

FCC BT LE REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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Date of Issue:
October 16, 2023

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

Report No.: HCT-RF-2310-FC015

FCC ID: A3LSMS926U

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model: SM-S926U

Additional Model: SM-S926U1

EUT Type: Mobile phone

Average Output Power: Ant.1: 18.92 dBm (78.06 mW)
Ant.2: 19.61 dBm (91.50 mW)
Dual Ant.1+ Ant.2: 17.02 dBm (50.37 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.

Report No.: HCT-RF-2310-FC015

REVIEWED BY



Report prepared by : Kyung Jun Woo
Engineer of Telecommunication Testing Center



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

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
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-2310-FC015	October 16, 2023	- First Approval Report

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1. EUT DESCRIPTION

Model	SM-S926U					
Additional Model	SM-S926U1					
EUT Type	Mobile Phone					
Power Supply	DC 3.88 V					
Frequency Range	2 402 MHz ~ 2 480 MHz					
Max. RF Output Power (Normal)	Ant.1	Peak (For information only)	1 M Bit/s: 18.924 dBm (78.05 mW) 2 M Bit/s: 19.100 dBm (81.28 mW) 125 k Bit/s : 11.205 dBm (13.20 mW) 500 k Bit/s : 11.304 dBm (13.50 mW)			
		Average	1 M Bit/s: 18.73 dBm (74.72 mW) 2 M Bit/s: 18.92 dBm (78.06 mW) 125 k Bit/s : 9.15 dBm (8.22 mW) 500 k Bit/s : 9.25 dBm (8.41 mW)			
	Ant.2	Peak (For information only)	1 M Bit/s: 19.806 dBm (95.63 mW) 2 M Bit/s: 19.894 dBm (97.59 mW) 125 k Bit/s : 11.611 dBm (14.49 mW) 500 k Bit/s : 11.654 dBm (14.64 mW)			
		Average	1 M Bit/s: 19.48 dBm (88.80 mW) 2 M Bit/s: 19.61 dBm (91.50 mW) 125 k Bit/s : 11.43 dBm (13.90 mW) 500 k Bit/s : 11.48 dBm (14.06 mW)			
	Dual Ant.1 + Ant.2	Peak (For information only)	1 M Bit/s: 17.222 dBm (52.75 mW) 2 M Bit/s:: 17.339 dBm (54.18 mW)			
		Average	1 M Bit/s: 16.97 dBm (49.78 mW) 2 M Bit/s:: 17.02 dBm (50.37 mW)			
	Modulation Type	GFSK				
	Bluetooth Version	5.3				
Number of Channels	40 Channels					
Date(s) of Tests	September 01, 2023 ~ October 15, 2023					
Serial number	Radiated: R3CW80MAYKF Conducted : R3CW80MCXPK					

ANTENNA CONFIGURATIONS

1. Below Tables are the possible configurations.

Amp.	SISO		Dual BT
	Ant1(Core-0)	Ant2(Core-1)	Ant1 & Ant2
ePA Mode	O	O	X
iPA Mode	X	X	O

Note:

1) O = Support, X = Not Support

2) Dual BT is supported BLE 1M/2Mbps, not supported 125k/500kbps.

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 March 31, 2022 (CAB identifier: 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.

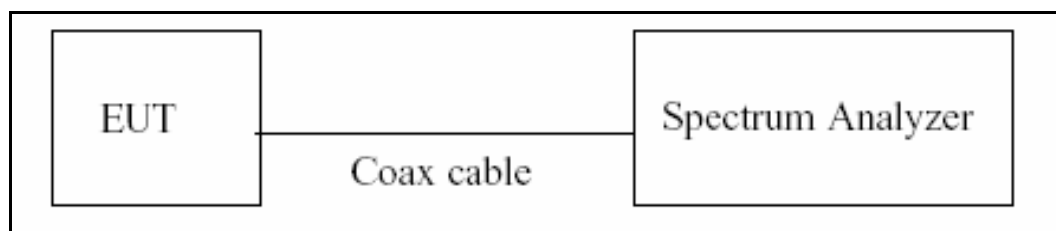
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.90 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.52 (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 8 MHz.

The zero-span method of measuring duty cycle shall not be used if $T \leq 6.25$ 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 $> 50/T$.

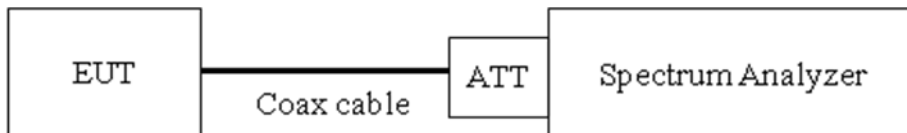
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10\log(1/\text{Duty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

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 $\geq 3 \times$ 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.

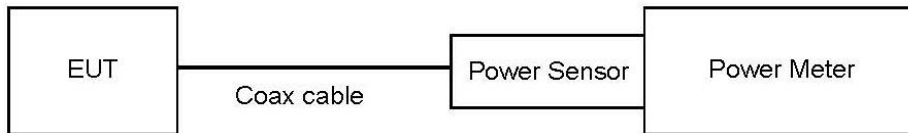
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

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

Dual BT Sample Calculation.

Ex) Ant 1 : 11.58 dBm Ant 2 : 12.08 dBm

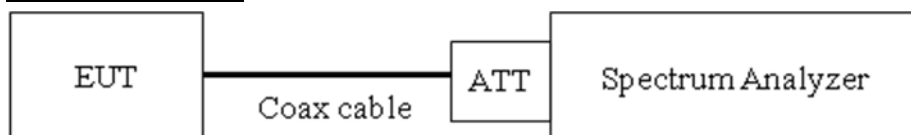
$$\text{Dual BT(Ant. 1 + Ant. 2)} = 11.58 \text{ dBm} + 12.08 \text{ dBm} = (14.387 \text{ mW} + 16.143 \text{ mW}) = 30.53 \text{ mW} = 14.88 \text{ dBm}$$

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) $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$.
- 4) $VBW \geq 3 \times RBW$.
- 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 $\geq [2 \times \text{span} / RBW]$.
- 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 + Duty Cycle Factor

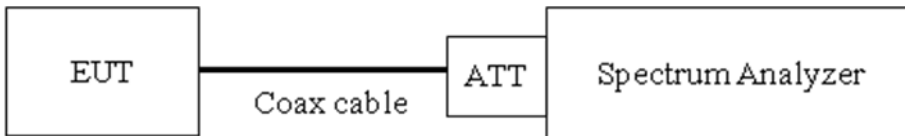
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

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 > 20 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 $\geq 3 \times$ 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 $\geq 2 \times$ 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	10.33
100	10.45
200	10.55
300	10.61
400	10.64
500	10.66
600	10.68
700	10.70
800	10.77
900	10.85
1 000	10.91
2 000	11.00
2 400	11.10
2 500	11.10
3 000	11.42
4 000	11.68
5 000	12.62
5 150	12.62
6 000	12.62
7 000	12.93
8 000	13.12
9 000	13.19
10 000	13.24
11 000	13.38
12 000	13.43
13 000	13.49
14 000	13.66
15 000	13.96
16 000	14.12
17 000	14.15
18 000	14.05
19 000	14.08
20 000	13.97
21 000	14.23
22 000	14.67
23 000	14.49
24 000	14.62
25 000	14.60

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

2. Factor = Attenuator loss + Cable loss

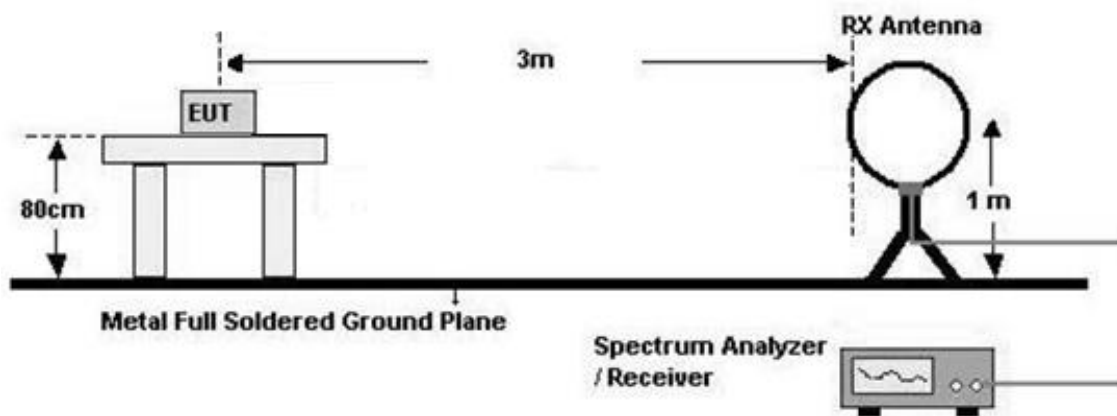
7.6. Radiated Test

Limit

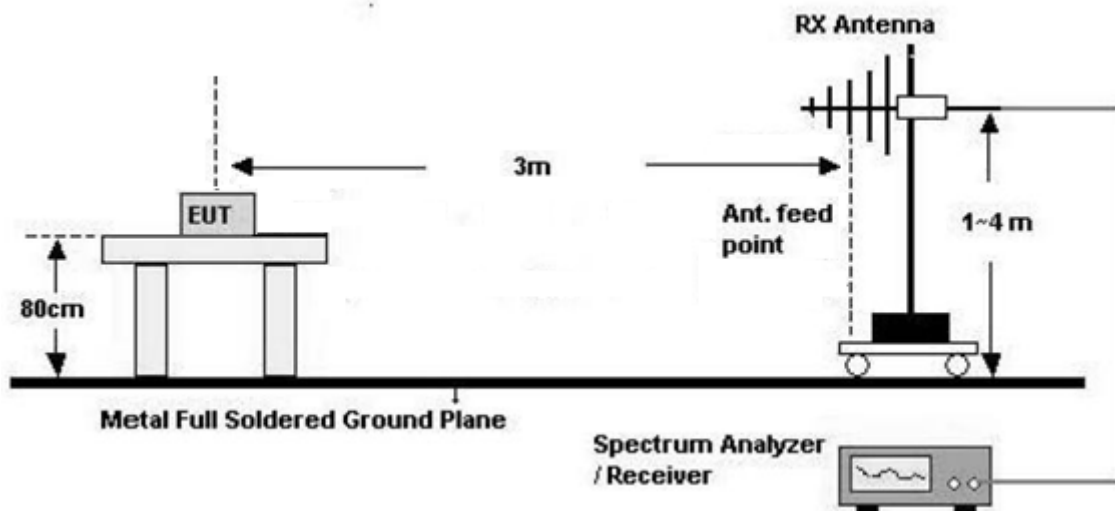
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

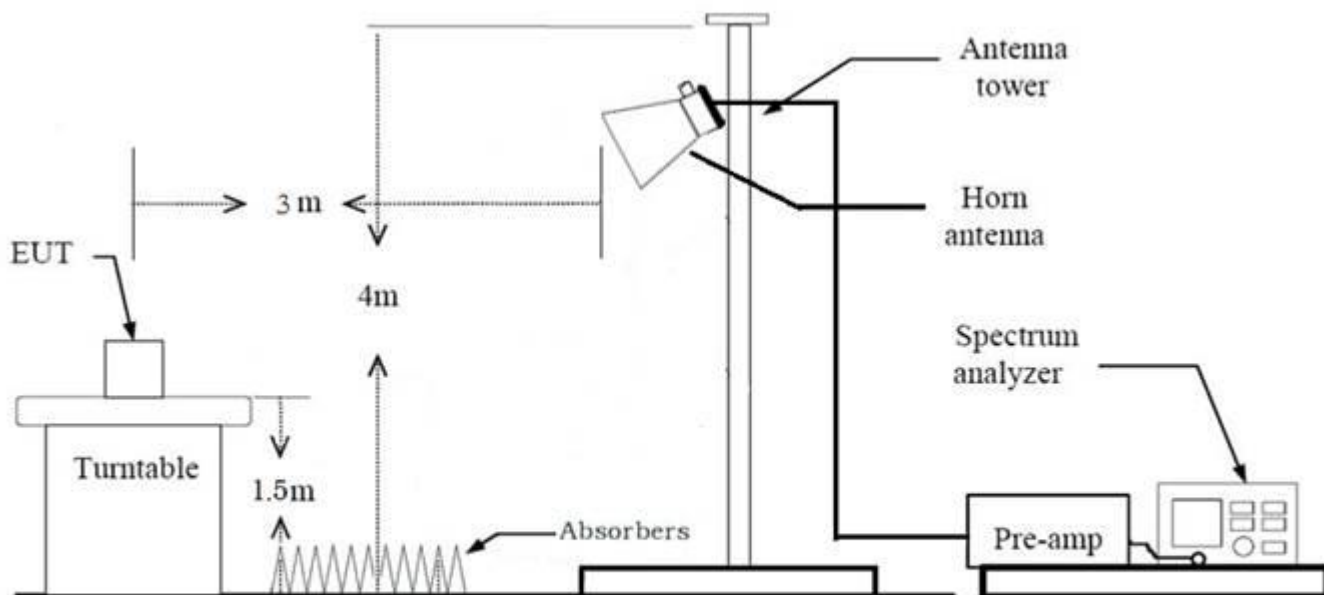
Below 30 MHz



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) = $40\log(3\text{ m}/300\text{ m}) = -80\text{ dB}$
Measurement Distance: 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$
Measurement Distance: 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ 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 $\geq$ 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 $\geq 3 \times$ RBW
 - (2) Measurement Type(Average):
 - Duty cycle $< 98 \%$, duty cycle variations are less than $\pm 2 \%$
 - Measured Frequency Range: 1 GHz – 25 GHz
 - Detector = RMS
 - Averaging type = power (i.e., RMS)
 - RBW = 1 MHz
 - VBW $\geq 3 \times$ 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 = $20\log(\text{test distance} / \text{specific distance})$ (dB)

11. Total

(1) Measurement(Peak)

= Measured Value(Peak)

(2) Measurement(Avg)

= Measured Value(Avg)

- We apply to the offset in range 1 GHz - 18 GHz

- The offset = Antenna Factor(A.F.) + Cable Loss(C.L) + Distance Factor(D.F) - Amp.Gain(A.G.)

#Note: Used Average measurement method according to KDB 558074 Section11 Q3

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 $\geq 3 \times$ 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 $\geq 3 \times$ 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 = $20\log(\text{test distance} / \text{specific distance})$ (dB)

11.Total

(1)Measurement(Peak)

= Measured Value(Peak)

(2)Measurement(Avg)

= Measured Value(Avg)

- We apply to the offset in range 1 GHz - 18 GHz

- The offset = Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

#Note : Used Average measurement method according to KDB 558074 Section11 Q3

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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	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 etc.)
 - Worst Case: Stand alone
2. EUT Axis
 - (1) Ant.1
 - Radiated Spurious Emissions : Z
 - Radiated Restricted Band Edge : X
 - (2) Ant.2
 - Radiated Spurious Emissions : Y
 - Radiated Restricted Band Edge : Y
 - (3) Dual Ant.1+ Ant.2
 - Radiated Spurious Emissions : Y
 - Radiated Restricted Band Edge : Y
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 data rate of operation were investigated and the worst case configuration results are reported.
 - Worst case: 1 Mbps, 2 Mbps
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
6. SM-S926U, SM-S926U1 were tested and the worst case results are reported.
(Worst case: SM-S926U)

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, etc.)+Travel Adapter
Stand alone + Travel Adapter
 - Worst Case: Stand alone + Travel Adapter
2. SM-S926U, SM-S926U1 were tested and the worst case results are reported.
(Worst case: SM-S926U)

Conducted test

1. The EUT was configured with packet length of highest power.
 - ALL supported mode tested.
 - Worst Results refer to Notes for each test item
2. SM-S926U, SM-S926U1 were tested and the worst case results are reported.
(Worst case: SM-S926U)

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

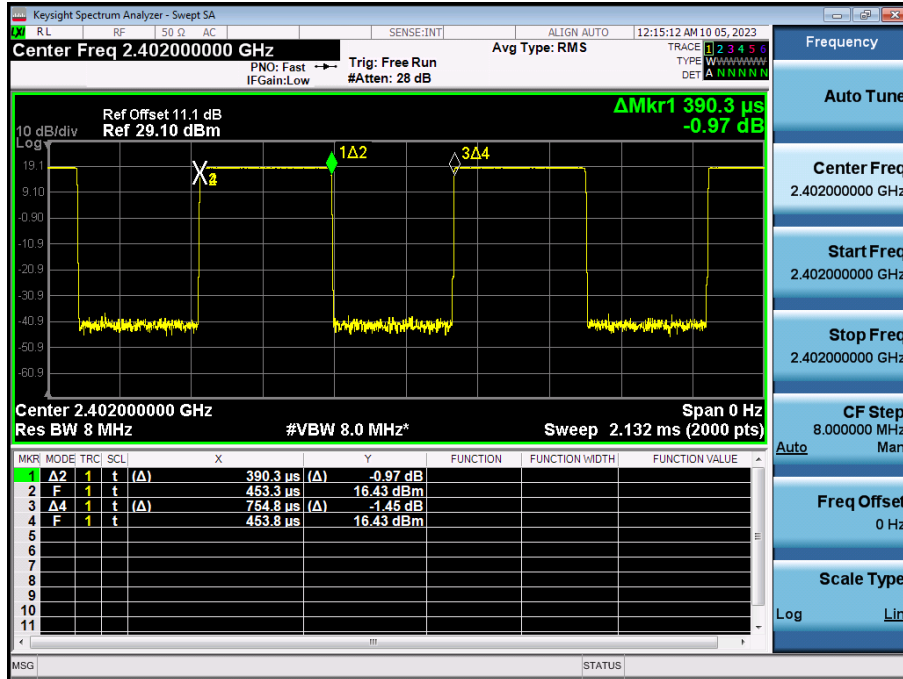
9. TEST RESULT

9.1 DUTY CYCLE

Data rate (Bit/s)	Packet length (Byte)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
1M	37	0.390	0.755	0.517	2.864
	255	2.131	2.499	0.853	0.692
2M	37	0.206	0.536	0.385	4.144
	255	1.076	1.408	0.764	1.168
125k	37	3.099	4.105	0.755	1.221
	255	17.010	18.040	0.943	0.255
500k	37	1.064	1.819	0.585	2.329
	255	4.549	5.300	0.858	0.664

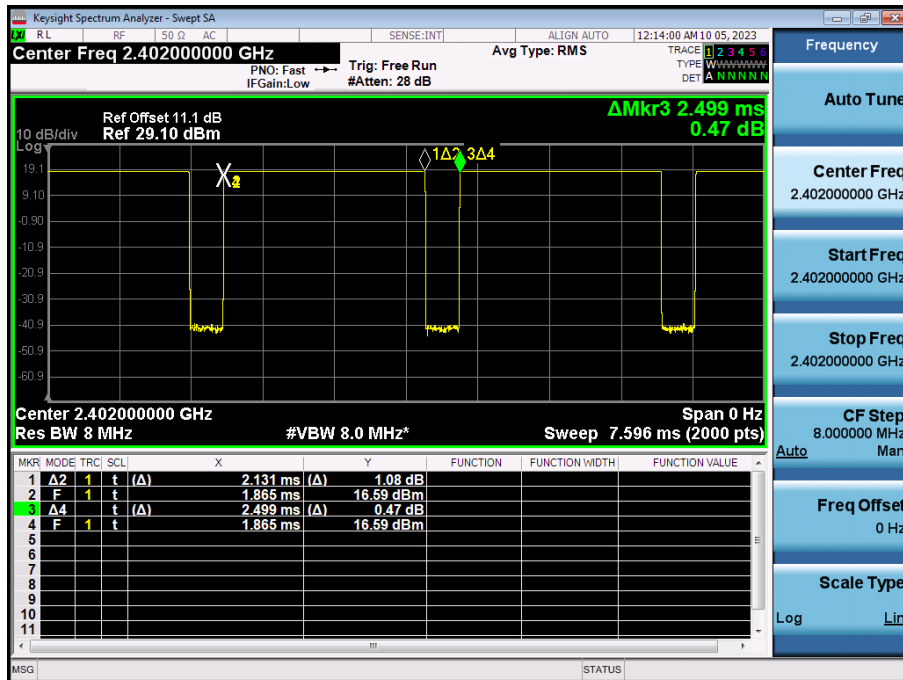
1 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



