

Appendix B - System Performance Check Plots



## System Performance Check at 2450 MHz

## DUT: D2450V2\_SN712

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz;  $\sigma$  = 1.785 S/m;  $\epsilon_r$  = 37.89;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

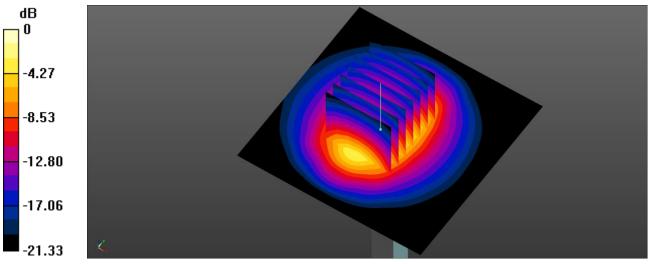
DASY5.2 Configuration:

- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN7647; ConvF(8.05, 8.05, 8.05) @ 2450 MHz; Calibrated: 2023/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2022/12/16
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 2450MHz/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm Maximum value of SAR (interpolated) = 3.97 W/kg

System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 46.78 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 4.78 W/kg SAR(1 g) = 2.58 W/kg; SAR(10 g) = 1.21 W/kg Smallest distance from peaks to all points 3 dB below = 9.1 mm Ratio of SAR at M2 to SAR at M1 = 49.8% Maximum value of SAR (measured) = 3.90 W/kg



0 dB = 3.90 W/kg = 5.91 dBW/kg



## System Performance Check at 2450 MHz

## DUT: D2450V2\_SN712

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz;  $\sigma$  = 1.823 S/m;  $\epsilon_r$  = 40.048;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

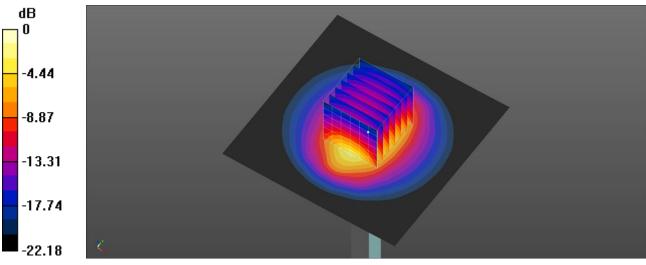
DASY5.2 Configuration:

- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN3847; ConvF(7.33, 7.5, 7.2) @ 2450 MHz; Calibrated: 2023/3/23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2023/3/22
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 2450MHz/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm Maximum value of SAR (interpolated) = 4.24 W/kg

System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 50.43 V/m; Power Drift = -0.11 dB Peak SAR (extrapolated) = 5.18 W/kg SAR(1 g) = 2.59 W/kg; SAR(10 g) = 1.23 W/kg Smallest distance from peaks to all points 3 dB below = 9 mm Ratio of SAR at M2 to SAR at M1 = 50.8% Maximum value of SAR (measured) = 4.25 W/kg



0 dB = 4.25 W/kg = 6.28 dBW/kg



## System Performance Check at 5250 MHz

## DUT: D5GHzV2\_SN1021

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5250 MHz;  $\sigma$  = 4.531 S/m;  $\epsilon_r$  = 34.611;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

DASY5.2 Configuration:

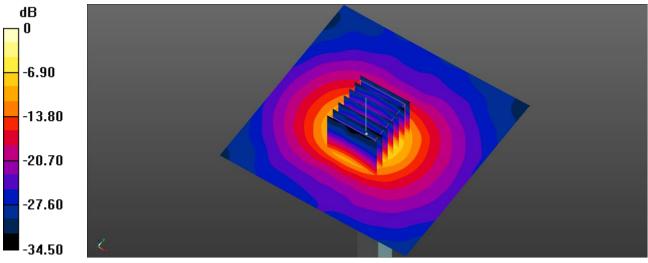
- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN7647; ConvF(5.6, 5.6, 5.6) @ 5250 MHz; Calibrated: 2023/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2022/12/16
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5250MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 8.80 W/kg

System Performance Check at 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 47.40 V/m; Power Drift = 0.10 dB Peak SAR (extrapolated) = 15.3 W/kg

SAR(1 g) = 3.79 W/kg; SAR(10 g) = 1.06 W/kg Smallest distance from peaks to all points 3 dB below = 7.4 mm Ratio of SAR at M2 to SAR at M1 = 65.5% Maximum value of SAR (measured) = 9.21 W/kg



