HCT
Testing and Certification

TEST REPORT

FCC BT LE Test for SM-S731U

Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2507-FC008

DATE OF ISSUE
July 14, 2025

Tested by
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TEST REPORT

REPORT NO.
HCT-RF-2507-FC008

DATE OF ISSUE
July 14, 2025

Additional Model
SM-S731U1

Applicant	SAMSUNG Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Product Name Model Name	Mobile Phone SM-S731U
FCC ID	A3LSMS731U
Date of Test	May 26, 2025~ July 14, 2025
FCC Classification	Digital Transmission System(DTS)
Test Standard Used	FCC Rule Part(s): Part 15.247
Test Results	PASS
Location of Test	■ Permanent Testing Lab ☐ On Site Testing Lab (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

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REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	July 14, 2025	Initial Release

Notice

Content
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. The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated. The test results have only been applied with the test methods required by the standard(s). The laboratory is not accredited for the test results marked *. Information provided by the applicant is marked **. Test results provided by external providers are marked ***. When confirmation of authenticity of this test report is required, please contact www.hct.co.kr The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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1. EUT DESCRIPTION

Model	SM-S731U		
Additional Model	SM-S731U1		
EUT Type	Mobile Phone		
Power Supply	DC 3.88 V		
Frequency Range	125k, 500k, 1M Bit/s : 2402 - 2480 MHz 2M Bit/s : 2404 - 2478 MHz (Except for 2426 MHz)		
Number of Channels	125k, 500k, 1M Bit/s : 40 Channels 2M Bit/s : 37 Channels		
Max. RF Output Power (Normal)	Ant.1	Peak	1 M Bit/s: 19.047 dBm (80.30 mW) 2 M Bit/s: 19.354 dBm (86.18 mW) 125 k Bit/s: 12.936 dBm (19.66 mW) 500 k Bit/s: 12.977 dBm (19.85 mW)
		Average	1 M Bit/s: 18.68 dBm (73.86 mW) 2 M Bit/s: 18.82 dBm (76.26 mW) 125 k Bit/s: 12.74 dBm (18.80 mW) 500 k Bit/s: 12.96 dBm (19.77 mW)
	Ant.2	Peak	1 M Bit/s: 20.069 dBm (101.60 mW) 2 M Bit/s: 20.069 dBm (101.60 mW) 125 k Bit/s: 13.918 dBm (24.65 mW) 500 k Bit/s: 13.981 dBm (25.01 mW)
		Average	1 M Bit/s: 19.64 dBm (92.06 mW) 2 M Bit/s: 19.62 dBm (91.57 mW) 125 k Bit/s: 13.74 dBm (23.64 mW) 500 k Bit/s: 13.92 dBm (24.65 mW)
	Dual Ant.1 + Ant.2	Peak	1 M Bit/s: 16.502 dBm (44.69 mW) 2 M Bit/s: 16.601 dBm (45.72 mW)
		Average	1 M Bit/s: 16.30 dBm (42.69 mW) 2 M Bit/s: 16.54 dBm (45.10 mW)
Modulation Type	GFSK		
Bluetooth Version	5.4		
Antenna Specification	Type: Metal ANT.1 Peak Gain: -5.12 dBi, ANT.2 Peak Gain: -5.26 dBi		
Serial number	Conducted : R3CY40XC7ET Radiated : R3CY40DEHDH		

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ANTENNA CONFIGURATIONS

1. Below Tables are the possible configurations.

Configurations	SISO		Dual BT
	Ant1(Core-0)	Ant2(Core-1)	Ant1 & Ant2
Bluetooth Low Energy	O	O	O

Note:

1) O = Support, X = Not Support
2) SISO = Single Input Single Output
3) BLE 1M/2Mbps Mode support Dual BT, But 125k/500kbps Mode do not support Dual BT.

2.This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4 GHz and 5 GHz or 6GHz Bands simultaneously on each antenna.

Simultaneous transmission Scenario	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	BTLE Ant.1	BTLE Ant.2	Test Case
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO	on	on	on	on	-	-	-	-	Scenario 1
2.4 GHz WiFi MIMO + 6 GHz WiFi MIMO	on	on	-	-	on	on	-	-	
BTLE ANT.1 + 5 GHz WiFi MIMO	-	-	on	on	-	-	on	-	Scenario 2
BTLE ANT.1 + 6 GHz WiFi MIMO	-	-			on	on	on	-	Scenario 3

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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)

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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 11, 2024 (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."

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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 (±kHz)
X dB, 99% Bandwidth	95 (Confidence level about 95 %, *k=2*)
Frequency stability	28 (Confidence level about 95 %, *k=2*)

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.54 (Confidence level about 95 %, *k=2*)
Conducted Output Power(Power Meter)	0.54 (Confidence level about 95 %, k=2)
Conducted Output Power(Signal Analyzer)	0.68 (Confidence level about 95 %, k=2)
Power Spectral Density	1.03 (Confidence level about 95 %, k=2)
Band Edge (Out of Band Emissions)	0.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.68 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.75 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.82 (Confidence level about 95 %, *k*=2)

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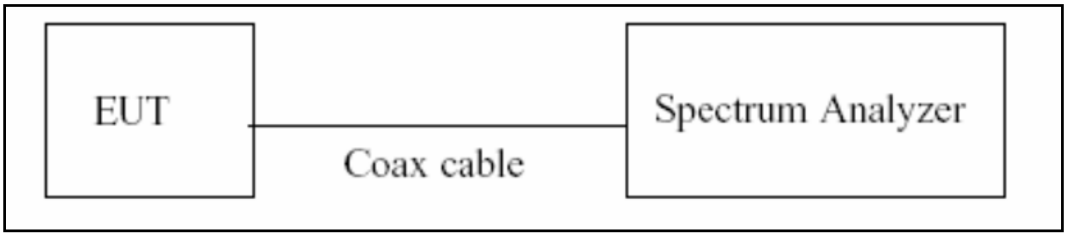
7. DESCRIPTION OF TESTS

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)

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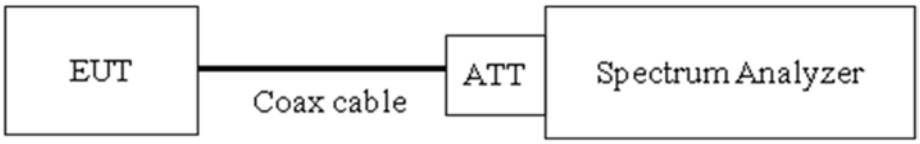
7.2. 6 dB Bandwidth

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.

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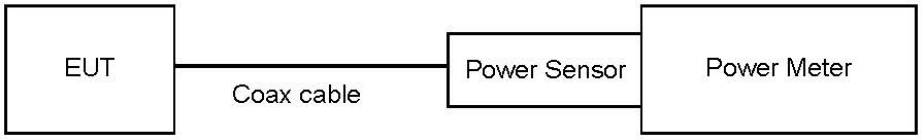
7.3. Output Power

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

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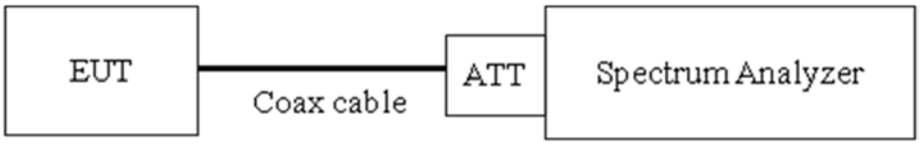
7.4. Power Spectral Density

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 + Duty Cycle Factor

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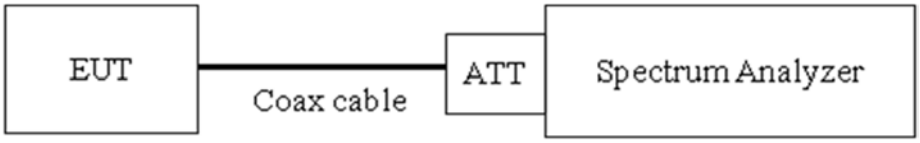
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

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) Allow trace to fully stabilize.
8) 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.

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Factors for frequency

Freq(MHz)	Factor(dB)
30	10.10
100	10.11
200	10.15
300	10.18
400	10.19
500	10.26
600	10.25
700	10.28
800	10.29
900	10.30
1000	10.30
2000	10.52
2400	10.60
2500	10.60
3000	10.62
4000	10.67
5000	10.80
6000	10.90
7000	10.90
8000	10.94
9000	11.04
10000	11.14
11000	11.18
12000	11.22
13000	11.28
14000	11.35
15000	11.44
16000	11.49
17000	11.53
18000	11.57
19000	11.63
20000	11.68
21000	11.71
22000	11.80
23000	11.82
24000	11.93
25000	11.95

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

2. Factor = Attenuator loss + Cable loss

3. EUT cable loss = 0.36 dB

4. Total Port offest = 10.96 dB

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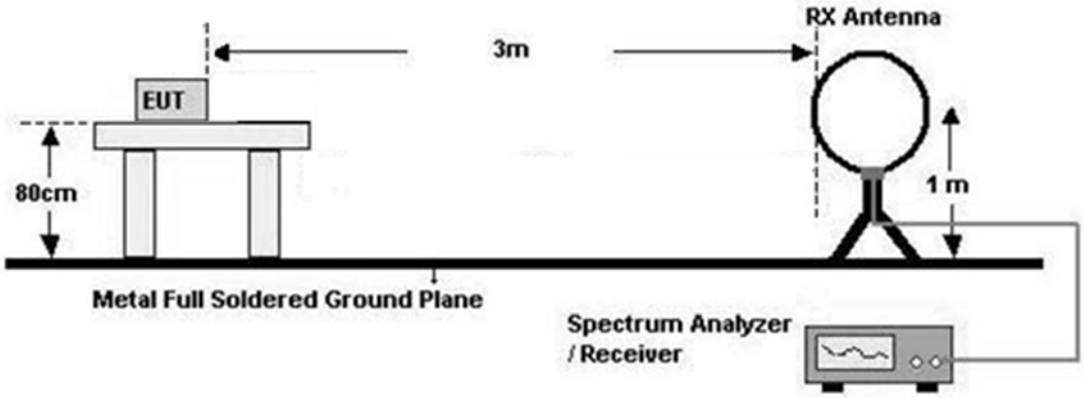
7.6. Radiated Test

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



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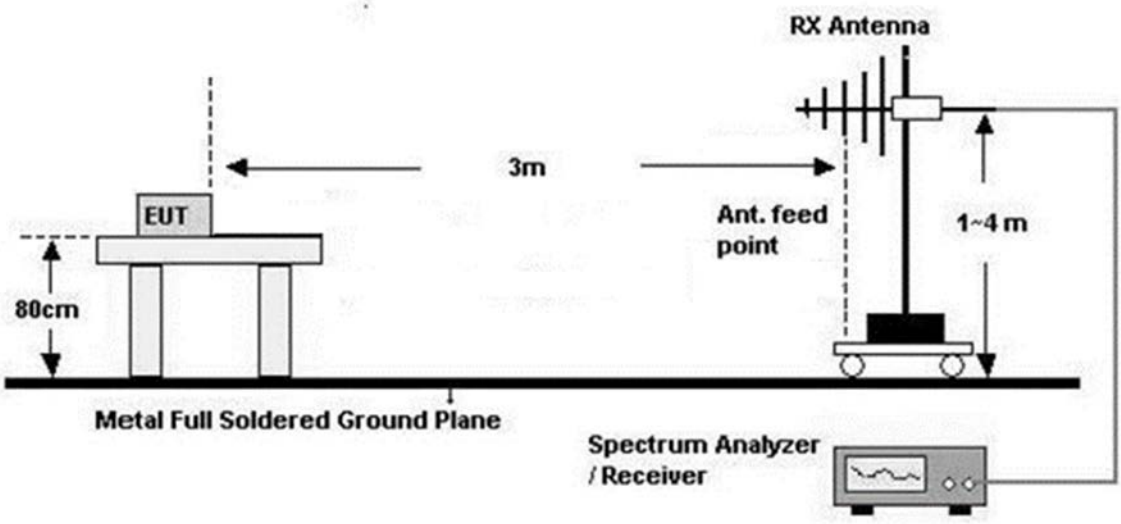
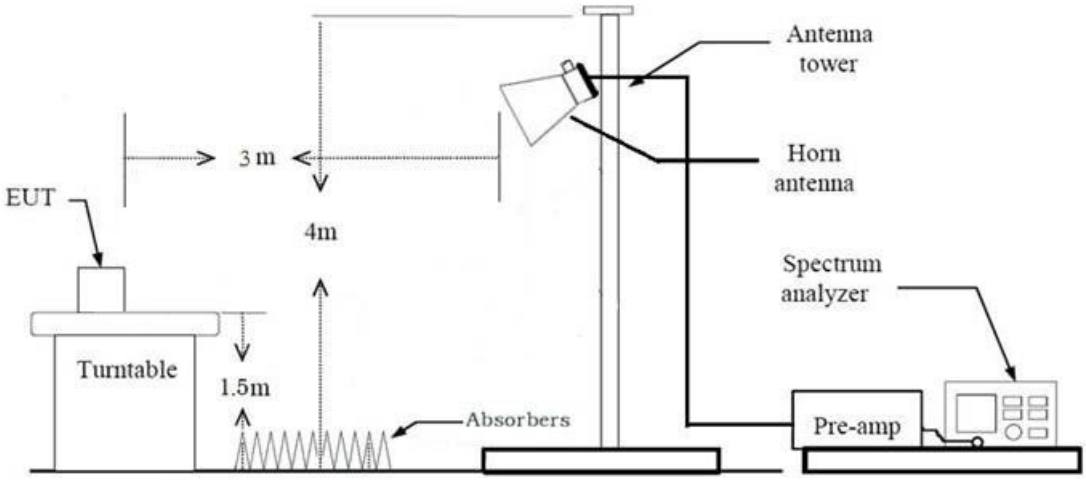
30 MHz - 1 GHz



Above 1 GHz



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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 = Max hold
   - 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.

