DASY5 Validation Report for Head TSL

Date: 12.06.2024

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1060

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5250 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.55 S/m; ε_r = 36.4; ρ = 1000 kg/m^3
Medium parameters used: f = 5250 MHz; σ = 4.6 S/m; ε_r = 36.3; ρ = 1000 kg/m^3
Medium parameters used: f = 5300 MHz; σ = 4.64 S/m; ε_r = 36.2; ρ = 1000 kg/m^3
Medium parameters used: f = 5500 MHz; σ = 4.86 S/m; ε_r = 35.8; ρ = 1000 kg/m^3
Medium parameters used: f = 5600 MHz; σ = 4.97 S/m; ε_r = 35.6; ρ = 1000 kg/m^3
Medium parameters used: f = 5750 MHz; σ = 5.14 S/m; ε_r = 35.4; ρ = 1000 kg/m^3
Medium parameters used: f = 5800 MHz; σ = 5.19 S/m; ε_r = 35.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.63, 5.63, 5.63) @ 5200 MHz, ConvF(5.39, 5.39, 5.39) @ 5250 MHz, ConvF(5.38, 5.38, 5.38) @ 5300 MHz, ConvF(5.04, 5.04, 5.04) @ 5500 MHz, ConvF(5, 5, 5) @ 5600 MHz, ConvF(4.98, 4.98, 4.98) @ 5750 MHz, ConvF(4.86, 4.86, 4.86) @ 5800 MHz; Calibrated: 07.03.2024
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 22.05.2024
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 75.67 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 27.1 W/kg
SAR(1 g) = 7.64 W/kg; SAR(10 g) = 2.18 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 69.1%
Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 77.05 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 26.8 W/kg
SAR(1 g) = 7.82 W/kg; SAR(10 g) = 2.23 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 70.1%
Maximum value of SAR (measured) = 18.0 W/kg

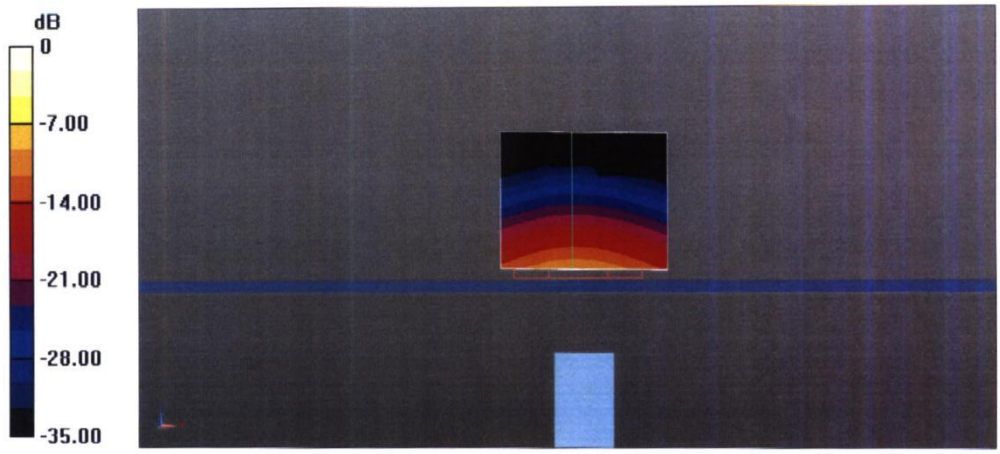
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 76.66 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 28.3 W/kg
SAR(1 g) = 7.94 W/kg; SAR(10 g) = 2.28 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 68.9%
Maximum value of SAR (measured) = 18.5 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 77.28 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 32.3 W/kg
SAR(1 g) = 8.34 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 6.8 mm
Ratio of SAR at M2 to SAR at M1 = 66.4%
Maximum value of SAR (measured) = 20.0 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 76.70 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 8.17 W/kg; SAR(10 g) = 2.32 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 67.1%
Maximum value of SAR (measured) = 19.6 W/kg

