FCC Sub6 REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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

Date of Issue:
May 19, 2022

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

Report No.: HCT-RF-2205-FC035-R1

FCC ID: **A3LSMG990U2**

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

Model(s):	SM-G990U2
Additional Model(s):	SM-G990U3/DS
EUT Type:	Mobile Phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
Sub6 n30 (5)	2307.5 – 2312.5	4M50G7D	PI/2 BPSK	0.197	22.95
		4M51G7D	QPSK	0.192	22.83
		4M48W7D	16QAM	0.152	21.81
		4M50W7D	64QAM	0.113	20.52
		4M49W7D	256QAM	0.062	17.93
Sub6 n30 (10)	2310.0	8M94G7D	PI/2 BPSK	0.196	22.93
		8M94G7D	QPSK	0.194	22.89
		8M94W7D	16QAM	0.151	21.79
		8M97W7D	64QAM	0.117	20.70
		8M96W7D	256QAM	0.063	17.98

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.
HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

REVIEWED BY

Report prepared by : Jung Ki Lim
Engineer of Telecommunication Testing Center

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

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2205-FC035	May 13, 2022	- First Approval Report
HCT-RF-2205-FC035-R1	May 19, 2022	- Revised the Section 3.9. (Page 17.)

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

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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:	A3LSMG990U2
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2
EUT Type:	Mobile Phone
Model(s):	SM-G990U2
Additional Model(s):	SM-G990U3/DS
SCS(kHz):	15
Waveform:	CP-OFDM, DFT-S-OFDM
Modulation:	DFT-S-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM
Tx Frequency:	2307.5 MHz – 2312.5 MHz (Sub6 n30 (5 MHz)) 2310.0 MHz (Sub6 n30 (10 MHz))
Date(s) of Tests:	April 08, 2022 ~ May 04, 2022
Serial number:	Radiated: R3CT30Q0QVR Conducted: R3CT30Q0RQT

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80), Bluetooth, BT LE, NFC, AIT, WPT, mmWave(n260/261).

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Channel Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 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 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

   The power is calculated by the following formula;

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

   Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.
3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference

   between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

Test Settings

1. RBW = 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;

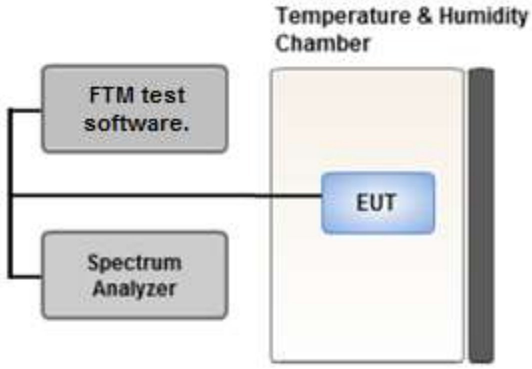
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

2. Set the number of counts to a value that stabilizes the measured CCDF curve;

3. Set the measurement interval as follows:

.- for continuous transmissions, set to 1 ms,

.- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

4. Record the maximum PAPR level associated with a probability of 0.1 %.

② Alternate Procedure for PAPR

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

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

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

Test Settings(Peak Power)

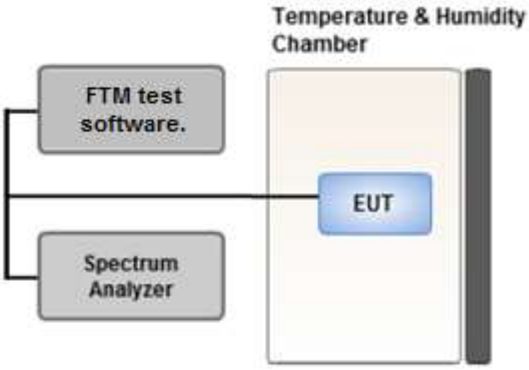
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

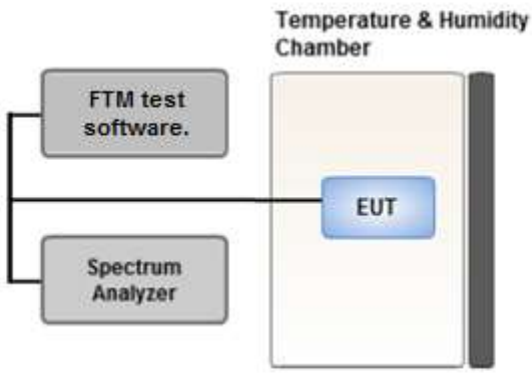
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 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.

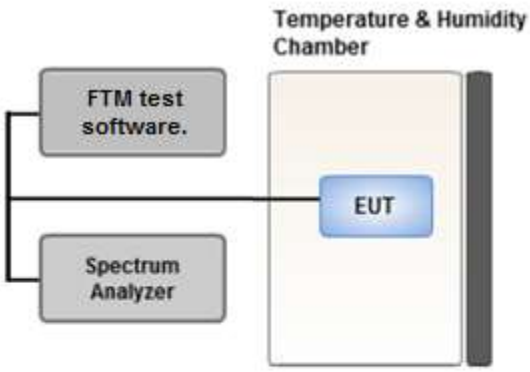
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 Limit

§27.53(a)

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz

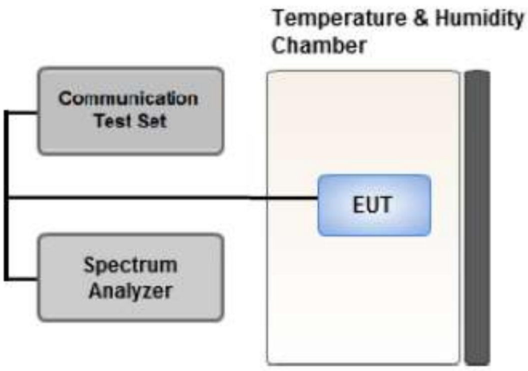
Test Notes

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.

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

   .- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.

   .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

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

3.9 WORST CASE(RADIATED TEST)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
  (Worst case: DFT-S-OFDM)
- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- 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
- We were performed the RSE test in condition of co-location.
  Mode : Stand alone, Simultaneous transmission scenarios
  Worst case : Stand alone
- All test are measured while operating in S.A mode.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-G990U2 & additional models were tested and the worst case results are reported.
  (Worst case : SM-G990U2)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	See Section 8.1		X
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Section 8.2		Y

3.10 WORST CASE(CONDUCTED TEST)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
  (Worst case: DFT-S-OFDM)
- Modulation : All Modulation of operation were investigated and the worst case configuration results are reported.
  (Worst case: PI/2 BPSK)
- All test are measured while operating in S.A mode.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-G990U2 & additional models were tested and the worst case results are reported.
  (Worst case : SM-G990U2)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth, Peak-To-Average Radio	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	5, 10	Mid	Full RB	0
Band Edge	PI/2 BPSK	5	Low, Mid, High	1	0, 24
		10	Mid	1	0, 51
		5	Low, Mid, High	Full RB	0
		10	Mid	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	5	Low, Mid, High	1	1
		10	Mid	1	1

