



EX3DV4- SN:3898

June 27, 2017

|           |                                                                |   |      |       |       |      |       |         |
|-----------|----------------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10427-AAA | IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)                 | X | 5.10 | 67.17 | 16.41 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 5.13 | 67.24 | 16.49 |      | 150.0 |         |
|           |                                                                | Z | 5.10 | 67.18 | 16.43 |      | 150.0 |         |
| 10430-AAA | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)                               | X | 4.45 | 73.55 | 18.83 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 4.36 | 73.07 | 18.66 |      | 150.0 |         |
|           |                                                                | Z | 4.51 | 73.93 | 18.97 |      | 150.0 |         |
| 10431-AAA | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)                              | X | 3.93 | 67.43 | 16.02 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 3.96 | 67.55 | 16.14 |      | 150.0 |         |
|           |                                                                | Z | 3.91 | 67.44 | 16.01 |      | 150.0 |         |
| 10432-AAA | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)                              | X | 4.25 | 67.26 | 16.21 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 4.29 | 67.35 | 16.32 |      | 150.0 |         |
|           |                                                                | Z | 4.24 | 67.26 | 16.22 |      | 150.0 |         |
| 10433-AAA | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)                              | X | 4.51 | 67.19 | 16.32 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 4.54 | 67.26 | 16.41 |      | 150.0 |         |
|           |                                                                | Z | 4.50 | 67.19 | 16.33 |      | 150.0 |         |
| 10434-AAA | W-CDMA (BS Test Model 1, 64 DPCH)                              | X | 4.61 | 74.53 | 18.61 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 4.51 | 74.05 | 18.47 |      | 150.0 |         |
|           |                                                                | Z | 4.68 | 74.88 | 18.71 |      | 150.0 |         |
| 10435-AAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) | X | 3.91 | 79.35 | 17.61 | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                | Y | 6.25 | 86.43 | 20.28 |      | 80.0  |         |
|           |                                                                | Z | 3.34 | 78.94 | 17.91 |      | 80.0  |         |
| 10447-AAA | LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)                 | X | 3.14 | 67.14 | 14.75 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 3.20 | 67.36 | 14.95 |      | 150.0 |         |
|           |                                                                | Z | 3.12 | 67.09 | 14.67 |      | 150.0 |         |
| 10448-AAA | LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)                | X | 3.80 | 67.24 | 15.90 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 3.84 | 67.36 | 16.03 |      | 150.0 |         |
|           |                                                                | Z | 3.79 | 67.24 | 15.90 |      | 150.0 |         |
| 10449-AAA | LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)                | X | 4.10 | 67.10 | 16.12 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 4.13 | 67.19 | 16.22 |      | 150.0 |         |
|           |                                                                | Z | 4.09 | 67.10 | 16.13 |      | 150.0 |         |
| 10450-AAA | LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)                | X | 4.32 | 66.97 | 16.18 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 4.35 | 67.05 | 16.27 |      | 150.0 |         |
|           |                                                                | Z | 4.31 | 66.97 | 16.19 |      | 150.0 |         |
| 10451-AAA | W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)                | X | 2.91 | 66.74 | 13.90 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 2.97 | 67.02 | 14.13 |      | 150.0 |         |
|           |                                                                | Z | 2.87 | 66.63 | 13.77 |      | 150.0 |         |
| 10456-AAA | IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)           | X | 6.05 | 67.79 | 16.62 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 6.07 | 67.84 | 16.68 |      | 150.0 |         |
|           |                                                                | Z | 6.06 | 67.83 | 16.67 |      | 150.0 |         |
| 10457-AAA | UMTS-FDD (DC-HSDPA)                                            | X | 3.72 | 65.65 | 15.92 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 3.74 | 65.71 | 16.01 |      | 150.0 |         |
|           |                                                                | Z | 3.72 | 65.68 | 15.93 |      | 150.0 |         |
| 10458-AAA | CDMA2000 (1xEV-DO, Rev. B, 2 carriers)                         | X | 2.56 | 65.08 | 12.43 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 2.62 | 65.37 | 12.69 |      | 150.0 |         |
|           |                                                                | Z | 2.50 | 64.84 | 12.20 |      | 150.0 |         |
| 10459-AAA | CDMA2000 (1xEV-DO, Rev. B, 3 carriers)                         | X | 3.65 | 64.11 | 14.09 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                | Y | 3.72 | 64.38 | 14.32 |      | 150.0 |         |
|           |                                                                | Z | 3.61 | 64.01 | 13.94 |      | 150.0 |         |

Certificate No: EX3-3898\_Jun17

Page 26 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                                   |   |      |       |       |      |       |         |
|-----------|-------------------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10460-AAA | UMTS-FDD (WCDMA, AMR)                                             | X | 0.87 | 67.88 | 15.88 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                   | Y | 0.94 | 69.24 | 16.74 |      | 150.0 |         |
|           |                                                                   | Z | 0.87 | 67.84 | 15.86 |      | 150.0 |         |
| 10461-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | X | 1.73 | 71.22 | 15.78 | 3.29 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 2.48 | 76.95 | 18.34 |      | 80.0  |         |
|           |                                                                   | Z | 1.60 | 71.21 | 16.16 |      | 80.0  |         |
| 10462-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.76 | 60.00 | 7.08  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.72 | 60.00 | 7.19  |      | 80.0  |         |
|           |                                                                   | Z | 0.71 | 60.00 | 7.22  |      | 80.0  |         |
| 10463-AAA | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 0.78 | 60.00 | 6.47  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.74 | 60.00 | 6.54  |      | 80.0  |         |
|           |                                                                   | Z | 0.73 | 60.00 | 6.57  |      | 80.0  |         |
| 10464-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 1.37 | 68.23 | 13.96 | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 1.86 | 72.93 | 16.20 |      | 80.0  |         |
|           |                                                                   | Z | 1.28 | 68.36 | 14.37 |      | 80.0  |         |
| 10465-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 0.76 | 60.00 | 7.02  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.72 | 60.00 | 7.12  |      | 80.0  |         |
|           |                                                                   | Z | 0.71 | 60.00 | 7.16  |      | 80.0  |         |
| 10466-AAA | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 0.78 | 60.00 | 6.44  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.74 | 60.00 | 6.50  |      | 80.0  |         |
|           |                                                                   | Z | 0.73 | 60.00 | 6.53  |      | 80.0  |         |
| 10467-AAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 1.41 | 68.72 | 14.20 | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 1.97 | 73.73 | 16.55 |      | 80.0  |         |
|           |                                                                   | Z | 1.32 | 68.86 | 14.63 |      | 80.0  |         |
| 10468-AAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 0.76 | 60.00 | 7.04  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.72 | 60.00 | 7.14  |      | 80.0  |         |
|           |                                                                   | Z | 0.71 | 60.00 | 7.18  |      | 80.0  |         |
| 10469-AAB | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 0.78 | 60.00 | 6.44  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.74 | 60.00 | 6.50  |      | 80.0  |         |
|           |                                                                   | Z | 0.73 | 60.00 | 6.54  |      | 80.0  |         |
| 10470-AAB | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | X | 1.41 | 68.72 | 14.19 | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 1.97 | 73.75 | 16.55 |      | 80.0  |         |
|           |                                                                   | Z | 1.32 | 68.86 | 14.63 |      | 80.0  |         |
| 10471-AAB | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | X | 0.76 | 60.00 | 7.02  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.72 | 60.00 | 7.13  |      | 80.0  |         |
|           |                                                                   | Z | 0.71 | 60.00 | 7.17  |      | 80.0  |         |
| 10472-AAB | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | X | 0.78 | 60.00 | 6.42  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.74 | 60.00 | 6.48  |      | 80.0  |         |
|           |                                                                   | Z | 0.73 | 60.00 | 6.52  |      | 80.0  |         |
| 10473-AAB | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | X | 1.41 | 68.68 | 14.18 | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 1.96 | 73.71 | 16.53 |      | 80.0  |         |
|           |                                                                   | Z | 1.31 | 68.82 | 14.61 |      | 80.0  |         |
| 10474-AAB | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | X | 0.76 | 60.00 | 7.02  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.72 | 60.00 | 7.13  |      | 80.0  |         |
|           |                                                                   | Z | 0.71 | 60.00 | 7.17  |      | 80.0  |         |
| 10475-AAB | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | X | 0.78 | 60.00 | 6.42  | 3.23 | 80.0  | ± 9.6 % |
|           |                                                                   | Y | 0.74 | 60.00 | 6.48  |      | 80.0  |         |
|           |                                                                   | Z | 0.73 | 60.00 | 6.52  |      | 80.0  |         |

