TEST REPORT

FCC LTE B26(Part90) Test for SM-S721B/DS
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2407-FC058

DATE OF ISSUE
July 24, 2024

Tested by
Jae Mun Do

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Jong Seok Lee

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TEST REPORT

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Additional Model
SM-S721B

Applicant	**SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Product Name Model Name	Mobile Phone SM-S721B/DS
Date of Test	May 21, 2024 ~ July 23, 2024
FCC ID	A3LSMS721B
Location of Test	■ Permanent Testing Lab ☐ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 Republic of Korea)
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
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	July 24, 2024	Initial Release

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:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMS721B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 90, § 22
EUT Type:	Mobile phone
Model(s):	SM-S721B/DS
Additional Model(s)	SM-S721B
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:	May 21, 2024 ~ July 23, 2024
Serial number:	Radiated : R3CX40LGCGM, R3CX60FDVCL(RSE) Conducted : R3CX503EC1Z

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	1M10G7D	QPSK	0.230	23.62
		1M10W7D	16QAM	0.177	22.47
		1M10W7D	64QAM	0.137	21.37
		1M10W7D	256QAM	0.076	18.81
LTE – Band26 (3)	815.5 – 824.0	2M71G7D	QPSK	0.236	23.72
		2M72W7D	16QAM	0.176	22.46
		2M71W7D	64QAM	0.145	21.60
		2M72W7D	256QAM	0.076	18.82
LTE – Band26 (5)	816.5 – 824.0	4M51G7D	QPSK	0.242	23.84
		4M55W7D	16QAM	0.178	22.51
		4M52W7D	64QAM	0.142	21.51
		4M53W7D	256QAM	0.078	18.94
LTE – Band26 (10)	819.0 – 824.0	9M05G7D	QPSK	0.239	23.79
		9M05W7D	16QAM	0.174	22.40
		9M03W7D	64QAM	0.139	21.44
		8M99W7D	256QAM	0.079	18.95
LTE – Band26 (15)	821.5	13M5G7D	QPSK	0.236	23.73
		13M5W7D	16QAM	0.176	22.45
		13M5W7D	64QAM	0.138	21.39
		13M5W7D	256QAM	0.077	18.87

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub 6.
It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160 MHz), Bluetooth(ePA), BT LE(ePA), NFC, WPT, WIFI 6E.

2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.3. TEST FACILITY

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.**

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
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
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 CONDUCTED OUTPUT POWER

Test Overview

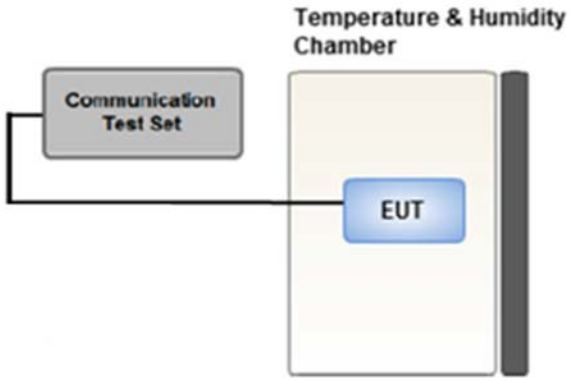
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base 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 Fully-anechoic chamber.
The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 1 MHz
3. VBW ≥ 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;

$$P_{d\ (dBm)} = Pg_{\ (dBm)} - \text{cable loss}_{\ (dB)} + \text{antenna gain}_{\ (dB)}$$

   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.

3.4 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW ≥ 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;

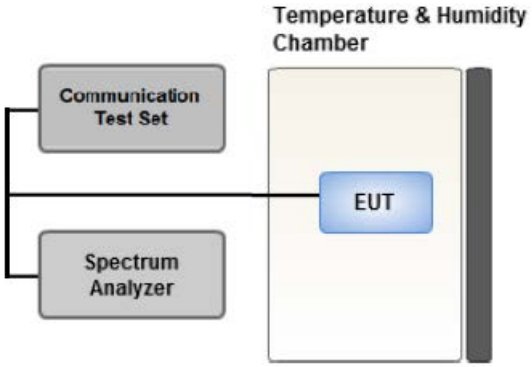
$$\text{Result}_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

$$EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$$

3.5 OCCUPIED BANDWIDTH.



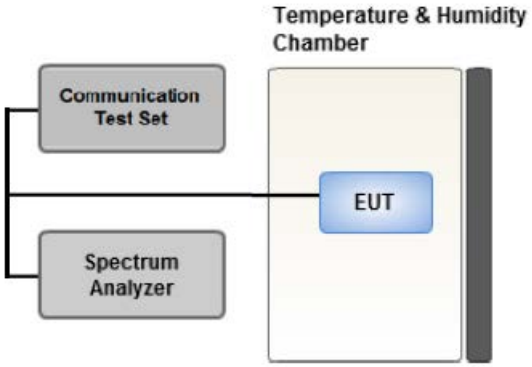
Test setup

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

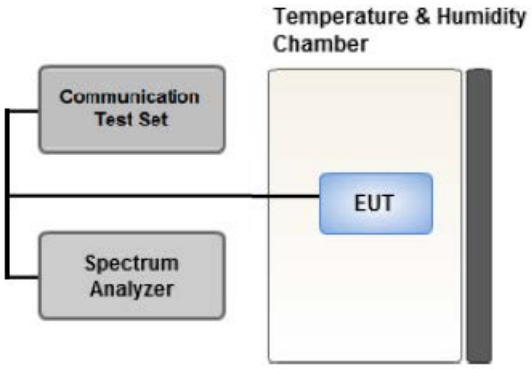
Test Overview

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 = RMS
4. Trace Mode = trace average
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

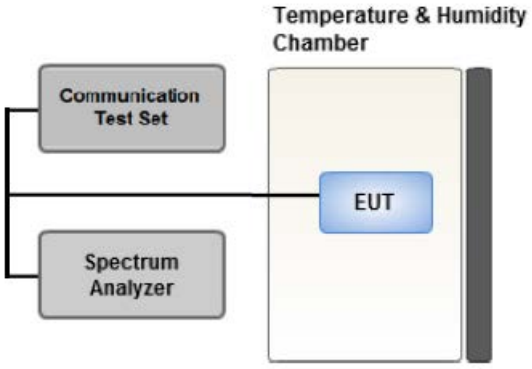
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW :
   .- EA licensee's frequency block by up to and including 37.5 kHz : 300 Hz
   .- EA licensee's frequency 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.
  Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
  Worst case : Stand alone
- All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.

  Therefore, only the worst case(stand-alone) results were reported.
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 3 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.
- SM-S721B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-S721B/DS)

[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		X

3.10 WORST CASE(CONDUCTED TEST)

- Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.
- SM-S721B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-S721B/DS)

[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

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	FBSR-02B(1.2G HPF+LNA)	T&M SYSTEM	F1L1	12/11/2024	Annual
RF Switching System	FBSR-02B(3.3G HPF+LNA)	T&M SYSTEM	F1L2	12/11/2024	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/17/2025	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	08/25/2024	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	03/09/2025	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	03/09/2025	Biennial
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	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	REOHDE & SCHWARZ	100931	08/17/2024	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	09/16/2024	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	09/16/2024	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/17/2024	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	12/11/2024	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	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 (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (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

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

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	23.60	0.229	100
		1	3	23.54	0.226	23.52	0.225	100
		1	5	23.54	0.226	23.51	0.224	100
		3	0	23.60	0.229	23.60	0.229	100
		3	1	23.56	0.227	23.55	0.226	100
		3	3	23.59	0.229	23.57	0.227	100
		6	0	22.19	0.166	22.16	0.165	100
	16QAM	1	0	22.47	0.177	22.44	0.175	100
		1	3	22.20	0.166	22.19	0.166	100
		1	5	22.44	0.175	22.41	0.174	100
		3	0	22.20	0.166	22.16	0.164	100
		3	1	22.16	0.164	22.15	0.164	100
		3	3	22.19	0.166	22.18	0.165	100
		6	0	21.16	0.131	21.16	0.130	100
	64QAM	1	0	21.37	0.137	21.34	0.136	100
		1	3	21.18	0.131	21.17	0.131	100
		1	5	21.34	0.136	21.33	0.136	100
		3	0	21.12	0.129	21.11	0.129	100
		3	1	21.14	0.130	21.12	0.129	100
		3	3	21.26	0.134	21.26	0.134	100
		6	0	20.21	0.105	20.20	0.105	100
	256QAM	1	0	18.81	0.076	18.80	0.076	100
		1	3	18.71	0.074	18.71	0.074	100
		1	5	18.81	0.076	18.78	0.075	100
		3	0	18.66	0.073	18.63	0.073	100
		3	1	18.62	0.073	18.61	0.073	100
		3	3	18.74	0.075	18.73	0.075	100
		6	0	18.68	0.074	18.65	0.073	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	23.72	0.236	23.70	0.235	100
		1	7	23.51	0.224	23.49	0.223	100
		1	14	23.60	0.229	23.59	0.229	100
		8	0	22.18	0.165	22.17	0.165	100
		8	3	22.15	0.164	22.11	0.163	100
		8	7	22.18	0.165	22.17	0.165	100
		15	0	22.26	0.168	22.24	0.168	100
	16QAM	1	0	22.40	0.174	22.39	0.173	100
		1	7	22.45	0.176	22.42	0.175	100
		1	14	22.46	0.176	22.45	0.176	100
		8	0	21.21	0.132	21.19	0.132	100
		8	3	21.29	0.135	21.29	0.134	100
		8	7	21.29	0.135	21.28	0.134	100
		15	0	21.24	0.133	21.20	0.132	100
	64QAM	1	0	21.42	0.139	21.39	0.138	100
		1	7	21.60	0.145	21.57	0.144	100
		1	14	21.49	0.141	21.46	0.140	100
		8	0	20.20	0.105	20.19	0.105	100
		8	3	20.21	0.105	20.19	0.104	100
		8	7	20.24	0.106	20.22	0.105	100
		15	0	20.22	0.105	20.20	0.105	100
	256QAM	1	0	18.82	0.076	18.81	0.076	100
		1	7	18.80	0.076	18.76	0.075	100
		1	14	18.66	0.073	18.66	0.073	100
		8	0	18.76	0.075	18.75	0.075	100
		8	3	18.75	0.075	18.71	0.074	100
		8	7	18.74	0.075	18.72	0.074	100
		15	0	18.72	0.074	18.68	0.074	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	23.84	0.242	23.82	0.241	100
		1	12	23.59	0.229	23.58	0.228	100
		1	24	23.55	0.226	23.53	0.225	100
		12	0	22.28	0.169	22.24	0.167	100
		12	6	22.28	0.169	22.27	0.169	100
		12	11	22.20	0.166	22.19	0.165	100
		25	0	22.22	0.167	22.22	0.167	100
	16QAM	1	0	22.49	0.177	22.47	0.177	100
		1	12	22.45	0.176	22.43	0.175	100
		1	24	22.51	0.178	22.51	0.178	100
		12	0	21.26	0.134	21.26	0.134	100
		12	6	21.24	0.133	21.21	0.132	100
		12	11	21.28	0.134	21.26	0.134	100
		25	0	21.24	0.133	21.22	0.133	100
	64QAM	1	0	21.51	0.142	21.49	0.141	100
		1	12	21.33	0.136	21.31	0.135	100
		1	24	21.37	0.137	21.35	0.137	100
		12	0	20.27	0.106	20.23	0.106	100
		12	6	20.27	0.106	20.23	0.105	100
		12	11	20.21	0.105	20.20	0.105	100
		25	0	20.27	0.106	20.23	0.105	100
	256QAM	1	0	18.94	0.078	18.92	0.078	100
		1	12	18.87	0.077	18.83	0.076	100
		1	24	18.78	0.076	18.76	0.075	100
		12	0	18.74	0.075	18.73	0.075	100
		12	6	18.78	0.076	18.76	0.075	100
		12	11	18.71	0.074	18.70	0.074	100
		25	0	18.71	0.074	18.70	0.074	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				819 MHz		
				dBm	W	
10	QPSK	1	0	23.78	0.239	100
		1	24	23.79	0.239	100
		1	49	23.67	0.233	100
		25	0	22.33	0.171	100
		25	12	22.25	0.168	100
		25	24	22.20	0.166	100
		50	0	22.29	0.170	100
	16QAM	1	0	22.40	0.174	100
		1	24	22.40	0.174	100
		1	49	22.22	0.167	100
		25	0	21.31	0.135	100
		25	12	21.25	0.133	100
		25	24	21.25	0.133	100
		50	0	21.26	0.134	100
	64QAM	1	0	21.43	0.139	100
		1	24	21.44	0.139	100
		1	49	21.36	0.137	100
		25	0	20.31	0.107	100
		25	12	20.27	0.106	100
		25	24	20.23	0.105	100
		50	0	20.30	0.107	100
	256QAM	1	0	18.93	0.078	100
		1	24	18.95	0.079	100
		1	49	18.75	0.075	100
		25	0	18.83	0.076	100
		25	12	18.74	0.075	100
		25	24	18.75	0.075	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	23.73	0.236	100
		1	36	23.63	0.231	100
		1	74	23.53	0.226	100
		36	0	22.22	0.167	100
		36	18	22.21	0.166	100
		36	39	22.18	0.165	100
		75	0	22.24	0.167	100
	16QAM	1	0	22.45	0.176	100
		1	36	22.40	0.174	100
		1	74	22.33	0.171	100
		36	0	21.21	0.132	100
		36	18	21.30	0.135	100
		36	39	21.17	0.131	100
		75	0	21.25	0.133	100
	64QAM	1	0	21.38	0.137	100
		1	36	21.35	0.136	100
		1	74	21.39	0.138	100
		36	0	20.29	0.107	100
		36	18	20.27	0.106	100
		36	39	20.19	0.105	100
		75	0	20.27	0.106	100
	256QAM	1	0	18.87	0.077	100
		1	36	18.78	0.075	100
		1	74	18.79	0.076	100
		36	0	18.74	0.075	100
		36	18	18.71	0.074	100
		36	39	18.65	0.073	100
		75	0	18.70	0.074	100

8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
814.7	LTE B26/ 1.4 MHz	QPSK	-31.21	29.63	-10.05	1.38	H	< 100	0.066	18.20	1	0
		16QAM	-32.87	27.97	-10.05	1.38	H		0.045	16.54		
		64QAM	-33.92	26.92	-10.05	1.38	H		0.035	15.49		
		256QAM	-34.98	25.86	-10.05	1.38	H		0.028	14.43		
823.3		QPSK	-31.36	29.54	-10.05	1.38	H		0.065	18.11	1	0
		16QAM	-33.06	27.84	-10.05	1.38	H		0.044	16.41		
		64QAM	-34.10	26.80	-10.05	1.38	H		0.035	15.37		
		256QAM	-35.15	25.75	-10.05	1.38	H		0.027	14.32		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
815.5	LTE B26/ 3 MHz	QPSK	-31.13	29.68	-10.05	1.38	H	< 100	0.067	18.25	1	0
		16QAM	-32.84	27.97	-10.05	1.38	H		0.045	16.54		
		64QAM	-33.89	26.92	-10.05	1.38	H		0.035	15.49		
		256QAM	-34.92	25.89	-10.05	1.38	H		0.028	14.46		
822.5		QPSK	-31.19	29.71	-10.05	1.38	H		0.067	18.28	1	0
		16QAM	-32.88	28.02	-10.05	1.38	H		0.046	16.59		
		64QAM	-33.92	26.98	-10.05	1.38	H		0.036	15.55		
		256QAM	-34.98	25.92	-10.05	1.38	H		0.028	14.49		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
816.5	LTE B26/ 5 MHz	QPSK	-31.23	29.51	-10.05	1.38	H	< 100	0.064	18.08	1	0
		16QAM	-32.94	27.80	-10.05	1.38	H		0.043	16.37		
		64QAM	-33.92	26.82	-10.05	1.38	H		0.035	15.39		
		256QAM	-35.05	25.69	-10.05	1.38	H		0.027	14.26		
821.5		QPSK	-31.22	29.70	-10.05	1.38	H		0.067	18.27	1	0
		16QAM	-32.94	27.98	-10.05	1.38	H		0.045	16.55		
		64QAM	-33.98	26.94	-10.05	1.38	H		0.036	15.51		
		256QAM	-35.08	25.84	-10.05	1.38	H		0.028	14.41		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
819.0	LTE B26/ 10 MHz	QPSK	-31.22	29.52	-10.05	1.38	H	< 100	0.065	18.09	1	0
		16QAM	-33.03	27.71	-10.05	1.38	H		0.043	16.28		
		64QAM	-34.06	26.68	-10.05	1.38	H		0.034	15.25		
		256QAM	-35.06	25.68	-10.05	1.38	H		0.027	14.25		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
821.5	LTE B26/ 15 MHz	QPSK	-31.54	29.38	-10.05	1.38	H	< 100	0.062	17.95	1	0
		16QAM	-33.22	27.70	-10.05	1.38	H		0.042	16.27		
		64QAM	-34.40	26.52	-10.05	1.38	H		0.032	15.09		
		256QAM	-35.48	25.44	-10.05	1.38	H		0.025	14.01		

Note

1. Limit: None (for reporting purposes only)

8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit	Size	
									Size	Offset
26705 (815.5)	1,631.00	-56.30	8.70	-64.22	1.93	H	-57.45	-13.00	1	0
	2,446.50	-46.32	10.20	-51.09	2.50	V	-43.39	-13.00		
	3,262.00	-59.19	10.60	-60.62	2.85	H	-52.87	-13.00		
26775 (822.5)	1,645.00	-56.88	9.20	-65.90	2.04	V	-58.73	-13.00	1	0
	2,467.50	-46.02	10.20	-50.16	2.49	H	-42.45	-13.00		
	3,290.00	-60.09	10.60	-62.58	2.90	V	-54.88	-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	1.0959
			16QAM			1.0986
			64QAM			1.0962
			256QAM			1.1034
	3 MHz	822.5	QPSK	15		2.7090
			16QAM			2.7148
			64QAM			2.7099
			256QAM			2.7167
	5 MHz	821.5	QPSK	25		4.5114
			16QAM			4.5489
			64QAM			4.5166
			256QAM			4.5251
	10 MHz	819.0	QPSK	50		9.0514
			16QAM			9.0477
			64QAM			9.0288
			256QAM			8.9856
	15 MHz	821.5	QPSK	75		13.469
			16QAM			13.471
			64QAM			13.456
			256QAM			13.465

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 46 ~ 65.

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	3.7214	27.976	-67.470	-39.494	-13.00
		823.3	3.7029	27.976	-67.305	-39.329	
	3	815.5	3.6945	27.976	-67.182	-39.206	
		822.5	3.6885	27.976	-67.326	-39.350	
	5	816.5	3.7054	27.976	-67.399	-39.423	
		821.5	3.6975	27.976	-66.942	-38.966	
	10	819.0	3.6985	27.976	-66.896	-38.920	
	15	821.5	3.7114	27.976	-66.983	-39.007	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 86 ~ 93.
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 CHANNEL EDGE

- Plots of the EUT's Band Edge are shown Page 66 ~ 85.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 26

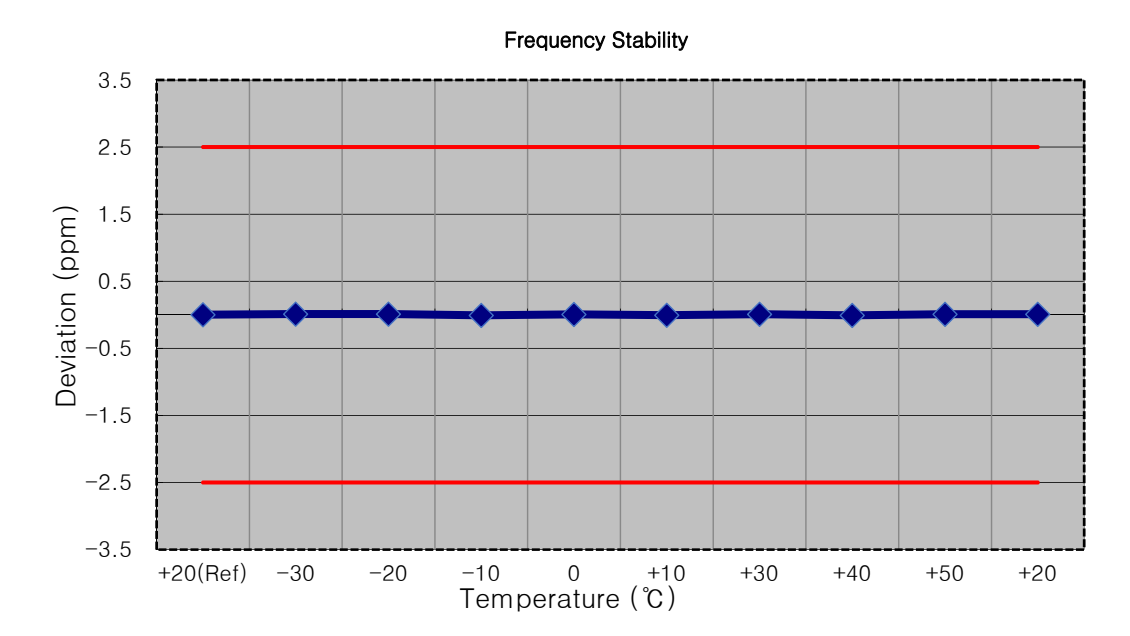
▣ OPERATING FREQUENCY: 814,700,000 Hz

▣ CHANNEL: 26697(1.4 MHz)

