74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
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FCC LTE REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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

Date of Issue:
August 19, 2021

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

Report No.: HCT-RF-2108-FC019

FCC ID:	**A3LSMM526B**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s): SM-M526B/DS
EUT Type: Mobile phone
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): §90, §22, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Output Power	
				Max. Power (W)	Max. Power (dBm)
LTE – Band26 (1.4)	814.7 – 823.3	1M09G7D	QPSK	0.242	23.84
		1M09W7D	16QAM	0.207	23.16
		1M09W7D	64QAM	0.163	22.13
LTE – Band26 (3)	815.5 – 822.5	2M71G7D	QPSK	0.243	23.85
		2M69W7D	16QAM	0.220	23.42
		2M70W7D	64QAM	0.166	22.21
LTE – Band26 (5)	816.5 – 821.5	4M51G7D	QPSK	0.254	24.05
		4M50W7D	16QAM	0.204	23.10
		4M50W7D	64QAM	0.167	22.23
LTE – Band26 (10)	819.0	9M00G7D	QPSK	0.240	23.80
		8M99W7D	16QAM	0.209	23.20
		8M99W7D	64QAM	0.168	22.25
LTE – Band26 (15)	821.5	13 M5G7D	QPSK	0.233	23.67
		13 M4W7D	16QAM	0.200	23.01
		13 M5W7D	64QAM	0.157	21.97

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)

REVIEWED BY

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

Report approved by : Kwon Jeong
Manager of Telecommunication Testing Center

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

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2108-FC019	August 19, 2021	- First Approval Report

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

Table of 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:	A3LSMM526B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§90, §22, §2
EUT Type:	Mobile phone
Model(s):	SM-M526B/DS
Tx Frequency:	814.7 MHz – 823.3 MHz (LTE – Band 26 (1.4 MHz)) 815.5 MHz – 822.5 MHz (LTE – Band 26 (3 MHz)) 816.5 MHz – 821.5 MHz (LTE – Band 26 (5 MHz)) 819.0 MHz (LTE – Band 26 (10 MHz)) 821.5 MHz (LTE – Band 26 (15 MHz))
Date(s) of Tests:	July 19, 2021 ~ August 17, 2021
Serial number:	Radiated: R3CR41328YL Conducted: R3CR60JBG9Z

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

It also supports IEEE 802.11 a/b/g/n/ac/ax (HT20/40/80), Bluetooth, BT LE, NFC.

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

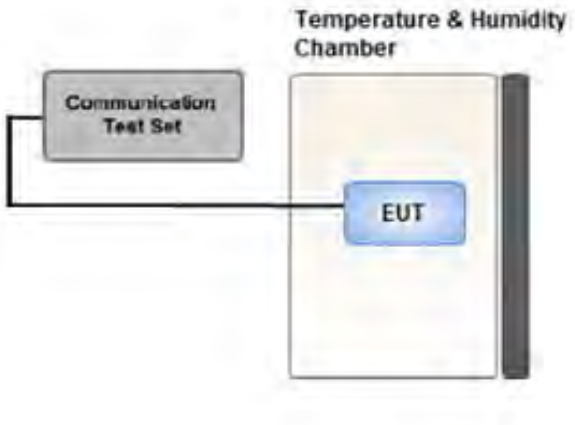
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base 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;

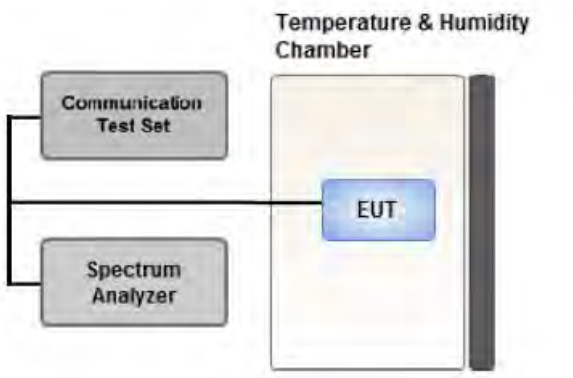
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

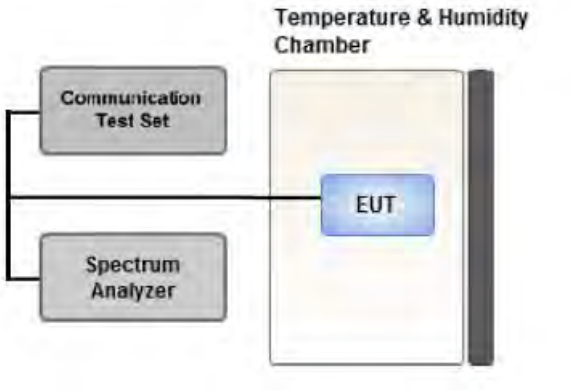
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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.

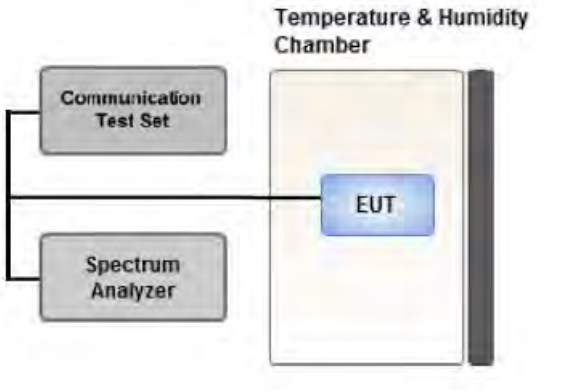
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 = 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.

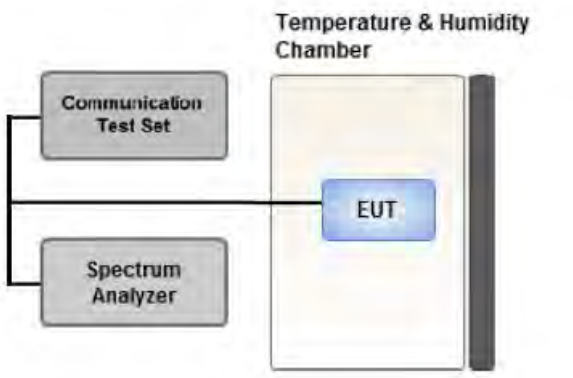
Test Settings

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.

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

   .- Unless otherwise specified, vary primary supply voltage from 85 % to 115% of the nominal value for other than hand carried battery equipment.

   .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

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

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.

(In the case of radiated spurious emissions, only the B.W result that confirmed the maximum radiated power was reported.)

- 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.

[Worst case]

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

3.10 WORST CASE(CONDUCTED TEST)

-Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM	1.4, 3, 5	High	Full RB	0
	QPSK, 16QAM, 64QAM	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 (Staddle 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

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15 G-10EF)/H.P.F	-	03/02/2021	Annual	03/02/2022
T&M SYSTEM	FBSR-02B(WHK3.3/18 G-10EF)/H.P.F	-	03/02/2021	Annual	03/02/2022
Hewlett Packard	11667B / Power Splitter(DC ~ 26.5 GHz)	11275	04/07/2021	Annual	04/07/2022
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
Schwarzbeck	UHAP/ Dipole Antenna	557	04/05/2021	Biennial	04/05/2023
Schwarzbeck	UHAP/ Dipole Antenna	558	04/05/2021	Biennial	04/05/2023
ESPEC	SU-642 / Chamber	93008124	03/15/2021	Annual	03/15/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1 ~ 18 GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1 ~ 18 GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15 ~ 40 GHz)	BBHA9170342	10/13/2020	Biennial	10/13/2022
Schwarzbeck	BBHA 9170/ Horn Antenna(15 ~ 40 GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10 Hz ~ 26.5 GHz)	MY50200093	11/17/2020	Annual	11/17/2021
Hewlett Packard	8493C/ATTENUATOR(20 dB)	17280	06/01/2021	Annual	06/01/2022
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10 Hz ~ 40 GHz)	100931	10/14/2020	Annual	10/14/2021
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Schwarzbeck	FMZB1513/ Loop Antenna(9 kHz ~ 30 MHz)	1513-333	03/19/2020	Biennial	03/19/2022
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/03/2021	Biennial	03/03/2023
Schwarzbeck	VULB9168/ Hybrid Antenna	760	02/22/2021	Biennial	02/22/2023
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/12/2021	Annual	07/12/2022
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/07/2021	Annual	01/07/2022
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100 kHz ~ 40 GHz)	177633	07/05/2021	Annual	07/05/2022
KEYSIGHT	N9030B / Signal Analyzer(5 Hz ~ 40.0 GHz)	MY55480167	06/02/2021	Annual	06/02/2022
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

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)	1.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
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	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	23.80	0.240	23.71	0.235	100
		1	3	23.84	0.242	23.84	0.242	100
		1	5	23.68	0.233	23.67	0.233	100
		3	0	23.74	0.237	23.62	0.230	100
		3	1	23.79	0.239	23.73	0.236	100
		3	3	23.71	0.235	23.68	0.233	100
		6	0	22.85	0.193	22.75	0.188	100
	16QAM	1	0	23.16	0.207	23.02	0.200	100
		1	3	22.93	0.196	23.00	0.200	100
		1	5	22.96	0.198	22.97	0.198	100
		3	0	22.84	0.192	22.85	0.193	100
		3	1	22.85	0.193	22.82	0.191	100
		3	3	22.79	0.190	22.80	0.191	100
		6	0	21.99	0.158	21.89	0.155	100
	64QAM	1	0	22.13	0.163	22.02	0.159	100
		1	3	22.06	0.161	22.03	0.160	100
		1	5	21.83	0.152	21.85	0.153	100
		3	0	21.84	0.153	21.83	0.152	100
		3	1	21.81	0.152	21.90	0.155	100
		3	3	21.93	0.156	21.93	0.156	100
		6	0	20.82	0.121	20.77	0.119	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	23.85	0.243	23.80	0.240	100
		1	7	23.81	0.240	23.83	0.242	100
		1	14	23.84	0.242	23.80	0.240	100
		8	0	22.92	0.196	22.85	0.193	100
		8	3	22.90	0.195	22.90	0.195	100
		8	7	22.93	0.196	22.91	0.195	100
		15	0	22.91	0.195	22.88	0.194	100
	16QAM	1	0	23.19	0.208	23.17	0.207	100
		1	7	23.42	0.220	23.40	0.219	100
		1	14	22.65	0.184	22.82	0.191	100
		8	0	21.96	0.157	21.90	0.155	100
		8	3	22.02	0.159	22.00	0.158	100
		8	7	21.89	0.155	21.88	0.154	100
		15	0	21.93	0.156	21.90	0.155	100
	64QAM	1	0	22.21	0.166	22.19	0.166	100
		1	7	22.00	0.158	21.98	0.158	100
		1	14	21.95	0.157	21.95	0.157	100
		8	0	20.89	0.123	20.89	0.123	100
		8	3	21.04	0.127	21.00	0.126	100
		8	7	20.95	0.124	20.96	0.125	100
		15	0	20.97	0.125	20.95	0.124	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	23.97	0.249	23.95	0.248	100
		1	12	24.05	0.254	24.03	0.253	100
		1	24	23.72	0.236	23.75	0.237	100
		12	0	22.93	0.196	22.90	0.195	100
		12	6	22.92	0.196	22.90	0.195	100
		12	11	22.81	0.191	22.83	0.192	100
		25	0	22.92	0.196	22.88	0.194	100
	16QAM	1	0	23.03	0.201	23.01	0.200	100
		1	12	22.91	0.195	22.94	0.197	100
		1	24	22.98	0.199	23.10	0.204	100
		12	0	21.97	0.157	21.95	0.157	100
		12	6	21.92	0.156	21.88	0.154	100
		12	11	21.92	0.156	21.62	0.145	100
		25	0	21.94	0.156	21.91	0.155	100
	64QAM	1	0	22.23	0.167	22.20	0.166	100
		1	12	21.96	0.157	21.94	0.156	100
		1	24	22.06	0.161	22.04	0.160	100
		12	0	20.98	0.125	20.94	0.124	100
		12	6	21.00	0.126	20.98	0.125	100
		12	11	20.88	0.122	20.91	0.123	100
		25	0	20.93	0.124	20.90	0.123	100

Band Width	Modulation	RB Size	RB Offset	Max. output power (dBm)		Limit (W)
				819 MHz		
				dBm	W	
10	QPSK	1	0	23.71	0.235	100
		1	24	23.55	0.226	100
		1	49	23.80	0.240	100
		25	0	22.81	0.191	100
		25	12	22.93	0.196	100
		25	24	22.94	0.197	100
		50	0	22.92	0.196	100
	16QAM	1	0	23.20	0.209	100
		1	24	22.84	0.192	100
		1	49	23.10	0.204	100
		25	0	21.94	0.156	100
		25	12	21.98	0.158	100
		25	24	21.85	0.153	100
		50	0	21.92	0.156	100
	64QAM	1	0	22.22	0.167	100
		1	24	22.25	0.168	100
		1	49	22.20	0.166	100
		25	0	21.03	0.127	100
		25	12	21.00	0.126	100
		25	24	20.87	0.122	100
		50	0	20.98	0.125	100

Band Width	Modulation	RB Size	RB Offset	Max. output power (dBm)		Limit (W)
				821.5 MHz		
				dBm	W	
15	QPSK	1	0	23.67	0.233	100
		1	36	23.54	0.226	100
		1	74	23.46	0.222	100
		36	0	22.73	0.187	100
		36	18	22.74	0.188	100
		36	39	22.78	0.190	100
		75	0	22.75	0.188	100
	16QAM	1	0	23.01	0.200	100
		1	36	22.91	0.195	100
		1	74	22.94	0.197	100
		36	0	21.75	0.150	100
		36	18	21.74	0.149	100
		36	39	21.81	0.152	100
		75	0	21.75	0.150	100
	64QAM	1	0	21.88	0.154	100
		1	36	21.97	0.157	100
		1	74	21.67	0.147	100
		36	0	20.81	0.121	100
		36	18	20.82	0.121	100
		36	39	20.81	0.121	100
		75	0	20.75	0.119	100

8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
814.7	LTE B26/ 1.4 MHz	QPSK	-33.46	29.79	-10.43	1.39	H	< 100	0.063	17.97
		16QAM	-34.05	29.20	-10.43	1.39	H		0.055	17.38
		64QAM	-35.10	28.15	-10.43	1.39	H		0.043	16.33
823.3		QPSK	-33.43	30.15	-10.42	1.39	H		0.068	18.34
		16QAM	-34.07	29.51	-10.42	1.39	H		0.059	17.70
		64QAM	-35.13	28.45	-10.42	1.39	H		0.046	16.64

