

12.2. System Check Plots

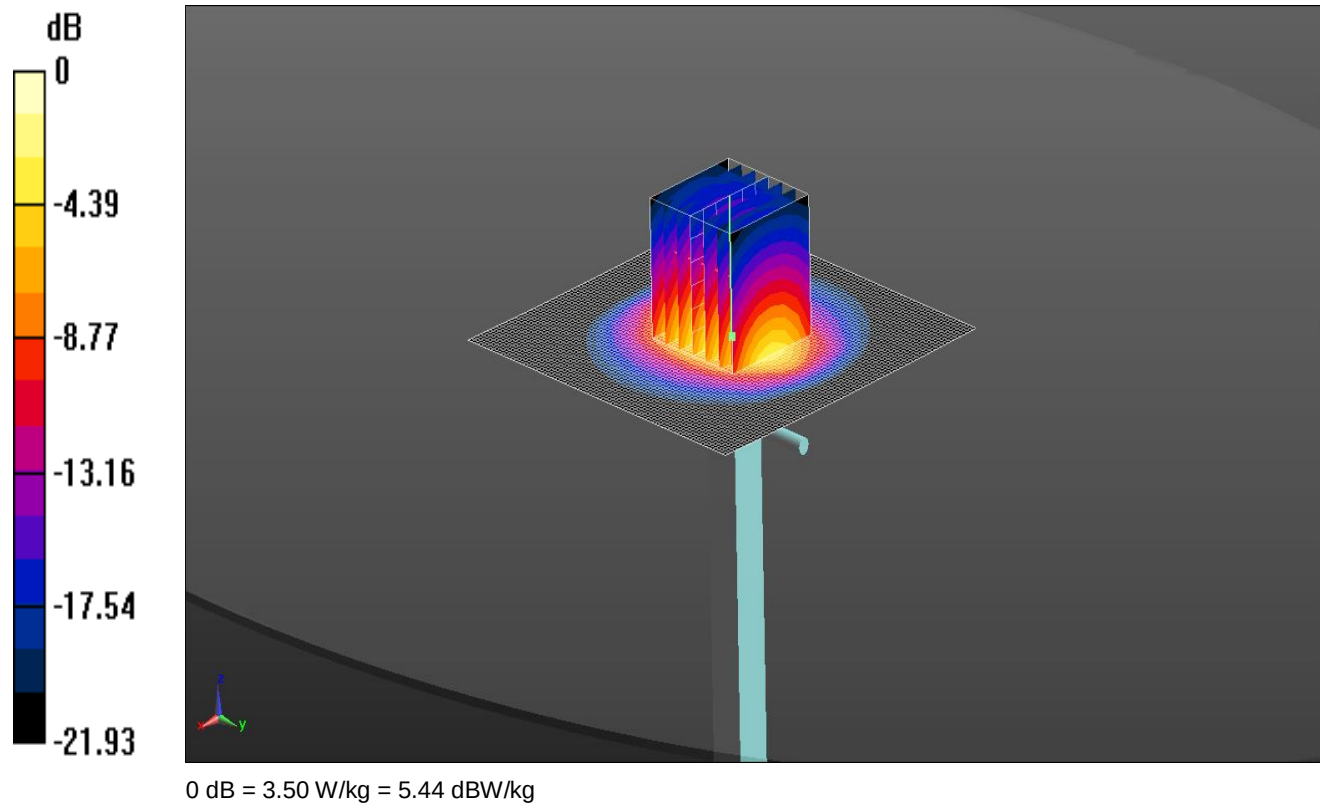
This appendix contains the following system validation distribution scans.

Scan Reference Number	Title
SYS/001	System Check 2450MHz Body 19 09 18 (Site 60)
SYS/002	System Check 2450MHz Body 26 09 18 (Site 60)
SYS/003	System Check 5250MHz Body 19 09 18 (Site 59)
SYS/004	System Check 5600MHz Body 24 09 18 (Site 59)
SYS/005	System Check 5600MHz Body 20 08 18 (Site 60)
SYS/006	System Check 5750MHz Body 19 09 18 (Site 60)

SYS/001: System Check 2450MHz Body 19 09 18 (Site 60)

Date: 19/09/2018

DUT: D2440V2 - SN701; Type: D2440V2; Serial: SN701



Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 10% MHz HSL Medium parameters used: $f = 2450$ MHz; $\sigma = 2.089$ S/m; $\epsilon_r = 51.063$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(7.69, 7.69, 7.69); Calibrated: 24/04/2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/d=10mm, Pin=250mW 2 2/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 3.51 W/kg

Configuration/d=10mm, Pin=250mW 2 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 37.87 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 5.42 W/kg