▣ REFERENCE VOLTAGE: 3.880 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.880	+20(Ref)	814 700 006	0.0	0.000 000	0.000
100 %		-30	814 700 014	8.3	0.000 001	0.010
100 %		-20	814 700 015	9.0	0.000 001	0.011
100 %		-10	814 699 999	-6.9	-0.000 001	-0.008
100 %		0	814 700 011	5.1	0.000 001	0.006
100 %		+10	814 700 001	-5.4	-0.000 001	-0.007
100 %		+30	814 700 013	6.6	0.000 001	0.008
100 %		+40	814 700 000	-6.1	-0.000 001	-0.007
100 %		+50	814 700 014	7.7	0.000 001	0.009
Batt. Endpoint	3.300	+20	814 700 013	7.5	0.000 001	0.009



▣ MODE: LTE 26

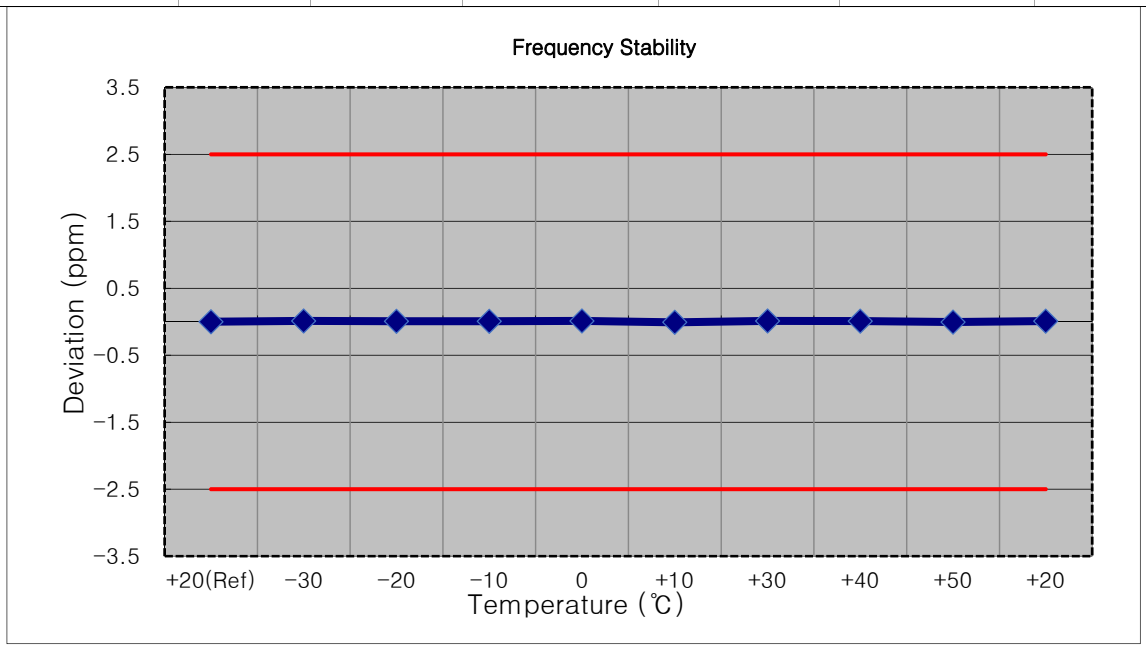
▣ OPERATING FREQUENCY: 815,500,000 Hz

▣ CHANNEL: 26705(3 MHz)

▣ REFERENCE VOLTAGE: 3.880 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.880	+20(Ref)	815 500 009	0.0	0.000 000	0.000
100 %		-30	815 500 018	9.0	0.000 001	0.011
100 %		-20	815 500 014	5.3	0.000 001	0.006
100 %		-10	815 500 015	5.7	0.000 001	0.007
100 %		0	815 500 019	10.2	0.000 001	0.013
100 %		+10	815 500 003	-6.4	-0.000 001	-0.008
100 %		+30	815 500 018	8.8	0.000 001	0.011
100 %		+40	815 500 017	8.5	0.000 001	0.010
100 %		+50	815 500 004	-5.1	-0.000 001	-0.006
Batt. Endpoint	3.300	+20	815 500 017	8.3	0.000 001	0.010



▣ MODE: LTE 26

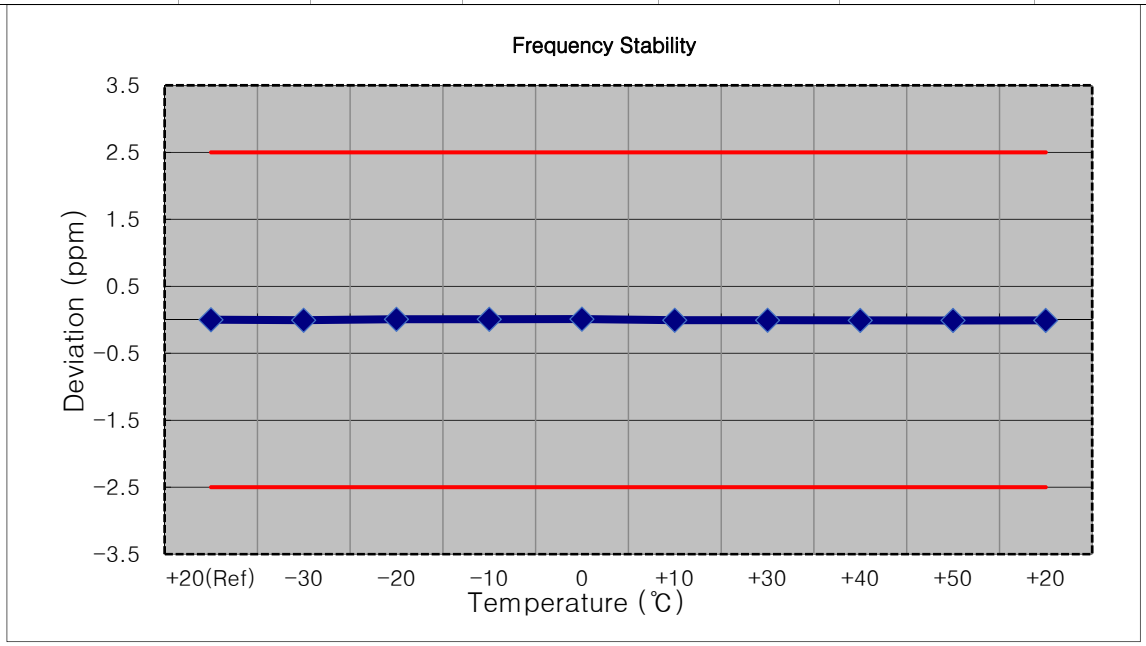
▣ OPERATING FREQUENCY: 816,500,000 Hz

▣ CHANNEL: 26715(5 MHz)

▣ REFERENCE VOLTAGE: 3.880 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	3.880	+20(Ref)	816 499 992	0.0	0.000 000	0.000
100 %		-30	816 499 985	-6.8	-0.000 001	-0.008
100 %		-20	816 499 998	6.3	0.000 001	0.008
100 %		-10	816 499 999	6.5	0.000 001	0.008
100 %		0	816 500 000	7.8	0.000 001	0.010
100 %		+10	816 499 986	-6.1	-0.000 001	-0.007
100 %		+30	816 499 986	-6.0	-0.000 001	-0.007
100 %		+40	816 499 984	-8.4	-0.000 001	-0.010
100 %		+50	816 499 983	-8.7	-0.000 001	-0.011
Batt. Endpoint	3.300	+20	816 499 985	-7.2	-0.000 001	-0.009



▣ MODE: LTE 26

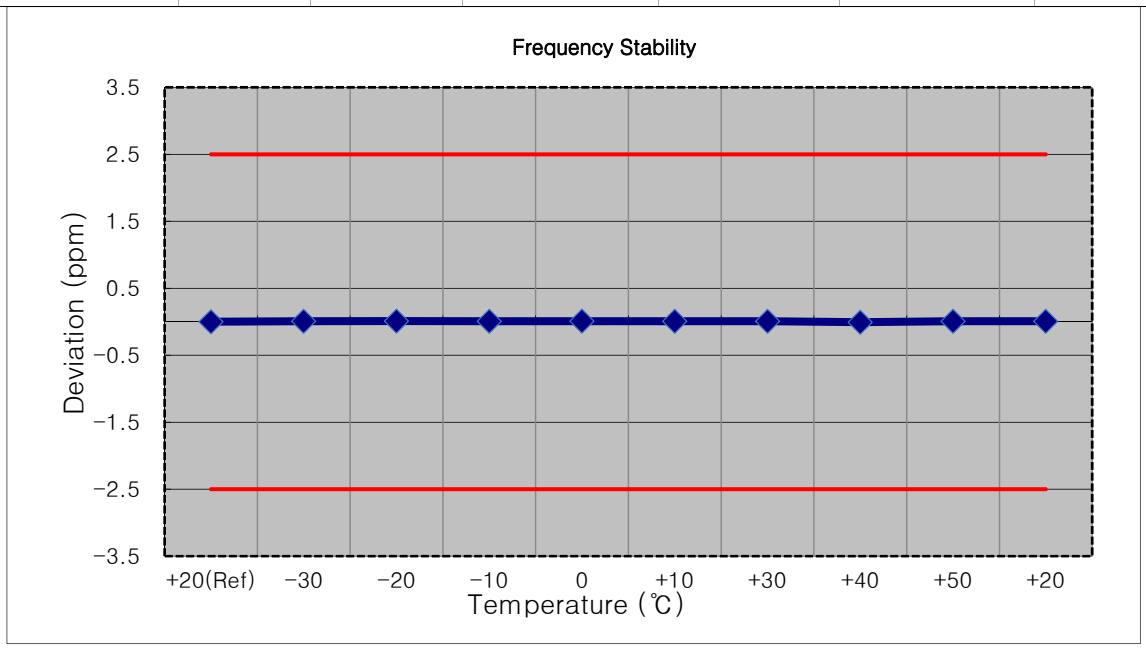
▣ OPERATING FREQUENCY: 819,000,000 Hz

▣ CHANNEL: 26740(10 MHz)

▣ REFERENCE VOLTAGE: 3.880 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	3.880	+20(Ref)	818 999 994	0.0	0.000 000	0.000
100 %		-30	819 000 001	6.4	0.000 001	0.008
100 %		-20	819 000 001	6.8	0.000 001	0.008
100 %		-10	818 999 999	4.9	0.000 001	0.006
100 %		0	819 000 001	6.9	0.000 001	0.008
100 %		+10	819 000 000	6.2	0.000 001	0.008
100 %		+30	819 000 000	6.2	0.000 001	0.008
100 %		+40	818 999 989	-5.6	-0.000 001	-0.007
100 %		+50	818 999 999	4.8	0.000 001	0.006
Batt. Endpoint	3.300	+20	819 000 000	5.4	0.000 001	0.007



▣ MODE: LTE 26

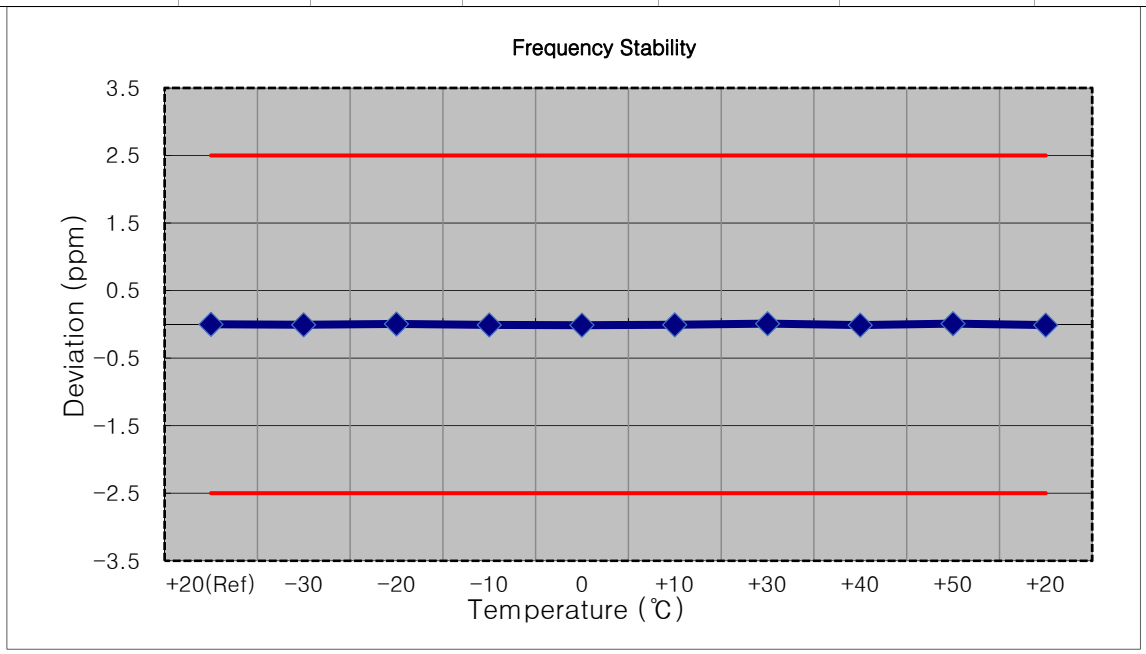
▣ OPERATING FREQUENCY: 821,500,000 Hz

▣ CHANNEL: 26765(15 MHz)

▣ REFERENCE VOLTAGE: 3.880 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	3.880	+20(Ref)	821 500 009	0.0	0.000 000	0.000
100 %		-30	821 500 003	-6.1	-0.000 001	-0.007
100 %		-20	821 500 014	5.4	0.000 001	0.007
100 %		-10	821 500 001	-7.8	-0.000 001	-0.009
100 %		0	821 499 999	-9.9	-0.000 001	-0.012
100 %		+10	821 500 003	-5.9	-0.000 001	-0.007
100 %		+30	821 500 017	7.7	0.000 001	0.009
100 %		+40	821 500 000	-9.2	-0.000 001	-0.011
100 %		+50	821 500 018	9.1	0.000 001	0.011
Batt. Endpoint	3.300	+20	821 500 000	-9.0	-0.000 001	-0.011



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	23.60	0.229	100
		1	3	23.51	0.225	100
		1	5	23.47	0.222	100
		3	0	23.59	0.228	100
		3	1	23.53	0.226	100
		3	3	23.55	0.226	100
		6	0	22.14	0.164	100
	16QAM	1	0	22.41	0.174	100
		1	3	22.17	0.165	100
		1	5	22.39	0.173	100
		3	0	22.12	0.163	100
		3	1	22.14	0.164	100
		3	3	22.16	0.165	100
		6	0	21.13	0.130	100
	64QAM	1	0	21.33	0.136	100
		1	3	21.15	0.130	100
		1	5	21.31	0.135	100
		3	0	21.08	0.128	100
		3	1	21.11	0.129	100
		3	3	21.24	0.133	100
		6	0	20.16	0.104	100
	256QAM	1	0	18.78	0.076	100
		1	3	18.68	0.074	100
		1	5	18.77	0.075	100
		3	0	18.63	0.073	100
		3	1	18.60	0.072	100
		3	3	18.70	0.074	100
		6	0	18.63	0.073	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
3	QPSK	1	0	23.67	0.233	100
		1	7	23.47	0.222	100
		1	14	23.57	0.227	100
		8	0	22.13	0.163	100
		8	3	22.08	0.161	100
		8	7	22.13	0.163	100
		15	0	22.22	0.167	100
	16QAM	1	0	22.35	0.172	100
		1	7	22.42	0.174	100
		1	14	22.41	0.174	100
		8	0	21.16	0.131	100
		8	3	21.26	0.134	100
		8	7	21.24	0.133	100
		15	0	21.20	0.132	100
	64QAM	1	0	21.38	0.138	100
		1	7	21.57	0.144	100
		1	14	21.43	0.139	100
		8	0	20.17	0.104	100
		8	3	20.18	0.104	100
		8	7	20.19	0.104	100
		15	0	20.17	0.104	100
	256QAM	1	0	18.79	0.076	100
		1	7	18.76	0.075	100
		1	14	18.63	0.073	100
		8	0	18.73	0.075	100
		8	3	18.70	0.074	100
		8	7	18.69	0.074	100
		15	0	18.66	0.073	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
5	QPSK	1	0	23.82	0.241	100
		1	12	23.57	0.228	100
		1	24	23.51	0.224	100
		12	0	22.20	0.166	100
		12	6	22.24	0.168	100
		12	11	22.17	0.165	100
		25	0	22.20	0.166	100
	16QAM	1	0	22.44	0.175	100
		1	12	22.39	0.174	100
		1	24	22.47	0.177	100
		12	0	21.24	0.133	100
		12	6	21.18	0.131	100
		12	11	21.25	0.133	100
		25	0	21.20	0.132	100
	64QAM	1	0	21.45	0.140	100
		1	12	21.27	0.134	100
		1	24	21.35	0.136	100
		12	0	20.22	0.105	100
		12	6	20.21	0.105	100
		12	11	20.19	0.105	100
		25	0	20.21	0.105	100
	256QAM	1	0	18.90	0.078	100
		1	12	18.81	0.076	100
		1	24	18.76	0.075	100
		12	0	18.72	0.074	100
		12	6	18.73	0.075	100
		12	11	18.67	0.074	100
		25	0	18.67	0.074	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
10	QPSK	1	0	23.76	0.238	100
		1	24	23.76	0.238	100
		1	49	23.66	0.232	100
		25	0	22.30	0.170	100
		25	12	22.22	0.167	100
		25	24	22.19	0.165	100
		50	0	22.25	0.168	100
	16QAM	1	0	22.39	0.173	100
		1	24	22.39	0.173	100
		1	49	22.20	0.166	100
		25	0	21.30	0.135	100
		25	12	21.24	0.133	100
		25	24	21.21	0.132	100
		50	0	21.25	0.133	100
	64QAM	1	0	21.40	0.138	100
		1	24	21.43	0.139	100
		1	49	21.32	0.136	100
		25	0	20.31	0.107	100
		25	12	20.25	0.106	100
		25	24	20.21	0.105	100
		50	0	20.27	0.106	100
	256QAM	1	0	18.92	0.078	100
		1	24	18.94	0.078	100
		1	49	18.72	0.074	100
		25	0	18.81	0.076	100
		25	12	18.70	0.074	100
		25	24	18.73	0.075	100
		50	0	18.75	0.075	100

8.8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 1.4 MHz	QPSK	-31.42	29.48	-10.05	1.38	H	< 7.00	0.064	18.05	1	0
		16QAM	-33.13	27.77	-10.05	1.38	H		0.043	16.34		
		64QAM	-34.15	26.75	-10.05	1.38	H		0.034	15.32		
		256QAM	-35.21	25.69	-10.05	1.38	H		0.027	14.26		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 3 MHz	QPSK	-31.33	29.57	-10.05	1.38	H	< 7.00	0.065	18.14	1	0
		16QAM	-32.97	27.93	-10.05	1.38	H		0.045	16.50		
		64QAM	-34.08	26.82	-10.05	1.38	H		0.035	15.39		
		256QAM	-35.18	25.72	-10.05	1.38	H		0.027	14.29		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 5 MHz	QPSK	-31.35	29.55	-10.05	1.38	H	< 7.00	0.065	18.12	1	0
		16QAM	-33.06	27.84	-10.05	1.38	H		0.044	16.41		
		64QAM	-34.10	26.80	-10.05	1.38	H		0.035	15.37		
		256QAM	-35.17	25.73	-10.05	1.38	H		0.027	14.30		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	LTE B26/ 10 MHz	QPSK	-31.25	29.65	-10.05	1.38	H	< 7.00	0.066	18.22	1	0
		16QAM	-33.06	27.84	-10.05	1.38	H		0.044	16.41		
		64QAM	-34.14	26.76	-10.05	1.38	H		0.034	15.33		
		256QAM	-35.13	25.77	-10.05	1.38	H		0.027	14.34		

8.8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit	RB	
									Size	Offset
26790 (824.0)	1,648.00	-57.98	9.20	-66.97	2.02	V	-59.79	-13.00	1	0
	2,472.00	-44.30	10.20	-48.44	2.49	H	-40.73	-13.00		
	3,296.00	-59.99	10.75	-62.34	2.91	V	-54.50	-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	1.4	824.0	3.7169	27.976	-67.172	-39.196	-13.00
	3		3.7164	27.976	-67.074	-39.098	
	5		3.7000	27.976	-67.352	-39.376	
	10		3.7024	27.976	-67.246	-39.270	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 95 ~ 98.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor (dB) = Cable Loss + Attenuator + Power Splitter

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

8.8.5 CHANNEL EDGE(Part90)

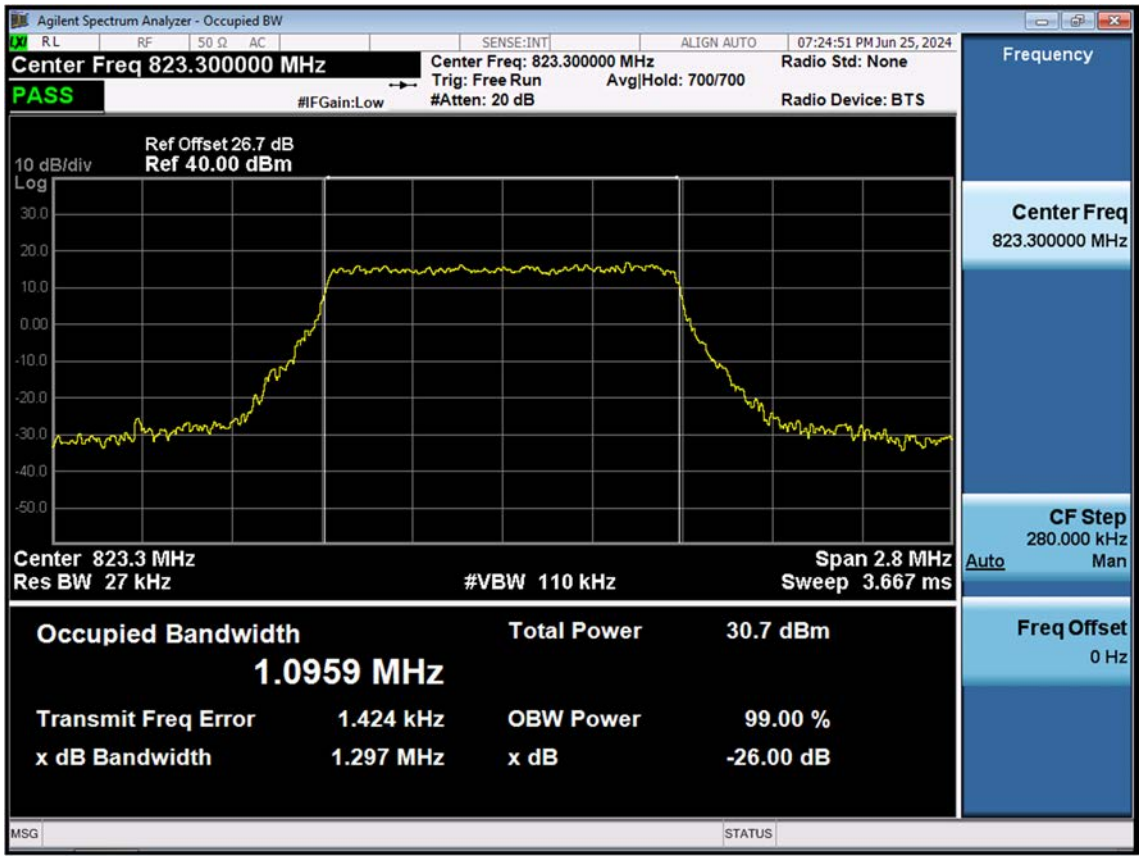
- Test Channel : 26790(824.0MHz)
- Plots of the EUT's Band Edge are shown Page 99 ~ 110.

