RF Exposure Lab

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# CERTIFICATE OF COMPLIANCE
# SAR EVALUATION

| | | | |
|---|---|---|---|
| Intel Mobile Communication<br>100 Center Point Circle, Suite 200<br>Columbia, SC  29210 | | Dates of Test:<br>Test Report Number: | August 13-16, 2013<br>SAR.20130806 |

| | |
|---|---|
| FCC ID: | PD97260H (Contains Model 7260HMW) |
| IC Certificate: | 1000M-7260H (Contains Model 7260HMW, 7260HMW AN, 7260HMW NB, 7260HMW BN) |
| Model(s): | TPN-Q128 |
| Contains WLAN Model(s): | Intel® Dual Band Wireless-AC 7260 (Model 7260HMW, 7260HMW AN, 7260HMW NB, 7260HMW BN) |
| Test Sample: | Engineering Unit Same as Production |
| Serial Number: | Eng 1, Eng 2 |
| Equipment Type: | Wireless Module Installed in Notebook |
| Classification: | Portable Transmitter Next to Body |
| TX Frequency Range: | 2412 – 2462 MHz; 5180 – 5320 MHz; 5500 – 5700 MHz; 5745 – 5825 MHz |
| Frequency Tolerance: | ± 2.5 ppm |
| Maximum RF Output: | 2450 MHz (b) – 15.50 dB, 2450 MHz (g) – 16.50 dB, 2450 MHz (n20) – 16.50 dB, 2450 MHz (n40) – 16.50 dB, 5250 MHz (a) – 16.00 dB, 5250 MHz (n20) – 16.00 dB, 5250 MHz (n40) – 15.50 dB, 5250 MHz (ac) – 11.00 dB, 5600 MHz (a) – 16.50 dB, 5600 MHz (n20) – 16.50 dB, 5600 MHz (n40) – 16.50 dB, 5600 MHz (ac) – 16.50 dB, 5800 MHz (a) – 16.50 dB, 5800 MHz (n20) – 16.50 dB, 5800 MHz (n40) – 16.50 dB, 5800 MHz (ac) – 14.00 dB Conducted |
| Signal Modulation: | DSSS, OFDM |
| Antenna Type: | Wistron Neweb Corp., P/N DQ6K15G7300 (Tx1), DQ6K15G7400 (Tx2); PIFA Antenna<br>Foxconn, P/N DQ6NBL00100 (Tx1), DQ6NBL00200 (Aux); PIFA Antenna |
| Application Type: | Certification |
| FCC Rule Parts: | Part 2, 15C, 15E |
| KDB Test Methodology: | KDB 447498 D01 v05, KDB 248227 v01r02, KDB 616217 D04 v01 |
| Industry Canada: | RSS-102, Safety Code 6 |
| Maximum SAR Value: | 1.08 W/kg Reported |
| Max. Simultaneous SAR: | 1.50 W/kg Reported |
| Separation Distance: | 5 mm |

This wireless mobile and/or portable device has been shown to be compliant for localized specific absorption rate (SAR) for uncontrolled environment/general exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in IEEE 1528-2003, IEC 62209-2 and OET Bulletin 65 Supp. C (See test report).

I attest to the accuracy of the data. All measurements were performed by myself or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RF Exposure Lab, LLC certifies that no party to this application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

Jay M. Moulton
Vice President

ACCREDITED
Certificate # 2387.01

# Table of Contents

# 1. Introduction

This measurement report shows compliance of the Intel Mobile Communications Model 7260HMW including family sub-model 7260HMW, 7260HMW AN, 7260HMW NB, 7260HMW BN installed in HP Model TPN-Q128 FCC ID: PD97260H with FCC Part 2, 1093, ET Docket 93-62 Rules for mobile and portable devices and IC Certificate: 1000M-7260H with RSS102 & Safety Code 6. The FCC have adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on August 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC regulated portable devices. [1], [6]

The test results recorded herein are based on a single type test of Intel Mobile Communications Model 7260HMW including family sub-model 7260HMW, 7260HMW AN, 7260HMW NB, 7260HMW BN installed in HP Model TPN-Q128 and therefore apply only to the tested sample.

The models are electrically identical with only differences in firmware. The firmware is programmed in the factory for these family models and cannot be changed by the OEM or the final user.

The test procedures, as described in ANSI C95.1 – 1999 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [2], ANSI C95.3 – 2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields [3], FCC OET Bulletin 65 Supp. C – 2001 [4], IEEE Std.1528 – 2003 Recommended Practice [5], and Industry Canada Safety Code 6 Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3kHz to 300 GHz were employed.

The following table indicates all the wireless technologies operating in the 7260HMW including family sub-model 7260HMW, 7260HMW AN, 7260HMW NB, 7260HMW BN installed in HP Model TPN-Q128 wireless modem. The table also shows the tolerance for the power level for each mode.

| Band | Technology | Class | 3GPP Nominal Power dBm | Setpoint Nominal Power dBm | Tolerance dBm | Lower Tolerance dBm | Upper Tolerance dBm |
|---|---|---|---|---|---|---|---|
| WLAN – 2.4 GHz | 802.11b | N/A | N/A | 15 | ±1.5 | 13.5 | 16.5 |
| WLAN – 2.4 GHz | 802.11g/n(Ch. 1 and 11) | N/A | N/A | 12 | ±1.5 | 10.5 | 13.5 |
| WLAN – 2.4 GHz | 802.11 b/g/n(Ch. 2-10) | N/A | N/A | 15 | ±1.5 | 13.5 | 16.5 |
| WLAN – 5 GHz | 802.11a (I and II) | N/A | N/A | 14.5 | ±1.5 | 13.0 | 16.0 |
| WLAN – 5 GHz | 802.11a (III and IV) | N/A | N/A | 15 | ±1.5 | 13.5 | 16.5 |
| WLAN – 5 GHz | 802.11n | N/A | N/A | 15 | ±1.5 | 13.5 | 16.5 |

## SAR Definition [5]

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (*dW*) absorbed by (dissipated in) an incremental mass (*dm*) contained in a volume element (*dV*) of a given density ($\rho$).

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dV}\right)$$

SAR is expressed in units of watts per kilogram (W/kg). *SAR* can be related to the electric field at a point by

$$SAR = \frac{\sigma |E|^2}{\rho}$$

where:

$\sigma$ = conductivity of the tissue (S/m)

$\rho$ = mass density of the tissue (kg/m$^3$)

$E$ = rms electric field strength (V/m)

# 2. SAR Measurement Setup

## Robotic System

The measurements are conducted utilizing the ALSAS-10-U automated dosimetric assessment system. The ALSAS-10-U is designed and manufactured by Aprel Laboratories in Nepean, Ontario, Canada. The system utilizes a Robcomm 3 robot manufactured by ThermoCRS located in Michigan USA.

## System Hardware

The system consists of a six axis articulated arm, controller for precise probe positioning (0.05 mm repeatability), a power supply, a teach pendent for teaching area scans, near field probe, an IBM Pentium 4™ 2.66 GHz PC with Windows XP Pro™, and custom software developed to enable communications between the robot controller software and the host operating system.

An amplifier is located on the articulated arm, which is isolated from the custom designed end effector and robot arm. The end effector provides the mechanical touch detection functionality and probe connection interface. The amplifier is functionally validated within the manufacturer's site and calibrated at NCL Calibration Laboratories. A Data Acquisition Card (DAC) is used to collect the signal as detected by the isotropic e-field probe. The DAC manufacturer calibrates the DAC to NIST standards. A formal validation is executed using all mechanical and electronic components to prove conformity of the measurement platform as a whole.

## System Description

The ALSAS-10-U has been designed to measure devices within the compliance environment to meet all recognized standards. The system also conforms to standards, which are currently being developed by the scientific and manufacturing community.

The course scan resolution is defined by the operator and reflects the requirements of the standard to which the device is being tested. Precise measurements are made within the predefined course scan area and the values are logged.

The user predefines the sample rate for which the measurements are made so as to ensure that the full duty-cycle of a pulse modulation device is covered during the sample. The following algorithm is an example of the function used by the system for linearization of the output for the probe.

$$V_i = U_i + U_i^2 \bullet \frac{cf}{dcp_i}$$

The Aprel E-Field probe is evaluated to establish the diode compression point.

A complex algorithm is then used to calculate the values within the measured points down to a resolution of 1mm. The data from this process is then used to provide the co-ordinates from which the cube scan is created for the determination of the 1 g and 10 g averages.

Cube scan averaging consists of a number of complex algorithms, which are used to calculate the one, and ten gram averages. The basis for the cube scan process is centered on the location where the maximum measured SAR value was found. When a secondary peak value is found which is within 60% of the initial peak value, the system will report this back to the operator who can then assess the need for further analysis of both the peak values prior to the one and ten-gram cube scan averaging process. The algorithm consists of 3D cubic Spline, and Lagrange extrapolation to the surface, which form the matrix for calculating the measurement output for the one and ten gram average values. The resolution for the physical scan integral is user defined with a final calculated resolution down to 1mm.

In-depth analysis for the differential of the physical scanning resolution for the cube scan analysis has been carried out, to identify the optimum setting for the probe positioning steps, and this has been determined at 8mm increments on the X, & Y planes. The reduction of the physical step increment increased the time taken for analysis but did not provide a better uncertainty or return on measured values.

The final output from the system provides data for the area scan measurements, physical and splined (1mm resolution) cube scan with physical and calculated values (1mm resolution).

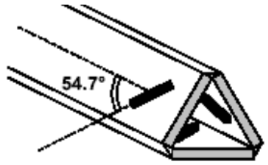
The overall uncertainty for the methodology and algorithms the ALSAS-10-U used during the SAR calculation was evaluated using the data from IEEE 1528 f3 algorithm:

$$f_3(x,y,z) = A\frac{a^2}{\frac{a^2}{4} + x'^2 + y'^2}\left(e^{-\frac{2z}{a}} + \frac{a^2}{2(a+2z)^2}\right)$$

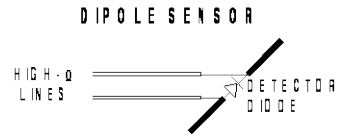
The probe used during the measurement process has been assessed to provide values for diode compression. These values are calculated during the probe calibration exercise and are used in the mathematical calculations for the assessment of SAR.

## E-Field Probe

The E-field probe used by RF Exposure Lab, LLC, has been fully calibrated and assessed for isotropic, and boundary effect. The probe utilizes a triangular sensor arrangement as detailed in the diagram below right.




Δ-BEAM




The SAR is assessed with the probe which moves at a default height of 4mm from the center of the diode, which is mounted to the sensor, to the phantom surface (Z height). The diagram above right shows how the center of the sensor is defined with the location of the diode placed at the center of the dipole. The 4mm default in the Z axis is the optimum height for assessing SAR where the boundary effect is at its least, with the probe located closest to the phantom surface (boundary).

The manufacturer specified precision of the robot is ± 0.05 mm and the precision of the APREL bottom detection device is ± 0.1 mm. These precisions are calibrated and tested in the manufacturing process of the bottom detection device. A constant distance is maintained because the surface of the phantom is dynamically detected for each point. The surface detection algorithm corrects the position of the robot so that the probe rests on the surface of the phantom. The probe is then moved to the measurement location 2.44 mm above the phantom surface resulting in the probe center location to be at 4.0 mm above the phantom surface. Therefore, the probe sensor will be at 4.0 mm above the phantom surface ± 0.1 mm for each SAR location for frequencies below 3 GHz. The probe is moved to the measurement location 1.44 mm above the phantom surface resulting in the probe center location to be at 2.0 mm above the phantom surface. Therefore, the probe sensor will be at 2.0 mm above the phantom surface ± 0.1 mm for each SAR location for frequencies above 3 GHz.

The probe boundary effect compensation cannot be disabled in the ALSAS-10U testing system. The probe tip will always be at least half a probe tip diameter from the phantom surface. For frequencies up to 3 GHz, the probe diameter is 5 mm. With the sensor offset set at 1.54 mm (default setting), the sensor to phantom gap will be 4.0 mm which is greater than half the probe tip diameter. For frequencies greater than 3 GHz, the probe diameter is 3 mm. With the sensor offset set at 0.56 mm (default setting), the sensor to phantom gap will be 3.0 mm which is greater than half the probe tip diameter.

The separation of the first 2 measurement points in the zoom scan is specified in the test setup software. For frequencies below 3 GHz, the user must specify a zoom scan resolution of less than 6 mm in the z-axis to have the first two measurements within 1 cm of the surface. The z-axis is set to 4 mm as shown on each of the data sheets in Appendix B. For frequencies above 3 GHz, the user must specify a zoom scan resolution of less than 3 mm in the z-axis to have the first two measurements within 5 mm of the surface. The z-axis is set to 2 mm as shown on each of the data sheets in Appendix B.

The zoom scan volume for devices ≤3 GHz with a cube scan of 5x5x8 yields a volume of 32x32x28 $mm^3$. For devices >3 GHz and <4.5 GHz, the cube scan of 9x9x9 yields a volume of 32x32x24 $mm^3$. For devices ≥4.5 GHz, the cube scan of 7x7x12 yields a volume of 24x24x22 $mm^3$.

# 3. Robot Specifications

## Specifications

| | |
|---|---|
| Positioner: | ThermoCRS, Robot Model: Robocomm 3 |
| Repeatability: | 0.05 mm |
| No. of axis: | 6 |

## Data Acquisition Card (DAC) System

### Cell Controller

| | |
|---|---|
| Processor: | Pentium 4™ |
| Clock Speed: | 2.66 GHz |
| Operating System: | Windows XP Pro™ |

### Data Converter

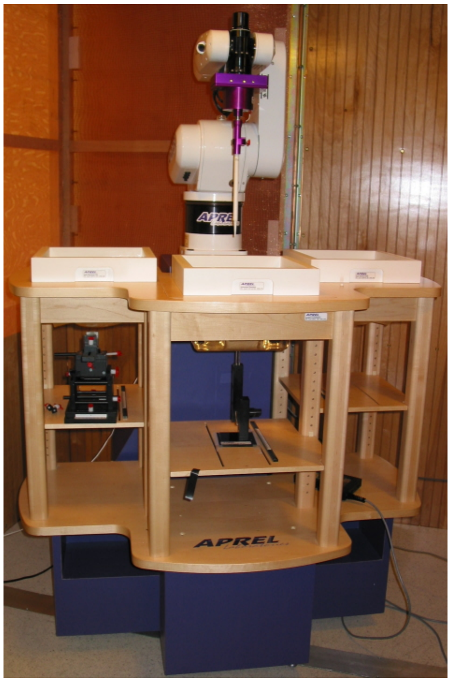
| | |
|---|---|
| Features: | Signal Amplifier, End Effector, DAC |
| Software: | ALSAS 10-U Software |

## E-Field Probe

| | |
|---|---|
| Model: | Various See Probe Calibration Sheet |
| Serial Number: | Various See Probe Calibration Sheet |
| Construction: | Triangular Core Touch Detection System |
| Frequency: | 10MHz to 6GHz |

## Phantom

| | |
|---|---|
| Phantom: | Uniphantom, Right Phantom, Left Phantom |



# 4. Probe and Dipole Calibration

**See Appendix D and E.**

# 5. Phantom & Simulating Tissue Specifications

## Head & Body Simulating Mixture Characterization

The head and body mixtures consist of the material based on the table listed below. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. Body tissue parameters that have not been specified in P1528 are derived from the issue dielectric parameters computed from the 4-Cole-Cole equations.

**Table 5.1 Typical Composition of Ingredients for Tissue**

| Ingredients | | Simulating Tissue | | | |
|---|---|---|---|---|---|
| | | 2450 MHz Body | 5250 MHz Body | 5600 MHz Body | 5785 MHz Body |
| Mixing Percentage | | | | | |
| Water | | 73.20 | Proprietary Mixture | | |
| Sugar | | 0.00 | | | |
| Salt | | 0.04 | | | |
| HEC | | 0.00 | | | |
| Bactericide | | 0.00 | | | |
| DGBE | | 26.70 | | | |
| Dielectric Constant | Target | 52.70 | 48.96 | 48.47 | 48.25 |
| Conductivity (S/m) | Target | 1.95 | 5.35 | 5.77 | 5.96 |

# 6. ANSI/IEEE C95.1 – 1992 RF Exposure Limits [2]

## Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

## Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Table 6.1 Human Exposure Limits**

| | UNCONTROLLED ENVIRONMENT<br>General Population<br>(W/kg) or (mW/g) | CONTROLLED ENVIROMENT<br>Professional Population<br>(W/kg) or (mW/g) |
|---|---|---|
| SPATIAL PEAK SAR[1]<br>Head | 1.60 | 8.00 |
| SPATIAL AVERAGE SAR[2]<br>Whole Body | 0.08 | 0.40 |
| SPATIAL PEAK SAR[3]<br>Hands, Feet, Ankles, Wrists | 4.00 | 20.00 |

[1] The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
[2] The Spatial Average value of the SAR averaged over the whole body.
[3] The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

# 7. Measurement Uncertainty

Measurement uncertainty table is not required per KDB 865664 D01 v01 section 2.8.2 page 12. SAR measurement uncertainty analysis is required in the SAR report only when the highest measured SAR in a frequency band is ≥ 1.5 W/kg for 1-g SAR. The equivalent ratio (1.5/1.6) should be applied to extremity and occupational exposure conditions. The highest reported value is less than 1.5 W/kg. Therefore, the measurement uncertainty table is not required.

# 8. System Validation

## Tissue Verification

**Table 8.1 Measured Tissue Parameters**

| | | 2450 MHz Body | | 5200 MHz Body | |
|---|---|---|---|---|---|
| Date(s) | | Aug. 15, 2013 | | Aug. 13, 2013 | |
| Liquid Temperature (˚C) | 20.0 | Target | Measured | Target | Measured |
| Dielectric Constant: ε | | 52.70 | 52.55 | 49.01 | 49.19 |
| Conductivity: σ | | 1.95 | 1.97 | 5.30 | 5.35 |
| | | 5600 MHz Body | | 5800 MHz Body | |
| Date(s) | | Aug. 13, 2013 | | Aug. 13, 2013 | |
| Liquid Temperature (˚C) | 20.0 | Target | Measured | Target | Measured |
| Dielectric Constant: ε | | 48.47 | 48.54 | 48.20 | 48.32 |
| Conductivity: σ | | 5.77 | 5.80 | 6.00 | 6.14 |

See Appendix A for data printout.

## Test System Verification

Prior to assessment, the system is verified to the ±10% of the specifications at the test frequency by using the system kit. Power is normalized to 1 watt. (Graphic Plots Attached)

**Table 8.2 System Dipole Validation Target & Measured**

| | Test Frequency | Targeted $SAR_{1g}$ (W/kg) | Measure $SAR_{1g}$ (W/kg) | Tissue Used for Verification | Deviation Target and Fast SAR to SAR (%) | Plot Number |
|---|---|---|---|---|---|---|
| 15-Aug-2013 | 2450 MHz | 51.50 | 51.79 | Body | + 0.56 | 1 |
| 13-Aug-2013 | 5200 MHz | 73.40 | 73.26 | Body | - 0.19 | 2 |
| 14-Aug-2013 | 5600 MHz | 79.10 | 78.07 | Body | - 1.30 | 3 |
| 15-Aug-2013 | 5800 MHz | 72.90 | 72.36 | Body | - 0.74 | 4 |

See Appendix A for data plots.5

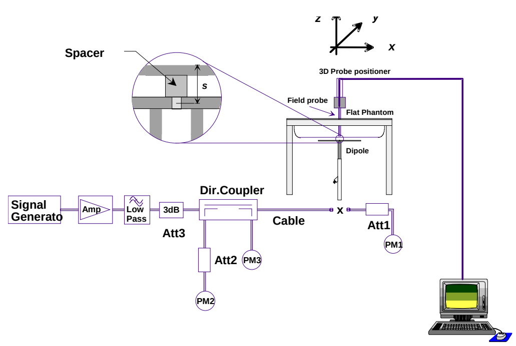



**Figure 8.1 Dipole Validation Test Setup**

# 9. SAR Test Data Summary

## See Measurement Result Data Pages

See Appendix B for SAR Test Data Plots.
See Appendix C for SAR Test Setup Photos.

## Procedures Used To Establish Test Signal

The device was either placed into simulated transmit mode using the manufacturer's test codes or the actual transmission is activated through a base station simulator or similar equipment. See data pages for actual procedure used in measurement.

## Device Test Condition

In order to verify that the device was tested at full power, conducted output power measurements were performed before and after each SAR measurement to confirm the output power unless otherwise noted. If a conducted power deviation of more than 5% occurred, the test was repeated. The power drift of each test is measured at the start of the test and again at the end of the test. The drift percentage is calculated by the formula ((end/start)-1)*100 and rounded to three decimal places. The drift percentage is calculated into the resultant SAR value on the data sheet for each test.

The EUT was tested on all sides of the device where the antenna was within 25 mm of that side. All measurements for the tablet condition were conducted with the side of the device in direct contact with the phantom. For sides of the antenna which were not measured in this report, the SAR was conduct on the module in the modular approval with the maximum distance of 8 mm on all six sides of the antenna. Therefore, the requirements mentioned in RSS-102 Supplementary Procedures (SPR)-001 – SAR Testing Requirements with Regards to Bystanders for Laptop Type Computers with Antennas Built-In on Display Screen (Laptop/Tablet Mode) are covered.

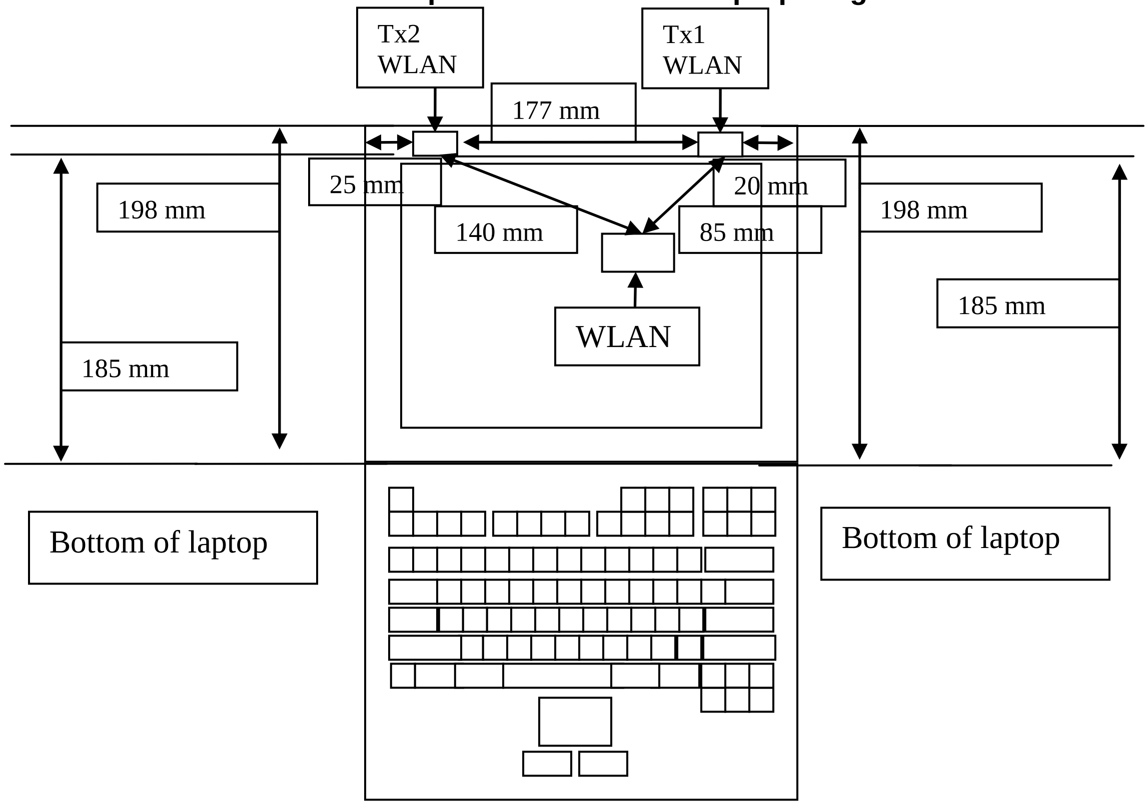
The Bluetooth transmitter does simultaneously transmit with the WiFi transmitter. When the BT is turned on, it transmits on Main and the WiFi transmits on Aux. The Main and Aux antennas are a minimum of 177 mm separation. Simultaneous transmission is evaluated on page 52.

The data rates used when evaluating the WiFi transmitter were the lowest data rates for each mode. The device was operating at its maximum output power at the lowest data rate for all measurements.

