# TEST REPORT

| Eurofins KCTL Co.,Ltd.<br>65, Sinwon-ro, Yeongtong-gu,<br>Suwon-si, Gyeonggi-do, 16677, Korea<br>TEL: 82-70-5008-1021 FAX: 82-505-299-8311<br>www.kctl.co.kr | Report No.:<br>KR25-SRF0033-A<br>Page(1) of (170) | eurofins \| KCTL |
|---|---|---|

**1. Client**

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2025-02-10

**2. Use of Report** : Certification

**3. Name of Product / Model** : Tablet PC / SM-X350

**4. Manufacturer / Country of Origin** : Samsung Electronics Co., Ltd. / Vietnam

**5. FCC ID** : A3LSMX350

**6. Date of Test** : 2025-02-19 to 2025-03-07

**7. Location of Test** : ■ Permanent Testing Lab ☐ On Site Testing
(Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

**8. Test method used** : FCC Part 15 Subpart E, 15.407

**9. Test Result** : Refer to the test result in the test report

| | Tested by | Technical Manager |
|---|---|---|
| Affirmation | Name : Kwonse Kim (Signature) | Name : Harim Lee (Signature) |

2025-03-24

**Eurofins KCTL Co.,Ltd.**

## REPORT REVISION HISTORY

| Date | Revision | Page No |
|---|---|---|
| 2025-03-18 | Originally issued | - |
| 2025-03-24 | Revised the note | 13 |
| | | |
| | | |
| | | |



Note. The report No. KR25-SRF0033 is superseded by the report No. KR25-SRF0033-A.

## General remarks for test reports

**Statement concerning the uncertainty of the measurement systems used for the tests**

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

**Procedure number, issue date and title:**

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

# CONTENTS

# 1. General information

| | | |
|---|---|---|
| Client | : | Samsung Electronics Co., Ltd. |
| Address | : | 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea |
| Manufacturer | : | Samsung Electronics Co., Ltd. |
| Address | : | 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea |
| Factory | : | Samsung Electronics Vietnam Thai Nguyen Co., Ltd |
| Address | : | Yen Binh Industrial Park, Dong Tien Ward, Pho Yen Town, Thai Nguyen Province, Vietnam |
| Laboratory | : | Eurofins KCTL Co.,Ltd. |
| Address | : | 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea |
| Accreditations | : | FCC Site Designation No: KR0040, FCC Site Registration No: 687132<br>VCCI Registration No. : R-20080, G-20078, C-20059, T-20056<br>CAB Identifier: KR0040<br>ISED Number: 8035A<br>KOLAS No.: KT231 |

# 2. Device information

| | | | | | | |
|---|---|---|---|---|---|---|
| Equipment under test | : | Tablet PC | | | | |
| Model | : | SM-X350 | | | | |
| Modulation technique | | WIFI (802.11a/n/ac) | : | OFDM | | |
| Number of channels | | UNII 1 | : | 4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒), 1 ch (160 ㎒) | | |
| | | UNII 2A | : | 4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) | | |
| | | UNII 2C | : | 12 ch (20 ㎒), 6 ch (40 ㎒), 3 ch (80 ㎒), 1 ch (160 ㎒) | | |
| | | UNII 3 | : | 5 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒), 1 ch (160 ㎒) | | |
| | | UNII 4 | : | 3 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒), 1 ch (160 ㎒) | | |
| Power source | : | DC 3.85 V | | | | |
| Antenna specification | | Antenna 1 | : | LDS Antenna | | |
| | | Antenna 2 | : | LDS Antenna | | |
| Antenna gain | : | Antenna 1 | | | Antenna 2 | |
| | | UNII 1 | : | -4.50 dBi | UNII 1 | : -4.70 dBi |
| | | UNII 2A | : | -4.20 dBi | UNII 2A | : -4.60 dBi |
| | | UNII 2C | : | -4.20 dBi | UNII 2C | : -4.80 dBi |
| | | UNII 3 | : | -4.40 dBi | UNII 3 | : -4.90 dBi |
| | | UNII 4 | : | -4.40 dBi | UNII 4 | : -4.50 dBi |
| Frequency range | | UNII 1 | : | 5 180 ㎒ ~ 5 240 ㎒ | (802.11a/n/ac_HT20/VHT20) | |
| | | UNII 1 | : | 5 190 ㎒ ~ 5 230 ㎒ | (802.11n/ac_HT40/VHT40) | |
| | | UNII 1 | : | 5 210 ㎒ | (802.11ac_VHT80) | |
| | | UNII 1&2A | : | 5 250 ㎒ | (802.11ac_VHT160) | |
| | | UNII 2A | : | 5 260 ㎒ ~ 5 320 ㎒ | (802.11a/n/ac_HT20/VHT20) | |
| | | UNII 2A | : | 5 270 ㎒ ~ 5 310 ㎒ | (802.11n/ac_HT40/VHT40) | |
| | | UNII 2A | : | 5 290 ㎒ | (802.11ac_VHT80) | |
| | | UNII 2C | : | 5 500 ㎒ ~ 5 720 ㎒ | (802.11a/n/ac_HT20/VHT20) | |
| | | UNII 2C | : | 5 510 ㎒ ~ 5 710 ㎒ | (802.11n/ac_HT40/VHT40) | |
| | | UNII 2C | : | 5 530 ㎒ ~ 5 690 ㎒ | (802.11ac_VHT80) | |
| | | UNII 2C | : | 5 570 ㎒ | (802.11ac_VHT160) | |
| | | UNII 3 | : | 5 745 ㎒ ~ 5 825 ㎒ | (802.11a/n/ac_HT20/VHT20) | |
| | | UNII 3 | : | 5 755 ㎒ ~ 5 795 ㎒ | (802.11n/ac_HT40/VHT40) | |
| | | UNII 3 | : | 5 775 ㎒ | (802.11ac_VHT80) | |
| | | UNII 4 | : | 5 845 ㎒ ~ 5 885 ㎒ | (802.11a/n/ac_HT20/VHT20) | |
| | | UNII 4 | : | 5 835 ㎒ ~ 5 875 ㎒ | (802.11n/ac_HT40/VHT40) | |
| | | UNII 4 | : | 5 855 ㎒ | (802.11ac_VHT80) | |
| | | UNII 3&4 | : | 5 815 ㎒ | (802.11ac_VHT160) | |
| Software version | : | X350.001 | | | | |
| Hardware version | : | REV1.0 | | | | |
| Test device serial No. | : | Conducted | : | R32XC01B5FA | | |
| | | Radiated | : | R32XC01BJCK, R32XC01BDGK | | |
| Operation temperature | : | 0 ℃ ~ 35 ℃ | | | | |

## 2.1. Frequency/channel operations

This device contains the following capabilities:
WLAN (11a/n/ac)

| UNII 1 | | UNII 2A | | UNII 2C | | UNII 3 | | UNII 4 | |
|---|---|---|---|---|---|---|---|---|---|
| Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) |
| 36 | 5 180 | 52 | 5 260 | 100 | 5 500 | 149 | 5 745 | 169 | 5 845 |
| 40 | 5 200 | 56 | 5 280 | 120 | 5 600 | 157 | 5 785 | 173 | 5 865 |
| 48 | 5 240 | 64 | 5 320 | 140 | 5 700 | 165 | 5 825 | 177 | 5 885 |
| | | | | 144 | 5 720 | | | | |

