

FCC Carrier Aggregation REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Date of Issue:

December 07, 2021

Location:

HCT CO., LTD.,

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

Report No.: HCT-RF-2111-FC056-R1

FCC ID:

A3LSMX808U

APPLICANT:

SAMSUNG Electronics Co., Ltd.

Model(s): SM-X808U
EUT Type: Tablet
FCC Classification: PCS Licensed Transmitter (PCB)
FCC Rule Part(s): §27, §2

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
10 MHz+15 MHz	1715.3 - 1772.5	QPSK	23M2G7D	0.269	24.30
		16QAM	23M1W7D	0.241	23.81
		64QAM	23M2W7D	0.164	22.15
		256QAM	23M0W7D	0.099	19.93
15 MHz+10 MHz	1717.5 - 1774.7	QPSK	23M2G7D	0.265	24.24
		16QAM	23M2W7D	0.232	23.65
		64QAM	23M2W7D	0.157	21.97
		256QAM	23M1W7D	0.100	19.98
10 MHz+20 MHz	1715.5 - 1770.0	QPSK	27M7G7D	0.278	24.44
		16QAM	27M6W7D	0.229	23.60
		64QAM	27M7W7D	0.157	21.96
		256QAM	27M7W7D	0.092	19.63
20 MHz+10 MHz	1720.0 - 1774.5	QPSK	27M8G7D	0.276	24.41
		16QAM	27M8W7D	0.232	23.65
		64QAM	27M8W7D	0.159	22.00
		256QAM	27M7W7D	0.100	19.98
15 MHz+15 MHz	1717.5 - 1772.5	QPSK	28M4G7D	0.263	24.20
		16QAM	28M3W7D	0.229	23.59
		64QAM	28M4W7D	0.155	21.91
		256QAM	28M3W7D	0.097	19.87
15 MHz+20 MHz	1717.8 - 1770.0	QPSK	32M6G7D	0.268	24.28
		16QAM	32M7W7D	0.228	23.58
		64QAM	32M6W7D	0.158	21.99
		256QAM	32M6W7D	0.097	19.85
20 MHz+15 MHz	1720.0 - 1772.2	QPSK	32M7G7D	0.260	24.15
		16QAM	32M6W7D	0.220	23.42
		64QAM	32M7W7D	0.150	21.77
		256QAM	32M6W7D	0.101	20.05
20 MHz+5 MHz	1720.0 - 1776.7	QPSK	22M9G7D	0.240	23.80
		16QAM	22M9W7D	0.214	23.30
		64QAM	22M9W7D	0.147	21.68
		256QAM	22M9W7D	0.100	20.01

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
5 MHz+20 MHz	1713.3 - 1770.0	QPSK	22M9G7D	0.255	24.06
		16QAM	22M9W7D	0.231	23.64
		64QAM	22M8W7D	0.160	22.03
		256QAM	22M8W7D	0.100	20.00
20 MHz+20 MHz	1720.0 - 1770.0	QPSK	37M6G7D	0.261	24.17
		16QAM	37M5W7D	0.216	23.34
		64QAM	37M5W7D	0.143	21.56
		256QAM	37M5W7D	0.093	19.69

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)

Report No.: HCT-RF-2111-FC056-R1

REVIEWED BY



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

Report approved by : Jong Seok Lee
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)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2111-FC056	November 24, 2021	- First Approval Report
HCT-RF-2111-FC056-R1	December 07, 2021	- Added the note on page 24 - Revised the data of conducted spurious emissions - Revised the limit of Equivalent Isotropic Radiated Power - Revised the test method of band edge

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

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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:	A3LSMX808U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§27, §2
EUT Type:	Tablet
Model(s):	SM-X808U
Tx Frequency:	1715.3 - 1772.5: 10 MHz+15 MHz 1717.5 - 1774.7: 15 MHz+10 MHz 1715.5 - 1770.0: 10 MHz+20 MHz 1720.0 - 1774.5: 20 MHz+10 MHz 1717.5 - 1772.5: 15 MHz+15 MHz 1717.8 - 1770.0: 15 MHz+20 MHz 1720.0 - 1772.2: 20 MHz+15 MHz 1720.0 - 1776.7: 20 MHz+5 MHz 1713.3 - 1770.0: 5 MHz+20 MHz 1720.0 - 1770.0: 20 MHz+20 MHz
Date(s) of Tests:	September 17, 2021 ~ November 22, 2021
Serial number:	Radiated: R32R9001N1N Conducted: R32R9001H5N
LTE CA :	CA 66C (Uplink)

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Tablet with UMTS and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160), WIFI 6E, Bluetooth, BT LE, WPT, mmWave(n260/261).

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
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
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 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 $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $> 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

$$P_d \text{ (dBm)} = P_g \text{ (dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.
These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method 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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $> 2 \times$ span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10th harmonics from 9 kHz.

Test Note

1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data
3. For spurious emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated. The spurious emissions is calculated by the following formula;

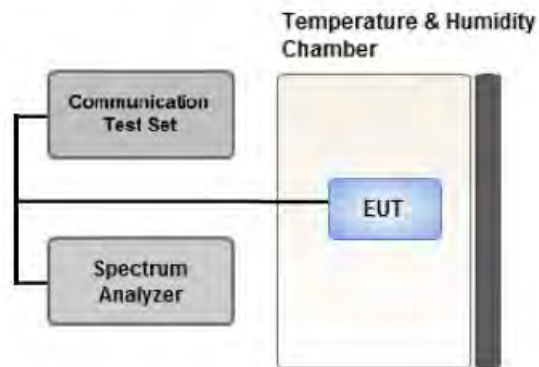
$$\text{Result}_{(\text{dBm})} = P_g_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

Where: P_g is the generator output power into the substitution antenna.

If the fundamental frequency is below 1 GHz, RF output power has been converted to EIRP.

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:
 - .- for continuous transmissions, set to 1 ms,
 - .- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1 %.

② Alternate Procedure for PAPR

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk} .

Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and record as P_{Avg} . Determine the P.A.R. from:

$$P.A.R. (dB) = P_{Pk} (dBm) - P_{Avg} (dBm) \quad (P_{Avg} = \text{Average Power} + \text{Duty cycle Factor})$$

Test Settings(Peak Power)

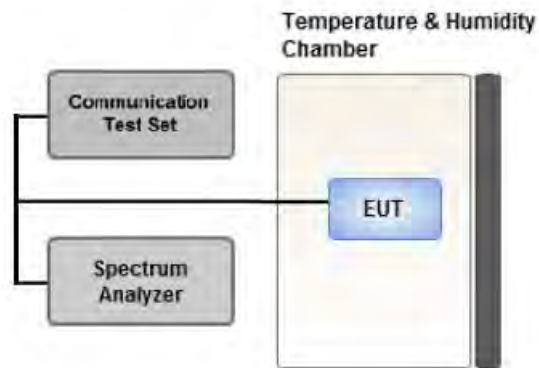
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

1. Set the RBW $\geq$ OBW.
2. Set VBW $\geq 3 \times$ RBW.
3. Set span $\geq 2 \times$ OBW.
4. Sweep time $\geq 10 \times$ (number of points in sweep) $\times$ (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

1. Set span to $2 \times$ to $3 \times$ the OBW.
2. Set RBW $\geq$ OBW.
3. Set VBW $\geq 3 \times$ RBW.
4. Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
5. Sweep time:
Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$ for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to "free run."
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add $[10 \log (1/\text{duty cycle})]$ to the measured maximum power level to compute the average power during continuous transmission. For example, add $[10 \log (1/0.25)] = 6$ dB if the duty cycle is a constant 25 %.

3.5 OCCUPIED BANDWIDTH.



Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

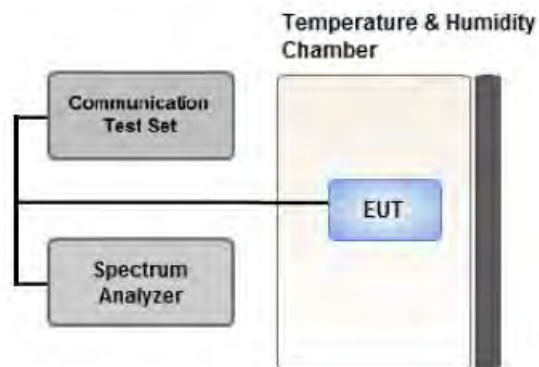
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

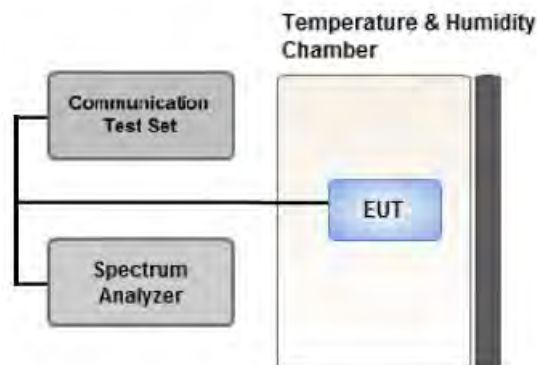
Test Overview

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

Test Settings

1. RBW = 1 MHz
2. VBW $\geq$ 3 MHz
3. Detector = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep $\geq$ 2 x Span / RBW

3.7 BAND EDGE



Test setup

Test Overview

Test Overview

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

Test Settings

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

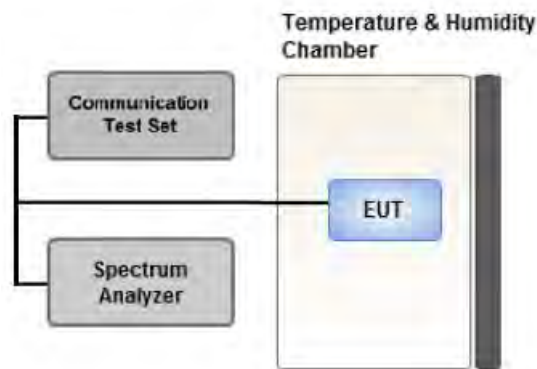
Test Notes

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

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

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

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.

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/28/2022	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2022	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	02/11/2022	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/18/2022	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	09/29/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9168	Schwarzbeck	760	02/22/2023	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262116770	07/12/2022	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	01/07/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

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

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$ 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
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(h)	$< 43 + 10\log_{10} (P[\text{Watts}])$ at Band Edge and for all out-of-band emissions	PASS
Peak- to- Average Ratio	27.50(d)(5)	$< 13 \text{ dB}$	PASS
Frequency stability / variation of ambient temperature	§2.1055, § 27.54	Emission must remain in band	PASS

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	27.50(d)(4)	$< 1 \text{ Watts max. EIRP}$	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(h)	$< 43 + 10\log_{10} (P[\text{Watts}])$ for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

7.2 EIRP Sample Calculation

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

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

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers 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 Note

1. All tests were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth.
2. Channel bandwidth is shown in the tables below based only on the channel bandwidths that were supported in this device.

Channel Bandwidth (PCC)	Channel Bandwidth (SCC)	Maximum aggregated bandwidth (MHz)
10	15	25
15	10	25
10	20	30
20	10	30
15	15	30
15	20	35
20	15	35
20	5	25
5	20	25
20	20	40

3. All modes of operation were investigated and the worst case configuration results are reported in this section.

Please refer to the table below.

- Worst case(Conducted Spurious Emissions, BandEdge)
: We have selected higher of the Conduction Output Power.
 - Worst case(Radiated Spurious Emissions) : We have selected higher of the EIRP.
 - Worst case(OBW, PAR, Frequency stability)
: All modes of operation were investigated and the worst case configuration results are reported.
4. All 3 channels(low/mid/high) of conducted power and radiated power were investigated and the worst case channel results are reported.

[Worst case]

Test Description	Mod	Operating frequency	PCC					SCC				
			BW (MHz)	Freq. (MHz)	Ch.	RB	RB Offset	BW (MHz)	Freq. (MHz)	Ch.	RB	RB Offset
Conducted Spurious Emissions/ Band Edge	QPSK	Low	15	1717.5	132047	1	74	15	1732.5	132197	1	0
	QPSK	Mid	20	1752.5	132397	1	99	5	1764.2	132514	1	0
	QPSK	High	20	1765.0	132522	1	99	5	1776.7	132639	1	0
	QPSK	Low	15	1717.5	132047	1	0	15	1732.5	132197	1	74
	QPSK	Mid	20	1752.5	132397	1	0	5	1764.2	132514	1	24
	QPSK	High	20	1765.0	132522	1	0	5	1776.7	132639	1	24
	QPSK	Low	15	1717.5	132047	75	0	10	1729.5	132167	50	0
	QPSK	Mid	20	1747.6	132348	100	0	15	1764.7	132519	75	0
	QPSK	High	20	1760.1	132473	100	0	10	1774.5	132617	50	0
	QPSK	Low	20	1720.0	132072	100	0	20	1739.8	132270	100	0
	QPSK	Mid	20	1745.1	132323	100	0	20	1764.9	132521	100	0
	QPSK	High	20	1750.2	132374	100	0	20	1770.0	132572	100	0
Radiated Spurious Emissions	QPSK	Low	20	1720.0	132072	1	99	15	1737.1	132243	1	0
	QPSK	Mid	10	1745.6	132328	1	49	20	1760.0	132472	1	0
	QPSK	High	20	1760.1	132473	1	99	10	1774.5	132617	1	0

[Worst case]

Test Description	Mod	Operating frequency	PCC					SCC				
			BW (MHz)	Freq. (MHz)	Ch.	RB	RB Offset	BW (MHz)	Freq. (MHz)	Ch.	RB	RB Offset
OBW, PAR	QPSK, 16QAM, 64QAM 256QAM	Mid	10	1747.9	132351	50	0	15	1759.9	132471	75	0
			15	1750.1	132373	75	0	10	1762.1	132493	50	0
			10	1745.6	132328	50	0	20	1760.0	132472	100	0
			20	1750.1	132373	100	0	10	1764.5	132517	50	0
			15	1747.5	132347	75	0	15	1762.5	132497	75	0
			15	1745.3	132325	75	0	20	1762.4	132496	100	0
			20	1747.6	132348	100	0	15	1764.7	132519	75	0
			20	1752.5	132397	100	0	5	1764.2	132514	25	0
			5	1745.8	132330	25	0	20	1757.5	132447	100	0
			20	1745.1	132323	100	0	20	1764.9	132521	100	0
Frequency stability	QPSK	Low	5	1713.3	132005	25	0	20	1725.0	132122	100	0
			10	1715.3	132025	50	0	15	1727.3	132145	75	0
			15	1717.5	132047	75	0	10	1729.5	132167	50	0
			20	1720.0	132072	100	0	20	1739.8	132270	100	0
		High	5	1758.3	132455	25	0	20	1770.0	132572	100	0
			10	1772.5	132597	50	0	15	1784.5	132717	75	0
			15	1762.7	132499	75	0	10	1774.7	132619	50	0
			20	1750.2	132374	100	0	20	1770.0	132572	100	0

