FCC SAR Test Report

APPLICANT	:	Acer Incorporated
EQUIPMENT	:	HSPA+ Module
BRAND NAME	:	acer
MODEL NAME	:	MU733
FCC ID	:	HLZMU733
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Supplement C (Edition 01-01)

The product was installed into Wireless Tablet PC (Brand Name: acer, Model Name: W511, W510P, WT3, FCC ID: HLZW510) during test.

The product was completely tested on Oct. 17, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

ilac-MRA

TAF Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA282240-03	Rev. 01	Initial issue of report	Nov. 12, 2012
FA282240-03	Rev. 02	1. Update antenna location drawing in page 26. 2. Clarify the statement of voice call function in page 7 and 26.	Nov. 30, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Acer Incorporated, HSPA+ Module, acer, MU733,** are as follows.

<Highest standalone SAR Summary>

Band	Position	SAR_{1g} (W/kg)
GSM850	Body (0 cm Gap)	0.554
GSM1900	Body (0 cm Gap)	0.845
WCDMA Band V	Body (0 cm Gap)	1.17
WCDMA Band II	Body (0 cm Gap)	1.11

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003 and FCC OET Bulletin 65 Supplement C (Edition 01-01).

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

2.2 Applicant

Company Name	Acer Incorporated
Address	8F., No. 88, Sec. 1, Hsin Tai Wu Rd., Xizhi, New Taipei City 221, Taiwan, R.O.C.

2.3 Manufacturer

Company Name	1. AMBIT MICROSYSTEMS (SHANGHAI) LTD. 2. Hon Fu Jin Precision Industry (Shenzhen) Co., Ltd. 3. Hong Fu Jin Precision Electrons (YanTai) Co., Ltd. 4. Hong Fu Jin Precision Electronics (Chongqing) Co., Ltd. 5. Foxconn CMMSG Industrial Electronics Ltd. 6. Fenix Industrial Electronics Ltd. 7. Foxconn MOEBG Industria De Eletronicos Ltda. 8. Nanning Fu Tai Hong Precision Electronic Co., Ltd. 9. Nanning Fu Tai Hong Precision Electronics Co., Ltd. 10. Nanning Fu Gui Precision Electronics Co., Ltd. 11. FUNING Precision Component (Bac Ninh) Co., Ltd. 12. Fuhong Precision Component (Bac Giang) Limited

Address	1. No. 1925, Nanle Road, Songjiang Export Process Zone, Shanghai, China 2. Communication Network Solution Business Group; No. 2, 2nd Donghuan Road, 10th Yousong Industrial District, Longhua Town, Baoan District, Shenzhen, Guangdong 518109 China 3. CNSBG-CPE1; A11 Building, Export Processing Zone, Economic & Technologic, Development Area, YanTai, Shandong, 264006, China 4. Building D02, No. 1, East Zone 1st Road , Shapingba District, Chongqing, 401332, China 5. N800, Marginal Rodovia dos Bandeirantes avenue, Engordadouro district, Jundiai City, Sao Paulo, Brazil, ZIP Code: 13213-008 6. N236, Jose de Palma Renno street, Centro district, Santa Rita do Sapucai City , Minas Gerais, Brazil , ZIP Code: 37540-000 7. No. 1580a Acai Street, Industrial district, Manaus Amazonas, Brazil, ZIP Code: 69075-020 8. HWV Product Division No. 13 Road, Keyuan East; High Technical Industrial, Development Zone, Nanning, Guangzi, 530007, China 9. The Forth Building, China-ASEAN Advanced Business Part Phase Three, No. 18, Zongbu Road, High Technical Industrial Development Zone, Nanninb, Guangxi, 530007, China 10. China-ASEAN Advanced Business Park Phase Three, No. 18, Zongbu Road, Hgh Technical Industrial Development Zone, Nanning , Guangxi , 530007, China 11. Que Vo industrial park, Van Duong commune, Bac Ninh city, BacNinh province, Vietnam 12. Dinh Tram Industrial Park, Viet Yen District Bac Giang Province 236100, Vietnam

2.4 Application Details

Date of Start during the Test	Sep. 11, 2012
Date of End during the Test	Oct. 17, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	HSPA+ Module
Brand Name	acer
Model Name	MU733
Maximum Average Output Power to Antenna	GSM850: 32.36 dBm GSM1900: 29.18 dBm WCDMA Band V: 23.41 dBm WCDMA Band II: 22.95 dBm
Antenna Type	WWAN: PIFA Antenna
HW Version	M/B : Rev. 1.05
SW Version	BIOS : [WT3_QS]v018t1_Debug
Uplink Modulations	GPRS: GMSK EDGE: GMSK / 8PSK WCDMA (Rel 99): QPSK HSDPA (Rel 6): QPSK HSUPA (Rel 6): QPSK
EUT Stage	Identical Prototype

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. Voice call over circuit-switch is not supported, thus GSM call is not supported.
3. This device does not support HSPA+ with16QAM uplink; only supports up to category 6.
4. WLAN module, FCC ID: HLZ-T77H389, is integrated into this host via C2PC filing that granted on 2012/10/11.
5. To address co-location simultaneous transmission conservatively, WLAN SAR was completely tested again in this Host.

3.2 Product Photos

Please refer to Appendix D.

3.3 Applied Standard

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v04
- FCC KDB 616217 D03 v01
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D03 v01
- FCC KDB 248227 D01 v01r02

3.4 Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

3.5 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

For WWAN SAR testing, the device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT.

The EUT was set from the emulator to radiate maximum WWAN output power during all tests. For Bottom-Face and Edge1 testing at 0cm separation, the proximity sensor will activate the power reduction and the maximum power is limited at the pre-defined level implemented in this device. The power reduction values are same for Bottom-Face and Edge1.

The power reduction scheme compliance is also verified at the proximity sensor trigger distance. During this testing the proximity sensor was disabling and EUT will transmit at the maximum power requested by the base station simulator.

For WLAN SAR testing, WLAN engineering testing software installed on the EUT can provide continuous transmitting RF signal.

Power reduction applied for each wireless mode and orientation

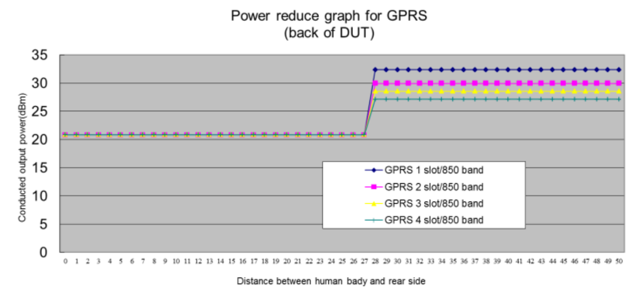
Exposure Position / wireless mode	GPRS/EDGE 850	GPRS/EDGE 1900	WCDMA Band 5	WCDMA Band 2
Bottom Face	Yes	Yes	Yes	Yes
Edge1	Yes	Yes	Yes	Yes
Edge2	N/A	N/A	N/A	N/A
Edge3	N/A	N/A	N/A	N/A
Edge4	N/A	N/A	N/A	N/A

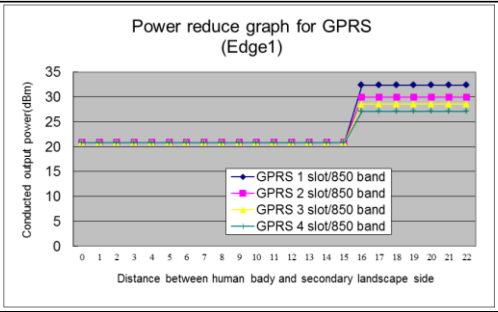
Remark:

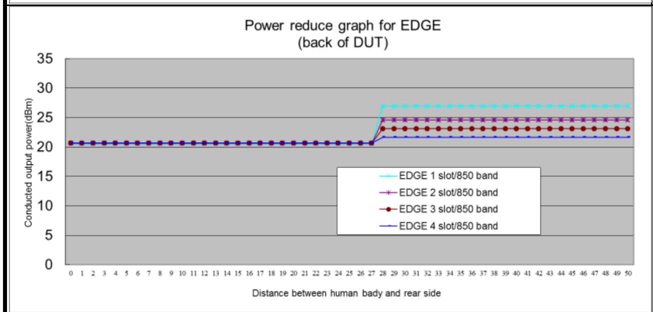
1. Yes: Reduced maximum limit applied by activation of proximity sensor.
2. N/A: Normal output power without reduction
3. Power reduction is not applicable for WiFi and Bluetooth.

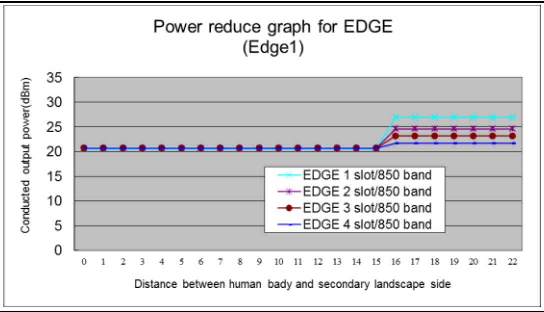
Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels
		w/o power back-off	w/ power back-off	(dB)
GSM850 GPRS 8 (1 Uplink) – CS1	189	32.36	20.82	11.54
GSM850 GPRS 10 (2 Uplink) – CS1	189	29.93	20.82	9.11
GSM850 GPRS 11 (1 Uplink) – CS1	189	28.55	20.84	7.71
GSM850 GPRS 12 (2 Uplink) – CS1	189	27.12	20.85	6.27
GSM850 EDGE 8 (8PSK, 1 Uplink) – MCS9	189	26.94	20.54	6.40
GSM850 EDGE 10 (8PSK, 2 Uplink) – MCS9	189	24.57	20.62	3.95
GSM850 EDGE 11 (8PSK, 1 Uplink) – MCS9	189	23.10	20.64	2.46
GSM850 EDGE 12 (8PSK, 2 Uplink) – MCS9	189	21.63	20.65	0.98
GSM1900 GPRS 8 (1 Uplink) – CS1	661	29.18	18.42	10.76
GSM1900 GPRS 10 (2 Uplink) – CS1	661	26.62	18.44	8.18
GSM1900 GPRS 11 (1 Uplink) – CS1	661	25.18	18.45	6.73
GSM1900 GPRS 12 (2 Uplink) – CS1	661	23.73	18.46	5.27
GSM1900 EDGE 8 (8PSK, 1 Uplink) – MCS9	661	25.47	18.23	7.24
GSM1900 EDGE 10 (8PSK, 2 Uplink) – MCS9	661	23.07	18.32	4.75
GSM1900 EDGE 11 (8PSK, 1 Uplink) – MCS9	661	21.57	18.33	3.24
GSM1900 EDGE 12 (8PSK, 2 Uplink) – MCS9	661	20.08	18.35	1.73
WCDMA Band 5 (RMC 12.2K)	4182	23.29	20.83	2.46
WCDMA Band 2 (RMC 12.2K)	9400	22.87	15.79	7.08

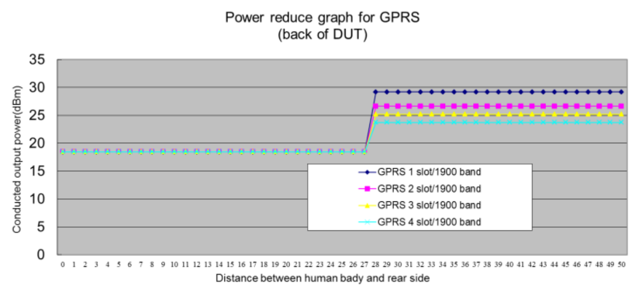
Proximity Sensor for Bottom Face detection	Proximity Sensor for Edge1 detection

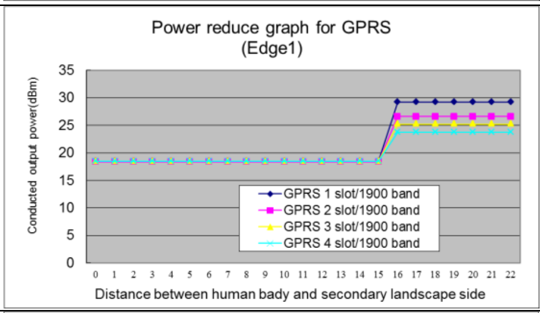


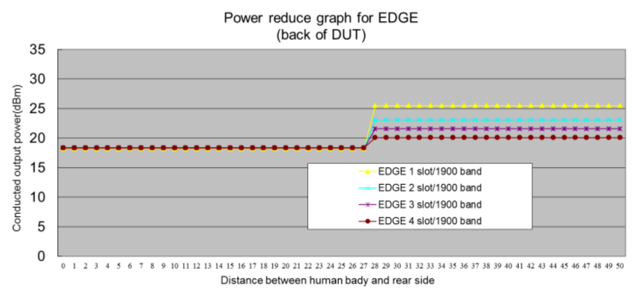


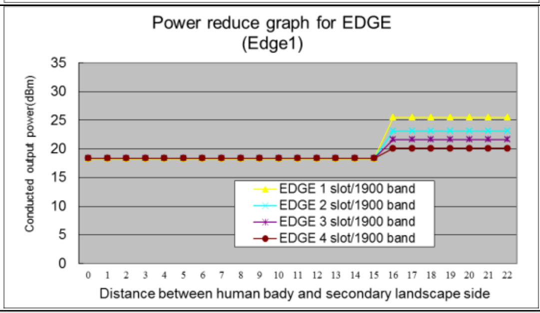


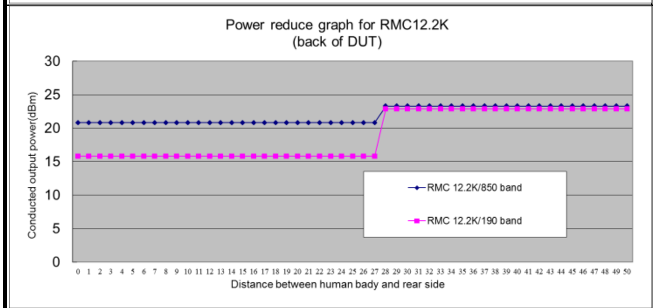


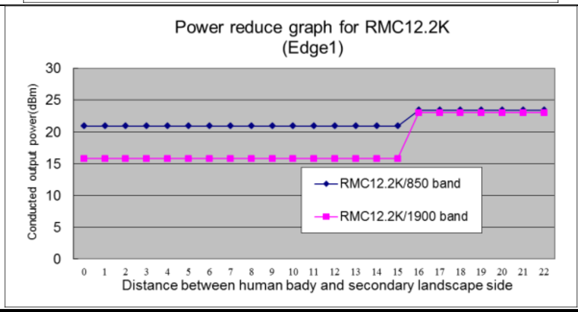












4. Specific Absorption Rate (SAR)

4.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

4.2 SAR Definition

The SAR definition is 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 (ρ). The equation description is as below:

