

APPENDIX A: VERIFICATION PLOTS

PCTEST

Date: 12-05-2020

3700 Head Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 3700.0 | 3600 Head | 2.99 | 37.3 | 21.4 | 20.5 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

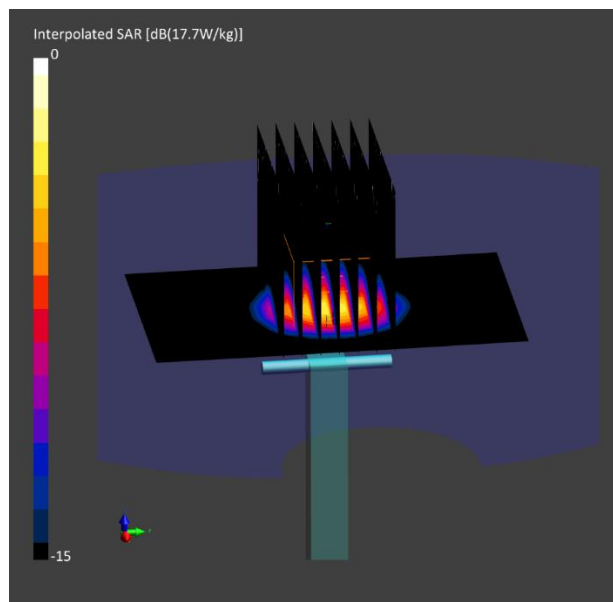
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|------------------------------|------------------|-----------------------------|-------------------|-------------------------|
| Twin-SAM V8.0 (Right) - 1981 | D3700V2 - SN1067 | EX3DV4 - SN7526, 2020-03-18 | 6.31 | DAE4 Sn1449, 2020-09-10 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 40.0 x 80.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 5.0 x 5.0 x 1.4 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | Yes |
| Grading Ratio | n/a | 1.5 |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 6.48 |
| psSAR10g [W/Kg] | 2.39 |
| Dev. 1g [%] | -3.57 |



PCTEST

Date: 10-27-2020

1750 Body Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 1750.0 | 1750 Body | 1.51 | 52.9 | 24.8 | 22.3 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

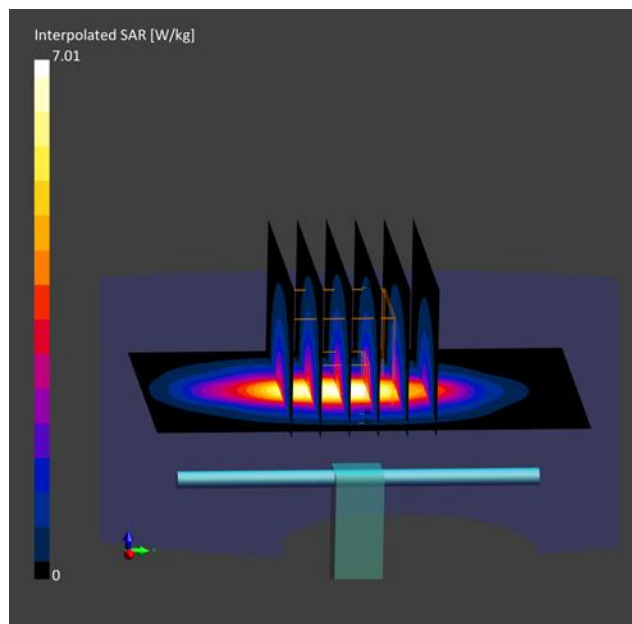
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|------------------------------|------------------|-----------------------------|-------------------|------------------------|
| Twin-SAM V8.0 (Right) - 1981 | D1750V2 - SN1150 | EX3DV4 - SN7526, 2020-03-18 | 7.62 | DAE4 Sn859, 2019-12-18 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 60.0 x 90.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 6.0 x 6.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | No |
| Grading Ratio | n/a | n/a |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 3.93 |
| psSAR10g [W/Kg] | 2.10 |
| Dev. 1g [%] | 7.38 |



