

# TEST REPORT

FCC CA\_41C Test for SC-54E  
Certification

**APPLICANT**  
SAMSUNG Electronics Co., Ltd.

**REPORT NO.**  
HCT-RF-2405-FC042

**DATE OF ISSUE**  
May 24, 2024

**Tested by**  
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<b>TEST REPORT</b>	<b>REPORT NO.</b> HCT-RF-2405-FC042
	<b>DATE OF ISSUE</b> May 24, 2024
	<b>Additional Model</b> SCG29

<b>Applicant</b>	<b>SAMSUNG Electronics Co., Ltd.</b> 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
<b>Product Name</b> <b>Model Name</b>	Mobile Phone SC-54E
<b>Date of Test</b>	May 07, 2024 ~ May 22, 2024
<b>Location of Test</b>	<input checked="" type="checkbox"/> Permanent Testing Lab <input type="checkbox"/> On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 Republic of Korea)
<b>FCC ID</b>	A3LSMF741JPN
<b>FCC Classification</b>	PCS Licensed Transmitter Held to Ear (PCE)
<b>Test Standard Used</b>	FCC Rule Part(s) : § 27
<b>Test Results</b>	PASS

## REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	May 24, 2024	Initial Release

## Notice

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### Content

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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](http://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

<b>Applicant Name:</b>	SAMSUNG Electronics Co., Ltd.
<b>Address:</b>	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
<b>FCC ID:</b>	A3LSMF741JPN
<b>Application Type:</b>	Certification
<b>FCC Classification:</b>	PCS Licensed Transmitter Held to Ear (PCE)
<b>FCC Rule Part(s):</b>	§ 27
<b>EUT Type:</b>	Mobile phone
<b>Model(s):</b>	SC-54E
<b>Additional Model(s)</b>	SCG29
<b>Tx Frequency:</b>	2499.3 - 2680.0: 5 MHz+20 MHz 2501.3 - 2682.5: 10 MHz+15 MHz 2501.5 - 2680.0: 10 MHz+20 MHz 2503.5 - 2684.7: 15 MHz+10 MHz 2503.5 - 2682.5: 15 MHz+15 MHz 2503.8 - 2680.0: 15 MHz+20 MHz 2506.0 - 2686.7: 20 MHz+5 MHz 2506.0 - 2684.5: 20 MHz+10 MHz 2506.0 - 2682.2: 20 MHz+15 MHz 2506.0 - 2680.0: 20 MHz+20 MHz
<b>Date(s) of Tests:</b>	May 07, 2024 ~ May 22, 2024
<b>Serial number:</b>	Radiated : R3CX30L0P6F Conducted : R3CX30L0KYR
<b>LTE CA :</b>	CA 41C (Uplink)

### 1.1. MAXIMUM OUTPUT POWER

#### Main 2 Ant

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
5 MHz + 20 MHz (PC3)	2499.3 - 2680.0	QPSK	22M9G7D	20.13	0.103
		16QAM	22M9W7D	19.55	0.090
		64QAM	22M8W7D	18.78	0.076
		256QAM	22M9W7D	15.84	0.038
10 MHz + 15 MHz (PC3)	2501.3 - 2682.5	QPSK	23M2G7D	19.53	0.090
		16QAM	23M1W7D	18.99	0.079
		64QAM	23M1W7D	18.29	0.067
10 MHz + 20 MHz (PC3)	2501.5 - 2680.0	256QAM	23M1W7D	15.07	0.032
		QPSK	27M8G7D	19.55	0.090
		16QAM	27M7W7D	19.19	0.083
15 MHz + 10 MHz (PC3)	2503.5 - 2684.7	64QAM	27M8W7D	18.36	0.069
		256QAM	27M7W7D	15.17	0.033
		QPSK	23M1G7D	19.52	0.090
15 MHz + 15 MHz (PC3)	2503.5 - 2682.5	16QAM	23M2W7D	18.97	0.079
		64QAM	23M2W7D	17.99	0.063
		256QAM	23M1W7D	15.14	0.033
		QPSK	28M4G7D	19.82	0.096
15 MHz + 20 MHz (PC3)	2503.8 - 2680.0	16QAM	28M4W7D	19.29	0.085
		64QAM	28M4W7D	18.17	0.066
		256QAM	28M4W7D	15.52	0.036
		QPSK	32M7G7D	19.14	0.082
20 MHz + 5 MHz (PC3)	2506.0 - 2686.7	16QAM	32M7W7D	18.82	0.076
		64QAM	32M8W7D	18.18	0.066
		256QAM	32M7W7D	15.33	0.034
		QPSK	22M9G7D	19.44	0.088
20 MHz + 10 MHz (PC3)	2506.0 - 2684.5	16QAM	23M0W7D	19.11	0.081
		64QAM	22M9W7D	18.07	0.064
		256QAM	22M9W7D	15.03	0.032
		QPSK	27M8G7D	19.39	0.087
20 MHz + 15 MHz (PC3)	2506.0 - 2682.2	16QAM	27M8W7D	18.90	0.078
		64QAM	27M8W7D	17.91	0.062
		256QAM	27M8W7D	15.21	0.033
		QPSK	32M7G7D	19.62	0.092
20 MHz + 20 MHz (PC3)	2506.0 - 2680.0	16QAM	32M6W7D	19.03	0.080
		64QAM	32M7W7D	17.97	0.063
		256QAM	32M6W7D	15.27	0.034
		QPSK	37M7G7D	19.51	0.089
		16QAM	37M7W7D	19.12	0.082
		64QAM	37M6W7D	18.40	0.069
		256QAM	37M5W7D	21.07	0.128

**Sub 5 Ant**

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
5 MHz + 20 MHz (PC3)	2499.3 - 2680.0	QPSK	22M8G7D	22.89	0.195
		16QAM	22M8W7D	22.23	0.167
		64QAM	22M9W7D	21.33	0.136
		256QAM	22M8W7D	18.17	0.066
10 MHz + 15 MHz (PC3)	2501.3 - 2682.5	QPSK	23M1G7D	22.18	0.165
		16QAM	23M2W7D	21.56	0.143
		64QAM	23M2W7D	20.98	0.125
		256QAM	23M1W7D	18.07	0.064
10 MHz + 20 MHz (PC3)	2501.5 - 2680.0	QPSK	27M7G7D	22.13	0.163
		16QAM	27M7W7D	21.75	0.150
		64QAM	27M8W7D	20.69	0.117
		256QAM	27M7W7D	17.88	0.061
15 MHz + 10 MHz (PC3)	2503.5 - 2684.7	QPSK	23M1G7D	22.10	0.162
		16QAM	23M2W7D	21.67	0.147
		64QAM	23M2W7D	20.81	0.121
		256QAM	23M1W7D	17.83	0.061
15 MHz + 15 MHz (PC3)	2503.5 - 2682.5	QPSK	28M4G7D	22.29	0.169
		16QAM	28M3W7D	21.97	0.157
		64QAM	28M3W7D	21.04	0.127
		256QAM	28M4W7D	18.18	0.066
15 MHz + 20 MHz (PC3)	2503.8 - 2680.0	QPSK	32M7G7D	22.23	0.167
		16QAM	32M7W7D	21.73	0.149
		64QAM	32M6W7D	20.77	0.119
		256QAM	32M7W7D	17.82	0.061
20 MHz + 5 MHz (PC3)	2506.0 - 2686.7	QPSK	23M0G7D	22.14	0.164
		16QAM	22M9W7D	21.77	0.150
		64QAM	22M9W7D	20.85	0.122
		256QAM	22M9W7D	17.80	0.060
20 MHz + 10 MHz (PC3)	2506.0 - 2684.5	QPSK	27M8G7D	21.95	0.157
		16QAM	27M8W7D	21.46	0.140
		64QAM	27M9W7D	20.79	0.120
		256QAM	27M9W7D	17.91	0.062
20 MHz + 15 MHz (PC3)	2506.0 - 2682.2	QPSK	32M7G7D	22.06	0.161
		16QAM	32M7W7D	21.74	0.149
		64QAM	32M7W7D	21.00	0.126
		256QAM	32M6W7D	17.90	0.062
20 MHz + 20 MHz (PC3)	2506.0 - 2680.0	QPSK	37M6G7D	22.49	0.177
		16QAM	37M5W7D	21.91	0.155
		64QAM	37M5W7D	21.17	0.131
		256QAM	37M6W7D	18.02	0.063

## 2. INTRODUCTION

### 2.1. DESCRIPTION OF EUT

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

### 2.2. MEASURING INSTRUMENT CALIBRATION

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

### 2.3. TEST FACILITY

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



### 3. DESCRIPTION OF TESTS

#### 3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Channel Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
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
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

## 3.2 RADIATED POWER

### Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

### Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 1 MHz
3. VBW  $\geq$  3 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 according to ANSI/TIA-603-E-2016.

#### Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW  $\geq$  3 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<sup>th</sup> harmonics from 9 kHz.

#### Test Note

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

The spurious emissions is calculated by the following formula;

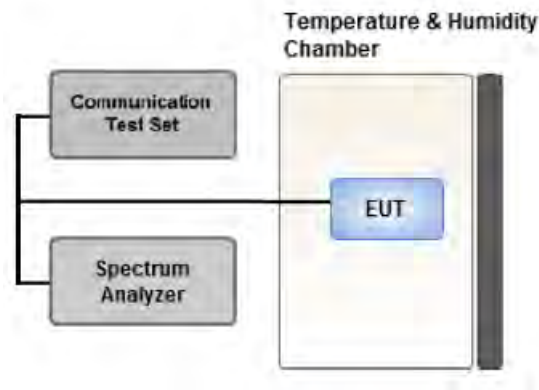
$$\text{Result}_{(dBm)} = P_g_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

### 3.4 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)**

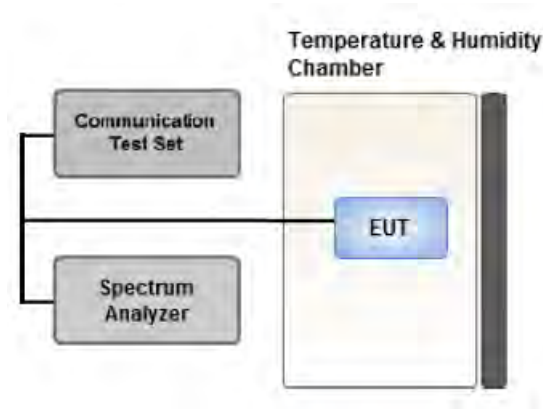
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq 3 \times$  RBW.

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  $\geq [10 \times$  (number of points in sweep)  $\times$  (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.

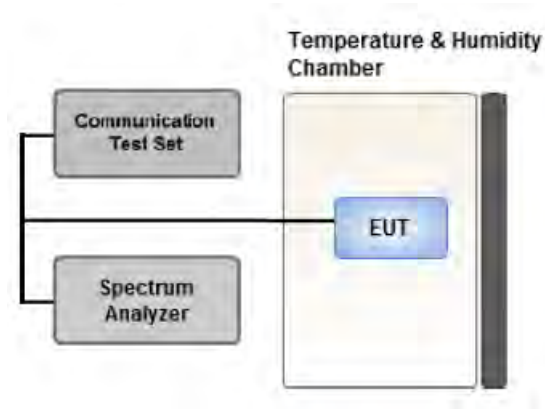
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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 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.

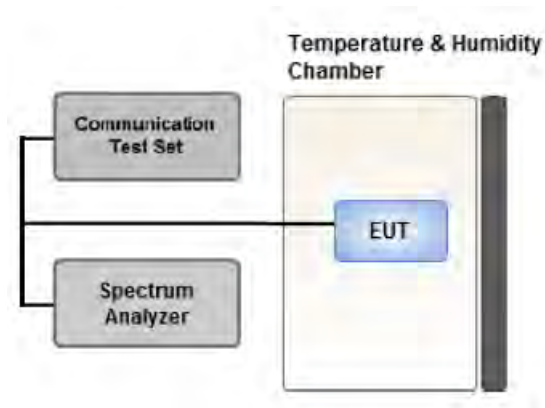
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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

### 3.7 BAND EDGE



Test setup

#### Test Overview

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  $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

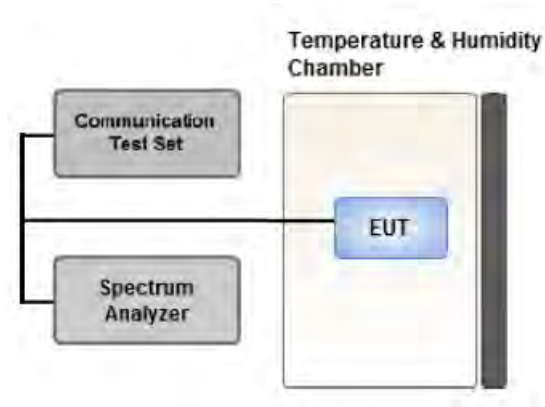


**Test Notes**

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 6 MHz 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

Where 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.

#### 4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	FBSR-02B(1.2G HPF+LNA)	T&M SYSTEM	F1L1	12/11/2024	Annual
RF Switching System	FBSR-02B(3.3G HPF+LNA)	T&M SYSTEM	F1L2	12/11/2024	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/17/2025	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/23/2024	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	03/09/2025	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	03/09/2025	Biennial
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/19/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/17/2024	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	09/16/2024	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	09/16/2024	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/17/2024	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	12/11/2024	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	06/22/2024	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

**Note:**

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

## 5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

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

Parameter	Expanded Uncertainty ( $\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$ )

## 6. SUMMARY OF TEST RESULTS

### 6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 27.53(m)(4)	<ul style="list-style-type: none"> <li>■ <math>&lt; 40 + 10\log_{10}(P[\text{Watts}])</math> at Channel edges</li> <li>■ <math>&lt; 43 + 10\log_{10}(P[\text{Watts}])</math> between 5 and X MHz from Channel edges</li> <li>■ <math>&lt; 55 + 10\log_{10}(P[\text{Watts}])</math> beyond X MHz beyond from Channel edges</li> <li>■ <math>&lt; 43 + 10 \log (P)</math> dB on all frequencies between 2490.5 MHz and 2496 MHz</li> </ul>	PASS
Conducted Output Power	§ 2.1046	N/A	<u>See Note1</u>
Peak- to- Average Ratio	§ 27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 27.54	Emission must remain in band	PASS

### 6.2 Test Condition : Radiated Test

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

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

- 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(Main 2 Ant)

### 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 10<sup>th</sup> 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	15	25
10	20	30
15	10	25
15	15	30
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, 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.

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. We were performed the RSE test in condition of co-location.

Mode : Stand alone, Simultaneous transmission scenarios

Worst case : Stand alone

6. All 3 channels(low/mid/high) of conducted power and radiated power were investigated and the worst case channel results are reported.

7. The EUT was tested in three modes(Open, Half-folded, Closed), the worst case configuration results are reported.

Worst case: open mode.

[ 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	5	2499.3	39683	1	24	20	2511.0	39800	1	0
	QPSK	Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0
	QPSK	High	20	2660.2	41292	1	99	20	2680.0	41490	1	0
	QPSK	Low	5	2499.3	39683	1	0	20	2511.0	39800	1	99
	QPSK	Mid	15	2583.3	40523	1	0	20	2600.4	40694	1	99
	QPSK	High	20	2660.2	41292	1	0	20	2680.0	41490	1	99
	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
Radiated Spurious Emissions	QPSK	Low	20	2506.0	39750	1	99	20	2525.8	39948	1	0
	QPSK	Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0
	QPSK	High	5	2668.3	41373	1	24	20	2680.0	41490	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	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

## 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	<b>5</b>	<b>2499.3</b>	<b>39683</b>	<b>1</b>	<b>24</b>	<b>20</b>	<b>2511.0</b>	<b>39800</b>	<b>1</b>	<b>0</b>	<b>21.64</b>
	10	2501.3	39703	1	49	15	2513.3	39823	1	0	21.52
	10	2501.5	39705	1	49	20	2515.9	39849	1	0	21.48
	15	2503.5	39725	1	74	10	2515.5	39845	1	0	21.50
	15	2503.5	39725	1	74	15	2518.5	39875	1	0	21.52
	15	2503.8	39728	1	74	20	2520.9	39899	1	0	21.46
	20	2506.0	39750	1	99	5	2517.7	39867	1	0	21.56
	20	2506.0	39750	1	99	10	2520.4	39894	1	0	21.48
	20	2506.0	39750	1	99	15	2523.1	39921	1	0	21.46
	20	2506.0	39750	1	99	20	2525.8	39948	1	0	21.40
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	21.28
	10	2585.9	40549	1	49	15	2597.9	40669	1	0	21.26
	10	2583.6	40526	1	49	20	2598.0	40670	1	0	21.26
	15	2588.1	40571	1	74	10	2600.1	40691	1	0	21.23
	15	2585.5	40545	1	74	15	2600.5	40695	1	0	21.20
	<b>15</b>	<b>2583.3</b>	<b>40523</b>	<b>1</b>	<b>74</b>	<b>20</b>	<b>2600.4</b>	<b>40694</b>	<b>1</b>	<b>0</b>	<b>21.30</b>
	20	2590.5	40595	1	99	5	2602.2	40712	1	0	21.23
	20	2588.1	40571	1	99	10	2602.5	40715	1	0	21.20
	20	2585.6	40546	1	99	15	2602.7	40717	1	0	21.23
	20	2583.1	40521	1	99	20	2602.9	40719	1	0	21.27
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	21.16
	10	2670.5	41395	1	49	15	2682.5	41515	1	0	21.10
	10	2665.6	41346	1	49	20	2680.0	41490	1	0	21.14
	15	2672.7	41417	1	74	10	2684.7	41537	1	0	20.95
	15	2667.5	41365	1	74	15	2682.5	41515	1	0	21.00
	15	2662.9	41319	1	74	20	2680.0	41490	1	0	21.09
	20	2675.0	41440	1	99	5	2686.7	41557	1	0	20.90
	20	2670.1	41391	1	99	10	2684.5	41535	1	0	21.02
	20	2665.1	41341	1	99	15	2682.2	41512	1	0	21.05
	<b>20</b>	<b>2660.2</b>	<b>41292</b>	<b>1</b>	<b>99</b>	<b>20</b>	<b>2680.0</b>	<b>41490</b>	<b>1</b>	<b>0</b>	<b>21.17</b>

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	19.82
	10	2501.3	39703	50	0	15	2513.3	39823	75	0	19.80
	10	2501.5	39705	50	0	20	2515.9	39849	100	0	19.79
	15	2503.5	39725	75	0	10	2515.5	39845	50	0	19.75
	15	2503.5	39725	75	0	15	2518.5	39875	75	0	19.79
	15	2503.8	39728	75	0	20	2520.9	39899	100	0	19.80
	20	2506.0	39750	100	0	5	2517.7	39867	25	0	19.77
	20	2506.0	39750	100	0	10	2520.4	39894	50	0	19.75
	20	2506.0	39750	100	0	15	2523.1	39921	75	0	19.80
		<b>20</b>	<b>2506.0</b>	<b>39750</b>	<b>100</b>	<b>0</b>	<b>20</b>	<b>2525.8</b>	<b>39948</b>	<b>100</b>	<b>0</b>
Mid	5	2583.8	40528	25	0	20	2595.5	40645	100	0	19.45
	10	2585.9	40549	50	0	15	2597.9	40669	75	0	19.50
	10	2583.6	40526	50	0	20	2598.0	40670	100	0	19.46
	15	2588.1	40571	75	0	10	2600.1	40691	50	0	19.52
	15	2585.5	40545	75	0	15	2600.5	40695	75	0	19.52
	15	2583.3	40523	75	0	20	2600.4	40694	100	0	19.54
	20	2590.5	40595	100	0	5	2602.2	40712	25	0	19.51
	20	2588.1	40571	100	0	10	2602.5	40715	50	0	19.48
	20	2585.6	40546	100	0	15	2602.7	40717	75	0	19.54
		<b>20</b>	<b>2583.1</b>	<b>40521</b>	<b>100</b>	<b>0</b>	<b>20</b>	<b>2602.9</b>	<b>40719</b>	<b>100</b>	<b>0</b>
High	5	2668.3	41373	25	0	20	2680.0	41490	100	0	19.45
	10	2670.5	41395	50	0	15	2682.5	41515	75	0	19.42
	10	2665.6	41346	50	0	20	2680.0	41490	100	0	19.46
	15	2672.7	41417	75	0	10	2684.7	41537	50	0	19.37
	15	2667.5	41365	75	0	15	2682.5	41515	75	0	19.43
	15	2662.9	41319	75	0	20	2680.0	41490	100	0	19.53
	20	2675.0	41440	100	0	5	2686.7	41557	25	0	19.28
	20	2670.1	41391	100	0	10	2684.5	41535	50	0	19.43
	20	2665.1	41341	100	0	15	2682.2	41512	75	0	19.47
		<b>20</b>	<b>2660.2</b>	<b>41292</b>	<b>100</b>	<b>0</b>	<b>20</b>	<b>2680.0</b>	<b>41490</b>	<b>100</b>	<b>0</b>

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	5	2499.3	39683	1	24	20	2511.0	39800	1	0	20.99
Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0	20.96
High	20	2660.2	41292	1	99	20	2680.0	41490	1	0	20.82
Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0	18.81
Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0	18.66
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	18.68

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	5	2499.3	39683	1	24	20	2511.0	39800	1	0	19.98
Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0	19.94
High	20	2660.2	41292	1	99	20	2680.0	41490	1	0	19.89
Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0	18.71
Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0	18.56
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	18.60

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	5	2499.3	39683	1	24	20	2511.0	39800	1	0	16.97
Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0	16.83
High	20	2660.2	41292	1	99	20	2680.0	41490	1	0	16.83
Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0	16.76
Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0	16.58
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	16.56

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	39683	1/24	20	39800	1/0	-25.58	11.28	10.55	2.57	H	0.084	19.26
	10	39703	1/49	15	39823	1/0	-25.55	11.34	10.59	2.57	H	0.086	19.36
	10	39705	1/49	20	39849	1/0	-25.51	11.38	10.59	2.57	H	0.087	19.40
	15	39725	1/74	10	39845	1/0	-25.90	10.99	10.59	2.57	H	0.080	19.01
	15	39725	1/74	15	39875	1/0	-25.73	11.16	10.59	2.57	H	0.083	19.18
	15	39728	1/74	20	39899	1/0	-25.86	11.03	10.59	2.57	H	0.080	19.05
	20	39750	1/99	5	39867	1/0	-25.51	11.38	10.59	2.57	H	0.087	19.40
	20	39750	1/99	10	39894	1/0	-25.52	11.37	10.59	2.57	H	0.087	19.39
	20	39750	1/99	15	39921	1/0	-25.54	11.34	10.64	2.59	H	0.087	19.39
		<b>20</b>	<b>39750</b>	<b>1/99</b>	<b>20</b>	<b>39948</b>	<b>1/0</b>	<b>-25.42</b>	<b>11.46</b>	<b>10.64</b>	<b>2.59</b>	<b>H</b>	<b>0.089</b>
Mid	<b>5</b>	<b>40528</b>	<b>1/24</b>	<b>20</b>	<b>40645</b>	<b>1/0</b>	<b>-25.02</b>	<b>12.20</b>	<b>10.64</b>	<b>2.71</b>	<b>H</b>	<b>0.103</b>	<b>20.13</b>
	10	40549	1/49	15	40669	1/0	-25.62	11.60	10.64	2.71	H	0.090	19.53
	10	40526	1/49	20	40670	1/0	-25.60	11.62	10.64	2.71	H	0.090	19.55
	15	40571	1/74	10	40691	1/0	-25.55	11.56	10.64	2.68	H	0.090	19.52
	15	40545	1/74	15	40695	1/0	-25.33	11.89	10.64	2.71	H	0.096	19.82
	15	40523	1/74	20	40694	1/0	-26.01	11.21	10.64	2.71	H	0.082	19.14
	20	40595	1/99	5	40712	1/0	-25.63	11.48	10.64	2.68	H	0.088	19.44
	20	40571	1/99	10	40715	1/0	-25.70	11.41	10.64	2.68	H	0.086	19.37
	20	40546	1/99	15	40717	1/0	-25.45	11.66	10.64	2.68	H	0.092	19.62
	20	40521	1/99	20	40719	1/0	-25.79	11.43	10.64	2.71	H	0.086	19.36
High	<b>5</b>	<b>41373</b>	<b>1/24</b>	<b>20</b>	<b>41490</b>	<b>1/0</b>	<b>-27.20</b>	<b>10.22</b>	<b>10.72</b>	<b>2.74</b>	<b>H</b>	<b>0.066</b>	<b>18.20</b>
	10	41395	1/49	15	41515	1/0	-27.24	10.18	10.72	2.74	H	0.065	18.16
	10	41346	1/49	20	41490	1/0	-27.46	9.96	10.72	2.74	H	0.062	17.94
	15	41417	1/74	10	41537	1/0	-27.56	9.87	10.72	2.75	H	0.061	17.84
	15	41365	1/74	15	41515	1/0	-27.45	9.97	10.72	2.74	H	0.062	17.95
	15	41319	1/74	20	41490	1/0	-27.30	10.12	10.71	2.73	H	0.065	18.10
	20	41440	1/99	5	41557	1/0	-27.52	9.91	10.72	2.75	H	0.061	17.88
	20	41391	1/99	10	41535	1/0	-27.67	9.75	10.72	2.74	H	0.059	17.73
	20	41341	1/99	15	41512	1/0	-27.34	10.08	10.72	2.74	H	0.064	18.06
	20	41292	1/99	20	41490	1/0	-27.22	10.20	10.71	2.73	H	0.066	18.18

Note:

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

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
20	39750	1/99	20	39948	1/0	-26.06	10.82	10.64	2.59	H	0.077	18.87
5	40528	1/24	20	40645	1/0	-25.60	11.62	10.64	2.71	H	0.090	19.55
10	40549	1/49	15	40669	1/0	-26.16	11.06	10.64	2.71	H	0.079	18.99
10	40526	1/49	20	40670	1/0	-25.96	11.26	10.64	2.71	H	0.083	19.19
15	40571	1/74	10	40691	1/0	-26.10	11.01	10.64	2.68	H	0.079	18.97
15	40545	1/74	15	40695	1/0	-25.86	11.36	10.64	2.71	H	0.085	19.29
15	40523	1/74	20	40694	1/0	-26.33	10.89	10.64	2.71	H	0.076	18.82
20	40595	1/99	5	40712	1/0	-25.96	11.15	10.64	2.68	H	0.081	19.11
20	40571	1/99	10	40715	1/0	-26.17	10.94	10.64	2.68	H	0.078	18.90
20	40546	1/99	15	40717	1/0	-26.04	11.07	10.64	2.68	H	0.080	19.03
20	40521	1/99	20	40719	1/0	-26.03	11.19	10.64	2.71	H	0.082	19.12
5	41373	1/24	20	41490	1/0	-27.79	9.63	10.72	2.74	H	0.058	17.61