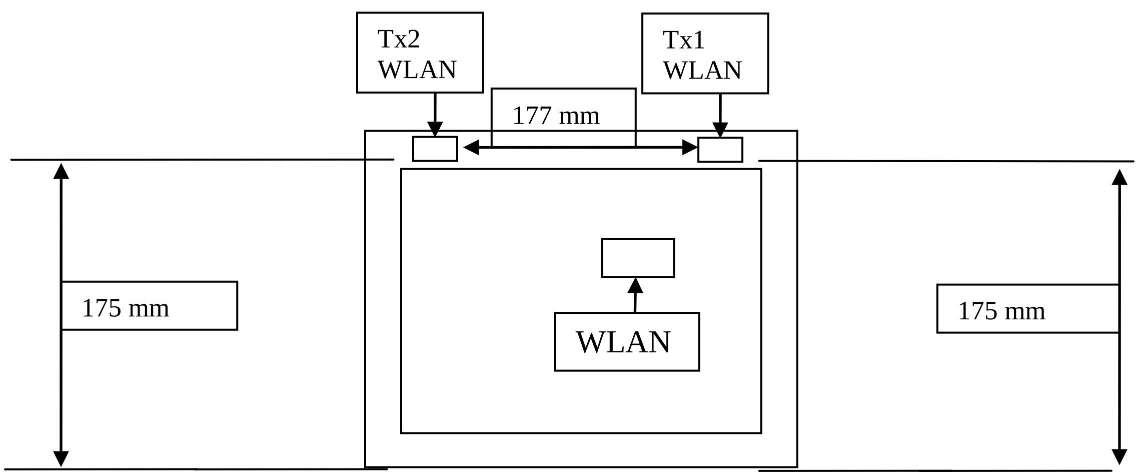
The tablet was using the Intel test utility DRTU Version 1.6.1-628 and the device driver was version 16.0.0.49.

The tablet was on a minimum of 10 cm of Styrofoam during each test. The following is a pictorial drawing of the locations and separation distances.

**Location and Separation Distances Laptop Diagrams**




**Location and Separation Distances Tablet Diagrams**



| Band | Mode | Bandwidth (MHz) | Channel | Frequency (MHz) | Data Rate | Antenna | Power (dBm) |
|---|---|---|---|---|---|---|---|
| 2450 MHz | 802.11b | 20 | 1 | 2412 | 1 Mbps | Main | 16.47 |
| | | | 6 | 2437 | | | 16.50 |
| | | | 11 | 2462 | | | 16.48 |
| | | | 1 | 2412 | | Aux | 16.48 |
| | | | 6 | 2437 | | | 16.50 |
| | | | 11 | 2462 | | | 16.49 |
| | 802.11g | 20 | 1 | 2412 | 6 Mbps | Main | 13.48 |
| | | | 6 | 2437 | | | 16.50 |
| | | | 11 | 2462 | | | 13.47 |
| | | | 1 | 2412 | | Aux | 11.99 |
| | | | 6 | 2437 | | | 15.49 |
| | | | 11 | 2462 | | | 13.46 |
| | 802.11n | 20 | 1 | 2412 | HT4 | Main | 13.48 |
| | | | 6 | 2437 | | | 16.50 |
| | | | 11 | 2462 | | | 13.46 |
| | | | 1 | 2412 | | Aux | 11.97 |
| | | | 6 | 2437 | | | 15.50 |
| | | | 11 | 2462 | | | 13.42 |
| | 802.11n | 40 | 3 | 2422 | HT4 | Main | 11.96 |
| | | | 6 | 2437 | | | 16.47 |
| | | | 9 | 2452 | | | 12.90 |
| | | | 3 | 2422 | | Aux | 9.92 |
| | | | 6 | 2437 | | | 13.42 |
| | | | 9 | 2452 | | | 12.89 |
| 5.15-5.25 GHz | 802.11a | 20 | 36 | 5180 | 6 Mbps | Main | 13.46 |
| | | | 40 | 5200 | | | 15.86 |
| | | | 44 | 5220 | | | 16.00 |
| | | | 48 | 5240 | | | 14.98 |
| | | | 36 | 5180 | | Aux | 12.89 |
| | | | 40 | 5200 | | | 15.92 |
| | | | 44 | 5220 | | | 16.00 |
| | | | 48 | 5240 | | | 14.96 |
| | 802.11n | 20 | 36 | 5180 | HT4 | Main | 13.42 |
| | | | 40 | 5200 | | | 15.87 |
| | | | 44 | 5220 | | | 16.00 |
| | | | 48 | 5240 | | | 15.48 |
| | | | 36 | 5180 | | Aux | 12.86 |
| | | | 40 | 5200 | | | 15.91 |
| | | | 44 | 5220 | | | 16.00 |
| | | | 48 | 5240 | | | 15.46 |
| | 802.11n | 40 | 38 | 5190 | HT4 | Main | 9.46 |
| | | | 46 | 5230 | | | 15.42 |
| | | | 38 | 5190 | HT4 | Aux | 9.94 |
| | | | 46 | 5230 | | | 15.37 |
| | 802.11ac | 80 | 42 | 5210 | VHT6 | Main | 8.46 |
| | | | | | | Aux | 8.39 |
| 5.25-5.35 GHz | 802.11a | 20 | 52 | 5260 | 6 Mbps | Main | 13.45 |
| | | | 56 | 5280 | | | 15.87 |
| | | | 60 | 5300 | | | 16.00 |
| | | | 64 | 5320 | | | 13.46 |
| | | | 52 | 5260 | | Aux | 12.90 |
| | | | 56 | 5280 | | | 15.93 |
| | | | 60 | 5300 | | | 16.00 |
| | | | 64 | 5320 | | | 12.94 |
| | 802.11n | 20 | 52 | 5260 | HT4 | Main | 13.42 |
| | | | 56 | 5280 | | | 15.81 |
| | | | 60 | 5300 | | | 15.94 |
| | | | 64 | 5320 | | | 13.48 |
| | | | 52 | 5260 | | Aux | 12.85 |
| | | | 56 | 5280 | | | 15.93 |
| | | | 60 | 5300 | | | 15.85 |
| | | | 64 | 5320 | | | 13.00 |
| | 802.11n | 40 | 54 | 5270 | HT4 | Main | 9.48 |
| | | | 62 | 5310 | | | 11.00 |
| | | | 54 | 5270 | HT4 | Aux | 9.99 |
| | | | 62 | 5310 | | | 10.97 |
| | 802.11ac | 80 | 58 | 5290 | VHT6 | Main | 10.47 |
| | | | | | | Aux | 10.92 |

| Band | Mode | Bandwidth (MHz) | Channel | Frequency (MHz) | Data Rate | Antenna | Power (dBm) |
|---|---|---|---|---|---|---|---|
| 5600 MHz | 802.11a | 20 | 100 | 5500 | 6 Mbps | Main | 13.46 |
| | | | 104 | 5520 | | | 16.42 |
| | | | 108 | 5540 | | | 16.39 |
| | | | 112 | 5560 | | | 16.50 |
| | | | 116 | 5580 | | | 16.48 |
| | | | 120 | 5600 | | | 16.42 |
| | | | 124 | 5620 | | | 16.46 |
| | | | 128 | 5640 | | | 16.37 |
| | | | 132 | 5660 | | | 16.50 |
| | | | 136 | 5680 | | | 16.47 |
| | | | 140 | 5700 | | | 12.93 |
| | | | 100 | 5500 | | Aux | 12.95 |
| | | | 104 | 5520 | | | 16.42 |
| | | | 108 | 5540 | | | 16.38 |
| | | | 112 | 5560 | | | 16.50 |
| | | | 116 | 5580 | | | 16.43 |
| | | | 120 | 5600 | | | 16.48 |
| | | | 124 | 5620 | | | 16.42 |
| | | | 128 | 5640 | | | 16.40 |
| | | | 132 | 5660 | | | 16.50 |
| | | | 136 | 5680 | | | 16.38 |
| | | | 140 | 5700 | | | 12.42 |
| | 802.11n | 20 | 100 | 5500 | HT4 | Main | 13.50 |
| | | | 104 | 5520 | | | 16.42 |
| | | | 108 | 5540 | | | 16.48 |
| | | | 112 | 5560 | | | 16.45 |
| | | | 116 | 5580 | | | 16.37 |
| | | | 120 | 5600 | | | 16.48 |
| | | | 124 | 5620 | | | 16.50 |
| | | | 128 | 5640 | | | 16.41 |
| | | | 132 | 5660 | | | 16.45 |
| | | | 136 | 5680 | | | 16.39 |
| | | | 140 | 5700 | | | 12.98 |
| | | | 100 | 5500 | | Aux | 12.99 |
| | | | 104 | 5520 | | | 16.34 |
| | | | 108 | 5540 | | | 16.39 |
| | | | 112 | 5560 | | | 16.41 |
| | | | 116 | 5580 | | | 16.50 |
| | | | 120 | 5600 | | | 16.42 |
| | | | 124 | 5620 | | | 16.48 |
| | | | 128 | 5640 | | | 16.43 |
| | | | 132 | 5660 | | | 16.47 |
| | | | 136 | 5680 | | | 16.48 |
| | | | 140 | 5700 | | | 12.49 |
| | 802.11n | 40 | 102 | 5510 | HT4 | Main | 10.42 |
| | | | 110 | 5550 | | | 16.48 |
| | | | 118 | 5580 | | | 16.42 |
| | | | 126 | 5610 | | | 16.47 |
| | | | 134 | 5670 | | | 15.49 |
| | | | 102 | 5510 | HT4 | Aux | 10.48 |
| | | | 110 | 5550 | | | 16.48 |
| | | | 118 | 5580 | | | 16.43 |
| | | | 126 | 5610 | | | 16.38 |
| | | | 134 | 5670 | | | 15.46 |
| | 802.11ac | 20 | 144 | 5720 | VHT0 | Main | 16.48 |
| | | | | | | Aux | 16.42 |
| | | 40 | 142 | 5710 | | Main | 16.43 |
| | | | | | | Aux | 16.47 |
| | | 80 | 106 | 5530 | VHT6 | Main | 8.97 |
| | | | 122 | 5610 | | | 13.95 |
| | | | 138 | 5690 | | | 13.92 |
| | | | 106 | 5530 | | Aux | 8.91 |
| | | | 122 | 5610 | | | 13.97 |
| | | | 138 | 5690 | | | 13.99 |

| Band | Mode | Bandwidth (MHz) | Channel | Frequency (MHz) | Data Rate | Antenna | Power (dBm) |
|---|---|---|---|---|---|---|---|
| 5800 MHz | 802.11a | 20 | 149 | 5745 | 6 Mbps | Main | 16.48 |
| | | | 153 | 5765 | | | 16.47 |
| | | | 157 | 5785 | | | 16.50 |
| | | | 161 | 5805 | | | 16.43 |
| | | | 165 | 5825 | | | 16.48 |
| | | | 149 | 5745 | | Aux | 16.42 |
| | | | 153 | 5765 | | | 16.45 |
| | | | 157 | 5785 | | | 16.50 |
| | | | 161 | 5805 | | | 16.47 |
| | | | 165 | 5825 | | | 16.49 |
| | 802.11n | 20 | 149 | 5745 | HT8 | Main | 16.42 |
| | | | 153 | 5765 | | | 16.45 |
| | | | 157 | 5785 | | | 16.48 |
| | | | 161 | 5805 | | | 16.43 |
| | | | 165 | 5825 | | | 16.41 |
| | | | 149 | 5745 | | Aux | 16.40 |
| | | | 153 | 5765 | | | 16.48 |
| | | | 157 | 5785 | | | 16.39 |
| | | | 161 | 5805 | | | 16.47 |
| | | | 165 | 5825 | | | 16.45 |
| | 802.11n | 40 | 151 | 5755 | HT8 | Main | 16.43 |
| | | | 159 | 5795 | | | 16.37 |
| | | | 151 | 5755 | | Aux | 16.36 |
| | | | 159 | 5795 | | | 16.42 |
| | 802.11ac | 80 | 155 | 5775 | VHT6 | Main | 13.98 |
| | | | | | | Aux | 14.00 |

# Figure 9.1 Test Reduction Table – 2.4 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11b | Back | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Top Edge | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Left | 1 – 2412 MHz | Reduced[3] |
| | | 6 – 2437 MHz | Reduced[3] |
| | | 11 – 2462 MHz | Reduced[3] |
| | Right | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Curved Edge | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| 802.11g | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| 802.11n | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.
Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the b mode, testing is not required per KDB 248227 page 5.
Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√2.462=0.29 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√2.462=0.30 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√2.462=0.40 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√2.462=0.38 which is equal to or less than 3.0.

# Figure 9.2 Test Reduction Table – 2.4 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11b | Back | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Top Edge | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Left | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Right | 1 – 2412 MHz | Reduced[3] |
| | | 6 – 2437 MHz | Reduced[3] |
| | | 11 – 2462 MHz | Reduced[3] |
| | Curved Edge | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| 802.11g | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| 802.11n | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the b mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√2.462=0.29 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√2.462=0.30 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√2.462=0.40 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√2.462=0.38 which is equal to or less than 3.0.

# Figure 9.3 Test Reduction Table – 2.4 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11b | Back | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Top Edge | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Left | 1 – 2412 MHz | Reduced[3] |
| | | 6 – 2437 MHz | Reduced[3] |
| | | 11 – 2462 MHz | Reduced[3] |
| | Right | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Curved Edge | 1 – 2412 MHz | Tested |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Tested |
| 802.11g | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| 802.11n | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the b mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√2.462=0.29 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√2.462=0.30 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√2.462=0.40 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√2.462=0.38 which is equal to or less than 3.0.

# Figure 9.4 Test Reduction Table – 2.4 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11b | Back | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Top Edge | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Left | 1 – 2412 MHz | Reduced[1] |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Reduced[1] |
| | Right | 1 – 2412 MHz | Reduced[3] |
| | | 6 – 2437 MHz | Reduced[3] |
| | | 11 – 2462 MHz | Reduced[3] |
| | Curved Edge | 1 – 2412 MHz | Tested |
| | | 6 – 2437 MHz | Tested |
| | | 11 – 2462 MHz | Tested |
| 802.11g | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| 802.11n | Back | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Top Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Left | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Right | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |
| | Curved Edge | 1 – 2412 MHz | Reduced[2] |
| | | 6 – 2437 MHz | Reduced[2] |
| | | 11 – 2462 MHz | Reduced[2] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the b mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√2.462=0.29 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√2.462=0.30 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√2.462=0.40 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√2.462=0.38 which is equal to or less than 3.0.

# Figure 9.5 Test Reduction Table – 5.1 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Top Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Left | 36 – 5180 MHz | Reduced[3] |
| | | 40 – 5200 MHz | Reduced[3] |
| | | 44 – 5220 MHz | Reduced[3] |
| | | 48 – 5240 MHz | Reduced[3] |
| | Right | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Curved Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Top Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Left | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Right | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Curved Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 42 – 5210 MHz | Reduced[2] |
| | Top Edge | 42 – 5210 MHz | Reduced[2] |
| | Left | 42 – 5210 MHz | Reduced[2] |
| | Right | 42 – 5210 MHz | Reduced[2] |
| | Curved Edge | 42 – 5210 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.24=0.42 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.24=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.24=0.58 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.24=0.55 which is equal to or less than 3.0.

# Figure 9.6 Test Reduction Table – 5.1 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Top Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Left | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Right | 36 – 5180 MHz | Reduced[3] |
| | | 40 – 5200 MHz | Reduced[3] |
| | | 44 – 5220 MHz | Reduced[3] |
| | | 48 – 5240 MHz | Reduced[3] |
| | Curved Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Top Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Left | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Right | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Curved Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 42 – 5210 MHz | Reduced[2] |
| | Top Edge | 42 – 5210 MHz | Reduced[2] |
| | Left | 42 – 5210 MHz | Reduced[2] |
| | Right | 42 – 5210 MHz | Reduced[2] |
| | Curved Edge | 42 – 5210 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.24=0.42 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.24=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.24=0.58 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.24=0.55 which is equal to or less than 3.0.

# Figure 9.7 Test Reduction Table – 5.1 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Top Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Left | 36 – 5180 MHz | Reduced[3] |
| | | 40 – 5200 MHz | Reduced[3] |
| | | 44 – 5220 MHz | Reduced[3] |
| | | 48 – 5240 MHz | Reduced[3] |
| | Right | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Curved Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Top Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Left | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Right | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Curved Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 42 – 5210 MHz | Reduced[2] |
| | Top Edge | 42 – 5210 MHz | Reduced[2] |
| | Left | 42 – 5210 MHz | Reduced[2] |
| | Right | 42 – 5210 MHz | Reduced[2] |
| | Curved Edge | 42 – 5210 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.24=0.42 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.24=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.24=0.58 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.24=0.55 which is equal to or less than 3.0.

# Figure 9.8 Test Reduction Table – 5.1 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Top Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Left | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| | Right | 36 – 5180 MHz | Reduced[3] |
| | | 40 – 5200 MHz | Reduced[3] |
| | | 44 – 5220 MHz | Reduced[3] |
| | | 48 – 5240 MHz | Reduced[3] |
| | Curved Edge | 36 – 5180 MHz | Reduced[1] |
| | | 40 – 5200 MHz | Reduced[1] |
| | | 44 – 5220 MHz | Tested |
| | | 48 – 5240 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Top Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Left | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Right | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| | Curved Edge | 36 – 5180 MHz | Reduced[2] |
| | | 40 – 5200 MHz | Reduced[2] |
| | | 44 – 5220 MHz | Reduced[2] |
| | | 48 – 5240 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 42 – 5210 MHz | Reduced[2] |
| | Top Edge | 42 – 5210 MHz | Reduced[2] |
| | Left | 42 – 5210 MHz | Reduced[2] |
| | Right | 42 – 5210 MHz | Reduced[2] |
| | Curved Edge | 42 – 5210 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.24=0.42 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.24=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.24=0.58 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.24=0.55 which is equal to or less than 3.0.

# Figure 9.9 Test Reduction Table – 5.2 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Top Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Left | 52 – 5260 MHz | Reduced[3] |
| | | 56 – 5280 MHz | Reduced[3] |
| | | 60 – 5300 MHz | Reduced[3] |
| | | 64 – 5320 MHz | Reduced[3] |
| | Right | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Curved Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Top Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Left | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Right | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Curved Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 58 – 5290 MHz | Reduced[2] |
| | Top Edge | 58 – 5290 MHz | Reduced[2] |
| | Left | 58 – 5290 MHz | Reduced[2] |
| | Right | 58 – 5290 MHz | Reduced[2] |
| | Curved Edge | 58 – 5290 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.32=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.32=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.32=0.59 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.32=0.56 which is equal to or less than 3.0.

## Figure 9.10 Test Reduction Table – 5.2 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Top Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Left | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Right | 52 – 5260 MHz | Reduced[3] |
| | | 56 – 5280 MHz | Reduced[3] |
| | | 60 – 5300 MHz | Reduced[3] |
| | | 64 – 5320 MHz | Reduced[3] |
| | Curved Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Top Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Left | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Right | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Curved Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 58 – 5290 MHz | Reduced[2] |
| | Top Edge | 58 – 5290 MHz | Reduced[2] |
| | Left | 58 – 5290 MHz | Reduced[2] |
| | Right | 58 – 5290 MHz | Reduced[2] |
| | Curved Edge | 58 – 5290 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.
Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.
Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.32=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.32=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.32=0.59 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.32=0.56 which is equal to or less than 3.0.

# Figure 9.11 Test Reduction Table – 5.2 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Top Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Left | 52 – 5260 MHz | Reduced[3] |
| | | 56 – 5280 MHz | Reduced[3] |
| | | 60 – 5300 MHz | Reduced[3] |
| | | 64 – 5320 MHz | Reduced[3] |
| | Right | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Curved Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Top Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Left | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Right | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Curved Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 58 – 5290 MHz | Reduced[2] |
| | Top Edge | 58 – 5290 MHz | Reduced[2] |
| | Left | 58 – 5290 MHz | Reduced[2] |
| | Right | 58 – 5290 MHz | Reduced[2] |
| | Curved Edge | 58 – 5290 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.32=0.43 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.32=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.32=0.59 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.32=0.56 which is equal to or less than 3.0.

# Figure 9.12 Test Reduction Table – 5.2 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5150 MHz | Back | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Top Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Left | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| | Right | 52 – 5260 MHz | Reduced[3] |
| | | 56 – 5280 MHz | Reduced[3] |
| | | 60 – 5300 MHz | Reduced[3] |
| | | 64 – 5320 MHz | Reduced[3] |
| | Curved Edge | 52 – 5260 MHz | Reduced[1] |
| | | 56 – 5280 MHz | Reduced[1] |
| | | 60 – 5300 MHz | Tested |
| | | 64 – 5320 MHz | Reduced[1] |
| 802.11n 5150 MHz | Back | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Top Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Left | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Right | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| | Curved Edge | 52 – 5260 MHz | Reduced[2] |
| | | 56 – 5280 MHz | Reduced[2] |
| | | 60 – 5300 MHz | Reduced[2] |
| | | 64 – 5320 MHz | Reduced[2] |
| 802.11ac 5210 MHz | Back | 58 – 5290 MHz | Reduced[2] |
| | Top Edge | 58 – 5290 MHz | Reduced[2] |
| | Left | 58 – 5290 MHz | Reduced[2] |
| | Right | 58 – 5290 MHz | Reduced[2] |
| | Curved Edge | 58 – 5290 MHz | Tested |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

$[(44.7 \text{ mW})/(242 \text{ mm})]*\sqrt{5.32}=0.43$ which is equal to or less than 3.0.
$[(44.7 \text{ mW})/(237 \text{ mm})]*\sqrt{5.32}=0.44$ which is equal to or less than 3.0.
$[(44.7 \text{ mW})/(175 \text{ mm})]*\sqrt{5.32}=0.59$ which is equal to or less than 3.0.
$[(44.7 \text{ mW})/(185 \text{ mm})]*\sqrt{5.32}=0.56$ which is equal to or less than 3.0.

# Figure 9.13 Test Reduction Table – 5.6 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5600 MHz | Back | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Top Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Left | 100 – 5500 MHz | Reduced[3] |
| | | 104 – 5520 MHz | Reduced[3] |
| | | 108 – 5540 MHz | Reduced[3] |
| | | 112 – 5560 MHz | Reduced[3] |
| | | 116 – 5580 MHz | Reduced[3] |
| | | 120 – 5600 MHz | Reduced[3] |
| | | 124 – 5620 MHz | Reduced[3] |
| | | 128 – 5640 MHz | Reduced[3] |
| | | 132 – 5660 MHz | Reduced[3] |
| | | 136 – 5680 MHz | Reduced[3] |
| | | 140 – 5700 MHz | Reduced[3] |
| | Right | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Curved Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.70=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.70=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.70=0.61 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.70=0.58 which is equal to or less than 3.0.

# Figure 9.14 Test Reduction Table – 5.6 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11n 5600 MHz | Back | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Top Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Left | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Right | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Curved Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

## Figure 9.15 Test Reduction Table – 5.6 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11ac 5600 MHz | Back | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Top Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Left | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Right | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Curved Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Tested |
| | | 138 – 5690 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

# Figure 9.16 Test Reduction Table – 5.6 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5600 MHz | Back | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Top Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Left | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Right | 100 – 5500 MHz | Reduced[3] |
| | | 104 – 5520 MHz | Reduced[3] |
| | | 108 – 5540 MHz | Reduced[3] |
| | | 112 – 5560 MHz | Reduced[3] |
| | | 116 – 5580 MHz | Reduced[3] |
| | | 120 – 5600 MHz | Reduced[3] |
| | | 124 – 5620 MHz | Reduced[3] |
| | | 128 – 5640 MHz | Reduced[3] |
| | | 132 – 5660 MHz | Reduced[3] |
| | | 136 – 5680 MHz | Reduced[3] |
| | | 140 – 5700 MHz | Reduced[3] |
| | Curved Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.70=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.70=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.70=0.61 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.70=0.58 which is equal to or less than 3.0.

# Figure 9.17 Test Reduction Table – 5.6 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11n 5600 MHz | Back | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Top Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Left | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Right | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Curved Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

## Figure 9.18 Test Reduction Table – 5.6 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11ac 5600 MHz | Back | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Top Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Left | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Right | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Curved Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Tested |
| | | 138 – 5690 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

# Figure 9.19 Test Reduction Table – 5.6 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5600 MHz | Back | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Top Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Left | 100 – 5500 MHz | Reduced[3] |
| | | 104 – 5520 MHz | Reduced[3] |
| | | 108 – 5540 MHz | Reduced[3] |
| | | 112 – 5560 MHz | Reduced[3] |
| | | 116 – 5580 MHz | Reduced[3] |
| | | 120 – 5600 MHz | Reduced[3] |
| | | 124 – 5620 MHz | Reduced[3] |
| | | 128 – 5640 MHz | Reduced[3] |
| | | 132 – 5660 MHz | Reduced[3] |
| | | 136 – 5680 MHz | Reduced[3] |
| | | 140 – 5700 MHz | Reduced[3] |
| | Right | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Curved Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.70=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.70=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.70=0.61 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.70=0.58 which is equal to or less than 3.0.

