



FCC RADIO TEST REPORT

FCC ID : UZ7TC720L
Equipment : Touch computer
Brand Name : Zebra
Model Name : TC720L
Applicant : Zebra Technologies Corporation
1 Zebra Plaza Holtsville, NY 11742
Manufacturer : Zebra Technologies Corporation
1 Zebra Plaza Holtsville, NY 11742
Standard : FCC Part 15 Subpart C §15.247

The product was received on Jul. 25, 2018 and testing was started from Aug. 21, 2018 and completed on Sep. 17, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Joseph Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report



Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|-----------------------|--|--------------------|---|
| 3.1 | 15.247(a)(2) | 6dB Bandwidth | Pass | - |
| 3.1 | 2.1049 | 99% Occupied Bandwidth | Reporting only | - |
| 3.2 | 15.247(b) | Power Output Measurement | Pass | - |
| 3.3 | 15.247(e) | Power Spectral Density | Pass | - |
| 3.4 | 15.247(d) | Conducted Band Edges | Pass | - |
| | | Conducted Spurious Emission | Pass | - |
| 3.5 | 15.247(d) | Radiated Band Edges and Radiated Spurious Emission | Pass | Under limit 1.04 dB at 2390.000 MHz & 2389.905 MHz |
| 3.6 | 15.207 | AC Conducted Emission | Pass | Under limit 5.66 dB at 13.560 MHz |
| 3.7 | 15.203 & 15.247(b) | Antenna Requirement | Pass | - |

Reviewed by: Wii Chang

Report Producer: Yimin Ho



1 General Description

1.1 Product Feature of Equipment Under Test

| Product Feature | |
|--|---|
| Equipment | Touch computer |
| Brand Name | Zebra |
| Model Name | TC720L |
| FCC ID | UZ7TC720L |
| EUT supports Radios application | NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE |
| HW Version | DV |
| SW Version | Android version 8.1.0 |
| FW Version | 91-09-14.00-OG-U00-STD |
| MFD | 03JUL18 |
| EUT Stage | Engineering Sample |

Remark: The above EUT's information was declared by manufacturer.

| Specification of Accessories | | | | |
|---|-------------------|--------|--------------------|--------------------|
| AC Adapter | Brand Name | Zebra | Part Number | PWR-BUA5V16W0WW |
| 4 PIN DC power cable | Brand Name | Zebra | Part Number | CBL-DC-383A1-01 |
| AC Power cable | Brand Name | Zebra | Part Number | 50-16000-182R |
| Snap-On USB/Charge Cable | Brand Name | Zebra | Part Number | CBL-TC7X-USB1-01 |
| Snap-On Charging Cable Cup | Brand Name | Zebra | Part Number | CHG-TC7X-CBL1-01 |
| Battery 1 | Brand Name | Zebra | Part Number | BT-000318-01 |
| Battery 2 (Falcon 1S3P Battery Pack) | Brand Name | Zebra | Part Number | BT-000318-51 |
| Battery 3 | Brand Name | Symbol | Part Number | 82-171249-02 |
| Earphone 1 | Brand Name | Zebra | Part Number | HDST-35MM-PTVP-01 |
| Earphone 2 | Brand Name | Zebra | Part Number | HS2100-OTH |
| Snap-on 3.5MM Audio Jack Adapter | Brand Name | Symbol | Part Number | ADP-TC7X-AUD35-01 |
| 3.5mm Jack 43"(1.1m) Standard Cable | Brand Name | Zebra | Part Number | CBL-HS2100-3MS1-01 |
| Holster | Brand Name | Zebra | Part Number | SG-TC7X-HLSTR1-02 |
| Rigid Holster | Brand Name | Zebra | Part Number | SG-TC7X-RHLSTR1-01 |



1.2 Product Specification of Equipment Under Test

| Standards-related Product Specification | |
|--|--|
| Tx/Rx Channel Frequency Range | 2412 MHz ~ 2462 MHz |
| Maximum (Average) Output Power to antenna <CDD Mode> | <Ant. 1> 802.11b : 22.59 dBm (0.1816 W) 802.11g : 22.78 dBm (0.1897 W) 802.11n HT20 : 22.68 dBm (0.1854 W) 802.11n HT40 : 17.32 dBm (0.0540 W) 802.11ac VHT20 : 22.72 dBm(0.1871 W) 802.11ac VHT40 : 17.33 dBm(0.0541 W) <Ant. 2> 802.11b : 22.93 dBm (0.1963 W) 802.11g : 22.21 dBm (0.1663 W) 802.11n HT20 : 22.13 dBm (0.1633 W) 802.11n HT40 : 16.28 dBm (0.0425 W) 802.11ac VHT20 : 22.16 dBm(0.1644 W) 802.11ac VHT40 : 16.29 dBm(0.0426 W) <MIMO Ant. 1 + 2> 802.11b : 25.86 dBm (0.3855 W) 802.11g : 24.56 dBm (0.2858 W) 802.11n HT20 : 24.44 dBm (0.2780 W) 802.11n HT40 : 18.26 dBm (0.0670 W) 802.11ac VHT20 : 24.45 dBm(0.2786 W) 802.11ac VHT40 : 18.33 dBm(0.0681 W) |
| Maximum (Average) Output Power to antenna <TXBF Mode> | <MIMO Ant. 1 + 2> 802.11ac VHT20 : 22.46 dBm(0.1762 W) 802.11ac VHT40 : 18.07 dBm(0.0641 W) |
| 99% Occupied Bandwidth <CDD Mode> | <Ant. 1> 802.11b : 15.03MHz 802.11g : 17.88MHz 802.11ac VHT20 : 20.53MHz 802.11ac VHT40 : 36.46MHz <Ant. 2> 802.11b : 15.03MHz 802.11g : 17.88MHz 802.11ac VHT20 : 16.78MHz 802.11ac VHT40 : 36.46MHz <MIMO Ant. 1> 802.11b : 15.13MHz 802.11g : 22.58MHz 802.11ac VHT20 : 23.23MHz 802.11ac VHT40 : 36.56MHz <MIMO Ant. 2> 802.11b : 15.43MHz 802.11g : 17.08MHz 802.11ac VHT20 : 18.28MHz 802.11ac VHT40 : 36.56MHz |



| Standards-related Product Specification | | |
|---|-------------------------|--|
| 99% Occupied Bandwidth <TXBF Mode> | | <MIMO Ant. 1> 802.11ac VHT20 : 18.03MHz 802.11ac VHT40 : 37.16MHz <MIMO Ant. 2> 802.11ac VHT20 : 17.88MHz 802.11ac VHT40 : 37.06MHz |
| Antenna Type / Gain | | <Ant. 1>PIFA Antenna with gain 2.0 dBi <Ant. 2>PIFA Antenna with gain 2.0 dBi |
| Type of Modulation | | 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) |
| Antenna Function Description | 802.11 b/g/n/ac | Ant. 1 |
| | 802.11 b/g/n/ac MIMO | V |
| | 802.11 ac TXBF | V |
| | | V |

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

| | | | |
|---------------------------|---|---------|-----------|
| Test Site | SPORTON INTERNATIONAL INC. | | |
| Test Site Location | No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978 | | |
| Test Site No. | Sporton Site No. | | |
| | TH05-HY | CO05-HY | 03CH07-HY |

Note: The test site complies with ANSI C63.4 2014 requirement.



1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|-----------------|---------|----------------|---------|----------------|
| 2400-2483.5 MHz | 1 | 2412 | 7 | 2442 |
| | 2 | 2417 | 8 | 2447 |
| | 3 | 2422 | 9 | 2452 |
| | 4 | 2427 | 10 | 2457 |
| | 5 | 2432 | 11 | 2462 |
| | 6 | 2437 | | |



2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Single Mode

| Modulation | Data Rate |
|---------------------------------|-----------|
| 802.11b | 1 Mbps |
| 802.11g | 6 Mbps |
| 802.11n HT20 (Covered by VHT20) | MCS0 |
| 802.11n HT40 (Covered by VHT40) | MCS0 |
| 802.11ac VHT20 | MCS0 |
| 802.11ac VHT40 | MCS0 |

MIMO Mode

| Modulation | Data Rate |
|---------------------------------|-----------|
| 802.11b | 1 Mbps |
| 802.11g | 6 Mbps |
| 802.11n HT20 (Covered by VHT20) | MCS0 |
| 802.11n HT40 (Covered by VHT40) | MCS0 |
| 802.11ac VHT20 | MCS0 |
| 802.11ac VHT40 | MCS0 |

TXBF Mode

| Modulation | Data Rate |
|----------------|-----------|
| 802.11ac VHT20 | MCS0 |
| 802.11ac VHT40 | MCS0 |

| Test Cases | |
|-----------------------|---|
| AC Conducted Emission | Mode 1: NFC Link + WLAN (2.4GHz) Link + Bluetooth Link + Snap on USB Cable Data Link with Notebook + Copy Data from Notebook to EDA (eMMC) + AC Adapter |



<CDD Modes>

<Ant. 1>

| 802.11b RF Avg. Output Power (dBm) | | | | | | | | | | | | | |
|------------------------------------|--------------------|-----------------|--------------------|---------|-----------------|-------|-------|-------|--|--|--|--|--|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | | | | |
| Channel | Frequency (MHz) | Data Rate (bps) | | Channel | Data Rate (bps) | | | | | | | | |
| | | 1M | | | 2M | 5.5M | 11M | | | | | | |
| Duty Cycle (%) | | 100.00 | | | 98.13 | 96.00 | 92.86 | | | | | | |
| CH 01 | 2412 | 22.55 | | | CH 06 | 22.58 | 22.53 | 22.56 | | | | | |
| CH 02 | 2417 | 22.56 | | | | | | | | | | | |
| CH 06 | 2437 | 22.59 | | | | | | | | | | | |
| CH 10 | 2457 | 22.53 | | | | | | | | | | | |
| CH 11 | 2462 | 19.98 | | | | | | | | | | | |

| 802.11g RF Avg. Output Power (dBm) | | | | | | | | | |
|------------------------------------|--------------------|-----------------|--------------------|--------|--------|--------|--------|--------|--------|
| Power vs. Channel | | | Power vs Data Rate | | | | | | |
| Channel | Frequency (MHz) | Data Rate (bps) | Data Rate (bps) | | | | | | |
| | | | 9Mbps | 12Mbps | 18Mbps | 24Mbps | 36Mbps | 48Mbps | 54Mbps |
| Duty Cycle (%) | | 94.85 | 93.24 | 91.96 | 87.42 | 85.81 | 80.53 | 75.56 | 72.09 |
| CH 01 | 2412 | 17.61 | CH 06 | 22.75 | 22.73 | 22.61 | 22.29 | 22.43 | 22.43 |
| CH 02 | 2417 | 20.53 | | | | | | | |
| CH 06 | 2437 | 22.78 | | | | | | | |
| CH 10 | 2457 | 20.14 | | | | | | | |
| CH 11 | 2462 | 17.13 | | | | | | | |

| 802.11n HT20 RF Avg. Output Power (dBm) | | | | | | | | | | |
|---|--------------------|-----------|--------------------|-------|-------|-------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | MCS Index | | | | | | | |
| | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | | | | |
| Duty Cycle (%) | | 94.12 | 90.74 | 85.71 | 85.81 | 79.82 | 75.28 | 73.49 | 71.79 | |
| CH 01 | 2412 | 17.05 | CH 06 | 22.52 | 22.62 | 22.49 | 22.24 | 22.27 | 22.33 | 22.24 |
| CH 02 | 2417 | 20.40 | | | | | | | | |
| CH 06 | 2437 | 22.68 | | | | | | | | |
| CH 10 | 2457 | 20.03 | | | | | | | | |
| CH 11 | 2462 | 15.94 | | | | | | | | |



| 802.11n HT40 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| Duty Cycle (%) | 90.73 | 84.72 | 79.25 | 74.71 | 68.12 | 64.41 | 61.40 | 58.49 |
| CH 03 | 2422 | 15.66 | CH 06 | 17.17 | 17.11 | 17.19 | 17.12 | 17.06 |
| CH 04 | 2427 | 16.37 | | | | | | 17.17 |
| CH 06 | 2437 | 17.32 | | | | | | 17.05 |
| CH 08 | 2447 | 15.59 | | | | | | |
| CH 09 | 2452 | 15.13 | | | | | | |

| 802.11ac VHT20 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| Duty Cycle (%) | 94.12 | 90.78 | 87.01 | 86.00 | 80.18 | 76.67 | 72.41 | 72.50 |
| CH 01 | 2412 | 16.95 | CH 06 | 22.67 | 22.70 | 22.64 | 22.37 | 22.34 |
| CH 02 | 2417 | 20.48 | | | | | | 22.54 |
| CH 06 | 2437 | 22.72 | | | | | | 22.44 |
| CH 10 | 2457 | 20.06 | | | | | | 22.30 |
| CH 11 | 2462 | 15.99 | | | | | | |

| 802.11ac VHT40 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| Duty Cycle (%) | 91.54 | 84.93 | 77.48 | 75.86 | 68.12 | 63.93 | 61.40 | 60.00 |
| CH 03 | 2422 | 15.67 | CH 06 | 17.21 | 17.26 | 17.23 | 17.17 | 17.14 |
| CH 04 | 2427 | 16.38 | | | | | | 17.22 |
| CH 06 | 2437 | 17.33 | | | | | | 17.12 |
| CH 08 | 2447 | 15.60 | | | | | | 17.25 |
| CH 09 | 2452 | 15.15 | | | | | | 17.27 |



<Ant. 2>

| 802.11b RF Avg. Output Power (dBm) | | | | | | | | |
|------------------------------------|--------------------|-----------------|--------------------|-----------------|-------|-------|--|--|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | Data Rate (bps) | | Data Rate (bps) | | | | |
| | | 1M | | 2M | 5.5M | 11M | | |
| Duty Cycle (%) | | 100.00 | | | 98.13 | 96.00 | | |
| CH 01 | 2412 | 15.45 | | | CH 06 | 92.86 | | |
| CH 02 | 2417 | 20.86 | | | | | | |
| CH 06 | 2437 | 22.93 | | | | | | |
| CH 10 | 2457 | 22.52 | | | | | | |
| CH 11 | 2462 | 21.26 | | | | | | |

| 802.11g RF Avg. Output Power (dBm) | | | | | | | | | |
|------------------------------------|--------------------|-----------------|--------------------|--------|--------|--------|--------|--------|--------|
| Power vs. Channel | | | Power vs Data Rate | | | | | | |
| Channel | Frequency (MHz) | Data Rate (bps) | Data Rate (bps) | | | | | | |
| | | | 9Mbps | 12Mbps | 18Mbps | 24Mbps | 36Mbps | 48Mbps | 54Mbps |
| Duty Cycle (%) | | 95.56 | 93.88 | 90.43 | 88.61 | 85.81 | 81.25 | 76.67 | 73.81 |
| CH 01 | 2412 | 15.59 | CH 06 | 21.93 | 21.94 | 21.98 | 21.70 | 21.85 | 22.15 |
| CH 02 | 2417 | 18.45 | | | | | | | |
| CH 06 | 2437 | 22.21 | | | | | | | |
| CH 10 | 2457 | 19.42 | | | | | | | |
| CH 11 | 2462 | 17.45 | | | | | | | |

| 802.11n HT20 RF Avg. Output Power (dBm) | | | | | | | | | |
|---|--------------------|-----------|--------------------|-------|-------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | | |
| Channel | Frequency (MHz) | MCS Index | MCS Index | | | | | | |
| | | MCS 0 | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 | MCS 6 | MCS 7 |
| Duty Cycle (%) | | 94.49 | 89.91 | 88.16 | 85.86 | 79.82 | 76.40 | 72.09 | 71.79 |
| CH 01 | 2412 | 13.77 | CH 06 | 21.66 | 21.75 | 21.74 | 21.71 | 21.76 | 21.87 |
| CH 02 | 2417 | 18.31 | | | | | | | |
| CH 06 | 2437 | 22.13 | | | | | | | |
| CH 10 | 2457 | 19.10 | | | | | | | |
| CH 11 | 2462 | 16.66 | | | | | | | |



| 802.11n HT40 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| Duty Cycle (%) | 90.70 | 83.67 | 79.44 | 73.86 | 66.67 | 63.79 | 60.71 | 60.38 |
| CH 03 | 2422 | 13.82 | CH 06 | 16.15 | 16.02 | 16.24 | 16.16 | 16.09 |
| CH 04 | 2427 | 15.05 | | 16.19 | 16.19 | 16.01 | | |
| CH 06 | 2437 | 16.28 | | | | | | |
| CH 08 | 2447 | 15.70 | | | | | | |
| CH 09 | 2452 | 15.70 | | | | | | |

| 802.11ac VHT20 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| Duty Cycle (%) | 94.49 | 90.74 | 87.01 | 85.33 | 80.00 | 75.82 | 73.81 | 73.42 |
| CH 01 | 2412 | 13.80 | CH 06 | 21.71 | 21.89 | 21.86 | 21.79 | 21.88 |
| CH 02 | 2417 | 18.36 | | 21.88 | 21.88 | 21.80 | 21.78 | |
| CH 06 | 2437 | 22.16 | | | | | | |
| CH 10 | 2457 | 19.13 | | | | | | |
| CH 11 | 2462 | 16.71 | | | | | | |

| 802.11ac VHT40 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| Duty Cycle (%) | 91.54 | 84.93 | 79.44 | 75.00 | 69.57 | 62.90 | 63.16 | 59.63 |
| CH 03 | 2422 | 13.83 | CH 06 | 16.10 | 16.25 | 16.18 | 16.23 | 16.20 |
| CH 04 | 2427 | 15.07 | | 16.15 | 16.17 | 16.20 | 16.15 | 16.17 |
| CH 06 | 2437 | 16.29 | | | | | | |
| CH 08 | 2447 | 15.73 | | | | | | |
| CH 09 | 2452 | 15.71 | | | | | | |