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacture	Serial No.	Due to Calibration	Calibration Interval
Precision Dipole Antenna	UHAP	Schwarzbeck	01273	03/27/2024	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	03/27/2024	Biennial
Horn Antenna(1~18GHz)	BBHA 9120D	Schwarzbeck	02289	03/21/2024	Biennial
Horn Antenna(1~18GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	05/04/2023	Biennial
Horn Antenna(15~40GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15~40GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Loop Antenna(9kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	06/04/2023	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/22/2023	Biennial
High Pass Filter	WHKX10-900-1000-15000-40SS	Wainwright Instruments	15	06/15/2022	Annual
High Pass Filter	WHKX10-2700-3000-18000-40SS	Wainwright Instruments	145	06/15/2022	Annual
High Pass Filter	WHNX6-4740-6000-26500-40CC	Wainwright Instruments	11	06/15/2022	Annual
LOW NOISE AMP (100 MHz ~ 18GHz)	CBLU1183540B-01	CERNEX	26822	06/15/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/02/2022	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/11/2023	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	09/15/2022	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	03/11/2023	Annual
Chamber	SU-642	ESPEC	93008124	03/04/2023	Annual
Signal Analyzer(10Hz~26.5GHz)	N9020A	Agilent	MY51110063	04/19/2023	Annual
ATTENUATOR(20dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10Hz~40GHz)	FSV40	REOHDE & SCHWARZ	101436	02/25/2023	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287700	05/25/2022	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/26/2022	Annual
SIGNAL GENERATOR (100kHz~40GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5Hz~40.0GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/27/2022	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. Espectially, 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)	2.00 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (Above 40 GHz)	5.48 (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(a)	Section 3.7	PASS
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, §27.54	Emission must remain in band	PASS

Note:

1. See SAR Report
2. Conducted tests were tested using 5G Wireless Tester.

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§27.50(a)(3)	< 0.25 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(a)	< 70 + 10log10 (P[Watts])	PASS

Note:

1. Radiateded tests were tested using 5G Wireless Tester

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
462000	2310.0	-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 = 4 M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4 M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4 M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2307.5	Sub6 n30/ 5 MHz [15 kHz]	PI/2 BPSK	-21.25	15.14	10.16	2.35	H	< 2.00	0.197	22.95	1	12
		QPSK	-21.37	15.02	10.16	2.35	H		0.192	22.83		
		16-QAM	-22.39	14.00	10.16	2.35	H		0.152	21.81		
		64-QAM	-23.68	12.71	10.16	2.35	H		0.113	20.52		
		256-QAM	-26.27	10.12	10.16	2.35	H		0.062	17.93		
2310.0		PI/2 BPSK	-21.37	15.02	10.16	2.35	H		0.192	22.83	1	1
		QPSK	-21.40	14.99	10.16	2.35	H		0.190	22.80		
		16-QAM	-22.48	13.91	10.16	2.35	H		0.149	21.72		
		64-QAM	-23.80	12.59	10.16	2.35	H		0.110	20.40		
		256-QAM	-26.39	10.00	10.16	2.35	H		0.060	17.81		
2312.5		PI/2 BPSK	-21.48	14.91	10.16	2.35	H		0.187	22.72	1	12
		QPSK	-21.56	14.83	10.16	2.35	H		0.184	22.64		
		16-QAM	-22.53	13.86	10.16	2.35	H		0.147	21.67		
		64-QAM	-23.86	12.53	10.16	2.35	H		0.108	20.34		
		256-QAM	-26.51	9.88	10.16	2.35	H		0.059	17.69		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2310.0	Sub6 n30/ 10 MHz [15 kHz]	PI/2 BPSK	-21.27	15.12	10.16	2.35	H	< 2.00	0.196	22.93	1	1
		QPSK	-21.31	15.08	10.16	2.35	H		0.194	22.89		
		16-QAM	-22.41	13.98	10.16	2.35	H		0.151	21.79		
		64-QAM	-23.50	12.89	10.16	2.35	H		0.117	20.70		
		256-QAM	-26.22	10.17	10.16	2.35	H		0.063	17.98		

8.2 RADIATED SPURIOUS EMISSIONS

- ▣ NR Band: N30
- ▣ Bandwidth: 5 MHz
- ▣ Modulation: PI/2 BPSK
- ▣ Distance: 1 meters
- ▣ SCS: 15 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)	Detector	RB	
										Size	Offset
461500 (2307.5)	4 615.00	-58.86	11.87	-60.75	3.58	H	-52.46	-40.00	Peak	1	12
	6 922.50	-64.17	11.10	-57.50	4.33	H	-50.73	-40.00	Peak		
	9 230.00	-59.43	11.16	-49.79	5.06	H	-43.69	-40.00	Peak		
	11 537.50	-66.46	12.48	-53.37	5.77	H	-46.66	-40.00	Peak		
	13 845.00	-66.35	13.01	-52.87	6.41	H	-46.27	-40.00	Average		
462000 (2310.0)	4 620.00	-59.08	11.86	-60.71	3.57	V	-52.42	-40.00	Peak	1	1
	6 930.00	-61.23	11.10	-54.10	4.32	H	-47.32	-40.00	Peak		
	9 240.00	-60.22	11.18	-50.22	5.04	H	-44.08	-40.00	Peak		
	11 550.00	-64.91	12.50	-51.50	5.79	H	-44.79	-40.00	Peak		
	13 860.00	-67.41	13.00	-54.31	6.42	H	-47.73	-40.00	Average		
462500 (2312.5)	4 625.00	-59.52	11.85	-61.43	3.57	H	-53.15	-40.00	Peak	1	12
	6 937.50	-63.83	11.10	-56.46	4.34	V	-49.70	-40.00	Peak		
	9 250.00	-61.43	11.20	-51.12	5.02	H	-44.94	-40.00	Peak		
	11 562.50	-65.41	12.54	-52.17	5.81	H	-45.44	-40.00	Peak		
	13 875.00	-67.75	13.00	-55.32	6.41	H	-48.73	-40.00	Average		

- NR Band: N30
- Bandwidth: 10 MHz
- Modulation: PI/2 BPSK
- Distance: 1 meters
- SCS: 15 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)	Detector	RB	
										Size	Offset
462000 (2310.0)	4 620.00	-59.01	11.86	-60.64	3.57	H	-52.35	-40.00	Peak	1	1
	6 930.00	-62.82	11.10	-55.69	4.32	H	-48.91	-40.00	Peak		
	9 240.00	-59.42	11.18	-49.42	5.04	V	-43.28	-40.00	Peak		
	11 550.00	-66.54	12.50	-53.13	5.79	H	-46.42	-40.00	Peak		
	13 860.00	-67.43	13.00	-54.33	6.42	H	-47.75	-40.00	Average		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n30	5 MHz	2310.0	BPSK	25	0	3.89
			QPSK			5.01
			16-QAM			5.64
			64-QAM			5.97
			256-QAM			6.28
	10 MHz		BPSK	50		3.74
			QPSK			4.79
			16-QAM			5.70
			64-QAM			5.95
			256-QAM			6.29

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 47 ~ 56.

2. Peak- to- Average Ratio is not required. These values are reported for information only.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n30	5 MHz	2310.0	BPSK	25	0	4.5021
			QPSK			4.5058
			16-QAM			4.4767
			64-QAM			4.4981
			256-QAM			4.4940
	10 MHz		BPSK	50		8.9425
			QPSK			8.9373
			16-QAM			8.9407
			64-QAM			8.9691
			256-QAM			8.9582

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 37 ~ 46.