8.8.6 BAND EDGE(Part22)

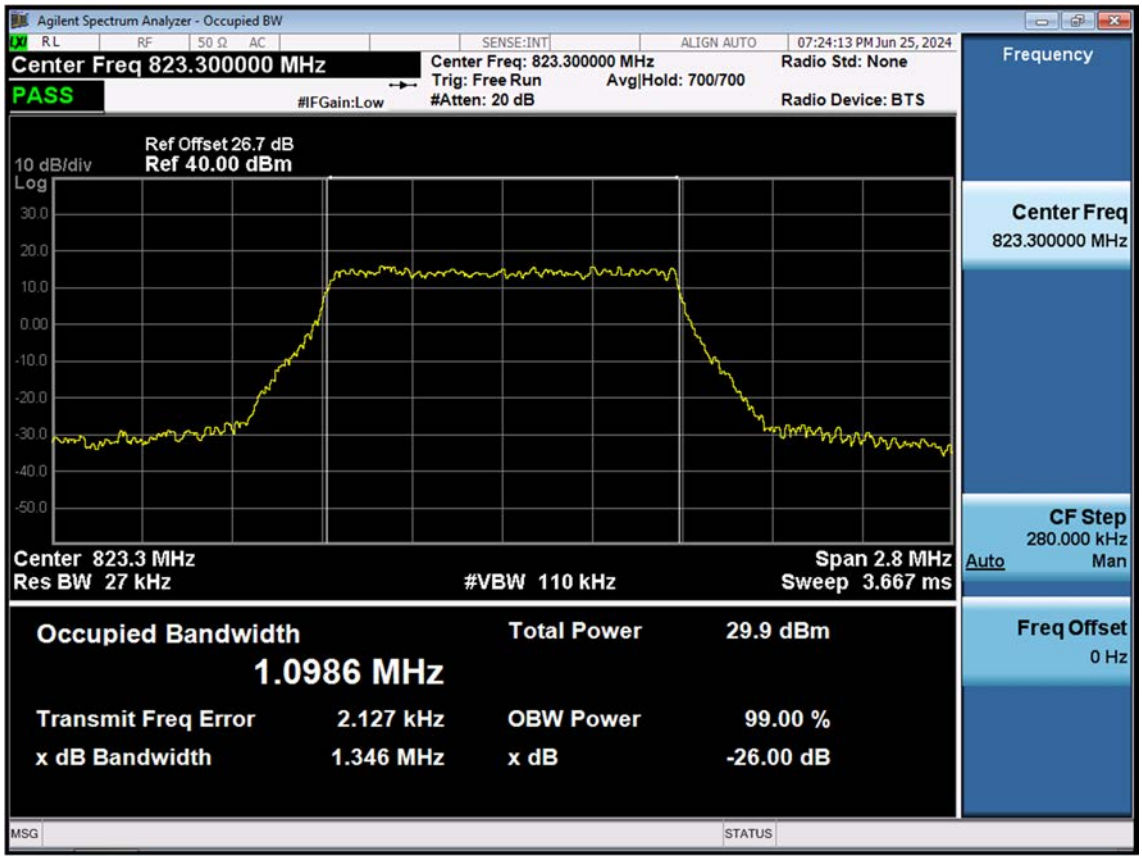
- Test Channel : 26790(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 111 ~ 118.

9. TEST PLOTS

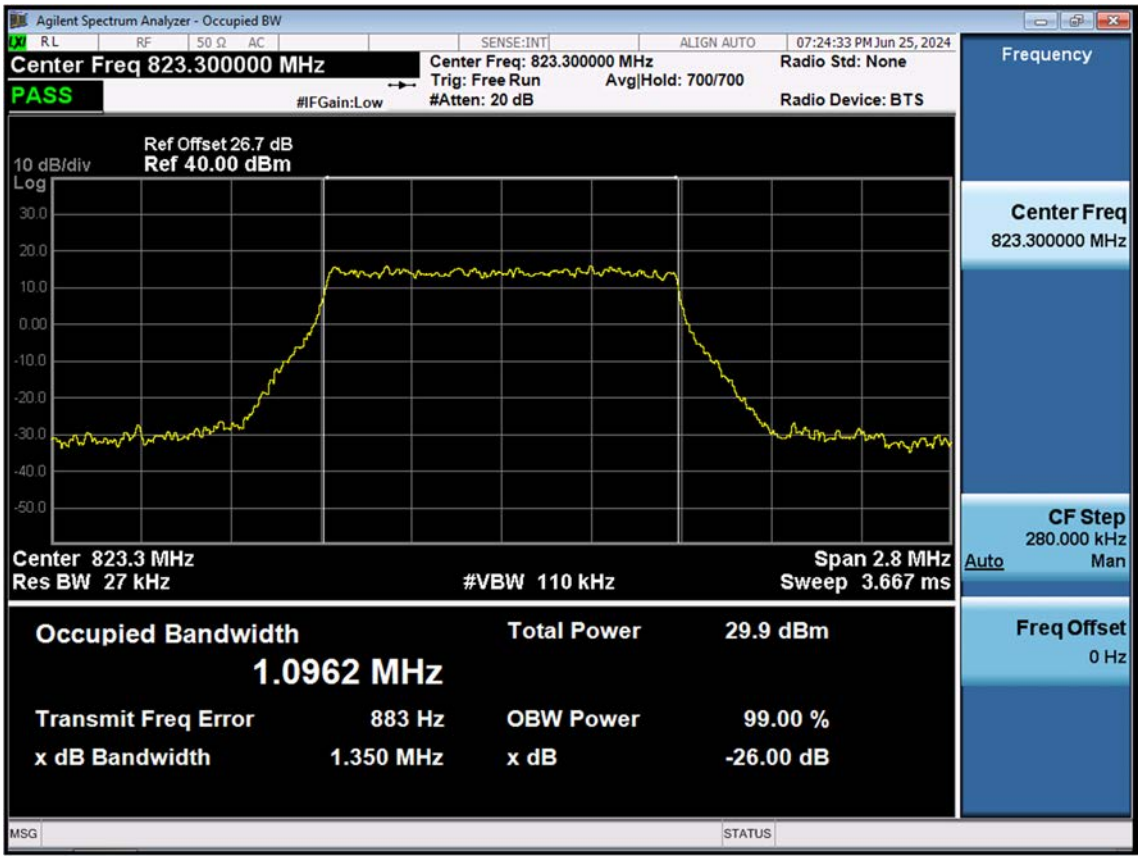
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 QPSK RB 6_0)



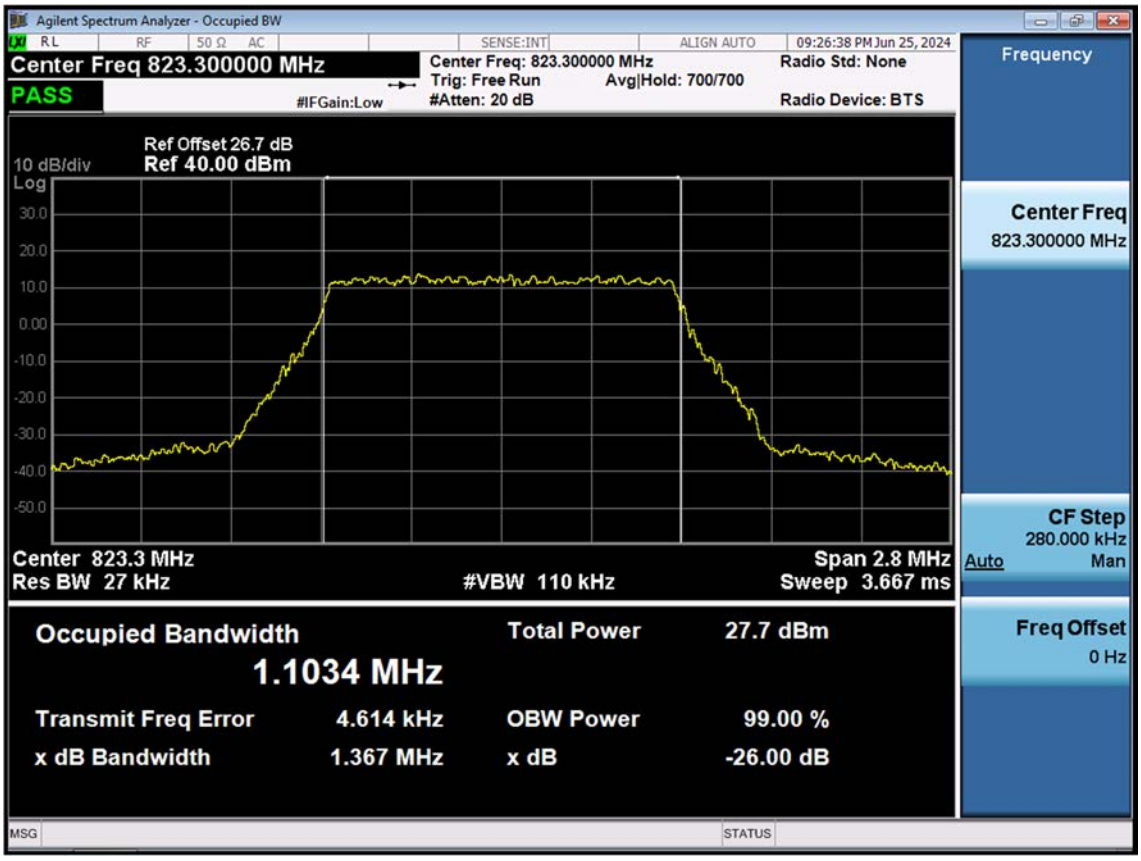
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 16QAM RB 6_0)



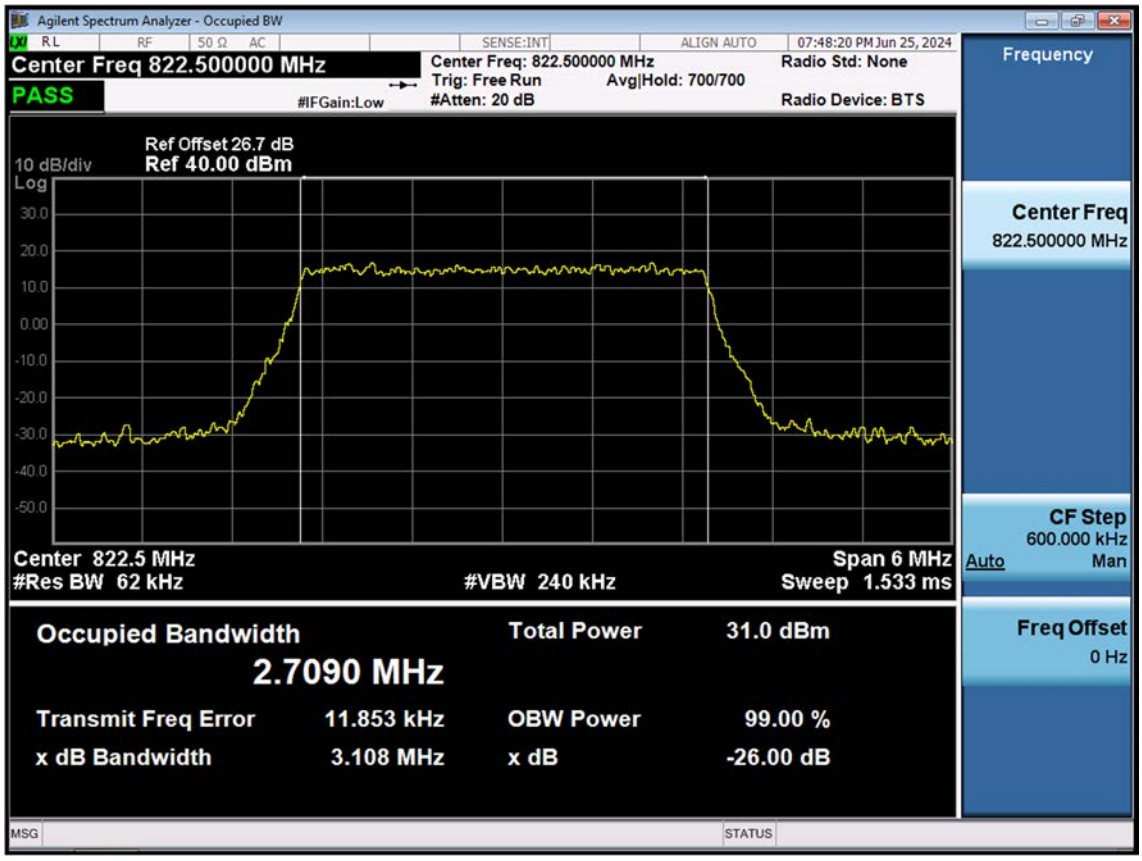
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 64QAM RB 6_0)



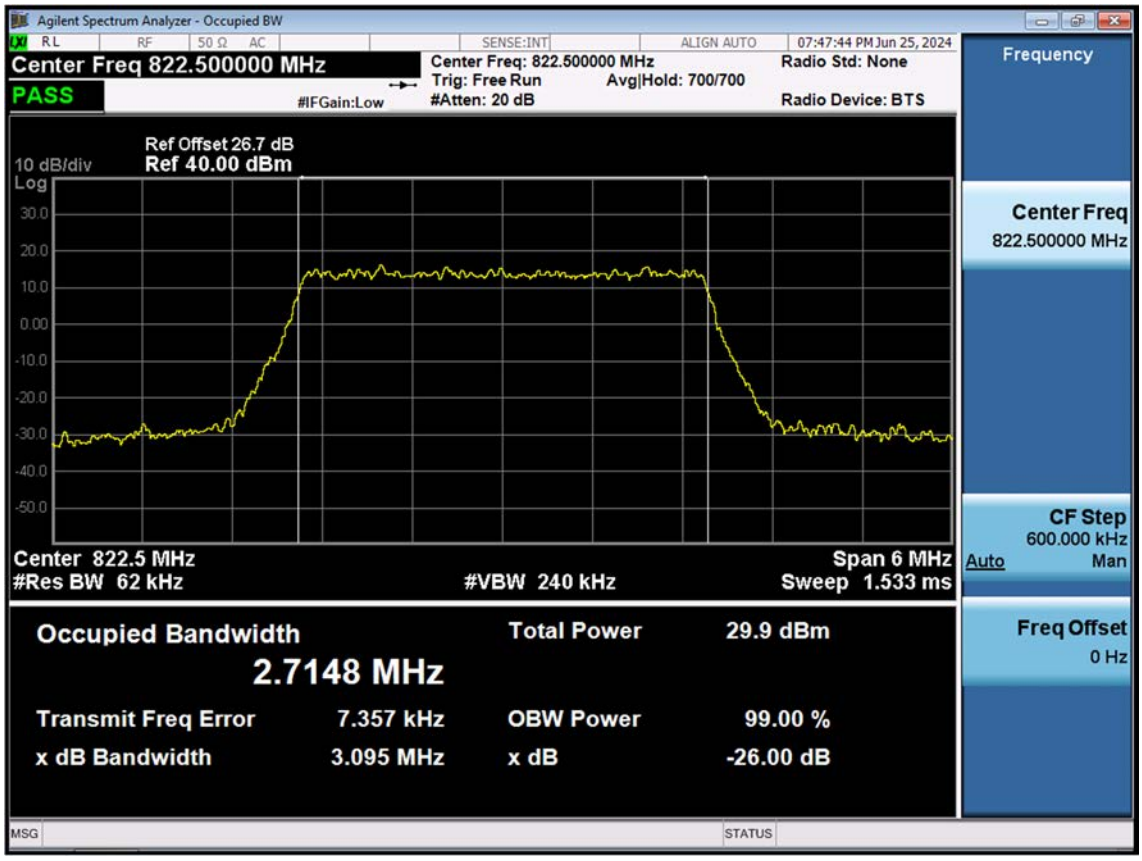
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 256QAM RB 6_0)



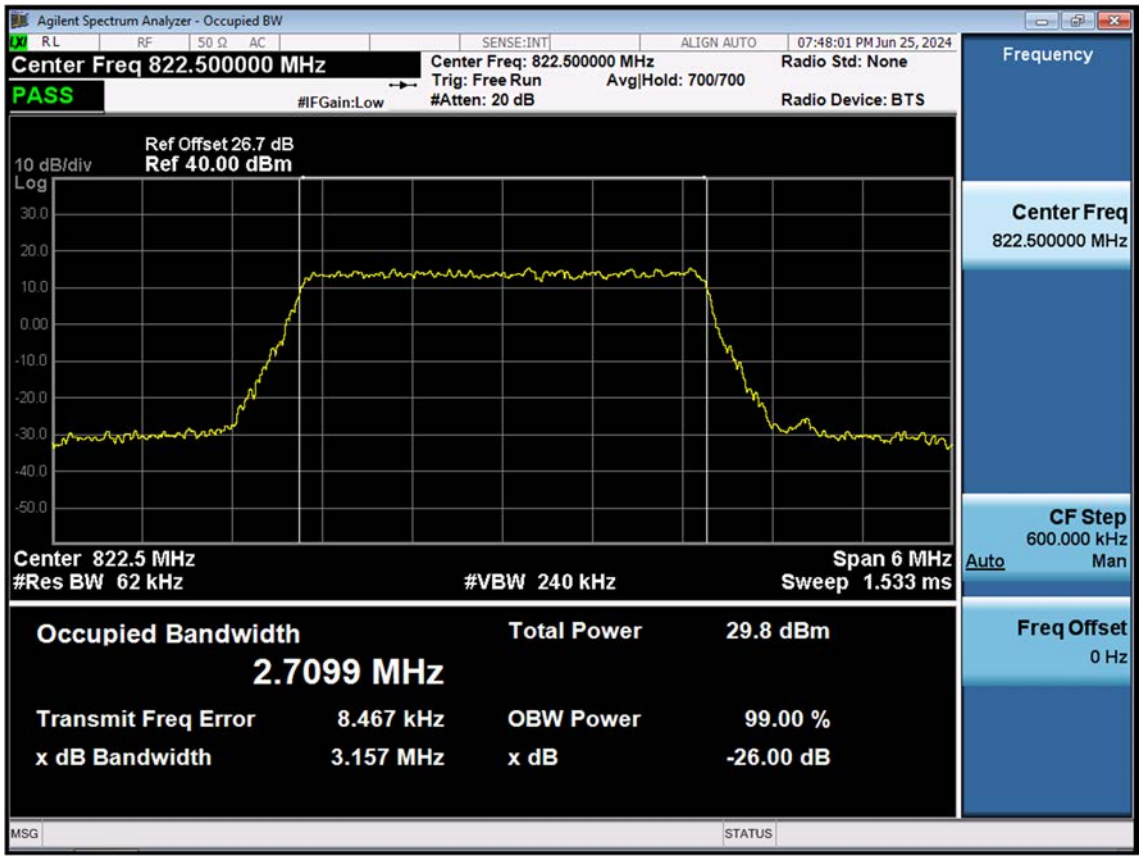
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 QPSK RB 15_0)



