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FCC BT LE 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:
November 24, 2021

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2111-FC033

FCC ID:	**A3LSMX808U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model:	SM-X808U
EUT Type:	Tablet
Average Output Power:	Ant.1: Normal : 9.20 dBm (8.31 mW), High Power : 16.48 dBm (44.50 mW) Ant.2: Normal : 8.47 dBm (7.03 mW), High Power : 16.21 dBm (41.79 mW)
Frequency Range:	2 402 MHz ~ 2 480 MHz
Modulation type	GFSK
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Woong Jin Kim
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)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2111-FC033	November 24, 2021	- First Approval Report

Table of Contents

1. EUT DESCRIPTION

Model	SM-X808U		
Additional Model	-		
EUT Type	Tablet		
Power Supply	DC 3.86 V		
Frequency Range	2 402 MHz ~ 2 480 MHz		
Max. RF Output Power (Normal)	Ant.1	Peak (For information only)	1 M Bit/s : 9.324 dBm (8.56 mW) 2 M Bit/s : 9.243 dBm (8.40 mW) 125 k Bit/s : 9.322 dBm (8.55 mW) 500 k Bit/s : 9.373 dBm (8.66 mW)
		Average	1M Bit/s : 9.20 dBm (8.31 mW) 2M Bit/s : 8.92 dBm (7.80 mW) 125 k Bit/s : 9.19 dBm (8.30 mW) 500 k Bit/s : 9.16 dBm (8.23 mW)
	Ant.2	Peak (For information only)	1 M Bit/s : 8.649 dBm (7.33 mW) 2 M Bit/s : 8.929 dBm (7.81 mW) 125 k Bit/s : 8.740 dBm (7.48 mW) 500 k Bit/s : 8.851 dBm (7.68 mW)
		Average	1 M Bit/s : 8.47 dBm (7.03 mW) 2 M Bit/s : 8.33 dBm (6.81 mW) 125 k Bit/s : 8.46 dBm (7.01 mW) 500 k Bit/s : 8.44 dBm (6.97 mW)
Max. RF Output Power (High Power)	Ant.1	Peak (For information only)	1 M Bit/s : 16.807 dBm (47.94 mW) 2 M Bit/s : 17.400 dBm (54.95 mW)
		Average	1 M Bit/s : 16.37 dBm (43.32 mW) 2 M Bit/s : 16.48 dBm (44.50 mW)
	Ant.2	Peak (For information only)	1 M Bit/s : 16.476 dBm (44.42 mW) 2 M Bit/s : 16.997 dBm (50.08 mW)
		Average	1 M Bit/s : 15.91 dBm (38.97 mW) 2 M Bit/s : 16.21 dBm (41.79 mW)
Modulation Type	GFSK		
Bluetooth Version	5.2		
Number of Channels	40 Channels		
Date(s) of Tests	September 13, 2021 ~ November 22, 2021		
Serial number	Radiated: R32R9003CGP Conducted: cc8d1f8a		

ANTENNA CONFIGURATIONS BT(LE)

Configurations	SISO	
	Ant1(core-0)	Ant2(Core-1)
Bluetooth Low Energy	O	O

Note:

1. O = Support, X = Not Support
2. SISO = Single Input Single Output

2. TEST METHODOLOGY

FCC KDB 558074 D01 15.247 Meas Guidance v05r02 dated April 02, 2019 entitled “guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices and the measurement procedure described in ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. 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's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-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.

The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test

Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of §15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

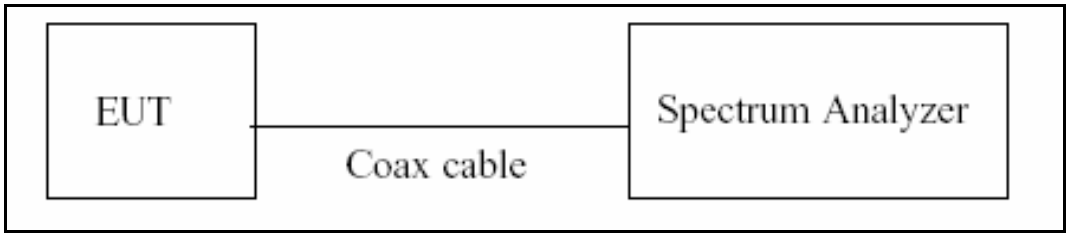
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, k=2)

7. DESCRIPTION OF TESTS

7.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to the zero-span measurement method, 6.0)b) in KDB 558074 v05r02.

The largest available value of RBW is 8 MHz and VBW is 50 MHz.

The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/*T*.

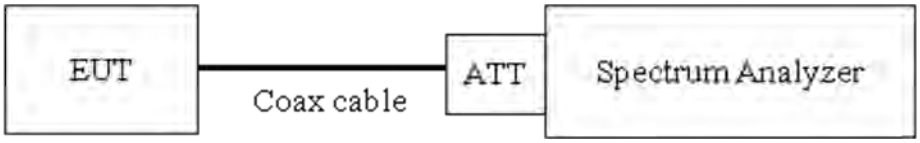
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

7.2. 6 dB Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

(Procedure 8.2 in KDB 558074 v05r02, Procedure 11.8.1 in ANSI 63.10-2013)

1) RBW = 100 kHz
2) VBW ≥ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize
7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

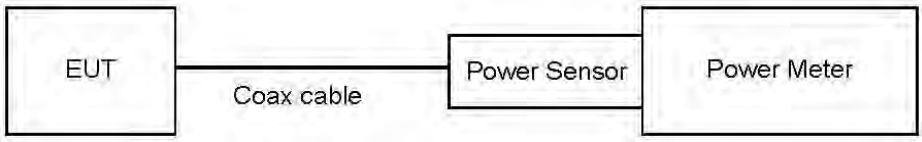
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

▪ Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)

: Measure the peak power of the transmitter.

▪ Average Power (Procedure 8.3.2.3 in KDB 558074 v05r02, Procedure 11.9.2.3 in ANSI 63.10-2013)

1) Measure the duty cycle.
2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

▪ Conducted Output Power(Peak) = Measured Value + ATT loss + Cable loss

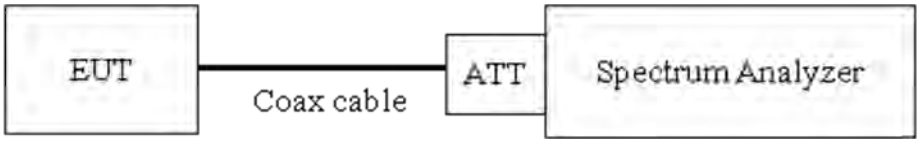
▪ Conducted Output Power(Average) = Measured Value + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

The transmitter power density average over 1-second interval shall not be greater than 8 dBm in any 3 kHz BW.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure 8.4 in KDB 558074 v05r02, Procedure 11.10 in ANSI 63.10-2013.

The spectrum analyzer is set to :

1) Set analyzer center frequency to DTS channel center frequency.
2) Set span to at least 1.5 times the OBW.
3) RBW = 3 kHz ≤ RBW ≤ 100 kHz.
4) VBW ≥ 3 x RBW.
5) Sweep = auto couple
6) Detector = power averaging (rms) or sample detector (when rms not available).
7) Ensure that the number of measurement points in the sweep ≥ [2 ×span / RBW].
8) Employ trace averaging (rms) mode over a minimum of 100 traces
9) Use the peak marker function to determine the maximum amplitude level.
10) Use the peak marker function to determine the maximum amplitude level within the RBW.
    If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11) if then duty factor shall be added to adjust the result if the duty cycle is less than 98 %

Sample Calculation

▪ Power Spectral Density = Measured Value + ATT loss + Cable loss

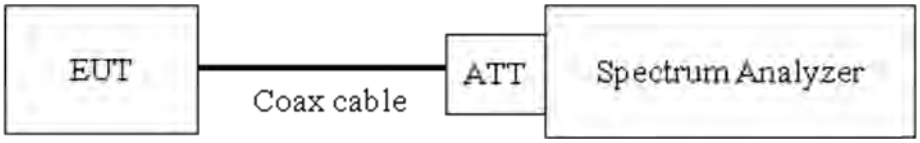
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

Limit

The maximum conducted (average) output power was used to demonstrate compliance, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

[Conducted > 30 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 8.5 in KDB 558074 v05r02, Procedure 11.11 in ANSI 63.10-2013)

1) RBW = 100 kHz
2) VBW ≥ 3 x RBW
3) Set span to encompass the spectrum to be examined
4) Detector = Peak
5) Trace Mode = max hold
6) Sweep time = auto couple
7) Ensure that the number of measurement points ≥ 2 x Span/VBW
8) Allow trace to fully stabilize.
9) Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.

Factors for frequency

Freq(MHz)	Factor(dB)
30	10.04
100	10.07
200	10.12
300	10.17
400	10.20
500	10.21
600	10.21
700	10.23
800	10.24
900	10.26
1000	10.27
2000	10.41
2400	10.45
2500	10.47
3000	10.52
4000	10.60
5000	10.71
6000	10.73
7000	10.80
8000	10.85
9000	10.91
10000	10.97
11000	11.02
12000	11.10
13000	11.19
14000	11.16
15000	11.21
16000	11.22
17000	11.25
18000	11.30
19000	11.32
20000	11.36
21000	11.48
22000	11.55
23000	11.55
24000	11.59
25000	11.68

Note : 1. 2400 ~ 2500 MHz is fundamental frequency range.

2. Factor = Attenuator loss(10 dB) + Cable loss(1ea)

3. EUT Cable loss = 0.35 dB

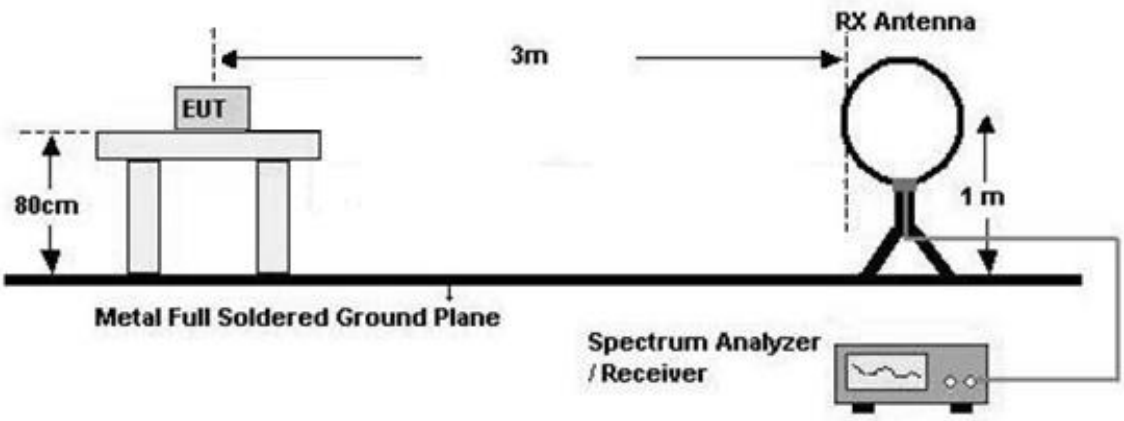
7.6. Radiated Test

Limit

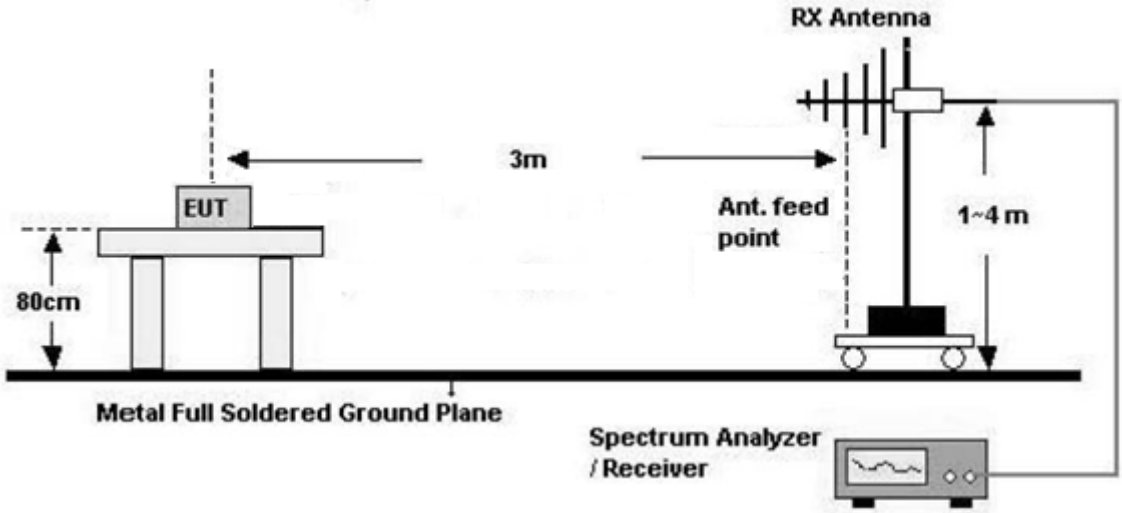
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

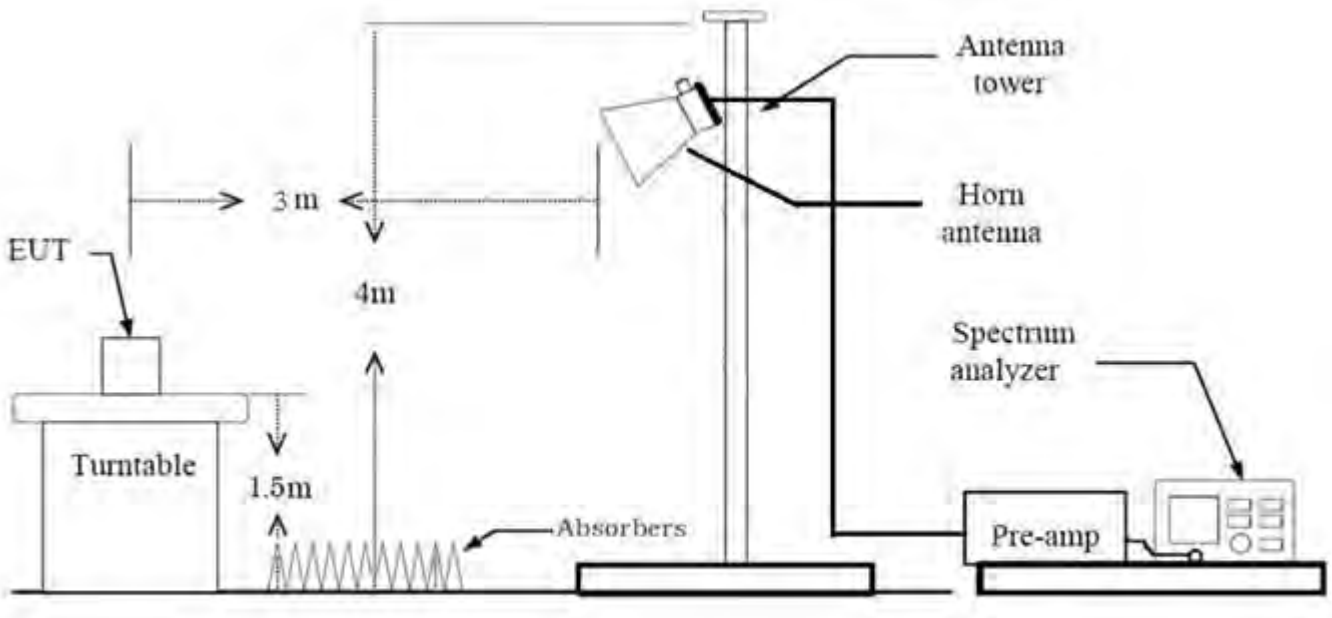
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8 m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 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.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz

   In general, (1) is used mainly
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 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.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting (Method 8.6 in KDB 558074 v05r02, Procedure 11.12 in ANSI 63.10-2013)
   (1) Measurement Type(Peak):
   - Measured Frequency Range : 1 GHz – 25 GHz
   - Detector = Peak
   - Trace = Max hold
   - RBW = 1 MHz
   - VBW ≥ 3 x RBW

   (2) Measurement Type(Average):
   - Duty cycle < 98 %, duty cycle variations are less than ±2 %
   - Measured Frequency Range : 1 GHz – 25 GHz
   - Detector = RMS
   - Averaging type = power (*i.e.*, RMS)
   - RBW = 1 MHz
   - VBW ≥ 3 x RBW
   - Sweep time = auto.
   - Trace mode = average (at least 100 traces).
   - Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.

- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1

9. Measurement value only up to 6 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.
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total (Measurement Type : Peak)
    = Peak Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F)

Total (Measurement Type : Average)

= Average Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G) + Distance Factor(D.F) + Duty Cycle Factor

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
   (1) Measurement Type(Peak):
   - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
   - Detector = Peak
   - Trace = Max hold
   - RBW = 1 MHz
   - VBW ≥ 3 x RBW

   (2) Measurement Type(Average):
   - Duty cycle < 98 %, duty cycle variations are less than ±2 %
   - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
   - Detector = RMS
   - Averaging type = power (*i.e.*, RMS)
   - RBW = 1 MHz
   - VBW ≥ 3 x RBW
   - Sweep time = auto.
   - Trace mode = average (at least 100 traces).
   - Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.
   - Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
9. Measurement value only up to 6 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.

10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total(Measurement Type : Peak)

= Peak Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

Total(Measurement Type : Average)

= Average Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
+ Duty Cycle Factor

7.7. AC Power line Conducted Emissions

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[a]	56 to 46[a]
0.50 to 5	56	46
5 to 30	60	50

[a]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Measured Value + Correction Factor

7.8. Worst case configuration and mode

Radiated Test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, Keyboard etc)
   - Worstcase : Stand alone
2. EUT Axis:
   - Radiated Spurious Emissions : X, Z
   - Radiated Restricted Band Edge : X
3. All packet length of operation were investigated and the test results are worst case in lowest packet length.
   (Worst case :1M Bit/s 37 Byte, 2M Bit/s 37 Byte)
   (125k, 500k, 1M Bit/s all have the same 1MHz Band width and only Worst result is attached.)
4. All datarate of operation were investigated and the worst case configuration results are reported.
   - Worst case : 1 M, 2 M
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + External accessories(Earphone, Keyboard etc) + Travel Adapter, Stand alone + Travel Adapter
   - Worstcase : Stand alone + Travel Adapter

Conducted test

1. The EUT was configured with packet length of highest power.
   - Worst case :1M Bit/s 37 Byte, 2M Bit/s 37 Byte

8. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz	Conducted	PASS
Conducted Maximum Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band		PASS
Band Edge (Out of Band Emissions)	§15.247(d)	Conducted > 30 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 7.7		PASS
Radiated Spurious Emissions	§15.247(d), 15.205, 15.209	cf. Section 7.6	Radiated	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 7.6		PASS

9. TEST RESULT

9.1 DUTY CYCLE

[Ant.1]

[Normal Power]

Data rate (Bit/s)	Packet length (Byte)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
125k	37	3.100	3.753	0.8259	0.83
	255	17.067	17.500	0.9752	0.11
500k	37	1.067	1.874	0.5695	2.45
	255	4.560	5.000	0.9120	0.40
1M	37	0.389	0.626	0.6215	2.07
	255	2.135	2.500	0.8540	0.69
2M	37	0.205	0.625	0.3286	4.83
	255	1.076	1.876	0.5736	2.41

[High Power]

Data rate (Bit/s)	Packet length (Byte)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
1M	37	0.389	0.625	0.6227	2.06
	255	2.130	2.500	0.8520	0.70
2M	37	0.205	0.625	0.3286	4.83
	255	1.074	1.874	0.5734	2.42

[Ant.2]

[Normal Power]

Data rate (Bit/s)	Packet length (Byte)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
125k	37	3.100	3.750	0.8267	0.83
	255	17.067	17.500	0.9752	0.11
500k	37	1.067	1.874	0.5695	2.45
	255	4.560	5.000	0.9120	0.40
1M	37	0.389	0.625	0.6227	2.06
	255	2.135	2.500	0.8540	0.69
2M	37	0.205	0.626	0.3279	4.84
	255	1.074	1.874	0.5734	2.42

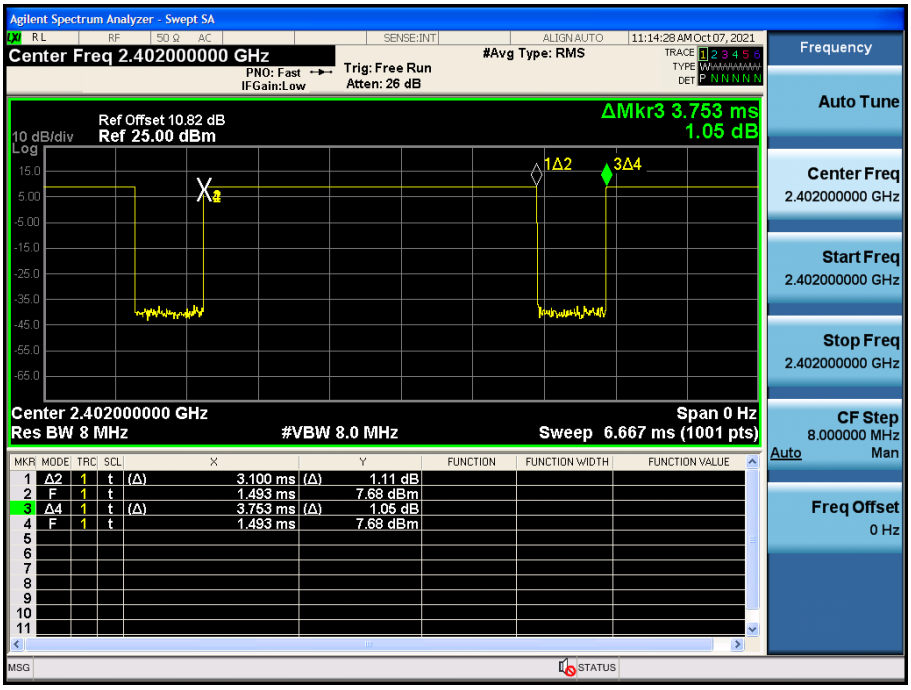
[High Power]

Data rate (Bit/s)	Packet length (Byte)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
1M	37	0.389	0.625	0.6227	2.06
	255	2.130	2.500	0.8520	0.70
2M	37	0.204	0.625	0.3266	4.86
	255	1.078	1.877	0.5742	2.41

[Ant.1]

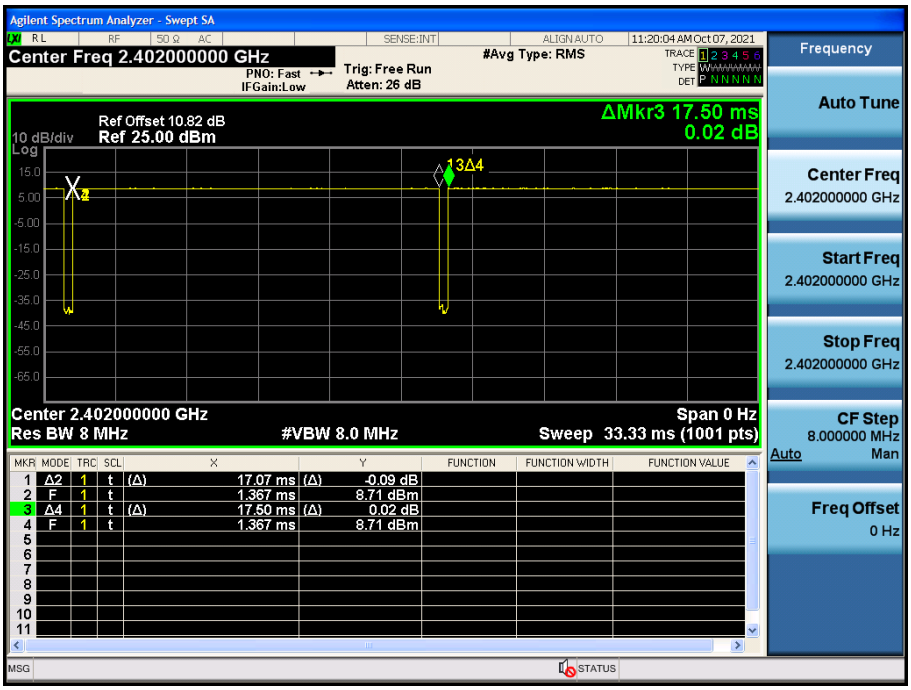
▣ 125 k Bit/s(37 Byte) Test Plots

Duty Cycle (Low-CH 0)



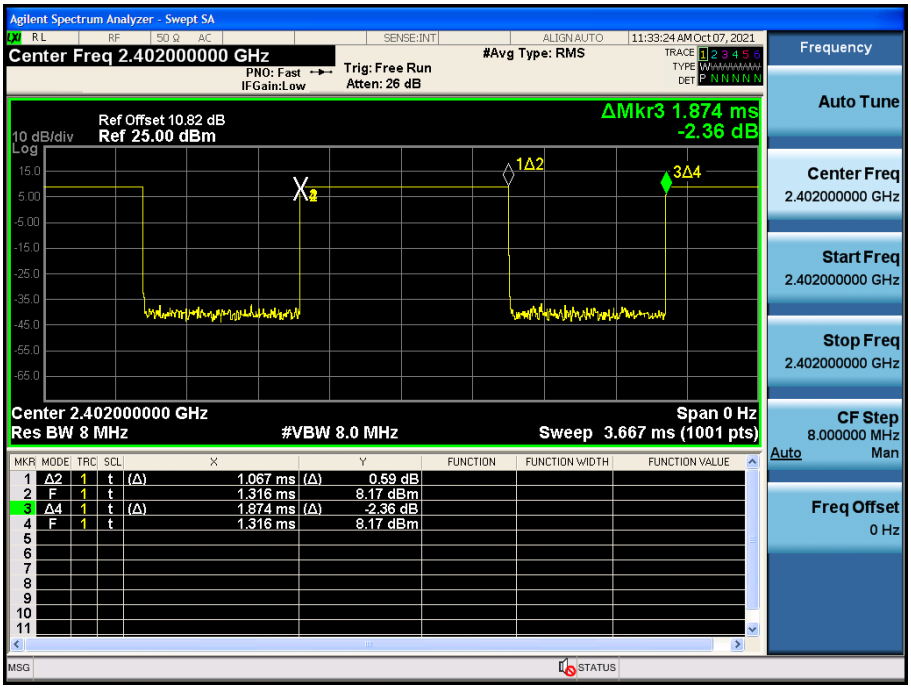
▣ 125 k Bit/s(255 Byte) Test Plots

Duty Cycle (Low-CH 0)



