

SAR TEST REPORT



The following samples were submitted and identified on behalf of the client as:

Equipment Under Test Smart Phone
Model Name 801FJ
Brand Name FUJITSU
Company Name FUJITSU CONNECTED TECHNOLOGIES Ltd.
Company Address 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki
211-8588, Japan
Standards IEEE/ANSI C95.1-1992, IEEE 1528-2013,
KDB248227D01v02r02, KDB865664D01v01r04,
KDB865664D02v01r02, KDB941225D01v03r01,
KDB941225D06v02r01, KDB447498D01v06,
KDB941225D05v02r05
FCC ID 2AQYEFMP170
Date of Test(s) Apr. 06th, 2019 ~ Apr. 15th, 2019
Date of Issue May. 15th, 2019

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Signed on behalf of SGS

| Clerk / Ruby Ou | Engineer / Bond Tsai | Asst. Manager / John Yeh |
|-----------------|----------------------|--------------------------|
| | | |

Date: May. 15th, 2019

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Revision History

| Report Number | Revision | Description | Issue Date |
|---------------|----------|------------------------------|-----------------|
| E5/2019/30031 | Rev.00 | Initial creation of document | May. 13th, 2019 |
| E5/2019/30031 | Rev.00 | Modify Ch1.3 | May. 15th, 2019 |
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1. General Information

1.1 Testing Laboratory

| | |
|---|---|
| SGS Taiwan Ltd. Electronics & Communication Laboratory | |
| 1F, No. 8, Alley 15, Lane 120, Sec. 1, NeiHu Road, Neihu District, Taipei City, 11493, Taiwan | |
| Tel | +886-2-2299-3279 |
| Fax | +886-2-2298-0488 |
| Internet | http://www.tw.sgs.com/ |

1.2 Details of Applicant

| | |
|-----------------|--|
| Company Name | FUJITSU CONNECTED TECHNOLOGIES Ltd. |
| Company Address | 1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan |

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1.3 Description of EUT

| | | | |
|-----------------------------|---|---|---------|
| EUT Name | Smart Phone | | |
| Model Name | 801FJ | | |
| Brand Name | FUJITSU | | |
| FCC ID | 2AQYEFMP170 | | |
| Mode of Operation | <input checked="" type="checkbox"/> GSM <input checked="" type="checkbox"/> GPRS <input checked="" type="checkbox"/> WCDMA <input checked="" type="checkbox"/> HSDPA <input checked="" type="checkbox"/> HSUPA <input checked="" type="checkbox"/> LTE FDD <input checked="" type="checkbox"/> WLAN802.11 a/b/g/n/ac(20M/40M/80M) <input checked="" type="checkbox"/> Bluetooth | | |
| Duty Cycle | GSM (DTM multi class B) | 1/8.3 | |
| | GPRS (support multi class 12 max) | 1/2 (1Dn4UP) 1/2.76 (1Dn3UP) 1/4.1 (1Dn2UP) 1/8.3 (1Dn1UP) | |
| | LTE FDD | 1 | |
| | WCDMA | 1 | |
| | WLAN802.11 a/b/g/n/ac(20M/40M/80M) | 1 | |
| | Bluetooth | 1 | |
| TX Frequency Range (MHz) | GSM1900 | 1850 | — 1910 |
| | WCDMA Band II | 1850 | — 1910 |
| | LTE FDD Band 2 | 1850 | — 1910 |
| | WiFi 2.4GHz | 2400 | — 2462 |
| | WiFi 5GHz | 5150 | — 5700 |
| | Bluetooth | 2402 | — 2480 |
| Channel Number (ARFCN) | GSM1900 | 512 | — 810 |
| | WCDMA Band II | 9262 | — 9538 |
| | LTE FDD Band 2 | 18607 | — 19193 |
| | WiFi 2.4GHz | 1 | — 11 |
| | WiFi 5GHz | 36 | — 140 |
| | Bluetooth | 0 | — 78 |

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WWAN antenna information:

| Antenna | WWAN |
|----------------|-------|
| Frequency(MHz) | 1900 |
| Gain (dBi) | -0.38 |

WLAN / Bluetooth antenna information:

| Antenna | WLAN | | | | |
|----------------|-------|-------|-------|-------|-------|
| Frequency(MHz) | 2.4G | 5.2G | 5.3G | 5.6G | 5.8G |
| Gain (dBi) | -1.52 | -2.98 | -3.06 | -1.28 | -2.13 |

| Max. SAR (1-g) (Unit: W/Kg) | | | | | |
|-----------------------------|----------------------|----------|----------|---|---|
| Mode | Band | Measured | Reported | Position / Channel | |
| Head | GSM 1900 | 0.04 | 0.06 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Cheek | <input checked="" type="checkbox"/> Right <input type="checkbox"/> Tilt 810 Channel |
| | WCDMA Band II | 0.07 | 0.07 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Cheek | <input checked="" type="checkbox"/> Right <input type="checkbox"/> Tilt 9400 Channel |
| | LTE FDD Band 2 | 0.09 | 0.11 | <input type="checkbox"/> Left <input checked="" type="checkbox"/> Cheek | <input checked="" type="checkbox"/> Right <input type="checkbox"/> Tilt 19100 Channel |
| | WLAN802.11 b | 0.46 | 0.47 | <input checked="" type="checkbox"/> Left <input checked="" type="checkbox"/> Cheek | <input type="checkbox"/> Right <input type="checkbox"/> Tilt 11 Channel |
| | WLAN802.11n(40M)5.2G | 0.23 | 0.23 | <input checked="" type="checkbox"/> Left <input type="checkbox"/> Cheek | <input type="checkbox"/> Right <input checked="" type="checkbox"/> Tilt 38 Channel |
| | WLAN802.11n(40M)5.3G | 0.21 | 0.21 | <input checked="" type="checkbox"/> Left <input type="checkbox"/> Cheek | <input type="checkbox"/> Right <input checked="" type="checkbox"/> Tilt 62 Channel |
| | WLAN802.11n(40M)5.6G | 0.22 | 0.22 | <input checked="" type="checkbox"/> Left <input type="checkbox"/> Cheek | <input type="checkbox"/> Right <input checked="" type="checkbox"/> Tilt 102 Channel |
| | Bluetooth | 0.04 | 0.06 | <input checked="" type="checkbox"/> Left <input checked="" type="checkbox"/> Cheek | <input type="checkbox"/> Right <input type="checkbox"/> Tilt 39 Channel |

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| Max. SAR (1-g) (Unit: W/Kg) | | | | |
|-----------------------------|----------------------|----------|----------|--|
| Mode | Band | Measured | Reported | Position / Channel |
| Body-worn | GSM 1900 | 0.28 | 0.39 | <input checked="" type="checkbox"/> Front <input type="checkbox"/> Back 810 Channel |
| | Bluetooth | 0.01 | 0.01 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back 39 Channel |
| | WLAN802.11n(40M)5.2G | 0.02 | 0.02 | <input checked="" type="checkbox"/> Front <input type="checkbox"/> Back 38 Channel |
| | WLAN802.11n(40M)5.3G | 0.02 | 0.02 | <input checked="" type="checkbox"/> Front <input type="checkbox"/> Back 62 Channel |
| | WLAN802.11n(40M)5.6G | 0.04 | 0.04 | <input checked="" type="checkbox"/> Front <input type="checkbox"/> Back 102 Channel |

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| Max. SAR (1-g) (Unit: W/Kg) | | | | |
|-----------------------------|--------------------|----------|----------|---|
| Mode | Band | Measured | Reported | Position / Channel |
| Hotspot mode | GPRS 1900 (1Dn4UP) | 0.68 | 0.97 | <input type="checkbox"/> Front <input type="checkbox"/> Back <input checked="" type="checkbox"/> Bottom <input type="checkbox"/> Right <input type="checkbox"/> Left 810 Channel |
| | WCDMA Band II | 1.33 | 1.44 | <input type="checkbox"/> Front <input type="checkbox"/> Back <input checked="" type="checkbox"/> Bottom <input type="checkbox"/> Right <input type="checkbox"/> Left 9262 Channel |
| | LTE FDD Band 2 | 1.06 | 1.40 | <input type="checkbox"/> Front <input type="checkbox"/> Back <input checked="" type="checkbox"/> Bottom <input type="checkbox"/> Right <input type="checkbox"/> Left 18700 Channel |
| | WLAN802.11 b | 0.10 | 0.10 | <input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Top <input type="checkbox"/> Right <input type="checkbox"/> Left 11 Channel |

| Highest simultaneous SAR (1-g) (Unit: W/Kg) | |
|---|------|
| Head | 0.53 |
| Body | 1.44 |

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GSM 1900 - conducted power table:

| EUT mode | Frequency (MHz) | CH | Max. Rated Avg. Power + Max.Tolerance (dBm) | Burst average power | Source-based time average power |
|--|-----------------|-----|---|---------------------|---------------------------------|
| | | | | Avg. (dBm) | Avg. (dBm) |
| GSM1900 (GMSK) | 1850.2 | 512 | 30.5 | 28.71 | 19.68 |
| | 1800 | 661 | 30.5 | 28.92 | 19.89 |
| | 1909.8 | 810 | 30.5 | 29.07 | 20.04 |
| The division factor compared to the number of TX time slot | | | | | |
| Division factor | | | | 1 TX time slot | |
| | | | | -9.03 | |

GPRS 1900 - conducted power table:

| Burst average power | | | | | | |
|--|-----------------|-----|----------------|----------------|----------------|----------------|
| Max. Rated Avg. Power + Max. Tolerance (dBm) | | | 30.50 | 28.50 | 26.50 | 25.50 |
| | | | 1Dn1UP | 1Dn2UP | 1Dn3UP | 1Dn4UP |
| EUT mode | Frequency (MHz) | CH | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) | Avg. (dBm) |
| GPRS 1900 | 1850.2 | 512 | 28.71 | 26.59 | 24.74 | 23.77 |
| | 1880 | 661 | 28.92 | 26.55 | 24.80 | 23.79 |
| | 1909.8 | 810 | 29.07 | 26.74 | 24.96 | 23.94 |
| Source-based time average power | | | | | | |
| GPRS 1900 | 1850.2 | 512 | 19.68 | 20.57 | 20.48 | 20.76 |
| | 1880 | 661 | 19.89 | 20.53 | 20.54 | 20.78 |
| | 1909.8 | 810 | 20.04 | 20.72 | 20.70 | 20.93 |
| The division factor compared to the number of TX time slot | | | | | | |
| Division factor | | | 1 TX time slot | 2 TX time slot | 3 TX time slot | 4 TX time slot |
| | | | -9.03 | -6.02 | -4.26 | -3.01 |

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WCDMA Band II - HSDPA / HSUPA Conducted power table (Unit: dBm):

| Band | | WCDMA II | | |
|--|-----------------|----------|-------|--------|
| TX Channel | | 9262 | 9400 | 9538 |
| Frequency (MHz) | | 1850.2 | 1880 | 1907.6 |
| Max. Rated Avg. Power+Max. Tolerance (dBm) | | 23.50 | | |
| 3GPP Rel 99 | RMC 12.2Kbps | 23.16 | 23.44 | 23.30 |
| 3GPP Rel 5 | HSDPA Subtest-1 | 22.49 | 22.46 | 22.49 |
| | HSDPA Subtest-2 | 22.46 | 22.47 | 22.49 |
| | HSDPA Subtest-3 | 21.96 | 21.90 | 21.92 |
| | HSDPA Subtest-4 | 21.96 | 21.93 | 21.92 |
| 3GPP Rel 6 | HSUPA Subtest-1 | 22.45 | 22.44 | 22.47 |
| | HSUPA Subtest-2 | 20.49 | 20.47 | 20.45 |
| | HSUPA Subtest-3 | 21.41 | 21.43 | 21.42 |
| | HSUPA Subtest-4 | 20.41 | 20.46 | 20.44 |
| | HSUPA Subtest-5 | 22.40 | 22.47 | 22.46 |

Subtests for WCDMA Release 5 HSDPA

| SUB-TEST | β_c | β_d | β_d (SF) | β_c/β_d | β_{HS} (Note 1, Note 2) | CM (dB) (Note 3) | MPR (dB) (Note 3) |
|----------|-----------|-----------|-------------------|-------------------|----------------------------------|---------------------|----------------------|
| 1 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 0.0 | 0.0 |
| 2 | 12/15 | 15/15 | 64 | 12/15 | 24/15 | 1.0 | 0.0 |
| 3 | 15/15 | 8/15 | 64 | 15/8 | 30/15 | 1.5 | 0.5 |
| 4 | 15/15 | 4/15 | 64 | 15/4 | 30/15 | 1.5 | 0.5 |

Subtests for WCDMA Release 6 HSUPA

| SUB-TEST | β_c | β_d | β_d (SF) | β_c/β_d | β_{HS} (Note 1) | β_{ec} | β_{ed} (Note 5) (Note 6) | β_{ed} (SF) | β_{ed} (Codes) | CM (dB) (Note 2) | MPR (dB) (Note 2) | AG Index (Note 6) | E-TFCI |
|----------|-----------|-----------|-------------------|-------------------|--------------------------|--------------|--|----------------------|-------------------------|------------------------|-------------------------|-------------------------|--------|
| 1 | 11/15 | 15/15 | 64 | 11/15 | 22/15 | 209/225 | 1309/225 | 4 | 1 | 1.0 | 0.0 | 20 | 75 |
| 2 | 6/15 | 15/15 | 64 | 6/15 | 12/15 | 12/15 | 94/75 | 4 | 1 | 3.0 | 2.0 | 12 | 67 |
| 3 | 15/15 | 9/15 | 64 | 15/9 | 30/15 | 30/15 | β_{ed1} : 47/15 β_{ed2} : 47/15 | 4 4 | 2 | 2.0 | 1.0 | 15 | 92 |
| 4 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 2/15 | 56/75 | 4 | 1 | 3.0 | 2.0 | 17 | 71 |
| 5 | 15/15 | 15/15 | 64 | 15/15 | 30/15 | 24/15 | 134/15 | 4 | 1 | 1.0 | 0.0 | 21 | 81 |

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LTE Band 2 - conducted power table:

| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 20 | QPSK | 1 RB | 0 | 1860 | 18700 | 22.66 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.70 | 24 | 0 | |
| | | | | 1900 | 19100 | 22.58 | 24 | 0 | |
| | | | 50 | 1860 | 18700 | 23.12 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.76 | 24 | 0 | |
| | | | | 1900 | 19100 | 23.15 | 24 | 0 | |
| | | | 99 | 1860 | 18700 | 22.79 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.89 | 24 | 0 | |
| | | | | 1900 | 19100 | 22.88 | 24 | 0 | |
| | | 50 RB | 0 | 1860 | 18700 | 22.06 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 22.15 | 23 | 0-1 | |
| | | | | 1900 | 19100 | 22.03 | 23 | 0-1 | |
| | | | 25 | 1860 | 18700 | 22.03 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 22.07 | 23 | 0-1 | |
| | | | | 1900 | 19100 | 22.00 | 23 | 0-1 | |
| | | | 50 | 1860 | 18700 | 22.03 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.92 | 23 | 0-1 | |
| | | | | 1900 | 19100 | 22.01 | 23 | 0-1 | |
| | | 100RB | | | 1860 | 18700 | 22.02 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 22.06 | 23 | 0-1 |
| | | | | | 1900 | 19100 | 22.06 | 23 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1860 | 18700 | 22.02 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 22.14 | 23 | 0-1 | |
| | | | | 1900 | 19100 | 21.46 | 23 | 0-1 | |
| | | | 50 | 1860 | 18700 | 22.37 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 22.29 | 23 | 0-1 | |
| | | | | 1900 | 19100 | 21.97 | 23 | 0-1 | |
| | | | 99 | 1860 | 18700 | 21.82 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.41 | 23 | 0-1 | |
| | | | | 1900 | 19100 | 22.12 | 23 | 0-1 | |
| | | | 50 RB | 0 | 1860 | 18700 | 21.06 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 21.18 | 22 | 0-2 |
| | | | | | 1900 | 19100 | 21.15 | 22 | 0-2 |
| | | | | 25 | 1860 | 18700 | 21.09 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 21.05 | 22 | 0-2 |
| | | | | | 1900 | 19100 | 21.11 | 22 | 0-2 |
| | | 50 | 1860 | 18700 | 21.05 | 22 | 0-2 | | |
| | | | 1880 | 18900 | 21.03 | 22 | 0-2 | | |
| | | | 1900 | 19100 | 21.25 | 22 | 0-2 | | |
| | | 100RB | | | 1860 | 18700 | 21.00 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 21.14 | 22 | 0-2 |
| | | | | | 1900 | 19100 | 20.97 | 22 | 0-2 |

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| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 15 | QPSK | 1 RB | 0 | 1857.5 | 18675 | 22.59 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.78 | 24 | 0 | |
| | | | | 1902.5 | 19125 | 22.77 | 24 | 0 | |
| | | | 36 | 1857.5 | 18675 | 22.77 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.75 | 24 | 0 | |
| | | | | 1902.5 | 19125 | 22.74 | 24 | 0 | |
| | | | 74 | 1857.5 | 18675 | 22.72 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.69 | 24 | 0 | |
| | | | | 1902.5 | 19125 | 22.73 | 24 | 0 | |
| | | 36 RB | 0 | 1857.5 | 18675 | 21.69 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.95 | 23 | 0-1 | |
| | | | | 1902.5 | 19125 | 21.75 | 23 | 0-1 | |
| | | | 18 | 1857.5 | 18675 | 21.74 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.71 | 23 | 0-1 | |
| | | | | 1902.5 | 19125 | 21.82 | 23 | 0-1 | |
| | | | 37 | 1857.5 | 18675 | 21.69 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.75 | 23 | 0-1 | |
| | | | | 1902.5 | 19125 | 21.79 | 23 | 0-1 | |
| | | 75RB | | | 1857.5 | 18675 | 21.68 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.73 | 23 | 0-1 |
| | | | | | 1902.5 | 19125 | 21.77 | 23 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1857.5 | 18675 | 21.32 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.56 | 23 | 0-1 | |
| | | | | 1902.5 | 19125 | 21.80 | 23 | 0-1 | |
| | | | 36 | 1857.5 | 18675 | 21.69 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.75 | 23 | 0-1 | |
| | | | | 1902.5 | 19125 | 21.80 | 23 | 0-1 | |
| | | | 74 | 1857.5 | 18675 | 21.40 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.80 | 23 | 0-1 | |
| | | | | 1902.5 | 19125 | 21.39 | 23 | 0-1 | |
| | | | 36 RB | 0 | 1857.5 | 18675 | 20.72 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.89 | 22 | 0-2 |
| | | | | | 1902.5 | 19125 | 20.81 | 22 | 0-2 |
| | | | | 18 | 1857.5 | 18675 | 20.89 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.74 | 22 | 0-2 |
| | | | | | 1902.5 | 19125 | 20.86 | 22 | 0-2 |
| | | | | 37 | 1857.5 | 18675 | 20.71 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.79 | 22 | 0-2 |
| | | | | | 1902.5 | 19125 | 20.88 | 22 | 0-2 |
| | | 75RB | | | 1857.5 | 18675 | 20.79 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.79 | 22 | 0-2 |
| | | | | | 1902.5 | 19125 | 21.03 | 22 | 0-2 |