8.1 Conducted Power

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	10	1715.3	132025	1	49	15	1727.3	132145	1	0	24.81
	15	1717.5	132047	1	74	10	1729.5	132167	1	0	24.74
	10	1715.5	132027	1	49	20	1729.9	132171	1	0	24.42
	20	1720.0	132072	1	99	10	1734.4	132216	1	0	24.82
	15	1717.5	132047	1	74	15	1732.5	132197	1	0	24.98
	15	1717.8	132050	1	74	20	1734.9	132221	1	0	24.82
	20	1720.0	132072	1	99	15	1737.1	132243	1	0	24.79
	20	1720.0	132072	1	99	5	1731.7	132189	1	0	24.90
	5	1713.3	132005	1	24	20	1725.0	132122	1	0	24.28
	20	1720.0	132072	1	99	20	1739.8	132270	1	0	24.86
Mid	10	1747.9	132351	1	49	15	1759.9	132471	1	0	24.61
	15	1750.1	132373	1	74	10	1762.1	132493	1	0	24.59
	10	1745.6	132328	1	49	20	1760.0	132472	1	0	24.55
	20	1750.1	132373	1	99	10	1764.5	132517	1	0	24.51
	15	1747.5	132347	1	74	15	1762.5	132497	1	0	24.59
	15	1745.3	132325	1	74	20	1762.4	132496	1	0	24.44
	20	1747.6	132348	1	99	15	1764.7	132519	1	0	24.56
	20	1752.5	132397	1	99	5	1764.2	132514	1	0	24.77
	5	1745.8	132330	1	24	20	1757.5	132447	1	0	24.47
	20	1745.1	132323	1	99	20	1764.9	132521	1	0	24.76
High	10	1760.5	132477	1	49	15	1772.5	132597	1	0	24.69
	15	1762.7	132499	1	74	10	1774.7	132619	1	0	24.75
	10	1755.6	132428	1	49	20	1770.0	132572	1	0	24.65
	20	1760.1	132473	1	99	10	1774.5	132617	1	0	24.73
	15	1757.5	132447	1	74	15	1772.5	132597	1	0	23.95
	15	1752.9	132401	1	74	20	1770.0	132572	1	0	24.62
	20	1755.1	132423	1	99	15	1772.2	132594	1	0	24.69
	20	1765.0	132522	1	99	5	1776.7	132639	1	0	24.76
	5	1758.3	132455	1	24	20	1770.0	132572	1	0	24.61
	20	1750.2	132374	1	99	20	1770.0	132572	1	0	24.63

Note:

Modulation : QPSK(1RB)

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	10	1715.3	132025	50	0	15	1727.3	132145	75	0	22.88
	15	1717.5	132047	75	0	10	1729.5	132167	50	0	23.04
	10	1715.5	132027	50	0	20	1729.9	132171	100	0	22.40
	20	1720.0	132072	100	0	10	1734.4	132216	50	0	22.89
	15	1717.5	132047	75	0	15	1732.5	132197	75	0	22.92
	15	1717.8	132050	75	0	20	1734.9	132221	100	0	22.92
	20	1720.0	132072	100	0	15	1737.1	132243	75	0	22.11
	20	1720.0	132072	100	0	5	1731.7	132189	25	0	22.66
	5	1713.3	132005	25	0	20	1725.0	132122	100	0	21.95
	20	1720.0	132072	100	0	20	1739.8	132270	100	0	22.85
Mid	10	1747.9	132351	50	0	15	1759.9	132471	75	0	22.60
	15	1750.1	132373	75	0	10	1762.1	132493	50	0	22.62
	10	1745.6	132328	50	0	20	1760.0	132472	100	0	22.58
	20	1750.1	132373	100	0	10	1764.5	132517	50	0	22.61
	15	1747.5	132347	75	0	15	1762.5	132497	75	0	22.49
	15	1745.3	132325	75	0	20	1762.4	132496	100	0	22.53
	20	1747.6	132348	100	0	15	1764.7	132519	75	0	22.85
	20	1752.5	132397	100	0	5	1764.2	132514	25	0	22.57
	5	1745.8	132330	25	0	20	1757.5	132447	100	0	22.49
	20	1745.1	132323	100	0	20	1764.9	132521	100	0	22.50
High	10	1760.5	132477	50	0	15	1772.5	132597	75	0	22.37
	15	1762.7	132499	75	0	10	1774.7	132619	50	0	22.63
	10	1755.6	132428	50	0	20	1770.0	132572	100	0	22.59
	20	1760.1	132473	100	0	10	1774.5	132617	50	0	22.66
	15	1757.5	132447	75	0	15	1772.5	132597	75	0	22.57
	15	1752.9	132401	75	0	20	1770.0	132572	100	0	22.52
	20	1755.1	132423	100	0	15	1772.2	132594	75	0	22.65
	20	1765.0	132522	100	0	5	1776.7	132639	25	0	22.33
	5	1758.3	132455	25	0	20	1770.0	132572	100	0	22.61
	20	1750.2	132374	100	0	20	1770.0	132572	100	0	22.47

Note:

Modulation : QPSK(Full RB)

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	15	1717.5	132047	1	74	15	1732.5	132197	1	0	23.50
Mid	20	1752.5	132397	1	99	5	1764.2	132514	1	0	23.88
High	20	1765.0	132522	1	99	5	1776.7	132639	1	0	23.85
Low	15	1717.5	132047	75	0	10	1729.5	132167	50	0	22.00
Mid	20	1747.6	132348	100	0	15	1764.7	132519	75	0	21.90
High	20	1760.1	132473	100	0	10	1774.5	132617	50	0	21.70

Note:

Modulation : 16QAM

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	15	1717.5	132047	1	74	15	1732.5	132197	1	0	22.10
Mid	20	1752.5	132397	1	99	5	1764.2	132514	1	0	22.45
High	20	1765.0	132522	1	99	5	1776.7	132639	1	0	22.29
Low	15	1717.5	132047	75	0	10	1729.5	132167	50	0	21.47
Mid	20	1747.6	132348	100	0	15	1764.7	132519	75	0	21.81
High	20	1760.1	132473	100	0	10	1774.5	132617	50	0	21.68

Note:

Modulation : 64QAM

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	15	1717.5	132047	1	74	15	1732.5	132197	1	0	19.97
Mid	20	1752.5	132397	1	99	5	1764.2	132514	1	0	19.96
High	20	1765.0	132522	1	99	5	1776.7	132639	1	0	19.98
Low	15	1717.5	132047	75	0	10	1729.5	132167	50	0	19.49
Mid	20	1747.6	132348	100	0	15	1764.7	132519	75	0	19.56
High	20	1760.1	132473	100	0	10	1774.5	132617	50	0	19.69

Note:

Modulation : 256QAM

8.2 Equivalent Isotropic Radiated Power

	PCC			SCC			Measured	Substitute	Ant.	C.L	Pol.	E.I.R.P	
	BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset	Level (dBm)	Level (dBm)	Gain (dBi)			W	dBm
Low	10	132025	1/49	15	132145	1/0	-19.66	14.05	10.08	2.05	H	0.162	22.08
	15	132047	1/74	10	132167	1/0	-19.30	14.41	10.08	2.05	H	0.176	22.44
	10	132027	1/49	20	132171	1/0	-19.74	13.97	10.08	2.05	H	0.159	22.00
	20	132072	1/99	10	132216	1/0	-19.09	14.61	10.12	2.05	H	0.185	22.68
	15	132047	1/74	15	132197	1/0	-19.33	14.38	10.10	2.05	H	0.175	22.43
	15	132050	1/74	20	132221	1/0	-19.09	14.62	10.10	2.05	H	0.185	22.67
	20	132072	1/99	15	132243	1/0	-18.56	15.14	10.12	2.05	H	0.209	23.21
	20	132072	1/99	5	132189	1/0	-18.78	14.93	10.10	2.05	H	0.199	22.98
	5	132005	1/24	20	132122	1/0	-19.63	14.08	10.08	2.05	H	0.163	22.11
	20	132072	1/99	20	132270	1/0	-18.87	14.83	10.12	2.05	H	0.195	22.90
Mid	10	132025	1/49	15	132471	1/0	-17.55	16.16	10.20	2.06	H	0.269	24.30
	15	132047	1/74	10	132493	1/0	-17.58	16.09	10.21	2.06	H	0.265	24.24
	10	132027	1/49	20	132472	1/0	-17.41	16.30	10.20	2.06	H	0.278	24.44
	20	132072	1/99	10	132517	1/0	-17.53	16.09	10.22	2.06	H	0.266	24.25
	15	132047	1/74	15	132497	1/0	-17.62	16.05	10.21	2.06	H	0.263	24.20
	15	132050	1/74	20	132496	1/0	-17.74	15.97	10.20	2.06	H	0.258	24.11
	20	132072	1/99	15	132519	1/0	-17.89	15.78	10.21	2.06	H	0.247	23.93
	20	132072	1/99	5	132514	1/0	-17.98	15.64	10.22	2.06	H	0.240	23.80
	5	132005	1/24	20	132447	1/0	-17.79	15.92	10.20	2.06	H	0.255	24.06
	20	132072	1/99	20	132521	1/0	-17.98	15.69	10.21	2.06	H	0.242	23.84
High	10	132025	1/49	15	132597	1/0	-17.71	15.95	10.23	2.07	H	0.258	24.11
	15	132047	1/74	10	132619	1/0	-17.64	16.05	10.24	2.07	H	0.264	24.22
	10	132027	1/49	20	132572	1/0	-18.02	15.60	10.22	2.06	H	0.238	23.76
	20	132072	1/99	10	132617	1/0	-17.45	16.24	10.24	2.07	H	0.276	24.41
	15	132047	1/74	15	132597	1/0	-17.96	15.70	10.23	2.07	H	0.243	23.86
	15	132050	1/74	20	132572	1/0	-17.50	16.12	10.22	2.06	H	0.268	24.28
	20	132072	1/99	15	132594	1/0	-17.63	15.99	10.22	2.06	H	0.260	24.15
	20	132072	1/99	5	132639	1/0	-18.60	15.09	10.24	2.07	H	0.212	23.26
	5	132005	1/24	20	132572	1/0	-17.87	15.79	10.23	2.07	H	0.248	23.95
	20	132072	1/99	20	132572	1/0	-17.61	16.01	10.22	2.06	H	0.261	24.17

Note:

1. Modulation : QPSK
2. Limit : < 1 Watts

PCC			SCC			Measured	Substitute	Ant.			E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset	Level (dBm)	Level (dBm)	Gain (dBi)	C.L	Pol.	W	dBm
20	132072	1/99	15	132243	1/0	-19.49	14.21	10.12	2.05	H	0.169	22.28
10	132025	1/49	15	132471	1/0	-18.04	15.67	10.20	2.06	H	0.241	23.81
15	132047	1/74	10	132493	1/0	-18.17	15.50	10.21	2.06	H	0.232	23.65
10	132027	1/49	20	132472	1/0	-18.25	15.46	10.20	2.06	H	0.229	23.60
20	132072	1/99	10	132517	1/0	-18.28	15.34	10.22	2.06	H	0.224	23.50
15	132047	1/74	15	132497	1/0	-18.23	15.44	10.21	2.06	H	0.229	23.59
15	132050	1/74	20	132496	1/0	-18.27	15.44	10.20	2.06	H	0.228	23.58
20	132072	1/99	15	132519	1/0	-18.40	15.27	10.21	2.06	H	0.220	23.42
20	132072	1/99	5	132514	1/0	-18.48	15.14	10.22	2.06	H	0.214	23.30
5	132005	1/24	20	132447	1/0	-18.21	15.50	10.20	2.06	H	0.231	23.64
20	132072	1/99	20	132521	1/0	-18.48	15.19	10.21	2.06	H	0.216	23.34
20	132072	1/99	10	132617	1/0	-18.21	15.48	10.24	2.07	H	0.232	23.65

Note:

1. Modulation : 16QAM
2. Limit : < 1 Watts

PCC			SCC			Measured	Substitute	Ant.			E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset	Level (dBm)	Level (dBm)	Gain (dBi)	C.L	Pol.	W	dBm
20	132072	1/99	15	132243	1/0	-21.20	12.50	10.12	2.05	H	0.114	20.57
10	132025	1/49	15	132471	1/0	-19.70	14.01	10.20	2.06	H	0.164	22.15
15	132047	1/74	10	132493	1/0	-19.85	13.82	10.21	2.06	H	0.157	21.97
10	132027	1/49	20	132472	1/0	-19.89	13.82	10.20	2.06	H	0.157	21.96
20	132072	1/99	10	132517	1/0	-19.87	13.75	10.22	2.06	H	0.155	21.91
15	132047	1/74	15	132497	1/0	-19.91	13.76	10.21	2.06	H	0.155	21.91
15	132050	1/74	20	132496	1/0	-19.86	13.85	10.20	2.06	H	0.158	21.99
20	132072	1/99	15	132519	1/0	-20.05	13.62	10.21	2.06	H	0.150	21.77
20	132072	1/99	5	132514	1/0	-20.10	13.52	10.22	2.06	H	0.147	21.68
5	132005	1/24	20	132447	1/0	-19.82	13.89	10.20	2.06	H	0.160	22.03
20	132072	1/99	20	132521	1/0	-20.26	13.41	10.21	2.06	H	0.143	21.56
20	132072	1/99	10	132617	1/0	-19.86	13.83	10.24	2.07	H	0.159	22.00

Note:

1. Modulation : 64QAM
2. Limit : < 1 Watts

PCC			SCC			Measured	Substitute	Ant.			E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset	Level (dBm)	Level (dBm)	Gain (dBi)	C.L	Pol.	W	dBm
20	132072	1/99	15	132243	1/0	-22.91	10.79	10.12	2.05	H	0.077	18.86
10	132025	1/49	15	132471	1/0	-21.92	11.79	10.20	2.06	H	0.099	19.93
15	132047	1/74	10	132493	1/0	-21.84	11.83	10.21	2.06	H	0.100	19.98
10	132027	1/49	20	132472	1/0	-22.22	11.49	10.20	2.06	H	0.092	19.63
20	132072	1/99	10	132517	1/0	-21.80	11.82	10.22	2.06	H	0.100	19.98
15	132047	1/74	15	132497	1/0	-21.95	11.72	10.21	2.06	H	0.097	19.87
15	132050	1/74	20	132496	1/0	-22.00	11.71	10.20	2.06	H	0.097	19.85
20	132072	1/99	15	132519	1/0	-21.77	11.90	10.21	2.06	H	0.101	20.05
20	132072	1/99	5	132514	1/0	-21.77	11.85	10.22	2.06	H	0.100	20.01
5	132005	1/24	20	132447	1/0	-21.85	11.86	10.20	2.06	H	0.100	20.00
20	132072	1/99	20	132521	1/0	-22.13	11.54	10.21	2.06	H	0.093	19.69
20	132072	1/99	10	132617	1/0	-21.95	11.74	10.24	2.07	H	0.098	19.91

Note:

1. Modulation : 256QAM
2. Limit : < 1 Watts

8.3 Conducted Spurious Emissions

Operating frequency	PCC				SCC				Measurement	Factor (dB)	Measurement	Result (dBm)
	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset	Maximum Frequency (GHz)		Maximum Data (dBm)	
Low	15	132047	1717.5	1/74	15	132197	1732.5	1/0	5.2393	28.591	-74.16	-45.57
Mid	20	132397	1752.5	1/99	5	132514	1764.2	1/0	3.8041	27.976	-74.05	-46.07
High	20	132522	1765.0	1/99	5	132639	1776.7	1/0	8.2313	28.591	-74.15	-45.56
Low	15	132047	1717.5	1/0	15	132197	1732.5	1/74	8.8539	28.591	-75.25	-46.66
Mid	20	132397	1752.5	1/0	5	132514	1764.2	1/24	9.6820	28.591	-73.48	-44.89
High	20	132522	1765.0	1/0	5	132639	1776.7	1/24	3.8146	27.976	-73.97	-45.99
Low	15	132047	1717.5	75/0	10	132167	1729.5	50/0	4.9273	27.976	-74.43	-46.45
Mid	20	132348	1747.6	100/0	15	132519	1764.7	75/0	8.2946	28.591	-74.33	-45.74
High	20	132473	1760.1	100/0	10	132617	1774.5	50/0	8.8809	28.591	-73.68	-46.09
Low	20	132072	1720.0	100/0	20	132270	1739.8	100/0	3.7957	27.976	-74.50	-46.53
Mid	20	132323	1745.1	100/0	20	132521	1764.9	100/0	3.7752	27.976	-74.46	-46.48
High	20	132374	1750.2	100/0	20	132572	1770.0	100/0	9.1127	28.591	-74.19	-45.60

