SAR TEST REPORT

Application No.:	SZCR2309003223AT
Applicant:	Cosmo Technologies, Inc.
Address of Applicant:	747 Grape St, Denver, Colorado 80220 United States
Manufacturer:	Shenzhen Qinmi Smart Technology Co., Ltd.
Address of Manufacturer:	4rd floor, Building 09, Tongfuyu Industrial Park, Lezhujiao Village, Xixiang, Baoan, Shenzhen
Product Name:	COSMO JrTrack Kids Smartwatch
Model No.(EUT):	JRTV3
Trade Mark:	JrTrack
FCC ID:	2A3RL-JRTRACK03
Standard(s) :	FCC 47CFR §2.1093
Date of Receipt:	2023-10-16
Date of Test:	2023-10-18 to 2023-10-23
Date of Issue:	2023-10-31
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86–755) 26012053 f (86–755) 26710594 www.sgsgroup.com.cn
中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编:518057 t (86–755) 26012053 f (86–755) 26710594 sgs.china@sgs.com

REVISION HISTORY

Version	***Chapter***	***Date***	***Modifier***	***Remark***
01		*2023-10-31*		*Original*

Authorized for issue by:

Roman Pan/Project Engineer

Eric Fu/Reviewer

TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)	
	Next to the mouth	Limbs
GSM850	0.21	0.64
GSM1900	0.19	0.52
WCDMA Band II	0.39	1.55
WCDMA Band IV	0.51	1.70
WCDMA Band V	0.10	0.35
LTE Band 2	0.67	1.53
LTE Band 4	0.52	1.45
LTE Band 5	0.09	0.39
LTE Band 7	0.44	1.52
LTE Band 12	0.08	0.26
LTE Band 13	0.08	0.31
LTE Band 17	0.08	0.31
LTE Band 66	0.60	1.88
WI-FI (2.4GHz)	0.01	0.01
BT	0.01	0.02
SAR Limited(W/kg)	1.6	4.0
Maximum Simultaneous Transmission SAR (W/kg)		
Scenario	Next to the mouth	Limbs
Sum SAR	0.68	1.90
SPLSR	/	/
SPLSR Limited	0.04	0.1

CONTENTS

1 General Information

1.1 General Description of EUT

Device Type:	Portable device
Exposure Category:	Uncontrolled environment / general population
SN:	867798043565614
Hardware Version:	QW98-MB-V2.0
Software Version:	S118WUS_SW_QW98_B680_3_LH_V01
Antenna Gain:	BT/2.4G WIFI: -1dBi GSM 850: -6.5dBi, PCS1900: -1.72dBi, WCDMA b2: -1.72dBi, b4: -1.63dBi, b5: -6.5dBi, LTE b2: -1.72dBi, b4: -1.63dBi, b5: -6.5dBi, b7: -0.88dBi, b12: -6.93dBi, b13: -6.43dBi, b17: -6.93dBi , b66: -1.63dBi (Provided by Manufacturer)
Antenna Type:	PIFA Antenna
Device Operating Configurations:	
Modulation Mode:	BT: GFSK, π/4DQPSK, 8DPSK BLE: GFSK 2.4G WIFI: DSSS, OFDM GSM: GMSK, 8PSK WCDMA: QPSK LTE: QPSK, 16QAM

	Band	Tx (MHz)	Rx (MHz)
Frequency Bands:	Bluetooth	2402-2480	2402-2480
	BLE	2402-2480	2402-2480
	WIFI(2.4GHz)	2412~2462	2412~2462
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA B2	1850~1910	1930~1990
	WCDMA B4	1710~1755	2110~2155
	WCDMA B5	824~849	869~894
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 17	704~716	736~746
	LTE Band 66	1710~1780	2110~2200

Battery Information:	Model:	602831
	Normal Voltage:	DC3.8V
	Rated capacity:	680mAh
	Battery Type:	Rechargeable Li-ion Battery
	Manufacturer:	Shenzhen Ruiyixin Energy Co., Ltd.

1.1.1 DUT Antenna Locations

Please see the Appendix D

1.2 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radio frequency Radiation Exposure Evaluation: Portable Devices
IEEE Std C95.1 – 1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D01 v03r01	3G SAR Measurement Procedures
KDB 941225 D05 v02r05	SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES
KDB 248227 D01 v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 447498 D04 v01	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
KDB 865664 D01 v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 v01r02	RF Exposure Compliance Reporting and Documentation Considerations

1.3 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 W/kg	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)

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中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编：518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

1.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

2 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

3 SAR Measurements System Configuration

3.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

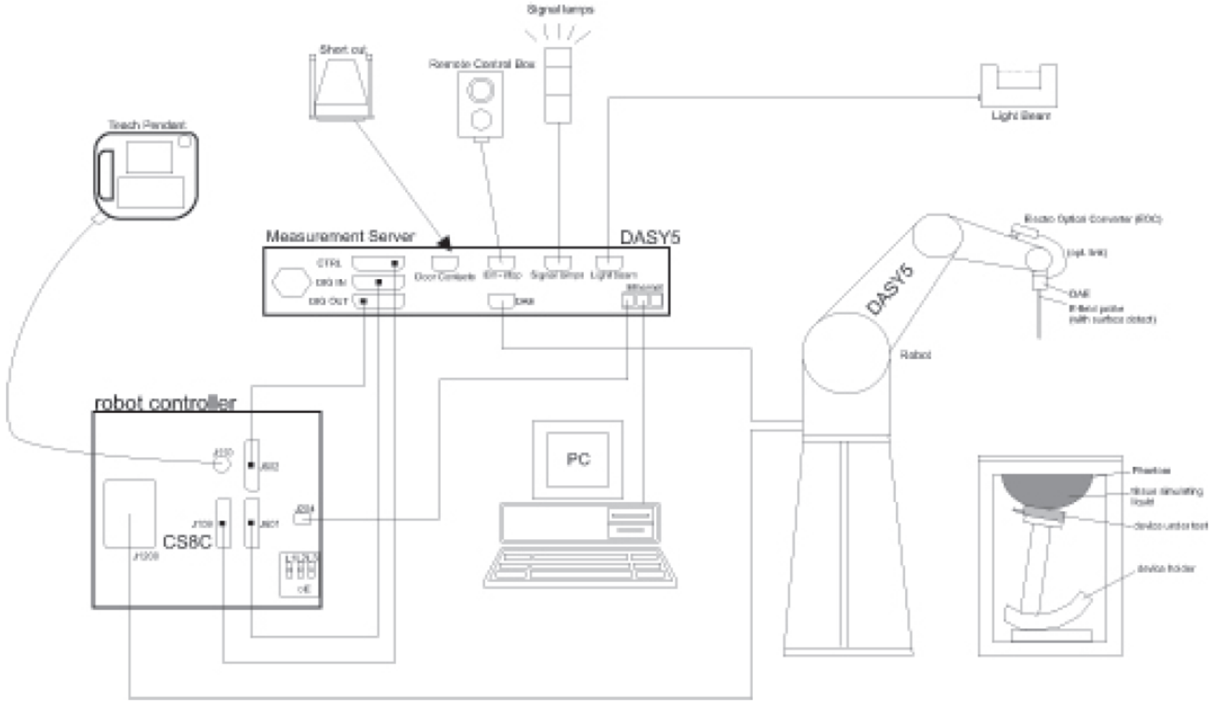
The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

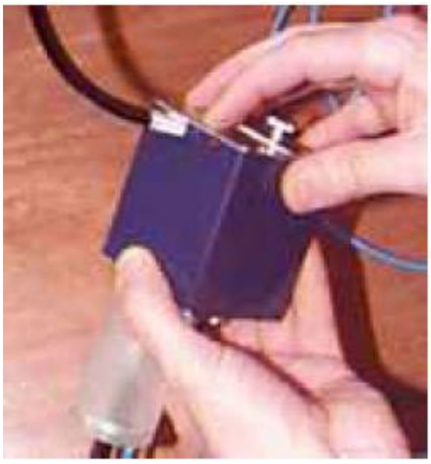
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

3.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (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: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

3.3 Data Acquisition Electronics (DAE)

Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5μV (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



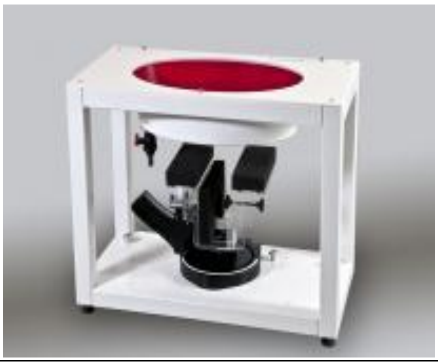
3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.

3.6 Device Holder for Transmitters

F-2. **Device Holder for Transmitters**

- 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 centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

- The DASY device holder has been made out 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.

