## element

## LTE Band 13 - Ant A



Plot 7-83. Conducted Spurious Plot (LTE Band 13-10MHz QPSK - 1 RB - Ant A)


Plot 7-84. Conducted Spurious Plot (LTE Band 13-10MHz QPSK - 1 RB - Ant A)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ | EUT Type: <br> Portable Handset | Page 68 of 137 |



Plot 7-85. Conducted Spurious Plot (LTE Band 13-10MHz QPSK - 1 RB - Ant A)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT |  |
| :--- | :--- | :--- | :--- | | Approved by: |
| :--- |
| Technical Manager |


| Mode | Bandwidth | Channel | Range [MHz] | Level [dBm] | Limit <br> [dBm] | Margin [dB] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WCDMA-AWS | 5 MHz | Low | 30.0-1705.0 | -37.79 | -13 | -24.79 |
|  |  | Low | 1755.0-10000.0 | -40.63 | -13 | -27.63 |
|  |  | Low | 10000.0-20000.0 | -56.74 | -13 | -43.74 |
|  |  | Mid | 30.0-1710.0 | -47.74 | -13 | -34.74 |
|  |  | Mid | 1755.0-10000.0 | -40.67 | -13 | -27.67 |
|  |  | Mid | 10000.0-20000.0 | -56.77 | -13 | -43.77 |
|  |  | High | 30.0-1710.0 | -47.66 | -13 | -34.66 |
|  |  | High | 1760.0-10000.0 | -37.16 | -13 | -24.16 |
|  |  | High | 10000.0-20000.0 | -56.83 | -13 | -43.83 |
| LTE-B66-4 | 20MHz | Low | 30.0-1709.0 | -39.12 | -13 | -26.12 |
|  |  | Low | 1780.0-10000.0 | -39.4 | -13 | -26.40 |
|  |  | Low | 10000.0-20000.0 | -55.09 | -13 | -42.09 |
|  |  | Mid | 30.0-1710.0 | -47.39 | -13 | -34.39 |
|  |  | Mid | 1780.0-10000.0 | -39.72 | -13 | -26.72 |
|  |  | Mid | 10000.0-20000.0 | -55.3 | -13 | -42.29 |
|  |  | High | 30.0-1710.0 | -47.62 | -13 | -34.62 |
|  |  | High | 1781.0-10000.0 | -38.26 | -13 | -25.26 |
|  |  | High | 10000.0-20000.0 | -54.98 | -13 | -41.98 |
| NR-n66 | 40MHz | Low | 30.0-1710.0 | -40.57 | -13 | -27.57 |
|  |  | Low | 1780.0-10000.0 | -39.95 | -13 | -26.95 |
|  |  | Low | 10000.0-20000.0 | -56.1 | -13 | -43.10 |
|  |  | Mid | 30.0-1710.0 | -43.62 | -13 | -30.62 |
|  |  | Mid | 1780.0-10000.0 | -40 | -13 | -26.99 |
|  |  | Mid | 10000.0-20000.0 | -56.13 | -13 | -43.13 |
|  |  | High | 30.0-1710.0 | -46.57 | -13 | -33.57 |
|  |  | High | 1780.0-10000.0 | -39.77 | -13 | -26.77 |
|  |  | High | 10000.0-20000.0 | -56.07 | -13 | -43.07 |

Table 7-11. Conducted Spurious Emission Results - Above 1GHz - Ant B

| FCC ID: A3LSMA356E | PART 27 MEASUREMENT REPORT |  | Approved by: <br> Technical Manager |
| :---: | :---: | :---: | :---: |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: 11/30/2023-12/12/2023 | EUT Type: <br> Portable Handset | Page 70 of 137 |

WCDMA AWS - Ant B


Plot 7-86. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel - Ant B)


Plot 7-87. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: <br> 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | | Portable Handset |
| :--- |



Plot 7-88. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: <br> 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | | Portable Handset |
| :--- |

## element

LTE Band 66/4 - Ant B


Plot 7-89. Conducted Spurious Plot (LTE Band 66/4-20MHz QPSK - 1 RB - Mid Channel - Ant B)


Plot 7-90. Conducted Spurious Plot (LTE Band 66/4-20MHz QPSK - 1 RB - Mid Channel - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ |  | Page 73 of 137 |