Note:

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

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
20	39750	1/99	20	39948	1/0	-26.89	9.99	10.64	2.59	H	0.064	18.04
5	40528	1/24	20	40645	1/0	-26.37	10.85	10.64	2.71	H	0.076	18.78
10	40549	1/49	15	40669	1/0	-26.86	10.36	10.64	2.71	H	0.067	18.29
10	40526	1/49	20	40670	1/0	-26.79	10.43	10.64	2.71	H	0.069	18.36
15	40571	1/74	10	40691	1/0	-27.08	10.03	10.64	2.68	H	0.063	17.99
15	40545	1/74	15	40695	1/0	-26.98	10.24	10.64	2.71	H	0.066	18.17
15	40523	1/74	20	40694	1/0	-26.97	10.25	10.64	2.71	H	0.066	18.18
20	40595	1/99	5	40712	1/0	-27.00	10.11	10.64	2.68	H	0.064	18.07
20	40571	1/99	10	40715	1/0	-27.16	9.95	10.64	2.68	H	0.062	17.91
20	40546	1/99	15	40717	1/0	-27.10	10.01	10.64	2.68	H	0.063	17.97
20	40521	1/99	20	40719	1/0	-26.75	10.47	10.64	2.71	H	0.069	18.40
5	41373	1/24	20	41490	1/0	-28.54	8.88	10.72	2.74	H	0.049	16.86

Note:

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

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
20	39750	1/99	20	39948	1/0	-30.04	6.84	10.64	2.59	H	0.031	14.89
5	40528	1/24	20	40645	1/0	-29.31	7.91	10.64	2.71	H	0.038	15.84
10	40549	1/49	15	40669	1/0	-30.08	7.14	10.64	2.71	H	0.032	15.07
10	40526	1/49	20	40670	1/0	-29.98	7.24	10.64	2.71	H	0.033	15.17
15	40571	1/74	10	40691	1/0	-29.93	7.18	10.64	2.68	H	0.033	15.14
15	40545	1/74	15	40695	1/0	-29.63	7.59	10.64	2.71	H	0.036	15.52
15	40523	1/74	20	40694	1/0	-29.82	7.40	10.64	2.71	H	0.034	15.33
20	40595	1/99	5	40712	1/0	-30.04	7.07	10.64	2.68	H	0.032	15.03
20	40571	1/99	10	40715	1/0	-29.86	7.25	10.64	2.68	H	0.033	15.21
20	40546	1/99	15	40717	1/0	-29.80	7.31	10.64	2.68	H	0.034	15.27
20	40521	1/99	20	40719	1/0	-29.85	7.37	10.64	2.71	H	0.034	15.30
5	41373	1/24	20	41490	1/0	-31.64	5.78	10.72	2.74	H	0.024	13.76

Note:

1. Modulation : 256QAM
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	5	39683	2499.3	1/24	20	39800	2511.0	1/0	9.7363	32.570	-75.954	-43.38
Mid	15	40523	2583.3	1/74	20	40694	2600.4	1/0	8.2956	32.570	-76.470	-43.90
High	20	41292	2660.2	1/99	20	41490	2680.0	1/0	8.0035	32.570	-76.265	-43.70
Low	5	39683	2499.3	1/0	20	39800	2511.0	1/99	8.2682	32.570	-75.913	-43.34
Mid	15	40523	2583.3	1/0	20	40694	2600.4	1/99	8.2478	32.570	-76.215	-43.65
High	20	41292	2660.2	1/0	20	41490	2680.0	1/99	8.0215	32.570	-75.946	-43.38
Low	20	39750	2506.0	100/0	20	39948	2525.8	100/0	9.1256	32.570	-75.643	-43.07
Mid	20	40521	2583.1	100/0	20	40719	2602.9	100/0	9.9362	32.570	-76.476	-43.91
High	20	41292	2660.2	100/0	20	41490	2680.0	100/0	8.2717	32.570	-76.175	-43.61

Note:

1. Modulation : QPSK

2. Duty Cycle factor already applied on the factor.

- Duty Cycle factor(dB) = 3.979

- Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter

- Result(dBm) = Measurement Maximum Data (dBm) + Factor

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	34.110

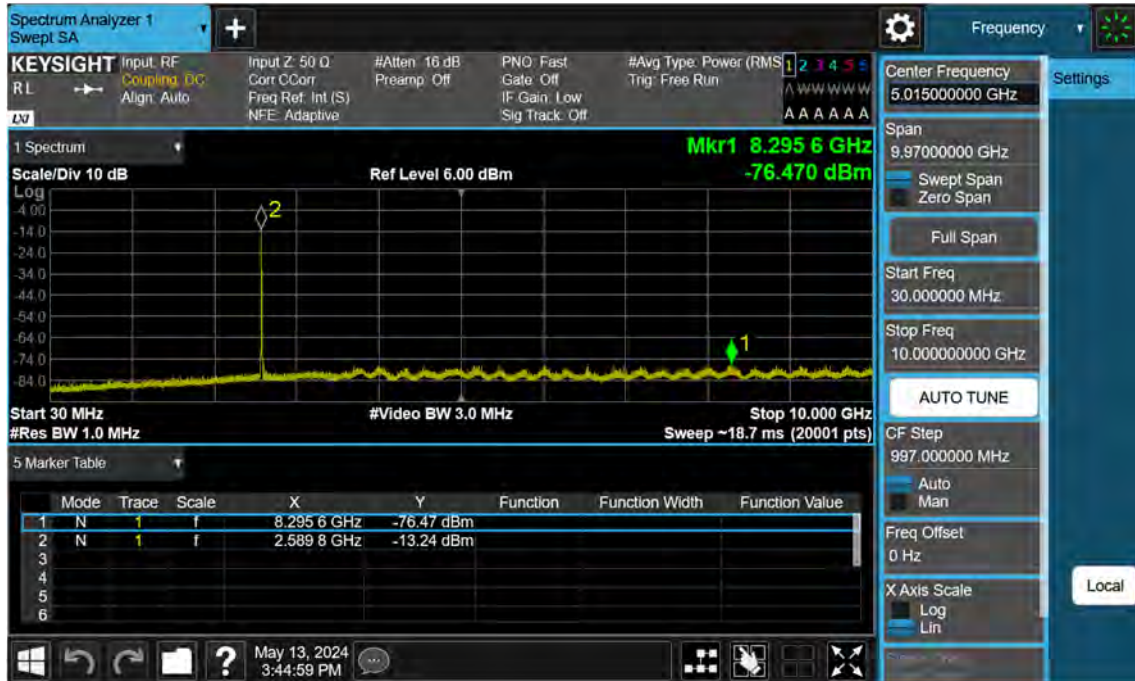
3. Limit : -25.0 dBm

Frequency Range : 30 MHz ~ 10 GHz

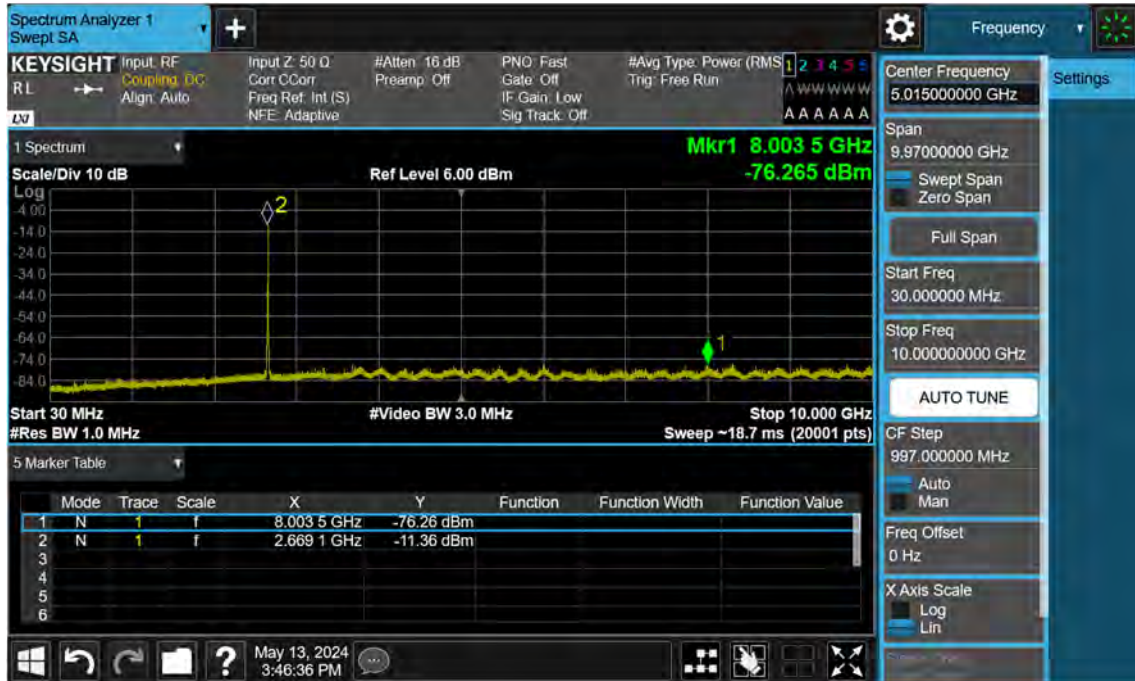
PCC 5 MHz Ch39683 RB1 Offset24 SCC 20 MHz Ch39800 RB1 Offset0



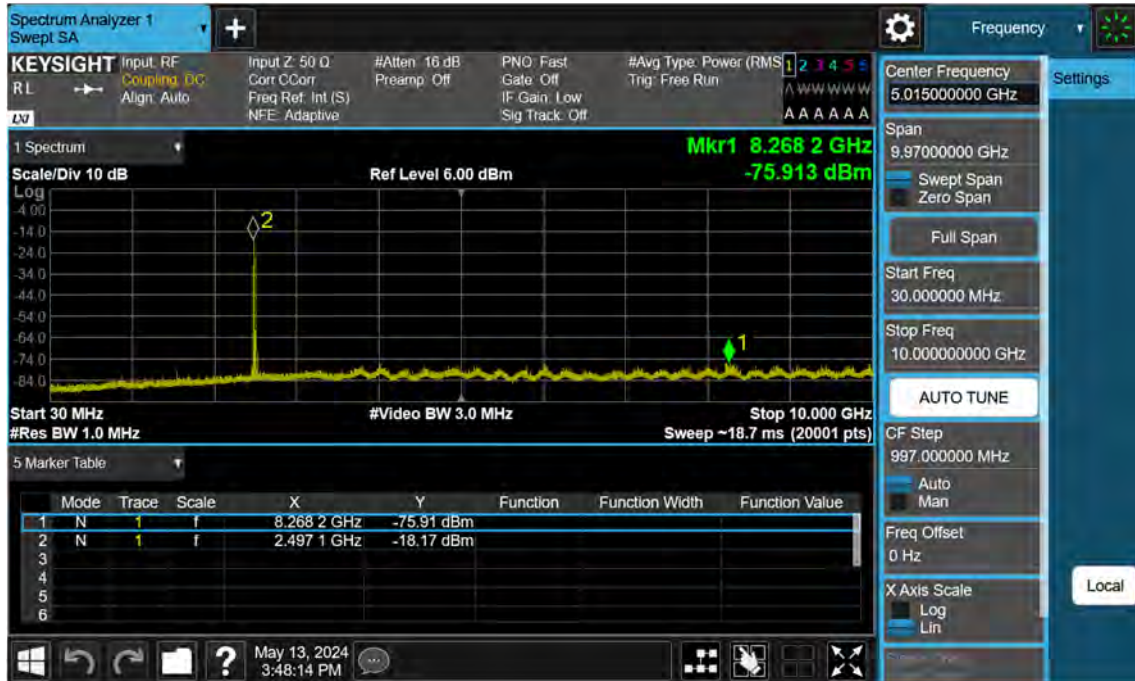
PCC 15 MHz Ch40523 RB1 Offset74 SCC 20 MHz Ch40694 RB1 Offset0



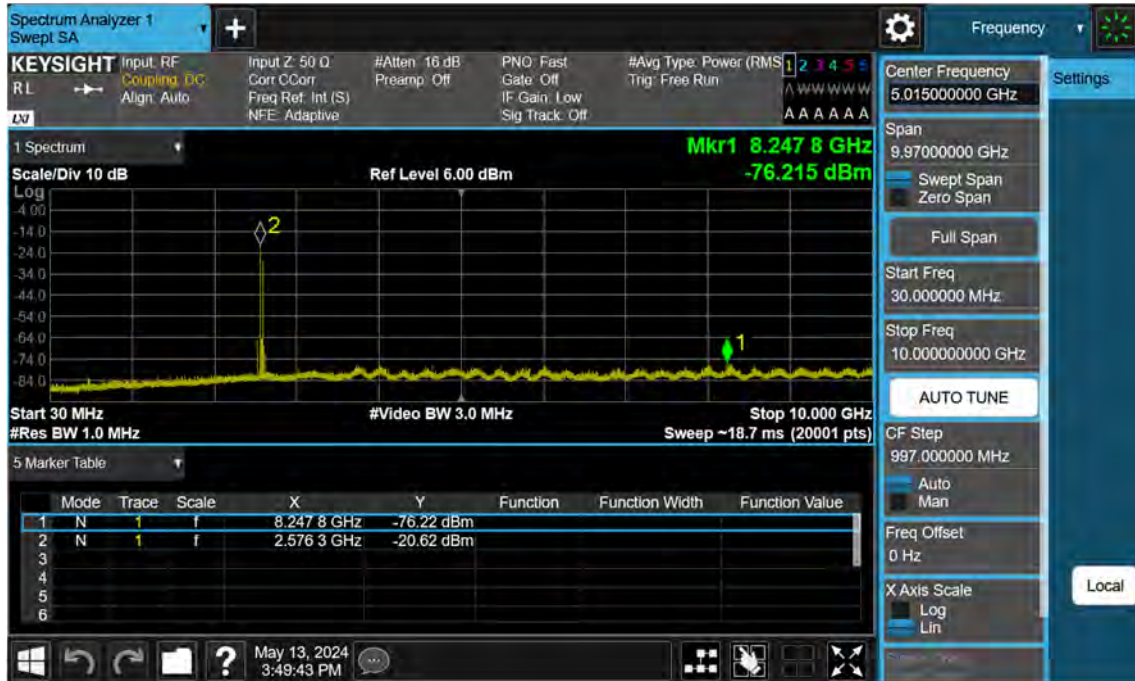
PCC 20 MHz Ch41292 RB1 Offset99 SCC 20 MHz Ch41490 RB1 Offset0



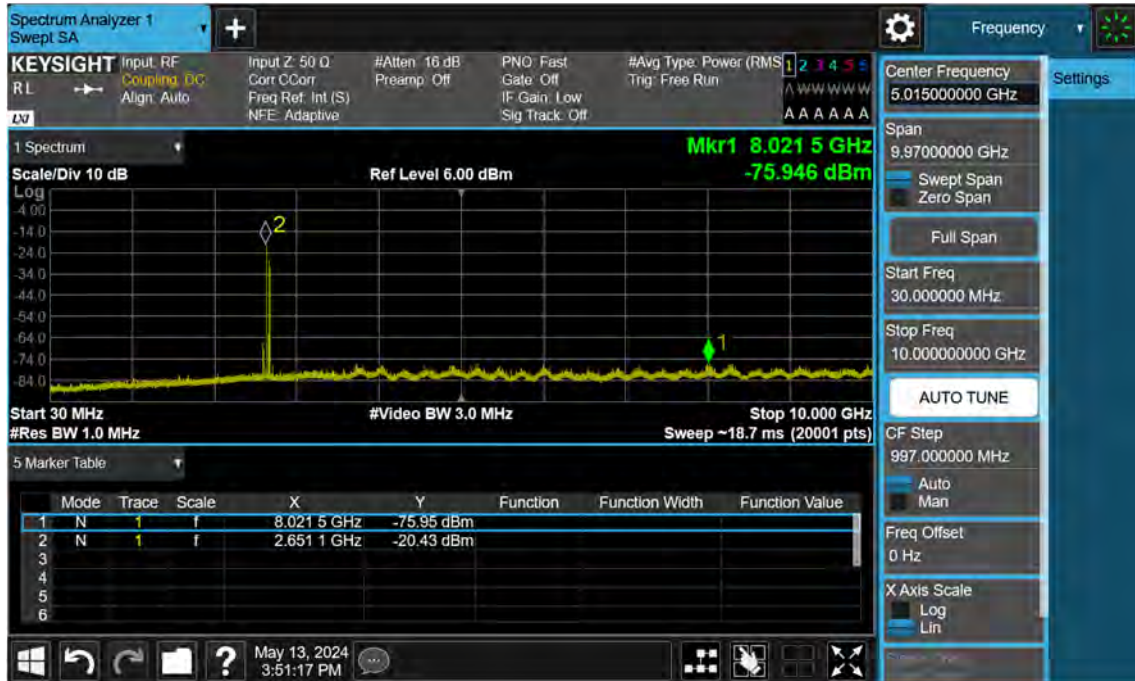
PCC 5 MHz Ch39683 RB1 Offset0 SCC 20 MHz Ch39800 RB1 Offset99



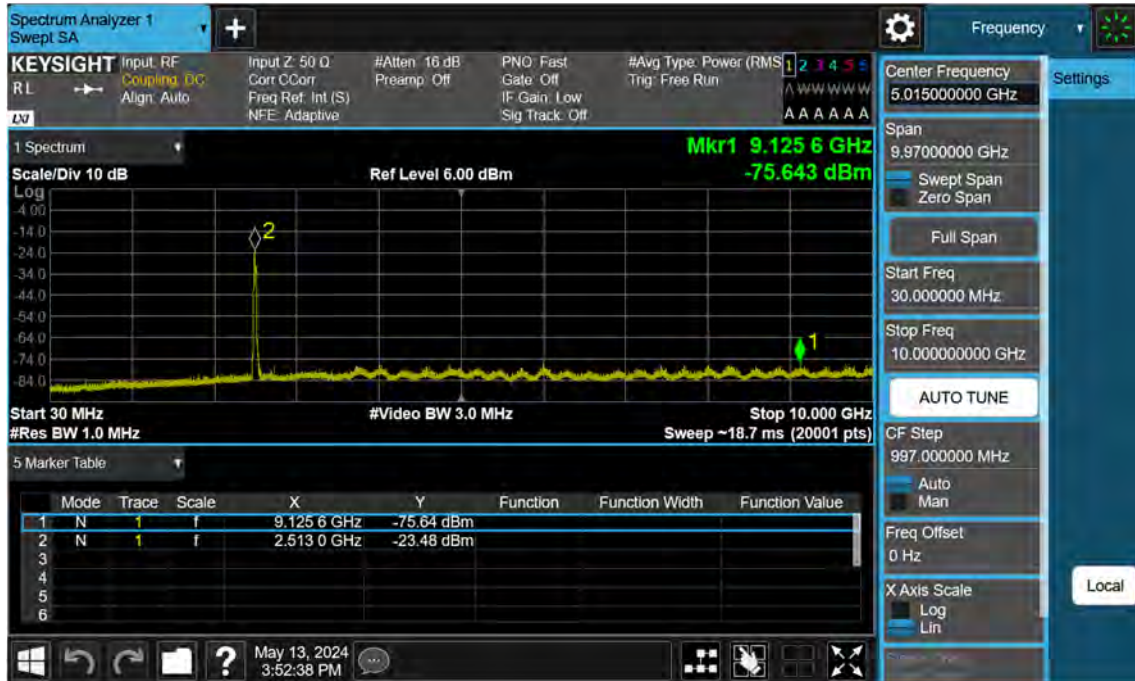
PCC 15 MHz Ch40523 RB1 Offset0 SCC 20 MHz Ch40694 RB1 Offset99



