TEST REPORT

FCC ULCA 66C Test for SM-F741U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2404-FC041

DATE OF ISSUE
April 26, 2024

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TEST REPORT

REPORT NO.
HCT-RF-2404-FC041

DATE OF ISSUE
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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

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).

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	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:	1715.3 - 1772.5: 10 MHz+15 MHz 1717.5 - 1774.7: 15 MHz+10 MHz 1715.5 - 1770.0: 10 MHz+20 MHz 1720.0 - 1774.5: 20 MHz+10 MHz 1717.5 - 1772.5: 15 MHz+15 MHz 1717.8 - 1770.0: 15 MHz+20 MHz 1720.0 - 1772.2: 20 MHz+15 MHz 1720.0 - 1776.7: 20 MHz+5 MHz 1713.3 - 1770.0: 5 MHz+20 MHz 1720.0 - 1770.0: 20 MHz+20 MHz
Date(s) of Tests:	February 22, 2024 ~ April 23, 2024
Serial number:	Radiated : R3CX20KJT0F Conducted : 7b5599bdac507ece
LTE CA :	CA 66C (Uplink)

1.1. MAXIMUM OUTPUT POWER

Main 1 Ant

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
10 MHz+15 MHz	1715.3 - 1772.5	QPSK	23M1G7D	22.91	0.195
		16QAM	23M0W7D	22.37	0.173
		64QAM	23M1W7D	21.01	0.126
		256QAM	23M1W7D	18.39	0.069
15 MHz+10 MHz	1717.5 - 1774.7	QPSK	23M2G7D	22.76	0.189
		16QAM	23M1W7D	22.22	0.167
		64QAM	23M1W7D	21.06	0.128
		256QAM	23M2W7D	18.29	0.067
10 MHz+20 MHz	1715.5 - 1770.0	QPSK	27M7G7D	23.19	0.208
		16QAM	27M7W7D	22.62	0.183
		64QAM	27M8W7D	21.51	0.142
		256QAM	27M7W7D	18.58	0.072
20 MHz+10 MHz	1720.0 - 1774.5	QPSK	27M8G7D	22.69	0.186
		16QAM	27M8W7D	22.17	0.165
		64QAM	27M8W7D	21.11	0.129
		256QAM	27M8W7D	18.18	0.066
15 MHz+15 MHz	1717.5 - 1772.5	QPSK	28M4G7D	22.77	0.189
		16QAM	28M4W7D	22.31	0.170
		64QAM	28M3W7D	21.01	0.126
		256QAM	28M3W7D	18.38	0.069
15 MHz+20 MHz	1717.8 - 1770.0	QPSK	32M6G7D	22.93	0.196
		16QAM	32M5W7D	22.43	0.175
		64QAM	32M7W7D	21.03	0.127
		256QAM	32M6W7D	18.40	0.069
20 MHz+15 MHz	1720.0 - 1772.2	QPSK	32M7G7D	22.83	0.192
		16QAM	32M7W7D	22.34	0.171
		64QAM	32M7W7D	21.14	0.130
		256QAM	32M6W7D	18.35	0.068
20 MHz+5 MHz	1720.0 - 1776.7	QPSK	23M0G7D	22.79	0.190
		16QAM	22M9W7D	22.24	0.167
		64QAM	22M9W7D	21.25	0.133
		256QAM	23M0W7D	18.27	0.067
5 MHz+20 MHz	1713.3 - 1770.0	QPSK	22M9G7D	23.39	0.218
		16QAM	22M8W7D	22.79	0.190
		64QAM	22M9W7D	21.68	0.147
		256QAM	22M8W7D	18.75	0.075
20 MHz+20 MHz	1720.0 - 1770.0	QPSK	37M6G7D	22.98	0.199
		16QAM	37M6W7D	22.41	0.174
		64QAM	37M6W7D	21.33	0.136
		256QAM	37M6W7D	18.47	0.070

Sub 5 Ant

Mode (PCC+SCC)	Tx Frequency (MHz)	Modulation	Emission Designator	EIRP	
				Max. Power (dBm)	Max. Power (W)
10 MHz+15 MHz	1715.3 - 1772.5	QPSK	23M2G7D	22.06	0.161
		16QAM	23M1W7D	21.57	0.144
		64QAM	23M1W7D	20.53	0.113
		256QAM	23M1W7D	17.50	0.056
15 MHz+10 MHz	1717.5 - 1774.7	QPSK	23M2G7D	22.07	0.161
		16QAM	23M2W7D	21.70	0.148
		64QAM	23M1W7D	20.66	0.116
		256QAM	23M1W7D	17.69	0.059
10 MHz+20 MHz	1715.5 - 1770.0	QPSK	27M8G7D	22.02	0.159
		16QAM	27M8W7D	21.57	0.144
		64QAM	27M6W7D	20.59	0.115
		256QAM	27M8W7D	17.52	0.056
20 MHz+10 MHz	1720.0 - 1774.5	QPSK	27M9G7D	22.17	0.165
		16QAM	27M8W7D	21.75	0.150
		64QAM	27M8W7D	20.67	0.117
		256QAM	27M9W7D	17.72	0.059
15 MHz+15 MHz	1717.5 - 1772.5	QPSK	28M3G7D	22.09	0.162
		16QAM	28M4W7D	21.63	0.146
		64QAM	28M4W7D	20.68	0.117
		256QAM	28M4W7D	17.59	0.057
15 MHz+20 MHz	1717.8 - 1770.0	QPSK	32M6G7D	22.12	0.163
		16QAM	32M6W7D	21.68	0.147
		64QAM	32M6W7D	20.66	0.116
		256QAM	32M6W7D	17.61	0.058
20 MHz+15 MHz	1720.0 - 1772.2	QPSK	32M7G7D	22.21	0.166
		16QAM	32M7W7D	21.67	0.147
		64QAM	32M7W7D	20.75	0.119
		256QAM	32M8W7D	17.72	0.059
20 MHz+5 MHz	1720.0 - 1776.7	QPSK	22M9G7D	22.10	0.162
		16QAM	23M0W7D	21.63	0.146
		64QAM	23M0W7D	20.53	0.113
		256QAM	23M0W7D	17.56	0.057
5 MHz+20 MHz	1713.3 - 1770.0	QPSK	22M8G7D	21.97	0.157
		16QAM	22M8W7D	21.51	0.142
		64QAM	22M8W7D	20.52	0.113
		256QAM	22M8W7D	17.43	0.055
20 MHz+20 MHz	1720.0 - 1770.0	QPSK	37M7G7D	22.19	0.166
		16QAM	37M6W7D	21.71	0.148
		64QAM	37M5W7D	20.74	0.119
		256QAM	37M6W7D	17.68	0.059

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
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
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;

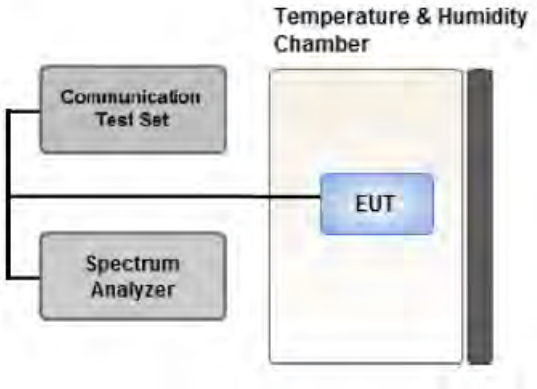
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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)

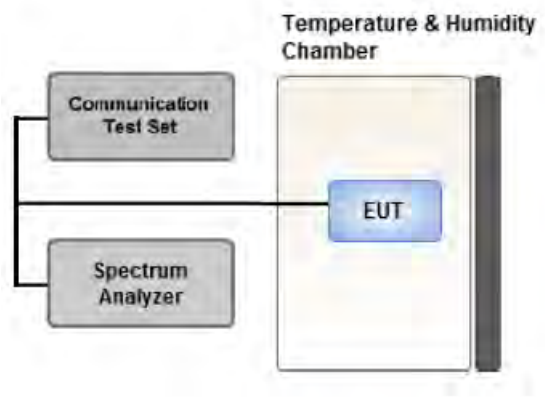
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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.



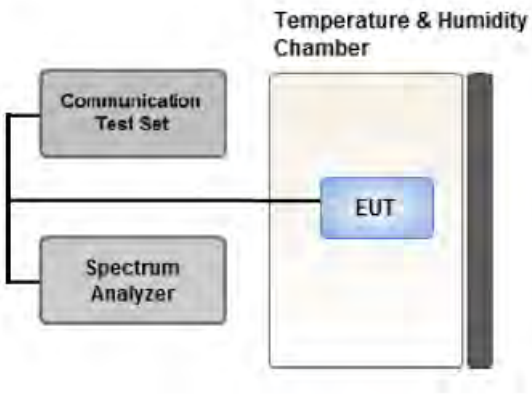
Test setup

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.

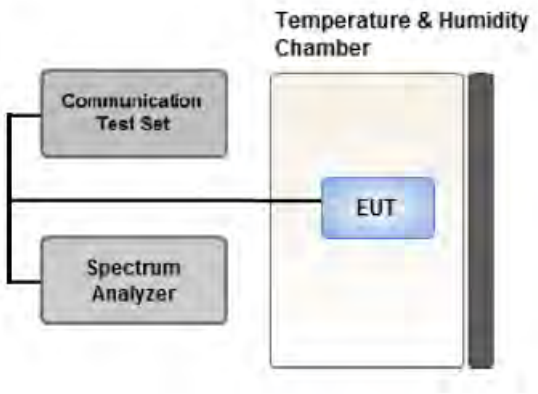
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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

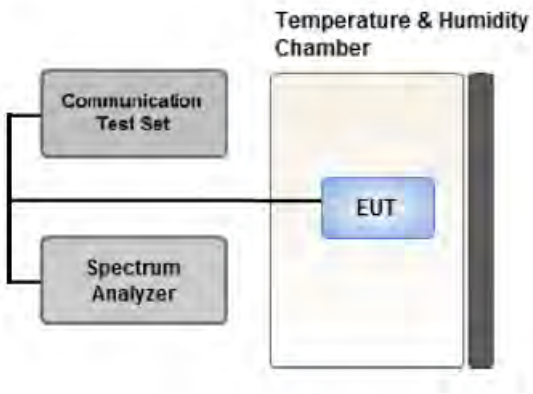
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW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

Test Notes

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
All measurements were done at 2 channels(low and high operational frequency range.)
The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

Where 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(h)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046	N/A	PASS
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(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 27.53(h)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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 1 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)
10	15	25
15	10	25
10	20	30
20	10	30
15	15	30
15	20	35
20	15	35
20	5	25
5	20	25
20	20	40

3. All modes of operation were investigated and the worst case configuration results are reported in this section.
   Please refer to the table below.
 - Worst case(Conducted Spurious Emissions, 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	20	1720.0	132072	1	99	15	1737.1	132243	1	0
		Mid	5	1745.8	132330	1	24	20	1757.5	132447	1	0
		High	5	1758.3	132455	1	24	20	1770.0	132572	1	0
		Low	20	1720.0	132072	1	0	15	1737.1	132243	1	74
		Mid	5	1745.8	132330	1	0	20	1757.5	132447	1	99
		High	5	1758.3	132455	1	0	20	1770.0	132572	1	99
		Low	20	1720.0	132072	100	0	20	1739.8	132270	100	0
		Mid	10	1745.6	132328	50	0	20	1760.0	132472	100	0
		High	5	1758.3	132455	25	0	20	1770.0	132572	100	0
		Mid	20	1745.1	132323	100	0	20	1764.9	132521	100	0
		High	20	1750.2	132374	100	0	20	1770.0	132572	100	0
Radiated Spurious Emissions	QPSK	Low	20	1720.0	132072	1	99	20	1739.8	132270	1	0
		Mid	5	1745.8	132330	1	24	20	1757.5	132447	1	0
		High	10	1755.6	132428	1	49	20	1770.0	132572	1	0

[Worst case]

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

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8.1 Conducted Power

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	10	1715.3	132025	1	49	15	1727.3	132145	1	0	23.52
	15	1717.5	132047	1	74	10	1729.5	132167	1	0	23.64
	10	1715.5	132027	1	49	20	1729.9	132171	1	0	23.67
	20	1720.0	132072	1	99	10	1734.4	132216	1	0	23.69
	15	1717.5	132047	1	74	15	1732.5	132197	1	0	23.54
	15	1717.8	132050	1	74	20	1734.9	132221	1	0	23.51
	20	***1720.0***	***132072***	***1***	***99***	***15***	***1737.1***	***132243***	***1***	***0***	***23.75***
	20	1720.0	132072	1	99	5	1731.7	132189	1	0	23.62
	5	1713.3	132005	1	24	20	1725.0	132122	1	0	23.53
	20	1720.0	132072	1	99	20	1739.8	132270	1	0	23.65
Mid	10	1747.9	132351	1	49	15	1759.9	132471	1	0	23.63
	15	1750.1	132373	1	74	10	1762.1	132493	1	0	23.75
	10	1745.6	132328	1	49	20	1760.0	132472	1	0	23.72
	20	1750.1	132373	1	99	10	1764.5	132517	1	0	23.68
	15	1747.5	132347	1	74	15	1762.5	132497	1	0	23.65
	15	1745.3	132325	1	74	20	1762.4	132496	1	0	23.64
	20	1747.6	132348	1	99	15	1764.7	132519	1	0	23.76
	20	1752.5	132397	1	99	5	1764.2	132514	1	0	23.71
	5	***1745.8***	***132330***	***1***	***24***	***20***	***1757.5***	***132447***	***1***	***0***	***23.78***
	20	1745.1	132323	1	99	20	1764.9	132521	1	0	23.68
High	10	1760.5	132477	1	49	15	1772.5	132597	1	0	23.60
	15	1762.7	132499	1	74	10	1774.7	132619	1	0	23.68
	10	1755.6	132428	1	49	20	1770.0	132572	1	0	23.72
	20	1760.1	132473	1	99	10	1774.5	132617	1	0	23.70
	15	1757.5	132447	1	74	15	1772.5	132597	1	0	23.67
	15	1752.9	132401	1	74	20	1770.0	132572	1	0	23.62
	20	1755.1	132423	1	99	15	1772.2	132594	1	0	23.72
	20	1765.0	132522	1	99	5	1776.7	132639	1	0	23.68
	5	***1758.3***	***132455***	***1***	***24***	***20***	***1770.0***	***132572***	***1***	***0***	***23.79***
	20	1750.2	132374	1	99	20	1770.0	132572	1	0	23.60

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	10	1715.3	132025	50	0	15	1727.3	132145	75	0	21.72
	15	1717.5	132047	75	0	10	1729.5	132167	50	0	21.79
	10	1715.5	132027	50	0	20	1729.9	132171	100	0	21.79
	20	1720.0	132072	100	0	10	1734.4	132216	50	0	21.79
	15	1717.5	132047	75	0	15	1732.5	132197	75	0	21.78
	15	1717.8	132050	75	0	20	1734.9	132221	100	0	21.83
	20	1720.0	132072	100	0	15	1737.1	132243	75	0	21.84
	20	1720.0	132072	100	0	5	1731.7	132189	25	0	21.85
	5	1713.3	132005	25	0	20	1725.0	132122	100	0	21.79
	20	***1720.0***	***132072***	***100***	***0***	***20***	***1739.8***	***132270***	***100***	***0***	***21.87***
Mid	10	1747.9	132351	50	0	15	1759.9	132471	75	0	21.93
	15	1750.1	132373	75	0	10	1762.1	132493	50	0	21.94
	10	***1745.6***	***132328***	***50***	***0***	***20***	***1760.0***	***132472***	***100***	***0***	***22.03***
	20	1750.1	132373	100	0	10	1764.5	132517	50	0	21.94
	15	1747.5	132347	75	0	15	1762.5	132497	75	0	21.93
	15	1745.3	132325	75	0	20	1762.4	132496	100	0	21.92
	20	1747.6	132348	100	0	15	1764.7	132519	75	0	22.00
	20	1752.5	132397	100	0	5	1764.2	132514	25	0	22.02
	5	1745.8	132330	25	0	20	1757.5	132447	100	0	21.96
	20	1745.1	132323	100	0	20	1764.9	132521	100	0	21.89
High	10	1760.5	132477	50	0	15	1772.5	132597	75	0	21.98
	15	1762.7	132499	75	0	10	1774.7	132619	50	0	22.00
	10	1755.6	132428	50	0	20	1770.0	132572	100	0	21.96
	20	1760.1	132473	100	0	10	1774.5	132617	50	0	21.99
	15	1757.5	132447	75	0	15	1772.5	132597	75	0	21.95
	15	1752.9	132401	75	0	20	1770.0	132572	100	0	22.02
	20	1755.1	132423	100	0	15	1772.2	132594	75	0	21.94
	20	1765.0	132522	100	0	5	1776.7	132639	25	0	21.89
	5	***1758.3***	***132455***	***25***	***0***	***20***	***1770.0***	***132572***	***100***	***0***	***22.08***
	20	1750.2	132374	100	0	20	1770.0	132572	100	0	21.96

Note:

Modulation : QPSK(Full RB)

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	20	1720.0	132072	1	99	15	1737.1	132243	1	0	22.71
Mid	5	1745.8	132330	1	24	20	1757.5	132447	1	0	22.75
High	5	1758.3	132455	1	24	20	1770.0	132572	1	0	22.78
Low	20	1720.0	132072	100	0	20	1739.8	132270	100	0	20.83
Mid	10	1745.6	132328	50	0	20	1760.0	132472	100	0	20.96
High	5	1758.3	132455	25	0	20	1770.0	132572	100	0	20.93

Note:

Modulation : 16QAM

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	20	1720.0	132072	1	99	15	1737.1	132243	1	0	20.94
Mid	5	1745.8	132330	1	24	20	1757.5	132447	1	0	21.01
High	5	1758.3	132455	1	24	20	1770.0	132572	1	0	20.58
Low	20	1720.0	132072	100	0	20	1739.8	132270	100	0	20.77
Mid	10	1745.6	132328	100	0	20	1760.0	132472	100	0	20.78
High	5	1758.3	132455	100	0	20	1770.0	132572	100	0	20.79

Note:

Modulation : 64QAM

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	20	1720.0	132072	1	99	15	1737.1	132243	1	0	18.74
Mid	5	1745.8	132330	1	24	20	1757.5	132447	1	0	18.75
High	5	1758.3	132455	1	24	20	1770.0	132572	1	0	18.78
Low	20	1720.0	132072	100	0	20	1739.8	132270	100	0	18.74
Mid	10	1745.6	132328	100	0	20	1760.0	132472	100	0	18.75
High	5	1758.3	132455	100	0	20	1770.0	132572	100	0	18.68

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	10	132025	1/49	15	132145	1/0	-19.33	14.18	10.01	2.22	V	0.157	21.97
	15	132047	1/74	10	132167	1/0	-19.41	14.19	10.04	2.20	V	0.160	22.03
	10	132027	1/49	20	132171	1/0	-19.15	14.36	10.01	2.22	V	0.164	22.15
	20	132072	1/99	10	132216	1/0	-19.35	14.31	10.07	2.17	V	0.166	22.21
	15	132047	1/74	15	132197	1/0	-19.38	14.22	10.04	2.20	V	0.161	22.06
	15	132050	1/74	20	132221	1/0	-19.29	14.31	10.04	2.20	V	0.164	22.15
	20	132072	1/99	15	132243	1/0	-19.38	14.28	10.07	2.17	V	0.165	22.18
	20	132072	1/99	5	132189	1/0	-19.30	14.30	10.04	2.20	V	0.164	22.14
	5	132005	1/24	20	132122	1/0	-19.05	14.46	10.01	2.22	V	0.168	22.25
	20	***132072***	***1/99***	***20***	***132270***	***1/0***	***-19.23***	***14.43***	***10.07***	***2.17***	***V***	***0.171***	***22.33***
Mid	10	132025	1/49	15	132471	1/0	-18.78	14.90	10.18	2.17	V	0.195	22.91
	15	132047	1/74	10	132493	1/0	-18.93	14.75	10.18	2.17	V	0.189	22.76
	10	132027	1/49	20	132472	1/0	-18.54	15.17	10.17	2.15	V	0.208	23.19
	20	132072	1/99	10	132517	1/0	-18.97	14.68	10.19	2.18	V	0.186	22.69
	15	132047	1/74	15	132497	1/0	-18.92	14.76	10.18	2.17	V	0.189	22.77
	15	132050	1/74	20	132496	1/0	-18.76	14.92	10.18	2.17	V	0.196	22.93
	20	132072	1/99	15	132519	1/0	-18.86	14.82	10.18	2.17	V	0.192	22.83
	20	132072	1/99	5	132514	1/0	-18.87	14.78	10.19	2.18	V	0.190	22.79
	5	***132005***	***1/24***	***20***	***132447***	***1/0***	***-18.34***	***15.37***	***10.17***	***2.15***	***V***	***0.218***	***23.39***
	20	132072	1/99	20	132521	1/0	-18.71	14.97	10.18	2.17	V	0.199	22.98
High	10	132025	1/49	15	132597	1/0	-19.07	14.56	10.19	2.21	V	0.180	22.55
	15	132047	1/74	10	132619	1/0	-19.17	14.44	10.20	2.23	V	0.174	22.41
	10	***132027***	***1/49***	***20***	***132572***	***1/0***	***-18.79***	***14.86***	***10.19***	***2.18***	***V***	***0.194***	***22.87***
	20	132072	1/99	10	132617	1/0	-19.14	14.47	10.20	2.23	V	0.175	22.44
	15	132047	1/74	15	132597	1/0	-18.96	14.67	10.19	2.21	V	0.184	22.66
	15	132050	1/74	20	132572	1/0	-18.87	14.78	10.19	2.18	V	0.190	22.79
	20	132072	1/99	15	132594	1/0	-18.91	14.72	10.19	2.21	V	0.187	22.71
	20	132072	1/99	5	132639	1/0	-19.19	14.42	10.20	2.23	V	0.173	22.39
	5	132005	1/24	20	132572	1/0	-18.82	14.81	10.19	2.21	V	0.190	22.80
	20	132072	1/99	20	132572	1/0	-18.83	14.82	10.19	2.18	V	0.192	22.83

