TEST REPORT

No. I20D00056-SAR01

For

Client: **NetEase Youdao Information Technology (Beijing) Co., Ltd.**

Production: **Youdao Translator 3**

Model Name: **YDE031，YDE032**

FCC ID: **2AV6G-YDE031**

Hardware Version: **V00A**

Software Version: **YDE031.0.0.2**

Issued date: **2020-06-30**

NOTE

1. The test results in this test report relate only to the devices specified in this report.
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3. KDB has not been approved by A2LA.
4. It has been confirmed with the customer that the Tune-up Power information provided by the customer may affect the validity of the measurement results in this report, and the impact and consequences will be borne by the customer.
5. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

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Revision Version

Report Number	Revision	Date	Memo
I20D0056-SAR01	00	2020-06-30	Initial creation of test report
I20D0056-SAR01	01	2020-07-23	UE capability change

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name	East China Institute of Telecommunications
Address	Building 4, No.766, Jinggang Road, Pudong, Shanghai, China
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Telephone	+86 21 63843300
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1.2. Testing Environment

Normal Temperature	18℃-25℃
Relative Humidity	25%-75%

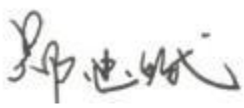
1.3. Project Data

Project Leader	Xu Yuting
Testing Start Date	2020-05-15
Testing End Date	2020-06-29

1.4. Signature

Wang Yubin
(Prepared this test report)

Yan Hang
(Reviewed this test report)



Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name	NetEase Youdao Information Technology (Beijing) Co., Ltd.
Address	No.7 Building,Zhongguancun Software Park West,No.10 Xibeiwang East RD,Haidian District,Beijing,PRC
Telephone	+086 13810968741
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2.2. Manufacturer Information

Company Name	NetEase Youdao Information Technology (Beijing) Co., Ltd.
Address	No.7 Building,Zhongguancun Software Park West,No.10 Xibeiwang East RD,Haidian District,Beijing,PRC
Telephone	+086 13810968741
Postcode	100089

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description:	Youdao Translator 3
Model Name:	YDE031，YDE032
Operation Model(s):	WCDMA Band II/IV/V LTE Band2/4/5/7/12/13/17/18/19/25/26/38/40/41/66； BT4.2/5.0;WiFi 802.11b/g/n/a/ac；
Tx Frequency:	1850 - 1910 MHz (WCDMA Band II) 1710 - 1755 MHz (WCDMA Band IV) 824 – 848 MHz (WCDMA Band V) 1850 - 1910 MHz (LTE Band 2) 1710 - 1755 MHz (LTE Band 4) 2500 - 2570 MHz (LTE Band 7) 699 - 716 MHz (LTE Band 12) 777 - 787 MHz (LTE Band 13) 704 - 716 MHz (LTE Band 17) 815 - 830 MHz (LTE Band 18) 830 - 845 MHz (LTE Band 19) 1850 - 1915 MHz (LTE Band 25) 814 - 849 MHz (LTE Band 26) 2570 - 2620MHz (LTE Band 38) 2300 – 2400 MHz (LTE Band 40) 2496 - 2690MHz (LTE Band 41) 1710 - 1780 MHz (LTE Band 66) 2412 - 2462 MHz (WiFi) 5150 - 5250 MHz(U-NII-1) 5250 - 5350 MHz(U-NII-2A) 5470 - 5725 MHz(U-NII-2C) 5725 - 5850 MHz(U-NII-3) 2402 - 2480 MHz (BT)
Test device Production Information:	Production unit
Release Version:	WCDMA: R8
	LTE: R9
WLAN Mode:	WLAN 2.4GHz 802.11b/g/n HT20/n HT40 WLAN 5GHz 802.11a/n/ac HT20/n/ac HT40/ac HT80
Device Type:	Portable device
Antenna Type:	Embedded antenna
Accessories/Body-worn	Battery

Configurations:	
Dimensions: Hotspot Mode:	125*49.6*13.4mm 2.4G WLAN Band：802.11b/g/n Support
Note: LTE band 2 is a sub-band of band 25 LTE band 4 is a sub-band of band 66 LTE band 5&18&19 is a sub-band of band 26 LTE band 17 is a sub-band of band 12 LTE band 38 is a sub-band of band 41 The EUT SAR Test without the charging battery cover is not applicable since no way to have this battery cover removed and replaced by normal battery cover. Photographs of EUT are shown in ANNEX C of this test report.	

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N03 (Main supply-Version Esim)	863589030041295	V00A	YDE031.0.0.2	2020-05-06
N13 (Secondary supply-Version Noesim)	863589030038440	V00A	YDE031.0.0.2	2020-05-06
N14 (Main supply-Version Noesim)	863589030037335	V00A	YDE031.0.0.2	2020-05-06
N23 (Secondary supply-Version esim)	863589030042194	V00A	YDE031.0.0.2	2020-05-06

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	Manufacturer
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*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Documents supplied by applicant

All technical documents are supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents

The following documents listed in this section are referred for testing.

Reference	Title	Version
ANSI C95.1	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.	**1999**
IEEE 1528	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.	**2013**
KDB648474	Handset SAR	**D04 v01r03**
KDB648474	Wireless Chargers Battery Cover	**D03 v01r04**
KDB248227	802 11 WiFi SAR	**D01 v02r02**
KDB447498	General RF Exposure Guidance	**D01 v06**
KDB865664	SAR Measurement 100 MHz to 6 GHz	**D01 v01r04**
KDB865664	RF Exposure Reporting	**D02 v01r02**
KDB941225	3G SAR Procedures	**D01 v03r01**
KDB941225	SAR for LTE Devices	**D05 v02r05**
KDB941225	Hotspot SAR	**D06 v02r01**
KDB616217	SAR for laptop and tablets	**D04 v01r02**

4.3. Criterion

At frequencies between 100 kHz and 6 GHz, the MPE (Maximum Permissible Exposure) in population/ uncontrolled environments for electromagnetic field strengths may be exceeded if

a) The exposure conditions can be shown by appropriate techniques to produce SARs below 0.08W/kg, as averaged over the whole body, and spatial peak SAR values not exceeding 1.6 W/kg, as averaged over any 1g of tissue (defined as a tissue volume in the shape of a cube), except for the hands, wrists, feet, and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10g of tissue (defined as a tissue volume in the shape of a cube); and

b) The induced currents in the body confirm with the MPE in table 2, Part B in ANSI C95.1-1999.

5. Test Summary and Statement of Compliance

5.1. Test Summary

The maximum results of Specific Absorption Rate (SAR) in standalone mode are as follows.

Table 5.1: Standalone Max. Reported SAR

Band	SAR 1g(w/kg)	
	Hotspot(10mm)	Body-Worn(10mm)
WCDMA Band2	0.795	0.795
WCDMA Band4	1.177	1.177
WCDMA Band5	0.670	0.670
LTE Band7	0.584	0.584
LTE Band12	0.180	0.180
LTE Band13	0.937	0.937
LTE Band25	0.546	0.546
LTE Band26	0.818	0.818
LTE Band40	0.417	0.417
LTE Band41	0.506	0.506
LTE Band66	1.141	1.141
WiFi 2G	0.199	0.199
WiFi 5G	0.393	0.393

The maximum results of Specific Absorption Rate (SAR) in simultaneous mode are as follows.

Table 5.2: Simultaneous Transmission SAR

Highest SAR 1g(W/kg)			
Mode	Position	Hotspot(10mm)	Body-worn(10mm)
WCDMA B4&WIFI 2.4G	Back Side	1.363	1.363

5.2. Statement of Compliance

The YDE031，YDE032，Youdao Translator 3 manufactured by NetEase Youdao Information Technology (Beijing) Co., Ltd. is a parent model for testing.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

For body worn operation mode, this device with any accessory that contained in this report has been tested and the values meet FCC RF exposure guidelines. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

Note: This project has two sets of configured sample N03，N13 (Main supply) and N14，N23 (Secondary supply), among which the N03 sample is the main test, and the N13，N14，N23 sample tests the worst mode of SAR.

6. Specific Absorption Rate (SAR)

6.1. Introduction

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

6.2. SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ) . The equation description is as below:

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = c\left(\frac{\delta T}{\delta t}\right)$$

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

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

Where:

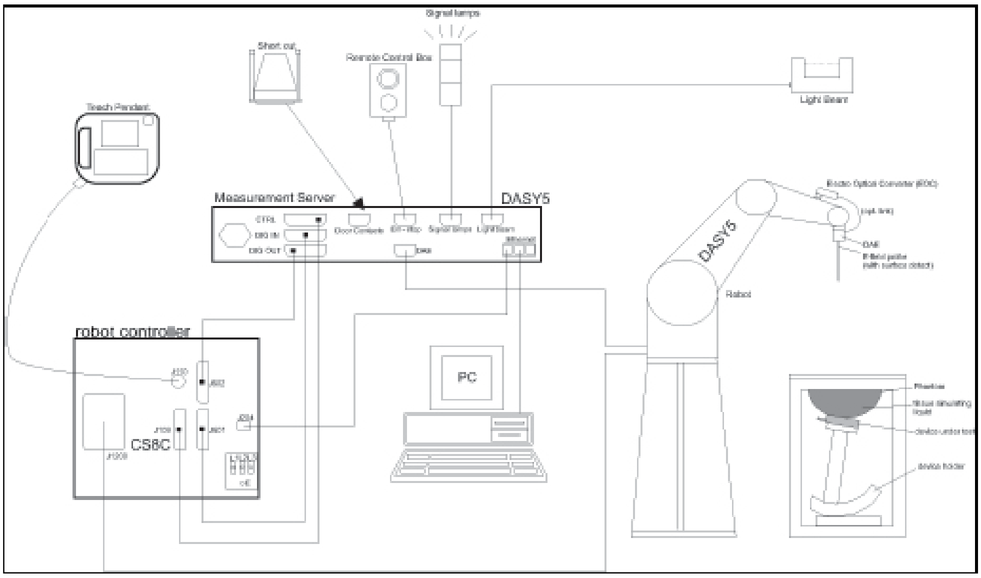
- σ is the conductivity of the tissue
- ρ is the mass density of tissue, which is normally set to 1g/cm^3
- E is the RMS electrical field strength

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

7. SAR Measurement System Introduction

7.1. Measurement Set-up

The DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture 7-1 SAR Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- 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 from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

7.2. E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection during a software approach and looks for the maximum using 2^{nd} ord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:	
Model:	**ES3DV3,EX3DV4**
Frequency Range:	**10MHz — 6GHz(EX3DV4)** **10MHz — 4GHz(ES3DV3)**
Calibration:	**In head and body simulating tissue at frequency from 650MHz to 5900MHz**
Linearity:	**± 0.2 dB(30 MHz to 4 GHz) for ES3DV3** **± 0.2 dB(30 MHz to 6 GHz) for EX3DV4**
Dynamic Range:	**10 mW/kg — 100 W/kg**
Probe Length:	**330 mm**
Probe Tip Length:	**20 mm**
Body Diameter:	**12 mm**
Tip Diameter: **Tip-Center:**	**2.5 mm (3.9 mm for ES3DV3)** **1 mm (2.0mm for ES3DV3)**
Application:	**SAR Dosimetry Testing** **Compliance tests of mobile phones** **Dosimetry in strong gradient fields**

Picture 7-2 Detail of Probe

Picture 7-3 E-field Probe

7.3. E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

Where:

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

7.4. Other Test Equipment

7.4.1. Data Acquisition Electronics (DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.
The input impedance of the DAE is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.