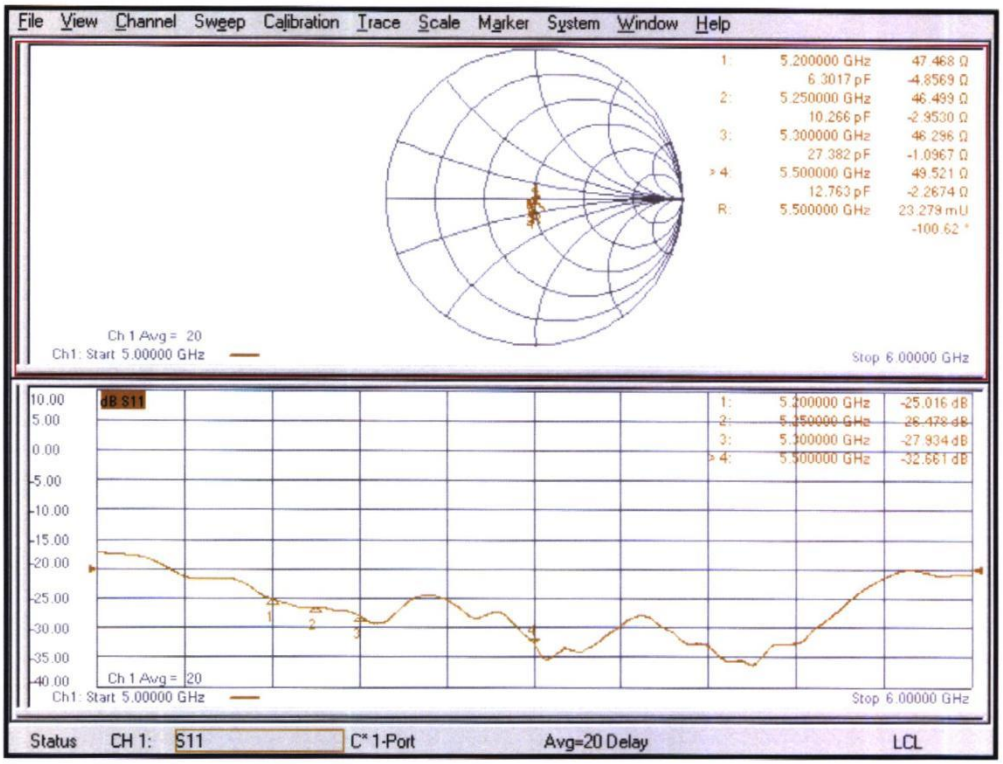
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 74.11 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.28 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65.6%
Maximum value of SAR (measured) = 19.3 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 74.18 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.88 W/kg; SAR(10 g) = 2.22 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65.1%
Maximum value of SAR (measured) = 19.3 W/kg

