

FCC

SAR

TEST REPORT

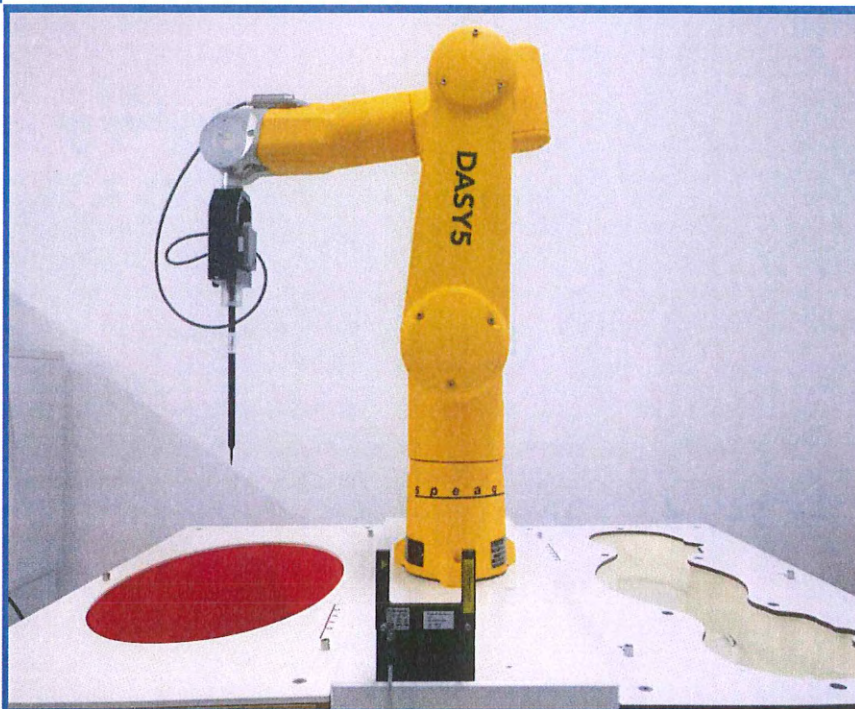
ISSUED BY  
Shenzhen BALUN Technology Co., Ltd.



FOR  
**LTE module**

ISSUED TO  
Fibocom Wireless Inc.

5/F, Tower A, Technology Building II, 1057 Nanhai Blvd, Shenzhen,  
518067 China



Tested by: Zong Liyao  
Zong Liyao  
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Date: Sep. 18, 2018

Approved by: Wei Yanquan  
Wei Yanquan  
(Chief Engineer)

Date: Sep. 18, 2018

Report No.: BL-SZ1870481-701

EUT Name: LTE module

Model: L850-GL

Brand Name: Fibocom

FCC ID: ZMOL850GL

Test Standard: FCC 47 CFR Part 2.1093

ANSI C95.1: 1999, IEEE 1528: 2013

Maximum SAR: Body (1 g): 0.965 W/kg

Test Conclusion: Pass

Test Date: Aug. 13, 2018 ~ Sep. 10, 2018

Date of Issue: Sep. 18, 2018

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**Revision History**

| <u>Version</u> | <u>Issue Date</u>    | <u>Revisions Content</u> |
|----------------|----------------------|--------------------------|
| <u>Rev. 01</u> | <u>Sep. 18, 2018</u> | <u>Initial Issue</u>     |

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# 1 GENERAL INFORMATION

## 1.1 Identification of the Testing Laboratory

|              |                                                                                                                                 |
|--------------|---------------------------------------------------------------------------------------------------------------------------------|
| Company Name | Shenzhen BALUN Technology Co., Ltd.                                                                                             |
| Address      | Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China |
| Phone Number | +86 755 6685 0100                                                                                                               |
| Fax Number   | +86 755 6182 4271                                                                                                               |

## 1.2 Identification of the Responsible Testing Location

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Location             | Shenzhen BALUN Technology Co., Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Address                   | Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Accreditation Certificate | <p>The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1.</p> <p>The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.</p> <p>The laboratory is a testing organization accredited by American Association for Laboratory Accreditation (A2LA) according to ISO/IEC 17025. The accreditation certificate is 4344.01.</p> <p>The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.</p> |
| Description               | All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## 1.3 Test Environment Condition

|                           |                    |
|---------------------------|--------------------|
| Ambient Temperature       | 21°C to 23°C       |
| Ambient Relative Humidity | 37% to 48%         |
| Ambient Pressure          | 100 KPa to 102 KPa |

## 1.4 Announce

- (1) The test report reference to the report template version v2.2.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

|           |                                                                                |
|-----------|--------------------------------------------------------------------------------|
| Applicant | Fibocom Wireless Inc.                                                          |
| Address   | 5/F, Tower A, Technology Building II, 1057 Nanhai Blvd, Shenzhen, 518067 China |

### 2.2 Manufacturer Information

|              |                                                                                |
|--------------|--------------------------------------------------------------------------------|
| Manufacturer | Fibocom Wireless Inc.                                                          |
| Address      | 5/F, Tower A, Technology Building II, 1057 Nanhai Blvd, Shenzhen, 518067 China |

### 2.3 Factory Information

|         |     |
|---------|-----|
| Factory | N/A |
| Address | N/A |

### 2.4 General Description for Equipment under Test (EUT)

|                                           |            |
|-------------------------------------------|------------|
| EUT Name                                  | LTE module |
| Model Name Under Test                     | L850-GL    |
| Series Model Name                         | N/A        |
| Description of Model Name Differentiation | N/A        |
| Hardware Version                          | N/A        |
| Software Version                          | N/A        |
| WWAN Module Band Name                     | Fibocom    |
| WWAN Module Model Name                    | L850-GL    |

#### 2.4.1 Host information

|                     |                           |
|---------------------|---------------------------|
| Product Description | Tablet PC                 |
| Model Name          | Lenovo ideapad D330-10IGM |
| Brand Name          | Lenovo                    |

| Item    | Manufacturer | Model Description | Specification                                       |
|---------|--------------|-------------------|-----------------------------------------------------|
| Battery | Simplo       | L17M2PF3          | DC7.68V, 39Wh                                       |
|         | Celxpert     | L17C2PF1          | DC7.7V, 39Wh                                        |
| Adapter | Delta        | ADP-450W B        | Input: 100-240 V~; 50-60Hz<br>Output: 20 V= 2.25 A. |
|         | Liteon       | ADLX45YLC3A       | Input: 100-240V~, 50-60Hz                           |

|  |         |             |                                                   |
|--|---------|-------------|---------------------------------------------------|
|  |         | ADLX45YCC3A | Output: 20V= 2.25A/ 15V=3A/<br>9 V= 2A/ 5V= 2A    |
|  | Chicony | ADL45WCC    | Input: 100-240 V~; 50-60Hz<br>Output: 20V= 2.25A. |

| Item        | Brand Name          | Model Name | Specification                        |
|-------------|---------------------|------------|--------------------------------------|
| WLAN Moduel | Qualcomm<br>Atheros | QCNFA425   | 802.11 a/b/g/n/ac WLAN+<br>Bluetooth |
|             | Intel               | 3162D2W    |                                      |
|             | Intel               | 8265D2W    |                                      |

| Antenna type | Manufacture | Port | Part No.            |
|--------------|-------------|------|---------------------|
| PIFA         | South Star  | Main | N19-0355-R0A        |
|              |             | Aux  | N19-0354-R0A        |
|              | Speed       | Main | F-OG-XZ-0117-001-W0 |
|              |             | Aux  | F-OG-XZ-0118-001-B0 |

## 2.5 Ancillary Equipment

Note: Not applicable.

## 2.6 Technical Information

|                                   |                                                                                                                                                                |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network and Wireless connectivity | 3G Network WCDMA/HSDPA/HSUPA Band 2/ 4/ 5;<br>4G Network FDD LTE Band 2/ 4/ 5/ 7/ 12/ 13/ 17/ 26/ 30/ 66;<br>TDD LTE Band 41;<br>WLAN; Bluetooth; GPS; GLONASS |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|

The requirement for the following technical information of the EUT was tested in this report:

|                   |                                                                                                                                          |                     |                                              |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------|
| Operating Mode    | WCDMA, FDD-LTE, 2.4G WLAN, 5G WLAN, Bluetooth                                                                                            |                     |                                              |
| Frequency Range   | WCDMA Band 2                                                                                                                             | TX: 1850 ~ 1910 MHz | RX: 1930 ~ 1990 MHz                          |
|                   | WCDMA Band 4                                                                                                                             | TX: 1710 ~ 1755 MHz | RX: 2110 ~ 2155 MHz                          |
|                   | WCDMA Band 5                                                                                                                             | TX: 824 ~ 849 MHz   | RX: 869 ~ 894 MHz                            |
|                   | LTE Band 2                                                                                                                               | TX: 1850 ~ 1910 MHz | RX: 1930 ~ 1990 MHz                          |
|                   | LTE Band 4                                                                                                                               | TX: 1710 ~ 1755 MHz | RX: 2110 ~ 2155 MHz                          |
|                   | LTE Band 5                                                                                                                               | TX: 824 ~ 849 MHz   | RX: 869 ~ 894 MHz                            |
|                   | LTE Band 7                                                                                                                               | TX: 2500 ~ 2570 MHz | RX: 2620 ~ 2690 MHz                          |
|                   | LTE Band 12                                                                                                                              | TX: 699 ~ 716 MHz   | RX: 729 ~ 746 MHz                            |
|                   | LTE Band 13                                                                                                                              | TX: 777 ~ 787 MHz   | RX: 746 ~ 756 MHz                            |
|                   | LTE Band 17                                                                                                                              | TX: 704 ~ 716 MHz   | RX: 734 ~ 746 MHz                            |
|                   | LTE Band 26                                                                                                                              | TX: 814 ~ 849 MHz   | RX: 859 ~ 894 MHz                            |
|                   | LTE Band 30                                                                                                                              | TX: 2305 ~ 2315 MHz | RX: 2350 ~ 2360 MHz                          |
|                   | LTE Band 66                                                                                                                              | TX: 1710 ~ 1780 MHz | RX: 2110 ~ 2180 MHz                          |
|                   | LTE Band 41                                                                                                                              | TX: 2496 ~ 2690 MHz | RX: 2496 ~ 2690 MHz                          |
|                   | 802.11b/g<br>/n(HT20/HT40)                                                                                                               | 2400 ~ 2483.5 MHz   |                                              |
|                   | 802.11a/<br>/n(HT20/HT40)<br>/ac(VHT20/VHT40/<br>VHT80)                                                                                  | 5150 ~ 5250 MHz     |                                              |
|                   |                                                                                                                                          | 5250 ~ 5350 MHz     |                                              |
|                   |                                                                                                                                          | 5470 ~ 5725 MHz     |                                              |
|                   |                                                                                                                                          | 5725 ~ 5850 MHz     |                                              |
| Bluetooth         | 2400 ~ 2483.5 MHz                                                                                                                        |                     |                                              |
| Antenna Type      | WWAN: PIFA Antenna<br>WLAN: PIFA Antenna<br>Bluetooth: PIFA Antenna                                                                      |                     |                                              |
| Hotspot Function  | Support                                                                                                                                  |                     |                                              |
| Power Reduction   | Support<br>The proximity sensor is only used for power reduction on 3G/4G antenna. The reduction power details please refer section 8.9. |                     |                                              |
| Exposure Category | General Population/Uncontrolled exposure                                                                                                 |                     |                                              |
| EUT Stage         | Portable Device                                                                                                                          |                     |                                              |
| Product           | Type                                                                                                                                     |                     |                                              |
|                   | <input checked="" type="checkbox"/> Production unit                                                                                      |                     | <input type="checkbox"/> Identical prototype |

### 3 SUMMARY OF TEST RESULT

#### 3.1 Test Standards

| No. | Identity                  | Document Title                                                                                                                                                              |
|-----|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 47 CFR Part 2             | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations                                                                                               |
| 2   | ANSI/IEEE Std. C95.1-1999 | IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz                                                  |
| 3   | IEEE Std. 1528-2013       | Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques |
| 4   | FCC KDB 447498 D01 v06    | Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies                                                                                      |
| 5   | FCC KDB 941225 D01 v03r01 | 3G SAR MEAUREMENT PROCEDURES                                                                                                                                                |
| 6   | FCC KDB 941225 D05 v02r05 | SAR Evaluation Considerations for LTE Devices                                                                                                                               |
| 7   | FCC KDB 865664 D01 v01r04 | SAR Measurement 100 MHz to 6 GHz                                                                                                                                            |
| 8   | FCC KDB 865664 D02 v01r02 | RF Exposure Reporting                                                                                                                                                       |
| 9   | KDB 616217 D04v01r02      | SAR for laptop and tablets                                                                                                                                                  |
| 10  | KDB 248227 D01 v02r02     | SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters                                                                                                                           |

### 3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user.

Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Table of Exposure Limits:

| Body Position                                                                    | SAR Value (W/Kg)                             |                                      |
|----------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------|
|                                                                                  | General Population/<br>Uncontrolled Exposure | Occupational/<br>Controlled Exposure |
| Whole-Body SAR<br>(averaged over the entire body)                                | 0.08                                         | 0.4                                  |
| Partial-Body SAR<br>(averaged over any 1 gram of tissue)                         | 1.60                                         | 8.0                                  |
| SAR for hands, wrists, feet and ankles<br>(averaged over any 10 grams of tissue) | 4.0                                          | 20.0                                 |

NOTE:

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

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

### 3.3 Test Result Summary

#### 3.3.1 Highest SAR (1 g Value)

| Frequency Band               |                 | Maximum SAR<br>(W/kg) 1 g |                       |
|------------------------------|-----------------|---------------------------|-----------------------|
|                              |                 | Body                      |                       |
|                              |                 | Proximity Sensory on      | Proximity Sensory off |
| WCDMA                        | Band 2          | 0.636                     | 0.965                 |
|                              | Band 4          | 0.626                     | 0.857                 |
|                              | Band 5          | 0.651                     | 0.706                 |
| LTE                          | Band 2          | 0.745                     | 0.800                 |
|                              | Band 5          | 0.706                     | 0.511                 |
|                              | Band 7          | 0.610                     | 0.929                 |
|                              | Band 12         | 0.723                     | 0.186                 |
|                              | Band 13         | 0.749                     | 0.510                 |
|                              | Band 26         | 0.726                     | 0.599                 |
|                              | Band 30         | 0.651                     | 0.812                 |
|                              | Band 41         | 0.709                     | 0.661                 |
|                              | Band 66         | 0.645                     | 0.784                 |
| WIFI<br>(Intel 3165D2W)      | 2.4G WLAN Main  | 0.910                     | /                     |
|                              | 2.4G WLAN Aux.  | 0.901                     | /                     |
|                              | 5.3G WLAN Main  | 1.082                     | /                     |
|                              | 5.3G WLAN Aux.  | 1.042                     | /                     |
|                              | 5.6G WLAN Main. | 0.987                     | /                     |
|                              | 5.6G WLAN Aux.  | 1.072                     | /                     |
|                              | 5.8G WLAN Main  | 0.841                     | /                     |
|                              | 5.8G WLAN Aux.  | 1.074                     | /                     |
| WIFI<br>(Intel 8265D2W)      | 2.4G WLAN Main  | 1.015                     | /                     |
|                              | 2.4G WLAN Aux.  | 0.943                     | /                     |
|                              | 5.3G WLAN Main  | <b>1.155</b>              | /                     |
|                              | 5.3G WLAN Aux.  | 1.143                     | /                     |
|                              | 5.6G WLAN Main. | 1.046                     | /                     |
|                              | 5.6G WLAN Aux.  | 0.677                     | /                     |
|                              | 5.8G WLAN Main  | 1.045                     | /                     |
|                              | 5.8G WLAN Aux.  | 0.830                     | /                     |
| WIFI<br>(QCNFA425)           | 2.4G WLAN Main  | 0.861                     | /                     |
|                              | 2.4G WLAN Aux.  | 0.783                     | /                     |
|                              | 5.3G WLAN Main  | 1.147                     | /                     |
|                              | 5.3G WLAN Aux.  | 0.901                     | /                     |
|                              | 5.6G WLAN Main. | 1.080                     | /                     |
|                              | 5.6G WLAN Aux.  | 0.782                     | /                     |
|                              | 5.8G WLAN Main  | 1.012                     | /                     |
|                              | 5.8G WLAN Aux.  | 0.858                     | /                     |
| Bluetooth<br>(Intel 3165D2W) | DH5 Aux.        | 0.088                     | /                     |

| Frequency Band                                                                                                                                                                                                                                                                                                                                   |           | Maximum SAR<br>(W/kg) 1 g |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------|-----------------------|
|                                                                                                                                                                                                                                                                                                                                                  |           | Body                      |                       |
|                                                                                                                                                                                                                                                                                                                                                  |           | Proximity Sensory on      | Proximity Sensory off |
| Bluetooth<br>(Intel 8265D2W)                                                                                                                                                                                                                                                                                                                     | DH5 Main  | 0.284                     | /                     |
| WIFI<br>(QCNFA425)                                                                                                                                                                                                                                                                                                                               | 2DH5 Main | 0.095                     | /                     |
|                                                                                                                                                                                                                                                                                                                                                  | 2DH5 Aux. | 0.056                     | /                     |
| Limits (W/kg)                                                                                                                                                                                                                                                                                                                                    |           | 1.6                       | 1.6                   |
| Test Verdict                                                                                                                                                                                                                                                                                                                                     |           | Pass                      |                       |
| Note1: Power reduction is not applicable for WLAN.                                                                                                                                                                                                                                                                                               |           |                           |                       |
| Note2: The proximity sensor is only used for power reduction on 3G/4G antenna.                                                                                                                                                                                                                                                                   |           |                           |                       |
| Note3: This device supports both LTE Band 4/17 and Band 66/12. Since the supported frequency span for LTE Band 4/17 falls completely within the supports frequency span for LTE Band 66/12, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE Band 66/12. |           |                           |                       |

### 3.3.2 Highest Simultaneous SAR

| Position | Simultaneous Configuration | Simultaneous SAR<br>(W/kg) | Limit (W/kg) | Verdict |
|----------|----------------------------|----------------------------|--------------|---------|
| Body     | L850-GL + Intel 3165D2W    | 1.552                      | 1.6          | Pass    |
|          | L850-GL + Intel 8265D2W    | 1.490                      | 1.6          | Pass    |
|          | L850-GL + QCNFA425         | <b>1.590</b>               | 1.6          | Pass    |

### 3.4 Test Uncertainty

According to KDB 865664 D01, when the highest measured 1 g SAR within a frequency band is  $< 1.5 \text{ W/kg}$ , the extensive SAR measurement uncertainty analysis is not required in SAR reports submitted for equipment approval.

The maximum 1 g SAR for the EUT in this report is  $1.155 \text{ W/kg}$ , which is lower than  $1.5 \text{ W/kg}$ , so the extensive SAR measurement uncertainty analysis is not required in this report.

## 4 MEASUREMENT SYSTEM

### 4.1 Specific Absorption Rate (SAR) Definition

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.

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 ( $\rho$ ). The equation description is as below:

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

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

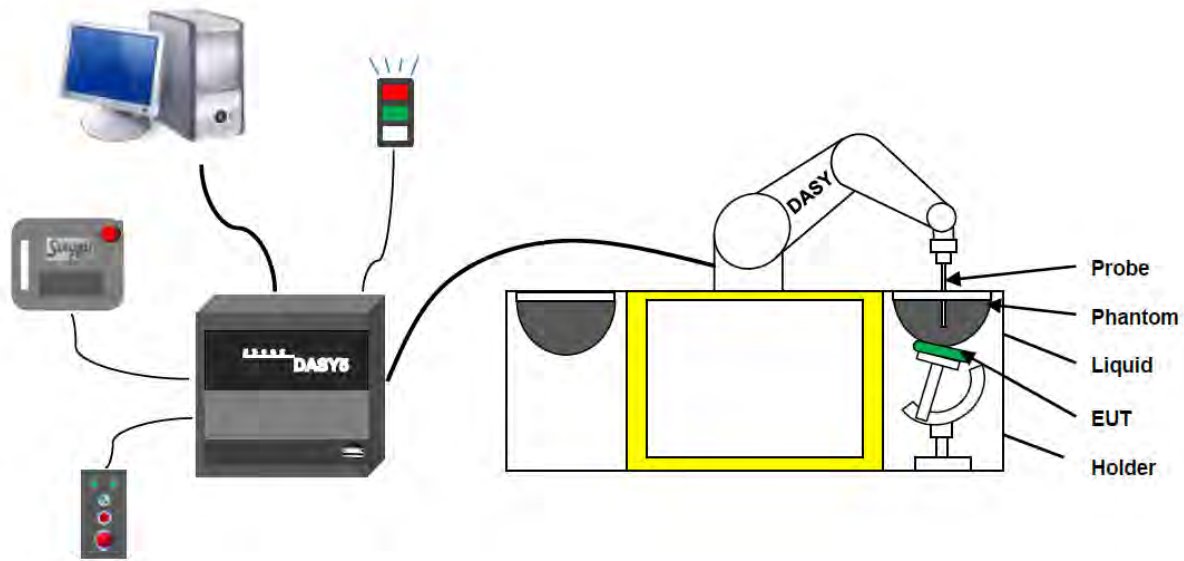
$$\text{SAR} = \frac{\sigma E^2}{\rho}$$

Where:  $\sigma$  is the conductivity of the tissue,

$\rho$  is the mass density of the tissue and E is the RMS electrical field strength.

## 4.2 DASY SAR System

### 4.2.1 DASY SAR System Diagram



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

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. 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.
3. A data acquisition electronic (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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

#### 4.2.2 Robot

The Dasy SAR system uses the high precision robots. Symmetrical design with triangular core Built-in optical fiber for surface detection system For the 6-axis controller system, Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents). The robot series have many features that are important for our application:



- High precision  
(repeatability  $\pm 0.02$  mm)
- High reliability  
(industrial design)
- Low maintenance costs  
(virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements  
(brush less synchron motors; no stepper motors)
- Low ELF interference  
(motor control \_elds shielded via the closed metallic construction shields)

### 4.2.3 E-Field Probe

The probe is specially designed and calibrated for use in liquids with high permittivities for the measurements the Specific Dosimetric E-Field Probe EX3DV4-SN:7510 with following specifications is used.

|               |                                                                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction  | Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether) |
| Calibration   | ISO/IEC 17025 calibration service available                                                                                                                                                                      |
| Frequency     | 10 MHz to 6 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)                                                                                                                                                       |
| Directivity   | $\pm 0.2$ dB in HSL (rotation around probe axis) ; $\pm 0.4$ dB in HSL (rotation normal to probe axis)                                                                                                           |
| Dynamic range | 5 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB                                                                                                                                                               |
| Dimensions    | Overall length: 337 mm (Tip: 9 mm) Tip diameter: 2.5 mm (Body: 10 mm) Distance from probe tip to dipole centers: 1.0 mm                                                                                          |
| Application   | General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms (EX3DV4)                                                                                           |



#### E-Field Probe Calibration Process

Probe calibration is realized, in compliance with CENELEC EN 62209-1/-2 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 62209-1/2 annexe technique using reference guide at the five frequencies.

#### 4.2.4 Data Acquisition Electronics

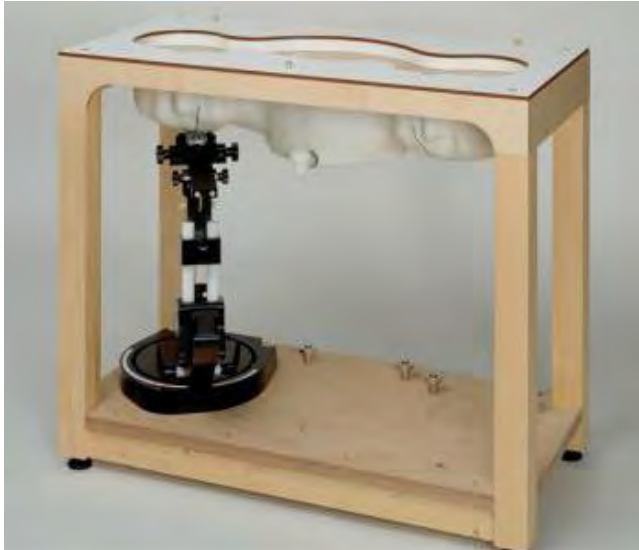
The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through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



- Input Impedance: 200M $\Omega$ m
- The Inputs: Symmetrical and Floating
- Common Mode Rejection: Above 80dB

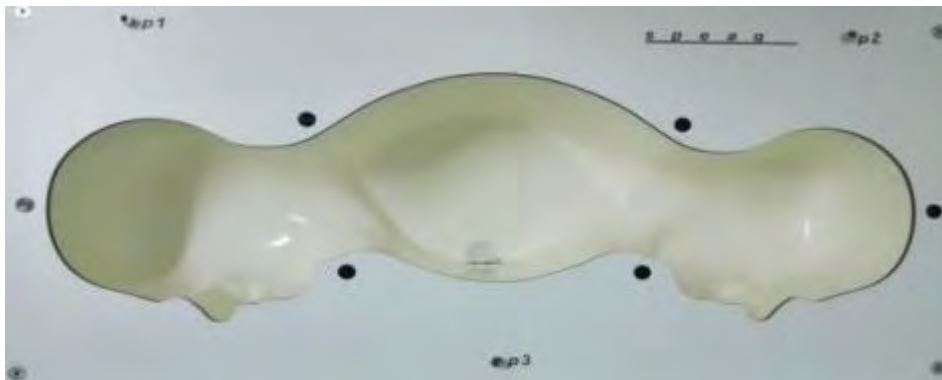
#### 4.2.5 Phantoms

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.



- Left hand
- Right hand
- Flat phantom

Photo of Phantom SN1857



| Serial Number | Material                           | Length | Height |
|---------------|------------------------------------|--------|--------|
| SN 1857 SAM   | Vinylester, glass fiber reinforced | 1000   | 500    |

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI4 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.



· Flat phantom

Photo of Phantom SN1012



| Serial Number | Shell Thickness (mm) | Major ellipse axis (mm) | Minor axis ( mm ) |
|---------------|----------------------|-------------------------|-------------------|
| SN 1012 ELI4  | 2.0 ± 0.2            | 600                     | 500               |

#### 4.2.6 Device Holder

##### Mounting Device for Hand-Held Transmitter

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of  $65^\circ$ . The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA"s only. If necessary an additional support of polystyrene material is used. Larger DUT"s (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.



The positioning system allows obtaining cheek and tilting position with a very good accuracy. Incompliance with CENELEC, the tilt angle uncertainty is lower than  $1^\circ$ .

##### Mounting Device for Laptops and other Body-Worn Transmitters

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



## 4.2.7 Simulating Liquid

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5%.



The following table gives the recipes for tissue simulating liquid and the theoretical Conductivity/Permittivity.

| Head (Reference IEEE1528)           |              |                       |                  |             |                     |             |                                |                            |
|-------------------------------------|--------------|-----------------------|------------------|-------------|---------------------|-------------|--------------------------------|----------------------------|
| Frequency<br>(MHz)                  | Water<br>(%) | Sugar<br>(%)          | Cellulose<br>(%) | Salt<br>(%) | Preventol<br>(%)    | DGBE<br>(%) | Conductivity<br>$\sigma$ (S/m) | Permittivity<br>$\epsilon$ |
| 750                                 | 41.1         | 57.0                  | 0.2              | 1.4         | 0.2                 | 0           | 0.89                           | 41.9                       |
| 835                                 | 40.3         | 57.9                  | 0.2              | 1.4         | 0.2                 | 0           | 0.90                           | 41.5                       |
| 900                                 | 40.3         | 57.9                  | 0.2              | 1.4         | 0.2                 | 0           | 0.97                           | 41.5                       |
| 1800, 1900, 2000                    | 55.2         | 0                     | 0                | 0.3         | 0                   | 44.5        | 1.4                            | 40.0                       |
| 2450                                | 55.0         | 0                     | 0                | 0.1         | 0                   | 44.9        | 1.80                           | 39.2                       |
| 2600                                | 54.9         | 0                     | 0                | 0.1         | 0                   | 45.0        | 1.96                           | 39.0                       |
| Frequency<br>(MHz)                  | Water<br>(%) | Hexyl Carbitol<br>(%) |                  |             | Triton X-100<br>(%) |             | Conductivity<br>$\sigma$ (S/m) | Permittivity<br>$\epsilon$ |
| 5200                                | 62.52        | 17.24                 |                  |             | 17.24               |             | 4.66                           | 36.0                       |
| 5800                                | 62.52        | 17.24                 |                  |             | 17.24               |             | 5.27                           | 35.3                       |
| Body (From instrument manufacturer) |              |                       |                  |             |                     |             |                                |                            |
| Frequency<br>(MHz)                  | Water<br>(%) | Sugar<br>(%)          | Cellulose<br>(%) | Salt<br>(%) | Preventol<br>(%)    | DGBE<br>(%) | Conductivity<br>$\sigma$ (S/m) | Permittivity<br>$\epsilon$ |
| 750                                 | 51.7         | 47.2                  | 0                | 0.9         | 0.1                 | 0           | 0.96                           | 55.5                       |
| 835                                 | 50.8         | 48.2                  | 0                | 0.9         | 0.1                 | 0           | 0.97                           | 55.2                       |
| 900                                 | 50.8         | 48.2                  | 0                | 0.9         | 0.1                 | 0           | 1.05                           | 55.0                       |
| 1800, 1900, 2000                    | 70.2         | 0                     | 0                | 0.4         | 0                   | 29.4        | 1.52                           | 53.3                       |
| 2450                                | 68.6         | 0                     | 0                | 0.1         | 0                   | 31.3        | 1.95                           | 52.7                       |
| 2600                                | 68.2         | 0                     | 0                | 0.1         | 0                   | 31.7        | 2.16                           | 52.5                       |
| Frequency(MHz)                      | Water        | DGBE<br>(%)           |                  |             | Salt<br>(%)         |             | Conductivity<br>$\sigma$ (S/m) | Permittivity<br>$\epsilon$ |
| 5200                                | 78.60        | 21.40                 |                  |             | /                   |             | 5.54                           | 47.86                      |
| 5800                                | 78.50        | 21.40                 |                  |             | 0.1                 |             | 6.0                            | 48.20                      |