Note:

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

PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
20	132072	1/99	20	132270	1/0	-19.68	13.98	10.07	2.17	V	0.154	21.88
10	132025	1/49	15	132471	1/0	-19.32	14.36	10.18	2.17	V	0.173	22.37
15	132047	1/74	10	132493	1/0	-19.47	14.21	10.18	2.17	V	0.167	22.22
10	132027	1/49	20	132472	1/0	-19.11	14.60	10.17	2.15	V	0.183	22.62
20	132072	1/99	10	132517	1/0	-19.49	14.16	10.19	2.18	V	0.165	22.17
15	132047	1/74	15	132497	1/0	-19.38	14.30	10.18	2.17	V	0.170	22.31
15	132050	1/74	20	132496	1/0	-19.26	14.42	10.18	2.17	V	0.175	22.43
20	132072	1/99	15	132519	1/0	-19.35	14.33	10.18	2.17	V	0.171	22.34
20	132072	1/99	5	132514	1/0	-19.42	14.23	10.19	2.18	V	0.167	22.24
5	132005	1/24	20	132447	1/0	-18.94	14.77	10.17	2.15	V	0.190	22.79
20	132072	1/99	20	132521	1/0	-19.28	14.40	10.18	2.17	V	0.174	22.41
10	132027	1/49	20	132572	1/0	-19.35	14.30	10.19	2.18	V	0.170	22.31

Note:

1. Modulation : 16QAM

2. Limit : < 1 Watts

PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
20	132072	1/99	20	132270	1/0	-21.26	12.40	10.07	2.17	V	0.107	20.30
10	132025	1/49	15	132471	1/0	-20.68	13.00	10.18	2.17	V	0.126	21.01
15	132047	1/74	10	132493	1/0	-20.63	13.05	10.18	2.17	V	0.128	21.06
10	132027	1/49	20	132472	1/0	-20.22	13.49	10.17	2.15	V	0.142	21.51
20	132072	1/99	10	132517	1/0	-20.55	13.10	10.19	2.18	V	0.129	21.11
15	132047	1/74	15	132497	1/0	-20.68	13.00	10.18	2.17	V	0.126	21.01
15	132050	1/74	20	132496	1/0	-20.66	13.02	10.18	2.17	V	0.127	21.03
20	132072	1/99	15	132519	1/0	-20.55	13.13	10.18	2.17	V	0.130	21.14
20	132072	1/99	5	132514	1/0	-20.41	13.24	10.19	2.18	V	0.133	21.25
5	132005	1/24	20	132447	1/0	-20.05	13.66	10.17	2.15	V	0.147	21.68
20	132072	1/99	20	132521	1/0	-20.36	13.32	10.18	2.17	V	0.136	21.33
10	132027	1/49	20	132572	1/0	-20.24	13.41	10.19	2.18	V	0.139	21.42

Note:

1. Modulation : 64QAM

2. Limit : < 1 Watts

PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
20	132072	1/99	20	132270	1/0	-23.68	9.98	10.07	2.17	V	0.061	17.88
10	132025	1/49	15	132471	1/0	-23.30	10.38	10.18	2.17	V	0.069	18.39
15	132047	1/74	10	132493	1/0	-23.40	10.28	10.18	2.17	V	0.067	18.29
10	132027	1/49	20	132472	1/0	-23.15	10.56	10.17	2.15	V	0.072	18.58
20	132072	1/99	10	132517	1/0	-23.48	10.17	10.19	2.18	V	0.066	18.18
15	132047	1/74	15	132497	1/0	-23.31	10.37	10.18	2.17	V	0.069	18.38
15	132050	1/74	20	132496	1/0	-23.29	10.39	10.18	2.17	V	0.069	18.40
20	132072	1/99	15	132519	1/0	-23.34	10.34	10.18	2.17	V	0.068	18.35
20	132072	1/99	5	132514	1/0	-23.39	10.26	10.19	2.18	V	0.067	18.27
5	132005	1/24	20	132447	1/0	-22.98	10.73	10.17	2.15	V	0.075	18.75
20	132072	1/99	20	132521	1/0	-23.22	10.46	10.18	2.17	V	0.070	18.47
10	132027	1/49	20	132572	1/0	-23.35	10.30	10.19	2.18	V	0.068	18.31

Note:

1. Modulation : 256QAM

2. Limit : < 1 Watts

8.3 Conducted Spurious Emissions

Operating frequency	PCC				SCC				Measurement Maximum Frequency (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)
	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset				
Low	20	132072	1720.0	1/99	15	132243	1737.1	1/0	5.9811	28.591	-75.94	-47.35
Mid	5	132330	1745.8	1/24	20	132447	1757.5	1/0	8.2717	28.591	-74.81	-46.22
High	5	132455	1758.3	1/24	20	132572	1770.0	1/0	9.6690	28.591	-75.77	-47.18
Low	20	132072	1720.0	1/0	15	132243	1737.1	1/74	7.1974	28.591	-76.34	-47.75
Mid	5	132330	1745.8	1/0	20	132447	1757.5	1/99	4.0479	27.976	-75.49	-47.51
High	5	132455	1758.3	1/0	20	132572	1770.0	1/99	4.0409	27.976	-75.77	-47.79
Low	20	132072	1720.0	100/0	20	132270	1739.8	100/0	8.3116	28.591	-75.94	-47.34
Mid	10	132328	1745.6	50/0	20	132472	1760.0	100/0	9.9811	28.591	-75.03	-46.44
High	5	132455	1758.3	25/0	20	132572	1770.0	100/0	3.7254	27.976	-74.38	-46.40
Mid	20	132323	1745.1	100/0	20	132521	1764.9	100/0	9.7358	28.591	-75.86	-47.27
High	20	132374	1750.2	100/0	20	132572	1770	100/0	9.7059	28.591	-75.91	-47.32

Note:

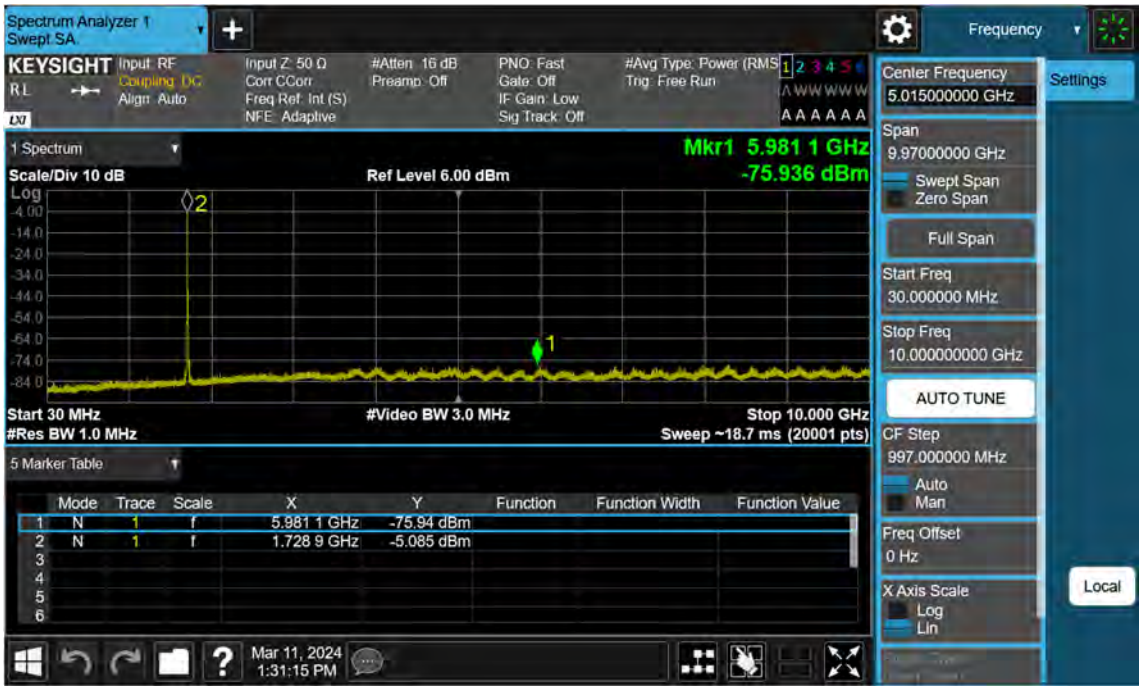
1. Modulation : QPSK
2. Factor(dB) = Cable Loss + Ext. Attenuator + Power Splitter
3. Factors for frequency :

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

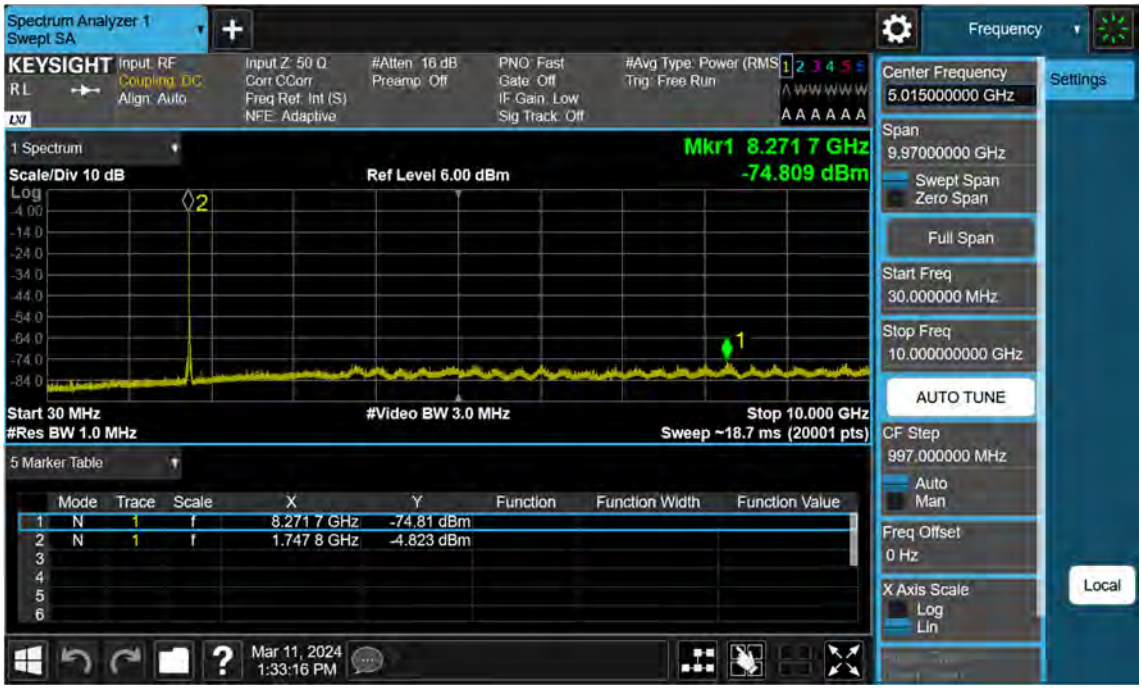
4. Limit : -13.0 dBm

Frequency Range : 30 MHz ~ 10 GHz

PCC 20 MHz Ch132072 RB1 Offset99 SCC 15 MHz Ch132243 RB1 Offset0



PCC 5 MHz Ch132330 RB1 Offset24 SCC 20 MHz Ch132447 RB1 Offset0



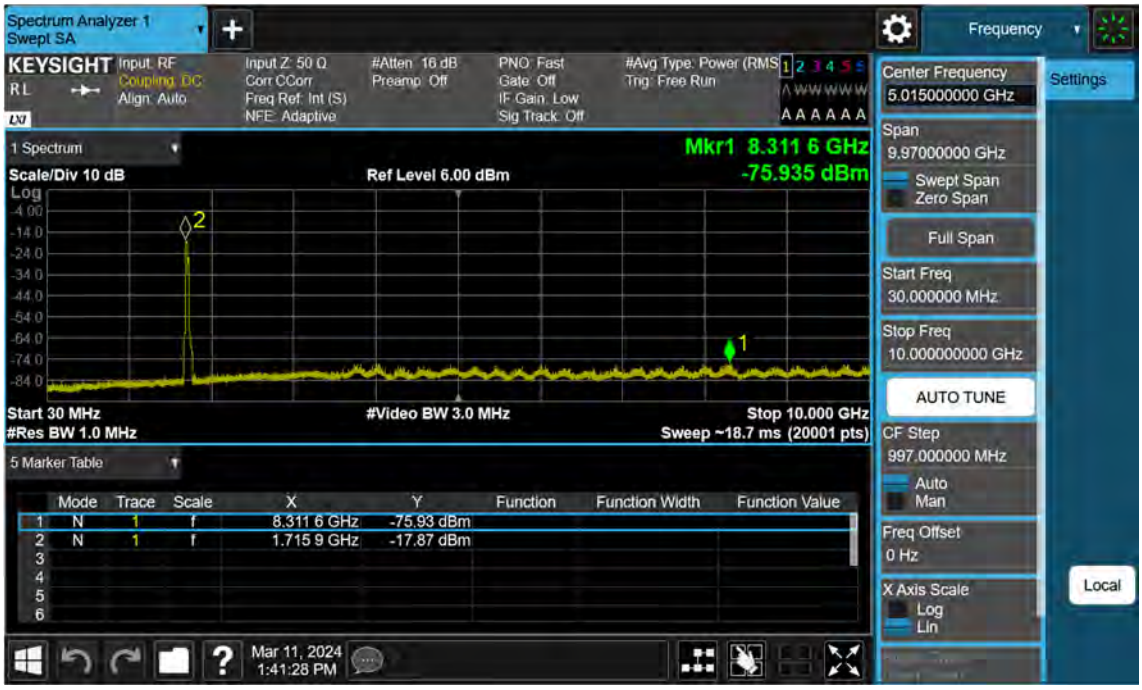
PCC 5 MHz Ch132455 RB1 Offset24 SCC 20 MHz Ch132572 RB1 Offset0

PCC 20 MHz Ch132072 RB1 Offset0 SCC 15 MHz Ch132243 RB1 Offset74

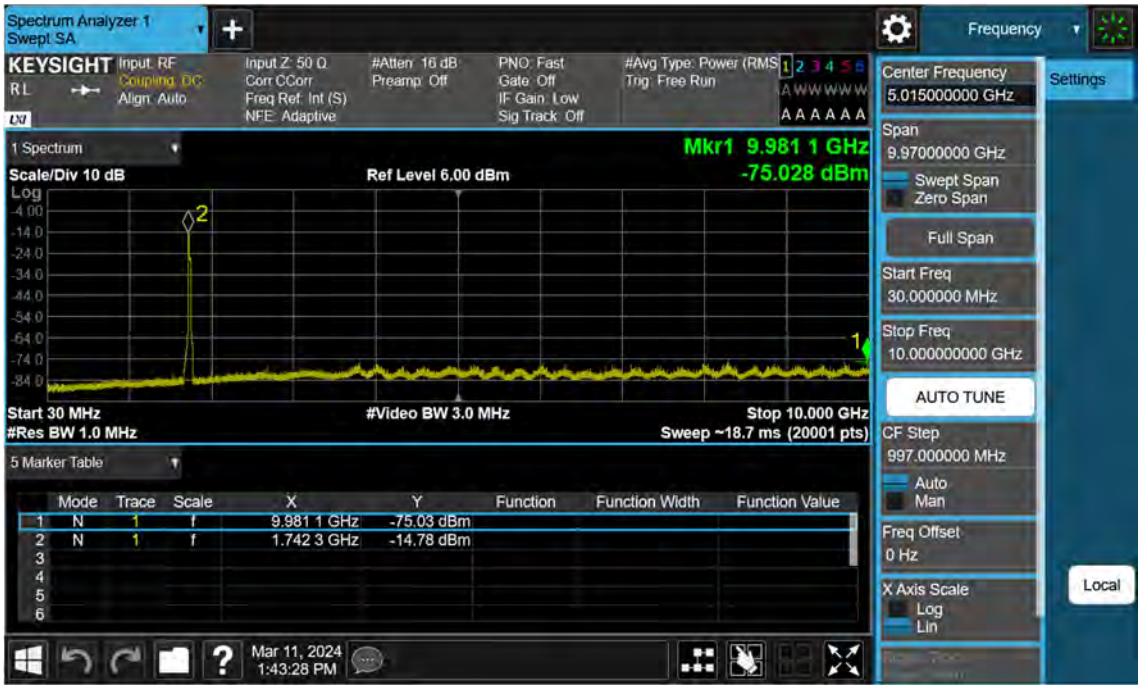
PCC 5 MHz Ch132330 RB1 Offset0 SCC 20 MHz Ch132447 RB1 Offset99

PCC 5 MHz Ch132455 RB1 Offset0 SCC 20 MHz Ch132572 RB1 Offset99

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



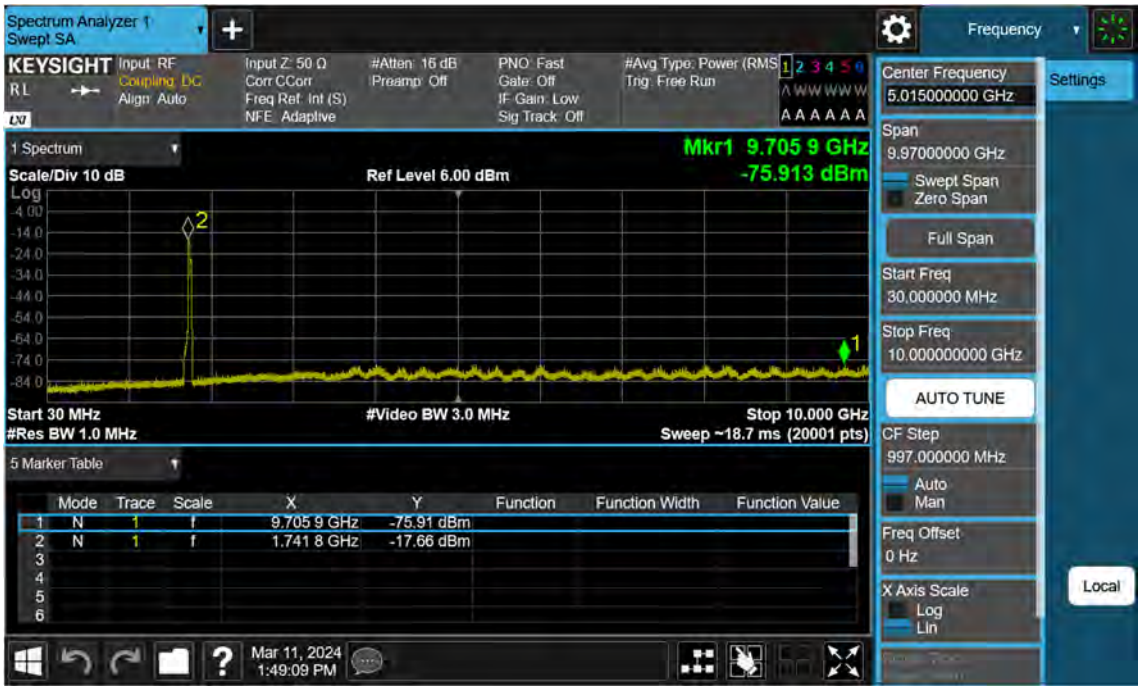
PCC 10 MHz Ch132328 RB50 Offset0 SCC 20 MHz Ch132472 RB100 Offset0



PCC 5 MHz Ch132455 RB25 Offset0 SCC 20 MHz Ch132572 RB100 Offset0

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

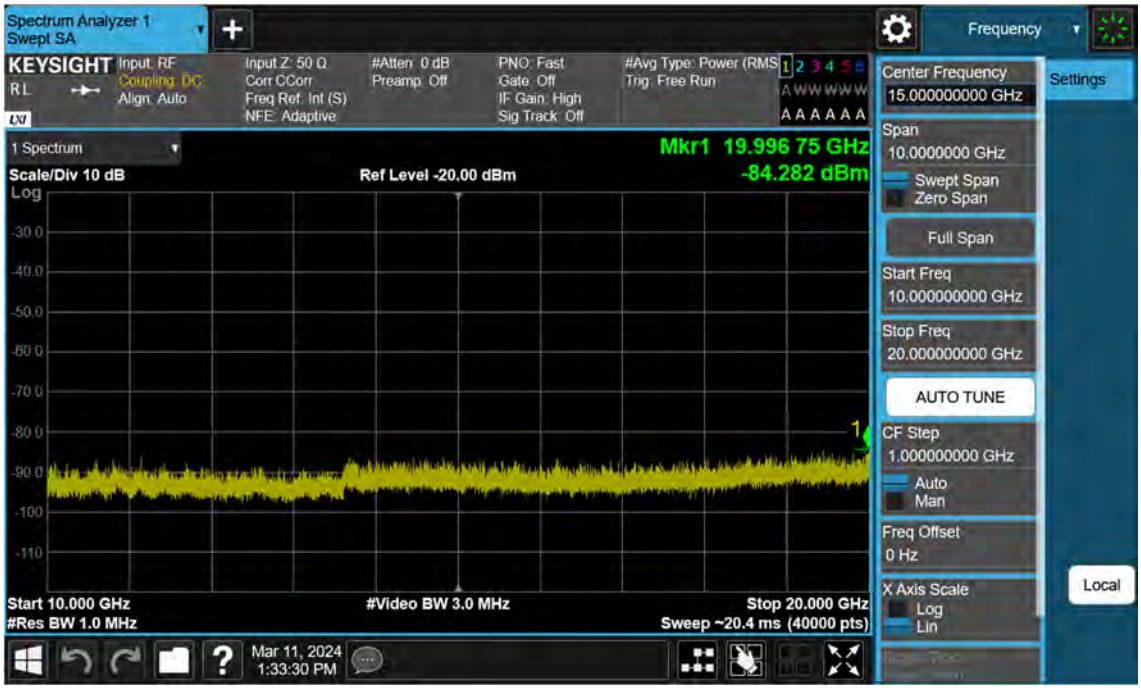
PCC 20 MHz Ch132374 RB100 Offset0 SCC 20 MHz Ch132572 RB100 Offset0