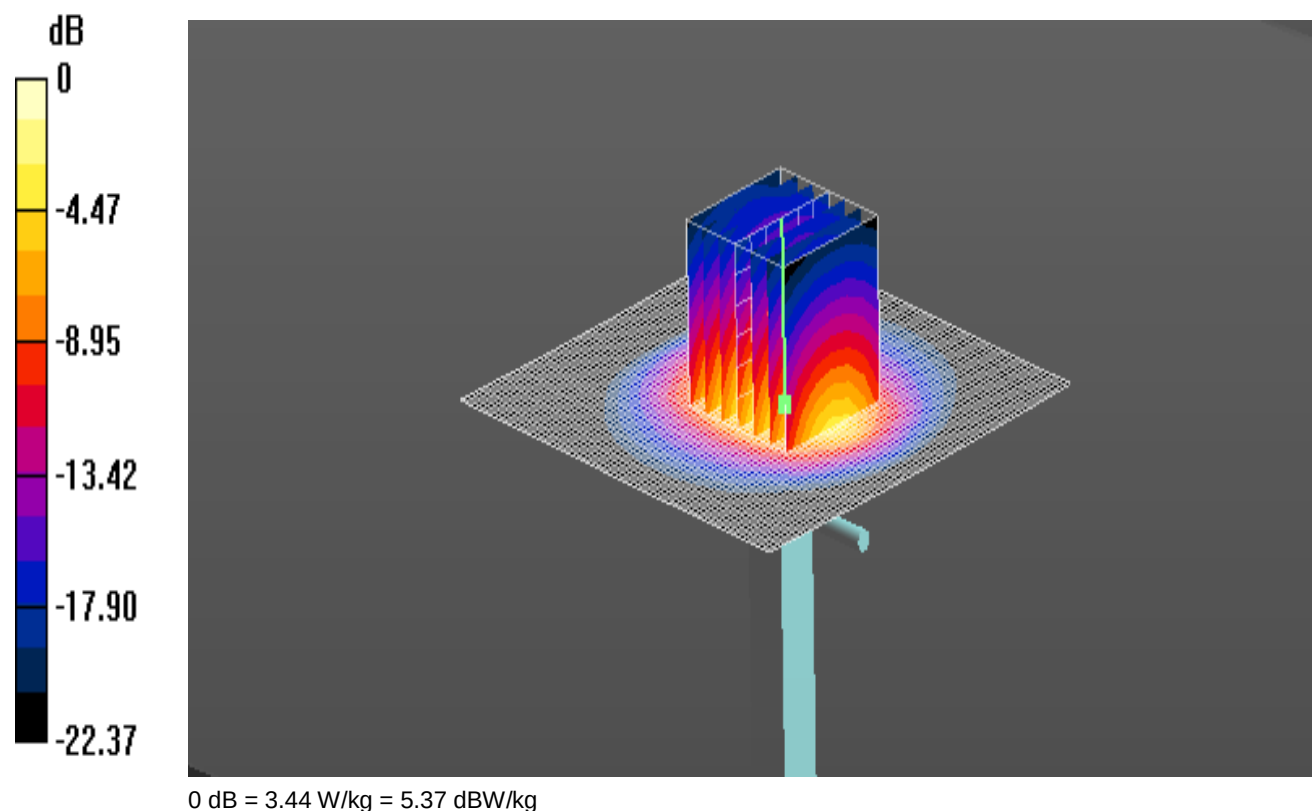
SAR(1 g) = 2.61 W/kg; SAR(10 g) = 1.22 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 3.50 W/kg

SYS/002: System Check 2450MHz Body 26 09 18 (Site 60)

Date: 26/09/2018

DUT: D2440V2 - SN701; Type: D2440V2; Serial: SN701



Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 10% MHz HSL Medium parameters used: $f = 2450$ MHz; $\sigma = 2.047$ S/m; $\epsilon_r = 49.494$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(7.69, 7.69, 7.69); Calibrated: 24/04/2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/d=10mm, Pin=50mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 3.49 W/kg

Configuration/d=10mm, Pin=50mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 37.37 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 5.39 W/kg

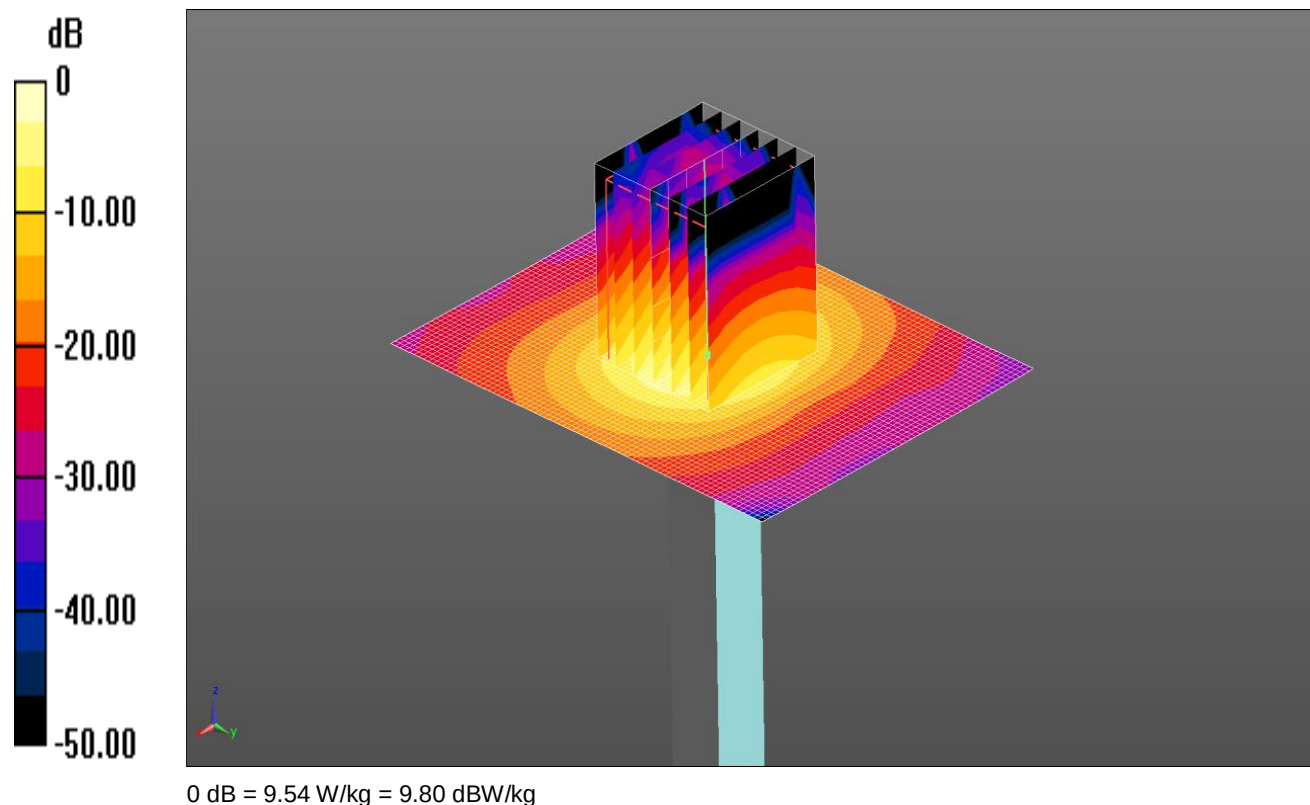
SAR(1 g) = 2.57 W/kg; SAR(10 g) = 1.19 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 3.44 W/kg