MIMO <Ant. 1+2>

| 802.11b RF Avg. Output Power (dBm) | | | | | | | | | |
|------------------------------------|--------------------|-----------------|--|--------------------|-----------------|-------|--|--|--|
| Power vs. Channel | | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | Data Rate (bps) | | Channel | Data Rate (bps) | | | | |
| | | 1M | | | 2M | 5.5M | | | |
| CH 01 | 2412 | 17.97 | | CH 06 | 25.80 | 25.62 | | | |
| CH 02 | 2417 | 23.55 | | | | | | | |
| CH 06 | 2437 | 25.86 | | | | | | | |
| CH 10 | 2457 | 24.46 | | | | | | | |
| CH 11 | 2462 | 23.13 | | | | | | | |

| 802.11g RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------------|--------------------|-----------------|--------|--------|--------|--------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | Data Rate (bps) | Channel | Data Rate (bps) | | | | |
| | | | | 9Mbps | 12Mbps | 18Mbps | 24Mbps | 36Mbps |
| CH 01 | 2412 | 17.80 | CH 06 | 24.44 | 24.42 | 24.46 | 24.30 | 24.14 |
| CH 02 | 2417 | 21.44 | | | | | | |
| CH 06 | 2437 | 24.56 | | | | | | |
| CH 10 | 2457 | 22.62 | | | | | | |
| CH 11 | 2462 | 20.13 | | | | | | |
| 802.11n HT20 RF Avg. Output Power (dBm) | | | | | | | | |
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 |
| CH 01 | 2412 | 17.47 | CH 06 | | | | | |
| CH 02 | 2417 | 21.32 | | | | | | |
| CH 06 | 2437 | 24.44 | 24.22 | 24.30 | 24.25 | 24.05 | 24.11 | |
| CH 10 | 2457 | 21.85 | | | | | | |
| CH 11 | 2462 | 18.84 | | | | | | |



| 802.11n HT40 RF Output Power (dBm) | | | | | | | | |
|------------------------------------|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | MCS0 | | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 |
| CH 03 | 2422 | 15.99 | CH 06 | 16.15 | 16.02 | 16.24 | 16.16 | 16.09 |
| CH 04 | 2427 | 16.37 | | | | | | 16.19 |
| CH 06 | 2437 | 18.26 | | | | | | 16.01 |
| CH 08 | 2447 | 17.95 | | | | | | |
| CH 09 | 2452 | 17.48 | | | | | | |

| 802.11ac VHT20 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | MCS 0 | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| CH 01 | 2412 | 17.50 | CH 06 | 24.30 | 24.38 | 24.31 | 24.15 | 24.19 |
| CH 02 | 2417 | 21.33 | | | | | | 24.12 |
| CH 06 | 2437 | 24.45 | | | | | | 24.22 |
| CH 10 | 2457 | 21.86 | | | | | | 24.20 |
| CH 11 | 2462 | 18.85 | | | | | | |

| 802.11ac VHT40 RF Avg. Output Power (dBm) | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | |
| | | MCS 0 | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 |
| CH 03 | 2422 | 16.06 | CH 06 | 18.22 | 18.04 | 18.04 | 18.07 | 18.00 |
| CH 04 | 2427 | 16.42 | | | | | | 18.02 |
| CH 06 | 2437 | 18.33 | | | | | | 18.03 |
| CH 08 | 2447 | 18.02 | | | | | | 18.08 |
| CH 09 | 2452 | 17.56 | | | | | | 18.04 |



<TXBF Modes>

MIMO <Ant. 1+2>

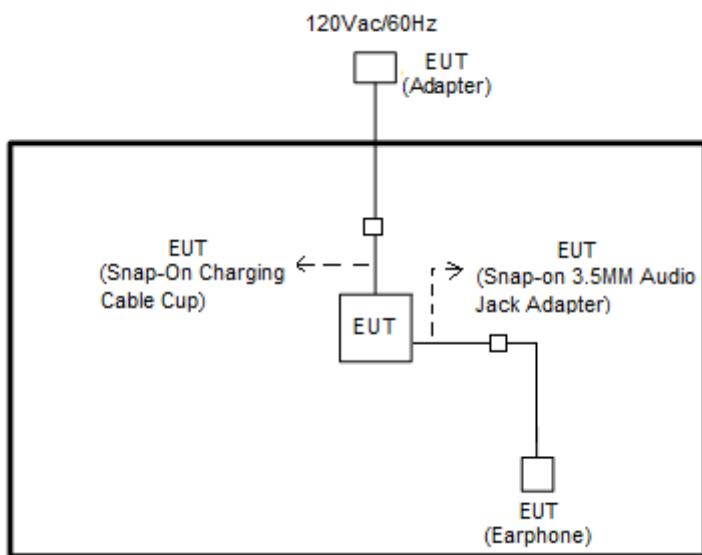
| 802.11ac VHT20 RF Avg. Output Power (dBm) | | | | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | | |
| | | MCS 0 | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 | MCS 6 | MCS 7 | MCS 8 |
| CH 01 | 2412 | 17.47 | CH 06 | 22.36 | 22.31 | 22.26 | 22.01 | 22.06 | 22.01 | 22.06 | 22.11 |
| CH 06 | 2437 | 22.46 | | | | | | | | | |
| CH 11 | 2462 | 18.77 | | | | | | | | | |

| 802.11ac VHT40 RF Avg. Output Power (dBm) | | | | | | | | | | | | |
|---|--------------------|-----------|--------------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
| Power vs. Channel | | | Power vs Data Rate | | | | | | | | | |
| Channel | Frequency (MHz) | MCS Index | Channel | MCS Index | | | | | | | | |
| | | MCS 0 | | MCS 1 | MCS 2 | MCS 3 | MCS 4 | MCS 5 | MCS 6 | MCS 7 | MCS 8 | MCS 9 |
| CH 03 | 2422 | 15.91 | CH 06 | 18.01 | 18.02 | 18.01 | 18.01 | 18.01 | 18.02 | 18.02 | 18.02 | 18.02 |
| CH 06 | 2437 | 18.07 | | | | | | | | | | |
| CH 09 | 2452 | 17.25 | | | | | | | | | | |

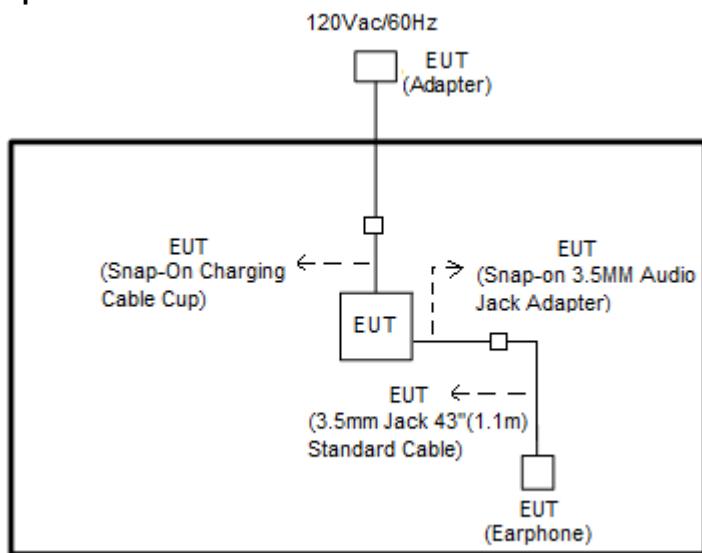
2.3 Connection Diagram of Test System

<Radiated Emission Mode>

<CDD Mode with Earphone 1>

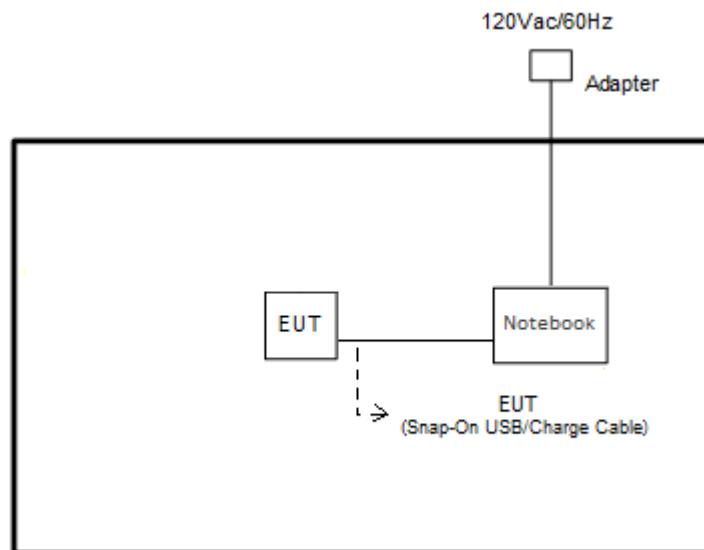


<CDD Mode with Earphone 2>

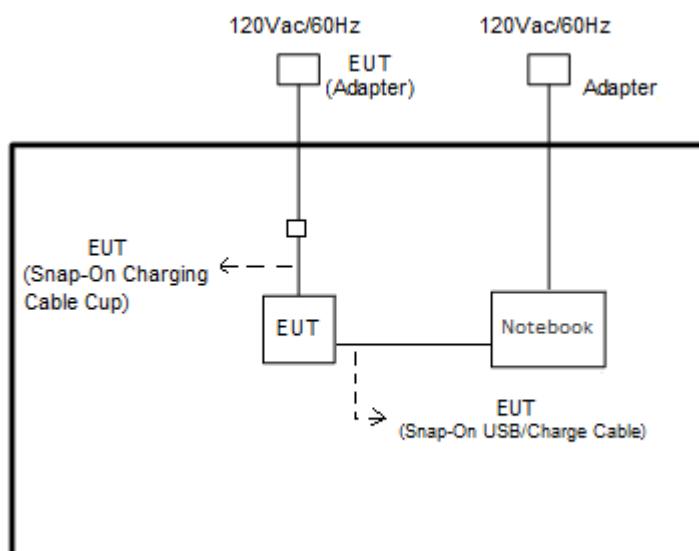




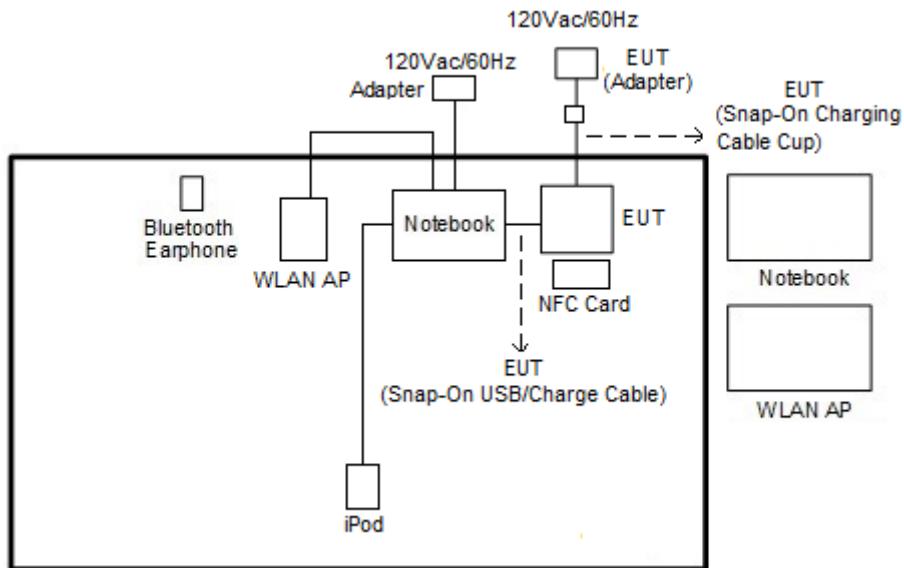
<CDD Mode with Notebook>



<TXBF Mode>



<AC Conducted Emission>



2.4 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model Name | FCC ID | Data Cable | Power Cord |
|------|--------------------|---------------|----------------|--|-----------------|--|
| 1. | Bluetooth Earphone | Sony Ericsson | MW600 | PY7DDA-2029 | N/A | N/A |
| 2. | WLAN AP | ASUS | RT-AC66U | MSQ-RTAC66U | N/A | Unshielded, 1.8 m |
| 3. | iPod | Apple | A1285 | FCC DoC | Shielded, 1.0 m | N/A |
| 4. | Notebook | DELL | Latitude E6320 | FCC DoC/ Contains FCC ID: QDS-BRCM1054 | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 5. | Notebook | DELL | Latitude E3340 | FCC DoC/ Contains FCC ID: PD97260NGU | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 6. | Notebook | DELL | P79G | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 7. | SD Card | SanDisk | MicroSD HC | FCC DoC | N/A | N/A |
| 8. | NFC Card | Metro Taipei | Easy Card | N/A | N/A | N/A |



2.5 EUT Operation Test Setup

The RF test items, utility “QRCT” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

For TXBF mode, the modulation modes and data rates manipulated by the command lines in the engineering program made the EUT link to another EUT by power under the normal operation. The “ADB” software tool was used to enable the EUT to transmit signals continuously.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator 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.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\text{Offset(dB)} = \text{RF cable loss(dB)} + \text{attenuator factor(dB)}.$$

$$= 4.2 + 10 = 14.2 \text{ (dB)}$$



3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

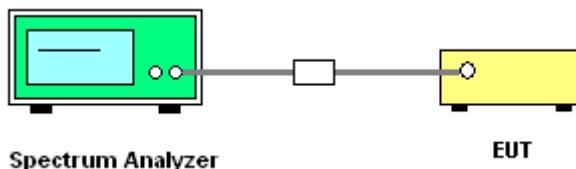
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
6. Measure and record the results in the test report.

3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

<CDD Mode>

| Mod. | Data Rate | N _{TX} | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | | 6dB BW (MHz) | | 6dB BW Limit (MHz) | Pass/Fail |
|-------|-----------|-----------------|-----|----------------|--------------------------|-------|-----------------|-------|-----------------------|-----------|
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| | | | | | | | | | | |
| 11b | 1Mbps | 1 | 1 | 2412 | 15.03 | 12.94 | 8.05 | 8.03 | 0.50 | Pass |
| 11b | 1Mbps | 1 | 6 | 2437 | 14.89 | 15.03 | 8.05 | 8.05 | 0.50 | Pass |
| 11b | 1Mbps | 1 | 11 | 2462 | 13.19 | 14.14 | 8.03 | 8.05 | 0.50 | Pass |
| 11g | 6Mbps | 1 | 1 | 2412 | 16.78 | 16.78 | 16.04 | 16.30 | 0.50 | Pass |
| 11g | 6Mbps | 1 | 6 | 2437 | 17.88 | 17.88 | 15.70 | 15.68 | 0.50 | Pass |
| 11g | 6Mbps | 1 | 11 | 2462 | 16.63 | 16.63 | 15.13 | 15.70 | 0.50 | Pass |
| VHT20 | MCS0 | 1 | 1 | 2412 | 17.93 | 16.78 | 17.16 | 18.03 | 0.50 | Pass |
| VHT20 | MCS0 | 1 | 6 | 2437 | 20.53 | 15.96 | 15.96 | 18.63 | 0.50 | Pass |
| VHT20 | MCS0 | 1 | 11 | 2462 | 17.78 | 15.96 | 15.15 | 17.83 | 0.50 | Pass |
| VHT40 | MCS0 | 1 | 3 | 2422 | 36.46 | 36.36 | 35.09 | 35.13 | 0.50 | Pass |
| VHT40 | MCS0 | 1 | 6 | 2437 | 36.36 | 36.46 | 35.13 | 35.33 | 0.50 | Pass |
| VHT40 | MCS0 | 1 | 9 | 2452 | 36.46 | 36.46 | 35.72 | 35.68 | 0.50 | Pass |
| 11b | 1Mbps | 2 | 1 | 2412 | 13.09 | 13.04 | 8.03 | 7.55 | 0.50 | Pass |
| 11b | 1Mbps | 2 | 6 | 2437 | 15.13 | 15.43 | 9.03 | 9.03 | 0.50 | Pass |
| 11b | 1Mbps | 2 | 11 | 2462 | 13.44 | 13.74 | 8.03 | 8.03 | 0.50 | Pass |
| 11g | 6Mbps | 2 | 1 | 2412 | 16.88 | 16.73 | 15.90 | 15.70 | 0.50 | Pass |
| 11g | 6Mbps | 2 | 6 | 2437 | 22.58 | 17.08 | 15.43 | 16.02 | 0.50 | Pass |
| 11g | 6Mbps | 2 | 11 | 2462 | 16.68 | 16.53 | 15.31 | 15.33 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | 18.13 | 17.83 | 16.78 | 16.90 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 23.23 | 18.28 | 15.94 | 16.92 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 17.73 | 17.78 | 15.13 | 15.96 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 36.36 | 36.26 | 35.09 | 35.13 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 36.36 | 36.56 | 35.13 | 35.13 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 36.56 | 36.46 | 35.72 | 35.41 | 0.50 | Pass |