Frequency Range : 10 GHz ~ 26.5GHz

PCC 20 MHz Ch132072 RB1 Offset99, SCC 15 MHz Ch132243 RB1 Offset0

PCC 5 MHz Ch132330 RB1 Offset24, SCC 20 MHz Ch132447 RB1 Offset0

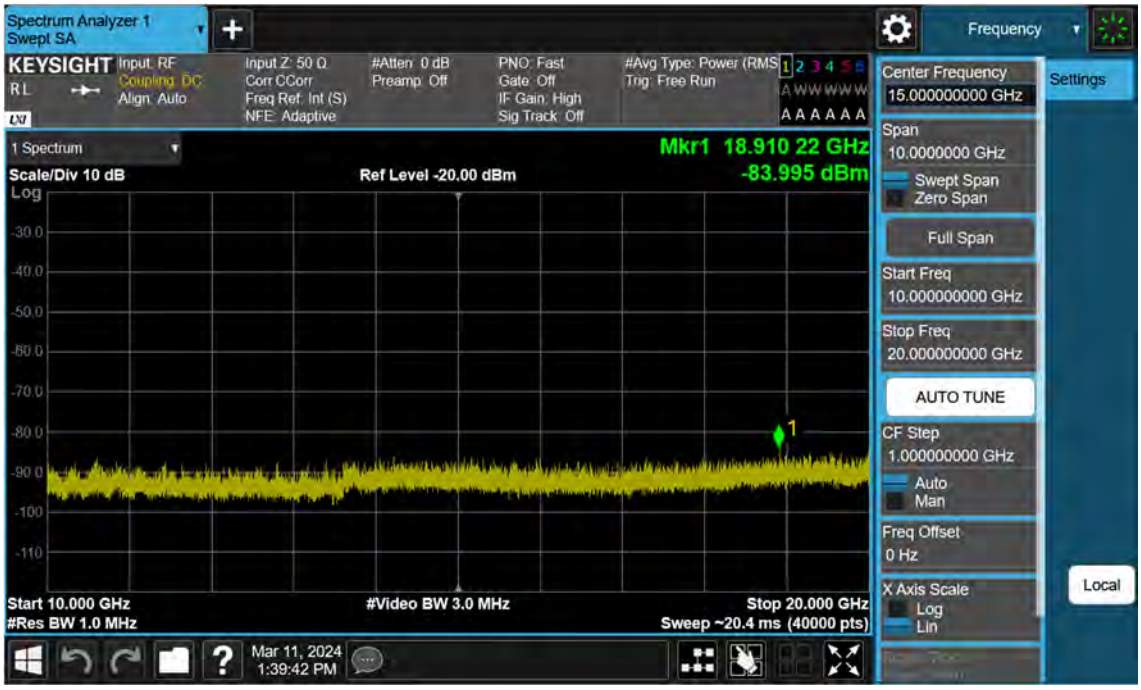


PCC 5 MHz Ch132455 RB1 Offset24, SCC 20 MHz Ch132572 RB1 Offset0

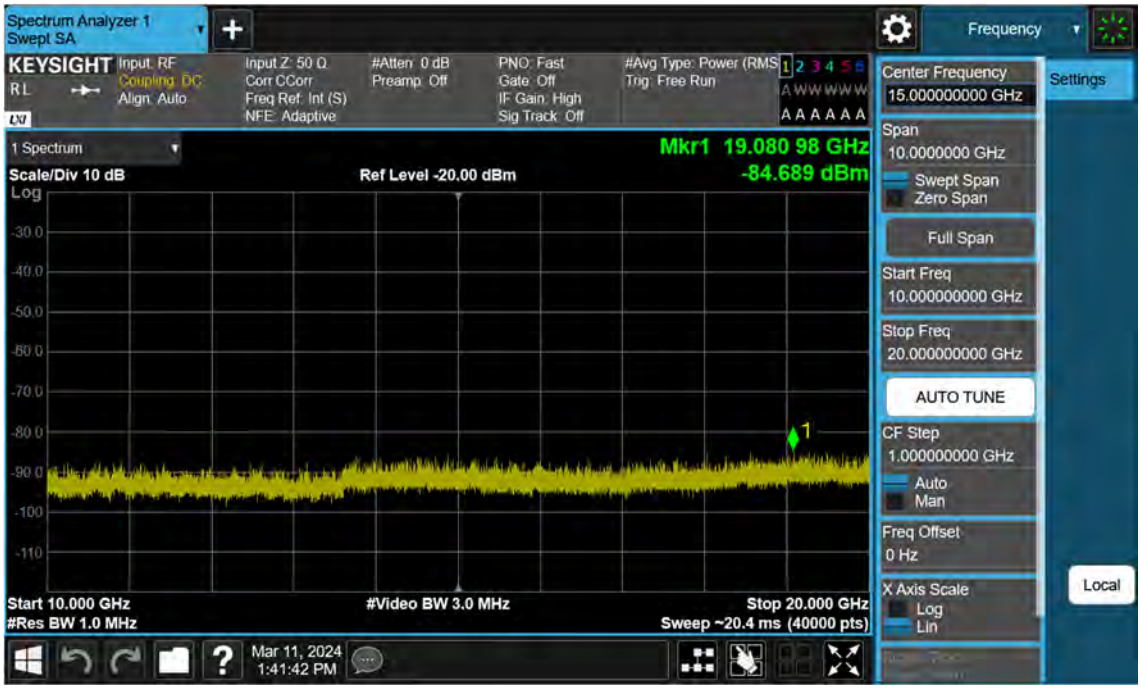
PCC 20 MHz Ch132072 RB1 Offset0, SCC 15 MHz Ch132243 RB1 Offset74

PCC 5 MHz Ch132330 RB1 Offset0, SCC 20 MHz Ch132447 RB1 Offset99

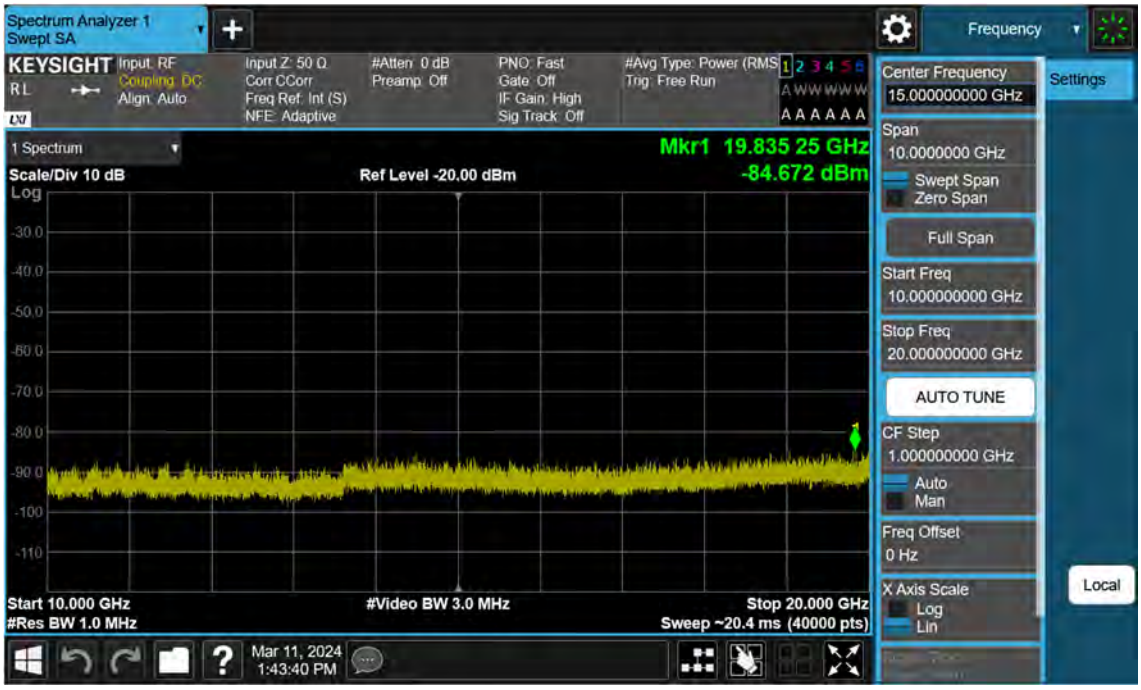
PCC 5 MHz Ch132455 RB1 Offset0, SCC 20 MHz Ch132572 RB1 Offset99



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



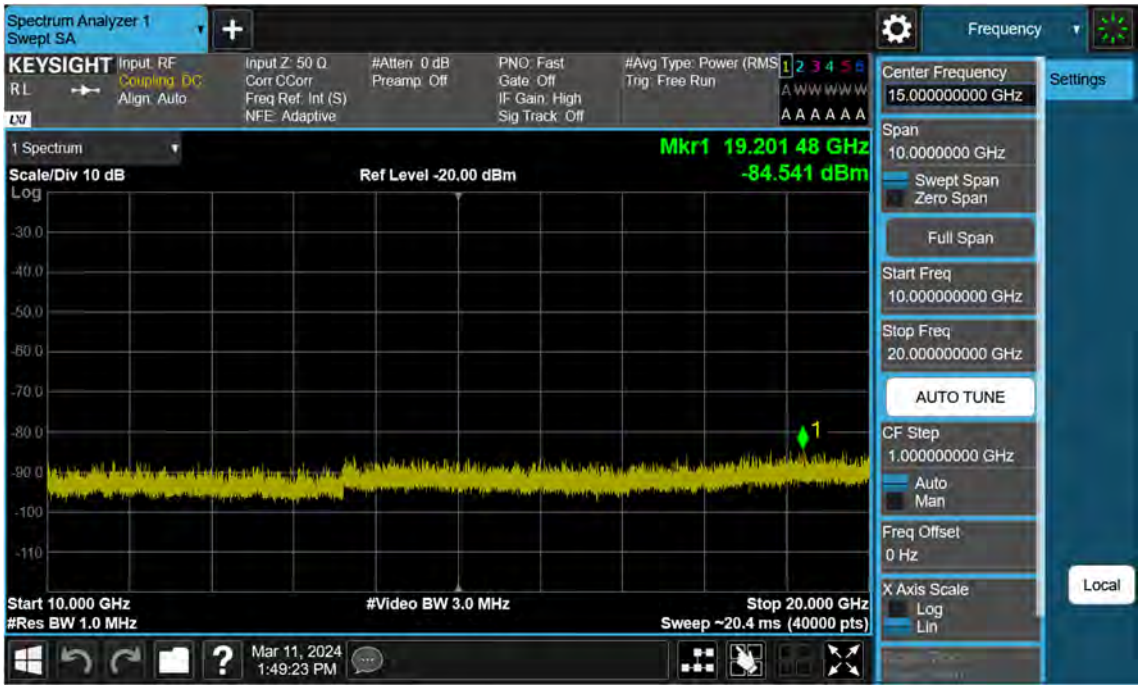
PCC 10 MHz Ch132328 RB50 Offset0, SCC 20 MHz Ch132472 RB100 Offset0



PCC 5 MHz Ch132455 RB25 Offset0, SCC 20 MHz Ch132572 RB100 Offset0

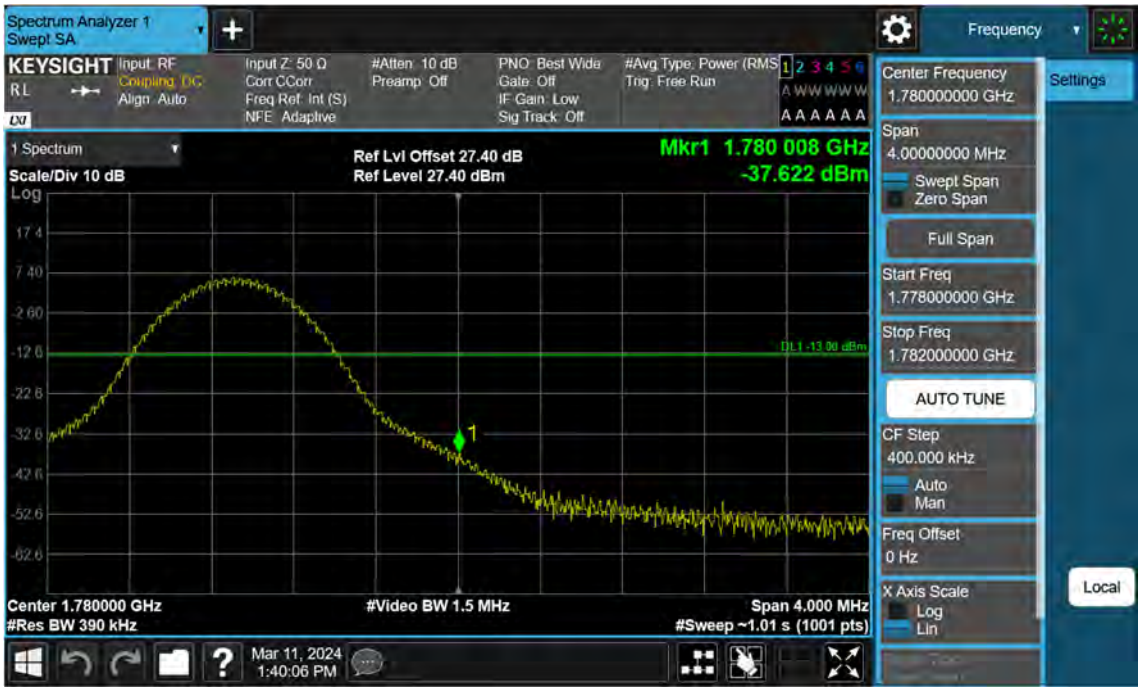
PCC 20 MHz Ch132323 RB100 Offset0, SCC 20 MHz Ch132521 RB100 Offset0

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

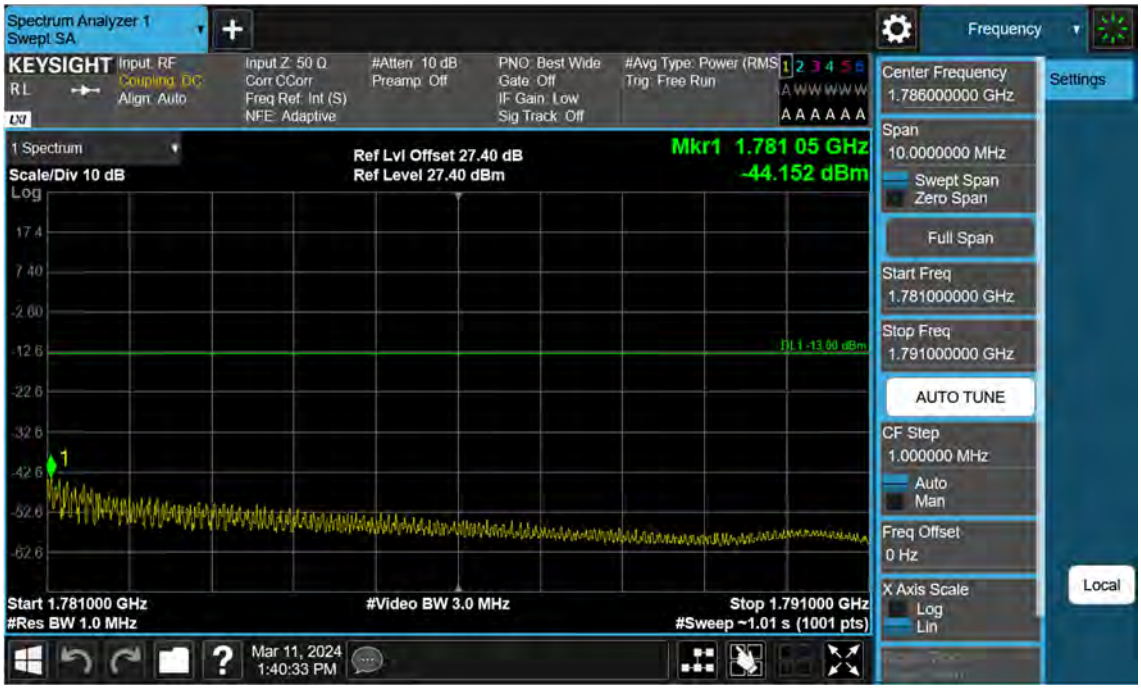


8.4 Channel Edge

Highest Channel_PCC 5 MHz Ch132455 RB1 Offset0 SCC 20 MHz Ch132572 RB1 Offset99(1)

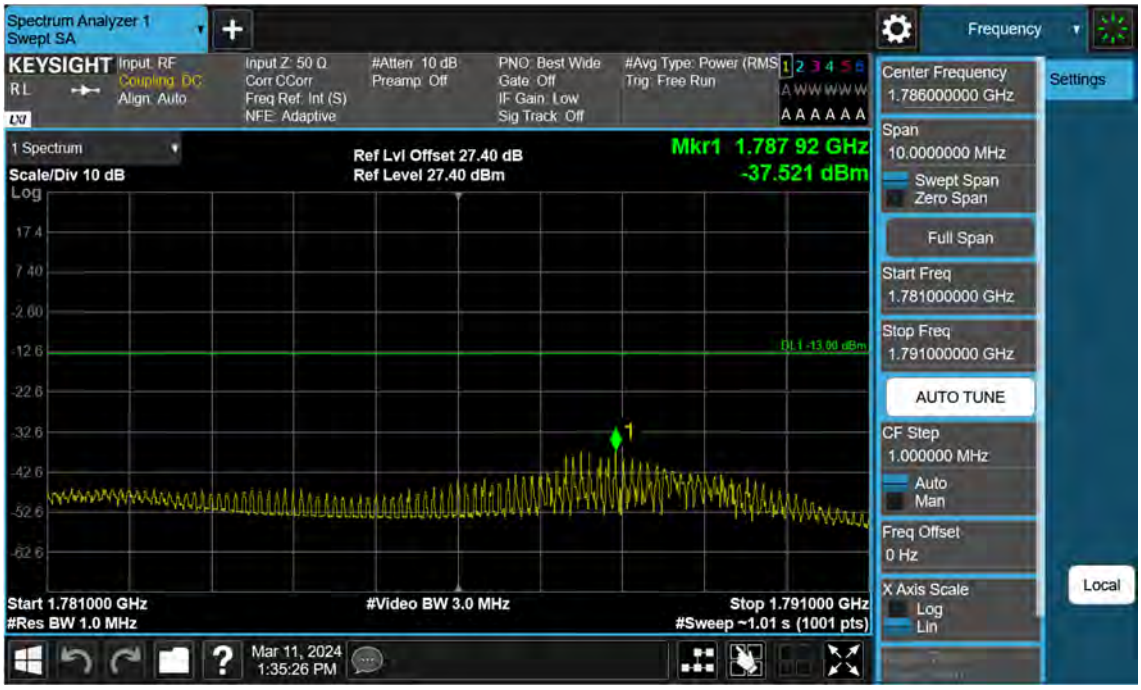


Highest Channel_PCC 5 MHz Ch132455 RB1 Offset0 SCC 20 MHz Ch132572 RB1 Offset99(2)



Highest Channel_PCC 5 MHz Ch132455 RB1 Offset24 SCC 20 MHz Ch132572 RB1 Offset0(1)

Highest Channel_PCC 5 MHz Ch132455 RB1 Offset24 SCC 20 MHz Ch132572 RB1 Offset0(2)

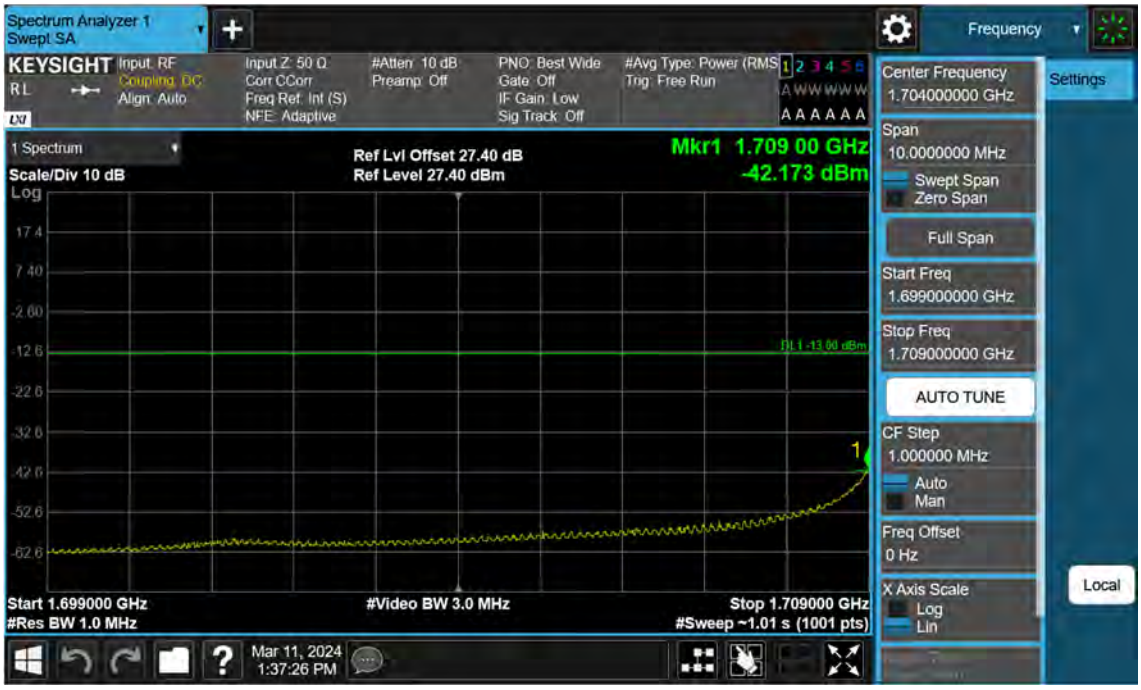


Highest Channel_PCC 5 MHz Ch132455 RB25 Offset0 SCC 20 MHz Ch132572 RB100 Offset0(1)