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
815.5	LTE B26/ 3 MHz	QPSK	-33.30	29.95	-10.43	1.39	H	< 100	0.065	18.13
		16QAM	-33.96	29.29	-10.43	1.39	H		0.056	17.47
		64QAM	-35.02	28.23	-10.43	1.39	H		0.044	16.41
822.5		QPSK	-33.29	30.22	-10.42	1.39	H		0.069	18.41
		16QAM	-33.97	29.54	-10.42	1.39	H		0.059	17.73
		64QAM	-35.10	28.41	-10.42	1.39	H		0.046	16.60

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
816.5	LTE B26/ 5 MHz	QPSK	-33.31	29.95	-10.43	1.39	H	< 100	0.065	18.13
		16QAM	-33.95	29.31	-10.43	1.39	H		0.056	17.49
		64QAM	-35.06	28.20	-10.43	1.39	H		0.043	16.38
821.5		QPSK	-33.20	30.26	-10.42	1.39	H		0.070	18.45
		16QAM	-33.92	29.54	-10.42	1.39	H		0.059	17.73
		64QAM	-35.06	28.40	-10.42	1.39	H		0.046	16.59

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
819.0	LTE B26/ 10 MHz	QPSK	-33.42	29.93	-10.43	1.39	H	< 100	0.065	18.11
		16QAM	-34.00	29.35	-10.43	1.39	H		0.057	17.53
		64QAM	-35.06	28.29	-10.43	1.39	H		0.044	16.47

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
821.5	LTE B26/ 15 MHz	QPSK	-33.53	29.93	-10.42	1.39	H	< 7.00	0.065	18.12
		16QAM	-34.16	29.30	-10.42	1.39	H		0.056	17.49
		64QAM	-35.31	28.15	-10.42	1.39	H		0.043	16.34

Note

1. Limit: None (for reporting purposes only)

8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26715 (816.5)	1 633.00	-52.41	9.40	-61.84	1.98	H	-54.42	-13.00
	2 449.50	-54.79	10.53	-58.54	2.46	V	-50.47	-13.00
	3 266.00	-58.05	12.05	-58.90	2.88	V	-49.73	-13.00
26765 (821.5)	1 643.00	-53.03	9.45	-62.78	1.98	H	-55.31	-13.00
	2 464.50	-54.94	10.58	-59.08	2.46	V	-50.96	-13.00
	3 286.00	-57.44	12.15	-58.58	2.88	H	-49.31	-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	1.0924
			16QAM			1.0918
			64QAM			1.0916
	3 MHz	822.5	QPSK	15		2.7073
			16QAM			2.6936
			64QAM			2.7040
	5 MHz	821.5	QPSK	25		4.5098
			16QAM			4.4965
			64QAM			4.4965
	10 MHz	819.0	QPSK	50		9.0004
			16QAM			8.9861
			64QAM			8.9849
	15 MHz	821.5	QPSK	75		13.446
			16QAM			13.441
			64QAM			13.450

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 45 ~ 59.

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	3.8505	27.976	-64.936	-36.960	-13.00
		823.3	3.8660	27.976	-65.446	-37.470	
	3	815.5	3.8455	27.976	-65.611	-37.635	
		822.5	3.8575	27.976	-65.392	-37.416	
	5	816.5	3.8794	27.976	-65.549	-37.573	
		821.5	3.8804	27.976	-65.482	-37.506	
	10	819.0	3.8355	27.976	-65.154	-37.178	
	15	821.5	3.8729	27.976	-65.550	-37.574	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 80 ~ 87.
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	30.131

8.6 CHANNEL EDGE

- Plots of the EUT's Band Edge are shown Page 60 ~ 79.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 26

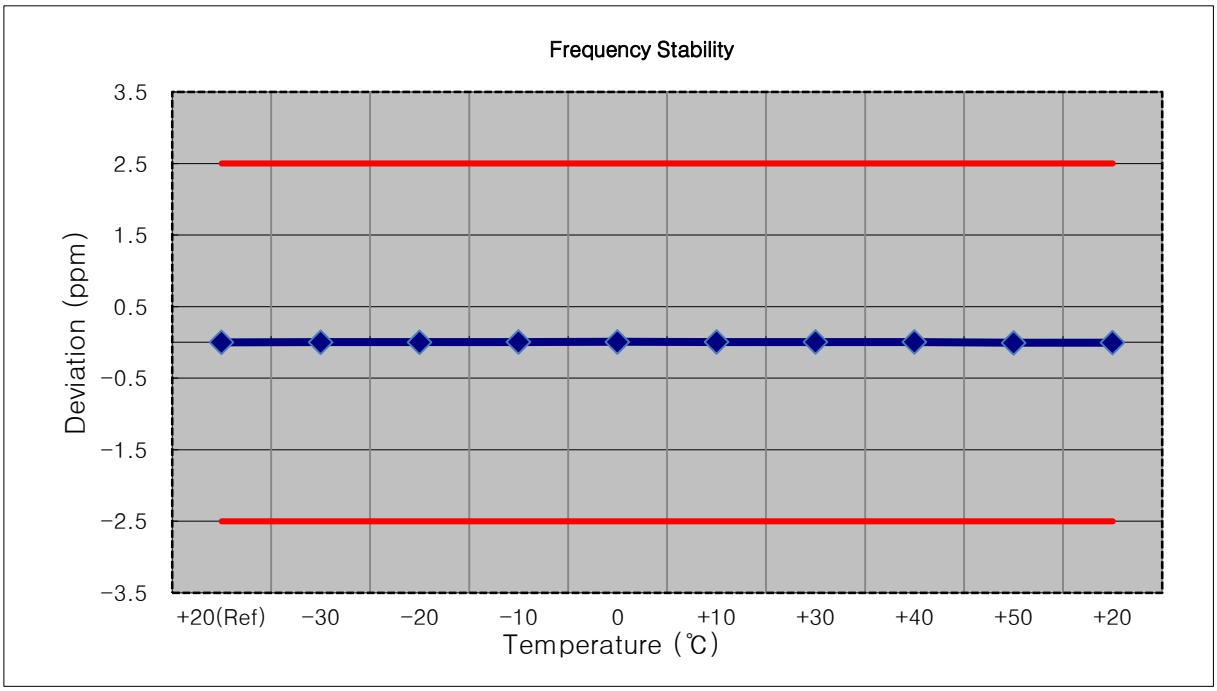
▣ OPERATING FREQUENCY: 814,700,000 Hz

▣ CHANNEL: 26697(1.4 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	814 700 004	0.0	0.000 000	0.000
100%		-30	814 700 008	3.5	0.000 000	0.004
100%		-20	814 700 008	3.5	0.000 000	0.004
100%		-10	814 700 008	4.1	0.000 001	0.005
100%		0	814 700 011	6.6	0.000 001	0.008
100%		+10	814 700 009	4.7	0.000 001	0.006
100%		+30	814 700 008	3.9	0.000 000	0.005
100%		+40	814 700 009	5.3	0.000 001	0.007
100%		+50	814 700 000	-4.6	-0.000 001	-0.006
Batt. Endpoint	3.550	+20	814 700 001	-3.0	0.000 000	-0.004



▣ MODE: LTE 26

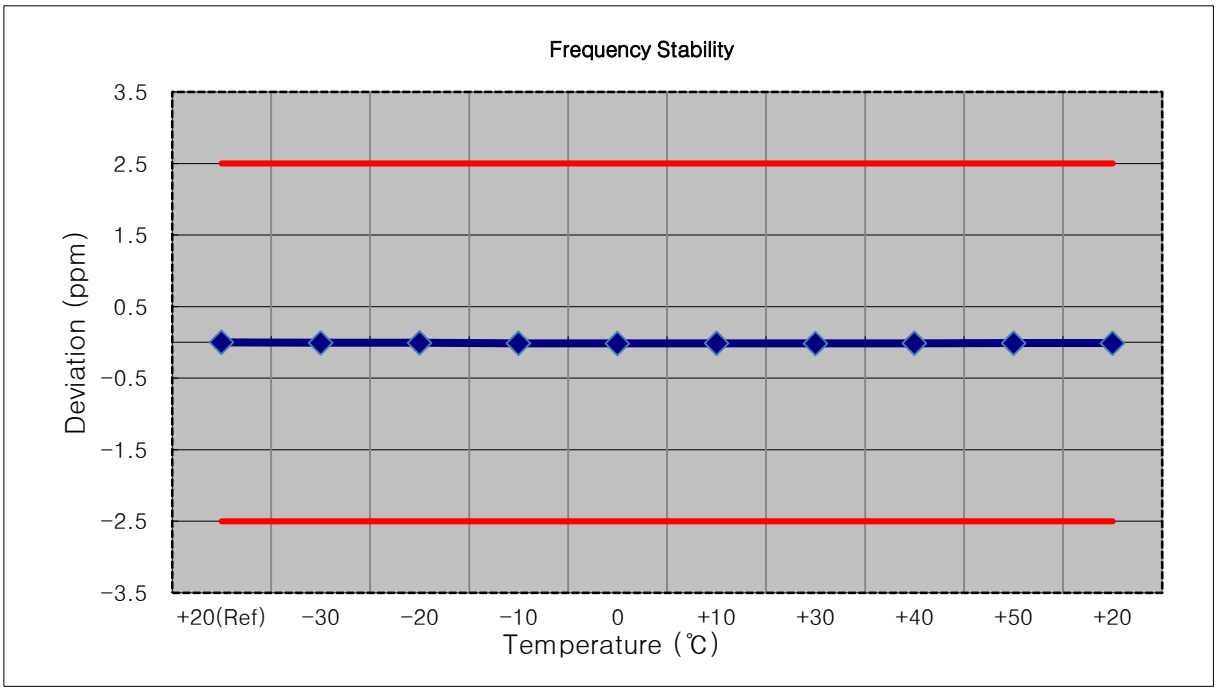
▣ OPERATING FREQUENCY: 815,500,000 Hz

▣ CHANNEL: 26705(3 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	815 499 990	0.0	0.000 000	0.000
100%		-30	815 499 986	-4.6	-0.000 001	-0.006
100%		-20	815 499 986	-4.0	0.000 000	-0.005
100%		-10	815 499 980	-10.5	-0.000 001	-0.013
100%		0	815 499 978	-12.2	-0.000 001	-0.015
100%		+10	815 499 980	-10.7	-0.000 001	-0.013
100%		+30	815 499 979	-11.4	-0.000 001	-0.014
100%		+40	815 499 980	-10.1	-0.000 001	-0.012
100%		+50	815 499 982	-8.3	-0.000 001	-0.010
Batt. Endpoint	3.550	+20	815 499 982	-8.6	-0.000 001	-0.011



▣ MODE: LTE 26

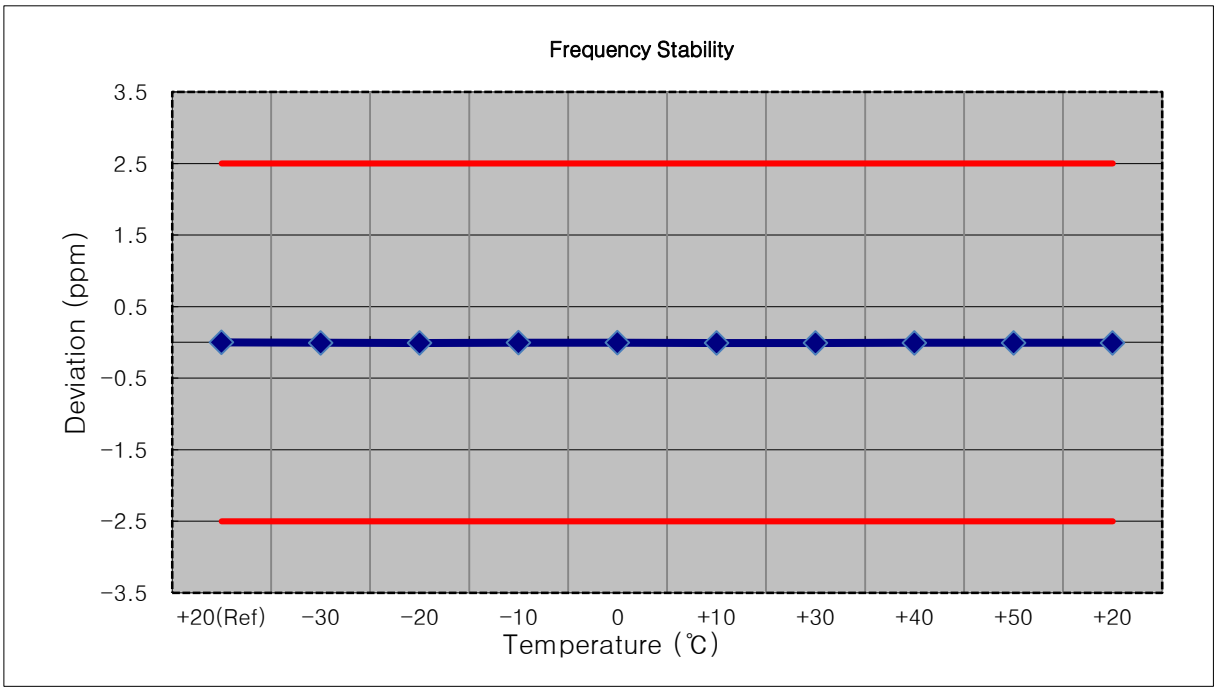
▣ OPERATING FREQUENCY: 816,500,000 Hz

▣ CHANNEL: 26715(5 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	816 499 995	0.0	0.000 000	0.000
100%		-30	816 499 991	-4.1	-0.000 001	-0.005
100%		-20	816 499 989	-5.7	-0.000 001	-0.007
100%		-10	816 499 991	-3.6	0.000 000	-0.004
100%		0	816 499 992	-3.1	0.000 000	-0.004
100%		+10	816 499 989	-5.8	-0.000 001	-0.007
100%		+30	816 499 988	-6.3	-0.000 001	-0.008
100%		+40	816 499 990	-4.8	-0.000 001	-0.006
100%		+50	816 499 990	-4.5	-0.000 001	-0.006
Batt. Endpoint	3.550	+20	816 499 990	-4.4	-0.000 001	-0.005