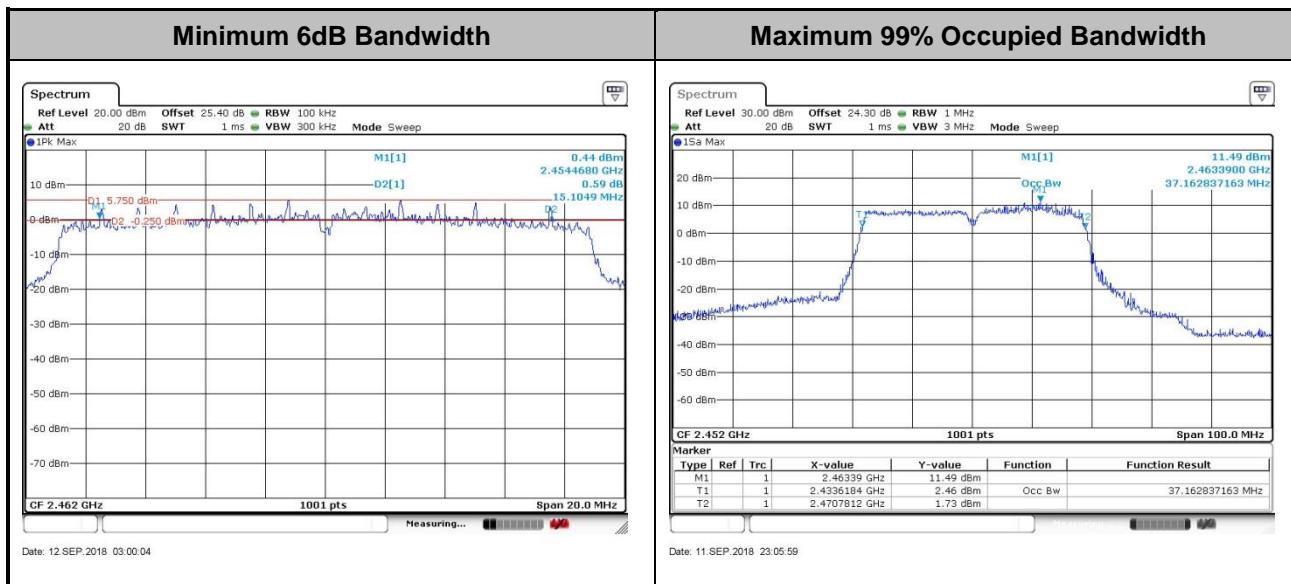


Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



<TXBF Modes>

| Mod. | Data Rate | N _{TX} | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | | 6dB BW (MHz) | | 6dB BW Limit (MHz) | Pass/Fail |
|-------|-----------|-----------------|-----|----------------|--------------------------|-------|-----------------|-------|-----------------------|-----------|
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| VHT20 | MCS0 | 2 | 1 | 2412 | 18.03 | 17.88 | 16.77 | 16.92 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 17.93 | 17.88 | 16.32 | 16.92 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 17.78 | 17.78 | 15.10 | 16.26 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 36.26 | 36.36 | 36.92 | 36.96 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 37.16 | 37.06 | 36.32 | 35.01 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 37.16 | 37.06 | 35.72 | 35.68 | 0.50 | Pass |



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

<CDD Modes>

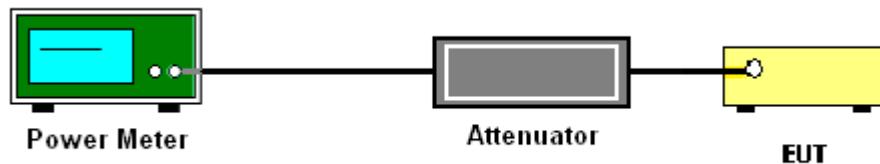
1. For Peak Power, the testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v05 section 9.1.3 PKPM1 Peak power meter method.
2. For Average Power, the testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v05 section 9.2.3.1 Method AVGPM.
3. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.
6. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

<TXBF Modes>

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v05 section 9.2.3.2 Method AVGPM-G.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.



3.2.4 Test Setup





3.2.5 Test Result of Peak Output Power (Reporting Only)

<CDD Modes>

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | | | DG (dBi) | | EIRP Power (dBm) | |
|-------|-----------|-----|-----|-------------|----------------------------|-------|-----|----------|-------|------------------|-------|
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 |
| 11b | 1Mbps | 1 | 1 | 2412 | 24.54 | 18.47 | | 2.00 | 2.00 | 26.54 | 20.47 |
| 11b | 1Mbps | 1 | 2 | 2417 | 24.57 | 23.14 | | 2.00 | 2.00 | 26.57 | 25.14 |
| 11b | 1Mbps | 1 | 6 | 2437 | 24.60 | 25.06 | | 2.00 | 2.00 | 26.60 | 27.06 |
| 11b | 1Mbps | 1 | 10 | 2457 | 24.52 | 24.50 | | 2.00 | 2.00 | 26.52 | 26.50 |
| 11b | 1Mbps | 1 | 11 | 2462 | 22.57 | 23.65 | | 2.00 | 2.00 | 24.57 | 25.65 |
| 11g | 6Mbps | 1 | 1 | 2412 | 21.94 | 20.18 | | 2.00 | 2.00 | 23.94 | 22.18 |
| 11g | 6Mbps | 1 | 2 | 2417 | 24.04 | 22.27 | | 2.00 | 2.00 | 26.04 | 24.27 |
| 11g | 6Mbps | 1 | 6 | 2437 | 25.40 | 25.08 | | 2.00 | 2.00 | 27.40 | 27.08 |
| 11g | 6Mbps | 1 | 10 | 2457 | 24.01 | 23.26 | | 2.00 | 2.00 | 26.01 | 25.26 |
| 11g | 6Mbps | 1 | 11 | 2462 | 21.80 | 21.71 | | 2.00 | 2.00 | 23.80 | 23.71 |
| HT20 | MCS0 | 1 | 1 | 2412 | 21.58 | 18.56 | | 2.00 | 2.00 | 23.58 | 20.56 |
| HT20 | MCS0 | 1 | 2 | 2417 | 23.98 | 22.33 | | 2.00 | 2.00 | 25.98 | 24.33 |
| HT20 | MCS0 | 1 | 6 | 2437 | 25.47 | 25.12 | | 2.00 | 2.00 | 27.47 | 27.12 |
| HT20 | MCS0 | 1 | 10 | 2457 | 23.99 | 23.25 | | 2.00 | 2.00 | 25.99 | 25.25 |
| HT20 | MCS0 | 1 | 11 | 2462 | 20.97 | 21.28 | | 2.00 | 2.00 | 22.97 | 23.28 |
| HT40 | MCS0 | 1 | 3 | 2422 | 21.51 | 19.84 | | 2.00 | 2.00 | 23.51 | 21.84 |
| HT40 | MCS0 | 1 | 4 | 2427 | 21.80 | 20.91 | | 2.00 | 2.00 | 23.80 | 22.91 |
| HT40 | MCS0 | 1 | 6 | 2437 | 22.55 | 21.90 | | 2.00 | 2.00 | 24.55 | 23.90 |
| HT40 | MCS0 | 1 | 8 | 2447 | 21.56 | 21.82 | | 2.00 | 2.00 | 23.56 | 23.82 |
| HT40 | MCS0 | 1 | 9 | 2452 | 21.49 | 21.74 | | 2.00 | 2.00 | 23.49 | 23.74 |
| VHT20 | MCS0 | 1 | 1 | 2412 | 21.78 | 18.59 | | 2.00 | 2.00 | 23.78 | 20.59 |
| VHT20 | MCS0 | 1 | 2 | 2417 | 24.02 | 22.35 | | 2.00 | 2.00 | 26.02 | 24.35 |
| VHT20 | MCS0 | 1 | 6 | 2437 | 25.50 | 25.13 | | 2.00 | 2.00 | 27.50 | 27.13 |
| VHT20 | MCS0 | 1 | 10 | 2457 | 24.00 | 23.28 | | 2.00 | 2.00 | 26.00 | 25.28 |
| VHT20 | MCS0 | 1 | 11 | 2462 | 21.06 | 21.30 | | 2.00 | 2.00 | 23.06 | 23.30 |
| VHT40 | MCS0 | 1 | 3 | 2422 | 21.55 | 19.88 | | 2.00 | 2.00 | 23.55 | 21.88 |
| VHT40 | MCS0 | 1 | 4 | 2427 | 21.85 | 20.92 | | 2.00 | 2.00 | 23.85 | 22.92 |
| VHT40 | MCS0 | 1 | 6 | 2437 | 22.59 | 21.92 | | 2.00 | 2.00 | 24.59 | 23.92 |
| VHT40 | MCS0 | 1 | 8 | 2447 | 21.57 | 21.86 | | 2.00 | 2.00 | 23.57 | 23.86 |
| VHT40 | MCS0 | 1 | 9 | 2452 | 21.55 | 21.81 | | 2.00 | 2.00 | 23.55 | 23.81 |



| 2.4GHz Band | | | | | | | | | | | |
|-------------|-----------|-----|-----|-------------|----------------------------|-------|-------|----------|-------|------------------|-------|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | | | DG (dBi) | | EIRP Power (dBm) | |
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 |
| 11b | 1Mbps | 2 | 1 | 2412 | 17.84 | 18.14 | 21.00 | 2.00 | 2.00 | 23.00 | |
| 11b | 1Mbps | 2 | 2 | 2417 | 22.95 | 22.78 | 25.88 | 2.00 | 2.00 | 27.88 | |
| 11b | 1Mbps | 2 | 6 | 2437 | 24.55 | 25.10 | 27.84 | 2.00 | 2.00 | 29.84 | |
| 11b | 1Mbps | 2 | 10 | 2457 | 23.80 | 23.72 | 26.77 | 2.00 | 2.00 | 28.77 | |
| 11b | 1Mbps | 2 | 11 | 2462 | 22.91 | 22.33 | 25.64 | 2.00 | 2.00 | 27.64 | |
| 11g | 6Mbps | 2 | 1 | 2412 | 19.53 | 19.35 | 22.45 | 2.00 | 2.00 | 24.45 | |
| 11g | 6Mbps | 2 | 2 | 2417 | 22.46 | 22.25 | 25.37 | 2.00 | 2.00 | 27.37 | |
| 11g | 6Mbps | 2 | 6 | 2437 | 24.42 | 24.75 | 27.60 | 2.00 | 2.00 | 29.60 | |
| 11g | 6Mbps | 2 | 10 | 2457 | 23.75 | 23.15 | 26.47 | 2.00 | 2.00 | 28.47 | |
| 11g | 6Mbps | 2 | 11 | 2462 | 21.91 | 21.36 | 24.65 | 2.00 | 2.00 | 26.65 | |
| HT20 | MCS0 | 2 | 1 | 2412 | 19.29 | 19.24 | 22.28 | 2.00 | 2.00 | 24.28 | |
| HT20 | MCS0 | 2 | 2 | 2417 | 22.42 | 22.30 | 25.37 | 2.00 | 2.00 | 27.37 | |
| HT20 | MCS0 | 2 | 6 | 2437 | 24.36 | 24.74 | 27.56 | 2.00 | 2.00 | 29.56 | |
| HT20 | MCS0 | 2 | 10 | 2457 | 23.34 | 22.69 | 26.04 | 2.00 | 2.00 | 28.04 | |
| HT20 | MCS0 | 2 | 11 | 2462 | 21.20 | 20.38 | 23.82 | 2.00 | 2.00 | 25.82 | |
| HT40 | MCS0 | 2 | 3 | 2422 | 18.86 | 19.53 | 22.22 | 2.00 | 2.00 | 24.22 | |
| HT40 | MCS0 | 2 | 4 | 2427 | 19.14 | 19.64 | 22.41 | 2.00 | 2.00 | 24.41 | |
| HT40 | MCS0 | 2 | 6 | 2437 | 21.00 | 21.11 | 24.07 | 2.00 | 2.00 | 26.07 | |
| HT40 | MCS0 | 2 | 8 | 2447 | 21.12 | 20.92 | 24.03 | 2.00 | 2.00 | 26.03 | |
| HT40 | MCS0 | 2 | 9 | 2452 | 21.01 | 20.67 | 23.85 | 2.00 | 2.00 | 25.85 | |
| VHT20 | MCS0 | 2 | 1 | 2412 | 19.35 | 19.39 | 22.38 | 2.00 | 2.00 | 24.38 | |
| VHT20 | MCS0 | 2 | 2 | 2417 | 22.46 | 22.39 | 25.44 | 2.00 | 2.00 | 27.44 | |
| VHT20 | MCS0 | 2 | 6 | 2437 | 24.40 | 24.75 | 27.59 | 2.00 | 2.00 | 29.59 | |
| VHT20 | MCS0 | 2 | 10 | 2457 | 23.36 | 22.77 | 26.09 | 2.00 | 2.00 | 28.09 | |
| VHT20 | MCS0 | 2 | 11 | 2462 | 21.24 | 20.48 | 23.89 | 2.00 | 2.00 | 25.89 | |
| VHT40 | MCS0 | 2 | 3 | 2422 | 18.91 | 19.57 | 22.26 | 2.00 | 2.00 | 24.26 | |
| VHT40 | MCS0 | 2 | 4 | 2427 | 19.24 | 19.65 | 22.46 | 2.00 | 2.00 | 24.46 | |
| VHT40 | MCS0 | 2 | 6 | 2437 | 21.03 | 21.15 | 24.10 | 2.00 | 2.00 | 26.10 | |
| VHT40 | MCS0 | 2 | 8 | 2447 | 21.15 | 20.96 | 24.07 | 2.00 | 2.00 | 26.07 | |
| VHT40 | MCS0 | 2 | 9 | 2452 | 21.02 | 20.69 | 23.87 | 2.00 | 2.00 | 25.87 | |



3.2.6 Test Result of Average output Power

<CDD Mode>

| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | | Average Conducted Power (dBm) | | | Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power (dBm) | | EIRP Power Limit (dBm) | | Pass /Fail |
|-------|-----------|-----|-----|-------------|------------------|-------|-------------------------------|-------|-----|-----------------------------|-------|----------|-------|------------------|-------|------------------------|-------|------------|
| | | | | | | | | | | | | | | | | | | |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| 11b | 1Mbps | 1 | 1 | 2412 | 0.00 | 0.00 | 22.55 | 15.45 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.55 | 17.45 | 36.00 | 36.00 | Pass |
| 11b | 1Mbps | 1 | 2 | 2417 | 0.00 | 0.00 | 22.56 | 20.86 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.56 | 22.86 | 36.00 | 36.00 | Pass |
| 11b | 1Mbps | 1 | 6 | 2437 | 0.00 | 0.00 | 22.59 | 22.93 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.59 | 24.93 | 36.00 | 36.00 | Pass |
| 11b | 1Mbps | 1 | 10 | 2457 | 0.00 | 0.00 | 22.53 | 22.52 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.53 | 24.52 | 36.00 | 36.00 | Pass |
| 11b | 1Mbps | 1 | 11 | 2462 | 0.00 | 0.00 | 19.98 | 21.26 | | 30.00 | 30.00 | 2.00 | 2.00 | 21.98 | 23.26 | 36.00 | 36.00 | Pass |
| 11g | 6Mbps | 1 | 1 | 2412 | 0.23 | 0.20 | 17.61 | 15.59 | | 30.00 | 30.00 | 2.00 | 2.00 | 19.61 | 17.59 | 36.00 | 36.00 | Pass |
| 11g | 6Mbps | 1 | 2 | 2417 | 0.23 | 0.20 | 20.53 | 18.45 | | 30.00 | 30.00 | 2.00 | 2.00 | 22.53 | 20.45 | 36.00 | 36.00 | Pass |
| 11g | 6Mbps | 1 | 6 | 2437 | 0.23 | 0.20 | 22.78 | 22.21 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.78 | 24.21 | 36.00 | 36.00 | Pass |
| 11g | 6Mbps | 1 | 10 | 2457 | 0.23 | 0.20 | 20.14 | 19.42 | | 30.00 | 30.00 | 2.00 | 2.00 | 22.14 | 21.42 | 36.00 | 36.00 | Pass |
| 11g | 6Mbps | 1 | 11 | 2462 | 0.23 | 0.20 | 17.13 | 17.45 | | 30.00 | 30.00 | 2.00 | 2.00 | 19.13 | 19.45 | 36.00 | 36.00 | Pass |
| HT20 | MCS0 | 1 | 1 | 2412 | 0.26 | 0.25 | 17.05 | 13.77 | | 30.00 | 30.00 | 2.00 | 2.00 | 19.05 | 15.77 | 36.00 | 36.00 | Pass |
| HT20 | MCS0 | 1 | 2 | 2417 | 0.26 | 0.25 | 20.40 | 18.31 | | 30.00 | 30.00 | 2.00 | 2.00 | 22.40 | 20.31 | 36.00 | 36.00 | Pass |
| HT20 | MCS0 | 1 | 6 | 2437 | 0.26 | 0.25 | 22.68 | 22.13 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.68 | 24.13 | 36.00 | 36.00 | Pass |
| HT20 | MCS0 | 1 | 10 | 2457 | 0.26 | 0.25 | 20.03 | 19.10 | | 30.00 | 30.00 | 2.00 | 2.00 | 22.03 | 21.10 | 36.00 | 36.00 | Pass |
| HT20 | MCS0 | 1 | 11 | 2462 | 0.26 | 0.25 | 15.94 | 16.66 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.94 | 18.66 | 36.00 | 36.00 | Pass |
| HT40 | MCS0 | 1 | 3 | 2422 | 0.42 | 0.42 | 15.66 | 13.82 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.66 | 15.82 | 36.00 | 36.00 | Pass |
| HT40 | MCS0 | 1 | 4 | 2427 | 0.42 | 0.42 | 16.37 | 15.05 | | 30.00 | 30.00 | 2.00 | 2.00 | 18.37 | 17.05 | 36.00 | 36.00 | Pass |
| HT40 | MCS0 | 1 | 6 | 2437 | 0.42 | 0.42 | 17.32 | 16.28 | | 30.00 | 30.00 | 2.00 | 2.00 | 19.32 | 18.28 | 36.00 | 36.00 | Pass |
| HT40 | MCS0 | 1 | 8 | 2447 | 0.42 | 0.42 | 15.59 | 15.70 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.59 | 17.70 | 36.00 | 36.00 | Pass |
| HT40 | MCS0 | 1 | 9 | 2452 | 0.42 | 0.42 | 15.13 | 15.70 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.13 | 17.70 | 36.00 | 36.00 | Pass |
| VHT20 | MCS0 | 1 | 1 | 2412 | 0.26 | 0.25 | 16.95 | 13.80 | | 30.00 | 30.00 | 2.00 | 2.00 | 18.95 | 15.80 | 36.00 | 36.00 | Pass |
| VHT20 | MCS0 | 1 | 2 | 2417 | 0.26 | 0.25 | 20.48 | 18.36 | | 30.00 | 30.00 | 2.00 | 2.00 | 22.48 | 20.36 | 36.00 | 36.00 | Pass |
| VHT20 | MCS0 | 1 | 6 | 2437 | 0.26 | 0.25 | 22.72 | 22.16 | | 30.00 | 30.00 | 2.00 | 2.00 | 24.72 | 24.16 | 36.00 | 36.00 | Pass |
| VHT20 | MCS0 | 1 | 10 | 2457 | 0.26 | 0.25 | 20.06 | 19.13 | | 30.00 | 30.00 | 2.00 | 2.00 | 22.06 | 21.13 | 36.00 | 36.00 | Pass |
| VHT20 | MCS0 | 1 | 11 | 2462 | 0.26 | 0.25 | 15.99 | 16.71 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.99 | 18.71 | 36.00 | 36.00 | Pass |
| VHT40 | MCS0 | 1 | 3 | 2422 | 0.38 | 0.38 | 15.67 | 13.83 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.67 | 15.83 | 36.00 | 36.00 | Pass |
| VHT40 | MCS0 | 1 | 4 | 2427 | 0.38 | 0.38 | 16.38 | 15.07 | | 30.00 | 30.00 | 2.00 | 2.00 | 18.38 | 17.07 | 36.00 | 36.00 | Pass |
| VHT40 | MCS0 | 1 | 6 | 2437 | 0.38 | 0.38 | 17.33 | 16.29 | | 30.00 | 30.00 | 2.00 | 2.00 | 19.33 | 18.29 | 36.00 | 36.00 | Pass |
| VHT40 | MCS0 | 1 | 8 | 2447 | 0.38 | 0.38 | 15.60 | 15.73 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.60 | 17.73 | 36.00 | 36.00 | Pass |
| VHT40 | MCS0 | 1 | 9 | 2452 | 0.38 | 0.38 | 15.15 | 15.71 | | 30.00 | 30.00 | 2.00 | 2.00 | 17.15 | 17.71 | 36.00 | 36.00 | Pass |



