

**5.599%&26DB BANDWIDTH**

**Test Requirement:** FCC 47 CFR Part 2.1049(h)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4

**Limit:** No Limit, for reporting purposes only.

**Test Procedure:**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Pass

**Test Data:** Please refer to Appendix A3

## 5.6 BAND EDGE AT ANTENNA TERMINALS

**Test Requirement:** LTE Band 2: FCC 47 CFR Part 24.238(a)  
LTE Band 4: FCC 47 CFR Part 27.53(h)(1)  
LTE Band 5: FCC 47 CFR Part 22.917(a)  
LTE Band 7 & Band 38 & Band 41:: FCC 47 CFR Part 27.53(m)(4)  
LTE Band 40: FCC 47 CFR Part 27.53(a)(4)  
**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Limit:**

**FCC 47 CFR Part 24.238(a), 27.53(h)(1), 22.917(a):**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

**FCC 47 CFR Part 27.53(m)(4):**

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. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

**FCC 47 CFR Part 27.53(a)(4):** For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

- (i) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337 MHz;
- (ii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log(P)$  dB below 2288 MHz;
- (iii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log(P)$  dB above 2365 MHz.

FCC 47 CFR Part 27.53(a)(5): Measurement procedure. Compliance with these rules 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 channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 1 MHz). 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 emissions are attenuated at least 26 dB below the transmitter power.

**Test Procedure:**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

For each band edge measurement:

- 1) Set the spectrum analyzer span to include the block edge frequency.
- 2) Set a marker to point the corresponding band edge frequency in each test case.
- 3) Set display line at -13 dBm
- 4) Set resolution bandwidth to at least 1% of emission bandwidth.
- 5) Set spectrum analyzer with RMS detector.
- 6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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**Test Setup:** Refer to section 4.2.2 for details.  
**Instruments Used:** Refer to section 3 for details  
**Test Mode:** Link mode  
**Test Results:** Pass  
**Test Data:** **Please refer to Appendix A4**



## 5.7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

**Test Requirement:** LTE Band 2: FCC 47 CFR Part 24.238(a)  
LTE Band 4: FCC 47 CFR Part 27.53(h)  
LTE Band 5: FCC 47 CFR Part 22.917(a)  
LTE Band 7 & Band 38 & Band 41:: FCC 47 CFR Part 27.53(m)(4)  
LTE Band 40: FCC 47 CFR Part 27.53(a)(4)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Limit:**

**FCC 47 CFR Part 24.238(a), 27.53(h)(1), 22.917(a), 27.53(c)(2):**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

**FCC 47 CFR Part 27.53(m)(4):**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $55 + 10 \log(P)$  dB. The emission limit equal to -25 dBm.

**FCC 47 CFR Part 27.53(a)(4):** For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log(P)$  dB below 2288 MHz;

(iii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log(P)$  dB above 2365 MHz.

**Test Procedure:**

The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range. b. Measuring frequency range is from 30 MHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Pass

**Test Data:** Please refer to Appendix A5

## 5.8 FIELD STRENGTH OF SPURIOUS RADIATION

**Test Requirement:** LTE Band 2: FCC 47 CFR Part 24.238(a)  
LTE Band 4: FCC 47 CFR Part 27.53(h)  
LTE Band 5: FCC 47 CFR Part 22.917(a)  
LTE Band 7 & Band 38 & Band 41:: FCC 47 CFR Part 27.53(m)(4)  
LTE Band 40: FCC 47 CFR Part 27.53(a)(4)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Receiver Setup:**

| Frequency        | Detector   | RBW     | VBW     | Remark |
|------------------|------------|---------|---------|--------|
| 0.009 MHz-30 MHz | Peak       | 10 kHz  | 30 KHz  | Peak   |
| 30 MHz-1 GHz     | Quasi-peak | 100 kHz | 300 KHz | Peak   |
| Above 1 GHz      | Peak       | 1 MHz   | 3 MHz   | Peak   |

**Limits:**

**FCC 47 CFR Part 24.238(a), 27.53(h)(1), 22.917(a):**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

**FCC 47 CFR Part 27.53(m)(4):**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $55 + 10 \log(P)$  dB. The emission limit equal to -25 dBm.

**FCC 47 CFR Part 27.53(a)(4):** For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log(P)$  dB below 2288 MHz;

(iii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log(P)$  dB above 2365 MHz.