8.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
Sub6 n30	5	2307.5	3.7967	30.200	-80.070	-49.870	-40.00
		2310.0	8.0135	30.815	-80.280	-49.465	
		2312.5	8.2891	30.815	-80.188	-49.373	
	10	2310.0	9.1361	30.815	-80.655	-49.840	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 169 ~ 176.
2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
3. Factor(dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	27.494
1 – 5	30.200
5 – 10	30.815
10 – 15	31.340
15 – 20	31.713
Above 20	32.355

8.6 BAND EDGE

Band Width (MHz)	Frequency (MHz)	Modulation	RB (Size/ Offset)	Frequency Range (MHz)	Maximum Data (dBm)	Limit (dBm)
5	2307.5	BPSK	25/0	Below 2288	-58.263	-40
				2288 - 2292	-51.705	-37
				2292 - 2296	-43.408	-31
				2296 - 2300	-33.862	-25
				2300 - 2304	-22.425	-13
				2304 - 2305	-29.627	-13
				2315 - 2320	-32.620	-13
				2320 - 2324	-45.516	-25
				2324 - 2328	-53.743	-31
				2328 - 2337	-61.136	-37
				2337 - 2341	-64.540	-31
				2341 - 2345	-64.540	-25
				2345 - 2365	-63.354	-13
				Above 2365	-64.492	-40
	2310.0	BPSK	25/0	Below 2288	-59.822	-40
				2288 - 2292	-54.913	-37
				2292 - 2296	-48.275	-31
				2296 - 2300	-42.012	-25
				2300 - 2305	-26.428	-13
				2315 - 2320	-24.972	-13
				2320 - 2324	-41.591	-25
				2324 - 2328	-48.334	-31
				2328 - 2337	-58.986	-37
				2337 - 2341	-64.560	-31
				2341 - 2345	-64.517	-25
				2345 - 2365	-63.509	-13
				Above 2365	-64.692	-40
	2312.5	BPSK	25/0	Below 2288	-60.695	-40
				2288 - 2292	-57.350	-37
				2292 - 2296	-53.146	-31
				2296 - 2300	-45.500	-25
				2300 - 2305	-33.090	-13
				2315 - 2316	-27.361	-13

				2316 - 2320	-22.023	-13
				2320 - 2324	-34.287	-25
				2324 - 2328	-43.053	-31
				2328 - 2337	-55.364	-37
				2337 - 2341	-64.415	-31
				2341 - 2345	-64.373	-25
				2345 - 2365	-63.160	-13
				Above 2365	-64.447	-40
10	2310.0	BPSK	50/0	Below 2288	-46.672	-40
				2288 - 2292	-38.263	-37
				2292 - 2296	-34.699	-31
				2296 - 2300	-27.964	-25
				2300 - 2304	-23.896	-13
				2304 - 2305	-28.701	-13
				2315 - 2316	-32.396	-13
				2316 - 2320	-24.179	-13
				2320 - 2324	-26.129	-25
				2324 - 2328	-34.946	-31
				2328 - 2337	-42.656	-37
				2337 - 2341	-64.541	-31
				2341 - 2345	-64.393	-25
				2345 - 2365	-63.207	-13
				Above 2365	-64.591	-40

Band Width (MHz)	Frequency (MHz)	Modulation	RB (Size/ Offset)	Frequency Range (MHz)	Maximum Data (dBm)	Limit (dBm)
5	2307.5	BPSK	1/0	Below 2288	-58.302	-40
				2288 - 2292	-53.394	-37
				2292 - 2296	-49.496	-31
				2296 - 2300	-46.212	-25
				2300 - 2304	-33.722	-13
				2304 - 2305	-15.702	-13
			1/24	2315 - 2320	-46.228	-13
				2320 - 2324	-51.969	-25
				2324 - 2328	-54.444	-31
				2328 - 2337	-62.013	-37
				2337 - 2341	-64.571	-31
				2341 - 2345	-64.600	-25
				2345 - 2365	-62.627	-13
				Above 2365	-64.707	-40
	2310.0	BPSK	1/0	Below 2288	-59.741	-40
				2288 - 2292	-56.195	-37
				2292 - 2296	-51.740	-31
				2296 - 2300	-47.802	-25
				2300 - 2305	-40.116	-13
			1/24	2315 - 2320	-39.670	-13
				2320 - 2324	-48.955	-25
				2324 - 2328	-51.865	-31
				2328 - 2337	-61.093	-37
				2337 - 2341	-64.366	-31
				2341 - 2345	-64.456	-25
				2345 - 2365	-63.310	-13
				Above 2365	-64.510	-40
	2312.5	BPSK	1/0	Below 2288	-60.073	-40
				2288 - 2292	-57.068	-37
				2292 - 2296	-52.641	-31
				2296 - 2300	-48.973	-25
				2300 - 2305	-46.039	-13
			1/24	2315 - 2316	-14.339	-13

				2316 - 2320	-33.272	-13
				2320 - 2324	-45.757	-25
				2324 - 2328	-48.036	-31
				2328 - 2337	-57.188	-37
				2337 - 2341	-64.444	-31
				2341 - 2345	-64.417	-25
				2345 - 2365	-62.874	-13
				Above 2365	-64.557	-40
10	2310.0	BPSK	1/0	Below 2288	-57.796	-40
				2288 - 2292	-53.290	-37
				2292 - 2296	-48.845	-31
				2296 - 2300	-46.035	-25
				2300 - 2304	-32.973	-13
				2304 - 2305	-14.336	-13
			1/51	2315 - 2316	-18.889	-13
				2316 - 2320	-33.373	-13
				2320 - 2324	-47.212	-25
				2324 - 2328	-49.637	-31
				2328 - 2337	-58.447	-37
				2337 - 2341	-64.507	-31
				2341 - 2345	-64.493	-25
				2345 - 2365	-63.629	-13
				Above 2365	-64.589	-40

Note:

- Plots of the EUT's Band Edge are shown Page 57 ~ 168.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

- ▣ BandWidth: 5 MHz
- ▣ Voltage(100 %): 3.880 VDC
- ▣ Batt. Endpoint: 3.650 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2307.5	100 %	+20(Ref)	2307 500 017	0.0	0.000 000	0.000
	100 %	-30	2307 500 030	13.8	0.000 001	0.006
	100 %	-20	2307 500 028	11.6	0.000 001	0.005
	100 %	-10	2307 500 023	6.9	0.000 000	0.003
	100 %	0	2307 500 024	7.3	0.000 000	0.003
	100 %	+10	2307 500 032	15.1	0.000 001	0.007
	100 %	+30	2307 500 029	12.6	0.000 001	0.005
	100 %	+40	2307 500 033	16.2	0.000 001	0.007
	100 %	+50	2307 500 033	16.2	0.000 001	0.007
	Batt. Endpoint	+20	2307 500 024	7.6	0.000 000	0.003
2312.5	100 %	+20(Ref)	2312 500 008	0.0	0.000 000	0.000
	100 %	-30	2312 500 015	7.8	0.000 000	0.003
	100 %	-20	2312 500 013	4.9	0.000 000	0.002
	100 %	-10	2312 500 014	6.0	0.000 000	0.003
	100 %	0	2312 500 016	8.8	0.000 000	0.004
	100 %	+10	2312 500 018	10.4	0.000 000	0.005
	100 %	+30	2312 500 017	9.8	0.000 000	0.004
	100 %	+40	2312 500 023	15.4	0.000 001	0.007
	100 %	+50	2312 500 023	15.2	0.000 001	0.007
	Batt. Endpoint	+20	2312 500 024	16.3	0.000 001	0.007