| 2.4GHz Band | | | | | | | | | | | | | | | | | |
|-------------|-----------|-----|-----|-------------|------------------|-------------------------------|-------|-------|-----------------------------|-------|----------|-------|------------------|-------|------------------------|-------|------------|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | Average Conducted Power (dBm) | | | Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power (dBm) | | EIRP Power Limit (dBm) | | Pass /Fail |
| | | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| 11b | 1Mbps | 2 | 1 | 2412 | 0.00 | 0.00 | 14.91 | 15.00 | 17.97 | 30.00 | 2.00 | 2.00 | 19.97 | 36.00 | Pass | | |
| 11b | 1Mbps | 2 | 2 | 2417 | 0.00 | 0.00 | 20.52 | 20.55 | 23.55 | 30.00 | 2.00 | 2.00 | 25.55 | 36.00 | Pass | | |
| 11b | 1Mbps | 2 | 6 | 2437 | 0.00 | 0.00 | 22.70 | 22.99 | 25.86 | 30.00 | 2.00 | 2.00 | 27.86 | 36.00 | Pass | | |
| 11b | 1Mbps | 2 | 10 | 2457 | 0.00 | 0.00 | 21.46 | 21.44 | 24.46 | 30.00 | 2.00 | 2.00 | 26.46 | 36.00 | Pass | | |
| 11b | 1Mbps | 2 | 11 | 2462 | 0.00 | 0.00 | 20.44 | 19.77 | 23.13 | 30.00 | 2.00 | 2.00 | 25.13 | 36.00 | Pass | | |
| 11g | 6Mbps | 2 | 1 | 2412 | 0.23 | 0.23 | 14.89 | 14.69 | 17.80 | 30.00 | 2.00 | 2.00 | 19.80 | 36.00 | Pass | | |
| 11g | 6Mbps | 2 | 2 | 2417 | 0.23 | 0.23 | 18.33 | 18.52 | 21.44 | 30.00 | 2.00 | 2.00 | 23.44 | 36.00 | Pass | | |
| 11g | 6Mbps | 2 | 6 | 2437 | 0.23 | 0.23 | 21.33 | 21.75 | 24.56 | 30.00 | 2.00 | 2.00 | 26.56 | 36.00 | Pass | | |
| 11g | 6Mbps | 2 | 10 | 2457 | 0.23 | 0.23 | 19.95 | 19.24 | 22.62 | 30.00 | 2.00 | 2.00 | 24.62 | 36.00 | Pass | | |
| 11g | 6Mbps | 2 | 11 | 2462 | 0.23 | 0.23 | 17.41 | 16.80 | 20.13 | 30.00 | 2.00 | 2.00 | 22.13 | 36.00 | Pass | | |
| HT20 | MCS0 | 2 | 1 | 2412 | 0.25 | 0.25 | 14.53 | 14.39 | 17.47 | 30.00 | 2.00 | 2.00 | 19.47 | 36.00 | Pass | | |
| HT20 | MCS0 | 2 | 2 | 2417 | 0.25 | 0.25 | 18.21 | 18.40 | 21.32 | 30.00 | 2.00 | 2.00 | 23.32 | 36.00 | Pass | | |
| HT20 | MCS0 | 2 | 6 | 2437 | 0.25 | 0.25 | 21.20 | 21.65 | 24.44 | 30.00 | 2.00 | 2.00 | 26.44 | 36.00 | Pass | | |
| HT20 | MCS0 | 2 | 10 | 2457 | 0.25 | 0.25 | 19.12 | 18.55 | 21.85 | 30.00 | 2.00 | 2.00 | 23.85 | 36.00 | Pass | | |
| HT20 | MCS0 | 2 | 11 | 2462 | 0.25 | 0.25 | 16.13 | 15.51 | 18.84 | 30.00 | 2.00 | 2.00 | 20.84 | 36.00 | Pass | | |
| HT40 | MCS0 | 2 | 3 | 2422 | 0.39 | 0.39 | 12.72 | 13.23 | 15.99 | 30.00 | 2.00 | 2.00 | 17.99 | 36.00 | Pass | | |
| HT40 | MCS0 | 2 | 4 | 2427 | 0.39 | 0.39 | 13.18 | 13.53 | 16.37 | 30.00 | 2.00 | 2.00 | 18.37 | 36.00 | Pass | | |
| HT40 | MCS0 | 2 | 6 | 2437 | 0.39 | 0.39 | 15.27 | 15.22 | 18.26 | 30.00 | 2.00 | 2.00 | 20.26 | 36.00 | Pass | | |
| HT40 | MCS0 | 2 | 8 | 2447 | 0.39 | 0.39 | 15.21 | 14.65 | 17.95 | 30.00 | 2.00 | 2.00 | 19.95 | 36.00 | Pass | | |
| HT40 | MCS0 | 2 | 9 | 2452 | 0.39 | 0.39 | 14.83 | 14.07 | 17.48 | 30.00 | 2.00 | 2.00 | 19.48 | 36.00 | Pass | | |
| VHT20 | MCS0 | 2 | 1 | 2412 | 0.21 | 0.21 | 14.57 | 14.41 | 17.50 | 30.00 | 2.00 | 2.00 | 19.50 | 36.00 | Pass | | |
| VHT20 | MCS0 | 2 | 2 | 2417 | 0.21 | 0.21 | 18.23 | 18.41 | 21.33 | 30.00 | 2.00 | 2.00 | 23.33 | 36.00 | Pass | | |
| VHT20 | MCS0 | 2 | 6 | 2437 | 0.21 | 0.21 | 21.21 | 21.66 | 24.45 | 30.00 | 2.00 | 2.00 | 26.45 | 36.00 | Pass | | |
| VHT20 | MCS0 | 2 | 10 | 2457 | 0.21 | 0.21 | 19.11 | 18.57 | 21.86 | 30.00 | 2.00 | 2.00 | 23.86 | 36.00 | Pass | | |
| VHT20 | MCS0 | 2 | 11 | 2462 | 0.21 | 0.21 | 16.12 | 15.54 | 18.85 | 30.00 | 2.00 | 2.00 | 20.85 | 36.00 | Pass | | |
| VHT40 | MCS0 | 2 | 3 | 2422 | 0.42 | 0.42 | 12.81 | 13.28 | 16.06 | 30.00 | 2.00 | 2.00 | 18.06 | 36.00 | Pass | | |
| VHT40 | MCS0 | 2 | 4 | 2427 | 0.42 | 0.42 | 13.22 | 13.60 | 16.42 | 30.00 | 2.00 | 2.00 | 18.42 | 36.00 | Pass | | |
| VHT40 | MCS0 | 2 | 6 | 2437 | 0.42 | 0.42 | 15.37 | 15.27 | 18.33 | 30.00 | 2.00 | 2.00 | 20.33 | 36.00 | Pass | | |
| VHT40 | MCS0 | 2 | 8 | 2447 | 0.42 | 0.42 | 15.27 | 14.74 | 18.02 | 30.00 | 2.00 | 2.00 | 20.02 | 36.00 | Pass | | |
| VHT40 | MCS0 | 2 | 9 | 2452 | 0.42 | 0.42 | 14.90 | 14.17 | 17.56 | 30.00 | 2.00 | 2.00 | 19.56 | 36.00 | Pass | | |



<TXBF Mode>

| 2.4GHz Band | | | | | | | | | | | | | | | | | | |
|-------------|-----------|-----|-----|-------------|------------------|-------|-------------------------------|-------|-------|-----------------------------|-------|----------|-------|------------------|-------|------------------------|--|------------|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | | Average Conducted Power (dBm) | | | Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power (dBm) | | EIRP Power Limit (dBm) | | Pass /Fail |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | | |
| VHT20 | MCS0 | 2 | 1 | 2412 | - | - | 14.70 | 14.20 | 17.47 | 30.00 | 5.01 | 22.48 | 36.00 | Pass | | | | |
| VHT20 | MCS0 | 2 | 6 | 2437 | - | - | 19.30 | 19.60 | 22.46 | 30.00 | 5.01 | 27.57 | 36.00 | Pass | | | | |
| VHT20 | MCS0 | 2 | 11 | 2462 | - | - | 16.10 | 15.40 | 18.77 | 30.00 | 5.01 | 23.78 | 36.00 | Pass | | | | |
| VHT40 | MCS0 | 2 | 3 | 2422 | 0.00 | 0.00 | 12.90 | 12.90 | 15.91 | 30.00 | 5.01 | 20.92 | 36.00 | Pass | | | | |
| VHT40 | MCS0 | 2 | 6 | 2437 | 0.00 | 0.00 | 15.30 | 14.80 | 18.07 | 30.00 | 5.01 | 23.08 | 36.00 | Pass | | | | |
| VHT40 | MCS0 | 2 | 9 | 2452 | 0.00 | 0.00 | 14.80 | 13.60 | 17.25 | 30.00 | 5.01 | 22.26 | 36.00 | Pass | | | | |



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

<CDD Modes>

Method AVGPSD-2

1. The testing follows Measurement Procedure 10.5 Method AVGPSD-2 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace average at least 100 traces in power averaging mode.
8. 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. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
9. Measure and record the results in the test report.
10. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add $10 \log(N_{ANT})$ dB.

With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(N_{ANT})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{ANT})$ dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}^{th}$ of the PSD limit .

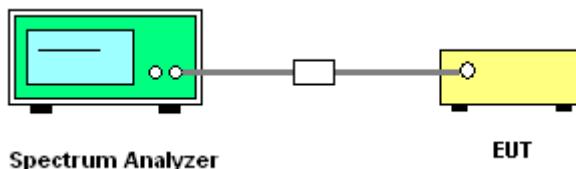
**<TXBF Modes>****Method AVGPSD-3**

1. The testing follows Measurement Procedure 10.7 Method AVGPSD-3 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
9. Measure and record the results in the test report.
10. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add $10 \log(N_{ANT})$ dB.

With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(N_{ANT})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{ANT})$ dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}^{th}$ of the PSD limit .

