TEST REPORT

FCC CA_41C Test for SM-F741U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2404-FC038-R1

DATE OF ISSUE
May 3, 2024

Tested by
Jae Mun Do

Technical Manager
Jong Seok Lee

HCT CO., LTD.
BongJai Huh / CEO

HCT CO., LTD. 2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA Tel. +82 31 645 6300 Fax. +82 31 645 6401

HCT CO.,LTD.
2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 645 6300 Fax. +82 31 645 6401

TEST REPORT

REPORT NO.
HCT-RF-2404-FC038-R1

DATE OF ISSUE
May 03, 2024

Additional Model
SM-F741U1

Applicant	**SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Product Name Model Name	Mobile Phone SM-F741U
Date of Test	February 22, 2024 ~ April 23, 2024
FCC ID	A3LSMF741U
Location of Test	■ Permanent Testing Lab ☐ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 Republic of Korea)
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 27

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	April 26, 2024	Initial Release
1	May 03, 2024	- Revised the Sub5 Ant EIRP result.(page 103~105)

Notice

Content
The measurements shown in this report were made in accordance with the procedures specified in CFR47 section § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)
The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated. The test results have only been applied with the test methods required by the standard(s).
When confirmation of authenticity of this test report is required, please contact www.hct.co.kr
The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

CONTENTS

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMF741U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 27
EUT Type:	Mobile phone
Model(s):	SM-F741U
Additional Model(s)	SM-F741U1
Tx Frequency:	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
Date(s) of Tests:	February 22, 2024 ~ April 23, 2024
Serial number:	Radiated : R3CX20KJT0F Conducted : 7b5599bdac507ece
LTE CA :	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	20.57	0.114
		16QAM	22M9W7D	19.83	0.096
		64QAM	22M8W7D	18.91	0.078
		256QAM	22M9W7D	15.85	0.038
10 MHz + 15 MHz (PC3)	2501.3 - 2682.5	QPSK	23M2G7D	20.19	0.104
		16QAM	23M1W7D	19.36	0.086
		64QAM	23M1W7D	18.42	0.070
		256QAM	23M1W7D	15.32	0.034
10 MHz + 20 MHz (PC3)	2501.5 - 2680.0	QPSK	27M7G7D	20.21	0.105
		16QAM	27M7W7D	19.52	0.090
		64QAM	27M7W7D	18.42	0.070
		256QAM	27M7W7D	15.36	0.034
15 MHz + 10 MHz (PC3)	2503.5 - 2684.7	QPSK	23M1G7D	20.21	0.105
		16QAM	23M2W7D	19.49	0.089
		64QAM	23M2W7D	18.38	0.069
		256QAM	23M2W7D	15.45	0.035
15 MHz + 15 MHz (PC3)	2503.5 - 2682.5	QPSK	28M4G7D	20.27	0.106
		16QAM	28M4W7D	19.78	0.095
		64QAM	28M3W7D	18.67	0.074
		256QAM	28M5W7D	15.65	0.037
15 MHz + 20 MHz (PC3)	2503.8 - 2680.0	QPSK	32M6G7D	20.07	0.102
		16QAM	32M6W7D	19.32	0.086
		64QAM	32M6W7D	18.28	0.067
		256QAM	32M7W7D	15.32	0.034
20 MHz + 5 MHz (PC3)	2506.0 - 2686.7	QPSK	22M9G7D	20.08	0.102
		16QAM	22M9W7D	19.36	0.086
		64QAM	22M9W7D	18.31	0.068
		256QAM	22M9W7D	15.26	0.034
20 MHz + 10 MHz (PC3)	2506.0 - 2684.5	QPSK	27M8G7D	20.27	0.106
		16QAM	27M8W7D	19.55	0.090
		64QAM	27M8W7D	18.52	0.071
		256QAM	27M8W7D	15.60	0.036
20 MHz + 15 MHz (PC3)	2506.0 - 2682.2	QPSK	32M6G7D	20.16	0.104
		16QAM	32M8W7D	19.54	0.090
		64QAM	32M7W7D	18.43	0.070
		256QAM	32M7W7D	15.49	0.035
20 MHz + 20 MHz (PC3)	2506.0 - 2680.0	QPSK	37M5G7D	20.44	0.111
		16QAM	37M7W7D	19.75	0.094
		64QAM	37M6W7D	18.88	0.077
		256QAM	37M6W7D	15.68	0.037

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	22M9G7D	24.49	0.281
		16QAM	22M9W7D	23.98	0.250
		64QAM	22M9W7D	23.00	0.200
		256QAM	22M8W7D	19.96	0.099
10 MHz + 15 MHz (PC3)	2501.3 - 2682.5	QPSK	23M2G7D	24.02	0.252
		16QAM	23M1W7D	23.51	0.224
		64QAM	23M2W7D	22.55	0.180
		256QAM	23M2W7D	19.49	0.089
10 MHz + 20 MHz (PC3)	2501.5 - 2680.0	QPSK	27M9G7D	24.23	0.265
		16QAM	27M7W7D	23.59	0.229
		64QAM	27M8W7D	22.61	0.182
		256QAM	27M7W7D	19.68	0.093
15 MHz + 10 MHz (PC3)	2503.5 - 2684.7	QPSK	23M2G7D	24.17	0.261
		16QAM	23M1W7D	23.68	0.233
		64QAM	23M1W7D	22.67	0.185
		256QAM	23M2W7D	19.63	0.092
15 MHz + 15 MHz (PC3)	2503.5 - 2682.5	QPSK	28M4G7D	24.37	0.274
		16QAM	28M3W7D	23.79	0.239
		64QAM	28M4W7D	22.88	0.194
		256QAM	28M3W7D	19.84	0.096
15 MHz + 20 MHz (PC3)	2503.8 - 2680.0	QPSK	32M7G7D	24.05	0.254
		16QAM	32M7W7D	23.54	0.226
		64QAM	32M6W7D	22.54	0.179
		256QAM	32M6W7D	19.51	0.089
20 MHz + 5 MHz (PC3)	2506.0 - 2686.7	QPSK	23M0G7D	24.06	0.255
		16QAM	23M0W7D	23.57	0.228
		64QAM	22M9W7D	22.60	0.182
		256QAM	23M0W7D	19.55	0.090
20 MHz + 10 MHz (PC3)	2506.0 - 2684.5	QPSK	27M8G7D	24.07	0.255
		16QAM	27M9W7D	23.61	0.230
		64QAM	27M7W7D	22.56	0.180
		256QAM	27M8W7D	19.57	0.091
20 MHz + 15 MHz (PC3)	2506.0 - 2682.2	QPSK	32M7G7D	24.15	0.260
		16QAM	32M7W7D	23.62	0.230
		64QAM	32M7W7D	22.69	0.186
		256QAM	32M6W7D	19.62	0.092
20 MHz + 20 MHz (PC3)	2506.0 - 2680.0	QPSK	37M6G7D	24.35	0.272
		16QAM	37M6W7D	23.81	0.240
		64QAM	37M6W7D	22.88	0.194
		256QAM	37M7W7D	19.82	0.096

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub 6, mmWave.
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 ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Note

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

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

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

3.3 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 ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10^{th} harmonics from 9 kHz.

Test Note

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

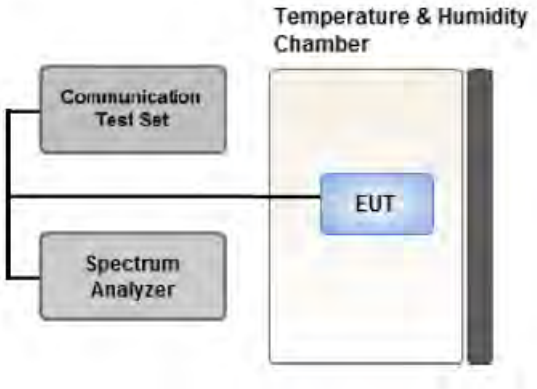
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

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

② Alternate Procedure for PAPR

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

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

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

Test Settings(Peak Power)

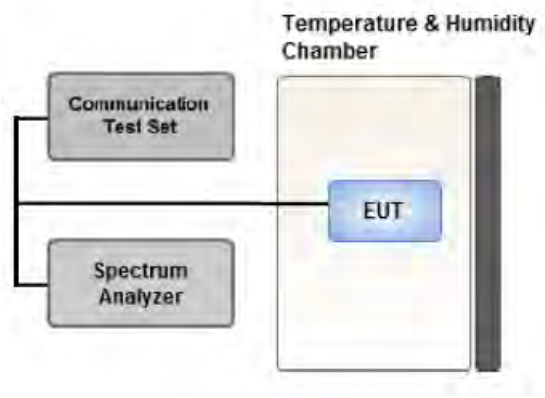
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



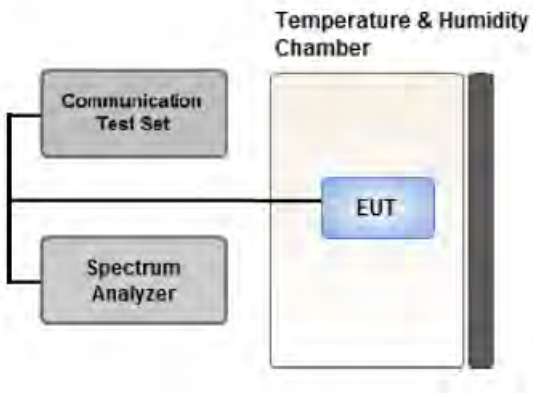
Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.
The EUT makes a call to the communication simulator.
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

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

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

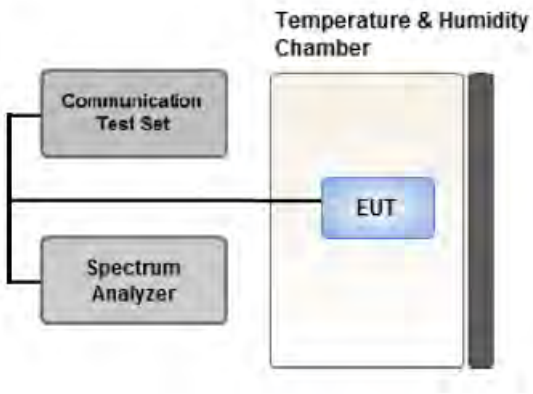
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

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

3.7 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

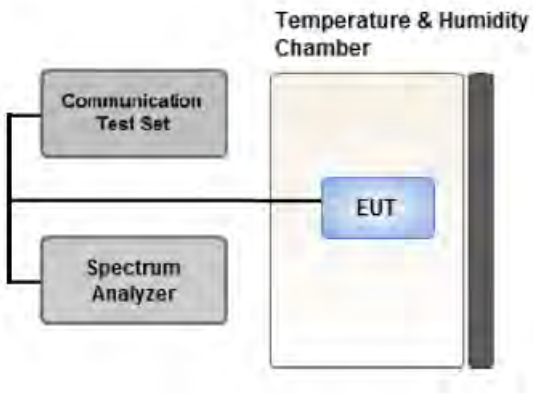
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW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

Test Notes

1. The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. 55 + 10 log (P) dB at or below 2490.5 MHz.
6. X is the greater of 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 MHz/ 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	05/24/2024	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_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (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)	■ < 40 + 10log10 (P[Watts]) at Channel edges ■ < 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges ■ < 55 + 10log10 (P[Watts]) beyond X MHz beyond from Channel edges ■ < 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz	PASS
Conducted Output Power	§ 2.1046	N/A	See Note1
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 + 10log10 (P[Watts])	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

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

7.2 EIRP Sample Calculation

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

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

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 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Note

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

Channel Bandwidth (PCC)	Channel Bandwidth (SCC)	Maximum aggregated bandwidth (MHz)
5	20	25
10	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-open, 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	20	2590.5	40595	1	99	5	2602.2	40712	1	0
	QPSK	High	5	2668.3	41373	1	24	20	2680.0	41490	1	0
	QPSK	Low	5	2499.3	39683	1	0	20	2511.0	39800	1	99
	QPSK	Mid	20	2590.5	40595	1	0	5	2602.2	40712	1	24
	QPSK	High	5	2668.3	41373	1	0	20	2680.0	41490	1	99
	QPSK	Low	10	2501.3	39703	50	0	15	2513.3	39823	75	0
	QPSK	Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0
	QPSK	High	10	2670.5	41395	50	0	15	2682.5	41515	75	0
	QPSK	Low	20	2506.0	39750	100	0	20	2525.8	39948	100	0
	QPSK	Mid	20	2583.1	40521	100	0	20	2602.9	40719	100	0
	QPSK	High	20	2660.2	41292	100	0	20	2680.0	41490	100	0
Radiated Spurious Emissions	QPSK	Low	20	2506.0	39750	1	99	10	2520.4	39894	1	0
	QPSK	Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0
	QPSK	High	10	2670.5	41395	1	49	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

8.1 Conducted Power

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	***5***	***2499.3***	***39683***	***1***	***24***	***20***	***2511.0***	***39800***	***1***	***0***	***21.98***
	10	2501.3	39703	1	49	15	2513.3	39823	1	0	21.95
	10	2501.5	39705	1	49	20	2515.9	39849	1	0	21.94
	15	2503.5	39725	1	74	10	2515.5	39845	1	0	21.96
	15	2503.5	39725	1	74	15	2518.5	39875	1	0	21.95
	15	2503.8	39728	1	74	20	2520.9	39899	1	0	21.90
	20	2506.0	39750	1	99	5	2517.7	39867	1	0	21.97
	20	2506.0	39750	1	99	10	2520.4	39894	1	0	21.95
	20	2506.0	39750	1	99	15	2523.1	39921	1	0	21.95
	20	2506.0	39750	1	99	20	2525.8	39948	1	0	21.94
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	21.74
	10	2585.9	40549	1	49	15	2597.9	40669	1	0	21.68
	10	2583.6	40526	1	49	20	2598.0	40670	1	0	21.69
	15	2588.1	40571	1	74	10	2600.1	40691	1	0	21.65
	15	2585.5	40545	1	74	15	2600.5	40695	1	0	21.68
	15	2583.3	40523	1	74	20	2600.4	40694	1	0	21.62
	20	***2590.5***	***40595***	***1***	***99***	***5***	***2602.2***	***40712***	***1***	***0***	***21.83***
	20	2588.1	40571	1	99	10	2602.5	40715	1	0	21.64
	20	2585.6	40546	1	99	15	2602.7	40717	1	0	21.69
	20	2583.1	40521	1	99	20	2602.9	40719	1	0	21.70
High	***5***	***2668.3***	***41373***	***1***	***24***	***20***	***2680.0***	***41490***	***1***	***0***	***21.66***
	10	2670.5	41395	1	49	15	2682.5	41515	1	0	21.60
	10	2665.6	41346	1	49	20	2680.0	41490	1	0	21.58
	15	2672.7	41417	1	74	10	2684.7	41537	1	0	21.52
	15	2667.5	41365	1	74	15	2682.5	41515	1	0	21.58
	15	2662.9	41319	1	74	20	2680.0	41490	1	0	21.58
	20	2675.0	41440	1	99	5	2686.7	41557	1	0	21.46
	20	2670.1	41391	1	99	10	2684.5	41535	1	0	21.49
	20	2665.1	41341	1	99	15	2682.2	41512	1	0	21.58
	20	2660.2	41292	1	99	20	2680.0	41490	1	0	21.60

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	20.07
	10	***2501.3***	***39703***	***50***	***0***	***15***	***2513.3***	***39823***	***75***	***0***	***20.12***
	10	2501.5	39705	50	0	20	2515.9	39849	100	0	20.09
	15	2503.5	39725	75	0	10	2515.5	39845	50	0	20.05
	15	2503.5	39725	75	0	15	2518.5	39875	75	0	20.04
	15	2503.8	39728	75	0	20	2520.9	39899	100	0	20.04
	20	2506.0	39750	100	0	5	2517.7	39867	25	0	20.02
	20	2506.0	39750	100	0	10	2520.4	39894	50	0	20.03
	20	2506.0	39750	100	0	15	2523.1	39921	75	0	20.02
	20	2506.0	39750	100	0	20	2525.8	39948	100	0	19.98
Mid	5	2583.8	40528	25	0	20	2595.5	40645	100	0	19.77
	10	2585.9	40549	50	0	15	2597.9	40669	75	0	19.79
	10	***2583.6***	***40526***	***50***	***0***	***20***	***2598.0***	***40670***	***100***	***0***	***19.85***
	15	2588.1	40571	75	0	10	2600.1	40691	50	0	19.81
	15	2585.5	40545	75	0	15	2600.5	40695	75	0	19.83
	15	2583.3	40523	75	0	20	2600.4	40694	100	0	19.83
	20	2590.5	40595	100	0	5	2602.2	40712	25	0	19.75
	20	2588.1	40571	100	0	10	2602.5	40715	50	0	19.75
	20	2585.6	40546	100	0	15	2602.7	40717	75	0	19.82
	20	2583.1	40521	100	0	20	2602.9	40719	100	0	19.82
High	5	2668.3	41373	25	0	20	2680.0	41490	100	0	19.71
	10	***2670.5***	***41395***	***50***	***0***	***15***	***2682.5***	***41515***	***75***	***0***	***19.74***
	10	2665.6	41346	50	0	20	2680.0	41490	100	0	19.73
	15	2672.7	41417	75	0	10	2684.7	41537	50	0	19.72
	15	2667.5	41365	75	0	15	2682.5	41515	75	0	19.67
	15	2662.9	41319	75	0	20	2680.0	41490	100	0	19.71
	20	2675.0	41440	100	0	5	2686.7	41557	25	0	19.68
	20	2670.1	41391	100	0	10	2684.5	41535	50	0	19.69
	20	2665.1	41341	100	0	15	2682.2	41512	75	0	19.73
	20	2660.2	41292	100	0	20	2680.0	41490	100	0	19.70

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	20	2590.5	40595	1	99	5	2602.2	40712	1	0	20.98
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	20.95
Low	10	2501.3	39703	50	0	15	2513.3	39823	75	0	19.13
Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0	18.82
High	10	2670.5	41395	50	0	15	2682.5	41515	75	0	18.73

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	20	2590.5	40595	1	99	5	2602.2	40712	1	0	19.91
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	19.97
Low	10	2501.3	39703	50	0	15	2513.3	39823	75	0	18.95
Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0	18.73
High	10	2670.5	41395	50	0	15	2682.5	41515	75	0	18.49

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	16.94
Mid	20	2590.5	40595	1	99	5	2602.2	40712	1	0	16.83
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	16.87
Low	10	2501.3	39703	50	0	15	2513.3	39823	75	0	16.91
Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0	16.88
High	10	2670.5	41395	50	0	15	2682.5	41515	75	0	16.75

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	25/0	20	39800	100/0	-24.86	12.00	10.55	2.57	H	0.099	19.98
	10	39703	50/0	15	39823	75/0	-24.72	12.17	10.59	2.57	H	0.104	20.19
	10	39705	50/0	20	39849	100/0	-24.71	12.18	10.59	2.57	H	0.105	20.20
	15	39725	75/0	10	39845	50/0	-25.05	11.84	10.59	2.57	H	0.097	19.86
	15	39725	75/0	15	39875	75/0	-25.10	11.79	10.59	2.57	H	0.096	19.81
	15	39728	75/0	20	39899	100/0	-25.11	11.78	10.59	2.57	H	0.096	19.80
	20	39750	100/0	5	39867	25/0	-24.83	12.06	10.59	2.57	H	0.102	20.08
	20	***39750***	***100/0***	***10***	***39894***	***50/0***	***-24.64***	***12.25***	***10.59***	***2.57***	***H***	***0.106***	***20.27***
	20	39750	100/0	15	39921	75/0	-24.77	12.11	10.64	2.59	H	0.104	20.16
	20	39750	100/0	20	39948	100/0	-24.70	12.18	10.64	2.59	H	0.105	20.23
Mid	***5***	***40528***	***25/0***	***20***	***40645***	***100/0***	***-24.58***	***12.64***	***10.64***	***2.71***	***H***	***0.114***	***20.57***
	10	40549	50/0	15	40669	75/0	-25.05	12.17	10.64	2.71	H	0.102	20.10
	10	40526	50/0	20	40670	100/0	-24.94	12.28	10.64	2.71	H	0.105	20.21
	15	40571	75/0	10	40691	50/0	-24.86	12.25	10.64	2.68	H	0.105	20.21
	15	40545	75/0	15	40695	75/0	-24.88	12.34	10.64	2.71	H	0.106	20.27
	15	40523	75/0	20	40694	100/0	-25.08	12.14	10.64	2.71	H	0.102	20.07
	20	40595	100/0	5	40712	25/0	-25.03	12.08	10.64	2.68	H	0.101	20.04
	20	40571	100/0	10	40715	50/0	-25.00	12.11	10.64	2.68	H	0.102	20.07
	20	40546	100/0	15	40717	75/0	-24.92	12.19	10.64	2.68	H	0.103	20.15
	20	40521	100/0	20	40719	100/0	-24.71	12.51	10.64	2.71	H	0.111	20.44
High	5	41373	25/0	20	41490	100/0	-27.20	10.22	10.72	2.74	H	0.066	18.20
	10	***41395***	***50/0***	***15***	***41515***	***75/0***	***-26.90***	***10.52***	***10.72***	***2.74***	***H***	***0.071***	***18.50***
	10	41346	50/0	20	41490	100/0	-27.13	10.29	10.72	2.74	H	0.067	18.27
	15	41417	75/0	10	41537	50/0	-27.22	10.21	10.72	2.75	H	0.066	18.18
	15	41365	75/0	15	41515	75/0	-26.97	10.45	10.72	2.74	H	0.070	18.43
	15	41319	75/0	20	41490	100/0	-26.98	10.44	10.71	2.73	H	0.069	18.42
	20	41440	100/0	5	41557	25/0	-27.30	10.13	10.72	2.75	H	0.065	18.10
	20	41391	100/0	10	41535	50/0	-27.24	10.18	10.72	2.74	H	0.065	18.16
	20	41341	100/0	15	41512	75/0	-27.00	10.42	10.72	2.74	H	0.069	18.40
	20	41292	100/0	20	41490	100/0	-27.01	10.41	10.71	2.73	H	0.069	18.39

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	100/0	10	39894	50/0	-25.36	11.53	10.59	2.57	H	0.090	19.55
5	40528	25/0	20	40645	100/0	-25.32	11.90	10.64	2.71	H	0.096	19.83
10	40549	50/0	15	40669	75/0	-25.79	11.43	10.64	2.71	H	0.086	19.36
10	40526	50/0	20	40670	100/0	-25.63	11.59	10.64	2.71	H	0.090	19.52
15	40571	75/0	10	40691	50/0	-25.58	11.53	10.64	2.68	H	0.089	19.49
15	40545	75/0	15	40695	75/0	-25.37	11.85	10.64	2.71	H	0.095	19.78
15	40523	75/0	20	40694	100/0	-25.83	11.39	10.64	2.71	H	0.086	19.32
20	40595	100/0	5	40712	25/0	-25.71	11.40	10.64	2.68	H	0.086	19.36
20	40571	100/0	10	40715	50/0	-25.60	11.51	10.64	2.68	H	0.088	19.47
20	40546	100/0	15	40717	75/0	-25.53	11.58	10.64	2.68	H	0.090	19.54
20	40521	100/0	20	40719	100/0	-25.40	11.82	10.64	2.71	H	0.094	19.75
10	41395	50/0	15	41515	75/0	-27.63	9.79	10.72	2.74	H	0.060	17.77

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	100/0	10	39894	50/0	-26.39	10.50	10.59	2.57	H	0.071	18.52
5	40528	25/0	20	40645	100/0	-26.24	10.98	10.64	2.71	H	0.078	18.91
10	40549	50/0	15	40669	75/0	-26.73	10.49	10.64	2.71	H	0.070	18.42
10	40526	50/0	20	40670	100/0	-26.73	10.49	10.64	2.71	H	0.070	18.42
15	40571	75/0	10	40691	50/0	-26.69	10.42	10.64	2.68	H	0.069	18.38
15	40545	75/0	15	40695	75/0	-26.48	10.74	10.64	2.71	H	0.074	18.67
15	40523	75/0	20	40694	100/0	-26.87	10.35	10.64	2.71	H	0.067	18.28
20	40595	100/0	5	40712	25/0	-26.76	10.35	10.64	2.68	H	0.068	18.31
20	40571	100/0	10	40715	50/0	-26.68	10.43	10.64	2.68	H	0.069	18.39
20	40546	100/0	15	40717	75/0	-26.64	10.47	10.64	2.68	H	0.070	18.43
20	40521	100/0	20	40719	100/0	-26.27	10.95	10.64	2.71	H	0.077	18.88
10	41395	50/0	15	41515	75/0	-28.50	8.92	10.72	2.74	H	0.049	16.90