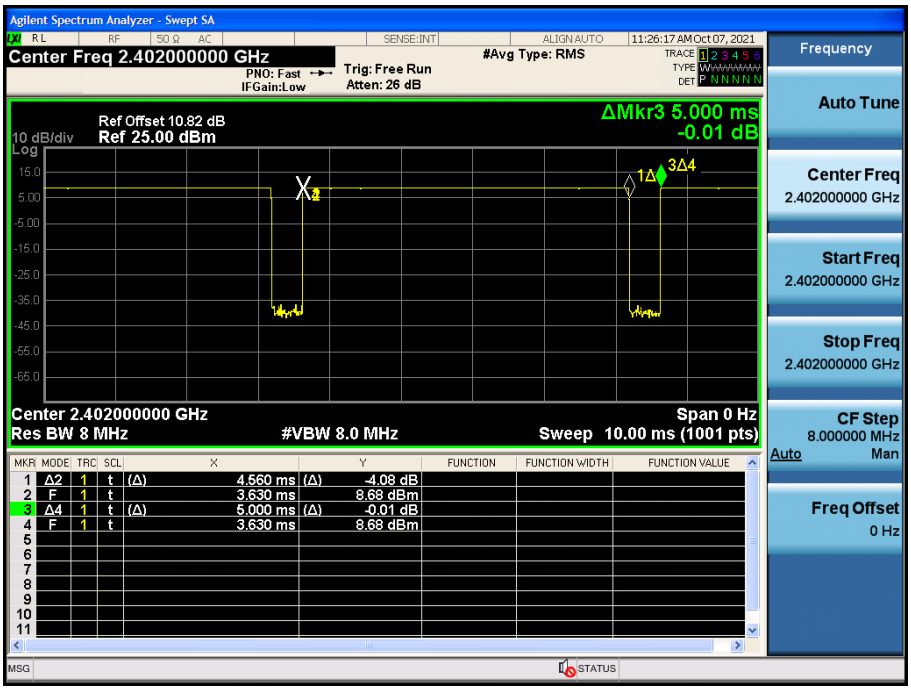
▣ 500 k Bit/s(37 Byte) Test Plots

Duty Cycle (Low-CH 0)



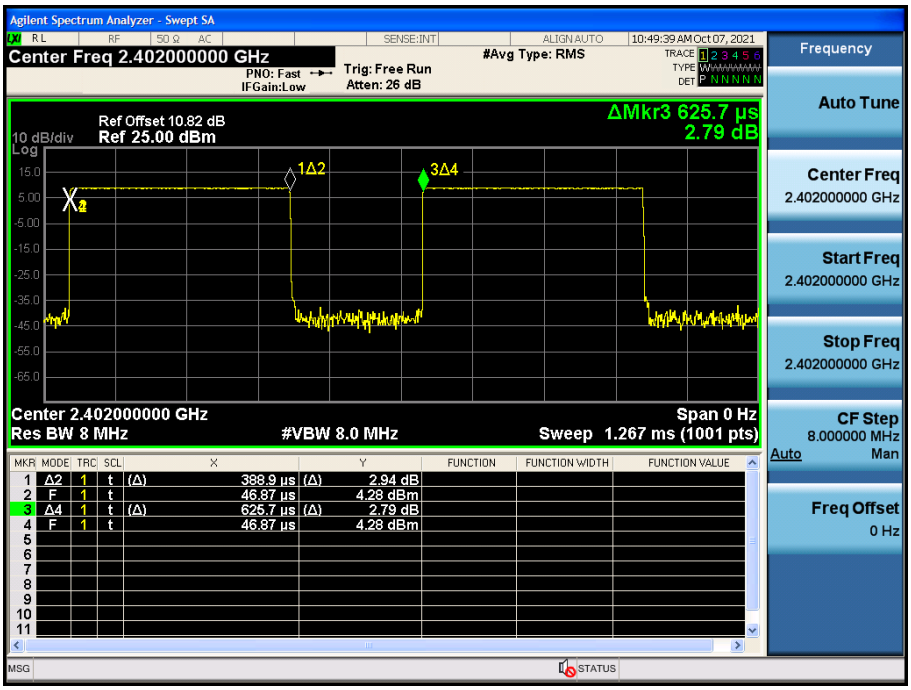
▣ 500 k Bit/s(255 Byte) Test Plots

Duty Cycle (Low-CH 0)



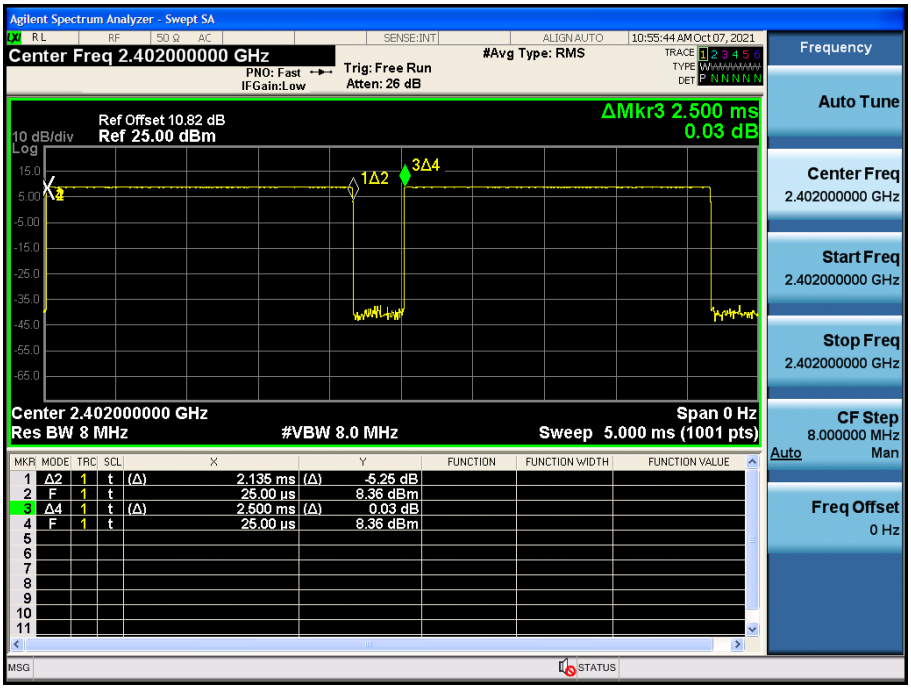
▣ 1 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



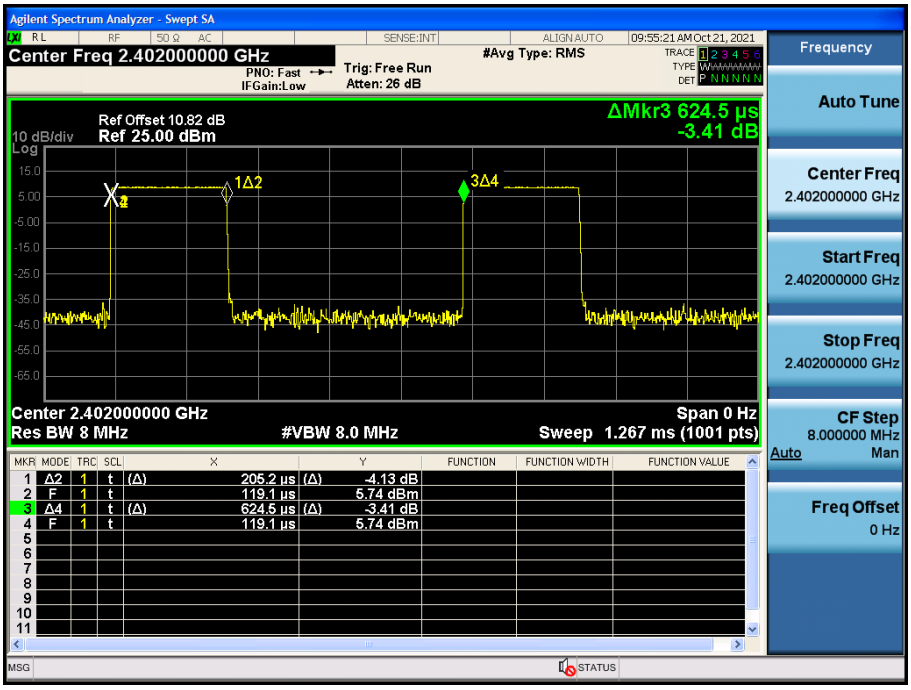
▣ 1 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



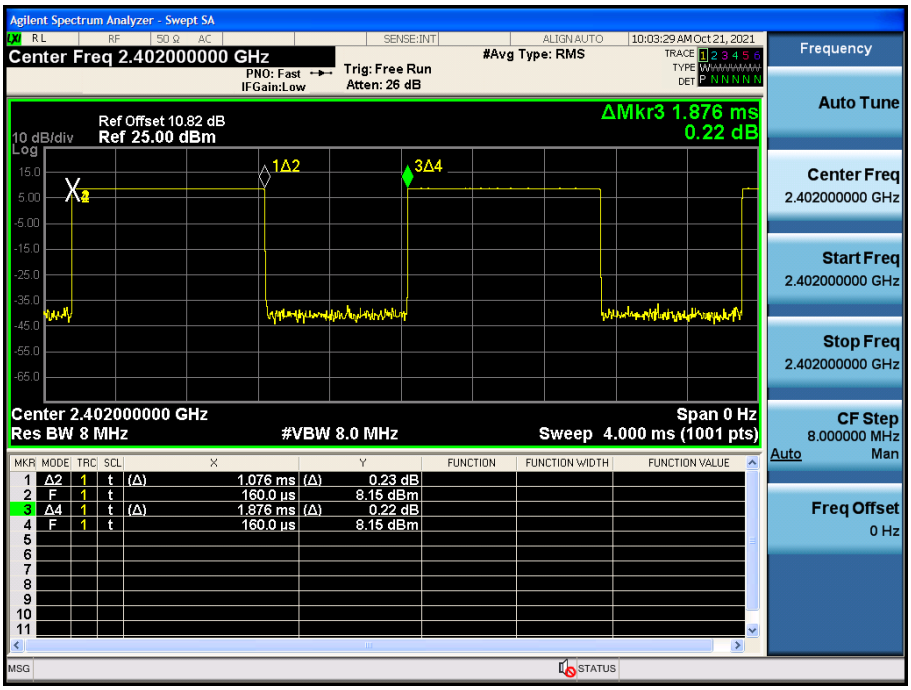
▣ 2 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



▣ 2 M Bit/s (255 Byte) Test Plots

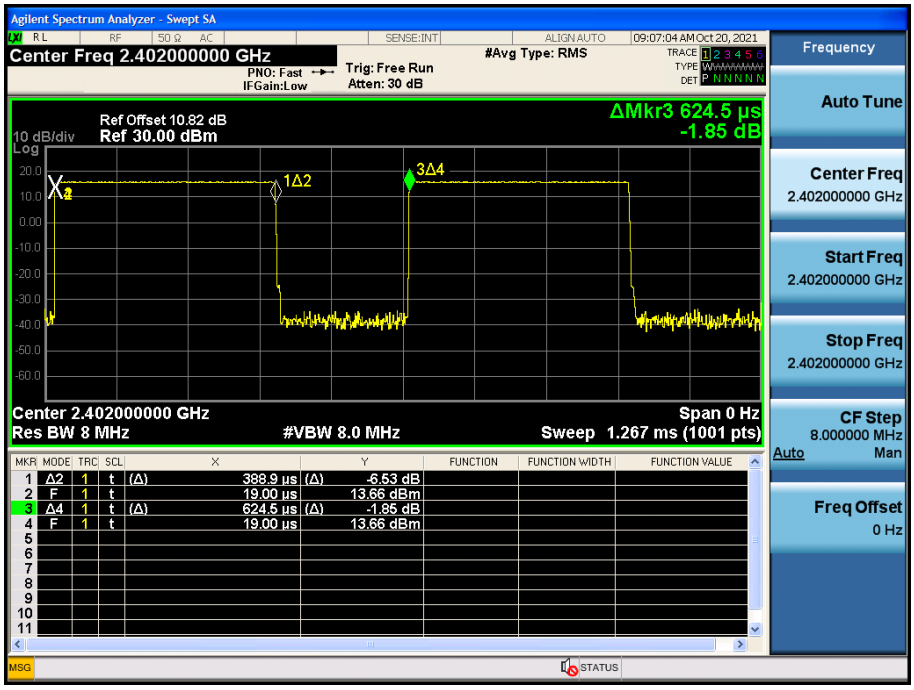
Duty Cycle (Low-CH 0)



High Power

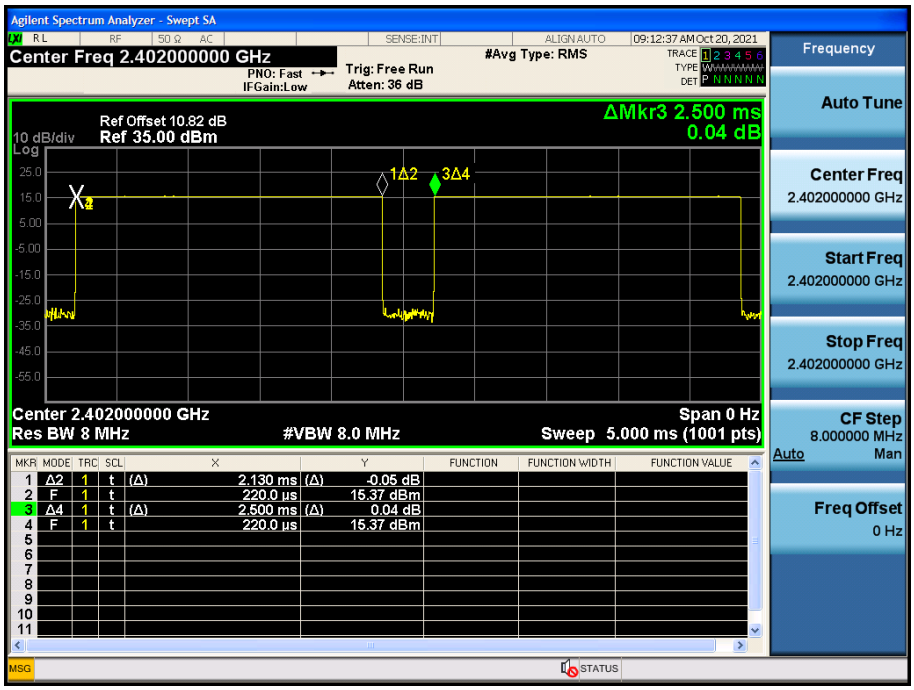
▣ 1 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



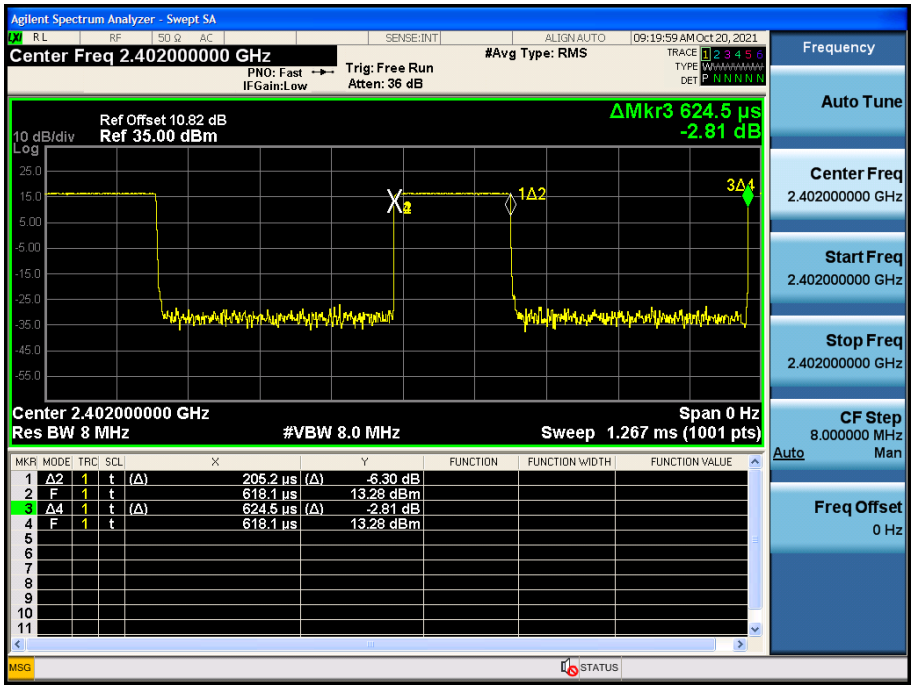
▣ 1 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



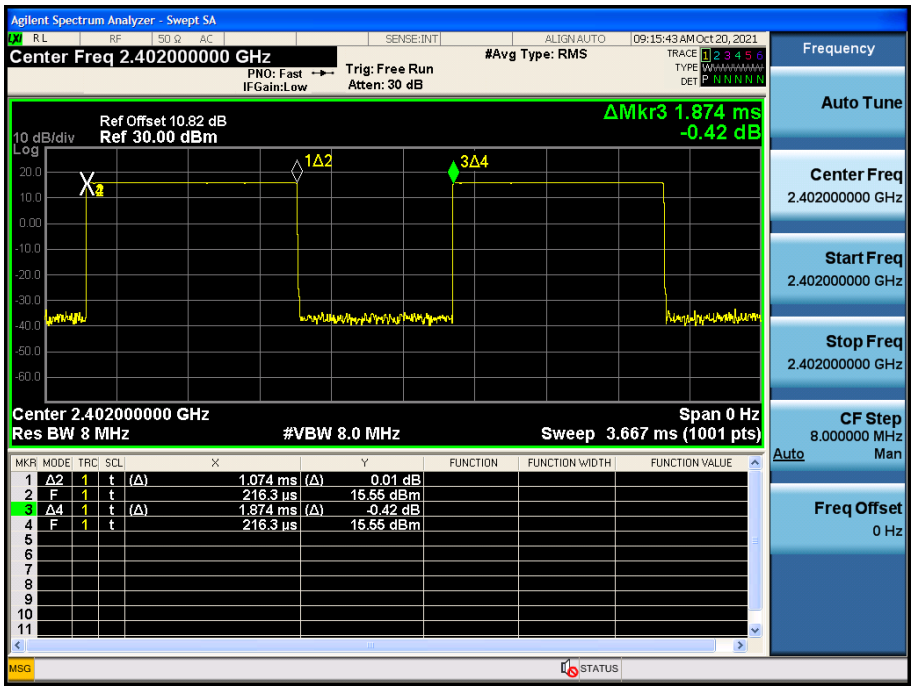
▣ 2 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



▣ 2 M Bit/s (255 Byte) Test Plots

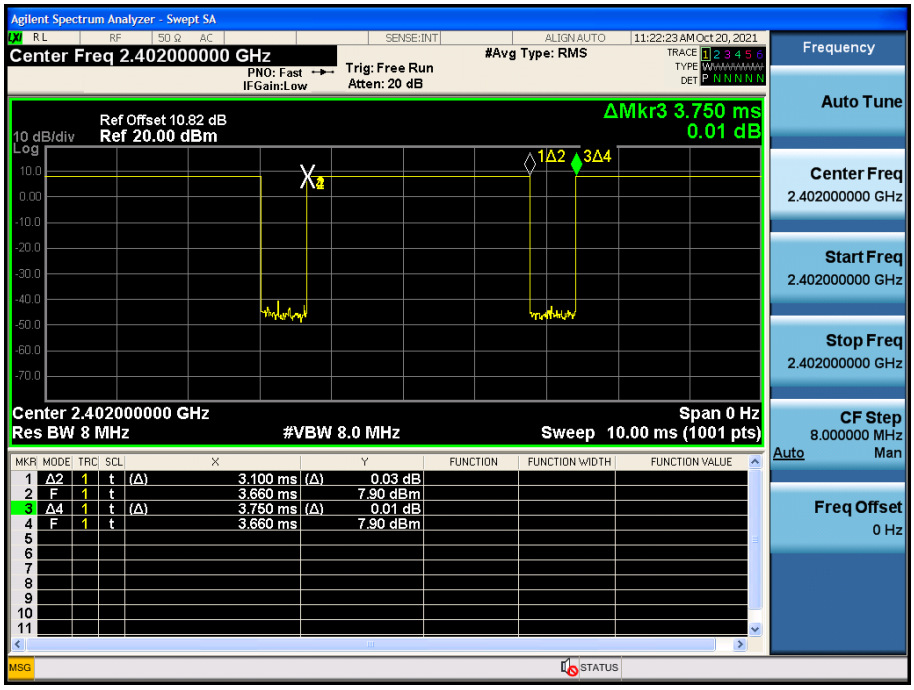
Duty Cycle (Low-CH 0)



[Ant.2]

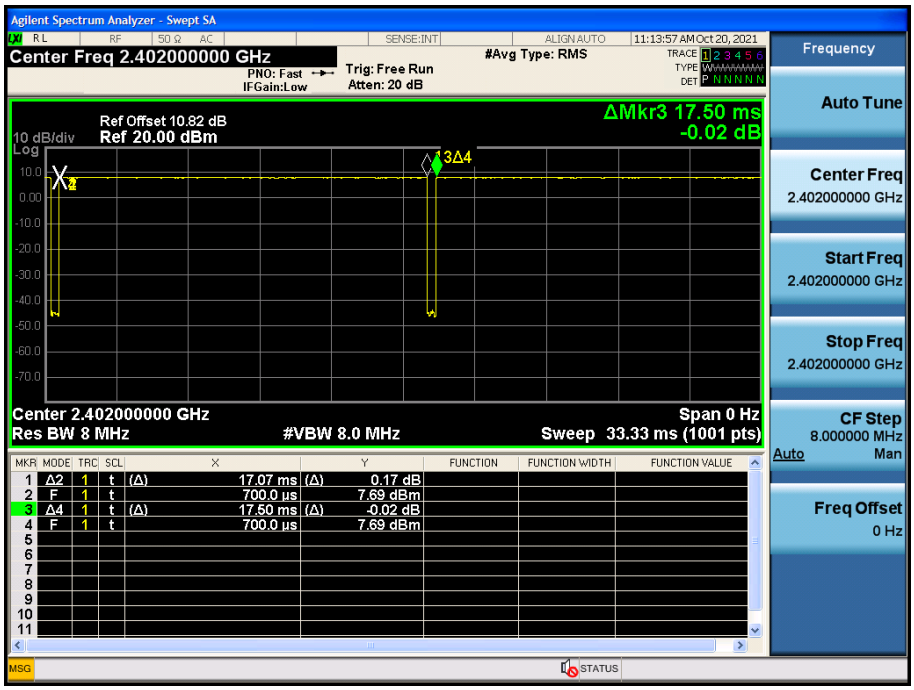
▣ 125 k Bit/s(37 Byte) Test Plots

Duty Cycle (Low-CH 0)



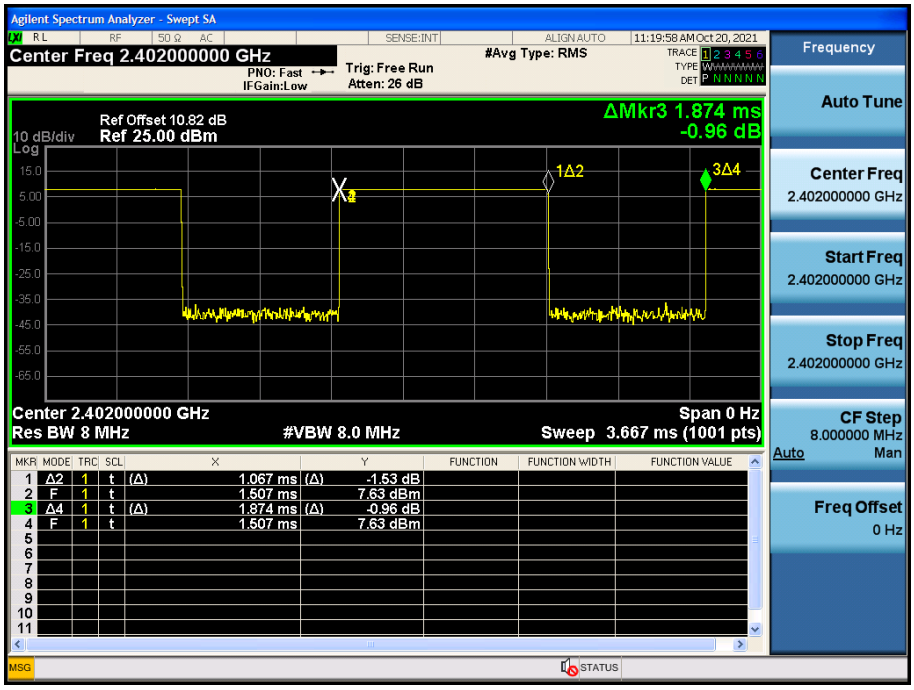
▣ 125 k Bit/s(255 Byte) Test Plots

Duty Cycle (Low-CH 0)



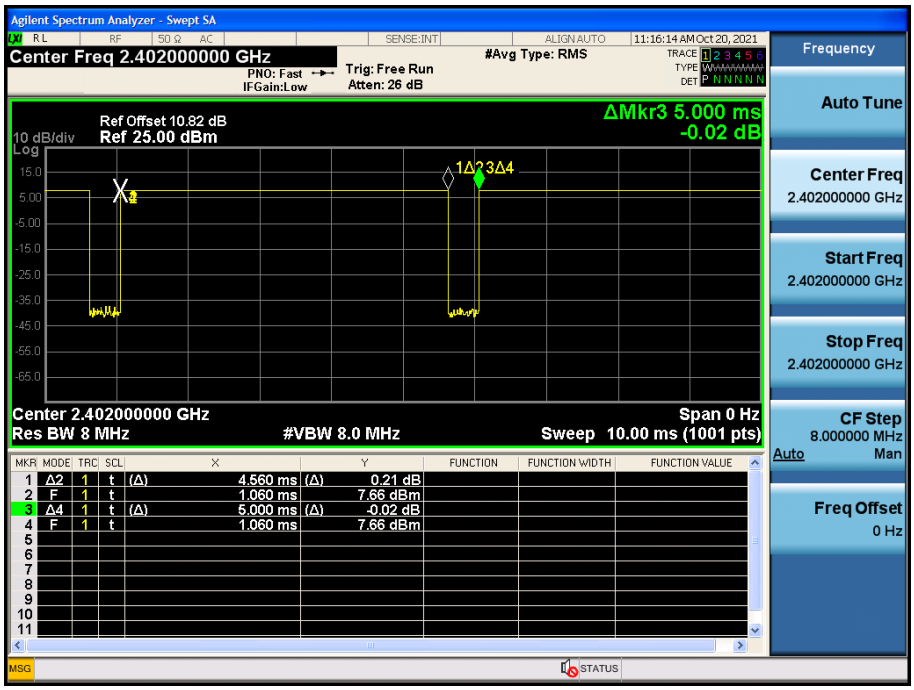
▣ 500 k Bit/s(37 Byte) Test Plots

Duty Cycle (Low-CH 0)



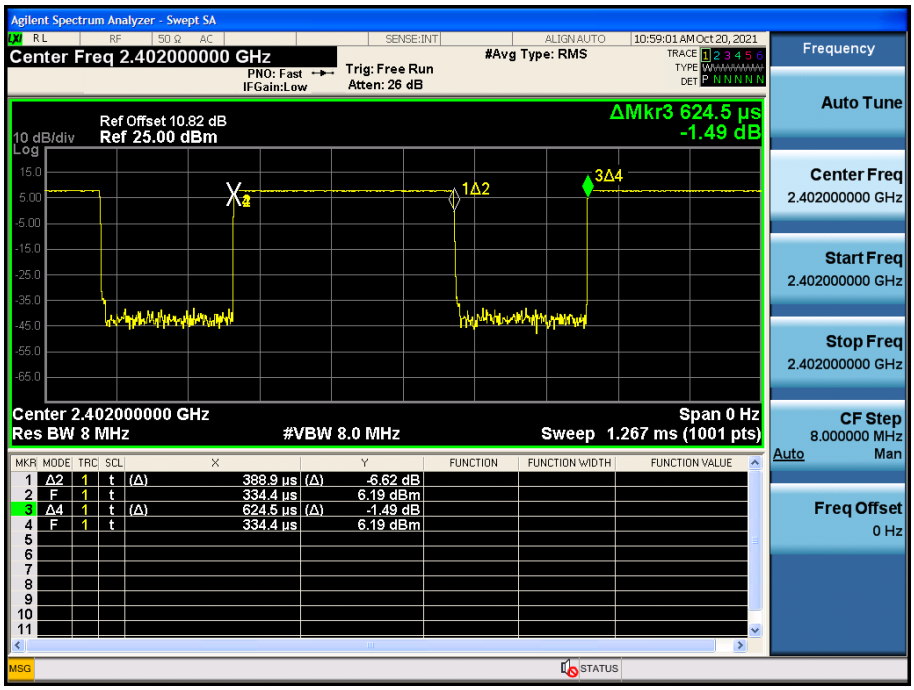
▣ 500 k Bit/s(255 Byte) Test Plots

Duty Cycle (Low-CH 0)