▣ MODE: LTE 26

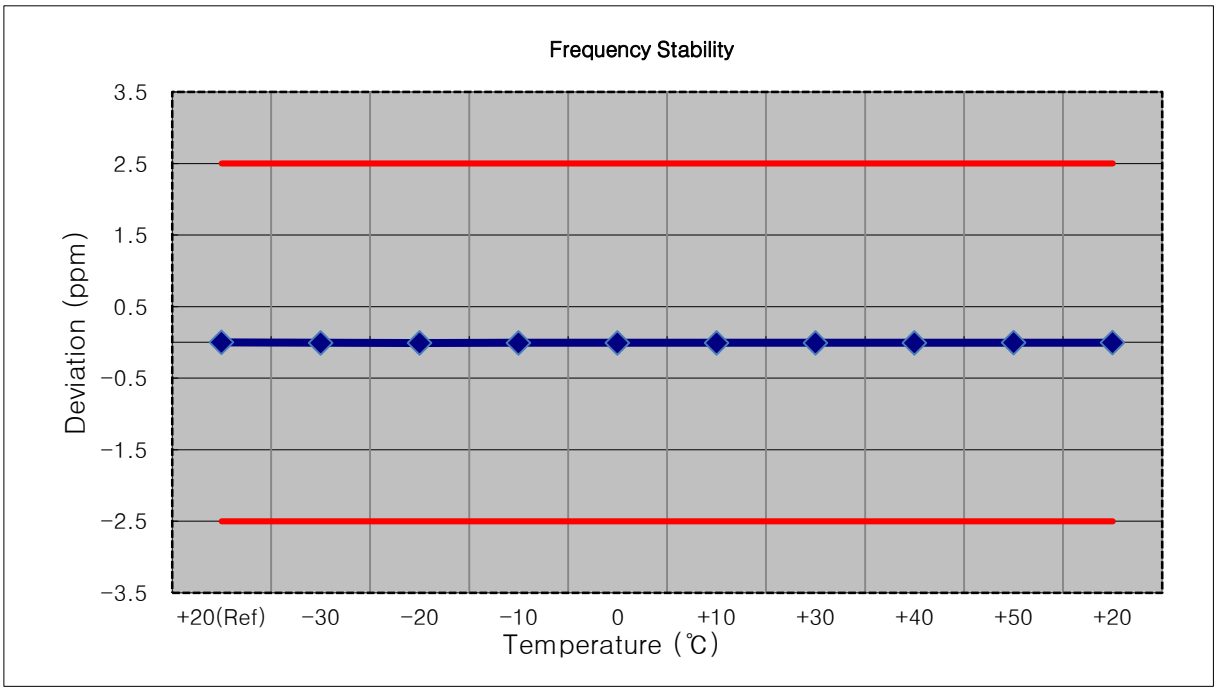
▣ OPERATING FREQUENCY: 819,000,000 Hz

▣ CHANNEL: 26740(10 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	818 999 994	0.0	0.000 000	0.000
100%		-30	818 999 989	-5.2	-0.000 001	-0.006
100%		-20	818 999 989	-5.6	-0.000 001	-0.007
100%		-10	818 999 989	-5.3	-0.000 001	-0.006
100%		0	818 999 989	-5.0	-0.000 001	-0.006
100%		+10	818 999 989	-5.0	-0.000 001	-0.006
100%		+30	818 999 990	-4.2	-0.000 001	-0.005
100%		+40	818 999 990	-4.4	-0.000 001	-0.005
100%		+50	818 999 991	-3.3	0.000 000	-0.004
Batt. Endpoint	3.550	+20	818 999 991	-3.2	0.000 000	-0.004



▣ MODE: LTE 26

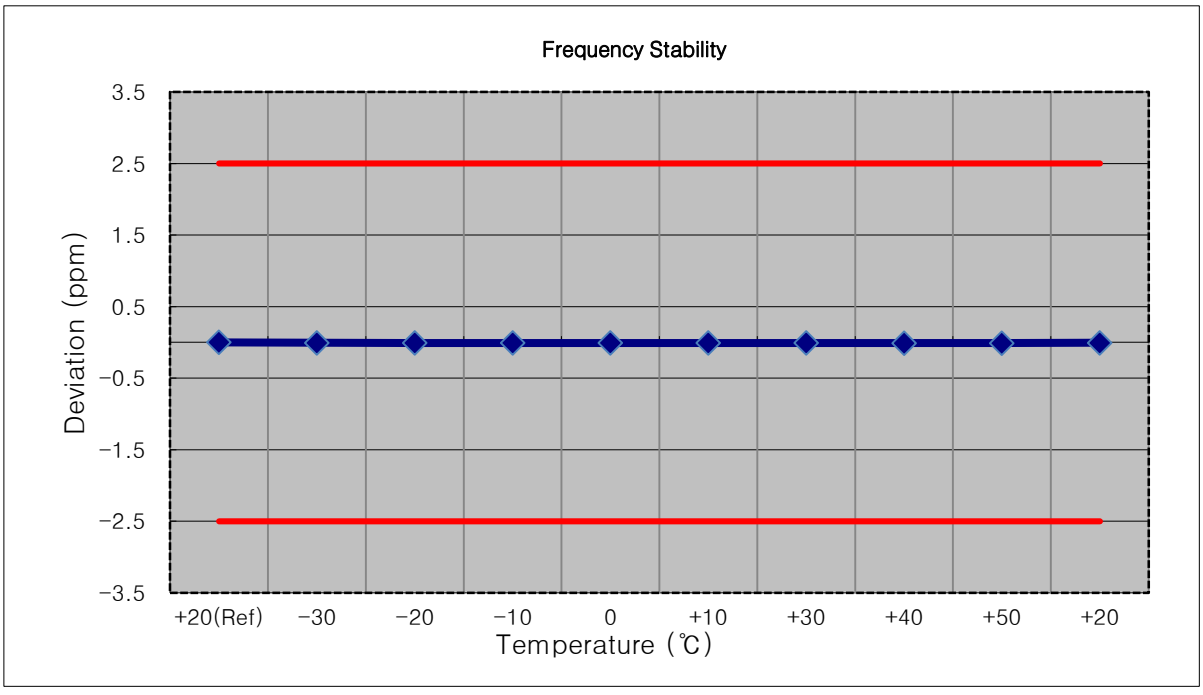
▣ OPERATING FREQUENCY: 821,500,000 Hz

▣ CHANNEL: 26765(15 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	821 499 993	0.0	0.000 000	0.000
100%		-30	821 499 988	-4.9	-0.000 001	-0.006
100%		-20	821 499 986	-7.0	-0.000 001	-0.009
100%		-10	821 499 986	-6.7	-0.000 001	-0.008
100%		0	821 499 987	-5.8	-0.000 001	-0.007
100%		+10	821 499 986	-6.3	-0.000 001	-0.008
100%		+30	821 499 987	-6.1	-0.000 001	-0.007
100%		+40	821 499 984	-8.3	-0.000 001	-0.010
100%		+50	821 499 985	-7.8	-0.000 001	-0.009
Batt. Endpoint	3.550	+20	821 499 989	-4.1	0.000 000	-0.005



8.8 STADDLE 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	23.65	0.232	100
		1	3	23.84	0.242	100
		1	5	23.67	0.233	100
		3	0	23.61	0.230	100
		3	1	23.72	0.236	100
		3	3	23.66	0.232	100
		6	0	22.68	0.185	100
	16QAM	1	0	22.98	0.199	100
		1	3	23.01	0.200	100
		1	5	22.96	0.198	100
		3	0	22.85	0.193	100
		3	1	22.79	0.190	100
		3	3	22.80	0.191	100
		6	0	21.81	0.152	100
	64QAM	1	0	21.89	0.155	100
		1	3	22.02	0.159	100
		1	5	21.87	0.154	100
		3	0	21.83	0.152	100
		3	1	21.92	0.156	100
		3	3	21.93	0.156	100
		6	0	20.77	0.119	100

Band Width	Modulation	RB Size	RB Offset	Max. output power (dBm)		Limit (W)
				824 MHz		
				dBm	W	
3	QPSK	1	0	23.71	0.235	100
		1	7	23.90	0.245	100
		1	14	23.64	0.231	100
		8	0	22.84	0.192	100
		8	3	22.89	0.195	100
		8	7	22.90	0.195	100
		15	0	22.86	0.193	100
	16QAM	1	0	23.09	0.204	100
		1	7	23.11	0.205	100
		1	14	23.00	0.200	100
		8	0	21.85	0.153	100
		8	3	21.95	0.157	100
		8	7	21.88	0.154	100
		15	0	21.87	0.154	100
	64QAM	1	0	22.16	0.164	100
		1	7	21.93	0.156	100
		1	14	21.96	0.157	100
		8	0	20.90	0.123	100
		8	3	20.95	0.124	100
		8	7	20.97	0.125	100
		15	0	20.88	0.122	100

Band Width	Modulation	RB Size	RB Offset	Max. output power (dBm)		Limit (W)
				824 MHz		
				dBm	W	
5	QPSK	1	0	23.94	0.248	100
		1	12	24.02	0.252	100
		1	24	23.78	0.239	100
		12	0	22.90	0.195	100
		12	6	22.85	0.193	100
		12	11	22.84	0.192	100
		25	0	22.83	0.192	100
	16QAM	1	0	23.00	0.200	100
		1	12	23.03	0.201	100
		1	24	23.11	0.205	100
		12	0	21.92	0.156	100
		12	6	21.71	0.148	100
		12	11	21.92	0.156	100
		25	0	21.89	0.155	100
	64QAM	1	0	22.11	0.163	100
		1	12	21.93	0.156	100
		1	24	22.04	0.160	100
		12	0	20.91	0.123	100
		12	6	20.93	0.124	100
		12	11	20.92	0.124	100
		25	0	20.87	0.122	100

Band Width	Modulation	RB Size	RB Offset	Max. output power (dBm)		Limit (W)
				824 MHz		
				dBm	W	
10	QPSK	1	0	23.60	0.229	100
		1	24	23.63	0.231	100
		1	49	23.75	0.237	100
		25	0	22.91	0.195	100
		25	12	22.89	0.195	100
		25	24	22.87	0.194	100
		50	0	22.93	0.196	100
	16QAM	1	0	23.00	0.200	100
		1	24	23.01	0.200	100
		1	49	23.04	0.201	100
		25	0	21.91	0.155	100
		25	12	21.92	0.156	100
		25	24	21.90	0.155	100
		50	0	21.87	0.154	100
	64QAM	1	0	22.15	0.164	100
		1	24	22.14	0.164	100
		1	49	22.11	0.163	100
		25	0	20.98	0.125	100
		25	12	20.97	0.125	100
		25	24	20.92	0.124	100
		50	0	20.95	0.124	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	
								W	W	dBm
824.0	LTE B26/ 1.4 MHz	QPSK	-33.39	30.18	-10.42	1.39	H	< 7.00	0.069	18.37
		16QAM	-34.03	29.54	-10.42	1.39	H		0.059	17.73
		64QAM	-35.10	28.47	-10.42	1.39	H		0.046	16.66

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 3 MHz	QPSK	-33.33	30.24	-10.42	1.39	H	< 7.00	0.070	18.43
		16QAM	-33.98	29.59	-10.42	1.39	H		0.060	17.78
		64QAM	-35.13	28.44	-10.42	1.39	H		0.046	16.63

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 5 MHz	QPSK	-33.32	30.25	-10.42	1.39	H	< 7.00	0.070	18.44
		16QAM	-33.94	29.63	-10.42	1.39	H		0.060	17.82
		64QAM	-35.14	28.43	-10.42	1.39	H		0.046	16.62

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 10 MHz	QPSK	-33.29	30.28	-10.42	1.39	H	< 7.00	0.070	18.47
		16QAM	-33.95	29.62	-10.42	1.39	H		0.060	17.81
		64QAM	-35.16	28.41	-10.42	1.39	H		0.046	16.60

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 (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26790 (824.0)	1 648.00	-52.95	9.50	-62.56	1.99	V	-55.05	-13.00
	2 472.00	-55.14	10.60	-59.27	2.47	V	-51.14	-13.00
	3 296.00	-57.93	12.25	-59.01	2.89	H	-49.65	-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	3.8500	27.976	-65.472	-37.496	-13.00
	3		3.8161	27.976	-65.571	-37.595	
	5		3.8724	27.976	-65.552	-37.576	
	10		3.8709	27.976	-65.326	-37.350	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 89 ~ 92.
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	30.131

8.8.5 CHANNEL EDGE(Part90)

- Test Channel : 26790(824.0MHz)

Plots of the EUT's Band Edge are shown Page 93 ~ 104.

8.8.6 BAND EDGE(Part22)

- Test Channel : 26790(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 105 ~ 112.

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 (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 (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 (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 (15 M BW Ch.26765 QPSK RB 75_0)

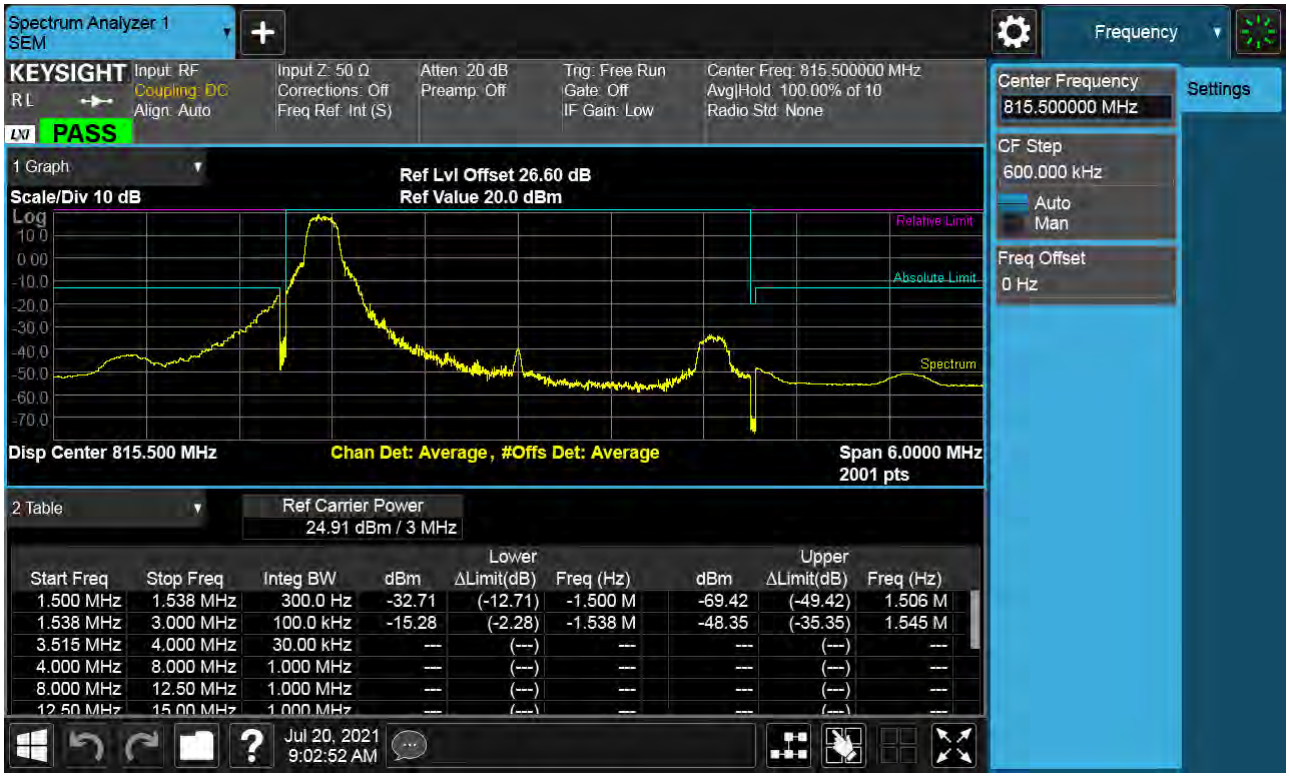
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 16QAM RB 75_0)