Note:

1. Modulation : QPSK
2. Factor(dB) = Cable Loss + Ext. Attenuator + Power Splitter
3. Factors for frequency :

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

4. Limit : -13.0 dBm

Frequency Range : 30 MHz ~ 10 GHz

PCC 15 MHz Ch132047 RB1 Offset0 SCC 15 MHz Ch132197 RB1 Offset74



PCC 15 MHz Ch132047 RB1 Offset74 SCC 15 MHz Ch132197 RB1 Offset0



PCC 15 MHz Ch132047 RB75 Offset0 SCC 10 MHz Ch132167 RB50 Offset0



PCC 20 MHz Ch132072 RB100 Offset0 SCC 20 MHz Ch132270 RB100 Offset0



PCC 20 MHz Ch132323 RB100 Offset0 SCC 20 MHz Ch132521 RB100 Offset0



PCC 20 MHz Ch132348 RB100 Offset0 SCC 15 MHz Ch132519 RB75 Offset0



PCC 20 MHz Ch132374 RB100 Offset0 SCC 20 MHz Ch132572 RB100 Offset0



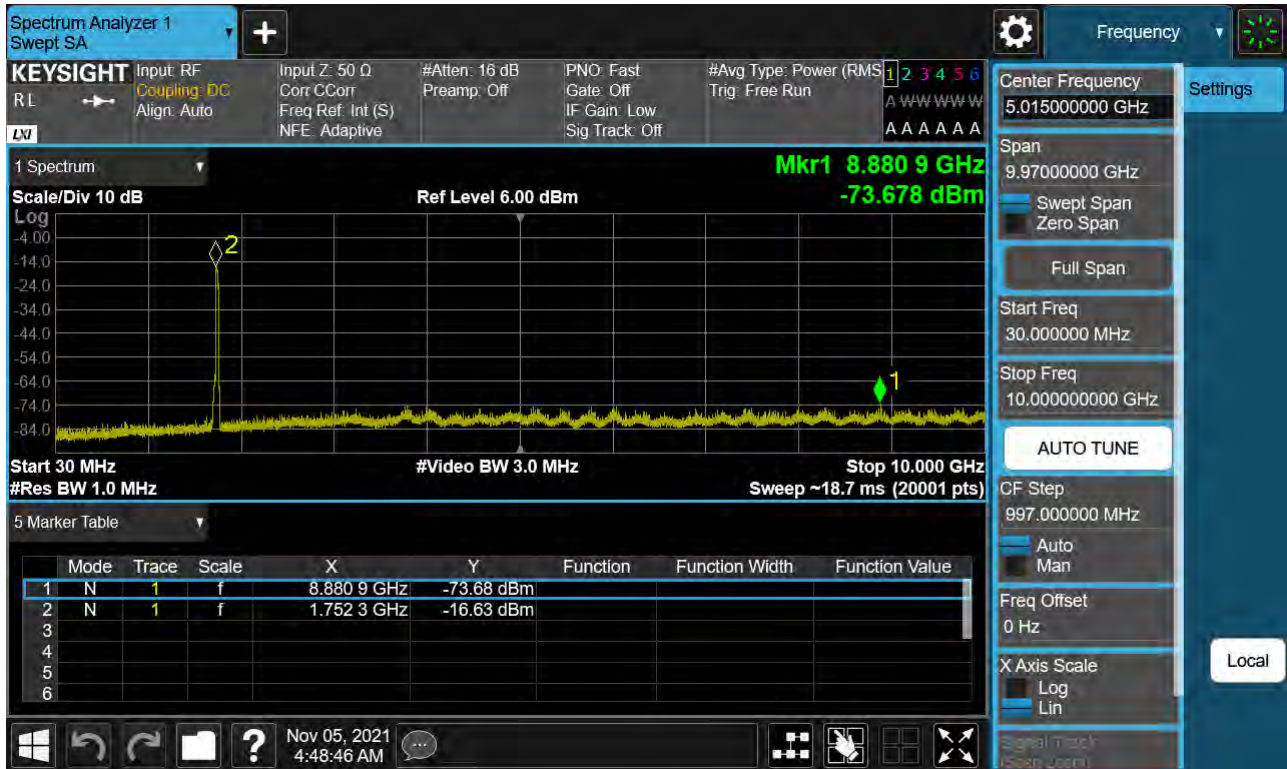
PCC 20 MHz Ch132397 RB1 Offset0 SCC 5 MHz Ch132514 RB1 Offset24



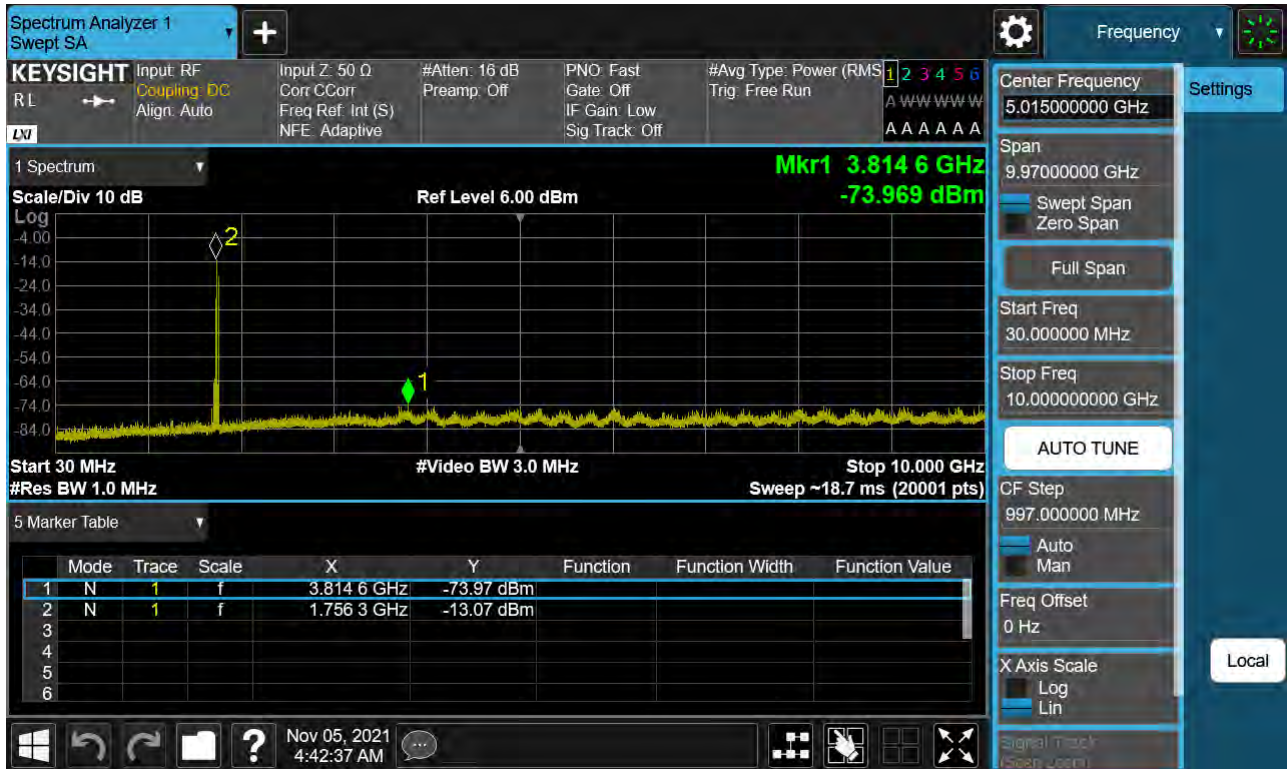
PCC 20 MHz Ch132397 RB1 Offset99 SCC 5 MHz Ch132514 RB1 Offset0



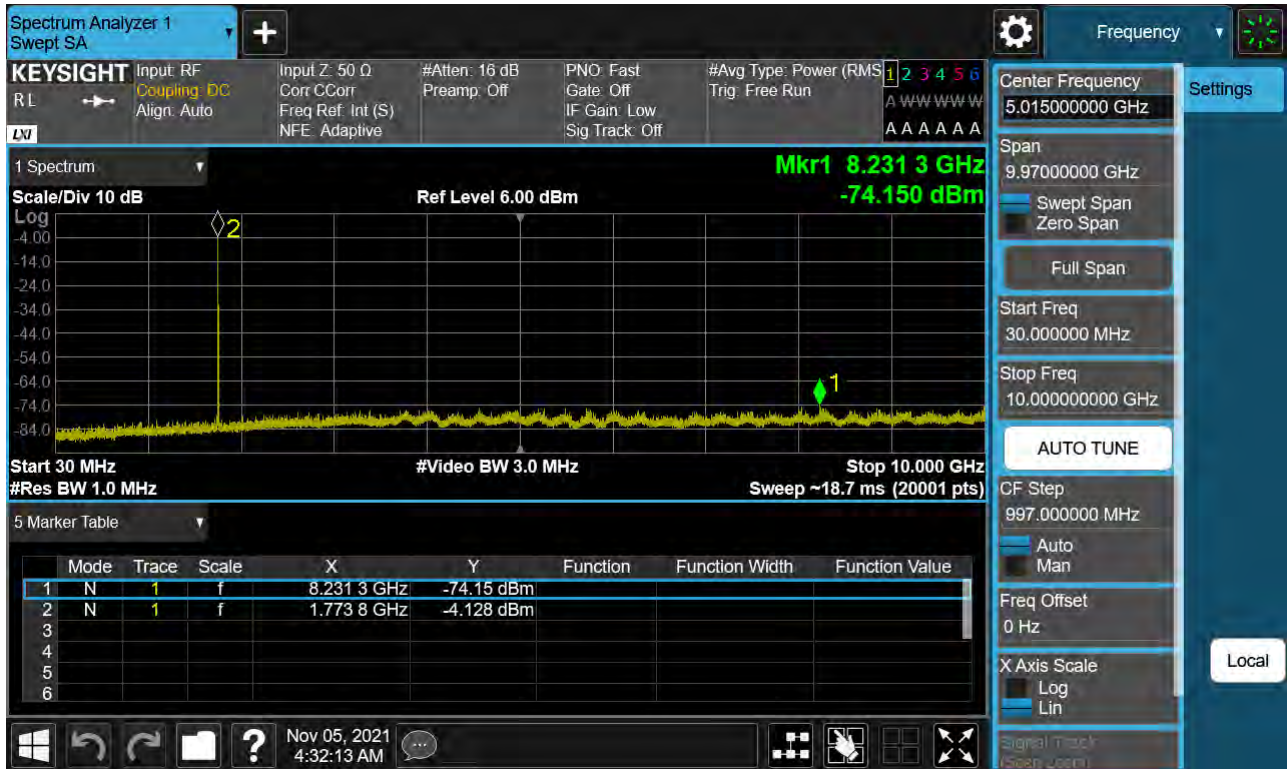
PCC 20 MHz Ch132473 RB100 Offset0 SCC 10 MHz Ch132617 RB50 Offset0



PCC 20 MHz Ch132522 RB1 Offset0 SCC 5 MHz Ch132639 RB1 Offset24

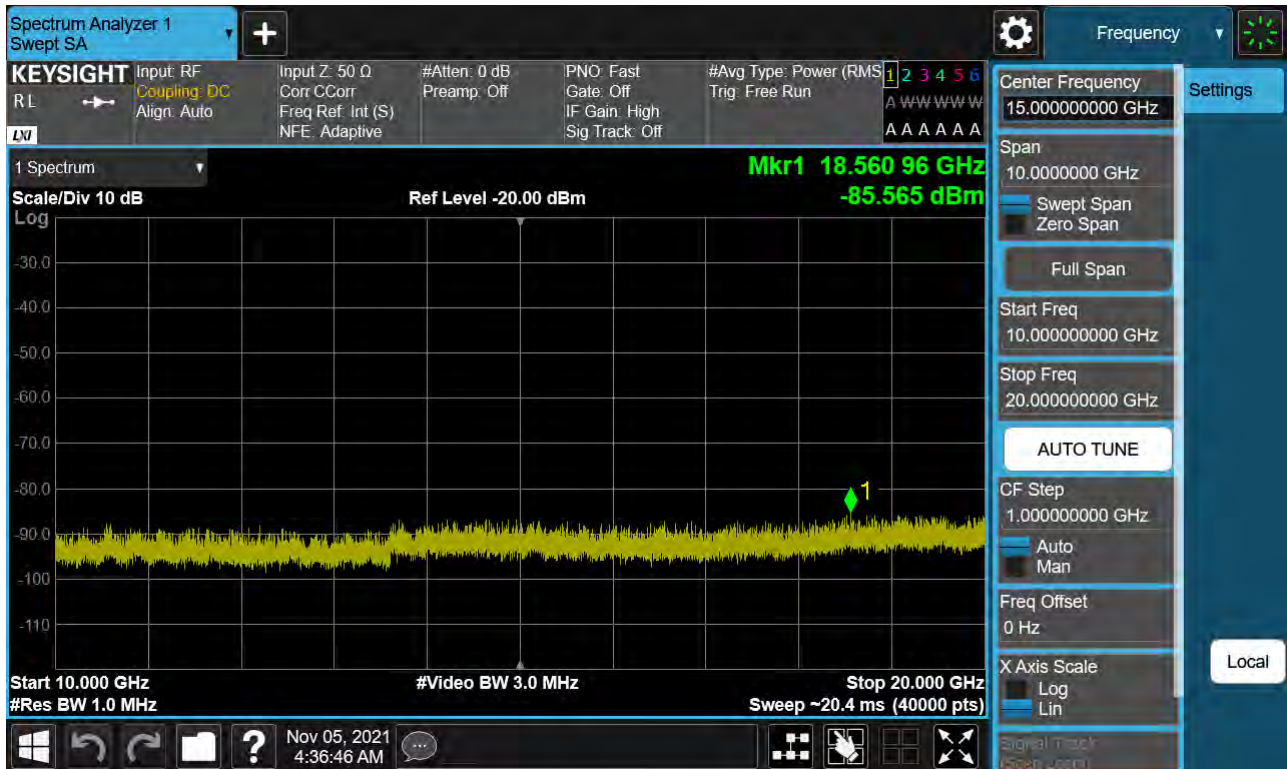


PCC 20 MHz Ch132522 RB1 Offset99 SCC 5 MHz Ch132639 RB1 Offset0



Frequency Range : 10 GHz ~ 26.5 GHz

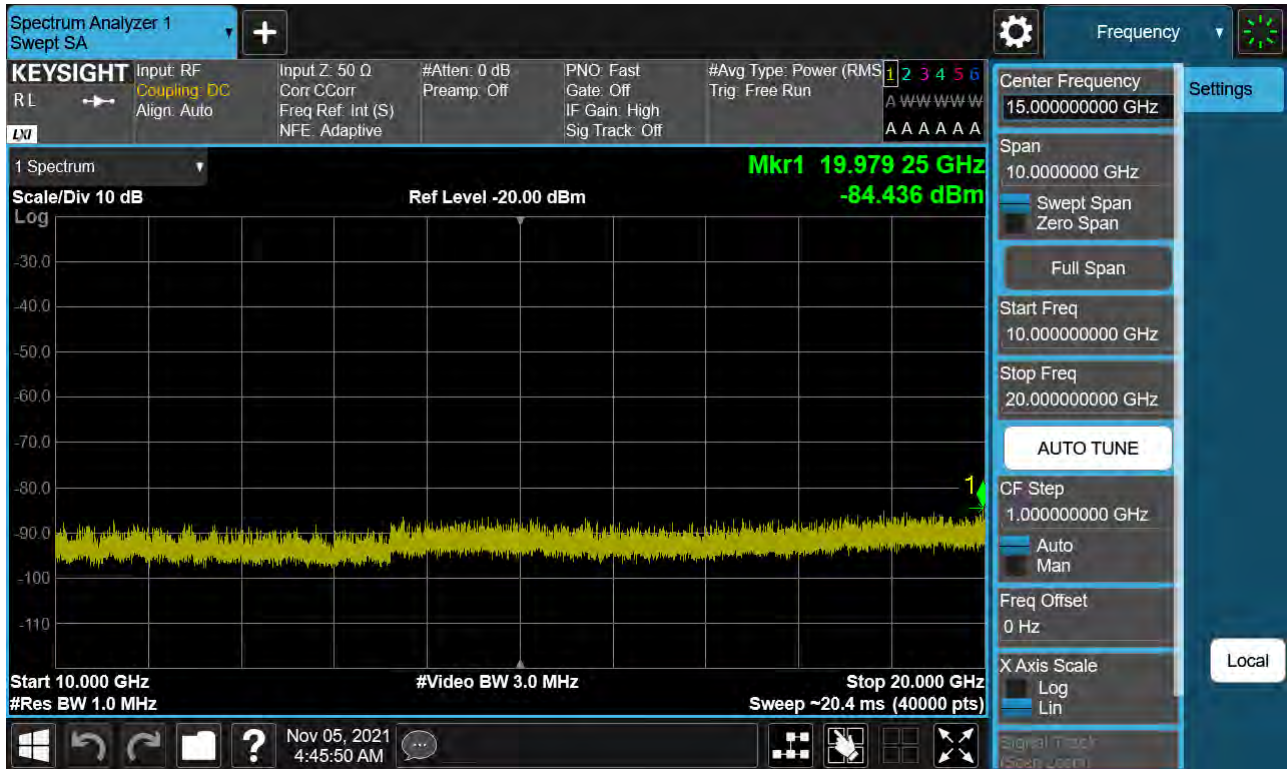
PCC 15 MHz Ch132047 RB1 Offset0, SCC 15 MHz Ch132197 RB1 Offset74