▣ BandWidth: 10 MHz

▣ Voltage(100 %): 3.880 VDC

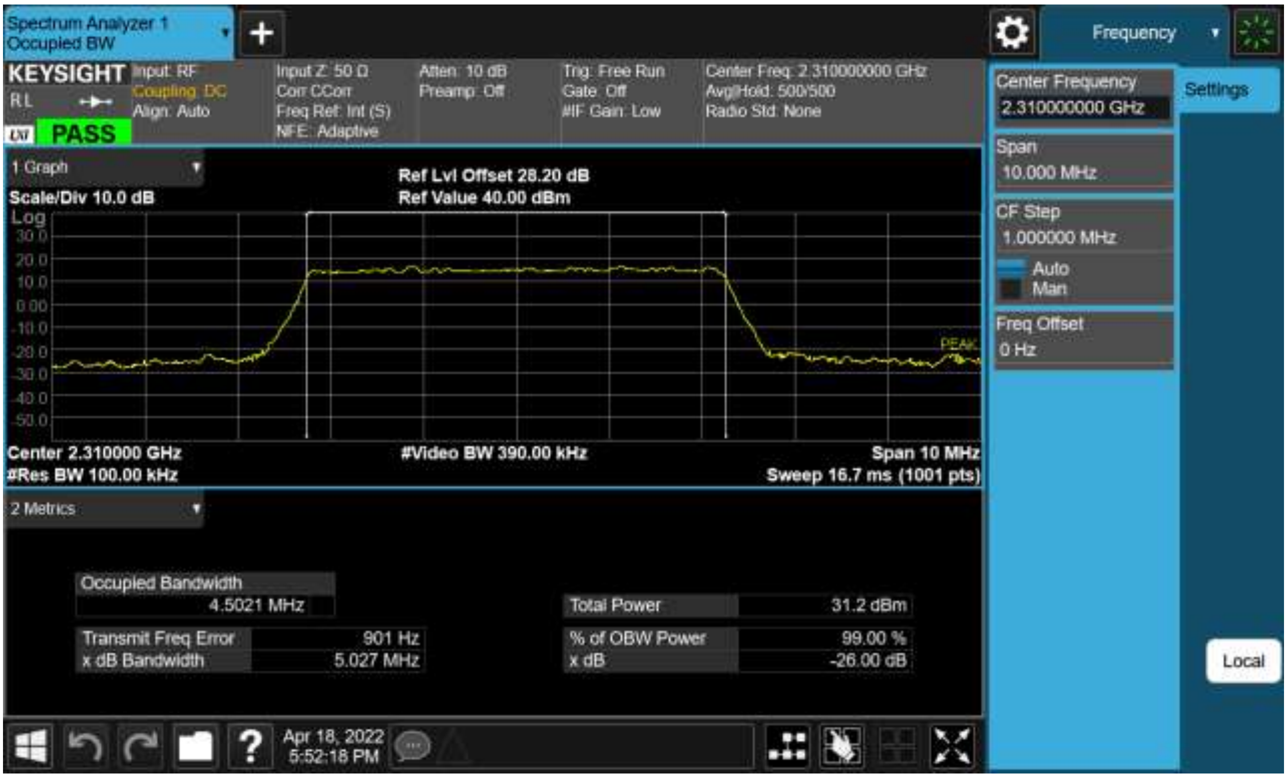
▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

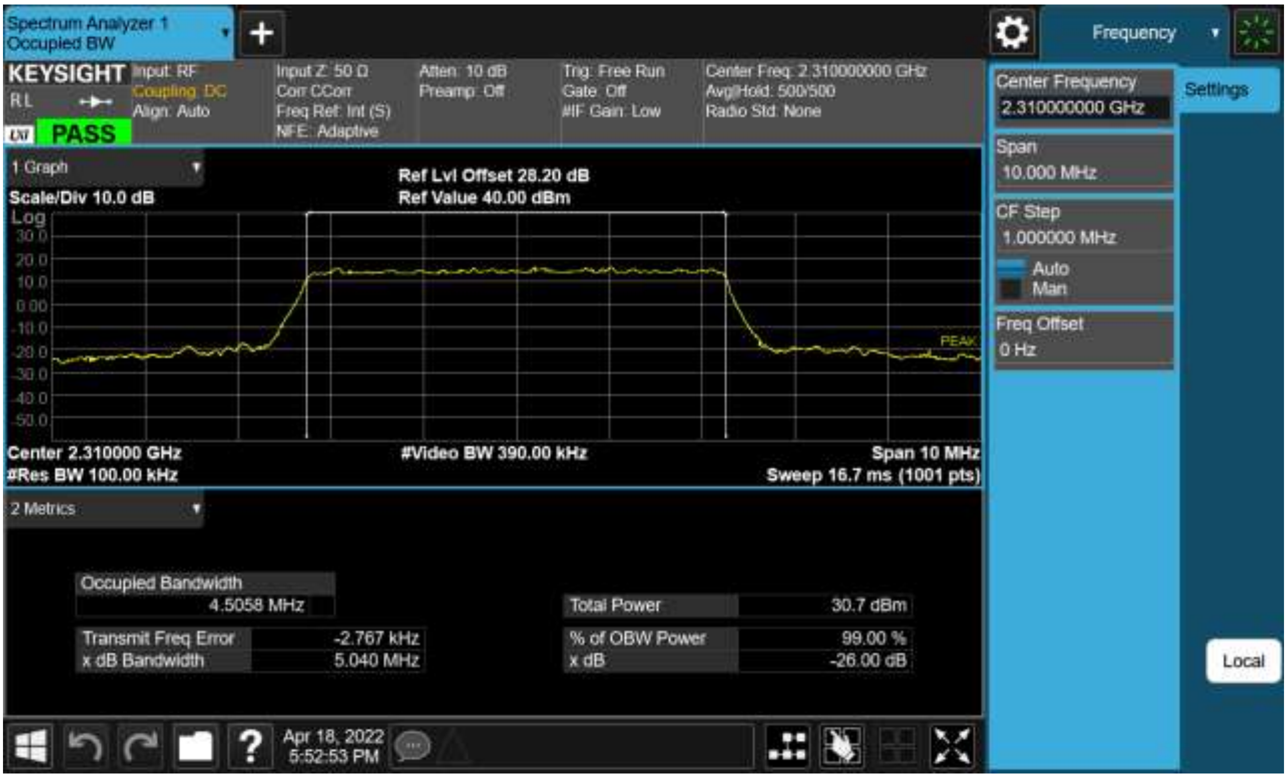
Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2310.0	100 %	+20(Ref)	2310 000 006	0.0	0.000 000	0.000
	100 %	-30	2310 000 015	8.4	0.000 000	0.004
	100 %	-20	2310 000 018	11.3	0.000 000	0.005
	100 %	-10	2310 000 015	8.4	0.000 000	0.004
	100 %	0	2310 000 013	6.3	0.000 000	0.003
	100 %	+10	2310 000 011	4.8	0.000 000	0.002
	100 %	+30	2310 000 012	6.0	0.000 000	0.003
	100 %	+40	2310 000 021	15.0	0.000 001	0.006
	100 %	+50	2310 000 012	5.2	0.000 000	0.002
	Batt. Endpoint	+20	2310 000 014	7.9	0.000 000	0.003

