

> Report No.: AR/2021/5000401 Page: 1 of 37

FCC TEST REPORT

| Application No: | AR/2021/50004 | | | | |
|--------------------------|---|--|--|--|--|
| Applicant: | Xiaomi Communications Co., Ltd. | | | | |
| Address of Applicant | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085 | | | | |
| Manufacturer: | Xiaomi Communications Co., Ltd. | | | | |
| Address of Manufacturer: | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085 | | | | |
| EUT Description: | Mobile Phone | | | | |
| Model No.: | 21081111RG | | | | |
| Trade Mark: | XIAOMI | | | | |
| FCC ID: | 2AFZZ11RG | | | | |
| Standards: | 47 CFR Part 2 47 CFR Part 22 47 CFR Part 27 | | | | |
| Date of Receipt: | 2021/6/10 | | | | |
| Date of Test: | 2021/6/29 to 2021/7/25 | | | | |
| Date of Issue: | 2021/7/27 | | | | |
| Test Result: | PASS * | | | | |

In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Jimin Ling

Simon Ling Wireless Laboratory Manager



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1 Version

| Revision Record | | | | |
|-----------------|---------|-----------|----------|----------|
| Version | Chapter | Date | Modifier | Remark |
| 01 | | 2021/7/27 | | Original |
| | | | | |
| | | | | |

| Authorized for issue by: | |
|--------------------------|--|
| Prepared By | Leah Chen (Leah Chen) / Engineer |
| Checked By | Daniel Wang (Daniel Wang) /Reviewer |



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2 Test Summary

2.1 NR Band N5(ENDC DC_7A-N5A)

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict |
|--|--|---|----------------------------|---------|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §22.913 | FCC: ERP ≤ 7 W | Section 1 of Appendix B | Pass |
| Peak-Average Ratio | | Limit≤13 dB | Section 2 of Appendix B | Pass |
| Modulation Characteristics | §2.1047 | Digital modulation | Section 3 of Appendix B | Pass |
| Bandwidth | §2.1049 | OBW: No limit. EBW: No limit. | Section 4 of Appendix B | Pass |
| Band Edges Compliance | §2.1051, §22.917 | ≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. | Section 5 of Appendix B | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §22.917 | FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges. | Section 6 of Appendix B | Pass |
| Field Strength of Spurious Radiation | §2.1053, §22.917 | FCC: ≤ -13 dBm/100 kHz. | Section 7 of Appendix B | Pass |
| Frequency Stability | §2.1055, §22.355 | ≤ ±2.5ppm. | Section 8 of Appendix B | Pass |
| Remark: For the vero | Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested". | | | |



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2.2 NR Band N7(ENDC DC_5A_N7A)/NR Band N38/NR Band N41(ENDC DC_38A_N41A/ DC_41A_N41A)

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict |
|--|------------------------|--|----------------------------|---------|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §27.50(h) | EIRP ≤ 2W | Section 1 of Appendix B | Pass |
| Peak-Average Ratio | §27.50(a) | ≤13 dB | Section 2 of Appendix B | Pass |
| Modulation Characteristics | §2.1047 | Digital modulation | Section 3 of Appendix B | Pass |
| Bandwidth | §2.1049 | OBW: No limit. EBW: No limit. | Section 4 of Appendix B | Pass |
| Band Edges Compliance | §2.1051, §27.53(m4) | For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. | Section 5 of Appendix B | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §27.53(m) | 9 kHz 9 5 MHz XMHz 10 th harmonics X=Max {6MHz, EBW} | Section 6 of Appendix B | Pass |
| Field Strength of Spurious Radiation | §2.1053, §27.53(m) | 9 kHz 9 5 MHz XMHz 10 th harmonics X=Max {6MHz, EBW} | Section 7 of Appendix B | Pass |
| Frequency Stability | §2.1055, §27.54 | Within authorized bands of operation/frequency block. | Section 8 of Appendix B | Pass |
| Remark: For the verc | lict, the "N/A" denot | es "not applicable", the "N/T" denotes "not | tested". | |



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2.3 NR Band N66(ENDC DC_7A-N66A)

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict | |
|--|--|--|----------------------------|---------|--|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §27.50(d) | EIRP ≤ 1 W | Section 1 of Appendix B | Pass | |
| Peak-Average Ratio | §2.1046, §27.50(d) | Limit≤13 dB | Section 2 of Appendix B | Pass | |
| Modulation Characteristics | §2.1047 | Digital modulation | Section 3 of Appendix B | Pass | |
| Bandwidth | §2.1049 | OBW: No limit. EBW: No limit. | Section 4 of Appendix B | Pass | |
| Band Edges Compliance | §2.1051, §27.53(h) | ≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block. | Section 5 of Appendix B | Pass | |
| Spurious Emission at Antenna Terminals | §2.1051, §27.53(h) | ≤ -13 dBm/1 MHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges. | Section 6 of Appendix B | Pass | |
| Field Strength of Spurious Radiation | §2.1053, §27.53(h) | ≤ -13 dBm/1 MHz. | Section 7 of Appendix B | Pass | |
| Frequency Stability | §2.1055, §27.54 | ≤ ±2.5 ppm. | Section 8 of Appendix B | Pass | |
| Remark: For the verdict, th | Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested". | | | | |



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2.4 NR Band N77/NR Band N78(ENDC DC_2A-N78A/ DC_5A-N78A/ DC_7A-N78A/ DC_38A-N78A/ DC_41A-N78A / DC_66A-N78A)

3700-3980MHz:

| Test Item | FCC Rule No. | Requirements | Test Result | Verdict |
|--|------------------------|---|----------------------------|---------|
| Effective (Isotropic) Radiated Power Output Data | §2.1046, §27.50(j) | EIRP ≤ 1W | Section 1 of Appendix B | Pass |
| Peak-Average Ratio | §27.50(a) | ≤13 dB | Section 2 of Appendix B | Pass |
| Modulation Characteristics | §2.1047 | Digital modulation | Section 3 of Appendix B | Pass |
| Bandwidth | §2.1049 | OBW: No limit. EBW: No limit. | Section 4 of Appendix B | Pass |
| Band Edges Compliance | §2.1051, §27.53(l2) | (2) For mobile operations in the 3700- 3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (I)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. | Section 5 of Appendix B | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §27.53(l) | not exceed -13 dBm/MHz. | Section 6 of Appendix B | Pass |
| Field Strength of Spurious Radiation | §2.1053, §27.53(l) | not exceed -13 dBm/MHz | Section 7 of Appendix B | Pass |
| Frequency Stability | §2.1055, §27.54 | Within authorized bands of operation/frequency block. | Section 8 of Appendix B | Pass |



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| Test Item | FCC Rule No. | Requirements | Test Result | Verdict |
|--|--------------------------|--|----------------------------|---------|
| Remark: For the verd | ict, the "N/A" denc | otes "not applicable", the "N/T" denotes "not t | ested". | |
| 3450-3550MHz: | | | | |
| Test Item | FCC Rule No. | Requirements | Test Result | Verdict |
| Effective (Isotropic) Radiated Power | §2.1046, §27 50(k)(3) | EIRP ≤ 30dBm | Section 1 of | Pass |
| | 321.00(11)(0) | | Аррепаіх в | |
| Peak-Average Ratio | §27.50(k)(4) | FCC: Limit≤13 dB | Section 2 of Appendix B | Pass |
| Bandwidth | §2.1049 | OBW: No limit. | Section 4 of | Pass |
| | 0 | EBW: No limit. | Appendix B | |
| Band Edges Compliance | §2.1051, §27.50(n)(2) | For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. | Section 5 of Appendix B | Pass |
| Spurious Emission at Antenna Terminals | §2.1051, §27.50(n)(2) | For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. | Section 6 of Appendix B | Pass |
| Field Strength of Spurious Radiation | §2.1053, §27.50(n)(2) | For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. | Section 7 of Appendix B | Pass |
| Frequency Stability | §2.1055, §27.54 | Within authorized bands of operation/ frequency block. | Section 8 of Appendix B | Pass |
| Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested". | | | | |



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3 General Information

3.1 Client Information

| Applicant: | Xiaomi Communications Co., Ltd. |
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| Address of Applicant: | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085 |
| Manufacturer: | Xiaomi Communications Co., Ltd. |
| Address of Manufacturer: | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085 |

3.2 Test Location

| Company: | SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. |
|----------------|---|
| Address: | 1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China |
| Post code: | 710086 |
| Test engineer: | Leah Chen,Ken Liu,Andy Yao |



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3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

FCC-Designation Number: CN1271.