Plot 7-91. Conducted Spurious Plot (LTE Band 66/4-20MHz QPSK - 1 RB - Mid Channel - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: |  | Page 74 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |

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## NR Band n66-Ant B



Plot 7-92. Conducted Spurious Plot (NR Band n66-40.0MHz-1 RB - Mid Channel - Ant B)


Plot 7-93. Conducted Spurious Plot (NR Band n66-40.0MHz - 1 RB - Mid Channel - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ |  | Page 75 of 137 |



Plot 7-94. Conducted Spurious Plot (NR Band n66-40.0MHz-1 RB - Mid Channel - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: |  | Page 76 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |

### 7.5 Band Edge Emissions at Antenna Terminal

## Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is $43+10 \log _{10}\left(P_{[\text {watts }}\right)$, where $P$ is the transmitter power in Watts.

## Test Procedure Used

ANSI C63.26-2015 - Section 5.7.3

## 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 $\geq 1 \%$ of the emission bandwidth
4. $\mathrm{VBW} \geq 3 \times \mathrm{RBW}$
5. $\quad$ Detector $=\mathrm{RMS}$
6. Number of sweep points $\geq 2 \times$ 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

## Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.


Figure 7-4. Test Instrument \& Measurement Setup

| FCC ID: A3LSMA356E | PART 27 MEASUREMENT REPORT |  | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 77 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset | V11.0 9/14/2022 |
| © 2023 ELEMENT |  |  |  |

## Test Notes

1. Per $27.53(\mathrm{~h})$ for $A W S$ band operation, 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 to demonstrate compliance with the out-of-band emissions limit. 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.
2. Per $27.53(\mathrm{~g})$ for operations in the $663-698 \mathrm{MHz}$ and $698-746 \mathrm{MHz}$ bands, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.
3. Per 27.53(c)(5) for operations in the $776-788 \mathrm{MHz}$ band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.
4. For all plots showing emissions in the $763-775 \mathrm{MHz}$ and $793-805 \mathrm{MHz}$ band, the FCC limit per 27.53(c)(4) is $65+10 \log _{10}(P)=-35 \mathrm{dBm}$ in a 6.25 kHz bandwidth .

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT |  |
| :--- | :--- | :--- | :--- | | Approved by: |
| :--- |
| Technical Manager |


| Mode | Bandwidth | Channel | Test Case | Level [dBm] | Limit [dBm] | Margin [dB] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LTE-B12-17 | 10 MHz | Low LB 12 | Band Edge | -26.28 | -13 | -13.28 |
|  |  | Low LB 17 | Band Edge | -25.60 | -13 | -12.60 |
|  |  | High | Band Edge | -28.49 | -13 | -15.49 |
|  | 5 MHz | Low LB 12 | Band Edge | -19.19 | -13 | -6.19 |
|  |  | Low LB 17 | Band Edge | -20.63 | -13 | -7.63 |
|  |  | High | Band Edge | -20.99 | -13 | -7.99 |
|  | 3 MHz | Low | Band Edge | -16.56 | -13 | -3.56 |
|  |  | High | Band Edge | -17.57 | -13 | -4.57 |
|  | 1.4 MHz | Low | Band Edge | -18.69 | -13 | -5.69 |
|  |  | High | Band Edge | -16.00 | -13 | -3.00 |
| LTE-B13 | 10 MHz | Low | Band Edge | -25.05 | -13 | -12.05 |
|  |  | Low | EmMask | -48.04 | -35 | -13.04 |
|  |  | High | Band Edge | -26.62 | -13 | -13.62 |
|  |  | High | EmMask | -49.17 | -35 | -14.17 |
|  | 5 MHz | Low | Band Edge | -18.73 | -13 | -5.73 |
|  |  | Low | EmMask | -43.97 | -35 | -8.97 |
|  |  | High | Band Edge | -19.32 | -13 | -6.32 |
|  |  | High | EmMask | -57.17 | -35 | -22.17 |

Table 7-12. Band Edge Test Results - Below 1GHz - Ant A

| FCC ID: A3LSMA356E | PART 27 MEASUREMENT REPORT |  | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 79 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |

## element

LTE Band 12 - Ant A


Plot 7-95. Lower Band Edge Plot (LTE Band 12 - 1.4MHz QPSK - Full RB - Ant A)


