



TEST REPORT

No.B22N00069-SAR

For

TCL Communication Ltd.

UMTS/LTE mobile phone

Model Name: 4058E

With

Hardware Version: 03

Software Version: QK1F

FCC ID: 2ACCJN063

Issued Date: 2022-02-18

Designation Number: CN1210

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

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REPORT HISTORY

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TCONTENTS

1. SUMMARY OF TEST REPORT	5
1.1. TEST ITEMS	5
1.2. TEST STANDARDS	5
1.3. TEST RESULT	5
1.4. TESTING LOCATION	5
1.5. PROJECT DATA	5
1.6. SIGNATURE	5
2. STATEMENT OF COMPLIANCE	6
3. CLIENT INFORMATION	9
3.1. APPLICANT INFORMATION	9
3.2. MANUFACTURER INFORMATION	9
4. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	10
4.1. ABOUT EUT	10
4.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	11
4.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	11
5. TEST METHODOLOGY	12
5.1. APPLICABLE LIMIT REGULATIONS	12
5.2. APPLICABLE MEASUREMENT STANDARDS	12
6. SPECIFIC ABSORPTION RATE (SAR).....	13
6.1. INTRODUCTION	13
6.2. SAR DEFINITION.....	13
7. TISSUE SIMULATING LIQUIDS	14
7.1. TARGETS FOR TISSUE SIMULATING LIQUID	14
7.2. DIELECTRIC PERFORMANCE	14
8. SYSTEM VERIFICATION	18
8.1. SYSTEM SETUP	18
8.2. SYSTEM VERIFICATION	19
9. MEASUREMENT PROCEDURES	20
9.1. TESTS TO BE PERFORMED	20
9.2. GENERAL MEASUREMENT PROCEDURE	22
9.3. WCDMA MEASUREMENT PROCEDURES FOR SAR	23
9.4. SAR MEASUREMENT FOR LTE	24
9.5. BLUETOOTH & WLAN MEASUREMENT PROCEDURES FOR SAR	24
9.6. POWER DRIFT	25
10. CONDUCTED OUTPUT POWER.....	26



10.1. WCDMA MEASUREMENT RESULT26

10.2. LTE MEASUREMENT RESULT29

10.3. BLUETOOTH AND WLAN MEASUREMENT RESULT84

11. SIMULTANEOUS TX SAR CONSIDERATIONS85

11.1. INTRODUCTION.....85

11.2. TRANSMIT ANTENNA SEPARATION DISTANCES.....85

11.3. SAR MEASUREMENT POSITIONS.....86

12. EVALUATION OF SIMULTANEOUS.....87

13. SUMMARY OF TEST RESULTS.....88

13.1. TESTING ENVIRONMENT.....88

13.2. SAR RESULTS89

13.3. WLAN EVALUATION FOR 2.4G.....101

13.4. PRODUCT SPECIFIC 10G SAR103

14. SAR MEASUREMENT VARIABILITY105

15. MEASUREMENT UNCERTAINTY106

15.1. MEASUREMENT UNCERTAINTY FOR NORMAL SAR TESTS (300MHz~3GHz)106

16. MAIN TEST INSTRUMENTS.....107

ANNEX A: GRAPH RESULTS108

ANNEX B: SYSTEMVERIFICATION RESULTS.....149

ANNEX C: SAR MEASUREMENT SETUP.....155

ANNEX D: POSITION OF THE WIRELESS DEVICE IN RELATION TO THE PHANTOM.....161

ANNEX E: EQUIVALENT MEDIA RECIPES164

ANNEX F: SYSTEM VALIDATION.....165

ANNEX G: DAE CALIBRATION CERTIFICATE166

ANNEX H: PROBE CALIBRATION CERTIFICATE169

ANNEX I: DIPOLE CALIBRATION CERTIFICATE178

ANNEX J: EXTENDED CALIBRATION SAR DIPOLE.....220



1. Summary of Test Report

1.1. Test Items

Description: UMTS/LTE mobile phone
Model Name: 4058E
Applicant's Name: TCL Communication Ltd.
Manufacturer's Name: TCL Communication Ltd.

1.2. Test Standards

ANSI C95.1:1992, IEEE 1528:2013

1.3. Test Result

Pass. Please refer to "13. Summary of Test Results"

1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road,
Futian District, Shenzhen, Guangdong, P. R. China

1.5. Project Data

Testing Start Date: 2022-01-21

Testing End Date: 2022-02-14

1.6. Signature

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(Approved this test report)

2. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for TCL Communication Ltd. UMTS/LTE mobile phone 4058E are as follows:

Table 2.1: Highest Reported SAR for Head (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/Kg)	Equipment Class
Head (Separation Distance 0mm)	WCDMA Band 2	0.70	PCE
	WCDMA Band 4	0.79	
	WCDMA Band 5	0.71	
	LTE Band 2	0.52	
	LTE Band 5	0.67	
	LTE Band 7	0.59	
	LTE Band 12	0.63	
	LTE Band 13	0.79	
	LTE Band 66	0.54	
	LTE Band 71	0.47	
	Bluetooth	0.05	
	WLAN 2.4GHz	0.69	DTS

Table 2.2: Highest Reported SAR for Hotspot (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/Kg)	Equipment Class
Hotspot (Separation Distance 10mm)	WCDMA Band 2	0.92	PCE
	WCDMA Band 4	1.10	
	WCDMA Band 5	0.94	
	LTE Band 2	1.02	
	LTE Band 5	0.91	
	LTE Band 7	1.09	
	LTE Band 12	0.76	
	LTE Band 13	0.89	
	LTE Band 66	1.05	
	LTE Band 71	0.49	
	Bluetooth	0.01	
	WLAN 2.4GHz	0.16	DTS

Table 2.3: Highest Reported SAR for Body-worn (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/Kg)	Equipment Class
Body-worn (Separation Distance 10/15mm)	WCDMA Band 2	1.01	PCE
	WCDMA Band 4	1.12	
	WCDMA Band 5	0.94	
	LTE Band 2	0.92	
	LTE Band 5	0.91	
	LTE Band 7	0.48	
	LTE Band 12	0.76	
	LTE Band 13	0.89	
	LTE Band 66	0.82	
	LTE Band 71	0.49	
	Bluetooth	0.01	DSS
WLAN 2.4GHz	0.07	DTS	

Table 2.4: Highest Reported Extremity SAR (10g)

Exposure Configuration	Technology Band	Highest Reported SAR 10g(W/Kg)	Equipment Class
Extremity (Separation Distance 0mm)	WCDMA Band 2	3.07	PCE
	WCDMA Band 4	3.25	
	LTE Band 2	2.99	
	LTE Band 7	3.06	
	LTE Band 66	2.86	

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/Kg as averaged over any 1g tissue according to the ANSI C95.1-1992.

The measurement together with the test system set-up is described in annex C of this test report. A detailed description of the equipment under test can be found in chapter 4 of this test report.

The highest reported SAR value is obtained at the case of **(Table 2.1 & 2.2 & 2.3 & 2.4)**, Head value is **0.79 kg (1g)**, Hotspot value is **1.10 kg (1g)**, Body-worn value is **1.12 kg (1g)** and Extremity SAR value is **3.25g (10g)**.

Table2.5: The sum of reported SAR values for WWAN antenna and WLAN antenna

/	Position	WWAN (W/kg)	WLAN (W/kg)	Sum (W/kg)
Highest reported SAR value for Head	Right Cheek	0.79	0.32	1.11
Highest reported SAR value for Hotspot	Rear Side	1.10	0.16	1.26
Highest reported SAR value for Body-worn	Rear Side	1.12	0.07	1.19

Note: the test positions of above tables are for the worse case that has been evaluated.

Table2.6: The sum of reported SAR values for WWAN antenna and Bluetooth antenna

/	Position	WWAN (W/kg)	Bluetooth (W/kg)	Sum (W/kg)
Highest reported SAR value for Head	Right Cheek	0.79	0.05	0.84
Highest reported SAR value for Hotspot	Rear Side	1.10	0.01	1.11
Highest reported SAR value for Body-worn	Rear Side	1.12	0.01	1.13

Note: the test positions of above tables are for the worse case that has been evaluated.

According to the above tables, the highest sum of reported SAR values is **1.26 W/kg (1g)**.

The detail for simultaneous transmission consideration is described in chapter 12.