Picture 7-4: DAE

7.4.2. Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90) type from Stäubli SA (France).
For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- ➢ High precision (repeatability 0.02mm)
- ➢ High reliability (industrial design)
- ➢ Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- ➢ Jerk-free straight movements (brushless synchronal motors; no stepper motors)
- ➢ Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture 7-5: DASY 5

7.4.3. Measurement Server

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

Picture 7-6: Server for DASY 5

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

7.4.4. Device Holder for Phantom

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

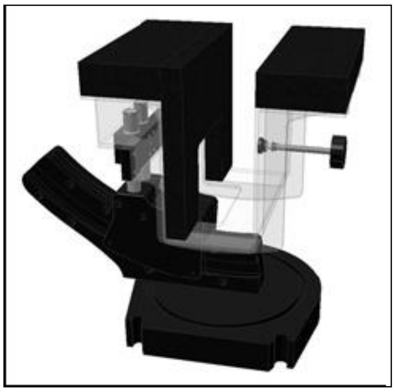
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference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

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

Picture 7-7: Device Holder

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

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



Picture 7-8: Laptop Extension Kit

7.4.5. Phantom

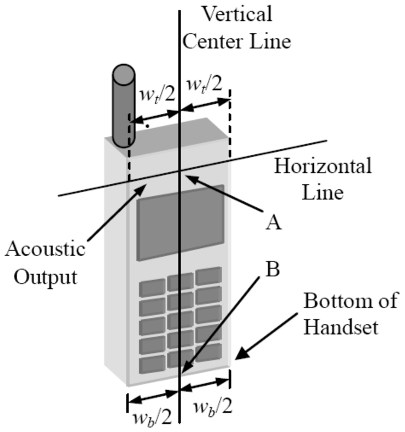
The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

Shell Thickness:	2 ± 0.2 mm	 Picture 7-9: SAM Twin Phantom
Available:	Special	
Filling Volume:	Approx. 25 liters	
Dimensions:	810 x l000 x 500 mm (H x L x W)	

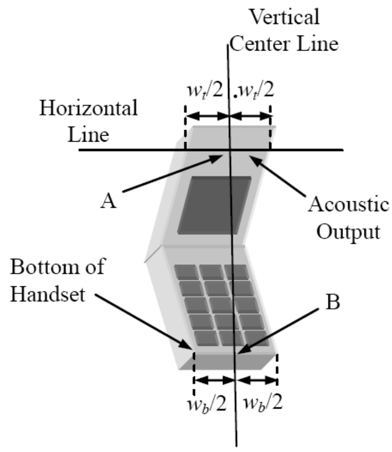
8. Test Position in Relation to the Phantom

8.1. General considerations

This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.

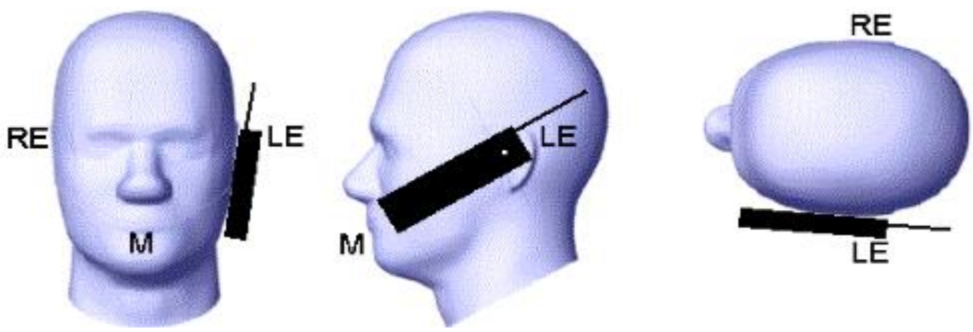


Picture 8-1 Typical “fixed” case handset

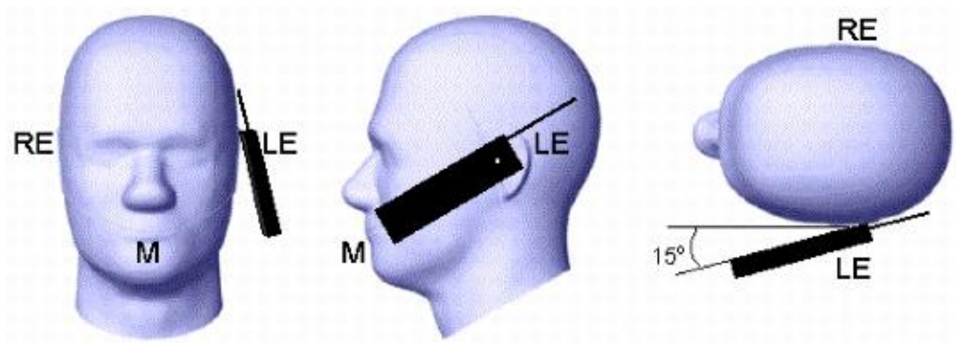


Picture 8-2 Typical “clam-shell” case handset

W_t	Width of the handset at the level of the acoustic
W_b	Width of the bottom of the handset
A	Midpoint of the width W_t of the handset at the level of the acoustic output
B	Midpoint of the width W_b of the bottom of th e handset



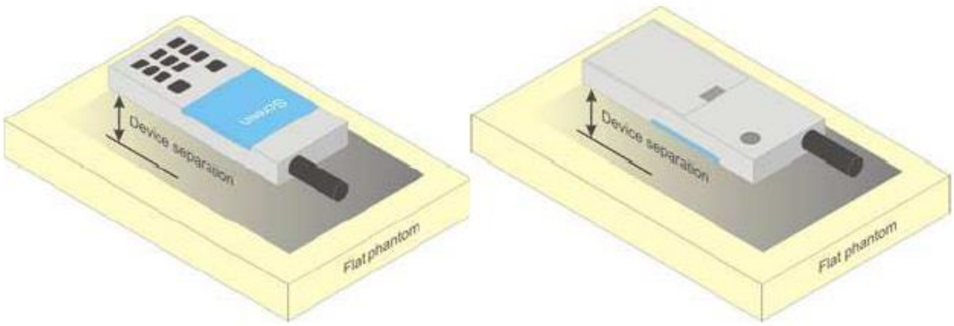
Picture 8-3 Cheek position of the wireless device on the left side of SAM



Picture 8-4 Tilt position of the wireless device on the left side of SAM

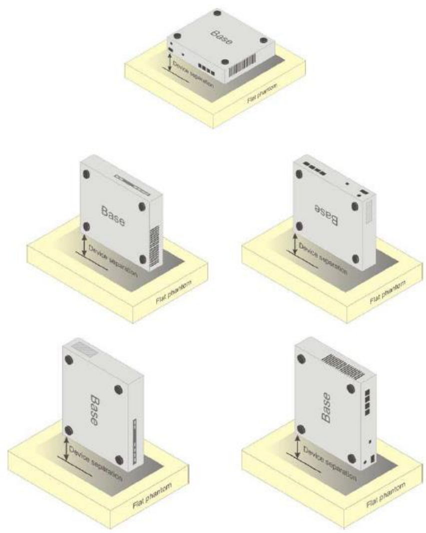
8.2. Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA (personal digital assistant) or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.



Picture 8-5 Test positions for body-worn devices

8.3. Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used. The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions. Tests shall be performed for all antenna positions specified. Picture 8-6 shows positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.	 **Picture 8-6 Test positions for desktop devices**

9. Tissue Simulating Liquids

9.1. Equivalent Tissues Composition

The liquid used for the frequency range of 650-6000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table 9.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

Table 9.1: Composition of the Head Tissue Equivalent Matter

Frequency (MHz)	835	900	1800	1950	2300	2450	2600	5800
Ingredients (% by weight)								
Water	41.45	40.92	55.242	54.89	56.34	58.79	58.79	65.53
Sugar	56.0	56.5	/	/	/	/	/	
Salt	1.45	1.48	0.306	0.18	0.14	0.06	0.06	
Preventol	0.1	0.1	/	/	/	/	/	
Cellulose	1.0	1.0	/	/	/	/	/	
GlycolMonobutyl	/	/	44.452	44.93	43.52	41.15	41.15	
Diethylenglycol momohexylether	/	/	/	/	/	/	/	17.24
Triton X-100	/	/	/	/	/	/	/	17.23
Dielectric Parameters Target Value	ε=41.5 σ=0.90	ε=41.5 σ=0.97	ε=40.0 σ=1.40	ε=40.0 σ=1.40	ε=39.5 σ=1.67	ε=39.2 σ=1.80	ε=39.0 σ=1.96	ε=35.3 σ=5.27

Table 9.2: Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Conductivity (σ)	± 5% Range	Permittivity (ε)	± 5% Range
835	Head	0.90	0.874~0.97	41.5	39.4~43.6
900	Head	0.97	0.92~1.02	41.5	39.4~43.6
1800	Head	1.40	1.33~1.47	40.0	38.0~42.0
1950	Head	1.40	1.33~1.47	40.0	38.0~42.0
2300	Head	1.67	1.59~1.75	39.5	37.5~41.4
2450	Head	1.80	1.71~1.89	39.2	37.2~41.2
2600	Head	1.96	1.86~2.06	39.0	37.5~40.95
5200	Head	4.66	4.43~4.89	35.99	34.19~37.79
5300	Head	4.76	4.52~4.99	35.87	34.08~37.66
5500	Head	4.96	4.71~5.2	35.6	33.82~37.38
5600	Head	5.07	4.82~5.32	35.53	33.75~37.30
5800	Head	5.27	5.01~5.53	35.3	33.54~37.05

Note: Effective February 19, 2019, FCC has permitted the use of single head-tissue simulating liquid specified in IEC 62209-1 for all SAR tests.