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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 = Max hold
      - 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.

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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)

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

#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 ≥ 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

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(1)Measurement(Peak)

= Peak Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(A.G)

+ Distance Factor(D.F) + Attenuator (ATT)

(2)Measurement(Avg)

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

+ Distance Factor(D.F) + Attenuator (ATT)

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

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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

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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)
   - Worstcase : Stand alone
2. EUT Axis
   (1) Ant.1
   - Radiated Spurious Emissions : Y
   - 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 : Z
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)
   (125k, 500k, 1M Bit/s all have the same 1 MHz Bandwidth 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
6. SM-S731U, SM-S731U1 were tested and the worst case results are reported.
(Worst case: SM-S731U)

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
   - Worstcase : Stand alone + Travel Adapter
2. SM-S731U, SM-S731U1 were tested and the worst case results are reported.
(Worst case: SM-S731U)

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-S731U, SM-S731U1 were tested and the worst case results are reported.
(Worst case: SM-S731U)

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Radiated test(Simultaneous transmission Scenario)

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 : Z
3. All of Simultaneous transmission Scenario were investigated and the worst case configuration results are reported.

Simultaneous transmission Scenario	2.4 GHz WiFi Ant.1	2.4 GHz WiFi Ant.2	5 GHz WiFi Ant.1	5 GHz WiFi Ant.2	6 GHz WiFi Ant.1	6 GHz WiFi Ant.2	BTLE Ant.1	BTLE Ant.2	Test Case
2.4 GHz WiFi MIMO + 5 GHz WiFi MIMO	on	on	on	on	-	-	-	-	Scenario 1
2.4 GHz WiFi MIMO + 6 GHz WiFi MIMO	on	on	-	-	on	on	-	-	
BTLE ANT.1 + 5 GHz WiFi MIMO	-	-	on	on	-	-	on	-	Scenario 2
BTLE ANT.1 + 6 GHz WiFi MIMO	-	-			on	on	on	-	Scenario 3

4. The Simultaneous transmission Scenario mode test investigated both intermodulation and radiated spurious emissions. And the worst results were reported.
   - Worst result : Radiated spurious emissions
   - Intermodulation : No signals are generated.
   - Radiated spurious emissions : cf. Section 10.6.2.

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5. The following tables show the worst case configurations determined during testing.

(Worst case : The lowest margin condition the channels and modes were selected for test.)

Scenario 2	Description	BTLE Emission	5 GHz Emission
BTLE ANT.1 + 5 GHz WiFi MIMO	Antenna	ANT 1	ANT ALL
	Channel	39	36
	Data Rate	1 Mbps	6 Mbps
	Mode	1M 37 Bytes	802.11a

Note : 5 GHz Simultaneous transmission Data refer to [UNII] Test Report

Scenario 3	Description	BTLE Emission	6 GHz Emission
BTLE ANT.1 + 6 GHz WiFi MIMO	Antenna	ANT 1	ANT ALL
	Channel	39	3
	Data Rate	1 Mbps	MCS0
	Mode	1M 37 Bytes	HE40/SU

Note : 6 GHz Simultaneous transmission Data refer to [UNII 6G] Test Report

6. SM-S731U, SM-S731U1 were tested and the worst case results are reported.

(Worst case : SM-S731U)

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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

Note: The decision rule applies 'simple acceptance'

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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	0.386	0.624	0.619	2.085
	255	2.130	2.500	0.852	0.696
2M	37	0.198	0.626	0.316	5.006
	255	1.071	1.874	0.571	2.430
125k	37	3.100	3.747	0.827	0.823
	255	17.033	17.500	0.973	0.117
500k	37	1.068	1.876	0.569	2.447
	255	4.560	5.000	0.912	0.400

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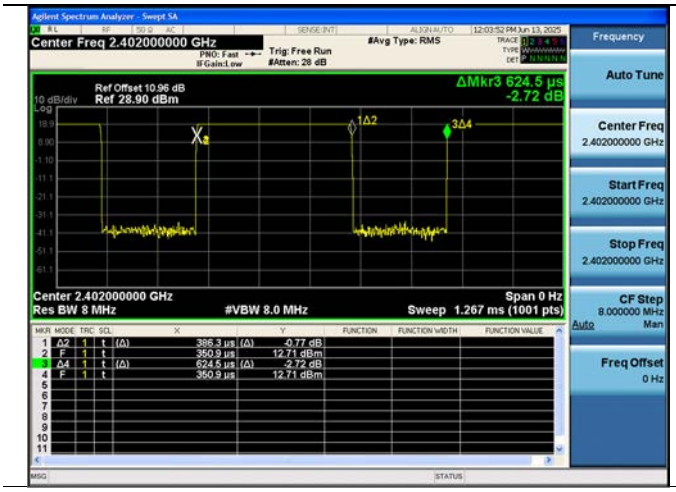
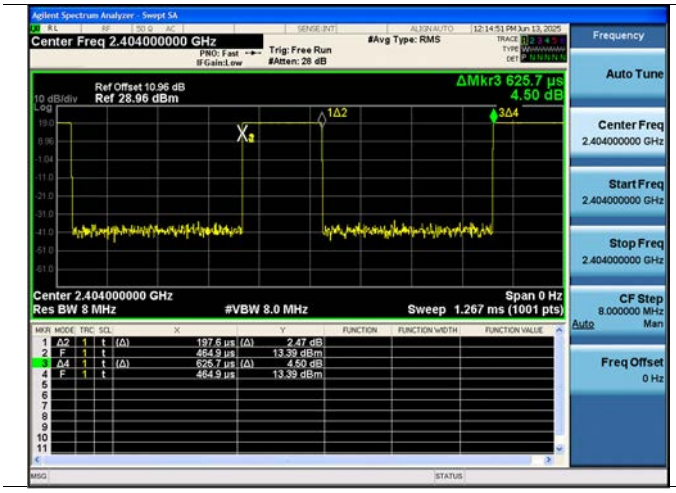
1 M Bit/s (37 Byte)

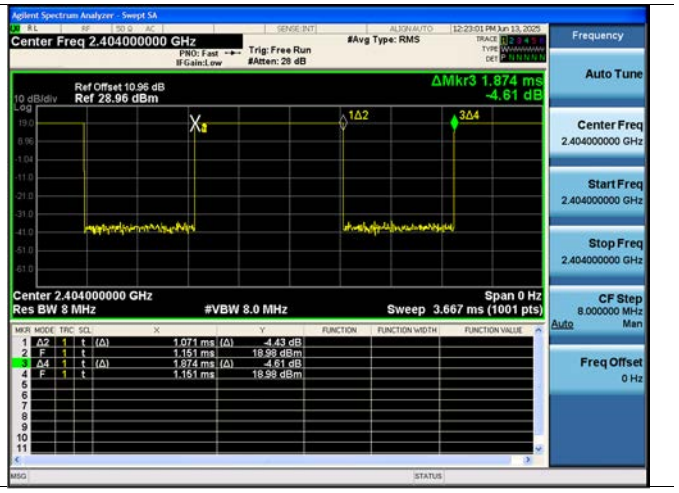


1 M Bit/s (255 Byte)

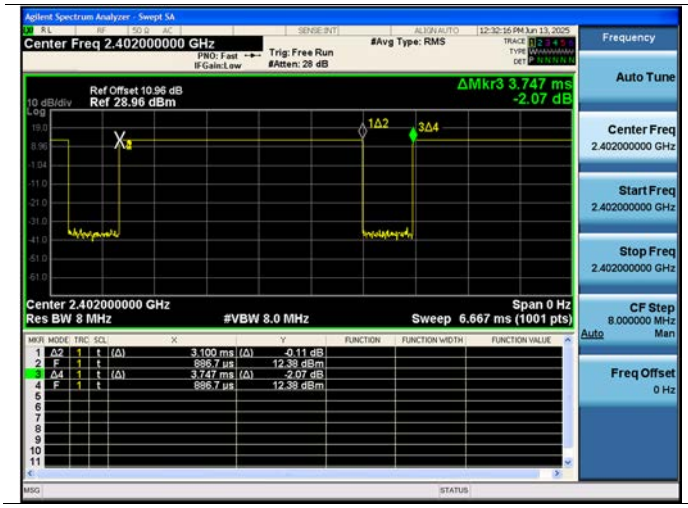
2 M Bit/s (37 Byte)



2 M Bit/s (255 Byte)



125 k Bit/s(37 Byte)



125 k Bit/s(255 Byte)

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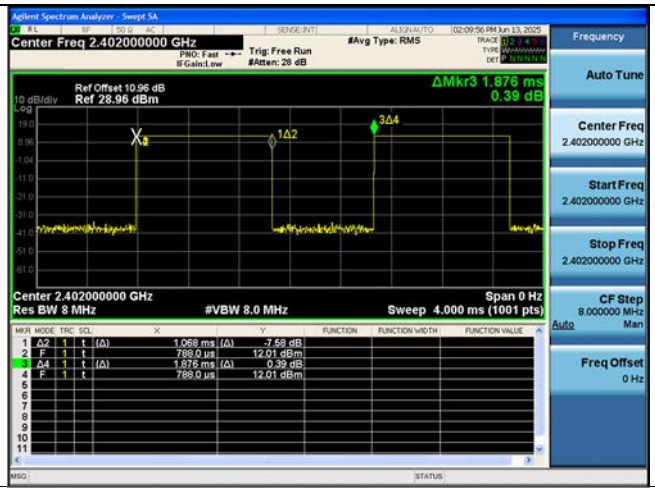
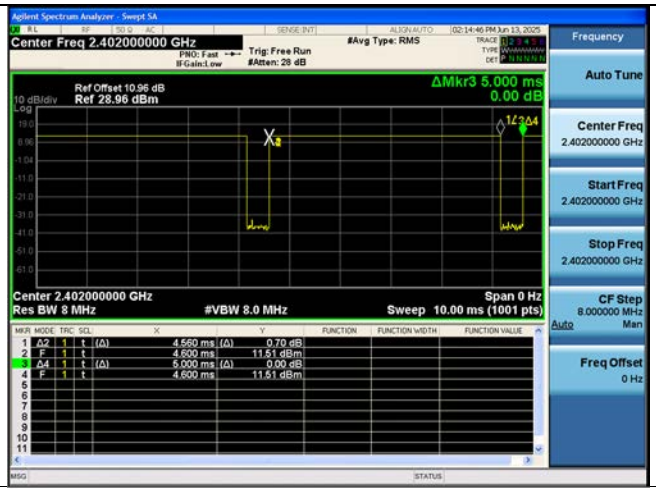
500 k Bit/s(37 Byte)	500 k Bit/s(255 Byte)
	

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9.2 6 dB BANDWIDTH

Mode	Channel	Frequency [MHz]	Ant.1 6dB BW [kHz]	Ant.2 6dB BW [kHz]	Limit [kHz]
1M 37Byte	37	2402	714.1	718.0	> 500
	17	2440	702.8	718.3	
	39	2480	719.3	718.4	
1M 255Byte	37	2402	666.4	663.9	
	17	2440	670.0	672.0	
	39	2480	671.4	663.8	
2M 37Byte	0	2404	1249	1246	
	17	2440	1247	1250	
	36	2478	1247	1249	
2M 255Byte	0	2404	1240	1235	
	17	2440	1240	1237	
	36	2478	1244	1244	
125k 37Byte	37	2402	658.6	657.8	
	17	2440	658.5	659.3	
	39	2480	648.1	652.8	
125k 255Byte	37	2402	636.1	648.6	
	17	2440	626.4	631.4	
	39	2480	637.7	641.5	
500k 37Byte	37	2402	667.1	666.2	
	17	2440	665.9	668.3	
	39	2480	665.8	667.3	
500k 255Byte	37	2402	693.3	666.4	
	17	2440	665.5	665.5	
	39	2480	666.1	666.6	

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[Dual BT]

Mode	Channel	Frequency [MHz]	Ant.1 6dB BW [kHz]	Ant.2 6dB BW [kHz]	Limit [kHz]
1M 37Byte	37	2402	693.9	708.1	> 500
	17	2440	683.8	710.0	
	39	2480	685.1	713.4	
1M 255Byte	37	2402	667.1	667.2	
	17	2440	667.0	666.5	
	39	2480	666.6	666.7	
2M 37Byte	0	2404	1189	1253	
	17	2440	1190	1252	
	36	2478	1193	1253	
2M 255Byte	0	2404	1187	1246	
	17	2440	1192	1188	
	36	2478	1191	1239	

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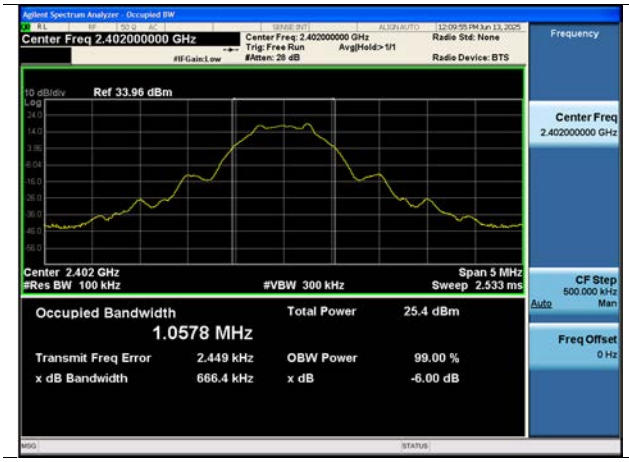
▣ Test Plots

Note: In order to simplify the report, attached plots were only the narrowest 6 dB BW channel (125k, 500k, 1M Bit/s all have the same 1 MHz Band width and only Worst result is attached.)