3.7 Measurement procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: *Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

Around this point, a volume of 30mm*30mm*30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5x5x7 points (≤2GHz) and 7x7x7 points (≥2GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

<table>
<tr><td colspan="3"></td><td>$\leq$ 3 GHz</td><td>$>$ 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>$\leq$ 2 GHz: $\leq$ 15 mm
2 – 3 GHz: $\leq$ 12 mm</td><td>3 – 4 GHz: $\leq$ 12 mm
4 – 6 GHz: $\leq$ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>$\leq$ 2 GHz: $\leq$ 8 mm
2 – 3 GHz: $\leq$ 5 mm*</td><td>3 – 4 GHz: $\leq$ 5 mm*
4 – 6 GHz: $\leq$ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>$\leq$ 5 mm</td><td>3 – 4 GHz: $\leq$ 4 mm
4 – 5 GHz: $\leq$ 3 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>$\leq$ 4 mm</td><td>3 – 4 GHz: $\leq$ 3 mm
4 – 5 GHz: $\leq$ 2.5 mm
5 – 6 GHz: $\leq$ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>$\geq$ 30 mm</td><td>3 – 4 GHz: $\geq$ 28 mm
4 – 5 GHz: $\geq$ 25 mm
5 – 6 GHz: $\geq$ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is $\leq$ 1.4 W/kg, $\leq$ 8 mm, $\leq$ 7 mm and $\leq$ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %

3.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE3". The 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 incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

The SEMCAD software 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 Normi, ai0, ai1, ai2

- Conversion factor ConvFi

- Diode compression point Dcpi

Device parameters: - Frequency f

- Crest factor cf

Media parameters: - Conductivity ε

- 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 multimeter 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:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With Vi = compensated signal of channel i (i = x, y, z)

Ui = 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:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel i (i = x, y, z)

Normi = sensor sensitivity of channel I (i = x, y, z)

[mV/(V/m)2] for E-field Probes

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

Ei = electric field strength of channel i in V/m

Hi = magnetic field strength of channel i in A/m

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

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

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

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

With SAR = local specific absorption rate in mW/g

Etot = total field strength in V/m

σ= conductivity in [mho/m] or [Siemens/m]

ε= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

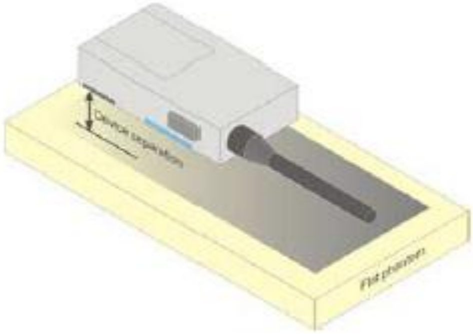
4.2 SAR measurement uncertainty

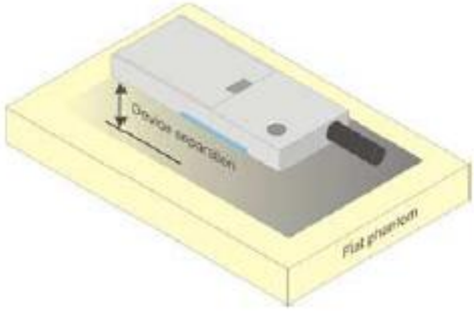
Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

5 Description of Test Position

5.1 Next to the Mouth Exposure Condition

Transmitters that are built-in within a wrist watch or similar wrist-worn devices typically operate in speaker mode for voice communication, with the device worn on the wrist and positioned next to the mouth. When SAR evaluation is required, next to the mouth use is evaluated with the front of the device positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium. The wrist bands should be strapped together to represent normal use conditions.

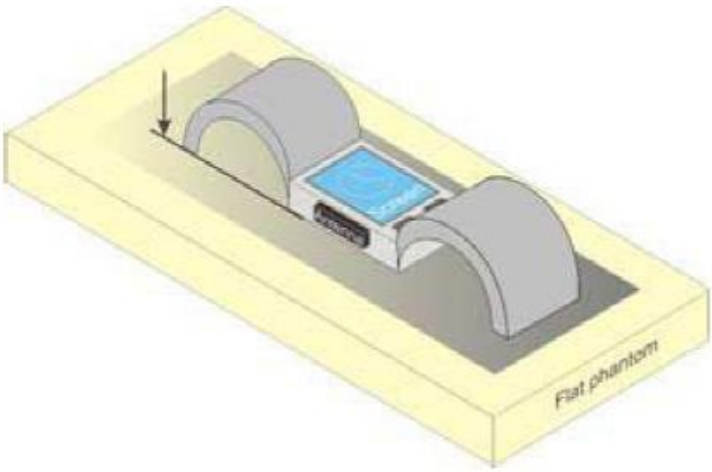




5.2 Extremity Exposure Condition

A limb-worn device is a unit whose intended use includes being strapped to the arm or leg of the user while transmitting (except in idle mode). The strap shall be opened so that it is divided into two parts as shown in the following. The device shall be positioned directly against the phantom surface with the strap straightened as much as possible and the back of the device towards the phantom. If the strap cannot normally be opened to allow placing in direct contact with the phantom surface, it may be necessary to break the strap of the device but ensuring to not damage the antenna.

The wrist bands should be strapped together to represent normal use conditions. SAR for wrist exposure is evaluated with the back of the device positioned in direct contact against a flat phantom filled with body tissue-equivalent medium. The wrist bands should be unstrapped and touching the phantom. The space introduced by the watch or wrist bands and the phantom must be representative of actual use conditions; otherwise, if applicable, the neck or a curved head region of the SAM phantom may be used, provided the device positioning and SAR probe access issues have been addressed through a KDB inquiry. When other device positioning and SAR measurement considerations are necessary, a KDB inquiry is also required for the test results to be acceptable; for example, devices with rigid wrist bands or electronic circuitry and/or antenna(s) incorporated in the wrist bands. These test configurations are applicable only to devices that are worn on the wrist and cannot support other use conditions; therefore, the operating restrictions must be fully demonstrated in both the test reports and user manuals.



6 SAR System Verification Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands：

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

HSL5GHz is composed of the following ingredients：

Water：50-65%

Mineral oil：10-30%

Emulsifiers：8-25%

Sodium salt：0-1.5%

MSL5GHz is composed of the following ingredients：

Water：64-78%

Mineral oil：11-18%

Emulsifiers：9-15%

Sodium salt：2-3%

6.1.2 Test Liquids Confirmation

Simulated tissue liquid parameter confirmation

The dielectric parameters were checked prior to assessment using the SPEAG DAK3.5 dielectric probe kit. The dielectric parameters measured are reported in each correspondent section.

IEEE SCC-34/SC-2 P1528 recommended tissue dielectric parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in P1528

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

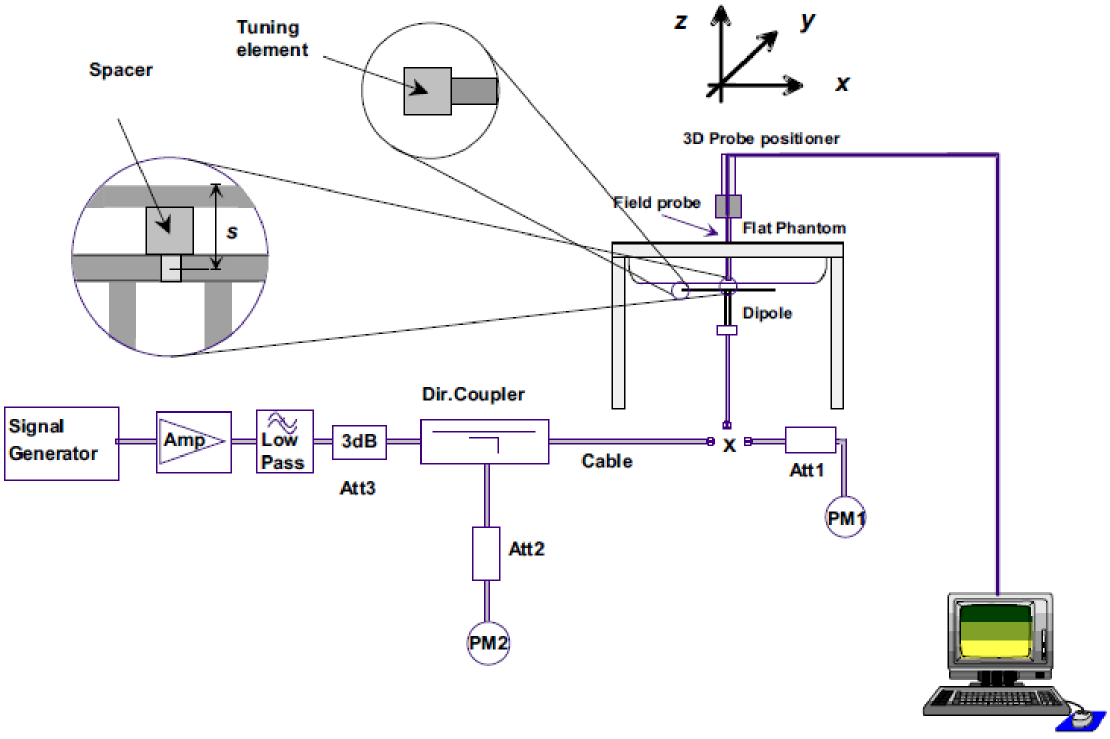
6.1.3 Measurement for Tissue Simulate Liquid

The dielectric properties for this Tissue Simulate Liquids were measured by using the SPEAG DAK3.5 dielectric probe kit in conjunction with Agilent Network Analyzer. The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Measurement for Tissue Simulate Liquid									
Tissue Type	Measured Frequency （MHz）	Measured Tissue		Target Tissue (±5%)		Deviation (Within ±5%)		Liquid Temp. (℃)	Test Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	ε_r	σ(S/m)		
750 Head	750	41.660	0.898	41.90	0.89	-0.57%	0.90%	22.1	2023/10/21
835 Head	835	42.668	0.909	41.50	0.90	2.81%	1.00%	22.4	2023/10/20
1750 Head	1750	39.159	1.332	40.10	1.37	-2.35%	-2.77%	22.3	2023/10/22
1900 Head	1900	39.564	1.414	40.00	1.40	-1.09%	1.00%	22.4	2023/10/19
2450 Head	2450	38.744	1.809	39.20	1.80	-1.16%	0.50%	22.6	2023/10/23
2600 Head	2600	38.194	1.978	39.00	1.96	-2.07%	0.92%	22.1	2023/10/18