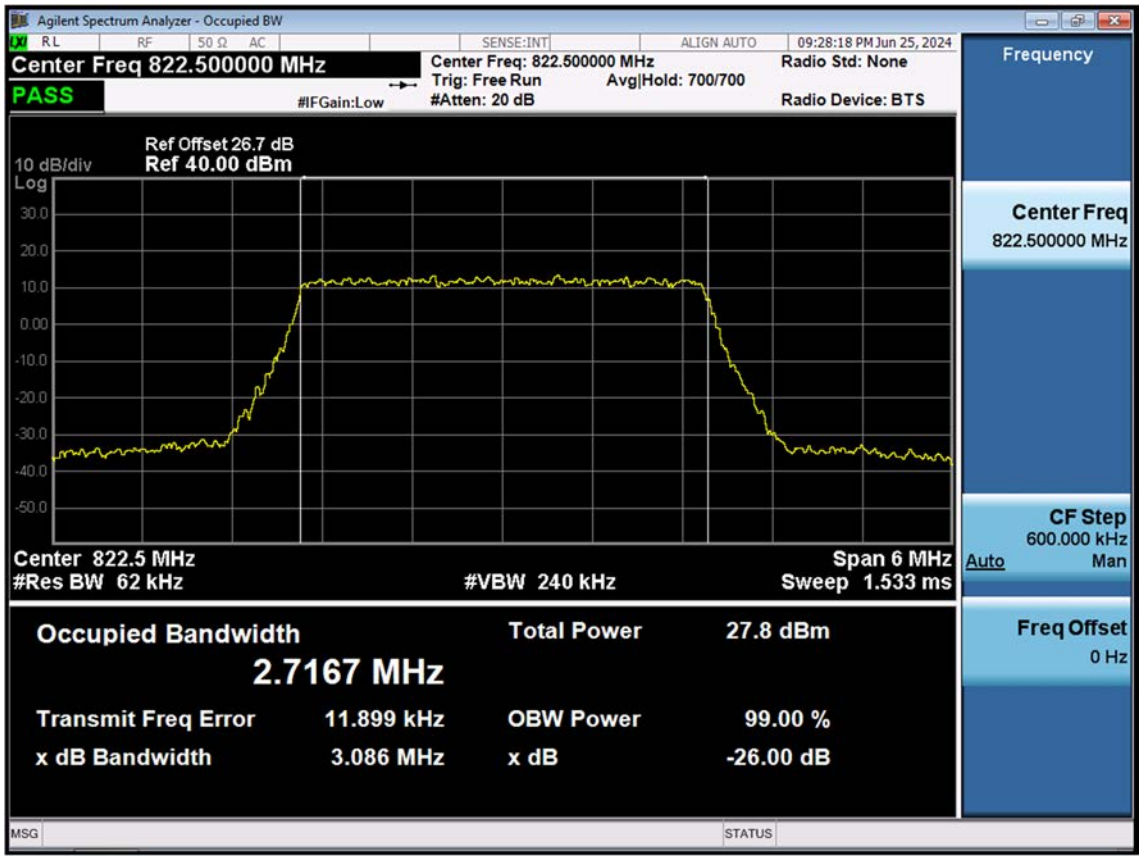
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 16QAM RB 15_0)



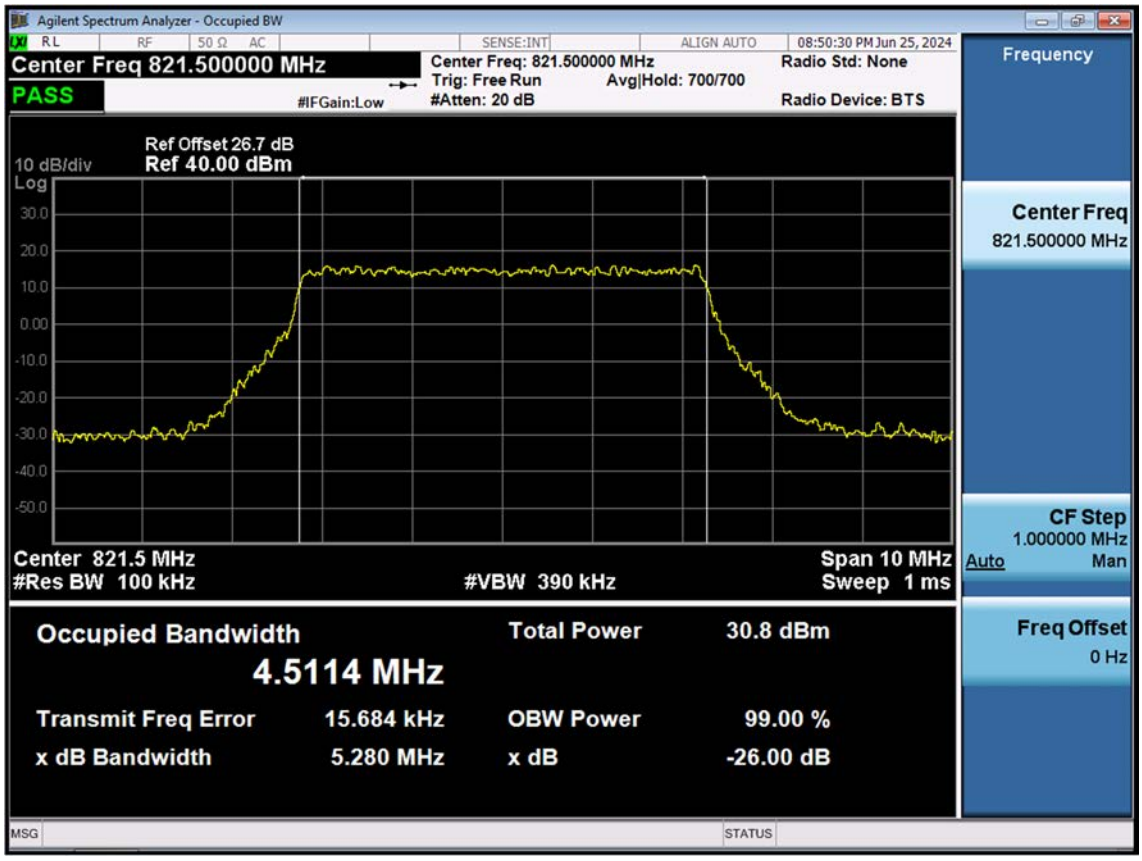
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 64QAM RB 15_0)



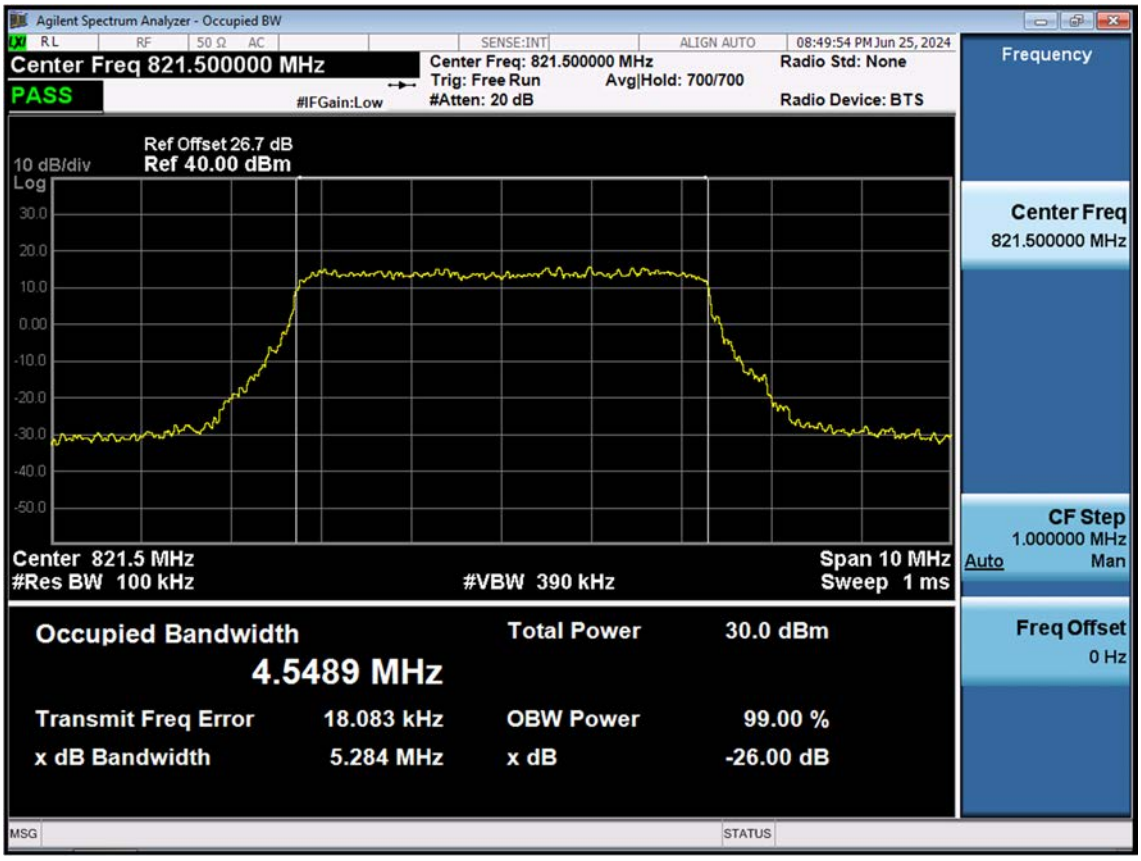
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 256QAM RB 15_0)



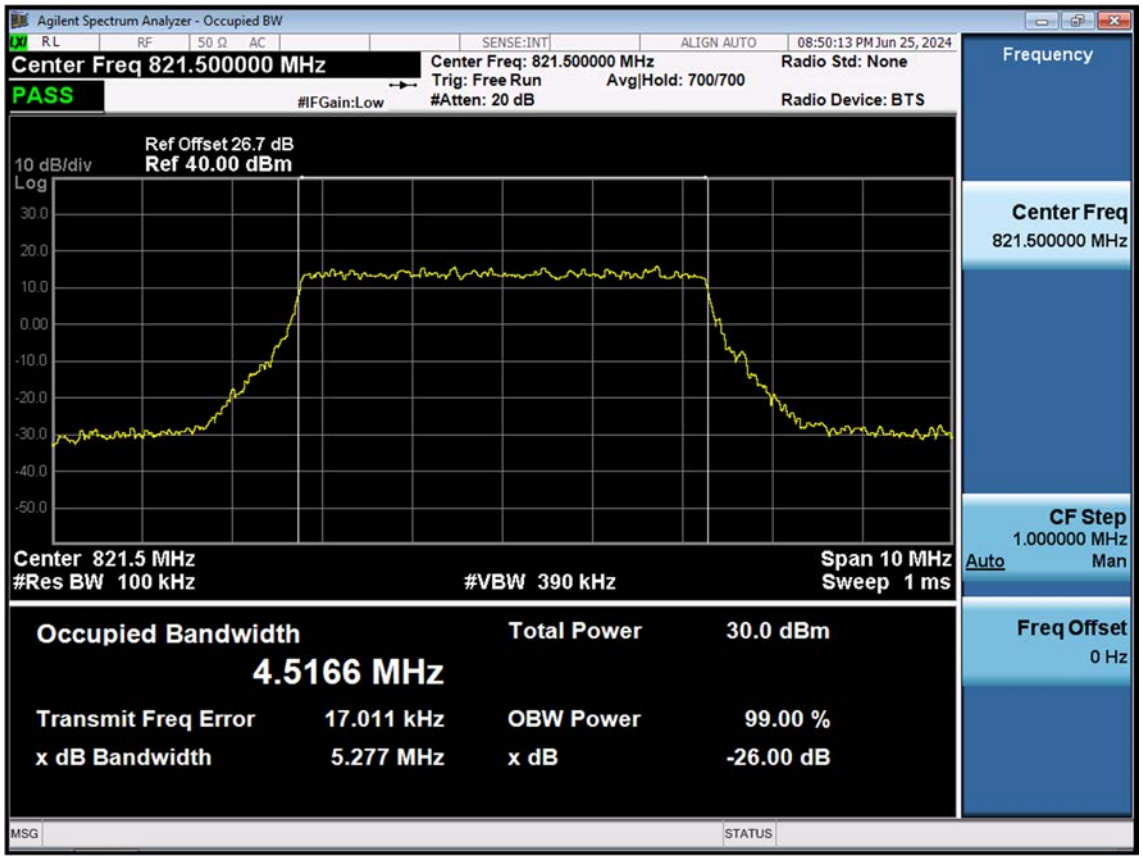
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 QPSK RB 25_0)



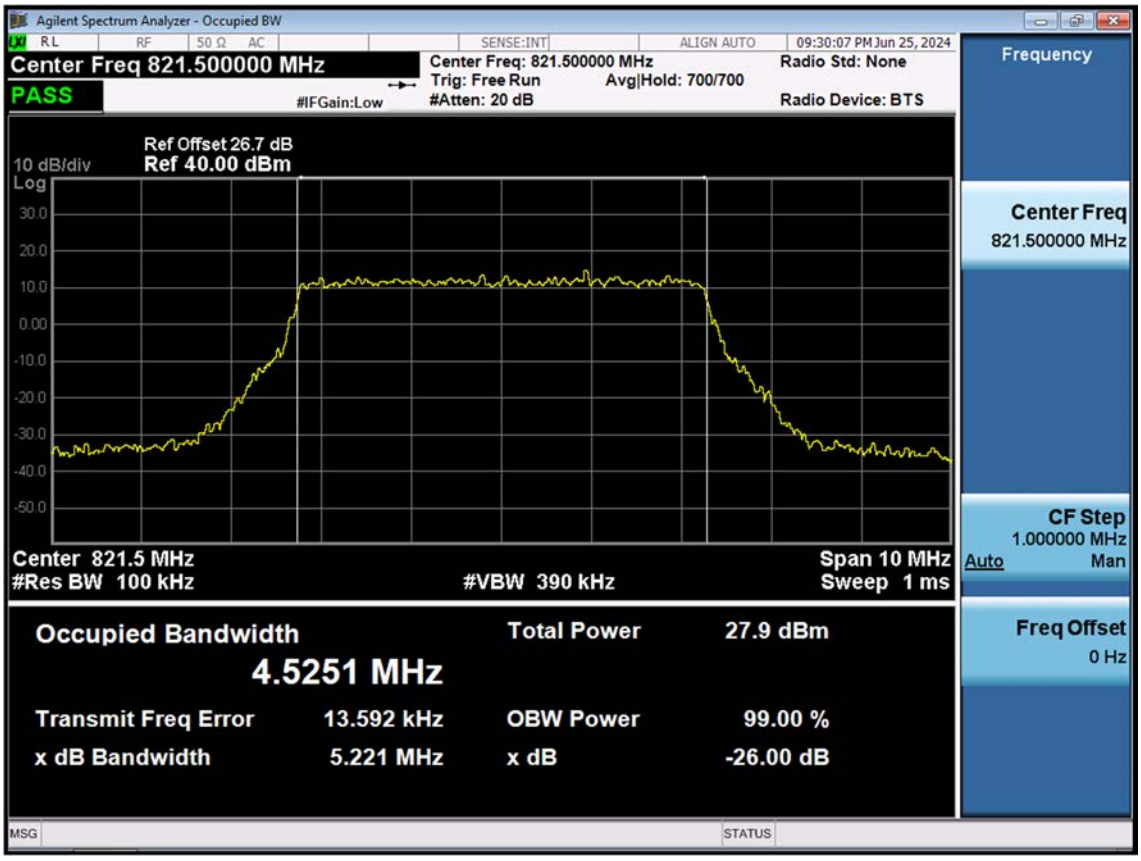
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 16QAM RB 25_0)



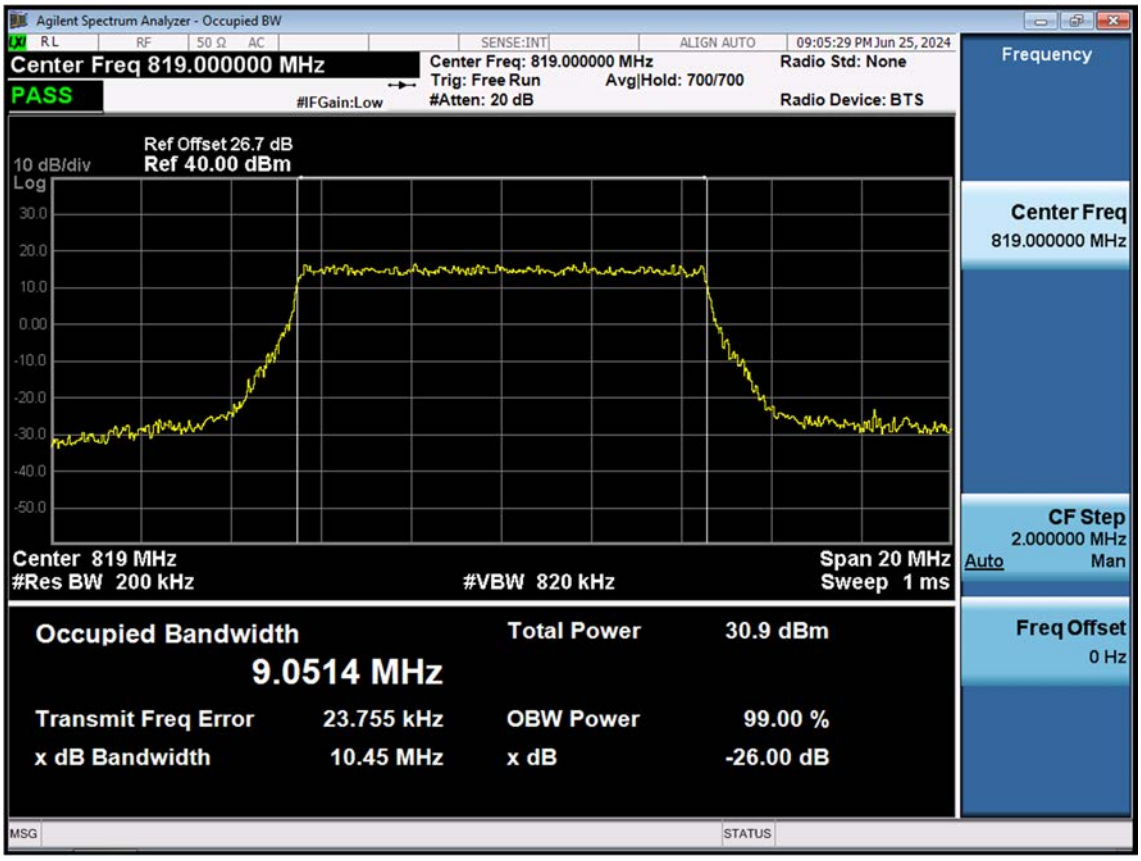
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 64QAM RB 25_0)



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

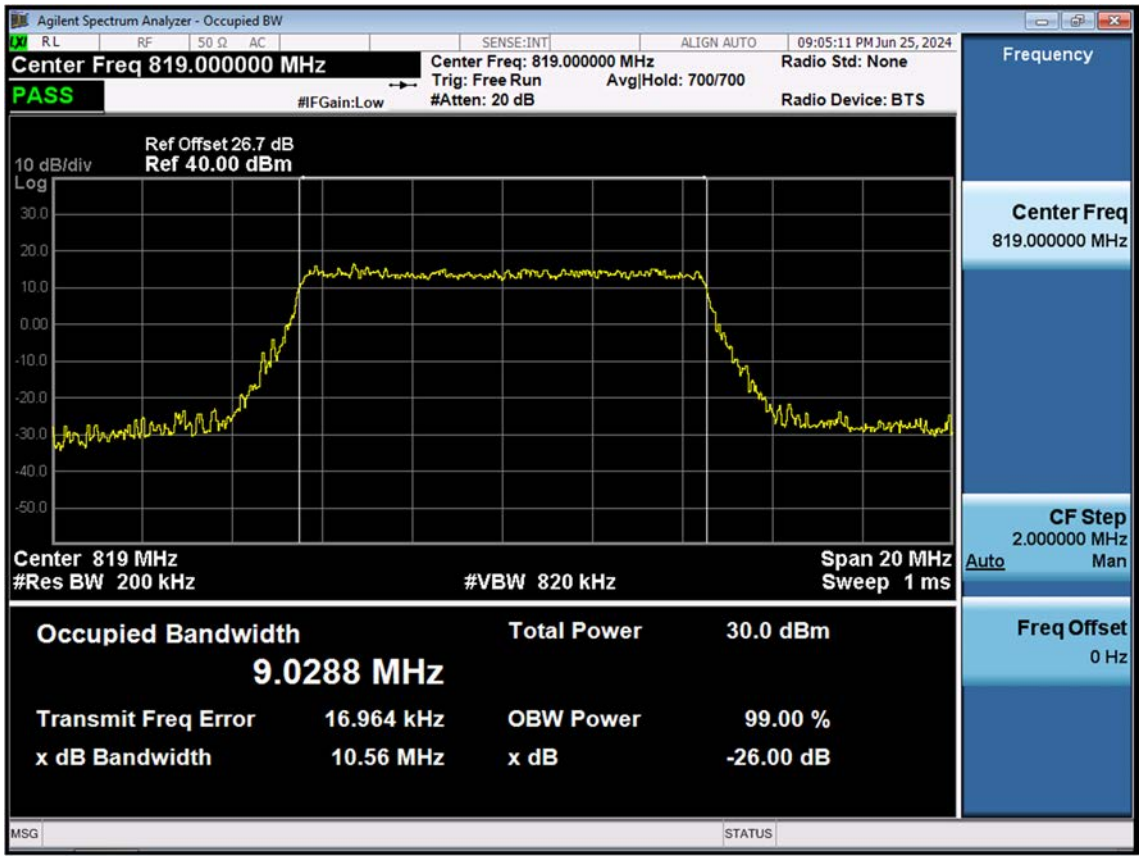


BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 QPSK RB 50_0)