**Test Setup:** Refer to section 4.2.1 for details.

**Test Procedures:** KDB 971168 D01v03r01 Section 7

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

**The worst measurement data as follows:**

### 5.8.1 LTE Band 2

| LTE Band 2_20 MHz_QPSK |           |            |                   |             |        |        |            |
|------------------------|-----------|------------|-------------------|-------------|--------|--------|------------|
| No.                    | Frequency | SA Reading | Correction factor | EIRP Result | Limit  | Margin | Ant. Pol.  |
|                        | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm)  | (dB)   |            |
| Lowest Channel         |           |            |                   |             |        |        |            |
| 1                      | 760.287   | -79.76     | 11.63             | -68.13      | -13.00 | -55.13 | Horizontal |
| 2                      | 833.013   | -80.42     | 13.24             | -67.18      | -13.00 | -54.18 | Horizontal |
| 3                      | 986.044   | -81.51     | 15.44             | -66.07      | -13.00 | -53.07 | Horizontal |
| 4                      | 3702.714  | -53.09     | 7.46              | -45.63      | -13.00 | -32.63 | Horizontal |
| 5                      | 5554.060  | -59.20     | 10.97             | -48.23      | -13.00 | -35.23 | Horizontal |
| 6                      | 7376.898  | -54.96     | 13.05             | -41.91      | -13.00 | -28.91 | Horizontal |
| 7                      | 723.793   | -80.53     | 11.58             | -68.95      | -13.00 | -55.95 | Vertical   |
| 8                      | 804.252   | -80.19     | 12.75             | -67.44      | -13.00 | -54.44 | Vertical   |
| 9                      | 958.714   | -80.68     | 14.93             | -65.75      | -13.00 | -52.75 | Vertical   |
| 10                     | 3702.714  | -55.88     | 7.46              | -48.42      | -13.00 | -35.42 | Vertical   |
| 11                     | 5580.000  | -59.51     | 11.04             | -48.47      | -13.00 | -35.47 | Vertical   |
| 12                     | 7376.898  | -56.57     | 13.05             | -43.52      | -13.00 | -30.52 | Vertical   |
| Middle Channel         |           |            |                   |             |        |        |            |
| 1                      | 838.887   | -80.10     | 13.30             | -66.80      | -13.00 | -53.80 | Horizontal |
| 2                      | 919.132   | -80.44     | 14.53             | -65.91      | -13.00 | -52.91 | Horizontal |
| 3                      | 986.044   | -81.41     | 15.44             | -65.97      | -13.00 | -52.97 | Horizontal |
| 4                      | 3724.224  | -54.76     | 7.56              | -47.20      | -13.00 | -34.20 | Horizontal |
| 5                      | 5640.000  | -61.17     | 11.18             | -49.99      | -13.00 | -36.99 | Horizontal |
| 6                      | 7462.854  | -54.41     | 13.07             | -41.34      | -13.00 | -28.34 | Horizontal |
| 7                      | 13089.280 | -55.04     | 17.01             | -38.03      | -13.00 | -25.03 | Horizontal |
| 8                      | 804.252   | -80.19     | 12.75             | -67.44      | -13.00 | -54.44 | Vertical   |
| 9                      | 887.398   | -80.74     | 14.17             | -66.57      | -13.00 | -53.57 | Vertical   |
| 10                     | 986.044   | -80.92     | 15.44             | -65.48      | -13.00 | -52.48 | Vertical   |
| 11                     | 3724.224  | -56.07     | 7.56              | -48.51      | -13.00 | -35.51 | Vertical   |
| 12                     | 5640.000  | -61.36     | 11.18             | -50.18      | -13.00 | -37.18 | Vertical   |
| 13                     | 7462.854  | -57.75     | 13.07             | -44.68      | -13.00 | -31.68 | Vertical   |
| Highest Channel        |           |            |                   |             |        |        |            |
| 1                      | 838.887   | -80.10     | 13.30             | -66.80      | -13.00 | -53.80 | Horizontal |
| 2                      | 881.184   | -80.45     | 14.07             | -66.38      | -13.00 | -53.38 | Horizontal |
| 3                      | 919.132   | -80.44     | 14.53             | -65.91      | -13.00 | -52.91 | Horizontal |
| 4                      | 3767.619  | -55.67     | 7.77              | -47.90      | -13.00 | -34.90 | Horizontal |
| 5                      | 5700.000  | -60.62     | 11.33             | -49.29      | -13.00 | -36.29 | Horizontal |
| 6                      | 7549.811  | -56.16     | 13.06             | -43.10      | -13.00 | -30.10 | Horizontal |
| 7                      | 13241.800 | -56.50     | 17.32             | -39.18      | -13.00 | -26.18 | Horizontal |
| 8                      | 881.184   | -81.26     | 14.07             | -67.19      | -13.00 | -54.19 | Vertical   |
| 9                      | 925.613   | -81.22     | 14.46             | -66.76      | -13.00 | -53.76 | Vertical   |
| 10                     | 986.044   | -81.60     | 15.44             | -66.16      | -13.00 | -53.16 | Vertical   |
| 11                     | 3767.619  | -52.54     | 7.77              | -44.77      | -13.00 | -31.77 | Vertical   |
| 12                     | 5700.000  | -60.59     | 11.33             | -49.26      | -13.00 | -36.26 | Vertical   |
| 13                     | 7334.292  | -58.11     | 13.05             | -45.06      | -13.00 | -32.06 | Vertical   |
| 14                     | 13241.800 | -56.91     | 17.32             | -39.59      | -13.00 | -26.59 | Vertical   |

