



FCC RADIO TEST REPORT

FCC ID : B94HNI32CTKR
Equipment : Notebook Computer
Brand Name : HP
Model Name : HSN-I32C
Applicant : HP Inc.
3390 East Harmony Road, Fort Collins,
Colorado, United States 80528
Standard : FCC 47 CFR Part 2, 22(H), 24(E), 27

The product was received on Apr. 16, 2020 and testing was started from Apr. 25, 2020 and completed on May 21, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E 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 partial 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.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|---|---|--------------------|----------|
| - | §2.1046 | Conducted Output Power | - | See Note |
| | §22.913 (a)(2) | Effective Radiated Power (Band 5) | - | |
| | §27.50 (c)(10) | Effective Radiated Power (Band 12) | | |
| | §24.232 (c) §27.50 (h)(2) | Equivalent Isotropic Radiated Power (Band 2) (Band 7) (Band 41) | | |
| | §27.50 (d)(4) | Equivalent Isotropic Radiated Power (Band 66) | | |
| - | §24.232 (d) §27.50 (d)(5) | Peak-to-Average Ratio | | - |
| - | §2.1049 | Occupied Bandwidth | - | See Note |
| - | §2.1051 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h) | Conducted Band Edge Measurement (Band 2) (Band 5) (Band 12) (Band 66) | - | See Note |
| | §2.1051 §27.53 (m)(4) | Conducted Band Edge Measurement (Band 7) (Band 41) | | |
| - | §2.1051 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h) | Conducted Spurious Emission (Band 2) (Band 5) (Band 12) (Band 66) | - | See Note |
| | §2.1051 §27.53 (m)(4) | Conducted Spurious Emission (Band 7) (Band 41) | | |
| - | §2.1055 §22.355 §24.235 §27.54 | Frequency Stability Temperature & Voltage | - | See Note |



| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|---|--|--------------------|--|
| 3.2 | §2.1053 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h) | Radiated Spurious Emission (Band 2) (Band 5) (Band 12) (Band 66) | Pass | Under limit 10.91 dB at 8010.000 MHz |
| | §2.1051 §27.53 (m)(4) | Radiated Spurious Emission (Band 7) (Band 41) | | |

Note: The module (Model: T99W175) makes no difference after verifying output power, this report reuses test data from the module report.

| |
|--|
| Declaration of Conformity: |
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| Comments and Explanations: |
| The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification. |

Reviewed by: Wii Chang

Report Producer: Tina Chuang



1 General Description

1.1 Product Feature of Equipment Under Test

WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, and GNSS.

| Product Specification subjective to this standard | |
|---|--|
| Antenna Type | WWAN <Ant. 1>: PIFA Antenna <Ant. 2>: PIFA Antenna (Rx only) <Ant. 3>: PIFA Antenna (Rx only) <Ant. 4>: PIFA Antenna WLAN <Ant. 1>: PIFA Antenna <Ant. 2>: PIFA Antenna Bluetooth: PIFA Antenna GPS/Glonass/BDS/Galileo: PIFA Antenna |



| WWAN Antenna Information NB Mode | | | |
|--|-------------|--------------|-------------------------------|
| Antenna Part Number | Manufacture | Antenna Type | Peak Gain (dBi) |
| Tx1/ Rx1 Antenna AUF6Y-100023 (6036B0269201) | AWAN | PIFA | 699-715MHz -4.53 dBi (peak) |
| | | | 703-748MHz -2.93 dBi (peak) |
| | | | 758-803MHz -2.38 dBi (peak) |
| | | | 814-849MHz -0.89 dBi (peak) |
| | | | 1710-1785MHz 2.45 dBi (peak) |
| | | | 1850-1915MHz 1.79 dBi (peak) |
| | | | 2300-2400MHz 2.04 dBi (peak) |
| | | | 2500-2570MHz 0.18 dBi (peak) |
| | | | 2496-2690MHz 0.41 dBi (peak) |
| | | | 3300~4200MHz -2.06 dBi (peak) |
| Tx2/ Rx4 Antenna AUP6Y-100063 (6036B0269401) | AWAN | PIFA | 1710-1785MHz 1.68 dBi (peak) |
| | | | 1850-1915MHz 1.77 dBi (peak) |
| | | | 2300-2400MHz -4.02 dBi (peak) |
| | | | 2500-2570MHz -2.50 dBi (peak) |
| | | | 2496-2690MHz 0.07 dBi (peak) |
| | | | 3300~4200MHz 0.28 dBi (peak) |

