

TEST REPORT

FCC CA_48C Test for SM-F766U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2504-FC030-R1

DATE OF ISSUE
May 23, 2025

Tested by
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TEST REPORT

REPORT NO.

HCT-RF-2504-FC030-R1

DATE OF ISSUE

May 23, 2025

Additional Model

SM-F766U1

Applicant**SAMSUNG Electronics Co., Ltd.**

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

Product Name

Mobile Phone

Model Name

SM-F766U

Date of Test

February 24, 2025 ~ April 21, 2025

FCC ID

A3LSMF766U

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing

(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

FCC Classification:

Citizens Band End User Devices (CBE)

Test Standard Used

FCC Rule Part: § 96

Test Results

PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	April 22, 2025	Initial Release
1	May 23, 2025	Revised the Power Supply Voltage. (DC 3.88 V → DC 3.90 V)

Notice

Content

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S. C.853(a)

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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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:	A3LSMF766U
Application Type:	Certification
FCC Classification:	Citizens Band End User Devices (CBE)
FCC Rule Part(s):	§ 96
EUT Type:	Mobile phone
Model(s):	SM-F766U
Additional Model(s)	SM-F766U1
Tx Frequency:	3553.3 - 3690.0: 5 MHz+20 MHz 3555.5 - 3690.0: 10 MHz+20 MHz 3557.8 - 3690.0: 15 MHz+20 MHz 3560.0 - 3696.7: 20 MHz+5 MHz 3560.0 - 3694.5: 20 MHz+10 MHz 3560.0 - 3692.2: 20 MHz+15 MHz 3560.0 - 3690.0: 20 MHz+20 MHz
Date(s) of Tests:	February 24, 2025 ~ April 21, 2025
Serial number:	Radiated : R3CY30SAQMT Conducted : R3CY207N1GR
LTE CA :	CA 48C (Uplink)

1.1. MAXIMUM OUTPUT POWER

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
5 MHz+20 MHz	3553.3 - 3690.0	QPSK	22M9G7D	15.63	0.037
		16QAM	22M8W7D	16.11	0.041
		64QAM	22M7W7D	16.06	0.040
		256QAM	22M8W7D	16.05	0.040
10 MHz+20 MHz	3555.5 - 3690.0	QPSK	27M5G7D	15.61	0.036
		16QAM	27M5W7D	16.08	0.041
		64QAM	27M7W7D	16.01	0.040
		256QAM	27M5W7D	15.76	0.038
15 MHz+20 MHz	3557.8 - 3690.0	QPSK	32M8G7D	15.83	0.038
		16QAM	32M5W7D	16.42	0.044
		64QAM	32M5W7D	16.40	0.044
		256QAM	32M6W7D	16.37	0.043
20 MHz+5 MHz	3560.0 - 3696.7	QPSK	22M8G7D	16.51	0.045
		16QAM	23M0W7D	17.17	0.052
		64QAM	22M8W7D	17.05	0.051
		256QAM	23M0W7D	16.74	0.047
20 MHz+10 MHz	3560.0 - 3694.5	QPSK	27M9G7D	15.36	0.034
		16QAM	27M6W7D	15.99	0.040
		64QAM	27M7W7D	15.95	0.039
		256QAM	27M9W7D	15.71	0.037
20 MHz+15 MHz	3560.0 - 3692.2	QPSK	32M6G7D	15.47	0.035
		16QAM	32M5W7D	16.19	0.042
		64QAM	32M4W7D	16.12	0.041
		256QAM	32M6W7D	15.97	0.040
20 MHz+20 MHz	3560.0 - 3690.0	QPSK	37M5G7D	16.79	0.048
		16QAM	37M2W7D	17.22	0.053
		64QAM	37M5W7D	17.02	0.050
		256QAM	37M4W7D	17.01	0.050

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

Please refer to the [2G3G] Test Report.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Channel Edge/ ACLR	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7 - KDB 940660 D01 v01
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Radiated Power	- ANSI C63.26-2015 – Section 5.2.4.4 - KDB 971168 D01 v03r01 – Section 5.8
Radiated Spurious and Harmonic Emissions	- ANSI C63.26-2015 – Section 5.5.3 - KDB 971168 D01 v03r01 – Section 5.8

3.2 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.

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 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Note

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

The power is calculated by the following formula;

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

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.

Test Settings

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

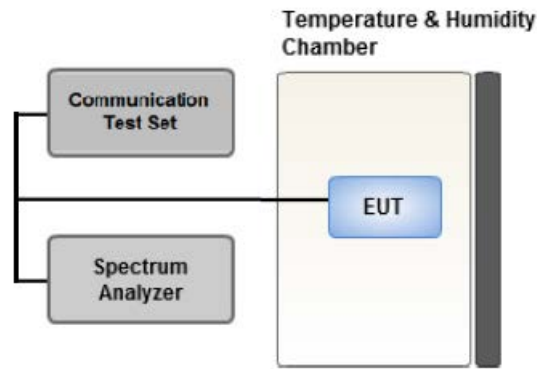
$$\text{Result}_{(\text{dBm})} = P_{g(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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)

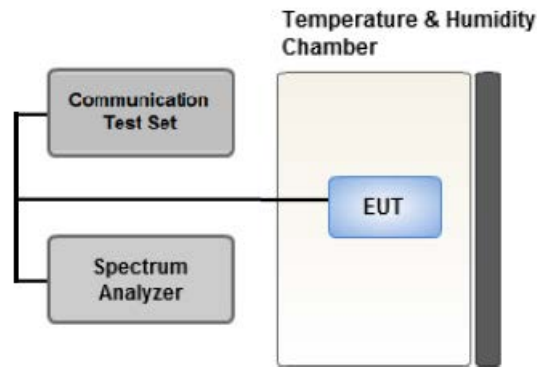
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

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 $[10 \log (1/0.25)] = 6 \text{ dB}$ 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.

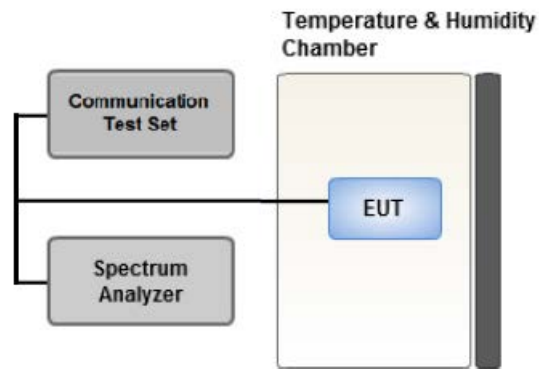
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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.

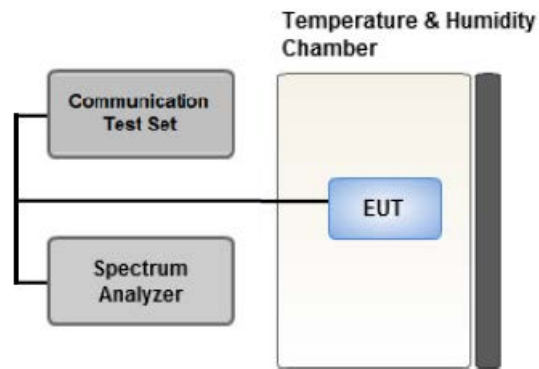
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 = Peak
4. Trace Mode = Max Hold
5. Sweep time = auto
6. Number of points in sweep $\geq$ 2 x Span / RBW

3.7 BAND EDGE



Test setup

Test Overview

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

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 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.

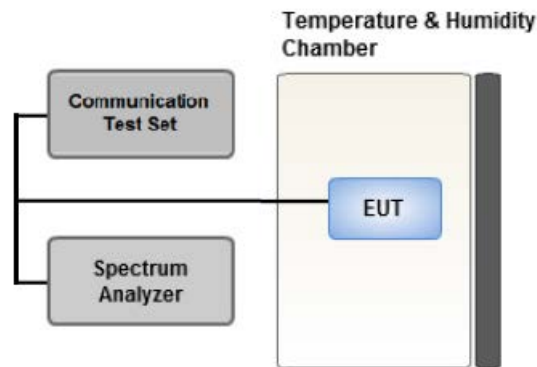
In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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.

Where $\text{Margin} < 1$ dB the emission level is either corrected by $10 \log(1 \text{ MHz} / \text{RB})$ or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

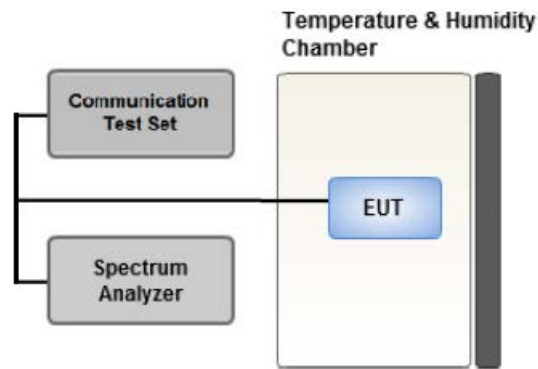
2. Primary Supply Voltage:

- .- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.
- .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

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

3.9 Adjacent Channel Leakage Ratio



Test setup

Test Settings

1. Use ACP measurement function of Spectrum analyzer to measure adjacent channel leakage ratio
2. Integ BW = Assigned channel bandwidth
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = 1 s
9. The trace was allowed to stabilize

Test Notes

the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1.2 G HPF+LNA)	HCT CO., LTD.	F1L1	11/11/2025	Annual
RF Switching System	Switch box(3.3 G HPF+LNA)	HCT CO., LTD.	F1L2	11/11/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.	F1L4	11/11/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.	F1L7	11/11/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/07/2025	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/19/2026	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/10/2026	Annual
DC Power Supply	E3632A	Agilent	MY40010147	08/06/2025	Annual
Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Dipole Antenna	UHAP	Schwarzbeck	01288	08/07/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/11/2026	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/23/2027	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/14/2026	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/10/2026	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/06/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/28/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	08/19/2026	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/13/2025	Annual
Radio Communication Test Station	MT8000A	Anritsu Corp.	6272613402	08/28/2025	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	Annual

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 ($\pm$ kHz)
Occupied Bandwidth	95 (Confidence level about 95 %, $k=2$)
Frequency stability	28 (Confidence level about 95 %, $k=2$)
Parameter	Expanded Uncertainty ($\pm$ kHz)
Block Edge	0.70 (Confidence level about 95 %, $k=2$)
Conducted Spurious Emissions	1.18 (Confidence level about 95 %, $k=2$)
Peak- to- Average Ratio	0.68 (Confidence level about 95 %, $k=2$)
Radiated Power	4.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.68 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.75 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$)

6. SUMMARY OF TEST RESULTS

-. The decision rule applies 'simple acceptance'

6.1 Test Condition: Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 96.41(e)	■ -13 dBm/MHz at frequencies within 0-10 MHz of channel edge ■ -25 dBm/MHz at frequencies greater than 10 MHz above and below channel edge ■ -40 dBm/MHz at frequencies below 3530 MHz and above 3720 MHz	PASS
Adjacent Channel Leakage Ratio	§ 96.41(e)	At least 30 dB.	PASS
Conducted Output Power	§ 2.1046	N/A	PASS
Frequency stability / variation of ambient temperature	§ 2.1055,	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	§ 96.41(b)	23 dBm/10 MHz	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 96.41(e)	-40 dBm/MHz	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)
5	20	25
10	20	35
15	20	35
20	5	25
20	10	30
20	15	35
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 modes of operation were investigated and the worst case configuration results are reported.
Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
Worst case : Stand alone
5. The EUT was tested in three modes(Open, Half-open, Closed), the worst case configuration results are reported.
(Worst case: Open mode)
6. All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.
Therefore, only the worst case(stand-alone) results were reported.
7. 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	16QAM	Low	20	3560.0	55340	1	99	20	3579.8	55538	1	0
		Mid	20	3615.1	55891	1	99	20	3634.9	56089	1	0
		High	20	3670.2	56442	1	99	20	3690.0	56640	1	0
		Low	20	3560.0	55340	1	0	20	3579.8	55538	1	99
		Mid	20	3615.1	55891	1	0	20	3634.9	56089	1	99
		High	20	3670.2	56442	1	0	20	3690.0	56640	1	99
		Low	20	3560.0	55340	100	0	20	3579.8	55538	100	0
		Mid	20	3615.1	55891	100	0	20	3634.9	56089	100	0
		High	20	3670.2	56442	100	0	20	3690.0	56640	100	0
Radiated Spurious Emissions	16QAM	Low	20	3560.0	55340	1	99	20	3579.8	55538	1	0
		Mid	20	3615.1	55891	1	99	20	3634.9	56089	1	0
		High	20	3670.2	56442	1	99	20	3690.0	56640	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	5	3615.8	55898	25	0	20	3627.5	56015	100	0
			10	3615.6	55896	50	0	20	3630.0	56040	100	0
			15	3615.3	55893	75	0	20	3632.4	56064	100	0
			20	3622.5	55965	100	0	5	3634.2	56082	25	0
			20	3620.1	55941	100	0	10	3634.5	56085	50	0
			20	3617.6	55916	100	0	15	3634.7	56087	75	0
			20	3615.1	55891	100	0	20	3634.9	56089	100	0
Frequency stability	16QAM	Low	5	3553.3	55273	25	0	20	3565.0	55390	100	0
			10	3555.5	55295	50	0	20	3569.9	55439	100	0
			15	3557.8	55318	75	0	20	3574.9	55489	50	0
			20	3560.0	55340	100	0	20	3579.8	55538	100	0
		High	5	3678.3	56523	25	0	20	3690.0	56640	100	0
			10	3675.6	56496	50	0	20	3690.0	56640	100	0
			15	3672.9	56469	75	0	20	3690.0	56640	50	0
			20	3670.2	56442	100	0	20	3690.0	56640	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	5	3553.3	55273	1	24	20	3565.0	55390	1	0	17.89
	10	3555.5	55295	1	49	20	3569.9	55439	1	0	17.52
	15	3557.8	55318	1	74	20	3574.9	55489	1	0	17.68
	20	3560.0	55340	1	99	5	3571.7	55457	1	0	18.97
	20	3560.0	55340	1	99	10	3574.4	55484	1	0	17.99
	20	3560.0	55340	1	99	15	3577.1	55511	1	0	17.99
	20	3560.0	55340	1	99	20	3579.8	55538	1	0	19.50
Mid	5	3615.8	55898	1	24	20	3627.5	56015	1	0	18.35
	10	3615.6	55896	1	49	20	3630.0	56040	1	0	18.16
	15	3615.3	55893	1	74	20	3632.4	56064	1	0	18.25
	20	3622.5	55965	1	99	5	3634.2	56082	1	0	19.53
	20	3620.1	55941	1	99	10	3634.5	56085	1	0	18.46
	20	3617.6	55916	1	99	15	3634.7	56087	1	0	17.52
	20	3615.1	55891	1	99	20	3634.9	56089	1	0	19.54
High	5	3678.3	56523	1	24	20	3690.0	56640	1	0	18.32
	10	3675.6	56496	1	49	20	3690.0	56640	1	0	17.28
	15	3672.9	56469	1	74	20	3690.0	56640	1	0	18.22
	20	3685.0	56590	1	99	5	3696.7	56707	1	0	19.60
	20	3680.1	56541	1	99	10	3694.5	56685	1	0	18.55
	20	3675.1	56491	1	99	15	3692.2	56662	1	0	18.41
	20	3670.2	56442	1	99	20	3690.0	56640	1	0	19.79