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	100/0	10	39894	50/0	-29.31	7.58	10.59	2.57	H	0.036	15.60
5	40528	25/0	20	40645	100/0	-29.30	7.92	10.64	2.71	H	0.038	15.85
10	40549	50/0	15	40669	75/0	-29.83	7.39	10.64	2.71	H	0.034	15.32
10	40526	50/0	20	40670	100/0	-29.79	7.43	10.64	2.71	H	0.034	15.36
15	40571	75/0	10	40691	50/0	-29.62	7.49	10.64	2.68	H	0.035	15.45
15	40545	75/0	15	40695	75/0	-29.50	7.72	10.64	2.71	H	0.037	15.65
15	40523	75/0	20	40694	100/0	-29.83	7.39	10.64	2.71	H	0.034	15.32
20	40595	100/0	5	40712	25/0	-29.81	7.30	10.64	2.68	H	0.034	15.26
20	40571	100/0	10	40715	50/0	-29.63	7.48	10.64	2.68	H	0.035	15.44
20	40546	100/0	15	40717	75/0	-29.58	7.53	10.64	2.68	H	0.035	15.49
20	40521	100/0	20	40719	100/0	-29.47	7.75	10.64	2.71	H	0.037	15.68
10	41395	50/0	15	41515	75/0	-31.66	5.76	10.72	2.74	H	0.024	13.74

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	9.1341	32.570	-75.96	-43.39
Mid	20	40595	2590.5	1/99	5	40712	2602.2	1/0	8.2612	32.570	-75.30	-42.73
High	5	41373	2668.3	1/24	20	41490	2680.0	1/0	4.0524	31.955	-76.12	-44.17
Low	5	39683	2499.3	1/0	20	39800	2511.0	1/99	8.3021	32.570	-75.41	-42.84
Mid	20	40595	2590.5	1/0	5	40712	2602.2	1/24	3.7658	31.955	-75.36	-43.41
High	5	41373	2668.3	1/0	20	41490	2680.0	1/99	8.8589	32.570	-75.42	-42.85
Low	10	39703	2501.3	50/0	15	39823	2513.3	75/0	8.0020	32.570	-75.96	-43.39
Mid	10	40526	2583.6	50/0	20	40670	2598.0	100/0	5.2328	32.570	-75.66	-43.09
High	10	41395	2670.5	50/0	15	41515	2682.5	75/0	7.9706	32.570	-75.74	-43.17
Low	20	39750	2506.0	100/0	20	39948	2525.8	100/0	4.0225	31.955	-75.44	-43.48
Mid	20	40521	2583.1	100/0	20	40719	2602.9	100/0	4.5993	31.955	-76.12	-44.17
High	20	41292	2660.2	100/0	20	41490	2680.0	100/0	8.0339	32.570	-76.12	-43.55

Note:

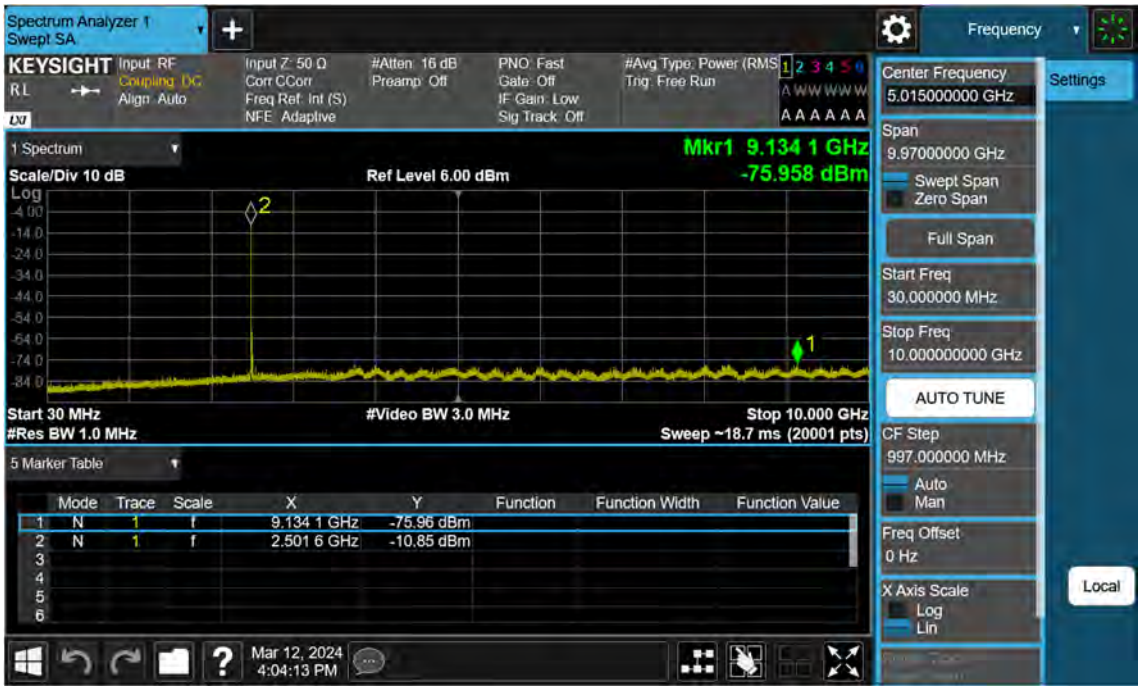
1. Modulation : QPSK
2. Duty Cycle factor already applied on the factor.
   - Duty Cycle factor(dB) = 3.979
   - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
   - Result(dBm) = Measurement Maximum Data (dBm) + Factor

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

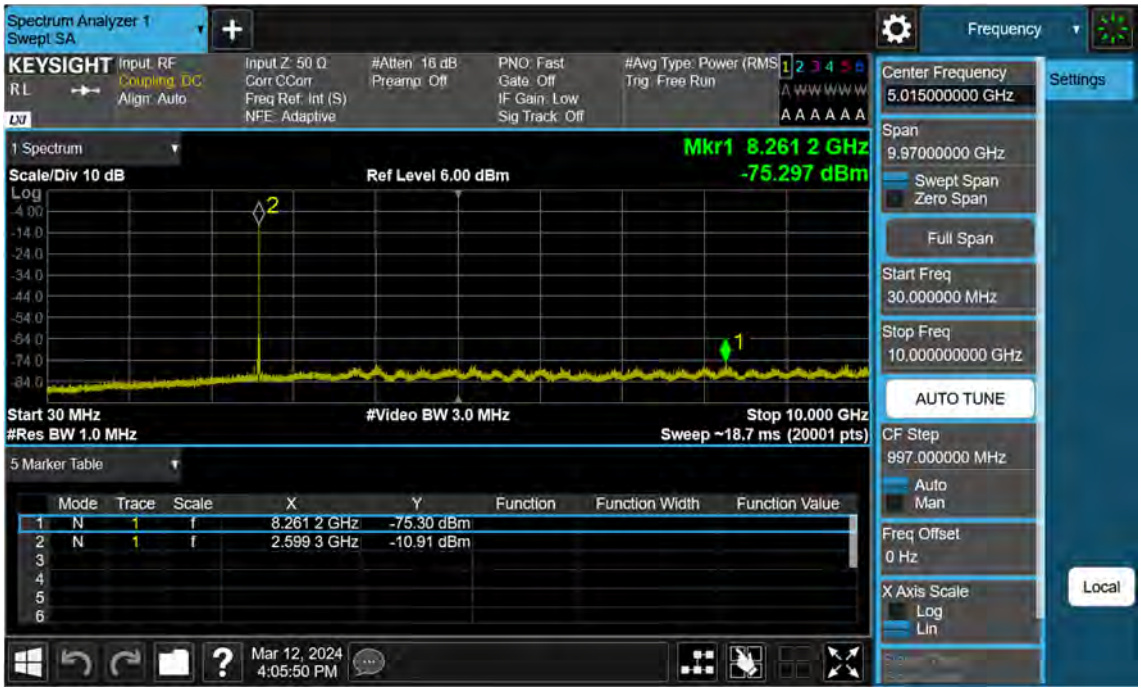
3. Limit : -25.0 dBm

Frequency Range : 30 MHz ~ 10 GHz

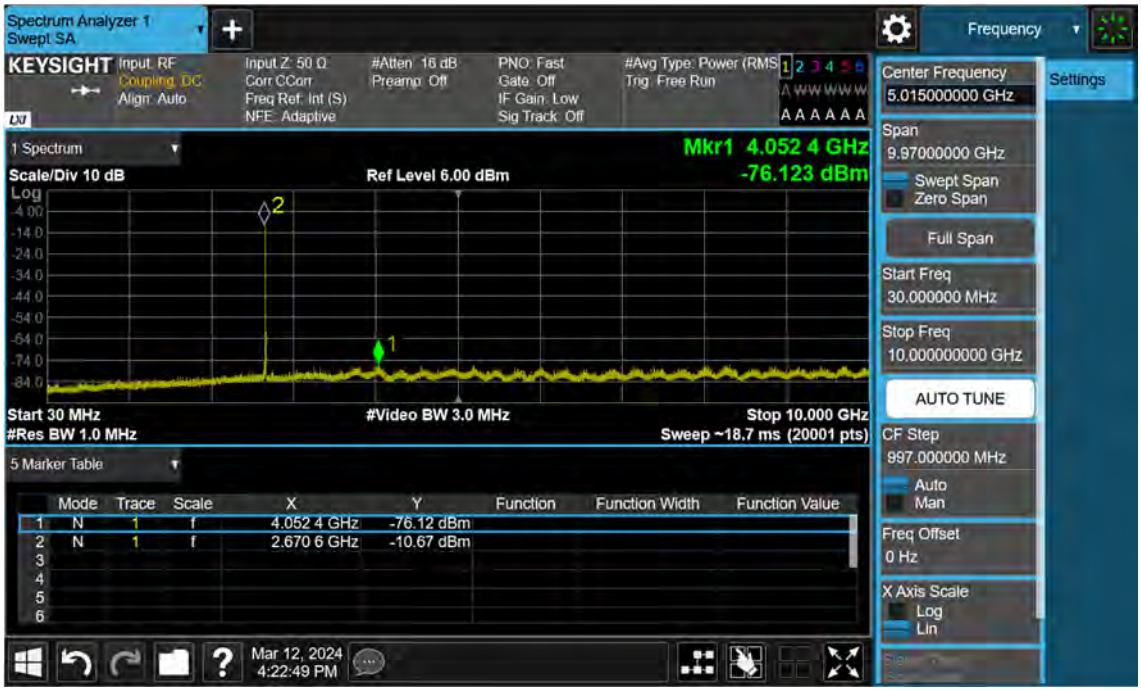
PCC 5 MHz Ch39683 RB1 Offset24 SCC 20 MHz Ch39800 RB1 Offset0



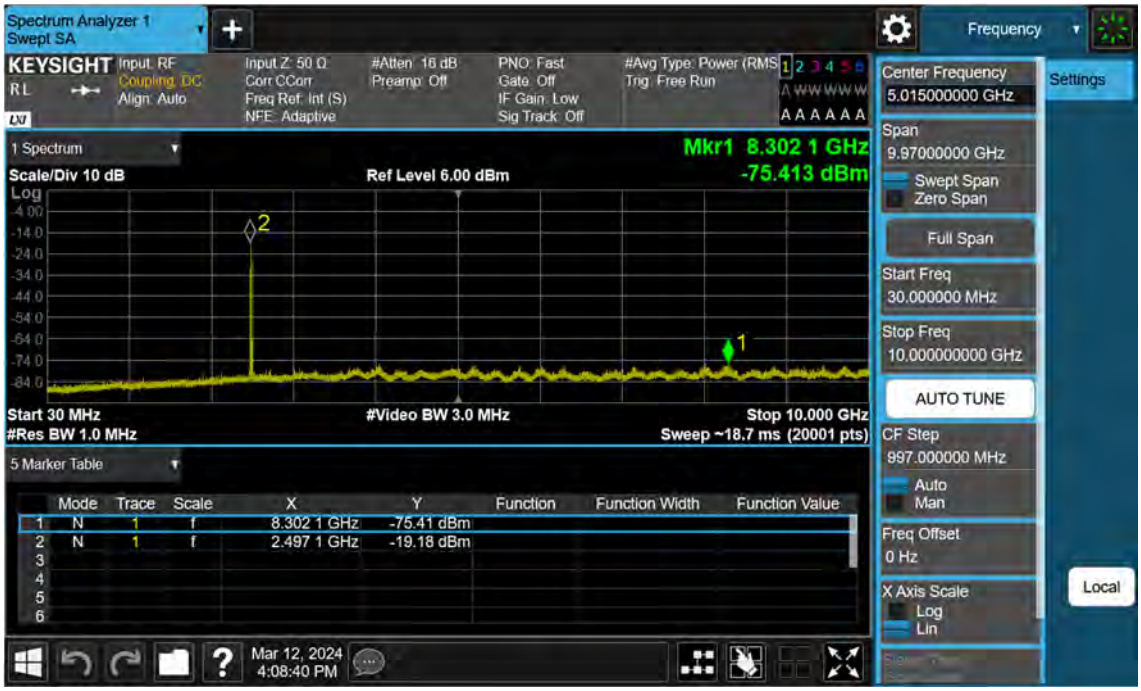
PCC 20 MHz Ch40595 RB1 Offset99 SCC 5 MHz Ch40712 RB1 Offset0



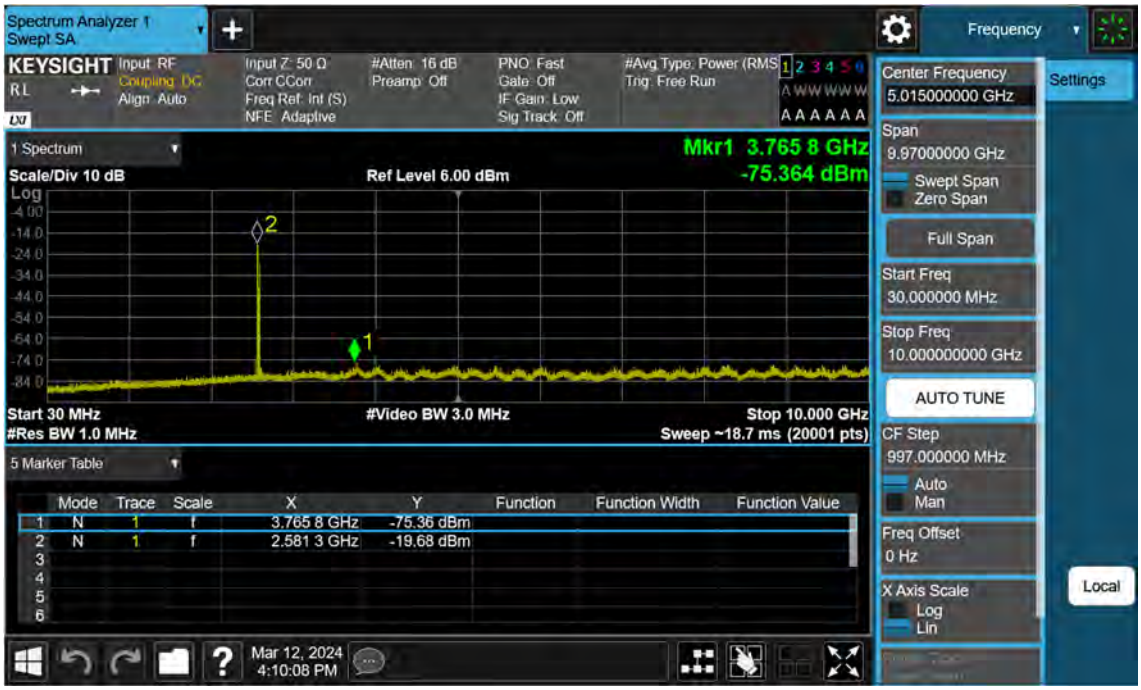
PCC 5 MHz Ch41373 RB1 Offset24 SCC 20 MHz Ch41490 RB1 Offset0



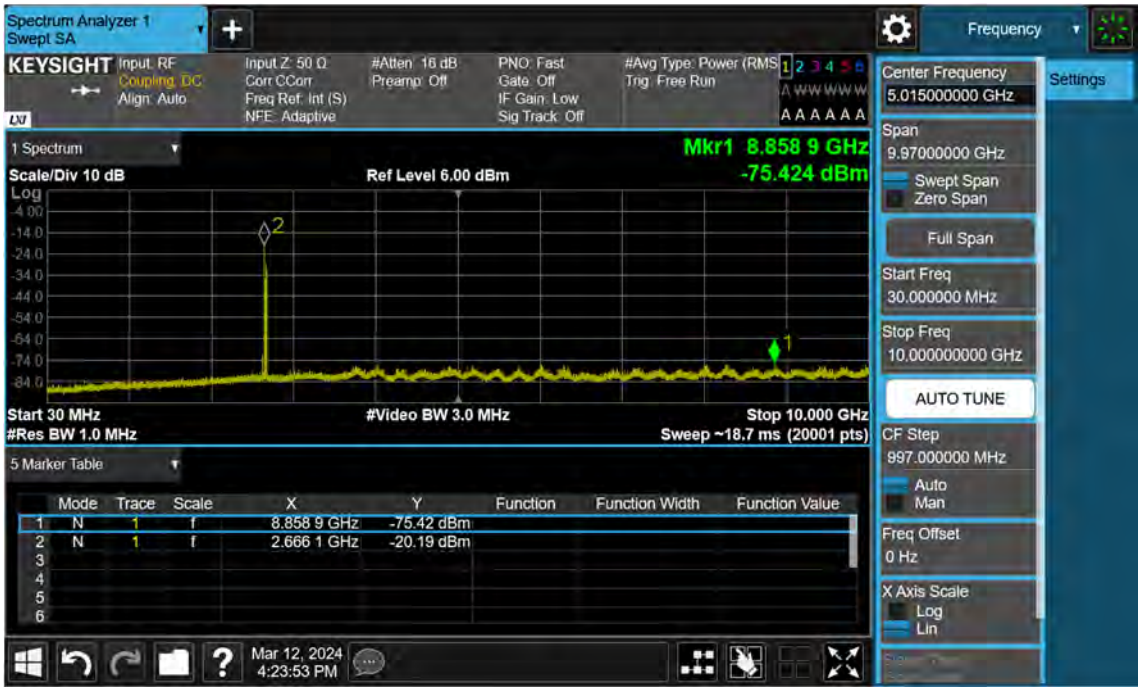
PCC 5 MHz Ch39683 RB1 Offset0 SCC 20 MHz Ch39800 RB1 Offset99



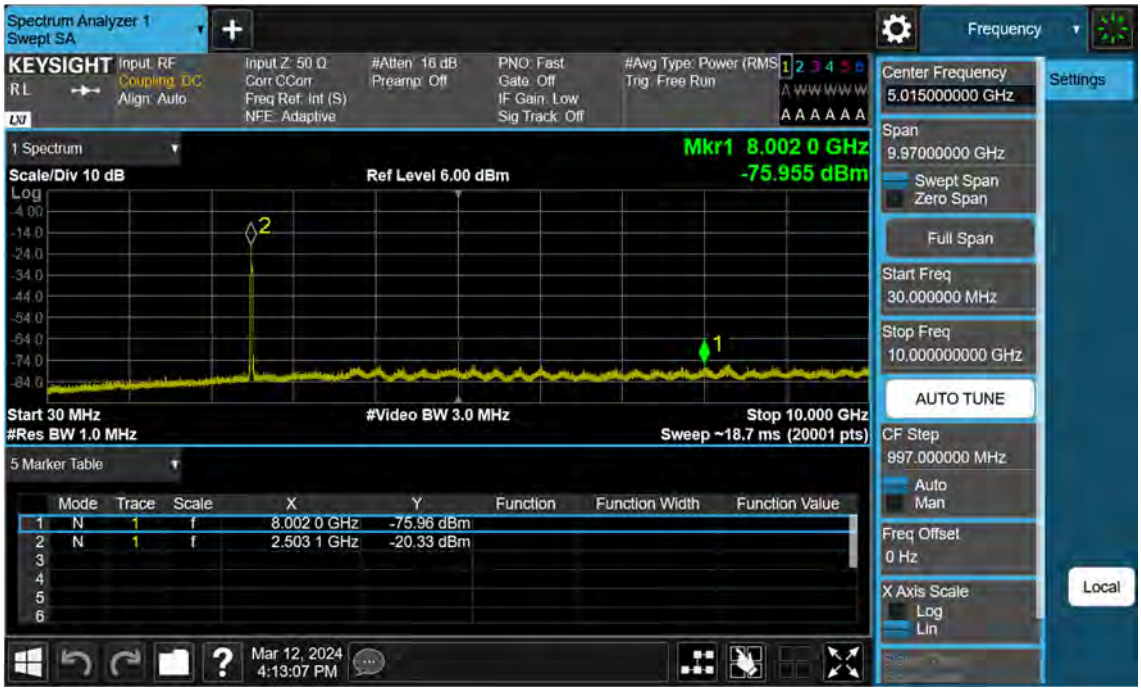
PCC 20 MHz Ch40595 RB1 Offset0 SCC 5 MHz Ch40712 RB1 Offset24



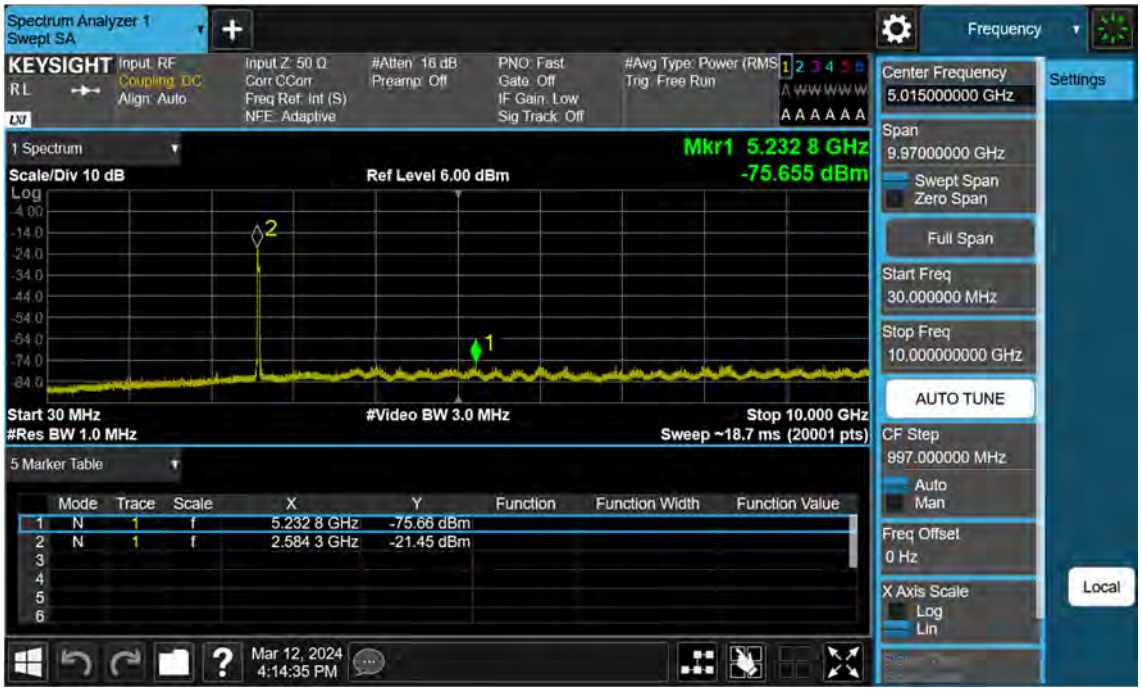
PCC 5 MHz Ch41373 RB1 Offset0 SCC 20 MHz Ch41490 RB1 Offset99



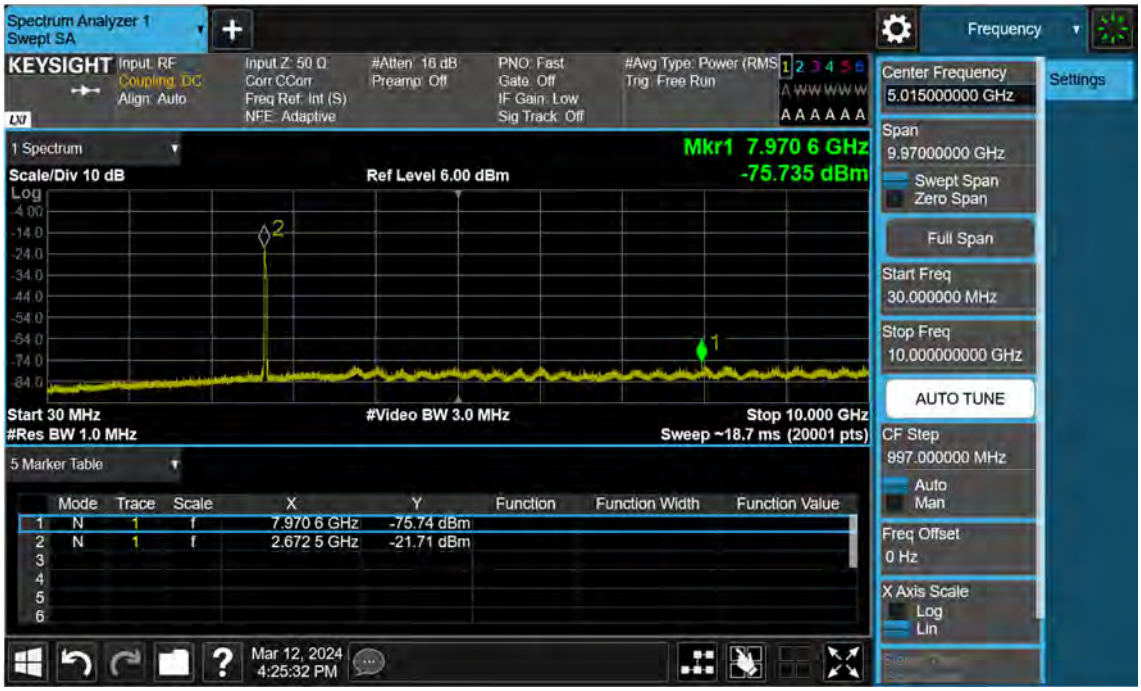
PCC 10 MHz Ch39703 RB50 Offset0 SCC 15 MHz Ch39823 RB75 Offset0