Ant.1

1 MBit/s 255 Byte (Low-CH 37)



2 MBit/s 255 Byte (Low-CH 0)

125k Bit/s 255 Byte (Low-CH 17)

500k Bit/s 255 Byte (Mid-CH 17)

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Ant.2

1 MBit/s 255 Byte (High-CH 39)

2 MBit/s 255 Byte (Low-CH 0)

125k Bit/s 255 Byte (Mid-CH 17)

500k Bit/s 255 Byte (Mid-CH 17)

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Dual Ant.1	
1 MBit/s 255 Byte (High-CH 39)	2 MBit/s 255 Byte (Low-CH 0)

Dual Ant.2	
1 MBit/s 255 Byte (Mid-CH 17)	2 MBit/s 255 Byte (Mid-CH 17)

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9.3 OUTPUT POWER

Peak Power

Note :

Dual Peak Power [dBm] = 10·log((10^(Dual Ant.1 Peak Power /10))+(10^(Dual Ant.2 Peak Power /10)))

Mode	Channel	Frequency [MHz]	Ant.1 Peak Power [dBm]	Ant.2 Peak Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	19.05	20.07	30
	17	2440	18.79	19.92	
	39	2480	17.91	18.93	
1M 255Byte	37	2402	18.91	19.80	
	17	2440	18.29	19.75	
	39	2480	17.46	18.81	
2M 37Byte	0	2404	19.35	20.07	
	17	2440	18.96	19.98	
	36	2478	18.22	19.41	
2M 255Byte	0	2404	19.15	19.92	
	17	2440	18.74	19.93	
	36	2478	17.96	19.21	
125k 37Byte	37	2402	12.42	13.92	
	17	2440	12.37	13.92	
	39	2480	12.86	11.15	
125k 255Byte	37	2402	12.56	13.91	
	17	2440	12.49	13.92	
	39	2480	12.94	11.13	
500k 37Byte	37	2402	12.59	13.97	
	17	2440	12.53	13.94	
	39	2480	12.98	11.18	
500k 255Byte	37	2402	12.46	13.98	
	17	2440	12.43	13.90	
	39	2480	12.85	11.14	

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

Mode	Channel	Frequency [MHz]	Dual Ant.1 Peak Power [dBm]	Dual Ant.2 Peak Power [dBm]	Dual Peak Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	12.58	14.21	16.48	30
	17	2440	12.47	14.32	16.50	
	39	2480	12.92	11.36	15.22	
1M 255Byte	37	2402	12.51	14.13	16.40	
	17	2440	12.40	14.26	16.44	
	39	2480	12.93	11.30	15.20	
2M 37Byte	0	2404	12.78	14.27	16.60	
	17	2440	12.56	14.37	16.57	
	36	2478	13.04	11.37	15.29	
2M 255Byte	0	2404	12.76	14.29	16.60	
	17	2440	12.55	14.33	16.54	
	36	2478	12.99	11.50	15.32	

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Average Power

Note :

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

Dual Total Power [dBm] = 10•log((10^(Dual Ant.1 Power /10))+(10^(Dual Ant.2 Power /10)))

[Ant.1]

Mode	Channel	Frequency [MHz]	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	16.60	2.09	18.68	30
	17	2440	16.10	2.09	18.18	
	39	2480	15.32	2.09	17.40	
1M 255Byte	37	2402	17.83	0.70	18.52	
	17	2440	17.27	0.70	17.97	
	39	2480	16.47	0.70	17.17	
2M 37Byte	0	2404	13.82	5.01	18.82	
	17	2440	13.45	5.01	18.45	
	36	2478	12.68	5.01	17.69	
2M 255Byte	0	2404	16.38	2.43	18.81	
	17	2440	15.75	2.43	18.18	
	36	2478	15.32	2.43	17.75	
125k 37Byte	37	2402	11.34	0.82	12.17	
	17	2440	11.46	0.82	12.29	
	39	2480	11.71	0.82	12.53	
125k 255Byte	37	2402	12.25	0.12	12.37	
	17	2440	12.16	0.12	12.27	
	39	2480	12.63	0.12	12.74	
500k 37Byte	37	2402	10.13	2.45	12.57	
	17	2440	9.94	2.45	12.38	
	39	2480	10.51	2.45	12.96	
500k 255Byte	37	2402	11.86	0.40	12.26	
	17	2440	11.82	0.40	12.22	
	39	2480	12.26	0.40	12.66	

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[Ant.2]

Mode	Channel	Frequency [MHz]	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	17.50	2.09	19.58	30
	17	2440	17.56	2.09	19.64	
	39	2480	16.47	2.09	18.56	
1M 255Byte	37	2402	18.76	0.70	19.46	
	17	2440	18.78	0.70	19.47	
	39	2480	17.76	0.70	18.45	
2M 37Byte	0	2404	14.61	5.01	19.62	
	17	2440	14.60	5.01	19.61	
	36	2478	14.02	5.01	19.03	
2M 255Byte	0	2404	17.17	2.43	19.60	
	17	2440	17.18	2.43	19.61	
	36	2478	16.18	2.43	18.61	
125k 37Byte	37	2402	12.87	0.82	13.69	
	17	2440	12.91	0.82	13.74	
	39	2480	10.15	0.82	10.98	
125k 255Byte	37	2402	13.61	0.12	13.73	
	17	2440	13.58	0.12	13.69	
	39	2480	10.84	0.12	10.95	
500k 37Byte	37	2402	11.47	2.45	13.92	
	17	2440	11.35	2.45	13.79	
	39	2480	8.56	2.45	11.01	
500k 255Byte	37	2402	13.28	0.40	13.68	
	17	2440	13.22	0.40	13.62	
	39	2480	10.55	0.40	10.95	

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[Dual Ant.1]

Mode	Channel	Frequency [MHz]	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	10.41	2.09	12.49	30
	17	2440	10.30	2.09	12.39	
	39	2480	10.82	2.09	12.91	
1M 255Byte	37	2402	11.78	0.70	12.48	
	17	2440	11.69	0.70	12.39	
	39	2480	12.22	0.70	12.91	
2M 37Byte	0	2404	7.47	5.01	12.48	
	17	2440	7.47	5.01	12.48	
	36	2478	7.94	5.01	12.95	
2M 255Byte	0	2404	10.23	2.43	12.66	
	17	2440	10.04	2.43	12.47	
	36	2478	10.42	2.43	12.85	

[Dual Ant.2]

Mode	Channel	Frequency [MHz]	Measured Power [dBm]	D.C.F [dB]	Total Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	11.88	2.09	13.97	30
	17	2440	11.86	2.09	13.95	
	39	2480	9.04	2.09	11.12	
1M 255Byte	37	2402	13.21	0.70	13.91	
	17	2440	13.30	0.70	14.00	
	39	2480	10.42	0.70	11.12	
2M 37Byte	0	2404	9.25	5.01	14.25	
	17	2440	8.93	5.01	13.93	
	36	2478	5.99	5.01	11.00	
2M 255Byte	0	2404	11.83	2.43	14.26	
	17	2440	11.60	2.43	14.03	
	36	2478	8.98	2.43	11.41	

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

Mode	Channel	Frequency [MHz]	Dual Ant.1 Total Power [dBm]	Dual Ant.2 Total Power [dBm]	Dual Total Power [dBm]	Limit [dBm]
1M 37Byte	37	2402	12.49	13.97	16.30	30
	17	2440	12.39	13.95	16.25	
	39	2480	12.91	11.12	15.12	
1M 255Byte	37	2402	12.48	13.91	16.26	
	17	2440	12.39	14.00	16.28	
	39	2480	12.91	11.12	15.12	
2M 37Byte	0	2404	12.48	14.25	16.46	
	17	2440	12.48	13.93	16.27	
	36	2478	12.95	11.00	15.09	
2M 255Byte	0	2404	12.66	14.26	16.54	
	17	2440	12.47	14.03	16.33	
	36	2478	12.85	11.41	15.20	

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9.4 POWER SPECTRAL DENSITY

Note :

Total PSD [dBm] = Measured PSD [dBm] + Duty Cycle Factor [dB]

Dual Total PSD [dBm] = 10·log((10^(Dual Ant.1 PSD /10))+(10^(Dual Ant.2 PSD /10)))

[Ant.1]

Mode	Channel	Frequency [MHz]	Measured PSD [dBm]	D.C.F [dB]	Total PSD [dBm]	Limit [dBm/3kHz]
1M 37Byte	37	2402	2.025	2.09	4.110	8
	17	2440	1.755	2.09	3.840	
	39	2480	0.619	2.09	2.704	
1M 255Byte	37	2402	1.860	0.70	2.556	
	17	2440	1.271	0.70	1.967	
	39	2480	0.152	0.70	0.848	
2M 37Byte	0	2404	-0.681	5.01	4.325	
	17	2440	-1.867	5.01	3.139	
	36	2478	-1.615	5.01	3.391	
2M 255Byte	0	2404	-1.876	2.43	0.554	
	17	2440	-2.135	2.43	0.295	
	36	2478	-1.993	2.43	0.437	
125k 37Byte	37	2402	4.152	0.82	4.975	
	17	2440	4.122	0.82	4.945	
	39	2480	4.550	0.82	5.373	
125k 255Byte	37	2402	5.281	0.12	5.398	
	17	2440	5.218	0.12	5.335	
	39	2480	5.700	0.12	5.817	
500k 37Byte	37	2402	-0.687	2.45	1.760	
	17	2440	-1.097	2.45	1.350	
	39	2480	0.017	2.45	2.464	
500k 255Byte	37	2402	-2.725	0.40	-2.325	
	17	2440	-3.291	0.40	-2.891	
	39	2480	-3.665	0.40	-3.265	

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[Ant.2]

Mode	Channel	Frequency [MHz]	Measured PSD [dBm]	D.C.F [dB]	Total PSD [dBm]	Limit [dBm/3kHz]
1M 37Byte	37	2402	3.280	2.09	5.365	8
	17	2440	3.604	2.09	5.689	
	39	2480	2.085	2.09	4.170	
1M 255Byte	37	2402	3.263	0.70	3.959	
	17	2440	3.150	0.70	3.846	
	39	2480	1.784	0.70	2.480	
2M 37Byte	0	2404	0.374	5.01	5.380	
	17	2440	-2.042	5.01	2.964	
	36	2478	-1.551	5.01	3.455	
2M 255Byte	0	2404	0.113	2.43	2.543	
	17	2440	0.094	2.43	2.524	
	36	2478	-1.247	2.43	1.183	
125k 37Byte	37	2402	6.285	0.82	7.108	
	17	2440	6.294	0.82	7.117	
	39	2480	2.979	0.82	3.802	
125k 255Byte	37	2402	6.333	0.12	6.450	
	17	2440	6.331	0.12	6.448	
	39	2480	3.528	0.12	3.645	
500k 37Byte	37	2402	3.349	2.45	5.796	
	17	2440	0.093	2.45	2.540	
	39	2480	-2.674	2.45	-0.227	
500k 255Byte	37	2402	-1.557	0.40	-1.157	
	17	2440	-2.370	0.40	-1.970	
	39	2480	-5.190	0.40	-4.790	

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[Dual Ant.1]

