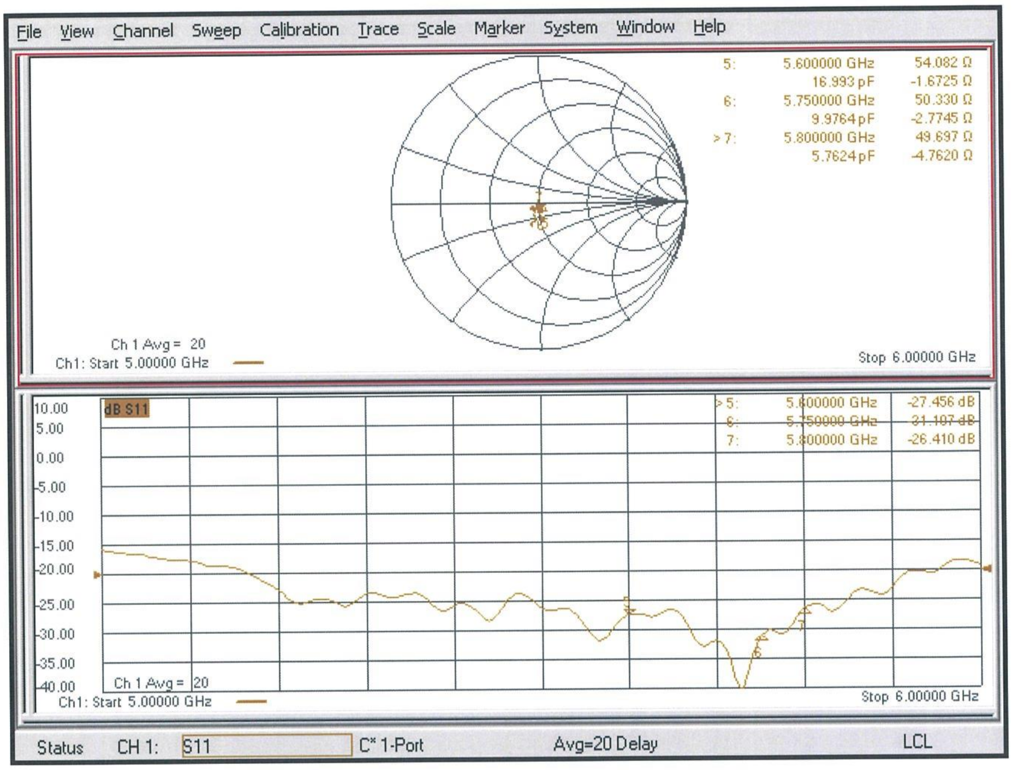
Impedance Measurement Plot for Head TSL (5600/5750/5800MHz)



DASY5 Validation Report for Body TSL

Date: 19.07.2018

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 = 5.4 S/m; ε_r = 47; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5250 MHz; σ = 5.47 S/m; ε_r = 46.9; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5300 MHz; σ = 5.53 S/m; ε_r = 46.8; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5500 MHz; σ = 5.8 S/m; ε_r = 46.5; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 5.94 S/m; ε_r = 46.3; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5750 MHz; σ = 6.14 S/m; ε_r = 46; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 6.21 S/m; ε_r = 45.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.35, 5.35, 5.35) @ 5200 MHz, ConvF(5.26, 5.26, 5.26) @ 5250 MHz, ConvF(5.15, 5.15, 5.15) @ 5300 MHz, ConvF(4.7, 4.7, 4.7) @ 5500 MHz, ConvF(4.65, 4.65, 4.65) @ 5600 MHz, ConvF(4.57, 4.57, 4.57) @ 5750 MHz, ConvF(4.53, 4.53, 4.53) @ 5800 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Dipole Calibration for Body 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 = 66.56 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 27.4 W/kg
SAR(1 g) = 7.35 W/kg; SAR(10 g) = 2.08 W/kg
Maximum value of SAR (measured) = 16.4 W/kg

Dipole Calibration for Body 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 = 67.54 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 28.7 W/kg
SAR(1 g) = 7.63 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 17.6 W/kg

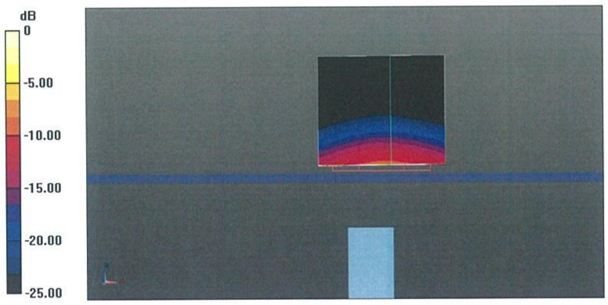
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.36 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 29.9 W/kg
SAR(1 g) = 7.6 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 17.6 W/kg

