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FCC Carrier Aggregation 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 31, 2020

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

Report No.: HCT-RF-2008-FC077

FCC ID:	**A3LSMG781U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s): SM-G781U
Additional Model(s): SM-G781U1/DS
EUT Type: Mobile Phone
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)
5MHz + 20MHz	2499.3 - 2680.0	QPSK	22M9G7D	21.65	0.15
		16QAM	22M8W7D	21.13	0.13
		64QAM	22M8W7D	20.11	0.10
10MHz + 15MHz	2501.3 - 2682.5	QPSK	23M1G7D	21.94	0.16
		16QAM	23M1W7D	21.25	0.13
		64QAM	23M1W7D	20.69	0.12
10MHz + 20MHz	2501.5 - 2680.0	QPSK	27M7G7D	21.93	0.16
		16QAM	27M7W7D	21.34	0.14
		64QAM	27M8W7D	20.66	0.12
15MHz + 10MHz	2503.5 - 2684.7	QPSK	23M1G7D	22.30	0.17
		16QAM	23M2W7D	21.94	0.16
		64QAM	23M1W7D	21.05	0.13
15MHz + 15MHz	2503.5 - 2682.5	QPSK	28M4G7D	21.92	0.16
		16QAM	28M3W7D	21.65	0.15
		64QAM	28M6W7D	20.76	0.12
15MHz + 20MHz	2503.8 - 2680.0	QPSK	32M6G7D	21.88	0.15
		16QAM	32M6W7D	21.60	0.14
		64QAM	32M6W7D	19.96	0.10
20MHz + 5MHz	2506.0 - 2686.7	QPSK	23M0G7D	22.05	0.16
		16QAM	22M9W7D	21.74	0.15
		64QAM	22M8W7D	20.88	0.12
20MHz + 10MHz	2506.0 - 2684.5	QPSK	27M8G7D	22.10	0.16
		16QAM	27M8W7D	21.71	0.15
		64QAM	27M8W7D	20.79	0.12
20MHz + 15MHz	2506.0 - 2682.2	QPSK	32M6G7D	22.53	0.18
		16QAM	32M7W7D	22.26	0.17
		64QAM	32M7W7D	20.90	0.12
20MHz + 20MHz	2506.0 - 2680.0	QPSK	37M7G7D	22.10	0.16
		16QAM	37M5W7D	21.78	0.15
		64QAM	37M5W7D	20.52	0.11

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 : Se Wook Park
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

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-2008-FC077	August 31, 2020	- 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:	A3LSMG781U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§27, §2
EUT Type:	Mobile Phone
Model(s):	SM-G781U
Additional Model(s):	SM-G781U1/DS
Tx Frequency:	2499.3 - 2680.0: 5MHz+20MHz 2501.3 - 2682.5: 10MHz+15MHz 2501.5 - 2680.0: 10MHz+20MHz 2503.5 - 2684.7: 15MHz+10MHz 2503.5 - 2682.5: 15MHz+15MHz 2503.8 - 2680.0: 15MHz+20MHz 2506.0 - 2686.7: 20MHz+5MHz 2506.0 - 2684.5: 20MHz+10MHz 2506.0 - 2682.2: 20MHz+15MHz 2506.0 - 2680.0: 20MHz+20MHz
Date(s) of Tests:	August 24, 2020 ~ August 31, 2020
LTE CA :	CA 41C(Uplink)

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS, CDMA(BC0, 1, 10) and LTE, Sub6.

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

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
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 NormalHz
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 1GHz, 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.

3.3 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 = 100kHz for emissions below 1GHz and NormalHz for emissions above 1GHz
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 1GHz, 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;

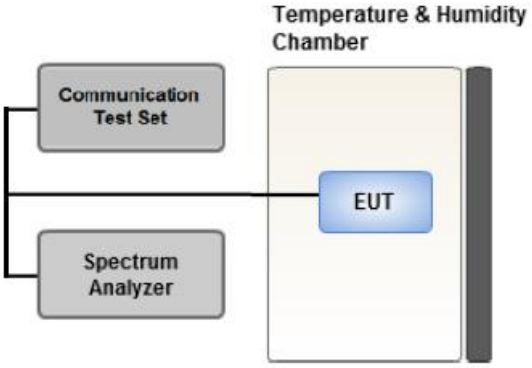
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ 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:

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

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 ≥ 3 × RBW.

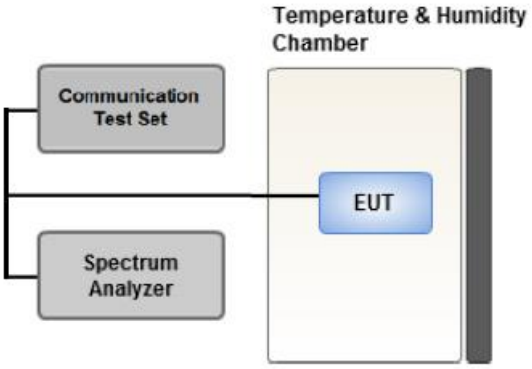
1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time:

   Set ≥ [10 × (number of points in sweep) × (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/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.

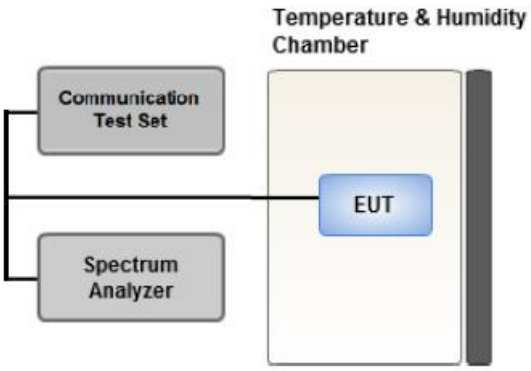
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

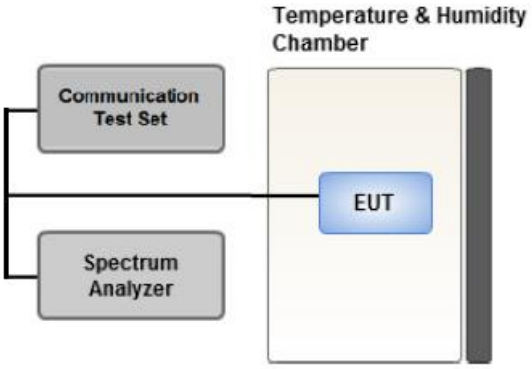
Test Overview

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

Test Settings

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

3.7 CHANNEL EDGE



Test setup

Test Overview

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

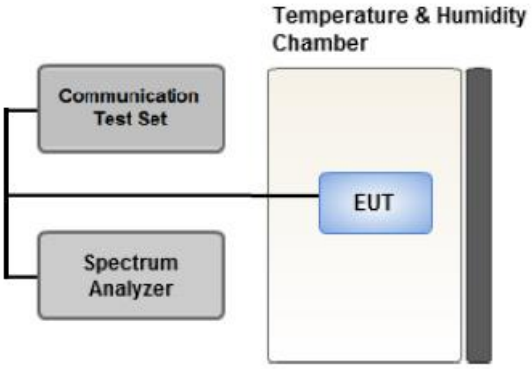
Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. Within 1MHz of the channel edge the RBW should be 2% of EBW, then 1 MHz after that.
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

1. The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. 55 + 10 log (P) dB at or below 2490.5 MHz.
6. X is the greater of 6MHz or the actual emission bandwidth
7. 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

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
WAINWRIGHT INSTRUMENT	WHNX6.0/26.5G-6SS/H.P.F	1	03/19/2020	Annual	03/19/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
Hewlett Packard	E3632A/DC Power Supply	MY4004427	09/27/2019	Annual	09/27/2020
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93008124	03/18/2020	Annual	03/18/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	04/27/2020	Annual	04/27/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2019	Annual	10/14/2020
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	04/26/2019	Biennial	04/26/2021
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/12/2019	Biennial	03/12/2021
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/22/2020	Annual	01/22/2021
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	E7515B / 5G Wireless Tester	MY58300756	01/07/2020	Annual	01/07/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
Mini-Circuits	ZC4PD-K1844+ / 4-Way Divider	942907	09/05/2019	Annual	09/05/2020
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
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

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(m)(4)	■ < 40 + 10log10 (P[Watts]) at Channel edges ■ < 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges ■ < 55 + 10log10 (P[Watts]) beyond X MHz beyond from Channel edges ■ < 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz	PASS
Frequency stability / variation of ambient temperature	§2.1055, §27.54	Emission must remain in band	PASS

Note:

1. The same samples were used for SAR and EMC

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§27.50(h)(2)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(m)(4)	< 55 + 10log10 (P[Watts])	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

16QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

64QAM 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	20	40
15	15, 20	40
20	10, 15, 20	40
5, 10	20	40
15	15, 20	40
20	5, 10, 15, 20	40
10	15, 20	40
15	10, 15, 20	40
20	10, 15, 20	40
10	20	40
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, Channel Edge)

: 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.

[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/ Channel Edge	QPSK	Low	20	2506.0	39750	1	99	15	2523.1	39921	1	0
	QPSK	Mid	20	2585.6	40546	1	99	15	2602.7	40717	1	0
	QPSK	High	20	2665.1	41341	1	99	15	2682.2	41512	1	0
	QPSK	Low	20	2506.0	39750	1	0	15	2523.1	39921	1	74
	QPSK	Mid	20	2585.6	40546	1	0	15	2602.7	40717	1	74
	QPSK	High	20	2665.1	41341	1	0	15	2682.2	41512	1	74
	QPSK	Low	20	2506.0	39750	100	0	15	2523.1	39921	75	0
	QPSK	Mid	20	2585.6	40546	100	0	15	2602.7	40717	75	0
	QPSK	High	20	2665.1	41341	100	0	15	2682.2	41512	75	0
	QPSK	Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0
	QPSK	Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0
	QPSK	High	20	2660.2	41292	100	0	20	2680.0	41490	100	0
Radiated Spurious Emissions	QPSK	Low	20	2506.0	39750	1	99	10	2520.4	39894	1	0
	QPSK	Mid	20	2585.6	40546	1	99	15	2602.7	40717	1	0
	QPSK	High	15	2667.5	41365	1	74	15	2686.7	41515	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	Mid	5	2583.8	40528	25	0	20	2595.5	40645	100	0
			10	2585.9	40549	50	0	15	2597.9	40669	75	0
			10	2583.6	40526	50	0	20	2598.0	40670	100	0
			15	2588.1	40571	75	0	10	2600.1	40691	50	0
			15	2585.5	40545	75	0	15	2600.5	40695	75	0
			15	2583.3	40523	75	0	20	2600.4	40694	100	0
			20	2590.5	40595	100	0	5	2602.2	40712	25	0
			20	2588.1	40571	100	0	10	2602.5	40715	50	0
			20	2585.6	40546	100	0	15	2602.7	40717	75	0
			20	2583.1	40521	100	0	20	2602.9	40719	100	0
Frequency stability	QPSK	Low	5	2499.3	39683	25	0	20	2511.0	39800	100	0
			10	2501.5	39705	50	0	20	2515.9	39849	100	0
			15	2503.8	39728	75	0	20	2520.9	39899	100	0
			20	2506.0	39750	100	0	20	2525.8	39948	100	0
		High	5	2668.3	41373	25	0	20	2680.0	41490	100	0
			10	2665.6	41346	50	0	20	2680.0	41490	100	0
			15	2662.9	41319	75	0	20	2680.0	41490	100	0
			20	2660.2	41292	100	0	20	2680.0	41490	100	0

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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	5	2499.3	39683	1	24	20	2511.0	39800	1	0	24.42
	10	2501.3	39703	1	49	15	2513.3	39823	1	0	24.42
	10	2501.5	39705	1	49	20	2515.9	39849	1	0	24.28
	15	2503.5	39725	1	74	10	2515.5	39845	1	0	24.41
	15	2503.5	39725	1	74	15	2518.5	39875	1	0	24.44
	15	2503.8	39728	1	74	20	2520.9	39899	1	0	24.49
	20	2506.0	39750	1	99	5	2517.7	39867	1	0	24.37
	20	2506.0	39750	1	99	10	2520.4	39894	1	0	24.40
	20	***2506.0***	***39750***	***1***	***99***	***15***	***2523.1***	***39921***	***1***	***0***	***24.48***
	20	2506.0	39750	1	99	20	2525.8	39948	1	0	24.46
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	24.20
	10	2585.9	40549	1	49	15	2597.9	40669	1	0	24.22
	10	2583.6	40526	1	49	20	2598.0	40670	1	0	24.20
	15	2588.1	40571	1	74	10	2600.1	40691	1	0	24.23
	15	2585.5	40545	1	74	15	2600.5	40695	1	0	24.35
	15	2583.3	40523	1	74	20	2600.4	40694	1	0	24.21
	20	2590.5	40595	1	99	5	2602.2	40712	1	0	24.32
	20	2588.1	40571	1	99	10	2602.5	40715	1	0	24.28
	20	***2585.6***	***40546***	***1***	***99***	***15***	***2602.7***	***40717***	***1***	***0***	***24.38***
	20	2583.1	40521	1	99	20	2602.9	40719	1	0	24.19
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	24.28
	10	2670.5	41395	1	49	15	2682.5	41515	1	0	24.27
	10	2665.6	41346	1	49	20	2680.0	41490	1	0	24.45
	15	2672.7	41417	1	74	10	2684.7	41537	1	0	24.39
	15	2667.5	41365	1	74	15	2682.5	41515	1	0	24.14
	15	2662.9	41319	1	74	20	2680.0	41490	1	0	24.05
	20	2675.0	41440	1	99	5	2686.7	41557	1	0	24.46
	20	2670.1	41391	1	99	10	2684.5	41535	1	0	24.43
	20	***2665.1***	***41341***	***1***	***99***	***15***	***2682.2***	***41512***	***1***	***0***	***24.47***
	20	2660.2	41292	1	99	20	2680.0	41490	1	0	24.08

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	5	2499.3	39683	25	0	20	2511.0	39800	100	0	22.56
	10	2501.3	39703	50	0	15	2513.3	39823	75	0	22.66
	10	2501.5	39705	50	0	20	2515.9	39849	100	0	22.67
	15	2503.5	39725	75	0	10	2515.5	39845	50	0	22.71
	15	2503.5	39725	75	0	15	2518.5	39875	75	0	22.70
	15	2503.8	39728	75	0	20	2520.9	39899	100	0	22.59
	20	2506.0	39750	100	0	5	2517.7	39867	25	0	22.68
	20	2506.0	39750	100	0	10	2520.4	39894	50	0	22.72
	20	***2506.0***	***39750***	***100***	***0***	***15***	***2523.1***	***39921***	***75***	***0***	***24.43***
	20	2506.0	39750	100	0	20	2525.8	39948	100	0	22.61
Mid	5	2583.8	40528	25	0	20	2595.5	40645	100	0	22.28
	10	2585.9	40549	50	0	15	2597.9	40669	75	0	22.42
	10	2583.6	40526	50	0	20	2598.0	40670	100	0	22.26
	15	2588.1	40571	75	0	10	2600.1	40691	50	0	22.40
	15	2585.5	40545	75	0	15	2600.5	40695	75	0	22.29
	15	2583.3	40523	75	0	20	2600.4	40694	100	0	22.24
	20	2590.5	40595	100	0	5	2602.2	40712	25	0	22.43
	20	2588.1	40571	100	0	10	2602.5	40715	50	0	22.33
	20	***2585.6***	***40546***	***100***	***0***	***15***	***2602.7***	***40717***	***75***	***0***	***24.35***
	20	2583.1	40521	100	0	20	2602.9	40719	100	0	22.19
High	5	2668.3	41373	25	0	20	2680.0	41490	100	0	22.52
	10	2670.5	41395	50	0	15	2682.5	41515	75	0	22.67
	10	2665.6	41346	50	0	20	2680.0	41490	100	0	22.64
	15	2672.7	41417	75	0	10	2684.7	41537	50	0	22.55
	15	2667.5	41365	75	0	15	2682.5	41515	75	0	22.57
	15	2662.9	41319	75	0	20	2680.0	41490	100	0	22.57
	20	2675.0	41440	100	0	5	2686.7	41557	25	0	22.60
	20	2670.1	41391	100	0	10	2684.5	41535	50	0	22.64
	20	***2665.1***	***41341***	***100***	***0***	***15***	***2682.2***	***41512***	***75***	***0***	***24.45***
	20	2660.2	41292	100	0	20	2680.0	41490	100	0	22.64

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	20	2506.0	39750	1	99	15	2523.1	39921	1	0	24.47
Mid	20	2585.6	40546	1	99	15	2602.7	40717	1	0	24.45
High	20	2665.1	41341	1	99	15	2682.2	41512	1	0	24.45
Low	20	2506.0	39750	100	0	15	2523.1	39921	75	0	24.41
Mid	20	2585.6	40546	100	0	15	2602.7	40717	75	0	24.14
High	20	2665.1	41341	100	0	15	2682.2	41512	75	0	24.40

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	20	2506.0	39750	1	99	15	2523.1	39921	1	0	24.20
Mid	20	2585.6	40546	1	99	15	2602.7	40717	1	0	23.11
High	20	2665.1	41341	1	99	15	2682.2	41512	1	0	23.01
Low	20	2506.0	39750	100	0	15	2523.1	39921	75	0	23.89
Mid	20	2585.6	40546	100	0	15	2602.7	40717	75	0	23.79
High	20	2665.1	41341	100	0	15	2682.2	41512	75	0	24.31

Note:

Modulation : 64QAM

8.2 Equivalent Isotropic Radiated Power

	PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
	BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
Low	5	39683	1/24	20	39800	100/0	-23.95	13.18	10.75	2.32	H	0.14	21.61
	10	39703	1/49	15	39823	75/0	-23.95	13.18	10.75	2.32	H	0.14	21.61
	10	39705	1/49	20	39849	100/0	-23.94	13.19	10.75	2.32	H	0.15	21.62
	15	39725	1/74	10	39845	50/0	-24.32	12.81	10.75	2.32	H	0.13	21.24
	15	39725	1/74	15	39875	75/0	-24.54	12.59	10.75	2.32	H	0.13	21.02
	15	39728	1/74	20	39899	100/0	-24.16	12.97	10.75	2.32	H	0.14	21.40
	20	39750	1/99	5	39867	25/0	-23.99	13.14	10.75	2.32	H	0.14	21.57
	20	39750	1/99	10	39894	50/0	-23.86	13.27	10.75	2.32	H	0.15	21.70
	20	39750	1/99	15	39921	75/0	-24.16	12.97	10.75	2.32	H	0.14	21.40
	20	39750	1/99	20	39948	100/0	-24.01	13.12	10.75	2.32	H	0.14	21.55
Mid	5	40528	1/24	20	40645	100/0	-24.13	13.02	10.98	2.35	H	0.15	21.65
	10	40549	1/49	15	40669	75/0	-23.84	13.31	10.98	2.35	H	0.16	21.94
	10	40526	1/49	20	40670	100/0	-23.85	13.30	10.98	2.35	H	0.16	21.93
	15	40571	1/74	10	40691	50/0	-23.48	13.67	10.98	2.35	H	0.17	22.30
	15	40545	1/74	15	40695	75/0	-23.86	13.29	10.98	2.35	H	0.16	21.92
	15	40523	1/74	20	40694	100/0	-23.90	13.25	10.98	2.35	H	0.15	21.88
	20	40595	1/99	5	40712	25/0	-23.73	13.42	10.98	2.35	H	0.16	22.05
	20	40571	1/99	10	40715	50/0	-23.68	13.47	10.98	2.35	H	0.16	22.10
	20	40546	1/99	15	40717	75/0	-23.25	13.90	10.98	2.35	H	0.18	22.53
	20	40521	1/99	20	40719	100/0	-23.68	13.47	10.98	2.35	H	0.16	22.10
High	5	41373	1/24	20	41490	100/0	-26.72	10.72	11.10	2.39	H	0.09	19.44
	10	41395	1/49	15	41515	75/0	-26.70	10.74	11.10	2.39	H	0.09	19.46
	10	41346	1/49	20	41490	100/0	-26.80	10.64	11.10	2.39	H	0.09	19.36
	15	41417	1/74	10	41537	50/0	-27.05	10.39	11.10	2.39	H	0.08	19.11
	15	41365	1/74	15	41515	75/0	-26.43	11.01	11.10	2.39	H	0.09	19.73
	15	41319	1/74	20	41490	100/0	-26.49	10.95	11.10	2.39	H	0.09	19.67
	20	41440	1/99	5	41557	25/0	-26.71	10.73	11.10	2.39	H	0.09	19.45
	20	41391	1/99	10	41535	50/0	-27.00	10.44	11.10	2.39	H	0.08	19.16
	20	41341	1/99	15	41512	75/0	-26.66	10.78	11.10	2.39	H	0.09	19.50
	20	41292	1/99	20	41490	100/0	-26.79	10.65	11.10	2.39	H	0.09	19.37

Note:

1. Modulation : QPSK
2. Limit : < 2 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	39750	1/99	10	39894	50/0	-24.44	12.69	10.75	2.32	H	0.13	21.12
5	40528	1/24	20	40645	100/0	-24.65	12.50	10.98	2.35	H	0.13	21.13
10	40549	1/49	15	40669	75/0	-24.53	12.62	10.98	2.35	H	0.13	21.25
10	40526	1/49	20	40670	100/0	-24.44	12.71	10.98	2.35	H	0.14	21.34
15	40571	1/74	10	40691	50/0	-23.84	13.31	10.98	2.35	H	0.16	21.94
15	40545	1/74	15	40695	75/0	-24.13	13.02	10.98	2.35	H	0.15	21.65
15	40523	1/74	20	40694	100/0	-24.18	12.97	10.98	2.35	H	0.14	21.60
20	40595	1/99	5	40712	25/0	-24.04	13.11	10.98	2.35	H	0.15	21.74
20	40571	1/99	10	40715	50/0	-24.07	13.08	10.98	2.35	H	0.15	21.71
20	40546	1/99	15	40717	75/0	-23.52	13.63	10.98	2.35	H	0.17	22.26
20	40521	1/99	20	40719	100/0	-24.00	13.15	10.98	2.35	H	0.15	21.78
15	41365	1/74	15	41515	75/0	-26.95	10.49	11.10	2.39	H	0.08	19.21

Note:

1. Modulation : 16QAM

2. Limit : < 2 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	39750	1/99	10	39894	50/0	-25.63	11.50	10.75	2.32	H	0.10	19.93
5	40528	1/24	20	40645	100/0	-25.67	11.48	10.98	2.35	H	0.10	20.11
10	40549	1/49	15	40669	75/0	-25.09	12.06	10.98	2.35	H	0.12	20.69
10	40526	1/49	20	40670	100/0	-25.12	12.03	10.98	2.35	H	0.12	20.66
15	40571	1/74	10	40691	50/0	-24.73	12.42	10.98	2.35	H	0.13	21.05
15	40545	1/74	15	40695	75/0	-25.02	12.13	10.98	2.35	H	0.12	20.76
15	40523	1/74	20	40694	100/0	-25.82	11.33	10.98	2.35	H	0.10	19.96
20	40595	1/99	5	40712	25/0	-24.90	12.25	10.98	2.35	H	0.12	20.88
20	40571	1/99	10	40715	50/0	-24.99	12.16	10.98	2.35	H	0.12	20.79
20	40546	1/99	15	40717	75/0	-24.88	12.27	10.98	2.35	H	0.12	20.90
20	40521	1/99	20	40719	100/0	-25.26	11.89	10.98	2.35	H	0.11	20.52
15	41365	1/74	15	41515	75/0	-28.22	9.22	11.10	2.39	H	0.06	17.94

Note:

1. Modulation : 64QAM

2. Limit : < 2 Watts

8.3 Conducted Spurious Emissions

Operating frequency	PCC				SCC				Measurement Maximum Frequency (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)
	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset				
Low	20	39750	2506.0	1/99	15	39921	2523.1	1/0	3.7702	31.956	-76.66	-44.70
Mid	20	40546	2585.6	1/99	15	40717	2602.7	1/0	3.1780	31.956	-76.23	-44.28
High	20	41341	2665.1	1/99	15	41512	2682.2	1/0	3.7553	31.956	-76.54	-44.58
Low	20	39750	2506.0	1/0	15	39921	2523.1	1/74	7.9801	32.571	-76.34	-43.77
Mid	20	40546	2585.6	1/0	15	40717	2602.7	1/74	3.3954	31.956	-76.53	-44.58
High	20	41341	2665.1	1/0	15	41512	2682.2	1/74	7.9826	32.571	-76.50	-43.93
Low	20	39750	2506.0	100/0	15	39921	2523.1	75/0	5.7488	32.571	-76.46	-43.89
Mid	20	40546	2585.6	100/0	15	40717	2602.7	75/0	8.0284	32.571	-76.48	-43.91
High	20	41341	2665.1	100/0	15	41512	2682.2	75/0	3.1332	31.956	-76.83	-44.88
Low	20	39750	2506.0	100/0	20	39948	2525.8	100/0	6.0743	32.571	-75.86	-43.29
Mid	20	40521	2583.1	100/0	20	40719	2602.9	100/0	3.7832	31.956	-76.44	-44.48
High	20	41292	2660.2	100/0	20	41490	2680.0	100/0	3.1840	31.956	-76.77	-44.81

Note:

1. Modulation : QPSK

2. Factor(dB) = Cable Loss + Ext. Attenuator + Power Splitter

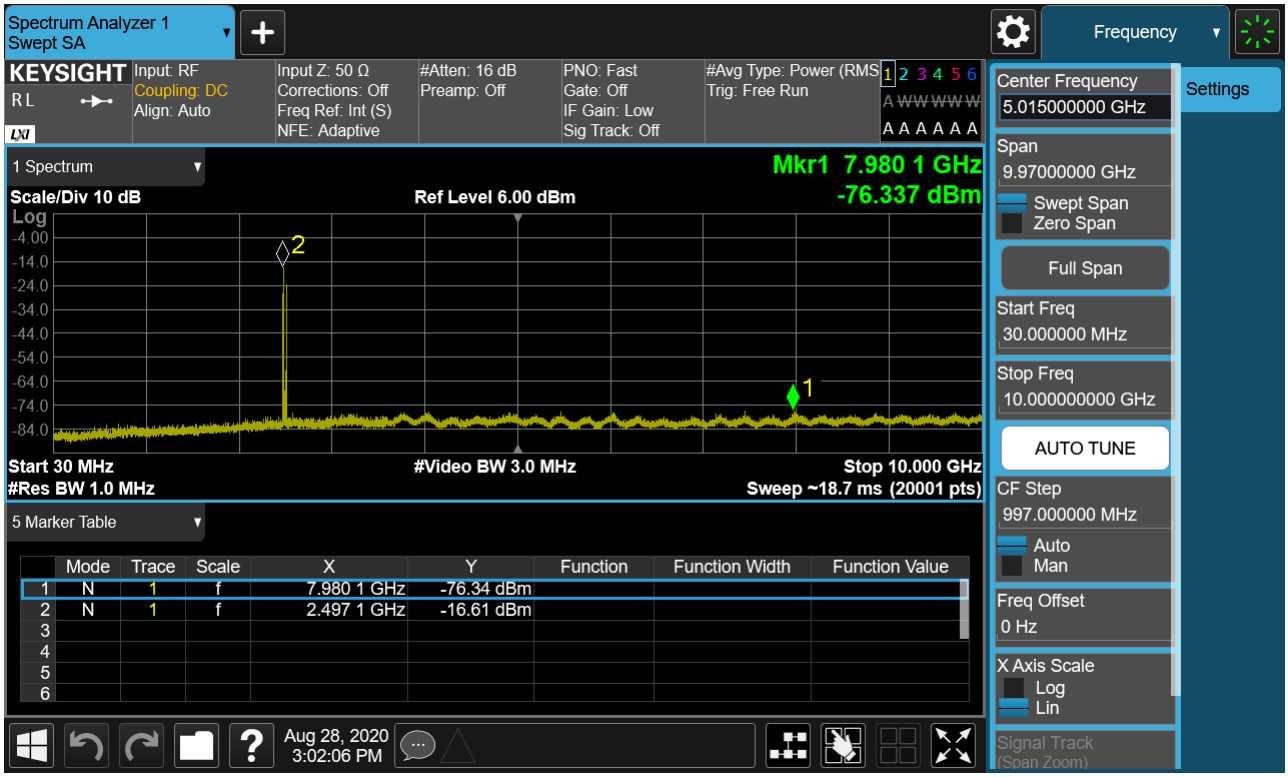
3. Factors for frequency :

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

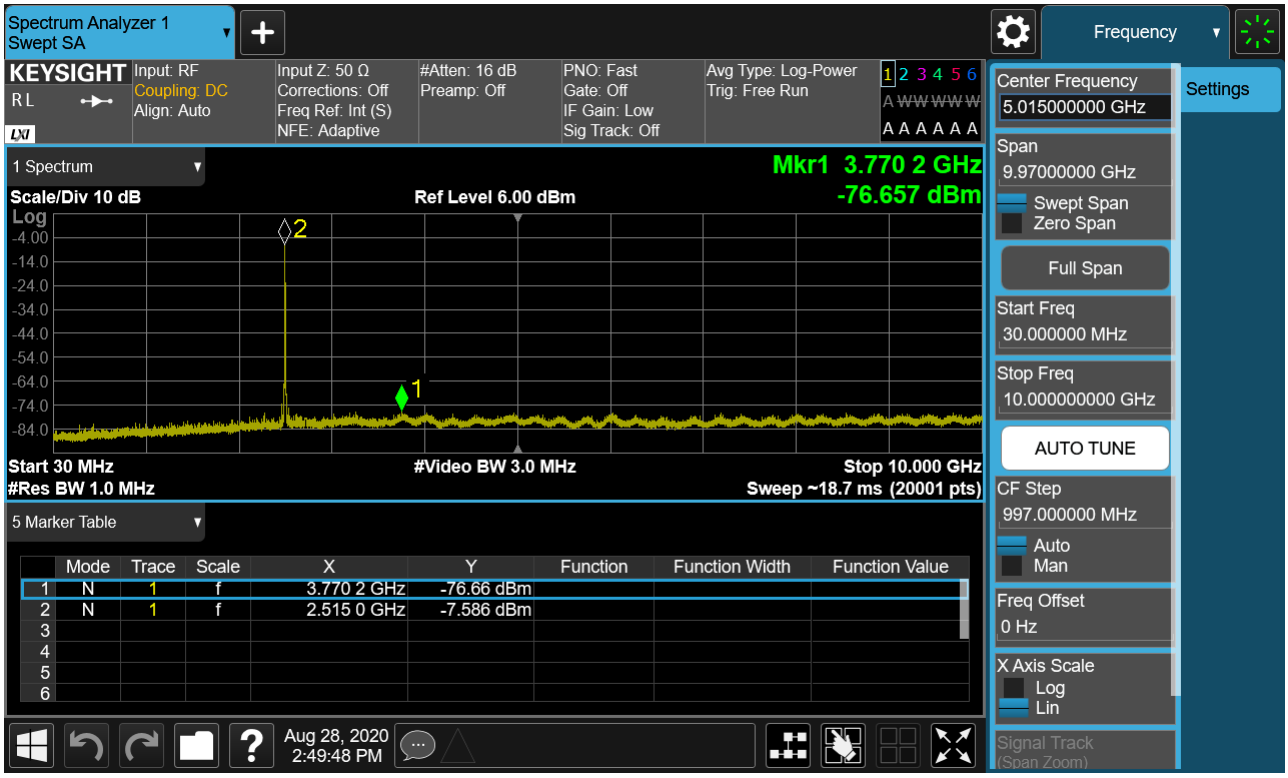
4. Limit : -25.0 dBm

Frequency Range : 30MHz ~ 10GHz

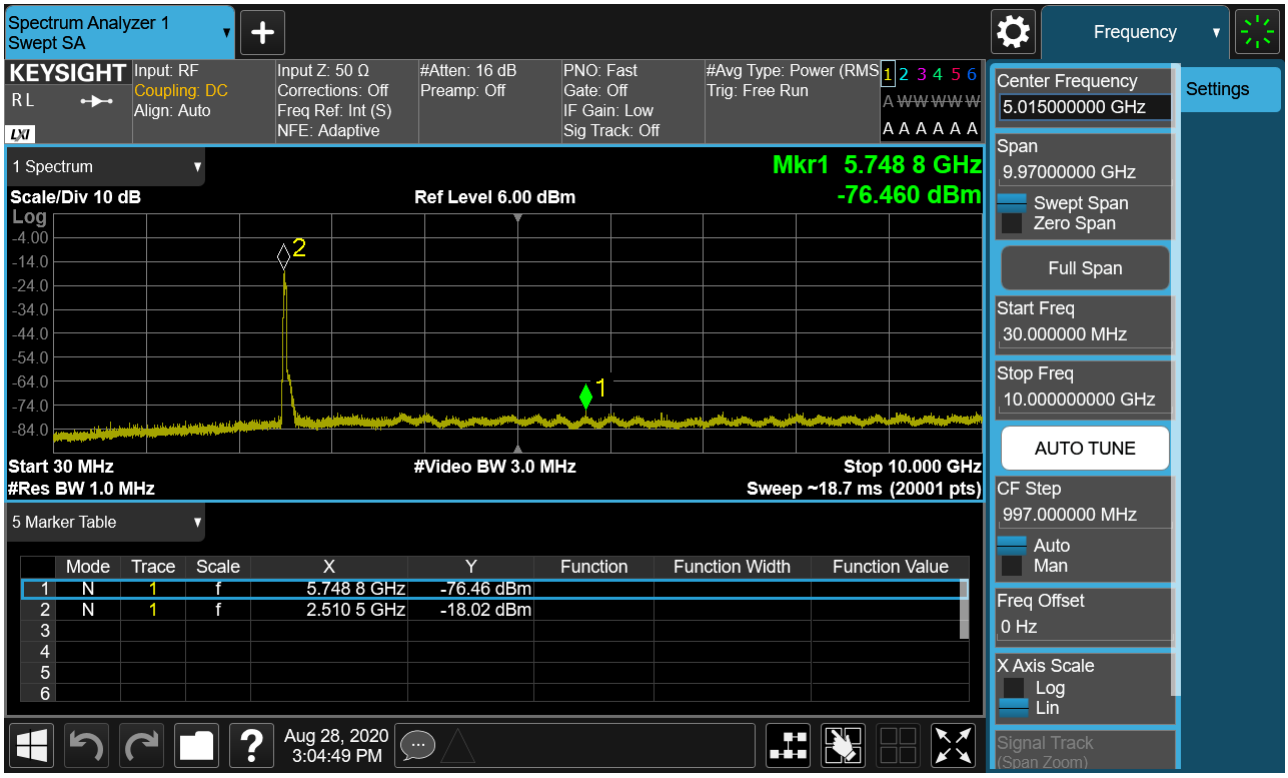
PCC 20MHz Ch39750 RB1 Offset0 SCC 15MHz Ch39921 RB1 Offset74



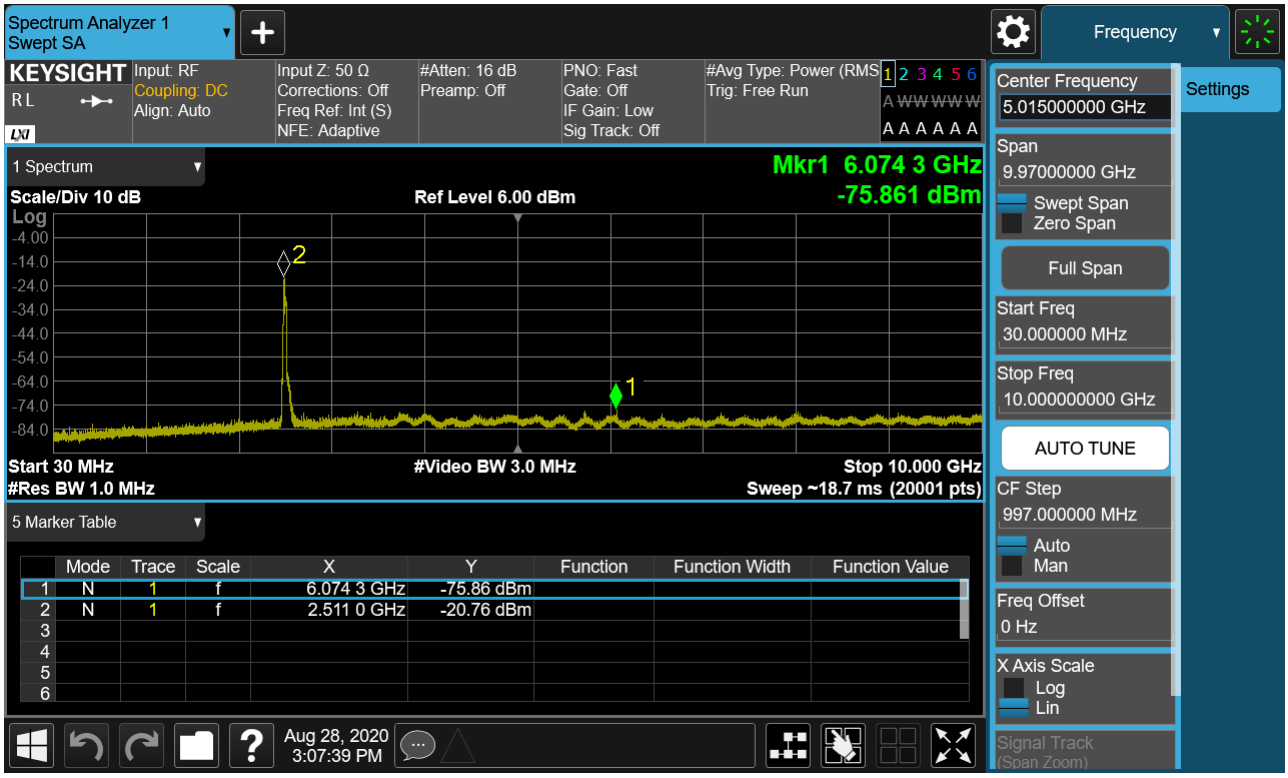
PCC 20MHz Ch39750 RB1 Offset99 SCC 15MHz Ch39921 RB1 Offset0



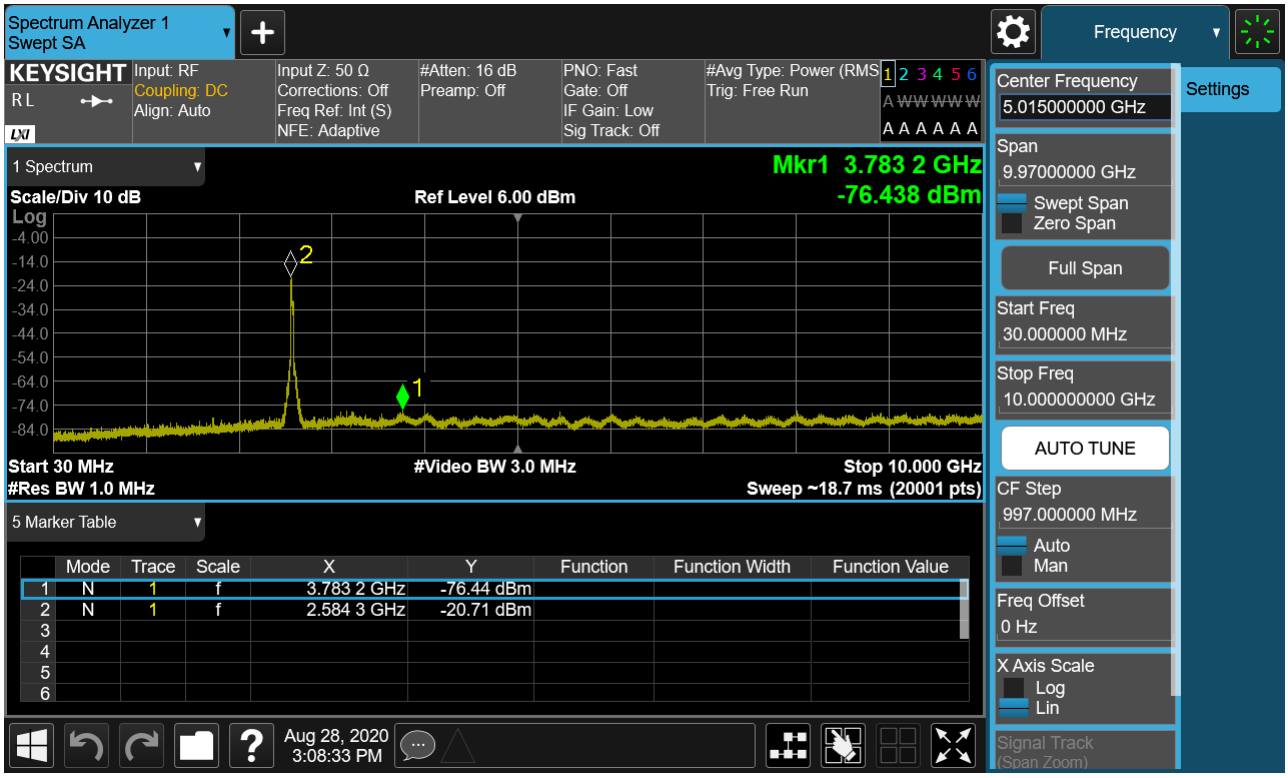
PCC 20MHz Ch39750 RB100 Offset0 SCC 15MHz Ch39921 RB75 Offset0



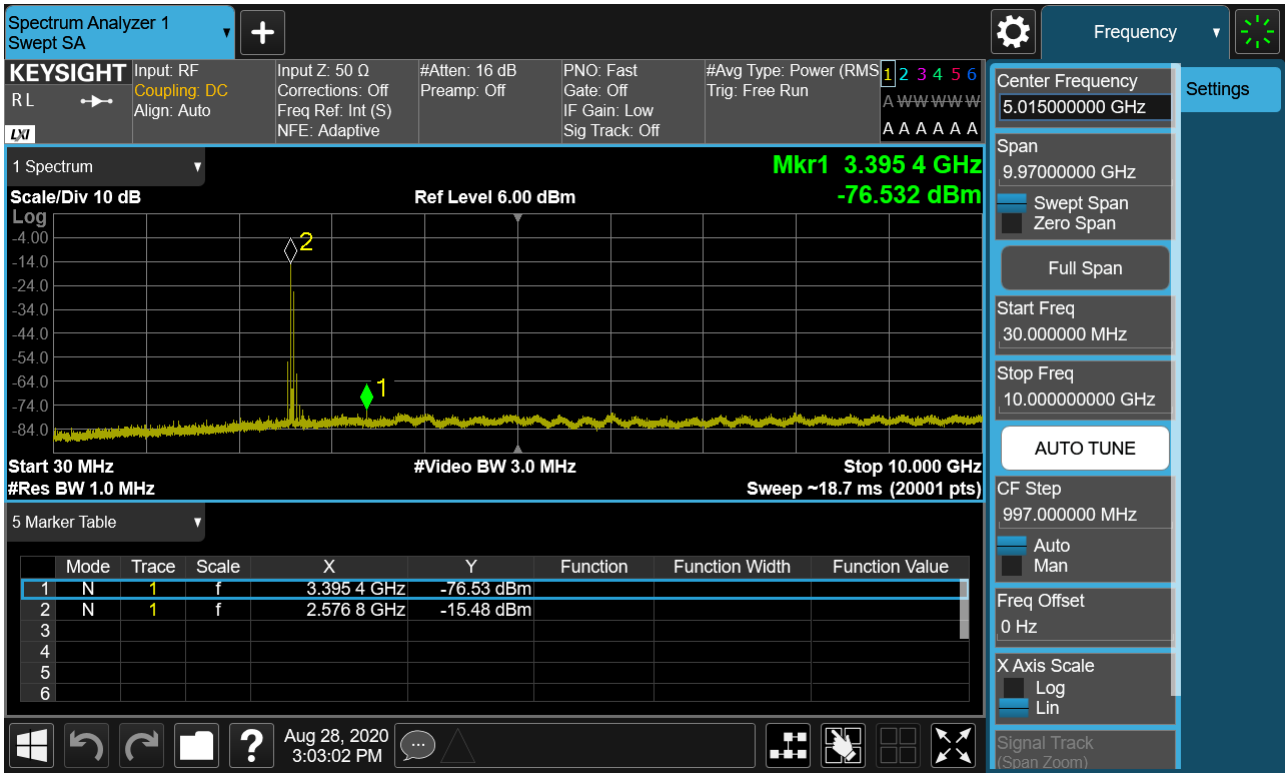
PCC 20MHz Ch39750 RB100 Offset0 SCC 20MHz Ch39948 RB100 Offset0



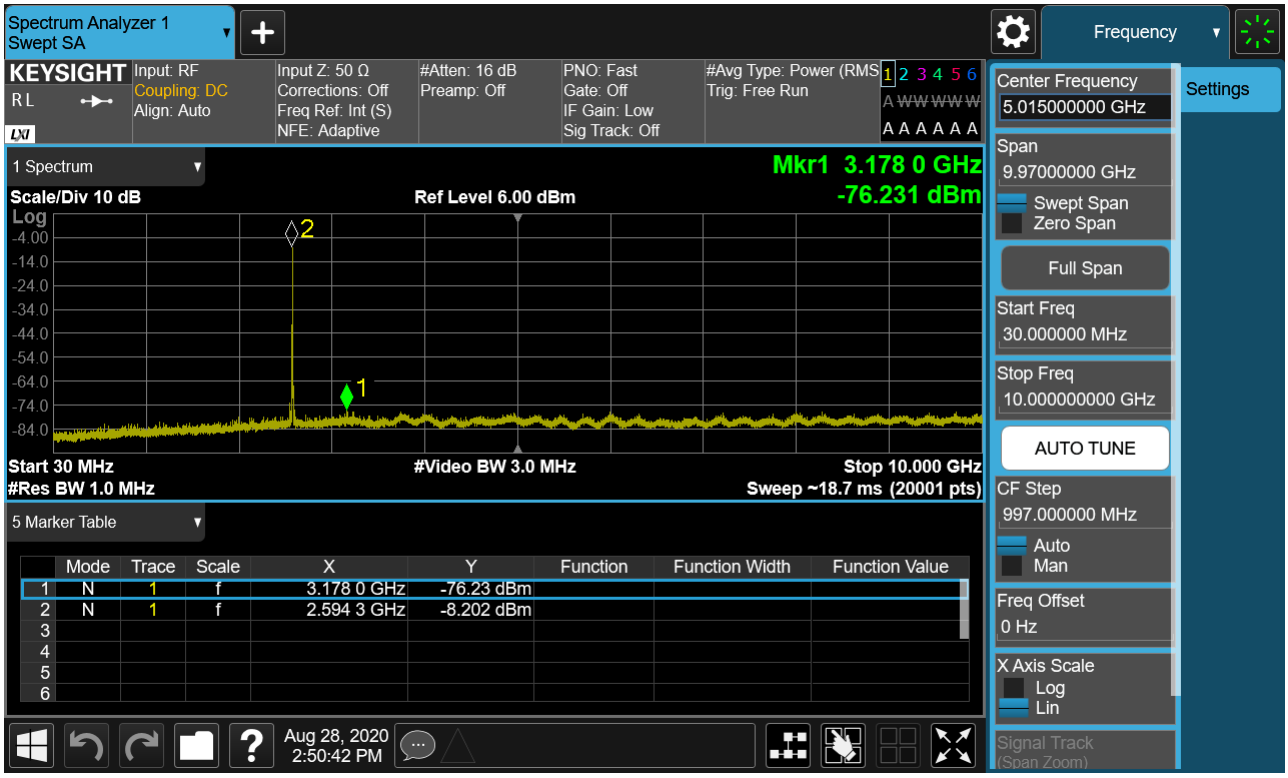
PCC 20MHz Ch40521 RB100 Offset0 SCC 20MHz Ch40719 RB100 Offset0