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

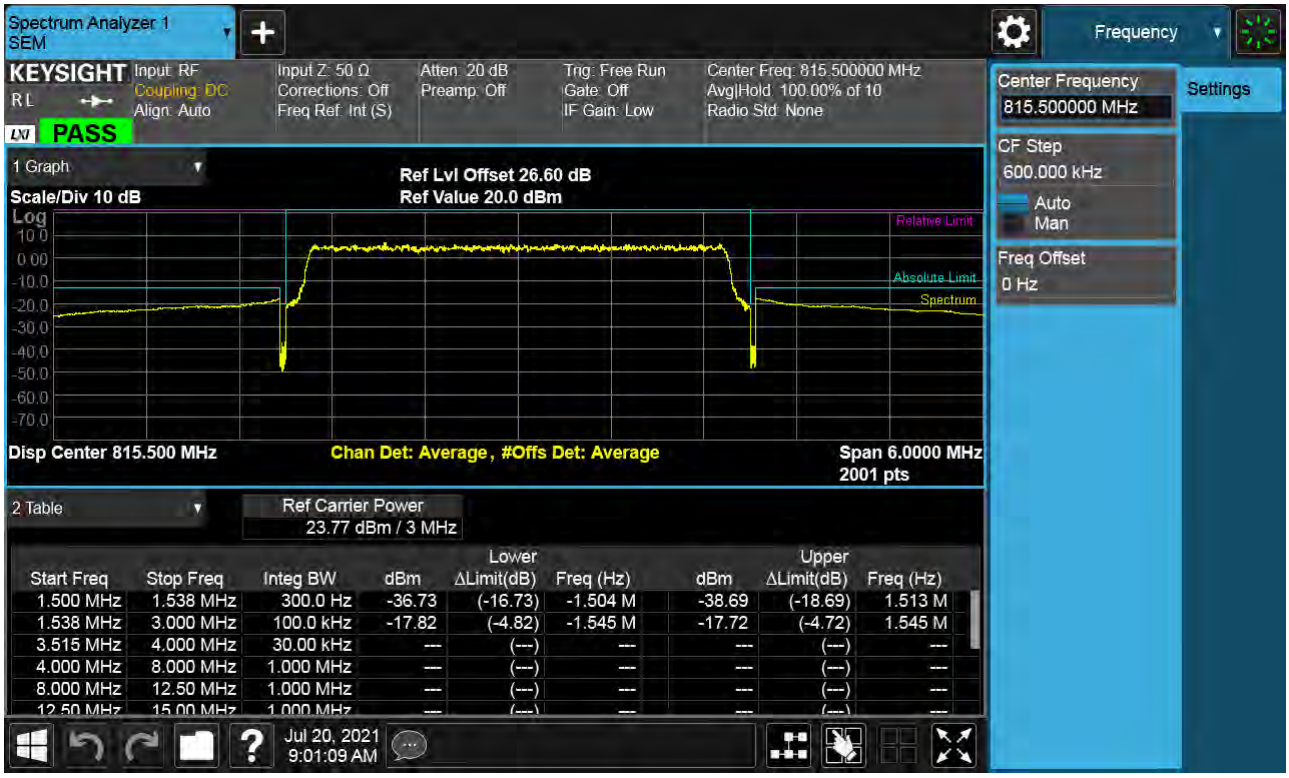
BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK RB 1, Offset 0)

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)



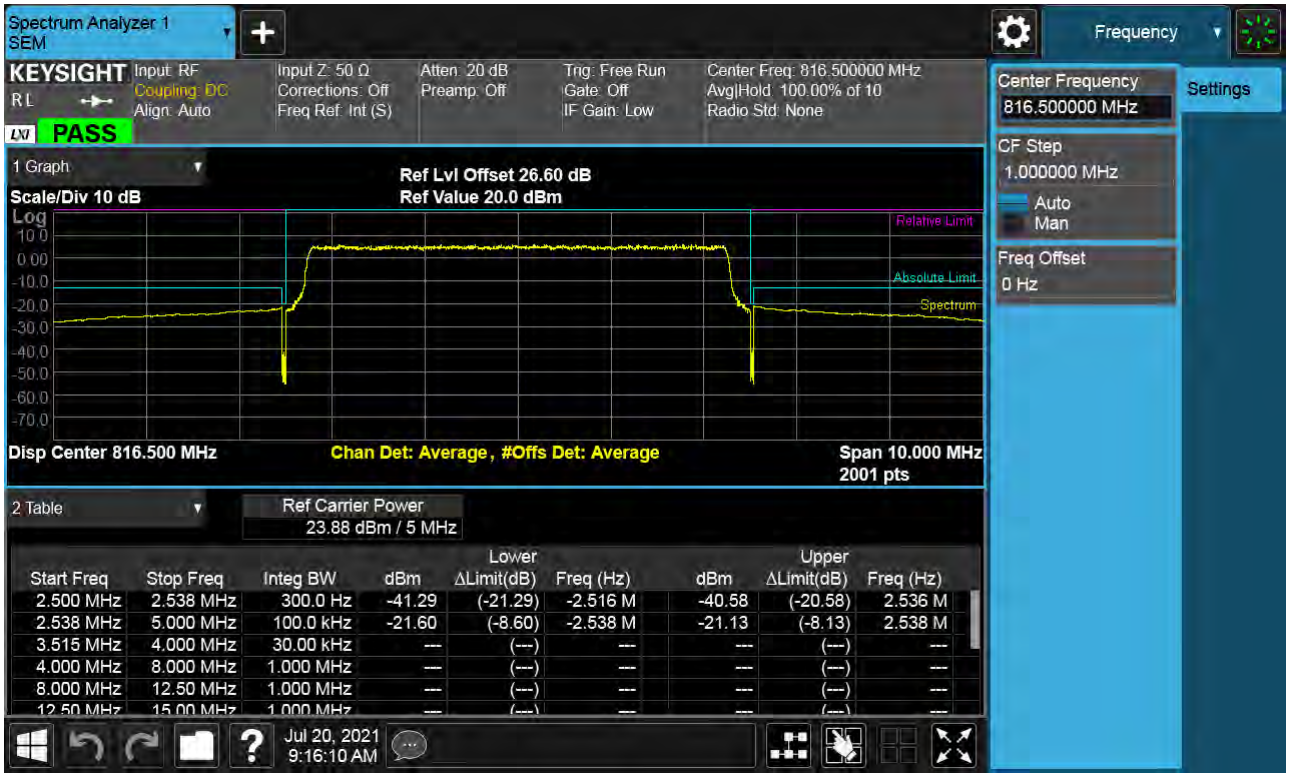
BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK_RB15_Offset 0)



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

Start Freq	Stop Freq	Integ BW	Lower dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	Upper dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
2.500 MHz	2.538 MHz	300.0 Hz	-40.11	(-20.11)	-2.501 M	-77.68	(-57.68)	2.502 M
2.538 MHz	5.000 MHz	100.0 kHz	-19.47	(-6.47)	-2.538 M	-51.34	(-38.34)	4.286 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	---	(---)	---	---	(---)	---

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

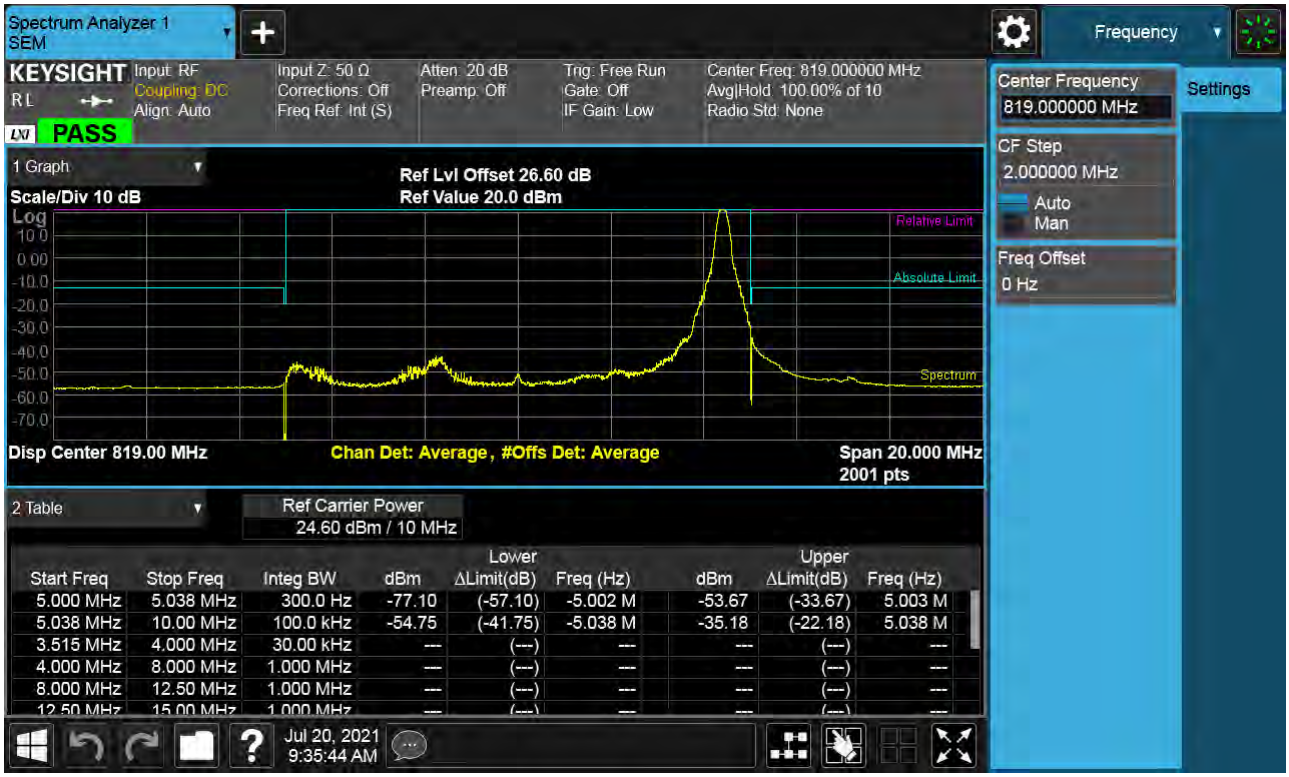


BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK RB 1, Offset 0)

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

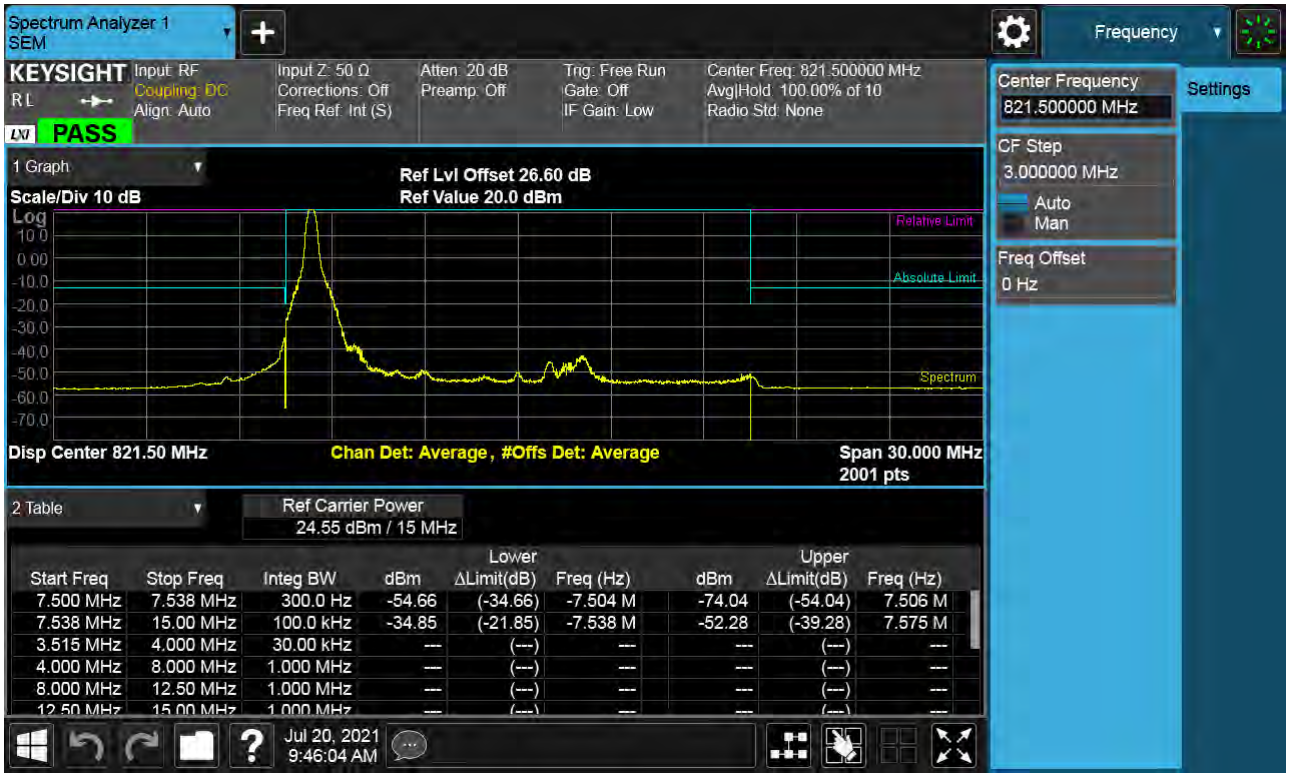
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
5.000 MHz	5.038 MHz	300.0 Hz	-45.08	(-25.08)	-5.028 M	-45.41	(-25.41)	5.022 M
5.038 MHz	10.00 MHz	100.0 kHz	-25.02	(-12.02)	-5.062 M	-24.20	(-11.20)	5.087 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
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	---	(---)	---	---	(---)	---

