| Full Power | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 5 MHz | 1RB_24 | 1777.5MHz | 23.01 | 21.98 | 20.91 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.84 | 21.82 | 20.83 | **24.0** | **23.0** | **22.0** |
| | | 1712.5MHz | 23.23 | 22.18 | 21.09 | **24.0** | **23.0** | **22.0** |
| | 1RB_12 | 1777.5MHz | 22.97 | 21.83 | 20.84 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.85 | 21.89 | 20.97 | **24.0** | **23.0** | **22.0** |
| | | 1712.5MHz | 23.09 | 22.01 | 20.88 | **24.0** | **23.0** | **22.0** |
| | 1RB_0 | 1777.5MHz | 22.99 | 21.81 | 20.64 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.92 | 21.61 | 20.38 | **24.0** | **23.0** | **22.0** |
| | | 1712.5MHz | 23.17 | 22.00 | 20.77 | **24.0** | **23.0** | **22.0** |
| | 12RB_13 | 1777.5MHz | 21.94 | 21.00 | 19.90 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.11 | 21.08 | 19.98 | **23.0** | **22.0** | **21.0** |
| | | 1712.5MHz | 22.07 | 21.02 | 20.00 | **23.0** | **22.0** | **21.0** |
| | 12RB_6 | 1777.5MHz | 21.87 | 20.89 | 19.85 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 21.94 | 20.81 | 19.75 | **23.0** | **22.0** | **21.0** |
| | | 1712.5MHz | 21.99 | 20.88 | 19.93 | **23.0** | **22.0** | **21.0** |
| | 12RB_0 | 1777.5MHz | 21.96 | 20.91 | 19.86 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.01 | 20.87 | 19.70 | **23.0** | **22.0** | **21.0** |
| | | 1712.5MHz | 22.09 | 21.01 | 19.86 | **23.0** | **22.0** | **21.0** |
| | 25RB_0 | 1777.5MHz | 21.99 | 21.20 | 20.38 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.02 | 21.17 | 20.40 | **23.0** | **22.0** | **21.0** |
| | | 1712.5MHz | 21.99 | 21.13 | 20.16 | **23.0** | **22.0** | **21.0** |

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| Full Power | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 10 MHz | 1RB_49 | 1775.0MHz | 22.96 | 22.02 | 20.89 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.83 | 21.82 | 20.76 | **24.0** | **23.0** | **22.0** |
| | | 1715.0MHz | 23.23 | 22.16 | 21.09 | **24.0** | **23.0** | **22.0** |
| | 1RB_24 | 1775.0MHz | 23.02 | 21.88 | 20.88 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.87 | 21.87 | 20.94 | **24.0** | **23.0** | **22.0** |
| | | 1715.0MHz | 23.06 | 22.03 | 20.93 | **24.0** | **23.0** | **22.0** |
| | 1RB_0 | 1775.0MHz | 23.02 | 21.88 | 20.68 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.96 | 21.64 | 20.39 | **24.0** | **23.0** | **22.0** |
| | | 1715.0MHz | 23.19 | 22.00 | 20.75 | **24.0** | **23.0** | **22.0** |
| | 25RB_25 | 1775.0MHz | 21.97 | 20.98 | 19.84 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.08 | 21.14 | 19.97 | **23.0** | **22.0** | **21.0** |
| | | 1715.0MHz | 22.05 | 20.99 | 20.08 | **23.0** | **22.0** | **21.0** |
| | 25RB_12 | 1775.0MHz | 21.96 | 20.87 | 19.78 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 21.87 | 20.84 | 19.71 | **23.0** | **22.0** | **21.0** |
| | | 1715.0MHz | 22.00 | 20.90 | 19.90 | **23.0** | **22.0** | **21.0** |
| | 25RB_0 | 1775.0MHz | 21.91 | 20.91 | 19.80 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.00 | 20.85 | 19.70 | **23.0** | **22.0** | **21.0** |
| | | 1715.0MHz | 22.04 | 20.98 | 19.82 | **23.0** | **22.0** | **21.0** |
| | 50RB_0 | 1775.0MHz | 22.04 | 21.18 | 20.34 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 21.97 | 21.20 | 20.38 | **23.0** | **22.0** | **21.0** |
| | | 1715.0MHz | 21.99 | 21.07 | 20.15 | **23.0** | **22.0** | **21.0** |

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| Full Power | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 15 MHz | 1RB_74 | 1772.5MHz | 22.97 | 21.98 | 20.95 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.81 | 21.77 | 20.81 | **24.0** | **23.0** | **22.0** |
| | | 1717.5MHz | 23.25 | 22.21 | 21.10 | **24.0** | **23.0** | **22.0** |
| | 1RB_37 | 1772.5MHz | 22.98 | 21.87 | 20.85 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.84 | 21.89 | 20.95 | **24.0** | **23.0** | **22.0** |
| | | 1717.5MHz | 23.09 | 21.99 | 20.90 | **24.0** | **23.0** | **22.0** |
| | 1RB_0 | 1772.5MHz | 22.98 | 21.81 | 20.64 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.97 | 21.64 | 20.35 | **24.0** | **23.0** | **22.0** |
| | | 1717.5MHz | 23.13 | 21.94 | 20.75 | **24.0** | **23.0** | **22.0** |
| | 36RB_38 | 1772.5MHz | 21.95 | 20.94 | 19.84 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.09 | 21.13 | 19.93 | **23.0** | **22.0** | **21.0** |
| | | 1717.5MHz | 22.09 | 20.98 | 20.08 | **23.0** | **22.0** | **21.0** |
| | 36RB_19 | 1772.5MHz | 21.88 | 20.92 | 19.82 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 21.95 | 20.85 | 19.70 | **23.0** | **22.0** | **21.0** |
| | | 1717.5MHz | 21.96 | 20.88 | 19.92 | **23.0** | **22.0** | **21.0** |
| | 36RB_0 | 1772.5MHz | 21.96 | 20.91 | 19.86 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 21.96 | 20.88 | 19.68 | **23.0** | **22.0** | **21.0** |
| | | 1717.5MHz | 22.09 | 21.00 | 19.86 | **23.0** | **22.0** | **21.0** |
| | 75RB_0 | 1772.5MHz | 22.03 | 21.13 | 20.32 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.00 | 21.18 | 20.32 | **23.0** | **22.0** | **21.0** |
| | | 1717.5MHz | 21.98 | 21.08 | 20.20 | **23.0** | **22.0** | **21.0** |

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| Full Power | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 20 MHz | 1RB_99 | 1770.0MHz | 23.03 | 22.03 | 20.98 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.89 | 21.83 | 20.83 | **24.0** | **23.0** | **22.0** |
| | | 1720.0MHz | **23.27** | 22.24 | 21.15 | **24.0** | **23.0** | **22.0** |
| | 1RB_50 | 1770.0MHz | 23.02 | 21.92 | 20.92 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.93 | 21.94 | 20.98 | **24.0** | **23.0** | **22.0** |
| | | 1720.0MHz | 23.12 | 22.08 | 20.94 | **24.0** | **23.0** | **22.0** |
| | 1RB_0 | 1770.0MHz | 23.05 | 21.89 | 20.69 | **24.0** | **23.0** | **22.0** |
| | | 1745.0MHz | 22.98 | 21.71 | 20.45 | **24.0** | **23.0** | **22.0** |
| | | 1720.0MHz | 23.21 | 22.04 | 20.82 | **24.0** | **23.0** | **22.0** |
| | 50RB_50 | 1770.0MHz | 22.03 | 21.01 | 19.92 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | **22.14** | 21.17 | 20.02 | **23.0** | **22.0** | **21.0** |
| | | 1720.0MHz | 22.12 | 21.06 | 20.08 | **23.0** | **22.0** | **21.0** |
| | 50RB_25 | 1770.0MHz | 21.96 | 20.97 | 19.88 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 21.95 | 20.88 | 19.78 | **23.0** | **22.0** | **21.0** |
| | | 1720.0MHz | 22.06 | 20.98 | 19.94 | **23.0** | **22.0** | **21.0** |
| | 50RB_0 | 1770.0MHz | 22.01 | 20.91 | 19.87 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.05 | 20.88 | 19.75 | **23.0** | **22.0** | **21.0** |
| | | 1720.0MHz | 22.10 | 21.03 | 19.89 | **23.0** | **22.0** | **21.0** |
| | 100RB_0 | 1770.0MHz | 22.07 | 21.22 | 20.41 | **23.0** | **22.0** | **21.0** |
| | | 1745.0MHz | 22.05 | 21.21 | 20.41 | **23.0** | **22.0** | **21.0** |
| | | 1720.0MHz | 22.05 | 21.16 | 20.24 | **23.0** | **22.0** | **21.0** |

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| Reduced power level 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 1.4 MHz | 1RB_5 | 1779.3MHz | 17.75 | 17.06 | 16.64 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.97 | 17.21 | 16.62 | **19.0** | **18.0** | **17.0** |
| | | 1710.7MHz | 18.59 | 17.95 | 16.40 | **19.0** | **18.0** | **17.0** |
| | 1RB_3 | 1779.3MHz | 17.39 | 16.98 | 16.64 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.39 | 16.97 | 16.46 | **19.0** | **18.0** | **17.0** |
| | | 1710.7MHz | 17.40 | 16.99 | 16.52 | **19.0** | **18.0** | **17.0** |
| | 1RB_0 | 1779.3MHz | 17.56 | 16.93 | 16.47 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.89 | 17.18 | 16.58 | **19.0** | **18.0** | **17.0** |
| | | 1710.7MHz | 17.60 | 16.99 | 16.49 | **19.0** | **18.0** | **17.0** |
| | 3RB_3 | 1779.3MHz | 17.73 | 17.07 | 16.55 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.95 | 17.22 | 16.68 | **19.0** | **18.0** | **17.0** |
| | | 1710.7MHz | 18.61 | 18.04 | 16.43 | **19.0** | **18.0** | **17.0** |
| | 3RB_1 | 1779.3MHz | 17.37 | 17.01 | 16.70 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.37 | 16.91 | 16.50 | **19.0** | **18.0** | **17.0** |
| | | 1710.7MHz | 17.40 | 17.04 | 16.56 | **19.0** | **18.0** | **17.0** |
| | 3RB_0 | 1779.3MHz | 17.48 | 16.93 | 16.40 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.92 | 17.19 | 16.55 | **19.0** | **18.0** | **17.0** |
| | | 1710.7MHz | 17.57 | 17.01 | 16.45 | **19.0** | **18.0** | **17.0** |
| | 6RB_0 | 1779.3MHz | 16.43 | 15.46 | 14.49 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.76 | 15.74 | 14.76 | **18.0** | **17.0** | **16.0** |
| | | 1710.7MHz | 16.83 | 15.86 | 14.78 | **18.0** | **17.0** | **16.0** |

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| Reduced power level 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 3 MHz | 1RB_14 | 1778.5MHz | 17.74 | 17.10 | 16.57 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.97 | 17.22 | 16.61 | **19.0** | **18.0** | **17.0** |
| | | 1711.5MHz | 18.54 | 17.81 | 16.82 | **19.0** | **18.0** | **17.0** |
| | 1RB_7 | 1778.5MHz | 17.42 | 16.99 | 16.68 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.44 | 16.90 | 16.42 | **19.0** | **18.0** | **17.0** |
| | | 1711.5MHz | 17.41 | 16.99 | 16.52 | **19.0** | **18.0** | **17.0** |
| | 1RB_0 | 1778.5MHz | 17.51 | 16.93 | 16.43 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.87 | 17.17 | 16.56 | **19.0** | **18.0** | **17.0** |
| | | 1711.5MHz | 17.59 | 16.95 | 16.45 | **19.0** | **18.0** | **17.0** |
| | 8RB_7 | 1778.5MHz | 16.86 | 15.87 | 15.04 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.94 | 16.20 | 15.40 | **18.0** | **17.0** | **16.0** |
| | | 1711.5MHz | 17.00 | 16.09 | 15.18 | **18.0** | **17.0** | **16.0** |
| | 8RB_4 | 1778.5MHz | 16.47 | 15.60 | 14.61 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.56 | 15.62 | 14.63 | **18.0** | **17.0** | **16.0** |
| | | 1711.5MHz | 16.58 | 15.64 | 14.56 | **18.0** | **17.0** | **16.0** |
| | 8RB_0 | 1778.5MHz | 16.01 | 15.16 | 14.23 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.89 | 16.05 | 15.17 | **18.0** | **17.0** | **16.0** |
| | | 1711.5MHz | 16.47 | 15.57 | 14.73 | **18.0** | **17.0** | **16.0** |
| | 15RB_0 | 1778.5MHz | 16.50 | 15.44 | 14.48 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.79 | 15.73 | 14.75 | **18.0** | **17.0** | **16.0** |
| | | 1711.5MHz | 16.86 | 15.83 | 14.79 | **18.0** | **17.0** | **16.0** |

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| Reduced power level 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 5 MHz | 1RB_24 | 1777.5MHz | 17.79 | 17.13 | 16.54 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.93 | 17.24 | 16.67 | **19.0** | **18.0** | **17.0** |
| | | 1712.5MHz | 18.58 | 17.83 | 16.85 | **19.0** | **18.0** | **17.0** |
| | 1RB_12 | 1777.5MHz | 17.41 | 17.01 | 16.72 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.44 | 16.92 | 16.52 | **19.0** | **18.0** | **17.0** |
| | | 1712.5MHz | 17.44 | 17.02 | 16.49 | **19.0** | **18.0** | **17.0** |
| | 1RB_0 | 1777.5MHz | 17.48 | 16.98 | 16.45 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.89 | 17.18 | 16.58 | **19.0** | **18.0** | **17.0** |
| | | 1712.5MHz | 17.50 | 16.92 | 16.51 | **19.0** | **18.0** | **17.0** |
| | 12RB_13 | 1777.5MHz | 16.81 | 15.94 | 15.04 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.98 | 16.15 | 15.41 | **18.0** | **17.0** | **16.0** |
| | | 1712.5MHz | 16.95 | 16.08 | 15.15 | **18.0** | **17.0** | **16.0** |
| | 12RB_6 | 1777.5MHz | 16.50 | 15.55 | 14.58 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.62 | 15.57 | 14.61 | **18.0** | **17.0** | **16.0** |
| | | 1712.5MHz | 16.57 | 15.62 | 14.62 | **18.0** | **17.0** | **16.0** |
| | 12RB_0 | 1777.5MHz | 16.02 | 15.18 | 14.15 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.91 | 16.12 | 15.17 | **18.0** | **17.0** | **16.0** |
| | | 1712.5MHz | 16.47 | 15.65 | 14.66 | **18.0** | **17.0** | **16.0** |
| | 25RB_0 | 1777.5MHz | 16.41 | 15.40 | 14.48 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.82 | 15.78 | 14.69 | **18.0** | **17.0** | **16.0** |
| | | 1712.5MHz | 16.82 | 15.81 | 14.76 | **18.0** | **17.0** | **16.0** |

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| Reduced power level 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 10 MHz | 1RB_49 | 1775.0MHz | 17.77 | 17.07 | 16.61 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.97 | 17.27 | 16.59 | **19.0** | **18.0** | **17.0** |
| | | 1715.0MHz | 18.56 | 17.99 | 16.66 | **19.0** | **18.0** | **17.0** |
| | 1RB_24 | 1775.0MHz | 17.32 | 17.06 | 16.66 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.37 | 16.91 | 16.44 | **19.0** | **18.0** | **17.0** |
| | | 1715.0MHz | 17.45 | 17.01 | 16.55 | **19.0** | **18.0** | **17.0** |
| | 1RB_0 | 1775.0MHz | 17.53 | 16.94 | 16.42 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.89 | 17.20 | 16.57 | **19.0** | **18.0** | **17.0** |
| | | 1715.0MHz | 17.60 | 17.00 | 16.44 | **19.0** | **18.0** | **17.0** |
| | 25RB_25 | 1775.0MHz | 16.87 | 15.92 | 14.98 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 17.00 | 16.23 | 15.37 | **18.0** | **17.0** | **16.0** |
| | | 1715.0MHz | 16.97 | 16.10 | 15.20 | **18.0** | **17.0** | **16.0** |
| | 25RB_12 | 1775.0MHz | 16.53 | 15.53 | 14.59 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.63 | 15.64 | 14.60 | **18.0** | **17.0** | **16.0** |
| | | 1715.0MHz | 16.59 | 15.65 | 14.53 | **18.0** | **17.0** | **16.0** |
| | 25RB_0 | 1775.0MHz | 16.05 | 15.12 | 14.17 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.91 | 16.05 | 15.18 | **18.0** | **17.0** | **16.0** |
| | | 1715.0MHz | 16.46 | 15.57 | 14.67 | **18.0** | **17.0** | **16.0** |
| | 50RB_0 | 1775.0MHz | 16.43 | 15.38 | 14.54 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.76 | 15.75 | 14.70 | **18.0** | **17.0** | **16.0** |
| | | 1715.0MHz | 16.84 | 15.86 | 14.81 | **18.0** | **17.0** | **16.0** |

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| Reduced power level 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 15 MHz | 1RB_74 | 1772.5MHz | 17.74 | 17.07 | 16.63 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.89 | 17.27 | 16.68 | **19.0** | **18.0** | **17.0** |
| | | 1717.5MHz | 18.53 | 17.80 | 16.83 | **19.0** | **18.0** | **17.0** |
| | 1RB_37 | 1772.5MHz | 17.37 | 17.04 | 16.68 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.42 | 16.92 | 16.48 | **19.0** | **18.0** | **17.0** |
| | | 1717.5MHz | 17.39 | 16.97 | 16.56 | **19.0** | **18.0** | **17.0** |
| | 1RB_0 | 1772.5MHz | 17.57 | 16.99 | 16.42 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.90 | 17.22 | 16.54 | **19.0** | **18.0** | **17.0** |
| | | 1717.5MHz | 17.57 | 16.98 | 16.48 | **19.0** | **18.0** | **17.0** |
| | 36RB_38 | 1772.5MHz | 16.87 | 15.86 | 14.97 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.96 | 16.25 | 15.32 | **18.0** | **17.0** | **16.0** |
| | | 1717.5MHz | 16.93 | 16.09 | 15.14 | **18.0** | **17.0** | **16.0** |
| | 36RB_19 | 1772.5MHz | 16.55 | 15.62 | 14.56 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.61 | 15.60 | 14.64 | **18.0** | **17.0** | **16.0** |
| | | 1717.5MHz | 16.62 | 15.62 | 14.58 | **18.0** | **17.0** | **16.0** |
| | 36RB_0 | 1772.5MHz | 16.07 | 15.11 | 14.15 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.87 | 16.05 | 15.15 | **18.0** | **17.0** | **16.0** |
| | | 1717.5MHz | 16.47 | 15.65 | 14.69 | **18.0** | **17.0** | **16.0** |
| | 75RB_0 | 1772.5MHz | 16.46 | 15.38 | 14.45 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.76 | 15.78 | 14.74 | **18.0** | **17.0** | **16.0** |
| | | 1717.5MHz | 16.83 | 15.85 | 14.81 | **18.0** | **17.0** | **16.0** |

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| Reduced power level 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **LTE Band 66** | | | Actual output Power (dBm) | | | **Tune up** | | |
| Band -width | RB No. / RB offset | Frequency | Modulation | | | Modulation | | |
| | | | QPSK | 16QAM | 64QAM | QPSK | 16QAM | 64QAM |
| 20 MHz | 1RB_99 | 1770.0MHz | 17.82 | 17.15 | 16.64 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.98 | 17.30 | 16.69 | **19.0** | **18.0** | **17.0** |
| | | 1720.0MHz | **18.63** | 17.75 | 16.84 | **19.0** | **18.0** | **17.0** |
| | 1RB_50 | 1770.0MHz | 17.42 | 17.07 | 16.73 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.45 | 16.97 | 16.52 | **19.0** | **18.0** | **17.0** |
| | | 1720.0MHz | 17.48 | 17.05 | 16.57 | **19.0** | **18.0** | **17.0** |
| | 1RB_0 | 1770.0MHz | 17.58 | 17.01 | 16.50 | **19.0** | **18.0** | **17.0** |
| | | 1745.0MHz | 17.92 | 17.26 | 16.62 | **19.0** | **18.0** | **17.0** |
| | | 1720.0MHz | 17.60 | 17.02 | 16.52 | **19.0** | **18.0** | **17.0** |
| | 50RB_50 | 1770.0MHz | 16.90 | 15.96 | 15.06 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | **17.04** | 16.25 | 15.42 | **18.0** | **17.0** | **16.0** |
| | | 1720.0MHz | 17.01 | 16.13 | 15.22 | **18.0** | **17.0** | **16.0** |
| | 50RB_25 | 1770.0MHz | 16.56 | 15.62 | 14.64 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.66 | 15.65 | 14.69 | **18.0** | **17.0** | **16.0** |
| | | 1720.0MHz | 16.66 | 15.66 | 14.62 | **18.0** | **17.0** | **16.0** |
| | 50RB_0 | 1770.0MHz | 16.10 | 15.20 | 14.24 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.97 | 16.14 | 15.23 | **18.0** | **17.0** | **16.0** |
| | | 1720.0MHz | 16.55 | 15.67 | 14.74 | **18.0** | **17.0** | **16.0** |
| | 100RB_0 | 1770.0MHz | 16.51 | 15.47 | 14.54 | **18.0** | **17.0** | **16.0** |
| | | 1745.0MHz | 16.84 | 15.79 | 14.77 | **18.0** | **17.0** | **16.0** |
| | | 1720.0MHz | 16.87 | 15.90 | 14.84 | **18.0** | **17.0** | **16.0** |

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## 10.4. Bluetooth and WLAN Measurement result

