FCC SAR Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	CDMA/LTE Digital Mobile Handset
BRAND NAME	:	ZTE
MODEL NAME	:	ZTE N9100/ZTE Aurora
FCC ID	:	Q78-ZTEN9100
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 completely tested on Sep. 06, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) 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.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA281701	Rev. 01	Initial issue of report	Sep. 28, 2012

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION DUT: CDMA/LTE Digital Mobile Handset, Brand Name: ZTE, Model Name: ZTE N9100/ZTE Aurora** are as follows.

<Highest 1-g SAR Summary>

Band	Position	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)
CDMA2000 BC0	Head	0.929	1.047
CDMA2000 BC1	Head	1.2	1.234
CDMA2000 BC10	Head	0.724	0.812
LTE Band 25	Head	1.37	1.408
WLAN 2.4G	Head	0.148	0.167
CDMA2000 BC0	Hotspot (1 cm Gap)	1.26	1.447
CDMA2000 BC1	Hotspot (1 cm Gap)	1.37	1.468
CDMA2000 BC10	Hotspot (1 cm Gap)	1.14	1.309
LTE Band 25	Hotspot (1 cm Gap)	1.24	1.275
WLAN 2.4G	Hotspot (1 cm Gap)	0.112	0.126
CDMA2000 BC0	Body-worn (1 cm Gap)	1.22	1.404
CDMA2000 BC1	Body-worn (1 cm Gap)	1.4	1.439
CDMA2000 BC10	Body-worn (1 cm Gap)	1.21	1.373
LTE Band 25	Body-worn (1 cm Gap)	1.25	1.285
WLAN 2.4G	Body-worn (1 cm Gap)	0.112	0.126

<Simultaneous transmission SAR>

Band	Position	Multi Band SAR_{1g} (W/kg)
CDMA 2000 BC1	Body-worn (1 cm Gap)	1.53
LTE Band 25		
WLAN 2.4G		

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 (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

2.2 Applicant

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

2.3 Manufacturer

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

2.4 Application Details

Date of Start during the Test	Aug. 31, 2012
Date of End during the Test	Sep. 06, 2012

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	CDMA/LTE Digital Mobile Handset
Brand Name	ZTE
Model Name	ZTE N9100/ZTE Aurora
FCC ID	Q78-ZTEN9100
MEID	99000058141881
Tx Frequency	CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10: 817.90 MHz ~ 823.10 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz WLAN 2.4G: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Rx Frequency	CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC10: 862.90 MHz ~ 868.10 MHz LTE Band 25: 1930.7 MHz ~ 1994.3 MHz WLAN 2.4G: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Maximum Output Power to Antenna	CDMA2000 BC0: 23.98 dBm CDMA2000 BC1: 23.90 dBm CDMA2000 BC10: 24.00 dBm LTE Band 25: 23.38 dBm 802.11b: 13.98 dBm 802.11g: 13.62 dBm 802.11n-HT20 (2.4GHz): 12.99 dBm Bluetooth: 0.55 dBm
Antenna Type	WWAN: PIFA Antenna LTE : PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna NFC: Coil Antenna
HW Version	N9100.H02
SW Version	N9100V1.0.0B04
Uplink Modulation	CDMA2000 1xRTT: QPSK CDMA2000 1xEV-DO: 8PSK LTE: QPSK / 16QAM 802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth V2.1 : GFSK Bluetooth V2.1 EDR : π/4-DQPSK, 8-DPSK Bluetooth V4.0 LE : GFSK NFC : ASK
EUT Stage	Identical Prototype
Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

The table below summarized necessary items addressed in KDB 941225 D05 v01.

FCC ID				Q78-ZTEN9100				
DUT Type				CDMA/LTE Digital Mobile Handset				
Operating Frequency Range of each LTE transmission band				Band 25: TX: 1850.7 MHz ~ 1914.3 MHz, RX: 1930.7 MHz ~ 1994.3 MHz				
Channel Bandwidth				Band 25: 1.4MHz, 3MHz, 5MHz, 10MHz				
Transmission (H, M, L) channel numbers and frequencies in each LTE band								
Band 25								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855
M	26365	1882.5	26365	1882.5	26365	1882.5	26365	1882.5
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910
UE category, uplink modulations used				Category 3, QPSK, and 16QAM				
LTE transmitter and antenna implementation (standalone or sharing hardware components / antennas)				LTE owns standalone transmitter and antenna.				
LTE Voice / Data requirements				Data only				
LTE MPR permanently built-in by design				Yes				
LTE A-MPR				Disabled during SAR testing. With CMW500, set NS value to NS_01 to disable A-MPR.				
LTE maximum averaged conducted output power				LTE Band 25: 23.38 dBm				
Other U.S. wireless operating modes / bands				CDMA2000 1xRTT	BC0: UL: 824.70 ~ 848.31 MHz / DL: 869.70 ~ 893.31 MHz BC1: UL: 1815.25 ~ 1908.75 MHz / DL: 1931.25 ~ 1988.75 MHz BC10: UL: 817.90 ~ 823.10 MHz / DL: 903.8 ~ 914.2 MHz			
				1xEVDO	BC0: UL: 824.70 ~ 848.31 MHz / DL: 869.70 ~ 893.31 MHz BC1: UL: 1815.25 ~ 1908.75 MHz / DL: 1931.25 ~ 1988.75 MHz BC10: UL: 817.90 ~ 823.10 MHz / DL: 903.8 ~ 914.2 MHz			
				WLAN	2.4G: 2412 MHz ~ 2462 MHz			
				Bluetooth	2402 MHz ~ 2480 MHz			
				NFC	13.56 MHz			
Simultaneous transmission configurations				In Section 11.4				
Power reduction applied to satisfy SAR compliance				Yes, SVLTE/SV1xRTT power reduction.				

The SVLTE and SV1xRTT operating mode for all frequency bands, power reduction is needed for SAR compliance. The power reduction is implemented on this device and cannot be changed by end users or overridden by power control command from base stations.
The power reduction implementation is defined as following table.

CDMA2000 1x voice BC0/BC10	LTE data mode Band 25
P ≥ 16.5	18.5
P < 16.5	23.5

CDMA2000 1x voice BC1	LTE data mode Band 25
P ≥ 16.5	18.5
P < 16.5	23.5

Table 3.1-A: Power Reduction Implementation (Unit: dBm)

CDMA 1xRTT		LTE Band 25 BW=1.4/3/5/10MHz, QPSK 1RB		
		Output Power (dBm)		
Output Power Level (dBm)		Low Ch.	Middle Ch.	High Ch.
BC0	11	23.5	23.5	23.5
	16	23.5	23.5	23.5
	16.5	18.5	18.5	18.5
	24.5	18.5	18.5	18.5
BC1	11	23.5	23.5	23.5
	16	23.5	23.5	23.5
	16.5	18.5	18.5	18.5
	24	18.5	18.5	18.5
BC10	11	23.5	23.5	23.5
	16	23.5	23.5	23.5
	16.5	18.5	18.5	18.5
	24.5	18.5	18.5	18.5

Table 3.1-B: Target Power Reduction (Unit: dBm)

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 648474 D01 v01r05
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D05 v01
- FCC KDB 941225 D06 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

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 output power during all tests.

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

The maximum rated power of WWAN is listed in "Tune-Up Procedure" exhibit, and the maximum rated power of WLAN is listed in "Operational Description" exhibit; The scaling factor is calculated according to the difference between measured output power and maximum tolerance power on this device.

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

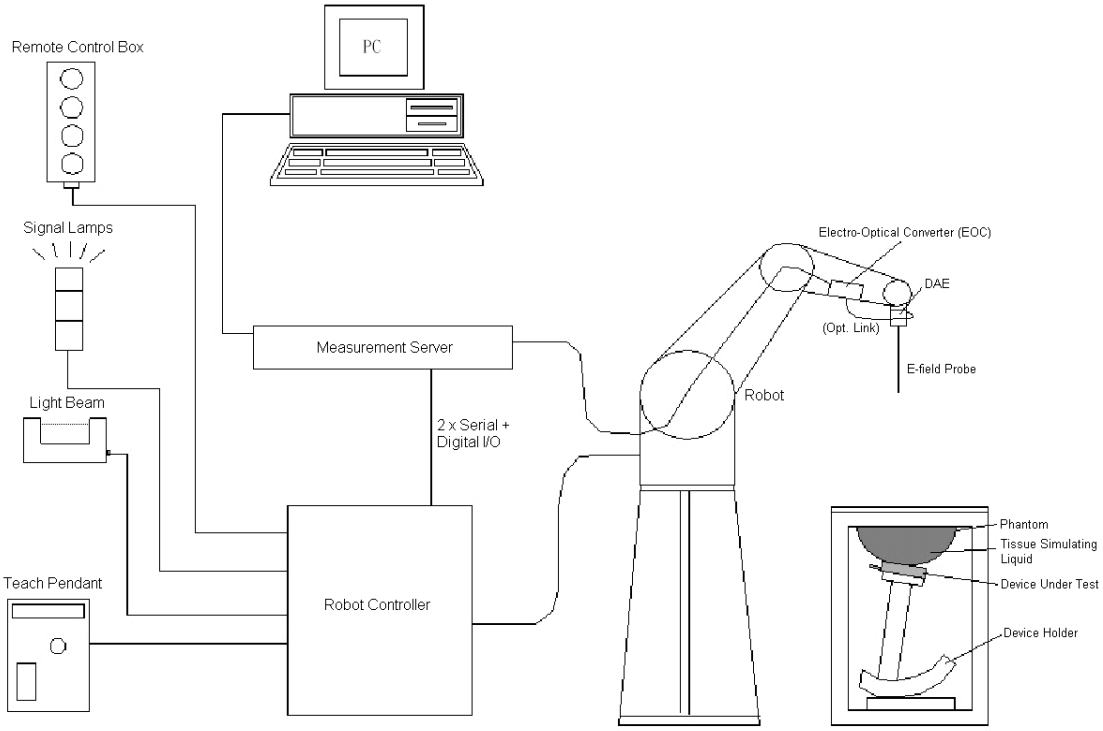


Fig 5.1 SPEAG DASY System Configurations

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

Component details are described in 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

<EX3DV4>

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 5.2 Photo of EX3DV4

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. 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 5.3 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (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 5.4 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128 MB), RAM (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 5.5 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

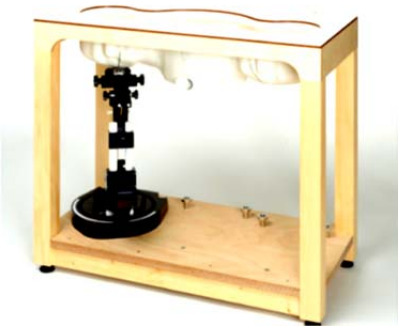


Fig 5.6 Photo of SAM Phantom

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

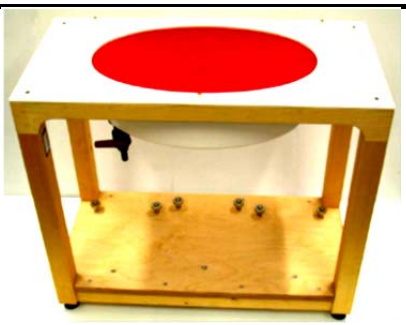


Fig 5.7 Photo of ELI4 Phantom

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 (EPR). 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 5.8 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.

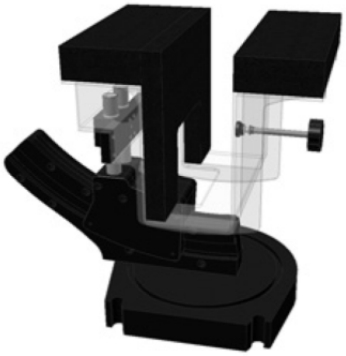


Fig 5.9 Laptop Extension Kit

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	4d091	Nov. 18, 2011	Nov. 17, 2012
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2011	Nov. 20, 2012
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	Data Acquisition Electronics	DAE4	1210	Nov. 18, 2011	Nov. 17, 2012
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	Jun. 20, 2012	Jun. 19, 2013
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1479	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201074235	Nov. 30, 2011	Nov. 29, 2013
Agilent	Wireless Communication Test Set	E5515C	GB47050646	Aug. 18, 2011	Aug. 17, 2013
Agilent	Wireless Communication Test Set	E5515C	MY48367160	Oct. 26, 2011	Oct. 25, 2013
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	Apr. 13, 2012	Apr. 12, 2013
R&S	Signal Generator	SMR40	100455	Dec. 30, 2011	Dec. 29, 2012
Agilent	Power Meter	E4416A	MY45101555	Aug. 22, 2012	Aug. 21, 2013
Agilent	Power Sensor	E9327A	MY44421198	Aug. 22, 2012	Aug. 21, 2013
R&S	Spectrum Analyzer	FSP30	101399	Jun. 01, 2012	May 31, 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 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