3. Client Information

3.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
City:	Hong Kong
Country:	China
Telephone:	0086-0574-27960825

3.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
City:	Hong Kong
Country:	China
Telephone:	0086-0574-27960825

4. Equipment under Test (EUT) and Ancillary Equipment (AE)

4.1. About EUT

Description:	UMTS/LTE mobile phone
Model Name:	4058E
Frequency Bands:	WCDMA Band 2/4/5, LTE Band 2/4/5/7/12/13/17/66/71, Bluetooth, WLAN 2.4G
Condition of EUT as received:	No obvious damage in appearance
Tested Tx Frequency:	1850 – 1910MHz (WCDMA Band 2)
	1710 – 1755MHz (WCDMA Band 4)
	824 – 849MHz (WCDMA Band 5)
	1850 – 1910MHz (LTE Band 2)
	1710 – 1755MHz (LTE Band 4)
	824 – 849MHz (LTE Band 5)
	2500 – 2570MHz (LTE Band 7)
	699 – 716MHz (LTE Band 12)
	777 – 787MHz (LTE Band 13)
	704 – 716MHz (LTE Band 17)
	1710 – 1780MHz (LTE Band 66)
	663 – 689MHz (LTE Band 71)
	2402 – 2480MHz (Bluetooth)
2412 – 2462MHz (WLAN 2.4G)	
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Hotspot mode:	Support
Product Dimensions:	Long 206.3mm; Wide 55.6mm; Overall Diagonal 207.5mm
Remark: 1. There are totally 2 power reduction levels of WWAN antenna and 2 power reduction levels of WLAN antenna, detail descriptions of the power reduction mechanism are included in the operational description. 2. For WWAN transmitter. a) Hotspot exposure conditions: Reduced power level 1 – WCDMA Band 2/4, LTE Band 2/4/7/66 While the device WWAN antenna is transmitting, and hotspot mode is enabled, power reduction enabled for those bands. b) Body-Worn exposure conditions: Reduced power level 2 – WCDMA Band 4, LTE Band 4/7/66 While the device is transmitting at the WWAN antenna and receiver is not working, power reduction enabled for those bands. 3. For WLAN transmitter (2 sets of power reduction levels). a) Head exposure conditions:	

Reduced power level 3 – WLAN 2.4G

While the device WLAN 2.4G antenna is transmitting and the audio is actively routed through the receiver, power reduction enabled for this band.

Reduced power level 4 – WLAN 2.4G

While the device WLAN 2.4G antenna is transmitting simultaneously with the WWAN antenna and the audio is actively routed through the receiver, power reduction enabled for this band.

4.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Receipt Date
UT02aa	016182000200202	03	QK1F	2022-01-19
UT05aa	016182000200616	03	QK1F	2022-01-19
UT06aa	016182000200699	03	QK1F	2022-01-19

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

Note: It is performed to test SAR with the UT05aa & UT06aa, and conducted power with the UT02aa.

4.3. Internal Identification of AE used during the test

AE ID*	Description	Model	Manufacturer
AE1	Battery	TLi017C7	veken

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



5. Test Methodology

5.1. Applicable Limit Regulations

ANSI C95.1:1992 IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.2. Applicable Measurement Standards

IEEE 1528:2013 Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Experimental Techniques.

KDB 447498 D01 General RF Exposure Guidance v06 RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices

KDB 648474 D04 Handset SAR v01r03 SAR Evaluation Considerations for Wireless Handsets.

KDB 941225 D01 SAR test for 3G devices v03r01 SAR Measurement Procedures for 3G Devices

KDB 941225 D05 SAR for LTE Devices v02r05 SAR Evaluation Considerations for LTE Devices

KDB 941225 D06 Hot Spot SAR v02r01 SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB 248227 D01 802.11 Wi-Fi SAR v02r02 SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters.

KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04 SAR Measurement Requirements for 100 MHz to 6 GHz

KDB 865664 D02 RF Exposure Reporting v01r02 RF Exposure Compliance Reporting and Documentation Considerations

KDB 941225 D07 UMPC Mini Tablet v01r02 SAR Evaluation Procedures for UMPC Mini-Tablet Devices

TCB workshop April 2019; RF Exposure Procedures (Tissue Simulating Liquids)

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 heat 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 and E is the RMS electrical field strength.

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

7. Tissue Simulating Liquids

7.1. Targets for tissue simulating liquid

Table 7.1: Targets for tissue simulating liquid

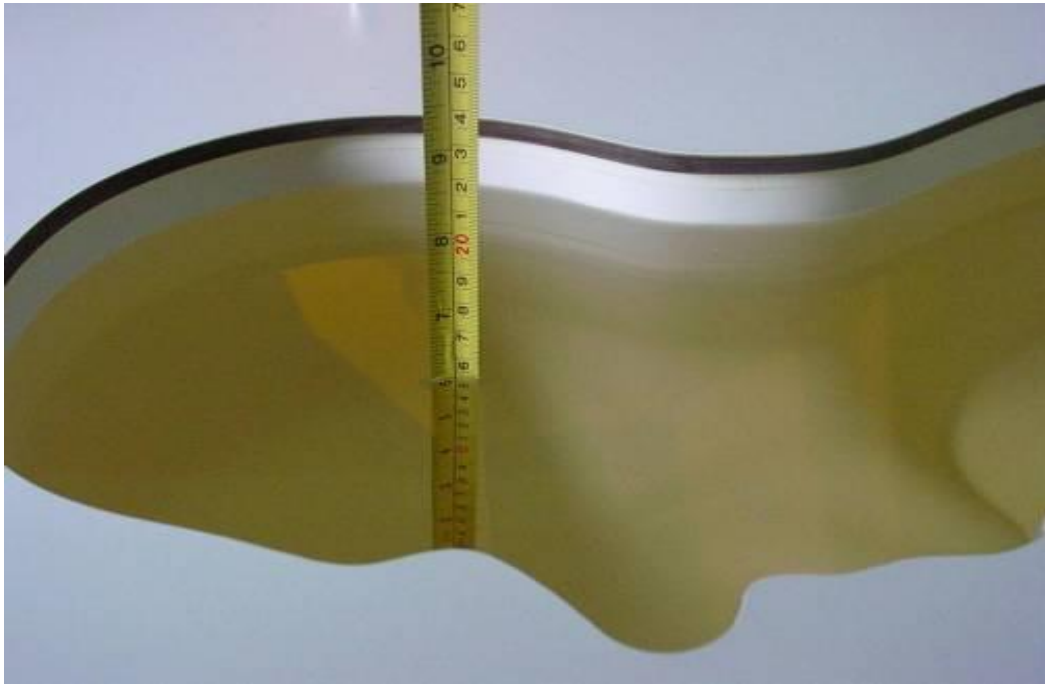
Frequency (MHz)	Liquid Type	Conductivity (σ)	$\pm 5\%$ Range	Permittivity (ϵ)	$\pm 5\%$ Range
750	Head	0.89	0.85~0.93	41.9	39.8~44.0
835	Head	0.90	0.86~0.95	41.5	39.4~43.6
1750	Head	1.37	1.30~1.44	40.1	38.1~42.1
1900	Head	1.40	1.33~1.47	40.0	38.0~42.0
2450	Head	1.80	1.71~1.89	39.2	37.2~41.2
2550	Head	1.91	1.81~2.01	39.1	37.1~41.0

7.2. Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency (MHz)	Conductivity σ (S/m)	Drift (%)	Permittivity ϵ	Drift (%)
2022-01-26	Head	750	0.905	1.69	41.19	-1.69
2022-01-21	Head	835	0.919	2.11	40.77	-1.76
2022-02-12	Head	1750	1.356	-1.02	39.70	-1.00
2022-01-23	Head	1900	1.417	1.21	39.41	-1.48
2022-01-25	Head	2450	1.831	1.72	38.39	-2.07
2022-02-14	Head	2550	1.948	1.99	38.15	-2.43

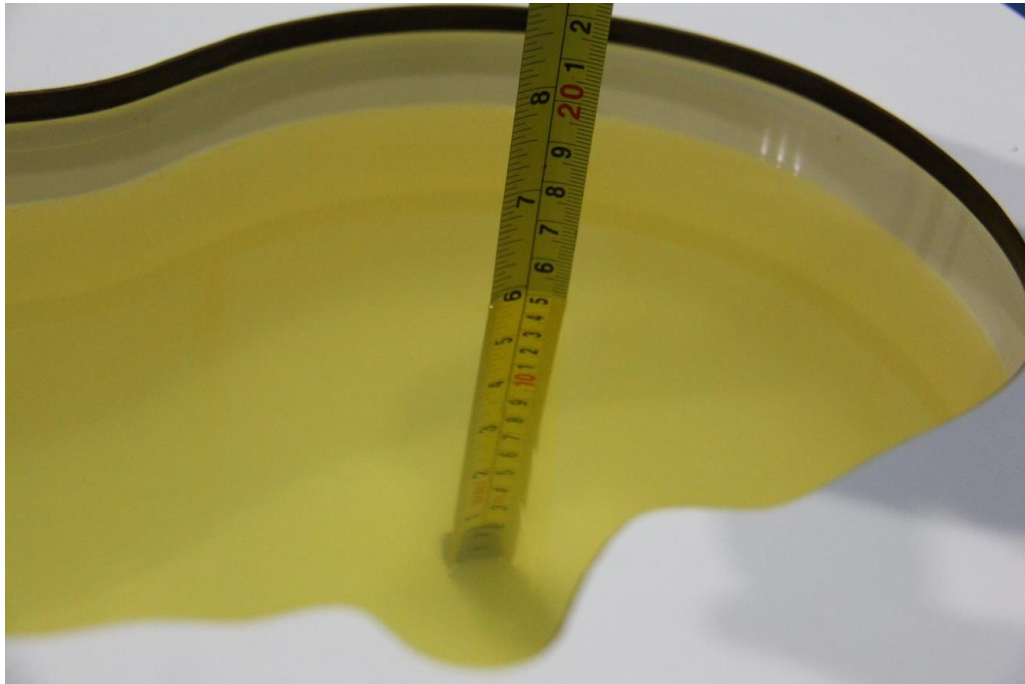
Note: The liquid temperature is 22.0°C.