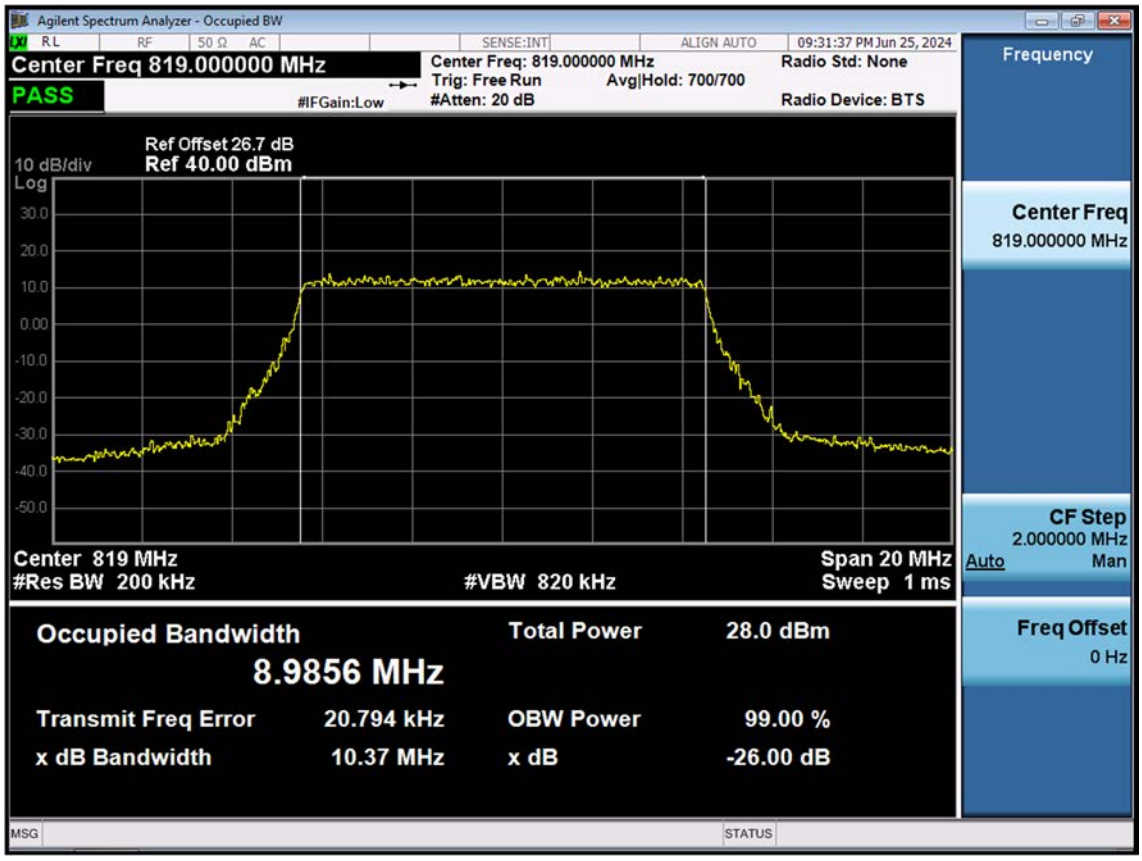


BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 16QAM RB 50_0)

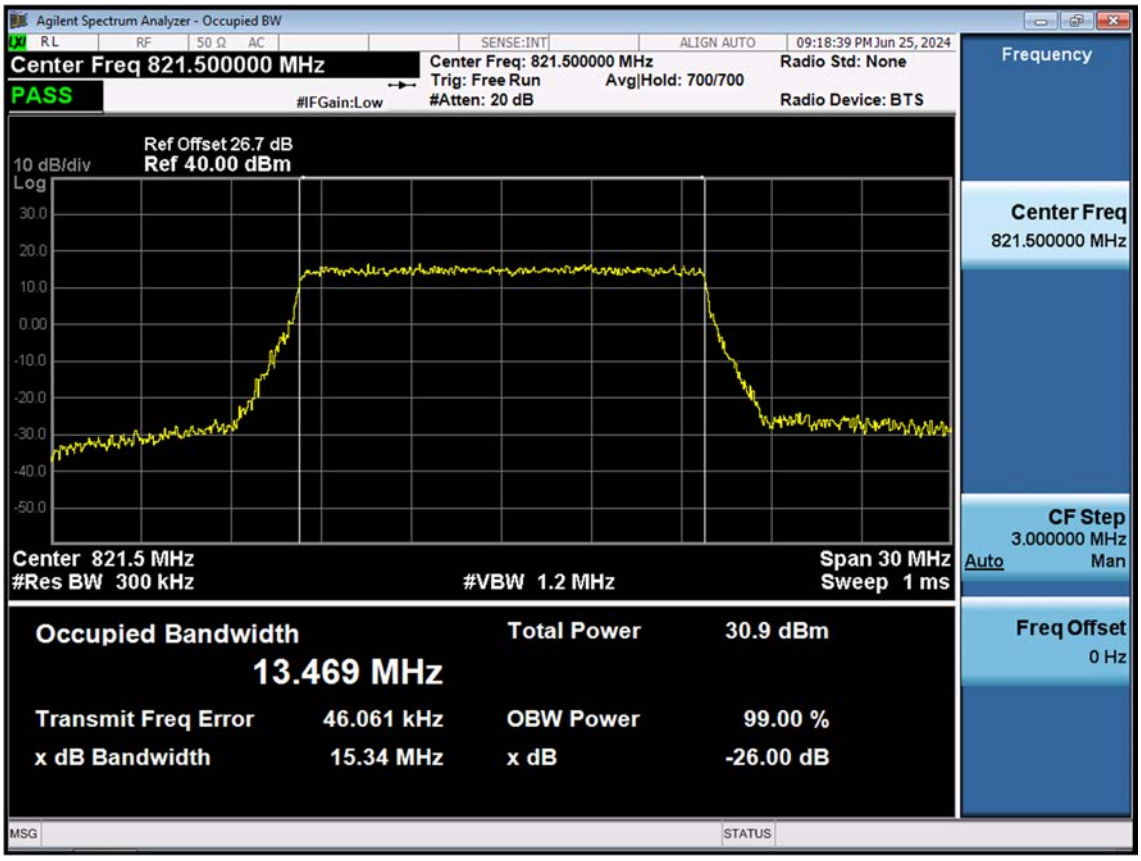
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 64QAM RB 50_0)



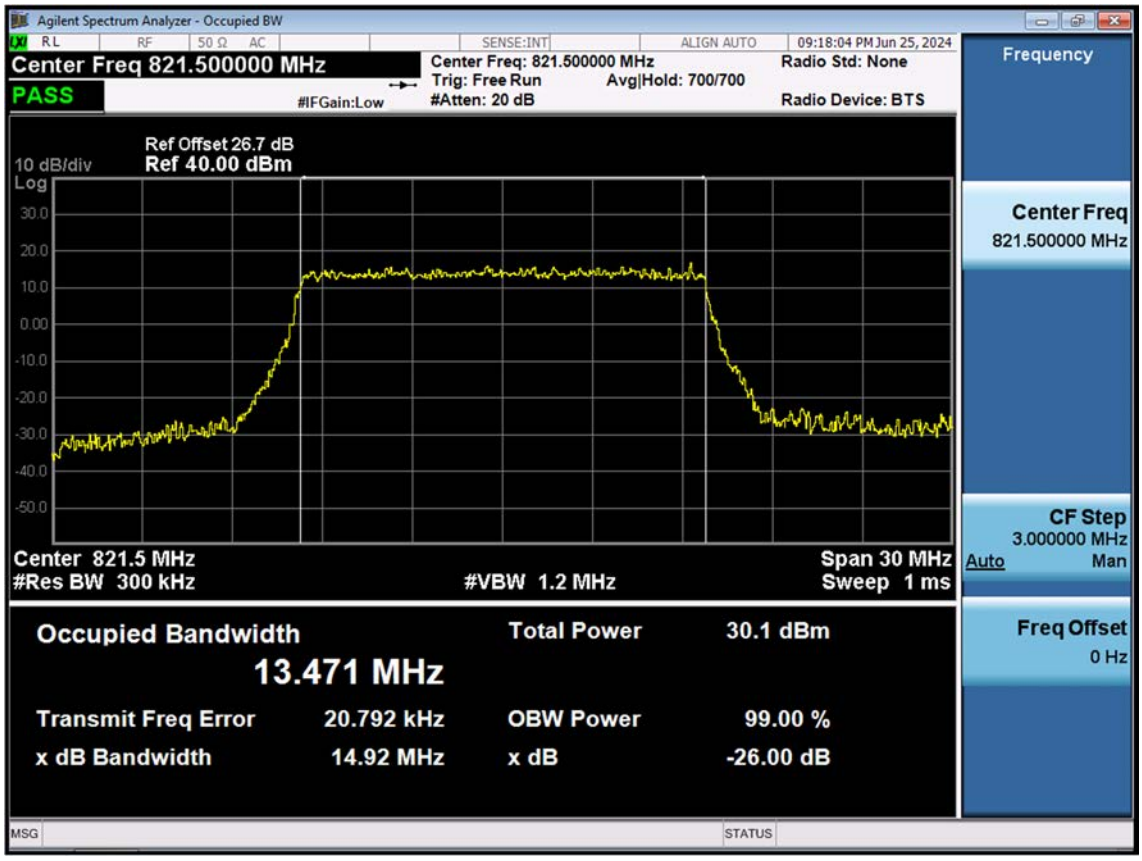
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 256QAM RB 50_0)



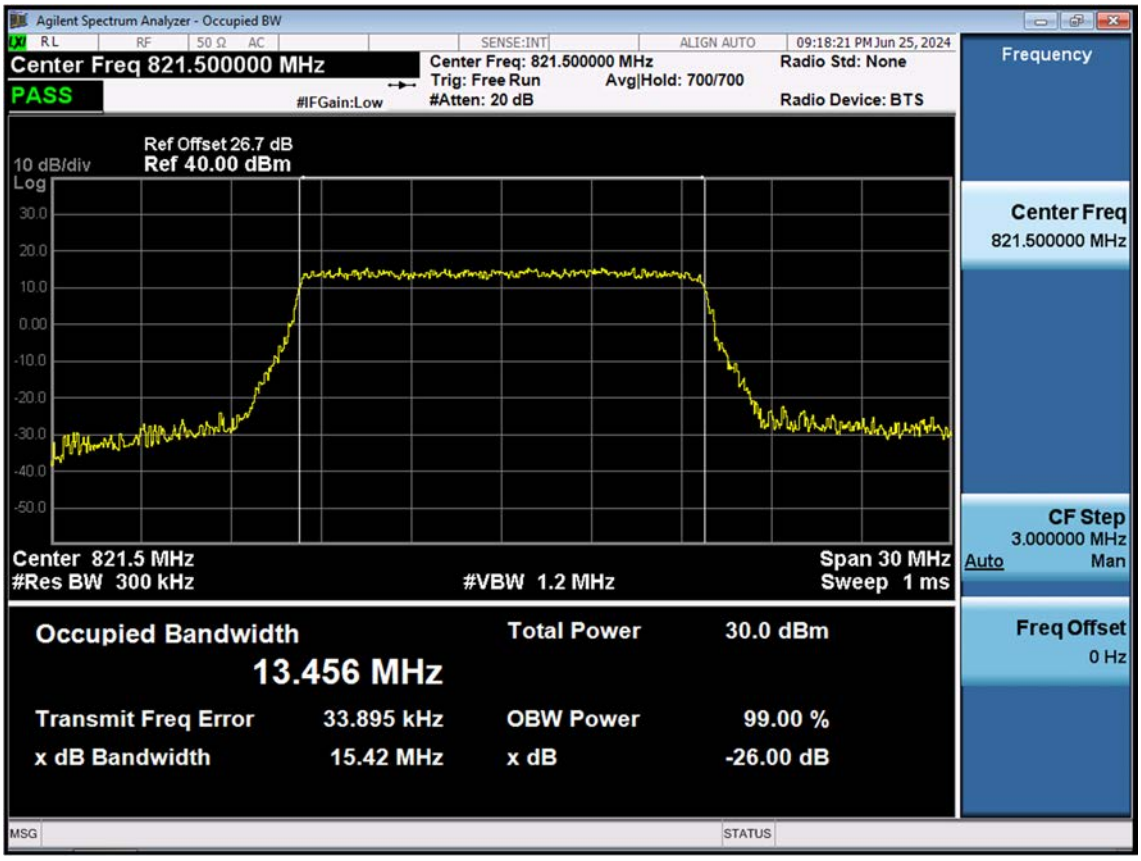
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 QPSK RB 75_0)



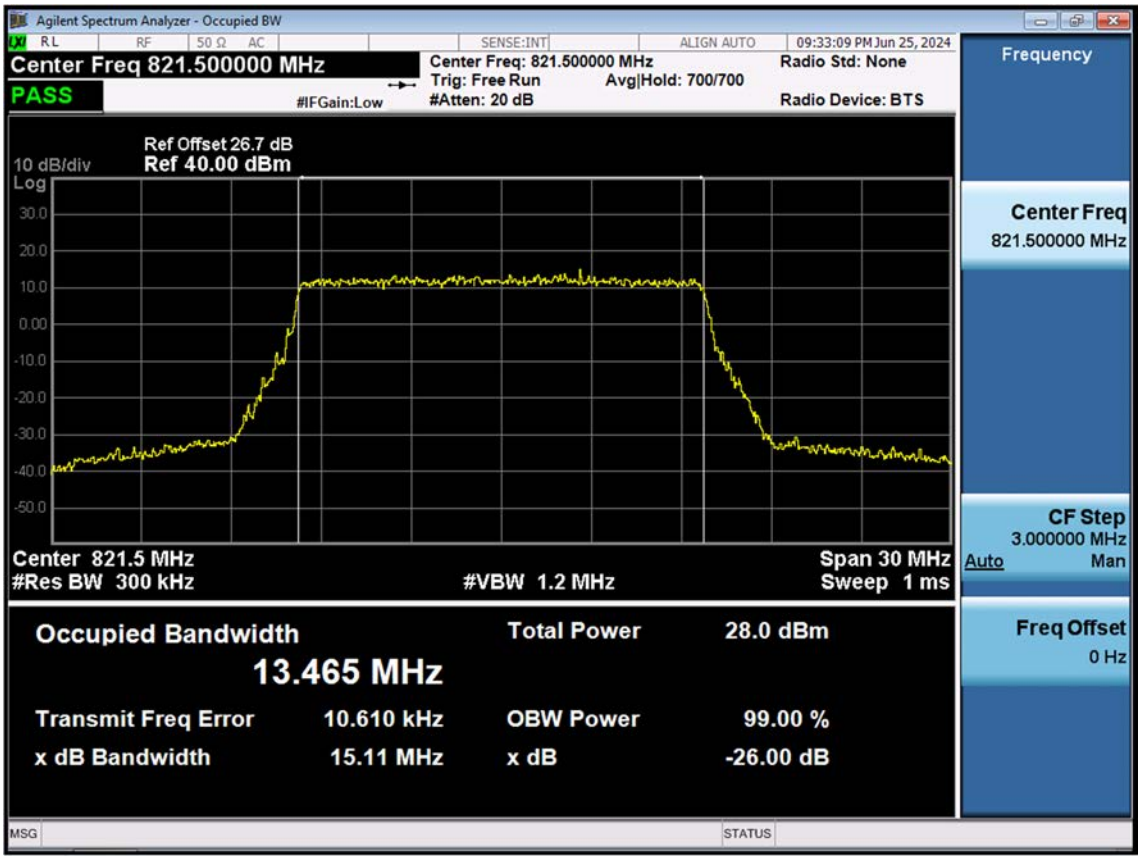
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 16QAM RB 75_0)



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

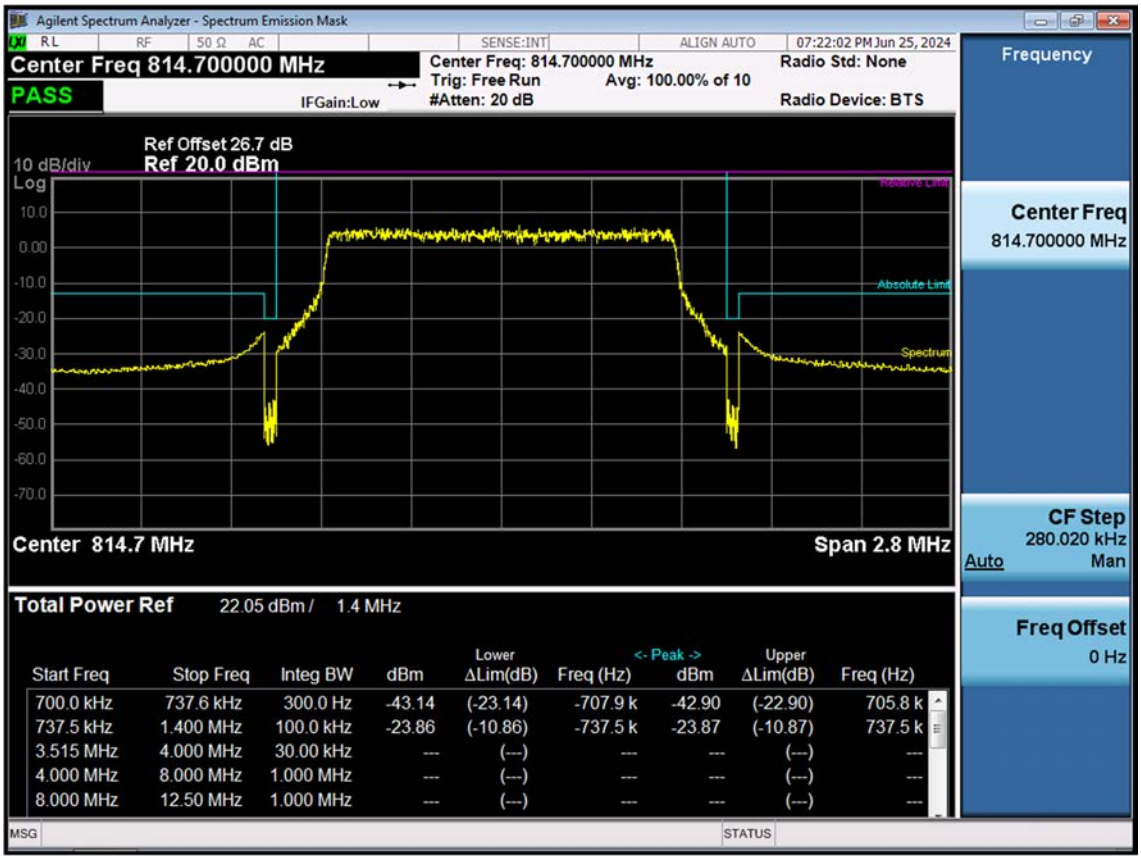


BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 256QAM RB 75_0)

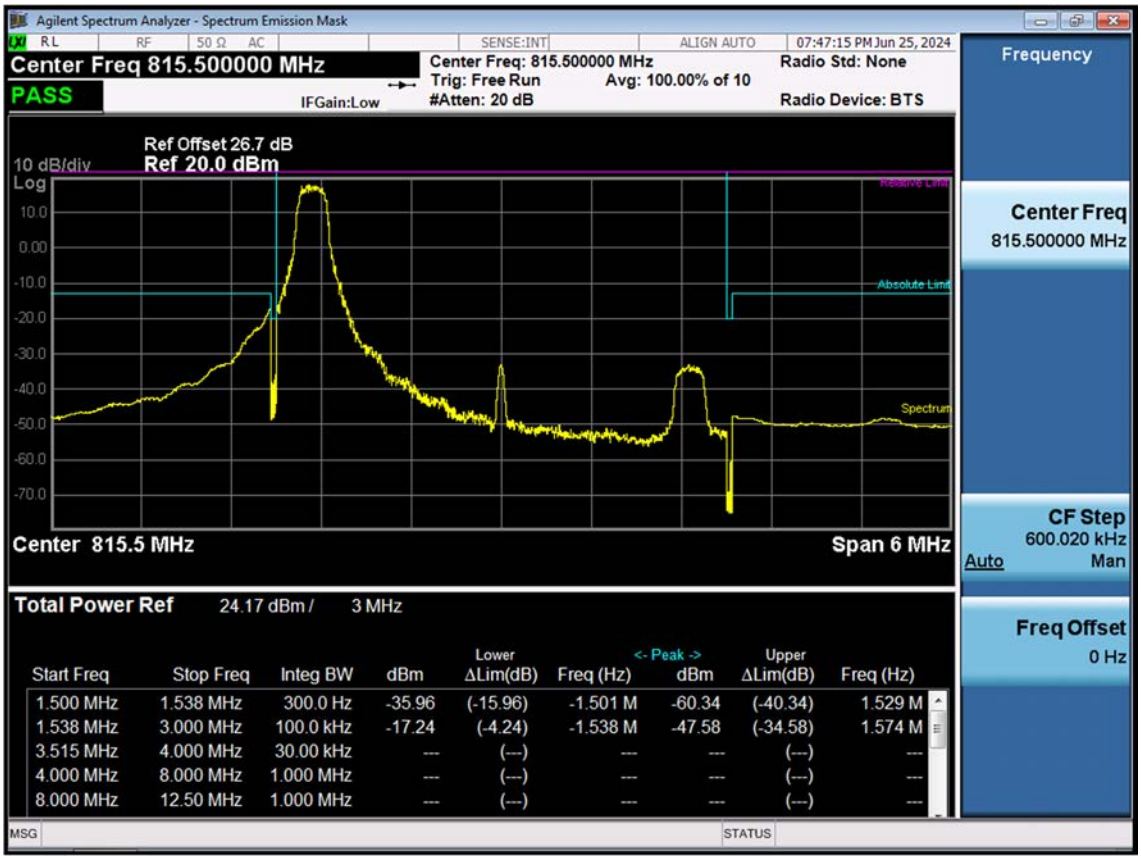


BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK RB 1, Offset 0)