# Figure 9.20 Test Reduction Table – 5.6 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11n 5600 MHz | Back | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Top Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Left | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Right | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Curved Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

## Figure 9.21 Test Reduction Table – 5.6 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11ac 5600 MHz | Back | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Top Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Left | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Right | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Curved Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Tested |
| | | 138 – 5690 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

# Figure 9.22 Test Reduction Table – 5.6 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5600 MHz | Back | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Top Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Left | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |
| | Right | 100 – 5500 MHz | Reduced[3] |
| | | 104 – 5520 MHz | Reduced[3] |
| | | 108 – 5540 MHz | Reduced[3] |
| | | 112 – 5560 MHz | Reduced[3] |
| | | 116 – 5580 MHz | Reduced[3] |
| | | 120 – 5600 MHz | Reduced[3] |
| | | 124 – 5620 MHz | Reduced[3] |
| | | 128 – 5640 MHz | Reduced[3] |
| | | 132 – 5660 MHz | Reduced[3] |
| | | 136 – 5680 MHz | Reduced[3] |
| | | 140 – 5700 MHz | Reduced[3] |
| | Curved Edge | 100 – 5500 MHz | Reduced[1] |
| | | 104 – 5520 MHz | Reduced[1] |
| | | 108 – 5540 MHz | Reduced[1] |
| | | 112 – 5560 MHz | Reduced[1] |
| | | 116 – 5580 MHz | Tested |
| | | 120 – 5600 MHz | Reduced[1] |
| | | 124 – 5620 MHz | Reduced[1] |
| | | 128 – 5640 MHz | Reduced[1] |
| | | 132 – 5660 MHz | Reduced[1] |
| | | 136 – 5680 MHz | Tested |
| | | 140 – 5700 MHz | Reduced[1] |

Reduced[1] – When the mid channel is 3 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.70=0.44 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.70=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.70=0.61 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.70=0.58 which is equal to or less than 3.0.

# Figure 9.23 Test Reduction Table – 5.6 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11n 5600 MHz | Back | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Top Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Left | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Right | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |
| | Curved Edge | 100 – 5500 MHz | Reduced[2] |
| | | 104 – 5520 MHz | Reduced[2] |
| | | 108 – 5540 MHz | Reduced[2] |
| | | 112 – 5560 MHz | Reduced[2] |
| | | 116 – 5580 MHz | Reduced[2] |
| | | 120 – 5600 MHz | Reduced[2] |
| | | 124 – 5620 MHz | Reduced[2] |
| | | 128 – 5640 MHz | Reduced[2] |
| | | 132 – 5660 MHz | Reduced[2] |
| | | 136 – 5680 MHz | Reduced[2] |
| | | 140 – 5700 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

## Figure 9.24 Test Reduction Table – 5.6 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11ac 5600 MHz | Back | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Top Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Left | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Right | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Reduced[2] |
| | | 138 – 5690 MHz | Reduced[2] |
| | Curved Edge | 106 – 5530 MHz | Reduced[2] |
| | | 122 – 5610 MHz | Tested |
| | | 138 – 5690 MHz | Reduced[2] |

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

## Figure 9.25 Test Reduction Table – 5.8 GHz Main Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5800 MHz | Back | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Top Edge | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Left | 149 – 5745 MHz | Reduced[3] |
| | | 153 – 5765 MHz | Reduced[3] |
| | | 157 – 5785 MHz | Reduced[3] |
| | | 161 – 5805 MHz | Reduced[3] |
| | | 165 – 5825 MHz | Reduced[3] |
| | Right | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Curved Edge | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| 802.11n 5800 MHz | Back | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Top Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Left | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Right | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Curved Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| 802.11ac 5775 MHz | Back | 155 – 5775 MHz | Reduced[2] |
| | Top Edge | 155 – 5775 MHz | Reduced[2] |
| | Left | 155 – 5775 MHz | Reduced[2] |
| | Right | 155 – 5775 MHz | Reduced[2] |
| | Curved Edge | 155 – 5775 MHz | Tested |

Reduced[1] – When the mid channel is 6 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.825=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.825=0.46 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.825=0.62 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.825=0.58 which is equal to or less than 3.0.

# Figure 9.26 Test Reduction Table – 5.8 GHz Aux Wistron

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5800 MHz | Back | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Top Edge | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Left | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Right | 149 – 5745 MHz | Reduced[3] |
| | | 153 – 5765 MHz | Reduced[3] |
| | | 157 – 5785 MHz | Reduced[3] |
| | | 161 – 5805 MHz | Reduced[3] |
| | | 165 – 5825 MHz | Reduced[3] |
| | Curved Edge | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| 802.11n 5800 MHz | Back | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Top Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Left | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Right | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Curved Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| 802.11ac 5775 MHz | Back | 155 – 5775 MHz | Reduced[2] |
| | Top Edge | 155 – 5775 MHz | Reduced[2] |
| | Left | 155 – 5775 MHz | Reduced[2] |
| | Right | 155 – 5775 MHz | Reduced[2] |
| | Curved Edge | 155 – 5775 MHz | Tested |

Reduced[1] – When the mid channel is 6 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.825=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.825=0.46 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.825=0.62 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.825=0.58 which is equal to or less than 3.0.

# Figure 9.27 Test Reduction Table – 5.8 GHz Main Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5800 MHz | Back | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Top Edge | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Left | 149 – 5745 MHz | Reduced[3] |
| | | 153 – 5765 MHz | Reduced[3] |
| | | 157 – 5785 MHz | Reduced[3] |
| | | 161 – 5805 MHz | Reduced[3] |
| | | 165 – 5825 MHz | Reduced[3] |
| | Right | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Curved Edge | 149 – 5745 MHz | Tested |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Tested |
| 802.11n 5800 MHz | Back | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Top Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Left | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Right | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Curved Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| 802.11ac 5775 MHz | Back | 155 – 5775 MHz | Reduced[2] |
| | Top Edge | 155 – 5775 MHz | Reduced[2] |
| | Left | 155 – 5775 MHz | Reduced[2] |
| | Right | 155 – 5775 MHz | Reduced[2] |
| | Curved Edge | 155 – 5775 MHz | Tested |

Reduced[1] – When the mid channel is 6 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
Right Side Distance from Aux: 237 mm
Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

$[(44.7\ \text{mW})/(242\ \text{mm})]*\sqrt{5.825}=0.45$ which is equal to or less than 3.0.
$[(44.7\ \text{mW})/(237\ \text{mm})]*\sqrt{5.825}=0.46$ which is equal to or less than 3.0.
$[(44.7\ \text{mW})/(175\ \text{mm})]*\sqrt{5.825}=0.62$ which is equal to or less than 3.0.
$[(44.7\ \text{mW})/(185\ \text{mm})]*\sqrt{5.825}=0.58$ which is equal to or less than 3.0.

# Figure 9.28 Test Reduction Table – 5.8 GHz Aux Foxconn

| Mode | Side | Required Channel | Tested/Reduced |
|---|---|---|---|
| 802.11a 5800 MHz | Back | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Top Edge | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Left | 149 – 5745 MHz | Reduced[1] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[1] |
| | Right | 149 – 5745 MHz | Reduced[3] |
| | | 153 – 5765 MHz | Reduced[3] |
| | | 157 – 5785 MHz | Reduced[3] |
| | | 161 – 5805 MHz | Reduced[3] |
| | | 165 – 5825 MHz | Reduced[3] |
| | Curved Edge | 149 – 5745 MHz | Tested |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Tested |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Tested |
| 802.11n 5800 MHz | Back | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Top Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Left | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Right | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| | Curved Edge | 149 – 5745 MHz | Reduced[2] |
| | | 153 – 5765 MHz | Reduced[2] |
| | | 157 – 5785 MHz | Reduced[2] |
| | | 161 – 5805 MHz | Reduced[2] |
| | | 165 – 5825 MHz | Reduced[2] |
| 802.11ac 5775 MHz | Back | 155 – 5775 MHz | Reduced[2] |
| | Top Edge | 155 – 5775 MHz | Reduced[2] |
| | Left | 155 – 5775 MHz | Reduced[2] |
| | Right | 155 – 5775 MHz | Reduced[2] |
| | Curved Edge | 155 – 5775 MHz | Tested |

Reduced[1] – When the mid channel is 6 dB below the limit, the remaining channels are not required per KDB 447498 D01 v05r01 section 4.3.3 page 14.

Reduced[2] – When the conducted power in this mode is less than 0.25 dB higher than the a mode, testing is not required per KDB 248227 page 5.

Reduced[3] – When the calculated value from a side is less than or equal to 3.0, the test can be reduced per KDB447498 D01 v05 section 4.3.1 1) page 11. See below for calculations.

Maximum power: 44.7 mW
Left Side Distance From Main: 242 mm
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Bottom Edge Distance from Main and Aux in tablet mode: 175 mm
Bottom Edge Distance from Main and Aux in laptop mode: 185 mm

[(44.7 mW)/(242 mm)]*√5.825=0.45 which is equal to or less than 3.0.
[(44.7 mW)/(237 mm)]*√5.825=0.46 which is equal to or less than 3.0.
[(44.7 mW)/(175 mm)]*√5.825=0.62 which is equal to or less than 3.0.
[(44.7 mW)/(185 mm)]*√5.825=0.58 which is equal to or less than 3.0.

## SAR Data Summary – 2450 MHz Body 802.11b

| MEASUREMENT RESULTS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Plot | Gap | Antenna | Position | Frequency | | Modulation | Diversity Antenna | End Power | Measured SAR (W/kg) | Reported SAR (W/kg) |
| | | | | MHz | Ch. | | | (dBm) | | |
| ----- | 0 mm | Wistron | Back | 2437 | 6 | DSSS | Main | 16.50 | 0.473 | 0.47 |
| ----- | | | Top Edge | 2437 | 6 | DSSS | | 16.50 | 0.409 | 0.41 |
| ----- | | | Curved Edge | 2437 | 6 | DSSS | | 16.50 | 0.775 | 0.78 |
| ----- | | | Right Side | 2437 | 6 | DSSS | | 16.50 | 0.226 | 0.23 |
| ----- | | | Back | 2437 | 6 | DSSS | Aux | 16.50 | 0.490 | 0.49 |
| ----- | | | Top Edge | 2437 | 6 | DSSS | | 16.50 | 0.225 | 0.23 |
| ----- | | | Curved Edge | 2437 | 6 | DSSS | | 16.50 | 0.691 | 0.69 |
| ----- | | | Left Side | 2437 | 6 | DSSS | | 16.50 | 0.168 | 0.17 |
| ----- | | Foxconn | Back | 2437 | 6 | DSSS | Main | 16.50 | 0.721 | 0.72 |
| ----- | | | Top Edge | 2437 | 6 | DSSS | | 16.50 | 0.706 | 0.71 |
| 1 | | | Curved Edge | 2412 | 1 | DSSS | | 16.47 | 1.077 | 1.08 |
| ----- | | | | 2437 | 6 | DSSS | | 16.50 | 0.935 | 0.94 |
| ----- | | | | 2462 | 11 | DSSS | | 16.48 | 1.073 | 1.08 |
| ----- | | | Right Side | 2437 | 6 | DSSS | | 16.50 | 0.468 | 0.47 |
| ----- | | | Back | 2437 | 6 | DSSS | Aux | 16.50 | 0.564 | 0.56 |
| ----- | | | Top Edge | 2437 | 6 | DSSS | | 16.50 | 0.426 | 0.43 |
| ----- | | | Curved Edge | 2412 | 1 | DSSS | | 16.48 | 0.713 | 0.72 |
| ----- | | | | 2437 | 6 | DSSS | | 16.50 | 0.802 | 0.80 |
| ----- | | | | 2462 | 11 | DSSS | | 16.49 | 0.751 | 0.75 |
| ----- | | | Left Side | 2437 | 6 | DSSS | | 16.50 | 0.351 | 0.35 |

**Body**
**1.6 W/kg (mW/g)**
averaged over 1 gram

1. Battery is fully charged for all tests.
   Power Measured ☒ Conducted ☐ ERP ☐ EIRP
2. SAR Measurement
   Phantom Configuration ☐ Left Head ☒ Uni-phantom ☐ Right Head
   SAR Configuration ☐ Head ☒ Body
3. Test Signal Call Mode ☒ Test Code ☐ Base Station Simulator
4. Test Configuration ☐ With Belt Clip ☐ Without Belt Clip ☒ N/A
5. Tissue Depth is at least 15.0 cm

Jay M. Moulton
Vice President

## SAR Data Summary – 5250 MHz Body 802.11a

### MEASUREMENT RESULTS

| Plot | Gap | Antenna | Position | Frequency MHz | Frequency Ch. | Modulation | Diversity Antenna | End Power (dBm) | Measured SAR (W/kg) | Reported SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| ----- | 0 mm | Wistron | Back | 5220 | 44 | OFDM | Main | 16.00 | 0.254 | 0.25 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.299 | 0.30 |
| ----- | | | Top Edge | 5220 | 44 | OFDM | | 16.00 | 0.361 | 0.36 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.408 | 0.41 |
| ----- | | | Curved Edge | 5220 | 44 | OFDM | | 16.00 | 0.386 | 0.39 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.431 | 0.43 |
| ----- | | | Right Side | 5220 | 44 | OFDM | | 16.00 | 0.168 | 0.17 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.189 | 0.19 |
| ----- | | | Back | 5220 | 44 | OFDM | Aux | 16.00 | 0.289 | 0.29 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.305 | 0.31 |
| ----- | | | Top Edge | 5220 | 44 | OFDM | | 16.00 | 0.406 | 0.41 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.426 | 0.43 |
| ----- | | | Curved Edge | 5220 | 44 | OFDM | | 16.00 | 0.513 | 0.51 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.584 | 0.58 |
| ----- | | | Left Side | 5220 | 44 | OFDM | | 16.00 | 0.234 | 0.23 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.267 | 0.27 |
| ----- | | Foxconn | Back | 5220 | 44 | OFDM | Main | 16.00 | 0.620 | 0.62 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.599 | 0.60 |
| ----- | | | Top Edge | 5220 | 44 | OFDM | | 16.00 | 0.518 | 0.52 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.548 | 0.55 |
| ----- | | | Curved Edge | 5220 | 44 | OFDM | | 16.00 | 0.547 | 0.55 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.569 | 0.57 |
| ----- | | | Right Side | 5220 | 44 | OFDM | | 16.00 | 0.329 | 0.33 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.384 | 0.38 |
| ----- | | | Back | 5220 | 44 | OFDM | Aux | 16.00 | 0.297 | 0.30 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.281 | 0.28 |
| ----- | | | Top Edge | 5220 | 44 | OFDM | | 16.00 | 0.642 | 0.64 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.504 | 0.50 |
| ----- | | | Curved Edge | 5220 | 44 | OFDM | | 16.00 | 0.587 | 0.59 |
| 2 | | | | 5300 | 60 | OFDM | | 16.00 | 0.683 | 0.68 |
| ----- | | | Left Side | 5220 | 44 | OFDM | | 16.00 | 0.397 | 0.40 |
| ----- | | | | 5300 | 60 | OFDM | | 16.00 | 0.406 | 0.41 |

**Body**
**1.6 W/kg (mW/g)**
averaged over 1 gram

1. Battery is fully charged for all tests.
   Power Measured ☒Conducted ☐ERP ☐EIRP
2. SAR Measurement
   Phantom Configuration ☐Left Head ☒Uni-phantom ☐Right Head
   SAR Configuration ☐Head ☒Body
3. Test Signal Call Mode ☒Test Code ☐Base Station Simulator
4. Test Configuration ☐With Belt Clip ☐Without Belt Clip ☒N/A
5. Tissue Depth is at least 15.0 cm

Jay M. Moulton
Vice President

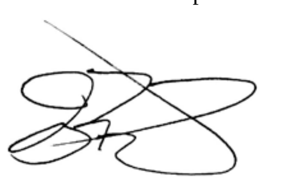
## SAR Data Summary – 5600 MHz Body 802.11a

### MEASUREMENT RESULTS

| Plot | Gap | Antenna | Position | Frequency | | Modulation | Diversity Antenna | End Power | Measured SAR (W/kg) | Reported SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MHz | Ch. | | | (dBm) | | |
| ----- | 0 mm | Wistron | Back | 5580 | 116 | OFDM | Main | 16.48 | 0.403 | 0.40 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.418 | 0.42 |
| ----- | | | Top Edge | 5580 | 116 | OFDM | | 16.48 | 0.432 | 0.43 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.410 | 0.41 |
| ----- | | | Curved Edge | 5580 | 116 | OFDM | | 16.48 | 0.443 | 0.45 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.362 | 0.36 |
| ----- | | | Right Side | 5580 | 116 | OFDM | | 16.48 | 0.286 | 0.29 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.257 | 0.26 |
| ----- | | | Back | 5580 | 116 | OFDM | Aux | 16.43 | 0.529 | 0.53 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.484 | 0.49 |
| ----- | | | Top Edge | 5580 | 116 | OFDM | | 16.43 | 0.543 | 0.55 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.486 | 0.49 |
| ----- | | | Curved Edge | 5580 | 116 | OFDM | | 16.43 | 0.356 | 0.36 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.430 | 0.43 |
| ----- | | | Left Side | 5580 | 116 | OFDM | | 16.43 | 0.291 | 0.29 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.305 | 0.31 |
| ----- | | Foxconn | Back | 5580 | 116 | OFDM | Main | 16.48 | 0.440 | 0.44 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.420 | 0.42 |
| ----- | | | Top Edge | 5580 | 116 | OFDM | | 16.48 | 0.529 | 0.53 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.530 | 0.53 |
| ----- | | | Curved Edge | 5580 | 116 | OFDM | | 16.48 | 0.454 | 0.46 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.362 | 0.36 |
| ----- | | | Right Side | 5580 | 116 | OFDM | | 16.48 | 0.168 | 0.17 |
| ----- | | | | 5680 | 136 | OFDM | | 16.47 | 0.197 | 0.20 |
| ----- | | | Back | 5580 | 116 | OFDM | Aux | 16.43 | 0.422 | 0.42 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.374 | 0.38 |
| ----- | | | Top Edge | 5580 | 116 | OFDM | | 16.43 | 0.438 | 0.44 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.443 | 0.45 |
| 3 | | | Curved Edge | 5580 | 116 | OFDM | | 16.43 | 0.558 | 0.56 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.507 | 0.51 |
| ----- | | | Left Side | 5580 | 116 | OFDM | | 16.43 | 0.204 | 0.21 |
| ----- | | | | 5680 | 136 | OFDM | | 16.38 | 0.232 | 0.23 |

**Body**
**1.6 W/kg (mW/g)**
averaged over 1 gram

1. Battery is fully charged for all tests.
   Power Measured ☒Conducted ☐ERP ☐EIRP
2. SAR Measurement
   Phantom Configuration ☐Left Head ☒Uni-phantom ☐Right Head
   SAR Configuration ☐Head ☒Body
3. Test Signal Call Mode ☒Test Code ☐Base Station Simulator
4. Test Configuration ☐With Belt Clip ☐Without Belt Clip ☒N/A
5. Tissue Depth is at least 15.0 cm



Jay M. Moulton
Vice President

## SAR Data Summary – 5800 MHz Body 802.11a

### MEASUREMENT RESULTS

| Plot | Gap | Antenna | Position | Frequency MHz | Frequency Ch. | Modulation | Diversity Antenna | End Power (dBm) | Measured SAR (W/kg) | Reported SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| ----- | 0 mm | Wistron | Back | 5785 | 157 | OFDM | Main | 16.50 | 0.457 | 0.46 |
| ----- | | | Top Edge | 5785 | 157 | OFDM | | 16.50 | 0.483 | 0.48 |
| ----- | | | Curved Edge | 5785 | 157 | OFDM | | 16.50 | 0.608 | 0.61 |
| ----- | | | Right Side | 5785 | 157 | OFDM | | 16.50 | 0.297 | 0.30 |
| ----- | | | Back | 5785 | 157 | OFDM | Aux | 16.50 | 0.521 | 0.52 |
| ----- | | | Top Edge | 5785 | 157 | OFDM | | 16.50 | 0.512 | 0.51 |
| ----- | | | Curved Edge | 5785 | 157 | OFDM | | 16.50 | 0.595 | 0.60 |
| ----- | | | Left Side | 5785 | 157 | OFDM | | 16.50 | 0.316 | 0.32 |
| ----- | | Foxconn | Back | 5785 | 157 | OFDM | Main | 16.50 | 0.520 | 0.52 |
| ----- | | | Top Edge | 5785 | 157 | OFDM | | 16.50 | 0.757 | 0.76 |
| ----- | | | Curved Edge | 5745 | 149 | OFDM | | 16.48 | 0.798 | 0.80 |
| ----- | | | | 5785 | 157 | OFDM | | 16.50 | 0.810 | 0.81 |
| ----- | | | | 5825 | 165 | OFDM | | 16.48 | 0.785 | 0.79 |
| ----- | | | Right Side | 5785 | 157 | OFDM | | 16.50 | 0.411 | 0.41 |
| ----- | | | Back | 5785 | 157 | OFDM | Aux | 16.50 | 0.588 | 0.59 |
| ----- | | | Top Edge | 5785 | 157 | OFDM | | 16.50 | 0.613 | 0.61 |
| ----- | | | Curved Edge | 5745 | 149 | OFDM | | 16.42 | 0.823 | 0.84 |
| 4 | | | | 5785 | 157 | OFDM | | 16.50 | 0.853 | 0.85 |
| ----- | | | | 5825 | 165 | OFDM | | 16.49 | 0.801 | 0.80 |
| ----- | | | Left Side | 5785 | 157 | OFDM | | 16.50 | 0.421 | 0.42 |

**Body**
**1.6 W/kg (mW/g)**
averaged over 1 gram

1. Battery is fully charged for all tests.
   Power Measured ☒Conducted ☐ERP ☐EIRP
2. SAR Measurement
   Phantom Configuration ☐Left Head ☒Eli4 ☐Right Head
   SAR Configuration ☐Head ☒Body
3. Test Signal Call Mode ☒Test Code ☐Base Station Simulator
4. Test Configuration ☐With Belt Clip ☐Without Belt Clip ☒N/A
5. Tissue Depth is at least 15.0 cm

Jay M. Moulton
Vice President

## SAR Data Summary – 5 GHz Body 802.11ac 80 MHz Bandwidth

### MEASUREMENT RESULTS

| Plot | Gap | Antenna | Position | Frequency | | Modulation | Diversity Antenna | End Power | Measured SAR (W/kg) | Reported SAR (W/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MHz | Ch. | | | (dBm) | | |
| ----- | 0 mm | Wistron | Curved Edge | 5210 | 42 | OFDM | Main | 8.46 | 0.215 | 0.22 |
| ----- | | Foxconn | Curved Edge | 5210 | 42 | OFDM | Main | 8.46 | 0.232 | 0.23 |
| ----- | | Wistron | Curved Edge | 5290 | 58 | OFDM | Aux | 10.92 | 0.265 | 0.27 |
| ----- | | Foxconn | Curved Edge | 5290 | 58 | OFDM | Aux | 10.92 | 0.274 | 0.28 |
| ----- | | Wistron | Top Edge | 5610 | 122 | OFDM | Aux | 13.97 | 0.331 | 0.33 |
| ----- | | Foxconn | Curved Edge | 5610 | 122 | OFDM | Aux | 13.97 | 0.362 | 0.36 |
| ----- | | Wistron | Curved Edge | 5775 | 155 | OFDM | Main | 13.98 | 0.611 | 0.61 |
| ----- | | Foxconn | Curved Edge | 5775 | 155 | OFDM | Aux | 14.00 | 0.657 | 0.66 |

**Body**
**1.6 W/kg (mW/g)**
averaged over 1 gram

1. Battery is fully charged for all tests.
   Power Measured ☒ Conducted ☐ ERP ☐ EIRP
2. SAR Measurement
   Phantom Configuration ☐ Left Head ☒ Eli4 ☐ Right Head
   SAR Configuration ☐ Head ☒ Body
3. Test Signal Call Mode ☒ Test Code ☐ Base Station Simulator
4. Test Configuration ☐ With Belt Clip ☐ Without Belt Clip ☒ N/A
5. Tissue Depth is at least 15.0 cm

Jay M. Moulton
Vice President

## SAR Data Summary – Simultaneous Evaluation

| MEASUREMENT RESULTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency | | Modulation | Frequency | | Modulation | $SAR_1$ | $SAR_2$ | SAR Total |
| MHz | Ch. | | MHz | Ch. | | | | |
| 2412 | 1 | DSSS | 2440 | 39 | GFSK | 1.08 | 0.42 | 1.50 |
| 5300 | 60 | OFDM | 2440 | 39 | GFSK | 0.68 | 0.42 | 1.10 |
| 5580 | 116 | OFDM | 2440 | 39 | GFSK | 0.56 | 0.42 | 0.98 |
| 5875 | 157 | OFDM | 2440 | 39 | GFSK | 0.85 | 0.42 | 1.27 |
| | | | | | Body<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | |

The sum of the two transmitters is less than the limit; therefore, the simultaneous transmission is compliant per KDB 447498 D01 v05r01 section 4.3.2.