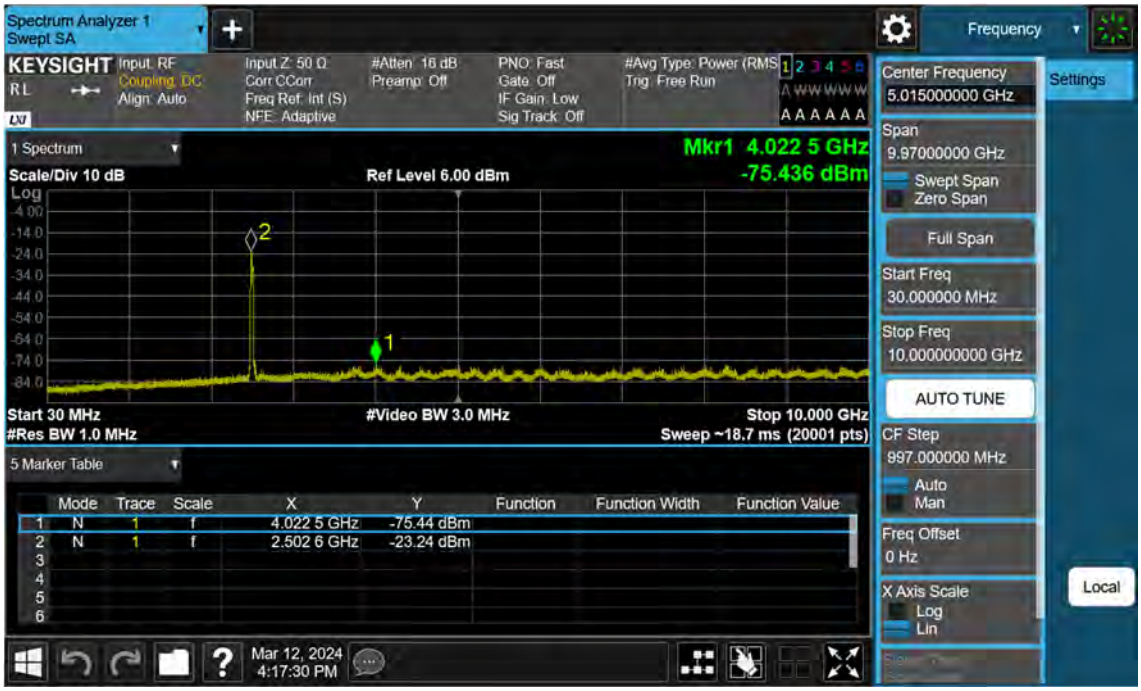
PCC 10 MHz Ch40526 RB50 Offset0 SCC 20 MHz Ch40670 RB100 Offset0



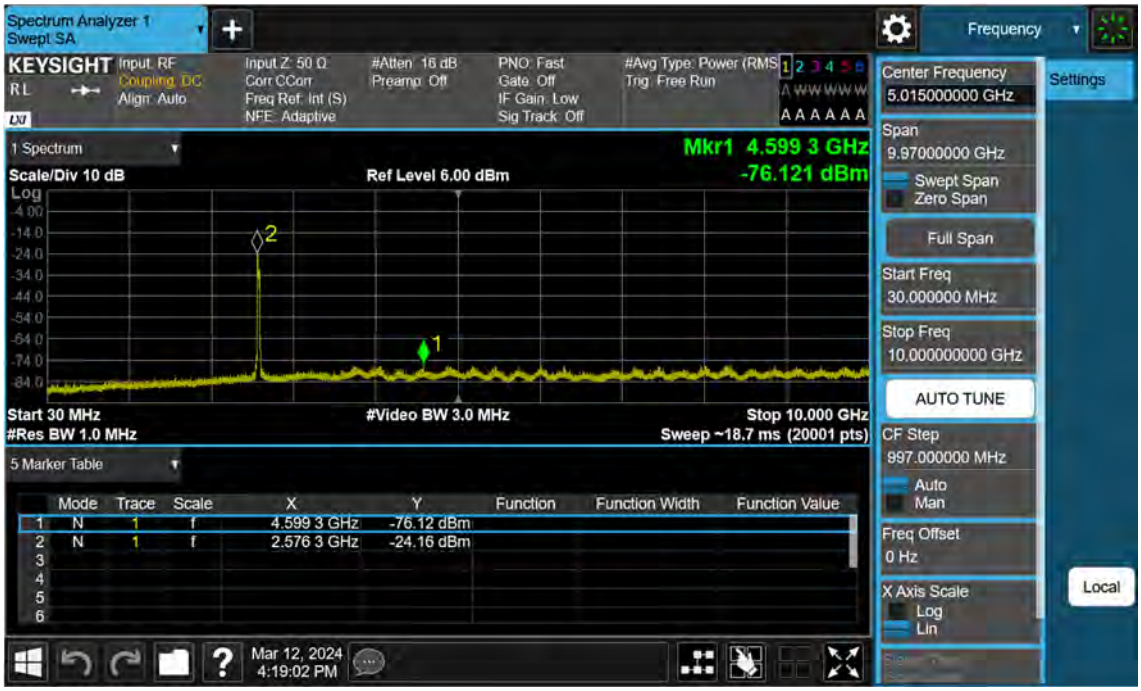
PCC 10 MHz Ch41395 RB50 Offset0 SCC 15 MHz Ch41515 RB75 Offset0



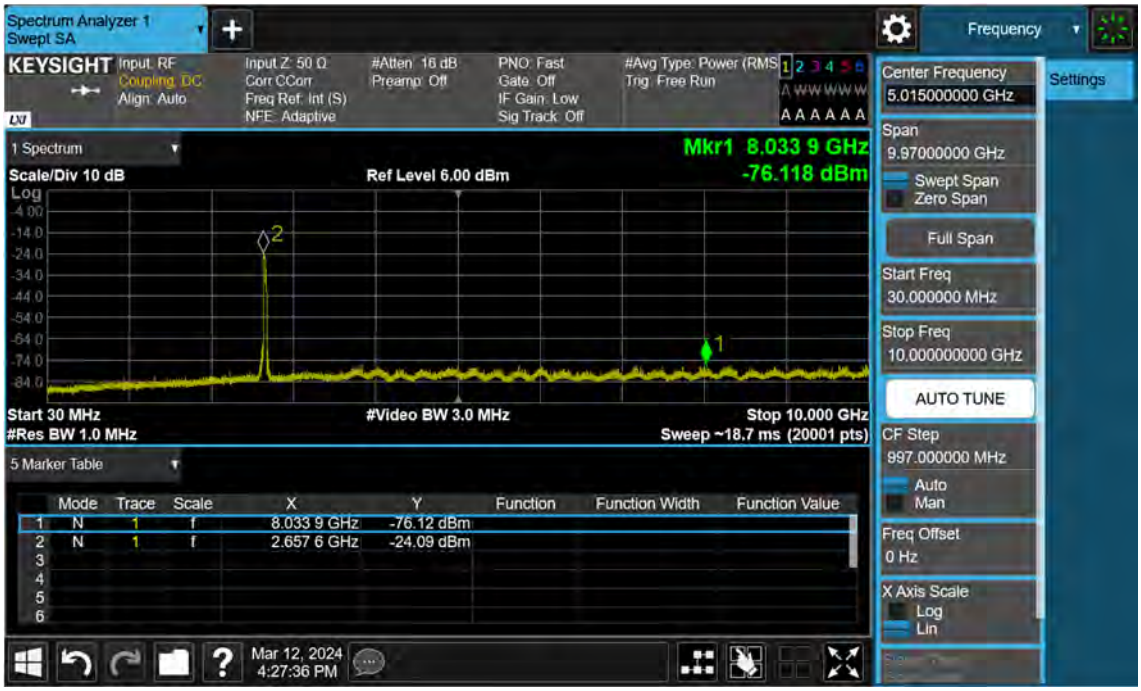
PCC 20 MHz Ch39750 RB100 Offset0 SCC 20 MHz Ch39948 RB100 Offset0



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

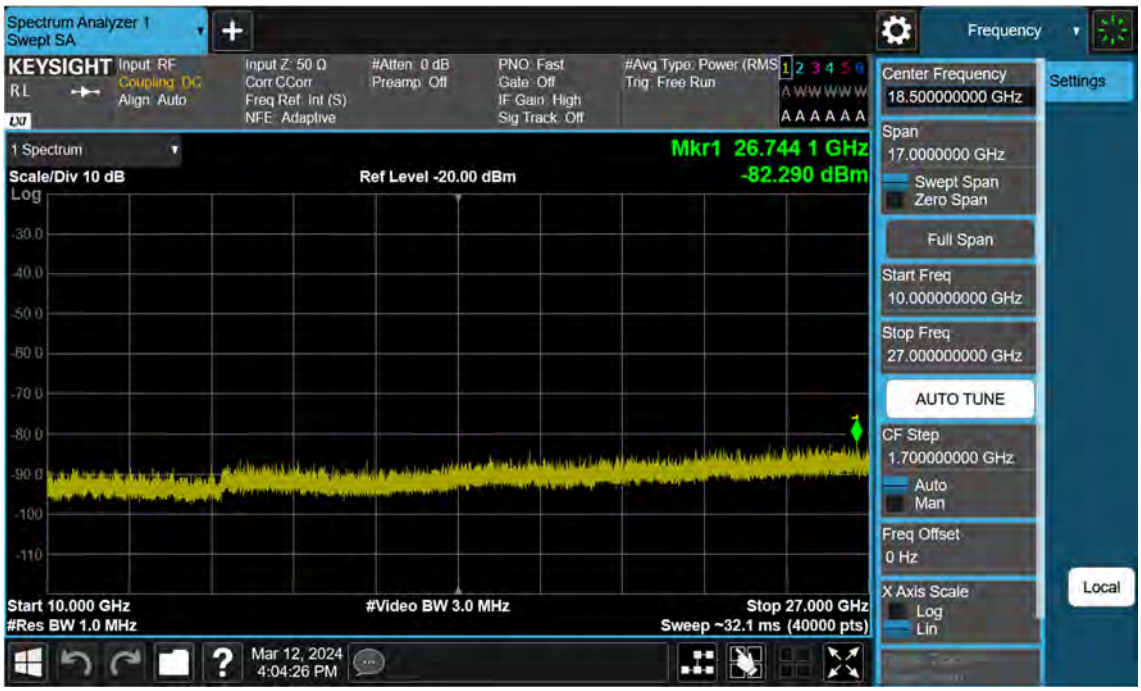


PCC 20 MHz Ch41292 RB100 Offset0 SCC 20 MHz Ch41490 RB100 Offset0



Frequency Range : 10 GHz ~ 27 GHz

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

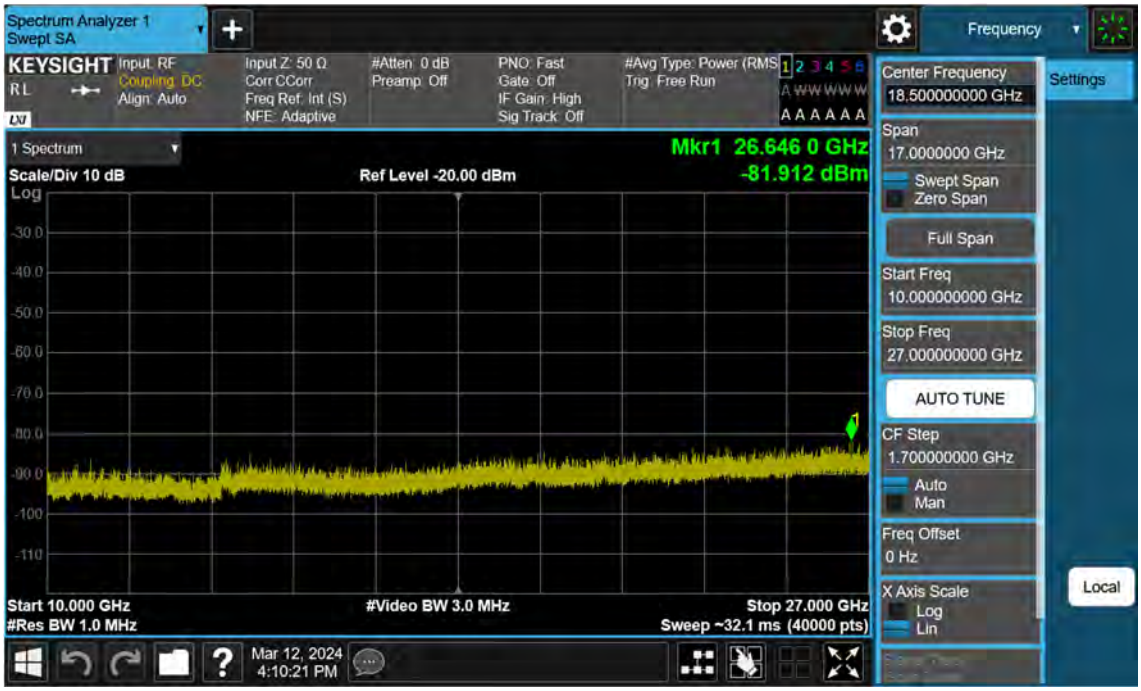


PCC 20 MHz Ch40595 RB1 Offset99, SCC 5 MHz Ch40712 RB1 Offset0

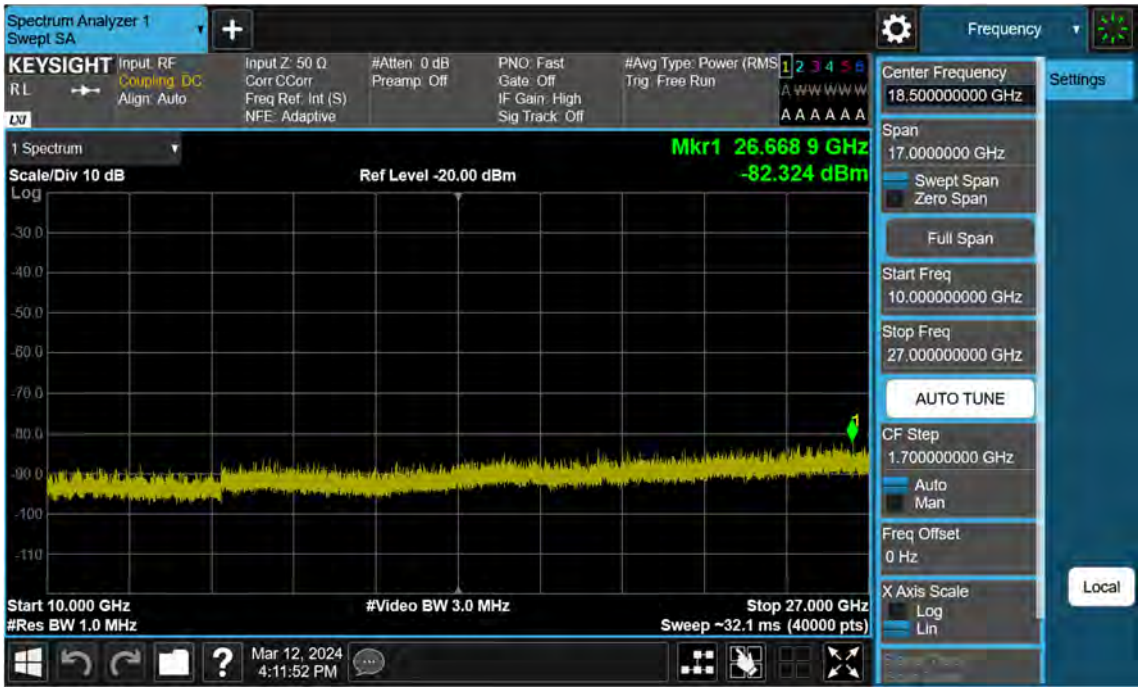
PCC 5 MHz Ch41373 RB1 Offset24, SCC 20 MHz Ch41490 RB1 Offset0

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

PCC 20 MHz Ch40595 RB1 Offset0, SCC 5 MHz Ch40712 RB1 Offset24

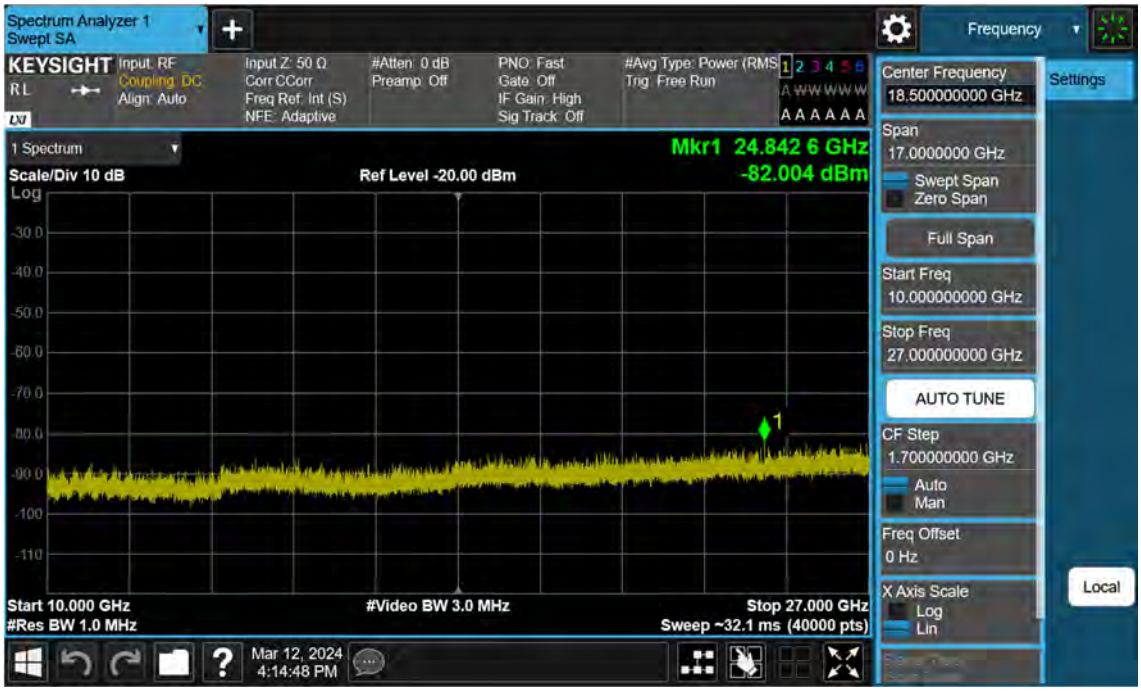


PCC 5 MHz Ch41373 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99



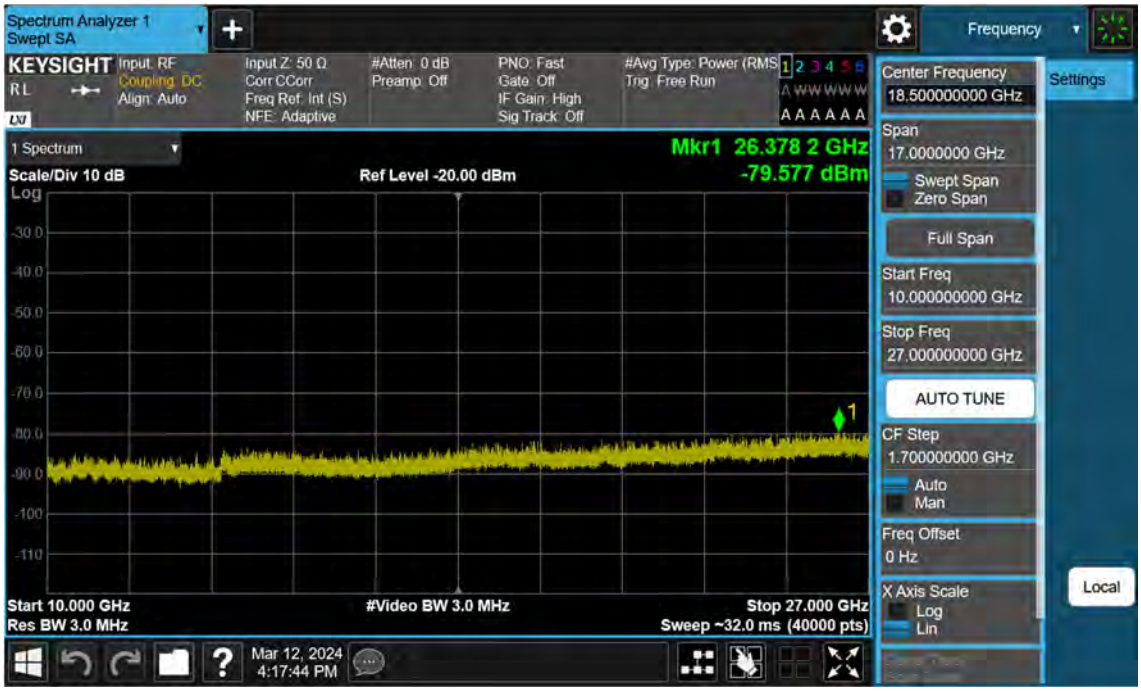
PCC 10 MHz Ch39703 RB50 Offset0, SCC 15 MHz Ch39823 RB75 Offset0

PCC 10 MHz Ch40526 RB50 Offset0, SCC 20 MHz Ch40670 RB100 Offset0



PCC 10 MHz Ch41395 RB50 Offset0, SCC 15 MHz Ch41515 RB75 Offset0

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



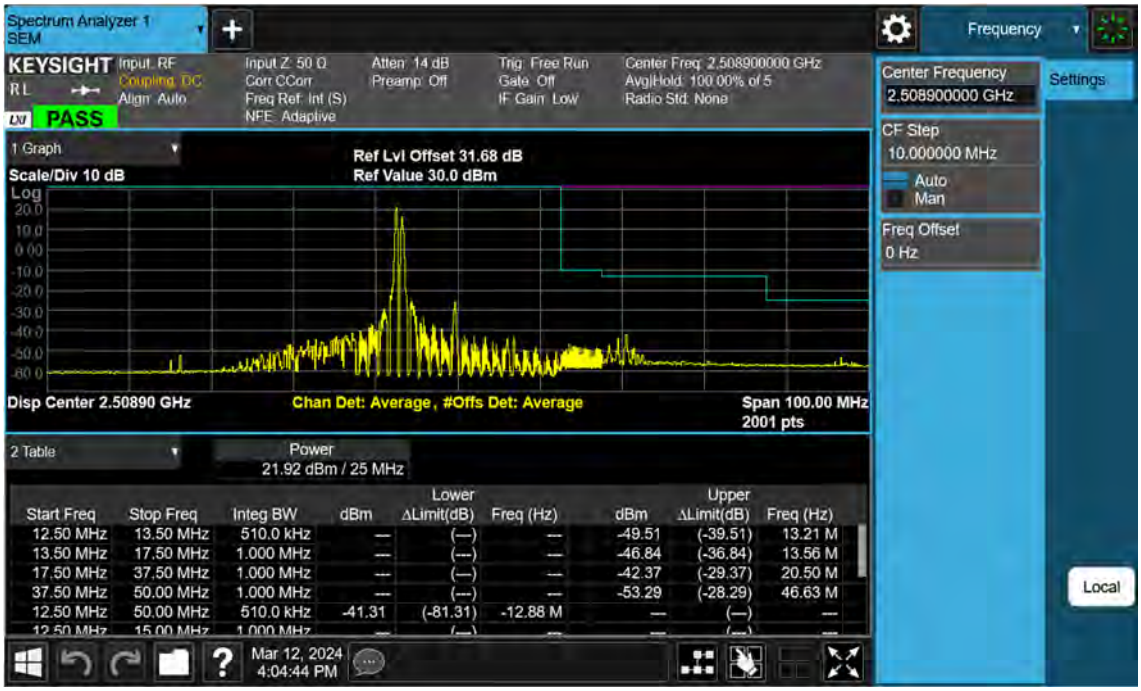
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0