Picture 7-1: Liquid depth in the Head Phantom (750MHz)



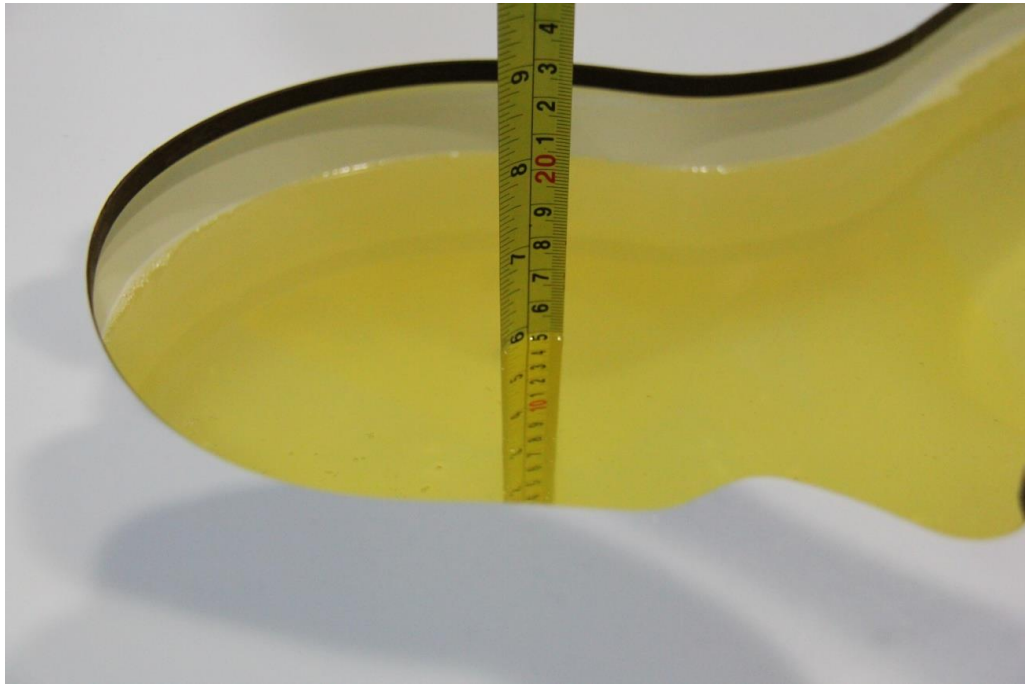
Picture 7-2: Liquid depth in the Head Phantom (835MHz)



Picture 7-3: Liquid depth in the Head Phantom (1750MHz)



Picture 7-4: Liquid depth in the Head Phantom (1900MHz)



Picture 7-5: Liquid depth in the Head Phantom(2450MHz)

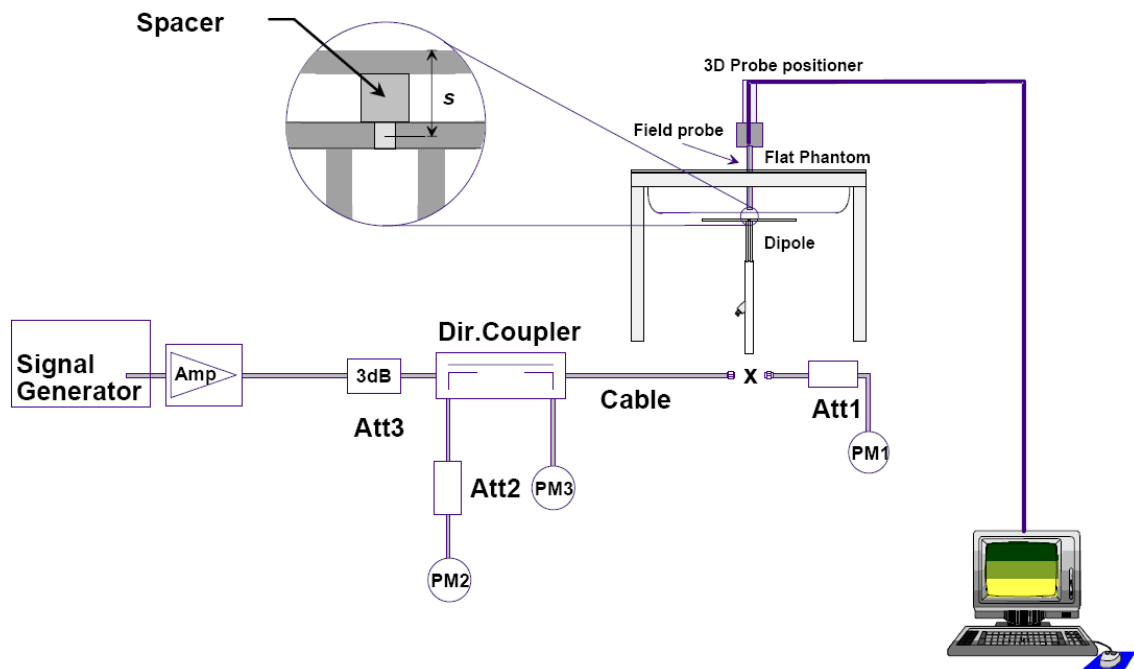


Picture 7-6: Liquid depth in the Head Phantom(2550MHz)

8. System verification

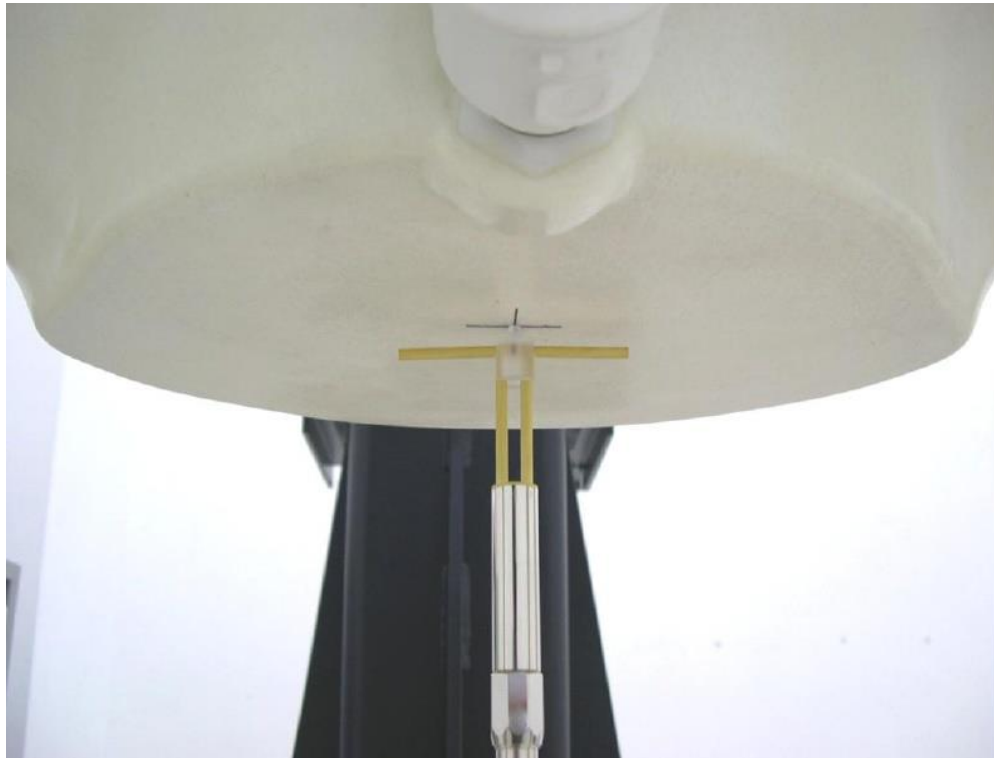
8.1. System Setup

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



Picture 8.1 System Setup for System Evaluation

For the dipole below 3GHz, the output power on dipole port must be calibrated to 24 dBm (250mW) before dipole is connected.



Picture 8.2 Photo of Dipole Setup

8.2. System Verification

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device.