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

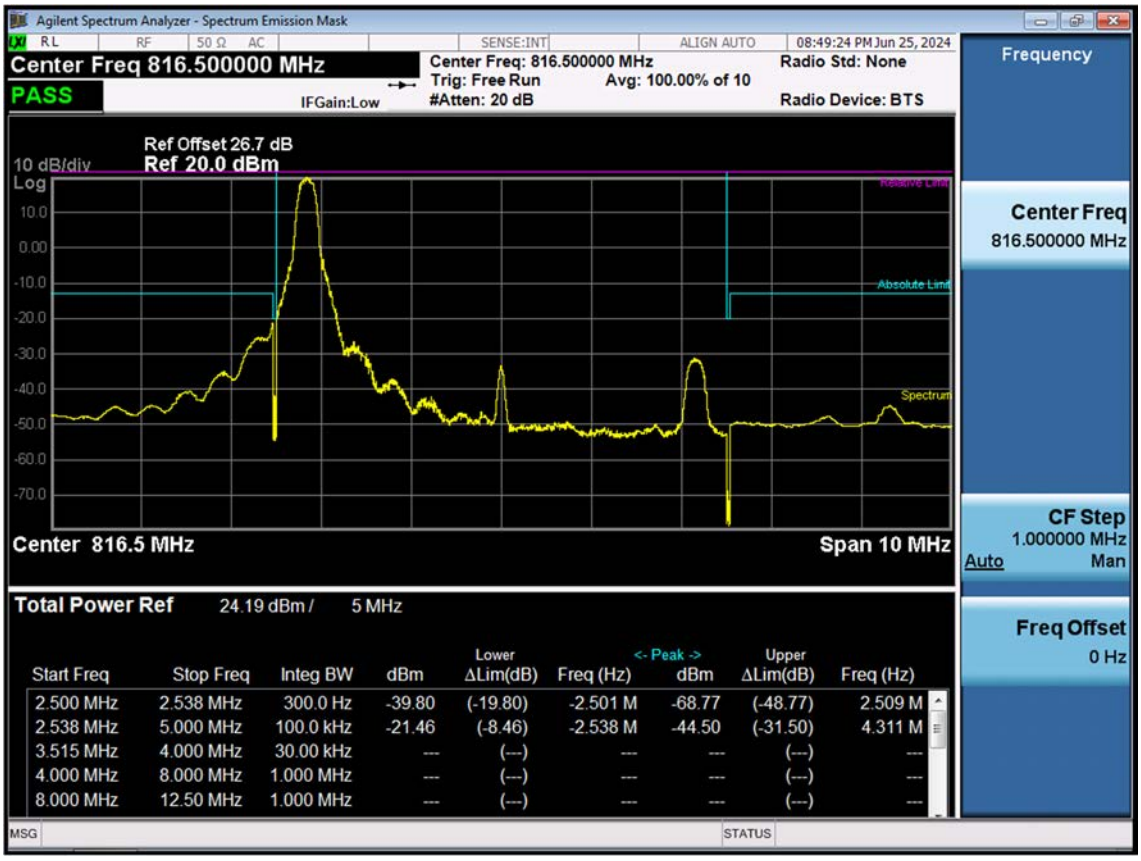


BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK RB 1, Offset 0)



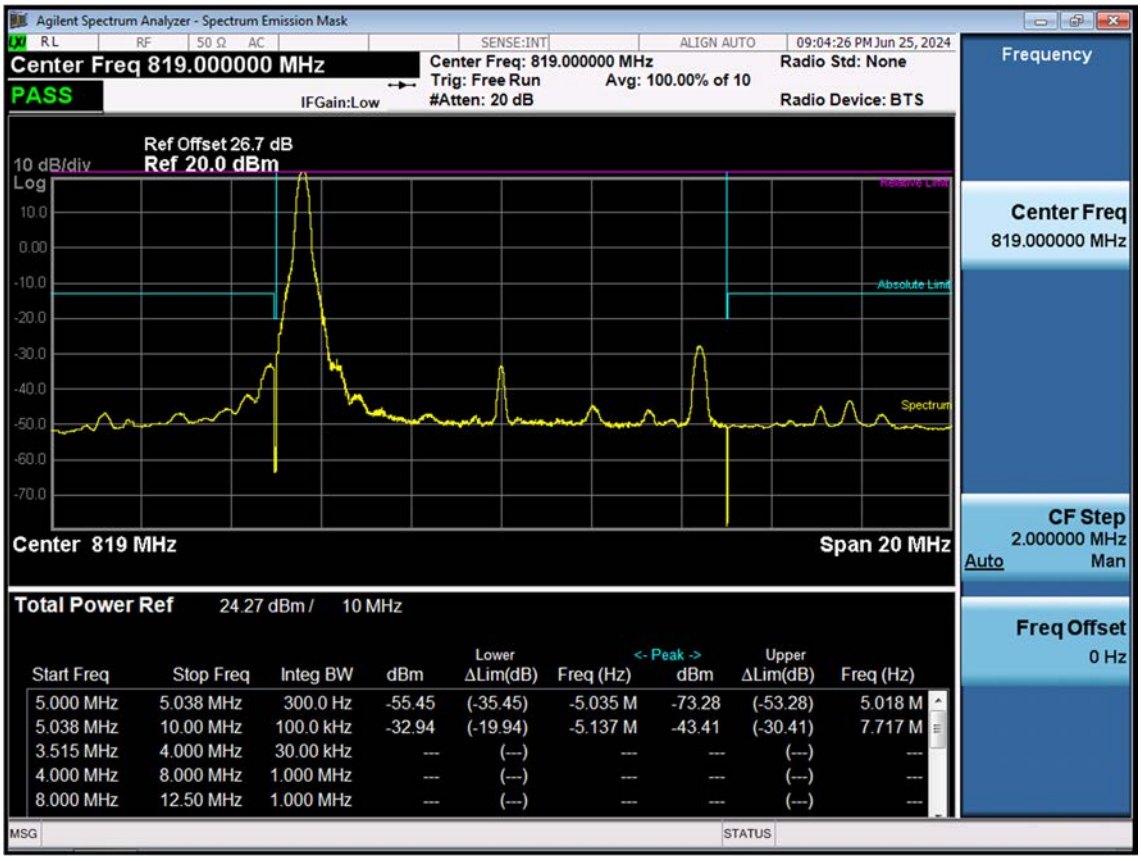
BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK_RB15_Offset 0)

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)

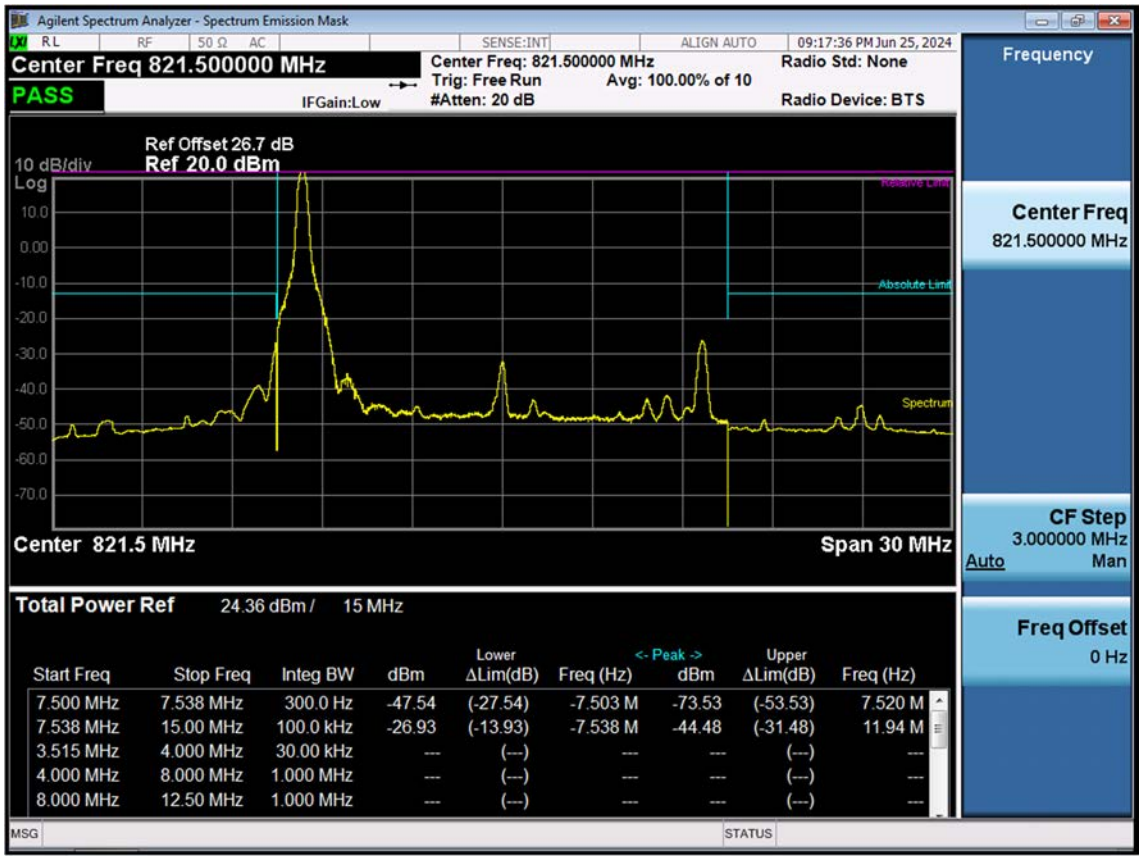
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK RB 1, Offset 0)



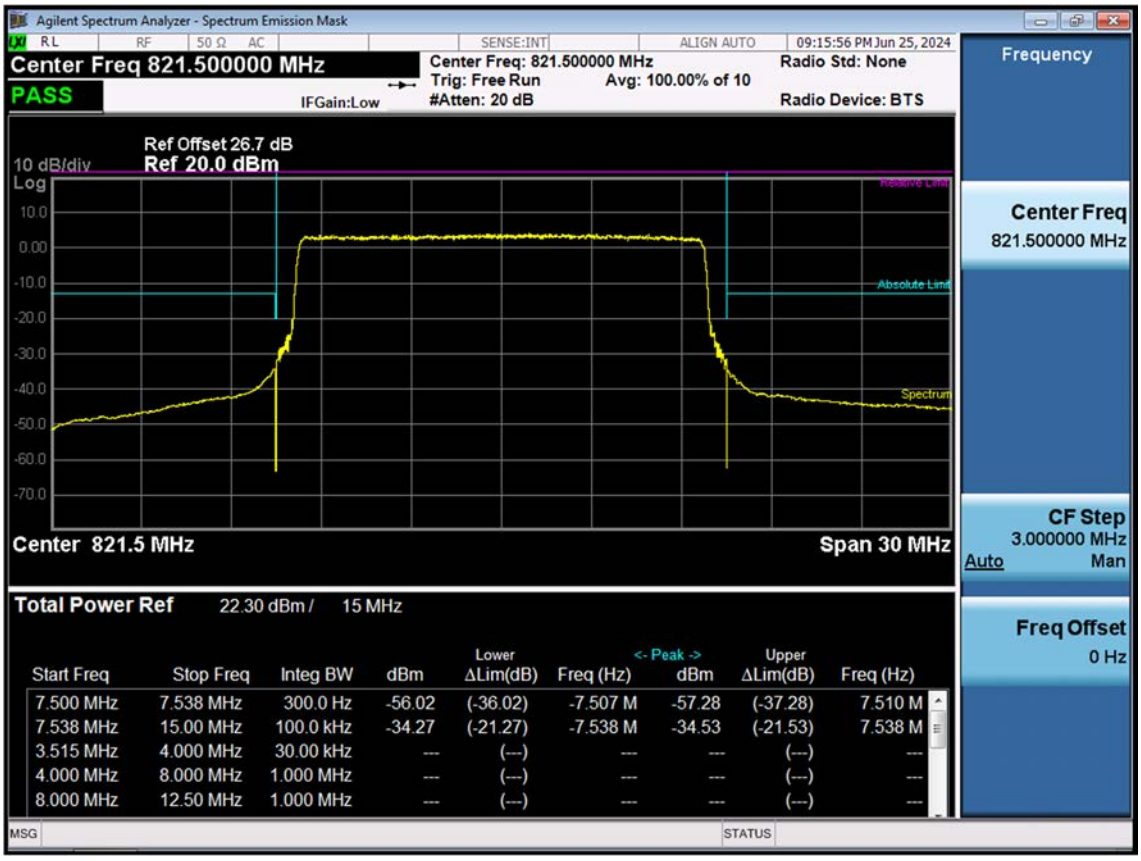
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK_RB50_Offset 0)

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

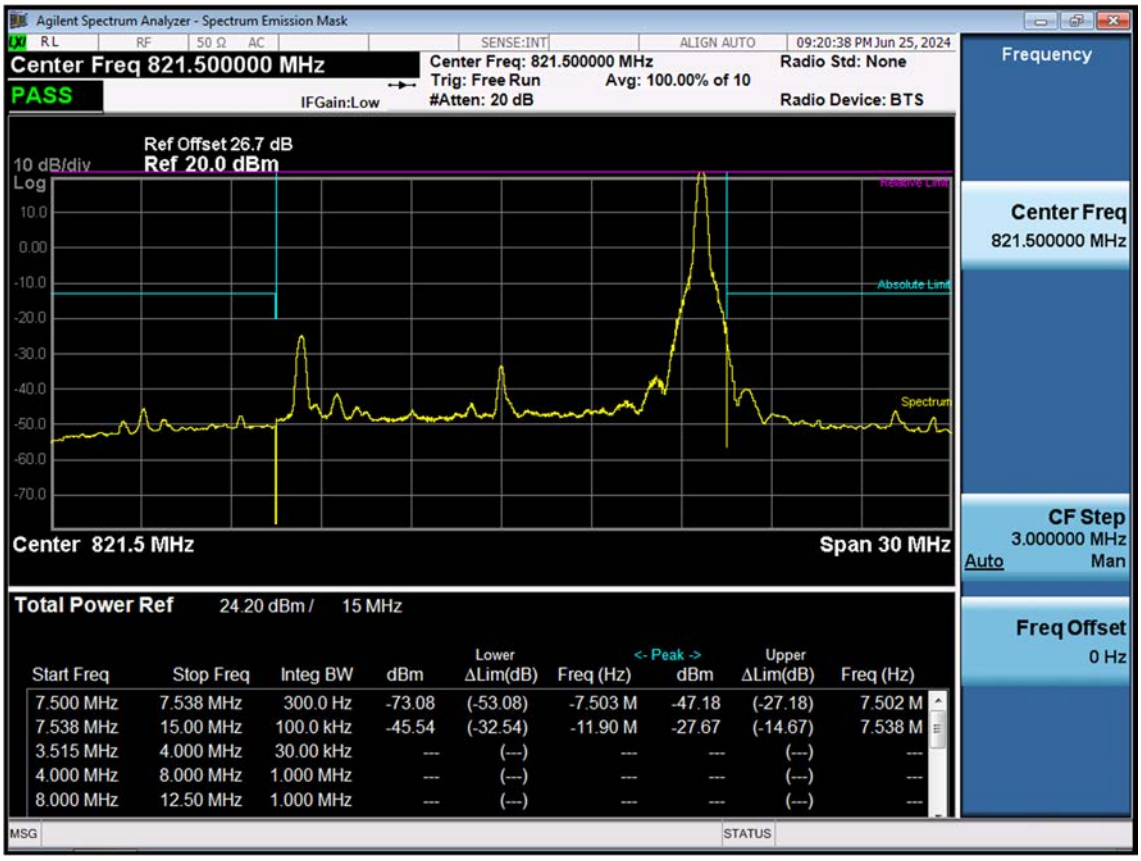
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset 0)



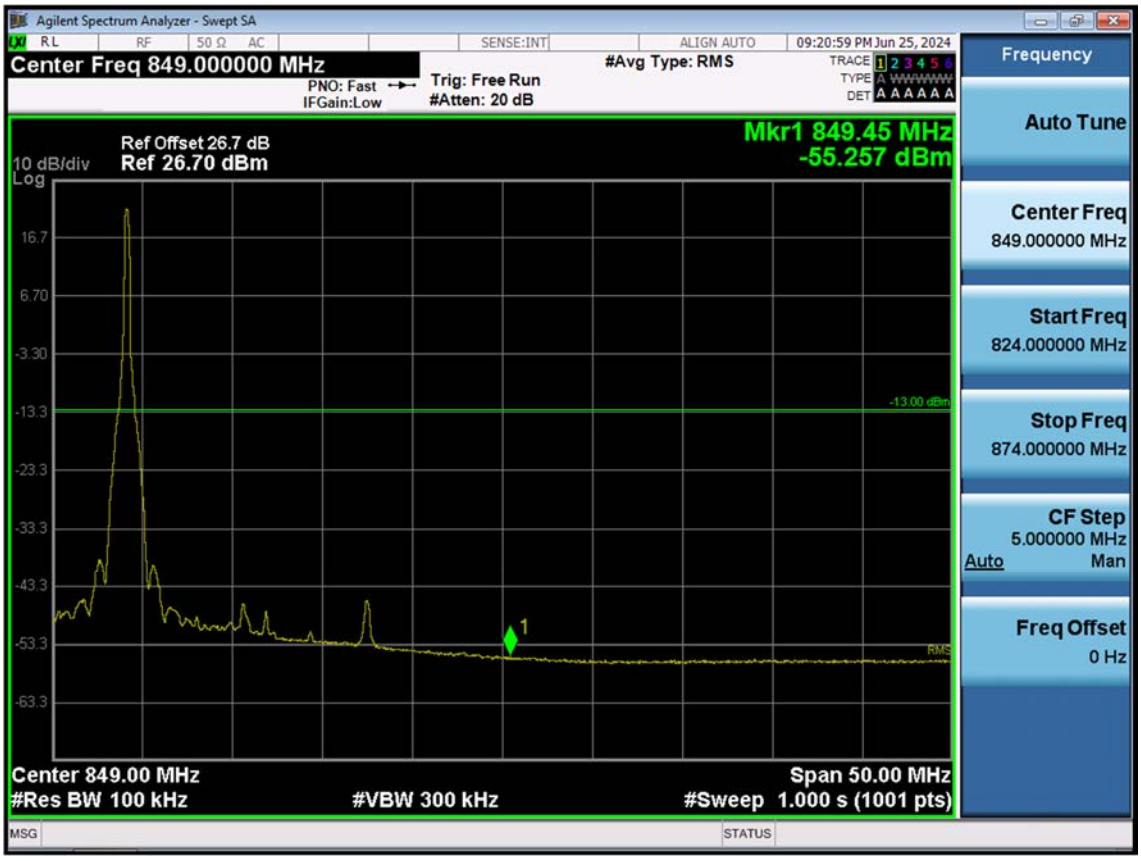
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 75, Offset0)



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

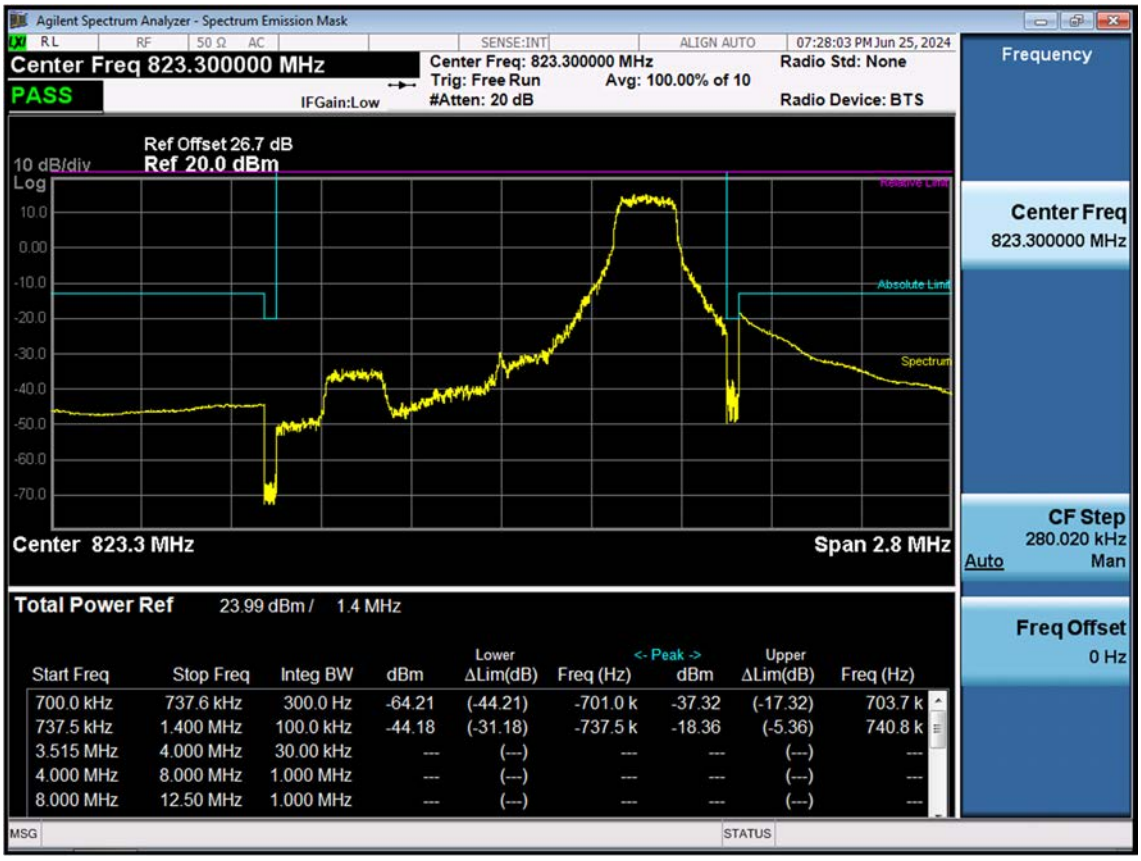


BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset74)