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

8.4 Channel Edge

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

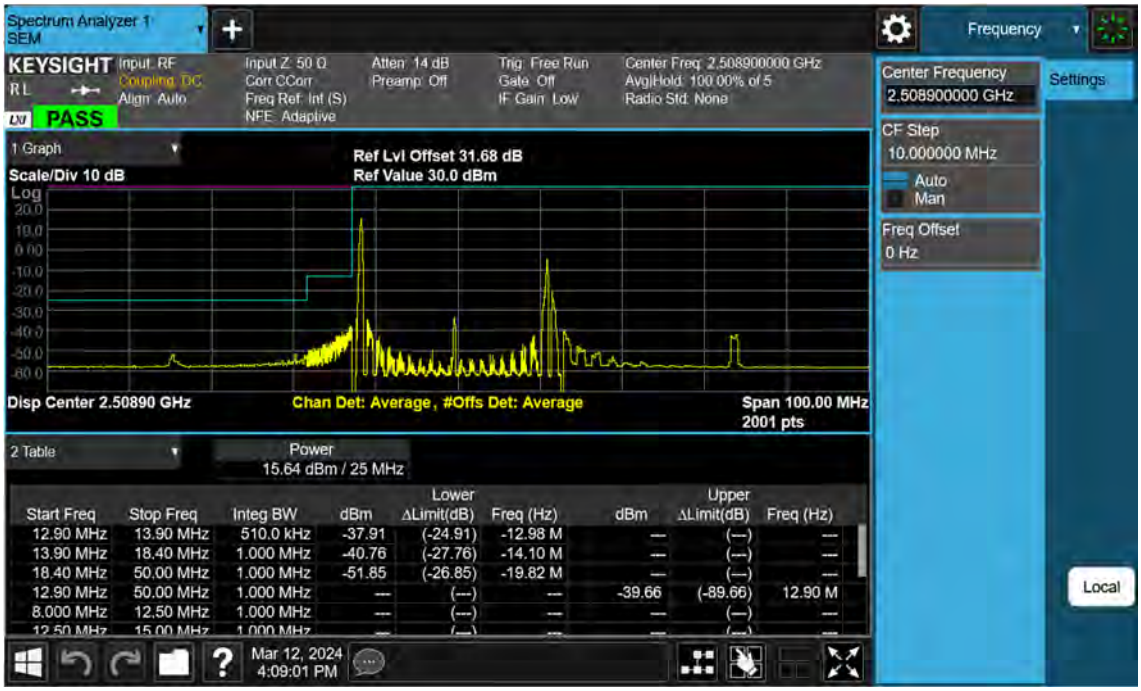
PCC 5 MHz Ch39683 RB1 Offset24, SCC 20 MHz Ch39800 RB1 Offset0-2



PCC 20 MHz Ch40595 RB1 Offset99, SCC 5 MHz Ch40712 RB1 Offset0

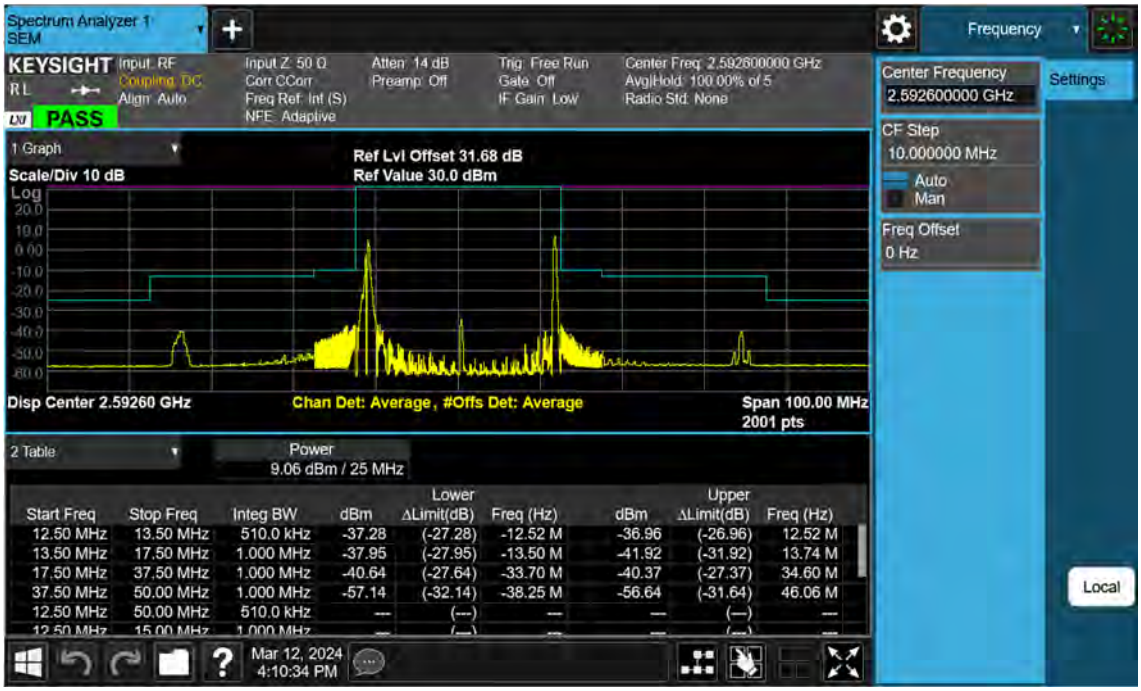
PCC 5 MHz Ch41373 RB1 Offset24, SCC 20 MHz Ch41490 RB1 Offset0

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

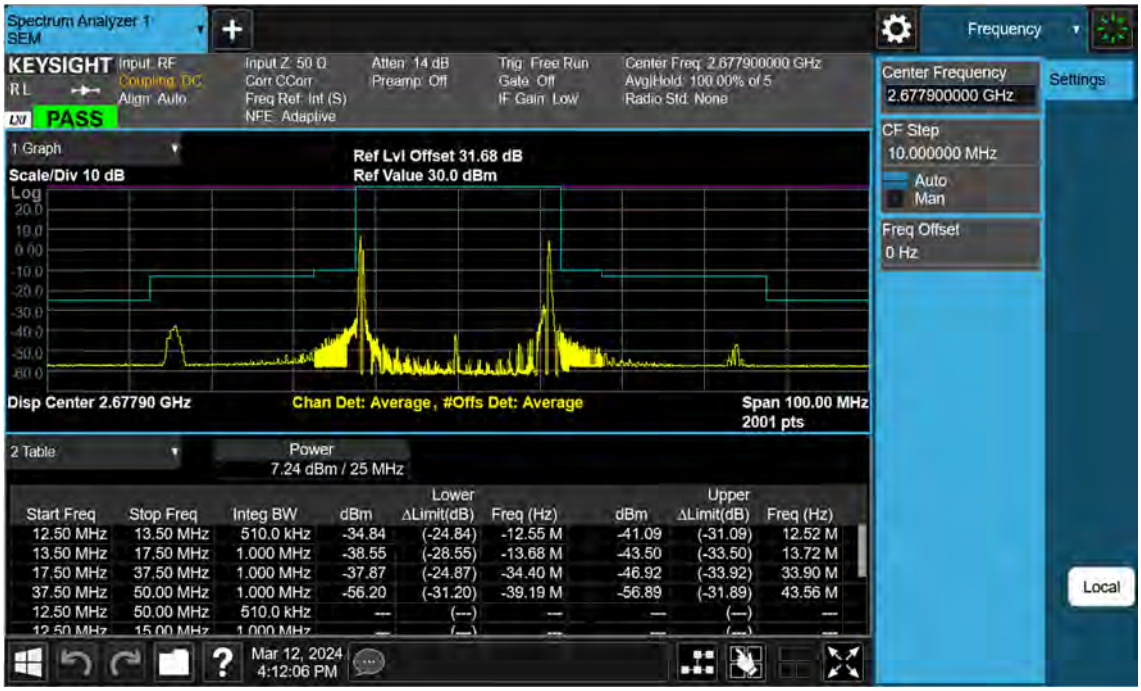


PCC 5 MHz Ch39683 RB1 Offset0, SCC 20 MHz Ch39800 RB1 Offset99-2

PCC 20 MHz Ch40595 RB1 Offset0, SCC 5 MHz Ch40712 RB1 Offset24



PCC 5 MHz Ch41373 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99



PCC 10 MHz Ch39703 RB50 Offset0, SCC 15 MHz Ch39823 RB75 Offset0-1

PCC 10 MHz Ch39703 RB50 Offset0, SCC 15 MHz Ch39823 RB75 Offset0-2

PCC 10 MHz Ch40526 RB50 Offset0, SCC 20 MHz Ch40670 RB100 Offset0

PCC 10 MHz Ch41395 RB50 Offset0, SCC 15 MHz Ch41515 RB75 Offset0

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

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	Temp.	PPM		Frequency Error (MHz)	
(%)	(VDC)	(℃)	PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.010	-0.013	2499.29995	2510.99993
100%		-30	-0.013	-0.007	2499.29991	2510.99994
100%		-20	0.001	-0.001	2499.29999	2510.99999
100%		-10	-0.018	-0.004	2499.29991	2510.99995
100%		0	-0.007	-0.006	2499.29998	2510.99993
100%		10	-0.011	0.002	2499.29995	2510.99996
100%		30	-0.002	0.006	2499.29996	2511.00001
100%		40	-0.008	0.001	2499.29994	2510.99996
100%		50	0.001	0.001	2499.29996	2510.99996
Batt. Endpoint	3.300	20	-0.004	0.012	2499.29998	2511.00003

▣ 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)	-0.011	-0.012	2501.49990	2515.89992
100%		-30	0.001	-0.002	2501.49992	2515.90001
100%		-20	-0.001	-0.014	2501.49999	2515.89996
100%		-10	-0.005	-0.003	2501.49996	2515.89999
100%		0	0.012	-0.003	2501.50003	2515.89992
100%		10	-0.019	0.002	2501.49988	2515.89997
100%		30	-0.015	-0.006	2501.49993	2515.89996
100%		40	-0.002	-0.006	2501.49994	2515.89991
100%		50	-0.002	0.005	2501.49992	2515.89996
Batt. Endpoint	3.300	20	-0.010	-0.007	2501.49996	2515.89995

▣ 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)	0.001	0.000	2503.79992	2520.90000
100%		-30	0.007	0.001	2503.79998	2520.89996
100%		-20	0.003	-0.007	2503.79995	2520.89996
100%		-10	-0.008	0.009	2503.79991	2520.89999
100%		0	0.003	-0.005	2503.79998	2520.89998
100%		10	-0.004	0.009	2503.79998	2520.89994
100%		30	0.003	-0.003	2503.79996	2520.89992
100%		40	0.012	0.004	2503.80002	2520.90001
100%		50	0.005	0.012	2503.79999	2520.90000
Batt. Endpoint	3.300	20	-0.007	0.001	2503.79992	2520.89995

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	0.002	0.002	2506.00000	2525.79993
100%		-30	-0.002	-0.009	2505.99995	2525.79991
100%		-20	-0.014	-0.010	2505.99989	2525.79991
100%		-10	-0.004	0.006	2505.99990	2525.79995
100%		0	-0.004	-0.006	2505.99997	2525.79994
100%		10	-0.001	-0.007	2505.99997	2525.79995
100%		30	-0.015	-0.009	2505.99990	2525.79990
100%		40	0.009	-0.011	2506.00002	2525.79993
100%		50	-0.006	-0.012	2505.99992	2525.79989
Batt. Endpoint	3.300	20	-0.007	-0.009	2505.99991	2525.79992

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.015	-0.007	2668.29995	2679.99991
100%		-30	-0.008	0.004	2668.29989	2679.99992
100%		-20	-0.009	0.011	2668.29991	2679.99996
100%		-10	0.006	-0.002	2668.29995	2679.99994
100%		0	-0.009	-0.016	2668.29993	2679.99996
100%		10	-0.013	0.008	2668.29992	2680.00002
100%		30	0.005	-0.004	2668.30001	2679.99996
100%		40	0.003	-0.021	2668.29993	2679.99990
100%		50	0.002	-0.005	2668.29998	2680.00001
Batt. Endpoint	3.300	20	-0.008	0.002	2668.29991	2680.00001

▣ 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)	0.006	-0.022	2665.59996	2679.99987
100%		-30	-0.013	0.000	2665.59995	2679.99998
100%		-20	-0.003	-0.006	2665.59996	2679.99997
100%		-10	-0.011	0.009	2665.59992	2680.00003
100%		0	-0.007	-0.017	2665.59998	2679.99992
100%		10	-0.014	-0.001	2665.59994	2679.99993
100%		30	-0.020	-0.010	2665.59990	2679.99991
100%		40	0.013	0.003	2665.59997	2679.99995
100%		50	-0.020	-0.016	2665.59989	2679.99987
Batt. Endpoint	3.300	20	0.004	-0.005	2665.59997	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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.008	-0.001	2662.89999	2679.99998
100%		-30	-0.014	-0.005	2662.89991	2679.99999
100%		-20	0.000	0.001	2662.89993	2679.99996
100%		-10	0.004	-0.007	2662.89996	2679.99995
100%		0	0.002	0.004	2662.89996	2679.99999
100%		10	0.009	-0.008	2662.90001	2679.99989
100%		30	-0.009	0.008	2662.89994	2679.99995
100%		40	-0.001	-0.017	2662.89998	2679.99989
100%		50	-0.002	-0.001	2662.89992	2679.99991
Batt. Endpoint	3.300	20	-0.003	-0.012	2662.89991	2679.99996

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	0.003	-0.007	2660.19997	2679.99994
100%		-30	0.004	-0.005	2660.19998	2679.99997
100%		-20	0.001	-0.012	2660.19991	2679.99995
100%		-10	0.005	0.001	2660.19993	2679.99995
100%		0	-0.004	-0.002	2660.19995	2680.00001
100%		10	0.003	0.004	2660.19992	2679.99995
100%		30	0.000	-0.011	2660.20000	2679.99992
100%		40	0.011	-0.003	2660.19996	2679.99998
100%		50	-0.003	0.007	2660.19992	2680.00002
Batt. Endpoint	3.300	20	0.002	-0.003	2660.19996	2679.99998

8.6 Radiated Spurious Emissions

- ▣ PCC Channel : 39750 (2506.0 MHz)
- ▣ PCC BW(MHz) : 20
- ▣ PCC RB/ RB Offset : 1/ 99
- ▣ SCC Channel : 39894 (2520.4 MHz)
- ▣ SCC BW(MHz) : 10
- ▣ SCC RB/ RB Offset : 1/ 0
- ▣ DISTANCE: 1 meters
- ▣ LIMIT: -25.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 026.40	-57.33	12.50	-67.50	3.90	V	-58.90
7 539.60	-45.40	10.88	-45.54	4.72	H	-39.38
10 052.80	-60.54	11.38	-57.14	5.47	V	-51.23

▣ 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	-57.68	12.52	-66.11	3.81	H	-57.40
7 768.95	-45.18	11.42	-45.04	4.78	H	-38.40
10 358.60	-57.63	11.45	-52.12	5.56	V	-46.23

▣ PCC Channel : 41395 (2670.5 MHz)

▣ PCC BW(MHz) : 10

▣ PCC RB/ RB Offset : 1/ 49

▣ SCC Channel : 41515 (2682.5 MHz)

▣ SCC BW(MHz) : 15

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 1 meters

▣ LIMIT: -25.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
5 353.00	-57.15	13.09	-66.09	3.91	H	-56.91
8 029.50	-47.93	10.72	-46.24	4.87	H	-40.39
10 706.00	-59.16	11.35	-54.96	5.82	H	-49.43

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	22.890
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	23.189
10	40526	2583.6	QPSK	50/ 0	20	40670	2598.0	QPSK	100/ 0	27.724
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	23.126
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	28.358
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	32.604
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	22.945
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	27.815
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	32.623
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	37.543

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	22.863
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	23.127
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	27.729
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	23.178
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	28.351
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	32.602
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	22.886
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	27.809
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	32.789
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	37.695

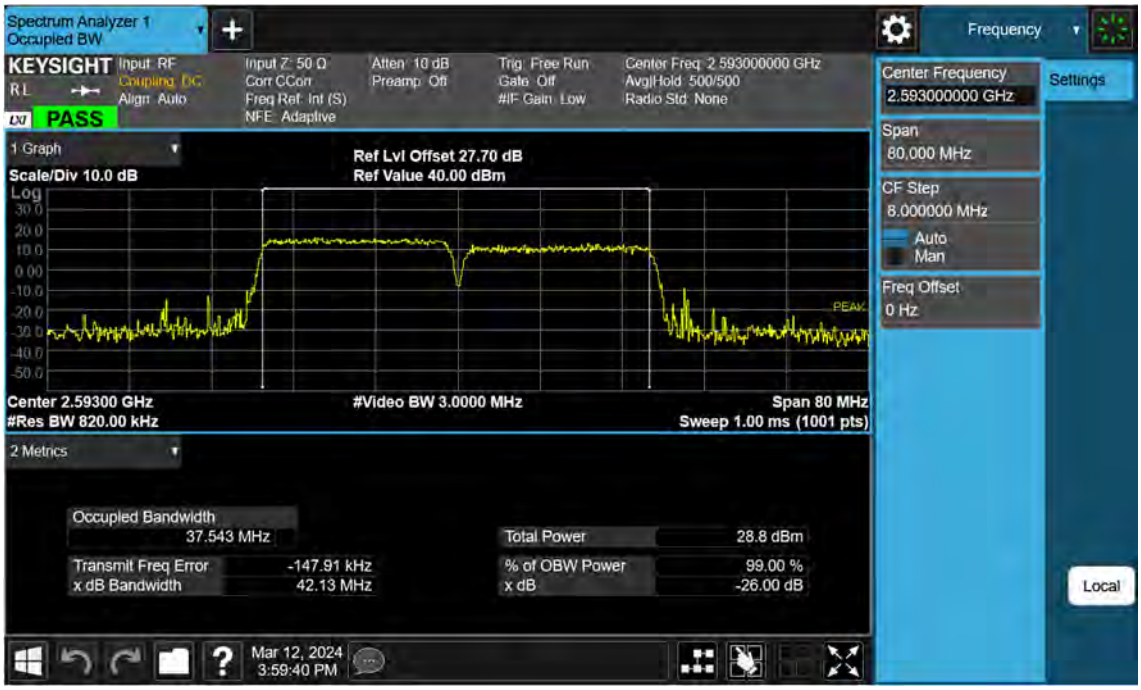
PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	64QAM	25/ 0	20	40645	2595.5	64QAM	100/ 0	22.835
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	23.137
10	40526	2583.6	64QAM	50/ 0	20	40670	2598.0	64QAM	100/ 0	27.712
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	23.178
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	28.295
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	32.625
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	22.919
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	27.780
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	32.665
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	37.604

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	22.867
10	40549	2585.9	256QAM	50/ 0	15	40669	2597.9	256QAM	75/ 0	23.089
10	40526	2583.6	256QAM	50/ 0	20	40670	2598.0	256QAM	100/ 0	27.696
15	40571	2588.1	256QAM	75/ 0	10	40691	2600.1	256QAM	50/ 0	23.210
15	40545	2585.5	256QAM	75/ 0	15	40695	2600.5	256QAM	75/ 0	28.474
15	40523	2583.3	256QAM	75/ 0	20	40694	2600.4	256QAM	100/ 0	32.671
20	40595	2590.5	256QAM	100/ 0	5	40712	2602.2	256QAM	25/ 0	22.895
20	40571	2588.1	256QAM	100/ 0	10	40715	2602.5	256QAM	50/ 0	27.848
20	40546	2585.6	256QAM	100/ 0	15	40717	2602.7	256QAM	75/ 0	32.681
20	40521	2583.1	256QAM	100/ 0	20	40719	2602.9	256QAM	100/ 0	37.569

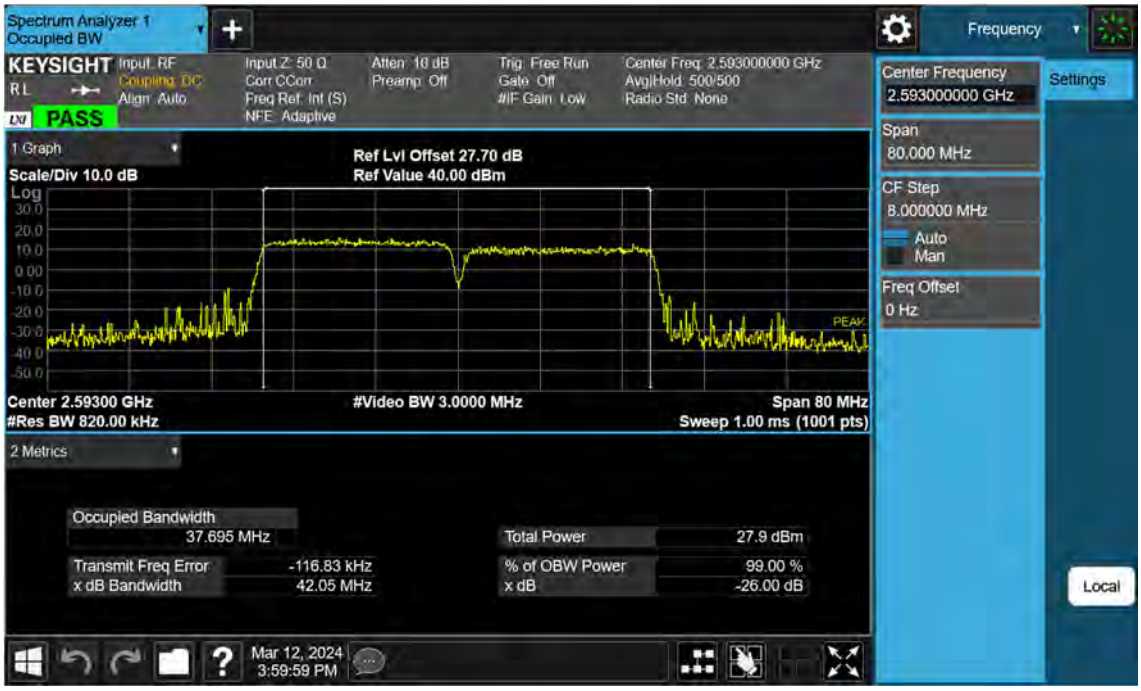
Note:

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

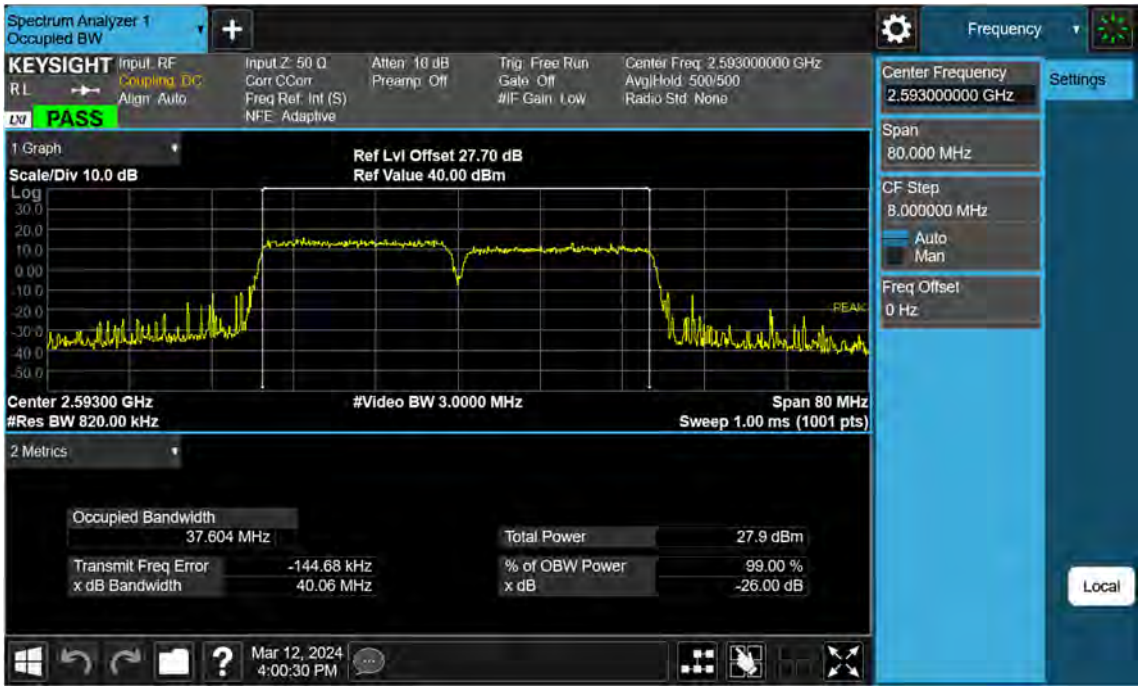
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0_(QPSK)



