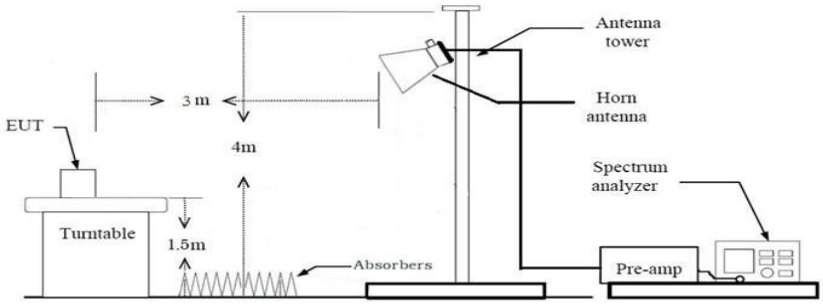
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



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 ≥ 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 EUT is placed on a turntable, which is 0.8 m above ground plane. (Below 1 GHz)
2. The EUT is placed on a turntable, which is 1.5 m above ground plane. (Above 1 GHz)
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
6. 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.
7. Total(dBμV/m) = Measured Value(dBμV) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
8. EIRP (dBm)
   = Total (dBμV/m) + 20 log D − 104.8 (where D is the measurement distance in meters. D=3)
   = Total (dBμV/m) - 95.2(dB)
9. ERP(dBm) = EIRP(dBm) - 2.15(dB)

3.4 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 ≥ 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 10^{th} 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;

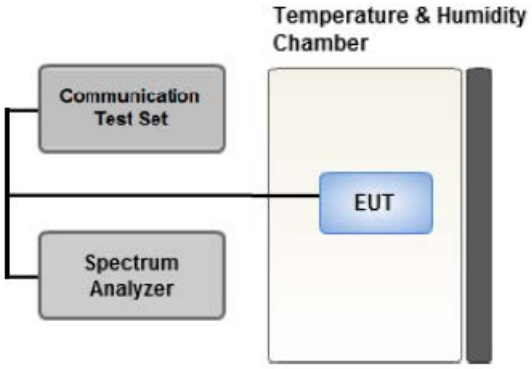
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

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

3.5 OCCUPIED BANDWIDTH.



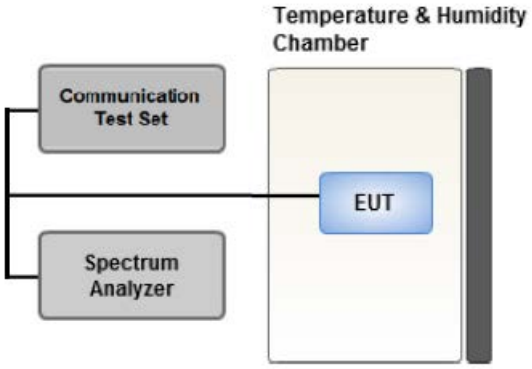
Test setup

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 ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

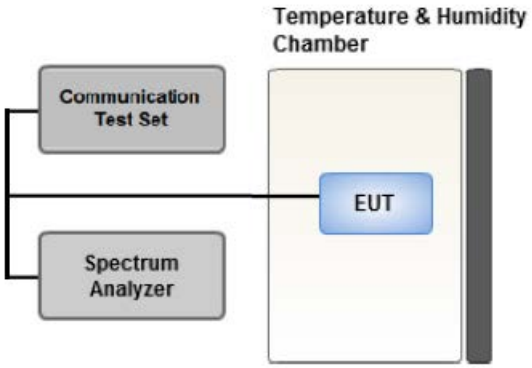
Test Overview

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

Test Settings

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

3.7 CHANNEL 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

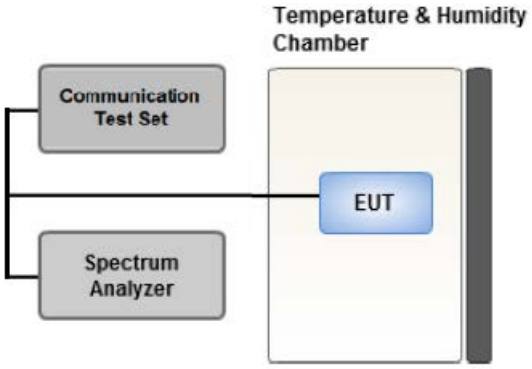
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW :
   .- EA licensee's frequency block by up to and including 37.5 kHz : 300 Hz
   .- EA licensee's frequency block greater than 37.5 kHz : 100 kHz
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

For 90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed.

Where Margin < 1 dB the emission level is either corrected by 10 log(1 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.
- 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 : 15 MHz)
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- All modes of operation were tested and the worst case results are reported.
- Please refer to the table below.
- JIG was used to test the EUT. (EUT + JIG)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 8.2		Y
Radiated Spurious and Harmonic Emissions	QPSK	See Section 8.3		Y

3.10 WORST CASE(CONDUCTED TEST)

- Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.
- JIG was used to test the EUT. (EUT + JIG)

[Worst case]

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

4. LIST OF TEST EQUIPMENT

[Fully-anechoic chamber]

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1 G HPF+LNA)	HCT CO., LTD.,	F2L2	12/12/2025	Annual
RF Switching System	Switch box(3 G HPF+LNA)	HCT CO., LTD.,	F2L3	12/12/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.,	F2L5	12/12/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.,	F2L14	12/12/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/07/2025	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/17/2025	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	93022487	06/27/2025	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	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/19/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	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 & 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.,	-	-	-

[Semi-anechoic chamber]

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Antenna Position Tower	MA4640	Innco systems	S4AM	08/07/2025	Annual
Turn Table	DS2000-S	Innco systems	N/A	N/A	-
Turn Table	Turn Table	Ets	N/A	N/A	-
Controller (Antenna mast & Turn Table)	CO3000	Innco systems	CO3000/1251/48920320/P	N/A	-
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM20090002	N/A	-
RF Switch System	FBSR-04C(3G HPF+LNA)	TNM System	S4L1	04/11/2025	Annual
RF Switch System	FBSR-04C(7G HPF+LNA)	TNM System	S4L5	04/11/2025	Annual
RF Switch System	FBSR-04C(LNA)	TNM System	S4L4	04/11/2025	Annual
RF Switch System	FBSR-04C(Thru)	TNM System	S4L6	04/11/2025	Annual
HIGHPASS FILTER	WHKX10-900-1000-15000-40SS	WAINWRIGHT INSTRUMENTS	16	07/24/2025	Annual
LOW NOISE AMPLIFIER	310N	SONOMA Instrument	186169	02/05/2026	Annual
LOW NOISE AMPLIFIER	TK-PA1840H	TESTEK	170011-L	10/11/2025	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120	Schwarzbeck	937	02/07/2027	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Trilog Broadband Antenna	VULB 9168	Schwarzbeck	9168-0895	08/28/2026	Biennial
DC Power Supply	E3632A	Agilent	MY40010147	08/06/2025	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	101436	02/04/2026	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287701	05/16/2025	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6272613402	08/28/2025	Annual
Signal Analyzer(3 Hz ~ 50 GHz)	N9030A	Agilent	MY49430478	02/12/2026	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	

Note:

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

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{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 (±kHz)
Occupied Bandwidth	95 (Confidence level about 95 %, k=2)
Frequency stability	28 (Confidence level about 95 %, k=2)

Parameter	Expanded Uncertainty (±dB)
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)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

Note. 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
Channel Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 90.691	< 50 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions within 37.5 kHz of Block Edge	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 22.917(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046 § 90.635	< 100 Watts	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 90.213 § 22.355	< 2.5 ppm	PASS

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§ 22.913(a)(5)	< 7 Watts max. ERP (Only 15 MHz B.W)	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 90.691 § 22.917(a)	< 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, § 22.917(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal..	Y	-
§ 2.1055, § 90.213, § 22.355	Frequency stability / variation of ambient temperature	Y	-
§ 22.913(a)(5)	Effective Radiated Power	Y	Spot-check
§ 2.1053, § 90.691, § 22.917(a)	Radiated Spurious and Harmonic Emissions	Y	Spot-check
§ 2.1046, § 90.635	Conducted Output Power	Y	-

Spot-Check Result

1. Data was leveraged from model TM15FNEUJL0 for the certification of TM15FNEUJL1.
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

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

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

7.2 EIRP Sample Calculation

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

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

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 CONDUCTED OUTPUT POWER

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				814.7 MHz		823.3 MHz		
				dBm	W	dBm	W	
1.4	QPSK	1	0	23.62	0.230	23.33	0.215	100
		1	3	23.41	0.219	23.58	0.228	100
		1	5	23.48	0.223	23.59	0.229	100
		3	0	23.52	0.225	23.56	0.227	100
		3	1	23.45	0.221	23.61	0.229	100
		3	3	23.45	0.221	23.56	0.227	100
		6	0	22.53	0.179	22.65	0.184	100
	16QAM	1	0	22.85	0.193	23.00	0.200	100
		1	3	23.09	0.204	23.01	0.200	100
		1	5	22.62	0.183	22.95	0.197	100
		3	0	22.74	0.188	22.54	0.179	100
		3	1	22.70	0.186	22.81	0.191	100
		3	3	22.53	0.179	22.82	0.191	100
		6	0	21.71	0.148	21.55	0.143	100
	64QAM	1	0	21.84	0.153	21.92	0.155	100
		1	3	21.68	0.147	21.81	0.152	100
		1	5	21.70	0.148	21.80	0.151	100
		3	0	21.71	0.148	21.74	0.149	100
		3	1	21.72	0.149	21.79	0.151	100
		3	3	21.63	0.146	21.85	0.153	100
		6	0	20.60	0.115	20.58	0.114	100
	256QAM	1	0	18.68	0.074	18.77	0.075	100
		1	3	18.64	0.073	18.71	0.074	100
		1	5	18.71	0.074	18.77	0.075	100
		3	0	18.72	0.074	18.81	0.076	100
		3	1	18.71	0.074	18.81	0.076	100
		3	3	18.73	0.075	18.79	0.076	100
		6	0	18.68	0.074	18.73	0.075	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				815.5 MHz		822.5 MHz		
				dBm	W	dBm	W	
3	QPSK	1	0	23.63	0.231	23.54	0.226	100
		1	7	23.42	0.220	23.75	0.237	100
		1	14	23.53	0.225	23.74	0.237	100
		8	0	22.67	0.185	22.79	0.190	100
		8	3	22.83	0.192	22.70	0.186	100
		8	7	22.66	0.185	22.70	0.186	100
		15	0	22.76	0.189	22.62	0.183	100
	16QAM	1	0	22.99	0.199	22.95	0.197	100
		1	7	23.20	0.209	22.97	0.198	100
		1	14	22.92	0.196	23.06	0.202	100
		8	0	21.66	0.147	21.81	0.152	100
		8	3	21.85	0.153	21.87	0.154	100
		8	7	21.73	0.149	21.82	0.152	100
		15	0	21.73	0.149	21.78	0.150	100
	64QAM	1	0	21.74	0.149	21.85	0.153	100
		1	7	21.69	0.148	21.93	0.156	100
		1	14	21.64	0.146	21.79	0.151	100
		8	0	20.85	0.122	20.72	0.118	100
		8	3	20.71	0.118	20.75	0.119	100
		8	7	20.65	0.116	20.65	0.116	100
		15	0	20.65	0.116	20.64	0.116	100
	256QAM	1	0	18.71	0.074	18.86	0.077	100
		1	7	18.81	0.076	18.82	0.076	100
		1	14	18.68	0.074	18.68	0.074	100
		8	0	18.87	0.077	18.70	0.074	100
		8	3	18.67	0.074	18.79	0.076	100
		8	7	18.68	0.074	18.83	0.076	100
		15	0	18.82	0.076	18.76	0.075	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				816.5 MHz		821.5 MHz		
				dBm	W	dBm	W	
5	QPSK	1	0	23.68	0.233	23.55	0.227	100
		1	12	23.65	0.232	23.62	0.230	100
		1	24	23.61	0.230	23.55	0.226	100
		12	0	22.64	0.184	22.78	0.190	100
		12	6	22.80	0.191	22.58	0.181	100
		12	11	22.81	0.191	22.61	0.183	100
		25	0	22.82	0.191	22.54	0.180	100
	16QAM	1	0	23.18	0.208	22.84	0.192	100
		1	12	23.12	0.205	23.13	0.206	100
		1	24	22.92	0.196	22.83	0.192	100
		12	0	21.64	0.146	21.69	0.147	100
		12	6	21.73	0.149	21.67	0.147	100
		12	11	21.71	0.148	21.53	0.142	100
		25	0	21.62	0.145	21.64	0.146	100
	64QAM	1	0	22.05	0.160	21.78	0.151	100
		1	12	21.90	0.155	21.82	0.152	100
		1	24	21.83	0.152	21.64	0.146	100
		12	0	20.79	0.120	20.72	0.118	100
		12	6	20.79	0.120	20.64	0.116	100
		12	11	20.67	0.117	20.55	0.114	100
		25	0	20.66	0.116	20.57	0.114	100
	256QAM	1	0	18.78	0.076	18.84	0.077	100
		1	12	18.85	0.077	18.65	0.073	100
		1	24	18.63	0.073	18.67	0.074	100
		12	0	18.64	0.073	18.50	0.071	100
		12	6	18.82	0.076	18.53	0.071	100
		12	11	18.69	0.074	18.63	0.073	100
		25	0	18.82	0.076	18.61	0.073	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				819 MHz		
				dBm	W	
10	QPSK	1	0	23.42	0.220	100
		1	24	23.49	0.224	100
		1	49	23.53	0.225	100
		25	0	22.50	0.178	100
		25	12	22.66	0.185	100
		25	24	22.65	0.184	100
		50	0	22.50	0.178	100
	16QAM	1	0	22.94	0.197	100
		1	24	22.80	0.190	100
		1	49	22.87	0.194	100
		25	0	21.56	0.143	100
		25	12	21.59	0.144	100
		25	24	21.57	0.144	100
		50	0	21.49	0.141	100
	64QAM	1	0	21.60	0.145	100
		1	24	21.77	0.150	100
		1	49	21.65	0.146	100
		25	0	20.67	0.117	100
		25	12	20.74	0.119	100
		25	24	20.62	0.115	100
		50	0	20.58	0.114	100
	256QAM	1	0	18.63	0.073	100
		1	24	18.43	0.070	100
		1	49	18.84	0.077	100
		25	0	18.69	0.074	100
		25	12	18.77	0.075	100
		25	24	18.56	0.072	100
		50	0	18.76	0.075	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				821.5 MHz		
				dBm	W	
15	QPSK	1	0	23.59	0.228	100
		1	36	23.43	0.221	100
		1	74	23.57	0.228	100
		36	0	22.66	0.184	100
		36	18	22.58	0.181	100
		36	39	22.73	0.188	100
		75	0	22.67	0.185	100
	16QAM	1	0	22.98	0.199	100
		1	36	22.78	0.190	100
		1	74	22.72	0.187	100
		36	0	21.59	0.144	100
		36	18	21.68	0.147	100
		36	39	21.61	0.145	100
		75	0	21.58	0.144	100
	64QAM	1	0	21.64	0.146	100
		1	36	21.65	0.146	100
		1	74	21.62	0.145	100
		36	0	20.70	0.118	100
		36	18	20.84	0.121	100
		36	39	20.62	0.115	100
		75	0	20.75	0.119	100
	256QAM	1	0	18.68	0.074	100
		1	36	18.78	0.076	100
		1	74	18.76	0.075	100
		36	0	18.67	0.074	100
		36	18	18.73	0.075	100
		36	39	18.55	0.072	100
		75	0	18.61	0.073	100

8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
814.7	LTE B26/ 1.4 MHz	QPSK	92.95	28.40	1.12	122.47	H	< 7.00	0.534	27.27	1	5
		16QAM	92.23	28.40	1.12	121.75	H		0.452	26.55		
		64QAM	91.35	28.40	1.12	120.87	H		0.369	25.67		
		256QAM	88.56	28.40	1.12	118.08	H		0.194	22.88		
823.3		QPSK	93.13	28.50	1.14	122.77	H		0.571	27.57	1	2
		16QAM	92.45	28.50	1.14	122.09	H		0.489	26.89		
		64QAM	91.50	28.50	1.14	121.14	H		0.393	25.94		
		256QAM	88.67	28.50	1.14	118.31	H		0.205	23.11		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
815.5	LTE B26/ 3 MHz	QPSK	93.19	28.40	1.12	122.71	H	< 7.00	0.564	27.51	1	7
		16QAM	92.41	28.40	1.12	121.93	H		0.471	26.73		
		64QAM	91.58	28.40	1.12	121.10	H		0.389	25.90		
		256QAM	88.71	28.40	1.12	118.23	H		0.201	23.03		
822.5		QPSK	93.15	28.50	1.14	122.79	H		0.574	27.59	1	7
		16QAM	92.43	28.50	1.14	122.07	H		0.486	26.87		
		64QAM	91.52	28.50	1.14	121.16	H		0.394	25.96		
		256QAM	88.76	28.50	1.14	118.40	H		0.209	23.20		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
816.5	LTE B26/ 5 MHz	QPSK	93.13	28.40	1.12	122.65	H	< 7.00	0.556	27.45	1	12
		16QAM	92.35	28.40	1.12	121.87	H		0.465	26.67		
		64QAM	91.57	28.40	1.12	121.09	H		0.388	25.89		
		256QAM	88.62	28.40	1.12	118.14	H		0.197	22.94		
821.5		QPSK	93.14	28.50	1.14	122.78	H		0.573	27.58	1	0
		16QAM	92.31	28.50	1.14	121.95	H		0.473	26.75		
		64QAM	91.61	28.50	1.14	121.25	H		0.403	26.05		
		256QAM	88.58	28.50	1.14	118.22	H		0.200	23.02		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
819.0	LTE B26/ 10 MHz	QPSK	93.13	28.40	1.12	122.65	H	< 7.00	0.556	27.45	1	24
		16QAM	92.34	28.40	1.12	121.86	H		0.463	26.66		
		64QAM	91.56	28.40	1.12	121.08	H		0.387	25.88		
		256QAM	88.62	28.40	1.12	118.14	H		0.197	22.94		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
821.5	LTE B26/ 15 MHz	QPSK	93.34	28.40	1.14	122.88	H	< 7.00	0.586	27.68	1	0
		16QAM	92.21	28.40	1.14	121.75	H		0.452	26.55		
		64QAM	91.51	28.40	1.14	121.05	H		0.385	25.85		
		256QAM	88.59	28.40	1.14	118.13	H		0.196	22.93		

Note

1. Limit: None (for reporting purposes only)

8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit	Size	
									Size	Offset
26765 (821.5)	1,643.00	-51.88	9.39	-66.72	2.00	H	-59.33	-13.00	1	0
	2,464.50	-53.37	10.37	-64.53	2.59	H	-56.75	-13.00		
	3,286.00	-53.61	10.98	-61.72	2.95	H	-53.69	-13.00		
	4,107.50	-54.44	11.63	-60.76	3.33	H	-52.46	-13.00		
	4,929.00	-56.30	11.31	-57.96	3.64	H	-50.29	-13.00		

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 26	1.4 MHz	823.3	QPSK	6	0	1.0894
			16QAM			1.0865
			64QAM			1.0898
			256QAM			1.0862
	3 MHz	822.5	QPSK	15		2.7016
			16QAM			2.6914
			64QAM			2.6954
			256QAM			2.7003
	5 MHz	821.5	QPSK	25		4.5010
			16QAM			4.4841
			64QAM			4.4964
			256QAM			4.5087
	10 MHz	819.0	QPSK	50		8.9731
			16QAM			8.9586
			64QAM			8.9744
			256QAM			8.9718
	15 MHz	821.5	QPSK	75		13.477
			16QAM			13.448
			64QAM			13.459
			256QAM			13.461

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 48 ~ 67.