Note:

Modulation : QPSK(1RB)

Operating frequency	PCC					SCC					Conducted.
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Power [dBm]
Low	5	3553.3	55273	25	0	20	3565.0	55390	100	0	11.46
	10	3555.5	55295	50	0	20	3569.9	55439	100	0	11.65
	15	3557.8	55318	75	0	20	3574.9	55489	100	0	12.60
	20	3560.0	55340	100	0	5	3571.7	55457	25	0	11.75
	20	3560.0	55340	100	0	10	3574.4	55484	50	0	12.75
	20	3560.0	55340	100	0	15	3577.1	55511	75	0	11.85
	20	3560.0	55340	100	0	20	3579.8	55538	100	0	12.76
Mid	5	3615.8	55898	25	0	20	3627.5	56015	100	0	12.29
	10	3615.6	55896	50	0	20	3630.0	56040	100	0	13.25
	15	3615.3	55893	75	0	20	3632.4	56064	100	0	12.32
	20	3622.5	55965	100	0	5	3634.2	56082	25	0	12.41
	20	3620.1	55941	100	0	10	3634.5	56085	50	0	12.46
	20	3617.6	55916	100	0	15	3634.7	56087	75	0	13.32
	20	3615.1	55891	100	0	20	3634.9	56089	100	0	13.33
High	5	3678.3	56523	25	0	20	3690.0	56640	100	0	12.23
	10	3675.6	56496	50	0	20	3690.0	56640	100	0	13.24
	15	3672.9	56469	75	0	20	3690.0	56640	100	0	13.19
	20	3685.0	56590	100	0	5	3696.7	56707	25	0	12.52
	20	3680.1	56541	100	0	10	3694.5	56685	50	0	13.41
	20	3675.1	56491	100	0	15	3692.2	56662	75	0	13.41
	20	3670.2	56442	100	0	20	3690.0	56640	100	0	13.42

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	3560.0	55340	1	99	20	3579.8	55538	1	0	19.93
Mid	20	3615.1	55891	1	99	20	3634.9	56089	1	0	20.34
High	20	3670.2	56442	1	99	20	3690.0	56640	1	0	20.22
Low	20	3560.0	55340	100	0	20	3579.8	55538	100	0	11.93
Mid	20	3615.1	55891	100	0	20	3634.9	56089	100	0	12.44
High	20	3670.2	56442	100	0	20	3690.0	56640	100	0	13.21

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	3560.0	55340	1	99	20	3579.8	55538	1	0	19.14
Mid	20	3615.1	55891	1	99	20	3634.9	56089	1	0	19.47
High	20	3670.2	56442	1	99	20	3690.0	56640	1	0	19.44
Low	20	3560.0	55340	100	0	20	3579.8	55538	100	0	11.90
Mid	20	3615.1	55891	100	0	20	3634.9	56089	100	0	12.40
High	20	3670.2	56442	100	0	20	3690.0	56640	100	0	13.17

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	20	3560.0	55340	1	99	20	3579.8	55538	1	0	19.68
Mid	20	3615.1	55891	1	99	20	3634.9	56089	1	0	19.64
High	20	3670.2	56442	1	99	20	3690.0	56640	1	0	19.95
Low	20	3560.0	55340	100	0	20	3579.8	55538	100	0	11.90
Mid	20	3615.1	55891	100	0	20	3634.9	56089	100	0	13.32
High	20	3670.2	56442	100	0	20	3690.0	56640	100	0	12.28

Note:

Modulation : 256QAM

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	55273	1/24	20	55390	1/0	-32.73	6.34	12.38	3.09	H	0.037	15.63
	10	55295	1/49	20	55439	1/0	-32.75	6.32	12.38	3.09	H	0.036	15.61
	15	55318	1/74	20	55489	1/0	-32.58	6.55	12.37	3.09	H	0.038	15.83
	20	55340	1/99	5	55457	1/0	-31.90	7.23	12.37	3.09	H	0.045	16.51
	20	55340	1/99	10	55484	1/0	-33.05	6.08	12.37	3.09	H	0.034	15.36
	20	55340	1/99	15	55511	1/0	-33.00	6.20	12.36	3.09	H	0.035	15.47
	20	55340	1/99	20	55538	1/0	-31.68	7.52	12.36	3.09	H	0.048	16.79
Mid	5	55898	1/24	20	56015	1/0	-32.85	6.49	12.26	3.14	H	0.036	15.61
	10	55896	1/49	20	56040	1/0	-33.04	6.30	12.26	3.14	H	0.035	15.42
	15	55893	1/74	20	56064	1/0	-33.13	6.23	12.25	3.13	H	0.034	15.35
	20	55965	1/99	5	56082	1/0	-32.57	6.79	12.25	3.13	H	0.039	15.91
	20	55941	1/99	10	56085	1/0	-33.24	6.12	12.25	3.13	H	0.033	15.24
	20	55916	1/99	15	56087	1/0	-33.50	5.86	12.25	3.13	H	0.031	14.98
	20	55891	1/99	20	56089	1/0	-32.07	7.29	12.25	3.13	H	0.044	16.41
High	5	56523	1/24	20	56640	1/0	-33.13	6.32	12.27	3.10	H	0.035	15.50
	10	56496	1/49	20	56640	1/0	-33.75	5.70	12.27	3.10	H	0.031	14.88
	15	56469	1/74	20	56640	1/0	-33.45	6.06	12.26	3.11	H	0.033	15.21
	20	56590	1/99	5	56707	1/0	-32.57	6.83	12.28	3.08	H	0.040	16.03
	20	56541	1/99	10	56685	1/0	-33.47	5.98	12.27	3.10	H	0.033	15.16
	20	56491	1/99	15	56662	1/0	-33.60	5.85	12.27	3.10	H	0.032	15.03
	20	56442	1/99	20	56640	1/0	-32.02	7.49	12.26	3.11	H	0.046	16.64

Note:

1. Modulation : QPSK
2. Limit : < 23 dBm

	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	55273	1/24	20	55390	1/0	-32.25	6.82	12.38	3.09	H	0.041	16.11
	10	55295	1/49	20	55439	1/0	-32.28	6.79	12.38	3.09	H	0.041	16.08
	15	55318	1/74	20	55489	1/0	-31.99	7.14	12.37	3.09	H	0.044	16.42
	20	55340	1/99	5	55457	1/0	-31.24	7.89	12.37	3.09	H	0.052	17.17
	20	55340	1/99	10	55484	1/0	-32.42	6.71	12.37	3.09	H	0.040	15.99
	20	55340	1/99	15	55511	1/0	-32.28	6.92	12.36	3.09	H	0.042	16.19
	20	55340	1/99	20	55538	1/0	-31.25	7.95	12.36	3.09	H	0.053	17.22
Mid	5	55898	1/24	20	56015	1/0	-32.60	6.74	12.26	3.14	H	0.039	15.86
	10	55896	1/49	20	56040	1/0	-32.90	6.44	12.26	3.14	H	0.036	15.56
	15	55893	1/74	20	56064	1/0	-32.65	6.71	12.25	3.13	H	0.038	15.83
	20	55965	1/99	5	56082	1/0	-32.30	7.06	12.25	3.13	H	0.041	16.18
	20	55941	1/99	10	56085	1/0	-33.07	6.29	12.25	3.13	H	0.035	15.41
	20	55916	1/99	15	56087	1/0	-33.04	6.32	12.25	3.13	H	0.035	15.44
	20	55891	1/99	20	56089	1/0	-31.67	7.69	12.25	3.13	H	0.048	16.81
High	5	56523	1/24	20	56640	1/0	-32.98	6.47	12.27	3.10	H	0.037	15.65
	10	56496	1/49	20	56640	1/0	-33.10	6.35	12.27	3.10	H	0.036	15.53
	15	56469	1/74	20	56640	1/0	-33.21	6.30	12.26	3.11	H	0.035	15.45
	20	56590	1/99	5	56707	1/0	-32.44	6.95	12.28	3.08	H	0.041	16.16
	20	56541	1/99	10	56685	1/0	-33.24	6.21	12.27	3.10	H	0.035	15.39
	20	56491	1/99	15	56662	1/0	-33.21	6.24	12.27	3.10	H	0.035	15.42
	20	56442	1/99	20	56640	1/0	-31.63	7.88	12.26	3.11	H	0.050	17.03

Note:

1. Modulation : 16QAM
2. Limit : < 23 dBm

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
5	55273	1/24	20	55390	1/0	-32.30	6.77	12.38	3.09	H	0.040	16.06
10	55295	1/49	20	55439	1/0	-32.35	6.72	12.38	3.09	H	0.040	16.01
15	55318	1/74	20	55489	1/0	-32.01	7.12	12.37	3.09	H	0.044	16.40
20	55340	1/99	5	55457	1/0	-31.36	7.77	12.37	3.09	H	0.051	17.05
20	55340	1/99	10	55484	1/0	-32.46	6.67	12.37	3.09	H	0.039	15.95
20	55340	1/99	15	55511	1/0	-32.35	6.85	12.36	3.09	H	0.041	16.12
20	55340	1/99	20	55538	1/0	-31.56	7.64	12.36	3.09	H	0.049	16.91
20	55891	1/99	20	56089	1/0	-31.70	7.66	12.25	3.13	H	0.048	16.78
20	56442	1/99	20	56640	1/0	-31.64	7.87	12.26	3.11	H	0.050	17.02

Note:

1. Modulation : 64QAM
2. Limit : < 23 dBm

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
5	55273	1/24	20	55390	1/0	-32.31	6.76	12.38	3.09	H	0.040	16.05
10	55295	1/49	20	55439	1/0	-32.60	6.47	12.38	3.09	H	0.038	15.76
15	55318	1/74	20	55489	1/0	-32.04	7.09	12.37	3.09	H	0.043	16.37
20	55340	1/99	5	55457	1/0	-31.67	7.46	12.37	3.09	H	0.047	16.74
20	55340	1/99	10	55484	1/0	-32.70	6.43	12.37	3.09	H	0.037	15.71
20	55340	1/99	15	55511	1/0	-32.50	6.70	12.36	3.09	H	0.039	15.97
20	55340	1/99	20	55538	1/0	-31.46	7.74	12.36	3.09	H	0.050	17.01
20	55891	1/99	20	56089	1/0	-31.87	7.49	12.25	3.13	H	0.046	16.61
20	56442	1/99	20	56640	1/0	-31.82	7.69	12.26	3.11	H	0.048	16.84

Note:

1. Modulation : 256QAM
2. Limit : < 23 dBm

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	20	55340	3560.0	1/99	20	55538	3579.8	1/0	8.2777	32.570	-85.17	-52.60
Mid	20	55891	3615.1	1/99	20	56089	3634.9	1/0	8.2877	32.570	-85.34	-52.77
High	20	56442	3670.2	1/99	20	56640	3690.0	1/0	8.2667	32.570	-85.10	-52.53
Low	20	55340	3560.0	1/0	20	55538	3579.8	1/99	8.2936	32.570	-85.24	-52.67
Mid	20	55891	3615.1	1/0	20	56089	3634.9	1/99	8.2822	32.570	-85.36	-52.79
High	20	56442	3670.2	1/0	20	56640	3690.0	1/99	8.2657	32.570	-85.07	-52.50
Low	20	55340	3560.0	100/0	20	55538	3579.8	100/0	8.2682	32.570	-85.12	-52.55
Mid	20	55891	3615.1	100/0	20	56089	3634.9	100/0	8.2667	32.570	-84.91	-52.34
High	20	56442	3670.2	100/0	20	56640	3690.0	100/0	8.8584	32.570	-84.99	-52.42

Note:

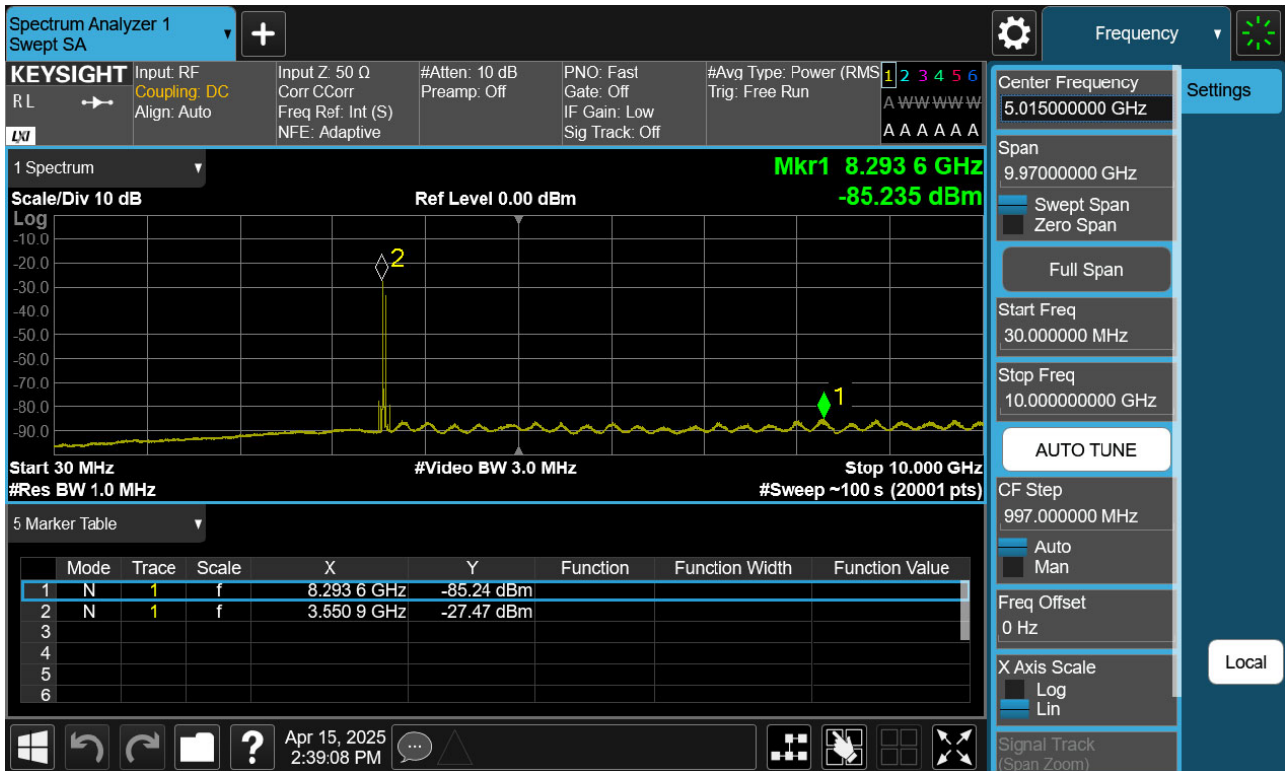
1. Modulation : 16QAM
2. Duty Cycle factor already applied on the factor.
- Duty Cycle factor(dB) = 3.979
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB) + Duty Cycle factor(dB)
4. Factor (dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	29.249
1 – 5	31.955
5 – 10	32.570
10 – 15	33.095
15 – 20	33.468
Above 20(26.5)	34.110