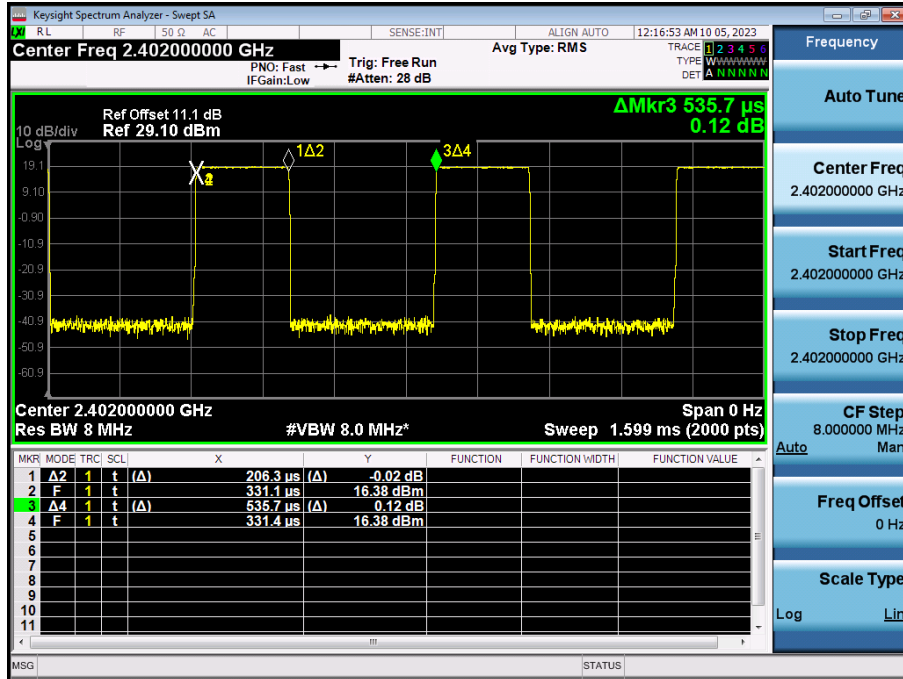
1 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



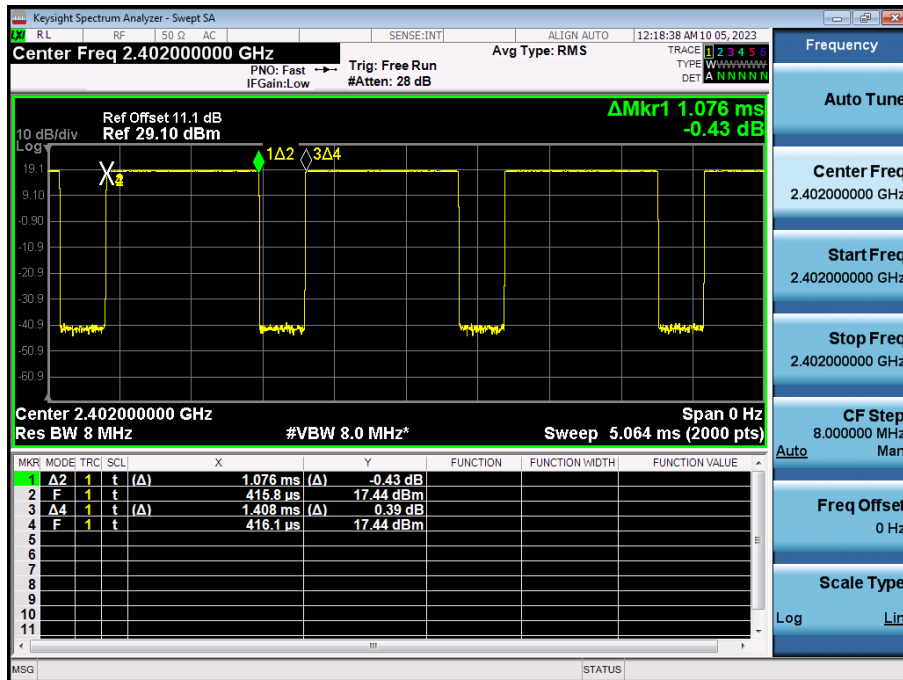
2 M Bit/s (37 Byte) Test Plots

Duty Cycle (Low-CH 0)



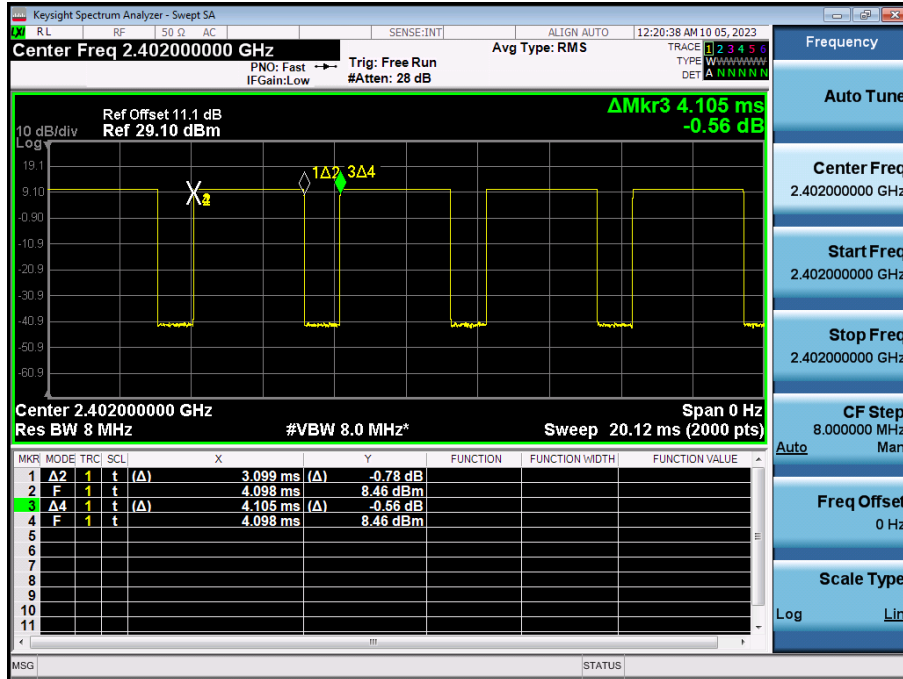
2 M Bit/s (255 Byte) Test Plots

Duty Cycle (Low-CH 0)



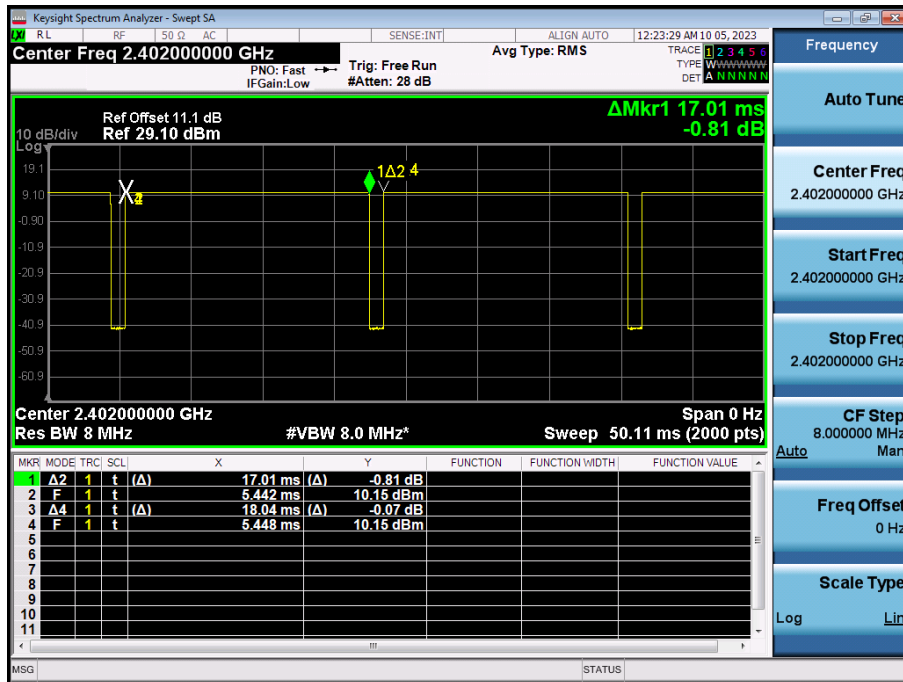
■ 125 k Bit/s(37 Byte) Test Plots

Duty Cycle (Low-CH 0)



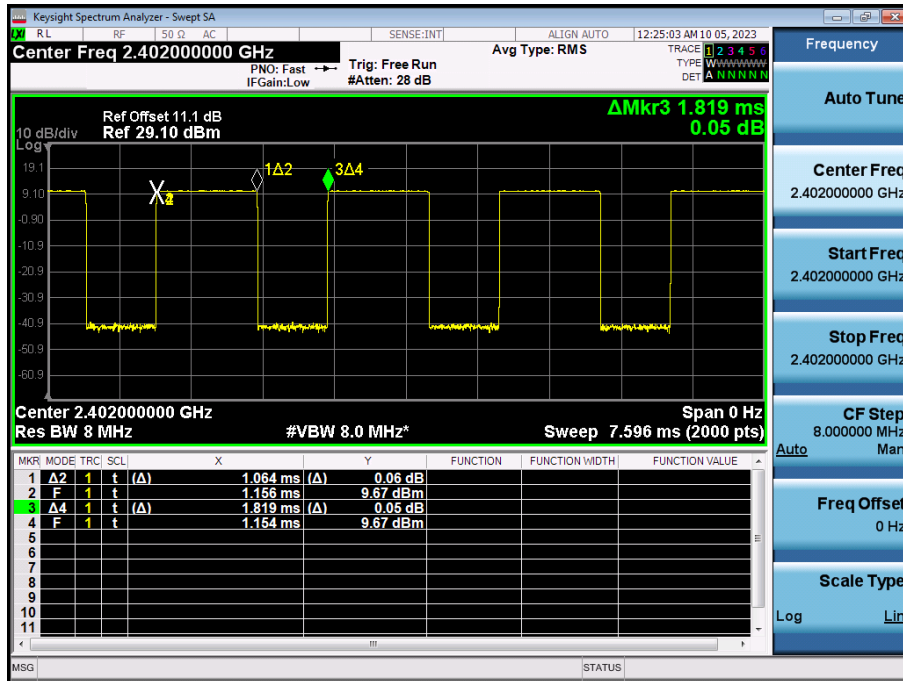
■ 125 k Bit/s(255 Byte) Test Plots

Duty Cycle (Low-CH 0)



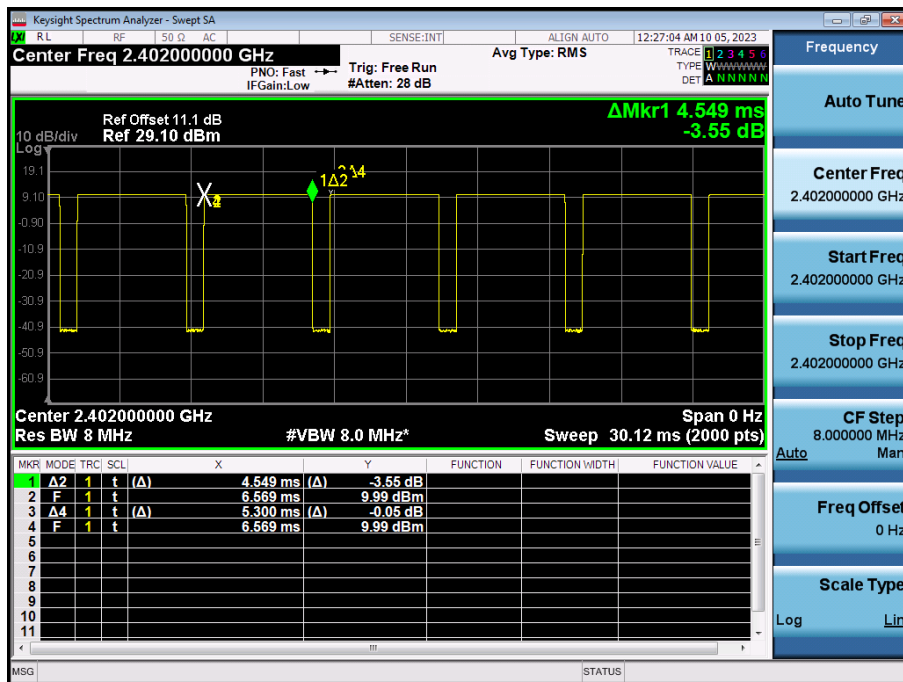
■ 500 k Bit/s(37 Byte) Test Plots

Duty Cycle (Low-CH 0)



■ 500 k Bit/s(255 Byte) Test Plots

Duty Cycle (Low-CH 0)



9.2 6 dB BANDWIDTH

[SISO]

[Ant.1]

Mode (Bit/s)	Channel	6 dB Bandwidth (kHz)	Limit (kHz)
1M(37)	0	688.5	> 500
	19	689.4	
	39	693.3	
1M(255)	0	666.8	> 500
	19	665.9	
	39	667.7	
2M(37)	0	1170	> 500
	19	1164	
	39	1166	
2M(255)	0	1161	> 500
	19	1167	
	39	1174	
125k(37)	0	610.9	> 500
	19	613.6	
	39	613.8	
125k(255)	0	611.0	> 500
	19	613.1	
	39	610.3	
500k(37)	0	666.4	> 500
	19	666.7	
	39	672.8	
500k(255)	0	666.6	> 500
	19	667.5	
	39	666.6	

Note:

In order to simplify the report, attached plots were only the narrowest 6 dB BW Channel.

1M Bit/s: 255 Byte

2M Bit/s: 255 Byte

125k Bit/s: 255 Byte

500k Bit/s: 37 Byte

[Ant.2]

Mode (Bit/s)	Channel	6 dB Bandwidth (kHz)	Limit (kHz)
1M(37)	0	683.7	> 500
	19	681.8	
	39	689.7	
1M(255)	0	667.2	> 500
	19	666.4	
	39	669.0	
2M(37)	0	1154	> 500
	19	1162	
	39	1166	
2M(255)	0	1168	> 500
	19	1168	
	39	1169	
125k(37)	0	611.2	> 500
	19	612.5	
	39	612.6	
125k(255)	0	610.8	> 500
	19	616.8	
	39	610.4	
500k(37)	0	664.5	> 500
	19	663.8	
	39	664.3	
500k(255)	0	666.2	> 500
	19	668.7	
	39	665.7	

Note:

In order to simplify the report, attached plots were only the narrowest 6 dB BW Channel.

1M Bit/s: 255 Byte

2M Bit/s: 37 Byte

125k Bit/s: 255 Byte

500k Bit/s: 37 Byte

[Dual BT]

[Ant.1]

Mode (Bit/s)	Channel	6 dB Bandwidth (kHz)	Limit (kHz)
1M(37)	0	669.0	> 500
	19	674.5	
	39	688.7	
1M(255)	0	665.8	> 500
	19	663.7	
	39	670.5	
2M(37)	0	1150	> 500
	19	1148	
	39	1152	
2M(255)	0	1160	> 500
	19	1161	
	39	1162	

Note:

In order to simplify the report, attached plots were only the narrowest 6 dB BW Channel.

1M Bit/s: 255 Byte

2M Bit/s: 37 Byte

[Ant.2]

Mode (Bit/s)	Channel	6 dB Bandwidth (kHz)	Limit (kHz)
1M(37)	0	667.4	> 500
	19	671.1	
	39	694.5	
1M(255)	0	665.8	> 500
	19	663.2	
	39	662.7	
2M(37)	0	1150	> 500
	19	1144	
	39	1155	
2M(255)	0	1156	> 500
	19	1145	
	39	1162	

Note:

In order to simplify the report, attached plots were only the narrowest 6 dB BW Channel

1M Bit/s: 255 Byte

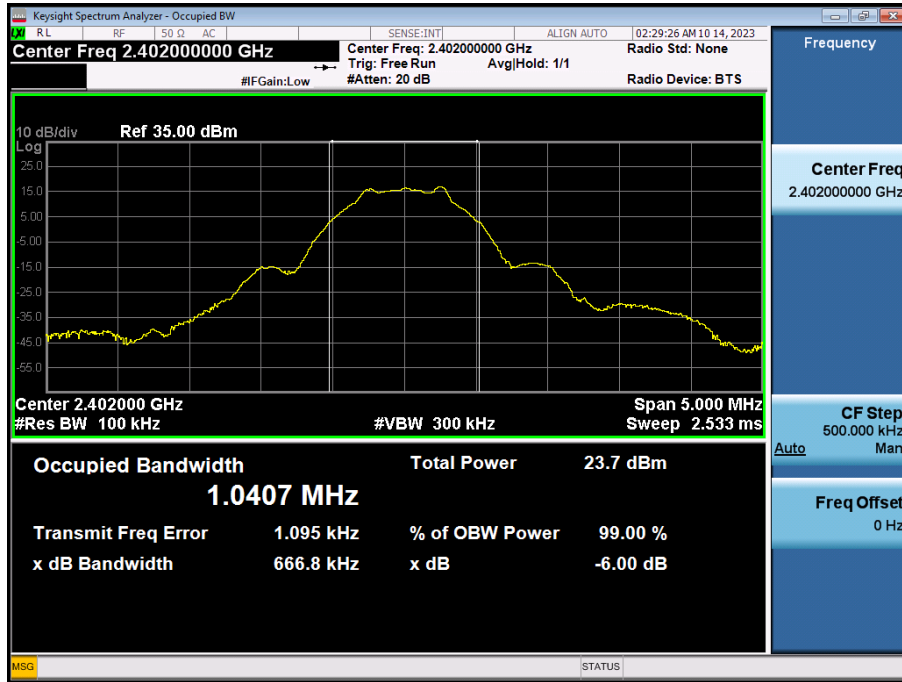
2M Bit/s: 37 Byte

[SISO]

[Ant.1]

1 MBit/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 MBit/s (255 Byte) Test Plots

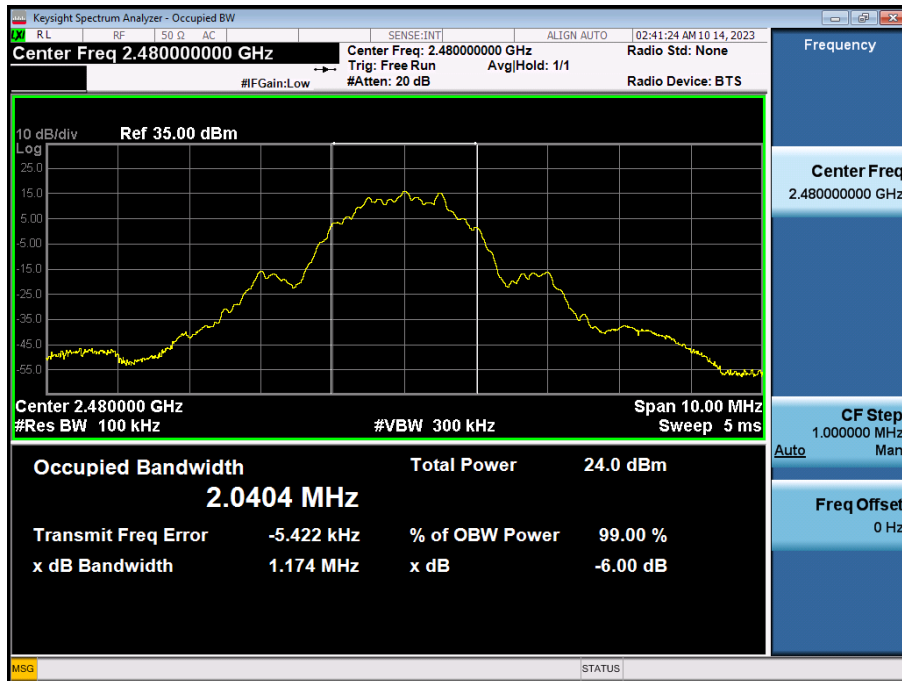
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)



6 dB Bandwidth plot (High-CH 39)