SYS/003: System Check 5250 MHz Body 19 09 18 (Site 59)

Date: 19/09/2018

DUT: D5GHzV2 - SN1016; Type: D5GHzV2; Serial: SN1016



Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5250, 5600, 5750 5% MHz HSL Medium parameters used: $f = 5250$ MHz; $\sigma = 5.304$ S/m; $\epsilon_r = 47.223$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7496; ConvF(5.09, 5.09, 5.09); Calibrated: 16/03/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 18/04/2018
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/d=10mm, Pin=100mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 9.58 W/kg

Configuration/d=10mm, Pin=100mW/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 45.86 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 16.0 W/kg

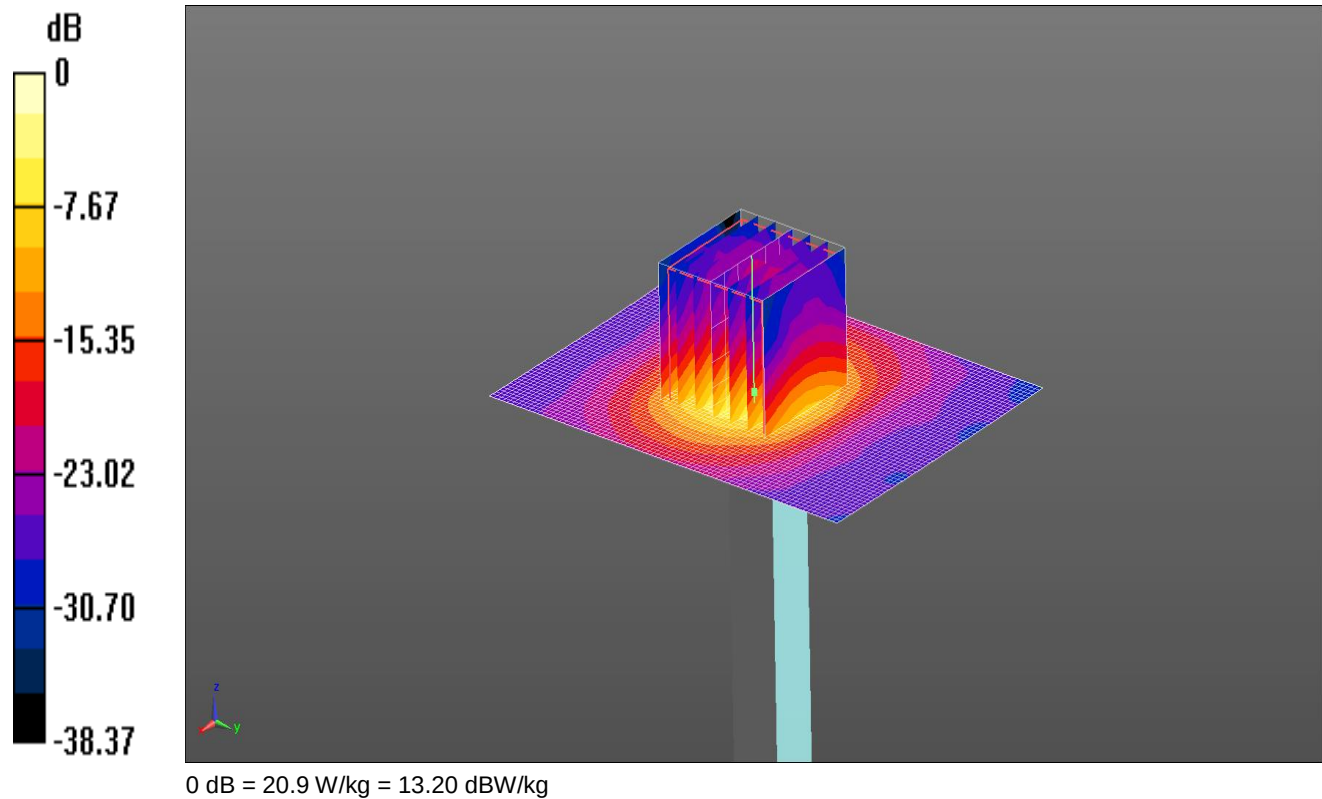
SAR(1 g) = 3.73 W/kg; SAR(10 g) = 1.05 W/kg

Maximum value of SAR (measured) = 9.54 W/kg

SYS/004: System Check 5600 MHz Body 24 09 18 (Site 59)

Date: 24/09/2018

DUT: D5GHzV2 - SN1016; Type: D5GHzV2; Serial: SN1016



Communication System: UID 0, CW (0); Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5600 5750 5% Medium parameters used: $f = 5600$ MHz; $\sigma = 5.89$ S/m; $\epsilon_r = 47.712$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7496; ConvF(4.32, 4.32, 4.32); Calibrated: 16/03/2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 18/04/2018
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/d=10mm, Pin=100mW 2 2/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 12.4 W/kg

Configuration/d=10mm, Pin=100mW 2 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.40 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 36.0 W/kg