Table 2.1-1. 802.11a/n/ac HT20/VHT20 mode

| UNII 1 | | UNII 2A | | UNII 2C | | UNII 3 | | UNII 4 | |
|---|---|---|---|---|---|---|---|---|---|
| Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) |
| 38 | 5 190 | 54 | 5 270 | 102 | 5 510 | 151 | 5 755 | 167 | 5 835 |
| 46 | 5 230 | 62 | 5 310 | 118 | 5 590 | 159 | 5 795 | 175 | 5 875 |
| | | | | 134 | 5 670 | | | | |
| | | | | 142 | 5 710 | | | | |

Table 2.1-2. 802.11n/ac HT40/VHT40 mode

| UNII 1 | | UNII 2A | | UNII 2C | | UNII 3 | | UNII 4 | |
|---|---|---|---|---|---|---|---|---|---|
| Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) |
| 42 | 5 210 | 58 | 5 290 | 106 | 5 530 | 155 | 5 775 | 171 | 5 855 |
| | | | | 122 | 5 610 | | | | |
| | | | | 138 | 5 690 | | | | |

Table 2.1-3. 802.11ac VHT80 mode

| UNII 1&2A | | UNII 2C | | UNII 3&4 | |
|---|---|---|---|---|---|
| Ch. | Frequency (㎒) | Ch. | Frequency (㎒) | Ch. | Frequency (㎒) |
| 50 | 5 250 | 114 | 5 570 | 163 | 5 815 |

Table 2.1-4. 802.11ac VHT160 mode

**Notes:**

1. The device supports DFS bands between UNII 2A and UNII 2C and operates as a slave device controlled by master

## 2.2. Simultaneous Tx Condition

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

Simultaneous Tx condition – not RSDB

| Mode | # of TX | WLAN 2.4 ㎓ | | WLAN 5, 6 ㎓ | | Bluetooth | | Report |
|---|---|---|---|---|---|---|---|---|
| | | ANT 1 | ANT 2 | ANT 1 | ANT 2 | ANT 1 | ANT 2 | |
| WLAN + Bluetooth | 2 | - | O | - | - | O | - | - |
| WLAN + Bluetooth | 3 | - | - | O | O | O | - | √ |
| WLAN + Bluetooth | 3 | - | - | O | O | - | O | √ |

**Notes.**

1. Simultaneous condition was performed as a worst case which is configured as a combination of lowest margin for each mode during radiated spurious emission.
2. For simultaneous spurious emission test result, please refer to 15.407_6E ax test report.

## 2.3. Duty Cycle Factor

**MIMO**

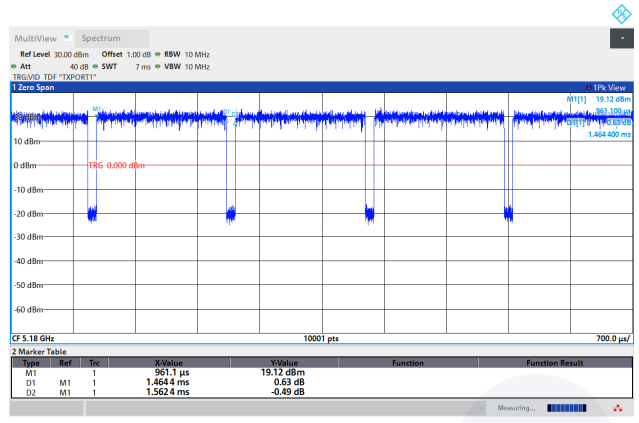
| Test mode | Period (ms) | $T_{on}$ time (ms) | Duty cycle | | Duty cycle factor (dB) |
|---|---|---|---|---|---|
| | | | (Linear) | (%) | |
| 802.11a | 1.562 | 1.464 | 0.937 3 | 93.73 | 0.28 |
| 802.11n_HT20 | 0.746 | 0.648 | 0.868 6 | 86.86 | 0.61 |
| 802.11n_HT40 | 0.429 | 0.332 | 0.773 9 | 77.39 | 1.11 |
| 802.11ac_VHT20 | 0.750 | 0.652 | 0.869 3 | 86.93 | 0.61 |
| 802.11ac_VHT40 | 0.433 | 0.336 | 0.776 0 | 77.60 | 1.10 |
| 802.11ac_VHT80 | 0.276 | 0.180 | 0.652 2 | 65.22 | 1.86 |
| 802.11ac_VHT160 | 0.208 | 0.112 | 0.538 5 | 53.85 | 2.69 |

**Notes.**

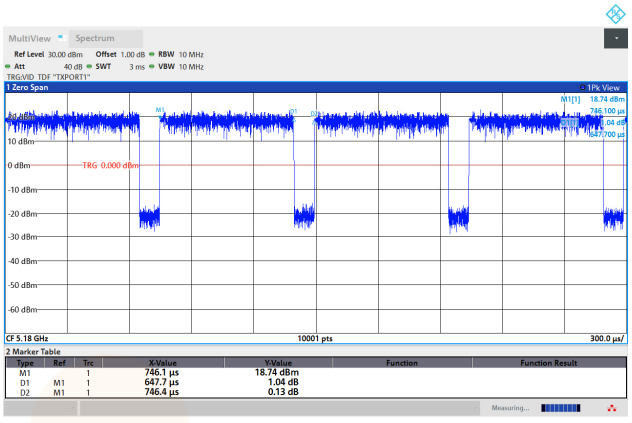
1. Duty cycle (Linear) = $T_{on}$ time / Period
2. DCF(Duty cycle factor) = 10log(1/duty cycle)
3. DCF is not compensated to average result if duty cycle is more than 98%