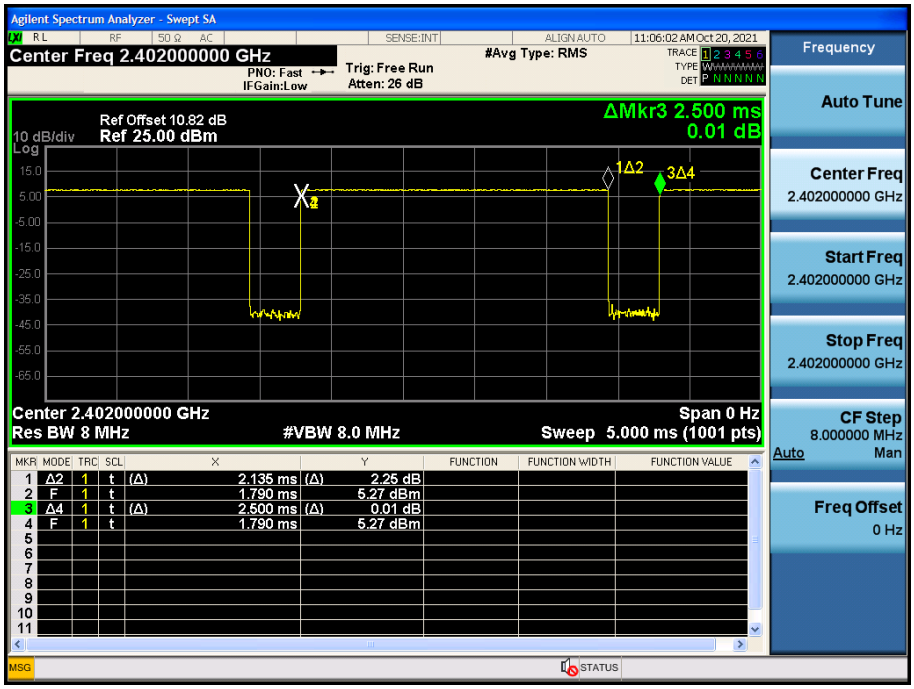
▣ 1 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



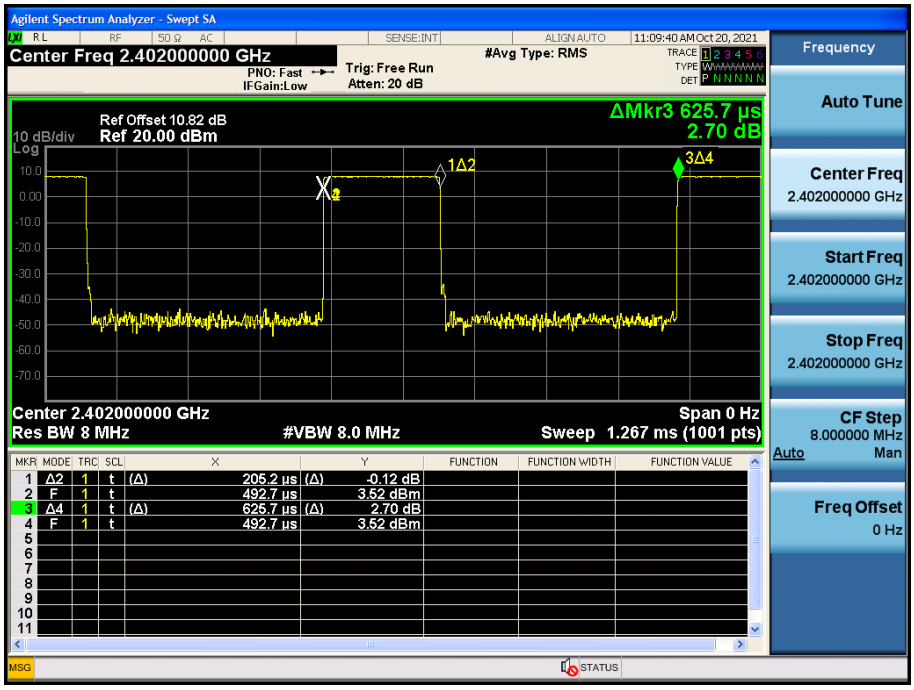
▣ 1 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



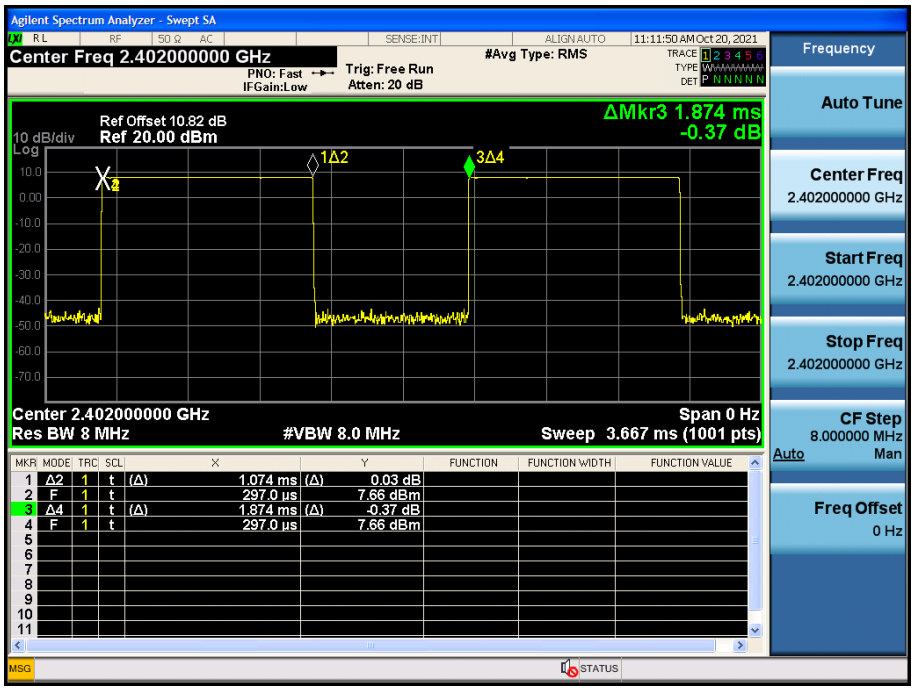
▣ 2 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



▣ 2 M Bit/s (255 Byte) Test Plots

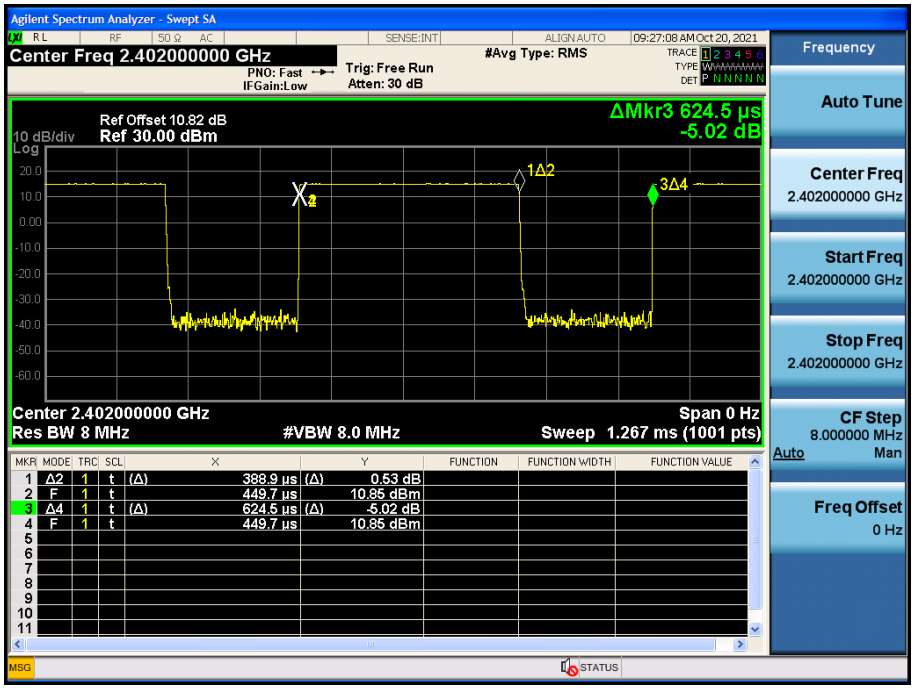
Duty Cycle (Low-CH 0)



High Power

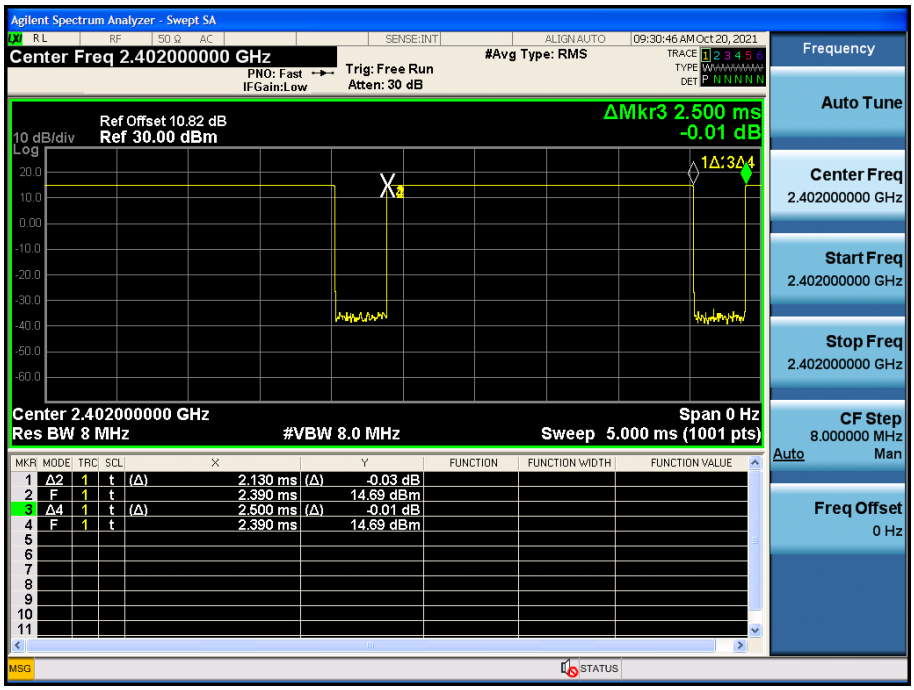
▣ 1 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



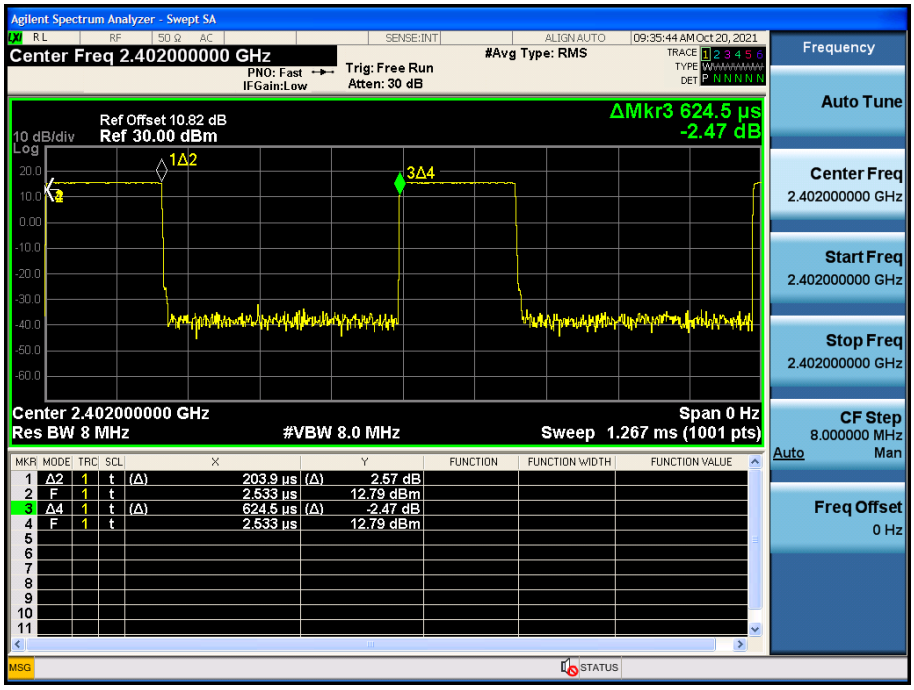
▣ 1 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



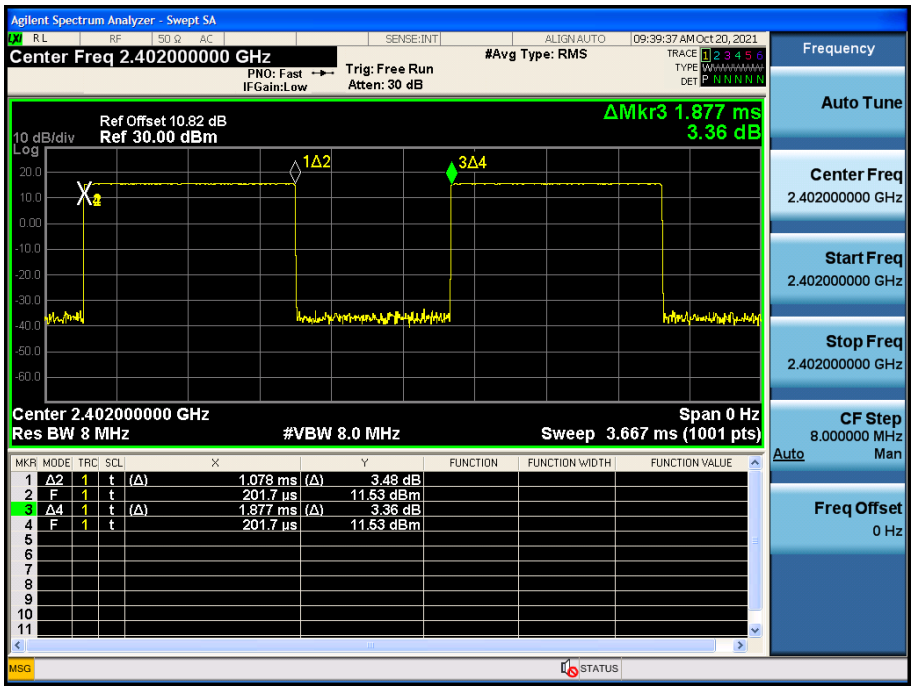
▣ 2 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



▣ 2 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



9.2 6 dB BANDWIDTH

[Ant.1]

Mode (Bit/s)	Channel	6 dB Bandwidth (kHz)	Limit (kHz)
125 k(37 Bytes) Normal Power	0	628.9	> 500
	19	626.8	
	39	625.3	
125 k(255 Bytes) Normal Power	0	627.2	> 500
	19	641.8	
	39	658.3	
500 k(37 Bytes) Normal Power	0	663.8	> 500
	19	665.3	
	39	664.8	
500 k(255 Bytes) Normal Power	0	665.1	> 500
	19	675.9	
	39	663.7	
1 M(37 Bytes) Normal Power	0	669.6	> 500
	19	668.6	
	39	667.4	
1 M(255 Bytes) Normal Power	0	665.2	> 500
	19	668.3	
	39	666.9	
2 M(37 Bytes) Normal Power	0	1138	> 500
	19	1140	
	39	1141	
2 M(255 Bytes) Normal Power	0	1144	> 500
	19	1156	
	39	1152	
1 M(37 Bytes) High Power	0	670.4	> 500
	19	669.1	
	39	668.5	
1 M(255 Bytes) High Power	0	666.6	> 500
	19	665.1	
	39	665.8	
2 M(37 Bytes) High Power	0	1136	> 500
	19	1141	
	39	1143	
2 M(255 Bytes) High Power	0	1145	> 500
	19	1152	
	39	1152	

Note:

Plot of worst case are only reported.

[Worst Case]

125k Bit/s : 37 Bytes (Normal Power)

500k Bit/s : 255 Bytes (Normal Power)

1M Bit/s : 255 Bytes (High Power)

2M Bit/s : 37 Bytes (High Power)

[Ant.2]

Mode (Bit/s)	Channel	6 dB Bandwidth (kHz)	Limit (kHz)
125 k(37 Bytes) Normal Power	0	629.7	> 500
	19	627.3	
	39	630.1	
125 k(255 Bytes) Normal Power	0	635.1	> 500
	19	635.2	
	39	632.7	
500 k(37 Bytes) Normal Power	0	664.5	> 500
	19	665.8	
	39	664.2	
500 k(255 Bytes) Normal Power	0	664.6	> 500
	19	664.6	
	39	663.3	
1 M(37 Bytes) Normal Power	0	670.5	> 500
	19	669.3	
	39	671.7	
1 M(255 Bytes) Normal Power	0	665.4	> 500
	19	665.2	
	39	669.3	
2 M(37 Bytes) Normal Power	0	1137	> 500
	19	1141	
	39	1142	
2 M(255 Bytes) Normal Power	0	1145	> 500
	19	1139	
	39	1157	
1 M(37 Bytes) High Power	0	670.2	> 500
	19	670.6	
	39	669.5	
1 M(255 Bytes) High Power	0	665.7	> 500
	19	669.3	
	39	666.2	
2 M(37 Bytes) High Power	0	1138	> 500
	19	1137	
	39	1141	
2 M(255 Bytes) High Power	0	1147	> 500
	19	1154	
	39	1153	

Note:

Plot of worst case are only reported.

[Worst Case]

125k Bit/s : 37 Bytes (Normal Power)

500k Bit/s : 255 Bytes (Normal Power)

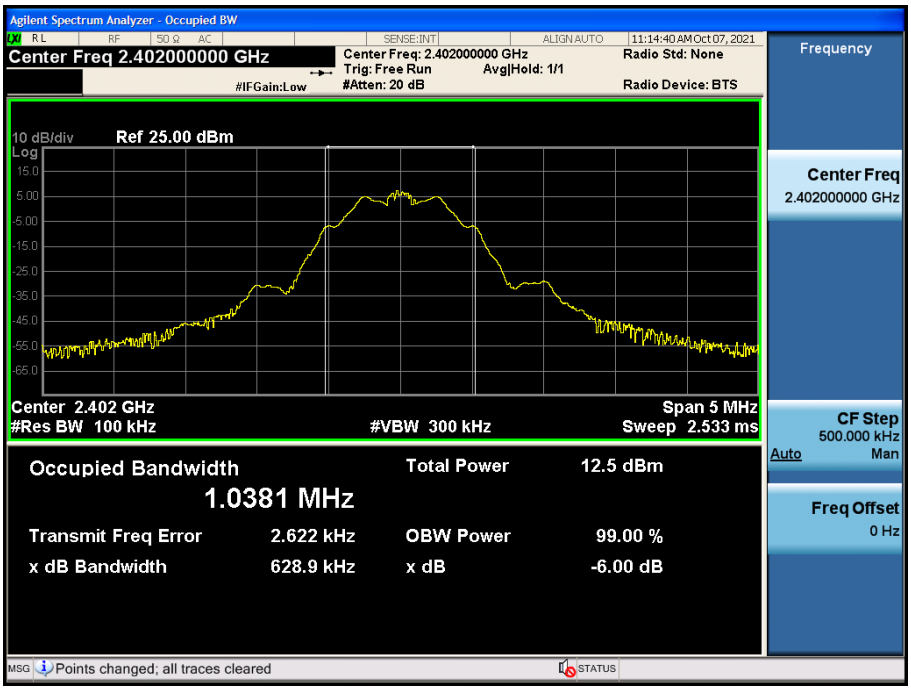
1M Bit/s : 255 Bytes (Normal Power)

2M Bit/s : 37 Bytes (High Power)

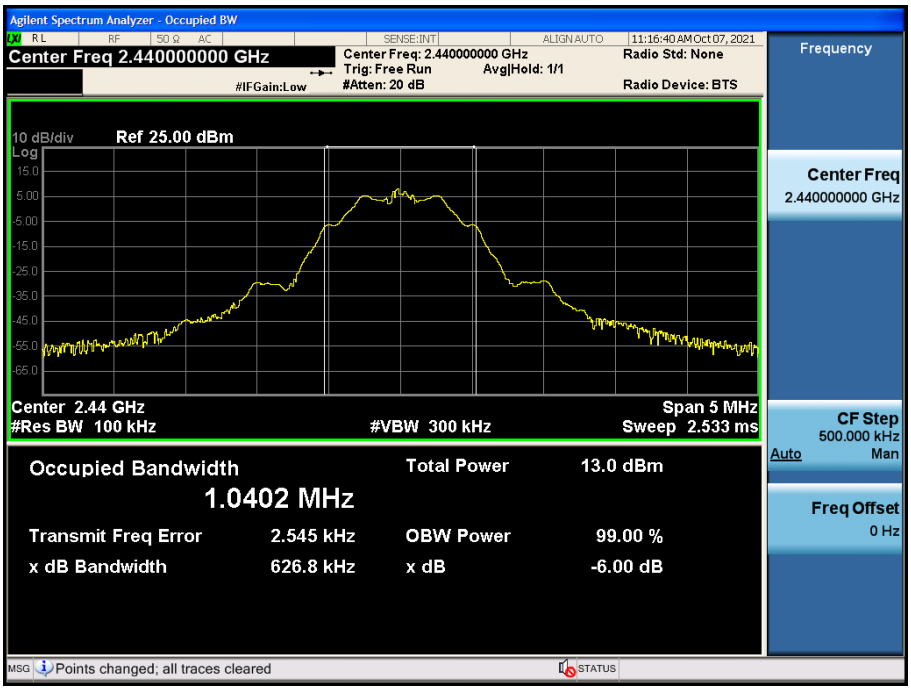
[Ant.1]

▣ 125 k Bit/s(37 Byte) Test Plots

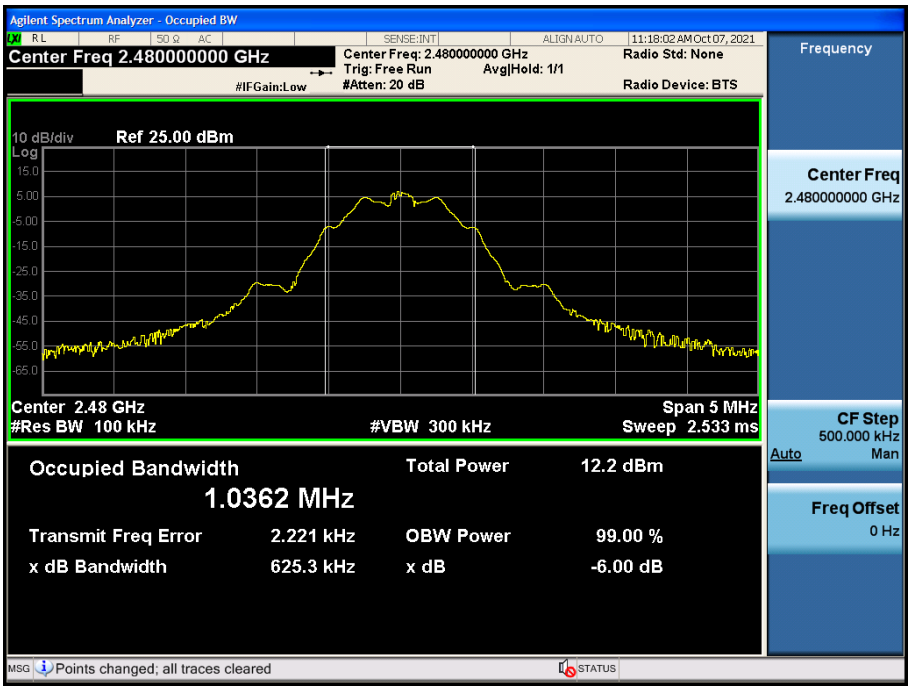
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

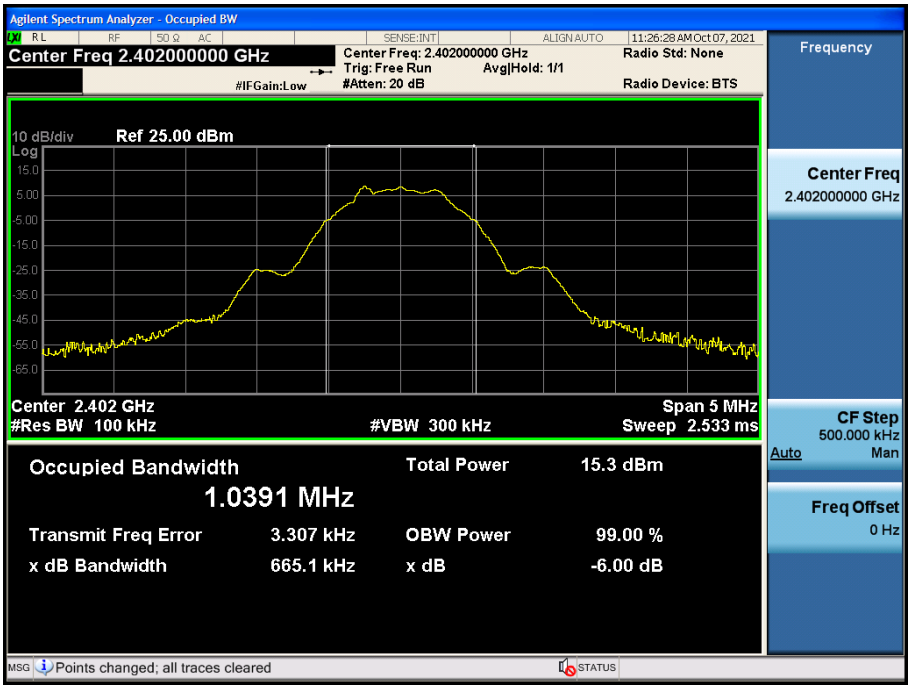


6 dB Bandwidth plot (High-CH 39)