Plot 7-96. Upper Band Edge Plot (LTE Band 12 - 1.4MHz QPSK - Full RB - Ant A)

| FCC ID: A3LSMA356E | PART 27 MEASUREMENT REPORT |  | Approved by: <br> Technical Manager |
| :---: | :---: | :---: | :---: |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: 11/30/2023-12/12/2023 | EUT Type: <br> Portable Handset | Page 80 of 137 |

## element

LTE Band 13 - Ant A


Plot 7-97. Lower Band Edge Plot (LTE Band 13 - 5MHz QPSK - Full RB - Ant A)


Plot 7-98. Lower Emission Mask Plot (LTE Band 13-5MHz QPSK - Full RB - Ant A)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ | EUT Type: <br> Portable Handset | Page 81 of 137 |



## Plot 7-99. Upper Band Edge Plot (LTE Band 13-5MHz QPSK - Full RB - Ant A)



Plot 7-100. Upper Emission Mask Plot (LTE Band 13 - 5MHz QPSK - Full RB - Ant A)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: <br> 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | | Portable Handset |
| :--- |


| Mode | Bandwidth | Channel | Test Case | Level [dBm] | Limit [dBm] | Margin [dB] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WCDMA-AWS | 5 MHz | Low | Band Edge | -23.00 | -13 | -10.00 |
|  |  | Low | Extended | -15.07 | -13 | -2.07 |
|  |  | High | Band Edge | -26.15 | -13 | -13.15 |
|  |  | High | Extended | -18.18 | -13 | -5.18 |
| LTE-B66-4 | 20 MHz | Low | Band Edge | -30.21 | -13 | -17.21 |
|  |  | Low | Extended | -27.90 | -13 | -14.90 |
|  |  | High (B4) | Band Edge | -28.57 | -13 | -15.57 |
|  |  | High (B4) | Extended | -28.54 | -13 | -15.54 |
|  |  | High (B66) | Band Edge | -28.85 | -13 | -15.85 |
|  |  | High (B66) | Extended | -29.83 | -13 | -16.83 |
|  | 15 MHz | Low | Band Edge | -27.35 | -13 | -14.35 |
|  |  | Low | Extended | -24.80 | -13 | -11.80 |
|  |  | High (B4) | Band Edge | -24.45 | -13 | -11.45 |
|  |  | High (B4) | Extended | -24.29 | -13 | -11.29 |
|  |  | High (B66) | Band Edge | -27.61 | -13 | -14.61 |
|  |  | High (B66) | Extended | -25.85 | -13 | -12.85 |
|  | 10 MHz | Low | Band Edge | -26.85 | -13 | -13.85 |
|  |  | Low | Extended | -21.68 | -13 | -8.68 |
|  |  | High (B4) | Band Edge | -24.01 | -13 | -11.01 |
|  |  | High (B4) | Extended | -22.22 | -13 | -9.22 |
|  |  | High (B66) | Band Edge | -23.81 | -13 | -10.81 |
|  |  | High (B66) | Extended | -23.10 | -13 | -10.10 |
|  | 5 MHz | Low | Band Edge | -20.71 | -13 | -7.71 |
|  |  | Low | Extended | -25.52 | -13 | -12.52 |
|  |  | High (B4) | Band Edge | -19.40 | -13 | -6.40 |
|  |  | High (B4) | Extended | -27.34 | -13 | -14.34 |
|  |  | High (B66) | Band Edge | -19.36 | -13 | -6.36 |
|  |  | High (B66) | Extended | -28.26 | -13 | -15.26 |
|  | 3 MHz | Low | Band Edge | -19.18 | -13 | -6.18 |
|  |  | Low | Extended | -25.69 | -13 | -12.69 |
|  |  | High (B4) | Band Edge | -21.66 | -13 | -8.66 |
|  |  | High (B4) | Extended | -27.57 | -13 | -14.57 |
|  |  | High (B66) | Band Edge | -20.67 | -13 | -7.67 |
|  |  | High (B66) | Extended | -28.69 | -13 | -15.69 |
|  | 1.4 MHz | Low | Band Edge | -26.40 | -13 | -13.40 |
|  |  | Low | Extended | -32.01 | -13 | -19.01 |
|  |  | High (B4) | Band Edge | -25.65 | -13 | -12.65 |
|  |  | High (B4) | Extended | -33.19 | -13 | -20.19 |
|  |  | High (B66) | Band Edge | -25.95 | -13 | -12.95 |
|  |  | High (B66) | Extended | -33.59 | -13 | -20.59 |
| NR-n66 | 40 MHz | Low | Band Edge | -26.38 | -13 | -13.38 |
|  |  | Low | Extended | -25.25 | -13 | -12.24 |
|  |  | High | Band Edge | -20.78 | -13 | -7.78 |
|  |  | High | Extended | -21.60 | -13 | -8.60 |
|  | 30 MHz | Low | Band Edge | -20.51 | -13 | -7.51 |
|  |  | Low | Extended | -22.81 | -13 | -9.81 |
|  |  | High | Band Edge | -22.27 | -13 | -9.27 |
|  |  | High | Extended | -23.03 | -13 | -10.03 |
|  | 25 MHz | Low | Band Edge | -29.00 | -13 | -16.00 |
|  |  | Low | Extended | -25.24 | -13 | -12.24 |
|  |  | High | Band Edge | -27.31 | -13 | -14.31 |
|  |  | High | Extended | -25.71 | -13 | -12.71 |
|  | 20 MHz | Low | Band Edge | -28.26 | -13 | -15.26 |
|  |  | Low | Extended | -25.32 | -13 | -12.32 |
|  |  | High | Band Edge | -28.05 | -13 | -15.05 |
|  |  | High | Extended | -26.42 | -13 | -13.41 |
|  | 15 MHz | Low | Band Edge | -25.50 | -13 | -12.50 |
|  |  | Low | Extended | -22.48 | -13 | -9.48 |
|  |  | High | Band Edge | -25.43 | -13 | -12.43 |
|  |  | High | Extended | -22.72 | -13 | -9.72 |
|  | 10 MHz | Low | Band Edge | -27.09 | -13 | -14.09 |
|  |  | Low | Extended | -17.86 | -13 | -4.86 |
|  |  | High | Band Edge | -23.90 | -13 | -10.90 |
|  |  | High | Extended | -18.43 | -13 | -5.43 |
|  | 5 MHz | Low | Band Edge | -24.10 | -13 | -11.10 |
|  |  | Low | Extended | -26.32 | -13 | -13.32 |
|  |  | High | Band Edge | -23.90 | -13 | -10.90 |
|  |  | High | Extended | -28.77 | -13 | -15.77 |