**BT Calculated SAR per KDB 447498 D01 v05r01 section 4.3.2 2) page 12.**

SAR = [(Max power including tolerance, mW)/(Min test separation distance, mm)]*[$\sqrt{f_{(GHz)}}$/7.5]

Max power = 10 mW
Test Separation = 5 mm
$f_{(GHz)}$ = 2.48

SAR = (10/5)*($\sqrt{2.48}$/7.5) = 0.42

# 10. Test Equipment List

**Table 10.1 Equipment Specifications**

| Type | Calibration Due Date | Calibration Done Date | Serial Number |
|---|---|---|---|
| ThermoCRS Robot | N/A | N/A | RAF0338198 |
| ThermoCRS Controller | N/A | N/A | RCF0338224 |
| ThermoCRS Teach Pendant (Joystick) | N/A | N/A | STP0334405 |
| IBM Computer, 2.66 MHz P4 | N/A | N/A | 8189D8U KCPR08N |
| Aprel E-Field Probe ALS-E020 | 08/01/2014 | 08/01/2013 | RFE-217 |
| Aprel E-Field Probe ALS-E030 | 07/17/2014 | 07/17/2013 | E030-001 |
| Aprel Uni-Phantom | N/A | N/A | RFE-273 |
| Speag Validation Dipole D2450V2 | 12/04/2013 | 12/04/2012 | 829 |
| Speag Validation Dipole D5GHzV2 | 12/11/2013 | 12/11/2012 | 1085 |
| Agilent N1911A Power Meter | 03/25/2014 | 03/25/2013 | GB45100254 |
| Agilent N1922A Power Sensor | 03/27/2014 | 03/27/2013 | MY45240464 |
| Advantest R3261A Spectrum Analyzer | 03/25/2014 | 03/25/2013 | 31720068 |
| Agilent (HP) 8350B Signal Generator | 03/25/2014 | 03/25/2013 | 2749A10226 |
| Agilent (HP) 83525A RF Plug-In | 03/25/2014 | 03/25/2013 | 2647A01172 |
| Agilent (HP) 8753C Vector Network Analyzer | 03/25/2014 | 03/25/2013 | 3135A01724 |
| Agilent (HP) 85047A S-Parameter Test Set | 03/25/2014 | 03/25/2013 | 2904A00595 |
| Agilent (HP) 8960 Base Station Sim. | 04/05/2014 | 04/05/2012 | MY48360364 |
| Anritsu MT8820C | 08/03/2014 | 08/03/2012 | 6201176199 |
| Aprel Dielectric Probe Assembly | N/A | N/A | 0011 |
| Body Equivalent Matter (2450 MHz) | N/A | N/A | N/A |
| Body Equivalent Matter (5 GHz) | N/A | N/A | N/A |

# 11. Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body is a very complex phenomena that depends on the mass, shape, and size of the body; the orientation of the body with respect to the field vectors; and, the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

# 12. References

[1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radio Frequency Radiation, August 1996

[2] ANSI/IEEE C95.1 – 1992, American National Standard Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300kHz to 100GHz, New York: IEEE, 1992.

[3] ANSI/IEEE C95.3 – 1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave, New York: IEEE, 1992.

[4] Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, June 2001.

[5] IEEE Standard 1528 – 2003, IEEE Recommended Practice for Determining the Peak-Spatial Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communication Devices: Measurement Techniques, October 2003.

[6] Industry Canada, RSS – 102e, Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands), March 2010.

[7] Health Canada, Safety Code 6, Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3kHz to 300 GHz, 2009.

# Appendix A – System Validation Plots and Data

```
************************************************************
Test Result for UIM Dielectric Parameter
Thu 15/Aug/2013
Freq   Frequency(GHz)
FCC_eH FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon  of  UIM
Test_s Sigma of UIM
************************************************************
```

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|---|---|---|---|---|
| 2.4100 | 52.75 | 1.91 | 52.62 | 1.92 |
| 2.4120 | 52.748 | 1.912 | 52.616 | 1.922* |
| 2.4200 | 52.74 | 1.92 | 52.60 | 1.93 |
| 2.4300 | 52.73 | 1.93 | 52.59 | 1.94 |
| 2.4370 | 52.716 | 1.937 | 52.576 | 1.954* |
| 2.4400 | 52.71 | 1.94 | 52.57 | 1.96 |
| 2.4500 | 52.70 | 1.95 | 52.55 | 1.97 |
| 2.4600 | 52.69 | 1.96 | 52.54 | 1.98 |
| 2.4620 | 52.686 | 1.964 | 52.536 | 1.982* |
| 2.4700 | 52.67 | 1.98 | 52.52 | 1.99 |
| 2.4800 | 52.66 | 1.99 | 52.51 | 2.01 |

* value interpolated

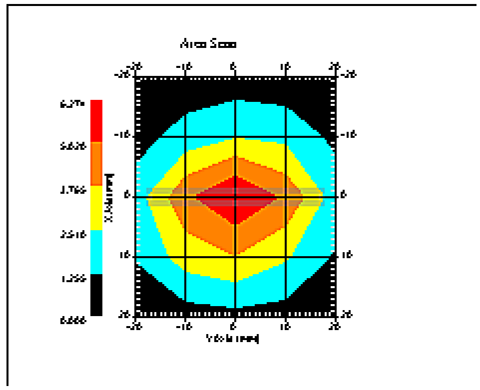
```
************************************************************
Test Result for UIM Dielectric Parameter
Tue 13/Aug/2013
Freq   Frequency(GHz)
FCC_eH FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon
FCC_sH FCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma
FCC_eB FCC Limits for Body Epsilon
FCC_sB FCC Limits for Body Sigma
Test_e Epsilon  of  UIM
Test_s Sigma of UIM
************************************************************
```

| Freq | FCC_eB | FCC_sB | Test_e | Test_s |
|---|---|---|---|---|
| 5.1000 | 49.15 | 5.18 | 49.31 | 5.21 |
| 5.1200 | 49.12 | 5.21 | 49.28 | 5.24 |
| 5.1400 | 49.10 | 5.23 | 49.26 | 5.27 |
| 5.1600 | 49.07 | 5.25 | 49.24 | 5.30 |
| 5.1800 | 49.04 | 5.28 | 49.21 | 5.33 |
| 5.2000 | 49.01 | 5.30 | 49.19 | 5.35 |
| 5.2100 | 49.00 | 5.31 | 49.18 | 5.36* |
| 5.2200 | 48.99 | 5.32 | 49.17 | 5.37 |
| 5.2400 | 48.96 | 5.35 | 49.15 | 5.40 |
| 5.2600 | 48.93 | 5.37 | 49.12 | 5.42 |
| 5.2800 | 48.91 | 5.39 | 49.10 | 5.44 |
| 5.2900 | 48.895 | 5.405 | 49.09 | 5.45* |
| 5.3000 | 48.88 | 5.42 | 49.08 | 5.46 |
| 5.3200 | 48.85 | 5.44 | 49.05 | 5.49 |
| 5.3400 | 48.82 | 5.46 | 49.03 | 5.51 |
| 5.3600 | 48.80 | 5.49 | 49.01 | 5.53 |
| 5.3800 | 48.77 | 5.51 | 48.99 | 5.55 |
| 5.4000 | 48.74 | 5.53 | 48.97 | 5.57 |
| 5.4200 | 48.72 | 5.56 | 48.94 | 5.59 |
| 5.4400 | 48.69 | 5.58 | 48.92 | 5.62 |
| 5.4600 | 48.66 | 5.60 | 48.90 | 5.64 |
| 5.4800 | 48.63 | 5.63 | 48.88 | 5.66 |
| 5.5000 | 48.61 | 5.65 | 48.85 | 5.69 |
| 5.5200 | 48.58 | 5.67 | 48.83 | 5.71 |
| 5.5400 | 48.55 | 5.70 | 48.81 | 5.73 |
| 5.5600 | 48.53 | 5.72 | 48.59 | 5.76 |
| 5.5800 | 48.50 | 5.74 | 48.56 | 5.78 |
| 5.6000 | 48.47 | 5.77 | 48.54 | 5.80 |
| 5.6100 | 48.455 | 5.78 | 48.53 | 5.815* |
| 5.6200 | 48.44 | 5.79 | 48.52 | 5.83 |
| 5.6400 | 48.42 | 5.81 | 48.50 | 5.85 |
| 5.6600 | 48.39 | 5.84 | 48.47 | 5.87 |
| 5.6800 | 48.36 | 5.86 | 48.45 | 6.00 |
| 5.7000 | 48.34 | 5.88 | 48.43 | 6.02 |
| 5.7200 | 48.31 | 5.91 | 48.41 | 6.04 |
| 5.7400 | 48.28 | 5.93 | 48.38 | 6.07 |
| 5.7450 | 48.273 | 5.935 | 48.375 | 6.075* |
| 5.7600 | 48.25 | 5.95 | 48.36 | 6.09 |
| 5.7750 | 48.235 | 5.973 | 48.345 | 6.105* |
| 5.7800 | 48.23 | 5.98 | 48.34 | 6.11 |
| 5.7850 | 48.223 | 5.985 | 48.335 | 6.118* |
| 5.8000 | 48.20 | 6.00 | 48.32 | 6.14 |
| 5.8200 | 48.17 | 6.02 | 48.30 | 6.16 |
| 5.8250 | 48.165 | 6.028 | 48.293 | 6.165* |
| 5.8400 | 48.15 | 6.05 | 48.27 | 6.18 |

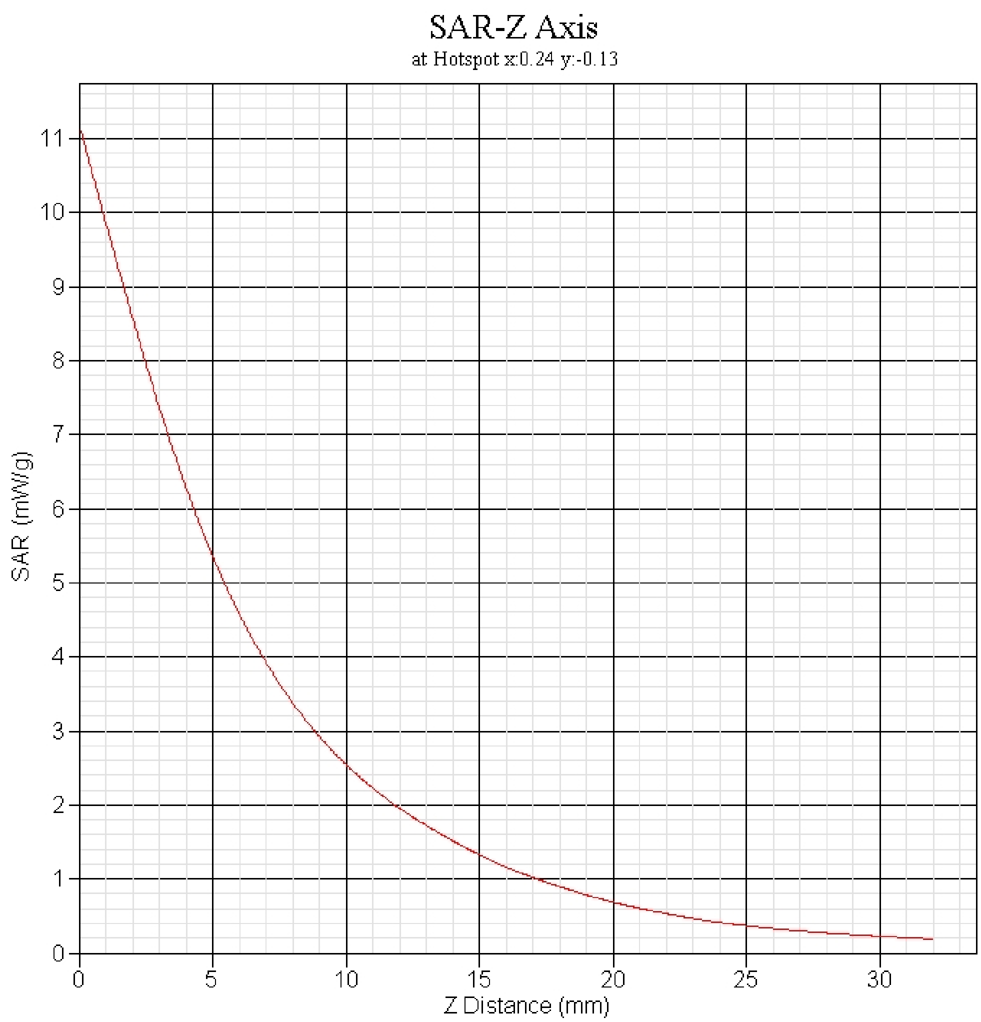
* value interpolated

# SAR Test Report
# Plot 1

```
By Operator        : Jay
Measurement Date   : 15-Aug-2013

Product Data
Device Name        : Validation
Serial No.         : 829
Type               : Dipole
Model              : D2450V2
Frequency          : 2450.00 MHz
Max. Transmit Pwr  : 0.1 W
Drift Time         : 0 min(s)
Power Drift-Start  : 6.215 W/kg
Power Drift-Finish : 6.280 W/kg
Power Drift (%)    : 1.050

Phantom Data
Name               : APREL-Uni
Type               : Uni-Phantom
Size (mm)          : 280 x 280 x 200
Serial No.         : RFE-273

Tissue Data
Type               : BODY
Serial No.         : 2450
Frequency          : 2450.00 MHz
Last Calib. Date   : 15-Aug-2013
Temperature        : 20.00 °C
Ambient Temp.      : 23.00 °C
Humidity           : 45.00 RH%
Epsilon            : 52.55 F/m
Sigma              : 1.97 S/m
Density            : 1000.00 kg/cu. m

Probe Data
Name               : Probe 217 - RFEL
Model              : E020
Serial No.         : 217
Last Calib. Date   : 01-Aug-2013
Frequency          : 2450.00 MHz
Duty Cycle Factor  : 1
Conversion Factor  : 4.7
Probe Sensitivity  : 1.20  1.20  1.20   μV/(V/m)^2
Compression Point  : 95.00 mV
Offset             : 1.56 mm

Measurement Data
Crest Factor       : 1
Area Scan          : 5x5x1 : Measurement x=10mm, y=10mm, z=4mm
Zoom Scan          : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm

Other Data
Separation         : 10 mm
Channel            : Mid
```



```
1 gram SAR value    : 5.179 W/kg
10 gram SAR value   : 2.352 W/kg
Area Scan Peak SAR : 6.274 W/kg
Zoom Scan Peak SAR : 11.190 W/kg
```



# SAR Test Report
## Plot 2

By Operator : Jay
Measurement Date : 13-Aug-2013

Product Data
Device Name : Validation
Serial No. : 1085
Type : Dipole
Model : D5GHzV2
Frequency : 5200.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time : 0 min(s)
Power Drift-Start : 9.020 W/kg
Power Drift-Finish: 9.076 W/kg
Power Drift (%) : 0.614

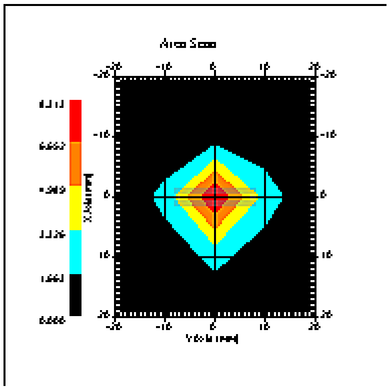
Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : RFE-273

Tissue Data
Type : BODY
Serial No. : 5200
Frequency : 5200.00 MHz
Last Calib. Date : 13-Aug-2013
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 50.00 RH%
Epsilon : 49.19 F/m
Sigma : 5.35 S/m
Density : 1000.00 kg/cu. m

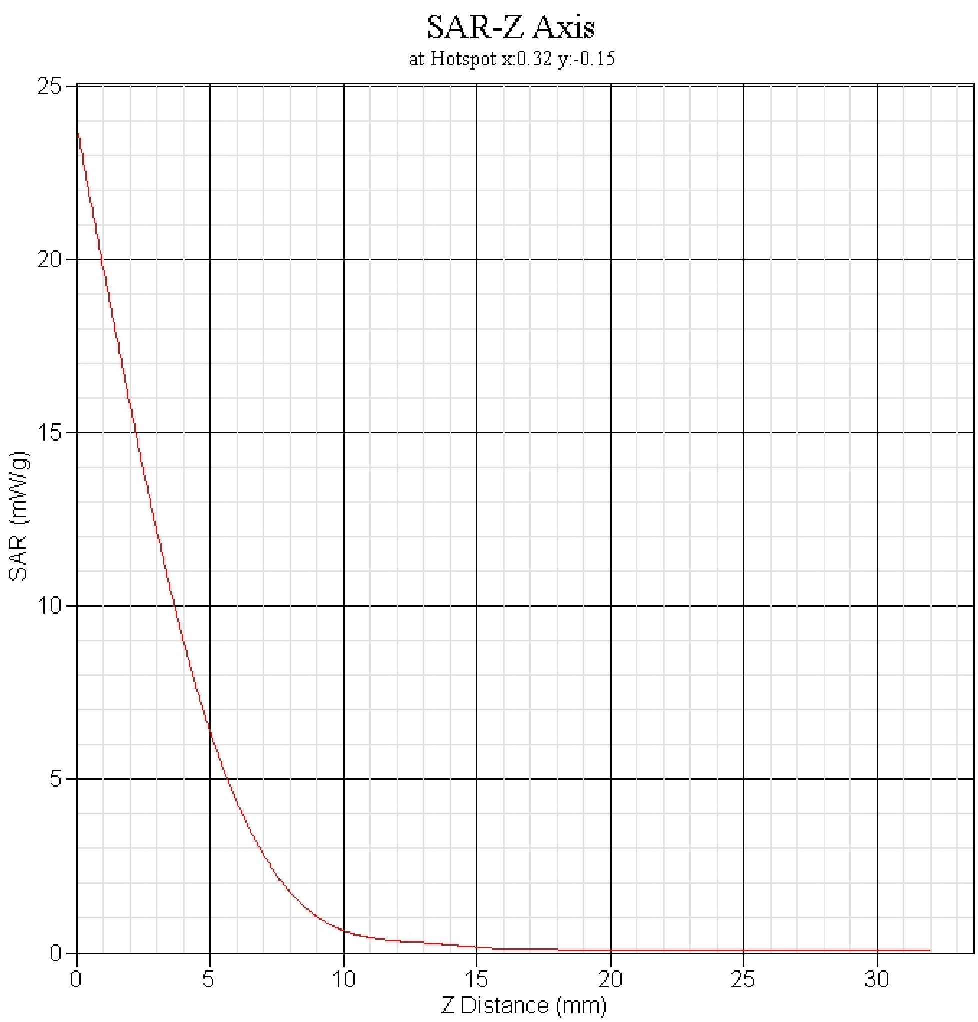
Probe Data
Name : Probe E030-001 - RFEL
Model : E-030
Type : E-Field Triangle
Serial No. : E030-001
Last Calib. Date : 17-Jul-2013
Frequency : 5200.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 5.7
Probe Sensitivity: 1.20 1.20 1.20 $\mu V/(V/m)^2$
Compression Point: 95.00 mV
Offset : 0.56 mm

Measurement Data
Crest Factor : 1
Area Scan : 5x5x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan : 7x7x12 : Measurement x=4mm, y=4mm, z=2mm

Other Data
Separation : 10 mm
Channel : Mid

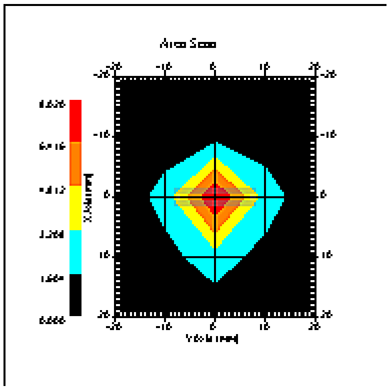



```
1 gram SAR value    : 7.326 W/kg
10 gram SAR value   : 2.042 W/kg
Area Scan Peak SAR : 8.313 W/kg
Zoom Scan Peak SAR : 23.919 W/kg
```

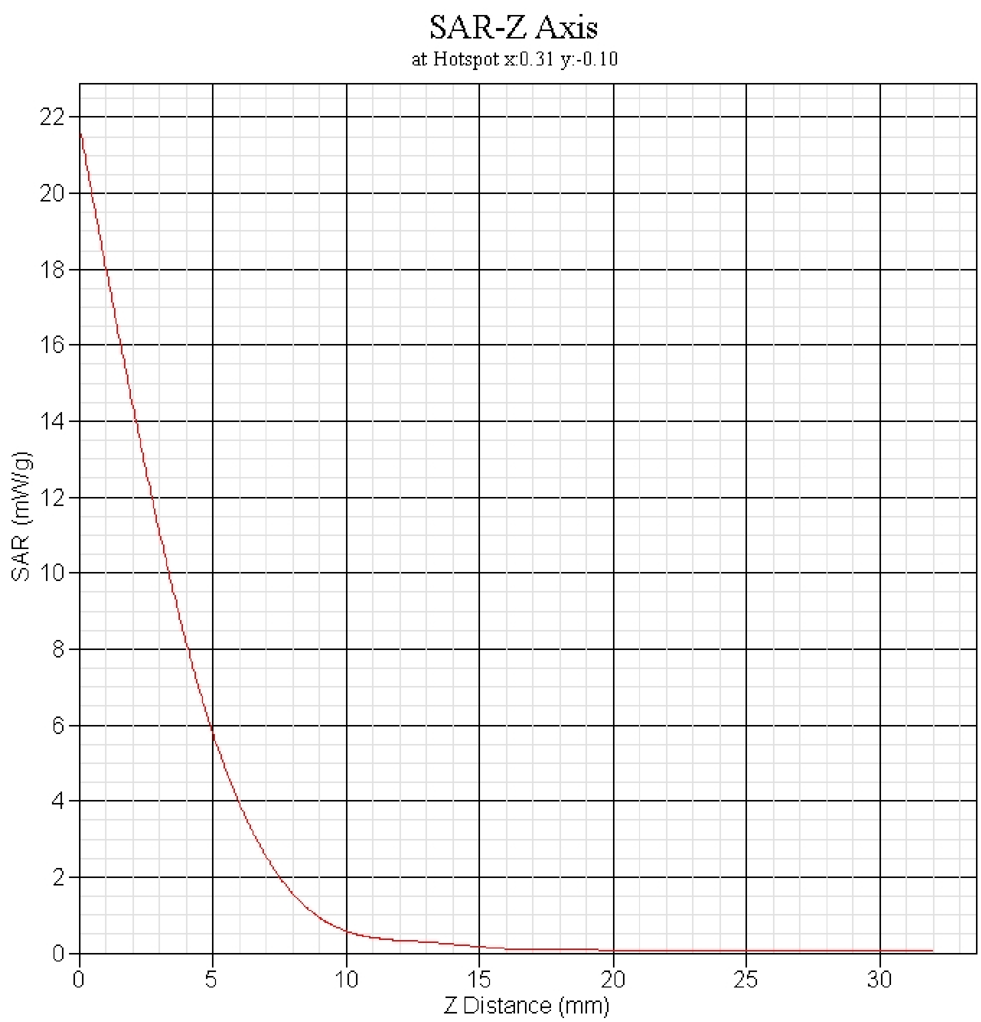


# SAR Test Report
# Plot 3

```
By Operator        : Jay
Measurement Date   : 14-Aug-2013

Product Data
Device Name        : Validation
Serial No.         : 1085
Type               : Dipole
Model              : D5GHzV2
Frequency          : 5600.00 MHz
Max. Transmit Pwr  : 0.1 W
Drift Time         : 0 min(s)
Power Drift-Start  : 8.157 W/kg
Power Drift-Finish : 8.316 W/kg
Power Drift (%)    : 1.956

Phantom Data
Name              : APREL-Uni
Type              : Uni-Phantom
Size (mm)         : 280 x 280 x 200
Serial No.        : RFE-273

Tissue Data
Type              : BODY
Serial No.        : 5600
Frequency         : 5600.00 MHz
Last Calib. Date  : 13-Aug-2013
Temperature       : 20.00 °C
Ambient Temp.     : 23.00 °C
Humidity          : 50.00 RH%
Epsilon           : 48.54 F/m
Sigma             : 5.80 S/m
Density           : 1000.00 kg/cu. m

Probe Data
Name              : Probe E030-001 - RFEL
Model             : E-030
Type              : E-Field Triangle
Serial No.        : E030-001
Last Calib. Date  : 17-Jul-2013
Frequency         : 5600.00 MHz
Duty Cycle Factor : 1
Conversion Factor : 5.6
Probe Sensitivity : 1.20  1.20  1.20   μV/(V/m)^2
Compression Point : 95.00 mV
Offset            : 0.56 mm

Measurement Data
Crest Factor      : 1
Area Scan         : 5x5x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan         : 7x7x12 : Measurement x=4mm, y=4mm, z=2mm

Other Data
Separation        : 10 mm
Channel           : Mid
```

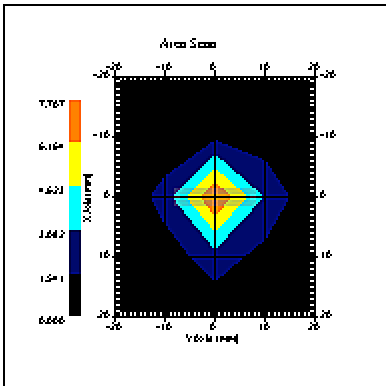


```
1 gram SAR value    : 7.807 W/kg
10 gram SAR value   : 2.075 W/kg
Area Scan Peak SAR : 8.020 W/kg
Zoom Scan Peak SAR : 21.817 W/kg
```