9.2. Dielectric Performance of TSL

Table 9.3: Dielectric Performance of Head Tissue Simulating Liquid

Tissue Simulating Liquid								
Frequency (MHz)	**Head(Standard)**		**Temperature**	**Date**	**Test Result**		**Deviation (%)**	
	Permittivity ε	**Conductivity σ**			**Permittivity ε**	**Conductivity σ**	**Permittivity ε**	**Conductivity σ**
750	41.90	0.89	22.6℃	2020-05-15	41.104	0.933	-1.90%	4.83%
835	41.50	0.90	22.6℃	2020-05-15	40.856	0.926	-1.55%	2.89%
900	41.50	0.97	22.6℃	2020-05-18	40.685	0.985	-1.96%	1.55%
1750	40.10	1.37	22.6℃	2020-05-27	39.173	1.365	-2.31%	-0.36%
1900	40.00	1.40	22.6℃	2020-05-20	38.947	1.452	-2.63%	3.71%
2000	40.00	1.40	22.6℃	2020-05-20	38.799	1.467	-3.00%	4.79%
2300	39.50	1.67	22.6℃	2020-05-19	38.46	1.7	-2.63%	1.80%
2450	39.20	1.80	22.6℃	2020-05-21	38.281	1.81	-2.34%	0.56%
2600	39.00	1.96	22.6℃	2020-05-22	38.041	1.92	-2.46%	-2.04%
5300	35.87	4.76	22.6℃	2020-05-23	36.988	4.697	3.12%	-1.32%
5600	35.50	5.07	22.6℃	2020-05-23	36.426	5.024	2.61%	-0.91%

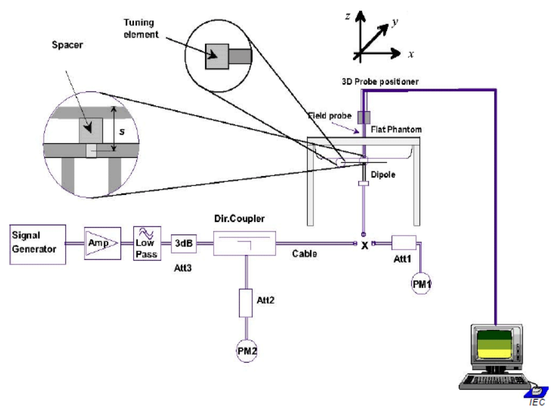
10. System Validation

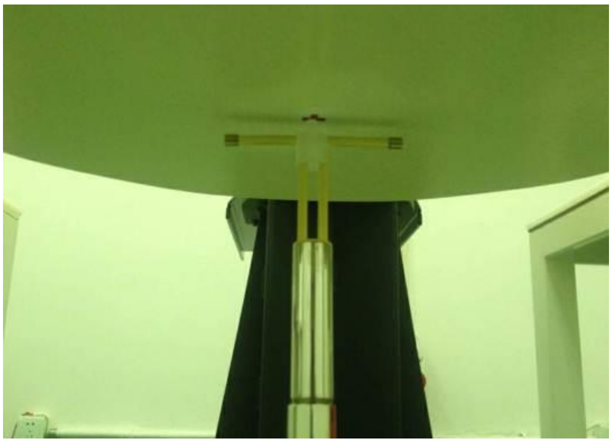
10.1. System Validation

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

10.2. System Setup

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





Picture 10-1 Setup for System Evaluation **Picture 10-2. Setup for Dipole**

10.3. System Validation Result

Table 10.1: System Validation Result of SAR

SAR System Validation								
Frequency (MHz)	**Average Target Value (w/kg)**		**Temperature**	**Date**	**Test Result (w/kg)**		**Deviation (%)**	
	10g	**1g**			**10g**	**1g**	**10g**	**1g**
750	5.59	8.5	22.6℃	2020-05-15	5.56	8.44	-0.54%	-0.71%
835	6.25	9.63	22.6℃	2020-05-15	6.52	9.88	4.32%	2.60%
900	7.01	10.9	22.6℃	2020-05-18	6.92	10.64	-1.28%	-2.39%

1750	19.4	36.5	22.6℃	2020-05-27	19.32	36.16	-0.41%	-0.93%
1900	21.1	40.5	22.6℃	2020-05-20	20.28	39.2	-3.89%	-3.21%
2000	20.9	40.9	22.6℃	2020-05-20	21.2	41.6	1.44%	1.71%
2300	23.6	49.5	22.6℃	2020-05-19	21.6	46	-8.47%	-7.07%
2450	24.4	52.4	22.6℃	2020-05-21	23.4	50.8	-4.10%	-3.05%
2600	25.4	57.2	22.6℃	2020-05-22	25	56	-1.57%	-2.10%
5300	21.2	75.8	22.6℃	2020-05-23	21	73.3	-0.94%	-3.30%
5600	22.2	79.3	22.6℃	2020-05-23	21	73.9	-5.41%	-6.81%
Note: The input power level is equivalent to 1w								

11. Measurement Procedures

11.1. Test Steps

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

(a) Power reference measurement

The reference and drift jobs are useful for monitoring the power drift of the device under test in the batch process. Both jobs measure the electric field strength at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

(b) Area scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. The scan area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the area scan's property sheet is brought up, grid was at to 15mm * 15mm and can be edited by users.

(c) Zoom scan

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1g and 10g of simulated tissue. The default zoom scan measures 5 * 5 * 7 points within a cube whose base faces are centered around the maximum found in a preceding area scan job within the same procedure. If the preceding Area Scan job indicates more than one maximum, the number of Zoom Scans has to be enlarged accordingly.

(12) Power drift measurement

The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same setting. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under within a batch process. In the properties of the drift job, the user can specify a limit for the drift and have DASY software stop the measurements if this limit is exceeded. This ensures that the power drift during one measurement is within 5%.

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit it maximum output power

(b) Measure conducted output power through RF cable

€ Place the EUT in the specific position of phantom

(d) Measure SAR results for Middle channel or the highest power channel on each testing position

€ Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

(f) Record the SAR value

11.2. Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE1529 standard. It can be conducted for 1g and 10g.
The DASY system allows evaluations that combine measured data and robot positions, such as:

a) Maximum Search

During a maximum search, global and local maximum searches are automatically performed in 2D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2dB of the global maxima for all SAR distributions.

b) Extrapolation

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3D space. They are used in the Cube Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 5*5*5 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10 cubes.

c) Boundary effect

For measurements in the immediate vicinity of a phantom surface, the field coupling effects between the probe and the boundary influence the probe characteristics. Boundary effect errors of different dosi-metric probe types have been analyzed by measurements and using a numerical probe model. As expected, both methods showed an enhanced sensitivity in the immediate vicinity of the boundary. The effect strongly depends on the probe dimensions and disappears with increasing distance from the boundary. The sensitivity can be approximately given as:

$$\mathrm{S} \approx \mathrm{So} + \mathrm{Sb} * \exp\left(-\frac{z}{a}\right) * \cos(\pi\frac{z}{\lambda})$$

Since the decay of the boundary effect dominates for small probe (a≪ λ), the cos-term can be omitted. Factors Sb (parameter Alpha in the DASY software) and a (parameter Delta in the DASY software) ard assessed during probe calibration and used for numerical compensation of the boundary effect. Several simulations and measurements have confirmed that the compensation is valid for different field and boundary configurations.
This simple compensation procedure can largely reduce the probe uncertainty near boundaries. It works well as long as:

- The boundary curvature is small
- The probe axis is angled less than 30_to the boundary normal
- The distance between probe and boundary is larger than 25% of the probe diameter
- The probe is symmetric (all sensors have the same offset from the probe tip)

Since all of these requirements are fulfilled in a DASY system, the correction of the probe boundary effect in the vicinity of the phantom surface is performed in a fully automated manner via the measurement data extraction during post processing.

11.3. General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. 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. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

Table 11.1: Test Resolution Requirement

<table>
<tr><th colspan="3">Items</th><th>≤3GHz</th><th>>3GHz</th></tr>
<tr><td colspan="3">Maximum Distance</td><td>5mm ±1mm</td><td>$\frac{1}{2} * \delta * \ln(2)$ mm ±0.5mm</td></tr>
<tr><td colspan="3">Maximum probe angle</td><td>30±1°</td><td>20±1°</td></tr>
<tr><td colspan="3" rowspan="3">Maximum Area Scan spatial resolution:
Δx_{Area} , Δy_{Area}</td><td>≤2GHz: ≤15mm</td><td>3-4GHz: ≤12mm</td></tr>
<tr><td>2-3GHz: ≤12mm</td><td>4-6GHz: ≤10mm</td></tr>
<tr><td colspan="2">when the x or y dimension of the device , in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the device with at least one measurement point on the device</td></tr>
<tr><td colspan="3" rowspan="2">Maximum Zoom Scan spatial resolution:
Δx_{Zoom} , Δy_{Zoom}</td><td>≤2GHz: ≤8mm</td><td>3-4GHz: ≤5mm</td></tr>
<tr><td>2-3GHz: ≤5mm</td><td>4-6GHz: ≤4mm</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>≤5mm</td><td>3-4GHz: ≤4mm
4-5GHz: ≤3mm
5-6GHz: ≤2mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤4mm</td><td>3-4GHz: ≤3mm
4-5GHz: ≤2.5mm
5-6GHz: ≤2mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$ between subsequent points</td><td colspan="2">≤1.5*</td></tr>
<tr><td>minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥30mm</td><td>3-4GHz: ≥28mm
4-5GHz: ≥25mm
5-6GHz: ≥22mm</td></tr>
<tr><td colspan="5">Notes:
δ is the penetration depth of a plane-wave at normal incidence to the tissue medium in IEEE 1528-2013.
When Zoom Scan is required and reported SAR from the Area Scan based 1-g SAR estimation procedure of KDB publication 447498 is ≤1.4 W/kg, ≤8mm for 2GHz-3GHz, ≤7mm for 3GHz-4GHz, ≤5mm for 4GHz-6GHz Zoom Scan resolution may be applied.</td></tr>
</table>

11.4. WCDMA Measurement Procedures

The following procedures are applicable to WCDMA handsets operating under 3GPP Release99, Release 5 and Release 6. The default test configuration is to measure SAR with an established radio link between the DUT and a communication test set using a 12.2kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations (DPCCH & DPDCHn), HSDPA and HSPA (HSUPA/HSDPA) modes according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. SAR for Release 5 HSDPA and Release 6 HSPA are measured using the applicable FRC (fixed reference channel) and E-DCH reference channel configurations. Maximum output power is verified according to applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. When Maximum Power Reduction (MPR) is not implemented according to Cubic Metric (CM) requirements for Release 6 HSPA, the following procedures do not apply.