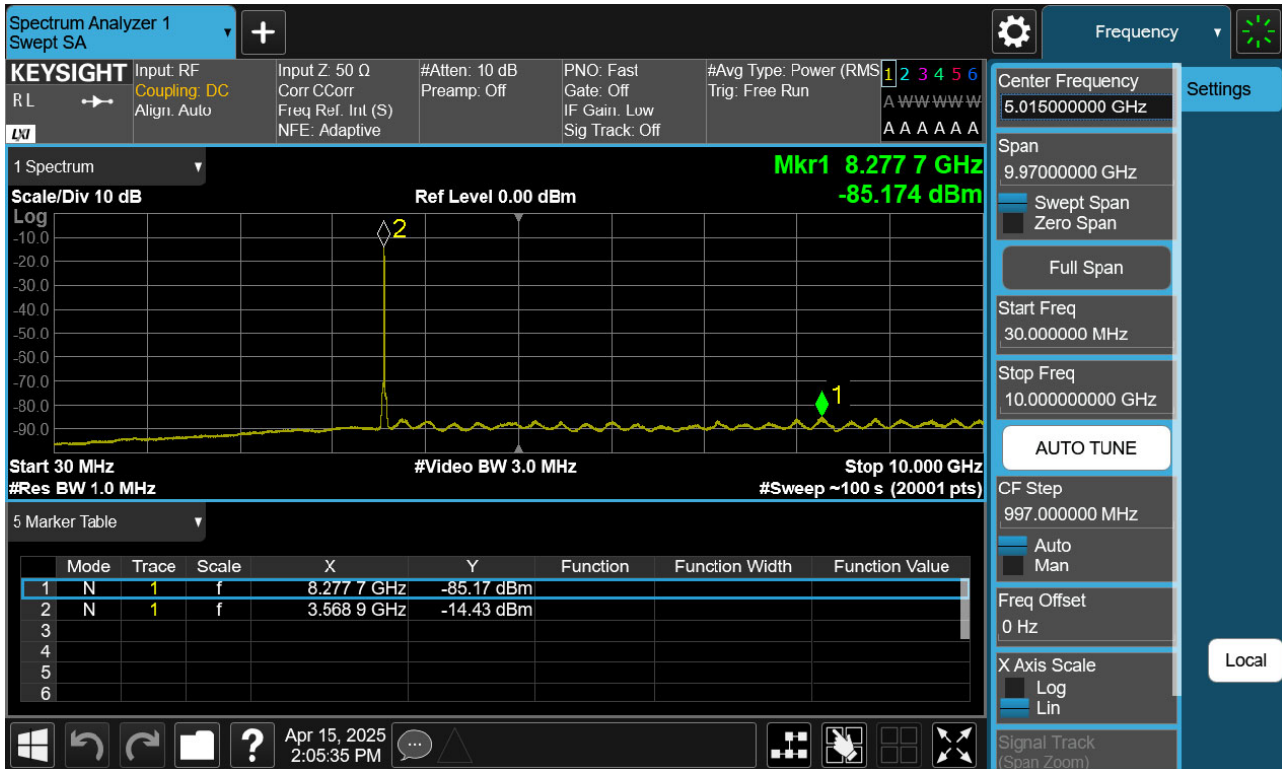
5. Limit : -40.0 dBm

Frequency Range : 30 MHz ~ 10 GHz

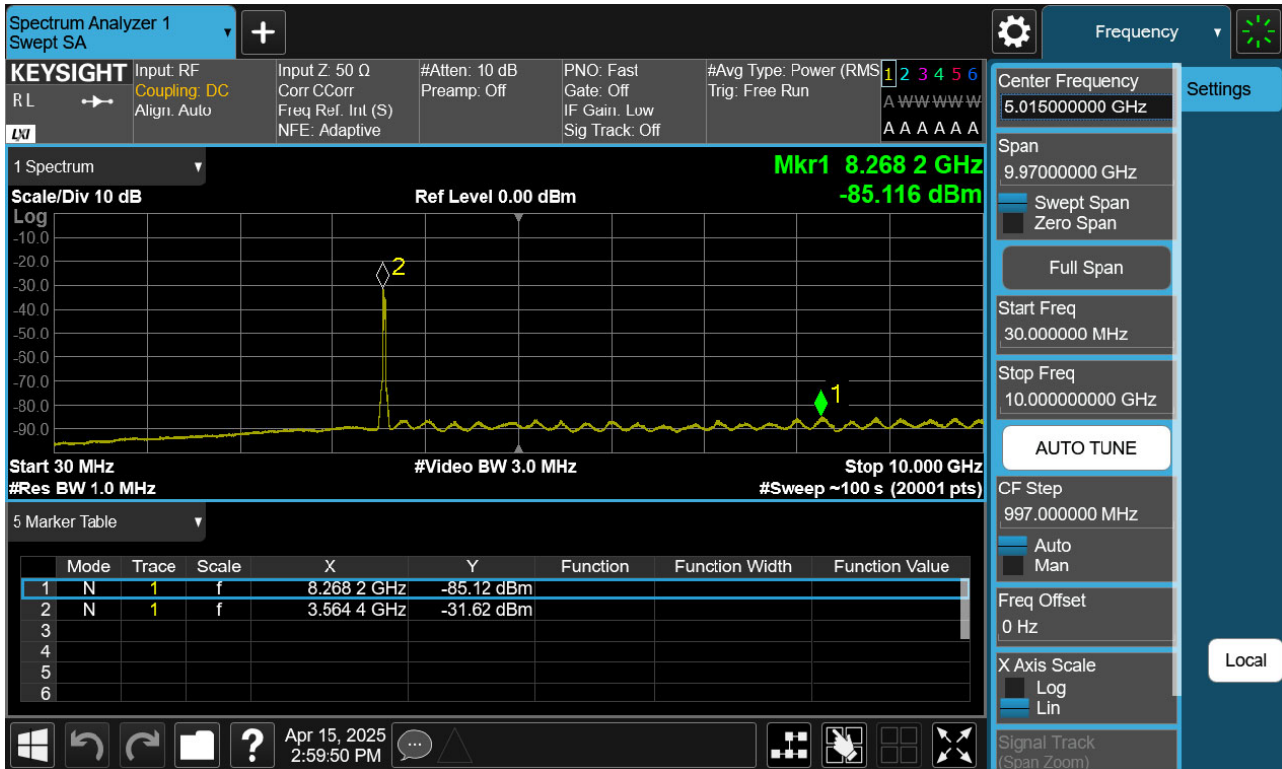
PCC 20MHz Ch55340 RB1 Offset0 SCC 20MHz Ch55538 RB1 Offset99



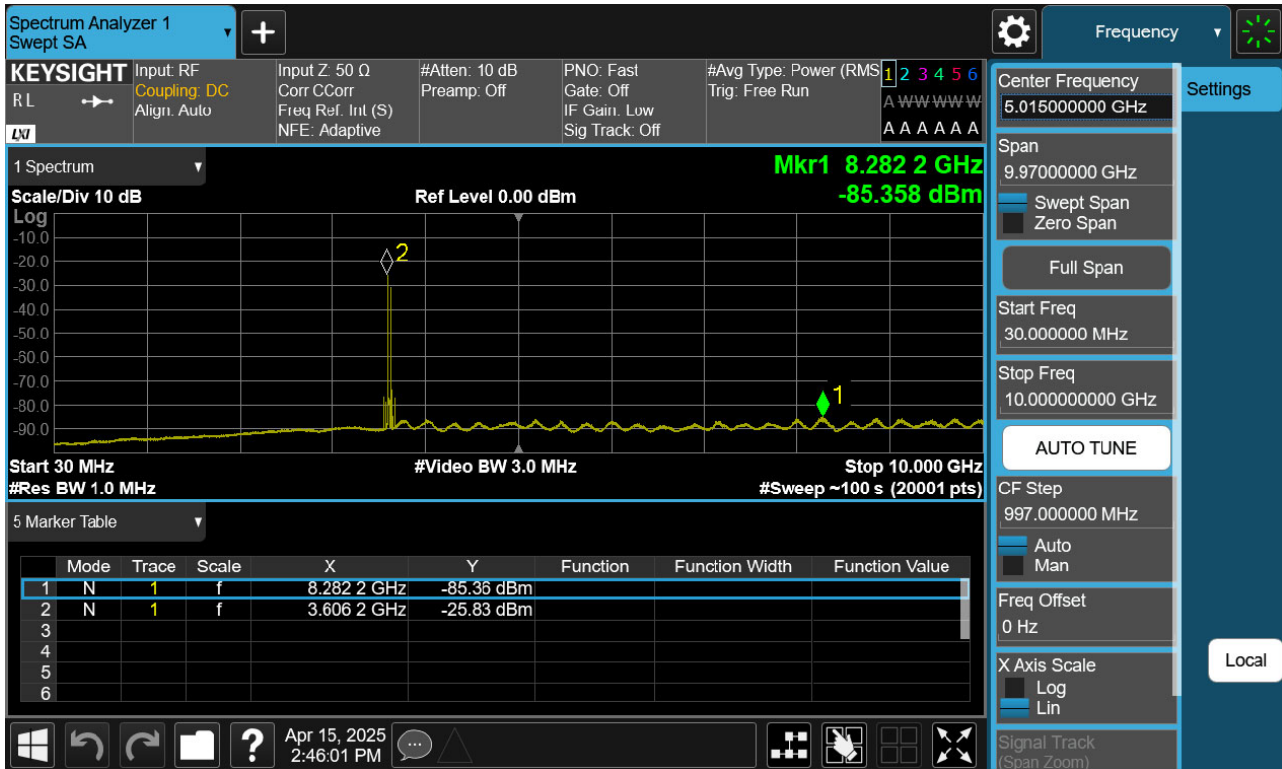
PCC 20MHz Ch55340 RB1 Offset99 SCC 20MHz Ch55538 RB1 Offset0



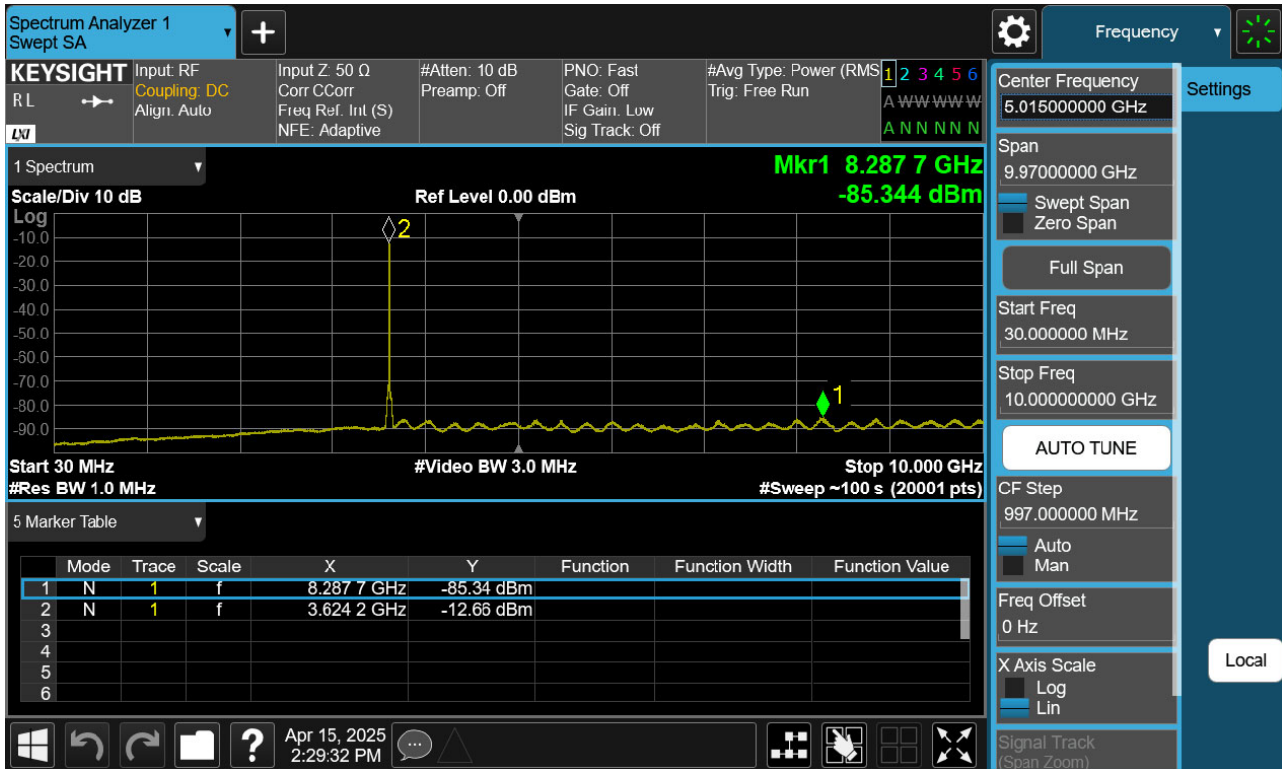
PCC 20MHz Ch55340 RB100 Offset0 SCC 20MHz Ch55538 RB100 Offset0