## MIMO

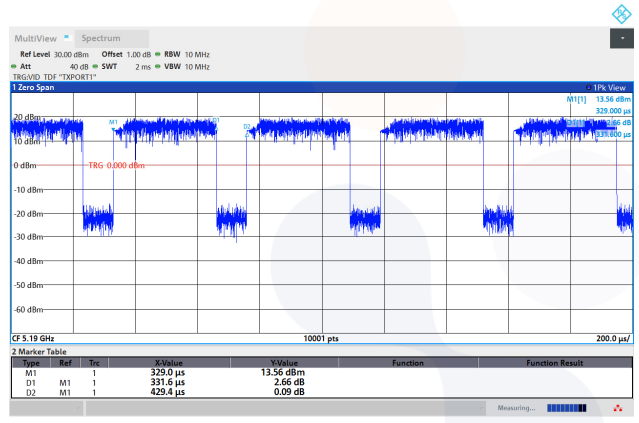
### 802.11a



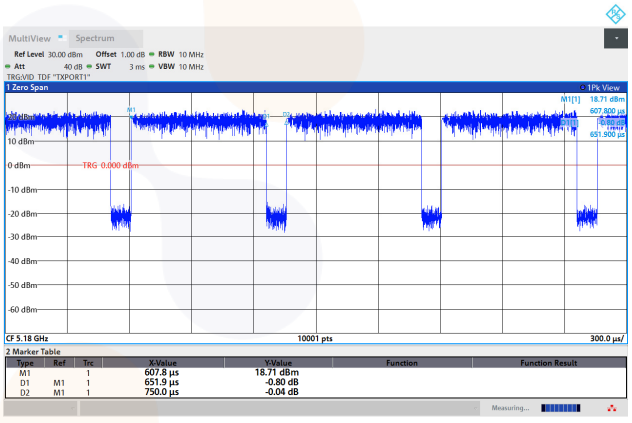

### 802.11n_HT20

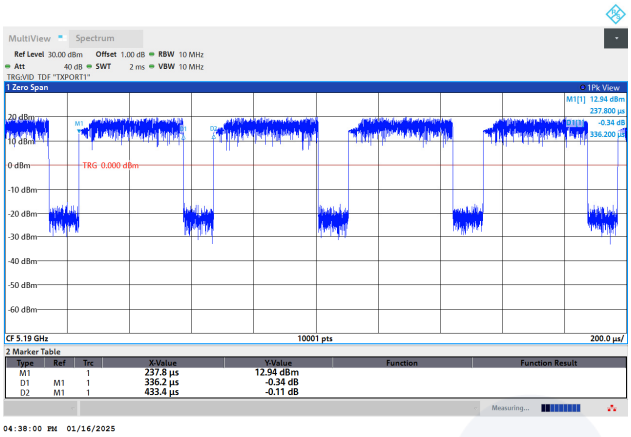
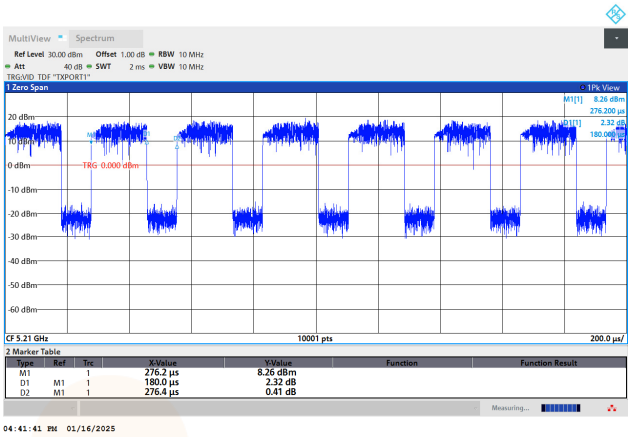
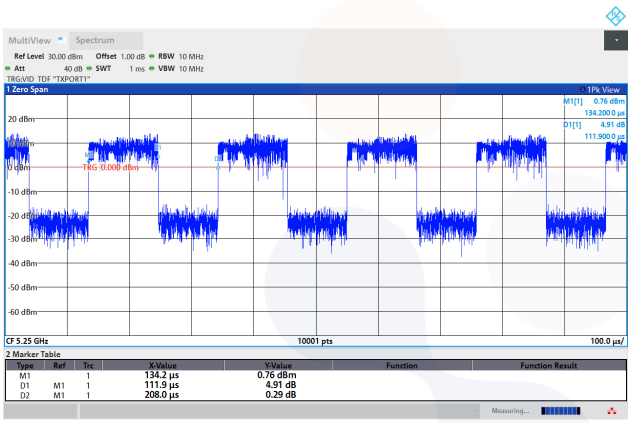



### 802.11n_HT40




### 802.11ac_VHT20



| 802.11ac_VHT40 | 802.11ac_VHT80 |
|---|---|
|  |  |
| **802.11ac_VHT160** | **-** |
|  | Blank |

# 3. Antenna requirement

**Requirement of FCC part section 15.203**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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.

- The transmitter has permanently attached LDS Antenna (Internal antenna) on board.
- The E.U.T Complies with the requirement of §15.203, §15.407.

## 3.1 Antenna information

| Mode | SISO | | CDD | SDM |
|---|---|---|---|---|
| | ANT1 | ANT2 | ANT1 + 2 | ANT1 + 2 |
| 802.11a | X | X | √ | X |
| 802.11n HT20 | X | X | √ | √ |
| 802.11n HT40 | X | X | √ | √ |
| 802.11ac VHT20 | X | X | √ | √ |
| 802.11ac VHT40 | X | X | √ | √ |
| 802.11ac VHT80 | X | X | √ | √ |
| 802.11ac VHT160 | X | X | √ | √ |

√ = Support, ✕ = Not support

## 3.2 Directional Gain Calculations

According to clause F), 2), d), (i) and (ii) of KDB 662911 D01 Multiple Transmitter Output, Directional gain may be calculated by using the formulas as below.

**Directional Antenna Gain**

| Band | ANT1 Gain (dBi) | ANT2 Gain (dBi) | Power Directional Gain (dBi) |
|---|---|---|---|
| UNII 1 | -4.50 | -4.70 | -1.59 |
| UNII 2A | -4.20 | -4.60 | -1.39 |
| UNII 2C | -4.20 | -4.80 | -1.48 |
| UNII 3 | -4.40 | -4.90 | -1.64 |
| UNII 4 | -4.40 | -4.50 | -1.44 |

**Correlated_CDD**

| Band | ANT1 Gain (dBi) | ANT2 Gain (dBi) | Power Directional Gain (dBi) |
|---|---|---|---|
| UNII 1 | -4.50 | -4.70 | -4.60 |
| UNII 2A | -4.20 | -4.60 | -4.40 |
| UNII 2C | -4.20 | -4.80 | -4.49 |
| UNII 3 | -4.40 | -4.90 | -4.64 |
| UNII 4 | -4.40 | -4.50 | -4.45 |

**Uncorrelated_SDM**

**Note.**

**1. Correlated_CDD**

Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1$, $G_2$, …, $G_N$ dBi
Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}$] dBi

**Sample calculation**

In case of UNII 1, directional gain = 10 log[$(10^{-4.50/20} + 10^{-4.70/20})^2 / 2$] = -1.59 dBi

**2. Uncorrelated_SDM**

Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1$, $G_2$, …, $G_N$ dBi
Directional gain = 10 log[$(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10}) / N_{ANT}$] dBi

**Sample calculation**

In case of UNII 1, directional gain = 10 log[$(10^{-4.50/10} + 10^{-4.70/10}) / 2$] = -4.60 dBi

# 4. Introduction

This report referenced from the FCC ID: A3LSMX356B
Based on their similarity, the FCC Part 15E (equipment class: NII) reuse the original model's result and do spot-check, following the FCC KDB 484596 D01 v02r03.
And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

## 4.1 Difference

The FCC ID: A3LSMX350 share the same enclosure and circuit board as FCC ID: A3LSMX356B. The WIFI/BT/BLE antenna and surrounding circuitry and layout are identical between these two units.
As for all bands, they have been verified and the parent model test results under
FCC ID : A3LSMX356B shall remain representative of FCC ID: A3LSMX350.

**Note.** The difference between the parent and variant is that the RF circuit for GSM/WCDMA/LTE/NR bands in the parent model SM-X356B is removed from the variant model SM-X350.

## 4.2 Deviation Criteria

The spot-check measurements, while being always compliant with the applicable rule part(s) for the test under consideration, may show a deviation $d_{dB}$ from the reference data no larger than 3 dB.