Table 11.2: HSDPA setting for Release 5

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs}	CM (dB)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	1.5	0.5
2	12/15	15/15	64	12/15	24/25	2.0	1
3	15/15	8/15	64	15/8	30/15	2.0	1
4	15/15	4/15	64	15/4	30/15	2.0	1

Table 11.3: HSUPA setting for Release 6

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

Note:

A KDB inquiry is required to address test and approval requirements when the maximum output power measured in HS-DPCCH Sub-test 2 – 4 is higher than Sub-test 1.

A KDB inquiry is required to determine test and approval requirements when the maximum output power measured in E-DCH Sub-test 2 – 4 is higher than Sub-test 5.

11.5. LTE Measurement Procedure

SAR tests for LTE are performed with a base station simulator. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.

1. Per KDB 941225 D05, 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.

2. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.

3. 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 reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is ＞ 1.45 W/kg, the remaining required test channels must also be tested.

4. 16QAM/64QAM output power for each RB allocation configuration is ＞ not $\frac{1}{2}$dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; 16QAM/64QAM SAR testing is not required.

5. Smaller bandwidth output power for each RB allocation configuration is ＞not $\frac{1}{2}$dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; smaller bandwidth SAR testing is not required.

6. For LTE B12 / B26 the maximum bandwidth does not support three non-overlapping channels, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

7. LTE band 17 / 2 / 5 / 38 / 4 SAR test was covered by Band 12 / 25 / 26 / 41 / 66; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if

a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.

b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

LTE Carrier Aggregation Conducted Power (Downlink)

According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

LTE TDD Considerations

According to KDB 941225 D05 SAR for LTE Devices, 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 sub-frame configuration 7.

LTE TDD Band 41 supports 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 sub-frame configurations.

Table 11.4 Calculated Duty Cycle for LTE TDD

Uplink-Downlink Configuration		Sub-frame Number										Calculated
0	Periodicity	1	2	3	4	5	6	7	8	9	10	Duty Cycle (%)
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

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = (5120 $\times$ Ts $\times$ 2 + 6 ms) / 10ms = 63.33%
Where
Ts = 1/(15000 x 2048) seconds

11.6. Bluetooth & WiFi Measurement Procedures

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.
Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

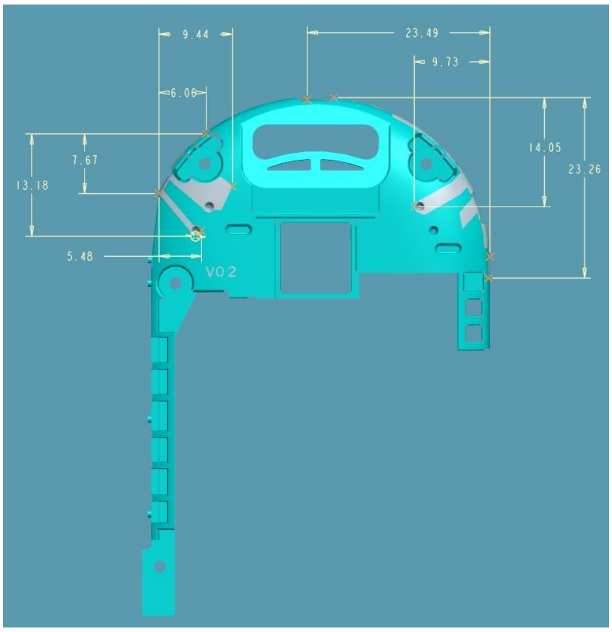
12. Simultaneous Transmission SAR Considerations

12.1. Reference Document

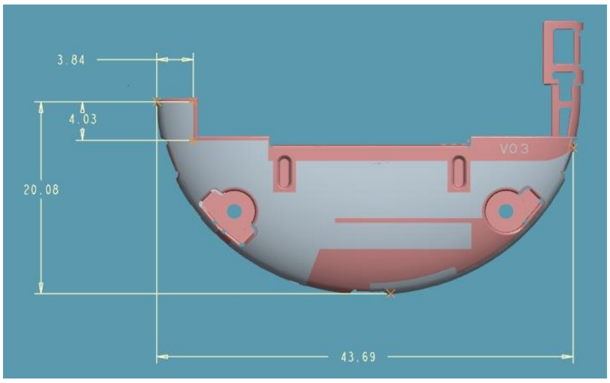
The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

12.2. Antenna Separation Distances

WIFI antenna on the left, DIV antenna on the right：



The main antenna：



Picture 12-1 Antenna Locations

12.3. SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR v01, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

Table 12.1: SAR measurement Positions

Antenna Mode	Front	Back	Left	Right	Top	Bottom
2/3/4G	Yes	Yes	Yes	Yes	No	Yes
BT/WiFi	Yes	Yes	No	Yes	Yes	No

12.4. Low Power Transmitters SAR Consideration

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation for low power transmitters is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.
The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} * \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

Where

- Frequency(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

According to the KDB447498 appendix A, the SAR test exclusion threshold for 2450MHz at 5mm test separation distances is 10mW. That means the transmitters with tune-up power below 10mW are excluded for SAR measurement.

12.5. Simultaneous Transmission Analysis

KDB 447498 D01 General RF Exposure Guidance introduces a new formula for calculating the SPLSR (SAR to Peak Location Ratio) between pairs of simultaneously transmitting antennas:

$$\mathrm{SPLSR} = \sqrt{(\mathrm{SAR1} + \mathrm{SAR2})^3}/\mathrm{Ri}$$

Where

- SAR1 is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition.
- SAR2 is the highest measured or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first.
- Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location , based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$$(\mathrm{x1} - \mathrm{x2})^2 + (\mathrm{y1} - \mathrm{y2})^2 + (z1 - z2)^2$$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$\sqrt{(SAR1 + SAR2)^3}/Ri < 0.04$$

12.6. Simultaneous Transmission Table

Table 12.2: Simultaneous Transmission Configurations

Items	Capable Transmit Configurations
1	WCDMA + BT
2	WCDMA+ WiFi 2.4G
3	LTE + BT
4	LTE + WiFi 2.4G

13. Conducted Output Power

13.1. WCDMA Measurement result

Table 13.1: The conducted Power for WCDMA Band2

WCDMA		WCDMA B2			
Mode	Test Mode	Tune up	Channel		
			9262	9400	9538
WCDMA	RMC	23	22.3	22.4	22.52
HSDPA	Subtest1	22.5	22.16	22.22	22.25
	Subtest2	22.5	22.02	22.04	21.98
	Subtest3	22.5	21.88	21.86	21.71
	Subtest4	22	21.74	21.68	21.44
HSUPA	Subtest1	22	21.6	21.5	21.17
	Subtest2	22	21.46	21.32	20.9
	Subtest3	22	21.32	21.14	20.63
	Subtest4	22	21.18	20.96	20.36
	Subtest5	22	21.04	20.78	20.09

Table 13.2: The conducted Power for WCDMA Band4

WCDMA		WCDMA B4 (dBm)			
Mode	Test Mode	Tune up	Channel		
			1312	1413	1513
WCDMA	RMC	22	21.89	21.91	21.9
HSDPA	Subtest1	22	21.7	21.83	21.78
	Subtest2	22	21.51	21.75	21.66
	Subtest3	22	21.32	21.67	21.54
	Subtest4	22	21.13	21.59	21.42
HSUPA	Subtest1	22	20.94	21.51	21.3
	Subtest2	22	20.75	21.43	21.18
	Subtest3	22	20.56	21.35	21.06
	Subtest4	22	20.37	21.27	20.94
	Subtest5	22	20.18	21.19	20.82

Table 13.3: The conducted Power for WCDMA Band5

WCDMA		WCDMA B5 (dBm)			
Mode	Test Mode	Tune up	Channel		
			4132	4183	4233
WCDMA	RMC	23.5	23.12	23.1	23.12
HSDPA	Subtest1	23.5	22.89	22.83	22.98
	Subtest2	23.5	22.66	22.56	22.84
	Subtest3	23	22.43	22.29	22.7
	Subtest4	23	22.2	22.02	22.56
HSUPA	Subtest1	22.5	21.97	21.75	22.42
	Subtest2	22.5	21.74	21.48	22.28
	Subtest3	22.5	21.51	21.21	22.14
	Subtest4	22.5	21.28	20.94	22
	Subtest5	22.5	21.05	20.67	21.86

13.2. LTE Measurement result

Table 13.4: The conducted Power for LTE Band 2/4/5/7/12/13/17/18/19/25/26/40/41/66

LTE			LTE B2			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				18607	18900	19193
QPSK	1	Low	22	21.66	21.74	21.76
		Middle		21.79	21.88	21.90
		High		21.64	21.75	21.75
	50%	Low	22	21.77	21.84	21.87
		Middle		21.79	21.91	21.94
		High		21.80	21.87	21.87
	100%	/	21.5	20.78	20.87	20.88
16QAM	1	Low	21.5	20.99	21.14	21.11
		Middle		21.16	21.27	21.20
		High		21.00	21.13	21.09
	50%	Low	21.5	20.80	20.90	20.88
		Middle		20.85	20.98	20.95
		High		20.79	20.93	20.88
	100%	/	20.5	19.92	20.01	19.99
Modulation	RB	RB Offset	Tune up	3MHz		
				18615	18900	19185
QPSK	1	Low	22	21.69	21.77	21.78
		Middle		21.80	21.94	21.88