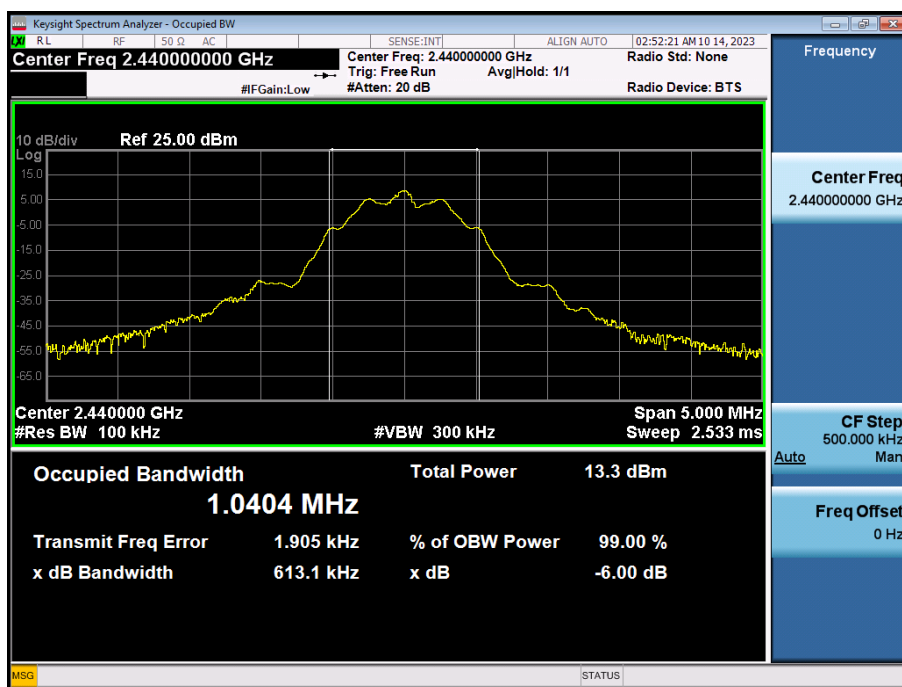


■ 125k Bit/s(255 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

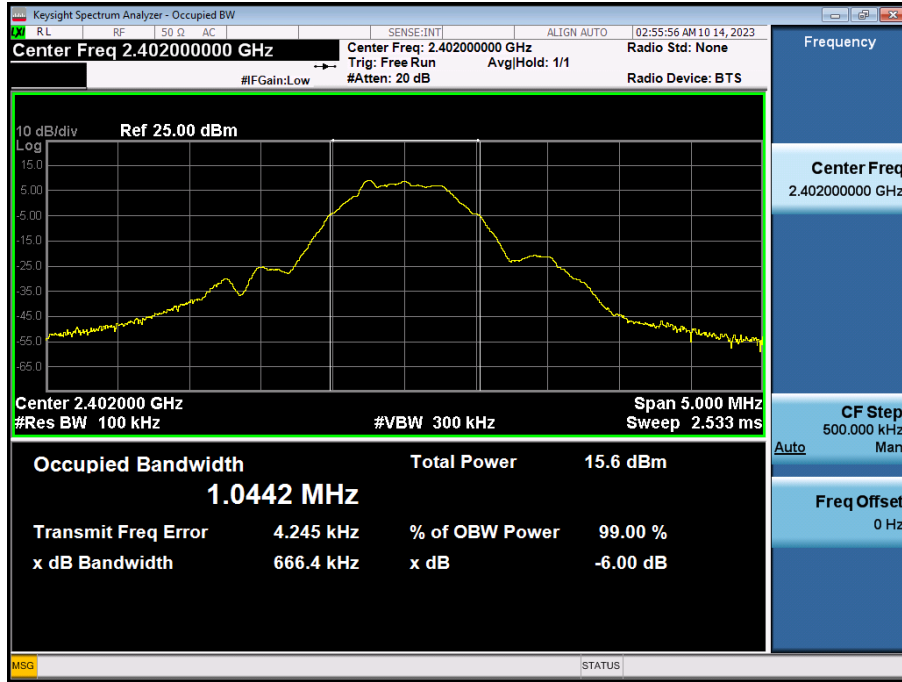


6 dB Bandwidth plot (High-CH 39)



■ 500k Bit/s(37 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)



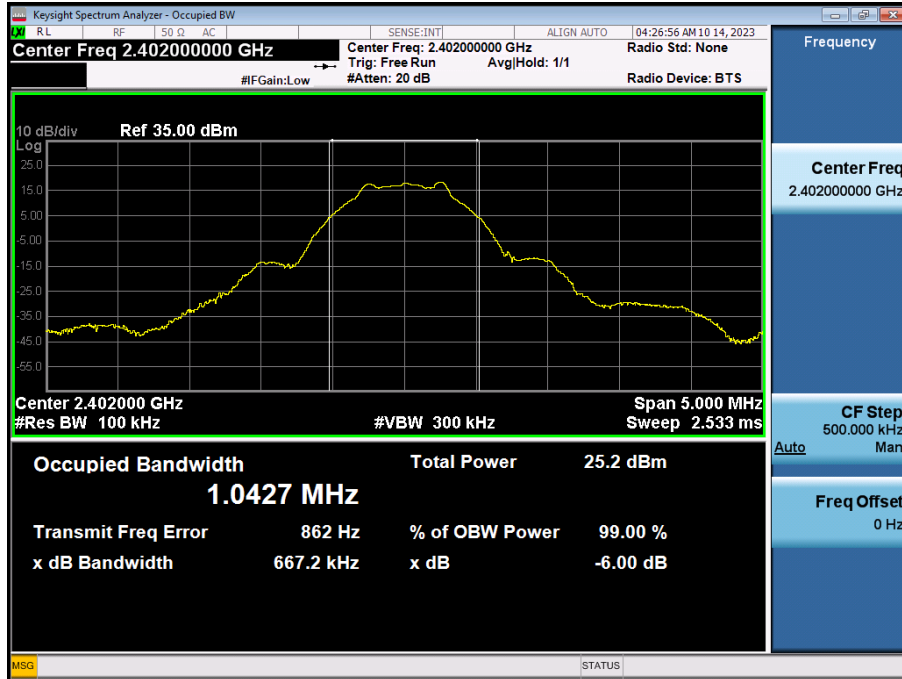
6 dB Bandwidth plot (High-CH 39)



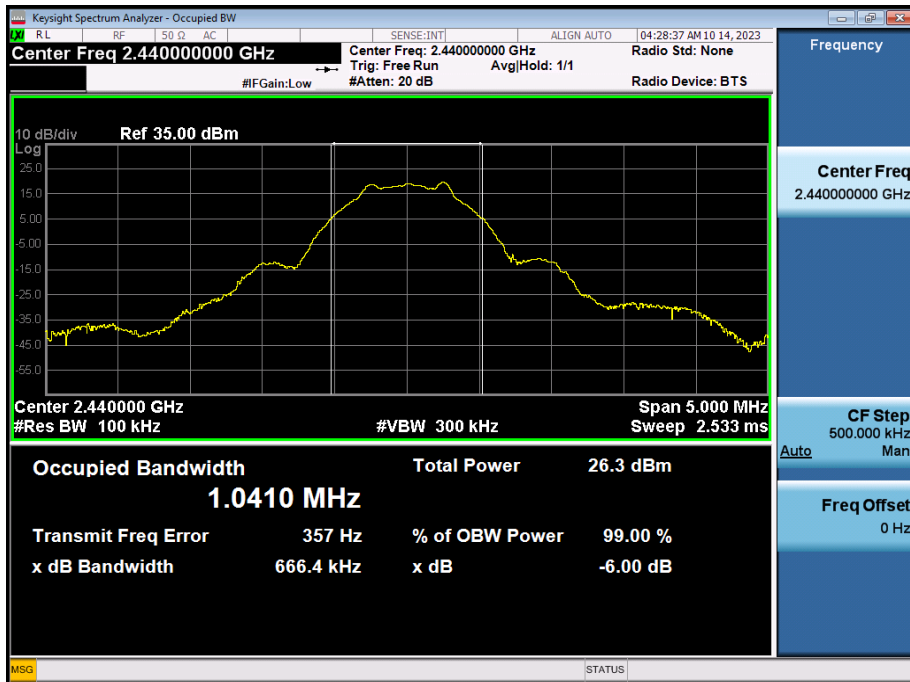
[Ant.2]

▣ 1 MBit/s (255 Byte) Test Plots

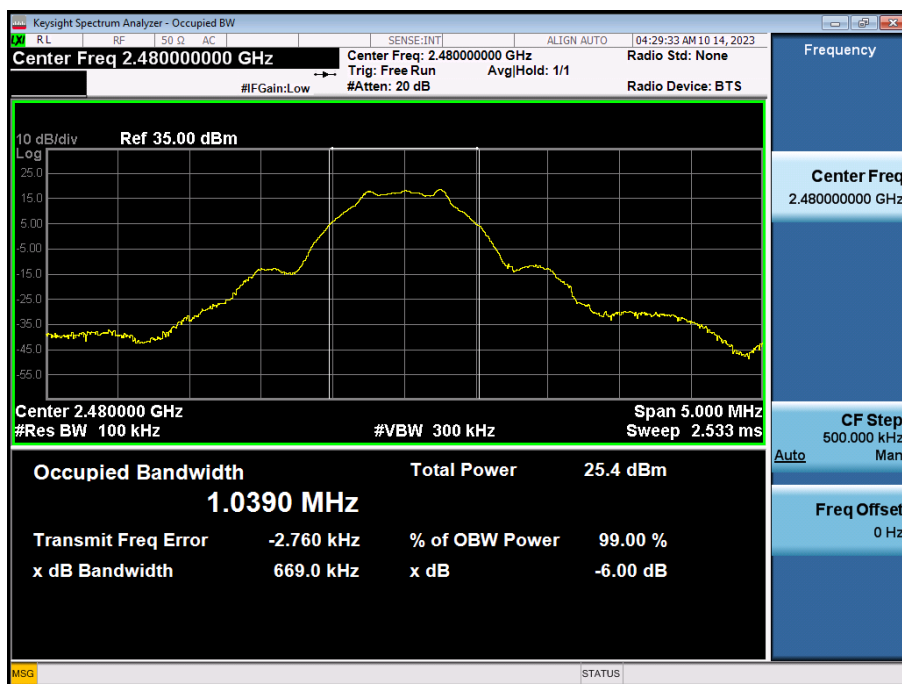
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)



6 dB Bandwidth plot (High-CH 39)



▣ 2 MBit/s (37 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

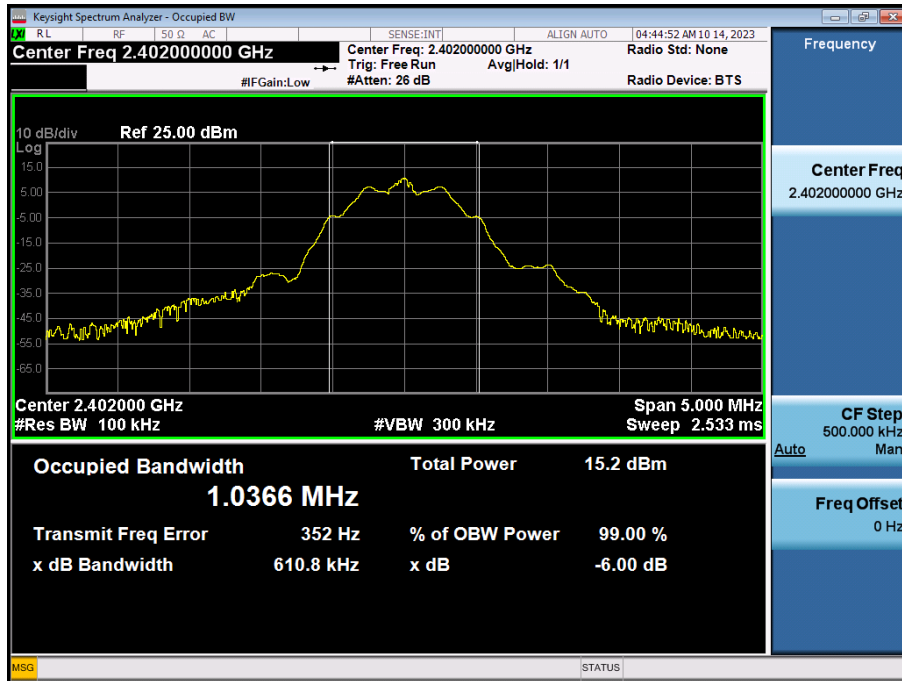


6 dB Bandwidth plot (High-CH 39)

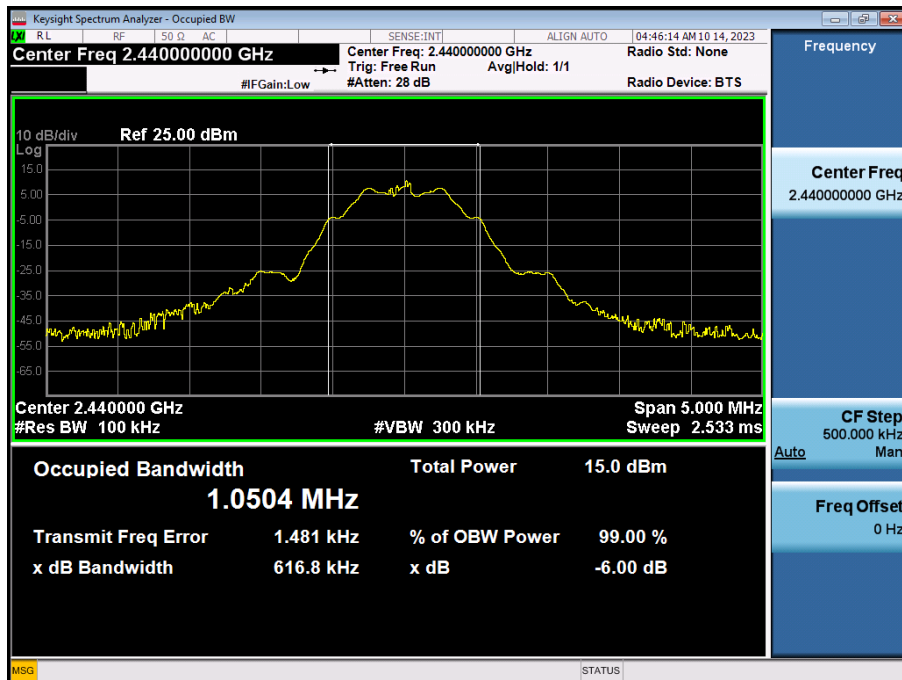


■ 125k Bit/s(255 Byte) Test Plots

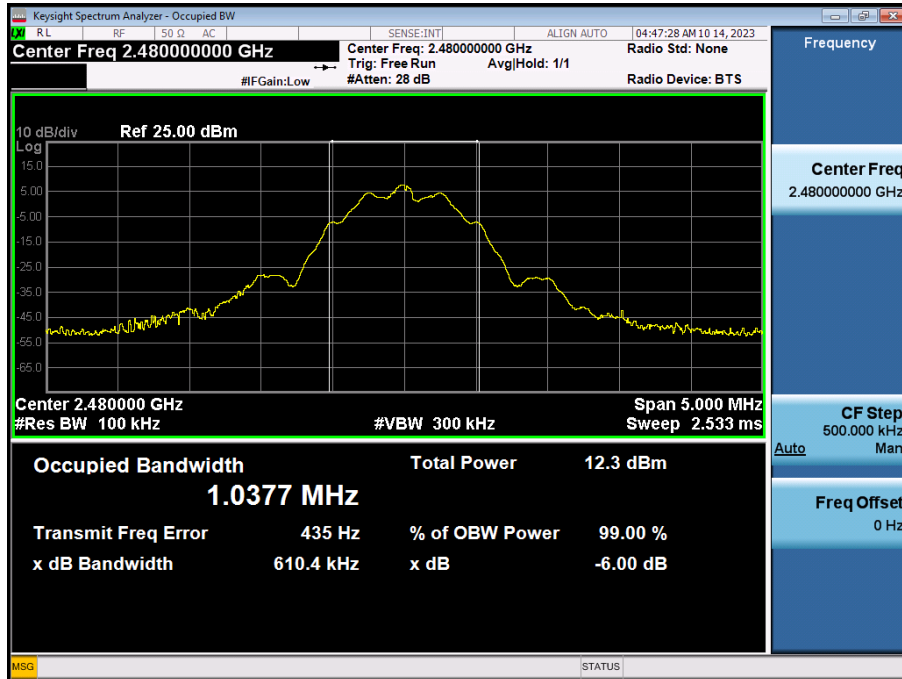
6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

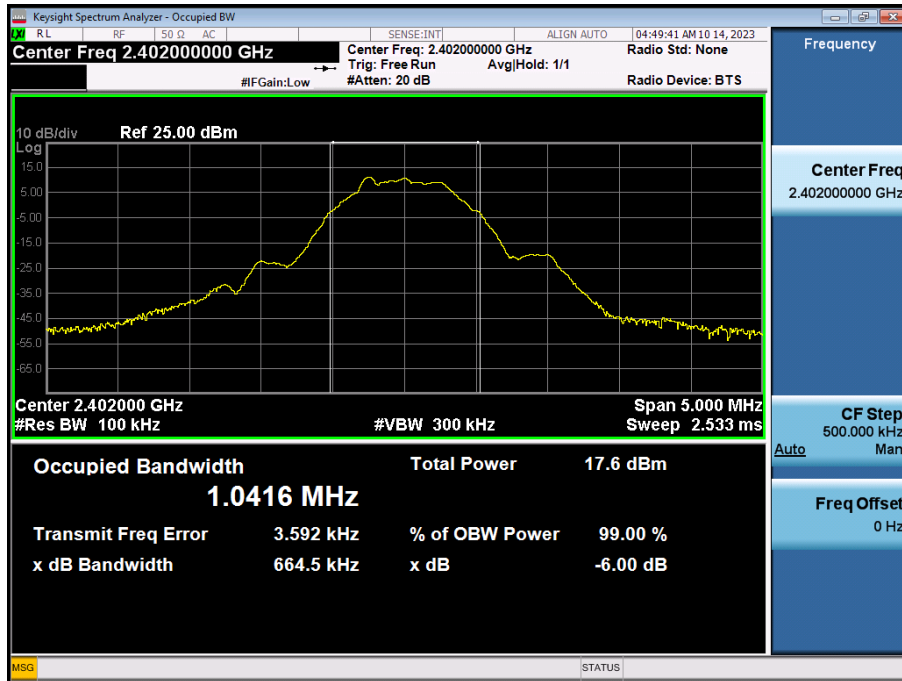


6 dB Bandwidth plot (High-CH 39)

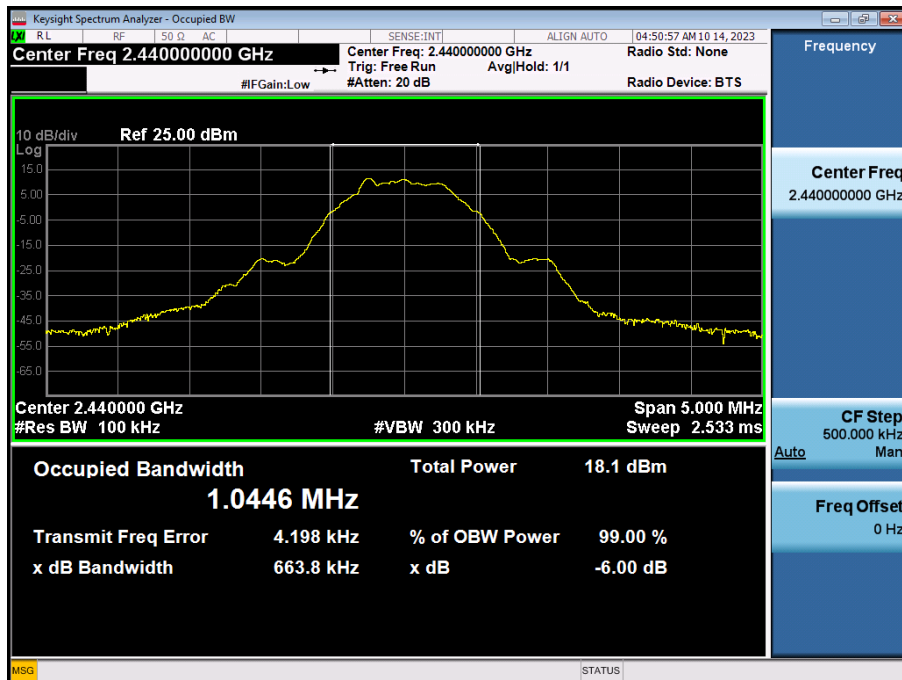


■ 500k Bit/s(37 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)