PCC 20 MHz Ch41292 RB1 Offset0 SCC 20 MHz Ch41490 RB1 Offset99

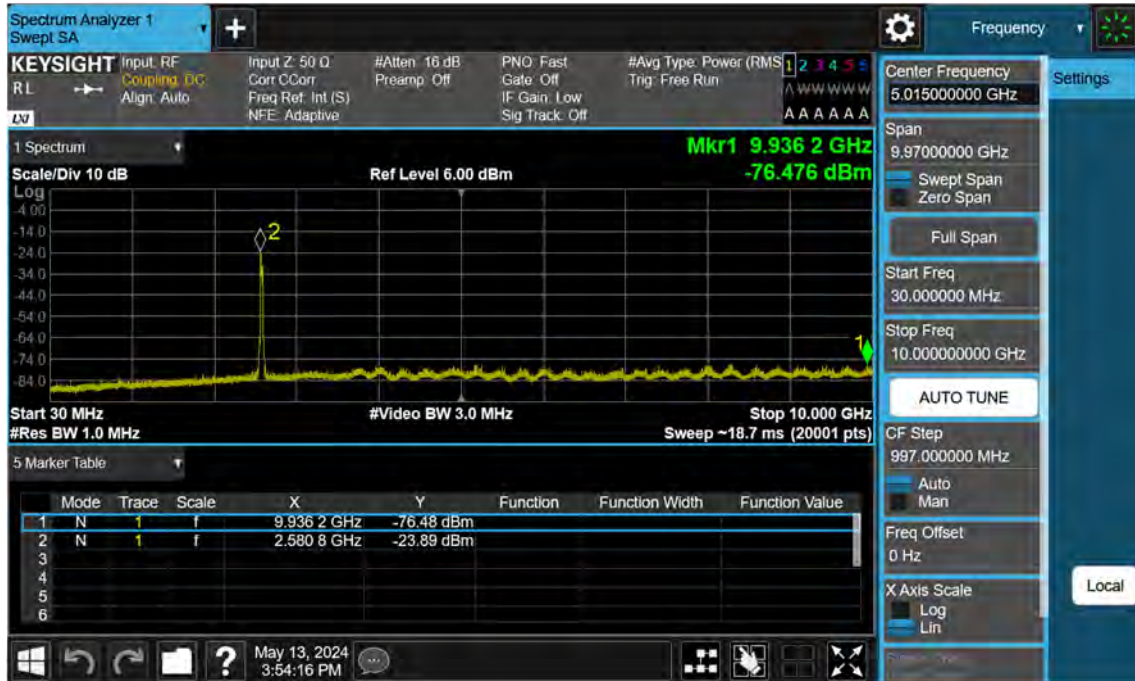


PCC 20 MHz Ch39750 RB100 Offset0 SCC 20 MHz Ch39948 RB100 Offset0

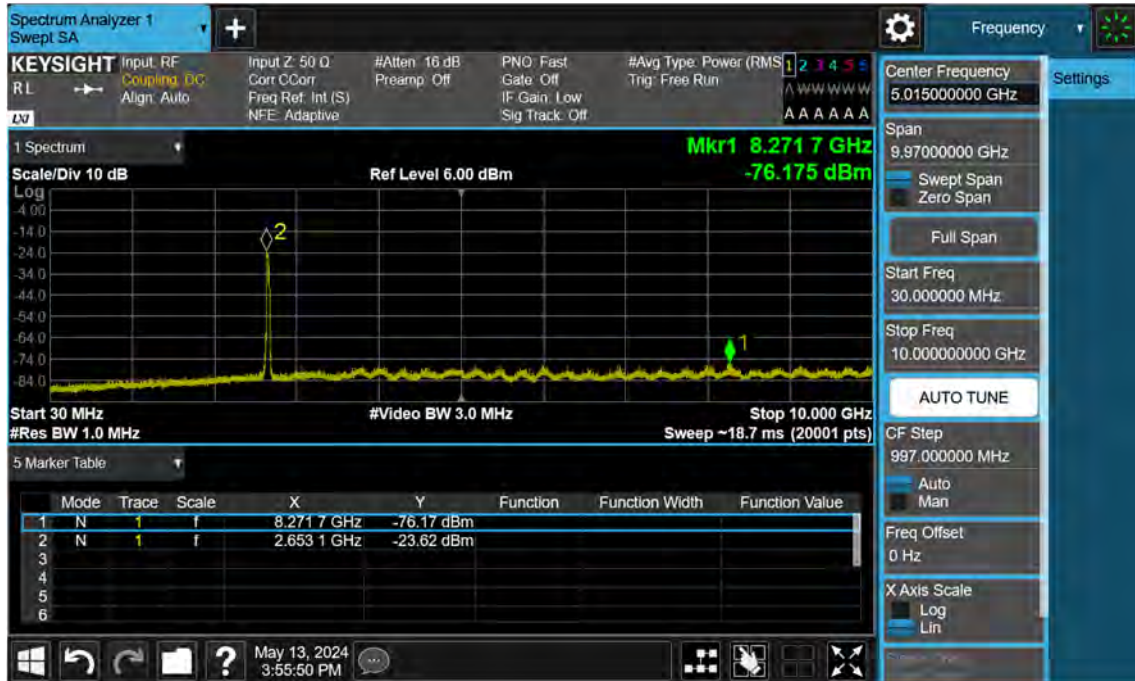




PCC 20 MHz Ch40521 RB100 Offset0 SCC 20 MHz Ch40719 RB100 Offset0



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

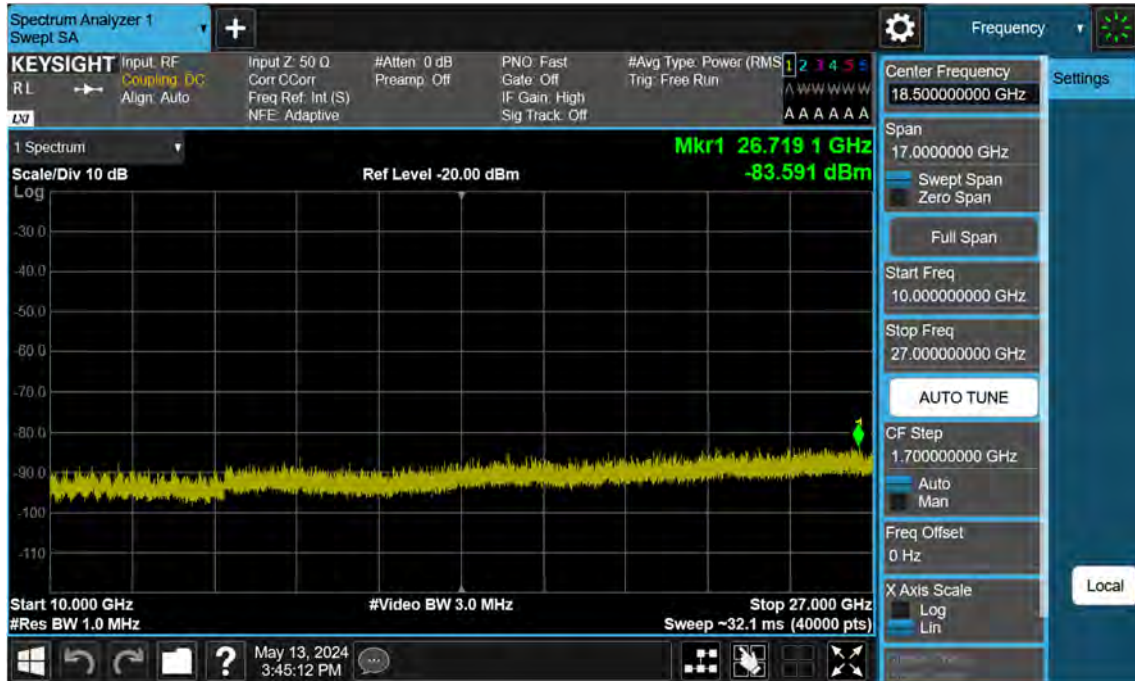


Frequency Range : 10 GHz ~ 27 GHz

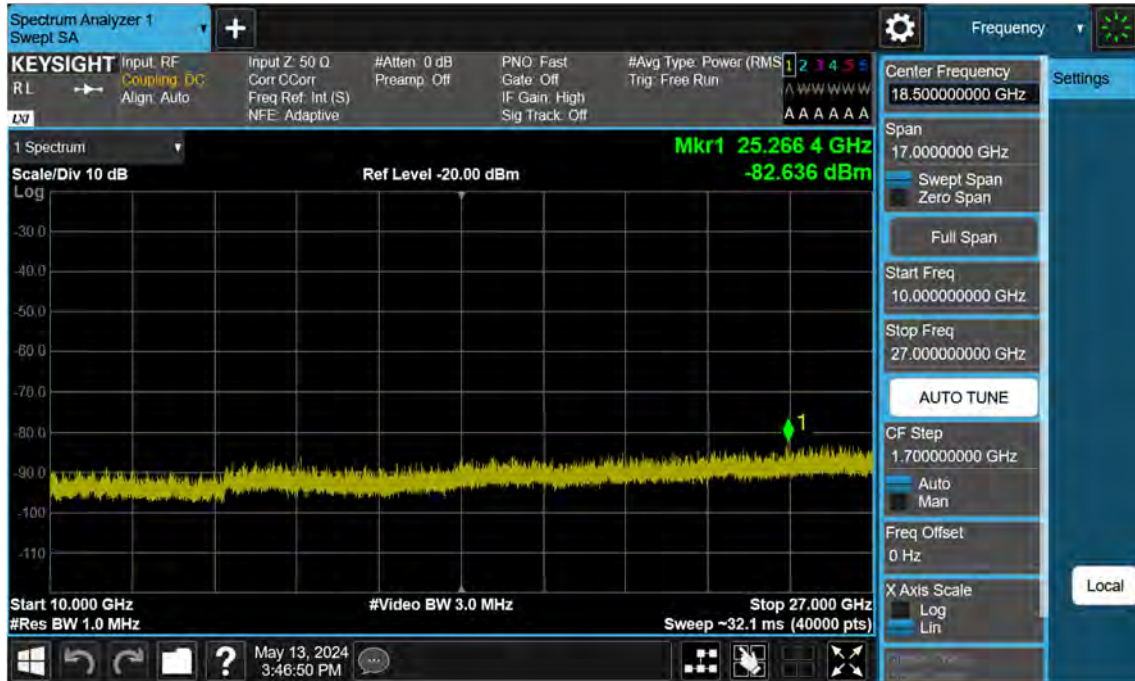
PCC 5 MHz Ch39683 RB1 Offset24 SCC 20 MHz Ch39800 RB1 Offset0



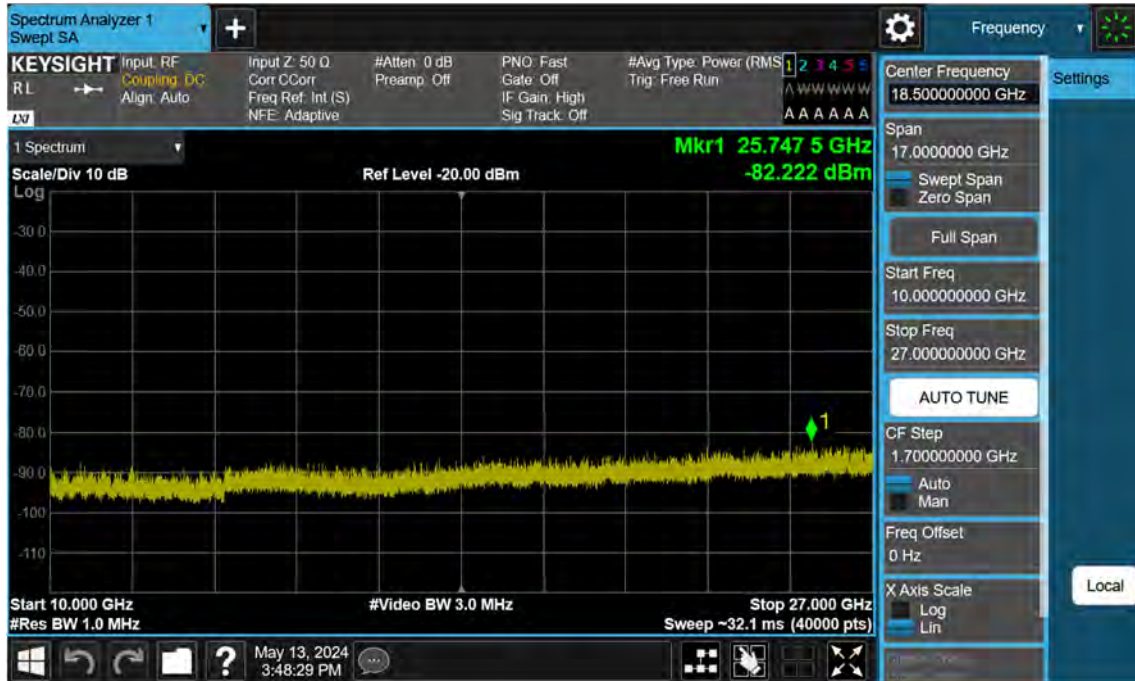
PCC 15 MHz Ch40523 RB1 Offset74 SCC 20 MHz Ch40694 RB1 Offset0



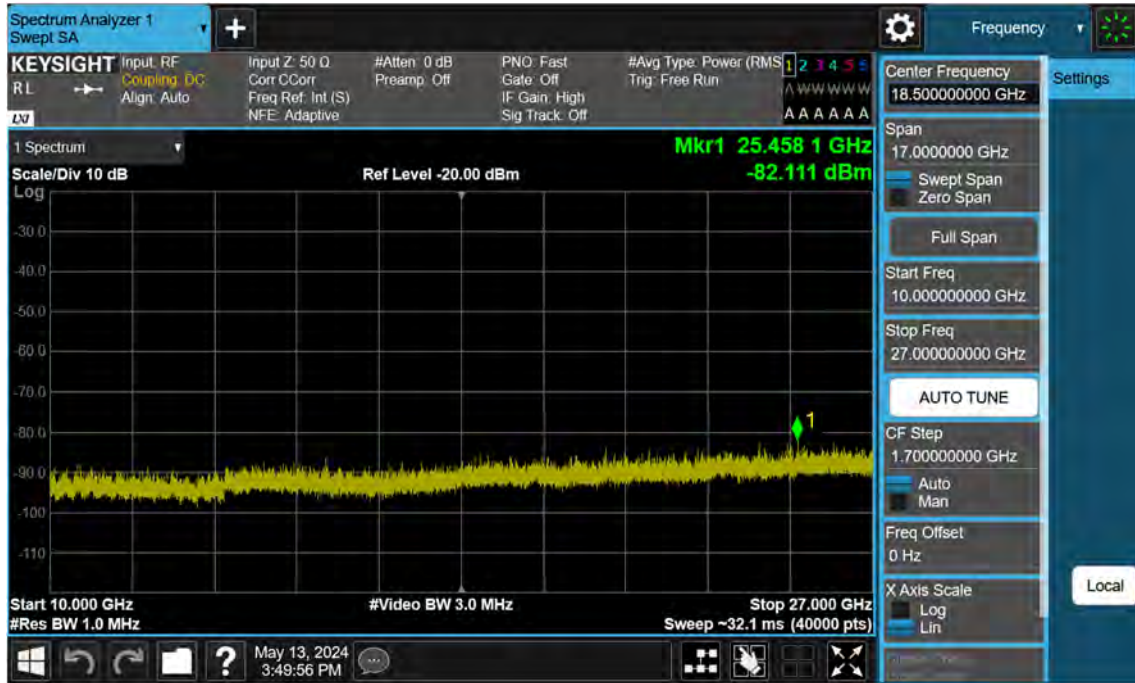
PCC 20 MHz Ch41292 RB1 Offset99 SCC 20 MHz Ch41490 RB1 Offset0



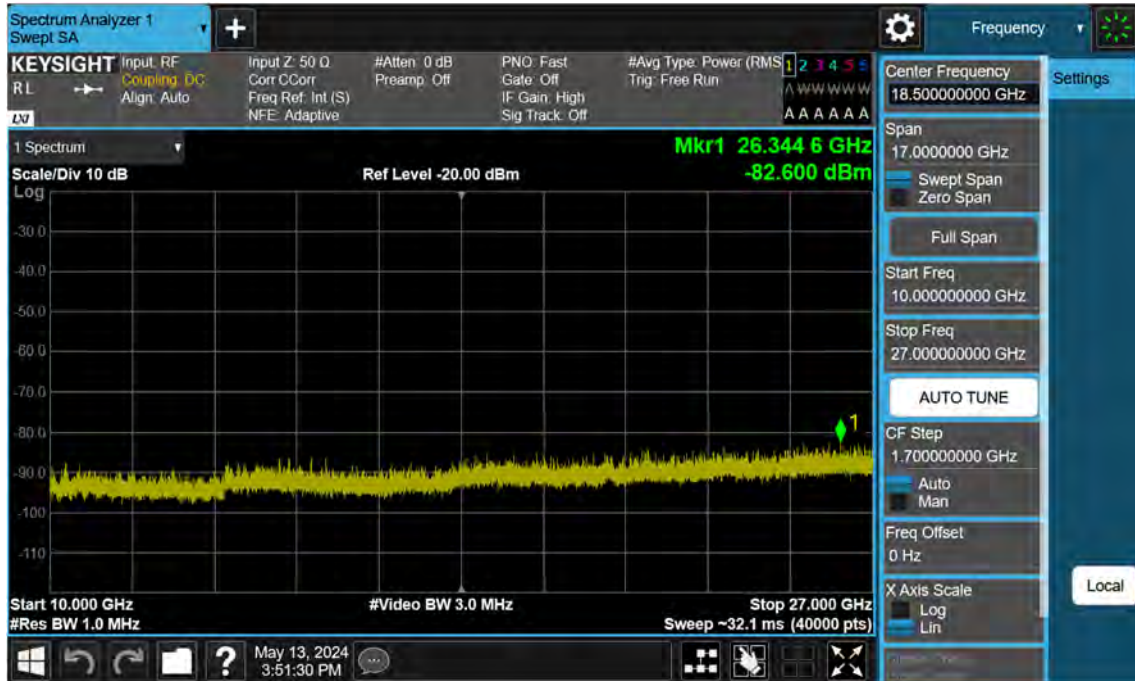
PCC 5 MHz Ch39683 RB1 Offset0 SCC 20 MHz Ch39800 RB1 Offset99



PCC 15 MHz Ch40523 RB1 Offset0 SCC 20 MHz Ch40694 RB1 Offset99



PCC 20 MHz Ch41292 RB1 Offset0 SCC 20 MHz Ch41490 RB1 Offset99

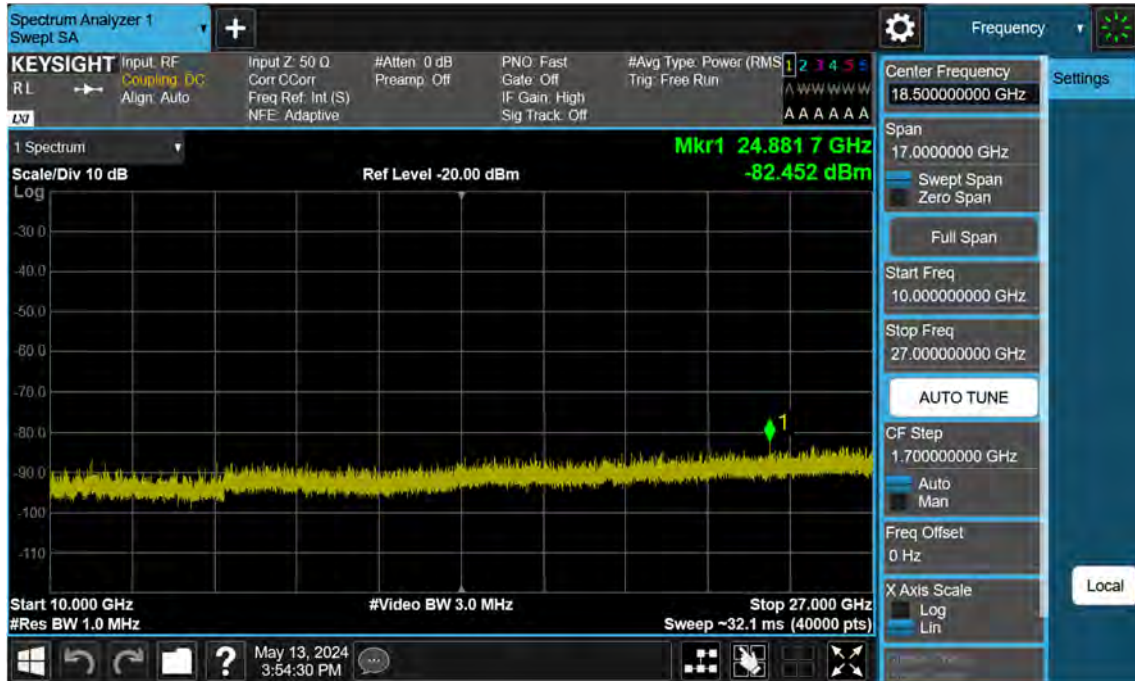




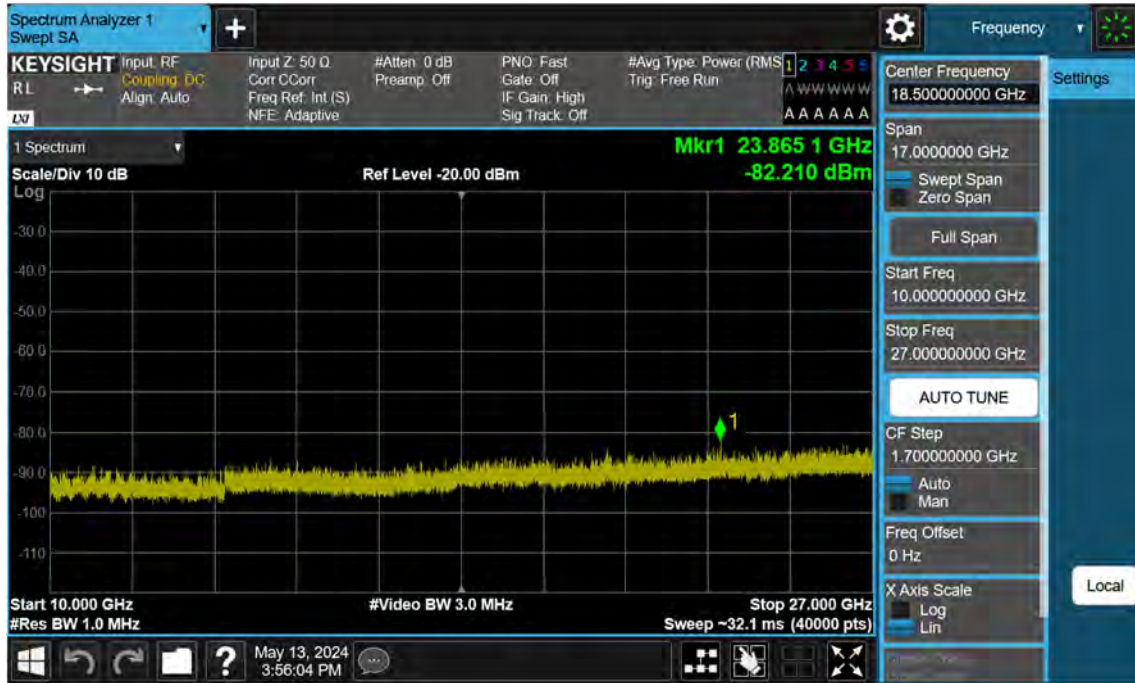
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PCC 20 MHz Ch40521 RB100 Offset0 SCC 20 MHz Ch40719 RB100 Offset0

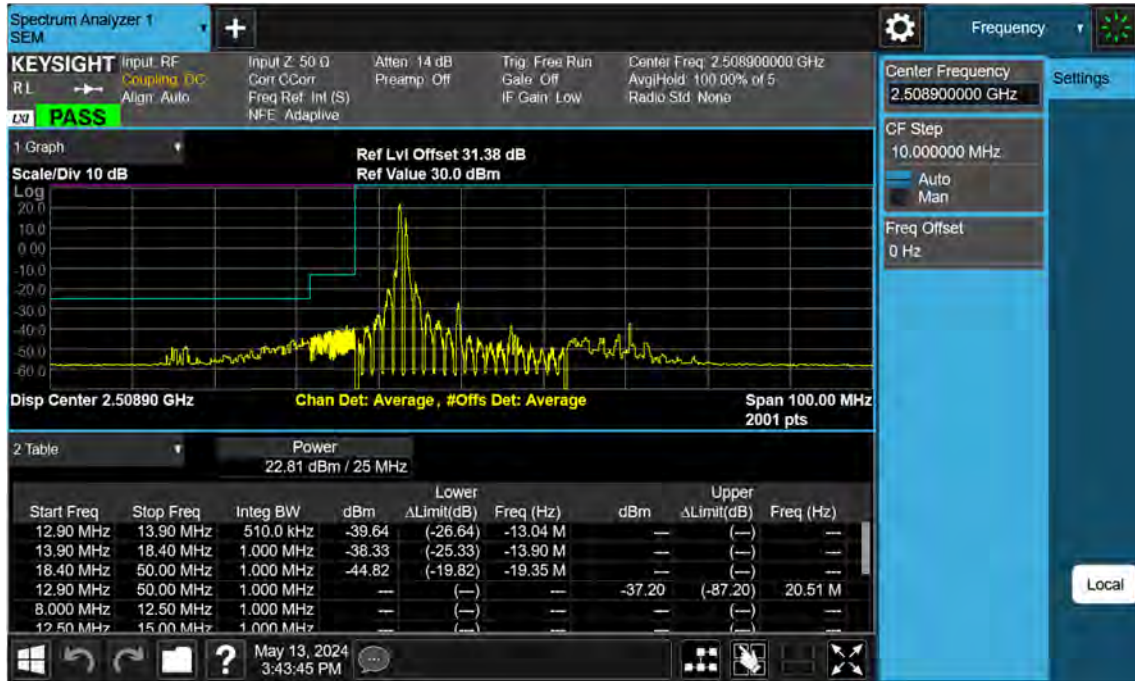


PCC 20 MHz Ch41292 RB100 Offset0 SCC 20 MHz Ch41490 RB100 Offset0

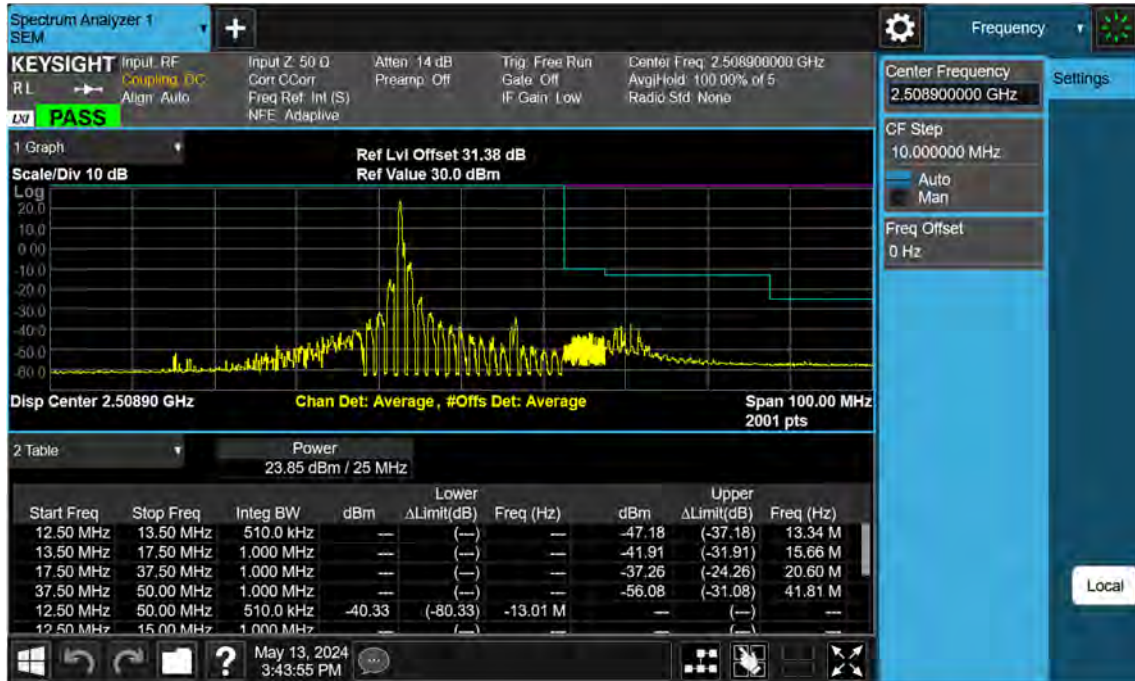


### 8.4 Channel Edge

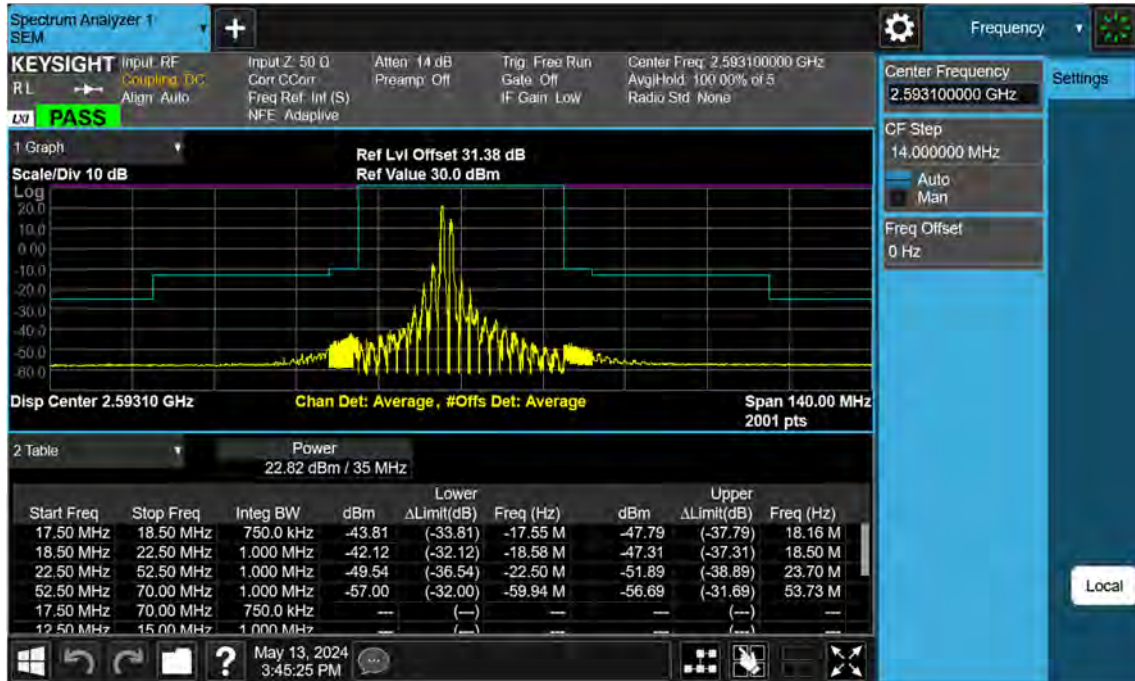
PCC 5 MHz Ch39683 RB1 Offset24, SCC 20 MHz Ch39800 RB1 Offset0-1



PCC 5 MHz Ch39683 RB1 Offset24, SCC 20 MHz Ch39800 RB1 Offset0-2



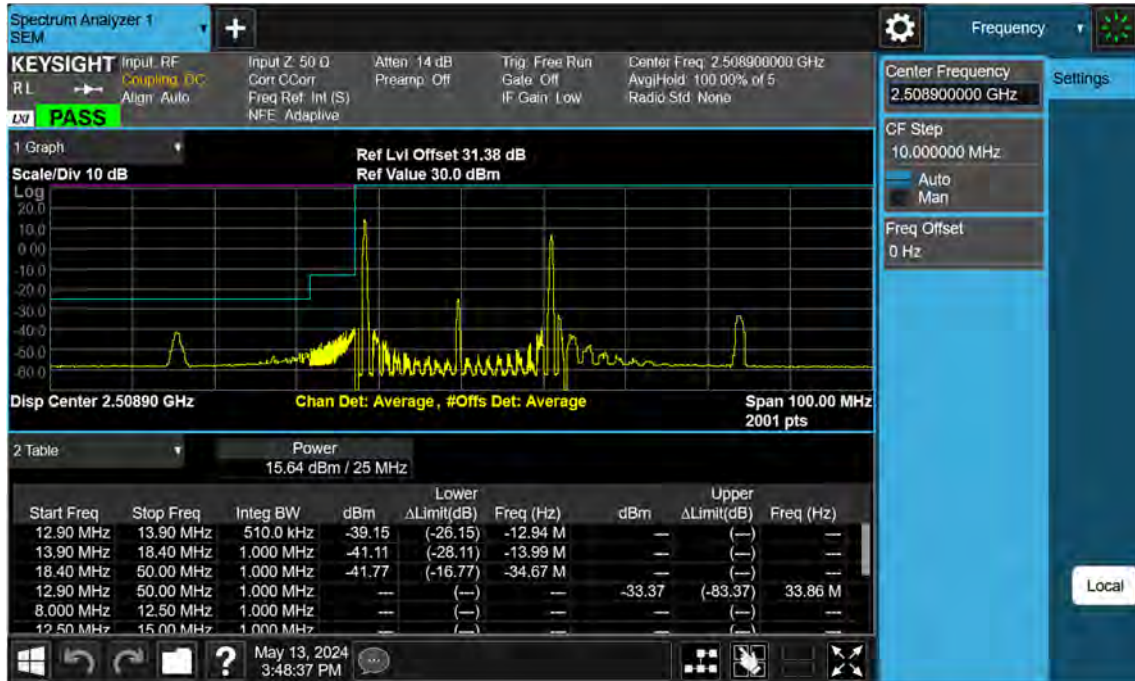
PCC 15 MHz Ch40523 RB1 Offset74, SCC 20 MHz Ch40694 RB1 Offset0