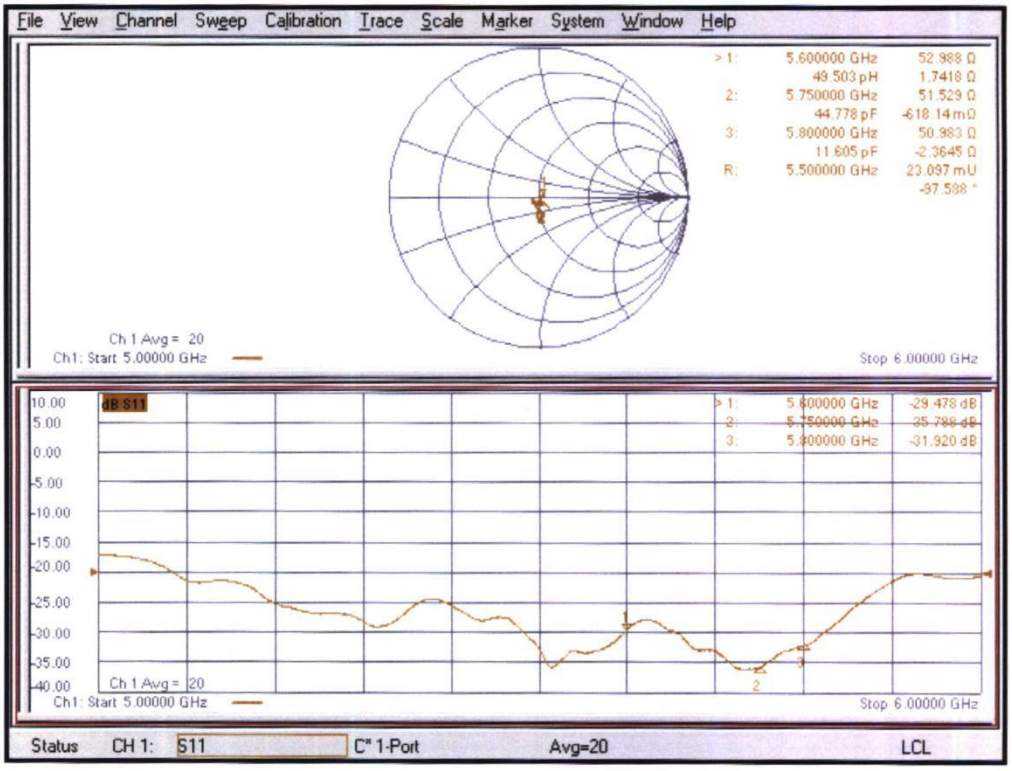


0 dB = 20.0 W/kg = 13.02 dBW/kg

Impedance Measurement Plot for Head TSL (5200, 5250, 5300, 5500 MHz)



Impedance Measurement Plot for Head TSL (5600, 5750, 5800 MHz)



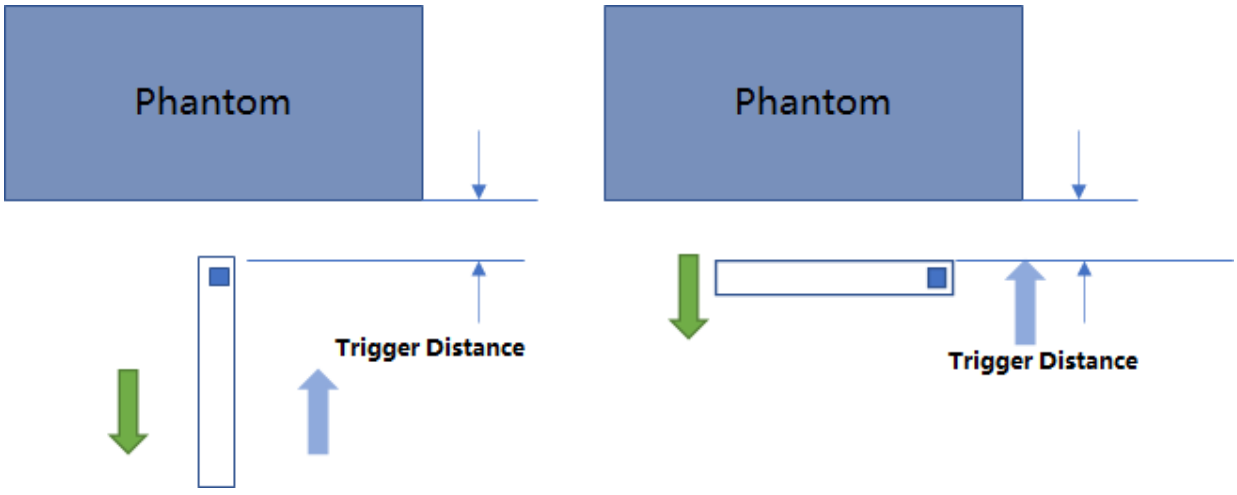
ANNEX I Sensor Triggering Data Summary

ANT	Rear	Left Side	Right Side	Bottom Side	Top Side
0	35mm	/	20mm	/	35mm
2	20mm	15mm	/	30mm	/
3	20mm	/	20mm	/	35mm
5	35mm	25mm	/	/	35mm
7	20mm	25mm	/	/	10mm

Rear, Left, Right, Bottom and Top of the DUT was placed directly below the flat phantom. The DUT was moved toward the phantom to determine the trigger distance for enabling power reduction. The DUT was moved away from the phantom to determine the trigger distance for resuming full power.

To ensure all production units are compliant it is necessary to test SAR at a distance 1mm less than the smallest distance from the device and SAR phantom with the device at maximum output power without power reduction.

The DUT featured a visual indicator on its display that showed the status of the proximity sensor (Triggered or not triggered). This was used to determine the status of the sensor during the proximity sensor assessment as monitoring the output power directly was not practical without affecting the measurement. It was confirmed separately that the output power according to locking the proximity sensor status. Section 10 contains both the full and reduced conducted power measurements.



Blue arrow : Direction of DUT travel for determination of power reduction triggering point.