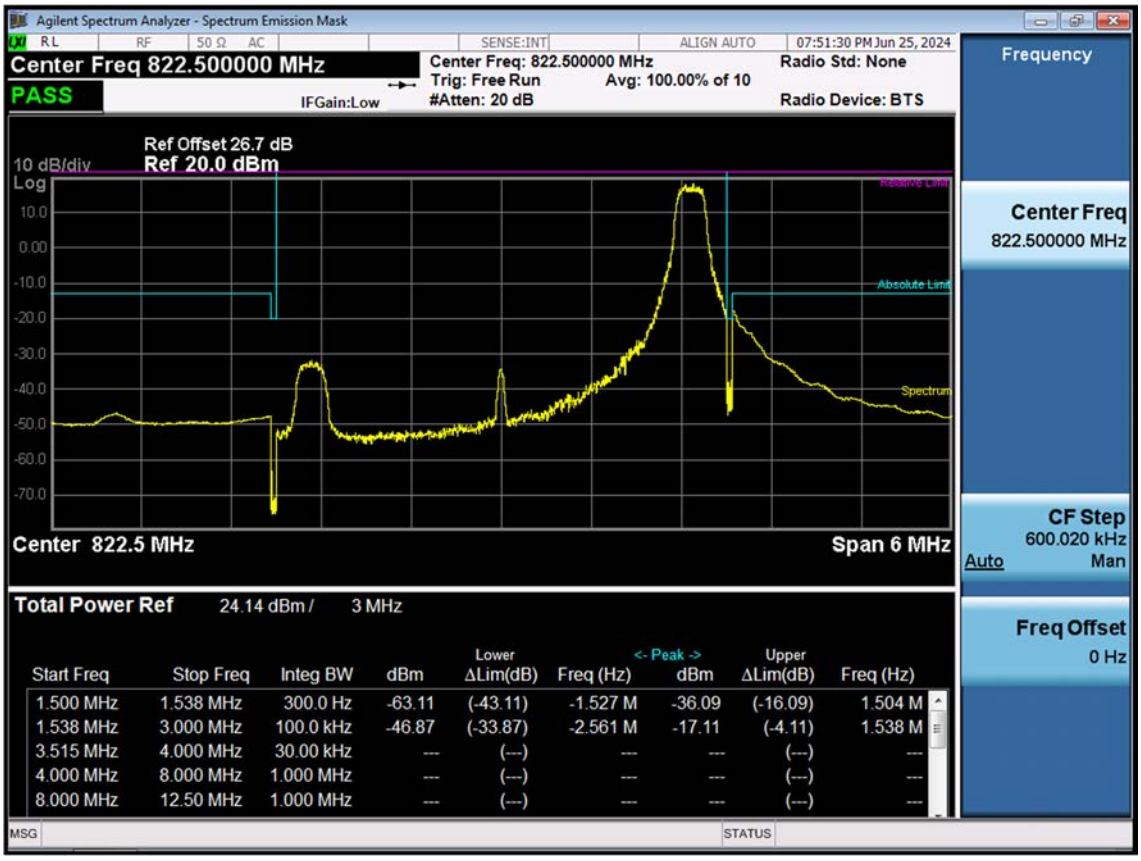
BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK_RB75_Offset 0)

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

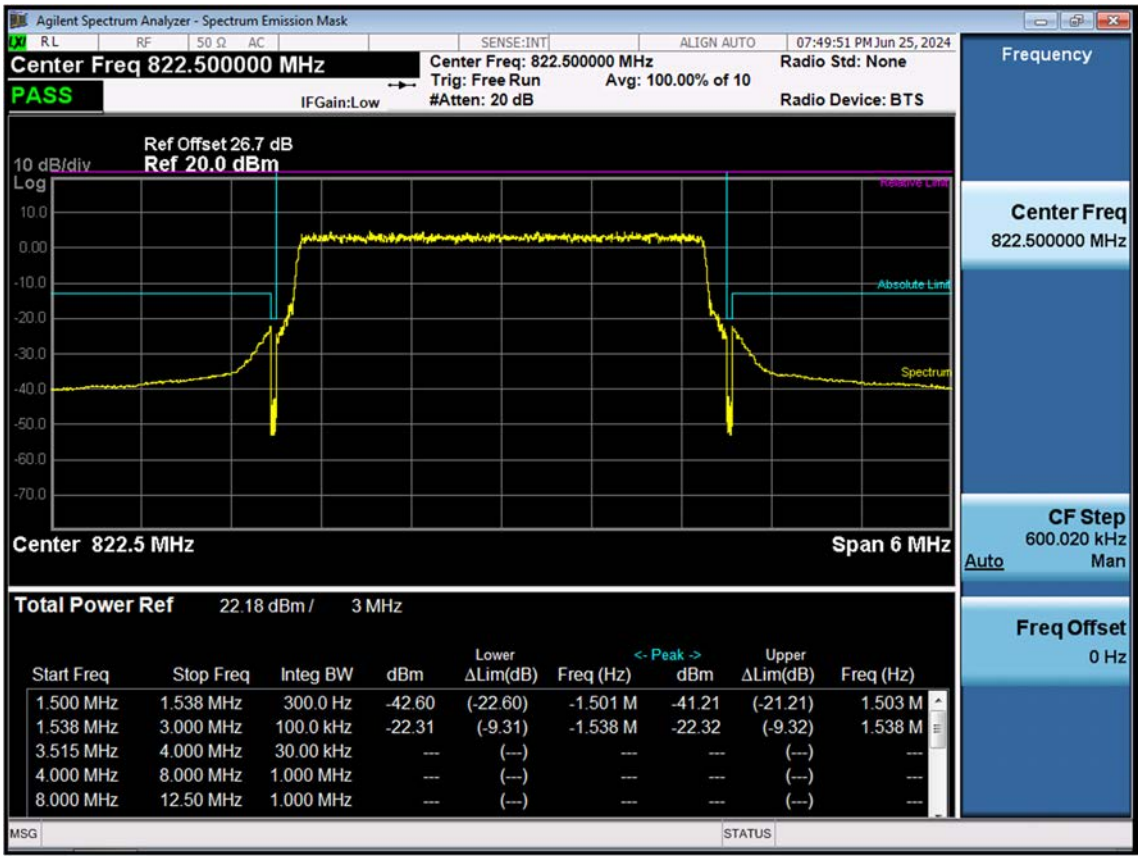


BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB6_Offset 0)

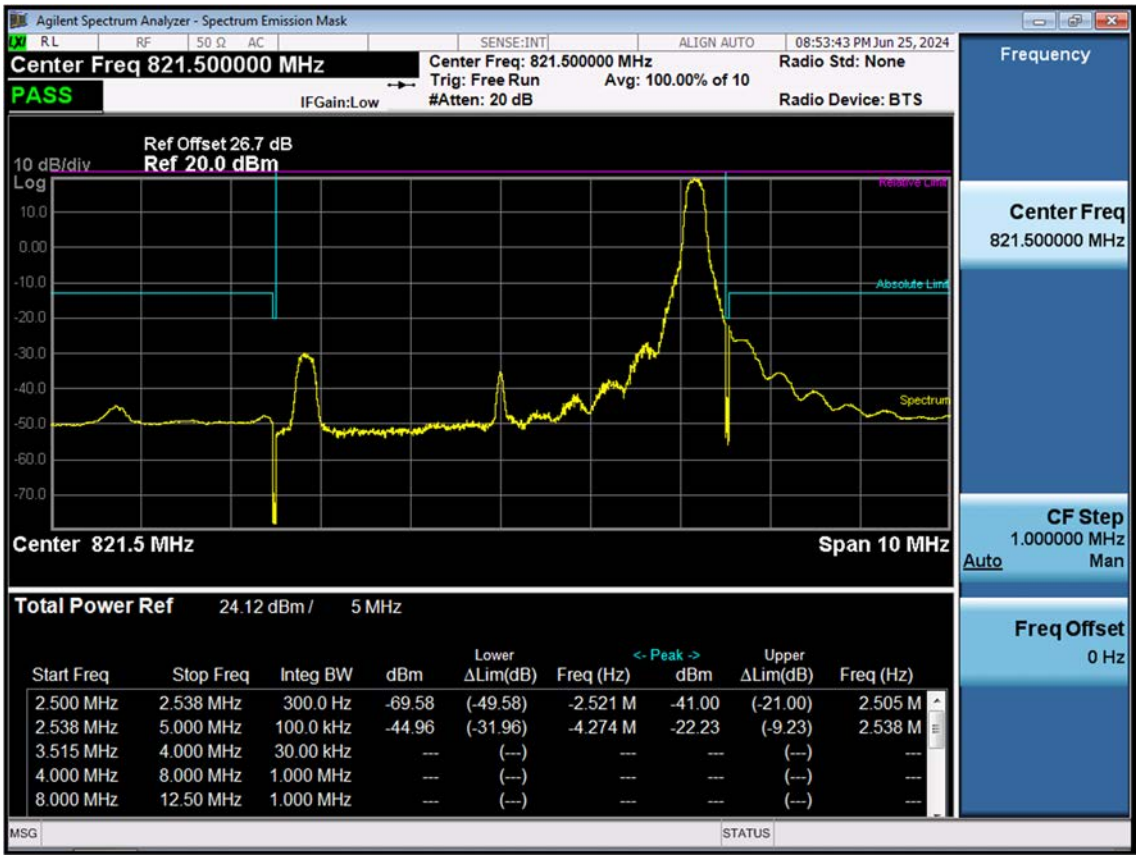
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB1_Offset 14)



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

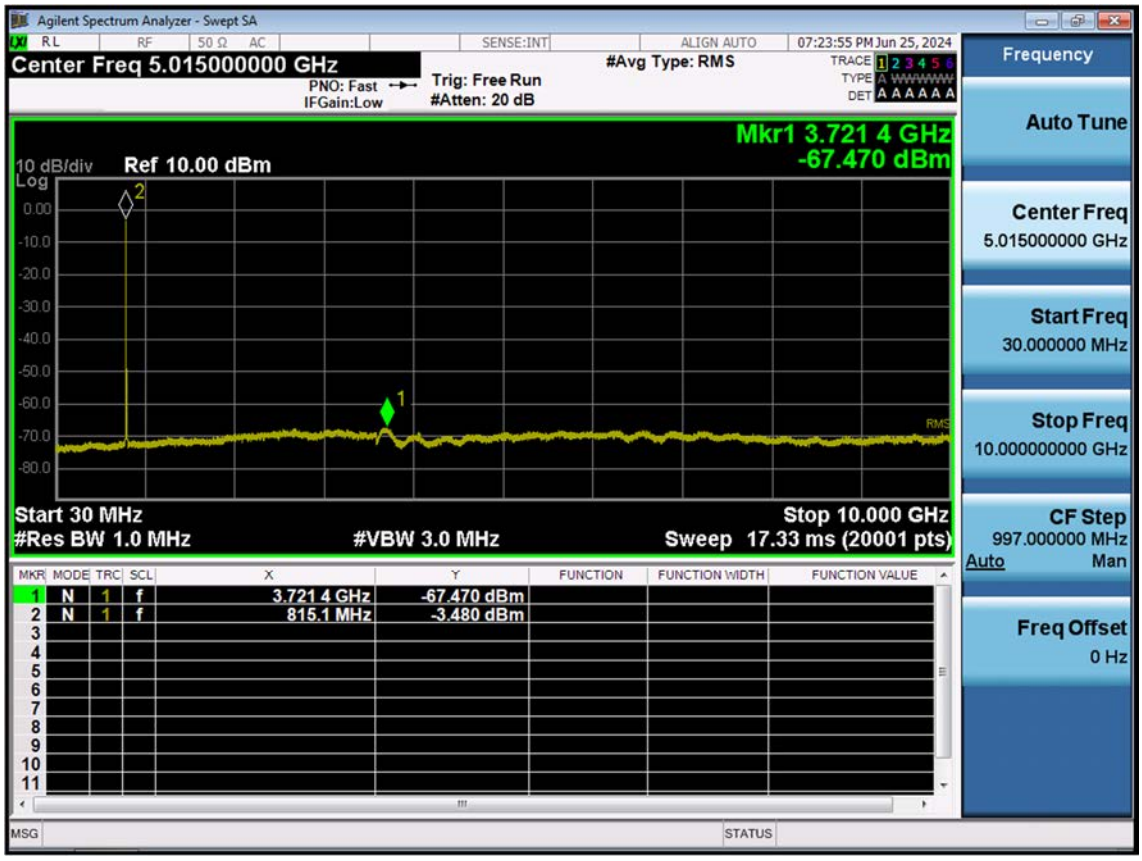


BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB1_Offset 24)

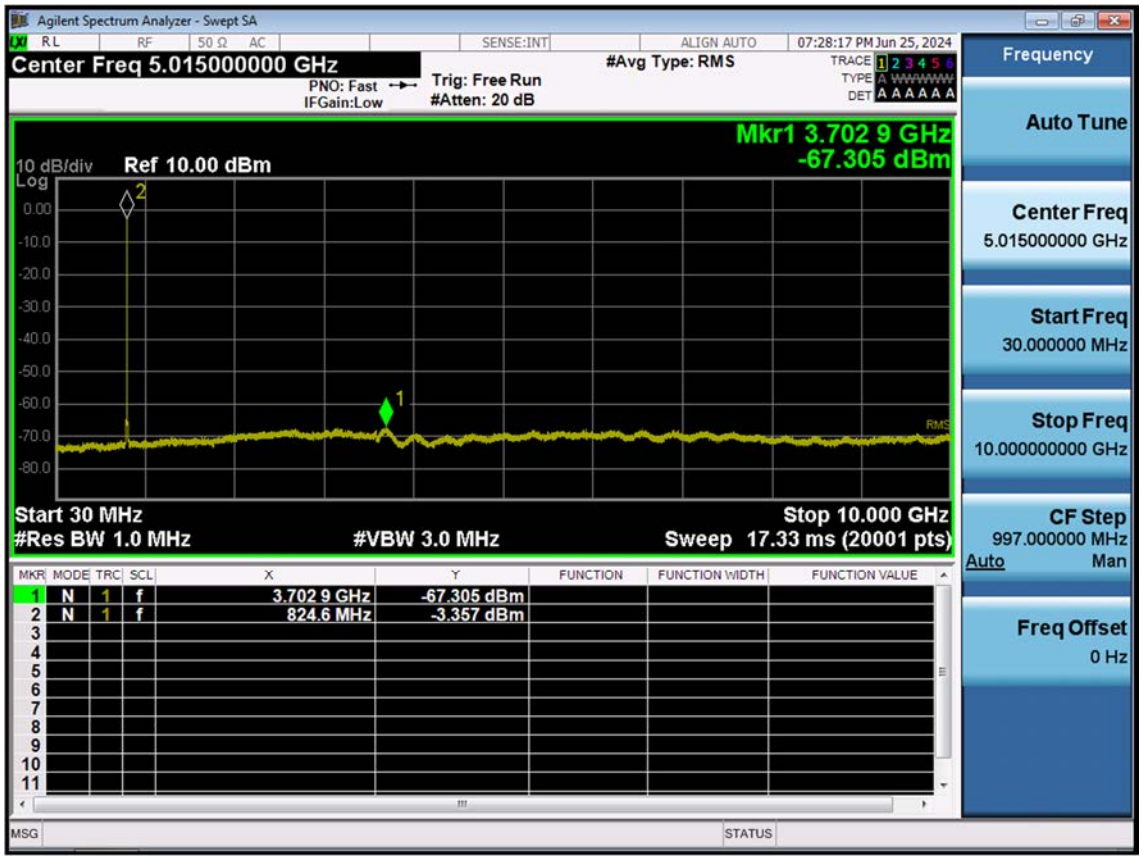


BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB25_Offset 0)

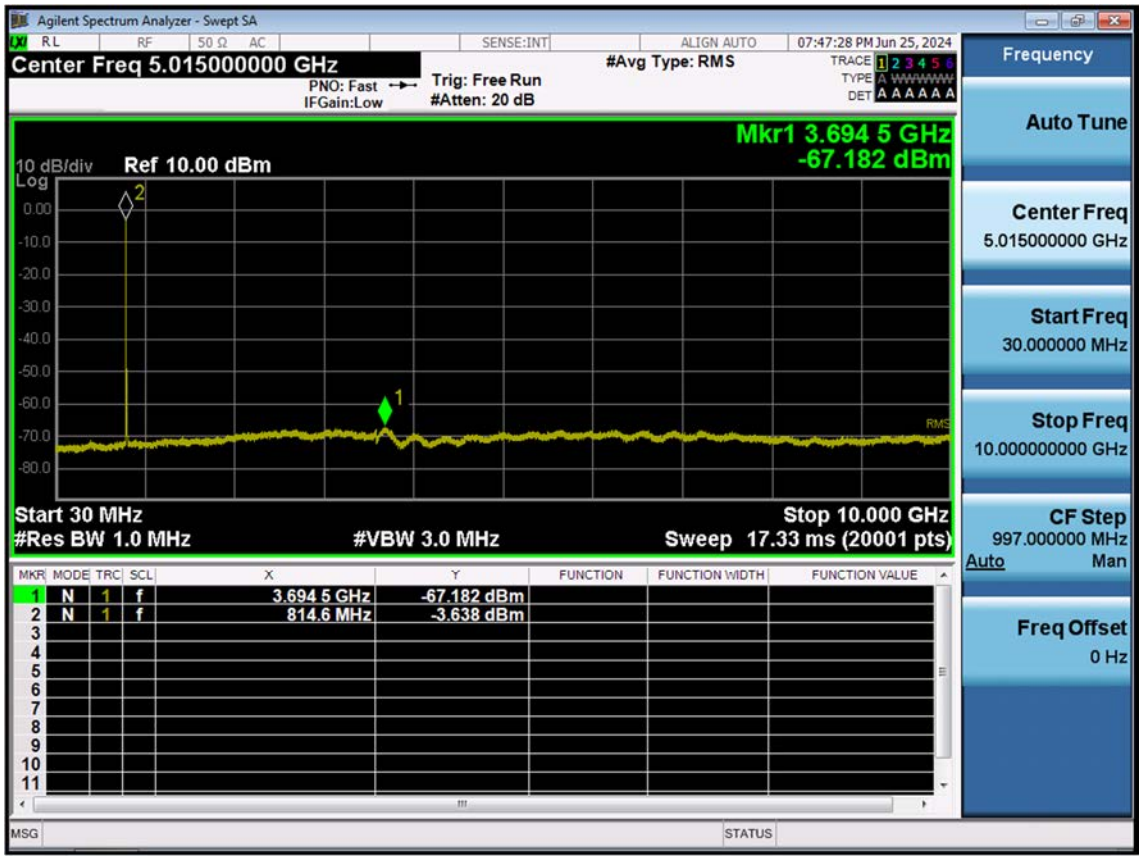
BAND 26. Conducted Spurious (26697 ch_1.4 MHz_QPSK_RB 1_0)



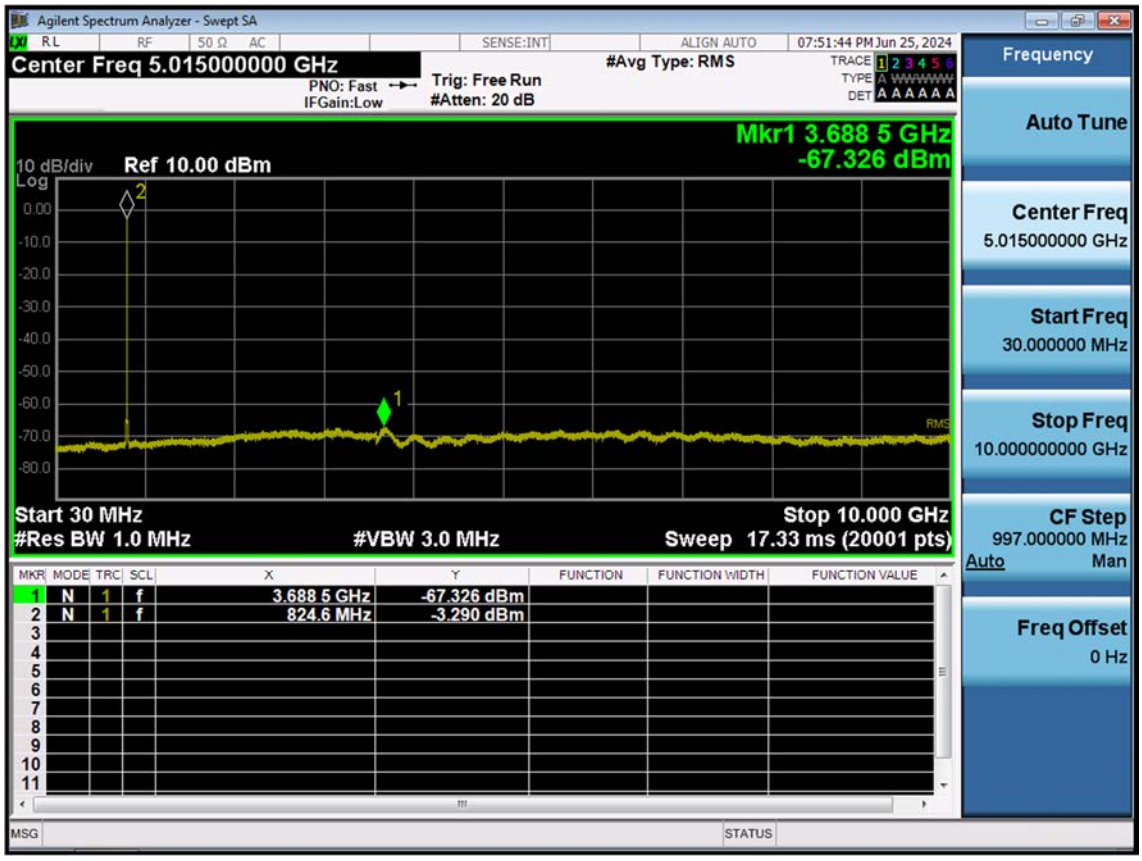
BAND 26. Conducted Spurious (26783 ch_1.4 MHz_QPSK_RB 1_0)