6.2 SAR System Check

The microwave circuit arrangement for system check is sketched in bellow figure. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table. During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-3. the microwave circuit arrangement used for SAR system verification

6.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

b) System check with specific dipole is within 10% of calibrated value;

c) Return-loss is within 10% of calibrated measurement;

d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

6.2.2 Summary System Check Result(s)

SAR System Validation Result(s)											
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D750V3	Head	2.05	1.35	8.20	5.40	8.37	5.53	-2.03%	-2.35%	22.1	2023/10/21
D835V2	Head	2.46	1.62	9.84	6.48	9.53	6.29	3.25%	3.02%	22.4	2023/10/20
D1750V2	Head	8.59	4.57	34.36	18.28	36.60	19.30	-6.12%	-5.28%	22.3	2023/10/22
D1900V2	Head	10	5.27	40.00	21.08	39.50	20.60	1.27%	2.33%	22.4	2023/10/19
D2450V2	Head	13.40	6.19	53.60	24.76	52.20	24.30	2.68%	1.89%	22.6	2023/10/23
D2600V2	Head	15.10	6.92	60.40	27.68	57.70	25.80	4.68%	7.29%	22.1	2023/10/18

6.2.1 Detailed System Check Results

Please see the Appendix A

7 Test Configuration

7.1 3G SAR Test Reduction Procedure

In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest measured SAR of the primary mode is scaled by the ratio of specified maximum output power of secondary to primary mode and the adjusted SAR is ≤ 1.5 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

7.2 Operation Configurations

7.2.1 GSM Test Configuration

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power, the higher number time-slot configuration should be tested.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

7.2.2 WCDMA Test Configuration

1）. Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

2）. Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure

3）. Body SAR

SAR for body configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreaing code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

4）. HSDPA / HSUPA / DC-HSDPA

RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA

a) HSDPA

HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) are set according to values indicated in the following table The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-test	βc	Bd	βd(SF)	βc/βd	βhs	CM(dB)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note1: △ACK, △NACK and △CQI= 8 Ahs = βhs/βc=30/15 βhs=30/15*βc

Note2:For the HS-DPCCH power mask requirement test in clause 5.2C,5.7A,and the Error Vector Magnitude(EVM) with HS-DPCCH test in clause 5.13.1.A,and HSDPA EVM with phase discontinuity in clause 5.13.1AA, △ACK and △NACK= 8 (Ahs=30/15) with βhs=30/15*βc,and △CQI=

7 (Ahs=24/15) with βhs=24/15*βc.

Note3: CM=1 forβc/βd =12/15, βhs/βc=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI"s
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Table 2： settings of required H-Set 1 QPSK acc. to 3GPP 34.121

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	MaximumH S-DSCH Transport BlockBits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

Table 3： HSDPA UE category

b) HSUPA

Due to inner loop power control requirements in HSUPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSUPA should be configured according to the values indicated below as well as other applicable procedures described in the „WCDMA Handset‟ and „Release 5 HSUPA Data Device‟ sections of 3G device.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ec} (SF)	β_{ed} (code)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ ACK, Δ NACK and Δ CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference

Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$

Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$

Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Table 4： Subtests for WCDMA Release 6 HSUPA

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Speading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM.(TS25.306-7.3.0).

Table 5： HSUPA UE category

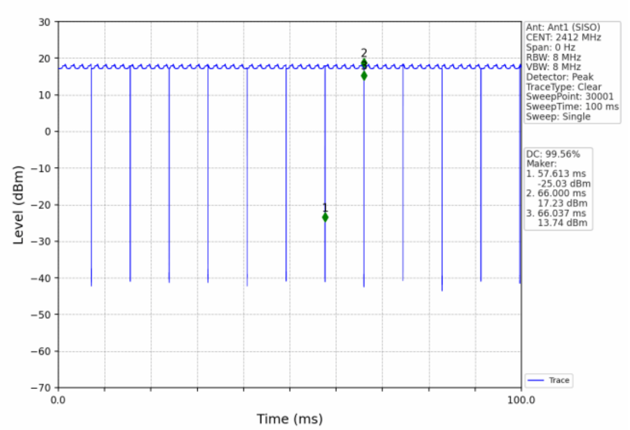
7.2.3 WiFi Test Configuration

For the 802.11b/g/n SAR tests, a communication link is set up with the test mode software for Wi-Fi mode test. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 1, 7 and 13 respectively in the case of 2450 MHz during the test at theeach test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest rate.802.11b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g/n modes are tested on channel 1, 7, 13; However if output power reduction is necessary for channels 1 and/or 13 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

7.2.3.1 Duty cycle

WLAN2.4 duty cycle: 99.56%



7.2.4 LTE Test Configuration

Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The R&S CMW500 was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

TDD LTE test consideration

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.

LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:

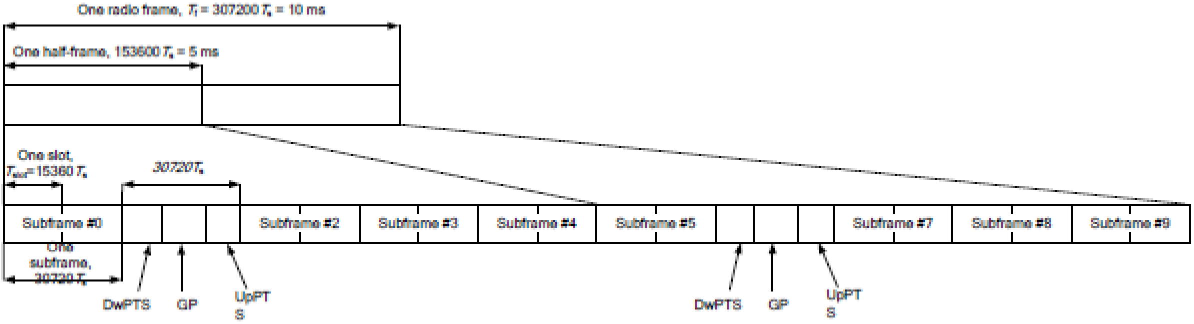


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	6592.Ts	2192.Ts	2560.Ts	7680.Ts	2192.Ts	2560.Ts
1	19760.Ts			20480.Ts		
2	21952.Ts			23040.Ts		
3	24144.Ts			25600.Ts		
4	26336.Ts			7680.Ts	4384.Ts	5120.Ts
5	6592.Ts	4384.Ts	5120.Ts	20480.Ts		
6	19760.Ts			23040.Ts		
7	21952.Ts			25600.Ts		
8	24144.Ts			-	-	-
9	13168.Ts			-	-	-

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the measured SAR is ≤ 1.0 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the measured SAR of a required test channel is > 1.80 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

For QPSK with 50% RB allocation, SAR is only required measure for the worst case of 1RB allocation used the highest maximum output power.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest measured SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 1.0 W/kg. Otherwise, SAR is measured for the highest output power channel and if the measured SAR is > 1.80 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the measured SAR for the QPSK configuration is > 1.80 W/kg.

E) Other channel bandwidth standalone SAR test requirements

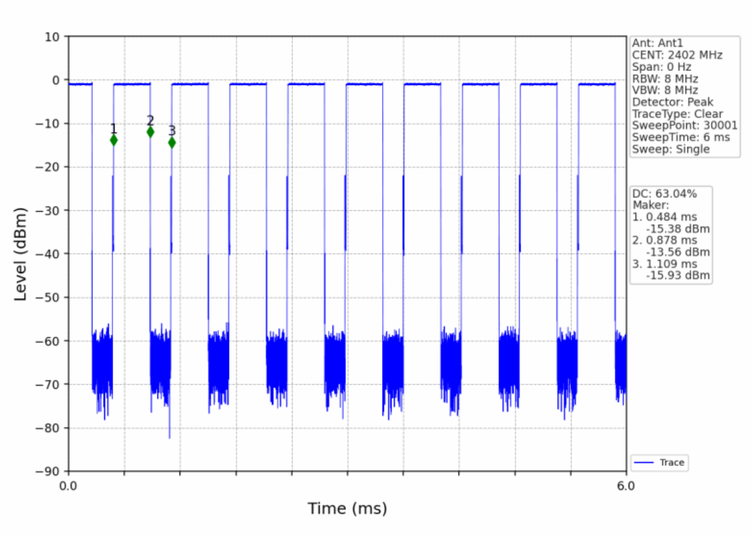
For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the measured SAR of a configuration for the largest channel bandwidth is > 1.80 W/kg.

7.2.5 Bluetooth Test Configuration

For the Bluetooth SAR tests, a communication link is set up with the test mode software for BT mode test. Bluetooth USES frequency hopping technology to divide the transmitted data into packets and transmit the packets respectively through 79 designated Bluetooth channels, 1MHz Bandwidth, frequency hops at 1600 hops/second per the Bluetooth standard. The Radio Frequency Channel Number (RFCN) is allocated to 0, 39 and 78 respectively in the case of 2402~2480 MHz during the test at each test frequency channel, the EUT is operated at the RF continuous emission mode.