PCC 20 MHz Ch41292 RB1 Offset99, SCC 20 MHz Ch41490 RB1 Offset0

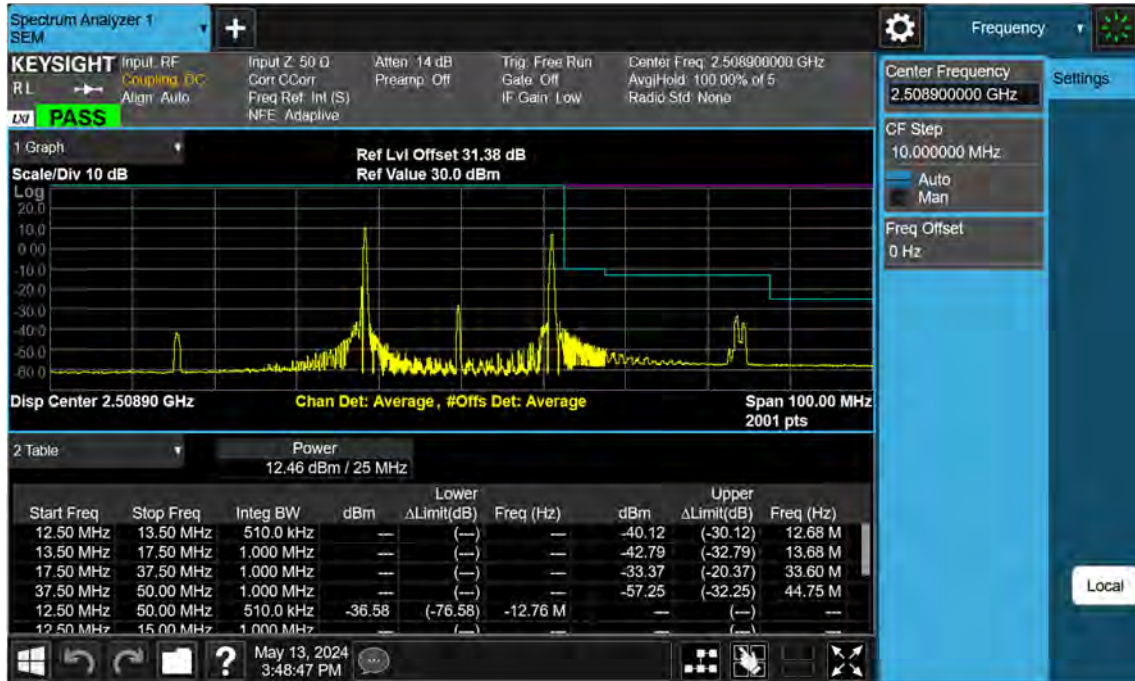


PCC 5 MHz Ch39683 RB1 Offset0, SCC 20 MHz Ch39800 RB1 Offset99-1

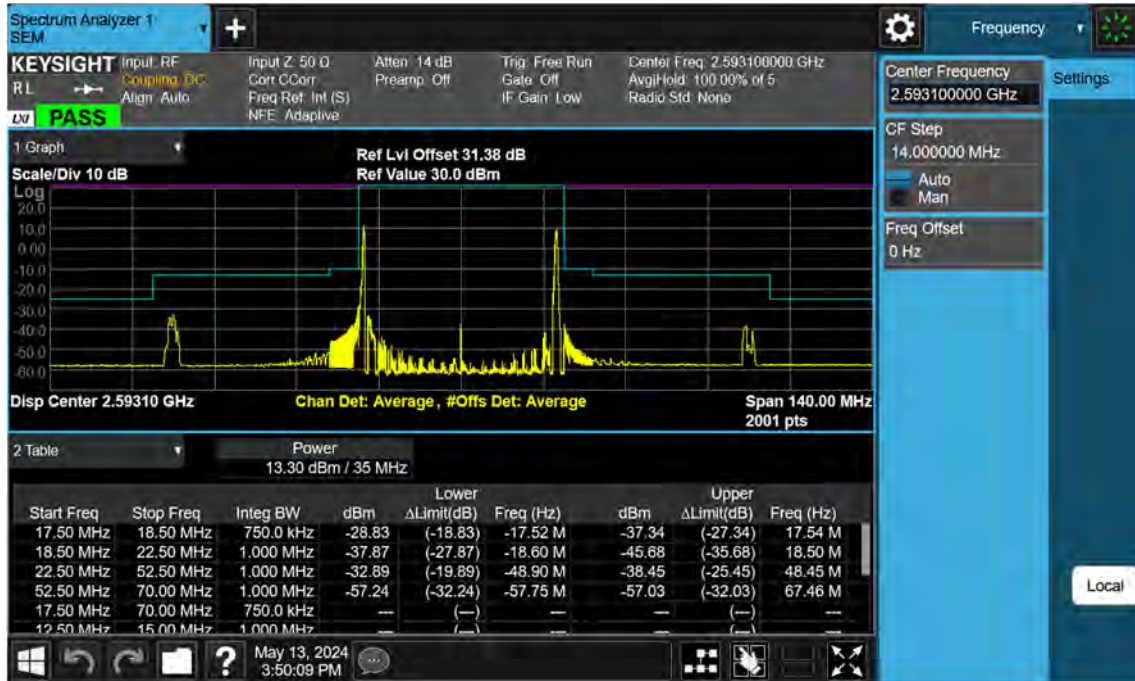




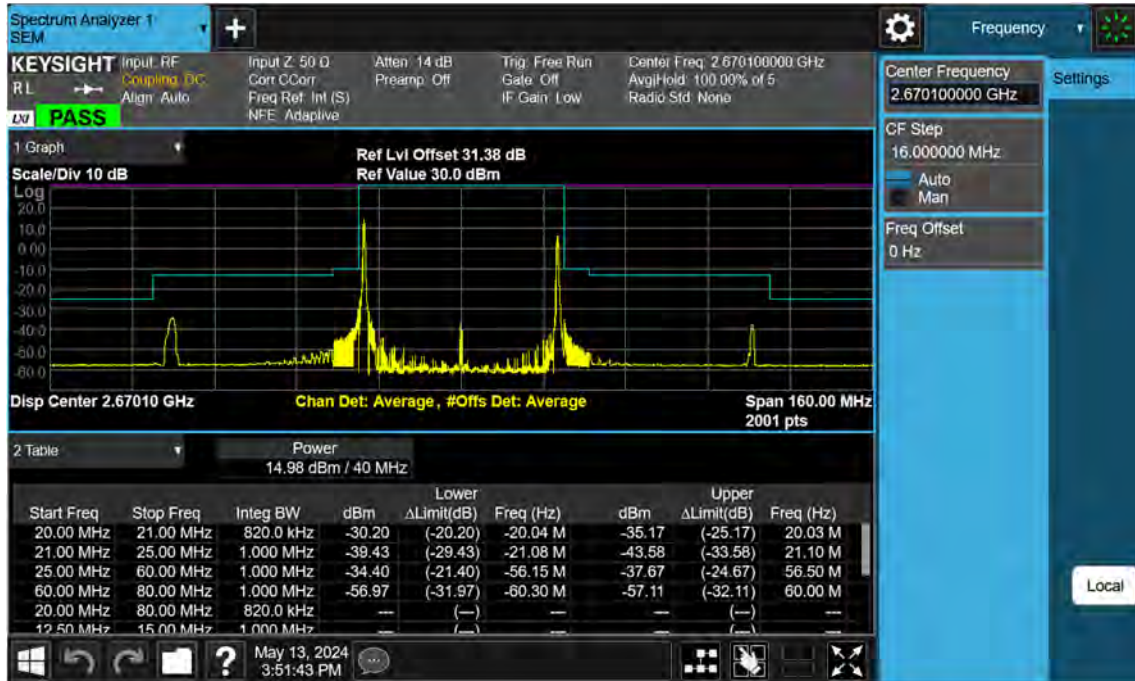
PCC 5 MHz Ch39683 RB1 Offset0, SCC 20 MHz Ch39800 RB1 Offset99-2



PCC 15 MHz Ch40523 RB1 Offset0, SCC 20 MHz Ch40694 RB1 Offset99



PCC 20 MHz Ch41292 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99



PCC 20 MHz Ch39750 RB100 Offset0, SCC 20 MHz Ch39948 RB100 Offset0-1



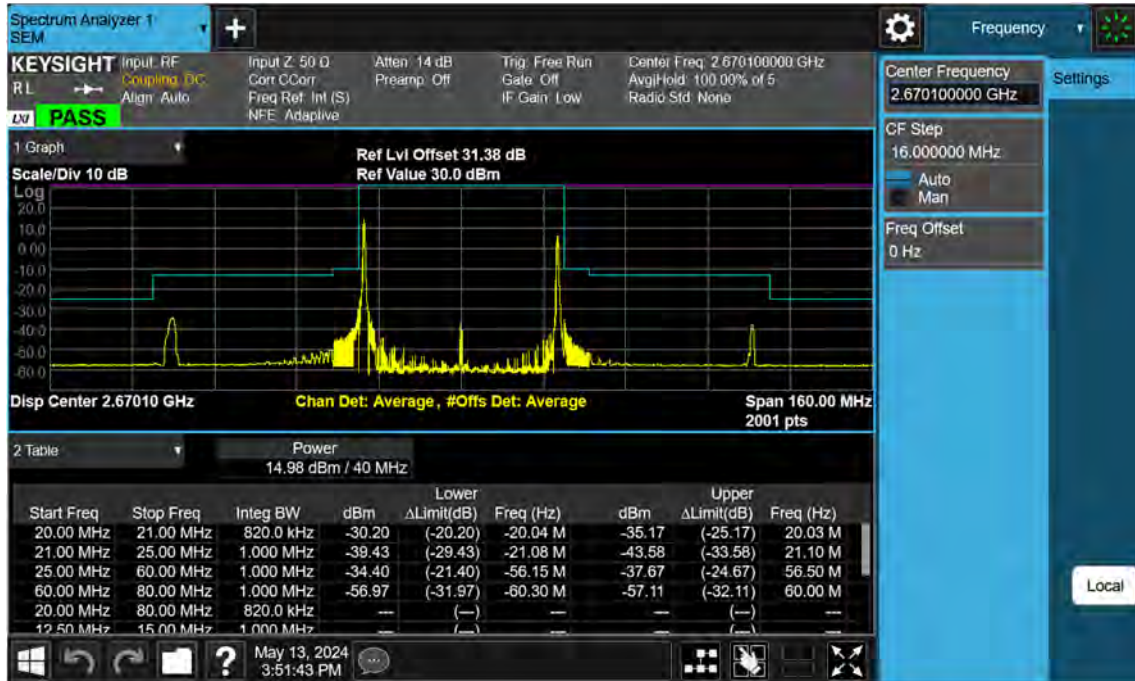
PCC 20 MHz Ch39750 RB100 Offset0, SCC 20 MHz Ch39948 RB100 Offset0-2



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



PCC 20 MHz Ch41292 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99



### 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.014	-0.027	2499.29987	2510.99982
100 %		-30	-0.017	-0.016	2499.29990	2510.99998
100 %		-20	-0.005	-0.009	2499.29999	2510.99982
100 %		-10	-0.020	-0.018	2499.29991	2510.99985
100 %		0	-0.006	-0.008	2499.29987	2510.99988
100 %		10	-0.020	-0.003	2499.29987	2510.99992
100 %		30	-0.011	0.004	2499.29995	2510.99999
100 %		40	-0.009	-0.011	2499.29998	2510.99992
100 %		50	-0.009	-0.009	2499.29991	2510.99986
Batt. Endpoint	3.300	20	-0.006	-0.002	2499.29989	2510.99988



- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.019	-0.022	2501.49982	2515.89981
100 %		-30	-0.005	-0.001	2501.49989	2515.89991
100 %		-20	-0.001	-0.018	2501.49990	2515.89989
100 %		-10	-0.008	-0.008	2501.49992	2515.89991
100 %		0	0.006	-0.015	2501.49991	2515.89992
100 %		10	-0.022	-0.003	2501.49982	2515.89989
100 %		30	-0.017	-0.007	2501.49983	2515.89983
100 %		40	0.002	-0.011	2501.49994	2515.89991
100 %		50	-0.016	0.005	2501.49991	2515.89990
Batt. Endpoint		3.300	20	-0.008	-0.015	2501.49987

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.009	-0.005	2503.79999	2520.89995
100 %		-30	0.002	-0.001	2503.80000	2520.89993
100 %		-20	-0.007	-0.017	2503.79997	2520.89987
100 %		-10	-0.011	-0.006	2503.79984	2520.89993
100 %		0	0.005	-0.014	2503.79997	2520.89992
100 %		10	-0.005	0.007	2503.79986	2520.89999
100 %		30	-0.009	-0.011	2503.79998	2520.89991
100 %		40	0.000	-0.008	2503.79993	2520.89993
100 %		50	-0.008	0.009	2503.79990	2520.89998
Batt. Endpoint		3.300	20	-0.008	-0.009	2503.79981

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.012	-0.003	2505.99985	2525.79985
100 %		-30	-0.003	-0.025	2505.99999	2525.79992
100 %		-20	-0.017	-0.013	2505.99985	2525.79993
100 %		-10	-0.004	-0.002	2505.99990	2525.79998
100 %		0	-0.018	-0.005	2505.99988	2525.79991
100 %		10	-0.009	-0.013	2505.99988	2525.79983
100 %		30	-0.020	-0.015	2505.99986	2525.79996
100 %		40	0.007	-0.013	2505.99993	2525.79991
100 %		50	-0.015	-0.021	2505.99985	2525.79987
Batt. Endpoint		3.300	20	-0.005	-0.011	2505.99986

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.025	-0.009	2668.29991	2679.99987
100 %		-30	-0.023	-0.013	2668.29988	2679.99992
100 %		-20	-0.006	0.009	2668.29990	2679.99997
100 %		-10	0.000	-0.010	2668.29998	2679.99995
100 %		0	-0.016	-0.016	2668.29996	2679.99993
100 %		10	-0.022	-0.001	2668.29996	2679.99992
100 %		30	-0.002	-0.004	2668.29997	2679.99992
100 %		40	0.001	-0.026	2668.29986	2679.99989
100 %		50	-0.002	-0.010	2668.29995	2679.99987
Batt. Endpoint		3.300	20	-0.016	-0.002	2668.29987

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.003	-0.016	2665.59988	2679.99983
100 %		-30	-0.023	-0.006	2665.59996	2679.99991
100 %		-20	-0.002	-0.007	2665.59998	2679.99984
100 %		-10	-0.019	0.003	2665.59995	2679.99996
100 %		0	-0.013	-0.021	2665.59992	2679.99993
100 %		10	-0.020	0.001	2665.59990	2679.99996
100 %		30	-0.019	-0.018	2665.59991	2679.99996
100 %		40	-0.006	0.006	2665.59995	2679.99990
100 %		50	-0.030	-0.025	2665.59988	2679.99985
Batt. Endpoint		3.300	20	-0.002	-0.012	2665.59995

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.010	-0.009	2662.89987	2679.99987
100 %		-30	-0.015	-0.009	2662.89988	2679.99991
100 %		-20	-0.009	0.001	2662.89991	2679.99985
100 %		-10	0.003	-0.010	2662.89991	2679.99988
100 %		0	-0.010	0.007	2662.89985	2679.99996
100 %		10	-0.008	-0.013	2662.89995	2679.99993
100 %		30	-0.008	-0.003	2662.89988	2679.99994
100 %		40	-0.006	-0.026	2662.89987	2679.99983
100 %		50	-0.011	-0.004	2662.89998	2679.99987
Batt. Endpoint		3.300	20	-0.011	-0.022	2662.89992

- ▣ 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 : 3.880 MHz
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.007	-0.005	2660.19988	2679.99990
100 %		-30	0.004	-0.013	2660.19999	2679.99986
100 %		-20	-0.016	-0.010	2660.19987	2679.99990
100 %		-10	-0.002	0.001	2660.19992	2679.99991
100 %		0	-0.020	-0.012	2660.19995	2679.99990
100 %		10	-0.005	0.001	2660.19995	2679.99991
100 %		30	-0.011	-0.024	2660.19990	2679.99981
100 %		40	-0.002	-0.011	2660.19993	2679.99996
100 %		50	-0.002	-0.002	2660.20000	2679.99990
Batt. Endpoint		3.300	20	0.003	-0.007	2660.19998

### 8.6 Radiated Spurious Emissions

▣ PCC Channel :	<u>39750 (2506.0 MHz)</u>
▣ PCC BW(MHz) :	20
▣ PCC RB/ RB Offset :	<u>1/ 99</u>
▣ SCC Channel :	<u>39948 (2525.8 MHz)</u>
▣ SCC BW(MHz) :	20
▣ SCC RB/ RB Offset :	<u>1/ 0</u>
▣ DISTANCE:	<u>1 meters</u>
▣ LIMIT:	<u>-25.0 dBm</u>

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 031.80	-58.45	12.48	-68.56	3.89	H	-59.97
7 547.70	-60.05	10.92	-59.92	4.72	H	-53.72
10 063.60	-60.88	11.42	-57.31	5.46	H	-51.35



- ▣ PCC Channel : 40528 (2583.8 MHz)
- ▣ PCC BW(MHz) : 5
- ▣ PCC RB/ RB Offset : 1/ 24
- ▣ SCC Channel : 40645 (2595.5 MHz)
- ▣ SCC BW(MHz) : 20
- ▣ 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)
5 179.30	-60.25	12.52	-68.68	3.81	H	-59.97
7 768.95	-60.78	11.42	-60.64	4.78	H	-54.00
10 358.60	-61.38	11.46	-55.93	5.57	H	-50.04

- ▣ PCC Channel : 41373 (2668.3 MHz)
- ▣ PCC BW(MHz) : 5
- ▣ PCC RB/ RB Offset : 1/ 24
- ▣ SCC Channel : 41490 (2680.0 MHz)
- ▣ SCC BW(MHz) : 20
- ▣ 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)
5 336.60	-58.89	13.09	-68.28	3.94	H	-59.13
8 004.90	-59.53	10.79	-57.78	4.88	H	-51.87
10 673.20	-59.92	11.33	-55.81	5.67	H	-50.15

### 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	22.882
10	40549	2585.9	QPSK	50/0	15	40669	2597.9	QPSK	75/0	23.149
10	40526	2583.6	QPSK	50/0	20	40670	2598	QPSK	100/0	27.787
15	40571	2588.1	QPSK	75/0	10	40691	2600.1	QPSK	50/0	23.091
15	40545	2585.5	QPSK	75/0	15	40695	2600.5	QPSK	75/0	28.385
15	40523	2583.3	QPSK	75/0	20	40694	2600.4	QPSK	100/0	32.659
20	40595	2590.5	QPSK	100/0	5	40712	2602.2	QPSK	25/0	22.902
20	40571	2588.1	QPSK	100/0	10	40715	2602.5	QPSK	50/0	27.767
20	40546	2585.6	QPSK	100/0	15	40717	2602.7	QPSK	75/0	32.649
20	40521	2583.1	QPSK	100/0	20	40719	2602.9	QPSK	100/0	37.659

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	22.862
10	40549	2585.9	16QAM	50/0	15	40669	2597.9	16QAM	75/0	23.130
10	40526	2583.6	16QAM	50/0	20	40670	2598	16QAM	100/0	27.734
15	40571	2588.1	16QAM	75/0	10	40691	2600.1	16QAM	50/0	23.176
15	40545	2585.5	16QAM	75/0	15	40695	2600.5	16QAM	75/0	28.376
15	40523	2583.3	16QAM	75/0	20	40694	2600.4	16QAM	100/0	32.692
20	40595	2590.5	16QAM	100/0	5	40712	2602.2	16QAM	25/0	22.968
20	40571	2588.1	16QAM	100/0	10	40715	2602.5	16QAM	50/0	27.770
20	40546	2585.6	16QAM	100/0	15	40717	2602.7	16QAM	75/0	32.637
20	40521	2583.1	16QAM	100/0	20	40719	2602.9	16QAM	100/0	37.695

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	22.801
10	40549	2585.9	64QAM	50/0	15	40669	2597.9	64QAM	75/0	23.106
10	40526	2583.6	64QAM	50/0	20	40670	2598	64QAM	100/0	27.816
15	40571	2588.1	64QAM	75/0	10	40691	2600.1	64QAM	50/0	23.186
15	40545	2585.5	64QAM	75/0	15	40695	2600.5	64QAM	75/0	28.350
15	40523	2583.3	64QAM	75/0	20	40694	2600.4	64QAM	100/0	32.799
20	40595	2590.5	64QAM	100/0	5	40712	2602.2	64QAM	25/0	22.921
20	40571	2588.1	64QAM	100/0	10	40715	2602.5	64QAM	50/0	27.769
20	40546	2585.6	64QAM	100/0	15	40717	2602.7	64QAM	75/0	32.657
20	40521	2583.1	64QAM	100/0	20	40719	2602.9	64QAM	100/0	37.605

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	256QAM	25/0	20	40645	2595.5	256QAM	100/0	22.848
10	40549	2585.9	256QAM	50/0	15	40669	2597.9	256QAM	75/0	23.110
10	40526	2583.6	256QAM	50/0	20	40670	2598	256QAM	100/0	27.712
15	40571	2588.1	256QAM	75/0	10	40691	2600.1	256QAM	50/0	23.141
15	40545	2585.5	256QAM	75/0	15	40695	2600.5	256QAM	75/0	28.411
15	40523	2583.3	256QAM	75/0	20	40694	2600.4	256QAM	100/0	32.655
20	40595	2590.5	256QAM	100/0	5	40712	2602.2	256QAM	25/0	22.944
20	40571	2588.1	256QAM	100/0	10	40715	2602.5	256QAM	50/0	27.801
20	40546	2585.6	256QAM	100/0	15	40717	2602.7	256QAM	75/0	32.619
20	40521	2583.1	256QAM	100/0	20	40719	2602.9	256QAM	100/0	37.514

Note:

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

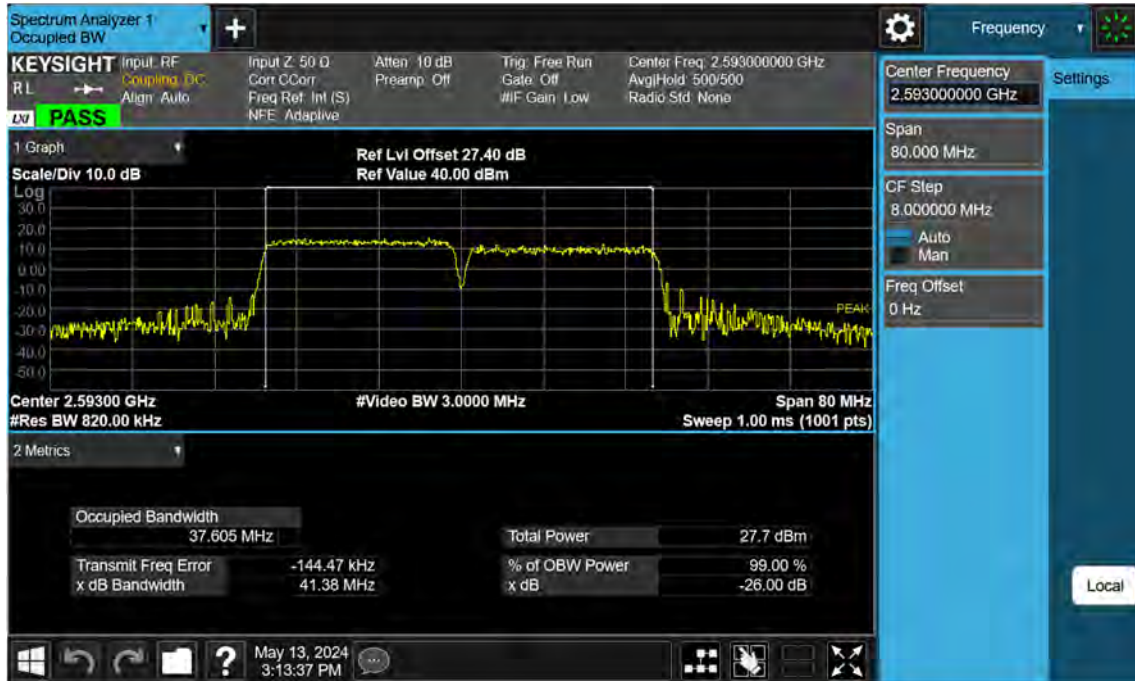
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(QPSK)