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| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 10 | QPSK | 1 RB | 0 | 1855 | 18650 | 22.37 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.57 | 24 | 0 | |
| | | | | 1905 | 19150 | 22.62 | 24 | 0 | |
| | | | 25 | 1855 | 18650 | 23.01 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.88 | 24 | 0 | |
| | | | | 1905 | 19150 | 22.89 | 24 | 0 | |
| | | | | 49 | 1855 | 18650 | 22.49 | 24 | 0 |
| | | | | | 1880 | 18900 | 22.52 | 24 | 0 |
| | | | | | 1905 | 19150 | 22.82 | 24 | 0 |
| | | 25 RB | 0 | 1855 | 18650 | 21.67 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.93 | 23 | 0-1 | |
| | | | | 1905 | 19150 | 21.80 | 23 | 0-1 | |
| | | | 12 | 1855 | 18650 | 21.64 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.80 | 23 | 0-1 | |
| | | | | 1905 | 19150 | 21.77 | 23 | 0-1 | |
| | | | 25 | 1855 | 18650 | 21.79 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.81 | 23 | 0-1 | |
| | | | | 1905 | 19150 | 21.79 | 23 | 0-1 | |
| | | 50RB | | | 1855 | 18650 | 21.63 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.74 | 23 | 0-1 |
| | | | | | 1905 | 19150 | 21.78 | 23 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1855 | 18650 | 21.41 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.48 | 23 | 0-1 | |
| | | | | 1905 | 19150 | 21.42 | 23 | 0-1 | |
| | | | 25 | 1855 | 18650 | 21.67 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.45 | 23 | 0-1 | |
| | | | | 1905 | 19150 | 21.39 | 23 | 0-1 | |
| | | | | 49 | 1855 | 18650 | 21.56 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.02 | 23 | 0-1 |
| | | | | | 1905 | 19150 | 21.55 | 23 | 0-1 |
| | | | 25 RB | 0 | 1855 | 18650 | 20.75 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 21.14 | 22 | 0-2 |
| | | | | | 1905 | 19150 | 20.87 | 22 | 0-2 |
| | | | | 12 | 1855 | 18650 | 20.72 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.95 | 22 | 0-2 |
| | | | | | 1905 | 19150 | 20.85 | 22 | 0-2 |
| | | | | 25 | 1855 | 18650 | 21.07 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 21.05 | 22 | 0-2 |
| | | | | | 1905 | 19150 | 20.88 | 22 | 0-2 |
| | | 500RB | | | 1855 | 18650 | 20.70 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.85 | 22 | 0-2 |
| | | | | | 1905 | 19150 | 20.87 | 22 | 0-2 |

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| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 5 | QPSK | 1 RB | 0 | 1852.5 | 18625 | 22.24 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.46 | 24 | 0 | |
| | | | | 1907.5 | 19175 | 22.37 | 24 | 0 | |
| | | | 12 | 1852.5 | 18625 | 22.68 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.92 | 24 | 0 | |
| | | | | 1907.5 | 19175 | 23.14 | 24 | 0 | |
| | | | 24 | 1852.5 | 18625 | 22.33 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.44 | 24 | 0 | |
| | | | | 1907.5 | 19175 | 22.77 | 24 | 0 | |
| | | 12 RB | 0 | 1852.5 | 18625 | 21.59 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.72 | 23 | 0-1 | |
| | | | | 1907.5 | 19175 | 21.81 | 23 | 0-1 | |
| | | | 6 | 1852.5 | 18625 | 21.63 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.82 | 23 | 0-1 | |
| | | | | 1907.5 | 19175 | 21.93 | 23 | 0-1 | |
| | | | 13 | 1852.5 | 18625 | 21.57 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.80 | 23 | 0-1 | |
| | | | | 1907.5 | 19175 | 21.84 | 23 | 0-1 | |
| | | 25RB | | | 1852.5 | 18625 | 21.67 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.77 | 23 | 0-1 |
| | | | | | 1907.5 | 19175 | 21.76 | 23 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1852.5 | 18625 | 21.04 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.31 | 23 | 0-1 | |
| | | | | 1907.5 | 19175 | 21.55 | 23 | 0-1 | |
| | | | 12 | 1852.5 | 18625 | 21.55 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.74 | 23 | 0-1 | |
| | | | | 1907.5 | 19175 | 22.13 | 23 | 0-1 | |
| | | | 24 | 1852.5 | 18625 | 21.64 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.72 | 23 | 0-1 | |
| | | | | 1907.5 | 19175 | 21.69 | 23 | 0-1 | |
| | | | 12 RB | 0 | 1852.5 | 18625 | 20.68 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.81 | 22 | 0-2 |
| | | | | | 1907.5 | 19175 | 20.80 | 22 | 0-2 |
| | | | | 6 | 1852.5 | 18625 | 20.64 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.89 | 22 | 0-2 |
| | | | | | 1907.5 | 19175 | 21.05 | 22 | 0-2 |
| | | 13 | 1852.5 | 18625 | 20.63 | 22 | 0-2 | | |
| | | | 1880 | 18900 | 20.83 | 22 | 0-2 | | |
| | | | 1907.5 | 19175 | 20.88 | 22 | 0-2 | | |
| | | 25RB | | | 1852.5 | 18625 | 20.74 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.95 | 22 | 0-2 |
| | | | | | 1907.5 | 19175 | 20.84 | 22 | 0-2 |

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| FDD Band 2 | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) |
| 3 | QPSK | 1 RB | 0 | 1851.5 | 18615 | 22.58 | 24 | 0 |
| | | | | 1880 | 18900 | 22.55 | 24 | 0 |
| | | | | 1908.5 | 19185 | 22.67 | 24 | 0 |
| | | | 7 | 1851.5 | 18615 | 22.65 | 24 | 0 |
| | | | | 1880 | 18900 | 22.70 | 24 | 0 |
| | | | | 1908.5 | 19185 | 23.09 | 24 | 0 |
| | | | 14 | 1851.5 | 18615 | 22.46 | 24 | 0 |
| | | | | 1880 | 18900 | 22.61 | 24 | 0 |
| | | | | 1908.5 | 19185 | 22.81 | 24 | 0 |
| | | 8 RB | 0 | 1851.5 | 18615 | 21.59 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.75 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 21.80 | 23 | 0-1 |
| | | | 4 | 1851.5 | 18615 | 21.64 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.81 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 21.79 | 23 | 0-1 |
| | | | 7 | 1851.5 | 18615 | 21.68 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.80 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 21.92 | 23 | 0-1 |
| | | 15RB | | 1851.5 | 18615 | 21.67 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.71 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 21.80 | 23 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1851.5 | 18615 | 21.17 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.47 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 21.36 | 23 | 0-1 |
| | | | 7 | 1851.5 | 18615 | 21.56 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.38 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 21.75 | 23 | 0-1 |
| | | | 14 | 1851.5 | 18615 | 21.52 | 23 | 0-1 |
| | | | | 1880 | 18900 | 21.44 | 23 | 0-1 |
| | | | | 1908.5 | 19185 | 22.11 | 23 | 0-1 |
| | | 8 RB | 0 | 1851.5 | 18615 | 20.95 | 22 | 0-2 |
| | | | | 1880 | 18900 | 20.73 | 22 | 0-2 |
| | | | | 1908.5 | 19185 | 21.02 | 22 | 0-2 |
| | | | 4 | 1851.5 | 18615 | 20.83 | 22 | 0-2 |
| | | | | 1880 | 18900 | 21.00 | 22 | 0-2 |
| | | | | 1908.5 | 19185 | 21.04 | 22 | 0-2 |
| | | | 7 | 1851.5 | 18615 | 20.87 | 22 | 0-2 |
| | | | | 1880 | 18900 | 20.99 | 22 | 0-2 |
| | | | | 1908.5 | 19185 | 21.00 | 22 | 0-2 |
| | | 15RB | | 1851.5 | 18615 | 20.89 | 22 | 0-2 |
| | | | | 1880 | 18900 | 20.79 | 22 | 0-2 |
| | | | | 1908.5 | 19185 | 20.93 | 22 | 0-2 |

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| FDD Band 2 | | | | | | | | | |
|------------|------------|---------|-----------|-----------------|---------|-----------------------|-------------------------------------|--------------------------|-----|
| BW(Mhz) | Modulation | RB Size | RB Offset | Frequency (MHz) | Channel | Conducted power (dBm) | Target Power + Max. Tolerance (dBm) | MPR Allowed per 3GPP(dB) | |
| 1.4 | QPSK | 1 RB | 0 | 1850.7 | 18607 | 22.68 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.47 | 24 | 0 | |
| | | | | 1909.3 | 19193 | 22.78 | 24 | 0 | |
| | | | 2 | 1850.7 | 18607 | 22.62 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.86 | 24 | 0 | |
| | | | | 1909.3 | 19193 | 22.82 | 24 | 0 | |
| | | | 5 | 1850.7 | 18607 | 22.70 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.85 | 24 | 0 | |
| | | | | 1909.3 | 19193 | 22.80 | 24 | 0 | |
| | | 3 RB | 0 | 1850.7 | 18607 | 22.83 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.89 | 24 | 0 | |
| | | | | 1909.3 | 19193 | 23.04 | 24 | 0 | |
| | | | 2 | 1850.7 | 18607 | 22.95 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.88 | 24 | 0 | |
| | | | | 1909.3 | 19193 | 22.81 | 24 | 0 | |
| | | | 3 | 1850.7 | 18607 | 22.91 | 24 | 0 | |
| | | | | 1880 | 18900 | 22.92 | 24 | 0 | |
| | | | | 1909.3 | 19193 | 22.80 | 24 | 0 | |
| | | 6RB | | | 1850.7 | 18607 | 21.67 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.77 | 23 | 0-1 |
| | | | | | 1909.3 | 19193 | 21.77 | 23 | 0-1 |
| | 16-QAM | 1 RB | 0 | 1850.7 | 18607 | 21.59 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.55 | 23 | 0-1 | |
| | | | | 1909.3 | 19193 | 21.81 | 23 | 0-1 | |
| | | | 2 | 1850.7 | 18607 | 21.75 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.45 | 23 | 0-1 | |
| | | | | 1909.3 | 19193 | 21.46 | 23 | 0-1 | |
| | | | 5 | 1850.7 | 18607 | 21.73 | 23 | 0-1 | |
| | | | | 1880 | 18900 | 21.64 | 23 | 0-1 | |
| | | | | 1909.3 | 19193 | 21.24 | 23 | 0-1 | |
| | | | 3 RB | 0 | 1850.7 | 18607 | 21.59 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.67 | 23 | 0-1 |
| | | | | | 1909.3 | 19193 | 21.72 | 23 | 0-1 |
| | | | | 2 | 1850.7 | 18607 | 21.46 | 23 | 0-1 |
| | | | | | 1880 | 18900 | 21.82 | 23 | 0-1 |
| | | | | | 1909.3 | 19193 | 21.67 | 23 | 0-1 |
| | | 3 | 1850.7 | 18607 | 21.77 | 23 | 0-1 | | |
| | | | 1880 | 18900 | 21.95 | 23 | 0-1 | | |
| | | | 1909.3 | 19193 | 21.70 | 23 | 0-1 | | |
| | | 6RB | | | 1850.7 | 18607 | 20.51 | 22 | 0-2 |
| | | | | | 1880 | 18900 | 20.90 | 22 | 0-2 |
| | | | | | 1909.3 | 19193 | 20.89 | 22 | 0-2 |

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WLAN802.11 a/b/g/n/ac (20/40/80M) conducted power table:

| Main Antenna | | | | | | |
|--------------|---------------|---------|-----------------|-----------|--|---------------------|
| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average power (dBm) |
| 2450 MHz | 802.11b | 1 | 2412 | 1Mbps | 17.00 | 16.96 |
| | | 6 | 2437 | | 17.00 | 16.91 |
| | | 11 | 2462 | | 17.00 | 16.97 |
| | 802.11g | 1 | 2412 | 6Mbps | 15.00 | 14.95 |
| | | 6 | 2437 | | 15.00 | 14.87 |
| | | 11 | 2462 | | 15.00 | 14.89 |
| | 802.11n20-HT0 | 1 | 2412 | MCS0 | 15.00 | 14.94 |
| | | 6 | 2437 | | 15.00 | 14.83 |
| | | 11 | 2462 | | 15.00 | 14.91 |

| Main Antenna | | | | | | |
|---------------|-----------------|---------|-----------------|-----------|--|---------------------|
| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average power (dBm) |
| 5.15-5.25 GHz | 802.11a | 36 | 5180 | 6Mbps | 15.00 | 14.98 |
| | | 44 | 5220 | | 15.00 | 14.95 |
| | | 48 | 5240 | | 15.00 | 14.92 |
| | 802.11n20-HT0 | 36 | 5180 | MCS0 | 15.00 | 14.97 |
| | | 44 | 5220 | | 15.00 | 14.94 |
| | | 48 | 5240 | | 15.00 | 14.93 |
| | 802.11ac20-VHT0 | 36 | 5180 | MCS0 | 12.00 | 11.92 |
| | | 44 | 5220 | | 12.00 | 11.83 |
| | | 48 | 5240 | | 12.00 | 11.85 |
| | 802.11n40-HT0 | 38 | 5190 | MCS0 | 15.00 | 14.96 |
| | | 46 | 5230 | | 15.00 | 14.94 |
| | 802.11ac40-VHT0 | 38 | 5190 | MCS0 | 11.00 | 10.97 |
| | | 46 | 5230 | | 11.00 | 10.87 |
| | 802.11ac80-VHT0 | 42 | 5210 | MCS0 | 9.00 | 8.99 |

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| Main Antenna | | | | | | |
|---------------|-----------------|---------|-----------------|-----------|--|---------------------|
| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average power (dBm) |
| 5.25-5.35 GHz | 802.11a | 52 | 5260 | 6Mbps | 15.00 | 14.94 |
| | | 60 | 5300 | | 15.00 | 14.93 |
| | | 64 | 5320 | | 15.00 | 14.99 |
| | 802.11n20-HT0 | 52 | 5260 | MCS0 | 15.00 | 14.92 |
| | | 60 | 5300 | | 15.00 | 14.89 |
| | | 64 | 5320 | | 15.00 | 14.82 |
| | 802.11ac20-VHT0 | 52 | 5260 | MCS0 | 12.00 | 11.83 |
| | | 60 | 5300 | | 12.00 | 11.87 |
| | | 64 | 5320 | | 12.00 | 11.96 |
| | 802.11n40-HT0 | 54 | 5270 | MCS0 | 15.00 | 14.90 |
| | | 62 | 5310 | | 15.00 | 14.95 |
| | 802.11ac40-VHT0 | 54 | 5270 | MCS0 | 11.00 | 10.85 |
| | | 62 | 5310 | | 11.00 | 10.93 |
| | 802.11ac80-VHT0 | 58 | 5290 | MCS0 | 9.00 | 8.83 |

| Main Antenna | | | | | | |
|--------------|-----------------|---------|-----------------|-----------|--|---------------------|
| Band | Mode | Channel | Frequency (MHz) | Data Rate | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average power (dBm) |
| 5600 MHz | 802.11a | 100 | 5500 | 6Mbps | 15.00 | 14.98 |
| | | 116 | 5580 | | 15.00 | 14.95 |
| | | 140 | 5700 | | 15.00 | 14.99 |
| | 802.11n20-HT0 | 100 | 5500 | MCS0 | 15.00 | 14.85 |
| | | 116 | 5580 | | 15.00 | 14.73 |
| | | 140 | 5700 | | 15.00 | 14.72 |
| | 802.11ac20-VHT0 | 100 | 5500 | MCS0 | 12.00 | 11.93 |
| | | 116 | 5580 | | 12.00 | 11.87 |
| | | 140 | 5700 | | 12.00 | 11.89 |
| | 802.11n40-HT0 | 102 | 5510 | MCS0 | 15.00 | 14.93 |
| | | 110 | 5550 | | 15.00 | 14.88 |
| | | 134 | 5670 | | 15.00 | 14.91 |
| | 802.11ac40-VHT0 | 102 | 5510 | MCS0 | 11.00 | 10.94 |
| | | 110 | 5550 | | 11.00 | 10.86 |
| | | 134 | 5670 | | 11.00 | 10.92 |
| | 802.11ac80-VHT0 | 106 | 5530 | MCS0 | 9.00 | 8.97 |
| | | 122 | 5610 | | 9.00 | 8.95 |

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Bluetooth maximum power table:

| Mode | Channel | Frequency (MHz) | 1Mbps | | 2Mbps | | 3Mbps | |
|--------|---------|-----------------|--|----------------------------|--|----------------------------|--|----------------------------|
| | | | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average Output Power (dBm) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average Output Power (dBm) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Average Output Power (dBm) |
| BR/EDR | CH 00 | 2402 | 10.50 | 9.18 | 8.50 | 7.07 | 8.50 | 7.07 |
| | CH 39 | 2441 | | 9.22 | | 7.11 | | 7.09 |
| | CH 78 | 2480 | | 8.72 | | 6.70 | | 6.57 |

| Mode | Channel | Frequency (MHz) | Average Output Power (dBm) | Max. Rated Avg. Power + Max. Tolerance (dBm) |
|------|---------|-----------------|----------------------------|--|
| | | | GFSK | |
| LE | CH 00 | 2402 | 4.42 | 5 |
| | CH 19 | 2440 | 4.31 | |
| | CH 39 | 2480 | 4.12 | |

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1.4 Test Environment

Ambient Temperature: $22\pm 2^{\circ}\text{C}$

Tissue Simulating Liquid: $22\pm 2^{\circ}\text{C}$

1.5 Operation Description

1. The EUT is controlled by using a Radio Communication Tester (MT8820C), and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
3. During the SAR testing, the DASY 5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. SAR test reduction for GPRS mode is determined by the source-based time-averaged output power. The data mode with highest specified time-averaged output power should be tested for SAR compliance.
5. The 3G SAR test reduction procedure is applied to HSDPA with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSDPA) is $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSDPA).
6. The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) with 12.2 kbps RMC as the primary mode. Since the maximum output power in a secondary mode (HSPA) is $\leq \frac{1}{4}$ dB higher than the primary mode (WCDMA), SAR measurement is not required for the secondary mode (HSPA).

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7. LTE modes test according to **KDB 941225D05v02r05**.

a. Per Section 5.2.1, the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation.

- Using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.

- When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.

- When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

b. Per Section 5.2.2, the largest channel bandwidth and measure SAR for QPSK with 50% RB allocation

- The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.

c. Per Section 5.2.3, the largest channel bandwidth and measure SAR for QPSK with 100% RB allocation

- For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg.

- Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

d. Per Section 5.2.4, Higher order modulations

- For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in sections 5.2.1, 5.2.2 and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

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- e. Per Section 5.3, other channel bandwidth standalone SAR test requirements
- For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 5.2 to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation etc. is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth.

