Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

SAR TEST REPORT

PRODUCT	Smart POS System
BRAND	SUNMI
MODEL	T6F10
FCC ID	2AH25T6F10
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
ISSUE DATE	January 24, 2024
STANDARD(S)	FCC 47 CFR Part 2.1093, ANSI/IEEE C95.1-1992, IEEE Std 1528-2013

Prepared by: Chen Jintao **Reviewed by: Yan Hang** **Approved by:** ***Zhang Min***

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1 Summary of Test Report

1.1 Test Standard (s)

No.	Test Standard(s)	Title	Version
1	FCC 47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices.	N/A
2	ANSI/IEEE C95.1	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.	1992
3	IEEE Std 1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques	2013
Note: The standard of FCC 47 CFR Part 2.1093 has not been accredited by A2LA.			

1.2 Reference Documents

No.	Reference Document(s)	Title	Version
1	KDB447498	General RF Exposure Guidance	D01 v06
2	KDB865664	SAR Measurement 100 MHz to 6 GHz	D01 v01r04
3	KDB865664	RF Exposure Reporting	D02 v01r02
4	KDB941225	3G SAR Procedures	D01 v03r01
5	KDB941225	SAR for LTE Devices	D05 v02r05
6	KDB941225	Hotspot SAR	D06 v02r01
7	KDB616217	SAR for laptop and tablets	D04 v01r02
8	KDB248227	802.11 Wi-Fi SAR	D01 v02r02

1.3 Summary of Test Results

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

Band	Reported SAR 1g(W/Kg)	Reported SAR 10g(W/Kg)	Detailed Results
	Body-Worn&Hotspot(5mm)	Limb(0mm)	
GSM850	0.97	1.30	See section 14.1
GSM1900	0.94	1.29	See section 14.1
WCDMA Band II	0.92	1.23	See section 14.1
WCDMA BandIV	0.96	**1.32**	See section 14.1
WCDMA Band V	0.62	0.56	See section 14.1
LTE Band 2	**1.00**	1.26	See section 14.1
LTE Band 4	0.95	1.21	See section 14.1
LTE Band 7	0.99	0.78	See section 14.1
LTE Band 26	0.82	1.02	See section 14.1
LTE Band 40	0.57	0.54	See section 14.1
LTE Band 41	0.78	0.66	See section 14.1
Wi-Fi 2.4G	0.50	0.29	See section 14.1
Wi-Fi 5G	0.39	0.28	See section 14.1
BT	0.17	0.10	See section 14.1

Band	Reported SAR 1g(W/Kg)	Reported SAR 10g(W/Kg)	Detailed Results
	Body-Worn&Hotspot(5mm)	Limb(0mm)	

NOTE1: The T6F10 manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new product for testing.
NOTE2: The product has two SIM cards, SIM 1 and SIM 2 does not support simultaneous work, only supports a single transmitter; When SIM 1 is working, SIM 2 will be suspended until SIM 2 is selected. When stop using the SIM 1, SIM 2 would work. SIM1 is the worst mode.
NOTE3: This project has two sets of configured sample S25aa (Main supply) and S24aa (Secondary supply), among which the S25aa sample is the main test, and the S24aa sample tests the worst mode of each frequency band. the differences are as follows:

Model / Difference	T6F10 (High Configuration) S25aa (Main supply)	T6F10 (Basic Configuration) S24aa (Secondary supply)
Scanner	Yes	No
LCD(Just different manufacturers)	SHENZHEN DJN PHOTOELECTRIC TECHNOLOGY CO., LTD	CPT Technology (Group) Co.,Ltd
DDR	It's just that the manufacturer and memory are different	
EMMC	It's just that the manufacturer and memory are different	

NOTE4: The device supports LTE Band 5, LTE Band 26, LTE Band 38 and LTE Band 41, since the supported frequency span for LTE Band 5/38 falls completely within the supports frequency span for LTE Band 26/41. The maximum output power(including tolerance) of LTE Band 5/38 is less than or equal to LTE Band 26/41, and both LTE bands share the same transmission path. According to TCB workshop April 2015 RF Exposure Procedures(Overlapping LTE Bands), LTE Band 5 is covered by LTE Band 26, LTE Band 38 is covered by LTE Band 41, therefore, SAR was only assessed for LTE Band 26 and LTE Band 41.
NOTE5: The device implements proximity sensor trigger reduced power for SAR compliance at different exposure conditions, which can refer to chapter 13.1.
NOTE6: Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

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

Highest Reported SAR 1g(W/kg)			
Mode	**Position**	**Simultaneous Transmission SAR**	**Detailed Results**
GSM 1900&Wi-Fi 2.4G	Body-Worn&Hotspot(5mm)	1.45	See section 14.2
Highest Reported SAR 10g(W/kg)			
WCDMA Band Ⅳ&Wi-Fi 2.4G	Limb(0mm)	1.61	See section 14.2

2 General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4， No. 766， Jingang Road， Pudong， Shanghai， China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364

2.2 Laboratory Environmental Requirements

Temperature	18°C~25°C
Relative Humidity	25%RH~75%RH

2.3 Project Information

Project Manager	Gao Hongning
Test Date	December 11, 2023 to January 22, 2024

3 General Information of The Customer

3.1 Applicant

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China
Telephone	18826519551

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China
Telephone	18826519551

3.3 Factory

Company	N/A
Address	N/A

4 General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product	Smart POS System
Model	T6F10
Date of Receipt	December 11, 2023
EUT ID*	S25aa(Main supply)/S24aa(Secondary supply)
SN/IMEI	S25aa:864789070004612/864789070014082 S24aa:864789070003184/864789070012656
Supported Radio Technology and Bands	GSM850/GSM900/GSM1800/GSM1900 WCDMA Band I/II/IV/V/VI/VIII/XIX LTE Band 1/2/3/4/5/7/8/18/19/20/26/28/34/38/39/40/41 Wi-Fi 802.11a/b/g/n/ac BT 5.0,BLE NFC
Tx Frequency	824 MHz -849 MHz (GSM850) 1850 MHz -1910 MHz (GSM1900) 1850 MHz -1910 MHz (WCDMA Band II) 1710 MHz -1755 MHz (WCDMA Band IV) 824 MHz -849 MHz (WCDMA Band V) 1850 MHz -1910 MHz (LTE Band 2) 1710 MHz -1755 MHz (LTE Band 4) 824 MHz -849 MHz (LTE Band 5) 2500 MHz -2570 MHz (LTE Band 7) 814 MHz -849 MHz (LTE Band 26) 2570 MHz -2620 MHz (LTE Band 38) 2305 MHz -2315 MHz/2350 MHz -2360 MHz (LTE Band 40) 2496 MHz -2690 MHz (LTE Band 41) 2412 MHz -2462 MHz (Wi-Fi 2.4G) 5180 MHz -5240 MHz (U-NII-1) 5260 MHz -5320 MHz (U-NII-2A) 5500 MHz -5700 MHz (U-NII-2C) 5745 MHz -5825 MHz (U-NII-3) 2402 MHz -2480 MHz (BT) 13.56 MHz (NFC)
Hardware Version	V1.0(LA+EU)
Software Version	V3.0.0
Dimension	200mm*80mm*17mm(L*W*H)
NOTE1: EUT ID is the internal identification code of the laboratory. NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Description for Auxiliary Equipment (AE)

AE ID*	Description	Model	SN/Remark
BA28	Battery	HPPA	E150140373B310138
BB13	Battery	HPPA	E150140373BL10001
NOTE: AE ID is the internal identification code of the laboratory.			

5 Test Configuration Information

5.1 Test Equipments Utilized

No.	Name	Model	S/N	Software Version	Hardware Version	Manufacturer	Cal. Date	Cal. Interval
1	Network analyzer	N5242A	MY51221755	A.09.33.09	N/A	Agilent	Oct.16, 2023	1 Year
2	Power meter	NRX	103851	02.50.21112602	N/A	R&S	Jul.26, 2023	1 Year
3	Power sensor	NRP18S-10	101841	N/A	N/A	R&S	Jul.26, 2023	1 Year
4	Power sensor	NRP18S-10	101842	N/A	N/A	R&S	Jul.26, 2023	1 Year
5	Signal Generator	E4438C	MY49072044	N/A	C.05.83	Agilent	Jul.26, 2023	1 Year
6	Amplifier	NTWPA-07605	22039018	N/A	N/A	RFLIGHT	Jul.26, 2023	1 Year
7	Test Software	DASY5	N/A	52.10.4.1527	N/A	SPEAG	N/A	N/A
8	DAE	DAE4	1244	N/A	N/A	SPEAG	Apr.10, 2023	1 Year
9	E-field Probe	EX3DV4	7633	N/A	N/A	SPEAG	Apr.28, 2023	1 Year
10	BTS	CMU 200	123102	V5.21	N/A	R&S	Jul.26, 2023	1 Year
11	BTS	MT8820C	6201240338	V3.8.10	N/A	Anritsu	Oct.16, 2023	1 Year
12	Dipole Validation Kit	D835V2	4d112	N/A	N/A	SPEAG	Sep.6, 2023	1 Year
13	Dipole Validation Kit	D1750V2	1044	N/A	N/A	SPEAG	Sep.8, 2023	1 Year
14	Dipole Validation Kit	D1900V2	5d232	N/A	N/A	SPEAG	Nov.16 ,2023	1 Year
15	Dipole Validation Kit	D2300V2	1021	N/A	N/A	SPEAG	Sep.11, 2023	1 Year
16	Dipole Validation Kit	D2450V2	858	N/A	N/A	SPEAG	Sep.12, 2023	1 Year
17	Dipole Validation Kit	D2600V2	1031	N/A	N/A	SPEAG	Sep.8, 2023	1 Year
18	Dipole Validation Kit	D5GHzV2	1172	N/A	N/A	SPEAG	Sep.7, 2023	1 Year

5.2 Measurement Uncertainty

Item	Uncertainty
SAR	$U_{SAR(1g)}$=21.70%, $U_{SAR(10g)}$=21.42%
NOTE: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5.3 EUT Connection Diagram of Test System

5.3.1 SAR

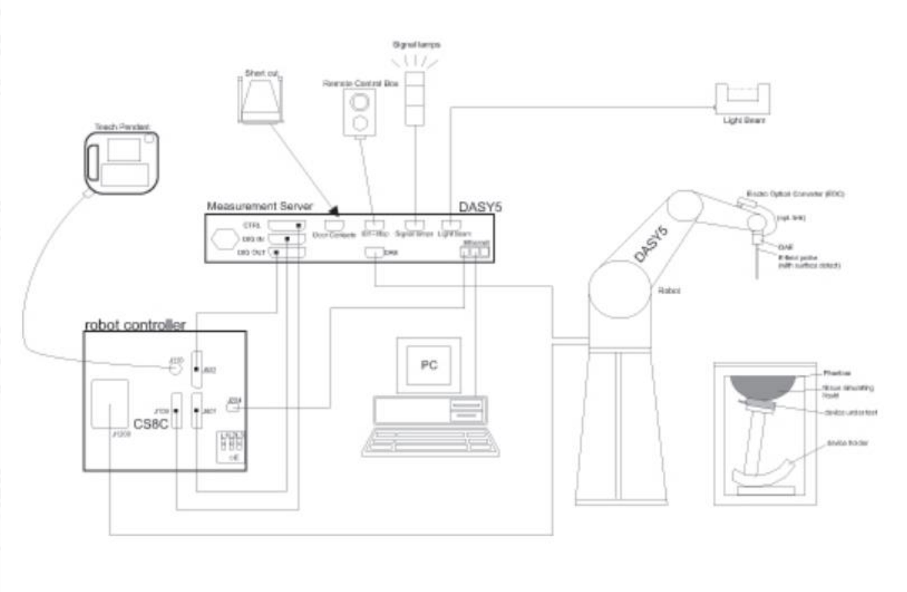


Figure 5.3.1-1 SAR Connection Diagram

6 Specific Absorption Rate(SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

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

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

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

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

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

Where:

σ is the conductivity of the tissue

ρ is the mass density of tissue, which is normally set to $1g/cm^3$

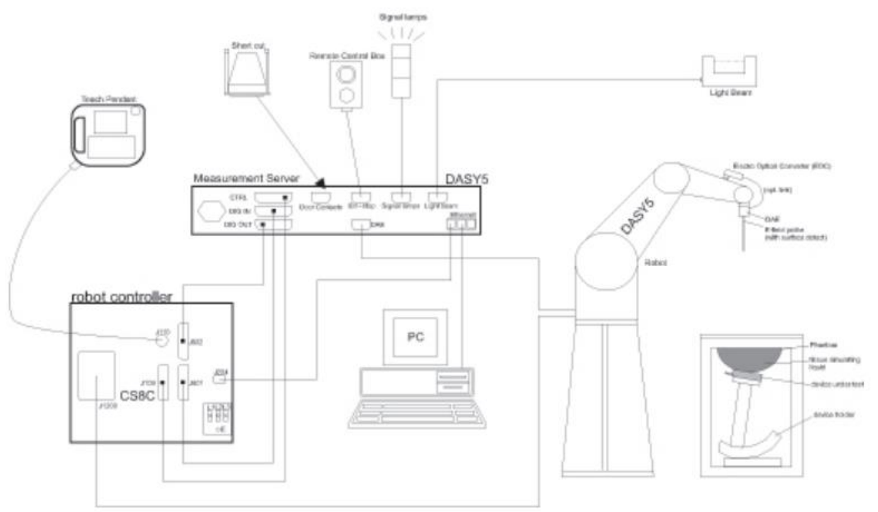
E is the RMS electrical field strength

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

7 SAR Measurement System Introduction

7.1 Measurement Set-up

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



Figures 7.1-1 SAR Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.

The phantom, the device holder and other accessories according to the targeted measurement.

7.2 E-field Probe System

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

Probe Specifications	
Model	EX3DV4
Frequency Range	4 MHz – 10 GHz
Calibration	In head simulating tissue at frequency from 650MHz to 5900MHz
Linearity	±0.2 dB (30 MHz – 10 GHz)
Dynamic Range	10 μW/g – >100 mW/g
Probe Length	337 mm
Probe Tip Length	20 mm
Body Diameter	12 mm
Tip Diameter	2.5 mm
Tip-Center	1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better than 30%.

Figure 7.2-1 Detail of Probe

Figure 7.2-2 E-field Probe

7.3 E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm2..

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

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

Where:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

7.4 Other Test Equipment

7.4.1 Data Acquisition Electronics (DAE)

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

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

Figure 7.4.1-1: DAE

7.4.2 Robot

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

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

Figure 7.4.2-1: DASY5

7.4.3 Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400 MHz intel ULV Celeron, 128 MB chipdisk and 128 MB RAM. The necessary circuits for communication with either the DAE4 (or DAE3) electronics box as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.