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

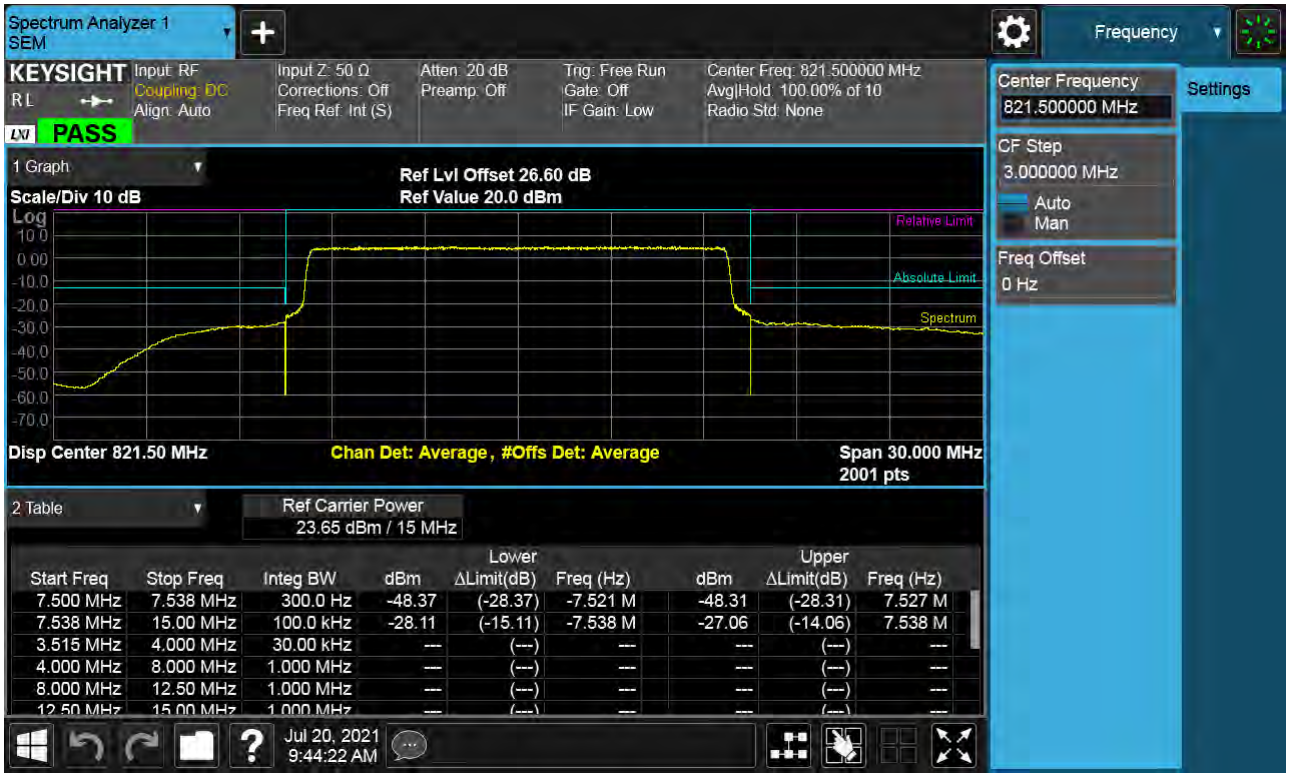


			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
5.000 MHz	5.038 MHz	300.0 Hz	-77.10	(-57.10)	-5.002 M	-53.67	(-33.67)	5.003 M
5.038 MHz	10.00 MHz	100.0 kHz	-54.75	(-41.75)	-5.038 M	-35.18	(-22.18)	5.038 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
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	---	(---)	---	---	(---)	---

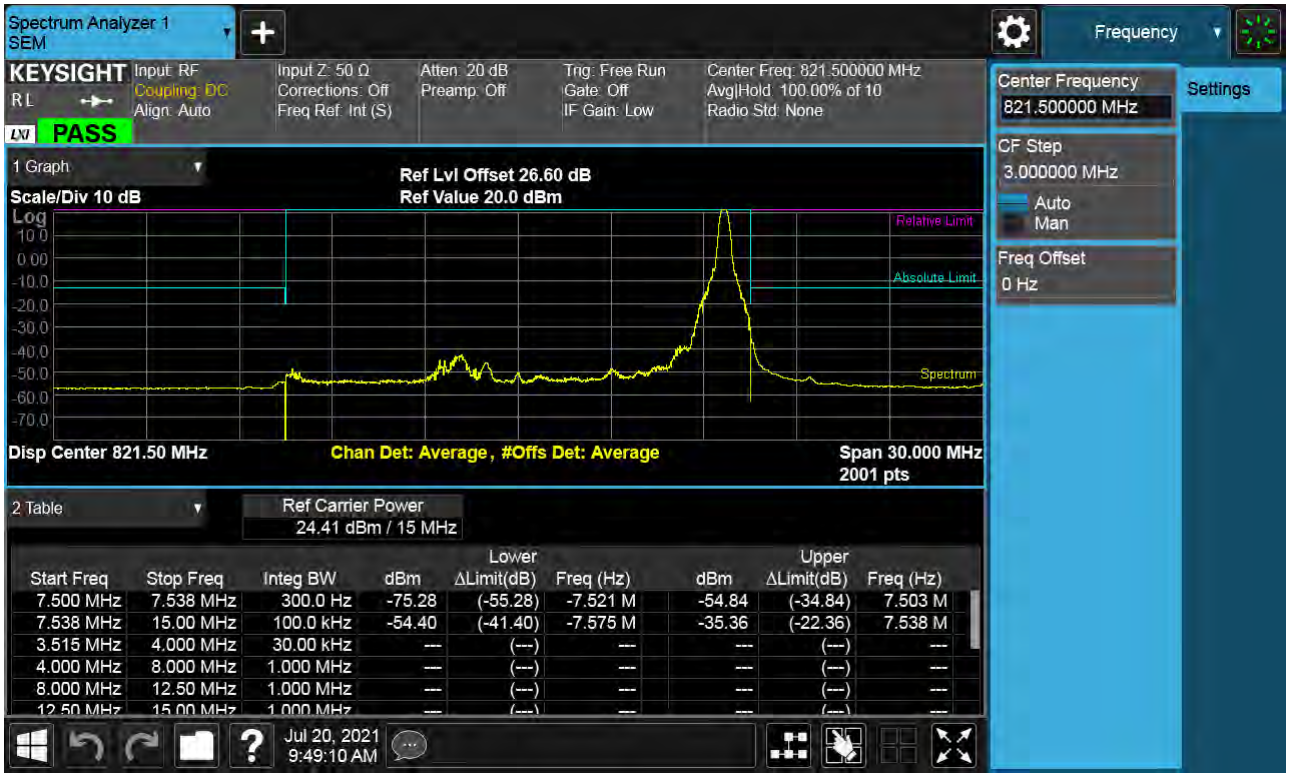
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset 0)



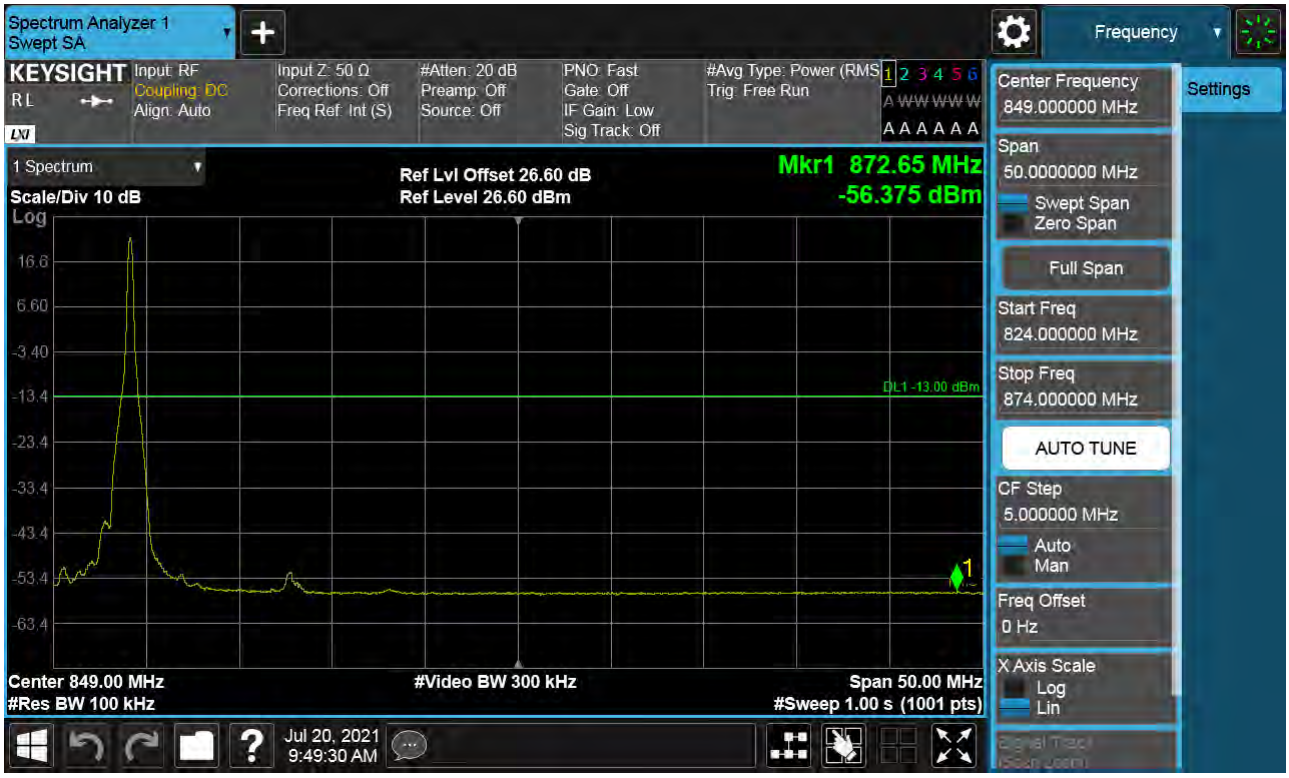
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 75, Offset0)



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

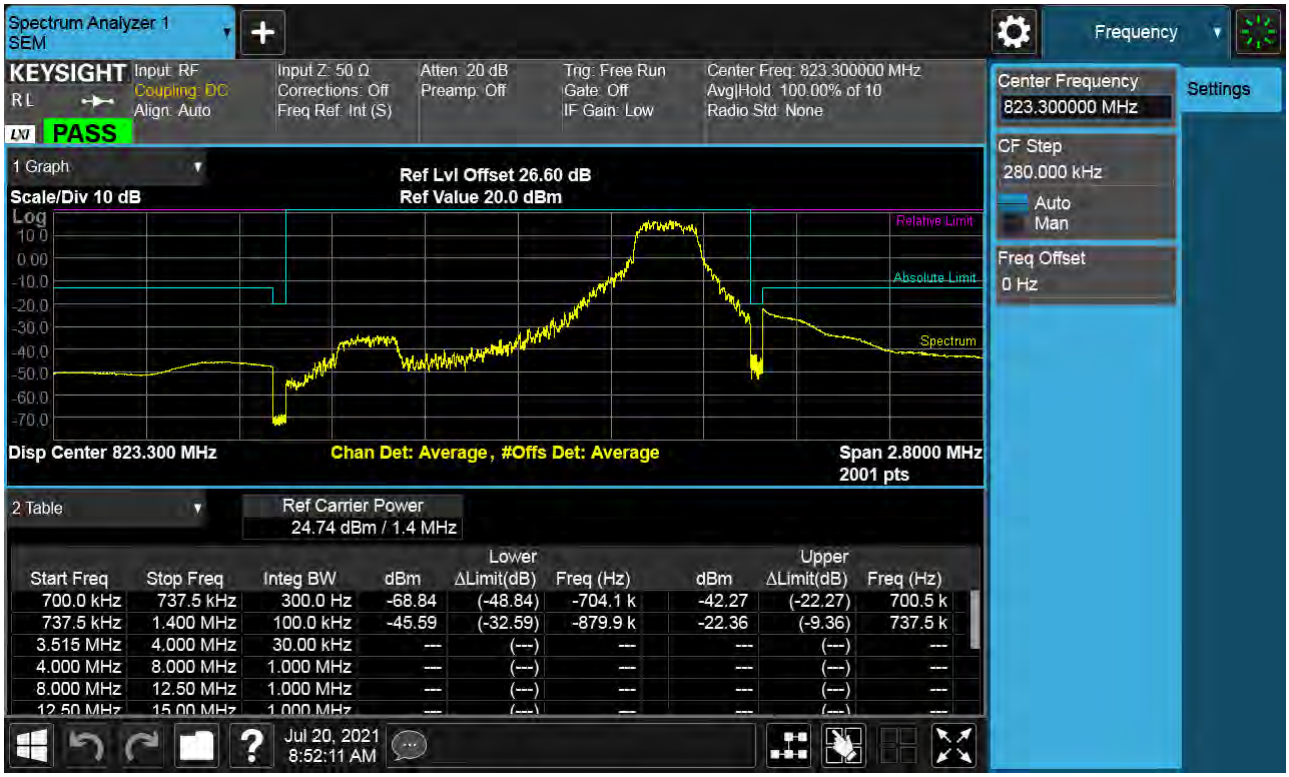


BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset74)



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)