| WWAN Antenna Information Tablet Mode | | | |
|--|-------------|--------------|-------------------------------|
| Antenna Part Number | Manufacture | Antenna Type | Peak Gain (dBi) |
| Tx1/ Rx1 Antenna AUF6Y-100023 (6036B0269201) | AWAN | PIFA | 699-715MHz -7.42 dBi (peak) |
| | | | 703-748MHz -5.99 dBi (peak) |
| | | | 758-803MHz -5.25 dBi (peak) |
| | | | 814-849MHz -3.38 dBi (peak) |
| | | | 1710-1785MHz -1.40 dBi (peak) |
| | | | 1850-1915MHz -1.15 dBi (peak) |
| | | | 2300-2400MHz -4.79 dBi (peak) |
| | | | 2500-2570MHz -5.30 dBi (peak) |
| | | | 2496-2690MHz -5.71 dBi (peak) |
| | | | 3300~4200MHz -1.18 dBi (peak) |
| Tx2/ Rx4 Antenna AUP6Y-100063 (6036B0269401) | AWAN | PIFA | 1710-1785MHz 0.41 dBi (peak) |
| | | | 1850-1915MHz 0.36 dBi (peak) |
| | | | 2300-2400MHz -6.56 dBi (peak) |
| | | | 2500-2570MHz -6.15dBi (peak) |
| | | | 2496-2690MHz -6.47 dBi (peak) |
| | | | 3300~4200MHz -3.25 dBi (peak) |

1.2 Modification of EUT

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



1.3 Testing Location

| | |
|--------------------|---|
| Test Site | SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory |
| Test Site Location | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855 |
| Test Site No. | Sporton Site No. 03CH15-HY |
| Test Engineer | Leo Lee, Mancy Chou and Bigshow Wang |
| Temperature | 21.3~23.4°C |
| Relative Humidity | 55~61% |

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

FCC Designation No.: TW0007

1.4 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

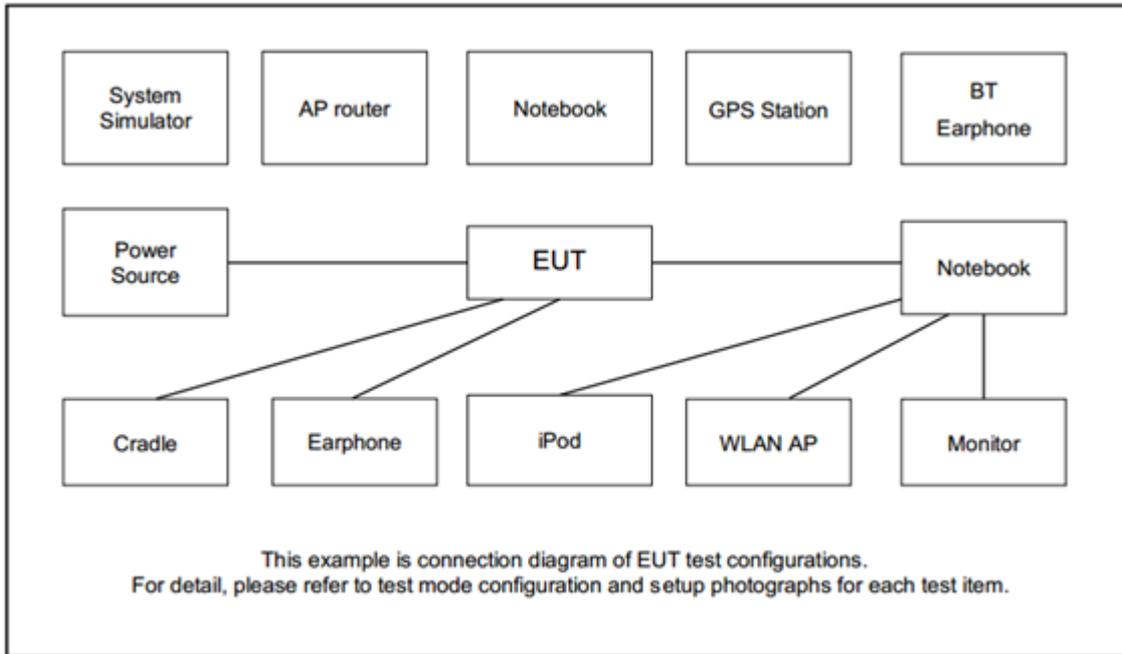
For radiated measurement, pre-scanned in Tablet type (three orthogonal panels, X, Y, Z) and Notebook type. The worst cases (X plane for 5G NR n2 and 5G NR n41 (HPUE); Y Plan for Band 41 (HPUE); Notebook Mode for 5G NR n5 and 5G NR n7) were recorded in this report.