- $d_{dB} = | V_{dB} – R_{dB} | \leq 3$ dB

$V_{dB}$ : The variant spot check level in dB
$R_{dB}$ : The reference model level in dB

Spot check may be considered acceptable when the deviation $d_{dB}$ from the reference data satisfies the following condition:

- $d_{dB} = | V_{dB} – R_{dB} | \leq (3 + M_{dB} /20)$ dB , for $0 \leq M_{dB} \leq 60$ dB
- $d_{dB} = | V_{dB} – R_{dB} | = 6$ dB , for $M_{dB} > 60$ dB

$C_{dB}$ : the compliance threshold in dB

## 4.3 Spot check verification data

| Band | Rule Part | Test mode | Test mode | Test Frequency (㎒) | Reference model | Variant model | Deviation | Deviation limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | SM-X356B | SM-X350 | (dB) | (dB) | |
| UNII-1 | 15.407(a) | Output power | 11a MIMO | 5 200 | 20.27 dBm | 20.30 dBm | 0.03 | ±3 | - |
| | | Power density | 11a MIMO | 5 240 | 9.94 dBm/MHz | 10.30 dBm/MHz | 0.36 | ±3 | - |
| | 15.407(b)., 15.205(a), 15.209(a) | Band-edge | 11ac160 MIMO | 5 250 | 44.74 dBuV/m | 43.70 dBuV/m | -1.04 | ±3 | - |
| | | Spurious | 11a MIMO | 5 180 | 59.43 dBuV/m | 58.63 dBuV/m | -0.80 | ±3 | - |
| UNII-2A | 15.407(a) | Output power | 11a MIMO | 5 320 | 20.39 dBm | 20.28 dBm | -0.11 | ±3 | - |
| | | Power density | 11a MIMO | 5 260 | 9.97 dBm/MHz | 10.45 dBm/MHz | 0.48 | ±3 | - |
| | 15.407(b)., 15.205(a), 15.209(a) | Band-edge | 11ac80 MIMO | 5 290 | 43.89 dBuV/m | 43.54 dBuV/m | -0.35 | ±3 | - |
| | | Spurious | 11a MIMO | 5 320 | 44.37 dBuV/m | 43.82 dBuV/m | -0.55 | ±3 | - |
| UNII-2C | 15.407(a) | Output power | 11a MIMO | 5 600 | 20.12 dBm | 20.01 dBm | -0.11 | ±3 | - |
| | | Power density | 11a MIMO | 5 600 | 9.91 dBm/MHz | 10.23 dBm/MHz | 0.32 | ±3 | - |
| | 15.407(b)., 15.205(a), 15.209(a) | Band-edge | 11ac160 MIMO | 5 570 | 45.13 dBuV/m | 46.43 dBuV/m | 1.30 | ±3 | - |
| | | Spurious | 11ac80 MIMO | 5 690 | 42.40 dBuV/m | 41.74 dBuV/m | -0.66 | ±3 | - |
| UNII-3 | 15.407(a) | Output power | 11a MIMO | 5 825 | 20.16 dBm | 20.03 dBm | -0.13 | ±3 | - |
| | | Power density | 11a MIMO | 5 785 | 8.23 dBm/MHz | 8.22 dBm/MHz | -0.01 | ±3 | - |
| | 15.407(b)., 15.205(a), 15.209(a) | Band-edge | 11a MIMO | 5 745 | 59.81 dBuV/m | 59.37 dBuV/m | -0.44 | ±3 | - |
| | | Spurious | 11ac80 MIMO | 5 775 | 42.26 dBuV/m | 41.60 dBuV/m | -0.66 | ±3 | - |
| UNII-4 | 15.407(a) | Output power | 11a MIMO | 5 865 | 19.26 dBm | 19.10 dBm | -0.16 | ±3 | - |
| | | Power density | 11a MIMO | 5 865 | 9.58 dBm/MHz | 9.35 dBm/MHz | -0.23 | ±3 | - |
| | 15.407(b)., 15.205(a), 15.209(a) | Band-edge | 11n20 MIMO | 5 885 | 79.91 dBuV/m | 77.80 dBuV/m | -2.11 | ±3 | - |
| | | Spurious | 11ac160 MIMO | 5 815 | 43.99 dBuV/m | 42.68 dBuV/m | -1.31 | ±3 | - |

**Notes:**

1. FCC ID: A3LSMX350 have been verified the performance as for WIFI identical with the FCC ID: A3LSMX356B.
2. The test procedure(s) in this report were performed in accordance as following.
   - KDB 484596 D01 v02r03

## 4.4 Reference Detail

Reference application that contains the reused reference data in the individual test reports.

| Equipment Class | Reference FCC ID | Application Type | Reference Test report Number | Exhibit Type | Variant Test Report Number | Data Re-used |
|---|---|---|---|---|---|---|
| DTS | A3LSMX356B | Original | KR25-SRF0022 (802.11b/g/n) | Test report | KR25-SRF0031 | All |
| | | | KR25-SRF0023 (802.11ax) | Test report | KR25-SRF0032 | All |
| | | | KR25-SRF0021-A (Bluetooth LE) | Test report | KR25-SRF0030 | All |
| DSS | A3LSMX356B | Original | KR25-SRF0020 (Bluetooth) | Test report | KR25-SRF0029 | All |
| NII | A3LSMX356B | Original | KR25-SRF0024 (802.11a/n/ac) | Test report | KR25-SRF0033 | Partial[1)] |
| | | | KR25-SRF0025 (802.11ax) | Test report | KR25-SRF0034 | All |
| 6CD, 6VL | A3LSMX356B | Original | KR25-SRF0028-A (802.11a/ax) | Test report | KR25-SRF0035 | Partial[2)] |

**Notes:**

1. The DFS (Dynamic Frequency Selection) test item was additionally investigated.
2. Contention-based protocol (CBP), dual client testing, standard power access points, and Transmitter power control (TPC) test items were also investigated.

## 5. Summary of tests

| FCC Part section(s) | Parameter | Test Condition | Test results |
|---|---|---|---|
| 15.407(a) | Maximum conducted output power | Conducted | Pass |
| 15.407(a) | Maximum power spectral density | | Pass |
| 15.407(a) | 26 dB Channel Bandwidth & 99% Bandwidth | | Pass |
| 15.407(e) | 6 dB Channel Bandwidth | | Pass |
| 15.207(a) | AC Conducted Emissions | | Pass |
| 15.407(h) | DFS<br>-Channel closing transmission time<br>-Channel move time<br>-Non occupied period | Conducted | Pass |
| 15.407(b)<br>15.205(a)<br>15.209(a) | Spurious emission | Radiated | Pass |
| | Band-edge, restricted band | | Pass |

**Notes:**

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2. According to exploratory test no any obvious emission were detected from 9 ㎑ to 30 ㎒. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
3. EUT was investigated in three orthogonal orientations X, Y and Z. it was determined that **Y** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **Y** orientation.
4. All configurations have been performed (Stand-alone, Stand-alone with TA, With accessories).
   - Accessory type: S-pen, TA, DLC, Protective cover
   - Worst case: Stand-alone
5. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.10-2013
   - KDB 662911 D01 v02r01
   - KDB 789033 D02 v02r01
   - KDB 291074 D02 v01
   - KDB 905462 D02 UNII DFS compliance procedure new rules.
   - KDB 905462 D03 UNII client without radar detection new rules.
6. Based on the baseline scan, the worst-case data rates were:
   802.11a mode: 6Mbps
   802.11n HT20 mode: MCS8
   802.11n HT40 mode: MCS8
   802.11ac VHT20 mode: MCS0
   802.11ac VHT40 mode: MCS0
   802.11ac VHT80 mode: MCS0
   802.11ac VHT160 mode: MCS0