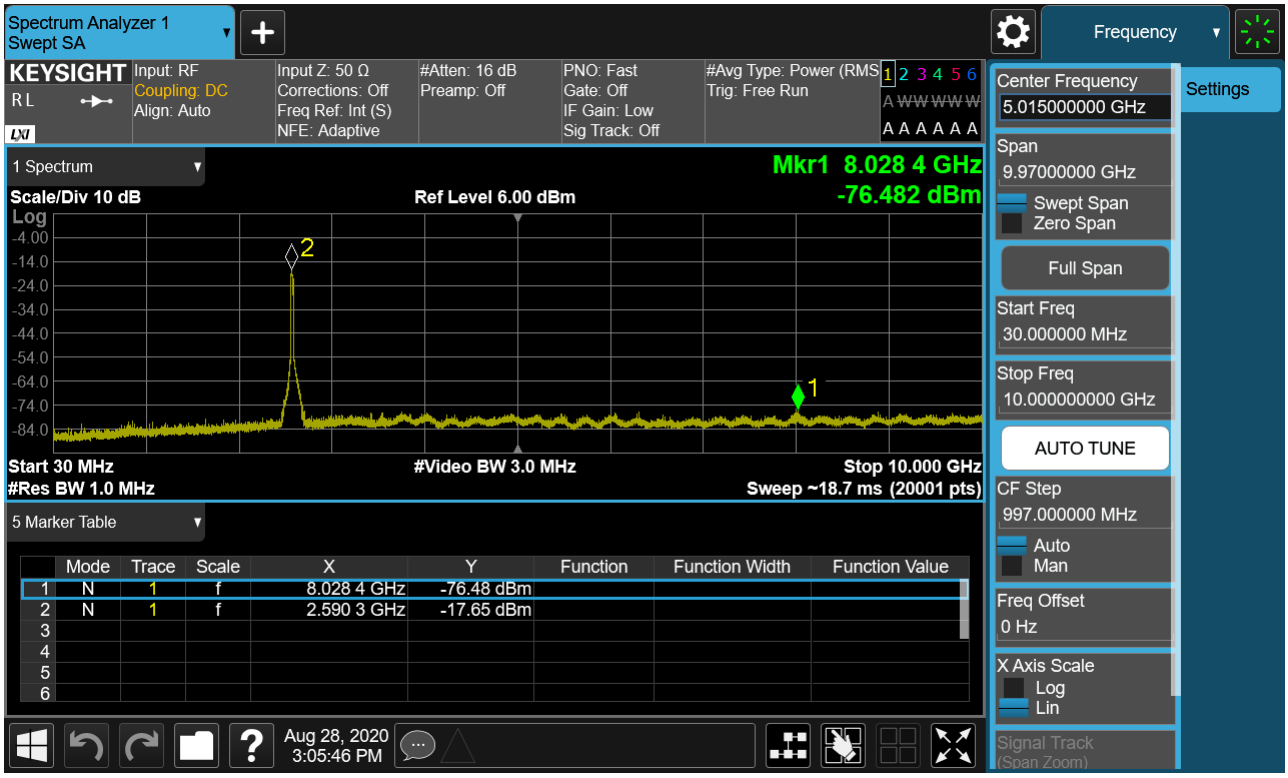
PCC 20MHz Ch40546 RB1 Offset0 SCC 15MHz Ch40717 RB1 Offset74



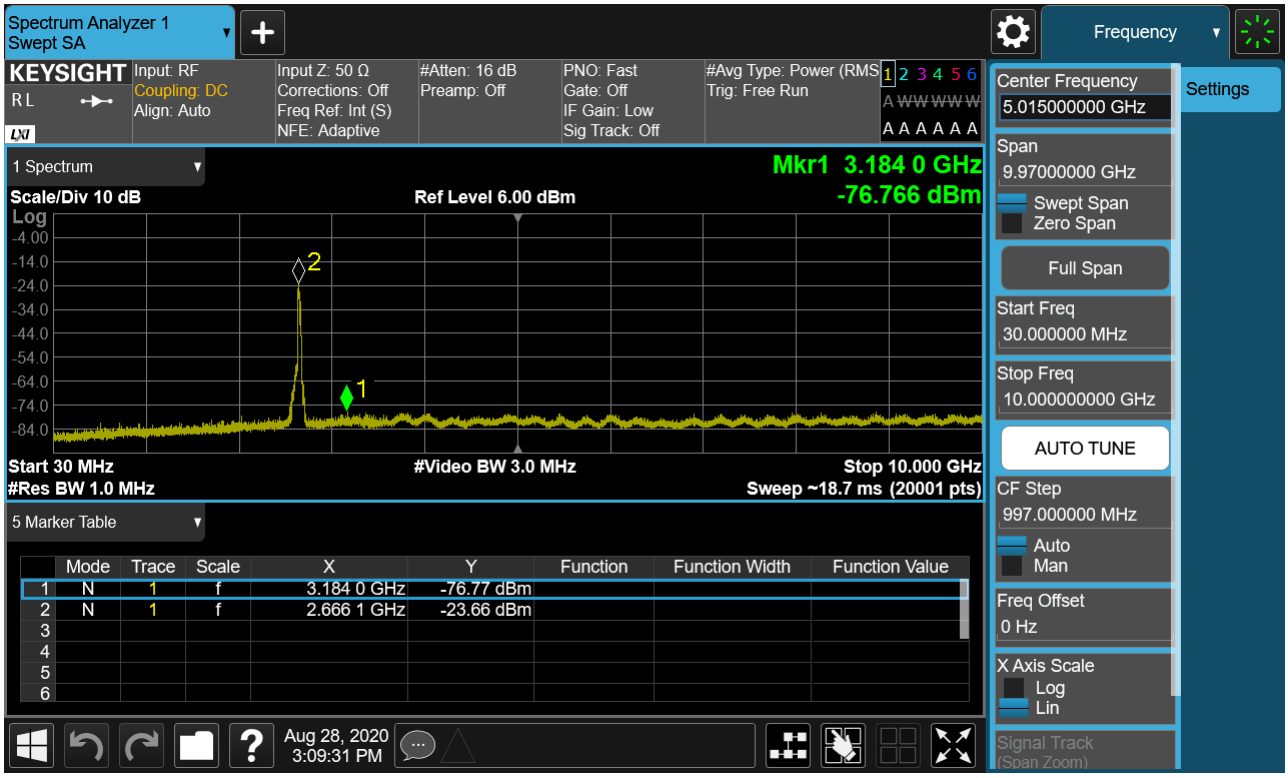
PCC 20MHz Ch40546 RB1 Offset99 SCC 15MHz Ch40717 RB1 Offset0



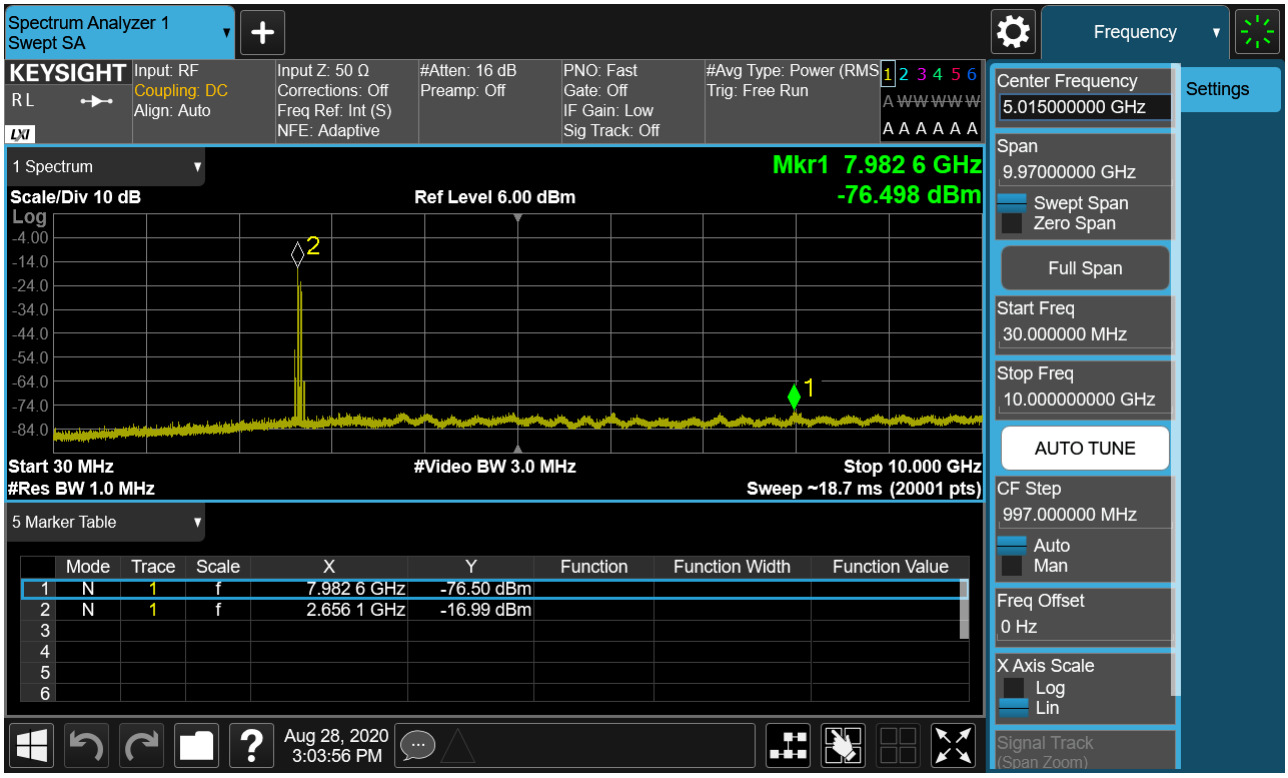
PCC 20MHz Ch40546 RB100 Offset0 SCC 15MHz Ch40717 RB75 Offset0



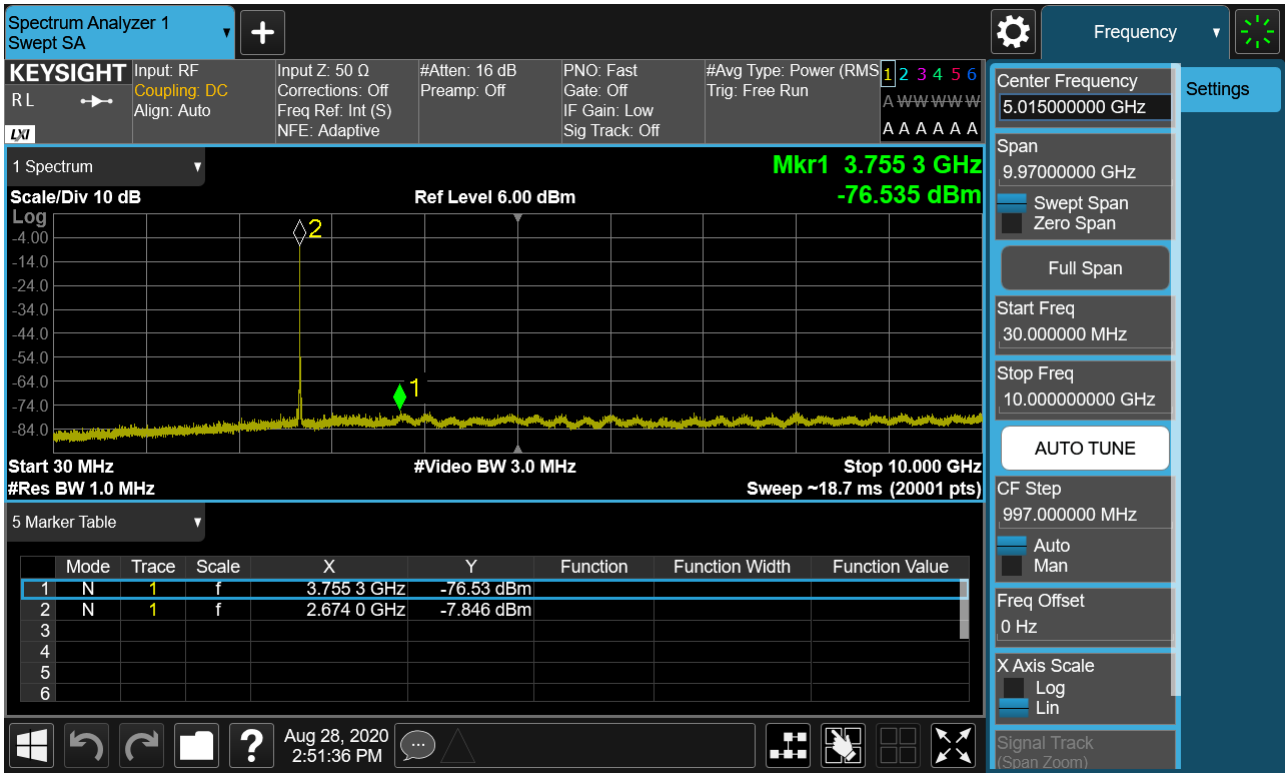
PCC 20MHz Ch41292 RB100 Offset0 SCC 20MHz Ch41490 RB100 Offset0



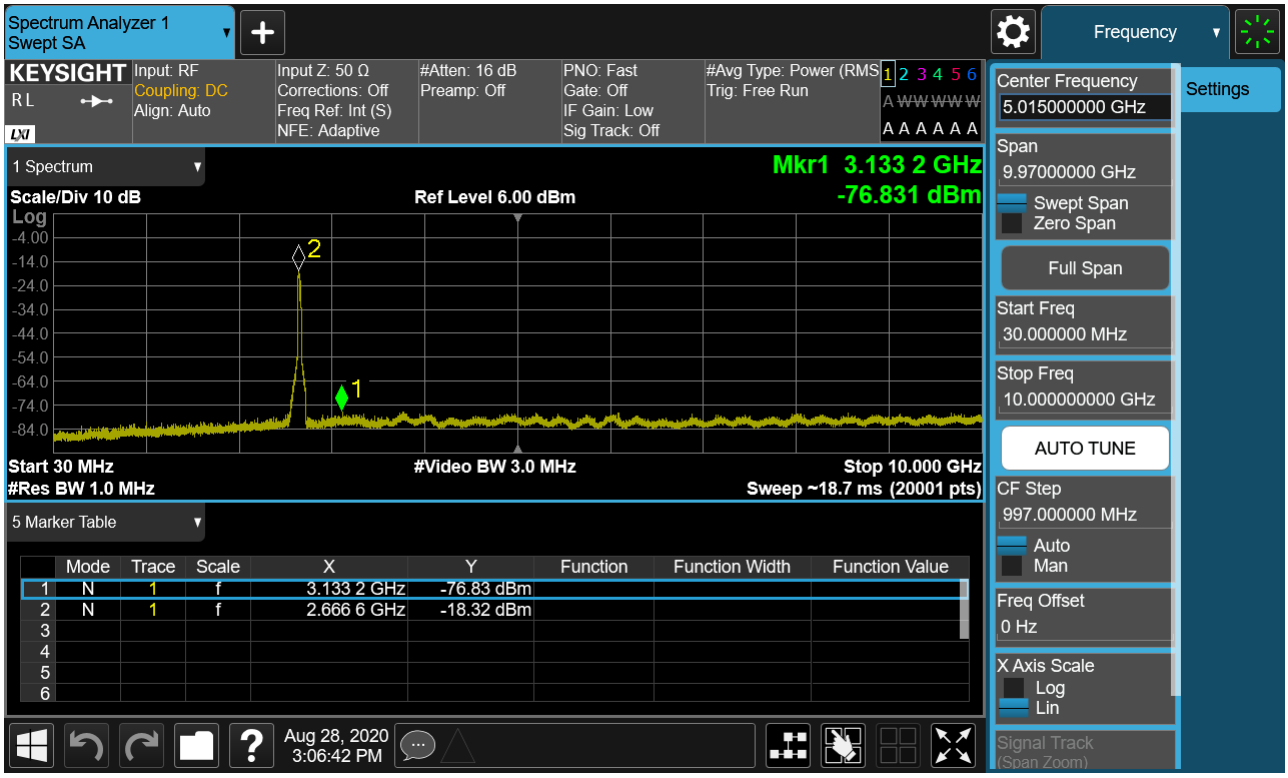
PCC 20MHz Ch41341 RB1 Offset0 SCC 15MHz Ch41512 RB1 Offset74



PCC 20MHz Ch41341 RB1 Offset99 SCC 15MHz Ch41512 RB1 Offset0

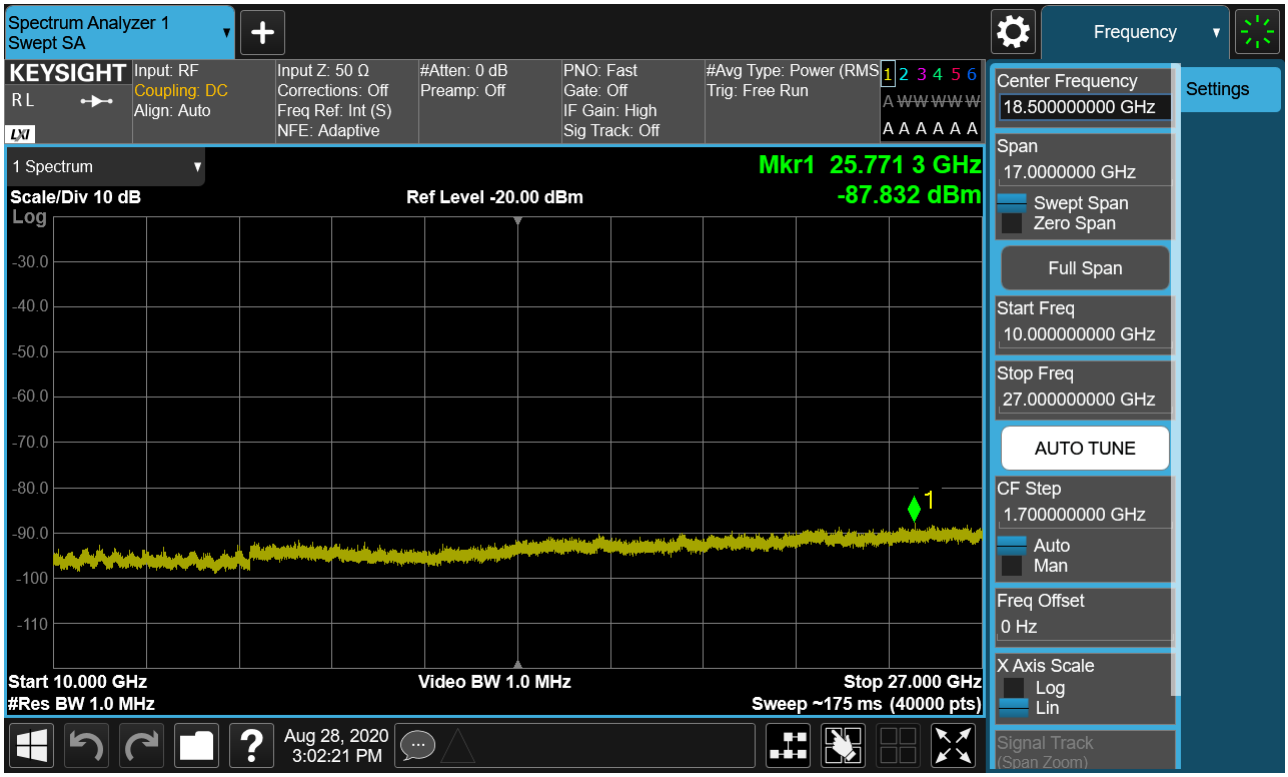


PCC 20MHz Ch41341 RB100 Offset0 SCC 15MHz Ch41512 RB75 Offset0

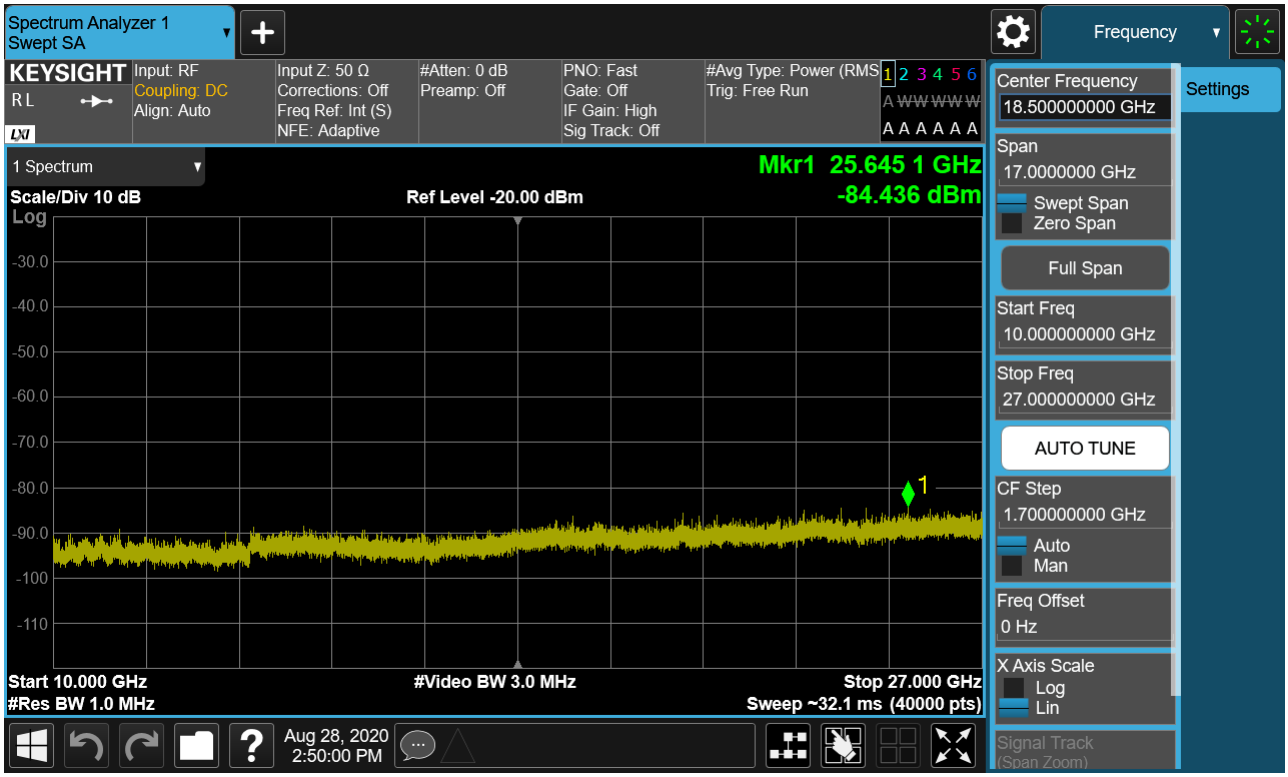


Frequency Range : 10GHz ~ 27.0GHz

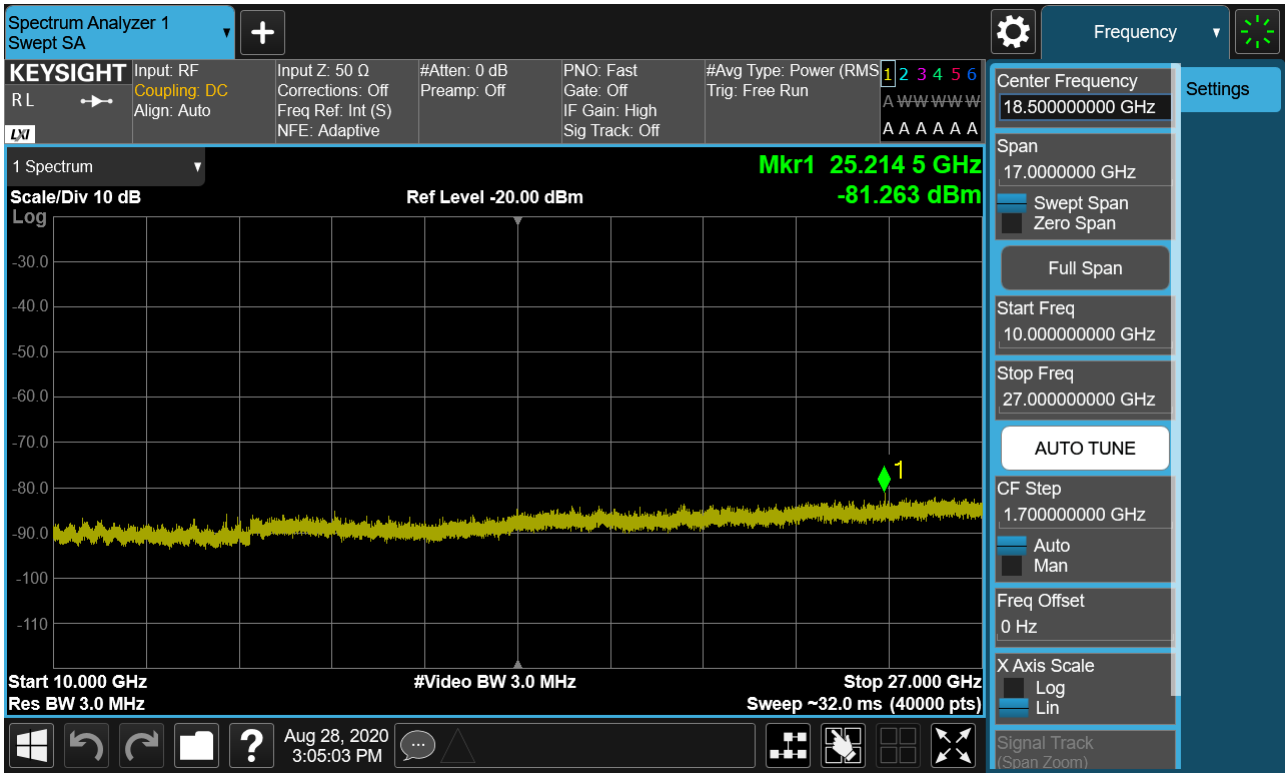
PCC 20MHz Ch39750 RB1 Offset0, SCC 15MHz Ch39921 RB1 Offset74