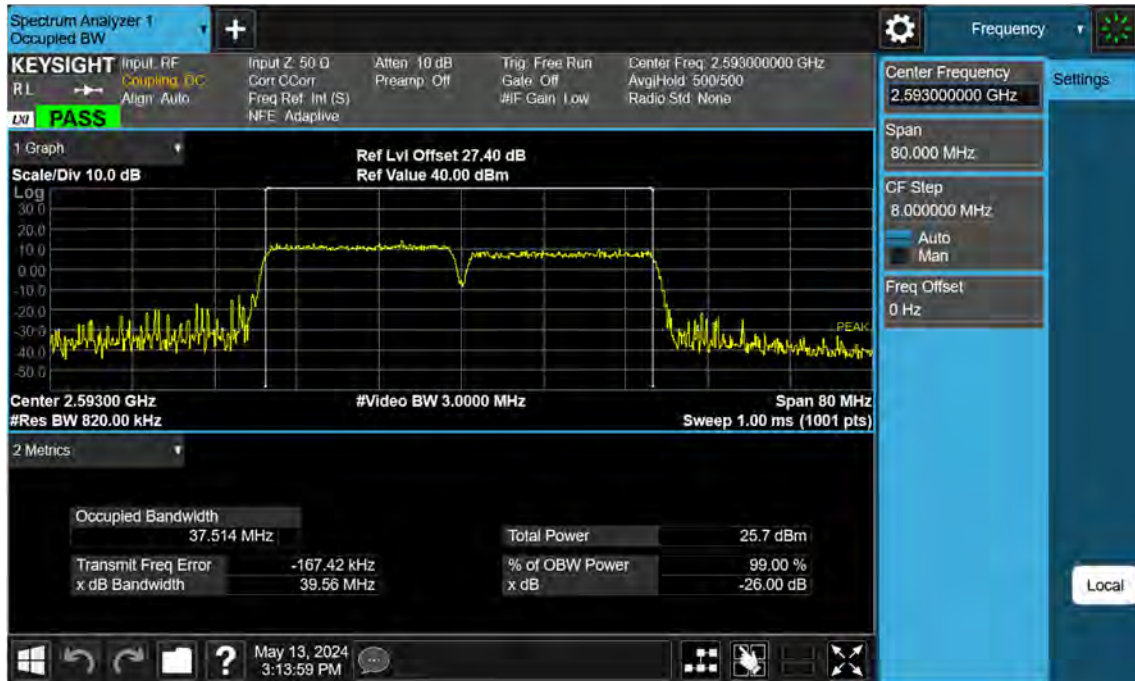
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(16QAM))



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



PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(256QAM)





### 8.8 Peak- to- Average Ratio

PCC					SCC					Data (dB)
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	5.47
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	5.23
10	40526	2583.6	QPSK	50/ 0	20	40670	2598	QPSK	100/ 0	5.29
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	5.27
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	5.35
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	5.33
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	5.38
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	5.34
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	5.34
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	5.44

PCC					SCC					Data (dB)
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	6.52
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	6.31
10	40526	2583.6	16QAM	50/ 0	20	40670	2598	16QAM	100/ 0	6.28
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	6.30
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	6.30
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	6.29
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	6.38
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	6.31
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	6.31
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	6.42

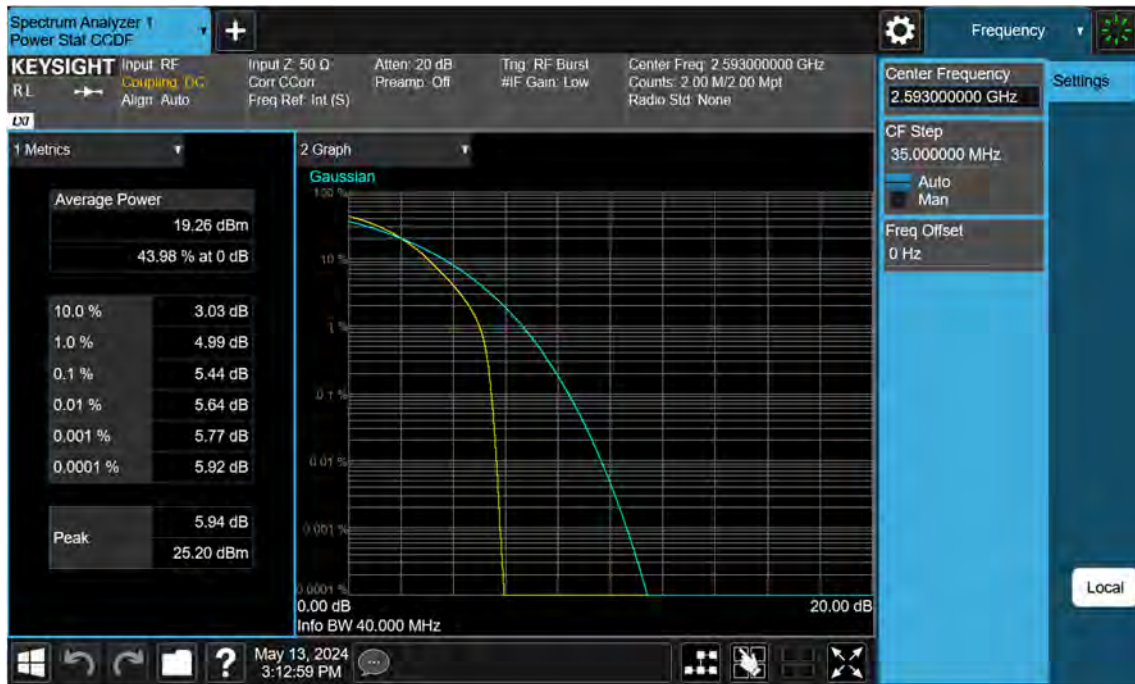
PCC					SCC					Data (dB)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	64QAM	25/ 0	20	40645	2595.5	64QAM	100/ 0	7.03
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	6.87
10	40526	2583.6	64QAM	50/ 0	20	40670	2598	64QAM	100/ 0	6.89
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	7.03
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	6.96
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	6.94
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	6.95
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	6.91
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	6.90
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	7.05

PCC					SCC					Data (dB)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	256QAM	25/ 0	20	40645	2595.5	256QAM	100/ 0	7.87
10	40549	2585.9	256QAM	50/ 0	15	40669	2597.9	256QAM	75/ 0	7.11
10	40526	2583.6	256QAM	50/ 0	20	40670	2598	256QAM	100/ 0	7.03
15	40571	2588.1	256QAM	75/ 0	10	40691	2600.1	256QAM	50/ 0	7.13
15	40545	2585.5	256QAM	75/ 0	15	40695	2600.5	256QAM	75/ 0	7.18
15	40523	2583.3	256QAM	75/ 0	20	40694	2600.4	256QAM	100/ 0	7.03
20	40595	2590.5	256QAM	100/ 0	5	40712	2602.2	256QAM	25/ 0	7.05
20	40571	2588.1	256QAM	100/ 0	10	40715	2602.5	256QAM	50/ 0	7.02
20	40546	2585.6	256QAM	100/ 0	15	40717	2602.7	256QAM	75/ 0	7.00
20	40521	2583.1	256QAM	100/ 0	20	40719	2602.9	256QAM	100/ 0	7.22

Note:

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

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



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



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



PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(256QAM)



## 9. TEST DATA(Sub 5 Ant)

### 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 10<sup>th</sup> 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	15	25
10	20	30
15	10	35
15	15	30
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, Band 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.

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. We were performed the RSE test in condition of co-location.

Mode : Stand alone, Simultaneous transmission scenarios

Worst case : Stand alone

6. All 3 channels(low/mid/high) of conducted power and radiated power were investigated and the worst case channel results are reported.

7. The EUT was tested in three modes(Open, Half-folded, Closed), the worst case configuration results are reported.

Worst case: Half-folded mode.

[ Worst case ]

Test Description	Mod	Operating frequency	PCC					SCC				
			BW (MHz)	Freq. (MHz)	Ch.	RB	RB Offset	BW (MHz)	Freq. (MHz)	Ch.	RB	RB Offset
Conducted Spurious Emissions/ Band Edge	QPSK	Low	20	2506.0	39750	1	99	10	2520.4	39894	1	0
		Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0
		High	20	2660.2	41292	1	99	20	2680.0	41490	1	0
		Low	20	2506.0	39750	1	0	10	2520.4	39894	1	49
		Mid	5	2583.8	40528	1	0	20	2595.5	40645	1	99
		High	20	2660.2	41292	1	0	20	2680.0	41490	1	99
		Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0
		Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0
		High	20	2660.2	41292	100	0	20	2680.0	41490	100	0
Radiated Spurious Emissions	QPSK	Low	5	2499.3	39683	1	24	20	2511.0	39800	1	0
		Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0
		High	15	2667.5	41365	1	74	15	2682.5	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 256QAM	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

## 9.1 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	23.98
	10	2501.3	39703	1	49	15	2513.3	39823	1	0	23.89
	10	2501.5	39705	1	49	20	2515.9	39849	1	0	23.86
	15	2503.5	39725	1	74	10	2515.5	39845	1	0	23.91
	15	2503.5	39725	1	74	15	2518.5	39875	1	0	23.90
	15	2503.8	39728	1	74	20	2520.9	39899	1	0	23.90
	20	2506.0	39750	1	99	5	2517.7	39867	1	0	24.04
	<b>20</b>	<b>2506.0</b>	<b>39750</b>	<b>1</b>	<b>99</b>	<b>10</b>	<b>2520.4</b>	<b>39894</b>	<b>1</b>	<b>0</b>	<b>24.30</b>
	20	2506.0	39750	1	99	15	2523.1	39921	1	0	23.94
	20	2506.0	39750	1	99	20	2525.8	39948	1	0	23.90
Mid	<b>5</b>	<b>2583.8</b>	<b>40528</b>	<b>1</b>	<b>24</b>	<b>20</b>	<b>2595.5</b>	<b>40645</b>	<b>1</b>	<b>0</b>	<b>23.74</b>
	10	2585.9	40549	1	49	15	2597.9	40669	1	0	23.71
	10	2583.6	40526	1	49	20	2598.0	40670	1	0	23.70
	15	2588.1	40571	1	74	10	2600.1	40691	1	0	23.64
	15	2585.5	40545	1	74	15	2600.5	40695	1	0	23.71
	15	2583.3	40523	1	74	20	2600.4	40694	1	0	23.68
	20	2590.5	40595	1	99	5	2602.2	40712	1	0	23.65
	20	2588.1	40571	1	99	10	2602.5	40715	1	0	23.67
	20	2585.6	40546	1	99	15	2602.7	40717	1	0	23.73
	20	2583.1	40521	1	99	20	2602.9	40719	1	0	23.68
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	23.59
	10	2670.5	41395	1	49	15	2682.5	41515	1	0	23.61
	10	2665.6	41346	1	49	20	2680.0	41490	1	0	23.65
	15	2672.7	41417	1	74	10	2684.7	41537	1	0	23.54
	15	2667.5	41365	1	74	15	2682.5	41515	1	0	23.55
	15	2662.9	41319	1	74	20	2680.0	41490	1	0	23.59
	20	2675.0	41440	1	99	5	2686.7	41557	1	0	23.47
	20	2670.1	41391	1	99	10	2684.5	41535	1	0	23.56
	20	2665.1	41341	1	99	15	2682.2	41512	1	0	23.53
	<b>20</b>	<b>2660.2</b>	<b>41292</b>	<b>1</b>	<b>99</b>	<b>20</b>	<b>2680.0</b>	<b>41490</b>	<b>1</b>	<b>0</b>	<b>23.66</b>

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	2499.3	39683	25	0	20	2511.0	39800	100	0	22.19
	10	2501.3	39703	50	0	15	2513.3	39823	75	0	22.22
	10	2501.5	39705	50	0	20	2515.9	39849	100	0	22.17
	15	2503.5	39725	75	0	10	2515.5	39845	50	0	22.17
	15	2503.5	39725	75	0	15	2518.5	39875	75	0	22.19
	15	2503.8	39728	75	0	20	2520.9	39899	100	0	22.21
	20	2506.0	39750	100	0	5	2517.7	39867	25	0	22.17
	20	2506.0	39750	100	0	10	2520.4	39894	50	0	22.20
	20	2506.0	39750	100	0	15	2523.1	39921	75	0	22.20
		<b>20</b>	<b>2506.0</b>	<b>39750</b>	<b>100</b>	<b>0</b>	<b>20</b>	<b>2525.8</b>	<b>39948</b>	<b>100</b>	<b>0</b>
Mid	5	2583.8	40528	25	0	20	2595.5	40645	100	0	22.19
	10	2585.9	40549	50	0	15	2597.9	40669	75	0	22.15
	10	2583.6	40526	50	0	20	2598.0	40670	100	0	22.20
	15	2588.1	40571	75	0	10	2600.1	40691	50	0	22.15
	15	2585.5	40545	75	0	15	2600.5	40695	75	0	22.16
	15	2583.3	40523	75	0	20	2600.4	40694	100	0	22.22
	20	2590.5	40595	100	0	5	2602.2	40712	25	0	22.15
	20	2588.1	40571	100	0	10	2602.5	40715	50	0	22.15
	20	2585.6	40546	100	0	15	2602.7	40717	75	0	22.22
		<b>20</b>	<b>2583.1</b>	<b>40521</b>	<b>100</b>	<b>0</b>	<b>20</b>	<b>2602.9</b>	<b>40719</b>	<b>100</b>	<b>0</b>
High	5	2668.3	41373	25	0	20	2680.0	41490	100	0	22.11
	10	2670.5	41395	50	0	15	2682.5	41515	75	0	22.06
	10	2665.6	41346	50	0	20	2680.0	41490	100	0	22.11
	15	2672.7	41417	75	0	10	2684.7	41537	50	0	22.10
	15	2667.5	41365	75	0	15	2682.5	41515	75	0	22.14
	15	2662.9	41319	75	0	20	2680.0	41490	100	0	22.21
	20	2675.0	41440	100	0	5	2686.7	41557	25	0	22.04
	20	2670.1	41391	100	0	10	2684.5	41535	50	0	22.12
	20	2665.1	41341	100	0	15	2682.2	41512	75	0	22.19
		<b>20</b>	<b>2660.2</b>	<b>41292</b>	<b>100</b>	<b>0</b>	<b>20</b>	<b>2680.0</b>	<b>41490</b>	<b>100</b>	<b>0</b>

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	10	2520.4	39894	1	0	23.57
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	23.31
High	20	2660.2	41292	1	99	20	2680.0	41490	1	0	23.32
Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0	21.71
Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0	21.27
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	21.17

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	10	2520.4	39894	1	0	22.75
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	22.46
High	20	2660.2	41292	1	99	20	2680.0	41490	1	0	22.51
Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0	21.65
Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0	21.15
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	21.10

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	2506.0	39750	1	99	10	2520.4	39894	1	0	19.82
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	19.33
High	20	2660.2	41292	1	99	20	2680.0	41490	1	0	19.32
Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0	19.80
Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0	19.14
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	19.20

Note:

Modulation : 256QAM

## 9.2 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	<b>5</b>	<b>39683</b>	<b>1/24</b>	<b>20</b>	<b>39800</b>	<b>1/0</b>	<b>-22.55</b>	<b>14.31</b>	<b>10.55</b>	<b>2.57</b>	<b>H</b>	<b>0.169</b>	<b>22.29</b>
	10	39703	1/49	15	39823	1/0	-22.79	14.10	10.59	2.57	H	0.163	22.12
	10	39705	1/49	20	39849	1/0	-22.83	14.06	10.59	2.57	H	0.161	22.08
	15	39725	1/74	10	39845	1/0	-23.14	13.75	10.59	2.57	H	0.150	21.77
	15	39725	1/74	15	39875	1/0	-23.40	13.49	10.59	2.57	H	0.142	21.51
	15	39728	1/74	20	39899	1/0	-22.93	13.96	10.59	2.57	H	0.158	21.98
	20	39750	1/99	5	39867	1/0	-22.91	13.98	10.59	2.57	H	0.158	22.00
	20	39750	1/99	10	39894	1/0	-22.96	13.93	10.59	2.57	H	0.157	21.95
	20	39750	1/99	15	39921	1/0	-22.93	13.95	10.64	2.59	H	0.158	22.00
	20	39750	1/99	20	39948	1/0	-23.08	13.80	10.64	2.59	H	0.153	21.85
Mid	5	40528	1/24	20	40645	1/0	-22.26	14.96	10.64	2.71	H	0.195	22.89
	10	40549	1/49	15	40669	1/0	-22.97	14.25	10.64	2.71	H	0.165	22.18
	10	40526	1/49	20	40670	1/0	-23.02	14.20	10.64	2.71	H	0.163	22.13
	15	40571	1/74	10	40691	1/0	-22.97	14.14	10.64	2.68	H	0.162	22.10
	15	40545	1/74	15	40695	1/0	-22.86	14.36	10.64	2.71	H	0.169	22.29
	15	40523	1/74	20	40694	1/0	-22.92	14.30	10.64	2.71	H	0.167	22.23
	20	40595	1/99	5	40712	1/0	-22.93	14.18	10.64	2.68	H	0.164	22.14
	20	40571	1/99	10	40715	1/0	-23.21	13.90	10.64	2.68	H	0.153	21.86
	20	40546	1/99	15	40717	1/0	-23.01	14.10	10.64	2.68	H	0.161	22.06
	20	40521	1/99	20	40719	1/0	-22.66	14.56	10.64	2.71	H	0.177	22.49
High	5	41373	1/24	20	41490	1/0	-23.79	13.63	10.72	2.74	H	0.145	21.61
	10	41395	1/49	15	41515	1/0	-23.72	13.70	10.72	2.74	H	0.147	21.68
	10	41346	1/49	20	41490	1/0	-23.92	13.50	10.72	2.74	H	0.141	21.48
	15	41417	1/74	10	41537	1/0	-23.92	13.51	10.72	2.75	H	0.141	21.48
	<b>15</b>	<b>41365</b>	<b>1/74</b>	<b>15</b>	<b>41515</b>	<b>1/0</b>	<b>-23.71</b>	<b>13.71</b>	<b>10.72</b>	<b>2.74</b>	<b>H</b>	<b>0.148</b>	<b>21.69</b>
	15	41319	1/74	20	41490	1/0	-23.73	13.69	10.71	2.73	H	0.147	21.67
	20	41440	1/99	5	41557	1/0	-24.00	13.43	10.72	2.75	H	0.138	21.40
	20	41391	1/99	10	41535	1/0	-24.10	13.32	10.72	2.74	H	0.135	21.30
	20	41341	1/99	15	41512	1/0	-23.83	13.59	10.72	2.74	H	0.144	21.57
	20	41292	1/99	20	41490	1/0	-24.05	13.37	10.71	2.73	H	0.136	21.35

Note:

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

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
<b>5</b>	<b>39683</b>	<b>1/24</b>	<b>20</b>	<b>39800</b>	<b>1/0</b>	<b>-22.97</b>	<b>13.89</b>	<b>10.55</b>	<b>2.57</b>	<b>H</b>	<b>0.154</b>	<b>21.87</b>
5	40528	1/24	20	40645	1/0	-22.92	14.30	10.64	2.71	H	0.167	22.23
10	40549	1/49	15	40669	1/0	-23.59	13.63	10.64	2.71	H	0.143	21.56
10	40526	1/49	20	40670	1/0	-23.40	13.82	10.64	2.71	H	0.150	21.75
15	40571	1/74	10	40691	1/0	-23.40	13.71	10.64	2.68	H	0.147	21.67
15	40545	1/74	15	40695	1/0	-23.18	14.04	10.64	2.71	H	0.157	21.97
15	40523	1/74	20	40694	1/0	-23.42	13.80	10.64	2.71	H	0.149	21.73
20	40595	1/99	5	40712	1/0	-23.30	13.81	10.64	2.68	H	0.150	21.77
20	40571	1/99	10	40715	1/0	-23.61	13.50	10.64	2.68	H	0.140	21.46
20	40546	1/99	15	40717	1/0	-23.33	13.78	10.64	2.68	H	0.149	21.74
20	40521	1/99	20	40719	1/0	-23.24	13.98	10.64	2.71	H	0.155	21.91
<b>15</b>	<b>41365</b>	<b>1/74</b>	<b>15</b>	<b>41515</b>	<b>1/0</b>	<b>-24.28</b>	<b>13.14</b>	<b>10.72</b>	<b>2.74</b>	<b>H</b>	<b>0.129</b>	<b>21.12</b>

Note:

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

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
<b>5</b>	<b>39683</b>	<b>1/24</b>	<b>20</b>	<b>39800</b>	<b>1/0</b>	<b>-23.98</b>	<b>12.88</b>	<b>10.55</b>	<b>2.57</b>	<b>H</b>	<b>0.122</b>	<b>20.86</b>
5	40528	1/24	20	40645	1/0	-23.82	13.40	10.64	2.71	H	0.136	21.33
10	40549	1/49	15	40669	1/0	-24.17	13.05	10.64	2.71	H	0.125	20.98
10	40526	1/49	20	40670	1/0	-24.46	12.76	10.64	2.71	H	0.117	20.69
15	40571	1/74	10	40691	1/0	-24.26	12.85	10.64	2.68	H	0.120	20.81
15	40545	1/74	15	40695	1/0	-24.11	13.11	10.64	2.71	H	0.127	21.04
15	40523	1/74	20	40694	1/0	-24.38	12.84	10.64	2.71	H	0.119	20.77
20	40595	1/99	5	40712	1/0	-24.22	12.89	10.64	2.68	H	0.121	20.85
20	40571	1/99	10	40715	1/0	-24.28	12.83	10.64	2.68	H	0.120	20.79
20	40546	1/99	15	40717	1/0	-24.07	13.04	10.64	2.68	H	0.126	21.00
20	40521	1/99	20	40719	1/0	-23.98	13.24	10.64	2.71	H	0.131	21.17
<b>15</b>	<b>41365</b>	<b>1/74</b>	<b>15</b>	<b>41515</b>	<b>1/0</b>	<b>-25.15</b>	<b>12.27</b>	<b>10.72</b>	<b>2.74</b>	<b>H</b>	<b>0.106</b>	<b>20.25</b>

Note:

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

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
<b>5</b>	<b>39683</b>	<b>1/24</b>	<b>20</b>	<b>39800</b>	<b>1/0</b>	<b>-27.20</b>	<b>9.66</b>	<b>10.55</b>	<b>2.57</b>	<b>H</b>	<b>0.058</b>	<b>17.64</b>
5	40528	1/24	20	40645	1/0	-26.98	10.24	10.64	2.71	H	0.066	18.17
10	40549	1/49	15	40669	1/0	-27.08	10.14	10.64	2.71	H	0.064	18.07
10	40526	1/49	20	40670	1/0	-27.27	9.95	10.64	2.71	H	0.061	17.88
15	40571	1/74	10	40691	1/0	-27.24	9.87	10.64	2.68	H	0.061	17.83
15	40545	1/74	15	40695	1/0	-26.97	10.25	10.64	2.71	H	0.066	18.18
15	40523	1/74	20	40694	1/0	-27.33	9.89	10.64	2.71	H	0.061	17.82
20	40595	1/99	5	40712	1/0	-27.27	9.84	10.64	2.68	H	0.060	17.80
20	40571	1/99	10	40715	1/0	-27.16	9.95	10.64	2.68	H	0.062	17.91
20	40546	1/99	15	40717	1/0	-27.17	9.94	10.64	2.68	H	0.062	17.90
20	40521	1/99	20	40719	1/0	-27.13	10.09	10.64	2.71	H	0.063	18.02
<b>15</b>	<b>41365</b>	<b>1/74</b>	<b>15</b>	<b>41515</b>	<b>1/0</b>	<b>-28.38</b>	<b>9.04</b>	<b>10.72</b>	<b>2.74</b>	<b>H</b>	<b>0.050</b>	<b>17.02</b>

Note:

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

### 9.3 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	10	39894	2520.4	1/0	4.0100	31.955	-75.661	-43.71
Mid	5	40528	2583.8	1/24	20	40645	2595.5	1/0	8.0244	32.570	-76.236	-43.67
High	20	41292	2660.2	1/99	20	41490	2680.0	1/0	8.2453	32.570	-76.417	-43.85
Low	20	39750	2506.0	1/0	10	39894	2520.4	1/49	8.8430	32.570	-76.464	-43.89
Mid	5	40528	2583.8	1/0	20	40645	2595.5	1/99	8.8470	32.570	-75.937	-43.37
High	20	41292	2660.2	1/0	20	41490	2680.0	1/99	5.7722	32.570	-76.432	-43.86
Low	20	39750	2506.0	100/0	20	39948	2525.8	100/0	8.2852	32.570	-76.014	-43.44
Mid	20	40521	2583.1	100/0	20	40719	2602.9	100/0	9.9756	32.570	-75.688	-43.12
High	20	41292	2660.2	100/0	20	41490	2680.0	100/0	8.8829	32.570	-76.473	-43.90