9. TEST PLOTS

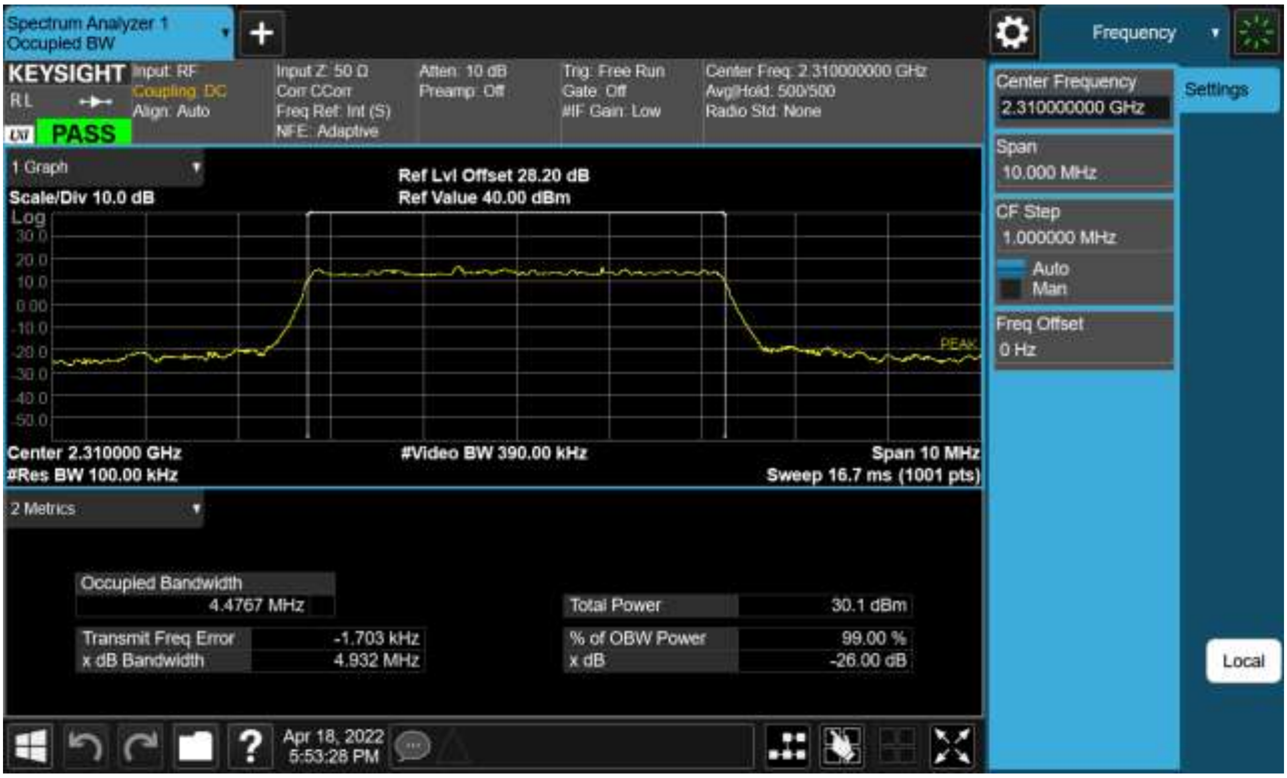
Sub6 n30. Occupied Bandwidth Plot (5 MHz Ch.462000 BPSK Full RB _0)



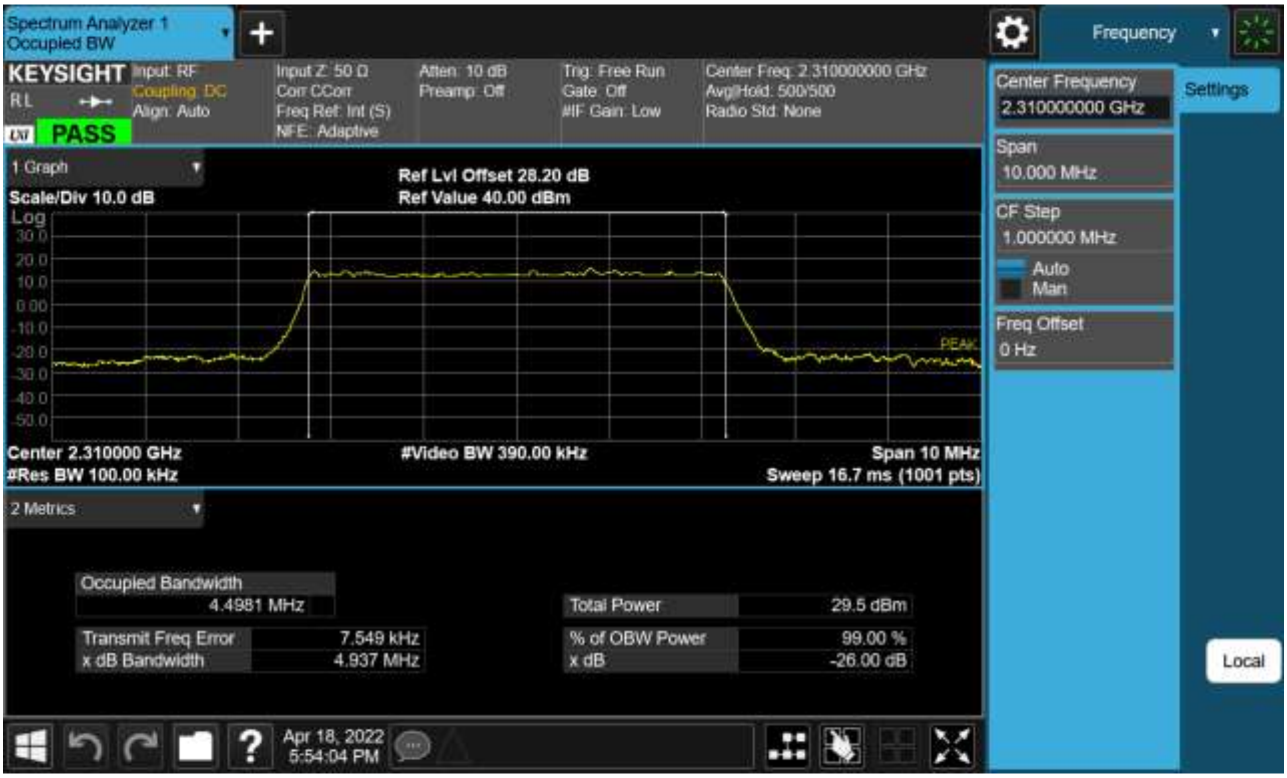
Sub6 n30. Occupied Bandwidth Plot (5 MHz Ch.462000 QPSK Full RB _0)



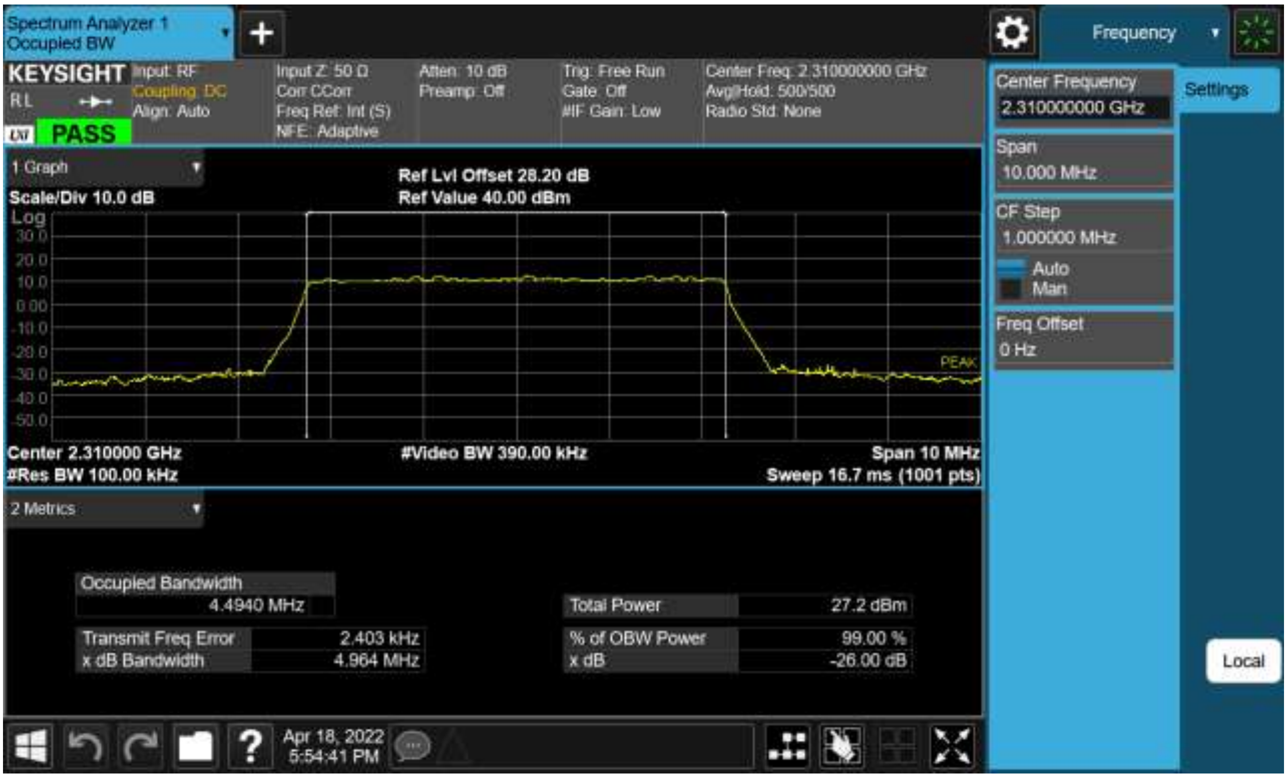
Sub6 n30. Occupied Bandwidth Plot (5 MHz Ch.462000 16-QAM Full RB _0)