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$\mathbf{SAR} = \mathbf{C}\left(\frac{\boldsymbol{\delta}\mathbf{T}}{\boldsymbol{\delta}\mathbf{t}}\right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

5. SAR Measurement System

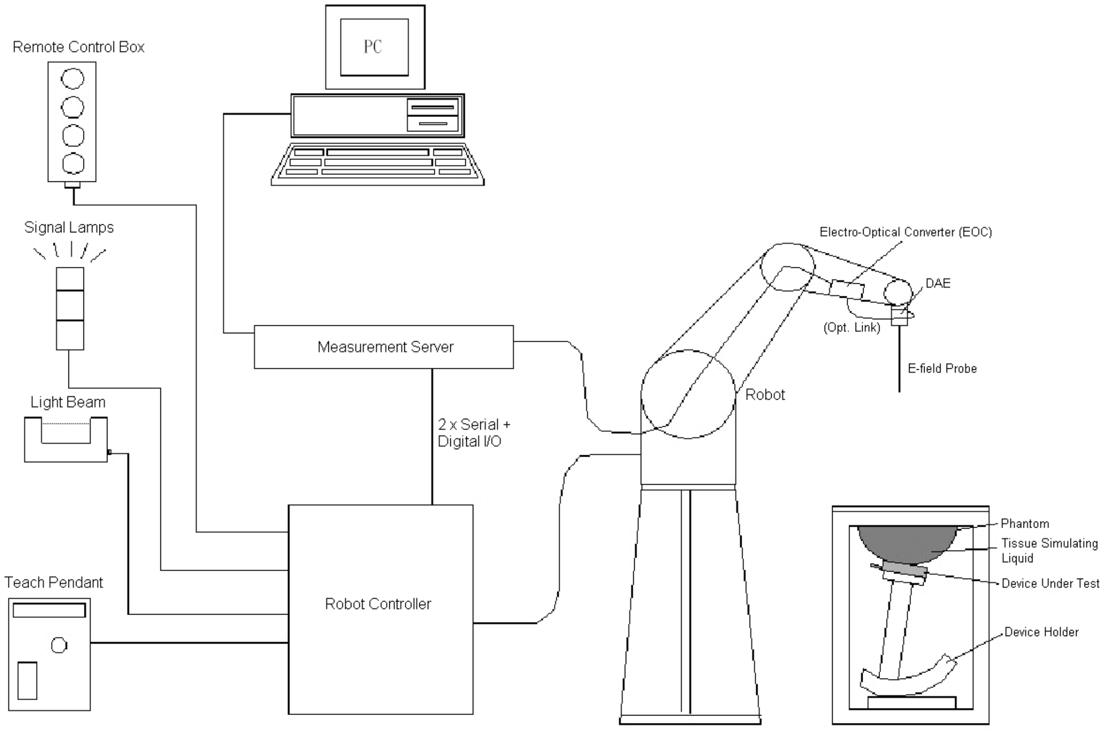


Fig 5.1 SPEAG DASY System Configurations

The DASY system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (EOC) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Some of the components are described in details in the following sub-sections.

5.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

5.1.1 E-Field Probe Specification

<ET3DV6 / ET3DV6R Probe >

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 3 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm

Fig 5.2 Photo of ET3DV6/ET3DV6R

<EX3DV4 / ES3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

Fig 5.3 Photo of EX3DV4/ES3DV4

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure. The calibration data can be referred to appendix C of this report.

5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.4 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90BL; DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

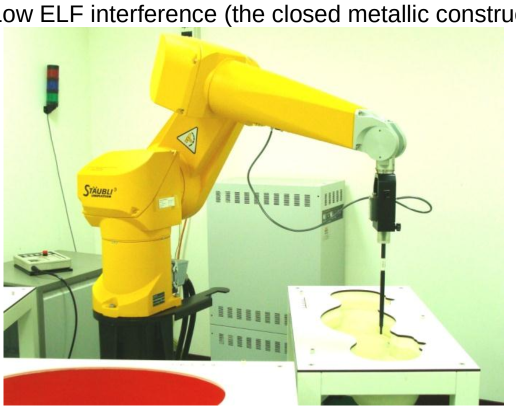


Fig 5.5 Photo of DASY4


Fig 5.6 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128 MB), RAM (DASY4: 64 MB, DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

Fig 5.7 Photo of Server for DASY4

Fig 5.8 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom

Fig 5.9 Photo of SAM Phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI4 Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm

Fig 5.10 Photo of ELI4 Phantom

The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Fig 5.11 Device Holder

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

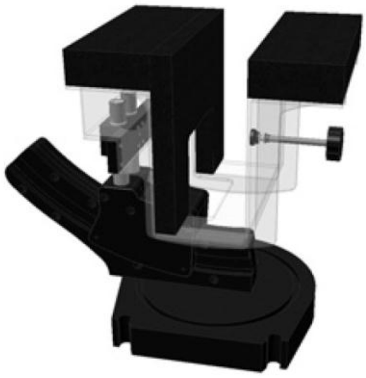


Fig 5.12 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files. The post-processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type (e.g., [V/m], [A/m], [mW/g]). Some of these units are not available in certain situations or give meaningless results, e.g., a SAR-output in a non-lose media, will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.7.2 Data Evaluation

The DASY post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
Device parameters：	- Frequency	f
	- Crest factor	cf
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.

The formula for each channel can be given as：

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

with V_i = compensated signal of channel i, (i = x, y, z)
U_i = input signal of channel i, (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals, the primary field data for each channel can be evaluated：

E-field Probes： $\mathbf{E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}}$

H-field Probes： $\mathbf{H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}}$

with V_i = compensated signal of channel i, (i = x, y, z)
$Norm_i$ = sensor sensitivity of channel i, (i = x, y, z), μV/(V/m)^2 for E-field Probes
ConvF = sensitivity enhancement in solution
a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
E_i = electric field strength of channel i in V/m
H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude)：

$$\mathbf{E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}}$$

The primary field data are used to calculate the derived field units.

$$\mathbf{SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}}$$

with SAR = local specific absorption rate in mW/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 22, 2010	Mar. 21, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 23, 2010	Mar. 22, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Jan. 18, 2012	Jan. 17, 2013
SPEAG	Data Acquisition Electronics	DAE4	1279	May 03, 2012	May 02, 2013
SPEAG	Data Acquisition Electronics	DAE3	495	Apr. 23, 2012	Apr. 22, 2013
SPEAG	Data Acquisition Electronics	DAE4	577	Jan. 06. 2012	Jan. 05. 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Aug. 27, 2012	Aug. 26, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3578	Jun. 21, 2012	Jun. 20, 2013
SPEAG	Dosimetric E-Field Probe	ET3DV6	1787	May 29, 2012	May 28, 2013
SPEAG	Dosimetric E-Field Probe	ES3DV3	3296	Apr. 10, 2012	Apr. 09, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 28, 2012	Sep. 27, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3801	Jun. 22, 2012	Jun. 21, 2013
Wisewind	Thermometer	ETP-101	TM560	Nov. 16, 2011	Nov. 15, 2012
Wisewind	Thermometer	HTC-1	TM685	Nov. 16, 2011	Nov. 15, 2012
Wisewind	Thermometer	HTC-1	TM659	Nov. 16, 2011	Nov. 15, 2012
H.M.IRIS	Thermometer	TH-08	TM658	Nov. 16, 2011	Nov. 15, 2012
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BB	1026	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 001 BA	1029	NCR	NCR
SPEAG	ELI4 Phantom	QD 0VA 002 AA	TP-1131	NCR	NCR
Agilent	Network Analyzer	E5071C	MY46101588	May 11, 2012	May 10, 2013
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 02, 2012	Oct. 01, 2013
Anritsu	Power Meter	ML2495A	1132003	Aug. 14, 2012	Aug. 13, 2013
Anritsu	Radio Communication Analyzer	MT8820C	6201074414	Dec. 21, 2011	Dec. 20, 2012
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
R&S	Universal Digital Radiocommunication Tester	CMU200	106656	Jun. 28, 2012	Jun. 27, 2013
R&S	Spectrum Analyzer	FSP	101131	Jul. 23, 2012	Jul. 22, 2013

Table 5.1 Test Equipment List

Note:
1. The calibration certificate of DASY can be referred to appendix C of this report.
2. Referring to KDB 450824 D02, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 499, D1900V2, SN: 5d041, and D2450V2, SN: 736 can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.2.

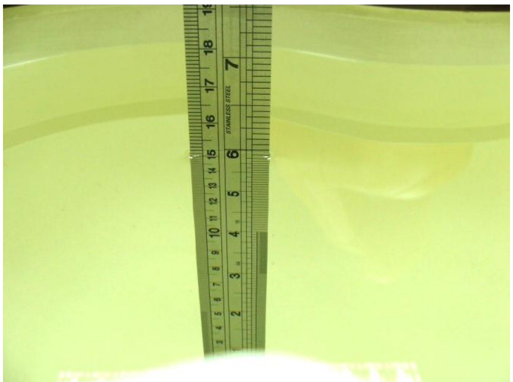


Fig 6.1 Photo of Liquid Height for Head SAR

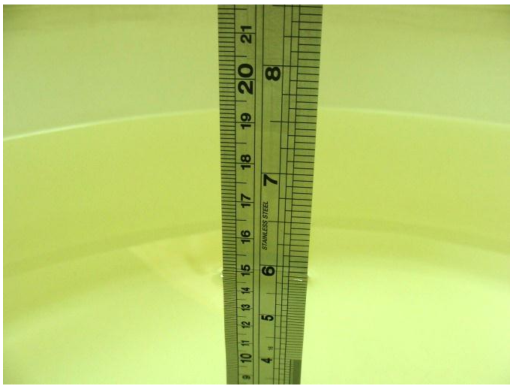


Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

Simulating Liquid for 5G, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

The following table shows the measuring results for simulating liquid.

Freq. (MHz)	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Body	21.5	0.994	54.715	0.97	55.2	2.47	-0.88	±5	Sep. 11, 2012
835	Body	21.6	0.955	52.69	0.97	55.2	2.47	-0.88	±5	Sep. 14, 2012
835	Body	21.5	0.981	55.337	0.97	55.2	1.13	0.25	±5	Sep. 21, 2012
835	Body	21.5	0.962	54.6	0.97	55.2	-0.82	-1.09	±5	Oct. 17, 2012
1900	Body	21.5	1.52	54.6	1.52	53.3	0.00	2.44	±5	Sep. 12, 2012
1900	Body	21.6	1.515	55.045	1.52	53.3	-0.33	3.27	±5	Sep. 14, 2012
1900	Body	21.4	1.531	52.652	1.52	53.3	0.72	-1.22	±5	Sep. 22, 2012
1900	Body	21.5	1.51	51.9	1.52	53.3	-0.66	-2.63	±5	Oct. 17, 2012
2450	Body	21.5	1.96	53.8	1.95	52.7	0.51	2.09	±5	Oct. 02, 2012
2450	Body	21.3	2.02	53.936	1.95	52.7	3.59	2.35	±5	Oct. 17, 2012
5200	Body	21.5	5.26	47.5	5.30	49.0	-0.75	-3.06	±5	Sep. 30, 2012
5200	Body	21.5	5.11	47.4	5.30	49.0	-3.58	-3.27	±5	Oct. 01, 2012
5200	Body	21.6	5.34	47.5	5.30	49.0	0.75	-3.06	±5	Oct. 17, 2012
5500	Body	21.5	5.65	47	5.65	48.6	0.00	-3.29	±5	Sep. 30, 2012
5500	Body	21.5	5.49	47	5.65	48.6	-2.83	-3.29	±5	Oct. 01, 2012
5800	Body	21.5	6.14	46.5	6.00	48.2	2.33	-3.53	±5	Sep. 30, 2012
5800	Body	21.5	5.96	46.5	6.00	48.2	-0.67	-3.53	±5	Oct. 01, 2012

Table 6.2 Measuring Results for Simulating Liquid

7. SAR Measurement Evaluation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

7.1 Purpose of System Performance check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

7.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

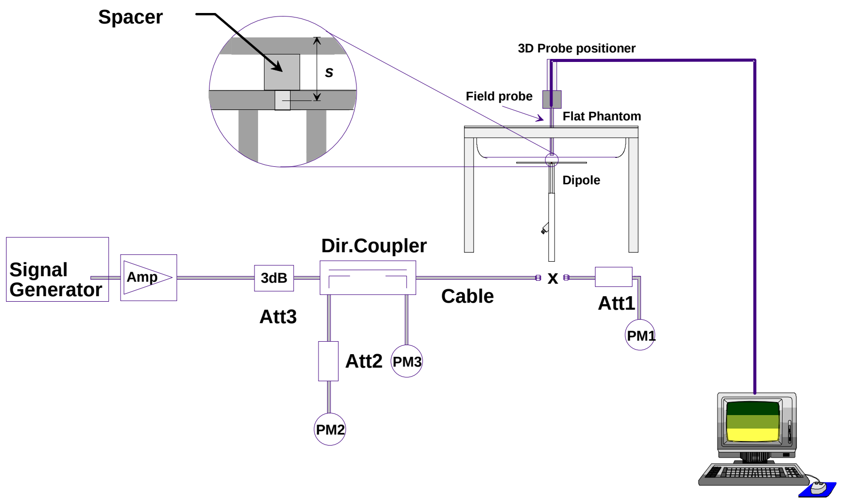


Fig 7.1 System Setup for System Evaluation

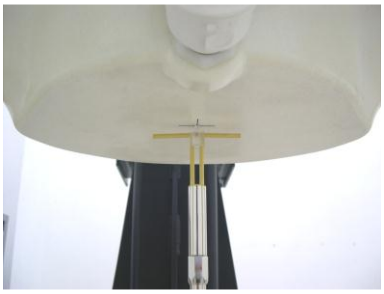


Fig 7.2 Photo of Dipole Setup

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

The output power on dipole port must be calibrated to 24 dBm (250 mW) before dipole is connected.