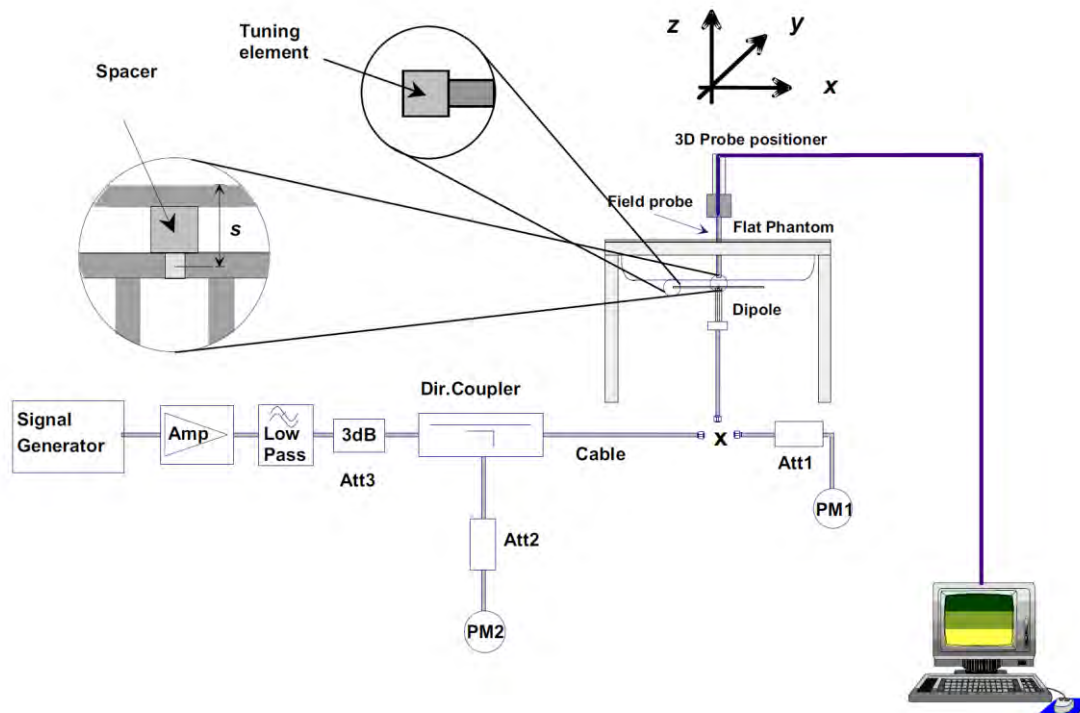
## 5 SYSTEM VERIFICATION

### 5.1 Purpose of System Check

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

### 5.2 System Check Setup

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



## 6 TEST POSITION CONFIGURATIONS

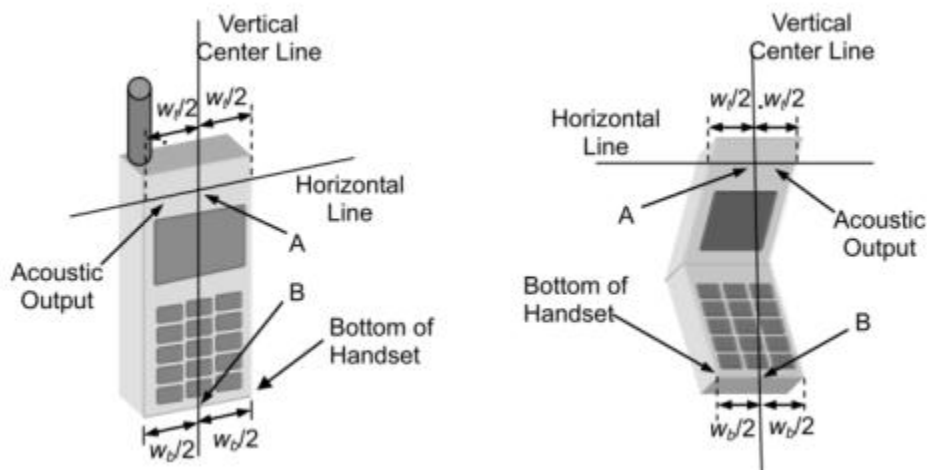
According to KDB 648474 D04 Handset, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

### 6.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2013 using the SAM phantom illustrated as below.

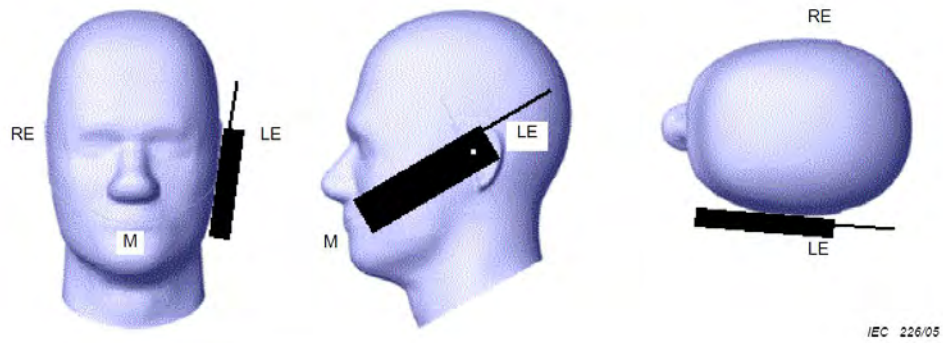
#### 6.1.1 Two Imaginary Lines on the Handset

- The vertical center line passes through two points on the front side of the handset - the midpoint of the width  $w_t$  of the handset at the level of the acoustic output, and the midpoint of the width  $w_b$  of the bottom of the handset.
- The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical center line is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



#### 6.1.2 Cheek Position

- To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



### 6.1.3 Tilted Position

- To position the device in the "cheek" position described above.
- While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.

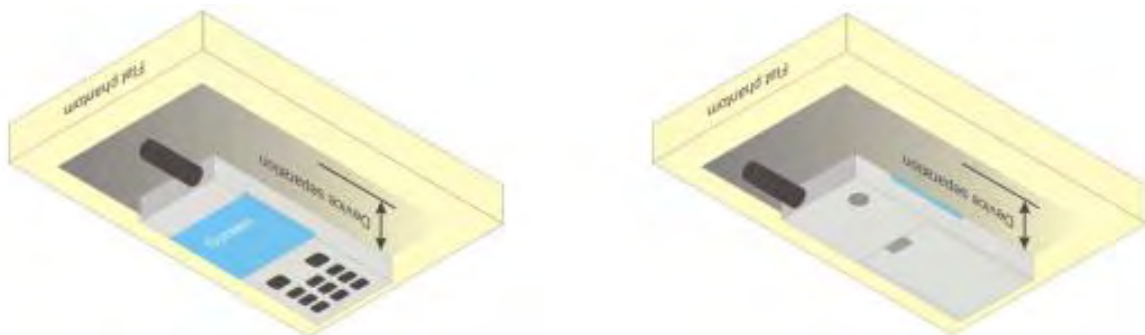


## 6.2 Body-worn Position Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory.

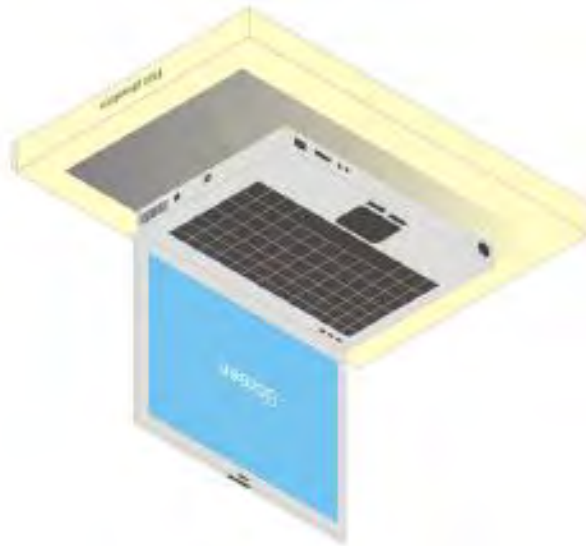
Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required. A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance  $\leq 5$  mm to support compliance.



### 6.3 Laptop Exposure Condition

This DUT should consider one position which is bottom of laptop touching with phantom 0 mm air gap and the screen portion of the device shall be an open position at a 90° angle.



### 6.4 Tablet Exposure Condition

This DUT was tested in four different positions. They are back side, left edge, Right edge and top edge in these positions.

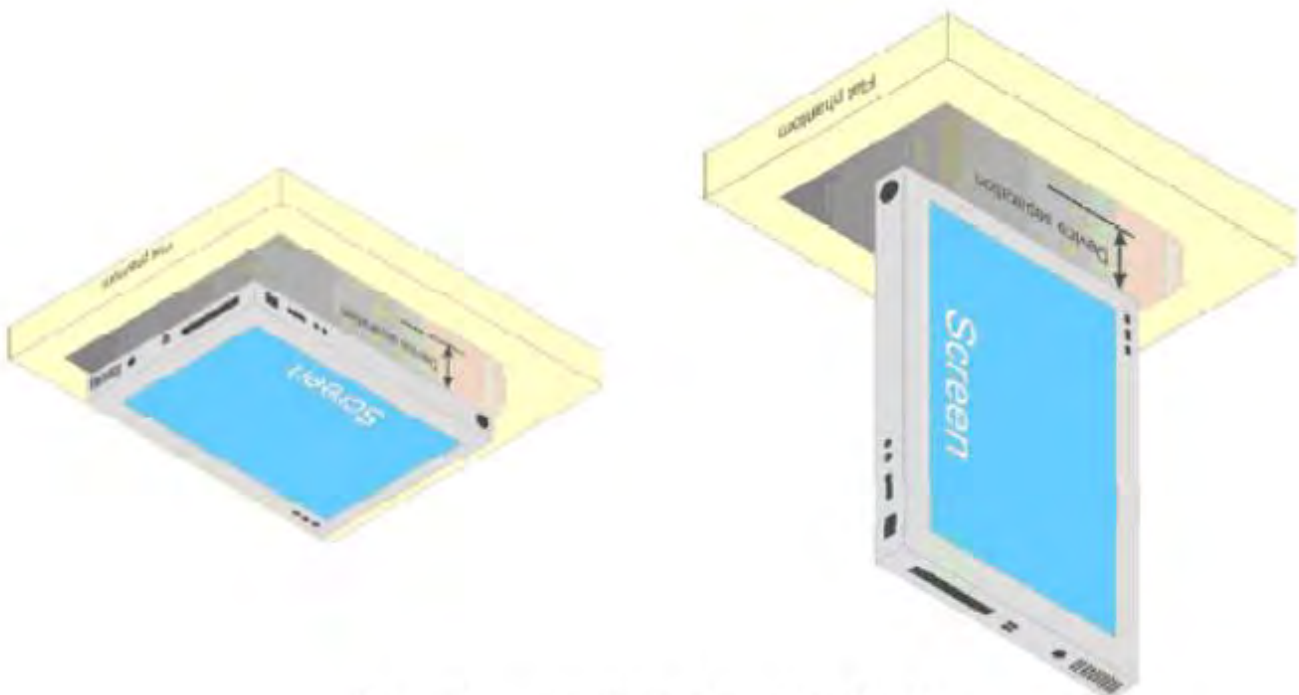
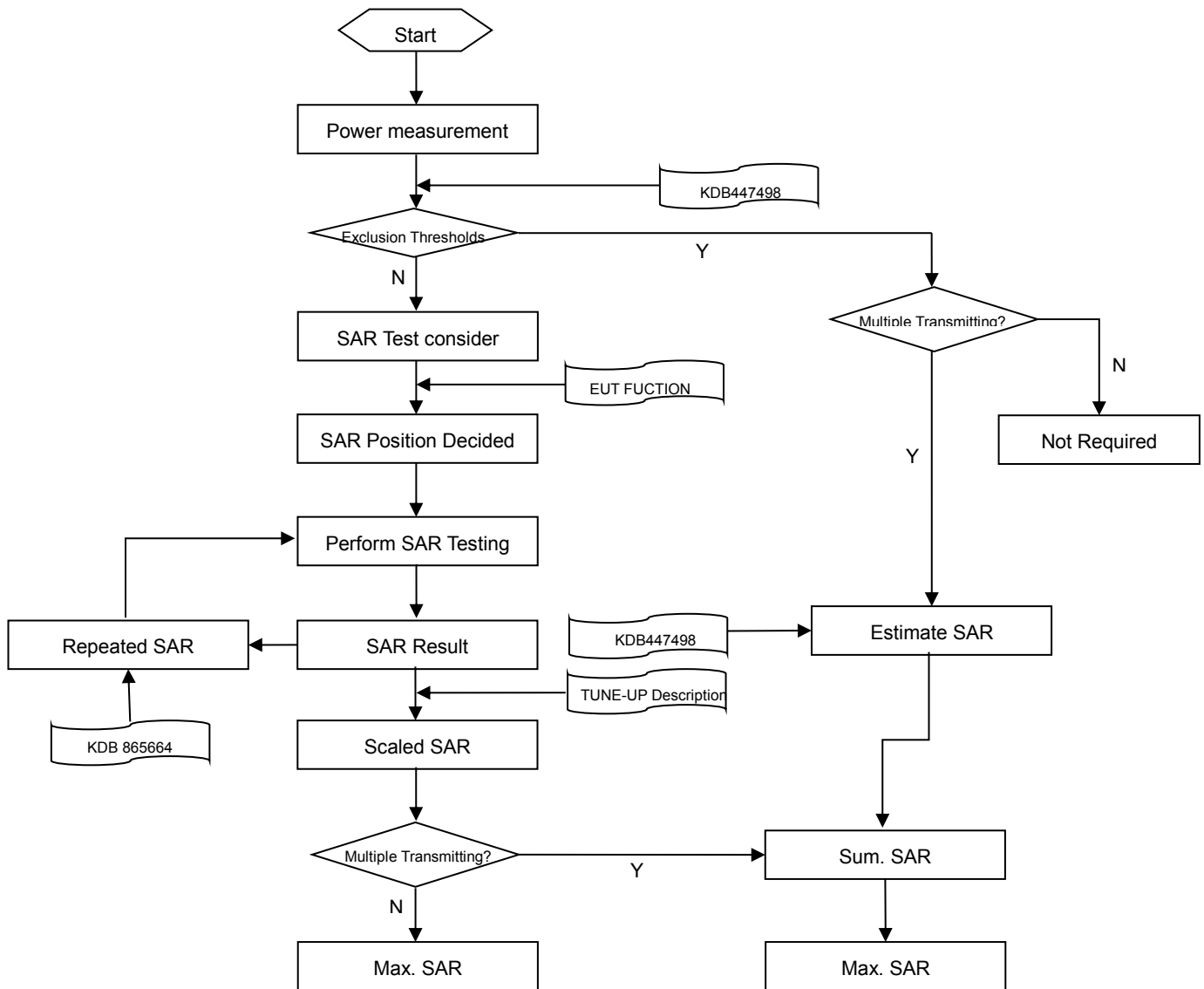


Fig Illustration for Lap-touching Position

## 7 MEASUREMENT PROCEDURE

### 7.1 Measurement Process Diagram



## 7.2 SAR Scan General Requirement

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.