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3.4 General Description of EUT

| EUT Description:: | Mobile Phone |
|-------------------|--|
| Model No.: | 21081111RG |
| Trade Mark: | XIAOMI |
| Hardware Version: | P2 |
| Software Version: | MIUI 12.5 |
| Sample Type: | ⊠ Portable Device, □Module |
| Antenna Type: | 🗌 External, 🔀 Integrated |
| Antenna Gain: | N5: -4.08dBi(Ant1); -6.2dBi(Ant3); N7: -1.2dBi(Ant2);2.16dBi(Ant4); 0.1dBi(Ant5); -1.83dBi(Ant8); N38: -1.2dBi(Ant2); -2.16dBi(Ant4); 0.1dBi(Ant5); -1.83dBi(Ant8); N41: -1.2dBi(Ant2); -2.16dBi(Ant4); 0.1dBi(Ant5); -1.83dBi(Ant8); N66: -0.94dBi(Ant2); -2.63dBi(Ant4); -1.5dBi(Ant5); -3.7dBi(Ant8); N77: -1.1dBi(Ant6); -2.65dBi(Ant11); 1.95dBi(Ant12); 0.1dBi(Ant13); N78: -1.3dBi(ANT6); -3.02dBi(Ant11); 1.95dBi(Ant12); 0.1dBi(Ant13); |

Remark: Conduction Power & EIRP of all antennas are tested, and only the worst data is presented

3.5 Test Mode

| Test Mode | Test Modes Description |
|-----------|---------------------------------------|
| NR/TM1 | NR system, DFT-s-Pi/2-BPSK modulation |
| NR/TM2 | NR system, DFT-s-QPSK modulation |
| NR/TM3 | NR system, DFT-s-16QAM modulation |
| NR/TM4 | NR system, DFT-s-64QAM modulation |
| NR/TM5 | NR system, DFT-s-256QAM modulation |
| NR/TM6 | NR system, CP-QPSK modulation |
| NR/TM7 | NR system, CP-16QAM modulation |
| NR/TM8 | NR system, CP-64QAM modulation |
| NR/TM9 | NR system, CP-256QAM modulation |

Remark: The test mode(s) are selected according to relevant radio technology specifications.



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3.6 Test Environment

| Environment Parameter | Selected Values During Tests | | | | |
|-----------------------|------------------------------|-------|--|--|--|
| Relative Humidity | 49% | | | | |
| Atmospheric Pressure: | 102.46 KPa | | | | |
| Temperature | NT 25 °C | | | | |
| | LV | 3.5V | | | |
| Voltage: | NV 3.85V | | | | |
| | HV | 4.35V | | | |

Remark: LV= lower extreme test voltage; NV= nominal voltage HV= upper extreme test voltage; NT= normal temperature

3.7 Technical Specification

| Characteristics | Description | | | | |
|--------------------------------|-------------|--|--------------------------------------|--|--|
| Radio System Type | 🖾 SA 🖾 NSA | | | | |
| | Band | ТХ | RX | | |
| | NR Band N5 | 824 to 849 MHz | 869 to 894 MHz | | |
| | NR Band N7 | 2500 to 2570 MHz | 2620 to 2690 MHz | | |
| Supported Frequency Range | NR Band N38 | 2570 to 2620 MHz | 2570 to 2620 MHz | | |
| | NR Band N41 | 2496 to 2690 MHz | 2496 to 2690 MHz | | |
| | NR Band N66 | 1710 to 1780 MHz | 2110 to 2180 MHz | | |
| | NR Band N77 | 3450 to 3550 MHz 3700 to 3980 MHz | 3450 to 3550 MHz 3700 to 3980 MHz | | |
| | NR Band N78 | 3450 to 3550 MHz | 3450 to 3550 MHz | | |
| | NR Band N5 | SCS 15kHz: ⊠5 MHz; ⊠10 MHz; ⊠15 MHz; ⊠20 MHz; | | | |
| | NR Band N7 | SCS 15kHz: ⊠5 MHz; ⊠10 MHz; ⊠15 MH ⊠20 MHz; ⊠25 MHz; ⊠30 MHz; ⊠40 MH ⊠50 MHz; | | | |
| | NR Band N38 | SCS 30kHz: ⊠20 MHz; ⊠30 MHz; ⊠40 MHz: | | | |
| Supported Channel Bandwidth | NR Band N41 | SCS 30kHz: ⊠20 MHz; ⊠30 MHz; ⊠40 MHz; ⊠50 MHz; ⊠60 MHz;⊠80 MHz; ⊠90 MHz: ⊠100 MHz | | | |
| | NR Band N66 | SCS 15kHz: 🛛 5 MHz; 🖾 10 MHz; 🖾 15 MHz; | | | |
| | NR Band N77 | SCS 30kHz: ⊠20 MHz; ⊠40 MHz; ⊠50 MHz; ⊠60 MHz; ⊠80 MHz; ⊠90 MHz; ⊠ 100 MHz | | | |
| | NR Band N78 | SCS 30kHz: 🛛 20 MHz; 🖂 |]30 MHz; 🖂40 | | |



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| | | MHz; 🛛 50 MHz; 🖾 60 MHz; 🖾 80 MHz; 🖾 |
|------------------------|-------------|--------------------------------------|
| | | 90 MHz; 🖾 100 MHz |
| | | SCS 15kHz: |
| | | 4M48G7D;4M47W7D; |
| | NR Band N5 | 8M94G7D;9M30W7D; |
| | | 13M4G7D;14M2W7D |
| | | 17M8G7D;19M0W7D |
| | | SCS 15kHz: |
| | | 4M47G7D;4M46W7D; |
| | | 8M96G7D;9M28W7D; |
| | NR Band N7 | 13M5G7D;14M1W7D |
| | | 17M9G7D;19M0W7D |
| | | 28M9G7D;28M7W7D |
| | | 38M7G7D;38M7W7D |
| | | 48M3G7D;48M3W7D |
| | | SCS 30kHz: |
| | NR Band N38 | 1/M9G/D;18M3W/D |
| | | 26M9G7D;27M9W7D |
| | | 35M9G7D;38M0W7D |
| | | SCS 30kHz: |
| Designation of | | 17M9G7D;18M3W7D |
| Emissions | | 26M9G7D;27M9W7D |
| (Remark: the necessary | NR Band N41 | 35M8G7D;37M9W7D |
| handwidth of which is | | 45M8G7D;47M5W7D |
| bandwidth of which is | | 57M8G7D;57M7W7D |
| the worst value from | | 77M4G7D;77M6W7D |
| the measured occupied | | 85M9G7D;87M7W7D |
| bandwidths for each | | 96M4G7D;97M4W7D |
| type of channel | | SCS 15kHz: |
| bandwidth | | 4M48G7D;4M46W7D; |
| configuration) | | 8M96G7D;9M30W7D; |
| oorniguration.) | NR Band N66 | 13M4G7D;14M2W7D |
| | | 17M9G7D;19M0W7D |
| | | 28M/G/D;28M6W/D |
| | | 38M9G7D;38M8W7D |
| | | SCS 30kHz: |
| | | 17M9G7D;18M2W7D |
| | | 35M8G7D;37M9W7D |
| | NR Band N77 | 45M/G/D;4/M5W/D |
| | | 5/M8G/D;5/M8W/D |
| | | //M3G/D;//M8W/D |
| | | 85M/G/D;8/M5W/D |
| | | 96M2G7D;97M4W7D |
| | | SCS 30kHz: |
| | | |
| | | |
| | NK Band N/8 | 35M8G/D;3/M9W/D |
| | | |
| | | 57M8G7D;57M8W7D |
| | | 77M1G7D;77M6W7D |