7.3 Validation Results

Comparing to the original SAR value provided by SPEAG, the validation data should be within its specification of 10 %. Table 7.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Measurement Date	Frequency (MHz)	Liquid Type	Targeted SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
Sep. 11, 2012	835	Body	9.82	2.42	9.68	-1.43
Sep. 14, 2012	835	Body	9.82	2.55	10.20	3.87
Sep. 21, 2012	835	Body	9.82	2.65	10.60	7.94
Oct. 17, 2012	835	Body	9.82	2.26	9.04	-7.94
Sep. 12, 2012	1900	Body	40	9.81	39.24	-1.90
Sep. 14, 2012	1900	Body	40	9.69	38.76	-3.10
Sep. 22, 2012	1900	Body	40	10	40.00	0.00
Oct. 17, 2012	1900	Body	40	9.87	39.48	-1.30
Oct. 02, 2012	2450	Body	52.3	14.1	56.40	7.84
Oct. 17, 2012	2450	Body	52.3	13.5	54.00	3.25
Sep. 30, 2012	5200	Body	72.60	19.2	76.80	5.79
Oct. 01, 2012	5200	Body	72.60	16.8	67.20	-7.44
Oct. 17, 2012	5200	Body	72.60	16.7	66.80	-7.99
Sep. 30, 2012	5500	Body	78.80	18.2	72.80	-7.61
Oct. 01, 2012	5500	Body	78.80	20.2	80.80	2.54
Sep. 30, 2012	5800	Body	73.10	16.9	67.60	-7.52
Oct. 01, 2012	5800	Body	73.10	17	68.00	-6.98

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

This EUT was tested in six different positions. They are bottom face of tablet PC, Edge1, Edge2, Edge4, and notebook bottom. In these positions, the surface of EUT is touching with phantom 0 cm gap and the flat phantom is 2.5 cm under Back of Display Screen position. Please refer to Appendix E for the test setup photos.

9. Measurement Procedures

The measurement procedures are as follows:

(a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
(b) Keep EUT to radiate maximum output power or 100% duty factor (if applicable)
(c) Measure output power through RF cable and power meter.
(d) Place the EUT in the positions as Appendix E demonstrates.
(e) Set scan area, grid size and other setting on the DASY software.
(f) Measure SAR results for the highest power channel on each testing position.
(g) Find out the largest SAR result on these testing positions of each band
(h) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

9.3 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

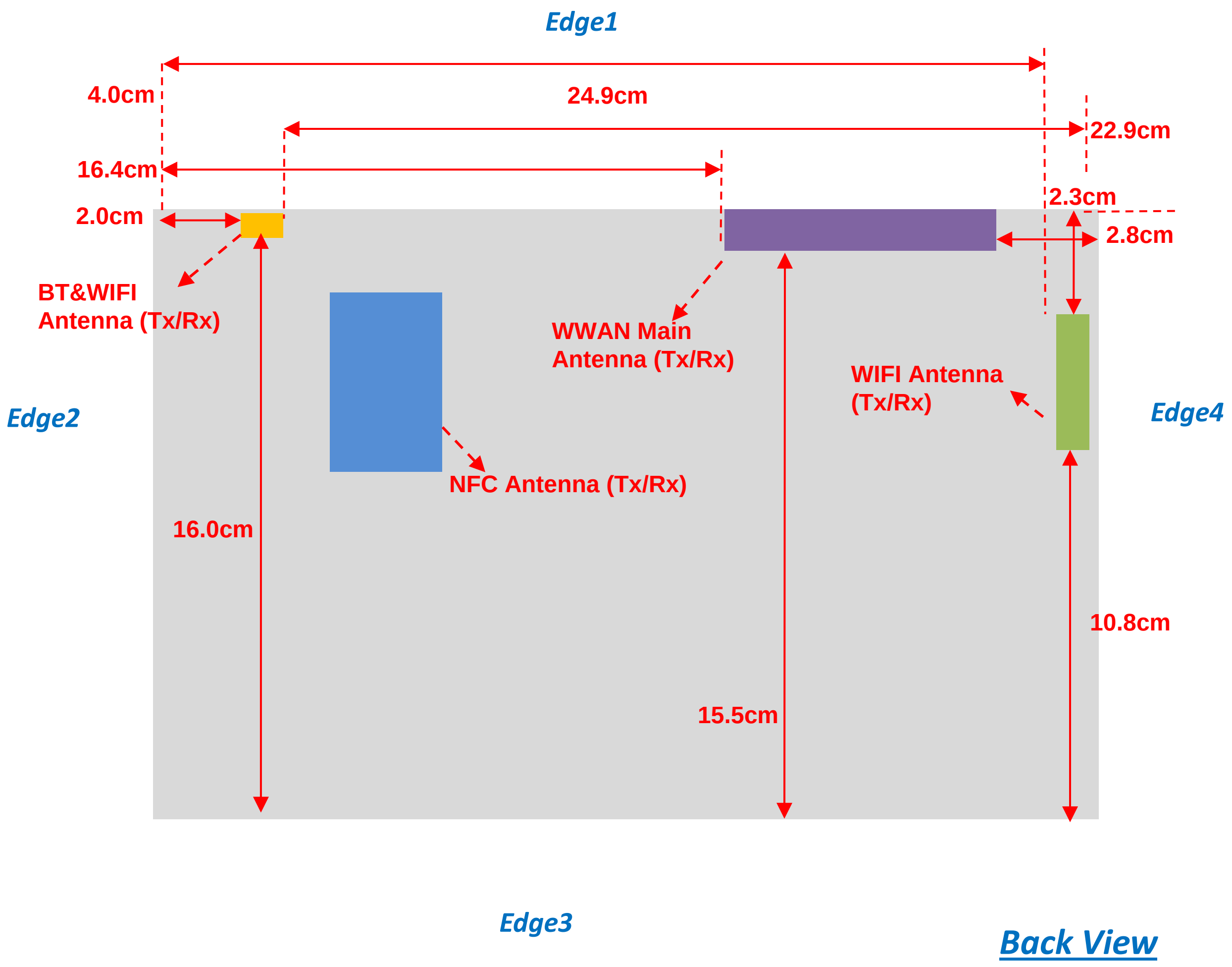
9.5 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10. SAR Test Configurations

10.1 Exposure Positions Consideration

<Tablet PC>



Label	Antenna	Wireless Interface
-	WWAN Main (Tx / Rx)	GSM850 GSM1900 WCDMA Band V WCDMA Band II
WLAN Ant. 0	BT/WLAN Main (Tx / Rx)	WLAN2.4G and 5G Bluetooth
WLAN Ant. 1	WLAN Aux. (Tx / Rx)	WLAN2.4G and 5G

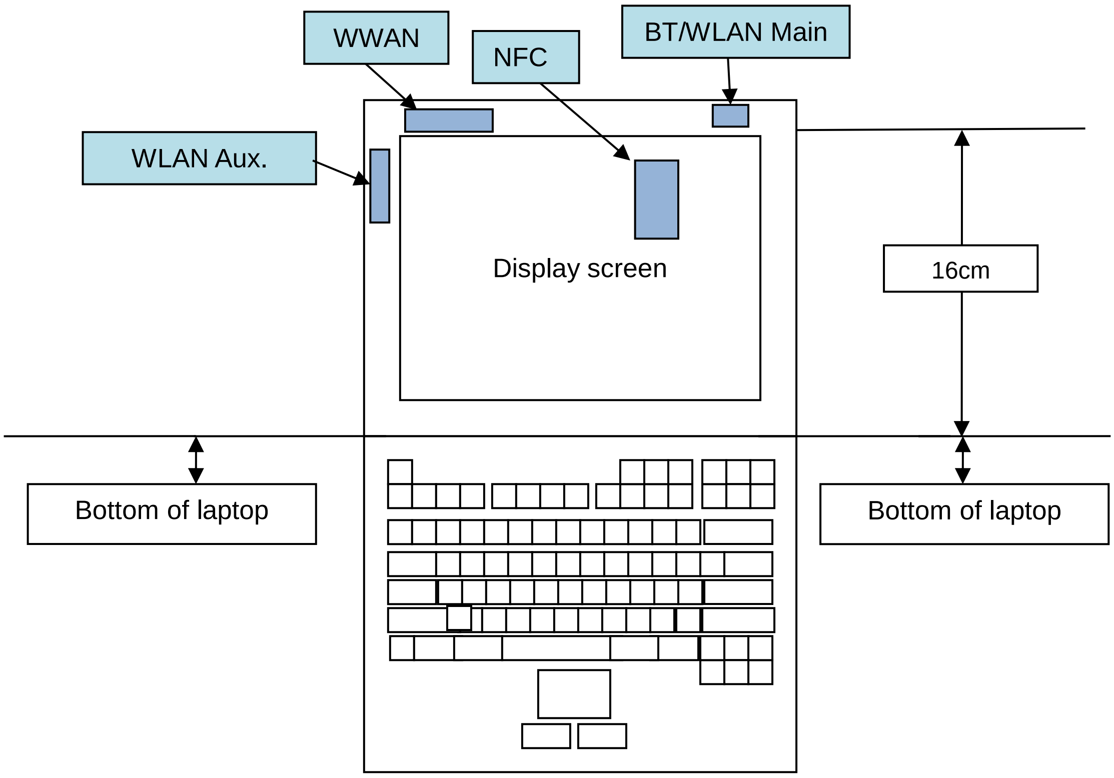
Sides for SAR tests; Tablet mode				
Antenna	Edge1	Edge2	Edge3	Edge4
WWAN Main	-	164mm	155mm	-
BT/WLAN Main	-	-	160mm	229mm
WLAN Aux.	-	249mm	108mm	-

Sides for SAR tests; Tablet mode						
Antenna	Front Face	Bottom Face	Edge1	Edge2	Edge3	Edge4
WWAN Main	No	Yes (0, 15mm)	Yes (0,14mm)	No	No	Yes (0 mm)
BT/WLAN Main	No	Yes (0 mm)	Yes (0 mm)	Yes (0 mm)	No	No
WLAN Aux.	No	Yes (0 mm)	Yes (0 mm)	No	No	Yes (0 mm)

Note:

1. Per KDB 941225 D07, the EUT diagonal > 20 cm and Mini-Tablet procedure is not applied. Therefore, SAR tests follow the Tablet Mode in KDB 447498.
2. There is no screen orientation limitation in EUT; that is 4 orientations are supported. The power reduction for SAR compliance is not triggered by the screen orientation, but triggered by proximity sensor when the user is 15 mm or closer to the EUT. Therefore, SAR test setup and test result is conservative for real life usage.
3. As in (1), the test distance is 0 mm to the flat phantom; SAR evaluation is required for Bottom Face and each applicable Edge with the antenna within 5 cm to the user.
4. The proximity sensor is designed to be triggered for Bottom Face and Edge1 exposure positions. During SAR tests for EUT other edges, the sensor is disabled via software setting.
5. The test distance 15 mm at Bottom Face and 14 mm at Edge1 are for verifying the conservative condition, whichever EUT proximity sensor maximum activated distance are 16 mm and 15 mm respectively. The EUT is set in full-power mode at 15 mm test distance to the phantom for Bottom Face and 14 mm test distance to the phantom for Edge1.
6. Voice call over circuit-switch is not supported, thus GSM call is not supported.
7. Per KDB 447498 D01, the distance from WWAN antenna to the Edge2 / Edge3 > 5 cm, therefore the stand-alone in these configurations SAR are not required.
8. Per KDB 447498 D01, the distance from BT/WLAN Main antenna to the Edge3 / Edge4 > 5 cm, therefore the stand-alone SAR in these configurations are not required.
9. Per KDB 447498 D01, the distance from WLAN Aux. antenna to the Edge2 / Edge3 > 5 cm, therefore the stand-alone SAR in these configurations are not required.
10. Per KDB 447498 D01, Bluetooth output power ≤ 60/f thus standalone SAR is not required.

<NB>



Label	Antenna	Wireless Interface
-	**WWAN Main (Tx / Rx)**	GSM850 GSM1900 WCDMA Band V WCDMA Band II
WLAN Ant. 0	**BT/WLAN Main (Tx / Rx)**	WLAN2.4G and 5G Bluetooth
WLAN Ant. 1	**WLAN Aux. (Tx / Rx)**	WLAN2.4G and 5G

Note:

1. Ant. 0 represents the BT/WLAN Main Antenna transmission only; Ant. 1 represents the WLAN Aux. Antenna transmission only.
2. The EUT can be used with an additional keyboard accessory, when the tablet combined with the keyboard the usage scenario is change to NB mode. SAR was evaluated in NB mode to consist with this usage. The antennas are all within the tablet portion as the same described in page 28 tablet mode.
3. As in (2), SAR is evaluated at laptop mode, bottom direct contact to the flat phantom.
4. SAR was also evaluated at the back of display screen position, which is applicable to approval in other countries.