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	Head	21.3	0.894	41.517	0.90	41.5	-0.67	0.04	±5	Aug. 31, 2012
835	Head	21.3	0.895	41.543	0.90	41.5	-0.56	0.10	±5	Sep. 04, 2012
835	Head	21.1	0.916	41.029	0.90	41.5	1.78	-1.13	±5	Sep. 06, 2012
1900	Head	21.5	1.419	40.609	1.40	40.0	1.36	1.52	±5	Sep. 03, 2012
1900	Head	21.2	1.453	39.146	1.40	40.0	3.79	-2.14	±5	Sep. 04, 2012
1900	Head	21.3	1.44	39.914	1.40	40.0	2.86	-0.21	±5	Sep. 06, 2012
2450	Head	21.3	1.823	37.961	1.80	39.2	1.28	-3.16	±5	Sep. 04, 2012
2450	Head	21.6	1.829	40.081	1.80	39.2	1.61	2.25	±5	Sep. 06, 2012
835	Body	21.5	0.974	54.283	0.97	55.2	0.41	-1.66	±5	Sep. 02, 2012
835	Body	21.1	0.977	54.379	0.97	55.2	0.72	-1.49	±5	Sep. 04, 2012
835	Body	21.4	0.977	54.395	0.97	55.2	0.72	-1.46	±5	Sep. 06, 2012
1900	Body	21.6	1.528	54.867	1.52	53.3	0.53	2.94	±5	Aug. 31, 2012
1900	Body	21.3	1.528	53.974	1.52	53.3	0.53	1.26	±5	Sep. 03, 2012
1900	Body	21.2	1.532	52.397	1.52	53.3	0.79	-1.69	±5	Sep. 05, 2012
2450	Body	21.4	2.002	53.464	1.95	52.7	2.67	1.45	±5	Sep. 04, 2012
2450	Body	21.2	1.976	54.13	1.95	52.7	1.33	2.71	±5	Sep. 05, 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:

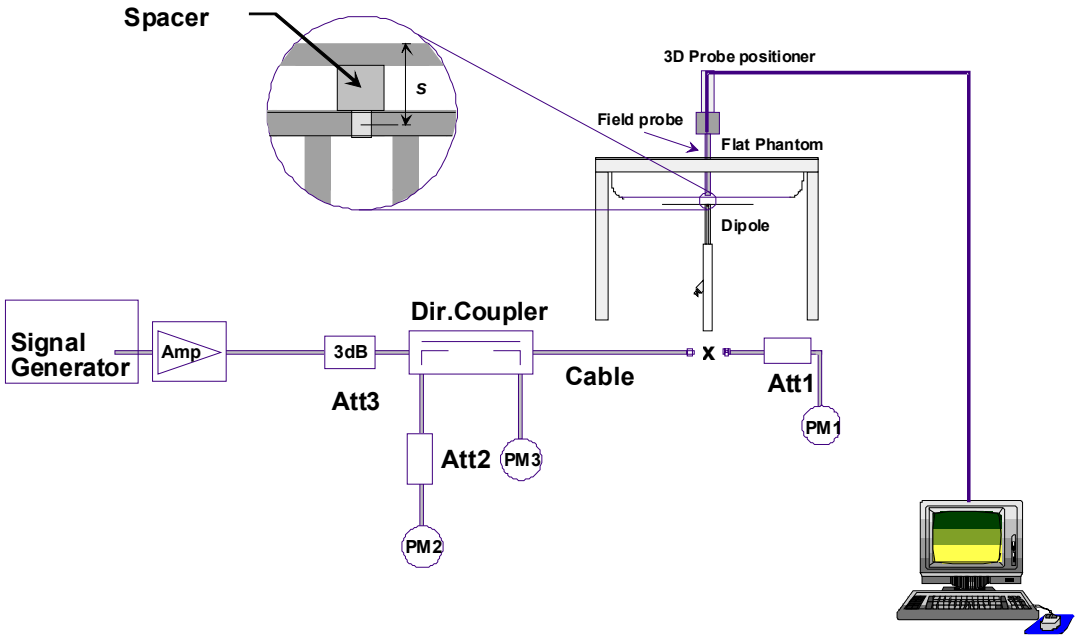


Fig 7.1 System Setup for System Evaluation

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.

Fig 7.2 Photo of Dipole Setup

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 (%)
Aug. 31, 2012	835	Head	9.4	2.4	9.60	2.13
Sep. 04, 2012	835	Head	9.4	2.41	9.64	2.55
Sep. 06, 2012	835	Head	9.4	2.46	9.84	4.68
Sep. 03, 2012	1900	Head	40.3	9.77	39.08	-3.03
Sep. 04, 2012	1900	Head	40.3	10	40.00	-0.74
Sep. 06, 2012	1900	Head	40.3	9.92	39.68	-1.54
Sep. 04, 2012	2450	Head	54.8	13.9	55.60	1.46
Sep. 06, 2012	2450	Head	54.8	14	56.00	2.19
Sep. 02, 2012	835	Body	9.42	2.34	9.36	-0.64
Sep. 04, 2012	835	Body	9.42	2.34	9.36	-0.64
Sep. 06, 2012	835	Body	9.42	2.34	9.36	-0.64
Aug. 31, 2012	1900	Body	41.8	10.2	40.80	-2.39
Sep. 03, 2012	1900	Body	41.8	10.3	41.20	-1.44
Sep. 05, 2012	1900	Body	41.8	10.3	41.20	-1.44
Sep. 04, 2012	2450	Body	52.3	12.7	50.80	-2.87
Sep. 05, 2012	2450	Body	52.3	12.6	50.40	-3.63

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

This EUT was tested in nine different positions. They are right cheek, right tilted, left cheek, left tilted, Front of the EUT with phantom 1 cm gap, Back of the EUT with phantom 1 cm gap, Bottom Side of the EUT with phantom 1 cm gap, Right Side of the EUT with phantom 1 cm gap, and Left Side of the EUT with phantom 1 cm gap, as illustrated below:

8.1 Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

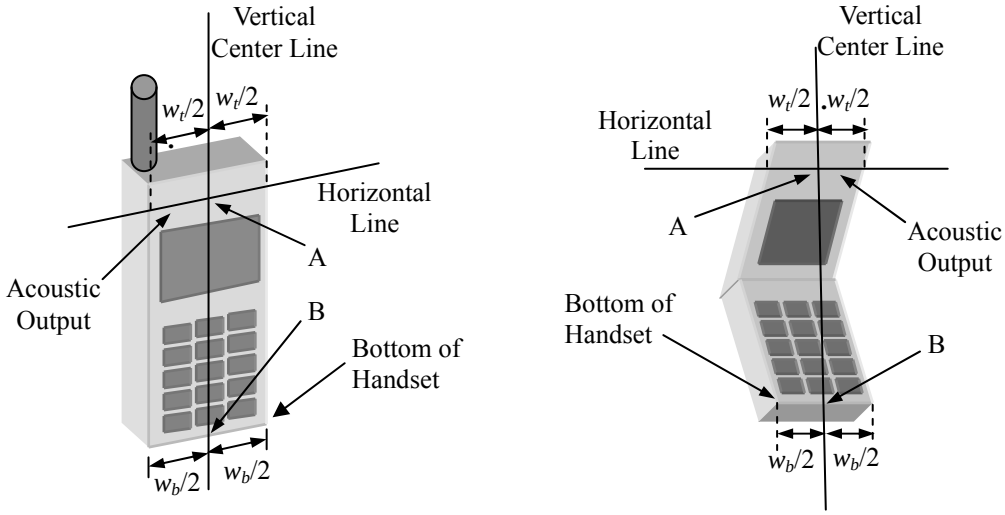


Fig 8.1 Illustration for Handset Vertical and Horizontal Reference Lines

8.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 9.2).

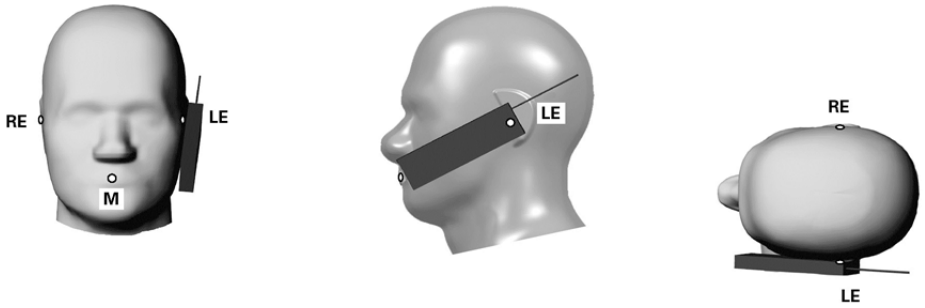


Fig 8.2 Illustration for Cheek Position

8.3 Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig. 9.3).

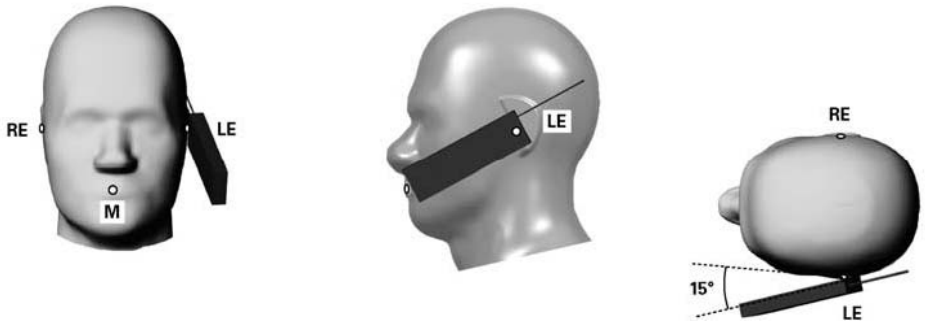


Fig 8.3 Illustration for Tilted Position

8.4 Body Worn Position

(a) To position the device parallel to the phantom surface with either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 1 cm.

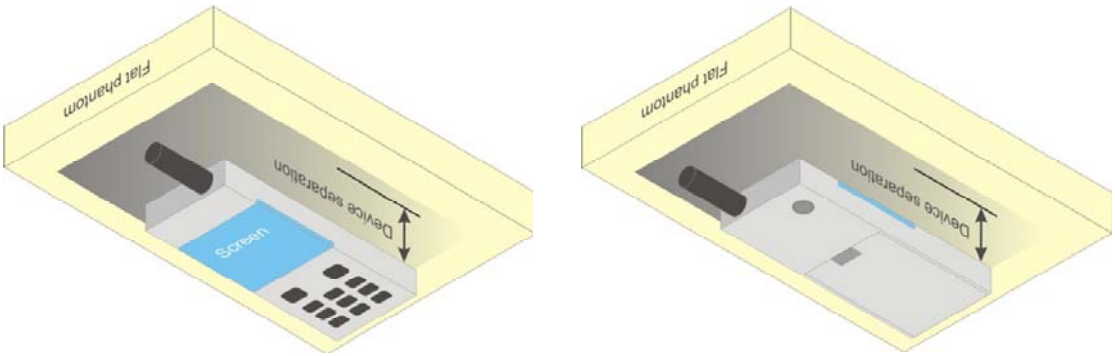


Fig 8.4 Illustration for Body Worn Position

<EUT Setup Photos>

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.

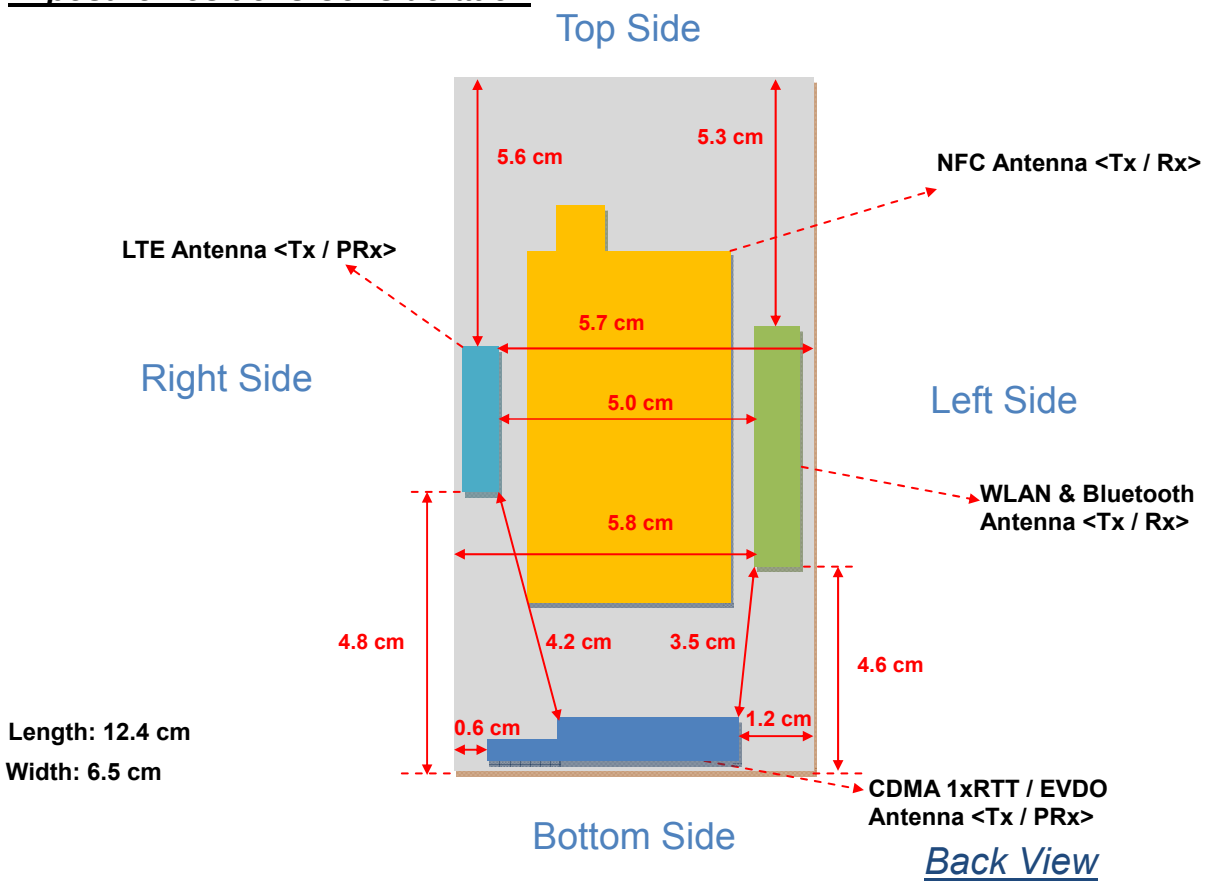
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty 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 drift more than 5%, the SAR will be retested.