**Table 10.5: The conducted Power measurement results for Bluetooth**

| Bluetooth | Tune up | Averaged Power (dBm) | | |
|---|---|---|---|---|
| Mode | | Ch.0 (2402MHz) | Ch.39 (2441MHz) | Ch.78 (2480MHz) |
| GFSK | **7.0** | 5.60 | 6.38 | 6.64 |
| EDR2M-4_DQPSK | **7.5** | 6.09 | 6.59 | 6.96 |
| EDR3M-8DPSK | **8.0** | 6.47 | 6.92 | 7.25 |
| / | **/** | Ch.0 (2402MHz) | Ch.19 (2440MHz) | Ch.39 (2480MHz) |
| BLE | **1.5** | -1.05 | 0.22 | 0.85 |

**Table 10.6: The conducted Power measurement results for WLAN 2.4G**

| Averaged Power (dBm) Duty Cycle: **100%** | | | | |
|---|---|---|---|---|
| Mode | **Tune up** | Ch.1 (2412MHz) | Ch.6 (2437Mhz) | Ch.11 (2462MHz) |
| 802.11b | **18.5** | 17.23 | 16.74 | **17.53** |
| 802.11g | **17.0** | 15.75 | 15.62 | 16.24 |
| 802.11n(20MHz) | **17.0** | 15.83 | 15.66 | 16.24 |

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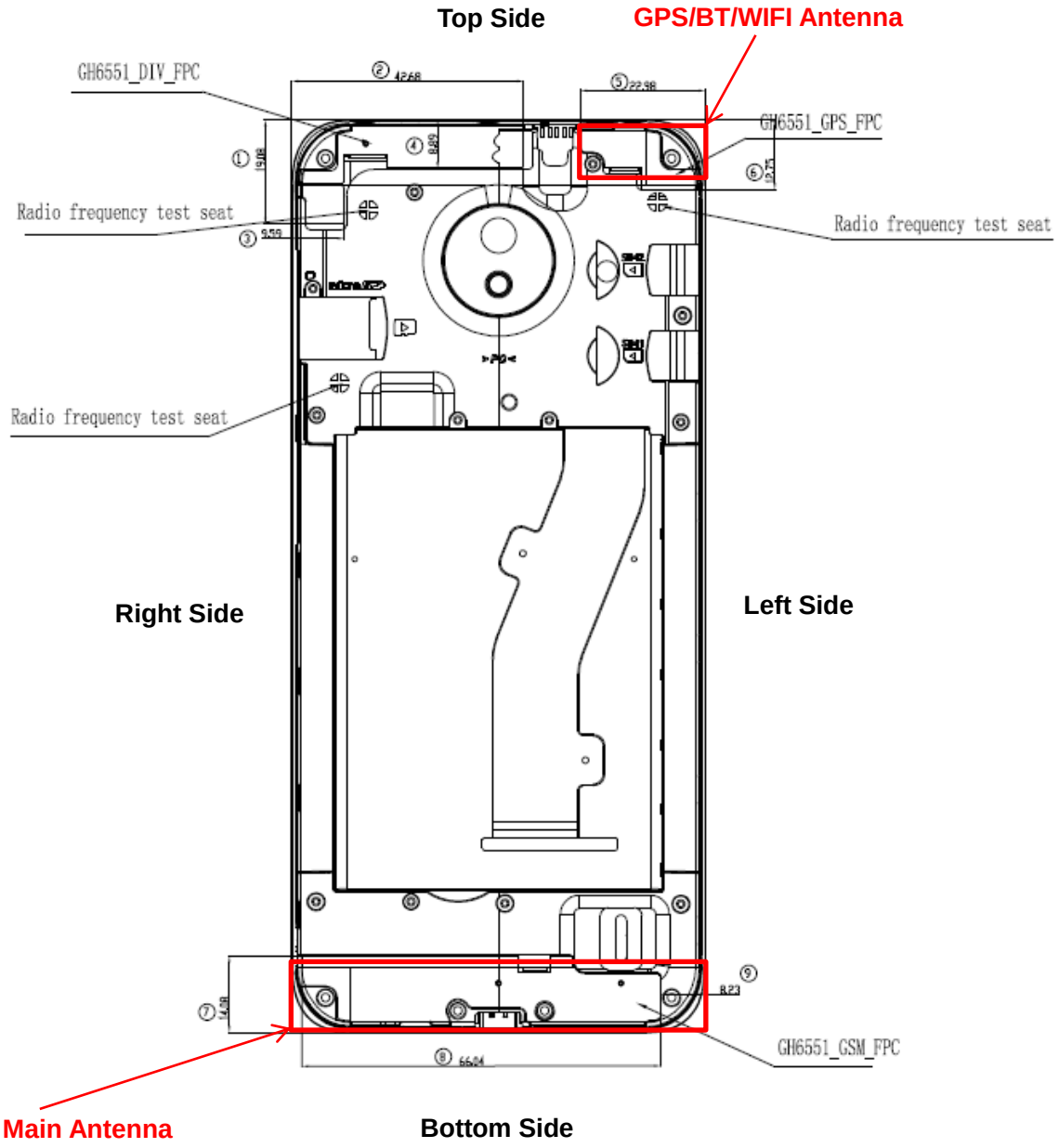
# 11. Simultaneous TX SAR Considerations

## 11.1. Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the Bluetooth and WLAN can transmit simultaneous with other transmitters.

## 11.2. Transmit Antenna Separation Distances




**Picture 11.1 Antenna Locations (Back View)**

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## 11.3. SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR, the edges with less than 25mm distance to the antennas need to be tested for SAR.

| SAR measurement positions | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Front | Rear | Left edge | Right edge | Top edge | Bottom edge |
| Main antenna | Yes | Yes | Yes | Yes | No | Yes |
| WLAN antenna | Yes | Yes | Yes | Yes | Yes | No |

## 11.4. Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.
The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

**Table 11.1: Standalone SAR test exclusion considerations**

| Band | f(GHz) | Position | SAR test exclusion threshold (mW) | RF output power | | SAR test exclusion |
|---|---|---|---|---|---|---|
| | | | | dBm | mW | |
| Bluetooth | 2.441 | Head | 9.60 | 8.0 | 6.31 | Yes |
| | | Body | 19.20 | 8.0 | 6.31 | Yes |
| WLAN 2.4G | 2.45 | Head | 9.58 | 18.5 | 70.79 | No |
| | | Body | 19.17 | 18.5 | 70.79 | No |

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# 12. Evaluation of Simultaneous

**Table 12.1: The sum of reported SAR values for main antenna and WLAN**

| / | Position | Main Antenna (W/kg) | WLAN (W/kg) | Sum (W/kg) |
|---|---|---|---|---|
| Highest reported SAR value for Head | Right Cheek | 0.32 | 0.74 | 1.06 |
| Highest reported SAR value for Hotspot | Rear | 1.16 | 0.21 | 1.37 |
| Highest reported SAR value for Body-worn | Rear | 1.16 | 0.21 | 1.37 |

Note: the test positions of above tables are for the worse case that has been evaluated.

**Table 12.2: The sum of reported SAR values for main antenna and Bluetooth**

| / | Position | Main Antenna (W/kg) | Bluetooth (W/kg) | Sum (W/kg) |
|---|---|---|---|---|
| Highest reported SAR value for Head | Left Cheek | 0.33 | 0.26 | 0.59 |
| Highest reported SAR value for Hotspot | Rear | 1.16 | 0.13 | 1.29 |
| Highest reported SAR value for Body-worn | Rear | 1.16 | 0.13 | 1.29 |

Note: the test positions of above tables are for the worse case that has been evaluated.

**Table 12.3: Estimated SAR for Bluetooth**

| Position | f (GHz) | Distance (mm) | Upper limit of power * | | Estimated$_{1g}$ (W/kg) |
|---|---|---|---|---|---|
| | | | dBm | mW | |
| Head | 2.441 | 5 | 8.0 | 6.31 | 0.26 |
| Body | 2.441 | 10 | 8.0 | 6.31 | 0.13 |

* - Maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
Where x = 7.5 for 1-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

**Conclusion:**
According to the above tables, the sum of reported SAR values is < 1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

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# 13. Summary of Test Results

According to the client's decision rule in the test registration form, which is "based on the measurement results as the basis of the conformity statement", the test conclusion of this report meets the limit requirements.

The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target} - P_{Measured})/10}$$

Where $P_{Target}$ is the power of manufacturing upper limit;

$P_{Measured}$ is the measured power in chapter 10.

The device support dual SIMs, SIM1 was used for the all configuration SAR testing and SIM2 test the worst case SAR of SIM1.

**Duty Cycle**

| Mode | Duty Cycle |
|---|---|
| Speech for GSM850/1900 | 1:8.3 |
| GPRS for GSM850 | 1:4 |
| GPRS for GSM1900 | 1:2 |
| WCDMA Band2/4/5 | 1:1 |
| FDD_LTE Band 2/4/5/7/12/17/66 | 1:1 |

## 13.1. Testing Environment

| | |
|---|---|
| Temperature: | 18°C~25°C |
| Relative humidity: | 30%~70% |
| Ground system resistance: | <4Ω |
| Ambient noise & Reflection: | < 0.012 W/kg |

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## 13.2. SAR results

**Table 13.1: SAR Values (GSM 850 - Head)**

| Ambient Temperature: 22.1°C Liquid Temperature: 21.6°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 190 | 836.6 | Speech | Left Cheek | **1** | 31.89 | 33.0 | **0.229** | **0.30** | 0.09 |
| 190 | 836.6 | Speech | Left Tilt | / | 31.89 | 33.0 | 0.119 | **0.15** | 0.12 |
| 190 | 836.6 | Speech | Right Cheek | / | 31.89 | 33.0 | 0.226 | **0.29** | 0.07 |
| 190 | 836.6 | Speech | Right Tilt | / | 31.89 | 33.0 | 0.126 | **0.16** | -0.01 |

**Table 13.2: SAR Values (GSM 850 - Body)**

| Ambient Temperature: 22.1°C Liquid Temperature: 21.6°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm)** | | | | | | | | | |
| 190 | 836.6 | GPRS | Front | / | 29.84 | 31.0 | 0.149 | **0.19** | -0.03 |
| 190 | 836.6 | GPRS | Rear | **2** | 29.84 | 31.0 | **0.324** | **0.42** | 0.02 |
| 190 | 836.6 | GPRS | Left | / | 29.84 | 31.0 | 0.218 | **0.28** | 0.02 |
| 190 | 836.6 | GPRS | Right | / | 29.84 | 31.0 | 0.183 | **0.24** | 0.05 |
| 190 | 836.6 | GPRS | Bottom | / | 29.84 | 31.0 | 0.060 | **0.08** | -0.03 |

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**Table 13.3: SAR Values (GSM 1900 - Head)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 512 | 1850.2 | Speech | Left Cheek | / | 29.05 | 30.0 | 0.025 | **0.03** | 0.02 |
| 512 | 1850.2 | Speech | Left Tilt | / | 29.05 | 30.0 | 0.024 | **0.03** | 0.02 |
| 512 | 1850.2 | Speech | Right Cheek | **3** | 29.05 | 30.0 | **0.032** | **0.04** | -0.18 |
| 512 | 1850.2 | Speech | Right Tilt | / | 29.05 | 30.0 | 0.021 | **0.03** | 0.04 |

**Table 13.4: SAR Values (GSM 1900 - Body)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm) - Reduced power level 1** | | | | | | | | | |
| 512 | 1850.2 | GPRS | Front | / | 23.04 | 23.5 | 0.188 | **0.21** | 0.04 |
| 512 | 1850.2 | GPRS | Rear | **4** | 23.04 | 23.5 | **0.546** | **0.61** | 0.01 |
| 512 | 1850.2 | GPRS | Left | / | 23.04 | 23.5 | 0.065 | **0.07** | 0.05 |
| 512 | 1850.2 | GPRS | Right | / | 23.04 | 23.5 | 0.056 | **0.06** | 0.05 |
| 512 | 1850.2 | GPRS | Bottom | / | 23.04 | 23.5 | 0.490 | **0.54** | 0.06 |

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**Table 13.5: SAR Values (WCDMA Band 2 - Head)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 9400 | 1800 | RMC | Left Cheek | / | 23.60 | 24.5 | 0.046 | **0.06** | 0.04 |
| 9400 | 1800 | RMC | Left Tilt | / | 23.60 | 24.5 | 0.048 | **0.06** | 0.02 |
| 9400 | 1800 | RMC | Right Cheek | **5** | 23.60 | 24.5 | **0.048** | **0.06** | 0.02 |
| 9400 | 1800 | RMC | Right Tilt | / | 23.60 | 24.5 | 0.027 | **0.03** | 0.04 |

**Table 13.6: SAR Values (WCDMA Band 2 - Body)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm) - Reduced power level 1** | | | | | | | | | |
| 9400 | 1800 | RMC | Front | / | 19.60 | 20.5 | 0.161 | **0.20** | -0.10 |
| 9400 | 1800 | RMC | Rear | **6** | 19.60 | 20.5 | **0.852** | **1.05** | -0.04 |
| 9400 | 1800 | RMC | Left | / | 19.60 | 20.5 | 0.035 | **0.04** | -0.18 |
| 9400 | 1800 | RMC | Right | / | 19.60 | 20.5 | 0.040 | **0.05** | 0.15 |
| 9400 | 1800 | RMC | Bottom | / | 19.60 | 20.5 | 0.404 | **0.50** | 0.01 |
| 9538 | 1907.6 | RMC | Rear | / | 19.60 | 20.5 | 0.661 | **0.81** | -0.11 |
| 9262 | 1852.4 | RMC | Rear | / | 19.70 | 20.5 | 0.549 | **0.66** | -0.14 |

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**Table 13.7: SAR Values (WCDMA Band 4 - Head)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.2°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 1413 | 1732.6 | RMC | Left Cheek | / | 24.60 | 25.0 | 0.189 | **0.21** | 0.08 |
| 1413 | 1732.6 | RMC | Left Tilt | **7** | 24.60 | 25.0 | **0.237** | **0.26** | 0.06 |
| 1413 | 1732.6 | RMC | Right Cheek | / | 24.60 | 25.0 | 0.229 | **0.25** | 0.06 |
| 1413 | 1732.6 | RMC | Right Tilt | / | 24.60 | 25.0 | 0.174 | **0.19** | 0.06 |

**Table 13.8: SAR Values ( WCDMA Band 4 - Body)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.2°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm) - Reduced power level 1** | | | | | | | | | |
| 1413 | 1732.6 | RMC | Front | / | 22.60 | 23.0 | 0.169 | **0.19** | 0.10 |
| 1413 | 1732.6 | RMC | Rear | **8** | 22.60 | 23.0 | **0.390** | **0.43** | -0.03 |
| 1413 | 1732.6 | RMC | Left | / | 22.60 | 23.0 | 0.085 | **0.09** | 0.07 |
| 1413 | 1732.6 | RMC | Right | / | 22.60 | 23.0 | 0.139 | **0.15** | 0.03 |
| 1413 | 1732.6 | RMC | Bottom | / | 22.60 | 23.0 | 0.289 | **0.32** | 0.19 |

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**Table 13.9: SAR Values (WCDMA Band 5 - Head)**

| Ambient Temperature: 22.1°C Liquid Temperature: 21.6°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 4182 | 836.4 | RMC | Left Cheek | **9** | 23.40 | 24.5 | **0.253** | **0.33** | 0.09 |
| 4182 | 836.4 | RMC | Left Tilt | / | 23.40 | 24.5 | 0.123 | **0.16** | 0.08 |
| 4182 | 836.4 | RMC | Right Cheek | / | 23.40 | 24.5 | 0.251 | **0.32** | 0.09 |
| 4182 | 836.4 | RMC | Right Tilt | / | 23.40 | 24.5 | 0.124 | **0.16** | 0.02 |
| 4182 | 836.4 | RMC | Left Cheek | SIM2 | 23.40 | 24.5 | 0.244 | **0.31** | 0.02 |

**Table 13.10: SAR Values (WCDMA Band 5 - Body)**

| Ambient Temperature: 22.1°C Liquid Temperature: 21.6°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm)** | | | | | | | | | |
| 4182 | 836.4 | RMC | Front | / | 23.40 | 24.5 | 0.192 | **0.25** | 0.01 |
| 4182 | 836.4 | RMC | Rear | **10** | 23.40 | 24.5 | **0.286** | **0.37** | -0.03 |
| 4182 | 836.4 | RMC | Left | / | 23.40 | 24.5 | 0.281 | **0.36** | 0.01 |
| 4182 | 836.4 | RMC | Right | / | 23.40 | 24.5 | 0.281 | **0.36** | 0.09 |
| 4182 | 836.4 | RMC | Bottom | / | 23.40 | 24.5 | 0.052 | **0.07** | -0.04 |

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**Table 13.11: SAR Values (LTE Band 2 - Head)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 18900 | 1880 | 1RB0 | Left Cheek | / | 23.17 | 24.0 | 0.052 | **0.06** | 0.08 |
| 18900 | 1880 | 50RB50 | Left Cheek | / | 22.62 | 23.0 | 0.037 | **0.04** | 0.01 |
| 18900 | 1880 | 1RB0 | Left Tilt | / | 23.17 | 24.0 | 0.062 | **0.08** | 0.09 |
| 18900 | 1880 | 50RB50 | Left Tilt | / | 22.62 | 23.0 | 0.043 | **0.05** | 0.05 |
| 18900 | 1880 | 1RB0 | Right Cheek | **11** | 23.17 | 24.0 | **0.085** | **0.10** | 0.04 |
| 18900 | 1880 | 50RB50 | Right Cheek | / | 22.62 | 23.0 | 0.060 | **0.07** | 0.06 |
| 18900 | 1880 | 1RB0 | Right Tilt | / | 23.17 | 24.0 | 0.048 | **0.06** | -0.04 |
| 18900 | 1880 | 50RB50 | Right Tilt | / | 22.62 | 23.0 | 0.027 | **0.03** | 0.02 |

**Table 13.12: SAR Values (LTE Band 2 - Body)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.1°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm) - Reduced power level 1** | | | | | | | | | |
| 18900 | 1880 | 1RB0 | Front | / | 19.98 | 21.0 | 0.148 | **0.19** | 0.19 |
| 18900 | 1880 | 50RB50 | Front | / | 19.08 | 20.0 | 0.137 | **0.17** | 0.10 |
| 18900 | 1880 | 1RB0 | Rear | **12** | 19.98 | 21.0 | **0.886** | **1.12** | -0.10 |
| 18900 | 1880 | 50RB50 | Rear | / | 19.08 | 20.0 | 0.728 | **0.90** | 0.05 |
| 18900 | 1880 | 1RB0 | Left | / | 19.98 | 21.0 | 0.058 | **0.07** | -0.11 |
| 18900 | 1880 | 50RB50 | Left | / | 19.08 | 20.0 | 0.042 | **0.05** | 0.06 |
| 18900 | 1880 | 1RB0 | Right | / | 19.98 | 21.0 | 0.053 | **0.07** | 0.05 |
| 18900 | 1880 | 50RB50 | Right | / | 19.08 | 20.0 | 0.034 | **0.04** | 0.04 |
| 18900 | 1880 | 1RB0 | Bottom | / | 19.98 | 21.0 | 0.413 | **0.52** | 0.02 |
| 18900 | 1880 | 50RB50 | Bottom | / | 19.08 | 20.0 | 0.354 | **0.44** | 0.11 |
| 19100 | 1900 | 1RB99 | Rear | / | 19.89 | 21.0 | 0.625 | **0.81** | 0.03 |
| 18700 | 1860 | 1RB99 | Rear | / | 19.83 | 21.0 | 0.851 | **1.11** | 0.16 |
| 19100 | 1900 | 50RB50 | Rear | / | 19.07 | 20.0 | 0.597 | **0.74** | 0.05 |
| 18700 | 1860 | 50RB50 | Rear | / | 19.04 | 20.0 | 0.809 | **1.01** | 0.18 |
| 18900 | 1880 | 100RB | Rear | / | 19.06 | 20.0 | 0.480 | **0.60** | 0.03 |

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**Table 13.13: SAR Values (LTE Band 5 - Head)**

| Ambient Temperature: 22.1°C Liquid Temperature: 21.6°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 20525 | 836.5 | 1RB49 | Left Cheek | **13** | 23.23 | 24.0 | **0.193** | **0.23** | 0.02 |
| 20525 | 836.5 | 25RB25 | Left Cheek | / | 22.02 | 23.0 | 0.135 | **0.17** | 0.04 |
| 20525 | 836.5 | 1RB49 | Left Tilt | / | 23.23 | 24.0 | 0.105 | **0.13** | 0.08 |
| 20525 | 836.5 | 25RB25 | Left Tilt | / | 22.02 | 23.0 | 0.084 | **0.11** | 0.03 |
| 20525 | 836.5 | 1RB49 | Right Cheek | / | 23.23 | 24.0 | 0.178 | **0.21** | 0.02 |
| 20525 | 836.5 | 25RB25 | Right Cheek | / | 22.02 | 23.0 | 0.143 | **0.18** | 0.02 |
| 20525 | 836.5 | 1RB49 | Right Tilt | / | 23.23 | 24.0 | 0.093 | **0.11** | 0.03 |
| 20525 | 836.5 | 25RB25 | Right Tilt | / | 22.02 | 23.0 | 0.075 | **0.09** | 0.03 |

**Table 13.14: SAR Values (LTE Band 5 - Body)**

| Ambient Temperature: 22.1°C Liquid Temperature: 21.6°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm)** | | | | | | | | | |
| 20525 | 836.5 | 1RB49 | Front | / | 23.23 | 24.0 | 0.145 | **0.17** | 0.02 |
| 20525 | 836.5 | 25RB25 | Front | / | 22.02 | 23.0 | 0.120 | **0.15** | 0.03 |
| 20525 | 836.5 | 1RB49 | Rear | / | 23.23 | 24.0 | 0.235 | **0.28** | 0.07 |
| 20525 | 836.5 | 25RB25 | Rear | / | 22.02 | 23.0 | 0.188 | **0.24** | 0.09 |
| 20525 | 836.5 | 1RB49 | Left | / | 23.23 | 24.0 | 0.151 | **0.18** | 0.15 |
| 20525 | 836.5 | 25RB25 | Left | / | 22.02 | 23.0 | 0.129 | **0.16** | 0.18 |
| 20525 | 836.5 | 1RB49 | Right | **14** | 23.23 | 24.0 | **0.242** | **0.29** | 0.11 |
| 20525 | 836.5 | 25RB25 | Right | / | 22.02 | 23.0 | 0.195 | **0.24** | 0.13 |
| 20525 | 836.5 | 1RB49 | Bottom | / | 23.23 | 24.0 | 0.047 | **0.06** | -0.14 |
| 20525 | 836.5 | 25RB25 | Bottom | / | 22.02 | 23.0 | 0.038 | **0.05** | 0.01 |