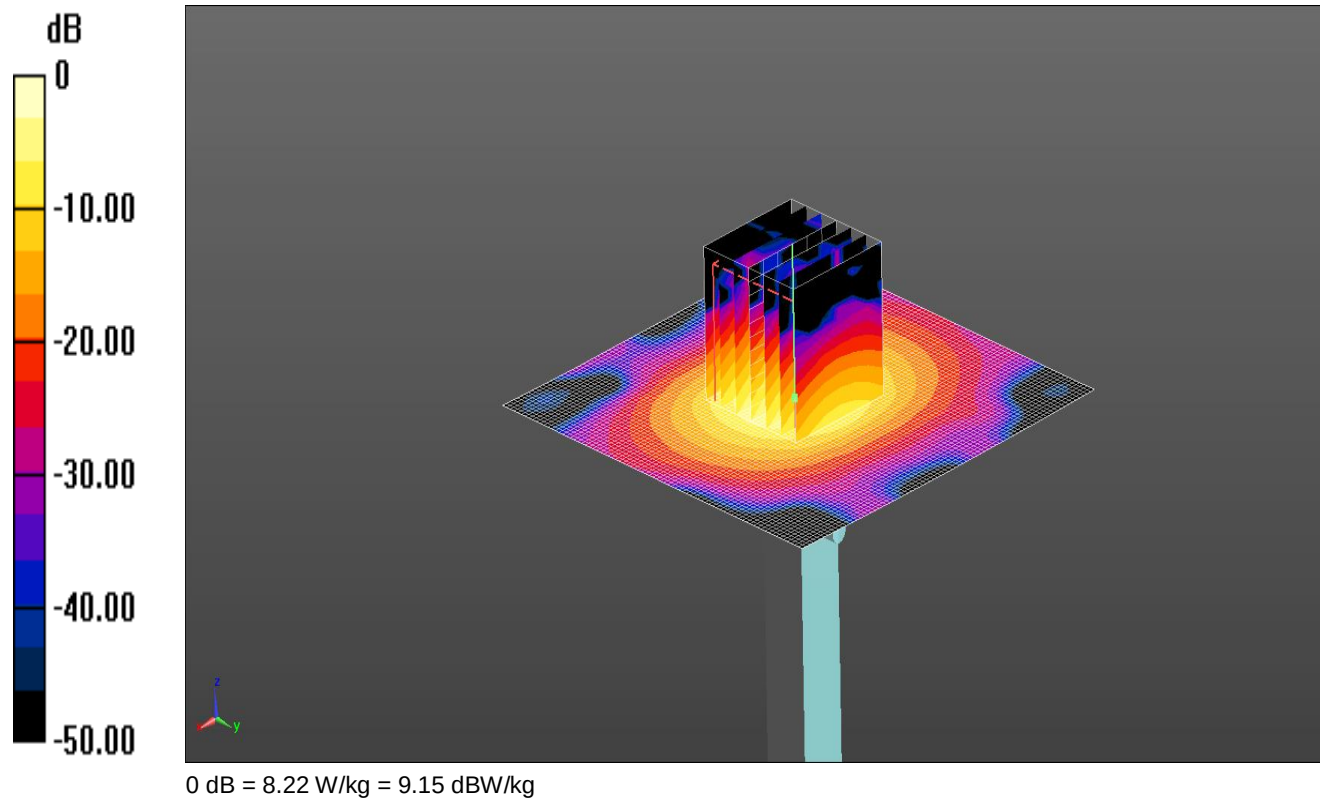
SAR(1 g) = 7.95 W/kg; SAR(10 g) = 2.25 W/kg

Maximum value of SAR (measured) = 20.9 W/kg

SYS/005: System Check 5600MHz Body 20 08 18 (Site 60)

Date: 20/08/2018

DUT: D5GHzV2 - SN1016; Type: D5GHzV2; Serial: SN1016



Communication System: UID 0, CW (0); Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5250,5600,5750 (5%) MHz MSL Medium parameters used: $f = 5600$ MHz; $\sigma = 5.959$ S/m; $\epsilon_r = 47.126$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(4.36, 4.36, 4.36); Calibrated: 24/04/2018;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

SAR/d=10mm, Pin=100mW 2/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 8.19 W/kg

SAR/d=10mm, Pin=100mW 2/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 27.36 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 16.7 W/kg

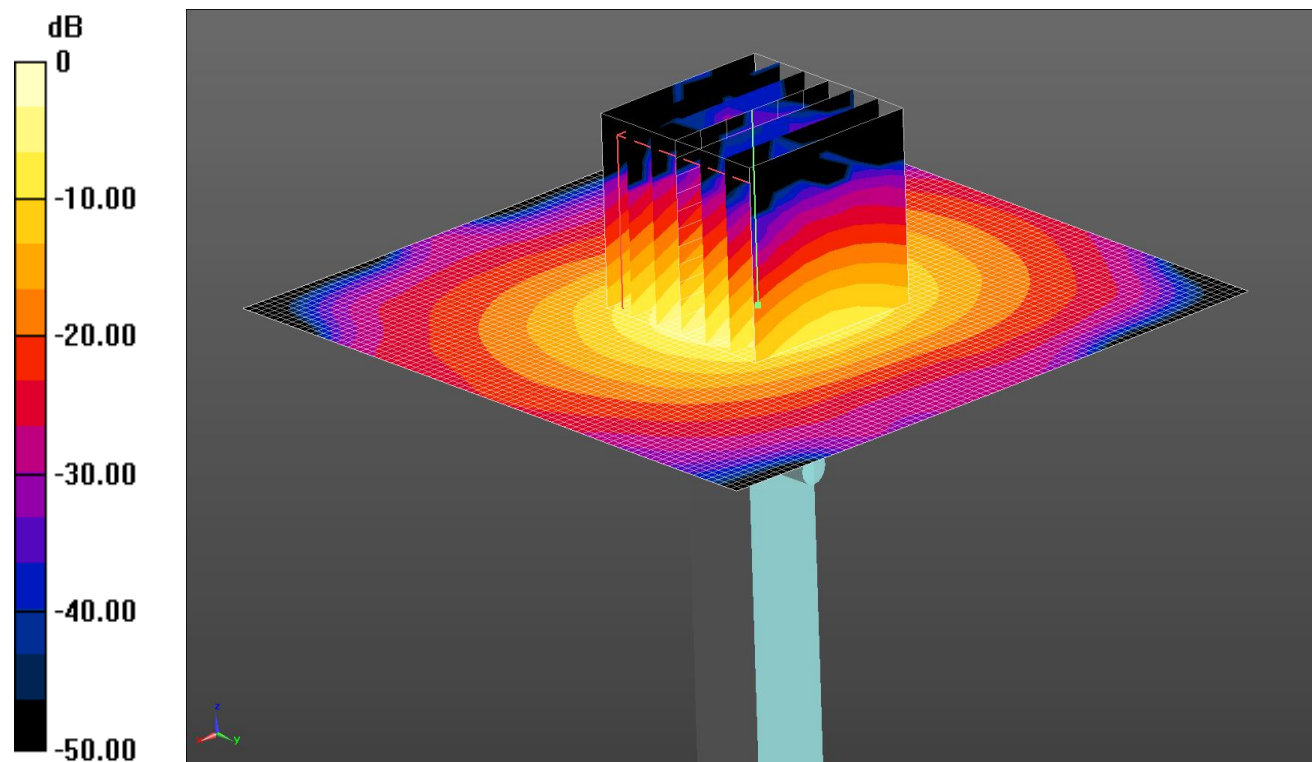
SAR(1 g) = 3.87 W/kg; SAR(10 g) = 1.07 W/kg