Figure 7.4.3-1 Server for DASY5

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

7.4.4 Device Holder for Phantom

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

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

Figure 7.4.4-1: Device Holder

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

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.	 Figure 7.4.4-2: Laptop Extension Kit
The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε =3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.	

7.4.5 Phantom

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

Shell Thickness	2 ± 0.2 mm	 Figure 7.4.5-1: SAM Twin Phantom
Available	Special	
Filling Volume	Approx. 25 liters	
Dimensions	810 mm x l000 mm x 500 mm (H x L x W)	

8 Test Position in Relation to the Phantom

8.1 General considerations

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

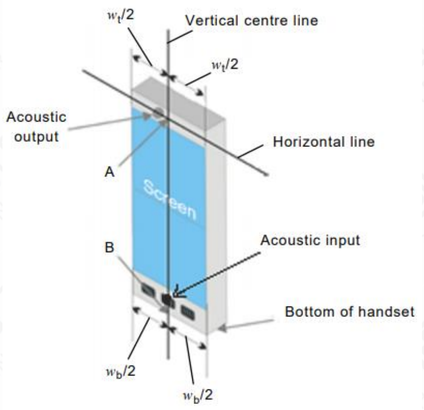


Figure 8.1-1 full touch screen smart phone (top)

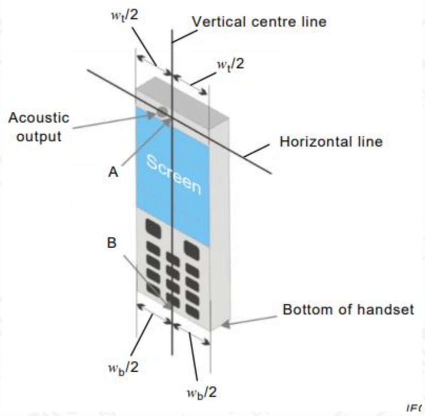


Figure 8.1-2 keyboard handset (bottom)

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

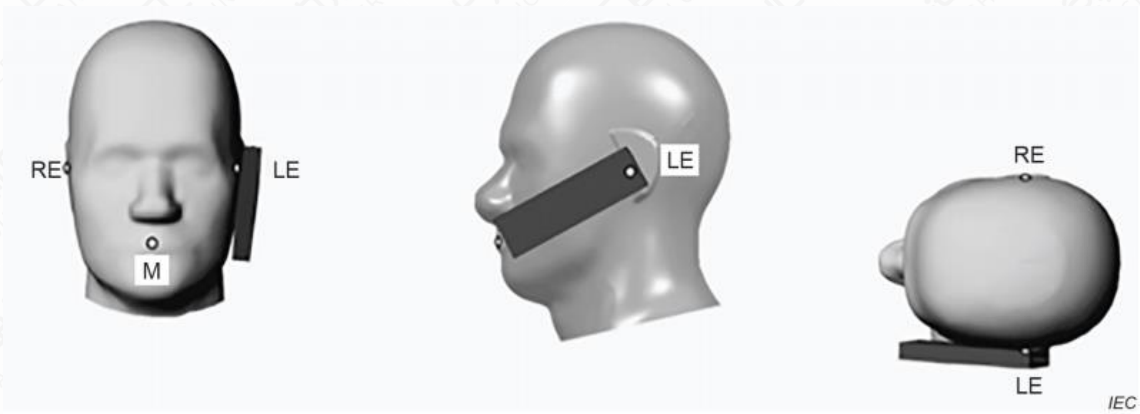


Figure 8.1-3 Cheek position of the wireless device on the left side of SAM

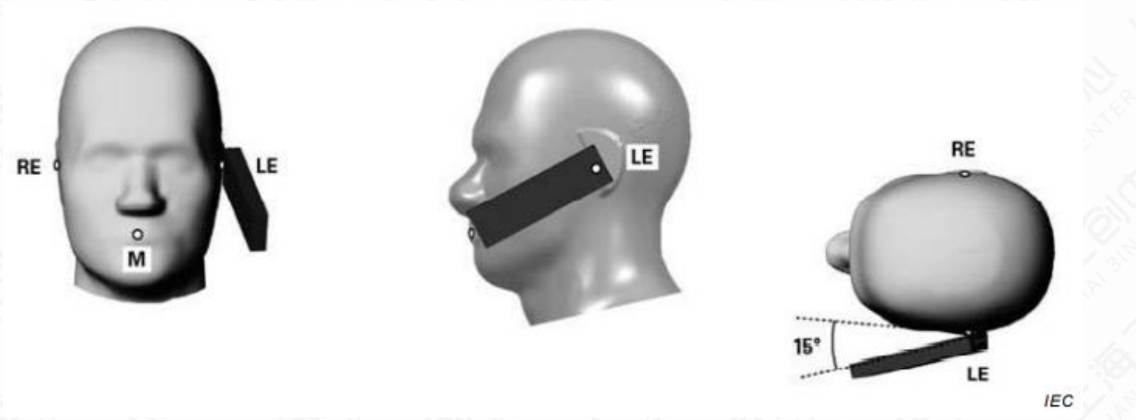


Figure 8.1-4 Tilt position of the wireless device on the left side of SAM

8.2 Body-worn device

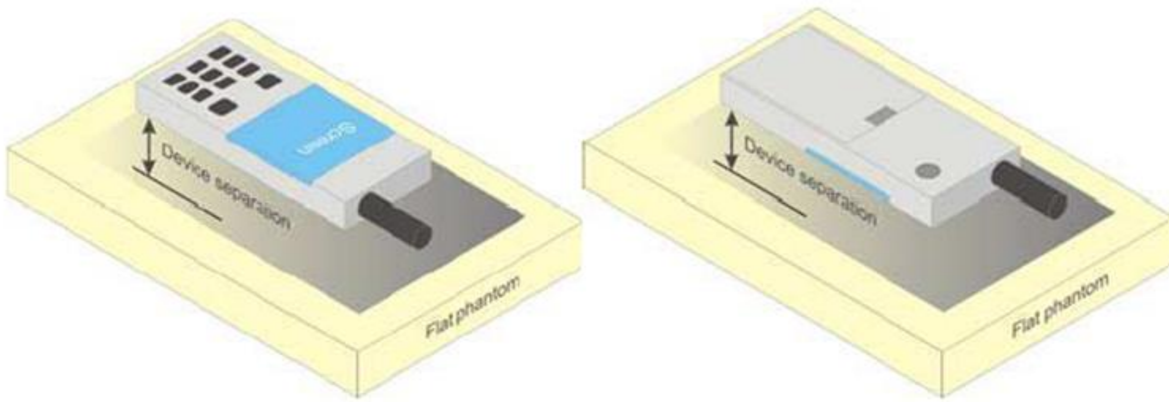
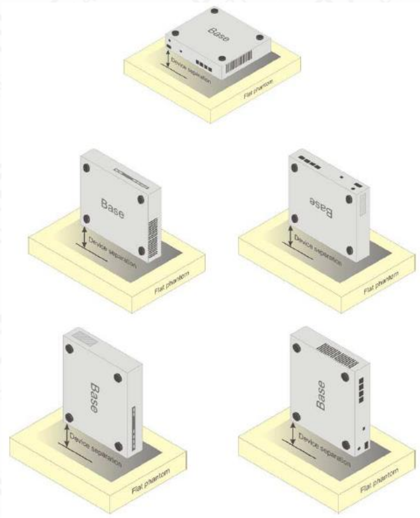


Figure 8.2-1 Test positions for body-worn devices

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

8.3 Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.	
The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions.	
Tests shall be performed for all antenna positions specified.	
Picture 8-6 shows positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat	Figure 8.3-1 Test positions for desktop devices

9 Tissue Simulating Liquids

9.1 Equivalent Tissues Composition

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

Table 9.1-1: Composition of the Head Tissue Equivalent Matter

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

Table 9.1-2: Targets for tissue simulating liquid

Frequency (MHz)	Liquid Type	Conductivity (σ)	±5% Range	Permittivity (ε)	±5% Range
750	Head	0.89	0.846~0.934	41.9	39.805~43.995
835	Head	0.90	0.855~0.945	41.5	39.425~43.575
900	Head	0.97	0.922~1.018	41.5	39.425~43.575
1450	Head	1.20	1.140~1.260	40.5	38.475~42.525
1800	Head	1.40	1.330~1.470	40.0	38.000~42.000
1900	Head	1.40	1.330~1.470	40.0	38.000~42.000
1950	Head	1.40	1.330~1.470	40.0	38.000~42.000
2000	Head	1.40	1.330~1.470	40.0	38.000~42.000
2100	Head	1.49	1.416~1.564	39.8	37.810~41.790
2450	Head	1.80	1.710~1.890	39.2	37.240~41.160
2600	Head	1.96	1.862~2.058	39.0	37.050~40.950
3000	Head	2.40	2.280~2.520	38.5	36.575~40.425
3500	Head	2.91	2.765~3.055	37.9	36.005~39.795
4000	Head	3.43	3.259~3.601	37.4	35.530~39.270
4500	Head	3.94	3.743~4.137	36.8	34.960~38.640
5000	Head	4.45	4.228~4.672	36.2	34.390~38.010
5200	Head	4.66	4.427~4.893	36.0	34.200~37.800
5400	Head	4.86	4.617~5.103	35.8	34.010~37.590
5600	Head	5.07	4.817~5.323	35.5	33.725~37.275
5800	Head	5.27	5.007~5.533	35.3	33.535~37.065
6000	Head	5.48	5.206~5.754	35.1	33.345~36.855

9.2 Liquid depth

The Measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0±0.2mm (bottom Plate) filled with Body or Head simulating Liquid.

The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with ≤ ±0.5 cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with ≤± 0.5 cm variation for measurements > 3 GHz.

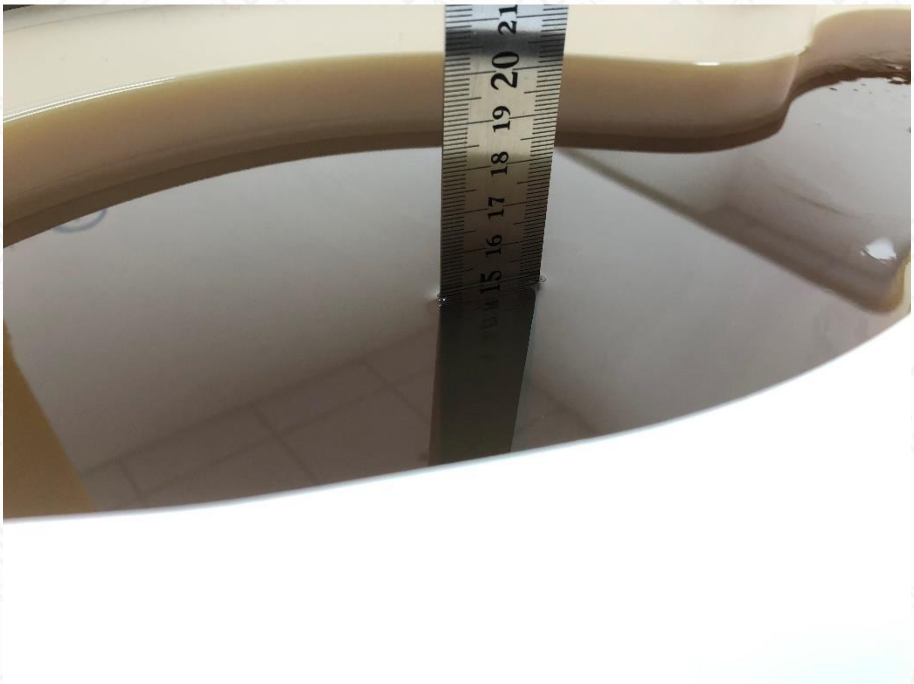


Figure 9.2-1 Liquid depth in the Flat Phantom for SAR measurements ≤ 3 GHz

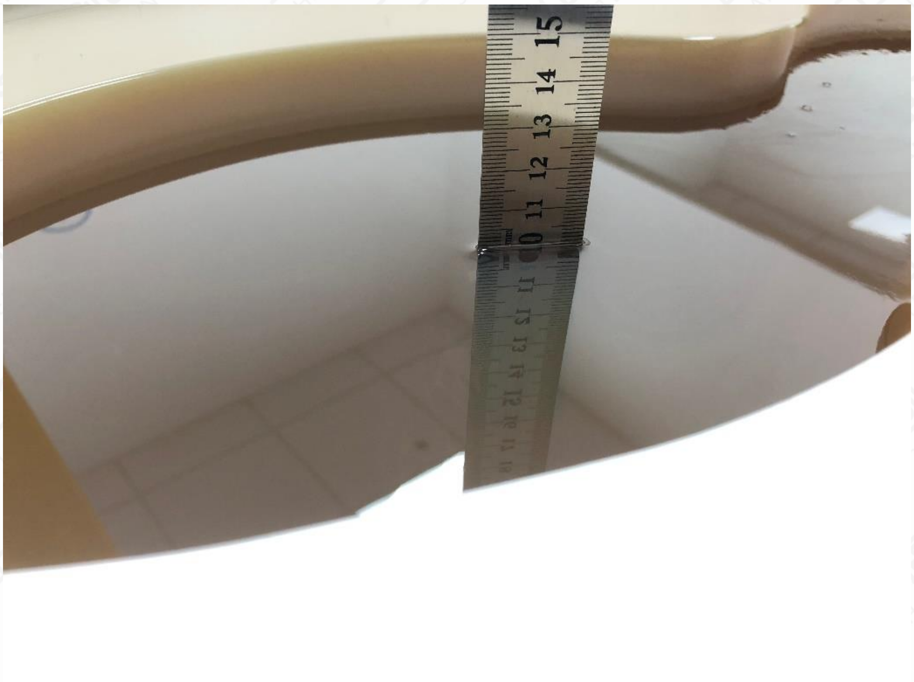


Figure 9.2-2 Liquid depth in the Flat Phantom for SAR measurements > 3 GHz

9.3 Dielectric Performance of TSL

Table 9.3-1: Dielectric Performance of Head Tissue Simulating Liquid

Frequency (MHz)	Head(Standard)		Temperature	Date	Test Result		Deviation	
	Permittivity ε	Conductivity σ			Permittivity ε	Conductivity σ	Permittivity ε	Conductivity σ
835	41.50	0.90	20.2℃	December 18, 2023	41.865	0.921	0.88%	2.33%
835	41.50	0.90	20.0℃	January 3, 2024	41.701	0.925	0.48%	2.78%
1750	40.10	1.37	20.2℃	December 11, 2023	38.810	1.323	-3.22%	-3.43%
1750	40.10	1.37	20.4℃	December 12, 2023	38.517	1.330	-3.95%	-2.92%
1900	40.00	1.40	20.1℃	December 14, 2023	38.451	1.415	-3.87%	1.07%
1900	40.00	1.40	20.0℃	December 25, 2023	38.557	1.416	-3.61%	1.14%
2300	39.50	1.67	20.2℃	December 17, 2023	38.011	1.713	-3.77%	2.57%
2450	39.20	1.80	20.2℃	December 20, 2023	38.215	1.809	-2.51%	0.50%
2600	39.00	1.96	20.1℃	December 13, 2023	37.445	1.931	-3.99%	-1.48%
2600	39.00	1.96	20.0℃	January 22, 2024	37.621	1.928	-3.54%	-1.63%
5200	36.00	4.66	20.2℃	December 21, 2023	35.736	4.685	-0.73%	0.54%
5300	35.90	4.76	20.2℃	December 21, 2023	35.535	4.798	-1.02%	0.80%
5600	35.50	5.07	20.2℃	December 21, 2023	34.939	5.143	-1.58%	1.44%
5800	35.30	5.27	20.2℃	December 21, 2023	34.549	5.383	-2.13%	2.14%