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	814.7	3.9881	26.600	-54.130	-27.530	-13.00
		823.3	3.7987	26.600	-55.844	-29.244	
	3	815.5	4.0679	26.600	-54.879	-28.279	
		822.5	9.7009	27.520	-55.935	-28.415	
	5	816.5	3.7987	26.600	-55.084	-28.484	
		821.5	5.2044	27.520	-56.747	-29.227	
	10	819.0	4.0479	26.600	-56.258	-29.658	
	15	821.5	4.6262	26.600	-56.319	-29.719	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 88 ~ 95.
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	26.08
1 – 5	26.60
5 – 10	27.52
10 – 15	29.12
15 – 20	31.71
Above 20(26.5)	32.35

8.6 CHANNEL EDGE

- Plots of the EUT's Band Edge are shown Page 68 ~ 87.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 26

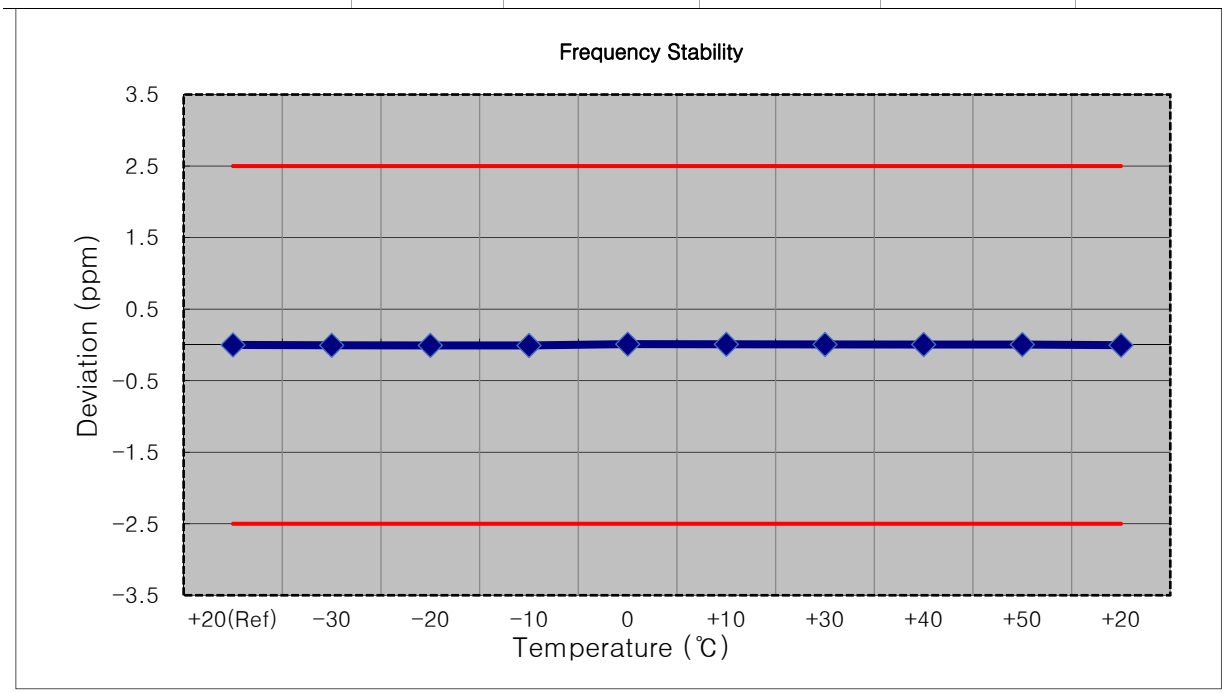
▣ OPERATING FREQUENCY: 814,700,000 Hz

▣ CHANNEL: 26697(1.4 MHz)

▣ REFERENCE VOLTAGE: 12.000 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	12.000	+20(Ref)	814 699 999	0.0	0.000 000	0.000
100 %		-30	814 699 995	-4.3	-0.000 001	-0.005
100 %		-20	814 699 993	-5.8	-0.000 001	-0.007
100 %		-10	814 699 993	-6.4	-0.000 001	-0.008
100 %		0	814 700 008	9.1	0.000 001	0.011
100 %		+10	814 700 006	7.3	0.000 001	0.009
100 %		+30	814 700 004	5.4	0.000 001	0.007
100 %		+40	814 700 003	4.4	0.000 001	0.005
100 %		+50	814 700 003	4.4	0.000 001	0.005
115 %		+20	814 700 002	3.1	0.000 000	0.004
85 %		+20	814 699 995	-4.4	-0.000 001	-0.005



▣ MODE: LTE 26

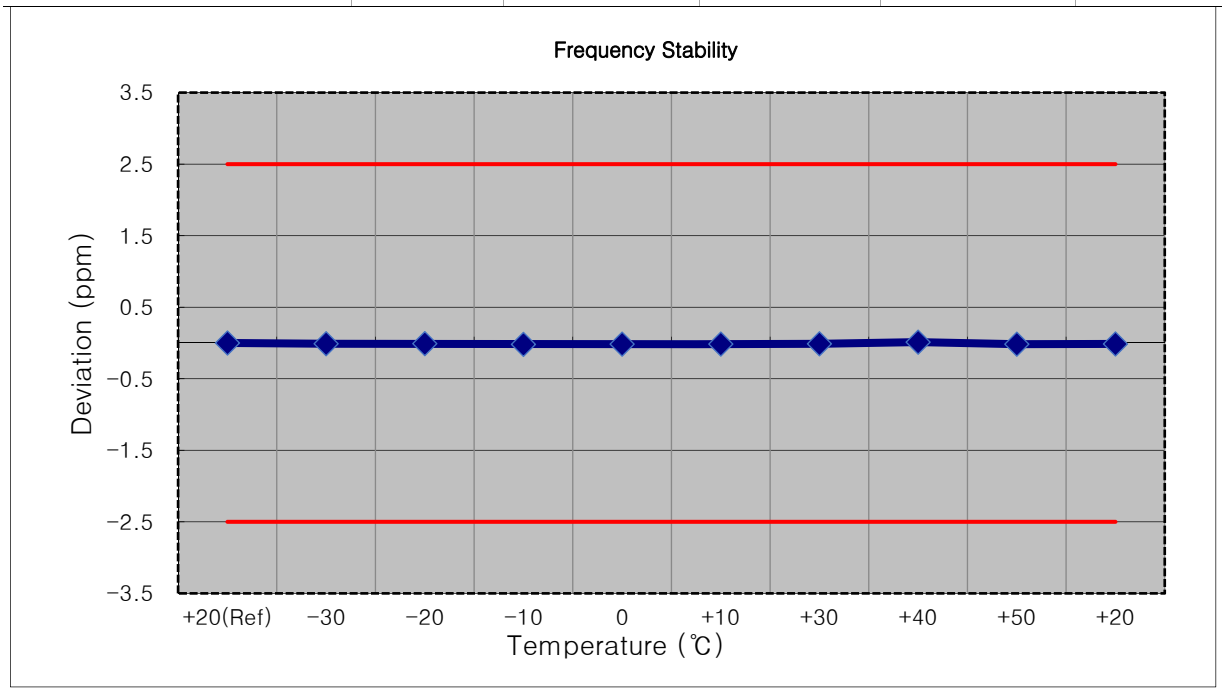
▣ OPERATING FREQUENCY: 815,500,000 Hz

▣ CHANNEL: 26705(3 MHz)

▣ REFERENCE VOLTAGE: 12.000 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	12.000	+20(Ref)	815 499 992	0.0	0.000 000	0.000
100 %		-30	815 499 983	-8.7	-0.000 001	-0.011
100 %		-20	815 499 984	-7.5	-0.000 001	-0.009
100 %		-10	815 499 976	-15.8	-0.000 002	-0.019
100 %		0	815 499 979	-12.9	-0.000 002	-0.016
100 %		+10	815 499 980	-11.9	-0.000 001	-0.015
100 %		+30	815 499 983	-9.2	-0.000 001	-0.011
100 %		+40	815 500 002	9.8	0.000 001	0.012
100 %		+50	815 499 978	-13.7	-0.000 002	-0.017
115 %		+20	815 499 987	-4.9	-0.000 001	-0.006
85 %		+20	815 499 985	-7.4	-0.000 001	-0.009



▣ MODE: LTE 26

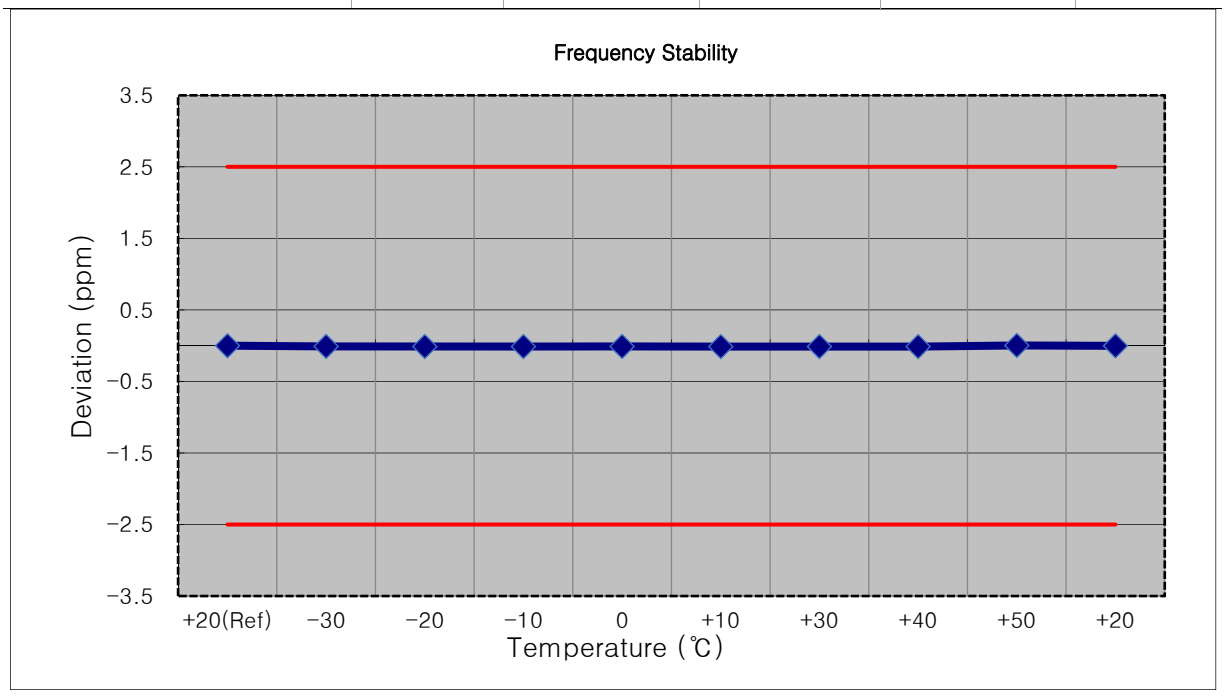
▣ OPERATING FREQUENCY: 816,500,000 Hz

▣ CHANNEL: 26715(5 MHz)

▣ REFERENCE VOLTAGE: 12.000 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	12.000	+20(Ref)	816 499 992	0.0	0.000 000	0.000
100 %		-30	816 499 983	-8.3	-0.000 001	-0.010
100 %		-20	816 499 982	-9.3	-0.000 001	-0.011
100 %		-10	816 499 982	-10.0	-0.000 001	-0.012
100 %		0	816 499 983	-8.8	-0.000 001	-0.011
100 %		+10	816 499 981	-10.2	-0.000 001	-0.012
100 %		+30	816 499 981	-10.3	-0.000 001	-0.013
100 %		+40	816 499 981	-10.1	-0.000 001	-0.012
100 %		+50	816 499 994	2.5	0.000 000	0.003
115 %		+20	815 499 987	-5.1	-0.000 001	-0.006
85 %		+20	815 499 986	-6.3	-0.000 001	-0.008



▣ MODE: LTE 26

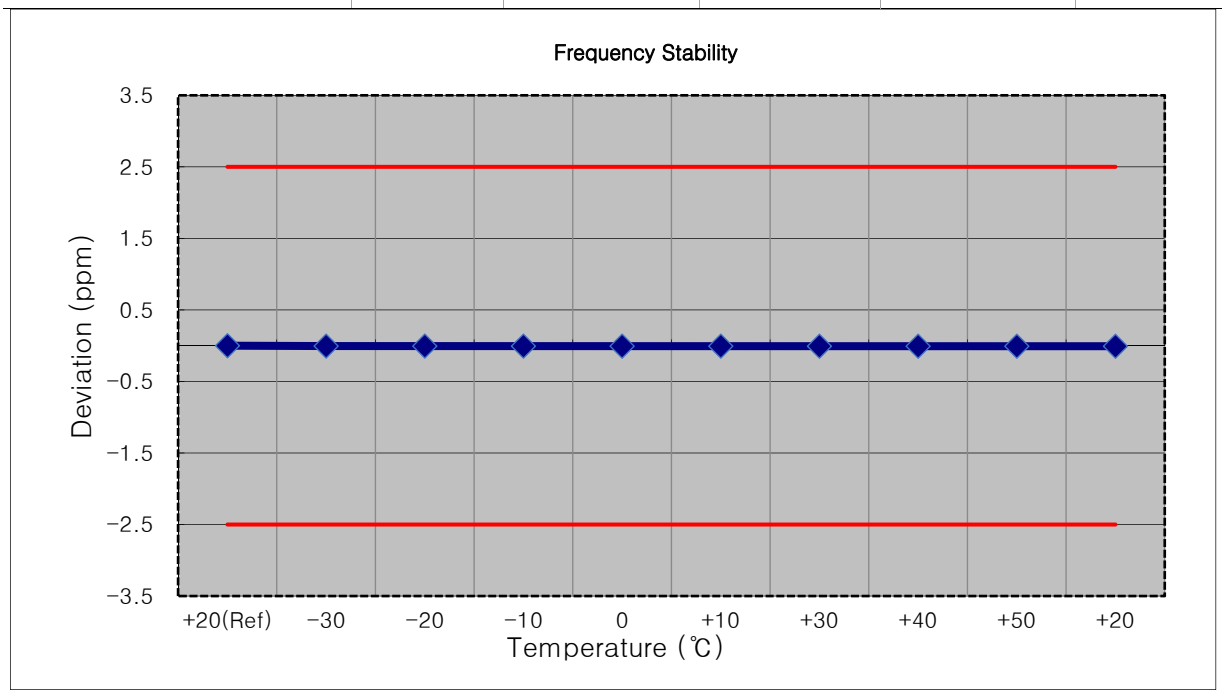
▣ OPERATING FREQUENCY: 819,000,000 Hz

▣ CHANNEL: 26740(10 MHz)

▣ REFERENCE VOLTAGE: 12.000 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	12.000	+20(Ref)	818 999 989	0.0	0.000 000	0.000
100 %		-30	818 999 984	-4.4	-0.000 001	-0.005
100 %		-20	818 999 984	-4.3	-0.000 001	-0.005
100 %		-10	818 999 984	-5.0	-0.000 001	-0.006
100 %		0	818 999 984	-5.2	-0.000 001	-0.006
100 %		+10	818 999 983	-5.4	-0.000 001	-0.007
100 %		+30	818 999 983	-5.5	-0.000 001	-0.007
100 %		+40	818 999 983	-5.8	-0.000 001	-0.007
100 %		+50	818 999 983	-5.8	-0.000 001	-0.007
115 %		+20	818 999 984	-4.7	-0.000 001	-0.006
85 %		+20	818 999 983	-5.6	-0.000 001	-0.007



▣ MODE: LTE 26

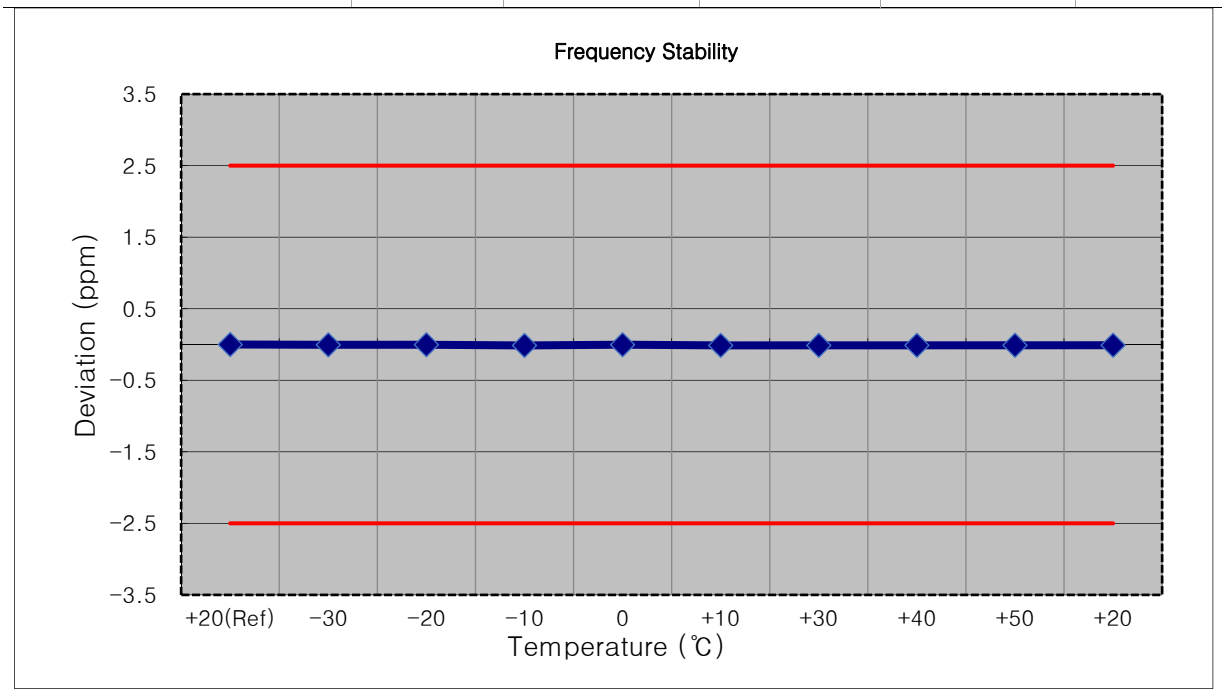
▣ OPERATING FREQUENCY: 821,500,000 Hz

▣ CHANNEL: 26765(15 MHz)

▣ REFERENCE VOLTAGE: 12.000 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %		+20(Ref)	821 499 996	0.0	0.000 000	0.000
100 %		-30	821 499 992	-3.6	0.000 000	-0.004
100 %		-20	821 499 993	-2.9	0.000 000	-0.004
100 %		-10	821 499 985	-10.6	-0.000 001	-0.013
100 %	12.000	0	821 499 993	-2.4	0.000 000	-0.003
100 %		+10	821 499 985	-10.1	-0.000 001	-0.012
100 %		+30	821 499 986	-9.9	-0.000 001	-0.012
100 %		+40	821 499 986	-9.5	-0.000 001	-0.012
100 %		+50	821 499 987	-8.9	-0.000 001	-0.011
115 %		+20	821 499 991	-4.3	-0.000 001	-0.005
85 %		+20	821 499 993	-2.5	0.000 000	-0.003



8.8 STRADDLE CHANNEL

8.8.1 CONDUCTED OUTPUT POWER

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
1.4	QPSK	1	0	23.40	0.219	100
		1	3	23.60	0.229	100
		1	5	23.60	0.229	100
		3	0	23.54	0.226	100
		3	1	23.53	0.225	100
		3	3	23.53	0.225	100
		6	0	22.62	0.183	100
	16QAM	1	0	23.00	0.199	100
		1	3	23.01	0.200	100
		1	5	22.89	0.195	100
		3	0	22.60	0.182	100
		3	1	22.78	0.190	100
		3	3	22.88	0.194	100
		6	0	21.60	0.145	100
	64QAM	1	0	21.91	0.155	100
		1	3	21.76	0.150	100
		1	5	21.83	0.152	100
		3	0	21.70	0.148	100
		3	1	21.73	0.149	100
		3	3	21.81	0.152	100
		6	0	20.58	0.114	100
	256QAM	1	0	18.81	0.076	100
		1	3	18.68	0.074	100
		1	5	18.82	0.076	100
		3	0	18.79	0.076	100
		3	1	18.86	0.077	100
		3	3	18.84	0.077	100
		6	0	18.69	0.074	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
3	QPSK	1	0	23.51	0.225	100
		1	7	23.77	0.238	100
		1	14	23.74	0.237	100
		8	0	22.84	0.192	100
		8	3	22.78	0.189	100
		8	7	22.73	0.187	100
		15	0	22.65	0.184	100
	16QAM	1	0	22.90	0.195	100
		1	7	22.89	0.195	100
		1	14	23.05	0.202	100
		8	0	21.77	0.150	100
		8	3	21.86	0.153	100
		8	7	21.86	0.153	100
		15	0	21.81	0.152	100
	64QAM	1	0	21.89	0.154	100
		1	7	21.86	0.153	100
		1	14	21.83	0.153	100
		8	0	20.80	0.120	100
		8	3	20.75	0.119	100
		8	7	20.67	0.117	100
		15	0	20.73	0.118	100
	256QAM	1	0	18.78	0.076	100
		1	7	18.82	0.076	100
		1	14	18.68	0.074	100
		8	0	18.64	0.073	100
		8	3	18.82	0.076	100
		8	7	18.78	0.075	100
		15	0	18.82	0.076	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
5	QPSK	1	0	23.59	0.228	100
		1	12	23.60	0.229	100
		1	24	23.47	0.222	100
		12	0	22.80	0.191	100
		12	6	22.63	0.183	100
		12	11	22.57	0.181	100
		25	0	22.60	0.182	100
	16QAM	1	0	22.85	0.193	100
		1	12	23.16	0.207	100
		1	24	22.84	0.192	100
		12	0	21.66	0.147	100
		12	6	21.61	0.145	100
		12	11	21.54	0.143	100
		25	0	21.60	0.145	100
	64QAM	1	0	21.76	0.150	100
		1	12	21.85	0.153	100
		1	24	21.56	0.143	100
		12	0	20.63	0.116	100
		12	6	20.66	0.116	100
		12	11	20.58	0.114	100
		25	0	20.60	0.115	100
	256QAM	1	0	18.75	0.075	100
		1	12	18.66	0.073	100
		1	24	18.67	0.074	100
		12	0	18.54	0.071	100
		12	6	18.58	0.072	100
		12	11	18.56	0.072	100
		25	0	18.58	0.072	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
10	QPSK	1	0	23.47	0.222	100
		1	24	23.51	0.224	100
		1	49	23.60	0.229	100
		25	0	22.59	0.182	100
		25	12	22.64	0.184	100
		25	24	22.65	0.184	100
		50	0	22.58	0.181	100
	16QAM	1	0	23.02	0.200	100
		1	24	22.89	0.194	100
		1	49	22.91	0.196	100
		25	0	21.61	0.145	100
		25	12	21.62	0.145	100
		25	24	21.61	0.145	100
		50	0	21.44	0.139	100
	64QAM	1	0	21.59	0.144	100
		1	24	21.73	0.149	100
		1	49	21.67	0.147	100
		25	0	20.65	0.116	100
		25	12	20.71	0.118	100
		25	24	20.65	0.116	100
		50	0	20.63	0.116	100
	256QAM	1	0	18.63	0.073	100
		1	24	18.39	0.069	100
		1	49	18.81	0.076	100
		25	0	18.60	0.072	100
		25	12	18.73	0.075	100
		25	24	18.58	0.072	100
		50	0	18.69	0.074	100

8.8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 1.4 MHz	QPSK	93.08	28.50	1.14	122.72	H	< 7.00	0.565	27.52	1	0
		16-QAM	92.23	28.50	1.14	121.87	H		0.465	26.67		
		64-QAM	91.34	28.50	1.14	120.98	H		0.378	25.78		
		256-QAM	88.51	28.50	1.14	118.15	H		0.197	22.95		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 3 MHz	QPSK	93.03	28.50	1.14	122.67	H	< 7.00	0.558	27.47	1	0
		16-QAM	92.25	28.50	1.14	121.89	H		0.467	26.69		
		64-QAM	91.37	28.50	1.14	121.01	H		0.381	25.81		
		256-QAM	88.49	28.50	1.14	118.13	H		0.196	22.93		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 5 MHz	QPSK	93.07	28.50	1.14	122.71	H	< 7.00	0.564	27.51	1	0
		16-QAM	92.31	28.50	1.14	121.95	H		0.473	26.75		
		64-QAM	91.35	28.50	1.14	120.99	H		0.379	25.79		
		256-QAM	88.56	28.50	1.14	118.20	H		0.200	23.00		

Freq (MHz)	Bandwidth	Modulation	Measured (dBμV/m)	Ant. Factor	C.L (dB)	Total (dBμV/m)	Pol.	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 10 MHz	QPSK	93.19	28.50	1.14	122.83	H	< 7.00	0.579	27.63	1	0
		16-QAM	92.39	28.50	1.14	122.03	H		0.482	26.83		
		64-QAM	91.41	28.50	1.14	121.05	H		0.385	25.85		
		256-QAM	88.70	28.50	1.14	118.34	H		0.206	23.14		

8.8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26(Straddle)

▣ 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
26790 (824.0)	1,648.00	-51.64	9.44	-66.58	2.02	H	-59.16	-13.00	1	0
	2,472.00	-53.22	10.35	-64.42	2.59	H	-56.66	-13.00		
	3,296.00	-53.30	11.06	-61.46	2.95	H	-53.35	-13.00		
	4,120.00	-54.90	11.65	-61.26	3.31	H	-52.92	-13.00		
	4,944.00	-56.04	11.28	-57.70	3.68	H	-50.10	-13.00		

8.8.4 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	824.0	824.0	4.0379	26.600	-56.668	-30.068	-13.00
	824.0		3.7987	26.600	-54.098	-27.498	
	824.0		8.3649	27.520	-56.674	-29.154	
	824.0		9.8106	27.520	-56.429	-28.909	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 97 ~ 100.
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	26.08
1 – 5	26.60
5 – 10	27.52
10 – 15	29.12
15 – 20	31.71
0.03 – 1	32.35

8.8.5 CHANNEL EDGE(Part90)

- Test Channel : 26790(824.0MHz)
- Plots of the EUT's Band Edge are shown Page 101 ~ 112.