Mode	Channel	Frequency [MHz]	Measured PSD [dBm]	D.C.F [dB]	Total PSD [dBm]	Limit [dBm/3kHz]
1M 37Byte	37	2402	-3.961	2.09	-1.876	8
	17	2440	-4.551	2.09	-2.466	
	39	2480	-3.960	2.09	-1.875	
1M 255Byte	37	2402	-5.024	0.70	-4.328	
	17	2440	-4.960	0.70	-4.264	
	39	2480	-4.290	0.70	-3.594	
2M 37Byte	0	2404	-7.446	5.01	-2.440	
	17	2440	-8.017	5.01	-3.011	
	36	2478	-8.117	5.01	-3.111	
2M 255Byte	0	2404	-8.873	2.43	-6.443	
	17	2440	-9.386	2.43	-6.956	
	36	2478	-6.888	2.43	-4.458	

[Dual Ant.2]

Mode	Channel	Frequency [MHz]	Measured PSD [dBm]	D.C.F [dB]	Total PSD [dBm]	Limit [dBm/3kHz]
1M 37Byte	37	2402	-2.286	2.09	-0.201	8
	17	2440	-2.552	2.09	-0.467	
	39	2480	-5.431	2.09	-3.346	
1M 255Byte	37	2402	-2.496	0.70	-1.800	
	17	2440	-2.570	0.70	-1.874	
	39	2480	-6.172	0.70	-5.476	
2M 37Byte	0	2404	-6.358	5.01	-1.352	
	17	2440	-7.482	5.01	-2.476	
	36	2478	-9.068	5.01	-4.062	
2M 255Byte	0	2404	-7.202	2.43	-4.772	
	17	2440	-6.667	2.43	-4.237	
	36	2478	-10.095	2.43	-7.665	

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

Mode	Channel	Frequency [MHz]	Dual Ant.1 Total PSD [dBm]	Dual Ant.2 Total PSD [dBm]	Dual Total PSD [dBm]	Limit [dBm/3kHz]
1M 37Byte	37	2402	-1.876	-0.201	2.053	8
	17	2440	-2.466	-0.467	1.658	
	39	2480	-1.875	-3.346	0.462	
1M 255Byte	37	2402	-4.328	-1.800	0.127	
	17	2440	-4.264	-1.874	0.103	
	39	2480	-3.594	-5.476	-1.424	
2M 37Byte	0	2404	-2.440	-1.352	1.148	
	17	2440	-3.011	-2.476	0.275	
	36	2478	-3.111	-4.062	-0.550	
2M 255Byte	0	2404	-6.443	-4.772	-2.517	
	17	2440	-6.956	-4.237	-2.376	
	36	2478	-4.458	-7.665	-2.761	

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▣ Test Plots

Note : In order to simplify the report, attached plots were only the worst case PSD channel.

[Ant.1]

1 MBit/s 37 Byte (Low-CH 37)

2 MBit/s 37 Byte (Low-CH 0)

125k Bit/s 255 Byte (High-CH 39)

500k Bit/s 37 Byte (High-CH 39)

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[Ant.2]

1 MBit/s 37 Byte (Mid-CH 17)	2 MBit/s 37 Byte (Low-CH 0)
125k Bit/s 37 Byte (Mid-CH 17)	500k Bit/s 37 Byte (Low-CH 37)

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[Dual BT]

1 MBit/s 37 Byte (Low-CH 37)

Dual Ant.1	Dual Ant.2

2 MBit/s 37 Byte (Low-CH 0)

Dual Ant.1	Dual Ant.2

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9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

[BAND EDGE]

Mode	Channel	Frequency [MHz]	Position	Ant.1 Band Edge [dB]	Ant.2 Band Edge [dB]	Limit [dBc]
1M 37Byte	37	2402	Lower	58.421	57.772	30
	39	2480	Upper	61.857	65.242	
1M 255Byte	37	2402	Lower	58.969	58.499	
	39	2480	Upper	64.807	64.257	
2M 37Byte	0	2404	Lower	60.304	59.541	
	36	2478	Upper	63.918	64.364	
2M 255Byte	0	2404	Lower	60.187	60.301	
	36	2478	Upper	63.337	65.745	
125k 37Byte	37	2402	Lower	55.859	56.075	
	39	2480	Upper	57.147	62.231	
125k 255Byte	37	2402	Lower	54.484	54.882	
	39	2480	Upper	60.703	58.975	
500k 37Byte	37	2402	Lower	57.176	59.080	
	39	2480	Upper	61.915	62.384	
500k 255Byte	37	2402	Lower	57.816	57.348	
	39	2480	Upper	61.697	62.285	

[Dual BT]

Mode	Channel	Frequency [MHz]	Position	Dual Ant.1 Band Edge [dB]	Dual Ant.2 Band Edge [dB]	Limit [dBc]
1M 37Byte	37	2402	Lower	56.917	55.961	30
	39	2480	Upper	61.708	60.164	
1M 255Byte	37	2402	Lower	52.877	55.011	
	39	2480	Upper	59.379	59.446	
2M 37Byte	0	2404	Lower	59.184	57.016	
	36	2478	Upper	63.543	61.299	
2M 255Byte	0	2404	Lower	59.365	57.714	
	36	2478	Upper	61.531	59.512	

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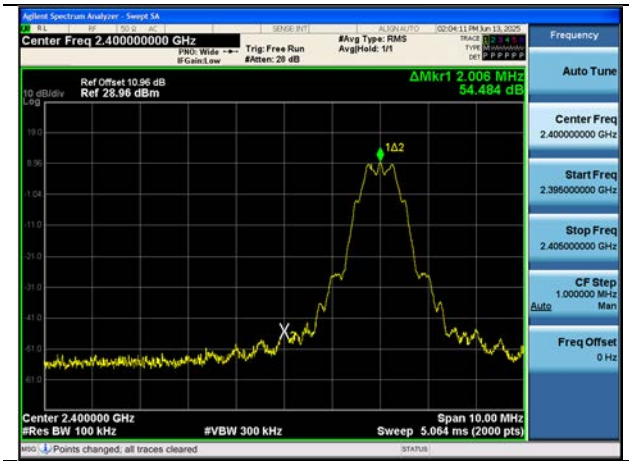
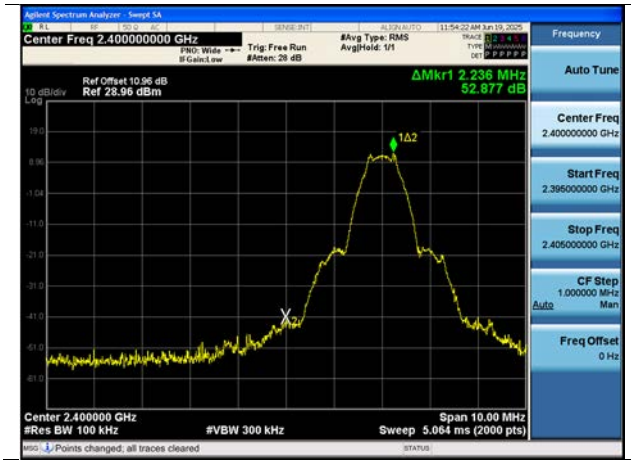
▣ Test Plot(Band Edge)

Ant.1, 125k Bit/s 255 Byte (Low-CH 37)	Ant.2, 125k Bit/s 255 Byte (Low-CH 37)
	
Dual Ant.1, 1 MBit/s 255 Byte (Low-CH 37)	Dual Ant.2, 1 MBit/s 255 Byte (Low-CH 37)
	

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[CONDUCTED SPURIOUS EMISSIONS]

In order to simplify the report, attached plots were only the worst case channel and data rate.

- Worst case

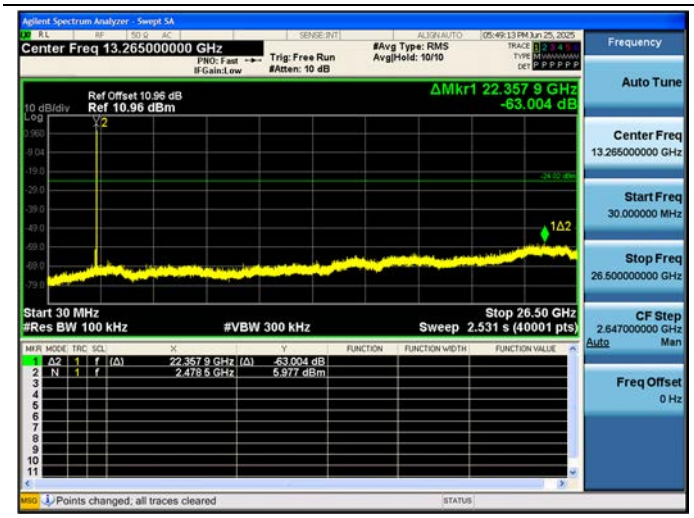
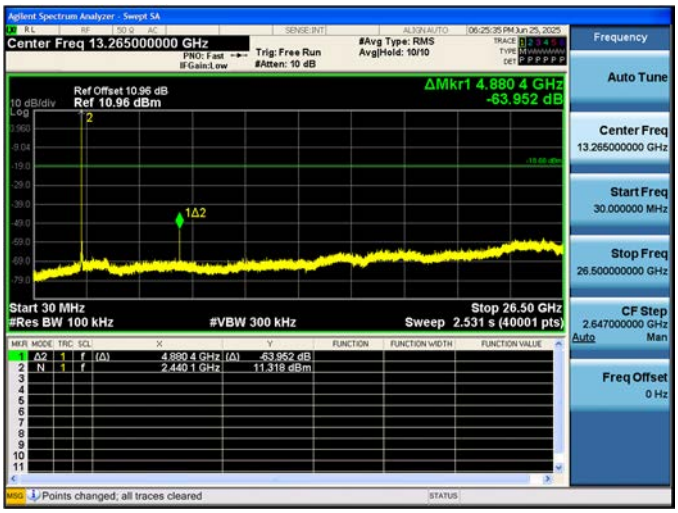
Ant. 1 : 2M Bit/s 37 Byte Ch. 36(2478 MHz)

Ant. 2 : 125k Bit/s 37 Byte Ch. 39(2480 MHz)

Dual Ant. 1 : 1M Bit/s 255 Byte Ch. 17(2440 MHz)

Dual Ant. 2 : 2M Bit/s 37 Byte Ch. 36(2478 MHz)

▣ Test Plots(Conducted Spurious Emission (30 MHz – 26.5 GHz))

Ant. 1 Conducted Spurious Emission	Ant. 2 Conducted Spurious Emission
	
Dual BT Ant. 1 Conducted Spurious Emission	Dual BT Ant. 2 Conducted Spurious Emission
	

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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.

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Frequency Range : Above 1 GHz

[Ant.1]

CH 37	2402	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	43.92	2.26	V	46.18	73.98	27.80	PK
4804	32.21	2.26	V	34.47	53.98	19.51	AV
7206	39.82	10.85	V	50.67	73.98	23.31	PK
7206	28.79	10.85	V	39.64	53.98	14.34	AV
7206	44.78	2.26	H	47.04	73.98	26.94	PK
7206	32.61	2.26	H	34.87	53.98	19.11	AV
7206	40.96	10.85	H	51.81	73.98	22.17	PK
7206	28.85	10.85	H	39.70	53.98	14.28	AV

CH 17	2440	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	46.28	2.35	V	48.63	73.98	25.35	PK
4880	34.05	2.35	V	36.40	53.98	17.58	AV
7320	41.08	9.96	V	51.04	73.98	22.94	PK
7320	29.55	9.96	V	39.51	53.98	14.47	AV
4880	45.31	2.35	H	47.66	73.98	26.32	PK
4880	34.01	2.35	H	36.36	53.98	17.62	AV
7320	41.76	9.96	H	51.72	73.98	22.26	PK
7320	29.68	9.96	H	39.64	53.98	14.34	AV

CH 39	2480	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	44.97	3.48	V	48.45	73.98	25.53	PK
4960	33.39	3.48	V	36.87	53.98	17.11	AV
7440	41.93	10.16	V	52.09	73.98	21.89	PK
7440	30.21	10.16	V	40.37	53.98	13.61	AV
4960	43.76	3.48	H	47.24	73.98	26.74	PK
4960	33.06	3.48	H	36.54	53.98	17.44	AV
7440	42.58	10.16	H	52.74	73.98	21.24	PK
7440	30.33	10.16	H	40.49	53.98	13.49	AV

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CH 0	2404	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4808	44.17	2.23	V	46.40	73.98	27.58	PK
4808	32.42	2.23	V	34.65	53.98	19.33	AV
7212	39.86	10.81	V	50.67	73.98	23.31	PK
7212	28.59	10.81	V	39.40	53.98	14.58	AV
4808	45.45	2.23	H	47.68	73.98	26.30	PK
4808	32.56	2.23	H	34.79	53.98	19.19	AV
7212	40.45	10.81	H	51.26	73.98	22.72	PK
7212	28.72	10.81	H	39.53	53.98	14.45	AV

CH 17	2440	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	45.98	2.35	V	48.33	73.98	25.65	PK
4880	33.57	2.35	V	35.92	53.98	18.06	AV
7320	40.56	9.96	V	50.52	73.98	23.46	PK
7320	29.05	9.96	V	39.01	53.98	14.97	AV
4880	46.52	2.35	H	48.87	73.98	25.11	PK
4880	34.20	2.35	H	36.55	53.98	17.43	AV
7320	41.06	9.96	H	51.02	73.98	22.96	PK
7320	29.36	9.96	H	39.32	53.98	14.66	AV