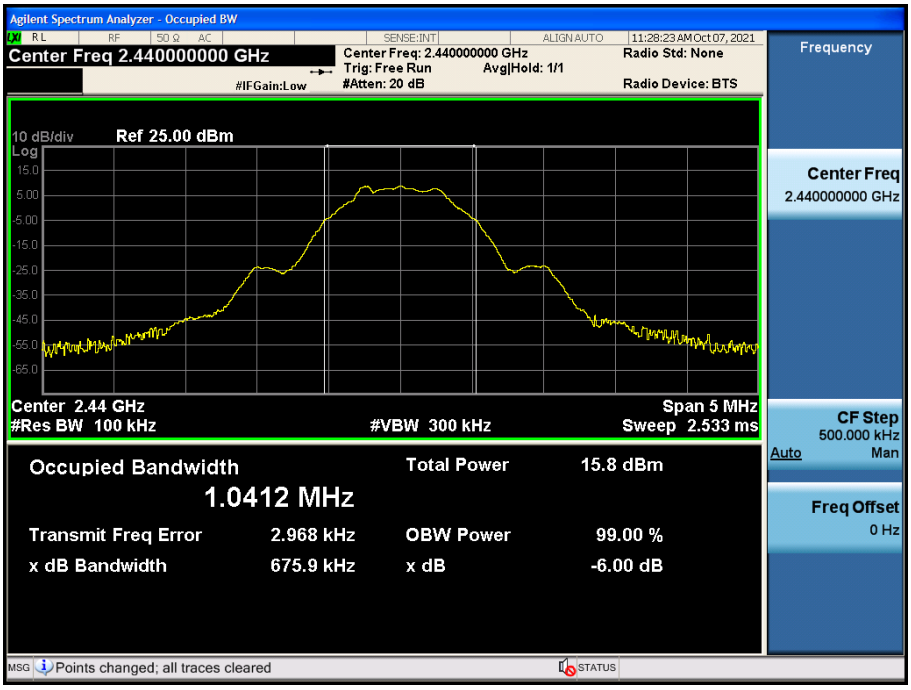


▣ 500 k Bit/s(255 Byte) Test Plots

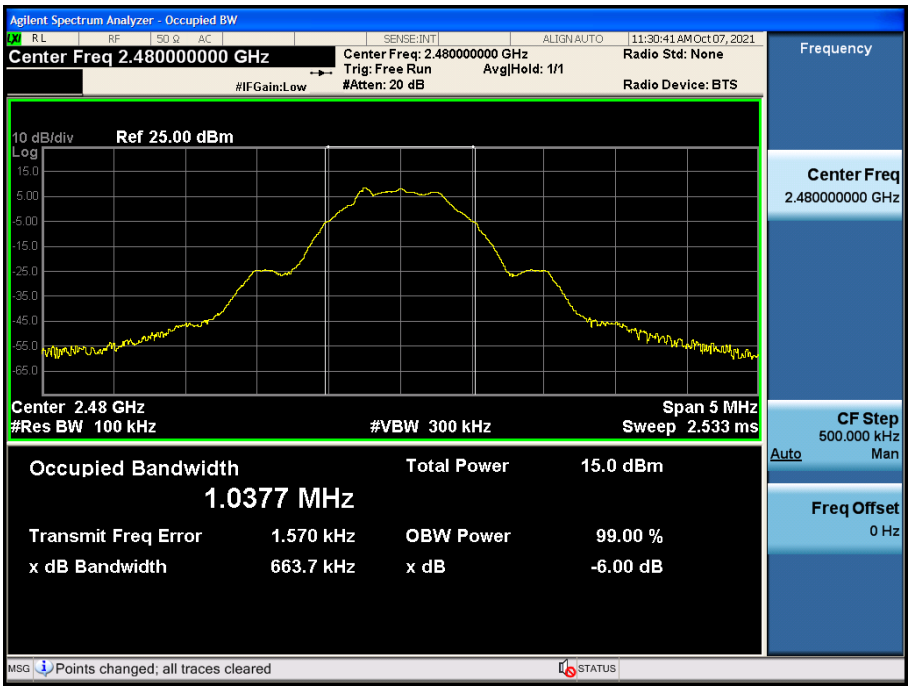
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

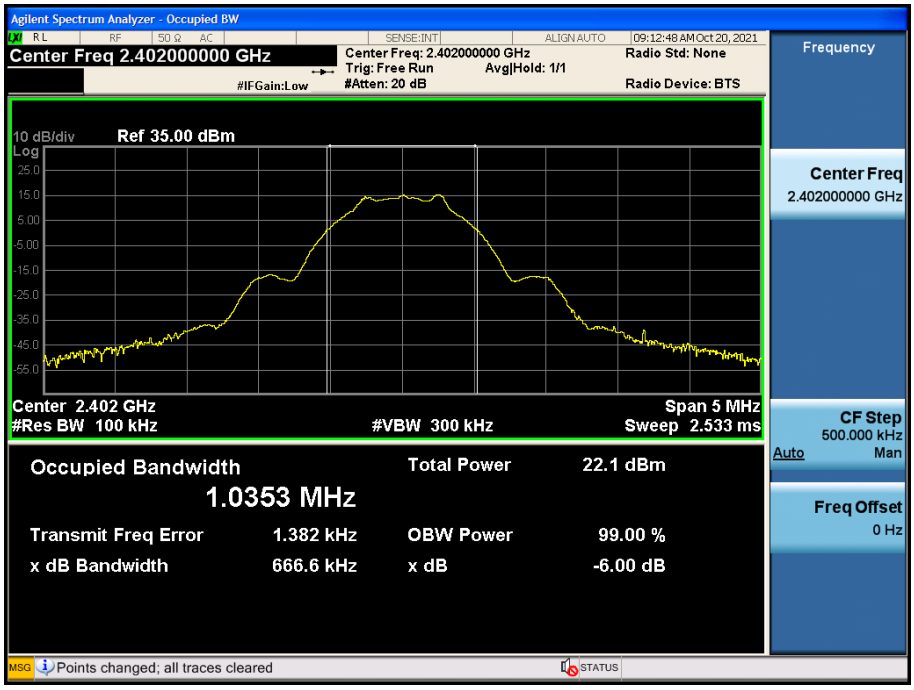


6 dB Bandwidth plot (High-CH 39)

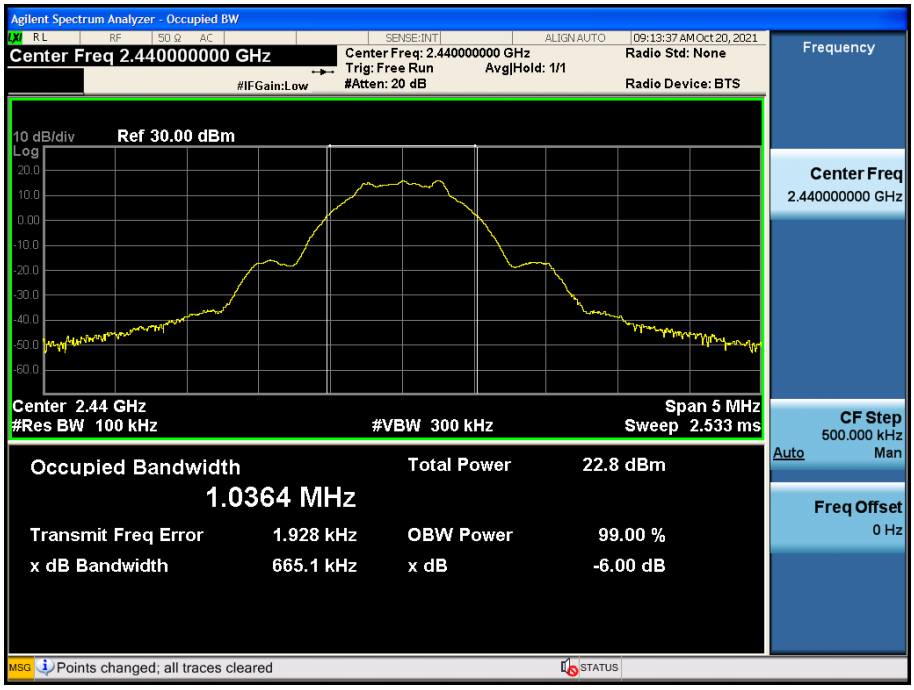


▣ 1 M Bit/s (255 Byte) Test Plots

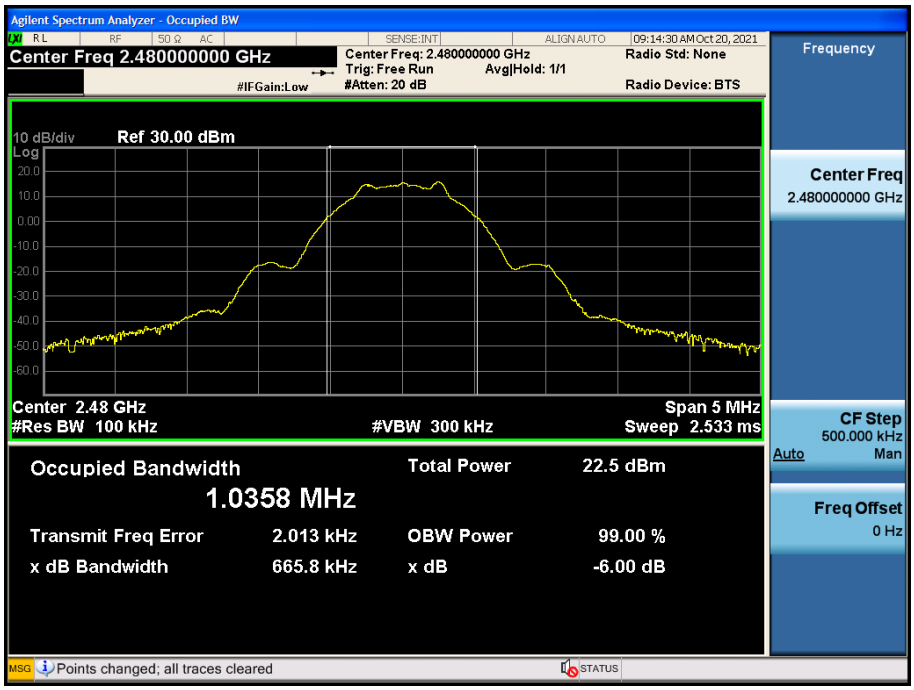
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

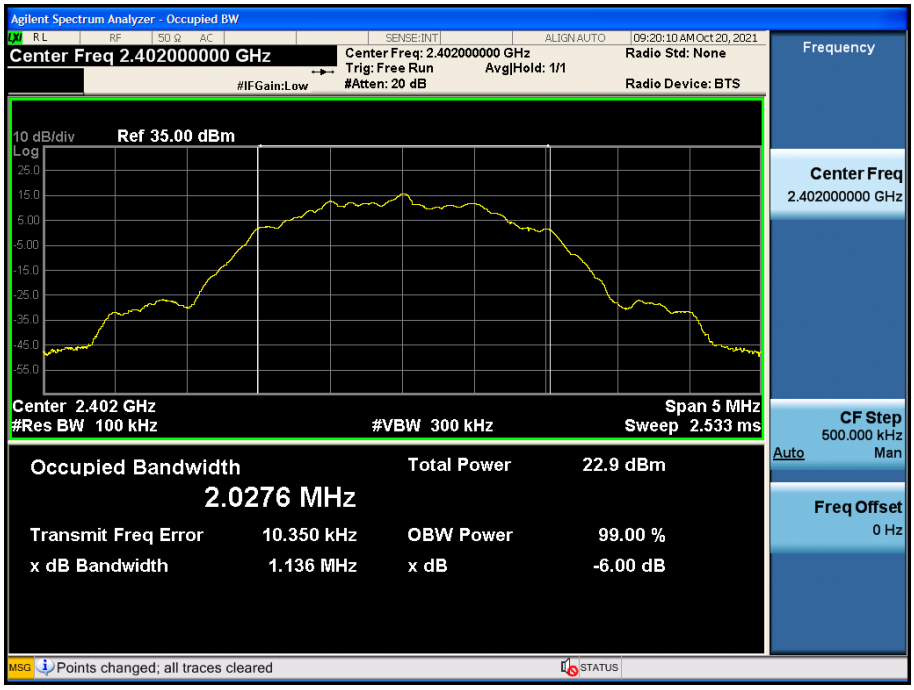


6 dB Bandwidth plot (High-CH 39)



▣ 2 M Bit/s (37 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



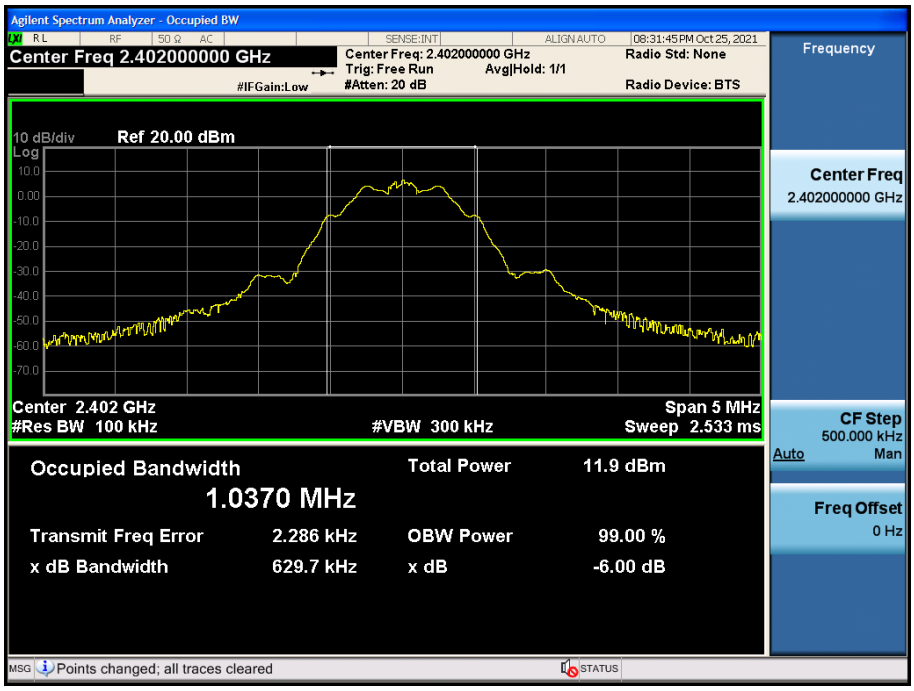
6 dB Bandwidth plot (Mid-CH 19)

6 dB Bandwidth plot (High-CH 39)

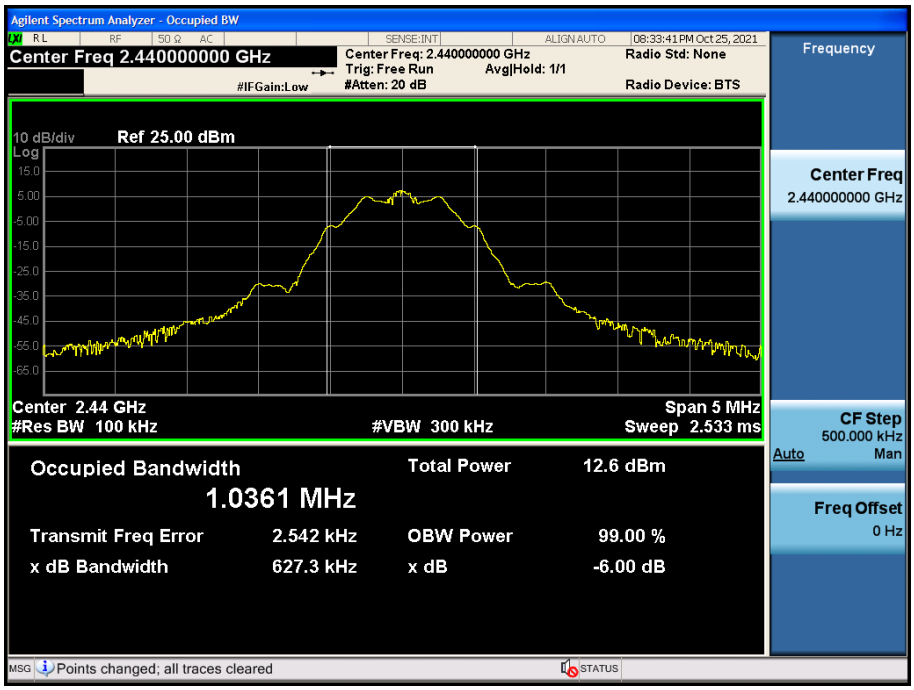
[Ant.2]

▣ 125 k Bit/s(37 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



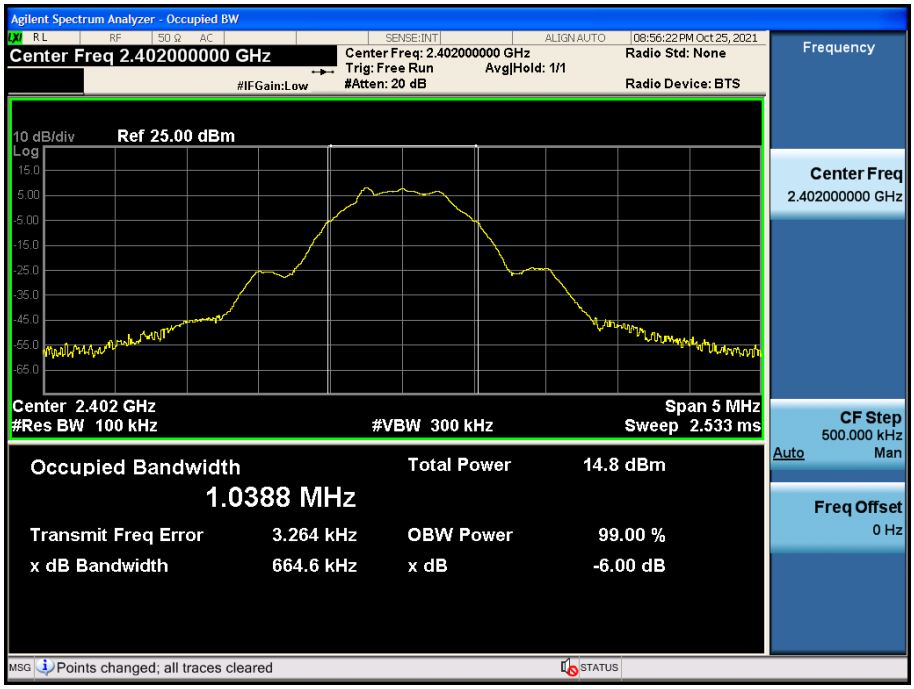
6 dB Bandwidth plot (Mid-CH 19)



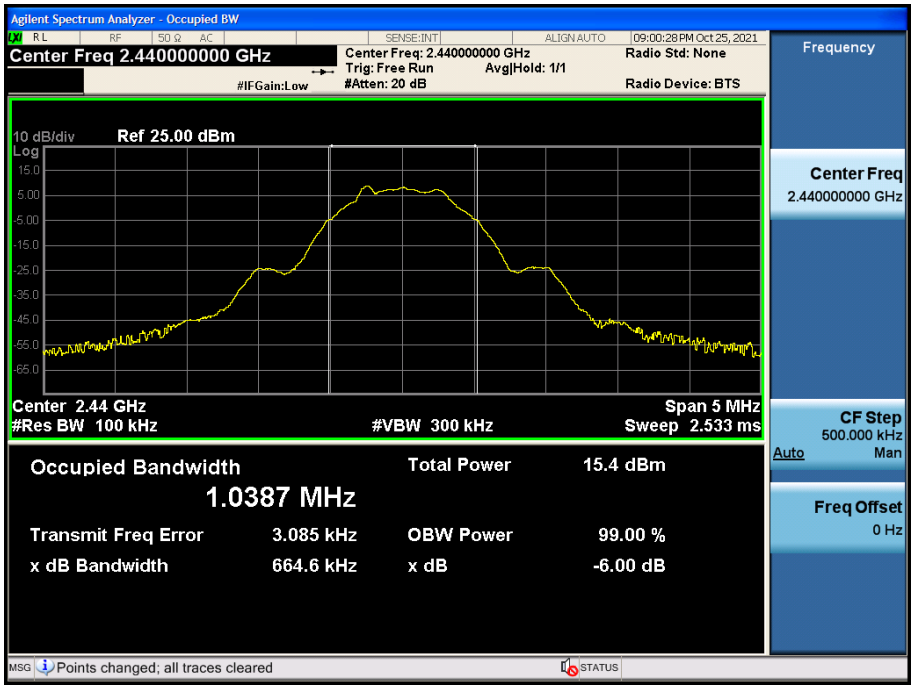
6 dB Bandwidth plot (High-CH 39)

▣ 500 k Bit/s(255 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



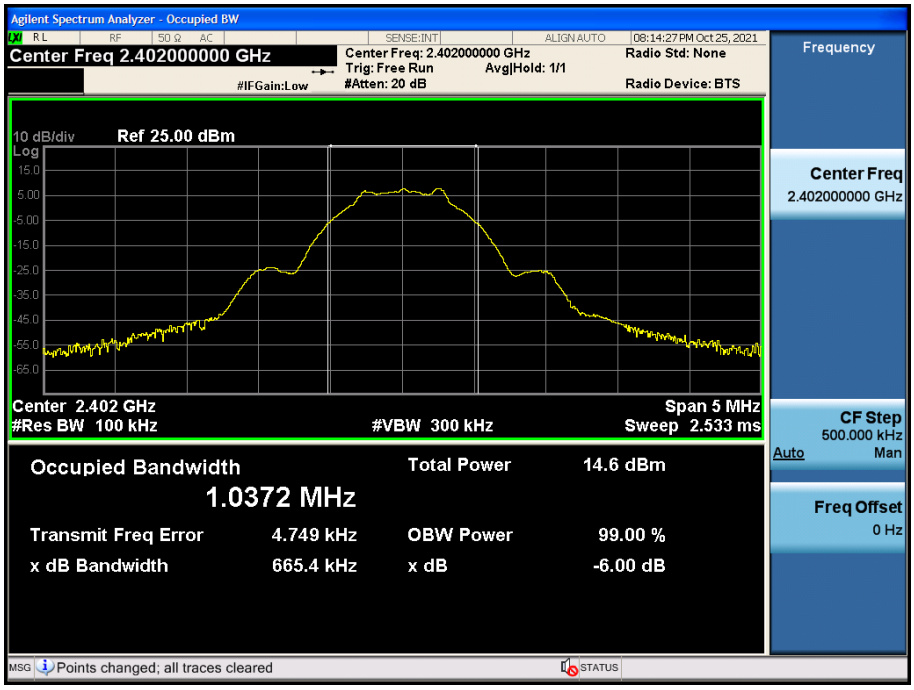
6 dB Bandwidth plot (Mid-CH 19)



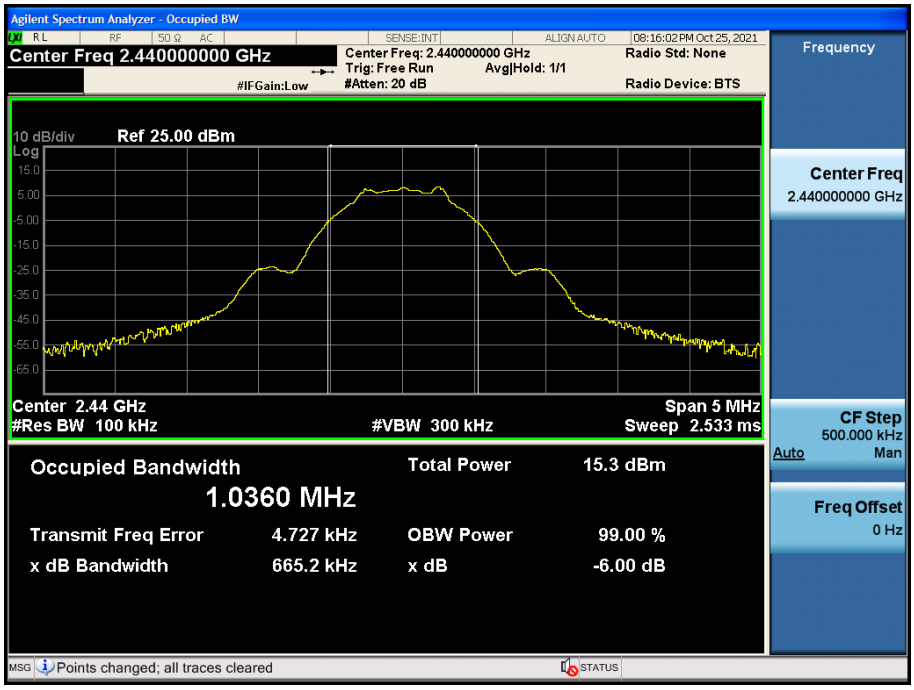
6 dB Bandwidth plot (High-CH 39)

▣ 1 M Bit/s (255 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



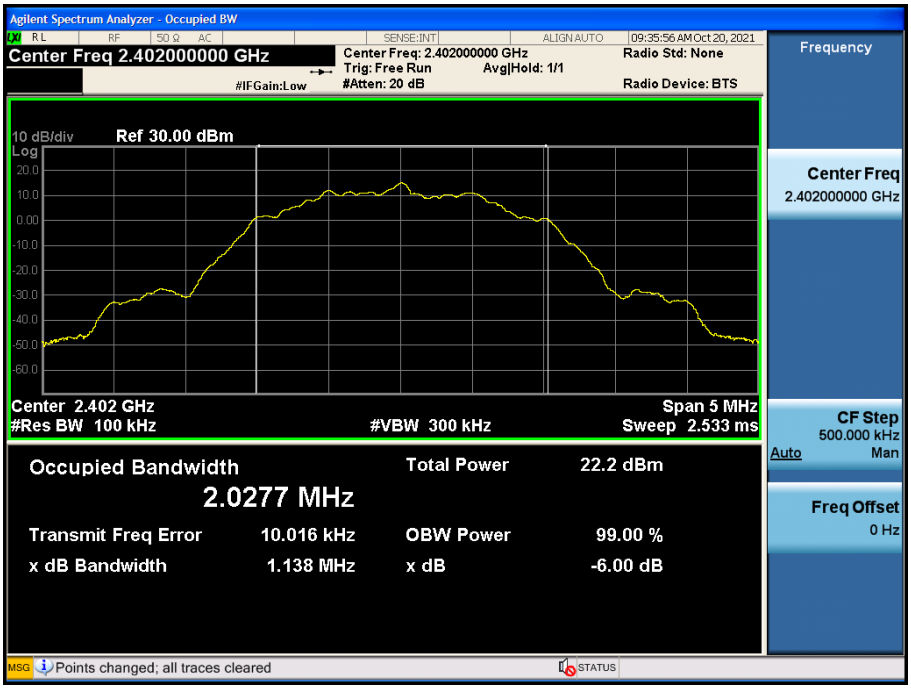
6 dB Bandwidth plot (Mid-CH 19)



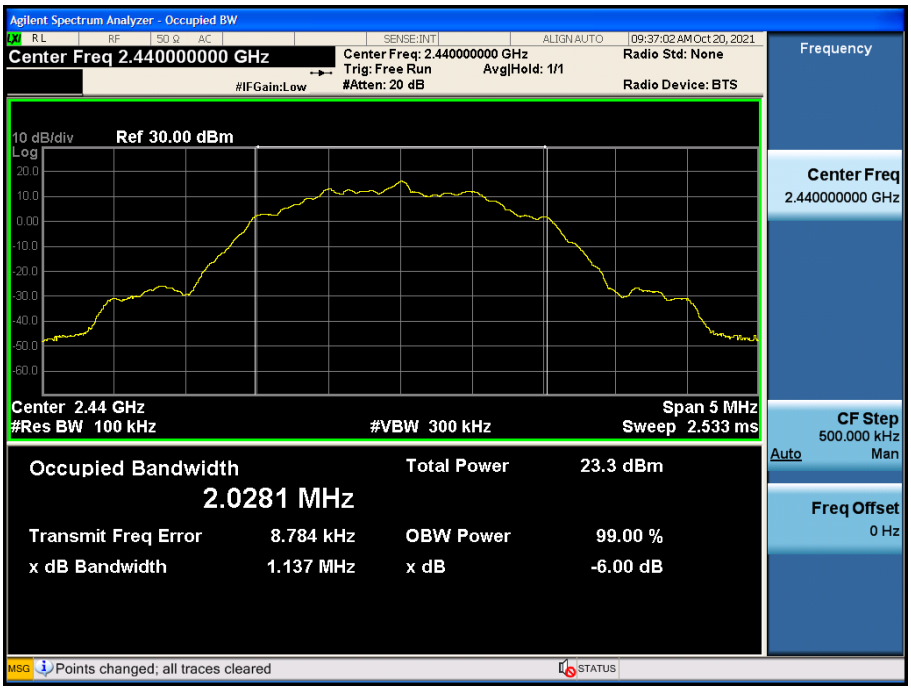
6 dB Bandwidth plot (High-CH 39)