3.3.4 Test Setup

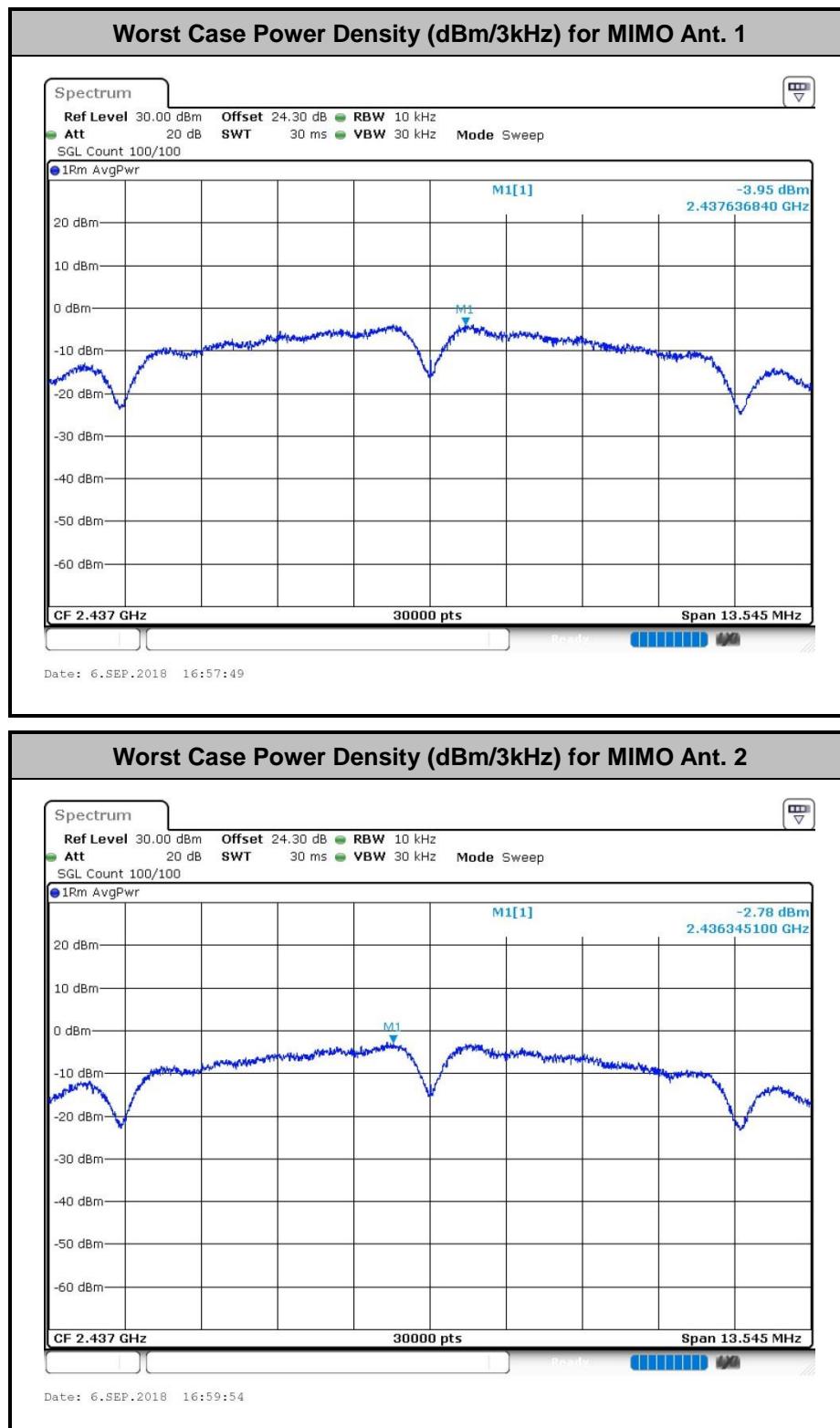




3.3.5 Test Result of Power Spectral Density

<CDD Mode>

| 2.4GHz Band | | | | | | | | | | | | | | |
|-------------|-----------|-----------------|-----|----------------|---------------------|-------|---------------------------|--------|--------------|-------------|-------|---------------------------------|-------|-----------|
| Mod. | Data Rate | N _{TX} | CH. | Freq. (MHz) | Duty Factor (dB) | | Average PSD (dBm/3kHz) | | | DG (dBi) | | Average PSD Limit (dBm/3kHz) | | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Worse + 3.01 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| 11b | 1Mbps | 1 | 1 | 2412 | 0.00 | 0.00 | -1.65 | -8.27 | - | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| 11b | 1Mbps | 1 | 6 | 2437 | 0.00 | 0.00 | -3.69 | -2.75 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| 11b | 1Mbps | 1 | 11 | 2462 | 0.00 | 0.00 | -5.56 | -4.52 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| 11g | 6Mbps | 1 | 1 | 2412 | 0.23 | 0.20 | -10.74 | -12.55 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| 11g | 6Mbps | 1 | 6 | 2437 | 0.23 | 0.20 | -5.78 | -5.84 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| 11g | 6Mbps | 1 | 11 | 2462 | 0.23 | 0.20 | -11.20 | -10.52 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| VHT20 | MCS0 | 1 | 1 | 2412 | 0.26 | 0.25 | -11.29 | -13.81 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| VHT20 | MCS0 | 1 | 6 | 2437 | 0.26 | 0.25 | -4.45 | -5.44 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| VHT20 | MCS0 | 1 | 11 | 2462 | 0.26 | 0.25 | -11.27 | -10.07 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| VHT40 | MCS0 | 1 | 3 | 2422 | 0.38 | 0.38 | -14.54 | -16.72 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| VHT40 | MCS0 | 1 | 6 | 2437 | 0.38 | 0.38 | -13.26 | -13.77 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| VHT40 | MCS0 | 1 | 9 | 2452 | 0.38 | 0.38 | -15.87 | -14.62 | | 2.00 | 2.00 | 8.00 | 8.00 | Pass |
| 11b | 1Mbps | 2 | 1 | 2412 | 0.00 | 0.00 | -10.80 | -10.27 | -7.26 | 5.01 | | 8.00 | | Pass |
| 11b | 1Mbps | 2 | 6 | 2437 | 0.00 | 0.00 | -3.95 | -2.78 | 0.23 | 5.01 | | 8.00 | | Pass |
| 11b | 1Mbps | 2 | 11 | 2462 | 0.00 | 0.00 | -5.54 | -5.51 | -2.50 | 5.01 | | 8.00 | | Pass |
| 11g | 6Mbps | 2 | 1 | 2412 | 0.23 | 0.23 | -10.29 | -13.28 | -7.28 | 5.01 | | 8.00 | | Pass |
| 11g | 6Mbps | 2 | 6 | 2437 | 0.23 | 0.23 | -6.15 | -5.64 | -2.63 | 5.01 | | 8.00 | | Pass |
| 11g | 6Mbps | 2 | 11 | 2462 | 0.23 | 0.23 | -9.78 | -9.24 | -6.23 | 5.01 | | 8.00 | | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | 0.21 | 0.21 | -12.74 | -13.06 | -9.73 | 5.01 | | 8.00 | | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 0.21 | 0.21 | -5.82 | -5.64 | -2.63 | 5.01 | | 8.00 | | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 0.21 | 0.21 | -10.55 | -11.64 | -7.54 | 5.01 | | 8.00 | | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 0.42 | 0.42 | -16.83 | -16.55 | -13.54 | 5.01 | | 8.00 | | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 0.42 | 0.42 | -12.79 | -13.63 | -9.78 | 5.01 | | 8.00 | | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 0.42 | 0.42 | -16.14 | -16.19 | -13.13 | 5.01 | | 8.00 | | Pass |



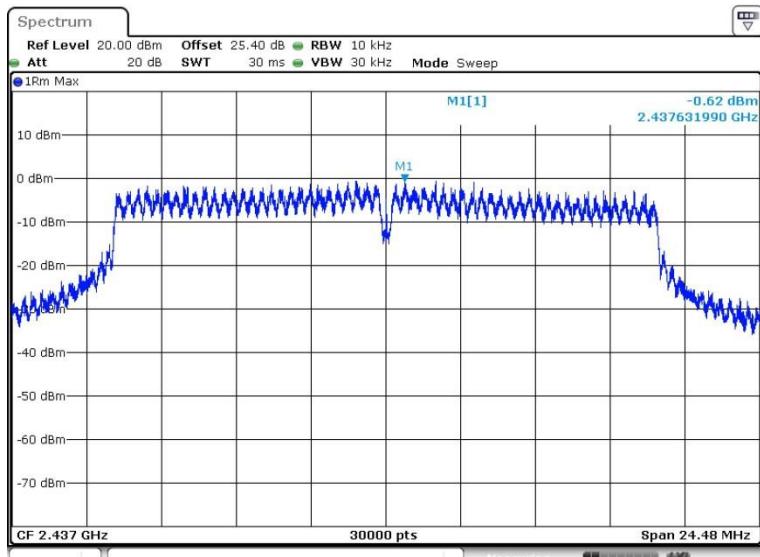


<TXBF Modes>

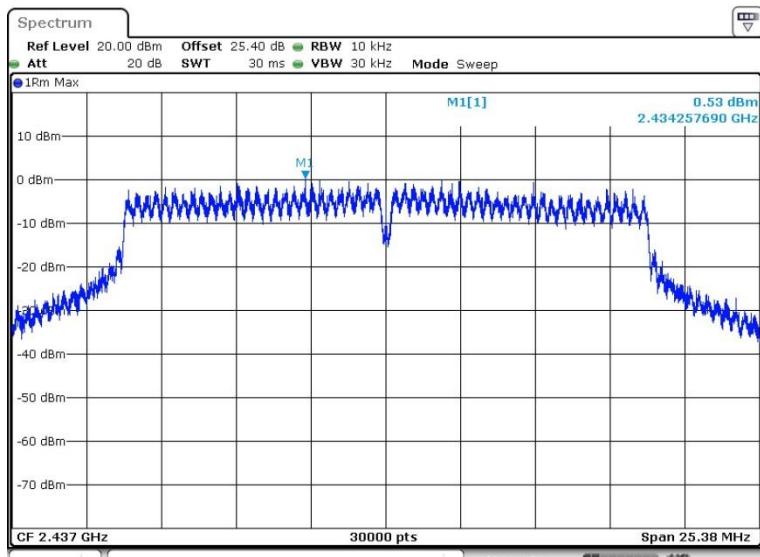
| 2.4GHz Band | | | | | | | | | | | | | | |
|-------------|-----------|-----|-----|-------------|------------------|-------|------------------------|--------|--------------|----------|-------|------------------------------|-------|-----------|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | | Average PSD (dBm/3kHz) | | | DG (dBi) | | Average PSD Limit (dBm/3kHz) | | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Worse + 3.01 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| VHT20 | MCS0 | 2 | 1 | 2412 | 0.00 | 0.00 | -5.94 | -5.26 | -2.25 | 5.01 | 5.01 | 8.00 | 8.00 | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 0.00 | 0.00 | -0.62 | 0.53 | 3.54 | 5.01 | 5.01 | 8.00 | 8.00 | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 0.00 | 0.00 | -3.50 | -3.57 | -0.49 | 5.01 | 5.01 | 8.00 | 8.00 | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 0.00 | 0.00 | -9.63 | -10.62 | -6.62 | 5.01 | 5.01 | 8.00 | 8.00 | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 0.00 | 0.00 | -7.17 | -7.21 | -4.16 | 5.01 | 5.01 | 8.00 | 8.00 | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 0.00 | 0.00 | -8.32 | -8.43 | -5.31 | 5.01 | 5.01 | 8.00 | 8.00 | Pass |



Worst Case Power Density (dBm/3kHz) for MIMO Ant. 1



Worst Case Power Density (dBm/3kHz) for MIMO Ant. 2





3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

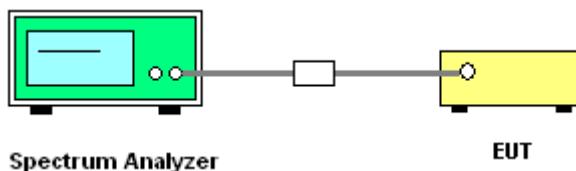
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



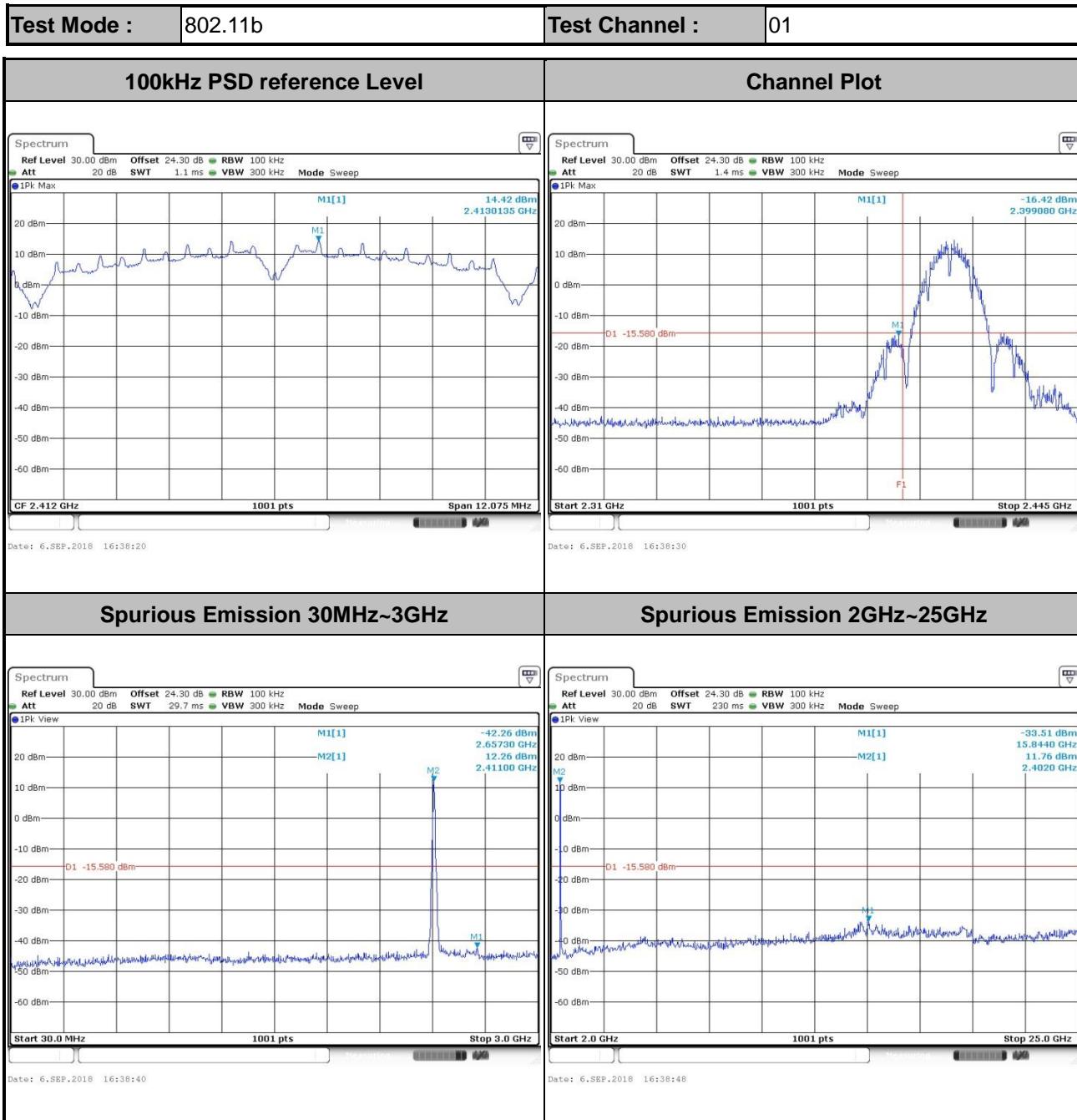


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

| | | | |
|------------------------|--|----------------------------|---------|
| Test Engineer : | Shiming Liu, Derek Hsu, Aking Chang, Luffy Lin, Kai Liao, and Allen Lin | Temperature : | 21~25°C |
| | | Relative Humidity : | 51~54% |

<CDD Mode>

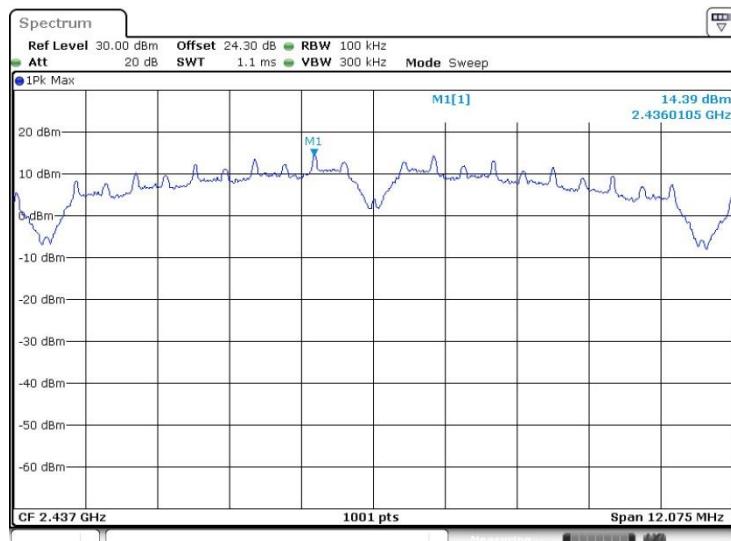
Number of TX = 1, Ant. 1 (Measured)



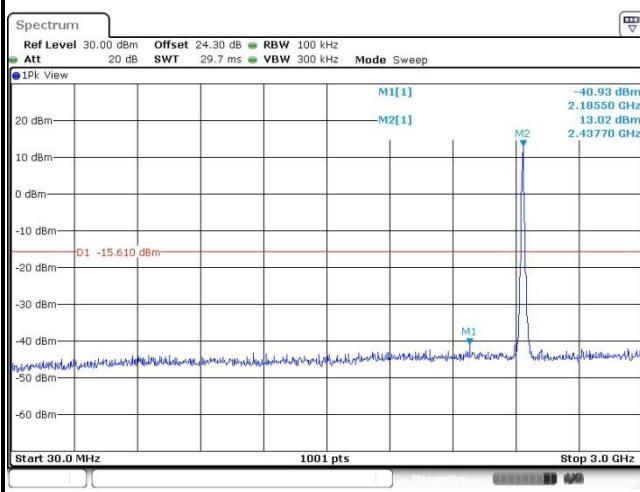


| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11b | Test Channel : | 06 |
|-------------|---------|----------------|----|

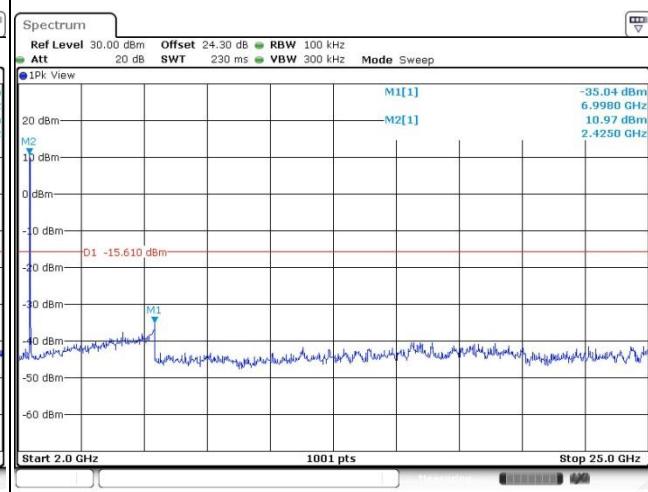
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz

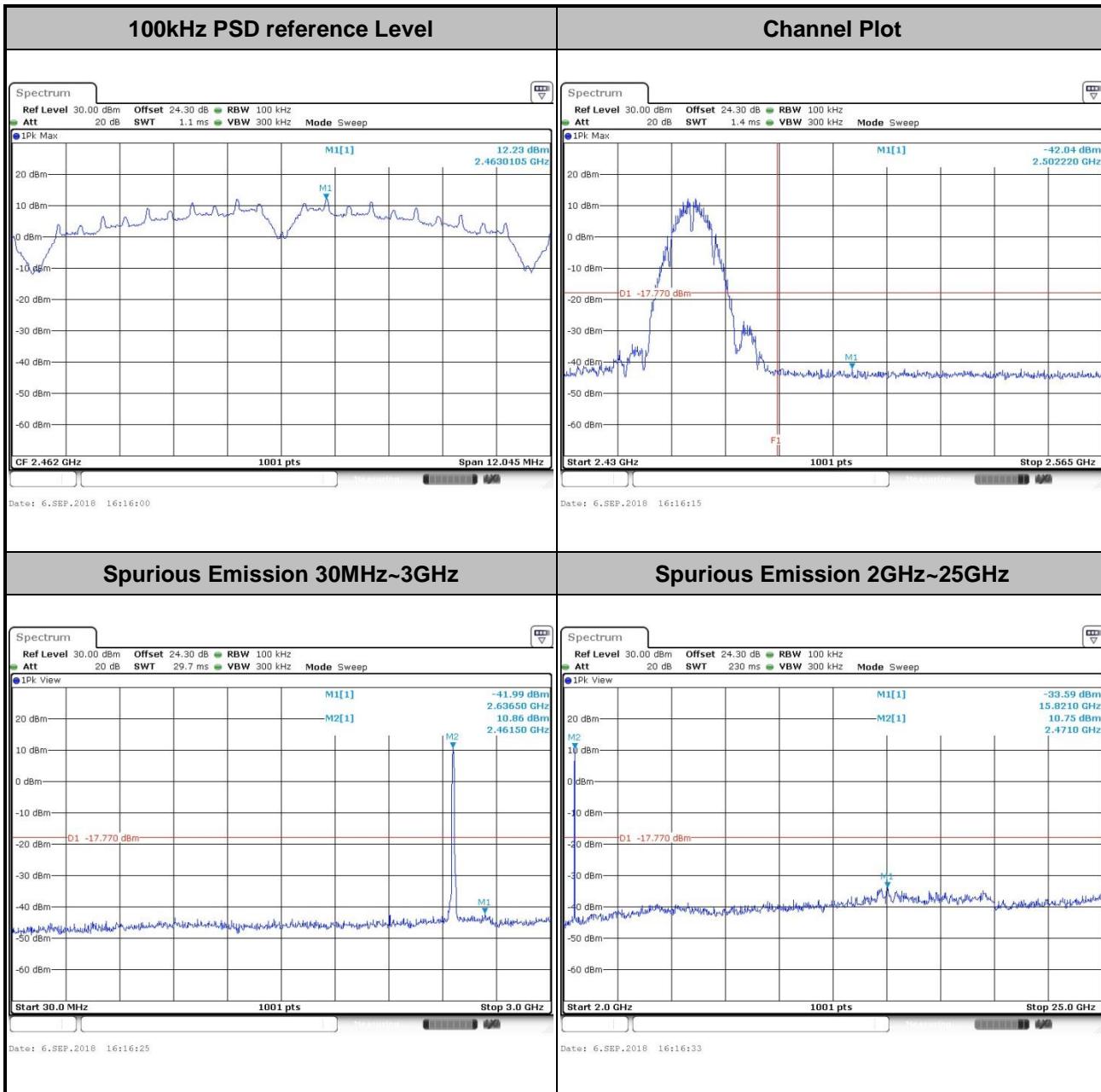


Spurious Emission 2GHz~25GHz



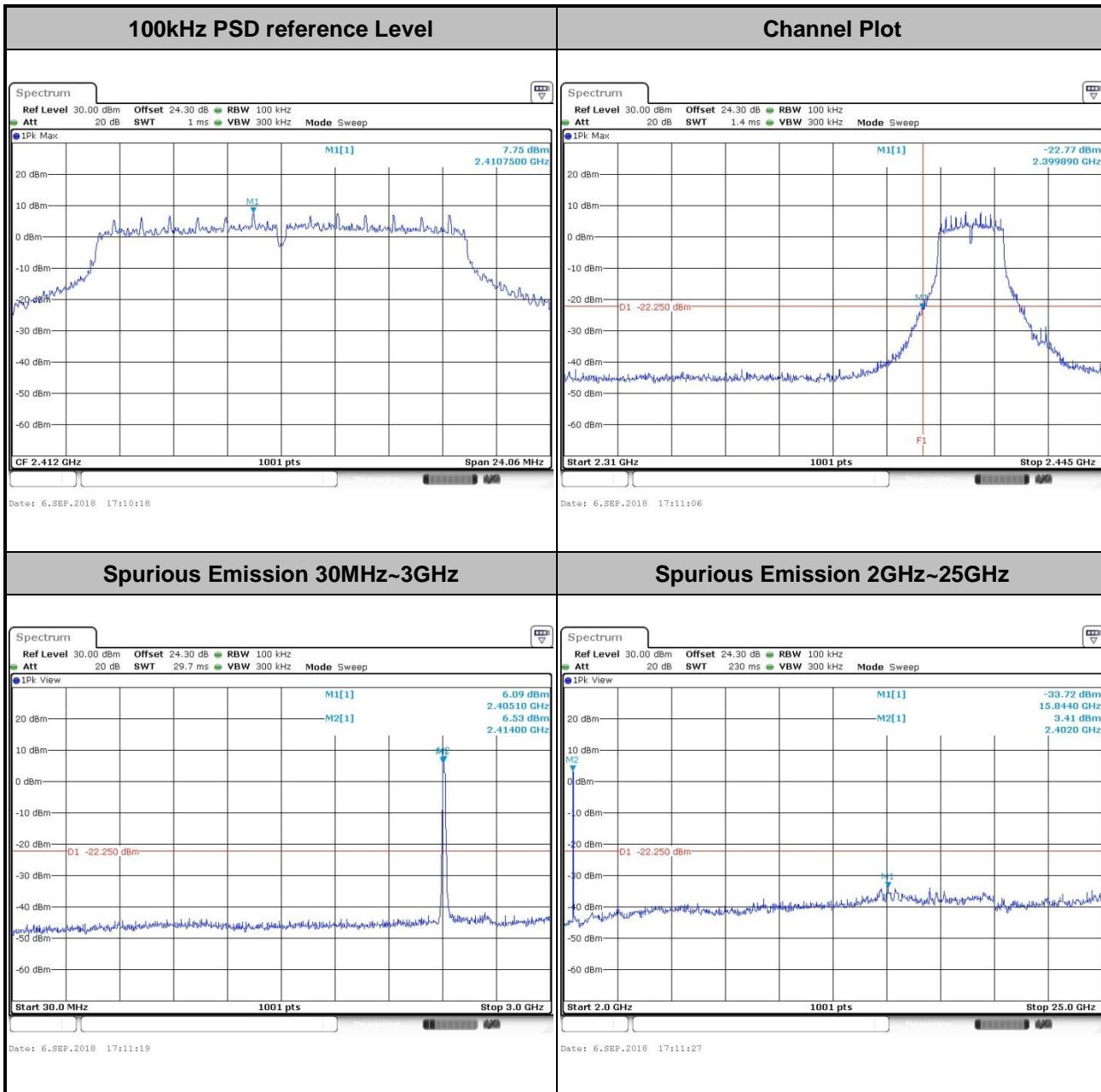


| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11b | Test Channel : | 11 |
|-------------|---------|----------------|----|





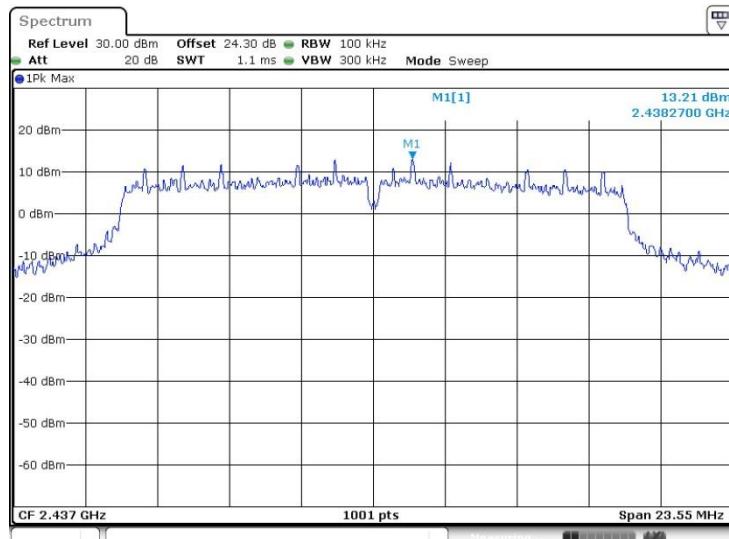
| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11g | Test Channel : | 01 |
|-------------|---------|----------------|----|



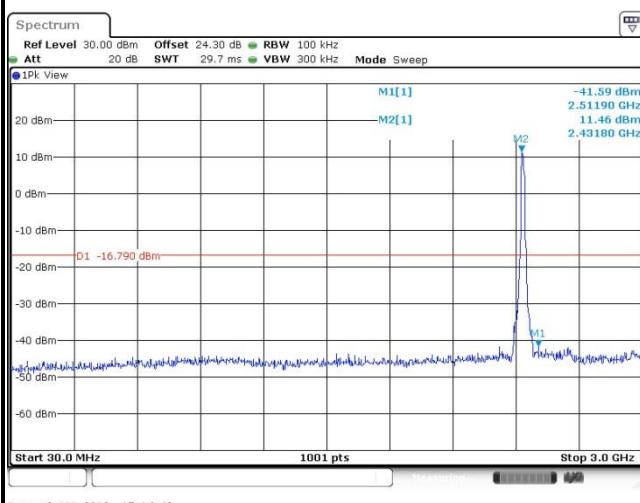


| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11g | Test Channel : | 06 |
|-------------|---------|----------------|----|

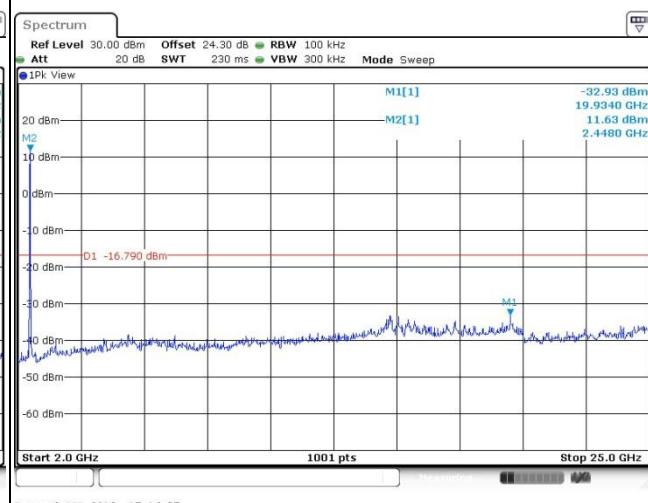
100kHz PSD reference Level

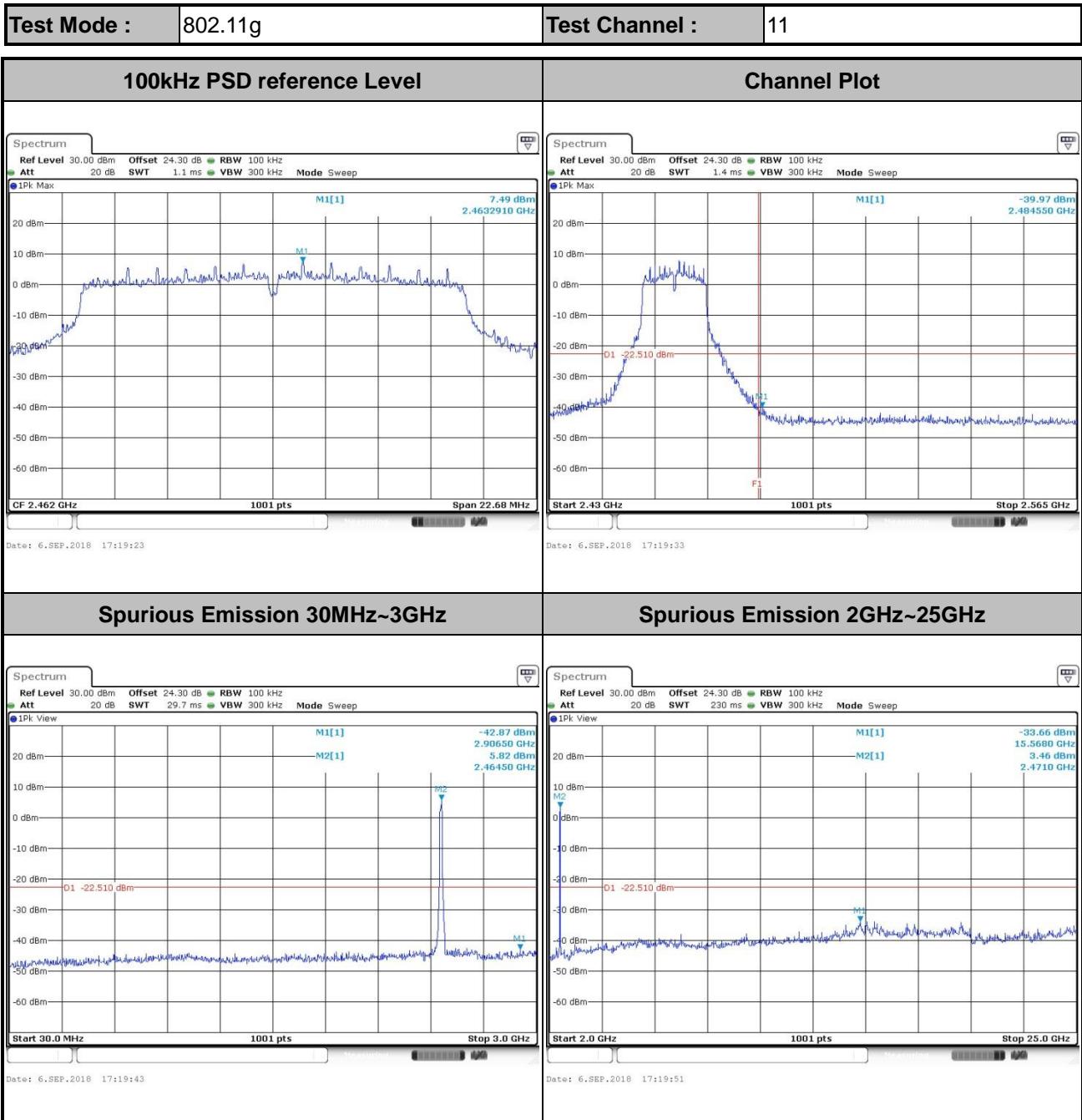


Spurious Emission 30MHz~3GHz



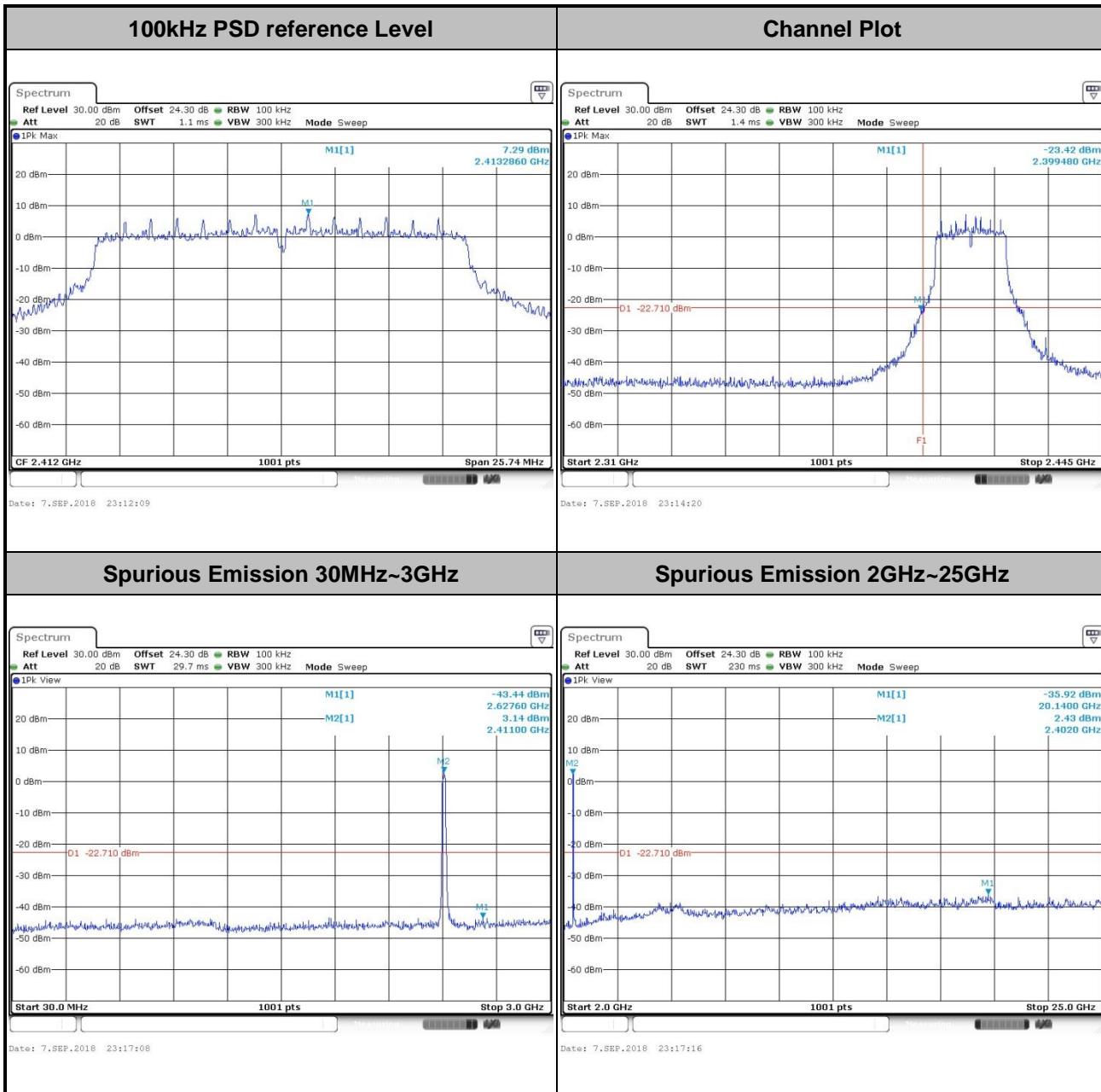
Spurious Emission 2GHz~25GHz







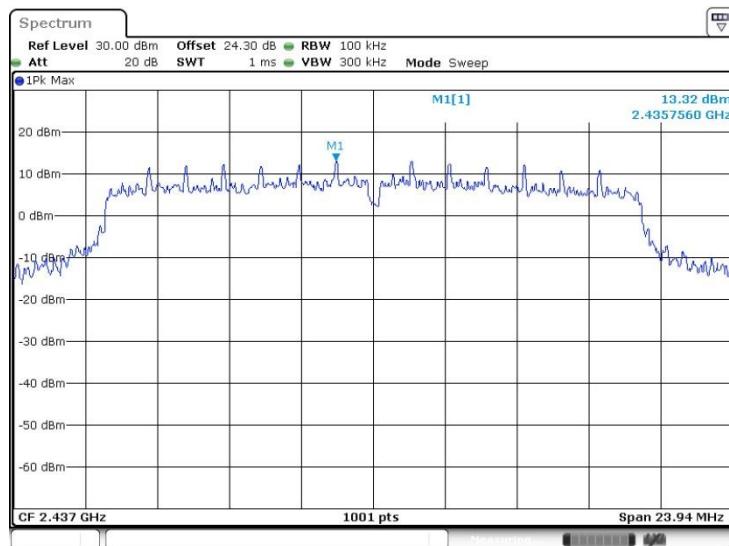
| | | | |
|-------------|----------------|----------------|----|
| Test Mode : | 802.11ac VHT20 | Test Channel : | 01 |
|-------------|----------------|----------------|----|