Table 8.1: System Verification of Head

Measurement Date	Frequency (MHz)	Target value (W/kg)		Measured value (W/kg)				Deviation (%)	
		10 g	1 g	/		Normalize to 1W		10 g	1 g
				10 g	1 g	10 g	1 g		
2022-01-26	750	5.70	8.53	1.44	2.17	5.76	8.68	1.05	1.76
2022-01-21	835	6.29	9.64	1.62	2.52	6.48	10.08	3.02	4.56
2022-02-12	1750	19.30	36.40	4.78	8.96	19.12	35.84	-0.93	-1.54
2022-01-23	1900	20.50	40.20	5.22	10.4	20.88	41.60	1.85	3.48
2022-01-25	2450	24.20	53.20	6.17	13.7	24.68	54.80	1.98	3.01
2022-02-14	2550	25.20	55.90	6.44	14.6	25.76	58.40	2.22	4.47

9. Measurement Procedures

9.1. Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in picture 9.1.

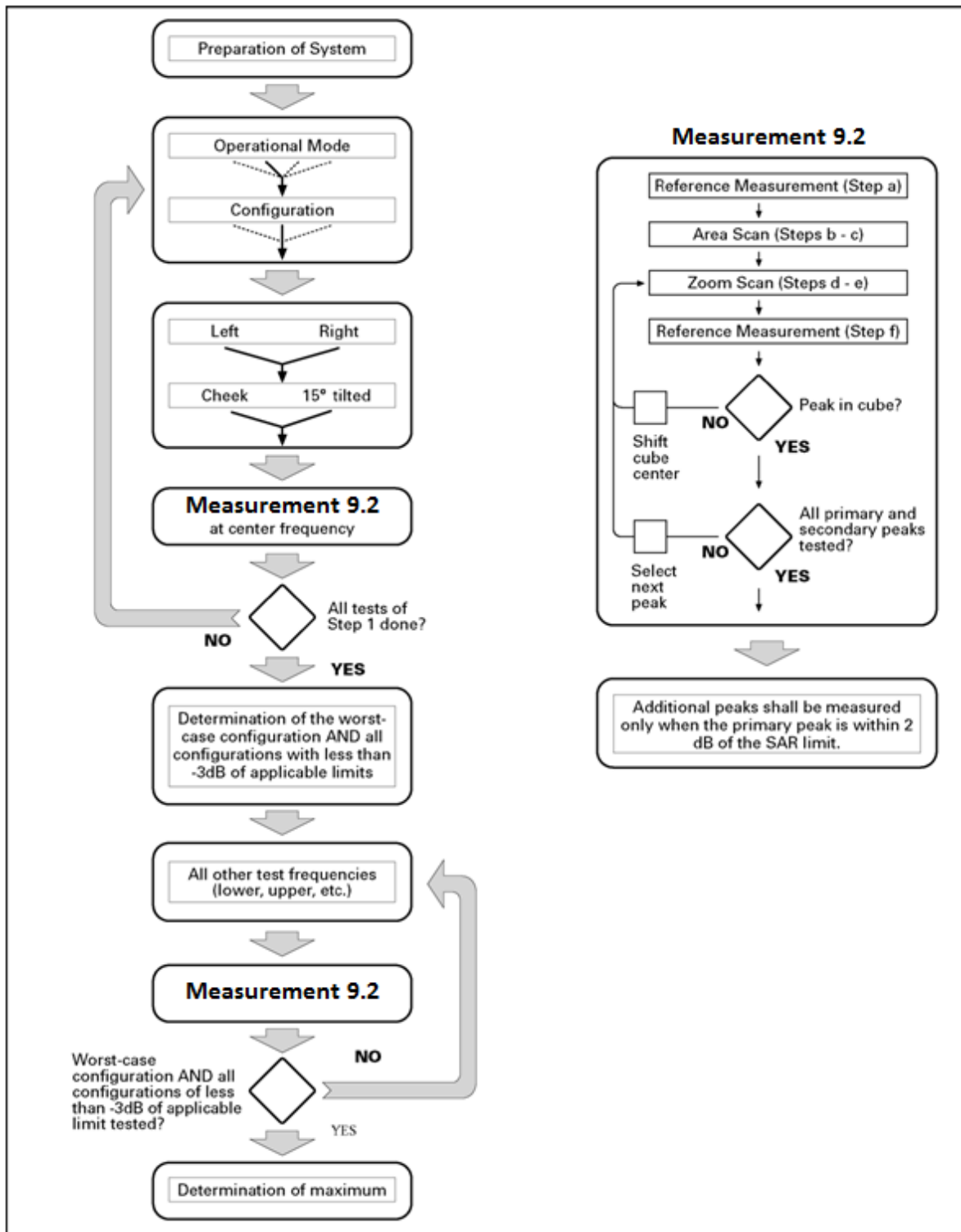
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the center of the transmit frequency band (f_c) for:

- a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in annex D),
- b) all configurations for each device position in a), e.g., antenna extended and retracted, and
- c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1, perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture 9.1 Block diagram of the tests to be performed

9.2. 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.

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

9.3. WCDMA Measurement Procedures for SAR

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_n), 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.

For Release 5 HSDPA Data Devices:

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs}	CM/dB
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

For Release 6 HSPA Data Devices

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	1.0	0.0	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	$\beta_{ed1}:47/15$ $\beta_{ed2}:47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	3.0	2.0	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	1.0	0.0	21	81

9.4. SAR Measurement for LTE

SAR tests for LTE are performed with a base station simulator, Anristu MT8820C. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. All powers were measured with the Anristu MT8820C. It is performed for conducted power and SAR based on the KDB941225 D05.

SAR is evaluated separately according to the following procedures for the different test positions in each exposure condition – head, body, body-worn accessories and other use conditions. The procedures in the following subsections are applied separately to test each LTE frequency band.

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) 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.

9.5. Bluetooth & WLAN Measurement Procedures for SAR

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

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



9.6. Power Drift

To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Section 14 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10. Conducted Output Power

10.1. WCDMA Measurement result

Table 10.1: T The conducted power measurement results WCDMA

Normal Power					
Item	band	WCDMA Band 2			
	ARFCN	Tune up	Ch.9538 (1907.6MHz)	Ch.9400 (1880MHz)	Ch.9262 (1852.4MHz)
WCDMA	\	24.0	23.00	23.00	22.90
HSUPA	1	21.5	20.50	20.40	20.50
	2	21.0	20.00	20.00	19.90
	3	22.0	21.10	21.00	21.00
	4	20.5	19.60	19.50	19.50
	5	22.0	21.10	21.00	20.90
HSDPA	1	23.0	22.00	22.00	22.00
	2	23.0	22.00	21.90	21.90
	3	22.5	21.60	21.40	21.40
	4	22.5	21.50	21.40	21.40
DC-HSDPA	1	23.0	22.00	22.00	21.90
	2	23.0	22.00	21.90	21.80
	3	22.5	21.60	21.50	21.40
	4	22.5	21.40	21.40	21.40
Reduced power level 1					
Item	band	WCDMA Band 2			
	ARFCN	Tune up	Ch.9538 (1907.6MHz)	Ch.9400 (1880MHz)	Ch.9262 (1852.4MHz)
WCDMA	\	21.0	20.00	20.00	19.90
HSUPA	1	18.5	17.50	17.40	17.40
	2	18.0	17.00	17.00	16.90
	3	19.0	18.00	17.90	17.90
	4	17.5	16.60	16.50	16.50
	5	19.0	18.00	18.00	17.90
HSDPA	1	20.0	19.00	19.00	18.90
	2	20.0	19.00	19.00	18.80
	3	19.5	18.50	18.50	18.40
	4	19.5	18.50	18.40	18.40
DC-HSDPA	1	20.0	19.10	19.00	18.90
	2	20.0	18.90	18.90	18.90
	3	19.5	18.50	18.40	18.40
	4	19.5	18.40	18.30	18.20

Normal Power					
Item	band	WCDMA Band 4			
	ARFCN	Tune up	Ch.1513 (1752.6MHz)	Ch.1413 (1732.6MHz)	Ch.1312 (1712.4MHz)
WCDMA	\	24.0	22.80	22.80	22.90
HSUPA	1	21.5	20.40	20.30	20.50
	2	21.0	19.80	19.90	19.90
	3	22.0	20.80	20.80	20.90
	4	20.5	19.40	19.40	19.50
	5	22.0	20.80	20.80	20.90
HSDPA	1	23.0	21.80	21.80	22.00
	2	23.0	21.80	21.80	22.00
	3	22.5	21.30	21.30	21.50
	4	22.5	21.30	21.20	21.40
DC-HSDPA	1	23.0	21.80	21.90	22.00
	2	23.0	21.70	21.80	21.90
	3	22.5	21.30	21.30	21.30
	4	22.5	21.20	21.20	21.40
Reduced power level 1					
Item	band	WCDMA Band 4			
	ARFCN	Tune up	Ch.1513 (1752.6MHz)	Ch.1413 (1732.6MHz)	Ch.1312 (1712.4MHz)
WCDMA	\	20.5	19.40	19.30	19.50
HSUPA	1	18.0	16.90	16.80	16.90
	2	17.5	16.40	16.30	16.40
	3	18.5	17.40	17.30	17.50
	4	17.0	15.90	15.80	16.10
	5	18.5	17.30	17.40	17.70
HSDPA	1	19.5	18.30	18.40	18.50
	2	19.5	18.30	18.30	18.50
	3	19.0	17.80	17.90	18.10
	4	19.0	17.80	17.80	18.00
DC-HSDPA	1	19.5	18.40	18.40	18.50
	2	19.5	18.30	18.30	18.40
	3	19.0	17.80	17.80	18.10
	4	19.0	17.80	17.70	17.90