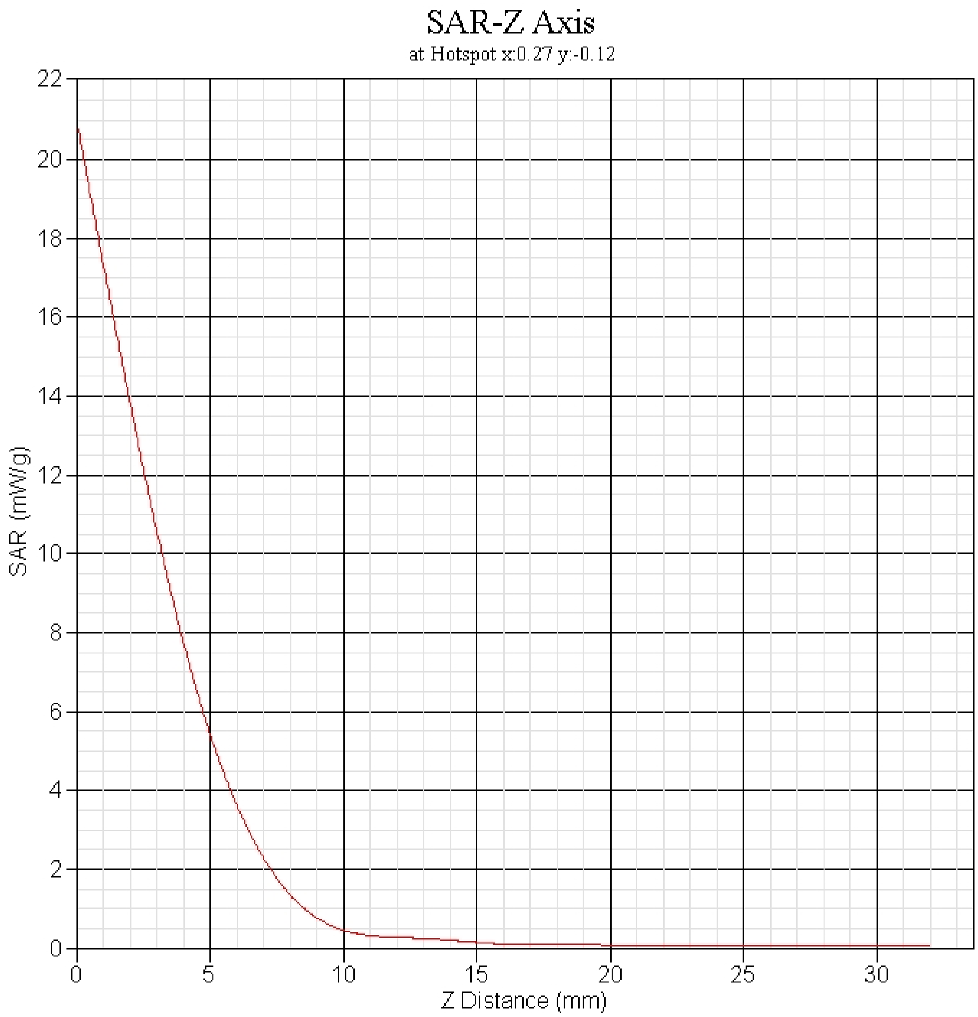


# SAR Test Report
# Plot 4

```
By Operator       : Jay
Measurement Date  : 15-Aug-2013

Product Data
Device Name       : Validation
Serial No.        : 1085
Type              : Dipole
Model             : D5GHzV2
Frequency         : 5800.00 MHz
Max. Transmit Pwr : 0.1 W
Drift Time        : 0 min(s)
Power Drift-Start : 7.595 W/kg
Power Drift-Finish: 7.773 W/kg
Power Drift (%)   : 2.345

Phantom Data
Name             : APREL-Uni
Type             : Uni-Phantom
Size (mm)        : 280 x 280 x 200
Serial No.       : RFE-273

Tissue Data
Type             : BODY
Serial No.       : 5800
Frequency        : 5800.00 MHz
Last Calib. Date : 13-Aug-2013
Temperature      : 20.00 °C
Ambient Temp.    : 23.00 °C
Humidity         : 50.00 RH%
Epsilon          : 48.32 F/m
Sigma            : 6.14 S/m
Density          : 1000.00 kg/cu. m

Probe Data
Name             : Probe E030-001 - RFEL
Model            : E-030
Type             : E-Field Triangle
Serial No.       : E030-001
Last Calib. Date : 17-Jul-2013
Frequency        : 5800.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 5.5
Probe Sensitivity: 1.20  1.20  1.20   μV/(V/m)^2
Compression Point: 95.00 mV
Offset           : 0.56 mm

Measurement Data
Crest Factor     : 1
Area Scan        : 5x5x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan        : 7x7x12 : Measurement x=4mm, y=4mm, z=2mm

Other Data
Separation       : 10 mm
Channel          : Mid
```



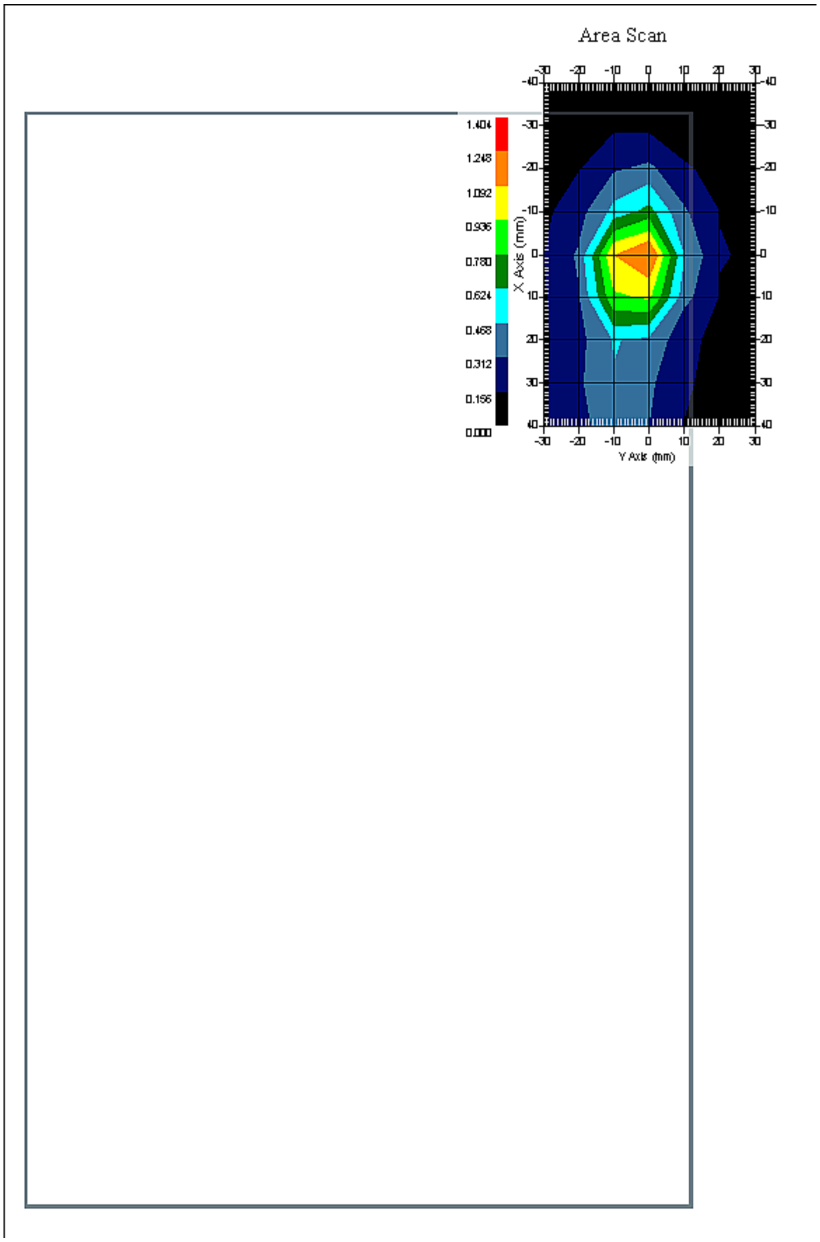
```
1 gram SAR value    : 7.236 W/kg
10 gram SAR value   : 2.006 W/kg
Area Scan Peak SAR : 7.707 W/kg
Zoom Scan Peak SAR : 21.016 W/kg
```



# Appendix B – SAR Test Data Plots

# SAR Test Report
## Plot 1

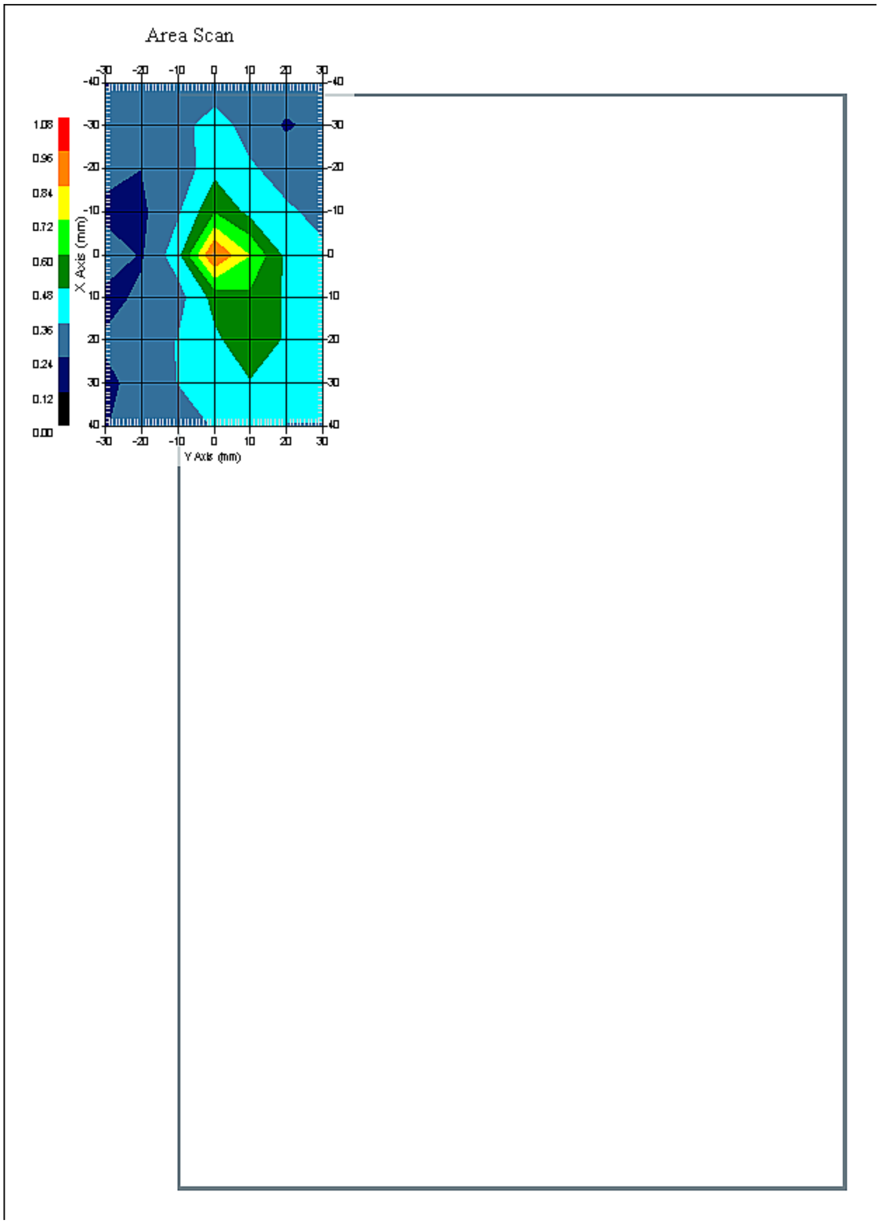
```
By Operator        : Jay
Measurement Date   : 15-Aug-2013

Product Data
Device Name        : Intel Corporation
Serial No.         : 5CD32652KX
Mode               : 802.11b
Model              : TPN-Q113
Frequency          : 2412.00 MHz
Max. Transmit Pwr  : 0.045 W
Drift Time         : 0 min(s)
Antenna Type       : Main
Orientation        : Curved Edge
Power Drift-Start  : 0.684 W/kg
Power Drift-Finish: 0.693 W/kg
Power Drift (%)    : 1.207

Phantom Data
Name              : APREL-Uni
Type              : Uni-Phantom
Size (mm)         : 280 x 280 x 200
Serial No.        : RFE-273

Tissue Data
Type              : BODY
Frequency         : 2412.00 MHz
Last Calib. Date  : 15-Aug-2013
Temperature       : 20.00 °C
Ambient Temp.     : 23.00 °C
Humidity          : 45.00 RH%
Epsilon           : 52.616 F/m
Sigma             : 1.922 S/m
Density           : 1000.00 kg/cu. m

Probe Data
Name              : RFEL 217
Model             : E020
Type              : E-Field Triangle
Serial No.        : 217
Last Calib. Date  : 01-Aug-2013
Frequency         : 2450.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 4.7
Probe Sensitivity: 1.20  1.20  1.20   μV/(V/m)^2
Compression Point: 95.00 mV
Offset            : 1.56 mm

Measurement Data
Crest Factor      : 1
Area Scan         : 9x7x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan         : 7x7x7 : Measurement x=5mm, y=5mm, z=5mm
```




```
1 gram SAR value    : 1.077 W/kg
10 gram SAR value   : 0.537 W/kg
Area Scan Peak SAR : 1.250 W/kg
Zoom Scan Peak SAR : 2.121 W/kg
```

# SAR Test Report
# Plot 2

```
By Operator        : Jay
Measurement Date   : 14-Aug-2013

Product Data
Device Name        : Intel Corporation
Serial No.         : 5CD32652KX
Mode               : 802.11a
Model              : TPN-Q113
Frequency          : 5300.00 MHz
Max. Transmit Pwr  : 0.045 W
Drift Time         : 0 min(s)
Antenna Type       : Aux
Orientation        : Curved Edge
Power Drift-Start  : 0.570 W/kg
Power Drift-Finish: 0.588 W/kg
Power Drift (%)    : 3.153

Phantom Data
Name              : APREL-Uni
Type              : Uni-Phantom
Size (mm)         : 280 x 280 x 200
Serial No.        : RFE-273

Tissue Data
Type              : BODY
Frequency         : 5300.00 MHz
Last Calib. Date  : 13-Aug-2013
Temperature       : 20.00 °C
Ambient Temp.     : 23.00 °C
Humidity          : 50.00 RH%
Epsilon           : 49.08 F/m
Sigma             : 5.46 S/m
Density           : 1000.00 kg/cu. m

Probe Data
Name              : Probe E030-001 - RFEL
Model             : E030
Type              : E-Field Triangle
Serial No.        : E030-001
Last Calib. Date  : 17-Jul-2013
Frequency         : 5200.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 5.7
Probe Sensitivity: 1.20  1.20  1.20   μV/(V/m)^2
Compression Point: 95.00 mV
Offset            : 0.56 mm

Measurement Data
Crest Factor      : 1
Area Scan         : 9x7x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan         : 7x7x12 : Measurement x=5mm, y=5mm, z=2mm
```




```
1 gram SAR value   : 0.683 W/kg
10 gram SAR value  : 0.425 W/kg
Area Scan Peak SAR : 0.964 W/kg
Zoom Scan Peak SAR : 1.251 W/kg
```

# SAR Test Report
## Plot 3

By Operator : Jay
Measurement Date : 14-Aug-2013

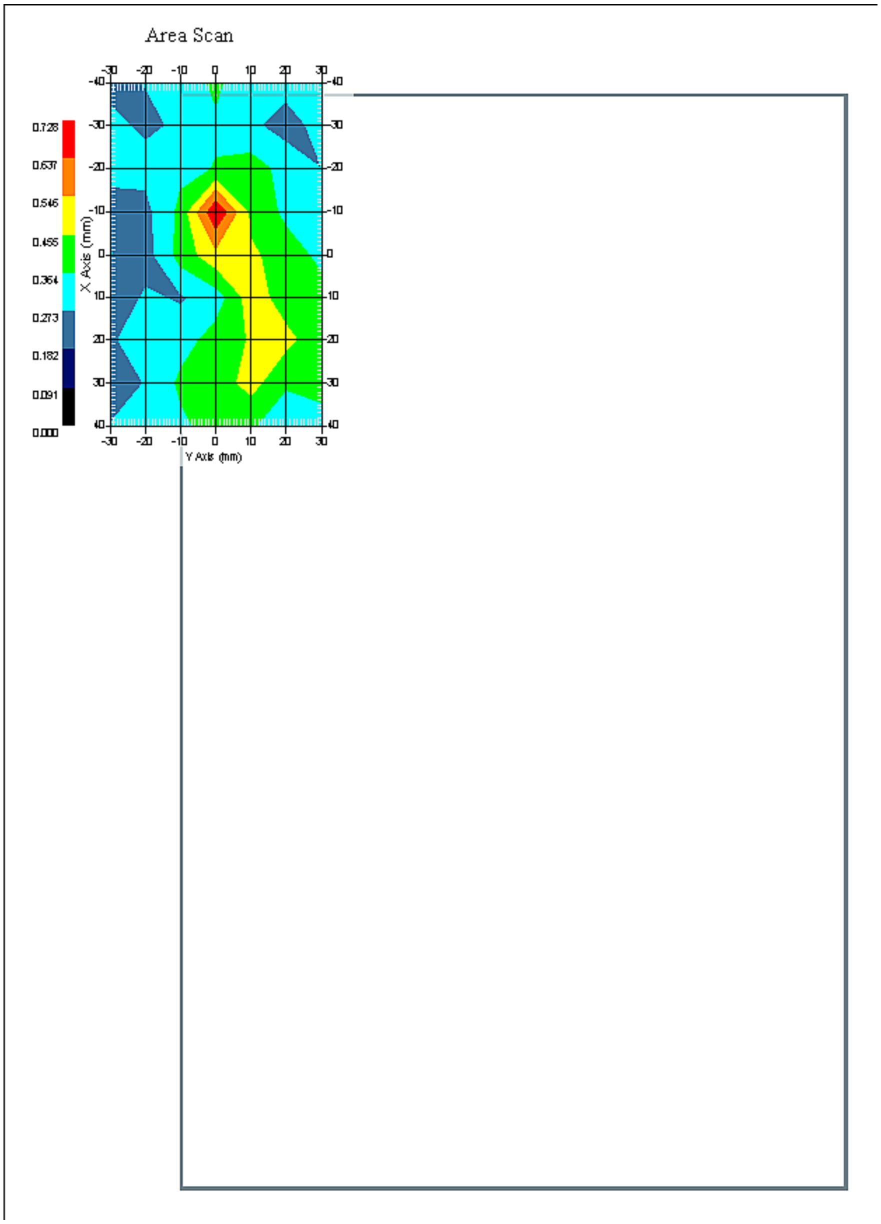
Product Data
Device Name : Intel Corporation
Serial No. : 5CD32652KX
Mode : 802.11a
Model : TPN-Q113
Frequency : 5580.00 MHz
Max. Transmit Pwr : 0.045 W
Drift Time : 0 min(s)
Antenna Type : Aux
Orientation : Curved Edge
Power Drift-Start : 0.686 W/kg
Power Drift-Finish: 0.705 W/kg
Power Drift (%) : 2.761

Phantom Data
Name : APREL-Uni
Type : Uni-Phantom
Size (mm) : 280 x 280 x 200
Serial No. : RFE-273

Tissue Data
Type : BODY
Frequency : 5580.00 MHz
Last Calib. Date : 13-Aug-2012
Temperature : 20.00 °C
Ambient Temp. : 23.00 °C
Humidity : 50.00 RH%
Epsilon : 48.56 F/m
Sigma : 5.78 S/m
Density : 1000.00 kg/cu. m

Probe Data
Name : Probe E030-001 - RFEL
Model : E030
Type : E-Field Triangle
Serial No. : E030-001
Last Calib. Date : 17-Jul-2013
Frequency : 5600.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 5.6
Probe Sensitivity: 1.20 1.20 1.20 $\mu V/(V/m)^2$
Compression Point: 95.00 mV
Offset : 0.56 mm

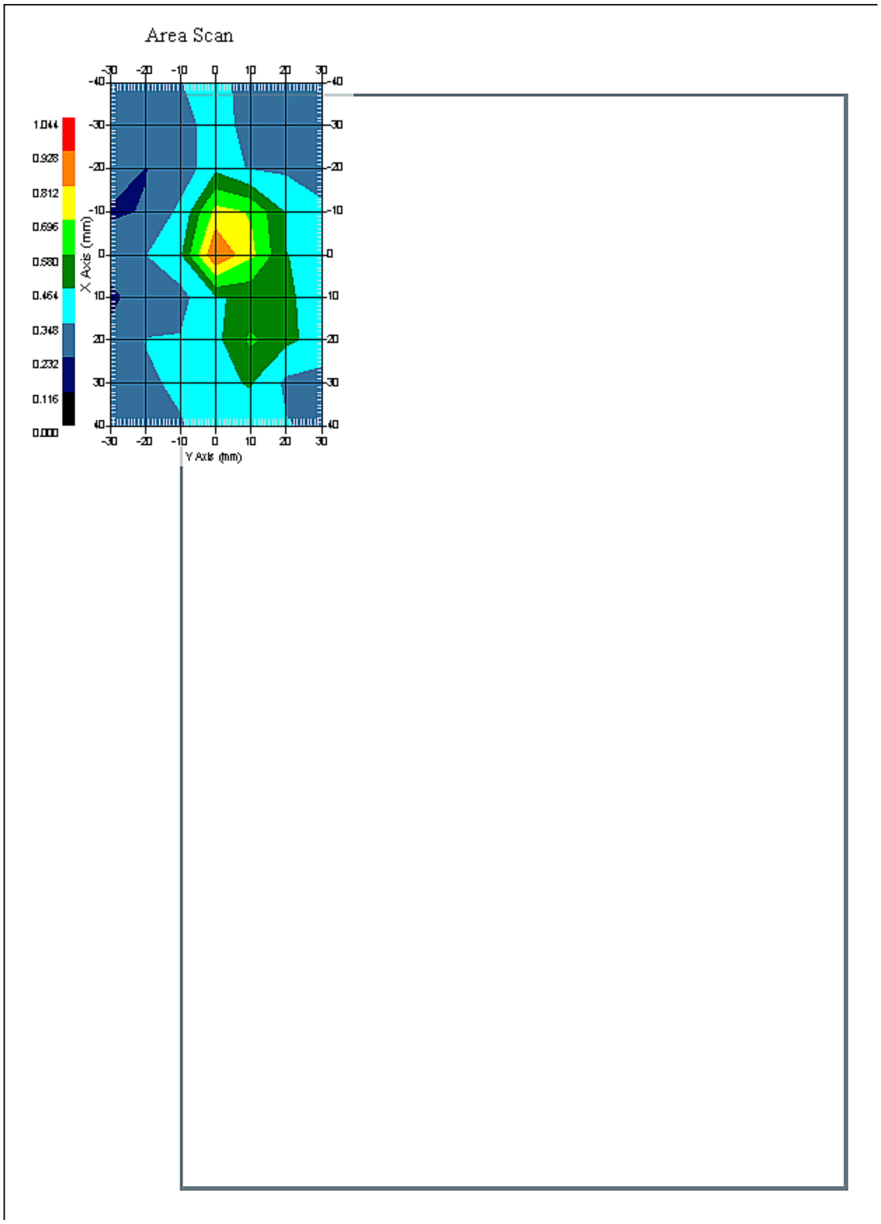
Measurement Data
Crest Factor : 1
Area Scan : 9x7x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan : 7x7x12 : Measurement x=5mm, y=5mm, z=2mm




```
1 gram SAR value   : 0.558 W/kg
10 gram SAR value  : 0.381 W/kg
Area Scan Peak SAR : 0.727 W/kg
Zoom Scan Peak SAR : 1.010 W/kg
```

# SAR Test Report
## Plot 4

```
By Operator        : Jay
Measurement Date   : 15-Aug-2013

Product Data
Device Name        : Intel Corporation
Serial No.         : 5CD32652KX
Mode               : 802.11a
Model              : TPN-Q113
Frequency          : 5785.00 MHz
Max. Transmit Pwr  : 0.045 W
Drift Time         : 0 min(s)
Antenna Type       : Aux
Orientation        : Curved Edge
Power Drift-Start  : 0.813 W/kg
Power Drift-Finish: 0.813 W/kg
Power Drift (%)    : 0.582

Phantom Data
Name              : APREL-Uni
Type              : Uni-Phantom
Size (mm)         : 280 x 280 x 200
Serial No.        : RFE-273

Tissue Data
Type              : BODY
Frequency         : 5785.00 MHz
Last Calib. Date  : 13-Aug-2013
Temperature       : 20.00 °C
Ambient Temp.     : 23.00 °C
Humidity          : 50.00 RH%
Epsilon           : 48.335 F/m
Sigma             : 6.118 S/m
Density           : 1000.00 kg/cu. m

Probe Data
Name              : Probe E030-001 - RFEL
Model             : E030
Type              : E-Field Triangle
Serial No.        : E030-001
Last Calib. Date  : 17-Jul-2013
Frequency         : 5800.00 MHz
Duty Cycle Factor: 1
Conversion Factor: 5.5
Probe Sensitivity: 1.20  1.20  1.20   μV/(V/m)^2
Compression Point: 95.00 mV
Offset            : 0.56 mm

Measurement Data
Crest Factor      : 1
Area Scan         : 9x7x1 : Measurement x=10mm, y=10mm, z=2mm
Zoom Scan         : 7x7x12 : Measurement x=5mm, y=5mm, z=2mm
```




```
1 gram SAR value   : 0.772 W/kg
10 gram SAR value  : 0.471 W/kg
Area Scan Peak SAR : 0.931 W/kg
Zoom Scan Peak SAR : 1.421 W/kg
```

# Appendix D – Probe Calibration Data Sheets

## NCL CALIBRATION LABORATORIES

**Calibration File No.:** PC1513

**Client.:** RFEL

# CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Equipment: Miniature Isotropic RF Probe
Record of Calibration
Head and Body
Manufacturer: APREL Laboratories
**Model No.:** E-020
**Serial No.:** 217

**Calibration Procedure:** D01-032-E020-V2, D22-012-Tissue, D28-002-Dipole
**Project No:** RFEL-PC-5740

**Calibrated:** 1st August 2013
**Released on:** 2nd August 2013

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________________

Art Brennan, Quality Manager


**NCL CALIBRATION LABORATORIES**

303 Terry Fox Drive, Suite 102
Kanata, Ontario
CANADA K2K 3J1

Division of APREL
TEL: (613) 435-8300
FAX: (613) 435-8306

## Introduction

This Calibration Report reproduces the results of the calibration performed in line with the references listed below. Calibration is performed using accepted methodologies as per the references listed below. Probes are calibrated for air, and tissue and the values reported are the results from the physical quantification of the probe through meteorgical practices.