▣ 2 M Bit/s (37 Byte) Test Plots

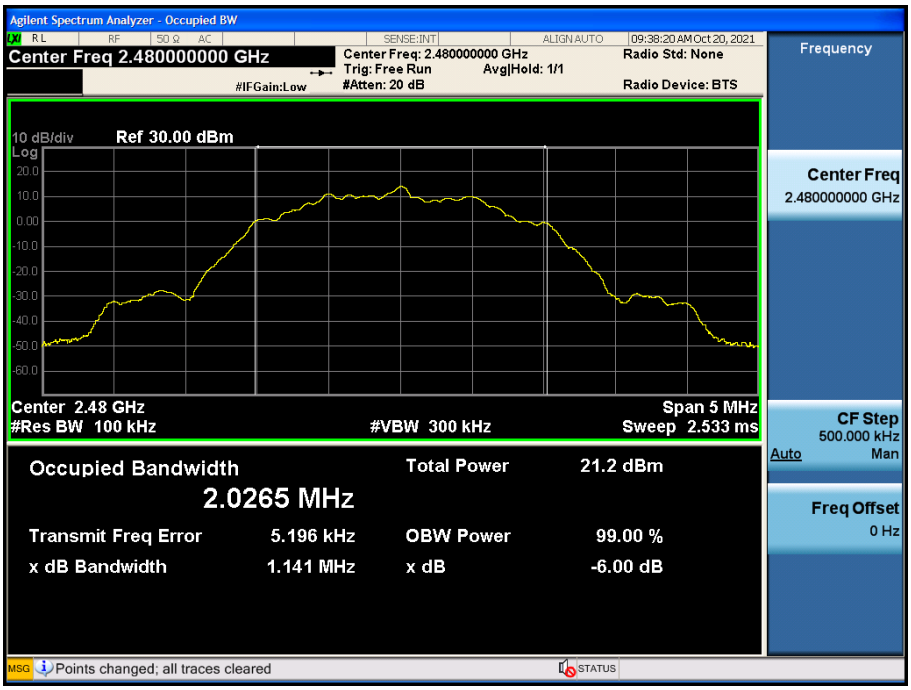
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)



6 dB Bandwidth plot (High-CH 39)



9.3 OUTPUT POWER

[Ant.1]

Peak Power (Normal Power)

Data rate	Packet length	LE Mode		Measured Power(dBm)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		
125k	37	2402	0	8.749	30
		2440	19	9.322	
		2480	39	8.470	
	255	2402	0	8.663	
		2440	19	9.231	
		2480	39	8.396	
500k	37	2402	0	8.822	
		2440	19	9.373	
		2480	39	8.546	
	255	2402	0	8.756	
		2440	19	9.299	
		2480	39	8.452	
1M	37	2402	0	8.778	
		2440	19	9.324	
		2480	39	8.464	
	255	2402	0	8.750	
		2440	19	9.289	
		2480	39	8.448	
2M	37	2402	0	8.750	
		2440	19	9.143	
		2480	39	8.388	
	255	2402	0	8.679	
		2440	19	9.243	
		2480	39	8.472	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

Peak Power (High Power Power)

Data rate	Packet length	LE Mode		Measured Power(dBm)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		
1M	37	2402	0	16.005	30
		2440	19	16.807	
		2480	39	16.665	
	255	2402	0	15.756	
		2440	19	16.466	
		2480	39	16.106	
2M	37	2402	0	16.610	
		2440	19	17.400	
		2480	39	17.398	
	255	2402	0	16.381	
		2440	19	17.040	
		2480	39	16.783	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

Average Power (Normal Power)

Data rate	Packet length	LE Mode		Measured Power (dBm)	Duty Cycle Factor	Result	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		(dB)	(dBm)	
125k	37	2402	0	7.78	0.83	8.61	30
		2440	19	8.36	0.83	9.19	
		2480	39	7.46	0.83	8.29	
	255	2402	0	8.45	0.11	8.56	
		2440	19	8.96	0.11	9.07	
		2480	39	8.13	0.11	8.24	
500k	37	2402	0	6.35	2.45	8.80	
		2440	19	6.71	2.45	9.16	
		2480	39	5.99	2.45	8.44	
	255	2402	0	8.19	0.40	8.59	
		2440	19	8.60	0.40	9.00	
		2480	39	7.86	0.40	8.26	
1M	37	2402	0	6.59	2.07	8.66	
		2440	19	7.13	2.07	9.20	
		2480	39	6.18	2.07	8.25	
	255	2402	0	7.88	0.69	8.57	
		2440	19	8.47	0.69	9.16	
		2480	39	7.61	0.69	8.30	
2M	37	2402	0	3.42	4.83	8.25	
		2440	19	4.09	4.83	8.92	
		2480	39	3.14	4.83	7.97	
	255	2402	0	5.82	2.41	8.23	
		2440	19	6.32	2.41	8.73	
		2480	39	5.49	2.41	7.90	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

Average Power (High Power)

Data rate	Packet length	LE Mode		Measured Power (dBm)	Duty Cycle Factor	Result	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		(dB)	(dBm)	
1M	37	2402	0	13.62	2.06	15.68	30
		2440	19	14.31	2.06	16.37	
		2480	39	14.16	2.06	16.22	
	255	2402	0	14.64	0.70	15.34	
		2440	19	15.26	0.70	15.96	
		2480	39	15.12	0.70	15.82	
2M	37	2402	0	11.11	4.83	15.94	
		2440	19	11.65	4.83	16.48	
		2480	39	11.50	4.83	16.33	
	255	2402	0	13.20	2.42	15.62	
		2440	19	13.79	2.42	16.21	
		2480	39	13.73	2.42	16.15	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

[Ant.2]

Peak Power (Normal Power)

Data rate (Bit/s)	Packet length (Byte)	LE Mode		Measured Power(dBm)	Limit (dBm)
		Frequency [MHz]	Channel		
125k	37	2402	0	8.080	30
		2440	19	8.740	
		2480	39	6.703	
	255	2402	0	8.035	
		2440	19	8.704	
		2480	39	6.628	
500k	37	2402	0	8.141	
		2440	19	8.797	
		2480	39	6.818	
	255	2402	0	8.167	
		2440	19	8.851	
		2480	39	6.775	
1M	37	2402	0	8.000	
		2440	19	8.629	
		2480	39	6.591	
	255	2402	0	7.997	
		2440	19	8.649	
		2480	39	6.642	
2M	37	2402	0	8.239	
		2440	19	8.929	
		2480	39	6.871	
	255	2402	0	8.244	
		2440	19	8.875	
		2480	39	6.794	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

Peak Power (High Power)

Data rate	Packet length	LE Mode		Measured Power(dBm)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		
1M	37	2402	0	15.404	30
		2440	19	16.476	
		2480	39	14.373	
	255	2402	0	15.150	
		2440	19	16.215	
		2480	39	14.083	
2M	37	2402	0	15.913	
		2440	19	16.997	
		2480	39	14.919	
	255	2402	0	15.649	
		2440	19	16.687	
		2480	39	14.521	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

Average Power (Normal Power)

Data rate	Packet length	LE Mode		Measured Power (dBm)	Duty Cycle Factor	Result	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		(dB)	(dBm)	
125k	37	2402	0	7.03	0.83	7.86	30
		2440	19	7.63	0.83	8.46	
		2480	39	5.65	0.83	6.48	
	255	2402	0	7.53	0.11	7.64	
		2440	19	8.26	0.11	8.37	
		2480	39	6.16	0.11	6.27	
500k	37	2402	0	5.45	2.45	7.90	
		2440	19	5.99	2.45	8.44	
		2480	39	3.94	2.45	6.39	
	255	2402	0	7.35	0.40	7.75	
		2440	19	8.02	0.40	8.42	
		2480	39	5.98	0.40	6.38	
1M	37	2402	0	5.56	2.06	7.62	
		2440	19	6.41	2.06	8.47	
		2480	39	4.20	2.06	6.26	
	255	2402	0	7.14	0.69	7.83	
		2440	19	7.68	0.69	8.37	
		2480	39	5.53	0.69	6.22	
2M	37	2402	0	2.74	4.84	7.58	
		2440	19	3.49	4.84	8.33	
		2480	39	1.42	4.84	6.26	
	255	2402	0	5.25	2.42	7.67	
		2440	19	5.88	2.42	8.30	
		2480	39	3.92	2.42	6.34	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

Average Power (High Power)

Data rate	Packet length	LE Mode		Measured Power (dBm)	Duty Cycle Factor	Result	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		(dB)	(dBm)	
1M	37	2402	0	12.82	2.06	14.88	30
		2440	19	13.85	2.06	15.91	
		2480	39	11.71	2.06	13.77	
	255	2402	0	14.14	0.70	14.84	
		2440	19	15.10	0.70	15.80	
		2480	39	12.87	0.70	13.57	
2M	37	2402	0	10.42	4.86	15.28	
		2440	19	11.35	4.86	16.21	
		2480	39	9.28	4.86	14.14	
	255	2402	0	12.66	2.41	15.07	
		2440	19	13.66	2.41	16.07	
		2480	39	11.63	2.41	14.04	

Note :

1. Power meter offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.

9.4 POWER SPECTRAL DENSITY

[Ant.1]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
2402	0	125 k 37 Bytes Normal Power	1.890	0.83	2.721	8 dBm / 3 kHz
2440	19		2.318	0.83	3.149	
2480	39		1.535	0.83	2.366	
2402	0	125 k 255 Bytes Normal Power	2.543	0.11	2.652	
2440	19		3.147	0.11	3.256	
2480	39		2.115	0.11	2.224	
2402	0	500 k 37 Bytes Normal Power	-0.399	2.45	2.046	
2440	19		-0.583	2.45	1.862	
2480	39		-1.068	2.45	1.377	
2402	0	500 k 255 Bytes Normal Power	1.436	0.40	1.836	
2440	19		2.136	0.40	2.536	
2480	39		1.437	0.40	1.837	
2402	0	1 MBit/s 37 Bytes Normal Power	0.523	2.07	2.589	
2440	19		0.705	2.07	2.771	
2480	39		0.183	2.07	2.249	
2402	0	1 MBit/s 255 Bytes Normal Power	1.216	0.69	1.901	
2440	19		1.976	0.69	2.661	
2480	39		1.050	0.69	1.735	
2402	0	2 MBit/s 37 Bytes Normal Power	-3.020	4.83	1.814	
2440	19		-3.844	4.83	0.990	
2480	39		-4.082	4.83	0.752	
2402	0	2 MBit/s 255 Bytes Normal Power	-1.490	2.41	0.924	
2440	19		-2.581	2.41	-0.167	
2480	39		-3.081	2.41	-0.667	
2402	0	1 MBit/s 37 Bytes High Power	3.184	2.06	5.241	
2440	19		4.314	2.06	6.371	
2480	39		3.654	2.06	5.711	
2402	0	1 MBit/s 255 Bytes High Power	3.619	0.70	4.315	
2440	19		4.448	0.70	5.144	
2480	39		3.728	0.70	4.424	
2402	0	2 MBit/s 37 Bytes High Power	0.376	4.83	5.210	
2440	19		0.343	4.83	5.177	
2480	39		0.723	4.83	5.557	
2402	0	2 MBit/s 255 Bytes High Power	0.084	2.42	2.500	
2440	19		0.094	2.42	2.510	
2480	39		0.033	2.42	2.449	

Note :

1. Spectrum measured Value not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.82 dB is offset for 2.4 GHz Band.
4. Plot of worst case are only reported.
   [Worst Case] :1 MBit/s (37 Bytes) High Power

[Ant.2]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Measured Power (dBm)	Duty Cycle Factor (dB)	Measured Power(dBm) + Duty Cycle Factor(dB)	Limit (dBm)
2402	0	125 k 37 Bytes Normal Power	1.109	0.83	1.936	8 dBm / 3 kHz
2440	19		1.909	0.83	2.736	
2480	39		-0.025	0.83	0.802	
2402	0	125 k 255 Bytes Normal Power	1.794	0.11	1.903	
2440	19		2.529	0.11	2.638	
2480	39		0.598	0.11	0.707	
2402	0	500 k 37 Bytes Normal Power	-1.411	2.45	1.034	
2440	19		-0.789	2.45	1.656	
2480	39		-2.417	2.45	0.028	
2402	0	500 k 255 Bytes Normal Power	0.979	0.40	1.379	
2440	19		1.439	0.40	1.839	
2480	39		-0.273	0.40	0.127	
2402	0	1 MBit/s 37 Bytes Normal Power	-0.391	2.06	1.666	
2440	19		0.578	2.06	2.635	
2480	39		-1.112	2.06	0.945	
2402	0	1 MBit/s 255 Bytes Normal Power	0.467	0.69	1.152	
2440	19		0.808	0.69	1.493	
2480	39		-0.846	0.69	-0.161	
2402	0	2 MBit/s 37 Bytes Normal Power	-3.694	4.84	1.148	
2440	19		-3.368	4.84	1.474	
2480	39		-4.884	4.84	-0.042	
2402	0	2 MBit/s 255 Bytes Normal Power	-1.715	2.42	0.701	
2440	19		-2.631	2.42	-0.215	
2480	39		-4.152	2.42	-1.736	
2402	0	1 MBit/s 37 Bytes High Power	2.194	2.06	4.251	
2440	19		3.338	2.06	5.395	
2480	39		1.050	2.06	3.107	
2402	0	1 MBit/s 255 Bytes High Power	2.796	0.70	3.492	
2440	19		3.494	0.70	4.190	
2480	39		1.422	0.70	2.118	
2402	0	2 MBit/s 37 Bytes High Power	-0.589	4.86	4.271	
2440	19		1.212	4.86	6.072	
2480	39		-1.247	4.86	3.613	
2402	0	2 MBit/s 255 Bytes High Power	-1.158	2.41	1.251	
2440	19		-0.099	2.41	2.310	
2480	39		-1.967	2.41	0.442	

Note :

1. Spectrum measured Value not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 20.52 dB is offset for 2.4 GHz Band.
4. Plot of worst case are only reported.
   [Worst Case] : 2 MBit/s (37 Byte) High Power

[Ant.1]

▣ 1 M Bit/s (37 Byte) Test Plots(High Power)

Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)

Power Spectral Density (High-CH 39)

[Ant.2]

▣ 2 M Bit/s (37 Byte) Test Plots_High Power

Power Spectral Density (Low-CH 0)

Power Spectral Density (Mid-CH 19)

Power Spectral Density (High-CH 39)

9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.
In order to simplify the report, attached plots were only the worst case channel and data rate.

[Ant.1]

▣ 2 M Bit/s (37 Byte) Test Plots –Band Edge(High Power)

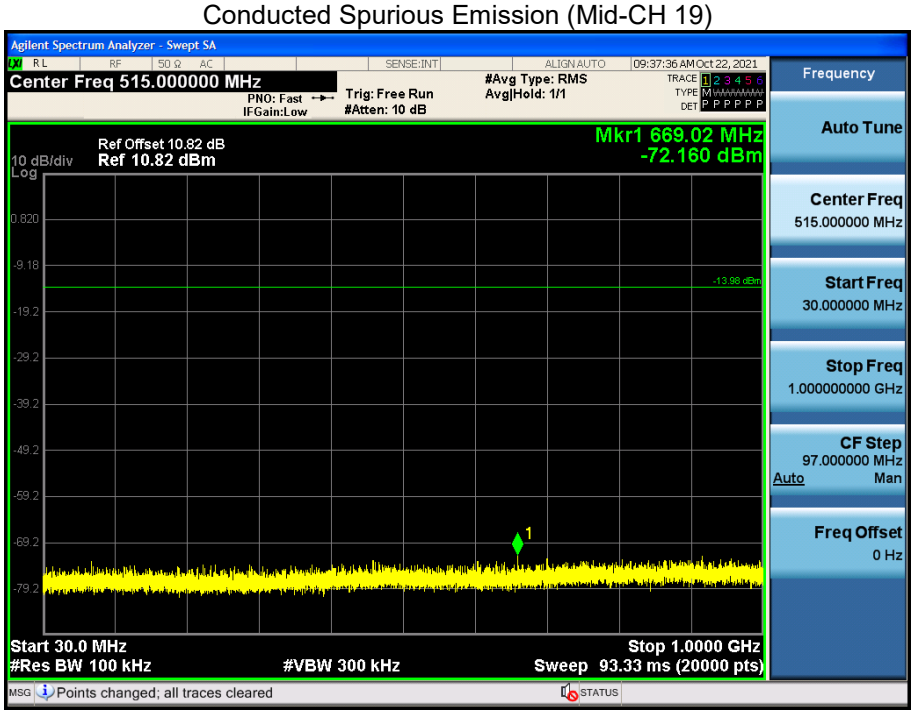
Low-CH 0

High-CH 39

▣ 1 M Bit/s (37 Byte) Test Plots -Conducted Spurious Emission(High Power)

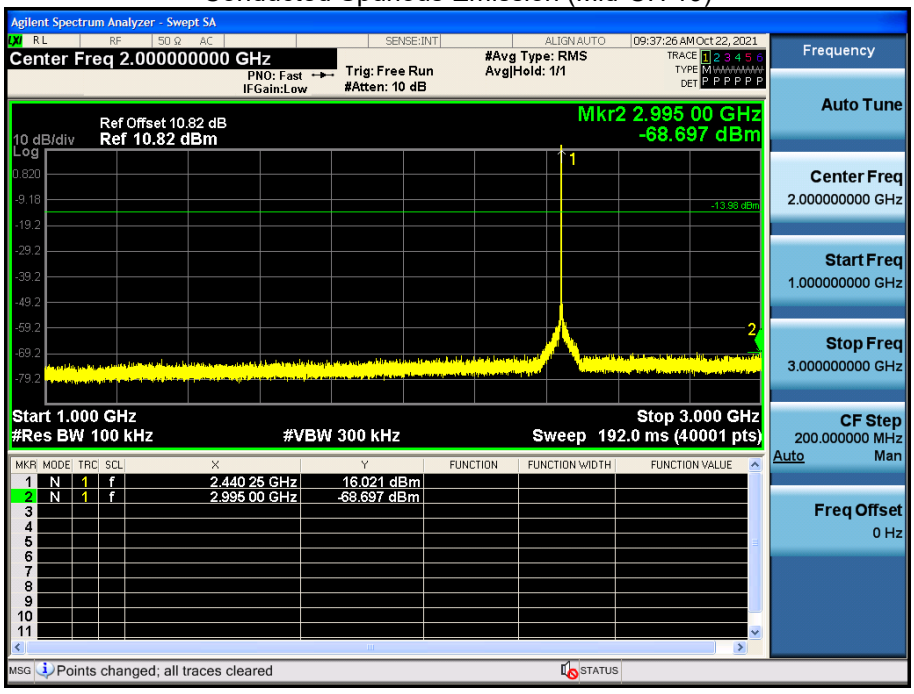
30 MHz ~ 1 GHz

Conducted Spurious Emission (Mid-CH 19)



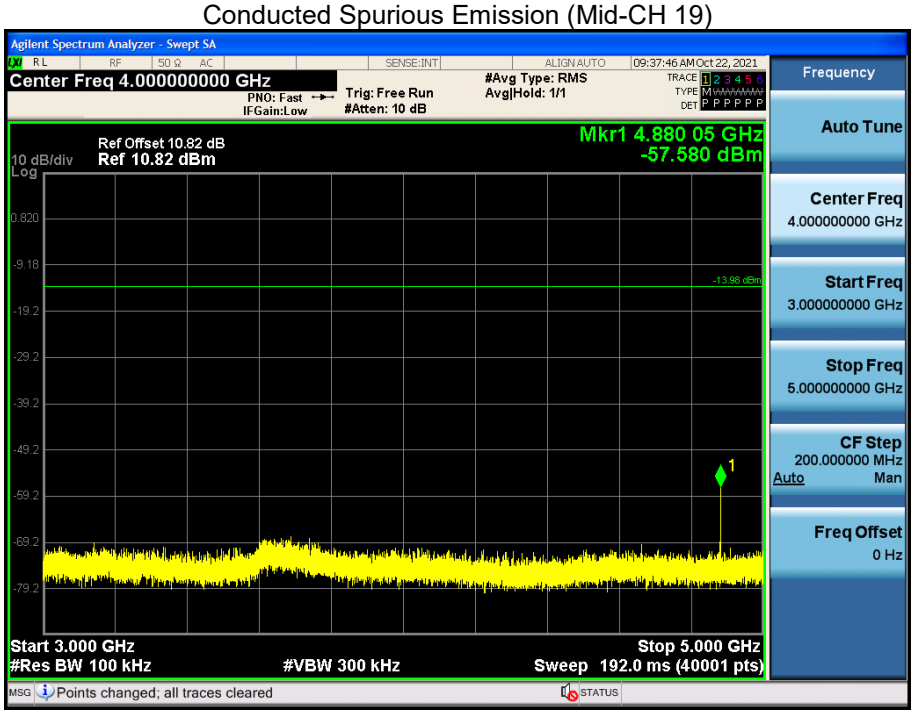
1 GHz ~ 3 GHz

Conducted Spurious Emission (Mid-CH 19)



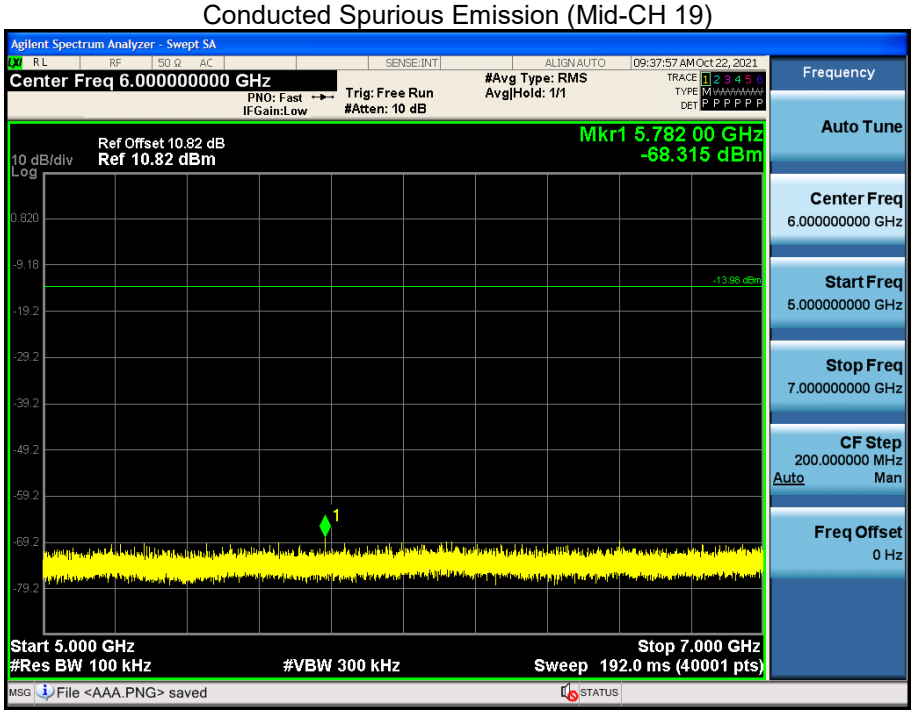
3 GHz ~ 5 GHz

Conducted Spurious Emission (Mid-CH 19)



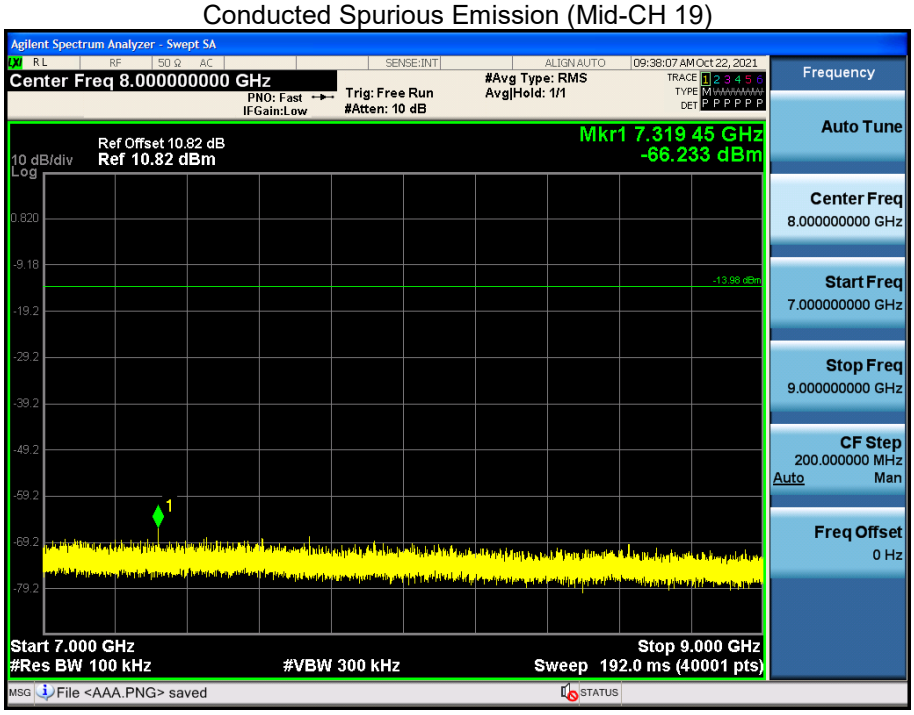
5 GHz ~ 7 GHz

Conducted Spurious Emission (Mid-CH 19)



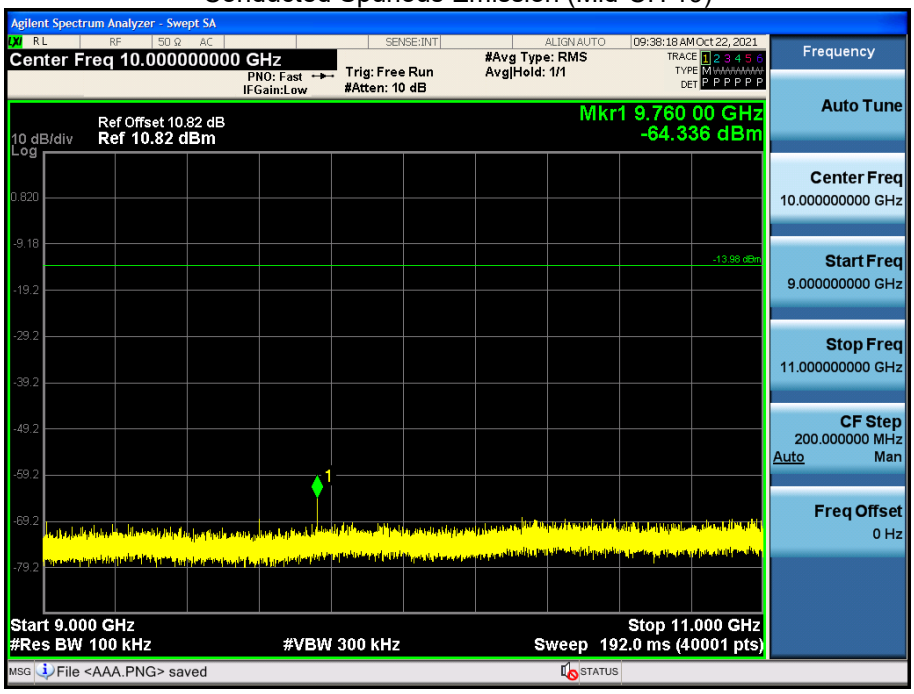
7 GHz ~ 9 GHz

Conducted Spurious Emission (Mid-CH 19)