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| 85M7G7D;87M5W7D | |
|-----------------|--|
| 96M2G7D;97M2W7D | |



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3.8 Test Frequencies

3.8.1 Reference test frequencies for NR operating band n5 3.8.1.1 Test frequencies for NR operating band n5 and SCS 15 kHz

| Bandwidth | Range | | Carrier centre | Carrier centre | SS DIOCK SCS | |
|-----------|----------|------|----------------|----------------|--------------|--|
| [INIHZ] | | | [IVIHZ] | [ARFCN] | [KHZ] | |
| 5 | Downlink | Low | 871.5 | 174300 | 15 | |
| | | Mid | 881.5 | 176300 | | |
| | | High | 891.5 | 178300 | | |
| | Uplink | Low | 826.5 | 165300 | - | |
| | | Mid | 836.5 | 167300 | | |
| | | High | 846.5 | 169300 | | |
| 10 | Downlink | Low | 874 | 174800 | 15 | |
| | | Mid | 881.5 | 176300 | | |
| | | High | 889 | 177800 | | |
| | Uplink | Low | 829 | 165800 | - | |
| | | Mid | 836.5 | 167300 | | |
| | | High | 844 | 168800 | | |
| 15 | Downlink | Low | 876.5 | 175300 | 15 | |
| | | Mid | 881.5 | 176300 | | |
| | | High | 886.5 | 177300 | | |
| | Uplink | Low | 831.5 | 166300 | - | |
| | | Mid | 836.5 | 167300 | | |
| | | High | 841.5 | 168300 | | |
| 20 | Downlink | Low | 879 | 175800 | 15 | |
| | | Mid | 881.5 | 176300 | | |
| | | High | 884 | 176800 | | |
| | Uplink | Low | 834 | 166800 | - | |
| | | Mid | 836.5 | 167300 | | |
| | | High | 839 | 167800 | | |



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3.8.2 Reference test frequencies for NR operating band n7 3.8.2.1 Test frequencies for NR operating band n7 and SCS 15 kHz