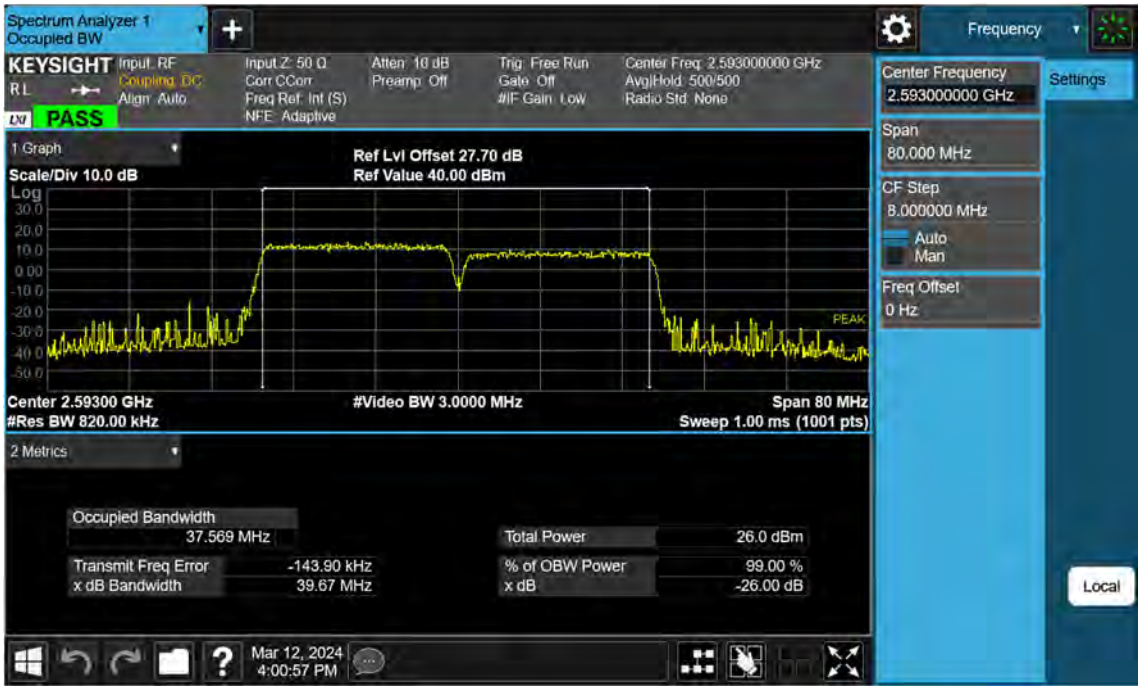
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0_(16QAM)



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	6.32
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	6.28
10	40526	2583.6	QPSK	50/ 0	20	40670	2598.0	QPSK	100/ 0	6.32
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	6.25
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	6.94
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	6.32
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	6.34
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	6.63
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	6.33
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	6.60

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	6.97
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	6.88
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	6.88
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	6.87
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	6.97
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	6.86
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	6.90
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	6.97
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	6.93
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	7.08

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	7.52
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	7.06
10	40526	2583.6	64QAM	50/ 0	20	40670	2598.0	64QAM	100/ 0	7.04
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	6.98
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	7.03
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	7.01
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	7.02
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	6.96
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	7.00
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	7.18

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	7.62
10	40549	2585.9	256QAM	50/ 0	15	40669	2597.9	256QAM	75/ 0	7.33
10	40526	2583.6	256QAM	50/ 0	20	40670	2598.0	256QAM	100/ 0	7.56
15	40571	2588.1	256QAM	75/ 0	10	40691	2600.1	256QAM	50/ 0	7.12
15	40545	2585.5	256QAM	75/ 0	15	40695	2600.5	256QAM	75/ 0	7.15
15	40523	2583.3	256QAM	75/ 0	20	40694	2600.4	256QAM	100/ 0	7.10
20	40595	2590.5	256QAM	100/ 0	5	40712	2602.2	256QAM	25/ 0	7.11
20	40571	2588.1	256QAM	100/ 0	10	40715	2602.5	256QAM	50/ 0	7.03
20	40546	2585.6	256QAM	100/ 0	15	40717	2602.7	256QAM	75/ 0	7.07
20	40521	2583.1	256QAM	100/ 0	20	40719	2602.9	256QAM	100/ 0	7.20

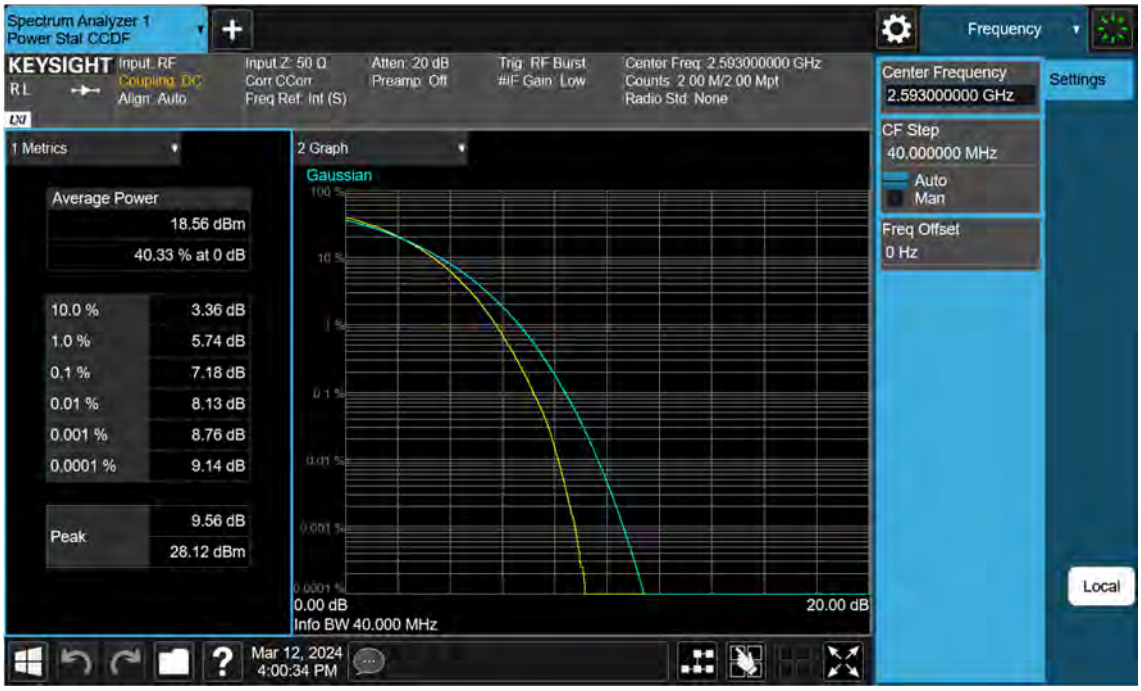
Note:

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

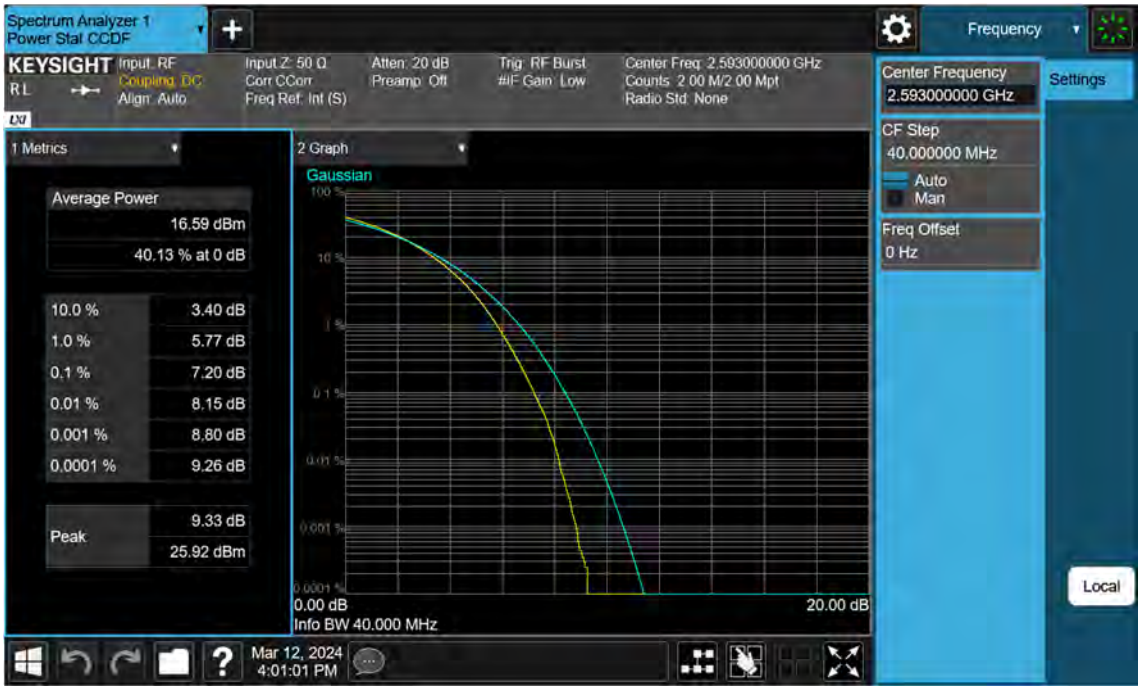
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0_(QPSK)

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 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Note

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

Channel Bandwidth (PCC)	Channel Bandwidth (SCC)	Maximum aggregated bandwidth (MHz)
5	20	25
10	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-open, Closed), the worst case configuration results are reported.
   Worst case: half-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/ Band Edge	QPSK	Low	5	2499.3	39683	1	24	20	2511.0	39800	1	0
		Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0
		High	5	2668.3	41373	1	24	20	2680.0	41490	1	0
		Low	5	2499.3	39683	1	0	20	2511.0	39800	1	99
		Mid	15	2583.3	40523	1	0	20	2600.4	40694	1	99
		High	5	2668.3	41373	1	0	20	2680.0	41490	1	99
		Low	10	2501.5	39705	50	0	20	2515.9	39849	100	0
		Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0
		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	20	2660.2	41292	1	99	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

.

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***	***24.28***
	10	2501.3	39703	1	49	15	2513.3	39823	1	0	24.06
	10	2501.5	39705	1	49	20	2515.9	39849	1	0	24.21
	15	2503.5	39725	1	74	10	2515.5	39845	1	0	24.10
	15	2503.5	39725	1	74	15	2518.5	39875	1	0	24.02
	15	2503.8	39728	1	74	20	2520.9	39899	1	0	24.03
	20	2506.0	39750	1	99	5	2517.7	39867	1	0	24.13
	20	2506.0	39750	1	99	10	2520.4	39894	1	0	24.17
	20	2506.0	39750	1	99	15	2523.1	39921	1	0	24.12
	20	2506.0	39750	1	99	20	2525.8	39948	1	0	24.06
Mid	5	2583.8	40528	1	24	20	2595.5	40645	1	0	23.86
	10	2585.9	40549	1	49	15	2597.9	40669	1	0	23.86
	10	2583.6	40526	1	49	20	2598.0	40670	1	0	23.87
	15	2588.1	40571	1	74	10	2600.1	40691	1	0	23.85
	15	2585.5	40545	1	74	15	2600.5	40695	1	0	23.88
	15	***2583.3***	***40523***	***1***	***74***	***20***	***2600.4***	***40694***	***1***	***0***	***23.90***
	20	2590.5	40595	1	99	5	2602.2	40712	1	0	23.83
	20	2588.1	40571	1	99	10	2602.5	40715	1	0	23.88
	20	2585.6	40546	1	99	15	2602.7	40717	1	0	23.87
	20	2583.1	40521	1	99	20	2602.9	40719	1	0	23.81
High	***5***	***2668.3***	***41373***	***1***	***24***	***20***	***2680.0***	***41490***	***1***	***0***	***23.87***
	10	2670.5	41395	1	49	15	2682.5	41515	1	0	23.85
	10	2665.6	41346	1	49	20	2680.0	41490	1	0	23.86
	15	2672.7	41417	1	74	10	2684.7	41537	1	0	23.73
	15	2667.5	41365	1	74	15	2682.5	41515	1	0	23.82
	15	2662.9	41319	1	74	20	2680.0	41490	1	0	23.80
	20	2675.0	41440	1	99	5	2686.7	41557	1	0	23.70
	20	2670.1	41391	1	99	10	2684.5	41535	1	0	23.77
	20	2665.1	41341	1	99	15	2682.2	41512	1	0	23.77
	20	2660.2	41292	1	99	20	2680.0	41490	1	0	23.75

Note:

Modulation : QPSK(1RB)

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	5	2499.3	39683	25	0	20	2511.0	39800	100	0	22.35
	10	2501.3	39703	50	0	15	2513.3	39823	75	0	22.32
	10	***2501.5***	***39705***	***50***	***0***	***20***	***2515.9***	***39849***	***100***	***0***	***22.37***
	15	2503.5	39725	75	0	10	2515.5	39845	50	0	22.24
	15	2503.5	39725	75	0	15	2518.5	39875	75	0	22.35
	15	2503.8	39728	75	0	20	2520.9	39899	100	0	22.36
	20	2506.0	39750	100	0	5	2517.7	39867	25	0	22.33
	20	2506.0	39750	100	0	10	2520.4	39894	50	0	22.33
	20	2506.0	39750	100	0	15	2523.1	39921	75	0	22.31
	20	2506.0	39750	100	0	20	2525.8	39948	100	0	22.35
Mid	5	2583.8	40528	25	0	20	2595.5	40645	100	0	22.12
	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***	***22.19***
	15	2588.1	40571	75	0	10	2600.1	40691	50	0	22.12
	15	2585.5	40545	75	0	15	2600.5	40695	75	0	22.17
	15	2583.3	40523	75	0	20	2600.4	40694	100	0	22.16
	20	2590.5	40595	100	0	5	2602.2	40712	25	0	22.14
	20	2588.1	40571	100	0	10	2602.5	40715	50	0	22.14
	20	2585.6	40546	100	0	15	2602.7	40717	75	0	22.15
	20	2583.1	40521	100	0	20	2602.9	40719	100	0	22.18
High	5	2668.3	41373	25	0	20	2680.0	41490	100	0	22.12
	10	2670.5	41395	50	0	15	2682.5	41515	75	0	22.11
	10	2665.6	41346	50	0	20	2680.0	41490	100	0	22.17
	15	2672.7	41417	75	0	10	2684.7	41537	50	0	22.05
	15	2667.5	41365	75	0	15	2682.5	41515	75	0	22.09
	15	2662.9	41319	75	0	20	2680.0	41490	100	0	22.15
	20	2675.0	41440	100	0	5	2686.7	41557	25	0	22.02
	20	2670.1	41391	100	0	10	2684.5	41535	50	0	22.09
	20	2665.1	41341	100	0	15	2682.2	41512	75	0	22.11
	20	***2660.2***	***41292***	***100***	***0***	***20***	***2680.0***	***41490***	***100***	***0***	***22.18***

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	23.61
Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0	23.45
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	23.44
Low	10	2501.5	39705	50	0	20	2515.9	39849	100	0	21.50
Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0	21.27
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	21.24

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	22.68
Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0	22.49
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	22.57
Low	10	2501.5	39705	50	0	20	2515.9	39849	100	0	21.45
Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0	21.18
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	21.22

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	19.58
Mid	15	2583.3	40523	1	74	20	2600.4	40694	1	0	19.32
High	5	2668.3	41373	1	24	20	2680.0	41490	1	0	19.38
Low	10	2501.5	39705	50	0	20	2515.9	39849	100	0	19.53
Mid	10	2583.6	40526	50	0	20	2598.0	40670	100	0	19.27
High	20	2660.2	41292	100	0	20	2680.0	41490	100	0	19.33

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	*5*	*39683*	*1/24*	*20*	*39800*	*1/0*	*-22.37*	*14.49*	*10.55*	*2.57*	*H*	*0.176*	*22.47*
	10	39703	1/49	15	39823	1/0	-22.73	14.16	10.59	2.57	H	0.165	22.18
	10	39705	1/49	20	39849	1/0	-22.86	14.03	10.59	2.57	H	0.160	22.05
	15	39725	1/74	10	39845	1/0	-23.27	13.62	10.59	2.57	H	0.146	21.64
	15	39725	1/74	15	39875	1/0	-23.25	13.64	10.59	2.57	H	0.147	21.66
	15	39728	1/74	20	39899	1/0	-23.31	13.58	10.59	2.57	H	0.145	21.60
	20	39750	1/99	5	39867	1/0	-23.00	13.89	10.59	2.57	H	0.155	21.91
	20	39750	1/99	10	39894	1/0	-23.20	13.69	10.59	2.57	H	0.148	21.71
	20	39750	1/99	15	39921	1/0	-23.03	13.85	10.64	2.59	H	0.155	21.90
	20	39750	1/99	20	39948	1/0	-22.93	13.95	10.64	2.59	H	0.158	22.00
Mid	*5*	*40528*	*1/24*	*20*	*40645*	*1/0*	*-20.66*	*16.56*	*10.64*	*2.71*	*H*	*0.281*	*24.49*
	10	40549	1/49	15	40669	1/0	-21.13	16.09	10.64	2.71	H	0.252	24.02
	10	40526	1/49	20	40670	1/0	-20.92	16.30	10.64	2.71	H	0.265	24.23
	15	40571	1/74	10	40691	1/0	-20.90	16.21	10.64	2.68	H	0.261	24.17
	15	40545	1/74	15	40695	1/0	-20.78	16.44	10.64	2.71	H	0.274	24.37
	15	40523	1/74	20	40694	1/0	-21.10	16.12	10.64	2.71	H	0.254	24.05
	20	40595	1/99	5	40712	1/0	-21.01	16.10	10.64	2.68	H	0.255	24.06
	20	40571	1/99	10	40715	1/0	-21.00	16.11	10.64	2.68	H	0.255	24.07
	20	40546	1/99	15	40717	1/0	-20.92	16.19	10.64	2.68	H	0.260	24.15
	20	40521	1/99	20	40719	1/0	-20.80	16.42	10.64	2.71	H	0.272	24.35
High	5	41373	1/24	20	41490	1/0	-22.55	14.87	10.72	2.74	H	0.193	22.85
	10	41395	1/49	15	41515	1/0	-22.54	14.88	10.72	2.74	H	0.193	22.86
	10	41346	1/49	20	41490	1/0	-22.51	14.91	10.72	2.74	H	0.194	22.89
	15	41417	1/74	10	41537	1/0	-22.83	14.60	10.72	2.75	H	0.181	22.57
	15	41365	1/74	15	41515	1/0	-22.59	14.83	10.72	2.74	H	0.191	22.81
	15	41319	1/74	20	41490	1/0	-22.44	14.98	10.71	2.73	H	0.198	22.96
	20	41440	1/99	5	41557	1/0	-23.04	14.39	10.72	2.75	H	0.172	22.36
	20	41391	1/99	10	41535	1/0	-23.04	14.38	10.72	2.74	H	0.172	22.36
	20	41341	1/99	15	41512	1/0	-22.51	14.91	10.72	2.74	H	0.194	22.89
	20	*41292*	*1/99*	*20*	*41490*	*1/0*	*-22.40*	*15.02*	*10.71*	*2.73*	*H*	*0.199*	*23.00*

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
5	39683	1/24	20	39800	1/0	-22.88	13.98	10.55	2.57	H	0.157	21.96
5	40528	1/24	20	40645	1/0	-21.17	16.05	10.64	2.71	H	0.250	23.98
10	40549	1/49	15	40669	1/0	-21.64	15.58	10.64	2.71	H	0.224	23.51
10	40526	1/49	20	40670	1/0	-21.56	15.66	10.64	2.71	H	0.229	23.59
15	40571	1/74	10	40691	1/0	-21.39	15.72	10.64	2.68	H	0.233	23.68
15	40545	1/74	15	40695	1/0	-21.36	15.86	10.64	2.71	H	0.239	23.79
15	40523	1/74	20	40694	1/0	-21.61	15.61	10.64	2.71	H	0.226	23.54
20	40595	1/99	5	40712	1/0	-21.50	15.61	10.64	2.68	H	0.228	23.57
20	40571	1/99	10	40715	1/0	-21.46	15.65	10.64	2.68	H	0.230	23.61
20	40546	1/99	15	40717	1/0	-21.45	15.66	10.64	2.68	H	0.230	23.62
20	40521	1/99	20	40719	1/0	-21.34	15.88	10.64	2.71	H	0.240	23.81
20	41292	1/99	20	41490	1/0	-22.91	14.51	10.71	2.73	H	0.177	22.49

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
5	39683	1/24	20	39800	1/0	-23.84	13.02	10.55	2.57	H	0.126	21.00
5	40528	1/24	20	40645	1/0	-22.15	15.07	10.64	2.71	H	0.200	23.00
10	40549	1/49	15	40669	1/0	-22.60	14.62	10.64	2.71	H	0.180	22.55
10	40526	1/49	20	40670	1/0	-22.54	14.68	10.64	2.71	H	0.182	22.61
15	40571	1/74	10	40691	1/0	-22.40	14.71	10.64	2.68	H	0.185	22.67
15	40545	1/74	15	40695	1/0	-22.27	14.95	10.64	2.71	H	0.194	22.88
15	40523	1/74	20	40694	1/0	-22.61	14.61	10.64	2.71	H	0.179	22.54
20	40595	1/99	5	40712	1/0	-22.47	14.64	10.64	2.68	H	0.182	22.60
20	40571	1/99	10	40715	1/0	-22.51	14.60	10.64	2.68	H	0.180	22.56
20	40546	1/99	15	40717	1/0	-22.38	14.73	10.64	2.68	H	0.186	22.69
20	40521	1/99	20	40719	1/0	-22.27	14.95	10.64	2.71	H	0.194	22.88
20	41292	1/99	20	41490	1/0	-23.94	13.48	10.71	2.73	H	0.140	21.46

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
5	39683	1/24	20	39800	1/0	-26.89	9.97	10.55	2.57	H	0.062	17.95
5	40528	1/24	20	40645	1/0	-25.19	12.03	10.64	2.71	H	0.099	19.96
10	40549	1/49	15	40669	1/0	-25.66	11.56	10.64	2.71	H	0.089	19.49
10	40526	1/49	20	40670	1/0	-25.47	11.75	10.64	2.71	H	0.093	19.68
15	40571	1/74	10	40691	1/0	-25.44	11.67	10.64	2.68	H	0.092	19.63
15	40545	1/74	15	40695	1/0	-25.31	11.91	10.64	2.71	H	0.096	19.84
15	40523	1/74	20	40694	1/0	-25.64	11.58	10.64	2.71	H	0.089	19.51
20	40595	1/99	5	40712	1/0	-25.52	11.59	10.64	2.68	H	0.090	19.55
20	40571	1/99	10	40715	1/0	-25.50	11.61	10.64	2.68	H	0.091	19.57
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	-25.33	11.89	10.64	2.71	H	0.096	19.82
20	41292	1/99	20	41490	1/0	-26.98	10.44	10.71	2.73	H	0.069	18.42

Note:

1. Modulation : 256QAM

2. Limit : < 2 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	5	39683	2499.3	1/24	20	39800	2511.0	1/0	8.0175	32.570	-75.90	-43.33
Mid	15	40523	2583.3	1/74	20	40694	2600.4	1/0	8.2637	32.570	-75.54	-42.97
High	5	41373	2668.3	1/24	20	41490	2680.0	1/0	3.7224	31.955	-76.34	-44.38
Low	5	39683	2499.3	1/0	20	39800	2511.0	1/99	9.6854	32.570	-76.16	-43.59
Mid	15	40523	2583.3	1/0	20	40694	2600.4	1/99	9.9462	32.570	-76.49	-43.92
High	5	41373	2668.3	1/0	20	41490	2680.0	1/99	4.0070	31.955	-76.22	-44.26
Low	10	39705	2501.5	50/0	20	39849	2515.9	100/0	8.3111	32.570	-76.52	-43.95
Mid	10	40526	2583.6	50/0	20	40670	2598.0	100/0	3.7992	31.955	-75.39	-43.44
Low	20	39750	2506.0	100/0	20	39948	2525.8	100/0	8.2717	32.570	-76.10	-43.53
Mid	20	40521	2583.1	100/0	20	40719	2602.9	100/0	8.0010	32.570	-75.40	-42.83
High	20	41292	2660.2	100/0	20	41490	2680.0	100/0	8.0294	32.570	-76.17	-43.60

Note:

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

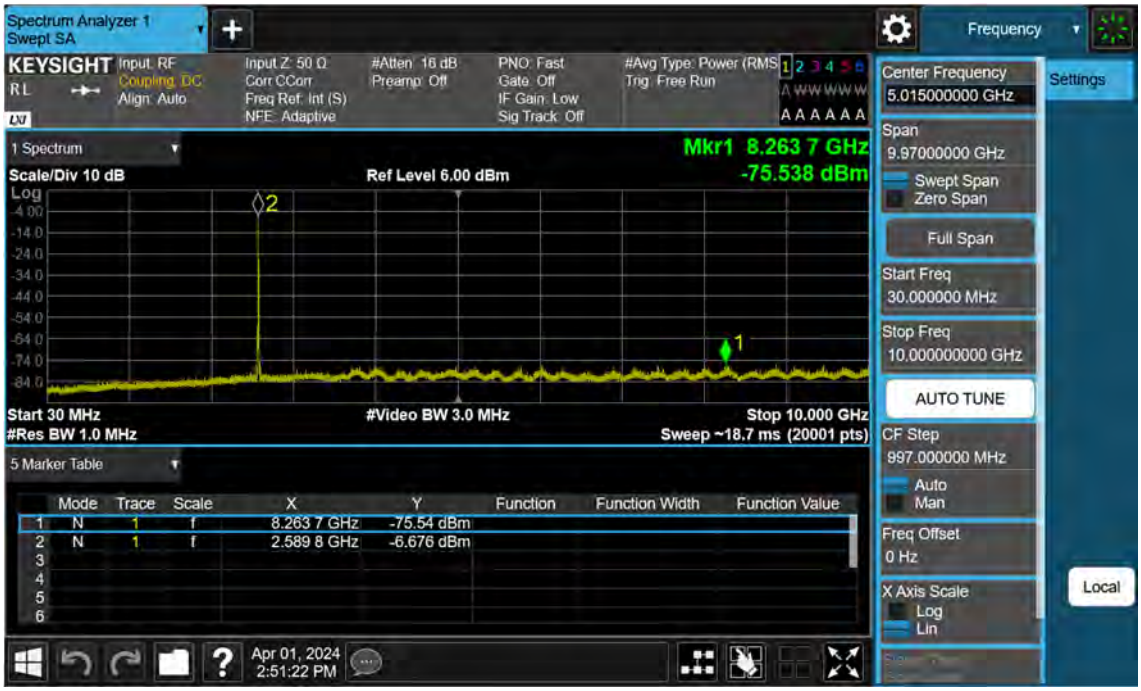
Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20(26.5)	30.131