Sub6 n30. Occupied Bandwidth Plot (5 MHz Ch.462000 64-QAM Full RB _0)



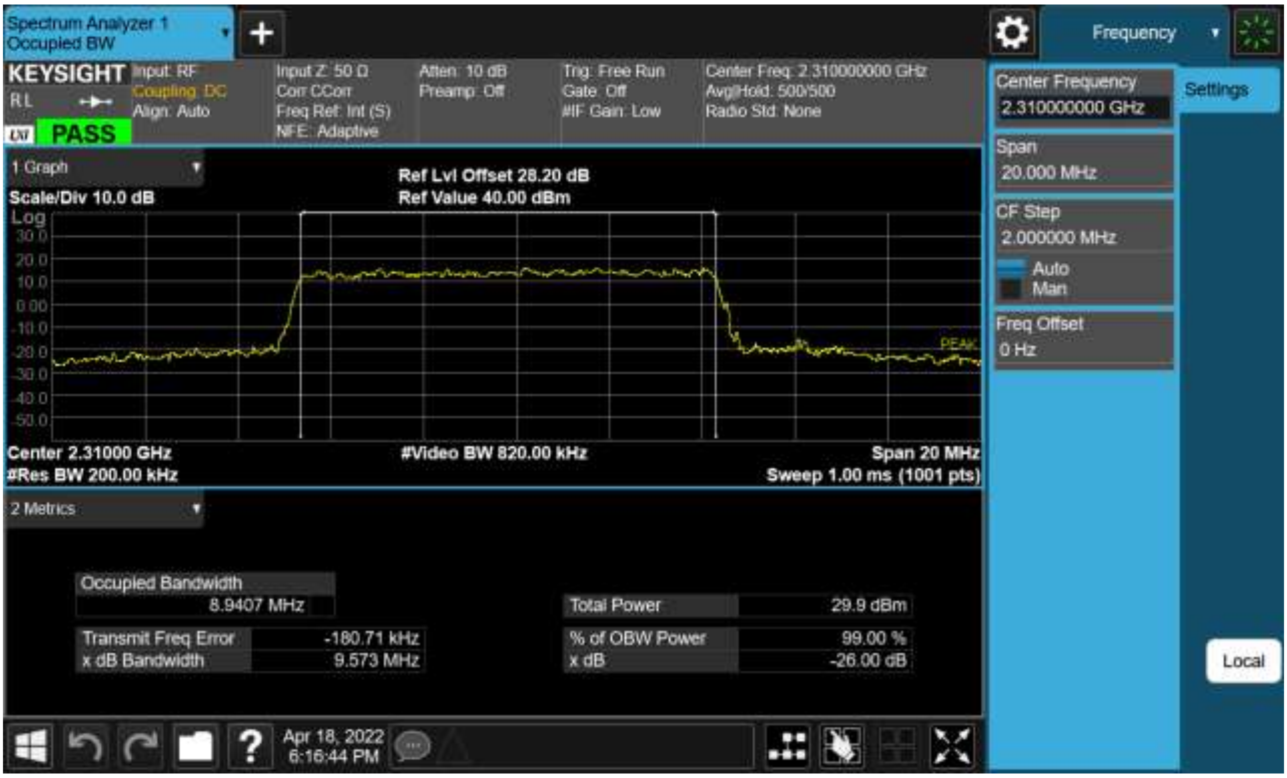
Sub6 n30. Occupied Bandwidth Plot (5 MHz Ch.462000 256-QAM Full RB _0)



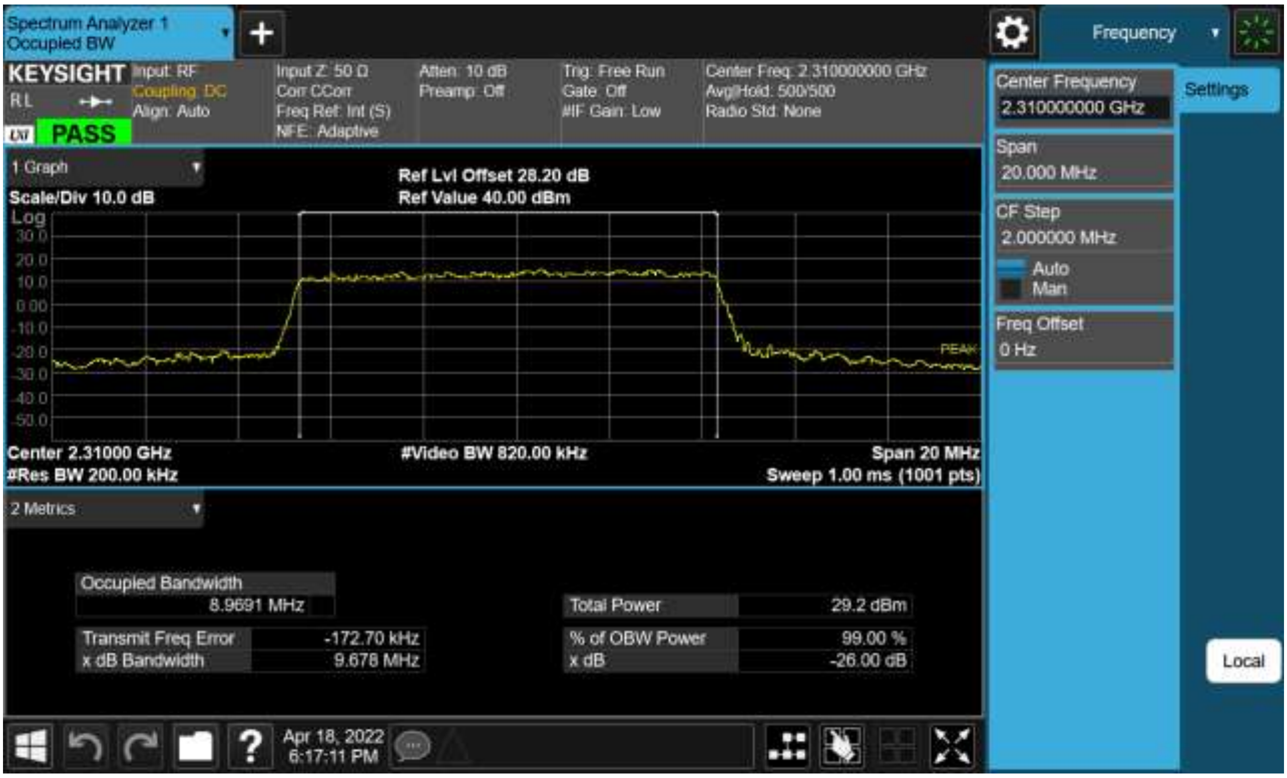
Sub6 n30. Occupied Bandwidth Plot (10 MHz Ch.462000 BPSK Full RB _0)