| 5 Downlink Low 2822.5 524600 15 Mid 2655 531000 - <t< th=""><th>CBW [MHz]</th><th>Range</th><th></th><th>Carrier centre</th><th>Carrier centre</th><th>SS block SCS [kHz]</th></t<> | CBW [MHz] | Range | | Carrier centre | Carrier centre | SS block SCS [kHz] |
|---|-----------|----------|------|----------------|----------------|-----------------------|
| Mid 2655 531000 Uplink Low 2602.5 500500 10 Downlink Low 2267.5 513500 10 Downlink Low 2265 525000 15 10 Downlink Low 2265 531000 - 11 Downlink Low 2265 531000 - 11 Downlink Low 2265 531000 - 11 Downlink Low 2265 531000 - 15 Downlink Low 2262.5 531000 - 15 Downlink Low 2262.5 531000 - 16 Mid 2655 531000 - - 17 Downlink Low 2262.5 512500 - 18 Downlink Low 2655 531000 - 19 Mid 2652.5 531000 - - 19 Mid | 5 | Downlink | Low | 2622.5 | 524500 | 15 |
| High 2687.5 537500 Uplink Low 2502.5 500500 Mid 2535 571300 10 Downlink Low 2262.5 525000 11 Downlink Low 2265 531000 10 Downlink Low 2265 531000 11 Downlink Low 2505 501000 11 Downlink Low 2665 531000 15 Downlink Low 2665 531000 16 High 2685 531000 - 17 Downlink Low 2630 526500 15 18 Downlink Low 2535 531000 - 19 Low 2630 526000 15 20 Downlink Low 2510 526000 15 19 2660 512000 - - - 21 Downlink Low 2635 5270 | | | Mid | 2655 | 531000 | |
| Uplink Low 2502.5 500500 50700 10 Downlink Low 2826 52500 15 10 Downlink Low 2826 52500 15 10 Downlink Low 2825 53700 - 11 Downlink Low 2855 507000 - 11 Downlink Low 2825 53700 - 15 Downlink Low 2825 53100 - 15 Downlink Low 2825.5 53100 - 16 Downlink Low 2825.5 53100 - 15 Downlink Low 2555 511500 - 16 2835 507000 - - - 16 Downlink Low 2510 502000 - 17 Mid 2855 531000 - - 19 Mid 2855 531000 - - <td></td> <td></td> <td>High</td> <td>2687.5</td> <td>537500</td> <td>_</td> | | | High | 2687.5 | 537500 | _ |
| $ \left \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | Uplink | Low | 2502.5 | 500500 | - |
| High 2567.5 513800 10 Downlink Low 2625 525000 15 10 Downlink Low 2685 531000 15 11 Low 2685 537000 - 15 11 Low 2505 501000 - - 11 Low 2625 537000 - - 12 Downlink Low 2627.5 525500 - - 14 Mid 2655 531000 - | | I | Mid | 2535 | 507000 | |
| 10 Downlink Low 2625 525000 15 Mid 2685 531000 15 Uplink Low 2505 501000 - High 2685 513000 - - High 2565 513000 - - 15 Downlink Low 2627.5 525500 15 16 Downlink Low 2625.5 531000 - 16 Mid 2635 531000 - - 17 Mid 2635 531000 - - 18 Uplink Low 2625 512500 - - 20 Downlink Low 2630 526000 - - 19 High 2680 51000 - - - 210 Downlink Low 2632.5 526000 - - 116 Mid 2635 531000 - - | | | High | 2567.5 | 513500 | |
| $ \left \begin{array}{ c c c c c } \hline \begin{tabular}{ c c c } \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c c c c } \hline \end{tabular}{ c c c c c c c } \hline \end{tabular}{ c c c c c c c } \hline \end{tabular}{ c c c c c c c } \hline \end{tabular}{ c c c c c c c c } \hline \end{tabular}{ c c c c c c c c } \hline \end{tabular}{ c c c c c c c c } \hline \end{tabular}{ c c c c c c c c } \hline \end{tabular}{ c c c c c c c c c c } \hline \end{tabular}{ c c c c c c c c c } \hline \end{tabular}{ c c c c c c c c c c } \hline \end{tabular}{ c c c c c c c c c c c } \hline \end{tabular}{ c c c c c c c c c c c c c c c c c c c$ | 10 | Downlink | Low | 2625 | 525000 | 15 |
| High 2685 537000 Uplink Low 2505 501000 Mid 2535 507000 High 2665 513000 15 Downlink Low 2627.5 525500 16 Mid 2682.5 531000 16 High 2682.5 531000 17 High 2682.5 507000 18 Low 2630 52600 19 High 2682.5 531000 20 Downlink Low 2630 52600 19 High 2680 536000 19 High 2680 536000 19 Low 2510 502000 19 High 2685 531000 19 High 2655 531000 19 High 2655 531000 19 High 2655 531000 19 High 2555 511500 | | | Mid | 2655 | 531000 | |
| Uplink Low 2505 501000 Mid 2535 507000 High 2565 513000 15 Downlink Low 2627.5 52500 Uplink Low 2625.5 531000 High 2685.5 531000 Uplink Low 2507.5 501500 Uplink Low 2625.5 512500 15 Mid 2535 512500 20 Downlink Low 2630 52600 16 High 2682.5 531000 High 2665 531000 - Mid 2535 507000 - Uplink Low 2630 51200 16 Mid 2655 531000 17 Mid 2655 531000 18 Mid 2655 531000 19 Kind 2635 527000 19 Mid 2635 531000 <t< td=""><td></td><td></td><td>High</td><td>2685</td><td>537000</td><td></td></t<> | | | High | 2685 | 537000 | |
| Mid 2535 507000 High 2565 513000 15 Downlink Low 2627.5 525500 15 Mid 2682.5 536500 Uplink Low 2507.5 501500 16 Mid 255.5 512500 17 Mid 255.5 512500 20 Downlink Low 2630 526000 16 High 2682.5 531000 15 7 Mid 2635 531000 15 17 Mid 2630 526000 15 20 Downlink Low 2631 507000 High 2685 531000 15 18 Mid 2635 507000 19 Kid 2635 507000 19 Mid 2635 507000 19 Mid 2635 531000 19 Mid 2635 531000 1 | | Uplink | Low | 2505 | 501000 | - |
| High 2565 513000 15 Downlink Low 2627.5 525500 15 Mid 2655 531000 15 15 Uplink Low 2657.5 501500 - Uplink Low 2535 507000 - Mid 2535 531000 - - Mid 2630 526000 15 - Mid 2630 530000 - - Mid 2630 530000 - - Uplink Low 2630 53000 - Uplink Low 2650 512000 - Mid 255 526500 15 - Uplink Low 2632.5 526500 - Mid 2635 531000 - - Uplink Low 2635 531000 - Mid 2635 531000 - - Uplink <td></td> <td>•</td> <td>Mid</td> <td>2535</td> <td>507000</td> <td></td> | | • | Mid | 2535 | 507000 | |
| 15 Downlink Low 2627.5 525500 15 Mid 2685.5 536600 - | | | High | 2565 | 513000 | |
| Mid 2655 531000 Uplink Llow 2507.5 501500 Mid 2535 507000 High 2662.5 512500 20 Downlink Low 2630 526000 115 Mid 2655 531000 20 Downlink Low 2630 526000 115 Mid 2655 531000 116 Mid 2655 531000 116 Mid 2655 531000 117 Mid 2560 51200 118 Mid 2655 531000 119 2660 51200 - 119 2660 51200 - 119 2660 512000 - 119 2665 531000 - 119 2665 531000 - 119 2657.5 511500 - 119 2655 511000 - 119 | 15 | Downlink | Low | 2627.5 | 525500 | 15 |
| High 2682.5 536500 Uplink Low 2507.5 501500 Mid 2535 507000 High 2562.5 512500 20 Downlink Low 2630 526000 High 2680 536000 15 Mid 2655 531000 - High 2680 536000 - Uplink Low 2510 502000 - Mid 2555 507000 - - Mid 2655 531000 - - 25 Downlink Low 2632.5 526500 15 Wid 2655 531000 - - - Mid 2657.5 511500 - - Mid 2655 531000 - - High 2677.5 53500 - - Mid 2655 531000 - - High 2 | | | Mid | 2655 | 531000 | |
| $ \left \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | | High | 2682.5 | 536500 | |
| $ \left \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | Uplink | Low | 2507.5 | 501500 | - |
| High 2662.5 512500 20 Downlink Low 2630 526000 15 Mid 2655 531000 15 15 Wild 2680 536000 - 15 Uplink Low 2510 502000 - Mid 2535 507000 - - 25 Downlink Low 2632.5 526500 15 26 Downlink Low 2635 531000 - Wild 2657.5 531500 - - - Uplink Low 2635 507000 - - Wild 2657.5 511500 - - - 30 Downlink Low 2635 531000 - - 40 Downlink Low 2655 511000 - - 40 Downlink Low 2655 531000 - - 40 Do | | • | Mid | 2535 | 507000 | |
| 20 Downlink Low 2630 526000 15 Mid 2655 531000 15 Uplink Low 2510 502000 - Mid 2535 507000 - - 25 Downlink Low 2632.5 526500 15 25 Downlink Low 2635 531000 - Wild 2655 531000 - - - 26 Downlink Low 2635.5 507000 - Wild 2655 531000 - - - Wild 2655 511500 - - - 30 Downlink Low 2635 527000 15 Mid 2655 511500 - - - 40 Downlink Low 2515 503000 - 40 Downlink Low 2520 504000 - 40 Downl | | | High | 2562.5 | 512500 | |
| $ \begin{array}{ c c c c c c c } \hline \begin{tabular}{ c c c c c } \hline \end{tabular} \\ \hline tabula$ | 20 | Downlink | Low | 2630 | 526000 | 15 |
| High 2680 536000 Uplink Low 2510 502000 Mid 2535 507000 High 2560 512000 25 Downlink Low 2632.5 526500 Uplink Low 2632.5 531000 Uplink Low 2635 531000 Uplink Low 2535 507000 Uplink Low 2635 507000 High 2655 531000 - Mid 2635 527000 - 30 Downlink Low 2635 531000 High 2655 531000 - Mid 2655 531000 - Uplink Low 2635 507000 High 2655 511000 - Mid 2655 531000 - Mid 2655 531000 - Mid 2655 531000 - | | | Mid | 2655 | 531000 | |
| Uplink Low 2510 502000 - 25 Downlink Low 2632.5 526500 15 25 Downlink Low 2632.5 526500 15 Mid 2655 531000 - - Mid 2655 531000 - Uplink Low 2535 502500 - Mid 2635 507000 - - Mid 2635 507000 - - Mid 2635 531000 - - Mid 2635 531000 - - Mid 2655 511500 - - Mid 2655 531000 - - Mid 2655 511000 - - Uplink Low 2615 531000 - High 2655 511000 - - Mid 2655 531000 - - | | | High | 2680 | 536000 | |
| $ \begin{array}{ c c c c c c } \hline \begin{tabular}{ c c c c } \hline \end{tabular} \\ \hline \end{tabular} \\$ | | Uplink | Low | 2510 | 502000 | - |
| High 2560 512000 25 Downlink Low 2632.5 526500 15 Mid 2655 531000 15 15 Uplink Low 257.5 502500 - Mid 2535 507000 - - Mid 2557.5 511500 - - 30 Downlink Low 2635 531000 - Mid 2655 531000 - - - Mid 2655 531000 - - - - Mid 2655 531000 - | | - 1 | Mid | 2535 | 507000 | |
| 25 Downlink Low 2632.5 526500 15 Mid 2655 531000 15 15 15 Uplink Low 2512.5 502500 - - Mid 2535 507000 - - - 30 Downlink Low 2635 527000 15 30 Downlink Low 2635 531000 - High 2557.5 511500 - - - Mid 2635 531000 - - - High 2675 535000 - - - Uplink Low 2615 501000 - - 40 Downlink Low 2640 528000 - - High 2670 534000 - - - - 40 Downlink Low 2620 504000 - - High 2635 <td< td=""><td></td><td></td><td>High</td><td>2560</td><td>512000</td><td></td></td<> | | | High | 2560 | 512000 | |
| $ \begin{array}{ c c c c c c c } \hline \begin{tabular}{ c c c c c } \hline \end{tabular} & \end{tabular} & \end{tabular} \\ \hline \end{tabular} & $ | 25 | Downlink | Low | 2632.5 | 526500 | 15 |