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**Table 13.15: SAR Values (LTE Band 7 - Head)**

| Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 20850 | 2510 | 1RB99 | Left Cheek | **15** | 21.87 | 22.5 | **0.116** | **0.13** | 0.03 |
| 20850 | 2510 | 50RB50 | Left Cheek | / | 21.33 | 22.0 | 0.101 | **0.12** | 0.07 |
| 20850 | 2510 | 1RB99 | Left Tilt | / | 21.87 | 22.5 | 0.069 | **0.08** | 0.02 |
| 20850 | 2510 | 50RB50 | Left Tilt | / | 21.33 | 22.0 | 0.061 | **0.07** | 0.07 |
| 20850 | 2510 | 1RB99 | Right Cheek | / | 21.87 | 22.5 | 0.102 | **0.12** | 0.06 |
| 20850 | 2510 | 50RB50 | Right Cheek | / | 21.33 | 22.0 | 0.094 | **0.11** | 0.07 |
| 20850 | 2510 | 1RB99 | Right Tilt | / | 21.87 | 22.5 | 0.103 | **0.12** | 0.07 |
| 20850 | 2510 | 50RB50 | Right Tilt | / | 21.33 | 22.0 | 0.102 | **0.12** | 0.09 |

**Table 13.16: SAR Values (LTE Band 7 - Body)**

| Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm)** | | | | | | | | | |
| 20850 | 2510 | 1RB99 | Front | / | 21.87 | 22.5 | 0.437 | **0.51** | 0.07 |
| 20850 | 2510 | 50RB50 | Front | / | 21.33 | 22.0 | 0.392 | **0.46** | -0.16 |
| 20850 | 2510 | 1RB99 | Rear | / | 21.87 | 22.5 | 0.908 | **1.05** | 0.02 |
| 20850 | 2510 | 50RB50 | Rear | / | 21.33 | 22.0 | 0.784 | **0.91** | -0.09 |
| 20850 | 2510 | 1RB99 | Left | / | 21.87 | 22.5 | 0.169 | **0.20** | 0.04 |
| 20850 | 2510 | 50RB50 | Left | / | 21.33 | 22.0 | 0.146 | **0.17** | 0.10 |
| 20850 | 2510 | 1RB99 | Right | / | 21.87 | 22.5 | 0.158 | **0.18** | 0.15 |
| 20850 | 2510 | 50RB50 | Right | / | 21.33 | 22.0 | 0.142 | **0.17** | 0.03 |
| 20850 | 2510 | 1RB99 | Bottom | / | 21.87 | 22.5 | 0.687 | **0.79** | 0.19 |
| 20850 | 2510 | 50RB50 | Bottom | / | 21.33 | 22.0 | 0.622 | **0.73** | 0.14 |
| 21350 | 2560 | 1RB99 | Rear | **16** | 21.85 | 22.5 | **0.999** | **1.16** | 0.03 |
| 21100 | 2535 | 1RB99 | Rear | / | 21.83 | 22.5 | 0.892 | **1.04** | 0.04 |
| 21350 | 2560 | 50RB50 | Rear | / | 21.15 | 22.0 | 0.892 | **1.08** | 0.07 |
| 21100 | 2535 | 50RB50 | Rear | / | 21.31 | 22.0 | 0.804 | **0.94** | 0.09 |
| 20850 | 2510 | 100RB | Rear | / | 21.23 | 22.0 | 0.702 | **0.84** | 0.07 |
| 21350 | 2560 | 1RB99 | Rear | SIM2 | 21.85 | 22.5 | 0.983 | **1.14** | 0.05 |

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**Table 13.17: SAR Values (LTE Band 12 - Head)**

| Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 23095 | 707.5 | 1RB49 | Left Cheek | **17** | 23.21 | 24.0 | **0.056** | **0.07** | 0.14 |
| 23095 | 707.5 | 25RB25 | Left Cheek | / | 22.45 | 23.0 | 0.046 | **0.05** | 0.04 |
| 23095 | 707.5 | 1RB49 | Left Tilt | / | 23.21 | 24.0 | 0.023 | **0.03** | -0.05 |
| 23095 | 707.5 | 25RB25 | Left Tilt | / | 22.45 | 23.0 | 0.019 | **0.02** | -0.05 |
| 23095 | 707.5 | 1RB49 | Right Cheek | / | 23.21 | 24.0 | 0.047 | **0.06** | 0.01 |
| 23095 | 707.5 | 25RB25 | Right Cheek | / | 22.45 | 23.0 | 0.040 | **0.05** | 0.03 |
| 23095 | 707.5 | 1RB49 | Right Tilt | / | 23.21 | 24.0 | 0.021 | **0.03** | 0.08 |
| 23095 | 707.5 | 25RB25 | Right Tilt | / | 22.45 | 23.0 | 0.018 | **0.02** | 0.11 |

**Table 13.18: SAR Values (LTE Band 12 - Body)**

| Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm)** | | | | | | | | | |
| 23095 | 707.5 | 1RB49 | Front | / | 23.21 | 24.0 | 0.061 | **0.07** | 0.04 |
| 23095 | 707.5 | 25RB25 | Front | / | 22.45 | 23.0 | 0.054 | **0.06** | 0.12 |
| 23095 | 707.5 | 1RB49 | Rear | **18** | 23.21 | 24.0 | **0.127** | **0.15** | 0.00 |
| 23095 | 707.5 | 25RB25 | Rear | / | 22.45 | 23.0 | 0.109 | **0.12** | 0.03 |
| 23095 | 707.5 | 1RB49 | Left | / | 23.21 | 24.0 | 0.100 | **0.12** | 0.02 |
| 23095 | 707.5 | 25RB25 | Left | / | 22.45 | 23.0 | 0.079 | **0.09** | 0.17 |
| 23095 | 707.5 | 1RB49 | Right | / | 23.21 | 24.0 | 0.089 | **0.11** | 0.17 |
| 23095 | 707.5 | 25RB25 | Right | / | 22.45 | 23.0 | 0.077 | **0.09** | 0.19 |
| 23095 | 707.5 | 1RB49 | Bottom | / | 23.21 | 24.0 | 0.063 | **0.08** | 0.05 |
| 23095 | 707.5 | 25RB25 | Bottom | / | 22.45 | 23.0 | 0.056 | **0.06** | -0.05 |

**Note:** SAR for LTE Band 17 is covered by LTE Band 12 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

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**Table 13.19: SAR Values (LTE Band 28 - Head)**

| Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 27460 | 728 | 1RB99 | Left Cheek | **19** | 22.98 | 24.0 | **0.100** | **0.13** | 0.06 |
| 27460 | 728 | 50RB50 | Left Cheek | / | 22.54 | 23.0 | 0.075 | **0.08** | 0.08 |
| 27460 | 728 | 1RB99 | Left Tilt | / | 22.98 | 24.0 | 0.044 | **0.06** | 0.10 |
| 27460 | 728 | 50RB50 | Left Tilt | / | 22.54 | 23.0 | 0.035 | **0.04** | 0.03 |
| 27460 | 728 | 1RB99 | Right Cheek | / | 22.98 | 24.0 | 0.079 | **0.10** | 0.01 |
| 27460 | 728 | 50RB50 | Right Cheek | / | 22.54 | 23.0 | 0.062 | **0.07** | 0.04 |
| 27460 | 728 | 1RB99 | Right Tilt | / | 22.98 | 24.0 | 0.039 | **0.05** | 0.08 |
| 27460 | 728 | 50RB50 | Right Tilt | / | 22.54 | 23.0 | 0.031 | **0.03** | 0.05 |

**Table 13.20: SAR Values (LTE Band 28 - Body)**

| Ambient Temperature: 22.3°C Liquid Temperature: 21.8°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm)** | | | | | | | | | |
| 27460 | 728 | 1RB99 | Front | / | 22.98 | 24.0 | 0.123 | **0.16** | -0.01 |
| 27460 | 728 | 50RB50 | Front | / | 22.54 | 23.0 | 0.104 | **0.12** | 0.05 |
| 27460 | 728 | 1RB99 | Rear | **20** | 22.98 | 24.0 | **0.199** | **0.25** | 0.06 |
| 27460 | 728 | 50RB50 | Rear | / | 22.54 | 23.0 | 0.164 | **0.18** | 0.05 |
| 27460 | 728 | 1RB99 | Left | / | 22.98 | 24.0 | 0.174 | **0.22** | 0.17 |
| 27460 | 728 | 50RB50 | Left | / | 22.54 | 23.0 | 0.145 | **0.16** | 0.16 |
| 27460 | 728 | 1RB99 | Right | / | 22.98 | 24.0 | 0.055 | **0.07** | 0.08 |
| 27460 | 728 | 50RB50 | Right | / | 22.54 | 23.0 | 0.037 | **0.04** | 0.02 |
| 27460 | 728 | 1RB99 | Bottom | / | 22.98 | 24.0 | 0.035 | **0.04** | 0.02 |
| 27460 | 728 | 50RB50 | Bottom | / | 22.54 | 23.0 | 0.029 | **0.03** | -0.06 |

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**Table 13.21: SAR Values (LTE Band 66 - Head)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.2°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 132072 | 1720 | 1RB99 | Left Cheek | / | 23.27 | 24.0 | 0.115 | **0.14** | 0.09 |
| 132322 | 1745 | 50RB50 | Left Cheek | / | 22.14 | 23.0 | 0.121 | **0.15** | 0.18 |
| 132072 | 1720 | 1RB99 | Left Tilt | / | 23.27 | 24.0 | 0.125 | **0.15** | -0.18 |
| 132322 | 1745 | 50RB50 | Left Tilt | / | 22.14 | 23.0 | 0.124 | **0.15** | 0.01 |
| 132072 | 1720 | 1RB99 | Right Cheek | **21** | 23.27 | 24.0 | **0.150** | **0.18** | 0.04 |
| 132322 | 1745 | 50RB50 | Right Cheek | / | 22.14 | 23.0 | 0.144 | **0.18** | -0.02 |
| 132072 | 1720 | 1RB99 | Right Tilt | / | 23.27 | 24.0 | 0.091 | **0.11** | 0.04 |
| 132322 | 1745 | 50RB50 | Right Tilt | / | 22.14 | 23.0 | 0.084 | **0.10** | 0.12 |

**Table 13.22: SAR Values (LTE Band 66 - Body)**

| Ambient Temperature: 22.6°C Liquid Temperature: 22.2°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Hotspot / Body-Worn Test Data (10mm) - Reduced power level 1** | | | | | | | | | |
| 132072 | 1720 | 1RB99 | Front | / | 18.63 | 19.0 | 0.175 | **0.19** | -0.05 |
| 132322 | 1745 | 50RB50 | Front | / | 17.04 | 18.0 | 0.180 | **0.22** | -0.11 |
| 132072 | 1720 | 1RB99 | Rear | **22** | 18.63 | 19.0 | **0.870** | **0.95** | 0.05 |
| 132322 | 1745 | 50RB50 | Rear | / | 17.04 | 18.0 | 0.689 | **0.86** | 0.01 |
| 132072 | 1720 | 1RB99 | Left | / | 18.63 | 19.0 | 0.073 | **0.08** | 0.11 |
| 132322 | 1745 | 50RB50 | Left | / | 17.04 | 18.0 | 0.066 | **0.08** | 0.02 |
| 132072 | 1720 | 1RB99 | Right | / | 18.63 | 19.0 | 0.071 | **0.08** | 0.12 |
| 132322 | 1745 | 50RB50 | Right | / | 17.04 | 18.0 | 0.065 | **0.08** | 0.08 |
| 132072 | 1720 | 1RB99 | Bottom | / | 18.63 | 19.0 | 0.461 | **0.50** | 0.15 |
| 132322 | 1745 | 50RB50 | Bottom | / | 17.04 | 18.0 | 0.339 | **0.42** | 0.13 |
| 132572 | 1770 | 1RB99 | Rear | / | 17.82 | 19.0 | 0.725 | **0.95** | 0.13 |
| 132322 | 1745 | 1RB99 | Rear | / | 17.98 | 19.0 | 0.866 | **1.10** | -0.07 |
| 132572 | 1770 | 50RB50 | Rear | / | 16.90 | 18.0 | 0.574 | **0.74** | 0.07 |
| 132322 | 1745 | 50RB50 | Rear | / | 17.01 | 18.0 | 0.672 | **0.84** | -0.04 |
| 132072 | 1720 | 100RB | Rear | / | 16.87 | 18.0 | 0.704 | **0.91** | 0.06 |

**Note:** SAR for LTE Band 4 is covered by LTE Band 66 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

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### 13.3. WLAN Evaluation for 2.4G

According to the KDB248227 D01, SAR is measured for 2.4GHz 802.11b DSSS using the initial test position procedure.

**Table 13.23: SAR Values (WLAN 2.4G - Head)**

| Ambient Temperature: 22.2°C Liquid Temperature: 21.7°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| 11 | 2462 | 802.11b | Left Cheek | / | 17.53 | 18.5 | 0.268 | **0.34** | 0.04 |
| 11 | 2462 | 802.11b | Left Tilt | / | 17.53 | 18.5 | 0.216 | **0.27** | 0.09 |
| 11 | 2462 | 802.11b | Right Cheek | **23** | 17.53 | 18.5 | **0.594** | **0.74** | 0.06 |
| 11 | 2462 | 802.11b | Right Tilt | / | 17.53 | 18.5 | 0.414 | **0.52** | 0.08 |

Note1: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

**Table 13.24: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)**

| Frequency | | Test Position | Actual duty factor | maximum duty factor | Reported SAR (1g)(W/kg) | Scaled reported SAR (1g)(W/kg) |
|---|---|---|---|---|---|---|
| Ch. | MHz | | | | | |
| 11 | 2462 | Right Cheek | 100% | 100% | 0.74 | **0.74** |

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.

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**Table 13.25: SAR Values (WLAN 2.4G - Body)**

| Ambient Temperature: 22.2°C Liquid Temperature: 21.7°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | | Test Mode | Test Position | Figure No. / Note | Conducted Power (dBm) | Max. tune-up Power (dBm) | Measured SAR(1g) (W/kg) | Reported SAR(1g) (W/kg) | Power Drift(dB) |
| Ch. | MHz | | | | | | | | |
| **Test Data (10mm)** | | | | | | | | | |
| 11 | 2462 | 802.11b | Front | / | 17.53 | 18.5 | 0.141 | **0.18** | 0.15 |
| 11 | 2462 | 802.11b | Rear | **24** | 17.53 | 18.5 | **0.170** | **0.21** | 0.05 |
| 11 | 2462 | 802.11b | Left | / | 17.53 | 18.5 | 0.139 | **0.17** | 0.01 |
| 11 | 2462 | 802.11b | Right | / | 17.53 | 18.5 | 0.016 | **0.02** | -0.16 |
| 11 | 2462 | 802.11b | Top | / | 17.53 | 18.5 | 0.093 | **0.12** | 0.03 |

Note1: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

**Table 13.26: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)**

| Frequency | | Test Position | Actual duty factor | maximum duty factor | Reported SAR (1g)(W/kg) | Scaled reported SAR (1g)(W/kg) |
|---|---|---|---|---|---|---|
| Ch. | MHz | | | | | |
| 11 | 2462 | Rear | 100% | 100% | 0.21 | **0.21** |

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.

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## 14. SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

**Table 14.1: SAR Measurement Variability for Body – WCDMA Band 2**

| Frequency | | Test Position | Original | 1st Repeated | Ratio | 2nd Repeated |
|---|---|---|---|---|---|---|
| Ch. | MHz | | SAR (W/kg) | SAR (W/kg) | | SAR (W/kg) |
| 9400 | 1800 | Rear | 0.852 | 0.843 | 1.01 | / |

**Table 14.2: SAR Measurement Variability for Body – LTE Band 2**

| Frequency | | Test Position | Original | 1st Repeated | Ratio | 2nd Repeated |
|---|---|---|---|---|---|---|
| Ch. | MHz | | SAR (W/kg) | SAR (W/kg) | | SAR (W/kg) |
| 18900 | 1880 | Rear | 0.886 | 0.869 | 1.02 | / |

**Table 14.3: SAR Measurement Variability for Body – LTE Band 7**

| Frequency | | Test Position | Original | 1st Repeated | Ratio | 2nd Repeated |
|---|---|---|---|---|---|---|
| Ch. | MHz | | SAR (W/kg) | SAR (W/kg) | | SAR (W/kg) |
| 21350 | 2560 | Rear | 0.999 | 0.975 | 1.02 | / |

**Table 14.4: SAR Measurement Variability for Body – LTE Band 66**

| Frequency | | Test Position | Original | 1st Repeated | Ratio | 2nd Repeated |
|---|---|---|---|---|---|---|
| Ch. | MHz | | SAR (W/kg) | SAR (W/kg) | | SAR (W/kg) |
| 132072 | 1720 | Rear | 0.870 | 0.854 | 1.02 | / |

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# 15. Measurement Uncertainty

## 15.1. Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

| No. | Error Description | Type | Uncertainty value | Probably Distribution | Div. | (Ci) 1g | (Ci) 10g | Std. Unc. (1g) | Std. Unc. (10g) | Degree of freedom |
|---|---|---|---|---|---|---|---|---|---|---|
| **Measurement system** | | | | | | | | | | |
| 1 | Probe calibration | B | 12 | N | 2 | 1 | 1 | 6.0 | 6.0 | ∞ |
| 2 | Axial isotropy | B | 4.7 | R | $\sqrt{3}$ | √0.5 | √0.5 | 4.3 | 4.3 | ∞ |
| 3 | Hemispherical isotropy | B | 9.6 | R | $\sqrt{3}$ | 1 | 1 | 4.8 | 4.8 | ∞ |
| 4 | Boundary effect | B | 1.1 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 5 | Linearity | B | 4.7 | R | $\sqrt{3}$ | 1 | 1 | 2.7 | 2.7 | ∞ |
| 6 | Detection limit | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 7 | Modulation response | B | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.3 | 2.3 | ∞ |
| 8 | Readout electronics | B | 1.0 | N | 1 | 1 | 1 | 1.0 | 1.0 | ∞ |
| 9 | Response time | B | 0.8 | R | $\sqrt{3}$ | 1 | 1 | 0.5 | 0.5 | ∞ |
| 10 | Integration time | B | 1.7 | R | $\sqrt{3}$ | 1 | 1 | 1.0 | 1.0 | ∞ |
| 11 | RF ambient conditions-noise | B | 3.0 | R | $\sqrt{3}$ | 1 | 1 | 1.7 | 1.7 | ∞ |
| 12 | RF ambient conditions-reflection | B | 3.0 | R | $\sqrt{3}$ | 1 | 1 | 1.7 | 1.7 | ∞ |
| 13 | Probe positioned mech. restrictions | B | 0.35 | R | $\sqrt{3}$ | 1 | 1 | 0.2 | 0.2 | ∞ |
| 14 | Probe positioning with respect to phantom shell | B | 2.9 | R | $\sqrt{3}$ | 1 | 1 | 1.7 | 1.7 | ∞ |
| 15 | Post-processing | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| **Test sample related** | | | | | | | | | | |
| 16 | Test sample positioning | A | 3.3 | N | 1 | 1 | 1 | 3.3 | 3.3 | 5 |
| 17 | Device holder uncertainty | A | 3.4 | N | 1 | 1 | 1 | 3.4 | 3.4 | 5 |
| 18 | Drift of output power | B | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.9 | 2.9 | ∞ |
| **Phantom and set-up** | | | | | | | | | | |
| 19 | Phantom uncertainty | B | 1.0 | R | $\sqrt{3}$ | 1 | 1 | 0.6 | 0.6 | ∞ |
| 20 | Liquid conductivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| 21 | Liquid conductivity (meas.) | A | 1.3 | N | 1 | 0.64 | 0.43 | 0.83 | 0.56 | 9 |
| 22 | Liquid permittivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| 23 | Liquid permittivity (meas.) | A | 1.6 | N | 1 | 0.6 | 0.49 | 0.96 | 0.78 | 9 |
| Combined standard uncertainty | | | $u_c' = \sqrt{\sum_{i=1}^{23} c_i^2 u_i^2}$ | | | | | 11.3 | 11.2 | 95.5 |
| Expanded uncertainty (Confidence interval of 95 %) | | | $u_e = 2u_c$ | | | | | 22.6 | 22.4 | |

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# 16. Main Test Instruments

**Table 16.1: List of Main Instruments**

| No. | Name | Type | Serial Number | Calibration Date | Valid Period |
|---|---|---|---|---|---|
| 01 | Network analyzer | E5071C | MY46103759 | 2020-11-15 | One year |
| 02 | Dielectric probe | 85070E | MY44300317 | / | / |
| 03 | Power meter | E4418B | MY50000366 | 2020-12-13 | One year |
| 04 | Power sensor | E9304A | MY50000188 | | |
| 05 | Power meter | NRP | 101460 | 2021-01-15 | One year |
| 06 | Power sensor | NRP-Z91 | 100553 | | |
| 07 | Signal Generator | E8257D | MY47461211 | 2021-01-15 | One year |
| 08 | Amplifier | VTL5400 | 0404 | / | / |
| 09 | E-field Probe | EX3DV4 | 3633 | 2020-04-01 | One year |
| 10 | DAE | DAE4 | 1527 | 2020-11-06 | One year |
| 11 | Dipole Validation Kit | D750V3 | 1163 | 2019-09-03 | Three year |
| 12 | Dipole Validation Kit | D835V2 | 4d057 | 2018-10-09 | Three year |
| 13 | Dipole Validation Kit | D1750V2 | 1152 | 2019-08-30 | Three year |
| 14 | Dipole Validation Kit | D1900V2 | 5d088 | 2018-10-24 | Three year |
| 15 | Dipole Validation Kit | D2450V2 | 873 | 2018-10-26 | Three year |
| 16 | Dipole Validation Kit | D2550V2 | 1010 | 2018-08-24 | Three year |
| 17 | BTS | CMW500 | 158344 | 2020-07-17 | One year |
| 18 | BTS | E5515C | GB46110722 | 2021-01-15 | One year |
| 19 | BTS | MT8820C | 6201341853 | 2021-01-15 | One year |
| 20 | Software | DASY5 | 52.8.8.1222 | / | / |