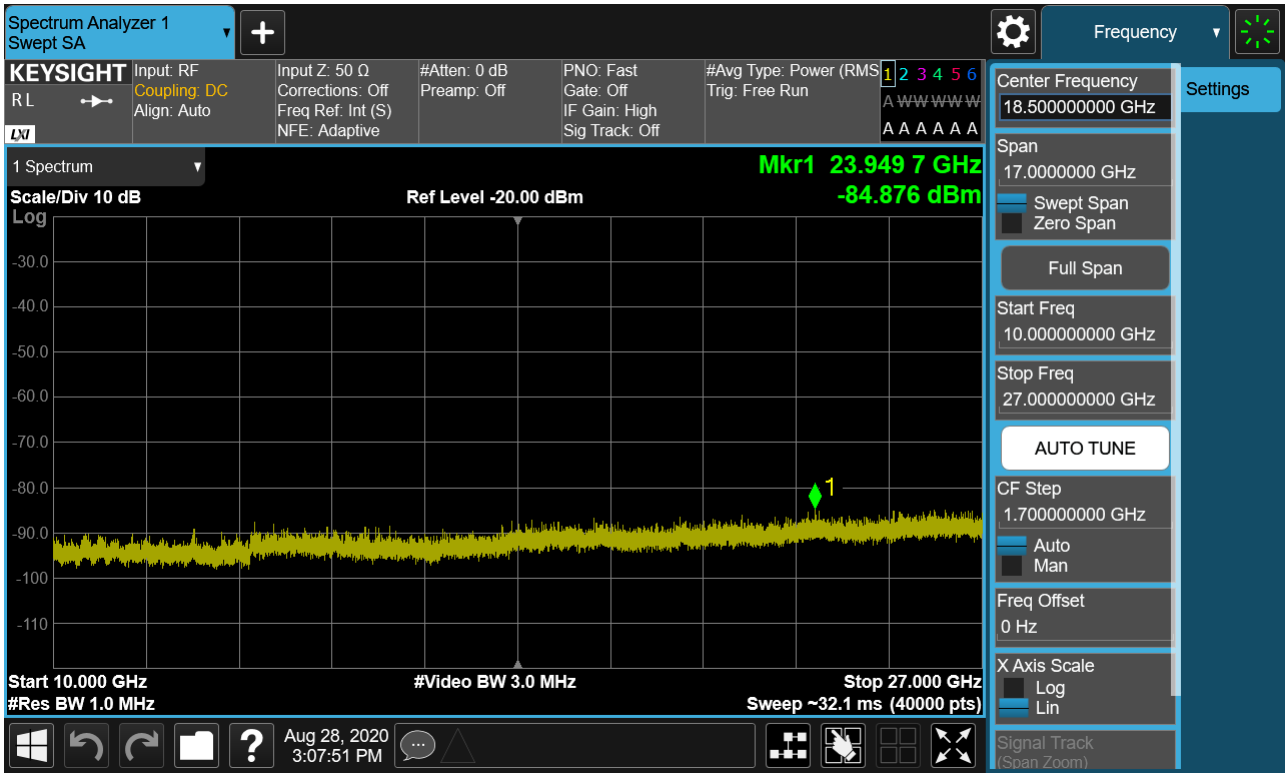
PCC 20MHz Ch39750 RB1 Offset99, SCC 15MHz Ch39921 RB1 Offset0



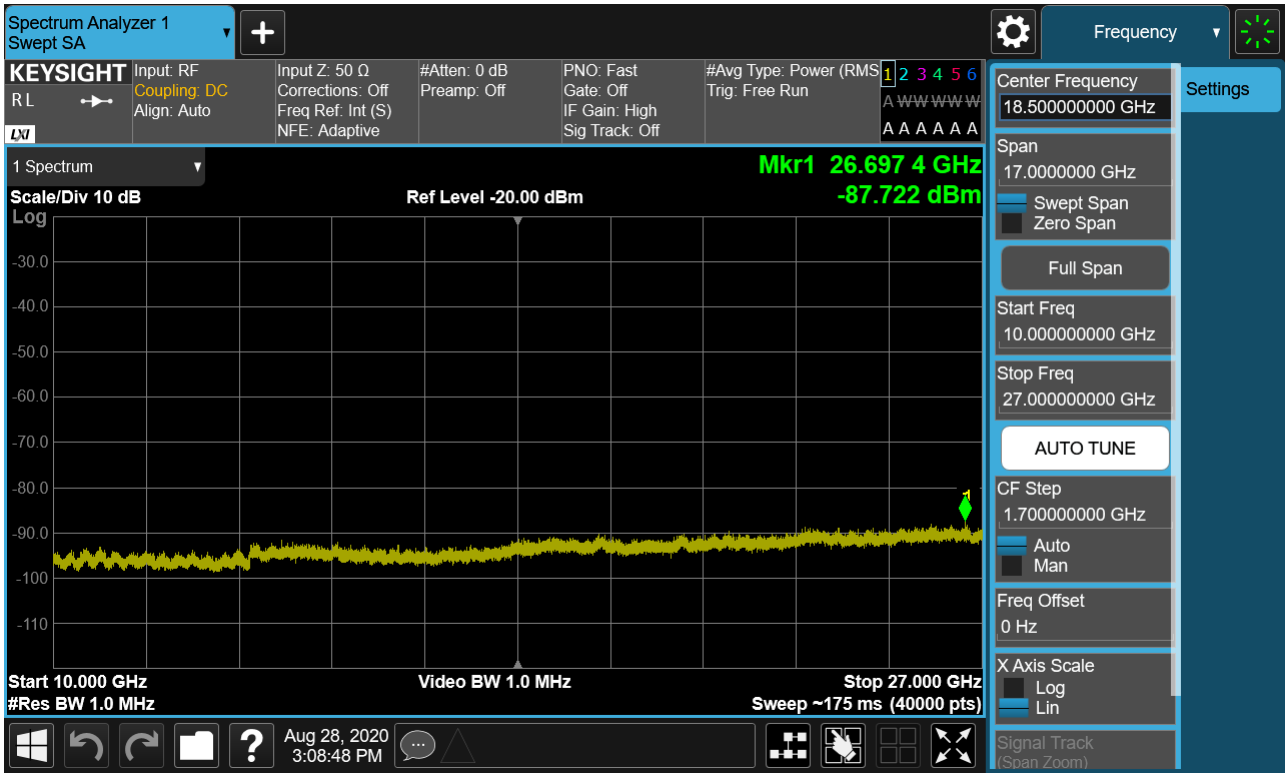
PCC 20MHz Ch39750 RB100 Offset0, SCC 15MHz Ch39921 RB75 Offset0



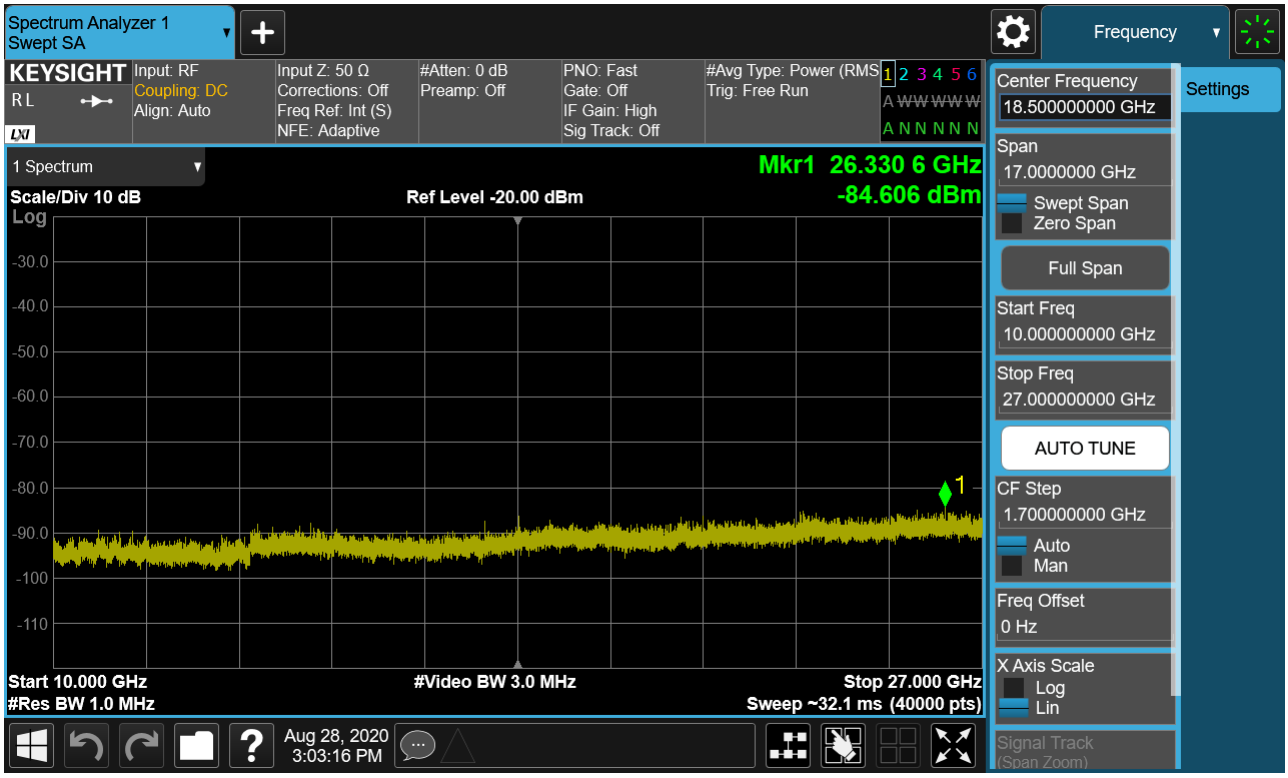
PCC 20MHz Ch39750 RB100 Offset0, SCC 20MHz Ch39948 RB100 Offset0



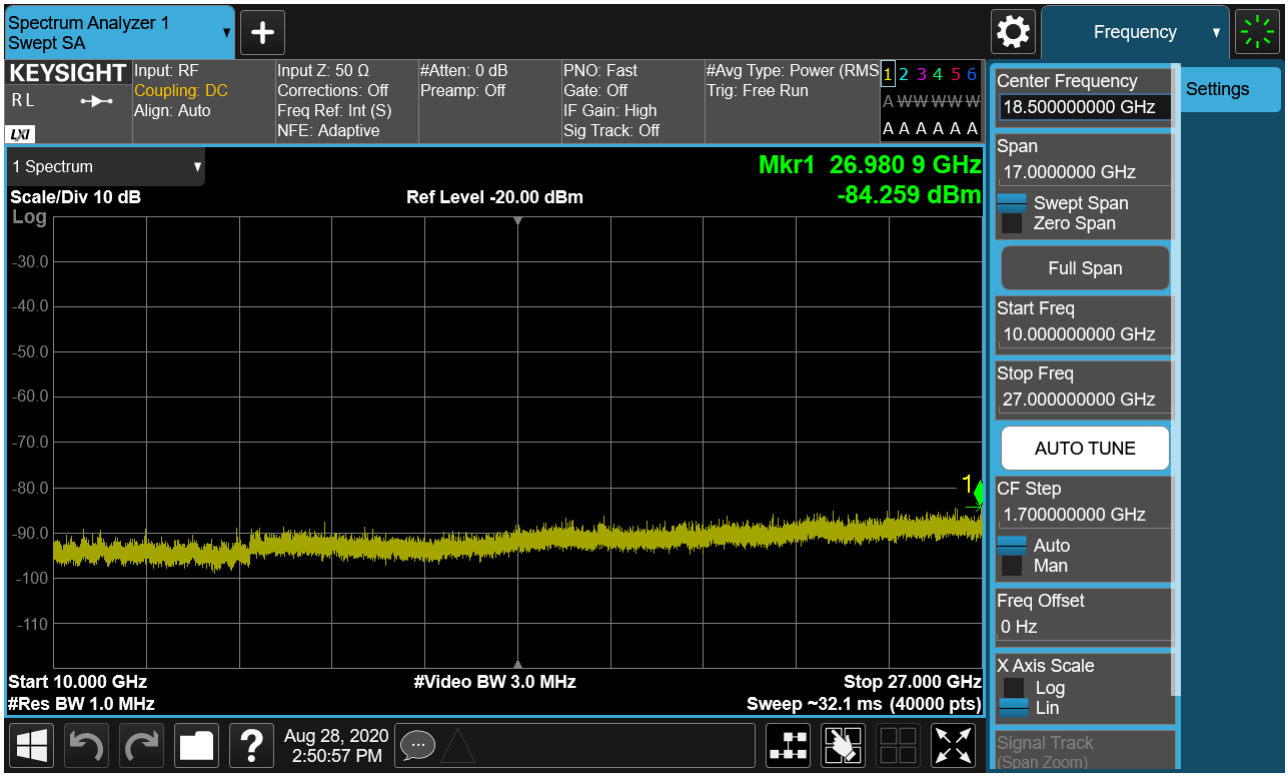
PCC 20MHz Ch40521 RB100 Offset0, SCC 20MHz Ch40719 RB100 Offset0



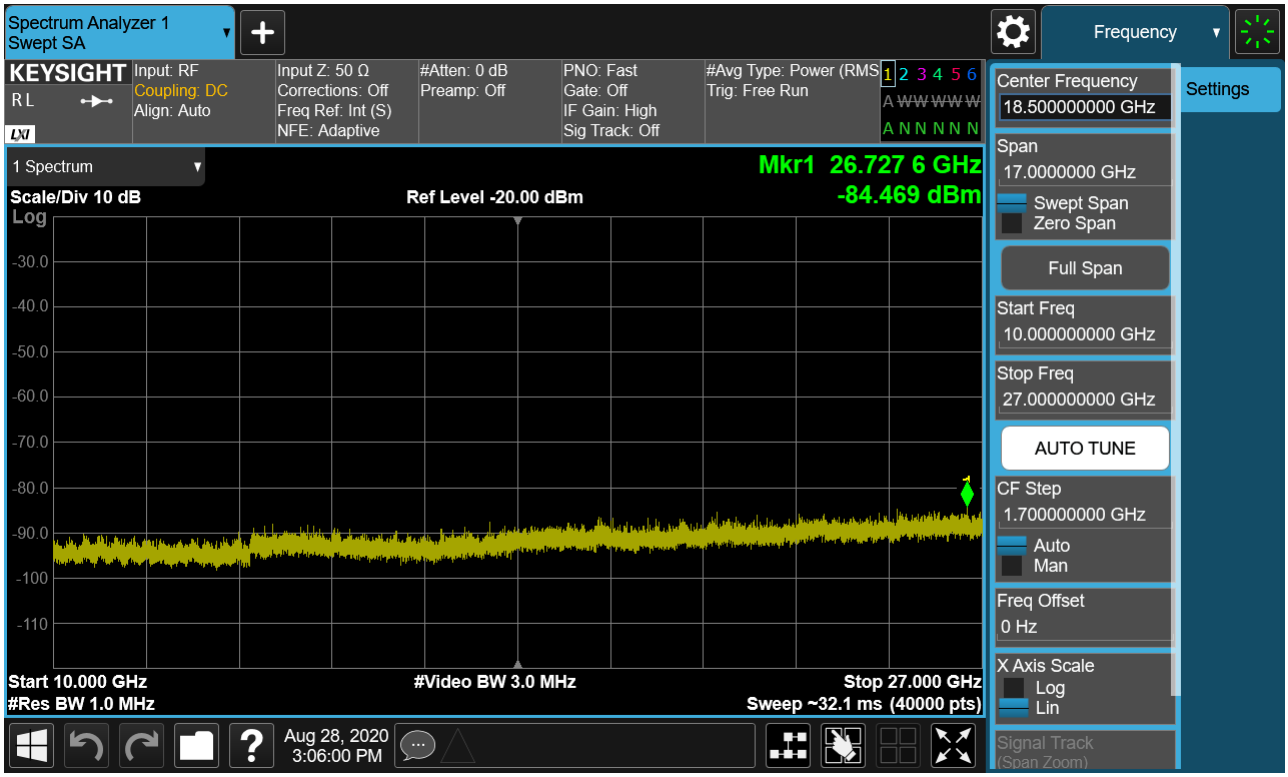
PCC 20MHz Ch40546 RB1 Offset0, SCC 15MHz Ch40717 RB1 Offset74



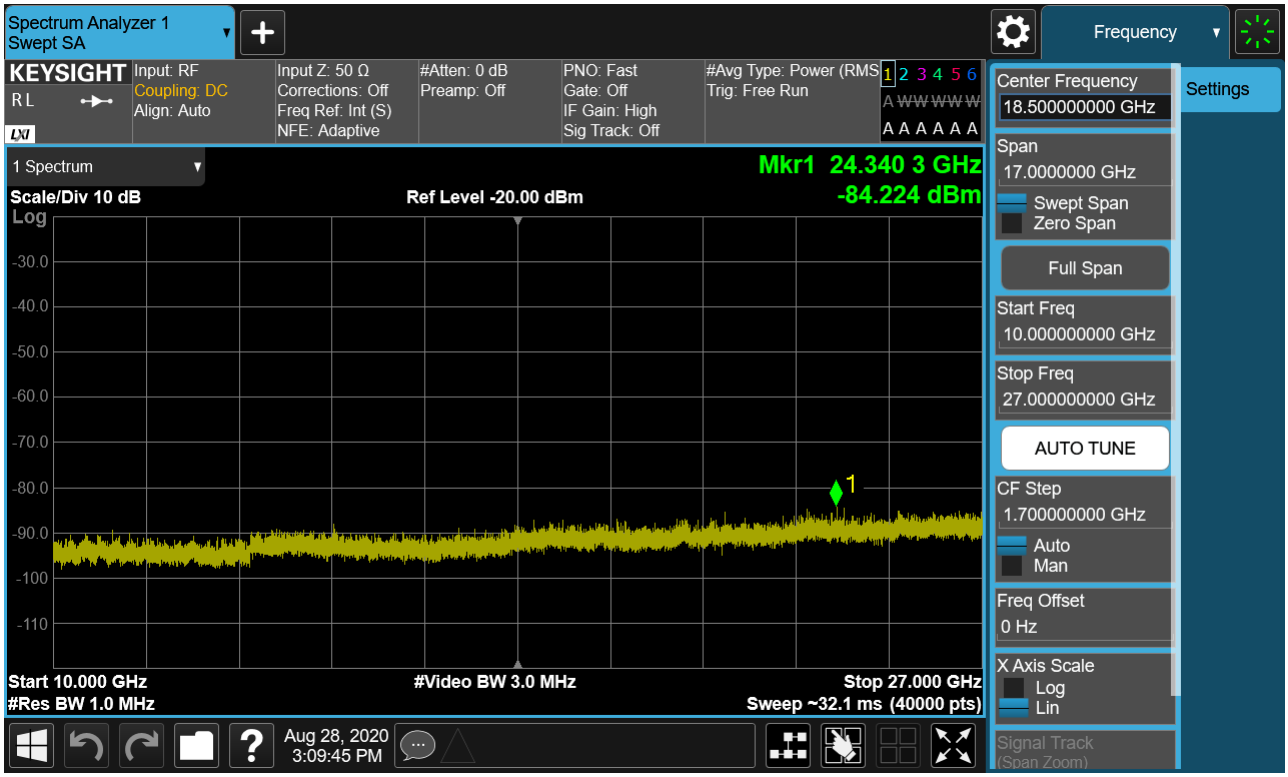
PCC 20MHz Ch40546 RB1 Offset99, SCC 15MHz Ch40717 RB1 Offset0