PCC 15 MHz Ch132047 RB1 Offset74, SCC 15 MHz Ch132197 RB1 Offset0



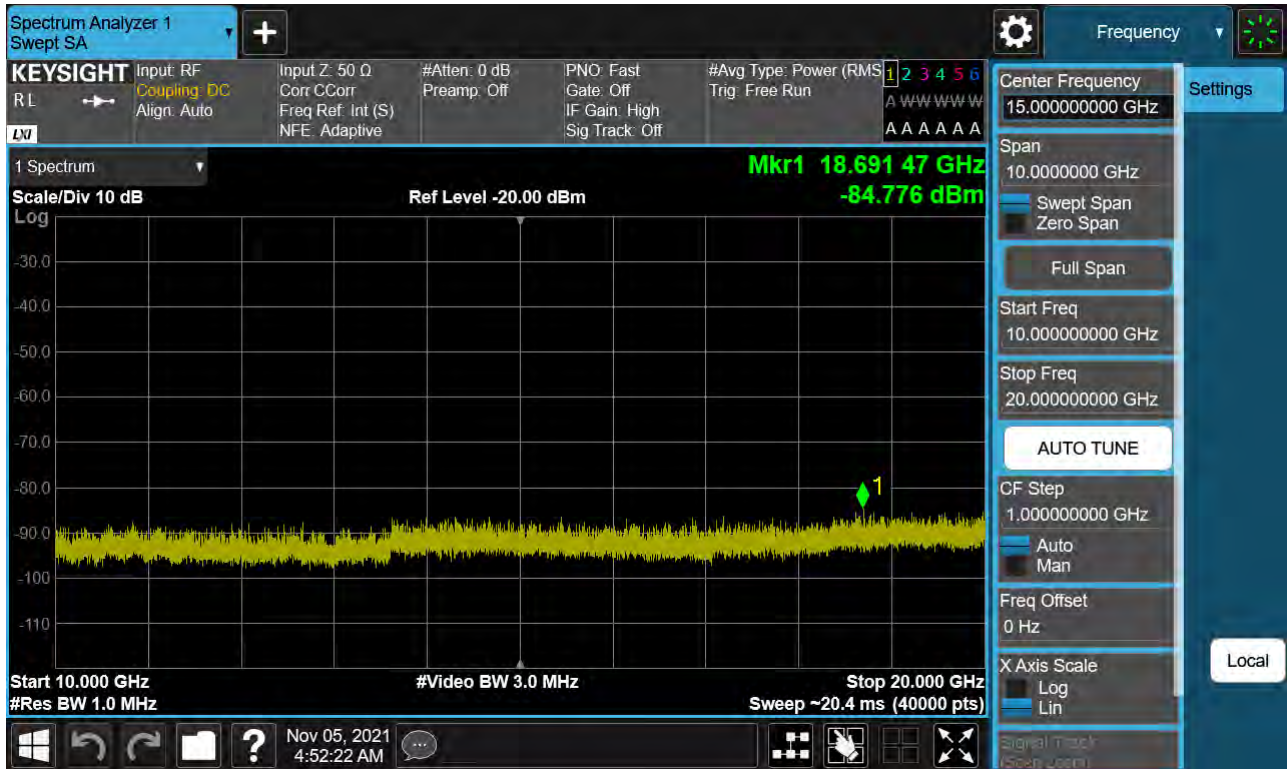
PCC 15 MHz Ch132047 RB75 Offset0, SCC 10 MHz Ch132167 RB50 Offset0



PCC 20 MHz Ch132072 RB100 Offset0, SCC 20 MHz Ch132270 RB100 Offset0



PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0



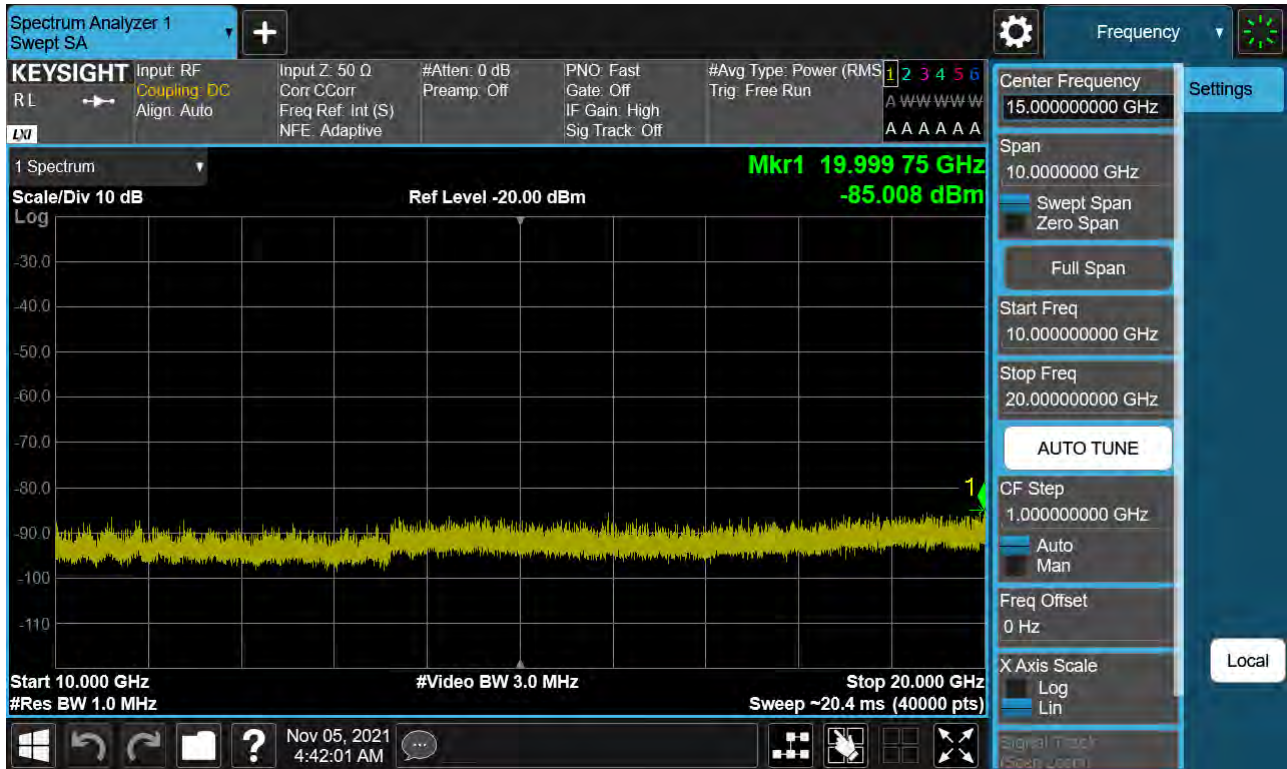
PCC 20 MHz Ch132348 RB100 Offset0, SCC 15 MHz Ch132519 RB75 Offset0



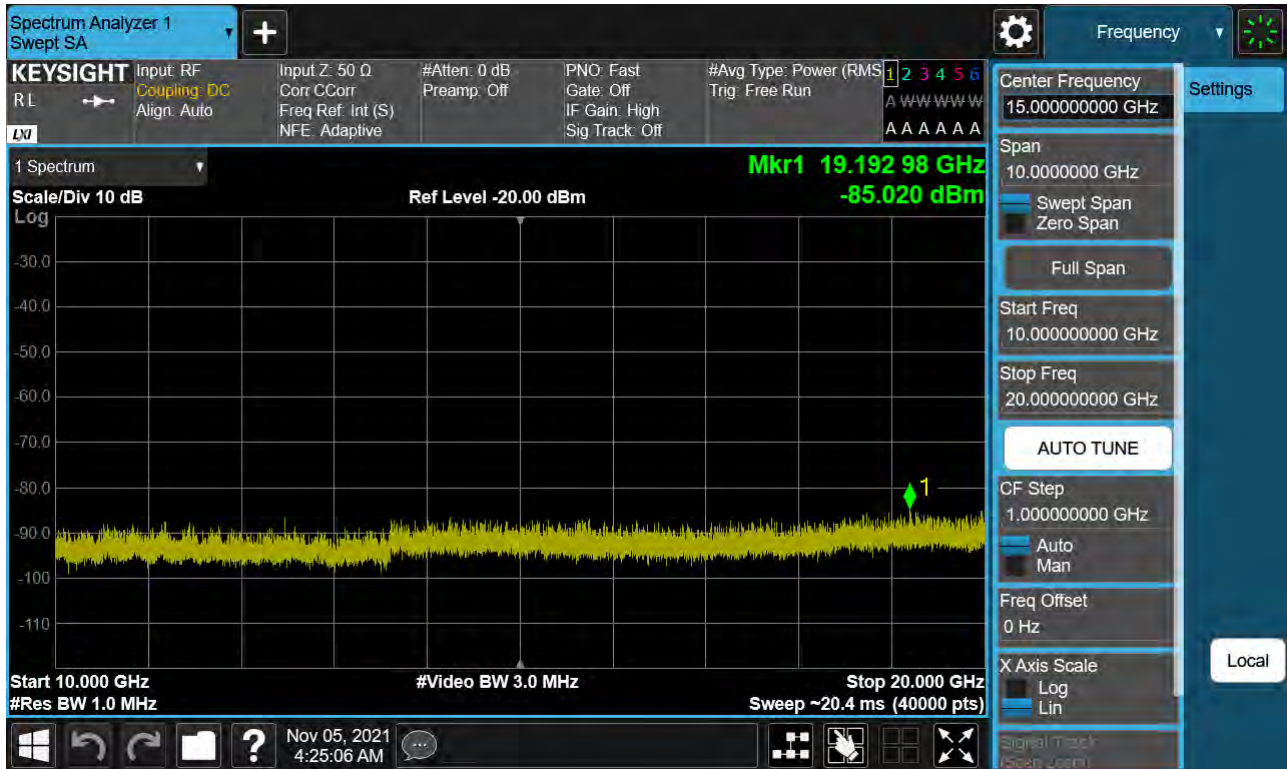
PCC 20 MHz Ch132374 RB100 Offset0, SCC 20 MHz Ch132572 RB100 Offset0



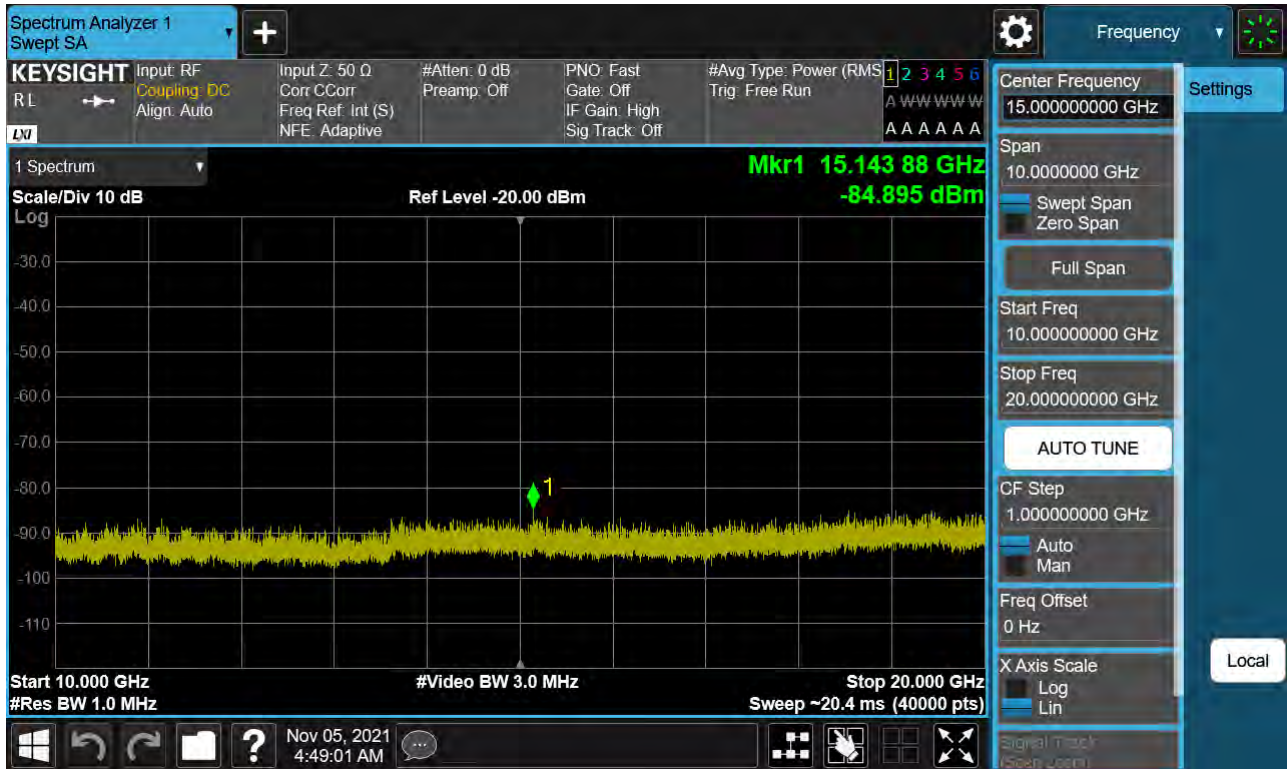
PCC 20 MHz Ch132397 RB1 Offset0, SCC 5 MHz Ch132514 RB1 Offset24



PCC 20 MHz Ch132397 RB1 Offset99, SCC 5 MHz Ch132514 RB1 Offset0



PCC 20 MHz Ch132473 RB100 Offset0, SCC 10 MHz Ch132617 RB50 Offset0



PCC 20 MHz Ch132522 RB1 Offset0, SCC 5 MHz Ch132639 RB1 Offset24



PCC 20 MHz Ch132522 RB1 Offset99, SCC 5 MHz Ch132639 RB1 Offset0



8.4 Channel Edge

Lowest Channel_PCC 15 MHz Ch132047 RB1 Offset0 SCC 15 MHz Ch132197 RB1 Offset74(1)