8.8.6 BAND EDGE(Part22)

- Test Channel : 26790(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 113 ~ 120.

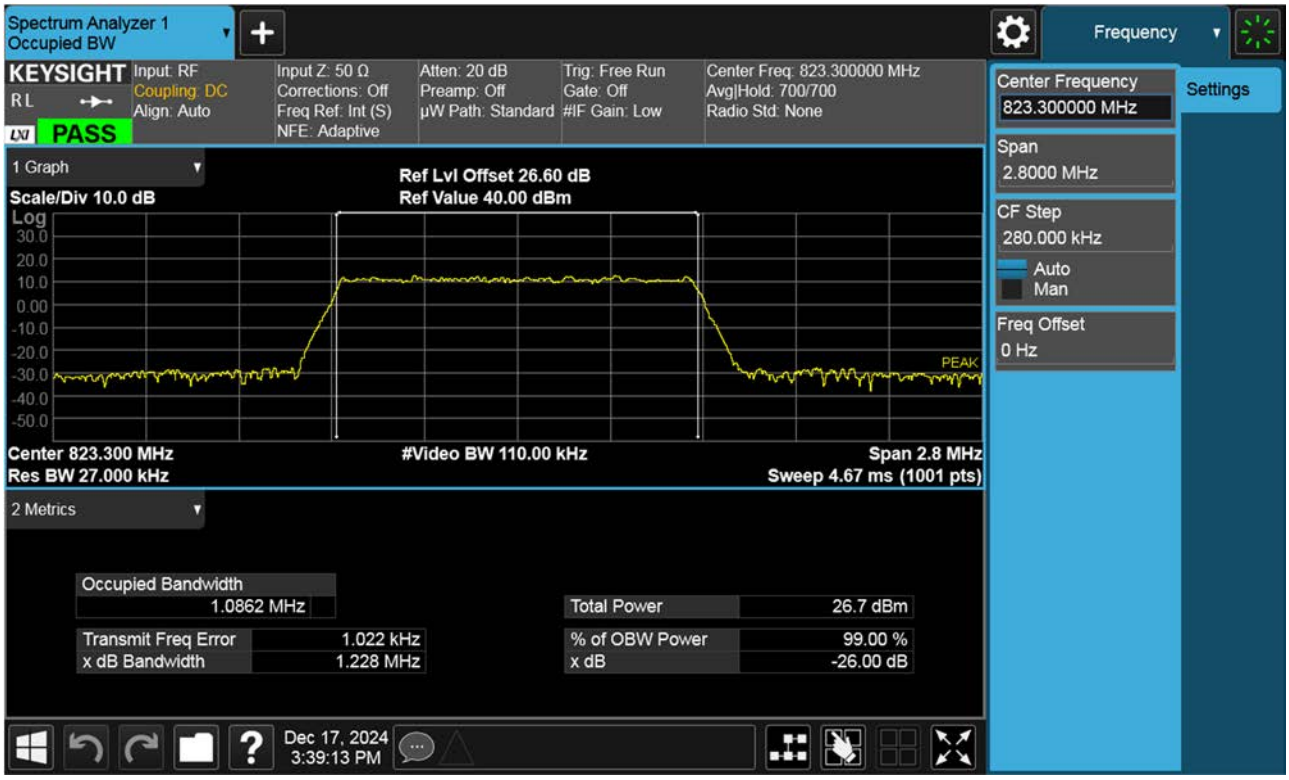
9. TEST PLOTS

BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 QPSK RB 6_0)

BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 16QAM RB 6_0)

BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 64QAM RB 6_0)

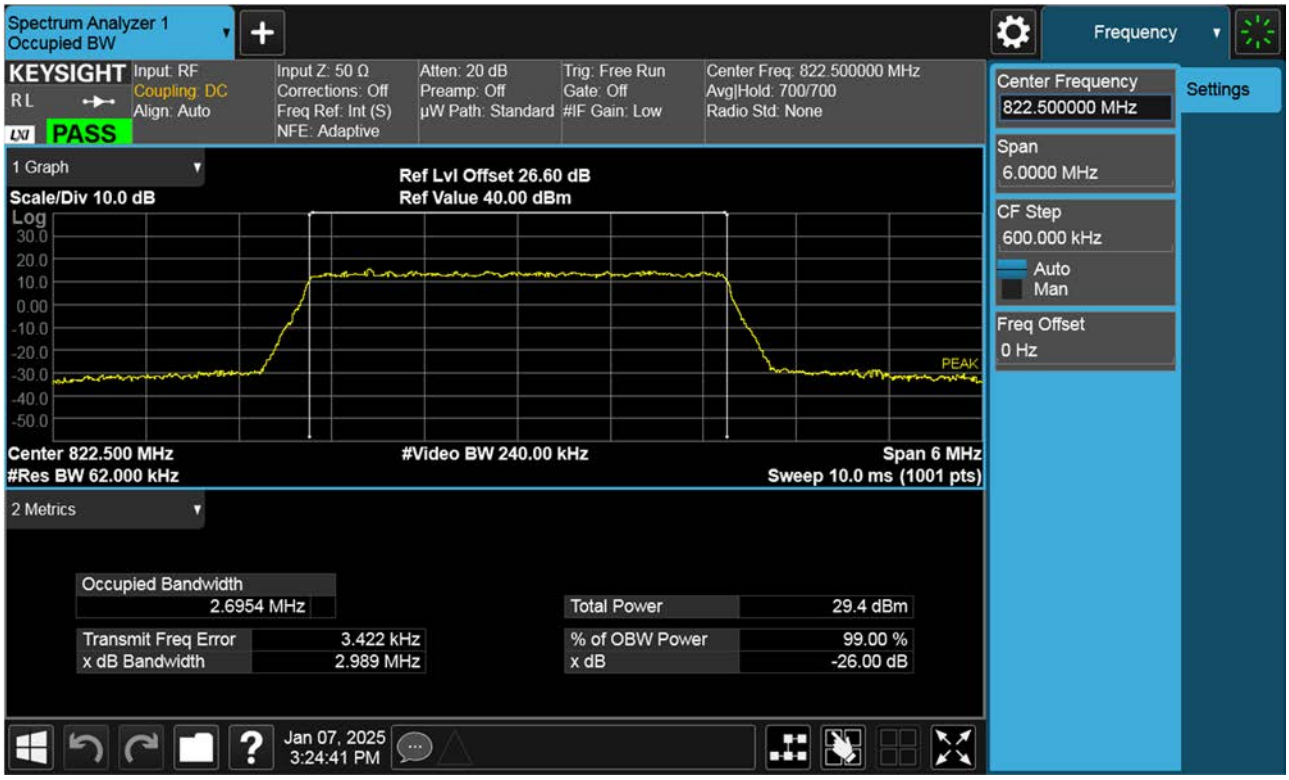
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 256QAM RB 6_0)



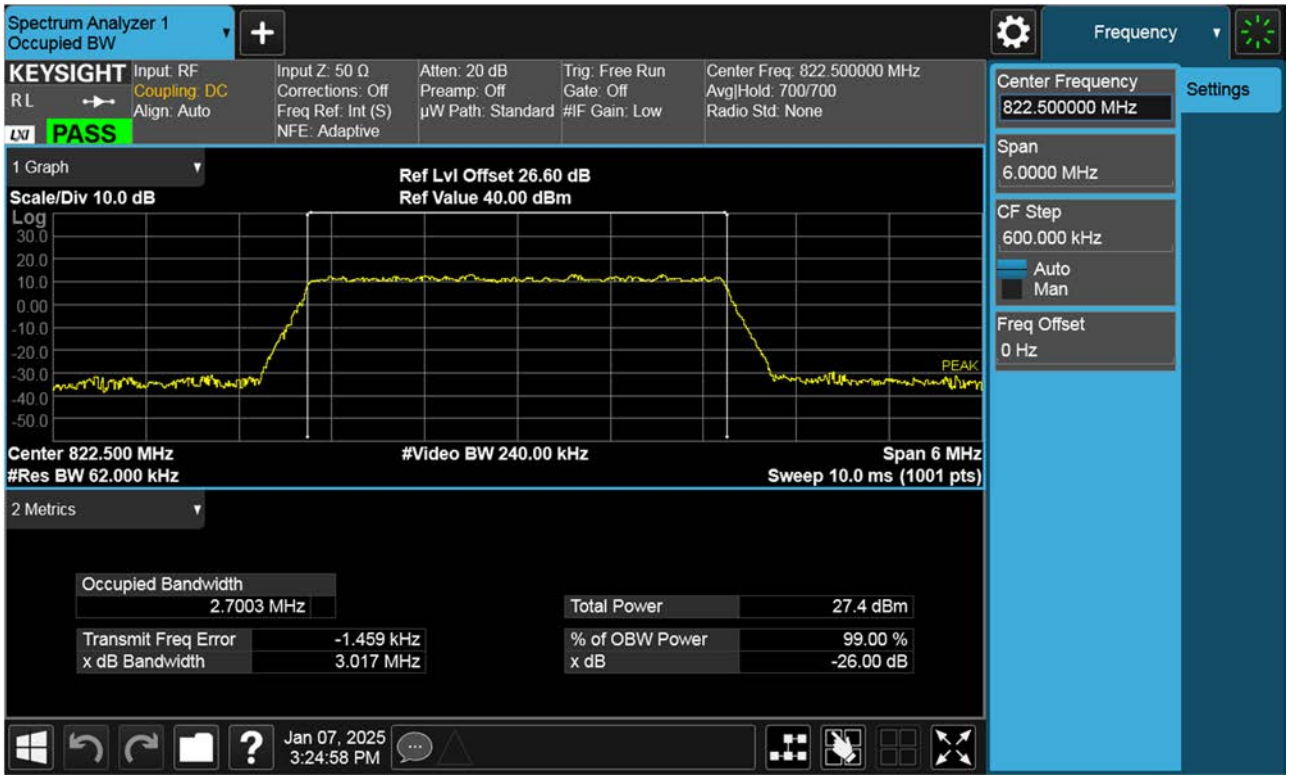
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 QPSK RB 15_0)

BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 16QAM RB 15_0)

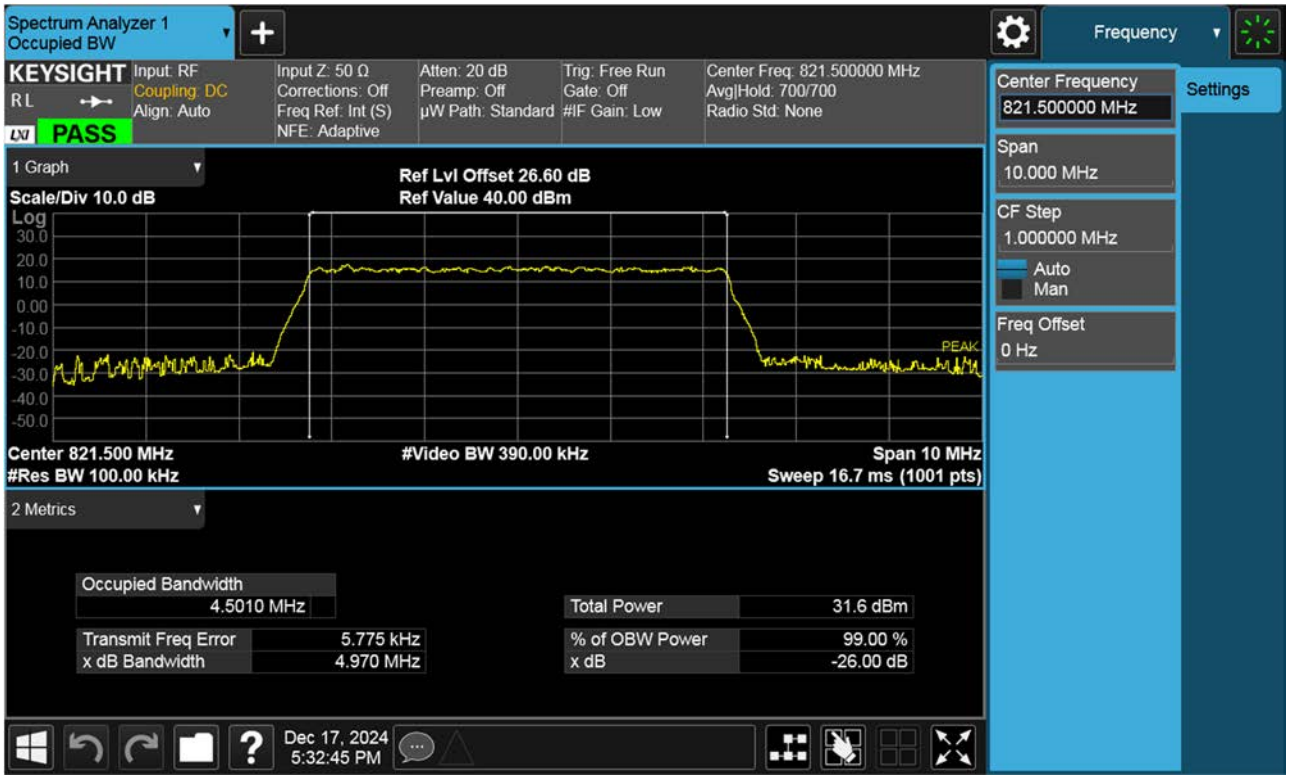
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 64QAM RB 15_0)



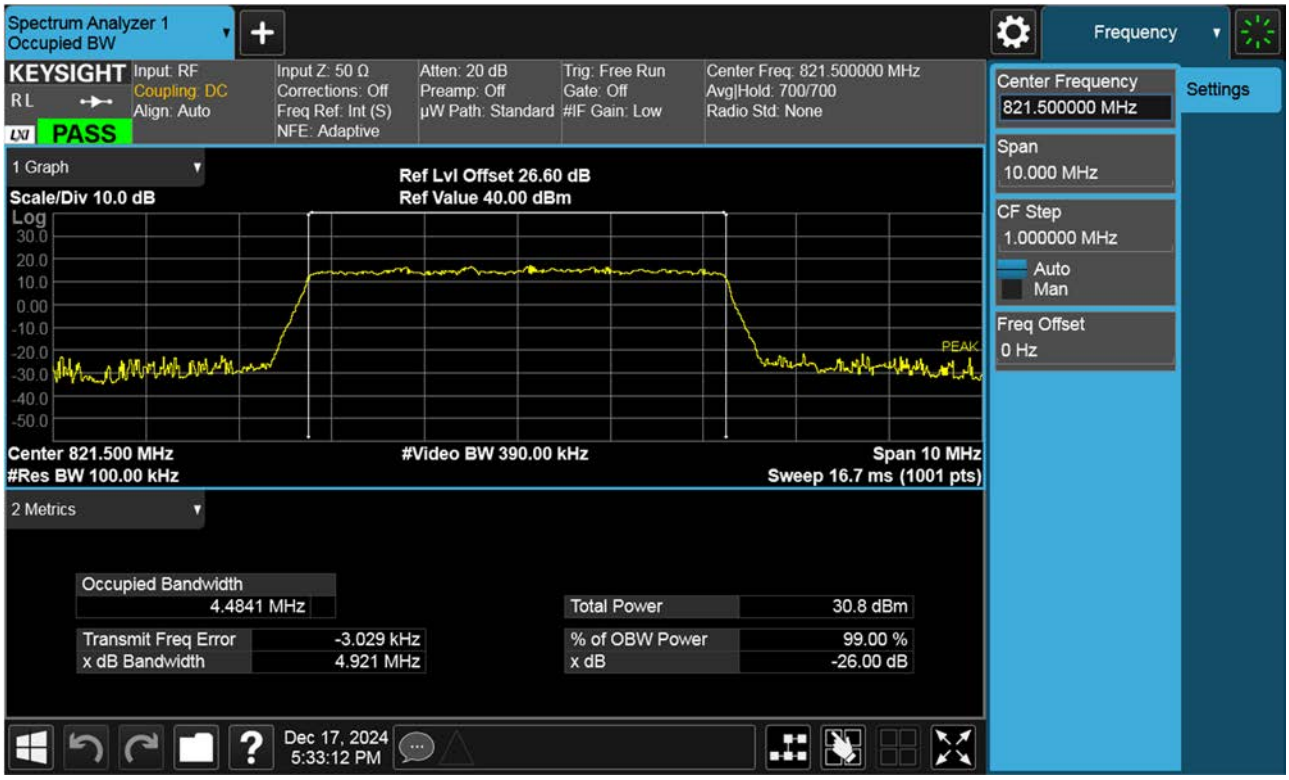
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 256QAM RB 15_0)



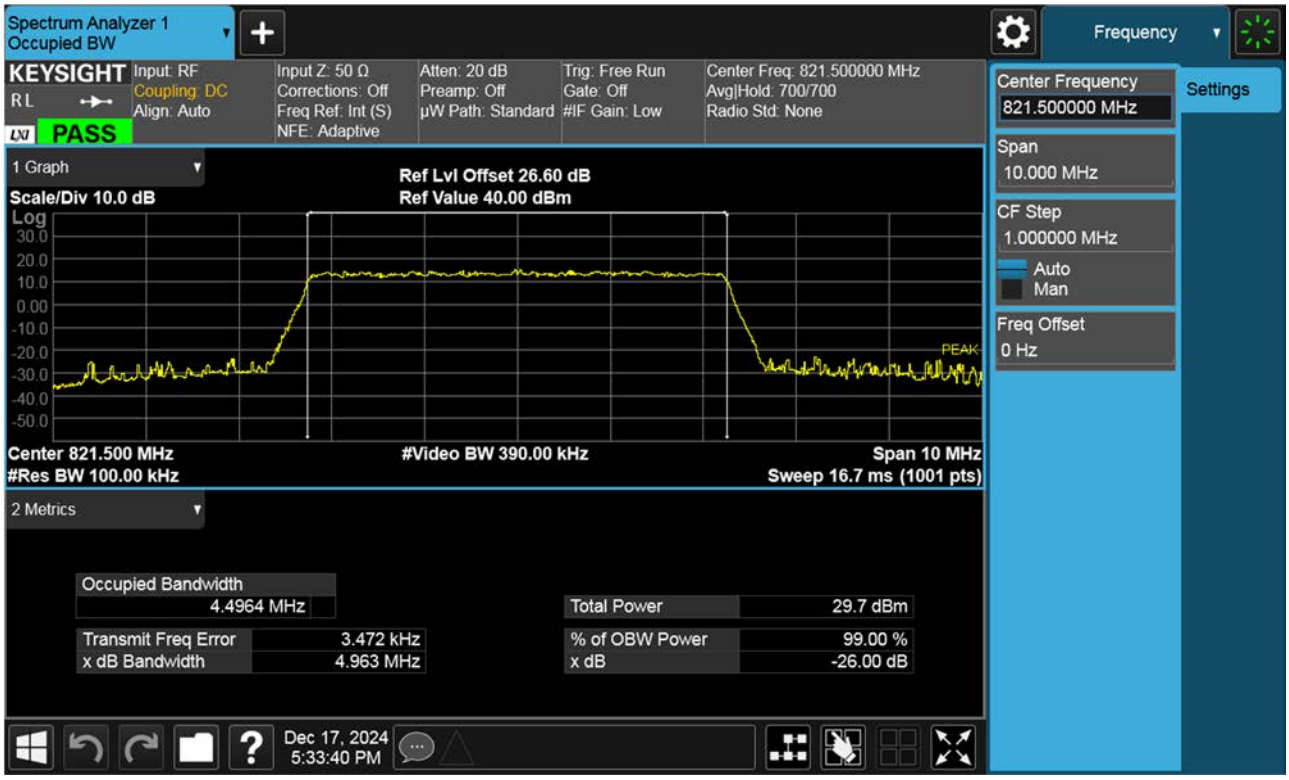
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 QPSK RB 25_0)