10.2 Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

GSM850 Burst Average Power (dBm)									
Channel	128	189	251	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	824.2	836.4	848.8
Mode	Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
GPRS (GMSK, 1 Tx slot) – CS1	32.23	32.36	32.30	20.66	20.82	20.76	11.57	11.54	11.54
GPRS (GMSK, 2 Tx slots) – CS1	29.83	29.93	29.87	20.66	20.82	20.76	9.17	9.11	9.11
GPRS (GMSK, 3 Tx slots) – CS1	28.42	28.55	28.49	20.68	20.84	20.78	7.74	7.71	7.71
GPRS (GMSK, 4 Tx slots) – CS1	26.99	27.12	27.06	20.70	20.85	20.79	6.29	6.27	6.27
EDGE (GMSK, 1 Tx slot) – MCS1	32.21	32.34	32.28	20.66	20.82	20.76	11.55	11.52	11.52
EDGE (GMSK, 2 Tx slots) – MCS1	29.82	29.92	29.86	20.66	20.82	20.76	9.16	9.10	9.10
EDGE (GMSK, 3 Tx slots) – MCS1	28.41	28.54	28.48	20.67	20.83	20.77	7.74	7.71	7.71
EDGE (GMSK, 4 Tx slots) – MCS1	27.00	27.11	27.06	20.69	20.84	20.78	6.31	6.27	6.28
EDGE (8PSK, 1 Tx slot) – MCS5	26.82	26.94	26.88	20.41	20.54	20.50	6.41	6.40	6.38
EDGE (8PSK, 2 Tx slots) – MCS5	24.44	24.57	24.50	20.49	20.62	20.58	3.95	3.95	3.92
EDGE (8PSK, 3 Tx slots) – MCS5	23.06	23.10	23.06	20.51	20.64	20.52	2.55	2.46	2.54
EDGE (8PSK, 4 Tx slots) – MCS5	21.49	21.63	21.58	20.52	20.65	20.60	0.97	0.98	0.98
GSM850 Frame-Average Power (dBm)									
Channel	128	189	251	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	824.2	836.4	848.8
Mode	Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
GPRS (GMSK, 1 Tx slot) – CS1	23.23	23.36	23.30	11.66	11.82	11.76	11.57	11.54	11.54
GPRS (GMSK, 2 Tx slots) – CS1	23.83	23.93	23.87	14.66	14.82	14.76	9.17	9.11	9.11
GPRS (GMSK, 3 Tx slots) – CS1	24.16	24.29	24.23	16.42	16.58	16.52	7.74	7.71	7.71
GPRS (GMSK, 4 Tx slots) – CS1	23.99	24.12	24.06	17.70	17.85	17.79	6.29	6.27	6.27
EDGE (GMSK, 1 Tx slot) – MCS1	23.21	23.34	23.28	11.66	11.82	11.76	11.55	11.52	11.52
EDGE (GMSK, 2 Tx slots) – MCS1	23.82	23.92	23.86	14.66	14.82	14.76	9.16	9.10	9.10
EDGE (GMSK, 3 Tx slots) – MCS1	24.15	24.28	24.22	16.41	16.57	16.51	7.74	7.71	7.71
EDGE (GMSK, 4 Tx slots) – MCS1	24.00	24.11	24.06	17.69	17.84	17.78	6.31	6.27	6.28
EDGE (8PSK, 1 Tx slot) – MCS5	17.82	17.94	17.88	11.41	11.54	11.50	6.41	6.40	6.38
EDGE (8PSK, 2 Tx slots) – MCS5	18.44	18.57	18.50	14.49	14.62	14.58	3.95	3.95	3.92
EDGE (8PSK, 3 Tx slots) – MCS5	18.80	18.84	18.80	16.25	16.38	16.26	2.55	2.46	2.54
EDGE (8PSK, 4 Tx slots) – MCS5	18.49	18.63	18.58	17.52	17.65	17.60	0.97	0.98	0.98

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method is shown as below:
Frame averaged power = Maximum burst averaged power (1 Tx slots) - 9 dB
Frame averaged power = Maximum burst averaged power (2 Tx slots) - 6 dB
Frame averaged power = Maximum burst averaged power (3 Tx slots) - 4.26 dB
Frame averaged power = Maximum burst averaged power (4 Tx slots) - 3 dB

Note:

1. Following KDB 941225 D03, for Body SAR testing, the EUT operating without power back-off was set in GPRS (3 Tx slots) and the EUT operating with power back-off was set in GPRS (4 Tx slots) due to its highest frame averaged power.
2. Per KDB 447498, the maximum output power channel is used for SAR testing and for further SAR test reduction.

GSM1900 Burst Average Power (dBm)									
Channel	**512**	**661**	**810**	**512**	**661**	**810**	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**	**1850.2**	**1880**	**1909.8**	**1850.2**	**1880**	**1909.8**
Mode	**Without Power Back-off**			**With Power Back-off**			**Pwr. Reduction (dB)**		
GPRS (GMSK, 1 Tx slot) – CS1	29.08	29.18	29.00	18.40	18.42	18.23	10.68	10.76	10.77
GPRS (GMSK, 2 Tx slots) – CS1	26.53	26.62	26.45	18.41	18.44	18.24	8.12	8.18	8.21
GPRS (GMSK, 3 Tx slots) – CS1	25.06	25.18	25.00	18.42	18.45	18.26	6.64	6.73	6.74
GPRS (GMSK, 4 Tx slots) – CS1	23.64	23.73	23.54	18.44	18.46	18.26	5.20	5.27	5.28
EDGE (GMSK, 1 Tx slot) – MCS1	29.08	29.17	28.99	18.39	18.42	18.23	10.69	10.75	10.76
EDGE (GMSK, 2 Tx slots) – MCS1	26.53	26.63	26.45	18.40	18.43	18.23	8.13	8.20	8.22
EDGE (GMSK, 3 Tx slots) – MCS1	25.07	25.16	25.00	18.41	18.45	18.25	6.66	6.71	6.75
EDGE (GMSK, 4 Tx slots) – MCS1	23.64	23.74	23.55	18.43	18.44	18.25	5.21	5.30	5.30
EDGE (8PSK, 1 Tx slot) – MCS5	25.40	25.47	25.27	18.17	18.23	18.02	7.23	7.24	7.25
EDGE (8PSK, 2 Tx slots) – MCS5	23.00	23.07	22.85	18.26	18.32	18.10	4.74	4.75	4.75
EDGE (8PSK, 3 Tx slots) – MCS5	21.51	21.57	21.35	18.26	18.33	18.12	3.25	3.24	3.23
EDGE (8PSK, 4 Tx slots) – MCS5	20.01	20.08	19.86	18.29	18.35	18.13	1.72	1.73	1.73
GSM1900 Frame-Averaged Power (dBm)									
Channel	**512**	**661**	**810**	**512**	**661**	**810**	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**	**1850.2**	**1880**	**1909.8**	**1850.2**	**1880**	**1909.8**
Mode	**Without Power Back-off**			**With Power Back-off**			**Pwr. Reduction (dB)**		
GPRS (GMSK, 1 Tx slot) – CS1	20.08	20.18	20.00	9.40	9.42	9.23	10.68	10.76	10.77
GPRS (GMSK, 2 Tx slots) – CS1	20.53	20.62	20.45	12.41	12.44	12.24	8.12	8.18	8.21
GPRS (GMSK, 3 Tx slots) – CS1	20.80	**20.92**	20.74	14.16	14.19	14.00	6.64	6.73	6.74
GPRS (GMSK, 4 Tx slots) – CS1	20.64	20.73	20.54	15.44	**15.46**	15.26	5.20	5.27	5.28
EDGE (GMSK, 1 Tx slot) – MCS1	20.08	20.17	19.99	9.39	9.42	9.23	10.69	10.75	10.76
EDGE (GMSK, 2 Tx slots) – MCS1	20.53	20.63	20.45	12.40	12.43	12.23	8.13	8.20	8.22
EDGE (GMSK, 3 Tx slots) – MCS1	20.81	20.90	20.74	14.15	14.19	13.99	6.66	6.71	6.75
EDGE (GMSK, 4 Tx slots) – MCS1	20.64	20.74	20.55	15.43	15.44	15.25	5.21	5.30	5.30
EDGE (8PSK, 1 Tx slot) – MCS5	16.40	16.47	16.27	9.17	9.23	9.02	7.23	7.24	7.25
EDGE (8PSK, 2 Tx slots) – MCS5	17.00	17.07	16.85	12.26	12.32	12.10	4.74	4.75	4.75
EDGE (8PSK, 3 Tx slots) – MCS5	17.25	17.31	17.09	14.00	14.07	13.86	3.25	3.24	3.23
EDGE (8PSK, 4 Tx slots) – MCS5	17.01	17.08	16.86	15.29	15.35	15.13	1.72	1.73	1.73

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method is shown as below:
Frame averaged power = Maximum burst averaged power (1 Tx slots) - 9 dB
Frame averaged power = Maximum burst averaged power (2 Tx slots) - 6 dB
Frame averaged power = Maximum burst averaged power (3 Tx slots) - 4.26 dB
Frame averaged power = Maximum burst averaged power (4 Tx slots) - 3 dB

Note:

1. Following KDB 941225 D03, for Body SAR testing, the EUT operating without power back-off was set in GPRS (3 Tx slots) and the EUT operating with power back-off was set in GPRS (4 Tx slots)due to its highest frame averaged power.
2. Per KDB 447498, the maximum output power channel is used for SAR testing and for further SAR test reduction.

<WCDMA Conducted Power>

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

<WCDMA Conducted Power>

WCDMA Band V Average power (dBm)										
Channel		4132	4182	4233	4132	4182	4233	4132	4182	4233
Frequency (MHz)		826.4	836.4	846.6	826.4	836.4	846.6	826.4	836.4	846.6
Mode		Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
3GPP Rel 99	RMC 12.2K	23.41	23.29	23.24	20.91	20.83	20.72	2.50	2.46	2.52
3GPP Rel 6	HSDPA Subtest-1	23.40	23.28	23.23	20.90	20.81	20.71	2.50	2.47	2.52
3GPP Rel 6	HSDPA Subtest-2	22.88	22.74	22.73	20.84	20.72	20.67	2.04	2.02	2.06
3GPP Rel 6	HSDPA Subtest-3	22.38	22.21	22.22	20.82	20.71	20.66	1.56	1.50	1.56
3GPP Rel 6	HSDPA Subtest-4	22.13	21.98	21.97	20.82	20.70	20.66	1.31	1.28	1.31
3GPP Rel 6	HSUPA Subtest-1	22.35	22.25	22.23	20.13	20.09	20.10	2.22	2.16	2.13
3GPP Rel 6	HSUPA Subtest-2	20.67	20.64	20.57	20.09	20.00	19.97	0.58	0.64	0.60
3GPP Rel 6	HSUPA Subtest-3	21.47	21.37	21.34	20.35	20.12	20.12	1.12	1.25	1.22
3GPP Rel 6	HSUPA Subtest-4	20.91	20.95	20.81	20.67	20.57	20.58	0.24	0.38	0.23
3GPP Rel 6	HSUPA Subtest-5	22.82	22.72	22.72	20.68	20.69	20.65	2.14	2.03	2.07

WCDMA Band V MPR Results (dB)								
Channel		4132	4182	4233	4132	4182	4233	3GPP MPR
Subtests		Without Power Back-off			With Power Back-off			(dB)
3GPP Rel 6	HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00	0
3GPP Rel 6	HSDPA Subtest-2	0.52	0.54	0.50	0.06	0.09	0.04	0
3GPP Rel 6	HSDPA Subtest-3	1.02	1.07	1.01	0.08	0.10	0.05	≤ 0.5
3GPP Rel 6	HSDPA Subtest-4	1.27	1.30	1.26	0.08	0.11	0.05	≤ 0.5
3GPP Rel 6	HSUPA Subtest-1	0.47	0.47	0.49	0.55	0.60	0.55	0
3GPP Rel 6	HSUPA Subtest-2	2.15	2.08	2.15	0.59	0.69	0.68	≤ 2
3GPP Rel 6	HSUPA Subtest-3	1.35	1.35	1.38	0.33	0.57	0.53	≤ 1
3GPP Rel 6	HSUPA Subtest-4	1.91	1.77	1.91	0.01	0.12	0.07	≤ 2
3GPP Rel 6	HSUPA Subtest-5	0.00	0.00	0.00	0.00	0.00	0.00	0

Note:

1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1 V9.1.0 to Rel. 6 HSPA.
2. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA output power is < 0.25dB higher than RMC, or SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA SAR evaluation can be excluded.
3. By design, HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps, detailed information is included in Tune-up Procure exhibit.
4. It is expected by the manufacturer that MPR for some HSDPA/HSUPA, subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in tune-up procedure exhibit.

WCDMA Band II Average power (dBm)										
Channel		9262	9400	9538	9262	9400	9538	9262	9400	9538
Frequency (MHz)		1852.4	1880.0	1907.6	1852.4	1880.0	1907.6	1852.4	1880.0	1907.6
Mode		Without Power Back-off			With Power Back-off			Pwr. Reduction (dB)		
3GPP Rel 99	RMC 12.2K	22.95	22.87	22.90	15.73	15.79	15.69	7.22	7.08	7.21
3GPP Rel 6	HSDPA Subtest-1	22.94	22.85	22.83	15.66	15.54	15.44	7.28	7.31	7.39
3GPP Rel 6	HSDPA Subtest-2	22.42	22.34	22.31	15.42	15.43	15.39	7.00	6.91	6.92
3GPP Rel 6	HSDPA Subtest-3	21.96	21.86	21.89	15.42	15.42	15.38	6.54	6.44	6.51
3GPP Rel 6	HSDPA Subtest-4	21.68	21.64	21.56	15.42	15.41	15.38	6.26	6.23	6.18
3GPP Rel 6	HSUPA Subtest-1	22.09	22.01	22.18	15.72	15.72	15.66	6.37	6.29	6.52
3GPP Rel 6	HSUPA Subtest-2	20.42	20.38	20.50	15.71	15.72	15.66	4.71	4.66	4.84
3GPP Rel 6	HSUPA Subtest-3	21.24	21.27	21.25	14.94	15.01	14.98	6.30	6.26	6.27
3GPP Rel 6	HSUPA Subtest-4	20.60	20.80	20.74	15.74	15.75	15.70	4.86	5.05	5.04
3GPP Rel 6	HSUPA Subtest-5	22.60	22.50	22.47	15.57	15.54	15.53	7.03	6.96	6.94

WCDMA Band II MPR Results (dB)								
Channel		9262	9400	9538	9262	9400	9538	3GPP MPR
Subtests		Without Power Back-off			With Power Back-off			(dB)
3GPP Rel 6	HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00	0
3GPP Rel 6	HSDPA Subtest-2	0.52	0.51	0.52	0.24	0.11	0.05	0
3GPP Rel 6	HSDPA Subtest-3	0.98	0.99	0.94	0.24	0.12	0.06	≤ 0.5
3GPP Rel 6	HSDPA Subtest-4	1.26	1.21	1.27	0.24	0.13	0.06	≤ 0.5
3GPP Rel 6	HSUPA Subtest-1	0.51	0.49	0.29	-0.15	-0.18	-0.13	0
3GPP Rel 6	HSUPA Subtest-2	2.18	2.12	1.97	-0.14	-0.18	-0.13	≤ 2
3GPP Rel 6	HSUPA Subtest-3	1.36	1.23	1.22	0.63	0.53	0.55	≤ 1
3GPP Rel 6	HSUPA Subtest-4	2.00	1.70	1.73	-0.17	-0.21	-0.17	≤ 2
3GPP Rel 6	HSUPA Subtest-5	0.00	0.00	0.00	0.00	0.00	0.00	0

Note:

1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1 V9.1.0 to Rel. 6 HSPA.
2. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA output power is < 0.25dB higher than RMC, or SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA SAR evaluation can be excluded.
3. By design, HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps, detailed information is included in Tune-up Procure exhibit.
4. It is expected by the manufacturer that MPR for some HSDPA/HSUPA, subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in tune-up procedure exhibit.