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

### 7.3 Measurement Procedure

The following steps are used for each test position

- a. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- b. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- c. Measurement of the SAR distribution with a grid of 8 to 16mm \* 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- d. Around this point, a cube of 30 \* 30 \* 30 mm or 32 \* 32 \* 32 mm is assessed by measuring 5 or 8 \* 5 or 8 \* 4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

### 7.4 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

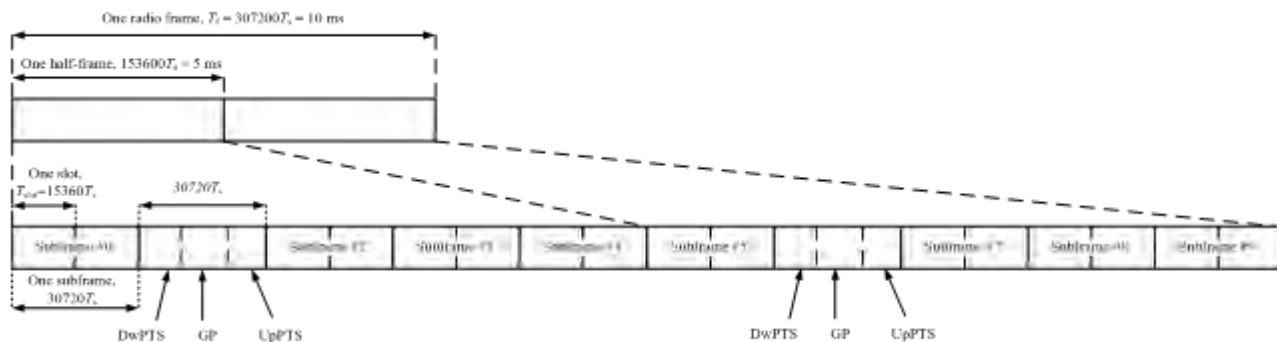
When the 1 g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

## 7.5 LTE (TDD) Considerations

During TDD-LTE SAR testing, the EUT was commanded to transmit on maximum output power and maximum transmitting bandwidth. The uplink and downlink slot configuration as below in one radio frame.



According to 3GPP Per 3GPP TS 36.211. Each radio frame of length ( $T_f=307200 \cdot T_s = 10\text{ms}$ ) of two half-frames of length ( $153600 \cdot T_s = 5\text{ms}$ ). Each half-frame consists of five sub-frames of length ( $30720 \cdot T_s = 1\text{ms}$ )



And the special sub-frame with the three fields DwPTS, GP and UpPTS.

The length of DwPTS and UpPTS is given by below table subject to the total length of DwPTS, GP and UpPTS being equal to  $30720 \cdot T_s = 1\text{ms}$ .

### Configuration of special sub-frame (lengths of DwPTS/GP/UpPTS)

| Special sub-frame 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                               | $6592 \cdot T_s$                 | $2192 \cdot T_s$               | $2560 \cdot T_s$                 | $7680 \cdot T_s$                   | $2192 \cdot T_s$               | $2560 \cdot T_s$                 |   |   |
| 1                               | $19760 \cdot T_s$                |                                |                                  | $20480 \cdot T_s$                  |                                |                                  |   |   |
| 2                               | $21592 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |   |   |
| 3                               | $24144 \cdot T_s$                |                                |                                  | $25600 \cdot T_s$                  |                                |                                  |   |   |
| 4                               | $26336 \cdot T_s$                |                                |                                  | $7680 \cdot T_s$                   |                                |                                  |   |   |
| 5                               | $6592 \cdot T_s$                 | $4384 \cdot T_s$               | $5120 \cdot T_s$                 | $20480 \cdot T_s$                  | $2560 \cdot T_s$               | $5120 \cdot T_s$                 |   |   |
| 6                               | $19760 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |   |   |
| 7                               | $21592 \cdot T_s$                |                                |                                  | $12800 \cdot T_s$                  |                                |                                  |   |   |
| 8                               | $24144 \cdot T_s$                |                                |                                  | -                                  |                                |                                  | - | - |
| 9                               | $13168 \cdot T_s$                |                                |                                  | -                                  |                                |                                  | - | - |

For special sub-frame uplink time we used the largest cyclic prefix for duty cycle calculate;

Maximum uplink time of one special sub-frame=(largest cyclic prefix)/(one sub-frame of length)\* time of one sub-frame= $5120 \cdot T_s / 30720 \cdot T_s \cdot 1\text{ms} = 0.167\text{ms}$

One radio frame with 6 uplink sub-frames and two special sub-frame,  
there for the maximum Uplink time in one radio frame is:  **$6 \cdot 1\text{ ms} + 2 \cdot 0.167\text{ ms} = 6.334\text{ms}$**   
So, the duty cycle for TDD-LTE is:  **$6.334\text{ms} / 10\text{ms} = 1: 1.58$**

## 8 CONDUCTED RF OUPUT POWER

### 8.1 WCDMA

| WCDMA Band      | Band 2 |              |              | Band 4 |              |       |
|-----------------|--------|--------------|--------------|--------|--------------|-------|
| Channel         | 9262   | 9400         | 9538         | 1312   | 1412         | 1513  |
| RMC 12.2Kbps    | 23.71  | <b>23.81</b> | 23.43        | 23.59  | <b>23.81</b> | 23.78 |
| HSDPA Subtest-1 | 23.78  | 23.82        | 23.47        | 23.60  | 23.71        | 23.87 |
| HSDPA Subtest-2 | 22.86  | 23.60        | 23.20        | 22.62  | 23.56        | 23.61 |
| HSDPA Subtest-3 | 22.29  | 23.39        | 22.96        | 22.18  | 23.33        | 23.39 |
| HSDPA Subtest-4 | 22.08  | 23.15        | 22.77        | 21.87  | 23.09        | 23.17 |
| HSUPA Subtest-1 | 22.76  | 22.30        | 22.02        | 22.57  | 22.78        | 22.87 |
| HSUPA Subtest-2 | 20.60  | 20.61        | 20.28        | 20.37  | 20.59        | 20.68 |
| HSUPA Subtest-3 | 21.34  | 21.39        | 21.00        | 21.11  | 21.35        | 21.40 |
| HSUPA Subtest-4 | 20.87  | 20.89        | 20.50        | 20.67  | 20.90        | 20.92 |
| HSUPA Subtest-5 | 22.78  | 22.83        | 22.49        | 22.62  | 22.88        | 22.83 |
| Band            | Band 5 |              |              | -      |              |       |
| Channel         | 4132   | 4182         | 4233         | -      | -            | -     |
| RMC 12.2Kbps    | 23.39  | 23.37        | <b>23.46</b> | -      | -            | -     |
| HSDPA Subtest-1 | 23.28  | 23.41        | 23.56        | -      | -            | -     |
| HSDPA Subtest-2 | 22.30  | 23.47        | 23.39        | -      | -            | -     |
| HSDPA Subtest-3 | 21.87  | 23.49        | 23.13        | -      | -            | -     |
| HSDPA Subtest-4 | 21.60  | 23.27        | 22.89        | -      | -            | -     |
| HSUPA Subtest-1 | 22.30  | 22.48        | 22.59        | -      | -            | -     |
| HSUPA Subtest-2 | 20.21  | 20.78        | 20.31        | -      | -            | -     |
| HSUPA Subtest-3 | 20.84  | 21.41        | 21.01        | -      | -            | -     |
| HSUPA Subtest-4 | 20.39  | 21.05        | 20.53        | -      | -            | -     |
| HSUPA Subtest-5 | 22.40  | 22.93        | 22.53        | -      | -            | -     |

## 8.2 LTE

| FDD LTE Band 2     |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 18700       | 18900 | 19100 | 18700 | 18900 | 19100 |
| 20MHz              | 1 (RB_Pos:0)   | 22.94       | 22.62 | 22.43 | 22.33 | 21.89 | 21.83 |
|                    | 1 (RB_Pos:49)  | 22.52       | 22.63 | 22.03 | 21.90 | 21.91 | 21.46 |
|                    | 1 (RB_Pos:99)  | 22.65       | 22.49 | 22.28 | 21.97 | 21.84 | 21.68 |
|                    | 50 (RB_Pos:0)  | 21.59       | 21.61 | 21.20 | 20.66 | 20.64 | 20.21 |
|                    | 50 (RB_Pos:24) | 21.40       | 21.55 | 21.11 | 20.48 | 20.62 | 20.02 |
|                    | 50 (RB_Pos:49) | 21.37       | 21.51 | 21.24 | 20.38 | 20.60 | 20.10 |
|                    | 100 (RB_Pos:0) | 21.47       | 21.62 | 21.33 | 20.59 | 20.71 | 20.44 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 18675       | 18900 | 19125 | 18675 | 18900 | 19125 |
| 15MHz              | 1 (RB_Pos:0)   | 22.84       | 22.68 | 22.16 | 22.44 | 22.31 | 21.41 |
|                    | 1 (RB_Pos:37)  | 22.69       | 22.65 | 22.14 | 22.22 | 22.31 | 21.40 |
|                    | 1 (RB_Pos:74)  | 22.39       | 22.56 | 22.25 | 21.97 | 22.26 | 21.45 |
|                    | 36 (RB_Pos:0)  | 21.67       | 21.67 | 21.07 | 20.73 | 20.71 | 20.17 |
|                    | 36 (RB_Pos:18) | 21.61       | 21.62 | 21.18 | 20.68 | 20.69 | 20.27 |
|                    | 36 (RB_Pos:37) | 21.46       | 21.59 | 21.23 | 20.49 | 20.67 | 20.28 |
|                    | 75 (RB_Pos:0)  | 21.69       | 21.63 | 21.29 | 20.56 | 20.68 | 20.37 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 18650       | 18900 | 19150 | 18650 | 18900 | 19150 |
| 10MHz              | 1 (RB_Pos:0)   | 22.97       | 22.84 | 22.12 | 22.54 | 21.84 | 21.43 |
|                    | 1 (RB_Pos:24)  | 22.86       | 22.74 | 22.19 | 22.31 | 21.79 | 21.52 |
|                    | 1 (RB_Pos:49)  | 22.70       | 22.80 | 22.25 | 22.17 | 21.82 | 21.57 |
|                    | 25 (RB_Pos:0)  | 21.79       | 21.71 | 21.17 | 20.82 | 20.76 | 20.25 |
|                    | 25 (RB_Pos:12) | 21.75       | 21.65 | 21.19 | 20.76 | 20.70 | 20.34 |
|                    | 25 (RB_Pos:24) | 21.75       | 21.61 | 21.27 | 20.73 | 20.71 | 20.38 |
|                    | 50 (RB_Pos:0)  | 21.69       | 21.57 | 21.28 | 20.69 | 20.67 | 20.26 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 18625       | 18900 | 19175 | 18625 | 18900 | 19175 |
| 5MHz               | 1 (RB_Pos:0)   | 22.76       | 22.71 | 22.23 | 22.13 | 21.86 | 21.44 |
|                    | 1 (RB_Pos:12)  | 22.63       | 22.57 | 22.19 | 22.07 | 21.73 | 21.42 |
|                    | 1 (RB_Pos:24)  | 22.61       | 22.58 | 22.25 | 21.95 | 21.75 | 21.47 |
|                    | 12 (RB_Pos:0)  | 21.69       | 21.56 | 21.19 | 20.77 | 20.69 | 20.23 |
|                    | 12 (RB_Pos:6)  | 21.62       | 21.53 | 21.18 | 20.70 | 20.65 | 20.22 |
|                    | 12 (RB_Pos:11) | 21.57       | 21.55 | 21.21 | 20.63 | 20.66 | 20.25 |
|                    | 25 (RB_Pos:0)  | 21.63       | 21.55 | 21.15 | 20.66 | 20.63 | 20.14 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 18615       | 18900 | 19185 | 18615 | 18900 | 19185 |