Table 7-13. Band Edge Test Results - Above 1GHz - Ant B

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 83 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |
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WCDMA AWS - Ant B


Plot 7-101. Lower Band Edge Plot (WCDMA AWS - Ch. 1312 - Ant B)


Plot 7-102. Lower Extended Band Edge Plot (WCDMA AWS - Ch. 1312 - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: <br> 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | | Portable Handset |
| :--- |



Plot 7-103. Upper Band Edge Plot (WCDMA AWS - Ch. 1513 - Ant B)


Plot 7-104. Upper Extended Band Edge Plot (WCDMA AWS - Ch. 1513- Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 85 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |

## element

LTE Band 66/4 - Ant B


Plot 7-105. Lower Band Edge Plot (LTE Band 66/4-3MHz QPSK - Full RB - Ant B)


Plot 7-106. Lower Extended Band Edge Plot (LTE Band 66/4-3MHz QPSK - Full RB - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ | EUT Type: <br> Portable Handset | Page 86 of 137 |



Plot 7-107. Upper Band Edge Plot (LTE Band 4 - 3MHz QPSK - Full RB - Ant B)


Plot 7-108. Upper Extended Band Edge Plot (LTE Band 4-3MHz QPSK - Full RB - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: | EUT Type: <br> Portable Handset | Page 87 of 137 |



Plot 7-109. Upper Band Edge Plot (LTE Band 66-3MHz QPSK - Full RB - Ant B)


Plot 7-110. Upper Extended Band Edge Plot (LTE Band 66-3MHz QPSK - Full RB - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ | EUT Type: <br> Portable Handset | Page 88 of 137 |

## NR Band n66-Ant B



Plot 7-111. Lower Band Edge Plot (NR Band n66-10.0MHz - DFT-s QPSK - Full RB - Ant B)


Plot 7-112. Lower Extended Band Edge Plot (NR Band n66-10.0MHz - DFT-s QPSK - Full RB - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 89 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |