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# ANNEX A: Graph Results

**GSM850 Head**

Date: 2021-3-4

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated): f = 836.6 MHz; $\sigma$ = 0.919 S/m; $\varepsilon_r$ = 40.714; $\rho$ = 1000 kg/m$^3$

Communication System: UID 0, GSM (0) Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Left Cheek Middle/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.252 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.612 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.297 W/kg

**SAR(1 g) = 0.229 W/kg; SAR(10 g) = 0.175 W/kg**

Maximum value of SAR (measured) = 0.255 W/kg

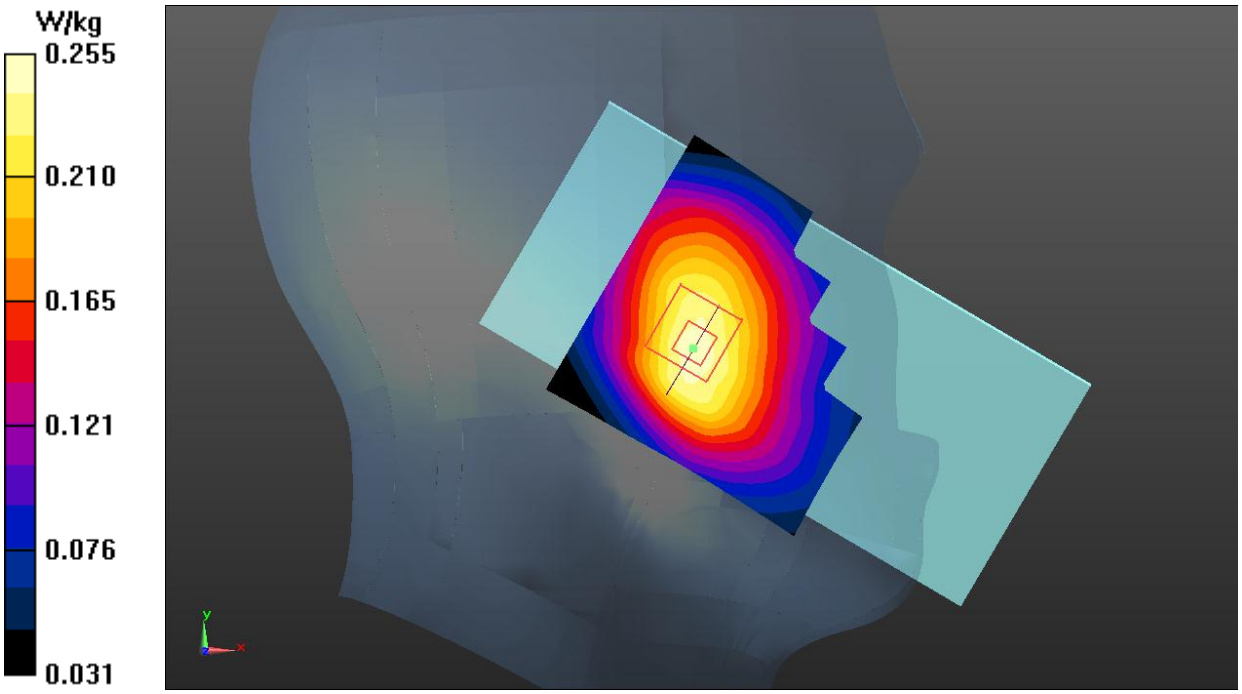


**Fig.1 GSM 850 Head**

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**GSM850 Body**
Date: 2021-3-4
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.6 MHz; $\sigma$ = 0.919 S/m; $\varepsilon_r$ = 40.714; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, GPRS 2Txslot (0) Frequency: 836.6 MHz Duty Cycle: 1:4
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Rear Side Middle/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.357 W/kg

**Rear Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.65 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.417 W/kg
**SAR(1 g) = 0.324 W/kg; SAR(10 g) = 0.246 W/kg**
Maximum value of SAR (measured) = 0.357 W/kg

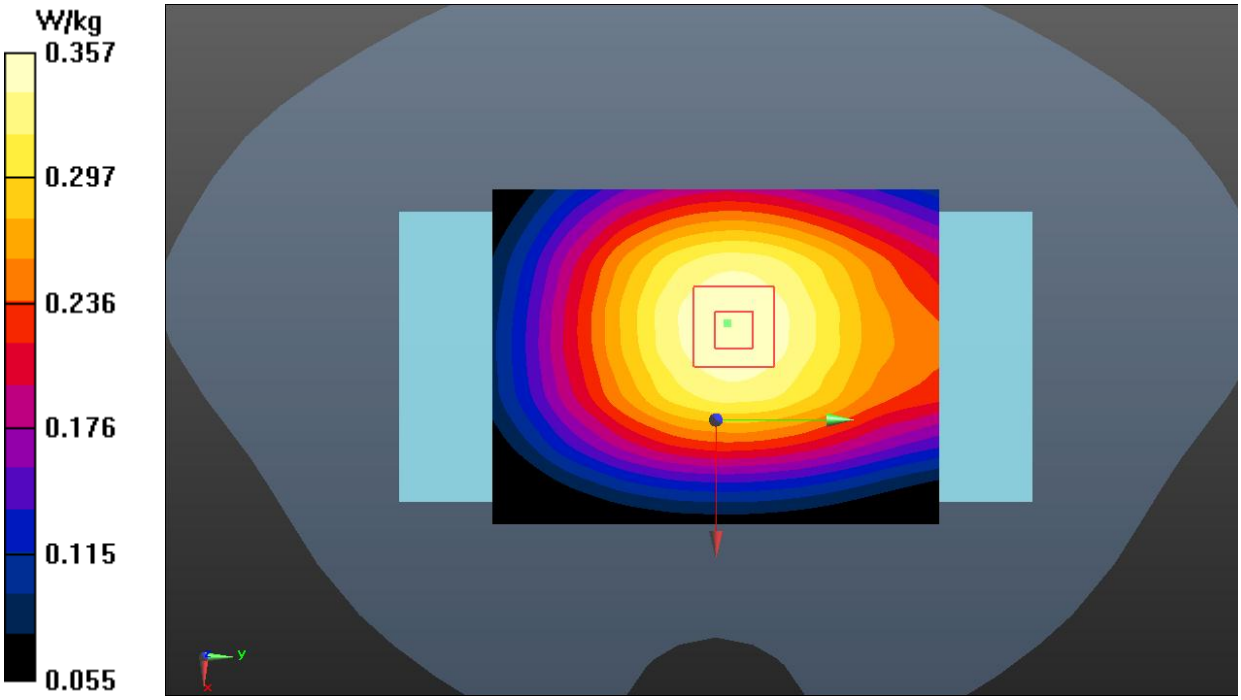


**Fig.2 GSM 850 Body**

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**GSM1900 Head**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; $\sigma$ = 1.38 S/m; $\varepsilon_r$ = 39.611; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, GSM (0) Frequency: 1850.2 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**Right Cheek Low/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0367 W/kg

**Right Cheek Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.509 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.0500 W/kg
**SAR(1 g) = 0.032 W/kg; SAR(10 g) = 0.020 W/kg**
Maximum value of SAR (measured) = 0.0373 W/kg

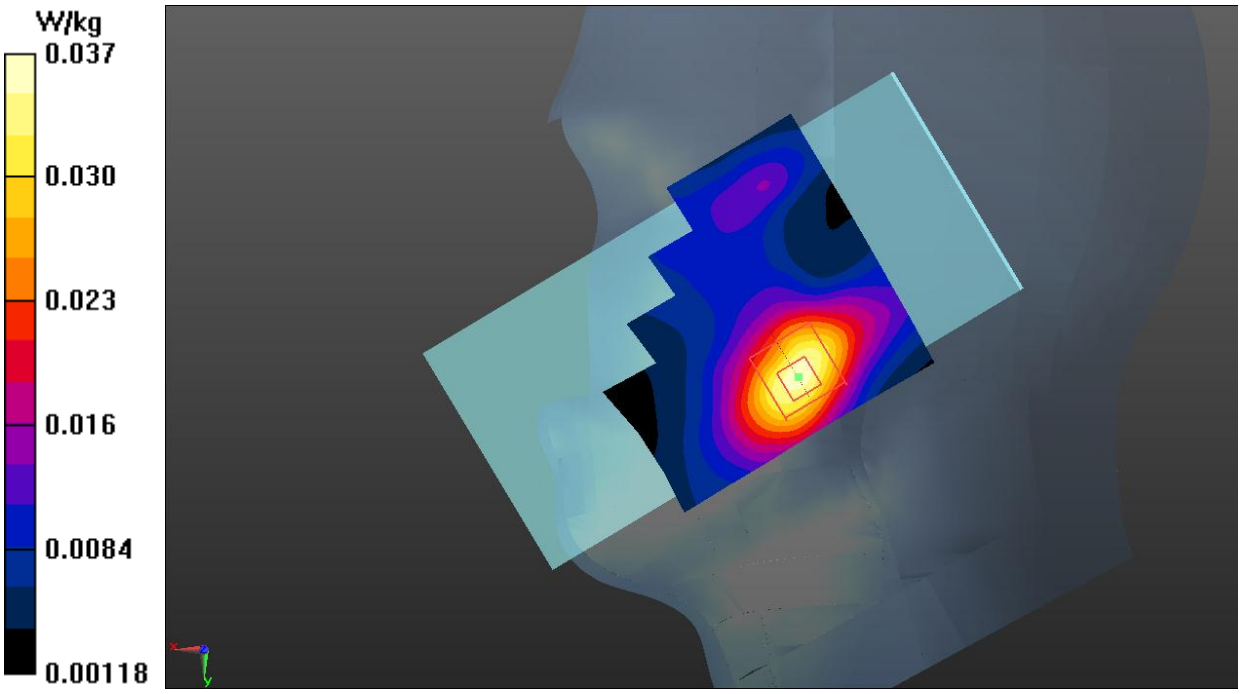


**Fig.3 GSM 1900 Head**

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**GSM1900 Body**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1850.2 MHz; $\sigma$ = 1.38 S/m; $\varepsilon_r$ = 39.611; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, GPRS 4Txslot (0) Frequency: 1850.2 MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**Rear Side Low/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.674 W/kg

**Rear Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.923 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.991 W/kg
**SAR(1 g) = 0.546 W/kg; SAR(10 g) = 0.275 W/kg**
Maximum value of SAR (measured) = 0.735 W/kg

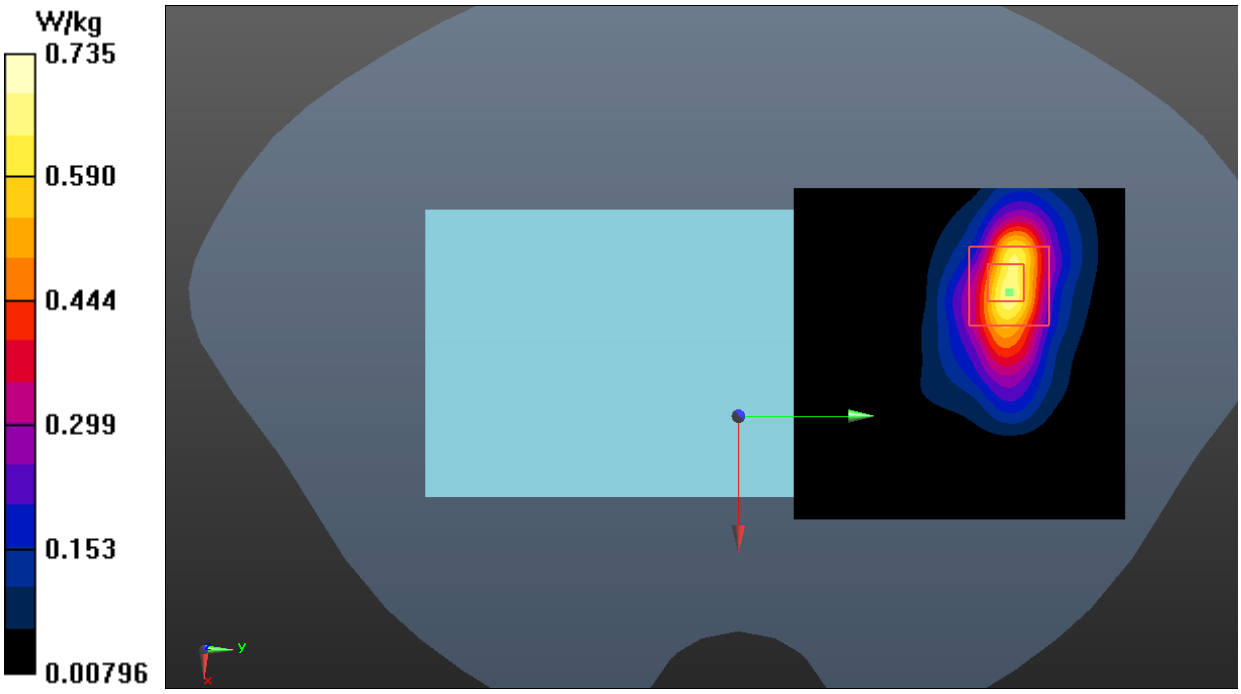


**Fig.4 GSM 1900 Body**

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**WCDMA Band 2 Head**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; $\sigma$ = 1.406 S/m; $\varepsilon_r$ = 39.495; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**Right Cheek Middle/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.065 W/kg

**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.159 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.076 W/kg
**SAR(1 g) = 0.048 W/kg; SAR(10 g) = 0.030 W/kg**
Maximum value of SAR (measured) = 0.059 W/kg

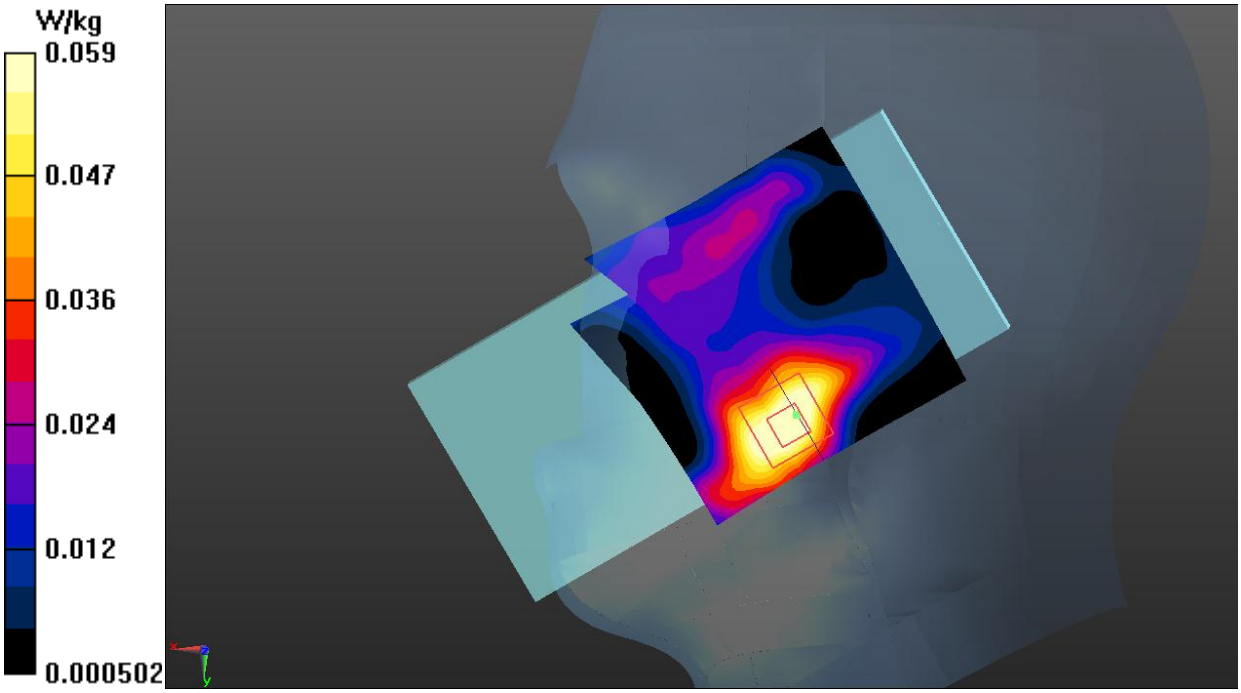


**Fig.5 WCDMA Band 2 Head**

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**WCDMA Band 2 Body**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; $\sigma$ = 1.406 S/m; $\varepsilon_r$ = 39.495; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WCDMA (0) Frequency: 1907.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**Rear Side Middle/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.02 W/kg

**Rear Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.049 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.70 W/kg
**SAR(1 g) = 0.852 W/kg; SAR(10 g) = 0.420 W/kg**
Maximum value of SAR (measured) = 1.10 W/kg

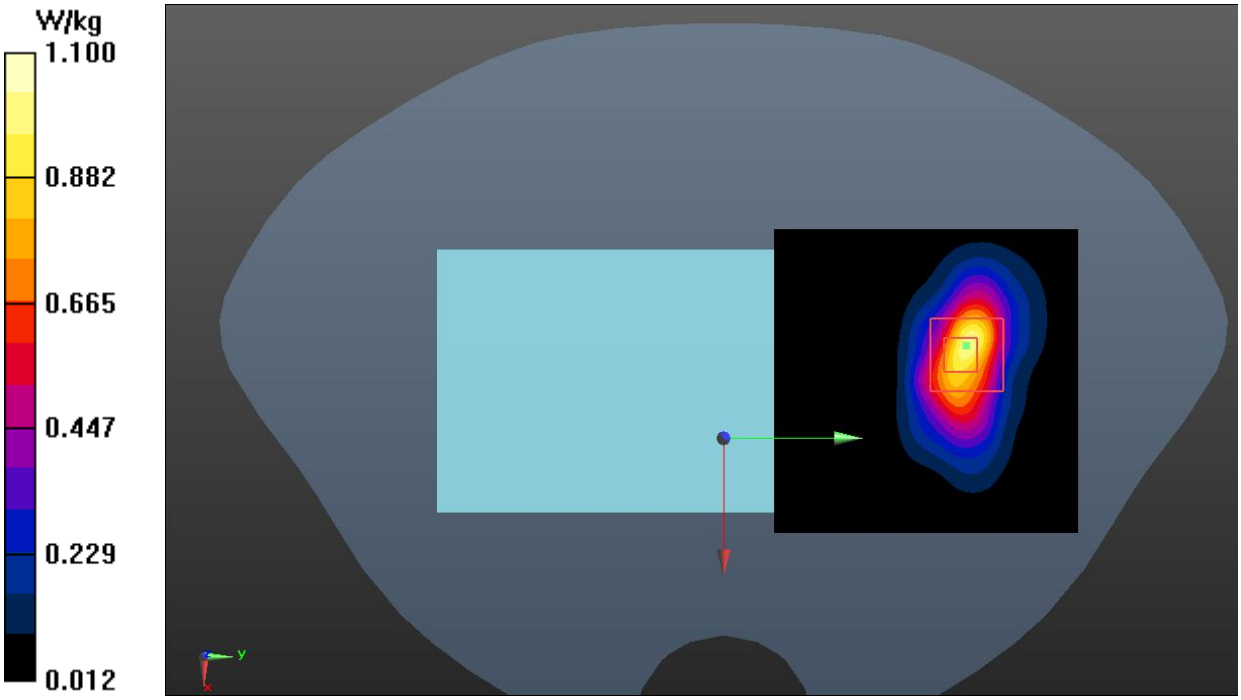


**Fig.6 WCDMA Band 2 Body**

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**WCDMA Band 4 Head**
Date: 2021-3-17
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1733 MHz; $\sigma$ = 1.344 S/m; $\varepsilon_r$ = 40.604; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (8.09, 8.09, 8.09);

**Left Tilt Middle/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.307 W/kg

**Left Tilt Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.887 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.345 W/kg
**SAR(1 g) = 0.237 W/kg; SAR(10 g) = 0.146 W/kg**
Maximum value of SAR (measured) = 0.296 W/kg