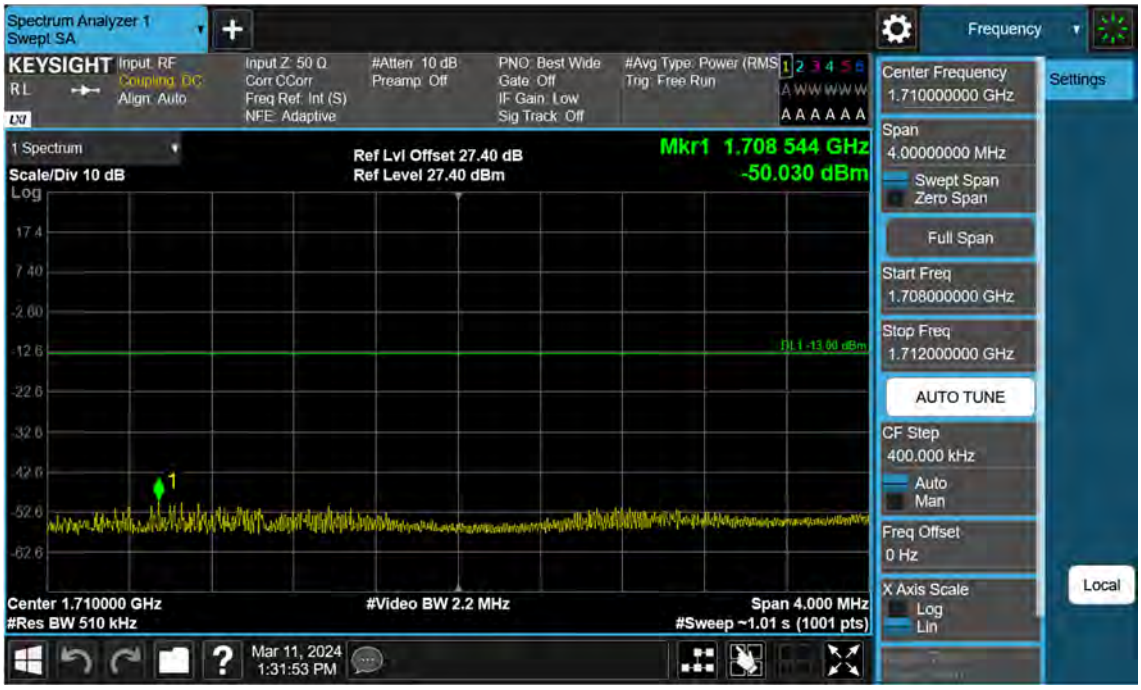
Highest Channel_PCC 5 MHz Ch132455 RB25 Offset0 SCC 20 MHz Ch132572 RB100 Offset0(2)

Lowest Channel_PCC 20 MHz Ch132072 RB1 Offset0 SCC 15 MHz Ch132243 RB1 Offset74(1)

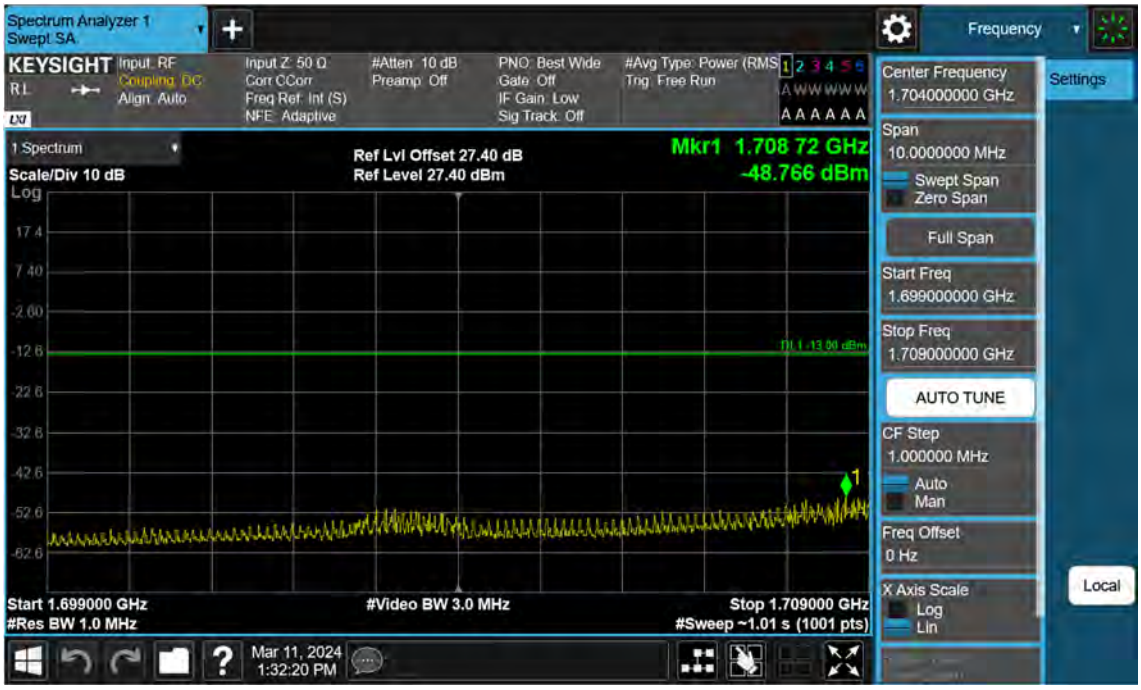
Lowest Channel_PCC 20 MHz Ch132072 RB1 Offset0 SCC 15 MHz Ch132243 RB1 Offset74(2)



Lowest Channel_PCC 20 MHz Ch132072 RB1 Offset99 SCC 15 MHz Ch132243 RB1 Offset0(1)

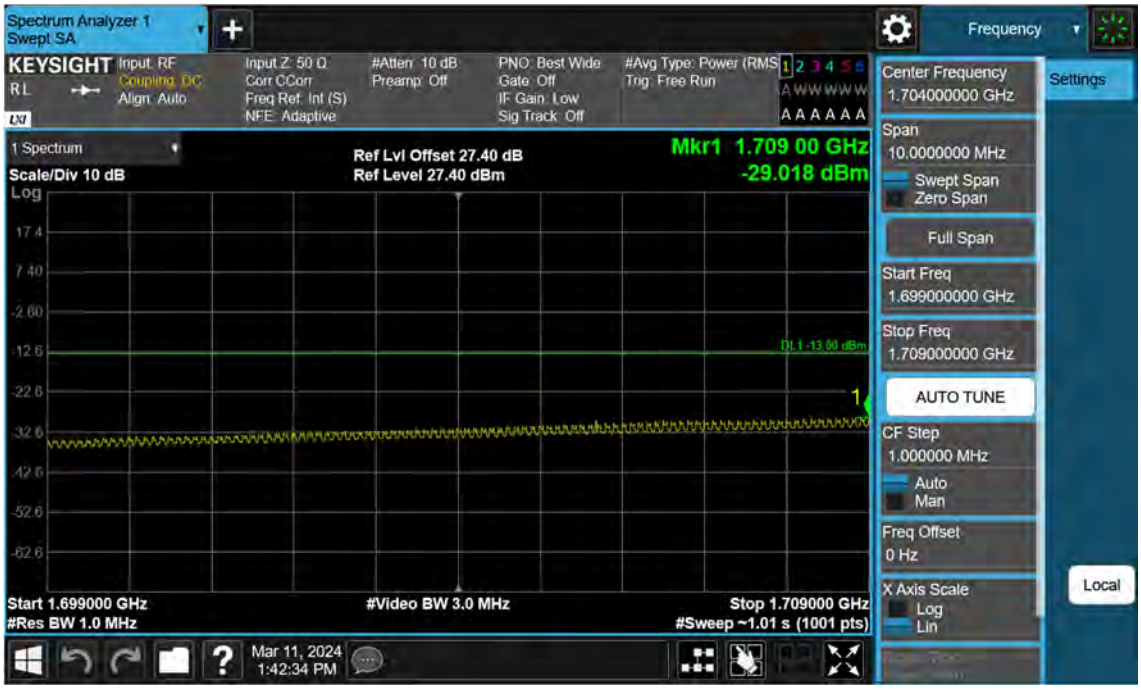


Lowest Channel_PCC 20 MHz Ch132072 RB1 Offset99 SCC 15 MHz Ch132243 RB1 Offset0(2)



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

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



Lowest Channel_PCC 20 MHz Ch132323 RB100 Offset0 SCC 20 MHz Ch132521 RB100 Offset0(1)

Lowest Channel_PCC 20 MHz Ch132323 RB100 Offset0 SCC 20 MHz Ch132521 RB100 Offset0(2)

8.5 Frequency Stability / Variation of Ambient Temperature

▣ PCC Channel:	132005	
▣ PCC Frequency:	1713.3	MHz
▣ PCC BandWidth:	5	MHz
▣ SCC Channel:	132122	
▣ SCC Frequency:	1725.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.880	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)	-0.040	0.034	1713.29985	1725.00002
100 %		-30	0.039	-0.049	1713.30003	1724.99987
100 %		-20	0.023	-0.034	1713.30000	1724.99992
100 %		-10	-0.031	0.034	1713.29992	1725.00000
100 %		0	0.027	0.021	1713.29996	1724.99999
100 %		10	0.023	0.037	1713.30002	1725.00006
100 %		30	0.023	0.032	1713.29999	1724.99998
100 %		40	0.033	-0.040	1713.29998	1724.99989
100 %		50	-0.027	-0.042	1713.29988	1724.99988
Batt. Endpoint	3.300	20	0.023	0.018	1713.30005	1725.00002

▣ PCC Channel: 132025
▣ PCC Frequency: 1715.3 MHz
▣ PCC BandWidth: 10 MHz
▣ SCC Channel: 132145
▣ SCC Frequency: 1727.3 MHz
▣ SCC BandWidth: 15 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.020	0.039	1715.30003	1727.30006
100 %		-30	0.025	0.027	1715.30001	1727.30000
100 %		-20	0.023	-0.030	1715.30001	1727.29991
100 %		-10	0.024	-0.029	1715.30002	1727.29991
100 %		0	0.024	0.033	1715.29997	1727.30003
100 %		10	0.038	0.030	1715.30005	1727.30000
100 %		30	-0.040	-0.035	1715.29990	1727.29991
100 %		40	-0.032	0.025	1715.29985	1727.29997
100 %		50	0.029	0.019	1715.29997	1727.30004
Batt. Endpoint	3.300	20	0.018	0.022	1715.29999	1727.30002

▣ PCC Channel: 132047
▣ PCC Frequency: 1717.5 MHz
▣ PCC BandWidth: 15 MHz
▣ SCC Channel: 132167
▣ SCC Frequency: 1729.5 MHz
▣ SCC BandWidth: 10 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.035	-0.046	1717.50000	1729.49985
100 %		-30	0.022	0.025	1717.49996	1729.50002
100 %		-20	-0.041	-0.038	1717.49985	1729.49987
100 %		-10	-0.032	0.027	1717.49994	1729.50001
100 %		0	0.026	-0.028	1717.50004	1729.49993
100 %		10	-0.035	-0.040	1717.49993	1729.49993
100 %		30	0.022	0.030	1717.49997	1729.49998
100 %		40	-0.036	0.034	1717.49985	1729.50002
100 %		50	-0.036	0.033	1717.49988	1729.50003
Batt. Endpoint	3.300	20	0.035	0.027	1717.50002	1729.50003

▣ PCC Channel: 132072
▣ PCC Frequency: 1720.0 MHz
▣ PCC BandWidth: 20 MHz
▣ SCC Channel: 132270
▣ SCC Frequency: 1739.8 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.036	-0.038	1720.00006	1739.79992
100 %		-30	0.017	-0.042	1720.00003	1739.79991
100 %		-20	0.024	-0.036	1720.00003	1739.79989
100 %		-10	0.034	0.017	1720.00002	1739.79998
100 %		0	0.036	0.021	1720.00005	1739.79997
100 %		10	0.035	0.019	1720.00001	1739.80000
100 %		30	0.025	0.029	1720.00002	1739.80002
100 %		40	0.015	-0.035	1720.00002	1739.79994
100 %		50	0.036	0.030	1720.00004	1739.80004
Batt. Endpoint	3.300	20	-0.045	0.022	1719.99990	1739.79999

▣ PCC Channel: 132455
▣ PCC Frequency: 1758.3 MHz
▣ PCC BandWidth: 5 MHz
▣ SCC Channel: 132572
▣ SCC Frequency: 1770.0 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.021	0.029	1758.29999	1769.99997
100 %		-30	0.033	0.034	1758.30005	1770.00004
100 %		-20	0.031	0.019	1758.30003	1770.00003
100 %		-10	0.019	0.020	1758.29998	1769.99995
100 %		0	0.023	-0.041	1758.30005	1769.99986
100 %		10	0.034	-0.036	1758.30001	1769.99993
100 %		30	0.032	0.033	1758.29997	1769.99998
100 %		40	0.032	-0.032	1758.30005	1769.99992
100 %		50	0.016	0.031	1758.29995	1770.00001
Batt. Endpoint	3.300	20	0.017	-0.035	1758.30001	1769.99995

▣ PCC Channel: 132597
▣ PCC Frequency: 1772.5 MHz
▣ PCC BandWidth: 10 MHz
▣ SCC Channel: 132717
▣ SCC Frequency: 1784.5 MHz
▣ SCC BandWidth: 15 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.047	0.027	1772.49990	1784.50001
100 %		-30	0.032	0.023	1772.50005	1784.50003
100 %		-20	0.024	-0.040	1772.49999	1784.49993
100 %		-10	0.032	0.029	1772.49999	1784.50004
100 %		0	0.029	0.027	1772.50007	1784.49999
100 %		10	0.020	0.030	1772.50004	1784.50001
100 %		30	0.017	0.020	1772.50002	1784.49996
100 %		40	0.031	0.037	1772.50003	1784.49998
100 %		50	0.031	0.042	1772.49998	1784.50007
Batt. Endpoint	3.300	20	0.023	-0.048	1772.50000	1784.49985

▣ PCC Channel: 132499
▣ PCC Frequency: 1762.7 MHz
▣ PCC BandWidth: 15 MHz
▣ SCC Channel: 132619
▣ SCC Frequency: 1774.7 MHz
▣ SCC BandWidth: 10 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.048	0.021	1762.69987	1774.69997
100 %		-30	0.026	0.031	1762.69998	1774.69999
100 %		-20	0.040	0.027	1762.70006	1774.69996
100 %		-10	0.019	0.037	1762.70000	1774.70005
100 %		0	-0.037	0.035	1762.69992	1774.69999
100 %		10	0.024	0.027	1762.70001	1774.69997
100 %		30	0.033	0.028	1762.70000	1774.69998
100 %		40	-0.049	0.026	1762.69992	1774.69999
100 %		50	0.037	0.042	1762.70001	1774.70004
Batt. Endpoint	3.300	20	0.028	0.022	1762.69996	1774.70000

▣ PCC Channel: 132374
▣ PCC Frequency: 1750.2 MHz
▣ PCC BandWidth: 20 MHz
▣ SCC Channel: 132572
▣ SCC Frequency: 1770.0 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.880 MHz
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.028	0.029	1750.20000	1770.00002
100 %		-30	-0.028	0.031	1750.19994	1769.99997
100 %		-20	-0.052	0.022	1750.19984	1770.00000
100 %		-10	-0.028	0.035	1750.19987	1770.00005
100 %		0	0.033	0.019	1750.20003	1770.00001
100 %		10	0.030	0.028	1750.20000	1770.00005
100 %		30	0.028	0.025	1750.20001	1769.99999
100 %		40	-0.047	0.038	1750.19992	1770.00007
100 %		50	-0.043	-0.044	1750.19990	1769.99985
Batt. Endpoint	3.300	20	-0.029	0.021	1750.19986	1770.00001

8.6 Radiated Spurious Emissions

▣ PCC Channel : 132072 (1720.0 MHz)

▣ PCC BW(MHz) : 20

▣ PCC RB/ RB Offset : 1/ 99

▣ SCC Channel : 132270 (1739.8 MHz)

▣ SCC BW(MHz) : 20

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 3 meters

▣ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 459.80	-55.74	12.35	-62.28	3.12	V	-53.05
5 189.70	-56.75	12.57	-55.02	3.83	H	-46.28
6 919.60	-56.25	11.69	-48.88	4.53	H	-41.72

▣ PCC Channel : 132330 (1745.8 MHz)

▣ PCC BW(MHz) : 5

▣ PCC RB/ RB Offset : 1/ 24

▣ SCC Channel : 132447 (1757.5 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)
3 503.30	-54.77	12.34	-60.89	3.10	V	-51.65
5 254.95	-55.33	12.96	-54.88	3.86	V	-45.78
7 006.60	-55.52	11.29	-47.40	4.57	H	-40.68

▣ PCC Channel : 132428 (1755.6 MHz)

▣ PCC BW(MHz) : 10

▣ PCC RB/ RB Offset : 1/ 49

▣ SCC Channel : 132572 (1770.0 MHz)

▣ SCC BW(MHz) : 20

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 3 meters

▣ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 525.60	-54.67	12.34	-61.03	3.15	H	-51.84
5 288.40	-56.54	13.07	-55.83	3.91	H	-46.67
7 051.20	-56.35	11.07	-47.42	4.54	V	-40.89

8.7 Occupied Bandwidth

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	QPSK	50/ 0	15	132471	1759.9	QPSK	75/ 0	23.122
15	132373	1750.1	QPSK	75/ 0	10	132493	1762.1	QPSK	50/ 0	23.172
10	132328	1745.6	QPSK	50/ 0	20	132472	1760.0	QPSK	100/ 0	27.726
20	132373	1750.1	QPSK	100/ 0	10	132517	1764.5	QPSK	50/ 0	27.772
15	132347	1747.5	QPSK	75/ 0	15	132497	1762.5	QPSK	75/ 0	28.401
15	132325	1745.3	QPSK	75/ 0	20	132496	1762.4	QPSK	100/ 0	32.618
20	132348	1747.6	QPSK	100/ 0	15	132519	1764.7	QPSK	75/ 0	32.668
20	132397	1752.5	QPSK	100/ 0	5	132514	1764.2	QPSK	25/ 0	22.968
5	132330	1745.8	QPSK	25/ 0	20	132447	1757.5	QPSK	100/ 0	22.930
20	132323	1745.1	QPSK	100/ 0	20	132521	1764.9	QPSK	100/ 0	37.591

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	16QAM	50/ 0	15	132471	1759.9	16QAM	75/ 0	23.005
15	132373	1750.1	16QAM	75/ 0	10	132493	1762.1	16QAM	50/ 0	23.099
10	132328	1745.6	16QAM	50/ 0	20	132472	1760.0	16QAM	100/ 0	27.707
20	132373	1750.1	16QAM	100/ 0	10	132517	1764.5	16QAM	50/ 0	27.793
15	132347	1747.5	16QAM	75/ 0	15	132497	1762.5	16QAM	75/ 0	28.358
15	132325	1745.3	16QAM	75/ 0	20	132496	1762.4	16QAM	100/ 0	32.512
20	132348	1747.6	16QAM	100/ 0	15	132519	1764.7	16QAM	75/ 0	32.661
20	132397	1752.5	16QAM	100/ 0	5	132514	1764.2	16QAM	25/ 0	22.932
5	132330	1745.8	16QAM	25/ 0	20	132447	1757.5	16QAM	100/ 0	22.820
20	132323	1745.1	16QAM	100/ 0	20	132521	1764.9	16QAM	100/ 0	37.625

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	64QAM	50/ 0	15	132471	1759.9	64QAM	75/ 0	23.117
15	132373	1750.1	64QAM	75/ 0	10	132493	1762.1	64QAM	50/ 0	23.127
10	132328	1745.6	64QAM	50/ 0	20	132472	1760.0	64QAM	100/ 0	27.752
20	132373	1750.1	64QAM	100/ 0	10	132517	1764.5	64QAM	50/ 0	27.781
15	132347	1747.5	64QAM	75/ 0	15	132497	1762.5	64QAM	75/ 0	28.329
15	132325	1745.3	64QAM	75/ 0	20	132496	1762.4	64QAM	100/ 0	32.662
20	132348	1747.6	64QAM	100/ 0	15	132519	1764.7	64QAM	75/ 0	32.699
20	132397	1752.5	64QAM	100/ 0	5	132514	1764.2	64QAM	25/ 0	22.916
5	132330	1745.8	64QAM	25/ 0	20	132447	1757.5	64QAM	100/ 0	22.890
20	132323	1745.1	64QAM	100/ 0	20	132521	1764.9	64QAM	100/ 0	37.551