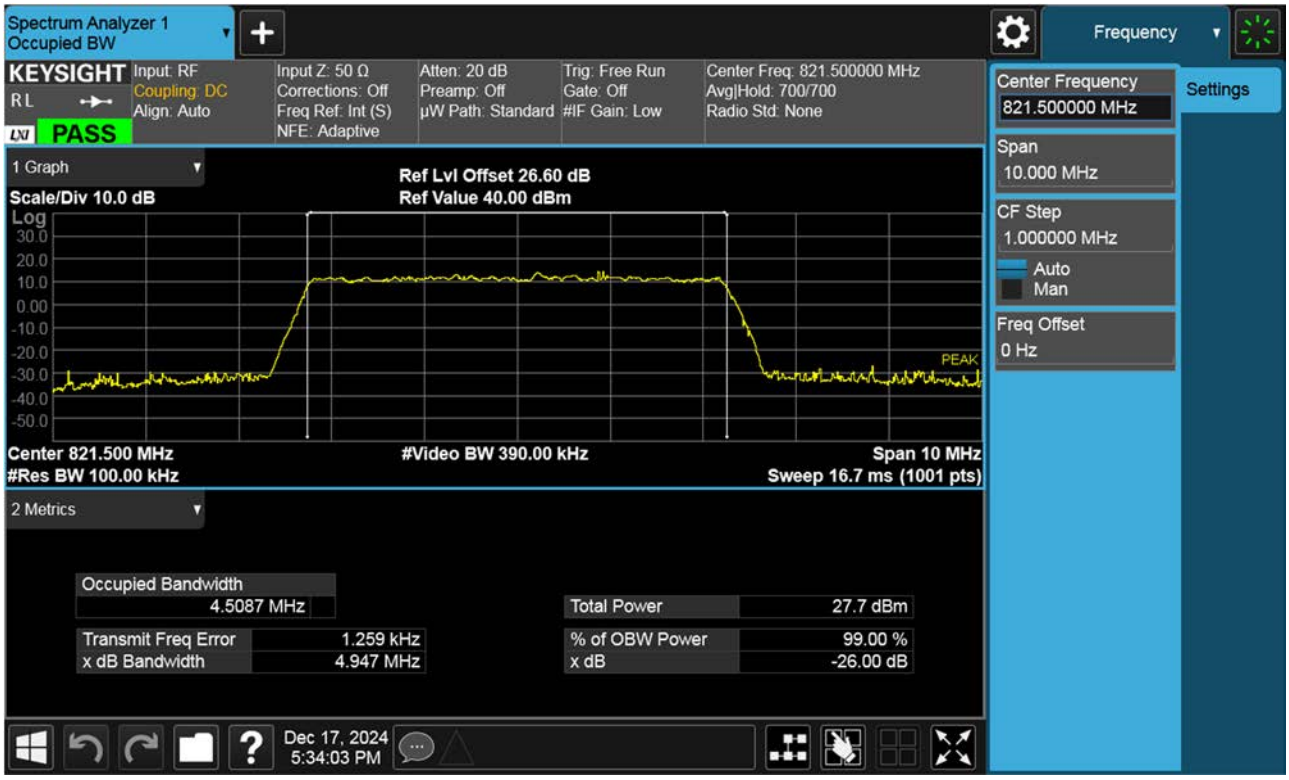
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 16QAM RB 25_0)



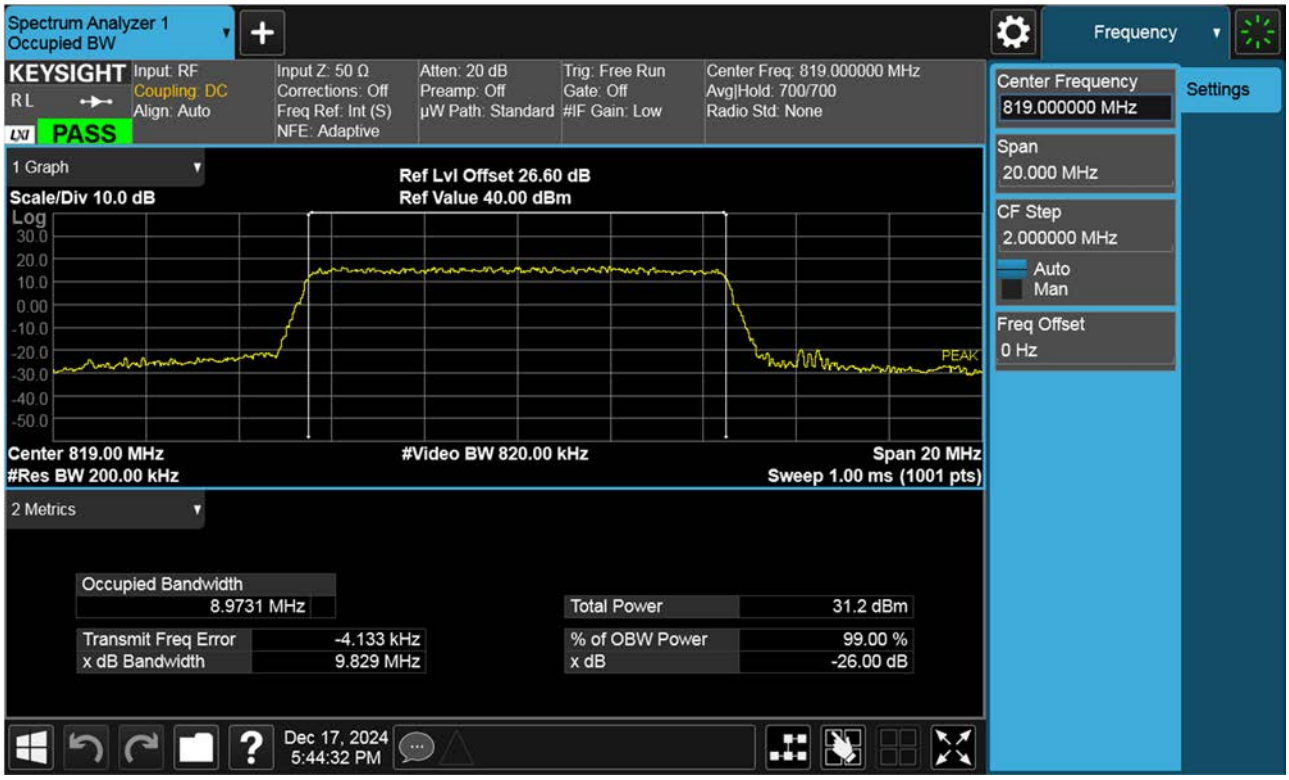
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 64QAM RB 25_0)



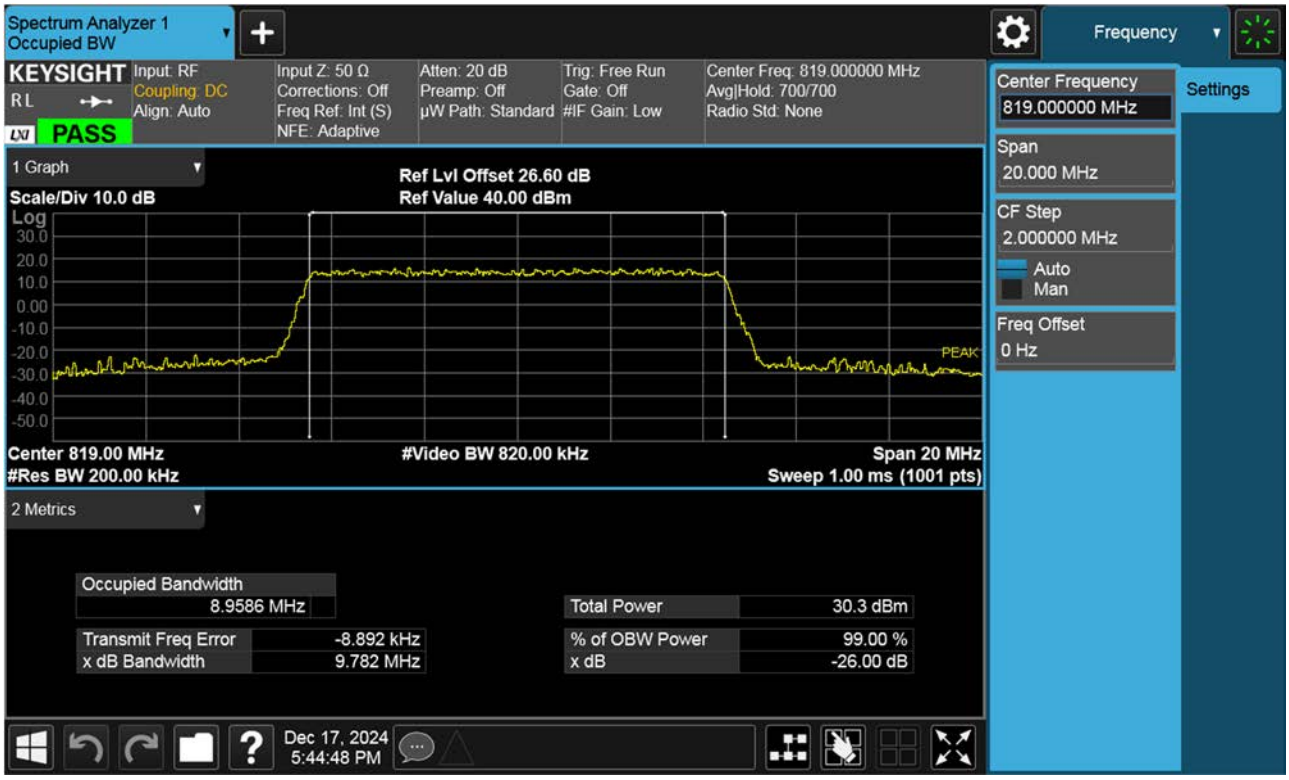
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 256QAM RB 25_0)



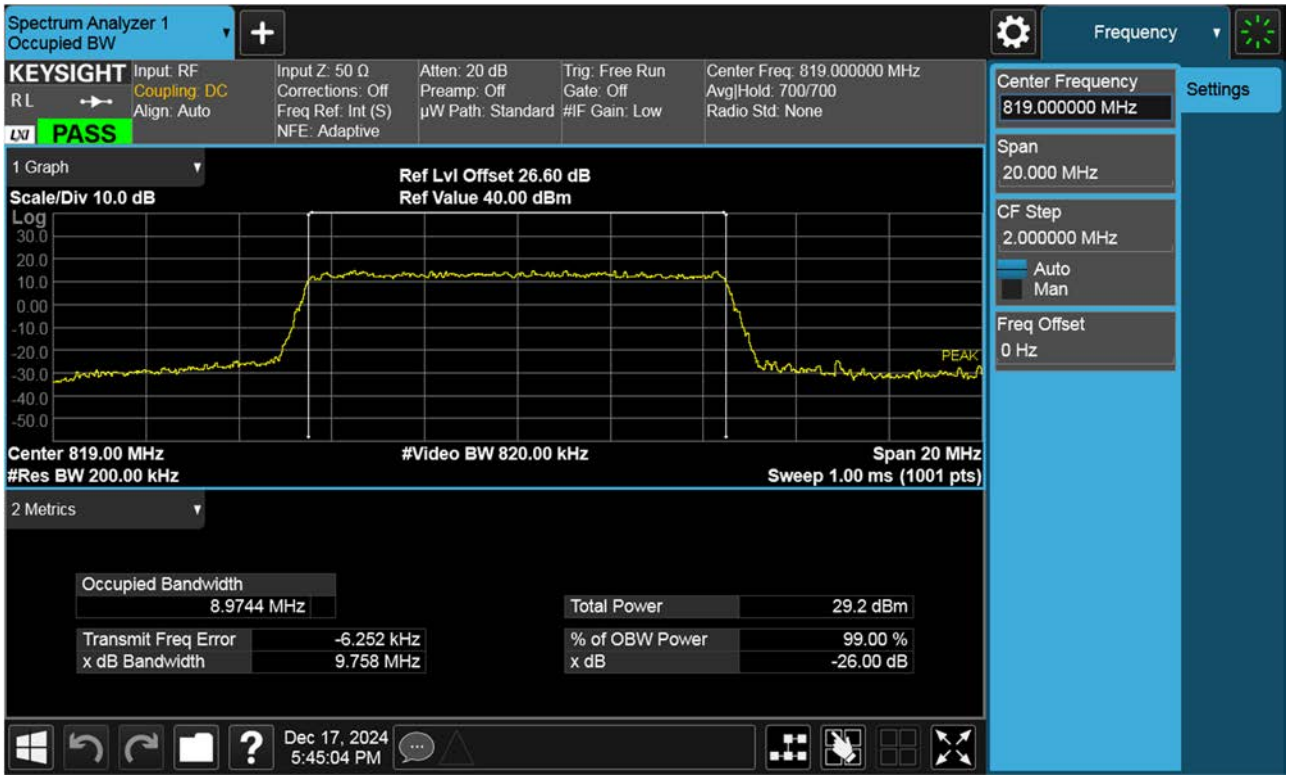
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 QPSK RB 50_0)



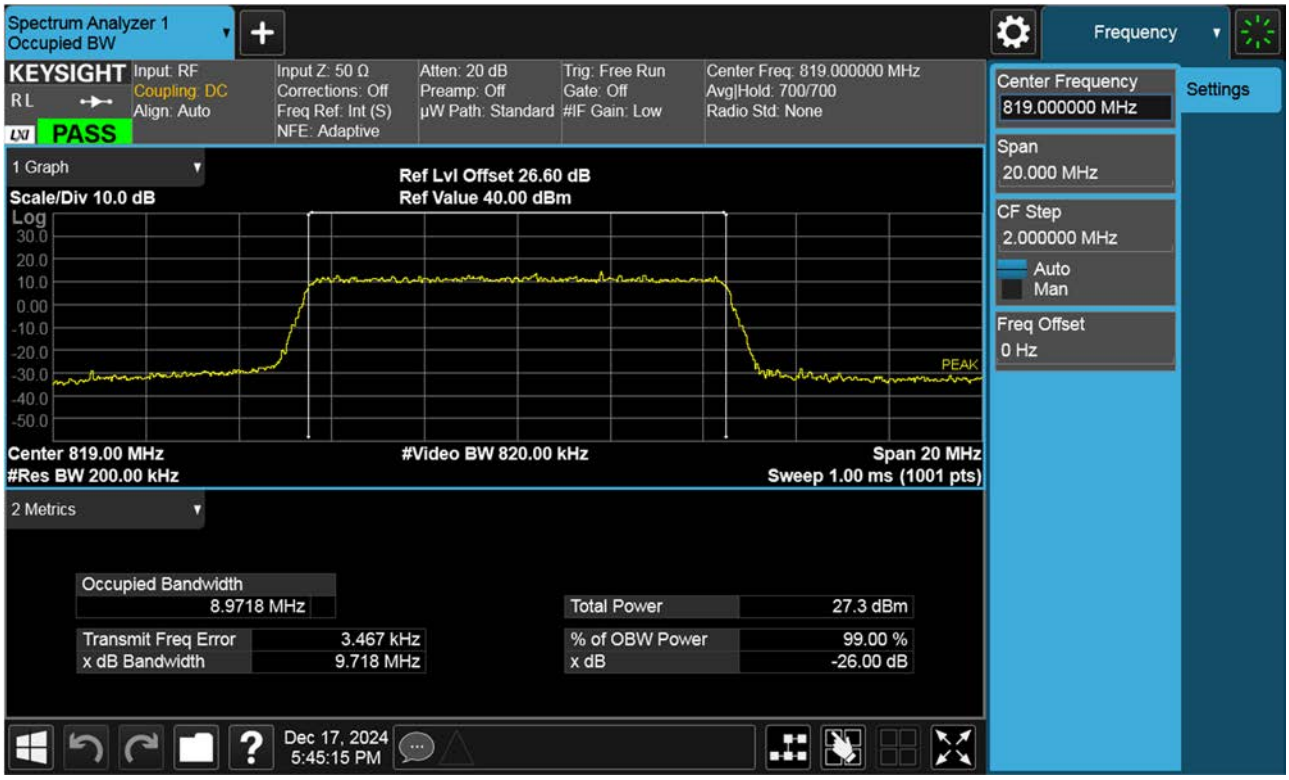
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 16QAM RB 50_0)



BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 64QAM RB 50_0)



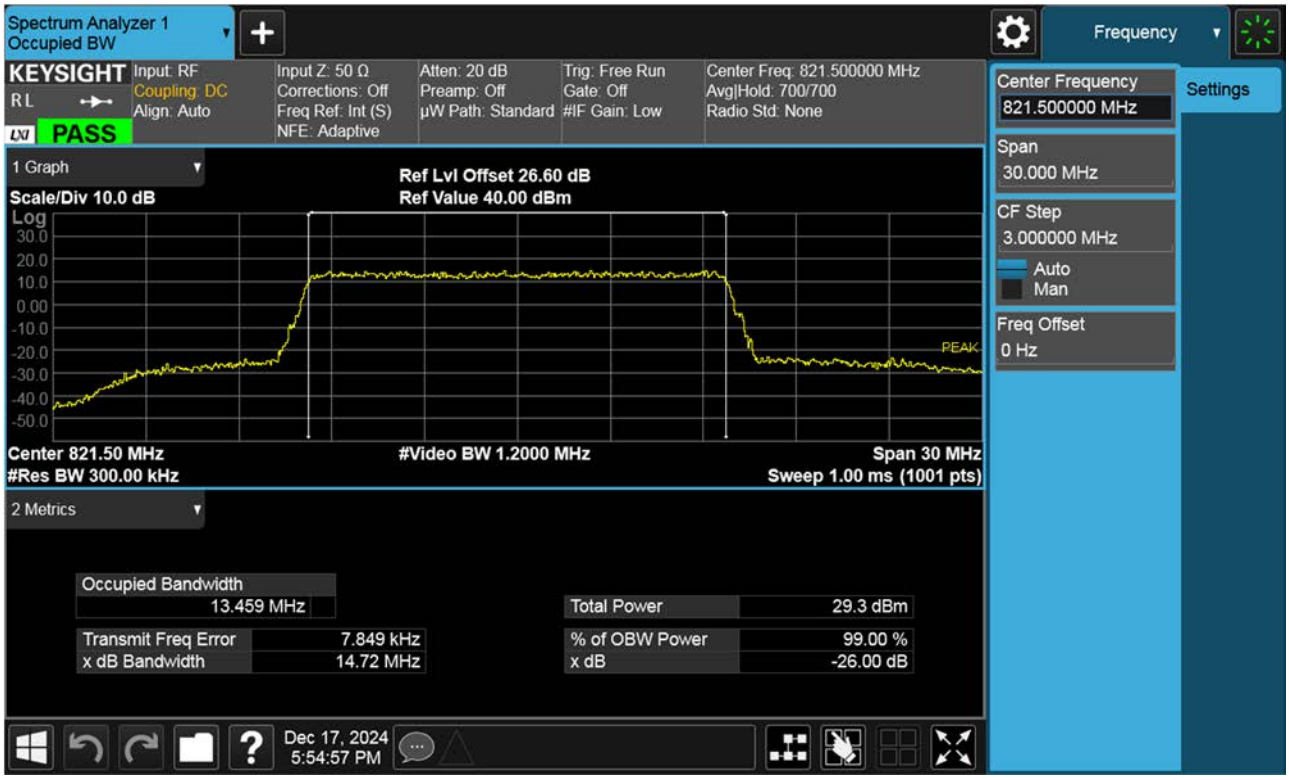
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 256QAM RB 50_0)



BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 QPSK RB 75_0)

BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 16QAM RB 75_0)

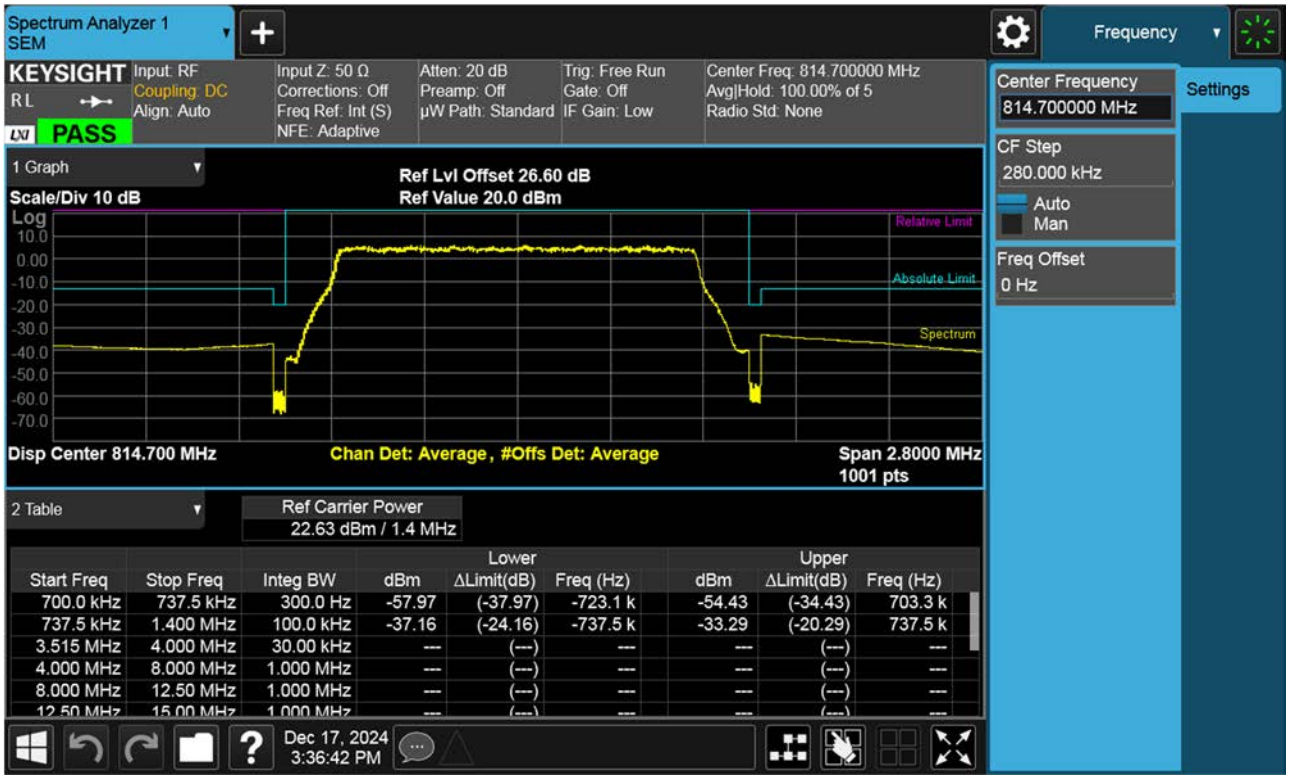
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 64QAM RB 75_0)



BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 256QAM RB 75_0)

BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK RB 1, Offset 0)