WLAN

802.11b DSSS SAR Test Requirements:

8. SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
9. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

802.11g/n OFDM SAR Test Exclusion Requirements:

10. SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
11. According to KDB447498D01v06, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is ≤ 0.8 W/kg, when the transmission band is ≤ 100 MHz.
12. According to **KDB865664D01v01r04**, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is ≥ 0.8 W/kg, repeated that measurement once. 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 ($\sim 10\%$ from the 1-g SAR limit)

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13. According to **KDB447498D01v06** – The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by: $[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for product specific 10-g SAR.

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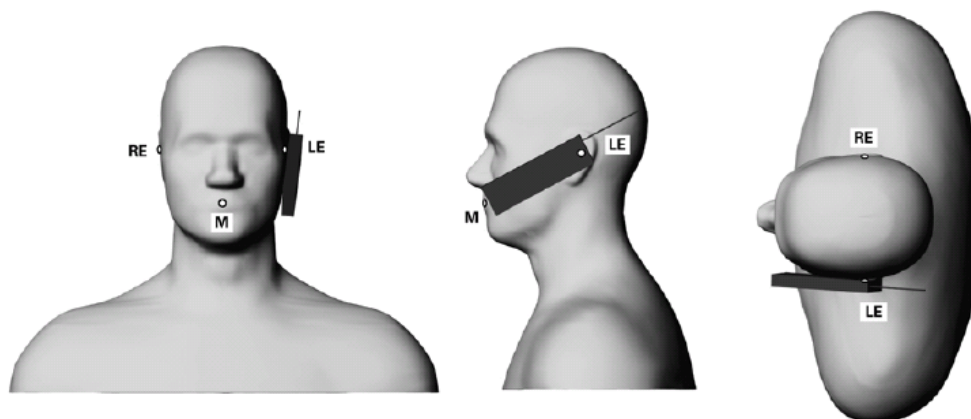
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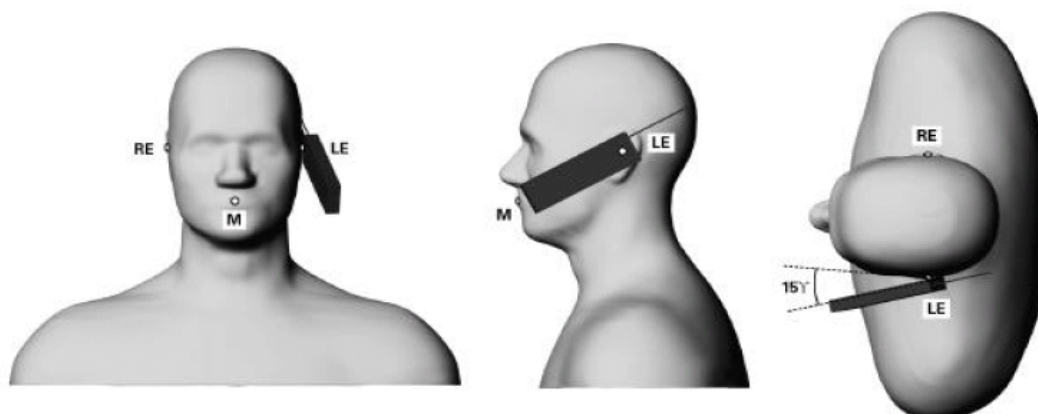
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1.6 Positioning Procedure

Head SAR measurement statement



Phone position 1, “cheek” or “touch” position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, “tilted position.” The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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Body SAR measurement statement

1. Body-worn exposure: 10mm

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

2. Hotspot exposure: 10mm

A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge when the form factor of a handset is larger than 9 cm \times 5 cm,

Test configurations of WWAN:

- (1) Front side
- (2) Back side
- (3) Bottom side
- (4) Right side
- (5) Left side

Test configurations of WLAN:

- (1) Front side
- (2) Back side
- (3) Top side
- (4) Left side
- (5) Right side

3. Phablet SAR test consideration

Since the device is not a phablet (overall diagonal dimension $< 16.0 \text{ cm}$), phablet SAR procedure is not required for this device.

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1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. The generation of a high-resolution mesh within the measured volume.
4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D

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interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is then moved around until the highest averaged SAR is found.

If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

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1.8 Probe Calibration Procedures

For the calibration of E-field probes in lossy liquids, an electric field with an accurately known field strength must be produced within the measured liquid. For standardization purposes it would be desirable if all measurements which are necessary to assess the correct field strength would be traceable to standardized measurement procedures. In the following two different calibration techniques are summarized:

1.8.1 Transfer Calibration with Temperature Probes

In lossy liquids the specific absorption rate (SAR) is related both to the electric field (E) and the temperature gradient ($\delta T / \delta t$) in the liquid.

$$SAR = C \frac{\delta T}{\delta t},$$

Whereby σ is the conductivity, ρ the density and c the heat capacity of the liquid.

Hence, the electric field in lossy liquid can be measured indirectly by measuring the temperature gradient in the liquid. Non-disturbing temperature probes (optical probes or thermistor probes with resistive lines) with high spatial resolution ($<1-2$ mm) and fast reaction time (<1 s) are available and can be easily calibrated with high precision [1]. The setup and the exciting source have no influence on the calibration; only the relative positioning uncertainties of the standard temperature probe and the E-field probe to be calibrated must be considered. However, several problems limit the available accuracy of probe calibrations with temperature probes:

1. The temperature gradient is not directly measurable but must be evaluated from temperature measurements at different time steps. Special precaution is necessary to avoid measurement errors caused by temperature gradients due to energy equalizing effects or convection currents in the liquid. Such effects cannot be completely avoided, as the measured field itself destroys the

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thermal equilibrium in the liquid. With a careful setup these errors can be kept small.

2. The measured volume around the temperature probe is not well defined. It is difficult to calculate the energy transfer from a surrounding gradient temperature field into the probe. These effects must be considered, since temperature probes are calibrated in liquid with homogeneous temperatures. There is no traceable standard for temperature rise measurements.
3. The calibration depends on the assessment of the specific density, the heat capacity and the conductivity of the medium. While the specific density and heat capacity can be measured accurately with standardized procedures ($\sim 2\%$ for c ; much better for ρ), there is no standard for the measurement of the conductivity. Depending on the method and liquid, the error can well exceed $\pm 5\%$.
4. Temperature rise measurements are not very sensitive and therefore are often performed at a higher power level than the E-field measurements. The nonlinearities in the system (e.g., power measurements, different components, etc.) must be considered.

Considering these problems, the possible accuracy of the calibration of E-field probes with temperature gradient measurements in a carefully designed setup is about $\pm 10\%$ (RSS) [2]. Recently, a setup which is a combination of the waveguide techniques and the thermal measurements was presented in [3]. The estimated uncertainty of the setup is $\pm 5\%$ (RSS) when the same liquid is used for the calibration and for actual measurements and $\pm 7-9\%$ (RSS) when not, which is in good agreement with the estimates given in [2].

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1.8.2 Calibration with Analytical Fields

In this method a technical setup is used in which the field can be calculated analytically from measurements of other physical magnitudes (e.g., input power). This corresponds to the standard field method for probe calibration in air; however, there is no standard defined for fields in lossy liquids.

When using calculated fields in lossy liquids for probe calibration, several points must be considered in the assessment of the uncertainty:

1. The setup must enable accurate determination of the incident power.
2. The accuracy of the calculated field strength will depend on the assessment of the dielectric parameters of the liquid.
3. Due to the small wavelength in liquids with high permittivity, even small setups might be above the resonant cutoff frequencies. The field distribution in the setup must be carefully checked for conformity with the theoretical field distribution.

References

- (1) N. Kuster, Q. Balzano, and J.C. Lin, Eds., *Mobile Communications Safety*, Chapman & Hall, London, 1997.
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- (3) K. Jokela, P. Hyysalo, and L. Puranen, "Calibration of specific absorption rate (SAR) probes in waveguide at 900 MHz", *IEEE Transactions on Instrumentation and Measurements*, vol. 47, no. 2, pp. 432-438, Apr. 1998.

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1.9 The SAR Measurement System

A block diagram of the SAR measurement system is given in Fig. a. This SAR measurement system uses a Computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). Model EX3DV4 field probes are used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E_i|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant.

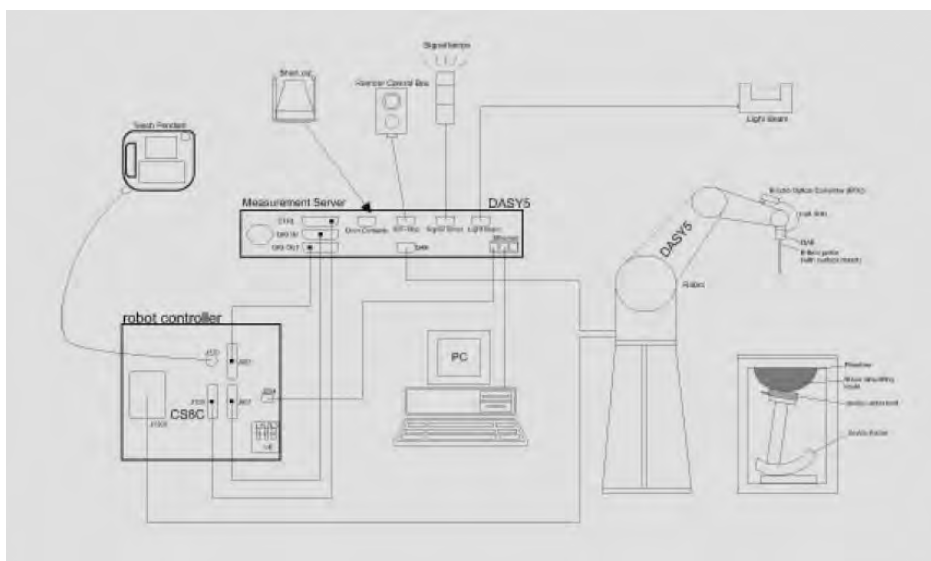


Fig. a A block diagram of the SAR measurement system

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The DASY 5 system for performing compliance tests consists of the following items:


1. A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. 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.
4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
5. 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.
6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
7. A computer operating Windows7
8. DASY 5 software.
9. Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
10. The SAM twin phantom enabling testing left-hand and right-hand usage.
11. The device holder for handheld mobile phones.
12. Tissue simulating liquid mixed according to the given recipes.
13. Validation dipole kits allowing to validate the proper functioning of the system.

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1.10 System Components


EX3DV4 E-Field Probe

| | | | |
|---------------|--|---|--|
| Construction | Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  | |
| Calibration | Basic Broad Band Calibration in air Conversion Factors (CF) for HSL1900/2450/5200/5300/5600 MHz Additional CF for other liquids and frequencies upon request | | |
| Frequency | 10 MHz to > 6 GHz, Linearity: ± 0.6 dB | | |
| Directivity | ± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis) | | |
| Dynamic Range | 10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g) | | |
| Dimensions | Tip diameter: 2.5 mm | | |
| Application | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%. | | |


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Phantom

| | | |
|-----------------|--|---|
| Model | Twin SAM | |
| Construction | <p>The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209.</p> <p>It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.</p> | |
| Shell Thickness | 2 ± 0.2 mm |  |
| Filling Volume | Approx. 25 liters | |
| Dimensions | Height: 850 mm; Length: 1000 mm; Width: 500 mm | |

DEVICE HOLDER

| | | |
|--------------|--|--|
| Construction | <p>In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).</p> |  <p>Device Holder</p> |
|--------------|--|--|

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1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ (according to KDB865664D01) from the target SAR values.

These tests were done at 1900/2450/5200/5300/5600 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the liquid depth above the ear reference points was above 15 cm ($\leq 3G$) or 10 cm ($> 3G$) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

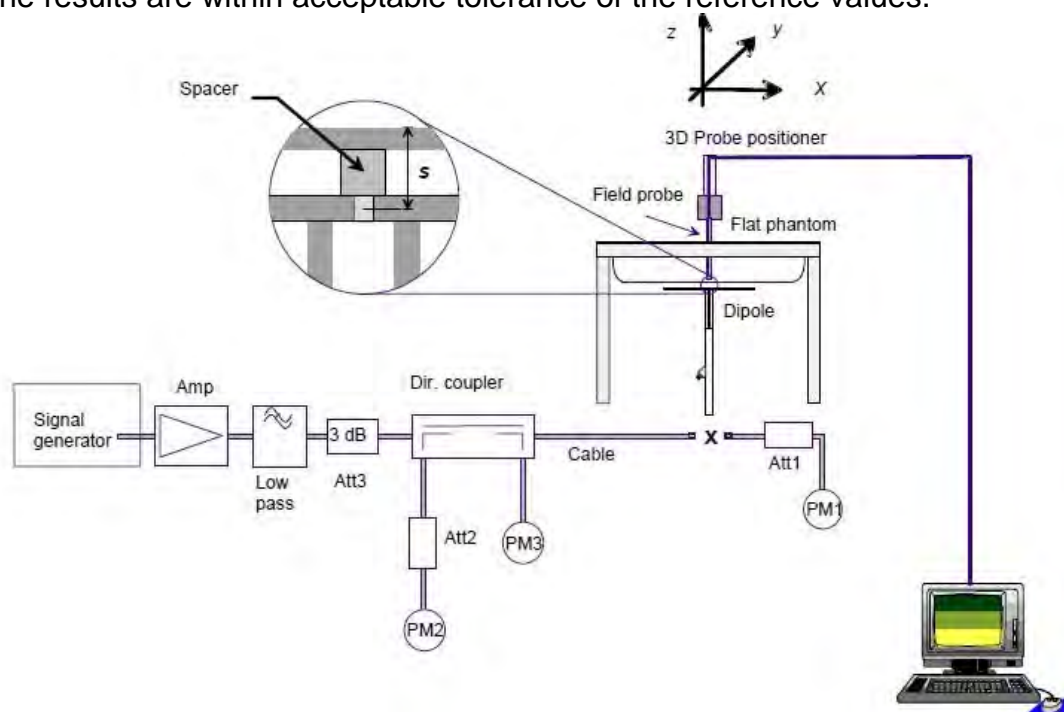


Fig. b The block diagram of system verification

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| Validation Kit | S/N | Frequency (MHz) | | 1W Target SAR-1g (mW/g) | pin=250mW Measured SAR-1g (mW/g) | Measured SAR-1g normalized to 1W (mW/g) | Deviation (%) | Measured Date |
|----------------|-------|-----------------|------|-------------------------|----------------------------------|---|---------------|-----------------|
| D1900V2 | 5d173 | 1900 | Head | 40.7 | 9.98 | 39.92 | -1.92% | Apr. 6th, 2019 |
| | | | Body | 40.9 | 9.98 | 39.92 | -2.40% | Apr. 11th, 2019 |
| D2450V2 | 727 | 2450 | Head | 52.1 | 13.30 | 53.20 | 2.11% | Apr. 7th, 2019 |
| | | | Body | 50.8 | 12.90 | 51.60 | 1.57% | Apr. 12th, 2019 |
| Validation Kit | S/N | Frequency (MHz) | | 1W Target SAR-1g (mW/g) | pin=100mW Measured SAR-1g (mW/g) | Measured SAR-1g normalized to 1W (mW/g) | Deviation (%) | Measured Date |
| D5GHzV2 | 1040 | 5200 | Head | 78.8 | 7.87 | 78.70 | -0.13% | Apr. 8th, 2019 |
| | | | Body | 75.2 | 7.56 | 75.60 | 0.53% | Apr. 13th, 2019 |
| | | 5300 | Head | 82.2 | 8.26 | 82.60 | 0.49% | Apr. 9th, 2019 |
| | | | Body | 76.4 | 7.74 | 77.40 | 1.31% | Apr. 14th, 2019 |
| | | 5600 | Head | 85.3 | 8.52 | 85.20 | -0.12% | Apr. 10th, 2019 |
| | | | Body | 81.5 | 8.21 | 82.10 | 0.74% | Apr. 15th, 2019 |

Table 1. Results of system validation

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1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070E Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Network Analyzer.

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was at least 15 cm ($\leq 3G$) or 10 cm ($> 3G$) during all tests. (Appendix Fig. 2)

| Tissue Type | Measurement Date | Measured Frequency (MHz) | Target Dielectric Constant, ϵ_r | Target Conductivity, σ (S/m) | Measured Dielectric Constant, ϵ_r | Measured Conductivity, σ (S/m) | % dev ϵ_r | % dev σ |
|-------------|------------------|--------------------------|--|-------------------------------------|--|---------------------------------------|--------------------|----------------|
| Head | Apr. 6th, 2019 | 1850.2 | 40.000 | 1.400 | 40.472 | 1.412 | 1.18% | 0.86% |
| | | 1860 | 40.000 | 1.400 | 40.496 | 1.413 | 1.24% | 0.93% |
| | | 1880 | 40.000 | 1.400 | 40.492 | 1.415 | 1.23% | 1.07% |
| | | 1900 | 40.000 | 1.400 | 40.476 | 1.417 | 1.19% | 1.21% |
| | | 1907.6 | 40.000 | 1.400 | 40.472 | 1.418 | 1.18% | 1.29% |
| | | 1909.8 | 40.000 | 1.400 | 40.468 | 1.419 | 1.17% | 1.36% |
| | Apr. 7th, 2019 | 2402 | 39.285 | 1.757 | 40.244 | 1.797 | 2.44% | 2.26% |
| | | 2412 | 39.268 | 1.766 | 40.202 | 1.806 | 2.38% | 2.25% |
| | | 2437 | 39.223 | 1.788 | 40.145 | 1.827 | 2.35% | 2.16% |
| | | 2441 | 39.216 | 1.792 | 40.138 | 1.832 | 2.35% | 2.23% |
| | | 2450 | 39.200 | 1.800 | 40.153 | 1.839 | 2.43% | 2.17% |
| | | 2462 | 39.185 | 1.813 | 40.145 | 1.853 | 2.45% | 2.20% |
| | Apr. 8th, 2019 | 2480 | 39.162 | 1.827 | 40.113 | 1.866 | 2.43% | 2.15% |
| | | 5190 | 35.997 | 4.645 | 35.090 | 4.608 | -2.52% | -0.79% |
| | | 5200 | 35.986 | 4.655 | 35.100 | 4.618 | -2.46% | -0.79% |
| | Apr. 9th, 2019 | 5230 | 35.951 | 4.686 | 35.035 | 4.636 | -2.55% | -1.06% |
| | | 5270 | 35.906 | 4.727 | 35.033 | 4.647 | -2.43% | -1.69% |
| | | 5300 | 35.871 | 4.758 | 35.011 | 4.663 | -2.40% | -1.99% |
| | Apr. 10th, 2019 | 5310 | 35.860 | 4.768 | 34.981 | 4.674 | -2.45% | -1.97% |
| | | 5510 | 35.631 | 4.973 | 36.515 | 5.003 | 2.48% | 0.61% |
| | | 5550 | 35.586 | 5.014 | 36.500 | 5.044 | 2.57% | 0.60% |
| | | 5600 | 35.529 | 5.065 | 36.420 | 5.098 | 2.51% | 0.65% |
| | | 5670 | 35.449 | 5.137 | 36.345 | 5.169 | 2.53% | 0.63% |