| High 2677.5 535500 Uplink Low 2512.5 502500 Mid 2535 507000 High 2557.5 511500 30 Downlink Low 2635 527000 Mid 2655 531000 15 Mid 2655 531000 15 Mid 2655 531000 - High 2675 535000 - Uplink Low 2515 503000 - Mid 2555 511000 - - Mid 2655 531000 - - Mid 2655 507000 - - Mid 2555 511000 - - 40 Downlink Low 2665 531000 - High 2670 534000 - - Uplink Low 2655 531000 - High 2550 507000 | | | Mid | 2655 | 531000 | |
| $ \begin{array}{ c c c c c c c } & Low & 2512.5 & 502500 & & & & & \\ \hline Mid & 2535 & 507000 & & & & \\ \hline Mid & 2535 & 507000 & & & & \\ \hline High & 2557.5 & 511500 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2655 & 535000 & & & & \\ \hline Mid & 2675 & 535000 & & & & \\ \hline Uplink & Low & 2515 & 503000 & & & & \\ \hline Mid & 2535 & 507000 & & & & \\ \hline Mid & 2555 & 511000 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2655 & 531000 & & & & \\ \hline Mid & 2520 & 504000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2550 & 510000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2655 & 531000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline Mid & 2535 & 507000 & & & \\ \hline \end{array}$ | | | High | 2677.5 | 535500 | |
| $ \begin{array}{ c c c c c c } \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{High} & 2557.5 & 511500 \\ \hline \mbox{High} & 2635 & 527000 \\ \hline \mbox{Mid} & 2635 & 531000 \\ \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{High} & 2675 & 535000 \\ \hline \mbox{Uplink} & \mbox{Low} & 2515 & 503000 \\ \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{Mid} & 2555 & 511000 \\ \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{Mid} & 2655 & 507000 \\ \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{Mid} & 2555 & 511000 \\ \hline \mbox{Mid} & 2555 & 511000 \\ \hline \mbox{Mid} & 2555 & 531000 \\ \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{High} & 2665 & 533000 \\ \hline \mbox{High} & 2655 & 505000 \\ \hline \mbox{High} & 2655 & 505000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2545 & 509000 \\ \hline \mbox{High} & 2545 & 50000 \\ \hline \mbox{High} & 2545 & 5000 \\ $ | | Uplink | Low | 2512.5 | 502500 | - |
| High 2557.5 511500 30 Downlink Low 2635 527000 15 Mid 2655 531000 15 15 15 Mid 2675 535000 15 15 15 15 Uplink Low 2515 503000 - | | I | Mid | 2535 | 507000 | |
| $ \begin{array}{ c c c c c c c } \hline 30 & Downlink & Low & 2635 & 527000 & 15 \\ \hline Mid & 2655 & 531000 & \\ \hline High & 2675 & 535000 & \\ \hline Uplink & Low & 2515 & 503000 & \\ \hline Mid & 2535 & 507000 & \\ \hline High & 2555 & 511000 & \\ \hline Mid & 2655 & 531000 & \\ \hline Mid & 2655 & 531000 & \\ \hline Mid & 2655 & 531000 & \\ \hline High & 2670 & 534000 & \\ \hline Uplink & Low & 2520 & 504000 & \\ \hline Mid & 2535 & 507000 & \\ \hline Mid & 2535 & 507000 & \\ \hline Mid & 2550 & 510000 & \\ \hline Mid & 2655 & 531000 & \\ \hline Mid & 2655 & 533000 & \\ \hline Uplink & Low & 2645 & 529000 & 15 \\ \hline Mid & 2655 & 531000 & \\ \hline Mid & 2655 & 533000 & \\ \hline Mid & 2655 & 533000 & \\ \hline Mid & 2655 & 533000 & \\ \hline High & 2665 & 533000 & \\ \hline High & 2545 & 509000 & \\ \hline \end{array} $ | | | High | 2557.5 | 511500 | |
| $ \begin{array}{ c c c c c c } \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{High} & 2675 & 535000 \\ \hline \mbox{Uplink} & \mbox{Low} & 2515 & 503000 \\ \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{High} & 2555 & 511000 \\ \hline \mbox{High} & 2555 & 511000 \\ \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{High} & 2670 & 534000 \\ \hline \mbox{High} & 2670 & 534000 \\ \hline \mbox{Uplink} & \mbox{Low} & 2520 & 504000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2555 & 511000 \\ \hline \mbox{High} & 2555 & 51000 \\ \hline \mbox{High} & 2555 & 51000 \\ \hline \mbox{High} & 2655 & 531000 \\ \hline \mbox{High} & 2665 & 531000 \\ \hline \mbox{High} & 2665 & 533000 \\ \hline \mbox{High} & 2665 & 505000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2545 & 509000 \\ \hline \mbox{High} & 2545 & 50900 \\ \hline \mbox{High} & 2545 & 5000 \\ \hline \mbo$ | 30 | Downlink | Low | 2635 | 527000 | 15 |
| High 2675 535000 Uplink Low 2515 503000 Mid 2535 507000 High 2555 511000 40 Downlink Low 2640 528000 15 Mid 2655 531000 15 Mid 2655 531000 15 Mid 2655 531000 15 Uplink Low 2520 504000 - Uplink Low 2535 507000 - Mid 2535 507000 - - 50 Downlink Low 2645 529000 15 50 Downlink Low 2645 529000 15 Mid 2655 531000 - - High 2665 533000 - - Uplink Low 2525 505000 - High 2645 509000 - - <td></td> <td></td> <td>Mid</td> <td>2655</td> <td>531000</td> <td></td> | | | Mid | 2655 | 531000 | |
| $ \begin{array}{ c c c c c c } & Low & 2515 & 503000 & & & & & & & & & & & & & & & & & $ | | | High | 2675 | 535000 | |
| $ \begin{array}{ c c c c c c } \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{High} & 2555 & 511000 \\ \hline \mbox{High} & 2640 & 528000 & 15 \\ \hline \mbox{Mid} & 2655 & 531000 & \\ \hline \mbox{Mid} & 2655 & 531000 & \\ \hline \mbox{High} & 2670 & 534000 & \\ \hline \mbox{Uplink} & Low & 2520 & 504000 & \\ \hline \mbox{Mid} & 2535 & 507000 & \\ \hline \mbox{Mid} & 2550 & 510000 & \\ \hline \mbox{Mid} & 2655 & 531000 & \\ \hline \mbox{Mid} & 2655 & 531000 & \\ \hline \mbox{Mid} & 2655 & 531000 & \\ \hline \mbox{Mid} & 2655 & 533000 & \\ \hline \mbox{Mid} & 2665 & 533000 & \\ \hline \mbox{Uplink} & Low & 2525 & 505000 & \\ \hline \mbox{Uplink} & Low & 2525 & 505000 & \\ \hline \mbox{High} & 2535 & 507000 & \\ \hline \mbox{High} & 2535 & 507000 & \\ \hline \mbox{High} & 2545 & 509000 & \\ \hline \mbox{High} & 2545 & 50900 & \\ \hline \mbox{High} & 2545 & 5090 & \\ \hline \mbox{High} & 2545 & 5090 & \\ \hline \mbox{High} & 2545 & 5090 & \\ \hline \\mbox{High} & 2545 & 5000 & \\ \hline \\mbox{High} & 2545 & 5000 & \\ \hline \\mbox{High} & 2545 & 5000 & \\ \hline \\mbox{High} & 2545 & 500 & \\ \hline \\mbox{High} & 2545 & 500 & \\ $ | | Uplink | Low | 2515 | 503000 | - |
| $ \begin{array}{ c c c c c c } \hline High & 2555 & 511000 \\ \hline High & 2655 & 511000 \\ \hline Mid & 2655 & 531000 \\ \hline High & 2670 & 534000 \\ \hline High & 2670 & 534000 \\ \hline Uplink & Low & 2520 & 504000 \\ \hline Mid & 2535 & 507000 \\ \hline High & 2550 & 510000 \\ \hline High & 2550 & 510000 \\ \hline & & & & & & & & & & & & & & & & & &$ | | • | Mid | 2535 | 507000 | |
| $ \begin{array}{ c c c c c c } \hline 40 & Downlink & Low & 2640 & 528000 & 15 \\ \hline Mid & 2655 & 531000 & \\ \hline High & 2670 & 534000 & \\ \hline Uplink & Low & 2520 & 504000 & \\ \hline Mid & 2535 & 507000 & \\ \hline Mid & 2550 & 510000 & \\ \hline High & 2550 & 510000 & \\ \hline 50 & Downlink & Low & 2645 & 529000 & 15 \\ \hline Mid & 2655 & 531000 & \\ \hline Mid & 2655 & 533000 & \\ \hline High & 2665 & 533000 & \\ \hline Uplink & Low & 2525 & 505000 & \\ \hline Mid & 2535 & 507000 & \\ \hline High & 2545 & 509000 & \\ \hline \end{array} $ | | | High | 2555 | 511000 | |
| $ \begin{array}{ c c c c c c } \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{High} & 2670 & 534000 \\ \hline \mbox{Uplink} & \mbox{Low} & 2520 & 504000 \\ \hline \mbox{Mid} & 2535 & 507000 \\ \hline \mbox{High} & 2550 & 510000 \\ \hline \mbox{S0} & \mbox{Downlink} & \mbox{Low} & 2645 & 529000 \\ \hline \mbox{Mid} & 2655 & 531000 \\ \hline \mbox{Mid} & 2665 & 533000 \\ \hline \mbox{High} & 2665 & 533000 \\ \hline \mbox{High} & 2665 & 505000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2535 & 507000 \\ \hline \mbox{High} & 2545 & 509000 \\ \hline \end{array} $ | 40 | Downlink | Low | 2640 | 528000 | 15 |
| High 2670 534000 Uplink Low 2520 504000 Mid 2535 507000 High 2550 510000 50 Downlink Low 2645 529000 15 Mid 2655 531000 15 Mid 2665 533000 15 Uplink Low 2525 505000 - High 2665 533000 - - High 2635 507000 - - High 2665 533000 - - High 2635 507000 - - High 2535 507000 - - | | | Mid | 2655 | 531000 | |
| Uplink Low 2520 504000 - Mid 2535 507000 - High 2550 510000 - 50 Downlink Low 2645 529000 15 Mid 2655 531000 - - - High 2665 533000 - - Uplink Low 2525 505000 - Mid 2535 507000 - - High 2545 509000 - | | | High | 2670 | 534000 | |
| Mid 2535 507000 High 2550 510000 50 Downlink Low 2645 529000 15 Mid 2655 531000 15 High 2665 533000 15 Uplink Low 2525 505000 - High 2535 507000 - High 2545 509000 - | | Uplink | Low | 2520 | 504000 | - |
| High 2550 510000 50 Downlink Low 2645 529000 15 Mid 2655 531000 15 High 2665 533000 15 Uplink Low 2525 505000 - Mid 2535 507000 - High 2545 509000 - | | I | Mid | 2535 | 507000 | |
| 50 Downlink Low 2645 529000 15 Mid 2655 531000 15 High 2665 533000 - Uplink Low 2525 505000 - Mid 2535 507000 - High 2545 509000 - | | | High | 2550 | 510000 | |
| Mid 2655 531000 High 2665 533000 Uplink Low 2525 505000 Mid 2535 507000 High 2545 509000 | 50 | Downlink | Low | 2645 | 529000 | 15 |
| High 2665 533000 Uplink Low 2525 505000 - Mid 2535 507000 - High 2545 509000 - | | | Mid | 2655 | 531000 | 1 |
| Uplink Low 2525 505000 - Mid 2535 507000 High 2545 509000 | | | High | 2665 | 533000 | |
| Mid 2535 507000 High 2545 509000 | | Uplink | Low | 2525 | 505000 | - |
| High 2545 509000 | | · · | Mid | 2535 | 507000 | |
| | | | High | 2545 | 509000 | |