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	256QAM	50/ 0	15	132471	1759.9	256QAM	75/ 0	23.083
15	132373	1750.1	256QAM	75/ 0	10	132493	1762.1	256QAM	50/ 0	23.167
10	132328	1745.6	256QAM	50/ 0	20	132472	1760.0	256QAM	100/ 0	27.727
20	132373	1750.1	256QAM	100/ 0	10	132517	1764.5	256QAM	50/ 0	27.800
15	132347	1747.5	256QAM	75/ 0	15	132497	1762.5	256QAM	75/ 0	28.329
15	132325	1745.3	256QAM	75/ 0	20	132496	1762.4	256QAM	100/ 0	32.602
20	132348	1747.6	256QAM	100/ 0	15	132519	1764.7	256QAM	75/ 0	32.632
20	132397	1752.5	256QAM	100/ 0	5	132514	1764.2	256QAM	25/ 0	22.958
5	132330	1745.8	256QAM	25/ 0	20	132447	1757.5	256QAM	100/ 0	22.843
20	132323	1745.1	256QAM	100/ 0	20	132521	1764.9	256QAM	100/ 0	37.597

Note:

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

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

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

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

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

8.8 Peak- to- Average Ratio

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	QPSK	50/ 0	15	132471	1759.9	QPSK	75/ 0	5.30
15	132373	1750.1	QPSK	75/ 0	10	132493	1762.1	QPSK	50/ 0	5.28
10	132328	1745.6	QPSK	50/ 0	20	132472	1760.0	QPSK	100/ 0	5.29
20	132373	1750.1	QPSK	100/ 0	10	132517	1764.5	QPSK	50/ 0	5.24
15	132347	1747.5	QPSK	75/ 0	15	132497	1762.5	QPSK	75/ 0	5.21
15	132325	1745.3	QPSK	75/ 0	20	132496	1762.4	QPSK	100/ 0	5.26
20	132348	1747.6	QPSK	100/ 0	15	132519	1764.7	QPSK	75/ 0	5.28
20	132397	1752.5	QPSK	100/ 0	5	132514	1764.2	QPSK	25/ 0	5.33
5	132330	1745.8	QPSK	25/ 0	20	132447	1757.5	QPSK	100/ 0	5.28
20	132323	1745.1	QPSK	100/ 0	20	132521	1764.9	QPSK	100/ 0	5.32

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	16QAM	50/ 0	15	132471	1759.9	16QAM	75/ 0	6.24
15	132373	1750.1	16QAM	75/ 0	10	132493	1762.1	16QAM	50/ 0	6.32
10	132328	1745.6	16QAM	50/ 0	20	132472	1760.0	16QAM	100/ 0	6.22
20	132373	1750.1	16QAM	100/ 0	10	132517	1764.5	16QAM	50/ 0	6.23
15	132347	1747.5	16QAM	75/ 0	15	132497	1762.5	16QAM	75/ 0	6.24
15	132325	1745.3	16QAM	75/ 0	20	132496	1762.4	16QAM	100/ 0	5.97
20	132348	1747.6	16QAM	100/ 0	15	132519	1764.7	16QAM	75/ 0	6.22
20	132397	1752.5	16QAM	100/ 0	5	132514	1764.2	16QAM	25/ 0	6.30
5	132330	1745.8	16QAM	25/ 0	20	132447	1757.5	16QAM	100/ 0	6.23
20	132323	1745.1	16QAM	100/ 0	20	132521	1764.9	16QAM	100/ 0	6.27

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	64QAM	50/ 0	15	132471	1759.9	64QAM	75/ 0	6.48
15	132373	1750.1	64QAM	75/ 0	10	132493	1762.1	64QAM	50/ 0	6.72
10	132328	1745.6	64QAM	50/ 0	20	132472	1760.0	64QAM	100/ 0	6.69
20	132373	1750.1	64QAM	100/ 0	10	132517	1764.5	64QAM	50/ 0	6.73
15	132347	1747.5	64QAM	75/ 0	15	132497	1762.5	64QAM	75/ 0	6.76
15	132325	1745.3	64QAM	75/ 0	20	132496	1762.4	64QAM	100/ 0	6.65
20	132348	1747.6	64QAM	100/ 0	15	132519	1764.7	64QAM	75/ 0	6.63
20	132397	1752.5	64QAM	100/ 0	5	132514	1764.2	64QAM	25/ 0	6.65
5	132330	1745.8	64QAM	25/ 0	20	132447	1757.5	64QAM	100/ 0	6.65
20	132323	1745.1	64QAM	100/ 0	20	132521	1764.9	64QAM	100/ 0	6.68

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	256QAM	50/ 0	15	132471	1759.9	256QAM	75/ 0	6.88
15	132373	1750.1	256QAM	75/ 0	10	132493	1762.1	256QAM	50/ 0	6.99
10	132328	1745.6	256QAM	50/ 0	20	132472	1760.0	256QAM	100/ 0	7.00
20	132373	1750.1	256QAM	100/ 0	10	132517	1764.5	256QAM	50/ 0	6.98
15	132347	1747.5	256QAM	75/ 0	15	132497	1762.5	256QAM	75/ 0	7.06
15	132325	1745.3	256QAM	75/ 0	20	132496	1762.4	256QAM	100/ 0	6.92
20	132348	1747.6	256QAM	100/ 0	15	132519	1764.7	256QAM	75/ 0	6.99
20	132397	1752.5	256QAM	100/ 0	5	132514	1764.2	256QAM	25/ 0	6.97
5	132330	1745.8	256QAM	25/ 0	20	132447	1757.5	256QAM	100/ 0	6.94
20	132323	1745.1	256QAM	100/ 0	20	132521	1764.9	256QAM	100/ 0	7.00

Note:

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

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

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

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

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

9. 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)
10	15	25
15	10	25
10	20	30
20	10	30
15	15	30
15	20	35
20	15	35
20	5	25
5	20	25
20	20	40

3. All modes of operation were investigated and the worst case configuration results are reported in this section.
Please refer to the table below.
- Worst case(Conducted Spurious Emissions, 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	15	1717.8	132050	1	74	20	1734.9	132221	1	0
		Mid	20	1747.6	132348	1	99	15	1764.7	132519	1	0
		High	10	1760.5	132477	1	49	15	1772.5	132597	1	0
		Low	15	1717.8	132050	1	0	20	1734.9	132221	1	99
		Mid	20	1747.6	132348	1	0	15	1764.7	132519	1	74
		High	10	1760.5	132477	1	0	15	1772.5	132597	1	74
		Low	10	1715.5	132027	50	0	20	1729.9	132171	100	0
		Mid	20	1750.1	132373	100	0	10	1764.5	132517	50	0
		High	15	1752.9	132401	75	0	20	1770.0	132572	100	0
		Low	20	1720.0	132072	100	0	20	1739.8	132270	100	0
		Mid	20	1745.1	132323	100	0	20	1764.9	132521	100	0
		High	20	1750.2	132374	100	0	20	1770.0	132572	100	0
Radiated Spurious Emissions	QPSK	Low	20	1720.0	132072	1	99	15	1737.1	132243	1	0
		Mid	5	1745.8	132330	1	24	20	1757.5	132447	1	0
		High	20	1750.2	132374	1	99	20	1770.0	132572	1	0

[Worst case]

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

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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	10	1715.3	132025	1	49	15	1727.3	132145	1	0	24.77
	15	1717.5	132047	1	74	10	1729.5	132167	1	0	24.80
	10	1715.5	132027	1	49	20	1729.9	132171	1	0	24.76
	20	1720.0	132072	1	99	10	1734.4	132216	1	0	24.84
	15	1717.5	132047	1	74	15	1732.5	132197	1	0	24.82
	15	***1717.8***	***132050***	***1***	***74***	***20***	***1734.9***	***132221***	***1***	***0***	***25.27***
	20	1720.0	132072	1	99	15	1737.1	132243	1	0	24.76
	20	1720.0	132072	1	99	5	1731.7	132189	1	0	24.77
	5	1713.3	132005	1	24	20	1725.0	132122	1	0	24.77
	20	1720.0	132072	1	99	20	1739.8	132270	1	0	24.74
Mid	10	1747.9	132351	1	49	15	1759.9	132471	1	0	24.71
	15	1750.1	132373	1	74	10	1762.1	132493	1	0	24.83
	10	1745.6	132328	1	49	20	1760.0	132472	1	0	24.79
	20	1750.1	132373	1	99	10	1764.5	132517	1	0	24.76
	15	1747.5	132347	1	74	15	1762.5	132497	1	0	24.79
	15	1745.3	132325	1	74	20	1762.4	132496	1	0	24.71
	20	***1747.6***	***132348***	***1***	***99***	***15***	***1764.7***	***132519***	***1***	***0***	***24.94***
	20	1752.5	132397	1	99	5	1764.2	132514	1	0	24.85
	5	1745.8	132330	1	24	20	1757.5	132447	1	0	24.91
	20	1745.1	132323	1	99	20	1764.9	132521	1	0	24.91
High	***10***	***1760.5***	***132477***	***1***	***49***	***15***	***1772.5***	***132597***	***1***	***0***	***24.85***
	15	1762.7	132499	1	74	10	1774.7	132619	1	0	24.69
	10	1755.6	132428	1	49	20	1770.0	132572	1	0	24.61
	20	1760.1	132473	1	99	10	1774.5	132617	1	0	24.70
	15	1757.5	132447	1	74	15	1772.5	132597	1	0	24.71
	15	1752.9	132401	1	74	20	1770.0	132572	1	0	24.70
	20	1755.1	132423	1	99	15	1772.2	132594	1	0	24.78
	20	1765.0	132522	1	99	5	1776.7	132639	1	0	24.81
	5	1758.3	132455	1	24	20	1770.0	132572	1	0	24.73
	20	1750.2	132374	1	99	20	1770.0	132572	1	0	24.75

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	10	1715.3	132025	50	0	15	1727.3	132145	75	0	22.95
	15	1717.5	132047	75	0	10	1729.5	132167	50	0	22.93
	10	***1715.5***	***132027***	***50***	***0***	***20***	***1729.9***	***132171***	***100***	***0***	***23.00***
	20	1720.0	132072	100	0	10	1734.4	132216	50	0	22.95
	15	1717.5	132047	75	0	15	1732.5	132197	75	0	22.95
	15	1717.8	132050	75	0	20	1734.9	132221	100	0	22.98
	20	1720.0	132072	100	0	15	1737.1	132243	75	0	22.90
	20	1720.0	132072	100	0	5	1731.7	132189	25	0	22.99
	5	1713.3	132005	25	0	20	1725.0	132122	100	0	22.96
	20	1720.0	132072	100	0	20	1739.8	132270	100	0	22.92
Mid	10	1747.9	132351	50	0	15	1759.9	132471	75	0	22.98
	15	1750.1	132373	75	0	10	1762.1	132493	50	0	22.95
	10	1745.6	132328	50	0	20	1760.0	132472	100	0	22.95
	20	***1750.1***	***132373***	***100***	***0***	***10***	***1764.5***	***132517***	***50***	***0***	***23.17***
	15	1747.5	132347	75	0	15	1762.5	132497	75	0	22.87
	15	1745.3	132325	75	0	20	1762.4	132496	100	0	23.04
	20	1747.6	132348	100	0	15	1764.7	132519	75	0	22.99
	20	1752.5	132397	100	0	5	1764.2	132514	25	0	22.98
	5	1745.8	132330	25	0	20	1757.5	132447	100	0	22.99
	20	1745.1	132323	100	0	20	1764.9	132521	100	0	22.94
High	10	1760.5	132477	50	0	15	1772.5	132597	75	0	22.95
	15	1762.7	132499	75	0	10	1774.7	132619	50	0	22.95
	10	1755.6	132428	50	0	20	1770.0	132572	100	0	22.96
	20	1760.1	132473	100	0	10	1774.5	132617	50	0	22.94
	15	1757.5	132447	75	0	15	1772.5	132597	75	0	22.91
	15	***1752.9***	***132401***	***75***	***0***	***20***	***1770.0***	***132572***	***100***	***0***	***22.99***
	20	1755.1	132423	100	0	15	1772.2	132594	75	0	22.95
	20	1765.0	132522	100	0	5	1776.7	132639	25	0	22.95
	5	1758.3	132455	25	0	20	1770.0	132572	100	0	22.93
	20	1750.2	132374	100	0	20	1770.0	132572	100	0	22.91

Note:

Modulation : QPSK(Full RB)

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	15	1717.8	132050	1	74	20	1734.9	132221	1	0	24.48
Mid	20	1747.6	132348	1	99	15	1764.7	132519	1	0	24.25
High	10	1760.5	132477	1	49	15	1772.5	132597	1	0	24.28
Low	10	1715.5	132027	50	0	20	1729.9	132171	100	0	22.13
Mid	20	1750.1	132373	100	0	10	1764.5	132517	50	0	22.13
High	15	1752.9	132401	75	0	20	1770.0	132572	100	0	22.06

Note:

Modulation : 16QAM

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	15	1717.8	132050	1	74	20	1734.9	132221	1	0	23.31
Mid	20	1747.6	132348	1	99	15	1764.7	132519	1	0	23.55
High	10	1760.5	132477	1	49	15	1772.5	132597	1	0	23.22
Low	10	1715.5	132027	50	0	20	1729.9	132171	100	0	22.08
Mid	20	1750.1	132373	100	0	10	1764.5	132517	50	0	22.07
High	15	1752.9	132401	75	0	20	1770.0	132572	100	0	22.03

Note:

Modulation : 64QAM

Operating frequency	PCC					SCC					Conducted. Power [dBm]
	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	Bandwidth [MHz]	Freq. (MHz)	Channel	RB	RB Offset	
Low	15	1717.8	132050	1	74	20	1734.9	132221	1	0	20.26
Mid	20	1747.6	132348	1	99	15	1764.7	132519	1	0	20.36
High	10	1760.5	132477	1	49	15	1772.5	132597	1	0	20.41
Low	10	1715.5	132027	50	0	20	1729.9	132171	100	0	20.22
Mid	20	1750.1	132373	100	0	10	1764.5	132517	50	0	20.14
High	15	1752.9	132401	75	0	20	1770.0	132572	100	0	20.16

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	10	132025	1/49	15	132145	1/0	-19.24	14.27	10.01	2.22	H	0.161	22.06
	15	132047	1/74	10	132167	1/0	-19.37	14.23	10.04	2.20	H	0.161	22.07
	10	132027	1/49	20	132171	1/0	-19.28	14.23	10.01	2.22	H	0.159	22.02
	20	132072	1/99	10	132216	1/0	-19.39	14.27	10.07	2.17	H	0.165	22.17
	15	132047	1/74	15	132197	1/0	-19.35	14.25	10.04	2.20	H	0.162	22.09
	15	132050	1/74	20	132221	1/0	-19.32	14.28	10.04	2.20	H	0.163	22.12
	20	***132072***	***1/99***	***15***	***132243***	***1/0***	***-19.35***	***14.31***	***10.07***	***2.17***	***H***	***0.166***	***22.21***
	20	132072	1/99	5	132189	1/0	-19.34	14.26	10.04	2.20	H	0.162	22.10
	5	132005	1/24	20	132122	1/0	-19.33	14.18	10.01	2.22	H	0.157	21.97
	20	132072	1/99	20	132270	1/0	-19.37	14.29	10.07	2.17	H	0.166	22.19
Mid	10	132025	1/49	15	132471	1/0	-20.29	13.39	10.18	2.17	H	0.138	21.40
	15	132047	1/74	10	132493	1/0	-20.21	13.47	10.18	2.17	H	0.141	21.48
	10	132027	1/49	20	132472	1/0	-20.03	13.68	10.17	2.15	H	0.148	21.70
	20	132072	1/99	10	132517	1/0	-20.23	13.42	10.19	2.18	H	0.139	21.43
	15	132047	1/74	15	132497	1/0	-20.09	13.59	10.18	2.17	H	0.145	21.60
	15	132050	1/74	20	132496	1/0	-19.98	13.70	10.18	2.17	H	0.148	21.71
	20	132072	1/99	15	132519	1/0	-20.06	13.62	10.18	2.17	H	0.146	21.63
	20	132072	1/99	5	132514	1/0	-20.15	13.50	10.19	2.18	H	0.141	21.51
	5	***132005***	***1/24***	***20***	***132447***	***1/0***	***-19.98***	***13.73***	***10.17***	***2.15***	***H***	***0.150***	***21.75***
	20	132072	1/99	20	132521	1/0	-20.16	13.52	10.18	2.17	H	0.142	21.53
High	10	132025	1/49	15	132597	1/0	-20.23	13.40	10.19	2.21	H	0.138	21.39
	15	132047	1/74	10	132619	1/0	-20.31	13.30	10.20	2.23	H	0.134	21.27
	10	132027	1/49	20	132572	1/0	-20.21	13.44	10.19	2.18	H	0.140	21.45
	20	132072	1/99	10	132617	1/0	-20.29	13.32	10.20	2.23	H	0.134	21.29
	15	132047	1/74	15	132597	1/0	-20.20	13.43	10.19	2.21	H	0.139	21.42
	15	132050	1/74	20	132572	1/0	-20.17	13.48	10.19	2.18	H	0.141	21.49
	20	132072	1/99	15	132594	1/0	-20.21	13.42	10.19	2.21	H	0.138	21.41
	20	132072	1/99	5	132639	1/0	-20.21	13.40	10.20	2.23	H	0.137	21.37
	5	132005	1/24	20	132572	1/0	-20.16	13.47	10.19	2.21	H	0.140	21.46
	20	***132072***	***1/99***	***20***	***132572***	***1/0***	***-20.13***	***13.52***	***10.19***	***2.18***	***H***	***0.142***	***21.53***

Note:

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

PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
10	132025	1/49	15	132145	1/0	-19.73	13.78	10.01	2.22	H	0.144	21.57
15	132047	1/74	10	132167	1/0	-19.74	13.86	10.04	2.20	H	0.148	21.70
10	132027	1/49	20	132171	1/0	-19.73	13.78	10.01	2.22	H	0.144	21.57
20	132072	1/99	10	132216	1/0	-19.81	13.85	10.07	2.17	H	0.150	21.75
15	132047	1/74	15	132197	1/0	-19.81	13.79	10.04	2.20	H	0.146	21.63
15	132050	1/74	20	132221	1/0	-19.76	13.84	10.04	2.20	H	0.147	21.68
20	132072	1/99	15	132243	1/0	-19.89	13.77	10.07	2.17	H	0.147	21.67
20	132072	1/99	5	132189	1/0	-19.81	13.79	10.04	2.20	H	0.146	21.63
5	132005	1/24	20	132122	1/0	-19.79	13.72	10.01	2.22	H	0.142	21.51
20	132072	1/99	20	132270	1/0	-19.85	13.81	10.07	2.17	H	0.148	21.71
5	132005	1/24	20	132447	1/0	-20.41	13.30	10.17	2.15	H	0.135	21.32
20	132072	1/99	20	132572	1/0	-20.61	13.04	10.19	2.18	H	0.127	21.05

Note:

1. Modulation : 16QAM

2. Limit : < 1 Watts

PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
10	132025	1/49	15	132145	1/0	-20.77	12.74	10.01	2.22	H	0.113	20.53
15	132047	1/74	10	132167	1/0	-20.78	12.82	10.04	2.20	H	0.116	20.66
10	132027	1/49	20	132171	1/0	-20.71	12.80	10.01	2.22	H	0.115	20.59
20	132072	1/99	10	132216	1/0	-20.89	12.77	10.07	2.17	H	0.117	20.67
15	132047	1/74	15	132197	1/0	-20.76	12.84	10.04	2.20	H	0.117	20.68
15	132050	1/74	20	132221	1/0	-20.78	12.82	10.04	2.20	H	0.116	20.66
20	132072	1/99	15	132243	1/0	-20.81	12.85	10.07	2.17	H	0.119	20.75
20	132072	1/99	5	132189	1/0	-20.91	12.69	10.04	2.20	H	0.113	20.53
5	132005	1/24	20	132122	1/0	-20.78	12.73	10.01	2.22	H	0.113	20.52
20	132072	1/99	20	132270	1/0	-20.82	12.84	10.07	2.17	H	0.119	20.74
5	132005	1/24	20	132447	1/0	-21.53	12.18	10.17	2.15	H	0.105	20.20
20	132072	1/99	20	132572	1/0	-21.57	12.08	10.19	2.18	H	0.102	20.09

Note:

1. Modulation : 64QAM

2. Limit : < 1 Watts

PCC			SCC			Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	E.I.R.P	
BW [MHz]	Channel	RB/ Offset	BW [MHz]	Channel	RB/ Offset						W	dBm
10	132025	1/49	15	132145	1/0	-23.80	9.71	10.01	2.22	H	0.056	17.50
15	132047	1/74	10	132167	1/0	-23.75	9.85	10.04	2.20	H	0.059	17.69
10	132027	1/49	20	132171	1/0	-23.78	9.73	10.01	2.22	H	0.056	17.52
20	132072	1/99	10	132216	1/0	-23.84	9.82	10.07	2.17	H	0.059	17.72
15	132047	1/74	15	132197	1/0	-23.85	9.75	10.04	2.20	H	0.057	17.59
15	132050	1/74	20	132221	1/0	-23.83	9.77	10.04	2.20	H	0.058	17.61
20	132072	1/99	15	132243	1/0	-23.84	9.82	10.07	2.17	H	0.059	17.72
20	132072	1/99	5	132189	1/0	-23.88	9.72	10.04	2.20	H	0.057	17.56
5	132005	1/24	20	132122	1/0	-23.87	9.64	10.01	2.22	H	0.055	17.43
20	132072	1/99	20	132270	1/0	-23.88	9.78	10.07	2.17	H	0.059	17.68
5	132005	1/24	20	132447	1/0	-24.46	9.25	10.17	2.15	H	0.053	17.27
20	132072	1/99	20	132572	1/0	-24.62	9.03	10.19	2.18	H	0.051	17.04