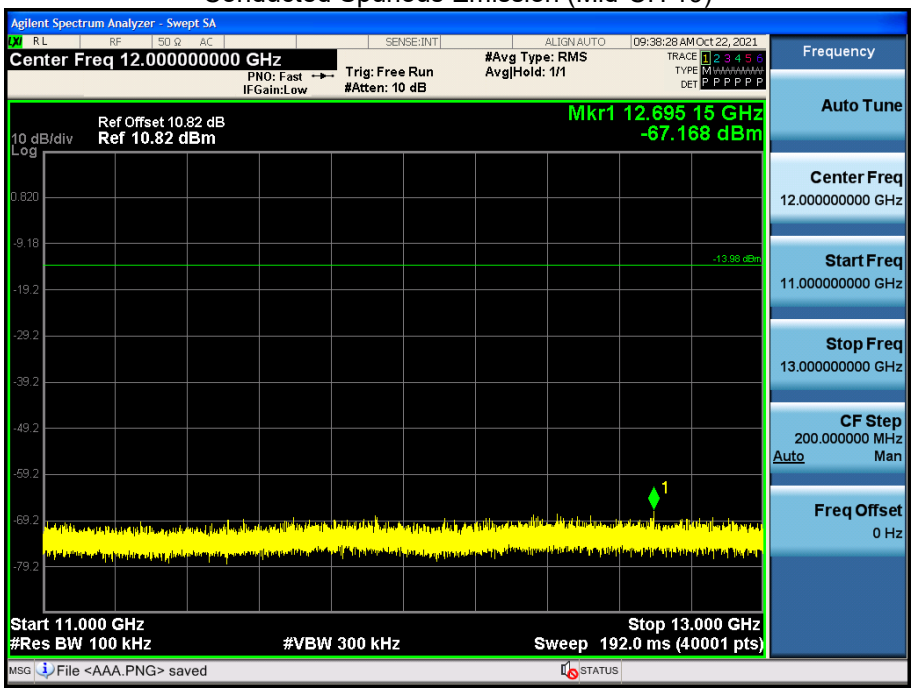
9 GHz ~ 11 GHz

Conducted Spurious Emission (Mid-CH 19)



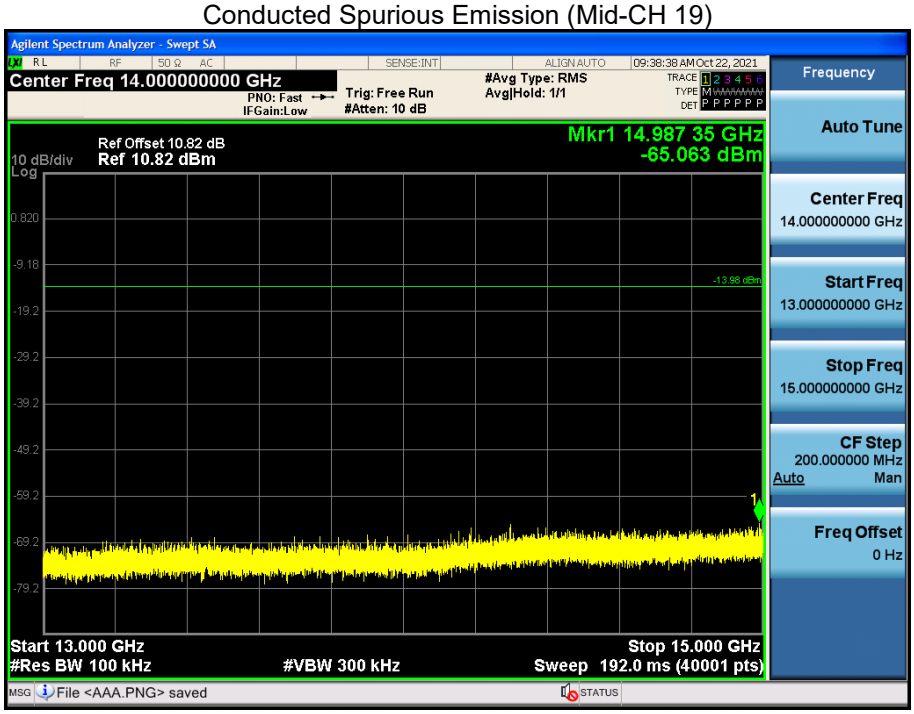
11 GHz ~ 13 GHz

Conducted Spurious Emission (Mid-CH 19)



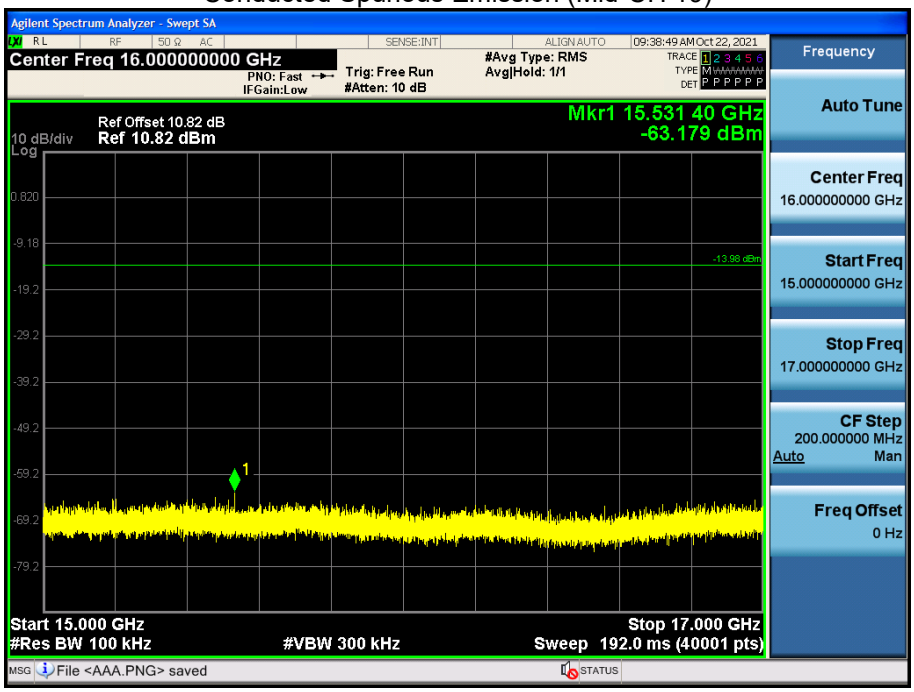
13 GHz ~ 15 GHz

Conducted Spurious Emission (Mid-CH 19)



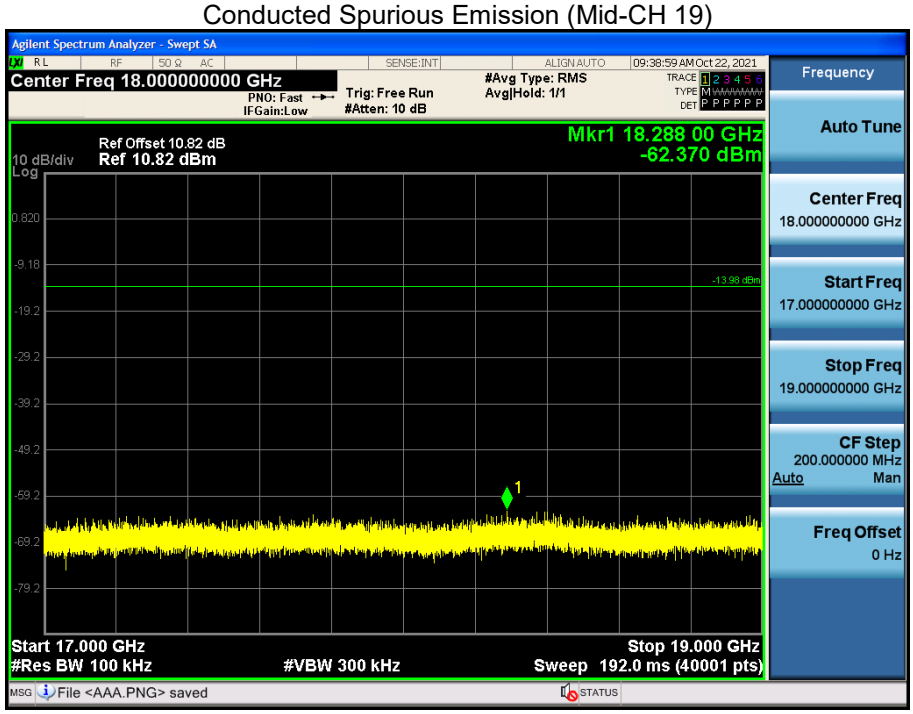
15 GHz ~ 17 GHz

Conducted Spurious Emission (Mid-CH 19)



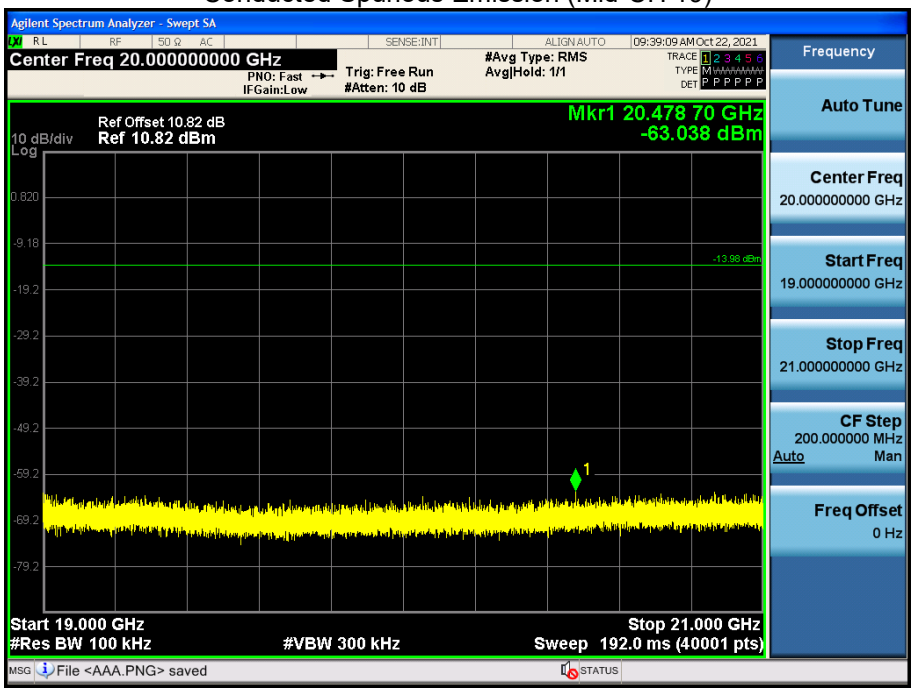
17 GHz ~ 19 GHz

Conducted Spurious Emission (Mid-CH 19)



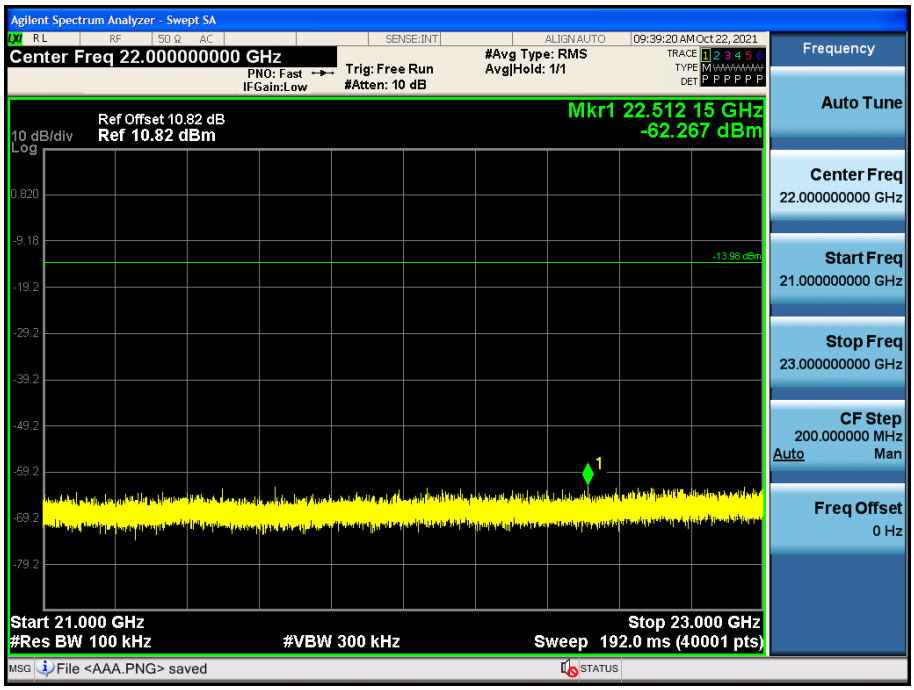
19 GHz ~ 21 GHz

Conducted Spurious Emission (Mid-CH 19)



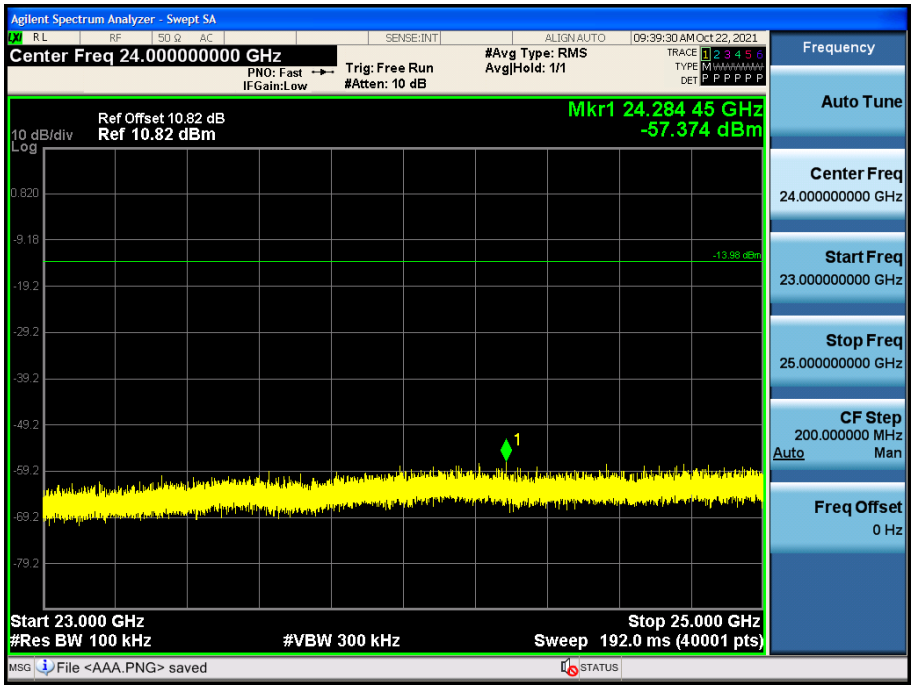
21 GHz ~ 23 GHz

Conducted Spurious Emission (Mid-CH 19)



23 GHz ~ 25 GHz

Conducted Spurious Emission (Mid-CH 19)



[Ant.2]

▣ 2 M Bit/s (37 Byte) Test Plots –BandEdge(High Power)

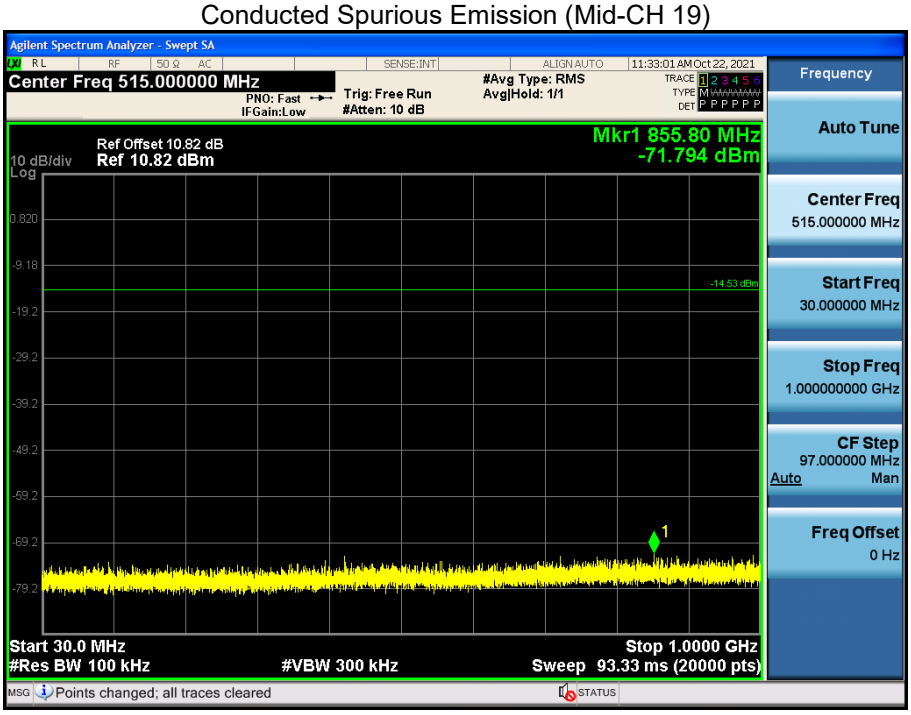
Low-CH 0

High-CH 39

▣ 1 M Bit/s (37 Byte) Test Plots -Conducted Spurious Emission(High Power)

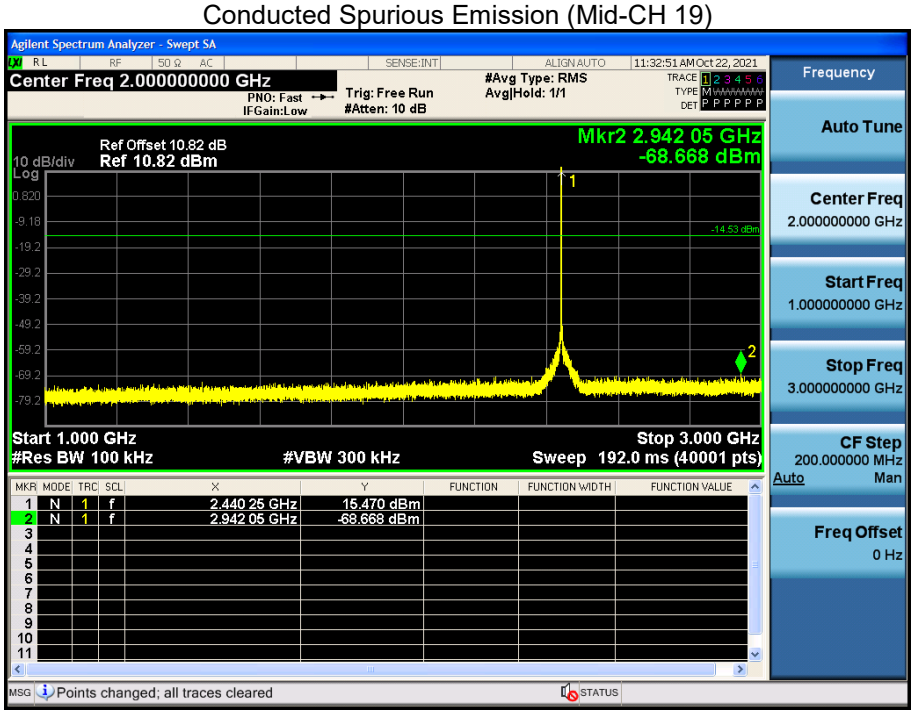
30 MHz ~ 1 GHz

Conducted Spurious Emission (Mid-CH 19)



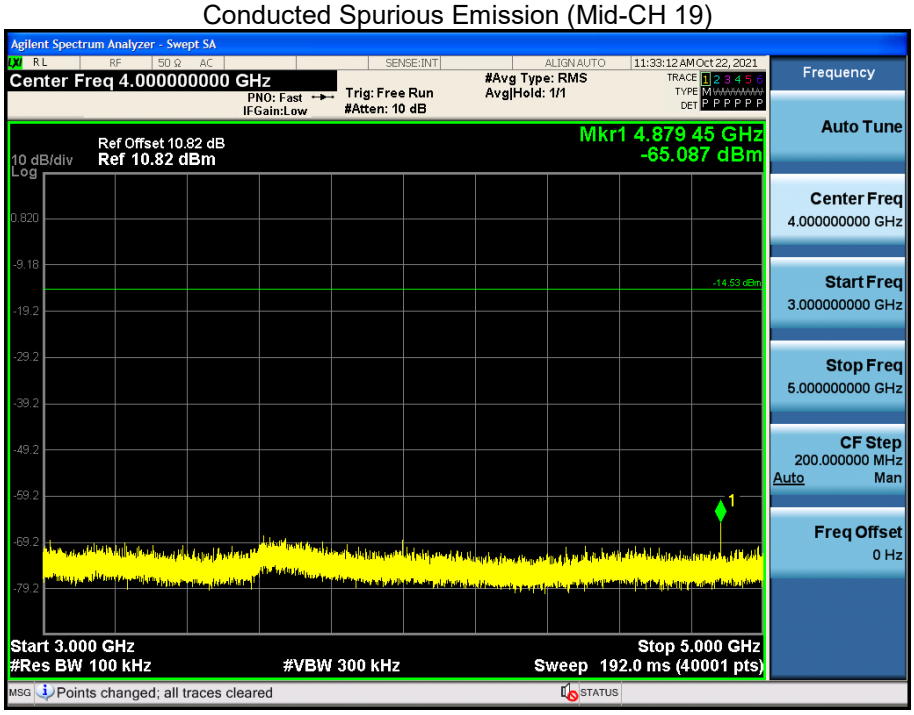
1 GHz ~ 3 GHz

Conducted Spurious Emission (Mid-CH 19)



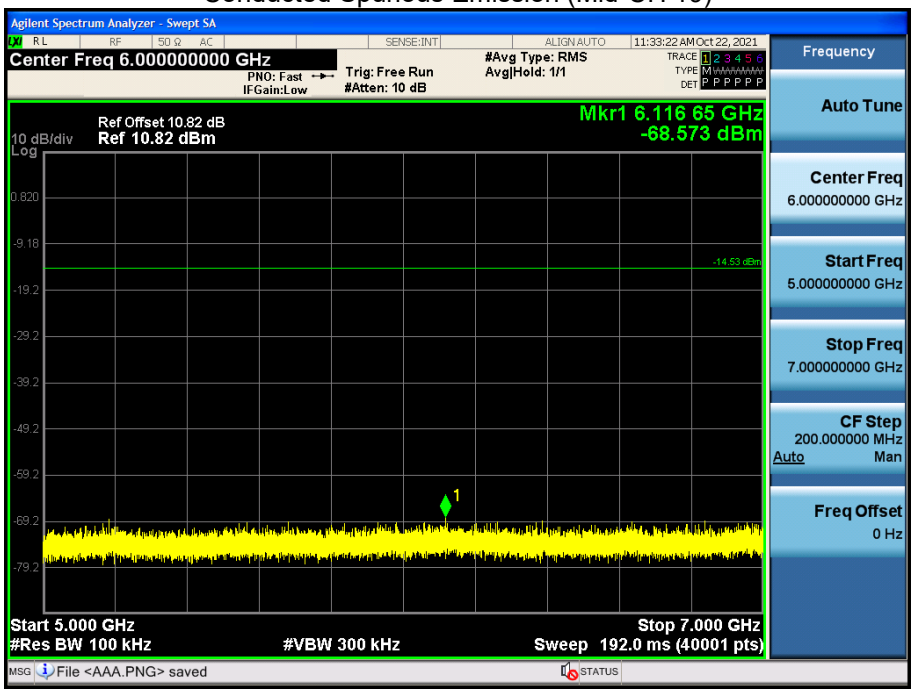
3 GHz ~ 5 GHz

Conducted Spurious Emission (Mid-CH 19)



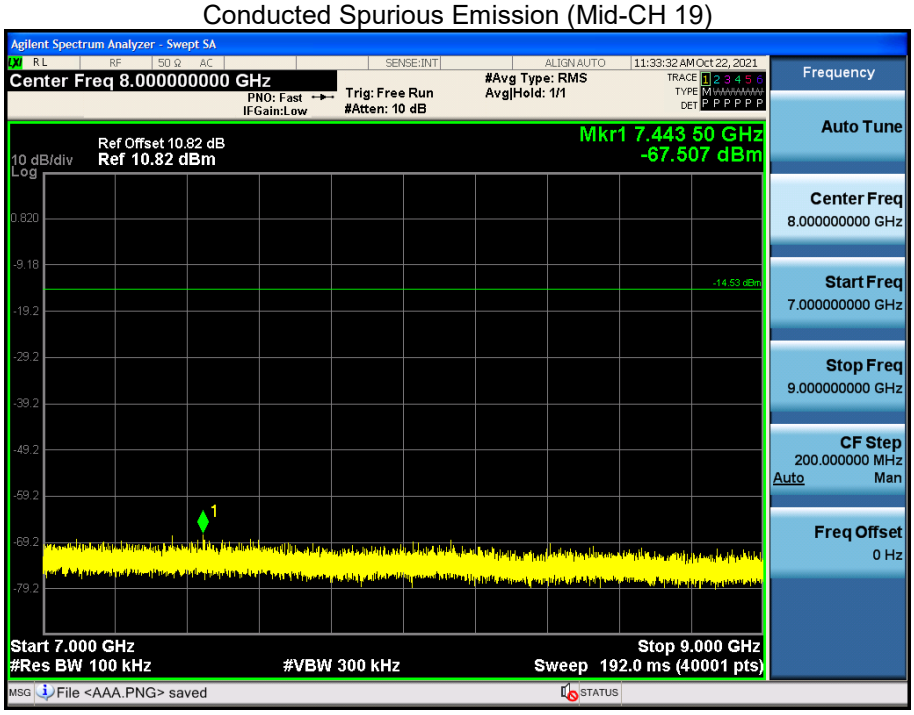
5 GHz ~ 7 GHz

Conducted Spurious Emission (Mid-CH 19)