		High		21.66	21.75	21.77
	50%	Low	21.5	20.72	20.82	20.80
		Middle		20.75	20.84	20.85
		High		20.72	20.78	20.82
	100%	/	21.5	20.73	20.78	20.82
16QAM	1	Low	21.5	21.06	21.17	21.14
		Middle		21.21	21.34	21.22
		High		21.02	21.14	21.05
	50%	Low	20.5	19.85	19.93	19.93
		Middle		19.89	19.97	19.96
		High		19.85	19.92	19.92
	100%	/	20.5	19.79	19.85	19.86

Modulation	RB	RB Offset	Tune up	5MHz		
				18625	18900	19175
QPSK	1	Low	22	21.62	21.70	21.71
		Middle		21.89	21.98	21.97
		High		21.58	21.66	21.67
	50%	Low	21.5	20.77	20.84	20.84
		Middle		20.81	20.89	20.89
		High		20.75	20.78	20.86
	100%	/	21.5	20.77	20.83	20.85
16QAM	1	Low	21.5	20.98	21.06	21.11
		Middle		21.24	21.31	21.29
		High		20.95	21.09	21.01
	50%	Low	20.5	19.80	19.89	19.86
		Middle		19.85	19.93	19.92
		High		19.78	19.83	19.88
	100%	/	20.5	19.81	19.87	19.90

Modulation	RB	RB Offset	Tune up	10MHz		
				18650	18900	19150
QPSK	1	Low	22	21.72	21.79	21.78
		Middle		21.81	21.89	21.91
		High		21.61	21.73	21.76
	50%	Low	21.5	20.79	20.92	20.95
		Middle		20.79	20.84	20.89
		High		20.86	20.80	20.89
	100%	/	21.5	20.86	20.88	20.93
16QAM	1	Low	21.5	21.10	21.20	21.14
		Middle		21.17	21.28	21.30
		High		20.97	21.11	21.09
	50%	Low	20.5	19.85	19.96	19.98
		Middle		19.82	19.91	19.93
		High		19.90	19.86	19.93

	100%	/	20.5	19.89	19.91	19.98
Modulation	RB	RB Offset	Tune up	15MHz		
				18675	18900	19125
QPSK	1	Low	22	21.69	21.71	21.71
		Middle		21.73	21.82	21.81
		High		21.56	21.69	21.71
	50%	Low	21.5	20.79	20.94	20.90
		Middle		20.82	20.88	20.90
		High		20.85	20.81	20.85
	100%	/	21.5	20.82	20.89	20.89
16QAM	1	Low	21.5	21.09	21.10	21.06
		Middle		21.05	21.19	21.17
		High		20.89	21.04	21.07
	50%	Low	20.5	19.82	19.95	19.90
		Middle		19.81	19.88	19.92
		High		19.85	19.83	19.86
	100%	/	20.5	19.85	19.90	19.92
Modulation	RB	RB Offset	Tune up	20MHz		
				18700	18900	19100
QPSK	1	Low	22	21.74	21.76	21.73
		Middle		21.87	**21.97**	21.92
		High		21.60	21.66	21.66
	50%	Low	21.5	20.79	**21.06**	20.84
		Middle		20.89	20.95	20.92
		High		21.01	20.90	20.78
	100%	/	21.5	20.91	**20.98**	20.82
16QAM	1	Low	21.5	21.10	21.14	21.07
		Middle		21.20	21.36	21.26
		High		20.95	21.02	21.04
	50%	Low	20.5	19.84	20.08	19.86
		Middle		19.91	19.97	19.93
		High		20.01	19.94	19.83
	100%	/	20.5	19.91	20.01	19.82

LTE			**LTE B4**			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				19957	20175	20393
QPSK	1	Low	22	21.04	21.09	21.05
		Middle		21.15	21.20	21.21
		High		21.01	21.08	21.00
	50%	Low	22	21.14	21.20	21.15
		Middle		21.21	21.20	21.16
		High		21.11	21.17	21.16

Modulation	RB	RB Offset	Tune up			
	100%	/	21	20.14	20.18	20.13
16QAM	1	Low	21	20.36	20.46	20.43
		Middle		20.49	20.59	20.59
		High		20.37	20.42	20.45
	50%	Low	21	20.17	20.22	20.18
		Middle		20.18	20.27	20.29
		High		20.17	20.25	20.21
	100%	/	20	19.21	19.32	19.32
Modulation	RB	RB Offset	Tune up	3MHz		
				19965	20175	20385
QPSK	1	Low	22	21.10	21.16	21.14
		Middle		21.21	21.28	21.28
		High		21.11	21.14	21.09
	50%	Low	21	20.15	20.21	20.14
		Middle		20.16	20.26	20.18
		High		20.16	20.19	20.15
	100%	/	21	20.15	20.17	20.16
16QAM	1	Low	21	20.47	20.54	20.52
		Middle		20.62	20.64	20.69
		High		20.53	20.52	20.56
	50%	Low	20	19.22	19.34	19.31
		Middle		19.27	19.34	19.33
		High		19.23	19.31	19.29
	100%	/	20	19.20	19.26	19.20
Modulation	RB	RB Offset	Tune up	5MHz		
				19975	20175	20375
QPSK	1	Low	22	21.02	21.06	21.03
		Middle		21.31	21.34	21.31
		High		21.02	20.99	21.00
	50%	Low	21	20.14	20.21	20.17
		Middle		20.25	20.28	20.24
		High		20.18	20.17	20.18
	100%	/	21	20.15	20.20	20.18
16QAM	1	Low	21	20.43	20.49	20.43
		Middle		20.73	20.65	20.69
		High		20.39	20.43	20.33
	50%	Low	20	19.21	19.23	19.20
		Middle		19.24	19.29	19.25
		High		19.23	19.21	19.20
	100%	/	20	19.20	19.23	19.23
Modulation	RB	RB Offset	Tune up	10MHz		
				20000	20175	20350
QPSK	1	Low	22	21.13	21.16	21.13

		Middle		21.31	21.20	21.22
		High		21.10	21.02	21.03
	50%	Low	21	20.20	20.23	20.26
		Middle		20.20	20.23	20.25
		High		20.24	20.21	20.18
	100%	/	21	20.22	20.18	20.23
16QAM	1	Low	21	20.47	20.47	20.53
		Middle		20.66	20.59	20.62
		High		20.51	20.48	20.50
	50%	Low	20	19.23	19.25	19.33
		Middle		19.22	19.21	19.28
		High		19.27	19.23	19.25
	100%	/	20	19.26	19.22	19.25
Modulation	RB	RB Offset	Tune up	15MHz		
				20025	20175	20325
QPSK	1	Low	22	21.07	21.13	21.10
		Middle		21.18	21.16	21.19
		High		21.00	20.97	20.96
	50%	Low	21	20.25	20.28	20.22
		Middle		20.26	20.23	20.26
		High		20.23	20.20	20.22
	100%	/	21	20.20	20.20	20.19
16QAM	1	Low	21	20.48	20.51	20.45
		Middle		20.58	20.58	20.57
		High		20.42	20.35	20.33
	50%	Low	20	19.24	19.21	19.27
		Middle		19.28	19.24	19.23
		High		19.24	19.18	19.21
	100%	/	20	19.24	19.25	19.25
Modulation	RB	RB Offset	Tune up	20MHz		
				20050	20175	20300
QPSK	1	Low	22	21.03	21.12	21.08
		Middle		21.31	21.26	21.20
		High		20.96	20.94	20.91
	50%	Low	21	20.22	20.22	20.28
		Middle		20.26	20.24	20.24
		High		20.22	20.13	20.17
	100%	/	21	20.25	20.16	20.19
16QAM	1	Low	21	20.35	20.53	20.44
		Middle		20.66	20.63	20.60
		High		20.32	20.30	20.22
	50%	Low	20	19.24	19.25	19.30
		Middle		19.28	19.27	19.25

		High		19.28	19.17	19.21
	100%	/	20	19.27	19.20	19.21

LTE			LTE B5			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				20407	20525	20643
QPSK	1	Low	23.5	23.05	23.00	23.03
		Middle		23.15	23.13	23.14
		High		23.05	23.02	23.03
	50%	Low	23.5	23.15	23.13	23.14
		Middle		23.21	23.18	23.19
		High		23.15	23.13	23.16
	100%	/	23	22.24	22.12	22.16
16QAM	1	Low	23	22.28	22.14	22.10
		Middle		22.41	22.24	22.17
		High		22.31	22.15	22.07
	50%	Low	23	22.14	22.00	21.97
		Middle		22.19	22.05	22.03
		High		22.13	22.00	21.96
	100%	/	21.5	21.28	21.21	21.21
Modulation	RB	RB Offset	Tune up	3MHz		
				20415	20525	20635
QPSK	1	Low	23.5	23.08	23.06	23.05
		Middle		23.19	23.20	23.20
		High		23.07	23.04	23.07
	50%	Low	23	22.18	22.06	22.10
		Middle		22.20	22.10	22.12
		High		22.17	22.07	22.08
	100%	/	23	22.19	22.10	22.13
16QAM	1	Low	23	22.37	22.16	22.17
		Middle		22.43	22.29	22.29
		High		22.31	22.18	22.07
	50%	Low	21.5	21.22	21.14	21.16
		Middle		21.25	21.18	21.16
		High		21.22	21.15	21.10
	100%	/	21.5	21.19	21.12	21.13
Modulation	RB	RB Offset	Tune up	5MHz		
				20425	20525	20625
QPSK	1	Low	23.5	22.99	22.96	22.93
		Middle		23.20	23.19	23.17
		High		23.00	22.92	22.96
	50%	Low	23	22.18	22.03	22.11
		Middle		22.21	22.11	22.12