Reduced power level 2					
Item	band	WCDMA Band 4			
	ARFCN	Tune up	Ch.1513 (1752.6MHz)	Ch.1413 (1732.6MHz)	Ch.1312 (1712.4MHz)
WCDMA	\	23.0	21.80	21.80	21.80
HSUPA	1	20.5	19.30	19.30	19.40
	2	20.0	18.80	18.80	18.90
	3	21.0	19.80	19.80	19.90
	4	19.5	18.30	18.30	18.50
	5	21.0	19.80	19.90	20.00
HSDPA	1	22.0	20.80	20.80	21.00
	2	22.0	20.80	20.80	20.90
	3	21.5	20.30	20.30	20.40
	4	21.5	20.30	20.30	20.50
DC-HSDPA	1	22.0	20.80	20.90	21.00
	2	22.0	20.80	20.80	20.80
	3	21.5	20.20	20.30	20.40
	4	21.5	20.20	20.30	20.30

Item	band	WCDMA Band 5			
	ARFCN	Tune up	Ch.4233 (846.6MHz)	Ch.4182 (836.4MHz)	Ch.4132 (826.4MHz)
WCDMA	\	24.0	23.10	23.20	23.20
HSUPA	1	21.5	20.60	20.70	20.70
	2	21.0	20.10	20.20	20.20
	3	22.0	21.10	21.20	21.20
	4	20.5	19.60	19.70	19.70
	5	22.0	21.00	21.10	21.20
HSDPA	1	23.0	22.10	22.20	22.20
	2	23.0	22.00	22.20	22.20
	3	22.5	21.50	21.70	21.70
	4	22.5	21.50	21.60	21.70
DC-HSDPA	1	23.0	22.20	22.20	22.20
	2	23.0	22.10	22.20	22.20
	3	22.5	21.50	21.60	21.70
	4	22.5	21.50	21.50	21.60

10.2. LTE Measurement result

According to April 2015 TCB workshop, SAR Test exclusion can be applied for testing overlapping LTE Bands as follows:

- a) The maximum out power, including tolerance, for the smaller band must be \leq the larger band to qualify for SAR test exclusion.
- b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.

LTE Band 4 (1710-1755MHz) is covered by LTE Band 66 (1710-1780MHz)

LTE Band 17 (704-716MHz) is covered by LTE Band 12 (699-716MHz)

Table 10.2: The conducted Power for LTE

Normal Power											
LTE Band 2			Actual output Power (dBm)			Tune up					
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation					
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM			
1.4 MHz	1RB_5	1909.3	21.89	21.14	/	23.5	22.5	/			
		1880.0	21.83	21.12	/						
		1850.7	22.05	21.30	/						
	1RB_3	1909.3	22.00	21.22	/						
		1880.0	21.94	21.21	/						
		1850.7	22.12	21.40	/						
	1RB_0	1909.3	21.89	21.11	/						
		1880.0	21.83	21.08	/						
		1850.7	22.01	21.27	/						
	3RB_3	1909.3	21.97	20.99	/						
		1880.0	21.92	20.90	/						
		1850.7	22.13	21.13	/						
	3RB_1	1909.3	22.01	21.03	/						
		1880.0	21.95	20.97	/						
		1850.7	22.13	21.20	/						
	3RB_0	1909.3	21.96	20.96	/						
		1880.0	21.91	20.93	/						
		1850.7	22.10	21.16	/						
	6RB_0	1909.3	20.97	20.04	/				22.5	21.5	/
		1880.0	20.90	19.94	/						
		1850.7	21.11	20.19	/						



Normal Power								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
3 MHz	1RB_14	1908.5	22.00	21.25	/	23.5	22.5	/
		1880.0	21.91	21.21	/			
		1851.5	22.11	21.42	/			
	1RB_7	1908.5	22.13	21.41	/			
		1880.0	22.02	21.34	/			
		1851.5	22.30	21.58	/			
	1RB_0	1908.5	21.98	21.23	/			
		1880.0	21.92	21.24	/			
		1851.5	22.09	21.44	/			
	8RB_7	1908.5	20.96	20.04	/	22.5	21.5	/
		1880.0	20.91	19.94	/			
		1851.5	21.13	20.18	/			
	8RB_4	1908.5	21.05	20.05	/			
		1880.0	20.98	19.99	/			
		1851.5	21.16	20.18	/			
	8RB_0	1908.5	20.98	20.04	/			
		1880.0	20.93	19.94	/			
		1851.5	21.14	20.16	/			
15RB_0	1908.5	20.99	19.97	/				
	1880.0	20.88	19.88	/				
	1851.5	21.12	20.14	/				



Normal Power									
LTE Band 2			Actual output Power (dBm)			Tune up			
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation			
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
5 MHz	1RB_24	1907.5	22.00	21.13	/	23.5	22.5	/	
		1880.0	21.77	21.05	/				
		1852.5	22.03	21.28	/				
	1RB_12	1907.5	22.10	21.36	/				
		1880.0	22.10	21.31	/				
		1852.5	22.28	21.58	/				
	1RB_0	1907.5	21.83	21.04	/				
		1880.0	21.79	21.07	/				
		1852.5	21.97	21.23	/				
	12RB_13	12RB_13	1907.5	20.96	19.99	/	22.5	21.5	/
			1880.0	20.91	19.89	/			
			1852.5	21.19	20.18	/			
		12RB_6	1907.5	21.01	20.03	/			
			1880.0	20.93	19.98	/			
			1852.5	21.20	20.21	/			
		12RB_0	1907.5	20.93	19.96	/			
			1880.0	20.92	19.89	/			
			1852.5	21.09	20.11	/			
25RB_0	1907.5	20.97	19.96	/					
	1880.0	20.94	19.90	/					
	1852.5	21.14	20.11	/					



Normal Power								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	1905.0	22.42	21.22	/	23.5	22.5	/
		1880.0	21.83	21.07	/			
		1855.0	22.09	21.37	/			
	1RB_24	1905.0	22.49	21.33	/			
		1880.0	21.99	21.27	/			
		1855.0	22.23	21.51	/			
	1RB_0	1905.0	22.08	21.25	/			
		1880.0	21.98	21.21	/			
		1855.0	22.10	21.38	/			
	25RB_25	1905.0	21.01	19.97	/	22.5	21.5	/
		1880.0	20.94	19.89	/			
		1855.0	21.18	20.17	/			
	25RB_12	1905.0	20.99	19.95	/			
		1880.0	21.00	19.95	/			
		1855.0	21.20	20.17	/			
	25RB_0	1905.0	20.99	20.00	/			
		1880.0	21.05	19.98	/			
		1855.0	21.09	20.13	/			
50RB_0	1905.0	20.99	19.98	/				
	1880.0	21.06	20.01	/				
	1855.0	21.16	20.13	/				



Normal Power								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	1902.5	22.33	21.18	/	23.5	22.5	/
		1880.0	22.25	21.08	/			
		1857.5	22.29	21.25	/			
	1RB_37	1902.5	22.39	21.25	/			
		1880.0	22.36	21.19	/			
		1857.5	22.45	21.44	/			
	1RB_0	1902.5	22.25	21.08	/			
		1880.0	22.33	21.24	/			
		1857.5	22.11	21.35	/			
	36RB_38	1902.5	21.47	20.00	/	22.5	21.5	/
		1880.0	21.31	20.14	/			
		1857.5	21.43	20.29	/			
	36RB_19	1902.5	21.50	19.98	/			
		1880.0	21.36	20.28	/			
		1857.5	21.63	20.48	/			
	36RB_0	1902.5	21.47	20.04	/			
		1880.0	21.43	20.35	/			
		1857.5	21.16	20.13	/			
75RB_0	1902.5	21.47	19.95	/				
	1880.0	21.35	20.35	/				
	1857.5	21.20	20.28	/				



Normal Power								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	1900.0	22.21	21.59	/	23.5	22.5	/
		1880.0	22.10	21.44	/			
		1860.0	22.31	21.63	/			
	1RB_50	1900.0	22.41	21.76	/			
		1880.0	22.43	21.79	/			
		1860.0	22.67	21.98	/			
	1RB_0	1900.0	22.16	21.43	/			
		1880.0	22.34	21.70	/			
		1860.0	22.42	21.76	/			
	50RB_50	1900.0	21.38	20.36	/	22.5	21.5	/
		1880.0	21.34	20.34	/			
		1860.0	21.56	20.54	/			
	50RB_25	1900.0	21.45	20.45	/			
		1880.0	21.53	20.47	/			
		1860.0	21.67	20.65	/			
	50RB_0	1900.0	21.40	20.38	/			
		1880.0	21.51	20.49	/			
		1860.0	21.54	20.52	/			
100RB_0	1900.0	21.37	20.36	/				
	1880.0	21.39	20.41	/				
	1860.0	21.56	20.51	/				