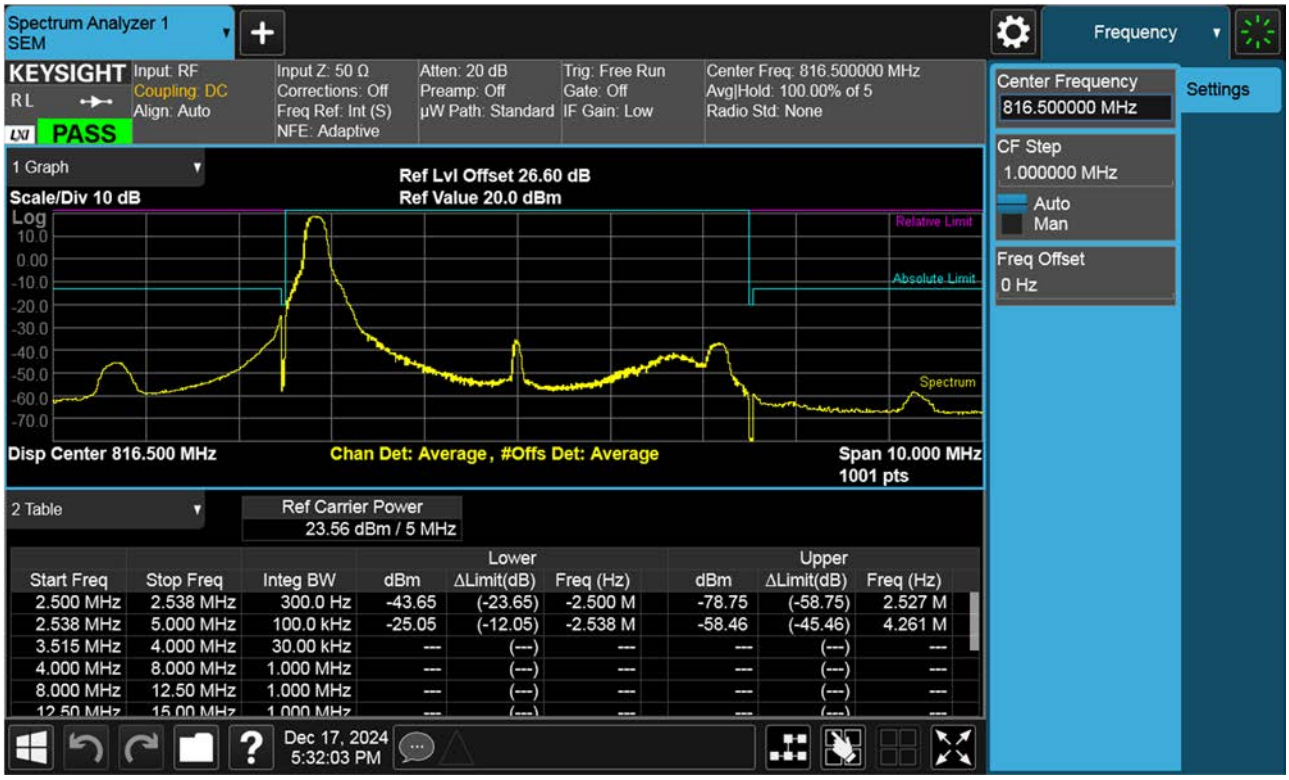
BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK_RB6_Offset 0)



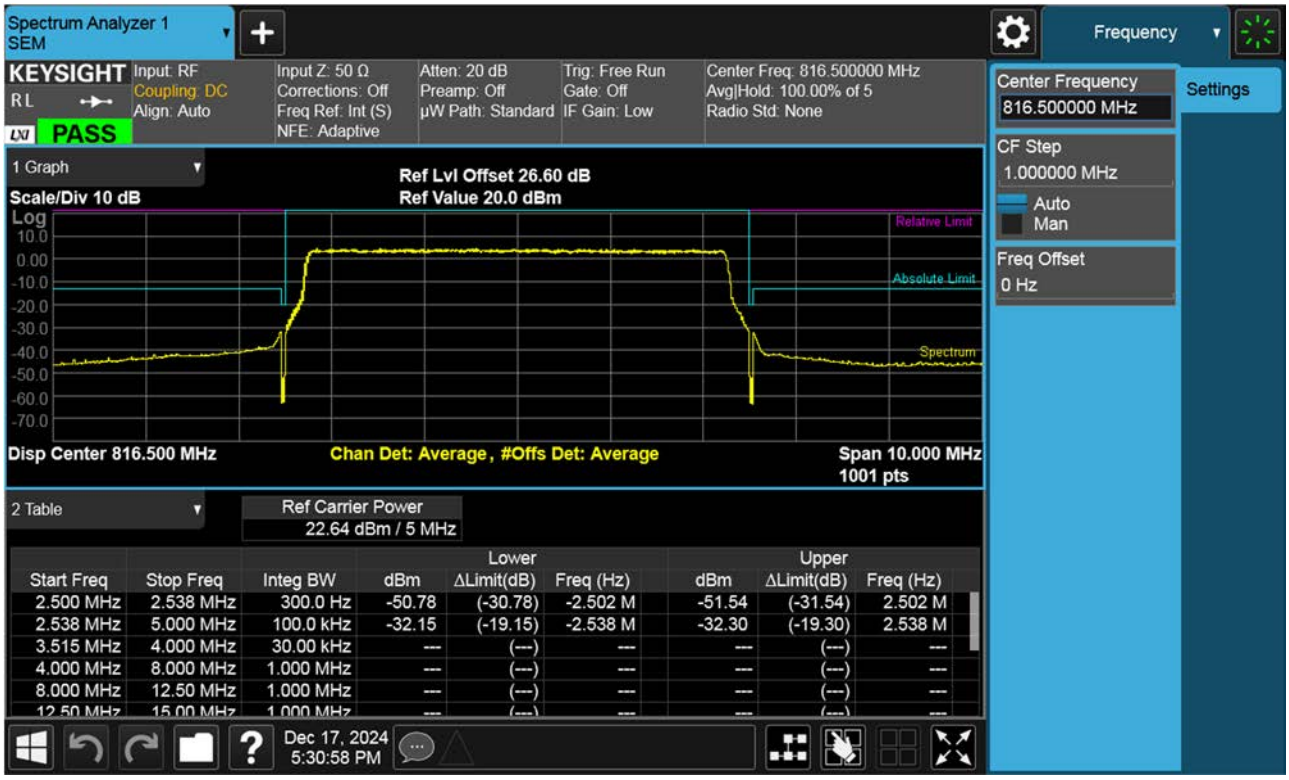
BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK RB 1, Offset 0)

BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK_RB15_Offset 0)

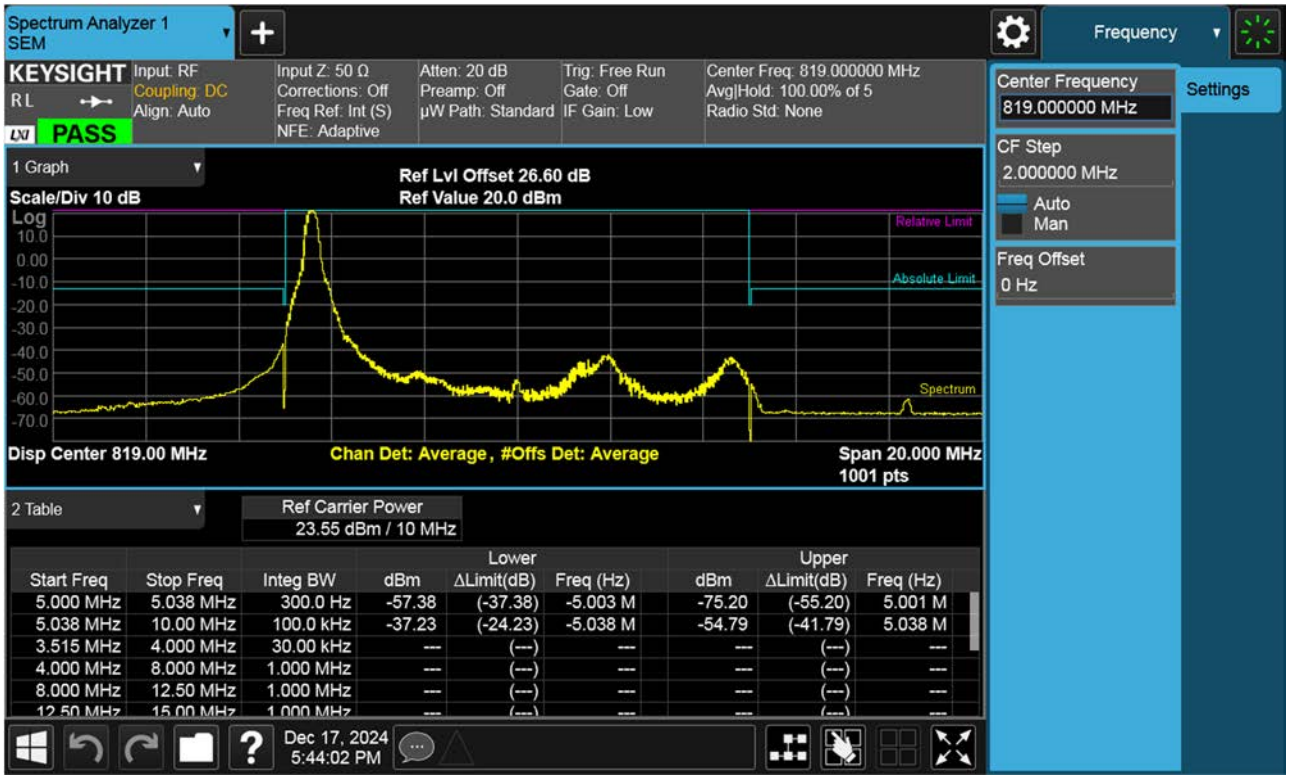
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK RB 1, Offset 0)



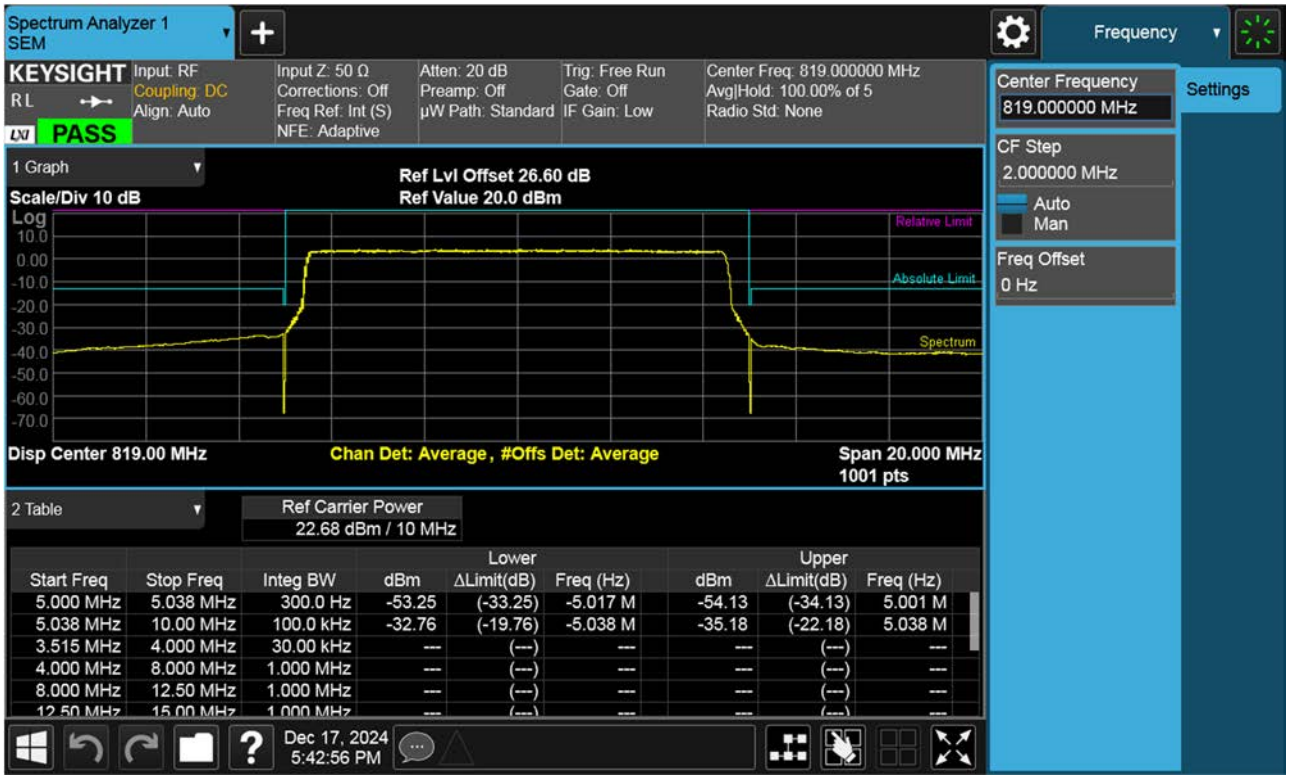
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK_RB25_Offset 0)



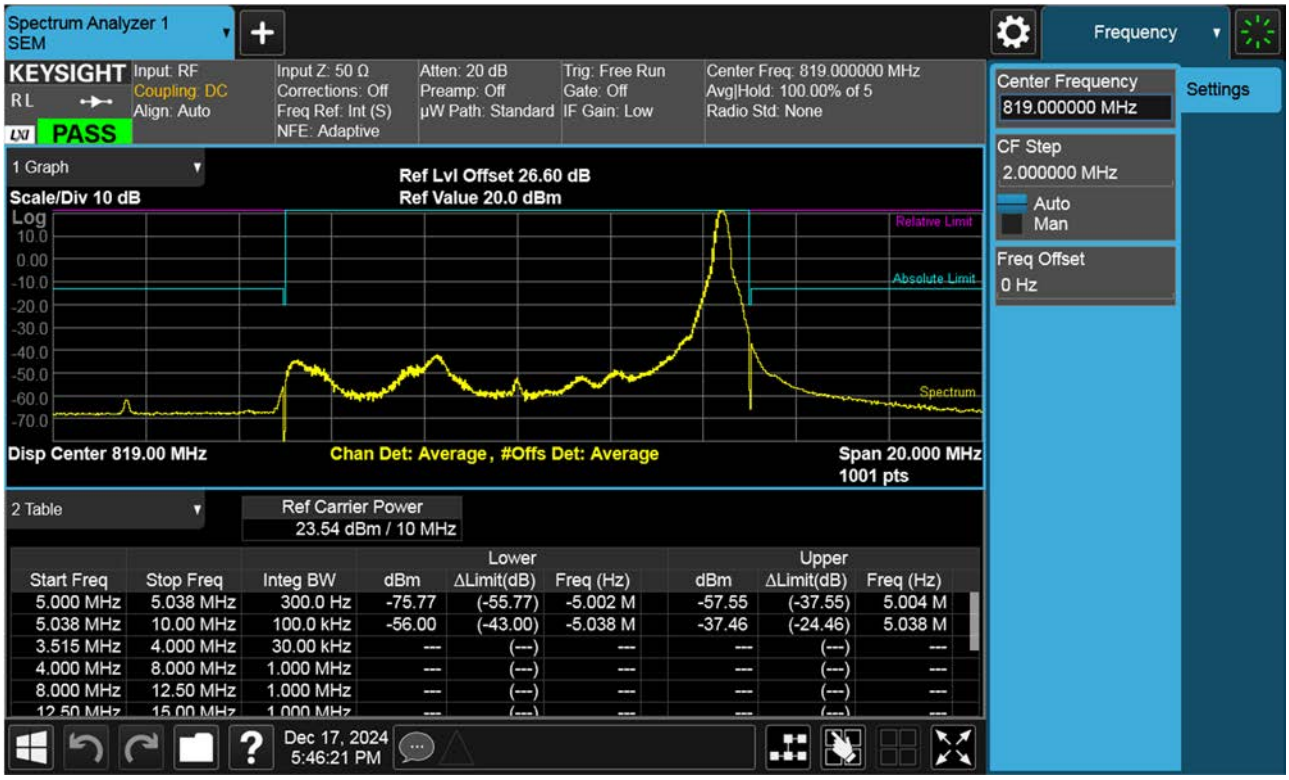
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK RB 1, Offset 0)



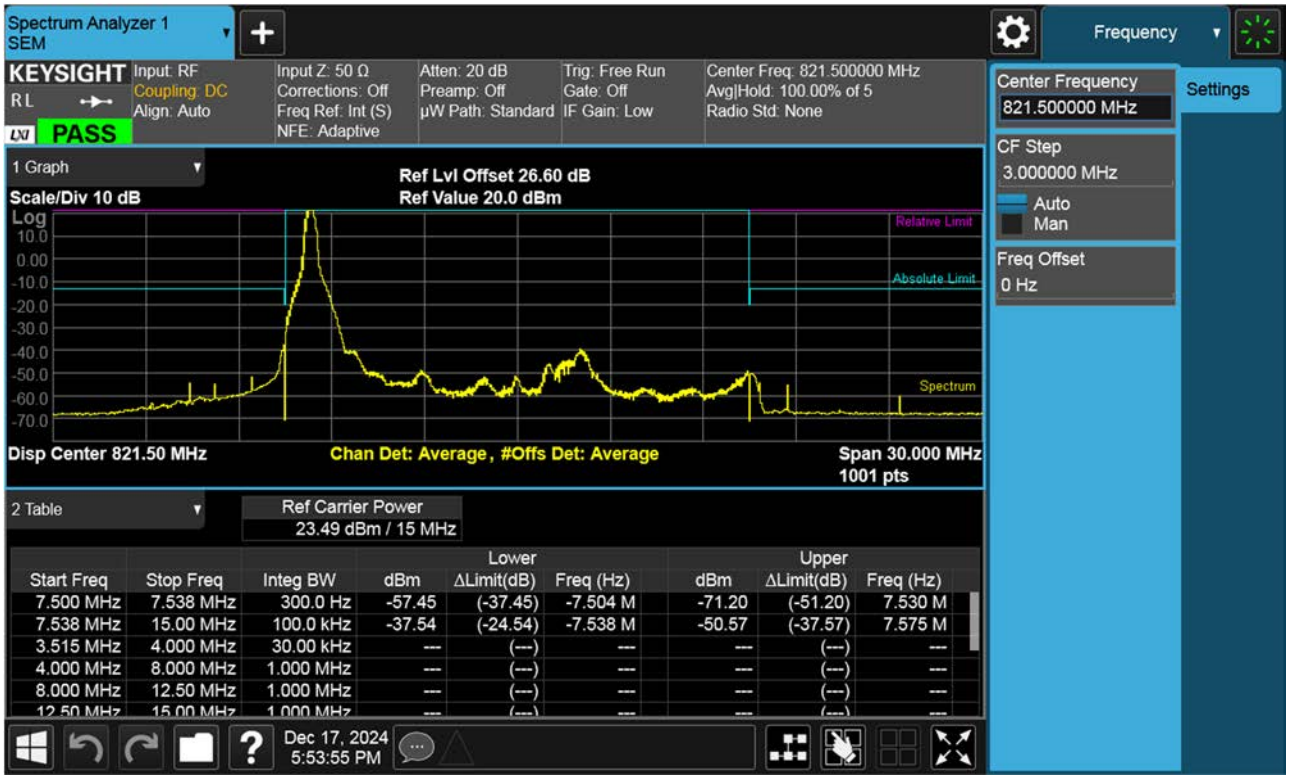
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK_RB50_Offset 0)



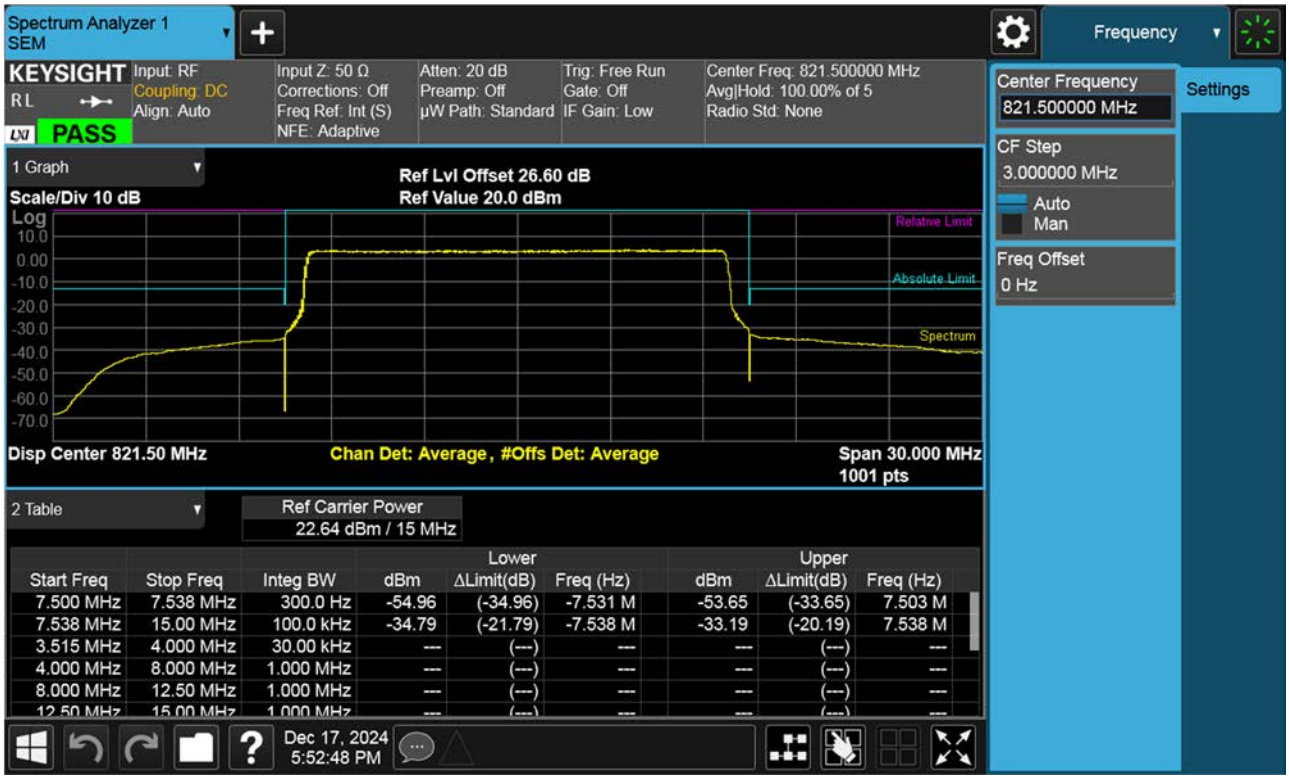
BAND 26. Mid Channel Edge Plot (10 M BW Ch. 26740 QPSK_RB1_Offset 49)