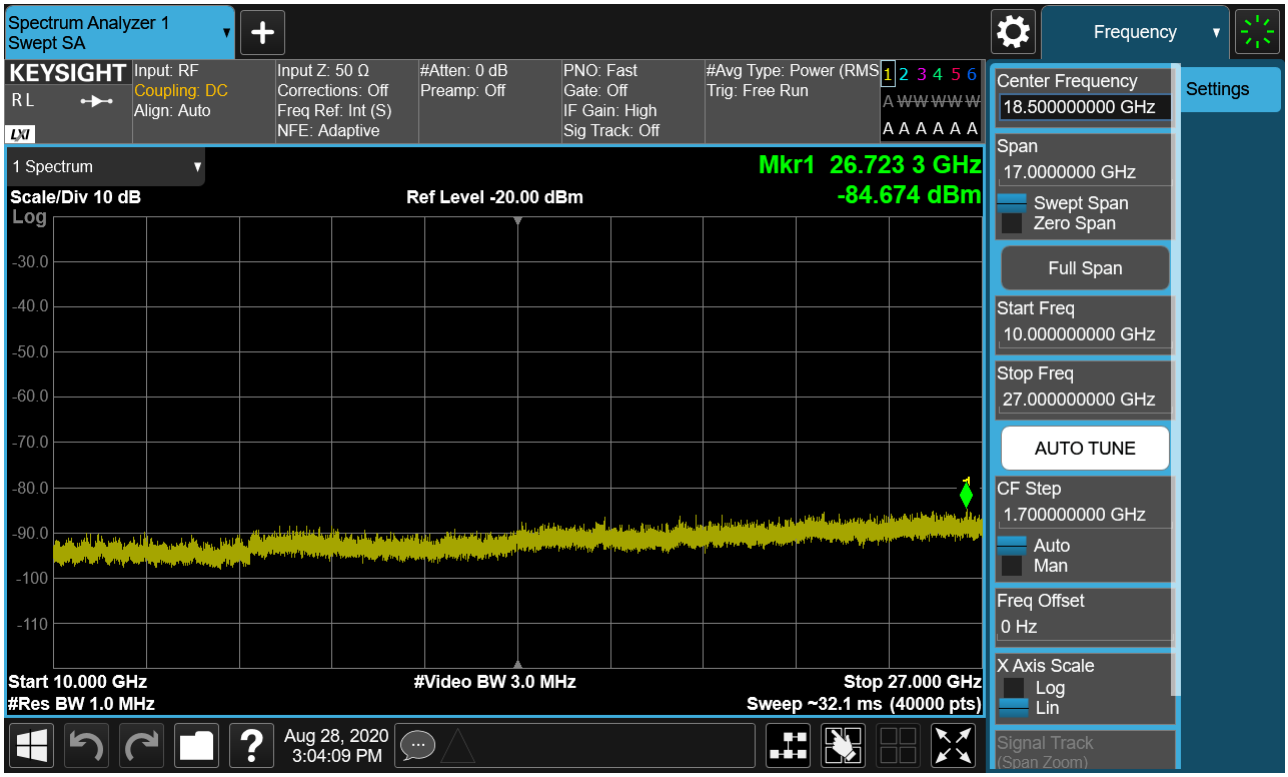
PCC 20MHz Ch40546 RB100 Offset0, SCC 15MHz Ch40717 RB75 Offset0



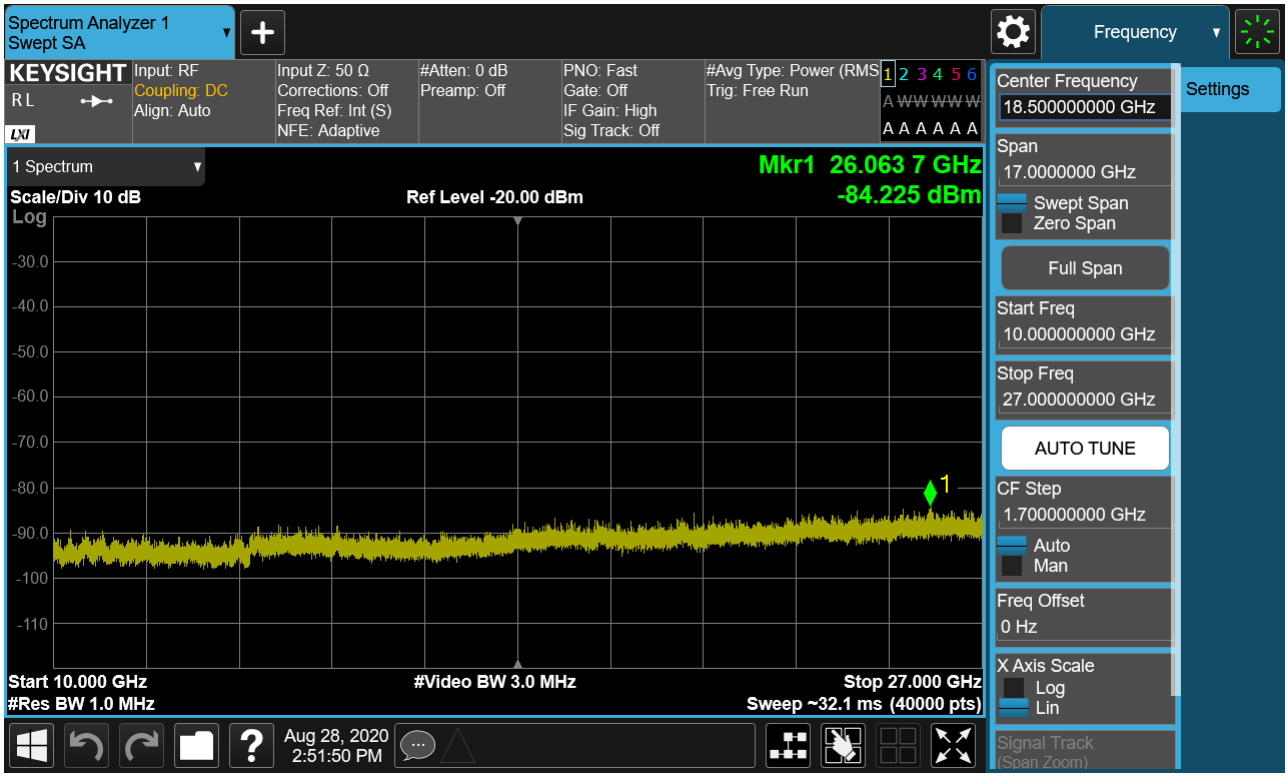
PCC 20MHz Ch41292 RB100 Offset0, SCC 20MHz Ch41490 RB100 Offset0



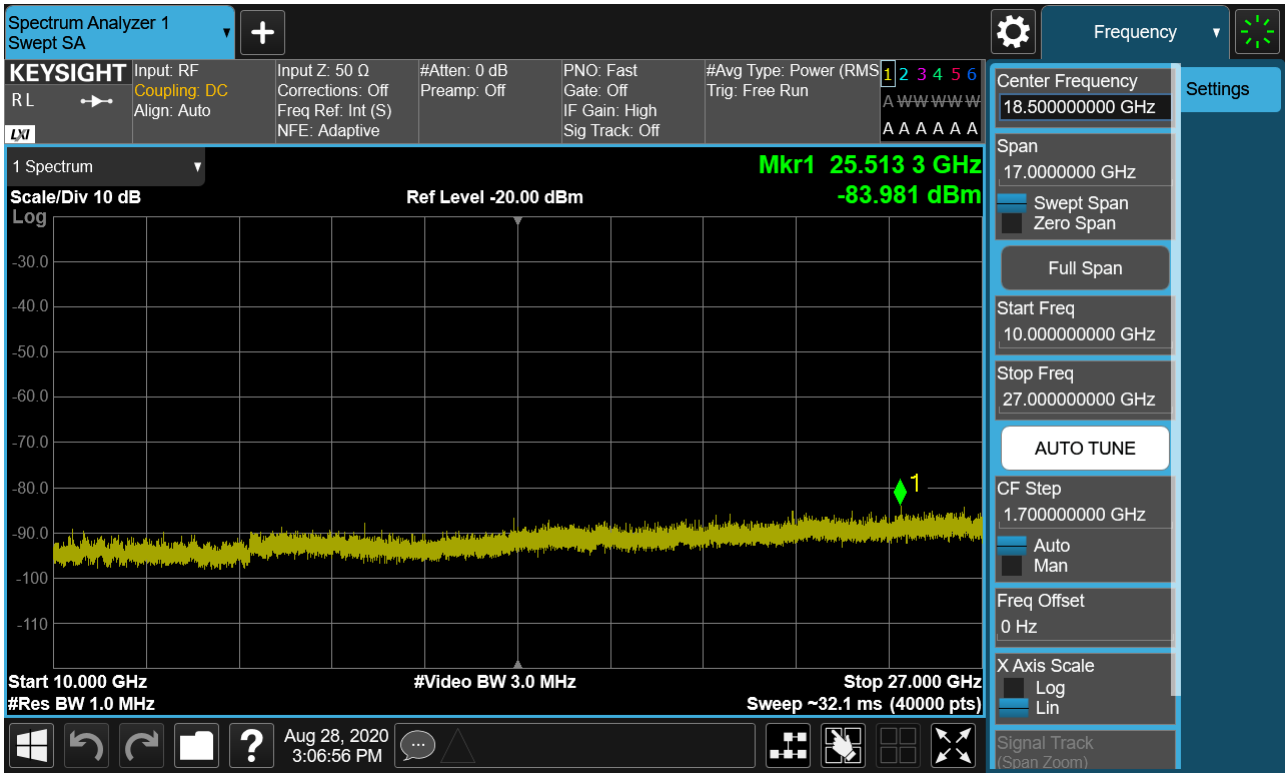
PCC 20MHz Ch41341 RB1 Offset0, SCC 15MHz Ch41512 RB1 Offset74



PCC 20MHz Ch41341 RB1 Offset99, SCC 15MHz Ch41512 RB1 Offset0

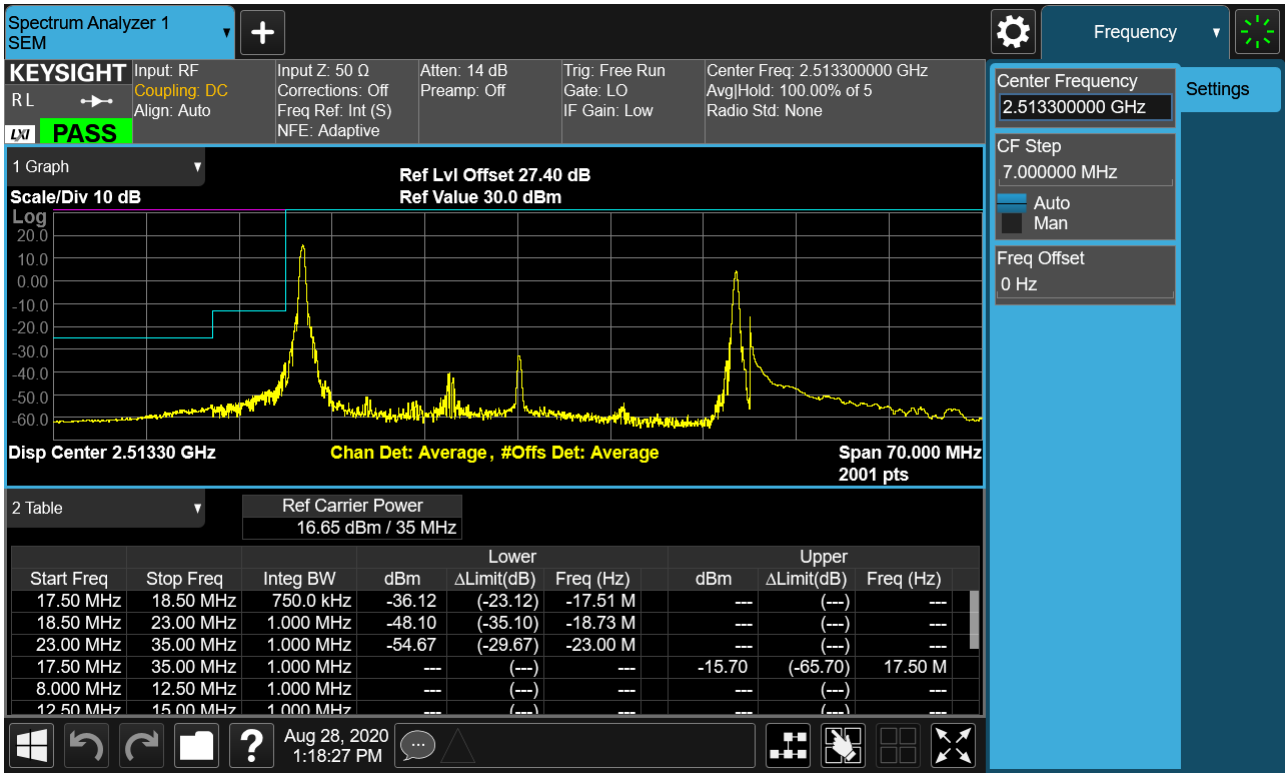


PCC 20MHz Ch41341 RB100 Offset0, SCC 15MHz Ch41512 RB75 Offset0



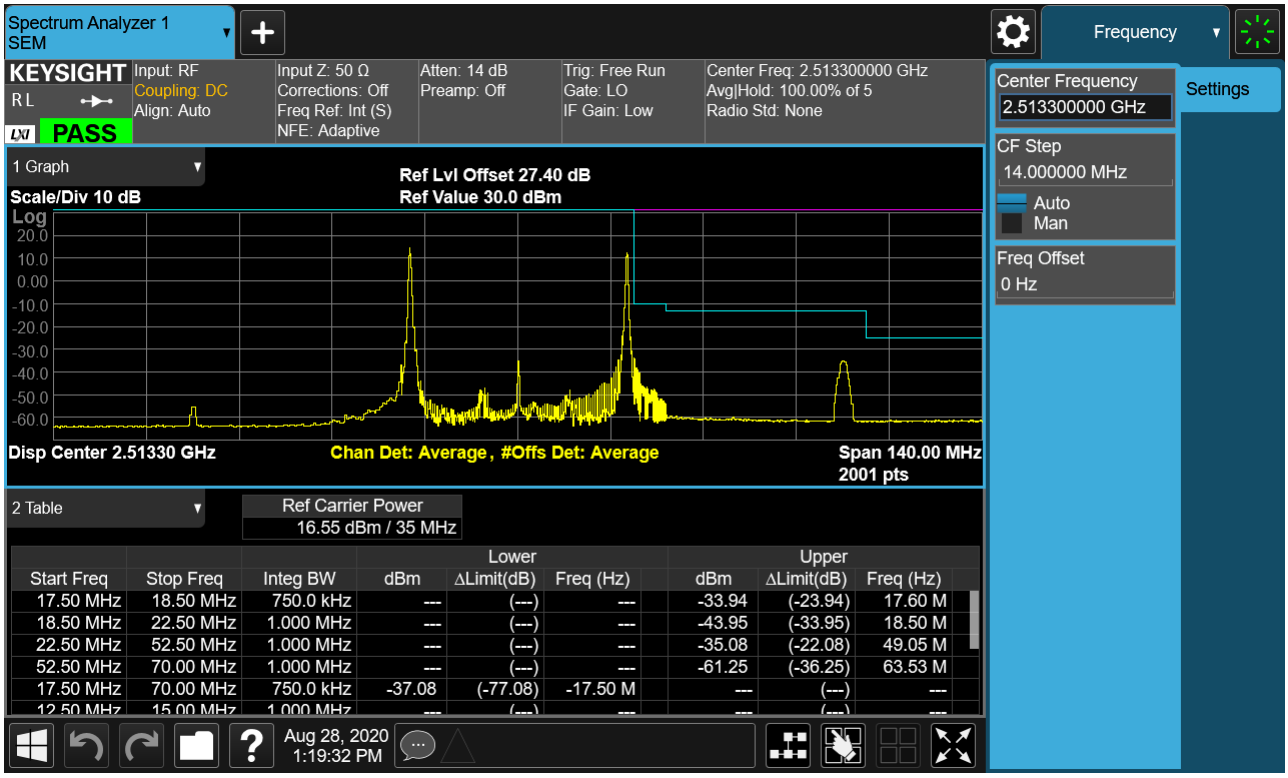
8.4 Channel Edge

PCC 20MHz Ch39750 RB1 Offset0, SCC 15MHz Ch39921 RB1 Offset74-1



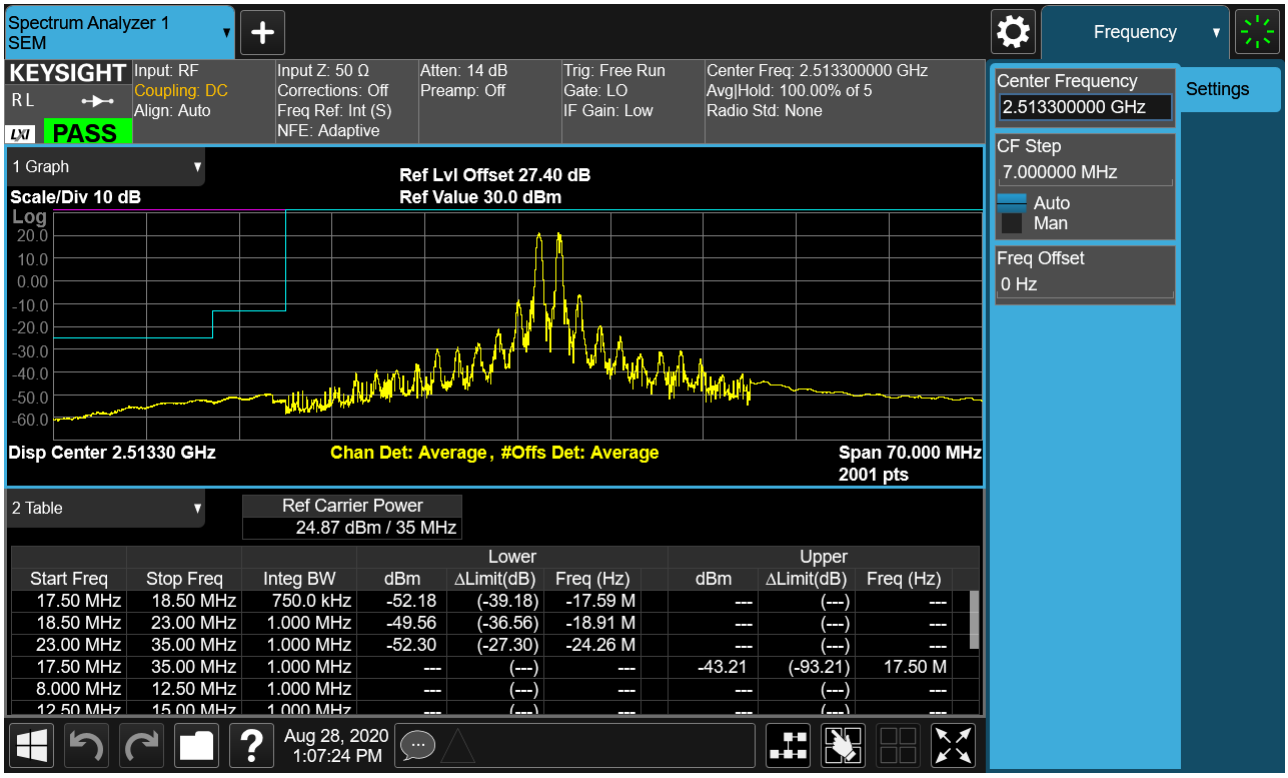
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-36.12	(-23.12)	-17.51 M	---	(---)	---
18.50 MHz	23.00 MHz	1.000 MHz	-48.10	(-35.10)	-18.73 M	---	(---)	---
23.00 MHz	35.00 MHz	1.000 MHz	-54.67	(-29.67)	-23.00 M	---	(---)	---
17.50 MHz	35.00 MHz	1.000 MHz	---	(---)	---	-15.70	(-65.70)	17.50 M
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch39750 RB1 Offset0, SCC 15MHz Ch39921 RB1 Offset74-2



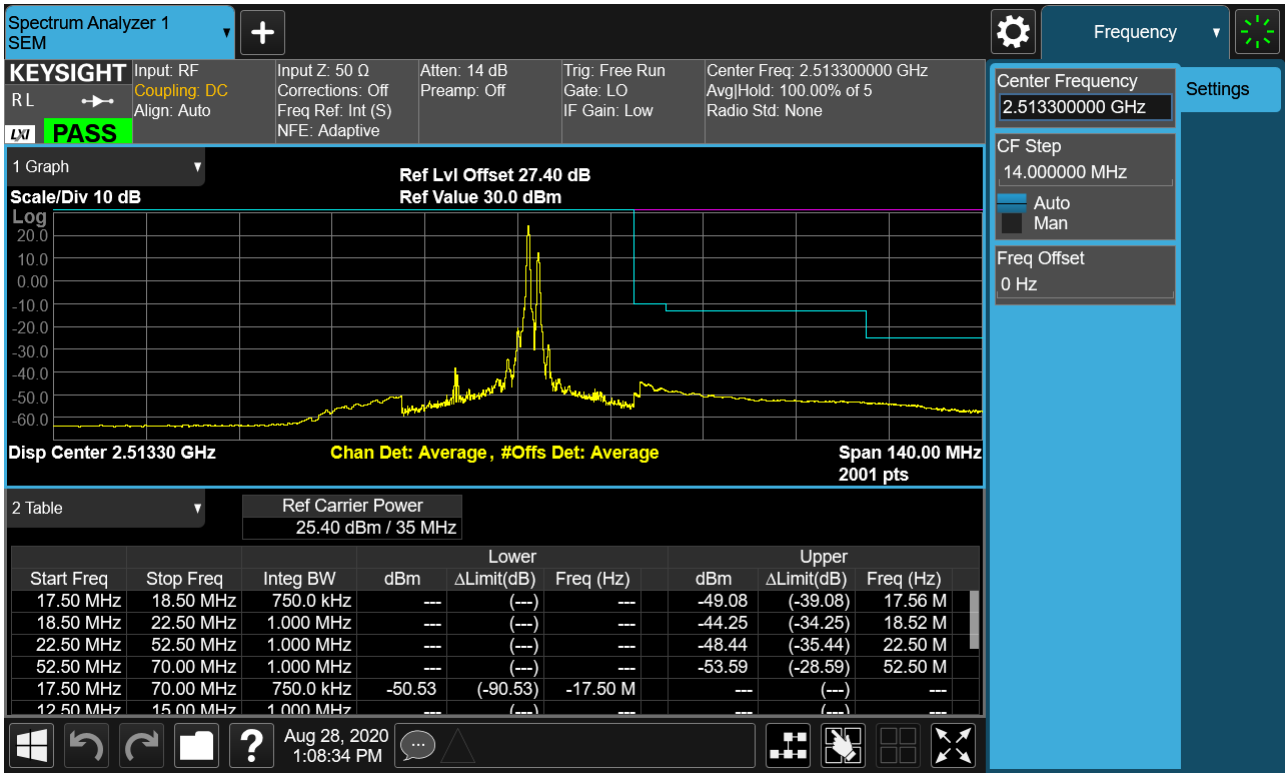
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	---	(---)	---	-33.94	(-23.94)	17.60 M
18.50 MHz	22.50 MHz	1.000 MHz	---	(---)	---	-43.95	(-33.95)	18.50 M
22.50 MHz	52.50 MHz	1.000 MHz	---	(---)	---	-35.08	(-22.08)	49.05 M
52.50 MHz	70.00 MHz	1.000 MHz	---	(---)	---	-61.25	(-36.25)	63.53 M
17.50 MHz	70.00 MHz	750.0 kHz	-37.08	(-77.08)	-17.50 M	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch39750 RB1 Offset99, SCC 15MHz Ch39921 RB1 Offset0-1