		High		22.16	22.07	22.05
	100%	/	23	22.20	22.08	22.10
16QAM	1	Low	23	22.24	22.10	22.12
		Middle		22.42	22.33	22.32
		High		22.22	22.10	22.00
	50%	Low	21.5	21.17	21.03	21.13
		Middle		21.19	21.13	21.13
		High		21.12	21.08	21.03
	100%	/	21.5	21.15	21.09	21.11
Modulation	RB	RB Offset	Tune up	10MHz		
				20450	20525	20600
QPSK	1	Low	23.5	23.07	23.07	23.07
		Middle		23.21	23.16	23.15
		High		23.06	23.04	23.03
	50%	Low	23	22.28	22.11	22.23
		Middle		22.23	22.14	22.18
		High		22.29	22.17	22.07
	100%	/	23	22.30	22.13	22.17
16QAM	1	Low	23	22.32	22.18	22.21
		Middle		22.39	22.28	22.32
		High		22.14	22.21	22.04
	50%	Low	21.5	21.25	21.12	21.25
		Middle		21.19	21.15	21.20
		High		21.24	21.19	21.09
	100%	/	21.5	21.26	21.14	21.19

LTE			LTE B7			
Modulation	RB	RB Offset	Tune up	5MHz		
				20775	21100	21425
QPSK	1	Low	23	22.30	22.33	22.37
		Middle		22.57	22.62	22.59
		High		22.33	22.39	22.37
	50%	Low	22.5	21.52	21.50	21.48
		Middle		21.57	21.52	21.52
		High		21.52	21.50	21.48
	100%	/	22.5	21.55	21.50	21.50
16QAM	1	Low	22.5	21.60	21.62	21.64
		Middle		21.82	21.85	21.87
		High		21.64	21.64	21.66
	50%	Low	21	20.49	20.46	20.47
		Middle		20.53	20.50	20.51
		High		20.48	20.45	20.48
	100%	/	21	20.54	20.48	20.49

Modulation	RB	RB Offset	Tune up	10MHz		
				20800	21100	21400
QPSK	1	Low	23	22.40	22.41	22.46
		Middle		22.53	**22.58**	22.57
		High		22.40	22.48	22.48
	50%	Low	22.5	21.57	21.60	21.61
		Middle		21.57	21.55	21.57
		High		21.68	21.53	21.52
	100%	/	22.5	21.64	21.58	21.59
16QAM	1	Low	22.5	21.72	21.69	21.71
		Middle		21.84	21.80	21.84
		High		21.74	21.71	21.75
	50%	Low	21	20.55	20.56	20.60
		Middle		20.54	20.52	20.53
		High		20.66	20.51	20.50
	100%	/	21	20.61	20.54	20.58
Modulation	RB	RB Offset	Tune up	15MHz		
				20825	21100	21375
QPSK	1	Low	23	22.37	22.36	22.38
		Middle		22.47	22.51	**22.53**
		High		22.42	22.45	22.48
	50%	Low	22.5	21.58	21.59	21.62
		Middle		21.59	21.56	21.57
		High		21.71	21.58	21.52
	100%	/	22.5	21.63	21.58	21.58
16QAM	1	Low	22.5	21.66	21.62	21.63
		Middle		21.79	21.79	21.80
		High		21.69	21.73	21.73
	50%	Low	21	20.50	20.55	20.59
		Middle		20.53	20.51	20.54
		High		20.65	20.52	20.48
	100%	/	21	20.59	20.55	20.54
Modulation	RB	RB Offset	Tune up	20MHz		
				20850	21100	21350
QPSK	1	Low	23	22.27	22.43	22.53
		Middle		22.59	22.74	**22.80**
		High		22.47	22.58	22.62
	50%	Low	22.5	21.43	**21.81**	21.77
		Middle		21.61	21.74	21.77
		High		21.80	21.80	21.64
	100%	/	22.5	21.67	21.79	21.67
16QAM	1	Low	22.5	21.56	21.66	21.78
		Middle		21.87	22.00	22.05

		High		21.76	21.87	21.84
	50%	Low	21	20.41	20.78	20.73
		Middle		20.59	20.70	20.74
		High		20.78	20.76	20.60
	100%	/	21	20.63	20.75	20.64

LTE			**LTE B12**			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				23017	23095	23173
QPSK	1	Low	23.5	22.97	22.98	22.95
		Middle		23.09	23.11	23.07
		High		22.98	22.96	22.96
	50%	Low	23.5	23.08	23.08	23.07
		Middle		23.13	23.13	23.09
		High		23.10	23.08	23.07
	100%	/	23	22.08	22.07	22.08
16QAM	1	Low	23	22.26	22.28	22.26
		Middle		22.41	22.41	22.37
		High		22.28	22.30	22.24
	50%	Low	23	22.07	22.09	22.05
		Middle		22.13	22.14	22.11
		High		22.09	22.07	22.05
	100%	/	22	21.20	21.19	21.16
Modulation	RB	RB Offset	Tune up	3MHz		
				23025	23095	23165
QPSK	1	Low	23.5	22.93	22.89	22.74
		Middle		23.25	23.21	23.07
		High		22.97	22.96	22.83
	50%	Low	23	22.05	22.07	21.92
		Middle		22.14	22.10	22.04
		High		22.13	22.03	21.96
	100%	/	23	22.09	22.05	21.96
16QAM	1	Low	23	22.23	22.22	21.98
		Middle		22.61	22.59	22.32
		High		22.28	22.32	22.15
	50%	Low	22	21.06	21.09	20.91
		Middle		21.16	21.15	21.03
		High		21.14	21.06	20.96
	100%	/	22	21.09	21.09	20.98
Modulation	RB	RB Offset	Tune up	5MHz		
				23035	23095	23155
QPSK	1	Low	23.5	22.93	22.98	22.87
		Middle		23.18	23.21	23.15

		High		23.00	22.97	22.93
	50%	Low	23	21.92	22.10	21.98
		Middle		22.13	22.13	22.10
		High		21.99	22.17	21.87
	100%	/	23	21.97	22.13	21.96
16QAM	1	Low	23	22.22	22.33	22.16
		Middle		22.53	22.54	22.45
		High		22.34	22.31	22.26
	50%	Low	22	20.95	21.13	21.00
		Middle		21.15	21.16	21.14
		High		21.00	21.21	20.90
	100%	/	22	20.99	21.16	20.97
Modulation	RB	RB Offset	Tune up	10MHz		
				23060	23095	23130
QPSK	1	Low	23.5	23.00	22.99	23.02
		Middle		23.19	23.20	23.12
		High		23.09	23.05	23.07
	50%	Low	23	22.15	22.25	22.00
		Middle		22.16	22.16	22.14
		High		22.15	22.41	22.01
	100%	/	23	22.13	22.34	22.00
16QAM	1	Low	23	22.31	22.31	22.36
		Middle		22.55	22.53	22.42
		High		22.40	22.34	22.36
	50%	Low	22	21.14	21.26	21.00
		Middle		21.20	21.16	21.15
		High		21.15	21.42	21.01
	100%	/	22	21.18	21.34	21.03

LTE				**LTE B13**		
Modulation	RB	RB Offset	Tune up	5MHz		
				23205	23230	23255
QPSK	1	Low	23.5	22.75	22.80	22.74
		Middle		23.10	23.07	23.01
		High		22.81	22.77	22.74
	50%	Low	23	22.04	22.00	21.92
		Middle		22.05	22.01	22.01
		High		21.93	22.01	22.08
	100%	/	23	21.98	22.01	22.00
16QAM	1	Low	23	22.08	22.17	22.09
		Middle		22.47	22.40	22.31
		High		22.15	22.09	22.03
	50%	Low	21.5	21.05	21.02	20.92

		Middle		21.05	21.03	21.02
		High		20.93	20.99	21.07
	100%	/	21.5	21.00	21.00	21.01
Modulation	RB	RB Offset	Tune up	10MHz		
				23230	23230	23230
QPSK	1	Low	23.5	22.86	22.87	22.86
		Middle		23.01	23.01	23.00
		High		22.86	22.86	22.86
	50%	Low	23	22.18	22.17	22.16
		Middle		22.04	22.05	22.03
		High		22.22	22.20	22.20
	100%	/	23	22.19	22.19	22.18
16QAM	1	Low	23	22.20	22.21	22.19
		Middle		22.33	22.38	22.34
		High		22.15	22.15	22.17
	50%	Low	21.5	21.16	21.16	21.19
		Middle		21.04	21.05	21.06
		High		21.18	21.18	21.19
	100%	/	21.5	21.16	21.17	21.18

LTE			LTE B17			
Modulation	RB	RB Offset	Tune up	5MHz		
				23755	23790	23825
QPSK	1	Low	23.5	22.96	22.93	22.89
		Middle		23.22	23.22	23.17
		High		22.97	22.92	22.92
	50%	Low	23	22.18	21.99	21.98
		Middle		22.18	22.14	22.09
		High		22.12	22.24	21.85
	100%	/	23	22.15	22.13	21.93
16QAM	1	Low	23	22.27	22.25	22.22
		Middle		22.56	22.51	22.47
		High		22.28	22.23	22.22
	50%	Low	22	21.15	20.98	20.99
		Middle		21.18	21.13	21.11
		High		21.12	21.21	20.87
	100%	/	22	21.14	21.15	20.97
Modulation	RB	RB Offset	Tune up	10MHz		
				23780	23790	23800
QPSK	1	Low	23.5	23.04	23.05	23.05
		Middle		23.15	23.15	23.16
		High		23.06	23.06	23.08
	50%	Low	23	22.16	22.08	21.97

		Middle		22.15	22.15	22.13
		High		22.37	22.21	22.01
	100%	/	23	22.27	22.17	22.01
16QAM	1	Low	23	22.35	22.37	22.35
		Middle		22.43	22.42	22.45
		High		22.34	22.38	22.38
	50%	Low	22	21.16	21.06	21.00
		Middle		21.13	21.17	21.15
		High		21.37	21.23	21.04
	100%	/	22	21.26	21.17	21.03