Reduced power level 1								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4 MHz	1RB_5	1909.3	19.39	19.23	/	20.5	20.5	/
		1880.0	18.94	19.10	/			
		1850.7	19.06	19.36	/			
	1RB_3	1909.3	19.27	19.33	/			
		1880.0	19.15	19.21	/			
		1850.7	19.11	19.46	/			
	1RB_0	1909.3	19.31	19.20	/			
		1880.0	19.20	19.09	/			
		1850.7	19.03	19.34	/			
	3RB_3	1909.3	19.27	19.02	/			
		1880.0	19.22	18.90	/			
		1850.7	19.12	19.15	/			
	3RB_1	1909.3	19.32	19.09	/			
		1880.0	19.32	18.97	/			
		1850.7	19.14	19.19	/			
	3RB_0	1909.3	18.98	19.04	/			
		1880.0	19.23	18.91	/			
		1850.7	19.09	19.15	/			
	6RB_0	1909.3	19.02	19.06	/	20.5	20.5	/
		1880.0	19.21	18.96	/			
		1850.7	19.15	19.21	/			



Reduced power level 1								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
3 MHz	1RB_14	1908.5	19.45	19.70	/	20.5	20.5	/
		1880.0	19.39	19.20	/			
		1851.5	19.61	19.42	/			
	1RB_7	1908.5	19.61	19.70	/			
		1880.0	19.59	19.37	/			
		1851.5	19.67	19.53	/			
	1RB_0	1908.5	19.43	19.37	/			
		1880.0	19.41	19.25	/			
		1851.5	19.55	19.40	/			
	8RB_7	1908.5	19.49	19.10	/	20.5	20.5	/
		1880.0	19.39	18.97	/			
		1851.5	19.63	19.23	/			
	8RB_4	1908.5	19.54	19.13	/			
		1880.0	19.45	19.03	/			
		1851.5	19.64	19.23	/			
	8RB_0	1908.5	19.47	19.04	/			
		1880.0	19.40	18.96	/			
		1851.5	19.64	19.22	/			
15RB_0	1908.5	19.49	19.03	/				
	1880.0	19.39	18.95	/				
	1851.5	19.64	19.16	/				



Reduced power level 1								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5 MHz	1RB_24	1907.5	19.37	19.64	/	20.5	20.5	/
		1880.0	19.28	19.38	/			
		1852.5	19.47	19.78	/			
	1RB_12	1907.5	19.59	19.93	/			
		1880.0	19.51	19.68	/			
		1852.5	19.83	19.85	/			
	1RB_0	1907.5	19.28	19.60	/			
		1880.0	19.27	19.48	/			
		1852.5	19.49	19.29	/			
	12RB_13	1907.5	19.47	19.46	/	20.5	20.5	/
		1880.0	19.35	19.39	/			
		1852.5	19.64	19.51	/			
	12RB_6	1907.5	19.50	19.48	/			
		1880.0	19.45	19.35	/			
		1852.5	19.71	19.53	/			
	12RB_0	1907.5	19.43	19.30	/			
		1880.0	19.39	19.36	/			
		1852.5	19.60	19.37	/			
	25RB_0	1907.5	19.46	19.39	/			
		1880.0	19.41	19.41	/			
		1852.5	19.63	19.30	/			



Reduced power level 1								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	1905.0	19.32	19.42	/	20.5	20.5	/
		1880.0	19.21	19.26	/			
		1855.0	19.53	19.47	/			
	1RB_24	1905.0	19.26	19.69	/			
		1880.0	19.44	19.30	/			
		1855.0	19.70	19.71	/			
	1RB_0	1905.0	19.05	19.45	/			
		1880.0	19.35	19.51	/			
		1855.0	19.52	19.42	/			
	25RB_25	1905.0	19.14	19.17	/	20.5	20.5	/
		1880.0	19.41	19.09	/			
		1855.0	19.65	19.21	/			
	25RB_12	1905.0	19.17	19.21	/			
		1880.0	19.48	19.15	/			
		1855.0	19.63	19.32	/			
	25RB_0	1905.0	19.14	19.11	/			
		1880.0	19.45	19.25	/			
		1855.0	19.61	19.15	/			
	50RB_0	1905.0	19.02	19.12	/			
		1880.0	19.46	19.15	/			
		1855.0	19.68	19.26	/			



Reduced power level 1								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	1902.5	19.13	19.19	/	20.5	20.5	/
		1880.0	18.81	19.08	/			
		1857.5	19.07	19.36	/			
	1RB_37	1902.5	19.22	19.21	/			
		1880.0	19.26	19.26	/			
		1857.5	19.29	19.52	/			
	1RB_0	1902.5	19.02	19.08	/			
		1880.0	19.17	19.29	/			
		1857.5	19.07	19.39	/			
	36RB_38	1902.5	19.00	19.00	/	20.5	20.5	/
		1880.0	19.22	18.95	/			
		1857.5	19.30	19.19	/			
	36RB_19	1902.5	18.98	19.03	/			
		1880.0	19.21	18.99	/			
		1857.5	19.27	19.20	/			
	36RB_0	1902.5	19.02	18.98	/			
		1880.0	19.25	19.00	/			
		1857.5	19.13	19.15	/			
	75RB_0	1902.5	19.00	18.97	/			
		1880.0	19.15	18.99	/			
		1857.5	19.36	19.16	/			



Reduced power level 1								
LTE Band 2			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	1900.0	18.79	19.08	/	20.5	20.5	/
		1880.0	18.65	18.91	/			
		1860.0	18.88	19.15	/			
	1RB_50	1900.0	18.97	19.26	/			
		1880.0	18.99	19.20	/			
		1860.0	19.19	19.49	/			
	1RB_0	1900.0	18.68	18.97	/			
		1880.0	18.89	19.16	/			
		1860.0	19.01	19.29	/			
	50RB_50	1900.0	18.95	18.92	/	20.5	20.5	/
		1880.0	18.82	18.87	/			
		1860.0	19.07	19.12	/			
	50RB_25	1900.0	18.97	18.95	/			
		1880.0	18.98	18.98	/			
		1860.0	19.24	19.17	/			
	50RB_0	1900.0	18.92	18.93	/			
		1880.0	19.02	19.02	/			
		1860.0	19.07	19.09	/			
	100RB_0	1900.0	18.95	18.90	/			
		1880.0	18.93	18.94	/			
		1860.0	19.09	19.07	/			



LTE Band 5			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4 MHz	1RB_5	848.3	22.12	21.39	/	23.5	22.5	/
		836.5	22.07	21.38	/			
		824.7	22.12	21.43	/			
	1RB_3	848.3	22.22	21.49	/			
		836.5	22.17	21.46	/			
		824.7	22.28	21.50	/			
	1RB_0	848.3	22.09	21.34	/			
		836.5	22.05	21.35	/			
		824.7	22.11	21.43	/			
	3RB_3	848.3	22.19	21.17	/			
		836.5	22.15	21.19	/			
		824.7	22.17	21.19	/			
	3RB_1	848.3	22.25	21.22	/			
		836.5	22.19	21.25	/			
		824.7	22.25	21.25	/			
	3RB_0	848.3	22.22	21.18	/			
		836.5	22.15	21.10	/			
		824.7	22.19	21.21	/			
6RB_0	848.3	21.25	20.27	/	22.5	21.5	/	
	836.5	21.13	20.22	/				
	824.7	21.20	20.29	/				



LTE Band 5			Actual output Power (dBm)			Tune up			
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation			
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
3 MHz	1RB_14	847.5	22.21	21.43	/	23.5	22.5	/	
		836.5	22.19	21.45	/				
		825.5	22.24	21.46	/				
	1RB_7	847.5	22.38	21.60	/				
		836.5	22.32	21.63	/				
		825.5	22.29	21.57	/				
	1RB_0	847.5	22.22	21.46	/				
		836.5	22.14	21.40	/				
		825.5	22.20	21.46	/				
	8RB_7	847.5	21.22	20.29	/	22.5	21.5	/	
		836.5	21.19	20.22	/				
		825.5	21.22	20.25	/				
		8RB_4	847.5	21.26	20.31				/
			836.5	21.24	20.28				/
			825.5	21.25	20.29				/
	8RB_0	847.5	21.22	20.25	/				
		836.5	21.20	20.23	/				
		825.5	21.22	20.24	/				
15RB_0	847.5	21.26	20.25	/					
	836.5	21.23	20.16	/					
	825.5	21.22	20.22	/					