| Test Items | Band | Bandwidth (MHz) | | | | | | Modulation | | | RB # | | | Test Channel | | |
|----------------------------|--|-----------------|---|---|----|----|----|------------|-------|-------|------|------|------|--------------|---|---|
| | | 1.4 | 3 | 5 | 10 | 15 | 20 | QPSK | 16QAM | 64QAM | 1 | Half | Full | L | M | H |
| Radiated Spurious Emission | 41 | - | - | - | - | - | v | v | | | | | v | v | v | v |
| Remark | 1. The mark "v " means that this configuration is chosen for testing 2. The mark "- " means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. | | | | | | | | | | | | | | | |

| Test Items | NR | Bandwidth (MHz) | | | | | Modulation | | | | | RB # | | | Test Channel | | |
|----------------------------|--|-----------------|----|----|----|----|------------|------|-------|-------|--------|------|------|------|--------------|---|---|
| | | 5 | 10 | 15 | 20 | 40 | PI/2 BPSK | QPSK | 16QAM | 64QAM | 256QAM | 1 | Half | Full | L | M | H |
| Radiated Spurious Emission | n2 | - | - | - | v | | v | | | | | v | | | v | v | v |
| | n5 | - | - | - | v | | v | | | | | v | | | v | v | v |
| | n7 | - | - | - | v | - | v | | | | | v | | | v | v | v |
| Remark | 1. The mark "v " means that this configuration is chosen for testing 2. The mark "- " means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. Test combination is EN-DC 5A-n2A, EN-DC 2A-n5A, EN-DC 5A-n7A 5. For radiated measurement, pre-scanned in two modes, DFT-s OFDM and CP OFDM. The worst cases (DFT-s OFDM) were recorded in this report. | | | | | | | | | | | | | | | | |

| Test Items | NR | Bandwidth (MHz) | | | | | | | Modulation | | | | | RB # | | | Test Channel | | | |
|----------------------------|---|-----------------|----|----|----|----|----|-----|------------|------|-------|-------|--------|------|------|------|--------------|---|---|---|
| | | 20 | 40 | 50 | 60 | 80 | 90 | 100 | PI/2 BPSK | QPSK | 16QAM | 64QAM | 256QAM | 1 | Half | Full | L | M | H | |
| Radiated Spurious Emission | n41 | - | - | - | - | - | - | v | v | | | | | | v | | | v | v | v |
| Remark | 1. The mark "v " means that this configuration is chosen for testing 2. The mark "- " means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. For radiated measurement, pre-scanned in two modes, DFT-s OFDM and CP OFDM. The worst cases (DFT-s OFDM) were recorded in this report. 5. The 5G NR n41 test items make the EUT get into the FTM modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals. | | | | | | | | | | | | | | | | | | | |

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|------|------------------|------------|-----------|--------------|------------------|-------------------|
| 1. | System Simulator | Anritsu | MT8821C | N/A | N/A | Unshielded, 1.8 m |
| 2. | iPod Earphone | Apple | N/A | Verification | Unshielded, 1.0m | N/A |



2.4 Frequency List of Low/Middle/High Channels

| LTE Band 41 Channel and Frequency List | | | | |
|--|------------------------|--------|--------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 20 | Channel | 39750 | 40620 | 41490 |
| | Frequency | 2506.0 | 2593.0 | 2680.0 |
| 15 | Channel | 39725 | 40620 | 41515 |
| | Frequency | 2503.5 | 2593.0 | 2682.5 |
| 10 | Channel | 39700 | 40620 | 41540 |
| | Frequency | 2501.0 | 2593.0 | 2685.0 |
| 5 | Channel | 39675 | 40620 | 41565 |
| | Frequency | 2498.5 | 2593.0 | 2687.5 |

| 5G NR n2 Channel and Frequency List | | | | |
|-------------------------------------|------------------------|--------|--------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 20 | Channel | 372000 | 376000 | 380000 |
| | Frequency | 1860.0 | 1880.0 | 1900.0 |
| 15 | Channel | 371500 | 376000 | 380500 |
| | Frequency | 1857.5 | 1880.0 | 1902.5 |
| 10 | Channel | 371000 | 376000 | 381000 |
| | Frequency | 1855.0 | 1880.0 | 1905.0 |
| 5 | Channel | 370500 | 376000 | 381500 |
| | Frequency | 1852.5 | 1880.0 | 1907.5 |

| 5G NR n5 Channel and Frequency List | | | | |
|-------------------------------------|------------------------|--------|--------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 20 | Channel | 166800 | 167300 | 167800 |
| | Frequency | 834.0 | 836.5 | 839.0 |
| 15 | Channel | 166300 | 167300 | 168300 |
| | Frequency | 831.5 | 836.5 | 841.5 |
| 10 | Channel | 165800 | 167300 | 168800 |
| | Frequency | 829.0 | 836.5 | 844.0 |
| 5 | Channel | 165300 | 167300 | 169300 |
| | Frequency | 826.5 | 836.5 | 846.5 |