PCTEST

Date: 12-01-2020

1750 Body Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 1750.0 | 1750 Body | 1.45 | 55.4 | 21.4 | 21.0 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

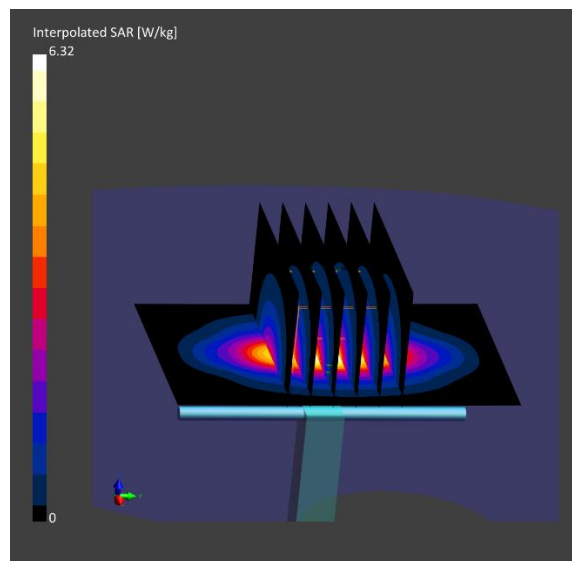
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|----------------------|------------------|-----------------------------|-------------------|-------------------------|
| Twin-SAM V8.0 - 1978 | D1750V2 - SN1150 | EX3DV4 - SN7527, 2020-03-17 | 8.1 | DAE4 Sn1582, 2020-04-15 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 60.0 x 90.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | Yes |
| Grading Ratio | n/a | 1.5 |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 3.48 |
| psSAR10g [W/Kg] | 1.86 |
| Dev. 10g [%] | -4.12 |



PCTEST

Date: 10-26-2020

1900 Body Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 1900.0 | 1900 Body | 1.57 | 53.1 | 21.3 | 20.9 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

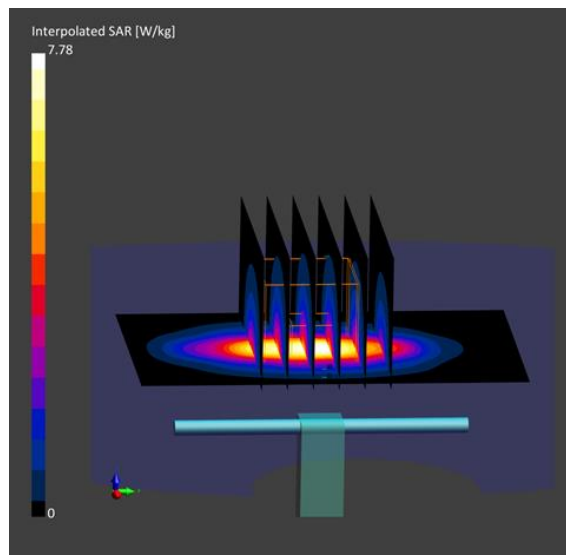
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|------------------------------|-------------------|-----------------------------|-------------------|------------------------|
| Twin-SAM V8.0 (Right) - 1981 | D1900V2 - SN5d080 | EX3DV4 - SN7526, 2020-03-18 | 7.33 | DAE4 Sn859, 2019-12-18 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 60.0 x 90.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 6.0 x 6.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | No |
| Grading Ratio | n/a | n/a |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 4.24 |
| psSAR10g [W/Kg] | 2.18 |
| Dev. 1g [%] | 8.16 |
| Dev. 10g [%] | 5.83 |



PCTEST

Date: 11-04-2020

1900 Body Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 1900.0 | 1900 Body | 1.58 | 52.9 | 22.4 | 22.5 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