LTE Band 5			Actual output Power (dBm)			Tune up			
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation			
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
5 MHz	1RB_24	846.5	22.12	21.42	/	23.5	22.5	/	
		836.5	22.09	21.36	/				
		826.5	22.10	21.43	/				
	1RB_12	846.5	22.39	21.68	/				
		836.5	22.37	21.68	/				
		826.5	22.47	21.68	/				
	1RB_0	846.5	22.14	21.43	/				
		836.5	22.07	21.34	/				
		826.5	22.12	21.43	/				
	12RB_13	846.5	21.28	20.31	/	22.5	21.5	/	
		836.5	21.17	20.14	/				
		826.5	21.24	20.26	/				
		12RB_6	846.5	21.29	20.27				/
			836.5	21.26	20.29				/
			826.5	21.22	20.26				/
	12RB_0	846.5	21.20	20.22	/				
		836.5	21.20	20.21	/				
		826.5	21.14	20.11	/				
25RB_0	846.5	21.26	20.24	/					
	836.5	21.22	20.18	/					
	826.5	21.22	20.22	/					



LTE Band 5			Actual output Power (dBm)			Tune up			
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation			
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
10 MHz	1RB_49	844.0	22.25	21.47	/	23.5	22.5	/	
		836.5	22.23	21.51	/				
		829.0	22.22	21.48	/				
	1RB_24	844.0	22.33	21.56	/				
		836.5	22.27	21.57	/				
		829.0	22.30	21.52	/				
	1RB_0	844.0	22.14	21.48	/				
		836.5	22.16	21.42	/				
		829.0	22.20	21.45	/				
	25RB_25	844.0	21.35	20.31	/	22.5	21.5	/	
		836.5	21.23	20.20	/				
		829.0	21.32	20.31	/				
		25RB_12	844.0	21.32	20.29				/
			836.5	21.28	20.24				/
			829.0	21.31	20.25				/
	25RB_0	844.0	21.32	20.30	/				
		836.5	21.29	20.28	/				
		829.0	21.14	20.15	/				
50RB_0	844.0	21.33	20.31	/					
	836.5	21.24	20.23	/					
	829.0	21.24	20.24	/					



Normal Power								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5 MHz	1RB_24	2567.5	22.23	21.48	/	23.5	22.5	/
		2535.0	22.19	21.40	/			
		2502.5	21.59	20.83	/			
	1RB_12	2567.5	22.47	21.63	/			
		2535.0	22.45	21.71	/			
		2502.5	21.72	21.05	/			
	1RB_0	2567.5	22.11	21.31	/			
		2535.0	22.16	21.39	/			
		2502.5	21.50	20.70	/			
	12RB_13	2567.5	21.26	20.25	/	22.5	21.5	/
		2535.0	21.28	20.26	/			
		2502.5	20.63	19.68	/			
	12RB_6	2567.5	21.34	20.35	/			
		2535.0	21.35	20.35	/			
		2502.5	20.69	19.72	/			
	12RB_0	2567.5	21.26	20.26	/			
		2535.0	21.24	20.26	/			
		2502.5	20.58	19.61	/			
25RB_0	2567.5	21.31	20.27	/				
	2535.0	21.28	20.26	/				
	2502.5	20.66	19.66	/				



Normal Power								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	2565.0	22.37	21.59	/	23.5	22.5	/
		2535.0	22.34	21.56	/			
		2505.0	21.78	21.05	/			
	1RB_24	2565.0	22.37	21.61	/			
		2535.0	22.42	21.69	/			
		2505.0	21.80	21.04	/			
	1RB_0	2565.0	22.19	21.44	/			
		2535.0	22.25	21.50	/			
		2505.0	21.60	20.84	/			
	25RB_25	2565.0	21.29	20.27	/	22.5	21.5	/
		2535.0	21.34	20.31	/			
		2505.0	20.78	19.79	/			
	25RB_12	2565.0	21.31	20.29	/			
		2535.0	21.37	20.33	/			
		2505.0	20.72	19.74	/			
	25RB_0	2565.0	21.27	20.21	/			
		2535.0	21.29	20.23	/			
		2505.0	20.65	19.62	/			
50RB_0	2565.0	21.30	20.24	/				
	2535.0	21.28	20.26	/				
	2505.0	20.71	19.72	/				



Normal Power								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	2562.5	22.36	21.65	/	23.5	22.5	/
		2535.0	22.31	21.56	/			
		2507.5	21.88	21.18	/			
	1RB_37	2562.5	22.30	21.58	/			
		2535.0	22.33	21.60	/			
		2507.5	21.82	21.08	/			
	1RB_0	2562.5	22.19	21.41	/			
		2535.0	22.14	21.43	/			
		2507.5	21.56	20.83	/			
	36RB_38	2562.5	21.34	20.35	/	22.5	21.5	/
		2535.0	21.40	20.38	/			
		2507.5	20.90	19.91	/			
	36RB_19	2562.5	21.29	20.32	/			
		2535.0	21.31	20.31	/			
		2507.5	20.83	19.81	/			
	36RB_0	2562.5	21.29	20.27	/			
		2535.0	21.25	20.27	/			
		2507.5	20.68	19.71	/			
75RB_0	2562.5	21.31	20.27	/				
	2535.0	21.33	20.32	/				
	2507.5	20.80	19.83	/				



Normal Power								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	2560.0	22.27	21.49	/	23.5	22.5	/
		2535.0	22.18	21.40	/			
		2510.0	21.88	21.13	/			
	1RB_50	2560.0	22.34	21.56	/			
		2535.0	22.36	21.58	/			
		2510.0	21.91	21.15	/			
	1RB_0	2560.0	22.05	21.29	/			
		2535.0	21.94	21.18	/			
		2510.0	21.84	20.65	/			
	50RB_50	2560.0	21.25	20.24	/	22.5	21.5	/
		2535.0	21.38	20.34	/			
		2510.0	20.94	19.94	/			
	50RB_25	2560.0	21.31	20.27	/			
		2535.0	21.35	20.32	/			
		2510.0	20.86	19.86	/			
	50RB_0	2560.0	21.24	20.22	/			
		2535.0	21.21	20.17	/			
		2510.0	20.62	19.67	/			
100RB_0	2560.0	21.26	20.25	/				
	2535.0	21.26	20.24	/				
	2510.0	20.78	19.79	/				



Reduced power level 1								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5 MHz	1RB_24	2567.4	20.61	20.89	/	21.5	21.5	/
		2535.0	20.59	20.90	/			
		2502.5	20.04	20.38	/			
	1RB_12	2567.4	20.80	21.09	/			
		2535.0	20.81	21.12	/			
		2502.5	20.27	20.42	/			
	1RB_0	2567.4	20.52	20.73	/			
		2535.0	20.60	20.85	/			
		2502.5	19.95	20.29	/			
	12RB_13	2567.4	20.67	20.68	/	21.5	21.5	/
		2535.0	20.68	20.70	/			
		2502.5	20.10	20.12	/			
	12RB_6	2567.4	20.74	20.74	/			
		2535.0	20.75	20.75	/			
		2502.5	20.15	20.17	/			
	12RB_0	2567.4	20.67	20.63	/			
		2535.0	20.66	20.68	/			
		2502.5	20.00	20.03	/			
	25RB_0	2567.4	20.70	20.67	/			
		2535.0	20.72	20.67	/			
		2502.5	20.09	20.08	/			



Reduced power level 1								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	2565.0	20.74	20.95	/	21.5	21.5	/
		2535.0	20.70	21.04	/			
		2505.0	20.24	20.56	/			
	1RB_24	2565.0	20.77	21.01	/			
		2535.0	20.74	21.08	/			
		2505.0	20.21	20.48	/			
	1RB_0	2565.0	20.57	20.83	/			
		2535.0	20.63	20.93	/			
		2505.0	20.06	20.32	/			
	25RB_25	2565.0	20.69	20.70	/	21.5	21.5	/
		2535.0	20.75	20.77	/			
		2505.0	20.21	20.22	/			
	25RB_12	2565.0	20.74	20.71	/			
		2535.0	20.77	20.77	/			
		2505.0	20.16	20.16	/			
	25RB_0	2565.0	20.67	20.64	/			
		2535.0	20.67	20.67	/			
		2505.0	20.08	20.11	/			
	50RB_0	2565.0	20.69	20.66	/			
		2535.0	20.69	20.72	/			
		2505.0	20.16	20.16	/			



Reduced power level 1								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	2562.5	19.70	21.03	/	21.5	21.5	/
		2535.0	20.73	20.97	/			
		2507.5	20.29	20.62	/			
	1RB_37	2562.5	20.71	20.95	/			
		2535.0	20.73	21.08	/			
		2507.5	20.22	20.50	/			
	1RB_0	2562.5	20.55	20.80	/			
		2535.0	20.54	20.83	/			
		2507.5	19.98	20.28	/			
	36RB_38	2562.5	20.75	20.75	/	21.5	21.5	/
		2535.0	20.82	20.80	/			
		2507.5	20.33	20.35	/			
	36RB_19	2562.5	20.68	20.72	/			
		2535.0	20.74	20.77	/			
		2507.5	20.26	20.26	/			
	36RB_0	2562.5	20.67	20.66	/			
		2535.0	20.70	20.69	/			
		2507.5	20.13	20.15	/			
	75RB_0	2562.5	20.73	20.69	/			
		2535.0	20.77	20.71	/			
		2507.5	20.26	20.22	/			