<WLAN 2.4G Ant. 0 Conducted Power>

WLAN 2.4G 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	11.48	CH 11	12.20	12.17	12.13
CH 06	2437	11.99				
CH 11	2462	12.24				

WLAN 2.4G 802.11g Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 01	2412	11.48	CH 11	12.41	12.37	12.38	12.31	12.27	12.29	12.30
CH 06	2437	12.15								
CH 11	2462	12.45								

WLAN 2.4G 802.11n (BW 20MHz) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	11.23	CH 11	11.96	11.91	11.93	11.90	11.86	11.88	11.89
CH 06	2437	11.76								
CH 11	2462	12.01								

Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227, 11g and 11n output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

<WLAN 2.4G Ant. 1 Conducted Power>

WLAN 2.4G 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	11.44	CH 11	12.20	12.16	12.19
CH 06	2437	11.91				
CH 11	2462	**12.25**				

WLAN 2.4G 802.11g Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 01	2412	11.64	CH 11	12.30	12.26	12.27	12.23	12.20	12.21	12.16
CH 06	2437	11.89								
CH 11	2462	**12.36**								

WLAN 2.4G 802.11n (BW 20MHz) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	11.11	CH 11	12.01	11.97	11.99	11.93	11.90	11.93	11.91
CH 06	2437	11.48								
CH 11	2462	**12.05**								

Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227, 11g and 11n output power is less than 1/4 dB higher than 11b mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

<Bluetooth>

Channel	Frequency (MHz)	Average power (dBm)		
		Mode		
		GFSK	π/4-DQPSK	8-DPSK
CH 0	2402	2.18	-0.02	0.01
CH 39	2441	3.04	0.84	0.87
CH 78	2480	**3.48**	1.25	1.13

Channel	Frequency (MHz)	Average power (dBm)
		Mode
		BT v4.0 LE, GFSK
CH 0	2402	3.91
CH 19	2440	4.74
CH 39	2480	**4.94**

Note: Per KDB 447498, 2.4GHz Bluetooth SAR is excluded due to highest output power ≤ 60/f (GHz) mW, where 60/f (GHz) = 24mW = 13.8dBm.

<WLAN 5G Ant. 0 Conducted Power>

WLAN 5G 802.11a Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 36	5180	12.27	CH 48	12.32	12.27	12.21	12.23	12.21	12.18	12.15
CH 40	5200	12.21								
CH 44	5220	12.31								
CH 48	5240	**12.37**								
CH 52	5260	**12.24**	CH 52	12.21	12.17	12.14	12.16	12.11	12.08	12.10
CH 56	5280	12.20								
CH 60	5300	12.19								
CH 64	5320	12.22								
CH 100	5500	12.41	CH 104	12.38	12.35	12.37	12.31	12.33	12.30	12.00
CH 104	5520	**12.42**								
CH 108	5540	12.23								
CH 112	5560	12.21								
CH 116	5580	12.34								
CH 132	5660	12.23								
CH 136	5680	12.12								
CH 140	5700	12.28								
CH 149	5745	11.25	CH 161	11.30	11.25	11.27	11.22	11.24	11.20	11.18
CH 153	5765	11.15								
CH 157	5785	11.22								
CH 161	5805	**11.33**								
CH 165	5825	11.14								

WLAN 5G 802.11n (BW 20M) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	12.02	CH 44	12.04	12.00	11.97	11.99	11.94	11.91	11.92
CH 40	5200	11.98								
CH 44	5220	**12.08**								
CH 48	5240	12.02								
CH 52	5260	**11.96**	CH 52	11.92	11.90	11.86	11.81	11.83	11.78	11.76
CH 56	5280	11.85								
CH 60	5300	11.86								
CH 64	5320	11.84								
CH 100	5500	12.03	CH 104	12.14	12.10	12.07	12.09	12.07	12.03	12.05
CH 104	5520	**12.17**								
CH 108	5540	11.99								
CH 112	5560	11.94								
CH 116	5580	11.91								
CH 132	5660	11.85								
CH 136	5680	11.74								
CH 140	5700	11.65								
CH 149	5745	10.81	CH 157	10.86	10.80	10.82	10.81	10.77	10.75	10.78
CH 153	5765	10.73								
CH 157	5785	**10.89**								
CH 161	5805	10.76								
CH 165	5825	10.86								

Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227, 11n output power is less than 1/4 dB higher than 11a mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

<WLAN 5G Ant. 1 Conducted Power>

WLAN 5G 802.11a Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)						
		6M		9M	12M	18M	24M	36M	48M	54M
CH 36	5180	12.38	CH 48	12.37	12.32	12.34	12.30	12.26	12.24	12.27
CH 40	5200	12.31								
CH 44	5220	12.37								
CH 48	5240	**12.41**								
CH 52	5260	**12.42**	CH 52	12.39	12.36	12.38	12.33	12.30	12.31	12.28
CH 56	5280	12.35								
CH 60	5300	12.32								
CH 64	5320	12.37								
CH 100	5500	12.34	CH 108	12.45	12.41	12.43	12.40	12.37	12.39	12.35
CH 104	5520	12.46								
CH 108	5540	**12.47**								
CH 112	5560	12.44								
CH 116	5580	12.43								
CH 132	5660	12.24								
CH 136	5680	12.15								
CH 140	5700	12.25								
CH 149	5745	11.38	CH 161	11.59	11.55	11.57	11.54	11.56	11.51	11.47
CH 153	5765	11.44								
CH 157	5785	11.35								
CH 161	5805	**11.63**								
CH 165	5825	11.52								

WLAN 5G 802.11n (BW 20M) Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index						
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	11.99	CH 48	12.14	12.10	12.06	12.01	12.04	11.97	11.93
CH 40	5200	12.04								
CH 44	5220	12.11								
CH 48	5240	**12.17**								
CH 52	5260	11.91	CH 64	12.02	12.01	11.97	11.93	11.94	11.89	11.86
CH 56	5280	12.05								
CH 60	5300	11.98								
CH 64	5320	**12.06**								
CH 100	5500	12.11	CH 116	12.11	12.07	12.09	12.05	12.01	12.02	11.98
CH 104	5520	12.04								
CH 108	5540	12.08								
CH 112	5560	12.07								
CH 116	5580	**12.14**								
CH 132	5660	11.93								
CH 136	5680	12.10								
CH 140	5700	11.96								
CH 149	5745	11.11	CH 161	11.31	11.33	11.29	11.24	11.26	11.21	11.23
CH 153	5765	10.98								
CH 157	5785	11.14								
CH 161	5805	**11.35**								
CH 165	5825	11.18								

Note:

1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227, 11n output power is less than 1/4 dB higher than 11a mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate.

11. SAR Test Results

11.1 Test Records for Body SAR Test

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Burst Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	Remark
7	GSM850	GPRS 3 TX slots	Bottom Face	1.5	189	836.4	28.55	0.01	0.255	Tablet
8	GSM850	GPRS 3 TX slots	Edge 1	1.4	189	836.4	28.55	0.07	0.133	Tablet
9	GSM850	GPRS 3 TX slots	Edge 4	0	189	836.4	28.55	0.08	0.162	Tablet
23	**GSM850**	**GPRS 4 TX slots**	**Bottom Face**	**0**	**189**	**836.4**	**20.85**	**0.145**	**0.554**	**Tablet**
24	GSM850	GPRS 4 TX slots	Edge 1	0	189	836.4	20.85	0.04	0.279	Tablet
111	GSM850	GPRS 4 TX slots	Curved surface of Edge 1	0	189	836.4	20.85	-0.168	0.423	Tablet
43	GSM850	GPRS 3 TX slots	Bottom	0	189	836.4	28.55	0.147	0.04	NB
44	GSM850	GPRS 3 TX slots	Back of Display Screen	2.5	189	836.4	28.55	0.01	0.131	NB
10	GSM1900	GPRS 3 TX slots	Bottom Face	1.5	661	1880.0	25.18	-0.128	0.364	Tablet
11	GSM1900	GPRS 3 TX slots	Edge 1	1.4	661	1880.0	25.18	0.053	0.604	Tablet
12	GSM1900	GPRS 3 TX slots	Edge 4	0	661	1880.0	25.18	0.029	0.593	Tablet
33	**GSM1900**	**GPRS 4 TX slots**	**Bottom Face**	**0**	**661**	**1880.0**	**18.46**	**0.126**	**0.845**	**Tablet**
34	GSM1900	GPRS 4 TX slots	Edge 1	0	661	1880.0	18.46	-0.1	0.567	Tablet
35	GSM1900	GPRS 4 TX slots	Bottom Face	0	512	1850.2	18.44	-0.011	0.788	Tablet
36	GSM1900	GPRS 4 TX slots	Bottom Face	0	810	1909.8	18.26	0.172	0.84	Tablet
104	GSM1900	GPRS 4 TX slots	Curved surface of Edge 1	0	661	1880.0	18.46	-0.11	0.772	Tablet
49	GSM1900	GPRS 3 TX slots	Bottom	0	661	1880.0	25.18	-0.159	0.00885	NB
50	GSM1900	GPRS 3 TX slots	Back of Display Screen	2.5	661	1880.0	25.18	0.135	0.15	NB

Note:

1. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)	Remark
13	WCDMA V	RMC12.2K	Bottom Face	1.5	4132	826.4	23.41	0.02	0.191	Tablet
14	WCDMA V	RMC12.2K	Edge 1	1.4	4132	826.4	23.41	0.03	0.097	Tablet
15	WCDMA V	RMC12.2K	Edge 4	0	4132	826.4	23.41	0.057	0.123	Tablet
25	**WCDMA V**	**RMC12.2K**	**Bottom Face**	**0**	**4132**	**826.4**	**20.91**	**0.123**	**1.17**	**Tablet**
26	WCDMA V	RMC12.2K	Edge 1	0	4132	826.4	20.91	0.02	0.727	Tablet
27	WCDMA V	RMC12.2K	Bottom Face	0	4182	836.4	20.83	0.05	1.12	Tablet
28	WCDMA V	RMC12.2K	Bottom Face	0	4233	846.6	20.72	-0.11	1.13	Tablet
108	WCDMA V	RMC12.2K	Curved surface of Edge 1	0	4132	826.4	20.91	-0.056	0.885	Tablet
109	WCDMA V	RMC12.2K	Curved surface of Edge 1	0	4182	836.4	20.83	0.024	0.908	Tablet
110	WCDMA V	RMC12.2K	Curved surface of Edge 1	0	4233	846.6	20.72	0.029	0.945	Tablet
45	WCDMA V	RMC12.2K	Bottom	0	4132	826.4	23.41	0.122	0.032	NB
46	WCDMA V	RMC12.2K	Back of Display Screen	2.5	4132	826.4	23.41	-0.02	0.092	NB
16	WCDMA II	RMC12.2K	Bottom Face	1.5	9262	1852.4	22.95	0.133	0.536	Tablet
17	WCDMA II	RMC12.2K	Edge 1	1.4	9262	1852.4	22.95	0.074	1.04	Tablet
21	WCDMA II	RMC12.2K	Edge 1	1.4	9400	1880.0	22.87	0.00359	0.941	Tablet
22	WCDMA II	RMC12.2K	Edge 1	1.4	9538	1907.6	22.9	-0.078	0.858	Tablet
18	WCDMA II	RMC12.2K	Edge 4	0	9262	1852.4	22.95	-0.045	0.827	Tablet
19	WCDMA II	RMC12.2K	Edge 4	0	9400	1880.0	22.87	-0.075	0.993	Tablet
20	**WCDMA II**	**RMC12.2K**	**Edge 4**	**0**	**9538**	**1907.6**	**22.9**	**-0.123**	**1.11**	**Tablet**
29	WCDMA II	RMC12.2K	Bottom Face	0	9400	1880.0	15.79	-0.184	1.03	Tablet
30	WCDMA II	RMC12.2K	Edge 1	0	9400	1880.0	15.79	0.14	0.699	Tablet
31	WCDMA II	RMC12.2K	Bottom Face	0	9662	1852.4	15.73	0.122	1.05	Tablet
32	WCDMA II	RMC12.2K	Bottom Face	0	9538	1907.6	15.69	0.132	1.02	Tablet
105	WCDMA II	RMC12.2K	Curved surface of Edge 1	0	9662	1852.4	15.73	-0.087	0.883	Tablet
106	WCDMA II	RMC12.2K	Curved surface of Edge 1	0	9400	1880.0	15.79	-0.022	0.873	Tablet
107	WCDMA II	RMC12.2K	Curved surface of Edge 1	0	9538	1907.6	15.69	-0.079	0.822	Tablet
47	WCDMA II	RMC12.2K	Bottom	0	9262	1852.4	22.95	0.168	0.016	NB
48	WCDMA II	RMC12.2K	Back of Display Screen	2.5	9262	1852.4	22.95	0.121	0.236	NB

Note:

1. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

<u><WLAN SAR></u>

Remark:

1. WLAN module, FCC ID: HLZ-T77H389, is integrated into this host via C2PC filing.
2. To address co-location simultaneous transmission conservatively, WLAN SAR was completely tested again in this Host.