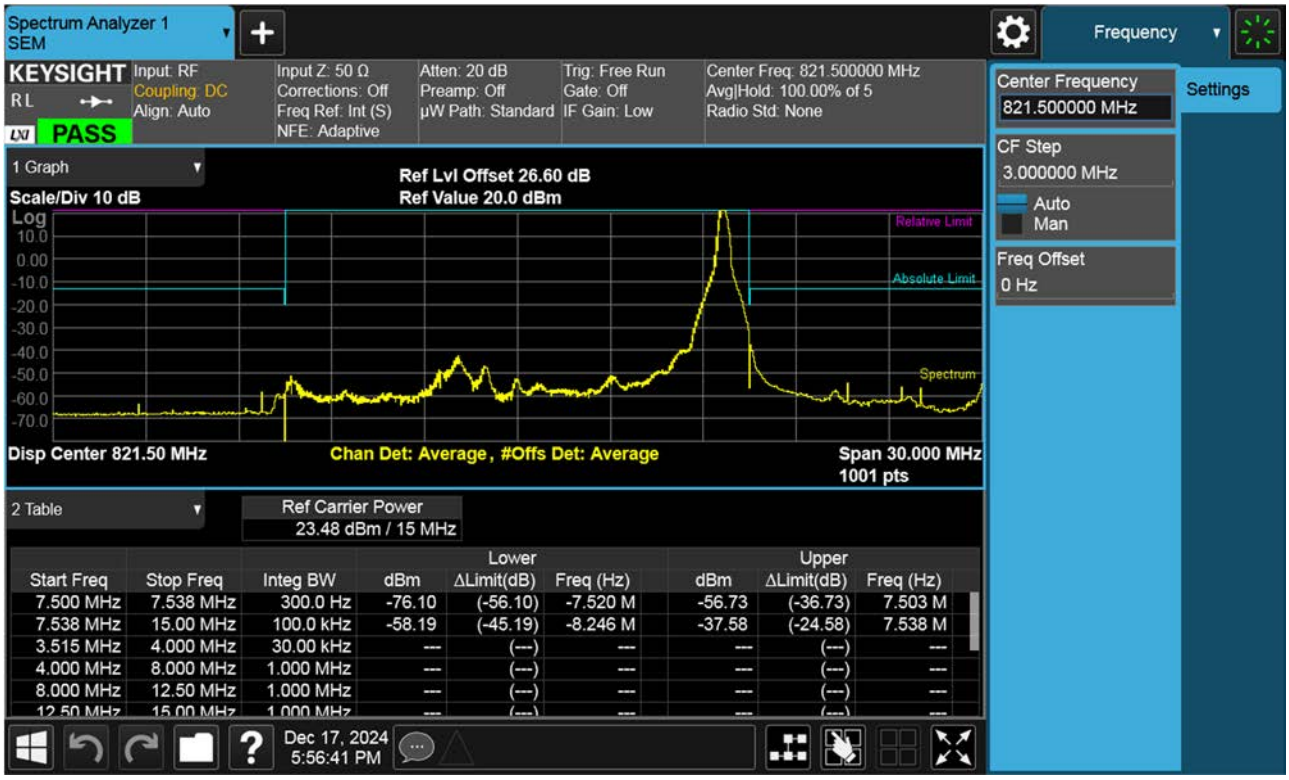
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset 0)



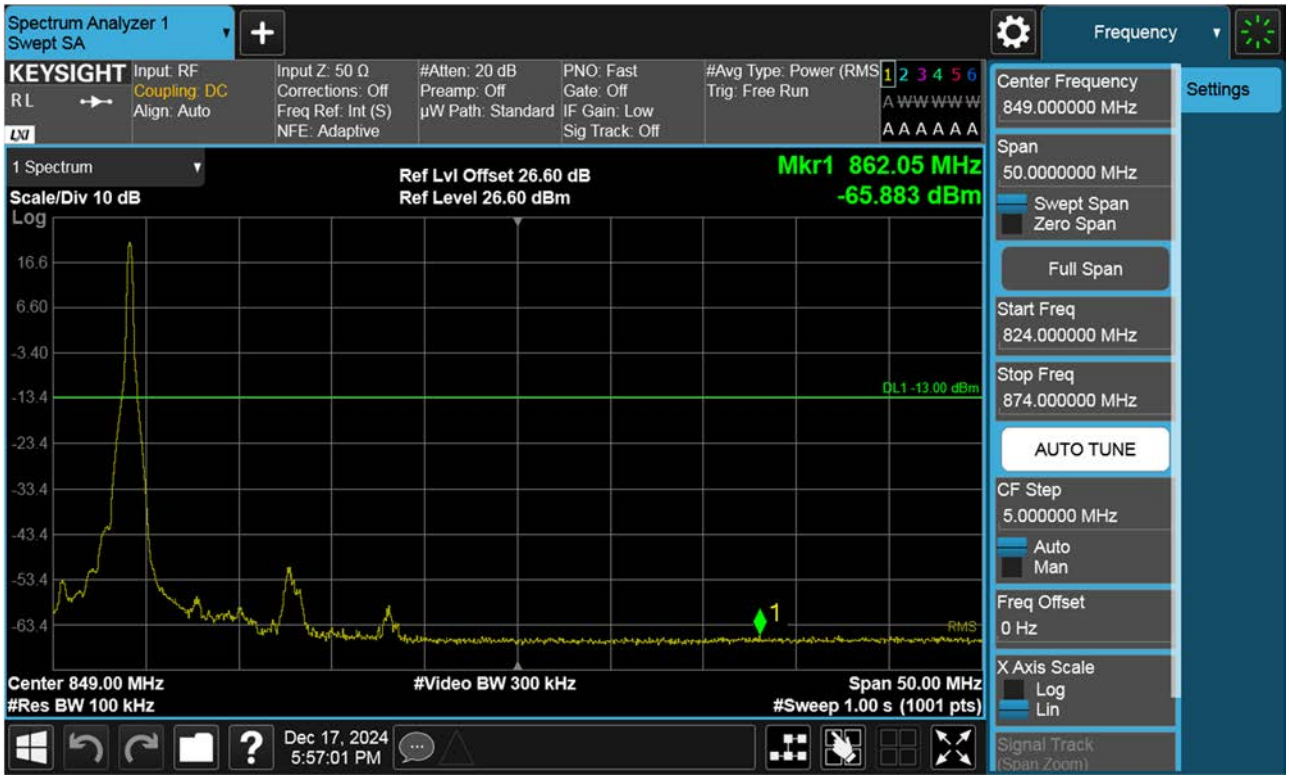
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 75, Offset0)



BAND 26. Mid Channel Edge Plot (15 M BW Ch.26765 QPSK_RB1_Offset 74)



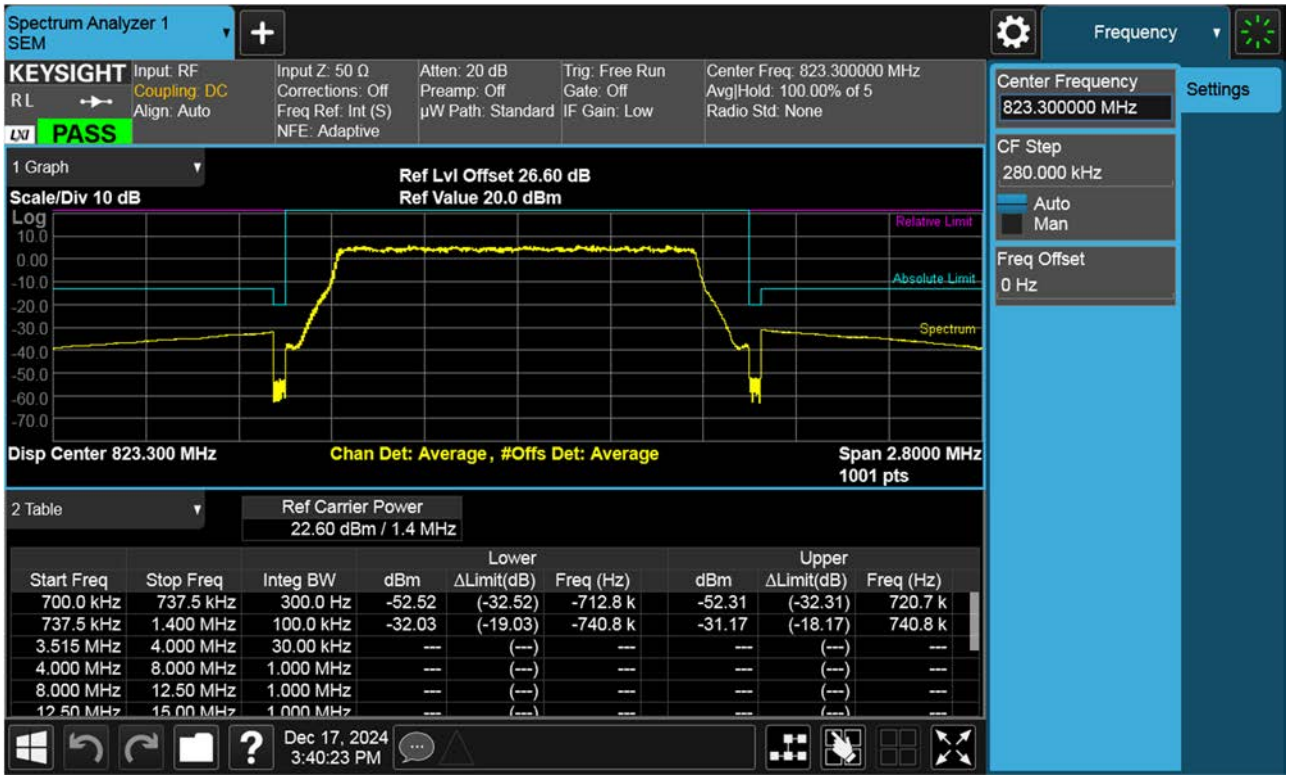
BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset74)



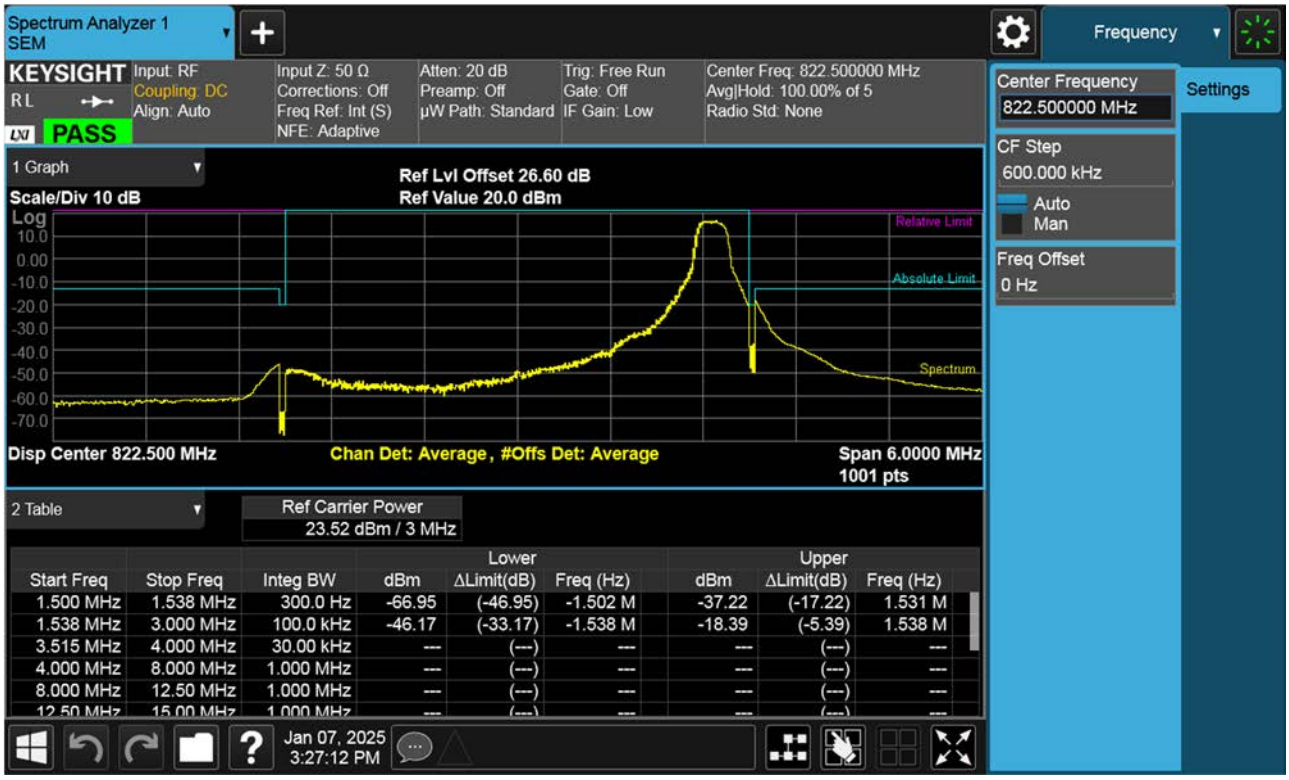
BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK_RB75_Offset 0)

BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB1_Offset 5)

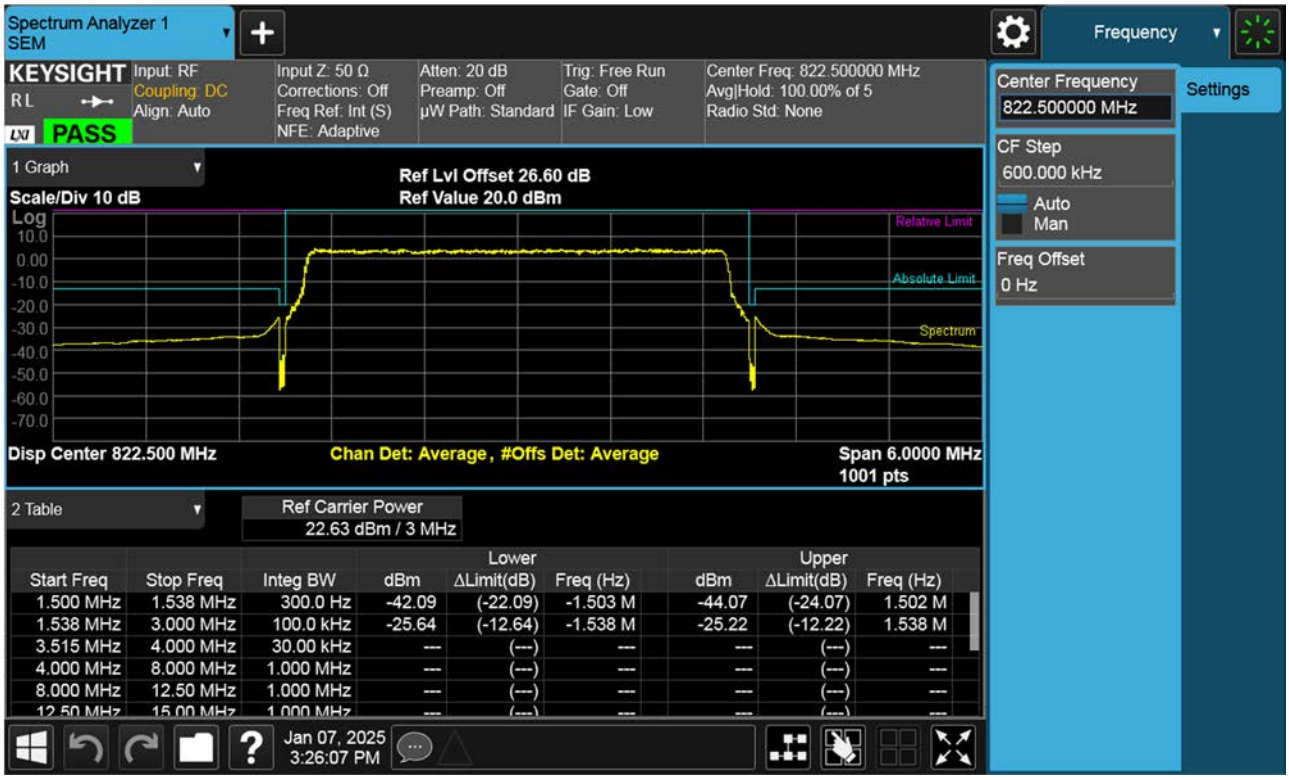
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB6_Offset 0)



BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB1_Offset 14)

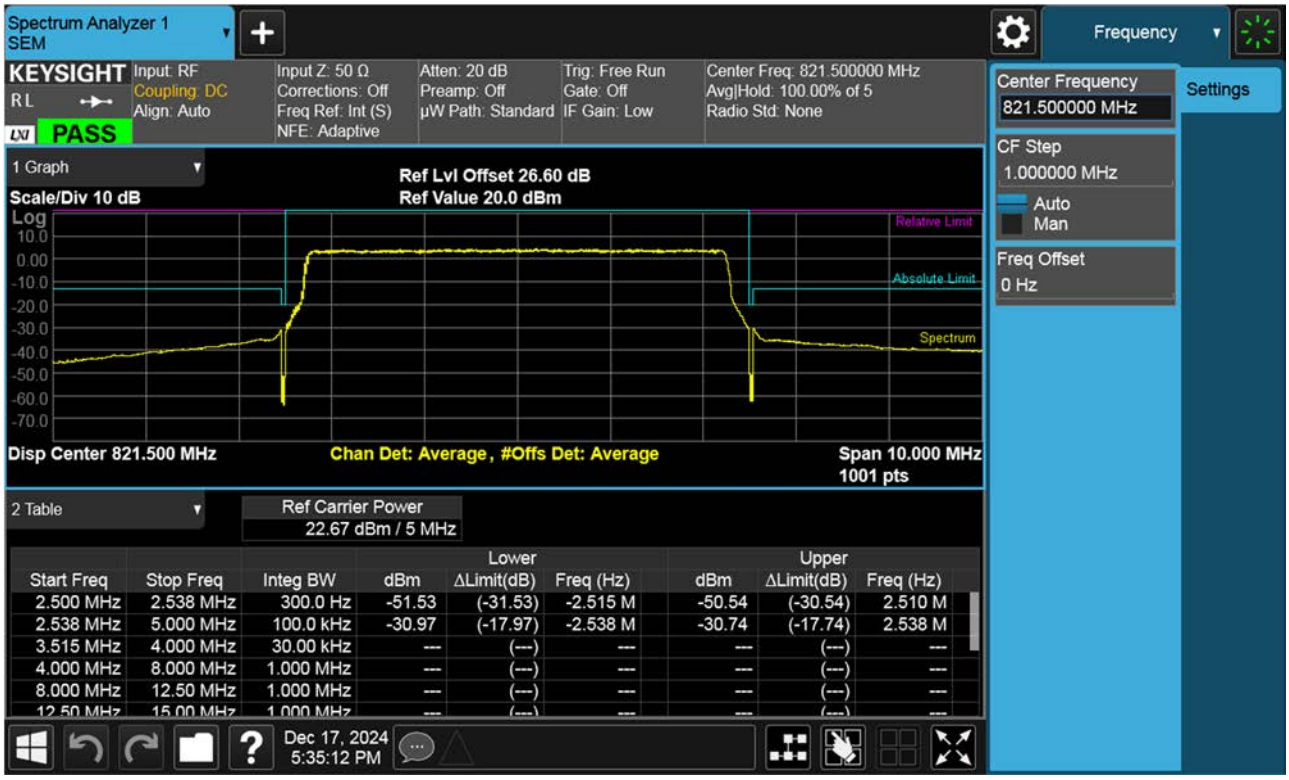


BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB15_Offset 0)

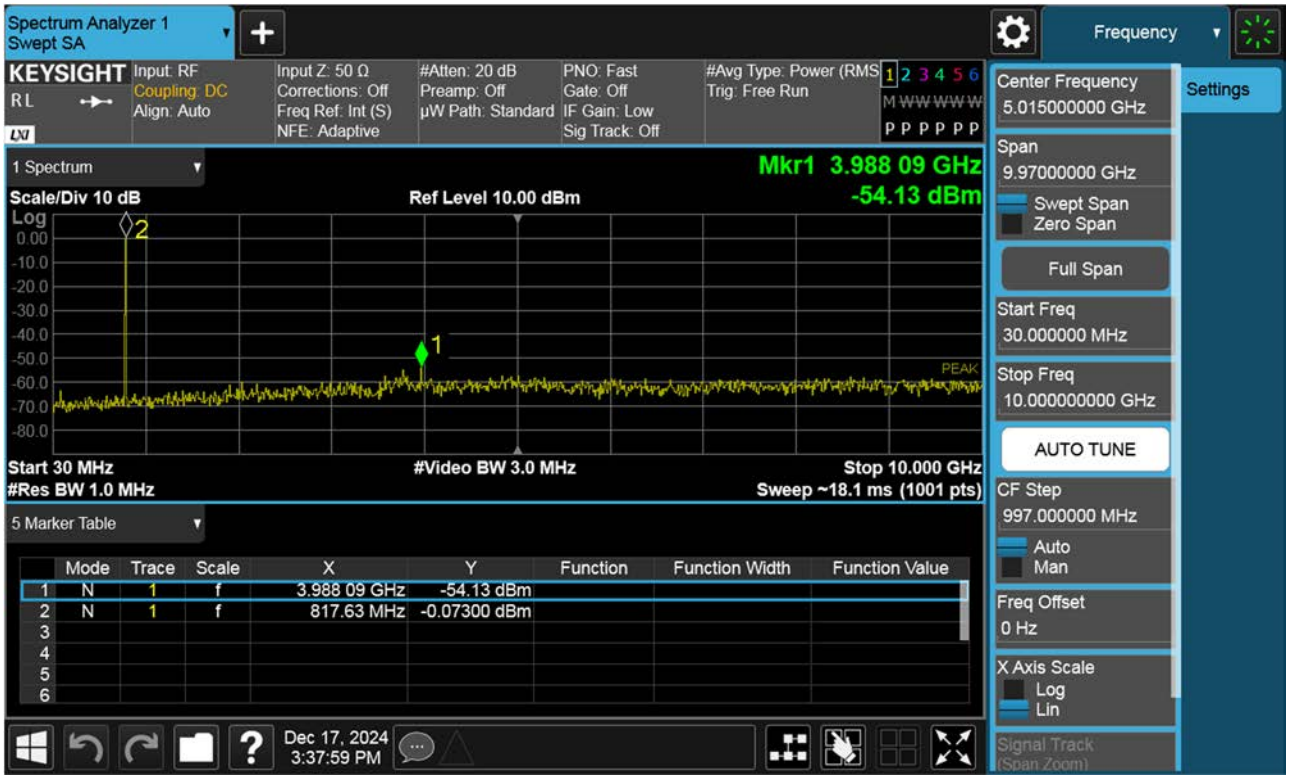


BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB1_Offset 24)