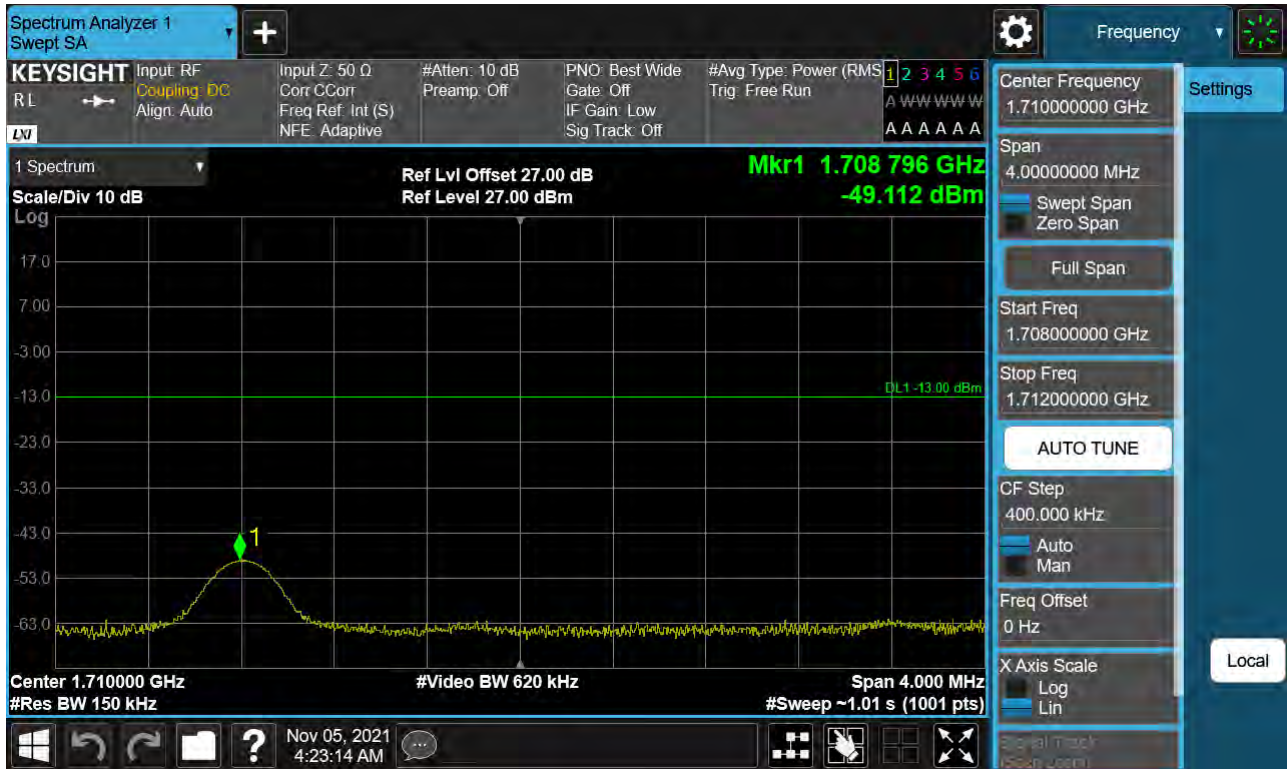
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(300 kHz/150 kHz) dB = -34.663 dBm + 3.010 dB = -31.653 dBm

Lowest Channel_PCC 15 MHz Ch132047 RB1 Offset0 SCC 15 MHz Ch132197 RB1 Offset74(2)



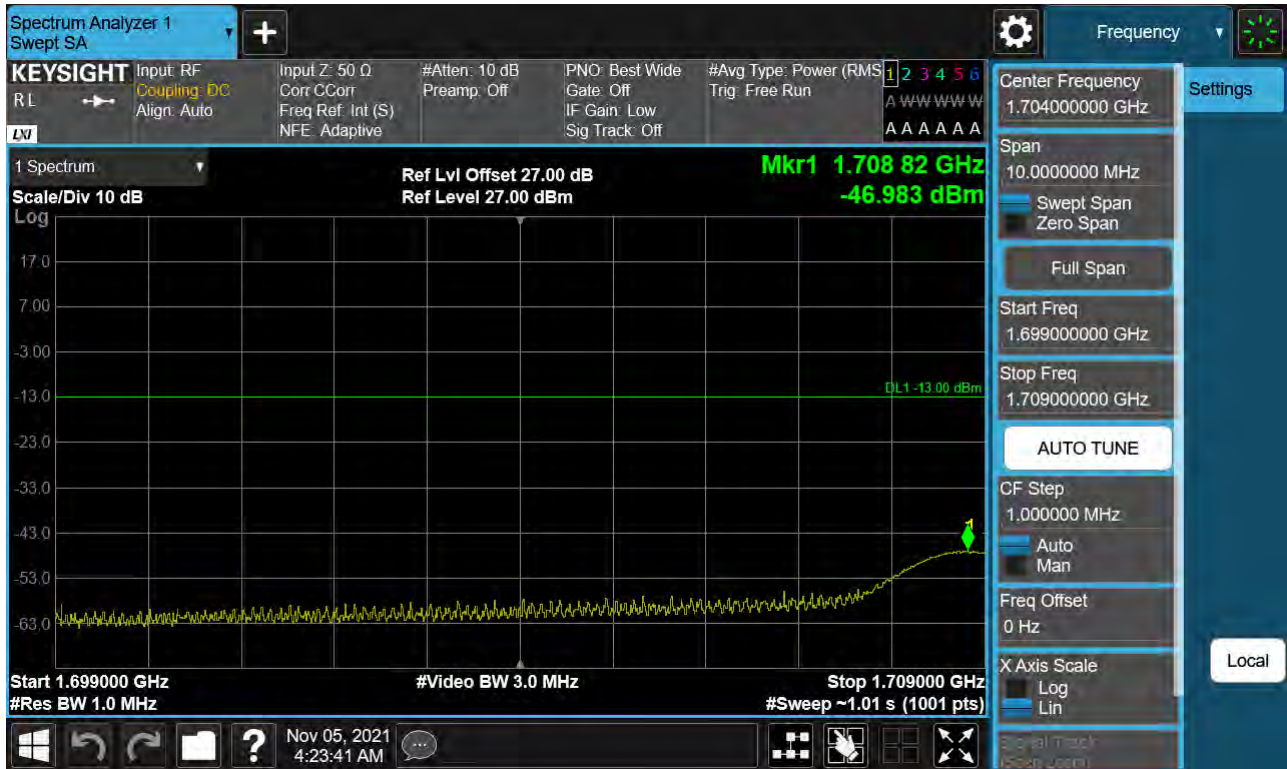
Lowest Channel_PCC 15 MHz Ch132047 RB1 Offset74 SCC 15 MHz Ch132197 RB1 Offset0(1)



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(300 kHz/150 kHz) dB = -49.112 dBm + 3.010 dB = -46.102 dBm

Lowest Channel_PCC 15 MHz Ch132047 RB1 Offset74 SCC 15 MHz Ch132197 RB1 Offset0(2)



Lowest Channel_PCC 15 MHz Ch132047 RB75 Offset0 SCC 10 MHz Ch132167 RB50 Offset0(2)



Lowest Channel_PCC 20 MHz Ch132072 RB100 Offset0 SCC 20 MHz Ch132270 RB100 Offset0(1)



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(400 kHz/200 kHz) dB = -37.536 dBm + 3.010 dB = -34.526 dBm

Lowest Channel_PCC 20 MHz Ch132072 RB100 Offset0 SCC 20 MHz Ch132270 RB100 Offset0(2)



Highest Channel_PCC 20 MHz Ch132374 RB100 Offset0 SCC 20 MHz Ch132572 RB100 Offset0(1)



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(400 kHz/200 kHz) dB = -41.538 dBm + 3.010 dB = -38.528 dBm

Highest Channel_PCC 20 MHz Ch132374 RB100 Offset0 SCC 20 MHz Ch132572 RB100 Offset0(2)



Highest Channel_PCC 20 MHz Ch132473 RB100 Offset0 SCC 10 MHz Ch132617 RB50 Offset0(1)



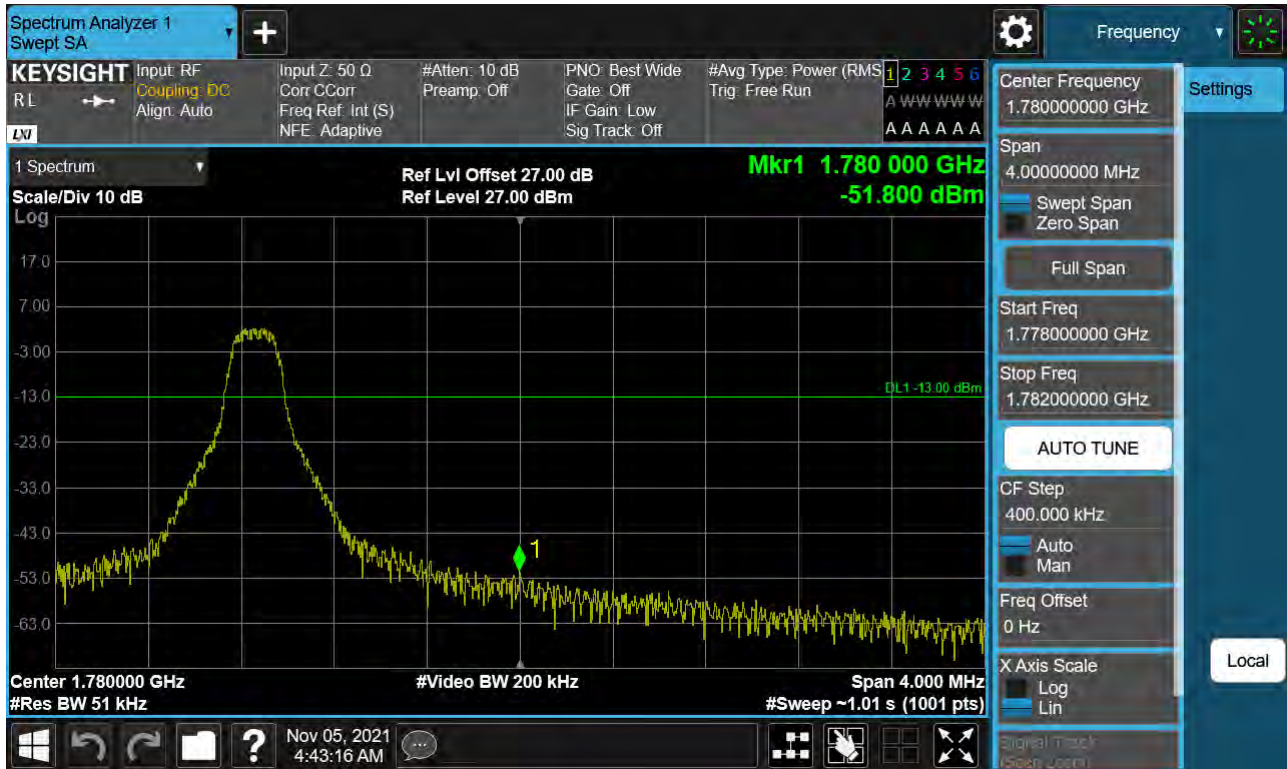
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(300 kHz/100 kHz) dB = -45.742 dBm + 4.771 dB = -40.971 dBm

Highest Channel_PCC 20 MHz Ch132473 RB100 Offset0 SCC 10 MHz Ch132617 RB50 Offset0(2)



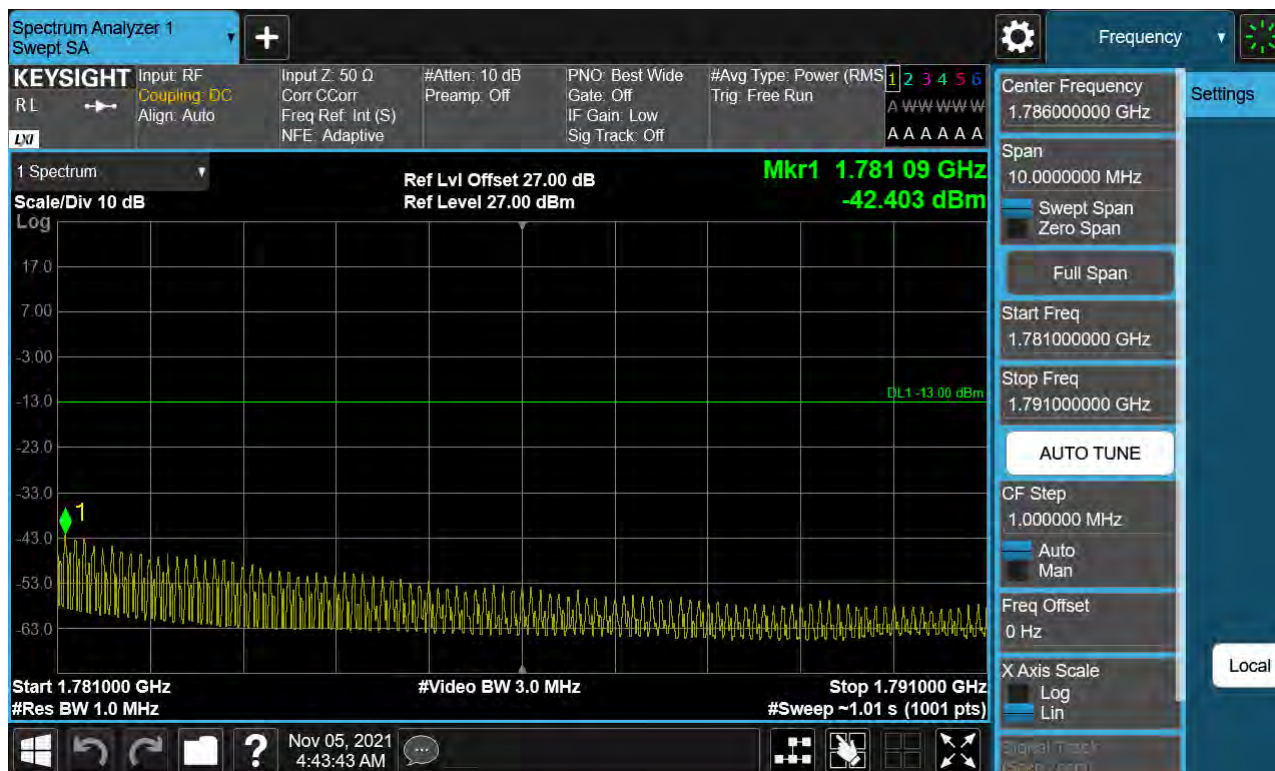
Highest Channel_PCC 20 MHz Ch132522 RB1 Offset0 SCC 5 MHz Ch132639 RB1 Offset24(1)