### 5.8.2 LTE Band 4

| LTE Band 4_ 20 MHz_ QPSK |           |            |                   |             |        |        |            |
|--------------------------|-----------|------------|-------------------|-------------|--------|--------|------------|
| No.                      | Frequency | SA Reading | Correction factor | EIRP Result | Limit  | Margin | Ant. Pol.  |
|                          | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm)  | (dB)   |            |
| Lowest Channel           |           |            |                   |             |        |        |            |
| 1                        | 765.648   | -79.74     | 11.85             | -67.89      | -13.00 | -54.89 | Horizontal |
| 2                        | 827.179   | -79.91     | 13.16             | -66.75      | -13.00 | -53.75 | Horizontal |
| 3                        | 979.139   | -81.47     | 15.25             | -66.22      | -13.00 | -53.22 | Horizontal |
| 4                        | 3414.304  | -52.68     | 6.38              | -46.30      | -13.00 | -33.30 | Horizontal |
| 5                        | 5160.000  | -59.72     | 10.10             | -49.62      | -13.00 | -36.62 | Horizontal |
| 6                        | 6841.814  | -55.77     | 13.00             | -42.77      | -13.00 | -29.77 | Horizontal |
| 7                        | 8526.351  | -57.11     | 13.62             | -43.49      | -13.00 | -30.49 | Horizontal |
| 8                        | 13710.090 | -57.92     | 18.41             | -39.51      | -13.00 | -26.51 | Horizontal |
| 9                        | 856.760   | -80.62     | 13.67             | -66.95      | -13.00 | -53.95 | Vertical   |
| 10                       | 906.304   | -81.15     | 14.53             | -66.62      | -13.00 | -53.62 | Vertical   |
| 11                       | 979.139   | -80.71     | 15.25             | -65.46      | -13.00 | -52.46 | Vertical   |
| 12                       | 3414.304  | -52.15     | 6.38              | -45.77      | -13.00 | -32.77 | Vertical   |
| 13                       | 5160.000  | -60.35     | 10.10             | -50.25      | -13.00 | -37.25 | Vertical   |
| Middle Channel           |           |            |                   |             |        |        |            |
| 1                        | 862.802   | -79.83     | 13.74             | -66.09      | -13.00 | -53.09 | Horizontal |
| 2                        | 887.398   | -80.09     | 14.17             | -65.92      | -13.00 | -52.92 | Horizontal |
| 3                        | 965.474   | -80.70     | 14.91             | -65.79      | -13.00 | -52.79 | Horizontal |
| 4                        | 3434.138  | -54.57     | 6.41              | -48.16      | -13.00 | -35.16 | Horizontal |
| 5                        | 5197.500  | -61.01     | 10.18             | -50.83      | -13.00 | -37.83 | Horizontal |
| 6                        | 6881.560  | -56.56     | 13.01             | -43.55      | -13.00 | -30.55 | Horizontal |
| 7                        | 13789.740 | -57.74     | 18.60             | -39.14      | -13.00 | -26.14 | Horizontal |
| 8                        | 809.924   | -80.85     | 12.89             | -67.96      | -13.00 | -54.96 | Vertical   |
| 9                        | 887.398   | -81.07     | 14.17             | -66.90      | -13.00 | -53.90 | Vertical   |
| 10                       | 952.000   | -80.85     | 14.82             | -66.03      | -13.00 | -53.03 | Vertical   |
| 11                       | 3434.138  | -55.67     | 6.41              | -49.26      | -13.00 | -36.26 | Vertical   |
| 12                       | 5197.500  | -61.65     | 10.18             | -51.47      | -13.00 | -38.47 | Vertical   |
| Highest Channel          |           |            |                   |             |        |        |            |
| 1                        | 838.887   | -80.96     | 13.30             | -67.66      | -13.00 | -54.66 | Horizontal |
| 2                        | 919.132   | -80.88     | 14.53             | -66.35      | -13.00 | -53.35 | Horizontal |
| 3                        | 992.997   | -81.80     | 15.56             | -66.24      | -13.00 | -53.24 | Horizontal |
| 4                        | 3454.087  | -53.04     | 6.45              | -46.59      | -13.00 | -33.59 | Horizontal |
| 5                        | 5235.000  | -60.13     | 10.26             | -49.87      | -13.00 | -36.87 | Horizontal |
| 6                        | 856.760   | -80.54     | 13.67             | -66.87      | -13.00 | -53.87 | Vertical   |
| 7                        | 912.695   | -80.97     | 14.49             | -66.48      | -13.00 | -53.48 | Vertical   |
| 8                        | 986.044   | -81.26     | 15.44             | -65.82      | -13.00 | -52.82 | Vertical   |
| 9                        | 3454.087  | -52.66     | 6.45              | -46.21      | -13.00 | -33.21 | Vertical   |
| 10                       | 5235.000  | -59.75     | 10.26             | -49.49      | -13.00 | -36.49 | Vertical   |