7.2.5.1 Duty cycle

Bluetooth duty cycle: 63.04%



8 Test Result

8.1 Measurement of RF Conducted Power

8.1.1 Conducted Power of GSM 850

GSM 850										
Burst Output Power(dBm)						Division Factors	Frame-Average Output Power(dBm)			
Channel		128	190	251	Tune up		128	190	251	Tune up
GSM(GMSK)	GSM	33.38	33.43	33.51	34.00	-9.19	24.19	24.24	24.32	24.81
GPRS (GMSK)	1 TX Slot	33.29	33.4	33.49	34.00	-9.19	24.10	24.21	24.30	24.81
	2 TX Slots	31.39	31.3	31.37	32.00	-6.18	25.21	25.12	25.19	25.82
	3 TX Slots	29.53	29.51	29.59	30.00	-4.42	25.11	25.09	25.17	25.58
	4 TX Slots	27.50	27.49	27.57	28.00	-3.17	24.33	24.32	24.40	24.83
EGPRS (8PSK)	1 TX Slot	26.94	26.4	26.22	27.00	-9.19	17.75	17.21	17.03	17.81
	2 TX Slots	25.72	25.36	25.33	26.00	-6.18	19.54	19.18	19.15	19.82
	3 TX Slots	23.35	23.08	23.03	24.00	-4.42	18.93	18.66	18.61	19.58
	4 TX Slots	21.17	21.91	21.51	22.00	-3.17	18.00	18.74	18.34	18.83

Table 6： Conducted Power of GSM 850

8.1.2 Conducted Power of GSM 1900

GSM 1900											
Burst Output Power(dBm)						Division Factors	Frame-Average Output Power(dBm)			
Channel		512	661	810	Tune up		512	661	810	Tune up
GSM(GMSK)	GSM	30.89	30.65	30.04	31.00	-9.19	21.70	21.46	20.85	21.81
GPRS (GMSK)	1 TX Slot	29.69	29.39	29.19	30.00	-9.19	20.50	20.20	20.00	20.81
	2 TX Slots	27.79	27.50	27.30	28.00	-6.18	21.61	21.32	21.12	21.82
	3 TX Slots	25.95	25.65	25.31	26.00	-4.42	21.53	21.23	20.89	21.58
	4 TX Slots	23.85	23.52	23.53	25.00	-3.17	20.68	20.35	20.36	21.83
EGPRS (8PSK)	1 TX Slot	25.33	25.77	25.67	26.00	-9.19	16.14	16.58	16.48	16.81
	2 TX Slots	23.34	23.56	23.05	24.00	-6.18	17.16	17.38	16.87	17.82
	3 TX Slots	20.60	20.94	20.74	22.00	-4.42	16.18	16.52	16.32	17.58
	4 TX Slots	18.84	18.45	18.66	20.00	-3.17	15.67	15.28	15.49	16.83

Table 7： Conducted Power of GSM 1900

8.1.3 Conducted Power of WCDMA 2

WCDMA Band II					
Average Conducted Power(dBm)					
Channel		9262	9400	9538	Tune up
WCDMA	12.2kbps RMC	24.24	24.31	24.05	25.00
	12.2kbps AMR	24.21	24.25	23.98	25.00
HSDPA	Subtest 1	23.57	23.08	23.45	24.00
	Subtest 2	23.63	23.09	23.49	24.00
	Subtest 3	23.59	23.12	23.50	24.00
	Subtest 4	23.62	23.06	23.46	24.00
HSUPA	Subtest 1	21.68	21.26	21.44	22.00
	Subtest 2	21.17	21.11	21.18	22.00
	Subtest 3	21.37	21.11	21.87	22.00
	Subtest 4	21.81	21.21	21.32	22.00
	Subtest 5	21.87	21.58	21.15	22.00

Table 8： Conducted Power of WCDMA 2

8.1.4 Conducted Power of WCDMA 4

WCDMA Band IV					
Average Conducted Power(dBm)					
Channel		1312	1412	1513	Tune up
WCDMA	12.2kbps RMC	23.74	23.79	23.96	24.00
	12.2kbps AMR	23.73	23.75	23.89	24.00
HSDPA	Subtest 1	23.50	23.44	23.62	24.00
	Subtest 2	23.54	23.47	23.66	24.00
	Subtest 3	23.58	23.48	23.67	24.00
	Subtest 4	23.54	23.42	23.61	24.00
HSUPA	Subtest 1	21.62	21.46	21.46	22.00
	Subtest 2	21.29	21.06	21.12	22.00
	Subtest 3	21.29	21.49	21.30	22.00
	Subtest 4	21.73	21.11	21.46	22.00
	Subtest 5	21.12	21.06	21.69	22.00

Table 9： Conducted Power of WCDMA 4

8.1.5 Conducted Power of WCDMA 5

WCDMA Band V					
Average Conducted Power(dBm)					
Channel		4132	4182	4233	Tune up
WCDMA	12.2kbps RMC	23.13	23.16	23.30	24.00
	12.2kbps AMR	23.13	23.11	23.28	24.00
HSDPA	Subtest 1	22.96	23.10	23.08	24.00
	Subtest 2	22.91	23.14	23.07	24.00
	Subtest 3	22.96	23.15	23.08	24.00
	Subtest 4	22.93	23.12	23.09	24.00
HSUPA	Subtest 1	22.67	22.06	22.01	23.00
	Subtest 2	22.12	22.56	22.52	23.00
	Subtest 3	22.61	22.75	22.70	23.00
	Subtest 4	22.21	22.34	22.31	23.00
	Subtest 5	22.12	22.01	22.98	23.00

Table 10： Conducted Power of WCDMA 5

8.1.6 Conducted Power of LTE 2

LTE Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193	Tune up
1.4MHz	QPSK	1	0	23.53	23.42	23.15	24.00
		1	2	23.50	23.31	23.12	24.00
		1	5	23.56	23.40	22.98	24.00
		3	0	22.87	22.81	22.82	23.00
		3	2	22.87	22.94	22.89	23.00
		3	3	22.81	22.84	22.91	23.00
		6	0	22.52	22.36	22.02	23.00
	16QAM	1	0	22.55	22.26	21.67	23.00
		1	2	22.62	22.20	21.60	23.00
		1	5	22.56	22.27	21.60	23.00
		3	0	21.93	21.74	21.91	22.00
		3	2	21.92	21.88	21.96	22.00
		3	3	21.92	21.78	21.85	22.00
		6	0	20.95	20.85	20.88	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185	Tune up
3MHz	QPSK	1	0	23.35	22.78	23.22	24.00
		1	7	23.33	22.81	23.16	24.00
		1	14	23.23	22.90	22.64	24.00
		8	0	22.43	21.84	22.09	23.00
		8	4	22.38	21.89	22.13	23.00
		8	7	22.38	21.94	22.04	23.00
		15	0	21.87	21.85	21.87	22.00
	16QAM	1	0	22.72	22.42	22.08	23.00
		1	7	22.65	22.40	22.03	23.00
		1	14	22.61	22.41	21.99	23.00
		8	0	21.57	21.04	21.34	22.00
		8	4	21.55	21.10	21.33	22.00
		8	7	21.64	21.12	21.29	22.00
		15	0	20.92	20.88	20.77	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175	Tune up
5MHz	QPSK	1	0	23.36	22.91	23.11	24.00
		1	13	23.35	22.96	22.96	24.00
		1	24	23.35	22.92	22.77	24.00
		12	0	22.39	22.24	22.21	23.00
		12	6	22.47	22.10	22.17	23.00
		12	13	22.40	22.26	22.07	23.00

		25	0	21.39	21.44	21.13	22.00
	16QAM	1	0	22.19	22.09	22.34	23.00
		1	13	22.22	22.06	22.19	23.00
		1	24	22.21	22.18	22.09	23.00
		12	0	21.49	21.00	21.31	22.00
		12	6	21.56	20.94	21.23	22.00
		12	13	21.49	21.00	21.15	22.00
		25	0	20.54	20.89	20.29	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18650	18900	19150	
10MHz	QPSK	1	0	23.41	23.06	23.42	24.00
		1	25	23.33	22.92	23.24	24.00
		1	49	23.36	22.99	22.69	24.00
		25	0	22.38	21.97	22.29	23.00
		25	13	22.50	21.98	22.19	23.00
		25	25	22.44	22.05	22.14	23.00
		50	0	21.57	21.74	21.19	22.00
	16QAM	1	0	22.81	22.22	22.31	23.00
		1	25	22.75	22.16	22.16	23.00
		1	49	22.76	22.29	22.08	23.00
		25	0	21.57	21.11	21.48	22.00
		25	13	21.56	21.12	21.42	22.00
		25	25	21.52	21.11	21.35	22.00
		50	0	20.54	20.09	20.27	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18675	18900	19125	
15MHz	QPSK	1	0	23.40	22.98	23.29	24.00
		1	38	23.22	22.88	23.22	24.00
		1	74	23.03	23.02	22.94	24.00
		36	0	22.44	21.90	22.28	23.00
		36	18	22.44	21.85	22.27	23.00
		36	39	22.44	21.99	22.13	23.00
		75	0	21.36	20.94	21.21	22.00
	16QAM	1	0	22.75	22.20	22.64	23.00
		1	38	22.69	22.25	22.62	23.00
		1	74	22.77	22.47	22.10	23.00
		36	0	21.49	21.06	21.37	22.00
		36	18	21.51	21.02	21.27	22.00
		36	39	21.42	21.07	21.25	22.00
		75	0	20.50	20.08	20.28	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18700	18900	19100	
20MHz	QPSK	1	0	23.29	22.95	23.39	24.00
		1	50	22.75	22.82	22.96	24.00
		1	99	23.11	23.08	22.82	24.00
		50	0	22.44	21.94	22.39	23.00
		50	25	22.42	22.03	22.22	23.00