6 dB Bandwidth plot (High-CH 39)



[Dual BT]

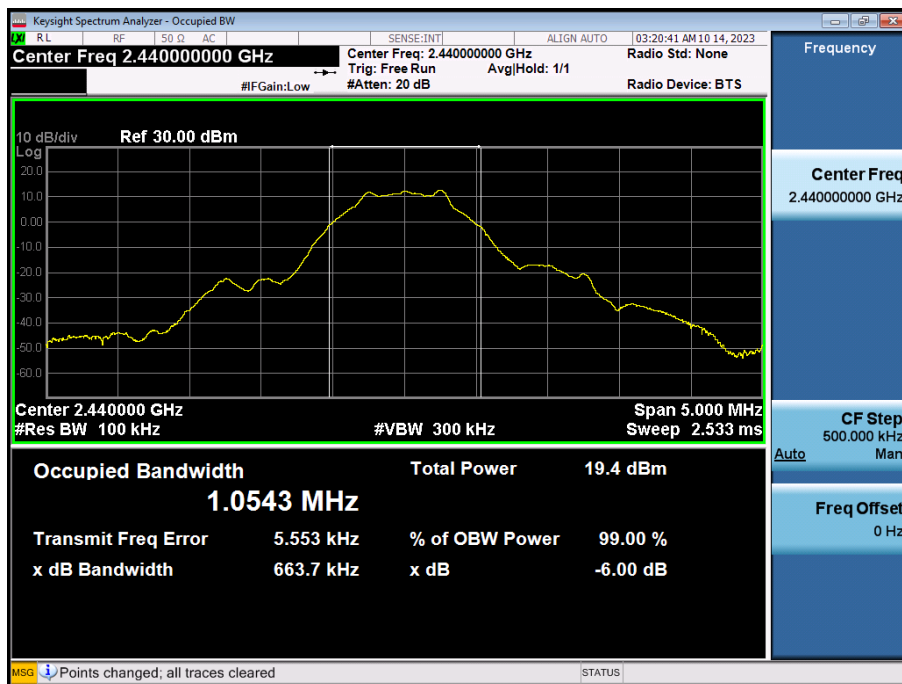
[Ant.1]

■ 1 MBit/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 MBit/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]

▣ 1 MBit/s (255 Byte) Test Plots

6 dB Bandwidth plot (Low-CH 0)



6 dB Bandwidth plot (Mid-CH 19)

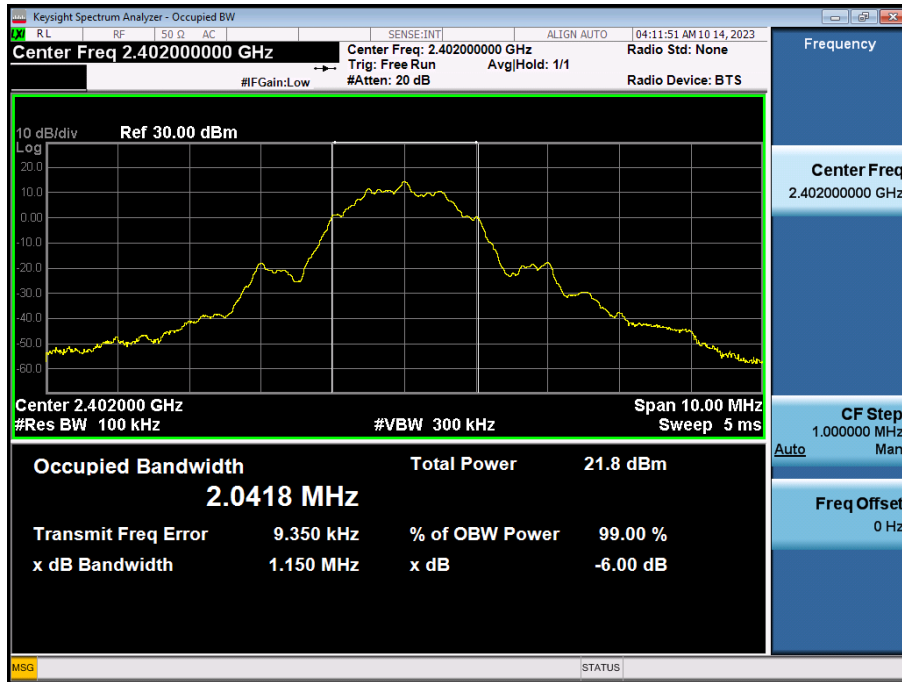


6 dB Bandwidth plot (High-CH 39)



2 MBit/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

Peak Power

[SISO]

[Ant.1]

Data rate (Bit/s)	Packet length (Byte)	LE Mode		Peak Power (dBm)	Limit (dBm)
		Frequency [MHz]	Channel		
1M	37	2402	0	17.664	30
		2440	19	18.924	
		2480	39	17.507	
	255	2402	0	17.530	
		2440	19	18.758	
		2480	39	17.163	
2M	37	2402	0	17.965	
		2440	19	19.100	
		2480	39	17.751	
	255	2402	0	17.554	
		2440	19	18.832	
		2480	39	17.526	
125k	37	2402	0	10.650	
		2440	19	11.201	
		2480	39	8.664	
	255	2402	0	10.650	
		2440	19	11.205	
		2480	39	8.653	
500k	37	2402	0	10.644	
		2440	19	11.304	
		2480	39	8.836	
	255	2402	0	10.620	
		2440	19	11.260	
		2480	39	8.694	

[Ant.2]

Data rate (Bit/s)	Packet length (Byte)	LE Mode		Peak Power (dBm)	Limit (dBm)
		Frequency [MHz]	Channel		
1M	37	2402	0	18.688	30
		2440	19	19.806	
		2480	39	19.228	
	255	2402	0	18.443	
		2440	19	19.490	
		2480	39	18.656	
2M	37	2402	0	18.788	
		2440	19	19.894	
		2480	39	19.468	
	255	2402	0	18.485	
		2440	19	19.623	
		2480	39	18.924	
125k	37	2402	0	11.192	
		2440	19	11.611	
		2480	39	8.293	
	255	2402	0	11.164	
		2440	19	11.570	
		2480	39	8.246	
500k	37	2402	0	11.193	
		2440	19	11.654	
		2480	39	8.363	
	255	2402	0	11.226	
		2440	19	11.595	
		2480	39	8.353	

[Dual BLE]

[Ant.1]

Data rate	Packet length	LE Mode		Peak Power (dBm)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		
1M	37	2402	0	12.260	30
		2440	19	12.779	
		2480	39	11.106	
	255	2402	0	12.145	
		2440	19	12.641	
		2480	39	10.968	
2M	37	2402	0	12.319	
		2440	19	12.854	
		2480	39	11.190	
	255	2402	0	12.129	
		2440	19	12.538	
		2480	39	10.985	

[Ant.2]

Data rate	Packet length	LE Mode		Peak Power (dBm)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel		
1M	37	2402	0	14.936	30
		2440	19	15.287	
		2480	39	12.095	
	255	2402	0	14.890	
		2440	19	15.247	
		2480	39	11.880	
2M	37	2402	0	14.993	
		2440	19	15.427	
		2480	39	12.204	
	255	2402	0	14.929	
		2440	19	15.343	
		2480	39	12.054	

[Dual BLE(Ant. 1 + Ant .2)]

Data rate	Packet length	LE Mode		Dual BLE Ant.1 Power(dBm)	Dual BLE Ant.2 Power(dBm)	Dual BLE Power(dBm) (Ant. 1 + Ant. 2)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel				
1M	37	2402	0	12.260	14.936	16.811	30
		2440	19	12.779	15.287	17.222	
		2480	39	11.106	12.095	14.639	
	255	2402	0	12.145	14.890	16.741	
		2440	19	12.641	15.247	17.147	
		2480	39	10.968	11.880	14.458	
2M	37	2402	0	12.319	14.993	16.869	
		2440	19	12.854	15.427	17.339	
		2480	39	11.190	12.204	14.737	
	255	2402	0	12.129	14.929	16.761	
		2440	19	12.538	15.343	17.173	
		2480	39	10.985	12.054	14.563	

Average Power

Note :

1. Total Power [dBm] = Measured Power [dBm] + Duty Cycle Factor [dB]

[SISO]

[Ant.1]

Data rate (Bit/s)	Packet length (Byte)	LE Mode		Measured Power (dBm)	Duty Cycle Factor (dB)	Result (dBm)	Limit (dBm)
		Frequency [MHz]	Channel				
1M	37	2402	0	14.00	2.86	16.86	30
		2440	19	15.87	2.86	18.73	
		2480	39	14.40	2.86	17.26	
	255	2402	0	15.97	0.69	16.66	
		2440	19	17.77	0.69	18.46	
		2480	39	16.10	0.69	16.79	
2M	37	2402	0	12.90	4.14	17.04	
		2440	19	14.78	4.14	18.92	
		2480	39	13.38	4.14	17.52	
	255	2402	0	15.57	1.17	16.74	
		2440	19	17.40	1.17	18.57	
		2480	39	15.77	1.17	16.94	
125k	37	2402	0	7.73	1.22	8.95	
		2440	19	7.93	1.22	9.15	
		2480	39	7.24	1.22	8.46	
	255	2402	0	8.70	0.26	8.96	
		2440	19	8.88	0.26	9.14	
		2480	39	8.24	0.26	8.50	
500k	37	2402	0	6.68	2.33	9.01	
		2440	19	6.92	2.33	9.25	
		2480	39	6.25	2.33	8.58	
	255	2402	0	8.27	0.66	8.93	
		2440	19	8.51	0.66	9.17	
		2480	39	7.80	0.66	8.46	

[Ant.2]

Data rate (Bit/s)	Packet length (Byte)	LE Mode		Measured Power (dBm)	Duty Cycle Factor (dB)	Result (dBm)	Limit (dBm)
		Frequency [MHz]	Channel				
1M	37	2402	0	15.55	2.86	18.41	30
		2440	19	16.62	2.86	19.48	
		2480	39	15.90	2.86	18.76	
	255	2402	0	17.55	0.69	18.24	
		2440	19	18.51	0.69	19.20	
		2480	39	17.62	0.69	18.31	
2M	37	2402	0	14.35	4.14	18.49	
		2440	19	15.47	4.14	19.61	
		2480	39	14.78	4.14	18.92	
	255	2402	0	17.05	1.17	18.22	
		2440	19	18.11	1.17	19.28	
		2480	39	17.24	1.17	18.41	
125k	37	2402	0	9.82	1.22	11.04	
		2440	19	10.21	1.22	11.43	
		2480	39	6.80	1.22	8.02	
	255	2402	0	10.71	0.26	10.97	
		2440	19	11.02	0.26	11.28	
		2480	39	7.78	0.26	8.04	
500k	37	2402	0	8.66	2.33	10.99	
		2440	19	9.15	2.33	11.48	
		2480	39	5.76	2.33	8.09	
	255	2402	0	10.31	0.66	10.97	
		2440	19	10.72	0.66	11.38	
		2480	39	7.40	0.66	8.06	

[Dual BLE]
[Ant.1]

Data rate	Packet length	LE Mode		Measured Power	Duty Cycle Factor	Result	Limit
(Bit/s)	(Byte)	Frequency [MHz]	Channel	(dBm)	(dB)	(dBm)	(dBm)
1M	37	2402	0	9.00	2.86	11.86	30
		2440	19	9.52	2.86	12.38	
		2480	39	7.81	2.86	10.67	
	255	2402	0	11.05	0.69	11.74	
		2440	19	11.62	0.69	12.31	
		2480	39	10.03	0.69	10.72	
2M	37	2402	0	7.79	4.14	11.93	
		2440	19	8.33	4.14	12.47	
		2480	39	6.62	4.14	10.76	
	255	2402	0	10.66	1.17	11.83	
		2440	19	11.17	1.17	12.34	
		2480	39	9.42	1.17	10.59	

[Ant.2]

Data rate	Packet length	LE Mode		Measured Power	Duty Cycle Factor	Result	Limit
(Bit/s)	(Byte)	Frequency [MHz]	Channel	(dBm)	(dB)	(dBm)	(dBm)
1M	37	2402	0	11.16	2.86	14.02	30
		2440	19	12.25	2.86	15.11	
		2480	39	8.83	2.86	11.69	
	255	2402	0	13.77	0.69	14.46	
		2440	19	14.38	0.69	15.07	
		2480	39	10.94	0.69	11.63	
2M	37	2402	0	10.48	4.14	14.62	
		2440	19	11.00	4.14	15.14	
		2480	39	7.65	4.14	11.79	
	255	2402	0	13.37	1.17	14.54	
		2440	19	14.00	1.17	15.17	
		2480	39	10.50	1.17	11.67	

[Dual BLE(Ant. 1 + Ant .2)]

Data rate	Packet length	LE Mode		Dual BLE Ant.1 Power	Dual BLE Ant.2 Power	Dual BLE Power(dBm) (Ant. 1 + Ant. 2)	Limit (dBm)
(Bit/s)	(Byte)	Frequency [MHz]	Channel	(dBm)	(dBm)		
1M	37	2402	0	11.86	14.02	16.09	30
		2440	19	12.38	15.11	16.97	
		2480	39	10.67	11.69	14.22	
	255	2402	0	11.74	14.46	16.32	
		2440	19	12.31	15.07	16.92	
		2480	39	10.72	11.63	14.21	
2M	37	2402	0	11.93	14.62	16.49	
		2440	19	12.47	15.14	17.02	
		2480	39	10.76	11.79	14.32	
	255	2402	0	11.83	14.54	16.40	
		2440	19	12.34	15.17	16.99	
		2480	39	10.59	11.67	14.17	

9.4 POWER SPECTRAL DENSITY

Note :

1. Total PSD = Measured PSD + Duty Cycle Factor
2. In order to simplify the report, the plots were attached with the highest PSD Mode.
Worst case : 125k Bit/s (255 Byte)

[SISO]

[Ant.1]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Measured PSD (dBm/3 kHz)	Duty Cycle Factor(dB)	Total PSD (dBm/ 3kHz)	Limit
2402	0	1 MBit/s 37 Byte	-2.079	2.86	0.785	8 dBm / 3 kHz
2440	19		-1.689	2.86	1.175	
2480	39		-3.210	2.86	-0.346	
2402	0	1 MBit/s 255 Byte	-5.125	0.69	-4.433	
2440	19		-3.693	0.69	-3.001	
2480	39		-5.495	0.69	-4.803	
2402	0	2 MBit/s 37 Byte	-4.404	4.14	-0.260	
2440	19		-3.534	4.14	0.610	
2480	39		-4.927	4.14	-0.783	
2402	0	2 MBit/s 255 Byte	-7.126	1.17	-5.958	
2440	19		-5.587	1.17	-4.419	
2480	39		-7.943	1.17	-6.775	
2402	0	125k 37 Byte	0.895	1.22	2.116	
2440	19		1.138	1.22	2.359	
2480	39		-1.312	1.22	-0.091	
2402	0	125k 255 Byte	1.978	0.26	2.233	
2440	19		1.959	0.26	2.214	
2480	39		-0.304	0.26	-0.049	
2402	0	500k 37 Byte	-4.308	2.33	-1.979	
2440	19		-5.541	2.33	-3.212	
2480	39		-8.016	0.66	-7.352	
2402	0	500k 255 Byte	-10.565	0.66	-9.901	
2440	19		-8.331	0.66	-7.667	
2480	39		-11.844	0.66	-11.180	

[Ant.2]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Measured PSD (dBm/3 kHz)	Duty Cycle Factor(dB)	Total PSD (dBm/ 3kHz)	Limit
2402	0	1 MBit/s 37 Byte	-1.194	2.86	1.670	8 dBm / 3 kHz
2440	19		0.488	2.86	3.352	
2480	39		-0.232	2.86	2.632	
2402	0	1 MBit/s 255 Byte	-2.799	0.69	-2.107	
2440	19		-1.774	0.69	-1.082	
2480	39		-3.087	0.69	-2.395	
2402	0	2 MBit/s 37 Byte	-3.185	4.14	0.959	
2440	19		-2.079	4.14	2.065	
2480	39		-2.490	4.14	1.654	
2402	0	2 MBit/s 255 Byte	-5.870	1.17	-4.702	
2440	19		-4.969	1.17	-3.801	
2480	39		-5.444	1.17	-4.276	
2402	0	125k 37 Byte	3.027	1.22	4.248	
2440	19		3.233	1.22	4.454	
2480	39		-1.414	1.22	-0.193	
2402	0	125k 255 Byte	4.121	0.26	4.376	
2440	19		4.351	0.26	4.606	
2480	39		0.987	0.26	1.242	
2402	0	500k 37 Byte	-3.603	2.33	-1.274	
2440	19		-3.369	2.33	-1.040	
2480	39		-6.850	0.66	-6.186	
2402	0	500k 255 Byte	-5.826	0.66	-5.162	
2440	19		-7.087	0.66	-6.423	
2480	39		-10.676	0.66	-10.012	

[Dual BT]
[Ant.1]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Measured PSD (dBm/3 kHz)	Duty Cycle Factor(dB)	Total PSD (dBm/ 3kHz)	Limit
2402	0	1M Bit/s 37 Byte	-7.835	2.86	-4.971	8dBm/3kHz
2440	19		-7.261	2.86	-4.397	
2480	39		-8.519	2.86	-5.655	
2402	0	1M Bit/s 255 Byte	-9.714	0.69	-9.022	
2440	19		-9.220	0.69	-8.528	
2480	39		-11.229	0.69	-10.537	
2402	0	2M Bit/s 37 Byte	-10.208	4.14	-6.064	
2440	19		-9.233	4.14	-5.089	
2480	39		-11.614	4.14	-7.470	
2402	0	2M Bit/s 255 Byte	-12.111	1.17	-10.943	
2440	19		-11.775	1.17	-10.607	
2480	39		-13.583	1.17	-12.415	

[Ant.2]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Measured PSD (dBm/3 kHz)	Duty Cycle Factor(dB)	Total PSD (dBm/ 3kHz)	Limit
2402	0	1M Bit/s 37 Byte	-4.730	2.86	-1.866	8dBm/3kHz
2440	19		-4.636	2.86	-1.772	
2480	39		-8.000	2.86	-5.136	
2402	0	1M Bit/s 255 Byte	-7.286	0.69	-6.594	
2440	19		-6.792	0.69	-6.100	
2480	39		-10.379	0.69	-9.687	
2402	0	2M Bit/s 37 Byte	-7.089	4.14	-2.945	
2440	19		-6.803	4.14	-2.659	
2480	39		-10.306	4.14	-6.162	
2402	0	2M Bit/s 255 Byte	-9.373	1.17	-8.205	
2440	19		-9.247	1.17	-8.079	
2480	39		-12.635	1.17	-11.467	

[Dual BLE(Ant.1+ Ant.2)]

Frequency (MHz)	Channel No.	Mode	Test Result			
			Dual BLE Ant. 1 PSD (dBm/3 kHz)	Dual BLE Ant. 2 PSD (dBm/3 kHz)	Dual BLE PSD (Ant.1 + Ant.2) (dBm/3 kHz)	Limit
2402	0	1 MBit/s 37 Byte	-4.971	-1.866	-0.136	8 dBm / 3 kHz
2440	19		-4.397	-1.772	0.122	
2480	39		-5.655	-5.136	-2.377	
2402	0	1 MBit/s 255 Byte	-9.022	-6.594	-4.630	
2440	19		-8.528	-6.100	-4.136	
2480	39		-10.537	-9.687	-7.081	
2402	0	2 MBit/s 37 Byte	-6.064	-2.945	-1.220	
2440	19		-5.089	-2.659	-0.696	
2480	39		-7.470	-6.162	-3.756	
2402	0	2 MBit/s 255 Byte	-10.943	-8.205	-6.352	
2440	19		-10.607	-8.079	-6.151	
2480	39		-12.415	-11.467	-8.905	

[SISO]

[Ant.1]

▣ 125k Bit/s (37 Byte) Test Plots

Power Spectral Density (Low-CH 0)



Power Spectral Density (Mid-CH 19)