4. Limit : -13.0 dBm

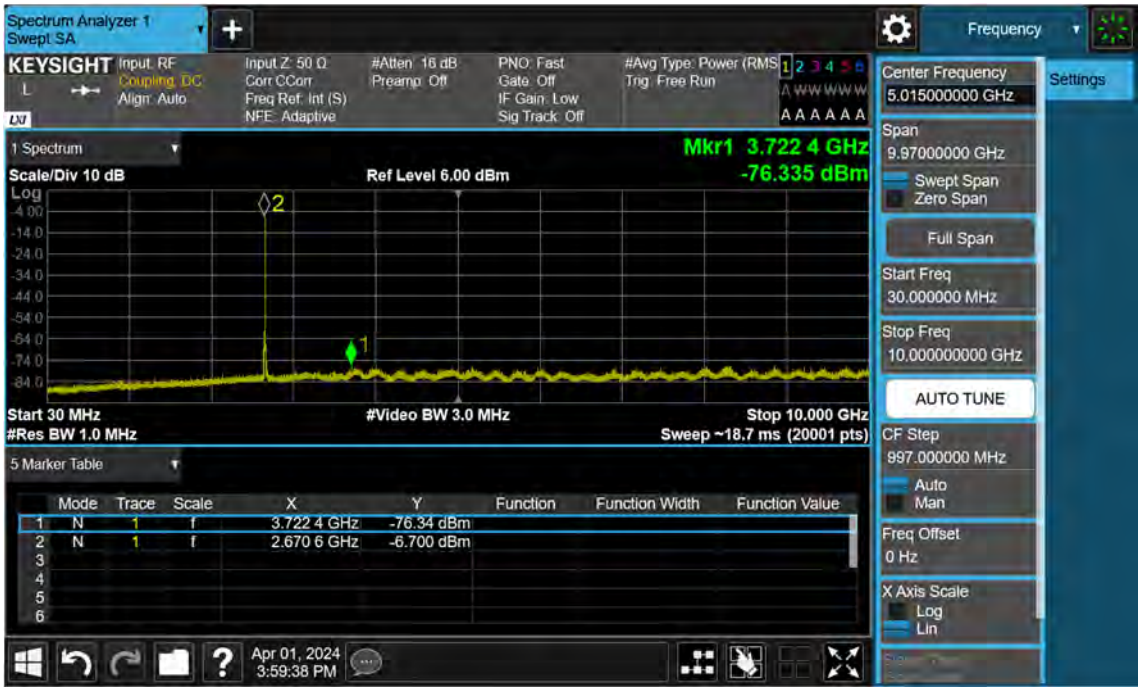
Frequency Range : 30 MHz ~ 10 GHz

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

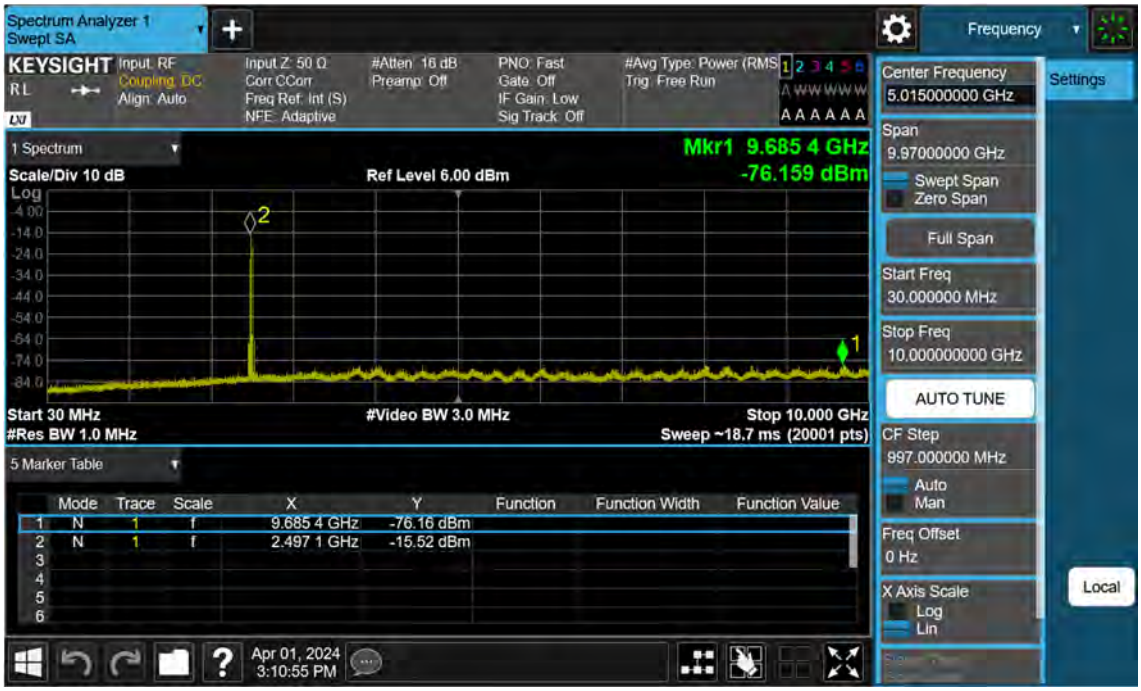
PCC 15 MHz Ch40523 RB1 Offset74 SCC 20 MHz Ch40694 RB1 Offset0



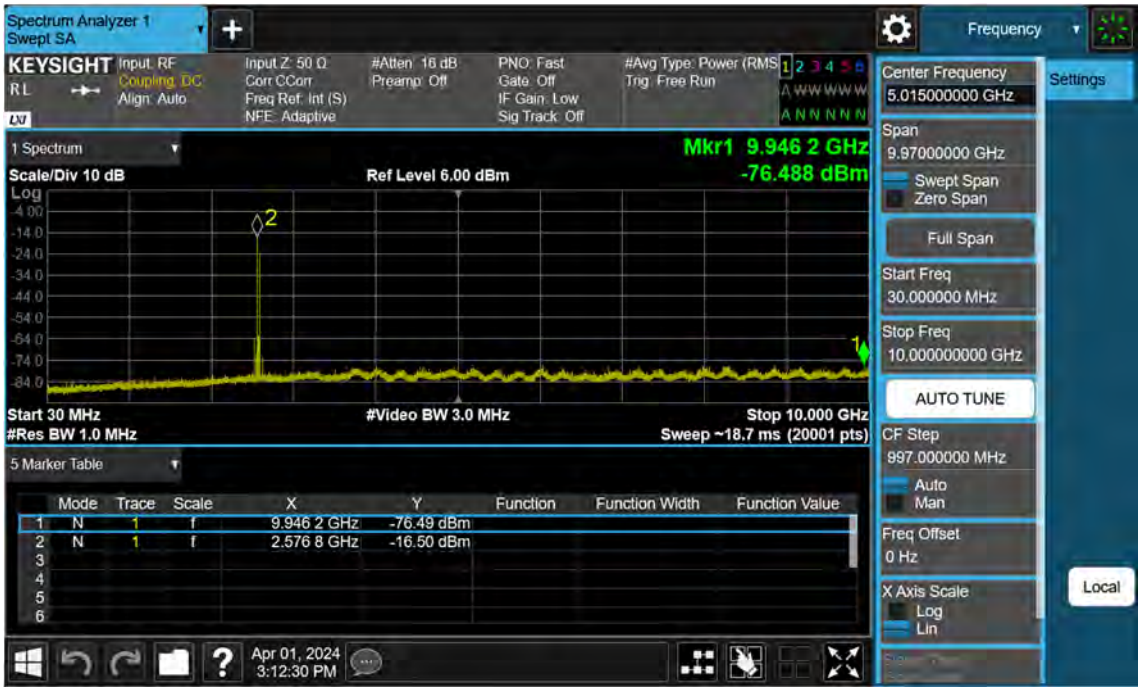
PCC 5 MHz Ch41373 RB1 Offset24 SCC 20 MHz Ch41490 RB1 Offset0



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

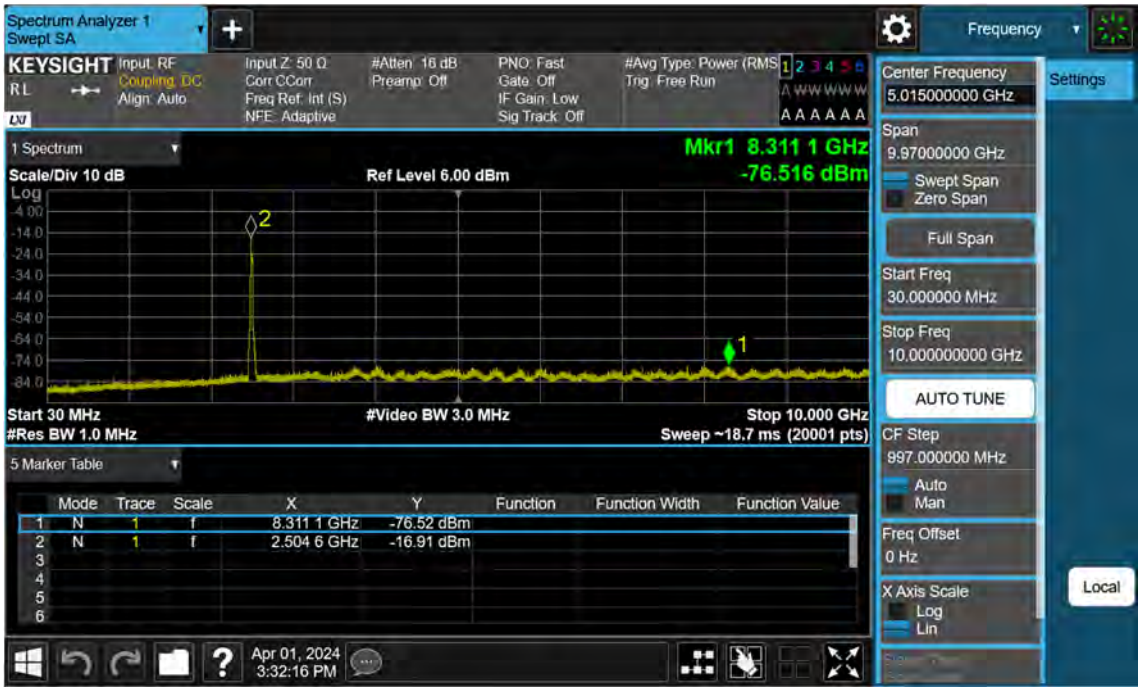


PCC 15 MHz Ch40523 RB1 Offset0 SCC 20 MHz Ch40694 RB1 Offset99

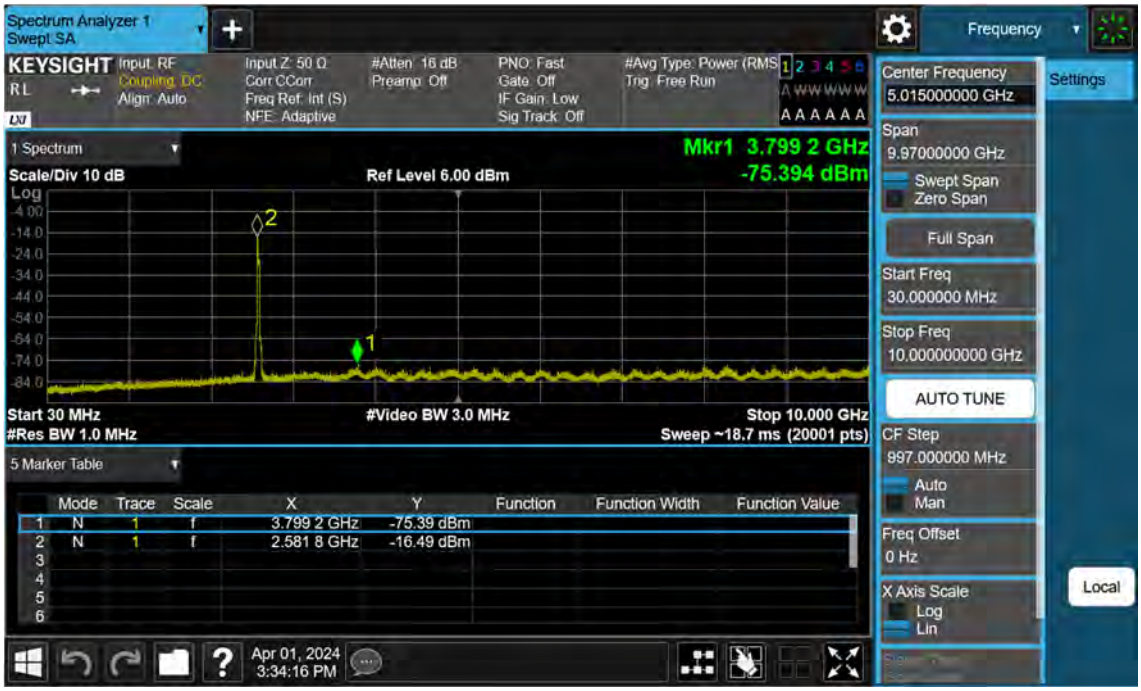


PCC 5 MHz Ch41373 RB1 Offset0 SCC 20 MHz Ch41490 RB1 Offset99

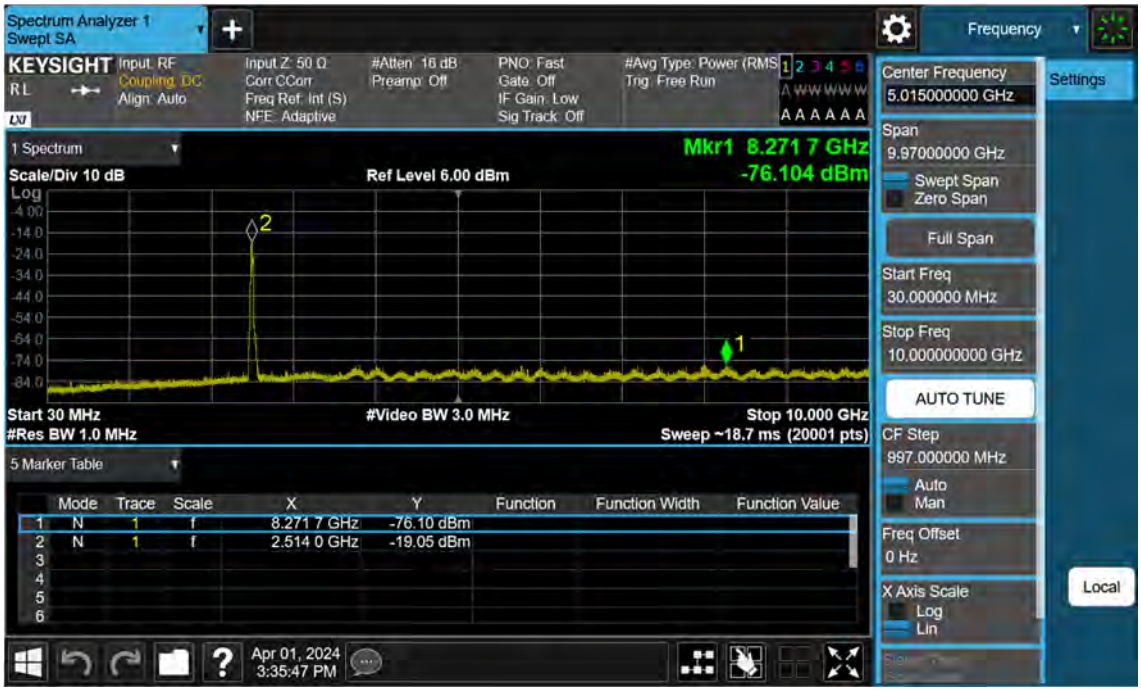
PCC 10 MHz Ch39705 RB50 Offset0 SCC 20 MHz Ch39849 RB100 Offset0



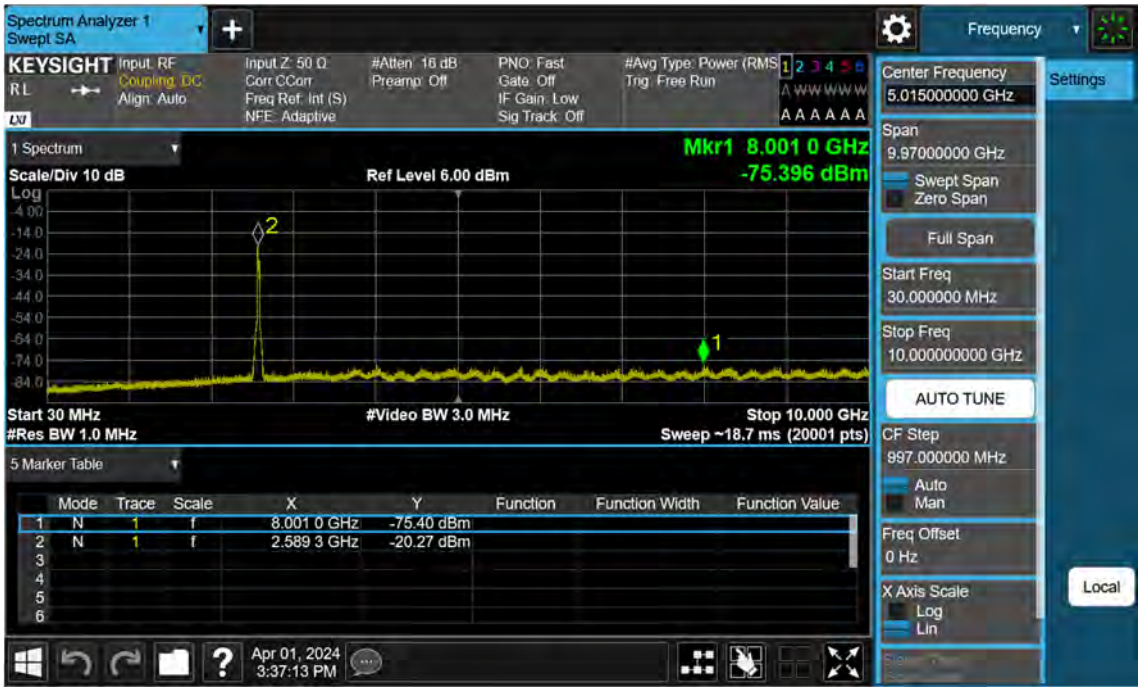
PCC 10 MHz Ch40526 RB50 Offset0 SCC 20 MHz Ch40670 RB100 Offset0



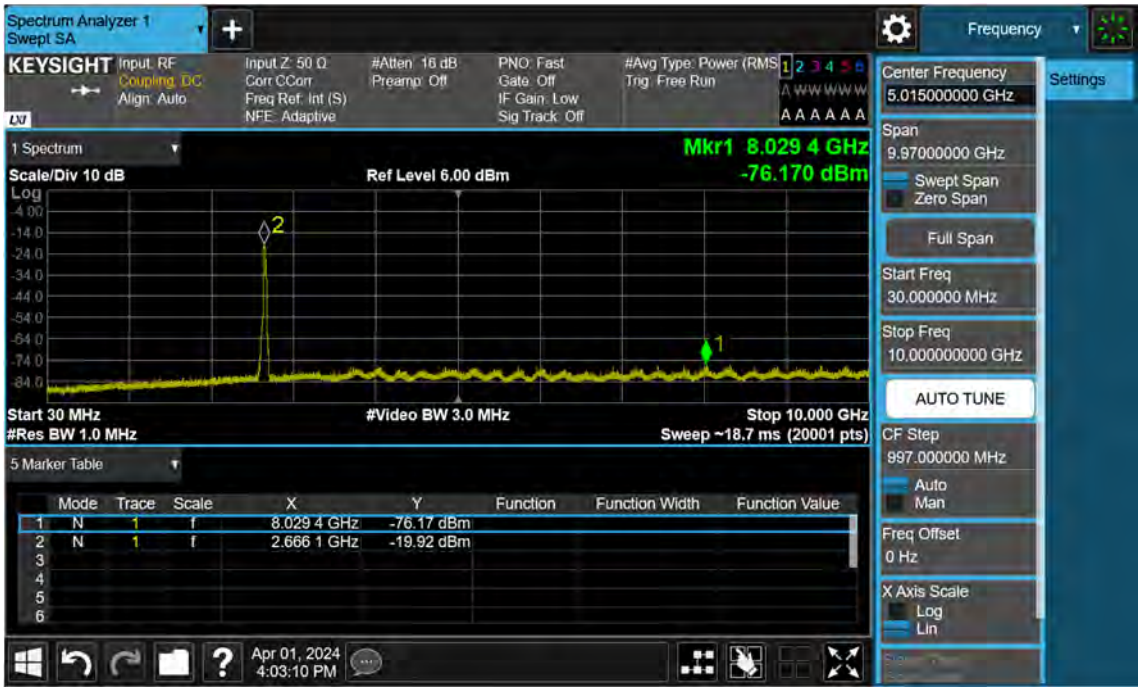
PCC 20 MHz Ch39750 RB100 Offset0 SCC 20 MHz Ch39948 RB100 Offset0



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



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

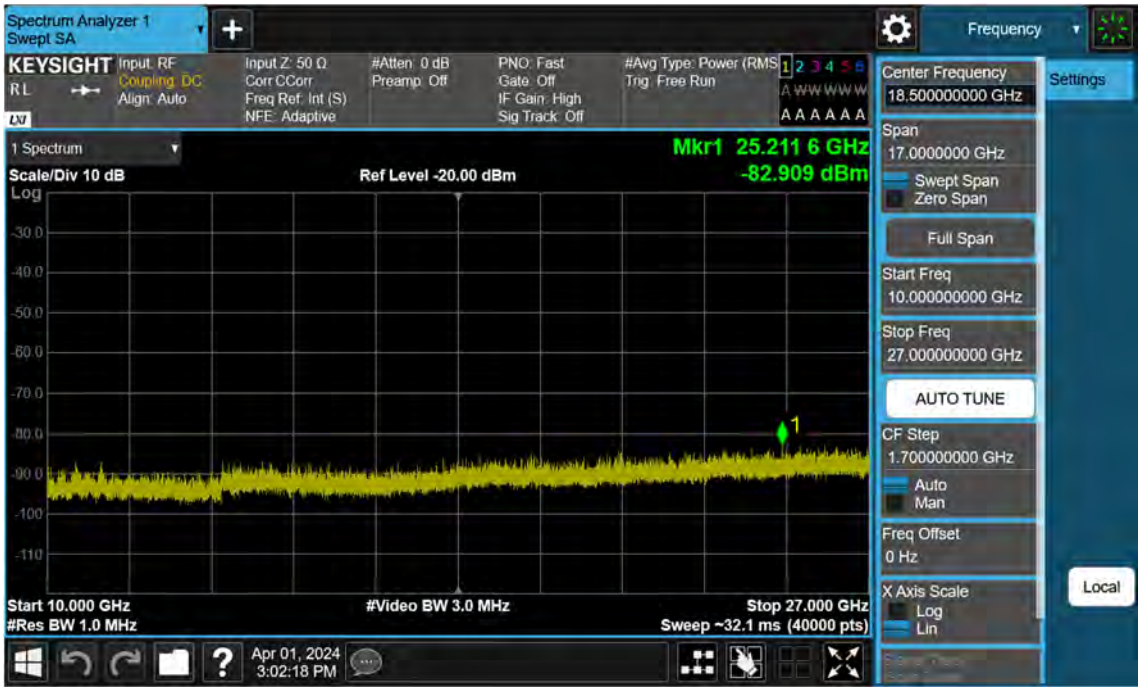


Frequency Range : 10 GHz ~ 20 GHz

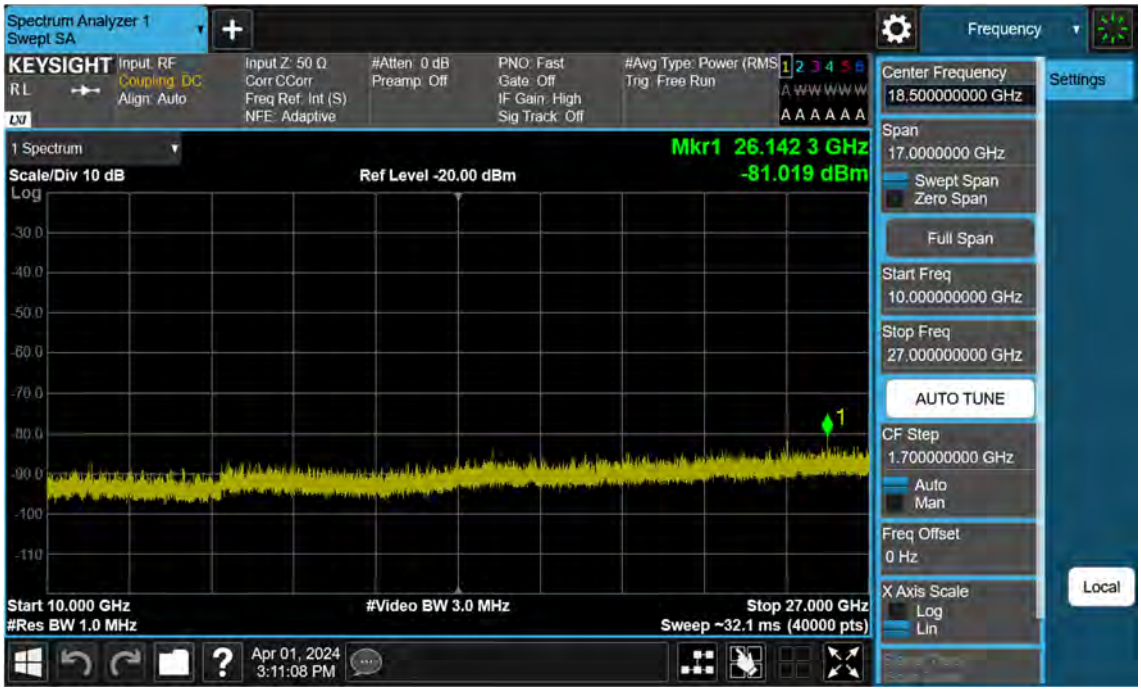
PCC 5 MHz Ch39683 RB1 Offset24, SCC 20 MHz Ch39800 RB1 Offset0