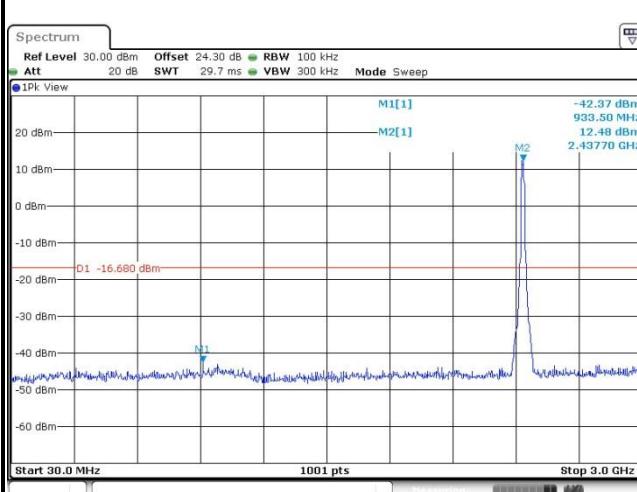
| | | | |
|-------------|----------------|----------------|----|
| Test Mode : | 802.11ac VHT20 | Test Channel : | 06 |
|-------------|----------------|----------------|----|

100kHz PSD reference Level



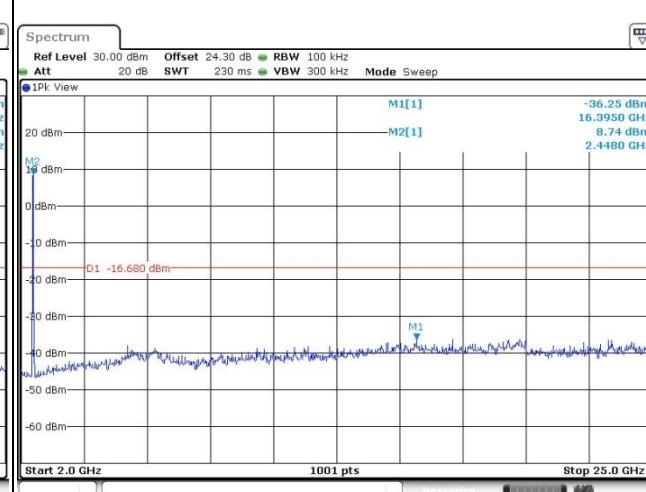
Date: 7.SEP.2018 23:20:56

Spurious Emission 30MHz~3GHz

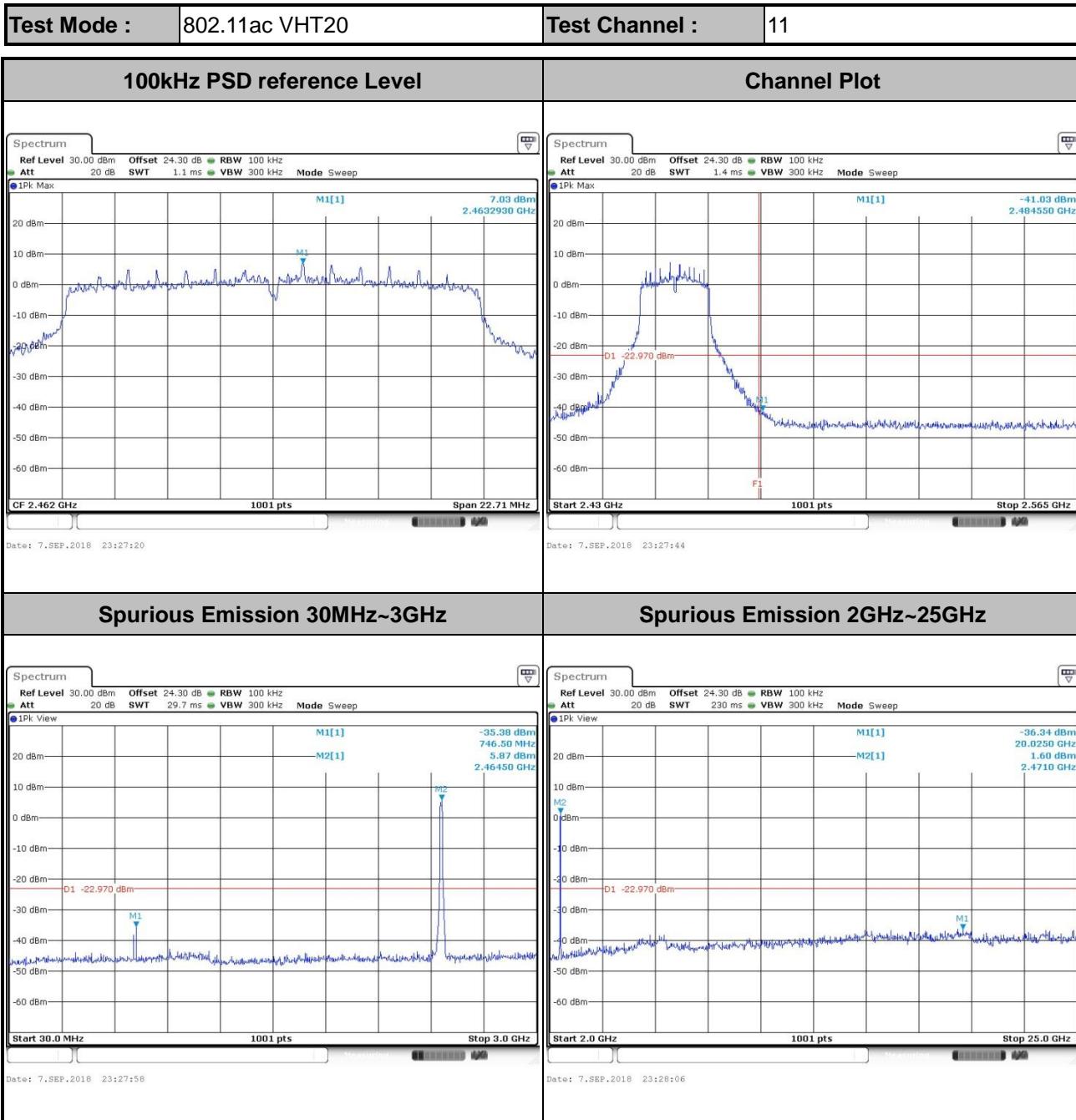


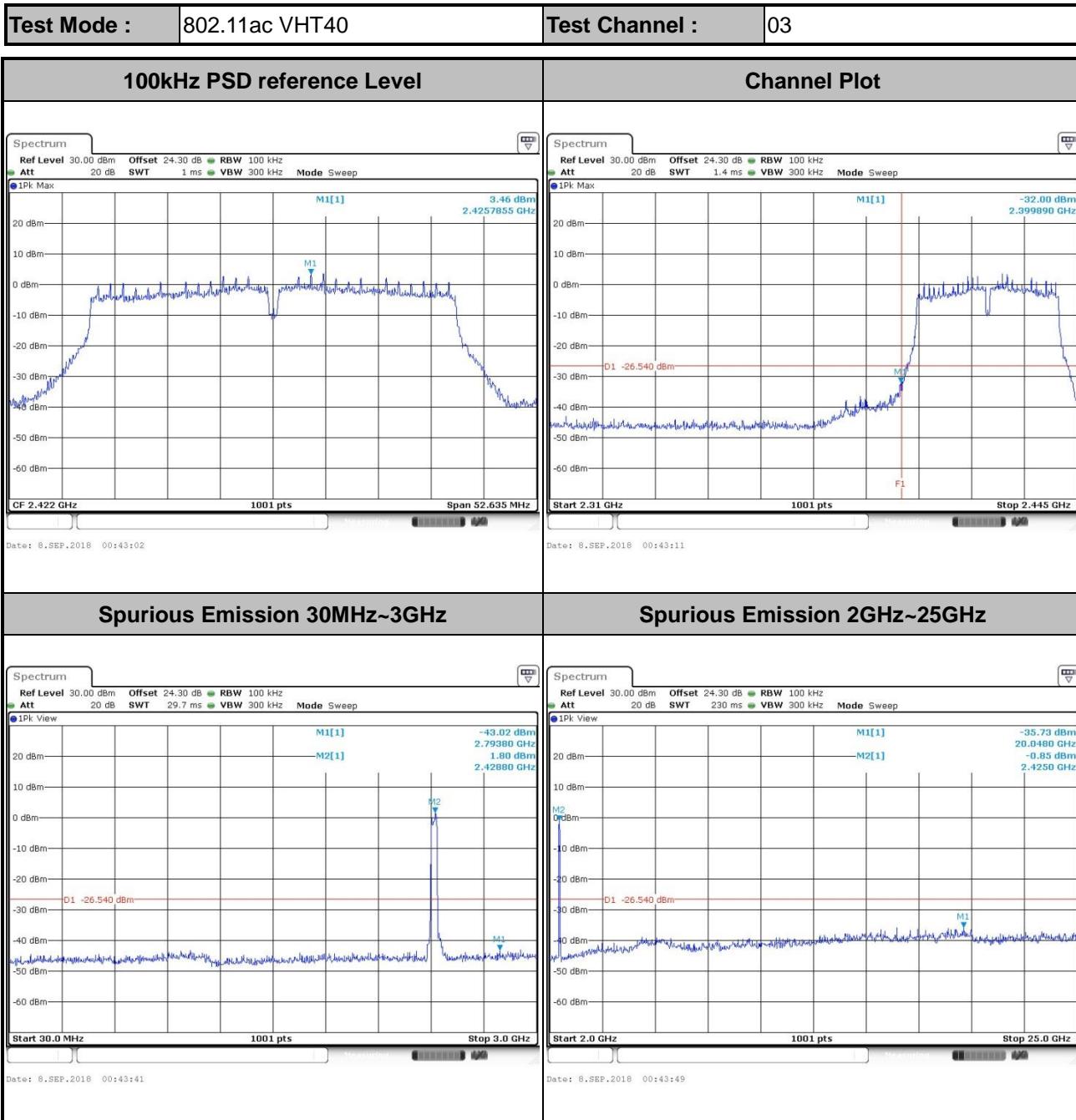
Date: 7.SEP.2018 23:21:09

Spurious Emission 2GHz~25GHz



Date: 7.SEP.2018 23:21:17





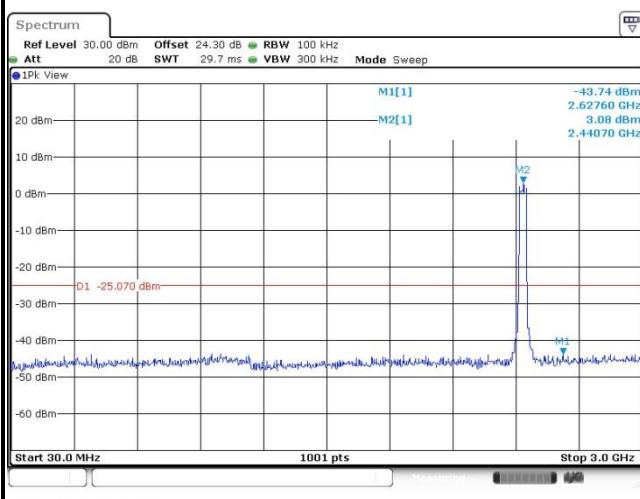


| | | | |
|-------------|----------------|----------------|----|
| Test Mode : | 802.11ac VHT40 | Test Channel : | 06 |
|-------------|----------------|----------------|----|

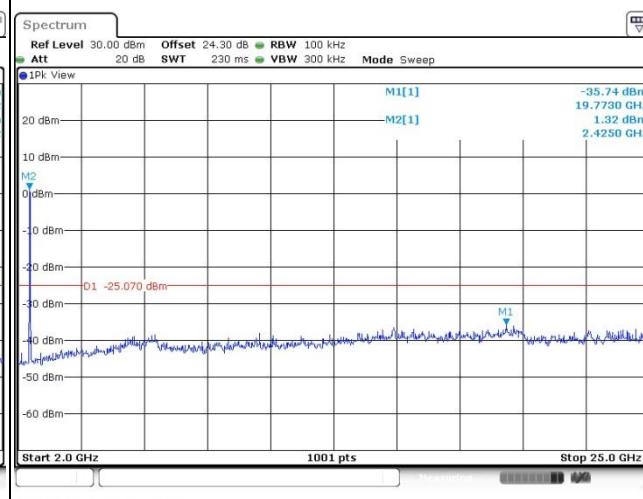
100kHz PSD reference Level

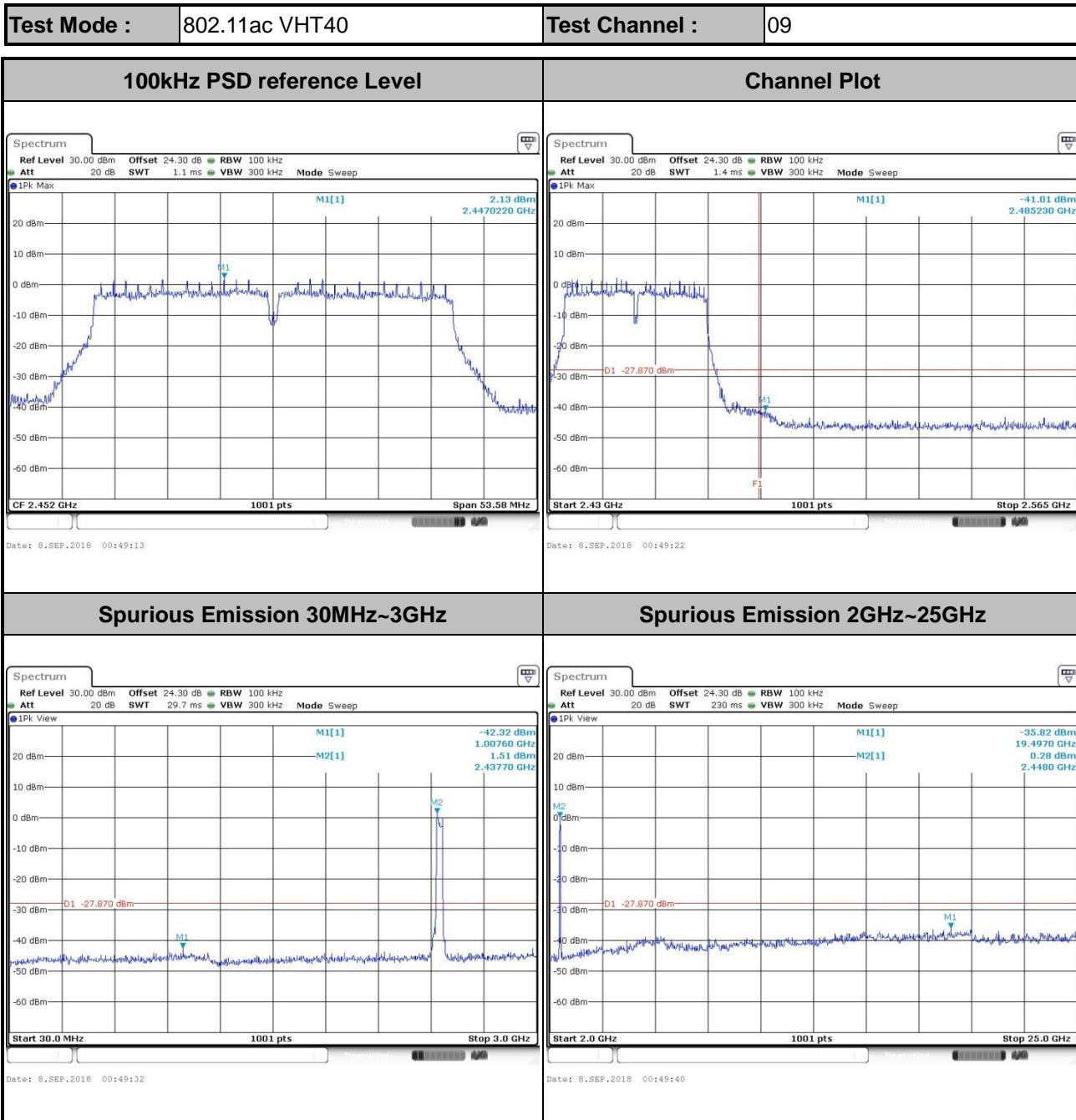


Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz

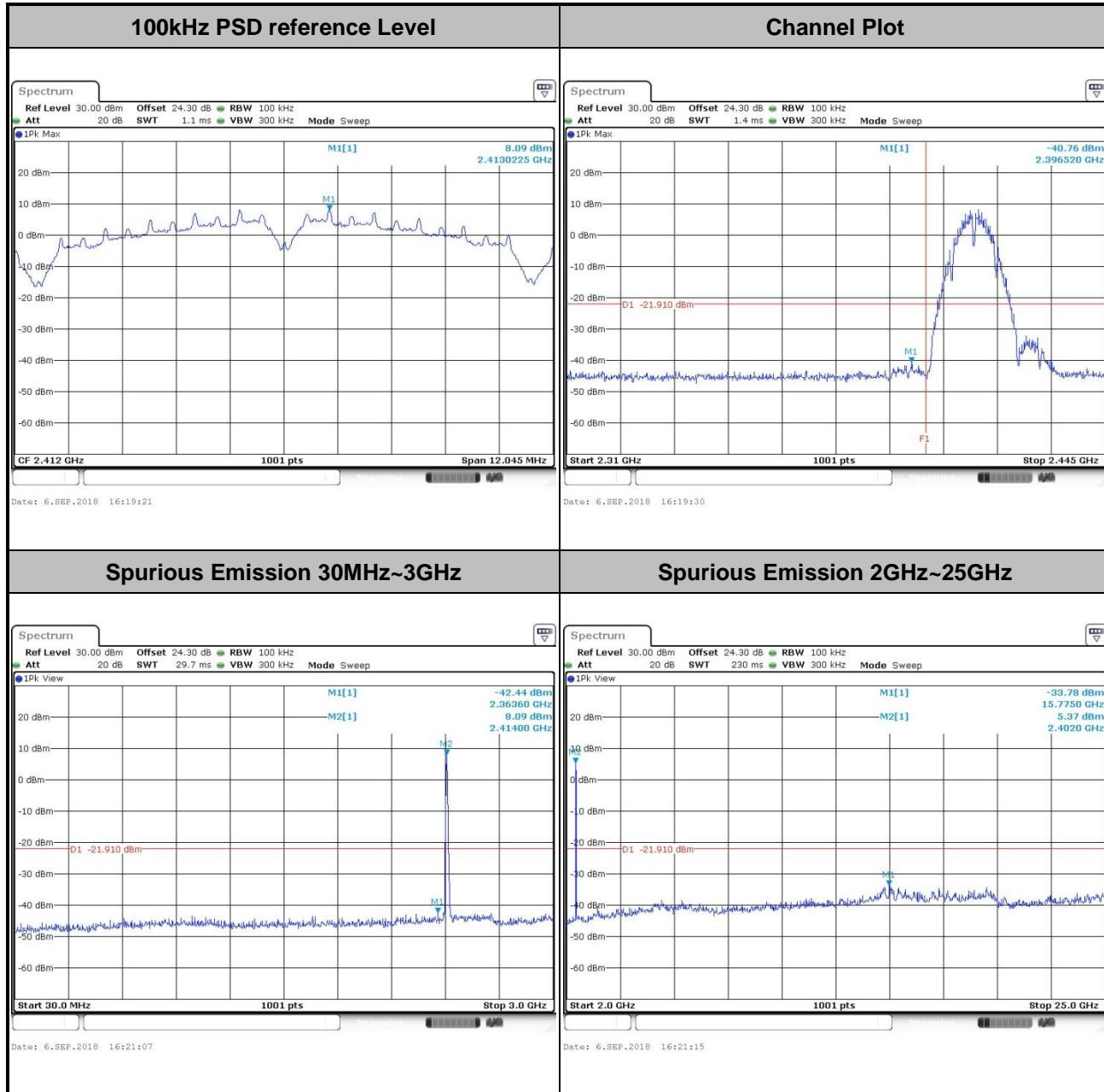






Number of TX = 1, Ant. 2 (Measured)