Maximum value of SAR (measured) = 8.22 W/kg

SYS/006: System Check 5750 MHz Body 19 09 18 (Site 60)

Date: 19/09/2018

DUT: D5GHzV2 - SN1016; Type: D5GHzV2; Serial: SN1016



0 dB = 16.4 W/kg = 12.15 dBW/kg

Communication System: UID 0, CW (0); Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5250 5600 5750 5% MHz MSL Medium parameters used: $f = 5750$ MHz; $\sigma = 6.118$ S/m; $\epsilon_r = 47.621$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(4.57, 4.57, 4.57); Calibrated: 24/04/2018;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/d=10mm, Pin=100mW 2 2/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

Configuration/d=10mm, Pin=100mW 2 2/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 63.99 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 33.9 W/kg

SAR(1 g) = 7.63 W/kg; SAR(10 g) = 2.13 W/kg

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

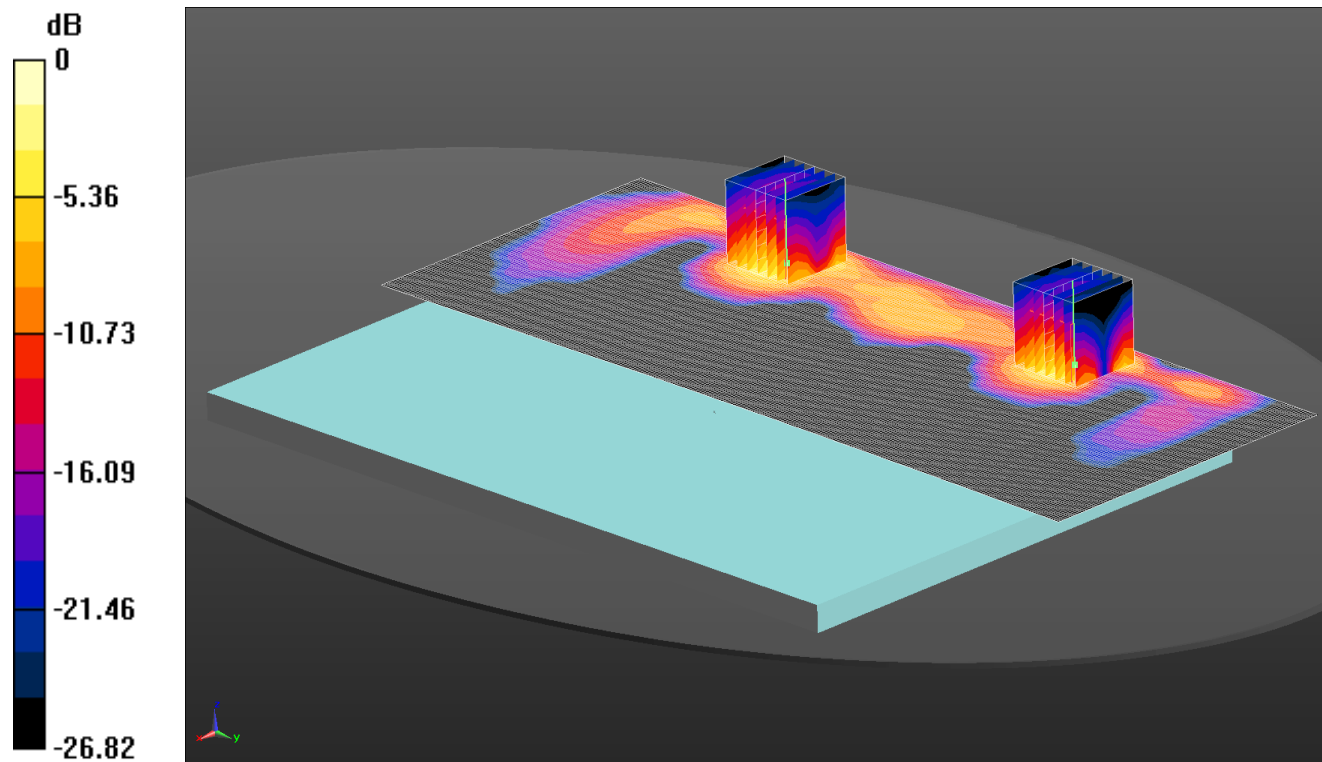
12.3. SAR Test Plots

Scan Reference Number	Title
SAR/001	Back 0mm WiFi 2.4 GHz 802.11n HT20 MIMO Ant W1+WF2 CH6
SAR/002	Back 0mm WiFi 5.3 GHz 802.11ac VHT80 SISO ANT WF2 CH58
SAR/003	Back 0mm WiFi 5.6 GHz 802.11ac VHT80 SISO ANT WF2 CH138
SAR/004	Back 0mm WiFi 5.8 GHz 802.11ac VHT80 SISO Ant WF2 CH155
SAR/005	Back 0mm BT EDR Ant WF1 CH39

SAR/001: Back 0mm WiFi 2.4 GHz 802.11n HT20 MIMO Ant WF1+WF2 CH6

Date: 19/09/2018

DUT: Apple Inc.; Type: Laptop Device ; Model No: A1932



0 dB = 1.32 W/kg = 1.21 dBW/kg

Communication System: UID 0, WLAN 802.11 (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 10% Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 2.078$ S/m; $\epsilon_r = 51.084$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(7.69, 7.69, 7.69); Calibrated: 24/04/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/Back 0mm 2/Area Scan (111x281x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.26 W/kg