10. SAR Test Configurations

10.1 Exposure Positions Consideration



Antennas	Wireless Interface
LTE Antenna (Tx / PRx)	LTE: band 25
CDMA 1xRTT / EVDO (Tx / PRx)	CDMA2000 1xRTT and EVDO BC 0/1/10
WLAN&BT Antenna (Tx / Rx)	WLAN 2.4GHz Bluetooth
NFC Antenna (Tx / Rx)	NFC

Sides for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
LTE	YES	YES	NO	NO	YES	NO
CDMA 1xRTT / EVDO	YES	YES	NO	YES	YES	YES
WLAN&BT	YES	YES	NO	NO	NO	YES

Note:
1. Head/Body-worn/Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
3. For LTE antenna, Top/Bottom/Left sides SAR are not required since the distance between transmitting antenna and surface or edge > 25mm.
4. For CDMA 1xRTT and EVDO antenna, Top side SAR is not required since the distance between transmitting antenna and surface or edge > 25mm.
5. For WLAN/BT antenna, Top/Bottom/Right sides SAR are not required since the distance between transmitting antenna and surface or edge > 25mm.

10.2 Conducted RF Output Power (Unit: dBm)

<1xRTT Conducted Power>

Band	CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC10		
Channel	1013	384	777	25	600	1175	476	580	684
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75	817.9	820.5	823.1
1x Voice Mode	Full Power (24.5dBm)			Full Power (24dBm)			Full Power (24.5dBm)		
1xRTT RC1+SO55	23.79	23.87	23.92	23.78	23.85	23.89	23.82	23.97	23.89
1xRTT RC3+SO55	23.87	23.89	**23.98**	23.72	23.81	**23.90**	23.94	**24.00**	23.89
1xRTT RC3+SO32(+F-SCH)	23.81	23.89	23.80	23.73	23.88	23.89	23.82	23.95	23.89
1xRTT RC3+SO32(+SCH)	23.79	23.82	23.82	23.67	23.79	23.85	23.57	23.89	23.83
1x Voice Mode	Reduced Power (16.5dBm)			Reduced Power (16.5dBm)			Reduced Power (16.5dBm)		
1xRTT RC1+SO55	15.85	**16.31**	16.20	16.36	16.32	16.45	16.13	16.29	**16.43**
1xRTT RC3+SO55	15.65	16.06	15.92	16.40	16.27	16.43	16.11	16.20	16.30
1xRTT RC3+SO32(+F-SCH)	15.81	16.25	16.15	16.22	16.19	**16.47**	15.98	16.19	16.31
1xRTT RC3+SO32(+SCH)	15.75	16.16	15.79	16.22	16.23	16.43	15.98	16.18	16.30

Note:
1. According to KDB 941225 D01, Head SAR is measured on RC3+SO55. Head SAR for RC1-SO55 is not required because the maximum average output power of RC1 is less than 1/4 dB higher than RC3-SO55.
2. The power measurements are based on the power reduction implementation configuration. Use RF engineering tool, with the pre-defined setting command, to measure reduced power.

<1xEVDO Conducted Power>

Band	CDMA2000 BC0			CDMA2000 BC1			CDMA2000 BC10		
Channel	1013	384	777	25	600	1175	476	580	684
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75	817.9	820.5	823.1
EVDO data mode	Full Power (24.5dBm)			Full Power (24dBm)			Full Power (24.5dBm)		
1xEVDO RTAP 153.6	23.89	**23.90**	23.87	23.61	23.70	**23.75**	23.84	**23.90**	23.85
1xEVDO RETAP 4096	23.88	23.90	23.90	23.56	23.65	23.75	23.85	23.92	23.84

Note:
1. Referring to KDB 941225 D01, in Hotspot mode SAR is tested with RTAP 153.6kbps (Ev-Do). If RETAP (4096 bits) power is less than 1/4dB higher than RTAP 153.6kbps, SAR tests with RETAP setting are not necessary.
2. The power measurements are based on the power reduction implementation configuration. Use RF engineering tool, with the pre-defined setting command, to measure reduced power.

<LTE Band 25 Conducted Power>

BW [MHz]	Mod / RB (Size - Offset)	Full Power (23.5dBm)							Reduced Power (18.5dBm)						
		Average Power. (dBm)			3GPP MPR	MPR Result (dB)			Average Power. (dBm)			3GPP MPR	MPR Result (dB)		
		Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch	Low Ch	Mid Ch	High Ch		Low Ch	Mid Ch	High Ch
Channel		26090	26365	26640		26090	26365	26640	26090	26365	26640		26090	26365	26640
Frequency (MHz)		1855	1882.5	1910		1855	1882.5	1910	1855	1882.5	1910		1855	1882.5	1910
10	QPSK 1-0	23.19	**23.38**	23.15	0	0.00	0.00	0.00	17.65	**17.98**	17.81	0	0.00	0.00	0.00
10	QPSK 1-49	23.09	23.12	22.78		0.10	0.26	0.37	17.56	17.93	17.45		0.09	0.05	0.36
10	QPSK 25-13	21.98	22.09	21.93	≤ 1	1.21	1.29	1.22	17.49	16.80	17.47	≤ 1	0.16	1.18	0.34
10	QPSK 50-0	21.77	21.93	21.73		1.42	1.45	1.42	17.25	16.76	17.36		0.40	1.22	0.45
10	16QAM 1-0	22.24	22.42	22.34	≤ 1	0.95	0.96	0.81	17.05	17.46	17.25	≤ 1	0.60	0.52	0.56
10	16QAM 1-49	22.15	22.25	21.85		1.04	1.13	1.30	17.03	16.49	16.40		0.62	1.49	1.41
10	16QAM 25-13	21.05	21.06	20.94	≤ 2	2.14	2.32	2.21	16.48	15.81	16.48	≤ 2	1.17	2.17	1.33
10	16QAM 50-0	20.76	20.91	20.65		2.43	2.47	2.50	16.46	15.80	16.40		1.19	2.18	1.41
Channel		26065	26365	26665		26065	26365	26665	26065	26365	26665		26065	26365	26665
Frequency (MHz)		1852.5	1882.5	1912.5		1852.5	1882.5	1912.5	1852.5	1882.5	1912.5		1852.5	1882.5	1912.5
5	QPSK 1-0	23.14	23.29	23.17	0	0.00	0.00	0.00	17.45	17.95	17.81	0	0.38	0.00	0.00
5	QPSK 1-24	23.05	23.17	22.71		0.09	0.12	0.46	17.83	17.79	17.38		0.00	0.16	0.43
5	QPSK 12-6	22.09	22.21	21.98	≤ 1	1.05	1.08	1.19	17.14	17.05	17.45	≤ 1	0.69	0.90	0.36
5	QPSK 25-0	21.93	21.96	21.71		1.21	1.33	1.46	17.03	16.84	17.40		0.80	1.11	0.41
5	16QAM 1-0	22.25	22.46	22.21	≤ 1	0.89	0.83	0.96	16.99	17.10	17.22	≤ 1	0.84	0.85	0.59
5	16QAM 1-24	22.10	22.32	21.68		1.04	0.97	1.49	16.79	16.59	16.31		1.04	1.36	1.50
5	16QAM 12-6	21.23	21.21	20.93	≤ 2	1.91	2.08	2.24	16.13	16.08	16.48	≤ 2	1.70	1.87	1.33
5	16QAM 25-0	20.97	20.98	20.68		2.17	2.31	2.49	16.03	15.89	16.46		1.80	2.06	1.35
Channel		26055	26365	26675		26055	26365	26675	26055	26365	26675		26055	26365	26675
Frequency (MHz)		1851.5	1882.5	1913.5		1851.5	1882.5	1913.5	1851.5	1882.5	1913.5		1851.5	1882.5	1913.5
3	QPSK 1-0	23.13	23.16	22.97	0	0.00	0.00	0.00	17.45	17.94	17.70	0	0.29	0.00	0.00
3	QPSK 1-14	23.04	23.04	22.65		0.09	0.12	0.32	17.74	17.91	17.20		0.00	0.03	0.50
3	QPSK 8-4	22.19	22.18	21.71	≤ 1	0.94	0.98	1.26	16.81	16.91	17.00	≤ 1	0.93	1.03	0.70
3	QPSK 15-0	22.06	21.98	21.62		1.07	1.18	1.35	16.73	16.87	16.97		1.01	1.07	0.73
3	16QAM 1-0	22.16	22.45	22.01	≤ 1	0.97	0.71	0.96	16.89	17.09	16.95	≤ 1	0.85	0.85	0.75
3	16QAM 1-14	22.04	22.27	21.68		1.09	0.89	1.29	16.90	16.91	16.28		0.84	1.03	1.42
3	16QAM 8-4	21.18	21.19	20.69	≤ 2	1.95	1.97	2.28	15.91	16.08	16.10	≤ 2	1.83	1.86	1.60
3	16QAM 15-0	21.06	21.04	20.51		2.07	2.12	2.46	15.86	15.92	16.03		1.88	2.02	1.67
Channel		26047	26365	26683		26047	26365	26683	26047	26365	26683		26047	26365	26683
Frequency (MHz)		1850.7	1882.5	1914.3		1850.7	1882.5	1914.3	1850.7	1882.5	1914.3		1850.7	1882.5	1914.3
1.4	QPSK 1-0	23.20	23.23	22.79	0	0.00	0	0.00	17.88	17.01	17.50	0	0.07	0	0.00
1.4	QPSK 1-5	23.17	23.15	22.70		0.03	0	0.09	17.95	16.93	17.13		0.00	0	0.37
1.4	QPSK 3-2	23.15	23.03	22.66		0.05	0	0.13	17.93	16.81	17.18		0.02	0	0.32
1.4	QPSK 6-0	22.06	22.32	21.68	≤ 1	1.14	1	1.11	16.86	16.43	16.71	≤ 1	1.09	1	0.79
1.4	16QAM 1-0	22.27	22.41	22.02	≤ 1	0.93	1	0.77	17.18	16.28	16.93	≤ 1	0.77	1	0.57
1.4	16QAM 1-5	22.05	22.24	21.84		1.15	1	0.95	17.11	16.04	16.64		0.84	1	0.86
1.4	16QAM 3-2	22.17	22.13	21.69		1.03	1	1.10	16.92	15.96	16.50		1.03	1	1.00
1.4	16QAM 6-0	20.98	21.36	20.80	≤ 2	2.22	2	1.99	15.91	15.54	15.91	≤ 2	2.04	2	1.59

Note: Per KDB 941225, if the output power variation across the band < 0.5dB, test middle channel SAR first and determine further test reduction based on the SAR results.

<WLAN 2.4G Conducted Power>

Mode	Channel	Frequency (MHz)	Average power (dBm)			
			Data Rate (bps)			
			1M	2M	5.5M	11M
802.11b	CH 01	2412	11.39	11.55	12.00	12.06
	CH 06	2437	10.90	10.30	10.60	10.62
	CH 11	2462	13.73	13.91	13.91	**13.98**

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			Data Rate (bps)							
			6M	9M	12M	18M	24M	36M	48M	54M
802.11g	CH 01	2412	11.84	12.04	11.99	11.90	11.79	12.05	12.02	12.02
	CH 06	2437	9.86	10.45	9.90	10.31	10.32	10.02	10.35	10.24
	CH 11	2462	**13.62**	13.53	13.62	13.42	13.62	13.60	13.39	13.48

Mode	Channel	Frequency (MHz)	Average power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n HT20	CH 01	2412	10.89	10.34	10.61	10.30	10.69	10.33	10.57	10.70
	CH 06	2437	9.21	9.00	9.32	9.06	9.26	9.10	8.67	9.20
	CH 11	2462	**12.99**	12.46	12.63	11.80	11.62	12.53	12.40	12.81

Note:

1. Per KDB 248227, choose the lowest data rate, highest output power channel to test SAR and determine further SAR exclusion; CH11 1Mbps was chosen
2. Per KDB 248227, 11g and 11n-HT20 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 Conducted Power>

Mode	Channel	Frequency (MHz)	Average Power (dBm)								
			Package Type								
			DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
Bluetooth	CH 00	2402	0.39	0.53	**0.55**	-0.71	-0.75	-0.73	-0.78	-0.70	-0.72
	CH 39	2441	0.04	0.22	0.26	-1.04	-1.05	-1.07	-1.11	-1.02	-1.06
	CH 78	2480	0.45	0.54	0.48	-0.35	-0.30	-0.29	-0.40	-0.28	-0.36

1. Per KDB KDB 648474 D01, Bluetooth (0.55dBm) output power ≤ P_{Ref} and the distance to CDMA transmitting antenna ≥ 2.5cm, stand-alone SAR is not required.
2. Per KDB KDB 648474 D01, Bluetooth (0.55dBm) output power ≤ $2P_{Ref}$ and the distance to LTE transmitting antenna ≥ 5cm, therefore, stand-alone SAR is not required.