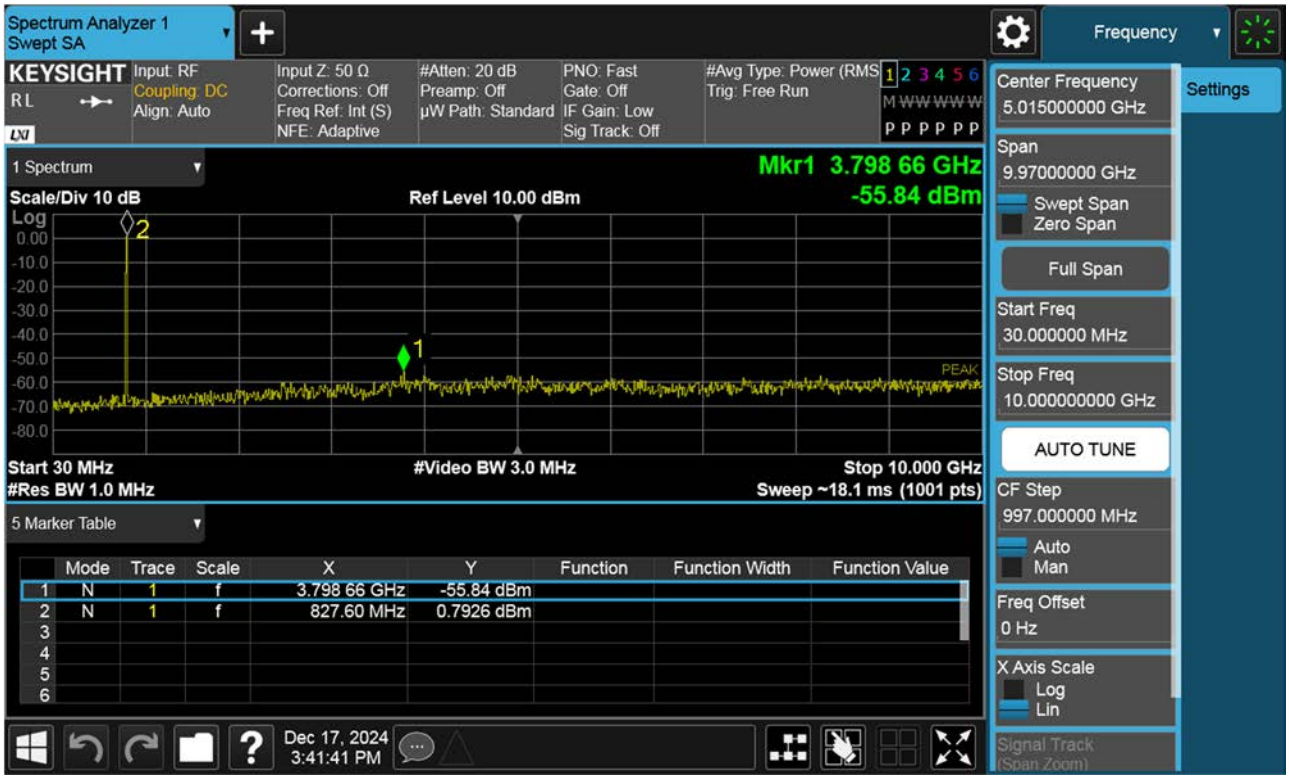
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB25_Offset 0)



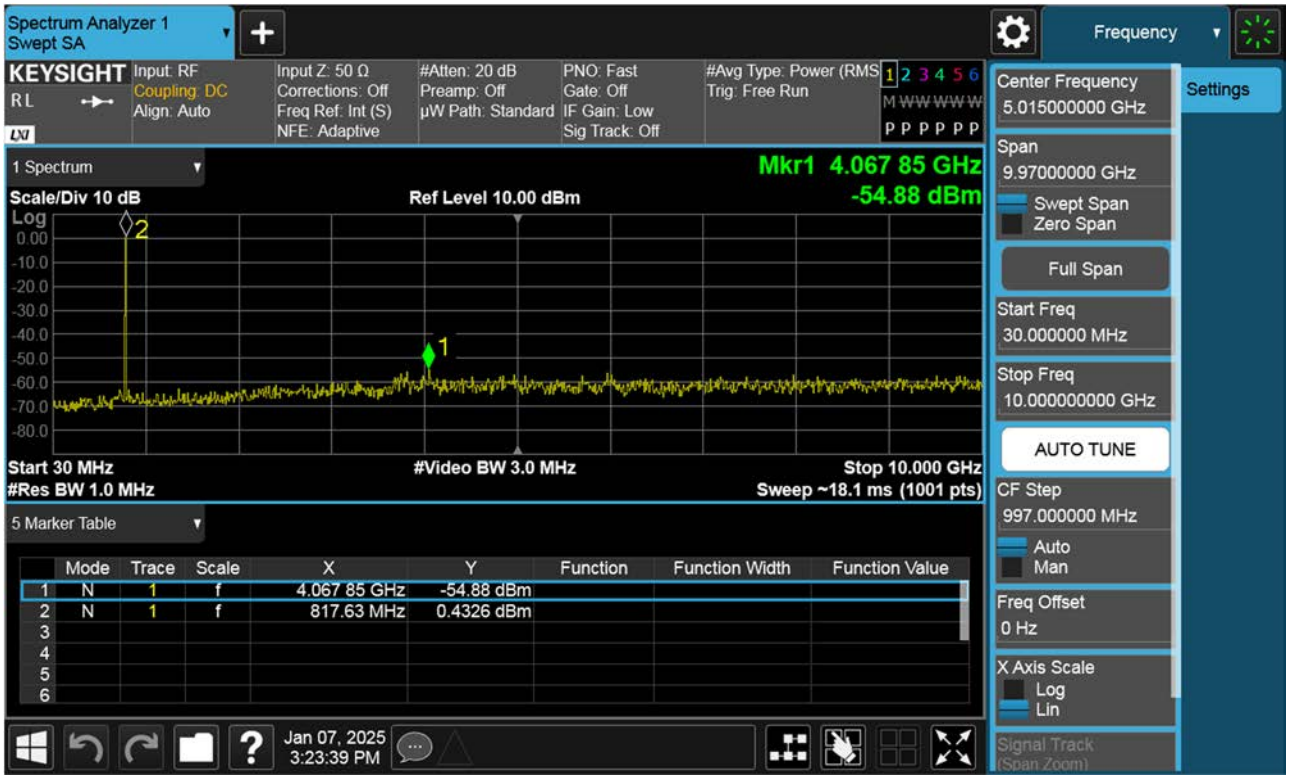
BAND 26. Conducted Spurious (26697 ch_1.4 MHz_QPSK_RB 1_0)



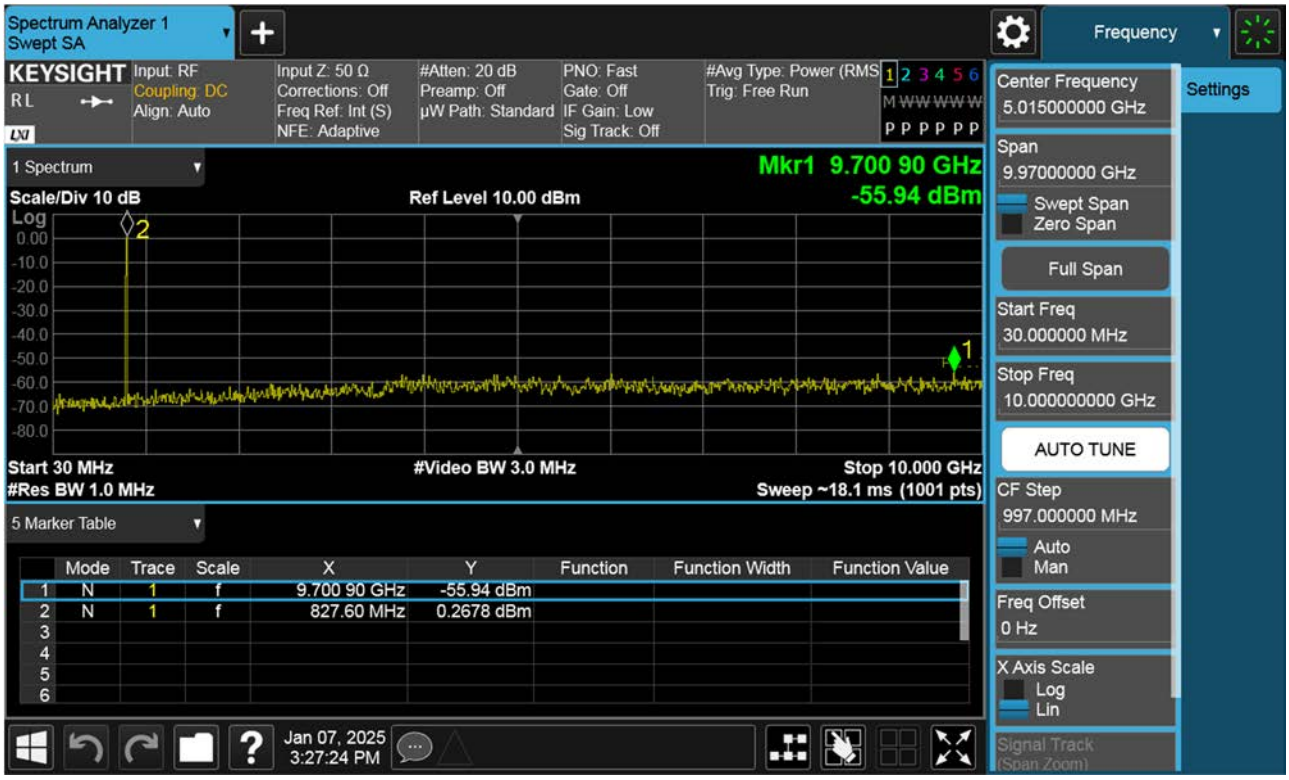
BAND 26. Conducted Spurious (26783 ch_1.4 MHz_QPSK_RB 1_0)



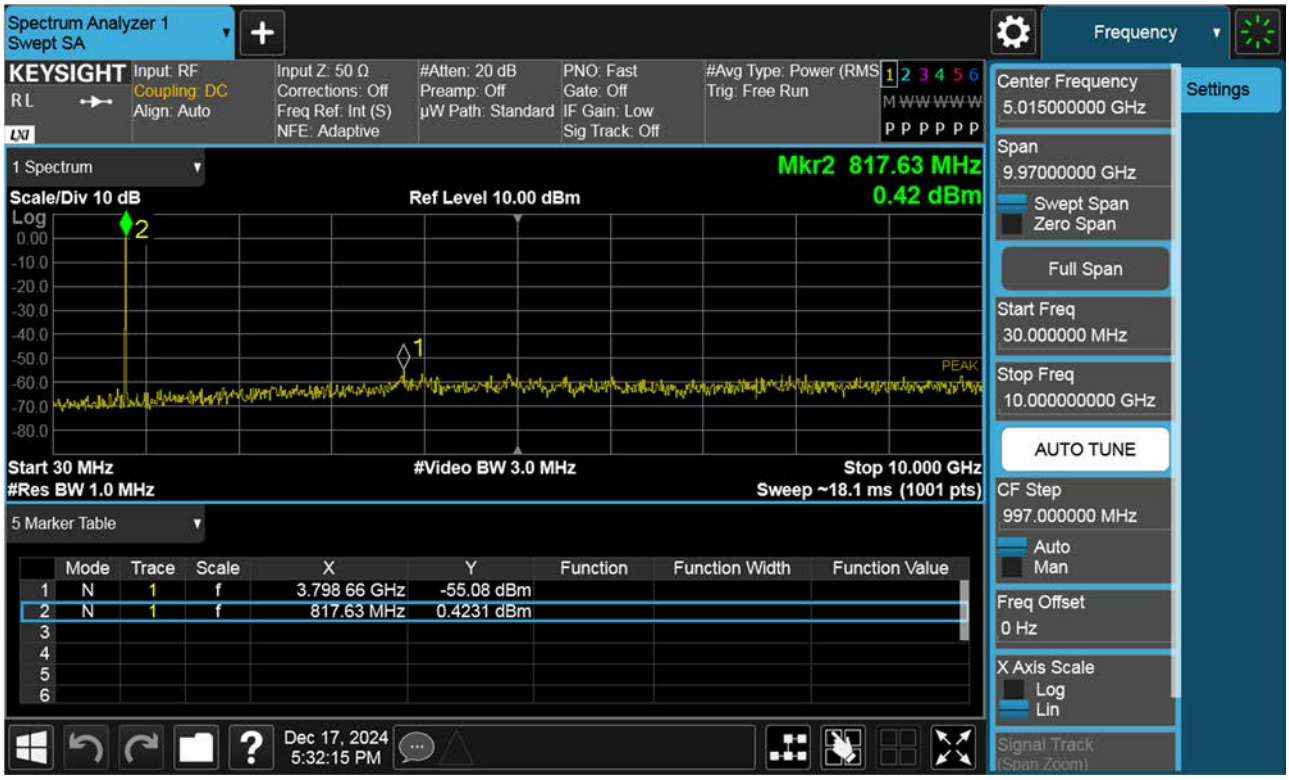
BAND 26. Conducted Spurious (26705 ch_3 MHz_QPSK_RB 1_0)



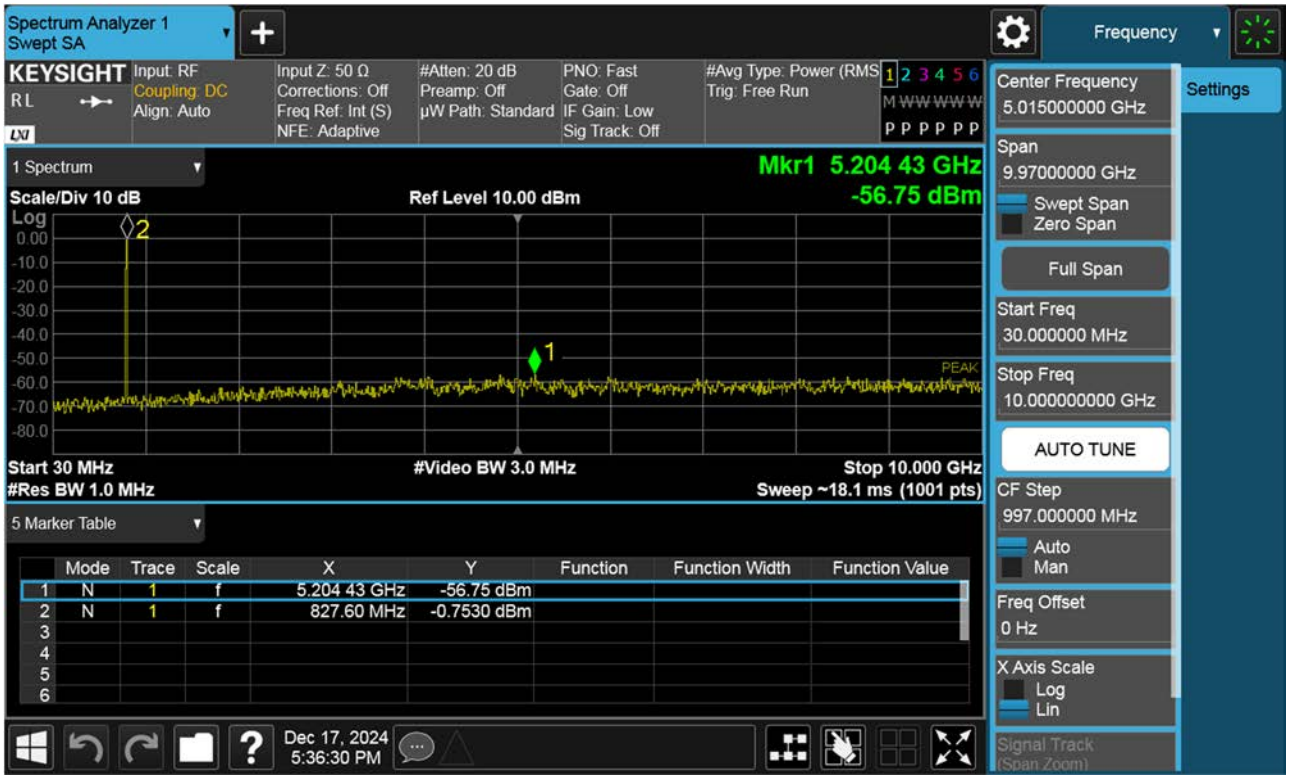
BAND 26. Conducted Spurious (26775 ch_3 MHz_QPSK_RB 1_0)



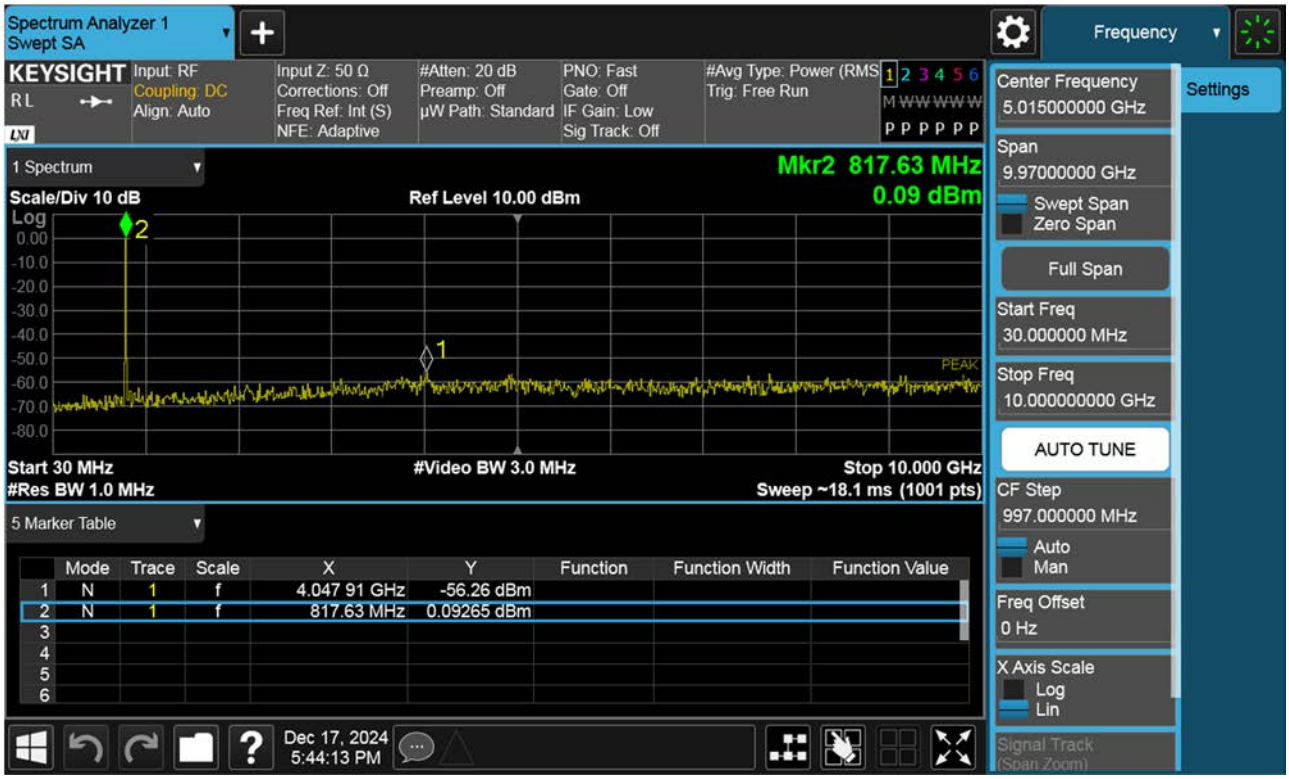
BAND 26. Conducted Spurious (26715 ch_5 MHz_QPSK_RB 1_0)