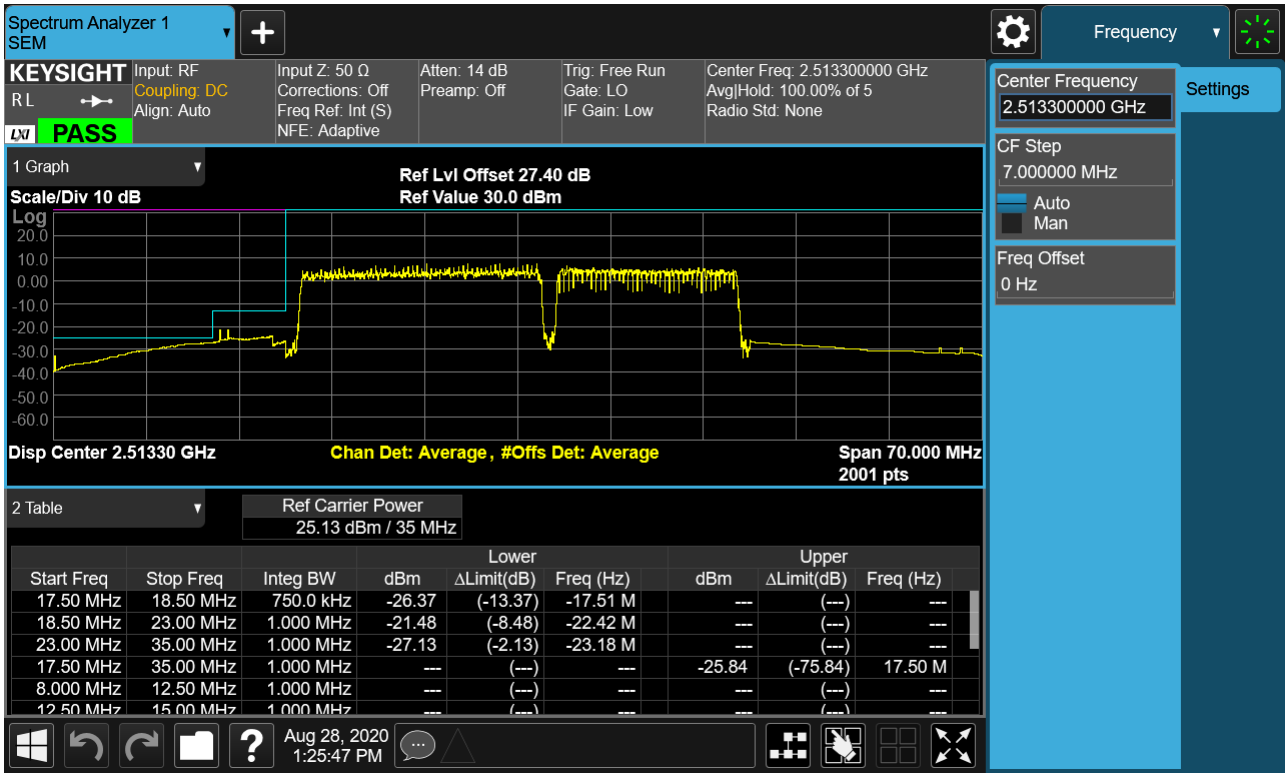
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-52.18	(-39.18)	-17.59 M	---	(---)	---
18.50 MHz	23.00 MHz	1.000 MHz	-49.56	(-36.56)	-18.91 M	---	(---)	---
23.00 MHz	35.00 MHz	1.000 MHz	-52.30	(-27.30)	-24.26 M	---	(---)	---
17.50 MHz	35.00 MHz	1.000 MHz	---	(---)	---	-43.21	(-93.21)	17.50 M
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch39750 RB1 Offset99, SCC 15MHz Ch39921 RB1 Offset0-2



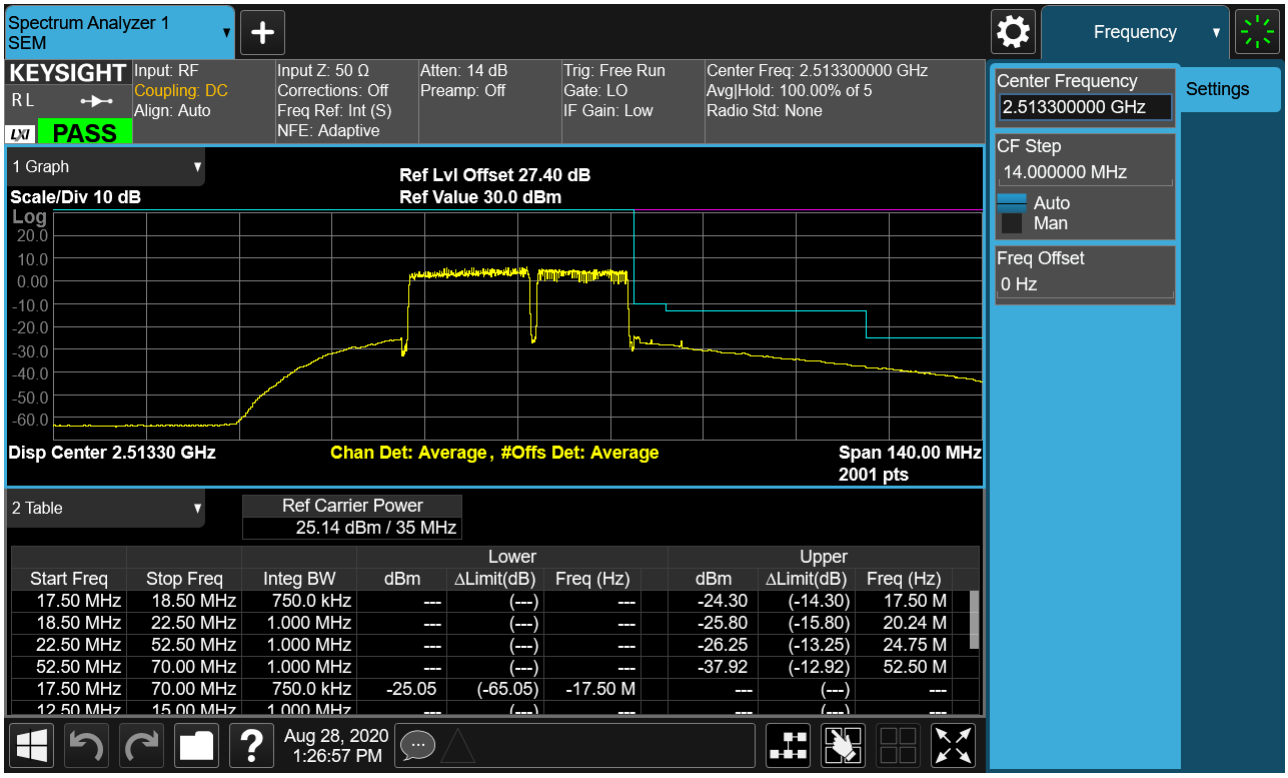
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	---	(---)	---	-49.08	(-39.08)	17.56 M
18.50 MHz	22.50 MHz	1.000 MHz	---	(---)	---	-44.25	(-34.25)	18.52 M
22.50 MHz	52.50 MHz	1.000 MHz	---	(---)	---	-48.44	(-35.44)	22.50 M
52.50 MHz	70.00 MHz	1.000 MHz	---	(---)	---	-53.59	(-28.59)	52.50 M
17.50 MHz	70.00 MHz	750.0 kHz	-50.53	(-90.53)	-17.50 M	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch39750 RB100 Offset0, SCC 15MHz Ch39921 RB75 Offset0-1



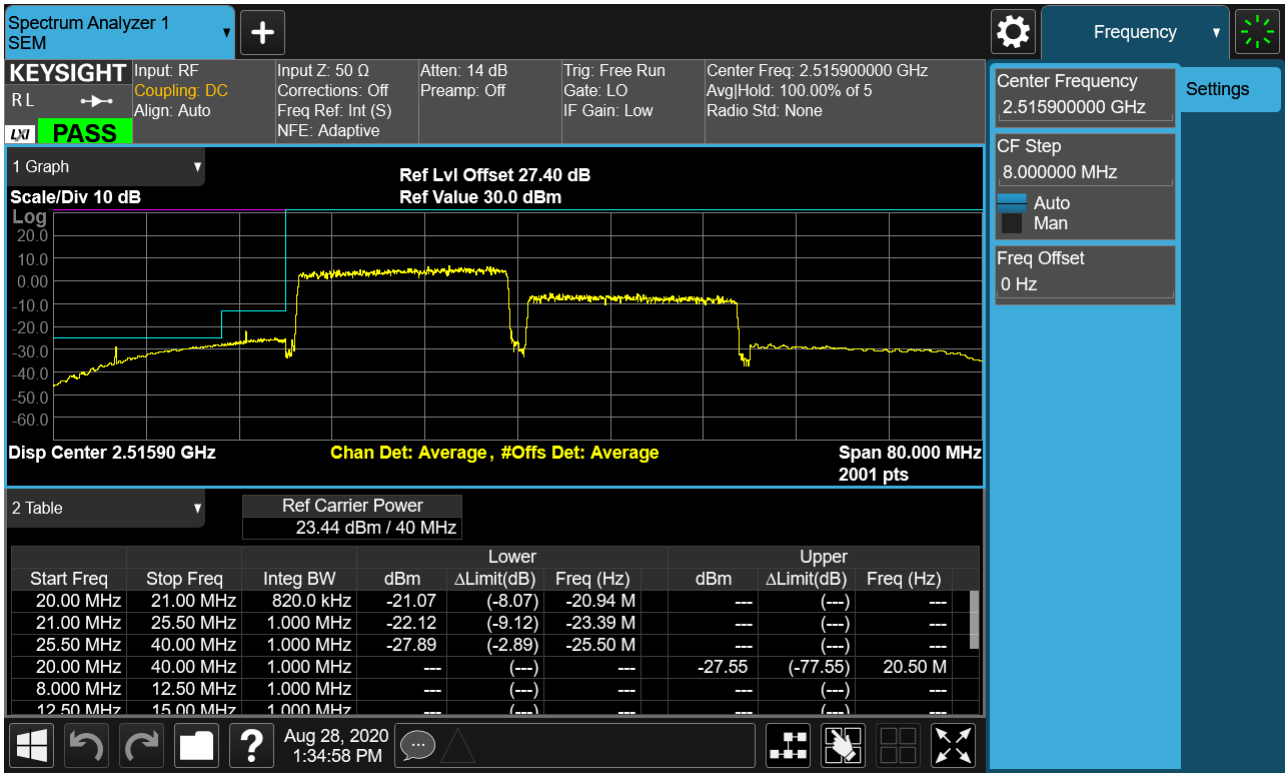
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-26.37	(-13.37)	-17.51 M	---	(---)	---
18.50 MHz	23.00 MHz	1.000 MHz	-21.48	(-8.48)	-22.42 M	---	(---)	---
23.00 MHz	35.00 MHz	1.000 MHz	-27.13	(-2.13)	-23.18 M	---	(---)	---
17.50 MHz	35.00 MHz	1.000 MHz	---	(---)	---	-25.84	(-75.84)	17.50 M
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch39750 RB100 Offset0, SCC 15MHz Ch39921 RB75 Offset0-2



			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	---	(---)	---	-24.30	(-14.30)	17.50 M
18.50 MHz	22.50 MHz	1.000 MHz	---	(---)	---	-25.80	(-15.80)	20.24 M
22.50 MHz	52.50 MHz	1.000 MHz	---	(---)	---	-26.25	(-13.25)	24.75 M
52.50 MHz	70.00 MHz	1.000 MHz	---	(---)	---	-37.92	(-12.92)	52.50 M
17.50 MHz	70.00 MHz	750.0 kHz	-25.05	(-65.05)	-17.50 M	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

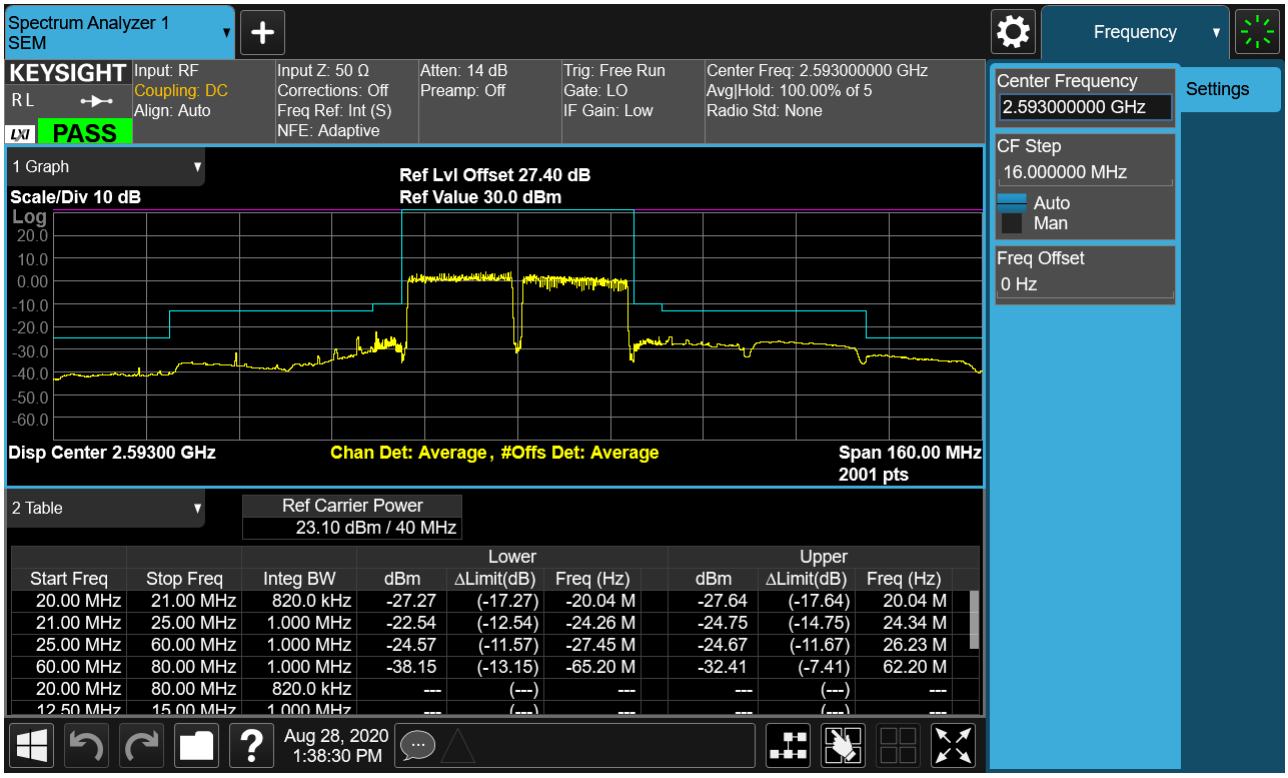
PCC 20MHz Ch39750 RB100 Offset0, SCC 20MHz Ch39948 RB100 Offset0_1



			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
20.00 MHz	21.00 MHz	820.0 kHz	-21.07	(-8.07)	-20.94 M	---	(---)	---
21.00 MHz	25.50 MHz	1.000 MHz	-22.12	(-9.12)	-23.39 M	---	(---)	---
25.50 MHz	40.00 MHz	1.000 MHz	-27.89	(-2.89)	-25.50 M	---	(---)	---
20.00 MHz	40.00 MHz	1.000 MHz	---	(---)	---	-27.55	(-77.55)	20.50 M
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

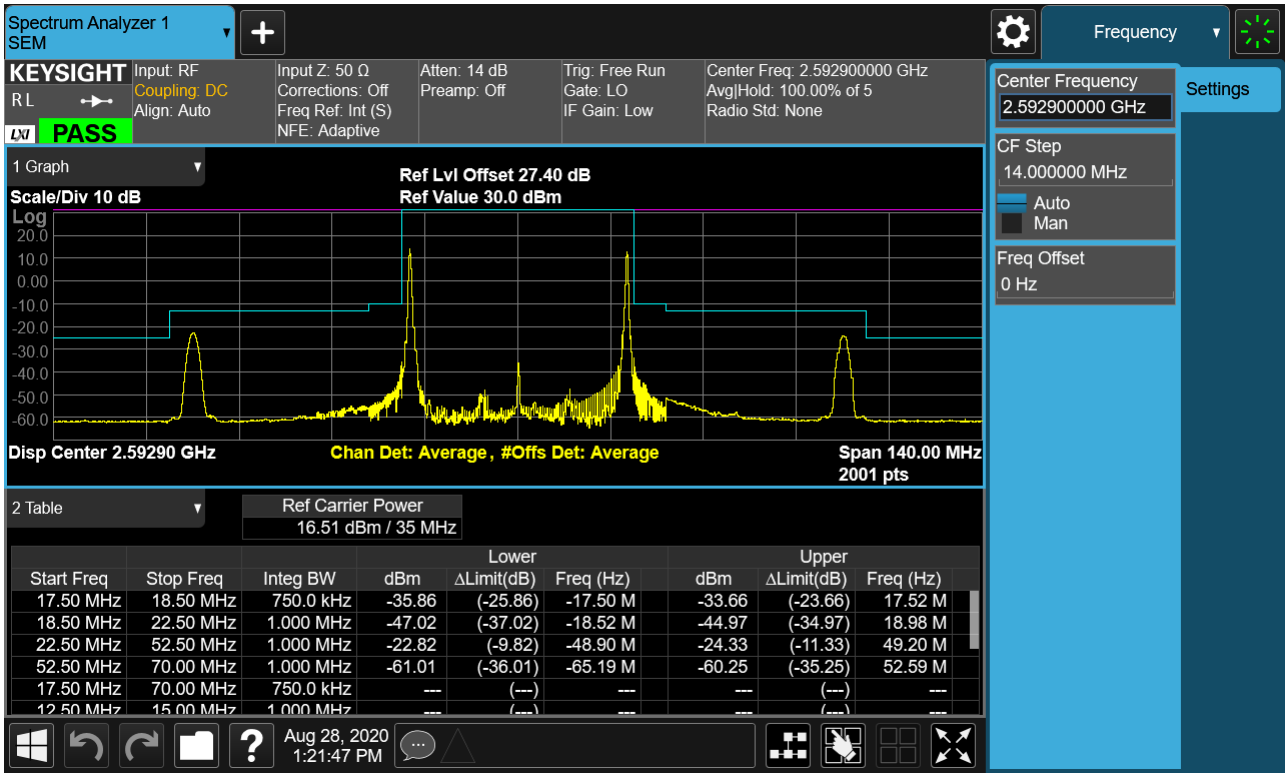
PCC 20MHz Ch39750 RB100 Offset0, SCC 20MHz Ch39948 RB100 Offset0_2

PCC 20MHz Ch40521 RB100 Offset0, SCC 20MHz Ch40719 RB100 Offset0

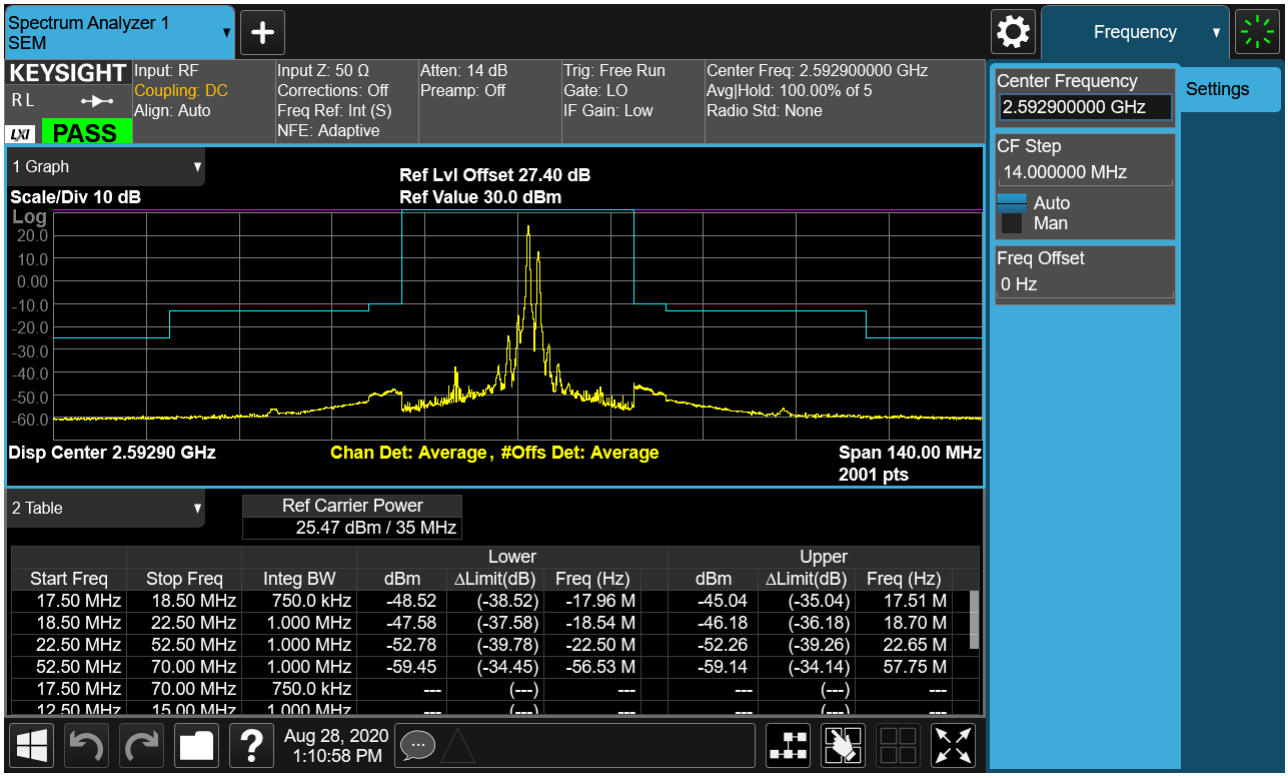


			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
20.00 MHz	21.00 MHz	820.0 kHz	-27.27	(-17.27)	-20.04 M	-27.64	(-17.64)	20.04 M
21.00 MHz	25.00 MHz	1.000 MHz	-22.54	(-12.54)	-24.26 M	-24.75	(-14.75)	24.34 M
25.00 MHz	60.00 MHz	1.000 MHz	-24.57	(-11.57)	-27.45 M	-24.67	(-11.67)	26.23 M
60.00 MHz	80.00 MHz	1.000 MHz	-38.15	(-13.15)	-65.20 M	-32.41	(-7.41)	62.20 M
20.00 MHz	80.00 MHz	820.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch40546 RB1 Offset0, SCC 15MHz Ch40717 RB1 Offset74