| 5G NR n7 Channel and Frequency List | | | | |
|-------------------------------------|------------------------|--------|--------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 20 | Channel | 502000 | 507000 | 512000 |
| | Frequency | 2510.0 | 2535.0 | 2560.0 |
| 15 | Channel | 501500 | 507000 | 512500 |
| | Frequency | 2507.5 | 2535.0 | 2562.5 |
| 10 | Channel | 501000 | 507000 | 513000 |
| | Frequency | 2505.0 | 2535.0 | 2565.0 |
| 5 | Channel | 500500 | 507000 | 513500 |
| | Frequency | 2502.5 | 2535.0 | 2567.5 |

| 5G NR n41 Channel and Frequency List | | | | |
|--------------------------------------|------------------------|---------|---------|---------|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 100 | Channel | 509202 | 518598 | 528000 |
| | Frequency | 2546.01 | 2592.99 | 2640.00 |
| 90 | Channel | 508200 | 518598 | 528996 |
| | Frequency | 2541.00 | 2592.99 | 2644.98 |
| 80 | Channel | 507204 | 518598 | 529998 |
| | Frequency | 2536.02 | 2592.99 | 2649.99 |
| 60 | Channel | 505200 | 518598 | 531996 |
| | Frequency | 2526.00 | 2592.99 | 2659.98 |
| 50 | Channel | 504204 | 518598 | 532998 |
| | Frequency | 2521.02 | 2592.99 | 2664.99 |
| 40 | Channel | 503202 | 518598 | 534000 |
| | Frequency | 2516.01 | 2592.99 | 2670.00 |
| 20 | Channel | 501204 | 518598 | 535998 |
| | Frequency | 2506.02 | 2592.99 | 2679.99 |

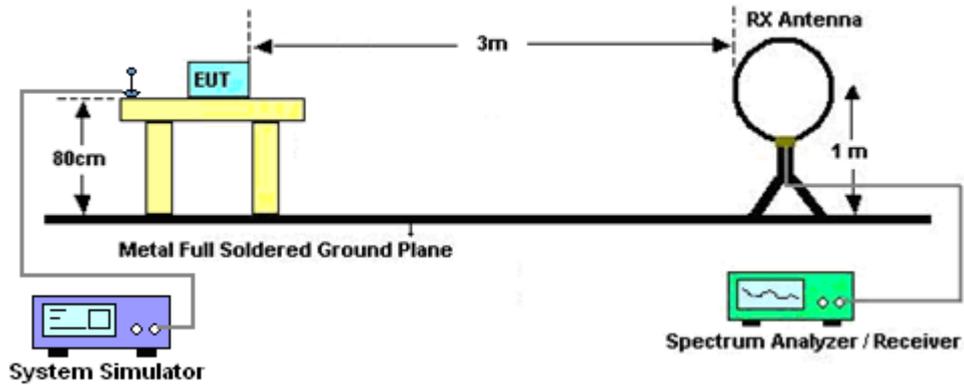
3 Radiated Test Items

3.1 Measuring Instruments

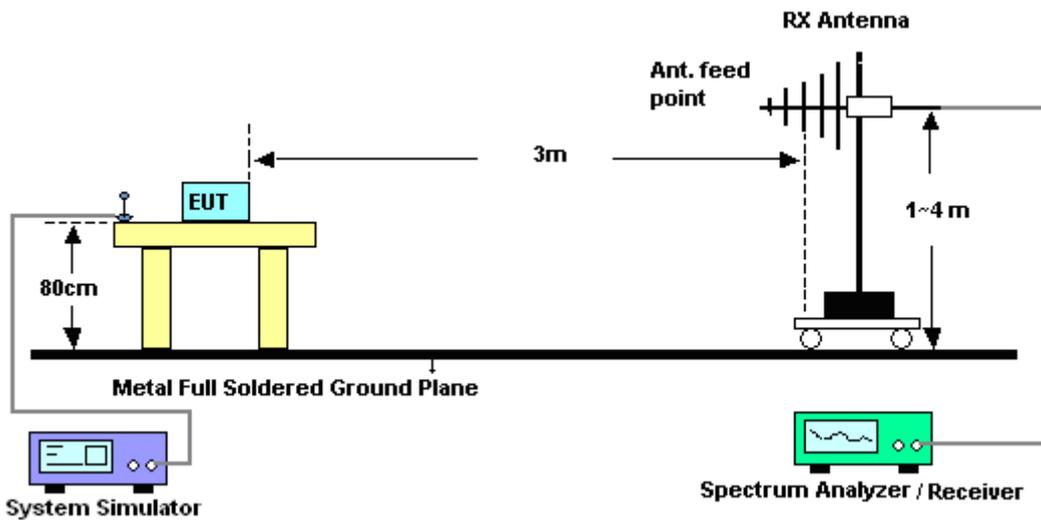
See list of measuring instruments of this test report.