Certificate No: EX3-3898\_Jun17

Page 27 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                                     |   |      |       |       |      |      |         |
|-----------|---------------------------------------------------------------------|---|------|-------|-------|------|------|---------|
| 10477-AAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)    | X | 0.76 | 60.00 | 7.00  | 3.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 0.72 | 60.00 | 7.10  |      | 80.0 |         |
|           |                                                                     | Z | 0.71 | 60.00 | 7.14  |      | 80.0 |         |
| 10478-AAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)    | X | 0.78 | 60.00 | 6.41  | 3.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 0.74 | 60.00 | 6.47  |      | 80.0 |         |
|           |                                                                     | Z | 0.73 | 60.00 | 6.51  |      | 80.0 |         |
| 10479-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | X | 3.51 | 75.91 | 18.12 | 3.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 4.65 | 80.42 | 20.02 |      | 80.0 |         |
|           |                                                                     | Z | 3.35 | 76.12 | 18.41 |      | 80.0 |         |
| 10480-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 2.06 | 66.11 | 12.01 | 3.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.44 | 68.39 | 13.17 |      | 80.0 |         |
|           |                                                                     | Z | 2.00 | 66.36 | 12.23 |      | 80.0 |         |
| 10481-AAA | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.64 | 63.45 | 10.41 | 3.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 1.83 | 64.88 | 11.25 |      | 80.0 |         |
|           |                                                                     | Z | 1.57 | 63.52 | 10.52 |      | 80.0 |         |
| 10482-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 1.34 | 62.39 | 10.63 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 1.43 | 63.31 | 11.29 |      | 80.0 |         |
|           |                                                                     | Z | 1.27 | 62.21 | 10.58 |      | 80.0 |         |
| 10483-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 1.46 | 60.79 | 8.98  | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 1.54 | 61.54 | 9.56  |      | 80.0 |         |
|           |                                                                     | Z | 1.36 | 60.41 | 8.74  |      | 80.0 |         |
| 10484-AAA | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 1.45 | 60.53 | 8.83  | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 1.53 | 61.21 | 9.38  |      | 80.0 |         |
|           |                                                                     | Z | 1.36 | 60.16 | 8.59  |      | 80.0 |         |
| 10485-AAB | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 1.93 | 66.25 | 13.91 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.08 | 67.57 | 14.73 |      | 80.0 |         |
|           |                                                                     | Z | 1.84 | 66.09 | 13.95 |      | 80.0 |         |
| 10486-AAB | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 1.94 | 63.48 | 11.80 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.04 | 64.22 | 12.34 |      | 80.0 |         |
|           |                                                                     | Z | 1.86 | 63.28 | 11.73 |      | 80.0 |         |
| 10487-AAB | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 1.96 | 63.26 | 11.66 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.04 | 63.94 | 12.17 |      | 80.0 |         |
|           |                                                                     | Z | 1.87 | 63.04 | 11.57 |      | 80.0 |         |
| 10488-AAB | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | X | 2.53 | 67.95 | 16.02 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.66 | 68.95 | 16.66 |      | 80.0 |         |
|           |                                                                     | Z | 2.42 | 67.64 | 16.03 |      | 80.0 |         |
| 10489-AAB | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | X | 2.77 | 66.35 | 15.13 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.84 | 66.94 | 15.57 |      | 80.0 |         |
|           |                                                                     | Z | 2.67 | 66.13 | 15.12 |      | 80.0 |         |
| 10490-AAB | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)  | X | 2.85 | 66.30 | 15.10 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 2.92 | 66.85 | 15.53 |      | 80.0 |         |
|           |                                                                     | Z | 2.75 | 66.08 | 15.09 |      | 80.0 |         |
| 10491-AAB | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | X | 2.93 | 67.67 | 16.24 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 3.03 | 68.38 | 16.73 |      | 80.0 |         |
|           |                                                                     | Z | 2.81 | 67.35 | 16.23 |      | 80.0 |         |
| 10492-AAB | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | X | 3.21 | 66.36 | 15.71 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                     | Y | 3.26 | 66.76 | 16.05 |      | 80.0 |         |
|           |                                                                     | Z | 3.11 | 66.10 | 15.68 |      | 80.0 |         |

Certificate No: EX3-3898\_Jun17

Page 28 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                                      |   |      |       |       |      |      |         |
|-----------|----------------------------------------------------------------------|---|------|-------|-------|------|------|---------|
| 10493-AAB | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 3.27 | 66.30 | 15.68 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 3.32 | 66.68 | 16.01 |      | 80.0 |         |
|           |                                                                      | Z | 3.17 | 66.04 | 15.65 |      | 80.0 |         |
| 10494-AAB | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 3.07 | 68.52 | 16.54 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 3.18 | 69.34 | 17.07 |      | 80.0 |         |
|           |                                                                      | Z | 2.94 | 68.19 | 16.54 |      | 80.0 |         |
| 10495-AAB | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 3.24 | 66.58 | 15.93 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 3.29 | 66.98 | 16.26 |      | 80.0 |         |
|           |                                                                      | Z | 3.13 | 66.30 | 15.90 |      | 80.0 |         |
| 10496-AAB | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 3.33 | 66.50 | 15.93 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 3.38 | 66.87 | 16.25 |      | 80.0 |         |
|           |                                                                      | Z | 3.23 | 66.23 | 15.91 |      | 80.0 |         |
| 10497-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | X | 1.02 | 60.00 | 7.99  | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 1.01 | 60.00 | 8.17  |      | 80.0 |         |
|           |                                                                      | Z | 0.98 | 60.00 | 7.95  |      | 80.0 |         |
| 10498-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.18 | 60.00 | 6.81  | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 1.17 | 60.00 | 6.95  |      | 80.0 |         |
|           |                                                                      | Z | 1.14 | 60.00 | 6.72  |      | 80.0 |         |
| 10499-AAA | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 1.20 | 60.00 | 6.66  | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 1.19 | 60.00 | 6.79  |      | 80.0 |         |
|           |                                                                      | Z | 1.16 | 60.00 | 6.55  |      | 80.0 |         |
| 10500-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 2.18 | 67.02 | 14.79 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 2.32 | 68.22 | 15.55 |      | 80.0 |         |
|           |                                                                      | Z | 2.08 | 66.80 | 14.82 |      | 80.0 |         |
| 10501-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 2.31 | 64.90 | 13.20 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 2.41 | 65.65 | 13.74 |      | 80.0 |         |
|           |                                                                      | Z | 2.22 | 64.72 | 13.17 |      | 80.0 |         |
| 10502-AAA | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 2.34 | 64.77 | 13.06 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 2.43 | 65.49 | 13.58 |      | 80.0 |         |
|           |                                                                      | Z | 2.25 | 64.59 | 13.02 |      | 80.0 |         |
| 10503-AAB | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)     | X | 2.51 | 67.79 | 15.92 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 2.63 | 68.78 | 16.57 |      | 80.0 |         |
|           |                                                                      | Z | 2.39 | 67.48 | 15.93 |      | 80.0 |         |
| 10504-AAB | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)   | X | 2.75 | 66.25 | 15.06 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 2.83 | 66.84 | 15.51 |      | 80.0 |         |
|           |                                                                      | Z | 2.66 | 66.03 | 15.05 |      | 80.0 |         |
| 10505-AAB | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)   | X | 2.83 | 66.21 | 15.04 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 2.91 | 66.76 | 15.47 |      | 80.0 |         |
|           |                                                                      | Z | 2.73 | 65.99 | 15.02 |      | 80.0 |         |
| 10506-AAB | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)    | X | 3.05 | 68.40 | 16.47 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 3.16 | 69.22 | 17.00 |      | 80.0 |         |
|           |                                                                      | Z | 2.92 | 68.07 | 16.47 |      | 80.0 |         |
| 10507-AAB | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)  | X | 3.22 | 66.51 | 15.89 | 2.23 | 80.0 | ± 9.6 % |
|           |                                                                      | Y | 3.27 | 66.92 | 16.22 |      | 80.0 |         |
|           |                                                                      | Z | 3.12 | 66.24 | 15.86 |      | 80.0 |         |