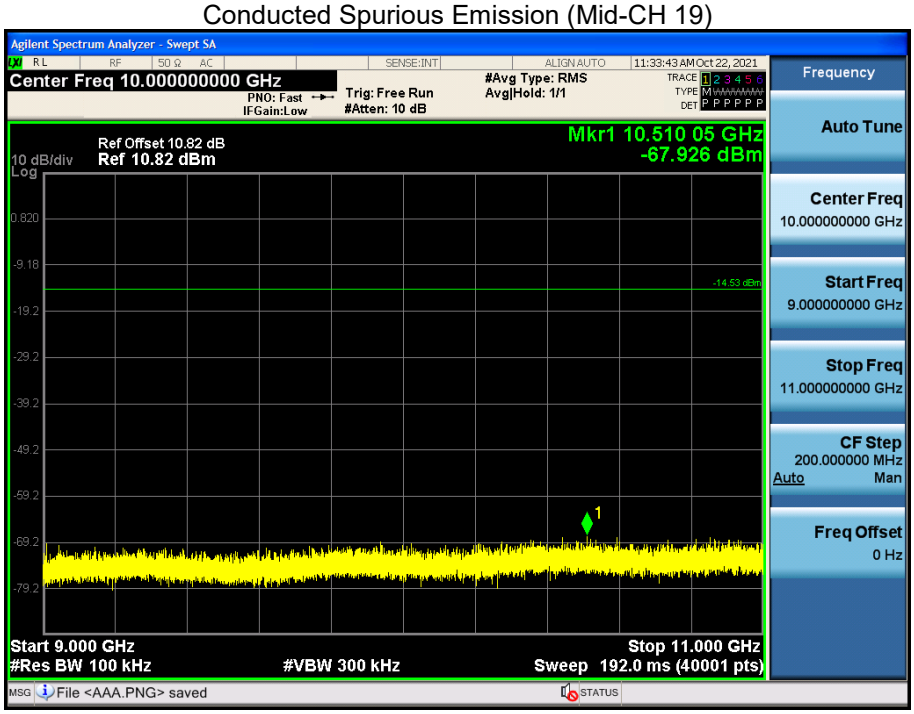
7 GHz ~ 9 GHz

Conducted Spurious Emission (Mid-CH 19)



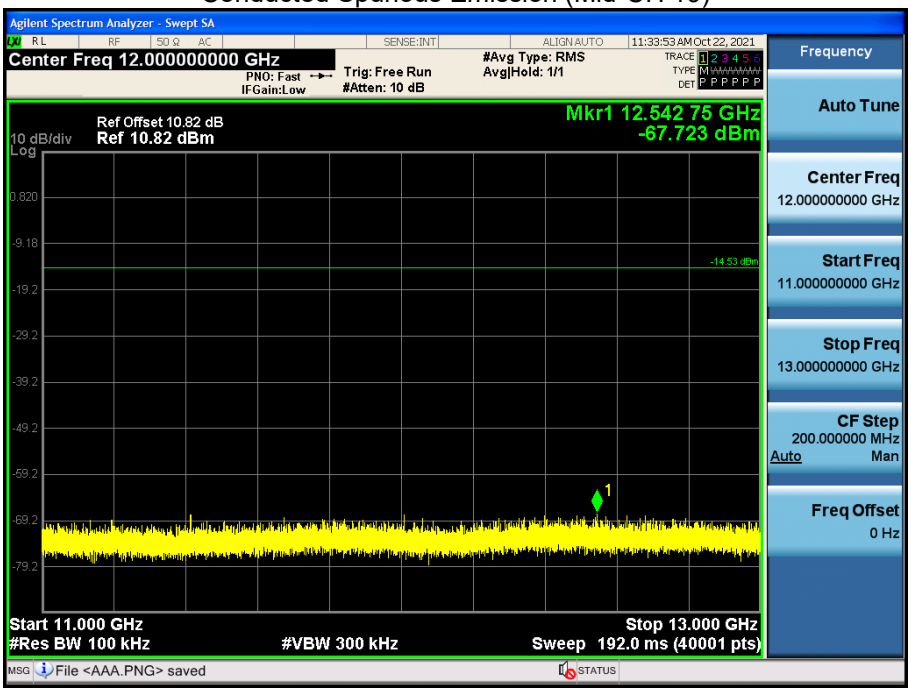
9 GHz ~ 11 GHz

Conducted Spurious Emission (Mid-CH 19)



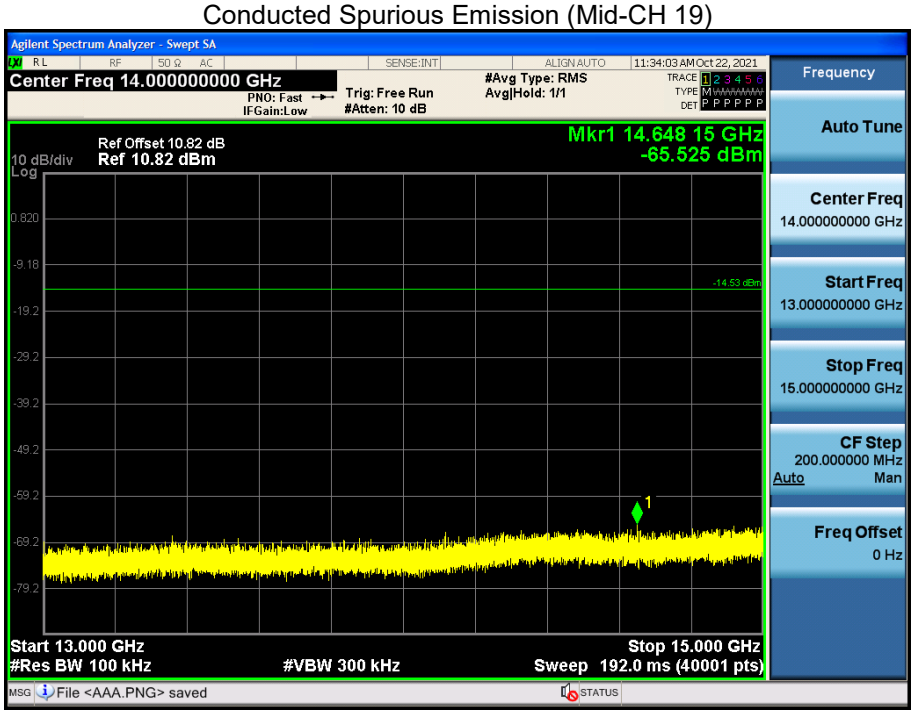
11 GHz ~ 13 GHz

Conducted Spurious Emission (Mid-CH 19)



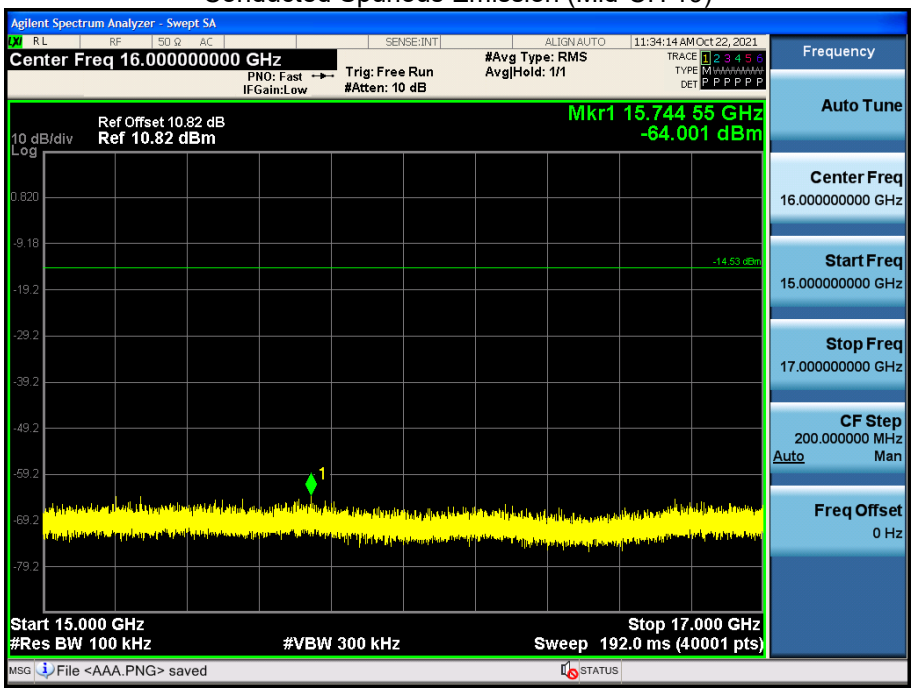
13 GHz ~ 15 GHz

Conducted Spurious Emission (Mid-CH 19)



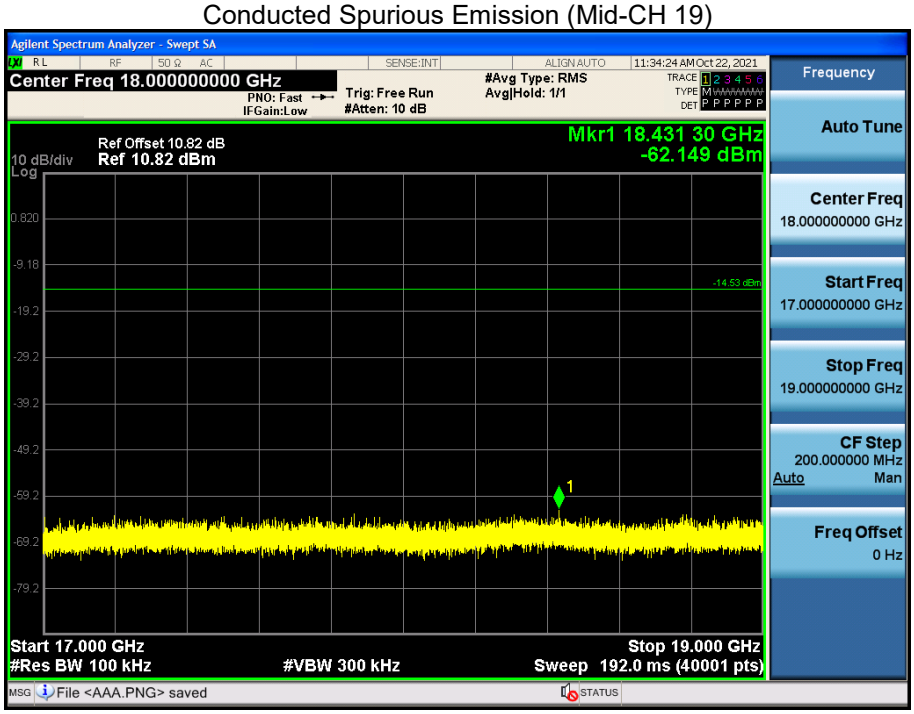
15 GHz ~ 17 GHz

Conducted Spurious Emission (Mid-CH 19)



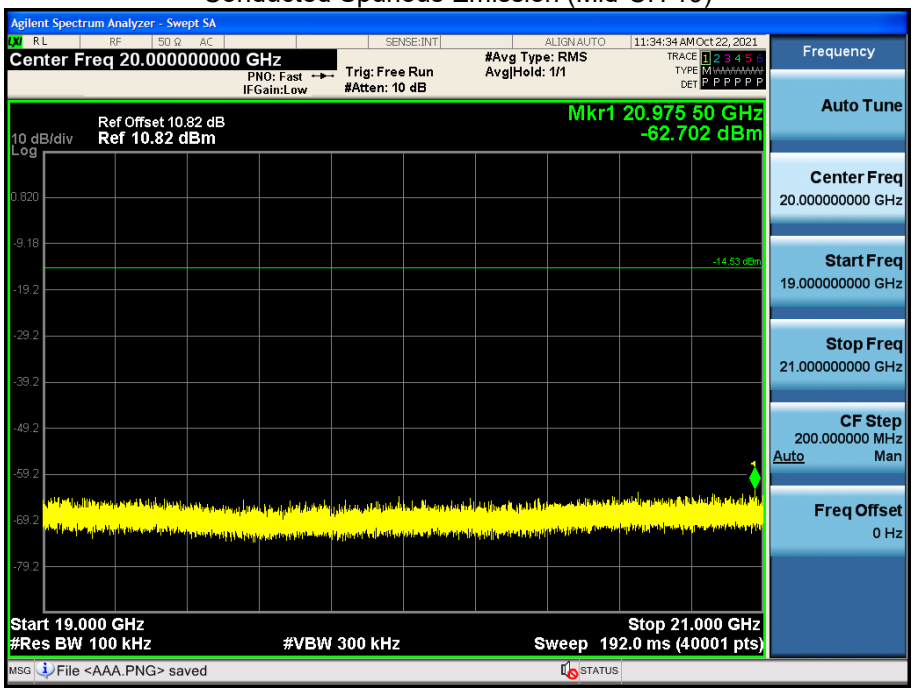
17 GHz ~ 19 GHz

Conducted Spurious Emission (Mid-CH 19)



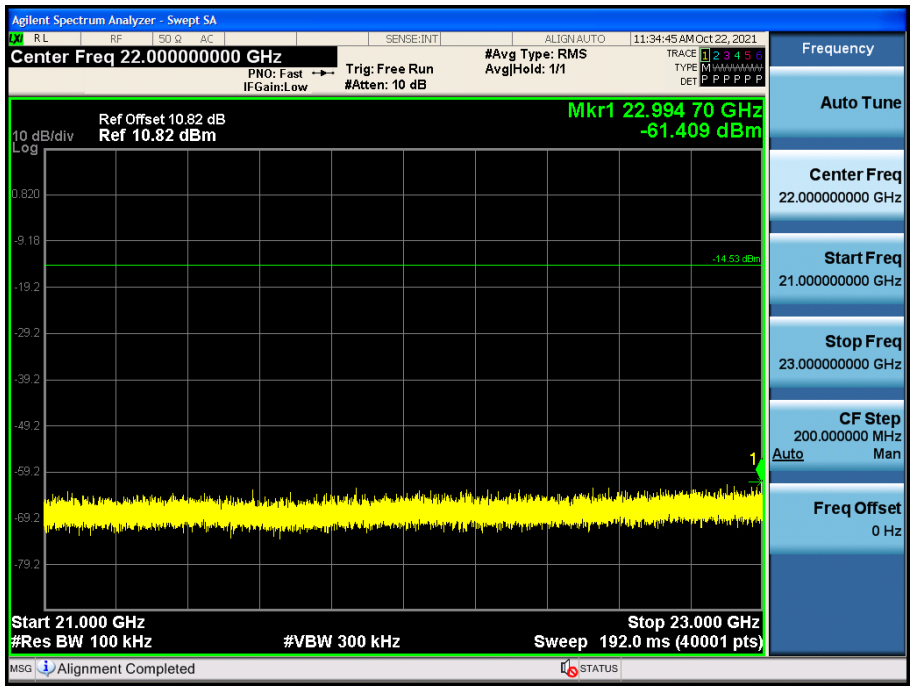
19 GHz ~ 21 GHz

Conducted Spurious Emission (Mid-CH 19)



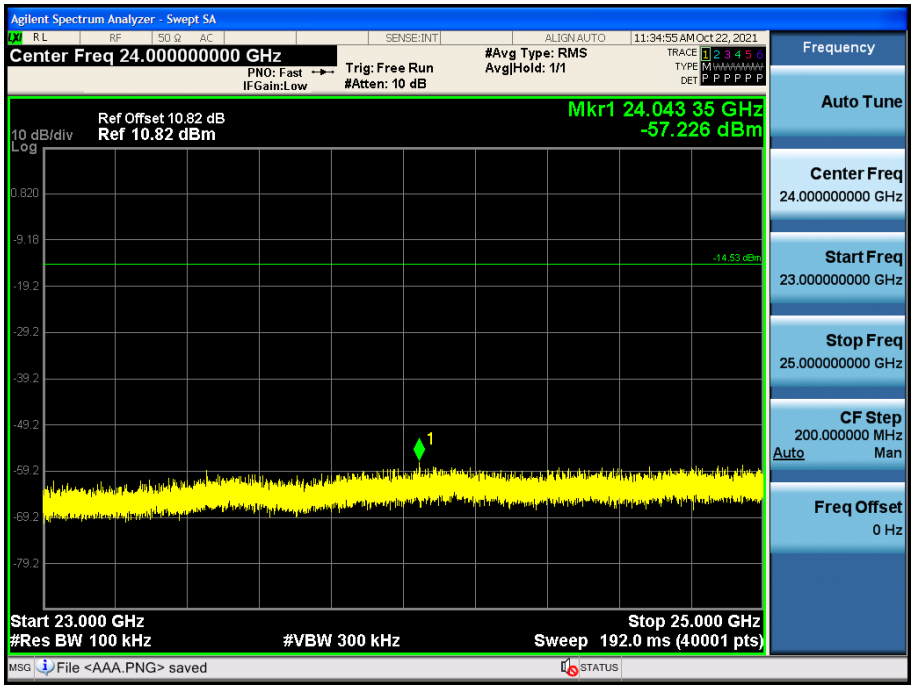
21 GHz ~ 23 GHz

Conducted Spurious Emission (Mid-CH 19)



23 GHz ~ 25 GHz

Conducted Spurious Emission (Mid-CH 19)



9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30 MHz

Frequency	Measured Value	A.F+C.L+D.F	POL	Total	Limit	Margin
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]
No Critical peaks found						

Note:

1. The Measured of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBμV) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	POL	Total	Limit	Margin
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]
No Critical peaks found						

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.

Frequency Range : Above 1 GHz

[Ant.1]

Mode : 1 M Bit/s (37 Bytes)_High Power

Operation Mode: CH Low

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4804	43.41	0.00	3.75	V	47.16	73.98	26.82	PK
4804	32.51	2.06	3.75	V	38.32	53.98	15.66	AV
7206	39.71	0.00	12.70	V	52.41	73.98	21.57	PK
7206	27.32	2.06	12.70	V	42.08	53.98	11.90	AV
4804	43.51	0.00	3.75	H	47.26	73.98	26.72	PK
4804	32.78	2.06	3.75	H	38.59	53.98	15.39	AV
7206	39.87	0.00	12.70	H	52.57	73.98	21.41	PK
7206	27.48	2.06	12.70	H	42.24	53.98	11.74	AV

Operation Mode: CH Mid

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4880	44.61	0.00	3.71	V	48.32	73.98	25.66	PK
4880	33.02	2.06	3.71	V	38.79	53.98	15.19	AV
7320	40.02	0.00	11.70	V	51.72	73.98	22.26	PK
7320	27.71	2.06	11.70	V	41.47	53.98	12.51	AV
4880	44.73	0.00	3.71	H	48.44	73.98	25.54	PK
4880	33.12	2.06	3.71	H	38.89	53.98	15.09	AV
7320	40.15	0.00	11.70	H	51.85	73.98	22.13	PK
7320	27.87	2.06	11.70	H	41.63	53.98	12.35	AV

Operation Mode: CH High

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4960	43.89	0.00	4.49	V	48.38	73.98	25.60	PK
4960	32.78	2.06	4.49	V	39.33	53.98	14.65	AV
7440	39.51	0.00	12.08	V	51.59	73.98	22.39	PK
7440	26.91	2.06	12.08	V	41.05	53.98	12.93	AV
4960	44.03	0.00	4.49	H	48.52	73.98	25.46	PK
4960	32.95	2.06	4.49	H	39.50	53.98	14.48	AV
7440	39.61	0.00	12.08	H	51.69	73.98	22.29	PK
7440	27.02	2.06	12.08	H	41.16	53.98	12.82	AV

Mode : 2 M Bit/s (37 Bytes)_ High Power

Operation Mode: CH Low

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4804	43.61	0.00	3.75	V	47.36	73.98	26.62	PK
4804	31.02	4.83	3.75	V	39.60	53.98	14.38	AV
7206	39.78	0.00	12.70	V	52.48	73.98	21.50	PK
7206	27.02	4.83	12.70	V	44.55	53.98	9.43	AV
4804	43.71	0.00	3.75	H	47.46	73.98	26.52	PK
4804	31.15	4.83	3.75	H	39.73	53.98	14.25	AV
7206	39.81	0.00	12.70	H	52.51	73.98	21.47	PK
7206	27.18	4.83	12.70	H	44.71	53.98	9.27	AV

Operation Mode: CH Mid

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4880	44.12	0.00	3.71	V	47.83	73.98	26.15	PK
4880	31.02	4.83	3.71	V	39.56	53.98	14.42	AV
7320	39.89	0.00	11.70	V	51.59	73.98	22.39	PK
7320	27.69	4.83	11.70	V	44.22	53.98	9.76	AV
4880	44.36	0.00	3.71	H	48.07	73.98	25.91	PK
4880	31.25	4.83	3.71	H	39.79	53.98	14.19	AV
7320	40.01	0.00	11.70	H	51.71	73.98	22.27	PK
7320	27.89	4.83	11.70	H	44.42	53.98	9.56	AV

Operation Mode: CH High

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4960	43.91	0.00	4.49	V	48.40	73.98	25.58	PK
4960	31.02	4.83	4.49	V	40.34	53.98	13.64	AV
7440	39.21	0.00	12.08	V	51.29	73.98	22.69	PK
7440	26.78	4.83	12.08	V	43.69	53.98	10.29	AV
4960	44.04	0.00	4.49	H	48.53	73.98	25.45	PK
4960	31.12	4.83	4.49	H	40.44	53.98	13.54	AV
7440	39.44	0.00	12.08	H	51.52	73.98	22.46	PK
7440	26.98	4.83	12.08	H	43.89	53.98	10.09	AV

[Ant.2]

Mode : 1 M Bit/s (37 Bytes)_ High Power

Operation Mode: CH Low

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4804	41.91	0.00	3.75	V	45.66	73.98	28.32	PK
4804	29.81	2.06	3.75	V	35.62	53.98	18.36	AV
7206	39.33	0.00	12.70	V	52.03	73.98	21.95	PK
7206	26.81	2.06	12.70	V	41.57	53.98	12.41	AV
4804	42.07	0.00	3.75	H	45.82	73.98	28.16	PK
4804	29.99	2.06	3.75	H	35.80	53.98	18.18	AV
7206	39.44	0.00	12.70	H	52.14	73.98	21.84	PK
7206	26.95	2.06	12.70	H	41.71	53.98	12.27	AV

Operation Mode: CH Mid

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4880	41.81	0.00	3.71	V	45.52	73.98	28.46	PK
4880	30.11	2.06	3.71	V	35.88	53.98	18.10	AV
7320	39.23	0.00	11.70	V	50.93	73.98	23.05	PK
7320	27.51	2.06	11.70	V	41.27	53.98	12.71	AV
4880	41.92	0.00	3.71	H	45.63	73.98	28.35	PK
4880	30.22	2.06	3.71	H	35.99	53.98	17.99	AV
7320	39.48	0.00	11.70	H	51.18	73.98	22.80	PK
7320	27.68	2.06	11.70	H	41.44	53.98	12.54	AV

Operation Mode: CH High

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4960	41.91	0.00	4.49	V	46.40	73.98	27.58	PK
4960	29.41	2.06	4.49	V	35.96	53.98	18.02	AV
7440	39.02	0.00	12.08	V	51.10	73.98	22.88	PK
7440	26.71	2.06	12.08	V	40.85	53.98	13.13	AV
4960	42.04	0.00	4.49	H	46.53	73.98	27.45	PK
4960	29.55	2.06	4.49	H	36.10	53.98	17.88	AV
7440	39.12	0.00	12.08	H	51.20	73.98	22.78	PK
7440	26.85	2.06	12.08	H	40.99	53.98	12.99	AV

Mode : 2 M Bit/s (37 Bytes)_ High Power

Operation Mode: CH Low

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4804	42.02	0.00	3.75	V	45.77	73.98	28.21	PK
4804	29.71	4.86	3.75	V	38.32	53.98	15.66	AV
7206	39.12	0.00	12.70	V	51.82	73.98	22.16	PK
7206	26.81	4.86	12.70	V	44.37	53.98	9.61	AV
4804	42.11	0.00	3.75	H	45.86	73.98	28.12	PK
4804	29.85	4.86	3.75	H	38.46	53.98	15.52	AV
7206	39.27	0.00	12.70	H	51.97	73.98	22.01	PK
7206	26.94	4.86	12.70	H	44.50	53.98	9.48	AV

Operation Mode: CH Mid

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4880	41.81	0.00	3.71	V	45.52	73.98	28.46	PK
4880	30.02	4.86	3.71	V	38.59	53.98	15.39	AV
7320	39.41	0.00	11.70	V	51.11	73.98	22.87	PK
7320	27.48	4.86	11.70	V	44.04	53.98	9.94	AV
4880	41.94	0.00	3.71	H	45.65	73.98	28.33	PK
4880	30.22	4.86	3.71	H	38.79	53.98	15.19	AV
7320	39.55	0.00	11.70	H	51.25	73.98	22.73	PK
7320	27.69	4.86	11.70	H	44.25	53.98	9.73	AV

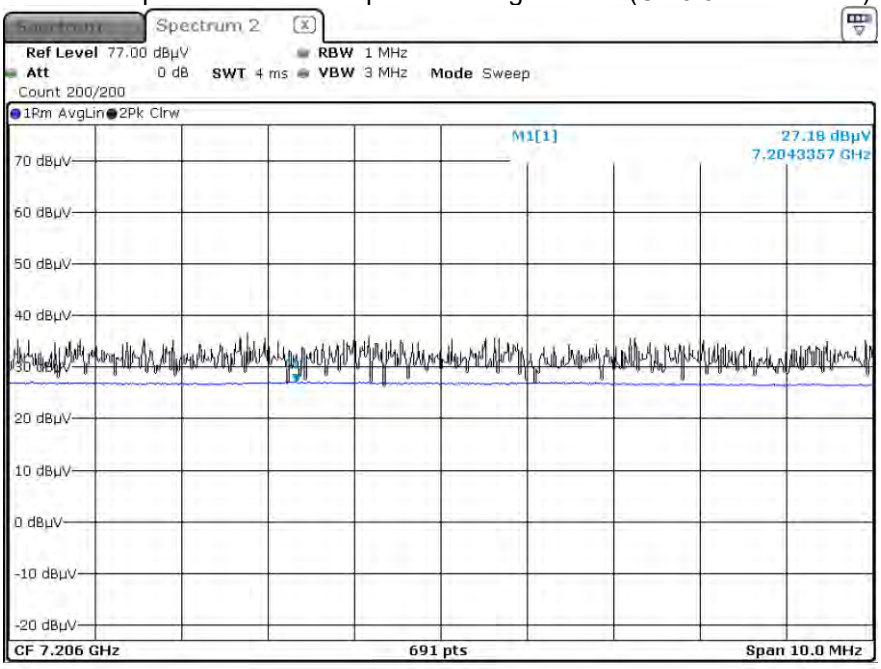
Operation Mode: CH High

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F + C.L - A.G + D.F [dB/m]	Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
4960	42.32	0.00	4.49	V	46.81	73.98	27.17	PK
4960	29.51	4.86	4.49	V	38.86	53.98	15.12	AV
7440	39.02	0.00	12.08	V	51.10	73.98	22.88	PK
7440	26.71	4.86	12.08	V	43.65	53.98	10.33	AV
4960	42.42	0.00	4.49	H	46.91	73.98	27.07	PK
4960	29.62	4.86	4.49	H	38.97	53.98	15.01	AV
7440	39.28	0.00	12.08	H	51.36	73.98	22.62	PK
7440	26.81	4.86	12.08	H	43.75	53.98	10.23	AV