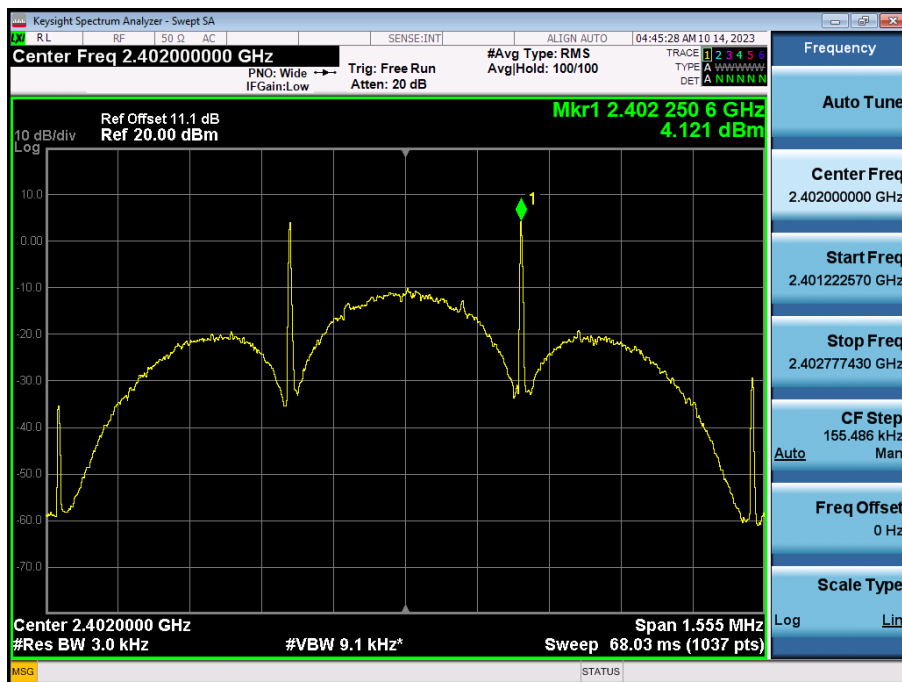
Power Spectral Density (High-CH 39)



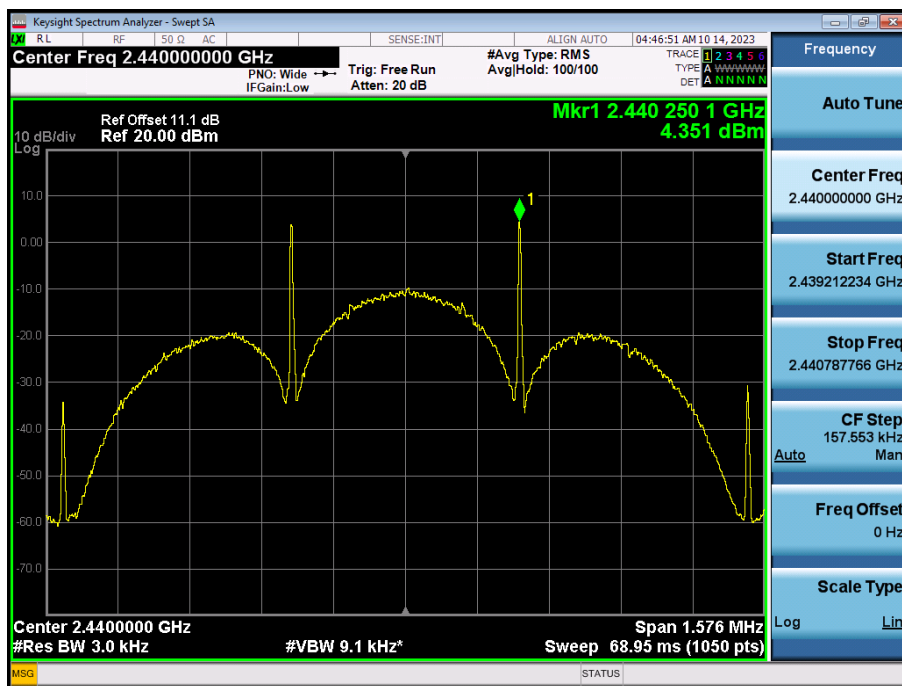
[Ant.2]

125k Bit/s (255 Byte) Test Plots

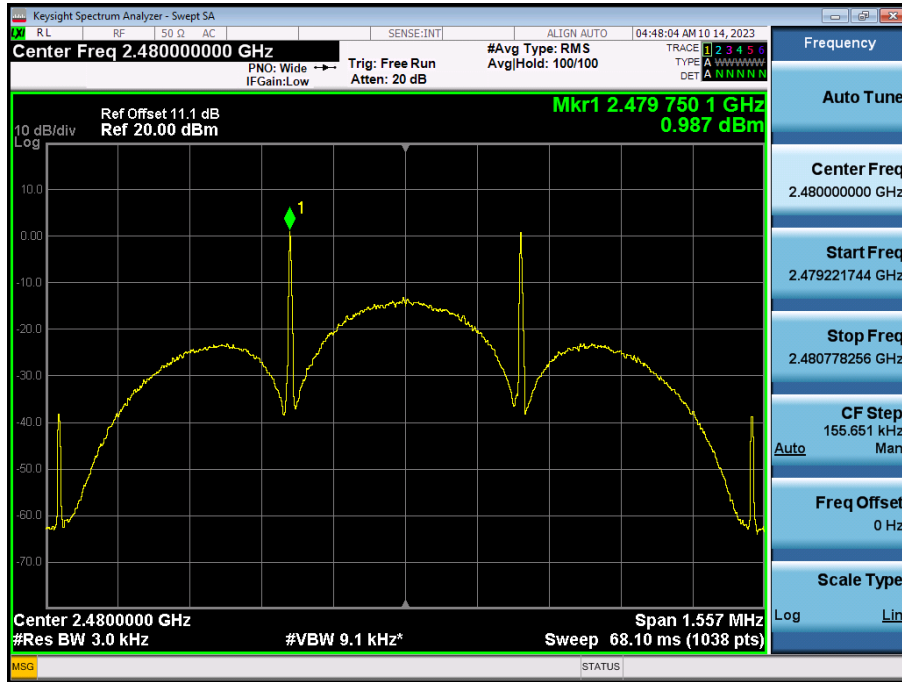
Power Spectral Density (Low-CH 0)



Power Spectral Density (Mid-CH 19)



Power Spectral Density (High-CH 39)

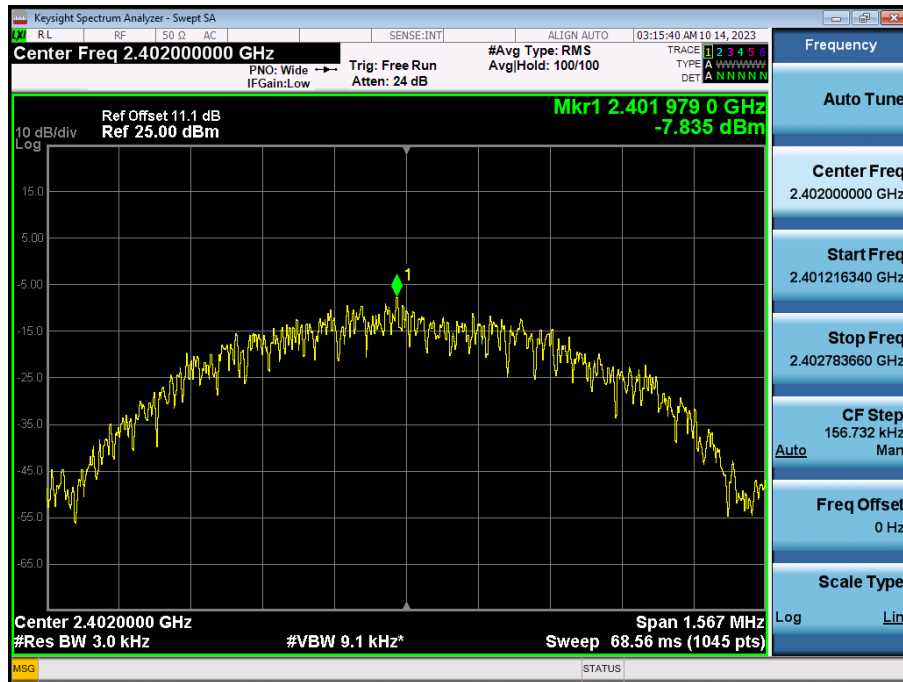


[Dual BT]

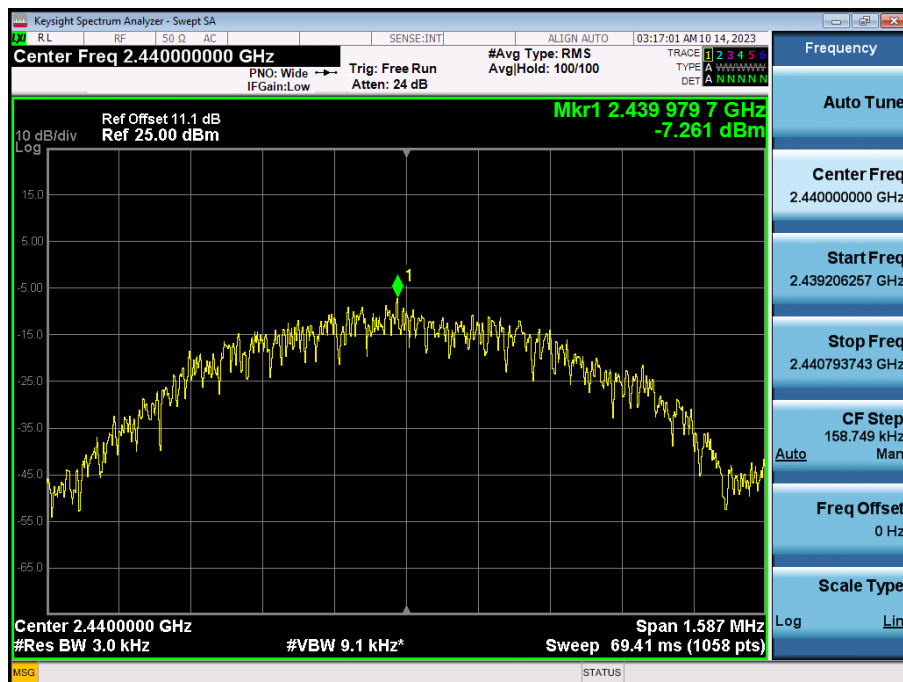
[Ant.1]

▣ 1M Bit/s (37 Byte) Test Plots

Power Spectral Density (Low-CH 0)



Power Spectral Density (Mid-CH 19)



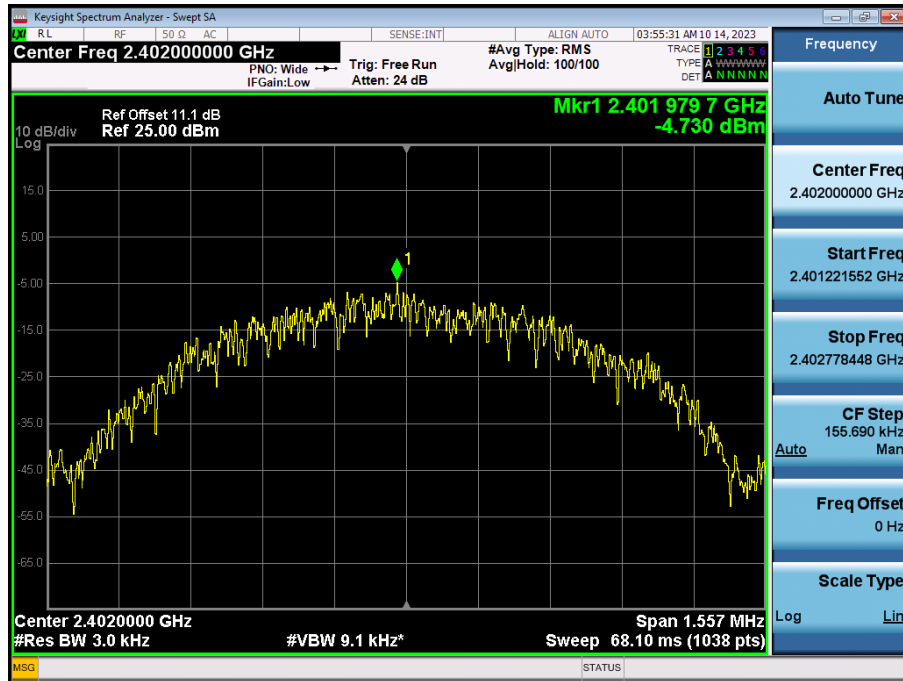
Power Spectral Density (High-CH 39)



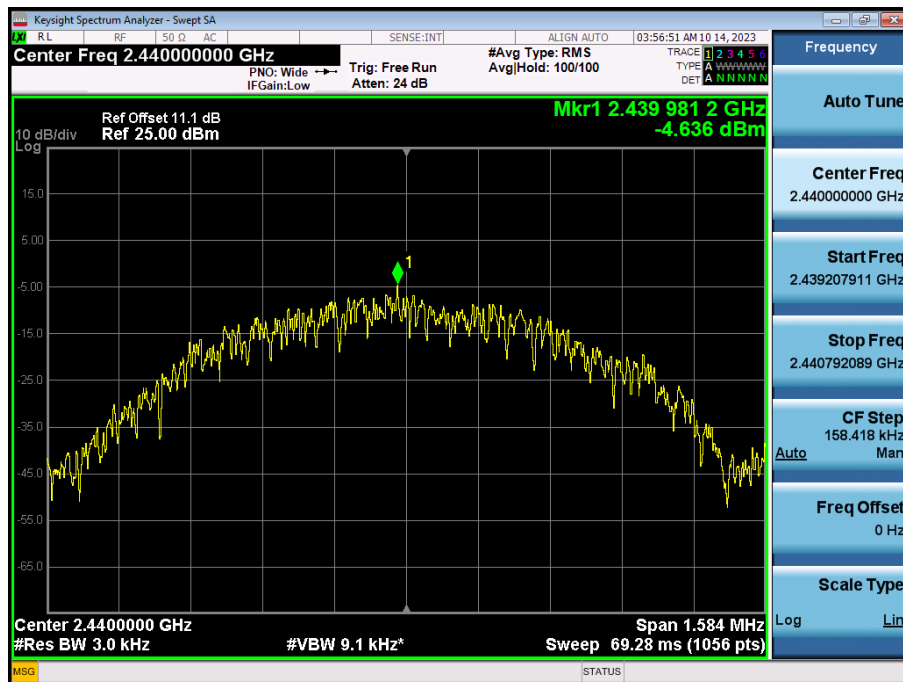
[Ant.2]

▣ 1M Bit/s (37 Byte) Test Plots

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

[SISO]

[Ant.1]

[BAND EDGE]

Frequency (MHz)	Mode	Channel No.	Position	Test Result	
				Measured Level (dB)	Limit (dBc)
2402	1M Bit/s 37 Byte	0	Lower	54.497	30
2480		39	Upper	59.177	30
2402	1M Bit/s 255 Byte	0	Lower	55.641	30
2480		39	Upper	60.077	30
2402	2M Bit/s 37 Byte	0	Lower	32.419	30
2480		39	Upper	55.657	30
2402	2M Bit/s 255 Byte	0	Lower	32.784	30
2480		39	Upper	54.669	30
2402	125k Bit/s 37 Byte	0	Lower	56.957	30
2480		39	Upper	60.164	30
2402	125k Bit/s 255 Byte	0	Lower	54.756	30
2480		39	Upper	58.928	30
2402	500k Bit/s 37 Byte	0	Lower	56.433	30
2480		39	Upper	60.567	30
2402	500k Bit/s 255 Byte	0	Lower	55.302	30
2480		39	Upper	59.829	30

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
 - Lower Band Edge 2M Bit/s (37 Byte)
 - Upper Band Edge 2M Bit/s (255 Byte)

[CONDUCTED SPURIOUS EMISSIONS]

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
Worst case 2M Bit/s (37 Byte)

[Ant.2]

[BAND EDGE]

Frequency (MHz)	Mode	Channel No.	Position	Test Result	
				Measured Level (dB)	Limit (dBc)
2402	1M Bit/s 37 Byte	0	Lower	54.832	30
2480		39	Upper	61.107	30
2402	1M Bit/s 255 Byte	0	Lower	54.130	30
2480		39	Upper	58.893	30
2402	2M Bit/s 37 Byte	0	Lower	32.150	30
2480		39	Upper	55.683	30
2402	2M Bit/s 255 Byte	0	Lower	32.609	30
2480		39	Upper	54.450	30
2402	125k Bit/s 37 Byte	0	Lower	55.172	30
2480		39	Upper	55.156	30
2402	125k Bit/s 255 Byte	0	Lower	52.989	30
2480		39	Upper	58.924	30
2402	500k Bit/s 37 Byte	0	Lower	58.109	30
2480		39	Upper	61.868	30
2402	500k Bit/s 255 Byte	0	Lower	58.096	30
2480		39	Upper	52.486	30

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
(1) Lower 2M Bit/s (37 Byte)
(2) Upper 500k Bit/s (255 Byte)

[CONDUCTED SPURIOUS EMISSIONS]

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
Worst case 2M Bit/s (37 Byte)

[Dual BT]

[Ant.1]

[BAND EDGE]

Frequency (MHz)	Mode	Channel No.	Position	Test Result	
				Measured Level (dB)	Limit (dBc)
2402	1M Bit/s 37 Byte	0	Lower	54.440	30
2480		39	Upper	58.507	30
2402	1M Bit/s 255 Byte	0	Lower	55.003	30
2480		39	Upper	59.050	30
2402	2M Bit/s 37 Byte	0	Lower	31.949	30
2480		39	Upper	55.470	30
2402	2M Bit/s 255 Byte	0	Lower	32.179	30
2480		39	Upper	54.902	30

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
 - Lower Band Edge 2M Bit/s (37 Byte)
 - Upper Band Edge 2M Bit/s (255 Byte)

[CONDUCTED SPURIOUS EMISSIONS]

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
Worst case 2M Bit/s (37 Byte)

[Ant.2]

[BAND EDGE]

Frequency (MHz)	Mode	Channel No.	Position	Test Result	
				Measured Level (dB)	Limit (dBc)
2402	1M Bit/s 37 Byte	0	Lower	55.480	30
2480		39	Upper	59.503	30
2402	1M Bit/s 255 Byte	0	Lower	55.937	30
2480		39	Upper	60.117	30
2402	2M Bit/s 37 Byte	0	Lower	32.318	30
2480		39	Upper	54.729	30
2402	2M Bit/s 255 Byte	0	Lower	32.421	30
2480		39	Upper	55.374	30

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
 - Lower 2M Bit/s (37 Byte)
 - Upper 2M Bit/s (37 Byte)

[CONDUCTED SPURIOUS EMISSIONS]

Note :

- In order to simplify the report, attached plots were only the worst case channel and data rate.
Worst case 2M Bit/s (37 Byte)

[SISO]

[Ant.1]

▣ Test Plots(Band Edge_Lower)

2M Bit/s (37 Byte) Low Channel(Ch. 0)



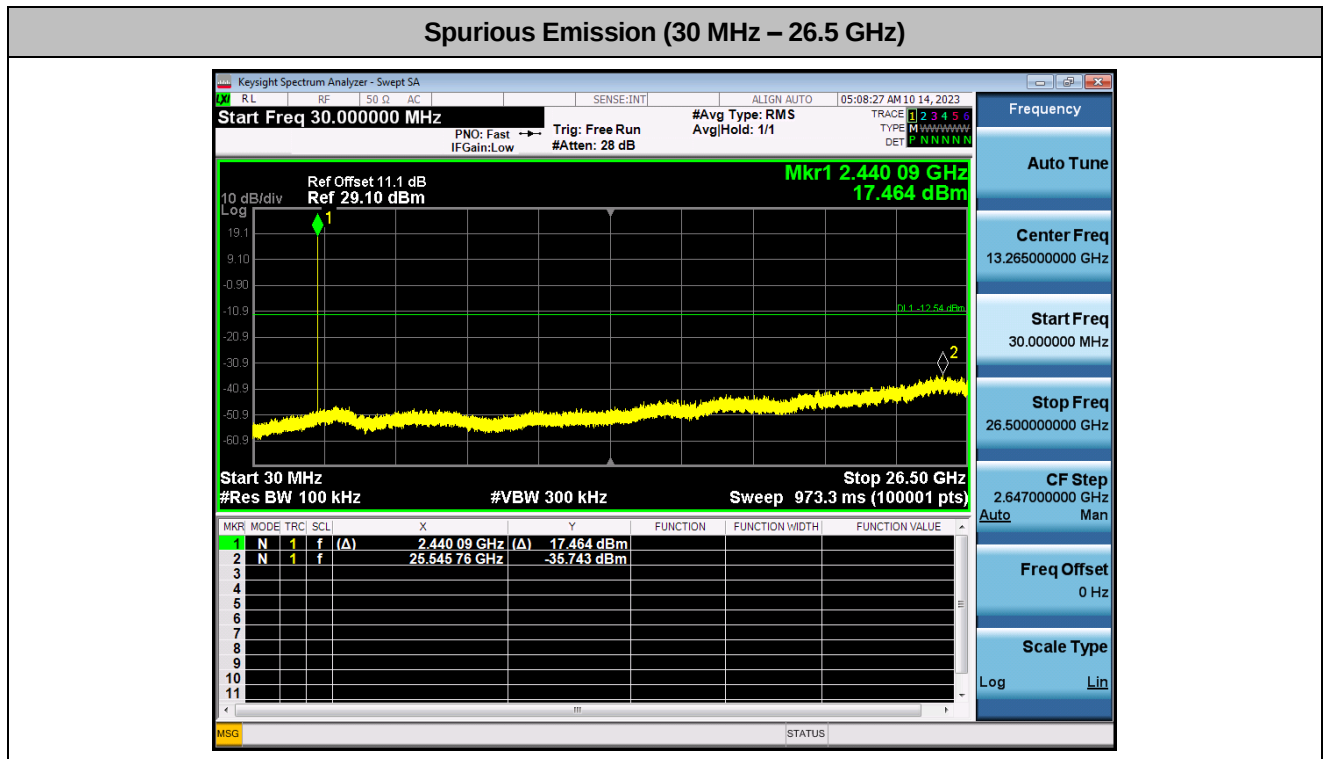
▣ Test Plots(Band Edge_Upper)