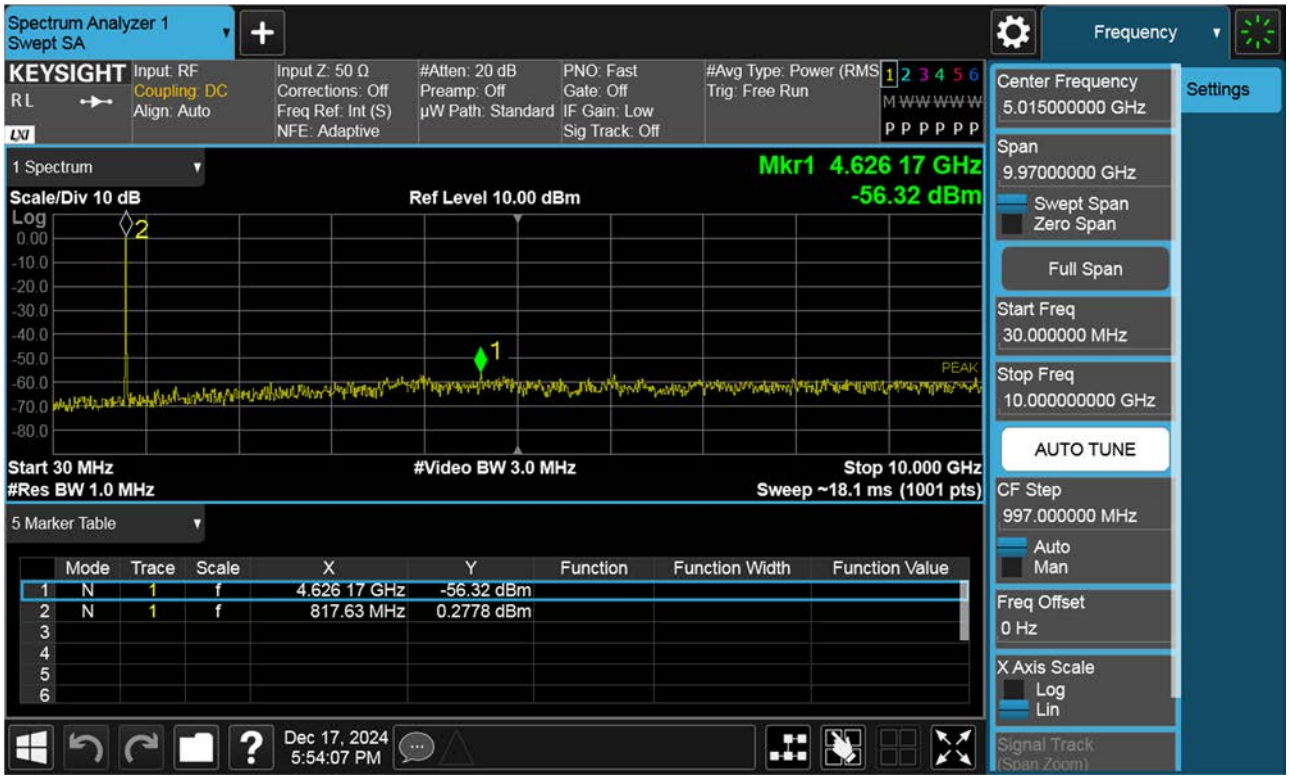
BAND 26. Conducted Spurious (26765 ch_5 MHz_QPSK_RB 1_0)



BAND 26. Conducted Spurious (26740 ch_10 MHz_QPSK_RB 1_0)

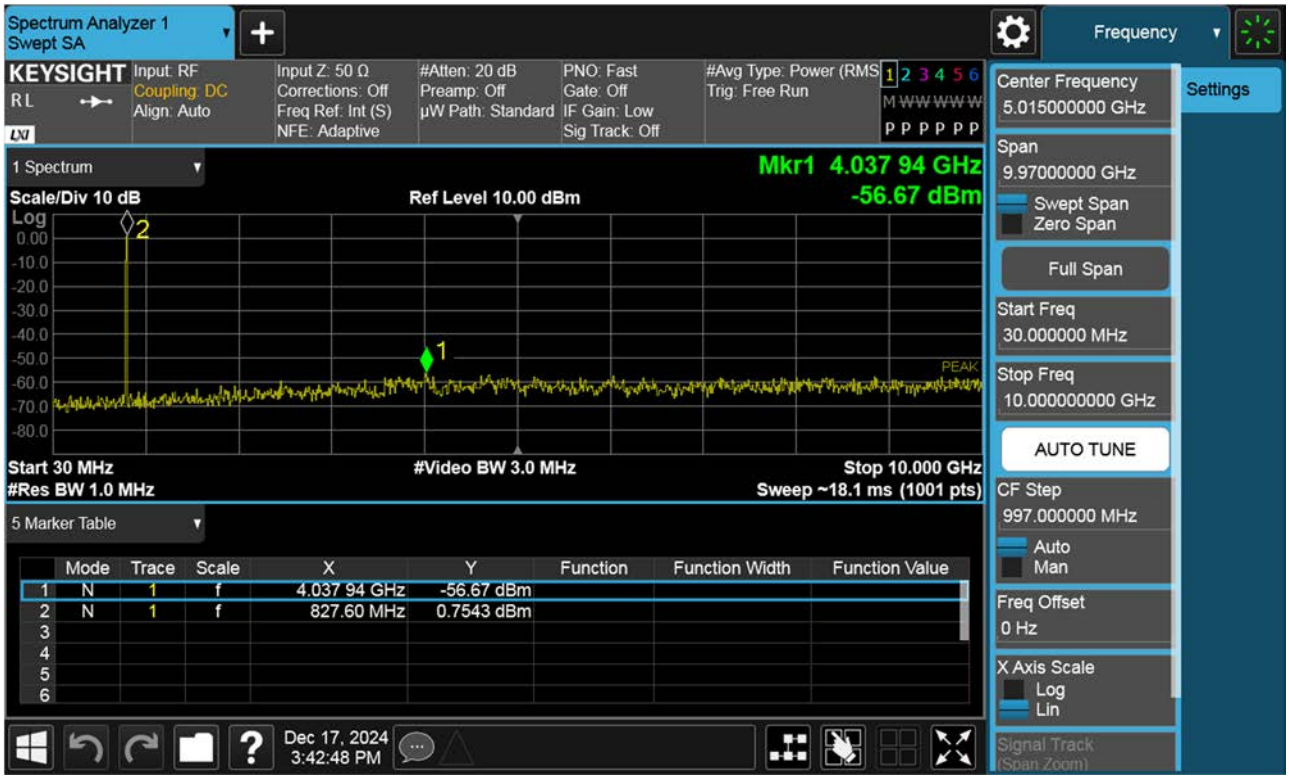


BAND 26. Conducted Spurious (26765 ch_15 MHz_QPSK_RB 1_0)

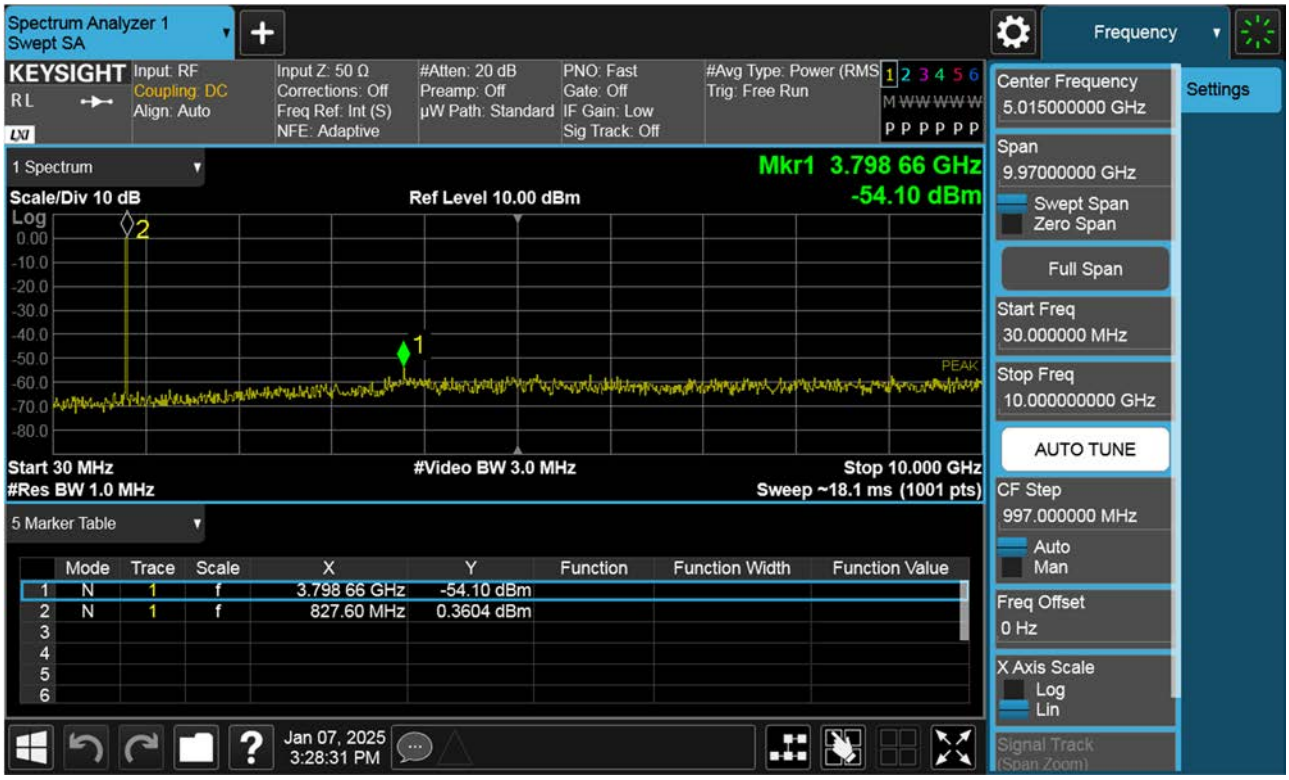


10. TEST PLOTS (STRADDLE CHANNEL)

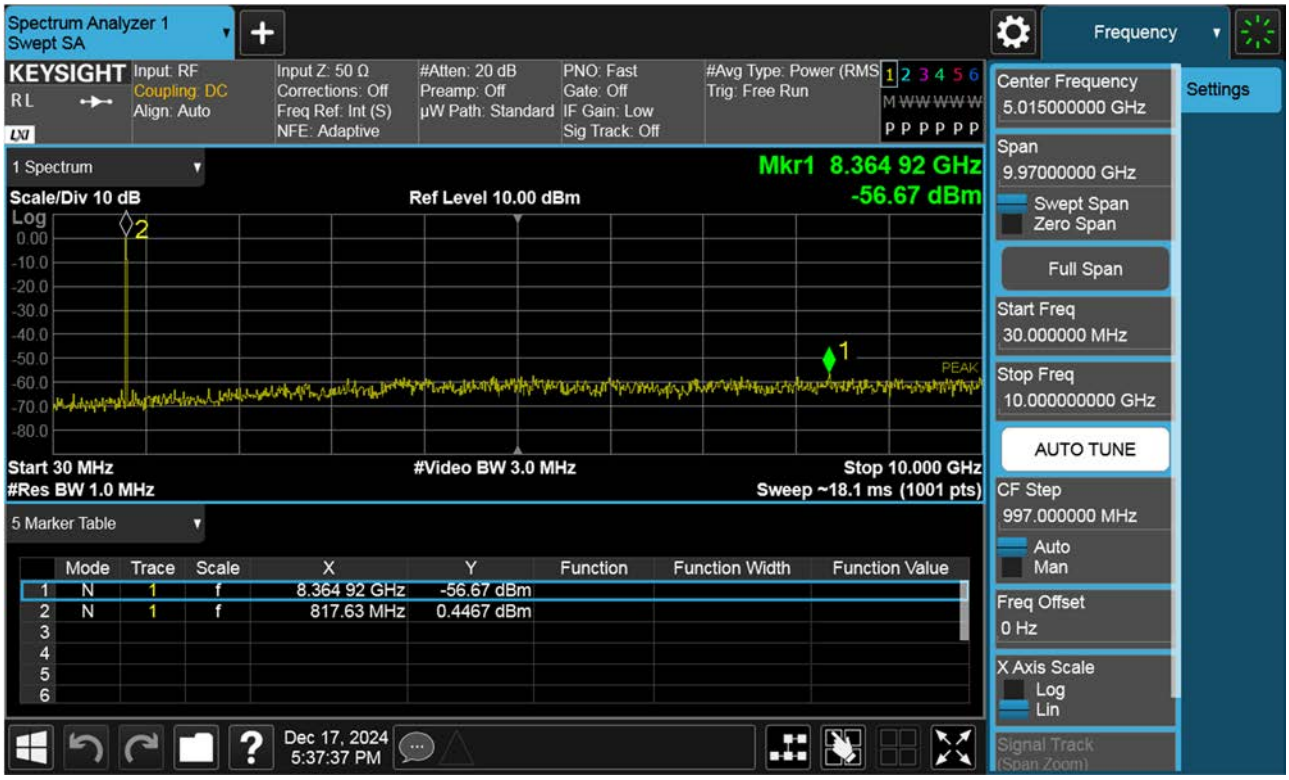
BAND 26. Conducted Spurious (1.4 MHz_QPSK_RB 1_0)



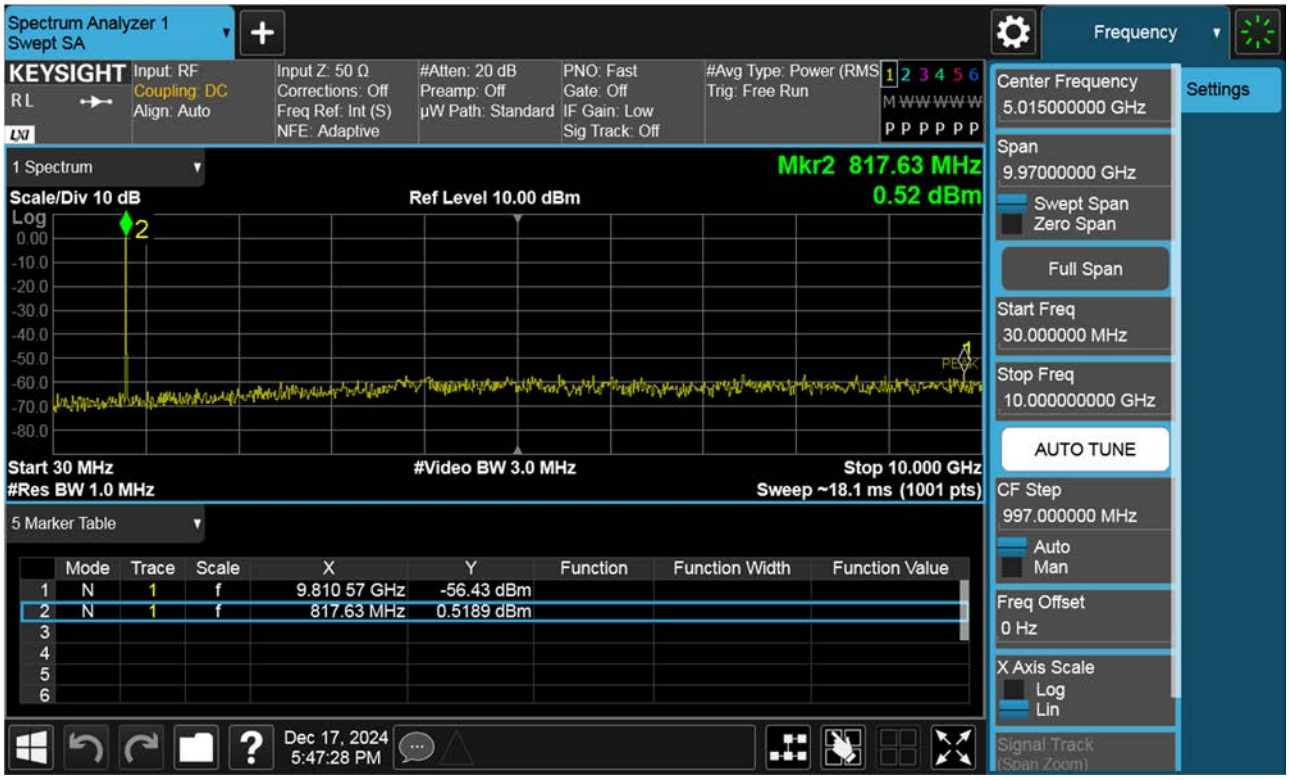
BAND 26. Conducted Spurious (3 MHz_QPSK_RB 1_0)



BAND 26. Conducted Spurious (5 MHz_QPSK_RB 1_0)



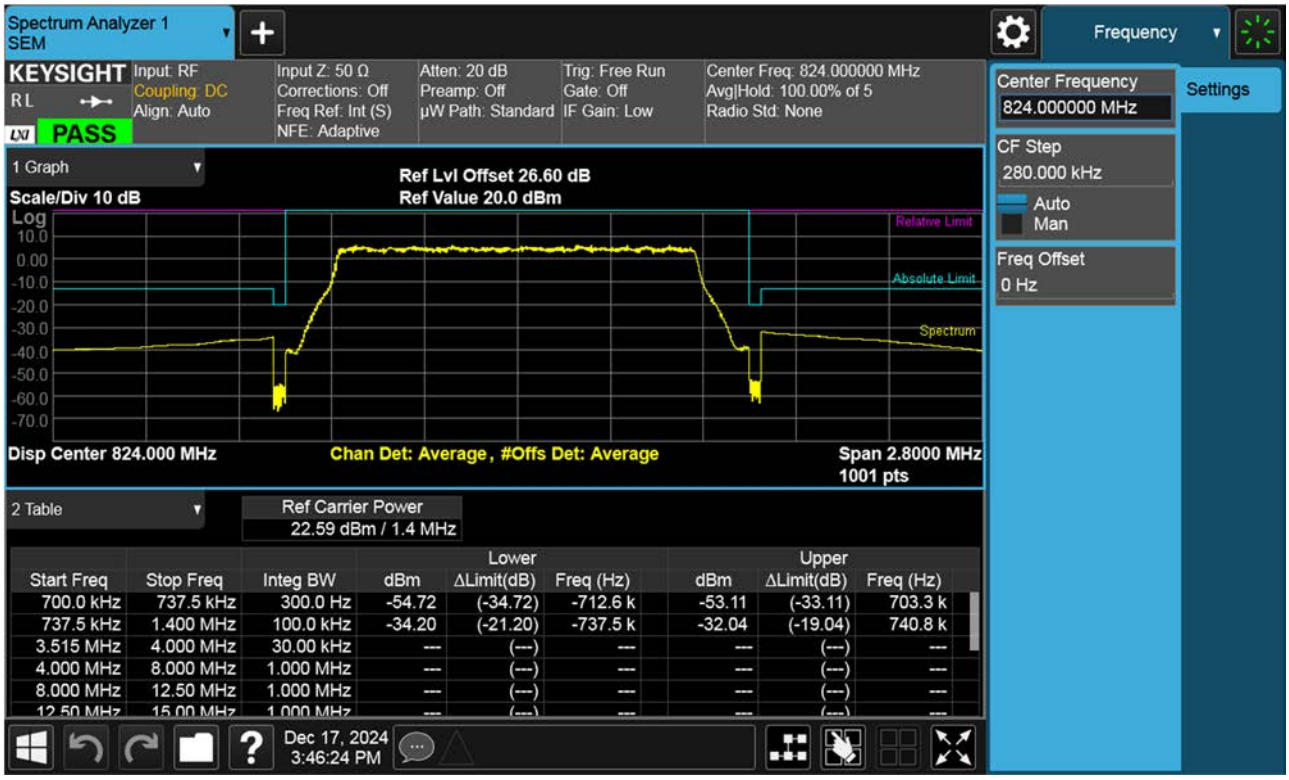
BAND 26. Conducted Spurious (10 MHz_QPSK_RB 1_0)



BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_0)

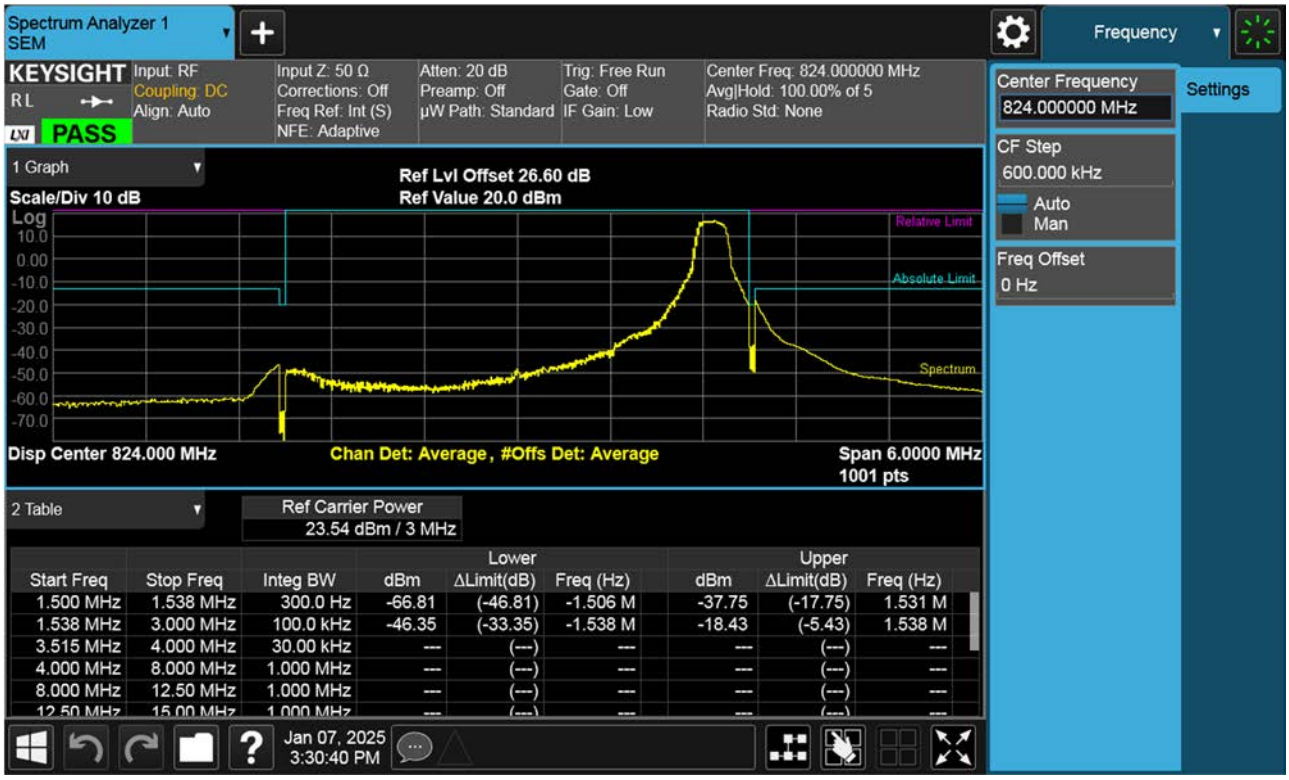
BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_5)

BAND 26. Channel Edge (1.4 MHz_QPSK_Full RB)



BAND 26. Channel Edge (3 MHz_QPSK_RB 1_0)

BAND 26. Channel Edge (3 MHz_QPSK_RB 1_14)



			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
1.500 MHz	1.538 MHz	300.0 Hz	-66.81	(-46.81)	-1.506 M	-37.75	(-17.75)	1.531 M
1.538 MHz	3.000 MHz	100.0 kHz	-46.35	(-33.35)	-1.538 M	-18.43	(-5.43)	1.538 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---