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

PCC 5 MHz Ch41373 RB1 Offset24, SCC 20 MHz Ch41490 RB1 Offset0



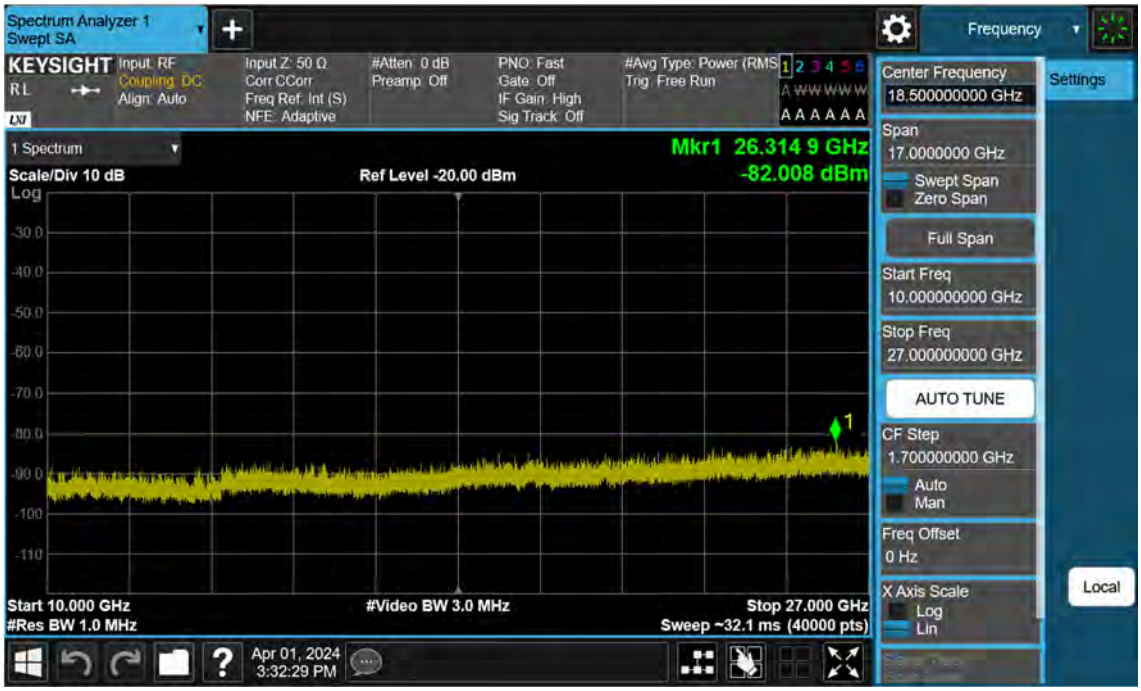
PCC 5 MHz Ch39683 RB1 Offset0, SCC 20 MHz Ch39800 RB1 Offset99



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

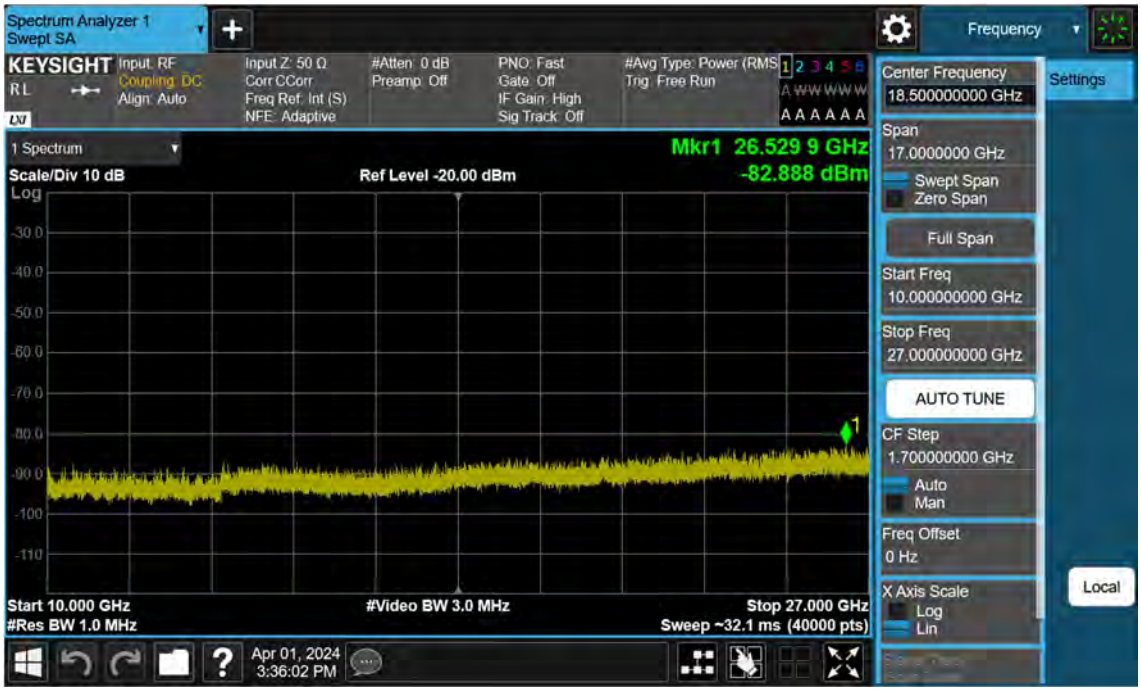
PCC 5 MHz Ch41373 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99

PCC 10 MHz Ch39705 RB50 Offset0, SCC 20 MHz Ch39849 RB100 Offset0

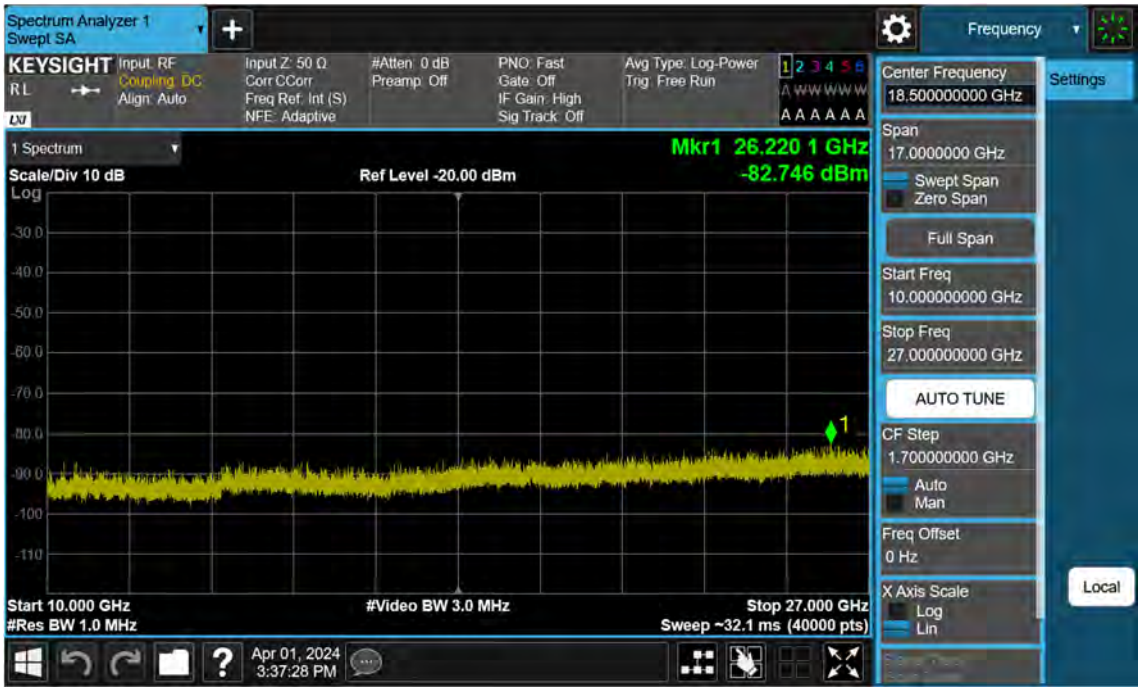


PCC 10 MHz Ch40526 RB50 Offset0, SCC 20 MHz Ch40670 RB100 Offset0

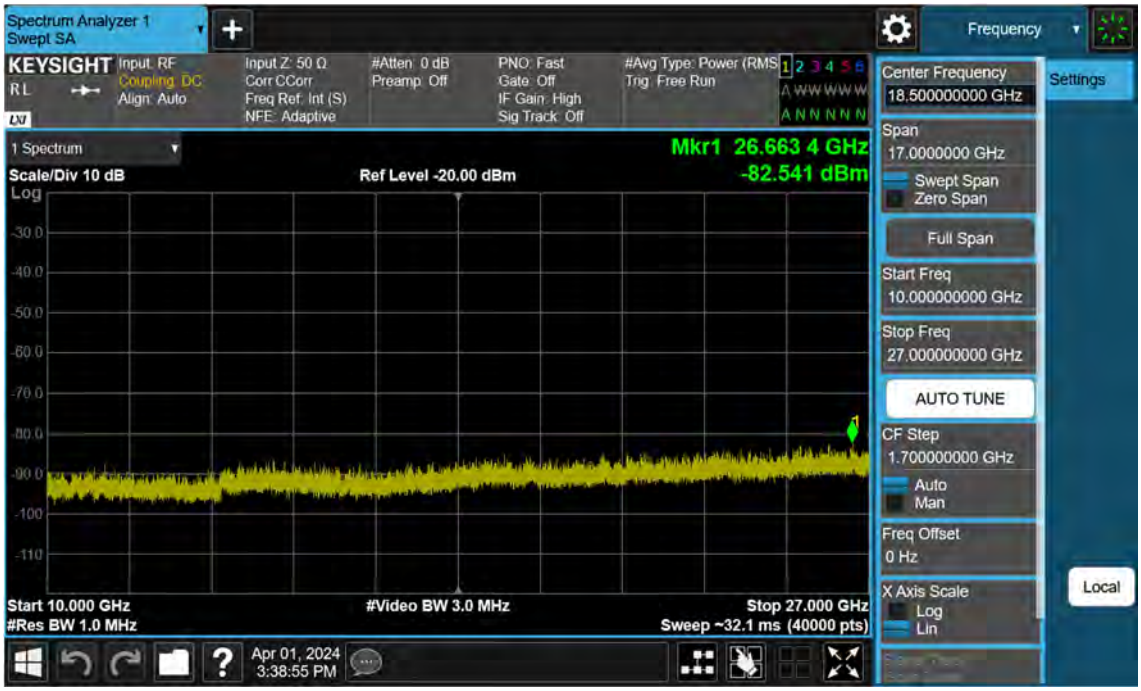
PCC 20 MHz Ch39750 RB100 Offset0, SCC 20 MHz Ch39948 RB100 Offset0



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

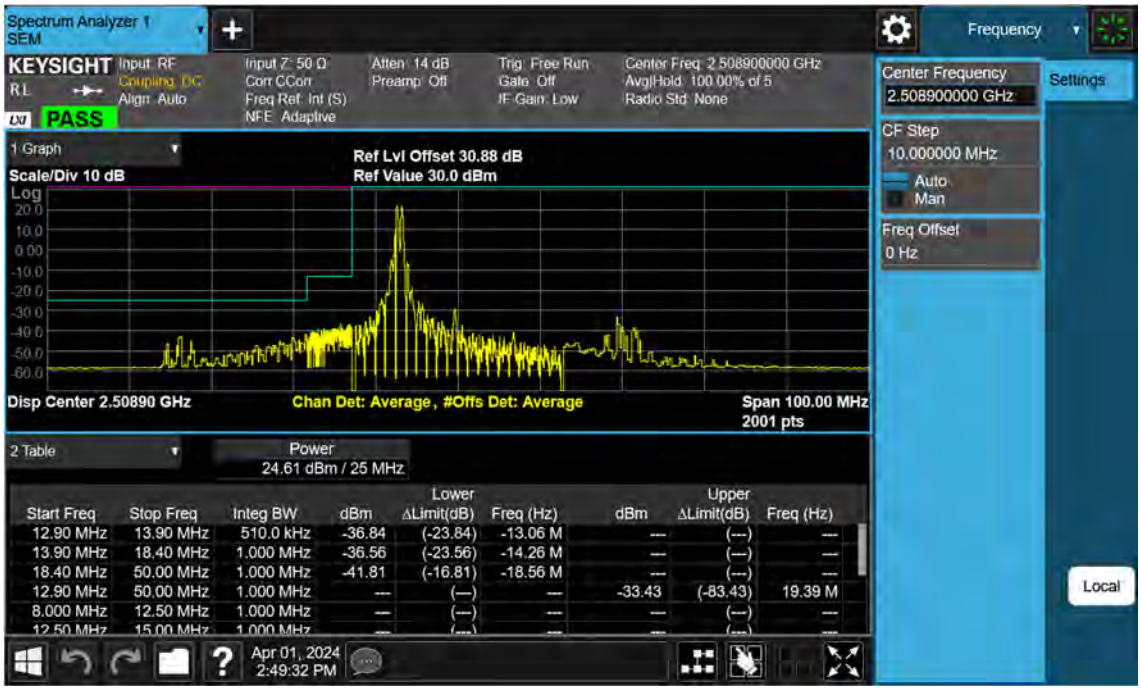


PCC 20 MHz Ch41292 RB100 Offset0, SCC 20 MHz Ch41490 RB100 Offset0

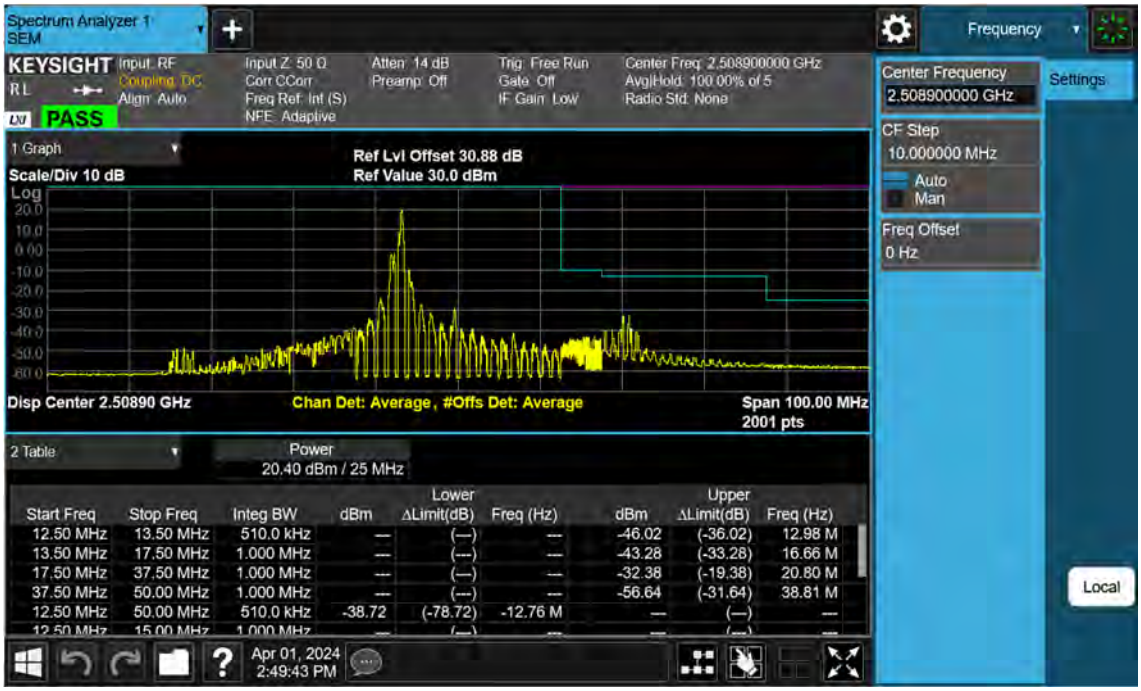


9.4 Channel Edge

PCC 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

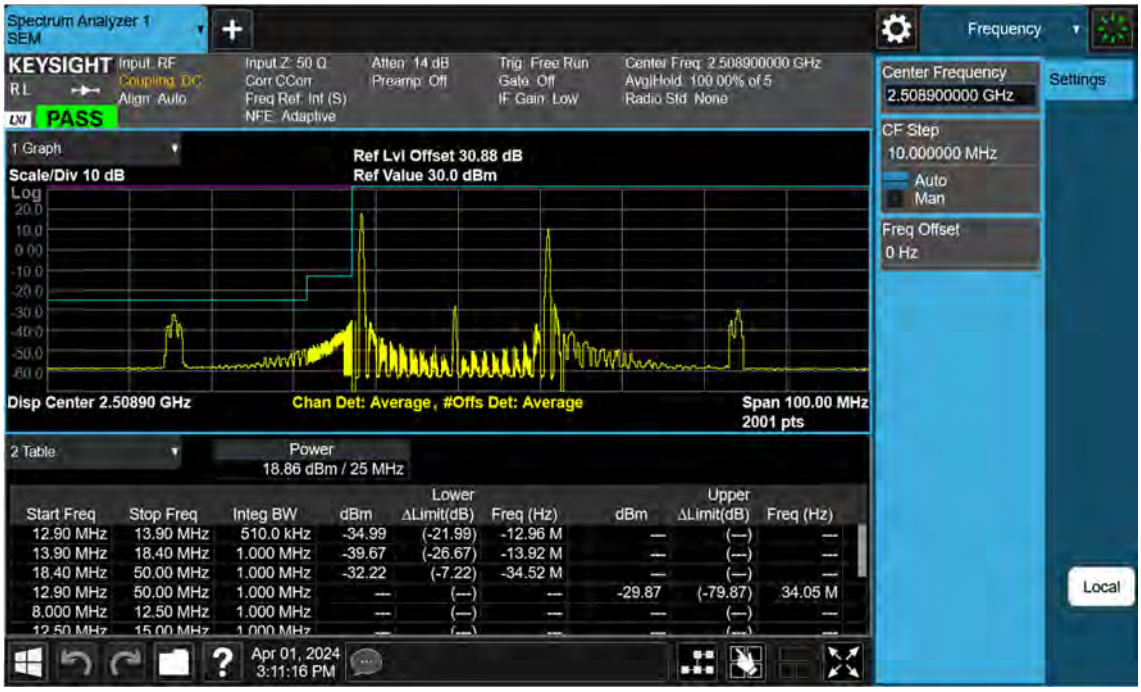


PCC 15 MHz Ch40523 RB1 Offset74, SCC 20 MHz Ch40694 RB1 Offset0

Start Freq	Stop Freq	Integ BW	Lower dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	Upper dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
17.50 MHz	18.50 MHz	750.0 kHz	-41.13	(-31.13)	-18.44 M	-46.84	(-36.84)	17.81 M
18.50 MHz	22.50 MHz	1.000 MHz	-40.17	(-30.17)	-18.56 M	-46.74	(-36.74)	19.04 M
22.50 MHz	52.50 MHz	1.000 MHz	-49.27	(-36.27)	-24.00 M	-50.89	(-37.89)	23.85 M
52.50 MHz	70.00 MHz	1.000 MHz	-57.74	(-32.74)	-53.81 M	-57.21	(-32.21)	55.74 M
17.50 MHz	70.00 MHz	750.0 kHz	---	(---)	---	---	(---)	---

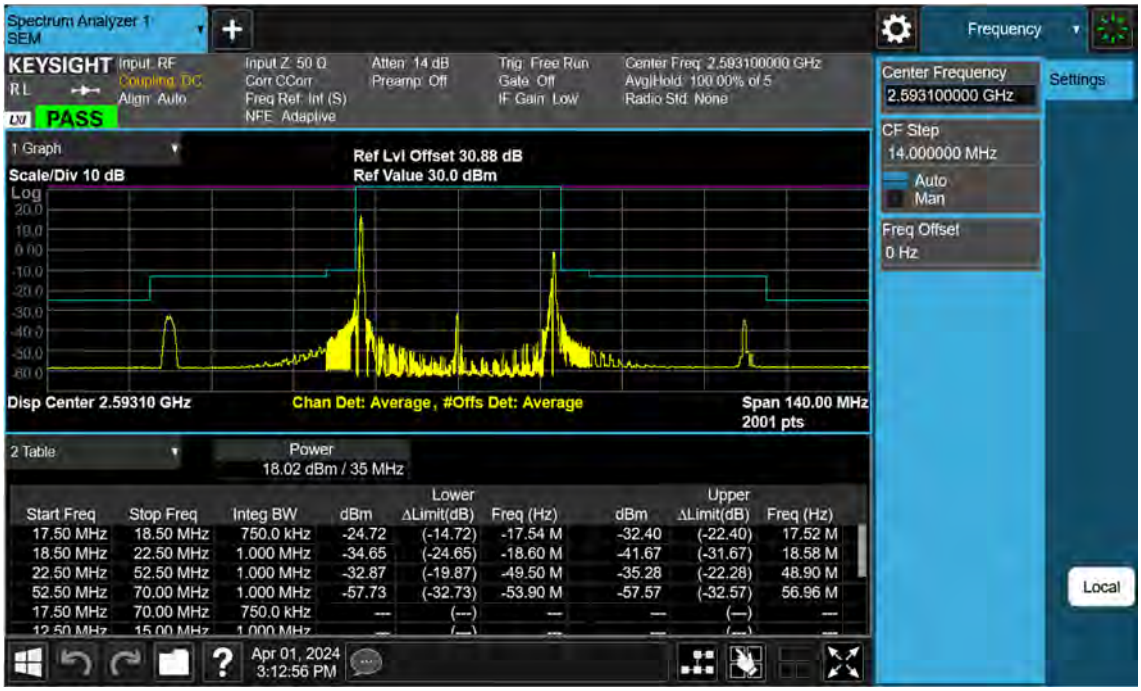
PCC 5 MHz Ch41373 RB1 Offset24, SCC 20 MHz Ch41490 RB1 Offset0

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



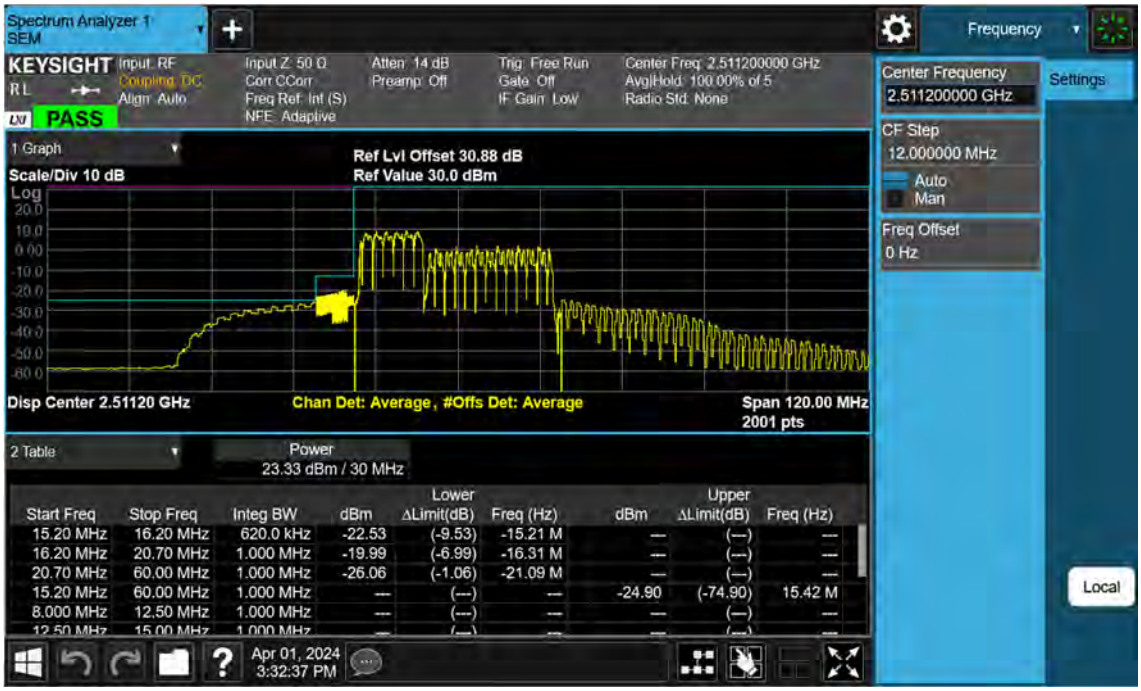
PCC 5 MHz Ch39683 RB1 Offset0, SCC 20 MHz Ch39800 RB1 Offset99-2