3.1.1 Test Setup

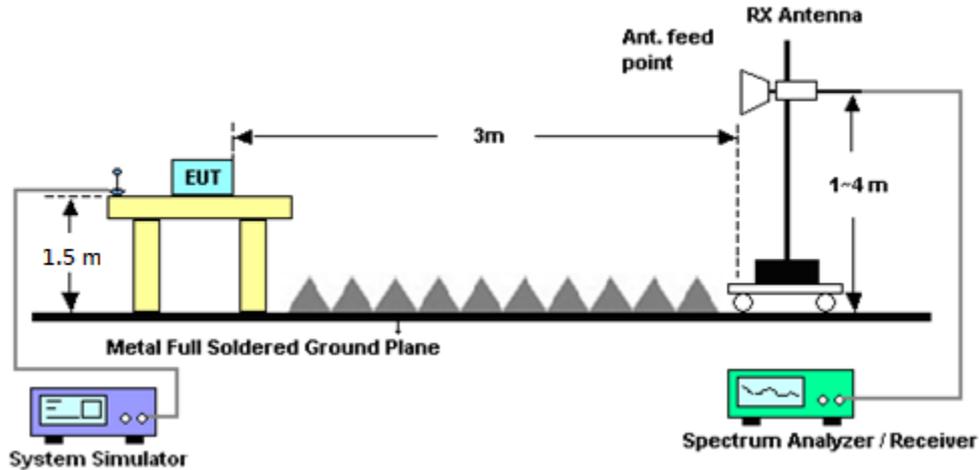
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



3.2 Radiated Spurious Emission Measurement

3.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For LTE Band 7, 41

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

For LTE Band 7, 41

The limit line is derived from $55 + 10\log(P)$ dB below the transmitter power P(Watts)

$EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$

$ERP \text{ (dBm)} = EIRP - 2.15$



4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|-------------------------|--------------------|--------------------------------------|----------------------|-----------------------------|------------------|--------------------------------|---------------|--------------------------|
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100488 | 9 kHz~30 MHz | Jan. 09, 2020 | Apr. 25, 2020~ May 21, 2020 | Jan. 08, 2021 | Radiation (03CH15-HY) |
| Bilog Antenna | TESEQ | CBL6111D&00 800N1D01N-0 6 | 41912&05 | 30MHz to 1GHz | Feb. 09, 2020 | Apr. 25, 2020~ May 21, 2020 | Feb. 08, 2021 | Radiation (03CH15-HY) |
| Horn Antenna | SCHWARZBE CK | BBHA 9120 D | 9120D-2114 | 1-18GHz | Jul. 31, 2019 | Apr. 25, 2020~ May 21, 2020 | Jul. 30, 2020 | Radiation (03CH15-HY) |
| SHF-EHF Horn Antenna | SCHWARZBE CK | BBHA 9170 | BBHA917058 4 | 18GHz- 40GHz | Dec. 10, 2019 | Apr. 25, 2020~ May 21, 2020 | Dec. 09, 2020 | Radiation (03CH15-HY) |
| Amplifier | SONOMA | 310N | 363440 | 9kHz~1GHz | Dec. 27, 2019 | Apr. 25, 2020~ May 21, 2020 | Dec. 26, 2020 | Radiation (03CH15-HY) |
| Preamplifier | Jet-Power | JPA0118-55-3 03 | 1710001800 055007 | 1GHz~18GHz | Mar. 31, 2020 | Apr. 25, 2020~ May 21, 2020 | Mar. 30, 2021 | Radiation (03CH15-HY) |
| Preamplifier | Keysight | 83017A | MY53270195 | 1GHz~26.5GHz | Aug. 23, 2019 | Apr. 25, 2020~ May 21, 2020 | Aug. 22, 2020 | Radiation (03CH15-HY) |
| Preamplifier | EMEC | EM18G40G | 060715 | 18GHz ~ 40GHz | Dec. 13, 2019 | Apr. 25, 2020~ May 21, 2020 | Dec. 12, 2020 | Radiation (03CH15-HY) |
| EMI Test Receiver | Keysight | N9038A(MXE) | MY54130085 | 20MHz~8.4GHz | Nov. 01, 2019 | Apr. 25, 2020~ May 21, 2020 | Oct. 31, 2020 | Radiation (03CH15-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESU26 | 100390 | 20Hz~26.5GHz | Feb. 25, 2020 | Apr. 25, 2020~ May 21, 2020 | Feb. 24, 2021 | Radiation (03CH15-HY) |
| Antenna Mast | ChainTek | MBS-520-1 | N/A | 1m~4m | N/A | Apr. 25, 2020~ May 21, 2020 | N/A | Radiation (03CH15-HY) |
| Turn Table | ChainTek | T-200-S-1 | N/A | 0~360 Degree | N/A | Apr. 25, 2020~ May 21, 2020 | N/A | Radiation (03CH15-HY) |
| Software | Audix | E3 6.2009-8-24 (k5) | RK-000451 | N/A | N/A | Apr. 25, 2020~ May 21, 2020 | N/A | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY36980/4 | 30M-18G | Apr. 14, 2020 | Apr. 25, 2020~ May 21, 2020 | Apr. 13, 2021 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY9838/4PE | 30M-18G | Apr. 14, 2020 | Apr. 25, 2020~ May 21, 2020 | Apr. 13, 2021 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY802430/4 | 30M~18GHz | Apr. 14, 2020 | Apr. 25, 2020~ May 21, 2020 | Apr. 13, 2021 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 505134/2 | 30MHz-40GHz | Feb. 25, 2020 | Apr. 25, 2020~ May 21, 2020 | Feb. 24, 2021 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 800740/2 | 30MHz-40GHz | Feb. 25, 2020 | Apr. 25, 2020~ May 21, 2020 | Feb. 24, 2021 | Radiation (03CH15-HY) |
| Filter | Wainwright | WLK4-1000-15 30-8000-40SS | SN4 | 1.53G Low Pass | Jul. 04, 2019 | Apr. 25, 2020~ May 21, 2020 | Jul. 03, 2020 | Radiation (03CH15-HY) |
| Filter | Wainwright | WHKX8-5872. 5-6750-18000- 40ST | SN6 | 6.75GHz High Pass Filter | Jul. 02, 2019 | Apr. 25, 2020~ May 21, 2020 | Jul. 01, 2020 | Radiation (03CH15-HY) |