2M Bit/s (255 Byte) High Channel(Ch. 39)



2M Bit/s (37 Byte) Test Plots

[CONDUCTED SPURIOUS EMISSIONS]



Limit (dBm): -12.54

[Ant.2]

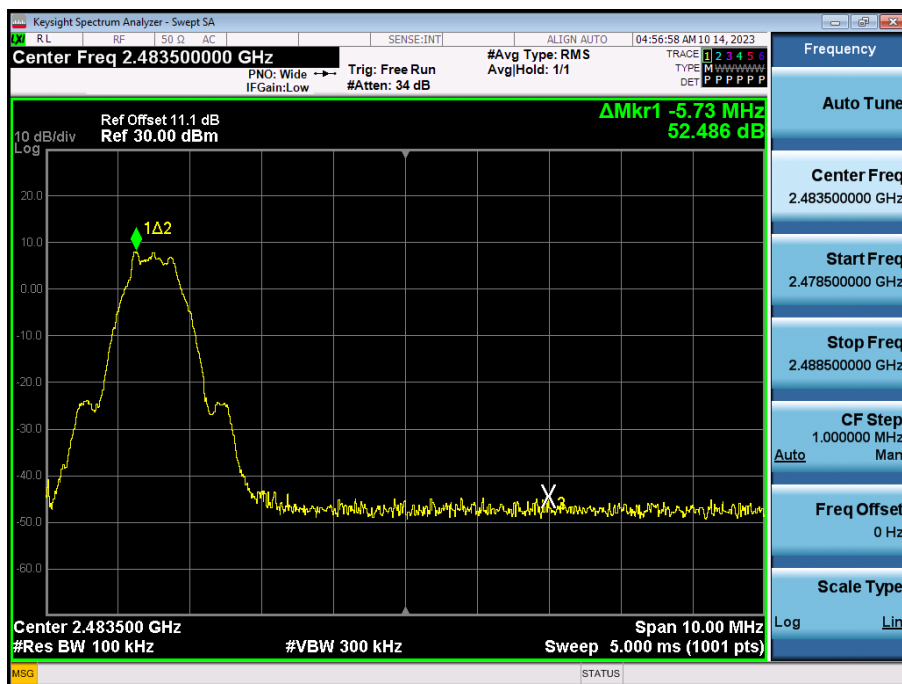
▣ Test Plots(Band Edge_Lower)

2M Bit/s (37 Byte) Low Channel(Ch. 0)



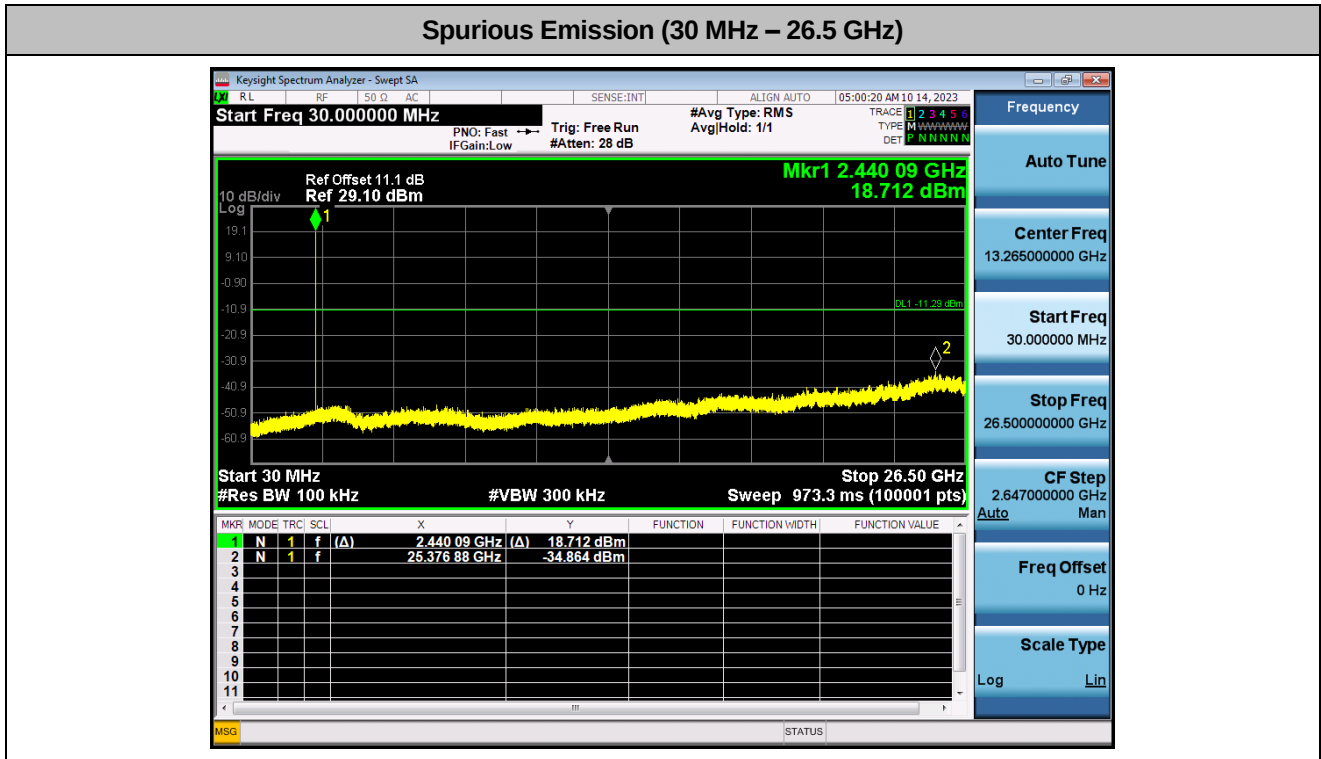
▣ Test Plots(Band Edge_Upper)

500k Bit/s (255 Byte) High Channel(Ch. 39)



2M Bit/s (37 Byte) Test Plots

[CONDUCTED SPURIOUS EMISSIONS]



Limit (dBm): -11.29

[Dual BT]

[Ant.1]

▣ Test Plots(Band Edge_Lower)

2M Bit/s (37 Byte) Low Channel(Ch. 0)



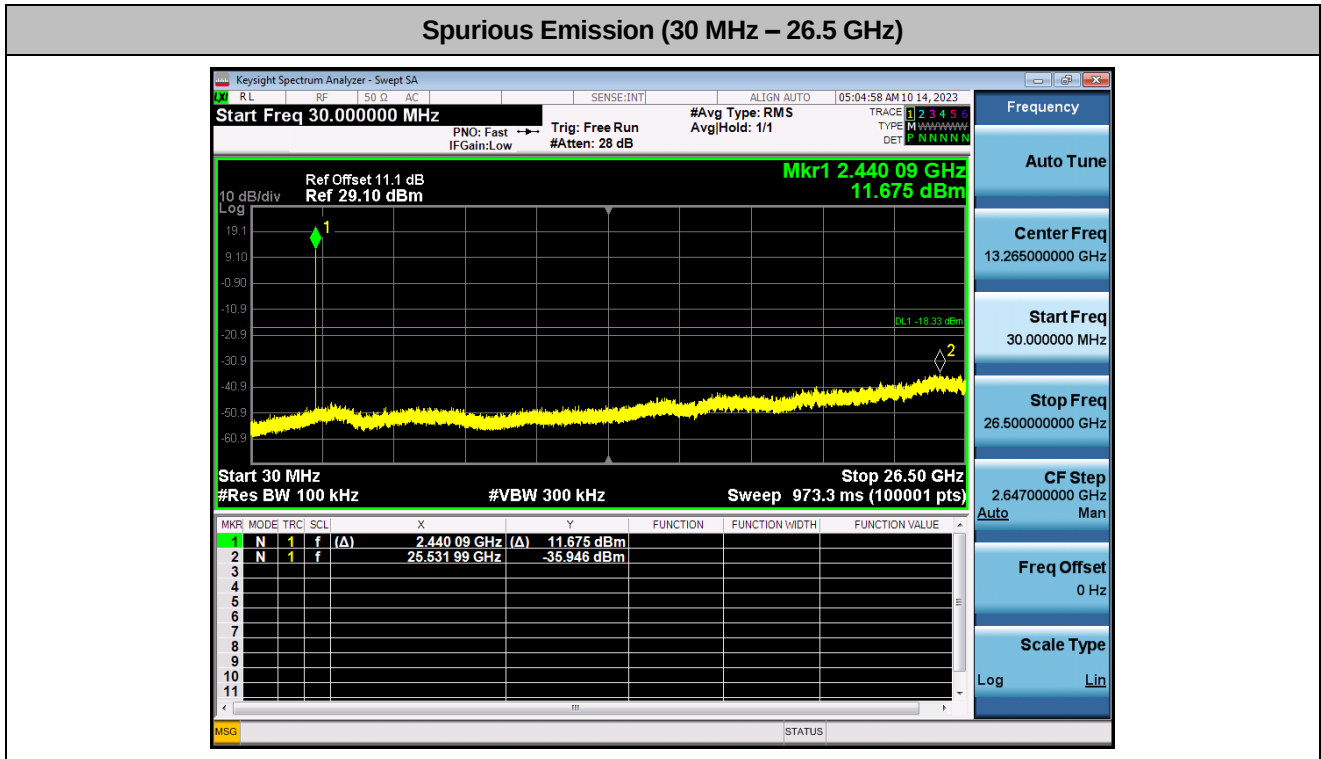
▣ Test Plots(Band Edge_Upper)

2M Bit/s (255 Byte) High Channel(Ch. 39)



2M Bit/s (37 Byte) Test Plots

[CONDUCTED SPURIOUS EMISSIONS]



Limit (dBm): -18.33

[Ant.2]

▣ Test Plots(Band Edge_Lower)

2M Bit/s (37 Byte) Low Channel(Ch. 0)



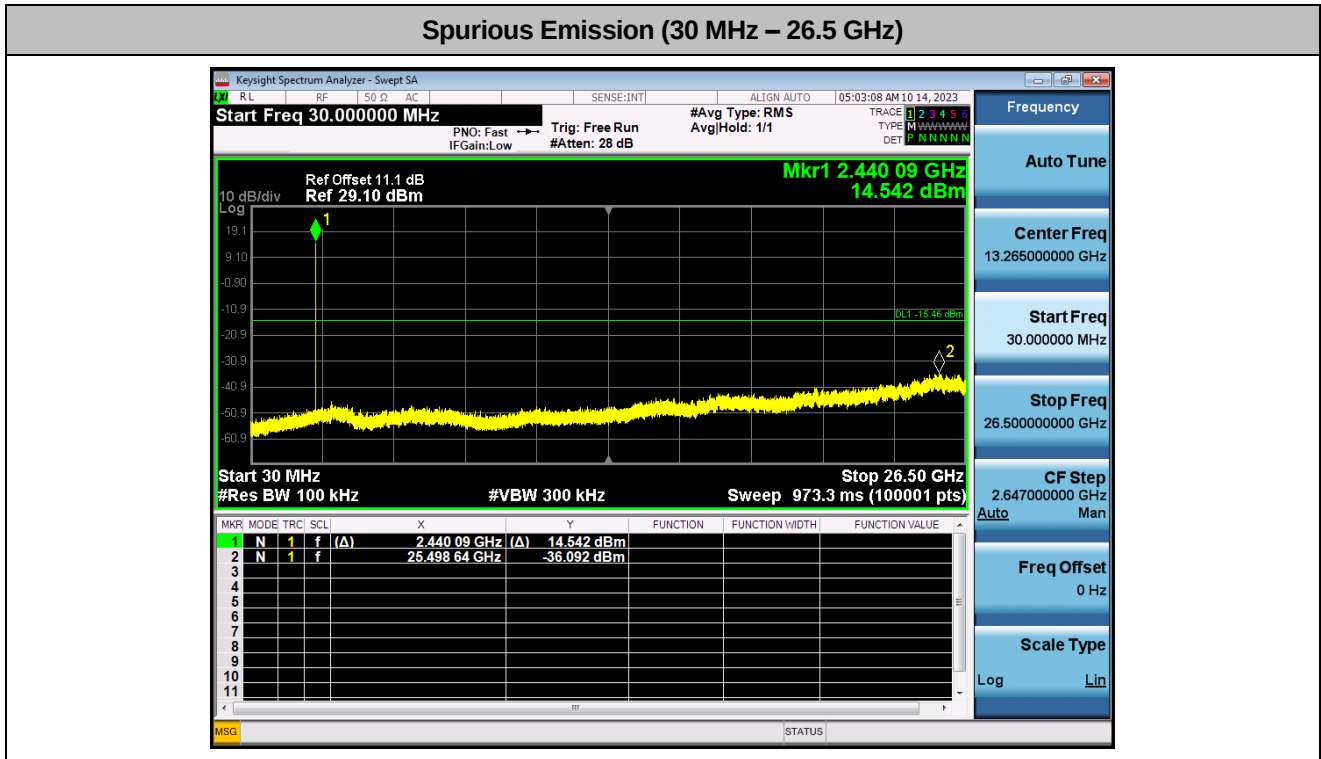
▣ Test Plots(Band Edge_Upper)

2M Bit/s (37 Byte) High Channel(Ch. 39)



2M Bit/s (37 Byte) Test Plots

[CONDUCTED SPURIOUS EMISSIONS]



Limit (dBm): -15.46

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 = $40 \log (\text{specific distance} / \text{test distance})$ (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

[SISO]

[Ant.1]

Mode : 1 M Bit/s (37 Bytes)

Operation Frequency : 2402 MHz(Ch. 0)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	48.57	V	48.57	73.98	25.41	PK
4804	35.44	V	35.44	53.98	18.54	AV
7206	50.97	V	50.97	73.98	23.01	PK
7206	38.49	V	38.49	53.98	15.49	AV
4804	48.60	H	48.60	73.98	25.38	PK
4804	35.46	H	35.46	53.98	18.52	AV
7206	51.09	H	51.09	73.98	22.89	PK
7206	38.61	H	38.61	53.98	15.37	AV

Operation Frequency : 2440 MHz(Ch. 19)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	47.69	V	47.69	73.98	26.29	PK
4880	35.42	V	35.42	53.98	18.56	AV
7320	51.60	V	51.60	73.98	22.38	PK
7320	39.27	V	39.27	53.98	14.71	AV
4880	47.81	H	47.81	73.98	26.17	PK
4880	35.57	H	35.57	53.98	18.41	AV
7320	51.78	H	51.78	73.98	22.20	PK
7320	39.30	H	39.30	53.98	14.68	AV

Operation Frequency : 2480 MHz(Ch. 39)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	46.79	V	46.79	73.98	27.19	PK
4960	34.94	V	34.94	53.98	19.04	AV
7440	51.61	V	51.61	73.98	22.37	PK
7440	39.25	V	39.25	53.98	14.73	AV
4960	46.95	H	46.95	73.98	27.03	PK
4960	35.04	H	35.04	53.98	18.94	AV
7440	51.72	H	51.72	73.98	22.26	PK
7440	39.39	H	39.39	53.98	14.59	AV

Mode : 2 M Bit/s (37 Bytes)

Operation Frequency : 2402 MHz(Ch. 0)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	47.99	V	47.99	73.98	25.99	PK
4804	34.91	V	34.91	53.98	19.07	AV
7206	50.67	V	50.67	73.98	23.31	PK
7206	38.15	V	38.15	53.98	15.83	AV
4804	48.02	H	48.02	73.98	25.96	PK
4804	35.06	H	35.06	53.98	18.92	AV
7206	50.81	H	50.81	73.98	23.17	PK
7206	38.29	H	38.29	53.98	15.69	AV

Operation Frequency : 2440 MHz(Ch. 19)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	46.89	V	46.89	73.98	27.09	PK
4880	34.81	V	34.81	53.98	19.17	AV
7320	52.11	V	52.11	73.98	21.87	PK
7320	39.21	V	39.21	53.98	14.77	AV
4880	46.96	H	46.96	73.98	27.02	PK
4880	34.83	H	34.83	53.98	19.15	AV
7320	52.13	H	52.13	73.98	21.85	PK
7320	39.24	H	39.24	53.98	14.74	AV

Operation Frequency : 2480 MHz(Ch. 39)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	49.61	V	49.61	73.98	24.37	PK
4960	33.82	V	33.82	53.98	20.16	AV
7440	51.65	V	51.65	73.98	22.33	PK
7440	39.17	V	39.17	53.98	14.81	AV
4960	49.62	H	49.62	73.98	24.36	PK
4960	34.01	H	34.01	53.98	19.97	AV
7440	51.65	H	51.65	73.98	22.33	PK
7440	39.35	H	39.35	53.98	14.63	AV

[Ant.2]
Mode : 1 M Bit/s (37 Bytes)

Operation Frequency : 2402 MHz(Ch. 0)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	50.64	V	50.64	73.98	23.34	PK
4804	39.51	V	39.51	53.98	14.47	AV
7206	50.02	V	50.02	73.98	23.96	PK
7206	38.07	V	38.07	53.98	15.91	AV
4804	50.79	H	50.79	73.98	23.19	PK
4804	39.59	H	39.59	53.98	14.39	AV
7206	50.06	H	50.06	73.98	23.92	PK
7206	38.10	H	38.10	53.98	15.88	AV

Operation Frequency : 2440 MHz(Ch. 19)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	50.62	V	50.62	73.98	23.36	PK
4880	39.84	V	39.84	53.98	14.14	AV
7320	51.63	V	51.63	73.98	22.35	PK
7320	39.15	V	39.15	53.98	14.83	AV
4880	50.72	H	50.72	73.98	23.26	PK
4880	40.17	H	40.17	53.98	13.81	AV
7320	51.79	H	51.79	73.98	22.19	PK
7320	39.22	H	39.22	53.98	14.76	AV

Operation Frequency : 2480 MHz(Ch. 39)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	52.11	V	52.11	73.98	21.87	PK
4960	41.11	V	41.11	53.98	12.87	AV
7440	51.67	V	51.67	73.98	22.31	PK
7440	39.18	V	39.18	53.98	14.80	AV
4960	52.58	H	52.58	73.98	21.40	PK
4960	41.27	H	41.27	53.98	12.71	AV
7440	51.83	H	51.83	73.98	22.15	PK
7440	39.39	H	39.39	53.98	14.59	AV

Mode : 2 M Bit/s (37 Bytes)

Operation Frequency : 2402 MHz(Ch. 0)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	50.94	V	50.94	73.98	23.04	PK
4804	36.97	V	36.97	53.98	17.01	AV
7206	50.49	V	50.49	73.98	23.49	PK
7206	38.08	V	38.08	53.98	15.90	AV
4804	51.03	H	51.03	73.98	22.95	PK
4804	37.70	H	37.70	53.98	16.28	AV
7206	50.58	H	50.58	73.98	23.40	PK
7206	38.14	H	38.14	53.98	15.84	AV