Dipole Calibration for Body 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 = 67.91 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 33.1 W/kg
SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.23 W/kg
Maximum value of SAR (measured) = 18.9 W/kg

Dipole Calibration for Body 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 = 67.38 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 33.7 W/kg
SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.23 W/kg
Maximum value of SAR (measured) = 19.0 W/kg

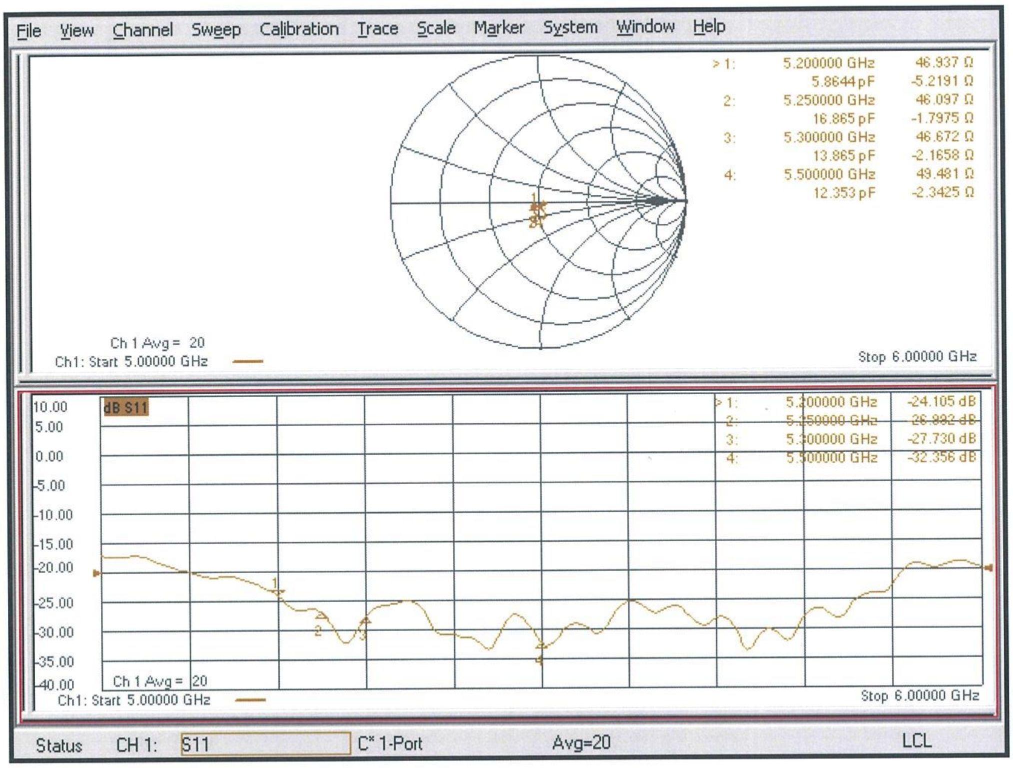
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.03 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 32.8 W/kg
SAR(1 g) = 7.76 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 19.0 W/kg

Dipole Calibration for Body 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 = 65.33 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 32.9 W/kg
SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 18.3 W/kg