CH 36	2478	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4956	45.27	3.42	V	48.69	73.98	25.29	PK
4956	33.43	3.42	V	36.85	53.98	17.13	AV
7434	41.05	10.24	V	51.29	73.98	22.69	PK
7434	29.83	10.24	V	40.07	53.98	13.91	AV
4956	44.25	3.42	H	47.67	73.98	26.31	PK
4956	33.11	3.42	H	36.53	53.98	17.45	AV
7434	41.53	10.24	H	51.77	73.98	22.21	PK
7434	29.90	10.24	H	40.14	53.98	13.84	AV

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[Ant.2]

CH 37	2402	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4804	44.39	2.26	V	46.65	73.98	27.33	PK
4804	32.46	2.26	V	34.72	53.98	19.26	AV
7206	39.85	10.85	V	50.70	73.98	23.28	PK
7206	28.28	10.85	V	39.13	53.98	14.85	AV
4804	44.52	2.26	H	46.78	73.98	27.20	PK
4804	32.52	2.26	H	34.78	53.98	19.20	AV
7206	40.05	10.85	H	50.90	73.98	23.08	PK
7206	28.38	10.85	H	39.23	53.98	14.75	AV

CH 17	2440	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4880	44.75	2.35	V	47.10	73.98	26.88	PK
4880	34.17	2.35	V	36.52	53.98	17.46	AV
7320	40.97	9.96	V	50.93	73.98	23.05	PK
7320	28.55	9.96	V	38.51	53.98	15.47	AV
4880	45.97	2.35	H	48.32	73.98	25.66	PK
4880	34.23	2.35	H	36.58	53.98	17.40	AV
7320	41.75	9.96	H	51.71	73.98	22.27	PK
7320	29.51	9.96	H	39.47	53.98	14.51	AV

CH 39	2480	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4960	44.05	3.48	V	47.53	73.98	26.45	PK
4960	32.27	3.48	V	35.75	53.98	18.23	AV
7440	42.04	10.16	V	52.20	73.98	21.78	PK
7440	30.26	10.16	V	40.42	53.98	13.56	AV
4960	45.36	3.48	H	48.84	73.98	25.14	PK
4960	32.98	3.48	H	36.46	53.98	17.52	AV
7440	43.27	10.16	H	53.43	73.98	20.55	PK
7440	30.35	10.16	H	40.51	53.98	13.47	AV

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CH 0	2404	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4808	43.50	2.23	V	45.73	73.98	28.25	PK
4808	32.27	2.23	V	34.50	53.98	19.48	AV
7212	40.46	10.81	V	51.27	73.98	22.71	PK
7212	28.35	10.81	V	39.16	53.98	14.82	AV
4808	44.57	2.23	H	46.80	73.98	27.18	PK
4808	32.51	2.23	H	34.74	53.98	19.24	AV
7212	40.68	10.81	H	51.49	73.98	22.49	PK
7212	28.45	10.81	H	39.26	53.98	14.72	AV

CH 17	2440	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4880	44.99	2.35	V	47.34	73.98	26.64	PK
4880	34.05	2.35	V	36.40	53.98	17.58	AV
7320	40.61	9.96	V	50.57	73.98	23.41	PK
7320	29.32	9.96	V	39.28	53.98	14.70	AV
4880	45.72	2.35	H	48.07	73.98	25.91	PK
4880	34.11	2.35	H	36.46	53.98	17.52	AV
7320	40.96	9.96	H	50.92	73.98	23.06	PK
7320	29.44	9.96	H	39.40	53.98	14.58	AV

CH 36	2478	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4956	43.89	3.42	V	47.31	73.98	26.67	PK
4956	32.67	3.42	V	36.09	53.98	17.89	AV
7434	41.05	10.24	V	51.29	73.98	22.69	PK
7434	30.21	10.24	V	40.45	53.98	13.53	AV
4956	45.42	3.42	H	48.84	73.98	25.14	PK
4956	32.92	3.42	H	36.34	53.98	17.64	AV
7434	42.05	10.24	H	52.29	73.98	21.69	PK
7434	30.32	10.24	H	40.56	53.98	13.42	AV

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[Dual Ant.1+ Ant.2]

CH 37	2402	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4804	44.48	2.26	V	46.74	73.98	27.24	PK
4804	32.69	2.26	V	34.95	53.98	19.03	AV
7206	41.48	10.85	V	52.33	73.98	21.65	PK
7206	30.32	10.85	V	41.17	53.98	12.81	AV
7206	43.69	2.26	H	45.95	73.98	28.03	PK
7206	32.44	2.26	H	34.70	53.98	19.28	AV
7206	43.25	10.85	H	54.10	73.98	19.88	PK
7206	32.93	10.85	H	43.78	53.98	10.20	AV

CH 17	2440	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4880	46.15	2.35	V	48.50	73.98	25.48	PK
4880	34.04	2.35	V	36.39	53.98	17.59	AV
7320	42.91	9.96	V	52.87	73.98	21.11	PK
7320	32.99	9.96	V	42.95	53.98	11.03	AV
4880	45.62	2.35	H	47.97	73.98	26.01	PK
4880	34.01	2.35	H	36.36	53.98	17.62	AV
7320	41.75	9.96	H	51.71	73.98	22.27	PK
7320	32.52	9.96	H	42.48	53.98	11.50	AV

CH 39	2480	MHz	Mode :		1 M Bit/s (37 Bytes)		
Frequency [MHz]	Measured value [dBμV]	AF+CL-AG+DF [dB/m]	Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4960	45.38	3.48	V	48.86	73.98	25.12	PK
4960	33.12	3.48	V	36.60	53.98	17.38	AV
7440	44.32	10.16	V	54.48	73.98	19.50	PK
7440	32.85	10.16	V	43.01	53.98	10.97	AV
4960	44.55	3.48	H	48.03	73.98	25.95	PK
4960	32.97	3.48	H	36.45	53.98	17.53	AV
7440	42.16	10.16	H	52.32	73.98	21.66	PK
7440	31.96	10.16	H	42.12	53.98	11.86	AV

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CH 0	2404	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4808	44.10	2.23	V	46.33	73.98	27.65	PK
4808	32.41	2.23	V	34.64	53.98	19.34	AV
7212	41.08	10.81	V	51.89	73.98	22.09	PK
7212	30.82	10.81	V	41.63	53.98	12.35	AV
4808	43.52	2.23	H	45.75	73.98	28.23	PK
4808	32.17	2.23	H	34.40	53.98	19.58	AV
7212	42.69	10.81	H	53.50	73.98	20.48	PK
7212	31.59	10.81	H	42.40	53.98	11.58	AV

CH 17	2440	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4880	46.05	2.35	V	48.40	73.98	25.58	PK
4880	34.09	2.35	V	36.44	53.98	17.54	AV
7320	42.43	9.96	V	52.39	73.98	21.59	PK
7320	32.10	9.96	V	42.06	53.98	11.92	AV
4880	44.92	2.35	H	47.27	73.98	26.71	PK
4880	33.04	2.35	H	35.39	53.98	18.59	AV
7320	41.99	9.96	H	51.95	73.98	22.03	PK
7320	31.46	9.96	H	41.42	53.98	12.56	AV

CH 36	2478	MHz	Mode :		2 M Bit/s (37 Bytes)		
Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4956	44.80	3.42	V	48.22	73.98	25.76	PK
4956	32.84	3.42	V	36.26	53.98	17.72	AV
7434	44.09	10.24	V	54.33	73.98	19.65	PK
7434	30.61	10.24	V	40.85	53.98	13.13	AV
4956	43.27	3.42	H	46.69	73.98	27.29	PK
4956	32.67	3.42	H	36.09	53.98	17.89	AV
7434	42.98	10.24	H	53.22	73.98	20.76	PK
7434	30.25	10.24	H	40.49	53.98	13.49	AV

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[Simultaneous transmission Scenario)

Scenario 2

ANT1_BTLE 1M 37 Bytes Ch. 39 + ANT ALL(MIMO) 5 GHz 802.11a Ch. 36_6 Mbps

Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4960	46.17	3.48	V	49.65	73.98	24.33	PK
4960	35.52	3.48	V	39.00	53.98	14.98	AV
7440	42.12	10.16	V	52.28	73.98	21.70	PK
7440	30.09	10.16	V	40.25	53.98	13.73	AV
4960	45.67	3.48	H	49.15	73.98	24.83	PK
4960	34.67	3.48	H	38.15	53.98	15.83	AV
7440	42.99	10.16	H	53.15	73.98	20.83	PK
7440	30.78	10.16	H	40.94	53.98	13.04	AV

Scenario 2

ANT1_BTLE 1M 37 Bytes Ch. 39 + ANT ALL(MIMO) 6 GHz 802.11ax HE40 SU Ch. 3_MCS0

Frequency	Measured value	AF+CL-AG+DF	Pol.	Total	Limit	Margin	Measurement Type
[MHz]	[dBμV]	[dB/m]	[H/V]	[dBμV/m]	[dBμV/m]	[dB]	
4960	47.34	3.48	V	50.82	73.98	23.16	PK
4960	35.41	3.48	V	38.89	53.98	15.09	AV
7440	42.51	10.16	V	52.67	73.98	21.31	PK
7440	29.95	10.16	V	40.11	53.98	13.87	AV
4960	46.29	3.48	H	49.77	73.98	24.21	PK
4960	35.11	3.48	H	38.59	53.98	15.39	AV
7440	43.29	10.16	H	53.45	73.98	20.53	PK
7440	30.82	10.16	H	40.98	53.98	13.00	AV

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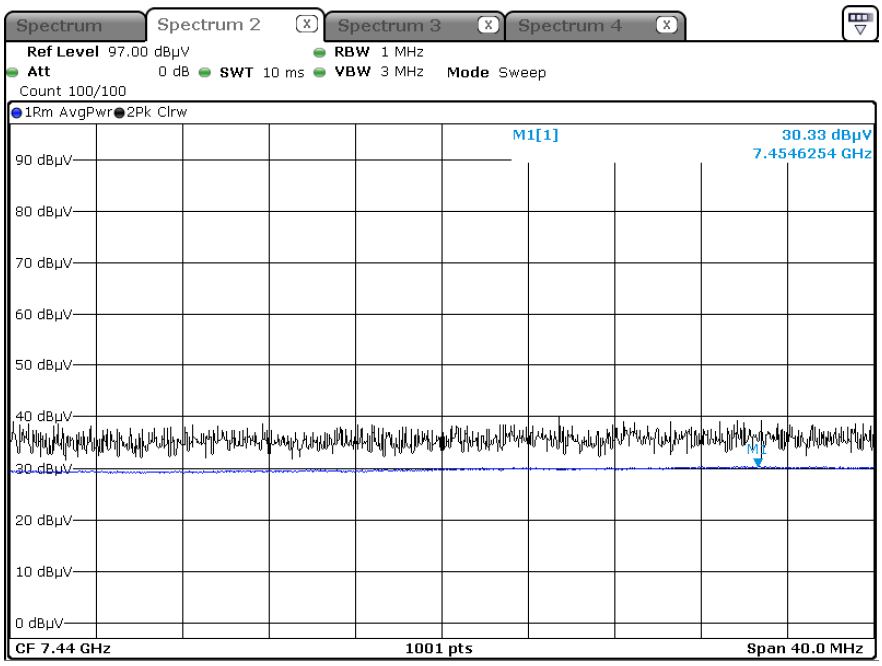
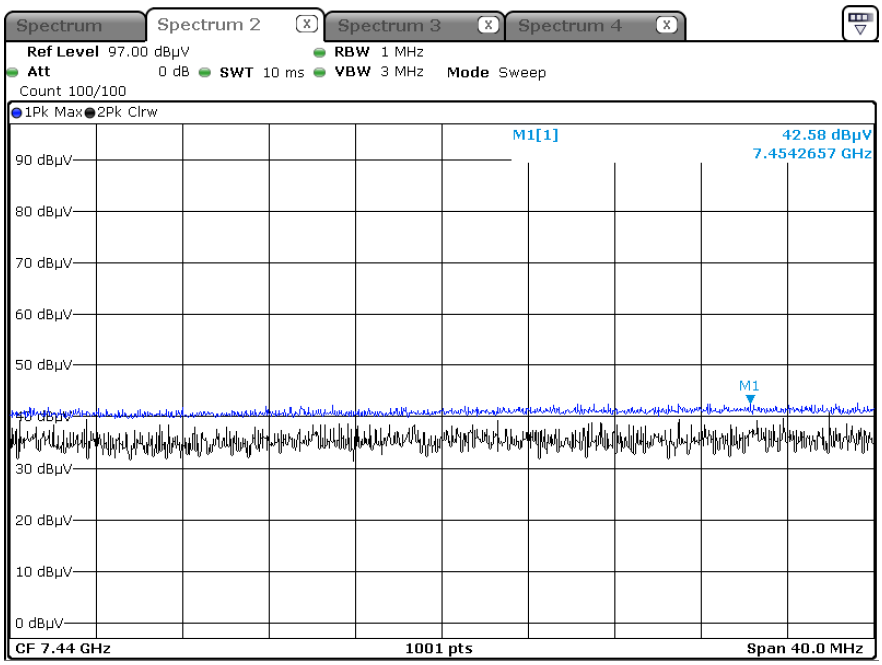
[Ant.1]

▣ 1 M Bit/s 37 Bytes Test Plots (Worst case : Y-H)

Radiated Spurious Emissions plot – Average Result (Ch.39 3rd Harmonic)



Radiated Spurious Emissions plot – Peak Result (Ch.39 3rd Harmonic)



Note:

Plots of worst case are only reported.