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	WLAN Ant	Power Drift (dB)	SAR_{1g} (W/kg)	Remark
94	**WLAN2.4G**	**802.11b**	**Bottom Face**	**0**	**11**	**2462.0**	**12.24**	**0**	**0.03**	**0.699**	**Tablet**
95	WLAN2.4G	802.11b	Edge 1	0	11	2462.0	12.24	0	0.058	0.239	Tablet
96	WLAN2.4G	802.11b	Edge 2	0	11	2462.0	12.24	0	0.012	0.074	Tablet
112	WLAN2.4G	802.11b	Curved surface of Edge 1	0	11	2462.0	12.24	0	-0.111	0.494	Tablet
97	WLAN2.4G	802.11b	Bottom	0	11	2462.0	12.24	0	0.018	0.013	NB
98	WLAN2.4G	802.11b	Back of Display Screen	2.5	11	2462.0	12.24	0	0.07	0.019	NB
99	WLAN2.4G	802.11b	Bottom Face	0	11	2462.0	12.25	1	0.03	0.082	Tablet
100	WLAN2.4G	802.11b	Edge 1	0	11	2462.0	12.25	1	0.05	0.0078	Tablet
101	WLAN2.4G	802.11b	Edge 4	0	11	2462.0	12.25	1	0.07	0.037	Tablet
102	WLAN2.4G	802.11b	Bottom	0	11	2462.0	12.25	1	-0.125	0.0014	NB
103	WLAN2.4G	802.11b	Back of Display Screen	2.5	11	2462.0	12.25	1	0.04	0.00243	NB

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	WLAN Ant	Power Drift (dB)	SAR_{1g} (W/kg)	Remark
51	WLAN5G	802.11a	Bottom Face	0	48	5240.0	12.37	0	0.117	0.715	Tablet
52	**WLAN5G**	**802.11a**	**Edge 1**	**0**	**48**	**5240.0**	**12.37**	**0**	**-0.182**	**0.787**	**Tablet**
53	WLAN5G	802.11a	Edge 2	0	48	5240.0	12.37	0	0.142	0.129	Tablet
54	WLAN5G	802.11a	Bottom	0	48	5240.0	12.37	0	-0.169	0.035	NB
55	WLAN5G	802.11a	Back of Display Screen	2.5	48	5240.0	12.37	0	0.143	0.055	NB
74	WLAN5G	802.11a	Bottom Face	0	48	5240.0	12.41	1	0.052	0.212	Tablet
75	WLAN5G	802.11a	Edge 1	0	48	5240.0	12.41	1	0.075	0.041	Tablet
76	WLAN5G	802.11a	Edge 4	0	48	5240.0	12.41	1	0.021	0.495	Tablet
77	WLAN5G	802.11a	Bottom	0	48	5240.0	12.41	1	-0.023	0.011	NB
78	WLAN5G	802.11a	Back of Display Screen	2.5	48	5240.0	12.41	1	-0.045	0.022	NB
56	WLAN5G	802.11a	Bottom Face	0	52	5260.0	12.24	0	0.193	0.729	Tablet
57	WLAN5G	802.11a	Edge 1	0	52	5260.0	12.24	0	0.087	0.869	Tablet
58	WLAN5G	802.11a	Edge 1	0	64	5320.0	12.24	0	0.177	0.77	Tablet
59	WLAN5G	802.11a	Edge 2	0	52	5260.0	12.24	0	0.182	0.164	Tablet
113	**WLAN5G**	**802.11a**	**Curved surface of Edge 1**	**0**	**52**	**5260.0**	**12.24**	**0**	**0.135**	**0.902**	**Tablet**
114	WLAN5G	802.11a	Curved surface of Edge 1	0	64	5320.0	12.22	0	0.162	0.641	Tablet
60	WLAN5G	802.11a	Bottom	0	52	5260.0	12.24	0	0.137	0.035	NB
61	WLAN5G	802.11a	Back of Display Screen	2.5	52	5260.0	12.24	0	0.075	0.046	NB
79	WLAN5G	802.11a	Bottom Face	0	52	5260.0	12.42	1	0.145	0.249	Tablet
80	WLAN5G	802.11a	Edge 1	0	52	5260.0	12.42	1	0.006	0.047	Tablet
81	WLAN5G	802.11a	Edge 4	0	52	5260.0	12.42	1	0.023	0.502	Tablet
82	WLAN5G	802.11a	Bottom	0	52	5260.0	12.42	1	0.121	0.012	NB
83	WLAN5G	802.11a	Back of Display Screen	2.5	52	5260.0	12.42	1	0.068	0.000174	NB
62	WLAN5G	802.11a	Bottom Face	0	104	5520.0	12.42	0	0.03	0.732	Tablet
63	WLAN5G	802.11a	Edge 1	0	104	5520.0	12.42	0	-0.01	0.807	Tablet
64	**WLAN5G**	**802.11a**	**Edge 1**	**0**	**116**	**5580.0**	**12.42**	**0**	**0.027**	**0.835**	**Tablet**
65	WLAN5G	802.11a	Edge 1	0	140	5700.0	12.42	0	0.045	0.716	Tablet
66	WLAN5G	802.11a	Edge 2	0	104	5520.0	12.42	0	0.051	0.181	Tablet
67	WLAN5G	802.11a	Bottom	0	104	5520.0	12.42	0	-0.033	0.028	NB
68	WLAN5G	802.11a	Back of Display Screen	2.5	104	5520.0	12.42	0	0.12	0.052	NB
84	WLAN5G	802.11a	Bottom Face	0	108	5540.0	12.47	1	0.154	0.216	Tablet
85	WLAN5G	802.11a	Edge 1	0	108	5540.0	12.47	1	0.111	0.045	Tablet
86	WLAN5G	802.11a	Edge 4	0	108	5540.0	12.47	1	0.119	0.398	Tablet
87	WLAN5G	802.11a	Bottom	0	108	5540.0	12.47	1	0.1	0.096	Tablet
88	WLAN5G	802.11a	Back of Display Screen	2.5	108	5540.0	12.47	1	-0.05	0.021	Tablet
69	WLAN5G	802.11a	Bottom Face	0	161	5805.0	11.33	0	0.01	0.504	Tablet
70	**WLAN5G**	**802.11a**	**Edge 1**	**0**	**161**	**5805.0**	**11.33**	**0**	**0.04**	**0.661**	**Tablet**
71	WLAN5G	802.11a	Edge 2	0	161	5805.0	11.33	0	0.19	0.144	Tablet
72	WLAN5G	802.11a	Bottom	0	161	5805.0	11.33	0	0.087	0.021	NB
73	WLAN5G	802.11a	Back of Display Screen	2.5	161	5805.0	11.33	0	0.09	0.041	NB
89	WLAN5G	802.11a	Bottom Face	0	161	5805.0	11.63	1	0.01	0.11	Tablet
90	WLAN5G	802.11a	Edge 1	0	161	5805.0	11.63	1	0.124	0.033	Tablet
91	WLAN5G	802.11a	Edge 4	0	161	5805.0	11.63	1	0.124	0.244	Tablet
92	WLAN5G	802.11a	Bottom	0	161	5805.0	11.63	1	0.01	0.012	NB
93	WLAN5G	802.11a	Back of Display Screen	2.5	161	5805.0	11.63	1	0.03	0.02	NB

Note: Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

11.2 Simultaneous Transmission SAR Analysis and Measurements

No.	Applicable Simultaneous Transmission Combination
1.	2G/3G + WLAN
2.	WLAN 2.4G + BT
3.	WLAN 5G + BT

Note:

1. WLAN and BT share the same antenna, and cannot transmit simultaneously.
2. 2G and 3G share the same antenna, and cannot transmit simultaneously.
3. EUT will choose either WLAN2.4G or WLAN5G according to the network signal condition; therefore, they will not transmit simultaneously.
4. EUT will choose either 2G or 3G according to the network signal condition; therefore, they cannot transmit simultaneously.
5. WLAN 5GHz band 1/2/3 operation does not supports ad-hoc or hotspot, and will not transmit with WWAN simultaneously.

<Tablet SAR - Without Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 0)		Scaled WLAN2.4G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 1.5cm	GSM850	7	0.255	28.55	28.7	1.035	0.264	94	0.699	12.24	12.5	1.062	0.742	**0.95**	**1.01**	
	GSM1900	10	0.364	25.18	25.7	1.127	0.410	94	0.699	12.24	12.5	1.062	0.742	**1.06**	**1.15**	
	WCDMA V	13	0.191	23.41	24	1.146	0.219	94	0.699	12.24	12.5	1.062	0.742	**0.89**	**0.96**	
	WCDMA II	16	0.536	22.95	23.5	1.135	0.608	94	0.699	12.24	12.5	1.062	0.742	**1.24**	**1.35**	
Edge1 At 1.4cm	GSM850	8	0.133	28.55	28.7	1.035	0.138	95	0.239	12.24	12.5	1.062	0.254	**0.37**	**0.39**	
	GSM1900	11	0.604	25.18	25.7	1.127	0.681	95	0.239	12.24	12.5	1.062	0.254	**0.84**	**0.94**	
	WCDMA V	14	0.097	23.41	24	1.146	0.111	95	0.239	12.24	12.5	1.062	0.254	**0.34**	**0.37**	
	WCDMA II	17	1.04	22.95	23.5	1.135	1.180	95	0.239	12.24	12.5	1.062	0.254	**1.28**	**1.43**	
Edge4 At 0cm	GSM850	9	0.162	28.55	28.7	1.035	0.168							**0.16**	**0.17**	
	GSM1900	12	0.593	25.18	25.7	1.127	0.668							**0.59**	**0.67**	
	WCDMA V	15	0.123	23.41	24	1.146	0.141							**0.12**	**0.14**	
	WCDMA II	20	1.11	22.9	23.5	1.148	1.274							**1.11**	**1.27**	

	WWAN			Scaled WWAN				WLAN5G (Ant. 0)		Scaled WLAN5G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 1.5cm	GSM850	7	0.255	28.55	28.7	1.035	0.264	69	0.504	11.33	11.5	1.040	0.524	**0.76**	**0.79**	
	GSM1900	10	0.364	25.18	25.7	1.127	0.410	69	0.504	11.33	11.5	1.040	0.524	**0.87**	**0.93**	
	WCDMA V	13	0.191	23.41	24	1.146	0.219	69	0.504	11.33	11.5	1.040	0.524	**0.70**	**0.74**	
	WCDMA II	16	0.536	22.95	23.5	1.135	0.608	69	0.504	11.33	11.5	1.040	0.524	**1.04**	**1.13**	
Edge1 At 1.4cm	GSM850	8	0.133	28.55	28.7	1.035	0.138	70	0.661	11.33	11.5	1.040	0.687	**0.79**	**0.83**	
	GSM1900	11	0.604	25.18	25.7	1.127	0.681	70	0.661	11.33	11.5	1.040	0.687	**1.27**	**1.37**	
	WCDMA V	14	0.097	23.41	24	1.146	0.111	70	0.661	11.33	11.5	1.040	0.687	**0.76**	**0.80**	
	WCDMA II	17	1.04	22.95	23.5	1.135	1.180	70	0.661	11.33	11.5	1.040	0.687	**1.70**	**1.87**	**S01**
	WCDMA II	21	0.941	22.87	23.5	1.156	1.088	70	0.661	11.33	11.5	1.040	0.687	**1.60**	**1.78**	**S02**
	WCDMA II	22	0.858	22.9	23.5	1.148	0.985	70	0.661	11.33	11.5	1.040	0.687	**1.52**	**1.67**	**S03**
Edge4 At 0cm	GSM850	9	0.162	28.55	28.7	1.035	0.168							**0.16**	**0.17**	
	GSM1900	12	0.593	25.18	25.7	1.127	0.668							**0.59**	**0.67**	
	WCDMA V	15	0.123	23.41	24	1.146	0.141							**0.12**	**0.14**	
	WCDMA II	20	1.11	22.9	23.5	1.148	1.274							**1.11**	**1.27**	

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
3. If 1g-SAR summation > 1.6W/kg, SPLSR calculation is necessary.
4. WLAN SAR data at 0mm is applied here, and it will represent more conservative situation than WLAN SAR data at 15mm and 14mm.

<Tablet SAR - Without Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 1)		Scaled WLAN2.4G (Ant. 1)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 1.5cm	GSM850	7	0.255	28.55	28.7	1.035	0.264	99	0.082	12.25	12.5	1.059	0.087	**0.34**	**0.35**	
	GSM1900	10	0.364	25.18	25.7	1.127	0.410	99	0.082	12.25	12.5	1.059	0.087	**0.45**	**0.50**	
	WCDMA V	13	0.191	23.41	24	1.146	0.219	99	0.082	12.25	12.5	1.059	0.087	**0.27**	**0.31**	
	WCDMA II	16	0.536	22.95	23.5	1.135	0.608	99	0.082	12.25	12.5	1.059	0.087	**0.62**	**0.70**	
Edge1 At 1.4cm	GSM850	8	0.133	28.55	28.7	1.035	0.138	100	0.0078	12.25	12.5	1.059	0.008	**0.14**	**0.15**	
	GSM1900	11	0.604	25.18	25.7	1.127	0.681	100	0.0078	12.25	12.5	1.059	0.008	**0.61**	**0.69**	
	WCDMA V	14	0.097	23.41	24	1.146	0.111	100	0.0078	12.25	12.5	1.059	0.008	**0.10**	**0.12**	
	WCDMA II	17	1.04	22.95	23.5	1.135	1.180	100	0.0078	12.25	12.5	1.059	0.008	**1.05**	**1.19**	
Edge4 At 0cm	GSM850	9	0.162	28.55	28.7	1.035	0.168	101	0.037	12.25	12.5	1.059	0.039	**0.20**	**0.21**	
	GSM1900	12	0.593	25.18	25.7	1.127	0.668	101	0.037	12.25	12.5	1.059	0.039	**0.63**	**0.71**	
	WCDMA V	15	0.123	23.41	24	1.146	0.141	101	0.037	12.25	12.5	1.059	0.039	**0.16**	**0.18**	
	WCDMA II	20	1.11	22.9	23.5	1.148	1.274	101	0.037	12.25	12.5	1.059	0.039	**1.15**	**1.31**	

	WWAN			Scaled WWAN				WLAN5G (Ant. 1)		Scaled WLAN5G (Ant. 1)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 1.5cm	GSM850	7	0.255	28.55	28.7	1.035	0.264	89	0.11	11.63	12	1.089	0.120	**0.37**	**0.38**	
	GSM1900	10	0.364	25.18	25.7	1.127	0.410	89	0.11	11.63	12	1.089	0.120	**0.47**	**0.53**	
	WCDMA V	13	0.191	23.41	24	1.146	0.219	89	0.11	11.63	12	1.089	0.120	**0.30**	**0.34**	
	WCDMA II	16	0.536	22.95	23.5	1.135	0.608	89	0.11	11.63	12	1.089	0.120	**0.65**	**0.73**	
Edge1 At 1.4cm	GSM850	8	0.133	28.55	28.7	1.035	0.138	90	0.033	11.63	12	1.089	0.036	**0.17**	**0.17**	
	GSM1900	11	0.604	25.18	25.7	1.127	0.681	90	0.033	11.63	12	1.089	0.036	**0.64**	**0.72**	
	WCDMA V	14	0.097	23.41	24	1.146	0.111	90	0.033	11.63	12	1.089	0.036	**0.13**	**0.15**	
	WCDMA II	17	1.04	22.95	23.5	1.135	1.180	90	0.033	11.63	12	1.089	0.036	**1.07**	**1.22**	
	WCDMA II	21	0.941	22.87	23.5	1.156	1.088	90	0.033	11.63	12	1.089	0.036	**0.97**	**1.12**	
	WCDMA II	22	0.858	22.9	23.5	1.148	0.985	90	0.033	11.63	12	1.089	0.036	**0.89**	**1.02**	
Edge4 At 0cm	GSM850	9	0.162	28.55	28.7	1.035	0.168	91	0.244	11.63	12	1.089	0.266	**0.41**	**0.43**	
	GSM1900	12	0.593	25.18	25.7	1.127	0.668	91	0.244	11.63	12	1.089	0.266	**0.84**	**0.93**	
	WCDMA V	15	0.123	23.41	24	1.146	0.141	91	0.244	11.63	12	1.089	0.266	**0.37**	**0.41**	
	WCDMA II	20	1.11	22.9	23.5	1.148	1.274	91	0.244	11.63	12	1.089	0.266	**1.35**	**1.54**	

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
3. WLAN SAR data at 0mm is applied here, and it will represent more conservative situation than WLAN SAR data at 15mm and 14mm.