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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### 5.8.3 LTE Band 5

| LTE Band 5_ 10 MHz_ QPSK |           |            |                   |             |        |        |            |
|--------------------------|-----------|------------|-------------------|-------------|--------|--------|------------|
| No.                      | Frequency | SA Reading | Correction factor | EIRP Result | Limit  | Margin | Ant. Pol.  |
|                          | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm)  | (dB)   |            |
| Lowest Channel           |           |            |                   |             |        |        |            |
| 1                        | 651.383   | -80.13     | 9.85              | -70.28      | -13.00 | -57.28 | Horizontal |
| 2                        | 739.214   | -80.52     | 11.58             | -68.94      | -13.00 | -55.94 | Horizontal |
| 3                        | 893.656   | -80.22     | 14.20             | -66.02      | -13.00 | -53.02 | Horizontal |
| 4                        | 1645.658  | -48.48     | -0.32             | -48.80      | -13.00 | -35.80 | Horizontal |
| 5                        | 2487.000  | -59.24     | 3.50              | -55.74      | -13.00 | -42.74 | Horizontal |
| 6                        | 3278.635  | -50.97     | 6.14              | -44.83      | -13.00 | -31.83 | Horizontal |
| 7                        | 739.214   | -80.35     | 11.58             | -68.77      | -13.00 | -55.77 | Vertical   |
| 8                        | 919.132   | -81.09     | 14.53             | -66.56      | -13.00 | -53.56 | Vertical   |
| 9                        | 979.139   | -81.40     | 15.25             | -66.15      | -13.00 | -53.15 | Vertical   |
| 10                       | 1645.658  | -45.40     | -0.32             | -45.72      | -13.00 | -32.72 | Vertical   |
| 11                       | 2487.000  | -59.59     | 3.50              | -56.09      | -13.00 | -43.09 | Vertical   |
| 12                       | 3278.635  | -47.00     | 6.14              | -40.86      | -13.00 | -27.86 | Vertical   |
| Middle Channel           |           |            |                   |             |        |        |            |
| 1                        | 739.214   | -79.90     | 11.58             | -68.32      | -13.00 | -55.32 | Horizontal |
| 2                        | 809.924   | -80.60     | 12.89             | -67.71      | -13.00 | -54.71 | Horizontal |
| 3                        | 986.044   | -80.58     | 15.44             | -65.14      | -13.00 | -52.14 | Horizontal |
| 4                        | 1664.833  | -54.49     | -0.17             | -54.66      | -13.00 | -41.66 | Horizontal |
| 5                        | 2509.500  | -59.76     | 3.58              | -56.18      | -13.00 | -43.18 | Horizontal |
| 6                        | 3316.838  | -52.27     | 6.21              | -46.06      | -13.00 | -33.06 | Horizontal |
| 7                        | 739.214   | -80.45     | 11.58             | -68.87      | -13.00 | -55.87 | Vertical   |
| 8                        | 919.132   | -81.23     | 14.53             | -66.70      | -13.00 | -53.70 | Vertical   |
| 9                        | 972.283   | -81.45     | 15.04             | -66.41      | -13.00 | -53.41 | Vertical   |
| 10                       | 1664.833  | -52.28     | -0.17             | -52.45      | -13.00 | -39.45 | Vertical   |
| 11                       | 2509.500  | -60.41     | 3.58              | -56.83      | -13.00 | -43.83 | Vertical   |
| 12                       | 3316.838  | -50.82     | 6.21              | -44.61      | -13.00 | -31.61 | Vertical   |
| Highest Channel          |           |            |                   |             |        |        |            |
| 1                        | 809.924   | -80.95     | 12.89             | -68.06      | -13.00 | -55.06 | Horizontal |
| 2                        | 945.334   | -80.88     | 14.69             | -66.19      | -13.00 | -53.19 | Horizontal |
| 3                        | 979.139   | -81.35     | 15.25             | -66.10      | -13.00 | -53.10 | Horizontal |
| 4                        | 1674.504  | -55.53     | -0.11             | -55.64      | -13.00 | -42.64 | Horizontal |
| 5                        | 2532.000  | -59.45     | 3.68              | -55.77      | -13.00 | -42.77 | Horizontal |
| 6                        | 3355.486  | -54.85     | 6.27              | -48.58      | -13.00 | -35.58 | Horizontal |
| 7                        | 754.963   | -80.33     | 11.60             | -68.73      | -13.00 | -55.73 | Vertical   |
| 8                        | 893.656   | -80.42     | 14.20             | -66.22      | -13.00 | -53.22 | Vertical   |
| 9                        | 925.613   | -80.87     | 14.46             | -66.41      | -13.00 | -53.41 | Vertical   |
| 10                       | 1674.504  | -51.76     | -0.11             | -51.87      | -13.00 | -38.87 | Vertical   |
| 11                       | 2532.000  | -60.10     | 3.68              | -56.42      | -13.00 | -43.42 | Vertical   |
| 12                       | 3355.486  | -54.27     | 6.27              | -48.00      | -13.00 | -35.00 | Vertical   |