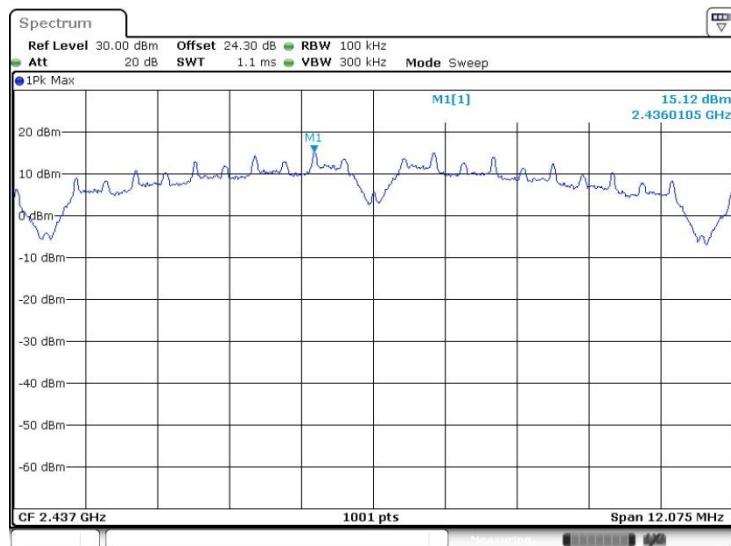
| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11b | Test Channel : | 01 |
|-------------|---------|----------------|----|



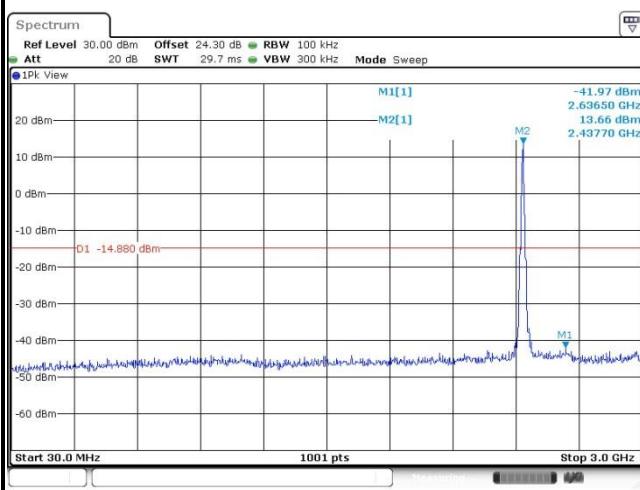


| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11b | Test Channel : | 06 |
|-------------|---------|----------------|----|

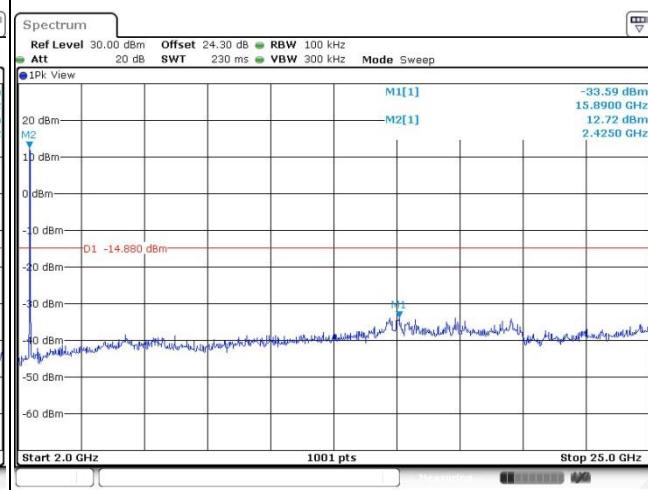
100kHz PSD reference Level

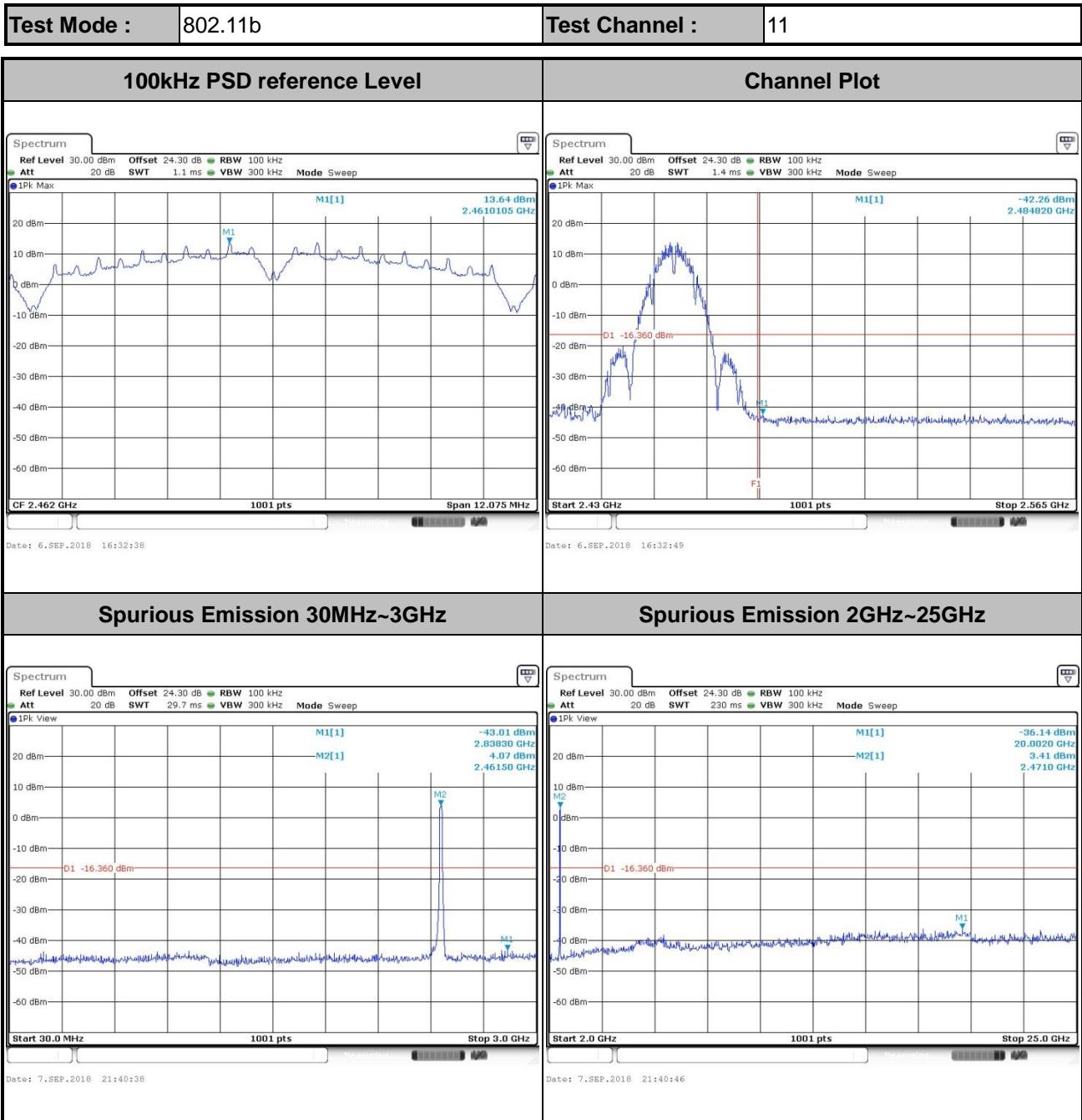


Spurious Emission 30MHz~3GHz



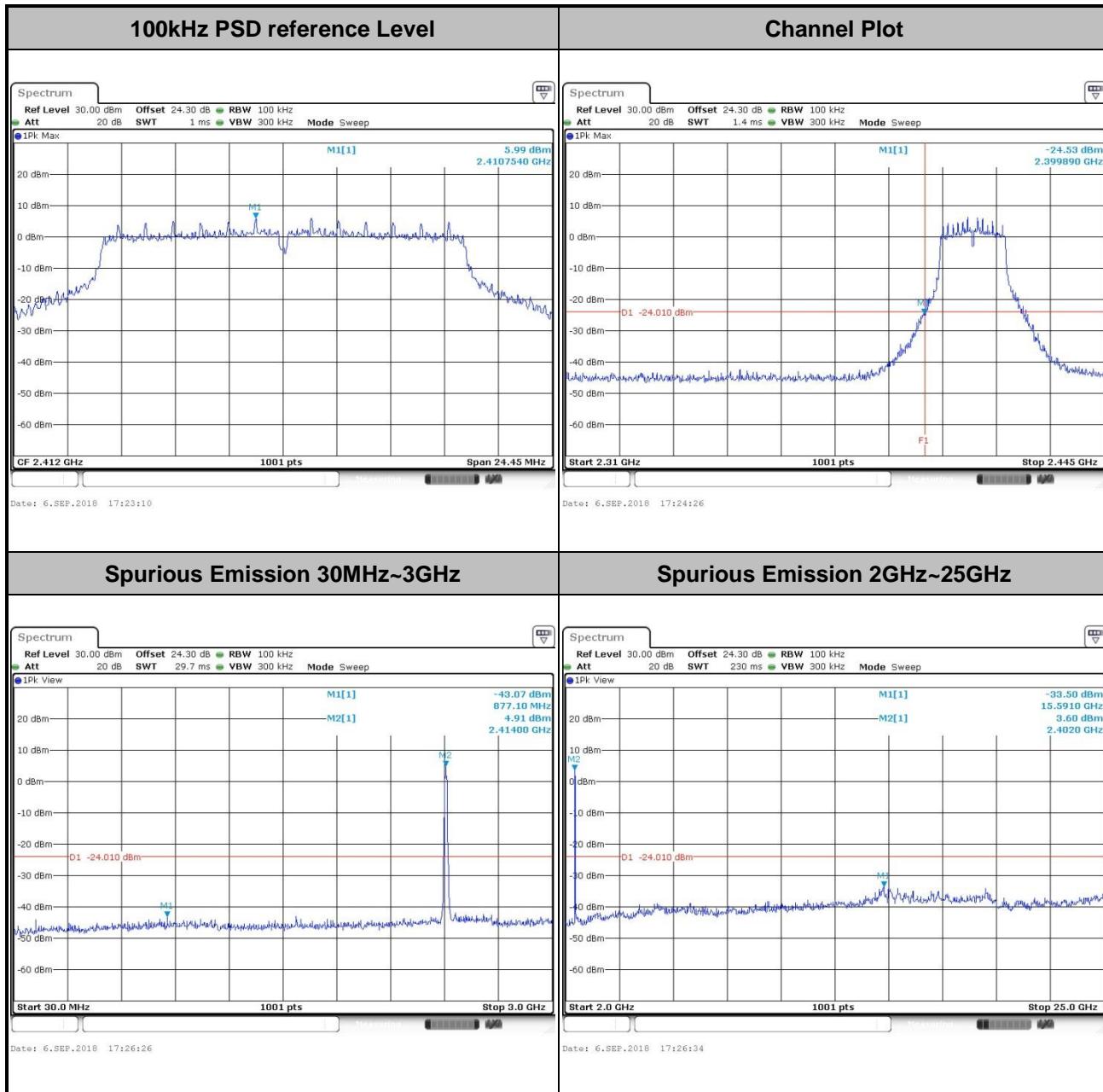
Spurious Emission 2GHz~25GHz







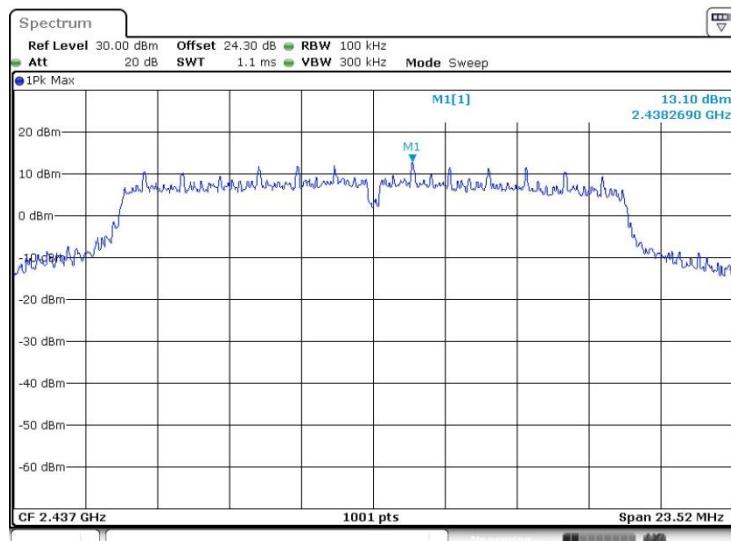
| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11g | Test Channel : | 01 |
|-------------|---------|----------------|----|



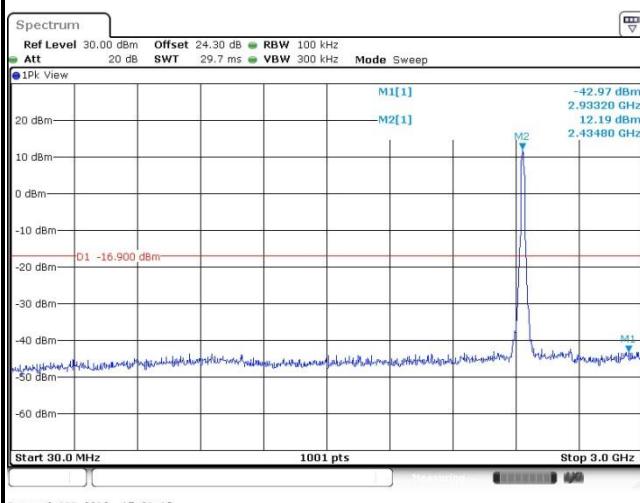


| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11g | Test Channel : | 06 |
|-------------|---------|----------------|----|

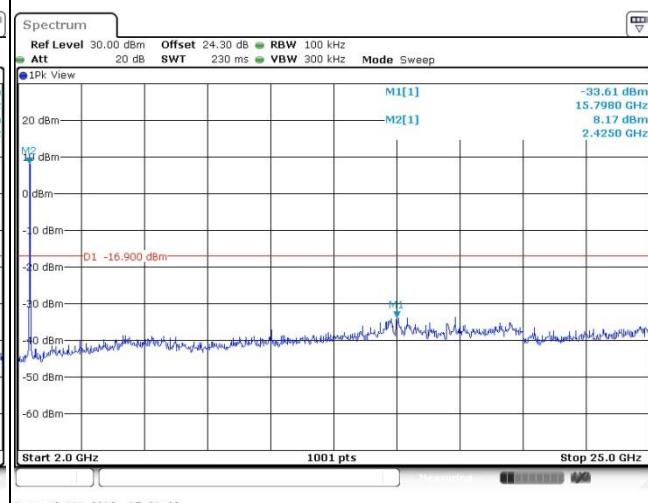
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz





| | | | |
|-------------|---------|----------------|----|
| Test Mode : | 802.11g | Test Channel : | 11 |
|-------------|---------|----------------|----|