LTE			LTE B18			
Modulation	RB	RB Offset	Tune up	5MHz		
				23875	23925	23975
QPSK	1	Low	23.5	22.81	22.81	22.75
		Middle		23.06	23.03	23.01
		High		22.77	22.75	22.74
	50%	Low	23	21.96	21.99	22.00
		Middle		22.09	22.06	22.03
		High		22.03	21.97	21.97
	100%	/	23	22.03	22.00	22.00
16QAM	1	Low	23	22.01	22.02	22.05
		Middle		22.24	22.34	22.27
		High		22.03	22.05	22.03
	50%	Low	21.5	20.90	20.97	20.99
		Middle		21.04	21.02	21.03
		High		20.99	20.97	20.96
	100%	/	21.5	20.98	20.98	21.00
Modulation	RB	RB Offset	Tune up	10MHz		
				23900	23925	23950
QPSK	1	Low	23.5	22.92	22.93	22.88
		Middle		23.00	23.00	22.98
		High		22.90	22.89	22.84
	50%	Low	23	22.00	22.05	22.10
		Middle		22.10	22.08	22.06
		High		22.09	22.05	22.07
	100%	/	23	22.08	22.07	22.10
16QAM	1	Low	23	22.11	22.12	22.15
		Middle		22.20	22.30	22.25
		High		22.18	22.16	22.11
	50%	Low	21.5	20.94	21.01	21.08
		Middle		21.05	21.06	21.05
		High		21.06	21.03	21.04

	100%	/	21.5	21.02	21.04	21.09
Modulation	RB	RB Offset	Tune up	15MHz		
				23925	23925	23925
QPSK	1	Low	23.5	22.83	22.84	22.85
		Middle		22.93	22.94	22.94
		High		22.87	22.87	22.87
	50%	Low	23	21.98	21.98	21.98
		Middle		22.06	22.07	22.07
		High		22.05	22.06	22.05
	100%	/	23	22.02	22.03	22.04
16QAM	1	Low	23	22.04	22.05	22.03
		Middle		22.20	22.22	22.19
		High		22.12	22.10	22.11
	50%	Low	21.5	20.94	20.92	20.93
		Middle		21.02	21.04	21.03
		High		21.01	21.01	21.01
	100%	/	21.5	20.98	20.98	20.98

LTE				**LTE B19**		
Modulation	RB	RB Offset	Tune up	5MHz		
				24025	24075	24125
QPSK	1	Low	23.5	22.81	22.78	22.81
		Middle		23.06	23.05	23.05
		High		22.81	22.76	22.76
	50%	Low	23	21.99	21.95	22.00
		Middle		22.06	22.03	22.03
		High		22.03	21.98	21.95
	100%	/	23	22.05	22.01	22.02
16QAM	1	Low	23	22.03	22.03	22.06
		Middle		22.29	22.26	22.27
		High		22.01	22.01	22.05
	50%	Low	21.5	20.96	20.92	20.97
		Middle		21.02	21.00	21.02
		High		20.99	20.96	20.94
	100%	/	21.5	21.00	20.94	20.97
Modulation	RB	RB Offset	Tune up	10MHz		
				24050	24075	24100
QPSK	1	Low	23.5	22.93	22.92	22.91
		Middle		23.07	23.04	23.06
		High		22.89	22.90	22.86
	50%	Low	23	22.06	22.06	22.07
		Middle		22.14	22.10	22.12
		High		22.18	22.13	22.07

	100%	/	23	22.14	22.09	22.10
16QAM	1	Low	23	22.17	22.11	22.12
		Middle		22.23	22.23	22.26
		High		22.13	22.13	22.13
	50%	Low	21.5	21.00	20.99	21.02
		Middle		21.07	21.05	21.09
		High		21.11	21.08	21.03
	100%	/	21.5	21.08	21.02	21.05
Modulation	RB	RB Offset	Tune up	15MHz		
				24075	24075	24075
QPSK	1	Low	23.5	22.87	22.88	22.87
		Middle		22.94	22.95	22.93
		High		22.82	22.82	22.83
	50%	Low	23	21.99	22.00	21.99
		Middle		22.07	22.07	22.08
		High		22.04	22.05	22.05
	100%	/	23	22.03	22.02	22.03
16QAM	1	Low	23	22.11	22.11	22.10
		Middle		22.16	22.15	22.18
		High		22.07	22.08	22.09
	50%	Low	21.5	20.92	20.94	20.93
		Middle		21.00	21.02	21.01
		High		20.99	21.00	20.99
	100%	/	21.5	20.98	20.98	20.99

LTE			LTE B25			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				26047	26365	26683
QPSK	1	Low	22	21.51	21.60	21.57
		Middle		21.62	21.71	21.69
		High		21.52	21.59	21.59
	50%	Low	22	21.62	21.69	21.68
		Middle		21.66	21.74	21.72
		High		21.61	21.70	21.68
	100%	/	21.5	20.60	20.68	20.72
16QAM	1	Low	21.5	20.88	20.99	20.85
		Middle		21.02	21.10	20.92
		High		20.87	21.03	20.84
	50%	Low	21.5	20.66	20.78	20.68
		Middle		20.68	20.83	20.71
		High		20.63	20.79	20.66
	100%	/	20.5	19.78	19.85	19.82
Modulation	RB	RB Offset	Tune up	3MHz		

				26055	26365	26675
QPSK	1	Low	22	21.56	21.66	21.63
		Middle		21.74	21.72	21.75
		High		21.56	21.65	21.61
	50%	Low	21.5	20.61	20.71	20.71
		Middle		20.64	20.72	20.69
		High		20.60	20.68	20.66
	100%	/	21.5	20.59	20.68	20.71
16QAM	1	Low	21.5	20.92	21.06	20.95
		Middle		21.13	21.17	21.02
		High		20.94	21.03	20.88
	50%	Low	20.5	19.75	19.84	19.77
		Middle		19.77	19.85	19.77
		High		19.72	19.80	19.72
	100%	/	20.5	19.66	19.75	19.70
Modulation	RB	RB Offset	Tune up	5MHz		
				26065	26365	26665
QPSK	1	Low	22	21.50	21.57	21.59
		Middle		21.80	21.81	21.87
		High		21.45	21.53	21.52
	50%	Low	21.5	20.66	20.70	20.71
		Middle		20.72	20.74	20.77
		High		20.62	20.66	20.64
	100%	/	21.5	20.67	20.69	20.70
16QAM	1	Low	21.5	20.85	20.98	20.94
		Middle		21.12	21.26	21.09
		High		20.81	20.91	20.82
	50%	Low	20.5	19.70	19.76	19.73
		Middle		19.74	19.80	19.79
		High		19.67	19.71	19.67
	100%	/	20.5	19.67	19.74	19.70
Modulation	RB	RB Offset	Tune up	10MHz		
				26090	26365	26640
QPSK	1	Low	22	21.61	21.64	21.66
		Middle		21.71	21.79	21.78
		High		21.51	21.61	21.61
	50%	Low	21.5	20.71	20.78	20.75
		Middle		20.70	20.74	20.79
		High		20.75	20.72	20.72
	100%	/	21.5	20.72	20.73	20.77
16QAM	1	Low	21.5	21.01	21.05	21.03
		Middle		21.05	21.13	21.11
		High		20.87	20.99	20.88

	50%	Low	20.5	19.75	19.82	19.78
		Middle		19.72	19.78	19.81
		High		19.74	19.75	19.72
	100%	/	20.5	19.77	19.78	19.76
Modulation	RB	RB Offset	Tune up	15MHz		
				26115	26365	26615
QPSK	1	Low	22	21.57	21.58	21.59
		Middle		21.60	21.68	21.68
		High		21.41	21.55	21.54
	50%	Low	21.5	20.68	20.77	20.79
		Middle		20.66	20.72	20.78
		High		20.70	20.74	20.77
	100%	/	21.5	20.70	20.77	20.78
16QAM	1	Low	21.5	20.95	20.97	20.97
		Middle		20.96	21.09	21.05
		High		20.73	20.92	20.81
	50%	Low	20.5	19.70	19.80	19.79
		Middle		19.68	19.72	19.78
		High		19.70	19.74	19.76
	100%	/	20.5	19.73	19.79	19.80
Modulation	RB	RB Offset	Tune up	20MHz		
				26140	26365	26590
QPSK	1	Low	22	21.61	21.58	21.59
		Middle		21.75	**21.82**	21.80
		High		21.43	21.52	21.46
	50%	Low	21.5	20.69	**20.93**	20.90
		Middle		20.74	20.77	20.78
		High		20.81	20.82	20.78
	100%	/	21.5	20.72	**20.85**	20.83
16QAM	1	Low	21.5	20.99	21.00	20.95
		Middle		21.11	21.21	21.19
		High		20.78	20.89	20.73
	50%	Low	20.5	19.72	19.97	19.93
		Middle		19.74	19.80	19.80
		High		19.84	19.81	19.79
	100%	/	20.5	19.75	19.85	19.82

LTE			LTE B26			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				26697	26865	27033
QPSK	1	Low	23.5	23.00	22.92	22.90
		Middle		23.13	23.05	23.04
		High		22.99	22.92	22.90

	50%	Low	23.5	23.11	23.04	23.02
		Middle		23.17	23.09	23.10
		High		23.11	23.04	23.03
	100%	/	23	22.16	22.13	22.12
16QAM	1	Low	23	22.21	22.10	22.07
		Middle		22.30	22.23	22.14
		High		22.16	22.12	22.00
	50%	Low	23	22.07	22.00	21.95
		Middle		22.11	22.03	21.99
		High		22.04	21.98	21.92
	100%	/	21.5	21.21	21.14	21.11
Modulation	RB	RB Offset	Tune up	3MHz		
				26705	26865	27025
QPSK	1	Low	23.5	21.16	22.98	23.01
		Middle		21.32	23.13	23.11
		High		21.12	22.99	23.01
	50%	Low	23	20.21	22.07	22.09
		Middle		20.22	22.10	22.09
		High		20.19	22.08	22.08
	100%	/	23	20.20	22.10	22.11
16QAM	1	Low	23	20.55	22.24	22.24
		Middle		20.71	22.33	22.29
		High		20.48	22.20	22.09
	50%	Low	21.5	19.34	21.10	21.12
		Middle		19.35	21.14	21.12
		High		19.31	21.11	21.05
	100%	/	21.5	19.27	21.08	21.08
Modulation	RB	RB Offset	Tune up	5MHz		
				26715	26865	27015
QPSK	1	Low	23.5	22.97	22.91	22.88
		Middle		23.15	23.13	23.18
		High		22.96	22.88	22.92
	50%	Low	23	22.04	22.09	22.11
		Middle		22.16	22.13	22.15
		High		22.16	22.10	22.04
	100%	/	23	22.15	22.12	22.13
16QAM	1	Low	23	22.20	22.14	22.10
		Middle		22.34	22.33	22.32
		High		22.18	22.07	21.99
	50%	Low	21.5	21.03	21.04	21.07
		Middle		21.13	21.10	21.09
		High		21.12	21.05	20.97
	100%	/	21.5	21.12	21.08	21.07