11. SAR Test Results

11.1 Test Records for Head SAR Test

<CDMA2000 SAR>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
1	**1xRTT / EVDO**	**CDMA2000 BC0**	**RC3 SO55**	**Right Cheek**	**777**	**23.98**	**24.5**	**1.127**	**0.929**	**1.047**	**0.08**	**0**
146	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Right Cheek	777	15.92	16.5	1.143	0.163	0.186	0.18	8.06
129	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Right Cheek	1013	23.87	24.5	1.156	0.722	0.835	-0.03	0
130	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Right Cheek	384	23.89	24.5	1.151	0.879	1.012	-0.0089	0
2	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Right Tilted	777	23.98	24.5	1.127	0.533	0.601	-0.03	0
3	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Left Cheek	777	23.98	24.5	1.127	0.789	0.889	0.08	0
147	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Left Cheek	777	15.92	16.5	1.143	0.127	0.145	0.04	8.06
4	1xRTT / EVDO	CDMA2000 BC0	RC3 SO55	Left Tilted	777	23.98	24.5	1.127	0.510	0.575	-0.08	0
5	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Right Cheek	1175	23.89	24	1.026	1.09	1.118	1.09	0
133	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Right Cheek	25	23.73	24	1.064	1.15	1.224	1.15	0
134	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Right Cheek	600	23.88	24	1.028	1.19	1.223	1.19	0
148	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Right Cheek	600	16.27	16.5	1.054	0.285	0.301	0.15	7.61
6	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Right Tilted	1175	23.89	24	1.026	0.227	0.233	-0.08	0
7	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Left Cheek	1175	23.89	24	1.026	1.1	1.128	0.07	0
135	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Left Cheek	25	23.73	24	1.064	1.16	1.234	0.12	0
136	**1xRTT / EVDO**	**CDMA2000 BC1**	**RC3 SO55**	**Left Cheek**	**600**	**23.88**	**24**	**1.028**	**1.2**	**1.234**	**0.02**	**0**
149	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Left Cheek	600	16.27	16.5	1.054	0.254	0.268	0.0069	7.61
8	1xRTT / EVDO	CDMA2000 BC1	RC3 SO55	Left Tilted	1175	23.89	24	1.026	0.219	0.225	0.08	0
9	**1xRTT / EVDO**	**CDMA2000 BC10**	**RC3 SO55**	**Right Cheek**	**580**	**24**	**24.5**	**1.122**	**0.724**	**0.812**	**0.19**	**0**
150	1xRTT / EVDO	CDMA2000 BC10	RC3 SO55	Right Cheek	580	16.2	16.5	1.072	0.132	0.141	-0.04	7.8
10	1xRTT / EVDO	CDMA2000 BC10	RC3 SO55	Right Tilted	580	24	24.5	1.122	0.440	0.494	-0.05	0
11	1xRTT / EVDO	CDMA2000 BC10	RC3 SO55	Left Cheek	580	24	24.5	1.122	0.619	0.695	0.15	0
151	1xRTT / EVDO	CDMA2000 BC10	RC3 SO55	Left Cheek	580	16.2	16.5	1.072	0.117	0.125	0.09	7.8
12	1xRTT / EVDO	CDMA2000 BC10	RC3 SO55	Left Tilted	580	24	24.5	1.122	0.442	0.496	-0.09	0

Note:
1. Per KDB 447498 and KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. Reduced power SAR is repeated for simultaneous transmission analysis. The simultaneous transmission analysis starts from each wireless interface maximum power standalone SAR. Only the test cases which cannot pass 1g summation or SPLSR will be repeated with reduced power.

<LTE SAR>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
13	LTE	LTE Band 25	QPSK	10	25	13	Right Cheek	26365	22.09	22.5	1.099	0.957	1.052	0.10	0
126	LTE	LTE Band 25	QPSK	10	25	13	Right Cheek	26090	21.98	22.5	1.127	0.895	1.009	0.18	0
127	LTE	LTE Band 25	QPSK	10	25	13	Right Cheek	26640	21.93	22.5	1.140	0.880	1.003	-0.06	0
17	**LTE**	**LTE Band 25**	**QPSK**	**10**	**1**	**0**	**Right Cheek**	**26365**	**23.38**	**23.5**	**1.028**	**1.37**	**1.408**	**0.07**	**0**
152	LTE	LTE Band 25	QPSK	10	1	0	Right Cheek	26365	17.98	18.5	1.127	0.33	0.372	0.01	5.4
21	LTE	LTE Band 25	QPSK	10	1	49	Right Cheek	26365	23.12	23.5	1.091	1.13	1.233	-0.04	0
25	LTE	LTE Band 25	16QAM	10	25	13	Right Cheek	26365	21.06	21.5	1.107	0.767	0.849	0.08	0
29	LTE	LTE Band 25	16QAM	10	1	0	Right Cheek	26365	22.42	23	1.143	1.12	1.280	0.0071	0
33	LTE	LTE Band 25	16QAM	10	1	49	Right Cheek	26365	22.25	23	1.189	0.926	1.101	0.10	0
14	LTE	LTE Band 25	QPSK	10	25	13	Right Tilted	26365	22.09	22.5	1.099	0.146	0.160	0.01	0
18	LTE	LTE Band 25	QPSK	10	1	0	Right Tilted	26365	23.38	23.5	1.028	0.221	0.227	0.04	0
22	LTE	LTE Band 25	QPSK	10	1	49	Right Tilted	26365	23.12	23.5	1.091	0.179	0.195	0.07	0
26	LTE	LTE Band 25	16QAM	10	25	13	Right Tilted	26365	21.06	21.5	1.107	0.112	0.124	0.12	0
30	LTE	LTE Band 25	16QAM	10	1	0	Right Tilted	26365	22.42	23	1.143	0.164	0.187	0.01	0
34	LTE	LTE Band 25	16QAM	10	1	49	Right Tilted	26365	22.25	23	1.189	0.135	0.160	0.02	0
15	LTE	LTE Band 25	QPSK	10	25	13	Left Cheek	26365	22.09	22.5	1.099	0.640	0.703	0.11	0
19	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	26365	23.38	23.5	1.028	0.937	0.963	-0.15	0
153	LTE	LTE Band 25	QPSK	10	1	0	Left Cheek	26365	17.98	18.5	1.127	0.212	0.239	0.02	5.4
23	LTE	LTE Band 25	QPSK	10	1	49	Left Cheek	26365	23.12	23.5	1.091	0.775	0.846	0.09	0
27	LTE	LTE Band 25	16QAM	10	25	13	Left Cheek	26365	21.06	21.5	1.107	0.484	0.536	0.05	0
31	LTE	LTE Band 25	16QAM	10	1	0	Left Cheek	26365	22.42	23	1.143	0.732	0.837	-0.09	0
35	LTE	LTE Band 25	16QAM	10	1	49	Left Cheek	26365	22.25	23	1.189	0.611	0.726	0.05	0
16	LTE	LTE Band 25	QPSK	10	25	13	Left Tilted	26365	22.09	22.5	1.099	0.193	0.212	0.08	0
20	LTE	LTE Band 25	QPSK	10	1	0	Left Tilted	26365	23.38	23.5	1.028	0.270	0.278	-0.06	0
24	LTE	LTE Band 25	QPSK	10	1	49	Left Tilted	26365	23.12	23.5	1.091	0.239	0.261	0.04	0
28	LTE	LTE Band 25	16QAM	10	25	13	Left Tilted	26365	21.06	21.5	1.107	0.148	0.164	0.15	0
32	LTE	LTE Band 25	16QAM	10	1	0	Left Tilted	26365	22.42	23	1.143	0.215	0.246	-0.10	0
36	LTE	LTE Band 25	16QAM	10	1	49	Left Tilted	26365	22.25	23	1.189	0.190	0.226	0.06	0

Note:

1. Considering the users may install 3rd party software to enable VOIP, LTE Head SAR is also evaluated. Because FCC has not published uniform procedures for VOIP in LTE, therefore all channels and modes and modulations required under the other KDB pub 941225 D05 FCC LTE procedures were used for the held-near-head testing.
2. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is ≤ 1.45 W/kg, SAR for smaller bandwidth can be excluded.
3. Per KDB 941225 D05, if the measured 50%-RB QPSK 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
4. Per KDB 941225 D05, for LTE, if 50%-RB QPSK SAR ≤ 1.45 W/kg, 100%-RB QPSK SAR can be excluded; if 50%-RB 16QAM SAR ≤ 1.45 W/kg, 100%-RB 16QAM SAR can be excluded.
5. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
6. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for QPSK and 50% RB allocation, measure SAR on the highest output power channel for the 1 RB allocation.
7. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for 16QAM and 50% RB measure SAR on the highest output power channel for the 1 RB allocation.
8. Reduced power SAR is repeated for simultaneous transmission analysis. The simultaneous transmission analysis starts from each wireless interface maximum power standalone SAR. Only the test cases which cannot pass 1g summation or SPLSR will be repeated with reduced power.

<WLAN SAR>

Plot No.	Antenna	Band	Mode	Test Position	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
37	WLAN/BT	WLAN 2.4G	802.11b	Right Cheek	11	13.98	14.5	1.127	0.086	0.097	0.02	0
38	WLAN/BT	WLAN 2.4G	802.11b	Right Tilted	11	13.98	14.5	1.127	0.039	0.044	0.15	0
39	**WLAN/BT**	**WLAN 2.4G**	**802.11b**	**Left Cheek**	**11**	**13.98**	**14.5**	**1.127**	**0.148**	**0.167**	**-0.05**	**0**
40	WLAN/BT	WLAN 2.4G	802.11b	Left Tilted	11	13.98	14.5	1.127	0.034	0.038	-0.07	0

Note: Per KDB 248227 and KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

11.2 Test Records for Hotspot SAR Test

<CDMA2000 SAR>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
47	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Front	1	777	23.87	24.5	1.156	0.909	1.051	-0.05	0
122	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Front	1	1013	23.89	24.5	1.151	0.766	0.882	0.04	0
123	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Front	1	384	23.9	24.5	1.148	0.972	1.116	0.08	0
48	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Back	1	777	23.87	24.5	1.156	1.1	1.272	-0.08	0
120	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Back	1	1013	23.89	24.5	1.151	0.906	1.043	0.05	0
121	**1xRTT / EVDO**	**CDMA2000 BC0**	**RTAP 153.6**	**Back**	**1**	**384**	**23.9**	**24.5**	**1.148**	**1.26**	**1.447**	**-0.02**	**0**
49	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Left Side	1	777	23.87	24.5	1.156	0.745	0.861	-0.02	0
50	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Right Side	1	777	23.87	24.5	1.156	0.645	0.746	-0.07	0
51	1xRTT / EVDO	CDMA2000 BC0	RTAP 153.6	Bottom Side	1	777	23.87	24.5	1.156	0.193	0.223	0.08	0
58	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Front	1	1175	23.75	24	1.059	1.1	1.165	-0.12	0
128	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Front	1	25	23.61	24	1.094	1.04	1.138	-0.005	0
143	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Front	1	600	23.7	24	1.072	1.13	1.211	-0.09	0
59	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Back	1	1175	23.75	24	1.059	1.34	1.419	0.02	0
144	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Back	1	25	23.61	24	1.094	1.24	1.357	0.11	0
145	**1xRTT / EVDO**	**CDMA2000 BC1**	**RTAP 153.6**	**Back**	**1**	**600**	**23.7**	**24**	**1.072**	**1.37**	**1.468**	**-0.0083**	**0**
60	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Left Side	1	1175	23.75	24	1.059	0.583	0.618	-0.19	0
61	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Right Side	1	1175	23.75	24	1.059	0.335	0.355	0.09	0
62	1xRTT / EVDO	CDMA2000 BC1	RTAP 153.6	Bottom Side	1	1175	23.75	24	1.059	0.640	0.678	0.04	0
69	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Front	1	580	23.9	24.5	1.148	0.847	0.972	0.08	0
124	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Front	1	476	23.84	24.5	1.164	0.68	0.792	-0.03	0
125	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Front	1	684	23.85	24.5	1.161	0.806	0.936	0.09	0
70	**1xRTT / EVDO**	**CDMA2000 BC10**	**RTAP 153.6**	**Back**	**1**	**580**	**23.9**	**24.5**	**1.148**	**1.14**	**1.309**	**-0.06**	**0**
118	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Back	1	476	23.84	24.5	1.164	0.888	1.034	-0.05	0
119	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Back	1	684	23.85	24.5	1.161	1.02	1.185	0.0048	0
71	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Left Side	1	580	23.9	24.5	1.148	0.718	0.824	0.03	0
72	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Right Side	1	580	23.9	24.5	1.148	0.703	0.807	0.03	0
73	1xRTT / EVDO	CDMA2000 BC10	RTAP 153.6	Bottom Side	1	580	23.9	24.5	1.148	0.144	0.165	0.05	0

Note:
1. Per KDB 941225 D06, for EUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front / Back / Bottom Side / Right Side / Left Side is necessary for 1xRTT and EVDO.
3. Per KDB 447498 and KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
4. Reduced power SAR is repeated for simultaneous transmission analysis. The simultaneous transmission analysis starts from each wireless interface maximum power standalone SAR. Only the test cases which cannot pass 1g summation or SPLSR will be repeated with reduced power.