Certificate No: EX3-3898\_Jun17

Page 29 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                                     |   |      |       |       |      |       |         |
|-----------|---------------------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10508-AAB | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.32 | 66.43 | 15.89 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.37 | 66.80 | 16.20 |      | 80.0  |         |
|           |                                                                     | Z | 3.21 | 66.16 | 15.86 |      | 80.0  |         |
| 10509-AAB | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | X | 3.55 | 68.19 | 16.49 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.64 | 68.78 | 16.90 |      | 80.0  |         |
|           |                                                                     | Z | 3.42 | 67.89 | 16.49 |      | 80.0  |         |
| 10510-AAB | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.74 | 66.59 | 16.18 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.77 | 66.88 | 16.45 |      | 80.0  |         |
|           |                                                                     | Z | 3.63 | 66.30 | 16.15 |      | 80.0  |         |
| 10511-AAB | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.82 | 66.51 | 16.18 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.85 | 66.78 | 16.44 |      | 80.0  |         |
|           |                                                                     | Z | 3.71 | 66.23 | 16.15 |      | 80.0  |         |
| 10512-AAB | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)   | X | 3.53 | 68.87 | 16.64 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.65 | 69.60 | 17.11 |      | 80.0  |         |
|           |                                                                     | Z | 3.39 | 68.55 | 16.65 |      | 80.0  |         |
| 10513-AAB | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.62 | 66.62 | 16.20 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.66 | 66.94 | 16.48 |      | 80.0  |         |
|           |                                                                     | Z | 3.51 | 66.32 | 16.17 |      | 80.0  |         |
| 10514-AAB | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) | X | 3.68 | 66.43 | 16.16 | 2.23 | 80.0  | ± 9.6 % |
|           |                                                                     | Y | 3.72 | 66.71 | 16.42 |      | 80.0  |         |
|           |                                                                     | Z | 3.58 | 66.13 | 16.13 |      | 80.0  |         |
| 10515-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)           | X | 0.99 | 63.31 | 14.64 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 1.01 | 63.68 | 14.99 |      | 150.0 |         |
|           |                                                                     | Z | 0.99 | 63.31 | 14.65 |      | 150.0 |         |
| 10516-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)         | X | 0.57 | 68.71 | 16.68 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 0.65 | 71.13 | 18.13 |      | 150.0 |         |
|           |                                                                     | Z | 0.57 | 68.55 | 16.63 |      | 150.0 |         |
| 10517-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)          | X | 0.82 | 64.86 | 15.16 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 0.85 | 65.57 | 15.72 |      | 150.0 |         |
|           |                                                                     | Z | 0.83 | 64.83 | 15.16 |      | 150.0 |         |
| 10518-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)           | X | 4.32 | 66.96 | 16.17 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 4.35 | 67.04 | 16.27 |      | 150.0 |         |
|           |                                                                     | Z | 4.31 | 66.97 | 16.19 |      | 150.0 |         |
| 10519-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)          | X | 4.46 | 67.11 | 16.26 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 4.49 | 67.19 | 16.35 |      | 150.0 |         |
|           |                                                                     | Z | 4.45 | 67.12 | 16.27 |      | 150.0 |         |
| 10520-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)          | X | 4.32 | 67.04 | 16.17 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 4.35 | 67.12 | 16.27 |      | 150.0 |         |
|           |                                                                     | Z | 4.31 | 67.04 | 16.19 |      | 150.0 |         |
| 10521-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)          | X | 4.25 | 66.99 | 16.15 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 4.28 | 67.08 | 16.25 |      | 150.0 |         |
|           |                                                                     | Z | 4.24 | 66.99 | 16.16 |      | 150.0 |         |
| 10522-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)          | X | 4.29 | 67.08 | 16.22 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                     | Y | 4.32 | 67.17 | 16.32 |      | 150.0 |         |
|           |                                                                     | Z | 4.27 | 67.07 | 16.22 |      | 150.0 |         |

Certificate No: EX3-3898\_Jun17

Page 30 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                            |   |      |       |       |      |       |         |
|-----------|------------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10523-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) | X | 4.24 | 67.16 | 16.19 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.27 | 67.25 | 16.30 |      | 150.0 |         |
|           |                                                            | Z | 4.23 | 67.18 | 16.21 |      | 150.0 |         |
| 10524-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) | X | 4.25 | 67.08 | 16.24 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.28 | 67.17 | 16.34 |      | 150.0 |         |
|           |                                                            | Z | 4.24 | 67.08 | 16.25 |      | 150.0 |         |
| 10525-AAA | IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)          | X | 4.30 | 66.23 | 15.88 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.32 | 66.32 | 15.98 |      | 150.0 |         |
|           |                                                            | Z | 4.29 | 66.24 | 15.90 |      | 150.0 |         |
| 10526-AAA | IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)          | X | 4.40 | 66.47 | 15.98 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.43 | 66.56 | 16.08 |      | 150.0 |         |
|           |                                                            | Z | 4.39 | 66.47 | 15.99 |      | 150.0 |         |
| 10527-AAA | IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)          | X | 4.34 | 66.45 | 15.93 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.37 | 66.54 | 16.03 |      | 150.0 |         |
|           |                                                            | Z | 4.33 | 66.45 | 15.94 |      | 150.0 |         |
| 10528-AAA | IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)          | X | 4.35 | 66.46 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.38 | 66.56 | 16.06 |      | 150.0 |         |
|           |                                                            | Z | 4.34 | 66.46 | 15.97 |      | 150.0 |         |
| 10529-AAA | IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)          | X | 4.35 | 66.46 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.38 | 66.56 | 16.06 |      | 150.0 |         |
|           |                                                            | Z | 4.34 | 66.46 | 15.97 |      | 150.0 |         |
| 10531-AAA | IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)          | X | 4.31 | 66.46 | 15.92 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.34 | 66.56 | 16.03 |      | 150.0 |         |
|           |                                                            | Z | 4.30 | 66.45 | 15.93 |      | 150.0 |         |
| 10532-AAA | IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)          | X | 4.20 | 66.33 | 15.86 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.23 | 66.43 | 15.96 |      | 150.0 |         |
|           |                                                            | Z | 4.19 | 66.33 | 15.87 |      | 150.0 |         |
| 10533-AAA | IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)          | X | 4.35 | 66.55 | 15.96 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.39 | 66.64 | 16.06 |      | 150.0 |         |
|           |                                                            | Z | 4.34 | 66.55 | 15.98 |      | 150.0 |         |
| 10534-AAA | IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)          | X | 4.92 | 66.42 | 16.02 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.95 | 66.49 | 16.11 |      | 150.0 |         |
|           |                                                            | Z | 4.91 | 66.42 | 16.04 |      | 150.0 |         |
| 10535-AAA | IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)          | X | 4.95 | 66.52 | 16.07 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.98 | 66.59 | 16.16 |      | 150.0 |         |
|           |                                                            | Z | 4.94 | 66.51 | 16.09 |      | 150.0 |         |
| 10536-AAA | IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)          | X | 4.85 | 66.53 | 16.05 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.87 | 66.61 | 16.14 |      | 150.0 |         |
|           |                                                            | Z | 4.84 | 66.52 | 16.07 |      | 150.0 |         |
| 10537-AAA | IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)          | X | 4.92 | 66.56 | 16.07 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.95 | 66.63 | 16.16 |      | 150.0 |         |
|           |                                                            | Z | 4.92 | 66.56 | 16.10 |      | 150.0 |         |
| 10538-AAA | IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)          | X | 4.97 | 66.48 | 16.07 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 5.00 | 66.56 | 16.15 |      | 150.0 |         |
|           |                                                            | Z | 4.96 | 66.47 | 16.09 |      | 150.0 |         |
| 10540-AAA | IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)          | X | 4.90 | 66.44 | 16.07 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                            | Y | 4.93 | 66.52 | 16.16 |      | 150.0 |         |
|           |                                                            | Z | 4.90 | 66.43 | 16.09 |      | 150.0 |         |