Operation Frequency : 2440 MHz(Ch. 19)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	51.08	V	51.08	73.98	22.90	PK
4880	37.46	V	37.46	53.98	16.52	AV
7320	51.48	V	51.48	73.98	22.50	PK
7320	39.12	V	39.12	53.98	14.86	AV
4880	51.13	H	51.13	73.98	22.85	PK
4880	37.57	H	37.57	53.98	16.41	AV
7320	51.78	H	51.78	73.98	22.20	PK
7320	39.26	H	39.26	53.98	14.72	AV

Operation Frequency : 2480 MHz(Ch. 39)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	52.11	V	52.11	73.98	21.87	PK
4960	38.29	V	38.29	53.98	15.69	AV
7440	52.08	V	52.08	73.98	21.90	PK
7440	39.17	V	39.17	53.98	14.81	AV
4960	52.29	H	52.29	73.98	21.69	PK
4960	38.40	H	38.40	53.98	15.58	AV
7440	52.14	H	52.14	73.98	21.84	PK
7440	39.35	H	39.35	53.98	14.63	AV

[Dual Ant.1+ Ant.2]
Mode : 1 M Bit/s (37 Bytes)

Operation Frequency : 2402 MHz(Ch. 0)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	47.67	V	47.67	73.98	26.31	PK
4804	35.14	V	35.14	53.98	18.84	AV
7206	50.53	V	50.53	73.98	23.45	PK
7206	38.32	V	38.32	53.98	15.66	AV
4804	47.52	H	47.52	73.98	26.46	PK
4804	35.08	H	35.08	53.98	18.90	AV
7206	50.28	H	50.28	73.98	23.70	PK
7206	38.19	H	38.19	53.98	15.79	AV

Operation Frequency : 2440 MHz(Ch. 19)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	46.69	V	46.69	73.98	27.29	PK
4880	34.73	V	34.73	53.98	19.25	AV
7320	51.79	V	51.79	73.98	22.19	PK
7320	39.39	V	39.39	53.98	14.59	AV
4880	46.58	H	46.58	73.98	27.40	PK
4880	34.68	H	34.68	53.98	19.30	AV
7320	51.68	H	51.68	73.98	22.30	PK
7320	39.33	H	39.33	53.98	14.65	AV

Operation Frequency : 2480 MHz(Ch. 39)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	47.15	V	47.15	73.98	26.83	PK
4960	33.91	V	33.91	53.98	20.07	AV
7440	51.59	V	51.59	73.98	22.39	PK
7440	39.70	V	39.70	53.98	14.28	AV
4960	47.07	H	47.07	73.98	26.91	PK
4960	33.89	H	33.89	53.98	20.09	AV
7440	51.46	H	51.46	73.98	22.52	PK
7440	39.67	H	39.67	53.98	14.31	AV

Mode : 2 M Bit/s (37 Bytes)

Operation Frequency : 2402 MHz(Ch. 0)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	47.58	V	47.58	73.98	26.40	PK
4804	35.12	V	35.12	53.98	18.86	AV
7206	50.37	V	50.37	73.98	23.61	PK
7206	38.29	V	38.29	53.98	15.69	AV
4804	47.33	H	47.33	73.98	26.65	PK
4804	35.11	H	35.11	53.98	18.87	AV
7206	50.19	H	50.19	73.98	23.79	PK
7206	38.08	H	38.08	53.98	15.90	AV

Operation Frequency : 2440 MHz(Ch. 19)

Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	46.68	V	46.68	73.98	27.30	PK
4880	34.71	V	34.71	53.98	19.27	AV
7320	51.58	V	51.58	73.98	22.40	PK
7320	39.32	V	39.32	53.98	14.66	AV
4880	46.52	H	46.52	73.98	27.46	PK
4880	34.69	H	34.69	53.98	19.29	AV
7320	51.37	H	51.37	73.98	22.61	PK
7320	39.21	H	39.21	53.98	14.77	AV

Operation Frequency : 2480 MHz(Ch. 39)

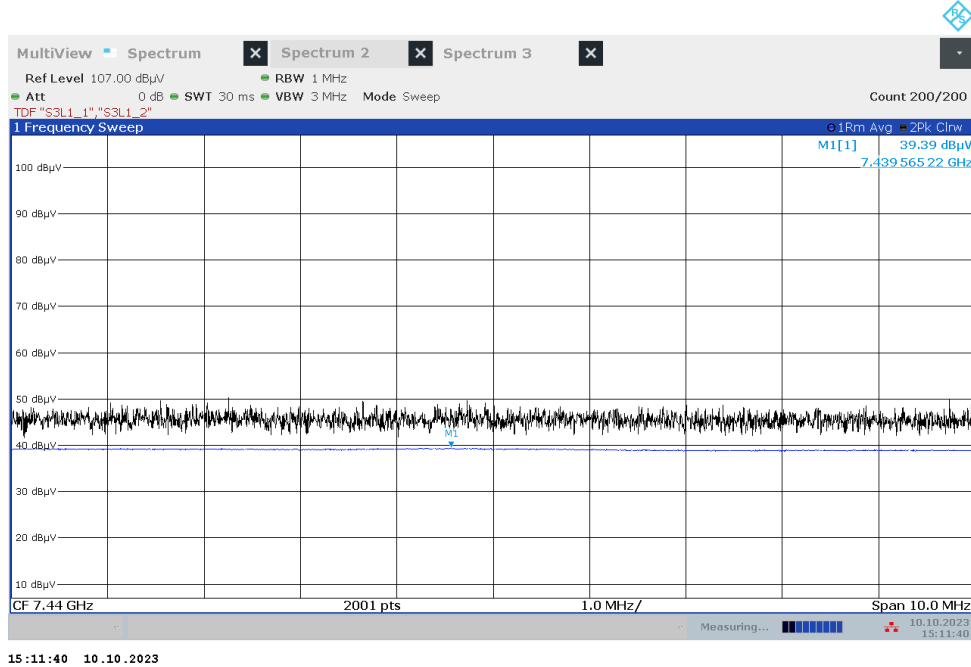
Frequency [MHz]	Measured Value [dBμV]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	47.11	V	47.11	73.98	26.87	PK
4960	33.89	V	33.89	53.98	20.09	AV
7440	51.80	V	51.80	73.98	22.18	PK
7440	39.66	V	39.66	53.98	14.32	AV
4960	47.09	H	47.09	73.98	26.89	PK
4960	33.86	H	33.86	53.98	20.12	AV
7440	51.68	H	51.68	73.98	22.30	PK
7440	39.46	H	39.46	53.98	14.52	AV

[SISO]

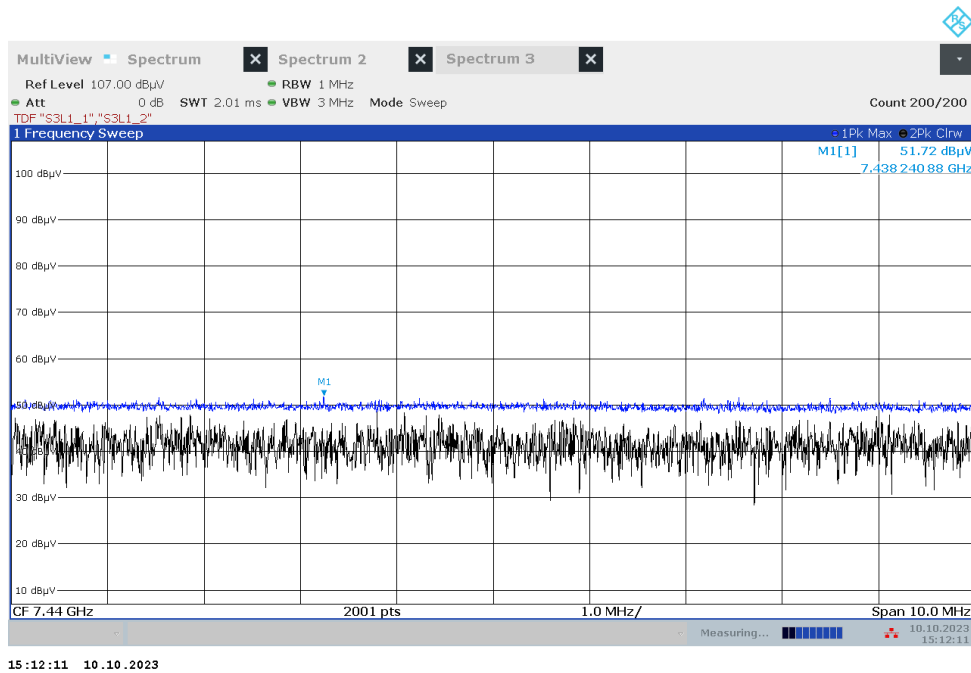
[Ant.1]

Mode : 1M Bit/s (37 Bytes) Test Plots

Radiated Spurious Emissions plot – Average Result (Ch.39 3rd Harmonic, Z-H)



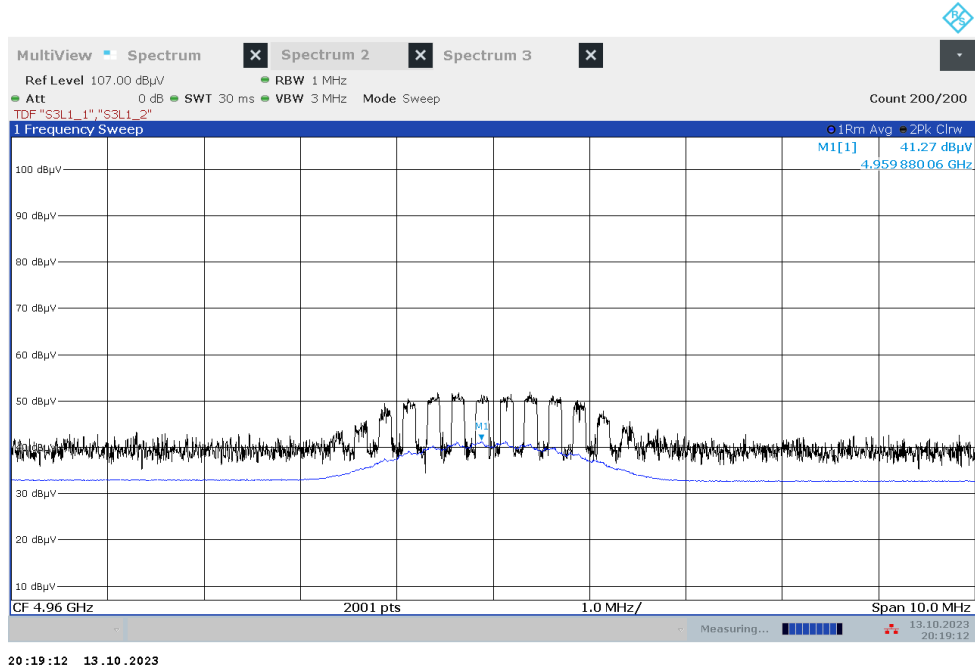
Radiated Spurious Emissions plot – Peak Result (Ch.39 3rd Harmonic, Z-H)



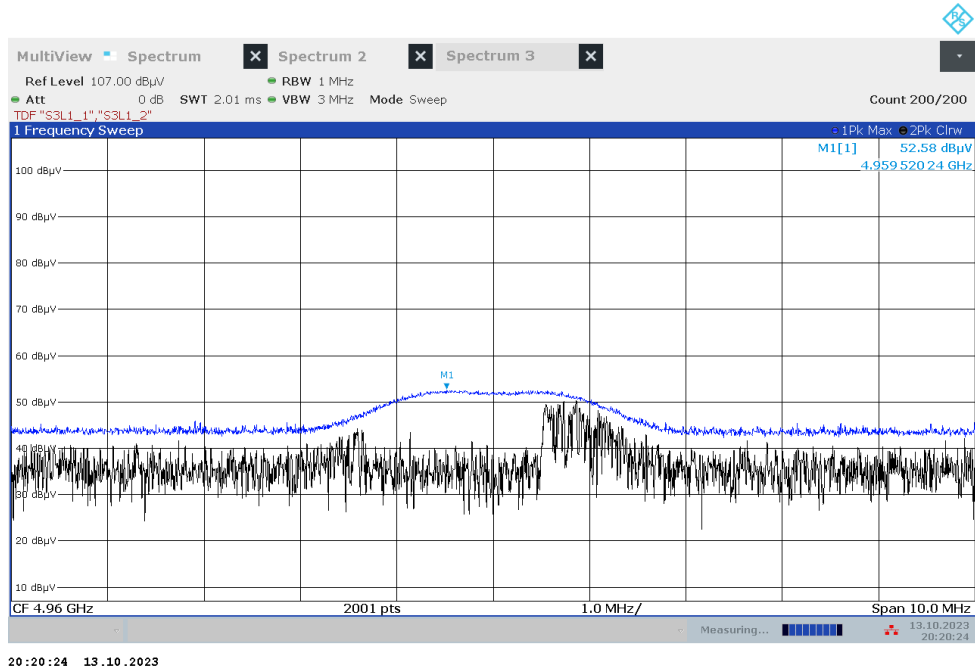
[Ant.2]

Mode : 1M Bit/s (37 Bytes) Test Plots

Radiated Spurious Emissions plot – Average Result (Ch.39 2nd Harmonic, Y-H)



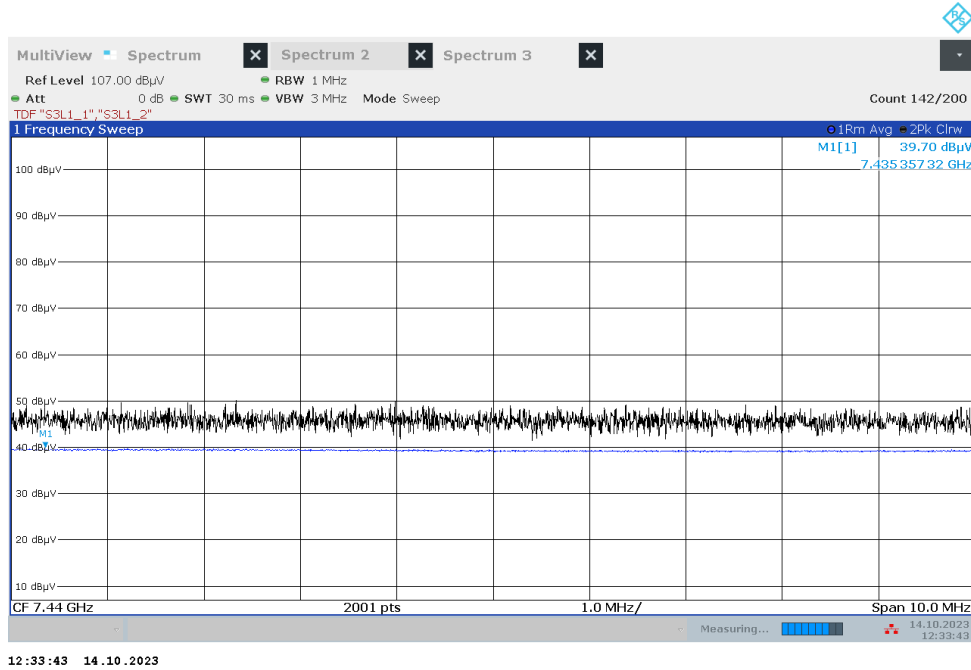
Radiated Spurious Emissions plot – Peak Result (Ch.39 2nd Harmonic, Y-H)



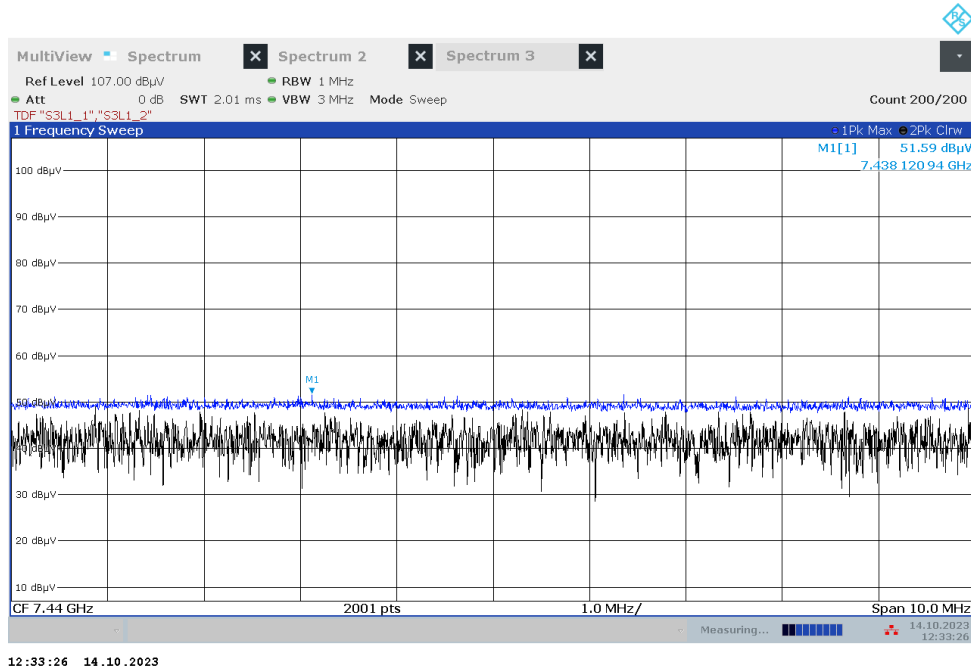
[Dual Ant.1+ Ant.2]

Mode : 1M Bit/s (37 Bytes) Test Plots

Radiated Spurious Emissions plot – Average Result (Ch.39 3rd Harmonic, Y-V)



Radiated Spurious Emissions plot – Peak Result (Ch.39 3rd Harmonic, Y-V)



Note:

In order to simplify the report, Plots of worst case are only reported.

9.7 RADIATED RESTRICTED BAND EDGES

[SISO]

[Ant.1]

Mode : 1M Bit/s (37 Bytes)

Operating Frequency

2402 MHz, 2480 MHz

Channel No.

0 CH, 39 CH

Frequency [MHz]	Measured Value [dBμV]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	54.11	H	54.11	73.98	19.87	PK
2390.0	42.27	H	42.27	53.98	11.71	AV
2390.0	54.08	V	54.08	73.98	19.90	PK
2390.0	42.11	V	42.11	53.98	11.87	AV
2483.5	67.69	H	67.69	73.98	6.29	PK
2483.5	45.69	H	45.69	53.98	8.29	AV
2483.5	67.58	V	67.58	73.98	6.40	PK
2483.5	45.05	V	45.05	53.98	8.93	AV

Mode : 2M Bit/s (37 Bytes)

Operating Frequency

2402 MHz, 2480 MHz

Channel No.

0 CH, 39 CH

Frequency [MHz]	Measured Value [dBμV]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	54.68	H	54.68	73.98	19.30	PK
2390.0	42.21	H	42.21	53.98	11.77	AV
2390.0	54.63	V	54.63	73.98	19.35	PK
2390.0	42.19	V	42.19	53.98	11.79	AV
#2483.5	64.70	H	64.70	73.98	9.28	PK
#2483.5	45.31	H	45.31	53.98	8.67	AV
#2483.5	64.02	V	64.02	73.98	9.96	PK
#2483.5	45.27	V	45.27	53.98	8.71	AV

#Note :

1. Integration method Used (ANSI C63.10 Section11.13.3)
2. Used Average measurement method accroding to KDB 558074 Section11 Q3) b)

[Ant.2]

Mode : 1M Bit/s (37 Bytes)

Operating Frequency

2402 MHz, 2480 MHz

Channel No.

0 CH, 39 CH

Frequency [MHz]	Measured Value [dBμV]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	54.90	H	54.90	73.98	19.08	PK
2390.0	42.11	H	42.11	53.98	11.87	AV
2390.0	54.86	V	54.86	73.98	19.12	PK
2390.0	42.09	V	42.09	53.98	11.89	AV
2483.5	60.75	H	60.75	73.98	13.23	PK
2483.5	43.26	H	43.26	53.98	10.72	AV
2483.5	60.31	V	60.31	73.98	13.67	PK
2483.5	42.89	V	42.89	53.98	11.09	AV

Mode : 2M Bit/s (37 Bytes)

Operating Frequency

2402 MHz, 2480 MHz

Channel No.