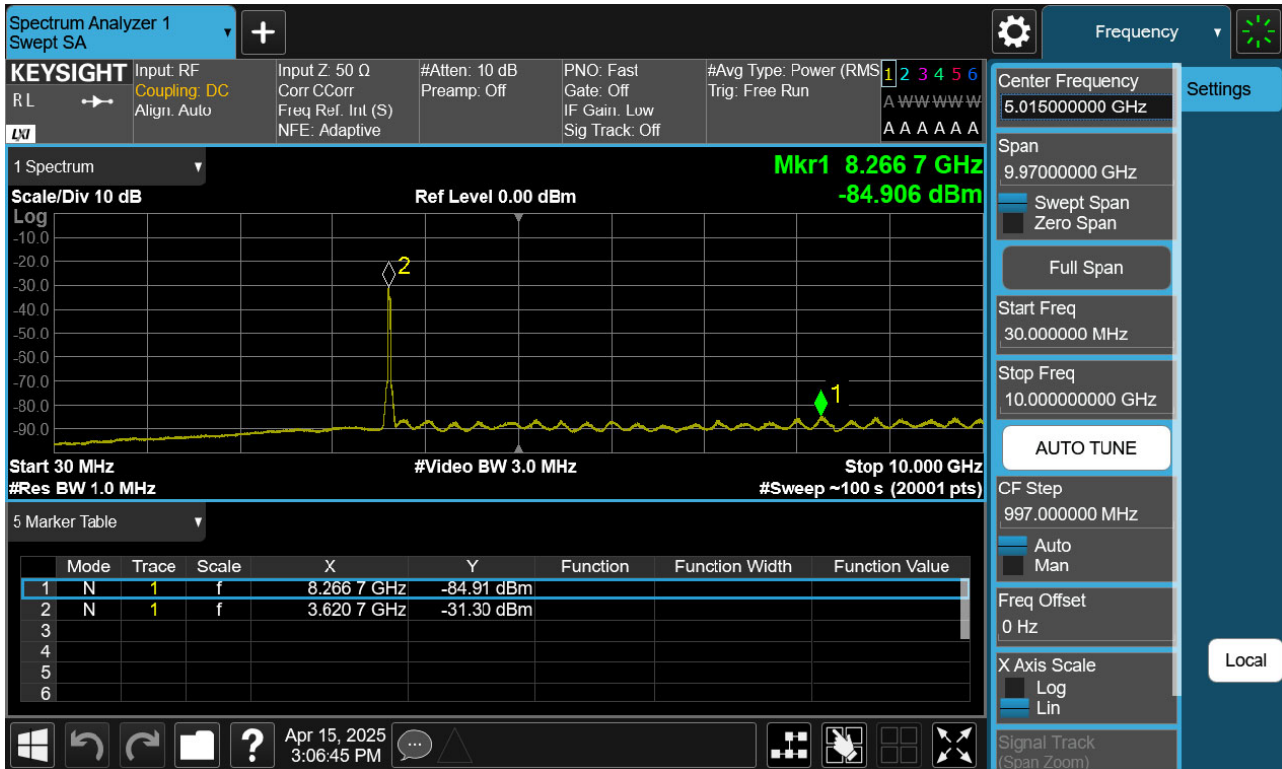
PCC 20MHz Ch55891 RB1 Offset0 SCC 20MHz Ch56089 RB1 Offset99



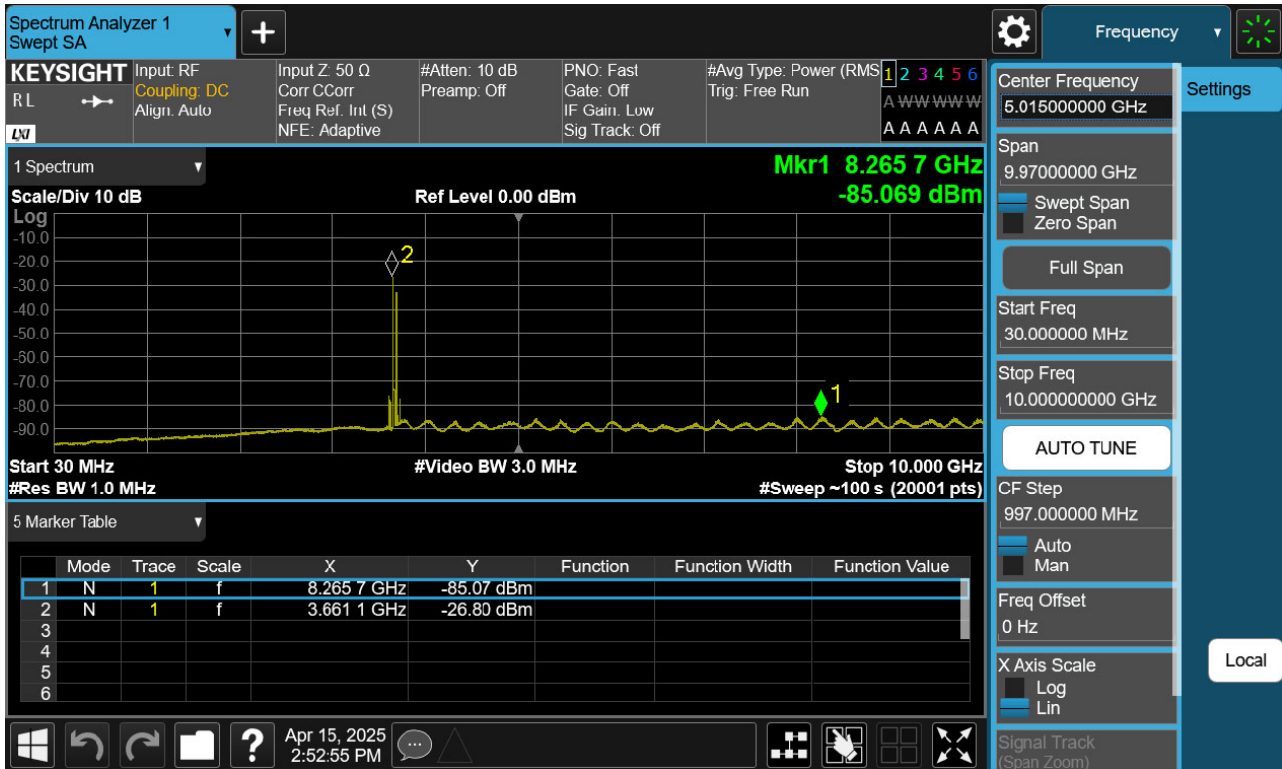
PCC 20MHz Ch55891 RB1 Offset99 SCC 20MHz Ch56089 RB1 Offset0



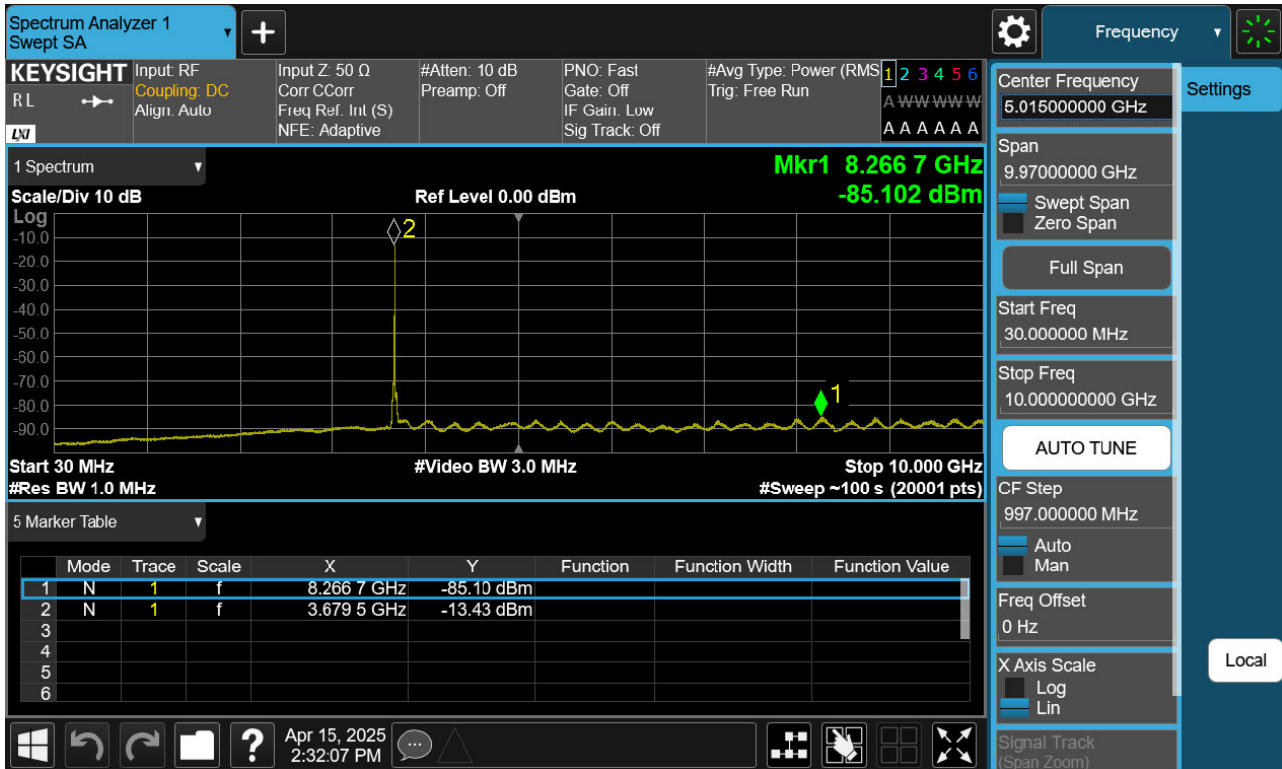
PCC 20MHz Ch55891 RB100 Offset0 SCC 20MHz Ch56089 RB100 Offset0



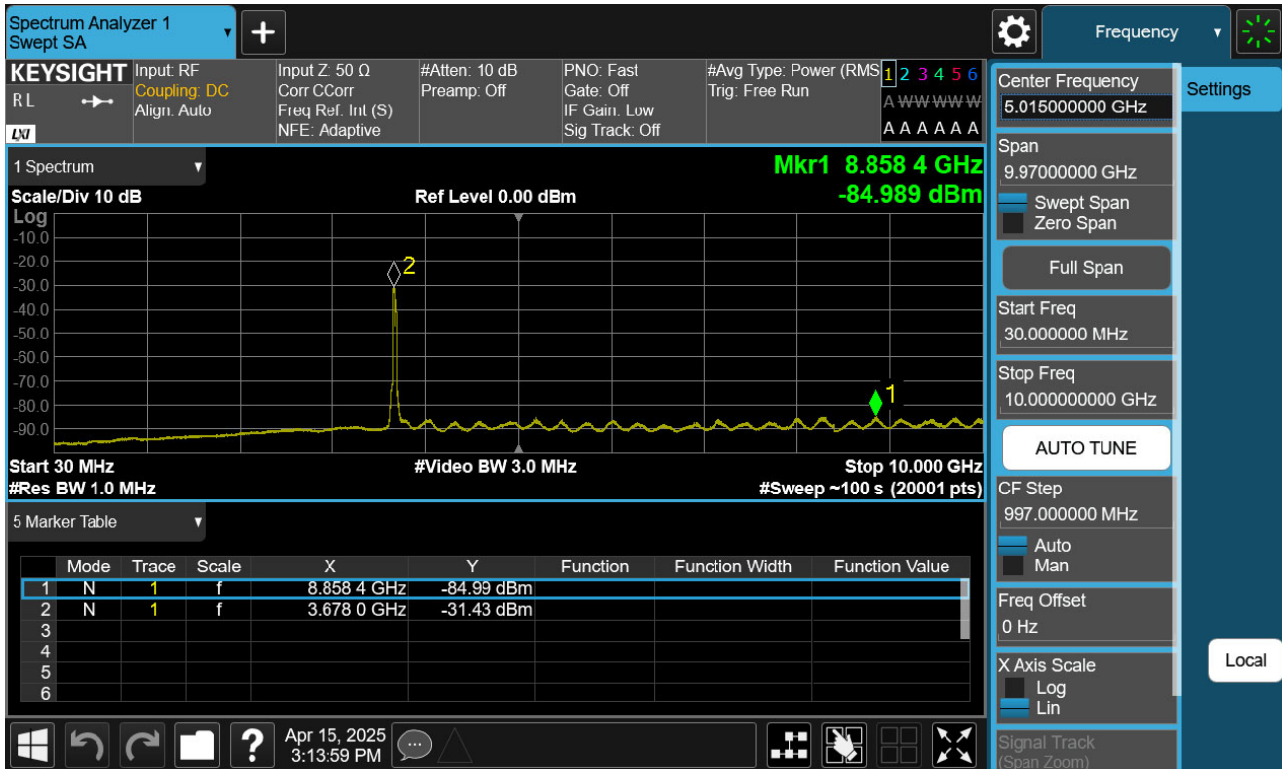
PCC 20MHz Ch56442 RB1 Offset0 SCC 20MHz Ch56640 RB1 Offset99