**Note:**

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

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

4. Limit : -13.0 dBm

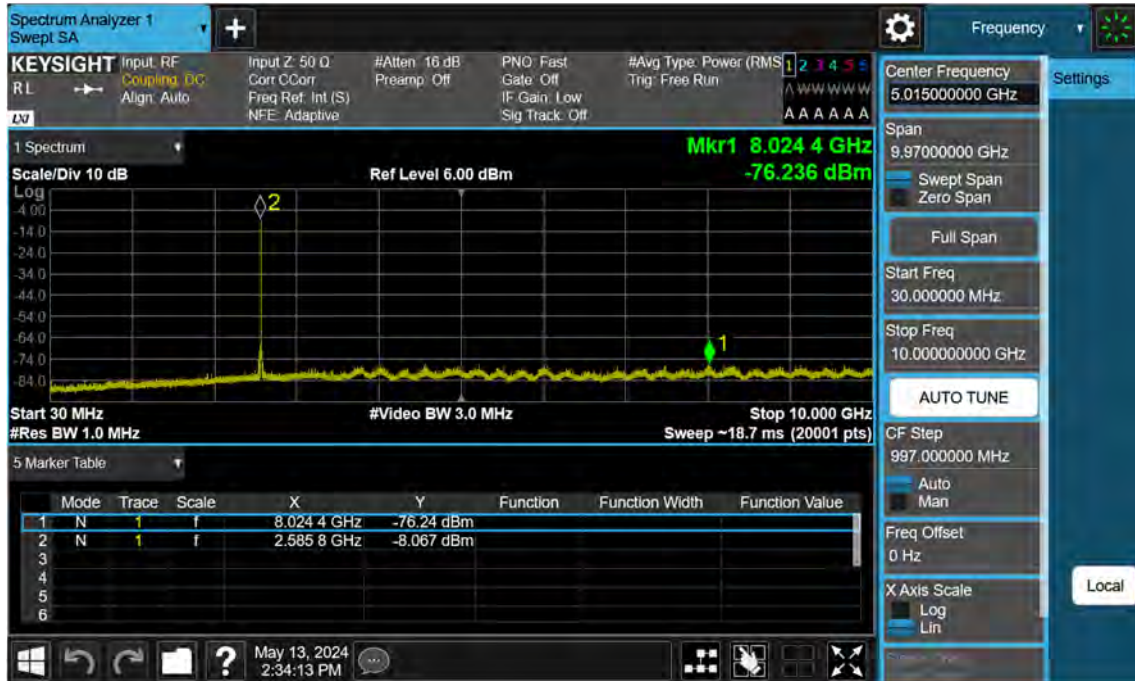


Frequency Range : 30 MHz ~ 10 GHz

PCC 20 MHz Ch39750 RB1 Offset99 SCC 10 MHz Ch39894 RB1 Offset0



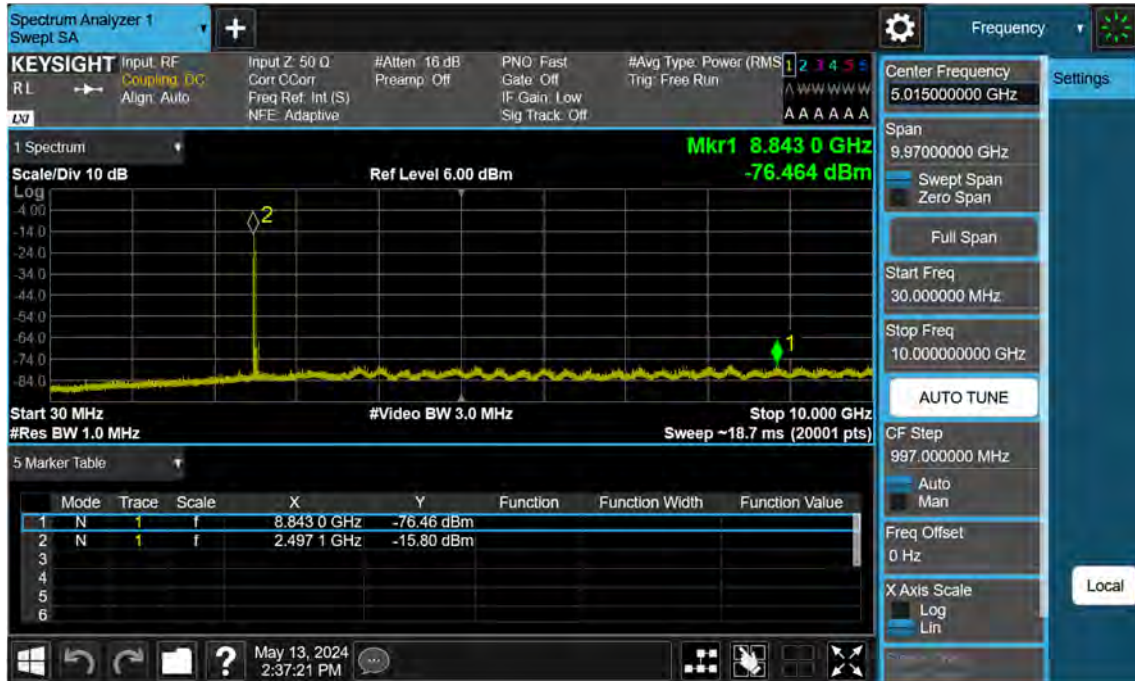
PCC 5 MHz Ch40528 RB1 Offset24 SCC 20 MHz Ch40645 RB1 Offset0



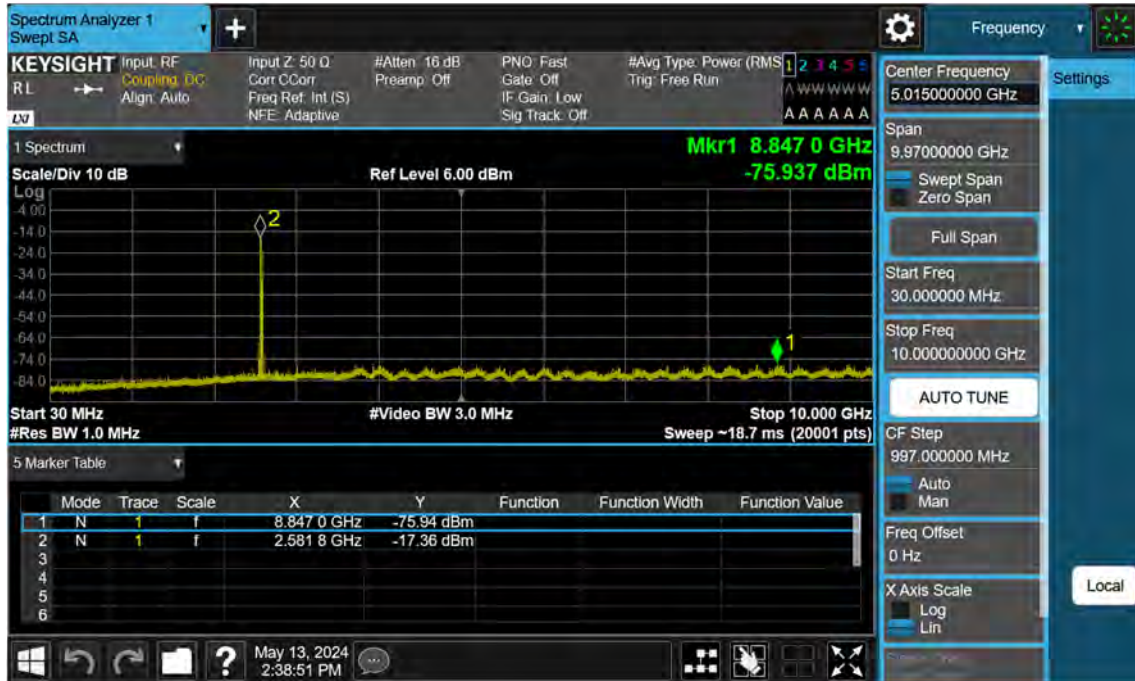
PCC 20 MHz Ch41292 RB1 Offset99 SCC 20 MHz Ch41490 RB1 Offset0



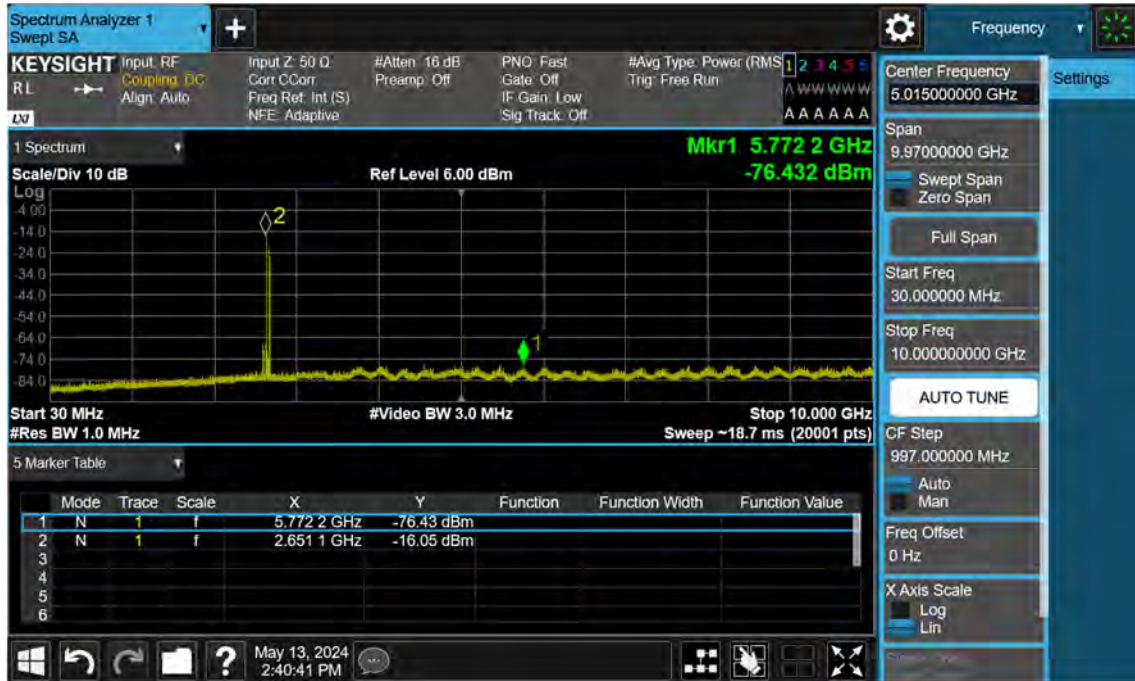
PCC 20 MHz Ch39750 RB1 Offset0 SCC 10 MHz Ch39894 RB1 Offset49



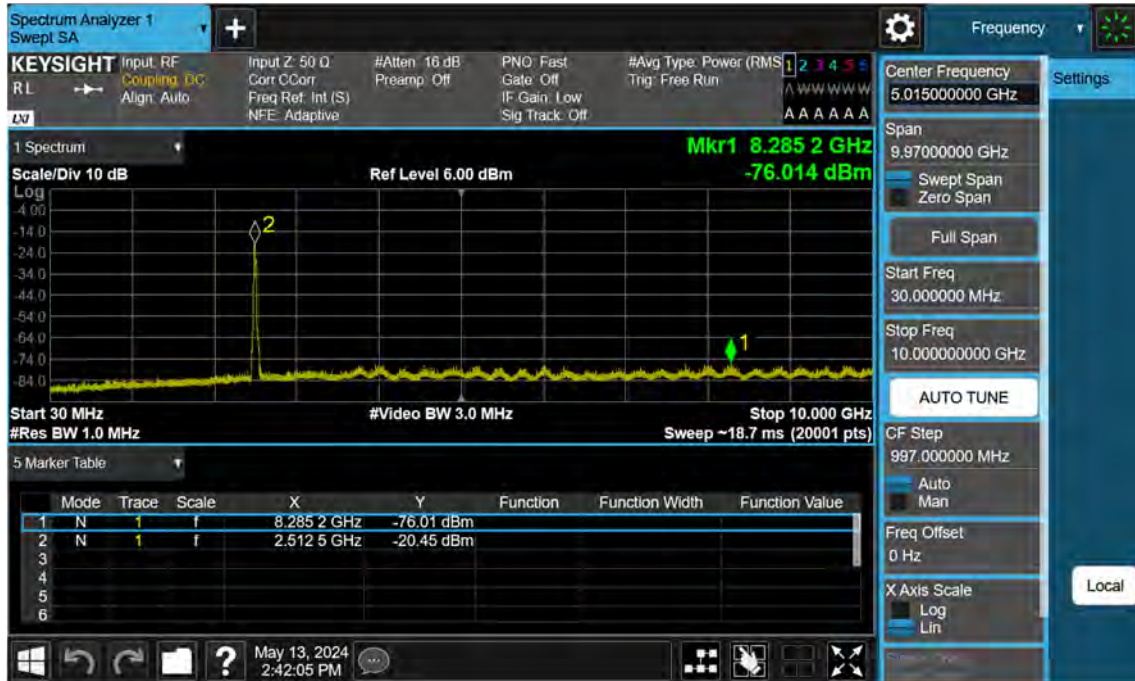
PCC 5 MHz Ch40528 RB1 Offset0 SCC 20 MHz Ch40645 RB1 Offset99



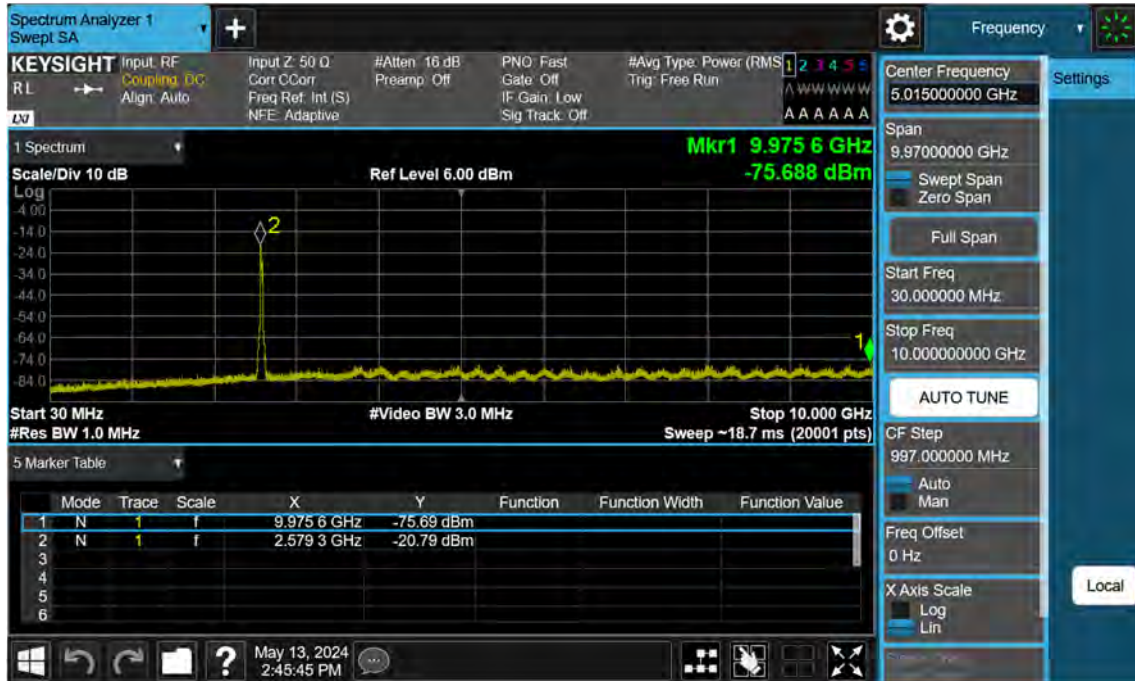
PCC 20 MHz Ch41292 RB1 Offset0 SCC 20 MHz Ch41490 RB1 Offset99



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

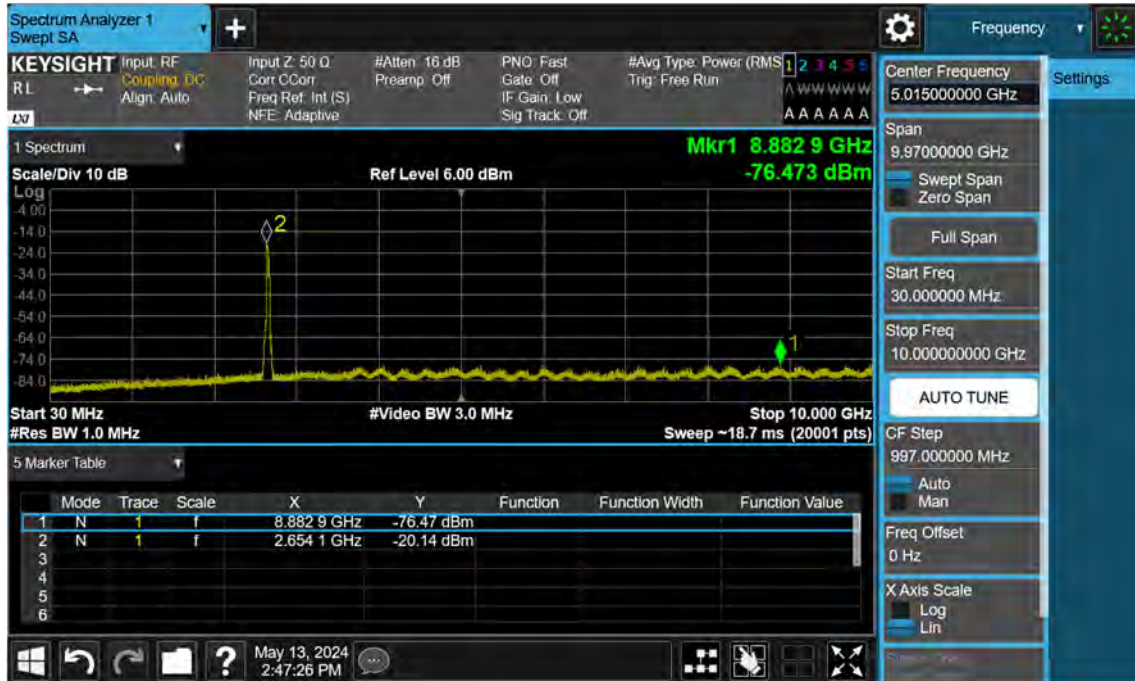


PCC 20 MHz Ch40521 RB100 Offset0 SCC 20 MHz Ch40719 RB100 Offset0



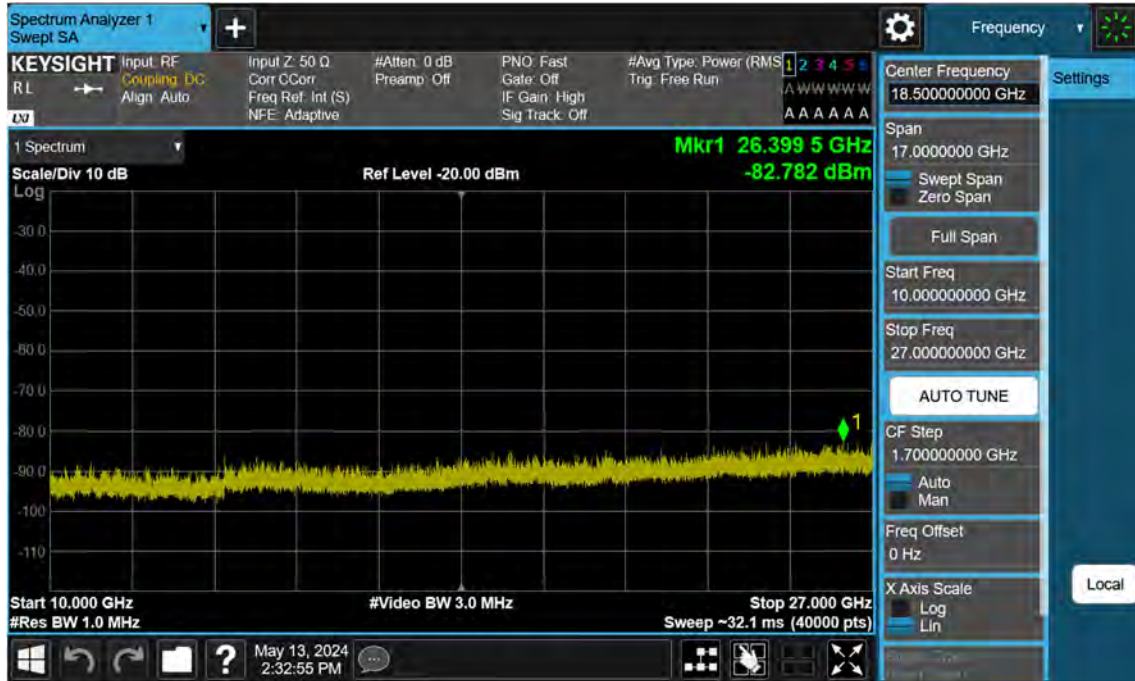


PCC 20 MHz Ch41292 RB100 Offset0 SCC 20 MHz Ch41490 RB100 Offset0



Frequency Range : 10 GHz ~ 20 GHz

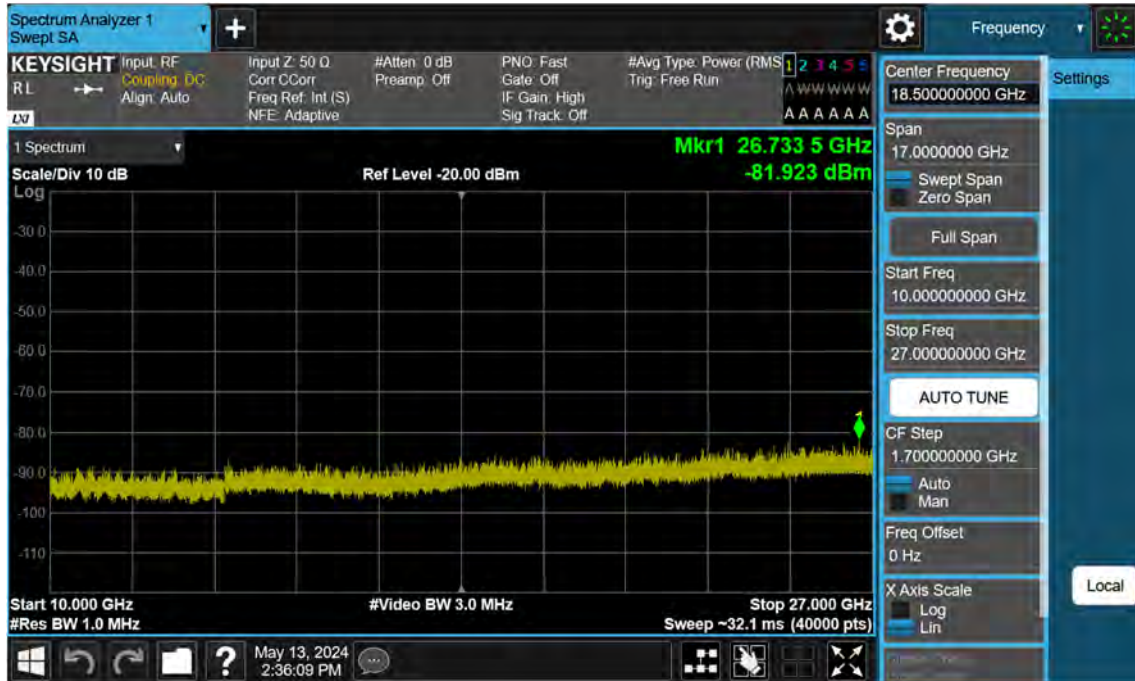
PCC 20 MHz Ch39750 RB1 Offset99 SCC 10 MHz Ch39894 RB1 Offset0



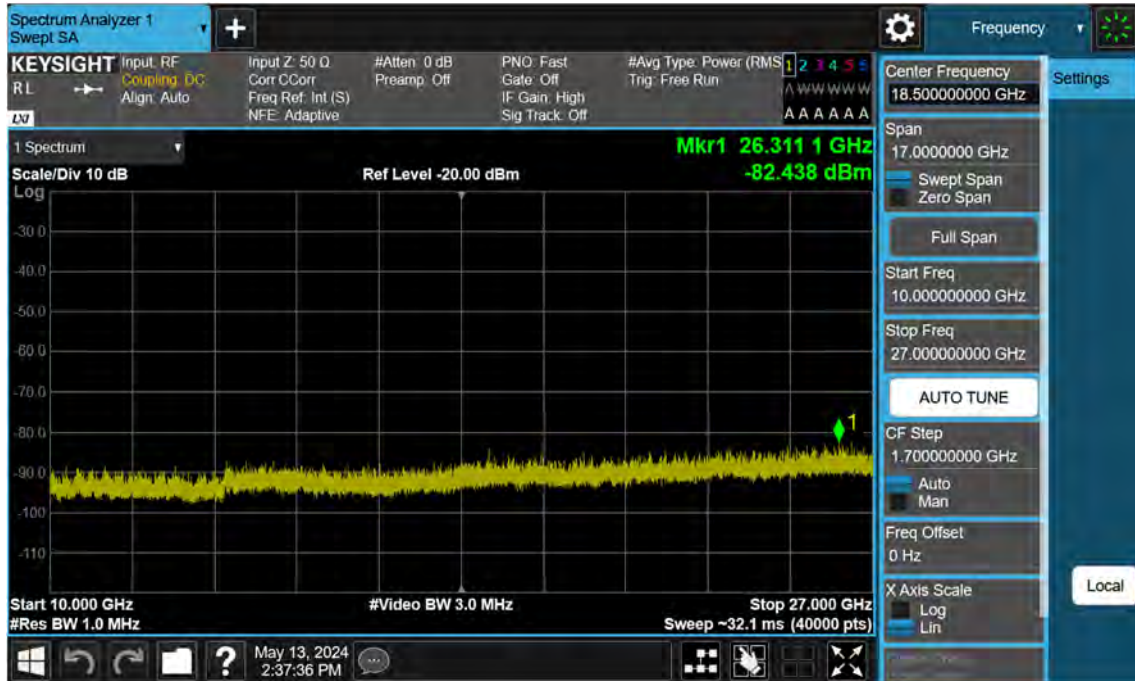
PCC 5 MHz Ch40528 RB1 Offset24 SCC 20 MHz Ch40645 RB1 Offset0



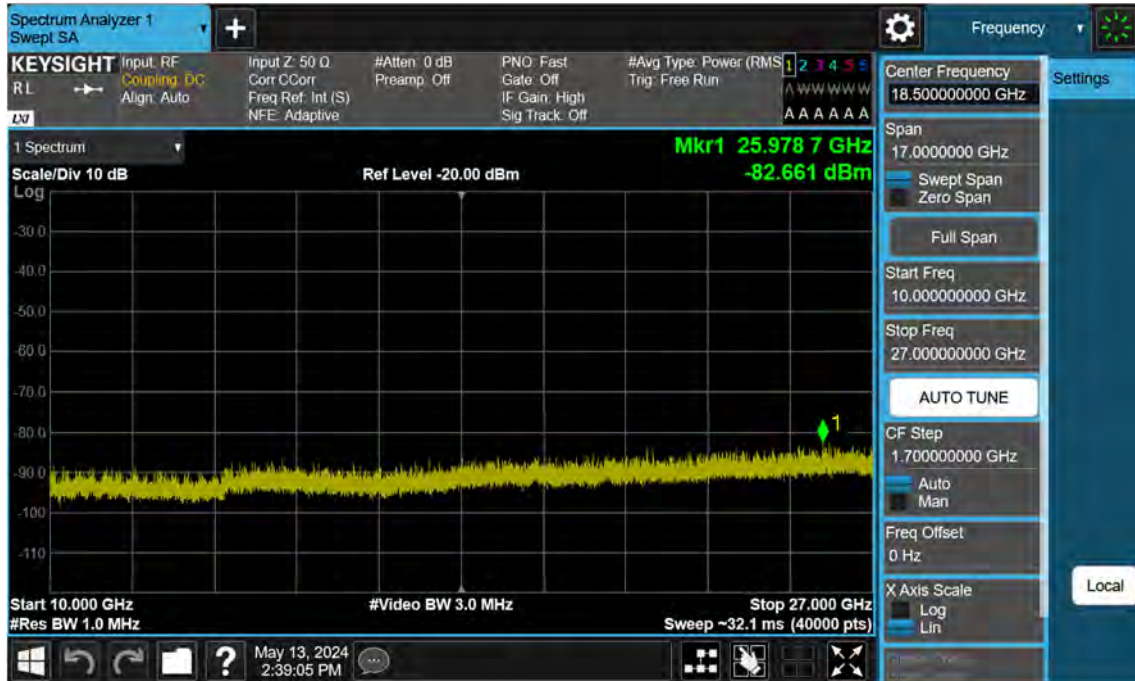
PCC 20 MHz Ch41292 RB1 Offset99 SCC 20 MHz Ch41490 RB1 Offset0