Plot 7-113. Upper Band Edge Plot (NR Band n66-10.0MHz - DFT-s BPSK - Full RB - Ant B)


Plot 7-114. Upper Extended Band Edge Plot (NR Band n66-10.0MHz - DFT-s BPSK - Full RB - Ant B)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ |  | Page 90 of 137 |


| Mode | Bandwidth | Channel | Test Case | Level <br> [dBm] | Limit [dBm] | Margin [dB] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LTE-B66-4 | 20 MHz | Low | B and Edge | -28.18 | -13 | -15.18 |
|  |  | Low | Extended | -28.81 | -13 | -15.80 |
|  |  | High (B4) | Band Edge | -30.22 | -13 | -17.22 |
|  |  | High (B4) | Extended | -30.90 | -13 | -17.90 |
|  |  | High (B66) | Band Edge | -29.60 | -13 | -16.60 |
|  |  | High (B66) | Extended | -28.64 | -13 | -15.64 |
|  | 15 MHz | Low | B and Edge | -24.19 | -13 | -11.19 |
|  |  | Low | Extended | -26.22 | -13 | -13.22 |
|  |  | High (B4) | Band Edge | -26.01 | -13 | -13.01 |
|  |  | High (B4) | Extended | -28.73 | -13 | -15.73 |
|  |  | High (B66) | Band Edge | -26.89 | -13 | -13.89 |
|  |  | High (B66) | Extended | -24.19 | -13 | -11.19 |
|  | 10 MHz | Low | B and Edge | -26.46 | -13 | -13.46 |
|  |  | Low | Extended | -22.64 | -13 | -9.64 |
|  |  | High (B4) | Band Edge | -23.55 | -13 | -10.55 |
|  |  | High (B4) | Extended | -23.68 | -13 | -10.68 |
|  |  | High (B66) | Band Edge | -23.44 | -13 | -10.44 |
|  |  | High (B66) | Extended | -21.44 | -13 | -8.44 |
|  | 5 MHz | Low | Band Edge | -19.87 | -13 | -6.87 |
|  |  | Low | Extended | -24.31 | -13 | -11.31 |
|  |  | High (B4) | Band Edge | -20.15 | -13 | -7.15 |
|  |  | High (B4) | Extended | -30.80 | -13 | -17.80 |
|  |  | High (B66) | Band Edge | -19.95 | -13 | -6.95 |
|  |  | High (B66) | Extended | -22.34 | -13 | -9.34 |
|  | 3 MHz | Low | Band Edge | -19.64 | -13 | -6.64 |
|  |  | Low | Extended | -23.35 | -13 | -10.35 |
|  |  | High (B4) | Band Edge | -22.73 | -13 | -9.73 |
|  |  | High (B4) | Extended | -30.30 | -13 | -17.30 |
|  |  | High (B66) | B and Edge | -20.99 | -13 | -7.99 |
|  |  | High (B66) | Extended | -22.40 | -13 | -9.40 |
|  | 1.4 MHz | Low | B and Edge | -21.48 | -13 | -8.48 |
|  |  | Low | Extended | -30.30 | -13 | -17.30 |
|  |  | High (B4) | B and Edge | -25.16 | -13 | -12.16 |
|  |  | High (B4) | Extended | -31.75 | -13 | -18.75 |
|  |  | High (B66) | Band Edge | -22.20 | -13 | -9.20 |
|  |  | High (B66) | Extended | -23.15 | -13 | -10.15 |
| NR-n66 | 40 MHz | Low | Band Edge | -24.79 | -13 | -11.79 |
|  |  | Low | Extended | -25.56 | -13 | -12.56 |
|  |  | High | B and Edge | -21.86 | -13 | -8.86 |
|  |  | High | Extended | -23.92 | -13 | -10.92 |
|  | 30 MHz | Low | B and Edge | -21.80 | -13 | -8.80 |
|  |  | Low | Extended | -24.18 | -13 | -11.18 |
|  |  | High | B and Edge | -21.22 | -13 | -8.22 |
|  |  | High | Extended | -22.05 | -13 | -9.05 |
|  | 25 MHz | Low | Band Edge | -28.01 | -13 | -15.01 |
|  |  | Low | Extended | -25.95 | -13 | -12.95 |
|  |  | High | B and Edge | -27.60 | -13 | -14.60 |
|  |  | High | Extended | -26.43 | -13 | -13.43 |
|  | 20 MHz | Low | B and Edge | -27.73 | -13 | -14.73 |
|  |  | Low | Extended | -23.60 | -13 | -10.60 |
|  |  | High | Band Edge | -28.64 | -13 | -15.63 |
|  |  | High | Extended | -25.32 | -13 | -12.32 |
|  | 15 MHz | Low | Band Edge | -26.74 | -13 | -13.74 |
|  |  | Low | Extended | -23.03 | -13 | -10.03 |
|  |  | High | B and Edge | -27.68 | -13 | -14.68 |
|  |  | High | Extended | -22.76 | -13 | -9.76 |
|  | 10 MHz | Low | Band Edge | -25.10 | -13 | -12.10 |
|  |  | Low | Extended | -18.09 | -13 | -5.09 |
|  |  | High | B and Edge | -25.53 | -13 | -12.52 |
|  |  | High | Extended | -18.49 | -13 | -5.49 |
|  | 5 MHz | Low | B and Edge | -23.31 | -13 | -10.30 |
|  |  | Low | Extended | -21.82 | -13 | -8.82 |
|  |  | High | B and Edge | -22.95 | -13 | -9.95 |
|  |  | High | Extended | -23.04 | -13 | -10.04 |