PCC 20MHz Ch56442 RB1 Offset99 SCC 20MHz Ch56640 RB1 Offset0

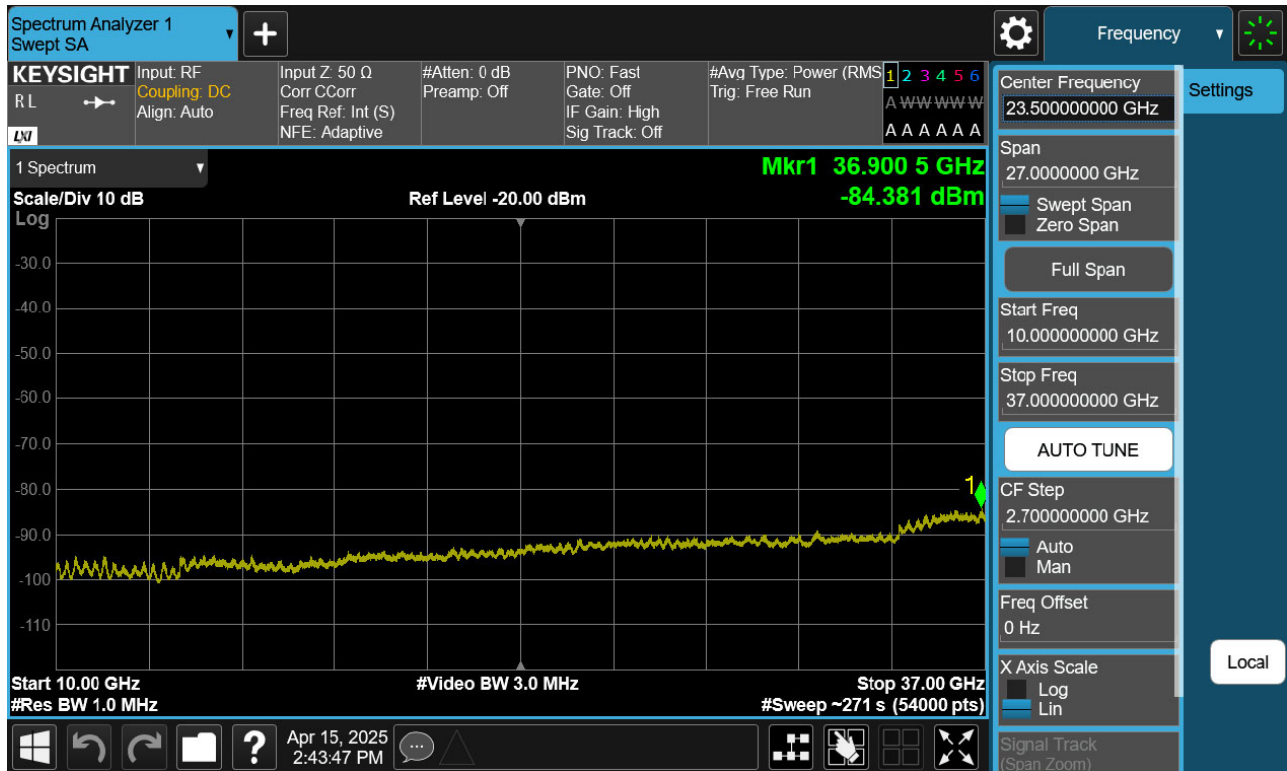


PCC 20MHz Ch56442 RB100 Offset0 SCC 20MHz Ch56640 RB100 Offset0



Frequency Range : 10 GHz ~ 37 GHz

PCC 20MHz Ch55340 RB1 Offset0, SCC 20MHz Ch55538 RB1 Offset99



PCC 20MHz Ch55340 RB1 Offset99, SCC 20MHz Ch55538 RB1 Offset0



PCC 20MHz Ch55340 RB100 Offset0, SCC 20MHz Ch55538 RB100 Offset0



PCC 20MHz Ch55891 RB1 Offset0, SCC 20MHz Ch56089 RB1 Offset99



PCC 20MHz Ch55891 RB1 Offset99, SCC 20MHz Ch56089 RB1 Offset0



PCC 20MHz Ch55891 RB100 Offset0, SCC 20MHz Ch56089 RB100 Offset0



PCC 20MHz Ch56442 RB1 Offset0, SCC 20MHz Ch56640 RB1 Offset99



PCC 20MHz Ch56442 RB1 Offset99, SCC 20MHz Ch56640 RB1 Offset0



PCC 20MHz Ch56442 RB100 Offset0, SCC 20MHz Ch56640 RB100 Offset0

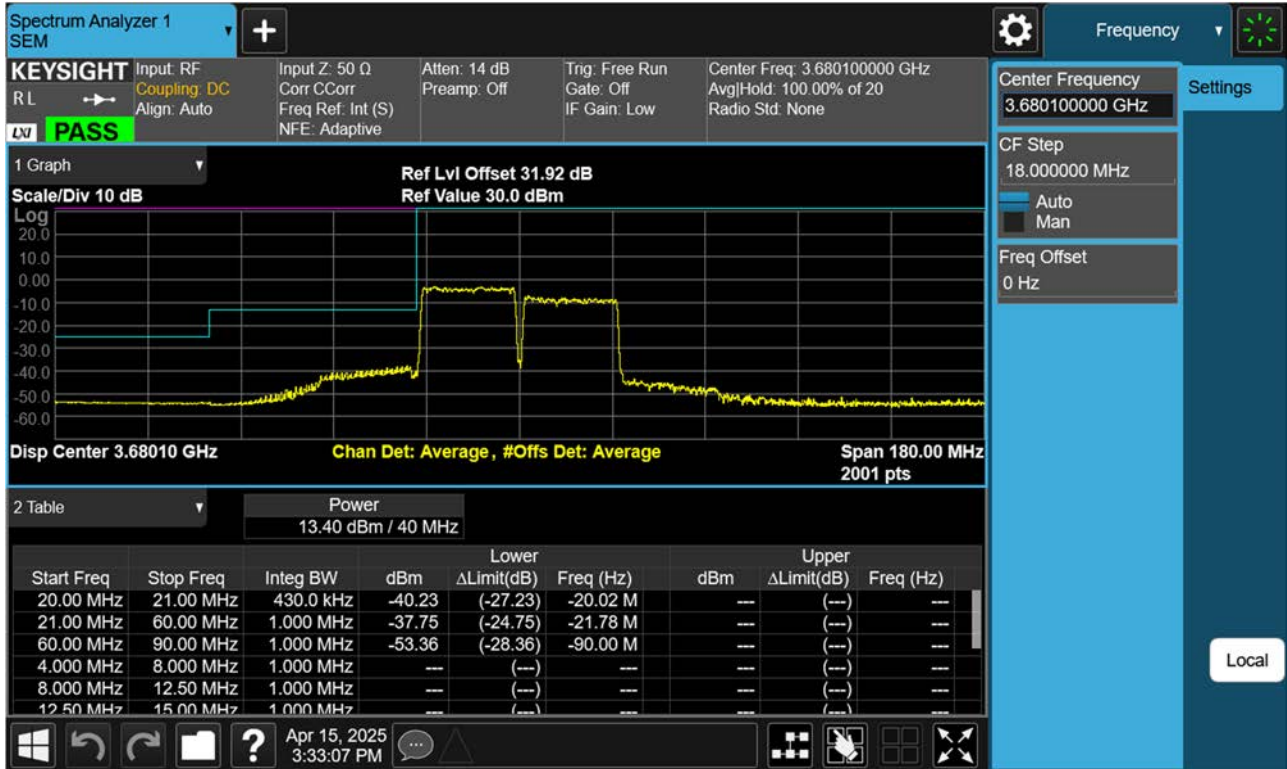


8.4 Channel Edge

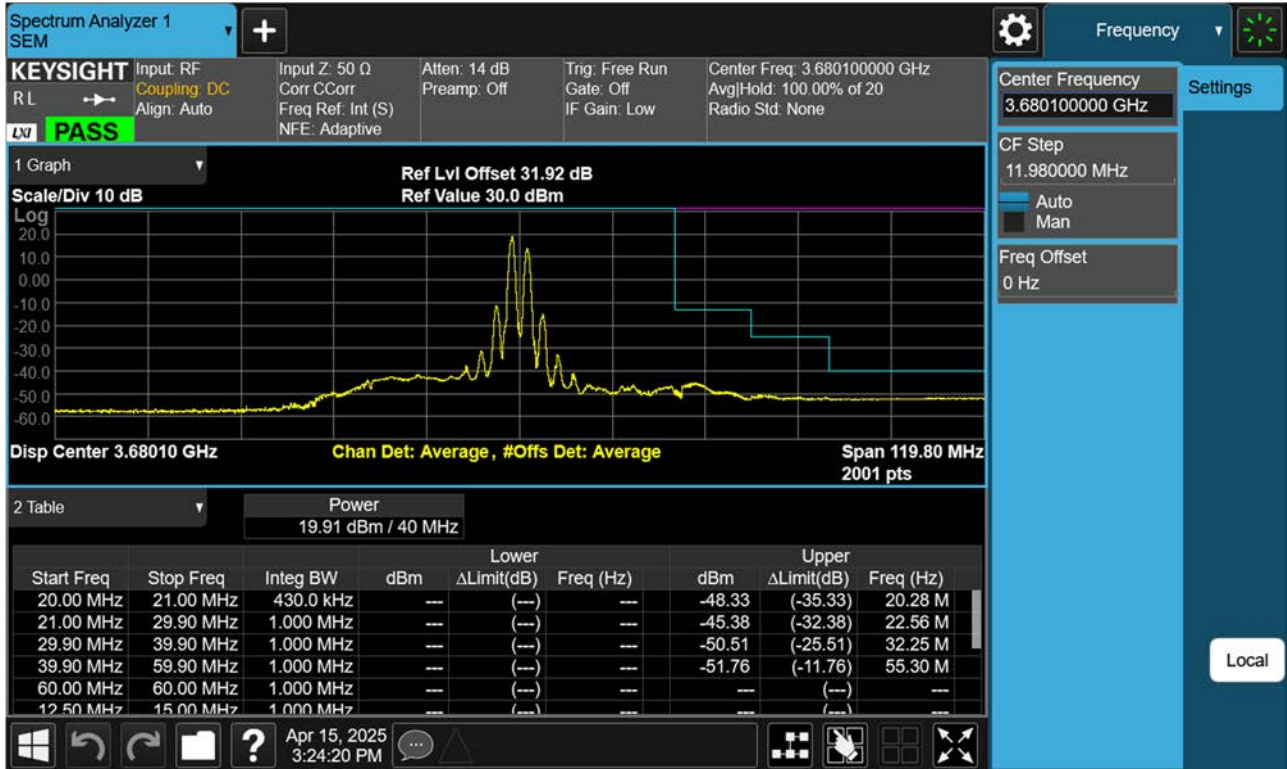
PCC 20MHz Ch56442 RB100 Offset0, SCC 20MHz Ch56640 RB100 Offset0-2



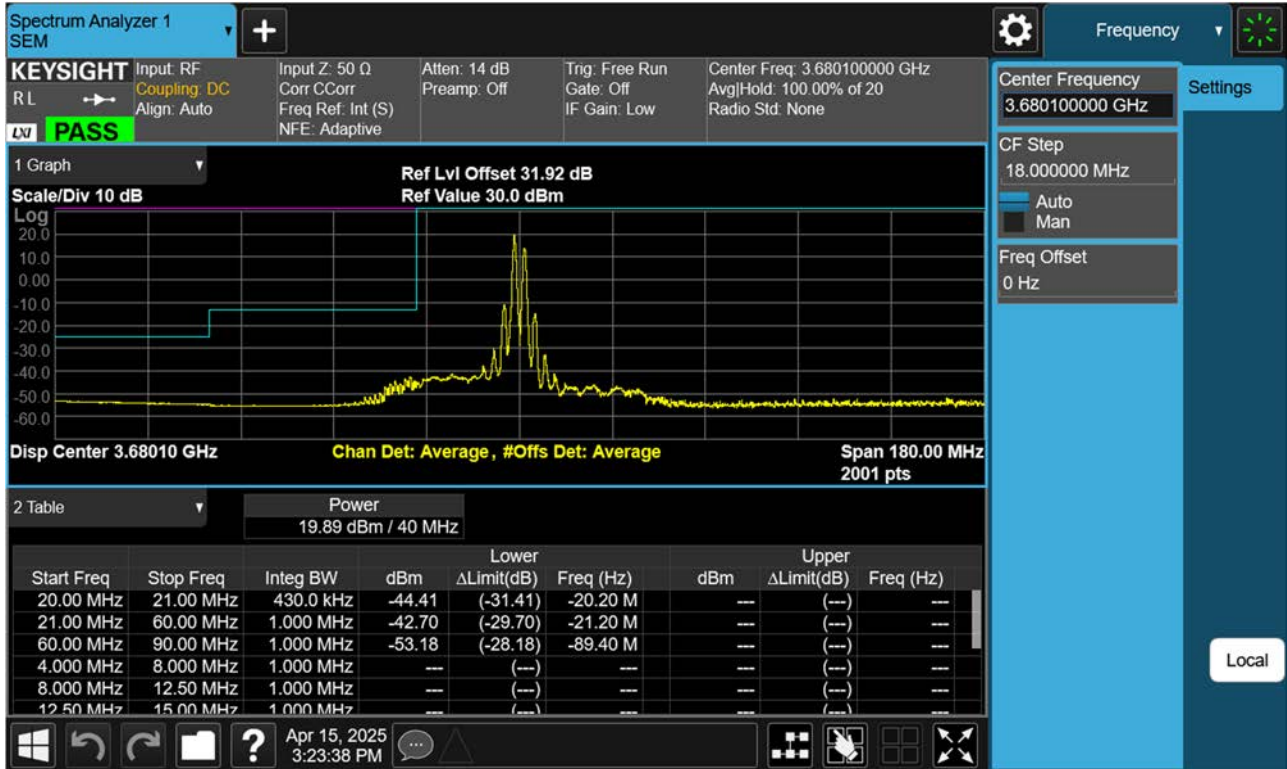
PCC 20MHz Ch56442 RB100 Offset0, SCC 20MHz Ch56640 RB100 Offset0-1



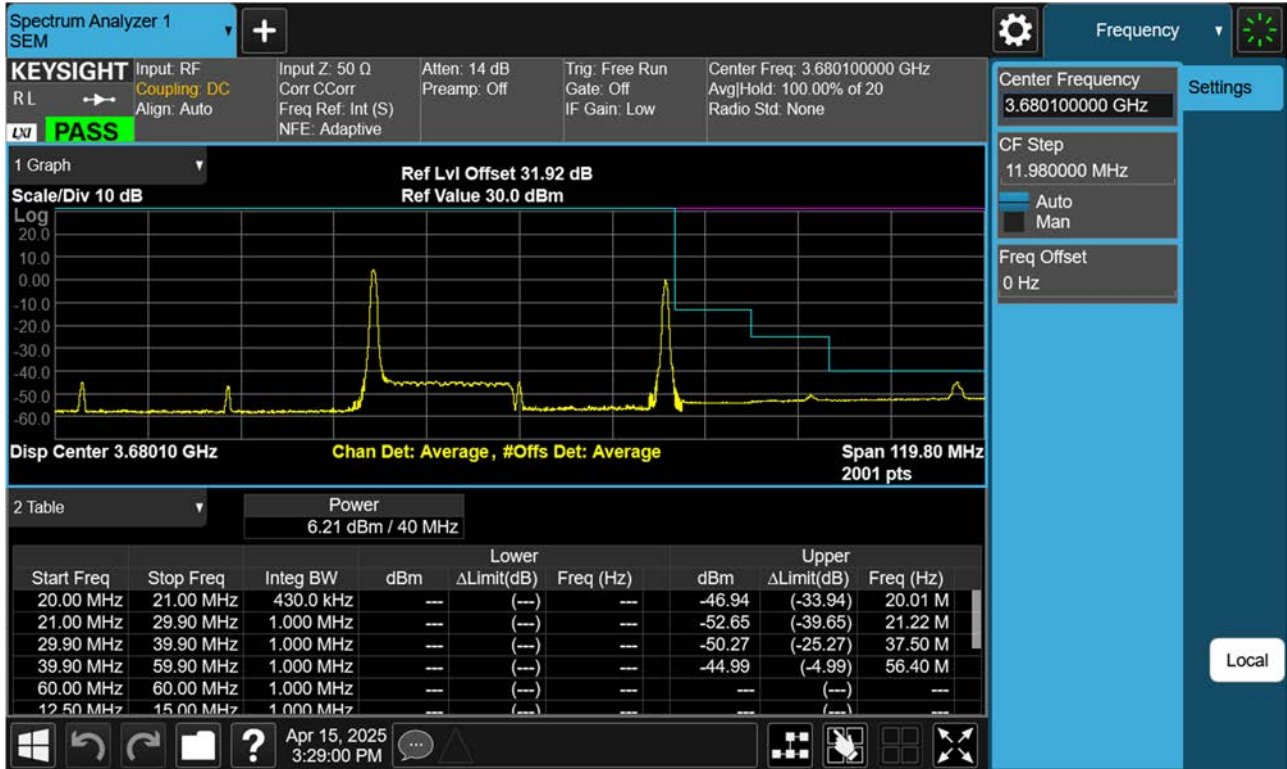
PCC 20MHz Ch56442 RB1 Offset99, SCC 20MHz Ch56640 RB1 Offset0-2