Sub6 n30. Occupied Bandwidth Plot (10 MHz Ch.462000 QPSK Full RB _0)

Sub6 n30. Occupied Bandwidth Plot (10 MHz Ch.462000 16-QAM Full RB _0)



Sub6 n30. Occupied Bandwidth Plot (10 MHz Ch.462000 64-QAM Full RB _0)



Sub6 n30. Occupied Bandwidth Plot (10 MHz Ch.462000 256-QAM Full RB _0)

Sub6 n30. PAR Plot (5 M BW_Ch.462000_BPSK_ Full RB _0)

Sub6 n30. PAR Plot (5 M BW_Ch.462000_QPSK_ Full RB _0)

Sub6 n30. PAR Plot (5 M BW_Ch.462000_16QAM_ Full RB _0)

Sub6 n30. PAR Plot (5 M BW_Ch.462000_64QAM_ Full RB _0)

Sub6 n30. PAR Plot (5 M BW_Ch.462000_256QAM_ Full RB _0)

Sub6 n30. PAR Plot (10 M BW_Ch.462000_BPSK_ Full RB _0)

Sub6 n30. PAR Plot (10 M BW_Ch.462000_QPSK_ Full RB _0)

Sub6 n30. PAR Plot (10 M BW_Ch.462000_16QAM_ Full RB _0)

Sub6 n30. PAR Plot (10 M BW_Ch.462000_64QAM_ Full RB _0)

Sub6 n30. PAR Plot (10 M BW_Ch.462000_256QAM_ Full RB _0)

Sub6 n30. 5 M_BandEdge(2280 MHz-2288 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2280 MHz-2288 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2280 MHz-2288 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2280 MHz-2288 MHz)_Mid_2310 MHz_BPSK_Full RB

Sub6 n30. 5 M_BandEdge(2280 MHz-2288 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2280 MHz-2288 MHz)_High_2312.5 MHz_BPSK_Full RB

Sub6 n30. 5 M_BandEdge(2288 MHz-2292 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2288 MHz-2292 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2288 MHz-2292 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2288 MHz-2292 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2288 MHz-2292 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2288 MHz-2292 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2292 MHz-2296 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2292 MHz-2296 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2292 MHz-2296 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2292 MHz-2296 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2292 MHz-2296 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2292 MHz-2296 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2296 MHz-2300 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2296 MHz-2300 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2296 MHz-2300 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2296 MHz-2300 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2296 MHz-2300 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2296 MHz-2300 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2300 MHz-2304 MHz)_Low_2307.5 MHz_BPSK_1RB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -43.722 dBm + 10 dB = -33.722 dBm

Sub6 n30. 5 M_BandEdge(2300 MHz-2304 MHz)_Low_2307.5 MHz_BPSK_FullRB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -32.425 dBm + 10 dB = -22.425 dBm

Sub6 n30. 5 M_BandEdge(2300 MHz-2305 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2300 MHz-2305 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2300 MHz-2305 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2300 MHz-2305 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2304 MHz-2305 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2304 MHz-2305 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2315 MHz-2320 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2315 MHz-2320 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2315 MHz-2320 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2315 MHz-2320 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2315 MHz-2316 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2315 MHz-2316 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2316 MHz-2320 MHz)_High_2312.5 MHz_BPSK_1RB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -43.272 dBm + 10 dB = -33.272 dBm

Sub6 n30. 5 M_BandEdge(2316 MHz-2320 MHz)_High_2312.5 MHz_BPSK_FullRB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -32.023 dBm + 10 dB = -22.023 dBm

Sub6 n30. 5 M_BandEdge(2320 MHz-2324 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2320 MHz-2324 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2320 MHz-2324 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2320 MHz-2324 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2320 MHz-2324 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2320 MHz-2324 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2324 MHz-2328 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2324 MHz-2328 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2324 MHz-2328 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2324 MHz-2328 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2324 MHz-2328 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2324 MHz-2328 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2328 MHz-2337 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2328 MHz-2337 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2328 MHz-2337 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2328 MHz-2337 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2328 MHz-2337 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2328 MHz-2337 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2337 MHz-2341 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2337 MHz-2341 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2337 MHz-2341 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2337 MHz-2341 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2337 MHz-2341 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2337 MHz-2341 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2341 MHz-2345 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2341 MHz-2345 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2341 MHz-2345 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2341 MHz-2345 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2341 MHz-2345 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2341 MHz-2345 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2345 MHz-2365 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2345 MHz-2365 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2345 MHz-2365 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2345 MHz-2365 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2345 MHz-2365 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2345 MHz-2365 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2365 MHz-2400 MHz)_Low_2307.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2365 MHz-2400 MHz)_Low_2307.5 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2365 MHz-2400 MHz)_Mid_2310 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2365 MHz-2400 MHz)_Mid_2310 MHz_BPSK_FullRB

Sub6 n30. 5 M_BandEdge(2365 MHz-2400 MHz)_High_2312.5 MHz_BPSK_1RB

Sub6 n30. 5 M_BandEdge(2365 MHz-2400 MHz)_High_2312.5 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2280 MHz-2288 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2280 MHz-2288 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2288 MHz-2292 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2288 MHz-2292 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2292 MHz-2296 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2292 MHz-2296 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2296 MHz-2300 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2296 MHz-2300 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2300 MHz-2304 MHz)_Low_2310 MHz_BPSK_1RB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -42.973 dBm + 10 dB = -32.973 dBm

Sub6 n30. 10 M_BandEdge(2300 MHz-2304 MHz)_Low_2310 MHz_BPSK_FullRB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -33.896 dBm + 10 dB = -23.896 dBm

Sub6 n30. 10 M_BandEdge(2304 MHz-2305 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2304 MHz-2305 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2315 MHz-2316 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2315 MHz-2316 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2316 MHz-2320 MHz)_Low_2310 MHz_BPSK_1RB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -43.373 dBm + 10 dB = -33.373 dBm

Sub6 n30. 10 M_BandEdge(2316 MHz-2320 MHz)_Low_2310 MHz_BPSK_FullRB

Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -34.179 dBm + 10 dB = -24.179 dBm

Sub6 n30. 10 M_BandEdge(2320 MHz-2324 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2320 MHz-2324 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2324 MHz-2328 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2324 MHz-2328 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2328 MHz-2337 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2328 MHz-2337 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2337 MHz-2341 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2337 MHz-2341 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2341 MHz-2345 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2341 MHz-2345 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. 10 M_BandEdge(2345 MHz-2365 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2345 MHz-2365 MHz)_Low_2310 MHz_BPSK_FullRB