0 dB = 9.21 W/kg = 9.64 dBW/kg



### System Performance Check at 5250 MHz

## DUT: D5GHzV2\_SN1021

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5250 MHz;  $\sigma$  = 4.441 S/m;  $\epsilon_r$  = 33.955;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

DASY5.2 Configuration:

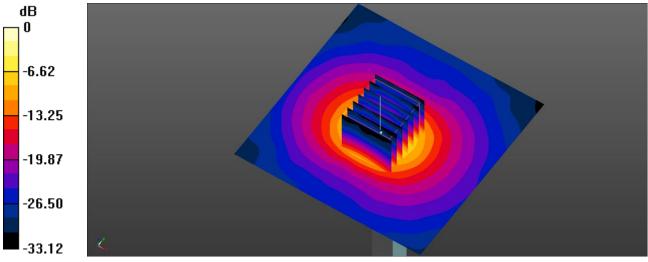
- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN7647; ConvF(5.6, 5.6, 5.6) @ 5250 MHz; Calibrated: 2023/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2022/12/16
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5250MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 8.62 W/kg

System Performance Check at 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 46.10 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 15.0 W/kg **SAR(1 g) = 3.72 W/kg; SAR(10 g) = 1.04 W/kg** Smallest distance from peaks to all points 3 dB below = 7.7 mm Ratio of SAR at M2 to SAR at M1 = 61.5% Maximum value of SAR (measured) = 9.03 W/kg



0 dB = 9.03 W/kg = 9.56 dBW/kg



## System Performance Check at 5250 MHz

## DUT: D5GHzV2\_SN1358

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5250 MHz;  $\sigma$  = 4.581 S/m;  $\epsilon_r$  = 35.406;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

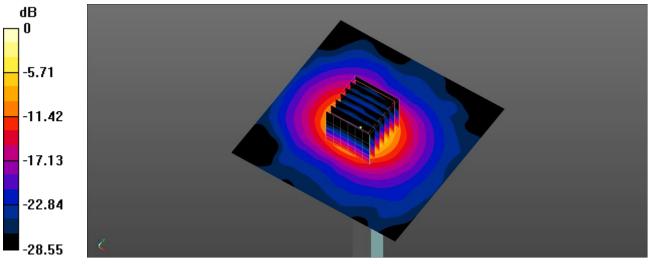
DASY5.2 Configuration:

- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN3847; ConvF(5.24, 5.27, 5.14) @ 5250 MHz; Calibrated: 2023/3/23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2023/3/22
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5250MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 9.72 W/kg

System Performance Check at 5250MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 47.22 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 16.6 W/kg SAR(1 g) = 4.01 W/kg; SAR(10 g) = 1.13 W/kg Smallest distance from peaks to all points 3 dB below = 7.4 mm Ratio of SAR at M2 to SAR at M1 = 63.9% Maximum value of SAR (measured) = 9.79 W/kg



<sup>0</sup> dB = 9.79 W/kg = 9.91 dBW/kg



## System Performance Check at 5600 MHz

## DUT: D5GHzV2\_SN1021

Communication System: UID 0, CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5600 MHz;  $\sigma$  = 4.986 S/m;  $\epsilon_r$  = 34.083;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

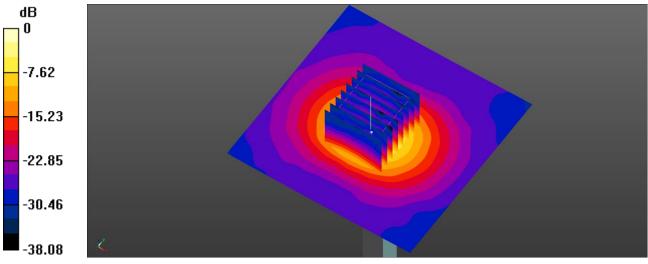
DASY5.2 Configuration:

- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN7647; ConvF(5.08, 5.08, 5.08) @ 5600 MHz; Calibrated: 2023/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2022/12/16
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5600MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 10.3 W/kg