Certificate No: EX3-3898\_Jun17

Page 31 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                     |   |      |       |       |      |       |         |
|-----------|-----------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10541-AAA | IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)   | X | 4.90 | 66.40 | 16.03 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 4.92 | 66.46 | 16.11 |      | 150.0 |         |
|           |                                                     | Z | 4.89 | 66.39 | 16.04 |      | 150.0 |         |
| 10542-AAA | IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)   | X | 5.05 | 66.48 | 16.09 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.07 | 66.55 | 16.17 |      | 150.0 |         |
|           |                                                     | Z | 5.04 | 66.48 | 16.10 |      | 150.0 |         |
| 10543-AAA | IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)   | X | 5.12 | 66.59 | 16.17 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.15 | 66.65 | 16.25 |      | 150.0 |         |
|           |                                                     | Z | 5.12 | 66.59 | 16.19 |      | 150.0 |         |
| 10544-AAA | IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)   | X | 5.27 | 66.48 | 16.01 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.30 | 66.55 | 16.09 |      | 150.0 |         |
|           |                                                     | Z | 5.27 | 66.47 | 16.03 |      | 150.0 |         |
| 10545-AAA | IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)   | X | 5.43 | 66.89 | 16.18 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.46 | 66.97 | 16.26 |      | 150.0 |         |
|           |                                                     | Z | 5.43 | 66.89 | 16.20 |      | 150.0 |         |
| 10546-AAA | IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)   | X | 5.30 | 66.59 | 16.04 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.33 | 66.66 | 16.12 |      | 150.0 |         |
|           |                                                     | Z | 5.30 | 66.57 | 16.05 |      | 150.0 |         |
| 10547-AAA | IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)   | X | 5.39 | 66.74 | 16.11 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.41 | 66.81 | 16.19 |      | 150.0 |         |
|           |                                                     | Z | 5.39 | 66.75 | 16.14 |      | 150.0 |         |
| 10548-AAA | IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)   | X | 5.49 | 67.22 | 16.33 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.52 | 67.32 | 16.42 |      | 150.0 |         |
|           |                                                     | Z | 5.48 | 67.21 | 16.34 |      | 150.0 |         |
| 10550-AAA | IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)   | X | 5.37 | 66.82 | 16.16 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.39 | 66.89 | 16.25 |      | 150.0 |         |
|           |                                                     | Z | 5.37 | 66.84 | 16.20 |      | 150.0 |         |
| 10551-AAA | IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)   | X | 5.29 | 66.55 | 15.99 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.31 | 66.62 | 16.07 |      | 150.0 |         |
|           |                                                     | Z | 5.28 | 66.52 | 16.01 |      | 150.0 |         |
| 10552-AAA | IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)   | X | 5.28 | 66.62 | 16.03 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.31 | 66.69 | 16.11 |      | 150.0 |         |
|           |                                                     | Z | 5.28 | 66.61 | 16.05 |      | 150.0 |         |
| 10553-AAA | IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)   | X | 5.33 | 66.55 | 16.02 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.35 | 66.61 | 16.10 |      | 150.0 |         |
|           |                                                     | Z | 5.32 | 66.53 | 16.04 |      | 150.0 |         |
| 10554-AAA | IEEE 1602.11ac WiFi (160MHz, MCS0, 99pc duty cycle) | X | 5.70 | 66.81 | 16.09 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.73 | 66.87 | 16.16 |      | 150.0 |         |
|           |                                                     | Z | 5.70 | 66.79 | 16.10 |      | 150.0 |         |
| 10555-AAA | IEEE 1602.11ac WiFi (160MHz, MCS1, 99pc duty cycle) | X | 5.78 | 66.99 | 16.17 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.80 | 67.06 | 16.24 |      | 150.0 |         |
|           |                                                     | Z | 5.78 | 66.97 | 16.18 |      | 150.0 |         |
| 10556-AAA | IEEE 1602.11ac WiFi (160MHz, MCS2, 99pc duty cycle) | X | 5.82 | 67.12 | 16.22 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.85 | 67.19 | 16.30 |      | 150.0 |         |
|           |                                                     | Z | 5.83 | 67.12 | 16.24 |      | 150.0 |         |
| 10557-AAA | IEEE 1602.11ac WiFi (160MHz, MCS3, 99pc duty cycle) | X | 5.78 | 67.00 | 16.18 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                     | Y | 5.80 | 67.06 | 16.25 |      | 150.0 |         |
|           |                                                     | Z | 5.78 | 66.98 | 16.19 |      | 150.0 |         |

Certificate No: EX3-3898\_Jun17

Page 32 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                                 |   |      |       |       |      |       |         |
|-----------|-----------------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10558-AAA | IEEE 1602.11ac WiFi (160MHz, MCS4, 99pc duty cycle)             | X | 5.77 | 67.00 | 16.19 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 5.80 | 67.07 | 16.27 |      | 150.0 |         |
|           |                                                                 | Z | 5.76 | 66.96 | 16.20 |      | 150.0 |         |
| 10560-AAA | IEEE 1602.11ac WiFi (160MHz, MCS6, 99pc duty cycle)             | X | 5.80 | 66.97 | 16.21 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 5.83 | 67.03 | 16.29 |      | 150.0 |         |
|           |                                                                 | Z | 5.80 | 66.94 | 16.23 |      | 150.0 |         |
| 10561-AAA | IEEE 1602.11ac WiFi (160MHz, MCS7, 99pc duty cycle)             | X | 5.73 | 66.94 | 16.23 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 5.76 | 67.01 | 16.31 |      | 150.0 |         |
|           |                                                                 | Z | 5.73 | 66.92 | 16.25 |      | 150.0 |         |
| 10562-AAA | IEEE 1602.11ac WiFi (160MHz, MCS8, 99pc duty cycle)             | X | 5.77 | 67.07 | 16.30 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 5.80 | 67.15 | 16.38 |      | 150.0 |         |
|           |                                                                 | Z | 5.77 | 67.04 | 16.31 |      | 150.0 |         |
| 10563-AAA | IEEE 1602.11ac WiFi (160MHz, MCS9, 99pc duty cycle)             | X | 5.88 | 67.08 | 16.27 | 0.00 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 5.91 | 67.16 | 16.35 |      | 150.0 |         |
|           |                                                                 | Z | 5.88 | 67.06 | 16.28 |      | 150.0 |         |
| 10564-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)  | X | 4.62 | 66.91 | 16.26 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.65 | 67.00 | 16.37 |      | 150.0 |         |
|           |                                                                 | Z | 4.62 | 66.92 | 16.27 |      | 150.0 |         |
| 10565-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle) | X | 4.82 | 67.35 | 16.60 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.84 | 67.41 | 16.69 |      | 150.0 |         |
|           |                                                                 | Z | 4.81 | 67.36 | 16.62 |      | 150.0 |         |
| 10566-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle) | X | 4.65 | 67.13 | 16.38 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.68 | 67.22 | 16.48 |      | 150.0 |         |
|           |                                                                 | Z | 4.64 | 67.13 | 16.40 |      | 150.0 |         |
| 10567-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle) | X | 4.70 | 67.59 | 16.80 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.72 | 67.63 | 16.88 |      | 150.0 |         |
|           |                                                                 | Z | 4.69 | 67.60 | 16.83 |      | 150.0 |         |
| 10568-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle) | X | 4.52 | 66.74 | 16.04 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.56 | 66.86 | 16.17 |      | 150.0 |         |
|           |                                                                 | Z | 4.51 | 66.72 | 16.04 |      | 150.0 |         |
| 10569-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle) | X | 4.69 | 67.86 | 16.96 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.72 | 67.90 | 17.03 |      | 150.0 |         |
|           |                                                                 | Z | 4.69 | 67.89 | 17.00 |      | 150.0 |         |
| 10570-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle) | X | 4.68 | 67.60 | 16.83 | 0.46 | 150.0 | ± 9.6 % |
|           |                                                                 | Y | 4.71 | 67.65 | 16.91 |      | 150.0 |         |
|           |                                                                 | Z | 4.67 | 67.61 | 16.85 |      | 150.0 |         |
| 10571-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)       | X | 1.14 | 63.82 | 14.89 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 1.15 | 64.13 | 15.24 |      | 130.0 |         |
|           |                                                                 | Z | 1.12 | 63.61 | 14.84 |      | 130.0 |         |
| 10572-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)       | X | 1.14 | 64.32 | 15.21 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 1.16 | 64.65 | 15.58 |      | 130.0 |         |
|           |                                                                 | Z | 1.13 | 64.09 | 15.17 |      | 130.0 |         |
| 10573-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)     | X | 1.07 | 74.72 | 18.97 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 1.28 | 78.28 | 20.78 |      | 130.0 |         |
|           |                                                                 | Z | 0.96 | 73.37 | 18.65 |      | 130.0 |         |
| 10574-AAA | IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)      | X | 1.18 | 68.96 | 17.73 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 1.21 | 69.63 | 18.27 |      | 130.0 |         |
|           |                                                                 | Z | 1.15 | 68.56 | 17.65 |      | 130.0 |         |