## Calibration Method

Probes are calibrated using the following methods.

<1000MHz
TEM Cell for sensitivity in air
Standard phantom using temperature transfer method for sensitivity in tissue

>1000MHz
Waveguide* method to determine sensitivity in air and tissue
*Waveguide is numerically (simulation) assessed to determine the field distribution and power

The boundary effect for the probe is assessed using a standard flat phantom where the probe output is compared against a numerically simulated series of data points

## References

- IEEE Standard 1528 (2003) including Amendment 1
  IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
- EN 62209-1 (2006)
  Human Exposure to RF Fields from hand-held and body-mounted wireless communication devices - Human models. instrumentation, and procedures-Part 1: Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices
- IEC 62209-2 Ed. 1.0 (2010-03)
  Human exposure to RF fields from hand-held and body-mounted wireless devices - Human models, instrumentation, and procedures - Part 2: specific absorption rate (SAR) for wireless communication devices (30 MHz - 6 GHz)
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

### Conditions

Probe 217 was a new calibration exercise.

| | |
|---|---|
| **Ambient Temperature of the Laboratory:** | 22 °C +/- 1.5°C |
| **Temperature of the Tissue:** | 21 °C +/- 1.5°C |
| **Relative Humidity:** | < 60% |

### Primary Measurement Standards

| Instrument | Serial Number | Cal due date |
|---|---|---|
| Tektronix USB Power Meter | 11C940 | May 14, 2015 |
| Attenuator HP 8495A (70dB) | 1944A10711 | Mar. 10, 2015 |
| Network Analyzer Anritsu 37347C | 002106 | Feb. 20, 2015 |

### Secondary Measurement Standards

| | | |
|---|---|---|
| Signal Generator HP 83640B | 3844A00689 | Feb 12, 2015 |

### Attestation

The below named signatories have conducted the calibration and review of the data which is presented in this calibration report.

**We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.**

-----------------------------------------------
**Art Brennan, Quality Manager**

-----------------------------------------------
**Dan Brooks, Test Engineer**

**Probe Summary**

| | |
|---|---|
| **Probe Type**: | E-Field Probe E020 |
| **Serial Number:** | 217 |
| **Sensor Offset:** | 1.56 |
| **Sensor Length:** | 2.5 |
| **Tip Enclosure:** | Composite* |
| **Tip Diameter:** | < 2.9 mm |
| **Tip Length:** | 55 mm |
| **Total Length:** | 289 mm |

*Resistive to recommended tissue recipes per IEEE-1528

**Sensitivity in Air**

| | |
|---|---|
| **Channel X:** | 1.2 $\mu V/(V/m)^2$ |
| **Channel Y:** | 1.2 $\mu V/(V/m)^2$ |
| **Channel Z:** | 1.2 $\mu V/(V/m)^2$ |

**Diode Compression Point:** 95 mV

Calibration for Tissue (Head H, Body B)

| Frequency | Tissue Type | Measured Epsilon | Measured Sigma | Calibration Uncertainty | Tolerance Uncertainty for 5%* | Conversion Factor |
|---|---|---|---|---|---|---|
| 650 B | Body | 57.17 | 0.904 | 3.96 | 3.5 | 6.3 |
| 750 H | Head | X | X | X | X | 6.3 |
| **750 B** | **Body** | **57.17** | **0.92** | **3.94** | **3.4** | **6.3** |
| 835 H | Head | X | X | X | X | X |
| 835 B | Body | 53.02 | 0.95X | 3.5 | 3.4 | 6.5 |
| 900 H | Head | X | X | X | X | X |
| 900 B | Body | 52.46 | 1.02 | 3.5 | 3.4 | 6 |
| 1450 H | Head | X | X | X | X | X |
| 1450 B | Body | X | X | X | X | X |
| 1500 H | Head | X | X | X | X | X |
| 1500 B | Body | X | X | X | X | X |
| 1640 H | Head | 39.63 | 1.25 | 3.5 | 2.7 | 5.2 |
| 1640 B | Body | 52.75 | 1.4 | 3.5 | 2.7 | 5. |
| 1735 H | Head | X | X | X | X | X |
| 1735 B | Body | 52.38 | 1.51 | 3.5 | 2.7 | 5.5 |
| 1800 H | Head | X | X | X | X | X |
| 1800 B | Body | X | X | X | X | X |
| 1900 H | Head | X | X | X | X | X |
| 1900 B | Body | 53.36 | 1.56 | 3.5 | 2.7 | 5 |
| 2000 H | Head | X | X | X | X | X |
| 2000 B | Body | X | X | X | X | X |
| 2100 H | Head | X | X | X | X | X |
| 2100 B | Body | X | X | X | X | X |
| 2300 H | Head | X | X | X | X | X |
| 2300 B | Body | X | X | X | X | X |
| 2450 H | Head | X | X | X | X | X |
| 2450B | Body | 50.63 | 2 | 3.5 | 3.5 | 4.7 |
| 2600 H | Head | X | X | X | X | X |
| 2600 B | Body | 50.09 | 2.21 | 3.5 | 3.5 | 4.6 |
| 3000 H | Head | X | X | X | X | X |
| 3000 B | Body | X | X | X | X | X |
| 3600 H | Head | X | X | X | X | X |
| 3600 B | Body | X | X | X | X | X |
| 5200 H | Head | X | X | X | X | X |
| 5200 B | Body | X | X | X | X | X |
| 5600 H | Head | X | X | X | X | X |
| 5600 B | Body | X | X | X | X | X |
| 5800 H | Head | X | X | X | X | X |
| 5800 B | Body | X | X | X | X | X |

**Boundary Effect:**

Uncertainty resulting from the boundary effect is less than 2.1% for the distance between the tip of the probe and the tissue boundary, when less than 0.58mm.

**Spatial Resolution:**

The spatial resolution uncertainty is less than 1.5% for 4.9mm diameter probe.
The spatial resolution uncertainty is less than 1.0% for 2.5mm diameter probe.

**DAQ-PAQ Contribution**

To minimize the uncertainty calculation all tissue sensitivity values were calculated using a load impedance of 5 MΩ.

**Boundary Effect:**

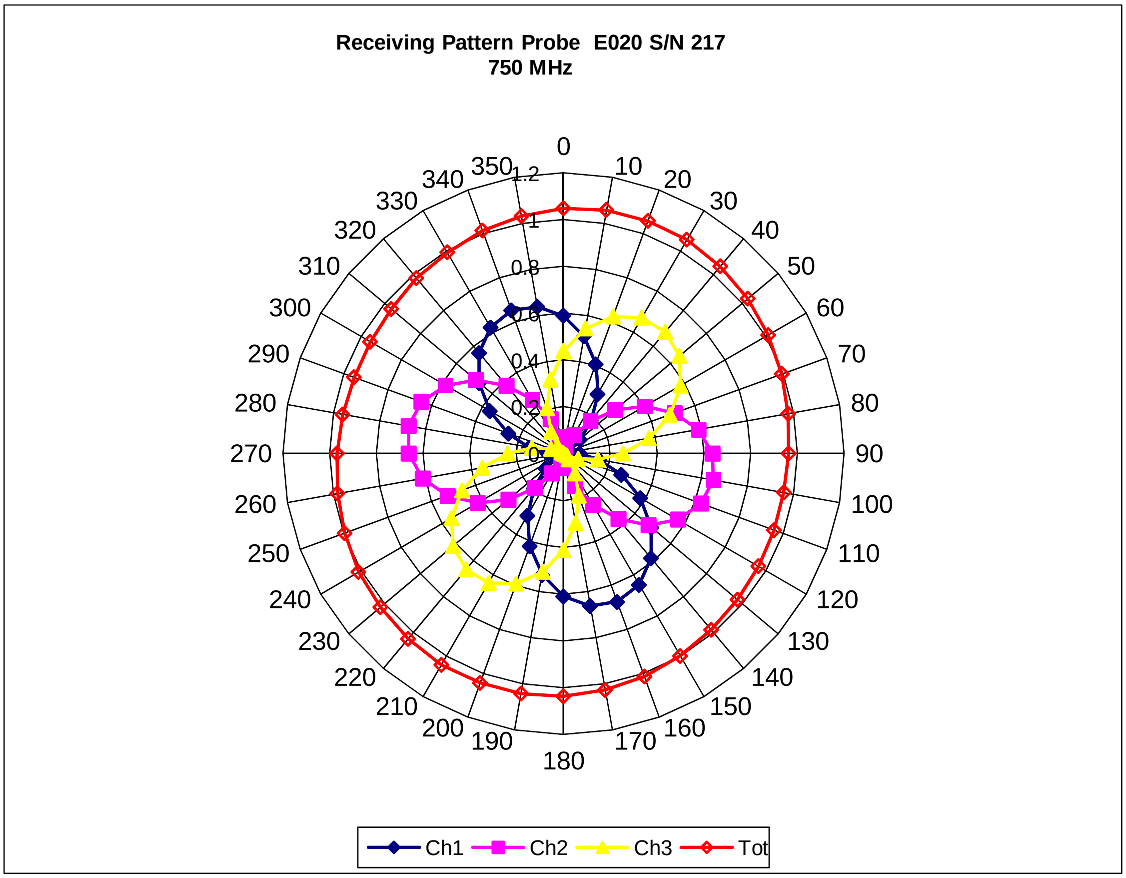
For a distance of 0.58mm the worst case evaluated uncertainty (increase in the probe sensitivity) is less than 2.1%.

**NOTES:**

*The maximum deviation from the centre frequency when comparing the lower to upper range is listed.

The probe was received in good condition.

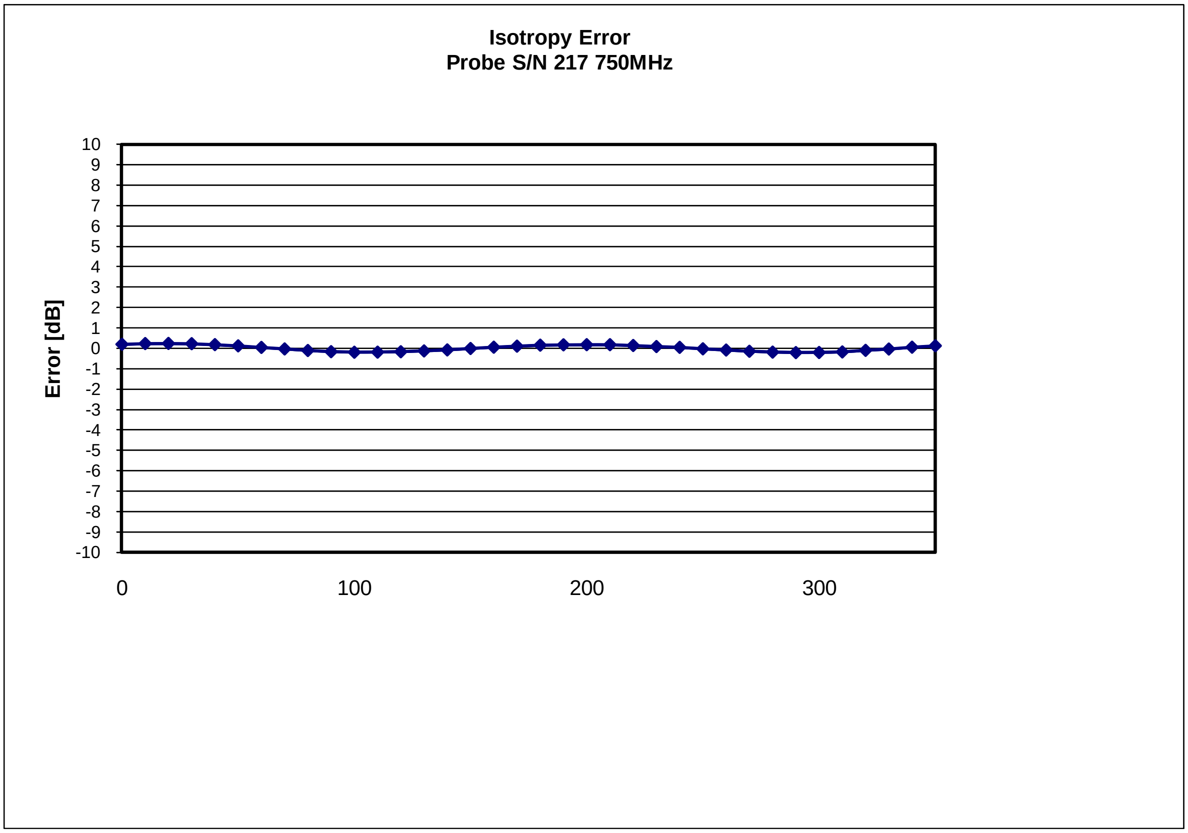
## Receiving Pattern Air

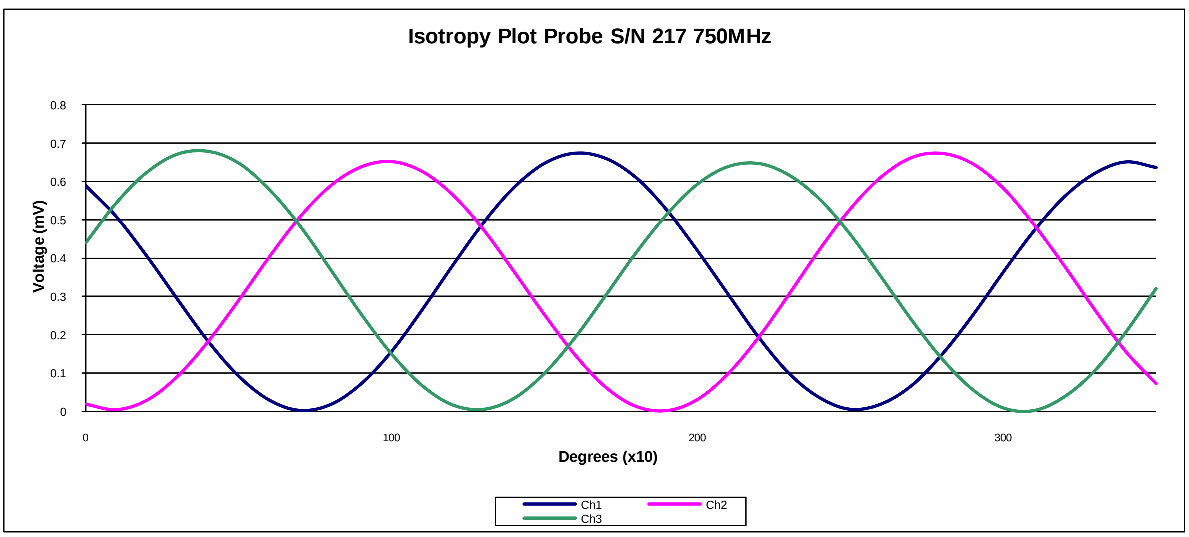




This page has been reviewed for content and attested to on Page 2 of this document.

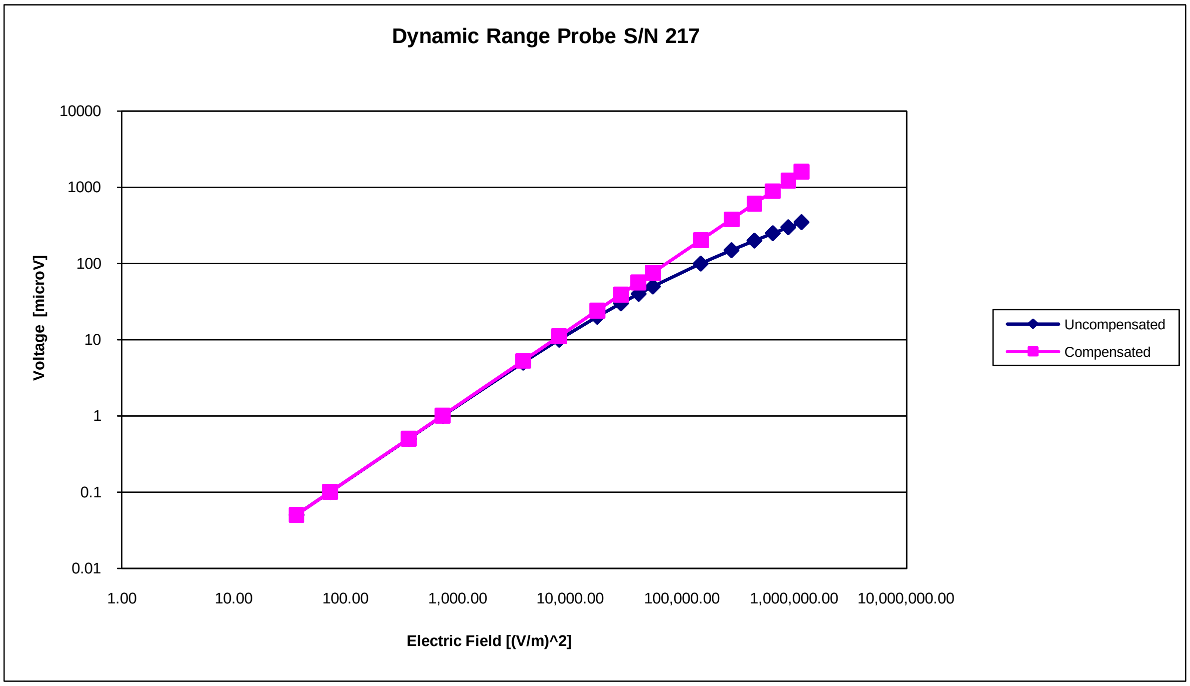
# Isotropy Error 750 MHz (Air)



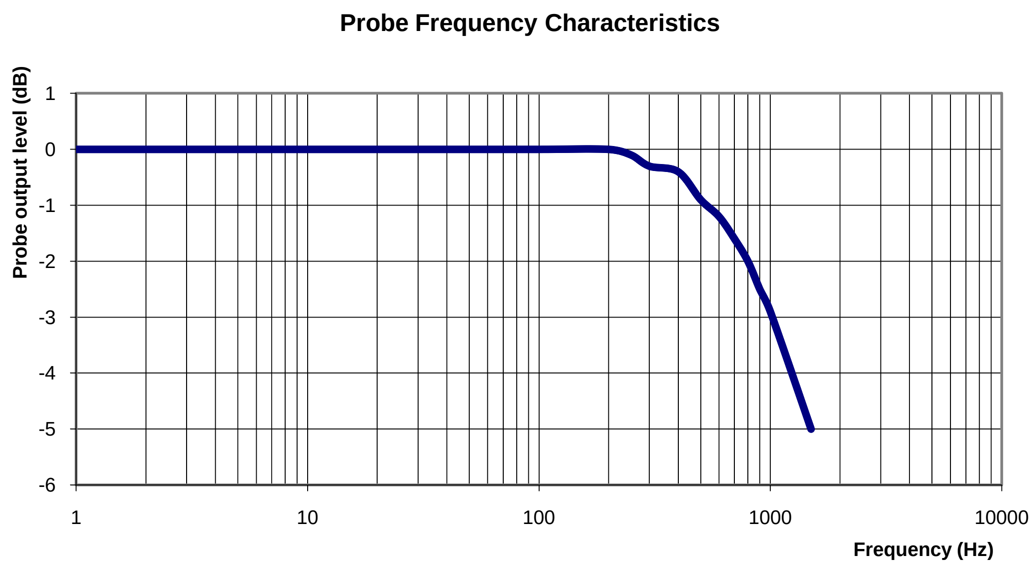




**Isotropicity Tissue:** 0.10 dB

# Dynamic Range



# Video Bandwidth




**Video Bandwidth at 500 Hz** 1 dB
**Video Bandwidth at 1.02 KHz:** 3 dB

### Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2013.

# NCL CALIBRATION LABORATORIES

**Calibration File No.:** 1512

**Client.:** RF Exposure Laboratories

# C E R T I F I C A T E  OF  C A L I B R A T I O N

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Equipment: Miniature Isotropic RF Probe

Record of Calibration

Body

Manufacturer: APREL Laboratories

**Model No.:** E-030

**Serial No.:** E030-001

**Calibration Procedure:** D01-032-E020-V2, D22-012-Tissue, D28-002-Dipole

**Project No:** RFEL-5739

**Calibrated:** 17th July 2013

**Released on:** 19h July 2013

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________________

Art Brennan, Quality Manager


**NCL CALIBRATION LABORATORIES**

303 Terry Fox Drive, Suite 102
Kanata, Ontario
CANADA K2K 3J1

Division of APREL
TEL: (613) 435-8300
FAX: (613) 435-8306

## Introduction

This Calibration Report reproduces the results of the calibration performed in line with the references listed below. Calibration is performed using accepted methodologies as per the references listed below. Probes are calibrated for air, and tissue and the values reported are the results from the physical quantification of the probe through meteorgical practices.

## Calibration Method

Probes are calibrated using the following methods.

<1000MHz
TEM Cell for sensitivity in air
Standard phantom using temperature transfer method for sensitivity in tissue

>1000MHz
Waveguide* method to determine sensitivity in air and tissue
*Waveguide is numerically (simulation) assessed to determine the field distribution and power

The boundary effect for the probe is assessed using a standard flat phantom where the probe output is compared against a numerically simulated series of data points

## References

- IEEE Standard 1528 (2003) including Amendment 1
  IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
- EN 62209-1 (2006)
  Human Exposure to RF Fields from hand-held and body-mounted wireless communication devices - Human models. instrumentation, and procedures-Part 1: Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices
- IEC 62209-2 Ed. 1.0 (2010-03)
  Human exposure to RF fields from hand-held and body-mounted wireless devices - Human models, instrumentation, and procedures - Part 2: specific absorption rate (SAR) for wireless communication devices (30 MHz - 6 GHz)
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

## Conditions

Probe E030-001 was a re-calibration.

| | |
|---|---|
| **Ambient Temperature of the Laboratory:** | 22 °C +/- 1.5°C |
| **Temperature of the Tissue:** | 21 °C +/- 1.5°C |
| **Relative Humidity:** | < 60% |

## Primary Measurement Standards

| Instrument | Serial Number | Cal due date |
|---|---|---|
| Tektronix USB Power Meter | 11C940 | May 14, 2015 |
| Attenuator HP 8495A (70dB) | 1944A10711 | Mar. 10, 2015 |
| Network Analyzer Anritsu 37347C | 002106 | Feb. 20, 2015 |

## Secondary Measurement Standards

| | | |
|---|---|---|
| Signal Generator HP 83640B | 3844A00689 | Feb 12, 2015 |

## Attestation

The below named signatories have conducted the calibration and review of the data which is presented in this calibration report.