System Performance Check at 5600MHz/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 49.07 V/m; Power Drift = 0.12 dB Peak SAR (extrapolated) = 18.7 W/kg SAR(1 g) = 4.23 W/kg; SAR(10 g) = 1.21 W/kg Smallest distance from peaks to all points 3 dB below = 7.5 mm Ratio of SAR at M2 to SAR at M1 = 62.1% Maximum value of SAR (measured) = 10.7 W/kg



0 dB = 10.7 W/kg = 10.29 dBW/kg



## System Performance Check at 5600 MHz

## DUT: D5GHzV2\_SN1358

Communication System: UID 0, CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5600 MHz;  $\sigma$  = 4.916 S/m;  $\epsilon_r$  = 34.969;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

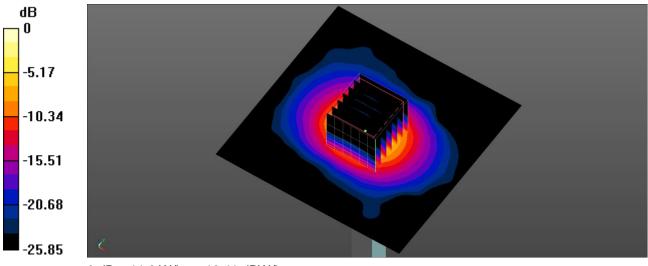
DASY5.2 Configuration:

- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN3847; ConvF(4.5, 4.5, 4.41) @ 5600 MHz; Calibrated: 2023/3/23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2023/3/22
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5600MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 10.5 W/kg

System Performance Check at 5600MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 54.19 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 18.7 W/kg SAR(1 g) = 4.39 W/kg; SAR(10 g) = 1.22 W/kg Smallest distance from peaks to all points 3 dB below = 7.4 mm Ratio of SAR at M2 to SAR at M1 = 63% Maximum value of SAR (measured) = 11.0 W/kg





## System Performance Check at 5750 MHz

## DUT: D5GHzV2\_SN1021

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5750 MHz;  $\sigma$  = 5.228 S/m;  $\epsilon_r$  = 33.68;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

DASY5.2 Configuration:

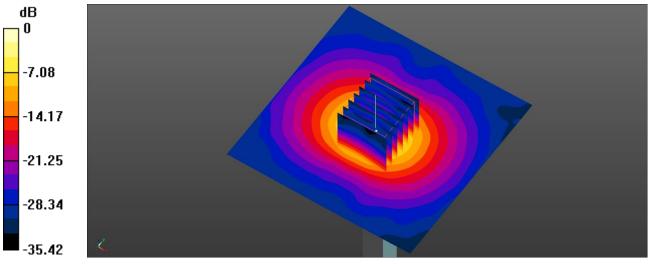
- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN7647; ConvF(5.05, 5.05, 5.05) @ 5750 MHz; Calibrated: 2023/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2022/12/16
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5750MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 9.60 W/kg

System Performance Check at 5750MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 48.08 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 17.9 W/kg **SAR(1 g) = 3.95 W/kg; SAR(10 g) = 1.09 W/kg** Smallest distance from peaks to all points 3 dB below = 7.4 mm Ratio of SAR at M2 to SAR at M1 = 61.2% Maximum value of SAR (measured) = 10.1 W/kg



0 dB = 10.1 W/kg = 10.04 dBW/kg



## System Performance Check at 5800 MHz

## DUT: D5GHzV2\_SN1021

Communication System: UID 0, CW (0); Frequency: 5800 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5800 MHz;  $\sigma$  = 5.176 S/m;  $\epsilon_r$  = 33.794;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

DASY5.2 Configuration:

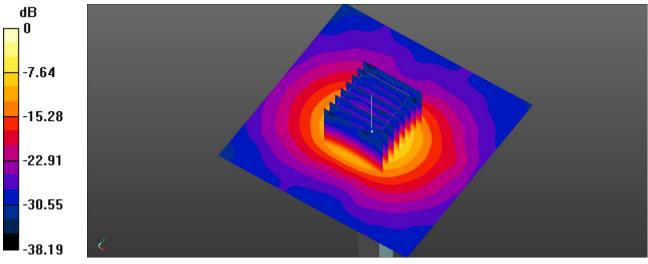
- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN7647; ConvF(5.05, 5.05, 5.05) @ 5800 MHz; Calibrated: 2023/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1253; Calibrated: 2022/12/16
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5800MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 9.76 W/kg