10 System Check

10.1 System Check

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

10.2 System Setup

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

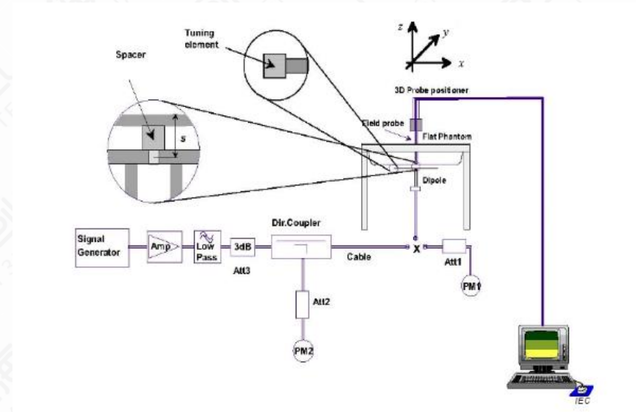


Figure 10.2-1 Set-up for the system check

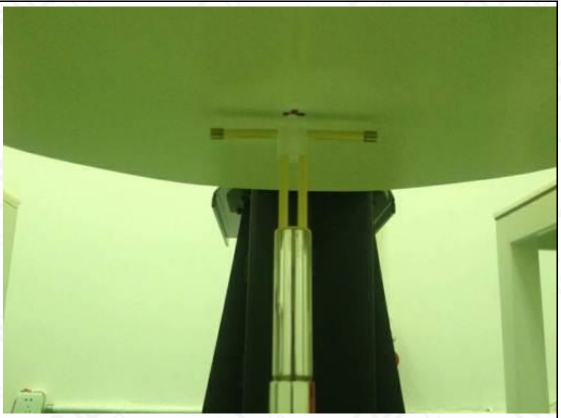


Figure 10.2-2. Setup for Dipole

10.3 System Check Result

Table 10.3-1: System Check Result of SAR

SAR System Check								
Frequency (MHz)	Target Value (w/kg)		Temperature	Date	Test Result (w/kg)		Deviation	
	10g	1g			10g	1g	10g	1g
835	6.24	9.67	21.3℃	December 18, 2023	6.28	9.76	0.64%	0.93%
835	6.24	9.67	21.1℃	January 3, 2024	6.12	9.52	-1.92%	-1.55%
1750	19.40	36.70	21.3℃	December 11, 2023	19.40	36.68	0.00%	-0.05%
1750	19.40	36.70	21.4℃	December 12, 2023	19.28	36.40	-0.62%	-0.82%
1900	20.70	39.80	21.1℃	December 14, 2023	19.96	38.88	-3.57%	-2.31%
1900	20.70	39.80	21.0℃	December 25, 2023	20.40	39.72	-1.45%	-0.20%
2300	23.90	50.30	21.3℃	December 17, 2023	23.88	50.40	-0.08%	0.20%
2450	24.40	52.60	21.3℃	December 20, 2023	23.60	50.80	-3.28%	-3.42%
2600	24.80	55.70	21.4℃	December 13, 2023	25.20	56.00	1.61%	0.54%
2600	24.80	55.70	21.0℃	January 22, 2024	24.48	54.80	-1.29%	-1.62%
5200	21.80	77.40	21.2℃	December 21, 2023	22.00	76.90	0.92%	-0.65%
5300	22.50	79.40	21.2℃	December 21, 2023	22.50	78.60	0.00%	-1.01%
5600	23.20	82.40	21.2℃	December 21, 2023	22.80	81.00	-1.72%	-1.70%
5800	22.00	78.60	21.2℃	December 21, 2023	22.50	78.80	2.27%	0.25%
NOTE: The system verifies that the measured input power level is equivalent to 250mW for 0.6GHz to 3GHz and above 3GHz is equivalent to 100mW, and the measured results are compared with the target value by converting to 1W.								

11 Measurement Procedures

11.1 Test Steps

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

(a) Power reference measurement

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

(b) Area scan

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

(c) Zoom scan

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

(d) Power drift measurement

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

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

(a) Make EUT to transmit it maximum output power

(b) Measure conducted output power through RF cable

(c) Place the EUT in the specific position of phantom

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

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

(f) Record the SAR value

11.2 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE Std 1528 standard. It can be conducted for 1g and 10g.

The DASY system allows evaluations that combine measured data and robot positions, such as:

(a) Maximum Search

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

(b) Extrapolation

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation.

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

(c) Boundary effect

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

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

Since the decay of the boundary effect dominates for small probe ($a \ll \lambda$), the cos-term can be omitted. Factors Sb (parameter Alpha in the DASY software) and a (parameter Delta in the DASY software) and assessed during probe calibration and used for numerical compensation of the boundary effect. Several simulations and measurements have confirmed that the compensation is valid for different field and boundary configurations.

This simple compensation procedure can largely reduce the probe uncertainty near boundaries. It works well as long as:

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

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

11.3 General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2013. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

Table 11.3-1: Test Resolution Requirement

<table>
<tr><th colspan="3">Items</th><th>≤3GHz</th><th>>3GHz</th></tr>
<tr><td colspan="3">Maximum Distance</td><td>5mm ±1mm</td><td>$\frac{1}{2} * \delta * \ln(2)$ mm ±0.5mm</td></tr>
<tr><td colspan="3">Maximum probe angle</td><td>30±1°</td><td>20±1°</td></tr>
<tr><td colspan="3" rowspan="3">Maximum Area Scan spatial resolution:
Δx_{Area} , Δy_{Area}</td><td>≤2GHz: ≤15mm</td><td>3-4GHz: ≤12mm</td></tr>
<tr><td>2-3GHz: ≤12mm</td><td>4-6GHz: ≤10mm</td></tr>
<tr><td colspan="2">when the x or y dimension of the device , in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the device with at least one measurement point on the device</td></tr>
<tr><td colspan="3" rowspan="2">Maximum Zoom Scan spatial resolution:
Δx_{Zoom} , Δy_{Zoom}</td><td>≤2GHz: ≤8mm</td><td>3-4GHz: ≤5mm</td></tr>
<tr><td>2-3GHz: ≤5mm</td><td>4-6GHz: ≤4mm</td></tr>
<tr><td rowspan="3">maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤5mm</td><td>3-4GHz: ≤4mm
4-5GHz: ≤3mm
5-6GHz: ≤2mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤4mm</td><td>3-4GHz: ≤3mm
4-5GHz: ≤2.5mm
5-6GHz: ≤2mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$ between subsequent points</td><td colspan="2">≤1.5*</td></tr>
<tr><td>minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥30mm</td><td>3-4GHz: ≥28mm
4-5GHz: ≥25mm
5-6GHz: ≥22mm</td></tr>
</table>

Notes:

δ is the penetration depth of a plane-wave at normal incidence to the tissue medium in IEEE Std 1528-2013.

When Zoom Scan is required and reported SAR from the Area Scan based 1-g SAR estimation procedure of KDB publication 447498 is ≤1.4 W/kg, ≤8mm for 2GHz-3GHz, ≤7mm for 3GHz-4GHz, ≤5mm for 4GHz-6GHz Zoom Scan resolution may be applied.

11.4 GSM/GPRS Measurement Procedures

GSM/GPRS/EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Other configurations of GSM/GPRS/EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is s $\leq \frac{1}{4}$dB higher than the primary mode, SAR measurement is not required for the secondary mode.

11.5 WCDMA Measurement Procedures

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

Table 11.5-1: HSDPA setting for Release 5

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

Table 11.5-2: HSUPA setting for Release 6

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI

1	11/15	15/15	64	11/15	22/15	209/225	1039/225	4	1	2.0	1.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	12/15	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	3.0	2.0	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	2.0	1.0	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	2.0	1.0	21	81

11.6 LTE Measurement Procedure

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

(a) KDB 941225 D05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.

(b) 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.

(c) For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

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

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

(f) For LTE Band 12/26 the maximum bandwidth does not support three non-overlapping channels, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

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

- The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
- The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

11.6.1 LTE Carrier Aggregation Conducted Power (Downlink)

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

11.6.2 LTE Carrier Aggregation Conducted Power (Uplink)

UL CA shall be tested based on the worst-case SAR configuration determined from non-CA SAR testing result. The channel BW, channel number, RB allocation, etc. would be selected to allow contiguous CA of PCC and SCC. Uplink output power for UL CA is the total power measured across the PCC and SCC.

UL CA power measurements were performed for each antennas at with QPSK modulation based on the worst-case standalone SAR.

The UL CA mode power measurements represent the total power across both carriers. Measurements were made for all supported PCC bandwidths using the channel/RB combination resulting in the highest standalone output power at the least MPR (0 dB). SCCs were set to use configurations similar to the PCC to establish conservative or worst case equivalent SAR test conditions (highest maximum power with MPR of 0 dB).

The standalone power measurement is the power for the PCC in the non-CA mode (i.e. single carrier power). In all cases the UL CA power is less than or equal to the standalone power.

11.6.3 LTE TDD Considerations

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

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

Table 11.6.3-1 Calculated Duty Cycle for LTE TDD

Uplink-Downlink Configuration		**Sub-frame Number**										**Calculated**
Config	Periodicity	1	2	3	4	5	6	7	8	9	10	Duty Cycle (%)
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67

6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = (5120 × Ts × 2 + 6 ms) / 10ms = 63.33%

Where

Ts = 1/(15000 x 2048) seconds

11.7 Bluetooth & Wi-Fi Measurement Procedures

Normal network operating configurations are not suitable for measuring the SAR of IEEE 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤1.2 W/kg.

Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤1.2 W/kg, SAR is not required for U-NII-1 band. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤1.2 W/kg or all required channels are tested.

11.8 Area Scan Based 1g SAR

According to the KDB447498 D01, a first class of fast SAR techniques is based on a modified measurement procedure and post processing algorithms. In practice, these methods require a special software, for example DASY52 form SPEAG.

When the implementation is based the specific polynomial fit algorithm as presented at the 29th Bio-electromagnetics Society meeting (2007) and the estimated 1-g SAR is ≤ 1.2 W/kg, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

There must not be any warning or alert messages due to various measurement concerns identified by the SAR system; for example, noise in measurements, peaks too close to scan boundary, peaks are too sharp, spatial resolution and uncertainty issues etc. When all the SAR results for each exposure condition in a frequency band and wireless mode are based on estimated 1-g SAR, the 1-g SAR for the highest SAR configuration must be determined by a zoom scan.

The approach is based on the area scan measurement applying a frequency dependent attenuation parameter. This attenuation parameter was empirically determined by analyzing a large number of phones. The MOTOROLA FAST SAR was developed and validated by the MOTOROLA Research Group in Ft. Lauderdale.

In the initial study, an approximation algorithm based on Linear fit was developed. The accuracy of the algorithm has been demonstrated across a broad frequency range (136-2450 MHz) and for both 1-g and 10-g averaged SAR using a sample of 264 SAR measurements from 55 wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithm are 1.2% and 5.8% for 1- and 10-g averaged SAR, respectively. The paper describing the algorithm in detail is expected to be published in August 2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomial fit whereby the frequency validity was extended to cover the range 30MHz-6000MHz. Details of this study can be found in the BEMS 2007 Proceedings.

12 Simultaneous Transmission SAR Considerations

12.1 Reference Document

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

12.2 Antenna Separation Distances

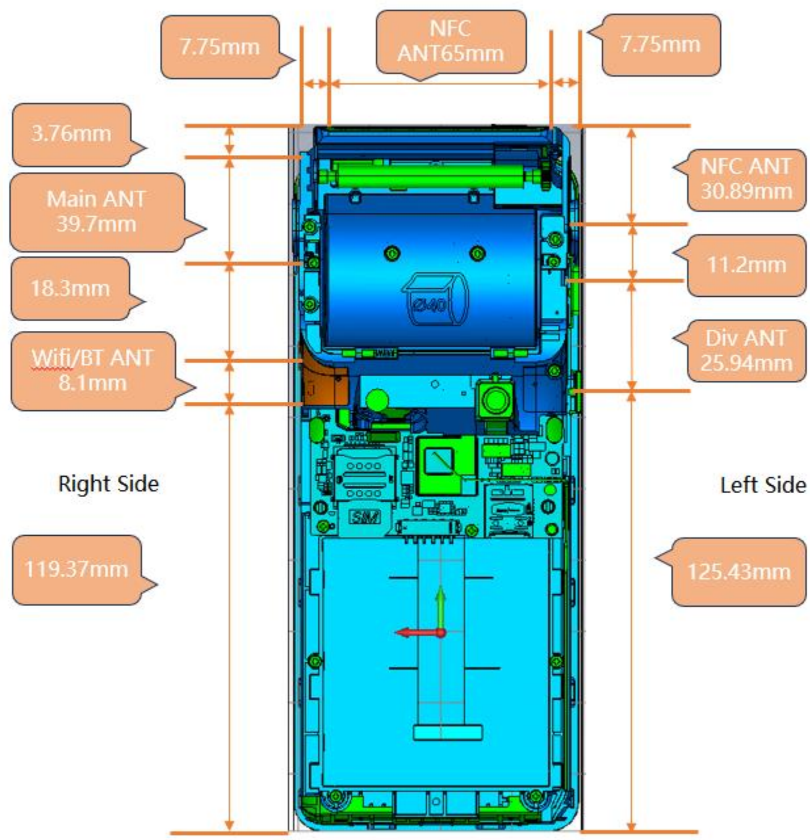


Figure 12.2-1 Antenna Locations (Back View)

12.3 SAR Measurement Positions

The edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

Table 12.3-1: SAR measurement Positions

Antenna Mode	Front	Back	Left	Right	Top	Bottom
Main ANT	Yes	Yes	No	Yes	Yes	No
Wi-Fi/BT ANT	Yes	Yes	No	Yes	Yes	No

12.4 Low Power Transmitters SAR Consideration

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation for low power transmitters is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

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

Where:

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

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

SAR test exclusion for NFC separation＜50mm=[474*(1+log(100/$f_{(MHz)}$))]/2=443 mW, the maximum tune up of NFC is -23.00 dBm(0.005mW), NFC can be exempted.