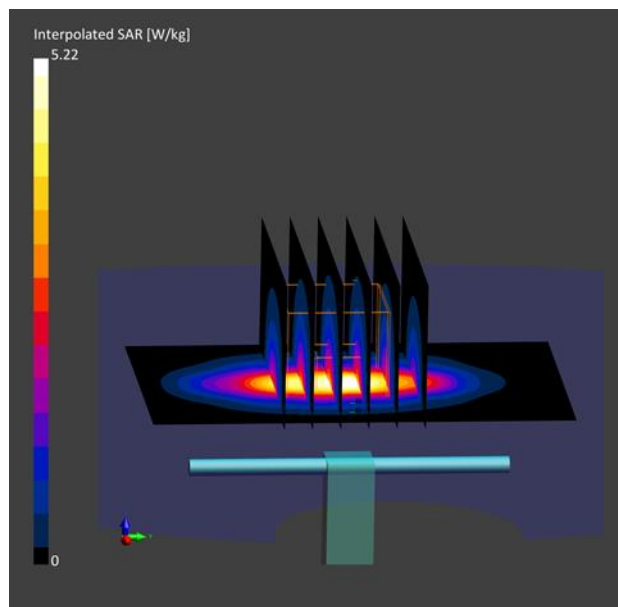
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|------------------------------|-------------------|-----------------------------|-------------------|------------------------|
| Twin-SAM V8.0 (Right) - 1981 | D1900V2 - SN5d148 | EX3DV4 - SN7526, 2020-03-18 | 7.33 | DAE4 Sn859, 2019-12-18 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 60.0 x 90.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 6.0 x 6.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | No |
| Grading Ratio | n/a | n/a |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 4.15 |
| psSAR10g [W/Kg] | 2.14 |
| Dev. 1g [%] | 6.14 |



PCTEST

Date: 12-01-2020

1900 Body Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 1900.0 | 1900 Body | 1.56 | 55.1 | 21.4 | 21.0 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

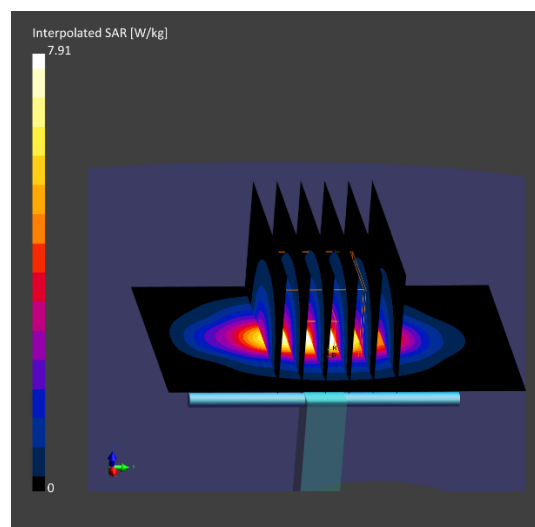
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|----------------------|-------------------|-----------------------------|-------------------|-------------------------|
| Twin-SAM V8.0 - 1978 | D1900V2 - SN5d149 | EX3DV4 - SN7527, 2020-03-17 | 7.78 | DAE4 Sn1582, 2020-04-15 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 60.0 x 90.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | Yes |
| Grading Ratio | n/a | 1.5 |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 4.05 |
| psSAR10g [W/Kg] | 2.09 |
| Dev. 1g [%] | 2.79 |



PCTEST

Date: 11-02-2020

2600 Body Verification

Medium

| Frequency [MHz] | TSL | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [C] | Tissue Temperature [C] |
|-----------------|-----------|------------------------|------------------|-------------------------|------------------------|
| 2600.0 | 2450 Body | 2.21 | 51.6 | 20.8 | 20.5 |

Exposure Conditions

| Phantom Section | Test Distance [mm] | Power [dBm] | Communication System, UID |
|-----------------|--------------------|-------------|---------------------------|
| Flat | 10 | 20.0 | CW, 0 |