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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### 5.8.4 LTE Band 7

| LTE Band 7_20 MHz_QPSK |           |            |                   |             |        |        |            |
|------------------------|-----------|------------|-------------------|-------------|--------|--------|------------|
| No.                    | Frequency | SA Reading | Correction factor | EIRP Result | Limit  | Margin | Ant. Pol.  |
|                        | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm)  | (dB)   |            |
| Lowest Channel         |           |            |                   |             |        |        |            |
| 1                      | 925.613   | -81.25     | 14.46             | -66.79      | -25.00 | -41.79 | Horizontal |
| 2                      | 958.714   | -81.30     | 14.93             | -66.37      | -25.00 | -41.37 | Horizontal |
| 3                      | 992.997   | -81.62     | 15.56             | -66.06      | -25.00 | -41.06 | Horizontal |
| 4                      | 5020.000  | -59.15     | 9.79              | -49.36      | -25.00 | -24.36 | Horizontal |
| 5                      | 7506.207  | -52.12     | 13.07             | -39.05      | -25.00 | -14.05 | Horizontal |
| 6                      | 10027.650 | -53.77     | 15.07             | -38.70      | -25.00 | -13.70 | Horizontal |
| 7                      | 868.886   | -79.88     | 13.80             | -66.08      | -25.00 | -41.08 | Vertical   |
| 8                      | 945.334   | -80.02     | 14.69             | -65.33      | -25.00 | -40.33 | Vertical   |
| 9                      | 992.997   | -79.80     | 15.56             | -64.24      | -25.00 | -39.24 | Vertical   |
| 10                     | 5020.000  | -59.22     | 9.79              | -49.43      | -25.00 | -24.43 | Vertical   |
| 11                     | 7506.207  | -53.76     | 13.07             | -40.69      | -25.00 | -15.69 | Vertical   |
| Middle Channel         |           |            |                   |             |        |        |            |
| 1                      | 815.635   | -80.51     | 13.04             | -67.47      | -25.00 | -42.47 | Horizontal |
| 2                      | 899.958   | -80.76     | 14.32             | -66.44      | -25.00 | -41.44 | Horizontal |
| 3                      | 958.714   | -81.30     | 14.93             | -66.37      | -25.00 | -41.37 | Horizontal |
| 4                      | 5033.218  | -55.66     | 9.81              | -45.85      | -25.00 | -20.85 | Horizontal |
| 5                      | 7549.811  | -52.67     | 13.06             | -39.61      | -25.00 | -14.61 | Horizontal |
| 6                      | 10085.910 | -54.13     | 15.08             | -39.05      | -25.00 | -14.05 | Horizontal |
| 7                      | 798.620   | -80.72     | 12.53             | -68.19      | -25.00 | -43.19 | Vertical   |
| 8                      | 844.803   | -80.36     | 13.42             | -66.94      | -25.00 | -41.94 | Vertical   |
| 9                      | 887.398   | -80.64     | 14.17             | -66.47      | -25.00 | -41.47 | Vertical   |
| 10                     | 5070.000  | -59.40     | 9.90              | -49.50      | -25.00 | -24.50 | Vertical   |
| 11                     | 7549.811  | -56.22     | 13.06             | -43.16      | -25.00 | -18.16 | Vertical   |
| Highest Channel        |           |            |                   |             |        |        |            |
| 1                      | 718.725   | -79.99     | 11.51             | -68.48      | -25.00 | -43.48 | Horizontal |
| 2                      | 821.387   | -80.23     | 13.20             | -67.03      | -25.00 | -42.03 | Horizontal |
| 3                      | 925.613   | -79.34     | 14.46             | -64.88      | -25.00 | -39.88 | Horizontal |
| 4                      | 5091.865  | -54.84     | 9.94              | -44.90      | -25.00 | -19.90 | Horizontal |
| 5                      | 7637.782  | -57.87     | 13.02             | -44.85      | -25.00 | -19.85 | Horizontal |
| 6                      | 10203.430 | -56.17     | 15.11             | -41.06      | -25.00 | -16.06 | Horizontal |
| 7                      | 12789.500 | -57.06     | 16.31             | -40.75      | -25.00 | -15.75 | Horizontal |
| 8                      | 804.252   | -79.81     | 12.75             | -67.06      | -25.00 | -42.06 | Vertical   |
| 9                      | 899.958   | -80.36     | 14.32             | -66.04      | -25.00 | -41.04 | Vertical   |
| 10                     | 992.997   | -81.52     | 15.56             | -65.96      | -25.00 | -40.96 | Vertical   |
| 11                     | 5091.865  | -57.29     | 9.94              | -47.35      | -25.00 | -22.35 | Vertical   |
| 12                     | 7680.000  | -59.87     | 13.02             | -46.85      | -25.00 | -21.85 | Vertical   |
| 13                     | 10203.430 | -58.25     | 15.11             | -43.14      | -25.00 | -18.14 | Vertical   |