## 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 indicated a 95 % level of confidence. The measurement data shown herein meets of 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 (±) | |
|---|---|---|
| Conducted RF Power | 0.9 dB | |
| Conducted spurious emissions | 2.0 dB | |
| Radiated spurious emissions | Below 30 ㎒ | 2.3 dB |
| | 30 ㎒ to 1 000 ㎒ | 2.6 dB |
| | 1 000 ㎒ to 18 000 ㎒ | 4.8 dB |
| | Above 18 000 ㎒ | 4.8 dB |
| Conducted emissions | 150 ㎑ to 30 ㎒ | 2.9 dB |

## 7. Measurement results explanation example

The offset level is set in the spectrum analyzer to compensate the RF cable loss factor between EUT conducted output port and spectrum analyzer.
With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

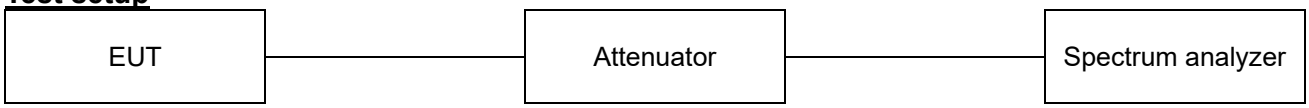
| Frequency (㎒) | Factor(㏈) | Frequency (㎒) | Factor(㏈) |
|---|---|---|---|
| 30 | 10.10 | 16 000 | 14.55 |
| 50 | 10.12 | 17 000 | 13.83 |
| 100 | 10.13 | 18 000 | 13.85 |
| 200 | 10.18 | 19 000 | 14.23 |
| 300 | 10.36 | 20 000 | 14.06 |
| 400 | 10.35 | 21 000 | 14.05 |
| 500 | 10.40 | 22 000 | 14.24 |
| 600 | 10.35 | 23 000 | 14.58 |
| 700 | 10.40 | 24 000 | 13.99 |
| 800 | 10.33 | 25 000 | 14.81 |
| 900 | 10.52 | 26 000 | 14.84 |
| 1 000 | 10.58 | 26 500 | 14.81 |
| 2 000 | 10.98 | 27 000 | 14.41 |
| 3 000 | 11.30 | 28 000 | 15.21 |
| 4 000 | 11.55 | 29 000 | 15.37 |
| 5 000 | 11.80 | 30 000 | 15.20 |
| 6 000 | 12.01 | 31 000 | 15.37 |
| 7 000 | 12.29 | 32 000 | 15.17 |
| 8 000 | 12.33 | 33 000 | 15.58 |
| 9 000 | 12.69 | 34 000 | 15.58 |
| 10 000 | 12.85 | 35 000 | 15.60 |
| 11 000 | 12.96 | 36 000 | 15.54 |
| 12 000 | 13.37 | 37 000 | 15.57 |
| 13 000 | 13.53 | 38 000 | 15.80 |
| 14 000 | 13.66 | 39 000 | 16.40 |
| 15 000 | 13.79 | 40 000 | 16.40 |

**Notes:**
Offset(㏈) = RF cable loss(㏈) + Attenuator(㏈)

# 8. Test results

## 8.1. Maximum conducted output power

**Test setup**




**Limit**

**According to §15.407(a),**

| Band | EUT category | | Conducted output power limit |
|---|---|---|---|
| UNII-1 | | Outdoor access point | 1 W (30 dBm) |
| | | Indoor access point | |
| | | Fixed point-to-point access point | |
| | √ | Client device | 250 mW (23.98 dBm) |
| UNII-2A | √ | | 250 mW or 11 dBm + 10logB[1)] |
| UNII-2C | √ | | 250 mW or 11 dBm + 10logB[1)] |
| UNII-3 | √ | | 1 W (30 dBm) |
| UNII-4 | √ | | EIRP 30 dBm |

**Note:**

1) Limit B is the 26 dB emission bandwidth.

**Test procedure**

ANSI C63.10-2013-Section 12.3.2.4 or 12.3.3.1, 14.2
KDB 789033 D02 v02r01 - Section E.2.d)
KDB 662911 D01 v02r01 – Section E).1) and Section F)

**Test settings**

**Used test method is Section E.2.d)**

◆ **KDB 789033 D02 v02r01**

**Section E.2.d)**

**Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction):**

(i) Measure the duty cycle, x, of the transmitter output signal as described in II.B..

(ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(iii) Set RBW = 1 ㎒

(iv) Set RBW ≥ 3 ㎒

(v) Number of points in sweep ≥ 2 x span/RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(vi) Sweep time = auto.

(vii) Detector = power averaging (rms), if available. Otherwise use sample detector mode.

(viii) Do not use sweep triggering. Allow the sweep to “free run.”

(ix) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.

(x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 ㎒ intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(xi) 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 (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log(1/0,25) = 6 ㏈ if the duty cycle is 25%.

## Test results

### MIMO

### Conducted Output Power

| Test mode | Band | Frequency (㎒) | Measured output power | | | | Limit (dBm) |
|---|---|---|---|---|---|---|---|
| | | | Reading (dBm) | | DCF (dB) | Result (dBm) | |
| | | | ANT1 | ANT2 | | | |
| 802.11a | UNII 1 | 5 180 | 17.13 | 16.79 | 0.28 | 20.25 | 23.98 |
| | | 5 200 | 16.98 | 16.98 | | 20.27 | |
| | | 5 240 | 16.72 | 17.19 | | 20.25 | |
| | UNII 2A | 5 260 | 17.00 | 17.18 | | 20.38 | 23.78 |
| | | 5 280 | 16.77 | 17.13 | | 20.24 | |
| | | 5 320 | 17.09 | 17.10 | | 20.39 | |
| | UNII 2C | 5 500 | 17.34 | 15.96 | | 19.99 | 23.79 |
| | | 5 600 | 16.96 | 16.70 | | 20.12 | |
| | | 5 700 | 17.28 | 16.32 | | 20.12 | |
| | UNII 3 | 5 745 | 17.11 | 16.57 | | 20.14 | 30.00 |
| | | 5 785 | 17.28 | 16.23 | | 20.08 | |
| | | 5 825 | 17.18 | 16.54 | | 20.16 | |
| | UNII 4 | 5 845 | 17.16 | 16.73 | | 20.24 | 30.00 |
| | | 5 865 | 17.63 | 17.18 | | 20.70 | |
| | | 5 885 | 17.41 | 17.12 | | 20.56 | |
| 802.11n HT20 | UNII 1 | 5 180 | 15.99 | 15.41 | 0.61 | 19.33 | 23.98 |
| | | 5 200 | 15.86 | 15.82 | | 19.46 | |
| | | 5 240 | 15.62 | 16.27 | | 19.58 | |
| | UNII 2A | 5 260 | 15.92 | 16.14 | | 19.65 | 23.98 |
| | | 5 280 | 15.77 | 16.01 | | 19.51 | |
| | | 5 320 | 15.83 | 15.95 | | 19.51 | |
| | UNII 2C | 5 500 | 16.31 | 14.81 | | 19.24 | 23.98 |
| | | 5 600 | 16.00 | 15.65 | | 19.45 | |
| | | 5 700 | 16.05 | 15.26 | | 19.29 | |
| | UNII 3 | 5 745 | 16.09 | 15.49 | | 19.42 | 30.00 |
| | | 5 785 | 16.06 | 15.10 | | 19.23 | |
| | | 5 825 | 15.79 | 15.41 | | 19.22 | |
| | UNII 4 | 5 845 | 15.95 | 15.56 | | 19.38 | 30.00 |
| | | 5 865 | 16.41 | 16.12 | | 19.89 | |
| | | 5 885 | 16.23 | 16.03 | | 19.75 | |