Hardware Setup

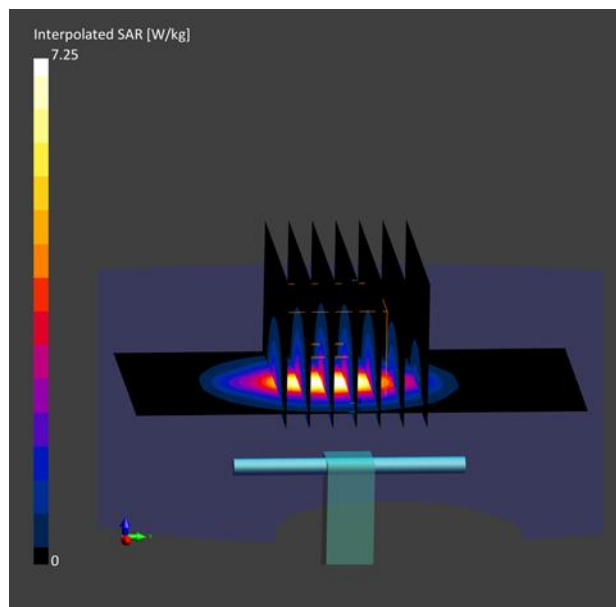
| Phantom | Dipole | Probe, Calibration Date | Conversion Factor | DAE, Calibration Date |
|------------------------------|------------------|-----------------------------|-------------------|------------------------|
| Twin-SAM V8.0 (Right) - 1981 | D2600V2 - SN1064 | EX3DV4 - SN7526, 2020-03-18 | 7.0 | DAE4 Sn859, 2019-12-18 |

Scans Setup

| | Area Scan | Zoom Scan |
|---------------------|-------------|--------------------|
| Grid Extents [mm] | 48.0 x 96.0 | 50.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 12.0 x 12.0 | 5.0 x 5.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | No | No |
| Grading Ratio | n/a | n/a |

Measurement Results

| | Zoom Scan |
|-----------------|-----------|
| psSAR1g [W/Kg] | 5.76 |
| psSAR10g [W/Kg] | 2.56 |
| Dev. 10g [%] | 2.40 |



PCTEST

Date: 11/23/2020

30 GHz System Verification

Device Under Test Properties

| | |
|----------------------------|---------------|
| DUT | Serial Number |
| 30 GHz Verification Source | 1043 |

Exposure Conditions

| Phantom Section | Position | Test Distance [mm] | Band | Frequency [MHz] |
|-----------------|----------|--------------------|-----------------|-----------------|
| 5G | FRONT | 5.55 | Validation band | 30000.0 |

Hardware Setup

| | |
|-----------------------------|-------------------------|
| Probe, Calibration Date | DAE, Calibration Date |
| EUmWV3 - SN9364, 06/24/2020 | DAE4 SN1582, 04/15/2020 |

Software Setup

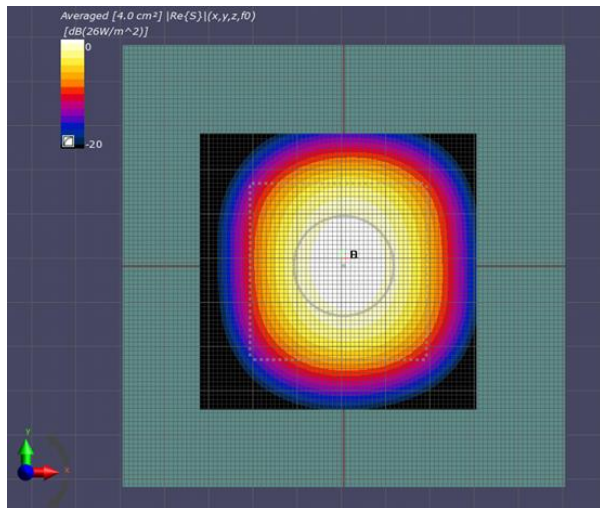
| | |
|----------------------|------------------|
| Software | Software Version |
| cDASY6 Module mmWave | 2.0.2.34 |