System Performance Check at 5800MHz/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 48.66 V/m; Power Drift = -0.05 dB Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 3.83 W/kg; SAR(10 g) = 1.09 W/kg Smallest distance from peaks to all points 3 dB below = 7.4 mm Ratio of SAR at M2 to SAR at M1 = 60.7% Maximum value of SAR (measured) = 9.84 W/kg



0 dB = 9.84 W/kg = 9.93 dBW/kg



## System Performance Check at 5800MHz

## DUT: D5GHzV2\_SN1358

Communication System: UID 0, CW (0); Frequency: 5800 MHz;Duty Cycle: 1:1 Medium parameters used: f = 5800 MHz;  $\sigma$  = 5.144 S/m;  $\epsilon_r$  = 34.61;  $\rho$  = 1000 kg/m<sup>3</sup> Phantom section: Flat Section Measurement Standard: DASY5

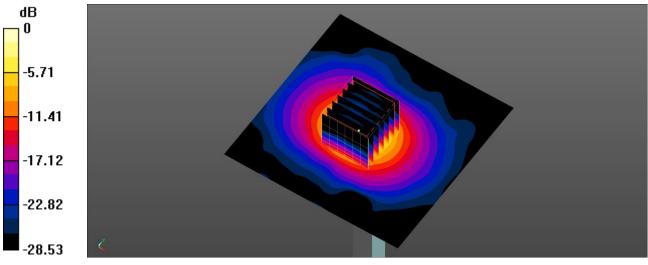
DASY5.2 Configuration:

- Area Scan setting Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 SN3847; ConvF(4.62, 4.66, 4.53) @ 5800 MHz; Calibrated: 2023/3/23
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2023/3/22
- Phantom: ELI; Type: QD OVA 002 AA; Serial: 1175
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5800MHz/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm Maximum value of SAR (interpolated) = 9.97 W/kg

System Performance Check at 5800MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 46.36 V/m; Power Drift = 0.06 dB Peak SAR (extrapolated) = 17.8 W/kg SAR(1 g) = 3.93 W/kg; SAR(10 g) = 1.1 W/kg Smallest distance from peaks to all points 3 dB below = 7.9 mm Ratio of SAR at M2 to SAR at M1 = 61.3% Maximum value of SAR (measured) = 9.79 W/kg



0 dB = 9.79 W/kg = 9.91 dBW/kg

Test Date : 2023-11-21 | Ambient Temp : 23.2 °C | Tissue Temp : 22.2 °C

#### System Performance Check

# System Performance Check at 6500 MHz

### Verification Source Properties

Manufacturer	Model No.	Serial No.	Input Power [dBm]
SPEAG	D6.5GHzV2	1016	20.0

### Exposure Conditions

Phantom Section	Group	Frequency [MHz]	<b>Conversion Factor</b>	TSL Conductivity [S/m]	TSL Permittivity
Flat	CW	6500.000	5.56	5.65	32.2

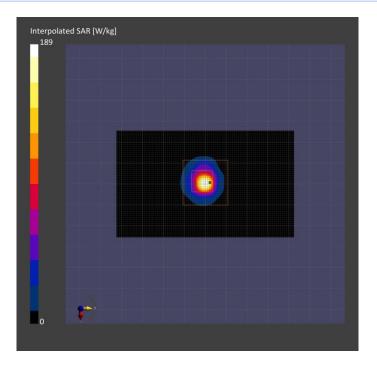
#### Hardware Setup

Phantom	Tissue Simulating Liquid	Probe   Calibration Date	DAE   Calibration Date
ELI V5.0 (20deg probe tilt) -	H51T71N2	EX3DV4 - SN7647 / 2023-04-26	DAE4 Sn1253 / 2022-12-16
1175			

#### Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	51.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	N/A	Yes
Grading Ratio	N/A	1.4

	Area Scan	Zoom Scan
psSAR-1g [W/kg]	23.1	28.4
psSAR- <i>8g</i> [W/kg]	5.55	6.16
psSAR- <i>10g</i> [W/kg]	4.48	5.32
psAPD (1.0 cm², sq) [W/m²]		284
psAPD (4.0 cm², sq) [W/m²]		138
Power Drift [dB]		0.15
TSL Correction	Positive only	Positive only