Configuration/Back 0mm 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.72 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 0.651 W/kg; SAR(10 g) = 0.259 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 1.24 W/kg

Configuration/Back 0mm 2/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.72 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.77 W/kg

SAR(1 g) = 0.731 W/kg; SAR(10 g) = 0.299 W/kg (SAR corrected for target medium)

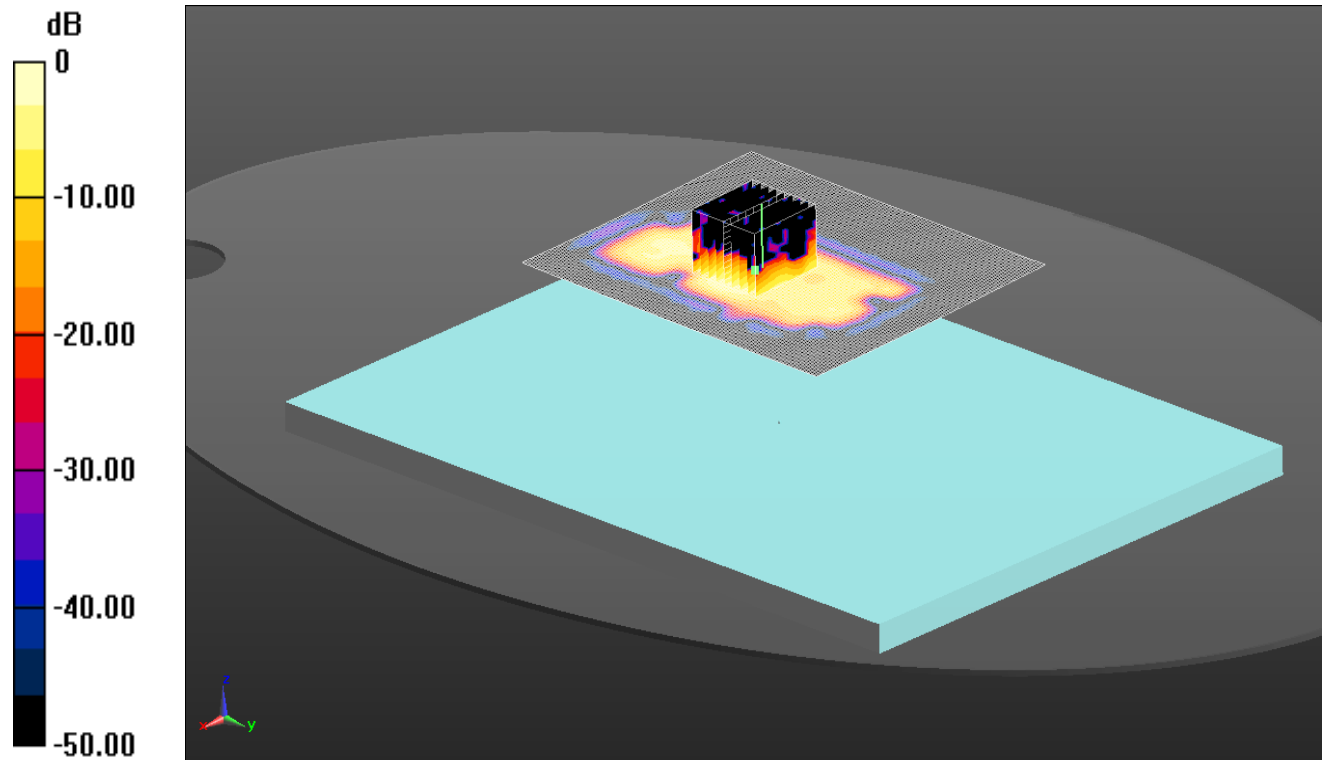
Maximum value of SAR (measured) = 1.32 W/kg

Note: DASY system is configured to measure any secondary maxima that are within 2dB of the measured SAR level.

SAR/002: Back 0mm WiFi 5.3 GHz 802.11ac VHT80 SISO ANT WF2 CH58

Date: 20/09/2018

DUT: Apple Inc.; Type: Laptop Device ; Model No: A1932



0 dB = 0.691 W/kg = -1.61 dBW/kg

Communication System: UID 0, WLAN 802.11 (0); Frequency: 5290 MHz; Duty Cycle: 1:1

Medium: 5250, 5600, 5750 5% MHz HSL Medium parameters used (interpolated): $f = 5290$ MHz; $\sigma = 5.359$ S/m; $\epsilon_r = 47.146$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7496; ConvF(5.09, 5.09, 5.09); Calibrated: 16/03/2018;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 18/04/2018
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/Back 0mm/Area Scan (121x151x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.512 W/kg

Configuration/Back 0mm/Zoom Scan (9x9x12)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

Reference Value = 10.13 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.57 W/kg