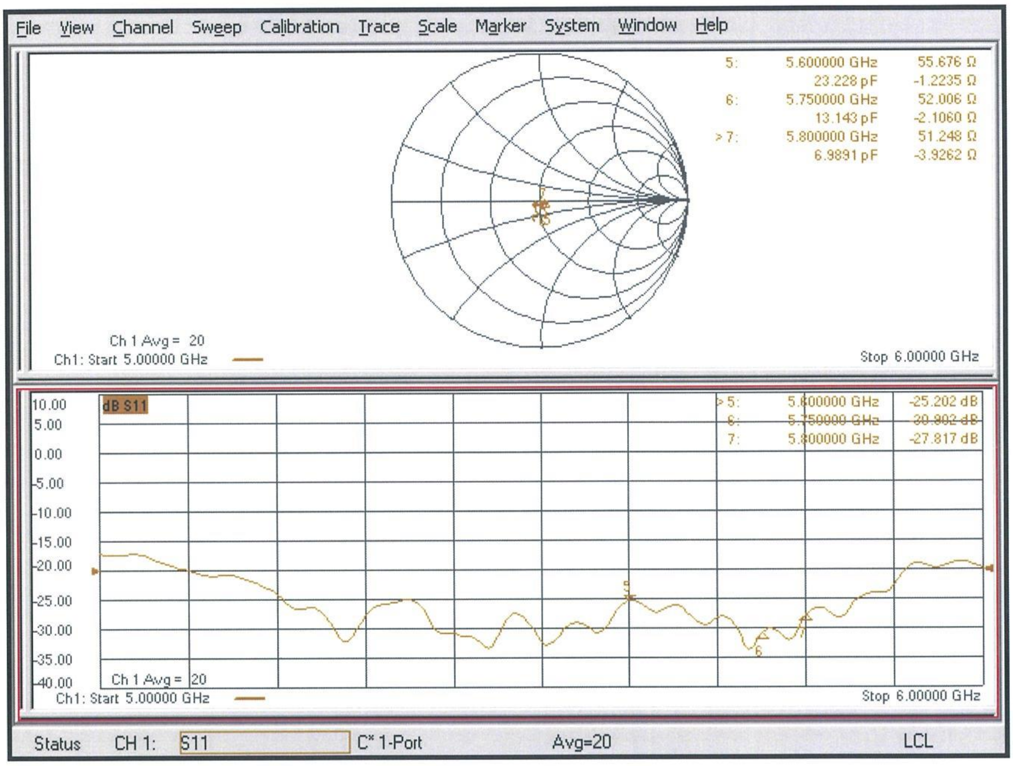


0 dB = 18.3 W/kg = 12.62 dBW/kg

Impedance Measurement Plot for Body TSL (5200/5250/5300/5500MHz)



Impedance Measurement Plot for Body TSL (5600/5750/5800MHz)



ANNEX I Sensor Triggering Data Summary

Per FCC KDB Publication 616217 D04v01r02, this device was tested by the manufacturer to determine the proximity sensor triggering distances for the rear, left edge, right edge and bottom edge of the device. The measured output power within ±5mm of the triggering points (or until touching the phantom) is included for rear and each applicable edge.

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.

We tested the power or state and got the different proximity sensor triggering distances for rear, left, right and top edge. The manufacturer has declared 15mm is the most conservative triggering distance for main antenna with rear. The 13mm distance for right edge and top edge. So base on the most conservative triggering distance of 15 or 13mm, additional SAR measurements were required at 14mm from the highest SAR position for rear of main antenna, and at 12mm for top edge.
Sincerely, the most conservative triggering distance for WIFI antenna is 10mm with rear and 8mm with top edge and left edge. So we also test SAR measurements with 9mm at rear, and 7mm at top/left edge.

Main antenna

Rear

Moving device toward the phantom:

The power state											
Distance [mm]	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**
Main antenna	Normal	Normal	Low	Low	Low	Low	Low	Low	Low	Low	Low

Moving device away from the phantom:

The power state											
Distance [mm]	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Main antenna	Low	Low	Low	Low	Low	Low	Low	Low	Low	Normal	Normal

Right Edge

Moving device toward the phantom:

The power state											
Distance [mm]	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**
Main antenna	Normal	Normal	Normal	Normal	Normal	Low	Low	Low	Low	Low	Low

Moving device away from the phantom:

The power state											
Distance [mm]	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Main antenna	Low	Low	Low	Low	Low	Low	Normal	Normal	Normal	Normal	Normal

Top Edge

Moving device toward the phantom:

The power state											
Distance [mm]	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**
Main antenna	Normal	Normal	Normal	Normal	Normal	Low	Low	Low	Low	Low	Low

Moving device away from the phantom:

The power state											
Distance [mm]	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Main antenna	Low	Low	Low	Low	Low	Low	Normal	Normal	Normal	Normal	Normal

WIFI antenna

Rear

Moving device toward the phantom:

The power return value (KDB 616217 6.2.6)											
Distance [mm]	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**
Main antenna	19.98	20.01	19.97	20.02	20.03	10.60	10.59	10.61	10.60	10.58	10.57

Moving device away from the phantom:

The power return value (KDB 616217 6.2.6)											
Distance [mm]	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Main antenna	10.59	10.61	10.60	10.58	10.58	10.59	19.97	20.02	20.03	20.07	19.98