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Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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### 5.8.5 LTE Band 38

| LTE Band 38_20 MHz_QPSK |           |            |                   |             |        |        |            |
|-------------------------|-----------|------------|-------------------|-------------|--------|--------|------------|
| No.                     | Frequency | SA Reading | Correction factor | EIRP Result | Limit  | Margin | Ant. Pol.  |
|                         | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm)  | (dB)   |            |
| Lowest Channel          |           |            |                   |             |        |        |            |
| 1                       | 850.760   | -81.41     | 13.57             | -67.84      | -25.00 | -42.84 | Horizontal |
| 2                       | 881.184   | -81.86     | 14.07             | -67.79      | -25.00 | -42.79 | Horizontal |
| 3                       | 932.141   | -81.02     | 14.41             | -66.61      | -25.00 | -41.61 | Horizontal |
| 4                       | 5121.445  | -55.91     | 10.01             | -45.90      | -25.00 | -20.90 | Horizontal |
| 5                       | 7682.150  | -56.19     | 13.02             | -43.17      | -25.00 | -18.17 | Horizontal |
| 6                       | 10262.700 | -55.73     | 15.10             | -40.63      | -25.00 | -15.63 | Horizontal |
| 7                       | 815.635   | -81.50     | 13.04             | -68.46      | -25.00 | -43.46 | Vertical   |
| 8                       | 868.886   | -81.34     | 13.80             | -67.54      | -25.00 | -42.54 | Vertical   |
| 9                       | 912.695   | -81.09     | 14.49             | -66.60      | -25.00 | -41.60 | Vertical   |
| 10                      | 5121.445  | -56.85     | 10.01             | -46.84      | -25.00 | -21.84 | Vertical   |
| 11                      | 7682.150  | -57.87     | 13.02             | -44.85      | -25.00 | -19.85 | Vertical   |
| 12                      | 10262.700 | -58.38     | 15.10             | -43.28      | -25.00 | -18.28 | Vertical   |
| Middle Channel          |           |            |                   |             |        |        |            |
| 1                       | 798.620   | -79.83     | 12.53             | -67.30      | -25.00 | -42.30 | Horizontal |
| 2                       | 881.184   | -81.06     | 14.07             | -66.99      | -25.00 | -41.99 | Horizontal |
| 3                       | 938.714   | -81.09     | 14.52             | -66.57      | -25.00 | -41.57 | Horizontal |
| 4                       | 5151.196  | -58.20     | 10.07             | -48.13      | -25.00 | -23.13 | Horizontal |
| 5                       | 7785.000  | -59.46     | 12.99             | -46.47      | -25.00 | -21.47 | Horizontal |
| 6                       | 833.013   | -80.35     | 13.24             | -67.11      | -25.00 | -42.11 | Vertical   |
| 7                       | 912.695   | -81.09     | 14.49             | -66.60      | -25.00 | -41.60 | Vertical   |
| 8                       | 979.139   | -81.16     | 15.25             | -65.91      | -25.00 | -40.91 | Vertical   |
| 9                       | 5190.000  | -61.11     | 10.16             | -50.95      | -25.00 | -25.95 | Vertical   |
| 10                      | 7785.000  | -60.45     | 12.99             | -47.46      | -25.00 | -22.46 | Vertical   |
| Highest Channel         |           |            |                   |             |        |        |            |
| 1                       | 821.387   | -80.27     | 13.20             | -67.07      | -25.00 | -42.07 | Horizontal |
| 2                       | 868.886   | -80.12     | 13.80             | -66.32      | -25.00 | -41.32 | Horizontal |
| 3                       | 986.044   | -81.21     | 15.44             | -65.77      | -25.00 | -40.77 | Horizontal |
| 4                       | 5181.120  | -57.02     | 10.13             | -46.89      | -25.00 | -21.89 | Horizontal |
| 5                       | 7771.663  | -57.31     | 13.00             | -44.31      | -25.00 | -19.31 | Horizontal |
| 6                       | 10382.280 | -55.19     | 15.12             | -40.07      | -25.00 | -15.07 | Horizontal |
| 7                       | 833.013   | -80.39     | 13.24             | -67.15      | -25.00 | -42.15 | Vertical   |
| 8                       | 893.656   | -81.04     | 14.20             | -66.84      | -25.00 | -41.84 | Vertical   |
| 9                       | 979.139   | -80.75     | 15.25             | -65.50      | -25.00 | -40.50 | Vertical   |
| 10                      | 5220.000  | -61.65     | 10.23             | -51.42      | -25.00 | -26.42 | Vertical   |
| 11                      | 7830.000  | -59.62     | 12.98             | -46.64      | -25.00 | -21.64 | Vertical   |
| 12                      | 10382.280 | -59.00     | 15.12             | -43.88      | -25.00 | -18.88 | Vertical   |