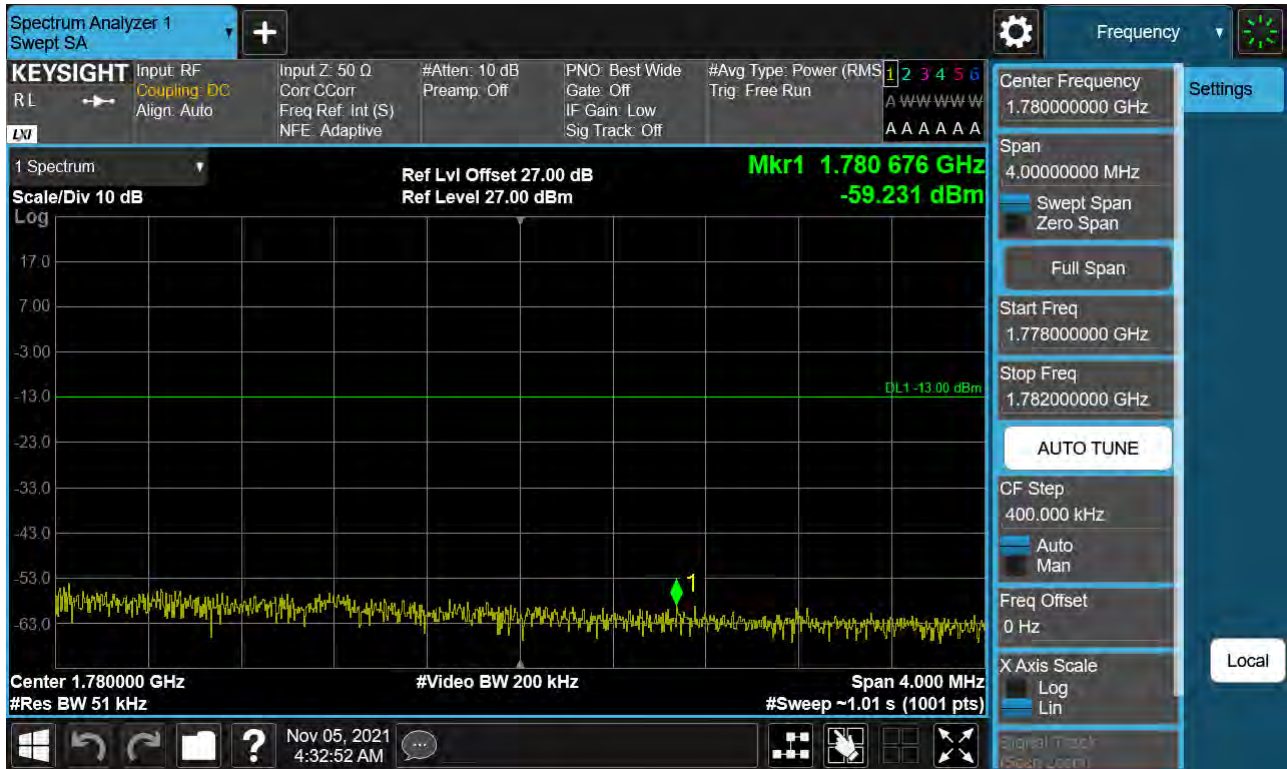
Note : We used a narrower RBW in order to increase accuracy.

$$\text{Calculation} = \text{Reading Value} + 10 \times \log(250 \text{ kHz}/51 \text{ kHz}) \text{ dB} = -51.800 \text{ dBm} + 6.904 \text{ dB} = -44.896 \text{ dBm}$$

Highest Channel_PCC 20 MHz Ch132522 RB1 Offset0 SCC 5 MHz Ch132639 RB1 Offset24(2)



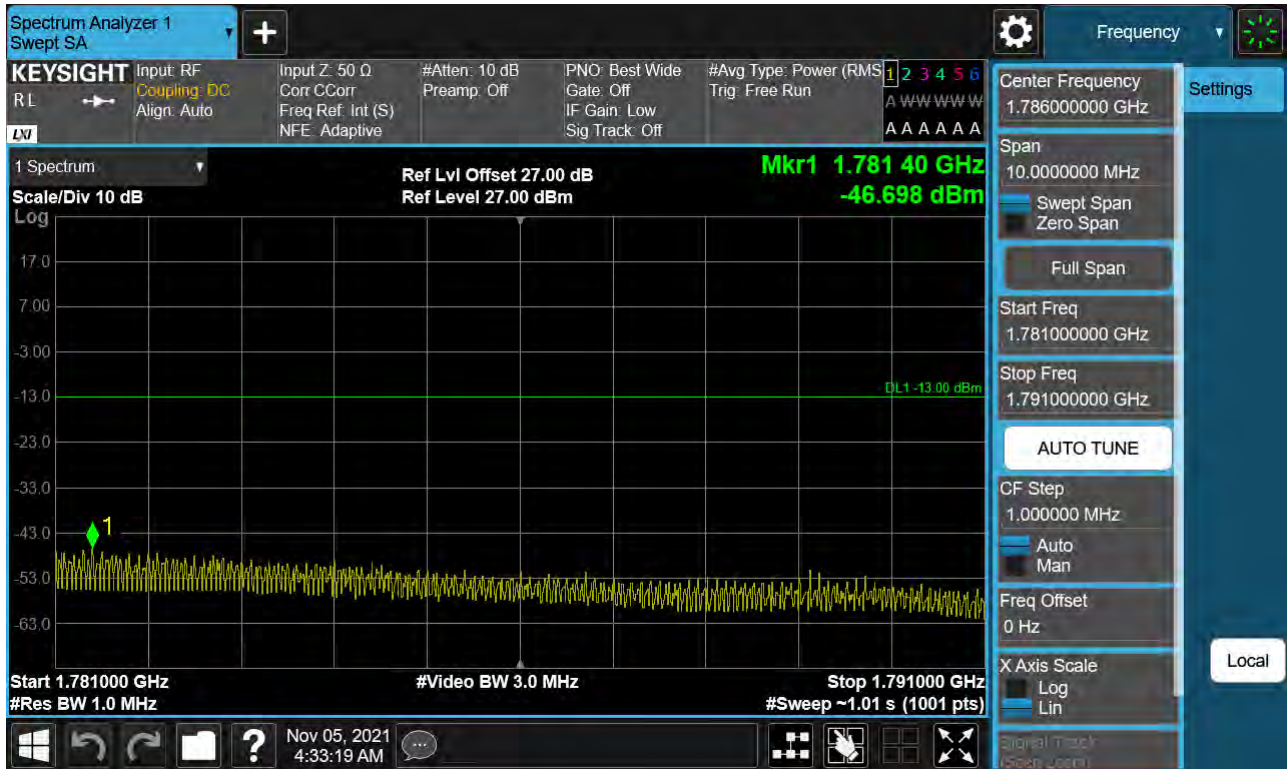
Highest Channel_PCC 20 MHz Ch132522 RB1 Offset99 SCC 5 MHz Ch132639 RB1 Offset0(1)



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(250 kHz/51 kHz) dB = -59.231 dBm + 6.904 dB = -52.327 dBm

Highest Channel_PCC 20 MHz Ch132522 RB1 Offset99 SCC 5 MHz Ch132639 RB1 Offset0(2)



8.5 Frequency Stability / Variation Of Ambient Temperature

■ PCC Channel:	132005	
■ PCC Frequency:	1713.3	MHz
■ PCC BandWidth:	5	MHz
■ SCC Channel:	132122	
■ SCC Frequency:	1725.0	MHz
■ SCC BandWidth:	20	MHz
■ Voltage :	3.860	VDC
■ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	-0.033	0.039	1713.29994	1725.00007
100 %		-30	0.043	-0.042	1713.30007	1724.99993
100 %		-20	0.024	-0.026	1713.30004	1724.99996
100 %		-10	-0.026	0.041	1713.29996	1725.00007
100 %		0	0.031	0.026	1713.30005	1725.00004
100 %		10	0.024	0.038	1713.30004	1725.00007
100 %		30	0.023	0.034	1713.30004	1725.00006
100 %		40	0.035	-0.036	1713.30006	1724.99994
100 %		50	-0.027	-0.042	1713.29995	1724.99993
Batt. Endpoint	3.400	20	0.032	0.027	1713.30005	1725.00005

☐ PCC Channel: 132025
☐ PCC Frequency: 1715.3 MHz
☐ PCC BandWidth: 10 MHz
☐ SCC Channel: 132145
☐ SCC Frequency: 1727.3 MHz
☐ SCC BandWidth: 15 MHz
☐ Voltage : 3.860 VDC
☐ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	0.028	0.041	1715.30005	1727.30007
100 %		-30	0.027	0.029	1715.30005	1727.30005
100 %		-20	0.030	-0.027	1715.30005	1727.29995
100 %		-10	0.031	-0.025	1715.30005	1727.29996
100 %		0	0.027	0.034	1715.30005	1727.30006
100 %		10	0.043	0.039	1715.30007	1727.30007
100 %		30	-0.034	-0.029	1715.29994	1727.29995
100 %		40	-0.031	0.033	1715.29995	1727.30006
100 %		50	0.038	0.027	1715.30007	1727.30005
Batt. Endpoint	3.400	20	0.025	0.031	1715.30004	1727.30005

☐ PCC Channel: 132047
☐ PCC Frequency: 1717.5 MHz
☐ PCC BandWidth: 15 MHz
☐ SCC Channel: 132167
☐ SCC Frequency: 1729.5 MHz
☐ SCC BandWidth: 10 MHz
☐ Voltage : 3.860 VDC
☐ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	0.036	-0.039	1717.50006	1729.49993
100 %		-30	0.026	0.033	1717.50004	1729.50006
100 %		-20	-0.035	-0.036	1717.49994	1729.49994
100 %		-10	-0.024	0.030	1717.49996	1729.50005
100 %		0	0.028	-0.024	1717.50005	1729.49996
100 %		10	-0.026	-0.033	1717.49996	1729.49994
100 %		30	0.031	0.033	1717.50005	1729.50006
100 %		40	-0.034	0.035	1717.49994	1729.50006
100 %		50	-0.036	0.034	1717.49994	1729.50006
Batt. Endpoint	3.400	20	0.037	0.036	1717.50006	1729.50006

- PCC Channel: 132072
- PCC Frequency: 1720.0 MHz
- PCC BandWidth: 20 MHz
- SCC Channel: 132270
- SCC Frequency: 1739.8 MHz
- SCC BandWidth: 20 MHz
- Voltage : 3.860 VDC
- LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	0.042	-0.030	1720.00007	1739.79995
100 %		-30	0.026	-0.034	1720.00004	1739.79994
100 %		-20	0.030	-0.027	1720.00005	1739.79995
100 %		-10	0.036	0.024	1720.00006	1739.80004
100 %		0	0.036	0.026	1720.00006	1739.80005
100 %		10	0.040	0.026	1720.00007	1739.80004
100 %		30	0.035	0.029	1720.00006	1739.80005
100 %		40	0.023	-0.030	1720.00004	1739.79995
100 %		50	0.042	0.036	1720.00007	1739.80006
Batt. Endpoint	3.400	20	-0.038	0.028	1719.99993	1739.80005

- PCC Channel: 132455
- PCC Frequency: 1758.3 MHz
- PCC BandWidth: 5 MHz
- SCC Channel: 132572
- SCC Frequency: 1770.0 MHz
- SCC BandWidth: 20 MHz
- Voltage : 3.860 VDC
- LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	0.028	0.038	1758.30005	1770.00007
100 %		-30	0.033	0.041	1758.30006	1770.00007
100 %		-20	0.035	0.027	1758.30006	1770.00005
100 %		-10	0.029	0.029	1758.30005	1770.00005
100 %		0	0.032	-0.040	1758.30006	1769.99993
100 %		10	0.038	-0.032	1758.30007	1769.99994
100 %		30	0.038	0.033	1758.30007	1770.00006
100 %		40	0.039	-0.026	1758.30007	1769.99995
100 %		50	0.024	0.040	1758.30004	1770.00007
Batt. Endpoint	3.400	20	0.025	-0.026	1758.30004	1769.99995

- PCC Channel: 132597
- PCC Frequency: 1772.5 MHz
- PCC BandWidth: 10 MHz
- SCC Channel: 132717
- SCC Frequency: 1784.5 MHz
- SCC BandWidth: 15 MHz
- Voltage : 3.860 VDC
- LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	-0.037	0.027	1772.49993	1784.50005
100 %		-30	0.036	0.032	1772.50006	1784.50006
100 %		-20	0.033	-0.036	1772.50006	1784.49994
100 %		-10	0.039	0.034	1772.50007	1784.50006
100 %		0	0.038	0.030	1772.50007	1784.50005
100 %		10	0.030	0.038	1772.50005	1784.50007
100 %		30	0.026	0.024	1772.50005	1784.50004
100 %		40	0.036	0.038	1772.50006	1784.50007
100 %		50	0.033	0.042	1772.50006	1784.50007
Batt. Endpoint	3.400	20	0.032	-0.043	1772.50006	1784.49992

☐ PCC Channel: 132499
☐ PCC Frequency: 1762.7 MHz
☐ PCC BandWidth: 15 MHz
☐ SCC Channel: 132619
☐ SCC Frequency: 1774.7 MHz
☐ SCC BandWidth: 10 MHz
☐ Voltage : 3.860 VDC
☐ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	-0.040	0.031	1762.69993	1774.70006
100 %		-30	0.029	0.035	1762.70005	1774.70006
100 %		-20	0.040	0.030	1762.70007	1774.70005
100 %		-10	0.026	0.038	1762.70005	1774.70007
100 %		0	-0.036	0.036	1762.69994	1774.70006
100 %		10	0.025	0.035	1762.70004	1774.70006
100 %		30	0.036	0.036	1762.70006	1774.70006
100 %		40	-0.040	0.028	1762.69993	1774.70005
100 %		50	0.041	0.042	1762.70007	1774.70007
Batt. Endpoint	3.400	20	0.029	0.024	1762.70005	1774.70004

☐ PCC Channel: 132374
☐ PCC Frequency: 1750.2 MHz
☐ PCC BandWidth: 20 MHz
☐ SCC Channel: 132572
☐ SCC Frequency: 1770.0 MHz
☐ SCC BandWidth: 20 MHz
☐ Voltage : 3.860 MHz
☐ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.860	+20(Ref)	0.033	0.039	1750.20006	1770.00007
100 %		-30	-0.026	0.036	1750.19995	1770.00006
100 %		-20	-0.043	0.029	1750.19993	1770.00005
100 %		-10	-0.024	0.037	1750.19996	1770.00007
100 %		0	0.037	0.024	1750.20007	1770.00004
100 %		10	0.039	0.032	1750.20007	1770.00006
100 %		30	0.032	0.032	1750.20006	1770.00006
100 %		40	-0.042	0.042	1750.19993	1770.00007
100 %		50	-0.041	-0.036	1750.19993	1769.99994
Batt. Endpoint	3.400	20	-0.025	0.025	1750.19996	1770.00004

8.6 Radiated Spurious Emissions

▣ PCC Channel :	<u>132072 (1720.0 MHz)</u>
▣ PCC BW(MHz) :	20
▣ PCC RB/ RB Offset :	<u>1/ 99</u>
▣ SCC Channel :	<u>132243 (1737.1 MHz)</u>
▣ SCC BW(MHz) :	<u>15</u>
▣ SCC RB/ RB Offset :	<u>1/ 0</u>
▣ DISTANCE:	<u>3 meters</u>
▣ LIMIT:	<u>-13.0 dBm</u>

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 440.00	-54.26	12.52	-60.45	2.97	V	-50.90
5 160.00	-55.99	12.34	-53.80	3.65	H	-45.11
6 880.00	-56.64	11.94	-49.92	4.27	H	-42.25

PCC Channel : 132328 (1745.6 MHz)
 PCC BW(MHz) : 10
 PCC RB/ RB Offset : 1/ 49
 SCC Channel : 132472 (1760.0 MHz)
 SCC BW(MHz) : 20
 SCC RB/ RB Offset : 1/ 0
 DISTANCE: 3 meters
 LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 491.20	-55.40	12.42	-61.50	2.97	H	-52.05
5 236.80	-56.03	12.71	-55.23	3.70	H	-46.21
6 982.40	-56.21	11.52	-48.03	4.28	H	-40.79

☐ PCC Channel : 132072 (1720.0 MHz)
☐ PCC BW(MHz) : 20
☐ PCC RB/ RB Offset : 1/ 99
☐ SCC Channel : 132617 (1774.5 MHz)
☐ SCC BW(MHz) : 10
☐ SCC RB/ RB Offset : 3/ 0
☐ DISTANCE: 1 meters
☐ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 520.20	-53.33	12.40	-59.13	2.99	V	-49.72
5 280.30	-54.81	12.92	-54.37	3.73	H	-45.18
7 040.40	-56.79	11.16	-48.41	4.31	H	-41.56