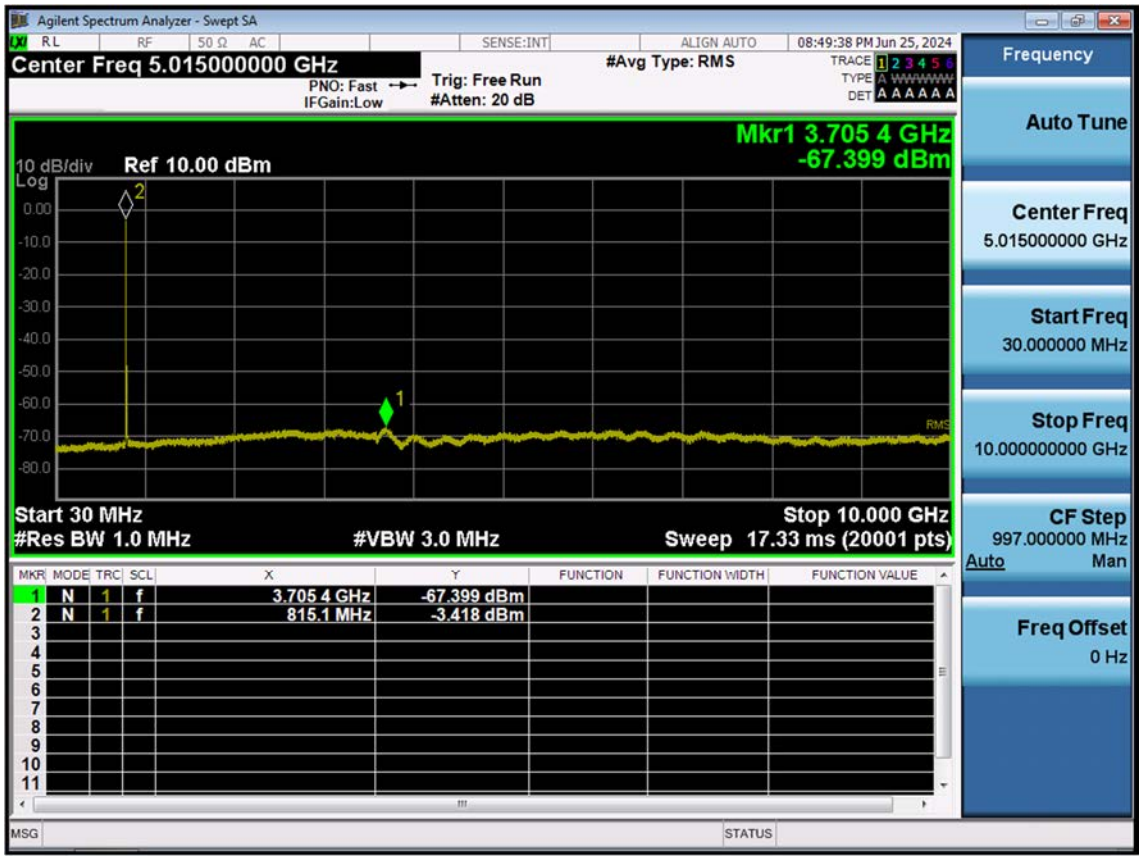
BAND 26. Conducted Spurious (26705 ch_3 MHz_QPSK_RB 1_0)



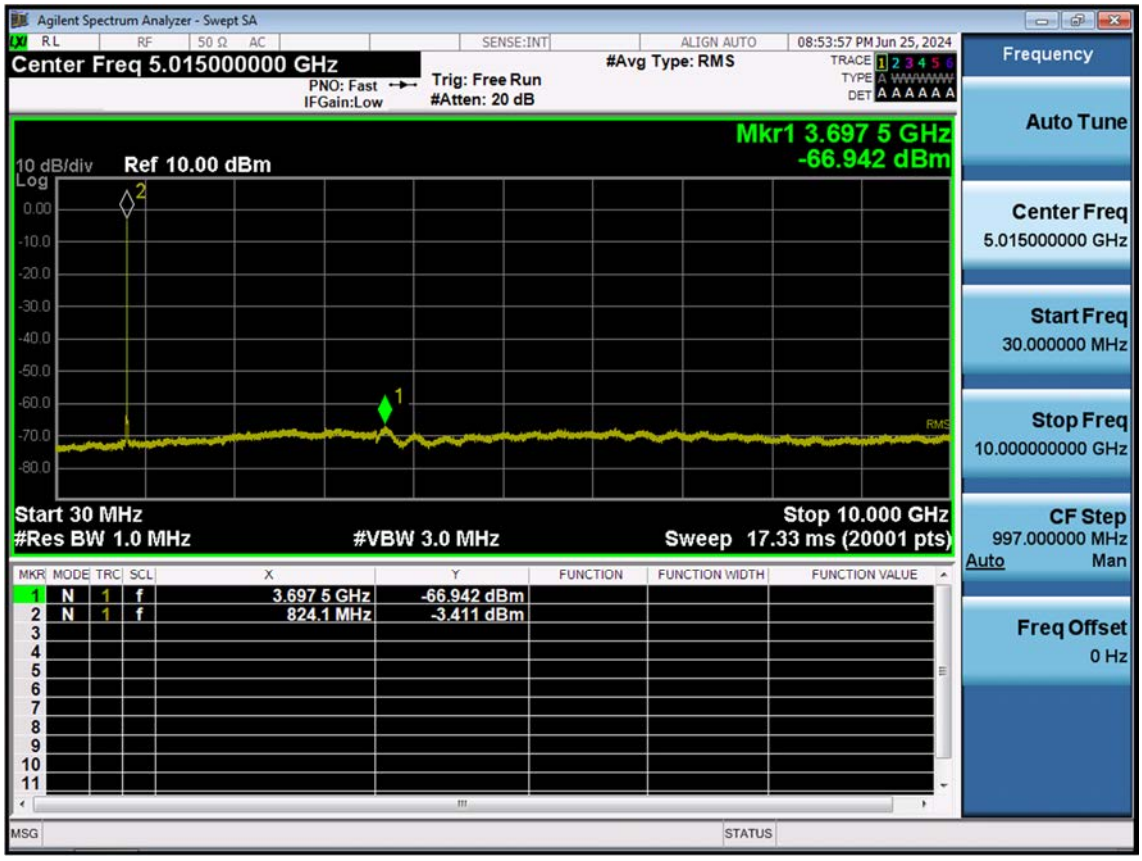
BAND 26. Conducted Spurious (26775 ch_3 MHz_QPSK_RB 1_0)



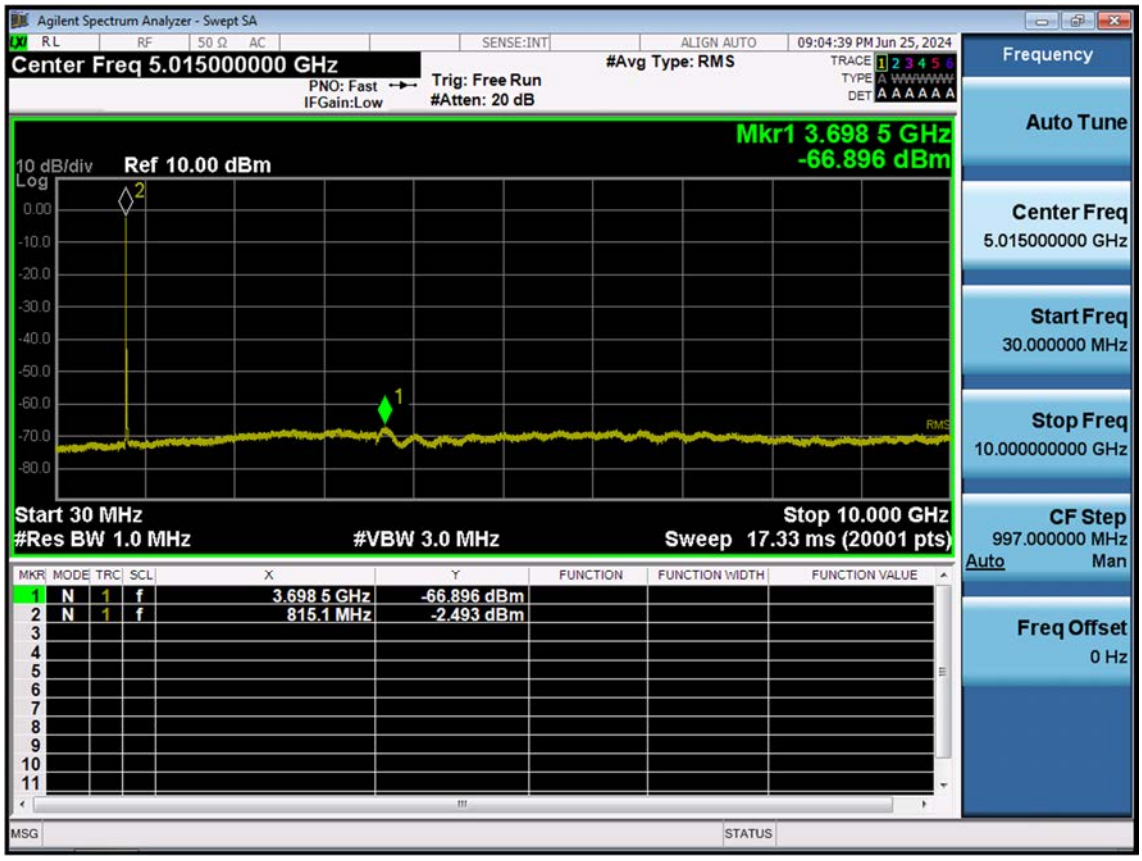
BAND 26. Conducted Spurious (26715 ch_5 MHz_QPSK_RB 1_0)



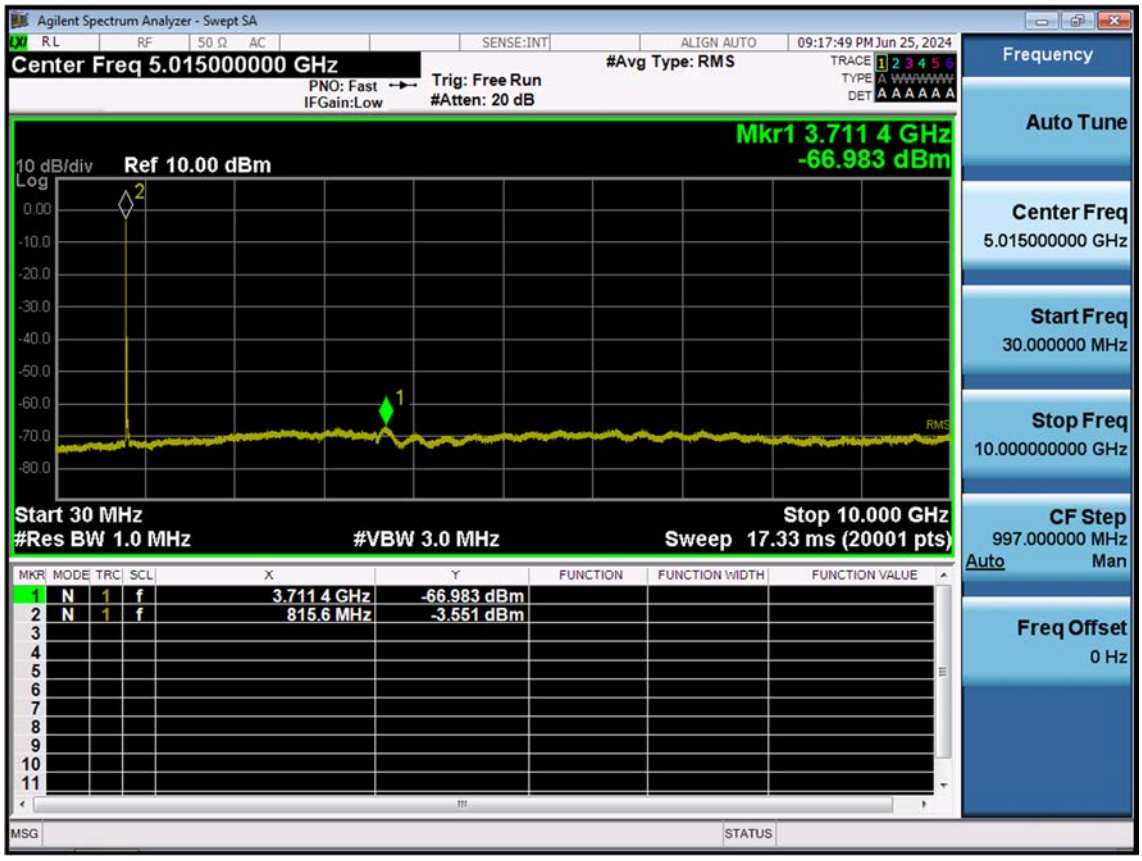
BAND 26. Conducted Spurious (26765 ch_5 MHz_QPSK_RB 1_0)



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

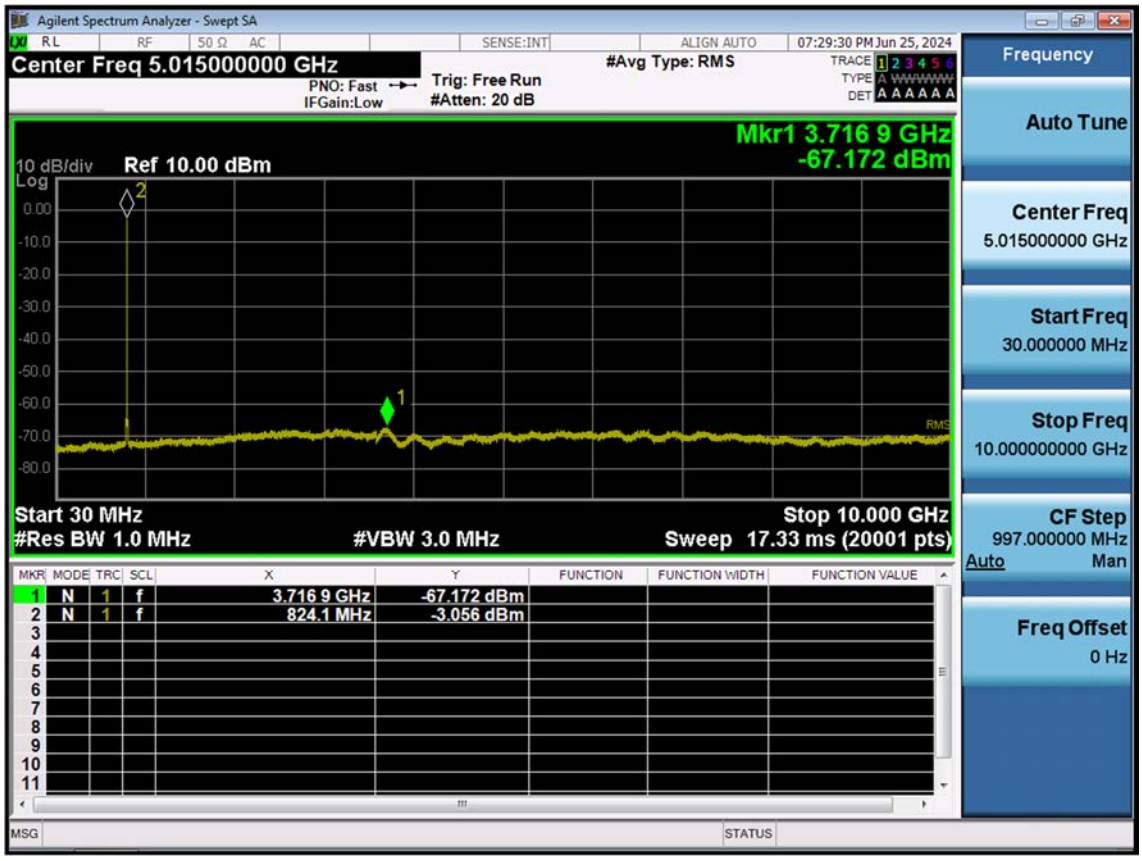


BAND 26. Conducted Spurious (26765 ch_15 MHz_QPSK_RB 1_0)

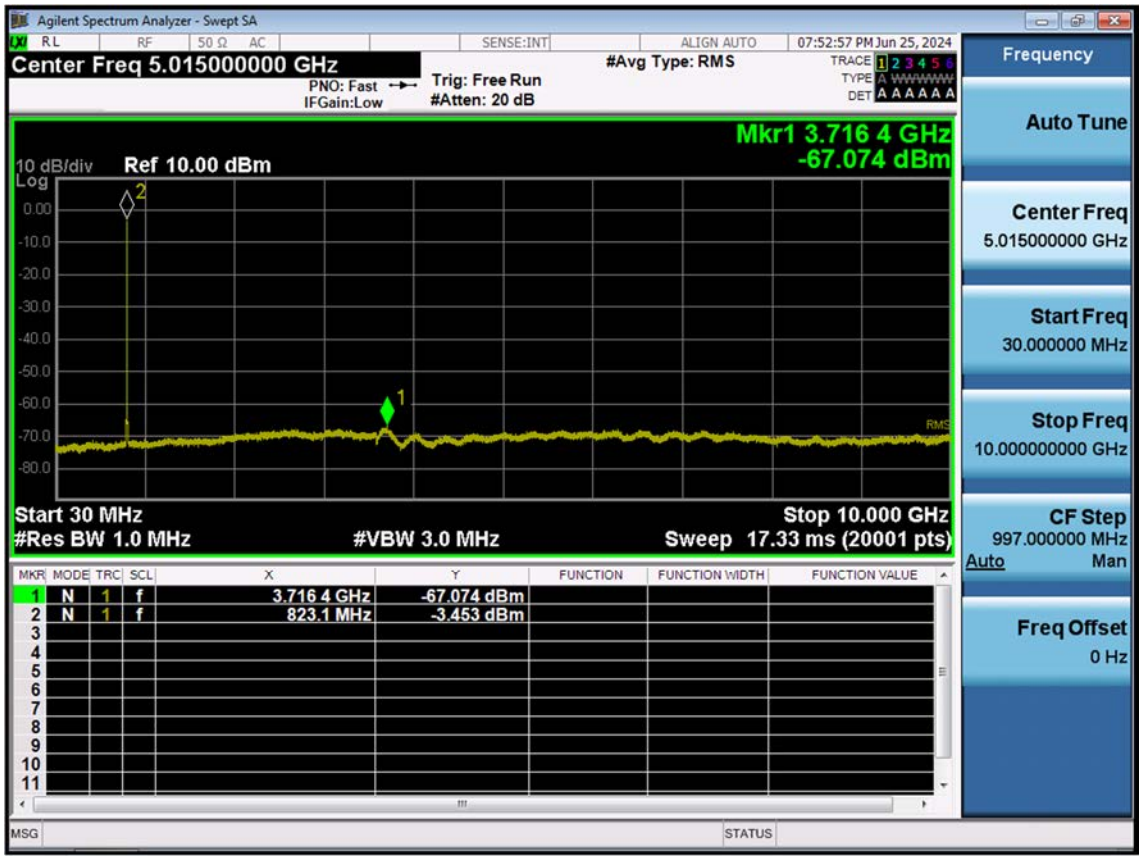


10. TEST PLOTS (STRADDLE CHANNEL)

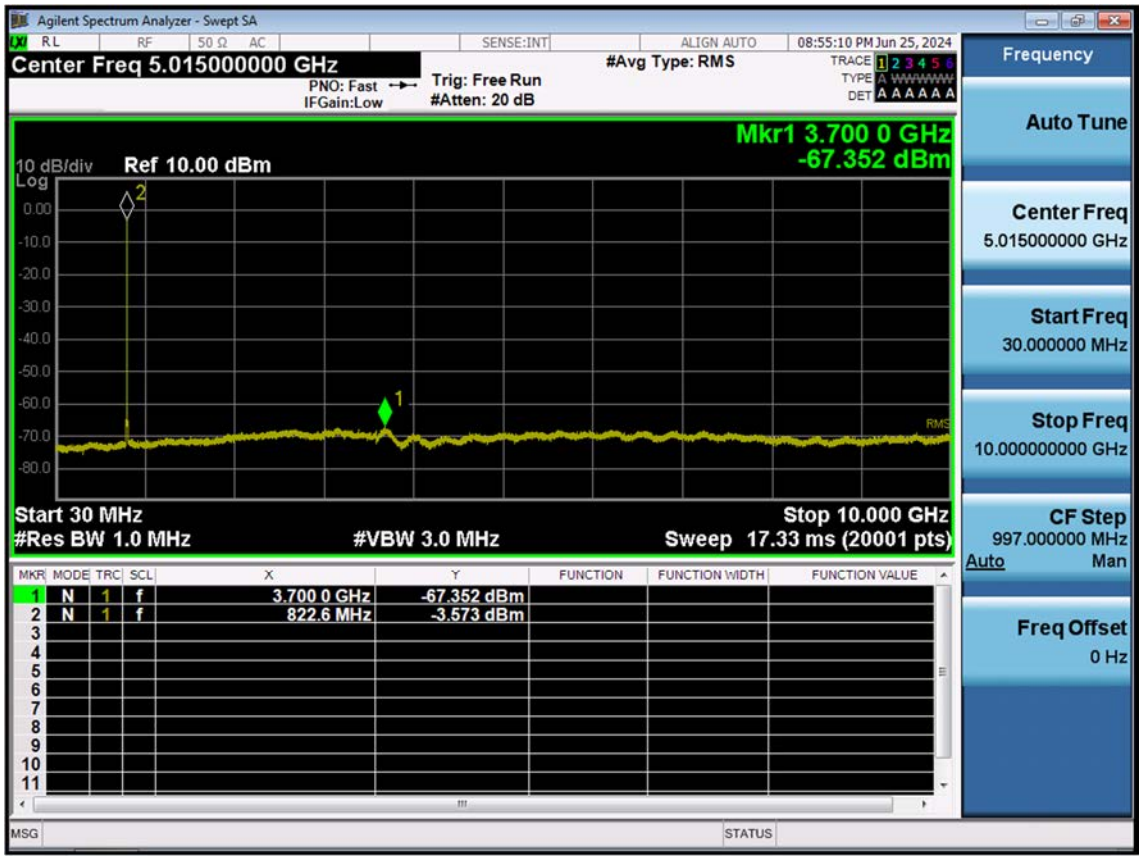
BAND 26. Conducted Spurious (1.4 MHz_QPSK_RB 1_0)



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)