		50	50	22.26	22.04	22.18	23.00
		100	0	21.41	21.36	21.30	22.00
	16QAM	1	0	22.50	21.89	22.75	23.00
		1	50	22.41	21.86	22.92	23.00
		1	99	22.18	22.16	22.38	23.00
		50	0	21.50	21.02	21.35	22.00
		50	25	21.53	21.01	21.35	22.00
		50	50	21.38	21.18	21.21	22.00
		100	0	20.44	20.06	20.31	21.00

Table 11：Conducted Power of LTE 2

8.1.7 Conducted Power of LTE 4

LTE Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393	Tune up
1.4MHz	QPSK	1	0	23.93	24.04	24.28	24.50
		1	2	23.98	24.08	24.17	24.50
		1	5	23.96	24.09	24.15	24.50
		3	0	23.07	23.27	23.04	23.50
		3	2	23.09	23.26	23.12	23.50
		3	3	23.01	23.25	23.06	23.50
		6	0	21.89	22.15	22.13	23.50
	16QAM	1	0	23.02	23.33	23.39	23.50
		1	2	23.05	23.31	23.28	23.50
		1	5	23.04	23.31	23.41	23.50
		3	0	22.34	22.33	22.41	22.50
		3	2	22.41	22.38	22.45	22.50
		3	3	22.42	22.37	22.44	22.50
		6	0	21.02	21.35	21.28	22.50
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385	Tune up
3MHz	QPSK	1	0	23.92	24.08	24.32	24.50
		1	7	23.89	24.06	24.31	24.50
		1	14	23.89	24.06	24.29	24.50
		8	0	22.97	23.13	23.11	23.50
		8	4	22.92	23.12	23.15	23.50
		8	7	22.90	23.17	23.10	23.50
		15	0	21.99	22.08	22.07	23.50
	16QAM	1	0	23.37	23.31	23.35	23.50
		1	7	23.36	23.35	23.35	23.50
		1	14	23.38	23.26	23.31	23.50
		8	0	22.31	22.28	22.46	22.50
		8	4	22.33	22.29	22.39	22.50
		8	7	22.32	22.29	22.35	22.50
		15	0	21.11	21.25	21.23	22.50
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375	Tune up
5MHz	QPSK	1	0	24.00	24.12	24.04	24.50
		1	13	23.95	24.12	23.76	24.50
		1	24	23.97	23.82	23.86	24.50
		12	0	23.03	23.16	23.14	23.50
		12	6	23.11	23.19	23.03	23.50
		12	13	23.02	23.18	23.12	23.50

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
		25	0	21.99	22.18	22.13	23.50
	16QAM	1	0	22.31	23.25	23.24	23.50
		1	13	22.27	23.26	23.21	23.50
		1	24	22.32	23.23	23.24	23.50
		12	0	22.14	22.16	22.18	22.50
		12	6	22.11	22.22	22.24	22.50
		12	13	22.13	22.21	22.20	22.50
		25	0	21.17	21.22	21.35	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	23.55	23.80	23.82	24.50
		1	25	23.60	23.81	23.77	24.50
		1	49	23.56	23.80	23.75	24.50
		25	0	23.09	23.16	23.12	23.50
		25	13	23.02	23.15	23.10	23.50
		25	25	23.11	23.14	23.09	23.50
		50	0	22.06	22.22	22.07	23.50
	16QAM	1	0	23.03	23.18	23.06	23.50
		1	25	23.12	23.15	23.04	23.50
		1	49	23.09	23.17	23.16	23.50
		25	0	22.07	22.14	22.15	22.50
		25	13	22.04	22.22	22.17	22.50
		25	25	22.02	22.20	22.13	22.50
		50	0	21.08	21.18	21.11	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	23.97	24.07	24.24	24.50
		1	38	23.99	24.14	24.22	24.50
		1	74	24.00	24.20	24.18	24.50
		36	0	23.10	23.01	23.25	23.50
		36	18	23.11	23.20	23.24	23.50
		36	39	22.90	23.11	23.16	23.50
		75	0	22.02	22.13	22.16	23.50
	16QAM	1	0	23.47	23.36	23.34	23.50
		1	38	23.48	23.48	23.20	23.50
		1	74	23.36	23.32	23.21	23.50
		36	0	22.15	22.19	22.44	22.50
		36	18	22.02	22.15	22.33	22.50
		36	39	22.03	22.25	22.36	22.50
		75	0	21.98	21.15	21.26	22.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	24.28	24.19	24.28	24.50
		1	50	24.21	24.24	24.34	24.50
		1	99	24.30	24.42	24.23	24.50
		50	0	23.08	23.06	23.27	23.50
		50	25	23.11	23.23	23.22	23.50

		50	50	22.98	23.19	23.28	23.50
		100	0	22.11	22.04	22.18	23.50
	16QAM	1	0	23.17	23.06	23.42	23.50
		1	50	23.17	23.20	23.49	23.50
		1	99	23.24	23.28	23.46	23.50
		50	0	22.16	22.07	22.22	22.50
		50	25	21.99	22.20	22.20	22.50
		50	50	22.12	22.23	22.23	22.50
		100	0	21.49	21.75	21.83	22.50

Table 12： Conducted Power of LTE 4

8.1.8 Conducted Power of LTE 5

LTE Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643	Tune up
1.4MHz	QPSK	1	0	23.70	23.73	23.64	24.00
		1	2	23.84	23.85	23.69	24.00
		1	5	23.82	23.86	23.70	24.00
		3	0	22.80	22.83	22.80	23.00
		3	2	22.79	22.81	22.92	23.00
		3	3	22.71	22.78	22.81	23.00
		6	0	22.72	22.66	22.73	23.00
	16QAM	1	0	22.88	22.19	22.59	23.00
		1	2	22.93	22.23	22.62	23.00
		1	5	22.91	22.27	22.61	23.00
		3	0	21.94	21.71	21.89	22.00
		3	2	21.94	21.64	21.95	22.00
		3	3	21.90	21.65	21.87	22.00
		6	0	21.76	21.81	21.52	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635	Tune up
3MHz	QPSK	1	0	23.63	23.78	23.79	24.00
		1	7	23.64	23.84	23.76	24.00
		1	14	23.58	23.84	23.76	24.00
		8	0	22.69	22.73	22.78	23.00
		8	4	22.68	22.71	22.76	23.00
		8	7	22.64	22.77	22.85	23.00
		15	0	22.69	22.65	22.89	23.00
	16QAM	1	0	22.90	22.39	22.32	23.00
		1	7	22.88	22.38	22.30	23.00
		1	14	22.79	22.42	22.25	23.00
		8	0	21.73	21.88	21.43	22.00
		8	4	21.74	21.93	21.42	22.00
		8	7	21.81	21.98	21.48	22.00
		15	0	21.72	21.82	21.40	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625	Tune up
5MHz	QPSK	1	0	23.60	23.68	23.66	24.00
		1	13	23.49	23.68	23.66	24.00
		1	24	23.50	23.75	23.67	24.00
		12	0	22.63	22.66	22.88	23.00
		12	6	22.45	22.73	22.80	23.00
		12	13	22.65	22.68	22.87	23.00

Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600	Tune up
		25	0	22.57	22.73	22.88	23.00
	16QAM	1	0	21.87	22.80	22.85	23.00
		1	13	21.83	22.82	22.86	23.00
		1	24	21.81	22.90	22.84	23.00
		12	0	21.64	21.75	21.87	22.00
		12	6	21.72	21.81	21.91	22.00
		12	13	21.69	21.82	21.90	22.00
		25	0	21.53	21.69	21.78	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600	Tune up
10MHz	QPSK	1	0	23.75	23.75	23.86	24.00
		1	25	23.69	23.81	23.93	24.00
		1	49	23.60	23.91	23.92	24.00
		25	0	22.71	22.66	22.81	23.00
		25	13	22.49	22.77	22.78	23.00
		25	25	22.74	22.70	22.82	23.00
		50	0	22.59	22.67	22.80	23.00
	16QAM	1	0	22.81	22.81	22.74	23.00
		1	25	22.73	22.88	22.76	23.00
		1	49	22.70	22.95	22.69	23.00
		25	0	21.79	21.77	21.92	22.00
		25	13	21.57	21.86	21.83	22.00
		25	25	21.81	21.85	21.84	22.00
		50	0	21.80	21.88	21.96	22.00

Table 13：Conducted Power of LTE 5

8.1.9 Conducted Power of LTE 7

LTE Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425	Tune up
5MHz	QPSK	1	0	24.10	24.29	24.46	25.00
		1	13	24.50	24.47	24.53	25.00
		1	24	23.92	24.91	24.06	25.00
		12	0	23.11	23.43	23.16	24.00
		12	6	23.23	23.31	23.17	24.00
		12	13	23.07	23.28	23.08	24.00
		25	0	23.01	23.37	23.15	24.00
	16QAM	1	0	23.50	23.82	23.74	24.00
		1	13	23.96	23.78	23.83	24.00
		1	24	23.53	23.79	23.43	24.00
		12	0	22.67	22.88	22.82	23.00
		12	6	22.46	22.84	22.80	23.00
		12	13	22.58	22.79	22.77	23.00
		25	0	22.15	22.32	22.32	23.00
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400	Tune up
10MHz	QPSK	1	0	23.82	24.45	24.22	25.00
		1	25	24.09	24.52	24.05	25.00
		1	49	24.50	24.45	23.89	25.00
		25	0	23.90	23.91	23.84	24.00
		25	13	23.86	23.93	23.75	24.00
		25	25	23.90	23.96	23.87	24.00
		50	0	22.96	22.99	22.71	24.00
	16QAM	1	0	23.55	23.80	23.69	24.00
		1	25	23.91	23.72	23.43	24.00
		1	49	23.86	23.65	23.43	24.00
		25	0	22.75	22.64	22.82	23.00
		25	13	22.75	22.64	22.59	23.00
		25	25	22.74	22.58	22.60	23.00
		50	0	22.33	22.04	22.54	23.00
Bandwidth	Modulation	RB size	RB offset	Channel 20825	Channel 21100	Channel 21375	Tune up
15MHz	QPSK	1	0	24.96	24.94	24.56	25.00
		1	38	24.92	24.93	24.56	25.00
		1	74	24.75	24.78	24.57	25.00
		36	0	23.97	23.88	23.69	24.00
		36	18	23.91	23.76	23.72	24.00
		36	39	23.90	23.72	23.60	24.00