8.7 Occupied Bandwidth

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	QPSK	50/ 0	15	132471	1759.9	QPSK	75/ 0	23.146
15	132373	1750.1	QPSK	75/ 0	10	132493	1762.1	QPSK	50/ 0	23.173
10	132328	1745.6	QPSK	50/ 0	20	132472	1760.0	QPSK	100/ 0	27.701
20	132373	1750.1	QPSK	100/ 0	10	132517	1764.5	QPSK	50/ 0	27.797
15	132347	1747.5	QPSK	75/ 0	15	132497	1762.5	QPSK	75/ 0	28.403
15	132325	1745.3	QPSK	75/ 0	20	132496	1762.4	QPSK	100/ 0	32.607
20	132348	1747.6	QPSK	100/ 0	15	132519	1764.7	QPSK	75/ 0	32.665
20	132397	1752.5	QPSK	100/ 0	5	132514	1764.2	QPSK	25/ 0	22.875
5	132330	1745.8	QPSK	25/ 0	20	132447	1757.5	QPSK	100/ 0	22.905
20	132323	1745.1	QPSK	100/ 0	20	132521	1764.9	QPSK	100/ 0	37.621

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	16QAM	50/ 0	15	132471	1759.9	16QAM	75/ 0	23.079
15	132373	1750.1	16QAM	75/ 0	10	132493	1762.1	16QAM	50/ 0	23.150
10	132328	1745.6	16QAM	50/ 0	20	132472	1760.0	16QAM	100/ 0	27.636
20	132373	1750.1	16QAM	100/ 0	10	132517	1764.5	16QAM	50/ 0	27.752
15	132347	1747.5	16QAM	75/ 0	15	132497	1762.5	16QAM	75/ 0	28.319
15	132325	1745.3	16QAM	75/ 0	20	132496	1762.4	16QAM	100/ 0	32.653
20	132348	1747.6	16QAM	100/ 0	15	132519	1764.7	16QAM	75/ 0	32.589
20	132397	1752.5	16QAM	100/ 0	5	132514	1764.2	16QAM	25/ 0	22.941
5	132330	1745.8	16QAM	25/ 0	20	132447	1757.5	16QAM	100/ 0	22.901
20	132323	1745.1	16QAM	100/ 0	20	132521	1764.9	16QAM	100/ 0	37.541

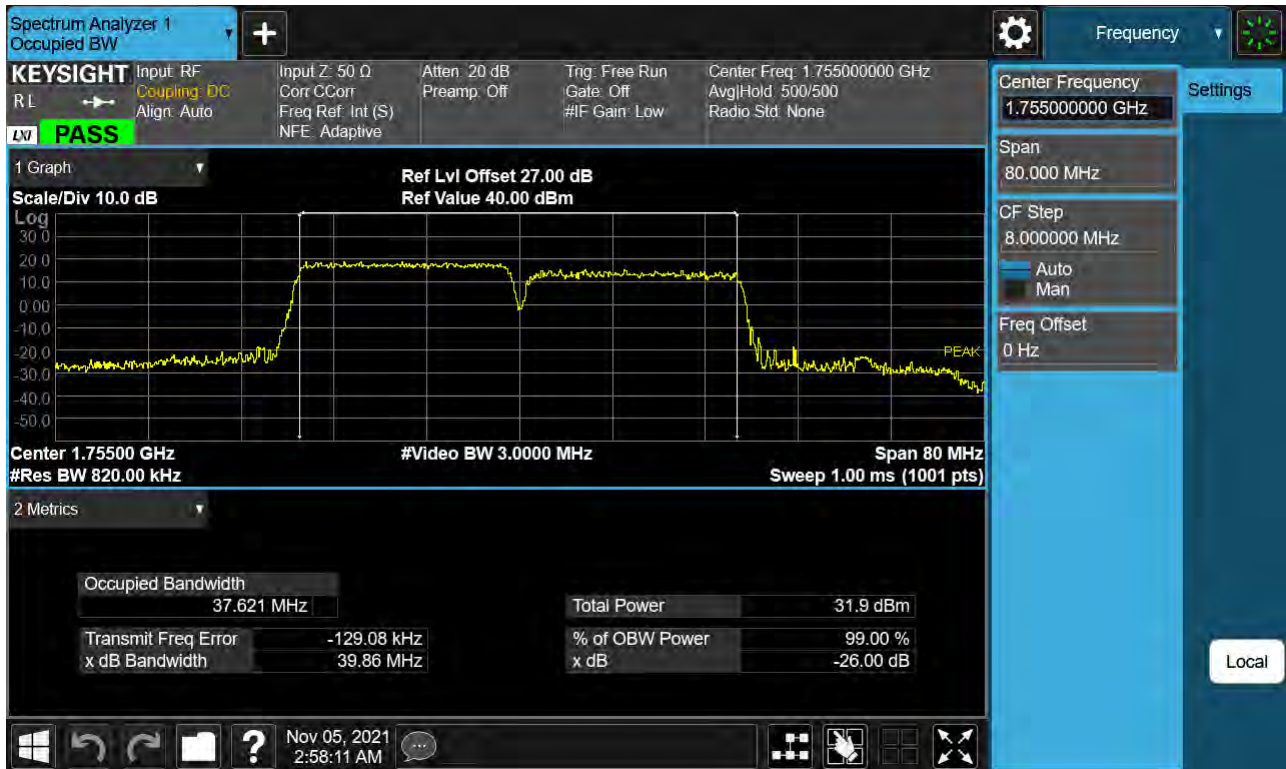
PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	64QAM	50/ 0	15	132471	1759.9	64QAM	75/ 0	23.150
15	132373	1750.1	64QAM	75/ 0	10	132493	1762.1	64QAM	50/ 0	23.194
10	132328	1745.6	64QAM	50/ 0	20	132472	1760.0	64QAM	100/ 0	27.700
20	132373	1750.1	64QAM	100/ 0	10	132517	1764.5	64QAM	50/ 0	27.799
15	132347	1747.5	64QAM	75/ 0	15	132497	1762.5	64QAM	75/ 0	28.380
15	132325	1745.3	64QAM	75/ 0	20	132496	1762.4	64QAM	100/ 0	32.644
20	132348	1747.6	64QAM	100/ 0	15	132519	1764.7	64QAM	75/ 0	32.647
20	132397	1752.5	64QAM	100/ 0	5	132514	1764.2	64QAM	25/ 0	22.882
5	132330	1745.8	64QAM	25/ 0	20	132447	1757.5	64QAM	100/ 0	22.826
20	132323	1745.1	64QAM	100/ 0	20	132521	1764.9	64QAM	100/ 0	37.522

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	256QAM	50/ 0	15	132471	1759.9	256QAM	75/ 0	23.038
15	132373	1750.1	256QAM	75/ 0	10	132493	1762.1	256QAM	50/ 0	23.091
10	132328	1745.6	256QAM	50/ 0	20	132472	1760.0	256QAM	100/ 0	27.728
20	132373	1750.1	256QAM	100/ 0	10	132517	1764.5	256QAM	50/ 0	27.741
15	132347	1747.5	256QAM	75/ 0	15	132497	1762.5	256QAM	75/ 0	28.330
15	132325	1745.3	256QAM	75/ 0	20	132496	1762.4	256QAM	100/ 0	32.556
20	132348	1747.6	256QAM	100/ 0	15	132519	1764.7	256QAM	75/ 0	32.586
20	132397	1752.5	256QAM	100/ 0	5	132514	1764.2	256QAM	25/ 0	22.922
5	132330	1745.8	256QAM	25/ 0	20	132447	1757.5	256QAM	100/ 0	22.837
20	132323	1745.1	256QAM	100/ 0	20	132521	1764.9	256QAM	100/ 0	37.500

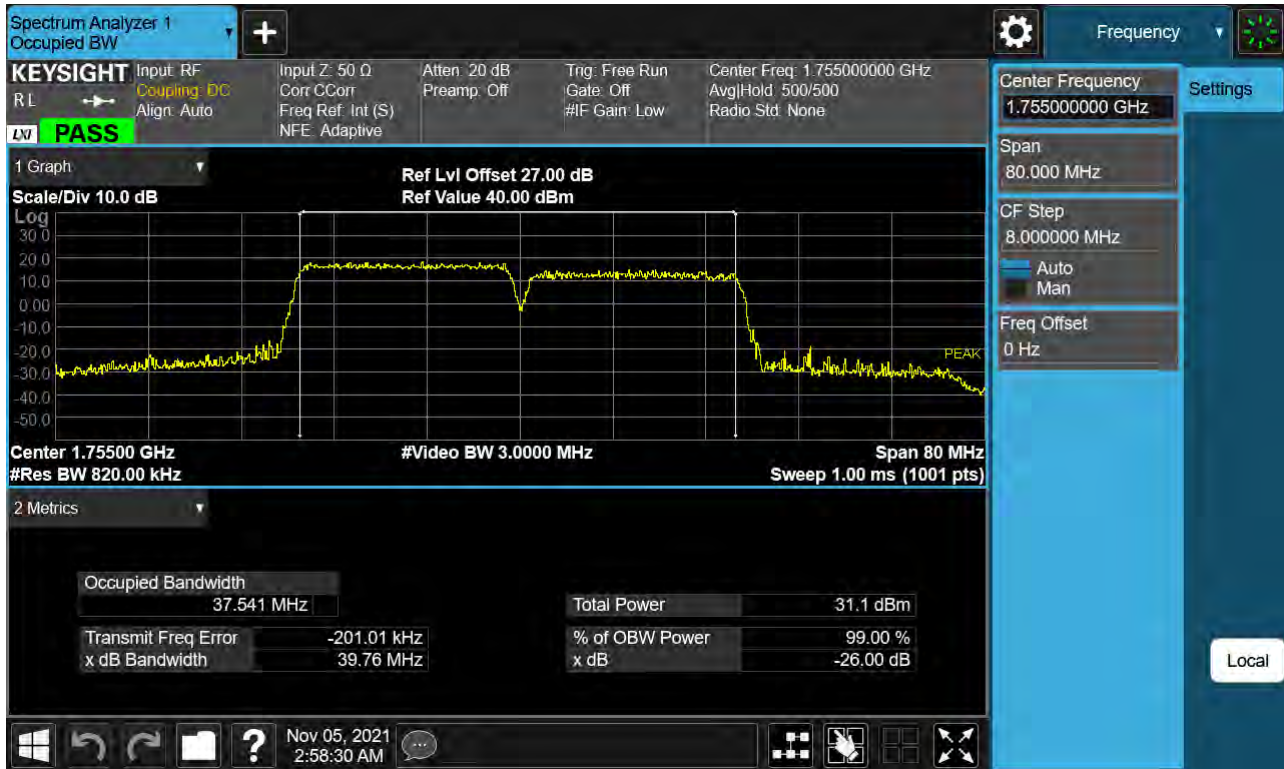
Note:

In order to simplify the report, attached plots were only Max.Bandwidth(20+20)

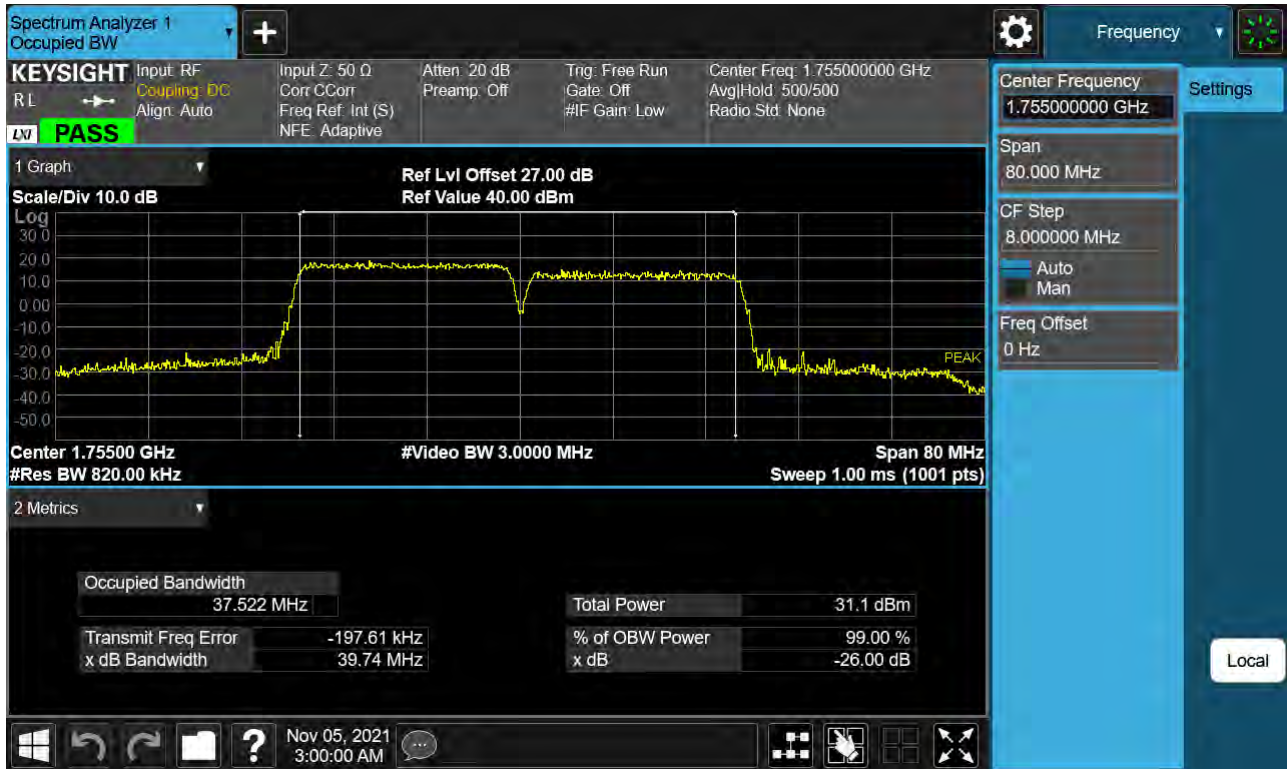
PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(QPSK)