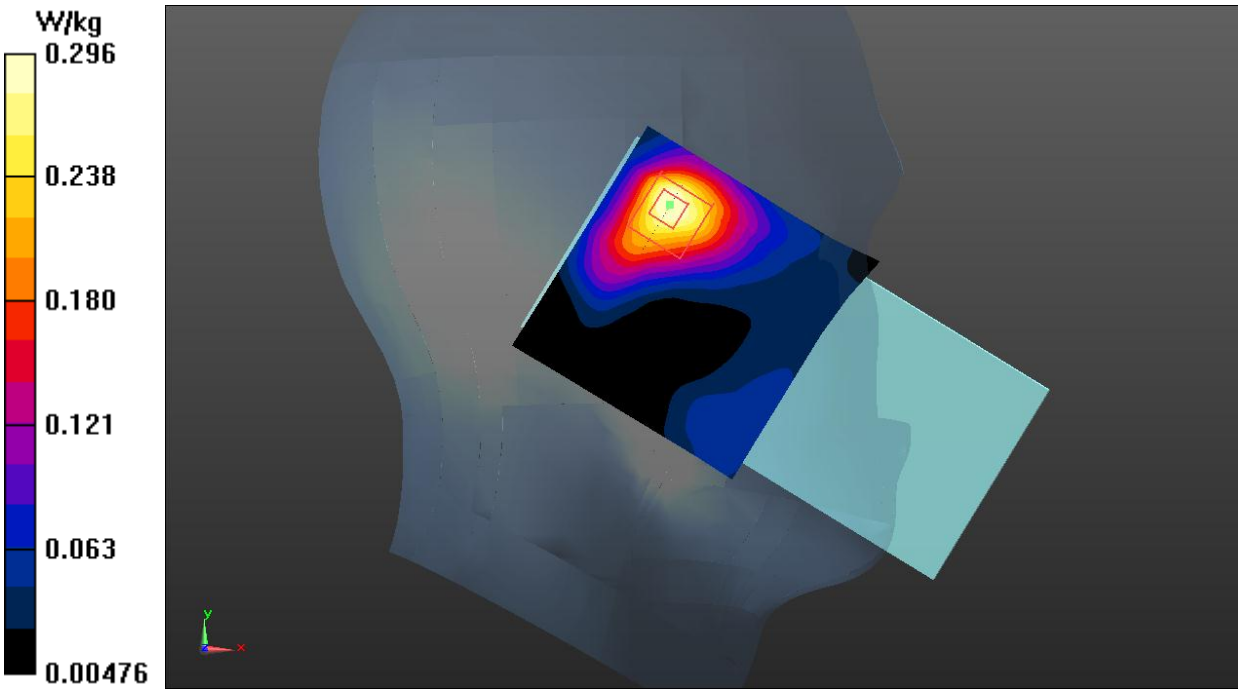


**Fig.7 WCDMA Band 4 Head**

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**WCDMA Band 4 Body**
Date: 2021-3-17
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1733 MHz; $\sigma$ = 1.344 S/m; $\varepsilon_r$ = 40.604; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (8.09, 8.09, 8.09);

**Rear Side Middle/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.476 W/kg

**Rear Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.863 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.738 W/kg
**SAR(1 g) = 0.390 W/kg; SAR(10 g) = 0.208 W/kg**
Maximum value of SAR (measured) = 0.483 W/kg

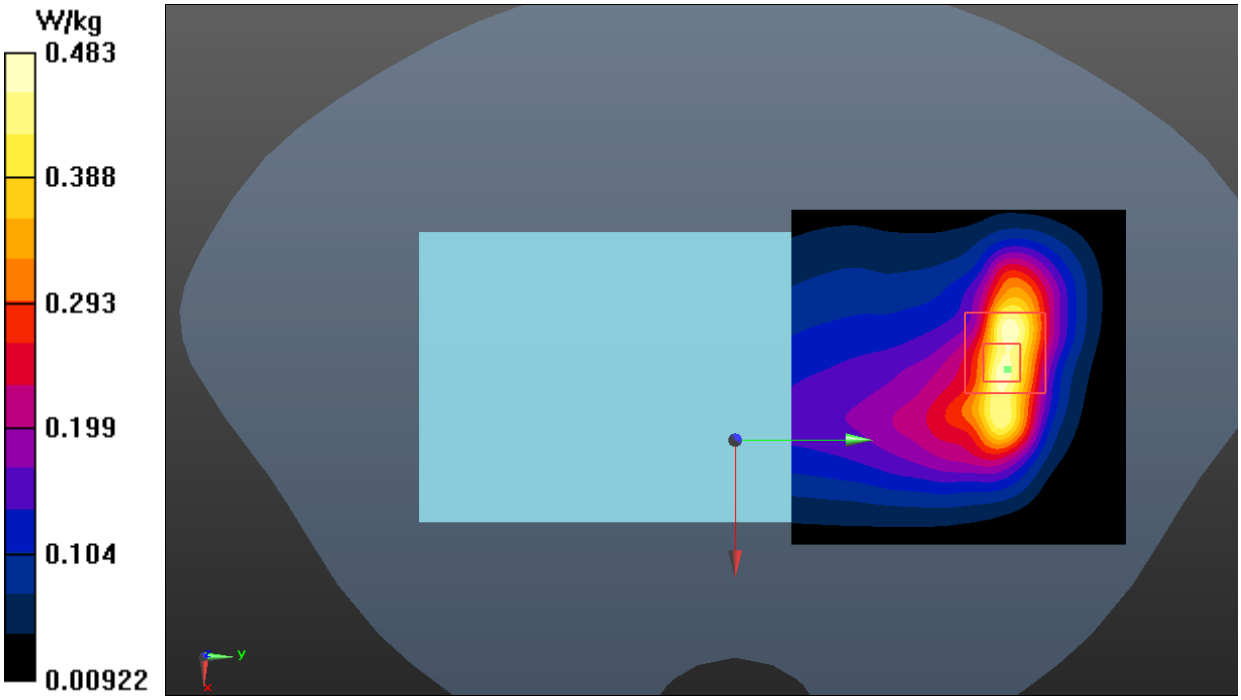


**Fig.8 WCDMA Band 4 Body**

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**WCDMA Band 5 Head**
Date: 2021-3-4
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.4 MHz; $\sigma$ = 0.919 S/m; $\varepsilon_r$ = 40.716; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Left Cheek Middle/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.293 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.052 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.324 W/kg
**SAR(1 g) = 0.253 W/kg; SAR(10 g) = 0.194 W/kg**
Maximum value of SAR (measured) = 0.292 W/kg

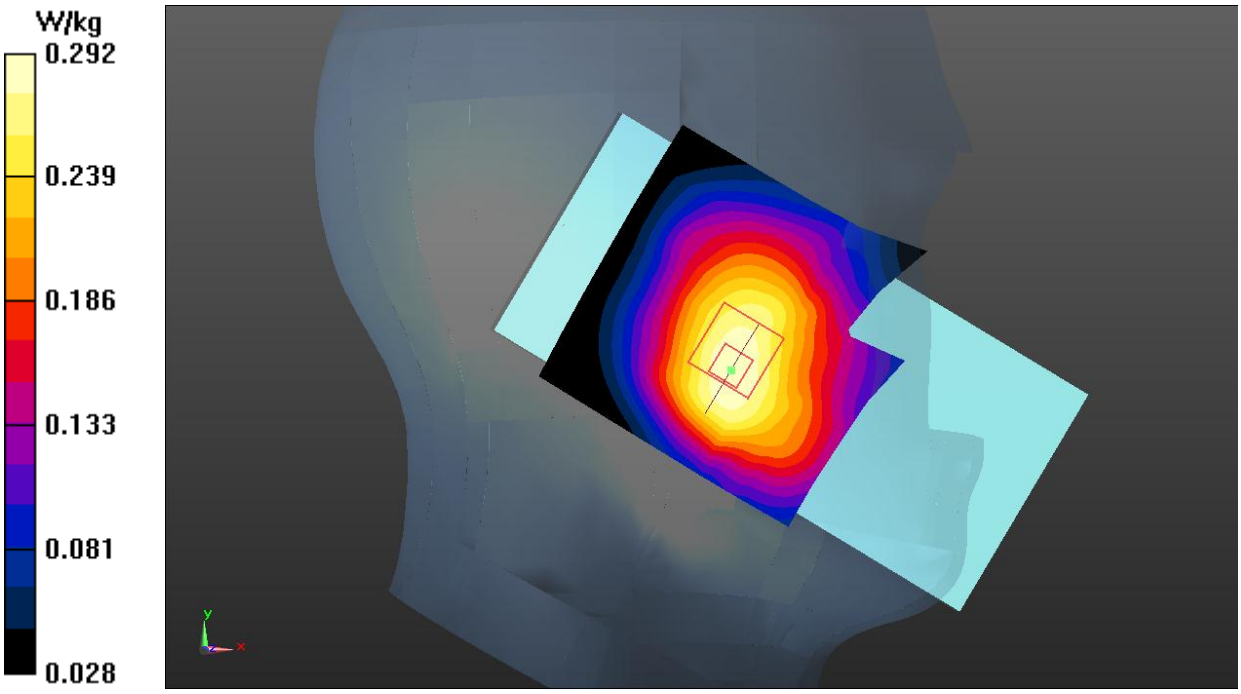


**Fig.9 WCDMA Band 5 Head**

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**WCDMA Band 5 Body**
Date: 2021-3-4
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.4 MHz; $\sigma$ = 0.919 S/m; $\varepsilon_r$ = 40.716; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Rear Side Middle/Area Scan (61x111x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.310 W/kg

**Rear Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.29 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.364 W/kg
**SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.221 W/kg**
Maximum value of SAR (measured) = 0.313 W/kg

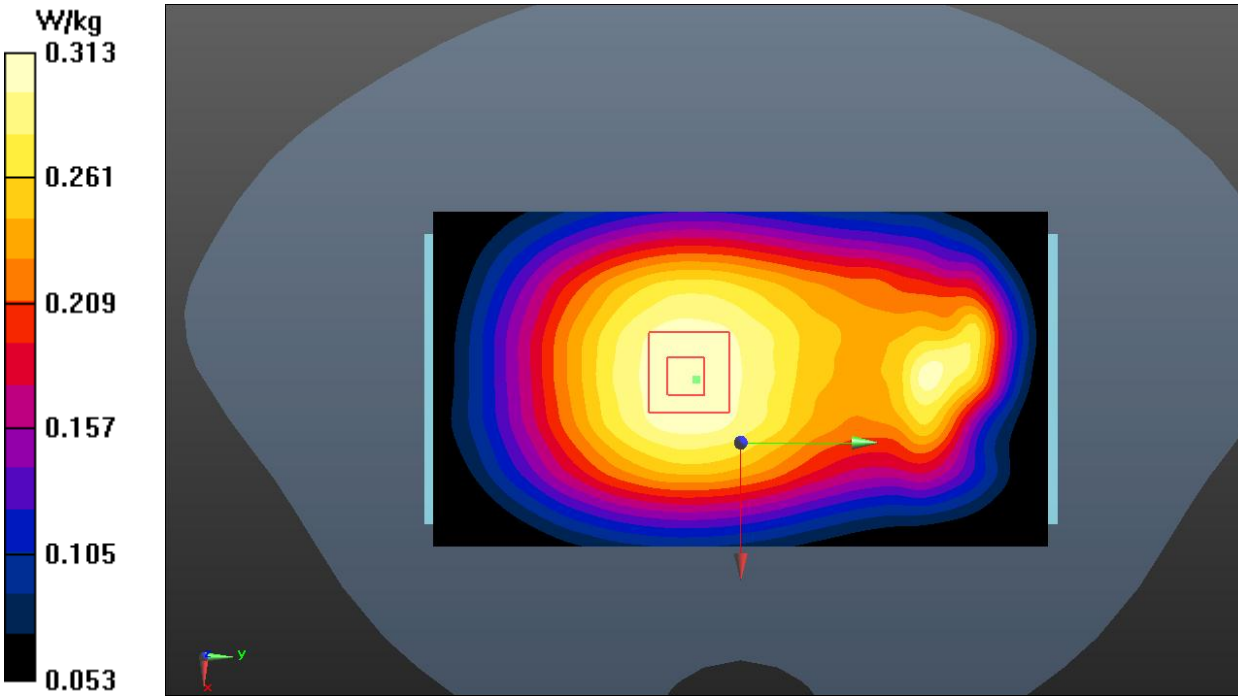


**Fig.10 WCDMA Band 5 Body**

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**LTE Band 2 Head**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; $\sigma$ = 1.406 S/m; $\varepsilon_r$ = 39.495; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**Right Cheek Middle 1RB0/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.105 W/kg

**Right Cheek Middle 1RB0/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.739 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.206 W/kg
**SAR(1 g) = 0.085 W/kg; SAR(10 g) = 0.047 W/kg**
Maximum value of SAR (interpolated) = 0.121 W/kg

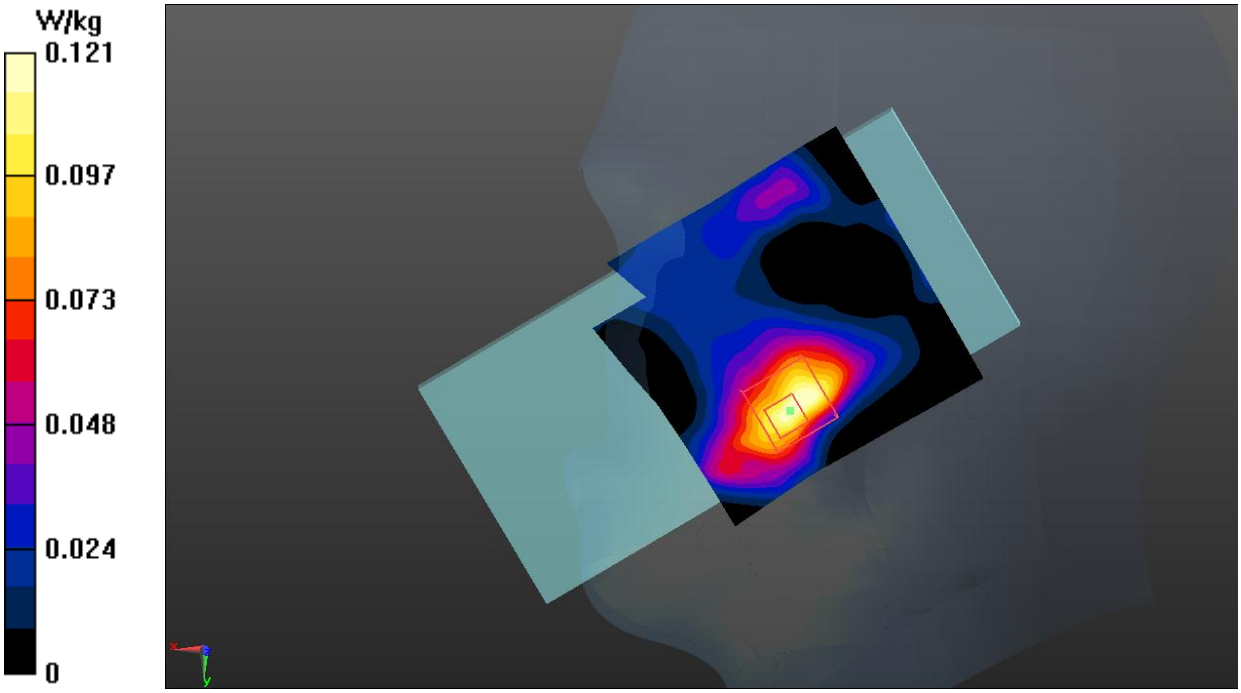


**Fig.11 LTE Band 2 Head**

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**LTE Band 2 Body**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1880 MHz; $\sigma$ = 1.406 S/m; $\varepsilon_r$ = 39.495; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**Rear Side Middle 1RB0/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

**Rear Side Middle 1RB0/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.438 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.69 W/kg
**SAR(1 g) = 0.886 W/kg; SAR(10 g) = 0.440 W/kg**
Maximum value of SAR (measured) = 1.06 W/kg

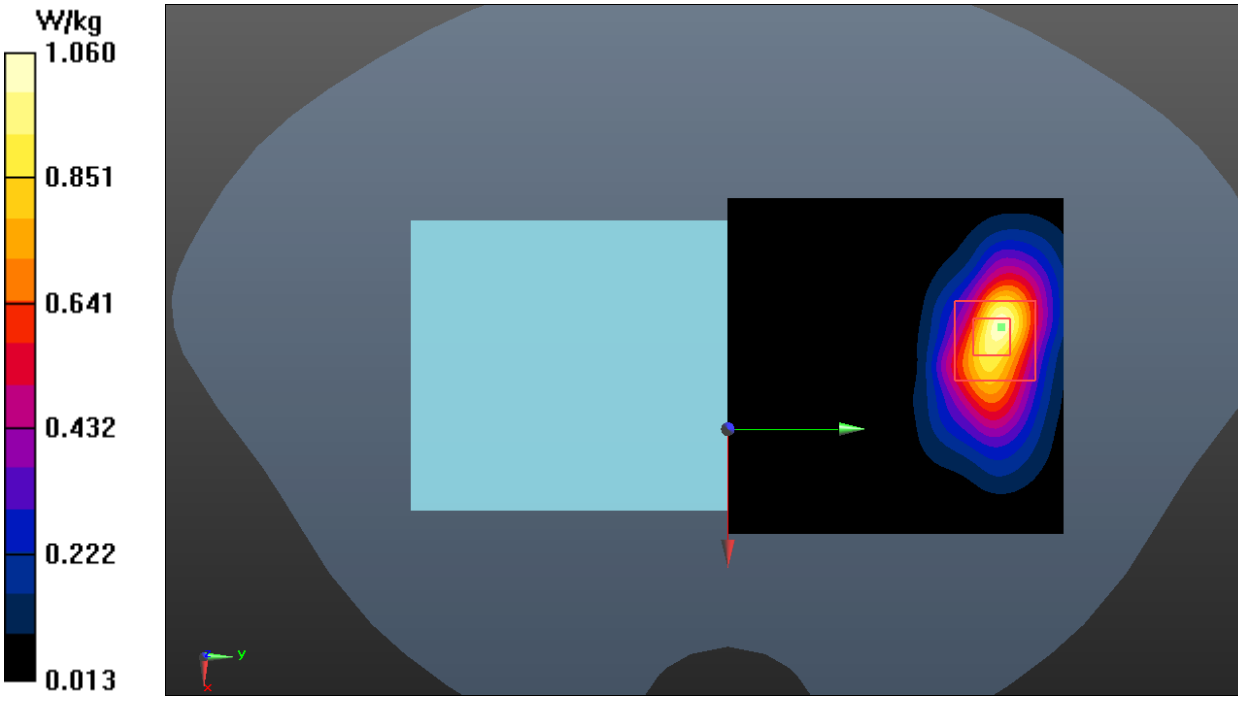


**Fig.12 LTE Band 2 Body**

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**LTE Band 5 Head**
Date: 2021-3-4
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.5 MHz; $\sigma$ = 0.919 S/m; $\varepsilon_r$ = 40.715; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Left Cheek Middle 1RB49/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.220 W/kg

**Left Cheek Middle 1RB49/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.184 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.249 W/kg
**SAR(1 g) = 0.193 W/kg; SAR(10 g) = 0.146 W/kg**
Maximum value of SAR (measured) = 0.224 W/kg

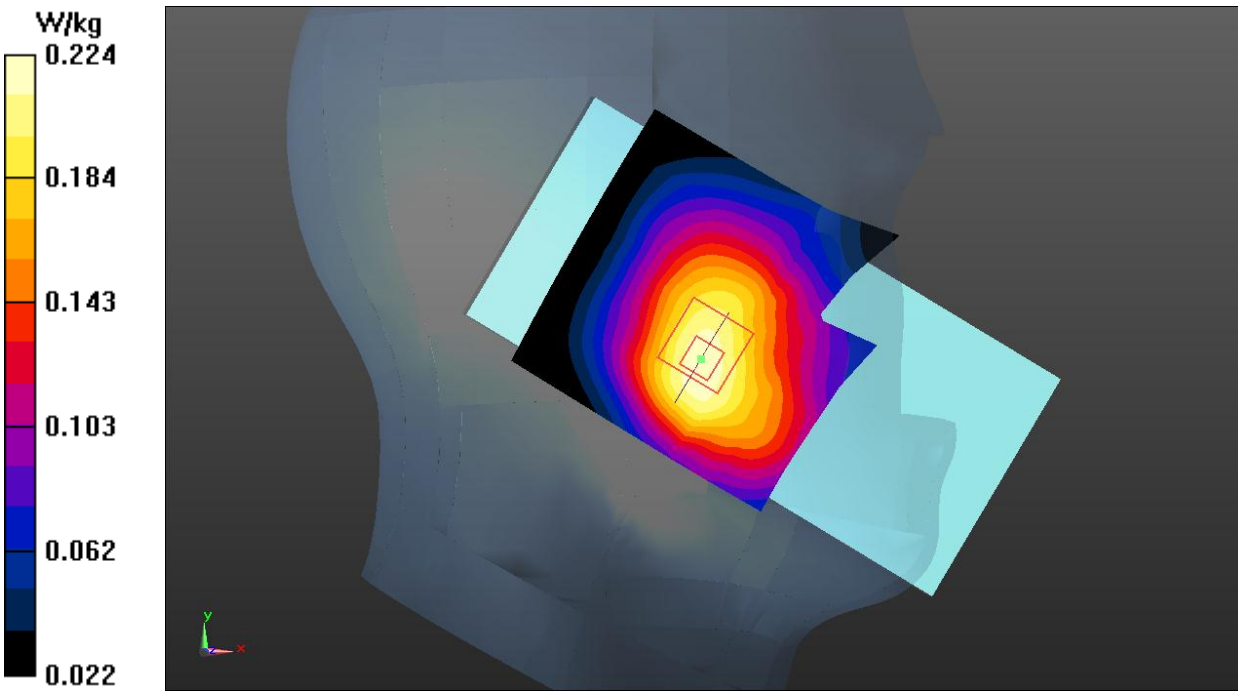


**Fig.13 LTE Band 5 Head**

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**LTE Band 5 Body**
Date: 2021-3-4
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 836.5 MHz; $\sigma$ = 0.919 S/m; $\varepsilon_r$ = 40.715; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Right Side Middle 1RB49/Area Scan (41x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.259 W/kg

**Right Side Middle 1RB49/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.62 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.302 W/kg
**SAR(1 g) = 0.242 W/kg; SAR(10 g) = 0.164 W/kg**
Maximum value of SAR (measured) = 0.259 W/kg