12.5 Simultaneous Transmission Analysis

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

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

Where:

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

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

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

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

12.6 Simultaneous Transmission Table

Table 12.6-1: Simultaneous Transmission Configurations

Items	Capable Transmit Configurations
1	GSM/GPRS/EDGE+BT
2	GSM/GPRS/EDGE+Wi-Fi 2.4G
3	GSM/GPRS/EDGE+Wi-Fi 5G
4	WCDMA+BT
5	WCDMA+Wi-Fi 2.4G
6	WCDMA+Wi-Fi 5G
7	LTE+BT
8	LTE+Wi-Fi 2.4G
9	LTE+Wi-Fi 5G
NOTE: For the DUT, the following combination that can transmit signal simultaneously.	

13 Conducted Output Power

13.1 Power Reduction Procedures

The device uses a proximity sensor to reduce the maximum output power of main transmitting antenna in selected wireless modes and operating configurations to ensure SAR compliance. The procedures in KDB 616217 are applied to determine proximity sensor triggering distances, and sensor coverage for normal and tilt positions.

The following tables summarize the key power reduction information of main transmitting antenna triggered by specific use conditions.

Table 13.1-1:WWAN power reduction table

Main Antenna				
Band	Mode	Full Power (Tune Up)dBm	Sensor on (Tune Up)dBm	Power Reduction(dB)
GSM850	GPRS 1TS	33.50	24.50	9.00
	GPRS 2TS	32.50	24.50	8.00
	GPRS 3TS	30.50	24.50	6.00
	GPRS 4TS	30.00	24.50	5.50
	EGPRS 1TS	27.00	17.50	9.50
	EGPRS 2TS	25.50	17.50	8.00
	EGPRS 3TS	23.00	17.50	5.50
	EGPRS 4TS	22.00	17.50	4.50
GSM1900	GPRS 1TS	30.00	23.00	7.00
	GPRS 2TS	29.50	23.00	6.50
	GPRS 3TS	27.50	23.00	4.50
	GPRS 4TS	26.50	22.50	4.00
	EGPRS 1TS	27.00	19.00	8.00
	EGPRS 2TS	25.50	19.00	6.50
	EGPRS 3TS	23.50	19.00	4.50
	EGPRS 4TS	22.00	19.00	3.00
WCDMA Band II	RMC	23.50	18.50	5.00
WCDMA Band IV	RMC	23.50	21.50	2.00
WCDMA Band V	RMC	24.50	21.50	3.00
LTE Band 2	QPSK	23.00	18.00	5.00
LTE Band 4	QPSK	23.00	20.00	3.00
LTE Band 5	QPSK	23.50	21.00	2.50
LTE Band 7	QPSK	23.50	16.50	7.00
LTE Band 26	QPSK	23.50	21.00	2.50
LTE Band 38	QPSK	24.00	18.00	6.00
LTE Band 40	QPSK	23.50	17.50	6.00
LTE Band 41	QPSK	24.00	18.00	6.00

13.2 GSM Measurement result

Table 13.2-1: The conducted power measurement results for GSM850

GSM850			Full power								
Mode	Modulation	Time Slot	Tune up (dBm)	Measure Power(dBm)			Devision Factor (dB)	Tune up Max	Average Power(dBm)		
				128/824.2	190/836.6	251/848.8			128/824.2	190/836.6	251/848.8
GPRS	GMSK	1 Tx	33.50	32.81	32.95	33.02	-9.03	24.47	23.78	23.92	23.99
		2 Tx	32.50	32.05	32.16	32.25	-6.02	26.48	26.03	26.14	26.23
		3 Tx	30.50	30.24	30.36	30.44	-4.26	26.24	25.98	26.10	26.18
		4 Tx	30.00	29.12	29.38	29.36	-3.01	26.99	26.11	26.37	26.35
EGPRS	8PSK	1 Tx	27.00	26.38	26.47	26.42	-9.03	17.97	17.35	17.44	17.39
		2 Tx	25.50	24.94	25.11	25.14	-6.02	19.48	18.92	19.09	19.12
		3 Tx	23.00	22.66	22.76	22.75	-4.26	18.74	18.40	18.50	18.49
		4 Tx	22.00	21.57	21.71	21.72	-3.01	18.99	18.56	18.70	18.71

GSM850			Sensor on								
Mode	Modulation	Time Slot	Tune up (dBm)	Measure Power(dBm)			Devision Factor (dB)	Tune up Max	Average Power(dBm)		
				128/824.2	190/836.6	251/848.8			128/824.2	190/836.6	251/848.8
GPRS	GMSK	1 Tx	24.50	23.95	24.06	24.18	-9.03	15.47	14.92	15.03	15.15
		2 Tx	24.50	23.88	23.99	24.12	-6.02	18.48	17.86	17.97	18.10
		3 Tx	24.50	23.76	23.85	23.98	-4.26	20.24	19.50	19.59	19.72
		4 Tx	24.50	23.67	23.81	23.80	-3.01	21.49	20.66	20.80	20.79
EGPRS	8PSK	1 Tx	17.50	16.63	16.79	16.78	-9.03	8.47	7.60	7.76	7.75
		2 Tx	17.50	16.39	16.52	16.53	-6.02	11.48	10.37	10.50	10.51
		3 Tx	17.50	16.11	16.24	16.21	-4.26	13.24	11.85	11.98	11.95
		4 Tx	17.50	16.06	16.03	16.01	-3.01	14.49	13.05	13.02	13.00

Table 13.2-2: The conducted power measurement results for GSM1900

GSM1900			Full power								
Mode	Modulation	Time Slot	Tune up (dBm)	Measure Power(dBm)			Devision Factor (dB)	Tune up Max	Average Power(dBm)		
				512/1850.2	661/1880	810/1909.8			512/1850.2	661/1880	810/1909.8
GPRS	GMSK	1 Tx	30.00	29.74	29.62	29.37	-9.03	20.97	20.71	20.59	20.34
		2 Tx	29.50	29.01	28.91	28.78	-6.02	23.48	22.99	22.89	22.76
		3 Tx	27.50	27.26	27.24	27.17	-4.26	23.24	23.00	22.98	22.91
		4 Tx	26.50	26.13	26.14	26.11	-3.01	23.49	23.12	23.13	23.10
EGPRS	8PSK	1 Tx	27.00	26.68	26.34	26.14	-9.03	17.97	17.65	17.31	17.11
		2 Tx	25.50	25.25	25.04	24.88	-6.02	19.48	19.23	19.02	18.86
		3 Tx	23.50	23.01	22.78	22.51	-4.26	19.24	18.75	18.52	18.25
		4 Tx	22.00	21.76	21.48	21.23	-3.01	18.99	18.75	18.47	18.22

GSM1900			Sensor on								
Mode	Modulation	Time Slot	Tune up (dBm)	Measure Power(dBm)			Devision Factor (dB)	Tune up Max	Average Power(dBm)		
				512/1850.2	661/1880	810/1909.8			512/1850.2	661/1880	810/1909.8
GPRS	GMSK	1 Tx	23.00	22.45	22.48	22.51	-9.03	13.97	13.42	13.45	13.48
		2 Tx	23.00	22.38	22.44	22.47	-6.02	16.98	16.36	16.42	16.45
		3 Tx	23.00	22.35	22.39	22.44	-4.26	18.74	18.09	18.13	18.18
		4 Tx	22.50	22.31	22.44	22.42	-3.01	19.99	19.30	19.37	19.41
EGPRS	8PSK	1 Tx	19.00	18.60	18.49	18.31	-9.03	9.97	9.57	9.46	9.28
		2 Tx	19.00	18.50	18.26	18.11	-6.02	12.98	12.48	12.24	12.09
		3 Tx	19.00	18.46	18.26	18.13	-4.26	14.74	14.20	14.00	13.87
		4 Tx	19.00	18.55	18.24	18.14	-3.01	15.99	15.54	15.23	15.13

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the body measurements are performed with 4Txslots for GSM850 and 4Txslots for GSM1900.

13.3 WCDMA Measurement result

Table 13.3-1: The conducted power for WCDMA Band Ⅱ

Full power					
WCDMA Band II		Maximum Conducted Power (dBm)			
Mode	Test Mode	Tune up	Channel/Frequency(MHz)		
			9262/1852.4	9400/1880	9538/1907.6
WCDMA	RMC	23.50	23.05	23.08	23.06
HSDPA	Subtest1	22.50	21.93	22.18	21.92
	Subtest2	22.50	22.11	22.02	22.02
	Subtest3	22.00	21.47	21.54	21.44
	Subtest4	22.00	21.61	21.70	21.46
HSUPA	Subtest1	20.50	20.15	20.04	20.04
	Subtest2	20.50	20.03	20.06	20.00
	Subtest3	21.50	21.11	21.08	21.22
	Subtest4	20.00	19.41	19.52	19.60
	Subtest5	21.50	21.11	20.96	21.20

Sensor on					
WCDMA Band II		Maximum Conducted Power (dBm)			
Mode	Test Mode	Tune up	Channel/Frequency(MHz)		
			9262/1852.4	9400/1880	9538/1907.6
WCDMA	RMC	18.50	18.07	18.03	18.02
HSDPA	Subtest1	17.50	17.11	17.11	17.08
	Subtest2	17.50	17.03	17.11	16.90
	Subtest3	17.50	16.61	16.47	16.68
	Subtest4	17.50	16.59	16.57	16.58
HSUPA	Subtest1	15.50	14.93	15.03	14.88
	Subtest2	15.50	14.93	14.89	15.08
	Subtest3	16.50	16.09	16.17	15.98
	Subtest4	15.50	14.63	14.59	14.36
	Subtest5	16.50	16.07	16.03	15.94

Table 13.3-2: The conducted power for WCDMA Band Ⅳ

Full power					
WCDMA BandⅣ		Maximum Conducted Power (dBm)			
Mode	Test Mode	Tune up	Channel/Frequency(MHz)		
			1312/1712.4	1413/1732.6	1513/1752.6
WCDMA	RMC	23.50	23.11	23.13	23.06
HSDPA	Subtest1	22.50	22.01	22.11	22.14
	Subtest2	22.50	22.05	22.25	21.90
	Subtest3	22.00	21.55	21.77	21.44
	Subtest4	22.00	21.55	21.55	21.44
HSUPA	Subtest1	20.50	20.25	20.17	20.06
	Subtest2	20.50	20.03	20.01	20.10
	Subtest3	21.50	21.01	21.09	21.16
	Subtest4	20.00	19.73	19.61	19.48
	Subtest5	21.50	20.99	21.07	21.18

Sensor on					
WCDMA BandⅣ		Maximum Conducted Power (dBm)			
Mode	Test Mode	Tune up	Channel/Frequency(MHz)		
			1312/1712.4	1413/1732.6	1513/1752.6
WCDMA	RMC	21.50	21.14	21.06	21.09
HSDPA	Subtest1	20.50	20.08	20.06	19.95
	Subtest2	20.50	20.18	19.94	19.97
	Subtest3	20.50	19.80	19.54	19.47
	Subtest4	20.00	19.64	19.56	19.43
HSUPA	Subtest1	18.50	18.00	18.18	17.99
	Subtest2	18.50	18.06	17.98	17.99
	Subtest3	19.50	19.18	19.16	19.25
	Subtest4	18.00	17.72	17.52	17.53
	Subtest5	19.50	19.06	19.18	18.99

Table 13.3-3: The conducted power for WCDMA Band Ⅴ

Full power					
WCDMA Band Ⅴ		Maximum Conducted Power (dBm)			
Mode	Test Mode	Tune up	Channel/Frequency(MHz)		
			4132/826.4	4183/836.6	4233/846.6
WCDMA	RMC	24.50	23.76	23.78	23.73
HSDPA	Subtest1	23.50	22.80	22.64	22.89
	Subtest2	23.50	22.76	22.74	22.85
	Subtest3	23.00	22.10	22.28	22.37
	Subtest4	22.50	22.24	22.24	22.27
HSUPA	Subtest1	21.50	20.74	20.82	20.73
	Subtest2	21.50	20.80	20.92	20.69
	Subtest3	22.00	21.66	21.64	21.63
	Subtest4	20.50	20.20	20.24	20.19
	Subtest5	22.50	21.62	21.86	21.75

Sensor on					
WCDMA Band Ⅴ		Maximum Conducted Power (dBm)			
Mode	Test Mode	Tune up	Channel/Frequency(MHz)		
			4132/826.4	4183/836.6	4233/846.6
WCDMA	RMC	21.50	20.65	20.66	20.65
HSDPA	Subtest1	20.00	19.49	19.68	19.61
	Subtest2	20.00	19.69	19.68	19.73
	Subtest3	20.00	19.17	19.30	19.27
	Subtest4	19.50	19.27	19.08	19.23
HSUPA	Subtest1	18.50	17.59	17.70	17.81
	Subtest2	18.00	17.63	17.76	17.51
	Subtest3	19.00	18.61	18.70	18.49
	Subtest4	17.50	17.27	17.12	17.13
	Subtest5	19.00	18.65	18.50	18.57

13.4 LTE Measurement result

Table 13.4-1: The conducted power for LTE Band 2

Full power						
LTE B2				Maximum Conducted Power (dBm)		
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				18607/1850.7	18900/1880	19193/1909.3
QPSK	1	Low	23.00	22.06	22.12	22.11
		Middle		22.29	22.27	22.25
		High		21.97	21.98	22.01
	50%	Low	23.00	22.19	22.33	22.28
		Middle		22.20	22.25	22.17
		High		22.17	22.27	22.05
	100%	/	22.00	21.27	21.38	21.25
16QAM	1	Low	22.00	21.41	21.57	21.52
		Middle		21.39	21.44	21.47
		High		21.40	21.37	21.31
	50%	Low	22.00	21.35	21.28	21.25
		Middle		21.33	21.26	21.35
		High		21.34	21.32	21.26
	100%	/	21.00	20.34	20.42	20.36
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				18615/1851.5	18900/1880	19185/1908.5
QPSK	1	Low	23.00	22.08	22.16	22.14
		Middle		22.27	22.30	22.29
		High		22.00	22.03	22.05
	50%	Low	22.00	21.29	21.55	21.41
		Middle		21.32	21.35	21.29
		High		21.27	21.38	21.15
	100%	/	22.00	21.27	21.42	21.28
16QAM	1	Low	22.00	21.44	21.59	21.55
		Middle		21.42	21.44	21.51
		High		21.42	21.41	21.34
	50%	Low	21.00	20.46	20.41	20.37
		Middle		20.44	20.39	20.47
		High		20.44	20.44	20.39
	100%	/	21.00	20.37	20.46	20.39
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				18625/1852.5	18900/1880	19175/1907.5