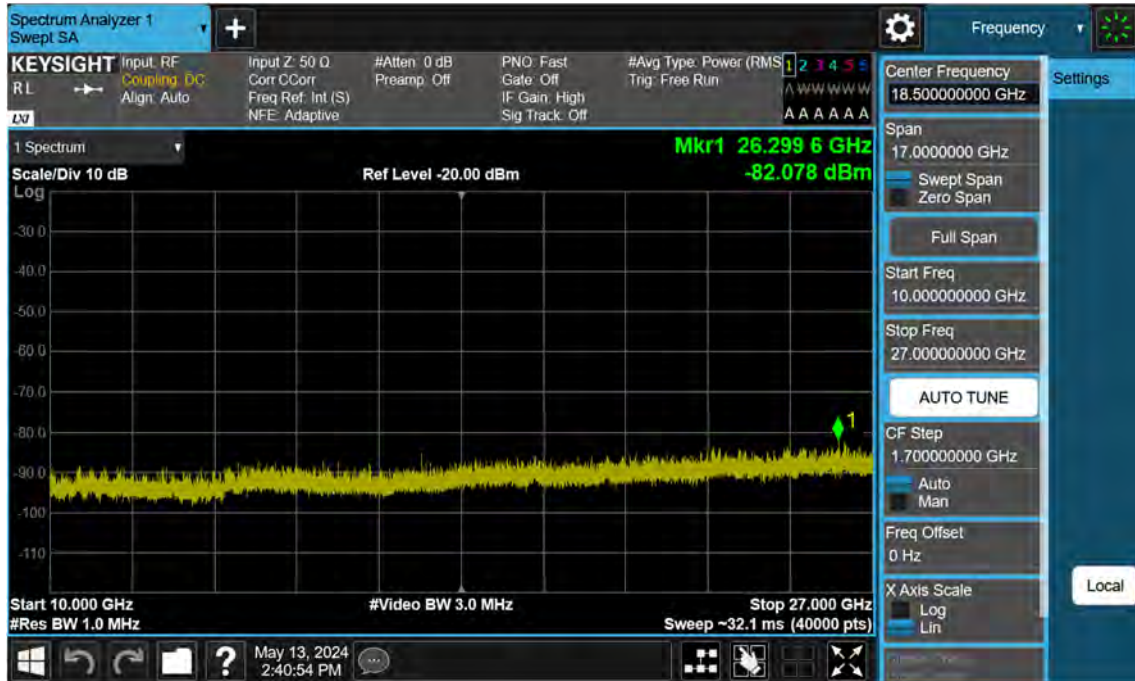
PCC 20 MHz Ch39750 RB1 Offset0 SCC 10 MHz Ch39894 RB1 Offset49



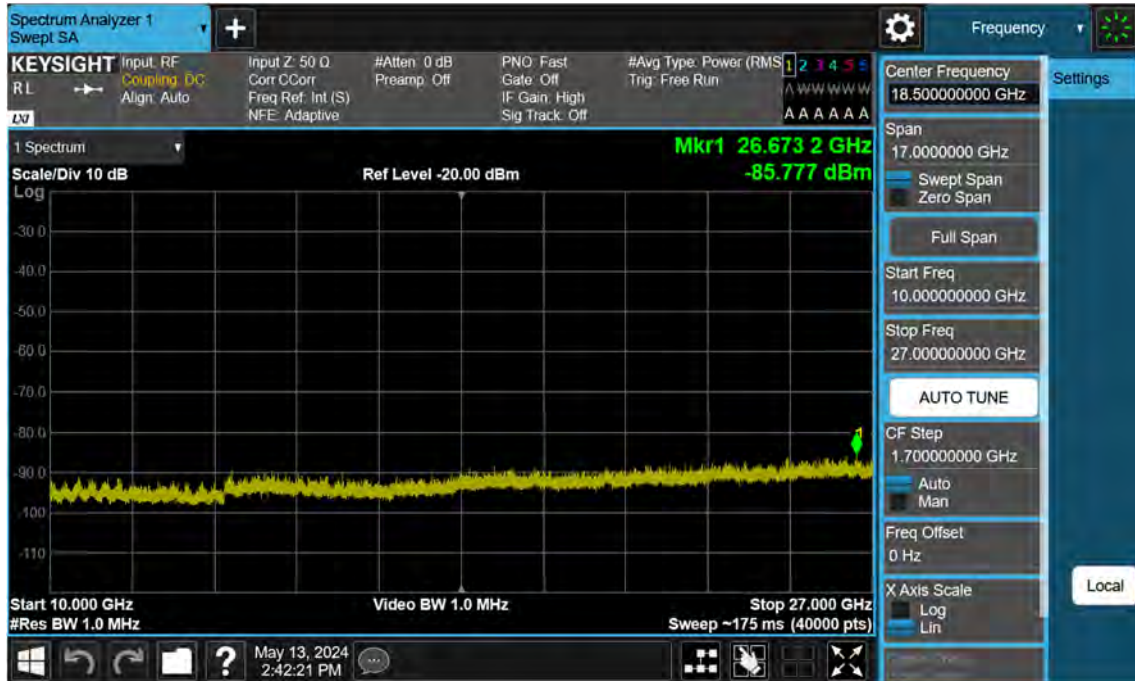
PCC 5 MHz Ch40528 RB1 Offset0 SCC 20 MHz Ch40645 RB1 Offset99



PCC 20 MHz Ch41292 RB1 Offset0 SCC 20 MHz Ch41490 RB1 Offset99



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





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

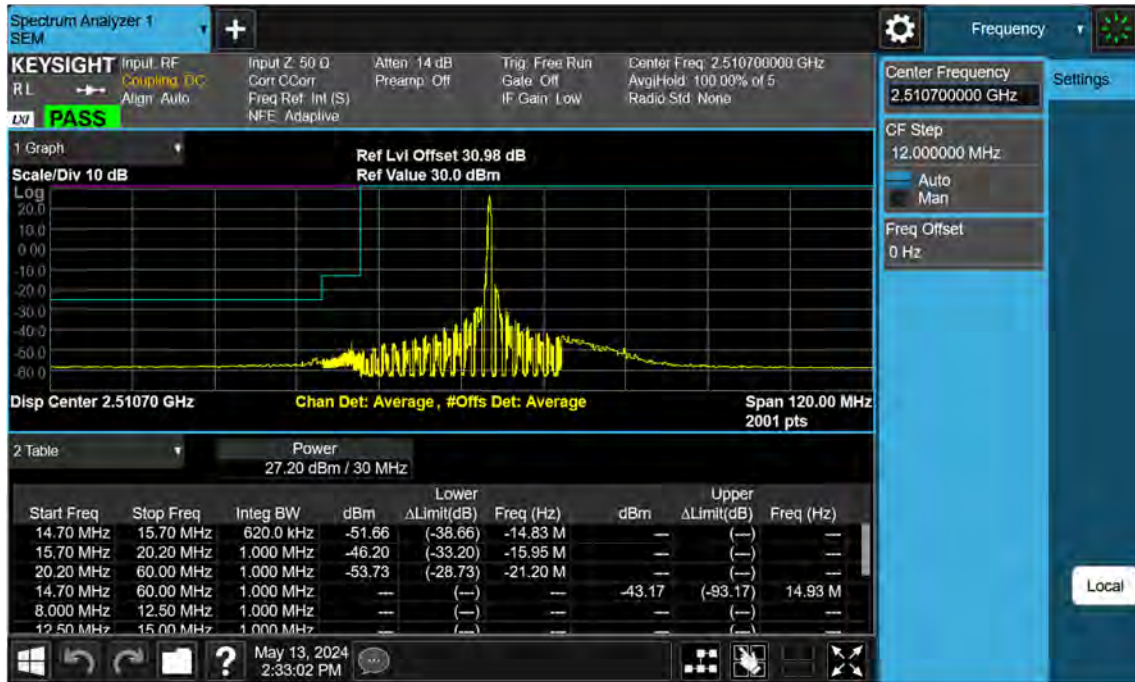


PCC 20 MHz Ch41292 RB100 Offset0 SCC 20 MHz Ch41490 RB100 Offset0

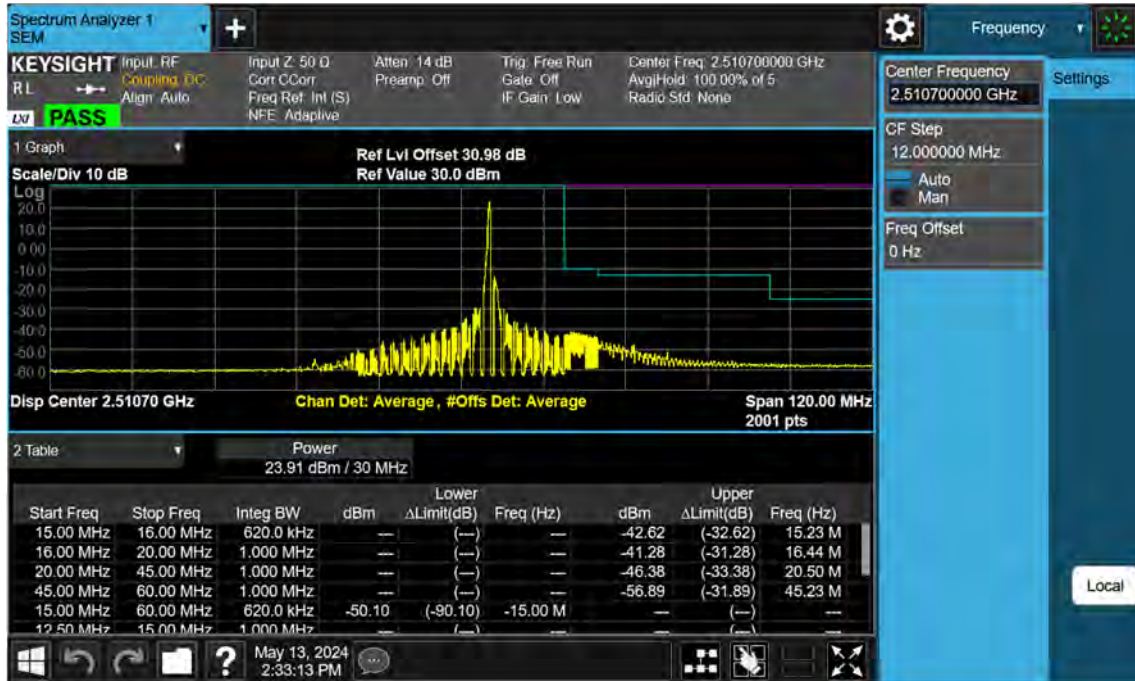


### 9.4 Channel Edge

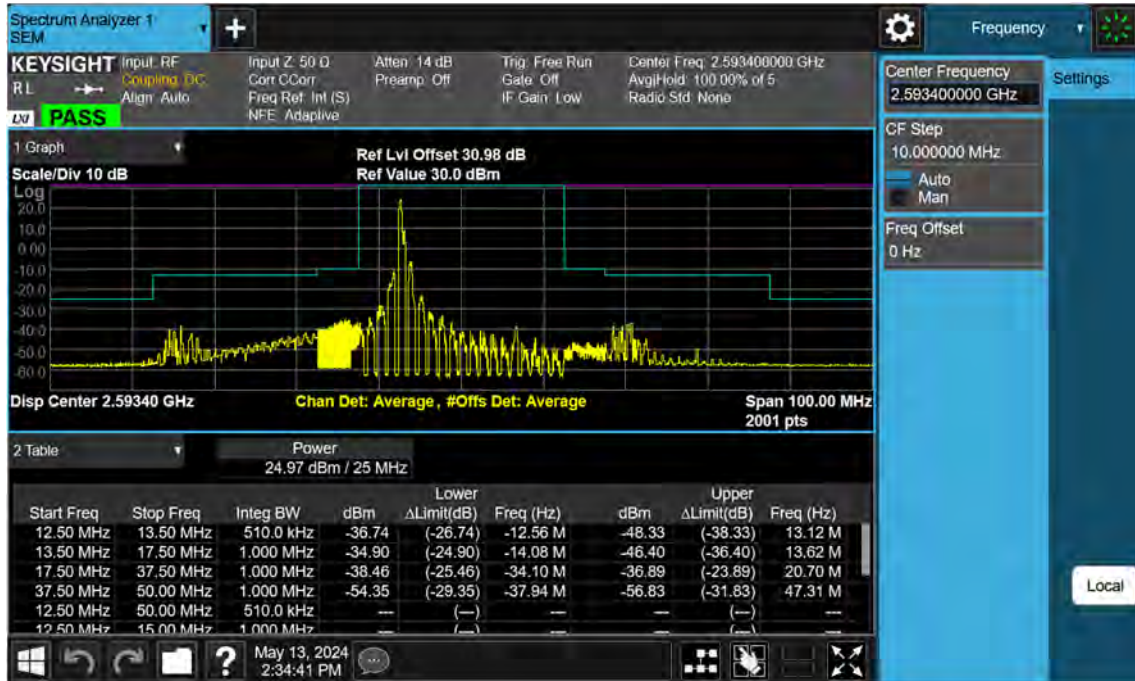
PCC 20 MHz Ch39750 RB1 Offset99, SCC 10 MHz Ch39894 RB1 Offset0-1



PCC 20 MHz Ch39750 RB1 Offset99, SCC 10 MHz Ch39894 RB1 Offset0-2



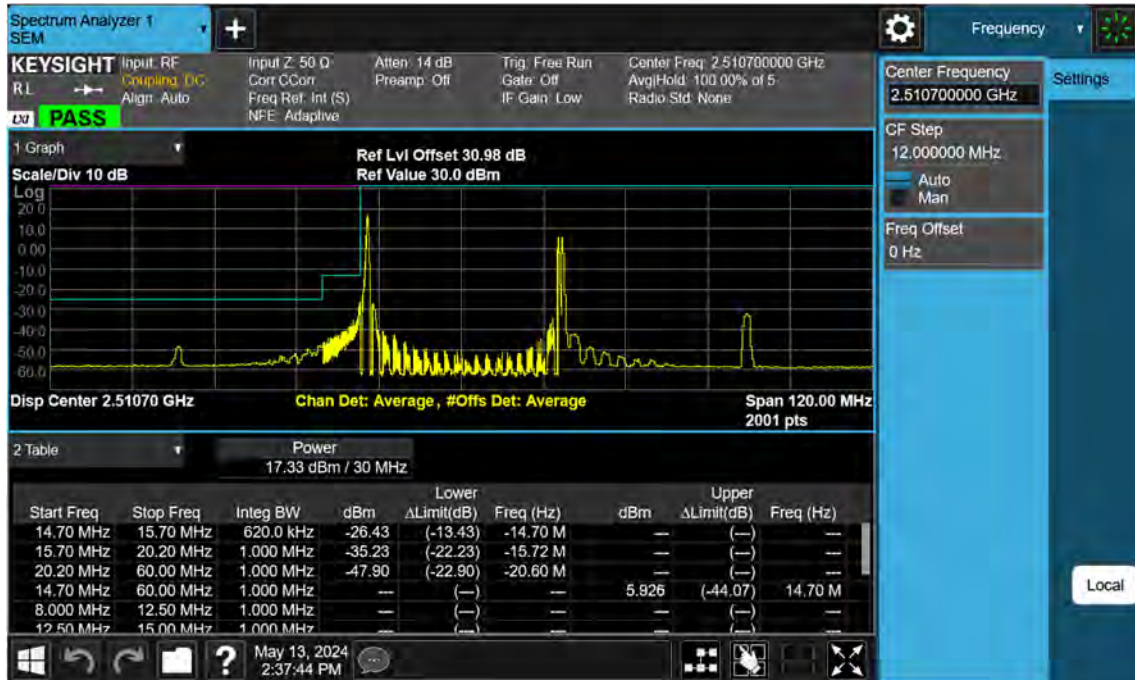
PCC 5 MHz Ch40528 RB1 Offset24, SCC 20 MHz Ch40645 RB1 Offset0



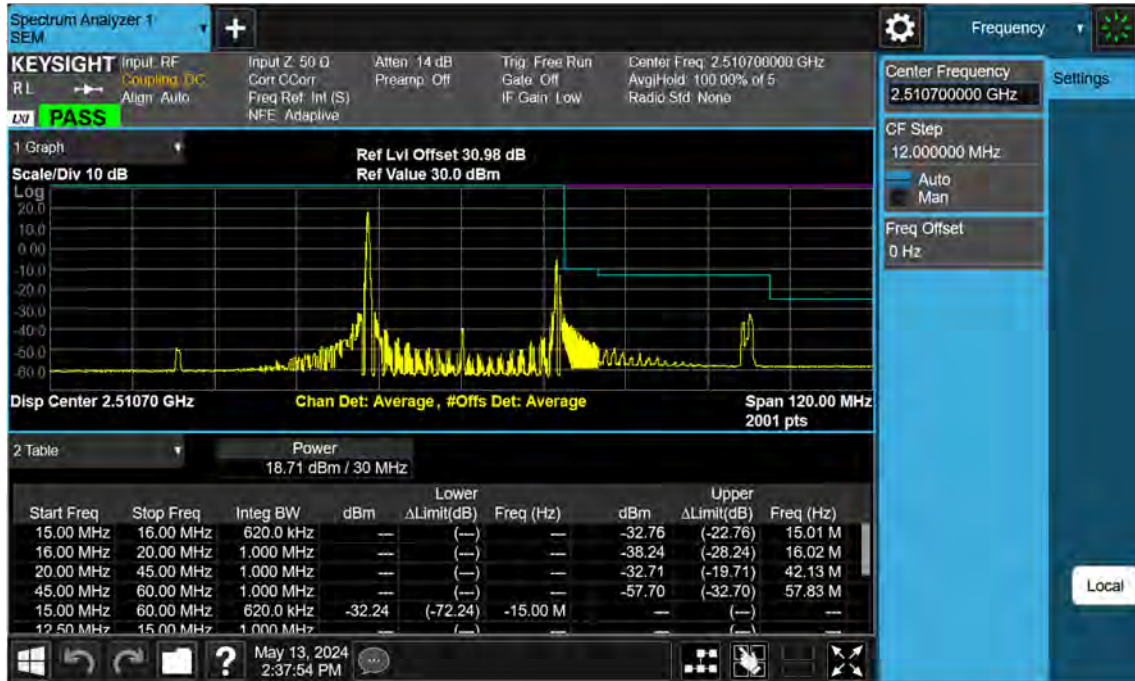
PCC 20 MHz Ch41292 RB1 Offset99, SCC 20 MHz Ch41490 RB1 Offset0



PCC 20 MHz Ch39750 RB1 Offset0, SCC 10 MHz Ch39894 RB1 Offset49-1

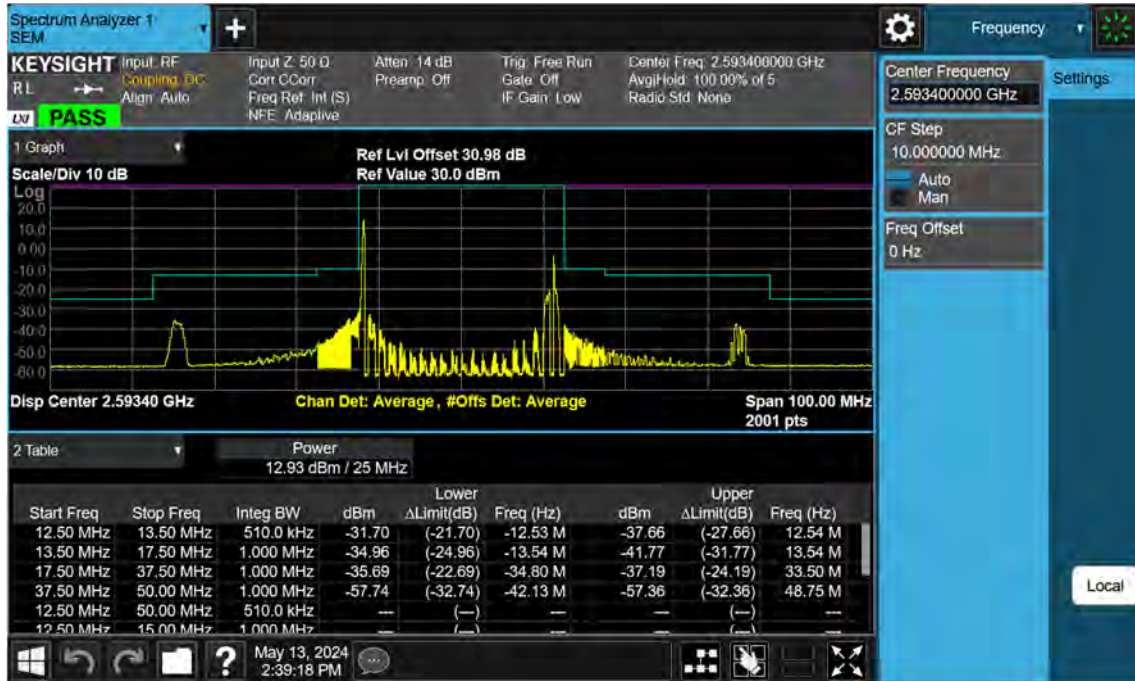


PCC 20 MHz Ch39750 RB1 Offset0, SCC 10 MHz Ch39894 RB1 Offset49-2

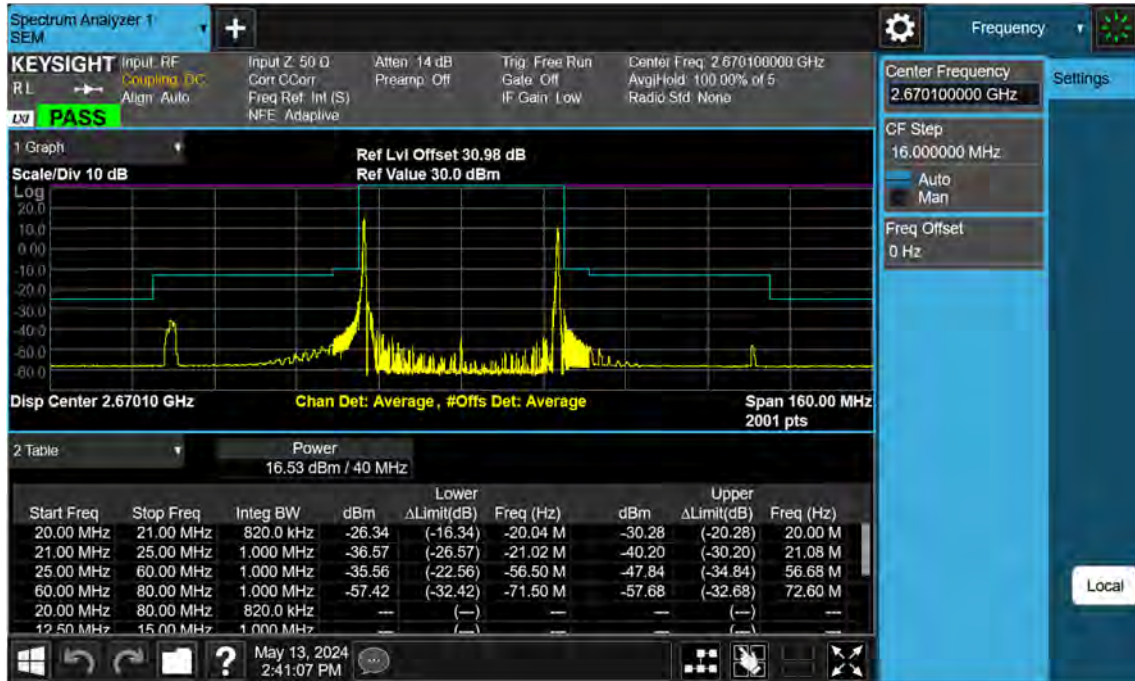




PCC 5 MHz Ch40528 RB1 Offset0, SCC 20 MHz Ch40645 RB1 Offset99



PCC 20 MHz Ch41292 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99



PCC 20 MHz Ch39750 RB100 Offset0, SCC 20 MHz Ch39948 RB100 Offset0-1



PCC 20 MHz Ch39750 RB100 Offset0, SCC 20 MHz Ch39948 RB100 Offset0-2



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



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



### 9.5 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.018	-0.021	2499.29989	2510.99985
100 %		-30	-0.023	-0.009	2499.29988	2510.99996
100 %		-20	0.000	-0.010	2499.29992	2510.99982
100 %		-10	-0.025	-0.014	2499.29993	2510.99990
100 %		0	-0.003	-0.015	2499.29992	2510.99996
100 %		10	-0.021	-0.007	2499.29987	2510.99987
100 %		30	-0.005	-0.002	2499.29988	2510.99999
100 %		40	-0.008	-0.002	2499.29993	2510.99992
100 %		50	-0.011	-0.008	2499.29991	2510.99985
Batt. Endpoint	3.300	20	-0.008	-0.001	2499.29990	2510.99990

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.017	-0.020	2501.49981	2515.89984
100 %		-30	-0.004	-0.002	2501.49987	2515.89995
100 %		-20	0.003	-0.014	2501.49992	2515.89987
100 %		-10	-0.010	-0.002	2501.49990	2515.89995
100 %		0	0.003	-0.013	2501.49998	2515.89991
100 %		10	-0.031	0.001	2501.49981	2515.89995
100 %		30	-0.023	-0.005	2501.49979	2515.89987
100 %		40	0.003	-0.009	2501.49988	2515.89991
100 %		50	-0.012	0.009	2501.49987	2515.89994
Batt. Endpoint		3.300	20	-0.013	-0.011	2501.49994



- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.011	0.001	2503.79993	2520.89988
100 %		-30	0.001	0.002	2503.79992	2520.89994
100 %		-20	-0.007	-0.015	2503.79996	2520.89990
100 %		-10	-0.012	-0.004	2503.79985	2520.89984
100 %		0	0.006	-0.016	2503.79996	2520.89987
100 %		10	-0.007	0.003	2503.79989	2520.90000
100 %		30	-0.006	-0.012	2503.79991	2520.89993
100 %		40	0.004	-0.009	2503.79990	2520.89997
100 %		50	-0.005	0.003	2503.79992	2520.90001
Batt. Endpoint	3.300	20	-0.006	-0.005	2503.79989	2520.89988

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.008	-0.004	2505.99984	2525.79994
100 %		-30	0.005	-0.018	2505.99997	2525.79991
100 %		-20	-0.014	-0.008	2505.99987	2525.79991
100 %		-10	-0.010	-0.002	2505.99988	2525.79994
100 %		0	-0.012	-0.009	2505.99988	2525.79984
100 %		10	-0.005	-0.011	2505.99992	2525.79986
100 %		30	-0.023	-0.019	2505.99979	2525.79995
100 %		40	0.003	-0.018	2505.99986	2525.79991
100 %		50	-0.012	-0.018	2505.99992	2525.79994
Batt. Endpoint		3.300	20	-0.010	-0.014	2505.99981