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| Tissue Type | Measurement Date | Measured Frequency (MHz) | Target Dielectric Constant, ϵ_r | Target Conductivity, σ (S/m) | Measured Dielectric Constant, ϵ_r | Measured Conductivity, σ (S/m) | % dev ϵ_r | % dev σ |
|-------------|------------------|--------------------------|--|-------------------------------------|--|---------------------------------------|--------------------|----------------|
| Body | Apr. 11th, 2019 | 1850.2 | 53.300 | 1.520 | 51.728 | 1.495 | -2.95% | -1.64% |
| | | 1852.4 | 53.300 | 1.520 | 51.736 | 1.496 | -2.93% | -1.58% |
| | | 1860 | 53.300 | 1.520 | 51.744 | 1.497 | -2.92% | -1.51% |
| | | 1880 | 53.300 | 1.520 | 51.781 | 1.499 | -2.85% | -1.38% |
| | | 1900 | 53.300 | 1.520 | 51.733 | 1.501 | -2.94% | -1.25% |
| | | 1907.6 | 53.300 | 1.520 | 51.770 | 1.503 | -2.87% | -1.12% |
| | | 1909.8 | 53.300 | 1.520 | 51.749 | 1.504 | -2.91% | -1.05% |
| | Apr. 12th, 2019 | 2402 | 52.764 | 1.904 | 51.171 | 1.851 | -3.02% | -2.79% |
| | | 2412 | 52.751 | 1.914 | 51.195 | 1.860 | -2.95% | -2.81% |
| | | 2437 | 52.717 | 1.938 | 51.146 | 1.884 | -2.98% | -2.77% |
| | | 2441 | 52.712 | 1.941 | 51.120 | 1.887 | -3.02% | -2.80% |
| | | 2450 | 52.700 | 1.950 | 51.145 | 1.895 | -2.95% | -2.82% |
| | | 2462 | 52.685 | 1.967 | 51.104 | 1.913 | -3.00% | -2.75% |
| | Apr. 13th, 2019 | 2480 | 52.662 | 1.993 | 51.092 | 1.937 | -2.98% | -2.79% |
| | | 5190 | 49.028 | 5.288 | 50.469 | 5.252 | 2.94% | -0.67% |
| | | 5200 | 49.014 | 5.299 | 50.441 | 5.264 | 2.91% | -0.67% |
| | Apr. 14th, 2019 | 5230 | 48.974 | 5.334 | 50.384 | 5.299 | 2.88% | -0.66% |
| | | 5270 | 48.919 | 5.381 | 50.362 | 5.343 | 2.95% | -0.71% |
| | | 5300 | 48.879 | 5.416 | 48.805 | 5.587 | -0.15% | 3.16% |
| | Apr. 15th, 2019 | 5310 | 48.865 | 5.428 | 48.797 | 5.601 | -0.14% | 3.19% |
| | | 5510 | 48.594 | 5.661 | 48.540 | 5.604 | -0.11% | -1.01% |
| | | 5550 | 48.539 | 5.708 | 47.884 | 5.661 | -1.35% | -0.82% |
| | | 5600 | 48.471 | 5.766 | 47.769 | 5.742 | -1.45% | -0.42% |
| | | 5670 | 48.376 | 5.848 | 47.719 | 5.842 | -1.36% | -0.11% |

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

| Frequency (MHz) | Mode | Ingredient | | | | | | Total amount |
|-----------------|------|------------|----------|--------|---------------|-----------|-------|--------------|
| | | DGMBE | Water | Salt | Preventol D-7 | Cellulose | Sugar | |
| 1900 | Head | 444.52 g | 552.42 g | 3.06 g | — | — | — | 1.0L(Kg) |
| | Body | 300.67 g | 716.56 g | 4.0 g | — | — | — | 1.0L(Kg) |
| 2450 | Head | 550 g | 450 g | — | — | — | — | 1.0L(Kg) |
| | Body | 301.7 g | 698.3 g | — | — | — | — | 1.0L(Kg) |

Simulating Liquids for 5 GHz, Manufactured by SPEAG:

| Ingredients | Water | Esters, Emulsifiers, Inhibitors | Sodium and Salt |
|---------------|-------|---------------------------------|-----------------|
| (% by weight) | 60-80 | 20-40 | 0-1.5 |

Table 3. Recipes for tissue simulating liquid

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1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1, By the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

1. Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over a 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

2. Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

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Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .6)

| Human Exposure | Uncontrolled Environment General Population | Controlled Environment Occupational |
|--|--|--|
| Spatial Peak SAR (Brain) | 1.60 W/kg | 8.00 W/kg |
| Spatial Average SAR (Whole Body) | 0.08 W/kg | 0.40 W/kg |
| Spatial Peak SAR (Hands/Feet/Ankle/Wrist) | 4.00 W/kg | 20.00 W/kg |

Table 4. RF exposure limits

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

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2. Summary of Results

2.1 Decision rules

Reported measurement data comply with IEEE 1528-2013:
Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.2 Summary of Results

GSM 1900

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-------------------------|-------------|---------------|-----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| Head (GSM) | Re Cheek | - | 512 | 1850.2 | 30.50 | 28.71 | 51.01% | 0.036 | 0.054 | - |
| | Re Cheek | - | 661 | 1880 | 30.50 | 28.92 | 43.88% | 0.038 | 0.055 | - |
| | Re Cheek | - | 810 | 1909.8 | 30.50 | 29.07 | 39.00% | 0.041 | 0.057 | 53 |
| | Re Tilt | - | 810 | 1909.8 | 30.50 | 29.07 | 39.00% | 0.016 | 0.022 | - |
| | Le Cheek | - | 810 | 1909.8 | 30.50 | 29.07 | 39.00% | 0.018 | 0.025 | - |
| | Le Tilt | - | 810 | 1909.8 | 30.50 | 29.07 | 39.00% | 0.015 | 0.021 | - |
| Body-worn (GSM) | Front side | 10 | 512 | 1850.2 | 30.50 | 28.71 | 51.01% | 0.251 | 0.379 | - |
| | Front side | 10 | 661 | 1880 | 30.50 | 28.92 | 43.88% | 0.263 | 0.378 | - |
| | Front side | 10 | 810 | 1909.8 | 30.50 | 29.07 | 39.00% | 0.280 | 0.389 | 54 |
| | Back side | 10 | 810 | 1909.8 | 30.50 | 29.07 | 39.00% | 0.266 | 0.370 | - |
| Hotspot (GPRS) <1Dn4Up> | Front side | 10 | 810 | 1909.8 | 25.50 | 23.94 | 43.22% | 0.305 | 0.437 | - |
| | Back side | 10 | 810 | 1909.8 | 25.50 | 23.94 | 43.22% | 0.287 | 0.411 | - |
| | Bottom side | 10 | 512 | 1850.2 | 25.50 | 23.77 | 48.94% | 0.597 | 0.889 | - |
| | Bottom side | 10 | 661 | 1880 | 25.50 | 23.79 | 48.25% | 0.593 | 0.879 | - |
| | Bottom side | 10 | 810 | 1909.8 | 25.50 | 23.94 | 43.22% | 0.677 | 0.970 | 55 |
| | Right side | 10 | 810 | 1909.8 | 25.50 | 23.94 | 43.22% | 0.072 | 0.103 | - |
| | Left side | 10 | 810 | 1909.8 | 25.50 | 23.94 | 43.22% | 0.031 | 0.044 | - |

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WCDMA Band II

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|------------|-------------|---------------|------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| R99 (Head) | RE Cheek | - | 9262 | 1850.2 | 23.5 | 23.16 | 8.14% | 0.067 | 0.072 | - |
| | RE Cheek | - | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.073 | 0.074 | 56 |
| | RE Cheek | - | 9538 | 1907.6 | 23.5 | 23.30 | 4.71% | 0.065 | 0.068 | - |
| | RE Tilt | - | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.054 | 0.055 | - |
| | LE Cheek | - | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.066 | 0.067 | - |
| | LE Tilt | - | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.034 | 0.034 | - |
| Hotspot | Front side | 10 | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.384 | 0.389 | - |
| | Back side | 10 | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.327 | 0.332 | - |
| | Bottom side | 10 | 9262 | 1850.2 | 23.5 | 23.16 | 8.14% | 1.330 | 1.438 | 57 |
| | Bottom side | 10 | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 1.260 | 1.278 | - |
| | Bottom side | 10 | 9538 | 1907.6 | 23.5 | 23.30 | 4.71% | 1.160 | 1.215 | - |
| | Right side | 10 | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.072 | 0.073 | - |
| | Left side | 10 | 9400 | 1880 | 23.5 | 23.44 | 1.39% | 0.036 | 0.037 | - |

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LTE FDD Band 2

| Mode | Bandwidth (MHz) | Modulation | RB Size | RB start | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|---------|-----------------|------------|---------|----------|-------------|---------------|-------|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | | | | | Measured | Reported | |
| Head | 20MHz | QPSK | 1 RB | 50 | RE Cheek | - | 18700 | 1860 | 24 | 23.12 | 22.46% | 0.087 | 0.107 | - |
| | | | | | RE Cheek | - | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.094 | 0.114 | 58 |
| | | | | | RE Tilt | - | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.024 | 0.029 | - |
| | | | | | LE Cheek | - | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.042 | 0.051 | - |
| | | | | | LE Tilt | - | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.023 | 0.028 | - |
| | | | 50 RB | 0 | RE Cheek | - | 18900 | 1880 | 24 | 22.89 | 29.12% | 0.077 | 0.099 | - |
| | | | | | RE Cheek | - | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.066 | 0.080 | - |
| | | | | | RE Tilt | - | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.016 | 0.019 | - |
| | | | | | LE Cheek | - | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.028 | 0.034 | - |
| | | | | | LE Tilt | - | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.014 | 0.017 | - |
| | | | 1000 RB | | RE Cheek | - | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.066 | 0.082 | - |
| | | | | | RE Tilt | - | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.015 | 0.019 | - |
| | | | | | LE Cheek | - | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.026 | 0.032 | - |
| | | | | | LE Tilt | - | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.011 | 0.014 | - |
| Hotspot | 20MHz | QPSK | 1 RB | 50 | Front side | 10 | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.317 | 0.386 | - |
| | | | | | Back side | 10 | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.295 | 0.359 | - |
| | | | | | Bottom side | 10 | 19100 | 1900 | 24 | 23.15 | 21.62% | 1.030 | 1.253 | - |
| | | | | | Right side | 10 | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.044 | 0.054 | - |
| | | | | | Left side | 10 | 19100 | 1900 | 24 | 23.15 | 21.62% | 0.102 | 0.124 | - |
| | | | | 99 | Bottom side | 10 | 18700 | 1860 | 24 | 22.79 | 32.13% | 1.060 | 1.401 | 59 |
| | | | | | Bottom side | 10 | 18900 | 1880 | 24 | 22.89 | 29.12% | 0.989 | 1.277 | - |
| | | | 50 RB | 0 | Front side | 10 | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.251 | 0.305 | - |
| | | | | | Back side | 10 | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.231 | 0.281 | - |
| | | | | | Bottom side | 10 | 18700 | 1860 | 23 | 22.06 | 24.17% | 0.811 | 1.007 | - |
| | | | | | Bottom side | 10 | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.844 | 1.026 | - |
| | | | | | Right side | 10 | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.034 | 0.041 | - |
| | | | | 50 | Left side | 10 | 18900 | 1880 | 23 | 22.15 | 21.62% | 0.077 | 0.094 | - |
| | | | | | Bottom side | 10 | 18700 | 1860 | 23 | 22.03 | 25.03% | 0.803 | 1.004 | - |
| | | | 100 RB | | Front side | 10 | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.249 | 0.309 | - |
| | | | | | Back side | 10 | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.232 | 0.288 | - |
| | | | | | Bottom side | 10 | 18700 | 1860 | 23 | 22.02 | 25.31% | 0.822 | 1.030 | - |
| | | | | | Bottom side | 10 | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.835 | 1.037 | - |
| | | | | | Bottom side | 10 | 19100 | 1900 | 23 | 22.06 | 24.17% | 0.821 | 1.019 | - |
| | | | | | Right side | 10 | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.035 | 0.043 | - |
| | | | | | Left side | 10 | 18900 | 1880 | 23 | 22.06 | 24.17% | 0.079 | 0.098 | - |

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WLAN 802.11b

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|---------|------------|---------------|----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| Head | RE Cheek | - | 11 | 2462 | 17 | 16.97 | 0.61% | 0.223 | 0.224 | - |
| | RE Tilt | - | 11 | 2462 | 17 | 16.97 | 0.61% | 0.254 | 0.256 | - |
| | LE Cheek | - | 11 | 2462 | 17 | 16.97 | 0.61% | 0.463 | 0.466 | 60 |
| | LE Tilt | - | 11 | 2462 | 17 | 16.97 | 0.61% | 0.374 | 0.376 | - |
| Hotspot | Front side | 10 | 11 | 2462 | 17 | 16.97 | 0.61% | 0.073 | 0.073 | - |
| | Back side | 10 | 11 | 2462 | 17 | 16.97 | 0.61% | 0.095 | 0.096 | 61 |
| | Top side | 10 | 11 | 2462 | 17 | 16.97 | 0.61% | 0.004 | 0.004 | - |
| | Right side | 10 | 11 | 2462 | 17 | 16.97 | 0.61% | 0.005 | 0.005 | - |
| | Left side | 10 | 11 | 2462 | 17 | 16.97 | 0.61% | 0.002 | 0.002 | - |

Bluetooth

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------|------------|---------------|----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| Head | RE Cheek | - | 39 | 2441 | 10.5 | 9.22 | 34.28% | 0.021 | 0.028 | - |
| | RE Tilt | - | 39 | 2441 | 10.5 | 9.22 | 34.28% | 0.023 | 0.031 | - |
| | LE Cheek | - | 39 | 2441 | 10.5 | 9.22 | 34.28% | 0.042 | 0.056 | 62 |
| | LE Tilt | - | 39 | 2441 | 10.5 | 9.22 | 34.28% | 0.034 | 0.046 | - |
| Body-worn | Front side | 10 | 39 | 2441 | 10.5 | 9.22 | 34.28% | 0.004 | 0.005 | - |
| | Back side | 10 | 39 | 2441 | 10.5 | 9.22 | 34.28% | 0.005 | 0.006 | 63 |

WLAN 802.11n(40M) 5.2G

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------|------------|---------------|----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| Head | RE Cheek | - | 38 | 5190 | 15 | 14.96 | 0.99% | 0.102 | 0.103 | - |
| | RE Tilt | - | 38 | 5190 | 15 | 14.96 | 0.99% | 0.089 | 0.090 | - |
| | LE Cheek | - | 38 | 5190 | 15 | 14.96 | 0.99% | 0.197 | 0.199 | - |
| | LE Tilt | - | 38 | 5190 | 15 | 14.96 | 0.99% | 0.227 | 0.229 | 64 |
| Body-worn | Front side | 10 | 38 | 5190 | 15 | 14.96 | 0.99% | 0.022 | 0.022 | 65 |
| | Back side | 10 | 38 | 5190 | 15 | 14.96 | 0.99% | 0.018 | 0.018 | - |

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WLAN 802.11n(40M) 5.3G

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------|------------|---------------|----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| Head | RE Cheek | - | 62 | 5310 | 15 | 14.95 | 1.22% | 0.094 | 0.095 | - |
| | RE Tilt | - | 62 | 5310 | 15 | 14.95 | 1.22% | 0.082 | 0.083 | - |
| | LE Cheek | - | 62 | 5310 | 15 | 14.95 | 1.22% | 0.182 | 0.184 | - |
| | LE Tilt | - | 62 | 5310 | 15 | 14.95 | 1.22% | 0.207 | 0.210 | 66 |
| Body-worn | Front side | 10 | 62 | 5310 | 15 | 14.95 | 1.22% | 0.023 | 0.023 | 67 |
| | Back side | 10 | 62 | 5310 | 15 | 14.95 | 1.22% | 0.022 | 0.022 | - |

WLAN 802.11n(40M) 5.6G

| Mode | Position | Distance (mm) | CH | Freq. (MHz) | Max. Rated Avg. Power + Max. Tolerance (dBm) | Measured Avg. Power (dBm) | Scaling | Averaged SAR over 1g (W/kg) | | Plot page |
|-----------|------------|---------------|-----|-------------|--|---------------------------|---------|-----------------------------|----------|-----------|
| | | | | | | | | Measured | Reported | |
| Head | RE Cheek | - | 102 | 5510 | 15 | 14.93 | 1.69% | 0.098 | 0.100 | - |
| | RE Tilt | - | 102 | 5510 | 15 | 14.93 | 1.69% | 0.085 | 0.086 | - |
| | LE Cheek | - | 102 | 5510 | 15 | 14.93 | 1.69% | 0.192 | 0.195 | - |
| | LE Tilt | - | 102 | 5510 | 15 | 14.93 | 1.69% | 0.219 | 0.223 | 68 |
| Body-worn | Front side | 10 | 102 | 5510 | 15 | 14.93 | 1.69% | 0.036 | 0.037 | 69 |
| | Back side | 10 | 102 | 5510 | 15 | 14.93 | 1.69% | 0.025 | 0.026 | - |

Note:

$$\text{Scaling} = \frac{\text{reported SAR}}{\text{measured SAR}} = \frac{P_2(\text{mW})}{P_1(\text{mW})} = 10^{\left(\frac{P_2 - P_1}{10}\right)} (\text{dBm})$$

Reported SAR = measured SAR * (scaling)

Where P2 is maximum specified power, P1 is measured conducted power

2.3 Reporting statements of conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

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3. Simultaneous Transmission Analysis

Simultaneous Transmission Scenarios:

| Simultaneous Transmit Configurations | Head | Body-Worn | Hotspot |
|--------------------------------------|------|-----------|---------|
| GSM + 2.4GHz Wi-Fi | Yes | Yes | No |
| GPRS + 2.4GHz Wi-Fi | No | No | Yes |
| WCDMA + 2.4GHz Wi-Fi | Yes | Yes | Yes |
| LTE + 2.4GHz Wi-Fi | Yes | Yes | Yes |
| GSM + 5GHz Wi-Fi | Yes | Yes | No |
| GPRS + 5GHz Wi-Fi | No | No | No |
| WCDMA + 5GHz Wi-Fi | Yes | Yes | No |
| LTE + 5GHz Wi-Fi | Yes | Yes | No |
| GSM + BT | Yes | Yes | No |
| WCDMA + BT | Yes | Yes | No |
| LTE + BT | Yes | Yes | No |

Note:

1. The device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Based on KDB447498D01 note 36, when SAR test exclusion is allowed by other published RF exposure KDB procedures, such as the 2.5 cm hotspot mode SAR test exclusion for an edge or surface, then estimated SAR is not required to determine simultaneous SAR test exclusion.