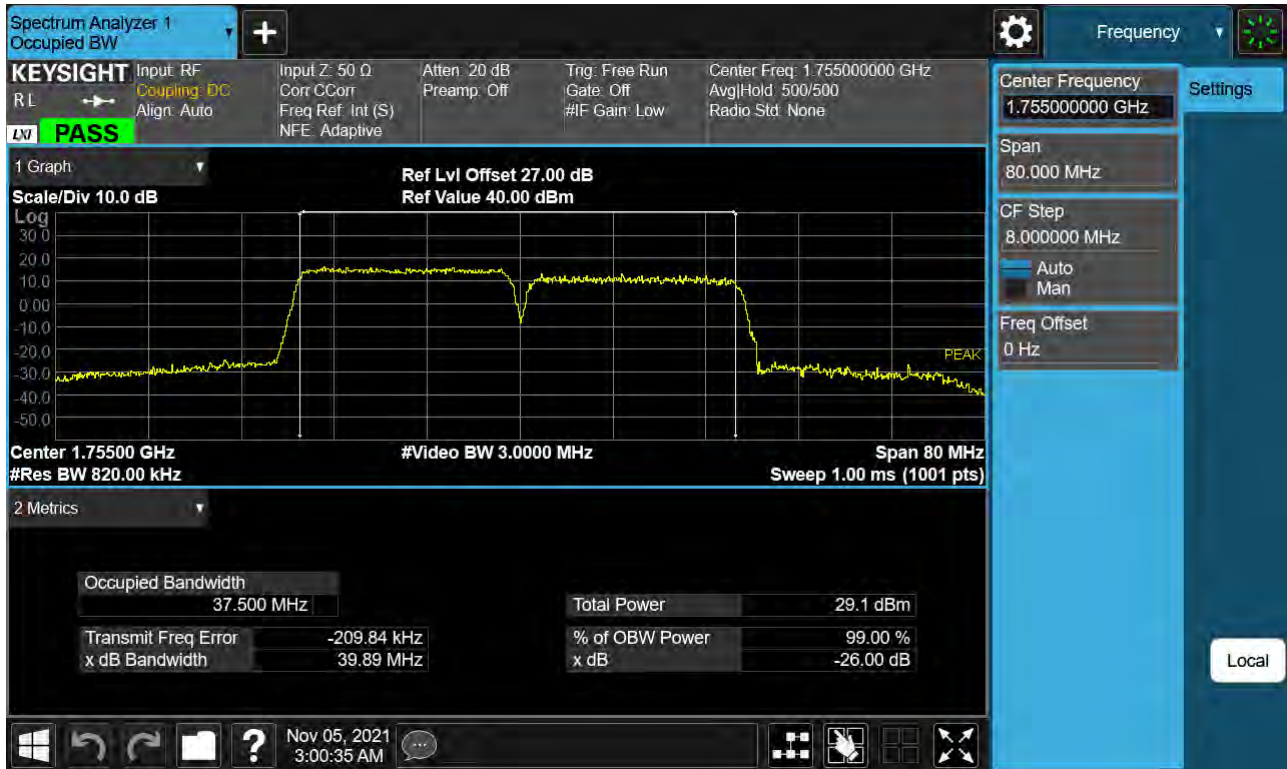
PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(16QAM)



PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(64QAM)



PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(256QAM)



8.8 Peak- to- Average Ratio

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	QPSK	50/ 0	15	132471	1759.9	QPSK	75/ 0	6.11
15	132373	1750.1	QPSK	75/ 0	10	132493	1762.1	QPSK	50/ 0	6.06
10	132328	1745.6	QPSK	50/ 0	20	132472	1760.0	QPSK	100/ 0	6.06
20	132373	1750.1	QPSK	100/ 0	10	132517	1764.5	QPSK	50/ 0	6.05
15	132347	1747.5	QPSK	75/ 0	15	132497	1762.5	QPSK	75/ 0	6.29
15	132325	1745.3	QPSK	75/ 0	20	132496	1762.4	QPSK	100/ 0	6.01
20	132348	1747.6	QPSK	100/ 0	15	132519	1764.7	QPSK	75/ 0	5.95
20	132397	1752.5	QPSK	100/ 0	5	132514	1764.2	QPSK	25/ 0	6.10
5	132330	1745.8	QPSK	25/ 0	20	132447	1757.5	QPSK	100/ 0	6.02
20	132323	1745.1	QPSK	100/ 0	20	132521	1764.9	QPSK	100/ 0	6.14

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	16QAM	50/ 0	15	132471	1759.9	16QAM	75/ 0	6.73
15	132373	1750.1	16QAM	75/ 0	10	132493	1762.1	16QAM	50/ 0	6.66
10	132328	1745.6	16QAM	50/ 0	20	132472	1760.0	16QAM	100/ 0	6.67
20	132373	1750.1	16QAM	100/ 0	10	132517	1764.5	16QAM	50/ 0	6.71
15	132347	1747.5	16QAM	75/ 0	15	132497	1762.5	16QAM	75/ 0	6.76
15	132325	1745.3	16QAM	75/ 0	20	132496	1762.4	16QAM	100/ 0	6.65
20	132348	1747.6	16QAM	100/ 0	15	132519	1764.7	16QAM	75/ 0	6.56
20	132397	1752.5	16QAM	100/ 0	5	132514	1764.2	16QAM	25/ 0	6.66
5	132330	1745.8	16QAM	25/ 0	20	132447	1757.5	16QAM	100/ 0	6.72
20	132323	1745.1	16QAM	100/ 0	20	132521	1764.9	16QAM	100/ 0	6.72

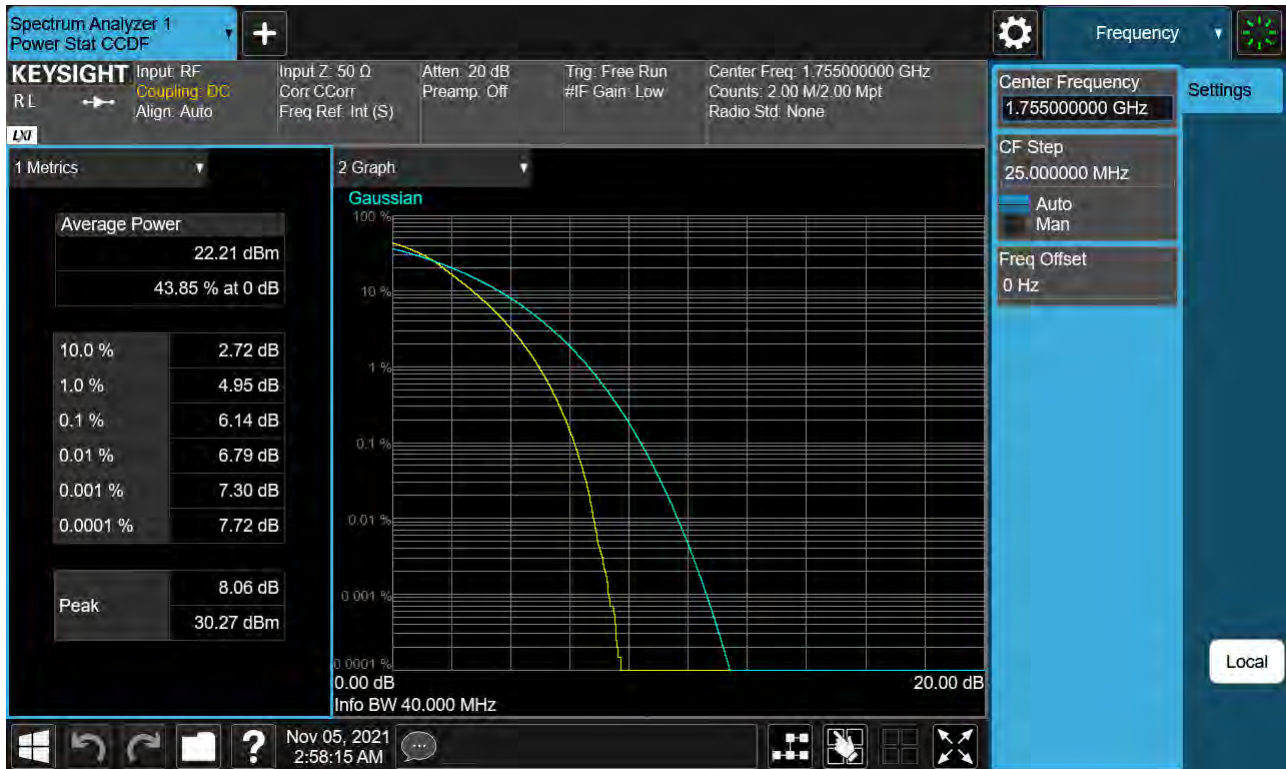
PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	64QAM	50/ 0	15	132471	1759.9	64QAM	75/ 0	6.78
15	132373	1750.1	64QAM	75/ 0	10	132493	1762.1	64QAM	50/ 0	6.72
10	132328	1745.6	64QAM	50/ 0	20	132472	1760.0	64QAM	100/ 0	6.70
20	132373	1750.1	64QAM	100/ 0	10	132517	1764.5	64QAM	50/ 0	6.66
15	132347	1747.5	64QAM	75/ 0	15	132497	1762.5	64QAM	75/ 0	6.70
15	132325	1745.3	64QAM	75/ 0	20	132496	1762.4	64QAM	100/ 0	6.68
20	132348	1747.6	64QAM	100/ 0	15	132519	1764.7	64QAM	75/ 0	6.69
20	132397	1752.5	64QAM	100/ 0	5	132514	1764.2	64QAM	25/ 0	6.70
5	132330	1745.8	64QAM	25/ 0	20	132447	1757.5	64QAM	100/ 0	6.79
20	132323	1745.1	64QAM	100/ 0	20	132521	1764.9	64QAM	100/ 0	6.69

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	256QAM	50/ 0	15	132471	1759.9	256QAM	75/ 0	7.08
15	132373	1750.1	256QAM	75/ 0	10	132493	1762.1	256QAM	50/ 0	7.07
10	132328	1745.6	256QAM	50/ 0	20	132472	1760.0	256QAM	100/ 0	7.06
20	132373	1750.1	256QAM	100/ 0	10	132517	1764.5	256QAM	50/ 0	7.08
15	132347	1747.5	256QAM	75/ 0	15	132497	1762.5	256QAM	75/ 0	7.12
15	132325	1745.3	256QAM	75/ 0	20	132496	1762.4	256QAM	100/ 0	7.11
20	132348	1747.6	256QAM	100/ 0	15	132519	1764.7	256QAM	75/ 0	7.00
20	132397	1752.5	256QAM	100/ 0	5	132514	1764.2	256QAM	25/ 0	7.10
5	132330	1745.8	256QAM	25/ 0	20	132447	1757.5	256QAM	100/ 0	7.13
20	132323	1745.1	256QAM	100/ 0	20	132521	1764.9	256QAM	100/ 0	7.12

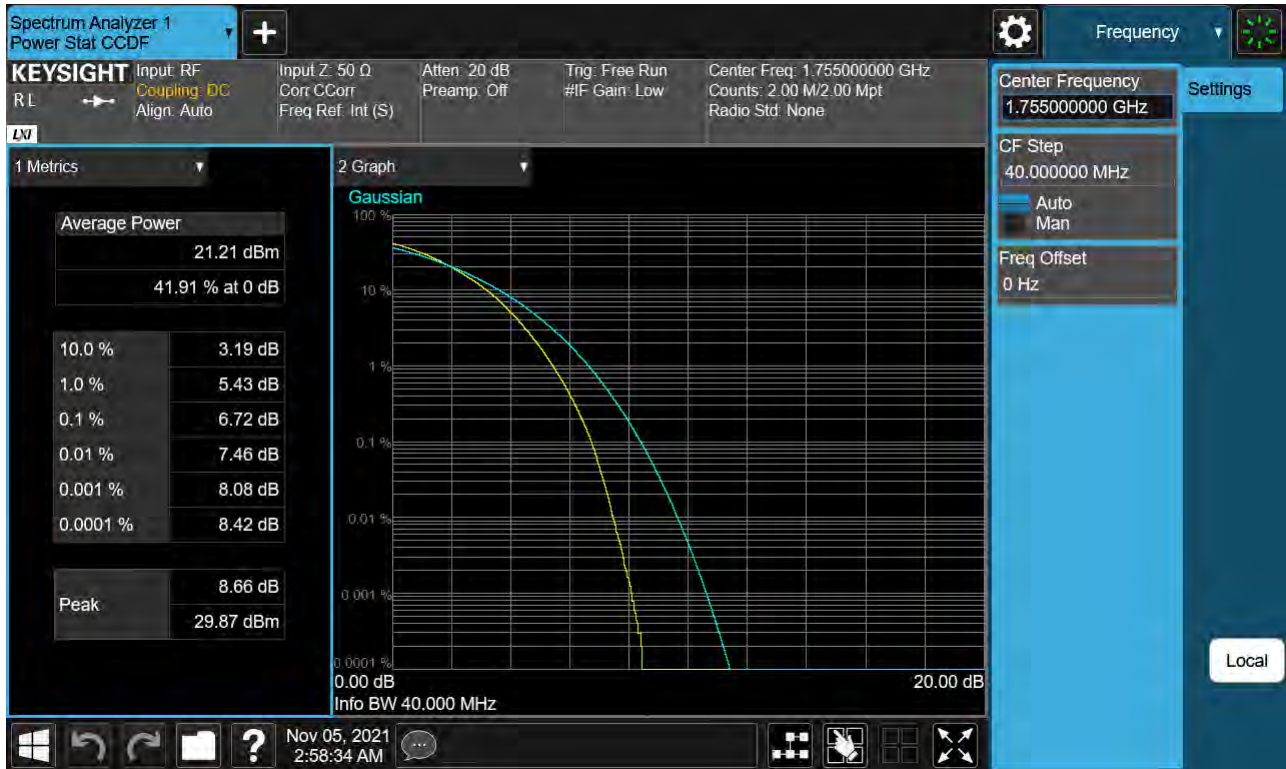
Note:

In order to simplify the report, attached plots were only Max.Bandwidth(20+20)

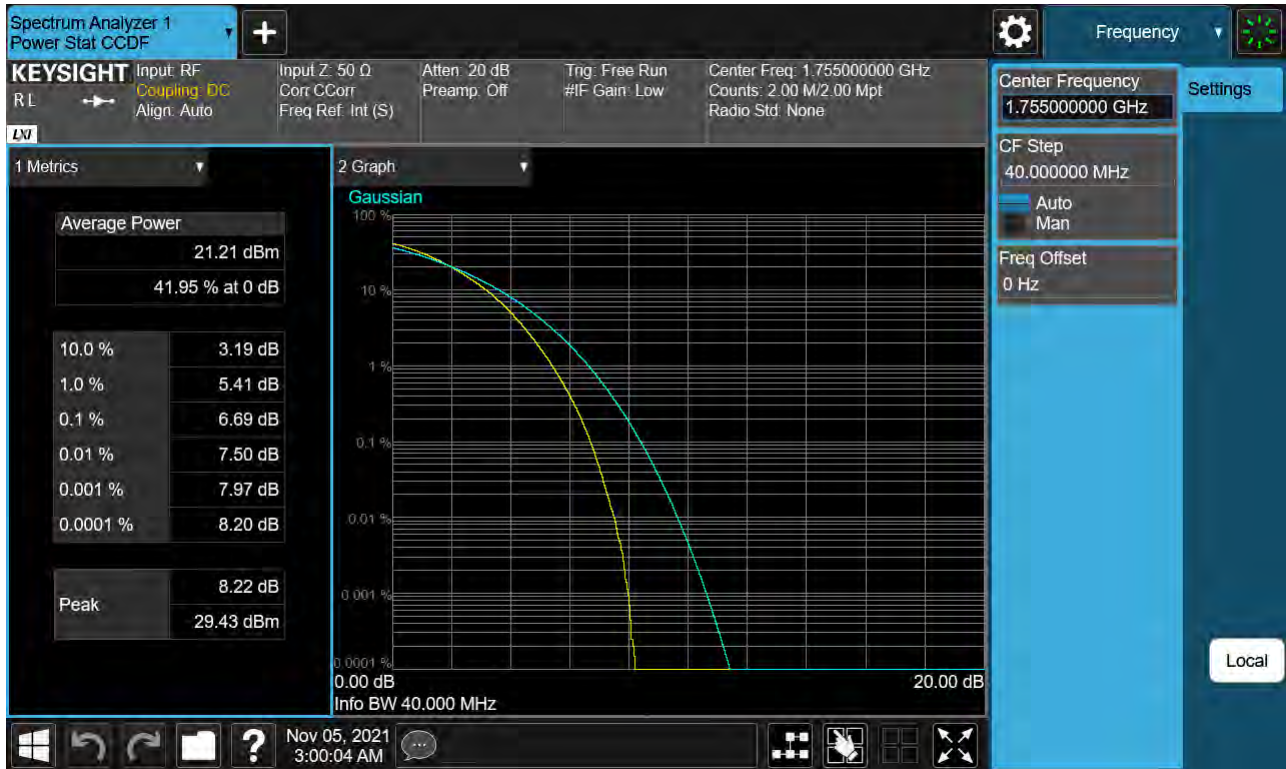
PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(QPSK)



PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(16QAM)



PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(64QAM)



PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0_(256QAM)



9. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2111-FC056-P