Modulation	RB	RB Offset	Tune up	10MHz		
				26750	26865	26990
QPSK	1	Low	23.5	23.02	23.03	22.99
		Middle		23.14	23.12	23.10
		High		22.98	22.95	23.00
	50%	Low	23	22.09	22.17	22.21
		Middle		22.18	22.18	22.15
		High		22.19	22.22	22.07
	100%	/	23	22.16	22.20	22.13
16QAM	1	Low	23	22.20	22.29	22.22
		Middle		22.32	22.31	22.32
		High		22.26	22.19	22.10
	50%	Low	21.5	21.05	21.14	21.16
		Middle		21.14	21.14	21.12
		High		21.15	21.17	21.02
	100%	/	21.5	21.12	21.16	21.09
Modulation	RB	RB Offset	Tune up	15MHz		
				26775	26865	26965
QPSK	1	Low	23.5	22.95	22.96	22.90
		Middle		23.02	23.01	22.97
		High		22.95	22.90	22.90
	50%	Low	23	22.10	22.18	22.09
		Middle		22.15	22.15	22.13
		High		22.14	22.14	22.04
	100%	/	23	22.11	22.15	22.10
16QAM	1	Low	23	22.15	22.24	22.09
		Middle		22.31	22.22	22.19
		High		22.19	22.10	22.06
	50%	Low	21.5	21.04	21.13	21.03
		Middle		21.12	21.09	21.07
		High		21.10	21.08	20.99
	100%	/	21.5	21.08	21.13	21.03

LTE			**LTE B38**			
Modulation	RB	RB Offset	Tune up	5MHz		
				37775	38000	38225
QPSK	1	Low	23.5	23.10	23.16	23.22
		Middle		23.23	23.32	23.34
		High		23.11	23.19	23.21
	50%	Low	23	22.28	22.30	22.31
		Middle		22.35	22.33	22.38
		High		22.27	22.25	22.32
	100%	/	23	22.28	22.26	22.33

16QAM	1	Low	23	22.31	22.32	22.35
		Middle		22.42	22.48	22.50
		High		22.34	22.35	22.36
	50%	Low	22	21.26	21.26	21.28
		Middle		21.31	21.30	21.35
		High		21.28	21.26	21.28
	100%	/	22	21.32	21.27	21.34
Modulation	RB	RB Offset	Tune up	10MHz		
				37800	38000	38200
QPSK	1	Low	23.5	23.18	23.18	23.27
		Middle		23.31	23.36	23.38
		High		23.18	23.27	23.28
	50%	Low	23	22.34	22.28	22.32
		Middle		22.32	22.34	22.36
		High		22.27	22.31	22.34
	100%	/	23	22.32	22.28	22.34
16QAM	1	Low	23	22.35	22.37	22.43
		Middle		22.52	22.56	22.56
		High		22.43	22.45	22.47
	50%	Low	22	21.36	21.32	21.35
		Middle		21.35	21.35	21.38
		High		21.27	21.34	21.37
	100%	/	22	21.34	21.33	21.38
Modulation	RB	RB Offset	Tune up	15MHz		
				37825	38000	38175
QPSK	1	Low	23.5	23.01	23.03	23.17
		Middle		23.19	23.25	23.25
		High		23.08	23.18	23.18
	50%	Low	23	22.23	22.21	22.22
		Middle		22.28	22.25	22.28
		High		22.22	22.25	22.31
	100%	/	23	22.23	22.22	22.22
16QAM	1	Low	23	22.27	22.25	22.34
		Middle		22.38	22.41	22.44
		High		22.29	22.36	22.38
	50%	Low	22	21.17	21.15	21.18
		Middle		21.19	21.19	21.21
		High		21.14	21.22	21.23
	100%	/	22	21.25	21.22	21.25
Modulation	RB	RB Offset	Tune up	20MHz		
				37850	38000	38150
QPSK	1	Low	23.5	23.17	23.06	23.07
		Middle		23.33	23.32	23.23

		High		23.09	23.09	22.99
	50%	Low	23	22.37	22.27	22.19
		Middle		22.35	22.25	22.16
		High		22.28	22.20	22.15
	100%	/	23	22.36	22.25	22.17
16QAM	1	Low	23	22.37	22.27	22.23
		Middle		22.56	22.51	22.40
		High		22.37	22.25	22.17
	50%	Low	22	21.41	21.30	21.21
		Middle		21.40	21.26	21.20
		High		21.29	21.22	21.16
	100%	/	22	21.36	21.24	21.17

LTE			LTE B40			
Modulation	RB	RB Offset	Tune up	5MHz		
				38675	39150	39625
QPSK	1	Low	24	23.27	23.30	23.25
		Middle		23.36	23.41	23.36
		High		23.22	23.25	23.20
	50%	Low	23	22.37	22.38	22.33
		Middle		22.40	22.42	22.40
		High		22.34	22.34	22.34
	100%	/	23	22.32	22.34	22.32
16QAM	1	Low	23	22.43	22.49	22.45
		Middle		22.54	22.57	22.51
		High		22.40	22.46	22.37
	50%	Low	22	21.39	21.39	21.40
		Middle		21.40	21.44	21.44
		High		21.33	21.36	21.38
	100%	/	22	21.35	21.38	21.41
Modulation	RB	RB Offset	Tune up	10MHz		
				38700	39150	39600
QPSK	1	Low	24	23.37	23.41	23.36
		Middle		23.45	23.48	23.45
		High		23.25	23.31	23.27
	50%	Low	23	22.40	22.49	22.40
		Middle		22.41	22.42	22.37
		High		22.37	22.40	22.36
	100%	/	23	22.42	22.46	22.40
16QAM	1	Low	23	22.56	22.61	22.56
		Middle		22.64	22.69	22.66
		High		22.47	22.55	22.44
	50%	Low	22	21.43	21.54	21.52

		Middle		21.43	21.50	21.48
		High		21.41	21.42	21.45
	100%	/	22	21.41	21.49	21.46
Modulation	RB	RB Offset	Tune up	15MHz		
				38725	39150	39575
QPSK	1	Low	24	23.32	23.34	23.30
		Middle		23.29	23.36	23.36
		High		23.17	23.17	23.18
	50%	Low	23	22.37	22.45	22.40
		Middle		22.36	22.38	22.37
		High		22.33	22.35	22.37
	100%	/	23	22.34	22.35	22.37
16QAM	1	Low	23	22.51	22.54	22.49
		Middle		22.54	22.60	22.54
		High		22.38	22.40	22.36
	50%	Low	22	21.34	21.40	21.42
		Middle		21.29	21.34	21.38
		High		21.28	21.31	21.35
	100%	/	22	21.33	21.37	21.44
Modulation	RB	RB Offset	Tune up	20MHz		
				38750	39150	39550
QPSK	1	Low	24	23.09	23.28	23.41
		Middle		23.20	23.53	23.59
		High		22.96	23.26	23.26
	50%	Low	23	22.14	22.52	22.70
		Middle		22.16	22.47	22.55
		High		22.15	22.42	22.36
	100%	/	23	22.20	22.50	22.64
16QAM	1	Low	23	22.29	22.49	22.60
		Middle		22.42	22.75	22.78
		High		22.19	22.46	22.44
	50%	Low	22	21.18	21.56	21.77
		Middle		21.19	21.51	21.62
		High		21.20	21.48	21.49
	100%	/	22	21.22	21.51	21.66

LTE			**LTE B41**			
Modulation	RB	RB Offset	Tune up	5MHz		
				39675	40620	41565
QPSK	1	Low	23.5	22.99	23.12	23.02
		Middle		23.11	23.24	23.16
		High		22.98	23.11	22.98
	50%	Low	23	22.17	22.22	22.14

		Middle		22.26	22.25	22.21
		High		22.18	22.16	22.14
	100%	/	23	22.17	22.18	22.12
16QAM	1	Low	23	22.21	22.26	22.15
		Middle		22.33	22.40	22.27
		High		22.22	22.26	22.12
	50%	Low	22	21.18	21.22	21.13
		Middle		21.25	21.24	21.20
		High		21.20	21.16	21.13
	100%	/	22	21.21	21.23	21.18
Modulation	RB	RB Offset	Tune up	10MHz		
				39700	40620	41540
QPSK	1	Low	23.5	23.09	23.17	23.11
		Middle		23.20	23.30	23.23
		High		23.07	23.20	23.11
	50%	Low	23	22.22	22.26	22.19
		Middle		22.27	22.26	22.21
		High		22.22	22.26	22.19
	100%	/	23	22.28	22.26	22.22
16QAM	1	Low	23	22.35	22.32	22.28
		Middle		22.43	22.48	22.36
		High		22.30	22.39	22.22
	50%	Low	22	21.27	21.30	21.21
		Middle		21.27	21.29	21.24
		High		21.31	21.28	21.23
	100%	/	22	21.26	21.28	21.24
Modulation	RB	RB Offset	Tune up	15MHz		
				39725	40620	41515
QPSK	1	Low	23.5	23.04	23.01	23.05
		Middle		23.07	23.21	23.12
		High		22.99	23.16	23.00
	50%	Low	23	22.17	22.19	22.16
		Middle		22.21	22.23	22.20
		High		22.19	22.22	22.16
	100%	/	23	22.16	22.21	22.13
16QAM	1	Low	23	22.25	22.28	22.22
		Middle		22.33	22.40	22.28
		High		22.21	22.32	22.16
	50%	Low	22	21.08	21.15	21.11
		Middle		21.18	21.18	21.14
		High		21.10	21.17	21.12
	100%	/	22	21.17	21.21	21.13
Modulation	RB	RB Offset	Tune up	20MHz		