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3.8.3 Reference test frequencies for NR operating band n38 3.8.3.1 Test frequencies for NR operating band n38 and SCS 30 kHz

| Bandwidth [MHz] | Range | | Carrier centre [MHz] | Carrier centre [ARFCN] | SS block SCS [kHz] |
|--------------------|----------|------|-------------------------|---------------------------|-----------------------|
| 20 | Downlink | Low | 2580 | 516000 | 30 |
| | & | Mid | 2595 | 519000 | |
| | Uplink | High | 2610 | 522000 | |
| 30 | Downlink | Low | 2585 | 517000 | 30 |
| | & | Mid | 2595 | 519000 | |
| | Uplink | High | 2605 | 521000 | |
| 40 | Downlink | Low | 2590 | 518000 | 30 |
| | & | Mid | 2595 | 519000 | |
| | Uplink | High | 2600 | 520000 | |

3.8.4Reference test frequencies for NR operating band n413.8.4.1Test frequencies for NR operating band n41 and SCS 30 kHz

| Bandwidth [MHz] | Range | | Carrier centre [MHz] | Carrier centre [ARFCN] | SS block SCS [kHz] |
|--------------------|----------|------|-------------------------|---------------------------|-----------------------|
| 20 | Downlink | Low | 2506.02 | 501204 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2670 | 534000 | |
| 30 | Downlink | Low | 2511 | 502200 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2675 | 535000 | |
| 40 | Downlink | Low | 2516.01 | 503202 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2670 | 534000 | |
| 50 | Downlink | Low | 2521.02 | 504204 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2664.99 | 532998 | |
| 60 | Downlink | Low | 2526 | 505200 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2659.98 | 531996 | |
| 80 | Downlink | Low | 2536.02 | 507204 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2649.99 | 529998 | |
| 90 | Downlink | Low | 2541 | 508200 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2644.98 | 528996 | |
| 100 | Downlink | Low | 2546.01 | 509202 | 30 |
| | & | Mid | 2592.99 | 518598 | |
| | Uplink | High | 2640 | 528000 | |



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3.8.5 Reference test frequencies for NR operating band n66 3.8.5.1 Test frequencies for NR operating band n66 and SCS 15 kHz

| Bandwidth [MHz] | Range |) | Carrier centre [MHz] | Carrier centre [ARFCN] | SS block SCS [kHz] |
|--------------------|----------|------|-------------------------|---------------------------|-----------------------|
| 5 | Downlink | Low | 2112.5 | 422500 | 15 |
| | | Mid | 2145 | 429000 | |
| | | High | 2177.5 | 435500 | |
| | Uplink | Low | 1712.5 | 342500 | - |
| | | Mid | 1745 | 349000 | |
| | | High | 1777.5 | 355500 | |
| 10 | Downlink | Low | 2115 | 423000 | 15 |
| | | Mid | 2145 | 429000 | |
| | | High | 2175 | 435000 | |
| | Uplink | Low | 1715 | 343000 | - |
| | | Mid | 1745 | 349000 | |
| | | High | 1775 | 355000 | |
| 15 | Downlink | Low | 2117.5 | 423500 | 15 |
| | | Mid | 2145 | 429000 | |
| | | High | 2172.5 | 434500 | |
| | Uplink | Low | 1717.5 | 343500 | - |
| | | Mid | 1745 | 349000 | |
| | | High | 1772.5 | 354500 | |
| 20 | Downlink | Low | 2120 | 424000 | 15 |
| | | Mid | 2145 | 429000 | |
| | | High | 2170 | 434000 | |
| | Uplink | Low | 1720 | 344000 | - |
| | | Mid | 1745 | 349000 | |
| | | High | 1770 | 354000 | |
| 30 | Downlink | Low | 2125 | 425000 | 15 |
| | | Mid | 2145 | 429000 | |
| | | High | 2165 | 433000 | |
| | Uplink | Low | 1725 | 345000 | - |
| | | Mid | 1745 | 349000 | |
| | | High | 1765 | 353000 | |
| 40 | Downlink | Low | 2130 | 426000 | 15 |
| | | Mid | 2145 | 429000 | _ |
| | | High | 2160 | 432000 | |
| | Uplink | Low | 1730 | 346000 | |
| | | Mid | 1745 | 349000 | 4 |
| | | High | 1760 | 352000 | |