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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### 5.8.6 LTE Band 40A

| LTE Band 40_ 10 MHz_ QPSK |                    |                        |                                |                         |                |                |            |
|---------------------------|--------------------|------------------------|--------------------------------|-------------------------|----------------|----------------|------------|
| No.                       | Frequency<br>(MHz) | SA<br>Reading<br>(dBm) | Correction<br>factor<br>(dB/m) | EIRP<br>Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Ant. Pol.  |
| 1                         | 893.656            | -80.72                 | 14.20                          | -66.52                  | -40.00         | -26.52         | Horizontal |
| 2                         | 952.000            | -80.93                 | 14.82                          | -66.11                  | -40.00         | -26.11         | Horizontal |
| 3                         | 992.997            | -80.73                 | 15.56                          | -65.17                  | -40.00         | -25.17         | Horizontal |
| 4                         | 4620.000           | -61.34                 | 9.59                           | -51.75                  | -40.00         | -11.75         | Horizontal |
| 5                         | 6930.000           | -56.83                 | 13.01                          | -43.82                  | -40.00         | -3.82          | Horizontal |
| 6                         | 862.802            | -81.44                 | 13.74                          | -67.70                  | -40.00         | -27.70         | Vertical   |
| 7                         | 932.141            | -81.41                 | 14.41                          | -67.00                  | -40.00         | -27.00         | Vertical   |
| 8                         | 965.474            | -80.99                 | 14.91                          | -66.08                  | -40.00         | -26.08         | Vertical   |
| 9                         | 4620.000           | -60.20                 | 9.59                           | -50.61                  | -40.00         | -10.61         | Vertical   |
| 10                        | 6930.000           | -58.73                 | 13.01                          | -45.72                  | -40.00         | -5.72          | Vertical   |

### 5.8.7 LTE Band 40B

| LTE Band 40_ 10 MHz_ QPSK |                    |                        |                                |                         |                |                |            |
|---------------------------|--------------------|------------------------|--------------------------------|-------------------------|----------------|----------------|------------|
| No.                       | Frequency<br>(MHz) | SA<br>Reading<br>(dBm) | Correction<br>factor<br>(dB/m) | EIRP<br>Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Ant. Pol.  |
| 1                         | 815.635            | -80.44                 | 13.04                          | -67.40                  | -40.00         | -27.40         | Horizontal |
| 2                         | 919.132            | -81.62                 | 14.53                          | -67.09                  | -40.00         | -27.09         | Horizontal |
| 3                         | 972.283            | -81.13                 | 15.04                          | -66.09                  | -40.00         | -26.09         | Horizontal |
| 4                         | 4710.000           | -59.46                 | 9.63                           | -49.83                  | -40.00         | -9.83          | Horizontal |
| 5                         | 7065.000           | -59.12                 | 13.02                          | -46.10                  | -40.00         | -6.10          | Horizontal |
| 6                         | 815.635            | -80.43                 | 13.04                          | -67.39                  | -40.00         | -27.39         | Vertical   |
| 7                         | 862.802            | -80.76                 | 13.74                          | -67.02                  | -40.00         | -27.02         | Vertical   |
| 8                         | 912.695            | -80.72                 | 14.49                          | -66.23                  | -40.00         | -26.23         | Vertical   |
| 9                         | 4710.000           | -59.64                 | 9.63                           | -50.01                  | -40.00         | -10.01         | Vertical   |
| 10                        | 7065.000           | -59.12                 | 13.02                          | -46.10                  | -40.00         | -6.10          | Vertical   |