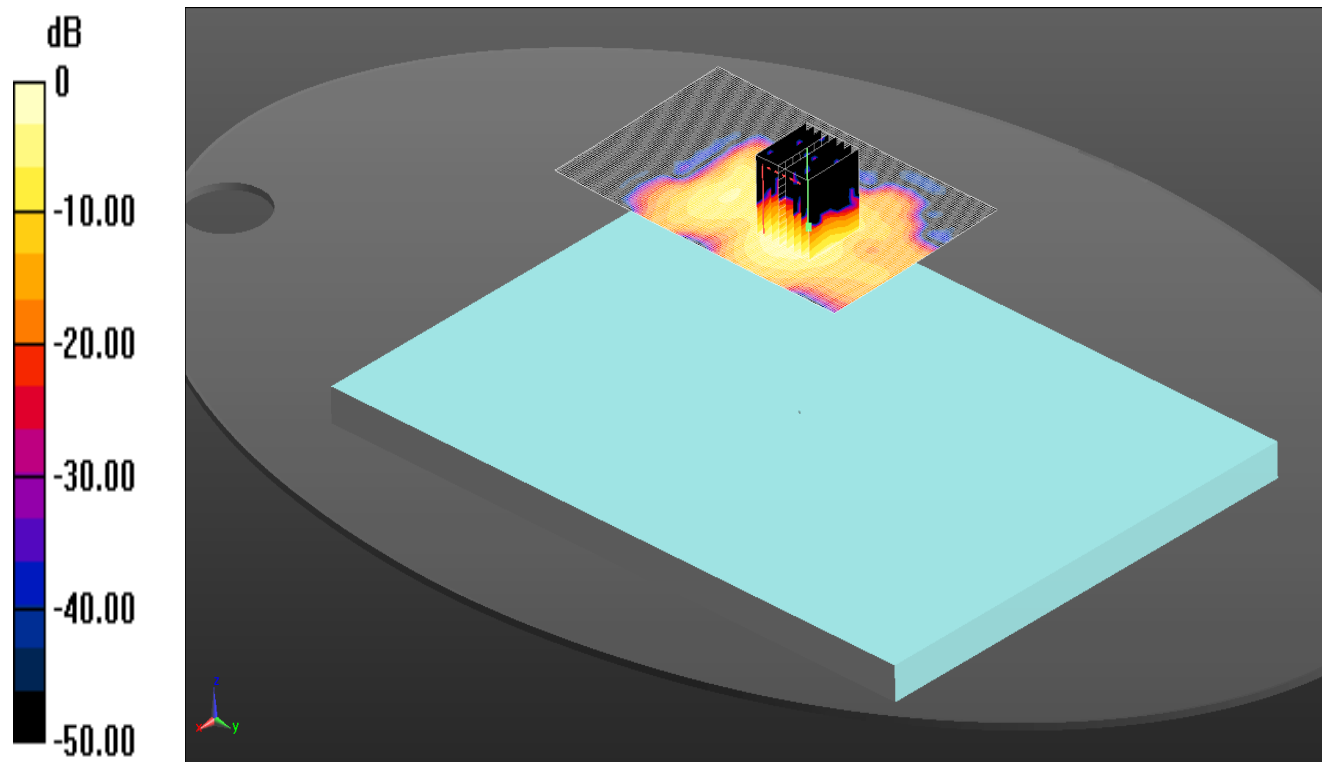
SAR(1 g) = 0.477 W/kg; SAR(10 g) = 0.169 W/kg

Maximum value of SAR (measured) = 0.691 W/kg

SAR/003: Back 0mm WiFi 5.6 GHz 802.11ac VHT80 SISO ANT WF2 CH138

Date: 22/09/2018

DUT: Apple Inc.; Type: Laptop Device ; Model No: A1932



0 dB = 1.16 W/kg = 0.64 dBW/kg

Communication System: UID 0, WLAN 802.11 (0); Frequency: 5690 MHz; Duty Cycle: 1:1

Medium: 5250, 5600, 5750 5% MHz HSL Medium parameters used (interpolated): $f = 5690$ MHz; $\sigma = 5.914$ S/m; $\epsilon_r = 46.442$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN7496; ConvF(4.54, 4.54, 4.54); Calibrated: 16/03/2018;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 18/04/2018
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/Back 0mm 2/Area Scan (91x151x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 0.840 W/kg

Configuration/Back 0mm 2/Zoom Scan (8x8x12)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

Reference Value = 14.27 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.98 W/kg

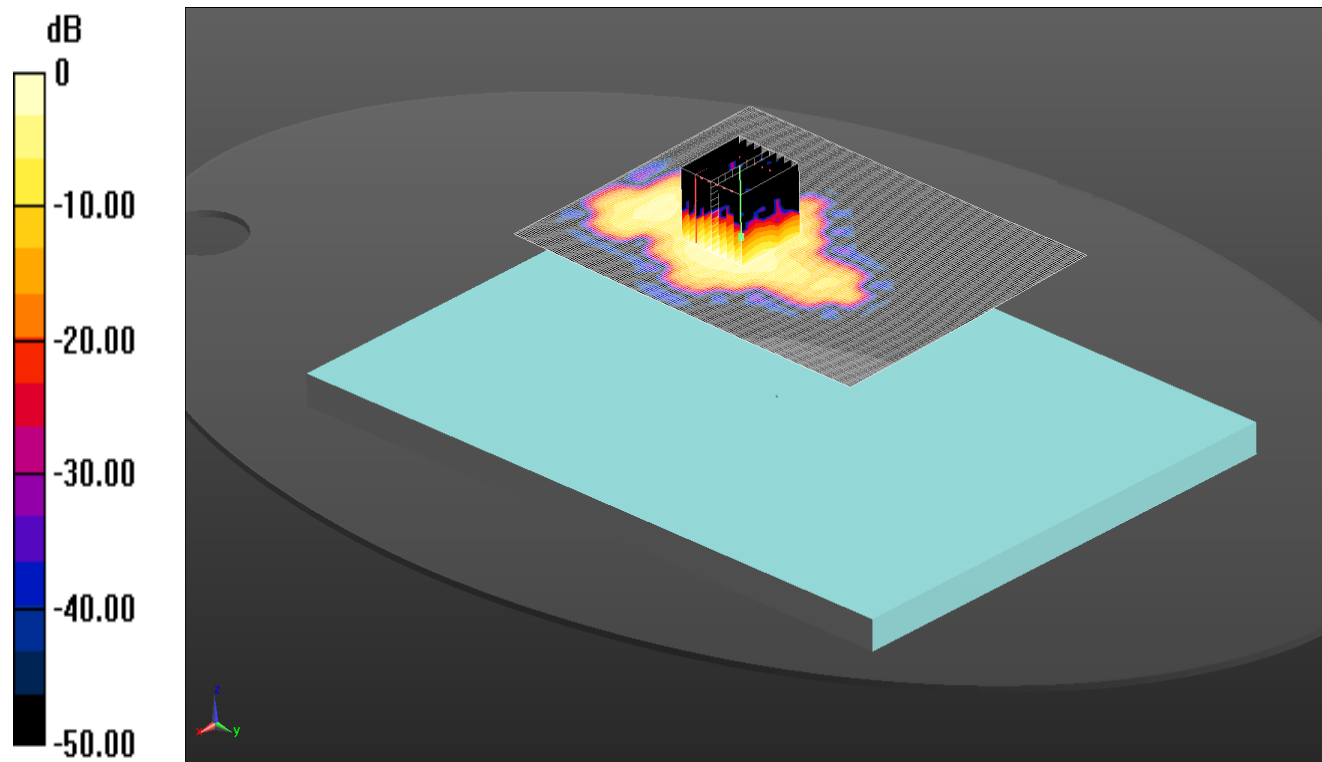
SAR(1 g) = 0.789 W/kg; SAR(10 g) = 0.280 W/kg