<LTE SAR>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
74	LTE	LTE Band 25	QPSK	10	25	13	Front	1	26365	22.09	22.5	1.099	0.308	0.338	-0.08	0
82	LTE	LTE Band 25	QPSK	10	1	0	Front	1	26365	23.38	23.5	1.028	0.447	0.460	-0.03	0
165	LTE	LTE Band 25	QPSK	10	1	0	Front	1	26365	17.98	18.5	1.127	0.127	0.143	0.02	5.4
86	LTE	LTE Band 25	QPSK	10	1	49	Front	1	26365	23.12	23.5	1.091	0.37	0.404	-0.02	0
90	LTE	LTE Band 25	16QAM	10	25	13	Front	1	26365	21.06	22.5	1.393	0.24	0.334	0.007	0
94	LTE	LTE Band 25	16QAM	10	1	0	Front	1	26365	22.42	22.5	1.019	0.359	0.366	-0.17	0
98	LTE	LTE Band 25	16QAM	10	1	49	Front	1	26365	22.25	22.5	1.059	0.29	0.307	-0.01	0
75	LTE	LTE Band 25	QPSK	10	25	13	Back	1	26365	22.09	22.5	1.099	0.86	0.945	0.03	0
106	LTE	LTE Band 25	QPSK	10	25	13	Back	1	26090	21.98	22.5	1.127	0.738	0.832	0.02	0
107	LTE	LTE Band 25	QPSK	10	25	13	Back	1	26640	21.93	22.5	1.140	0.779	0.888	0.02	0
83	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26365	23.38	23.5	1.028	1.19	1.223	0.04	0
166	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26365	17.98	18.5	1.127	0.328	0.370	0.03	5.4
87	LTE	LTE Band 25	QPSK	10	1	49	Back	1	26365	23.12	23.5	1.091	1.03	1.124	0.09	0
91	LTE	LTE Band 25	16QAM	10	25	13	Back	1	26365	21.06	22.5	1.393	0.626	0.872	0.10	0
95	LTE	LTE Band 25	16QAM	10	1	0	Back	1	26365	22.42	22.5	1.019	0.875	0.891	0.10	0
99	LTE	LTE Band 25	16QAM	10	1	49	Back	1	26365	22.25	22.5	1.059	0.744	0.788	0.05	0
76	LTE	LTE Band 25	QPSK	10	25	13	Right Side	1	26365	22.09	22.5	1.099	0.862	0.947	-0.10	0
131	LTE	LTE Band 25	QPSK	10	25	13	Right Side	1	26090	21.98	22.5	1.127	0.833	0.939	-0.03	0
132	LTE	LTE Band 25	QPSK	10	25	13	Right Side	1	26640	21.93	22.5	1.140	0.754	0.860	-0.13	0
84	**LTE**	**LTE Band 25**	**QPSK**	**10**	**1**	**0**	**Right Side**	**1**	**26365**	**23.38**	**23.5**	**1.028**	**1.24**	**1.275**	**-0.08**	**0**
167	LTE	LTE Band 25	QPSK	10	1	0	Right Side	1	26365	17.98	18.5	1.127	0.317	0.357	-0.05	5.4
88	LTE	LTE Band 25	QPSK	10	1	49	Right Side	1	26365	23.12	23.5	1.091	1.06	1.157	-0.15	0
92	LTE	LTE Band 25	16QAM	10	25	13	Right Side	1	26365	21.06	22.5	1.393	0.683	0.952	-0.07	0
96	LTE	LTE Band 25	16QAM	10	1	0	Right Side	1	26365	22.42	22.5	1.019	0.962	0.980	-0.11	0
100	LTE	LTE Band 25	16QAM	10	1	49	Right Side	1	26365	22.25	22.5	1.059	0.839	0.889	-0.17	0

Note:
1. Per KDB 941225 D06, for DUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front / Back/ Right Side is necessary for LTE Band 25.
3. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½ dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is < 1.45 W/kg, SAR for smaller bandwidth can be excluded. Therefore LTE 5MHz bandwidth SAR tests are excluded.
4. Per KDB 941225 D05, if the measured 50%-RB 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
5. Per KDB 941225 D05, for LTE, if 50%-RB QPSK SAR ≤ 1.45 W/kg, 100%-RB QPSK SAR can be excluded; if 50%-RB 16QAM SAR ≤ 1.45 W/kg, 100%-RB 16QAM SAR can be excluded. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
6. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for QPSK and 50% RB allocation, measure SAR on the highest output power channel for the 1 RB allocation.
7. If the maximum average conducted output power for a 1 RB allocation is > ½ dB higher than the 50% RB allocation, instead of using the highest SAR channel measured for 16QAM and 50% RB measure SAR on the highest output power channel for the 1 RB allocation.
8. Reduced power SAR is repeated for simultaneous transmission analysis. The simultaneous transmission analysis starts from each wireless interface maximum power standalone SAR. Only the test cases which cannot pass 1g summation or SPLSR will be repeated with reduced power.

<WLAN SAR>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
102	WLAN/BT	WLAN 2.4G	802.11b	Front	1	11	13.98	14.5	1.127	0.042	0.047	0.03	0
103	**WLAN/BT**	**WLAN 2.4G**	**802.11b**	**Back**	**1**	**11**	**13.98**	**14.5**	**1.127**	**0.112**	**0.126**	**-0.03**	**0**
104	WLAN/BT	WLAN 2.4G	802.11b	Left Side	1	11	13.98	14.5	1.127	0.105	0.118	0.04	0

Note:
1. Per KDB 941225 D06, for EUT dimension ≥ 9cm*5cm, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.
2. As in (1), SAR for Front / Back / Left Side is necessary.
3. Per KDB 248227 and KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

11.3 Test Records for Body-worn SAR Test

<CDMA2000 SAR>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
41	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Front	1	777	23.8	24.5	1.175	0.901	1.059	0.0012	0
78	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Front	1	1013	23.81	24.5	1.172	0.776	0.910	0.08	0
79	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Front	1	384	23.89	24.5	1.151	0.985	1.134	0.0022	0
155	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Front	1	384	16.25	16.5	1.059	0.172	0.182	-0.02	7.64
42	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back	1	777	23.8	24.5	1.175	1.12	1.316	-0.06	0
110	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back	1	1013	23.81	24.5	1.172	0.89	1.043	0.05	0
111	**1xRTT / EVDO**	**CDMA2000 BC0**	**RC3 SO32**	**Back**	**1**	**384**	**23.89**	**24.5**	**1.151**	**1.22**	**1.404**	**-0.07**	**0**
156	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back	1	384	16.25	16.5	1.059	0.223	0.236	0.03	7.64
46	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back w/ headset	1	384	23.89	24.5	1.151	0.951	1.094	-0.03	0
157	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back w/ headset	1	384	16.25	16.5	1.059	0.174	0.184	0.17	7.64
112	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back w/ headset	1	1013	23.81	24.5	1.172	0.780	0.914	0.02	0
113	1xRTT / EVDO	CDMA2000 BC0	RC3 SO32	Back w/ headset	1	777	23.8	24.5	1.175	0.793	0.932	-0.05	0
52	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Front	1	1175	23.89	24	1.026	1.09	1.118	-0.08	0
139	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Front	1	25	23.73	24	1.064	1.05	1.117	-0.13	0
140	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Front	1	600	23.88	24	1.028	1.13	1.162	0.04	0
159	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Front	1	600	16.19	16.5	1.074	0.22	0.236	0.18	7.69
53	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back	1	1175	23.89	24	1.026	1.31	1.344	-0.10	0
137	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back	1	25	23.73	24	1.064	1.29	1.373	0.00031	0
138	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back	1	600	23.88	24	1.028	1.37	1.408	-0.03	0
160	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back	1	600	16.19	16.5	1.074	0.262	0.281	-0.01	7.69
57	**1xRTT / EVDO**	**CDMA2000 BC1**	**RC3 SO32**	**Back w/ headset**	**1**	**600**	**23.88**	**24**	**1.028**	**1.4**	**1.439**	**0.05**	**0**
161	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back w/ headset	1	600	16.19	16.5	1.074	0.27	0.290	0.10	7.69
141	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back w/ headset	1	25	23.73	24	1.064	1.27	1.351	-0.02	0
142	1xRTT / EVDO	CDMA2000 BC1	RC3 SO32	Back w/ headset	1	1175	23.89	24	1.026	1.36	1.395	0.02	0
63	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Front	1	580	23.95	24.5	1.135	0.861	0.977	-0.10	0
80	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Front	1	476	23.82	24.5	1.169	0.687	0.803	0.0096	0
81	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Front	1	684	23.89	24.5	1.151	0.83	0.955	-0.05	0
64	**1xRTT / EVDO**	**CDMA2000 BC10**	**RC3 SO32**	**Back**	**1**	**580**	**23.95**	**24.5**	**1.135**	**1.21**	**1.373**	**-0.02**	**0**
162	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back	1	580	16.19	16.5	1.074	0.215	0.231	-0.01	7.76
114	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back	1	476	23.82	24.5	1.169	1.2	1.403	0.07	0
115	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back	1	684	23.89	24.5	1.151	0.999	1.150	0.01	0
68	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back w/ headset	1	580	23.95	24.5	1.135	0.858	0.974	0.06	0
164	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back w/ headset	1	580	16.19	16.5	1.074	0.166	0.178	0.00085	7.76
116	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back w/ headset	1	476	23.82	24.5	1.169	0.737	0.862	0.0025	0
117	1xRTT / EVDO	CDMA2000 BC10	RC3 SO32	Back w/ headset	1	684	23.89	24.5	1.151	0.822	0.946	0.02	0

Note:
1. Per KDB 447498 and KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. Reduced power SAR is repeated for simultaneous transmission analysis. The simultaneous transmission analysis starts from each wireless interface maximum power standalone SAR. Only the test cases which cannot pass 1g summation or SPLSR will be repeated with reduced power.

<LTE SAR>

Plot No.	Antenna	Band	Mode	BW (MHz)	RB Size	RB Offset	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
74	LTE	LTE Band 25	QPSK	10	25	13	Front	1	26365	22.09	22.5	1.099	0.308	0.338	-0.08	0
82	LTE	LTE Band 25	QPSK	10	1	0	Front	1	26365	23.38	23.5	1.028	0.447	0.460	-0.03	0
165	LTE	LTE Band 25	QPSK	10	1	0	Front	1	26365	17.98	18.5	1.127	0.127	0.143	0.02	5.4
86	LTE	LTE Band 25	QPSK	10	1	49	Front	1	26365	23.12	23.5	1.091	0.37	0.404	-0.02	0
90	LTE	LTE Band 25	16QAM	10	25	13	Front	1	26365	21.06	22.5	1.393	0.24	0.334	0.007	0
94	LTE	LTE Band 25	16QAM	10	1	0	Front	1	26365	22.42	22.5	1.019	0.359	0.366	-0.17	0
98	LTE	LTE Band 25	16QAM	10	1	49	Front	1	26365	22.25	22.5	1.059	0.29	0.307	-0.01	0
75	LTE	LTE Band 25	QPSK	10	25	13	Back	1	26365	22.09	22.5	1.099	0.86	0.945	0.03	0
106	LTE	LTE Band 25	QPSK	10	25	13	Back	1	26090	21.98	22.5	1.127	0.738	0.832	0.02	0
107	LTE	LTE Band 25	QPSK	10	25	13	Back	1	26640	21.93	22.5	1.140	0.779	0.888	0.02	0
83	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26365	23.38	23.5	1.028	1.19	1.223	0.04	0
166	LTE	LTE Band 25	QPSK	10	1	0	Back	1	26365	17.98	18.5	1.127	0.328	0.370	0.03	5.4
87	LTE	LTE Band 25	QPSK	10	1	49	Back	1	26365	23.12	23.5	1.091	1.03	1.124	0.09	0
91	LTE	LTE Band 25	16QAM	10	25	13	Back	1	26365	21.06	22.5	1.393	0.626	0.872	0.10	0
95	LTE	LTE Band 25	16QAM	10	1	0	Back	1	26365	22.42	22.5	1.019	0.875	0.891	0.10	0
99	LTE	LTE Band 25	16QAM	10	1	49	Back	1	26365	22.25	22.5	1.059	0.744	0.788	0.05	0
77	LTE	LTE Band 25	QPSK	10	25	13	Back w/ headset	1	26365	22.09	22.5	1.099	0.838	0.921	0.05	0
108	LTE	LTE Band 25	QPSK	10	25	13	Back w/ headset	1	26090	21.98	22.5	1.127	0.698	0.787	0.05	0
109	LTE	LTE Band 25	QPSK	10	25	13	Back w/ headset	1	26640	21.93	22.5	1.140	0.787	0.897	0.16	0
85	**LTE**	**LTE Band 25**	**QPSK**	**10**	**1**	**0**	**Back w/ headset**	**1**	**26365**	**23.38**	**23.5**	**1.028**	**1.25**	**1.285**	**0.02**	**0**
168	LTE	LTE Band 25	QPSK	10	1	0	Back w/ headset	1	26365	17.98	18.5	1.127	0.337	0.380	0.04	5.4
89	LTE	LTE Band 25	QPSK	10	1	49	Back w/ headset	1	26365	23.12	23.5	1.091	1.05	1.146	0.14	0
93	LTE	LTE Band 25	16QAM	10	25	13	Back w/ headset	1	26365	21.06	22.5	1.393	0.647	0.901	0.04	0
97	LTE	LTE Band 25	16QAM	10	1	0	Back w/ headset	1	26365	22.42	22.5	1.019	0.889	0.906	-0.04	0
101	LTE	LTE Band 25	16QAM	10	1	49	Back w/ headset	1	26365	22.25	22.5	1.059	0.747	0.791	0.11	0

Note:

1. Per KDB 941225 D05, for LTE, if the smaller bandwidth output power is within +/- ½ dB of the largest bandwidth, and the maximum SAR of the largest bandwidth is ≤ 1.45 W/kg, SAR for smaller bandwidth can be excluded.
2. Per KDB 941225 D05, if the measured 50%-RB 1g-SAR for the middle or highest output power channel is ≤ 0.8W/kg, remaining 2 channels SAR tests can be excluded. Otherwise, 50% RB allocation of the remaining 2 channels SAR tests are necessary.
3. Per KDB 941225 D05, for LTE, if 50%-RB QPSK SAR ≤ 1.45 W/kg, 100%-RB QPSK SAR can be excluded; if 50%-RB 16QAM SAR ≤ 1.45 W/kg, 100%-RB 16QAM SAR can be excluded.
4. If SAR of 1 RB allocation is ≤ 1.45W/kg, SAR of 1 RB allocation of remaining channels can be excluded.
5. Reduced power SAR is repeated for simultaneous transmission analysis. The simultaneous transmission analysis starts from each wireless interface maximum power standalone SAR. Only the test cases which cannot pass 1g summation or SPLSR will be repeated with reduced power.