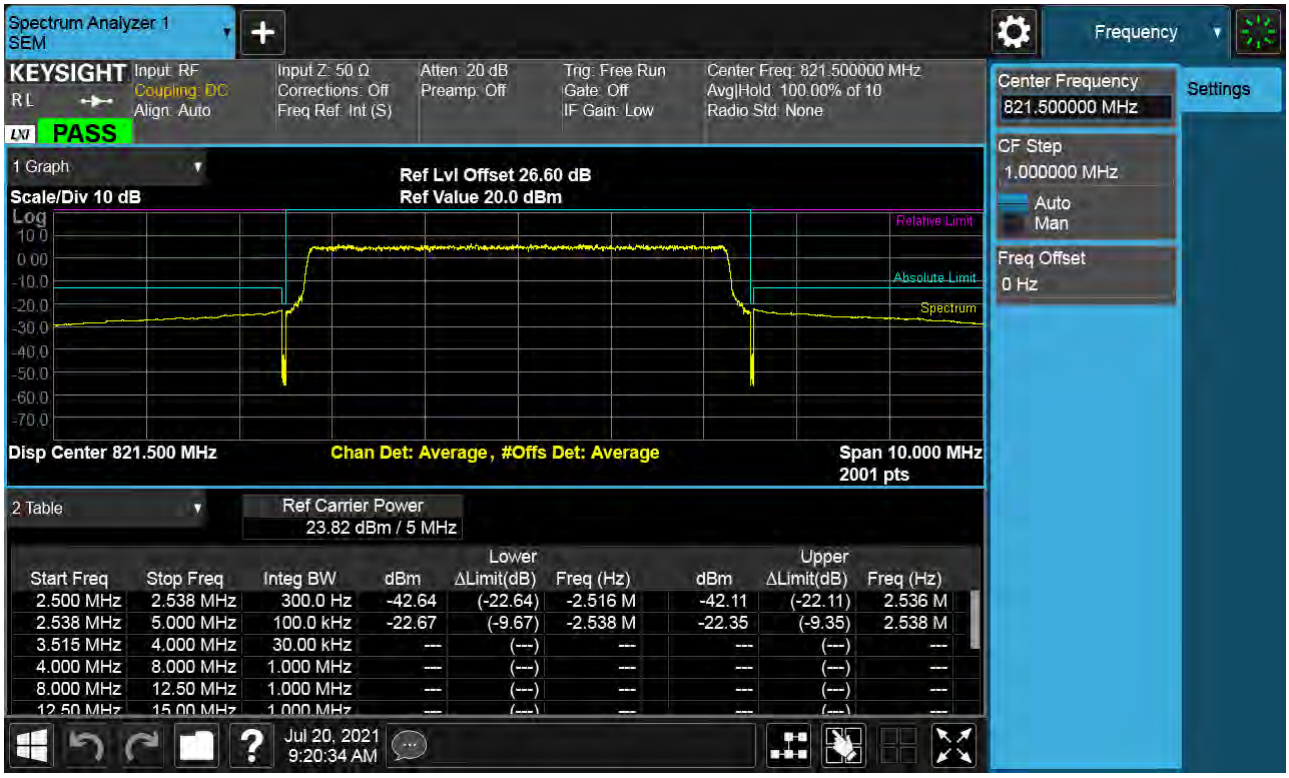
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB1_Offset 14)

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)

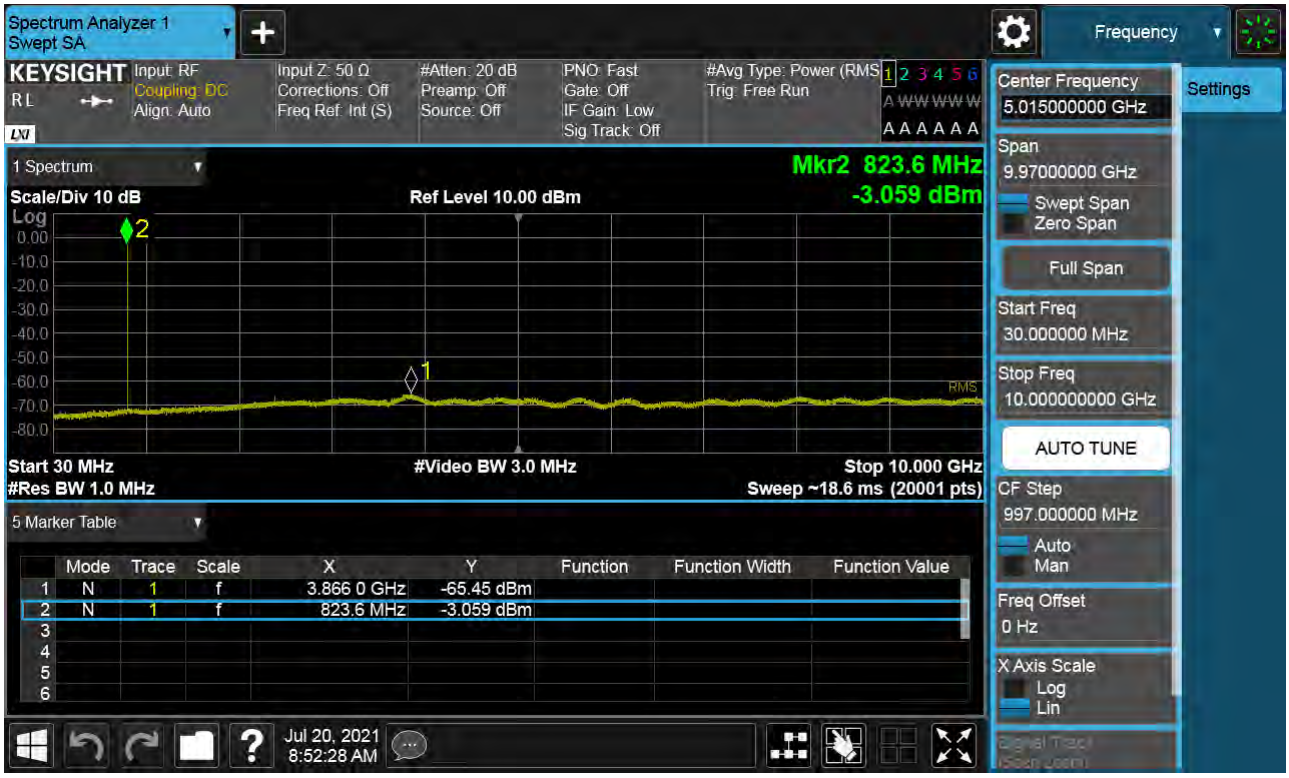
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
2.500 MHz	2.538 MHz	300.0 Hz	-77.35	(-57.35)	-2.503 M	-41.92	(-21.92)	2.509 M
2.538 MHz	5.000 MHz	100.0 kHz	-55.39	(-42.39)	-2.538 M	-22.65	(-9.65)	2.538 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
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	---	(---)	---	---	(---)	---

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

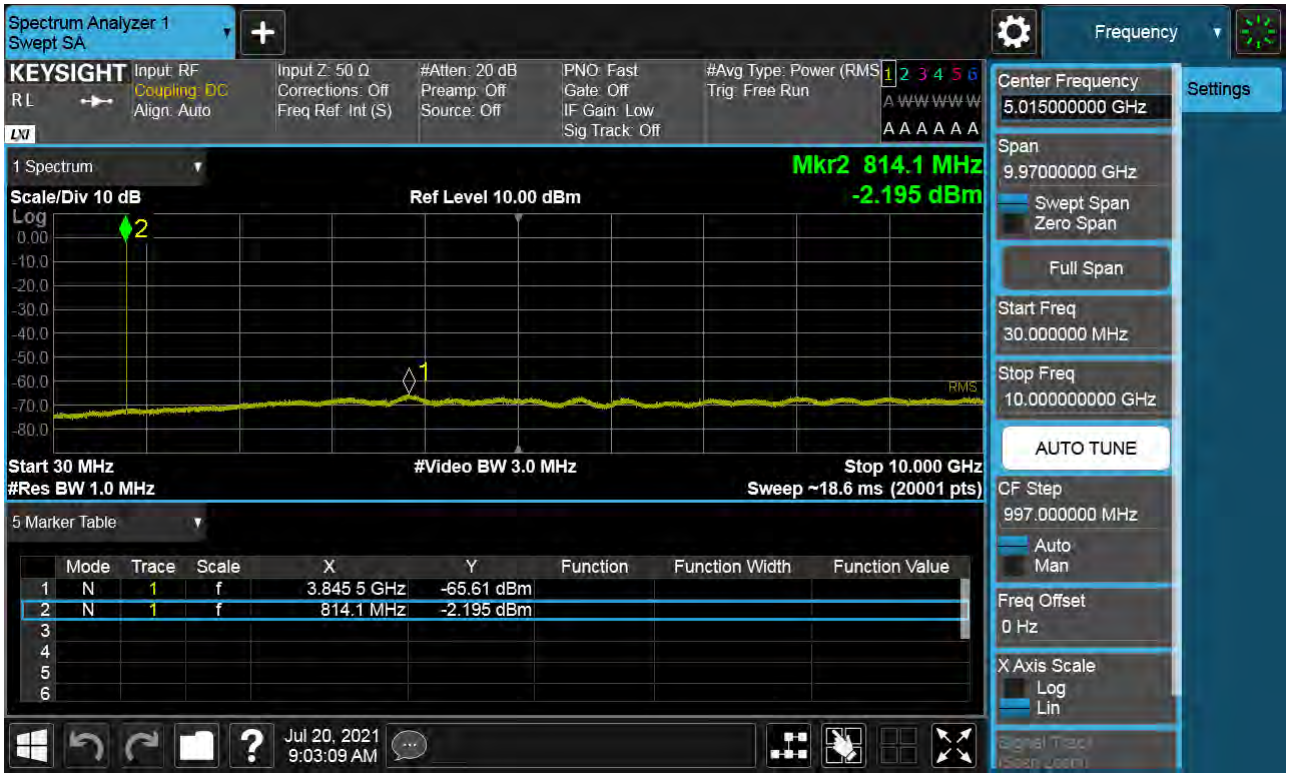


BAND 26. Conducted Spurious (26697 ch_1.4 MHz_QPSK_RB 1_0)

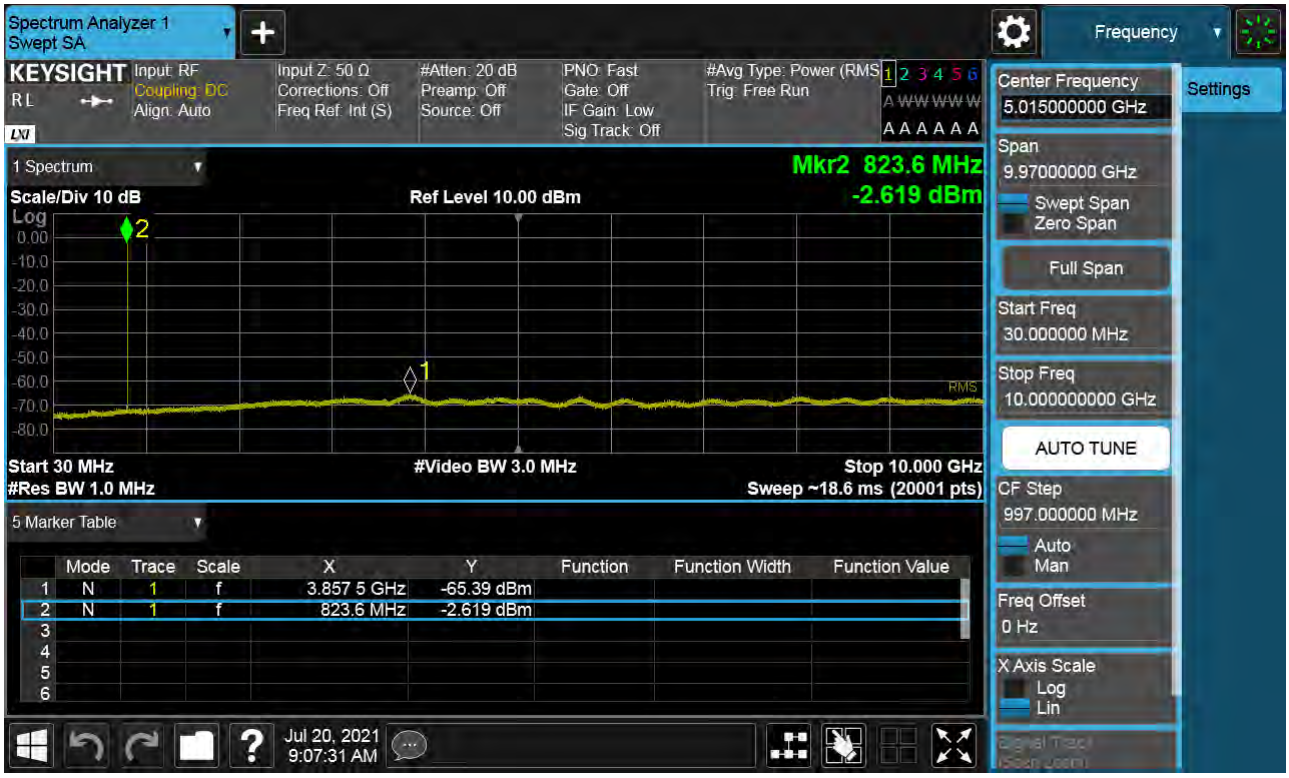
BAND 26. Conducted Spurious (26783 ch_1.4 MHz_QPSK_RB 1_0)



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

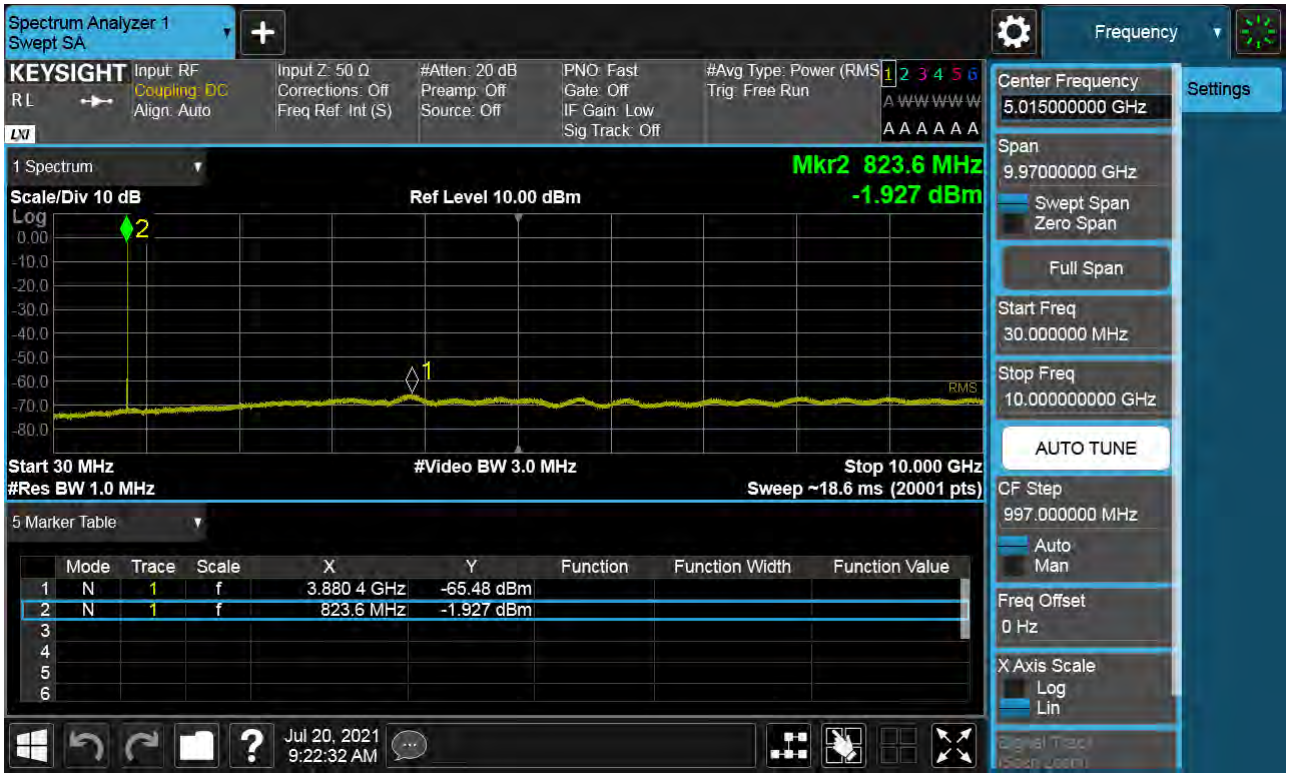


BAND 26. Conducted Spurious (26775 ch_3 MHz_QPSK_RB 1_0)