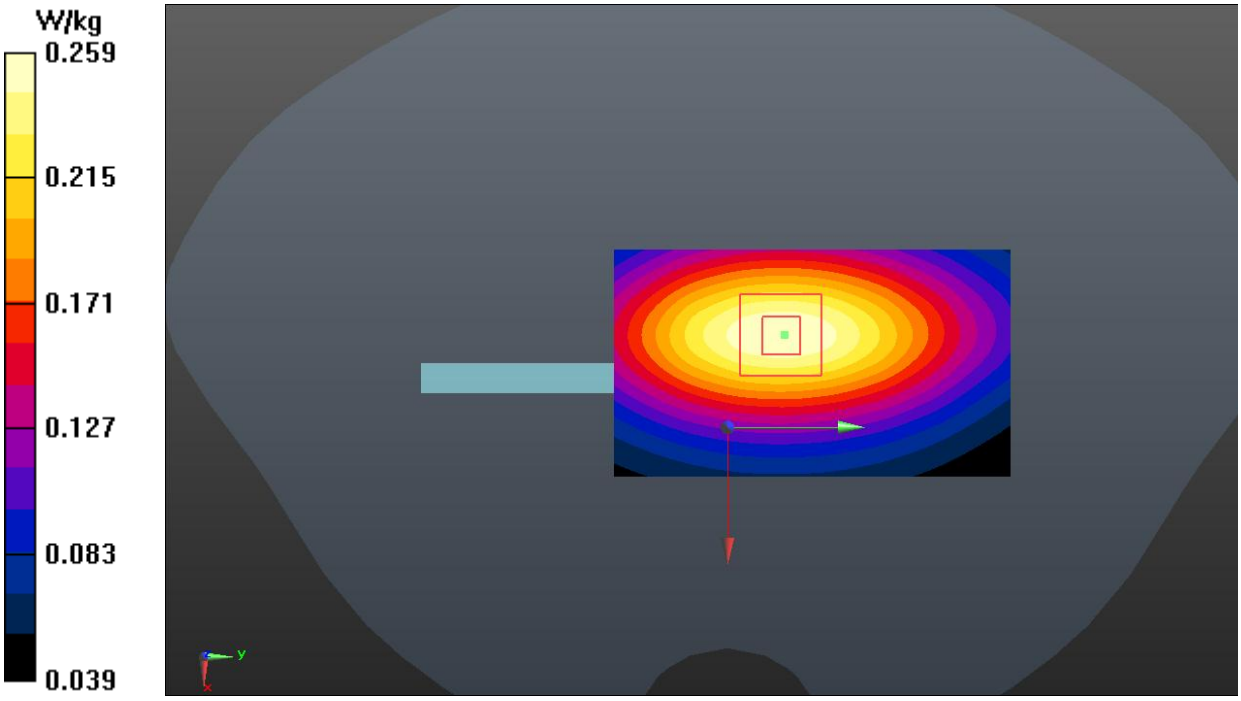


**Fig.14 LTE Band 5 Body**

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**LTE Band 7 Head**
Date: 2021-3-8
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2510 MHz; $\sigma$ = 1.894 S/m; $\varepsilon_r$ = 38.608; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.43, 7.43, 7.43);

**Left Cheek Low 1RB99/Area Scan (91x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.187 W/kg

**Left Cheek Low 1RB99/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.211 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.207 W/kg
**SAR(1 g) = 0.116 W/kg; SAR(10 g) = 0.063 W/kg**
Maximum value of SAR (measured) = 0.155 W/kg

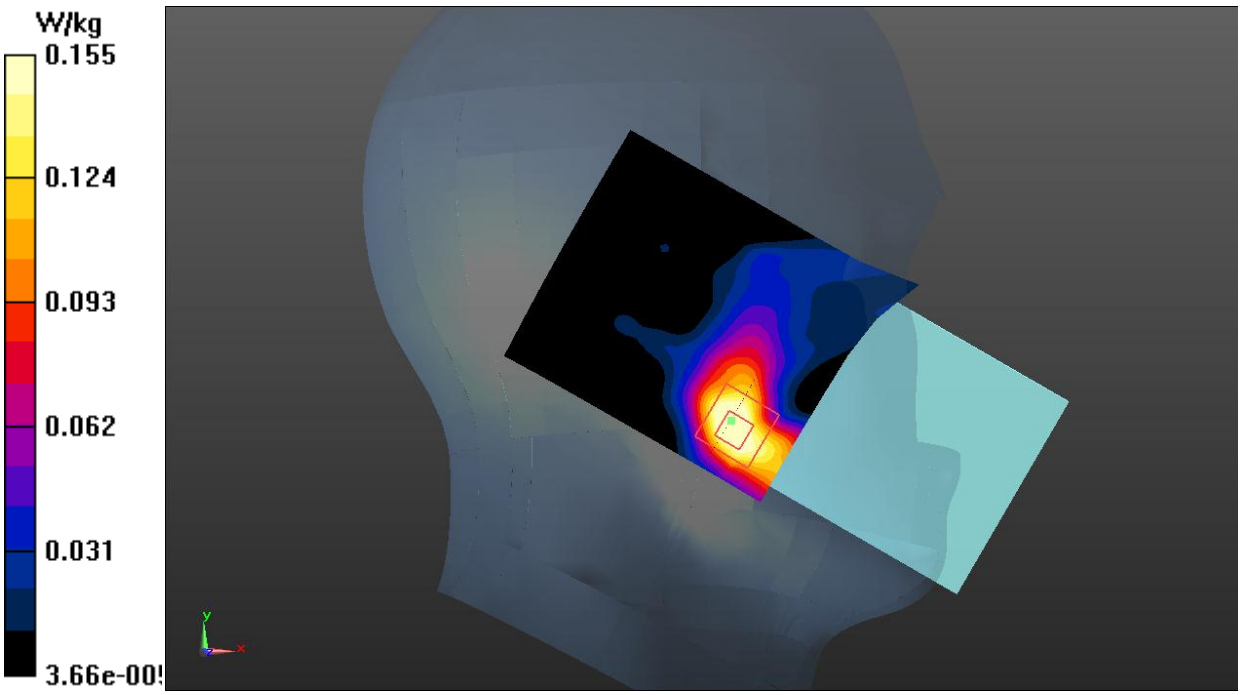


**Fig.15 LTE Band 7 Head**

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**LTE Band 7 Body**
Date: 2021-3-8
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2560 MHz; $\sigma$ = 1.953 S/m; $\varepsilon_r$ = 38.443; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.20, 7.20, 7.20);

**Rear Side High 1RB99/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.47 W/kg

**Rear Side High 1RB99/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.740 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.05 W/kg
**SAR(1 g) = 0.999 W/kg; SAR(10 g) = 0.477 W/kg**
Maximum value of SAR (measured) = 1.49 W/kg

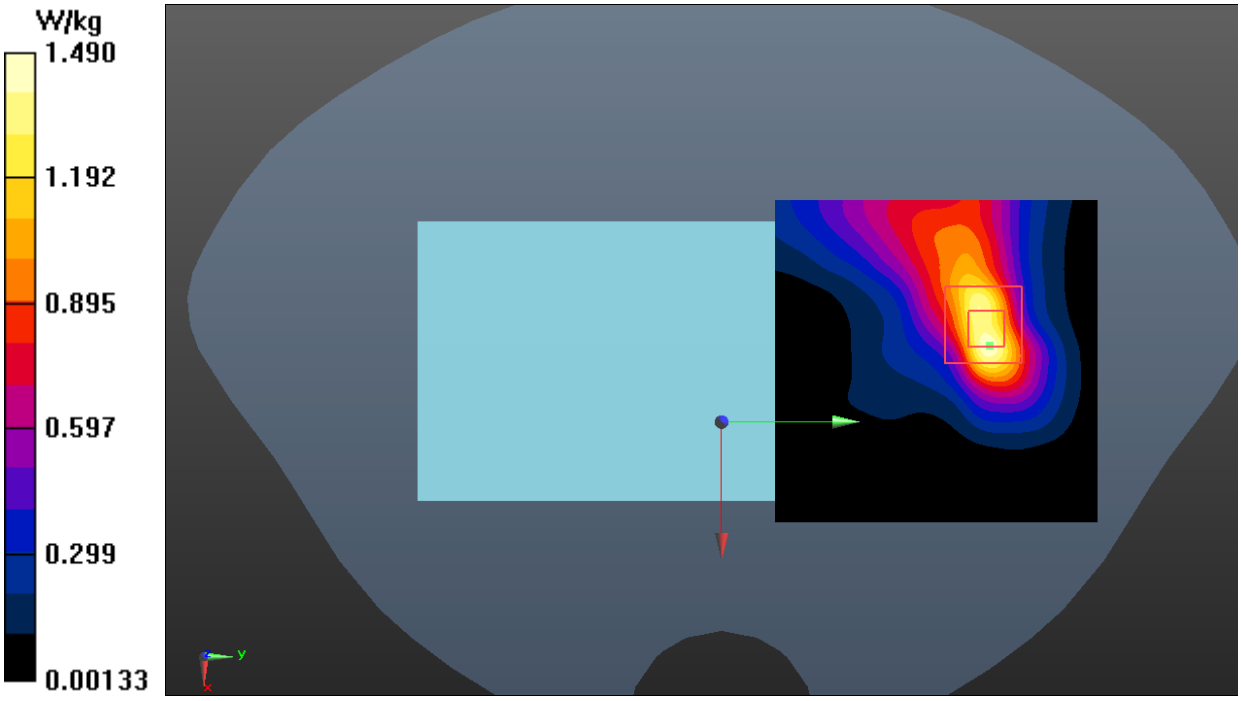


**Fig.16 LTE Band 7 Body**

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**LTE Band 12 Head**
Date: 2021-3-5
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 708 MHz; $\sigma$ = 0.869 S/m; $\varepsilon_r$ = 41.456; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Left Cheek Middle 1RB49/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0650 W/kg

**Left Cheek Middle 1RB49/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.064 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.0730 W/kg
**SAR(1 g) = 0.056 W/kg; SAR(10 g) = 0.043 W/kg**
Maximum value of SAR (measured) = 0.0641 W/kg

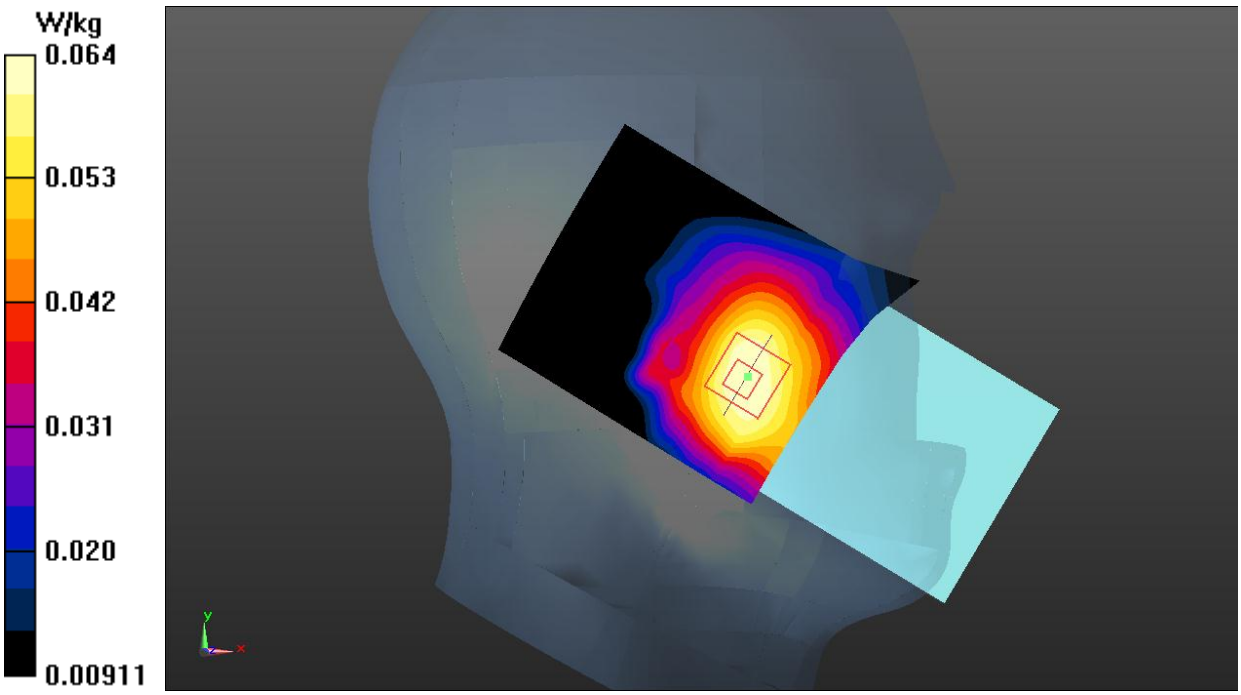


**Fig.17 LTE Band 12 Head**

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**LTE Band 12 Body**
Date: 2021-3-5
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 708 MHz; $\sigma$ = 0.869 S/m; $\varepsilon_r$ = 41.456; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Rear Side Middle 1RB49/Area Scan (61x81x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.139 W/kg

**Rear Side Middle 1RB49/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.03 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.162 W/kg
**SAR(1 g) = 0.127 W/kg; SAR(10 g) = 0.097 W/kg**
Maximum value of SAR (measured) = 0.139 W/kg

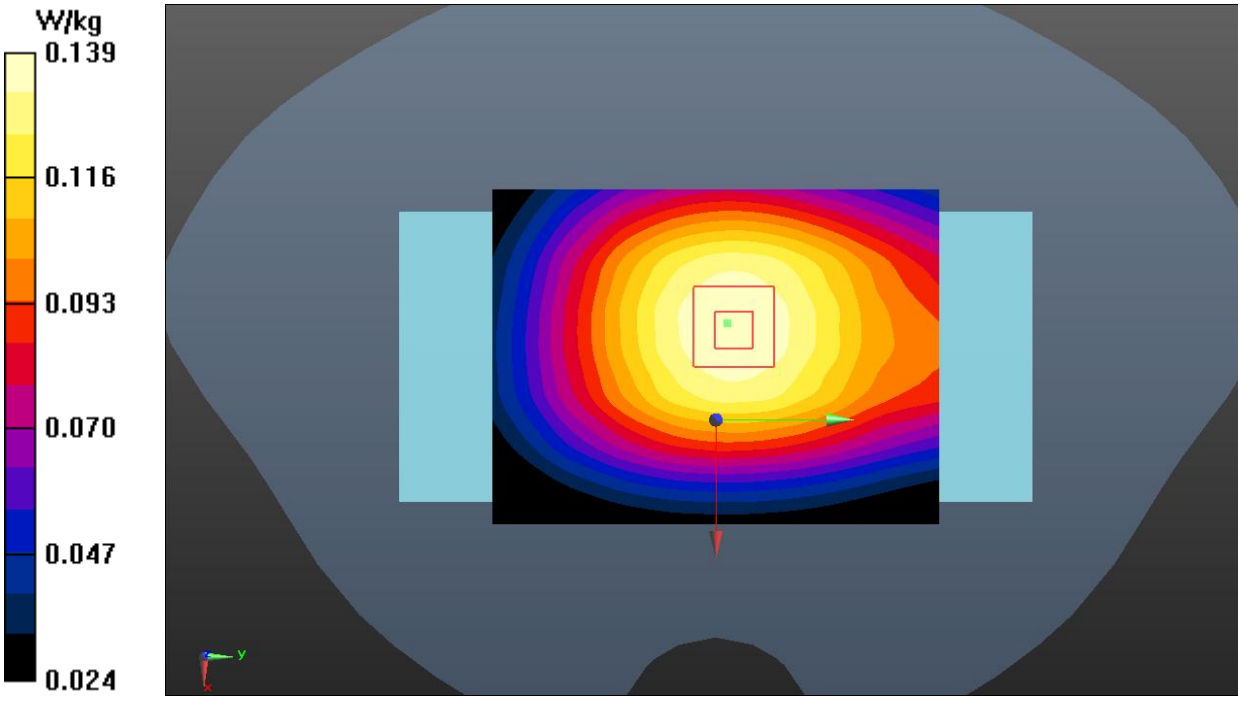


**Fig.18 LTE Band 12 Body**

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**LTE Band 28 Head**
Date: 2021-3-5
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 728 MHz; $\sigma$ = 0.882 S/m; $\varepsilon_r$ = 41.215; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 728 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Left Cheek Middle 1RB99/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.116 W/kg

**Left Cheek Middle 1RB99/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.969 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.131 W/kg
**SAR(1 g) = 0.100 W/kg; SAR(10 g) = 0.077 W/kg**
Maximum value of SAR (measured) = 0.116 W/kg

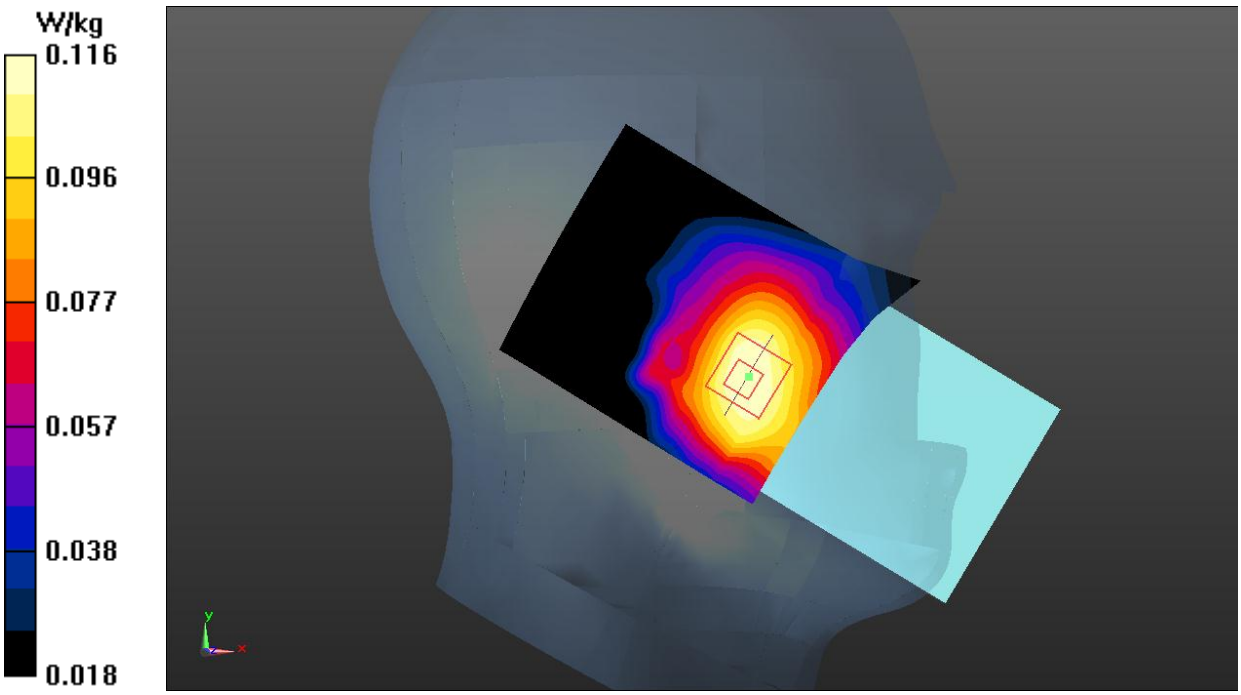


**Fig.19 LTE Band 28 Head**

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**LTE Band 28 Body**
Date: 2021-3-5
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 728 MHz; $\sigma$ = 0.882 S/m; $\varepsilon_r$ = 41.215; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 728 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**Rear Side Middle 1RB99/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.231 W/kg

**Rear Side Middle 1RB99/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.85 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.258 W/kg
**SAR(1 g) = 0.199 W/kg; SAR(10 g) = 0.150 W/kg**
Maximum value of SAR (measured) = 0.230 W/kg

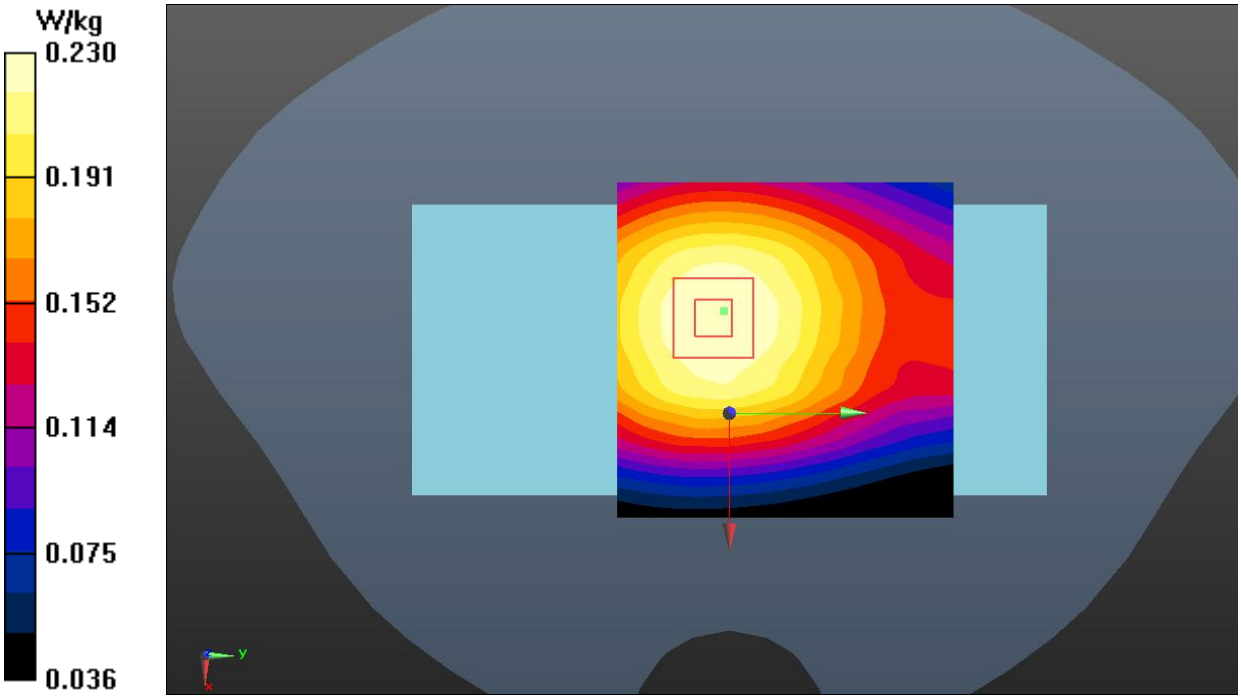


**Fig.20 LTE Band 28 Body**

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**LTE Band 66 Head**
Date: 2021-3-17
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1720 MHz; $\sigma$ = 1.333 S/m; $\varepsilon_r$ = 40.655; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (8.09, 8.09, 8.09);