5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 3.06 |
|---|------|

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 3.63 |
|---|------|

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

| | |
|---|------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 4.16 |
|---|------|



Appendix A. Test Results of Radiated Test

LTE Band 41(HPUE)

| LTE Band 41 / 20MHz / QPSK | | | | | | | | | |
|----------------------------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 4992 | -41.65 | -25 | -16.65 | -36.08 | -52.40 | 1.95 | 12.70 | H |
| | 7488 | -38.94 | -25 | -13.94 | -39.91 | -48.08 | 2.17 | 11.31 | H |
| | 9990 | -49.48 | -25 | -24.48 | -52.49 | -58.26 | 2.43 | 11.21 | H |
| | 4992 | -40.39 | -25 | -15.39 | -34.95 | -51.14 | 1.95 | 12.70 | V |
| | 7488 | -45.20 | -25 | -20.20 | -46.23 | -54.34 | 2.17 | 11.31 | V |
| | 9990 | -47.10 | -25 | -22.10 | -49.44 | -55.88 | 2.43 | 11.21 | V |
| Middle | 5166 | -40.52 | -25 | -15.52 | -35.46 | -51.45 | 1.97 | 12.90 | H |
| | 7752 | -38.73 | -25 | -13.73 | -39.4 | -47.63 | 2.35 | 11.25 | H |
| | 10332 | -48.98 | -25 | -23.98 | -51.82 | -57.48 | 2.57 | 11.07 | H |
| | 5166 | -43.85 | -25 | -18.85 | -38.44 | -54.78 | 1.97 | 12.90 | V |
| | 7752 | -39.15 | -25 | -14.15 | -39.93 | -48.05 | 2.35 | 11.25 | V |
| | 10332 | -48.69 | -25 | -23.69 | -51.18 | -57.19 | 2.57 | 11.07 | V |
| Highest | 5340 | -42.99 | -25 | -17.99 | -37.87 | -54.11 | 1.99 | 13.11 | H |
| | 8010 | -35.91 | -25 | -10.91 | -38.55 | -44.59 | 2.52 | 11.20 | H |
| | 10683 | -49.60 | -25 | -24.60 | -52.49 | -57.94 | 2.63 | 10.96 | H |
| | 5340 | -45.20 | -25 | -20.20 | -40.02 | -56.32 | 1.99 | 13.11 | V |
| | 8010 | -41.06 | -25 | -16.06 | -43.56 | -49.74 | 2.52 | 11.20 | V |
| | 10683 | -49.44 | -25 | -24.44 | -52.48 | -57.78 | 2.63 | 10.96 | V |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