Reduced power level 1								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	2560.0	20.61	20.92	/	21.5	21.5	/
		2535.0	20.57	20.86	/			
		2510.0	20.31	20.63	/			
	1RB_50	2560.0	20.73	20.99	/			
		2535.0	20.75	21.11	/			
		2510.0	20.38	20.60	/			
	1RB_0	2560.0	20.38	20.74	/			
		2535.0	20.35	20.68	/			
		2510.0	19.84	20.15	/			
	50RB_50	2560.0	20.66	20.64	/	21.5	21.5	/
		2535.0	20.76	20.78	/			
		2510.0	20.32	20.36	/			
	50RB_25	2560.0	20.70	20.69	/			
		2535.0	20.72	20.74	/			
		2510.0	20.28	20.30	/			
	50RB_0	2560.0	20.59	20.63	/			
		2535.0	20.58	20.64	/			
		2510.0	20.05	20.08	/			
	100RB_0	2560.0	20.60	20.63	/			
		2535.0	20.64	20.70	/			
		2510.0	20.19	20.20	/			



Reduced power level 2								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5 MHz	1RB_24	2567.4	21.63	21.90	/	22.0	22.0	/
		2535.0	21.62	21.87	/			
		2502.5	21.06	21.34	/			
	1RB_12	2567.4	21.84	21.92	/			
		2535.0	21.88	21.96	/			
		2502.5	21.26	21.65	/			
	1RB_0	2567.4	21.50	21.73	/			
		2535.0	21.58	21.86	/			
		2502.5	20.97	21.26	/			
	12RB_13	2567.4	21.67	20.69	/	22.0	21.5	/
		2535.0	21.68	20.69	/			
		2502.5	21.10	20.11	/			
	12RB_6	2567.4	21.75	20.73	/			
		2535.0	21.77	20.76	/			
		2502.5	21.13	20.15	/			
	12RB_0	2567.4	21.67	20.65	/			
		2535.0	21.67	20.67	/			
		2502.5	21.03	20.03	/			
25RB_0	2567.4	21.73	20.66	/				
	2535.0	21.74	20.71	/				
	2502.5	21.10	20.10	/				



Reduced power level 2								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10 MHz	1RB_49	2565.0	21.78	21.98	/	22.0	22.0	/
		2535.0	21.73	21.96	/			
		2505.0	21.28	21.55	/			
	1RB_24	2565.0	21.75	22.00	/			
		2535.0	21.84	21.93	/			
		2505.0	21.23	21.53	/			
	1RB_0	2565.0	21.61	21.83	/			
		2535.0	21.64	21.94	/			
		2505.0	21.04	21.32	/			
	25RB_25	2565.0	21.73	20.67	/	22.0	21.5	/
		2535.0	21.77	20.76	/			
		2505.0	21.22	20.20	/			
	25RB_12	2565.0	21.74	20.72	/			
		2535.0	21.78	20.76	/			
		2505.0	21.19	20.16	/			
	25RB_0	2565.0	21.64	20.61	/			
		2535.0	21.69	20.66	/			
		2505.0	21.07	20.09	/			
50RB_0	2565.0	21.66	20.67	/				
	2535.0	21.73	20.70	/				
	2505.0	21.18	20.14	/				



Reduced power level 2								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
15 MHz	1RB_74	2562.5	21.74	21.98	/	22.0	22.0	/
		2535.0	21.75	21.96	/			
		2507.5	21.29	21.60	/			
	1RB_37	2562.5	21.71	21.93	/			
		2535.0	21.78	21.95	/			
		2507.5	21.24	21.52	/			
	1RB_0	2562.5	21.57	21.82	/			
		2535.0	21.60	21.81	/			
		2507.5	21.00	21.30	/			
	36RB_38	2562.5	21.75	20.75	/	22.0	21.5	/
		2535.0	21.78	20.80	/			
		2507.5	21.33	20.35	/			
	36RB_19	2562.5	21.71	20.71	/			
		2535.0	21.76	20.79	/			
		2507.5	21.27	20.27	/			
	36RB_0	2562.5	21.68	20.68	/			
		2535.0	21.70	20.71	/			
		2507.5	21.16	20.15	/			
75RB_0	2562.5	21.75	20.70	/				
	2535.0	21.75	20.73	/				
	2507.5	21.27	20.24	/				



Reduced power level 2								
LTE Band 7			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20 MHz	1RB_99	2560.0	21.66	21.89	/	22.0	22.0	/
		2535.0	21.62	21.86	/			
		2510.0	21.35	21.59	/			
	1RB_50	2560.0	21.75	21.98	/			
		2535.0	21.78	21.92	/			
		2510.0	21.36	21.58	/			
	1RB_0	2560.0	21.48	21.74	/			
		2535.0	21.38	21.68	/			
		2510.0	20.85	21.06	/			
	50RB_50	2560.0	21.68	20.66	/	22.0	21.5	/
		2535.0	21.78	20.72	/			
		2510.0	21.36	20.34	/			
	50RB_25	2560.0	21.74	20.71	/			
		2535.0	21.75	20.77	/			
		2510.0	21.29	20.28	/			
	50RB_0	2560.0	21.63	20.62	/			
		2535.0	21.65	20.65	/			
		2510.0	21.10	20.07	/			
100RB_0	2560.0	21.67	20.65	/				
	2535.0	21.70	20.66	/				
	2510.0	21.22	20.22	/				



LTE Band 12			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4 MHz	1RB_5	715.3	21.93	21.20	/	23.5	22.5	/
		707.5	21.99	21.26	/			
		699.7	22.08	21.33	/			
	1RB_3	715.3	22.05	21.32	/			
		707.5	22.11	21.40	/			
		699.7	22.22	21.45	/			
	1RB_0	715.3	21.89	21.17	/			
		707.5	22.00	21.31	/			
		699.7	22.08	21.35	/			
	3RB_3	715.3	21.99	20.97	/			
		707.5	22.05	21.04	/			
		699.7	22.17	21.25	/			
	3RB_1	715.3	22.02	21.00	/			
		707.5	22.13	21.13	/			
		699.7	22.22	21.28	/			
	3RB_0	715.3	22.01	20.96	/			
		707.5	22.04	21.06	/			
		699.7	22.16	21.22	/			
6RB_0	715.3	20.99	20.09	/	22.5	21.5	/	
	707.5	21.05	20.14	/				
	699.7	21.14	20.29	/				



LTE Band 12			Actual output Power (dBm)			Tune up			
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation			
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM	
3 MHz	1RB_14	714.5	22.04	21.24	/	23.5	22.5	/	
		707.5	22.12	21.30	/				
		700.5	22.20	21.40	/				
	1RB_7	714.5	22.20	21.39	/				
		707.5	22.26	21.46	/				
		700.5	22.32	21.65	/				
	1RB_0	714.5	22.00	21.21	/				
		707.5	22.08	21.32	/				
		700.5	22.15	21.43	/				
	8RB_7	8RB_7	714.5	21.04	20.11	/	22.5	21.5	/
			707.5	21.11	20.20	/			
			700.5	21.19	20.28	/			
		8RB_4	714.5	21.06	20.14	/			
			707.5	21.15	20.23	/			
			700.5	21.22	20.31	/			
	8RB_0	8RB_0	714.5	21.02	20.10	/			
			707.5	21.10	20.17	/			
			700.5	21.21	20.31	/			
15RB_0	15RB_0	714.5	21.00	20.03	/				
		707.5	21.08	20.11	/				
		700.5	21.17	20.21	/				



LTE Band 12			Actual output Power (dBm)			Tune up		
Band -width	RB No. / RB offset	Frequency (MHz)	Modulation			Modulation		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5 MHz	1RB_24	713.5	21.94	21.22	/	23.5	22.5	/
		707.5	22.01	21.30	/			
		701.5	22.11	21.37	/			
	1RB_12	713.5	22.17	21.50	/			
		707.5	22.27	21.56	/			
		701.5	22.36	21.65	/			
	1RB_0	713.5	21.94	21.18	/	22.5	21.5	/
		707.5	22.05	21.33	/			
		701.5	22.06	21.36	/			
	12RB_13	713.5	21.05	20.10	/			
		707.5	21.17	20.17	/			
		701.5	21.22	20.31	/			
	12RB_6	713.5	21.07	20.11	/			
		707.5	21.14	20.19	/			
		701.5	21.25	20.27	/			
	12RB_0	713.5	21.07	20.08	/			
		707.5	21.06	20.11	/			
		701.5	21.23	20.28	/			
25RB_0	713.5	21.00	20.03	/				
	707.5	21.13	20.11	/				
	701.5	21.24	20.26	/				