| Test mode | Band | Frequency (㎒) | Measured output power | | | | Limit (dBm) |
|---|---|---|---|---|---|---|---|
| | | | Reading (dBm) | | DCF (dB) | Result (dBm) | |
| | | | ANT1 | ANT2 | | | |
| 802.11n HT40 | UNII 1 | 5 190 | 15.76 | 15.17 | 1.11 | 19.60 | 23.98 |
| | | 5 230 | 15.52 | 15.71 | | 19.74 | |
| | UNII 2A | 5 270 | 15.63 | 15.59 | | 19.73 | 23.98 |
| | | 5 310 | 15.65 | 15.53 | | 19.71 | |
| | UNII 2C | 5 510 | 15.54 | 14.01 | | 18.96 | 23.98 |
| | | 5 590 | 15.36 | 14.70 | | 19.16 | |
| | | 5 670 | 15.27 | 14.55 | | 19.05 | |
| | UNII 3 | 5 755 | 15.77 | 14.62 | | 19.35 | 30.00 |
| | | 5 795 | 15.79 | 14.34 | | 19.25 | |
| | UNII 4 | 5 835 | 15.33 | 14.33 | | 18.98 | 30.00 |
| | | 5 875 | 15.81 | 15.40 | | 19.73 | |
| 802.11ac VHT20 | UNII 1 | 5 180 | 15.91 | 15.44 | 0.61 | 19.30 | 23.98 |
| | | 5 200 | 15.83 | 15.70 | | 19.39 | |
| | | 5 240 | 15.65 | 16.20 | | 19.55 | |
| | UNII 2A | 5 260 | 15.74 | 16.15 | | 19.57 | 23.98 |
| | | 5 280 | 15.62 | 16.10 | | 19.49 | |
| | | 5 320 | 15.83 | 15.94 | | 19.51 | |
| | UNII 2C | 5 500 | 16.18 | 14.84 | | 19.18 | 23.98 |
| | | 5 600 | 15.86 | 15.58 | | 19.34 | |
| | | 5 700 | 15.90 | 15.26 | | 19.21 | |
| | UNII 3 | 5 745 | 15.94 | 15.33 | | 19.27 | 30.00 |
| | | 5 785 | 16.00 | 15.04 | | 19.17 | |
| | | 5 825 | 15.83 | 15.31 | | 19.20 | |
| | UNII 4 | 5 845 | 15.83 | 15.51 | | 19.29 | 30.00 |
| | | 5 865 | 16.26 | 16.12 | | 19.81 | |
| | | 5 885 | 16.21 | 15.99 | | 19.72 | |

| Test mode | Band | Frequency (㎒) | Measured output power | | | | Limit (dBm) |
|---|---|---|---|---|---|---|---|
| | | | Reading (dBm) | | DCF (dB) | Result (dBm) | |
| | | | ANT1 | ANT2 | | | |
| 802.11ac VHT40 | UNII 1 | 5 190 | 14.82 | 14.10 | 1.10 | 18.59 | 23.98 |
| | | 5 230 | 14.42 | 14.77 | | 18.71 | |
| | UNII 2A | 5 270 | 14.59 | 14.53 | | 18.67 | 23.98 |
| | | 5 310 | 14.65 | 14.41 | | 18.64 | |
| | UNII 2C | 5 510 | 14.68 | 13.03 | | 18.04 | 23.98 |
| | | 5 590 | 14.44 | 13.96 | | 18.32 | |
| | | 5 670 | 14.35 | 13.78 | | 18.18 | |
| | UNII 3 | 5 755 | 14.77 | 13.79 | | 18.42 | 30.00 |
| | | 5 795 | 14.89 | 13.49 | | 18.36 | |
| | UNII 4 | 5 835 | 14.43 | 13.26 | | 17.99 | 30.00 |
| | | 5 875 | 14.80 | 14.33 | | 18.69 | |
| 802.11ac VHT80 | UNII 1 | 5 210 | 13.64 | 13.19 | 1.86 | 18.29 | 23.98 |
| | UNII 2A | 5 290 | 13.54 | 13.26 | | 18.27 | 23.98 |
| | UNII 2C | 5 530 | 14.07 | 12.47 | | 18.21 | 23.98 |
| | | 5 610 | 13.77 | 12.93 | | 18.24 | |
| | UNII 3 | 5 775 | 14.02 | 12.53 | | 18.21 | 30.00 |
| | UNII 4 | 5 855 | 13.73 | 12.61 | | 18.08 | 30.00 |
| 802.11ac VHT160 | UNII 1&2A | 5 250 | 11.91 | 11.46 | 2.69 | 17.39 | 23.98 |
| | UNII 2C | 5 570 | 12.24 | 11.03 | | 17.38 | 23.98 |
| | UNII 3&4 | 5 815 | 12.05 | 10.44 | | 17.02 | 30.00 |