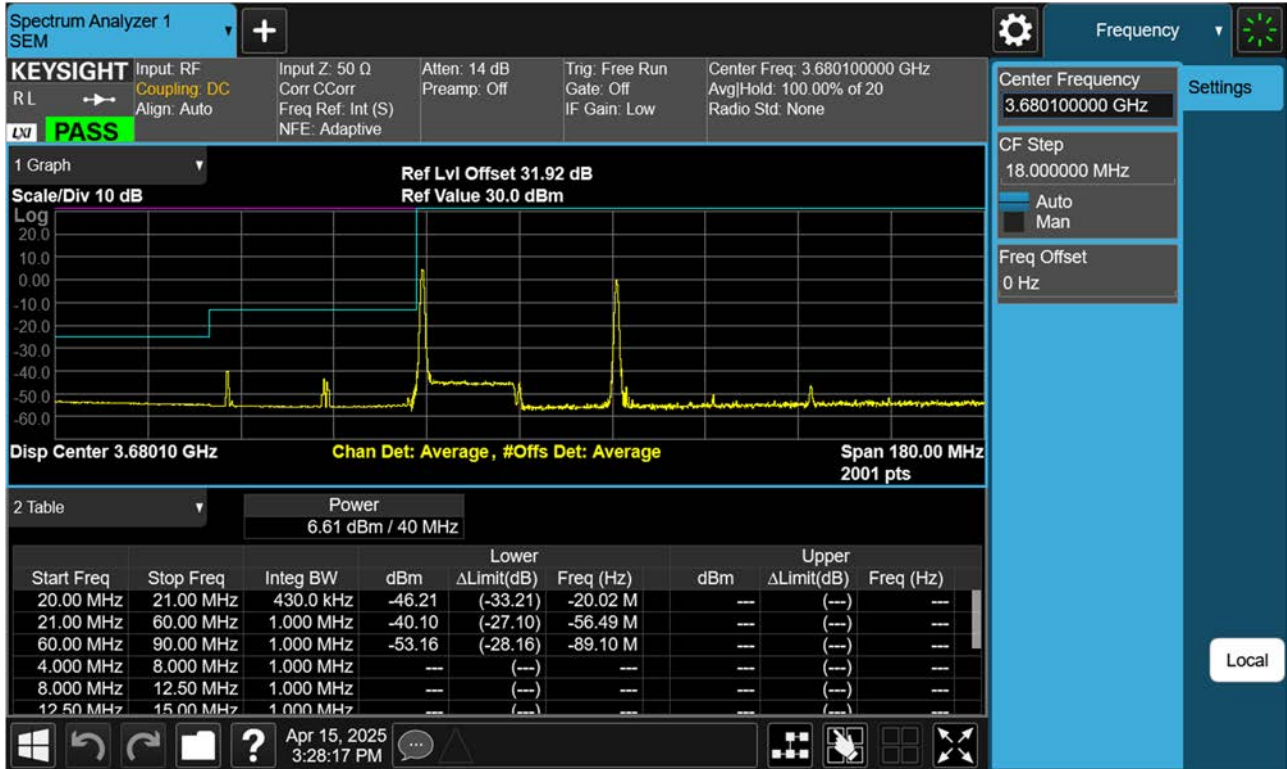
PCC 20MHz Ch56442 RB1 Offset99, SCC 20MHz Ch56640 RB1 Offset0-1



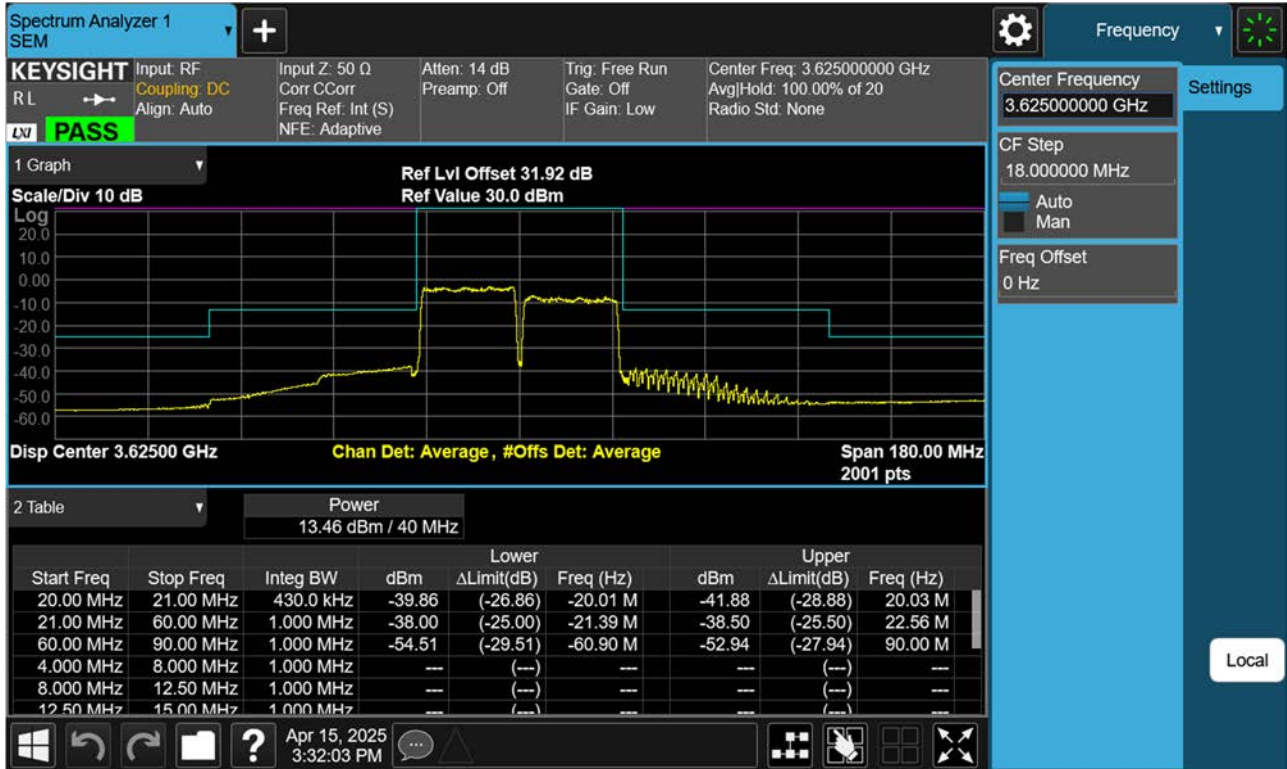
PCC 20MHz Ch56442 RB1 Offset0, SCC 20MHz Ch56640 RB1 Offset99-2



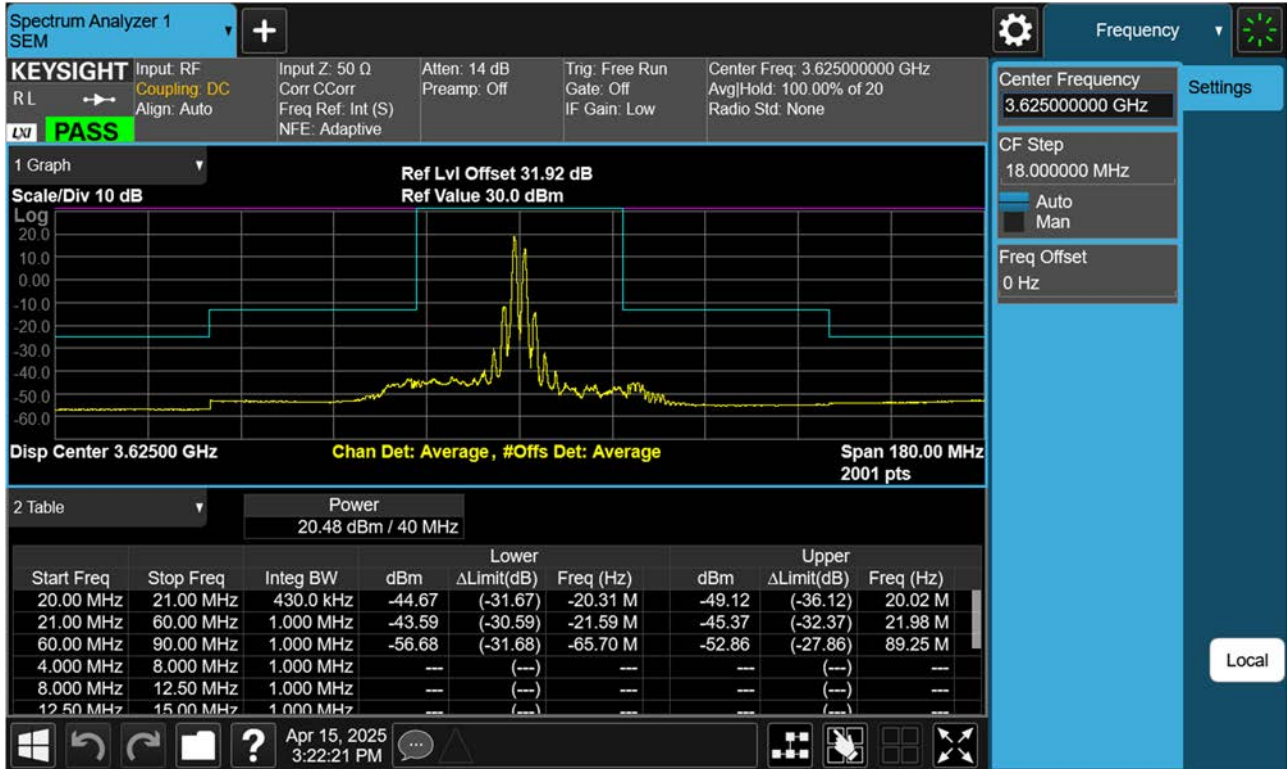
PCC 20MHz Ch56442 RB1 Offset0, SCC 20MHz Ch56640 RB1 Offset99-1



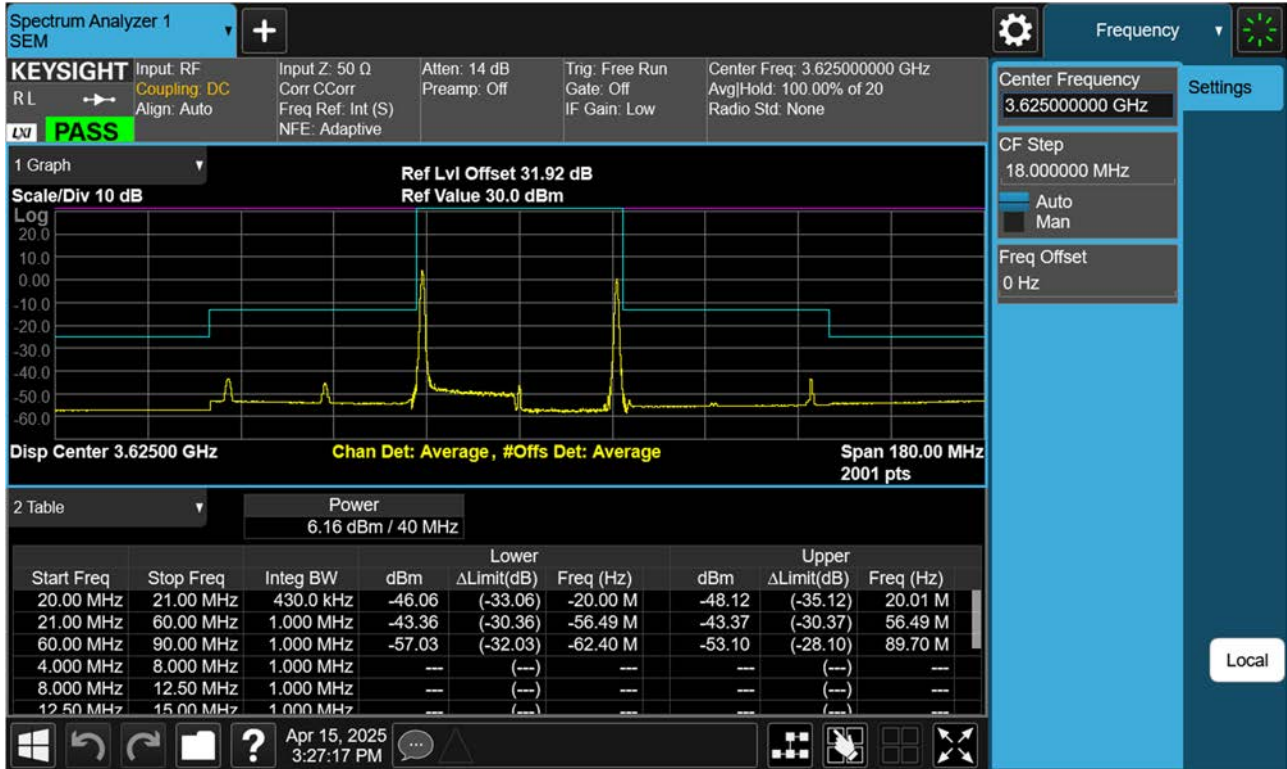
PCC 20MHz Ch55891 RB100 Offset0, SCC 20MHz Ch56089 RB100 Offset0



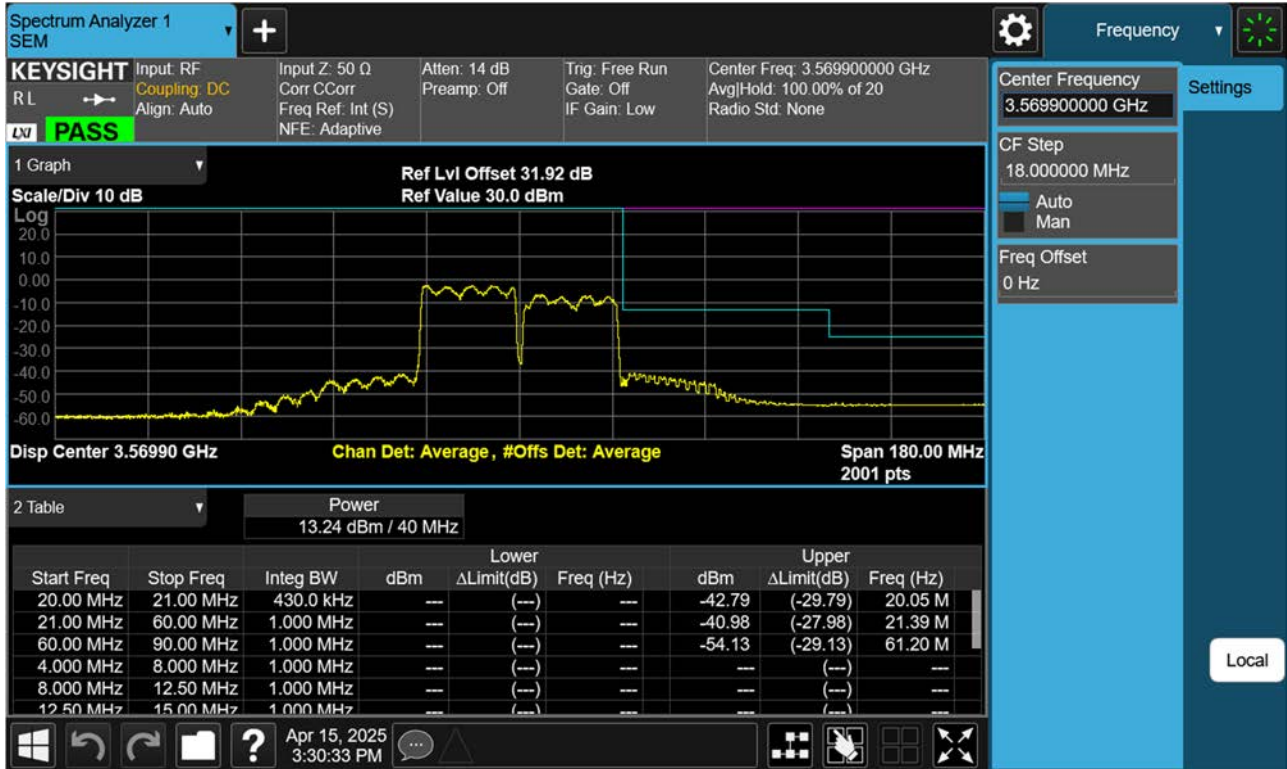
PCC 20MHz Ch55891 RB1 Offset99, SCC 20MHz Ch56089 RB1 Offset0