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3.8.6 Reference test frequencies for NR operating band n77 3.8.6.1 Test frequencies for NR operating band n77 and SCS 30 kHz

| 5.0.0.1 Test frequencies for Mix operating band firr and 505 50 km² | | | | | |
|---|----------|------|-------------------------|---------------------------|-----------------------|
| Bandwidth [MHz] | Range | • | Carrier centre [MHz] | Carrier centre [ARFCN] | SS block SCS [kHz] |
| 20 | Downlink | Low | 3710.01 | 647334 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3969.99 | 664666 | |
| 40 | Downlink | Low | 3720 | 648000 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3960 | 664000 | |
| 50 | Downlink | Low | 3725.01 | 648334 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3954.99 | 663666 | |
| 60 | Downlink | Low | 3730.02 | 648668 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3949.98 | 663332 | |
| 80 | Downlink | Low | 3740.01 | 649334 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3939.99 | 662666 | |
| 90 | Downlink | Low | 3745.02 | 649668 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3934.98 | 662332 | |
| 100 | Downlink | Low | 3750 | 650000 | 30 |
| | & | Mid | 3840 | 656000 | |
| | Uplink | High | 3930 | 662000 | |

| Bandwidth [MHz] | Range | | Carrier centre [MHz] | Carrier centre [ARFCN] | SS block SCS [kHz] |
|--------------------|----------|------|-------------------------|---------------------------|-----------------------|
| 20 | Downlink | Low | 3459.99 | 630666 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3540 | 636000 | |
| 40 | Downlink | Low | 3470.01 | 631334 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3530.01 | 635334 | |
| 50 | Downlink | Low | 3474.99 | 631666 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3525 | 635000 | |
| 60 | Downlink | Low | 3480 | 632000 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3519.99 | 634666 | |
| 80 | Downlink | Low | 3489.99 | 632666 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3510 | 634000 | |
| 90 | Downlink | Low | 3495 | 633000 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3504.99 | 633666 | |
| 100 | Downlink | Low | 1 | / | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | \ | \ | |



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3.8.7 Reference test frequencies for NR operating band n78 3.8.7.1 Test frequencies for NR operating band n78 and SCS 30 kHz

| Bandwidth | Range | | Carrier centre | Carrier centre | SS block SCS |
|-----------|----------|------|----------------|----------------|--------------|
| [MHz] | | | [MHz] | [ARFCN] | [kHz] |
| 20 | Downlink | Low | 3459.99 | 630666 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3540 | 636000 | |
| 30 | Downlink | Low | 3465 | 631000 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3534.99 | 635666 | |
| 40 | Downlink | Low | 3470.01 | 631334 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3530.01 | 635334 | |
| 50 | Downlink | Low | 3474.99 | 631666 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3525 | 635000 | |
| 60 | Downlink | Low | 3480 | 632000 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3519.99 | 634666 | |
| 80 | Downlink | Low | 3489.99 | 632666 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3510 | 634000 | |
| 90 | Downlink | Low | 3495 | 633000 | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | 3504.99 | 633666 | |
| 100 | Downlink | Low | | \ | 30 |
| | & | Mid | 3500.01 | 633334 | |
| | Uplink | High | \ | \ | |



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Description of Tests 4

4.1 Conducted Output Power

Measurement Procedure: FCC KDB 971168 D01 V03r01

The transmitter output was connected to a calibrated coaxial cable, attenuator and power meter, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The power output at the transmitter antenna port was determined by adding the value of the cable insertion loss to the power reading. The tests were performed at three frequencies (low channel, middle channel and high channel) and on the highest power levels, which can be setup on the transmitters.

Remark: Reference test setup 1

4.2 Effective (Isotropic) Radiated Power of Transmitter

Measurement Procedure: FCC KDB 971168 D01 V03r01 ; C63.26 (2015) Calculate power in dBm by the following formula: ERP (dBm) = Conducted Power (dBm) + antenna gain (dBd) EIRP(dBm) = Conducted Power (dBm) + antenna gain (dBi) EIRP=ERP+2.15dB



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4.3 Occupied Bandwidth

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 4.2

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel, middle channel and high channel). The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

Remark: Reference test setup 1

Test Settings

- The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW ≥ 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
 - 1 5% of the 99% occupied bandwidth observed in Step 7



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4.4 Band Edge at Antenna Terminals

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at two frequencies (low channel and high channel).in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to peak or peak hold power.

Remark: Reference test setup 1

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW ≥ 1% of the emission bandwidth
- 4. $VBW > 3 \times RBW$
- 5. Detector = RMS
- 6. Number of sweep points ≥ 2 x Span/RBW
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize



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4.5 Spurious And Harmonic Emissions at Antenna Terminal

Measurement Procedure: FCC KDB 971168 D01 V03r01

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyzer, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel). The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Remark: Reference test setup 1

Test Settings

- Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings



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4.6 Peak-Average Ratio

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.7.1

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

Remark: Reference test setup 1

Test Settings

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power



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4.7 Field Strength of Spurious Radiation

Measurement Procedure: FCC KDB 971168 D01 V03r01

Below 1GHz test procedure as below:

- 1). The EUT was powered ON and placed on a 80cm high table in the chamber. The antenna of the transmitter was extended to its maximum length.
- 2). The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- 4). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
- 6). The output power into the substitution antenna was then measured.
- 7). Steps 5) and 6) were repeated with both antennas polarized.

8) Calculate power in dBm by the following formula:

ERP(dBm) = Pg(dBm) - cable loss (dB) + antenna gain (dBd)

Where:

Pd is the dipole equivalent power, Pg is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to Pg [dBm] – cable loss [dB]. The calculated Pd levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log 10$ (Power [Watts]).

Above 1GHz test procedure as below:

- 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber
- 2) Calculate power in dBm by the following formula:

EIRP(dBm) = Pg(dBm) - cable loss (dB) + antenna gain (dBi)EIRP=ERP+2.15dB

Where:

Pg is the generator output power into the substitution antenna.

- 3. Test the EUT in the lowest channel, the middle channel the Highest channel
- 4. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
- 5. Repeat above procedures until all frequencies measured was complete.

Remark: Reference test setup 3



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1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor 2) Scan from 9kHz to 40GHz,The disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

4) All modes have been tested, but only the worst case data displayed in this report.