0 CH, 39 CH

Frequency [MHz]	Measured Value [dBμV]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	54.69	H	54.69	73.98	19.29	PK
2390.0	42.04	H	42.04	53.98	11.94	AV
2390.0	54.62	V	54.62	73.98	19.36	PK
2390.0	41.97	V	41.97	53.98	12.01	AV
2483.5	71.43	H	71.43	73.98	2.55	PK
2483.5	50.39	H	50.39	53.98	3.59	AV
2483.5	69.48	V	69.48	73.98	4.50	PK
2483.5	49.93	V	49.93	53.98	4.05	AV

[Dual Ant.1+ Ant.2]

Mode : 1M Bit/s (37 Bytes)

Operating Frequency

2402 MHz, 2480 MHz

Channel No.

0 CH, 39 CH

Frequency [MHz]	Measured Value [dBμV]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	54.07	H	54.07	73.98	19.91	PK
2390.0	42.13	H	42.13	53.98	11.85	AV
2390.0	53.67	V	53.67	73.98	20.31	PK
2390.0	41.94	V	41.94	53.98	12.04	AV
2483.5	57.86	H	57.86	73.98	16.12	PK
2483.5	42.80	H	42.80	53.98	11.18	AV
2483.5	57.66	V	57.66	73.98	16.32	PK
2483.5	42.53	V	42.53	53.98	11.45	AV

Mode : 2M Bit/s (37 Bytes)

Operating Frequency

2402 MHz, 2480 MHz

Channel No.

0 CH, 39 CH

Frequency [MHz]	Measured Value [dBμV]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	53.97	H	53.97	73.98	20.01	PK
2390.0	42.16	H	42.16	53.98	11.82	AV
2390.0	53.66	V	53.66	73.98	20.32	PK
2390.0	41.94	V	41.94	53.98	12.04	AV
2483.5	65.41	H	65.41	73.98	8.57	PK
2483.5	45.39	H	45.39	53.98	8.59	AV
2483.5	64.99	V	64.99	73.98	8.99	PK
2483.5	44.85	V	44.85	53.98	9.13	AV

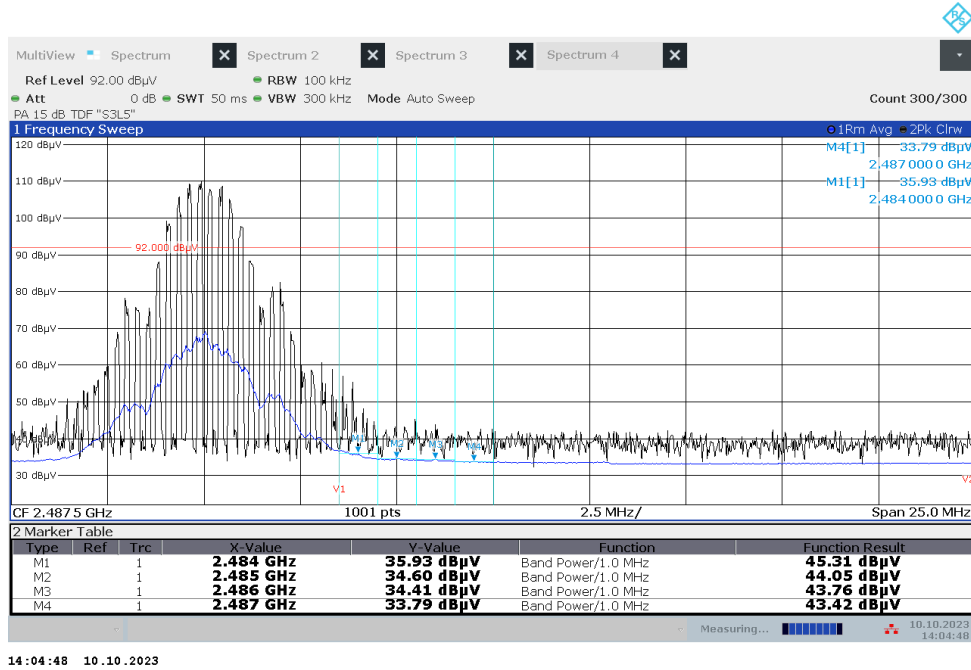
[SISO]

[Ant.1]

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

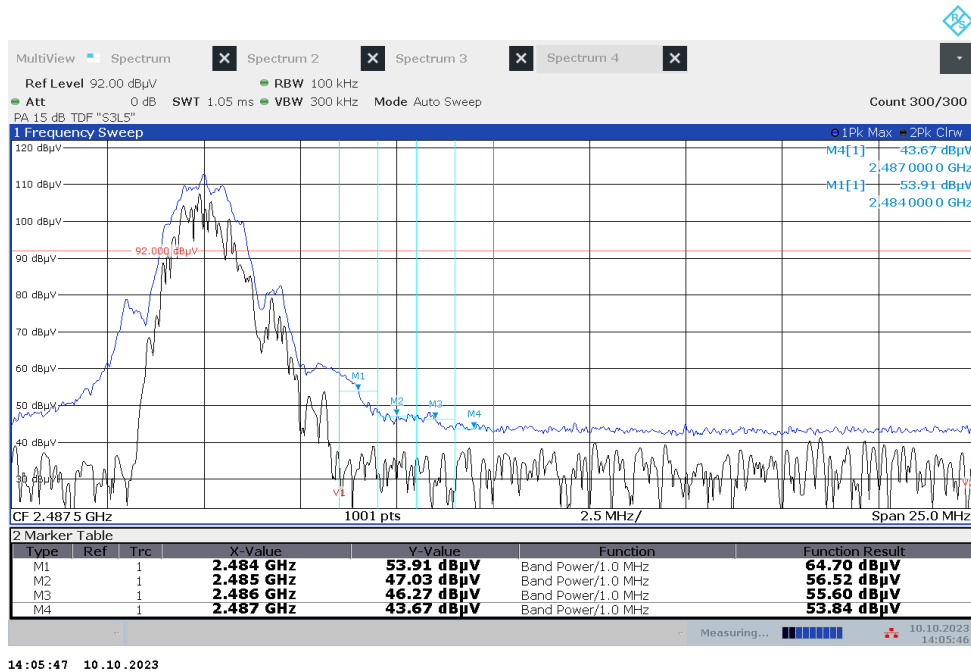
Radiated Restricted Band Edges plot – Average Result (Ch.39, X-H)

Integration method Used



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

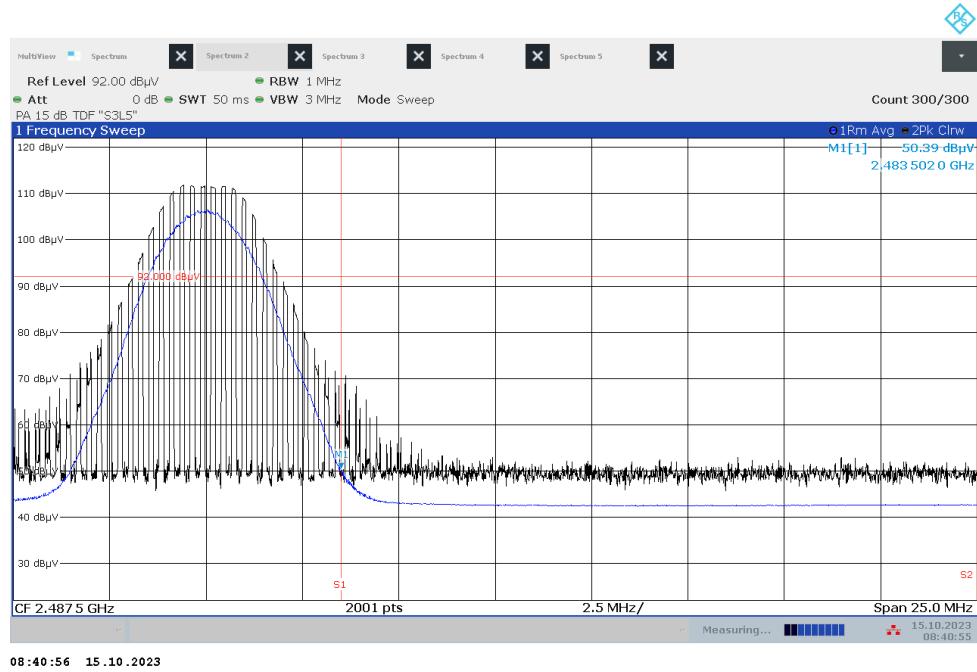
Integration method Used



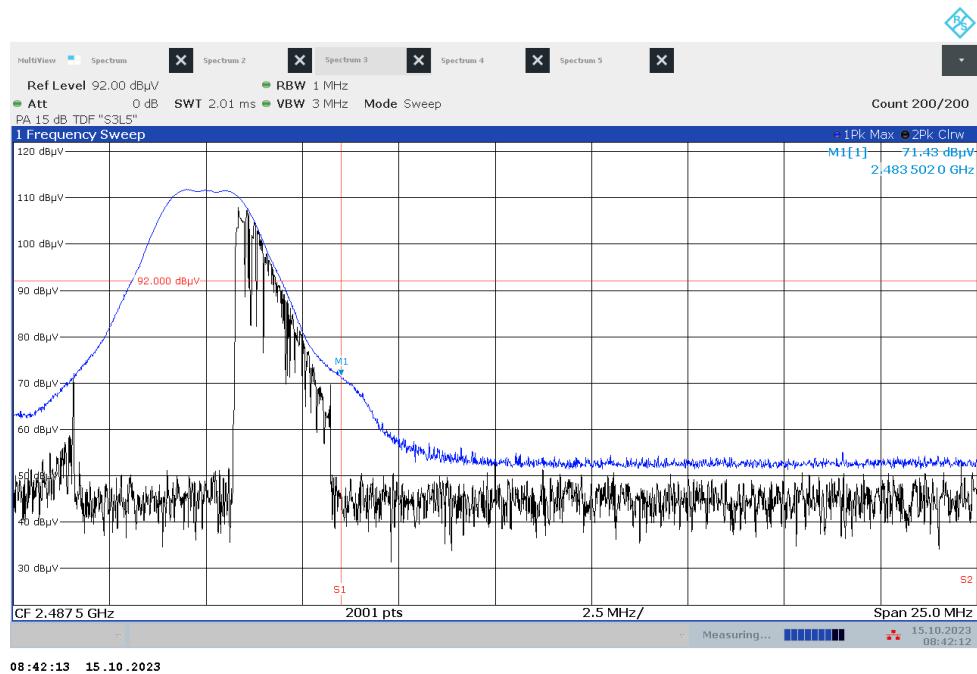
[Ant.2]

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

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



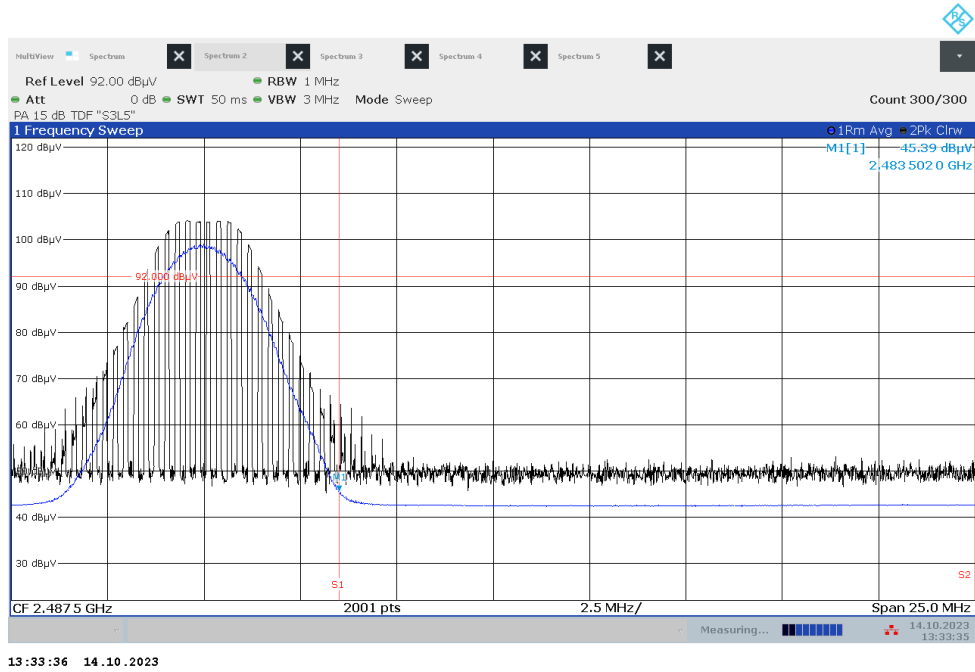
Radiated Restricted Band Edges plot – Peak Result (Ch.39, Y-H)



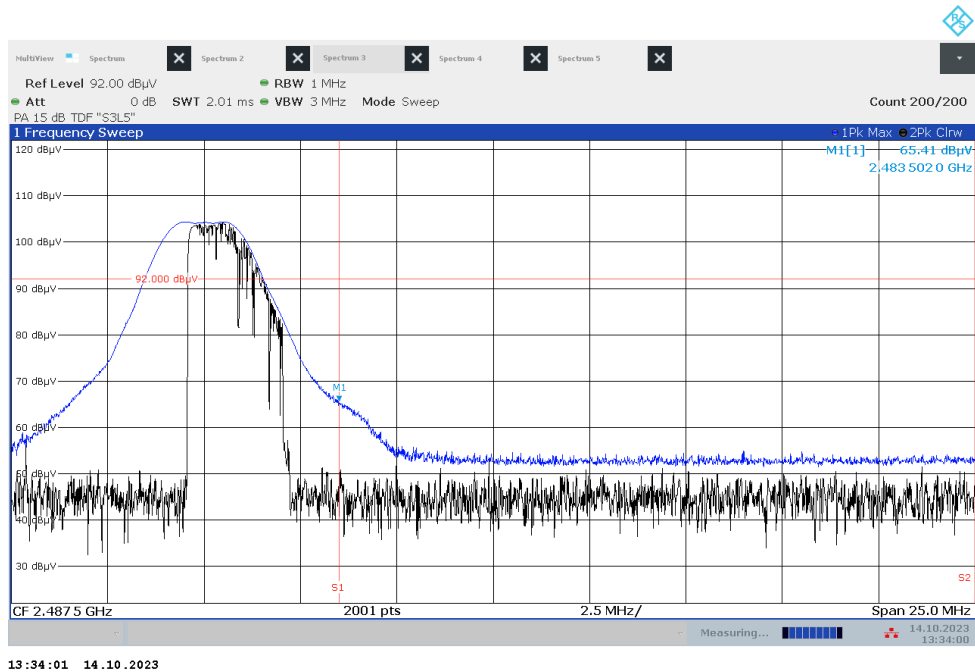
[Dual Ant.1+ Ant.2]

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

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



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



Note:

In order to simplify the report, Plot of worst case are only reported.

9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions

Test

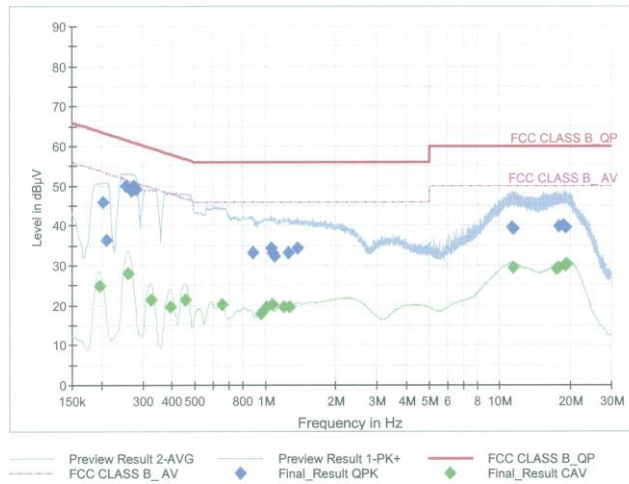
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Test Report

Common Information

EUT : SM-S926U
Operating Conditions : BLE Mode
Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.2040	45.78	63.45	17.67	9.000	N	9.6
0.2108	36.49	63.18	26.69	9.000	N	9.6
0.2535	50.04	61.64	11.61	9.000	N	9.6
0.2693	48.73	61.14	12.41	9.000	N	9.6
0.2760	49.83	60.94	11.11	9.000	N	9.6
0.2828	49.15	60.74	11.58	9.000	N	9.6
0.8915	33.08	56.00	22.92	9.000	L1	9.6
1.0625	34.43	56.00	21.57	9.000	L1	9.7
1.0715	33.25	56.00	22.75	9.000	L1	9.7
1.0985	32.41	56.00	23.59	9.000	L1	9.7
1.2628	33.22	56.00	22.78	9.000	L1	9.7
1.3730	34.42	56.00	21.58	9.000	L1	9.7
11.3023	39.56	60.00	20.44	9.000	N	10.1
11.4373	39.19	60.00	20.81	9.000	N	10.1
17.9510	39.94	60.00	20.06	9.000	N	10.4
18.7453	40.09	60.00	19.91	9.000	N	10.4
19.0715	39.64	60.00	20.36	9.000	N	10.4
19.0783	39.52	60.00	20.48	9.000	N	10.4

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Test

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Final Result_CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1973	24.67	53.73	29.05	9.000	N	9.6
0.2603	28.02	51.42	23.40	9.000	N	9.6
0.3255	21.25	49.57	28.31	9.000	N	9.6
0.3930	19.60	48.00	28.40	9.000	N	9.6
0.4560	21.36	46.77	25.40	9.000	N	9.6
0.6553	20.31	46.00	25.69	9.000	N	9.6
0.9545	17.91	46.00	28.09	9.000	N	9.7
1.0108	19.63	46.00	26.37	9.000	N	9.7
1.0693	20.25	46.00	25.75	9.000	N	9.7
1.0738	20.14	46.00	25.86	9.000	N	9.7
1.1975	19.70	46.00	26.30	9.000	N	9.7
1.2763	19.73	46.00	26.27	9.000	N	9.7
11.4373	29.34	50.00	20.66	9.000	N	10.1
17.4673	29.01	50.00	20.99	9.000	N	10.4
17.9510	29.37	50.00	20.63	9.000	N	10.4
19.0715	30.12	50.00	19.88	9.000	N	10.4
19.1660	30.17	50.00	19.83	9.000	N	10.4
19.4090	30.31	50.00	19.69	9.000	N	10.5

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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	08/02/2024	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	05/26/2024	Annual
Temperature Chamber	SU-642	ESPEC	93008124	02/22/2024	Annual
Signal Analyzer	N9030A	Keysight	MY55410508	09/04/2024	Annual
Power Meter	N1911A	Agilent	MY45100523	03/06/2024	Annual
Power Sensor	N1921A	Agilent	MY57820067	03/06/2024	Annual
Directional Coupler	87300B	Agilent	3116A03621	11/02/2023	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/06/2024	Annual
DC Power Supply	E3632A	Agilent	KR75305528	01/03/2024	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C-010	Agilent	08285	06/02/2024	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	03/08/2024	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
Bluetooth Tester	CBT	Rohde & Schwarz	100808	02/16/2024	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.

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	S3AM	08/03/2025	Biennial
Controller	EM2090	Emco	060520	N/A	N/A
Turn Table	N/A	Ets	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/17/2024	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/16/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/18/2023	Biennial
Horn Antenna(15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Amp & Filter Bank Switch Controller	FBSM-01A	TNM system	0	N/A	N/A
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/05/2024	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/12/2024	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/12/2024	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	02/09/2024	Annual
RF Switching System	FBSR-03A (3G HPF+LNA)	T&M SYSTEM	S3L1	12/05/2023	Annual
RF Switching System	FBSR-03A (10dB ATT+LNA)	T&M SYSTEM	S3L2	12/05/2023	Annual
RF Switching System	FBSR-03A (7G HPF+LNA)	T&M SYSTEM	S3L3	12/05/2023	Annual
RF Switching System	FBSR-03A (3dB ATT+LNA)	T&M SYSTEM	S3L4	12/05/2023	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/01/2023	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/02/2024	Annual
Bluetooth Tester	TC-3000C	TESCOM	3000C000175	03/28/2024	Annual
Spectrum Analyzer	FSVA40 (10 Hz ~ 40 GHz)	Rohde & Schwarz	101502	03/17/2024	Annual
Spectrum Analyzer	FSW	Rohde & Schwarz	101736	05/18/2024	Annual

Note:

- Equipment listed above that calibrated during the testing period was set for test after the calibration.
- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
- 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-2310-FC015-P