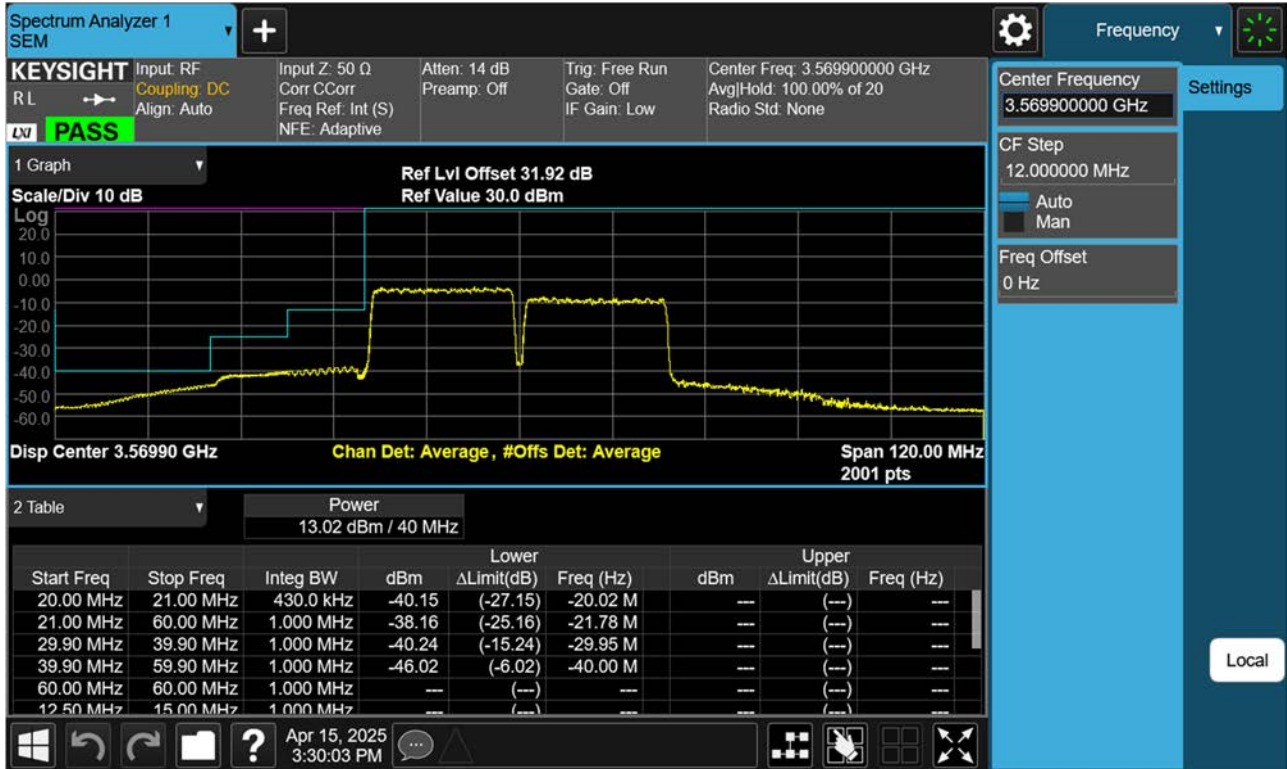
PCC 20MHz Ch55891 RB1 Offset0, SCC 20MHz Ch56089 RB1 Offset99



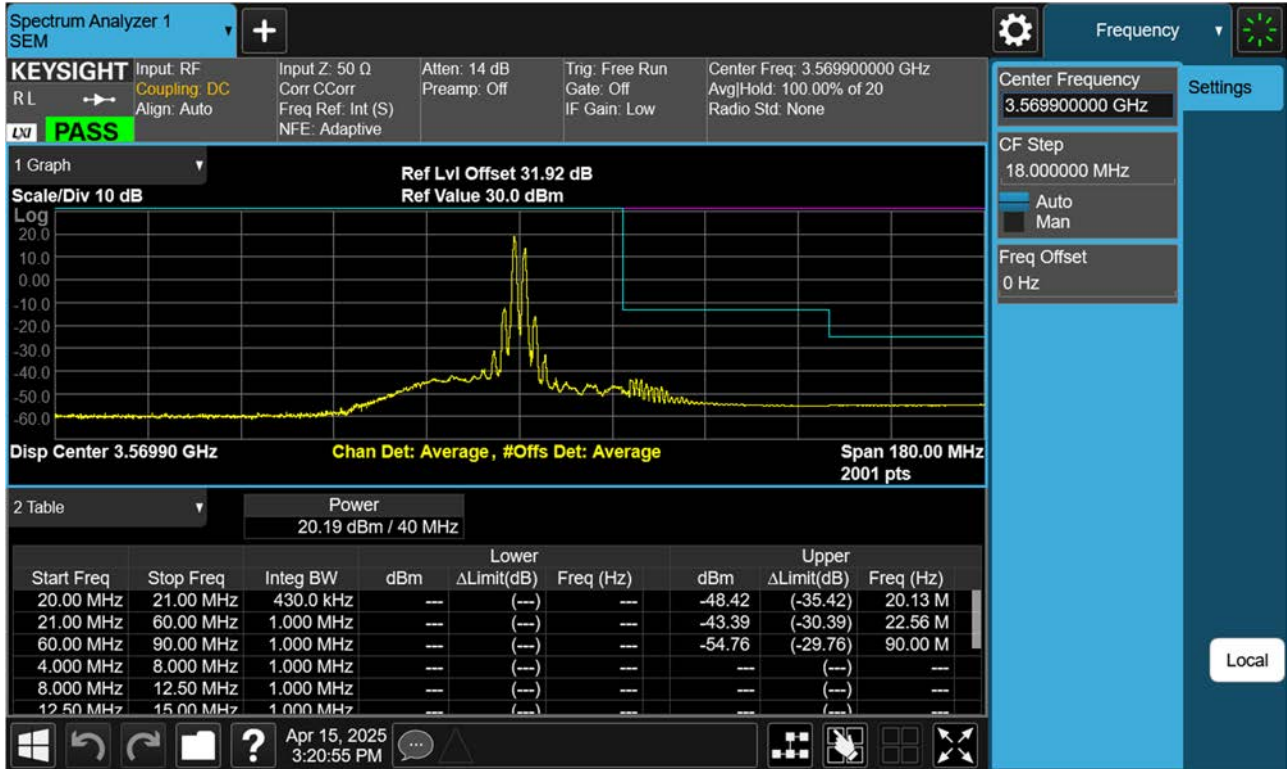
PCC 20MHz Ch55340 RB100 Offset0, SCC 20MHz Ch55538 RB100 Offset0-2



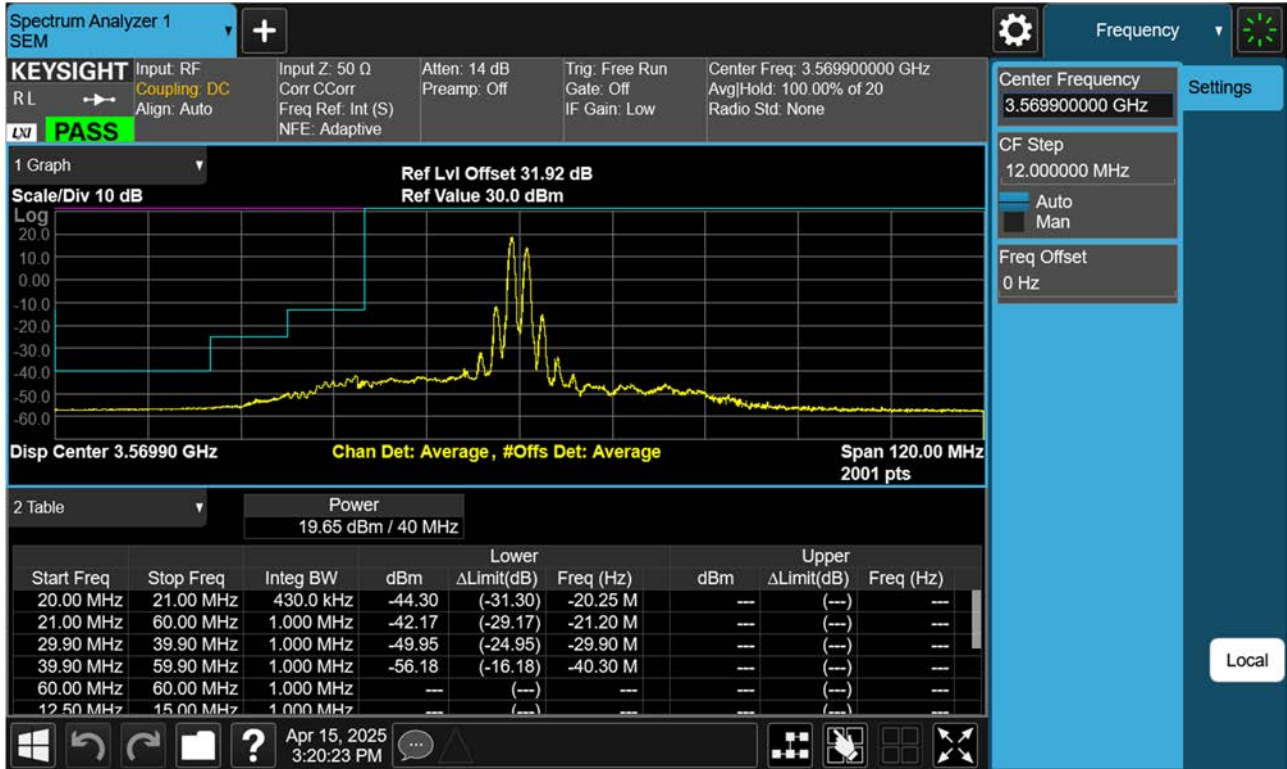
PCC 20MHz Ch55340 RB100 Offset0, SCC 20MHz Ch55538 RB100 Offset0-1



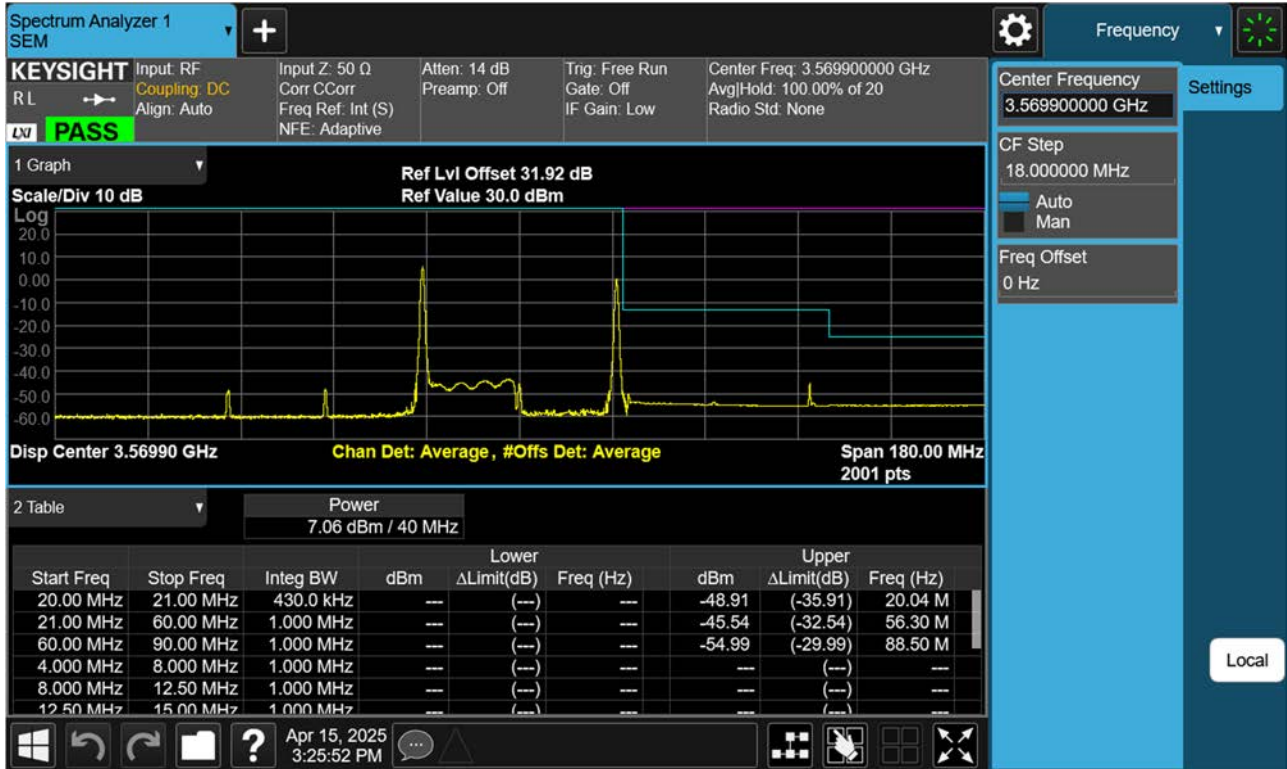
PCC 20MHz Ch55340 RB1 Offset99, SCC 20MHz Ch55538 RB1 Offset0-2



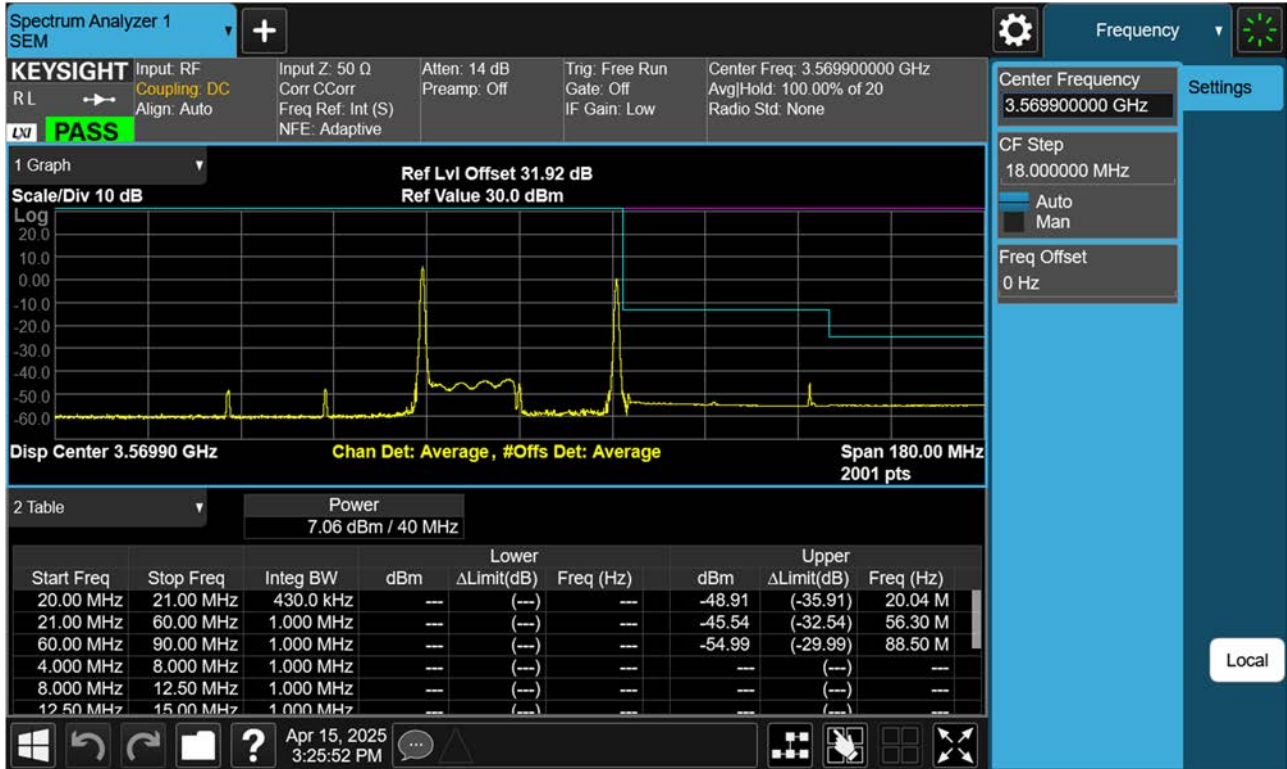
PCC 20MHz Ch55340 RB1 Offset99, SCC 20MHz Ch55538 RB1 Offset0-1