Top Edge

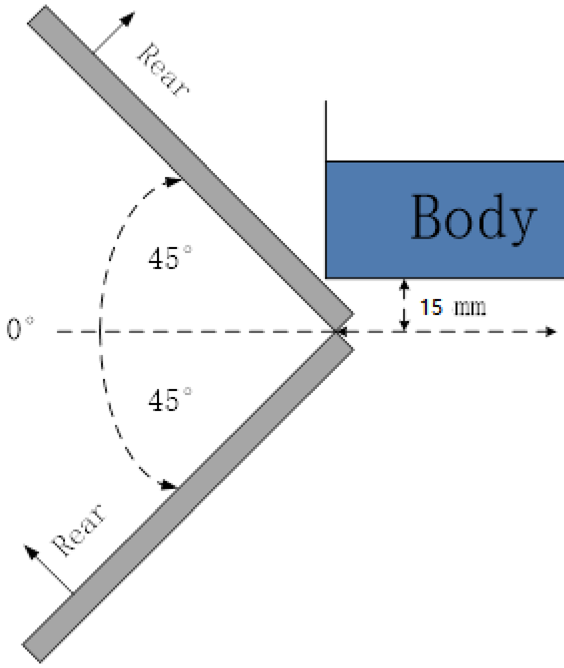
Moving device toward the phantom:

The power return value (KDB 616217 6.2.6)											
Distance [mm]	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**
Main antenna	20.01	19.97	20.02	20.03	20.07	10.55	10.61	10.61	10.63	10.55	10.52

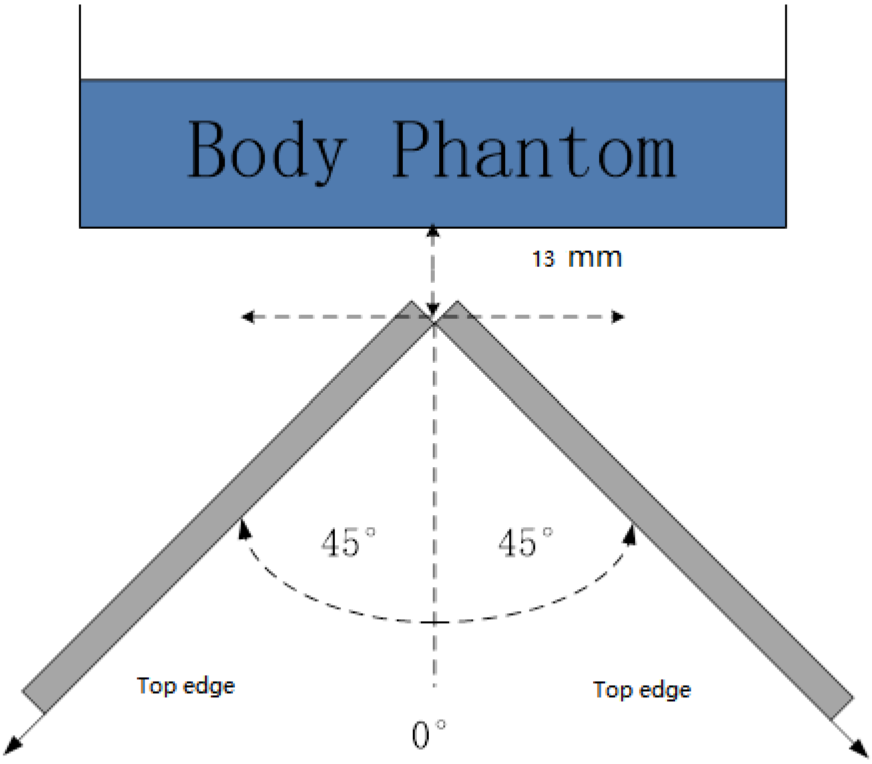
Moving device away from the phantom:

The power return value (KDB 616217 6.2.6)											
Distance [mm]	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Main antenna	10.63	10.61	10.67	10.51	10.64	10.60	20.01	19.99	20.03	20.01	20.08