|                    |               |             |       |       |       |       |       |
|--------------------|---------------|-------------|-------|-------|-------|-------|-------|
| 3MHz               | 1 (RB_Pos:0)  | 22.87       | 22.77 | 22.15 | 21.78 | 22.01 | 21.43 |
|                    | 1 (RB_Pos:7)  | 22.81       | 22.73 | 22.20 | 21.76 | 21.99 | 21.46 |
|                    | 1 (RB_Pos:14) | 22.81       | 22.72 | 22.20 | 22.07 | 21.98 | 21.33 |
|                    | 8 (RB_Pos:0)  | 21.77       | 21.64 | 21.22 | 20.88 | 20.76 | 20.28 |
|                    | 8 (RB_Pos:4)  | 21.64       | 21.59 | 21.14 | 20.81 | 20.68 | 20.25 |
|                    | 8 (RB_Pos:7)  | 21.65       | 21.61 | 21.16 | 20.82 | 20.71 | 20.26 |
|                    | 15 (RB_Pos:0) | 21.68       | 21.59 | 21.18 | 20.79 | 20.60 | 20.18 |
| Bandwidth<br>(MHz) | RB Set        | Power (dBm) |       |       |       |       |       |
|                    |               | QPSK        |       |       | 16QAM |       |       |
|                    | Channel       | 18607       | 18900 | 19193 | 18607 | 18900 | 19193 |
| 1.4MHz             | 1 (RB_Pos:0)  | 22.91       | 22.88 | 22.30 | 22.13 | 22.04 | 21.33 |
|                    | 1 (RB_Pos: 2) | 22.84       | 22.61 | 22.16 | 22.12 | 21.95 | 21.30 |
|                    | 1 (RB_Pos:5)  | 22.93       | 22.68 | 22.23 | 22.08 | 22.12 | 21.22 |
|                    | 3 (RB_Pos:0)  | 22.77       | 22.73 | 22.19 | 21.94 | 21.71 | 21.26 |
|                    | 3 (RB_Pos:1)  | 22.73       | 22.65 | 22.24 | 21.95 | 21.64 | 21.28 |
|                    | 3 (RB_Pos:2)  | 22.76       | 22.67 | 22.19 | 21.77 | 21.74 | 21.29 |
|                    | 6 (RB_Pos:0)  | 21.74       | 21.56 | 21.17 | 20.87 | 20.70 | 20.34 |

| FDD LTE Band 4     |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20050       | 20175 | 20300 | 20050 | 20175 | 20300 |
| 20MHz              | 1 (RB_Pos:0)   | 22.91       | 22.98 | 22.68 | 22.29 | 22.26 | 22.19 |
|                    | 1 (RB_Pos:49)  | 23.06       | 22.74 | 22.69 | 22.48 | 22.01 | 22.23 |
|                    | 1 (RB_Pos:99)  | 22.92       | 22.72 | 23.07 | 22.37 | 21.94 | 22.53 |
|                    | 50 (RB_Pos:0)  | 21.96       | 21.82 | 21.69 | 20.91 | 20.84 | 20.68 |
|                    | 50 (RB_Pos:24) | 21.94       | 21.77 | 21.78 | 20.88 | 20.76 | 20.81 |
|                    | 50 (RB_Pos:49) | 21.84       | 21.68 | 21.98 | 20.83 | 20.64 | 20.96 |
|                    | 100 (RB_Pos:0) | 22.08       | 21.82 | 21.98 | 21.00 | 20.85 | 20.98 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20025       | 20175 | 20325 | 20025 | 20175 | 20325 |
| 15MHz              | 1 (RB_Pos:0)   | 22.94       | 23.01 | 22.80 | 22.36 | 22.18 | 22.10 |
|                    | 1 (RB_Pos:37)  | 23.06       | 22.89 | 22.90 | 22.53 | 22.02 | 22.26 |
|                    | 1 (RB_Pos:74)  | 23.01       | 22.77 | 23.13 | 22.48 | 21.95 | 22.48 |
|                    | 36 (RB_Pos:0)  | 21.86       | 21.81 | 21.73 | 20.89 | 20.88 | 20.77 |
|                    | 36 (RB_Pos:18) | 21.95       | 21.76 | 21.84 | 21.00 | 20.81 | 20.92 |
|                    | 36 (RB_Pos:37) | 21.91       | 21.64 | 21.94 | 20.96 | 20.68 | 21.04 |
|                    | 75 (RB_Pos:0)  | 21.94       | 21.80 | 21.90 | 20.94 | 20.78 | 20.93 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20000       | 20175 | 20350 | 20000 | 20175 | 20350 |
| 10MHz              | 1 (RB_Pos:0)   | 22.63       | 23.04 | 22.92 | 21.87 | 22.22 | 21.95 |
|                    | 1 (RB_Pos:24)  | 22.83       | 22.93 | 23.13 | 22.07 | 22.13 | 22.11 |
|                    | 1 (RB_Pos:49)  | 22.83       | 22.86 | 23.29 | 22.16 | 22.04 | 22.22 |

|                    |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
|                    | 25 (RB_Pos:0)  | 21.76       | 21.88 | 21.94 | 20.83 | 20.98 | 20.96 |
|                    | 25 (RB_Pos:12) | 21.88       | 21.80 | 22.02 | 20.92 | 20.92 | 21.10 |
|                    | 25 (RB_Pos:24) | 21.88       | 21.74 | 22.09 | 20.95 | 20.86 | 21.20 |
|                    | 50 (RB_Pos:0)  | 21.88       | 21.78 | 21.94 | 20.92 | 20.81 | 21.01 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 19975       | 20175 | 20375 | 19975 | 20175 | 20375 |
| 5MHz               | 1 (RB_Pos:0)   | 22.71       | 22.85 | 23.02 | 21.82 | 22.33 | 22.40 |
|                    | 1 (RB_Pos:12)  | 22.78       | 22.69 | 23.03 | 21.87 | 22.18 | 22.46 |
|                    | 1 (RB_Pos:24)  | 22.81       | 22.68 | 23.10 | 21.98 | 22.17 | 22.45 |
|                    | 12 (RB_Pos:0)  | 21.57       | 21.81 | 21.94 | 20.61 | 21.00 | 21.03 |
|                    | 12 (RB_Pos:6)  | 21.64       | 21.76 | 22.00 | 20.68 | 20.92 | 21.12 |
|                    | 12 (RB_Pos:11) | 21.68       | 21.73 | 21.99 | 20.72 | 20.92 | 21.11 |
|                    | 25 (RB_Pos:0)  | 21.65       | 21.75 | 22.10 | 20.70 | 20.84 | 21.15 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 19965       | 20175 | 20385 | 19965 | 20175 | 20385 |
| 3.0MHz             | 1 (RB_Pos:0)   | 22.58       | 22.76 | 23.02 | 21.97 | 22.55 | 22.32 |
|                    | 1 (RB_Pos:7)   | 22.56       | 22.71 | 23.07 | 22.01 | 22.06 | 22.34 |
|                    | 1 (RB_Pos:14)  | 22.64       | 22.66 | 23.04 | 22.04 | 22.45 | 22.23 |
|                    | 8 (RB_Pos:0)   | 21.61       | 21.79 | 22.09 | 20.65 | 20.91 | 21.18 |
|                    | 8 (RB_Pos:4)   | 21.62       | 21.77 | 22.06 | 20.65 | 20.78 | 21.12 |
|                    | 8 (RB_Pos:7)   | 21.70       | 21.72 | 22.09 | 20.71 | 20.86 | 21.14 |
|                    | 15 (RB_Pos:0)  | 21.61       | 21.71 | 22.04 | 20.64 | 20.77 | 21.13 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 19957       | 20175 | 20393 | 19957 | 20175 | 20393 |
| 1.4MHz             | 1 (RB_Pos:0)   | 22.69       | 23.01 | 23.15 | 21.85 | 22.05 | 22.44 |
|                    | 1 (RB_Pos:2)   | 22.55       | 22.96 | 23.15 | 21.99 | 22.00 | 22.29 |
|                    | 1 (RB_Pos:5)   | 22.62       | 22.95 | 23.12 | 22.03 | 22.04 | 22.50 |
|                    | 3 (RB_Pos:0)   | 22.65       | 22.81 | 23.12 | 21.77 | 21.94 | 22.12 |
|                    | 3 (RB_Pos:1)   | 22.64       | 22.76 | 23.07 | 21.53 | 21.86 | 22.13 |
|                    | 3 (RB_Pos:2)   | 22.66       | 22.81 | 23.10 | 21.78 | 21.83 | 22.24 |
|                    | 6 (RB_Pos:0)   | 21.62       | 21.75 | 22.09 | 20.64 | 20.86 | 21.16 |

| FDD LTE Band 5     |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20450       | 20525 | 20600 | 20450 | 20525 | 20600 |
| 10 MHz             | 1 (RB_Pos:0)   | 22.67       | 22.69 | 22.72 | 21.80 | 21.98 | 22.10 |
|                    | 1 (RB_Pos:25)  | 22.65       | 22.65 | 22.69 | 21.71 | 22.00 | 22.00 |
|                    | 1 (RB_Pos:49)  | 22.76       | 22.64 | 22.79 | 21.85 | 21.98 | 22.21 |
|                    | 25 (RB_Pos:0)  | 21.44       | 21.58 | 21.63 | 20.52 | 20.69 | 20.75 |
|                    | 25 (RB_Pos:12) | 21.54       | 21.66 | 21.66 | 20.61 | 20.77 | 20.82 |
|                    | 25 (RB_Pos:25) | 21.65       | 21.66 | 21.68 | 20.71 | 20.75 | 20.81 |
|                    | 50 (RB_Pos:0)  | 21.72       | 21.67 | 21.72 | 20.71 | 20.77 | 20.76 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20425       | 20525 | 20625 | 20425 | 20525 | 20625 |
| 5MHz               | 1 (RB_Pos:0)   | 22.54       | 22.69 | 22.71 | 21.86 | 22.01 | 21.98 |
|                    | 1 (RB_Pos:13)  | 22.41       | 22.68 | 22.66 | 21.70 | 22.07 | 21.91 |
|                    | 1 (RB_Pos:24)  | 22.51       | 22.63 | 22.81 | 21.81 | 22.05 | 22.13 |
|                    | 12 (RB_Pos:0)  | 21.42       | 21.55 | 21.53 | 20.43 | 20.71 | 20.75 |
|                    | 12 (RB_Pos:6)  | 21.39       | 21.58 | 21.51 | 20.43 | 20.71 | 20.74 |
|                    | 12 (RB_Pos:13) | 21.49       | 21.55 | 21.57 | 20.48 | 20.67 | 20.81 |
|                    | 25 (RB_Pos:0)  | 21.48       | 21.60 | 21.70 | 20.45 | 20.66 | 20.76 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20415       | 20525 | 20635 | 20415 | 20525 | 20635 |
| 3.0 MHz            | 1 (RB_Pos:0)   | 22.46       | 22.57 | 22.44 | 21.94 | 21.98 | 21.75 |
|                    | 1 (RB_Pos:8)   | 22.36       | 22.63 | 22.81 | 21.80 | 21.91 | 21.86 |
|                    | 1 (RB_Pos:14)  | 22.37       | 22.59 | 22.64 | 21.83 | 21.99 | 21.90 |
|                    | 8 (RB_Pos:0)   | 21.45       | 21.55 | 21.54 | 20.42 | 20.62 | 20.59 |
|                    | 8 (RB_Pos:3)   | 21.33       | 21.59 | 21.56 | 20.34 | 20.66 | 20.91 |
|                    | 8 (RB_Pos:7)   | 21.37       | 21.54 | 21.60 | 20.38 | 20.59 | 20.68 |
|                    | 15 (RB_Pos:0)  | 21.31       | 21.57 | 21.79 | 20.32 | 20.57 | 20.78 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20407       | 20525 | 20643 | 20407 | 20525 | 20643 |
| 1.4MHz             | 1 (RB_Pos:0)   | 22.81       | 22.99 | 22.86 | 21.98 | 22.01 | 21.97 |
|                    | 1 (RB_Pos:3)   | 22.71       | 22.96 | 22.86 | 22.03 | 21.97 | 21.96 |
|                    | 1 (RB_Pos:5)   | 22.67       | 22.96 | 22.88 | 21.99 | 22.03 | 22.04 |
|                    | 3 (RB_Pos:0)   | 22.77       | 22.71 | 22.66 | 21.73 | 22.03 | 21.77 |
|                    | 3 (RB_Pos:1)   | 22.67       | 22.65 | 22.67 | 21.69 | 22.01 | 22.04 |
|                    | 3 (RB_Pos:3)   | 22.68       | 22.68 | 22.70 | 21.75 | 22.04 | 21.82 |
|                    | 6 (RB_Pos:0)   | 21.66       | 21.70 | 21.71 | 20.79 | 20.74 | 21.10 |

| FDD LTE Band 7     |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20850       | 21100 | 21350 | 20850 | 21100 | 21350 |
| 20MHz              | 1 (RB_Pos:0)   | 23.36       | 22.43 | 22.37 | 22.00 | 21.66 | 21.68 |
|                    | 1 (RB_Pos:49)  | 22.65       | 22.31 | 22.49 | 21.83 | 21.57 | 21.84 |
|                    | 1 (RB_Pos:99)  | 22.70       | 22.27 | 22.22 | 21.93 | 21.61 | 21.62 |
|                    | 50 (RB_Pos:0)  | 21.76       | 21.43 | 21.46 | 20.71 | 20.43 | 20.45 |
|                    | 50 (RB_Pos:24) | 21.63       | 21.28 | 21.60 | 20.66 | 20.34 | 20.58 |
|                    | 50 (RB_Pos:49) | 21.63       | 21.28 | 21.48 | 20.59 | 20.37 | 20.47 |
|                    | 100 (RB_Pos:0) | 21.79       | 21.47 | 21.73 | 20.78 | 20.48 | 20.76 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20825       | 21100 | 21375 | 20825 | 21100 | 21375 |
| 15MHz              | 1 (RB_Pos:0)   | 22.53       | 22.32 | 22.35 | 21.95 | 21.51 | 21.48 |
|                    | 1 (RB_Pos:37)  | 22.57       | 22.20 | 22.42 | 21.97 | 21.44 | 21.54 |
|                    | 1 (RB_Pos:74)  | 22.48       | 22.15 | 22.11 | 21.90 | 21.43 | 21.25 |
|                    | 36 (RB_Pos:0)  | 21.64       | 21.40 | 21.52 | 20.71 | 20.40 | 20.57 |
|                    | 36 (RB_Pos:18) | 21.65       | 21.34 | 21.50 | 20.63 | 20.35 | 20.55 |
|                    | 36 (RB_Pos:37) | 21.63       | 21.32 | 21.38 | 20.61 | 20.35 | 20.44 |
|                    | 75 (RB_Pos:0)  | 21.68       | 21.34 | 21.56 | 20.63 | 20.41 | 20.56 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20800       | 21100 | 21400 | 20800 | 21100 | 21400 |
| 10MHz              | 1 (RB_Pos:0)   | 22.52       | 22.38 | 22.53 | 21.98 | 21.55 | 21.66 |
|                    | 1 (RB_Pos:24)  | 22.54       | 22.30 | 22.46 | 21.99 | 21.48 | 21.58 |
|                    | 1 (RB_Pos:49)  | 22.62       | 22.27 | 22.31 | 22.08 | 21.52 | 21.41 |
|                    | 25 (RB_Pos:0)  | 21.71       | 21.37 | 21.54 | 20.69 | 20.37 | 20.64 |
|                    | 25 (RB_Pos:12) | 21.70       | 21.37 | 21.45 | 20.69 | 20.38 | 20.55 |
|                    | 25 (RB_Pos:24) | 21.67       | 21.30 | 21.42 | 20.71 | 20.38 | 20.52 |
|                    | 50 (RB_Pos:0)  | 21.67       | 21.31 | 21.52 | 20.71 | 20.43 | 20.49 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 20775       | 21100 | 21425 | 20775 | 21100 | 21425 |
| 5MHz               | 1 (RB_Pos:0)   | 22.62       | 22.32 | 22.44 | 21.87 | 21.25 | 21.67 |
|                    | 1 (RB_Pos:12)  | 22.58       | 22.23 | 22.36 | 21.77 | 21.31 | 21.51 |
|                    | 1 (RB_Pos:24)  | 22.63       | 22.27 | 22.22 | 21.90 | 21.34 | 21.46 |
|                    | 12 (RB_Pos:0)  | 21.63       | 21.25 | 21.42 | 20.67 | 20.24 | 20.47 |
|                    | 12 (RB_Pos:6)  | 21.62       | 21.29 | 21.33 | 20.72 | 20.29 | 20.43 |
|                    | 12 (RB_Pos:11) | 21.63       | 21.29 | 21.26 | 20.66 | 20.30 | 20.36 |
|                    | 25 (RB_Pos:0)  | 21.67       | 21.31 | 21.40 | 20.69 | 20.39 | 20.46 |