### 5.8.8 LTE Band 41

| LTE Band 41_20 MHz_QPSK |           |            |                   |             |        |        |            |
|-------------------------|-----------|------------|-------------------|-------------|--------|--------|------------|
| No.                     | Frequency | SA Reading | Correction factor | EIRP Result | Limit  | Margin | Ant. Pol.  |
|                         | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm)  | (dB)   |            |
| Lowest Channel          |           |            |                   |             |        |        |            |
| 1                       | 728.897   | -79.84     | 11.61             | -68.23      | -25.00 | -43.23 | Horizontal |
| 2                       | 815.635   | -80.53     | 13.04             | -67.49      | -25.00 | -42.49 | Horizontal |
| 3                       | 906.304   | -80.80     | 14.53             | -66.27      | -25.00 | -41.27 | Horizontal |
| 4                       | 5090.000  | -59.61     | 9.94              | -49.67      | -25.00 | -24.67 | Horizontal |
| 5                       | 7593.669  | -54.19     | 13.04             | -41.15      | -25.00 | -16.15 | Horizontal |
| 6                       | 10144.500 | -55.38     | 15.09             | -40.29      | -25.00 | -15.29 | Horizontal |
| 7                       | 689.051   | -79.92     | 11.04             | -68.88      | -25.00 | -43.88 | Vertical   |
| 8                       | 833.013   | -79.32     | 13.24             | -66.08      | -25.00 | -41.08 | Vertical   |
| 9                       | 979.139   | -81.06     | 15.25             | -65.81      | -25.00 | -40.81 | Vertical   |
| 10                      | 5090.000  | -59.20     | 9.94              | -49.26      | -25.00 | -24.26 | Vertical   |
| 11                      | 7593.669  | -55.31     | 13.04             | -42.27      | -25.00 | -17.27 | Vertical   |
| Middle Channel          |           |            |                   |             |        |        |            |
| 1                       | 739.214   | -80.24     | 11.58             | -68.66      | -25.00 | -43.66 | Horizontal |
| 2                       | 844.803   | -81.06     | 13.42             | -67.64      | -25.00 | -42.64 | Horizontal |
| 3                       | 932.141   | -80.42     | 14.41             | -66.01      | -25.00 | -41.01 | Horizontal |
| 4                       | 5190.000  | -60.12     | 10.16             | -49.96      | -25.00 | -24.96 | Horizontal |
| 5                       | 7785.000  | -59.60     | 12.99             | -46.61      | -25.00 | -21.61 | Horizontal |
| 6                       | 10322.320 | -55.84     | 15.11             | -40.73      | -25.00 | -15.73 | Horizontal |
| 7                       | 856.760   | -81.04     | 13.67             | -67.37      | -25.00 | -42.37 | Vertical   |
| 8                       | 932.141   | -81.20     | 14.41             | -66.79      | -25.00 | -41.79 | Vertical   |
| 9                       | 979.139   | -81.29     | 15.25             | -66.04      | -25.00 | -41.04 | Vertical   |
| 10                      | 5190.000  | -61.31     | 10.16             | -51.15      | -25.00 | -26.15 | Vertical   |
| 11                      | 7785.000  | -59.29     | 12.99             | -46.30      | -25.00 | -21.30 | Vertical   |
| Highest Channel         |           |            |                   |             |        |        |            |
| 1                       | 833.013   | -80.44     | 13.24             | -67.20      | -25.00 | -42.20 | Horizontal |
| 2                       | 919.132   | -80.08     | 14.53             | -65.55      | -25.00 | -40.55 | Horizontal |
| 3                       | 992.997   | -81.09     | 15.56             | -65.53      | -25.00 | -40.53 | Horizontal |
| 4                       | 5290.000  | -62.43     | 10.38             | -52.05      | -25.00 | -27.05 | Horizontal |
| 5                       | 7907.891  | -49.82     | 12.96             | -36.86      | -25.00 | -11.86 | Horizontal |
| 6                       | 13165.320 | -56.83     | 17.17             | -39.66      | -25.00 | -14.66 | Horizontal |
| 7                       | 821.387   | -79.90     | 13.20             | -66.70      | -25.00 | -41.70 | Vertical   |
| 8                       | 868.886   | -80.47     | 13.80             | -66.67      | -25.00 | -41.67 | Vertical   |
| 9                       | 979.139   | -81.65     | 15.25             | -66.40      | -25.00 | -41.40 | Vertical   |
| 10                      | 5290.000  | -62.82     | 10.38             | -52.44      | -25.00 | -27.44 | Vertical   |
| 11                      | 7907.891  | -52.35     | 12.96             | -39.39      | -25.00 | -14.39 | Vertical   |
| 12                      | 10564.270 | -57.14     | 15.00             | -42.14      | -25.00 | -17.14 | Vertical   |

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: [info@uttlab.com](mailto:info@uttlab.com)

<http://www.uttlab.com>

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## 5.9 FREQUENCY STABILITY

**Test Requirement:** FCC 47 CFR Part 2.1055 &  
FCC 47 CFR Part 22.355 &  
FCC 47 CFR Part 24.235 &  
FCC 47 CFR Part 27.54

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Limits:**

**FCC 47 CFR Part 22.355, FCC 47 CFR Part 90.213**

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

**FCC 47 CFR Part 24.235, FCC 47 CFR Part 27.54**

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**Test Setup:** Refer to section 4.2.2 for details.

**Test Procedures:**

- 1) Use CMW 500 with Frequency Error measurement capability.
  - a) Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$
  - b) Voltage = low voltage, 3.5 Vdc, Normal, 3.8 Vdc and High voltage, 4.3 Vdc.

- 2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

- 3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

**Equipment Used:** Refer to section 3 for details.

**Test Results:** Pass

**Test Data:** Please refer to Appendix A6

## APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

## APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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