<Tablet SAR - With Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 0)		Scaled WLAN2.4G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 0cm	GSM850	23	0.554	20.85	21	1.035	0.573	94	0.699	12.24	12.5	1.062	0.742	**1.25**	**1.32**	
	GSM1900	36	0.84	18.46	19	1.132	0.951	94	0.699	12.24	12.5	1.062	0.742	**1.54**	**1.69**	**S04**
	WCDMA V	28	1.13	20.72	21.5	1.197	1.352	94	0.699	12.24	12.5	1.062	0.742	**1.83**	**2.09**	**S05**
	WCDMA II	31	1.05	15.73	16	1.064	1.117	94	0.699	12.24	12.5	1.062	0.742	**1.75**	**1.86**	**S06**
Edge1 At 0cm	GSM850	24	0.279	20.85	21	1.035	0.289	95	0.239	12.24	12.5	1.062	0.254	**0.52**	**0.54**	
	GSM1900	34	0.567	18.46	19	1.132	0.642	95	0.239	12.24	12.5	1.062	0.254	**0.81**	**0.90**	
	WCDMA V	26	0.727	20.91	21.5	1.146	0.833	95	0.239	12.24	12.5	1.062	0.254	**0.97**	**1.09**	
	WCDMA II	30	0.699	15.79	16	1.050	0.734	95	0.239	12.24	12.5	1.062	0.254	**0.94**	**0.99**	

	WWAN			Scaled WWAN				WLAN5G (Ant. 0)		Scaled WLAN5G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 0cm	GSM850	23	0.554	20.85	21	1.035	0.573	69	0.504	11.33	11.5	1.040	0.524	**1.06**	**1.10**	
	GSM1900	36	0.84	18.46	19	1.132	0.951	69	0.504	11.33	11.5	1.040	0.524	**1.34**	**1.48**	
	WCDMA V	28	1.13	20.72	21.5	1.197	1.352	69	0.504	11.33	11.5	1.040	0.524	**1.63**	**1.88**	**S07**
	WCDMA V	25	1.17	20.91	21.5	1.146	1.340	69	0.504	11.33	11.5	1.040	0.524	**1.67**	**1.86**	**S08**
	WCDMA V	27	1.12	20.83	21.5	1.167	1.307	69	0.504	11.33	11.5	1.040	0.524	**1.62**	**1.83**	**S09**
	WCDMA II	31	1.05	15.73	16	1.064	1.117	69	0.504	11.33	11.5	1.040	0.524	**1.55**	**1.64**	**S10**
	WCDMA II	32	1.02	15.69	16	1.074	1.095	69	0.504	11.33	11.5	1.040	0.524	**1.52**	**1.62**	**S11**
	WCDMA II	29	1.03	15.79	16	1.050	1.081	69	0.504	11.33	11.5	1.040	0.524	**1.53**	**1.61**	**S12**
Edge1 At 0cm	GSM850	24	0.279	20.85	21	1.035	0.289	70	0.661	11.33	11.5	1.040	0.687	**0.94**	**0.98**	
	GSM1900	34	0.567	18.46	19	1.132	0.642	70	0.661	11.33	11.5	1.040	0.687	**1.23**	**1.33**	
	WCDMA V	26	0.727	20.91	21.5	1.146	0.833	70	0.661	11.33	11.5	1.040	0.687	**1.39**	**1.5**	
	WCDMA II	30	0.699	15.79	16	1.050	0.734	70	0.661	11.33	11.5	1.040	0.687	**1.36**	**1.42**	

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
3. If 1g-SAR summation > 1.6W/kg, SPLSR calculation is necessary.

<Tablet SAR - With Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 1)		Scaled WLAN2.4G (Ant. 1)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 0cm	GSM850	23	0.554	20.85	21	1.035	0.573	99	0.082	12.25	12.5	1.059	0.087	**0.64**	**0.66**	
	GSM1900	36	0.84	18.46	19	1.132	0.951	99	0.082	12.25	12.5	1.059	0.087	**0.92**	**1.04**	
	WCDMA V	28	1.13	20.72	21.5	1.197	1.352	99	0.082	12.25	12.5	1.059	0.087	**1.21**	**1.44**	
	WCDMA II	31	1.05	15.73	16	1.064	1.117	99	0.082	12.25	12.5	1.059	0.087	**1.13**	**1.20**	
Edge1 At 0cm	GSM850	24	0.279	20.85	21	1.035	0.289	100	0.0078	12.25	12.5	1.059	0.008	**0.29**	**0.30**	
	GSM1900	34	0.567	18.46	19	1.132	0.642	100	0.0078	12.25	12.5	1.059	0.008	**0.57**	**0.65**	
	WCDMA V	26	0.727	20.91	21.5	1.146	0.833	100	0.0078	12.25	12.5	1.059	0.008	**0.73**	**0.84**	
	WCDMA II	30	0.699	15.79	16	1.050	0.734	100	0.0078	12.25	12.5	1.059	0.008	**0.71**	**0.74**	

	WWAN			Scaled WWAN				WLAN5G (Ant. 1)		Scaled WLAN5G (Ant. 1)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom Face At 0cm	GSM850	23	0.554	20.85	21	1.035	0.573	89	0.11	11.63	12	1.089	0.120	**0.66**	**0.69**	
	GSM1900	36	0.84	18.46	19	1.132	0.951	89	0.11	11.63	12	1.089	0.120	**0.95**	**1.07**	
	WCDMA V	28	1.13	20.72	21.5	1.197	1.352	89	0.11	11.63	12	1.089	0.120	**1.24**	**1.47**	
	WCDMA V	25	1.17	20.91	21.5	1.146	1.340	89	0.11	11.63	12	1.089	0.120	**1.28**	**1.46**	
	WCDMA V	27	1.12	20.83	21.5	1.167	1.307	89	0.11	11.63	12	1.089	0.120	**1.23**	**1.43**	
	WCDMA II	31	1.05	15.73	16	1.064	1.117	89	0.11	11.63	12	1.089	0.120	**1.16**	**1.24**	
	WCDMA II	32	1.02	15.69	16	1.074	1.095	89	0.11	11.63	12	1.089	0.120	**1.13**	**1.22**	
	WCDMA II	29	1.03	15.79	16	1.050	1.081	89	0.11	11.63	12	1.089	0.120	**1.14**	**1.20**	
Edge1 At 0cm	GSM850	24	0.279	20.85	21	1.035	0.289	90	0.033	11.63	12	1.089	0.036	**0.31**	**0.33**	
	GSM1900	34	0.567	18.46	19	1.132	0.642	90	0.033	11.63	12	1.089	0.036	**0.60**	**0.68**	
	WCDMA V	26	0.727	20.91	21.5	1.146	0.833	90	0.033	11.63	12	1.089	0.036	**0.76**	**0.87**	
	WCDMA II	30	0.699	15.79	16	1.050	0.734	90	0.033	11.63	12	1.089	0.036	**0.73**	**0.77**	

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.

<Additional Tablet SAR at Curved Surface - With Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 0)		Scaled WLAN2.4G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Edge1 Curved Surface At 0cm	GSM850	111	0.423	20.85	21	1.035	0.438	112	0.484	12.24	12.5	1.062	0.514	0.91	0.95	
	GSM1900	104	0.772	18.46	19	1.132	0.874	112	0.484	12.24	12.5	1.062	0.514	1.26	1.4	
	WCDMA V	110	0.945	20.72	21.5	1.197	1.131	112	0.484	12.24	12.5	1.062	0.514	1.43	**1.65**	**S13**
	WCDMA II	105	0.883	15.73	16	1.064	0.940	112	0.484	12.24	12.5	1.062	0.514	1.37	1.5	

	WWAN			Scaled WWAN				WLAN5G (Ant. 0)		Scaled WLAN5G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Edge1 Curved Surface At 0cm	GSM850	111	0.423	20.85	21	1.035	0.438	113	0.902	12.24	12.5	1.062	0.958	1.33	1.34	
	GSM1900	104	0.772	18.46	19	1.132	0.874	113	0.902	12.24	12.5	1.062	0.958	1.67	**1.78**	**S14**
	WCDMA V	110	0.945	20.72	21.5	1.197	1.131	113	0.902	12.24	12.5	1.062	0.958	1.85	**2.03**	**S15**
	WCDMA II	105	0.883	15.73	16	1.064	0.940	113	0.902	12.24	12.5	1.062	0.958	1.79	**1.84**	**S16**

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
3. If 1g-SAR summation > 1.6W/kg, SPLSR calculation is necessary.

<NB SAR - Without Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 0)		Scaled WLAN2.4G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom At 0cm	GSM850	43	0.04	28.55	28.7	1.035	0.041	97	0.013	12.24	12.5	1.062	0.014	**0.05**	**0.06**	
	GSM1900	49	0.00885	25.18	25.7	1.127	0.010	97	0.013	12.24	12.5	1.062	0.014	**0.02**	**0.02**	
	WCDMA V	45	0.032	23.41	24	1.146	0.037	97	0.013	12.24	12.5	1.062	0.014	**0.05**	**0.05**	
	WCDMA II	47	0.016	22.95	23.5	1.135	0.018	97	0.013	12.24	12.5	1.062	0.014	**0.03**	**0.03**	
Back of Display Screen At 2.5cm	GSM850	44	0.131	28.55	28.7	1.035	0.136	98	0.019	12.24	12.5	1.062	0.020	**0.15**	**0.16**	
	GSM1900	50	0.15	25.18	25.7	1.127	0.169	98	0.019	12.24	12.5	1.062	0.020	**0.17**	**0.19**	
	WCDMA V	46	0.092	23.41	24	1.146	0.105	98	0.019	12.24	12.5	1.062	0.020	**0.11**	**0.13**	
	WCDMA II	48	0.236	22.95	23.5	1.135	0.268	98	0.019	12.24	12.5	1.062	0.020	**0.26**	**0.29**	

	WWAN			Scaled WWAN				WLAN5G (Ant. 0)		Scaled WLAN5G (Ant. 0)				WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)			
Bottom At 0cm	GSM850	43	0.04	28.55	28.7	1.035	0.041	72	0.021	11.33	11.5	1.040	0.022	**0.06**	**0.06**	
	GSM1900	49	0.00885	25.18	25.7	1.127	0.010	72	0.021	11.33	11.5	1.040	0.022	**0.03**	**0.03**	
	WCDMA V	45	0.032	23.41	24	1.146	0.037	72	0.021	11.33	11.5	1.040	0.022	**0.05**	**0.06**	
	WCDMA II	47	0.016	22.95	23.5	1.135	0.018	72	0.021	11.33	11.5	1.040	0.022	**0.04**	**0.04**	
Back of Display Screen At 2.5cm	GSM850	44	0.131	28.55	28.7	1.035	0.136	73	0.041	11.33	11.5	1.040	0.043	**0.17**	**0.18**	
	GSM1900	50	0.15	25.18	25.7	1.127	0.169	73	0.041	11.33	11.5	1.040	0.043	**0.19**	**0.21**	
	WCDMA V	46	0.092	23.41	24	1.146	0.105	73	0.041	11.33	11.5	1.040	0.043	**0.13**	**0.15**	
	WCDMA II	48	0.236	22.95	23.5	1.135	0.268	73	0.041	11.33	11.5	1.040	0.043	**0.28**	**0.31**	

Note:
1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
3. The back of display screen at 2.5 cm test results are voluntary submitted and applicable to approval in other countries.

<NB SAR - Without Power Reduction>

	WWAN			Scaled WWAN				WLAN2.4G (Ant. 1)		Scaled WLAN2.4G (Ant. 1)						
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)	WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Bottom At 0cm	GSM850	43	0.04	28.55	28.7	1.035	0.041	102	0.0014	12.25	12.5	1.059	0.001	**0.04**	**0.04**	
	GSM1900	49	0.00885	25.18	25.7	1.127	0.010	102	0.0014	12.25	12.5	1.059	0.001	**0.01**	**0.01**	
	WCDMA V	45	0.032	23.41	24	1.146	0.037	102	0.0014	12.25	12.5	1.059	0.001	**0.03**	**0.04**	
	WCDMA II	47	0.016	22.95	23.5	1.135	0.018	102	0.0014	12.25	12.5	1.059	0.001	**0.02**	**0.02**	
Back of Display Screen At 2.5cm	GSM850	44	0.131	28.55	28.7	1.035	0.136	103	0.00243	12.25	12.5	1.059	0.003	**0.13**	**0.14**	
	GSM1900	50	0.15	25.18	25.7	1.127	0.169	103	0.00243	12.25	12.5	1.059	0.003	**0.15**	**0.17**	
	WCDMA V	46	0.092	23.41	24	1.146	0.105	103	0.00243	12.25	12.5	1.059	0.003	**0.09**	**0.11**	
	WCDMA II	48	0.236	22.95	23.5	1.135	0.268	103	0.00243	12.25	12.5	1.059	0.003	**0.24**	**0.27**	

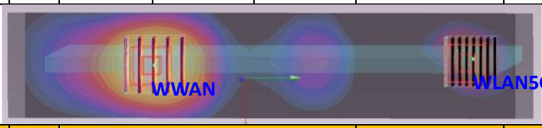
	WWAN			Scaled WWAN				WLAN5G (Ant. 1)		Scaled WLAN5G (Ant. 1)						
Position	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WWAN (W/kg)	Plot No	Max. WLAN SAR (W/kg)	Average Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	Scaled WLAN (W/kg)	WWAN + WLAN	Scaled WWAN + Scaled WLAN	Case No
Bottom At 0cm	GSM850	43	0.04	28.55	28.7	1.035	0.041	92	0.012	11.63	12	1.089	0.013	**0.05**	**0.05**	
	GSM1900	49	0.00885	25.18	25.7	1.127	0.010	92	0.012	11.63	12	1.089	0.013	**0.02**	**0.02**	
	WCDMA V	45	0.032	23.41	24	1.146	0.037	92	0.012	11.63	12	1.089	0.013	**0.04**	**0.05**	
	WCDMA II	47	0.016	22.95	23.5	1.135	0.018	92	0.012	11.63	12	1.089	0.013	**0.03**	**0.03**	
Back of Display Screen At 2.5cm	GSM850	44	0.131	28.55	28.7	1.035	0.136	93	0.02	11.63	12	1.089	0.022	**0.15**	**0.16**	
	GSM1900	50	0.15	25.18	25.7	1.127	0.169	93	0.02	11.63	12	1.089	0.022	**0.17**	**0.19**	
	WCDMA V	46	0.092	23.41	24	1.146	0.105	93	0.02	11.63	12	1.089	0.022	**0.11**	**0.13**	
	WCDMA II	48	0.236	22.95	23.5	1.135	0.268	93	0.02	11.63	12	1.089	0.022	**0.26**	**0.29**	

Note:

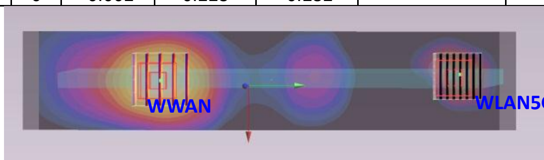
1. The maximum SAR summation is calculated based on the same configuration and test position.
2. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
3. The back of display screen at 2.5 cm test results are voluntary submitted and applicable to approval in other countries.