Note:

1. Modulation : 256QAM

2. Limit : < 1 Watts

9.3 Conducted Spurious Emissions

Operating frequency	PCC				SCC				Measurement Maximum Frequency (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)
	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset	BW [MHz]	Ch.	Freq. (MHz)	RB/ Offset				
Low	15	132050	1717.8	1/74	20	132221	1734.9	1/0	8.2174	28.591	-75.97	-47.38
Mid	20	132348	1747.6	1/99	15	132519	1764.7	1/0	8.2882	28.591	-76.22	-47.63
High	10	132477	1760.5	1/49	15	132597	1772.5	1/0	4.9437	27.976	-76.43	-48.46
Low	15	132050	1717.8	1/0	20	132221	1734.9	1/99	6.0524	28.591	-76.24	-47.65
Mid	20	132348	1747.6	1/0	15	132519	1764.7	1/74	8.2652	28.591	-76.15	-47.56
High	10	132477	1760.5	1/0	15	132597	1772.5	1/74	8.0494	28.591	-75.19	-46.60
Low	10	132027	1715.5	50/0	20	132171	1729.9	100/0	4.0634	27.976	-75.52	-47.54
Mid	20	132373	1750.1	100/0	10	132517	1764.5	50/0	8.2886	28.591	-76.41	-47.82
High	15	132401	1752.9	75/0	20	132572	1770.0	100/0	4.0669	27.976	-76.17	-48.20
Low	20	132072	1720.0	100/0	20	132270	1739.8	100/0	3.8171	27.976	-76.33	-48.36
Mid	20	132323	1745.1	100/0	20	132521	1764.9	100/0	8.0145	28.591	-76.14	-47.55
High	20	132374	1750.2	100/0	20	132572	1770.0	100/0	8.2747	28.591	-75.55	-46.96

Note:

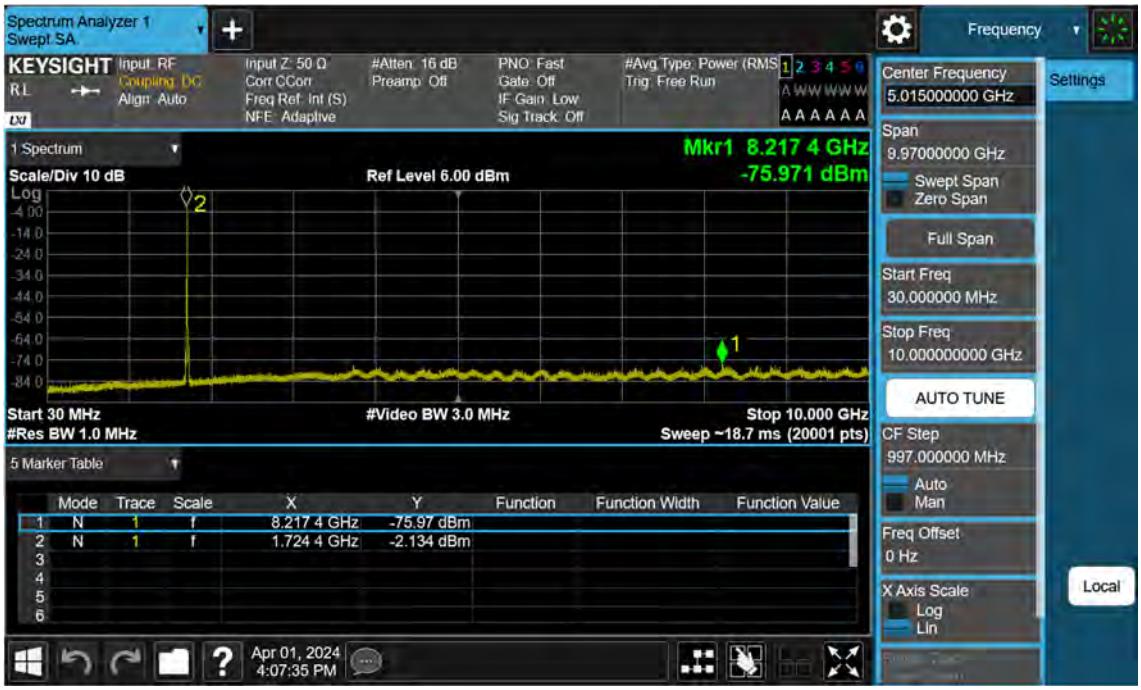
1. Modulation : QPSK
2. Factor(dB) = Cable Loss + Ext. Attenuator + Power Splitter
3. Factors for frequency :

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

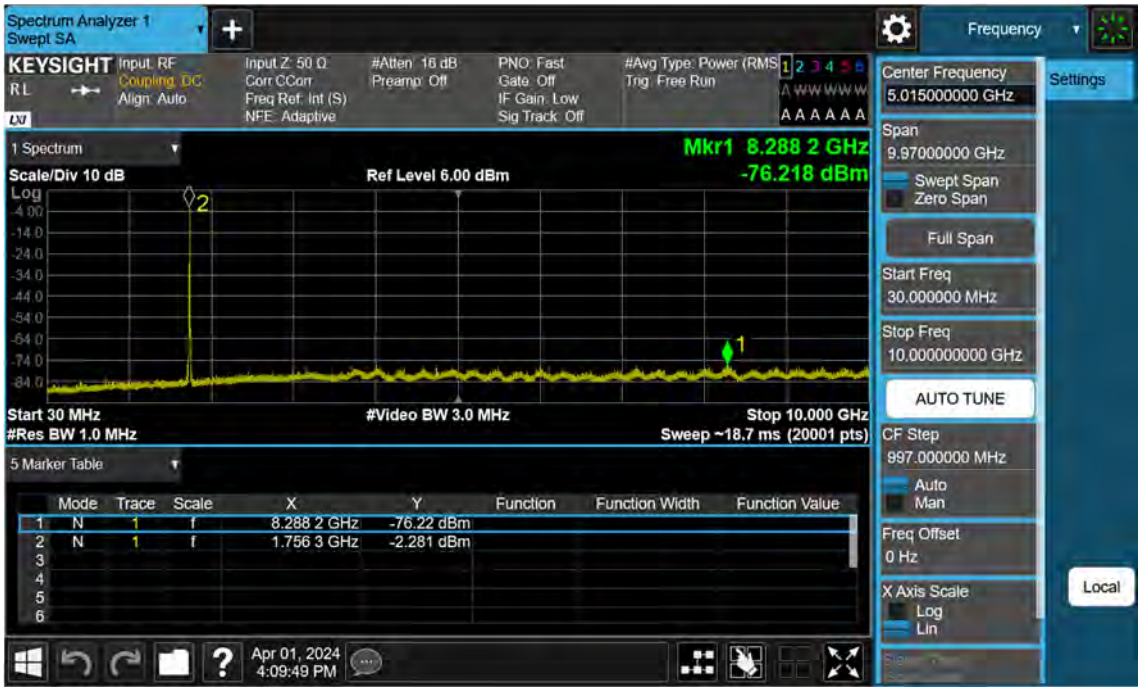
4. Limit : -13.0 dBm

Frequency Range : 30 MHz ~ 10 GHz

PCC 15 MHz Ch132050 RB1 Offset74 SCC 20 MHz Ch132221 RB1 Offset0



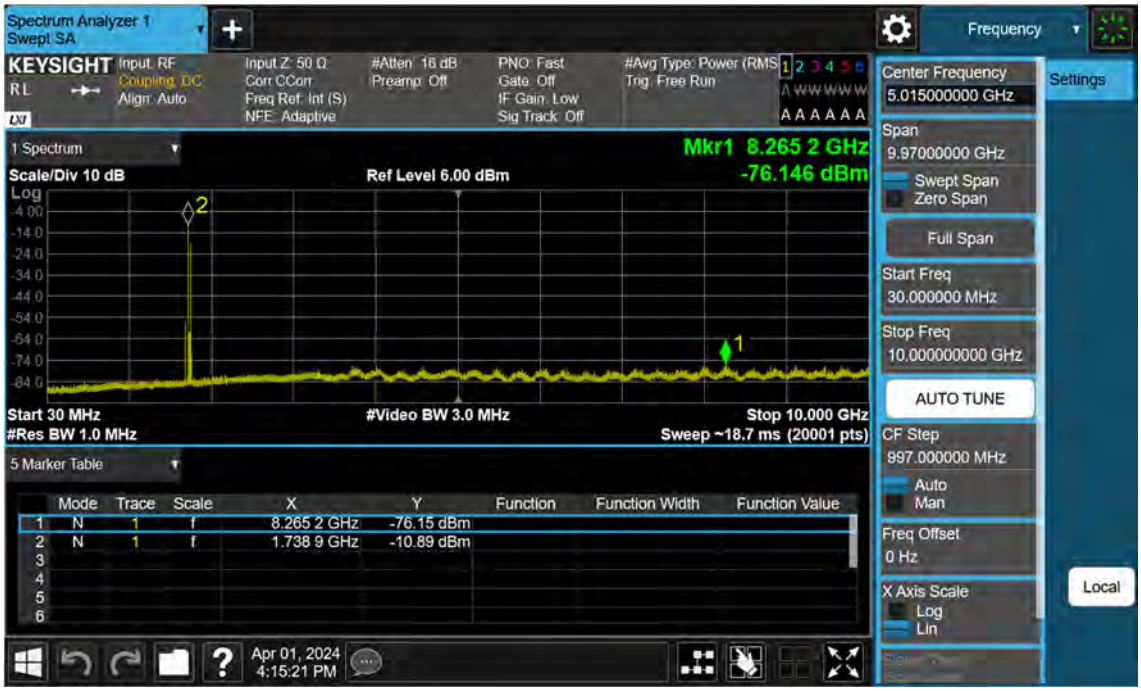
PCC 20 MHz Ch132348 RB1 Offset99 SCC 15 MHz Ch132519 RB1 Offset0



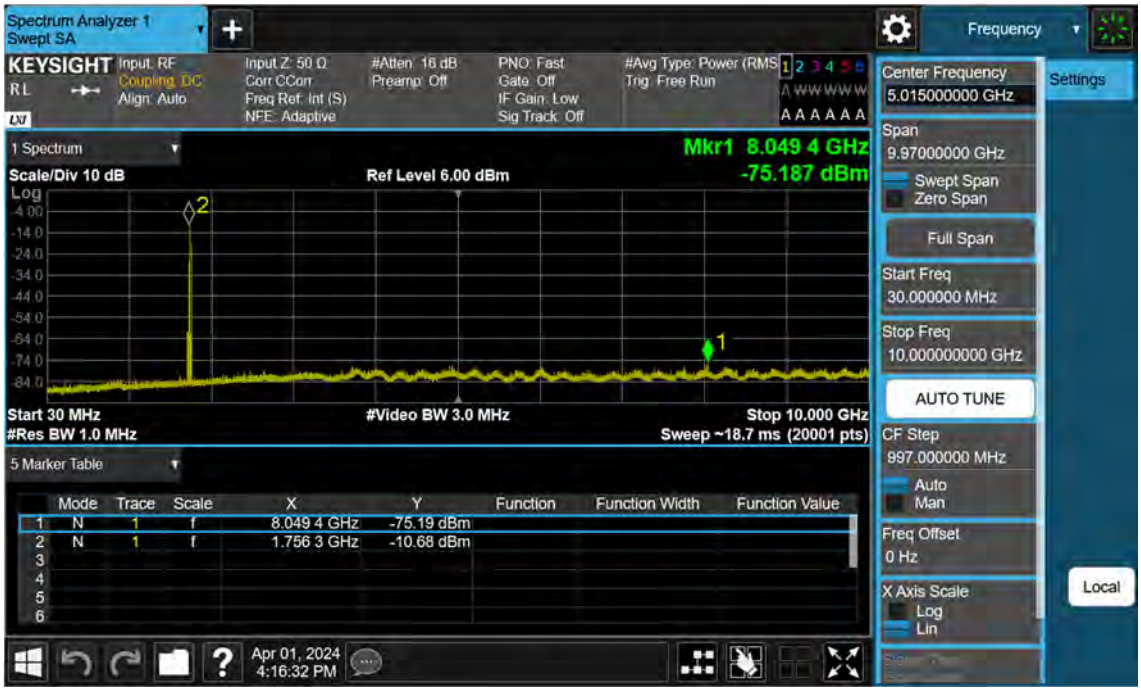
PCC 10 MHz Ch132477 RB1 Offset49 SCC 15 MHz Ch132597 RB1 Offset0

PCC 15 MHz Ch132050 RB1 Offset0 SCC 20 MHz Ch132221 RB1 Offset99

PCC 20 MHz Ch132348 RB1 Offset0 SCC 15 MHz Ch132519 RB1 Offset74

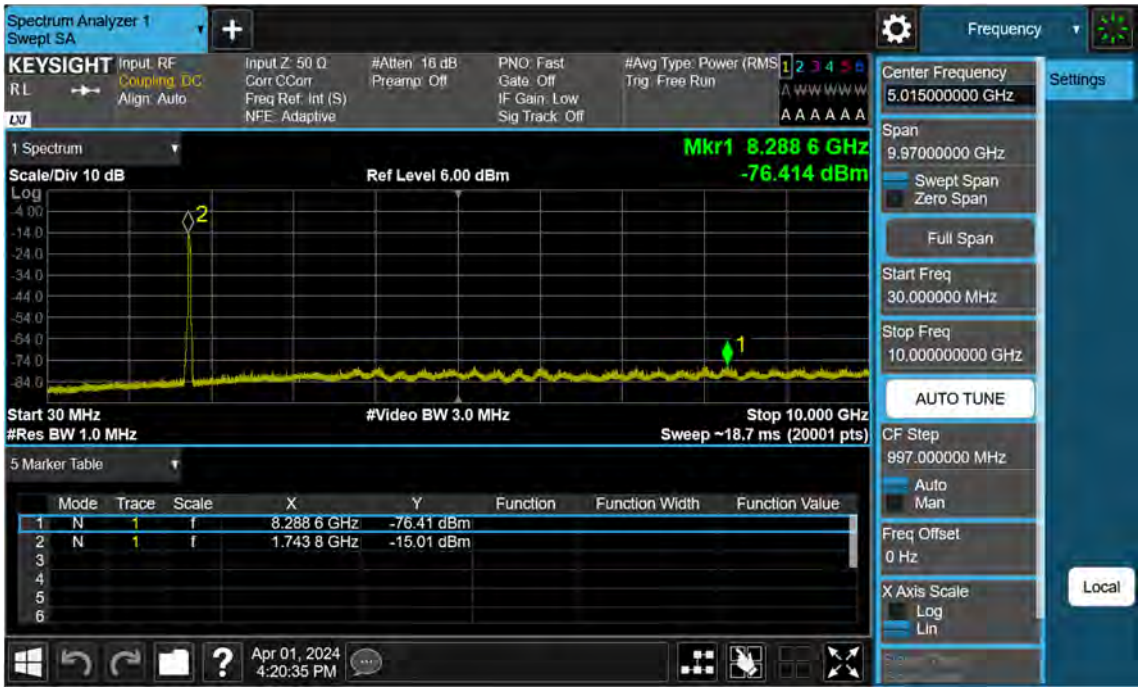


PCC 10 MHz Ch132477 RB1 Offset0 SCC 15 MHz Ch132597 RB1 Offset74



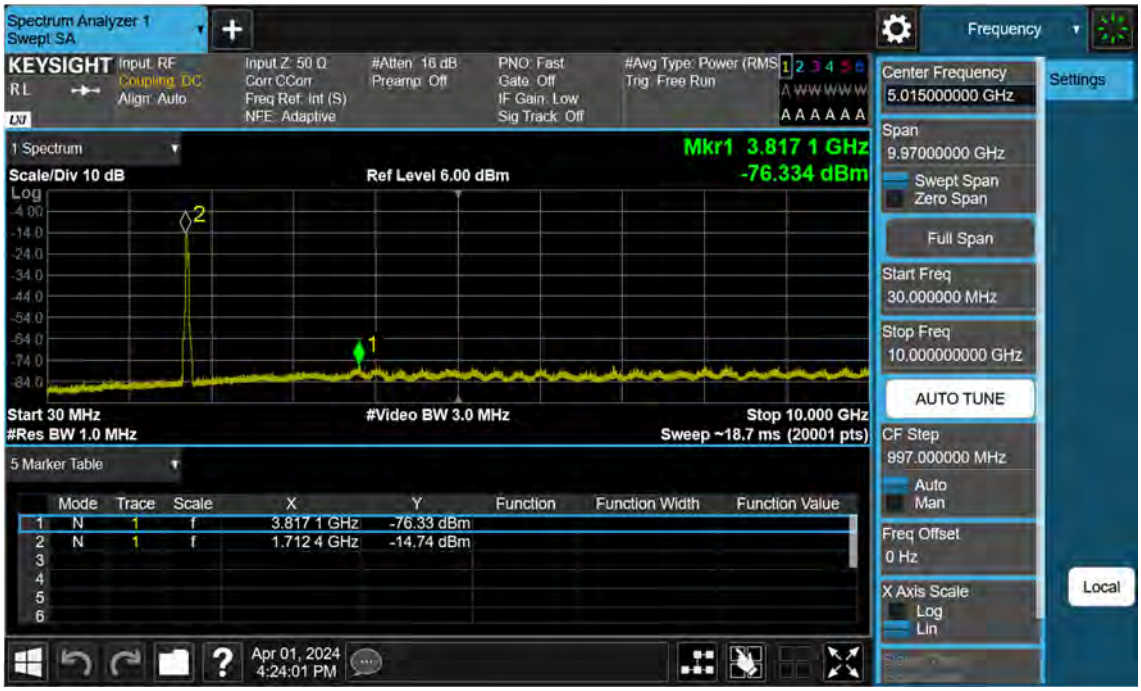
PCC 10 MHz Ch132027 RB50 Offset0 SCC 20 MHz Ch132171 RB100 Offset0

PCC 20 MHz Ch132373 RB100 Offset0 SCC 10 MHz Ch132517 RB50 Offset0

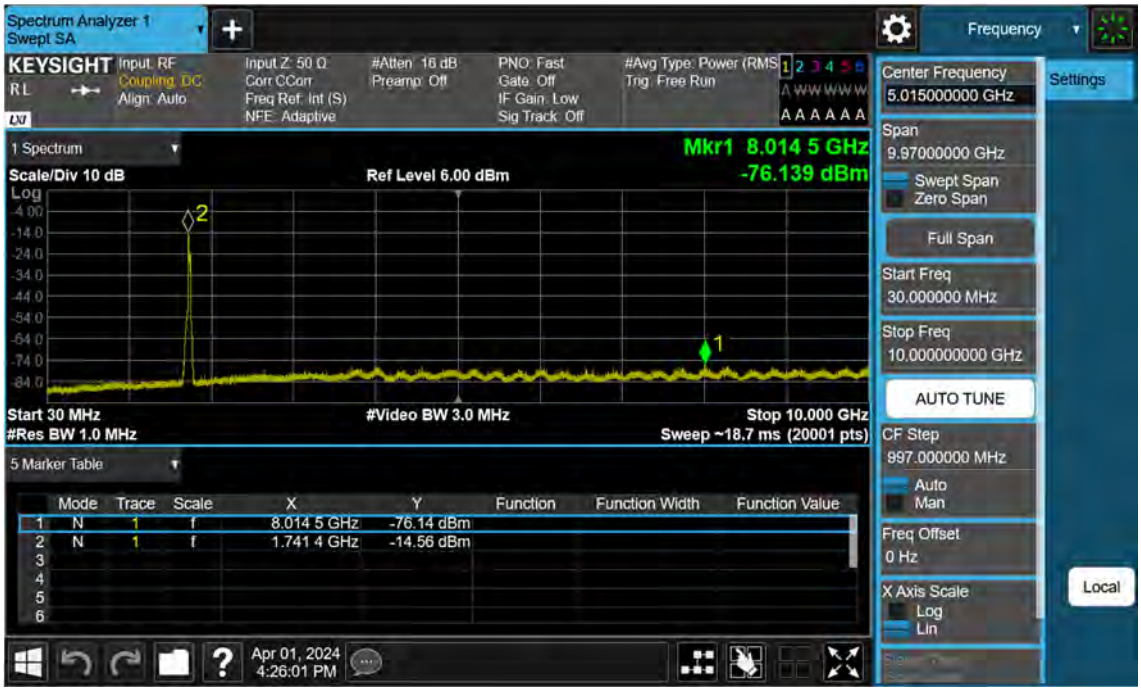


PCC 15 MHz Ch132401 RB75 Offset0 SCC 20 MHz Ch132572 RB100 Offset0

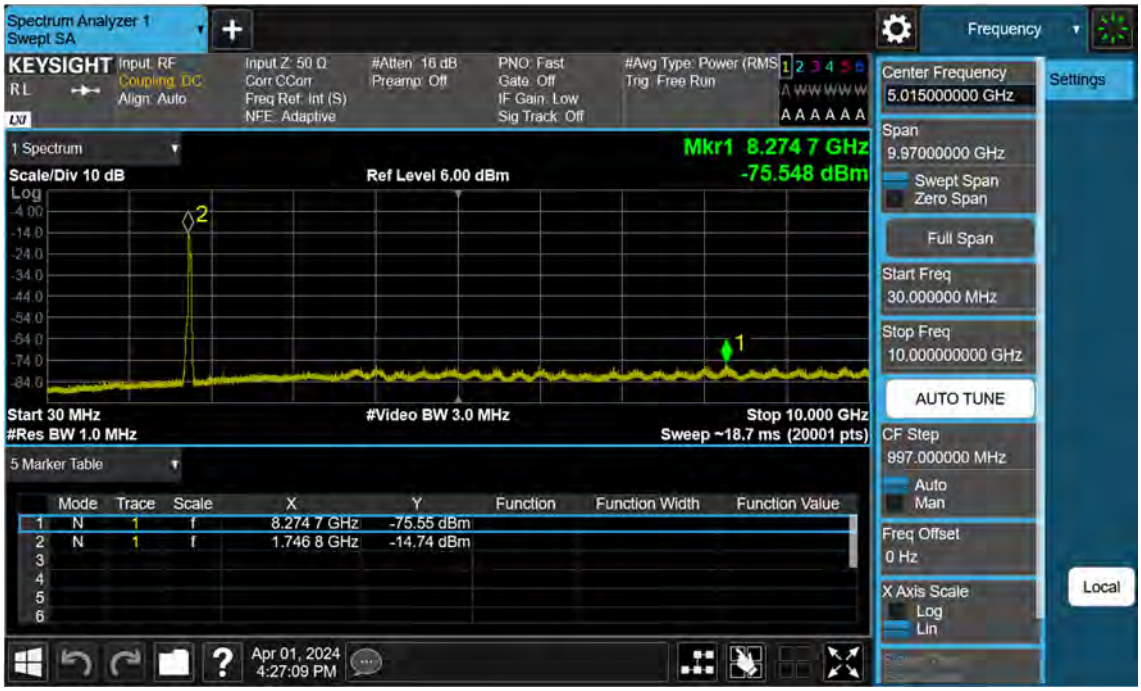
PCC 20 MHz Ch132072 RB100 Offset0 SCC 20 MHz Ch132270 RB100 Offset0