Test Date : 2023-12-27 | Ambient Temp : 22.8 °C | Tissue Temp : 22.0 °C

#### System Performance Check

# System Performance Check at 6500 MHz

### Verification Source Properties

Manufacturer	Model No.	Serial No.	Input Power [dBm]
SPEAG	D6.5GHzV2	1016	20.0

### Exposure Conditions

Phantom Section	Group	Frequency [MHz]	<b>Conversion Factor</b>	TSL Conductivity [S/m]	TSL Permittivity
Flat	CW	6500.000	5.6	6	33.4

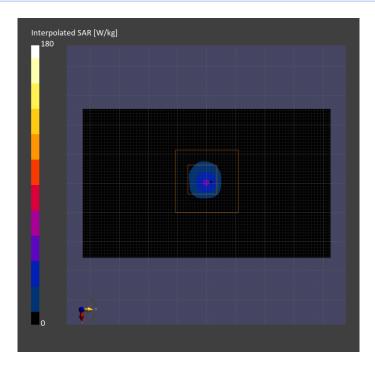
#### Hardware Setup

Phantom	Tissue Simulating Liquid	Probe   Calibration Date	DAE   Calibration Date
ELI V5.0 (20deg probe tilt) -	H51T71N2	EX3DV4 - SN3847 / 2023-03-23	DAE4 Sn541 / 2023-03-22
1175			

#### Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	51.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	N/A	Yes
Grading Ratio	N/A	1.4

	Area Scan	Zoom Scan
psSAR-1g [W/kg]	24.0	27.3
psSAR- <i>8g</i> [W/kg]	5.68	6.22
psSAR- <i>10g</i> [W/kg]	4.71	5.08
psAPD (1.0 cm², sq) [W/m²]		271
psAPD ( <i>4.0 cm</i> <sup>2</sup> , sq) [W/m <sup>2</sup> ]		121
Power Drift [dB]		0.03
TSL Correction	Positive only	Positive only





Test Date : 2023-11-22 | Ambient Temp : 22.9 °C

# System Performance Check

# System Performance Check at 10 GHz

# Verification Source Properties

Manufacturer	Model No.	Serial No.
SPEAG	10GHz	2003

# Exposure Conditions

Phantom Section	Group	Frequency [MHz]	Conversion Factor
5G	CW	10000.0	1.0

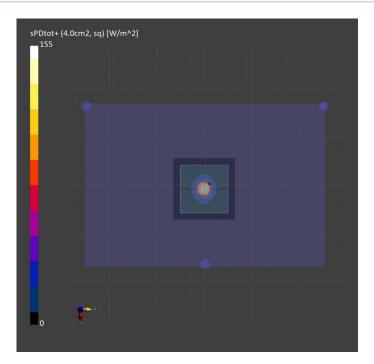
# Hardware Setup

Phantom	Medium	Probe   Calibration Date	DAE   Calibration Date
mmWave - 5G Phantom	Air	EUmmWV4 - SN9639_F1-55GHz / 2023-08-18	DAE4 Sn1253 / 2022-12-16

#### Scan Setup

	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [mm]	0.25 x 0.25
Sensor Surface [mm]	10.0

	5G Scan
Avg. Area [cm <sup>2</sup> ]	4.00
psPD n+ [W/m²]	155
psPD tot+ [W/m <sup>2</sup> ]	158
psPD mod+ [W/m <sup>2</sup> ]	162
E max [V/m]	282
Power Drift [dB]	0.09





Test Date : 2023-12-27 | Ambient Temp : 22.8 °C

## System Performance Check

# System Performance Check at 10 GHz

## Verification Source Properties

Manufacturer	Model No.	Serial No.
SPEAG	10GHz	1060

## Exposure Conditions

Phantom Section	Group	Frequency [MHz]	Conversion Factor
5G	CW	10000.0	1.0

### Hardware Setup

Phantom	Medium	Probe   Calibration Date	DAE   Calibration Date
mmWave - 5G Phantom	Air	EUmmWV4 - SN9639_F1-55GHz	DAE4 Sn541 / 2023-03-22
		/ 2023-08-18	

#### Scan Setup

	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [mm]	0.25 x 0.25
Sensor Surface [mm]	10.0

	5G Scan
Avg. Area [cm <sup>2</sup> ]	4.00
psPD n+ [W/m²]	52.2
psPD tot+ [W/m <sup>2</sup> ]	54.3
psPD mod+ [W/m <sup>2</sup> ]	54.9
E max [V/m]	158
Power Drift [dB]	-0.00