EN-DC 5A-n2A

| EN-DC_5A_n2A / 20MHz / 1RB1 DFT-s-OFDM BPSK | | | | | | | | | |
|---|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 3686 | -44.11 | -13 | -31.11 | -64.34 | -55.15 | 1.41 | 12.45 | H |
| | 5527.08 | -42.18 | -13 | -29.18 | -65.89 | -53.47 | 2.01 | 13.29 | H |
| | 7369.44 | -37.31 | -13 | -24.31 | -65 | -46.52 | 2.22 | 11.43 | H |
| | 3686 | -43.46 | -13 | -30.46 | -63.37 | -54.50 | 1.41 | 12.45 | V |
| | 5527.08 | -40.82 | -13 | -27.82 | -64.67 | -52.11 | 2.01 | 13.29 | V |
| | 7368 | -37.45 | -13 | -24.45 | -64.72 | -46.66 | 2.22 | 11.43 | V |
| Middle | 3742 | -44.90 | -13 | -31.90 | -65.25 | -55.93 | 1.46 | 12.49 | H |
| | 5612 | -41.16 | -13 | -28.16 | -64.82 | -52.44 | 2.00 | 13.28 | H |
| | 7480 | -37.00 | -13 | -24.00 | -64.75 | -46.14 | 2.18 | 11.32 | H |
| | 3742 | -45.01 | -13 | -32.01 | -65.09 | -56.04 | 1.46 | 12.49 | V |
| | 5612 | -41.83 | -13 | -28.83 | -65.79 | -53.11 | 2.00 | 13.28 | V |
| | 7482 | -37.08 | -13 | -24.08 | -64.85 | -46.22 | 2.18 | 11.32 | V |
| Highest | 3784 | -44.93 | -13 | -31.93 | -65.37 | -55.96 | 1.50 | 12.53 | H |
| | 5673 | -41.07 | -13 | -28.07 | -64.8 | -52.34 | 2.00 | 13.27 | H |
| | 7654 | -37.92 | -13 | -24.92 | -64.99 | -46.91 | 2.28 | 11.27 | H |
| | 3782 | -43.59 | -13 | -30.59 | -63.79 | -54.62 | 1.50 | 12.53 | V |
| | 5674 | -39.04 | -13 | -26.04 | -63.05 | -50.31 | 2.00 | 13.27 | V |
| | 7564 | -37.40 | -13 | -24.40 | -64.92 | -46.47 | 2.21 | 11.29 | V |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



EN-DC 2A-n5A

| EN-DC 2A-n5A / 20MHz /1RB1 DFT-s-OFDM BPSK | | | | | | | | | |
|--|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 1648 | -42.88 | -13 | -29.88 | -63.61 | -48.73 | 0.69 | 8.69 | H |
| | 2475 | -38.90 | -13 | -25.90 | -64.51 | -46.57 | 0.95 | 10.77 | H |
| | 3301 | -36.79 | -13 | -23.79 | -64.6 | -45.30 | 1.20 | 11.86 | H |
| | 1648 | -42.91 | -13 | -29.91 | -63.52 | -48.76 | 0.69 | 8.69 | V |
| | 2475 | -38.66 | -13 | -25.66 | -64.26 | -46.33 | 0.95 | 10.77 | V |
| | 3301 | -36.74 | -13 | -23.74 | -64.38 | -45.25 | 1.20 | 11.86 | V |
| Middle | 1656 | -42.01 | -13 | -29.01 | -62.78 | -47.89 | 0.70 | 8.72 | H |
| | 2483 | -38.91 | -13 | -25.91 | -64.51 | -46.59 | 0.95 | 10.78 | H |
| | 3311 | -36.10 | -13 | -23.10 | -63.87 | -44.63 | 1.20 | 11.88 | H |
| | 1656 | -42.71 | -13 | -29.71 | -63.37 | -48.59 | 0.70 | 8.72 | V |
| | 2483 | -38.57 | -13 | -25.57 | -64.15 | -46.25 | 0.95 | 10.78 | V |
| | 3311 | -36.40 | -13 | -23.40 | -63.97 | -44.93 | 1.20 | 11.88 | V |
| Highest | 1660 | -43.06 | -13 | -30.06 | -63.83 | -48.95 | 0.70 | 8.74 | H |
| | 2490 | -38.71 | -13 | -25.71 | -64.32 | -46.40 | 0.95 | 10.79 | H |
| | 3320 | -37.09 | -13 | -24.09 | -64.84 | -45.64 | 1.21 | 11.90 | H |
| | 1660 | -42.38 | -13 | -29.38 | -63.07 | -48.27 | 0.70 | 8.74 | V |
| | 2490 | -39.04 | -13 | -26.04 | -64.61 | -46.73 | 0.95 | 10.79 | V |
| | 3320 | -37.40 | -13 | -24.40 | -64.93 | -45.95 | 1.21 | 11.90 | V |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