**We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.**

-----------------------------------------------
**Art Brennan, Quality Manager**

-----------------------------------------------
**Dan Brooks, Test Engineer**

**Probe Summary**

| | |
|---|---|
| **Probe Type**: | E-Field Probe E030 |
| **Serial Number:** | E030-001 |
| **Frequency:** | As presented on page 5 |
| **Sensor Offset:** | 0.56 |
| **Sensor Length:** | 2.5 |
| **Tip Enclosure:** | Composite* |
| **Tip Diameter:** | < 2.9 mm |
| **Tip Length:** | 55 mm |
| **Total Length:** | 289 mm |

*Resistive to recommended tissue recipes per IEEE-1528

**Sensitivity in Air**

| | |
|---|---|
| **Channel X:** | 1.2 $\mu V/(V/m)^2$ |
| **Channel Y:** | 1.2 $\mu V/(V/m)^2$ |
| **Channel Z:** | 1.2 $\mu V/(V/m)^2$ |

**Diode Compression Point:** 95 mV

Calibration for Tissue (Head H, Body B)

| Frequency | Tissue Type | Measured Epsilon | Measured Sigma | Calibration Uncertainty | Tolerance Uncertainty for 5%* | Conversion Factor |
|---|---|---|---|---|---|---|
| 450 H | Head | X | X | X | X | X |
| 450 B | Body | X | X | X | X | X |
| 750 H | Head | X | X | X | X | X |
| 750 B | Body | X | X | X | X | X |
| 835 H | Head | X | X | X | X | X |
| 835 B | Body | X | X | X | X | X |
| 900 H | Head | X | X | X | X | X |
| 900 B | Body | X | X | X | X | X |
| 1450 H | Head | X | X | X | X | X |
| 1450 B | Body | X | X | X | X | X |
| 1500 H | Head | X | X | X | X | X |
| 1500 B | Body | X | X | X | X | X |
| 1640 H | Head | X | X | X | X | X |
| 1640 B | Body | X | X | X | X | X |
| 1750 H | Head | X | X | X | X | X |
| 1750 B | Body | X | X | X | X | X |
| 1800 H | Head | X | X | X | X | X |
| 1800 B | Body | X | X | X | X | X |
| 1900 H | Head | X | X | X | X | X |
| 1900 B | Body | X | X | X | X | X |
| 2000 H | Head | X | X | X | X | X |
| 2000 B | Body | X | X | X | X | X |
| 2100 H | Head | X | X | X | X | X |
| 2100 B | Body | X | X | X | X | X |
| 2300 H | Head | X | X | X | X | X |
| 2300 B | Body | X | X | X | X | X |
| 2450 H | Head | X | X | X | X | X |
| 2450B | Body | X | X | X | X | X |
| 2600 H | Head | X | X | X | X | X |
| 2600 B | Body | X | X | X | X | X |
| 3000 H | Head | X | X | X | X | X |
| 3000 B | Body | X | X | X | X | X |
| 3600 H | Head | X | X | X | X | X |
| 3600 B | Body | X | X | X | X | X |
| 5200 H | Head | X | X | X | X | X |
| **5200 B** | **Body** | **47.06** | **5.3** | **3.5** | **2.6** | **5.7** |
| 5600 H | Head | X | X | X | X | X |
| **5600 B** | **Body** | **45.98** | **5.89** | **3.5** | **2.6** | **5.6** |
| 5800 H | Head | X | X | X | X | X |
| **5800 B** | **Body** | **45.79** | **6.2** | **3.5** | **2.6** | **5.5** |

**Boundary Effect:**

Uncertainty resulting from the boundary effect is less than 2.1% for the distance between the tip of the probe and the tissue boundary, when less than 0.58mm.

**Spatial Resolution:**

The spatial resolution uncertainty is less than 1.5% for 4.9mm diameter probe.
The spatial resolution uncertainty is less than 1.0% for 2.5mm diameter probe.

**DAQ-PAQ Contribution**

To minimize the uncertainty calculation all tissue sensitivity values were calculated using a load impedance of 5 MΩ.

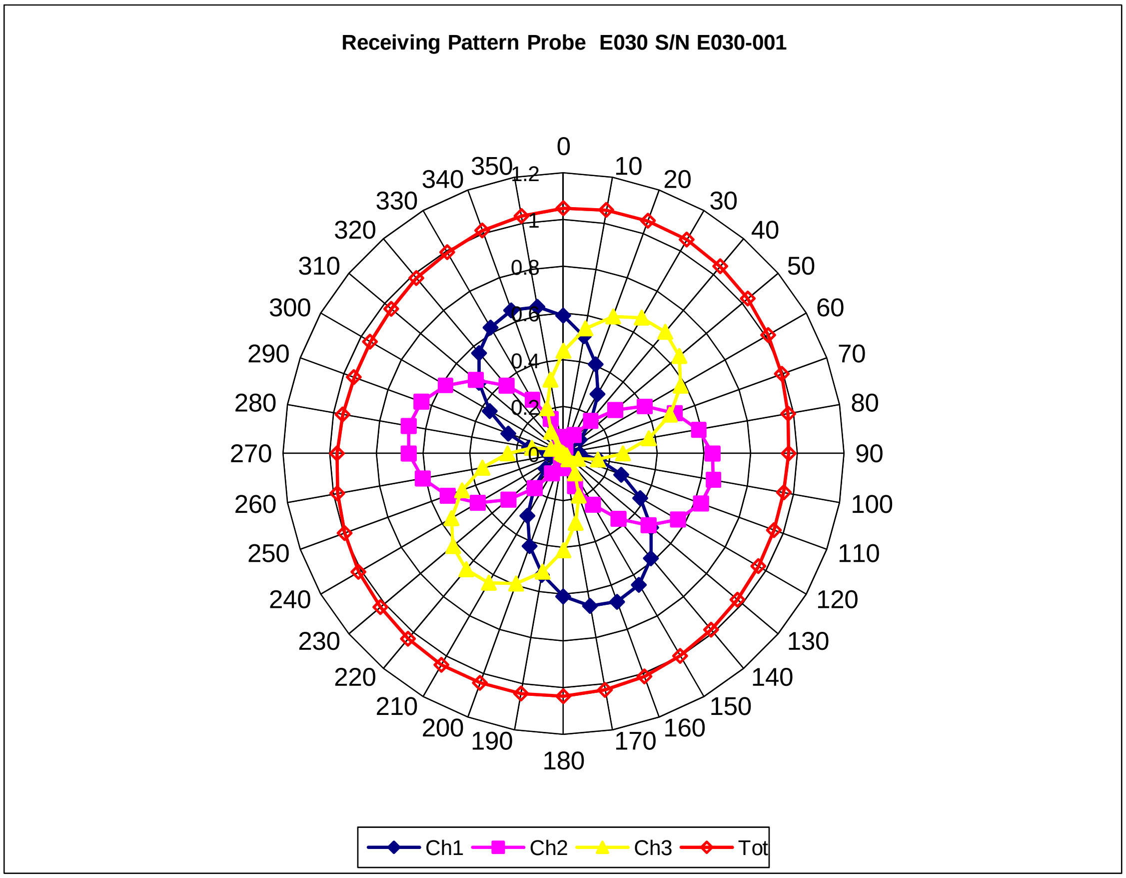
**Boundary Effect:**

For a distance of 0.58mm the worst case evaluated uncertainty (increase in the probe sensitivity) is less than 2.1%.

**NOTES:**

*The maximum deviation from the centre frequency when comparing the lower to upper range is listed.

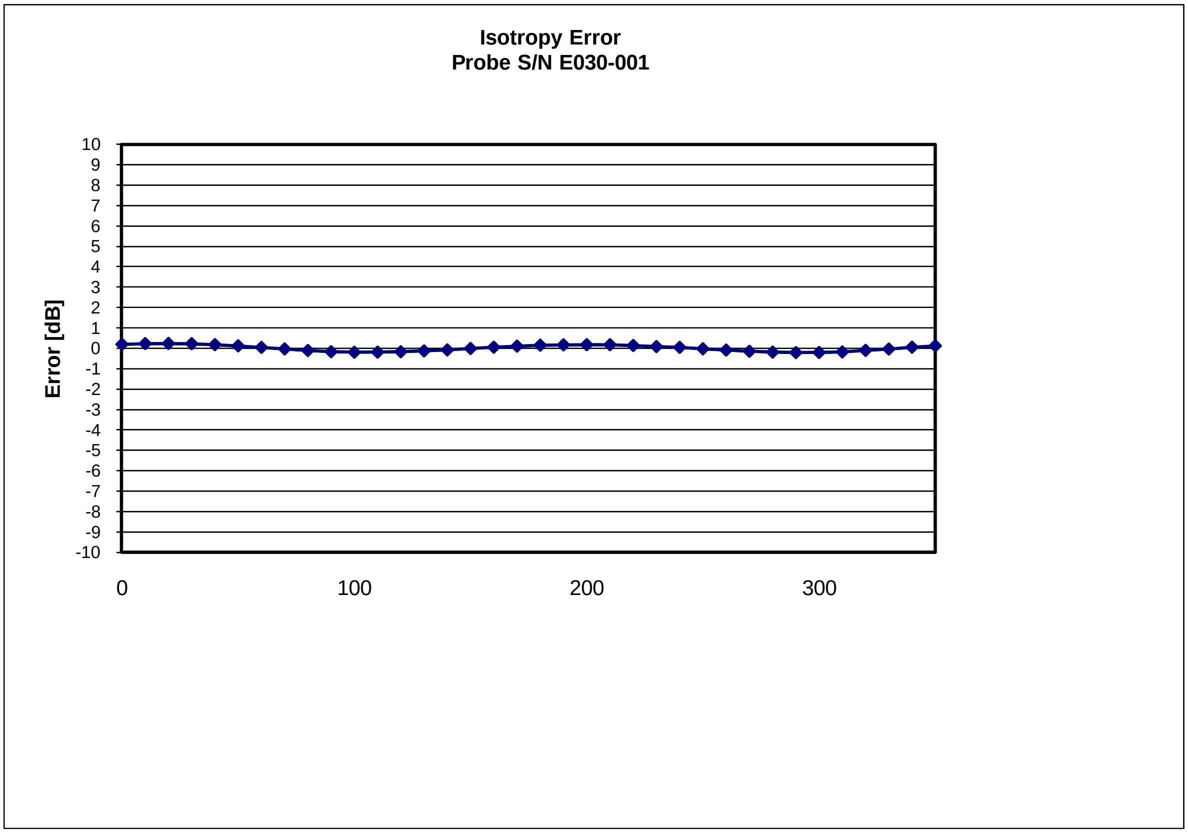
## Receiving Pattern Air

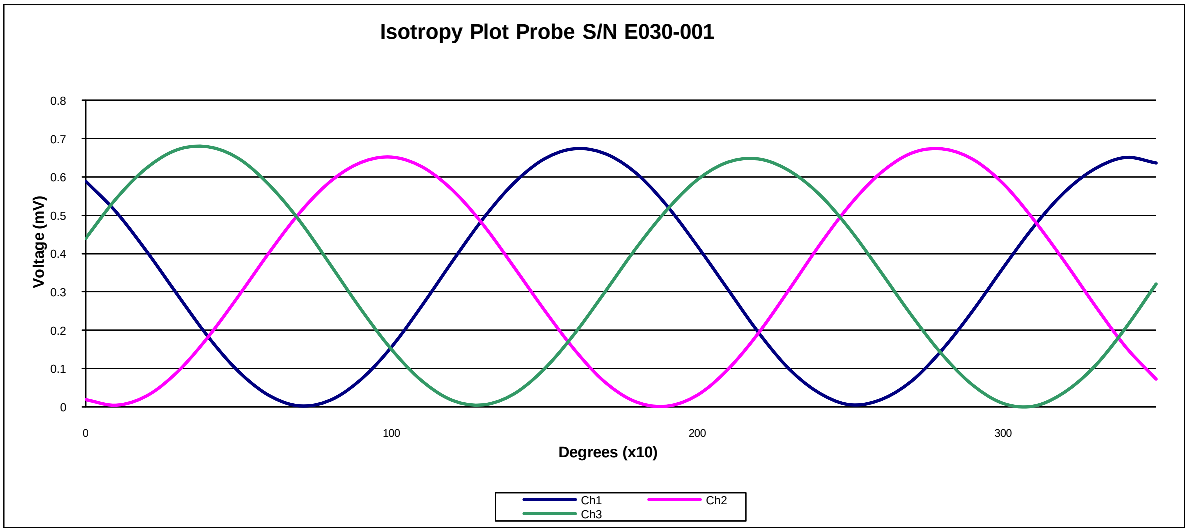




This page has been reviewed for content and attested to on Page 2 of this document.

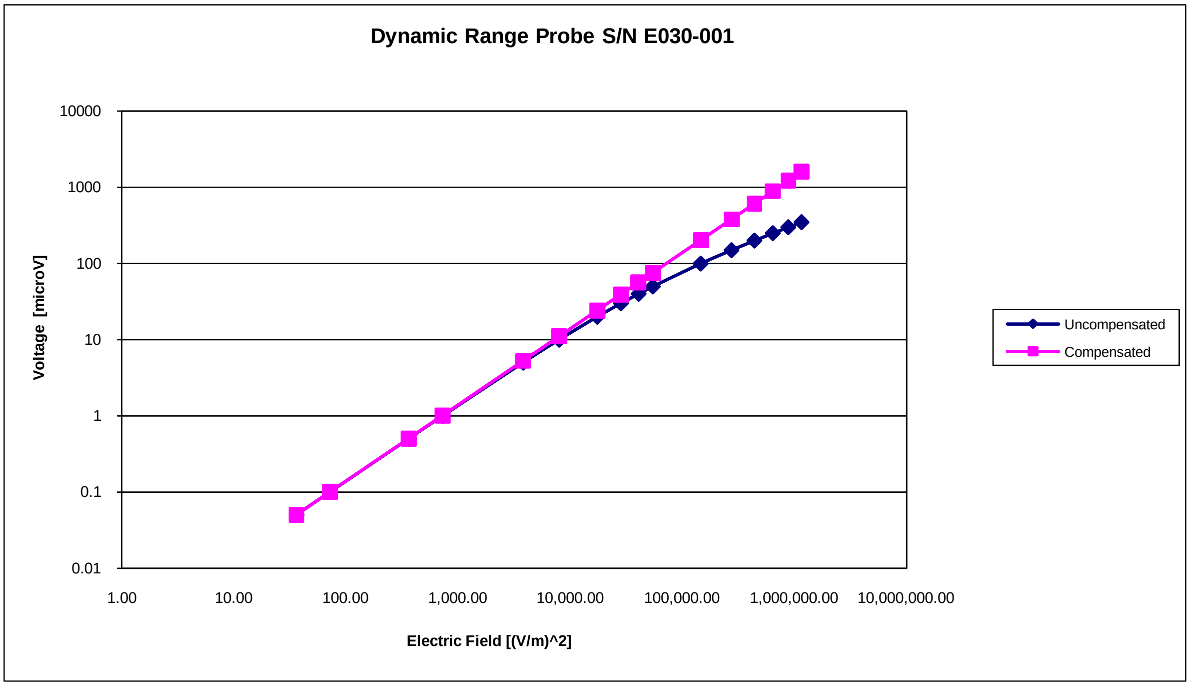
## Isotropy Error Air



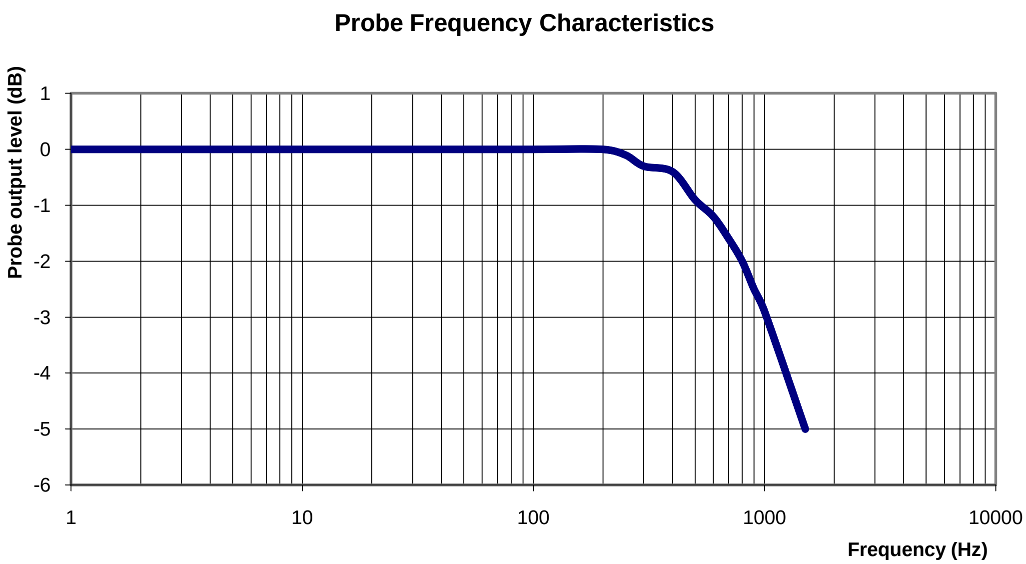




**Isotropicity Tissue:** 0.10 dB

# Dynamic Range



# Video Bandwidth




**Video Bandwidth at 500 Hz** 1 dB
**Video Bandwidth at 1.02 KHz:** 3 dB

**Test Equipment**

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2013.

# Appendix E – Dipole Calibration Data Sheets

**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

**S** **Schweizerischer Kalibrierdienst**
**C** **Service suisse d'étalonnage**
**S** **Servizio svizzero di taratura**
**Swiss Calibration Service**

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

**Client** **RF Exposure Lab**

**Certificate No: D2450V2-829_Dec12**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D2450V2 - SN: 829 |
| Calibration procedure(s) | QA CAL-05.v8<br>Calibration procedure for dipole validation kits above 700 MHz |
| Calibration date: | December 04, 2012 |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM-442A | GB37480704 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Power sensor HP 8481A | US37292783 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 27-Mar-12 (No. 217-01530) | Apr-13 |
| Type-N mismatch combination | SN: 5047.3 / 06327 | 27-Mar-12 (No. 217-01533) | Apr-13 |
| Reference Probe ES3DV3 | SN: 3205 | 30-Dec-11 (No. ES3-3205_Dec11) | Dec-12 |
| DAE4 | SN: 601 | 27-Jun-12 (No. DAE4-601_Jun12) | Jun-13 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06 | 100005 | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Leif Klysner | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: December 4, 2012

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A | not applicable or not measured |

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

d) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY5 | V52.8.3 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2450 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.2 | 1.80 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 38.2 ± 6 % | 1.84 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.7 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **53.9 W/kg ± 17.0 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 6.33 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **25.1 W/kg ± 16.5 % (k=2)** |

## Body TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 52.7 | 1.95 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 50.7 ± 6 % | 2.02 mho/m ± 6 % |
| **Body TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Body TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 13.2 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **51.5 W/kg ± 17.0 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 250 mW input power | 6.08 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **24.0 W/kg ± 16.5 % (k=2)** |

## Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 53.1 Ω + 4.2 jΩ |
| Return Loss | - 25.9 dB |

## Antenna Parameters with Body TSL

| | |
|---|---|
| Impedance, transformed to feed point | 49.7 Ω + 5.1 jΩ |
| Return Loss | - 25.9 dB |

## General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.158 ns |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

## Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | December 11, 2008 |

Date: 04.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 829**

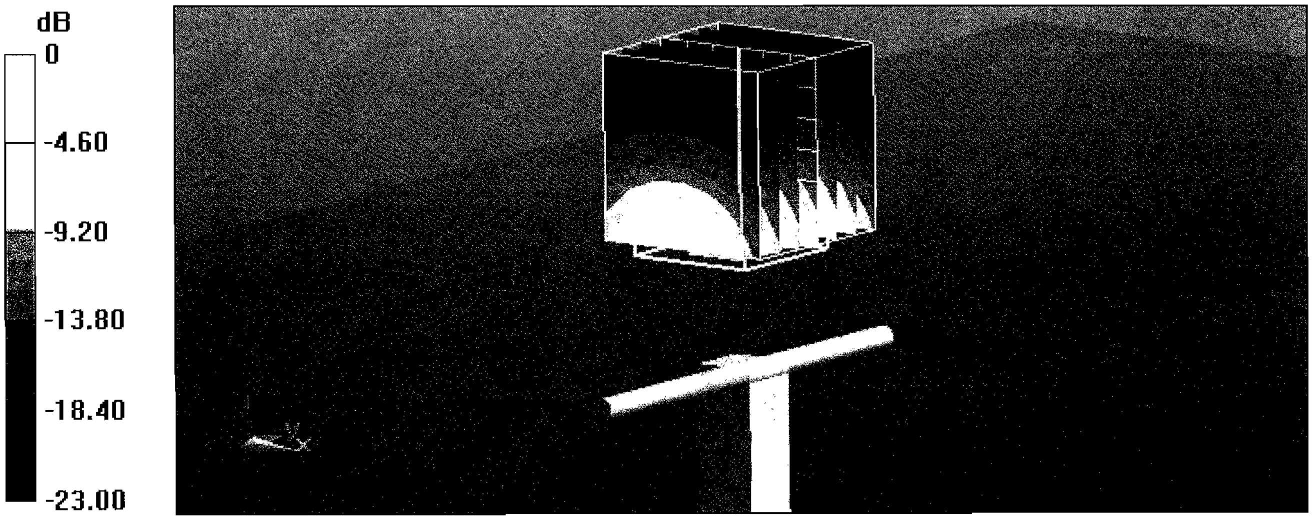
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.84 mho/m; $\varepsilon_r$ = 38.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

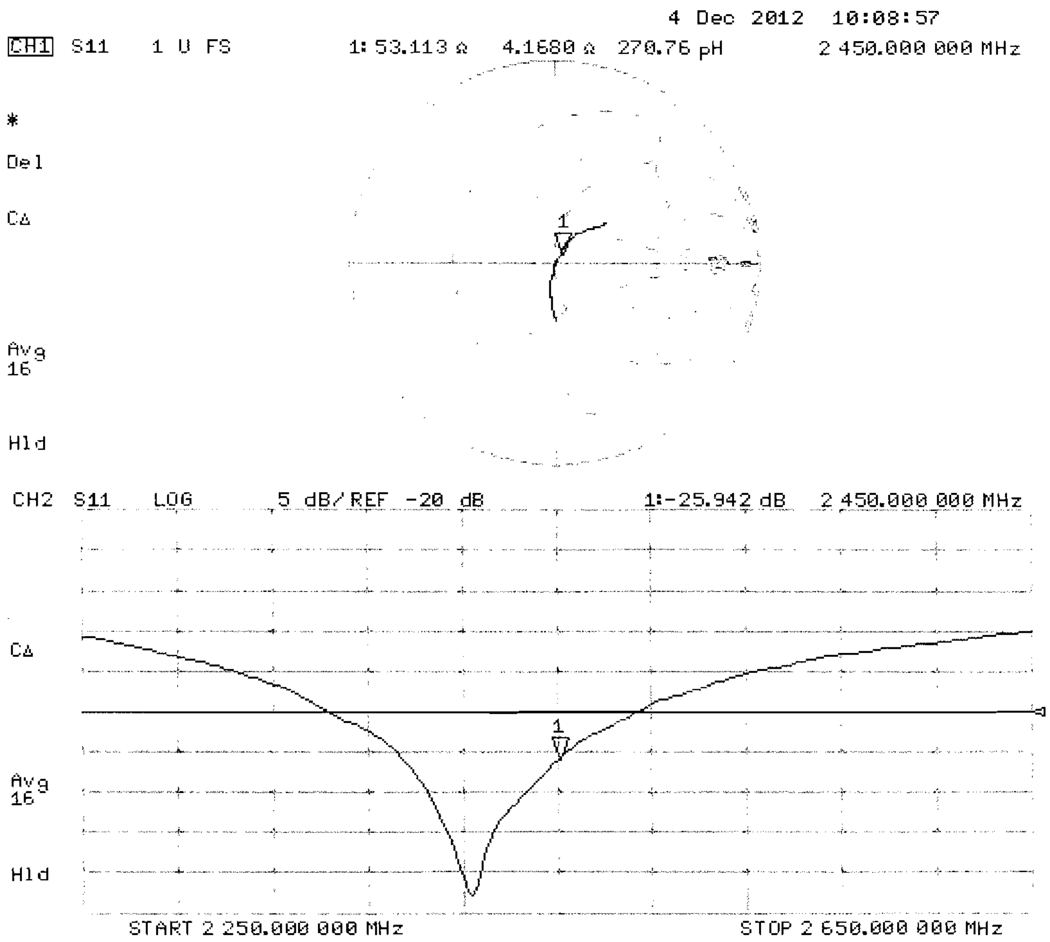
## Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.1 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 28.3 W/kg
**SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.33 W/kg**
Maximum value of SAR (measured) = 17.8 W/kg