QPSK	1	Low	23.00	22.05	22.14	22.10
		Middle		22.35	22.31	22.26
		High		21.97	21.98	22.01
	50%	Low	22.00	21.26	21.50	21.37
		Middle		21.30	21.31	21.24
		High		21.25	21.36	21.11
	100%	/	22.00	21.27	21.41	21.26
16QAM	1	Low	22.00	21.41	21.55	21.52
		Middle		21.39	21.42	21.48
		High		21.39	21.39	21.30
	50%	Low	21.00	20.44	20.37	20.34
		Middle		20.41	20.34	20.43
		High		20.41	20.39	20.35
	100%	/	21.00	20.35	20.42	20.34
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				18650/1855	18900/1880	19150/1905
QPSK	1	Low	23.00	22.07	22.15	22.13
		Middle		22.31	22.21	22.30
		High		21.99	22.02	22.04
	50%	Low	22.00	21.29	21.55	21.41
		Middle		21.33	21.36	21.28
		High		21.27	21.40	21.16
	100%	/	22.00	21.31	21.43	21.30
16QAM	1	Low	22.00	21.43	21.58	21.54
		Middle		21.42	21.46	21.51
		High		21.42	21.41	21.33
	50%	Low	21.00	20.47	20.42	20.38
		Middle		20.43	20.38	20.46
		High		20.44	20.44	20.39
	100%	/	21.00	20.38	20.47	20.38
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				18675/1857.5	18900/1880	19125/1902.5
QPSK	1	Low	23.00	22.06	22.11	22.11
		Middle		22.33	22.34	22.27
		High		21.96	21.97	22.00
	50%	Low	22.00	21.27	21.51	21.38
		Middle		21.30	21.31	21.24
		High		21.24	21.37	21.12
	100%	/	22.00	21.29	21.39	21.25
16QAM	1	Low	22.00	21.38	21.56	21.52

		Middle		21.40	21.43	21.49
		High		21.39	21.37	21.30
	50%	Low	21.00	20.44	20.40	20.35
		Middle		20.40	20.33	20.42
		High		20.42	20.40	20.36
	100%	/	21.00	20.35	20.42	20.34
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				18700/1860	18900/1880	19100/1900
QPSK	1	Low	23.00	22.03	22.07	22.08
		Middle		22.35	22.36	22.25
		High		21.94	21.96	21.97
	50%	Low	22.00	21.24	21.56	21.34
		Middle		21.28	21.27	21.21
		High		21.21	21.32	21.08
	100%	/	22.00	21.26	21.34	21.21
16QAM	1	Low	22.00	21.46	21.52	21.47
		Middle		21.36	21.41	21.45
		High		21.37	21.34	21.28
	50%	Low	21.00	20.41	20.36	20.32
		Middle		20.37	20.31	20.39
		High		20.39	20.35	20.32
	100%	/	21.00	20.33	20.38	20.31

Sensor on						
LTE B2			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				18607/1850.7	18900/1880	19193/1909.3
QPSK	1	Low	18.00	17.14	17.17	17.07
		Middle		17.29	17.27	17.28
		High		16.90	17.01	16.91
	50%	Low	18.00	17.09	17.21	17.15
		Middle		17.09	17.05	17.00
		High		17.07	17.08	17.08
	100%	/	18.00	17.09	17.17	17.12
16QAM	1	Low	18.00	17.06	17.03	16.97
		Middle		17.04	17.08	17.04
		High		17.12	17.17	17.06
	50%	Low	18.00	17.11	17.03	17.29
		Middle		17.11	17.16	17.11
		High		17.27	17.15	17.26
	100%	/	18.00	16.92	16.99	16.92

Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				18615/1851.5	18900/1880	19185/1908.5
QPSK	1	Low	18.00	17.16	17.21	17.10
		Middle		17.27	17.30	17.32
		High		16.93	17.06	16.95
	50%	Low	18.00	17.27	17.27	17.24
		Middle		17.17	17.27	17.20
		High		17.17	17.23	17.20
	100%	/	18.00	17.09	17.21	17.15
16QAM	1	Low	18.00	17.09	17.05	17.00
		Middle		17.07	17.08	17.08
		High		17.14	17.21	17.09
	50%	Low	18.00	17.22	17.16	17.11
		Middle		17.22	17.29	17.23
		High		16.87	16.97	16.89
	100%	/	18.00	16.95	17.03	16.95
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				18625/1852.5	18900/1880	19175/1907.5
QPSK	1	Low	18.00	17.13	17.19	17.06
		Middle		17.25	17.35	17.29
		High		16.90	17.01	16.91
	50%	Low	18.00	17.24	17.22	17.20
		Middle		17.15	17.23	17.15
		High		17.15	17.21	17.16
	100%	/	18.00	17.09	17.20	17.13
16QAM	1	Low	18.00	17.06	17.01	16.97
		Middle		17.04	17.06	17.05
		High		17.11	17.19	17.05
	50%	Low	18.00	17.20	17.12	17.08
		Middle		17.19	17.24	17.19
		High		16.84	16.92	16.85
	100%	/	18.00	16.93	16.99	16.90
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				18650/1855	18900/1880	19150/1905
QPSK	1	Low	18.00	17.15	17.20	17.09
		Middle		17.28	17.31	17.33
		High		16.92	17.05	16.94
	50%	Low	18.00	17.27	17.27	17.24
		Middle		17.18	17.23	17.19

		High		17.17	17.25	17.21
	100%	/	18.00	17.13	17.22	17.17
16QAM	1	Low	18.00	17.08	17.04	16.99
		Middle		17.07	17.10	17.08
		High		17.14	17.21	17.08
	50%	Low	18.00	17.23	17.17	17.12
		Middle		17.21	17.23	17.22
		High		16.87	16.97	16.89
	100%	/	18.00	16.96	17.04	16.94
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				18675/1857.5	18900/1880	19125/1902.5
QPSK	1	Low	18.00	17.14	17.16	17.07
		Middle		17.26	17.30	17.30
		High		16.89	17.00	16.90
	50%	Low	18.00	17.25	17.23	17.21
		Middle		17.15	17.23	17.15
		High		17.14	17.22	17.17
	100%	/	18.00	17.11	17.18	17.12
16QAM	1	Low	18.00	17.03	17.02	16.97
		Middle		17.05	17.07	17.06
		High		17.11	17.17	17.05
	50%	Low	18.00	17.20	17.15	17.09
		Middle		17.18	17.23	17.18
		High		16.85	16.93	16.86
	100%	/	18.00	16.93	16.99	16.90
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				18700/1860	18900/1880	19100/1900
QPSK	1	Low	18.00	17.11	17.12	17.04
		Middle		17.25	17.36	17.28
		High		16.87	16.99	16.87
	50%	Low	18.00	17.22	17.28	17.17
		Middle		17.13	17.19	17.12
		High		17.11	17.17	17.13
	100%	/	18.00	17.08	17.13	17.08
16QAM	1	Low	18.00	16.92	16.98	16.92
		Middle		17.01	17.05	17.02
		High		17.09	17.14	17.03
	50%	Low	18.00	17.17	17.11	17.06
		Middle		17.15	17.21	17.15
		High		16.82	16.88	16.82

	100%	/	18.00	16.91	16.95	16.87

Table 13.4-2: The conducted power for LTE Band 4

Full power						
LTE B4			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
QPSK	1	Low	23.00	21.97	22.02	21.88
		Middle		22.09	22.07	22.15
		High		21.75	21.79	21.82
	50%	Low	23.00	22.09	22.15	22.09
		Middle		22.09	22.12	22.10
		High		21.98	22.03	22.01
	100%	/	22.00	21.04	21.13	21.07
16QAM	1	Low	22.00	21.18	21.33	21.27
		Middle		21.16	21.22	21.14
		High		21.19	21.28	21.31
	50%	Low	22.00	21.06	21.09	21.06
		Middle		21.07	21.10	21.07
		High		21.07	20.98	20.86
	100%	/	21.00	20.19	20.10	20.07
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
QPSK	1	Low	23.00	21.99	22.06	21.91
		Middle		22.07	22.09	22.04
		High		21.78	21.84	21.86
	50%	Low	22.00	21.19	21.28	21.22
		Middle		21.21	21.22	21.25
		High		21.08	21.14	21.11
	100%	/	22.00	21.04	21.17	21.10
16QAM	1	Low	22.00	21.21	21.35	21.30
		Middle		21.19	21.22	21.18
		High		21.21	21.32	21.34
	50%	Low	21.00	20.17	20.22	20.18
		Middle		20.18	20.23	20.19
		High		20.17	20.10	19.99
	100%	/	21.00	20.22	20.14	20.10
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		

				19975/1712.5	20175/1732.5	20375/1752.5
QPSK	1	Low	23.00	21.96	22.04	21.87
		Middle		22.05	22.06	22.07
		High		21.75	21.79	21.82
	50%	Low	22.00	21.16	21.23	21.18
		Middle		21.19	21.28	21.17
		High		21.06	21.12	21.07
	100%	/	22.00	21.04	21.16	21.08
16QAM	1	Low	22.00	21.18	21.31	21.27
		Middle		21.16	21.20	21.15
		High		21.18	21.30	21.30
	50%	Low	21.00	20.15	20.18	20.15
		Middle		20.15	20.18	20.15
		High		20.14	20.05	19.95
	100%	/	21.00	20.20	20.10	20.05
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20000/1715	20175/1732.5	20350/1750
QPSK	1	Low	23.00	21.98	22.05	21.90
		Middle		22.08	22.14	22.12
		High		21.77	21.83	21.85
	50%	Low	22.00	21.19	21.28	21.22
		Middle		21.22	21.23	21.21
		High		21.08	21.16	21.12
	100%	/	22.00	21.08	21.18	21.12
16QAM	1	Low	22.00	21.20	21.34	21.29
		Middle		21.19	21.24	21.18
		High		21.21	21.32	21.33
	50%	Low	21.00	20.18	20.23	20.19
		Middle		20.17	20.22	20.18
		High		20.17	20.10	19.99
	100%	/	21.00	20.23	20.15	20.09
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
QPSK	1	Low	23.00	21.97	22.01	21.88
		Middle		22.06	22.11	22.07
		High		21.74	21.78	21.81
	50%	Low	22.00	21.17	21.24	21.19
		Middle		21.19	21.28	21.17
		High		21.05	21.13	21.08
	100%	/	22.00	21.06	21.14	21.07

16QAM	1	Low	22.00	21.15	21.32	21.27
		Middle		21.17	21.21	21.16
		High		21.18	21.28	21.30
	50%	Low	21.00	20.15	20.21	20.16
		Middle		20.14	20.17	20.14
		High		20.15	20.06	19.96
	100%	/	21.00	20.20	20.10	20.05
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				20050/1720	20175/1732.5	20300/1745
QPSK	1	Low	23.00	21.94	21.97	21.85
		Middle		22.05	22.16	22.15
		High		21.72	21.77	21.78
	50%	Low	22.00	21.14	21.29	21.15
		Middle		21.11	21.24	21.14
		High		21.02	21.08	21.04
	100%	/	22.00	21.03	21.09	21.03
16QAM	1	Low	22.00	21.16	21.28	21.22
		Middle		21.13	21.19	21.12
		High		21.16	21.25	21.28
	50%	Low	21.00	20.12	20.17	20.13
		Middle		20.11	20.15	20.11
		High		20.12	20.01	19.92
	100%	/	21.00	20.18	20.06	20.02
Sensor on						
LTE B4			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				19957/1710.7	20175/1732.5	20393/1754.3
QPSK	1	Low	20.00	19.04	19.10	19.11
		Middle		19.19	19.23	19.17
		High		19.14	19.03	18.97
	50%	Low	20.00	19.05	19.10	19.04
		Middle		19.14	19.06	19.16
		High		19.05	19.15	19.04
	100%	/	20.00	19.16	19.25	19.22
16QAM	1	Low	20.00	19.07	19.17	19.12
		Middle		19.05	19.10	19.04
		High		19.14	19.06	19.16
	50%	Low	20.00	19.07	19.17	19.12
		Middle		19.08	19.12	19.04
		High		19.12	19.06	19.11

	100%	/	20.00	19.10	19.06	19.12
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				19965/1711.5	20175/1732.5	20385/1753.5
QPSK	1	Low	20.00	19.06	19.14	19.14
		Middle		19.17	19.26	19.21
		High		19.17	19.08	19.01
	50%	Low	20.00	19.19	19.22	19.23
		Middle		19.26	19.17	19.21
		High		19.25	19.20	19.15
	100%	/	20.00	19.16	19.19	19.25
16QAM	1	Low	20.00	19.10	19.19	19.15
		Middle		19.08	19.10	19.08
		High		19.16	19.10	19.19
	50%	Low	20.00	19.12	19.18	19.23
		Middle		19.19	19.27	19.21
		High		19.08	19.18	19.22
	100%	/	20.00	19.13	19.10	19.15
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				19975/1712.5	20175/1732.5	20375/1752.5
QPSK	1	Low	20.00	19.03	19.12	19.10
		Middle		19.15	19.22	19.18
		High		19.14	19.03	18.97
	50%	Low	20.00	19.16	19.27	19.19
		Middle		19.24	19.23	19.26
		High		19.23	19.18	19.11
	100%	/	20.00	19.16	19.28	19.23
16QAM	1	Low	20.00	19.07	19.15	19.12
		Middle		19.05	19.08	19.05
		High		19.13	19.08	19.15
	50%	Low	20.00	19.10	19.14	19.20
		Middle		19.16	19.22	19.17
		High		19.05	19.13	19.18
	100%	/	20.00	19.11	19.06	19.10
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20000/1715	20175/1732.5	20350/1750
QPSK	1	Low	20.00	19.05	19.13	19.13
		Middle		19.18	19.27	19.22
		High		19.16	19.07	19.00
	50%	Low	20.00	19.19	19.12	19.23