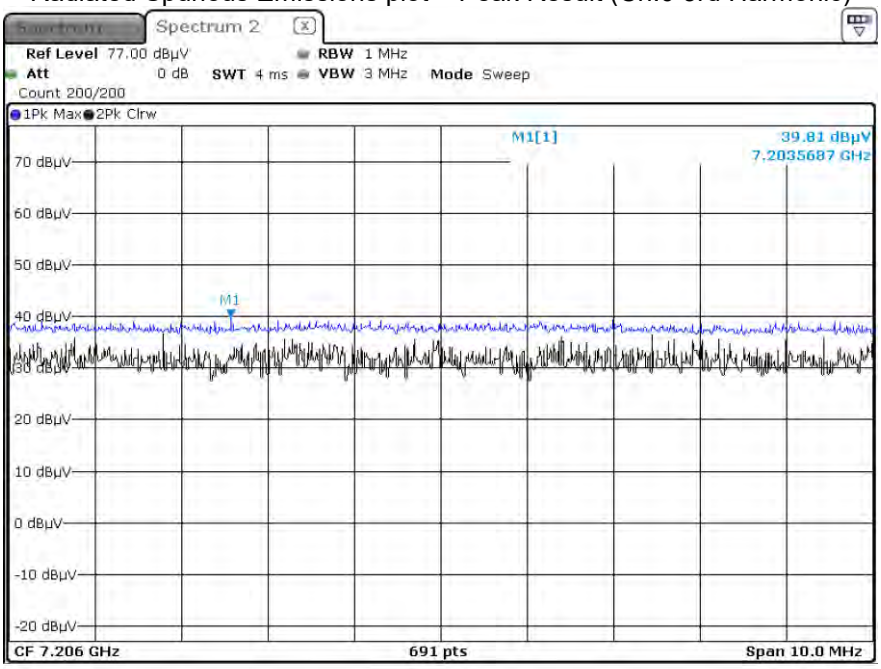
[Ant.1]

▣ 2 M Bit/s 37 Bytes Test Plots (Worst case : Z-H)_High Power

Radiated Spurious Emissions plot – Average Result (Ch.0 3rd Harmonic)



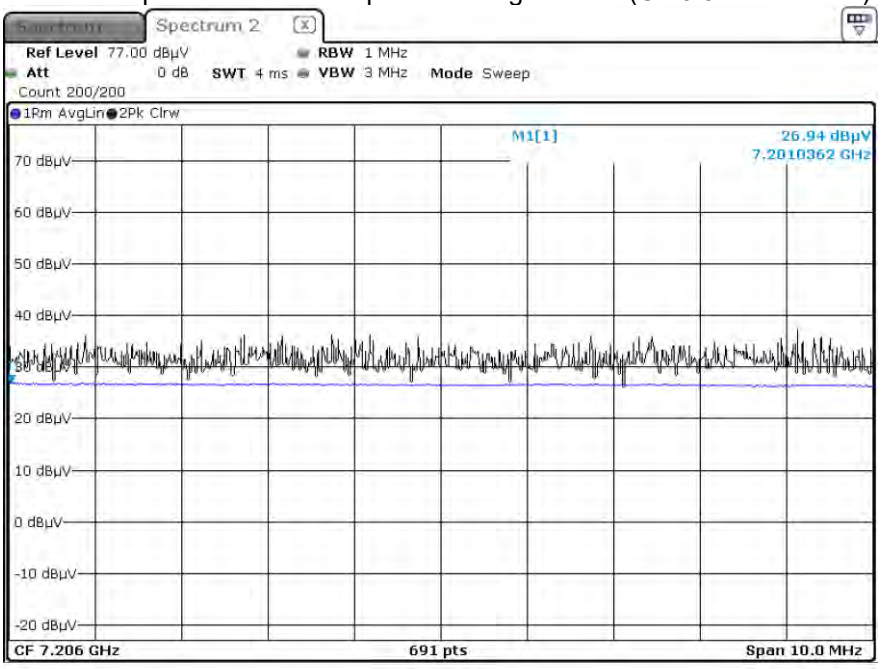
Radiated Spurious Emissions plot – Peak Result (Ch.0 3rd Harmonic)



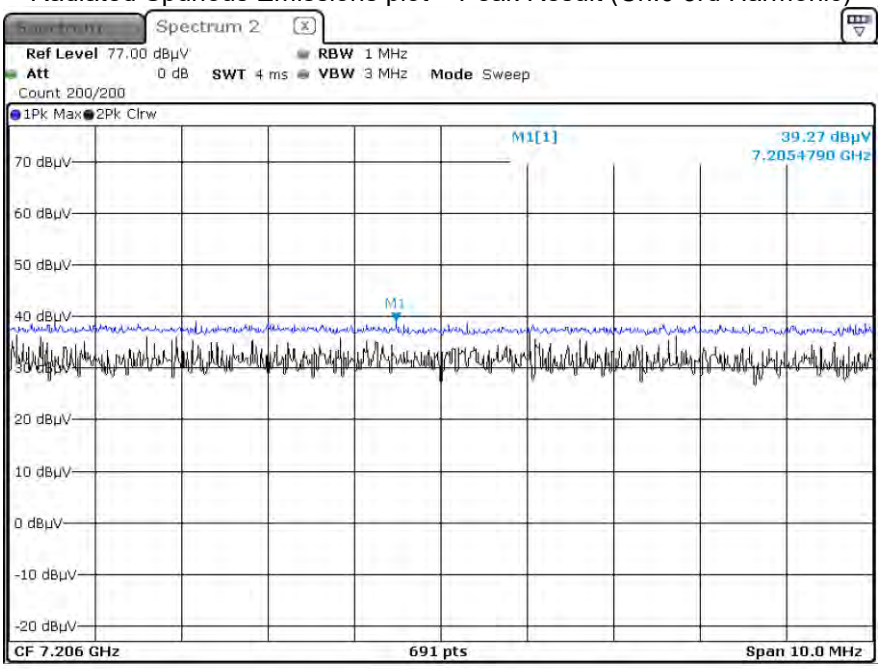
[Ant.2]

▣ 2 M Bit/s 37 Bytes Test Plots (Worst case : Z-H)_High Power

Radiated Spurious Emissions plot – Average Result (Ch.0 3rd Harmonic)



Radiated Spurious Emissions plot – Peak Result (Ch.0 3rd Harmonic)



Note:

Plot of worst case are only reported.

9.7 RADIATED RESTRICTED BAND EDGES

High Power

[Ant.1]

Mode : 1 M Bit/s (37 Bytes)

Operating Frequency 2402 MHz, 2480 MHz

Channel No. 0 CH, 39 CH

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
2390.0	21.222	0.00	34.04	H	55.26	73.98	18.72	PK
2390.0	10.125	2.06	34.04	H	46.23	53.98	7.76	AV
2390.0	21.111	0.00	34.04	V	55.15	73.98	18.83	PK
2390.0	10.029	2.06	34.04	V	46.13	53.98	7.85	AV
2483.5	28.148	0.00	35.00	H	63.15	73.98	10.83	PK
2483.5	11.035	2.06	35.00	H	48.10	53.98	5.89	AV
2483.5	28.023	0.00	35.00	V	63.02	73.98	10.96	PK
2483.5	11.001	2.06	35.00	V	48.06	53.98	5.92	AV

Mode : 2 M Bit/s (37 Bytes)

Operating Frequency 2402 MHz, 2480 MHz

Channel No. 0 CH, 39 CH

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
2390.0	21.801	0.00	34.04	H	55.84	73.98	18.14	PK
2390.0	9.851	4.83	34.04	H	48.72	53.98	5.26	AV
2390.0	21.691	0.00	34.04	V	55.73	73.98	18.25	PK
2390.0	9.712	4.83	34.04	V	48.58	53.98	5.40	AV
2483.5	28.894	0.00	35.00	H	63.89	73.98	10.09	PK
2483.5	10.801	4.83	35.00	H	50.63	53.98	3.35	AV
2483.5	28.713	0.00	35.00	V	63.71	73.98	10.27	PK
2483.5	10.710	4.83	35.00	V	50.54	53.98	3.44	AV

[Ant.2]

Mode : 1 MBit/s (37 Bytes)

Operating Frequency 2402 MHz, 2480 MHz

Channel No. 0 CH, 39 CH

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
2390.0	21.418	0.00	34.04	H	55.46	73.98	18.52	PK
2390.0	9.735	2.06	34.04	H	45.84	53.98	8.15	AV
2390.0	21.311	0.00	34.04	V	55.35	73.98	18.63	PK
2390.0	9.612	2.06	34.04	V	45.71	53.98	8.27	AV
2483.5	24.093	0.00	35.00	H	59.09	73.98	14.89	PK
2483.5	10.045	2.06	35.00	H	47.11	53.98	6.87	AV
2483.5	23.899	0.00	35.00	V	58.90	73.98	15.08	PK
2483.5	9.981	2.06	35.00	V	47.04	53.98	6.94	AV

Mode : 2 MBit/s (37 Bytes)

Operating Frequency 2402 MHz, 2480 MHz

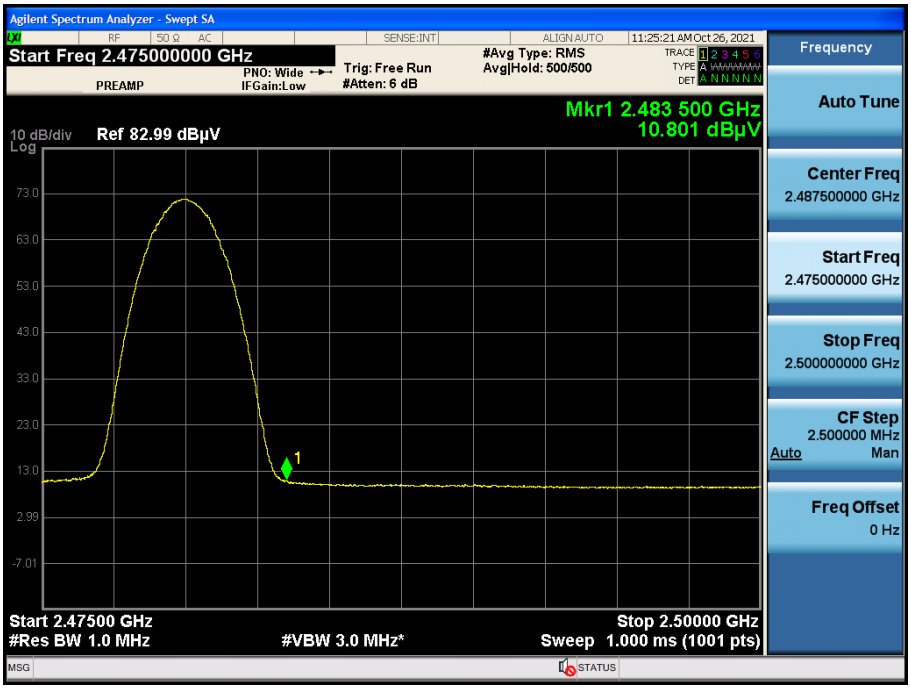
Channel No. 0 CH, 39 CH

Frequency [MHz]	Measured Value [dBµV]	Duty Cycle Factor [dB]	A.F+C.L+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Measurement Type
2390.0	21.495	0.00	34.04	H	55.54	73.98	18.45	PK
2390.0	9.698	4.86	34.04	H	48.60	53.98	5.38	AV
2390.0	21.312	0.00	34.04	V	55.35	73.98	18.63	PK
2390.0	9.512	4.86	34.04	V	48.41	53.98	5.57	AV
2483.5	24.754	0.00	35.00	H	59.75	73.98	14.23	PK
2483.5	10.109	4.86	35.00	H	49.97	53.98	4.01	AV
2483.5	24.612	0.00	35.00	V	59.61	73.98	14.37	PK
2483.5	9.912	4.86	35.00	V	49.77	53.98	4.21	AV

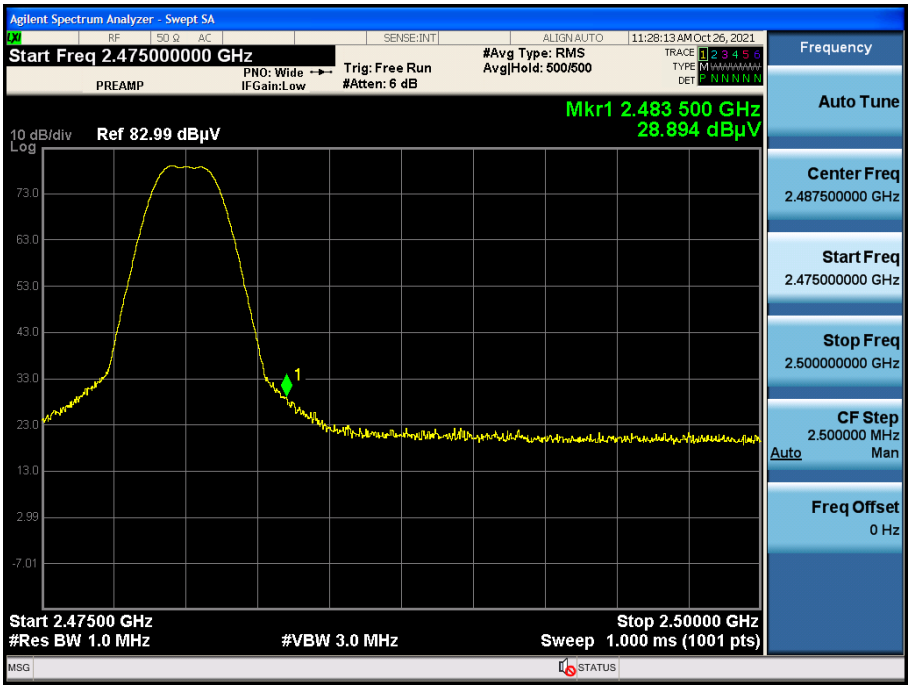
[Ant.1]

▣ Mode : 2 M Bit/s (37 Bytes) Test Plots _High Power

Radiated Restricted Band Edges plot – Average Result (Ch.39, X-H)



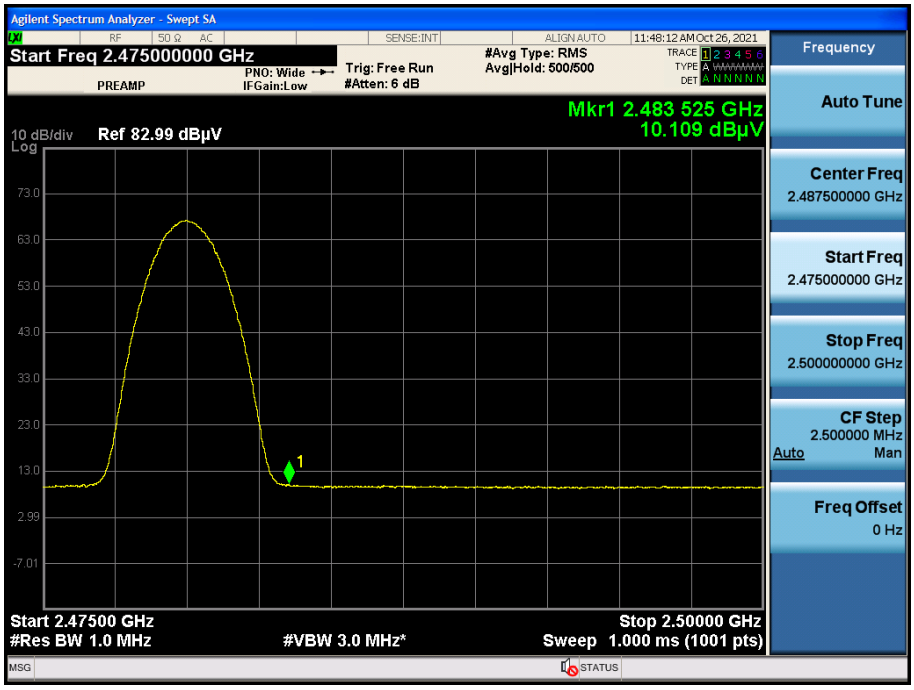
Radiated Restricted Band Edges plot – Peak Result (Ch.39, X-H)



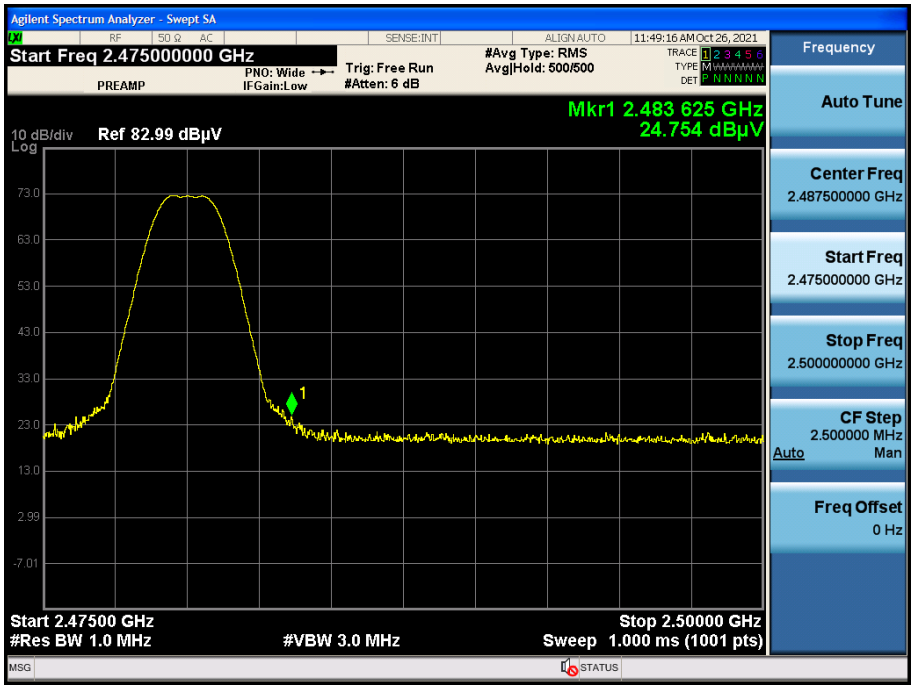
[Ant.2]

▣ Mode : 2 M Bit/s (37 Bytes) Test Plots_High Power

Radiated Restricted Band Edges plot – Average Result (Ch.39, X-H)



Radiated Restricted Band Edges plot – Peak Result (Ch.39, X-H)



Note:

Plot of worst case are only reported.

9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

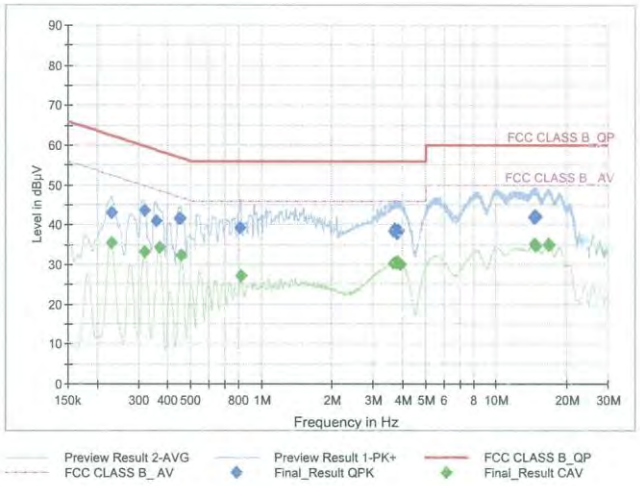
Test 1 / 2

Test Report

Common Information

EUT :	SM-X808U
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	BTLE L1
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2288	42.90	62.50	19.60	9.000	L1	OFF	9.6
0.3188	43.55	59.74	16.19	9.000	L1	OFF	9.6
0.3548	40.86	58.85	17.99	9.000	L1	OFF	9.6
0.4448	41.44	56.97	15.53	9.000	L1	OFF	9.6
0.4538	41.49	56.81	15.31	9.000	L1	OFF	9.6
0.8150	39.15	56.00	16.85	9.000	L1	OFF	9.7
3.6703	38.23	56.00	17.77	9.000	L1	OFF	9.8
3.6838	39.02	56.00	16.98	9.000	L1	OFF	9.8
3.7693	38.20	56.00	17.80	9.000	L1	OFF	9.8
3.7985	37.81	56.00	18.19	9.000	L1	OFF	9.8
3.8143	38.44	56.00	17.56	9.000	L1	OFF	9.8
3.8210	38.64	56.00	17.36	9.000	L1	OFF	9.8
14.4455	41.85	60.00	18.15	9.000	L1	OFF	10.2
14.5288	41.73	60.00	18.27	9.000	L1	OFF	10.2
14.5783	42.04	60.00	17.96	9.000	L1	OFF	10.2
14.6233	41.96	60.00	18.04	9.000	L1	OFF	10.2
14.7110	41.71	60.00	18.29	9.000	L1	OFF	10.2
14.7560	42.02	60.00	17.98	9.000	L1	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2288	35.39	52.50	17.10	9.000	L1	OFF	9.6
0.3188	33.06	49.74	16.68	9.000	L1	OFF	9.6
0.3683	34.46	48.54	14.08	9.000	L1	OFF	9.6
0.4560	32.29	46.77	14.47	9.000	L1	OFF	9.6
0.8173	27.19	46.00	18.81	9.000	L1	OFF	9.7
3.6748	30.28	46.00	15.72	9.000	L1	OFF	9.8
3.7265	30.49	46.00	15.51	9.000	L1	OFF	9.8
3.7648	30.48	46.00	15.52	9.000	L1	OFF	9.8
3.7715	30.39	46.00	15.61	9.000	L1	OFF	9.8
3.8098	30.57	46.00	15.43	9.000	L1	OFF	9.8
3.9043	29.91	46.00	16.09	9.000	L1	OFF	9.8
14.5265	35.11	50.00	14.89	9.000	L1	OFF	10.2
14.6233	35.04	50.00	14.96	9.000	L1	OFF	10.2
14.6593	34.99	50.00	15.01	9.000	L1	OFF	10.2
14.7943	34.65	50.00	15.35	9.000	L1	OFF	10.2
16.7068	35.15	50.00	14.85	9.000	L1	OFF	10.3
16.7968	34.95	50.00	15.05	9.000	L1	OFF	10.3
16.8283	34.84	50.00	15.16	9.000	L1	OFF	10.3

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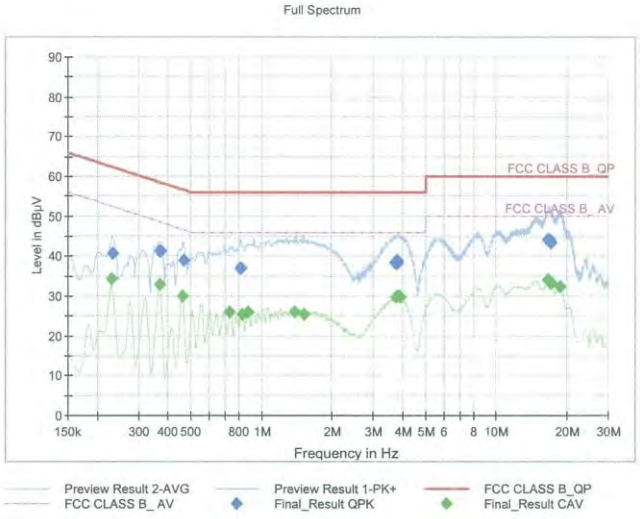
Conducted Emissions (Line 2)

Test 1 / 2

Test Report

Common Information

EUT :	SM-X808U
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	BTLE N
Operator Name:	
Comment:	



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2333	40.74	62.33	21.60	9.000	N	OFF	9.6
0.3705	41.26	58.49	17.23	9.000	N	OFF	9.6
0.3750	41.39	58.39	17.00	9.000	N	OFF	9.6
0.4650	38.82	56.60	17.78	9.000	N	OFF	9.6
0.8128	36.97	56.00	19.03	9.000	N	OFF	9.7
0.8173	36.91	56.00	19.09	9.000	N	OFF	9.7
3.7063	38.37	56.00	17.63	9.000	N	OFF	9.8
3.7805	38.15	56.00	17.85	9.000	N	OFF	9.8
3.7873	38.28	56.00	17.72	9.000	N	OFF	9.8
3.7940	38.25	56.00	17.75	9.000	N	OFF	9.8
3.8008	38.64	56.00	17.36	9.000	N	OFF	9.8
3.8075	38.94	56.00	17.06	9.000	N	OFF	9.8
16.5560	43.99	60.00	16.01	9.000	N	OFF	10.3
16.7180	44.20	60.00	15.80	9.000	N	OFF	10.3
16.7855	44.14	60.00	15.86	9.000	N	OFF	10.3
16.8688	43.99	60.00	16.01	9.000	N	OFF	10.3
16.8913	44.02	60.00	15.98	9.000	N	OFF	10.3
17.1118	43.15	60.00	16.85	9.000	N	OFF	10.4

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.2310	34.30	52.41	18.12	9.000	N	OFF	9.6
0.3683	32.87	48.54	15.67	9.000	N	OFF	9.6
0.4605	30.08	46.68	16.60	9.000	N	OFF	9.6
0.7363	25.89	46.00	20.11	9.000	N	OFF	9.7
0.8263	25.48	46.00	20.52	9.000	N	OFF	9.7
0.8758	25.96	46.00	20.04	9.000	N	OFF	9.7
1.3955	26.06	46.00	19.94	9.000	N	OFF	9.7
1.5148	25.37	46.00	20.63	9.000	N	OFF	9.7
3.7625	29.74	46.00	16.26	9.000	N	OFF	9.8
3.8075	29.95	46.00	16.05	9.000	N	OFF	9.8
3.8525	30.01	46.00	15.99	9.000	N	OFF	9.8
3.9088	29.67	46.00	16.33	9.000	N	OFF	9.8
16.5560	33.91	50.00	16.09	9.000	N	OFF	10.3
16.7135	33.99	50.00	16.01	9.000	N	OFF	10.3
16.8418	33.87	50.00	16.13	9.000	N	OFF	10.3
16.9813	33.55	50.00	16.45	9.000	N	OFF	10.4
17.1095	33.06	50.00	16.94	9.000	N	OFF	10.4
18.6283	32.29	50.00	17.71	9.000	N	OFF	10.4

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10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/23/2022	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/17/2022	Annual
Temperature Chamber	SU-642	ESPAC	0093008124	03/15/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	01/11/2022	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	101231	07/02/2022	Annual
BLUETOOTH TESTER	CBT	Rohde & Schwarz	100808	02/23/2022	Annual
Power Meter	N1911A	Agilent	MY45100523	04/08/2022	Annual
Power Sensor	N1921A	Keysight	MY57820067	04/08/2022	Annual
Directional Coupler	87300B	Agilent	3116A03621	11/02/2022	Annual
Power Splitter	11667B	Hewlett Packard	05001	05/20/2022	Annual
DC Power Supply	E3632A	Hewlett Packard	MY50360067	02/16/2022	Annual
Attenuator(10 dB)	8493C	Hewlett Packard	07560	06/18/2022	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/22/2023	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02299	05/19/2022	Biennial
Horn Antenna (15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170541	11/29/2021	Biennial
Spectrum Analyzer	FSV40-N	Rohde & Schwarz	102168	07/05/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	01/11/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/24/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/24/2022	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/06/2022	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/08/2022	Annual
High Pass Filter	WHK3.0/18G-10EF	Wainwright Instruments	8	02/03/2022	Annual
High Pass Filter	WHKX8-6090-7000-18000-40SS	Wainwright Instruments	25	02/03/2022	Annual
Attenuator (3 dB)	18B-03	Api tech.	1	02/03/2022	Annual
Attenuator(10 dB)	8493C-10	Agilent	08285	02/03/2022	Annual
Power Amplifier	CBLU1183540	CERNEX	22964	02/03/2022	Annual
Power Amplifier	CBL06185030	CERNEX	22965	02/03/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/04/2021	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	Annual

Note:

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

11. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2111-FC033-P