		75	0	22.92	22.89	22.62	24.00
	16QAM	1	0	23.93	23.76	23.92	24.00
		1	38	23.80	23.69	23.88	24.00
		1	74	23.69	23.60	23.80	24.00
		36	0	22.55	22.51	22.67	23.00
		36	18	22.55	22.43	22.81	23.00
		36	39	22.45	22.38	22.67	23.00
		75	0	22.11	22.40	22.72	23.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	24.98	24.92	24.90	25.00
		1	50	24.94	24.98	24.89	25.00
		1	99	24.91	24.84	24.88	25.00
		50	0	23.92	23.96	23.58	24.00
		50	25	23.97	23.93	23.67	24.00
		50	50	23.92	23.81	23.51	24.00
		100	0	22.99	22.90	22.72	24.00
	16QAM	1	0	23.92	23.90	23.66	24.00
		1	50	23.63	23.81	23.67	24.00
		1	99	23.64	23.61	23.60	24.00
		50	0	22.76	22.58	22.66	23.00
		50	25	22.60	22.56	22.57	23.00
		50	50	22.63	22.52	22.69	23.00
		100	0	22.49	22.41	22.78	23.00

Table 14: Conducted Power of LTE 7

8.1.10 Conducted Power of LTE 12

LTE FDD Band 12				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 23017	Channel 23095	Channel 23173	Tune up
1.4MHz	QPSK	1	0	23.75	23.28	23.49	24.00
		1	2	23.81	23.40	23.66	24.00
		1	5	23.78	23.38	23.65	24.00
		3	0	22.84	22.76	22.64	23.00
		3	2	22.83	22.74	22.63	23.00
		3	3	22.85	22.66	22.67	23.00
		6	0	22.68	22.55	22.55	23.00
	16QAM	1	0	22.30	22.84	22.07	23.00
		1	2	22.22	22.74	22.08	23.00
		1	5	22.24	22.81	22.14	23.00
		3	0	21.81	21.97	21.63	22.00
		3	2	21.85	21.98	21.63	22.00
		3	3	21.79	21.99	21.61	22.00
		6	0	21.77	21.69	21.56	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 23025	Channel 23095	Channel 23165	Tune up
3MHz	QPSK	1	0	23.64	23.43	23.58	24.00
		1	7	23.60	23.39	23.56	24.00
		1	14	23.66	23.38	23.55	24.00
		8	0	22.77	22.47	22.47	23.00
		8	4	22.70	22.55	22.49	23.00
		8	7	22.54	22.54	22.52	23.00
		15	0	22.72	22.60	22.53	23.00
	16QAM	1	0	22.75	22.71	22.17	23.00
		1	7	22.74	22.72	22.22	23.00
		1	14	22.53	22.66	22.27	23.00
		8	0	21.79	21.33	21.65	22.00
		8	4	21.80	21.55	21.65	22.00
		8	7	21.94	21.55	21.66	22.00
		15	0	21.70	21.52	21.55	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 23035	Channel 23095	Channel 23155	Tune up
5MHz	QPSK	1	0	23.55	23.48	23.58	24.00
		1	13	23.58	23.41	23.43	24.00
		1	24	23.48	23.48	23.47	24.00
		12	0	22.65	22.57	22.48	23.00
		12	6	22.60	22.58	22.47	23.00
		12	13	22.51	22.56	22.52	23.00
		25	0	22.55	22.55	22.51	23.00
	16QAM	1	0	21.80	22.51	22.38	23.00

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
		1	13	21.61	22.52	22.47	23.00
		1	24	21.69	22.44	22.58	23.00
		12	0	21.70	21.34	21.63	22.00
		12	6	21.75	21.45	21.56	22.00
		12	13	21.69	21.44	21.53	22.00
		25	0	21.88	21.56	21.65	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 23060	Channel 23095	Channel 23130	Tune up
10MHz	QPSK	1	0	23.61	23.82	23.44	24.00
		1	25	23.50	23.68	23.43	24.00
		1	49	23.43	23.74	23.48	24.00
		25	0	22.63	22.60	22.57	23.00
		25	13	22.57	22.60	22.54	23.00
		25	25	22.55	22.55	22.53	23.00
		50	0	22.60	22.63	22.51	23.00
	16QAM	1	0	22.45	22.13	22.56	23.00
		1	25	22.39	22.13	22.52	23.00
		1	49	22.30	22.00	22.64	23.00
		25	0	21.78	21.43	21.49	22.00
		25	13	21.78	21.59	21.55	22.00
		25	25	21.29	21.69	21.61	22.00
		50	0	21.27	21.56	21.65	22.00

Table 15： Conducted Power of LTE 12

8.1.11 Conducted Power of LTE 13

LTE FDD Band 13				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 23205	Channel 23230	Channel 23255	Tune up
5MHz	QPSK	1	0	23.70	23.74	23.64	24.00
		1	13	23.74	23.70	23.54	24.00
		1	24	23.66	23.59	23.64	24.00
		12	0	22.82	22.66	22.75	23.00
		12	6	22.76	22.63	22.59	23.00
		12	13	22.67	22.99	22.53	23.00
		25	0	22.72	22.57	22.73	23.00
	16QAM	1	0	22.70	21.86	22.72	23.00
		1	13	22.71	21.76	22.82	23.00
		1	24	22.63	21.78	22.64	23.00
		12	0	21.79	21.78	21.72	22.00
		12	6	21.79	21.80	21.78	22.00
		12	13	21.78	21.76	21.73	22.00
		25	0	21.90	21.87	21.68	22.00
Bandwidth	Modulation	RB size	RB offset	Channel /	Channel 23230	Channel /	Tune up
10MHz	QPSK	1	0	/	23.63	/	24.00
		1	25	/	23.62	/	24.00
		1	49	/	23.58	/	24.00
		25	0	/	22.69	/	23.00
		25	13	/	22.68	/	23.00
		25	25	/	22.64	/	23.00
		50	0	/	22.6	/	23.00
	16QAM	1	0	/	22.94	/	23.00
		1	25	/	22.99	/	23.00
		1	49	/	22.79	/	23.00
		25	0	/	21.79	/	22.00
		25	13	/	21.78	/	22.00
		25	25	/	21.77	/	22.00
		50	0	/	21.71	/	22.00

Table 16： Conducted Power of LTE 13

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86–755) 26012053 f (86–755) 26710594 www.sgsgroup.com.cn
中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编:518057 t (86–755) 26012053 f (86–755) 26710594 sgs.china@sgs.com

8.1.12 Conducted Power of LTE 17

LTE FDD Band 17				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 23755	Channel 23790	Channel 23825	Tune up
5MHz	QPSK	1	0	23.66	23.44	23.41	24.00
		1	13	23.56	23.39	23.38	24.00
		1	24	23.50	23.44	23.39	24.00
		12	0	22.62	22.48	22.54	23.00
		12	6	22.54	22.44	22.51	23.00
		12	13	22.63	22.40	22.46	23.00
		25	0	22.56	22.47	22.48	23.00
	16QAM	1	0	22.63	22.54	22.38	23.00
		1	13	22.64	22.41	22.45	23.00
		1	24	22.66	22.33	22.48	23.00
		12	0	21.31	21.43	21.61	22.00
		12	6	21.29	21.62	21.49	22.00
		12	13	21.48	21.66	21.51	22.00
		25	0	21.38	21.59	21.56	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 23780	Channel 23790	Channel 23800	Tune up
10MHz	QPSK	1	0	23.50	23.48	23.73	24.00
		1	25	23.31	23.42	23.68	24.00
		1	49	23.39	23.47	23.77	24.00
		25	0	22.52	22.60	22.64	23.00
		25	13	22.58	22.51	22.44	23.00
		25	25	22.37	22.44	22.52	23.00
		50	0	22.58	22.52	22.58	23.00
	16QAM	1	0	22.62	22.83	22.23	23.00
		1	25	22.54	22.75	22.01	23.00
		1	49	22.52	22.75	22.21	23.00
		25	0	21.34	21.58	21.59	22.00
		25	13	21.46	21.68	21.69	22.00
		25	25	21.67	21.72	21.63	22.00
		50	0	21.54	21.68	21.60	22.00