**Notes:**

1. Conducted Output power(dBm) = Reading 10log($10^{(ANT1/10)}$ + $10^{(ANT2/10)}$) (dBm) + D.C.F (dB)

**e.i.r.p.**

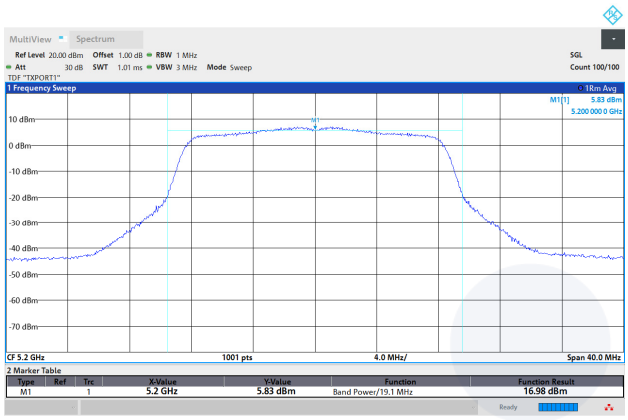
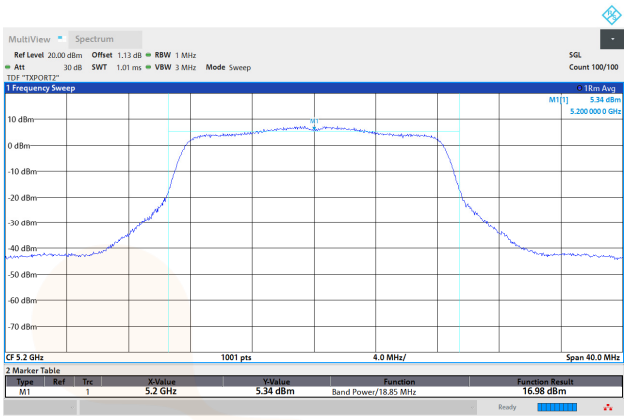
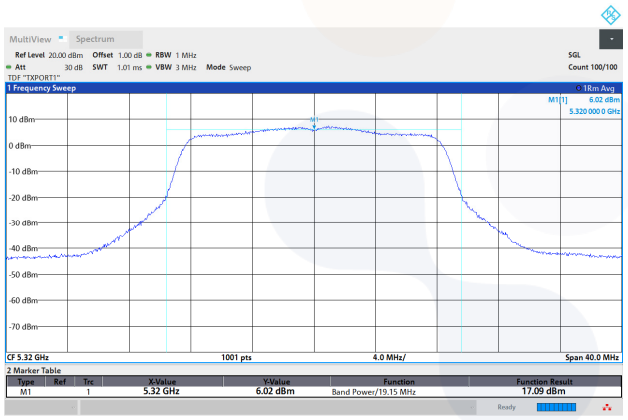
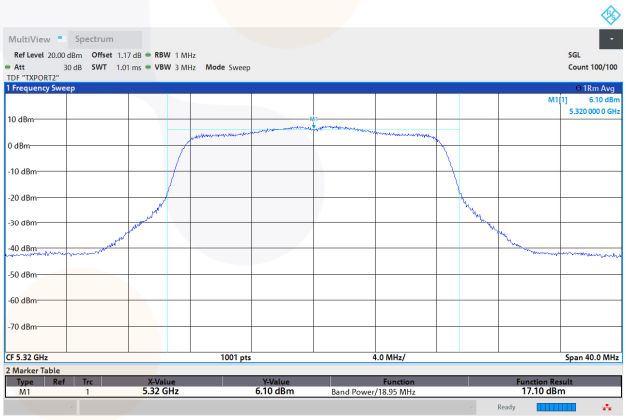
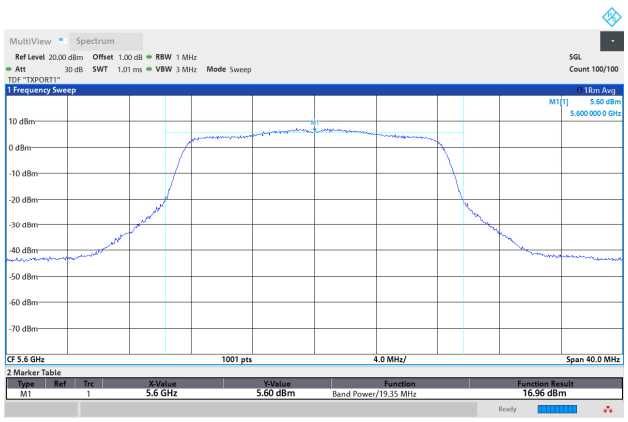
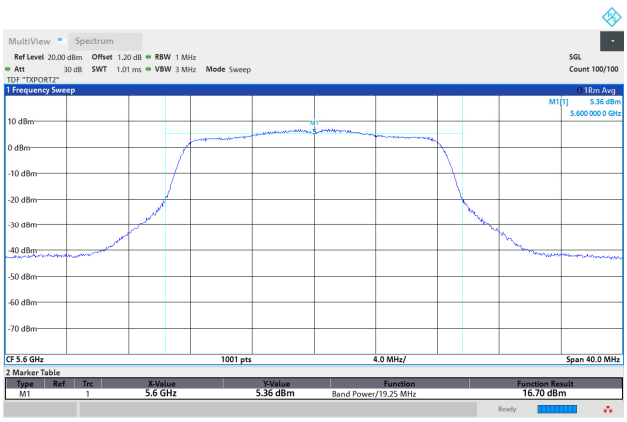
| Test mode | Band | Frequency (㎒) | Measured output power | | | MAX e.i.r.p Limit (dBm) |
|---|---|---|---|---|---|---|
| | | | Conducted output Power (dBm) | ANT gain (dBi) | MAX e.i.r.p (dBm) | |
| 802.11a | UNII 4 | 5 845 | 20.24 | -1.44 | 18.80 | 30.00 |
| | | 5 865 | 20.70 | | 19.26 | |
| | | 5 885 | 20.56 | | 19.12 | |
| 802.11n HT20 | UNII 4 | 5 845 | 19.38 | | 17.94 | 30.00 |
| | | 5 865 | 19.89 | | 18.45 | |
| | | 5 885 | 19.75 | | 18.31 | |
| 802.11n HT40 | UNII 4 | 5 835 | 18.98 | | 17.54 | 30.00 |
| | | 5 875 | 19.73 | | 18.29 | |
| 802.11ac VHT20 | UNII 4 | 5 845 | 19.29 | | 17.85 | 30.00 |
| | | 5 865 | 19.81 | | 18.37 | |
| | | 5 885 | 19.72 | | 18.28 | |
| 802.11ac VHT40 | UNII 4 | 5 835 | 17.99 | | 16.55 | 30.00 |
| | | 5 875 | 18.69 | | 17.25 | |
| 802.11ac VHT80 | UNII 4 | 5 855 | 18.08 | | 16.64 | 30.00 |
| 802.11ac VHT160 | UNII 3&4 | 5 815 | 17.02 | | 15.58 | 30.00 |

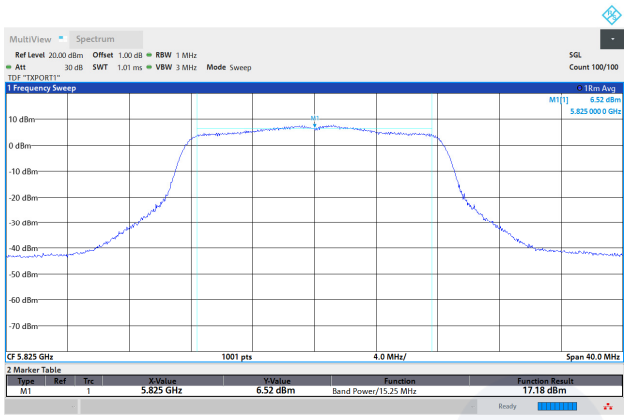
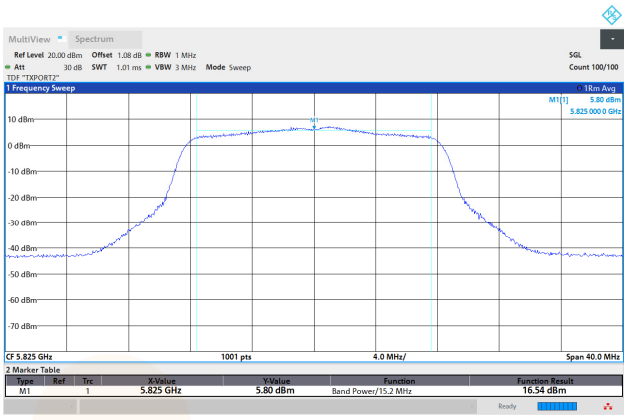
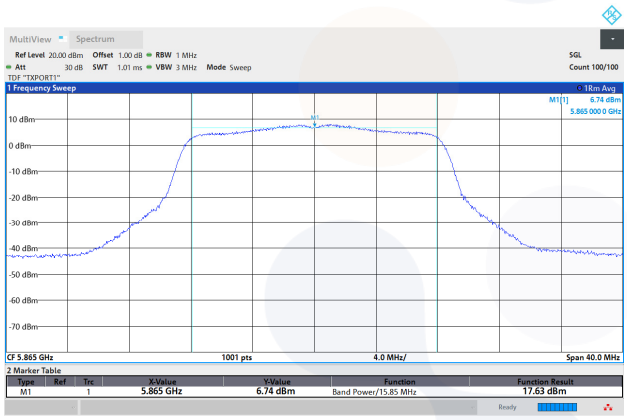
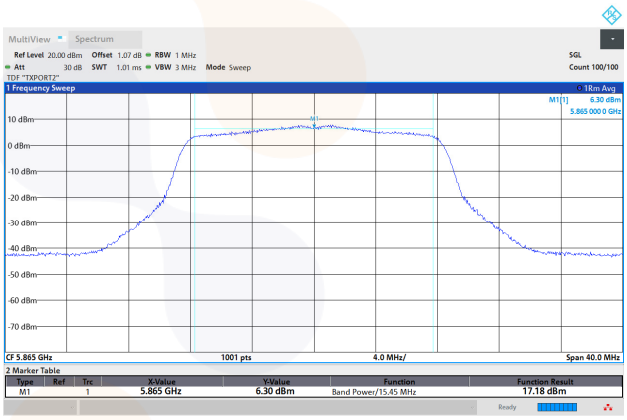
**Notes:**