<WLAN SAR>

Plot No.	Antenna	Band	Mode	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Power Drift (dB)	Reduced Power (dB)
102	WLAN/BT	WLAN 2.4G	802.11b	Front	1	11	13.98	14.5	1.127	0.042	0.047	0.03	0
103	**WLAN/BT**	**WLAN 2.4G**	**802.11b**	**Back**	**1**	**11**	**13.98**	**14.5**	**1.127**	**0.112**	**0.126**	**-0.03**	**0**
105	WLAN/BT	WLAN 2.4G	802.11b	Back w/ headset	1	11	13.98	14.5	1.127	0.1	0.113	-0.13	0

Note: Per KDB 248227 and KDB 648474, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.

11.4 Simultaneous Multi-band Transmission Analysis

	Position	Applicable Combination
Simultaneous Transmission	Head	1x CDMA (voice) + LTE (data) + WLAN (router)
		1x CDMA (voice) + WLAN (router)
		1x CDMA (voice) + LTE (data) + BT
		1x CDMA (voice) + BT
		1x CDMA (voice) + LTE (data)
	Hotspot	1x EVDO (data) + WLAN (router)
		LTE (data) + WLAN (router)
	Body-worn	1x CDMA (voice) + LTE (data) + WLAN (router)
		1x CDMA (voice) + LTE (data)
		1x CDMA (voice) + WLAN (router)
		LTE (data) + WLAN (router)
		1x CDMA (voice) + LTE (data) + BT
		1x CDMA (voice) + BT
		LTE (data) + BT

Note:

1. WLAN and BT share the same antenna, and cannot transmit simultaneously.
2. WLAN2.4G/BT share the same antenna and operates at the same frequency band, where BT output power (0.55dBm < 60/f) is far less than 802.11b output power (max:13.98dBm; min 10.30dBm), the RF exposure compliance of WLAN represent that of Bluetooth.
3. CDMA2000 1XRTT and EVDO share the same antenna, and cannot transmit simultaneously.
4. The maximum SAR summation is calculated based on the same configuration and test position.
5. When stand-alone 1-g SAR is not required for a transmitter or antenna, its SAR is considered zero in the 1-g SAR summing process to determine simultaneous transmission SAR evaluation requirements.
6. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary.
7. If 1g-SAR summation > 1.6W/kg, SPLSR calculation is necessary.

The implemented power combinations (Unit: dBm)

SVLTE Mode		Data Mode
Voice		LTE Band 25 BW=1.4/3/5/10MHz QPSK 1RB
1xRTT BC0/BC10	16.5	23.5
	24.5	18.5
1xRTT BC1	16.5	23.5
	24	18.5

Alternative combinations (Unit: dBm) – For analysis purpose only

Power combination	CDMA2000 1x voice	LTE data mode
#1	**Full Power** BC0/BC10: 24.5 BC1: 24	**Full Power** 23.5
#2	**Reduced Power** BC0/BC10: 16.5 BC1: 16.5	**Full Power** 23.5
#3	**Full Power** BC0/BC10: 24.5 BC1: 24	**Reduced Power** 18.5

Note:

1. For SVLTE mode which means LTE(data) and CDMA 1xRTT(voice) transmitting simultaneously, power reduction is implemented.
2. When EUT 1xRTT output power is > 16.5dBm, LTE maximum output power is limited to 18.5dBm regardless of the power control command from the base station.

Analysis Procedure:

Step1

1. Per KDB 941225 D05, maximum power standalone SAR of 1xRTT/EVDO/LTE is used for simultaneous transmission analysis.
2. Start analysis from full power combination (Alternative Power combination #1).
3. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement and further evaluations are not necessary.
4. If 1g-SAR summation >1.6W/kg, step2 analysis is required.

Step2

5. For the cases from step1, power combinations #2/#3 are used in further step2 analysis.
6. If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement and further evaluations are not necessary.
7. If 1g-SAR summation >1.6W/kg, SPLSR calculation is necessary.
8. If resulting SPLSR < 0.3, further evaluation is not required.
9. If resulting SPLSR > 0.3, volume scan measurement is required.

Table 11.4-A1: Head SAR analysis <Step1>

	Position	Applicable Combination
Simultaneous Transmission	Head	1x CDMA (voice) + LTE (data) + WLAN (router)
		1x CDMA (voice) + WLAN (router)
		1x CDMA (voice) + LTE (data) + BT
		1x CDMA (voice) + BT
		1x CDMA (voice) + LTE (data)

	Scaled WWAN (voice)				Scaled WWAN (data)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Right Cheek	CDMA BC0	1	23.98	1.047	LTE Band 25	17	23.38	1.408	37	13.98	0.097	**2.55**	#A1-1
	CDMA BC1	134	23.88	1.223	LTE Band 25	17	23.38	1.408	37	13.98	0.097	**2.73**	#A1-2
	CDMA BC10	9	24	0.812	LTE Band 25	17	23.38	1.408	37	13.98	0.097	**2.32**	#A1-3
Right Tilted	CDMA BC0	2	23.98	0.601	LTE Band 25	18	23.38	0.227	38	13.98	0.044	0.87	-
	CDMA BC1	6	23.89	0.233	LTE Band 25	18	23.38	0.227	38	13.98	0.044	0.50	-
	CDMA BC10	10	24	0.494	LTE Band 25	18	23.38	0.227	38	13.98	0.044	0.77	-
Left Cheek	CDMA BC0	3	23.98	0.889	LTE Band 25	19	23.38	0.963	39	13.98	0.167	**2.02**	#A1-4
	CDMA BC1	136	23.88	1.234	LTE Band 25	19	23.38	0.963	39	13.98	0.167	**2.36**	#A1-5
	CDMA BC10	11	24	0.695	LTE Band 25	19	23.38	0.963	39	13.98	0.167	**1.83**	#A1-6
Left Tilted	CDMA BC0	4	23.98	0.575	LTE Band 25	20	23.38	0.278	40	13.98	0.038	0.89	-
	CDMA BC1	8	23.89	0.225	LTE Band 25	20	23.38	0.278	40	13.98	0.038	0.54	-
	CDMA BC10	12	24	0.496	LTE Band 25	20	23.38	0.278	40	13.98	0.038	0.81	-

Remark:
1. The SAR summation represents the simultaneous transmission of, a WWAN voice call and WWAN data transmission and WLAN as hotspot router; 3 transmitters operating at the same time.
2. The ananlysis above will represent the compliance of the simultaneous transmission of a WWAN voice call and WWAN data transmission, since the possible WWAN output power configuration in SVLTE mode(2 transmitters) is exactly the same as the configuration in SVLTE+WLAN hotspot (3 transmitters).

	Scaled WWAN (voice)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Right Cheek	CDMA BC0	1	23.98	1.047	37	13.98	0.097	1.144	-
	CDMA BC1	134	23.88	1.223	37	13.98	0.097	1.32	-
	CDMA BC10	9	24	0.812	37	13.98	0.097	0.909	-
Right Tilted	CDMA BC0	2	23.98	0.601	38	13.98	0.044	0.645	-
	CDMA BC1	6	23.89	0.233	38	13.98	0.044	0.277	-
	CDMA BC10	10	24	0.494	38	13.98	0.044	0.538	-
Left Cheek	CDMA BC0	3	23.98	0.889	39	13.98	0.167	1.056	-
	CDMA BC1	136	23.88	1.234	39	13.98	0.167	1.401	-
	CDMA BC10	11	24	0.695	39	13.98	0.167	0.862	-
Left Tilted	CDMA BC0	4	23.98	0.575	40	13.98	0.038	0.613	-
	CDMA BC1	8	23.89	0.225	40	13.98	0.038	0.263	-
	CDMA BC10	12	24	0.496	40	13.98	0.038	0.534	-

Remark:
The SAR summation represents the simultaneous transmission of a WWAN voice call and WLAN data transmission.

Table 11.4-A2: Head SAR analysis <Step2>

	Scaled WWAN (voice)				Scaled WWAN (data)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Right Cheek	CDMA BC0	1	23.98	1.047	LTE Band 25	17	23.38	1.408	37	13.98	0.097	2.55	#A1-1
	CDMA BC0	146	15.92	0.186	LTE Band 25	17	23.38	1.408	37	13.98	0.097	**1.69**	#A2-1
	CDMA BC0	1	23.98	1.047	LTE Band 25	152	17.98	0.372	37	13.98	0.097	1.52	-
	CDMA BC1	134	23.88	1.223	LTE Band 25	17	23.38	1.408	37	13.98	0.097	2.73	#A1-2
	CDMA BC1	148	16.27	0.301	LTE Band 25	17	23.38	1.408	37	13.98	0.097	**1.81**	#A2-2
	CDMA BC1	134	23.88	1.223	LTE Band 25	152	17.98	0.372	37	13.98	0.097	**1.69**	#A2-3
	CDMA BC10	9	24	0.812	LTE Band 25	17	23.38	1.408	37	13.98	0.097	2.32	#A1-3
	CDMA BC10	150	16.2	0.141	LTE Band 25	17	23.38	1.408	37	13.98	0.097	**1.65**	#A2-4
	CDMA BC10	9	24	0.812	LTE Band 25	152	17.98	0.372	37	13.98	0.097	1.28	
Left Cheek	CDMA BC0	3	23.98	0.889	LTE Band 25	19	23.38	0.963	39	13.98	0.167	2.02	#A1-4
	CDMA BC0	147	15.92	0.145	LTE Band 25	19	23.38	0.963	39	13.98	0.167	1.28	
	CDMA BC0	3	23.98	0.889	LTE Band 25	153	17.98	0.239	39	13.98	0.167	1.29	
	CDMA BC1	136	23.88	1.234	LTE Band 25	19	23.38	0.963	39	13.98	0.167	2.36	#A1-5
	CDMA BC1	149	16.27	0.268	LTE Band 25	19	23.38	0.963	39	13.98	0.167	1.40	
	CDMA BC1	136	23.88	1.234	LTE Band 25	153	17.98	0.239	39	13.98	0.167	**1.64**	#A2-5
	CDMA BC10	11	24	0.695	LTE Band 25	19	23.38	0.963	39	13.98	0.167	1.83	#A1-6
	CDMA BC10	151	16.2	0.125	LTE Band 25	19	23.38	0.963	39	13.98	0.167	1.26	
	CDMA BC10	11	24	0.695	LTE Band 25	153	17.98	0.239	39	13.98	0.167	1.10	

Table 11.4-B1: Hotspot mode SAR analysis <Step1>

Refer to Exposure Positions Consideration in section 10.1

Sides for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	**Back**	**Front**	**Top Side**	**Bottom Side**	**Right Side**	**Left Side**
LTE	YES	YES	NO	NO	YES	NO
CDMA 1xRTT / EVDO	YES	YES	NO	YES	YES	YES
WLAN&BT	YES	YES	NO	NO	NO	YES

	Position	**Applicable Combination**
Simultaneous Transmission	**Hotspot**	EVDO (data) + WLAN (router)
		LTE (data) + WLAN (router)

	Scaled WWAN (data)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Front	1xEVDO BC0	123	23.9	1.116	102	13.98	0.047	1.16	-
	1xEVDO BC1	143	23.7	1.211	102	13.98	0.047	1.26	-
	1xEVDO BC10	69	23.9	0.972	102	13.98	0.047	1.02	-
	LTE Band 25	82	23.38	0.460	102	13.98	0.047	0.51	
Back	1xEVDO BC0	121	23.9	1.447	103	13.98	0.126	1.57	-
	1xEVDO BC1	145	23.7	1.468	103	13.98	0.126	1.59	-
	1xEVDO BC10	70	23.9	1.309	103	13.98	0.126	1.44	-
	LTE Band 25	83	23.38	1.223	103	13.98	0.126	1.35	
Left Side	1xEVDO BC0	49	23.87	0.861	104	13.98	0.118	0.98	-
	1xEVDO BC1	60	23.75	0.618	104	13.98	0.118	0.74	-
	1xEVDO BC10	71	23.9	0.824	104	13.98	0.118	0.94	-
	LTE Band 25	-	-	-	104	13.98	0.118	0.12	

Remark:

The SAR summation represents the simultaneous transmission of a WWAN data transmission and WLAN as hotspot router.