**Right Cheek Low 1RB99/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.202 W/kg

**Right Cheek Low 1RB99/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.269 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.225 W/kg
**SAR(1 g) = 0.150 W/kg; SAR(10 g) = 0.095 W/kg**
Maximum value of SAR (measured) = 0.190 W/kg

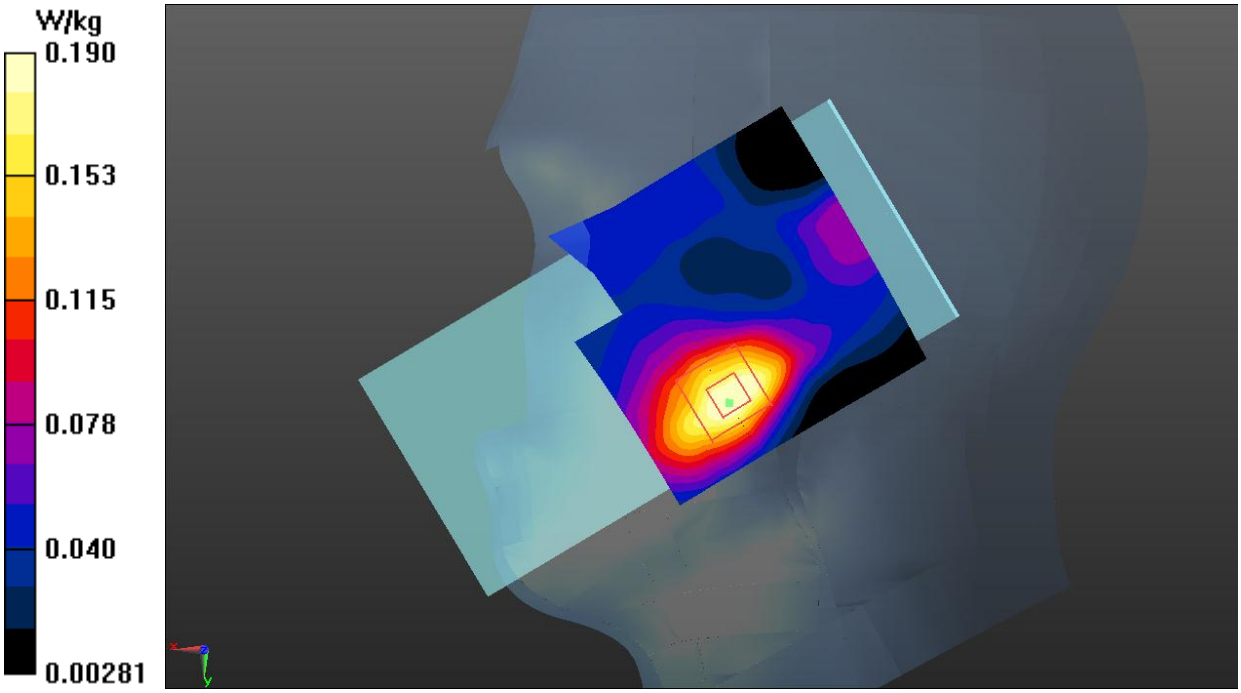


**Fig.21 LTE Band 66 Head**

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**LTE Band 66 Body**
Date: 2021-3-17
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1720 MHz; $\sigma$ = 1.333 S/m; $\varepsilon_r$ = 40.655; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, LTE_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (8.09, 8.09, 8.09);

**Rear Side Low 1RB99/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.08 W/kg

**Rear Side Low 1RB99/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.032 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.63 W/kg
**SAR(1 g) = 0.870 W/kg; SAR(10 g) = 0.436 W/kg**
Maximum value of SAR (measured) = 1.09 W/kg

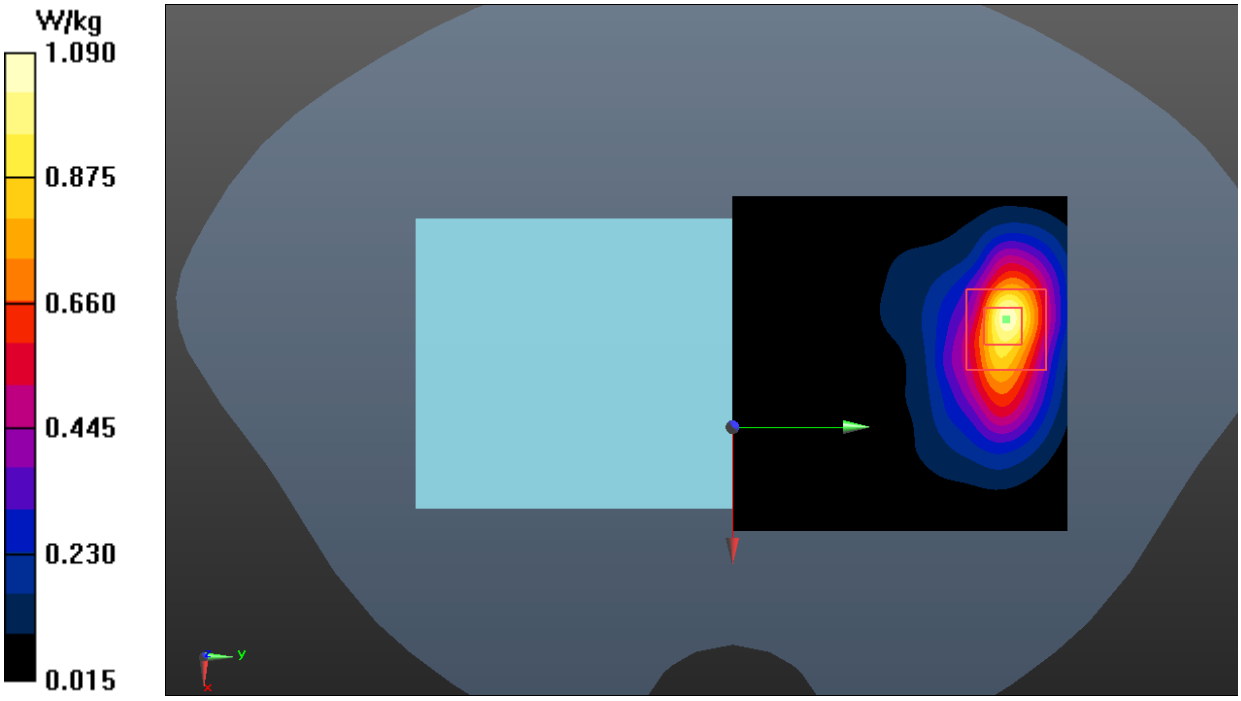


**Fig.22 LTE Band 66 Body**

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**WLAN 2.4G Head**
Date: 2021-3-6
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; $\sigma$ = 1.834 S/m; $\varepsilon_r$ = 38.591; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WiFi (0) Frequency: 2462 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.43, 7.43, 7.43);

**Right Cheek High/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.03 W/kg

**Right Cheek High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.128 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.23 W/kg
**SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.295 W/kg**
Maximum value of SAR (measured) = 0.838 W/kg

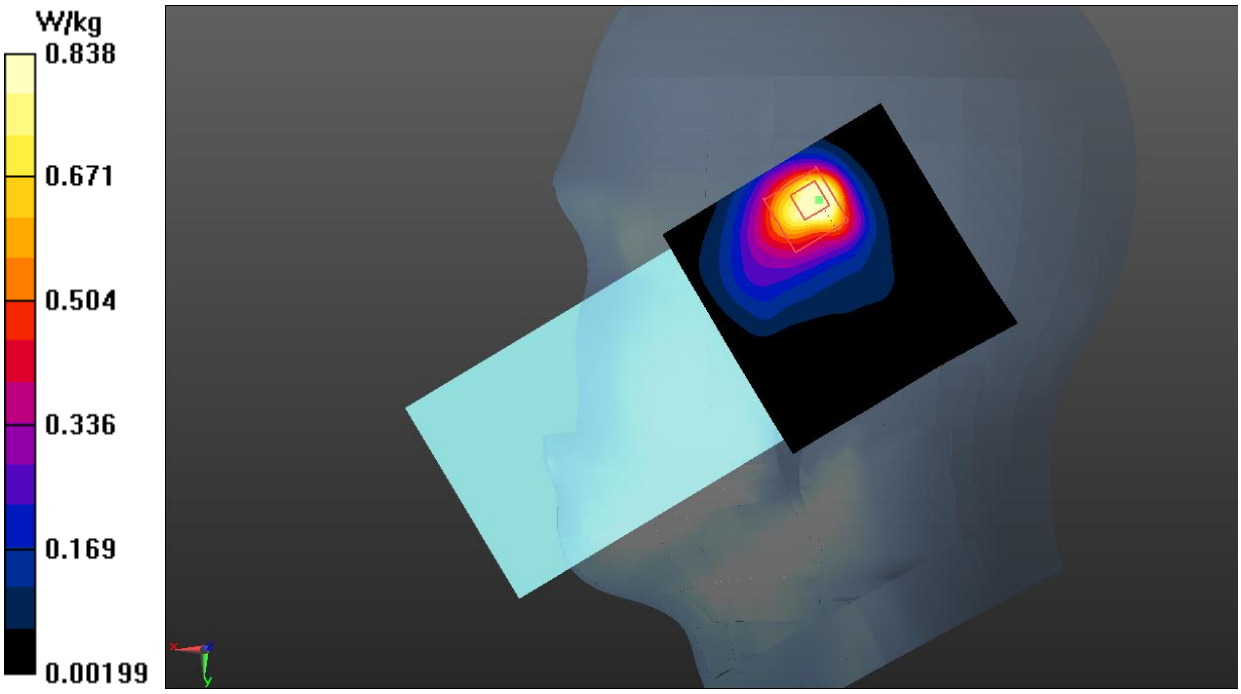


**Fig.23 WLAN 2.4G Head**

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**WLAN 2.4G Body**
Date: 2021-3-6
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2462 MHz; $\sigma$ = 1.834 S/m; $\varepsilon_r$ = 38.591; $\rho$ = 1000 kg/m$^3$
Communication System: UID 0, WiFi (0) Frequency: 2462 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.43, 7.43, 7.43);

**Rear Side High/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.260 W/kg

**Rear Side High/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.450 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.365 W/kg
**SAR(1 g) = 0.170 W/kg; SAR(10 g) = 0.084 W/kg**
Maximum value of SAR (measured) = 0.248 W/kg

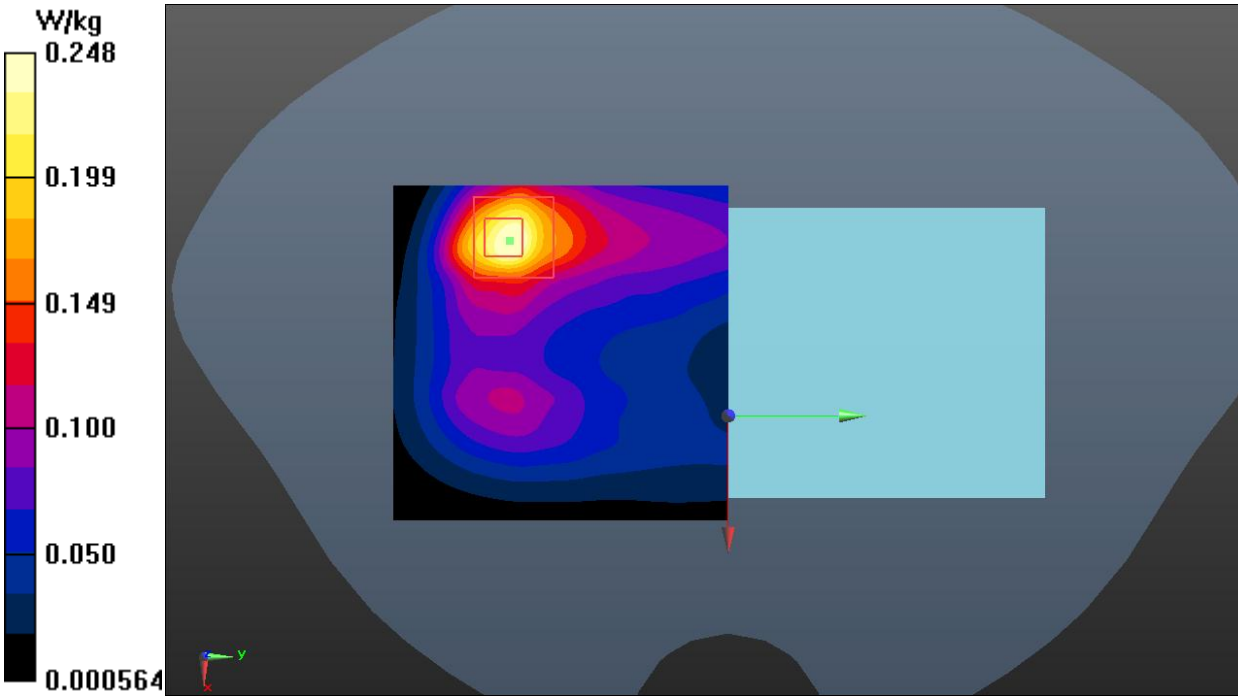


**Fig.24 WLAN 2.4G Body**

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# ANNEX B: SystemVerification Results

**750MHz**

Date: 2021-3-5

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used: f = 750 MHz; $\sigma$ = 0.896 S/m; $\varepsilon_r$ = 40.952; $\rho$ = 1000 kg/m$^3$

Communication System: CW_TMC Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**System Validation/Area Scan (81x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 61.225 V/m; Power Drift = -0.07 dB

**SAR(1 g) = 2.22 W/kg; SAR(10 g) = 1.46 W/kg**

Maximum value of SAR (interpolated) = 2.82 W/kg

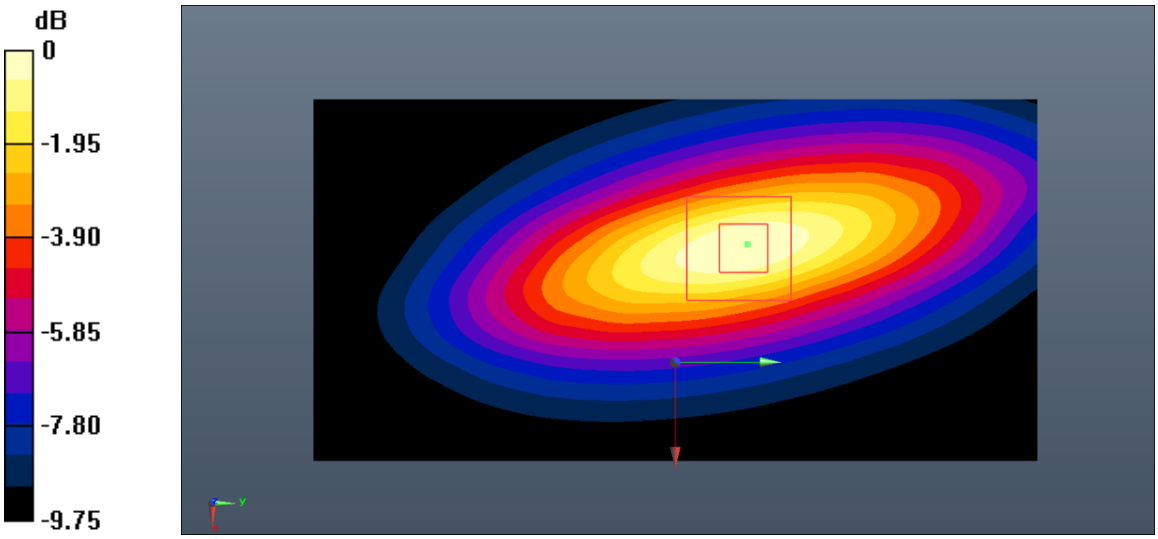
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.225 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 3.16 W/kg

**SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.44 W/kg**

Maximum value of SAR (measured) = 2.79 W/kg




0 dB = 2.79 W/kg = 4.46 dB W/kg

**Fig.B.1. Validation 750MHz 250mW**

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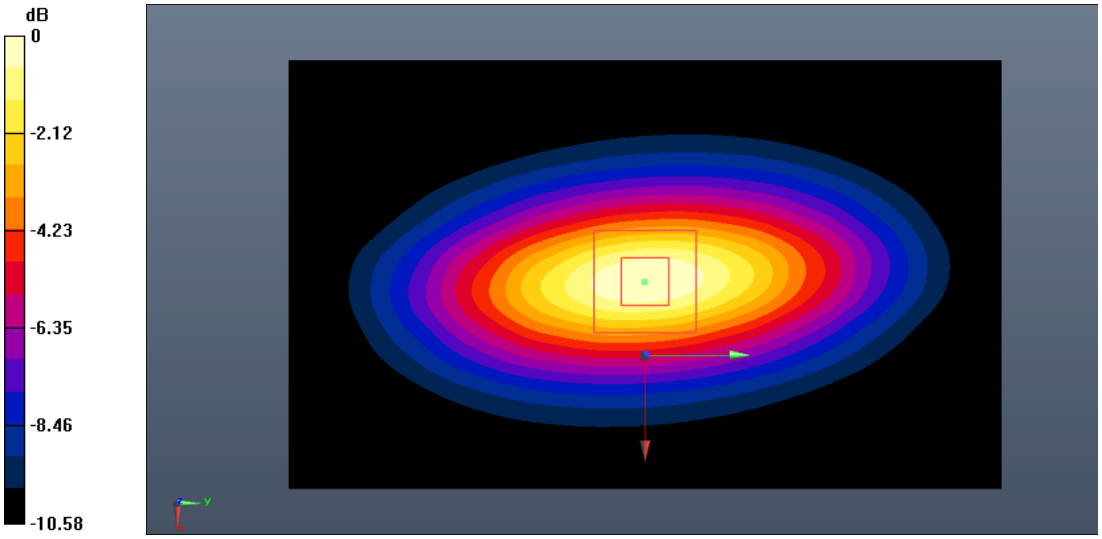
**835MHz**
Date: 2021-3-4
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used: f = 835 MHz; $\sigma$ = 0.918 S/m; $\varepsilon r$ = 40.733; $\rho$ = 1000 kg/$m^3$
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (9.59, 9.59, 9.59);

**System Validation/Area Scan (91x161x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 64.178 V/m; Power Drift = 0.10 dB
**SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.58 W/kg**
Maximum value of SAR (interpolated) = 3.45 W/kg

**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 64.178 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 4.12 W/kg
**SAR(1 g) = 2.49 W/kg; SAR(10 g) = 1.61 W/kg**
Maximum value of SAR (measured) = 3.49 W/kg




0 dB = 3.49 W/kg = 5.43 dB W/kg

**Fig.B.2. Validation 835MHz 250mW**

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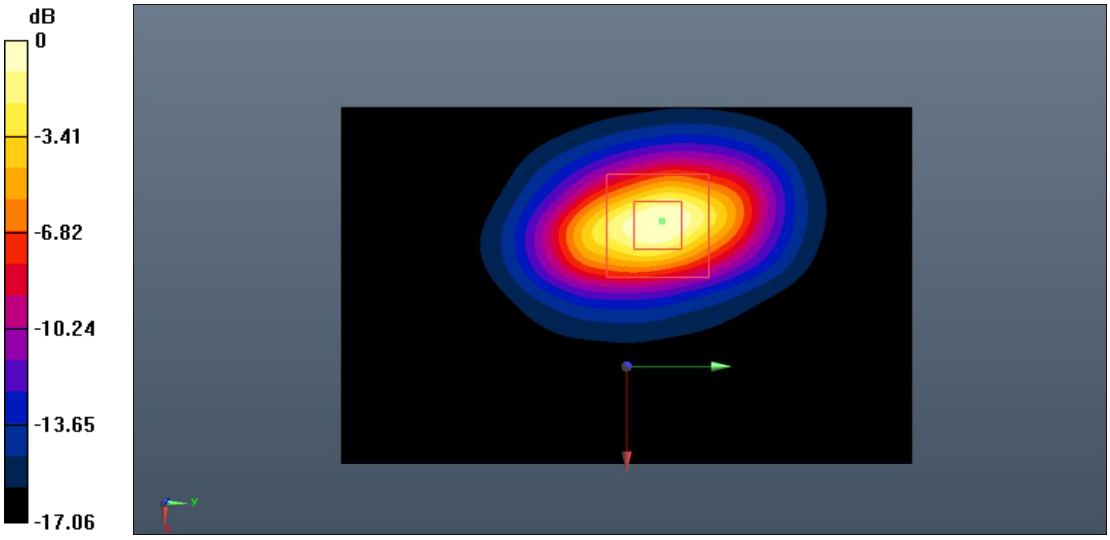
**1750MHz**
Date: 2021-3-17
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1750 MHz; $\sigma$ = 1.359 S/m; $\varepsilon_r$ = 40.538; $\rho$ = 1000 kg/m$^3$
Communication System: CW_TMC Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (8.09, 8.09, 8.09);

**System Validation/Area Scan (81x121x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 79.246 V/m; Power Drift = -0.05 dB
**SAR(1 g) = 9.11 W/kg; SAR(10 g) = 4.85 W/kg**
Maximum value of SAR (interpolated) = 10.7 W/kg

**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 79.246 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 20.6 W/kg
**SAR(1 g) = 8.92 W/kg; SAR(10 g) = 4.78 W/kg**
Maximum value of SAR (measured) = 10.5 W/kg