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3.1 Estimated SAR calculation

According to KDB447498 D01v06 – 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:

$$\text{Estimated SAR} = \frac{\text{Max. tune up power (mW)}}{\text{Min. test separation distance (mm)}} \times \frac{\sqrt{f(\text{GHz})}}{7.5}$$

If the minimum test separation distance is < 5mm, a distance of 5mm is used for estimated SAR calculation. When the test separation distance is >50mm, the 0.4W/kg is used for SAR-1g.

3.2 SPLSR evaluation and analysis

Per KDB447498D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR sum to peak location separation ratio(SPLSR).

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion.

The ratio is determined by $(\text{SAR1} + \text{SAR2})^{1.5}/R_i$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

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Simultaneous Transmission Combination

| reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation | | | | | | |
|--|----------|-------------|---------------------|-------|----------|-----------------------|
| Frequency band | Position | | reported SAR / W/kg | | ΣSAR | SPLSR |
| | | | WWAN | WLAN | <1.6W/kg | |
| GSM 1900 | Head | Right cheek | 0.057 | 0.224 | 0.281 | ΣSAR<1.6,Not required |
| | | Right tilt | 0.022 | 0.256 | 0.278 | ΣSAR<1.6,Not required |
| | | Left cheek | 0.025 | 0.466 | 0.491 | ΣSAR<1.6,Not required |
| | | Left tilt | 0.021 | 0.376 | 0.397 | ΣSAR<1.6,Not required |
| GPRS 1900 (1Dn4UP) | Hotspot | Front side | 0.437 | 0.073 | 0.510 | ΣSAR<1.6,Not required |
| | | Back side | 0.411 | 0.096 | 0.507 | ΣSAR<1.6,Not required |
| | | Top side | 0.970 | 0.004 | 0.974 | ΣSAR<1.6,Not required |
| | | Right side | 0.103 | 0.005 | 0.108 | ΣSAR<1.6,Not required |
| | | Left side | 0.044 | 0.002 | 0.046 | ΣSAR<1.6,Not required |
| WCDMA Band II | Head | Right cheek | 0.074 | 0.224 | 0.298 | ΣSAR<1.6,Not required |
| | | Right tilt | 0.055 | 0.256 | 0.311 | ΣSAR<1.6,Not required |
| | | Left cheek | 0.067 | 0.466 | 0.533 | ΣSAR<1.6,Not required |
| | | Left tilt | 0.034 | 0.376 | 0.410 | ΣSAR<1.6,Not required |
| | Hotspot | Front side | 0.389 | 0.073 | 0.462 | ΣSAR<1.6,Not required |
| | | Back side | 0.332 | 0.096 | 0.428 | ΣSAR<1.6,Not required |
| | | Top side | 1.438 | 0.004 | 1.442 | ΣSAR<1.6,Not required |
| | | Right side | 0.073 | 0.005 | 0.078 | ΣSAR<1.6,Not required |
| LTE FDD Band 2 | Head | Right cheek | 0.114 | 0.224 | 0.338 | ΣSAR<1.6,Not required |
| | | Right tilt | 0.029 | 0.256 | 0.285 | ΣSAR<1.6,Not required |
| | | Left cheek | 0.051 | 0.466 | 0.517 | ΣSAR<1.6,Not required |
| | | Left tilt | 0.028 | 0.376 | 0.404 | ΣSAR<1.6,Not required |
| | Hotspot | Front side | 0.386 | 0.073 | 0.459 | ΣSAR<1.6,Not required |
| | | Back side | 0.359 | 0.096 | 0.455 | ΣSAR<1.6,Not required |
| | | Top side | 1.401 | 0.004 | 1.405 | ΣSAR<1.6,Not required |
| | | Right side | 0.054 | 0.005 | 0.059 | ΣSAR<1.6,Not required |
| LTE FDD Band 2 | Hotspot | Left side | 0.124 | 0.002 | 0.126 | ΣSAR<1.6,Not required |
| | | Right side | 0.054 | 0.005 | 0.059 | ΣSAR<1.6,Not required |
| | | Top side | 1.401 | 0.004 | 1.405 | ΣSAR<1.6,Not required |
| | | Back side | 0.359 | 0.096 | 0.455 | ΣSAR<1.6,Not required |

| reported SAR WWAN and WLAN 2.4GHz, ΣSAR evaluation | | | | | | |
|--|-----------|------------|---------------------|-------|----------|-----------------------|
| Frequency band | Position | | reported SAR / W/kg | | ΣSAR | SPLSR |
| | | | WWAN | WLAN | <1.6W/kg | |
| GSM 1900 | Body-worn | Front side | 0.389 | 0.073 | 0.462 | ΣSAR<1.6,Not required |
| | | Back side | 0.370 | 0.096 | 0.466 | ΣSAR<1.6,Not required |
| WCDMA Band II | Body-worn | Front side | 0.389 | 0.073 | 0.462 | ΣSAR<1.6,Not required |
| | | Back side | 0.332 | 0.096 | 0.428 | ΣSAR<1.6,Not required |
| LTE FDD Band 2 | Body-worn | Front side | 0.386 | 0.073 | 0.459 | ΣSAR<1.6,Not required |
| | | Back side | 0.359 | 0.096 | 0.455 | ΣSAR<1.6,Not required |

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| reported SAR WWAN and WLAN 5GHz, Σ SAR evaluation | | | | | | |
|--|-----------|-------------|---------------------|-------|--------------|-------------------------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR | SPLSR |
| | | | WWAN | WLAN | <1.6W/kg | |
| GSM 1900 | Head | Right cheek | 0.057 | 0.103 | 0.160 | Σ SAR<1.6,Not required |
| | | Right tilt | 0.022 | 0.090 | 0.112 | Σ SAR<1.6,Not required |
| | | Left cheek | 0.025 | 0.199 | 0.224 | Σ SAR<1.6,Not required |
| | | Left tilt | 0.021 | 0.229 | 0.250 | Σ SAR<1.6,Not required |
| | Body-worn | Front side | 0.389 | 0.037 | 0.426 | Σ SAR<1.6,Not required |
| | | Back side | 0.370 | 0.026 | 0.396 | Σ SAR<1.6,Not required |
| WCDMA Band II | Head | Right cheek | 0.074 | 0.103 | 0.177 | Σ SAR<1.6,Not required |
| | | Right tilt | 0.055 | 0.090 | 0.145 | Σ SAR<1.6,Not required |
| | | Left cheek | 0.067 | 0.199 | 0.266 | Σ SAR<1.6,Not required |
| | | Left tilt | 0.034 | 0.229 | 0.263 | Σ SAR<1.6,Not required |
| | Body-worn | Front side | 0.389 | 0.037 | 0.426 | Σ SAR<1.6,Not required |
| | | Back side | 0.332 | 0.026 | 0.358 | Σ SAR<1.6,Not required |
| LTE FDD Band 2 | Head | Right cheek | 0.114 | 0.103 | 0.217 | Σ SAR<1.6,Not required |
| | | Right tilt | 0.029 | 0.090 | 0.119 | Σ SAR<1.6,Not required |
| | | Left cheek | 0.051 | 0.199 | 0.250 | Σ SAR<1.6,Not required |
| | | Left tilt | 0.028 | 0.229 | 0.257 | Σ SAR<1.6,Not required |
| | Body-worn | Front side | 0.386 | 0.037 | 0.423 | Σ SAR<1.6,Not required |
| | | Back side | 0.359 | 0.026 | 0.385 | Σ SAR<1.6,Not required |

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| reported SAR WWAN and Bluetooth, Σ SAR evaluation | | | | | | |
|--|-----------|-------------|---------------------|-------|--------------|-------------------------------|
| Frequency band | Position | | reported SAR / W/kg | | Σ SAR | SPLSR |
| | | | WWAN | BT | <1.6W/kg | |
| GSM 1900 | Head | Right cheek | 0.057 | 0.028 | 0.085 | Σ SAR<1.6,Not required |
| | | Right tilt | 0.022 | 0.031 | 0.053 | Σ SAR<1.6,Not required |
| | | Left cheek | 0.025 | 0.056 | 0.081 | Σ SAR<1.6,Not required |
| | | Left tilt | 0.021 | 0.046 | 0.067 | Σ SAR<1.6,Not required |
| | Body-worn | Front side | 0.389 | 0.005 | 0.394 | Σ SAR<1.6,Not required |
| | | Back side | 0.370 | 0.006 | 0.376 | Σ SAR<1.6,Not required |
| WCDMA Band II | Head | Right cheek | 0.074 | 0.028 | 0.102 | Σ SAR<1.6,Not required |
| | | Right tilt | 0.055 | 0.031 | 0.086 | Σ SAR<1.6,Not required |
| | | Left cheek | 0.067 | 0.056 | 0.123 | Σ SAR<1.6,Not required |
| | | Left tilt | 0.034 | 0.046 | 0.080 | Σ SAR<1.6,Not required |
| | Body-worn | Front side | 0.389 | 0.005 | 0.394 | Σ SAR<1.6,Not required |
| | | Back side | 0.332 | 0.006 | 0.338 | Σ SAR<1.6,Not required |
| LTE FDD Band 2 | Head | Right cheek | 0.114 | 0.028 | 0.142 | Σ SAR<1.6,Not required |
| | | Right tilt | 0.029 | 0.031 | 0.060 | Σ SAR<1.6,Not required |
| | | Left cheek | 0.051 | 0.056 | 0.107 | Σ SAR<1.6,Not required |
| | | Left tilt | 0.028 | 0.046 | 0.074 | Σ SAR<1.6,Not required |
| | Body-worn | Front side | 0.386 | 0.005 | 0.391 | Σ SAR<1.6,Not required |
| | | Back side | 0.359 | 0.006 | 0.365 | Σ SAR<1.6,Not required |

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4. Instruments List

| Manufacturer | Device | Type | Serial number | Date of last calibration | Date of next calibration |
|------------------|------------------------------|------------------|---------------|--------------------------|--------------------------|
| SPEAG | Dosimetric E-Field Probe | EX3DV4 | 3801 | Jun.26th,2018 | Jun.25th,2019 |
| SPEAG | System Validation Dipole | D1900V2 | 5d173 | Apr.25th,2019 | Apr.24th,2020 |
| | | D2450V2 | 727 | Apr.24th,2018 | Apr.23rd,2019 |
| | | D5GHzV2 | 1040 | Jun.28th,2019 | Jun.27th,2020 |
| SPEAG | Data acquisition Electronics | DAE4 | 914 | Dec.11th,2018 | De.10th,2019 |
| SPEAG | Software | DASY 52 V52.10.1 | N/A | Calibration not required | Calibration not required |
| SPEAG | Phantom | SAM | N/A | Calibration not required | Calibration not required |
| Network Analyzer | Agilent | E5071C | MY46107530 | Feb.23th,2019 | Feb.22th,2020 |
| Agilent | Dielectric Probe Kit | 85070E | MY44300677 | Calibration not required | Calibration not required |
| Agilent | Dual-directional coupler | 772D | MY46151242 | Jul.04th,2018 | Jul.03rd,2019 |
| | | 778D | MY48220468 | Jul.05th,2018 | Jul.04th,2019 |
| R&S | RF Signal Generator | SMB 100A | 175936 | Dec.18th,2018 | Dec.17th,2019 |
| Agilent | Power Meter | E4417A | 1326001 | Aug.09th,2018 | Aug.08th,2019 |
| Agilent | Power Sensor | E9301H | 1315048 | Aug.09th,2018 | Aug.08th,2019 |
| | | | 1315049 | Aug.09th,2018 | Aug.08th,2019 |
| TECPEL | Digital thermometer | DTM-303A | TP131515 | Jul.17th,2018 | Jul.16th,2019 |
| Anritsu | Radio Communication Test | MT8820C | 6201061049 | Dec.27th,2018 | Dec.26th,2019 |

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5. Measurements

Date: Apr. 6th, 2019

GSM 1900_Head_Re Cheek_CH 810

Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.418$ S/m; $\epsilon_r = 40.468$; $\rho = 1000$ kg/m³
Phantom section: Right Section
Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.78, 7.78, 7.78); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm
Maximum value of SAR (interpolated) = 0.0570 W/kg

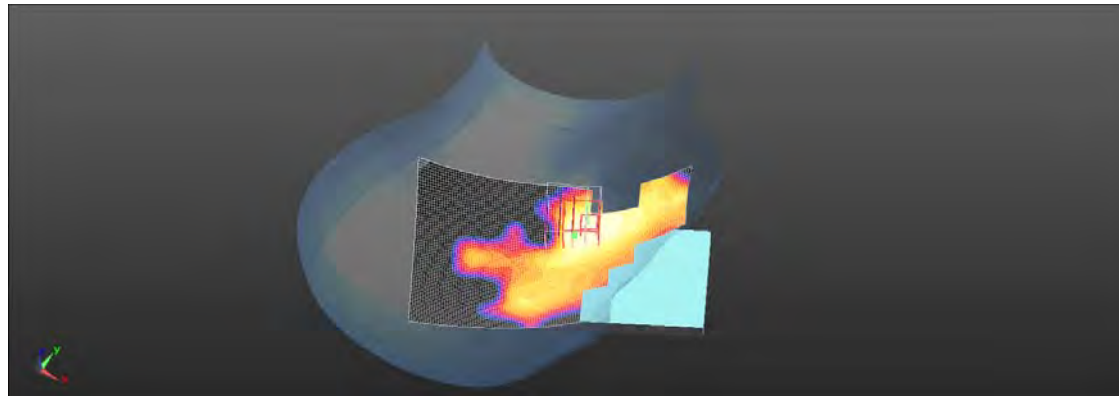
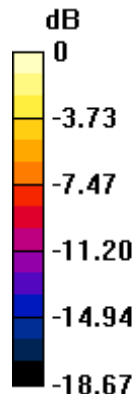
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.139 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.0660 W/kg

SAR(1 g) = 0.041 W/kg; SAR(10 g) = 0.024 W/kg

Maximum value of SAR (measured) = 0.0520 W/kg



0 dB = 0.0520 W/kg = -12.84 dBW/kg

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Date: Apr. 11th, 2019

GSM 1900_Body-worn_Front side_CH 810_10mm

Communication System: GSM; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.504$ S/m; $\epsilon_r = 51.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.390 W/kg

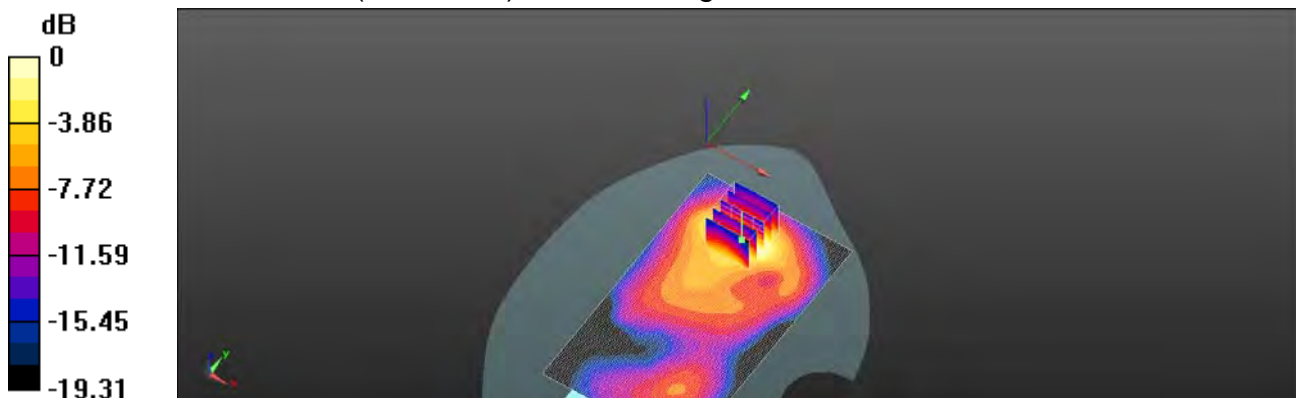
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.351 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.478 W/kg

SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.155 W/kg

Maximum value of SAR (measured) = 0.388 W/kg



0 dB = 0.388 W/kg = -4.11 dBW/kg

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Date: Apr. 11th, 2019

GPRS 1900_Hotspot_Bottom side_CH 810_10mm

Communication System: GPRS (1Dn4Up); Frequency: 1909.8 MHz; Duty Cycle: 1:1.99986

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.504$ S/m; $\epsilon_r = 51.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.05 W/kg

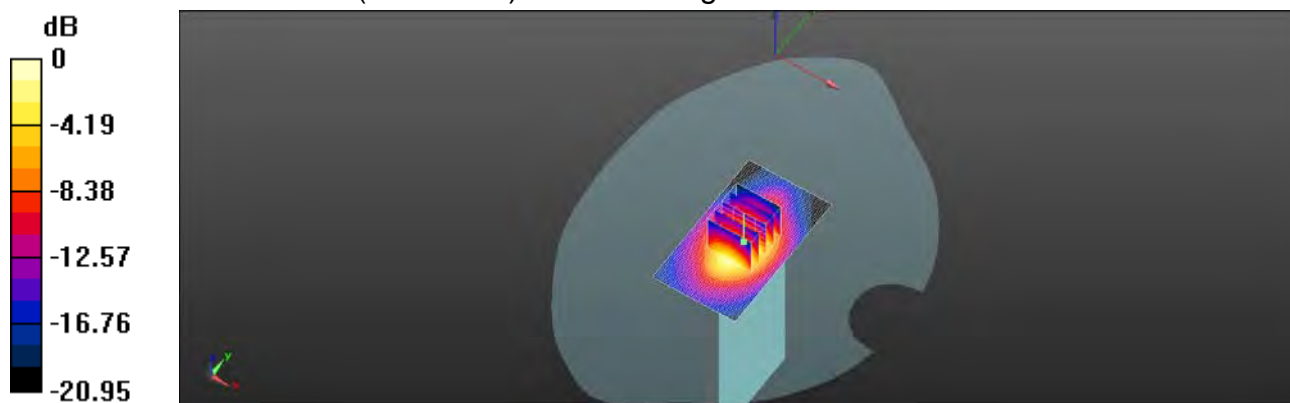
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.20 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.677 W/kg; SAR(10 g) = 0.354 W/kg

Maximum value of SAR (measured) = 0.946 W/kg



0 dB = 0.946 W/kg = -0.24 dBW/kg

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Date: Apr. 6th, 2019

WCDMA Band II_Head_Re Cheek_CH 9400

Communication System: WCDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.415$ S/m; $\epsilon_r = 40.492$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.78, 7.78, 7.78); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.0912 W/kg