0 dB = 17.8 W/kg = 12.50 dBW/kg

## Impedance Measurement Plot for Head TSL



Date: 04.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 829**

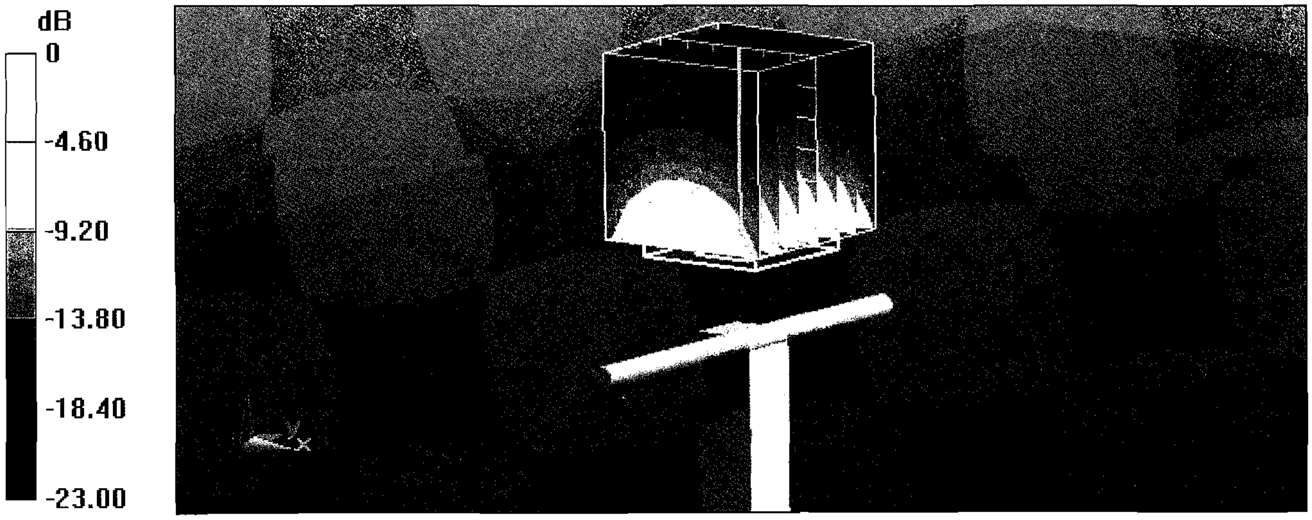
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 2.02 mho/m; $\varepsilon_r$ = 50.7; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

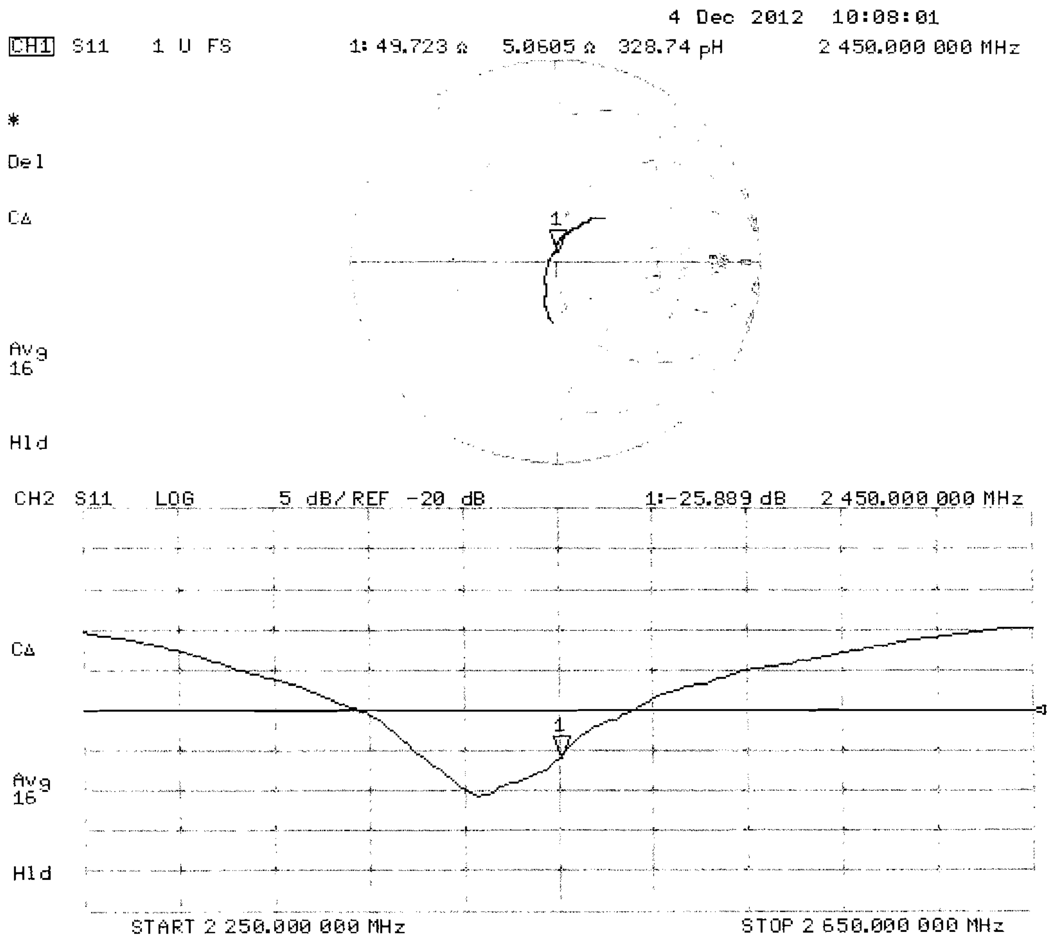
## Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.1 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 27.4 W/kg
**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.08 W/kg**
Maximum value of SAR (measured) = 17.5 W/kg




0 dB = 17.5 W/kg = 12.43 dBW/kg

## Impedance Measurement Plot for Body TSL



**Calibration Laboratory of**
Schmid & Partner
Engineering AG
**Zeughausstrasse 43, 8004 Zurich, Switzerland**

**S** **Schweizerischer Kalibrierdienst**
**C** **Service suisse d'étalonnage**
**S** **Servizio svizzero di taratura**
**S** **Swiss Calibration Service**

Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates**

**Accreditation No.: SCS 108**

**Client** **RF Exposure Lab**

**Certificate No: D5GHzV2-1085_Dec12**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D5GHzV2 - SN: 1085 |
| Calibration procedure(s) | QA CAL-22.v1<br>Calibration procedure for dipole validation kits between 3-6 GHz |
| Calibration date: | December 11, 2012 |

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter EPM-442A | GB37480704 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Power sensor HP 8481A | US37292783 | 01-Nov-12 (No. 217-01640) | Oct-13 |
| Reference 20 dB Attenuator | SN: 5058 (20k) | 27-Mar-12 (No. 217-01530) | Apr-13 |
| Type-N mismatch combination | SN: 5047.3 / 06327 | 27-Mar-12 (No. 217-01533) | Apr-13 |
| Reference Probe EX3DV4 | SN: 3503 | 30-Dec-11 (No. EX3-3503_Dec11) | Dec-12 |
| DAE4 | SN: 601 | 27-Jun-12 (No. DAE4-601_Jun12) | Jun-13 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (in house check Oct-11) | In house check: Oct-13 |
| RF generator R&S SMT-06 | 100005 | 04-Aug-99 (in house check Oct-11) | In house check: Oct-13 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (in house check Oct-12) | In house check: Oct-13 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Israe El-Naouq | Laboratory Technician | Israe El-Naouq |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: December 11, 2012

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| ConvF | sensitivity in TSL / NORM x,y,z |
| N/A | not applicable or not measured |

## Calibration is Performed According to the Following Standards:

a) IEC 62209-2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", March 2010
b) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

## Additional Documentation:

c) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

| | | |
|---|---|---|
| **DASY Version** | DASY5 | V52.8.3 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom V5.0 | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy = 4.0 mm, dz = 1.4 mm | Graded Ratio = 1.4 (Z direction) |
| **Frequency** | 5200 MHz ± 1 MHz<br>5300 MHz ± 1 MHz<br>5600 MHz ± 1 MHz<br>5800 MHz ± 1 MHz | |

## Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 36.0 | 4.66 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 34.8 ± 6 % | 4.53 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL at 5200 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 8.20 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **81.4 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.35 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **23.3 W/kg ± 19.5 % (k=2)** |

## Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 35.9 | 4.76 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 34.7 ± 6 % | 4.63 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL at 5300 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 8.35 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **82.9 W / kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.39 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **23.7 W/kg ± 19.5 % (k=2)** |

## Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 35.5 | 5.07 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 34.2 ± 6 % | 4.93 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL at 5600 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 8.69 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **86.1 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.48 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **24.5 W/kg ± 19.5 % (k=2)** |

## Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 35.3 | 5.27 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 34.0 ± 6 % | 5.15 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL at 5800 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 8.16 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **80.9 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.33 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **23.1 W/kg ± 19.5 % (k=2)** |

## Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 49.0 | 5.30 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 46.8 ± 6 % | 5.35 mho/m ± 6 % |
| **Body TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Body TSL at 5200 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 7.41 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **73.4 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.08 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **20.6 W/kg ± 19.5 % (k=2)** |

## Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 48.9 | 5.42 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 46.7 ± 6 % | 5.47 mho/m ± 6 % |
| **Body TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Body TSL at 5300 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 7.43 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **73.6 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.09 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **20.7 W/kg ± 19.5 % (k=2)** |

## Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 48.5 | 5.77 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 46.2 ± 6 % | 5.86 mho/m ± 6 % |
| **Body TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Body TSL at 5600 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 7.98 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **79.1 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.22 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **21.9 W/kg ± 19.5 % (k=2)** |

## Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---|---|---|
| **Nominal Body TSL parameters** | 22.0 °C | 48.2 | 6.00 mho/m |
| **Measured Body TSL parameters** | (22.0 ± 0.2) °C | 45.9 ± 6 % | 6.13 mho/m ± 6 % |
| **Body TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Body TSL at 5800 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of Body TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 7.36 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **72.9 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 $cm^3$ (10 g) of Body TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.04 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | **20.2 W/kg ± 19.5 % (k=2)** |

## Appendix

### Antenna Parameters with Head TSL at 5200 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 50.9 Ω - 9.9 jΩ |
| Return Loss | - 20.2 dB |

### Antenna Parameters with Head TSL at 5300 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 48.7 Ω - 5.6 jΩ |
| Return Loss | - 24.7 dB |

### Antenna Parameters with Head TSL at 5600 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 56.1 Ω - 4.4 jΩ |
| Return Loss | - 23.0 dB |

### Antenna Parameters with Head TSL at 5800 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 51.9 Ω - 4.6 jΩ |
| Return Loss | - 26.2 dB |

### Antenna Parameters with Body TSL at 5200 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 50.0 Ω - 9.5 jΩ |
| Return Loss | - 20.5 dB |

### Antenna Parameters with Body TSL at 5300 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 49.7 Ω - 5.0 jΩ |
| Return Loss | - 26.0 dB |

### Antenna Parameters with Body TSL at 5600 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 56.5 Ω - 3.4 jΩ |
| Return Loss | - 23.2 dB |

### Antenna Parameters with Body TSL at 5800 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 53.5 Ω - 4.7 jΩ |
| Return Loss | - 25.0 dB |

## General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.207 ns |

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

## Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | December 21, 2009 |

Date: 11.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1085**

Communication System: CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; $\sigma$ = 4.53 mho/m; $\varepsilon_r$ = 34.8; $\rho$ = 1000 kg/m$^3$ , Medium parameters used: f = 5300 MHz; $\sigma$ = 4.63 mho/m; $\varepsilon_r$ = 34.7; $\rho$ = 1000 kg/m$^3$ , Medium parameters used: f = 5600 MHz; $\sigma$ = 4.93 mho/m; $\varepsilon_r$ = 34.2; $\rho$ = 1000 kg/m$^3$ , Medium parameters used: f = 5800 MHz; $\sigma$ = 5.15 mho/m; $\varepsilon_r$ = 34; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

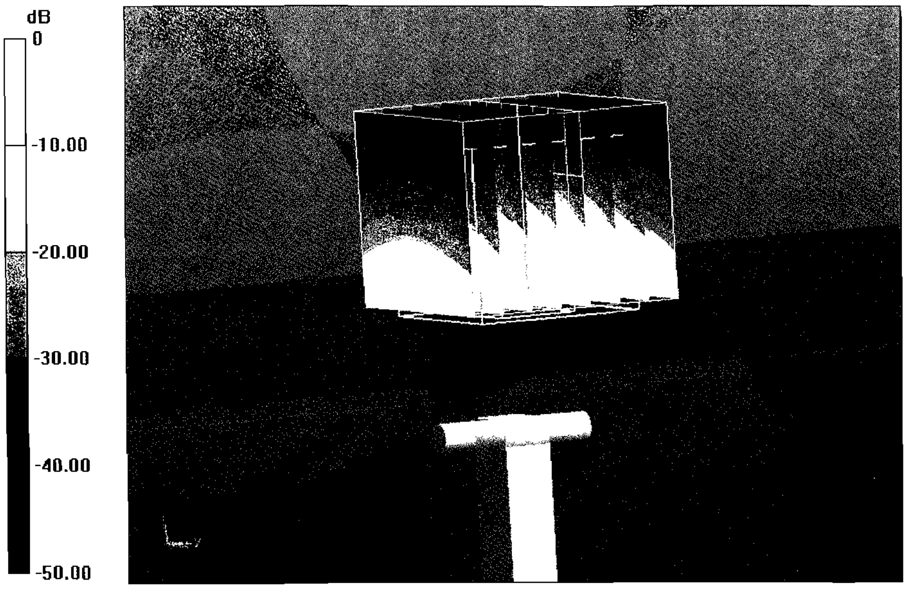
- Probe: EX3DV4 - SN3503; ConvF(5.41, 5.41, 5.41); Calibrated: 30.12.2011, ConvF(5.1, 5.1, 5.1); Calibrated: 30.12.2011, ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2011, ConvF(4.81, 4.81, 4.81); Calibrated: 30.12.2011;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

**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 = 64.782 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 30.1 W/kg
**SAR(1 g) = 8.2 W/kg; SAR(10 g) = 2.35 W/kg**
Maximum value of SAR (measured) = 18.9 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 = 64.947 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 31.3 W/kg
**SAR(1 g) = 8.35 W/kg; SAR(10 g) = 2.39 W/kg**
Maximum value of SAR (measured) = 19.4 W/kg

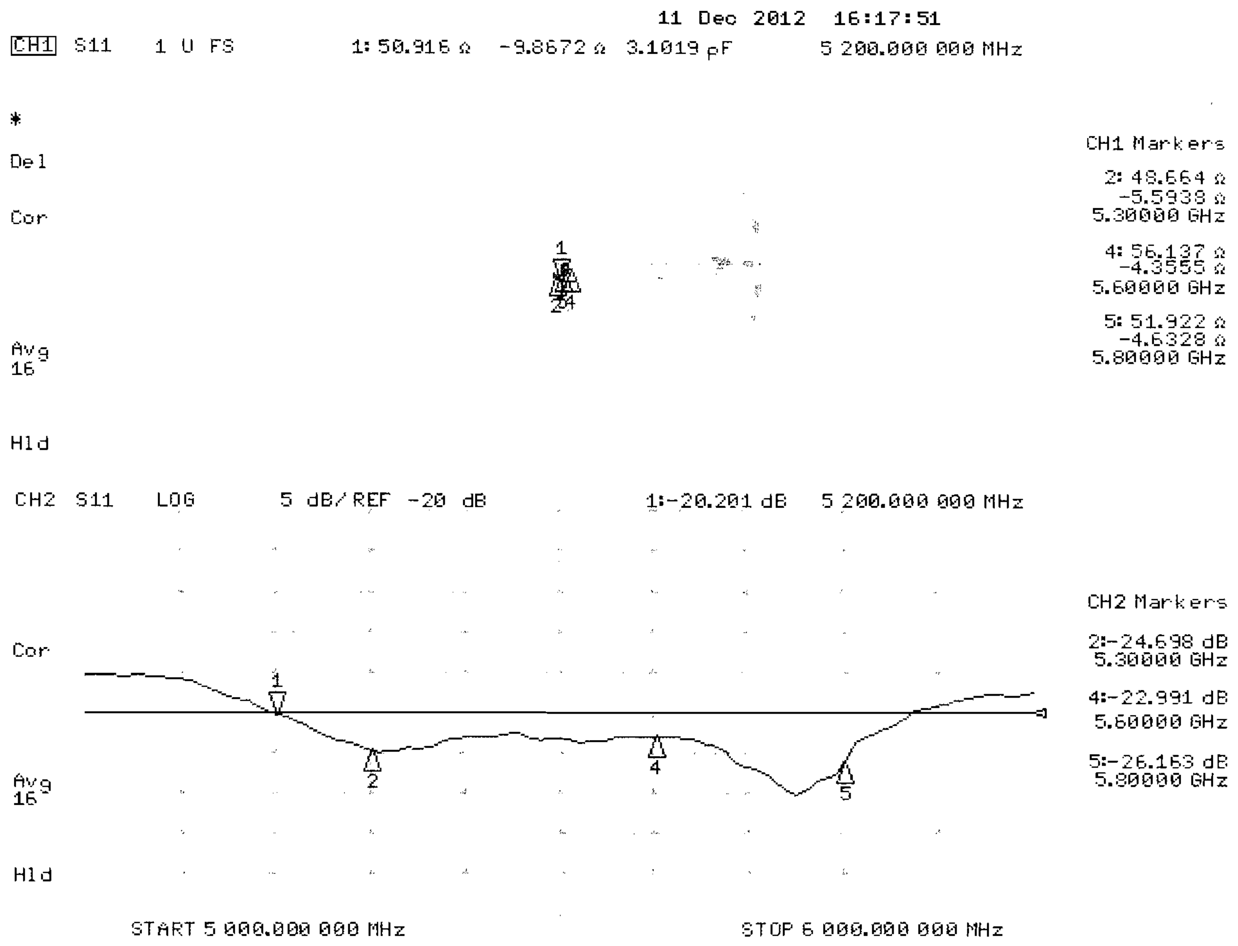
**Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.857 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 34.4 W/kg
**SAR(1 g) = 8.69 W/kg; SAR(10 g) = 2.48 W/kg**
Maximum value of SAR (measured) = 20.8 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 = 61.816 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 33.5 W/kg
**SAR(1 g) = 8.16 W/kg; SAR(10 g) = 2.33 W/kg**
Maximum value of SAR (measured) = 19.9 W/kg




0 dB = 19.9 W/kg = 12.99 dBW/kg

# Impedance Measurement Plot for Head TSL



Date: 10.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1085**

Communication System: CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; $\sigma$ = 5.35 mho/m; $\varepsilon_r$ = 46.8; $\rho$ = 1000 kg/m$^3$ , Medium parameters used: f = 5300 MHz; $\sigma$ = 5.47 mho/m; $\varepsilon_r$ = 46.7; $\rho$ = 1000 kg/m$^3$ , Medium parameters used: f = 5600 MHz; $\sigma$ = 5.86 mho/m; $\varepsilon_r$ = 46.2; $\rho$ = 1000 kg/m$^3$ , Medium parameters used: f = 5800 MHz; $\sigma$ = 6.13 mho/m; $\varepsilon_r$ = 45.9; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

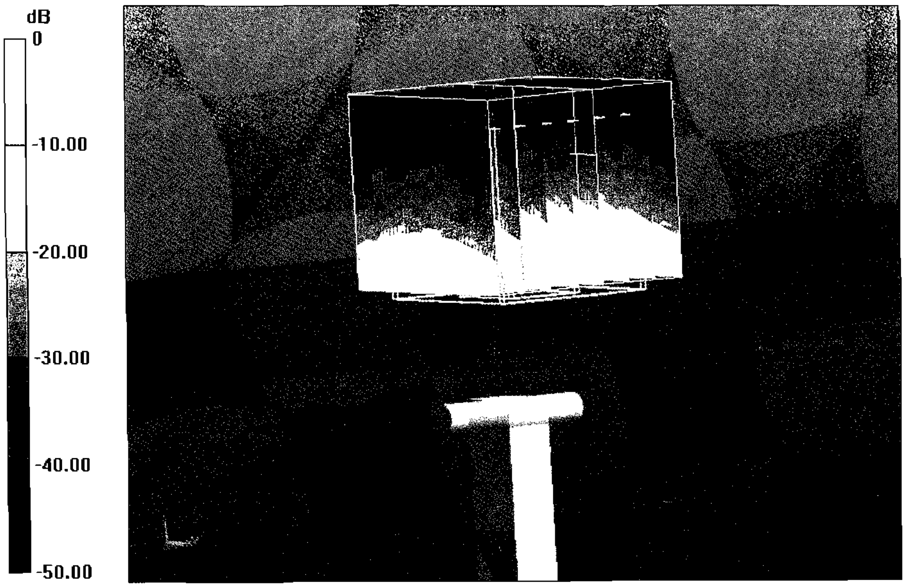
- Probe: EX3DV4 - SN3503; ConvF(4.91, 4.91, 4.91); Calibrated: 30.12.2011, ConvF(4.67, 4.67, 4.67); Calibrated: 30.12.2011, ConvF(4.22, 4.22, 4.22); Calibrated: 30.12.2011, ConvF(4.38, 4.38, 4.38); Calibrated: 30.12.2011;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

**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 = 58.435 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 29.5 W/kg
**SAR(1 g) = 7.41 W/kg; SAR(10 g) = 2.08 W/kg**
Maximum value of SAR (measured) = 17.3 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 = 57.938 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 30.1 W/kg
**SAR(1 g) = 7.43 W/kg; SAR(10 g) = 2.09 W/kg**
Maximum value of SAR (measured) = 17.4 W/kg

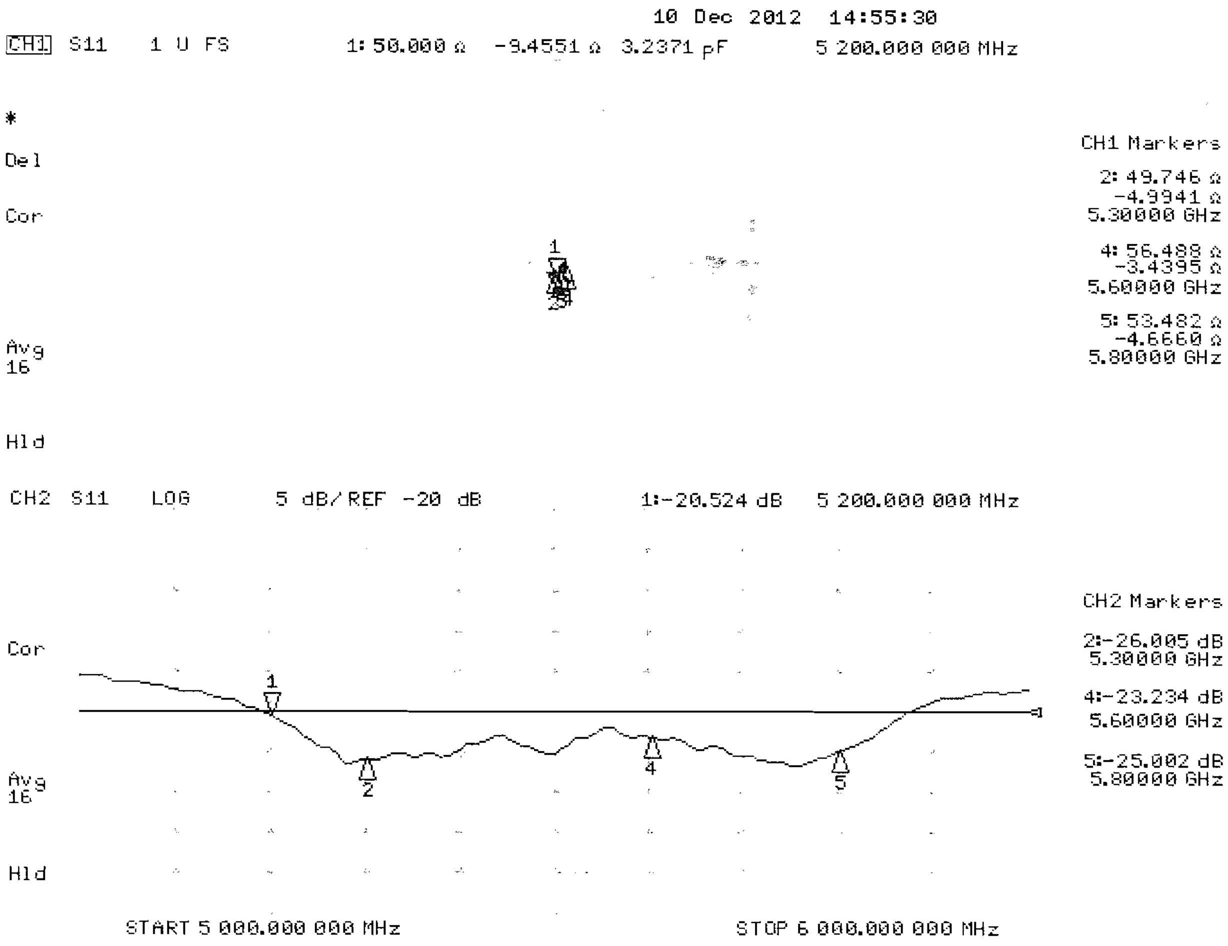
**Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.467 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 35.4 W/kg
**SAR(1 g) = 7.98 W/kg; SAR(10 g) = 2.22 W/kg**
Maximum value of SAR (measured) = 19.5 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 = 54.901 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 34.6 W/kg
**SAR(1 g) = 7.36 W/kg; SAR(10 g) = 2.04 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



# Appendix F – Phantom Calibration Data Sheets

## NCL CALIBRATION LABORATORIES

Calibration File No.: RFE-273

# CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to National Standards.

**Thickness of the UniPhantom is 2 mm ± 10%**
**Pinna thickness is 6 mm ± 10%**

| | | | |
|---|---|---|---|
| Resolution: | 0.01 mm | Calibrated to: | 0.0 mm |
| Stability: | OK | Accuracy: | < 0.1 mm |

Calibrated By: Karen K. Feb 17/04.

**NCL** CALIBRATION LABORATORIES

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CANADA K2R 1E6

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