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4.8 Frequency Stability / Temperature Variation

Measurement Procedure:

Frequency stability testing is performed in accordance with the guidelines of FCC KDB 971168 D01 V03r01; ANSI/C63.26 (2015)

- . The frequency stability of the transmitter is measured by:
- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Remark: Reference test setup 4



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4.9 Test Setups 4.9.1 **Test Setup 1** Spectrum analyser Power attenuator **Power Splitter** EUT Base station Non-Conducted Table

Ground Reference Plane

4.9.2 **Test Setup 2**



4.9.3 **Test Setup 3**





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Ground Reference Plane



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4.10Test Conditions

| Test Case | | Test Conditions | | |
|----------------------------|-------------------------------|---------------------------------|--|--|
| Average Power, Total | | Test Environment | Ambient Climate & Rated Voltage | |
| | Average | Test Setup | Test Setup 1 | |
| | Power, Total | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel) | |
| Transmit Output | | Test Mode | NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9; | |
| Power | Average | Test Environment | Ambient Climate & Rated Voltage | |
| Data | Power, | Test Setup | Test Setup 1 | |
| | Spectral Density (if | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel) | |
| | required) | Test Mode | NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9; | |
| | | Test Environment | Ambient Climate & Rated Voltage | |
| Peak-to-Ave | erage Ratio | Test Setup | Test Setup 1 | |
| (if required) | | RF Channels (TX) | M (M= middle channel) | |
| | | Test Mode | NR/TM1;NR/TM6 | |
| | | Test Environment | Ambient Climate & Rated Voltage | |
| Modulation | | Test Setup | Test Setup 1 | |
| Characteris | tics | RF Channels (TX) | M (M= middle channel) | |
| | | Test Mode | NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/T | |
| | Test Environment | Ambient Climate & Rated Voltage | | |
| | | Test Setup | Test Setup 1 | |
| | Occupied Bandwidth | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel) | |
| Bandwidth | | Test Mode | NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9; | |
| Danuwiutn | | Test Environment | Ambient Climate & Rated Voltage | |
| | Emission | Test Setup | Test Setup 1 | |
| | Bandwidth (if required) | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel) | |
| | | Test Mode | NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9; | |
| Dand Educ | | Test Environment | Ambient Climate & Rated Voltage | |
| Band Edges Compliance | | Test Setup | Test Setup 1 | |
| | | RF Channels (TX) | L, H (L= low channel, H= high channel) | |



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| | Test Mode | NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9; | | |
|---|------------------|--|--|--|
| | Test Environment | Ambient Climate & Rated Voltage | | |
| | Test Setup | Test Setup 1 | | |
| Spurious Emission at Antenna Terminals | RF Channels (TX) | L,M, H (L= low channel, M= middle channel, H= high channel) | | |
| | Test Mode | NR/TM1 | | |
| | Test Environment | Ambient Climate & Rated Voltage | | |
| | Test Setup | Test Setup 2 | | |
| Field Strength of Spurious Radiation | Test Mode | NR/TM1 Remark: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected. | | |
| | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= hig channel) | | |
| | Test Environment | (1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) VL, VN and VH of Rated Voltage at Ambient Climate. | | |
| Frequency Stability | Test Setup | Test Setup 4 | | |
| | RF Channels (TX) | L, M, H (L= low channel, M= middle channel, H= high channel) | | |
| | Test Mode | NR/TM1;NR/TM6 | | |



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Main Test Instruments 5

| RF conducted test | | | | | |
|-------------------------------------|--------------------|-----------|-----------------|------------------|------------------|
| | Manufacturar | Model No. | laurante au Nie | Cal. date | Cal.Due date |
| Test Equipment | Manufacturer | | Inventory No. | (yyyy-mm- dd) | (yyyy-mm- dd) |
| Signal Analyzer | Rohde & Schwarz | FSU | XAW01-13-02 | 2020/10/26 | 2021/10/25 |
| Radio communication Test Station | Anritsu | MT8000A | XAW01-03-12 | 2020/10/27 | 2021/10/26 |
| Radio communication analyzer | Anritsu | MT8821C | XAW01-03-13 | 2020/10/26 | 2021/10/25 |
| RF control Unit | Tonscend | JS0806-1 | N/A | N/A | N/A |
| Band Reject Filter Group | Tonscend | JS0806-F | N/A | N/A | N/A |
| Humidity/ Temperature Indicator | MingGao | TH101B | XAW01-01-08 | 2021/4/30 | 2022/4/29 |
| temperature chamber | Votsch | VT4002 | XAW01-18-01 | 2021/4/1 | 2022/3/31 |
| power supply | Angilent | 66311B | XAW01-17-01 | 2021/4/1 | 2022/3/31 |



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| RSE Test System | | | | | |
|--|----------------|---------------------|---------------|------------|-----------------|
| Equipment | Manufacturer | Model No. | Inventory No. | Cal Date | Cal Due Date |
| Semi-Anechoic Chamber | Brilliant-emc | N/A | XAW03-35-01 | 2019-09-11 | 2022-09-10 |
| MXA signal analyzer | Keysight | N9020A | XAW01-06-01 | 2021-04-01 | 2022-03-31 |
| Radio communication analyzer | ROHDE&SCHWARZ | CMW 500 | XAW01-03-02 | 2021-04-01 | 2022-03-31 |
| Spectrum Analyzer | ROHDE&SCHWARZ | FSV3044 | 101146 | 2021-06-08 | 2022-06-07 |
| Test receiver | ROHDE&SCHWARZ | ESR | XAW01-08-01 | 2020-09-11 | 2021-09-10 |
| Receiving antenna (30MHz-3GHz) | Schwarzbeck | VULB 9163 | XAW01-09-01 | 2019-10-13 | 2021-10-12 |
| Receiving antenna (1GHz~18GHz) | Schwarzbeck | BBHA 9120D | XAW01-09-02 | 2019-10-13 | 2021-10-12 |
| Receiving antenna (15GHz~40GHz) | Schwarzbeck | BBHA 9170 | XAW01-09-03 | 2019-10-13 | 2021-10-12 |
| Directional antenna rack controller | Max-Full | MF-7802BS | XAW03-03-01 | NCR | NCR |
| High-speed antenna rack controller | Max-Full | MF-7802 | XAW03-04-01 | NCR | NCR |
| Filter bank | Tonscend | JS0806-F | XAW03-05-01 | NCR | NCR |
| Filter bank | Tonscend | JS0806s | XAW03-05-02 | NCR | NCR |
| Amplifier | Tonscend | TAP00903040 | XAW01-41-01 | 2020-10-26 | 2021-10-25 |
| Amplifier | Tonscend | TAP01018048 | XAW01-41-02 | 2020-10-26 | 2021-10-25 |
| Amplifier | Tonscend | TAP18040048 | XAW01-41-03 | 2020-10-27 | 2021-10-26 |
| Amplifier | Shanghai Steed | YX28980930 | XAW01-41-06 | 2020-10-26 | 2021-10-25 |
| 5G UXM | Keysight | E7515B | XAW01-04-01 | 2020-09-11 | 2021-09-10 |
| Temperature and humidity meter | MingGao | TH101B | XAW01-01-01 | 2020-11-06 | 2021-11-05 |
| Measurement Software | Tonscend | TS+ RSE V3.0.0.2 | XAW02-05-01 | NCR | NCR |
| Loop Antenna | Schwarzbeck | FMZB 1519B | XAW01-48-02 | 2021/6/10 | 2022/6/9 |



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6 Measurement Uncertainty

For a 95% confidence level (k = 2), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

| No. | Item | Measurement Uncertainty | |
|-----|-------------------------------|-------------------------|--|
| 1 | Total RF power, conducted | ±0.41dB | |
| 2 | RF power density, conducted | ±1.96dB | |
| 3 | Spurious emissions, conducted | ±0.41dB | |
| 4 | Radio Frequency | ±7.10 x 10-8 | |
| 5 | Duty Cycle | ±0.49% | |
| 6 | Occupied Bandwidth | ±0.2% | |
| | | ± 4.8dB (Below 1GHz) | |
| 7 | Padiated Emission | ± 4.8dB (1GHz to 6GHz) | |
| | Radiated Emission | ± 4.5dB (6GHz to 18GHz) | |
| | | ± 5.02dB (Above 18GHz) | |



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7 Appendixes

| Appendix A | Setup Photos |
|---------------|---------------------------|
| Appendix B.20 | NR Band N5 |
| Appendix B.21 | NR Band N7 |
| Appendix B.22 | NR Band N38 |
| Appendix B.23 | NR Band N41 |
| Appendix B.24 | NR Band N66 |
| Appendix B.25 | NR Band N77 |
| Appendix B.26 | NR Band N77&N78,3450-3550 |

The End



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