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



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



Frequency Range : 10 GHz ~ 20 GHz

PCC 15 MHz Ch132050 RB1 Offset74, SCC 20 MHz Ch132221 RB1 Offset0

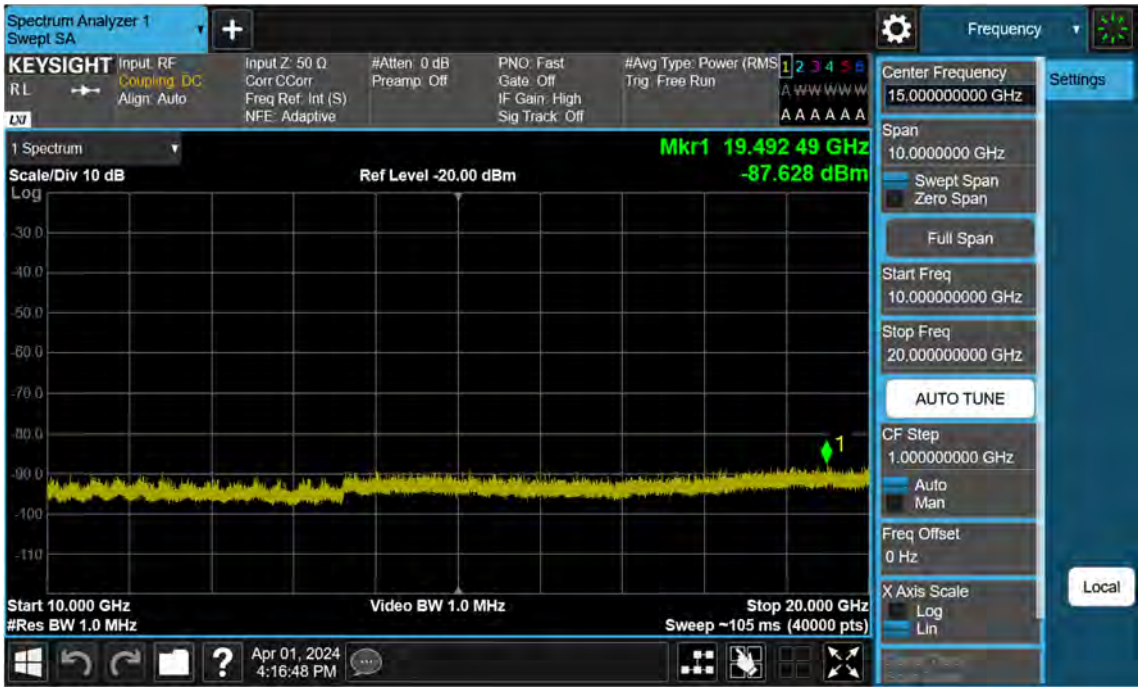
PCC 20 MHz Ch132348 RB1 Offset99, SCC 15 MHz Ch132519 RB1 Offset0

PCC 10 MHz Ch132477 RB1 Offset49, SCC 15 MHz Ch132597 RB1 Offset0

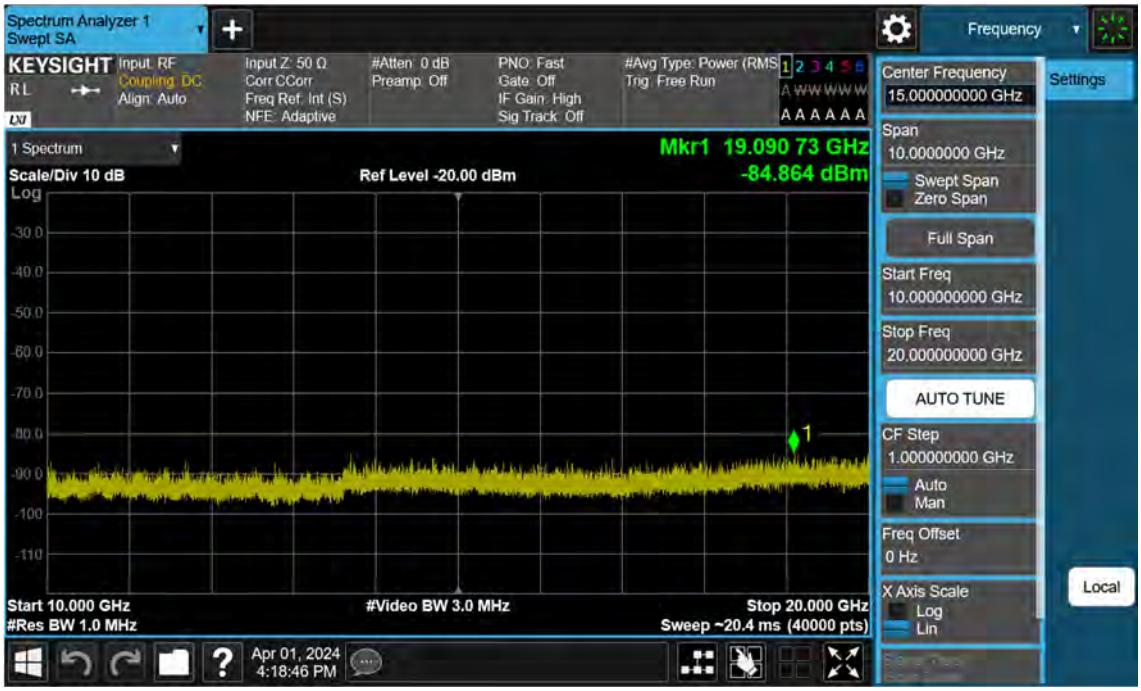
PCC 15 MHz Ch132050 RB1 Offset0, SCC 20 MHz Ch132221 RB1 Offset99

PCC 20 MHz Ch132348 RB1 Offset0, SCC 15 MHz Ch132519 RB1 Offset74

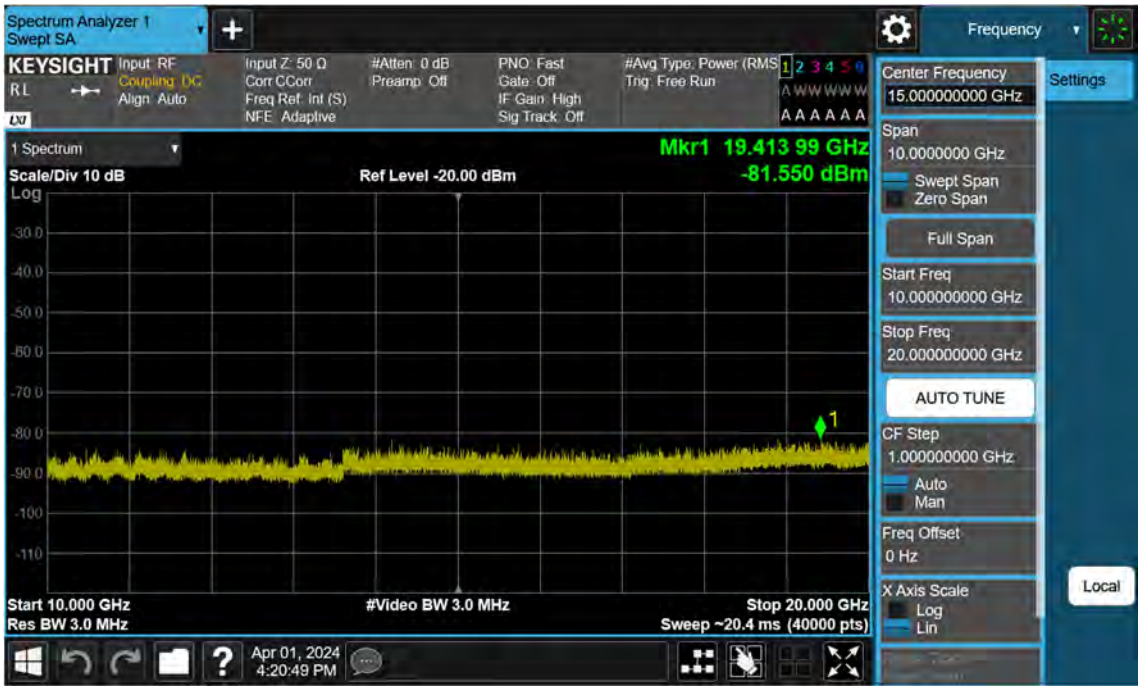
PCC 10 MHz Ch132477 RB1 Offset0, SCC 15 MHz Ch132597 RB1 Offset74



PCC 10 MHz Ch132027 RB50 Offset0, SCC 20 MHz Ch132171 RB100 Offset0



PCC 20 MHz Ch132373 RB100 Offset0, SCC 10 MHz Ch132517 RB50 Offset0

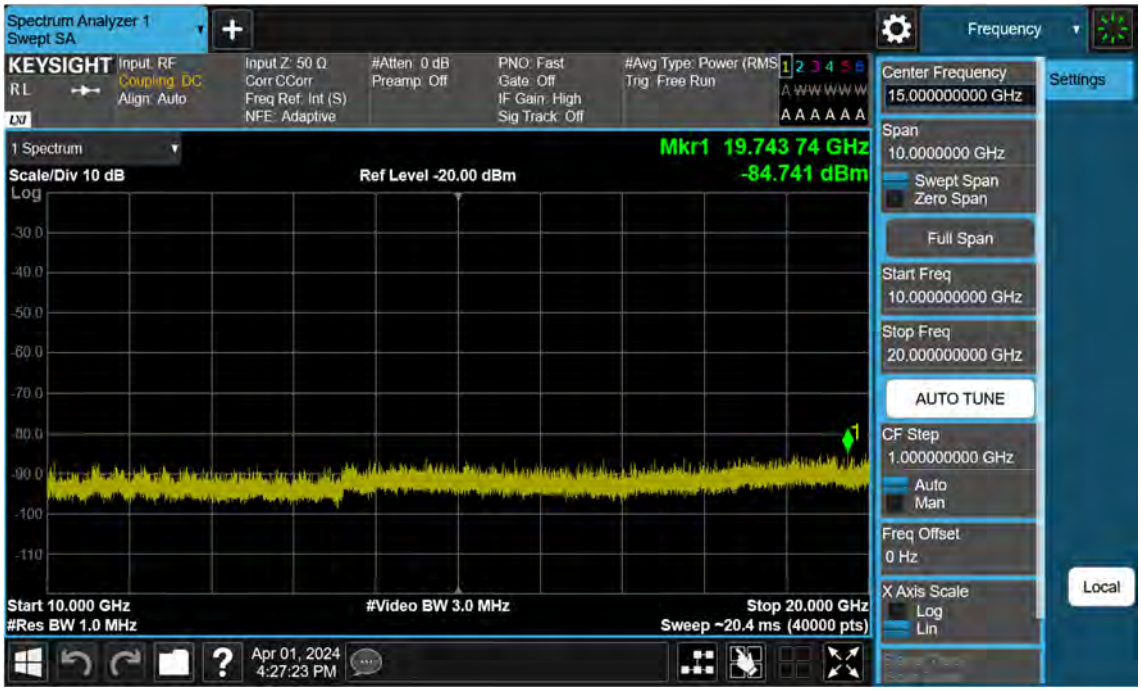


PCC 15 MHz Ch132401 RB75 Offset0, SCC 20 MHz Ch132572 RB100 Offset0

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

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

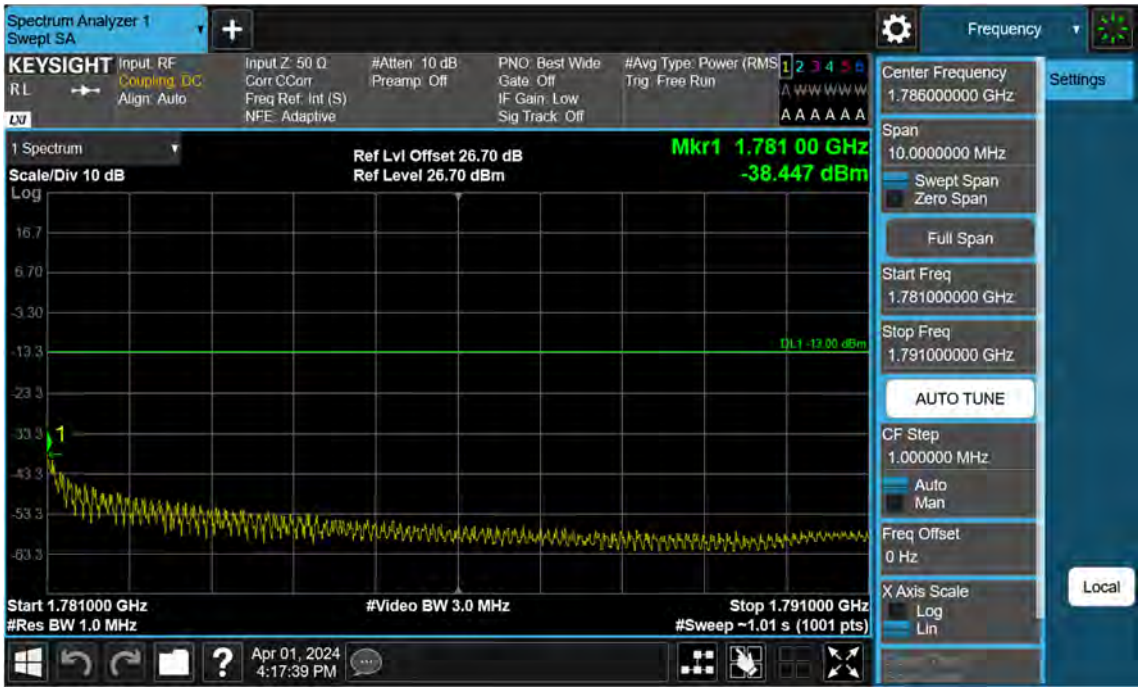
PCC 20 MHz Ch132374 RB100 Offset0, SCC 20 MHz Ch132572 RB100 Offset0



9.4 Channel Edge

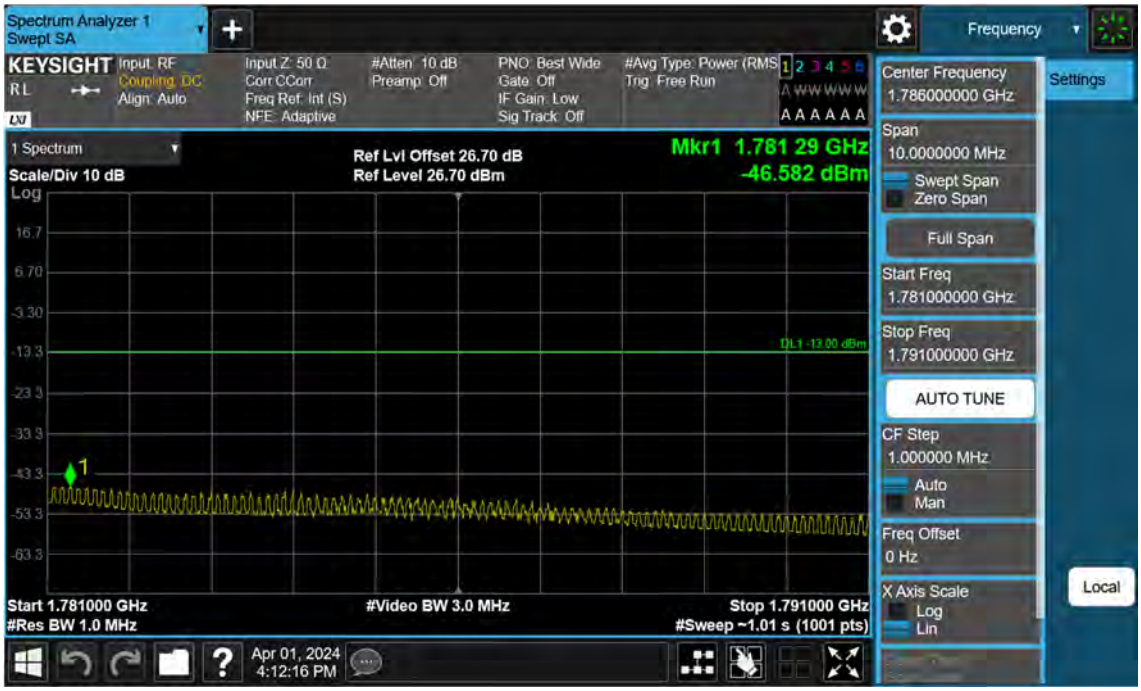
Highest Channel_PCC 10 MHz Ch132477 RB1 Offset0 SCC 15 MHz Ch132597 RB1 Offset74(1)

Highest Channel_PCC 10 MHz Ch132477 RB1 Offset0 SCC 15 MHz Ch132597 RB1 Offset74(2)



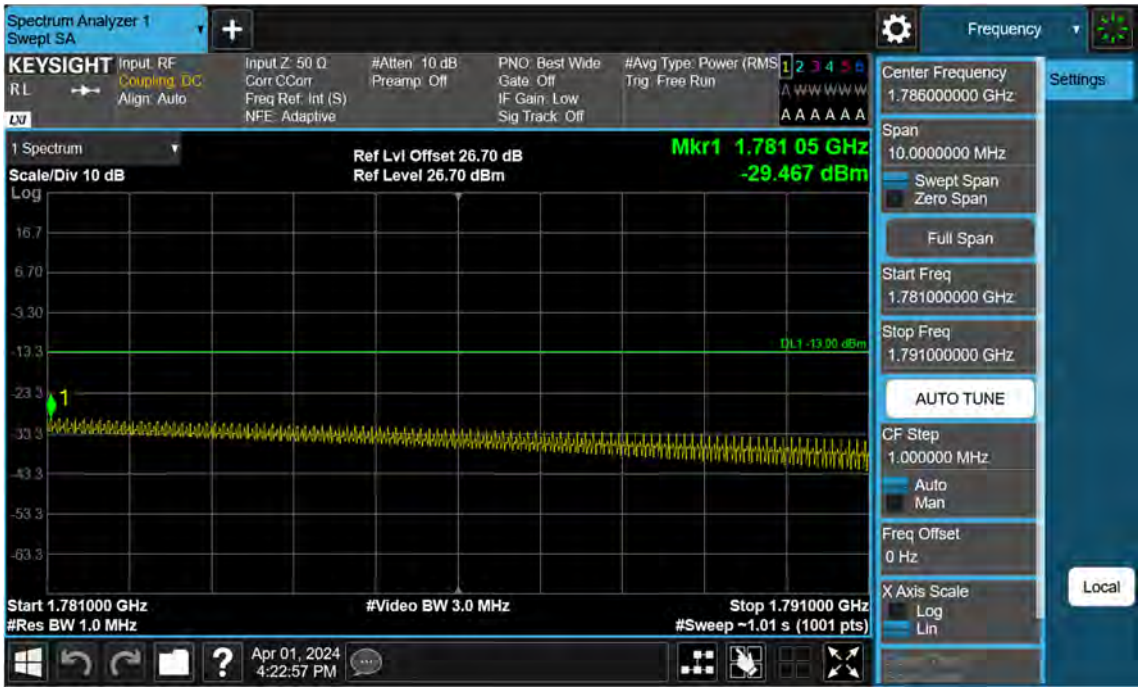
Highest Channel_PCC 10 MHz Ch132477 RB1 Offset49 SCC 15 MHz Ch132597 RB1 Offset0(1)

Highest Channel_PCC 10 MHz Ch132477 RB1 Offset49 SCC 15 MHz Ch132597 RB1 Offset0(2)



Highest Channel_PCC 15 MHz Ch132401 RB75 Offset0 SCC 20 MHz Ch132572 RB100 Offset0(1)

Highest Channel_PCC 15 MHz Ch132401 RB75 Offset0 SCC 20 MHz Ch132572 RB100 Offset0(2)