| FDD LTE Band 12    |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23060       | 23095 | 23130 | 23060 | 23095 | 23130 |
| 10MHz              | 1 (RB_Pos:0)   | 22.58       | 22.81 | 22.69 | 21.93 | 22.17 | 22.26 |
|                    | 1 (RB_Pos:25)  | 22.76       | 22.73 | 22.53 | 22.15 | 22.09 | 22.14 |
|                    | 1 (RB_Pos:49)  | 22.64       | 22.60 | 22.67 | 22.04 | 21.93 | 22.30 |
|                    | 25 (RB_Pos:0)  | 21.84       | 21.76 | 21.64 | 20.82 | 20.87 | 20.72 |
|                    | 25 (RB_Pos:12) | 21.81       | 21.77 | 21.62 | 20.87 | 20.82 | 20.76 |
|                    | 25 (RB_Pos:25) | 21.72       | 21.77 | 21.56 | 20.86 | 20.70 | 20.73 |
|                    | 50 (RB_Pos:0)  | 21.75       | 21.77 | 21.66 | 20.88 | 20.81 | 20.94 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23035       | 23095 | 23155 | 23035 | 23095 | 23155 |
| 5MHz               | 1 (RB_Pos:0)   | 22.69       | 22.70 | 22.56 | 21.96 | 22.24 | 21.92 |
|                    | 1 (RB_Pos:13)  | 22.74       | 22.58 | 22.57 | 22.09 | 22.14 | 22.00 |
|                    | 1 (RB_Pos:24)  | 22.80       | 22.59 | 22.63 | 22.23 | 22.12 | 22.06 |
|                    | 12 (RB_Pos:0)  | 21.49       | 21.63 | 21.47 | 20.44 | 20.74 | 20.54 |
|                    | 12 (RB_Pos:6)  | 21.60       | 21.63 | 21.50 | 20.65 | 20.74 | 20.63 |
|                    | 12 (RB_Pos:13) | 21.71       | 21.56 | 21.58 | 20.80 | 20.67 | 20.69 |
|                    | 25 (RB_Pos:0)  | 21.67       | 21.66 | 21.50 | 20.70 | 20.75 | 20.64 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23025       | 23095 | 23165 | 23025 | 23095 | 23165 |
| 3.0MHz             | 1 (RB_Pos:0)   | 22.52       | 22.77 | 22.52 | 22.18 | 21.90 | 21.90 |
|                    | 1 (RB_Pos:8)   | 22.61       | 22.70 | 22.55 | 22.28 | 21.91 | 21.74 |
|                    | 1 (RB_Pos:14)  | 22.64       | 22.68 | 22.47 | 22.37 | 21.81 | 21.91 |
|                    | 8 (RB_Pos:0)   | 21.51       | 21.68 | 21.52 | 20.44 | 20.72 | 20.55 |
|                    | 8 (RB_Pos:3)   | 21.53       | 21.65 | 21.61 | 20.47 | 20.68 | 20.59 |
|                    | 8 (RB_Pos:7)   | 21.61       | 21.59 | 21.56 | 20.57 | 20.63 | 20.69 |
|                    | 15 (RB_Pos:0)  | 21.52       | 21.68 | 21.69 | 20.66 | 20.73 | 20.57 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23017       | 23095 | 23173 | 23017 | 23095 | 23173 |
| 1.4MHz             | 1 (RB_Pos:0)   | 22.91       | 22.89 | 22.79 | 22.03 | 21.77 | 21.92 |
|                    | 1 (RB_Pos:3)   | 22.85       | 22.79 | 22.78 | 22.06 | 21.72 | 21.90 |
|                    | 1 (RB_Pos:5)   | 22.86       | 22.83 | 22.62 | 22.02 | 22.03 | 22.12 |
|                    | 3 (RB_Pos:0)   | 22.71       | 22.82 | 22.67 | 21.80 | 21.89 | 21.72 |
|                    | 3 (RB_Pos:1)   | 22.71       | 22.73 | 22.68 | 21.86 | 21.85 | 21.72 |
|                    | 3 (RB_Pos:3)   | 22.70       | 22.81 | 22.63 | 21.76 | 21.86 | 21.69 |
|                    | 6 (RB_Pos:0)   | 21.73       | 21.80 | 21.62 | 20.77 | 20.82 | 20.83 |

| FDD LTE Band 13    |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23230       |       |       | 23230 |       |       |
| 10MHz              | 1 (RB_Pos:0)   | 22.86       |       |       | 22.31 |       |       |
|                    | 1 (RB_Pos:25)  | 22.79       |       |       | 22.39 |       |       |
|                    | 1 (RB_Pos:49)  | 22.67       |       |       | 22.38 |       |       |
|                    | 25 (RB_Pos:0)  | 21.97       |       |       | 21.14 |       |       |
|                    | 25 (RB_Pos:12) | 21.79       |       |       | 20.99 |       |       |
|                    | 25 (RB_Pos:25) | 21.75       |       |       | 20.89 |       |       |
|                    | 50 (RB_Pos:0)  | 21.86       |       |       | 20.87 |       |       |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23205       | 23230 | 23255 | 23205 | 23230 | 23255 |
| 5MHz               | 1 (RB_Pos:0)   | 22.76       | 23.06 | 22.83 | 21.87 | 22.30 | 22.32 |
|                    | 1 (RB_Pos:13)  | 22.99       | 22.83 | 22.66 | 22.21 | 22.08 | 22.16 |
|                    | 1 (RB_Pos:24)  | 22.80       | 22.70 | 22.77 | 22.06 | 22.06 | 22.26 |
|                    | 12 (RB_Pos:0)  | 21.88       | 21.73 | 21.68 | 20.94 | 20.76 | 20.78 |
|                    | 12 (RB_Pos:6)  | 21.86       | 21.67 | 21.57 | 20.89 | 20.70 | 20.61 |
|                    | 12 (RB_Pos:13) | 21.78       | 21.75 | 21.62 | 20.76 | 20.81 | 20.70 |
|                    | 25 (RB_Pos:0)  | 21.89       | 21.72 | 21.63 | 20.98 | 20.82 | 20.72 |

| FDD LTE Band 17    |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23780       | 23790 | 23800 | 23780 | 23790 | 23800 |
| 10MHz              | 1 (RB_Pos:0)   | 22.86       | 22.80 | 22.71 | 22.23 | 22.26 | 21.84 |
|                    | 1 (RB_Pos:25)  | 22.76       | 22.62 | 22.53 | 22.07 | 22.07 | 21.62 |
|                    | 1 (RB_Pos:49)  | 22.66       | 22.67 | 22.72 | 22.12 | 22.27 | 21.84 |
|                    | 25 (RB_Pos:0)  | 21.91       | 21.78 | 21.64 | 20.87 | 20.85 | 20.79 |
|                    | 25 (RB_Pos:12) | 21.80       | 21.70 | 21.56 | 20.88 | 20.78 | 20.79 |
|                    | 25 (RB_Pos:25) | 21.74       | 21.61 | 21.62 | 20.86 | 20.67 | 20.71 |
|                    | 50 (RB_Pos:0)  | 21.68       | 21.74 | 21.64 | 20.80 | 20.64 | 20.70 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 23755       | 23790 | 23825 | 23755 | 23790 | 23825 |
| 5MHz               | 1 (RB_Pos:0)   | 22.87       | 22.68 | 22.57 | 22.23 | 22.07 | 21.68 |
|                    | 1 (RB_Pos:13)  | 22.77       | 22.54 | 22.62 | 22.11 | 21.95 | 21.76 |
|                    | 1 (RB_Pos:24)  | 22.68       | 22.49 | 22.69 | 22.04 | 21.92 | 21.82 |
|                    | 12 (RB_Pos:0)  | 21.84       | 21.49 | 21.45 | 20.92 | 20.74 | 20.46 |
|                    | 12 (RB_Pos:6)  | 21.77       | 21.43 | 21.61 | 20.85 | 20.69 | 20.61 |
|                    | 12 (RB_Pos:13) | 21.76       | 21.42 | 21.63 | 20.80 | 20.70 | 20.77 |
|                    | 25 (RB_Pos:0)  | 21.74       | 21.61 | 21.58 | 20.80 | 20.65 | 20.64 |

| FDD LTE Band 26    |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 26765       | 26865 | 26965 | 26765 | 26865 | 26965 |
| 15MHz              | 1 (RB_Pos:0)   | 22.06       | 22.27 | 22.33 | 21.58 | 21.80 | 21.53 |
|                    | 1 (RB_Pos:37)  | 22.32       | 22.38 | 22.31 | 21.87 | 21.88 | 21.52 |
|                    | 1 (RB_Pos:74)  | 22.21       | 22.35 | 22.39 | 21.73 | 21.99 | 21.61 |
|                    | 36 (RB_Pos:0)  | 21.35       | 21.28 | 21.30 | 20.39 | 20.38 | 20.40 |
|                    | 36 (RB_Pos:18) | 21.32       | 21.36 | 21.26 | 20.41 | 20.53 | 20.38 |
|                    | 36 (RB_Pos:37) | 21.14       | 21.31 | 21.26 | 20.21 | 20.50 | 20.41 |
|                    | 75 (RB_Pos:0)  | 21.43       | 21.51 | 21.22 | 20.50 | 20.56 | 20.45 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 26740       | 26865 | 26990 | 26740 | 26865 | 26990 |
| 10MHz              | 1 (RB_Pos:0)   | 22.09       | 22.36 | 22.48 | 21.62 | 21.79 | 21.67 |
|                    | 1 (RB_Pos:24)  | 22.37       | 22.45 | 22.41 | 21.89 | 21.91 | 21.63 |
|                    | 1 (RB_Pos:49)  | 22.37       | 22.52 | 22.54 | 21.86 | 22.01 | 21.83 |
|                    | 25 (RB_Pos:0)  | 21.44       | 21.40 | 21.32 | 20.42 | 20.52 | 20.45 |
|                    | 25 (RB_Pos:12) | 21.49       | 21.51 | 21.32 | 20.47 | 20.61 | 20.41 |
|                    | 25 (RB_Pos:24) | 21.49       | 21.52 | 21.45 | 20.47 | 20.61 | 20.49 |
|                    | 50 (RB_Pos:0)  | 21.46       | 21.51 | 21.42 | 20.54 | 20.56 | 20.40 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 26715       | 26865 | 27015 | 26715 | 26865 | 27015 |
| 5MHz               | 1 (RB_Pos:0)   | 22.17       | 22.38 | 22.37 | 21.62 | 21.79 | 21.84 |
|                    | 1 (RB_Pos:12)  | 22.33       | 22.45 | 22.34 | 21.80 | 21.90 | 21.87 |
|                    | 1 (RB_Pos:24)  | 22.48       | 22.54 | 22.55 | 21.88 | 22.04 | 22.11 |
|                    | 12 (RB_Pos:0)  | 21.23       | 21.33 | 21.39 | 20.20 | 20.35 | 20.29 |
|                    | 12 (RB_Pos:6)  | 21.37       | 21.39 | 21.43 | 20.37 | 20.41 | 20.33 |
|                    | 12 (RB_Pos:11) | 21.38       | 21.41 | 21.48 | 20.43 | 20.44 | 20.41 |
|                    | 25 (RB_Pos:0)  | 21.36       | 21.47 | 21.54 | 20.41 | 20.42 | 20.56 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 26705       | 26865 | 27025 | 26705 | 26865 | 27025 |
| 3.0MHz             | 1 (RB_Pos:0)   | 22.17       | 22.42 | 22.37 | 21.70 | 21.50 | 21.75 |
|                    | 1 (RB_Pos:7)   | 22.17       | 22.51 | 22.50 | 21.85 | 21.60 | 21.91 |
|                    | 1 (RB_Pos:14)  | 22.40       | 22.43 | 22.55 | 21.91 | 21.94 | 21.67 |
|                    | 8 (RB_Pos:0)   | 21.19       | 21.28 | 21.28 | 20.23 | 20.41 | 20.44 |
|                    | 8 (RB_Pos:4)   | 21.26       | 21.34 | 21.33 | 20.30 | 20.48 | 20.50 |
|                    | 8 (RB_Pos:7)   | 21.33       | 21.44 | 21.40 | 20.40 | 20.49 | 20.64 |
|                    | 15 (RB_Pos:0)  | 21.14       | 21.42 | 21.43 | 20.21 | 20.49 | 20.47 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 26697       | 26865 | 27033 | 26697 | 26865 | 27033 |
| 1.4MHz             | 1 (RB_Pos:0)   | 22.38       | 22.53 | 22.57 | 21.42 | 21.49 | 21.82 |

|  |              |       |       |       |       |       |       |
|--|--------------|-------|-------|-------|-------|-------|-------|
|  | 1 (RB_Pos:2) | 22.29 | 22.54 | 22.57 | 21.53 | 21.96 | 21.78 |
|  | 1 (RB_Pos:5) | 22.38 | 22.54 | 22.64 | 21.48 | 21.55 | 21.90 |
|  | 3 (RB_Pos:0) | 22.15 | 22.34 | 22.44 | 21.07 | 21.67 | 21.47 |
|  | 3 (RB_Pos:1) | 22.15 | 22.36 | 22.46 | 21.23 | 21.62 | 21.47 |
|  | 3 (RB_Pos:2) | 22.17 | 22.39 | 22.47 | 21.15 | 21.68 | 21.71 |
|  | 6 (RB_Pos:0) | 21.13 | 21.43 | 21.36 | 20.29 | 20.31 | 20.54 |