Certificate No: EX3-3898\_Jun17

Page 33 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                                 |   |      |       |       |      |       |         |
|-----------|-----------------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10575-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)  | X | 4.39 | 66.58 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.42 | 66.67 | 16.29 |      | 130.0 |         |
|           |                                                                 | Z | 4.38 | 66.59 | 16.19 |      | 130.0 |         |
| 10576-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)  | X | 4.42 | 66.82 | 16.28 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.45 | 66.90 | 16.39 |      | 130.0 |         |
|           |                                                                 | Z | 4.41 | 66.83 | 16.31 |      | 130.0 |         |
| 10577-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) | X | 4.57 | 67.04 | 16.43 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.60 | 67.12 | 16.53 |      | 130.0 |         |
|           |                                                                 | Z | 4.56 | 67.05 | 16.45 |      | 130.0 |         |
| 10578-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) | X | 4.49 | 67.21 | 16.56 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.51 | 67.28 | 16.65 |      | 130.0 |         |
|           |                                                                 | Z | 4.48 | 67.22 | 16.59 |      | 130.0 |         |
| 10579-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) | X | 4.22 | 66.25 | 15.71 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.25 | 66.38 | 15.85 |      | 130.0 |         |
|           |                                                                 | Z | 4.21 | 66.24 | 15.71 |      | 130.0 |         |
| 10580-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) | X | 4.24 | 66.27 | 15.70 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.28 | 66.41 | 15.85 |      | 130.0 |         |
|           |                                                                 | Z | 4.23 | 66.24 | 15.70 |      | 130.0 |         |
| 10581-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) | X | 4.40 | 67.30 | 16.54 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.43 | 67.38 | 16.64 |      | 130.0 |         |
|           |                                                                 | Z | 4.39 | 67.32 | 16.57 |      | 130.0 |         |
| 10582-AAA | IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) | X | 4.14 | 65.99 | 15.46 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.18 | 66.13 | 15.62 |      | 130.0 |         |
|           |                                                                 | Z | 4.12 | 65.96 | 15.46 |      | 130.0 |         |
| 10583-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)       | X | 4.39 | 66.58 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.42 | 66.67 | 16.29 |      | 130.0 |         |
|           |                                                                 | Z | 4.38 | 66.59 | 16.19 |      | 130.0 |         |
| 10584-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)       | X | 4.42 | 66.82 | 16.28 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.45 | 66.90 | 16.39 |      | 130.0 |         |
|           |                                                                 | Z | 4.41 | 66.83 | 16.31 |      | 130.0 |         |
| 10585-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)      | X | 4.57 | 67.04 | 16.43 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.60 | 67.12 | 16.53 |      | 130.0 |         |
|           |                                                                 | Z | 4.56 | 67.05 | 16.45 |      | 130.0 |         |
| 10586-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)      | X | 4.49 | 67.21 | 16.56 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.51 | 67.28 | 16.65 |      | 130.0 |         |
|           |                                                                 | Z | 4.48 | 67.22 | 16.59 |      | 130.0 |         |
| 10587-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)      | X | 4.22 | 66.25 | 15.71 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.25 | 66.38 | 15.85 |      | 130.0 |         |
|           |                                                                 | Z | 4.21 | 66.24 | 15.71 |      | 130.0 |         |
| 10588-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)      | X | 4.24 | 66.27 | 15.70 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.28 | 66.41 | 15.85 |      | 130.0 |         |
|           |                                                                 | Z | 4.23 | 66.24 | 15.70 |      | 130.0 |         |
| 10589-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)      | X | 4.40 | 67.30 | 16.54 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.43 | 67.38 | 16.64 |      | 130.0 |         |
|           |                                                                 | Z | 4.39 | 67.32 | 16.57 |      | 130.0 |         |
| 10590-AAA | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)      | X | 4.14 | 65.99 | 15.46 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                                 | Y | 4.18 | 66.13 | 15.62 |      | 130.0 |         |
|           |                                                                 | Z | 4.12 | 65.96 | 15.46 |      | 130.0 |         |

Certificate No: EX3-3898\_Jun17

Page 34 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                       |   |      |       |       |      |       |         |
|-----------|-------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10591-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle) | X | 4.55 | 66.71 | 16.33 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.58 | 66.79 | 16.43 |      | 130.0 |         |
|           |                                                       | Z | 4.54 | 66.72 | 16.35 |      | 130.0 |         |
| 10592-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle) | X | 4.66 | 66.97 | 16.44 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.68 | 67.05 | 16.55 |      | 130.0 |         |
|           |                                                       | Z | 4.65 | 66.98 | 16.47 |      | 130.0 |         |
| 10593-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle) | X | 4.57 | 66.83 | 16.29 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.60 | 66.92 | 16.40 |      | 130.0 |         |
|           |                                                       | Z | 4.56 | 66.84 | 16.31 |      | 130.0 |         |
| 10594-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle) | X | 4.63 | 67.03 | 16.47 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.66 | 67.11 | 16.57 |      | 130.0 |         |
|           |                                                       | Z | 4.62 | 67.04 | 16.49 |      | 130.0 |         |
| 10595-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle) | X | 4.59 | 67.00 | 16.37 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.62 | 67.08 | 16.48 |      | 130.0 |         |
|           |                                                       | Z | 4.58 | 67.00 | 16.39 |      | 130.0 |         |
| 10596-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) | X | 4.52 | 66.92 | 16.34 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.55 | 67.02 | 16.46 |      | 130.0 |         |
|           |                                                       | Z | 4.51 | 66.92 | 16.36 |      | 130.0 |         |
| 10597-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle) | X | 4.47 | 66.79 | 16.19 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.50 | 66.89 | 16.31 |      | 130.0 |         |
|           |                                                       | Z | 4.46 | 66.78 | 16.20 |      | 130.0 |         |
| 10598-AAA | IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle) | X | 4.48 | 67.08 | 16.50 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 4.51 | 67.15 | 16.60 |      | 130.0 |         |
|           |                                                       | Z | 4.47 | 67.09 | 16.52 |      | 130.0 |         |
| 10599-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle) | X | 5.24 | 67.14 | 16.59 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.26 | 67.22 | 16.69 |      | 130.0 |         |
|           |                                                       | Z | 5.24 | 67.17 | 16.63 |      | 130.0 |         |
| 10600-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle) | X | 5.31 | 67.40 | 16.69 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.34 | 67.51 | 16.81 |      | 130.0 |         |
|           |                                                       | Z | 5.31 | 67.43 | 16.73 |      | 130.0 |         |
| 10601-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) | X | 5.24 | 67.31 | 16.67 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.27 | 67.39 | 16.76 |      | 130.0 |         |
|           |                                                       | Z | 5.25 | 67.36 | 16.72 |      | 130.0 |         |
| 10602-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) | X | 5.30 | 67.20 | 16.52 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.33 | 67.30 | 16.63 |      | 130.0 |         |
|           |                                                       | Z | 5.29 | 67.21 | 16.55 |      | 130.0 |         |
| 10603-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle) | X | 5.36 | 67.49 | 16.82 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.39 | 67.59 | 16.92 |      | 130.0 |         |
|           |                                                       | Z | 5.35 | 67.49 | 16.85 |      | 130.0 |         |
| 10604-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) | X | 5.23 | 67.04 | 16.56 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.26 | 67.13 | 16.66 |      | 130.0 |         |
|           |                                                       | Z | 5.22 | 67.02 | 16.58 |      | 130.0 |         |
| 10605-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) | X | 5.29 | 67.25 | 16.66 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.32 | 67.35 | 16.78 |      | 130.0 |         |
|           |                                                       | Z | 5.29 | 67.26 | 16.69 |      | 130.0 |         |
| 10606-AAA | IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) | X | 5.11 | 66.78 | 16.27 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                       | Y | 5.14 | 66.88 | 16.39 |      | 130.0 |         |
|           |                                                       | Z | 5.11 | 66.80 | 16.31 |      | 130.0 |         |