0 dB = 10.5 W/kg = 10.21 dB W/kg

**Fig.B.3. Validation 1750MHz 250mW**

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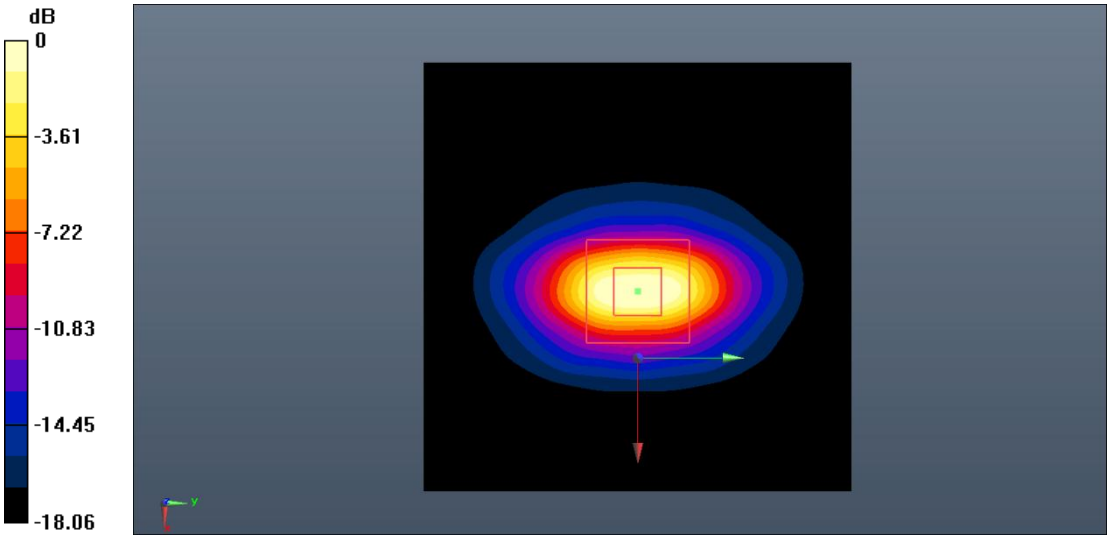
**1900MHz**
Date: 2021-3-25
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.424 S/m; $\varepsilon_r$ = 39.417; $\rho$ = 1000 kg/m$^3$
Communication System: CW_TMC Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.76, 7.76, 7.76);

**System Validation/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 85.013 V/m; Power Drift = 0.12 dB
**SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.21 W/kg**
Maximum value of SAR (interpolated) = 12.4 W/kg

**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.013 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 25.8 W/kg
**SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.33 W/kg**
Maximum value of SAR (measured) = 12.6 W/kg




0 dB = 12.6 W/kg = 11.00 dB W/kg

**Fig.B.4. Validation 1900MHz 250mW**

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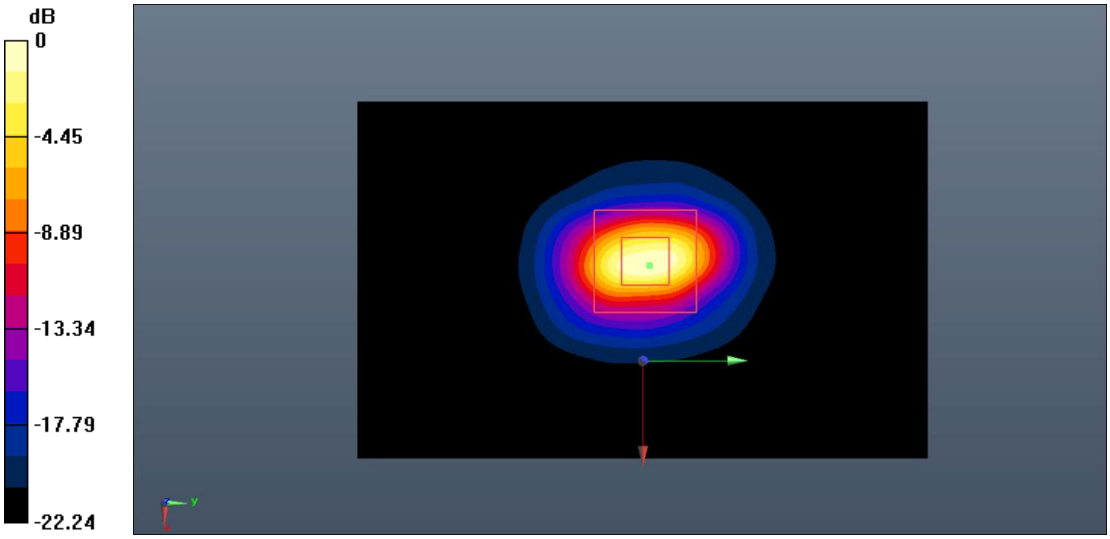
**2450MHz**
Date: 2021-3-6
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.82 S/m; $\varepsilon_r$ = 38.631; $\rho$ = 1000 kg/m$^3$
Communication System: CW_TMC Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.43, 7.43, 7.43);

**System Validation/Area Scan (81x121x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 89.452 V/m; Power Drift = 0.08 dB
**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.02 W/kg**
Maximum value of SAR (interpolated) = 15.5 W/kg

**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.452 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 28.7 W/kg
**SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.15 W/kg**
Maximum value of SAR (measured) = 15.8 W/kg




0 dB = 15.8 W/kg = 11.99 dB W/kg

**Fig.B.5. Validation 2450MHz 250mW**

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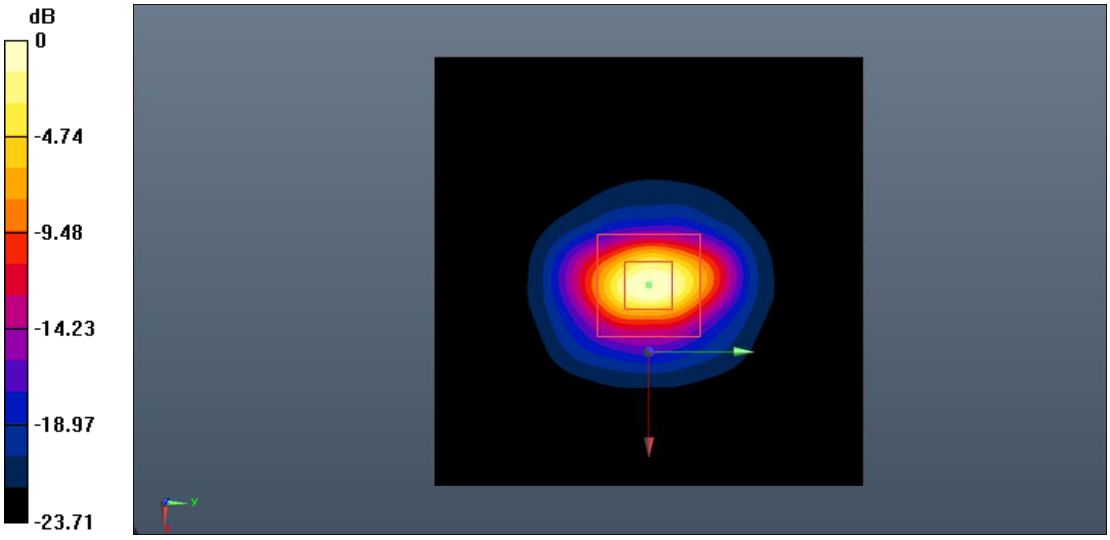
**2550MHz**
Date: 2021-3-8
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2550 MHz; $\sigma$ = 1.941 S/m; $\varepsilon_r$ = 38.476; $\rho$ = 1000 kg/m$^3$
Communication System: CW_TMC Frequency: 2550 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3633 ConvF (7.20, 7.20, 7.20);

**System Validation/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 94.036 V/m; Power Drift = 0.03 dB
**SAR(1 g) = 14.9 W/kg; SAR(10 g) = 6.65 W/kg**
Maximum value of SAR (interpolated) = 16.8 W/kg

**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.036 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 36.1 W/kg
**SAR(1 g) = 15.1 W/kg; SAR(10 g) = 6.81 W/kg**
Maximum value of SAR (measured) = 17.0 W/kg




0 dB = 17.0 W/kg = 12.30 dB W/kg

**Fig.B.6. Validation 2550MHz 250mW**

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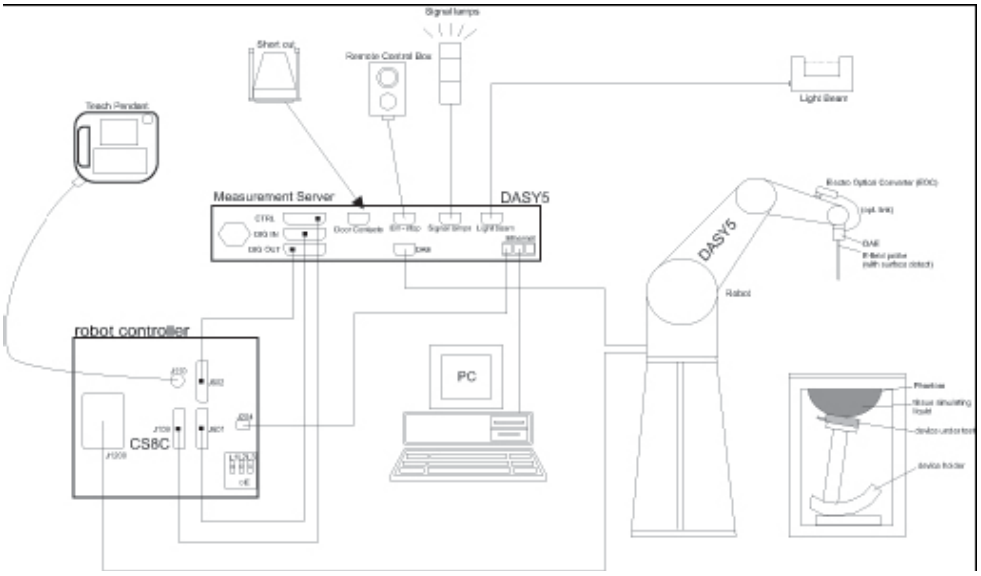
# ANNEX C: SAR Measurement Setup

## C.1. Measurement Set-up

DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:




**Picture C.1 SAR Lab Test Measurement Set-up**

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

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## C.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection durning a software approach and looks for the maximum using 2$^{nd}$ord curve fitting. The approach is stopped at reaching the maximum.

### Probe Specifications:

**Model:** ES3DV3, EX3DV4
**Frequency** 10MHz — 6.0GHz(EX3DV4)
**Range:** 10MHz — 4GHz(ES3DV3)
**Calibration:** In head and body simulating tissue at Frequencies from 835 up to 5800MHz
**Linearity:** ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
**Dynamic Range:** 10 mW/kg — 100W/kg
**Probe Length:** 330 mm
**Probe Tip**
**Length:** 20 mm
**Body Diameter:** 12 mm
**Tip Diameter:** 2.5 mm (3.9 mm for ES3DV3)
**Tip-Center:** 1 mm (2.0mm for ES3DV3)
**Application:** SAR Dosimetry Testing
Compliance tests of mobile phones
Dosimetry in strong gradient fields

**Picture C.2 Near-field Probe**

**Picture C.3 E-field Probe**

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## C.3. E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm$^2$) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/ cm$^2$.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:
$\Delta t$ = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
$\Delta T$ = Temperature increase due to RF exposure.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m$^3$).

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## C.4. Other Test Equipment

### C.4.1. Data Acquisition Electronics (DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

**PictureC.4: DAE**

### C.4.2. Robot

The SPEAG DASY system uses the high precision robots (DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)


**Picture C.5 DASY 5**

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### C.4.3. Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5:128MB), RAM (DASY5:128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.


**Picture C.6 Server for DASY 5**

### C.4.4. Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss

POM material having the following dielectric

parameters: relative permittivity $\varepsilon$ =3 and loss tangent $\delta$ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

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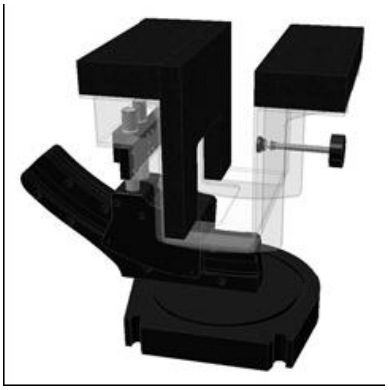
**Picture C.7-1: Device Holder**



**Picture C.7-2: Laptop Extension Kit**

### C.4.5. Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to
Represent the 90$^{th}$ percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

| | |
|---|---|
| Shell Thickness: | 2 ± 0. 2 mm |
| Filling Volume: | Approx. 25 liters |
| Dimensions: | 810 x l000 x 500 mm (H x L x W) |
| Available: | Special |

**Picture C.8: SAM Twin Phantom**

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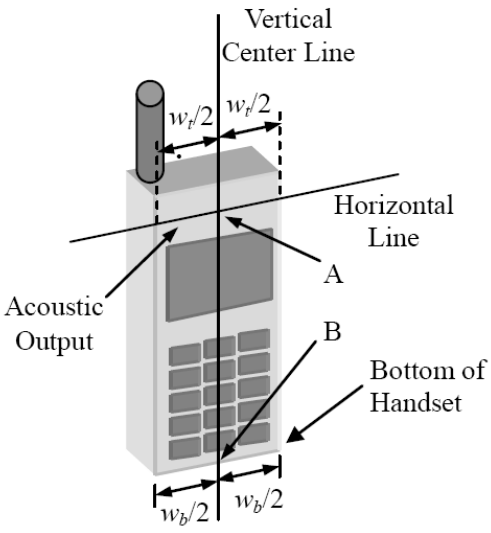
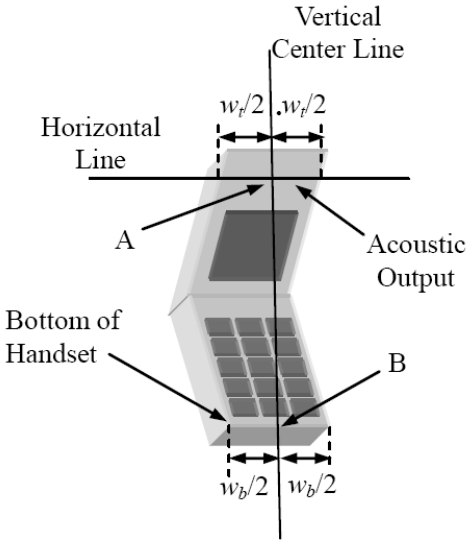
# ANNEX D: Position of the wireless device in relation to the phantom

## D.1. General considerations

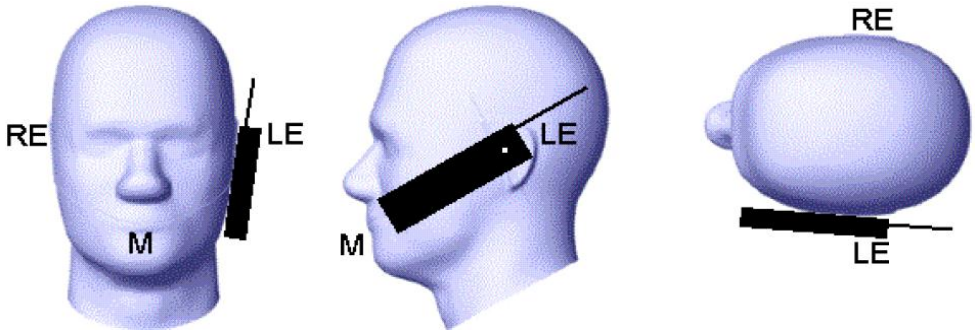
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.




| | |
|---|---|
| $w_t$ | Width of the handset at the level of the acoustic |
| $w_b$ | Width of the bottom of the handset |
| A | Midpoint of the width $w_t$ of the handset at the level of the acoustic output |
| B | Midpoint of the width $w_b$ of the bottom of the handset |

**Picture D.1-a Typical “fixed” case handset** **Picture D.1-b Typical “clam-shell” case handset**




**Picture D.2 Cheek position of the wireless device on the left side of SAM**

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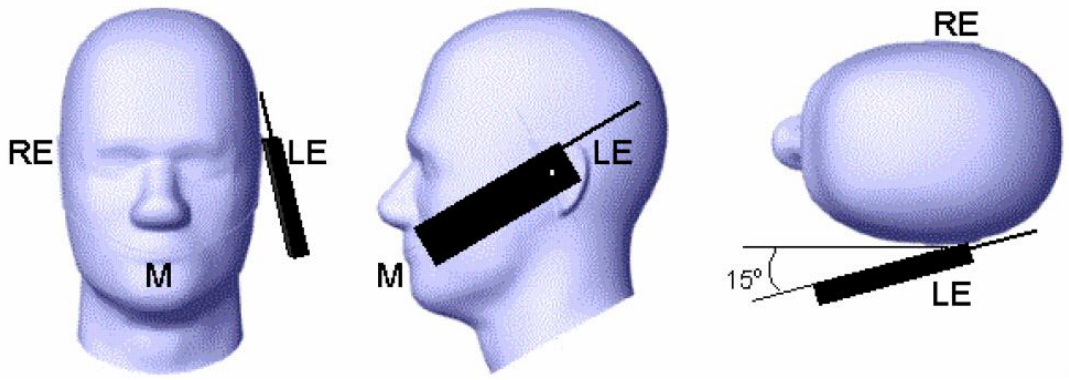
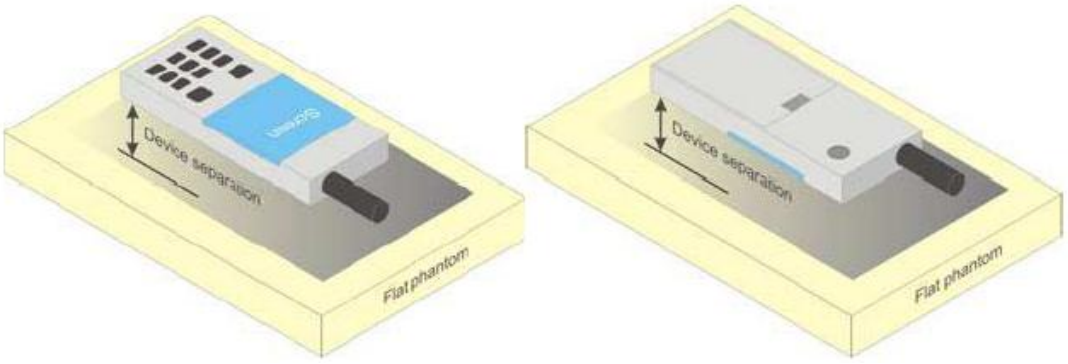



**Picture D.3 Tilt position of the wireless device on the left side of SAM**

## D.2. Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.




**Picture D.4 Test positions for body-worn devices**

## D.3. Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture 8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.

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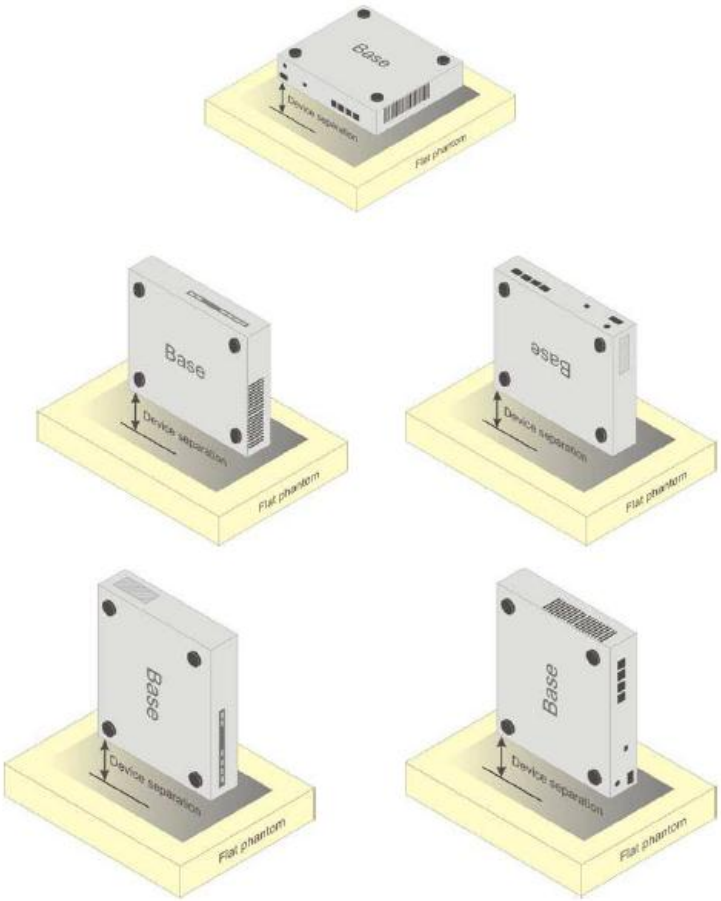


**Picture D.5 Test positions for desktop devices**

## D.4. DUT Setup Photos


**Picture D.6**

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## ANNEX E: Equivalent Media Recipes

The liquid used for the frequency range of 700-6000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

**Table E.1: Composition of the Tissue Equivalent Matter**

| Frequency (MHz) | 835 Head | 835 Body | 1900 Head | 1900 Body | 2450 Head | 2450 Body | 5800 Head | 5800 Body |
|---|---|---|---|---|---|---|---|---|
| Ingredients (% by weight) | | | | | | | | |
| Water | 41.45 | 52.5 | 55.242 | 69.91 | 58.79 | 72.60 | 65.53 | 65.53 |
| Sugar | 56.0 | 45.0 | \ | \ | \ | \ | \ | \ |
| Salt | 1.45 | 1.4 | 0.306 | 0.13 | 0.06 | 0.18 | \ | \ |
| Preventol | 0.1 | 0.1 | \ | \ | \ | \ | \ | \ |
| Cellulose | 1.0 | 1.0 | \ | \ | \ | \ | \ | \ |
| Glycol Monobutyl | \ | \ | 44.452 | 29.96 | 41.15 | 27.22 | \ | \ |
| Diethylenglycol monohexylether | \ | \ | \ | \ | \ | \ | 17.24 | 17.24 |
| Triton X-100 | \ | \ | \ | \ | \ | \ | 17.24 | 17.24 |
| Dielectric Parameters Target Value | ε=41.5 σ=0.90 | ε=55.2 σ=0.97 | ε=40.0 σ=1.40 | ε=53.3 σ=1.52 | ε=39.2 σ=1.80 | ε=52.7 σ=1.95 | ε=35.3 σ=5.27 | ε=48.2 σ=6.00 |

**Note: There is a little adjustment respectively for 750, 1800, 2600, 5200, 5300, and 5600, based on the recipe of closest frequency in table E.1**

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