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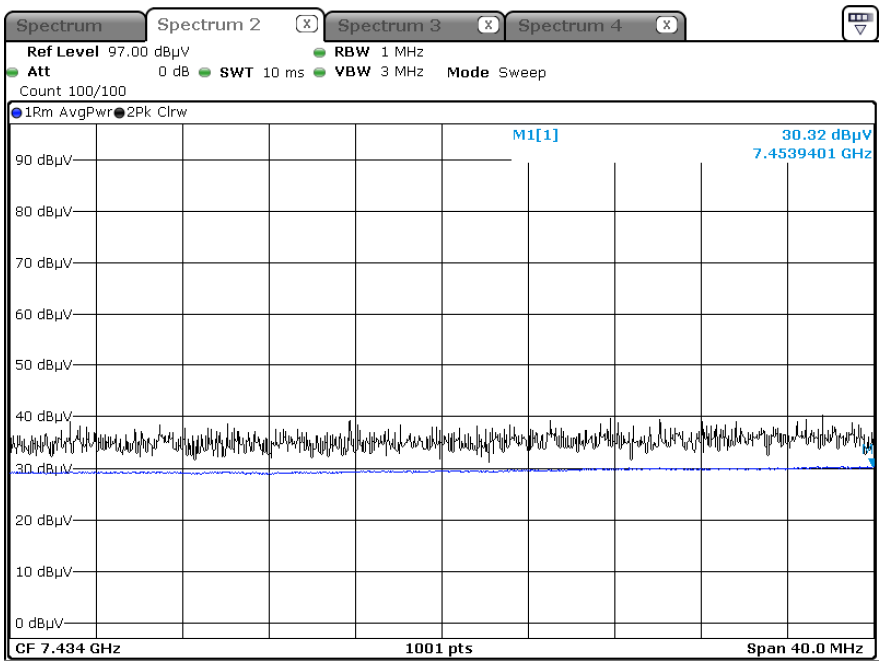
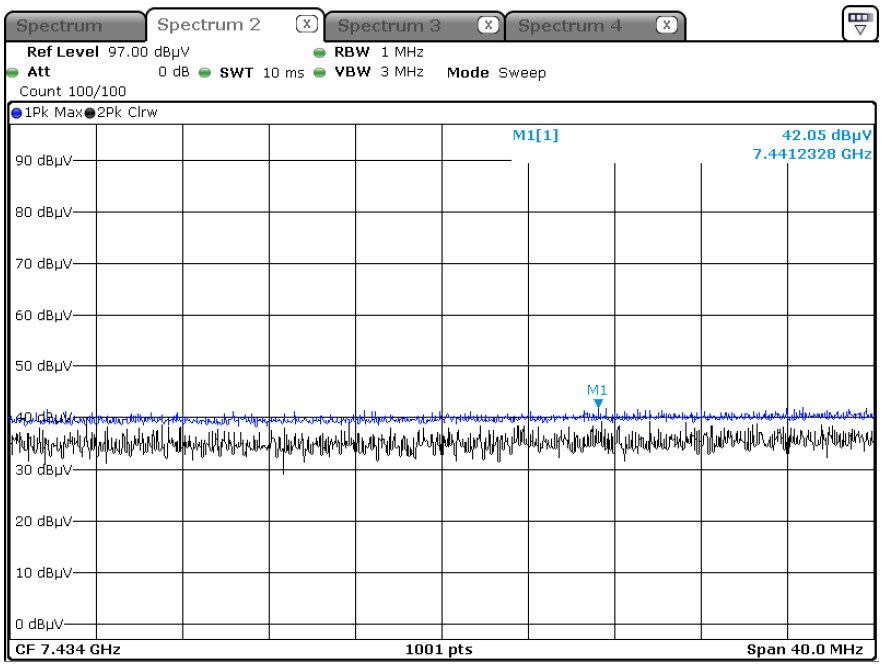
[Ant.2]

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

Radiated Spurious Emissions plot – Average Result (Ch.39 3rd Harmonic)



Radiated Spurious Emissions plot – Peak Result (Ch.39 3rd Harmonic)



Note:

Plots of worst case are only reported.

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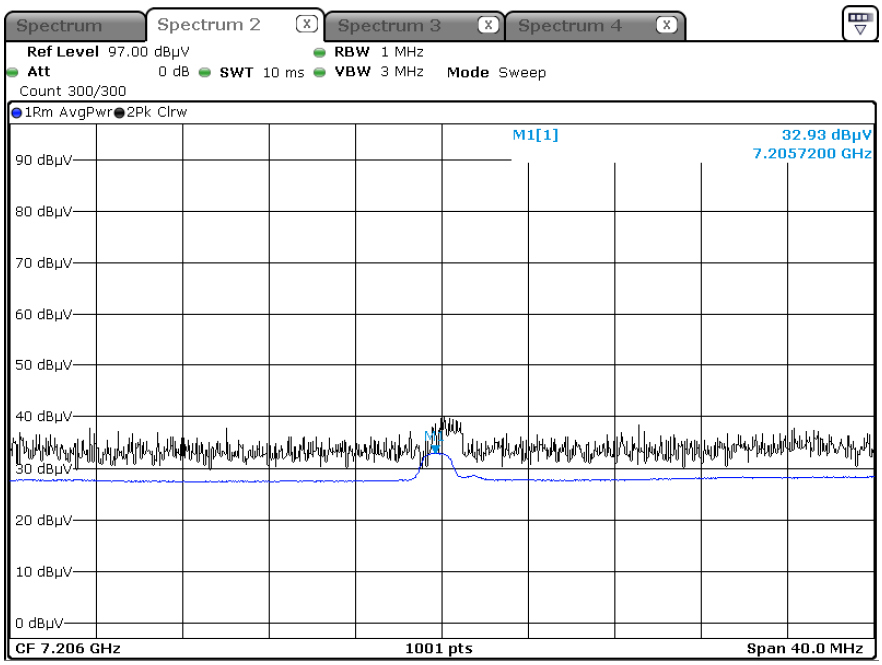
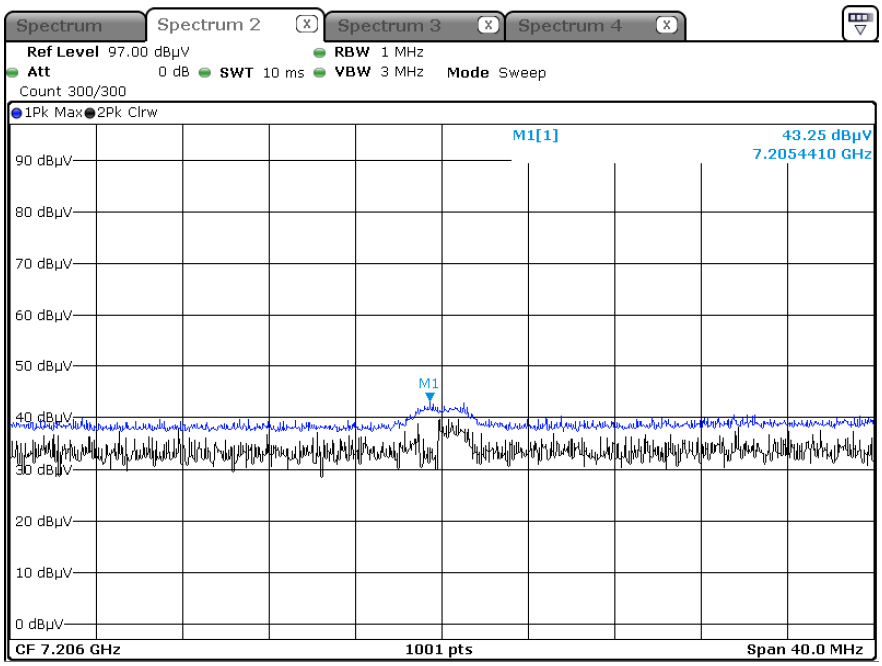
[Dual Ant.1+ Ant.2]

▣ 1 M Bit/s 37 Bytes Test Plots (Worst case : Y-H)

Radiated Spurious Emissions plot – Average Result (Ch.39 3rd Harmonic)



Radiated Spurious Emissions plot – Peak Result (Ch.39 3rd Harmonic)



Note:

Plots of worst case are only reported.

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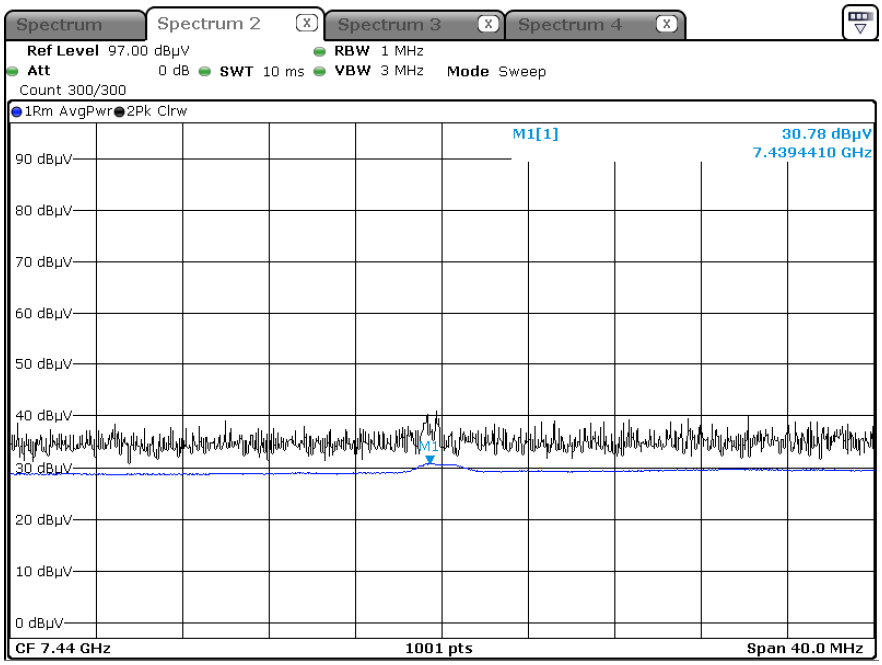
[Simultaneous transmission Scenario)