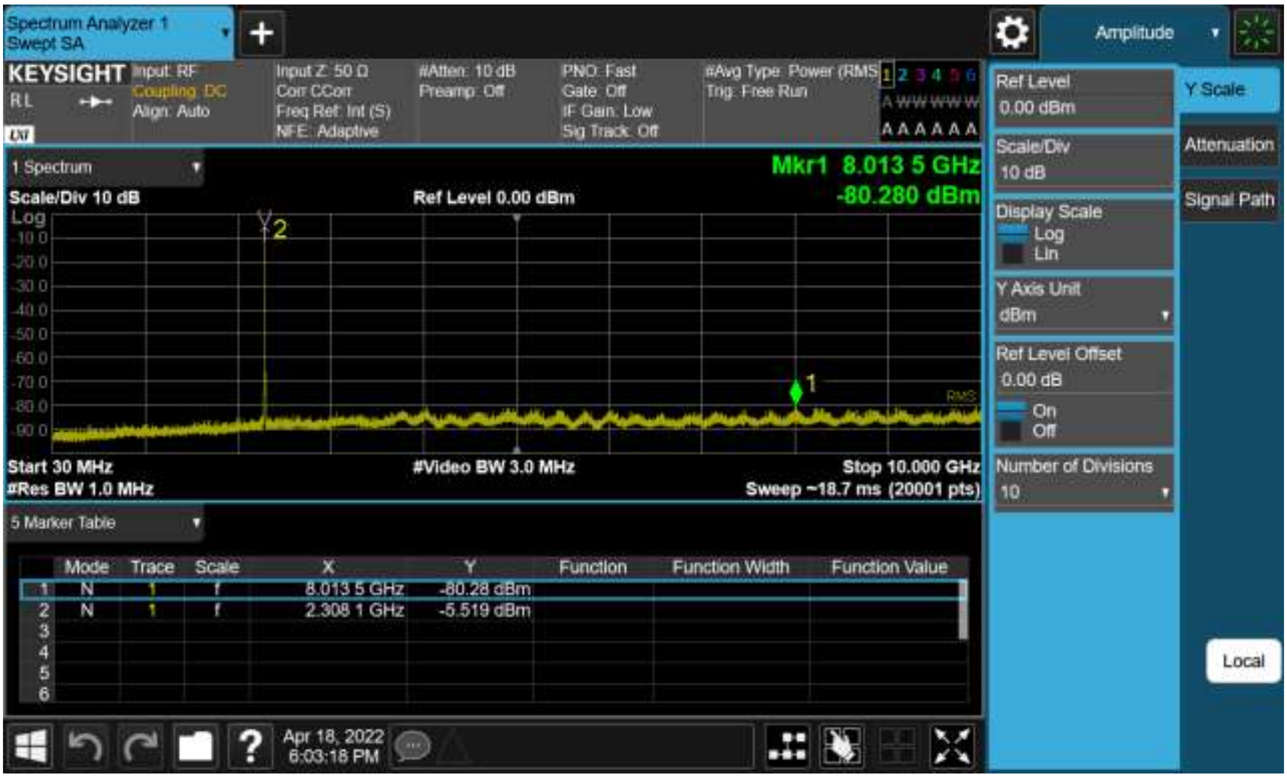
Sub6 n30. 10 M_BandEdge(2365 MHz-2400 MHz)_Low_2310 MHz_BPSK_1RB

Sub6 n30. 10 M_BandEdge(2365 MHz-2400 MHz)_Low_2310 MHz_BPSK_FullRB

Sub6 n30. Conducted Spurious Plot 1 (5 MHz Ch.461500 BPSK RB 1, Offset 1)

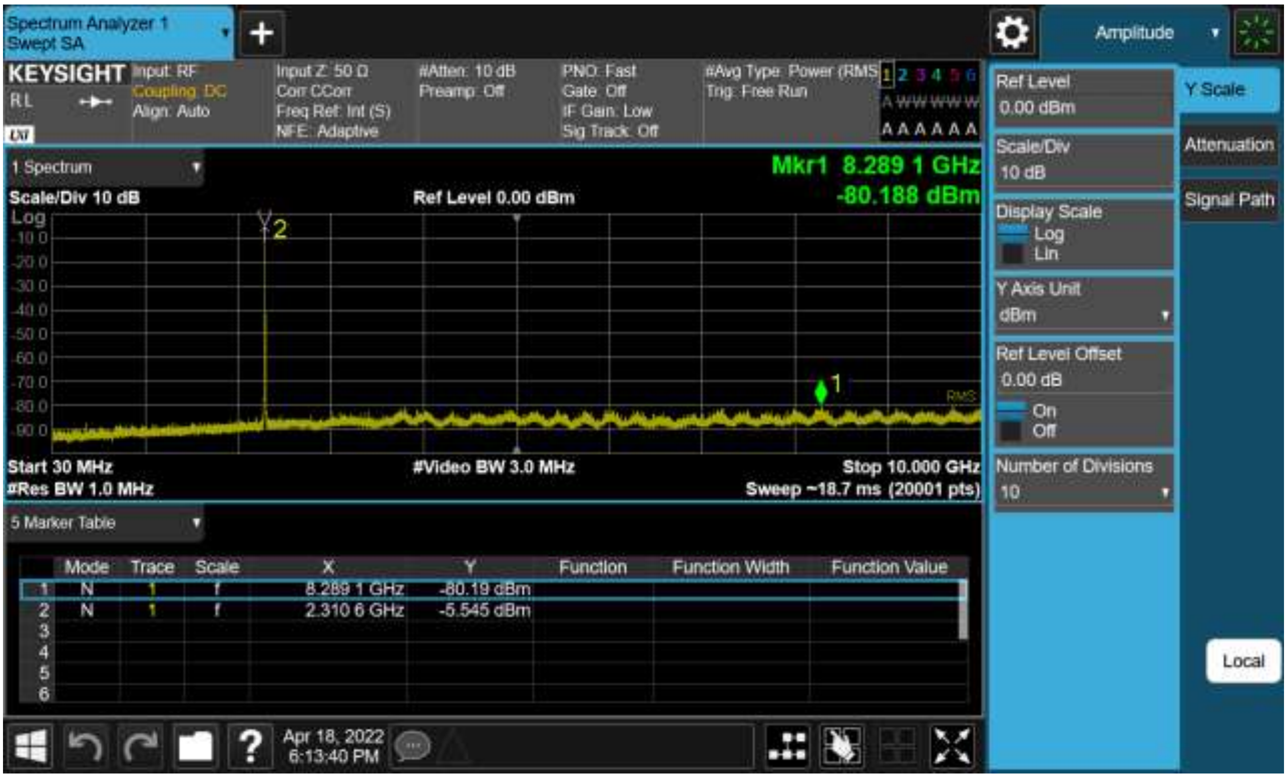
Sub6 n30. Conducted Spurious Plot 2 (5 MHz Ch.461500 BPSK RB 1, Offset 1)

Sub6 n30. Conducted Spurious Plot 1 (5 MHz Ch.462000 BPSK RB 1, Offset 1)



Sub6 n30. Conducted Spurious Plot 2 (5 MHz Ch. 462000 BPSK RB 1, Offset 1)

Sub6 n30. Conducted Spurious Plot 1 (5 MHz Ch.462500 BPSK RB 1, Offset 1)



Sub6 n30. Conducted Spurious Plot 2 (5 MHz Ch.462500 BPSK RB 1, Offset 1)

Sub6 n30. Conducted Spurious Plot 1 (10 MHz Ch.462000 BPSK RB 1, Offset 1)

Sub6 n30. Conducted Spurious Plot 2 (10 MHz Ch. 462000 BPSK RB 1, Offset 1)

10. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2205-FC035-P