Green arrow: Direction of DUT travel for determination of normal power triggering point

ANT0

Rear

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Right

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**25**	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Top

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

ANT2

Rear

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**25**	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Left

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Bottom

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**35**	**34**	**33**	**32**	**31**	**30**	**29**	**28**	**27**	**26**	**25**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

ANT3

Rear

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**25**	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Right

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**25**	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Top

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

ANT5

Rear

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Left

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**29**	**28**	**27**	**26**	**25**	**24**	**23**	**22**	**21**	**20**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Top

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**40**	**39**	**38**	**37**	**36**	**35**	**34**	**33**	**32**	**31**	**30**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

ANT7

Rear

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**25**	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Left

Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**30**	**29**	**28**	**27**	**26**	**25**	**24**	**23**	**22**	**21**	**20**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

Top

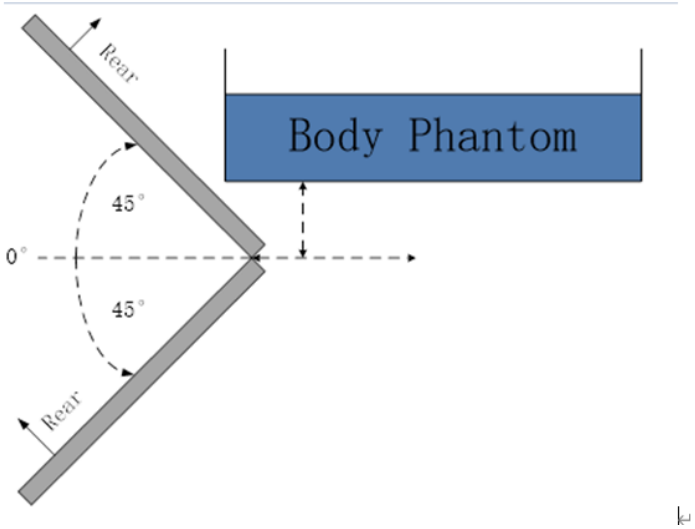
Moving device toward the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**
Main antenna	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES

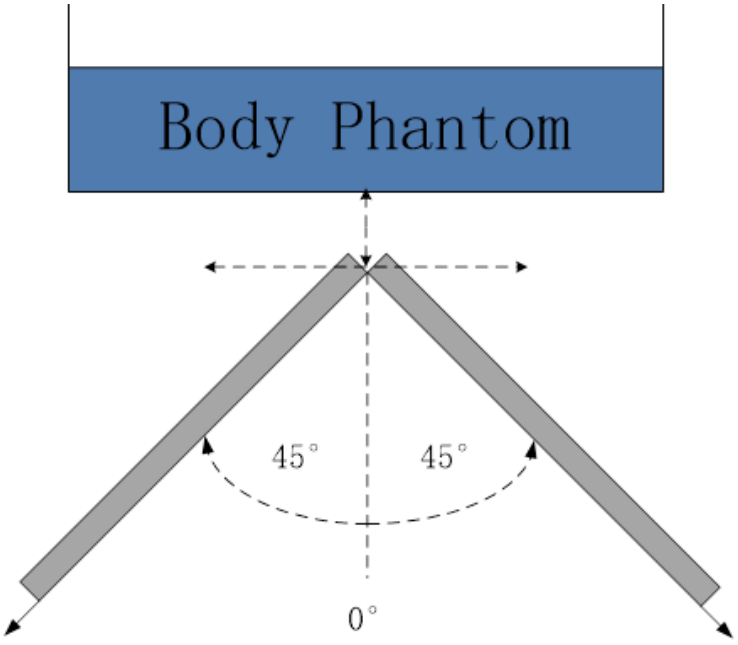
Moving device away from the phantom:

sensor Triggered or Not Triggered											
Distance [mm]	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Main antenna	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO

The influence of table tilt angles to proximity sensor triggering is determined by positioning each edge that contains a transmitting antenna, perpendicular to the flat phantom, at the smallest sensor triggering test distance by rotating the device around the edge next to the phantom in ≤ 10° increments until the tablet is ±45° or more from the vertical position at 0°.



The Rear evaluation



The Left/Right/Bottom/Top edge evaluation

ANNEX J Accreditation Certificate

Accredited Laboratory

A2LA has accredited

TELECOMMUNICATION TECHNOLOGY LABS, CAICT

Beijing, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 23rd day of July 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7049.01
Valid to July 31, 2026

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.