Certificate No: EX3-3898\_Jun17

Page 35 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                   |   |      |       |       |      |       |         |
|-----------|---------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10607-AAA | IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle) | X | 4.40 | 66.05 | 15.97 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.43 | 66.14 | 16.08 |      | 130.0 |         |
|           |                                                   | Z | 4.39 | 66.06 | 16.00 |      | 130.0 |         |
| 10608-AAA | IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle) | X | 4.52 | 66.33 | 16.10 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.55 | 66.43 | 16.21 |      | 130.0 |         |
|           |                                                   | Z | 4.51 | 66.34 | 16.13 |      | 130.0 |         |
| 10609-AAA | IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle) | X | 4.41 | 66.15 | 15.91 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.45 | 66.26 | 16.03 |      | 130.0 |         |
|           |                                                   | Z | 4.40 | 66.16 | 15.93 |      | 130.0 |         |
| 10610-AAA | IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle) | X | 4.47 | 66.34 | 16.10 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.50 | 66.44 | 16.21 |      | 130.0 |         |
|           |                                                   | Z | 4.46 | 66.36 | 16.12 |      | 130.0 |         |
| 10611-AAA | IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle) | X | 4.38 | 66.11 | 15.92 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.41 | 66.22 | 16.04 |      | 130.0 |         |
|           |                                                   | Z | 4.37 | 66.12 | 15.94 |      | 130.0 |         |
| 10612-AAA | IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle) | X | 4.35 | 66.19 | 15.93 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.39 | 66.31 | 16.06 |      | 130.0 |         |
|           |                                                   | Z | 4.34 | 66.18 | 15.94 |      | 130.0 |         |
| 10613-AAA | IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle) | X | 4.35 | 66.00 | 15.77 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.39 | 66.13 | 15.90 |      | 130.0 |         |
|           |                                                   | Z | 4.34 | 66.00 | 15.79 |      | 130.0 |         |
| 10614-AAA | IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle) | X | 4.34 | 66.30 | 16.07 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.37 | 66.40 | 16.18 |      | 130.0 |         |
|           |                                                   | Z | 4.33 | 66.31 | 16.10 |      | 130.0 |         |
| 10615-AAA | IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle) | X | 4.36 | 65.90 | 15.65 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 4.40 | 66.04 | 15.79 |      | 130.0 |         |
|           |                                                   | Z | 4.35 | 65.90 | 15.67 |      | 130.0 |         |
| 10616-AAA | IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle) | X | 5.03 | 66.30 | 16.16 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.06 | 66.38 | 16.26 |      | 130.0 |         |
|           |                                                   | Z | 5.03 | 66.31 | 16.19 |      | 130.0 |         |
| 10617-AAA | IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle) | X | 5.05 | 66.37 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.09 | 66.47 | 16.28 |      | 130.0 |         |
|           |                                                   | Z | 5.05 | 66.38 | 16.20 |      | 130.0 |         |
| 10618-AAA | IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle) | X | 4.97 | 66.45 | 16.23 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.00 | 66.54 | 16.33 |      | 130.0 |         |
|           |                                                   | Z | 4.97 | 66.45 | 16.26 |      | 130.0 |         |
| 10619-AAA | IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle) | X | 5.00 | 66.32 | 16.09 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.04 | 66.42 | 16.20 |      | 130.0 |         |
|           |                                                   | Z | 5.01 | 66.34 | 16.13 |      | 130.0 |         |
| 10620-AAA | IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle) | X | 5.06 | 66.27 | 16.11 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.09 | 66.36 | 16.22 |      | 130.0 |         |
|           |                                                   | Z | 5.05 | 66.27 | 16.14 |      | 130.0 |         |
| 10621-AAA | IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle) | X | 5.08 | 66.45 | 16.34 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.11 | 66.51 | 16.42 |      | 130.0 |         |
|           |                                                   | Z | 5.08 | 66.46 | 16.37 |      | 130.0 |         |
| 10622-AAA | IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle) | X | 5.07 | 66.51 | 16.37 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                   | Y | 5.09 | 66.59 | 16.45 |      | 130.0 |         |
|           |                                                   | Z | 5.06 | 66.52 | 16.40 |      | 130.0 |         |

Certificate No: EX3-3898\_Jun17

Page 36 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                     |   |      |       |       |      |       |         |
|-----------|-----------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10623-AAA | IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)   | X | 4.96 | 66.07 | 15.99 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 4.99 | 66.16 | 16.09 |      | 130.0 |         |
|           |                                                     | Z | 4.96 | 66.07 | 16.02 |      | 130.0 |         |
| 10624-AAA | IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)   | X | 5.15 | 66.33 | 16.19 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.18 | 66.41 | 16.29 |      | 130.0 |         |
|           |                                                     | Z | 5.15 | 66.34 | 16.22 |      | 130.0 |         |
| 10625-AAA | IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)   | X | 5.25 | 66.51 | 16.35 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.27 | 66.57 | 16.43 |      | 130.0 |         |
|           |                                                     | Z | 5.25 | 66.56 | 16.40 |      | 130.0 |         |
| 10626-AAA | IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)   | X | 5.37 | 66.32 | 16.12 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.40 | 66.40 | 16.21 |      | 130.0 |         |
|           |                                                     | Z | 5.37 | 66.32 | 16.15 |      | 130.0 |         |
| 10627-AAA | IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)   | X | 5.58 | 66.89 | 16.38 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.61 | 66.98 | 16.48 |      | 130.0 |         |
|           |                                                     | Z | 5.58 | 66.90 | 16.42 |      | 130.0 |         |
| 10628-AAA | IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)   | X | 5.35 | 66.26 | 15.99 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.38 | 66.35 | 16.09 |      | 130.0 |         |
|           |                                                     | Z | 5.35 | 66.25 | 16.01 |      | 130.0 |         |
| 10629-AAA | IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)   | X | 5.47 | 66.50 | 16.11 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.50 | 66.59 | 16.21 |      | 130.0 |         |
|           |                                                     | Z | 5.48 | 66.54 | 16.15 |      | 130.0 |         |
| 10630-AAA | IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)   | X | 5.62 | 67.17 | 16.45 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.67 | 67.30 | 16.57 |      | 130.0 |         |
|           |                                                     | Z | 5.62 | 67.15 | 16.47 |      | 130.0 |         |
| 10631-AAA | IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)   | X | 5.65 | 67.38 | 16.76 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.68 | 67.44 | 16.84 |      | 130.0 |         |
|           |                                                     | Z | 5.65 | 67.38 | 16.79 |      | 130.0 |         |
| 10632-AAA | IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)   | X | 5.61 | 67.17 | 16.67 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.63 | 67.23 | 16.75 |      | 130.0 |         |
|           |                                                     | Z | 5.62 | 67.22 | 16.73 |      | 130.0 |         |
| 10633-AAA | IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)   | X | 5.38 | 66.36 | 16.08 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.41 | 66.43 | 16.17 |      | 130.0 |         |
|           |                                                     | Z | 5.37 | 66.34 | 16.10 |      | 130.0 |         |
| 10634-AAA | IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)   | X | 5.42 | 66.59 | 16.25 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.45 | 66.66 | 16.34 |      | 130.0 |         |
|           |                                                     | Z | 5.42 | 66.59 | 16.28 |      | 130.0 |         |
| 10635-AAA | IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)   | X | 5.25 | 65.74 | 15.52 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.29 | 65.85 | 15.64 |      | 130.0 |         |
|           |                                                     | Z | 5.25 | 65.72 | 15.54 |      | 130.0 |         |
| 10636-AAA | IEEE 1602.11ac WiFi (160MHz, MCS0, 90pc duty cycle) | X | 5.81 | 66.67 | 16.21 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.84 | 66.74 | 16.30 |      | 130.0 |         |
|           |                                                     | Z | 5.82 | 66.67 | 16.24 |      | 130.0 |         |
| 10637-AAA | IEEE 1602.11ac WiFi (160MHz, MCS1, 90pc duty cycle) | X | 5.91 | 66.92 | 16.32 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.94 | 67.00 | 16.42 |      | 130.0 |         |
|           |                                                     | Z | 5.91 | 66.92 | 16.35 |      | 130.0 |         |
| 10638-AAA | IEEE 1602.11ac WiFi (160MHz, MCS2, 90pc duty cycle) | X | 5.95 | 67.05 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                     | Y | 5.98 | 67.13 | 16.46 |      | 130.0 |         |
|           |                                                     | Z | 5.96 | 67.06 | 16.40 |      | 130.0 |         |