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

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

Lowest Channel_PCC 10 MHz Ch132027 RB50 Offset0 SCC 20 MHz Ch132171 RB100 Offset0(1)

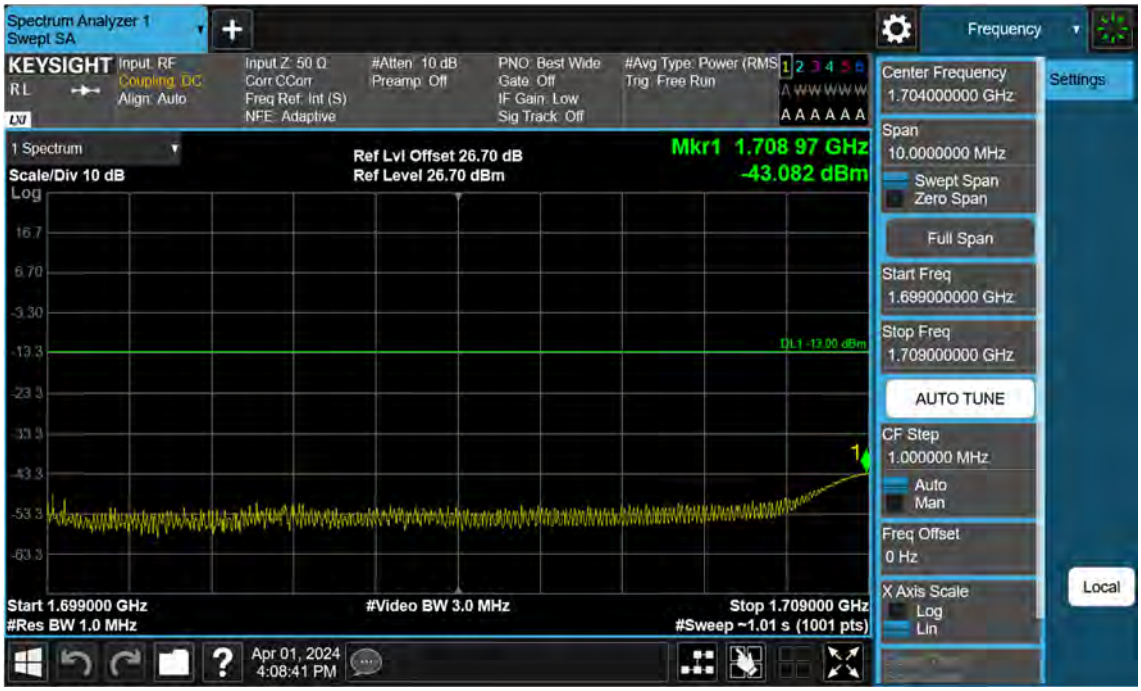
Lowest Channel_PCC 10 MHz Ch132027 RB50 Offset0 SCC 20 MHz Ch132171 RB100 Offset0(2)

Lowest Channel_PCC 15 MHz Ch132050 RB1 Offset0 SCC 20 MHz Ch132221 RB1 Offset99(1)

Lowest Channel_PCC 15 MHz Ch132050 RB1 Offset0 SCC 20 MHz Ch132221 RB1 Offset99(2)

Lowest Channel_PCC 15 MHz Ch132050 RB1 Offset74 SCC 20 MHz Ch132221 RB1 Offset0(1)

Lowest Channel_PCC 15 MHz Ch132050 RB1 Offset74 SCC 20 MHz Ch132221 RB1 Offset0(2)



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

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

9.5 Frequency Stability / Variation of Ambient Temperature

▣ PCC Channel:	132005	
▣ PCC Frequency:	1713.3	MHz
▣ PCC BandWidth:	5	MHz
▣ SCC Channel:	132122	
▣ SCC Frequency:	1725.0	MHz
▣ SCC BandWidth:	20	MHz
▣ Voltage :	3.880	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)	-0.042	0.038	1713.29992	1724.99999
100 %		-30	0.042	-0.043	1713.30003	1724.99990
100 %		-20	0.022	-0.034	1713.29999	1724.99993
100 %		-10	-0.035	0.040	1713.29994	1724.99998
100 %		0	0.027	0.018	1713.29996	1724.99999
100 %		10	0.020	0.030	1713.29999	1725.00003
100 %		30	0.014	0.027	1713.29998	1724.99997
100 %		40	0.028	-0.037	1713.30005	1724.99987
100 %		50	-0.031	-0.048	1713.29990	1724.99985
Batt. Endpoint	3.300	20	0.030	0.021	1713.29998	1725.00004

▣ PCC Channel: 132025
▣ PCC Frequency: 1715.3 MHz
▣ PCC BandWidth: 10 MHz
▣ SCC Channel: 132145
▣ SCC Frequency: 1727.3 MHz
▣ SCC BandWidth: 15 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.022	0.037	1715.30000	1727.29999
100 %		-30	0.026	0.026	1715.29998	1727.30002
100 %		-20	0.023	-0.033	1715.30004	1727.29993
100 %		-10	0.029	-0.031	1715.30000	1727.29988
100 %		0	0.018	0.025	1715.30003	1727.30003
100 %		10	0.035	0.034	1715.30007	1727.29998
100 %		30	-0.037	-0.030	1715.29994	1727.29986
100 %		40	-0.037	0.029	1715.29987	1727.29999
100 %		50	0.034	0.026	1715.29998	1727.30003
Batt. Endpoint	3.300	20	0.018	0.023	1715.30000	1727.29999

▣ PCC Channel:	132047	
▣ PCC Frequency:	1717.5	MHz
▣ PCC BandWidth:	15	MHz
▣ SCC Channel:	132167	
▣ SCC Frequency:	1729.5	MHz
▣ SCC BandWidth:	10	MHz
▣ Voltage :	3.880	VDC
▣ LIMIT:	Emission must remain in band	

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.035	-0.040	1717.50005	1729.49991
100 %		-30	0.022	0.028	1717.50000	1729.50000
100 %		-20	-0.037	-0.036	1717.49991	1729.49992
100 %		-10	-0.032	0.029	1717.49988	1729.49997
100 %		0	0.019	-0.034	1717.50001	1729.49986
100 %		10	-0.035	-0.038	1717.49989	1729.49985
100 %		30	0.029	0.031	1717.49999	1729.50003
100 %		40	-0.038	0.032	1717.49986	1729.49997
100 %		50	-0.041	0.028	1717.49993	1729.49999
Batt. Endpoint	3.300	20	0.031	0.027	1717.50003	1729.49998

▣ PCC Channel: 132072
▣ PCC Frequency: 1720.0 MHz
▣ PCC BandWidth: 20 MHz
▣ SCC Channel: 132270
▣ SCC Frequency: 1739.8 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.037	-0.031	1720.00001	1739.79993
100 %		-30	0.025	-0.035	1720.00002	1739.79987
100 %		-20	0.024	-0.032	1720.00004	1739.79986
100 %		-10	0.035	0.016	1719.99996	1739.80004
100 %		0	0.027	0.017	1719.99999	1739.79995
100 %		10	0.037	0.018	1719.99999	1739.80003
100 %		30	0.035	0.019	1720.00000	1739.80002
100 %		40	0.015	-0.032	1719.99998	1739.79985
100 %		50	0.033	0.027	1720.00006	1739.80000
Batt. Endpoint	3.300	20	-0.047	0.023	1719.99985	1739.80003

▣ PCC Channel: 132455
▣ PCC Frequency: 1758.3 MHz
▣ PCC BandWidth: 5 MHz
▣ SCC Channel: 132572
▣ SCC Frequency: 1770.0 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.026	0.036	1758.30004	1770.00005
100 %		-30	0.028	0.034	1758.29999	1770.00000
100 %		-20	0.032	0.027	1758.30004	1770.00001
100 %		-10	0.023	0.021	1758.29998	1770.00000
100 %		0	0.027	-0.041	1758.29996	1769.99986
100 %		10	0.033	-0.033	1758.30001	1769.99987
100 %		30	0.032	0.033	1758.29997	1770.00006
100 %		40	0.035	-0.035	1758.30001	1769.99995
100 %		50	0.022	0.035	1758.30002	1769.99998
Batt. Endpoint	3.300	20	0.017	-0.031	1758.29999	1769.99991

▣ PCC Channel: 132597
▣ PCC Frequency: 1772.5 MHz
▣ PCC BandWidth: 10 MHz
▣ SCC Channel: 132717
▣ SCC Frequency: 1784.5 MHz
▣ SCC BandWidth: 15 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.041	0.021	1772.49988	1784.50000
100 %		-30	0.033	0.027	1772.49997	1784.49997
100 %		-20	0.030	-0.040	1772.50000	1784.49984
100 %		-10	0.030	0.031	1772.49999	1784.50000
100 %		0	0.035	0.026	1772.50002	1784.49998
100 %		10	0.022	0.030	1772.49999	1784.49997
100 %		30	0.024	0.022	1772.49999	1784.50000
100 %		40	0.036	0.038	1772.50004	1784.50000
100 %		50	0.031	0.035	1772.50002	1784.49998
Batt. Endpoint	3.300	20	0.031	-0.045	1772.49999	1784.49992

▣ PCC Channel: 132499
▣ PCC Frequency: 1762.7 MHz
▣ PCC BandWidth: 15 MHz
▣ SCC Channel: 132619
▣ SCC Frequency: 1774.7 MHz
▣ SCC BandWidth: 10 MHz
▣ Voltage : 3.880 VDC
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	-0.046	0.026	1762.69991	1774.70003
100 %		-30	0.021	0.030	1762.69999	1774.70005
100 %		-20	0.036	0.028	1762.70000	1774.70005
100 %		-10	0.016	0.031	1762.70002	1774.70005
100 %		0	-0.040	0.031	1762.69985	1774.69998
100 %		10	0.018	0.034	1762.69995	1774.69999
100 %		30	0.036	0.035	1762.70006	1774.69997
100 %		40	-0.047	0.023	1762.69991	1774.70002
100 %		50	0.037	0.041	1762.69997	1774.70002
Batt. Endpoint	3.300	20	0.028	0.018	1762.69997	1774.69998

▣ PCC Channel: 132374
▣ PCC Frequency: 1750.2 MHz
▣ PCC BandWidth: 20 MHz
▣ SCC Channel: 132572
▣ SCC Frequency: 1770.0 MHz
▣ SCC BandWidth: 20 MHz
▣ Voltage : 3.880 MHz
▣ LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	PPM		Frequency Error (MHz)	
			PCC	SCC	PCC	SCC
100 %	3.880	+20(Ref)	0.032	0.033	1750.20003	1770.00003
100 %		-30	-0.034	0.030	1750.19991	1769.99997
100 %		-20	-0.050	0.022	1750.19990	1769.99997
100 %		-10	-0.028	0.029	1750.19993	1770.00002
100 %		0	0.028	0.017	1750.20004	1770.00000
100 %		10	0.037	0.031	1750.20000	1770.00001
100 %		30	0.032	0.031	1750.19997	1769.99998
100 %		40	-0.052	0.033	1750.19987	1769.99999
100 %		50	-0.045	-0.039	1750.19986	1769.99989
Batt. Endpoint	3.300	20	-0.035	0.023	1750.19989	1770.00001

9.6 Radiated Spurious Emissions

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

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 457.10	-53.18	12.35	-59.72	3.12	H	-50.49
5 185.65	-59.71	12.55	-57.86	3.82	V	-49.14
6 914.20	-59.67	11.72	-52.24	4.54	H	-45.06

▣ PCC Channel : 132330 (1745.8 MHz)

▣ PCC BW(MHz) : 5

▣ PCC RB/ RB Offset : 1/ 24

▣ SCC Channel : 132447 (1757.5 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)
3 503.30	-50.80	12.34	-56.92	3.10	H	-47.68
5 254.95	-56.53	12.96	-56.08	3.86	H	-46.98
7 006.60	-56.99	11.29	-48.87	4.57	V	-42.15

▣ PCC Channel : 132374 (1750.9 MHz)

▣ PCC BW(MHz) : 20

▣ PCC RB/ RB Offset : 1/ 99

▣ SCC Channel : 132572 (1770.0 MHz)

▣ SCC BW(MHz) : 20

▣ SCC RB/ RB Offset : 1/ 0

▣ DISTANCE: 3 meters

▣ LIMIT: -13.0 dBm

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)
3 520.20	-52.87	12.34	-59.23	3.13	V	-50.02
5 280.30	-59.57	13.06	-59.08	3.84	H	-49.86
7 040.40	-59.71	11.12	-50.63	4.54	H	-44.05

9.7 Occupied Bandwidth

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	QPSK	50/ 0	15	132471	1759.9	QPSK	75/ 0	23.187
15	132373	1750.1	QPSK	75/ 0	10	132493	1762.1	QPSK	50/ 0	23.160
10	132328	1745.6	QPSK	50/ 0	20	132472	1760.0	QPSK	100/ 0	27.765
20	132373	1750.1	QPSK	100/ 0	10	132517	1764.5	QPSK	50/ 0	27.869
15	132347	1747.5	QPSK	75/ 0	15	132497	1762.5	QPSK	75/ 0	28.337
15	132325	1745.3	QPSK	75/ 0	20	132496	1762.4	QPSK	100/ 0	32.643
20	132348	1747.6	QPSK	100/ 0	15	132519	1764.7	QPSK	75/ 0	32.657
20	132397	1752.5	QPSK	100/ 0	5	132514	1764.2	QPSK	25/ 0	22.946
5	132330	1745.8	QPSK	25/ 0	20	132447	1757.5	QPSK	100/ 0	22.820
20	132323	1745.1	QPSK	100/ 0	20	132521	1764.9	QPSK	100/ 0	37.691

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	16QAM	50/ 0	15	132471	1759.9	16QAM	75/ 0	23.082
15	132373	1750.1	16QAM	75/ 0	10	132493	1762.1	16QAM	50/ 0	23.186
10	132328	1745.6	16QAM	50/ 0	20	132472	1760.0	16QAM	100/ 0	27.787
20	132373	1750.1	16QAM	100/ 0	10	132517	1764.5	16QAM	50/ 0	27.803
15	132347	1747.5	16QAM	75/ 0	15	132497	1762.5	16QAM	75/ 0	28.375
15	132325	1745.3	16QAM	75/ 0	20	132496	1762.4	16QAM	100/ 0	32.646
20	132348	1747.6	16QAM	100/ 0	15	132519	1764.7	16QAM	75/ 0	32.743
20	132397	1752.5	16QAM	100/ 0	5	132514	1764.2	16QAM	25/ 0	23.004
5	132330	1745.8	16QAM	25/ 0	20	132447	1757.5	16QAM	100/ 0	22.755
20	132323	1745.1	16QAM	100/ 0	20	132521	1764.9	16QAM	100/ 0	37.625

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	64QAM	50/ 0	15	132471	1759.9	64QAM	75/ 0	23.126
15	132373	1750.1	64QAM	75/ 0	10	132493	1762.1	64QAM	50/ 0	23.148
10	132328	1745.6	64QAM	50/ 0	20	132472	1760.0	64QAM	100/ 0	27.649
20	132373	1750.1	64QAM	100/ 0	10	132517	1764.5	64QAM	50/ 0	27.847
15	132347	1747.5	64QAM	75/ 0	15	132497	1762.5	64QAM	75/ 0	28.401
15	132325	1745.3	64QAM	75/ 0	20	132496	1762.4	64QAM	100/ 0	32.632
20	132348	1747.6	64QAM	100/ 0	15	132519	1764.7	64QAM	75/ 0	32.687
20	132397	1752.5	64QAM	100/ 0	5	132514	1764.2	64QAM	25/ 0	23.028
5	132330	1745.8	64QAM	25/ 0	20	132447	1757.5	64QAM	100/ 0	22.797
20	132323	1745.1	64QAM	100/ 0	20	132521	1764.9	64QAM	100/ 0	37.518

PCC					SCC					Data (MHz)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	256QAM	50/ 0	15	132471	1759.9	256QAM	75/ 0	23.129
15	132373	1750.1	256QAM	75/ 0	10	132493	1762.1	256QAM	50/ 0	23.148
10	132328	1745.6	256QAM	50/ 0	20	132472	1760.0	256QAM	100/ 0	27.778
20	132373	1750.1	256QAM	100/ 0	10	132517	1764.5	256QAM	50/ 0	27.875
15	132347	1747.5	256QAM	75/ 0	15	132497	1762.5	256QAM	75/ 0	28.408
15	132325	1745.3	256QAM	75/ 0	20	132496	1762.4	256QAM	100/ 0	32.607
20	132348	1747.6	256QAM	100/ 0	15	132519	1764.7	256QAM	75/ 0	32.813
20	132397	1752.5	256QAM	100/ 0	5	132514	1764.2	256QAM	25/ 0	23.007
5	132330	1745.8	256QAM	25/ 0	20	132447	1757.5	256QAM	100/ 0	22.787
20	132323	1745.1	256QAM	100/ 0	20	132521	1764.9	256QAM	100/ 0	37.623

Note:

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

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

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

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

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

9.8 Peak- to- Average Ratio

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	QPSK	50/ 0	15	132471	1759.9	QPSK	75/ 0	5.37
15	132373	1750.1	QPSK	75/ 0	10	132493	1762.1	QPSK	50/ 0	5.42
10	132328	1745.6	QPSK	50/ 0	20	132472	1760.0	QPSK	100/ 0	5.32
20	132373	1750.1	QPSK	100/ 0	10	132517	1764.5	QPSK	50/ 0	5.38
15	132347	1747.5	QPSK	75/ 0	15	132497	1762.5	QPSK	75/ 0	5.60
15	132325	1745.3	QPSK	75/ 0	20	132496	1762.4	QPSK	100/ 0	5.33
20	132348	1747.6	QPSK	100/ 0	15	132519	1764.7	QPSK	75/ 0	5.25
20	132397	1752.5	QPSK	100/ 0	5	132514	1764.2	QPSK	25/ 0	5.55
5	132330	1745.8	QPSK	25/ 0	20	132447	1757.5	QPSK	100/ 0	5.20
20	132323	1745.1	QPSK	100/ 0	20	132521	1764.9	QPSK	100/ 0	5.20

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	16QAM	50/ 0	15	132471	1759.9	16QAM	75/ 0	6.35
15	132373	1750.1	16QAM	75/ 0	10	132493	1762.1	16QAM	50/ 0	6.26
10	132328	1745.6	16QAM	50/ 0	20	132472	1760.0	16QAM	100/ 0	6.24
20	132373	1750.1	16QAM	100/ 0	10	132517	1764.5	16QAM	50/ 0	6.23
15	132347	1747.5	16QAM	75/ 0	15	132497	1762.5	16QAM	75/ 0	6.20
15	132325	1745.3	16QAM	75/ 0	20	132496	1762.4	16QAM	100/ 0	6.16
20	132348	1747.6	16QAM	100/ 0	15	132519	1764.7	16QAM	75/ 0	6.13
20	132397	1752.5	16QAM	100/ 0	5	132514	1764.2	16QAM	25/ 0	6.24
5	132330	1745.8	16QAM	25/ 0	20	132447	1757.5	16QAM	100/ 0	6.15
20	132323	1745.1	16QAM	100/ 0	20	132521	1764.9	16QAM	100/ 0	6.17

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	64QAM	50/ 0	15	132471	1759.9	64QAM	75/ 0	6.40
15	132373	1750.1	64QAM	75/ 0	10	132493	1762.1	64QAM	50/ 0	6.46
10	132328	1745.6	64QAM	50/ 0	20	132472	1760.0	64QAM	100/ 0	6.34
20	132373	1750.1	64QAM	100/ 0	10	132517	1764.5	64QAM	50/ 0	6.41
15	132347	1747.5	64QAM	75/ 0	15	132497	1762.5	64QAM	75/ 0	6.48
15	132325	1745.3	64QAM	75/ 0	20	132496	1762.4	64QAM	100/ 0	6.33
20	132348	1747.6	64QAM	100/ 0	15	132519	1764.7	64QAM	75/ 0	6.42
20	132397	1752.5	64QAM	100/ 0	5	132514	1764.2	64QAM	25/ 0	6.57
5	132330	1745.8	64QAM	25/ 0	20	132447	1757.5	64QAM	100/ 0	6.29
20	132323	1745.1	64QAM	100/ 0	20	132521	1764.9	64QAM	100/ 0	6.34

PCC					SCC					Data (dBm)
BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	BW [MHz]	Ch	Freq [MHz]	Mod	RB/ Offset	
10	132351	1747.9	256QAM	50/ 0	15	132471	1759.9	256QAM	75/ 0	6.75
15	132373	1750.1	256QAM	75/ 0	10	132493	1762.1	256QAM	50/ 0	6.70
10	132328	1745.6	256QAM	50/ 0	20	132472	1760.0	256QAM	100/ 0	6.63
20	132373	1750.1	256QAM	100/ 0	10	132517	1764.5	256QAM	50/ 0	6.67
15	132347	1747.5	256QAM	75/ 0	15	132497	1762.5	256QAM	75/ 0	6.70
15	132325	1745.3	256QAM	75/ 0	20	132496	1762.4	256QAM	100/ 0	6.64
20	132348	1747.6	256QAM	100/ 0	15	132519	1764.7	256QAM	75/ 0	6.65
20	132397	1752.5	256QAM	100/ 0	5	132514	1764.2	256QAM	25/ 0	6.64
5	132330	1745.8	256QAM	25/ 0	20	132447	1757.5	256QAM	100/ 0	6.68
20	132323	1745.1	256QAM	100/ 0	20	132521	1764.9	256QAM	100/ 0	6.70

Note:

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

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

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

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

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

10. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2404-FC041-P