		Middle		19.27	19.18	19.20
		High		19.25	19.22	19.16
	100%	/	20.00	19.20	19.20	19.27
16QAM	1	Low	20.00	19.09	19.18	19.14
		Middle		19.08	19.12	19.08
		High		19.16	19.10	19.18
	50%	Low	20.00	19.13	19.19	19.24
		Middle		19.18	19.26	19.20
		High		19.08	19.18	19.22
	100%	/	20.00	19.14	19.11	19.14
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				20025/1717.5	20175/1732.5	20325/1747.5
QPSK	1	Low	20.00	19.04	19.09	19.11
		Middle		19.16	19.26	19.19
		High		19.13	19.02	18.96
	50%	Low	20.00	19.17	19.28	19.20
		Middle		19.24	19.23	19.26
		High		19.22	19.19	19.12
	100%	/	20.00	19.18	19.26	19.22
16QAM	1	Low	20.00	19.04	19.16	19.12
		Middle		19.06	19.09	19.06
		High		19.13	19.06	19.15
	50%	Low	20.00	19.10	19.17	19.21
		Middle		19.15	19.21	19.16
		High		19.06	19.14	19.19
	100%	/	20.00	19.11	19.06	19.10
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				20050/1720	20175/1732.5	20300/1745
QPSK	1	Low	20.00	19.01	19.05	19.08
		Middle		19.15	19.22	19.17
		High		19.11	19.01	18.93
	50%	Low	20.00	19.22	19.29	19.23
		Middle		19.21	19.28	19.20
		High		19.19	19.14	19.08
	100%	/	20.00	19.15	19.21	19.18
16QAM	1	Low	20.00	19.06	19.12	19.07
		Middle		19.02	19.07	19.02
		High		19.11	19.03	19.13
	50%	Low	20.00	19.07	19.13	19.18
		Middle		19.12	19.19	19.13

		High		19.03	19.09	19.15
	100%	/	20.00	19.09	19.02	19.07

Table 13.4-3: The conducted power for LTE Band 5

Full power						
LTE B5			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				20407/824.7	20525/836.5	20643/848.3
QPSK	1	Low	23.50	22.31	22.44	21.94
		Middle		22.42	22.36	21.94
		High		22.42	22.37	21.93
	50%	Low	23.50	22.37	22.44	22.36
		Middle		22.33	22.44	22.37
		High		22.27	22.30	22.24
	100%	/	22.50	21.29	21.40	21.45
16QAM	1	Low	22.50	21.47	21.46	21.51
		Middle		21.45	21.50	21.43
		High		21.51	21.49	21.48
	50%	Low	22.50	21.28	21.37	21.46
		Middle		21.45	21.36	21.44
		High		21.42	21.38	21.43
	100%	/	21.50	20.33	20.41	20.37
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				20415/825.5	20525/836.5	20635/847.5
QPSK	1	Low	23.50	22.32	22.37	21.96
		Middle		22.41	22.40	21.99
		High		22.44	22.41	21.96
	50%	Low	22.50	21.47	21.56	21.49
		Middle		21.46	21.55	21.48
		High		21.37	21.43	21.35
	100%	/	22.50	21.33	21.45	21.50
16QAM	1	Low	22.50	21.49	21.47	21.53
		Middle		21.48	21.52	21.47
		High		21.53	21.53	21.50
	50%	Low	21.50	20.40	20.51	20.59
		Middle		20.55	20.48	20.55
		High		20.52	20.50	20.56
	100%	/	21.50	20.37	20.46	20.39
Modulation	RB	RB Offset	Tune up	5MHz		

				Channel/Frequency(MHz)		
				20425/826.5	20525/836.5	20625/846.5
QPSK	1	Low	23.50	22.31	22.43	21.94
		Middle		22.39	22.39	21.96
		High		22.41	22.36	21.92
	50%	Low	22.50	21.45	21.52	21.46
		Middle		21.43	21.50	21.44
		High		21.34	21.40	21.31
	100%	/	22.50	21.31	21.41	21.45
16QAM	1	Low	22.50	21.44	21.45	21.51
		Middle		21.46	21.49	21.45
		High		21.50	21.49	21.47
	50%	Low	21.50	20.37	20.49	20.56
		Middle		20.52	20.43	20.51
		High		20.50	20.46	20.53
	100%	/	21.50	20.34	20.41	20.35
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20450/829	20525/836.5	20600/844
QPSK	1	Low	23.50	22.28	22.39	21.91
		Middle		22.38	22.45	21.94
		High		22.39	22.35	21.89
	50%	Low	22.50	21.42	21.57	21.42
		Middle		21.41	21.46	21.41
		High		21.31	21.35	21.27
	100%	/	22.50	21.28	21.36	21.41
16QAM	1	Low	22.50	21.48	21.41	21.46
		Middle		21.42	21.47	21.41
		High		21.48	21.46	21.45
	50%	Low	21.50	20.34	20.45	20.53
		Middle		20.49	20.41	20.48
		High		20.47	20.41	20.49
	100%	/	21.50	20.32	20.37	20.32
Sensor on						
LTE B5			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				20407/824.7	20525/836.5	20643/848.3
QPSK	1	Low	21.00	20.48	20.48	20.51
		Middle		20.41	20.47	20.51
		High		20.39	20.43	20.52
	50%	Low	21.00	20.36	20.54	20.46

		Middle		20.30	20.54	20.44
		High		20.20	20.32	20.28
	100%	/	21.00	20.27	20.43	20.36
16QAM	1	Low	21.00	20.43	20.41	20.33
		Middle		20.41	20.28	20.31
		High		20.44	20.49	20.40
	50%	Low	21.00	20.46	20.33	20.21
		Middle		20.41	20.28	20.23
		High		20.44	20.35	20.35
	100%	/	21.00	20.40	20.37	20.51
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				20415/825.5	20525/836.5	20635/847.5
QPSK	1	Low	21.00	20.49	20.51	20.53
		Middle		20.50	20.51	20.55
		High		20.41	20.47	20.55
	50%	Low	21.00	20.46	20.56	20.49
		Middle		20.43	20.55	20.55
		High		20.30	20.45	20.39
	100%	/	21.00	20.31	20.48	20.41
16QAM	1	Low	21.00	20.45	20.42	20.35
		Middle		20.44	20.30	20.35
		High		20.46	20.53	20.42
	50%	Low	21.00	20.48	20.47	20.34
		Middle		20.51	20.40	20.34
		High		20.54	20.47	20.48
	100%	/	21.00	20.44	20.42	20.53
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				20425/826.5	20525/836.5	20625/846.5
QPSK	1	Low	21.00	20.48	20.47	20.51
		Middle		20.48	20.50	20.53
		High		20.38	20.42	20.51
	50%	Low	21.00	20.44	20.52	20.56
		Middle		20.40	20.50	20.51
		High		20.27	20.42	20.35
	100%	/	21.00	20.29	20.44	20.36
16QAM	1	Low	21.00	20.40	20.40	20.33
		Middle		20.42	20.27	20.33
		High		20.43	20.49	20.39
	50%	Low	21.00	20.55	20.45	20.31
		Middle		20.48	20.35	20.30

		High		20.52	20.43	20.45
	100%	/	21.00	20.41	20.37	20.49
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20450/829	20525/836.5	20600/844
QPSK	1	Low	21.00	20.45	20.53	20.48
		Middle		20.47	20.56	20.51
		High		20.36	20.41	20.48
	50%	Low	21.00	20.41	20.57	20.52
		Middle		20.38	20.56	20.48
		High		20.24	20.37	20.31
	100%	/	21.00	20.26	20.39	20.32
16QAM	1	Low	21.00	20.41	20.36	20.28
		Middle		20.38	20.25	20.29
		High		20.41	20.46	20.37
	50%	Low	21.00	20.52	20.41	20.28
		Middle		20.45	20.33	20.27
		High		20.49	20.38	20.41
	100%	/	21.00	20.39	20.33	20.46

Table 13.4-4: The conducted Power for LTE Band 7

Full power						
LTE B7			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				20775/2502.5	21100/2535	21425/2567.5
QPSK	1	Low	23.50	22.19	22.08	22.16
		Middle		22.54	22.47	22.48
		High		22.34	22.29	22.22
	50%	Low	22.50	21.44	21.52	21.46
		Middle		21.38	21.51	21.40
		High		21.41	21.49	21.42
	100%	/	22.50	21.43	21.54	21.40
16QAM	1	Low	22.50	21.50	21.35	21.44
		Middle		21.48	21.54	21.45
		High		21.37	21.49	21.39
	50%	Low	21.50	20.44	20.53	20.43
		Middle		20.48	20.51	20.43
		High		20.61	20.58	20.51
	100%	/	21.50	20.48	20.63	20.47
Modulation	RB	RB Offset	Tune up	10MHz		

				Channel/Frequency(MHz)		
				20800/2505	21100/2535	21400/2565
QPSK	1	Low	23.50	22.21	22.09	22.19
		Middle		22.47	22.52	22.52
		High		22.36	22.33	22.25
	50%	Low	22.50	21.47	21.57	21.50
		Middle		21.41	21.56	21.44
		High		21.43	21.53	21.47
	100%	/	22.50	21.47	21.56	21.44
16QAM	1	Low	22.50	21.52	21.38	21.46
		Middle		21.51	21.58	21.48
		High		21.40	21.51	21.42
	50%	Low	21.50	20.47	20.58	20.47
		Middle		20.50	20.55	20.46
		High		20.64	20.63	20.55
	100%	/	21.50	20.51	20.68	20.51
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				20825/2507.5	21100/2535	21375/2562.5
QPSK	1	Low	23.50	22.20	22.05	22.17
		Middle		22.55	22.51	22.49
		High		22.33	22.28	22.21
	50%	Low	22.50	21.45	21.53	21.47
		Middle		21.38	21.51	21.40
		High		21.40	21.50	21.43
	100%	/	22.50	21.45	21.52	21.39
16QAM	1	Low	22.50	21.47	21.36	21.44
		Middle		21.49	21.55	21.46
		High		21.37	21.47	21.39
	50%	Low	21.50	20.44	20.56	20.44
		Middle		20.47	20.50	20.42
		High		20.62	20.59	20.52
	100%	/	21.50	20.48	20.63	20.47
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				20850/2510	21100/2535	21350/2560
QPSK	1	Low	23.50	22.17	22.01	22.14
		Middle		22.54	22.57	22.47
		High		22.31	22.27	22.18
	50%	Low	22.50	21.42	21.58	21.43
		Middle		21.36	21.47	21.37
		High		21.37	21.45	21.39

	100%	/	22.50	21.42	21.47	21.35
16QAM	1	Low	22.50	21.39	21.32	21.39
		Middle		21.45	21.53	21.42
		High		21.35	21.44	21.37
	50%	Low	21.50	20.41	20.52	20.41
		Middle		20.44	20.48	20.39
		High		20.59	20.54	20.48
	100%	/	21.50	20.46	20.59	20.44
Sensor on						
LTE B7			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				20775/2502.5	21100/2535	21425/2567.5
QPSK	1	Low	16.50	15.58	15.73	15.59
		Middle		15.98	16.05	15.89
		High		15.74	15.77	15.66
	50%	Low	16.50	15.78	16.06	15.82
		Middle		15.88	15.98	15.87
		High		15.86	15.96	15.82
	100%	/	16.50	15.90	16.02	15.92
16QAM	1	Low	16.50	15.78	15.92	15.84
		Middle		15.76	15.84	15.81
		High		15.75	15.90	15.78
	50%	Low	16.50	15.72	15.80	15.75
		Middle		15.70	15.78	15.72
		High		15.81	15.90	15.84
	100%	/	16.50	15.70	15.86	15.81
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				20800/2505	21100/2535	21400/2565
QPSK	1	Low	16.50	15.60	15.74	15.62
		Middle		16.01	16.04	15.93
		High		15.76	15.81	15.69
	50%	Low	16.50	15.81	15.95	15.86
		Middle		15.91	16.03	15.91
		High		15.88	16.00	15.87
	100%	/	16.50	15.94	16.01	15.96
16QAM	1	Low	16.50	15.80	15.95	15.86
		Middle		15.79	15.88	15.84
		High		15.78	15.92	15.81
	50%	Low	16.50	15.75	15.85	15.79
		Middle		15.72	15.82	15.75

		High		15.84	15.95	15.88
	100%	/	16.50	15.73	15.91	15.85
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				20825/2507.5	21100/2535	21375/2562.5
QPSK	1	Low	16.50	15.59	15.70	15.60
		Middle		15.99	16.01	15.90
		High		15.73	15.76	15.65
	50%	Low	16.50	15.79	16.01	15.83
		Middle		15.88	15.98	15.87
		High		15.85	15.97	15.83
	100%	/	16.50	15.92	16.02	15.91
16QAM	1	Low	16.50	15.75	15.93	15.84
		Middle		15.77	15.85	15.82
		High		15.75	15.88	15.78
	50%	Low	16.50	15.72	15.83	15.76
		Middle		15.69	15.77	15.71
		High		15.82	15.91	15.85
	100%	/	16.50	15.70	15.86	15.81
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				20850/2510	21100/2535	21350/2560
QPSK	1	Low	16.50	15.56	15.66	15.57
		Middle		15.98	16.05	15.88
		High		15.71	15.75	15.62
	50%	Low	16.50	15.76	16.02	15.79
		Middle		15.71	15.94	15.78
		High		15.70	15.92	15.75
	100%	/	16.50	15.89	16.01	15.87
16QAM	1	Low	16.50	15.81	15.89	15.79
		Middle		15.73	15.83	15.78
		High		15.73	15.85	15.76
	50%	Low	16.50	15.69	15.79	15.73
		Middle		15.66	15.75	15.68
		High		15.79	15.86	15.81
	100%	/	16.50	15.68	15.82	15.78

Table 13.4-5: The conducted Power for LTE Band 26

Full power				
LTE B26			**Maximum Conducted Power (dBm)**	
Modulation	RB	RB Offset	Tune up	1.4MHz

				Channel/Frequency(MHz)		
				26697/814.7	26865/831.5	27033/848.3
QPSK	1	Low	23.50	22.40	22.33	22.43
		Middle		22.37	22.36	22.36
		High		22.35	22.38	22.36
	50%	Low	23.50	22.49	22.55	22.39
		Middle		22.38	22.54	22.47
		High		22.48	22.49	22.44
	100%	/	22.50	21.42	21.52	21.45
16QAM	1	Low	22.50	21.58	21.60	21.51
		Middle		21.56	21.57	21.48
		High		21.39	21.51	21.35
	50%	Low	22.50	21.30	21.37	21.46
		Middle		21.45	21.37	21.52
		High		21.42	21.39	21.29
	100%	/	21.50	20.46	20.56	20.53
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				26705/815.5	26865/831.5	27025/847.5
QPSK	1	Low	23.50	22.39	22.35	22.42
		Middle		22.33	22.35	22.37
		High		22.35	22.38	22.36
	50%	Low	22.50	21.56	21.52	21.48
		Middle		21.48	21.50	21.54
		High		21.56	21.48	21.50
	100%	/	22.50	21.42	21.55	21.46
16QAM	1	Low	22.50	21.58	21.58	21.51
		Middle		21.56	21.55	21.49
		High		21.38	21.53	21.34
	50%	Low	21.50	20.39	20.46	20.55
		Middle		20.53	20.45	20.60
		High		20.49	20.46	20.38
	100%	/	21.50	20.47	20.56	20.51
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				26715/816.5	26865/831.5	27015/846.5
QPSK	1	Low	23.50	22.41	22.36	22.45
		Middle		22.36	22.40	22.41
		High		22.37	22.42	22.39
	50%	Low	22.50	21.49	21.57	21.52
		Middle		21.51	21.55	21.48
		High		21.48	21.52	21.55