Maximum value of SAR (measured) = 1.16 W/kg

SAR/004: Back 0mm WiFi 5.8 GHz 802.11ac VHT80 SISO Ant WF2 CH155

Date: 20/09/2018

DUT: Apple Inc.; Type: Laptop Device ; Model No: A1932



0 dB = 1.38 W/kg = 1.40 dBW/kg

Communication System: UID 0, WLAN 802.11 (0); Frequency: 5775 MHz; Duty Cycle: 1:1

Medium: 5250 5600 5750 5% MHz MSL Medium parameters used (interpolated): $f = 5775$ MHz; $\sigma = 6.155$ S/m; $\epsilon_r = 47.572$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(4.57, 4.57, 4.57); Calibrated: 24/04/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/Back 0mm 2/Area Scan (131x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.43 W/kg

Configuration/Back 0mm 2/Zoom Scan (9x9x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.409 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 2.47 W/kg

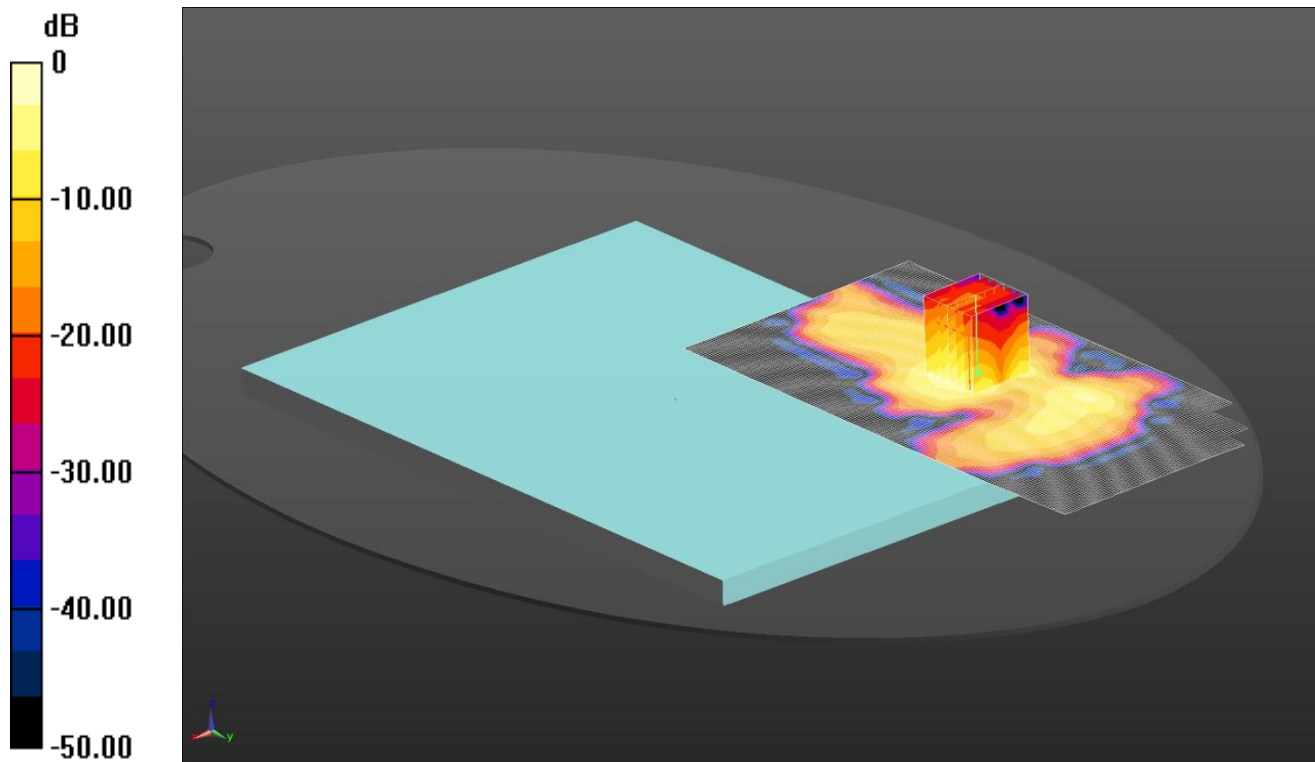
SAR(1 g) = 0.566 W/kg; SAR(10 g) = 0.202 W/kg

Maximum value of SAR (measured) = 1.38 W/kg

SAR/005: Back 0mm BT EDR WF1 CH39

Date: 26/09/2018

DUT: Apple Inc.; Type: Laptop Device ; Model No: A1932



0 dB = 0.478 W/kg = -3.21 dBW/kg

Communication System: UID 0, Bluetooth (0); Frequency: 2441 MHz; Duty Cycle: 1:1.30617

Medium: 2450 10% MHz HSL Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 2.039$ S/m; $\epsilon_r = 49.507$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3995; ConvF(7.69, 7.69, 7.69); Calibrated: 24/04/2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1435; Calibrated: 06/02/2018
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: xxxx
- ; SEMCAD X Version 14.6.10 (7417)

Configuration/Back 0mm 2/Area Scan (101x201x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.430 W/kg

Configuration/Back 0mm 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.133 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.621 W/kg

SAR(1 g) = 0.256 W/kg; SAR(10 g) = 0.105 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.478 W/kg