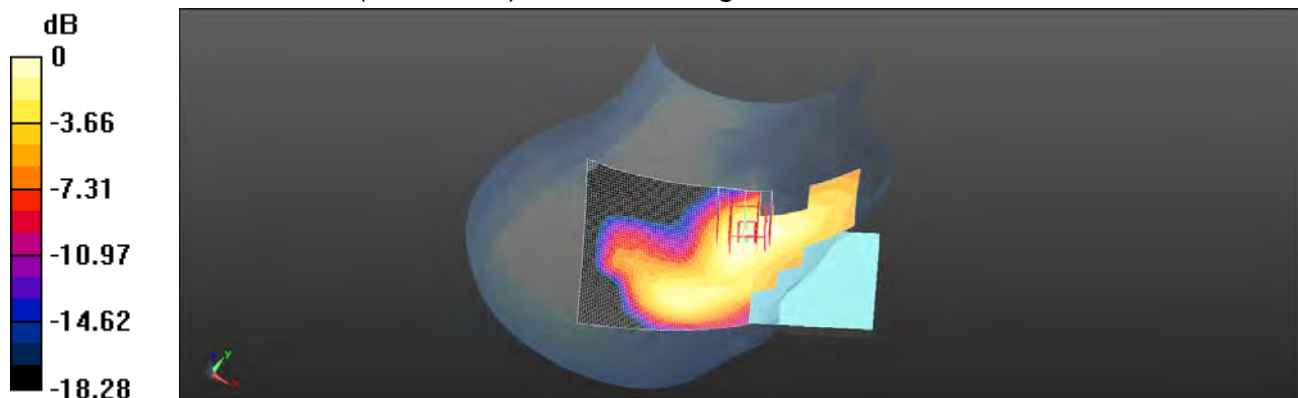
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.404 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.112 W/kg

SAR(1 g) = 0.073 W/kg; SAR(10 g) = 0.047 W/kg

Maximum value of SAR (measured) = 0.0909 W/kg



0 dB = 0.0909 W/kg = -10.41 dBW/kg

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Date: Apr. 11th, 2019

WCDMA Band II_Hotspot_Bottom side_CH 9262_10mm

Communication System: WCDMA; Frequency: 1850.2 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1850.2 \text{ MHz}$; $\sigma = 1.496 \text{ S/m}$; $\epsilon_r = 51.736$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient temperature: 22.1°C ; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x71x1): Interpolated grid: $dx=15 \text{ mm}$, $dy=15 \text{ mm}$

Maximum value of SAR (interpolated) = 2.07 W/kg

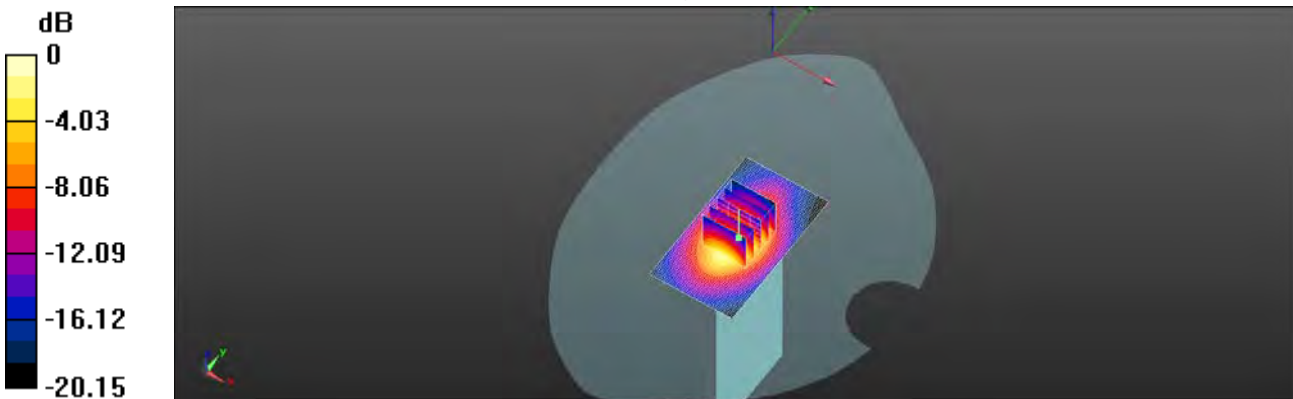
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.47 V/m ; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.40 W/kg

SAR(1 g) = 1.33 W/kg ; SAR(10 g) = 0.726 W/kg

Maximum value of SAR (measured) = 1.91 W/kg



0 dB = 1.91 W/kg = 2.82 dBW/kg

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Date: Apr. 6th, 2019

LTE Band 2 (20MHz)_Head_Re Cheek_CH 19100_QPSK_1-50

Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.417$ S/m; $\epsilon_r = 40.476$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.78, 7.78, 7.78); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x121x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 0.128 W/kg

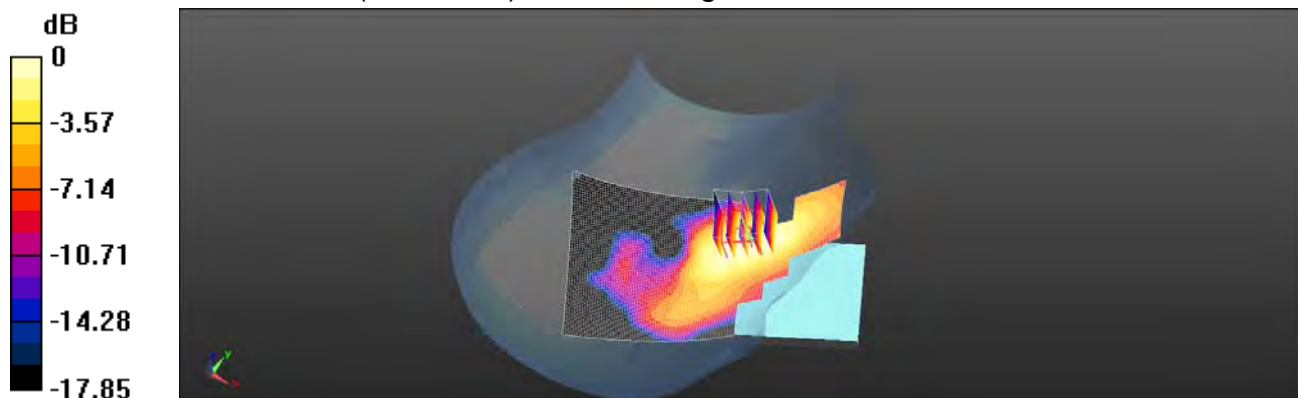
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.081 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.149 W/kg

SAR(1 g) = 0.094 W/kg; SAR(10 g) = 0.057 W/kg

Maximum value of SAR (measured) = 0.121 W/kg



0 dB = 0.121 W/kg = -9.18 dBW/kg

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Date: Apr. 11th, 2019

LTE Band 2 (20MHz)_Hotspot_Bottom side_CH 18700_QPSK_1-99_10mm

Communication System: LTE; Frequency: 1860 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1860$ MHz; $\sigma = 1.501$ S/m; $\epsilon_r = 51.733$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 1.63 W/kg

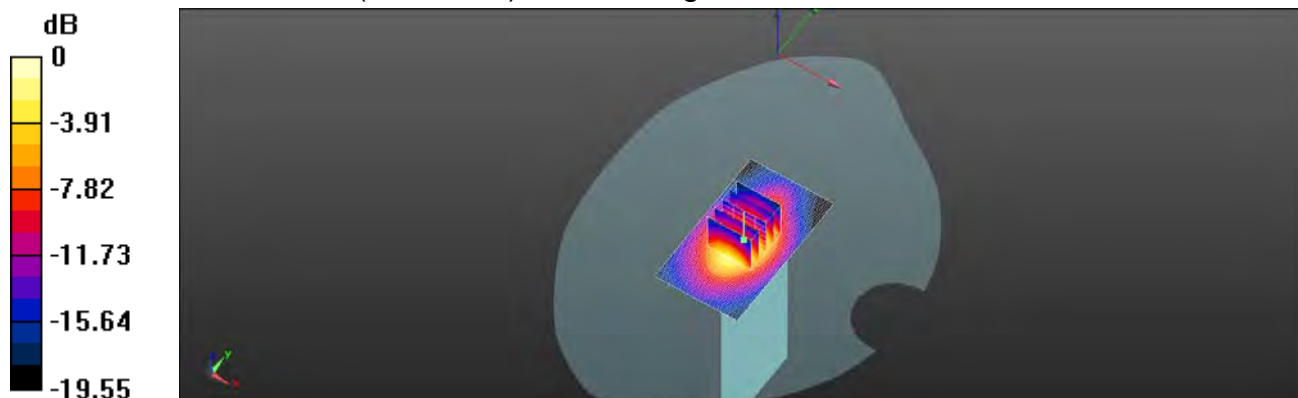
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.86 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.85 W/kg

SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.563 W/kg

Maximum value of SAR (measured) = 1.49 W/kg



0 dB = 1.49 W/kg = 1.72 dBW/kg

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Date: Apr. 7th, 2019

WLAN 802.11b_Head_Le Cheek_CH 11

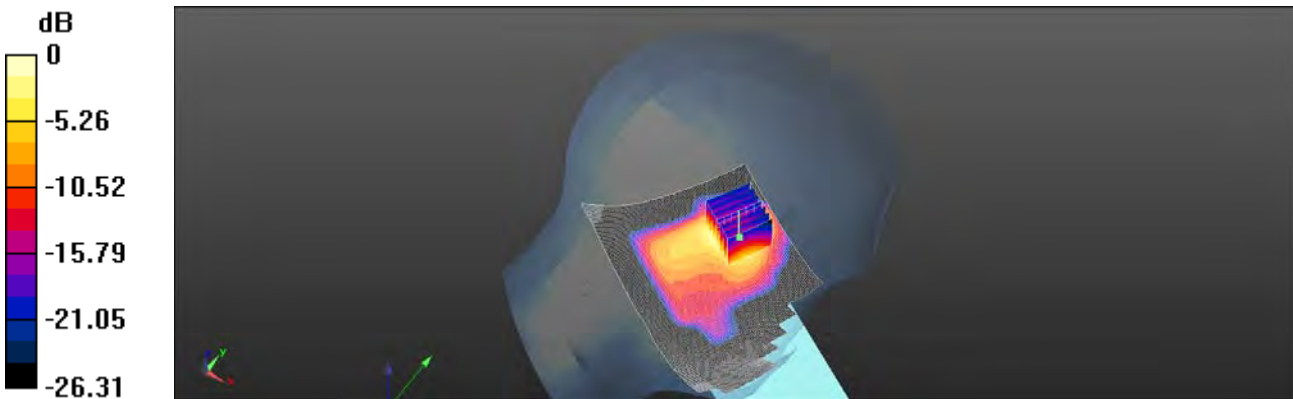
Communication System: WLAN 2.45G; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2462$ MHz; $\sigma = 1.853$ S/m; $\epsilon_r = 40.145$; $\rho = 1000$ kg/m³
Phantom section: Left Section
Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.08, 7.08, 7.08); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm
Maximum value of SAR (interpolated) = 0.689 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.339 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.463 W/kg; SAR(10 g) = 0.208 W/kg
Maximum value of SAR (measured) = 0.737 W/kg



0 dB = 0.737 W/kg = -1.32 dBW/kg

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Date: Apr. 12th, 2019

WLAN 802.11b_Hotspot_Back side_CH 11_10mm

Communication System: WLAN 2.45G; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.913$ S/m; $\epsilon_r = 51.104$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.8°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.19, 7.19, 7.19); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.142 W/kg

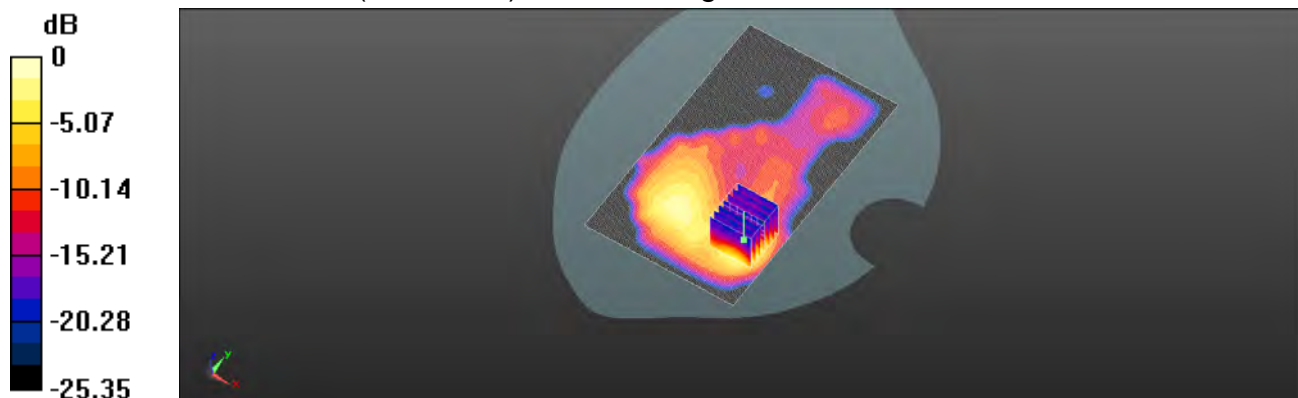
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.700 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.214 W/kg

SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.041 W/kg

Maximum value of SAR (measured) = 0.152 W/kg



0 dB = 0.152 W/kg = -8.18 dBW/kg

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Date: Apr. 7th, 2019

Bluetooth(GFSK)_Head_Le Cheek_CH 39

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2441$ MHz; $\sigma = 1.832$ S/m; $\epsilon_r = 40.138$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.08, 7.08, 7.08); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.107 W/kg

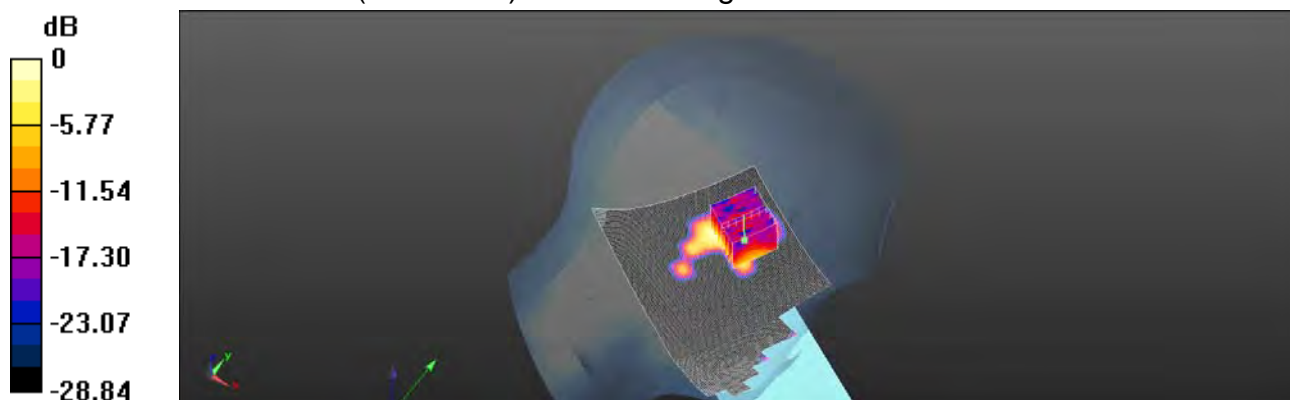
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.574 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.0920 W/kg

SAR(1 g) = 0.042 W/kg; SAR(10 g) = 0.018 W/kg

Maximum value of SAR (measured) = 0.0675 W/kg



0 dB = 0.0675 W/kg = -11.71 dBW/kg

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Date: Apr. 12th, 2019

Bluetooth(GFSK)_Body-worn_Back side_CH 39_10mm

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2441$ MHz; $\sigma = 1.887$ S/m; $\epsilon_r = 51.12$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.8°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.19, 7.19, 7.19); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (91x151x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.0120 W/kg

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

Reference Value = 0.8500 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.0230 W/kg

SAR(1 g) = 0.00471 W/kg; SAR(10 g) = 0.00153 W/kg

Maximum value of SAR (measured) = 0.00906 W/kg



0 dB = 0.00906 W/kg = -20.43 dBW/kg

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Date: Apr. 8th, 2019

WLAN 802.11n(40M) 5.2G_Head_Le Tilt_CH 38

Communication System: WLAN 5G; Frequency: 5190 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5190$ MHz; $\sigma = 4.608$ S/m; $\epsilon_r = 35.09$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.93, 4.93, 4.93); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.597 W/kg

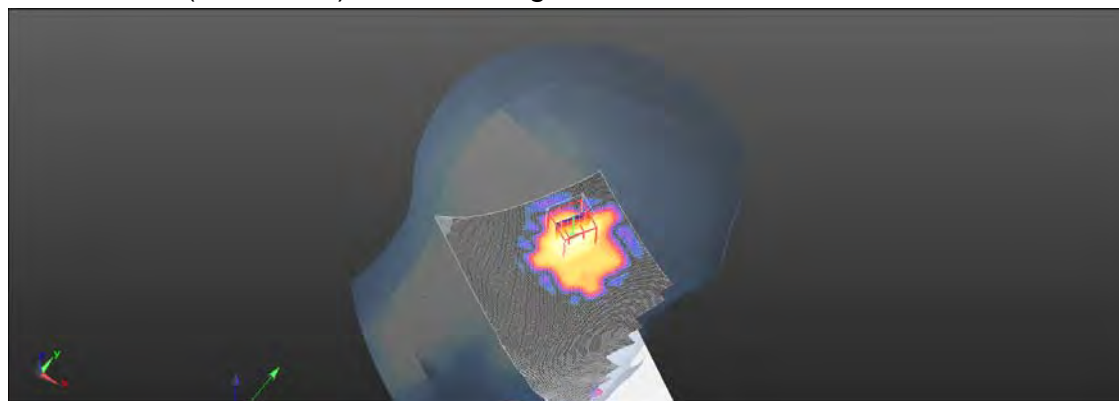
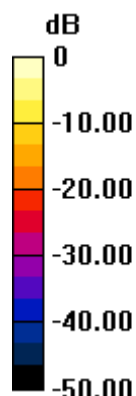
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.027 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.999 W/kg

SAR(1 g) = 0.227 W/kg; SAR(10 g) = 0.062 W/kg

Maximum value of SAR (measured) = 0.480 W/kg



0 dB = 0.480 W/kg = -3.19 dBW/kg

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Date: Apr. 13th, 2019

WLAN 802.11n(40M) 5.2G_Body-worn_Front side_CH 38_10mm

Communication System: WLAN 5G; Frequency: 5190 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5190 \text{ MHz}$; $\sigma = 5.252 \text{ S/m}$; $\epsilon_r = 50.469$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient temperature: 22.1°C ; Liquid temperature: 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (111x181x1): Interpolated grid: $dx=10 \text{ mm}$, $dy=10 \text{ mm}$