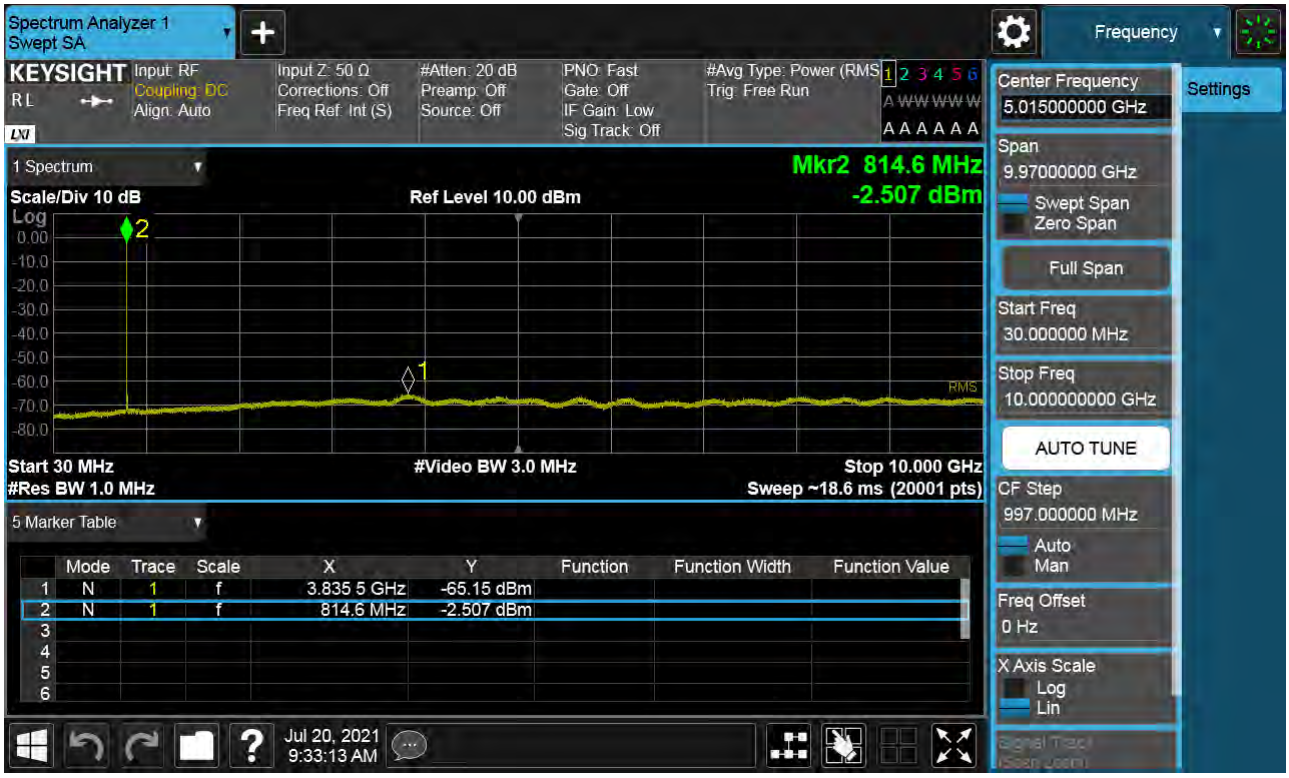


BAND 26. Conducted Spurious (26715 ch_5 MHz_QPSK_RB 1_0)

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



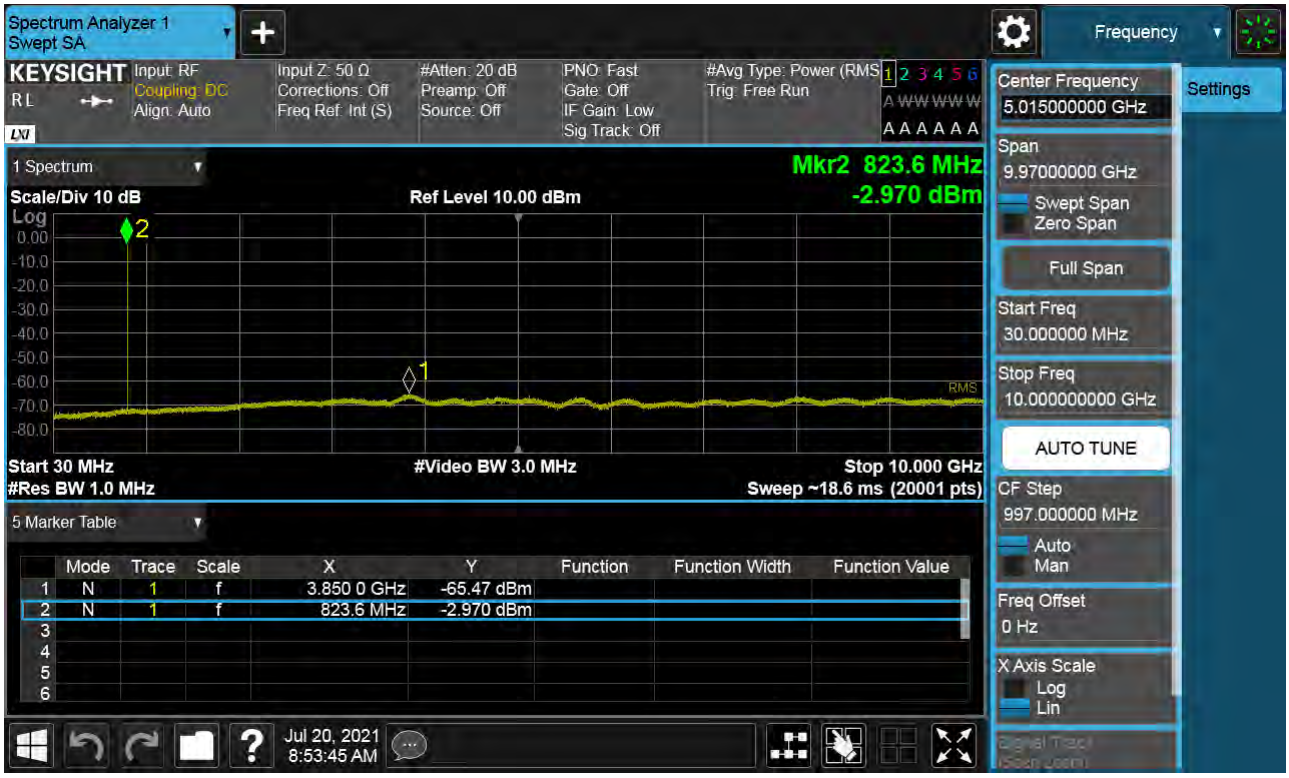
BAND 26. Conducted Spurious (26740 ch_10 MHz_QPSK_RB 1_0)



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

10. TEST PLOTS (STRADDLE CHANNEL)

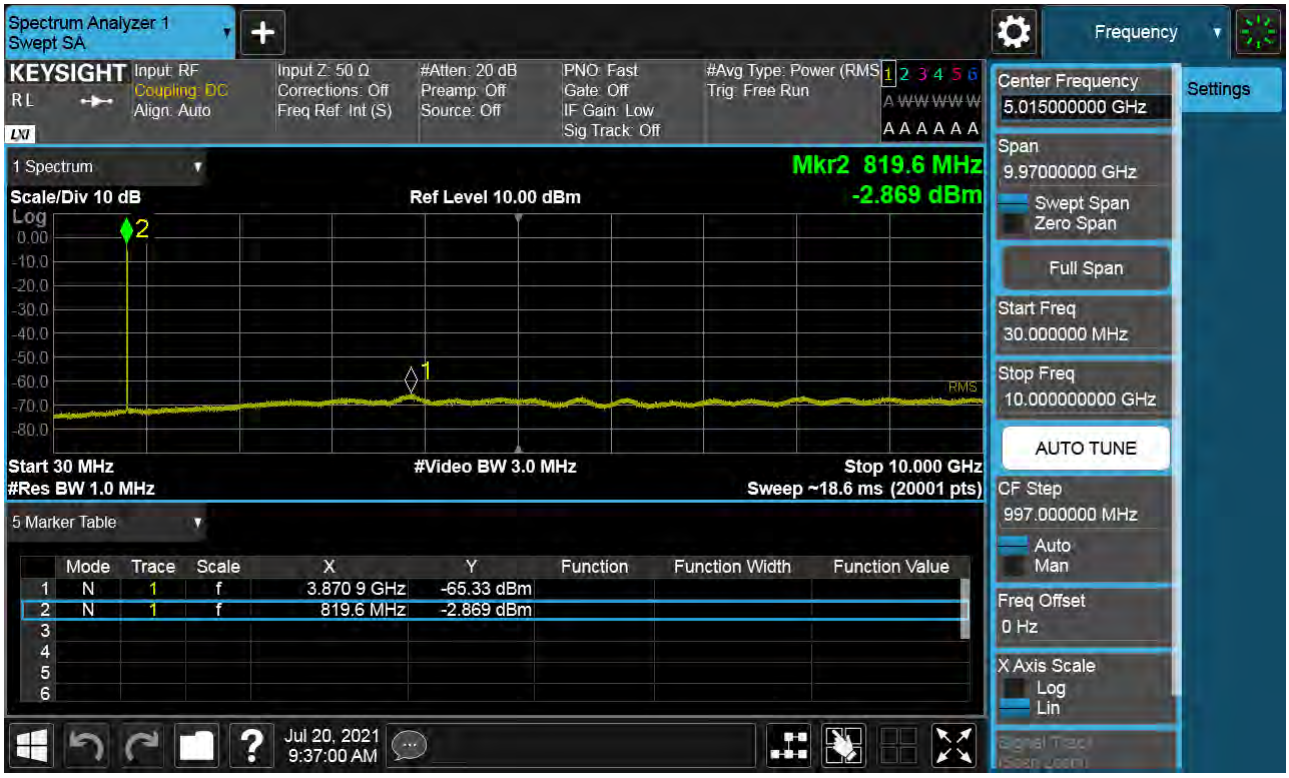
BAND 26. Conducted Spurious (1.4 MHz_QPSK_RB 1_0)



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)

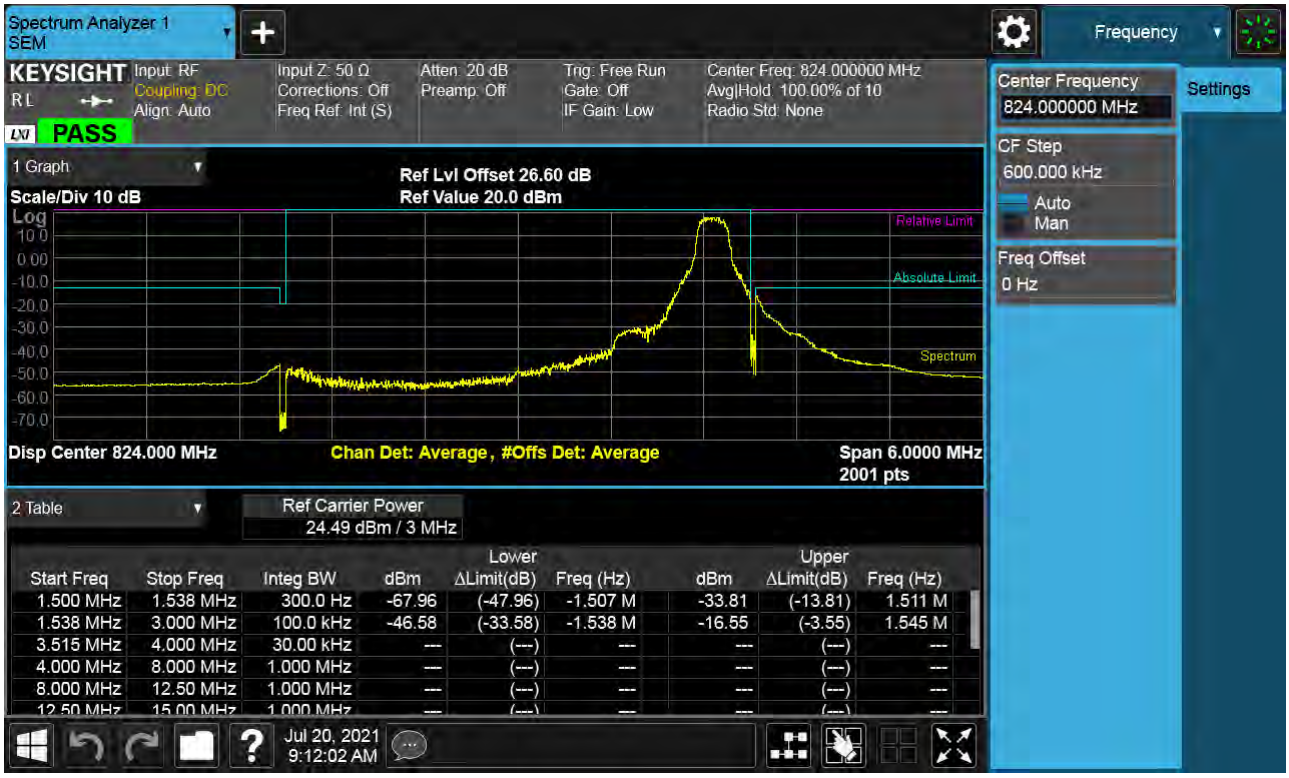
BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_5)

			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
700.0 kHz	737.5 kHz	300.0 Hz	-68.93	(-48.93)	-701.7 k	-42.47	(-22.47)	700.5 k
737.5 kHz	1.400 MHz	100.0 kHz	-45.62	(-32.62)	-883.3 k	-22.27	(-9.27)	737.5 k
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	---	(---)	---	---	(---)	---

BAND 26. Channel Edge (1.4 MHz_QPSK_Full RB)