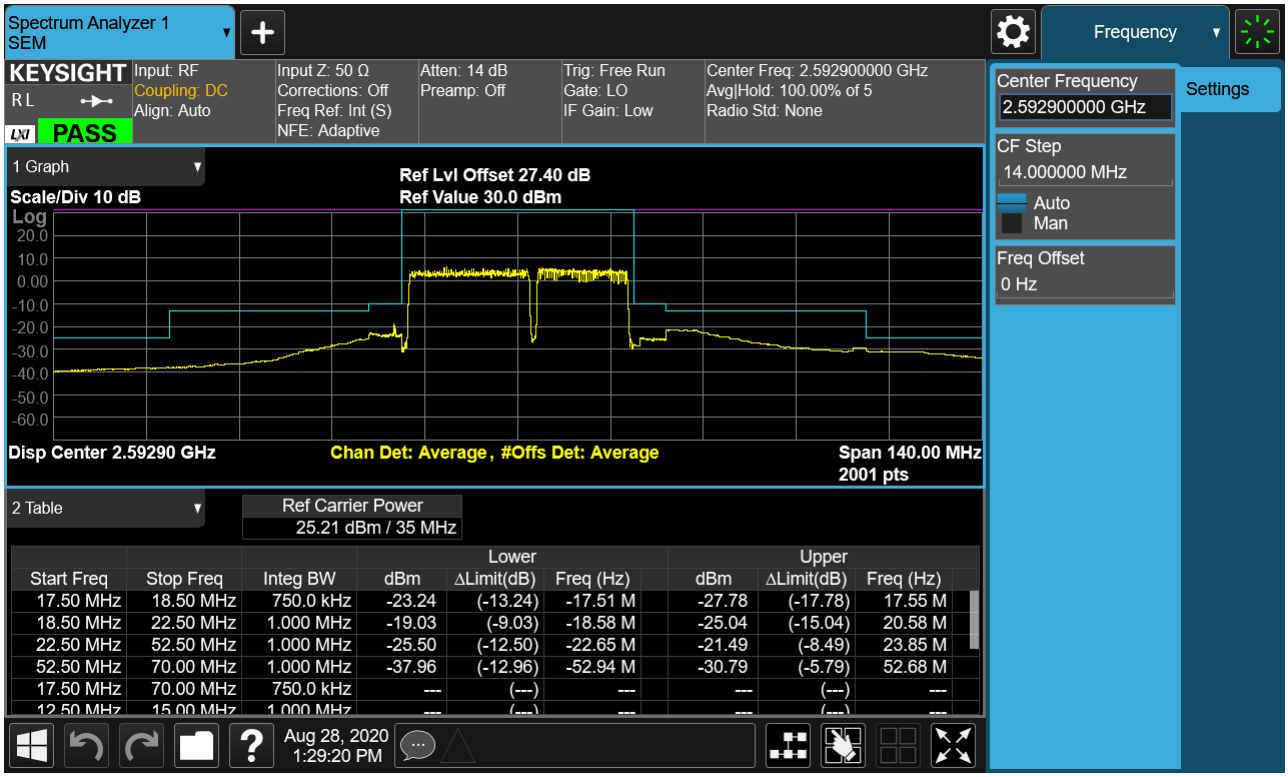


PCC 20MHz Ch40546 RB1 Offset99, SCC 15MHz Ch40717 RB1 Offset0

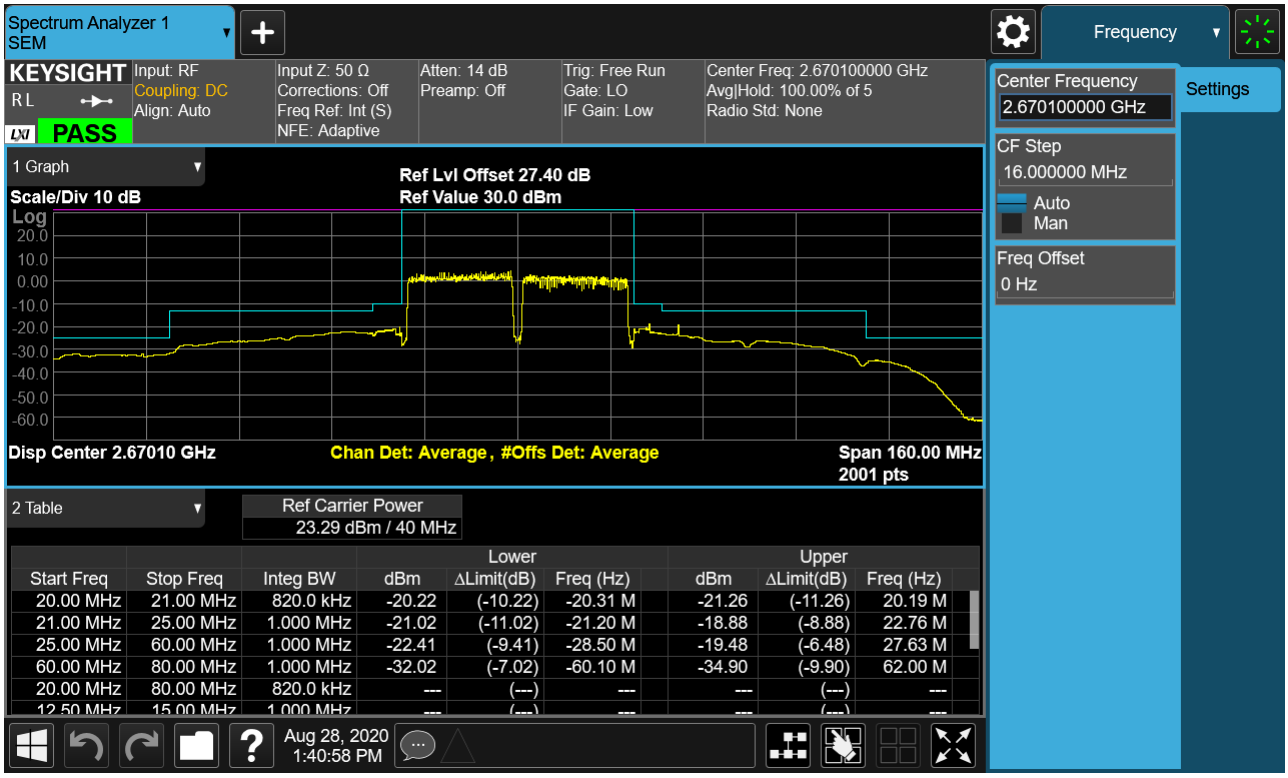


			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-48.52	(-38.52)	-17.96 M	-45.04	(-35.04)	17.51 M
18.50 MHz	22.50 MHz	1.000 MHz	-47.58	(-37.58)	-18.54 M	-46.18	(-36.18)	18.70 M
22.50 MHz	52.50 MHz	1.000 MHz	-52.78	(-39.78)	-22.50 M	-52.26	(-39.26)	22.65 M
52.50 MHz	70.00 MHz	1.000 MHz	-59.45	(-34.45)	-56.53 M	-59.14	(-34.14)	57.75 M
17.50 MHz	70.00 MHz	750.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch40546 RB100 Offset0, SCC 15MHz Ch40717 RB75 Offset0

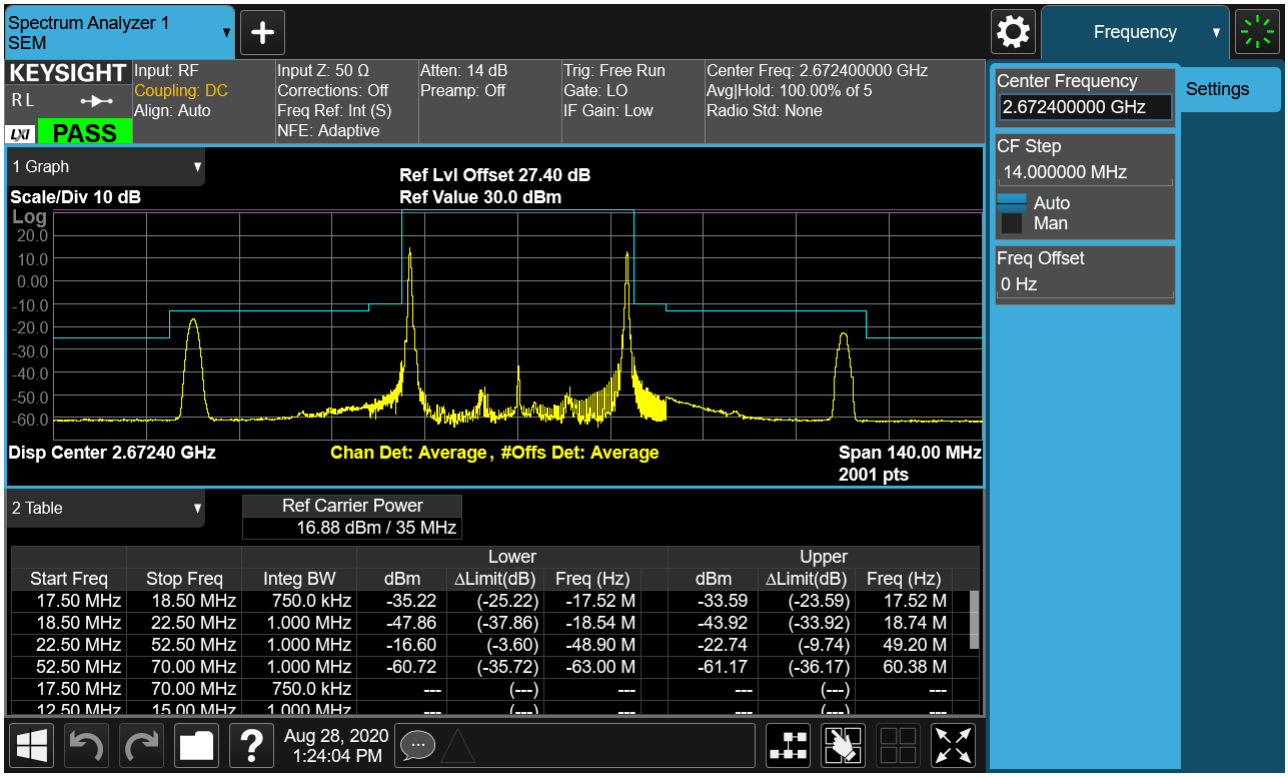


PCC 20MHz Ch41292 RB100 Offset0, SCC 20MHz Ch41490 RB100 Offset0



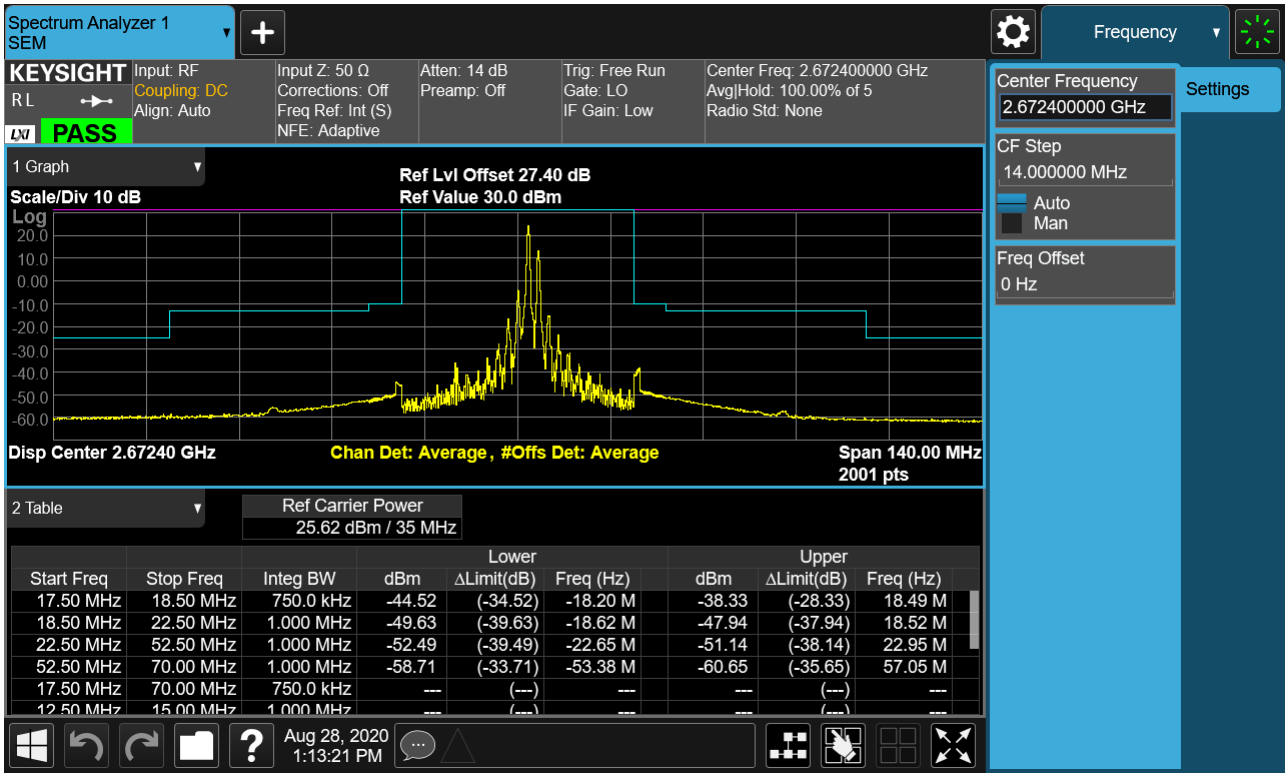
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
20.00 MHz	21.00 MHz	820.0 kHz	-20.22	(-10.22)	-20.31 M	-21.26	(-11.26)	20.19 M
21.00 MHz	25.00 MHz	1.000 MHz	-21.02	(-11.02)	-21.20 M	-18.88	(-8.88)	22.76 M
25.00 MHz	60.00 MHz	1.000 MHz	-22.41	(-9.41)	-28.50 M	-19.48	(-6.48)	27.63 M
60.00 MHz	80.00 MHz	1.000 MHz	-32.02	(-7.02)	-60.10 M	-34.90	(-9.90)	62.00 M
20.00 MHz	80.00 MHz	820.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch41341 RB1 Offset0, SCC 15MHz Ch41512 RB1 Offset74



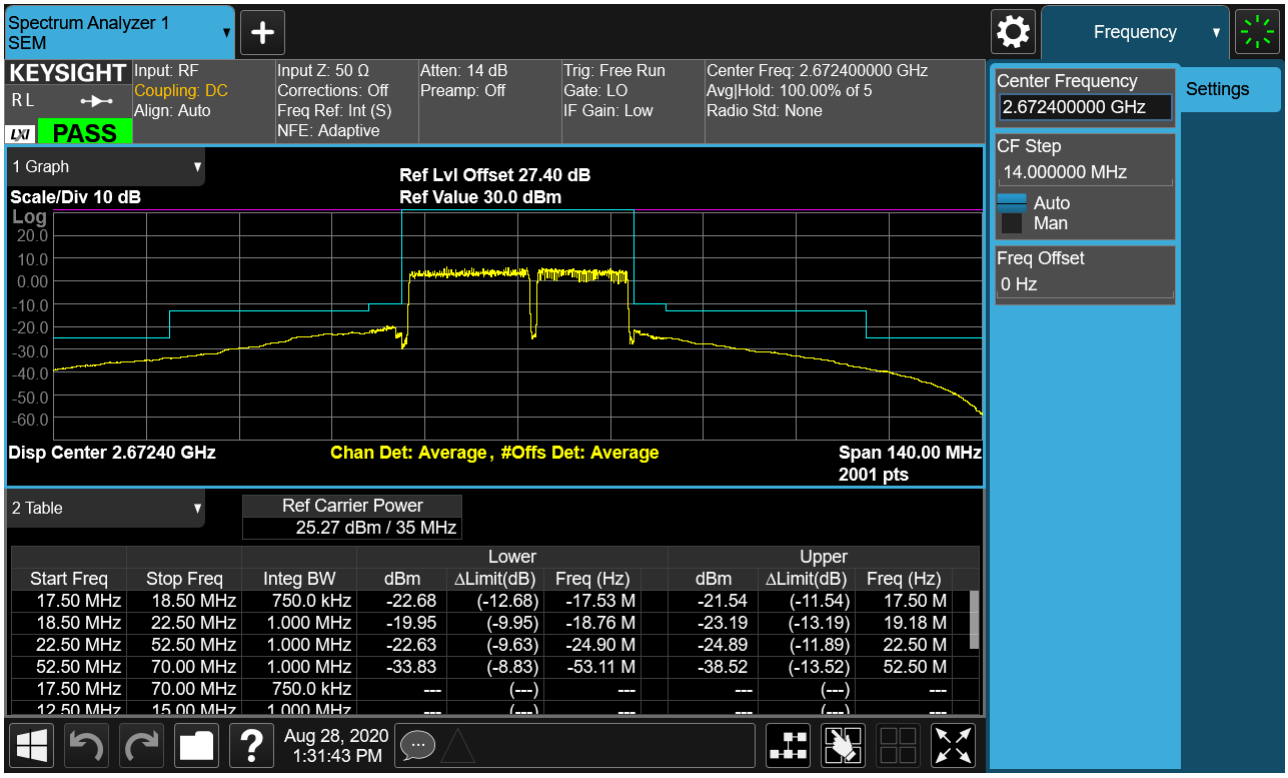
			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-35.22	(-25.22)	-17.52 M	-33.59	(-23.59)	17.52 M
18.50 MHz	22.50 MHz	1.000 MHz	-47.86	(-37.86)	-18.54 M	-43.92	(-33.92)	18.74 M
22.50 MHz	52.50 MHz	1.000 MHz	-16.60	(-3.60)	-48.90 M	-22.74	(-9.74)	49.20 M
52.50 MHz	70.00 MHz	1.000 MHz	-60.72	(-35.72)	-63.00 M	-61.17	(-36.17)	60.38 M
17.50 MHz	70.00 MHz	750.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch41341 RB1 Offset99, SCC 15MHz Ch41512 RB1 Offset0



			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-44.52	(-34.52)	-18.20 M	-38.33	(-28.33)	18.49 M
18.50 MHz	22.50 MHz	1.000 MHz	-49.63	(-39.63)	-18.62 M	-47.94	(-37.94)	18.52 M
22.50 MHz	52.50 MHz	1.000 MHz	-52.49	(-39.49)	-22.65 M	-51.14	(-38.14)	22.95 M
52.50 MHz	70.00 MHz	1.000 MHz	-58.71	(-33.71)	-53.38 M	-60.65	(-35.65)	57.05 M
17.50 MHz	70.00 MHz	750.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

PCC 20MHz Ch41341 RB100 Offset0, SCC 15MHz Ch41512 RB75 Offset0



			Lower			Upper		
Start Freq	Stop Freq	Integ BW	dBm	ΔLimit(dB)	Freq (Hz)	dBm	ΔLimit(dB)	Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-22.68	(-12.68)	-17.53 M	-21.54	(-11.54)	17.50 M
18.50 MHz	22.50 MHz	1.000 MHz	-19.95	(-9.95)	-18.76 M	-23.19	(-13.19)	19.18 M
22.50 MHz	52.50 MHz	1.000 MHz	-22.63	(-9.63)	-24.90 M	-24.89	(-11.89)	22.50 M
52.50 MHz	70.00 MHz	1.000 MHz	-33.83	(-8.83)	-53.11 M	-38.52	(-13.52)	52.50 M
17.50 MHz	70.00 MHz	750.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

8.5 Frequency Stability / Variation Of Ambient Temperature

▣ PCC Channel:	39683	
▣ PCC Frequency:	2499.3	MHz
▣ PCC BandWidth:	5	MHz
▣ SCC Channel:	39800	
▣ SCC Frequency:	2511.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.850	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.015	0.018	2499.30004	2511.00005
100%		-30	0.010	0.015	2499.30003	2511.00004
100%		-20	0.012	-0.010	2499.30003	2510.99997
100%		-10	-0.008	0.008	2499.29998	2511.00002
100%		0	-0.013	-0.023	2499.29997	2510.99994
100%		10	-0.017	-0.015	2499.29996	2510.99996
100%		30	-0.007	-0.006	2499.29998	2510.99998
100%		40	-0.017	0.006	2499.29996	2511.00001
100%		50	0.012	0.012	2499.30003	2511.00003
Batt. Endpoint	3.400	20	-0.009	0.014	2499.29998	2511.00004

▣ PCC Channel: 39705
▣ PCC Frequency: 2501.5 MHz
▣ PCC BandWidth: 10 MHz
▣ SCC Channel: 39849
▣ SCC Frequency: 2515.9 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.850 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.022	0.012	2501.50006	2515.90003
100%		-30	0.018	0.009	2501.50005	2515.90002
100%		-20	0.018	-0.014	2501.50004	2515.89997
100%		-10	0.009	0.022	2501.50002	2515.90006
100%		0	0.009	0.009	2501.50002	2515.90002
100%		10	0.023	-0.006	2501.50006	2515.89998
100%		30	-0.024	0.017	2501.49994	2515.90004
100%		40	0.017	0.012	2501.50004	2515.90003
100%		50	0.015	0.005	2501.50004	2515.90001
Batt. Endpoint	3.400	20	0.016	0.015	2501.50004	2515.90004

▣ PCC Channel: 39728
▣ PCC Frequency: 2503.8 MHz
▣ PCC BandWidth: 15 MHz
▣ SCC Channel: 39899
▣ SCC Frequency: 2520.9 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.850 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.005	0.009	2503.80001	2520.90002
100%		-30	0.012	-0.016	2503.80003	2520.89996
100%		-20	0.014	-0.008	2503.80004	2520.89998
100%		-10	0.016	0.010	2503.80004	2520.90002
100%		0	-0.019	0.024	2503.79995	2520.90006
100%		10	-0.013	0.023	2503.79997	2520.90006
100%		30	0.014	0.021	2503.80004	2520.90005
100%		40	-0.013	0.018	2503.79997	2520.90005
100%		50	0.008	0.014	2503.80002	2520.90004
Batt. Endpoint	3.400	20	0.019	0.019	2503.80005	2520.90005

▣ PCC Channel: 39750

▣ PCC Frequency: 2506.0 MHz

▣ PCC BandWidth: 20 MHz

▣ SCC Channel: 39948

▣ SCC Frequency: 2525.8 MHz

▣ SCC BandWidth: 20 MHz

▣ Voltage : 3.850 VDC

▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.017	0.008	2506.00004	2525.80002
100%		-30	-0.013	-0.012	2505.99997	2525.79997
100%		-20	0.009	0.022	2506.00002	2525.80005
100%		-10	0.025	-0.014	2506.00006	2525.79997
100%		0	0.016	0.025	2506.00004	2525.80006
100%		10	-0.012	0.009	2505.99997	2525.80002
100%		30	0.018	0.009	2506.00004	2525.80002
100%		40	-0.022	0.006	2505.99995	2525.80002
100%		50	-0.008	-0.017	2505.99998	2525.79996
Batt. Endpoint	3.400	20	0.006	-0.025	2506.00001	2525.79994

▣ PCC Channel: 41373
▣ PCC Frequency: 2668.3 MHz
▣ PCC BandWidth: 5 MHz
▣ SCC Channel: 41490
▣ SCC Frequency: 2680.0 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.850 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.010	0.006	2668.30003	2680.00002
100%		-30	-0.016	-0.012	2668.29996	2679.99997
100%		-20	0.018	-0.007	2668.30005	2679.99998
100%		-10	0.018	0.020	2668.30005	2680.00005
100%		0	-0.020	0.008	2668.29995	2680.00002
100%		10	0.018	0.023	2668.30005	2680.00006
100%		30	0.025	-0.022	2668.30007	2679.99994
100%		40	0.022	-0.023	2668.30006	2679.99994
100%		50	-0.013	0.013	2668.29997	2680.00003
Batt. Endpoint	3.400	20	-0.014	-0.011	2668.29996	2679.99997

▣ PCC Channel: 41346

▣ PCC Frequency: 2665.6 MHz

▣ PCC BandWidth: 10 MHz

▣ SCC Channel: 41490

▣ SCC Frequency: 2680.0 MHz

▣ SCC BandWidth: 20 MHz

▣ Voltage : 3.850 VDC

▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.022	0.014	2665.60006	2680.00004
100%		-30	0.022	0.013	2665.60006	2680.00004
100%		-20	-0.020	0.024	2665.59995	2680.00006
100%		-10	0.014	0.019	2665.60004	2680.00005
100%		0	0.015	-0.014	2665.60004	2679.99996
100%		10	0.013	-0.024	2665.60004	2679.99994
100%		30	-0.020	-0.024	2665.59995	2679.99994
100%		40	0.010	0.020	2665.60003	2680.00005
100%		50	0.007	0.014	2665.60002	2680.00004
Batt. Endpoint	3.400	20	0.019	-0.022	2665.60005	2679.99994

▣ PCC Channel: 41319

▣ PCC Frequency: 2662.9 MHz

▣ PCC BandWidth: 15 MHz

▣ SCC Channel: 41490

▣ SCC Frequency: 2680.0 MHz

▣ SCC BandWidth: 20 MHz

▣ Voltage : 3.850 VDC

▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.017	-0.005	2662.90005	2679.99999
100%		-30	0.025	0.011	2662.90007	2680.00003
100%		-20	-0.017	0.020	2662.89995	2680.00005
100%		-10	0.006	0.022	2662.90002	2680.00006
100%		0	0.020	0.015	2662.90005	2680.00004
100%		10	0.008	0.008	2662.90002	2680.00002
100%		30	0.006	-0.009	2662.90002	2679.99998
100%		40	-0.017	0.005	2662.89996	2680.00001
100%		50	-0.006	0.015	2662.89999	2680.00004
Batt. Endpoint	3.400	20	0.018	0.016	2662.90005	2680.00004

▣ PCC Channel: 41292

▣ PCC Frequency: 2660.2 MHz

▣ PCC BandWidth: 20 MHz

▣ SCC Channel: 41490

▣ SCC Frequency: 2680.0 MHz

▣ SCC BandWidth: 20 MHz

▣ Voltage : 3.850 MHz

▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.850	+20(Ref)	0.021	0.011	2660.20006	2680.00003
100%		-30	0.006	-0.012	2660.20002	2679.99997
100%		-20	0.019	-0.006	2660.20005	2679.99998
100%		-10	-0.020	0.012	2660.19995	2680.00003
100%		0	0.011	-0.023	2660.20003	2679.99994
100%		10	0.007	-0.022	2660.20002	2679.99994
100%		30	-0.018	0.018	2660.19995	2680.00005
100%		40	0.021	0.019	2660.20006	2680.00005
100%		50	-0.019	-0.019	2660.19995	2679.99995
Batt. Endpoint	3.400	20	0.023	0.008	2660.20006	2680.00002