Table 11.4-C1: Body-worn SAR analysis <Step1>

	Position	Applicable Combination
Simultaneous Transmission	Body-worn	1x CDMA (voice) + LTE (data) + WLAN (router)
		1x CDMA (voice) + LTE (data)
		1x CDMA (voice) + WLAN (router)
		1x CDMA (voice) + LTE (data) + BT
		1x CDMA (voice) + BT

	Scaled WWAN (voice)				Scaled WWAN (data)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Front	CDMA BC0	79	23.89	1.134	LTE Band 25	82	23.38	0.460	102	13.98	0.047	**1.64**	#C1-1
	CDMA BC1	140	23.88	1.162	LTE Band 25	82	23.38	0.460	102	13.98	0.047	**1.67**	#C1-2
	CDMA BC10	63	23.95	0.977	LTE Band 25	82	23.38	0.460	102	13.98	0.047	1.48	-
Back	CDMA BC0	111	23.89	1.404	LTE Band 25	83	23.38	1.223	103	13.98	0.126	**2.75**	#C1-3
	CDMA BC1	138	23.88	1.408	LTE Band 25	83	23.38	1.223	103	13.98	0.126	**2.76**	#C1-4
	CDMA BC10	64	23.95	1.373	LTE Band 25	83	23.38	1.223	103	13.98	0.126	**2.72**	#C1-5
Back (w/ headset)	CDMA BC0	46	23.89	1.094	LTE Band 25	85	23.38	1.285	105	13.98	0.113	**2.49**	#C1-6
	CDMA BC1	57	23.88	1.439	LTE Band 25	85	23.38	1.285	105	13.98	0.113	**2.84**	#C1-7
	CDMA BC10	68	23.95	0.974	LTE Band 25	85	23.38	1.285	105	13.98	0.113	**2.37**	#C1-8

Remark:

1. The SAR summation represents the simultaneous transmission of, a WWAN voice call and WWAN data transmission and WLAN as hotspot router; 3 transmitters operating at the same time.
2. The ananlysis above will represent the compliance of the simultaneous transmission of a WWAN voice call and WWAN data transmission, since the possible WWAN output power configuration in SVLTE mode(2 transmitters) is exactly the same as the configuration in SVLTE+WLAN hotspot (3 transmitters).

	Scaled WWAN (voice)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Front	CDMA BC0	79	23.89	1.134	102	13.98	0.047	1.181	-
	CDMA BC1	140	23.88	1.162	102	13.98	0.047	1.209	-
	CDMA BC10	63	23.95	0.977	102	13.98	0.047	1.024	-
Back	CDMA BC0	111	23.89	1.404	103	13.98	0.126	1.53	-
	CDMA BC1	138	23.88	1.408	103	13.98	0.126	1.534	-
	CDMA BC10	64	23.95	1.373	103	13.98	0.126	1.499	-
Back (w/ headset)	CDMA BC0	46	23.89	1.094	105	13.98	0.113	1.207	-
	CDMA BC1	57	23.88	1.439	105	13.98	0.113	1.552	-
	CDMA BC10	68	23.95	0.974	105	13.98	0.113	1.087	-

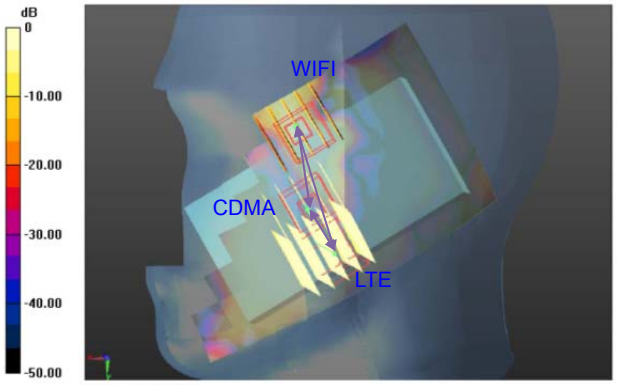
Remark: The SAR summation represents the simultaneous transmission of a WWAN voice call and WLAN data transmission.

Table 11.4-C2: Body-worn SAR analysis <Step2>

	Scaled WWAN (voice)				Scaled WWAN (data)				Scaled WLAN			Scaled WWAN + Scaled WLAN	Case No
Position	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	WWAN Band	Plot No	Output Power (dBm)	Scaled WWAN (W/kg)	Plot No	Output Power (dBm)	Scaled WLAN (W/kg)		
Front	CDMA BC0	79	23.89	1.134	LTE Band 25	82	23.38	0.460	102	13.98	0.047	1.64	#C1-1
	CDMA BC0	79	23.89	1.134	LTE Band 25	165	17.98	0.143	102	13.98	0.047	1.32	-
	CDMA BC0	155	16.25	0.182	LTE Band 25	82	23.38	0.460	102	13.98	0.047	0.69	-
	CDMA BC1	140	23.88	1.162	LTE Band 25	82	23.38	0.460	102	13.98	0.047	1.67	#C1-2
	CDMA BC1	140	23.88	1.162	LTE Band 25	165	17.98	0.143	102	13.98	0.047	1.35	-
	CDMA BC1	159	16.19	0.236	LTE Band 25	82	23.38	0.460	102	13.98	0.047	0.74	-
Back	CDMA BC0	111	23.89	1.404	LTE Band 25	83	23.38	1.223	103	13.98	0.126	2.75	#C1-3
	CDMA BC0	111	23.89	1.404	LTE Band 25	166	17.98	0.370	103	13.98	0.126	**1.90**	#C2-1
	CDMA BC0	156	16.25	0.236	LTE Band 25	83	23.38	1.223	103	13.98	0.126	1.59	-
	CDMA BC1	138	23.88	1.408	LTE Band 25	83	23.38	1.223	103	13.98	0.126	2.76	#C1-4
	CDMA BC1	138	23.88	1.408	LTE Band 25	166	17.98	0.370	103	13.98	0.126	**1.90**	#C2-2
	CDMA BC1	160	16.19	0.281	LTE Band 25	83	23.38	1.223	103	13.98	0.126	**1.63**	#C2-3
	CDMA BC10	64	23.95	1.373	LTE Band 25	83	23.38	1.223	103	13.98	0.126	2.72	#C1-5
	CDMA BC10	64	23.95	1.373	LTE Band 25	166	17.98	0.370	103	13.98	0.126	**1.87**	#C2-4
	CDMA BC10	162	16.19	0.231	LTE Band 25	83	23.38	1.223	103	13.98	0.126	1.58	-
Back (w/ headset)	CDMA BC0	46	23.89	1.094	LTE Band 25	85	23.38	1.285	105	13.98	0.113	2.49	#C1-6
	CDMA BC0	46	23.89	1.094	LTE Band 25	168	17.98	0.380	105	13.98	0.113	1.59	-
	CDMA BC0	157	16.25	0.184	LTE Band 25	85	23.38	1.285	105	13.98	0.113	1.58	-
	CDMA BC1	57	23.88	1.439	LTE Band 25	85	23.38	1.285	105	13.98	0.113	2.84	#C1-7
	CDMA BC1	57	23.88	1.439	LTE Band 25	168	17.98	0.380	105	13.98	0.113	**1.93**	#C2-5
	CDMA BC1	161	16.19	0.290	LTE Band 25	85	23.38	1.285	105	13.98	0.113	**1.69**	#C2-6
	CDMA BC10	68	23.95	0.974	LTE Band 25	85	23.38	1.285	105	13.98	0.113	2.37	#C1-8
	CDMA BC10	68	23.95	0.974	LTE Band 25	168	17.98	0.380	105	13.98	0.113	1.47	-
	CDMA BC10	164	16.19	0.178	LTE Band 25	85	23.38	1.285	105	13.98	0.113	1.58	-

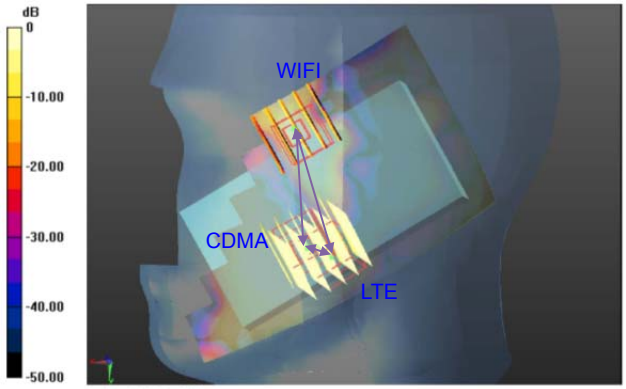
11.5 Simultaneous analysis - SPLSR calculation

Case No	Position	SVLTE/SV1xRTT	CDMA BC0			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#146			#17			#37			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#A2-1	Right Cheek	1xRTT(16.5dbm) LTE(23.5dbm)	0.186			1.408			0.097			1.69	1.59	2.7	0.59	0.28	4.1	0.07	1.51	6.6	0.23	Required
		peak ordinate (m)	0.0672	-0.277	-0.171	0.0534	-0.254	-0.171	0.0727	-0.317	-0.167											



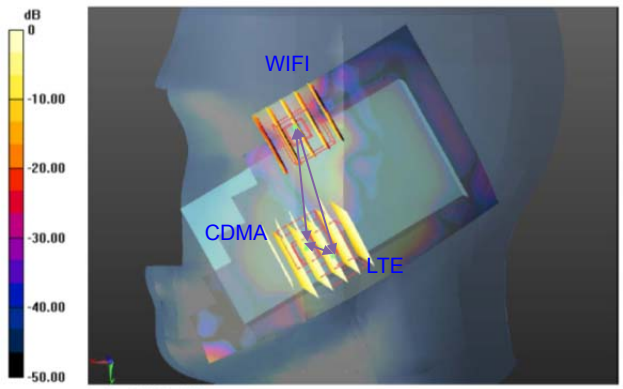
0 dB = 0.100mW/g

Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#148			#17			#37			SAR (W/kg)	CDMA+ LTE	CDMA+ LTE	CDMA+ LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA+ Wifi	LTE+ Wifi	LTE+ Wifi	LTE+ Wifi	
#A2-2	Right Cheek	1xRTT(16.5dbm) LTE(23.5dbm)	0.301			1.408			0.097			1.81	1.71	1.3	1.31	0.40	5.9	0.07	1.51	6.6	0.23	Required
		peak ordinate (m)	0.0654	-0.259	-0.17	0.0534	-0.254	-0.171	0.0727	-0.317	-0.167											



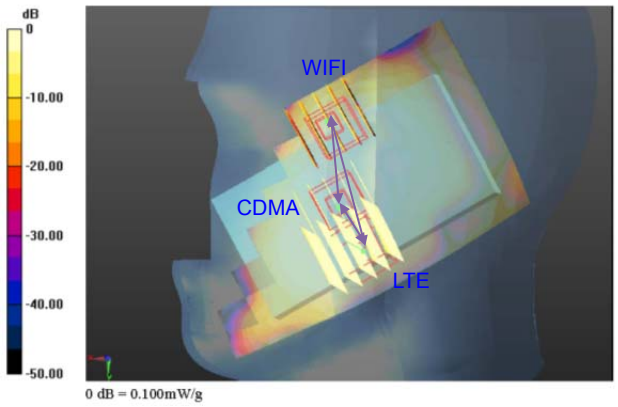
0 dB = 0.100mW/g

Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#134			#152			#37			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#A2-3	Right Cheek	1xRTT(24dbm) LTE(18.5dbm)	1.223			0.372			0.097			1.69	1.60	1.4	1.14	1.32	5.9	0.22	0.47	6.6	0.07	Required
		peak ordinate (m)	0.0667	-0.258	-0.169	0.0534	-0.254	-0.171	0.0727	-0.317	-0.167											



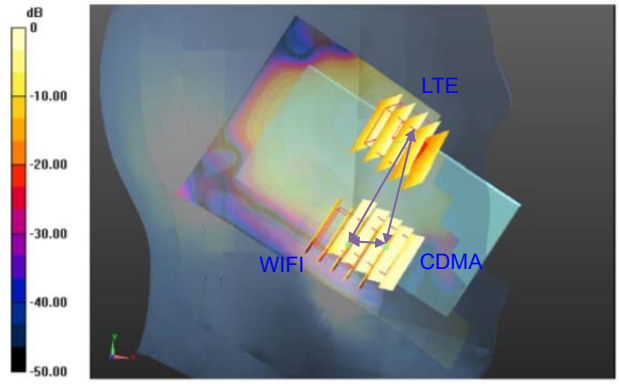
0 dB = 0.100mW/g

Case No	Position	SVLTE/SV1xRTT	CDMA BC10			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#150			#17			#37			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#A2-4	Right Cheek	1xRTT(16.5dbm) LTE(23.5dbm)	0.141			1.408			0.097			1.65	1.55	2.5	0.63	0.24	4.3	0.06	1.51	6.6	0.23	Required
		peak ordinate (m)	0.0665	-0.275	-0.171	0.0534	-0.254	-0.171	0.0727	-0.317	-0.167											



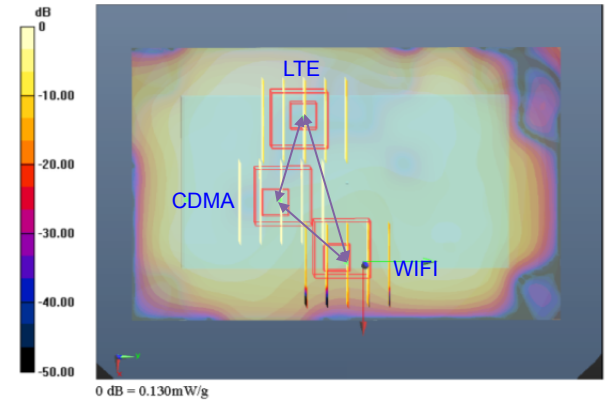
0 dB = 0.100mW/g

Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#136			#153			#39			SAR (W/kg)	CDMA+ LTE	CDMA+ LTE	CDMA+ LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA+ Wifi	LTE+ Wifi	LTE+ Wifi	LTE+ Wifi	
#A2-5	Left Cheek	1xRTT(24dbm) LTE(18.5dbm)	1.234			0.239			0.167			1.64	1.47	5.5	0.27	1.40	2.0	0.71	0.41	6.3	0.06	Required
		peak ordinate (m)	0.0684	0.256	-0.169	0.0792	0.31	-0.166	0.0488	0.255	-0.171											