Scans Setup

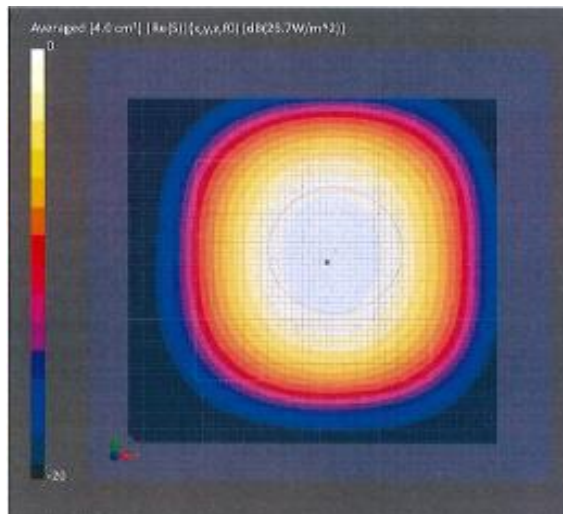
| | |
|---------------------|-------------|
| Scan Type | 5G Scan |
| Grid Extents [mm] | 60.0 x 60.0 |
| Grid Steps [lambda] | 0.25 x 0.25 |
| Sensor Surface [mm] | 5.55 |

Measurement Results

| | |
|-------------------------------------------|---------|
| Scan Type | 5G Scan |
| Avg. Area [cm ²] | 4.00 |
| pS _{tot} avg [W/m ²] | 26.0 |
| pS _n avg [W/m ²] | 25.6 |
| E _{peak} [V/m] | 116 |
| Deviation (dB) | -0.12 |



30GHz System Verification



Calibration Certificate

PCTEST

Date: 11/24/2020

30 GHz System Verification

Device Under Test Properties

| | |
|----------------------------|---------------|
| DUT | Serial Number |
| 30 GHz Verification Source | 1043 |

Exposure Conditions

| Phantom Section | Position | Test Distance [mm] | Band | Frequency [MHz] |
|-----------------|----------|--------------------|-----------------|-----------------|
| 5G | FRONT | 5.55 | Validation band | 30000.0 |

Hardware Setup

| | |
|------------------------------|-------------------------|
| Probe, Calibration Date | DAE, Calibration Date |
| EUmmWV3 - SN9364, 06/24/2020 | DAE4 SN1582, 04/15/2020 |

Software Setup

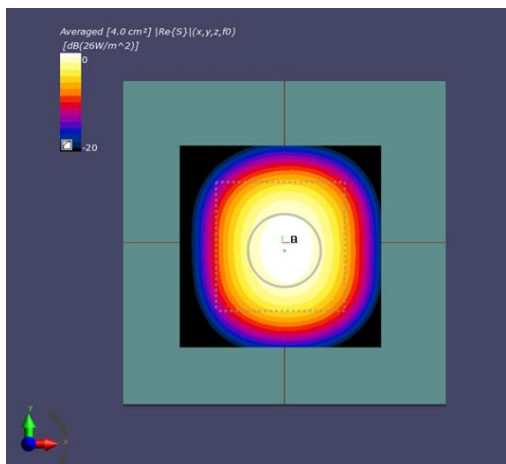
| | |
|----------------------|------------------|
| Software | Software Version |
| cDASY6 Module mmWave | 2.0.2.34 |

Scans Setup

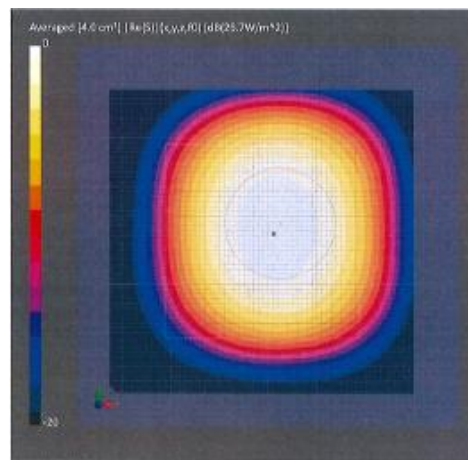
| | |
|---------------------|-------------|
| Scan Type | 5G Scan |
| Grid Extents [mm] | 60.0 x 60.0 |
| Grid Steps [lambda] | 0.25 x 0.25 |
| Sensor Surface [mm] | 5.55 |