Table 17：Conducted Power of LTE 17

8.1.13 Conducted Power of LTE 66

LTE Band 66				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 131979	Channel 132322	Channel 132665	Tune up
1.4MHz	QPSK	1	0	22.82	22.56	22.67	23.00
		1	2	22.87	22.71	22.66	23.00
		1	5	22.88	22.73	22.58	23.00
		3	0	21.78	21.73	21.59	22.00
		3	1	21.94	21.77	21.59	22.00
		3	3	21.86	21.71	21.56	22.00
		6	0	21.71	21.69	21.43	22.00
	16QAM	1	0	21.88	21.19	21.13	22.00
		1	2	21.89	21.05	21.19	22.00
		1	5	21.91	21.22	21.14	22.00
		3	0	20.96	20.76	20.52	21.00
		3	1	20.96	20.82	20.50	21.00
		3	3	20.96	20.75	20.48	21.00
		6	0	20.72	20.56	20.37	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 131987	Channel 132322	Channel 132657	Tune up
3MHz	QPSK	1	0	22.74	22.56	22.53	23.00
		1	7	22.75	22.61	22.39	23.00
		1	14	22.70	22.57	22.27	23.00
		8	0	21.80	21.69	21.25	22.00
		8	4	21.73	21.74	21.24	22.00
		8	7	21.76	21.70	21.20	22.00
		15	0	21.72	21.72	21.21	22.00
	16QAM	1	0	21.18	21.42	20.94	22.00
		1	7	21.11	21.50	20.90	22.00
		1	14	21.06	21.44	20.86	22.00
		8	0	21.00	20.95	20.77	21.00
		8	4	20.96	20.95	20.76	21.00
		8	7	20.92	20.95	20.73	21.00
		15	0	20.85	20.85	20.69	21.00
Bandwidth	Modulation	RB size	RB offset	Channel 131997	Channel 132322	Channel 132647	Tune up
5MHz	QPSK	1	0	22.76	22.78	22.52	23.00
		1	13	22.68	22.86	22.19	23.00
		1	24	22.76	22.85	21.93	23.00
		12	0	21.73	21.69	21.33	22.00
		12	6	21.77	21.64	21.21	22.00
		12	13	21.70	21.75	21.06	22.00
		25	0	21.62	21.71	21.10	22.00
	16QAM	1	0	21.07	21.78	21.10	22.00

		1	13	21.05	21.78	20.85	22.00
		1	24	21.01	21.78	20.63	22.00
		12	0	20.83	20.73	20.78	21.00
		12	6	20.80	20.73	20.71	21.00
		12	13	20.76	20.73	20.53	21.00
		25	0	20.86	20.73	20.65	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132022	132322	132622	
10MHz	QPSK	1	0	22.68	22.63	22.82	23.00
		1	25	22.66	22.70	22.33	23.00
		1	49	22.72	22.69	21.86	23.00
		25	0	21.77	21.66	21.51	22.00
		25	13	21.63	21.83	21.23	22.00
		25	25	21.66	21.72	21.66	22.00
		50	0	21.81	21.76	21.68	22.00
	16QAM	1	0	21.96	21.20	21.64	22.00
		1	25	21.94	21.27	21.65	22.00
		1	49	21.90	21.24	21.60	22.00
		25	0	20.86	20.82	20.97	21.00
		25	13	20.76	20.88	20.96	21.00
		25	25	20.77	20.89	20.89	21.00
		50	0	20.74	20.88	20.88	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132047	132322	132597	
15MHz	QPSK	1	0	22.67	22.73	22.84	23.00
		1	38	22.60	22.77	22.76	23.00
		1	74	22.55	22.73	22.13	23.00
		36	0	21.72	21.81	21.74	22.00
		36	18	21.54	21.71	21.68	22.00
		36	39	21.52	21.82	21.62	22.00
		75	0	21.66	21.71	21.73	22.00
	16QAM	1	0	21.84	21.33	21.11	22.00
		1	38	21.78	21.40	21.02	22.00
		1	74	21.73	21.42	21.61	22.00
		36	0	20.75	20.79	20.82	21.00
		36	18	20.71	20.84	20.77	21.00
		36	39	20.77	20.82	20.71	21.00
		75	0	20.80	20.86	20.78	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132072	132322	132572	
20MHz	QPSK	1	0	22.77	22.96	22.72	23.00
		1	50	22.72	22.91	22.50	23.00
		1	99	22.65	22.95	21.99	23.00
		50	0	21.61	21.64	21.81	22.00
		50	25	21.64	21.75	21.79	22.00
		50	50	21.53	21.66	21.68	22.00
		100	0	21.67	21.81	21.73	22.00

	16QAM	1	0	21.33	21.35	21.91	22.00
		1	50	21.23	21.29	21.89	22.00
		1	99	21.22	21.38	21.64	22.00
		50	0	20.78	20.81	20.93	21.00
		50	25	20.67	20.86	20.94	21.00
		50	50	20.64	20.87	20.84	21.00
		100	0	20.77	20.83	20.83	21.00

Table 18：Conducted Power of LTE 66

8.1.14 Conducted Power of 2.4GWIFI

WIFI 2.4G					
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
802.11b	1	2412	1	13.35	14.00
	6	2437		13.98	14.00
	11	2462		13.72	14.00
802.11g	1	2412	6	9.55	10.00
	6	2437		9.63	10.00
	11	2462		9.35	10.00
802.11n HT20	1	2412	6.5	8.58	9.00
	6	2437		8.97	9.00
	11	2462		8.92	9.00

8.1.15 Conducted Power of Bluetooth

BT		Average Conducted Power(dBm)			
Band	Channel	0	39	78	Tune up
BT	GFSK	5.26	5.19	4.57	6
	π/4DQPSK	6.16	6.49	5.85	7
	8DPSK	6.61	6.92	5.30	7
Band	Channel	0	19	39	Tune up
BLE 1M	GFSK	-0.80	-0.76	-1.55	0

Table 19： Conducted Power of BT

8.2 Measurement of SAR Data

Note:

1) The maximum Scaled SAR value is marked in bold. Graph Results refer to Appendix B

2) Per FCC KDB Publication 447498 D04, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg (2.0W/kg for 10g) then testing at the other channels is not required for such test configuration(s).

8.2.1 SAR Result Of GSM850

GSM850 SAR Test Record										
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)										
Front side	GPRS 2TS	190/836.6	1:4.15	0.175	0.07	31.30	32.00	1.175	**0.206**	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)										
Back side	GPRS 2TS	190/836.6	1:4.15	0.548	0.06	31.30	32.00	1.175	**0.644**	22.4

Table 20：SAR Result Of GSM850

8.2.2 SAR Result of GSM1900

GSM1900 SAR Test Record										
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)										
Front side	GPRS 4TS	661/1880	1:2.075	0.135	0.04	23.52	25.00	1.406	**0.190**	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)										
Back side	GPRS 4TS	661/1880	1:2.075	0.368	0.03	23.52	25.00	1.406	**0.517**	22.4

Table 21：SAR Result Of GSM1900

8.2.3 SAR Result Of WCDMA Band 2

WB2 SAR Test Record										
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)										
Front side	RMC	9400/1880	1:1	0.336	-0.05	24.31	25.00	1.172	**0.394**	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)										
Back side	RMC	9400/1880	1:1	1.320	0.09	24.31	25.00	1.172	**1.547**	22.4

Table 22：SAR Result Of WCDMA Band 2

8.2.4 SAR Result Of WCDMA Band 4

WB4 SAR Test Record										
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)										
Front side	RMC	1412/1732.4	1:1	0.482	0.10	23.79	24.00	1.050	**0.506**	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)										
Back side	RMC	1412/1732.4	1:1	1.620	0.05	23.79	24.00	1.050	**1.700**	22.4

Table 23：SAR Result Of WCDMA Band 4

8.2.5 SAR Result Of WCDMA Band 5

WB5 SAR Test Record										
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)										
Front side	RMC	4182/836.4	1:1	0.083	0.01	23.16	24.00	1.213	**0.100**	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)										
Back side	RMC	4182/836.4	1:1	0.285	0.13	23.16	24.00	1.213	**0.346**	22.4

Table 24： SAR Result Of WCDMA Band 5

8.2.6 SAR Result Of LTE band 2

LTE Band 2 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	19100/1900	1:1	0.581	-0.01	23.39	24.00	1.151	**0.669**	22.1
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_0	18700/1860	1:1	0.451	-0.11	22.44	23.00	1.138	0.513	22.1
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	20	QPSK 1_0	19100/1900	1:1	1.330	-0.12	23.39	24.00	1.151	**1.531**	22.1
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	20	QPSK 50_0	18700/1860	1:1	1.310	-0.12	22.44	23.00	1.138	1.490	22.1

Table 25：SAR Result Of LTE band 2

8.2.7 SAR Result Of LTE band 4

LTE Band 4 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_99	20175/1732.5	1:1	0.511	0.10	24.42	24.50	1.019	**0.521**	22.1
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_50	20300/1745	1:1	0.393	0.18	23.28	23.50	1.052	0.413	22.1
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	20	QPSK 1_99	20175/1732.5	1:1	1.420	-0.02	24.42	24.50	1.019	**1.446**	22.1
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	20	QPSK 50_50	20300/1745	1:1	1.230	0.00	23.28	23.50	1.052	1.294	22.1

Table 26：SAR Result Of LTE band 4

8.2.8 SAR Result Of LTE band 5

LTE Band 5 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1_25	20600/844	1:1	0.093	-0.06	23.93	24.00	1.016	**0.094**	22.1
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	10	QPSK 25_25	20600/844	1:1	0.069	-0.12	22.82	23.00	1.042	0.072	22.1
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	10	QPSK 1_25	20600/844	1:1	0.386	0.10	23.93	24.00	1.016	**0.392**	22.1
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	10	QPSK 25_25	20600/844	1:1	0.304	0.18	22.82	23.00	1.042	0.317	22.1