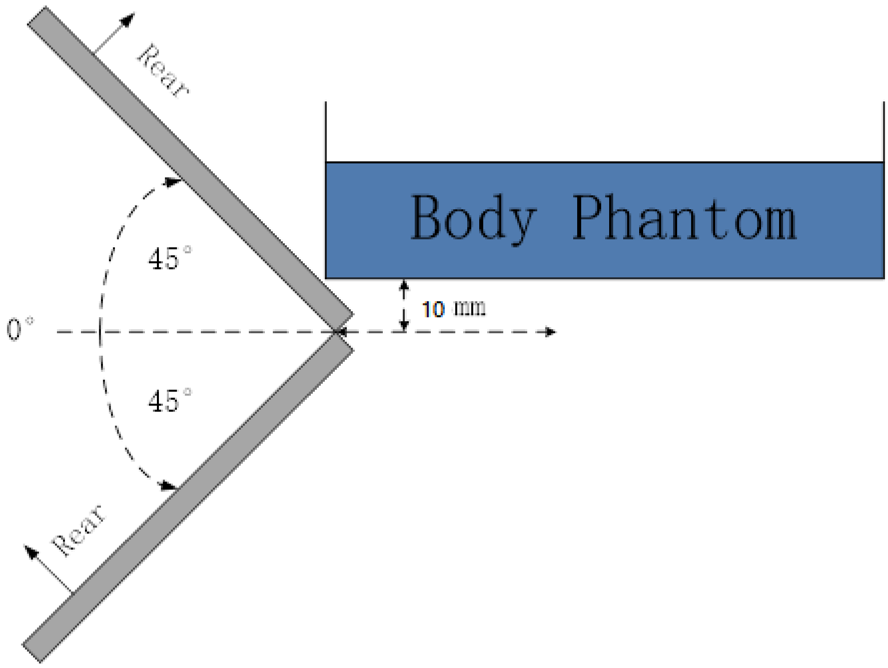
Per FCC KDB Publication 616217 D04v01r02, the influence of table tilt angles to proximity sensor triggering is determined by positioning each edge that contains a transmitting antenna, perpendicular to the flat phantom, at the smallest sensor triggering test distance by rotating the device around the edge next to the phantom in ≤ 10° increments until the tablet is ±45° or more from the vertical position at 0°.



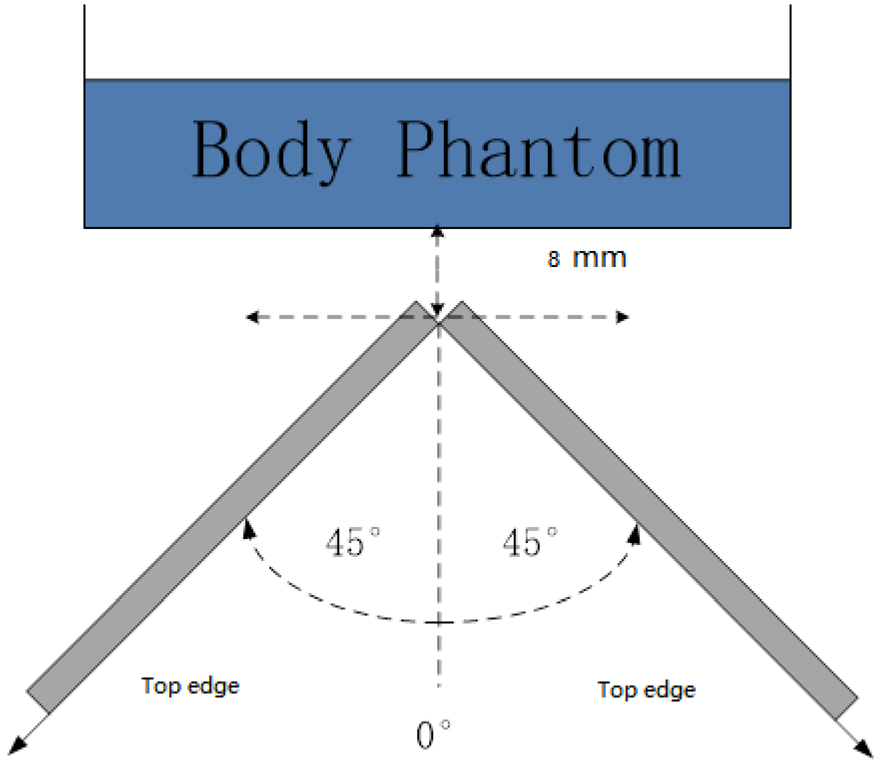
The rear evaluation for main antenna



The top edge evaluation for main antenna



The rear evaluation for WIFI antenna



The top evaluation for WIFI antenna

Based on the above evaluation, we come to the conclusion that the sensor triggering is not released and normal maximum output power is not restored within the ±45° range at the smallest sensor triggering test distance declared by manufacturer.

ANNEX J Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2018-09-28 through 2019-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program