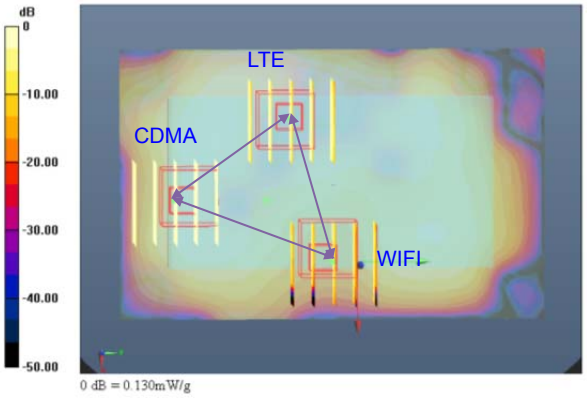
0 dB = 0.160mW/g

Case No	Position	SVLTE/SV1xRTT	CDMA BC0			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#111-0			#166			#103			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#C2-1	Back	1xRTT(24.5dbm) LTE(18.5dbm)	1.404			0.370			0.126			1.90	1.77	3.4	0.54	1.53	3.5	0.44	0.50	5.8	0.09	Required
		peak ordinate (m)	-0.011	-0.0255	-0.202	-0.0425	-0.0165	-0.202	0.013	0	-0.202											

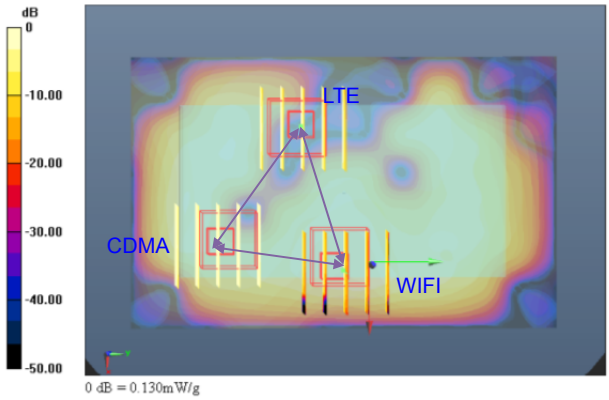


0 dB = 0.130mW/g

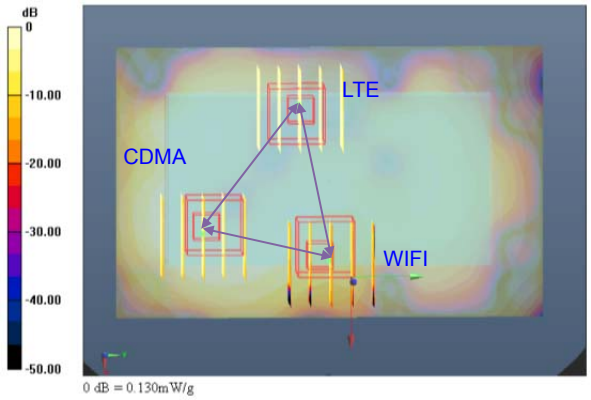
Case No	Position	SVLTE/SV1xRTT	CDMA BC0			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#111-1			#166			#103			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#C2-1	Back	1xRTT(24.5dbm) LTE(18.5dbm)	1.018			0.370			0.126			1.51	1.39	4.9	0.28	1.14	4.8	0.24	0.50	5.8	0.09	Not Required
		peak ordinate (m)	-0.003	-0.0455	-0.202	-0.0425	-0.0165	-0.202	0.013	0	-0.202											



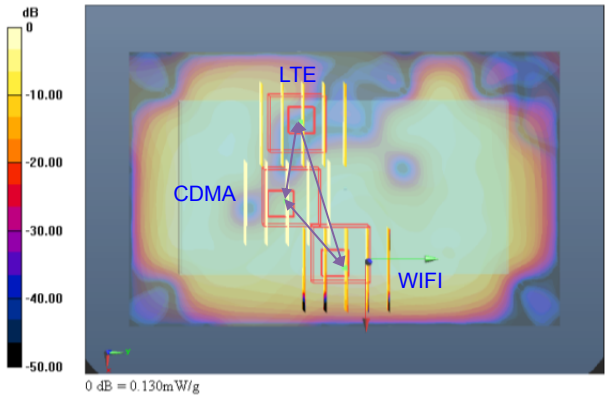
Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#138			#166			#103			SAR (W/kg)	CDMA+ LTE	CDMA+ LTE	CDMA+ LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA+ Wifi	LTE+ Wifi	LTE+ Wifi	LTE+ Wifi	
#C2-2	Back	1xRTT(24dbm) LTE(18.5dbm)	1.408			0.370			0.126			1.90	1.78	5.6	0.32	1.53	5.1	0.30	0.50	5.8	0.09	Required
		peak ordinate (m)	0.0025	-0.0495	-0.202	-0.0425	-0.0165	-0.202	0.013	0	-0.202											



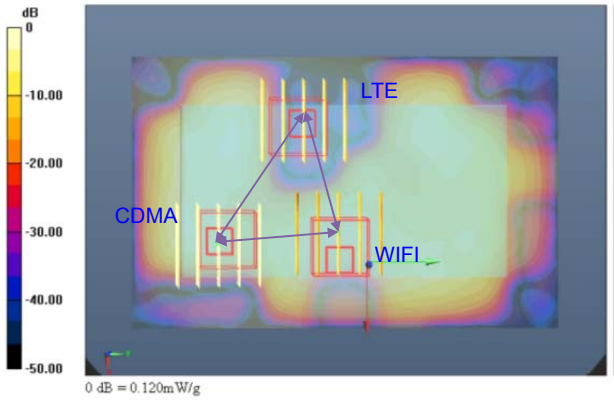
Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#160			#83			#103			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#C-3	Back	1xRTT(16.5dbm) LTE(23.5dbm)	0.281			1.223			0.126			1.63	1.50	6.2	0.24	0.41	5.1	0.08	1.35	6.1	0.22	Not Required
		peak ordinate (m)	0.0025	-0.0495	-0.202	-0.047	-0.012	-0.202	0.013	0	-0.202											



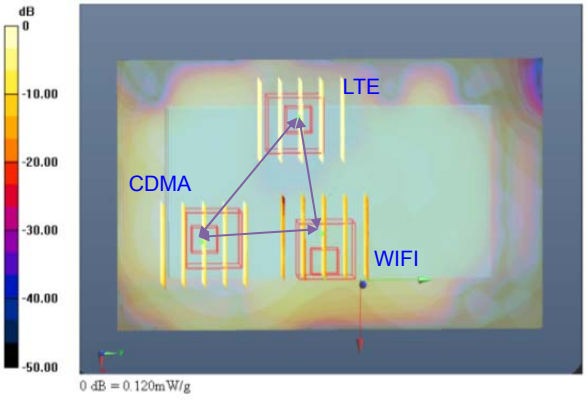
Case No	Position	SVLTE/SV1xRTT	CDMA BC10			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#64			#166			#103			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#C-4	Back	1xRTT(24.5dbm) LTE(18.5dbm)	1.373			0.370			0.126			1.87	1.74	3.1	0.57	1.50	3.4	0.44	0.50	5.8	0.09	Required
		peak ordinate (m)	-0.0125	-0.0225	-0.202	-0.0425	-0.0165	-0.202	0.013	0	-0.202											



Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#57			#168			#105			SAR (W/kg)	CDMA+ LTE	CDMA+ LTE	CDMA+ LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA+ Wifi	LTE+ Wifi	LTE+ Wifi	LTE+ Wifi	
#C-5	Back(w/ headset)	1xRTT(24dbm) LTE(18.5dbm)	1.439			0.380			0.113			1.93	1.82	5.7	0.32	1.55	4.8	0.32	0.49	6.1	0.08	Required
		peak ordinate (m)	0.001	-0.0495	-0.202	-0.0455	-0.0165	-0.202	0.014	-0.003	-0.202											



Case No	Position	SVLTE/SV1xRTT	CDMA BC1			LTE Band 25			WLAN 2.4G			Sum	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Pair SAR (W/kg)	Distance (cm)	SPLSR	Volume Scan
		Power setting	#161			#85			#105			SAR (W/kg)	CDMA + LTE	CDMA + LTE	CDMA + LTE	CDMA+ Wifi	CDMA+ Wifi	CDMA + Wifi	LTE + Wifi	LTE + Wifi	LTE + Wifi	
#C-6	Back(w/ headset)	1xRTT(16.5dbm) LTE(23.5dbm)	0.290			1.285			0.113			1.69	1.58	5.7	0.28	0.40	4.8	0.08	1.40	6.1	0.23	Not Required
		peak ordinate (m)	0.001	-0.0495	-0.202	-0.0455	-0.0165	-0.202	0.014	-0.003	-0.202											



Note:

1. Per KDB 447498, if SPLSR < 0.3, volume scan is not necessary.
2. Per KDB 447498, if SPLSR > 0.3, volume scan is necessary.

11.6 Volume scan test results

Case No	Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Output Power (dBm)	Tune-up Limit (dBm)	Scaling Factor	SAR_{1g} (W/kg)	Scaled SAR_{1g} (W/kg)	Multi Band SAR_{1g} (W/kg)	Remark
#A-1	146	CDMA BC0	RC3 SO55	Right Cheek	-	777	15.92	16.5	1.143	0.158	0.181	1.4	Pass
	17	LTE Band 25	1RB, 0 offset		-	26365	23.38	23.5	1.028	1.29	1.326		
	37	WLAN 2.4G	802.11b		-	11	13.98	14.5	1.127	0.083	0.094		
#A-2	148	CDMA BC1	RC3 SO55	Right Cheek	-	600	16.27	16.5	1.054	0.238	0.251	1.47	Pass
	17	LTE Band 25	1RB, 0 offset		-	26365	23.38	23.5	1.028	1.29	1.326		
	37	WLAN 2.4G	802.11b		-	11	13.98	14.5	1.127	0.083	0.094		
#A-3	134	CDMA BC1	RC3 SO55	Right Cheek	-	600	23.88	24	1.028	1.2	1.234	1.43	Pass
	152	LTE Band 25	1RB, 0 offset		-	26365	17.98	18.5	1.127	0.395	0.445		
	37	WLAN 2.4G	802.11b		-	11	13.98	14.5	1.127	0.083	0.094		
#A-4	150	CDMA BC10	RC3 SO55	Right Cheek	-	580	16.2	16.5	1.072	0.13	0.139	1.38	Pass
	17	LTE Band 25	1RB, 0 offset		-	26365	23.38	23.5	1.028	1.29	1.326		
	37	WLAN 2.4G	802.11b		-	11	13.98	14.5	1.127	0.083	0.094		
#A-5	136	CDMA BC1	RC3 SO55	Left Cheek	-	600	23.88	24	1.028	1.2	1.234	1.26	Pass
	153	LTE Band 25	1RB, 0 offset		-	26365	17.98	18.5	1.127	0.253	0.285		
	39	WLAN 2.4G	802.11b		-	11	13.98	14.5	1.127	0.184	0.207		
#C2-1	111	CDMA BC0	RC3 SO32	Back	1	384	23.89	24.5	1.151	1.24	1.427	1.5	Pass
	166	LTE Band 25	1RB, 0 offset		1	26365	17.98	18.5	1.127	0.323	0.364		
	103	WLAN 2.4G	802.11b		1	11	13.98	14.5	1.127	0.104	0.117		
#C2-2	138	CDMA BC1	RC3 SO32	Back	1	600	23.88	24	1.028	1.34	1.378	1.5	Pass
	166	LTE Band 25	1RB, 0 offset		1	26365	17.98	18.5	1.127	0.323	0.364		
	103	WLAN 2.4G	802.11b		1	11	13.98	14.5	1.127	0.104	0.117		
#C2-4	64	CDMA BC10	RC3 SO32	Back	1	580	23.95	24.5	1.135	1.18	1.339	1.39	Pass
	166	LTE Band 25	1RB, 0 offset		1	26365	17.98	18.5	1.127	0.323	0.364		
	103	WLAN 2.4G	802.11b		1	11	13.98	14.5	1.127	0.104	0.117		
#C2-5	57	CDMA BC1	RC3 SO32	Back(w/ headset)	1	600	23.88	24	1.028	1.37	1.408	**1.53**	Pass
	168	LTE Band 25	1RB, 0 offset		1	26365	17.98	18.5	1.127	0.342	0.386		
	105	WLAN 2.4G	802.11b		1	11	13.98	14.5	1.127	0.08	0.090		

Note:

1. The worst configuration on each position is used for the volume scan.
2. The scaling factor is applied in SEMCAD software in multi-band SAR combination procedure.

Test Engineer： Fulu Hu and Jimmy Cheng

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

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 447498 D02 v02, “SAR Measurement Procedures for USB Dongle Transmitters”, November 2009

[9] FCC KDB 616217 D01 v01r01, “SAR Evaluation Considerations for Laptop Computers with Antennas Built-in on Display Screens”, November 2009

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

[11] FCC KDB 648474 D01 v01r05, “SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas”, September 2008

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

[13] FCC KDB 941225 D02 v02 "3GPP R6 HSPA and R7 HSPA+ SAR Guidance", December 2009.

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

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

[16] FCC KDB 941225 D05 v01, “SAR Test Considerations for LTE Handsets and Data Modems”, December 15 2010

[17] FCC KDB 941225 D06 v01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", April 2011

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