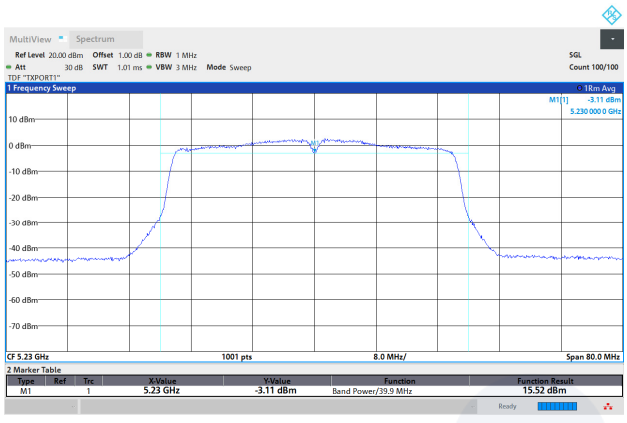
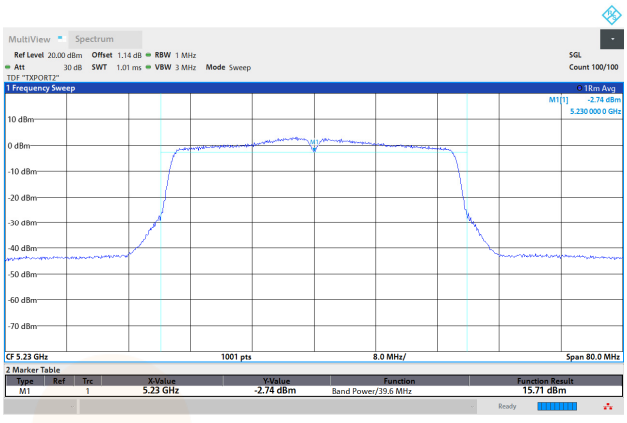
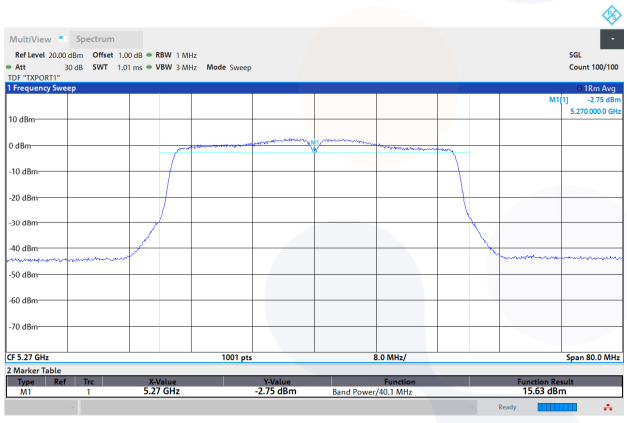
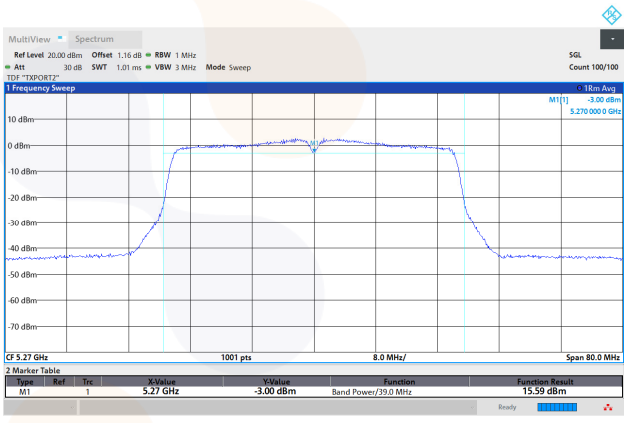
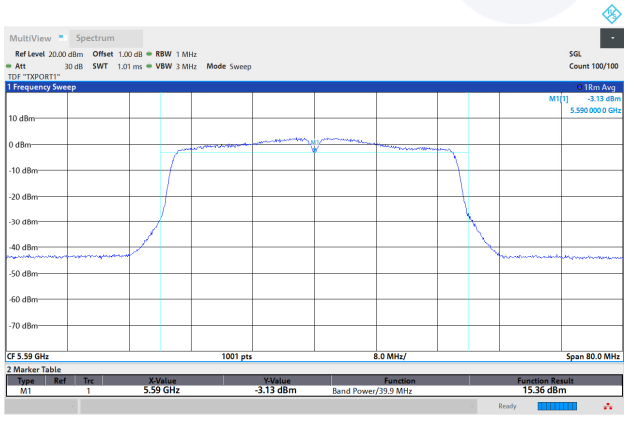
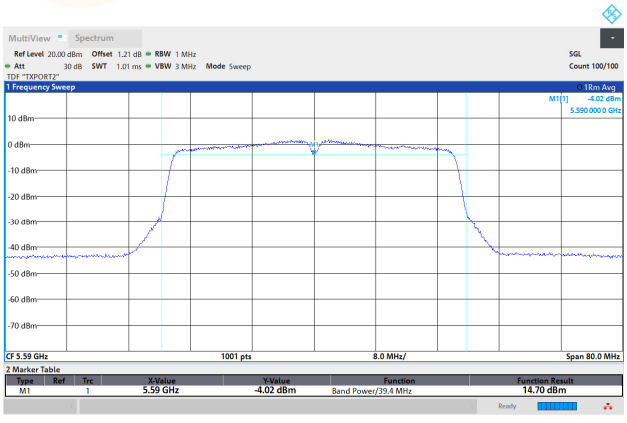
1. E.I.R.P. Calculation: E.I.R.P. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

**In order to simplify the report, attached plots were the worst case per bandwidth**

## MIMO

| MIMO_ANT1 | MIMO_ANT2 |
|---|---|
| **UNII 1 / 802.11a / Mid ch.** | |
|  |  |
| **UNII 2A / 802.11a / High ch.** | |
|  |  |
| **UNII 2C / 802.11a / Mid ch.** | |
|  |  |

| MIMO_ANT1 | MIMO_ANT2 |
|---|---|
| **UNII 3 / 802.11a / High ch.** | |
|  |  |
| **UNII 4 / 802.11a / Mid ch.** | |
|  |  |

| MIMO_ANT1 | MIMO_ANT2 |
|---|---|
| **UNII 1 / 802.11n HT40 / High ch.** | |
|  |  |
| **UNII 2A / 802.11n HT40 / Low ch.** | |
|  |  |
| **UNII 2C / 802.11n HT40 / Mid ch.** | |
|  |  |