	100%	/	22.50	21.46	21.57	21.50
16QAM	1	Low	22.50	21.60	21.61	21.53
		Middle		21.59	21.59	21.52
		High		21.41	21.55	21.37
	50%	Low	21.50	20.42	20.51	20.59
		Middle		20.55	20.49	20.63
		High		20.52	20.51	20.42
	100%	/	21.50	20.50	20.61	20.55
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				26740/819	26865/831.5	26990/844
QPSK	1	Low	23.50	22.40	22.32	22.43
		Middle		22.34	22.39	22.38
		High		22.34	22.37	22.35
	50%	Low	22.50	21.57	21.53	21.49
		Middle		21.48	21.50	21.54
		High		21.55	21.49	21.51
	100%	/	22.50	21.44	21.53	21.45
16QAM	1	Low	22.50	21.55	21.59	21.51
		Middle		21.57	21.56	21.50
		High		21.38	21.51	21.34
	50%	Low	21.50	20.39	20.49	20.56
		Middle		20.52	20.44	20.59
		High		20.50	20.47	20.39
	100%	/	21.50	20.47	20.56	20.51
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				26765/821.5	26865/831.5	26965/841.5
QPSK	1	Low	23.50	22.37	22.28	22.40
		Middle		22.33	22.45	22.36
		High		22.32	22.36	22.32
	50%	Low	22.50	21.54	21.58	21.45
		Middle		21.46	21.56	21.51
		High		21.52	21.54	21.47
	100%	/	22.50	21.41	21.48	21.41
16QAM	1	Low	22.50	21.47	21.55	21.46
		Middle		21.53	21.54	21.46
		High		21.36	21.48	21.32
	50%	Low	21.50	20.36	20.45	20.53
		Middle		20.49	20.42	20.56
		High		20.47	20.42	20.35
	100%	/	21.50	20.45	20.52	20.48

Sensor on						
LTE B26			Maximum Conducted Power (dBm)			
Modulation	RB	RB Offset	Tune up	1.4MHz		
				Channel/Frequency(MHz)		
				26697/814.7	26865/831.5	27033/848.3
QPSK	1	Low	21.00	20.72	20.84	20.78
		Middle		20.86	20.78	20.78
		High		20.79	20.78	20.82
	50%	Low	21.00	20.41	20.56	20.41
		Middle		20.44	20.55	20.40
		High		20.42	20.48	20.40
	100%	/	21.00	20.46	20.55	20.45
16QAM	1	Low	21.00	20.40	20.46	20.42
		Middle		20.38	20.50	20.37
		High		20.45	20.41	20.28
	50%	Low	21.00	20.33	20.26	20.32
		Middle		20.43	20.36	20.31
		High		20.37	20.35	20.26
	100%	/	21.00	20.46	20.38	20.32
Modulation	RB	RB Offset	Tune up	3MHz		
				Channel/Frequency(MHz)		
				26705/815.5	26865/831.5	27025/847.5
QPSK	1	Low	21.00	20.71	20.86	20.87
		Middle		20.82	20.77	20.79
		High		20.79	20.78	20.82
	50%	Low	21.00	20.48	20.53	20.50
		Middle		20.54	20.51	20.47
		High		20.50	20.57	20.46
	100%	/	21.00	20.46	20.58	20.46
16QAM	1	Low	21.00	20.40	20.44	20.42
		Middle		20.38	20.48	20.38
		High		20.44	20.43	20.27
	50%	Low	21.00	20.42	20.35	20.41
		Middle		20.51	20.44	20.39
		High		20.44	20.42	20.35
	100%	/	21.00	20.47	20.38	20.30
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				26715/816.5	26865/831.5	27015/846.5
QPSK	1	Low	21.00	20.73	20.87	20.80
		Middle		20.85	20.82	20.83

		High		20.81	20.82	20.85
	50%	Low	21.00	20.51	20.58	20.54
		Middle		20.57	20.56	20.51
		High		20.52	20.51	20.51
	100%	/	21.00	20.50	20.60	20.50
16QAM	1	Low	21.00	20.42	20.47	20.44
		Middle		20.41	20.52	20.41
		High		20.47	20.45	20.30
	50%	Low	21.00	20.45	20.40	20.45
		Middle		20.53	20.48	20.42
		High		20.47	20.47	20.39
	100%	/	21.00	20.50	20.43	20.34
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				26740/819	26865/831.5	26990/844
QPSK	1	Low	21.00	20.72	20.83	20.78
		Middle		20.83	20.81	20.80
		High		20.78	20.77	20.81
	50%	Low	21.00	20.49	20.54	20.51
		Middle		20.54	20.51	20.47
		High		20.49	20.58	20.47
	100%	/	21.00	20.48	20.56	20.45
16QAM	1	Low	21.00	20.37	20.45	20.42
		Middle		20.39	20.49	20.39
		High		20.44	20.41	20.27
	50%	Low	21.00	20.42	20.38	20.42
		Middle		20.50	20.43	20.38
		High		20.45	20.43	20.36
	100%	/	21.00	20.47	20.38	20.30
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				26765/821.5	26865/831.5	26965/841.5
QPSK	1	Low	21.00	20.69	20.79	20.85
		Middle		20.82	20.87	20.78
		High		20.76	20.86	20.78
	50%	Low	21.00	20.46	20.59	20.47
		Middle		20.52	20.57	20.44
		High		20.46	20.53	20.43
	100%	/	21.00	20.45	20.51	20.41
16QAM	1	Low	21.00	20.37	20.41	20.37
		Middle		20.35	20.47	20.35
		High		20.42	20.38	20.25

	50%	Low	21.00	20.39	20.34	20.39
		Middle		20.47	20.41	20.35
		High		20.42	20.38	20.32
	100%	/	21.00	20.45	20.34	20.27

Table 13.4-6: The conducted Power for LTE Band 38

Full power						
LTE B38			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				37775/2572.5	38000/2595	38225/2617.5
QPSK	1	Low	24.00	22.56	22.34	22.17
		Middle		22.51	22.55	22.59
		High		22.38	22.34	22.33
	50%	Low	23.00	21.38	21.43	21.39
		Middle		21.44	21.42	21.44
		High		21.40	21.41	21.45
	100%	/	23.00	21.43	21.42	21.48
16QAM	1	Low	23.00	21.51	21.31	21.27
		Middle		21.49	21.44	21.46
		High		21.34	21.43	21.28
	50%	Low	22.00	20.47	20.50	20.43
		Middle		20.50	20.55	20.50
		High		20.45	20.55	20.38
	100%	/	22.00	20.43	20.56	20.40
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				37800/2575	38000/2595	38200/2615
QPSK	1	Low	24.00	22.58	22.35	22.20
		Middle		22.54	22.60	22.53
		High		22.40	22.38	22.36
	50%	Low	23.00	21.41	21.48	21.43
		Middle		21.47	21.47	21.48
		High		21.42	21.45	21.40
	100%	/	23.00	21.47	21.44	21.42
16QAM	1	Low	23.00	21.43	21.34	21.29
		Middle		21.42	21.48	21.49
		High		21.37	21.45	21.31
	50%	Low	22.00	20.50	20.55	20.47
		Middle		20.52	20.59	20.53
		High		20.48	20.60	20.42

	100%	/	22.00	20.46	20.61	20.44
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				37825/2577.5	38000/2595	38175/2612.5
QPSK	1	Low	24.00	22.57	22.31	22.18
		Middle		22.52	22.59	22.50
		High		22.37	22.33	22.32
	50%	Low	23.00	21.39	21.44	21.40
		Middle		21.44	21.42	21.44
		High		21.39	21.42	21.46
	100%	/	23.00	21.45	21.40	21.47
16QAM	1	Low	23.00	21.48	21.32	21.27
		Middle		21.40	21.45	21.47
		High		21.34	21.41	21.28
	50%	Low	22.00	20.47	20.53	20.44
		Middle		20.49	20.54	20.49
		High		20.46	20.56	20.39
	100%	/	22.00	20.43	20.56	20.40
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				37850/2580	38000/2595	38150/2610
QPSK	1	Low	24.00	22.64	22.27	22.15
		Middle		22.51	22.65	22.58
		High		22.35	22.32	22.29
	50%	Low	23.00	21.36	21.49	21.36
		Middle		21.42	21.48	21.41
		High		21.36	21.47	21.42
	100%	/	23.00	21.42	21.45	21.43
16QAM	1	Low	23.00	21.21	21.28	21.22
		Middle		21.46	21.43	21.43
		High		21.32	21.38	21.26
	50%	Low	22.00	20.44	20.49	20.41
		Middle		20.46	20.52	20.46
		High		20.43	20.51	20.35
	100%	/	22.00	20.41	20.52	20.37
Sensor on						
LTE B38			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				37775/2572.5	38000/2595	38225/2617.5
QPSK	1	Low	18.00	16.69	16.79	16.69
		Middle		17.01	17.04	17.06

		High		16.85	16.91	16.98
	50%	Low	18.00	16.74	16.83	16.88
		Middle		16.91	17.11	17.14
		High		17.02	17.06	17.16
	100%	/	18.00	16.93	17.11	17.13
16QAM	1	Low	18.00	17.15	16.92	17.00
		Middle		17.15	17.16	17.11
		High		16.94	17.03	17.14
	50%	Low	18.00	16.89	17.04	17.16
		Middle		17.16	17.16	17.08
		High		17.10	17.08	16.95
	100%	/	18.00	16.89	16.97	17.11
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				37800/2575	38000/2595	38200/2615
QPSK	1	Low	18.00	16.71	16.80	16.72
		Middle		17.04	17.02	17.03
		High		16.87	16.95	17.01
	50%	Low	18.00	16.77	16.88	16.92
		Middle		16.94	17.16	17.08
		High		17.04	17.10	17.11
	100%	/	18.00	16.97	17.13	17.17
16QAM	1	Low	18.00	17.12	16.95	17.02
		Middle		17.14	17.15	17.14
		High		16.97	17.05	17.07
	50%	Low	18.00	16.92	17.09	17.13
		Middle		17.11	17.14	17.11
		High		17.13	17.13	16.99
	100%	/	18.00	16.92	17.02	17.15
Modulation	RB	RB Offset	Tune up	15MHz		
				Channel/Frequency(MHz)		
				37825/2577.5	38000/2595	38175/2612.5
QPSK	1	Low	18.00	16.70	16.76	16.70
		Middle		17.02	17.01	17.04
		High		16.84	16.90	16.97
	50%	Low	18.00	16.75	16.84	16.89
		Middle		16.91	17.11	17.14
		High		17.01	17.07	17.13
	100%	/	18.00	16.95	17.09	17.12
16QAM	1	Low	18.00	17.14	16.93	17.00
		Middle		17.16	17.14	17.12
		High		16.94	17.01	17.14

	50%	Low	18.00	16.89	17.07	17.15
		Middle		17.15	17.15	17.07
		High		17.11	17.09	16.96
	100%	/	18.00	16.89	16.97	17.11
Modulation	RB	RB Offset	Tune up	20MHz		
				Channel/Frequency(MHz)		
				37850/2580	38000/2595	38150/2610
QPSK	1	Low	18.00	16.67	16.72	16.67
		Middle		17.01	17.07	17.05
		High		16.82	16.89	16.94
	50%	Low	18.00	16.72	16.79	16.85
		Middle		16.89	17.17	17.11
		High		16.98	17.02	17.13
	100%	/	18.00	16.92	17.04	17.08
16QAM	1	Low	18.00	16.85	16.89	16.95
		Middle		17.12	17.15	17.08
		High		16.92	16.98	17.12
	50%	Low	18.00	16.86	17.03	17.14
		Middle		17.12	17.13	17.04
		High		17.08	17.04	16.92
	100%	/	18.00	16.87	16.93	17.08

Table 13.4-7: The conducted Power for LTE Band 40(2305MHz-2315MHz)

Full power						
LTE B40				**Maximum Conducted Power (dBm)**		
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				38725/2307.5	38750/2310	38775/2312.5
QPSK	1	Low	23.50	22.68	22.80	22.71
		Middle		22.77	22.82	22.77
		High		22.58	22.63	22.61
	50%	Low	22.50	21.81	21.82	21.80
		Middle		21.78	21.78	21.82
		High		21.79	21.87	21.81
	100%	/	22.50	21.75	21.90	21.60
16QAM	1	Low	22.50	21.14	21.82	21.70
		Middle		21.16	21.05	21.12
		High		21.56	21.71	21.45
	50%	Low	21.50	20.85	20.92	20.69
		Middle		20.81	20.91	20.75
		High		20.86	20.93	20.80

	100%	/	21.50	20.88	20.98	20.86
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				/	38750/2310	/
QPSK	1	Low	23.50	/	22.76	/
		Middle		/	22.83	/
		High		/	22.62	/
	50%	Low	22.50	/	21.87	/
		Middle		/	21.84	/
		High		/	21.82	/
	100%	/	22.50	/	21.85	/
16QAM	1	Low	22.50	/	21.78	/
		Middle		/	21.03	/
		High		/	21.68	/
	50%	Low	21.50	/	20.88	/
		Middle		/	20.89	/
		High		/	20.88	/
	100%	/	21.50	/	20.94	/
Sensor on						
LTE B40			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				38725/2307.5	38750/2310	38775/2312.5
QPSK	1	Low	17.50	16.97	17.05	16.96
		Middle		17.02	17.07	16.96
		High		16.98	16.86	16.84
	50%	Low	17.50	17.00	17.04	16.90
		Middle		17.04	17.04	17.00
		High		16.90	17.02	16.95
	100%	/	17.50	16.95	17.01	16.91
16QAM	1	Low	17.50	16.80	16.97	16.86
		Middle		16.82	16.91	16.86
		High		16.70	16.89	16.81
	50%	Low	17.50	16.78	16.97	16.85
		Middle		16.85	16.93	16.86
		High		16.89	16.94	16.83
	100%	/	17.50	16.73	16.80	16.72
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				/	38750/2310	/
QPSK	1	Low	17.50	/	17.01	/
		Middle		/	17.10	/

		High		/	16.85	/
	50%	Low	17.50	/	17.09	/
		Middle		/	17.07	/
		High		/	16.97	/
	100%	/	17.50	/	16.96	/
16QAM	1	Low	17.50	/	16.93	/
		Middle		/	16.89	/
		High		/	16.86	/
	50%	Low	17.50	/	16.93	/
		Middle		/	16.91	/
		High		/	16.89	/
	100%	/	17.50	/	16.76	/