8.6 Radiated Spurious Emissions

▣ PCC Channel : 39750 (2506MHz)

▣ PCC BW(MHz) : 20

▣ PCC RB/ RB Offset : 1/ 99

▣ SCC Channel : 39894 (2520.4MHz)

▣ SCC BW(MHz) : 10

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 1 meters

▣ LIMIT: -25.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 026.40	-54.89	12.60	-64.33	3.61	V	-55.34
7 539.60	-54.86	11.35	-55.63	4.45	H	-48.73
10 052.80	-57.41	11.20	-53.50	5.32	V	-47.62

▣ PCC Channel : 40546 (2585.6MHz)

▣ PCC BW(MHz) : 20

▣ PCC RB/ RB Offset : 1/ 99

▣ SCC Channel : 40717 (2602.7MHz)

▣ SCC BW(MHz) : 15

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 1 meters

▣ LIMIT: -25.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 188.30	-56.16	12.80	-64.91	3.70	V	-55.81
7 782.45	-56.66	11.65	-57.81	4.54	V	-50.70
10 376.60	-56.89	10.75	-52.25	5.45	V	-46.95

▣ PCC Channel : 41365 (2667.5MHz)

▣ PCC BW(MHz) : 15

▣ PCC RB/ RB Offset : 1/ 74

▣ SCC Channel : 41515 (2682.5MHz)

▣ SCC BW(MHz) : 15

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 1 meters

▣ LIMIT: -25.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 350.00	-51.84	13.30	-61.61	3.74	H	-52.05
8 025.00	-56.35	10.95	-55.10	4.60	H	-48.75
10 700.00	-56.81	10.90	-52.87	5.51	V	-47.48

8.7 Occupied Bandwidth

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	QPSK	25/ 0	20	40645	2595.5	QPSK	100/ 0	22.851
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	23.109
10	40526	2583.6	QPSK	50/ 0	20	40670	2598.0	QPSK	100/ 0	27.733
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	23.116
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	28.247
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	32.649
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	23.000
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	27.817
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	32.592
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	37.569

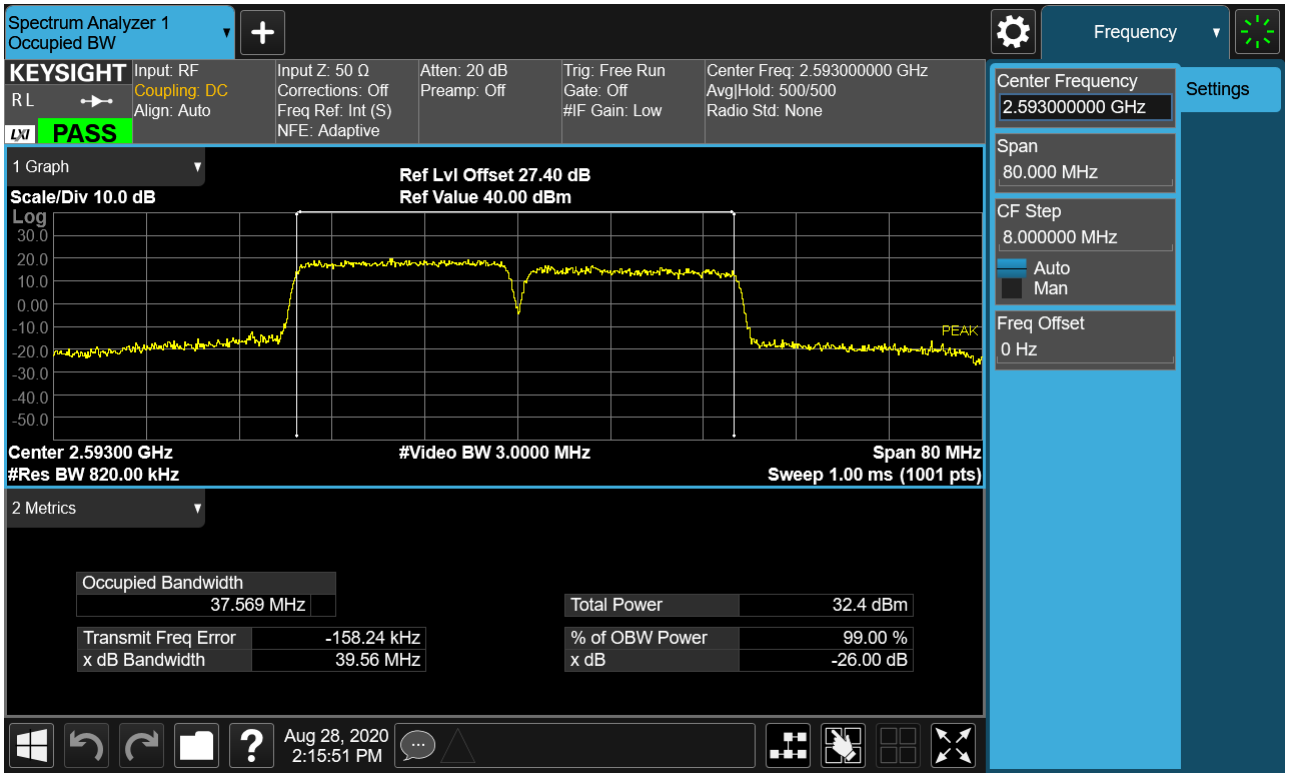
PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	16QAM	25/ 0	20	40645	2595.5	16QAM	100/ 0	22.742
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	23.037
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	27.678
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	23.081
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	28.291
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	32.514
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	22.970
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	27.780
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	32.575
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	37.521

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	64QAM	25/ 0	20	40645	2595.5	64QAM	100/ 0	22.810
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	22.963
10	40526	2583.6	64QAM	50/ 0	20	40670	2598.0	64QAM	100/ 0	27.735
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	23.165
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	28.259
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	32.535
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	22.872
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	27.728
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	32.617
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	37.486

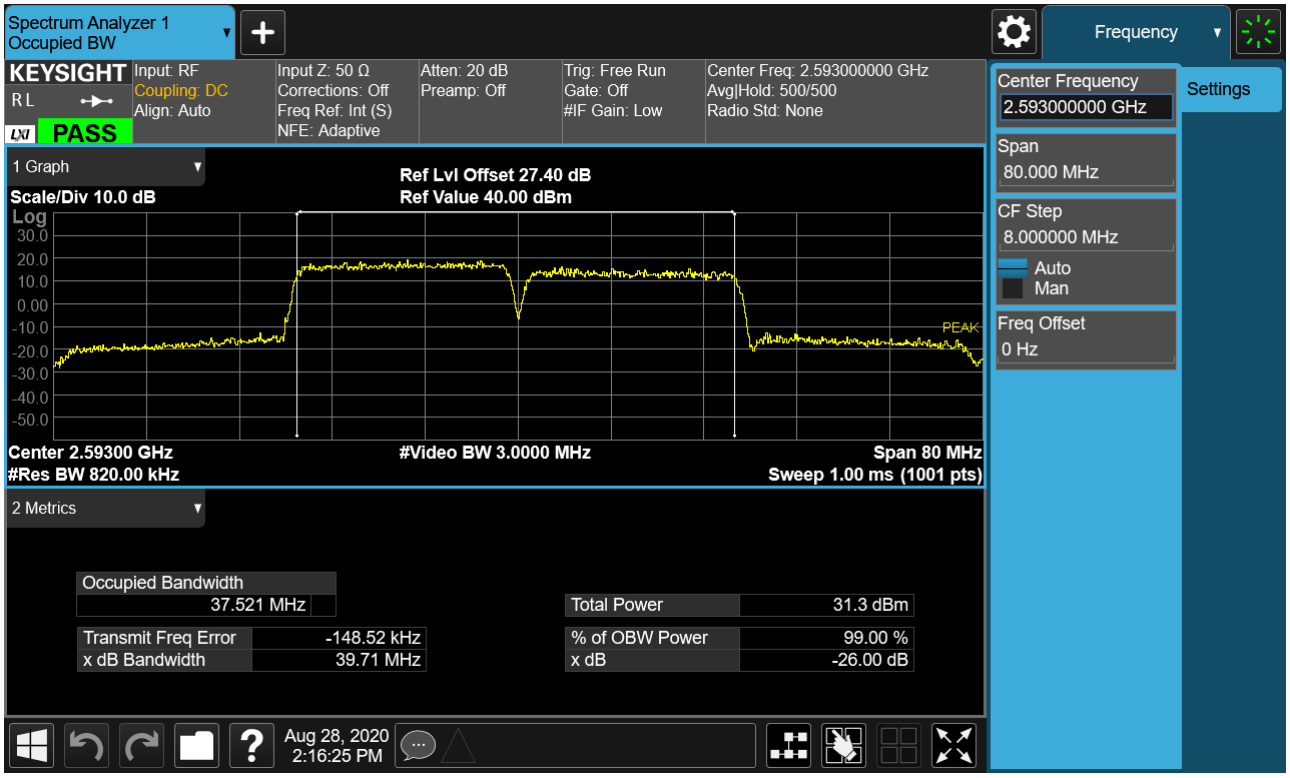
Note:

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

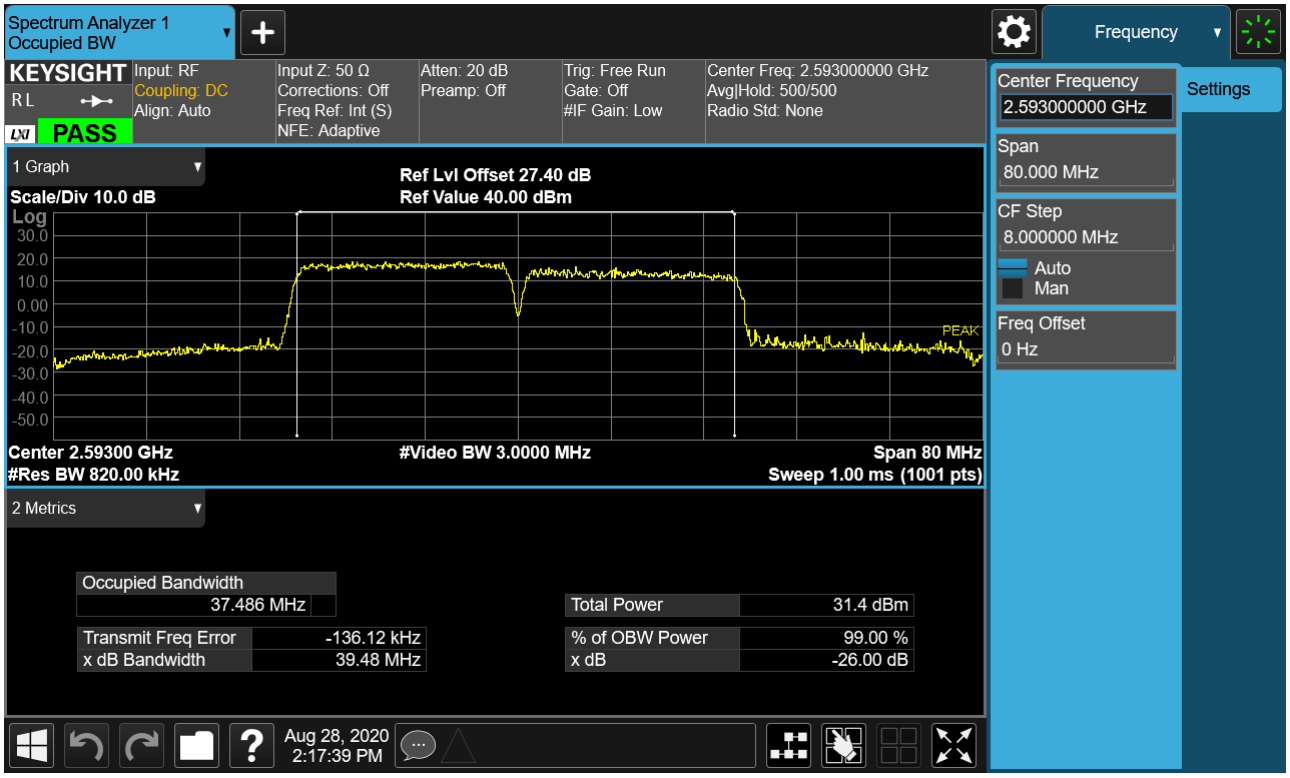
PCC 20MHz Ch40521 RB100 Offset0, SCC 20MHz Ch40719 RB100 Offset0_(QPSK)



PCC 20MHz Ch40521 RB100 Offset0, SCC 20MHz Ch40719 RB100 Offset0_(16QAM)



PCC 20MHz Ch40521 RB100 Offset0, SCC 20MHz Ch40719 RB100 Offset0_(64QAM)



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	
5	40528	2583.8	QPSK	25/ 0	20	40645	2595.5	QPSK	100/ 0	6.72
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	6.54
10	40526	2583.6	QPSK	50/ 0	20	40670	2598.0	QPSK	100/ 0	6.85
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	6.31
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	7.44
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	6.60
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	6.52
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	6.43
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	5.86
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	7.26

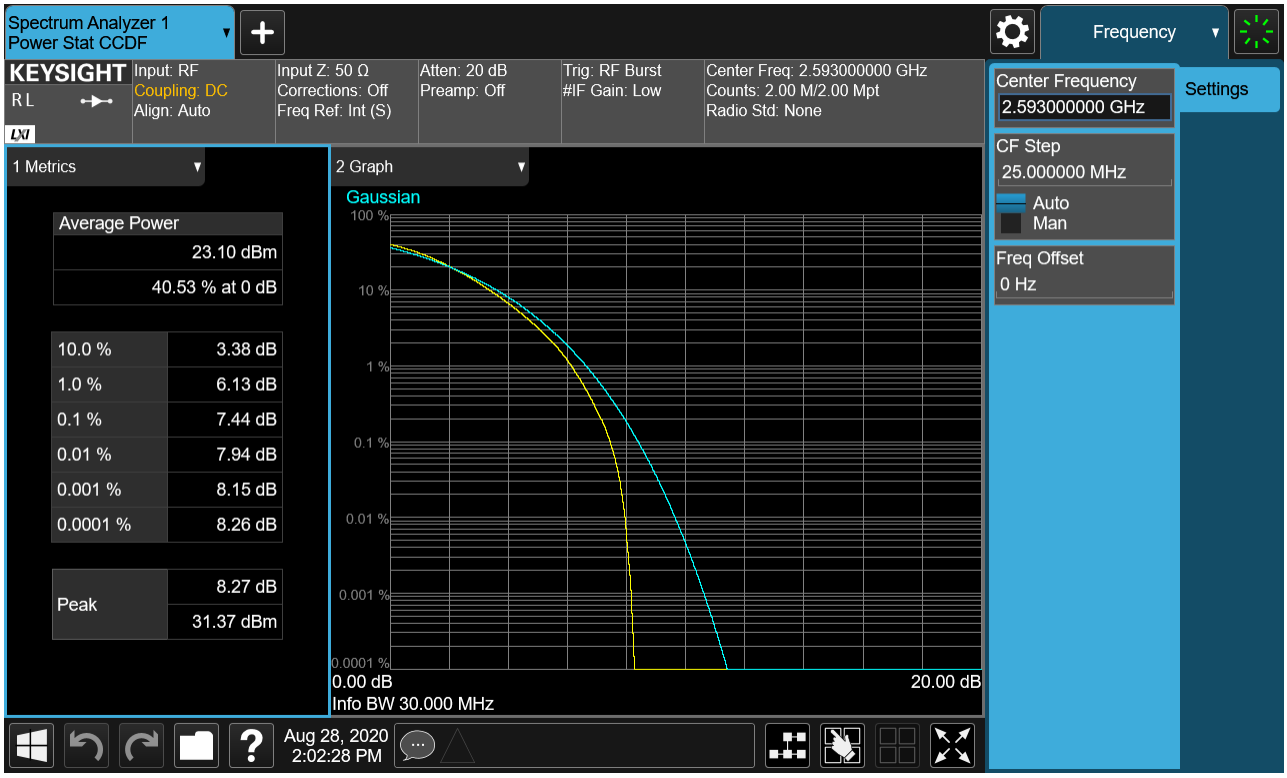
PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	16QAM	25/ 0	20	40645	2595.5	16QAM	100/ 0	7.01
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	7.35
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	7.08
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	7.03
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	8.06
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	7.44
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	7.41
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	7.43
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	6.18
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	8.04

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	64QAM	25/ 0	20	40645	2595.5	64QAM	100/ 0	7.71
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	7.71
10	40526	2583.6	64QAM	50/ 0	20	40670	2598.0	64QAM	100/ 0	7.70
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	7.37
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	8.36
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	7.57
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	7.45
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	7.51
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	6.86
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	8.32

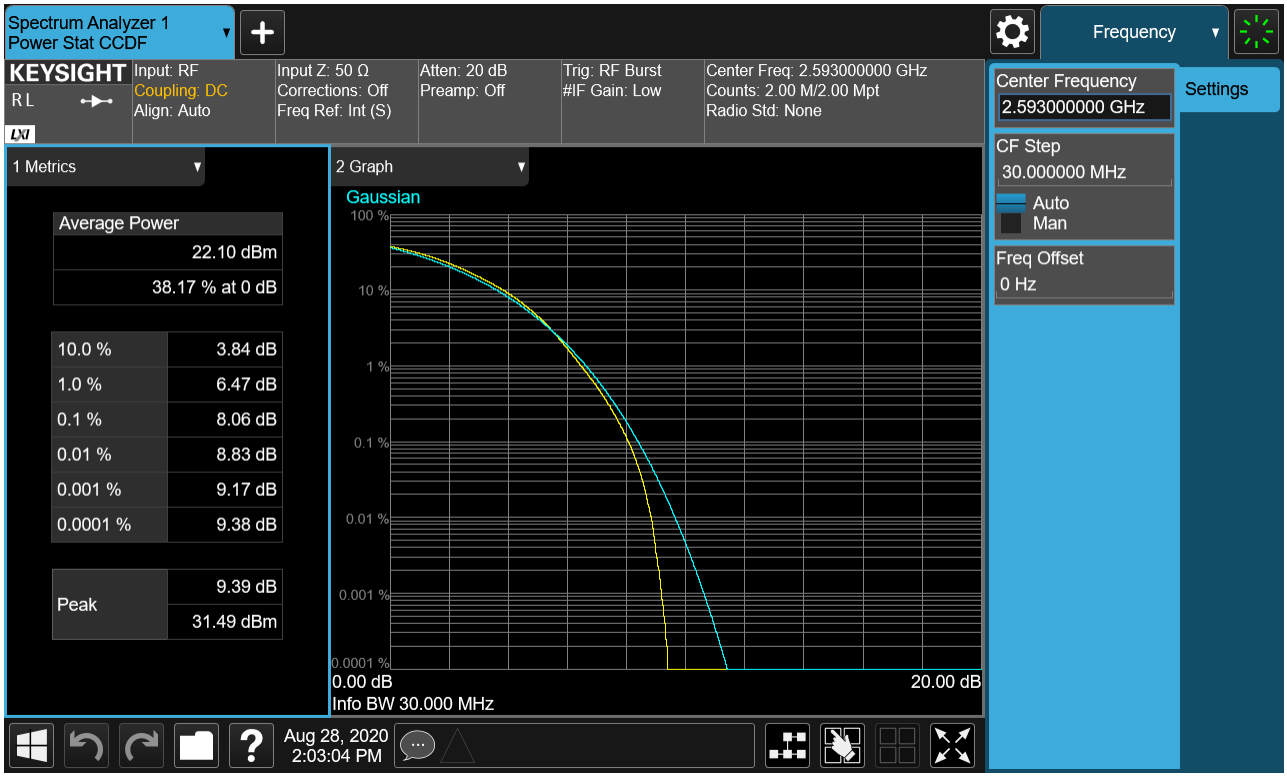
Note:

In order to simplify the report, attached plots were only Max Peak to Average Ratio.(15 MHz + 15 MHz)

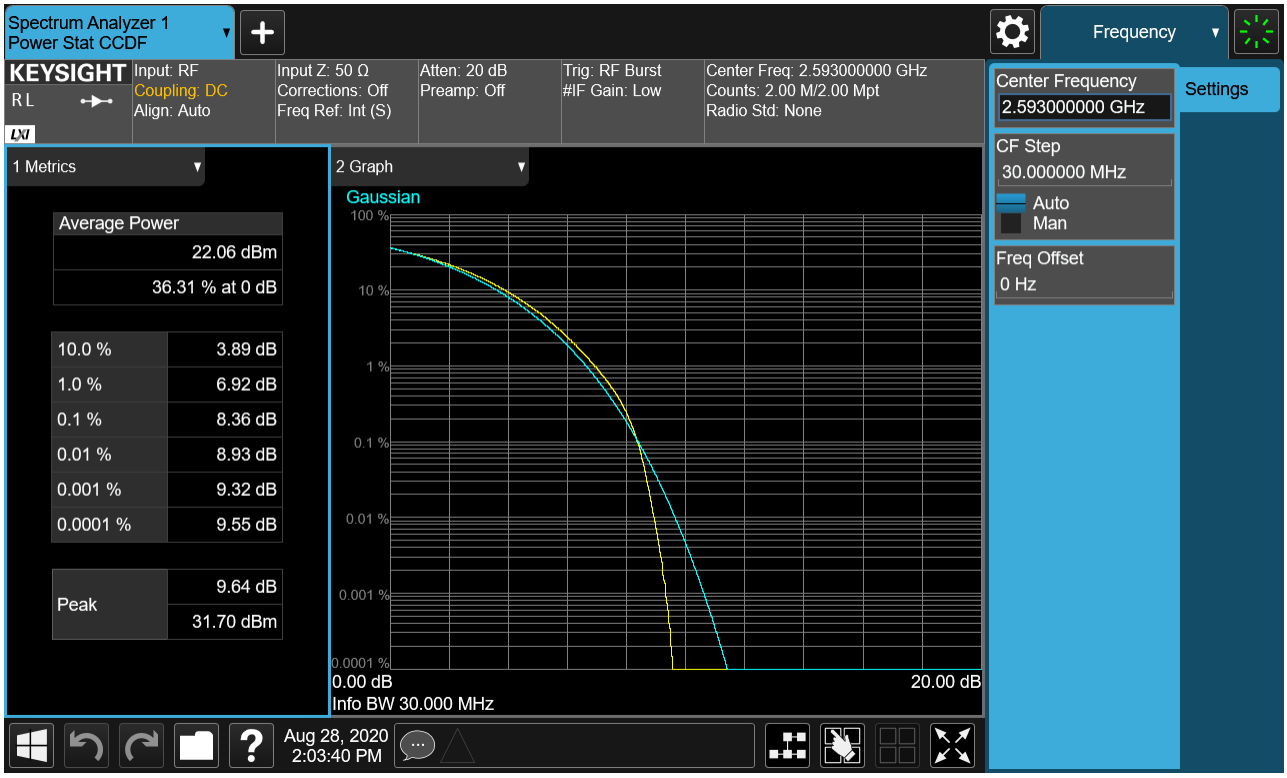
PCC 15MHz Ch40545 RB75 Offset0, SCC 15MHz Ch40695 RB75 Offset0_(QPSK)



PCC 15MHz Ch40545 RB75 Offset0, SCC 15MHz Ch40695 RB75 Offset0_(16QAM)



PCC 15MHz Ch40545 RB75 Offset0, SCC 15MHz Ch40695 RB75 Offset0_(64QAM)



9. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2008-FC077-P