EN-DC 5A-n7A

| EN-DC_5A_n7A / 20MHz / 1RB1 DFT-s-OFDM BPSK | | | | | | | | | |
|---|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | ERP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 4986 | -54.08 | -25 | -29.08 | -49.43 | -64.83 | 1.95 | 12.70 | H |
| | 7477.08 | -48.65 | -25 | -23.65 | -49.32 | -57.79 | 2.18 | 11.32 | H |
| | 9972 | -47.10 | -25 | -22.10 | -50.99 | -55.89 | 2.42 | 11.22 | H |
| | 4986 | -54.09 | -25 | -29.09 | -49.57 | -64.84 | 1.95 | 12.70 | V |
| | 7477.08 | -47.22 | -25 | -22.22 | -47.88 | -56.36 | 2.18 | 11.32 | V |
| | 9972 | -48.55 | -25 | -23.55 | -51.83 | -57.34 | 2.42 | 11.22 | V |
| Middle | 5052 | -50.60 | -25 | -25.60 | -46.11 | -61.41 | 1.96 | 12.76 | H |
| | 7578 | -43.40 | -25 | -18.40 | -43.62 | -52.46 | 2.22 | 11.28 | H |
| | 10105 | -46.86 | -25 | -21.86 | -50.6 | -55.54 | 2.47 | 11.16 | H |
| | 5052 | -51.44 | -25 | -26.44 | -46.93 | -62.25 | 1.96 | 12.76 | V |
| | 7578 | -42.19 | -25 | -17.19 | -42.63 | -51.25 | 2.22 | 11.28 | V |
| | 10105 | -47.83 | -25 | -22.83 | -50.19 | -56.51 | 2.47 | 11.16 | V |
| Highest | 5084.72 | -51.51 | -25 | -26.51 | -47.1 | -62.35 | 1.96 | 12.80 | H |
| | 7627.08 | -50.71 | -25 | -25.71 | -50.83 | -59.73 | 2.26 | 11.27 | H |
| | 10170 | -47.77 | -25 | -22.77 | -51.4 | -56.40 | 2.50 | 11.13 | H |
| | 5084.72 | -50.92 | -25 | -25.92 | -46.4 | -61.76 | 1.96 | 12.80 | V |
| | 7627.08 | -49.75 | -25 | -24.75 | -50.09 | -58.77 | 2.26 | 11.27 | V |
| | 10169.44 | -46.71 | -25 | -21.71 | -49.82 | -55.34 | 2.50 | 11.13 | V |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



n41 (HPUE)

| n41 HPUE / 100MHz / 1RB1 DFT-s-OFDM PI/2 BPSK | | | | | | | | | |
|---|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 4994 | -53.52 | -25 | -28.52 | -48.89 | -64.27 | 1.95 | 12.70 | H |
| | 7491 | -50.91 | -25 | -25.91 | -51.58 | -60.05 | 2.17 | 11.31 | H |
| | 9988 | -47.39 | -25 | -22.39 | -51.28 | -56.17 | 2.43 | 11.21 | H |
| | 4994 | -51.15 | -25 | -26.15 | -46.65 | -61.90 | 1.95 | 12.70 | V |
| | 7491 | -50.41 | -25 | -25.41 | -51.16 | -59.55 | 2.17 | 11.31 | V |
| | 9988 | -47.66 | -25 | -22.66 | -50.9 | -56.44 | 2.43 | 11.21 | V |
| Middle | 5088 | -53.56 | -25 | -28.56 | -49.15 | -64.41 | 1.96 | 12.81 | H |
| | 7632 | -50.53 | -25 | -25.53 | -50.65 | -59.54 | 2.26 | 11.27 | H |
| | 10176 | -47.13 | -25 | -22.13 | -50.75 | -55.76 | 2.50 | 11.13 | H |
| | 5088 | -53.45 | -25 | -28.45 | -48.92 | -64.30 | 1.96 | 12.81 | V |
| | 7632 | -50.73 | -25 | -25.73 | -51.07 | -59.74 | 2.26 | 11.27 | V |
| | 10176 | -47.57 | -25 | -22.57 | -50.68 | -56.20 | 2.50 | 11.13 | V |
| Highest | 5184 | -53.70 | -25 | -28.70 | -49.55 | -64.65 | 1.97 | 12.92 | H |
| | 7776 | -50.70 | -25 | -25.70 | -51 | -59.58 | 2.36 | 11.24 | H |
| | 10368 | -46.71 | -25 | -21.71 | -50.02 | -55.18 | 2.58 | 11.05 | H |
| | 5184 | -54.25 | -25 | -29.25 | -49.7 | -65.20 | 1.97 | 12.92 | V |
| | 7776 | -50.66 | -25 | -25.66 | -51.05 | -59.54 | 2.36 | 11.24 | V |
| | 10368 | -47.89 | -25 | -22.89 | -50.89 | -56.36 | 2.58 | 11.05 | V |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.