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



PCC 5 MHz Ch41373 RB1 Offset0, SCC 20 MHz Ch41490 RB1 Offset99

PCC 10 MHz Ch39705 RB50 Offset0, SCC 20 MHz Ch39849 RB100 Offset0-1



PCC 10 MHz Ch39705 RB50 Offset0, SCC 20 MHz Ch39849 RB100 Offset0-2

PCC 10 MHz Ch40526 RB50 Offset0, SCC 20 MHz Ch40670 RB100 Offset0

Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
15.00 MHz	16.00 MHz	620.0 kHz	-21.80	(-11.80)	-15.01 M	-27.02	(-17.02)	15.13 M
16.00 MHz	20.00 MHz	1.000 MHz	-20.42	(-10.42)	-16.00 M	-26.59	(-16.59)	16.32 M
20.00 MHz	45.00 MHz	1.000 MHz	-24.12	(-11.12)	-20.25 M	-29.63	(-16.63)	20.13 M
45.00 MHz	60.00 MHz	1.000 MHz	-41.63	(-16.63)	-45.15 M	-48.68	(-23.68)	45.30 M
15.00 MHz	60.00 MHz	620.0 kHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

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	Temp.	PPM		Frequency Error (MHz)	
(%)	(VDC)	(°C)	PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.018	-0.017	2499.29990	2510.99992
100%		-30	-0.018	-0.009	2499.29988	2510.99991
100%		-20	-0.002	-0.011	2499.29990	2510.99992
100%		-10	-0.027	-0.006	2499.29987	2510.99990
100%		0	-0.013	-0.014	2499.29992	2510.99992
100%		10	-0.019	-0.002	2499.29995	2510.99989
100%		30	-0.005	0.004	2499.29995	2510.99996
100%		40	-0.013	-0.008	2499.29987	2510.99987
100%		50	-0.008	-0.006	2499.29987	2510.99987
Batt. Endpoint	3.300	20	-0.009	0.007	2499.29989	2511.00000

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.016	-0.017	2501.49982	2515.89990
100%		-30	-0.003	-0.008	2501.49989	2515.89996
100%		-20	-0.006	-0.020	2501.49993	2515.89992
100%		-10	-0.011	-0.010	2501.49991	2515.89996
100%		0	0.005	-0.008	2501.49997	2515.89982
100%		10	-0.027	0.000	2501.49988	2515.89994
100%		30	-0.018	-0.007	2501.49992	2515.89986
100%		40	-0.011	-0.008	2501.49989	2515.89991
100%		50	-0.003	0.004	2501.49986	2515.89986
Batt. Endpoint	3.300	20	-0.020	-0.015	2501.49993	2515.89992

▣ 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	Temp.	PPM		Frequency Error (MHz)	
(%)	(VDC)	(℃)	PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.001	-0.010	2503.79987	2520.89992
100%		-30	-0.003	-0.006	2503.79994	2520.89994
100%		-20	-0.006	-0.015	2503.79990	2520.89990
100%		-10	-0.017	0.008	2503.79991	2520.89994
100%		0	-0.005	-0.014	2503.79996	2520.89988
100%		10	-0.009	0.007	2503.79996	2520.89991
100%		30	-0.006	-0.006	2503.79987	2520.89989
100%		40	0.006	0.001	2503.79995	2520.89994
100%		50	-0.005	0.006	2503.79998	2520.89992
Batt. Endpoint	3.300	20	-0.007	0.001	2503.79989	2520.89986

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.001	0.002	2505.99994	2525.79987
100%		-30	-0.003	-0.016	2505.99986	2525.79990
100%		-20	-0.017	-0.013	2505.99988	2525.79990
100%		-10	-0.012	0.006	2505.99987	2525.79989
100%		0	-0.011	-0.011	2505.99990	2525.79987
100%		10	-0.006	-0.012	2505.99993	2525.79990
100%		30	-0.023	-0.018	2505.99981	2525.79980
100%		40	0.009	-0.019	2506.00002	2525.79986
100%		50	-0.011	-0.021	2505.99983	2525.79986
Batt. Endpoint	3.300	20	-0.010	-0.010	2505.99991	2525.79989

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.019	-0.016	2668.29988	2679.99990
100%		-30	-0.012	0.001	2668.29981	2679.99987
100%		-20	-0.019	0.003	2668.29983	2679.99992
100%		-10	-0.004	-0.007	2668.29991	2679.99990
100%		0	-0.016	-0.025	2668.29990	2679.99993
100%		10	-0.015	0.003	2668.29983	2680.00000
100%		30	0.000	-0.005	2668.30000	2679.99987
100%		40	-0.002	-0.028	2668.29989	2679.99988
100%		50	-0.003	-0.008	2668.29990	2679.99996
Batt. Endpoint	3.300	20	-0.014	0.001	2668.29990	2679.99995

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	0.003	-0.026	2665.59993	2679.99978
100%		-30	-0.019	-0.006	2665.59994	2679.99988
100%		-20	-0.008	-0.012	2665.59989	2679.99992
100%		-10	-0.015	0.005	2665.59987	2679.99996
100%		0	-0.007	-0.021	2665.59990	2679.99991
100%		10	-0.019	-0.011	2665.59987	2679.99992
100%		30	-0.023	-0.013	2665.59985	2679.99990
100%		40	0.009	-0.003	2665.59987	2679.99990
100%		50	-0.021	-0.024	2665.59980	2679.99983
Batt. Endpoint	3.300	20	0.002	-0.013	2665.59994	2679.99996

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.017	-0.010	2662.89990	2679.99997
100%		-30	-0.015	-0.005	2662.89984	2679.99996
100%		-20	-0.003	-0.005	2662.89990	2679.99992
100%		-10	-0.003	-0.017	2662.89989	2679.99988
100%		0	-0.004	-0.004	2662.89990	2679.99990
100%		10	0.009	-0.015	2662.89991	2679.99987
100%		30	-0.012	0.002	2662.89988	2679.99987
100%		40	-0.001	-0.025	2662.89994	2679.99980
100%		50	-0.006	-0.006	2662.89991	2679.99991
Batt. Endpoint	3.300	20	-0.013	-0.022	2662.89987	2679.99993

▣ 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. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100%	3.880	+20(Ref)	-0.003	-0.016	2660.19996	2679.99986
100%		-30	0.002	-0.014	2660.19989	2679.99989
100%		-20	-0.006	-0.014	2660.19988	2679.99991
100%		-10	0.005	-0.009	2660.19983	2679.99990
100%		0	-0.010	-0.011	2660.19986	2679.99994
100%		10	-0.006	-0.005	2660.19987	2679.99990
100%		30	-0.006	-0.017	2660.19991	2679.99985
100%		40	0.008	-0.008	2660.19986	2679.99996
100%		50	-0.003	-0.002	2660.19985	2680.00000
Batt. Endpoint	3.300	20	-0.002	-0.006	2660.19988	2679.99992

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	-56.12	12.55	-66.14	3.88	V	-57.47
7 515.45	-56.97	10.80	-57.53	4.71	H	-51.44
10 020.60	-60.13	11.27	-55.84	5.54	H	-50.11

▣ 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	-57.41	12.52	-65.84	3.81	V	-57.13
7 768.95	-57.96	11.42	-57.82	4.78	H	-51.18
10 358.60	-59.70	11.45	-54.19	5.56	V	-48.30

▣ PCC Channel : 41292 (2660.2 MHz)

▣ PCC BW(MHz) : 20

▣ PCC RB/ RB Offset : 1/ 99

▣ SCC Channel : 41490 (2680.0 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)
5 340.20	-54.47	13.09	-63.66	3.93	V	-54.50
8 010.30	-56.91	10.77	-55.18	4.88	V	-49.29
10 680.40	-57.95	11.34	-54.10	5.72	H	-48.48

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	22.934
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	23.186
10	40526	2583.6	QPSK	50/ 0	20	40670	2598	QPSK	100/ 0	27.855
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	23.187
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	28.366
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	32.658
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	22.957
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	27.841
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	32.685
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	37.624

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	22.888
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	23.124
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	27.678
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	23.136
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	28.290
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	32.672
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	22.966
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	27.876
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	32.716
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	37.560

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	22.872
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	23.171
10	40526	2583.6	64QAM	50/ 0	20	40670	2598.0	64QAM	100/ 0	27.796
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	23.121
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	28.358
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	32.603
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	22.888
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	27.731
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	32.665
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	37.611

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	22.844
10	40549	2585.9	256QAM	50/ 0	15	40669	2597.9	256QAM	75/ 0	23.154
10	40526	2583.6	256QAM	50/ 0	20	40670	2598.0	256QAM	100/ 0	27.683
15	40571	2588.1	256QAM	75/ 0	10	40691	2600.1	256QAM	50/ 0	23.227
15	40545	2585.5	256QAM	75/ 0	15	40695	2600.5	256QAM	75/ 0	28.336
15	40523	2583.3	256QAM	75/ 0	20	40694	2600.4	256QAM	100/ 0	32.588
20	40595	2590.5	256QAM	100/ 0	5	40712	2602.2	256QAM	25/ 0	22.967
20	40571	2588.1	256QAM	100/ 0	10	40715	2602.5	256QAM	50/ 0	27.791
20	40546	2585.6	256QAM	100/ 0	15	40717	2602.7	256QAM	75/ 0	32.634
20	40521	2583.1	256QAM	100/ 0	20	40719	2602.9	256QAM	100/ 0	37.656

Note:

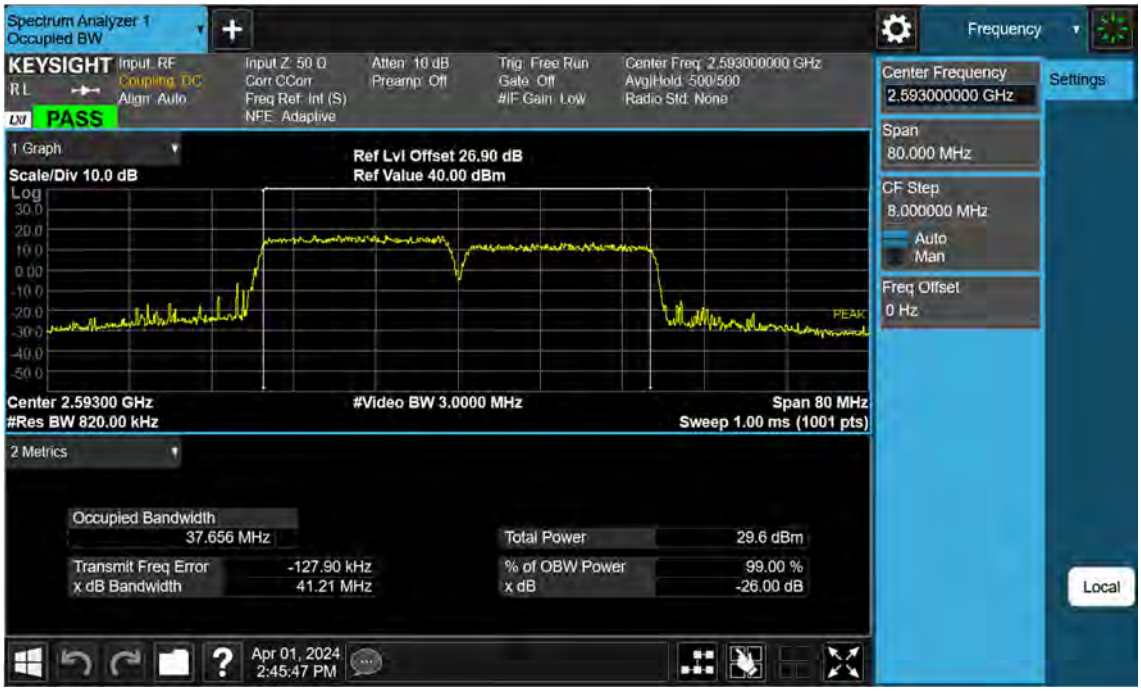
In order to simplify the report, attached plots were only widest bandwidth(20+20).

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	5.32
10	40549	2585.9	QPSK	50/ 0	15	40669	2597.9	QPSK	75/ 0	5.17
10	40526	2583.6	QPSK	50/ 0	20	40670	2598.0	QPSK	100/ 0	5.18
15	40571	2588.1	QPSK	75/ 0	10	40691	2600.1	QPSK	50/ 0	5.11
15	40545	2585.5	QPSK	75/ 0	15	40695	2600.5	QPSK	75/ 0	5.22
15	40523	2583.3	QPSK	75/ 0	20	40694	2600.4	QPSK	100/ 0	5.17
20	40595	2590.5	QPSK	100/ 0	5	40712	2602.2	QPSK	25/ 0	5.24
20	40571	2588.1	QPSK	100/ 0	10	40715	2602.5	QPSK	50/ 0	5.17
20	40546	2585.6	QPSK	100/ 0	15	40717	2602.7	QPSK	75/ 0	5.18
20	40521	2583.1	QPSK	100/ 0	20	40719	2602.9	QPSK	100/ 0	5.22

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	5.94
10	40549	2585.9	16QAM	50/ 0	15	40669	2597.9	16QAM	75/ 0	5.90
10	40526	2583.6	16QAM	50/ 0	20	40670	2598.0	16QAM	100/ 0	6.08
15	40571	2588.1	16QAM	75/ 0	10	40691	2600.1	16QAM	50/ 0	6.16
15	40545	2585.5	16QAM	75/ 0	15	40695	2600.5	16QAM	75/ 0	6.08
15	40523	2583.3	16QAM	75/ 0	20	40694	2600.4	16QAM	100/ 0	6.06
20	40595	2590.5	16QAM	100/ 0	5	40712	2602.2	16QAM	25/ 0	6.16
20	40571	2588.1	16QAM	100/ 0	10	40715	2602.5	16QAM	50/ 0	6.11
20	40546	2585.6	16QAM	100/ 0	15	40717	2602.7	16QAM	75/ 0	6.13
20	40521	2583.1	16QAM	100/ 0	20	40719	2602.9	16QAM	100/ 0	6.07

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	6.34
10	40549	2585.9	64QAM	50/ 0	15	40669	2597.9	64QAM	75/ 0	6.21
10	40526	2583.6	64QAM	50/ 0	20	40670	2598.0	64QAM	100/ 0	6.28
15	40571	2588.1	64QAM	75/ 0	10	40691	2600.1	64QAM	50/ 0	6.41
15	40545	2585.5	64QAM	75/ 0	15	40695	2600.5	64QAM	75/ 0	6.36
15	40523	2583.3	64QAM	75/ 0	20	40694	2600.4	64QAM	100/ 0	6.29
20	40595	2590.5	64QAM	100/ 0	5	40712	2602.2	64QAM	25/ 0	6.39
20	40571	2588.1	64QAM	100/ 0	10	40715	2602.5	64QAM	50/ 0	6.25
20	40546	2585.6	64QAM	100/ 0	15	40717	2602.7	64QAM	75/ 0	6.28
20	40521	2583.1	64QAM	100/ 0	20	40719	2602.9	64QAM	100/ 0	6.40

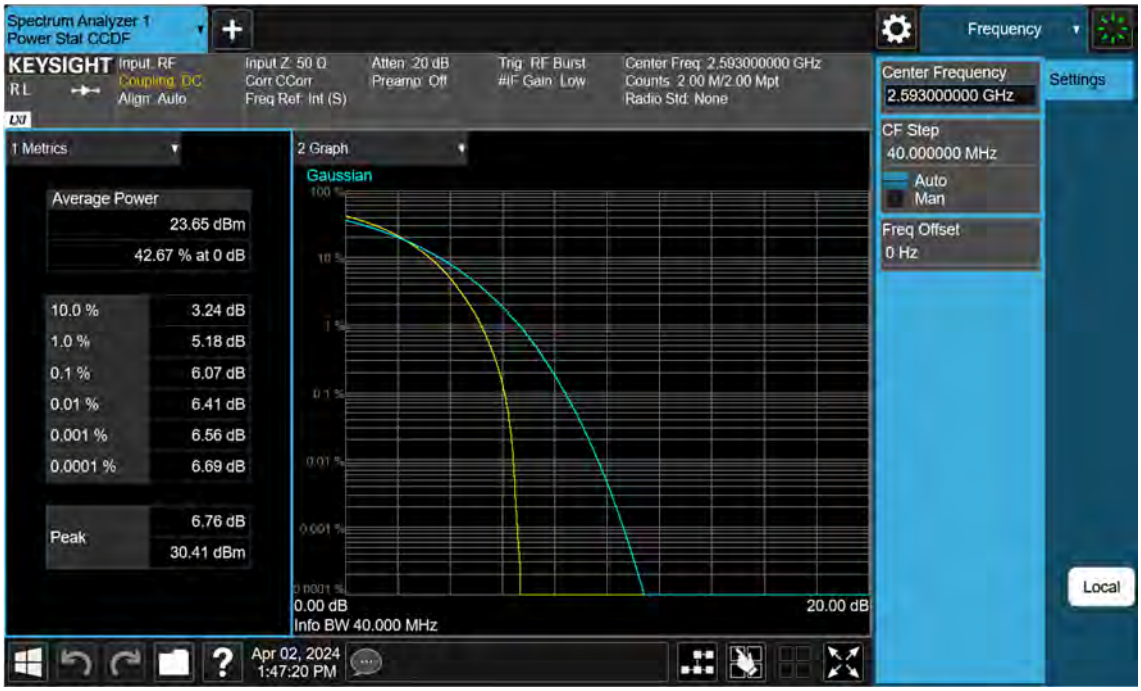
PCC					SCC					Data (dB)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
5	40528	2583.8	256QAM	25/ 0	20	40645	2595.5	256QAM	100/ 0	6.67
10	40549	2585.9	256QAM	50/ 0	15	40669	2597.9	256QAM	75/ 0	6.67
10	40526	2583.6	256QAM	50/ 0	20	40670	2598.0	256QAM	100/ 0	6.61
15	40571	2588.1	256QAM	75/ 0	10	40691	2600.1	256QAM	50/ 0	6.72
15	40545	2585.5	256QAM	75/ 0	15	40695	2600.5	256QAM	75/ 0	6.66
15	40523	2583.3	256QAM	75/ 0	20	40694	2600.4	256QAM	100/ 0	6.62
20	40595	2590.5	256QAM	100/ 0	5	40712	2602.2	256QAM	25/ 0	6.64
20	40571	2588.1	256QAM	100/ 0	10	40715	2602.5	256QAM	50/ 0	6.64
20	40546	2585.6	256QAM	100/ 0	15	40717	2602.7	256QAM	75/ 0	6.64
20	40521	2583.1	256QAM	100/ 0	20	40719	2602.9	256QAM	100/ 0	6.89

Note:

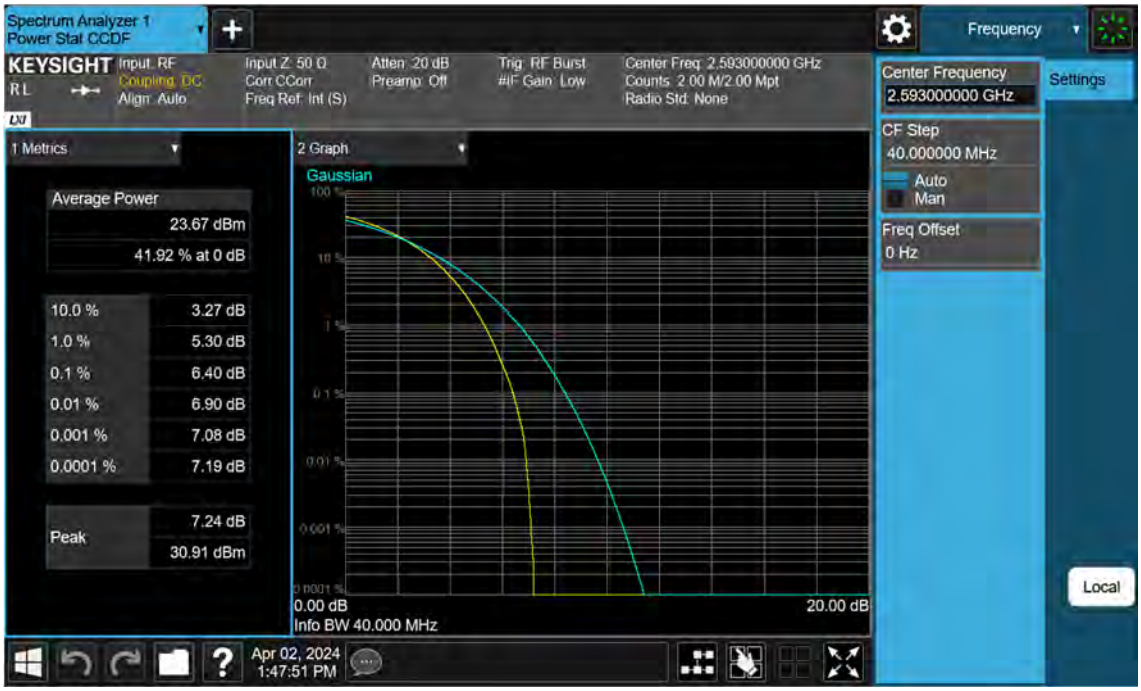
In order to simplify the report, attached plots were only Max.Bandwidth(20+20)

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

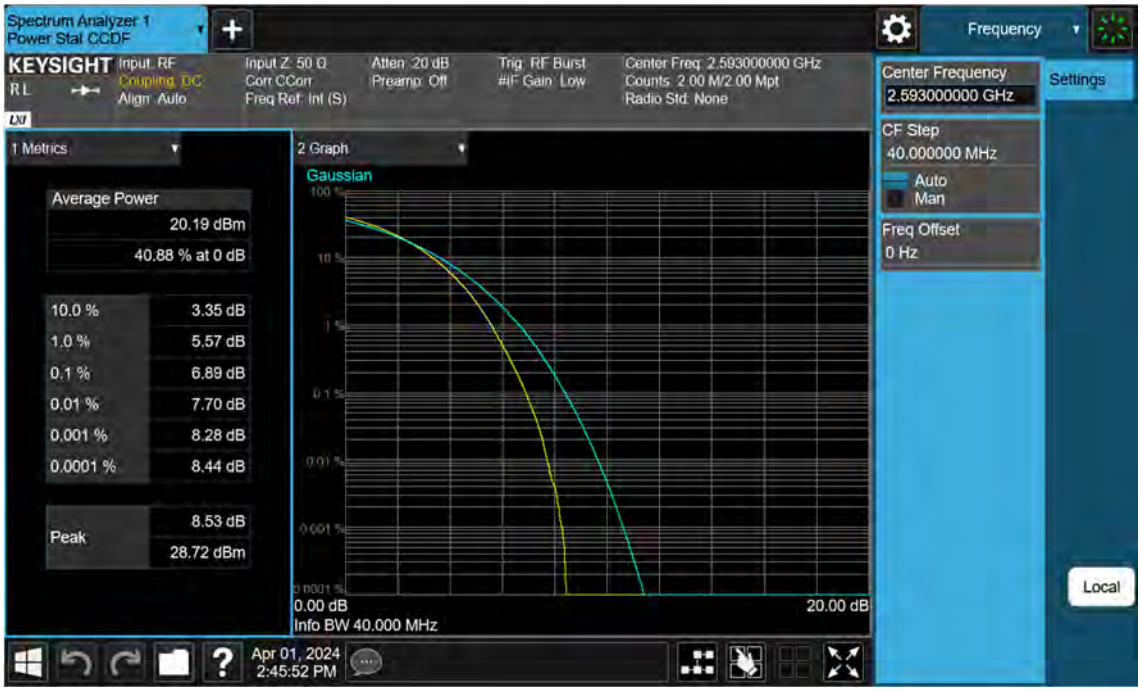
PCC 20 MHz Ch40521 RB100 Offset0, SCC 20 MHz Ch40719 RB100 Offset0_(16QAM)



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-2404-FC038-P