Table 7-14. Band Edge Test Results - Above 1GHz - Ant F

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: <br> 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | | Portable Handset |
| :--- |

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## element

LTE Band 66/4 - Ant F


Plot 7-115. Lower Band Edge Plot (LTE Band 66/4-3MHz QPSK - Full RB - Ant F)


Plot 7-116. Lower Extended Band Edge Plot (LTE Band 66/4-3MHz QPSK - Full RB - Ant F)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: |  | Page 92 of 137 |
| 11/30/2023-12/12/2023 | Portable Handset |  |  |



Plot 7-117. Upper Band Edge Plot (LTE Band 4-3MHz QPSK - Full RB - Ant F)


## Plot 7-118. Upper Extended Band Edge Plot (LTE Band 4-3MHz QPSK - Full RB - Ant F)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ |  | Page 93 of 137 |



Plot 7-119. Upper Band Edge Plot (LTE Band 66 - 3MHz QPSK - Full RB - Ant F)


Plot 7-120. Upper Extended Band Edge Plot (LTE Band 66-3MHz QPSK - Full RB - Ant F)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ | EUT Type: <br> Portable Handset | Page 94 of 137 |

## NR Band n66-Ant F



Plot 7-121. Lower Band Edge Plot (NR Band n66-10.0MHz - DFT-s BPSK - Full RB - Ant F)


Plot 7-122. Lower Extended Band Edge Plot (NR Band n66-10.0MHz - CP QPSK - Full RB - Ant F)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 95 of 137 |
| 1 M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset |  |



Plot 7-123. Upper Band Edge Plot (NR Band n66-10.0MHz - DFT-s BPSK - Full RB - Ant F)


Plot 7-124. Upper Extended Band Edge Plot (NR Band n66-10.0MHz - DFT-s BPSK - Full RB - Ant F)

| FCC ID: A3LSMA356E |  | PART 27 MEASUREMENT REPORT | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: <br> 1M2310260110-04.A3L | Test Dates: <br> $11 / 30 / 2023-12 / 12 / 2023$ |  | Page 96 of 137 |

### 7.6 Peak-Average Ratio

## Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. 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.

## Test Procedure Used

ANSI C63.26-2015 - Section 5.2.3.4

## Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW $\geq$ OBW or specified reference bandwidth
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 1 ms . 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

## Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.


Figure 7-5. Test Instrument \& Measurement Setup

## Test Notes

For the QAM modulations, 256QAM was found to have the worst-case peak-to-average ratio so it is the only QAM measurement included in this section.

| FCC ID: A3LSMA356E | PART 27 MEASUREMENT REPORT |  | Approved by: <br> Technical Manager |
| :--- | :--- | :--- | :--- |
| Test Report S/N: | Test Dates: | EUT Type: | Page 97 of 137 |
| 1M2310260110-04.A3L | $11 / 30 / 2023-12 / 12 / 2023$ | Portable Handset | V11.0 9/14/2022 |
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