PCC 20MHz Ch55340 RB1 Offset0, SCC 20MHz Ch55538 RB1 Offset99-2



PCC 20MHz Ch55340 RB1 Offset0, SCC 20MHz Ch55538 RB1 Offset99-1



8.5 Frequency Stability / Variation Of Ambient Temperature

▣ PCC Channel:	55273	
▣ PCC Frequency:	3553.3	MHz
▣ PCC BandWidth:	5	MHz
▣ SCC Channel:	55390	
▣ SCC Frequency:	3565.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.900	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0015	-0.0025	3553.30154	3565.00246
100 %		-30	-0.0012	-0.0039	3553.30125	3565.00389
100 %		-20	-0.0087	-0.0020	3553.30871	3565.00205
100 %		-10	-0.0038	-0.0119	3553.30376	3565.01185
100 %		0	-0.0049	-0.0064	3553.30492	3565.00640
100 %		10	-0.0076	-0.0103	3553.30764	3565.01027
100 %		30	-0.0025	-0.0046	3553.30247	3565.00462
100 %		40	-0.0045	-0.0074	3553.30446	3565.00738
100 %		50	-0.0032	-0.0081	3553.30324	3565.00809
Batt. Endpoint	3.300	20	-0.0014	-0.0019	3553.30138	3565.00193

- ▣ PCC Channel: 55295
- ▣ PCC Frequency: 3555.5 MHz
- ▣ PCC BandWidth: 10 MHz
- ▣ SCC Channel: 55439
- ▣ SCC Frequency: 3569.9 MHz
- ▣ SCC BandWidth: 20 MHz
- ▣ Voltage : 3.900 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0002	-0.0029	3555.50024	3569.90286
100 %		-30	0.0028	-0.0076	3555.49725	3569.90759
100 %		-20	-0.0058	-0.0087	3555.50581	3569.90875
100 %		-10	-0.0031	-0.0104	3555.50306	3569.91035
100 %		0	-0.0025	-0.0076	3555.50252	3569.90760
100 %		10	-0.0041	-0.0122	3555.50414	3569.91217
100 %		30	-0.0033	-0.0029	3555.50327	3569.90292
100 %		40	-0.0014	0.0005	3555.50136	3569.89948
100 %		50	-0.0100	-0.0037	3555.51004	3569.90369
Batt. Endpoint	3.300	20	-0.0007	-0.0051	3555.50068	3569.90513

▣ PCC Channel:	55318	
▣ PCC Frequency:	3557.8	MHz
▣ PCC BandWidth:	15	MHz
▣ SCC Channel:	55489	
▣ SCC Frequency:	3574.9	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.900	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0045	-0.0064	3557.80454	3574.90636
100 %		-30	-0.0053	-0.0048	3557.80535	3574.90479
100 %		-20	-0.0096	-0.0063	3557.80961	3574.90635
100 %		-10	-0.0064	-0.0099	3557.80636	3574.90985
100 %		0	-0.0017	-0.0042	3557.80172	3574.90420
100 %		10	-0.0031	-0.0049	3557.80314	3574.90487
100 %		30	-0.0022	-0.0022	3557.80217	3574.90222
100 %		40	-0.0057	0.0001	3557.80566	3574.89988
100 %		50	-0.0097	-0.0022	3557.80974	3574.90219
Batt. Endpoint	3.300	20	-0.0073	-0.0030	3557.80728	3574.90303

▣ PCC Channel:	55340	
▣ PCC Frequency:	3560.0	MHz
▣ PCC BandWidth:	20	MHz
▣ SCC Channel:	55538	
▣ SCC Frequency:	3579.8	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.900	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	0.0001	-0.0051	3559.99994	3579.80506
100 %		-30	-0.0017	-0.0036	3560.00175	3579.80359
100 %		-20	-0.0082	-0.0040	3560.00821	3579.80405
100 %		-10	0.0005	-0.0098	3559.99946	3579.80975
100 %		0	-0.0057	-0.0041	3560.00572	3579.80410
100 %		10	-0.0028	-0.0091	3560.00284	3579.80907
100 %		30	-0.0071	-0.0050	3560.00707	3579.80502
100 %		40	-0.0076	-0.0070	3560.00756	3579.80698
100 %		50	-0.0041	-0.0071	3560.00414	3579.80709
Batt. Endpoint	3.300	20	-0.0012	-0.0082	3560.00118	3579.80823

- ▣ PCC Channel: 56523
- ▣ PCC Frequency: 3678.3 MHz
- ▣ PCC BandWidth: 5 MHz
- ▣ SCC Channel: 56640
- ▣ SCC Frequency: 3690.0 MHz
- ▣ SCC BandWidth: 20 MHz
- ▣ Voltage : 3.900 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0015	-0.0042	3678.30154	3690.00416
100 %		-30	-0.0030	-0.0095	3678.30305	3690.00949
100 %		-20	-0.0072	-0.0089	3678.30721	3690.00895
100 %		-10	-0.0083	-0.0093	3678.30826	3690.00925
100 %		0	-0.0056	-0.0023	3678.30562	3690.00230
100 %		10	-0.0029	-0.0107	3678.30294	3690.01067
100 %		30	-0.0035	-0.0023	3678.30347	3690.00232
100 %		40	-0.0084	-0.0006	3678.30836	3690.00058
100 %		50	-0.0093	-0.0063	3678.30934	3690.00629
Batt. Endpoint	3.300	20	-0.0084	-0.0045	3678.30838	3690.00453

▣ PCC Channel:	56496	
▣ PCC Frequency:	3675.6	MHz
▣ PCC BandWidth:	10	MHz
▣ SCC Channel:	56640	
▣ SCC Frequency:	3690.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.900	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0059	-0.0024	3675.60594	3690.00236
100 %		-30	-0.0063	-0.0035	3675.60635	3690.00349
100 %		-20	-0.0101	-0.0009	3675.61011	3690.00095
100 %		-10	-0.0067	-0.0070	3675.60666	3690.00695
100 %		0	-0.0011	0.0014	3675.60112	3689.99860
100 %		10	-0.0045	-0.0052	3675.60454	3690.00517
100 %		30	-0.0086	-0.0089	3675.60857	3690.00892
100 %		40	-0.0036	-0.0035	3675.60356	3690.00348
100 %		50	-0.0028	-0.0084	3675.60284	3690.00839
Batt. Endpoint	3.300	20	-0.0024	-0.0091	3675.60238	3690.00913

▣ PCC Channel:	56469	
▣ PCC Frequency:	3672.9	MHz
▣ PCC BandWidth:	15	MHz
▣ SCC Channel:	56640	
▣ SCC Frequency:	3690.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.900	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0047	-0.0066	3672.90474	3690.00656
100 %		-30	0.0010	-0.0032	3672.89905	3690.00319
100 %		-20	-0.0067	-0.0033	3672.90671	3690.00335
100 %		-10	-0.0002	-0.0067	3672.90016	3690.00665
100 %		0	-0.0014	0.0000	3672.90142	3690.00000
100 %		10	-0.0056	-0.0060	3672.90564	3690.00597
100 %		30	-0.0101	-0.0095	3672.91007	3690.00952
100 %		40	-0.0022	-0.0019	3672.90216	3690.00188
100 %		50	-0.0090	-0.0009	3672.90904	3690.00089
Batt. Endpoint	3.300	20	-0.0049	-0.0069	3672.90488	3690.00693

▣ PCC Channel:	56442	
▣ PCC Frequency:	3670.2	MHz
▣ PCC BandWidth:	20	MHz
▣ SCC Channel:	56640	
▣ SCC Frequency:	3690.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.900	MHz
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.900	+20(Ref)	-0.0063	-0.0082	3670.20634	3690.00816
100 %		-30	0.0028	-0.0045	3670.19725	3690.00449
100 %		-20	-0.0102	-0.0093	3670.21021	3690.00935
100 %		-10	-0.0013	-0.0042	3670.20126	3690.00415
100 %		0	-0.0034	-0.0018	3670.20342	3690.00180
100 %		10	-0.0095	-0.0085	3670.20954	3690.00847
100 %		30	-0.0074	-0.0015	3670.20737	3690.00152
100 %		40	-0.0069	-0.0054	3670.20686	3690.00538
100 %		50	-0.0077	0.0003	3670.20774	3689.99969
Batt. Endpoint	3.300	20	-0.0016	-0.0066	3670.20158	3690.00663

8.6 Radiated Spurious Emissions

▣ PCC Channel :	<u>55340 (3560.0 MHz)</u>
▣ PCC BW(MHz) :	<u>20</u>
▣ PCC RB/ RB Offset :	<u>1/ 99</u>
▣ SCC Channel :	<u>55538 (3579.8 MHz)</u>
▣ SCC BW(MHz) :	<u>20</u>
▣ SCC RB/ RB Offset :	<u>1/ 0</u>
▣ DISTANCE:	<u>1 meters</u>
▣ LIMIT:	<u>-40.0 dBm</u>

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
7 139.80	-41.14	11.07	-57.09	4.48	V	-50.50
10 709.70	-39.81	10.67	-48.61	5.65	H	-43.59
14 279.60	-46.58	11.59	-49.79	6.57	H	-44.77

- ▣ PCC Channel : 55891 (3615.1 MHz)
- ▣ PCC BW(MHz) : 20
- ▣ PCC RB/ RB Offset : 1/ 99
- ▣ SCC Channel : 56089 (3634.9 MHz)
- ▣ SCC BW(MHz) : 20
- ▣ SCC RB/ RB Offset : 1/ 0
- ▣ DISTANCE: 1 meters
- ▣ LIMIT: -40.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
7 250.00	-43.85	10.99	-60.45	4.53	V	-53.99
10 875.00	-39.51	10.43	-47.90	5.82	H	-43.29
14 500.00	-45.15	11.52	-49.55	6.69	V	-44.72

▣ PCC Channel :	<u>56442 (3670.2 MHz)</u>
▣ PCC BW(MHz) :	<u>20</u>
▣ PCC RB/ RB Offset :	<u>1/ 99</u>
▣ SCC Channel :	<u>56640 (3690.0 MHz)</u>
▣ SCC BW(MHz) :	<u>20</u>
▣ SCC RB/ RB Offset :	<u>1/ 0</u>
▣ DISTANCE:	<u>1 meters</u>
▣ LIMIT:	<u>-40.0 dBm</u>

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
7 360.20	-43.90	10.94	-60.07	4.59	V	-53.72
11 040.30	-42.64	10.61	-50.91	5.73	H	-46.03
14 720.40	-46.77	11.56	-52.46	6.71	H	-47.61

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	55898	3615.8	QPSK	25/0	20	56015	3627.5	QPSK	100/0	22.886
10	55896	3615.6	QPSK	50/0	20	56040	3630	QPSK	100/0	27.546
15	55893	3615.3	QPSK	75/0	20	56064	3632.4	QPSK	100/0	32.795
20	55965	3622.5	QPSK	100/0	5	56082	3634.2	QPSK	25/0	22.790
20	55941	3620.1	QPSK	100/0	10	56085	3634.5	QPSK	50/0	27.877
20	55916	3617.6	QPSK	100/0	15	56087	3634.7	QPSK	75/0	32.617
20	55891	3615.1	QPSK	100/0	20	56089	3634.9	QPSK	100/0	37.518

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	55898	3615.8	16QAM	25/0	20	56015	3627.5	16QAM	100/0	22.820
10	55896	3615.6	16QAM	50/0	20	56040	3630	16QAM	100/0	27.517
15	55893	3615.3	16QAM	75/0	20	56064	3632.4	16QAM	100/0	32.463
20	55965	3622.5	16QAM	100/0	5	56082	3634.2	16QAM	25/0	23.032
20	55941	3620.1	16QAM	100/0	10	56085	3634.5	16QAM	50/0	27.570
20	55916	3617.6	16QAM	100/0	15	56087	3634.7	16QAM	75/0	32.451
20	55891	3615.1	16QAM	100/0	20	56089	3634.9	16QAM	100/0	37.213

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	55898	3615.8	64QAM	25/0	20	56015	3627.5	64QAM	100/0	22.720
10	55896	3615.6	64QAM	50/0	20	56040	3630	64QAM	100/0	27.663
15	55893	3615.3	64QAM	75/0	20	56064	3632.4	64QAM	100/0	32.516
20	55965	3622.5	64QAM	100/0	5	56082	3634.2	64QAM	25/0	22.816
20	55941	3620.1	64QAM	100/0	10	56085	3634.5	64QAM	50/0	27.727
20	55916	3617.6	64QAM	100/0	15	56087	3634.7	64QAM	75/0	32.386
20	55891	3615.1	64QAM	100/0	20	56089	3634.9	64QAM	100/0	37.484

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	55898	3615.8	256QAM	25/0	20	56015	3627.5	256QAM	100/0	22.787
10	55896	3615.6	256QAM	50/0	20	56040	3630	256QAM	100/0	27.512
15	55893	3615.3	256QAM	75/0	20	56064	3632.4	256QAM	100/0	32.643
20	55965	3622.5	256QAM	100/0	5	56082	3634.2	256QAM	25/0	22.995
20	55941	3620.1	256QAM	100/0	10	56085	3634.5	256QAM	50/0	27.889
20	55916	3617.6	256QAM	100/0	15	56087	3634.7	256QAM	75/0	32.648
20	55891	3615.1	256QAM	100/0	20	56089	3634.9	256QAM	100/0	37.401

Note:

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

PCC 20 MHz Ch55891 RB100 Offset0, SCC 20 MHz Ch56089 RB100 Offset0_(QPSK)