BAND 26. Channel Edge (3 MHz_QPSK_RB 1_0)

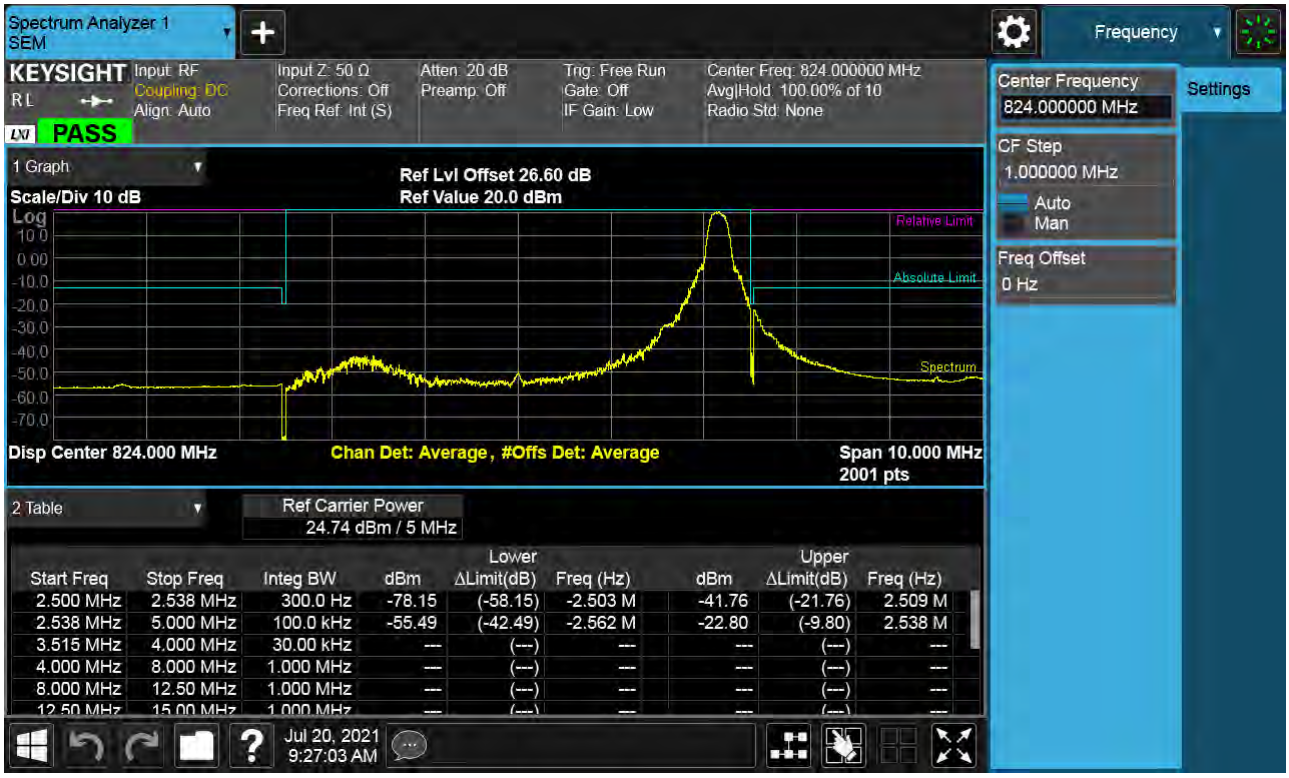
BAND 26. Channel Edge (3 MHz_QPSK_RB 1_14)



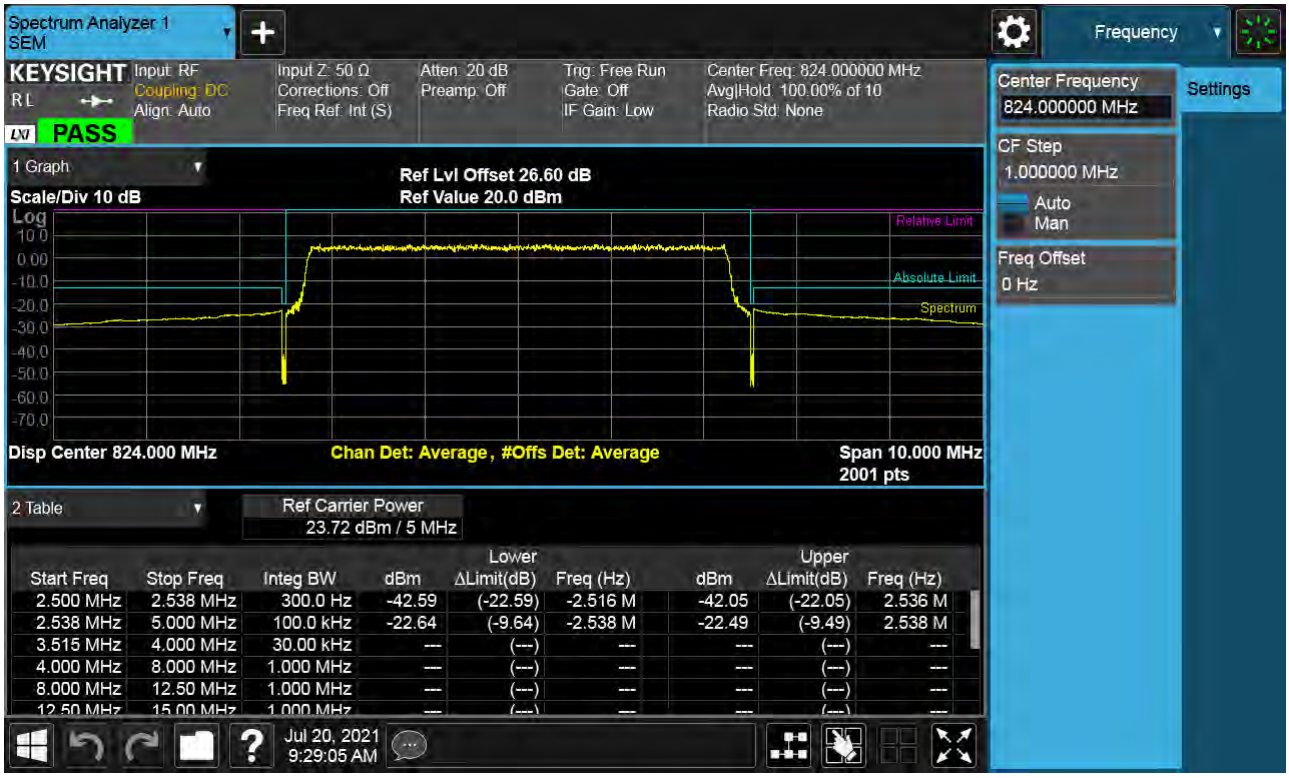
BAND 26. Channel Edge (3 MHz_QPSK_Full RB)

BAND 26. Channel Edge (5 MHz_QPSK_RB 1_0)

BAND 26. Channel Edge (5 MHz_QPSK_RB 1_24)



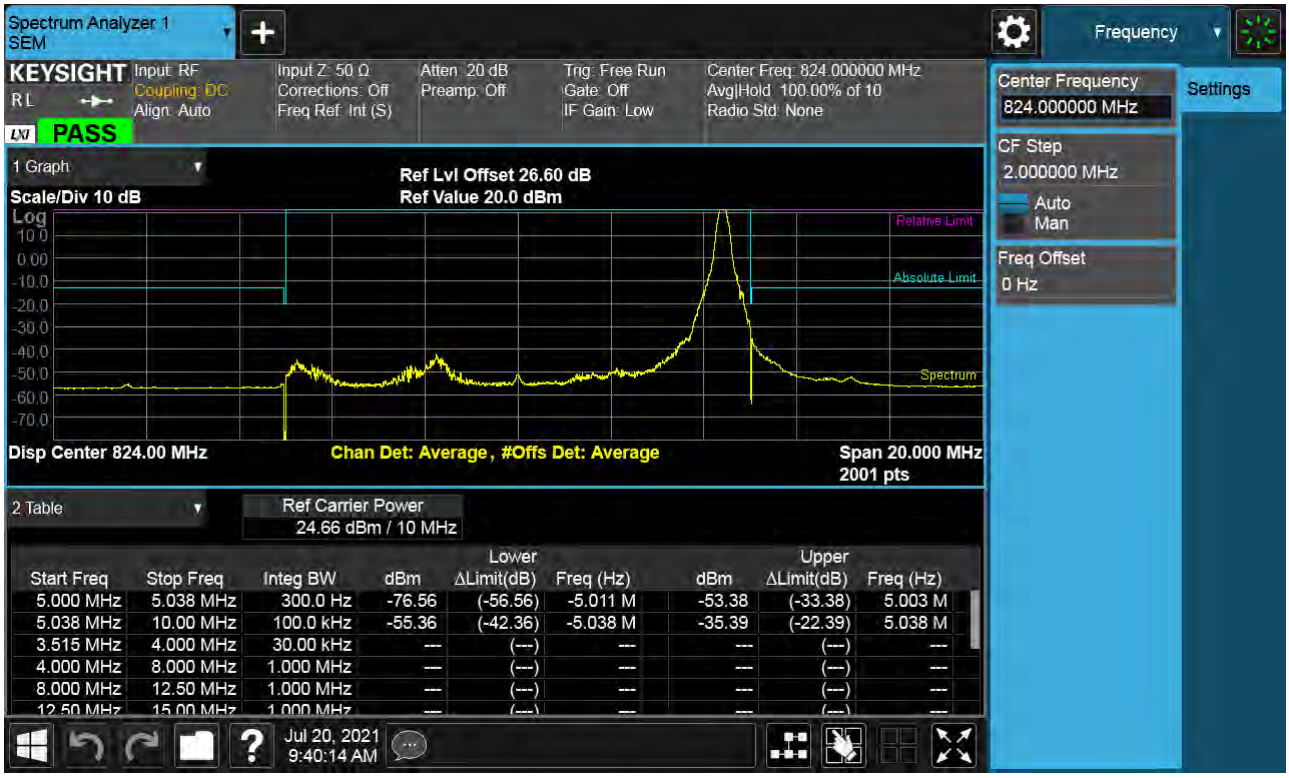
BAND 26. Channel Edge (5 MHz_QPSK_Full RB)



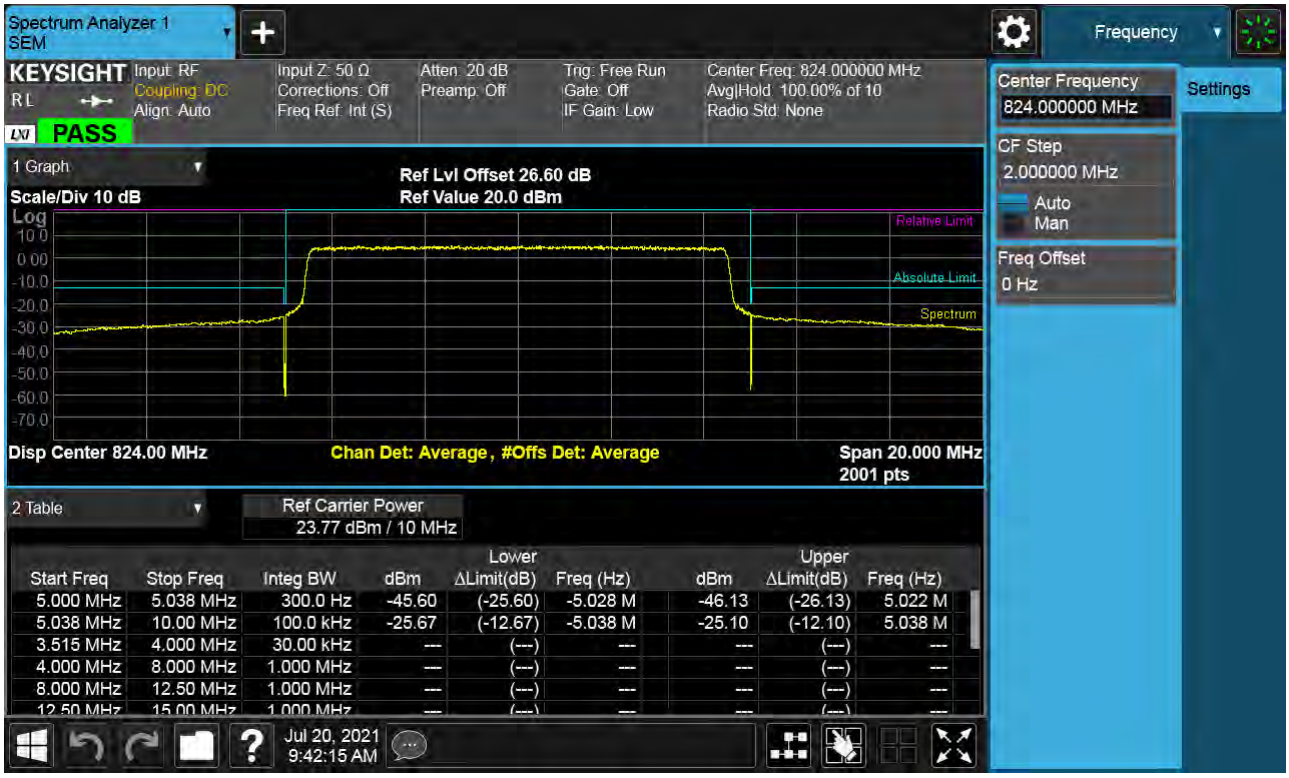
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
2.500 MHz	2.538 MHz	300.0 Hz	-42.59	(-22.59)	-2.516 M	-42.05	(-22.05)	2.536 M
2.538 MHz	5.000 MHz	100.0 kHz	-22.64	(-9.64)	-2.538 M	-22.49	(-9.49)	2.538 M
3.515 MHz	4.000 MHz	30.00 kHz	---	(---)	---	---	(---)	---
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	---	(---)	---	---	(---)	---

BAND 26. Channel Edge (10 MHz_QPSK_RB 1_0)

BAND 26. Channel Edge (10 MHz_QPSK_RB 1_49)



BAND 26. Channel Edge (10 MHz_QPSK_Full RB)



BAND 26. Band Edge (1.4 MHz_QPSK_RB 1_5)

BAND 26. Band Edge (1.4 MHz_QPSK_FullRB)

BAND 26. Band Edge (3 MHz_QPSK_RB 1_14)

BAND 26. Band Edge (3 MHz_QPSK_ Full RB)

BAND 26. Band Edge (5 MHz_QPSK_RB 1_24)

BAND 26. Band Edge (5 MHz_QPSK_ Full RB)

BAND 26. Band Edge (10 MHz_QPSK_RB 1_49)

BAND 26. Band Edge (10 MHz_QPSK_ Full RB)

11 ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2108-FC019-P