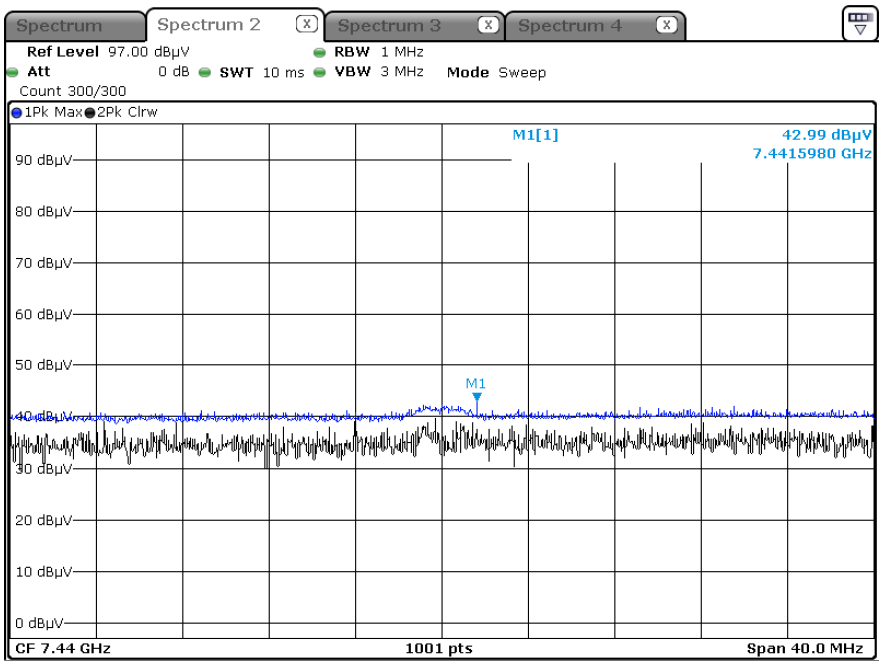
Scenario 2

ANT1_BTLE 1M 37 Bytes Ch. 39 + ANT ALL(MIMO) 5 GHz 802.11a Ch. 36_6 Mbps

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



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



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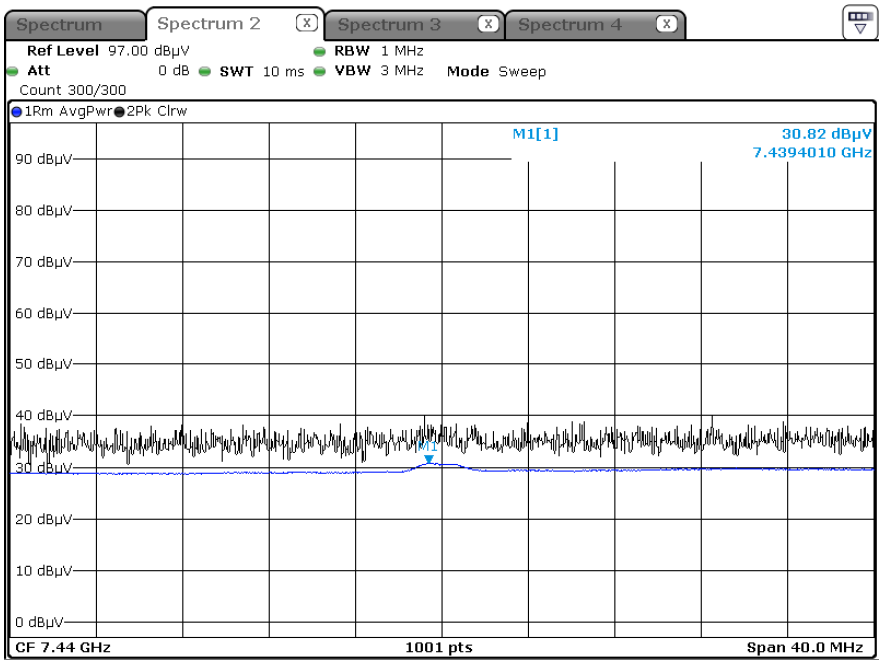
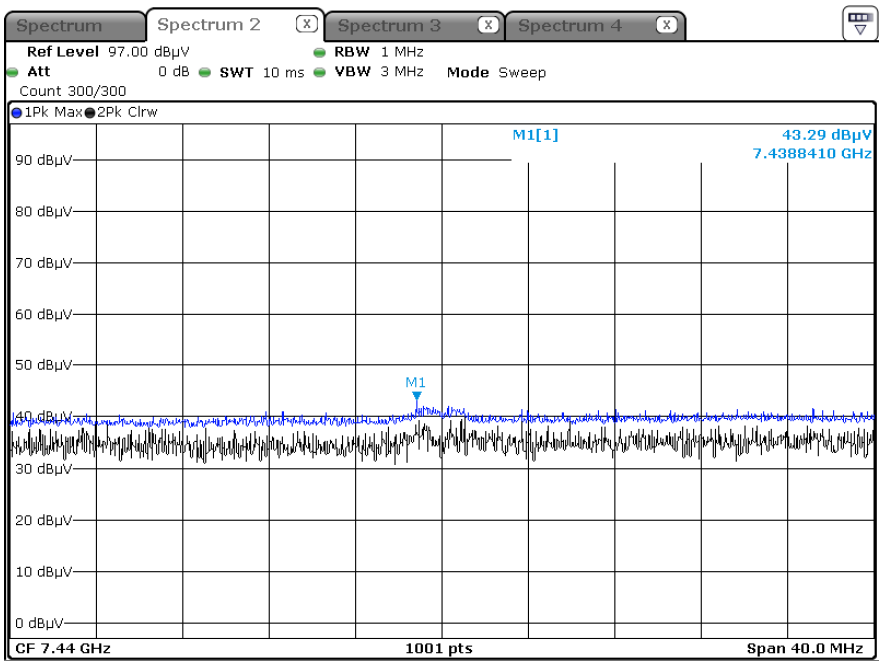
Scenario 3

ANT1_BTLE 1M 37 Bytes Ch. 39 + ANT ALL(MIMO) 6 GHz 802.11ax HE40 SU Ch. 3_MCS0

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



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



Note:

Plots of worst case are only reported.

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9.7 RADIATED RESTRICTED BAND EDGES

[Ant.1]

1 M Bit/s (37 Bytes)							
Channel	37 CH, 39 CH	Channel Frequency	2402 MHz, 2480 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	49.09	1.40	H	50.49	73.98	23.49	PK
2390.0	35.76	1.40	H	37.16	53.98	16.82	AV
2483.5	53.66	2.04	H	55.70	73.98	18.28	PK
2483.5	40.52	2.04	H	42.56	53.98	11.42	AV

1 M Bit/s (255 Bytes)							
Channel	37 CH, 39 CH	Channel Frequency	2402 MHz, 2480 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	49.22	1.40	H	50.62	73.98	23.36	PK
2390.0	35.85	1.40	H	37.25	53.98	16.73	AV
2483.5	53.44	2.04	H	55.48	73.98	18.50	PK
2483.5	41.27	2.04	H	43.31	53.98	10.67	AV

2 M Bit/s (37 Bytes)							
Channel	0 CH, 36 CH	Channel Frequency	2404 MHz, 2478 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	49.02	1.40	H	50.42	73.98	23.56	PK
2390.0	36.07	1.40	H	37.47	53.98	16.51	AV
2483.5	52.26	2.04	H	54.30	73.98	19.68	PK
2483.5	38.57	2.04	H	40.61	53.98	13.37	AV

2 M Bit/s (255 Bytes)							
Channel	0 CH, 36 CH	Channel Frequency	2404 MHz, 2478 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	48.81	1.40	H	50.21	73.98	23.77	PK
2390.0	35.87	1.40	H	37.27	53.98	16.71	AV
2483.5	51.96	2.04	H	54.00	73.98	19.98	PK
2483.5	39.61	2.04	H	41.65	53.98	12.33	AV

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[Ant.2]

1 M Bit/s (37 Bytes)							
Channel	37 CH, 39 CH	Channel Frequency	2402 MHz, 2480 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	48.87	1.40	H	50.27	73.98	23.71	PK
2390.0	36.37	1.40	H	37.77	53.98	16.21	AV
2483.5	52.09	2.04	H	54.13	73.98	19.85	PK
2483.5	38.68	2.04	H	40.72	53.98	13.26	AV

1 M Bit/s (255 Bytes)							
Channel	37 CH, 39 CH	Channel Frequency	2402 MHz, 2480 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	48.38	1.40	H	49.78	73.98	24.20	PK
2390.0	36.47	1.40	H	37.87	53.98	16.11	AV
2483.5	51.97	2.04	H	54.01	73.98	19.97	PK
2483.5	39.26	2.04	H	41.30	53.98	12.68	AV

2 M Bit/s (37 Bytes)							
Channel	0 CH, 36 CH	Channel Frequency	2404 MHz, 2478 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	49.46	1.40	H	50.86	73.98	23.12	PK
2390.0	36.57	1.40	H	37.97	53.98	16.01	AV
2483.5	50.79	2.04	H	52.83	73.98	21.15	PK
2483.5	37.50	2.04	H	39.54	53.98	14.44	AV

2 M Bit/s (255 Bytes)							
Channel	0 CH, 36 CH	Channel Frequency	2404 MHz, 2478 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	49.24	1.40	H	50.64	73.98	23.34	PK
2390.0	36.55	1.40	H	37.95	53.98	16.03	AV
2483.5	50.53	2.04	H	52.57	73.98	21.41	PK
2483.5	38.28	2.04	H	40.32	53.98	13.66	AV

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[Dual Ant.1+ Ant.2]

1 M Bit/s (37 Bytes)							
Channel	37 CH, 39 CH	Channel Frequency	2402 MHz, 2480 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	50.24	1.40	H	51.64	73.98	22.34	PK
2390.0	36.96	1.40	H	38.36	53.98	15.62	AV
2483.5	58.48	2.04	H	60.52	73.98	13.46	PK
2483.5	44.65	2.04	H	46.69	53.98	7.29	AV

1 M Bit/s (255 Bytes)							
Channel	37 CH, 39 CH	Channel Frequency	2402 MHz, 2480 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	52.15	1.40	H	53.55	73.98	20.43	PK
2390.0	36.77	1.40	H	38.17	53.98	15.81	AV
2483.5	60.85	2.04	H	62.89	73.98	11.09	PK
2483.5	42.73	2.04	H	44.77	53.98	9.21	AV

2 M Bit/s (37 Bytes)							
Channel	0 CH, 36 CH	Channel Frequency	2404 MHz, 2478 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	50.07	1.40	H	51.47	73.98	22.51	PK
2390.0	37.02	1.40	H	38.42	53.98	15.56	AV
2483.5	55.48	2.04	H	57.52	73.98	16.46	PK
2483.5	40.74	2.04	H	42.78	53.98	11.20	AV

2 M Bit/s (255 Bytes)							
Channel	0 CH, 36 CH	Channel Frequency	2404 MHz, 2478 MHz				
Frequency [MHz]	Measured Value [dBμV]	A.F+C.L+Att-A.G+D.F [dB/m]	Ant. Pol. [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	51.41	1.40	H	52.81	73.98	21.17	PK
2390.0	36.82	1.40	H	38.22	53.98	15.76	AV
2483.5	58.14	2.04	H	60.18	73.98	13.80	PK
2483.5	41.95	2.04	H	43.99	53.98	9.99	AV

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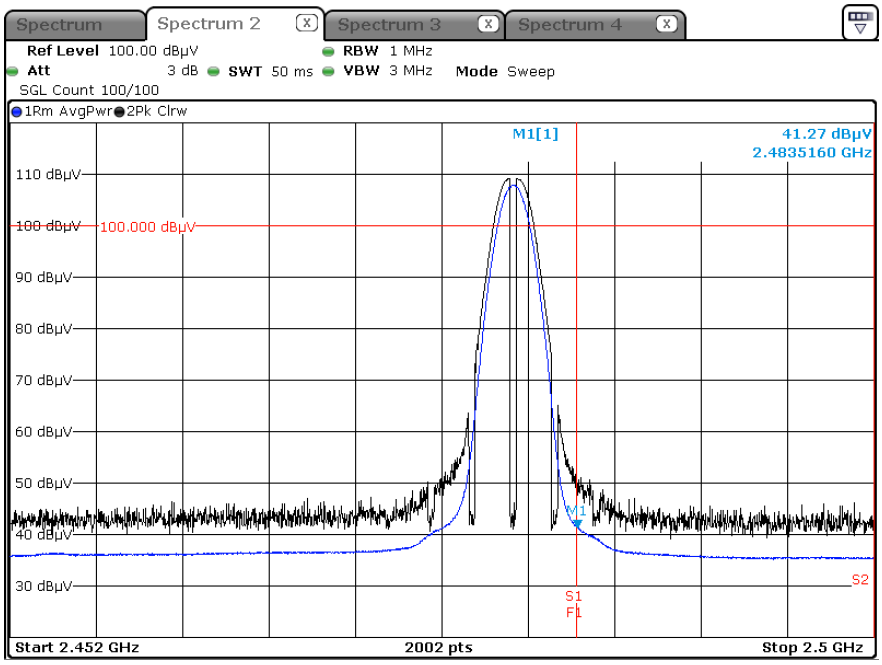
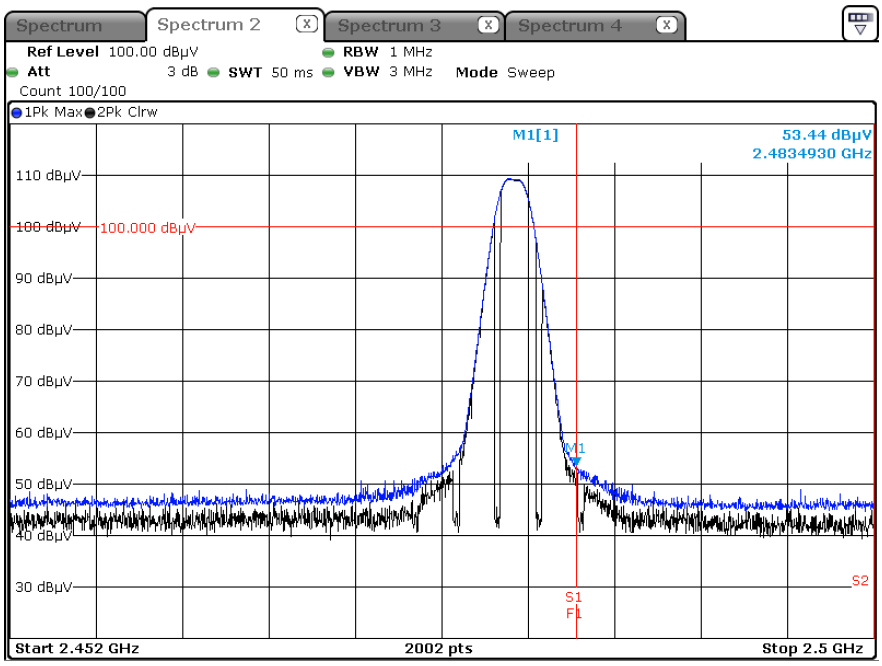
[Ant.1]