Table 27：SAR Result Of LTE band 5

8.2.9 SAR Result Of LTE band 7

LTE Band 7 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_50	21100/2535	1:1	0.440	0.09	24.98	25.00	1.005	**0.442**	22.1
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_25	20850/2510	1:1	0.343	0.08	23.97	24.00	1.007	0.345	22.1
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	20	QPSK 1_50	21100/2535	1:1	1.510	-0.15	24.98	25.00	1.005	**1.517**	22.1
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	20	QPSK 50_25	20850/2510	1:1	1.400	-0.11	23.97	24.00	1.007	1.410	22.1

Table 28：SAR Result Of LTE band 7

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编:518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

8.2.10 SAR Result Of LTE band 12

LTE Band 12 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1_0	23095/707.5	1:1	0.080	-0.01	23.82	24.00	1.042	**0.083**	22.1
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	10	QPSK 25_0	23060/704	1:1	0.067	0.04	22.63	23.00	1.089	0.073	22.1
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	10	QPSK 1_0	23095/707.5	1:1	0.249	0.08	23.82	24.00	1.042	**0.260**	22.1
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	10	QPSK 25_0	23060/704	1:1	0.213	0.08	22.63	23.00	1.089	0.232	22.1

Table 29：SAR Result Of LTE band 12

8.2.11 SAR Result Of LTE band 13

LTE Band 13 SAR Test Record											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1_0	23230/782	1:1	0.069	-0.04	23.63	24.00	1.089	**0.075**	22.3
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	10	QPSK 25_0	23230/782	1:1	0.067	0.02	22.69	23.00	1.074	0.072	22.3
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	10	QPSK 1_0	23230/782	1:1	0.281	0.10	23.63	24.00	1.089	**0.306**	22.3
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	10	QPSK 25_0	23230/782	1:1	0.269	0.04	22.69	23.00	1.074	0.289	22.3

Table 30：SAR Result Of LTE band 13

8.2.12 SAR Result Of LTE band 17

LTE Band 17 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	10	QPSK 1_49	23800/711	1:1	0.077	0.14	23.77	24.00	1.054	**0.081**	22.3
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	10	QPSK 25_0	23800/711	1:1	0.052	-0.17	22.64	23.00	1.086	0.056	22.3
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	10	QPSK 1_49	23800/711	1:1	0.293	0.14	23.77	24.00	1.054	**0.309**	22.3
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	10	QPSK 25_0	23800/711	1:1	0.219	0.14	22.64	23.00	1.086	0.238	22.3

Table 31： SAR Result Of LTE band 17

8.2.13 SAR Result Of LTE band 66

LTE Band 66 SAR Test Record											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm 1RB)											
Front side	20	QPSK 1_0	132322/1745	1:1	0.596	0.03	22.96	23.00	1.009	**0.602**	22.3
Next to the mouth Test data(Separate 10mm 50%RB)											
Front side	20	QPSK 50_0	132572/1770	1:1	0.489	-0.01	21.81	22.00	1.045	0.511	22.3
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm 1RB)											
Back side	20	QPSK 1_0	132322/1745	1:1	1.860	-0.15	22.96	23.00	1.009	**1.877**	22.3
Limbs SAR Test data(Separate 0mm 50%RB)											
Back side	20	QPSK 50_0	132572/1770	1:1	1.720	-0.05	21.81	22.00	1.045	1.797	22.3

Table 32：SAR Result Of LTE band 66

8.2.14 SAR Result Of 2.4GWIFI

Wi-Fi 2.4G SAR Test Record											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)											
Front side	802.11b	6/2437	99.56%	1.004	0.006	0.04	13.98	14.00	1.005	**0.007**	22.6
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)											
Back side	802.11b	6/2437	99.56%	1.004	0.014	0.16	13.98	14.00	1.005	**0.014**	22.6

Table 33： SAR Result Of WIFI

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Testing Center EEC Laboratory.
No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86–755) 26012053 f (86–755) 26710594 www.sgsgroup.com.cn
中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编:518057 t (86–755) 26012053 f (86–755) 26710594 sgs.china@sgs.com

8.2.15 SAR Result Of Bluetooth

Bluetooth SAR Test Record											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Next to the mouth Test data(Separate 10mm)											
Front side	3DH5	39/2441	63.04%	1.586	0.004	0.08	6.92	7.00	1.019	**0.006**	22.6
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Limbs SAR Test data(Separate 0mm)											
Back side	3DH5	39/2441	63.04%	1.586	0.013	0.16	6.92	7.00	1.019	**0.021**	22.6

Table 34：SAR Result Of BT

8.3 Multiple Transmitter Evaluation

8.3.1 Simultaneous SAR SAR test evaluation

Test position		SARmax (W/kg)				
		MAX WWAN	WiFi 2.4G	BT	Summed SAR	Summed SAR
		1	2	3	1+2	1+3
GSM850	Front side	0.206	0.007	0.006	0.213	0.212
GSM1900	Front side	0.190	0.007	0.006	0.197	0.196
WCDMA Band2	Front side	0.394	0.007	0.006	0.401	0.400
WCDMA Band4	Front side	0.506	0.007	0.006	0.513	0.512
WCDMA Band5	Front side	0.100	0.007	0.006	0.107	0.106
LTE Band2	Front side	0.669	0.007	0.006	0.676	0.675
LTE Band4	Front side	0.521	0.007	0.006	0.528	0.527
LTE Band5	Front side	0.094	0.007	0.006	0.101	0.100
LTE Band7	Front side	0.442	0.007	0.006	0.449	0.448
LTE Band12	Front side	0.083	0.007	0.006	0.090	0.089
LTE Band13	Front side	0.075	0.007	0.006	0.082	0.081
LTE Band17	Front side	0.081	0.007	0.006	0.088	0.087
LTE Band66	Front side	0.602	0.007	0.006	0.609	0.608

Test position		SARmax (W/kg)				
		MAX WWAN	WiFi 2.4G	BT	Summed SAR	Summed SAR
		1	2	3	1+2	1+3
GSM850	Back side	0.644	0.014	0.021	0.658	0.665
GSM1900	Back side	0.517	0.014	0.021	0.531	0.538
WCDMA Band2	Back side	1.547	0.014	0.021	1.561	1.568
WCDMA Band4	Back side	1.700	0.014	0.021	1.714	1.721
WCDMA Band5	Back side	0.346	0.014	0.021	0.360	0.367
LTE Band2	Back side	1.531	0.014	0.021	1.545	1.552
LTE Band4	Back side	1.446	0.014	0.021	1.460	1.467
LTE Band5	Back side	0.392	0.014	0.021	0.406	0.413
LTE Band7	Back side	1.517	0.014	0.021	1.531	1.538
LTE Band12	Back side	0.260	0.014	0.021	0.274	0.281
LTE Band13	Back side	0.306	0.014	0.021	0.320	0.327
LTE Band17	Back side	0.309	0.014	0.021	0.323	0.33
LTE Band66	Back side	1.877	0.014	0.021	1.891	1.898

9 Equipment list

Test Platform	SPEAG DASY Professional					
Description	SAR Test System (Frequency range 300MHz-6GHz)					
Software Reference	DASY52 52.8.4(1052); SEMCAD X 14.6.8(7028)					
Hardware Reference						
	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	SAM 5	1673	NCR	NCR
☒	DAE	SPEAG	DAE4	760	2023/06/26	2024/06/25
☒	E-Field Probe	SPEAG	EX3DV4	3836	2023/08/07	2024/08/06
☒	Validation Kits	SPEAG	D750V3	1160	2022/06/06	2025/06/05
☒	Validation Kits	SPEAG	D835V2	4d105	2022/11/02	2025/11/01
☒	Validation Kits	SPEAG	D1750V2	1149	2022/06/17	2025/06/16
☒	Validation Kits	SPEAG	D1900V2	5d028	2022/11/02	2023/11/01
☒	Validation Kits	SPEAG	D2450V2	733	2022/11/02	2025/11/01
☒	Validation Kits	SPEAG	D2600V2	1125	2022/06/14	2025/06/13
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	0005	2023/6/15	2024/6/14
☒	Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	0140913	2023/6/7	2024/6/6
☒	Radio Communication Analyzer	Anritsu	MT8820C	6201616273	2023/02/16	2024/02/15
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	Agilent	N5171B	MY53050736	2023/02/16	2024/02/15
☒	Preamplifier	Mini-Circuits	ZHL-42W	15542	NCR	NCR
☒	Preamplifier	Compliance Directions Systems Inc.	AMP28-3W	073501433	NCR	NCR
☒	Power Meter	Agilent	E4416A	GB41292095	2023/02/16	2024/02/15
☒	Power Sensor	Agilent	8481H	MY41091234	2023/02/16	2024/02/15
☒	Power Sensor	R&S	NRP-Z92	100025	2023/02/16	2024/02/15
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Speed reading thermometer	MingGao	T809	NA	2023/05/26	2024/05/25
☒	Humidity and	KIMTOKA	KIMTOKA	NA	2023/02/17	2024/02/16

	Temperature Indicator					

Note: All the equipments are within the valid period when the tests are performed.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Testing Center EC Laboratory.
No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86–755) 26012053 f (86–755) 26710594 www.sgsgroup.com.cn
中国・广东・深圳市南山区科技园中区M-10栋1号厂房 邮编：518057 t (86–755) 26012053 f (86–755) 26710594 sgs.china@sgs.com

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

- End of the Report -