

# APPENDIX E: MULTI-TX AND ANTENNA SAR CONSIDERATIONS

## E.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

## E.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is  $\leq 1.6$  W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

## E.3 Tablet SAR Analysis

**Table E-1**  
**Simultaneous Transmission Scenarios of WLAN/BT**

| Configuration | 2.4 GHz WLAN WIF1 0 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz WLAN WIF1 1 SAR (W/kg) | 5 GHz WLAN WIF1 0 SAR (W/kg) | 5 GHz WLAN WIF1 0 SAR (W/kg) | 5 GHz WLAN WIF1 1 SAR (W/kg) | 5 GHz WLAN WIF1 1 SAR (W/kg) | 5 GHz WLAN WIF1 1 SAR (W/kg) | 5 GHz WLAN WIF1 1 SAR (W/kg) | 5 GHz WLAN WIF1 1 SAR (W/kg) | 5 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 0 SAR (W/kg) | 6 GHz WLAN WIF1 0 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 6 GHz WLAN WIF1 1 SAR (W/kg) | 2.4 GHz Bluetooth WIF1 0 SAR (W/kg) | 2.4 GHz Bluetooth WIF1 0 SAR (W/kg) | 2.4 GHz Bluetooth WIF1 0 SAR (W/kg) | 2.4 GHz Bluetooth WIF1 0 SAR (W/kg) | 2.4 GHz 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Notes:

- For all combinations where the sum of WLAN+BT is less than 1.6 W/kg, there's no further analysis required for compliance demonstration.
- Values with \* were tested at a higher, more conservative power level.

|                              |                              |                                   |
|------------------------------|------------------------------|-----------------------------------|
| FCC ID: A3LSMX820            | <b>SAR EVALUATION REPORT</b> | Approved by:<br>Technical Manager |
| DUT Type:<br>Portable Tablet |                              | APPENDIX E:<br>Page 1 of 2        |

## E.4 Laptop SAR Analysis

**Table E-2**  
**Simultaneous Transmission Scenarios of WLAN/BT**

| Configuration |  | 2.4 GHz WLAN<br>WIFI 0<br>SAR<br>(W/kg) | 2.4 GHz WLAN<br>WIFI 1<br>SAR<br>(W/kg) | 2.4 GHz WLAN<br>MIMO<br>SAR<br>(W/kg) | 5 GHz WLAN<br>WIFI 0<br>SAR<br>(W/kg) | 5 GHz WLAN<br>WIFI 1<br>SAR<br>(W/kg) | 5 GHz WLAN<br>MIMO<br>SAR<br>(W/kg) | 6 GHz WLAN<br>WIFI 0<br>SAR<br>(W/kg) | 6 GHz WLAN<br>WIFI 1<br>SAR<br>(W/kg) | 6 GHz WLAN<br>MIMO<br>SAR<br>(W/kg) | 2.4 GHz Bluetooth<br>WIFI 0<br>SAR<br>(W/kg) | 2.4 GHz Bluetooth<br>WIFI 1<br>SAR<br>(W/kg) |
|---------------|--|-----------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|----------------------------------------------|----------------------------------------------|
|               |  | 1                                       | 2                                       | 3                                     | 4                                     | 5                                     | 6                                   | 7                                     | 8                                     | 9                                   | 10                                           | 11                                           |
| Bottom        |  | 0.157                                   | 0.005                                   | 0.191                                 | 0.373                                 | 0.054                                 | 0.371                               | 0.157                                 | 0.015                                 | 0.415                               | 0.075                                        | 0.000                                        |

| Configuration | 2.4 GHz Bluetooth WIFI 1 SAR (W/kg) | 2.4 GHz Bluetooth WIFI 1 + 6 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz Bluetooth WIFI 1 + 5 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz Bluetooth WIFI 0 SAR (W/kg) | 2.4 GHz Bluetooth WIFI 0 + 6 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz Bluetooth WIFI 0 + 5 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz WLAN MIMO SAR (W/kg) | 6 GHz WLAN MIMO SAR (W/kg) | 5 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz Bluetooth WIFI 0 + 2.4 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz Bluetooth WIFI 0 + 2.4 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz Bluetooth WIFI 0 + 2.4 GHz WLAN MIMO SAR (W/kg) | 2.4 GHz WLAN WIFI 0 SAR (W/kg) | 2.4 GHz WLAN WIFI 1 SAR (W/kg) | 5 GHz WLAN WIFI 0 SAR (W/kg) | 5 GHz WLAN WIFI 1 SAR (W/kg) | 6 GHz WLAN WIFI 0 SAR (W/kg) | 6 GHz WLAN WIFI 1 SAR (W/kg) | WLAN/BT Worst-case Combination SAR (W/kg) |
|---------------|-------------------------------------|-------------------------------------------------------|-------------------------------------------------------|-------------------------------------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------|----------------------------|----------------------------|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------------------|
|               | 11                                  | 11+6                                                  | 11+5                                                  | 10                                  | 10+6                                                  | 10+5                                                  | 9+6                                            | 9+5                                            | 8                            | 9                          | 6                          | 10+2+6                                                  | 10+2+5                                                  | 10+2                                                    | 1                              | 2                              | 4                            | 5                            | 7                            | 8                            |                                           |
| Bottom        | 0.000                               | 0.415                                                 | 0.371                                                 | 0.075                               | 0.490                                                 | 0.446                                                 | 0.606                                          | 0.562                                          | 0.191                        | 0.415                      | 0.371                      | 0.451                                                   | 0.495                                                   | 0.080                                                   | 0.157                          | 0.005                          | 0.373                        | 0.054                        | 0.157                        | 0.015                        | 0.606                                     |

Notes:

- For all combinations where the sum of WLAN+BT is less than 1.6 W/kg, there's no further analysis required for compliance demonstration.

## E.5 Conclusion

The above numerical summed SAR results are sufficient to show that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D04v01 and IEEE 1528- 2013 Section 6.3.4.1

|                              |                              |                                   |
|------------------------------|------------------------------|-----------------------------------|
| FCC ID: A3LSMX820            | <b>SAR EVALUATION REPORT</b> | Approved by:<br>Technical Manager |
| DUT Type:<br>Portable Tablet |                              | APPENDIX E:<br>Page 2 of 2        |