Measurement Results

| | |
|-------------------------------------------|---------|
| Scan Type | 5G Scan |
| Avg. Area [cm ²] | 4.00 |
| pS _{tot} avg [W/m ²] | 25.8 |
| pS _n avg [W/m ²] | 25.4 |
| E _{peak} [V/m] | 115 |
| Deviation (dB) | -0.15 |



30GHz System Verification



Calibration Certificate

PCTEST

Date: 12/05/2020

30 GHz System Verification

Device Under Test Properties

| | |
|----------------------------|---------------|
| DUT | Serial Number |
| 30 GHz Verification Source | 1043 |

Exposure Conditions

| Phantom Section | Position | Test Distance [mm] | Band | Frequency [MHz] |
|-----------------|----------|--------------------|-----------------|-----------------|
| 5G | FRONT | 5.55 | Validation band | 30000.0 |

Hardware Setup

| | |
|-----------------------------|-------------------------|
| Probe, Calibration Date | DAE, Calibration Date |
| EUmWV3 - SN9364, 06/24/2020 | DAE4 SN1582, 04/15/2020 |

Software Setup

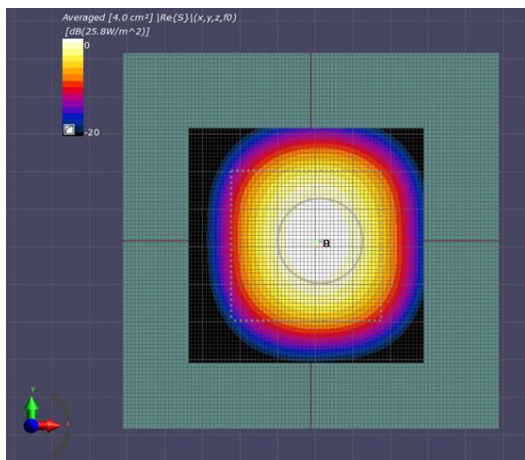
| | |
|----------------------|------------------|
| Software | Software Version |
| cDASY6 Module mmWave | 2.0.2.34 |

Scans Setup

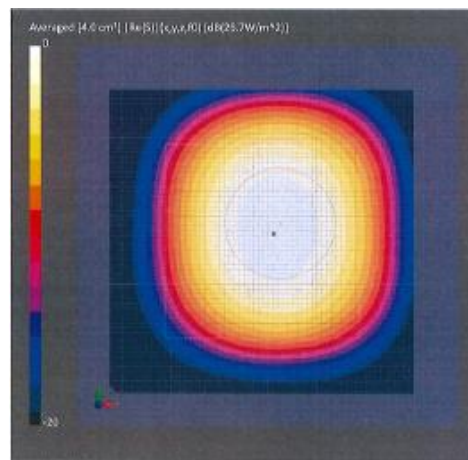
| | |
|---------------------|-------------|
| Scan Type | 5G Scan |
| Grid Extents [mm] | 60.0 x 60.0 |
| Grid Steps [lambda] | 0.25 x 0.25 |
| Sensor Surface [mm] | 5.55 |

Measurement Results

| | |
|-------------------------------------------|---------|
| Scan Type | 5G Scan |
| Avg. Area [cm ²] | 4.00 |
| pS _{tot} avg [W/m ²] | 25.7 |
| pS _n avg [W/m ²] | 26.0 |
| E _{peak} [V/m] | 116 |
| Deviation (dB) | -0.12 |



30GHz System Verification



Calibration Certificate