Certificate No: EX3-3898\_Jun17

Page 37 of 38



EX3DV4- SN:3898

June 27, 2017

|           |                                                        |   |      |       |       |      |       |         |
|-----------|--------------------------------------------------------|---|------|-------|-------|------|-------|---------|
| 10639-AAA | IEEE 1602.11ac WiFi (160MHz, MCS3, 90pc duty cycle)    | X | 5.90 | 66.89 | 16.33 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 5.93 | 66.97 | 16.42 |      | 130.0 |         |
|           |                                                        | Z | 5.90 | 66.89 | 16.36 |      | 130.0 |         |
| 10640-AAA | IEEE 1602.11ac WiFi (160MHz, MCS4, 90pc duty cycle)    | X | 5.83 | 66.70 | 16.17 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 5.86 | 66.79 | 16.27 |      | 130.0 |         |
|           |                                                        | Z | 5.83 | 66.67 | 16.19 |      | 130.0 |         |
| 10641-AAA | IEEE 1602.11ac WiFi (160MHz, MCS5, 90pc duty cycle)    | X | 5.95 | 66.83 | 16.26 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 5.98 | 66.93 | 16.36 |      | 130.0 |         |
|           |                                                        | Z | 5.95 | 66.84 | 16.29 |      | 130.0 |         |
| 10642-AAA | IEEE 1602.11ac WiFi (160MHz, MCS6, 90pc duty cycle)    | X | 5.98 | 67.06 | 16.55 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 6.00 | 67.13 | 16.63 |      | 130.0 |         |
|           |                                                        | Z | 5.98 | 67.06 | 16.58 |      | 130.0 |         |
| 10643-AAA | IEEE 1602.11ac WiFi (160MHz, MCS7, 90pc duty cycle)    | X | 5.81 | 66.70 | 16.25 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 5.84 | 66.79 | 16.35 |      | 130.0 |         |
|           |                                                        | Z | 5.81 | 66.69 | 16.27 |      | 130.0 |         |
| 10644-AAA | IEEE 1602.11ac WiFi (160MHz, MCS8, 90pc duty cycle)    | X | 5.86 | 66.86 | 16.35 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 5.89 | 66.95 | 16.45 |      | 130.0 |         |
|           |                                                        | Z | 5.86 | 66.84 | 16.37 |      | 130.0 |         |
| 10645-AAA | IEEE 1602.11ac WiFi (160MHz, MCS9, 90pc duty cycle)    | X | 5.99 | 66.94 | 16.36 | 0.46 | 130.0 | ± 9.6 % |
|           |                                                        | Y | 6.02 | 67.02 | 16.45 |      | 130.0 |         |
|           |                                                        | Z | 6.00 | 66.95 | 16.39 |      | 130.0 |         |
| 10646-AAC | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)  | X | 6.69 | 86.81 | 28.67 | 9.30 | 60.0  | ± 9.6 % |
|           |                                                        | Y | 7.72 | 91.33 | 30.89 |      | 60.0  |         |
|           |                                                        | Z | 5.52 | 83.14 | 27.53 |      | 60.0  |         |
| 10647-AAB | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7) | X | 5.99 | 84.97 | 28.10 | 9.30 | 60.0  | ± 9.6 % |
|           |                                                        | Y | 6.77 | 88.96 | 30.17 |      | 60.0  |         |
|           |                                                        | Z | 4.99 | 81.44 | 26.98 |      | 60.0  |         |
| 10648-AAA | CDMA2000 (1x Advanced)                                 | X | 0.51 | 61.86 | 8.44  | 0.00 | 150.0 | ± 9.6 % |
|           |                                                        | Y | 0.54 | 62.46 | 8.97  |      | 150.0 |         |
|           |                                                        | Z | 0.50 | 61.70 | 8.25  |      | 150.0 |         |

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



## ANNEX F: D835V2 Dipole Calibration Certificate



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY



中国认可  
国际互认  
校准  
CALIBRATION  
CNAS L0570

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

Client **TA(Shanghai)**Certificate No: **Z17-97114****CALIBRATION CERTIFICATE**Object **D835V2 - SN: 4d020**

Calibration Procedure(s) **FF-Z11-003-01**  
**Calibration Procedures for dipole validation kits**

Calibration date: **August 28, 2017**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&amp;TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRVD        | 102083     | 22-Sep-16 (CTTL, No.J16X06809)           | Sep-17                |
| Power sensor NRV-Z5     | 100595     | 22-Sep-16 (CTTL, No.J16X06809)           | Sep-17                |
| Reference Probe EX3DV4  | SN 3617    | 23-Jan-17(SPEAG,No.EX3-3617_Jan17)       | Jan-18                |
| DAE4                    | SN 1331    | 19-Jan-17(CTTL-SPEAG,No.Z17-97015)       | Jan-18                |
| Secondary Standards     | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 13-Jan-17 (CTTL, No.J17X00286)           | Jan-18                |
| Network Analyzer E5071C | MY46110673 | 13-Jan-17 (CTTL, No.J17X00285)           | Jan-18                |

|                | Name        | Function           | Signature |
|----------------|-------------|--------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |           |
| Reviewed by:   | Lin Hao     | SAR Test Engineer  |           |
| Approved by:   | Qi Dianyuan | SAR Project Leader |           |

Issued: August 31, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z17-97114

Page 1 of 8



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

#### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

#### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

#### Additional Documentation:

- DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

### Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                              |                          |              |
|------------------------------|--------------------------|--------------|
| DASY Version                 | DASY52                   | 52.10.0.1446 |
| Extrapolation                | Advanced Extrapolation   |              |
| Phantom                      | Triple Flat Phantom 5.1C |              |
| Distance Dipole Center - TSL | 15 mm                    | with Spacer  |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm        |              |
| Frequency                    | 835 MHz $\pm$ 1 MHz      |              |

### Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 41.5           | 0.90 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 41.2 $\pm$ 6 % | 0.89 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | <1.0 °C             | ---            | ---                  |

### SAR result with Head TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL   | Condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 2.34 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 9.45 mW / g $\pm$ 18.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                                |
| SAR measured                                            | 250 mW input power | 1.51 mW / g                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.09 mW / g $\pm$ 18.7 % (k=2) |

### Body TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Body TSL parameters             | 22.0 °C             | 55.2           | 0.97 mho/m           |
| Measured Body TSL parameters            | (22.0 $\pm$ 0.2) °C | 55.6 $\pm$ 6 % | 0.98 mho/m $\pm$ 6 % |
| Body TSL temperature change during test | <1.0 °C             | ---            | ---                  |

### SAR result with Body TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL   | Condition          |                                |
|---------------------------------------------------------|--------------------|--------------------------------|
| SAR measured                                            | 250 mW input power | 2.46 mW / g                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 9.75 mW / g $\pm$ 18.8 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | Condition          |                                |
| SAR measured                                            | 250 mW input power | 1.63 mW / g                    |
| SAR for nominal Body TSL parameters                     | normalized to 1W   | 6.47 mW / g $\pm$ 18.7 % (k=2) |

Certificate No: Z17-97114

Page 3 of 8



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 50.3Ω- 2.54jΩ |
| Return Loss                          | - 31.9dB      |

### Antenna Parameters with Body TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 46.8Ω- 4.57jΩ |
| Return Loss                          | - 24.8dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.495 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

# DASY5 Validation Report for Head TSL

Date: 08.28.2017

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.887 \text{ S/m}$ ;  $\epsilon_r = 41.22$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

## DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.73, 9.73, 9.73); Calibrated: 1/23/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

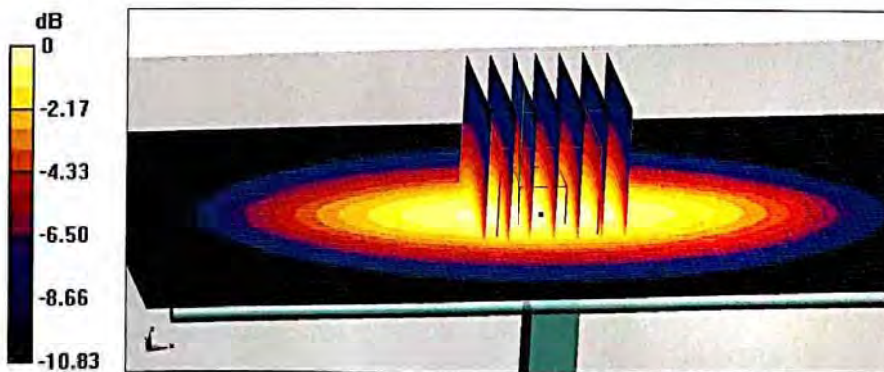
**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.74 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.60 W/kg

SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.51 W/kg

Maximum value of SAR (measured) = 3.16 W/kg



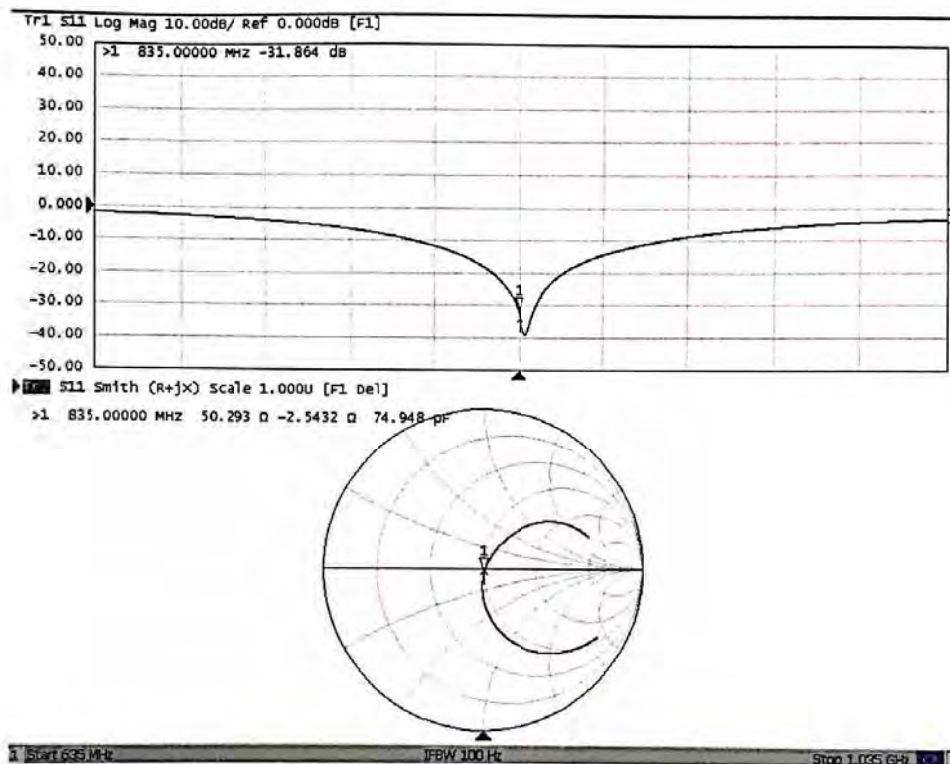
0 dB = 3.16 W/kg = 5.00 dBW/kg



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

### Impedance Measurement Plot for Head TSL





In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinattl.com http://www.chinattl.cn

# DASY5 Validation Report for Body TSL

Date: 08.27.2017

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.984 \text{ S/m}$ ;  $\epsilon_r = 55.62$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

## DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.64,9.64, 9.64); Calibrated: 1/23/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 1/19/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

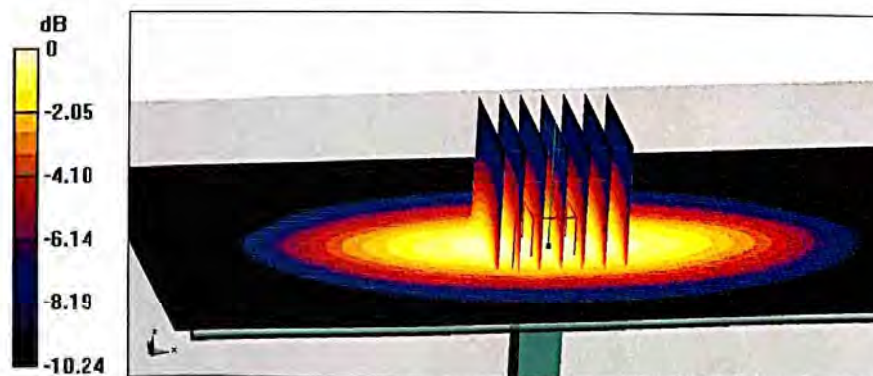
**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.55 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 3.71 W/kg

SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.63 W/kg

Maximum value of SAR (measured) = 3.29 W/kg



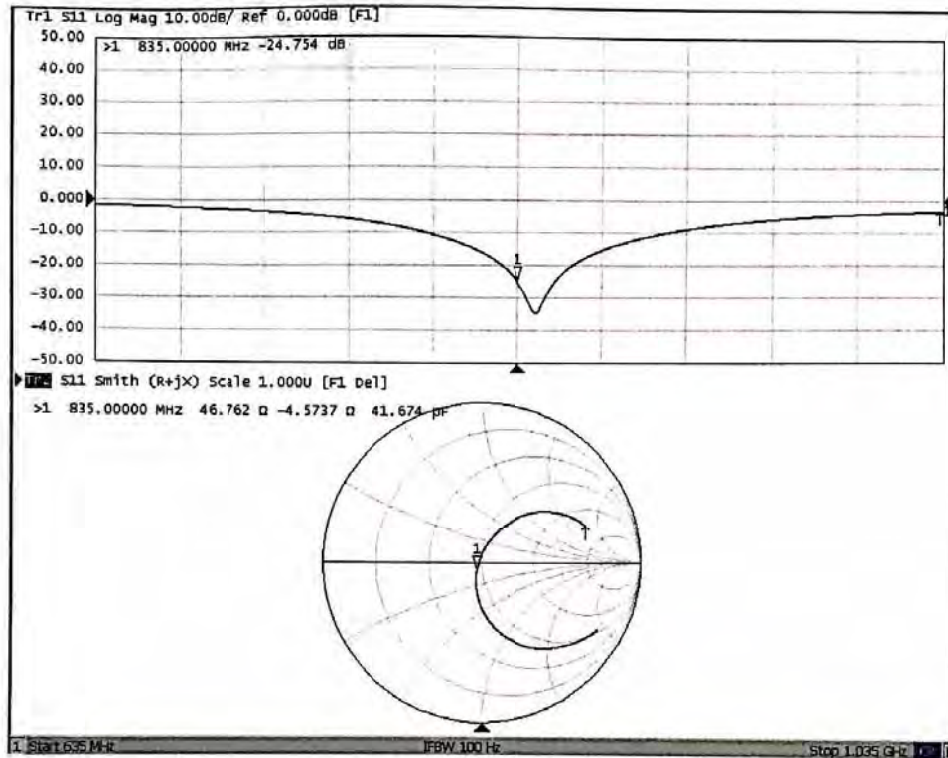
0 dB = 3.29 W/kg = 5.17 dBW/kg



In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cntl@chinattl.com http://www.chinattl.cn

### Impedance Measurement Plot for Body TSL



**ANNEX G: D1750V2 Dipole Calibration Certificate**

In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY



中国认可  
国际互认  
校准  
CALIBRATION  
CNAS L0570

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: cttl@chinatl.com http://www.chinatl.cn

Client

TA(Shanghai)

Certificate No: Z17-97002

**CALIBRATION CERTIFICATE**

Object

D1750V2 - SN: 1033

Calibration Procedure(s)

FD-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

January 10, 2017

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|------------------------------------------|-----------------------|
| Power Meter NRP2        | 101919     | 27-Jun-16 (CTTL, No.J16X04777)           | Jun-17                |
| Power sensor NRP-Z91    | 101547     | 27-Jun-16 (CTTL, No.J16X04777)           | Jun-17                |
| Reference Probe EX3DV4  | SN 7307    | 19-Feb-16(SPEAG,No.EX3-7307_Feb16)       | Feb-17                |
| DAE4                    | SN 771     | 02-Feb-16(CTTL-SPEAG,No.Z16-97011)       | Feb-17                |
| Secondary Standards     | ID #       | Cal Date(Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 01-Feb-16 (CTTL, No.J16X00893)           | Jan-17                |
| Network Analyzer E5071C | MY46110673 | 26-Jan-16 (CTTL, No.J16X00894)           | Jan-17                |

|                | Name        | Function                          | Signature |
|----------------|-------------|-----------------------------------|-----------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer                 |           |
| Reviewed by:   | Qi Dianyuan | SAR Project Leader                |           |
| Approved by:   | Lu Bingsong | Deputy Director of the laboratory |           |

Issued: January 12, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z17-97002

Page 1 of 8



Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504  
E-mail: ctll@chinattl.com http://www.chinattl.cn

#### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

#### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

#### Additional Documentation:

- DASY4/5 System Handbook

#### Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.