Maximum value of SAR (interpolated) = 0.0894 W/kg

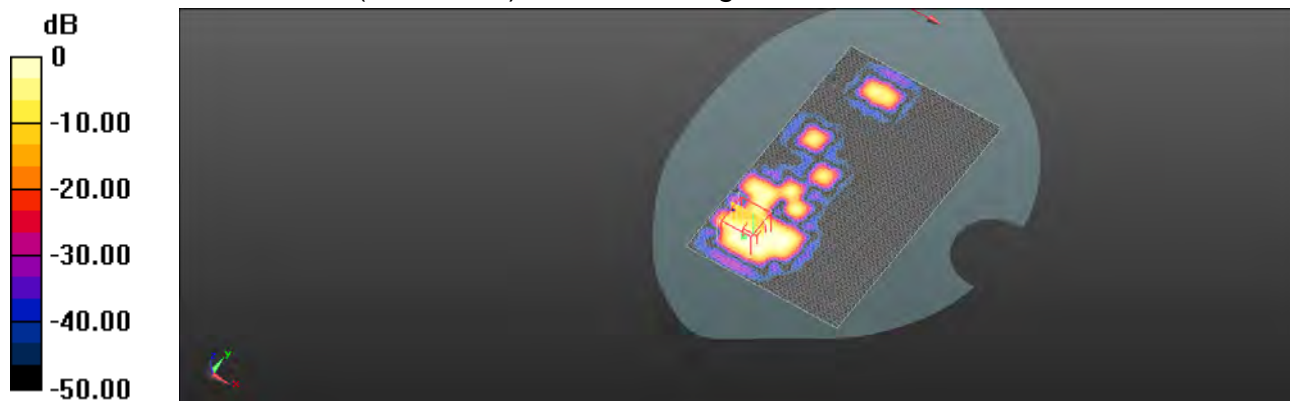
Zoom Scan (7x7x12)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 0.7590 V/m ; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.219 W/kg

SAR(1 g) = 0.022 W/kg ; SAR(10 g) = 0.00813 W/kg

Maximum value of SAR (measured) = 0.0565 W/kg



$0 \text{ dB} = 0.0565 \text{ W/kg} = -12.48 \text{ dBW/kg}$

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Date: Apr. 9th, 2019

WLAN 802.11n(40M) 5.3G_Head_Le Tilt_CH 62

Communication System: WLAN 5G; Frequency: 5310 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5310$ MHz; $\sigma = 4.674$ S/m; $\epsilon_r = 34.981$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Ambient temperature: 22.1°C; Liquid temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.7, 4.7, 4.7); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.574 W/kg

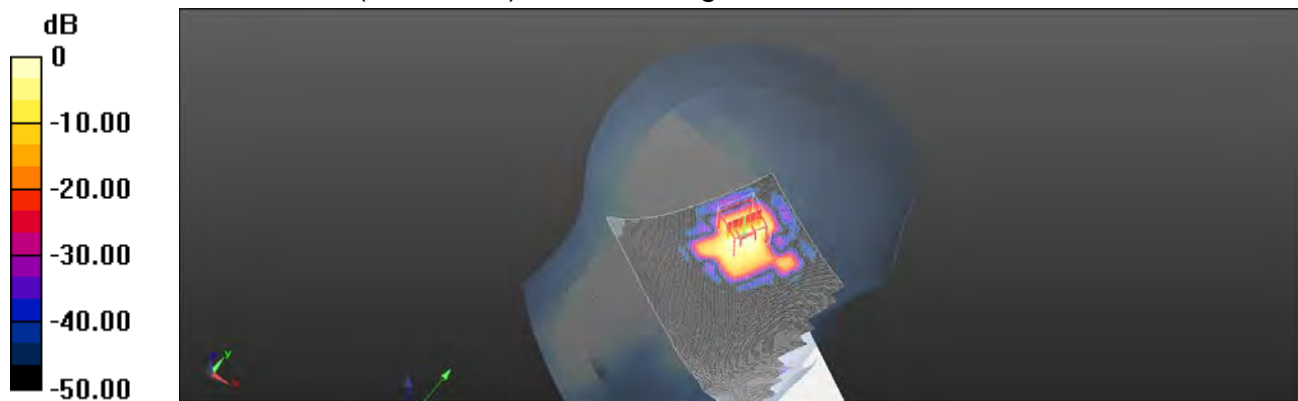
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.547 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.942 W/kg

SAR(1 g) = 0.207 W/kg; SAR(10 g) = 0.056 W/kg

Maximum value of SAR (measured) = 0.427 W/kg



0 dB = 0.427 W/kg = -3.70 dBW/kg

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Date: Apr. 14th, 2019

WLAN 802.11n(40M) 5.3G_Body-worn_Front side_CH 62_10mm

Communication System: WLAN 5G; Frequency: 5310 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5310$ MHz; $\sigma = 5.601$ S/m; $\epsilon_r = 48.797$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.7°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.09, 4.09, 4.09); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.162 W/kg

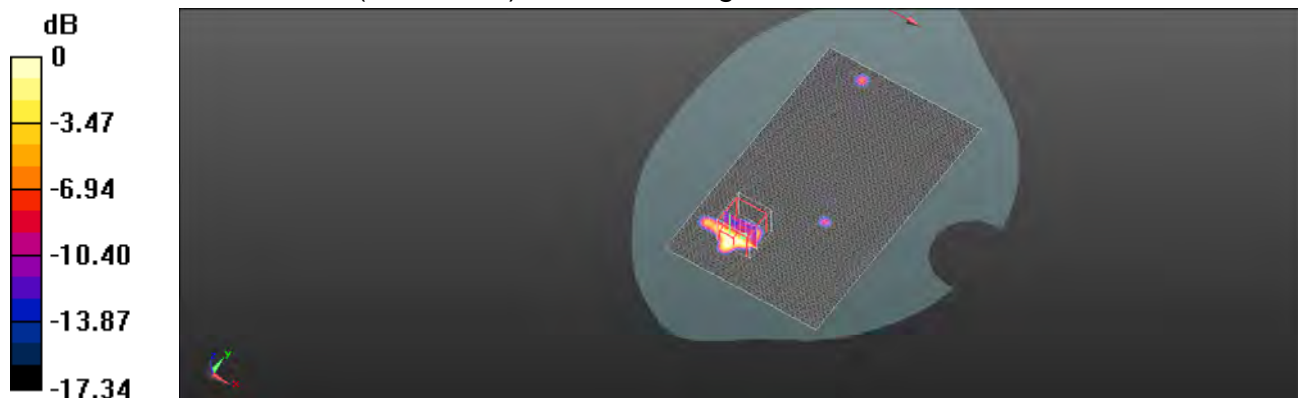
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.036 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.202 W/kg

SAR(1 g) = 0.023 W/kg; SAR(10 g) = 0.00799 W/kg

Maximum value of SAR (measured) = 0.0568 W/kg



0 dB = 0.0568 W/kg = -12.46 dBW/kg

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Date: Apr. 10th, 2019

WLAN 802.11n(40M) 5.6G_Head_Le Tilt_CH 102

Communication System: WLAN 5G; Frequency: 5510 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5510$ MHz; $\sigma = 5.003$ S/m; $\epsilon_r = 36.515$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Ambient temperature: 22.9°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.82, 4.82, 4.82); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.524 W/kg

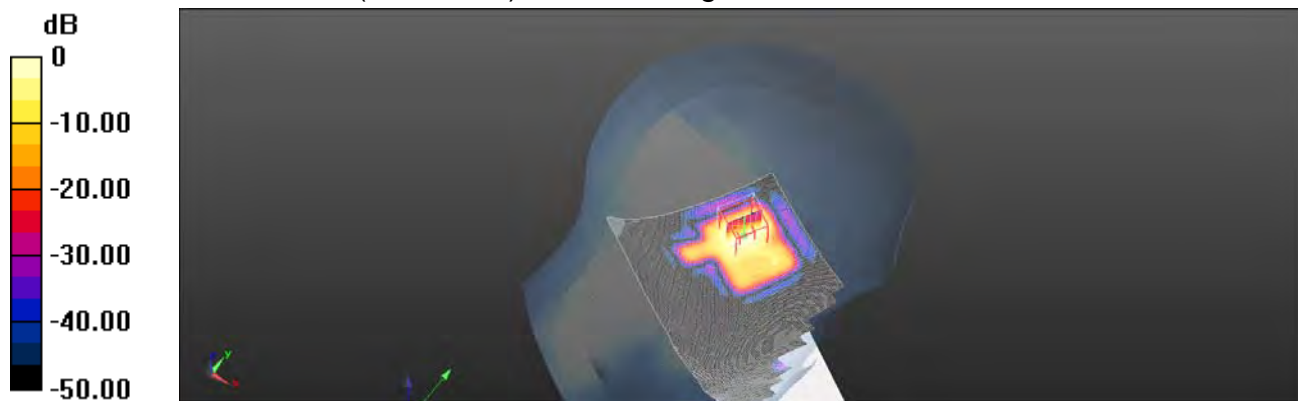
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.4750 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.981 W/kg

SAR(1 g) = 0.219 W/kg; SAR(10 g) = 0.062 W/kg

Maximum value of SAR (measured) = 0.443 W/kg



0 dB = 0.443 W/kg = -3.53 dBW/kg

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Date: Apr. 15th, 2019

WLAN 802.11n(40M) 5.6G_Body-worn_Front side_CH 102_10mm

Communication System: WLAN 5G; Frequency: 5510 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5510$ MHz; $\sigma = 5.604$ S/m; $\epsilon_r = 48.54$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(3.94, 3.94, 3.94); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (111x181x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.179 W/kg

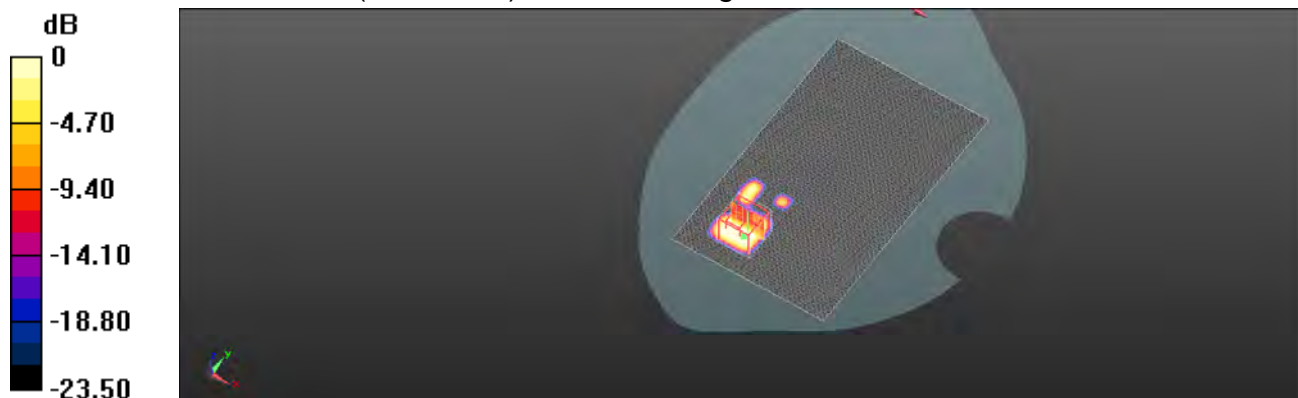
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.7760 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.447 W/kg

SAR(1 g) = 0.036 W/kg; SAR(10 g) = 0.011 W/kg

Maximum value of SAR (measured) = 0.0609 W/kg



0 dB = 0.0609 W/kg = -12.15 dBW/kg

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6. SAR System Performance Verification

Date: Apr. 6th, 2019

Dipole 1900 MHz_SN:5d173_Head

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.417$ S/m; $\epsilon_r = 40.476$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.2°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.78, 7.78, 7.78); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x81x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 13.9 W/kg

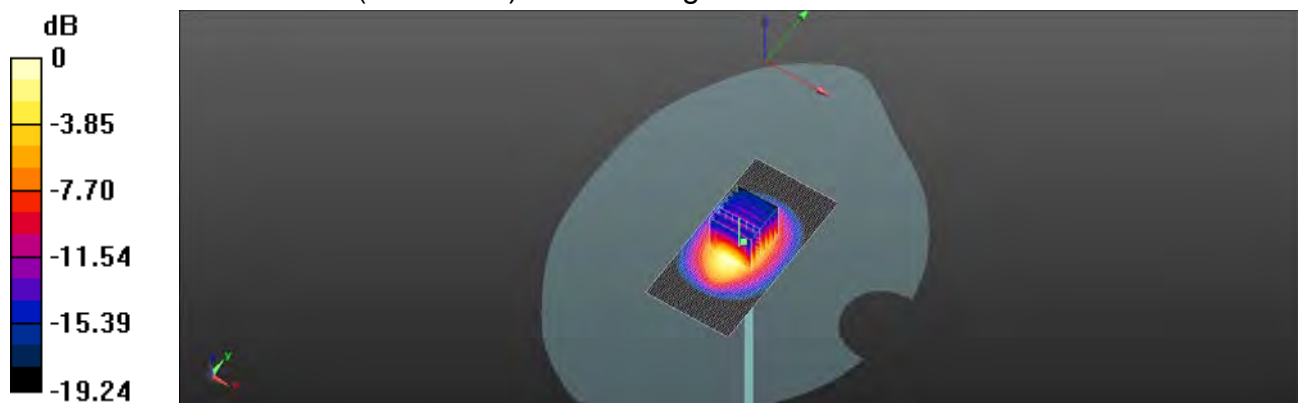
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.1 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 9.98 W/kg; SAR(10 g) = 5.23 W/kg

Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.38 dBW/kg

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Date: Apr. 11th, 2019

Dipole 1900 MHz_SN:5d173_Body

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.501$ S/m; $\epsilon_r = 51.733$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.37, 7.37, 7.37); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (41x71x1): Interpolated grid: dx=15 mm, dy=15 mm

Maximum value of SAR (interpolated) = 14.9 W/kg

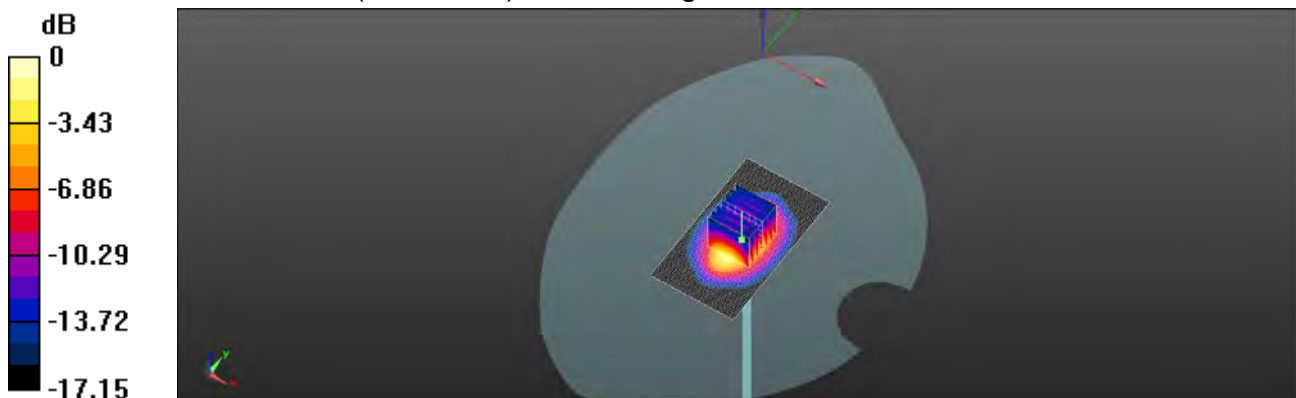
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.04 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.98 W/kg; SAR(10 g) = 5.35 W/kg

Maximum value of SAR (measured) = 14.0 W/kg



0 dB = 14.0 W/kg = 11.46 dBW/kg

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Date: Apr. 7th, 2019

Dipole 2450 MHz_SN:727_Head

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.839$ S/m; $\epsilon_r = 40.153$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.08, 7.08, 7.08); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (51x101x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.3 W/kg

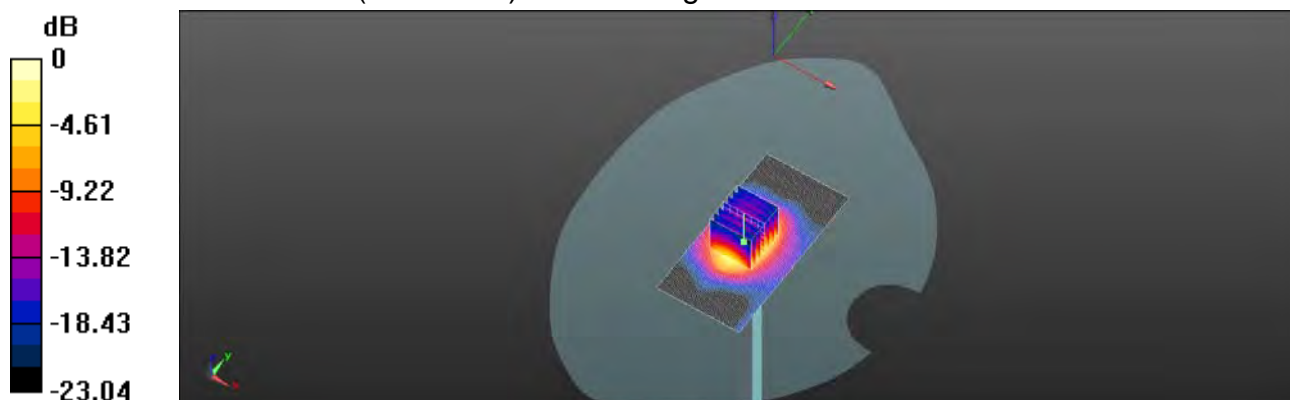
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 102.7 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 27.7 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.17 W/kg

Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.98 dBW/kg

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Date: Apr. 12th, 2019

Dipole 2450 MHz_SN:727_Body

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.895$ S/m; $\epsilon_r = 51.145$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.8°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(7.19, 7.19, 7.19); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (51x71x1): Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 20.7 W/kg

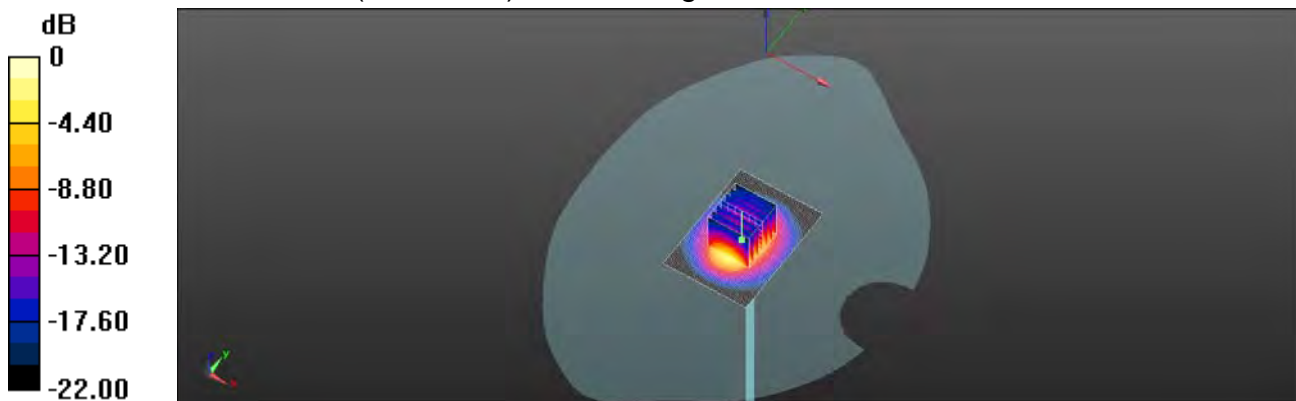
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.00 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 25.7 W/kg

SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.01 W/kg

Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.1 W/kg = 12.81 dBW/kg

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Date: Apr. 8th, 2019

Dipole 5200 MHz_SN:1040_Head

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.618$ S/m; $\epsilon_r = 35.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.93, 4.93, 4.93); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 16.3 W/kg

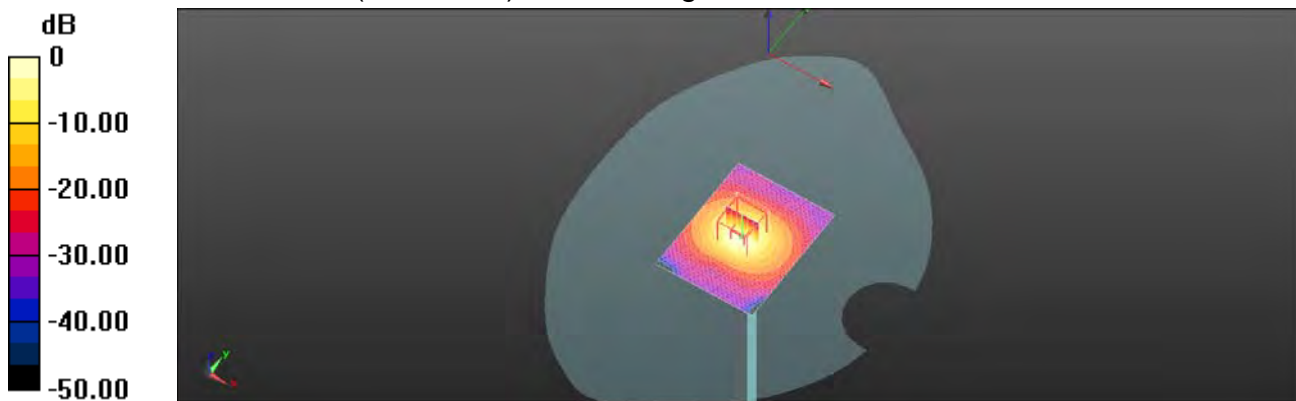
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 58.83 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 27.5 W/kg

SAR(1 g) = 7.87 W/kg; SAR(10 g) = 2.25 W/kg

Maximum value of SAR (measured) = 15.7 W/kg



0 dB = 15.7 W/kg = 11.95 dBW/kg

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Date: Apr. 13th, 2019

Dipole 5200 MHz_SN:1040_Body

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.264$ S/m; $\epsilon_r = 50.441$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.23, 4.23, 4.23); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.1 W/kg

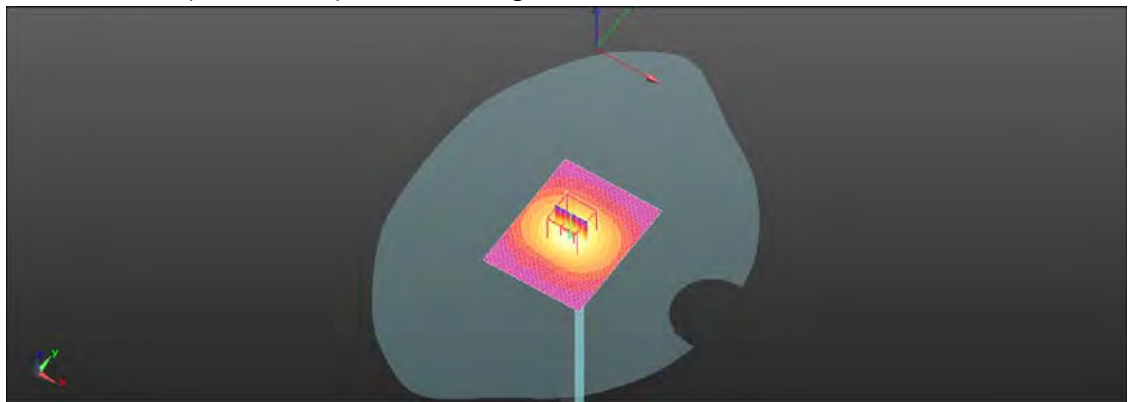
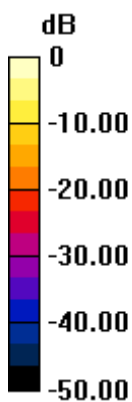
Zoom Scan (7x7x7) (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.40 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 34.1 W/kg

SAR(1 g) = 7.56 W/kg; SAR(10 g) = 2.16 W/kg

Maximum value of SAR (measured) = 16.4 W/kg



0 dB = 16.4 W/kg = 12.14 dBW/kg

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Date: Apr. 9th, 2019

Dipole 5300 MHz_SN:1040_Head

Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5300$ MHz; $\sigma = 4.663$ S/m; $\epsilon_r = 35.011$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.7, 4.7, 4.7); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.0 W/kg

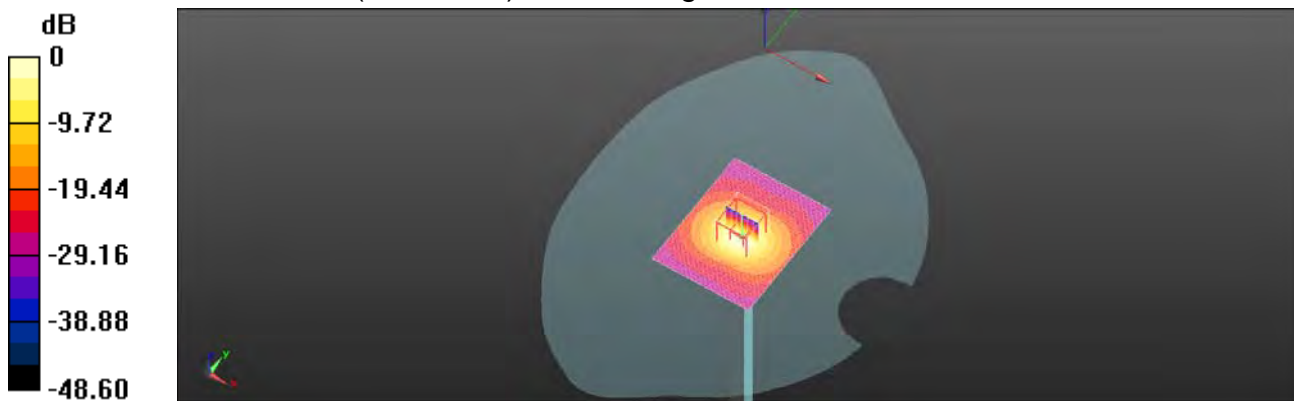
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 60.86 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 35.2 W/kg

SAR(1 g) = 8.26 W/kg; SAR(10 g) = 2.33 W/kg

Maximum value of SAR (measured) = 16.1 W/kg



0 dB = 16.1 W/kg = 12.08 dBW/kg

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Date: Apr. 14th, 2019

Dipole 5300 MHz_SN:1040_Body

Communication System: CW; Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5300$ MHz; $\sigma = 5.587$ S/m; $\epsilon_r = 48.805$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.7°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.09, 4.09, 4.09); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 16.4 W/kg

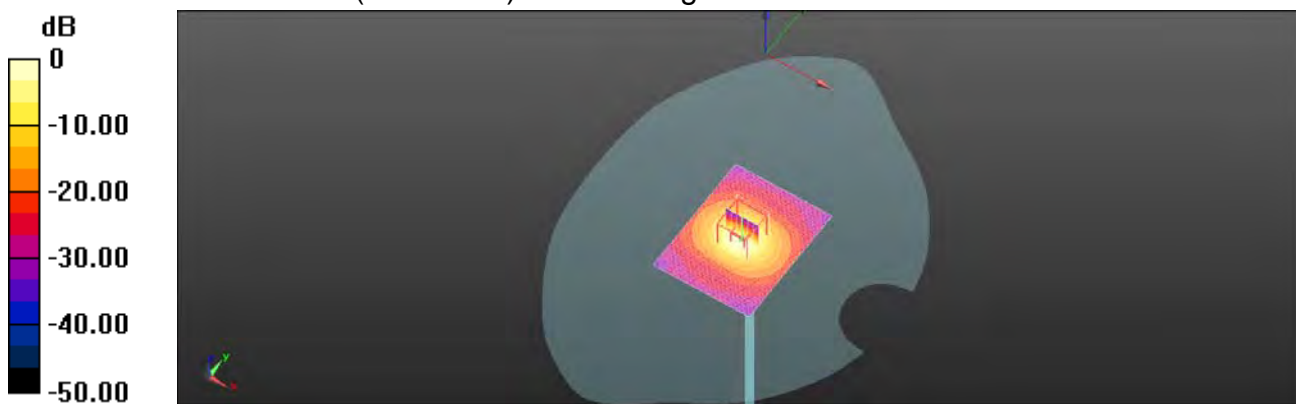
Zoom Scan (7x7x7) (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 58.41 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 34.3 W/kg

SAR(1 g) = 7.74 W/kg; SAR(10 g) = 2.15 W/kg

Maximum value of SAR (measured) = 15.9 W/kg



0 dB = 15.9 W/kg = 12.02 dBW/kg

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Member of SGS Group

Date: Apr. 10th, 2019

Dipole 5600 MHz_SN:1040_Head

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5600$ MHz; $\sigma = 5.098$ S/m; $\epsilon_r = 36.42$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.9°C; Liquid temperature: 21.8°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(4.82, 4.82, 4.82); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (61x91x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.5 W/kg

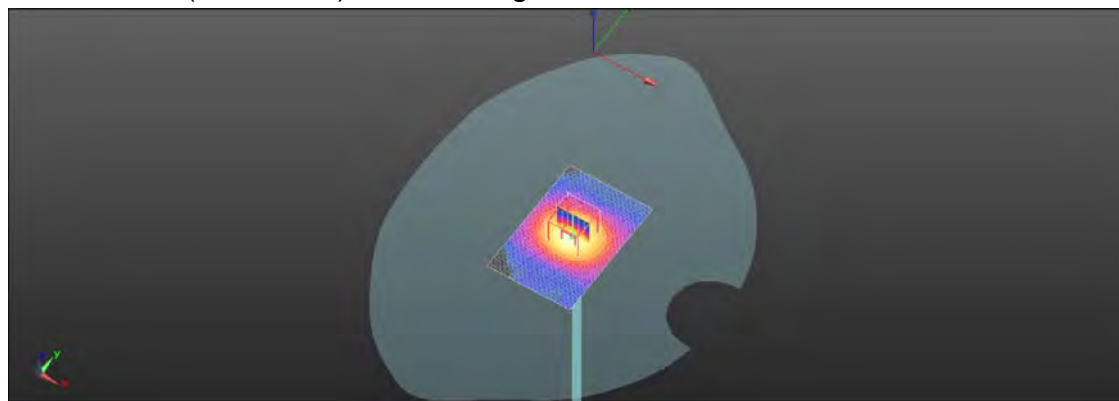
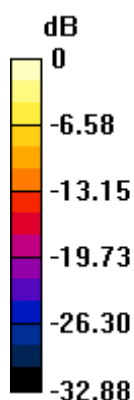
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 61.62 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 35.2 W/kg

SAR(1 g) = 8.52 W/kg; SAR(10 g) = 2.47 W/kg

Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 17.2 W/kg = 12.36 dBW/kg

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Date: Apr. 15th, 2019

Dipole 5600 MHz_SN:1040_Body

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5600$ MHz; $\sigma = 5.742$ S/m; $\epsilon_r = 47.769$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 21.6°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3801; ConvF(3.94, 3.94, 3.94); Calibrated: 2018/6/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn914; Calibrated: 2018/12/11
- Phantom: SAM
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Area Scan (71x91x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.9 W/kg

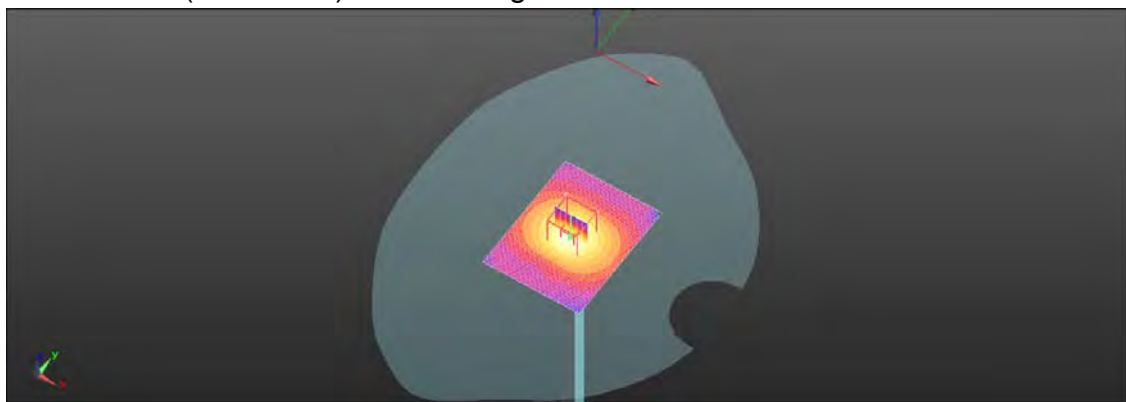
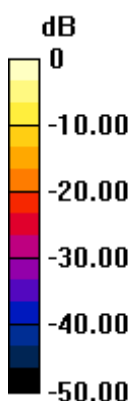
Zoom Scan (7x7x7) (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.42 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 41.5 W/kg

SAR(1 g) = 8.21 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 17.2 W/kg = 12.36 dBW/kg

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7. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test (0.3-3G)

| A | c | D | e | | f | g | h=c * f / e | i=c * g / e | k |
|---|---------------------------|-----------------|------------|-----------|---------|----------|-------------------------|-------------------------|-------------|
| Source of Uncertainty | Tolerance/ Uncertainty | Probabilit y | Div | Div Value | ci (1g) | ci (10g) | Standard uncertainty | Standard uncertainty | vi, or Veff |
| Measurement system | | | | | | | | | |
| Probe calibration | 6.00% | N | 1 | 1 | 1 | 1 | 6.00% | 6.00% | ∞ |
| Isotropy , Axial | 3.50% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.02% | 2.02% | ∞ |
| Isotropy, Hemispherical | 9.60% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 5.54% | 5.54% | ∞ |
| Modulation Response | 2.40% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.40% | 1.40% | ∞ |
| Boundary Effect | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Linearity | 4.70% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.71% | 2.71% | ∞ |
| Detection Limits | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Readout Electronics | 0.30% | N | 1 | 1 | 1 | 1 | 0.30% | 0.30% | ∞ |
| Response time | 0.80% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.46% | 0.46% | ∞ |
| Integration Time | 2.60% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.50% | 1.50% | ∞ |
| Measurement drift (class A evaluation) | 1.75% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.01% | 1.01% | ∞ |
| RF ambient condition - noise | 3.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| RF ambient conditions - reflections | 3.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| Probe positioner Mechanical restrictions | 0.40% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.23% | 0.23% | ∞ |
| Probe Positioning with respect to phantom | 2.90% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.67% | 1.67% | ∞ |
| Post-processing | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Max SAR Eval | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Test Sample related | | | | | | | | | |
| Test sample positioning | 2.90% | N | 1 | 1 | 1 | 1 | 2.90% | 2.90% | M-1 |
| Device Holder Uncertainty | 3.60% | N | 1 | 1 | 1 | 1 | 3.60% | 3.60% | M-1 |
| Drift of output power | 5.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.89% | 2.89% | ∞ |
| Phantom and Setup | | | | | | | | | |
| Phantom Uncertainty | 4.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.31% | 2.31% | ∞ |
| Liquid permittivity (mea.) | 3.02% | N | 1 | 1 | 0.64 | 0.43 | 1.93% | 1.30% | M |
| Liquid Conductivity (mea.) | 2.82% | N | 1 | 1 | 0.6 | 0.49 | 1.69% | 1.38% | M |
| Combined standard uncertainty | | RSS | | | | | 11.70% | 11.56% | |
| Expant uncertainty (95% confidence) | | | | | | | 23.41% | 23.13% | |

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Measurement Uncertainty evaluation template for DUT SAR test (3-6G)

| A | c | D | e | | f | g | h=c * f / e | i=c * g / e | k |
|---|---------------------------|-----------------|------------|-----------|---------|----------|-------------------------|-------------------------|-------------|
| Source of Uncertainty | Tolerance/ Uncertainty | Probabilit y | Div | Div Value | ci (1g) | ci (10g) | Standard uncertainty | Standard uncertainty | vi, or Veff |
| Measurement system | | | | | | | | | |
| Probe calibration | 6.55% | N | 1 | 1 | 1 | 1 | 6.55% | 6.55% | ∞ |
| Isotropy , Axial | 3.50% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.02% | 2.02% | ∞ |
| Isotropy, Hemispherical | 9.60% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 5.54% | 5.54% | ∞ |
| Modulation Response | 2.40% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.40% | 1.40% | ∞ |
| Boundary Effect | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Linearity | 4.70% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.71% | 2.71% | ∞ |
| Detection Limits | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Readout Electronics | 0.30% | N | 1 | 1 | 1 | 1 | 0.30% | 0.30% | ∞ |
| Response time | 0.80% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.46% | 0.46% | ∞ |
| Integration Time | 2.60% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.50% | 1.50% | ∞ |
| Measurement drift (class A evaluation) | 1.75% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.01% | 1.01% | ∞ |
| RF ambient condition - noise | 3.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| RF ambient conditions - reflections | 3.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.73% | 1.73% | ∞ |
| Probe positioner Mechanical restrictions | 0.40% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.23% | 0.23% | ∞ |
| Probe Positioning with respect to phantom | 2.90% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 1.67% | 1.67% | ∞ |
| Post-processing | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| Max SAR Eval | 1.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 0.58% | 0.58% | ∞ |
| | | | | | | | | | |
| Test Sample related | | | | | | | | | |
| Test sample positioning | 2.90% | N | 1 | 1 | 1 | 1 | 2.90% | 2.90% | M-1 |
| Device Holder Uncertainty | 3.60% | N | 1 | 1 | 1 | 1 | 3.60% | 3.60% | M-1 |
| Drift of output power | 5.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.89% | 2.89% | ∞ |
| | | | | | | | | | |
| Phantom and Setup | | | | | | | | | |
| Phantom Uncertainty | 4.00% | R | $\sqrt{3}$ | 1.732 | 1 | 1 | 2.31% | 2.31% | ∞ |
| Liquid permittivity (mea.) | 2.95% | N | 1 | 1 | 0.64 | 0.43 | 1.89% | 1.27% | M |
| Liquid Conductivity (mea.) | 3.19% | N | 1 | 1 | 0.6 | 0.49 | 1.91% | 1.56% | M |
| Combined standard uncertainty | | RSS | | | | | 12.02% | 11.88% | |
| Expant uncertainty (95% confidence) | | | | | | | 24.04% | 23.76% | |

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Appendixes

Refer to separated files for the following appendixes.

E5201930031 SAR_Appendix A Photographs

E5201930031 SAR_Appendix B DAE & Probe Cal. Certificate

E5201930031 SAR_Appendix C Phantom Description & Dipole Cal. Certificate

- End of report -

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