Table 13.4-8: The conducted Power for LTE Band 40(2350MHz-2360MHz)

Full power						
LTE B40				**Maximum Conducted Power (dBm)**		
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				39175/2352.5	39200/2355	39225/2357.5
QPSK	1	Low	23.50	22.88	22.94	22.89
		Middle		22.84	22.91	22.80
		High		22.84	22.98	22.87
	50%	Low	22.50	22.14	22.13	22.07
		Middle		22.10	22.12	22.10
		High		22.12	22.17	22.06
	100%	/	22.50	21.91	22.12	22.05
16QAM	1	Low	22.50	22.08	22.16	22.16
		Middle		22.10	22.04	21.99
		High		22.14	22.11	22.04
	50%	Low	21.50	21.08	21.26	21.07
		Middle		21.17	21.10	21.04
		High		21.14	21.22	21.10
	100%	/	21.50	21.21	21.15	21.09
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				/	39200/2355	/
QPSK	1	Low	23.50	/	22.96	/
		Middle		/	22.99	/
		High		/	22.97	/
	50%	Low	22.50	/	22.18	/
		Middle		/	22.16	/

		High		/	22.12	/
	100%	/	22.50	/	22.07	/
16QAM	1	Low	22.50	/	22.12	/
		Middle		/	22.02	/
		High		/	22.08	/
	50%	Low	21.50	/	21.22	/
		Middle		/	21.08	/
		High		/	21.17	/
	100%	/	21.50	/	21.11	/
Sensor on						
LTE B40			**Maximum Conducted Power (dBm)**			
Modulation	RB	RB Offset	Tune up	5MHz		
				Channel/Frequency(MHz)		
				39175/2352.5	39200/2355	39225/2357.5
QPSK	1	Low	17.50	16.90	17.06	17.07
		Middle		17.02	17.04	17.03
		High		16.88	16.98	16.90
	50%	Low	17.50	17.00	17.01	16.97
		Middle		16.89	17.04	16.97
		High		16.87	17.00	16.95
	100%	/	17.50	16.90	16.99	16.92
16QAM	1	Low	17.50	16.86	16.93	16.88
		Middle		16.88	16.93	16.80
		High		16.84	16.92	16.84
	50%	Low	17.50	16.74	16.83	16.78
		Middle		16.80	16.86	16.82
		High		16.85	16.98	17.03
	100%	/	17.50	16.74	16.82	16.76
Modulation	RB	RB Offset	Tune up	10MHz		
				Channel/Frequency(MHz)		
				/	39200/2355	/
QPSK	1	Low	17.50	/	17.02	/
		Middle		/	17.08	/
		High		/	16.97	/
	50%	Low	17.50	/	17.07	/
		Middle		/	17.04	/
		High		/	16.95	/
	100%	/	17.50	/	16.94	/
16QAM	1	Low	17.50	/	16.89	/
		Middle		/	16.91	/
		High		/	16.89	/
	50%	Low	17.50	/	16.79	/

		Middle		/	16.84	/
		High		/	16.93	/
	100%	/	17.50	/	16.78	/

Table 13.4-9: The conducted Power for LTE Band 41

Full power								
LTE B41				Maximum Conducted Power (dBm)				
Modulation	RB	RB Offset	Tune up	5MHz				
				Channel/Frequency(MHz)				
				39675/2498.5	40148/2545.8	40620/2593	41093/2640.3	41565/2687.5
QPSK	1	Low	24.00	22.68	22.58	22.74	22.55	22.79
		Middle		23.08	22.98	23.11	23.04	23.05
		High		22.81	22.75	22.80	22.74	22.81
	50%	Low	23.00	21.84	21.79	21.92	21.77	21.97
		Middle		21.87	21.76	22.09	21.94	22.03
		High		21.92	21.72	21.96	21.91	21.82
	100%	/	23.00	22.03	21.96	22.18	22.07	22.15
16QAM	1	Low	23.00	22.17	21.90	21.86	21.83	21.82
		Middle		22.15	21.88	22.12	22.16	22.13
		High		21.99	21.80	21.98	21.89	21.90
	50%	Low	22.00	21.12	21.19	21.04	21.11	21.16
		Middle		21.08	21.26	21.17	21.13	21.22
		High		21.20	21.15	21.15	21.21	21.21
	100%	/	22.00	21.23	21.19	21.09	21.15	21.29
Modulation	RB	RB Offset	Tune up	10MHz				
				Channel/Frequency(MHz)				
				39700/2501	40160/2547	40620/2593	41080/2639	41540/2685
QPSK	1	Low	24.00	22.70	22.60	22.75	22.58	22.80
		Middle		23.11	23.01	23.16	23.08	23.10
		High		22.83	22.77	22.84	22.77	22.85
	50%	Low	23.00	21.87	21.82	21.97	21.81	22.02
		Middle		21.90	21.79	22.14	21.98	22.08
		High		21.94	21.74	22.00	21.96	21.86
	100%	/	23.00	22.07	22.00	22.20	22.11	22.17
16QAM	1	Low	23.00	22.19	21.92	21.89	21.85	21.85
		Middle		22.18	21.91	22.16	22.19	22.17
		High		22.02	21.83	22.00	21.92	21.92
	50%	Low	22.00	21.15	21.22	21.09	21.15	21.21
		Middle		21.10	21.28	21.21	21.16	21.26
		High		21.23	21.18	21.20	21.25	21.26
	100%	/	22.00	21.26	21.22	21.14	21.19	21.34

Modulation	RB	RB Offset	Tune up	15MHz				
				Channel/Frequency(MHz)				
				39725/2503.5	40173/2548.3	40620/2593	41068/2637.8	41515/2682.5
QPSK	1	Low	24.00	22.66	22.59	22.71	22.56	22.72
		Middle		23.08	22.99	23.15	23.05	23.05
		High		22.78	22.74	22.79	22.73	22.79
	50%	Low	23.00	21.82	21.80	21.93	21.78	21.93
		Middle		21.85	21.76	22.09	21.94	21.99
		High		21.88	21.71	21.97	21.92	21.78
	100%	/	23.00	22.02	21.98	22.16	22.06	22.08
16QAM	1	Low	23.00	21.97	21.87	21.87	21.83	21.79
		Middle		22.12	21.89	22.13	22.17	22.12
		High		21.97	21.80	21.96	21.89	21.85
	50%	Low	22.00	21.09	21.19	21.07	21.12	21.15
		Middle		21.04	21.25	21.16	21.12	21.19
		High		21.18	21.16	21.16	21.22	21.17
	100%	/	22.00	21.21	21.19	21.09	21.15	21.25
Modulation	RB	RB Offset	Tune up	20MHz				
				Channel/Frequency(MHz)				
				39750/2506	40185/2549.5	40620/2593	41055/2636.5	41490/2680
QPSK	1	Low	24.00	22.72	22.62	22.73	22.59	22.78
		Middle		23.14	23.04	23.17	23.09	23.11
		High		22.84	22.78	22.84	22.76	22.85
	50%	Low	23.00	21.92	21.87	21.98	21.84	22.03
		Middle		21.95	21.84	22.15	22.01	22.09
		High		21.98	21.78	22.02	21.98	21.88
	100%	/	23.00	22.02	21.95	22.11	22.02	22.08
16QAM	1	Low	23.00	21.97	21.92	21.83	21.78	21.79
		Middle		22.12	21.85	22.11	22.13	22.12
		High		21.97	21.78	21.93	21.87	21.85
	50%	Low	22.00	21.09	21.16	21.03	21.09	21.15
		Middle		21.04	21.22	21.14	21.09	21.19
		High		21.18	21.13	21.11	21.18	21.17
	100%	/	22.00	21.21	21.17	21.05	21.12	21.25

Sensor on								
LTE B41			**Maximum Conducted Power (dBm)**					
Modulation	RB	RB Offset	Tune up	5MHz				
				Channel/Frequency(MHz)				
				39675/2498.5	40148/2545.8	40620/2593	41093/2640.3	41565/2687.5
QPSK	1	Low	18.00	16.60	16.54	16.75	16.56	16.80
		Middle		17.07	17.01	17.10	17.04	16.98
		High		16.58	16.52	16.77	16.58	16.96

	50%	Low	18.00	17.06	17.00	16.98	17.03	17.02
		Middle		17.04	17.01	17.09	17.04	16.98
		High		17.05	16.93	17.06	16.92	17.00
	100%	/	18.00	16.92	16.80	17.05	16.84	16.93
16QAM	1	Low	18.00	17.13	17.04	16.90	16.74	16.84
		Middle		17.11	17.02	16.99	16.99	16.96
		High		17.00	16.88	17.09	16.88	17.10
	50%	Low	18.00	16.84	16.75	16.89	16.74	16.79
		Middle		17.11	16.99	17.03	16.99	17.10
		High		17.10	17.02	17.09	17.03	17.06
	100%	/	18.00	17.09	17.00	17.09	17.07	16.98
Modulation	RB	RB Offset	Tune up	10MHz				
				Channel/Frequency(MHz)				
				39700/2501	40160/2547	40620/2593	41080/2639	41540/2685
QPSK	1	Low	18.00	16.62	16.56	16.76	16.59	16.83
		Middle		17.10	17.04	17.15	17.08	17.02
		High		16.60	16.54	16.81	16.61	16.99
	50%	Low	18.00	17.09	17.03	17.03	17.07	17.06
		Middle		17.07	17.04	17.14	17.08	17.02
		High		17.07	16.95	17.10	16.97	17.05
	100%	/	18.00	16.96	16.84	17.07	16.88	16.97
16QAM	1	Low	18.00	17.15	17.06	16.93	16.76	16.86
		Middle		17.14	17.05	17.03	17.02	16.99
		High		17.03	16.91	17.11	16.91	17.13
	50%	Low	18.00	16.87	16.78	16.94	16.78	16.83
		Middle		17.13	17.01	17.07	17.02	17.13
		High		17.13	17.05	17.14	17.07	17.10
	100%	/	18.00	17.12	17.03	17.14	17.11	17.02
Modulation	RB	RB Offset	Tune up	15MHz				
				Channel/Frequency(MHz)				
				39725/2503.5	40173/2548.3	40620/2593	41068/2637.8	41515/2682.5
QPSK	1	Low	18.00	16.61	16.55	16.72	16.57	16.81
		Middle		17.08	17.02	17.14	17.05	16.99
		High		16.57	16.51	16.76	16.57	16.95
	50%	Low	18.00	17.07	17.01	16.99	17.04	17.03
		Middle		17.04	17.01	17.09	17.04	16.98
		High		17.04	16.92	17.07	16.93	17.01
	100%	/	18.00	16.94	16.82	17.03	16.83	16.92
16QAM	1	Low	18.00	17.10	17.01	16.91	16.74	16.84
		Middle		17.12	17.03	17.00	17.00	16.97
		High		17.00	16.88	17.07	16.88	17.10
	50%	Low	18.00	16.84	16.75	16.92	16.75	16.80

		Middle		17.10	16.98	17.02	16.98	17.09
		High		17.11	17.03	17.10	17.04	17.07
	100%	/	18.00	17.09	17.00	17.09	17.07	16.98
Modulation	RB	RB Offset	Tune up	20MHz				
				Channel/Frequency(MHz)				
				39750/2506	40185/2549.5	40620/2593	41055/2636.5	41490/2680
QPSK	1	Low	18.00	16.64	16.58	16.74	16.60	16.84
		Middle		17.13	17.07	17.16	17.09	17.03
		High		16.61	16.55	16.81	16.60	16.98
	50%	Low	18.00	17.14	17.08	17.04	17.10	17.09
		Middle		17.12	17.09	17.15	17.11	17.05
		High		17.11	16.99	17.12	16.99	17.07
	100%	/	18.00	16.91	16.79	16.98	16.79	16.88
16QAM	1	Low	18.00	16.78	16.66	16.87	16.69	16.79
		Middle		17.08	16.99	16.98	16.96	16.93
		High		16.98	16.86	17.04	16.86	17.08
	50%	Low	18.00	16.83	16.74	16.90	16.74	16.79
		Middle		17.09	16.97	17.02	16.97	17.08
		High		17.10	17.02	17.07	17.02	17.05
	100%	/	18.00	17.07	16.98	17.05	17.04	16.95

13.5 BT Measurement result

Table 13.5-1: The conducted power for Bluetooth

Full power						
BlueTooth	**Maximum Output Power (dBm)**					
Channel/Frequency(MHz)	0/2402		39/2441		78/2480	
Mode	Tune up	Output Power	Tune up	Output Power	Tune up	Output Power
DH5	10.00	9.43	10.00	9.25	10.00	9.56
2DH5	9.00	8.67	9.00	8.80	9.00	8.83
3DH5	9.00	8.73	9.00	8.76	9.00	8.86
Mode	Channel/Frequency(MHz)		Tune up		Output Power	
BLE_1M	0/2402		-1.50		-2.50	
	19/2440		-1.00		-1.94	
	39/2480		-2.00		-2.74	
BLE_2M	0/2402		-1.50		-2.56	
	19/2440		-1.00		-1.93	
	39/2480		-2.00		-2.89	
BLE_125K	0/2402		-2.00		-2.83	
	19/2440		-1.00		-1.89	
	39/2480		-2.00		-2.64	
BLE_500K	0/2402		-2.00		-2.78	
	19/2440		-1.00		-1.89	
	39/2480		-2.00		-2.63	

13.6 Wi-Fi Measurement result

Table 13.6-1: The average conducted power for Wi-Fi 2.4G

Full power				
Wi-Fi 2.4G			Maximum Conducted Power (dBm)	
Mode	BW	Channel/Frequency(MHz)	Tune up(dBm)	Output Power(dBm)
802.11b	20M	1/2412	17.00	16.54
		6/2437	17.00	16.88
		11/2462	17.00	16.35
802.11g	20M	1/2412	15.00	14.58
		6/2437	16.00	15.10
		11/2462	15.00	14.39
802.11n	20M	1/2412	15.00	13.93
		6/2437	14.00	13.11
		11/2462	14.00	12.69
	40M	3/2422	12.00	10.62
		6/2437	14.00	13.15
		9/2452	14.00	12.96
802.11ac	20M	1/2412	10.00	9.31
		6/2437	10.50	9.80
		11/2462	10.50	9.43
	40M	3/2422	12.00	10.91
		6/2437	10.50	9.63
		9/2452	10.50	9.39

Table 13.6-2: The average conducted power for Wi-Fi 5G

Wi-Fi 5G			Maximum Conducted Power (dBm)	
Mode	BW	Channel/Frequency(MHz)	Tune up	Output Power
802.11a	20M	36/5180	11.00	10.62
		40/5200	8.00	6.79
		48/5240	10.00	9.00
		52/5260	10.00	9.13
		56/5280	10.00	8.98
		60/5300	9.00	7.54