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.021	-0.006	2668.29989	2679.99985
100 %		-30	-0.015	-0.007	2668.29988	2679.99991
100 %		-20	-0.008	0.007	2668.29987	2679.99994
100 %		-10	0.003	-0.008	2668.29995	2679.99992
100 %		0	-0.017	-0.020	2668.29997	2679.99988
100 %		10	-0.018	-0.007	2668.29994	2679.99989
100 %		30	0.000	-0.010	2668.29995	2679.99989
100 %		40	0.002	-0.023	2668.29989	2679.99990
100 %		50	-0.007	-0.002	2668.29992	2679.99996
Batt. Endpoint		3.300	20	-0.016	0.002	2668.29981

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.001	-0.024	2665.59995	2679.99986
100 %		-30	-0.022	-0.006	2665.59989	2679.99986
100 %		-20	-0.002	-0.008	2665.59994	2679.99982
100 %		-10	-0.014	0.007	2665.59996	2679.99997
100 %		0	-0.007	-0.019	2665.59989	2679.99986
100 %		10	-0.023	0.001	2665.59993	2679.99996
100 %		30	-0.023	-0.017	2665.59993	2679.99994
100 %		40	0.003	0.005	2665.60001	2679.99990
100 %		50	-0.028	-0.022	2665.59993	2679.99979
Batt. Endpoint	3.300	20	-0.007	-0.020	2665.59999	2679.99998

- ▣ 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 : 3.880 VDC
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.013	-0.011	2662.89985	2679.99990
100 %		-30	-0.016	-0.007	2662.89986	2679.99989
100 %		-20	-0.008	-0.001	2662.89992	2679.99989
100 %		-10	-0.001	-0.005	2662.89992	2679.99985
100 %		0	-0.010	0.003	2662.89984	2679.99992
100 %		10	-0.006	-0.017	2662.89995	2679.99990
100 %		30	-0.008	0.002	2662.89992	2679.99999
100 %		40	-0.006	-0.028	2662.89985	2679.99983
100 %		50	-0.011	-0.006	2662.89989	2679.99990
Batt. Endpoint	3.300	20	-0.010	-0.020	2662.89995	2679.99986

- ▣ 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 : 3.880 MHz
- ▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.004	-0.008	2660.19988	2679.99988
100 %		-30	0.006	-0.013	2660.19991	2679.99989
100 %		-20	-0.009	-0.012	2660.19991	2679.99988
100 %		-10	0.001	0.003	2660.19992	2679.99995
100 %		0	-0.016	-0.006	2660.19990	2679.99992
100 %		10	-0.002	-0.004	2660.19987	2679.99985
100 %		30	-0.013	-0.022	2660.19988	2679.99983
100 %		40	-0.005	-0.009	2660.19990	2679.99996
100 %		50	-0.003	0.003	2660.19992	2679.99991
Batt. Endpoint		3.300	20	0.006	-0.009	2660.19994

### 9.6 Radiated Spurious Emissions

- ▣ PCC Channel : 39683 (2499.3 MHz)
- ▣ PCC BW(MHz) : 5
- ▣ PCC RB/ RB Offset : 1/ 24
- ▣ SCC Channel : 39800 (2511.0 MHz)
- ▣ SCC BW(MHz) : 20
- ▣ SCC RB/ RB Offset : 1/ 0
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 010.30	-59.17	12.55	-69.19	3.88	H	-60.52
7 515.45	-59.37	10.80	-59.93	4.71	H	-53.84
10 020.60	-60.46	11.27	-56.17	5.54	H	-50.44

- ▣ PCC Channel : 40528 (2583.8 MHz)
- ▣ PCC BW(MHz) : 5
- ▣ PCC RB/ RB Offset : 1/ 24
- ▣ SCC Channel : 40645 (2595.5 MHz)
- ▣ SCC BW(MHz) : 20
- ▣ SCC RB/ RB Offset : 1/ 0
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 179.30	-59.43	12.52	-67.86	3.81	H	-59.15
7 768.95	-59.75	11.42	-59.61	4.78	H	-52.97
10 358.60	-60.61	11.46	-55.16	5.57	H	-49.27



- ▣ PCC Channel : 41365 (2667.5 MHz)
- ▣ PCC BW(MHz) : 15
- ▣ PCC RB/ RB Offset : 1/ 74
- ▣ SCC Channel : 41515 (2682.5 MHz)
- ▣ SCC BW(MHz) : 15
- ▣ SCC RB/ RB Offset : 1/ 0
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 350.00	-58.92	13.09	-67.86	3.91	H	-58.68
8 025.00	-61.09	10.73	-59.42	4.88	H	-53.57
10 700.00	-60.16	11.35	-56.06	5.81	H	-50.52

### 9.7 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	22.828
10	40549	2585.9	QPSK	50/0	15	40669	2597.9	QPSK	75/0	23.142
10	40526	2583.6	QPSK	50/0	20	40670	2598.0	QPSK	100/0	27.742
15	40571	2588.1	QPSK	75/0	10	40691	2600.1	QPSK	50/0	23.080
15	40545	2585.5	QPSK	75/0	15	40695	2600.5	QPSK	75/0	28.387
15	40523	2583.3	QPSK	75/0	20	40694	2600.4	QPSK	100/0	32.687
20	40595	2590.5	QPSK	100/0	5	40712	2602.2	QPSK	25/0	22.978
20	40571	2588.1	QPSK	100/0	10	40715	2602.5	QPSK	50/0	27.791
20	40546	2585.6	QPSK	100/0	15	40717	2602.7	QPSK	75/0	32.735
20	40521	2583.1	QPSK	100/0	20	40719	2602.9	QPSK	100/0	37.545

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	22.822
10	40549	2585.9	16QAM	50/0	15	40669	2597.9	16QAM	75/0	23.201
10	40526	2583.6	16QAM	50/0	20	40670	2598.0	16QAM	100/0	27.725
15	40571	2588.1	16QAM	75/0	10	40691	2600.1	16QAM	50/0	23.193
15	40545	2585.5	16QAM	75/0	15	40695	2600.5	16QAM	75/0	28.327
15	40523	2583.3	16QAM	75/0	20	40694	2600.4	16QAM	100/0	32.730
20	40595	2590.5	16QAM	100/0	5	40712	2602.2	16QAM	25/0	22.920
20	40571	2588.1	16QAM	100/0	10	40715	2602.5	16QAM	50/0	27.769
20	40546	2585.6	16QAM	100/0	15	40717	2602.7	16QAM	75/0	32.673
20	40521	2583.1	16QAM	100/0	20	40719	2602.9	16QAM	100/0	37.534

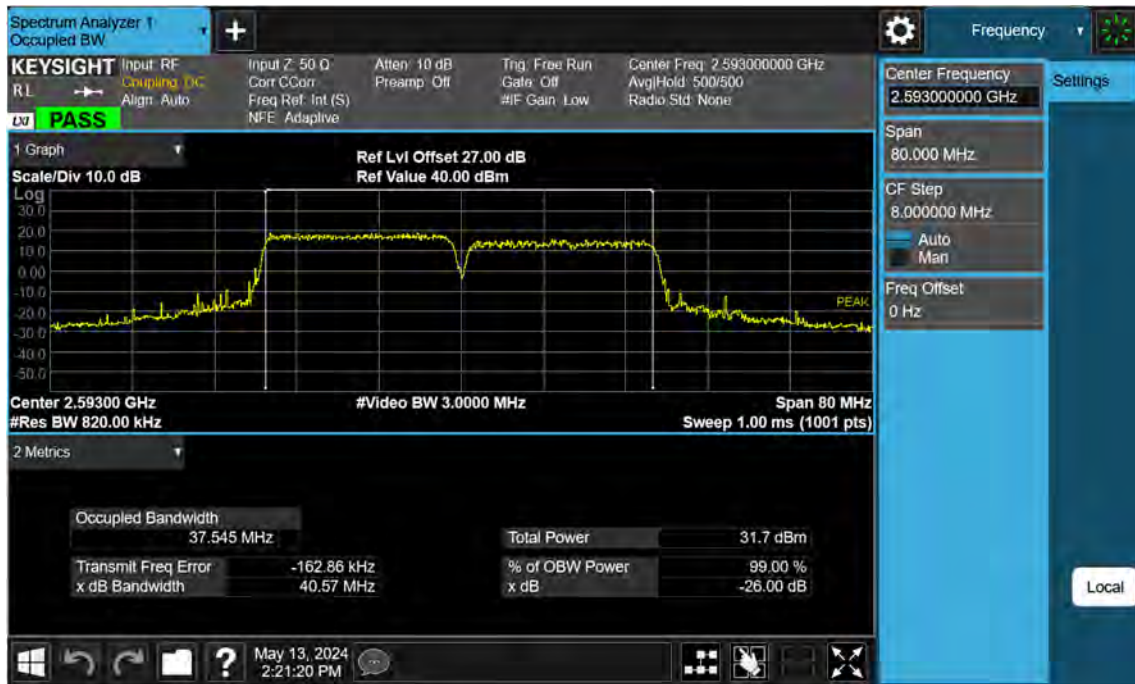
PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	64QAM	25/0	20	40645	2595.5	64QAM	100/0	22.899
10	40549	2585.9	64QAM	50/0	15	40669	2597.9	64QAM	75/0	23.211
10	40526	2583.6	64QAM	50/0	20	40670	2598.0	64QAM	100/0	27.760
15	40571	2588.1	64QAM	75/0	10	40691	2600.1	64QAM	50/0	23.171
15	40545	2585.5	64QAM	75/0	15	40695	2600.5	64QAM	75/0	28.325
15	40523	2583.3	64QAM	75/0	20	40694	2600.4	64QAM	100/0	32.621
20	40595	2590.5	64QAM	100/0	5	40712	2602.2	64QAM	25/0	22.949
20	40571	2588.1	64QAM	100/0	10	40715	2602.5	64QAM	50/0	27.869
20	40546	2585.6	64QAM	100/0	15	40717	2602.7	64QAM	75/0	32.657
20	40521	2583.1	64QAM	100/0	20	40719	2602.9	64QAM	100/0	37.514

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	256QAM	25/0	20	40645	2595.5	256QAM	100/0	22.774
10	40549	2585.9	256QAM	50/0	15	40669	2597.9	256QAM	75/0	23.121
10	40526	2583.6	256QAM	50/0	20	40670	2598.0	256QAM	100/0	27.718
15	40571	2588.1	256QAM	75/0	10	40691	2600.1	256QAM	50/0	23.084
15	40545	2585.5	256QAM	75/0	15	40695	2600.5	256QAM	75/0	28.376
15	40523	2583.3	256QAM	75/0	20	40694	2600.4	256QAM	100/0	32.661
20	40595	2590.5	256QAM	100/0	5	40712	2602.2	256QAM	25/0	22.913
20	40571	2588.1	256QAM	100/0	10	40715	2602.5	256QAM	50/0	27.883
20	40546	2585.6	256QAM	100/0	15	40717	2602.7	256QAM	75/0	32.642
20	40521	2583.1	256QAM	100/0	20	40719	2602.9	256QAM	100/0	37.578

Note:

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

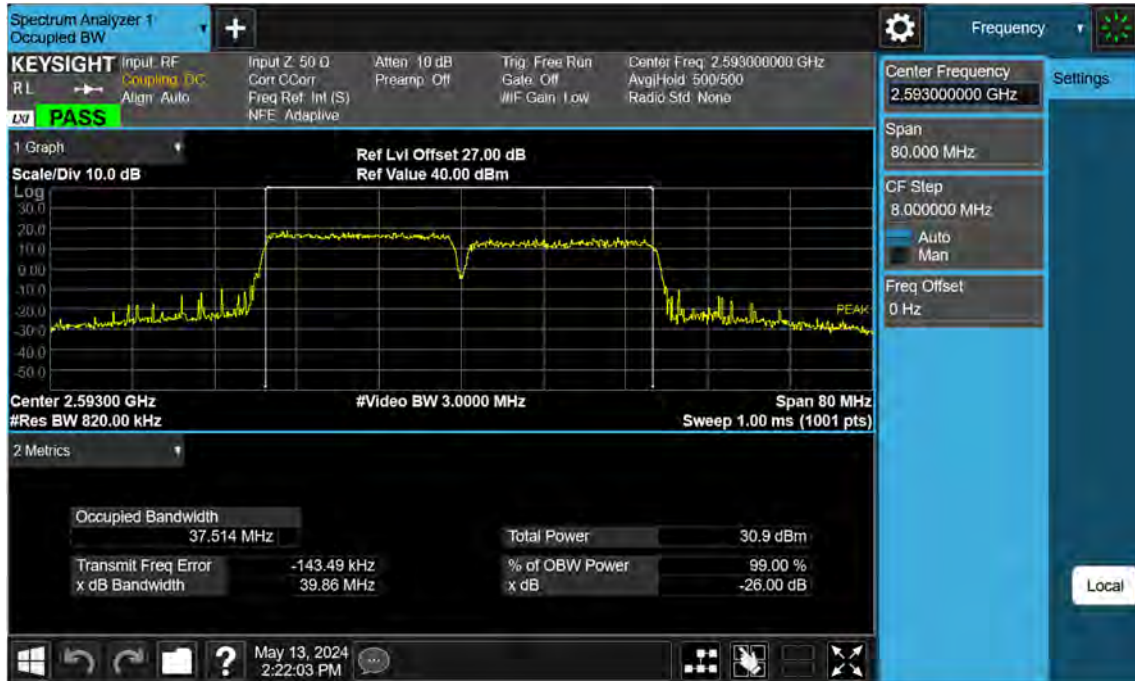
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(QPSK)



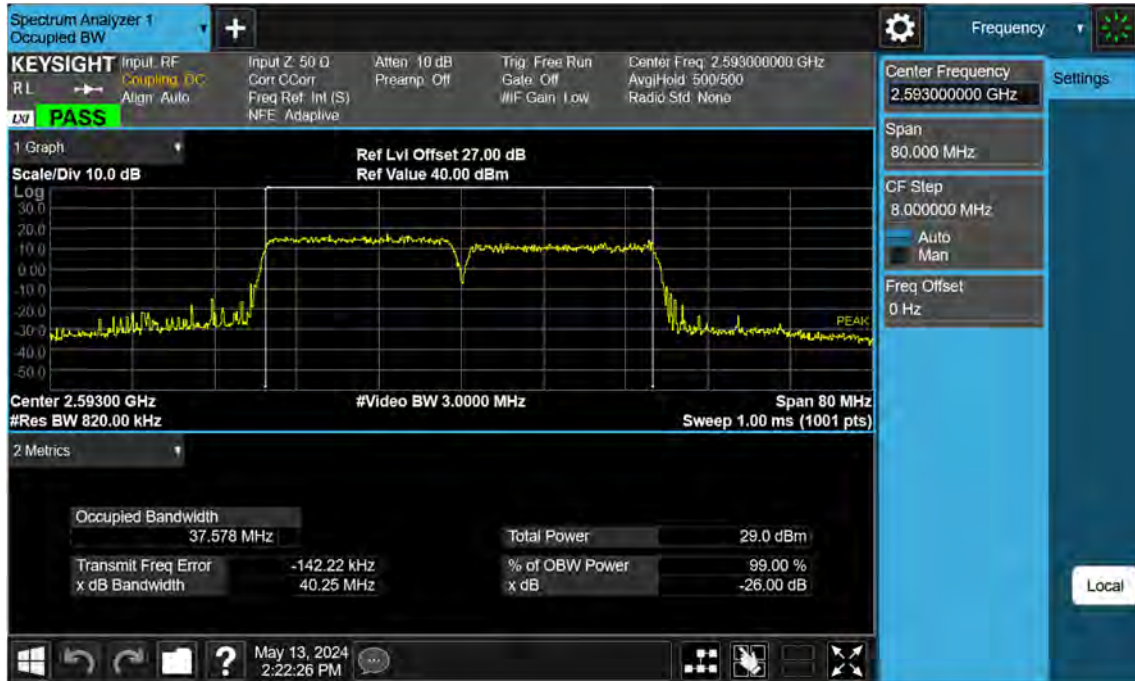
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(16QAM)



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



PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(256QAM)



**9.8 Peak- to- Average Ratio**

PCC					SCC					Data (dB)
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	5.53
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	5.63
10	40526	2583.6	QPSK	50/ 0	20	40670	2598.0	QPSK	100/ 0	5.49
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	5.54
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	5.59
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	5.55
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	5.54
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	5.54
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	5.56
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	5.58

PCC					SCC					Data (dB)
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	6.55
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	6.57
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	6.53
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	6.57
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	6.59
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	6.55
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	6.59
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	6.52
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	6.56
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	6.51



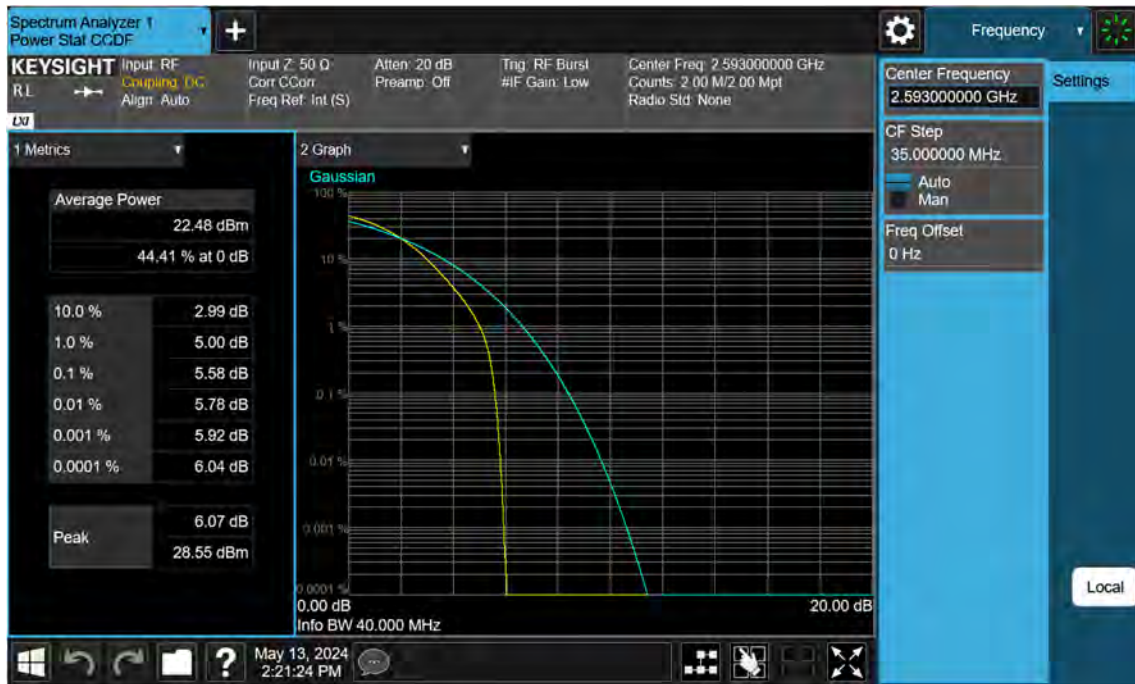
PCC					SCC					Data (dB)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	64QAM	25/0	20	40645	2595.5	64QAM	100/0	6.76
10	40549	2585.9	64QAM	50/0	15	40669	2597.9	64QAM	75/0	6.72
10	40526	2583.6	64QAM	50/0	20	40670	2598.0	64QAM	100/0	6.79
15	40571	2588.1	64QAM	75/0	10	40691	2600.1	64QAM	50/0	6.73
15	40545	2585.5	64QAM	75/0	15	40695	2600.5	64QAM	75/0	6.78
15	40523	2583.3	64QAM	75/0	20	40694	2600.4	64QAM	100/0	6.69
20	40595	2590.5	64QAM	100/0	5	40712	2602.2	64QAM	25/0	6.75
20	40571	2588.1	64QAM	100/0	10	40715	2602.5	64QAM	50/0	6.66
20	40546	2585.6	64QAM	100/0	15	40717	2602.7	64QAM	75/0	6.71
20	40521	2583.1	64QAM	100/0	20	40719	2602.9	64QAM	100/0	6.81

PCC					SCC					Data (dB)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/Offset	
5	40528	2583.8	256QAM	25/0	20	40645	2595.5	256QAM	100/0	6.96
10	40549	2585.9	256QAM	50/0	15	40669	2597.9	256QAM	75/0	7.01
10	40526	2583.6	256QAM	50/0	20	40670	2598.0	256QAM	100/0	6.90
15	40571	2588.1	256QAM	75/0	10	40691	2600.1	256QAM	50/0	6.95
15	40545	2585.5	256QAM	75/0	15	40695	2600.5	256QAM	75/0	6.94
15	40523	2583.3	256QAM	75/0	20	40694	2600.4	256QAM	100/0	6.93
20	40595	2590.5	256QAM	100/0	5	40712	2602.2	256QAM	25/0	6.96
20	40571	2588.1	256QAM	100/0	10	40715	2602.5	256QAM	50/0	6.94
20	40546	2585.6	256QAM	100/0	15	40717	2602.7	256QAM	75/0	6.96
20	40521	2583.1	256QAM	100/0	20	40719	2602.9	256QAM	100/0	7.08

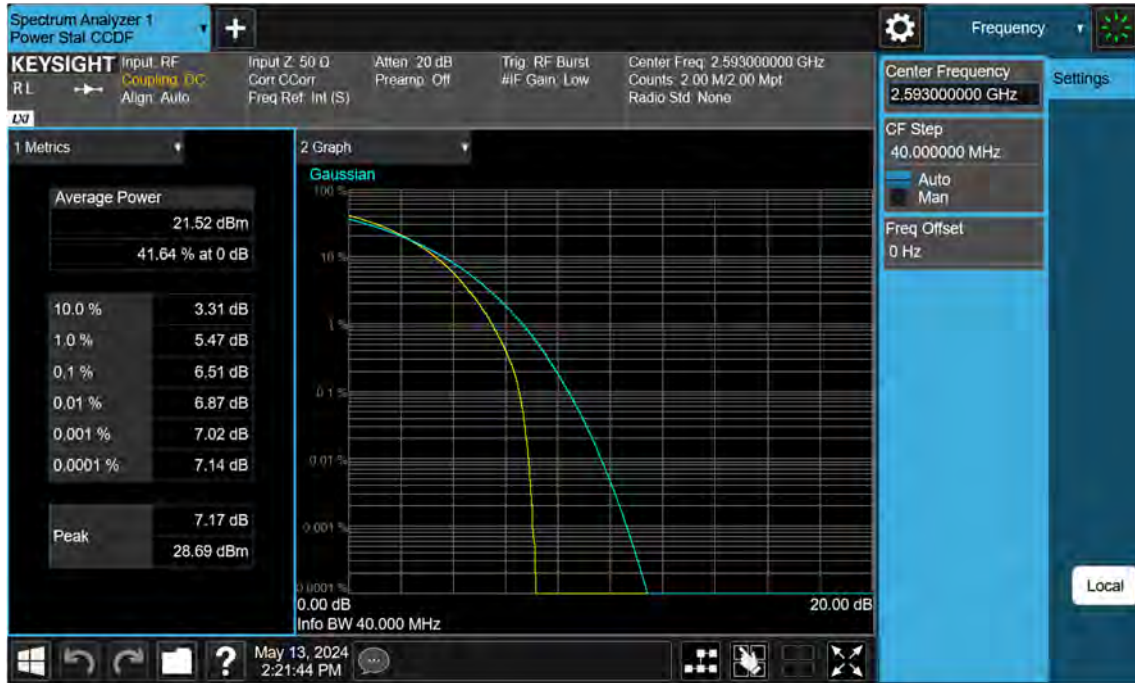
Note:

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

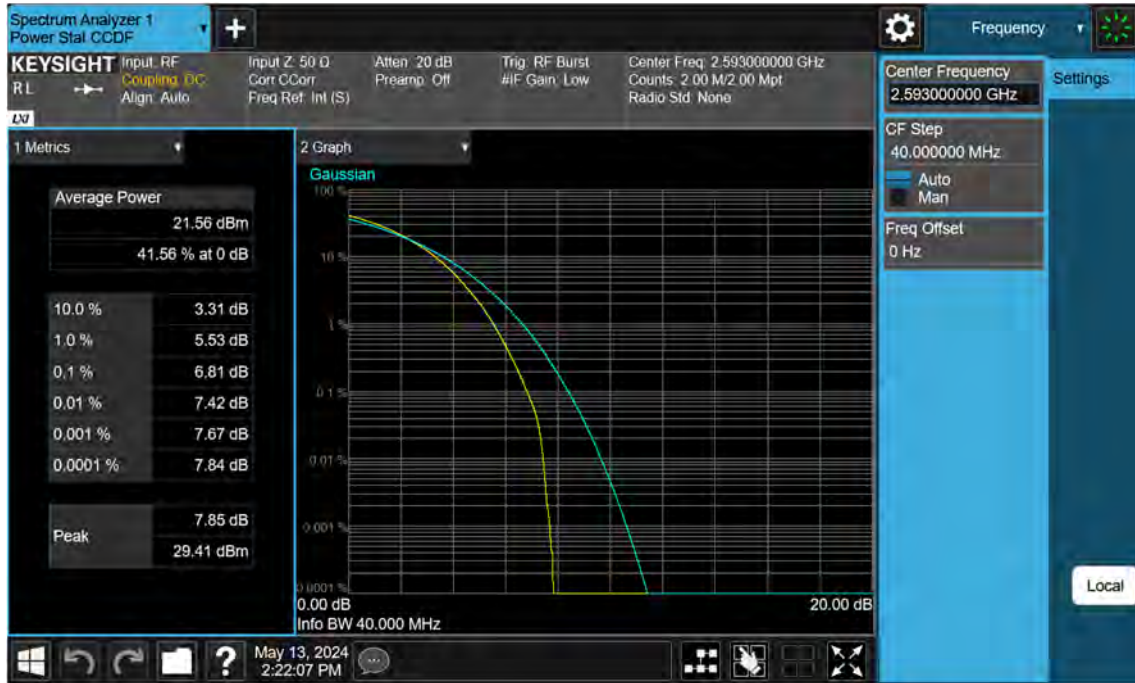
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(QPSK)



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



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



PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0\_(256QAM)



## 10. ANNEX A\_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2405-FC042