| FDD LTE Band 30    |                |             |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 27710       |       |       | 27710 |       |       |
| 10MHz              | 1 (RB_Pos:0)   | 22.43       |       |       | 21.76 |       |       |
|                    | 1 (RB_Pos:25)  | 22.41       |       |       | 21.76 |       |       |
|                    | 1 (RB_Pos:49)  | 22.41       |       |       | 21.73 |       |       |
|                    | 25 (RB_Pos:0)  | 21.41       |       |       | 20.48 |       |       |
|                    | 25 (RB_Pos:12) | 21.49       |       |       | 20.54 |       |       |
|                    | 25 (RB_Pos:25) | 21.43       |       |       | 20.47 |       |       |
|                    | 50 (RB_Pos:0)  | 21.60       |       |       | 20.57 |       |       |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |
|                    |                | QPSK        |       |       | 16QAM |       |       |
|                    | Channel        | 27685       | 27710 | 27735 | 27685 | 27710 | 27735 |
| 5MHz               | 1 (RB_Pos:0)   | 22.56       | 22.42 | 22.41 | 21.63 | 21.60 | 21.64 |
|                    | 1 (RB_Pos:13)  | 22.43       | 22.37 | 22.25 | 21.57 | 21.60 | 21.53 |
|                    | 1 (RB_Pos:24)  | 22.48       | 22.35 | 22.33 | 21.57 | 21.50 | 21.64 |
|                    | 12 (RB_Pos:0)  | 21.45       | 21.2  | 21.21 | 20.28 | 20.19 | 20.30 |
|                    | 12 (RB_Pos:6)  | 21.39       | 21.31 | 21.09 | 20.30 | 20.31 | 20.21 |
|                    | 12 (RB_Pos:13) | 21.44       | 21.38 | 21.22 | 20.33 | 20.33 | 20.28 |
|                    | 25 (RB_Pos:0)  | 21.33       | 21.38 | 21.23 | 20.39 | 20.37 | 20.25 |

| FDD LTE Band 41    |                |             |       |       |       |       |       |       |       |       |       |
|--------------------|----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |       |       |       |       |
|                    |                | QPSK        |       |       |       |       | 16QAM |       |       |       |       |
|                    | Channel        | 39750       | 40185 | 40620 | 41055 | 41490 | 39750 | 40185 | 40620 | 41055 | 41490 |
| 20MHz              | 1 (RB_Pos:0)   | 22.68       | 22.46 | 22.46 | 22.26 | 22.05 | 22.18 | 22.17 | 21.71 | 21.62 | 21.31 |
|                    | 1 (RB_Pos:50)  | 22.74       | 22.48 | 22.30 | 22.30 | 21.97 | 22.28 | 22.19 | 21.55 | 21.62 | 21.23 |
|                    | 1 (RB_Pos:99)  | 22.68       | 22.53 | 22.06 | 22.26 | 21.96 | 22.30 | 22.24 | 21.38 | 21.56 | 21.24 |
|                    | 50 (RB_Pos:0)  | 21.58       | 21.26 | 21.28 | 21.15 | 21.03 | 20.64 | 20.31 | 20.33 | 20.23 | 20.03 |
|                    | 50 (RB_Pos:25) | 21.58       | 21.30 | 21.18 | 21.19 | 20.96 | 20.62 | 20.37 | 20.26 | 20.29 | 19.95 |
|                    | 50 (RB_Pos:50) | 21.50       | 21.34 | 21.12 | 21.13 | 20.95 | 20.60 | 20.40 | 20.18 | 20.27 | 19.95 |
|                    | 100 (RB_Pos:0) | 21.55       | 21.32 | 21.16 | 21.17 | 20.99 | 20.62 | 20.38 | 20.26 | 20.20 | 20.06 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |       |       |       |       |
|                    |                | QPSK        |       |       |       |       | 16QAM |       |       |       |       |
|                    | Channel        | 39725       | 40160 | 40620 | 41080 | 41515 | 39725 | 40160 | 40620 | 41080 | 41515 |
| 15MHz              | 1 (RB_Pos:0)   | 22.28       | 22.25 | 22.33 | 22.14 | 22.23 | 21.64 | 21.41 | 21.87 | 21.74 | 21.44 |
|                    | 1 (RB_Pos:38)  | 22.39       | 22.25 | 22.16 | 22.14 | 22.17 | 21.74 | 21.41 | 21.76 | 21.81 | 21.37 |
|                    | 1 (RB_Pos:74)  | 22.39       | 22.26 | 21.99 | 22.04 | 22.03 | 21.73 | 21.45 | 21.59 | 21.72 | 21.26 |
|                    | 36 (RB_Pos:0)  | 21.58       | 21.36 | 21.31 | 21.22 | 21.04 | 20.69 | 20.36 | 20.47 | 20.35 | 20.19 |
|                    | 36 (RB_Pos:20) | 21.60       | 21.38 | 21.25 | 21.21 | 21.00 | 20.71 | 20.36 | 20.41 | 20.39 | 20.16 |
|                    | 36 (RB_Pos:39) | 21.63       | 21.37 | 21.16 | 21.19 | 20.97 | 20.68 | 20.41 | 20.33 | 20.35 | 20.15 |
|                    | 75 (RB_Pos:0)  | 21.58       | 21.32 | 21.23 | 21.18 | 21.09 | 20.56 | 20.37 | 20.31 | 20.25 | 19.95 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |       |       |       |       |
|                    |                | QPSK        |       |       |       |       | 16QAM |       |       |       |       |
|                    | Channel        | 39700       | 40135 | 40620 | 41105 | 41540 | 39700 | 40135 | 40620 | 41105 | 41540 |
| 10MHz              | 1 (RB_Pos:0)   | 22.56       | 22.43 | 22.32 | 22.32 | 21.92 | 21.52 | 21.97 | 22.01 | 21.88 | 21.60 |
|                    | 1 (RB_Pos:25)  | 22.65       | 22.35 | 22.16 | 22.27 | 21.87 | 21.57 | 21.95 | 21.93 | 21.83 | 21.54 |
|                    | 1 (RB_Pos:49)  | 22.72       | 22.41 | 22.12 | 22.16 | 21.80 | 21.64 | 21.93 | 21.92 | 21.79 | 21.47 |
|                    | 25 (RB_Pos:0)  | 21.55       | 21.53 | 21.35 | 21.37 | 21.08 | 20.58 | 20.53 | 20.49 | 20.42 | 20.26 |
|                    | 25 (RB_Pos:12) | 21.59       | 21.52 | 21.26 | 21.35 | 21.06 | 20.58 | 20.52 | 20.41 | 20.37 | 20.24 |
|                    | 25 (RB_Pos:25) | 21.55       | 21.49 | 21.21 | 21.32 | 21.06 | 20.55 | 20.53 | 20.35 | 20.33 | 20.23 |
|                    | 50 (RB_Pos:0)  | 21.53       | 21.47 | 21.24 | 21.25 | 21.02 | 20.58 | 20.52 | 20.33 | 20.40 | 20.05 |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |       |       |       |       |       |       |       |       |       |
|                    |                | QPSK        |       |       |       |       | 16QAM |       |       |       |       |
|                    | Channel        | 39675       | 40110 | 40620 | 41130 | 41565 | 39675 | 40110 | 40620 | 41130 | 41565 |
| 5MHz               | 1 (RB_Pos:0)   | 22.50       | 22.59 | 22.48 | 22.64 | 22.13 | 22.01 | 22.22 | 22.08 | 21.55 | 21.47 |
|                    | 1 (RB_Pos:13)  | 22.50       | 22.60 | 22.44 | 22.59 | 22.07 | 22.01 | 22.23 | 22.02 | 21.50 | 21.41 |
|                    | 1 (RB_Pos:24)  | 22.55       | 22.67 | 22.37 | 22.59 | 22.00 | 22.11 | 22.28 | 22.01 | 21.46 | 21.38 |
|                    | 12 (RB_Pos:0)  | 21.47       | 21.65 | 21.28 | 21.48 | 21.02 | 20.54 | 20.73 | 20.38 | 20.49 | 20.09 |
|                    | 12 (RB_Pos:6)  | 21.48       | 21.63 | 21.26 | 21.43 | 21.00 | 20.55 | 20.64 | 20.38 | 20.47 | 20.07 |
|                    | 12 (RB_Pos:13) | 21.47       | 21.60 | 21.28 | 21.38 | 20.99 | 20.59 | 20.64 | 20.39 | 20.42 | 20.08 |
|                    | 25 (RB_Pos:0)  | 21.43       | 21.59 | 21.30 | 21.45 | 20.98 | 20.54 | 20.55 | 20.43 | 20.51 | 20.01 |

| FDD LTE Band 66    |                |             |        |        |        |        |        |
|--------------------|----------------|-------------|--------|--------|--------|--------|--------|
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |        |        |        |        |        |
|                    |                | QPSK        |        |        | 16QAM  |        |        |
|                    | Channel        | 132072      | 132322 | 132572 | 132072 | 132322 | 132572 |
| 20MHz              | 1 (RB_Pos:0)   | 23.10       | 22.86  | 23.31  | 22.36  | 22.33  | 22.59  |
|                    | 1 (RB_Pos:49)  | 23.16       | 22.83  | 22.80  | 22.47  | 22.33  | 22.07  |
|                    | 1 (RB_Pos:99)  | 23.07       | 23.20  | 23.25  | 22.39  | 22.71  | 22.56  |
|                    | 50 (RB_Pos:0)  | 22.12       | 21.90  | 21.91  | 21.05  | 20.84  | 20.86  |
|                    | 50 (RB_Pos:24) | 22.06       | 21.96  | 21.77  | 21.02  | 20.91  | 20.67  |
|                    | 50 (RB_Pos:49) | 21.98       | 22.16  | 21.86  | 20.93  | 21.08  | 20.82  |
|                    | 100 (RB_Pos:0) | 22.24       | 22.23  | 22.08  | 21.21  | 21.19  | 21.03  |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |        |        |        |        |        |
|                    |                | QPSK        |        |        | 16QAM  |        |        |
|                    | Channel        | 132047      | 132322 | 132597 | 132047 | 132322 | 132597 |
| 15MHz              | 1 (RB_Pos:0)   | 22.96       | 22.97  | 22.88  | 21.99  | 22.17  | 22.32  |
|                    | 1 (RB_Pos:37)  | 23.18       | 23.06  | 22.63  | 22.25  | 22.24  | 22.16  |
|                    | 1 (RB_Pos:74)  | 23.05       | 23.26  | 23.13  | 22.14  | 22.44  | 22.53  |
|                    | 36 (RB_Pos:0)  | 22.04       | 21.78  | 21.78  | 20.93  | 20.75  | 20.58  |
|                    | 36 (RB_Pos:18) | 22.15       | 21.92  | 21.78  | 21.05  | 20.90  | 20.69  |
|                    | 36 (RB_Pos:37) | 22.09       | 22.08  | 21.96  | 20.98  | 20.99  | 21.00  |
|                    | 75 (RB_Pos:0)  | 22.18       | 22.04  | 21.99  | 21.17  | 21.07  | 20.91  |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |        |        |        |        |        |
|                    |                | QPSK        |        |        | 16QAM  |        |        |
|                    | Channel        | 132022      | 132322 | 132622 | 132022 | 132322 | 132622 |
| 10MHz              | 1 (RB_Pos:0)   | 22.82       | 23.10  | 22.87  | 22.00  | 22.10  | 22.15  |
|                    | 1 (RB_Pos:24)  | 22.95       | 23.09  | 22.87  | 22.15  | 22.11  | 22.14  |
|                    | 1 (RB_Pos:49)  | 23.09       | 23.33  | 23.19  | 22.29  | 22.31  | 22.47  |
|                    | 25 (RB_Pos:0)  | 21.97       | 21.83  | 21.74  | 20.94  | 20.82  | 20.64  |
|                    | 25 (RB_Pos:12) | 22.02       | 21.89  | 21.84  | 20.95  | 20.85  | 20.83  |
|                    | 25 (RB_Pos:24) | 22.05       | 21.95  | 22.02  | 21.03  | 20.88  | 21.02  |
|                    | 50 (RB_Pos:0)  | 22.09       | 22.02  | 21.98  | 21.03  | 20.96  | 20.99  |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |        |        |        |        |        |
|                    |                | QPSK        |        |        | 16QAM  |        |        |
|                    | Channel        | 131997      | 132322 | 132647 | 131997 | 132322 | 132647 |
| 5MHz               | 1 (RB_Pos:0)   | 22.94       | 22.82  | 23.04  | 22.39  | 22.35  | 22.10  |
|                    | 1 (RB_Pos:12)  | 23.04       | 22.90  | 23.22  | 22.47  | 22.36  | 22.37  |
|                    | 1 (RB_Pos:24)  | 23.07       | 22.92  | 23.28  | 22.58  | 22.43  | 22.40  |
|                    | 12 (RB_Pos:0)  | 21.67       | 21.73  | 21.87  | 20.52  | 20.55  | 20.59  |
|                    | 12 (RB_Pos:6)  | 21.74       | 21.77  | 21.93  | 20.54  | 20.59  | 20.61  |
|                    | 12 (RB_Pos:11) | 21.80       | 21.78  | 22.09  | 20.57  | 20.61  | 20.73  |
|                    | 25 (RB_Pos:0)  | 21.94       | 21.95  | 22.11  | 20.82  | 20.87  | 20.93  |
| Bandwidth<br>(MHz) | RB Set         | Power (dBm) |        |        |        |        |        |
|                    |                | QPSK        |        |        | 16QAM  |        |        |
|                    | Channel        | 131987      | 132322 | 132657 | 131987 | 132322 | 132657 |
| 3.0MHz             | 1 (RB_Pos:0)   | 22.52       | 23.05  | 23.25  | 21.57  | 21.75  | 22.52  |

|                    |               |             |        |        |        |        |        |
|--------------------|---------------|-------------|--------|--------|--------|--------|--------|
|                    | 1 (RB_Pos:7)  | 22.81       | 23.02  | 23.41  | 22.07  | 21.86  | 22.11  |
|                    | 1 (RB_Pos:14) | 22.63       | 23.01  | 23.31  | 22.13  | 22.30  | 22.00  |
|                    | 8 (RB_Pos:0)  | 21.73       | 21.60  | 21.83  | 20.54  | 20.65  | 20.85  |
|                    | 8 (RB_Pos:4)  | 21.66       | 21.68  | 21.95  | 20.60  | 20.88  | 20.93  |
|                    | 8 (RB_Pos:7)  | 21.86       | 21.72  | 21.99  | 20.67  | 20.73  | 20.99  |
|                    | 15 (RB_Pos:0) | 21.79       | 21.78  | 22.21  | 20.78  | 20.59  | 21.08  |
| Bandwidth<br>(MHz) | RB Set        | Power (dBm) |        |        |        |        |        |
|                    |               | QPSK        |        |        | 16QAM  |        |        |
|                    | Channel       | 131979      | 132322 | 132665 | 131979 | 132322 | 132665 |
| 1.4MHz             | 1 (RB_Pos:0)  | 23.17       | 23.17  | 23.14  | 22.13  | 22.20  | 22.84  |
|                    | 1 (RB_Pos:2)  | 23.08       | 22.62  | 23.31  | 22.03  | 22.26  | 22.66  |
|                    | 1 (RB_Pos:5)  | 23.25       | 23.17  | 23.08  | 21.65  | 21.83  | 22.82  |
|                    | 3 (RB_Pos:0)  | 22.81       | 22.76  | 23.00  | 21.94  | 21.85  | 22.11  |
|                    | 3 (RB_Pos:1)  | 22.83       | 22.76  | 23.01  | 21.94  | 21.92  | 22.41  |
|                    | 3 (RB_Pos:2)  | 22.80       | 22.76  | 23.04  | 22.01  | 21.69  | 22.06  |
|                    | 6 (RB_Pos:0)  | 21.89       | 21.67  | 21.82  | 20.82  | 20.62  | 21.24  |