11.3 Simultaneous analysis - SPLSR calculation

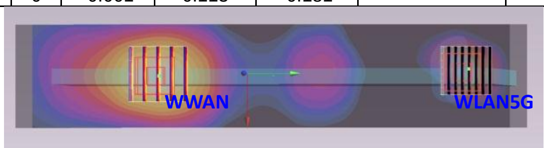
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S01	#17	WCDMA II	Edge 1	1.180	1.4	-0.001	-0.065	-0.176	17.8	1.87	0.10	Not required
	#70	WLAN 5G		0.687	0	-0.001	0.113	-0.181				



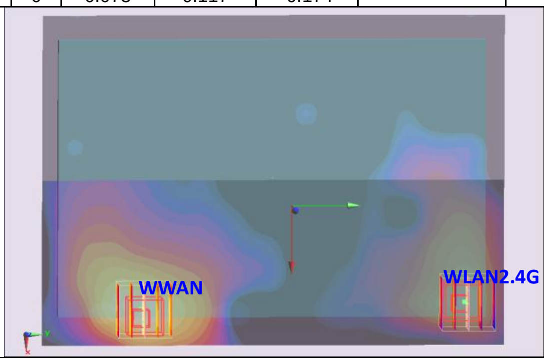
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S02	#21	WCDMA II	Edge 1	1.088	1.4	-0.001	-0.065	-0.176	17.8	1.78	0.10	Not required
	#70	WLAN 5G		0.687	0	-0.001	0.113	-0.181				



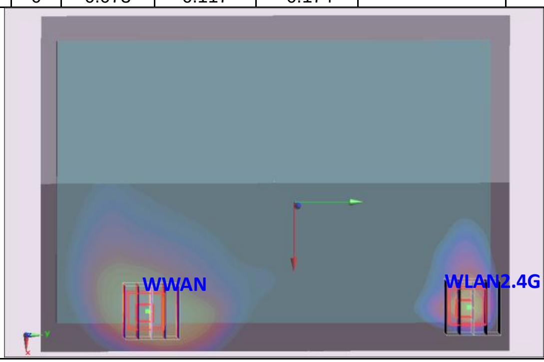
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S03	#22	WCDMA II	Edge 1	0.985	1.4	-0.001	-0.065	-0.176	17.8	1.67	0.09	Not required
	#70	WLAN 5G		0.687	0	-0.001	0.113	-0.181				



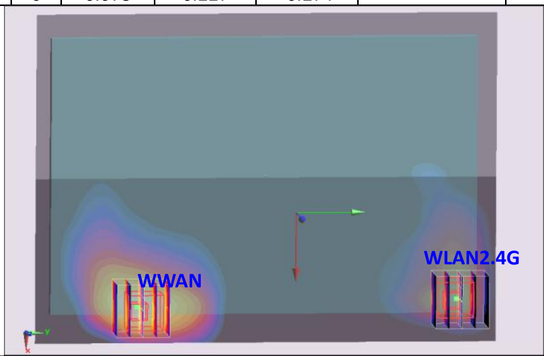
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S04	#36	GSM1900	Bottom Face	0.951	0	0.085	-0.079	-0.175	19.6	1.69	0.09	Not required
	#94	WLAN2.4G		0.742	0	0.073	0.117	-0.174				



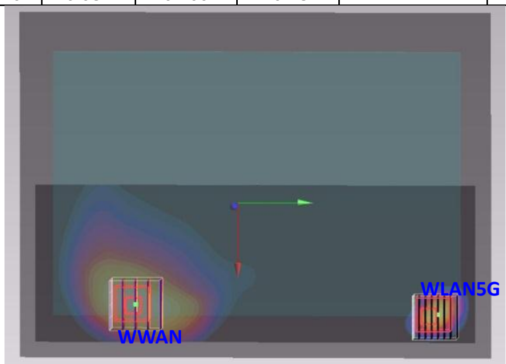
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S05	#28	WCDMA V	Bottom Face	1.352	0	0.075	-0.075	-0.176	19.2	2.09	0.11	Not required
	#94	WLAN2.4G		0.742	0	0.073	0.117	-0.174				



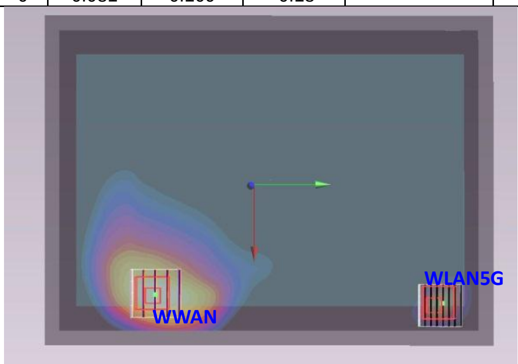
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S06	#31	WCDMA II	Bottom Face	1.117	0	0.077	-0.077	-0.175	19.4	1.86	0.10	Not required
	#94	WLAN2.4G		0.742	0	0.073	0.117	-0.174				



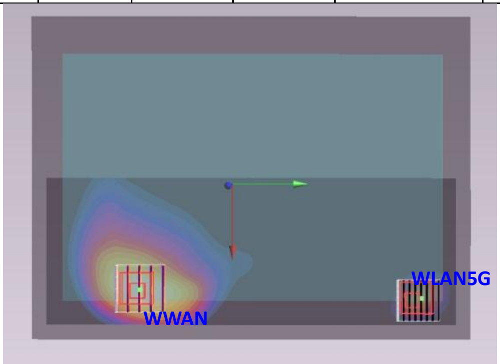
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S07	#28	WCDMA V	Bottom Face	1.352	0	0.075	-0.075	-0.176	18.4	1.88	0.10	Not required
	#69	WLAN 5G		0.524	0	0.081	0.109	-0.18				



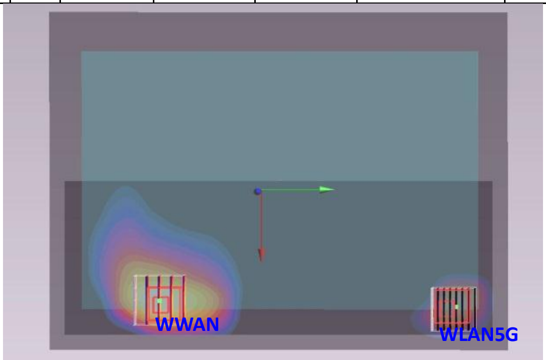
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S08	#25	WCDMA V	Bottom Face	1.340	0	0.075	-0.083	-0.176	19.2	1.86	0.10	Not required
	#69	WLAN 5G		0.524	0	0.081	0.109	-0.18				



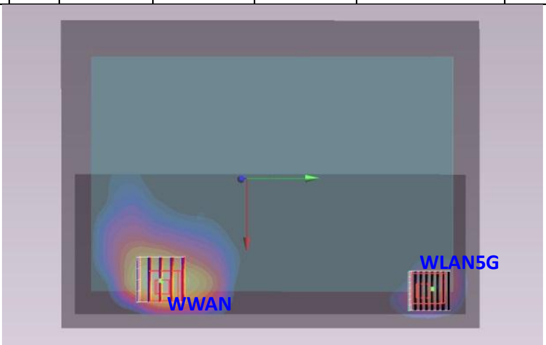
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S09	#27	WCDMA V	Bottom Face	1.307	0	0.075	-0.083	-0.176	19.2	1.83	0.10	Not required
	#69	WLAN 5G		0.524	0	0.081	0.109	-0.18				



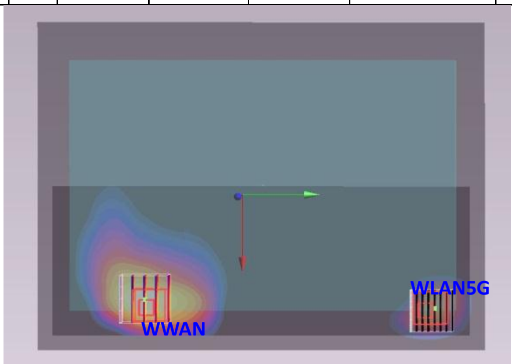
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S10	#31	WCDMA II	Bottom Face	1.117	0	0.077	-0.077	-0.175	18.6	1.64	0.09	Not required
	#69	WLAN 5G		0.524	0	0.081	0.109	-0.18				



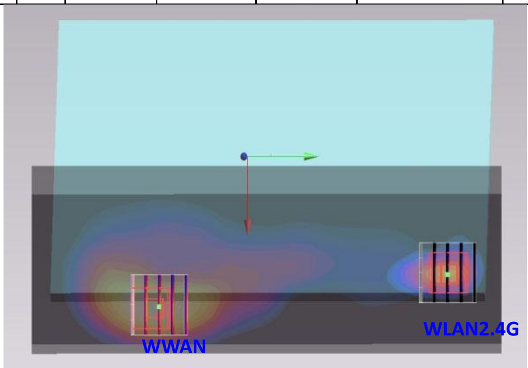
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m)			3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
						X	Y	Z				
S11	#32	WCDMA II	Bottom Face	1.095	0	0.083	-0.077	-0.175	18.6	1.62	0.09	Not required
	#69	WLAN 5G		0.524	0	0.081	0.109	-0.18				



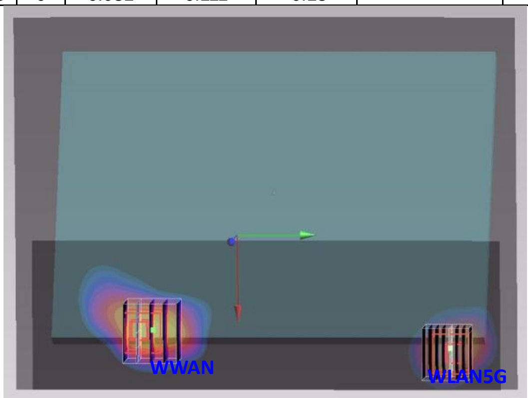
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
S12	#29	WCDMA II	Bottom Face	1.081	0	0.083	-0.077	-0.175	18.6	1.61	0.09	Not required
	#69	WLAN 5G		0.524	0	0.081	0.109	-0.18				



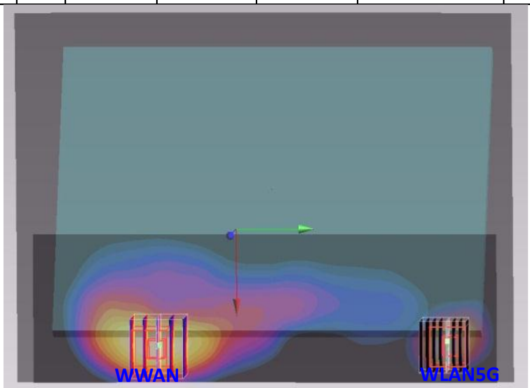
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
S13	#110	WCDMA V	Edge 1_Degree28	1.131	0	0.079	-0.063	-0.179	17.3	1.66	0.10	Not required
	#112	WLAN2.4G		0.524	0	0.062	0.109	-0.176				



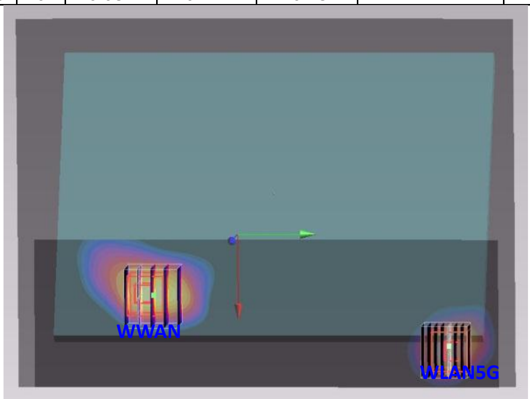
Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
S14	#104	GSM1900	Edge 1_Degree28	0.874	0	0.067	-0.075	-0.174	18.7	1.83	0.10	
	#113	WLAN5G		0.958	0	0.081	0.111	-0.18				



Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
S15	#110	WCDMA V	Edge 1_Degree28	1.131	0	0.079	-0.063	-0.179	17.4	2.09	0.12	Not required
	#113	WLAN5G		0.958	0	0.081	0.111	-0.18				



Case No	Plot No	Band	Position	SAR (W/kg)	Gap (cm)	SAR peak location (m) X	Y	Z	3D distance (cm)	Pair SAR sum (W/kg)	SPLSR	Simultaneous SAR
S16	#105	WCDMA II	Edge 1_Degree28	0.94	0	0.049	-0.075	-0.175	18.9	1.90	0.10	Not required
	#113	WLAN5G		0.958	0	0.081	0.111	-0.18				



Note: Per KDB 447498, if SPLSR < 0.3, simultaneously transmission SAR is not necessary.

Test Engineer： Vic Yang, Angelo Chang, Ted Sun, Jack Wu, Ken Li, and Casper Yu

12. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 12.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	$1/k^{(b)}$	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 12.1 Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables:

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 12.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 25.6 %**	**± 25.2 %**

Table 12.3 Uncertainty Budget of DASY for frequency range 3 GHz to 6 GHz

13. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003

[4] FCC OET Bulletin 65 (Edition 97-01) Supplement C (Edition 01-01), “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”, June 2001

[5] SPEAG DASY System Handbook

[6] FCC KDB 248227 D01 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

[7] FCC KDB 447498 D01 v04, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, November 2009

[8] FCC KDB 616217 D03 v01, “SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers”, November 2009

[9] FCC KDB 941225 D01 v02, “SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA”, October 2007

[10] FCC KDB 941225 D03 v01, “Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE”, December 2008

[11] FCC KDB 941225 D04 v01, “Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode”, January 27 2010

[12] FCC KDB 941225 D05 v01, “SAR Test Considerations for LTE Handsets and Data Modems”, December 2010

[13] FCC KDB 941225 D07 01, "SAR Evaluation Procedure for UMPC Mini-Tablet Devices", April 2011

[14] FCC KDB 388624 D02, "Permit But Ask List", December 2011.

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.