▣ Mode : 1 M Bit/s (255 Bytes) Test Plots

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



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



Note:

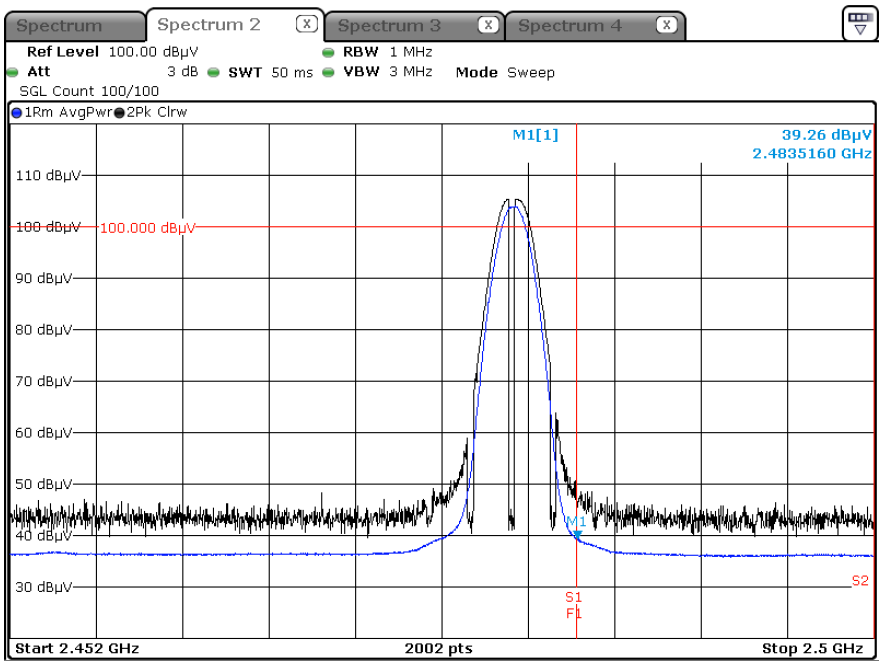
In order to simplify the report, Plot of worst case are only reported.

The report shall not be (partly) reproduced except in full without approval of the laboratory.

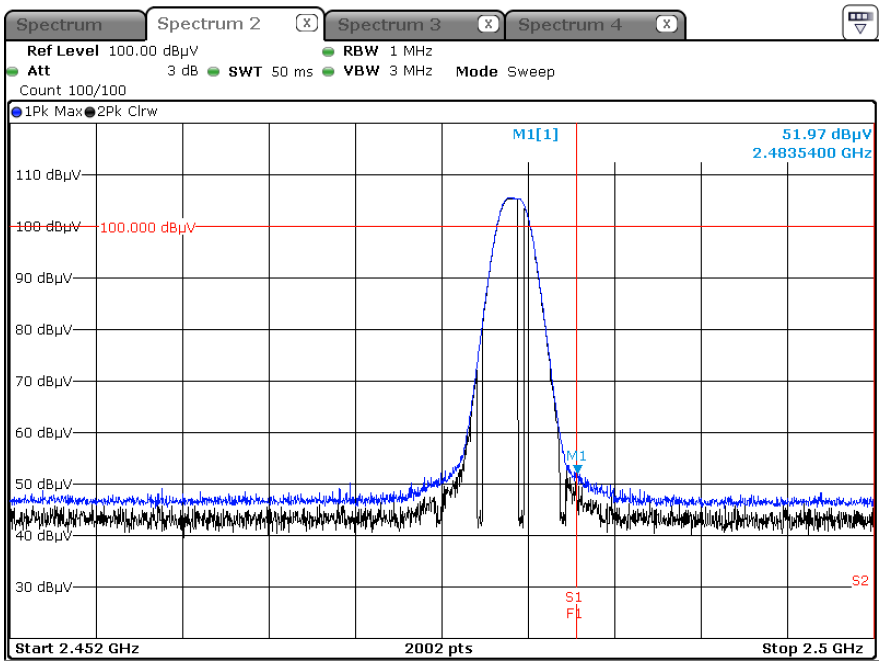
[Ant.2]

▣ Mode : 1 M Bit/s (255 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.

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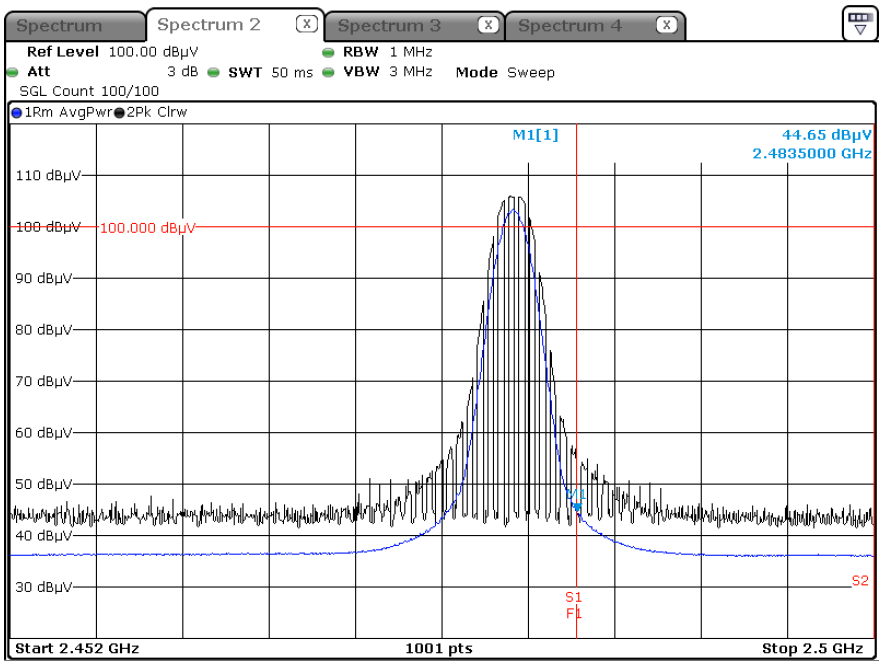
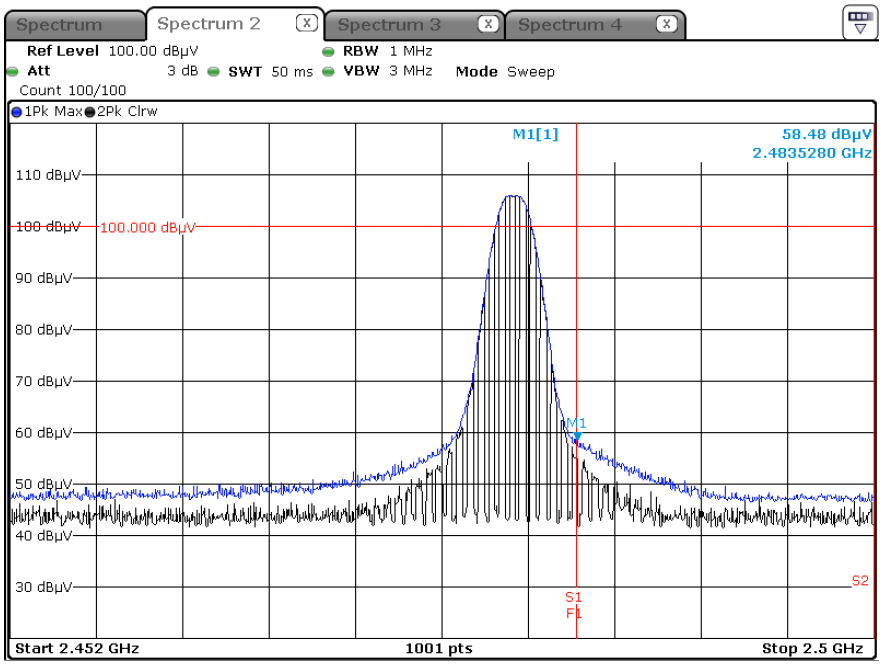
[Dual Ant.1+ Ant.2]

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

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



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



Note:

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

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9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions

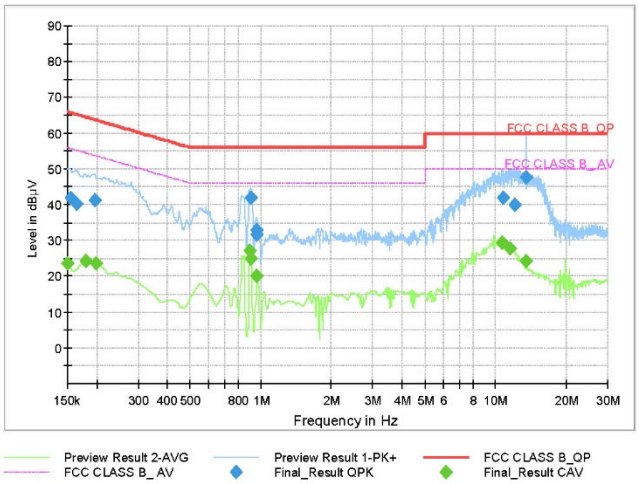
Test 1 / 1

Test Report

Common Information

EUT : SM-S731U
Operating Conditions : BTLE Mode
Comment :

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1545	41.90	65.75	23.85	9.000	L1	9.6
0.1635	40.23	65.28	25.05	9.000	L1	9.6
0.1973	41.25	63.73	22.47	9.000	L1	9.6
0.9095	41.95	56.00	14.05	9.000	N	9.7
0.9590	31.68	56.00	24.32	9.000	N	9.7
0.9635	33.05	56.00	22.95	9.000	N	9.7
10.7893	41.80	60.00	18.20	9.000	L1	10.1
12.0335	40.09	60.00	19.91	9.000	L1	10.1
13.5590	47.73	60.00	12.27	9.000	L1	10.2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.1500	23.68	56.00	32.32	9.000	L1	9.6
0.1793	24.28	54.52	30.24	9.000	N	9.6
0.1995	23.78	53.63	29.85	9.000	N	9.6
0.8983	27.10	46.00	18.90	9.000	L1	9.7
0.9095	25.04	46.00	20.96	9.000	N	9.7
0.9635	20.29	46.00	25.71	9.000	L1	9.7
10.6880	29.40	50.00	20.60	9.000	L1	10.1
11.5318	27.96	50.00	22.04	9.000	L1	10.1
13.5590	24.27	50.00	25.73	9.000	L1	10.2

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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	07/17/2025	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	08/27/2025	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	02/11/2026	Annual
Signal Analyzer	N9030A	Agilent	MY49431210	12/12/2025	Annual
Power Measurement Set	OSP 120	Rohde & Schwarz	101231	10/17/2025	Annual
Power Meter	N1911A	Agilent	MY45100523	02/21/2026	Annual
Power Sensor	N1921A	Agilent	MY57820067	02/04/2026	Annual
Directional Coupler	87300B	Agilent	3116A03621	10/21/2025	Annual
Power Splitter	11667B	Hewlett Packard	05001	04/10/2026	Annual
DC Power Supply	E3632A	H.P	KR75303243	04/16/2026	Annual
Attenuator(10 dB)	8493C	Hewlett Packard	07560	05/27/2026	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
Automation Software	FCC WLAN Conducted	HCT CO., LTD	-	-	-
Automation Software	FCC Bluetooth Conducted	HCT CO., LTD	-	-	-

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.

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Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller (Antenna mast & Turn Table)	CO3000	Innco system	CO3000/1031/ 41190717/P	N/A	N/A
Antenna Mast	MA4640	Innco system	S2AM	07/30/2025	Annual
Turn Table	DS2000-S	Innco system	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/07/2026	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/17/2027	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02299	01/29/2026	Biennial
Horn Antenna (15GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Spectrum Analyzer	FSV40	Rohde & Schwarz	100901	02/21/2026	Annual
Signal Analyzer	N9030A	Agilent	MY52350879	03/25/2026	Annual
Attenuator(3 dB)	18B-03	Api tech.	1	04/21/2026	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	05/27/2026	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	05/27/2026	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	12/26/2025	Annual
Band Reject Filter	WRCJV5100/5850-40/50-8EEK	Wainwright Instruments	1	01/09/2026	Annual
RF Switching System	FMSR-04B (3G HPF+LNA)	T&M SYSTEM	S2L1	12/23/2025	Annual
RF Switching System	FMSR-04B (10dB ATT+LNA)	T&M SYSTEM	S2L2	12/23/2025	Annual
RF Switching System	FMSR-04B (3dB ATT+LNA)	T&M SYSTEM	S2L3	12/23/2025	Annual
RF Switching System	FMSR-04B (LNA)	T&M SYSTEM	S2L4	12/23/2025	Annual
RF Switching System	FMSR-04B (7G HPF+LNA)	T&M SYSTEM	S2L5	12/23/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/07/2025	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/19/2026	Annual
Automation Software	FCC WLAN Radiated	HCT CO., LTD	-	-	-

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).

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11. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2507-FC008-P

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