### 8.3 WIFI for Module (Intel 3165D2W)

#### 8.3.1 2.4G WIFI (Main Antenna)

| Band (GHz)          | Mode          | Channel | Freq. (MHz) | Conducted Power (dBm) | Tune-up Power Limit (dBm) | SAR Test Require. |
|---------------------|---------------|---------|-------------|-----------------------|---------------------------|-------------------|
| 2.4<br>(2.4~2.4835) | 802.11b       | 1       | 2412        | <b>14.70</b>          | 15.00                     | Yes               |
|                     |               | 6       | 2437        | 14.60                 | 15.00                     | Yes               |
|                     |               | 11      | 2462        | 14.60                 | 15.00                     | Yes               |
|                     | 802.11g       | 1       | 2412        | 13.80                 | 15.00                     | No                |
|                     |               | 6       | 2437        | 13.70                 | 15.00                     | No                |
|                     |               | 11      | 2462        | 14.00                 | 15.00                     | No                |
|                     | 802.11n(HT20) | 1       | 2412        | 13.80                 | 15.00                     | No                |
|                     |               | 6       | 2437        | 13.60                 | 15.00                     | No                |
|                     |               | 11      | 2462        | 13.80                 | 15.00                     | No                |
|                     | 802.11n(HT40) | 3       | 2422        | 13.70                 | 15.00                     | No                |
|                     |               | 6       | 2437        | 13.90                 | 15.00                     | No                |
|                     |               | 9       | 2452        | 13.90                 | 15.00                     | No                |

#### 8.3.2 2.4G WIFI (Auxiliary Antenna)

| Band (GHz)          | Mode          | Channel | Freq. (MHz) | Conducted Power (dBm) | Tune-up Power Limit (dBm) | SAR Test Require. |
|---------------------|---------------|---------|-------------|-----------------------|---------------------------|-------------------|
| 2.4<br>(2.4~2.4835) | 802.11b       | 1       | 2412        | 14.50                 | 15.00                     | Yes               |
|                     |               | 6       | 2437        | 14.60                 | 15.00                     | Yes               |
|                     |               | 11      | 2462        | <b>14.70</b>          | 15.00                     | Yes               |
|                     | 802.11g       | 1       | 2412        | 14.20                 | 15.00                     | No                |
|                     |               | 6       | 2437        | 14.10                 | 15.00                     | No                |
|                     |               | 11      | 2462        | 14.00                 | 15.00                     | No                |
|                     | 802.11n(HT20) | 1       | 2412        | 14.00                 | 15.00                     | No                |
|                     |               | 6       | 2437        | 14.10                 | 15.00                     | No                |
|                     |               | 11      | 2462        | 14.00                 | 15.00                     | No                |
|                     | 802.11n(HT40) | 3       | 2422        | 13.80                 | 15.00                     | No                |
|                     |               | 6       | 2437        | 14.00                 | 15.00                     | No                |
|                     |               | 9       | 2452        | 13.90                 | 15.00                     | No                |

### 8.3.3 5G WIFI (Main Antenna)

| Band (GHz)          | Mode            | Channel | Freq. (MHz) | Conducted Power (dBm) | Tune-up Power Limit (dBm) | SAR Test Require. |
|---------------------|-----------------|---------|-------------|-----------------------|---------------------------|-------------------|
| 5.2<br>(5.15~5.25)  | 802.11a         | 36      | 5180        | 14.00                 | 14.50                     | No                |
|                     |                 | 40      | 5200        | 13.90                 | 14.50                     | No                |
|                     |                 | 48      | 5240        | 13.80                 | 14.50                     | No                |
|                     | 802.11n(HT20)   | 36      | 5180        | 13.50                 | 14.50                     | No                |
|                     |                 | 40      | 5200        | 13.60                 | 14.50                     | No                |
|                     |                 | 48      | 5240        | 13.70                 | 14.50                     | No                |
|                     | 802.11n(HT40)   | 38      | 5190        | 13.70                 | 14.50                     | No                |
|                     |                 | 46      | 5230        | 13.60                 | 14.50                     | No                |
|                     | 802.11ac(VHT20) | 36      | 5180        | 13.50                 | 14.50                     | No                |
|                     |                 | 40      | 5200        | 13.60                 | 14.50                     | No                |
|                     |                 | 48      | 5240        | 13.60                 | 14.50                     | No                |
|                     | 802.11ac(VHT40) | 38      | 5190        | 13.70                 | 14.50                     | No                |
|                     |                 | 46      | 5230        | 13.60                 | 14.50                     | No                |
| 5.3<br>(5.25~5.35)  | 802.11a         | 52      | 5260        | 14.20                 | 14.50                     | No                |
|                     |                 | 60      | 5300        | 14.10                 | 14.50                     | No                |
|                     |                 | 64      | 5320        | 14.10                 | 14.50                     | No                |
|                     | 802.11n(HT20)   | 52      | 5260        | 13.60                 | 14.50                     | No                |
|                     |                 | 60      | 5300        | 13.70                 | 14.50                     | No                |
|                     |                 | 64      | 5320        | 13.50                 | 14.50                     | No                |
|                     | 802.11n(HT40)   | 54      | 5270        | 13.60                 | 14.50                     | No                |
|                     |                 | 62      | 5310        | 13.60                 | 14.50                     | No                |
|                     | 802.11ac(VHT20) | 52      | 5260        | 13.60                 | 14.50                     | No                |
|                     |                 | 60      | 5300        | 13.60                 | 14.50                     | No                |
|                     |                 | 64      | 5320        | 13.50                 | 14.50                     | No                |
|                     | 802.11ac(VHT40) | 54      | 5270        | 13.50                 | 14.50                     | No                |
|                     |                 | 62      | 5310        | 13.50                 | 14.50                     | No                |
| 5.6<br>(5.47~5.725) | 802.11a         | 100     | 5500        | 12.90                 | 14.50                     | No                |
|                     |                 | 116     | 5580        | 13.20                 | 14.50                     | No                |
|                     |                 | 140     | 5700        | 13.00                 | 14.50                     | No                |
|                     |                 | 144     | 5720        | 13.10                 | 14.50                     | No                |
|                     | 802.11n(HT20)   | 100     | 5500        | 12.90                 | 14.50                     | No                |
|                     |                 | 116     | 5580        | 13.20                 | 14.50                     | No                |
|                     |                 | 140     | 5700        | 13.10                 | 14.50                     | No                |
|                     |                 | 144     | 5720        | 13.10                 | 14.50                     | No                |
|                     | 802.11n(HT40)   | 102     | 5510        | 13.00                 | 14.50                     | No                |
|                     |                 | 118     | 5590        | 13.20                 | 14.50                     | No                |
|                     |                 | 134     | 5670        | 13.10                 | 14.50                     | No                |
|                     |                 | 142     | 5710        | 13.20                 | 14.50                     | No                |
|                     | 802.11ac(VHT20) | 100     | 5500        | 13.20                 | 14.50                     | No                |
|                     |                 | 116     | 5580        | 13.20                 | 14.50                     | No                |

|                      |                 |     |      |              |       |     |
|----------------------|-----------------|-----|------|--------------|-------|-----|
|                      |                 | 140 | 5700 | 13.10        | 14.50 | No  |
|                      |                 | 144 | 5720 | 13.20        | 14.50 | No  |
|                      | 802.11ac(VHT40) | 102 | 5510 | 13.10        | 14.50 | No  |
|                      |                 | 118 | 5590 | 13.20        | 14.50 | No  |
|                      |                 | 134 | 5670 | 13.00        | 14.50 | No  |
|                      |                 | 142 | 5710 | 13.00        | 14.50 | No  |
|                      | 802.11ac(VHT80) | 106 | 5530 | 13.00        | 14.50 | Yes |
|                      |                 | 122 | 5610 | 13.10        | 14.50 | Yes |
|                      |                 | 138 | 5690 | <b>13.20</b> | 14.50 | Yes |
| 5.8<br>(5.725~5.850) | 802.11a         | 149 | 5745 | 14.00        | 14.50 | No  |
|                      |                 | 157 | 5785 | 14.00        | 14.50 | No  |
|                      |                 | 165 | 5825 | 14.20        | 14.50 | No  |
|                      | 802.11n(HT20)   | 149 | 5745 | 13.60        | 14.50 | No  |
|                      |                 | 157 | 5785 | 13.70        | 14.50 | No  |
|                      |                 | 165 | 5825 | 13.70        | 14.50 | No  |
|                      | 802.11n(HT40)   | 151 | 5755 | 13.50        | 14.50 | No  |
|                      |                 | 159 | 5795 | 13.60        | 14.50 | No  |
|                      | 802.11ac(VHT20) | 149 | 5745 | 13.60        | 14.50 | No  |
|                      |                 | 157 | 5785 | 13.70        | 14.50 | No  |
|                      |                 | 165 | 5825 | 13.70        | 14.50 | No  |
|                      | 802.11ac(VHT40) | 151 | 5755 | 13.60        | 14.50 | No  |
|                      |                 | 159 | 5795 | 13.60        | 14.50 | No  |
|                      | 802.11ac(VHT80) | 155 | 5775 | <b>13.50</b> | 14.50 | Yes |

### 8.3.4 5G WIFI (Auxiliary Antenna)

| Band (GHz)          | Mode            | Channel | Freq. (MHz) | Conducted Power (dBm) | Tune-up Power Limit (dBm) | SAR Test Require. |
|---------------------|-----------------|---------|-------------|-----------------------|---------------------------|-------------------|
| 5.2<br>(5.15~5.25)  | 802.11a         | 36      | 5180        | 14.20                 | 14.50                     | No                |
|                     |                 | 40      | 5200        | 14.00                 | 14.50                     | No                |
|                     |                 | 48      | 5240        | 13.90                 | 14.50                     | No                |
|                     | 802.11n(HT20)   | 36      | 5180        | 13.60                 | 14.50                     | No                |
|                     |                 | 40      | 5200        | 13.80                 | 14.50                     | No                |
|                     |                 | 48      | 5240        | 13.30                 | 14.50                     | No                |
|                     | 802.11n(HT40)   | 38      | 5190        | 13.70                 | 14.50                     | No                |
|                     |                 | 46      | 5230        | 13.50                 | 14.50                     | No                |
|                     | 802.11ac(VHT20) | 36      | 5180        | 13.50                 | 14.50                     | No                |
|                     |                 | 40      | 5200        | 13.80                 | 14.50                     | No                |
|                     |                 | 48      | 5240        | 13.40                 | 14.50                     | No                |
|                     | 802.11ac(VHT40) | 38      | 5190        | 13.70                 | 14.50                     | No                |
|                     |                 | 46      | 5230        | 13.50                 | 14.50                     | No                |
| 5.3<br>(5.25~5.35)  | 802.11a         | 52      | 5260        | 14.30                 | 14.50                     | No                |
|                     |                 | 60      | 5300        | 14.10                 | 14.50                     | No                |
|                     |                 | 64      | 5320        | 14.00                 | 14.50                     | No                |
|                     | 802.11n(HT20)   | 52      | 5260        | 13.70                 | 14.50                     | No                |
|                     |                 | 60      | 5300        | 13.80                 | 14.50                     | No                |
|                     |                 | 64      | 5320        | 13.50                 | 14.50                     | No                |
|                     | 802.11n(HT40)   | 54      | 5270        | 13.60                 | 14.50                     | No                |
|                     |                 | 62      | 5310        | 13.50                 | 14.50                     | No                |
|                     | 802.11ac(VHT20) | 52      | 5260        | 13.60                 | 14.50                     | No                |
|                     |                 | 60      | 5300        | 13.70                 | 14.50                     | No                |
|                     |                 | 64      | 5320        | 13.50                 | 14.50                     | No                |
|                     | 802.11ac(VHT40) | 54      | 5270        | 13.60                 | 14.50                     | No                |
|                     |                 | 62      | 5310        | 13.50                 | 14.50                     | No                |
| 5.6<br>(5.47~5.725) | 802.11a         | 100     | 5500        | 13.30                 | 14.50                     | No                |
|                     |                 | 116     | 5580        | 13.10                 | 14.50                     | No                |
|                     |                 | 140     | 5700        | 13.10                 | 14.50                     | No                |
|                     |                 | 144     | 5720        | 13.00                 | 14.50                     | No                |
|                     | 802.11n(HT20)   | 100     | 5500        | 13.30                 | 14.50                     | No                |
|                     |                 | 116     | 5580        | 13.30                 | 14.50                     | No                |
|                     |                 | 140     | 5700        | 13.10                 | 14.50                     | No                |
|                     |                 | 144     | 5720        | 13.20                 | 14.50                     | No                |
|                     | 802.11n(HT40)   | 102     | 5510        | 13.20                 | 14.50                     | No                |
|                     |                 | 118     | 5590        | 13.10                 | 14.50                     | No                |
|                     |                 | 134     | 5670        | 13.00                 | 14.50                     | No                |
|                     |                 | 142     | 5710        | 13.10                 | 14.50                     | No                |
|                     | 802.11ac(VHT20) | 100     | 5500        | 13.20                 | 14.50                     | No                |
|                     |                 | 116     | 5580        | 13.30                 | 14.50                     | No                |