



1FCC 47 CFR § 2.1093
IEEE Std 1528-2013

SAR EVALUATION REPORT

FOR

GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC

MODEL NUMBER: SM-A136B/DSN, SM-A136B/N

FCC ID: A3LSMA136B

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TL-637

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1. Attestation of Test Results

Applicant Name		SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID		A3LSMA136B			
Model Number		SM-A136B/DSN, SM-A136B/N			
Applicable Standards		FCC 47 CFR § 2.1093 IEEE Std 1528-2013 Published RF exposure KDB procedures			
Exposure Category		SAR Limits (W/Kg)			
		Peak spatial-average (1g of tissue)		Product Specific 10g (10g of tissue)	
General population / Uncontrolled exposure		1.6		4.0	
RF Exposure Conditions		Equipment Class - The Highest Reported SAR (W/kg)			
		PCE	DTS	NII	DSS
Head		0.38	0.22	0.33	0.13
Body-worn		0.41	0.11	0.63	<0.10
Hotspot		0.75	0.28	0.54	<0.10
Product Specific 10g		N/A	N/A	1.83	N/A
Simultaneous TX	Head	0.85	0.60	0.85	0.85
	Body-worn	1.07	0.52	1.07	1.07
	Hotspot	1.35	1.02	1.35	1.35
	Product Specific 10g	N/A	N/A	N/A	N/A
Date Tested		2/17/2022 to 3/25/2022			
Test Results		Pass			
<p>UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p>Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.</p>					
Approved & Released By:			Prepared By:		
					
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1.1. The Highest Reported SAR for RF exposure conditions for each bands

Equipment Class	Band	The Highest Reported SAR (W/kg)			
		1g of tissue			10g of tissue
		Head Exposure condition	Body-worn Exposure condition	Hotspot Exposure condition	Product Specific Exposure condition
PCE	GSM 850	0.380	0.409	0.317	N/A
	GSM 1900	0.225	0.302	0.243	N/A
	WCDMA Band II	0.228	0.364	0.478	N/A
	WCDMA Band IV	0.182	0.303	0.371	N/A
	WCDMA Band V	0.272	0.368	0.747	N/A
	LTE Band 2	0.218	0.289	0.343	N/A
	LTE Band 4	N/A	N/A	N/A	N/A
	LTE Band 5	N/A	N/A	N/A	N/A
	LTE Band 12	0.210	0.343	0.455	N/A
	LTE Band 17	N/A	N/A	N/A	N/A
	LTE Band 26	0.246	0.300	0.706	N/A
	LTE Band 66	0.157	0.224	0.332	N/A
	LTE Band 41	0.323	0.253	0.562	N/A
	NR Band n5	0.362	0.381	0.641	N/A
NR Band n41	0.140	0.120	0.255	N/A	
DTS	2.4GHz WLAN	0.218	0.113	0.276	N/A
UNII	5GHz WLAN	0.333	0.632	0.540	1.828
DSS	Bluetooth	0.134	0.024	0.066	N/A

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, ANSI C63.26-2015 the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 648474 D04 Handset SAR v01r03
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
- 941225 D06 Hotspot Mode v02r01
- 941225 D07 UMPC Mini Tablet v01r02
- 971168 D01 Power Meas License Digital System v03r01

In addition to the above, the following information was used:

- [TCB workshop](#) October, 2014; RF Exposure Procedures Update (Overlapping LTE Bands)
- [TCB workshop](#) October, 2014; RF Exposure Procedures Update (Other LTE Considerations)
- [TCB workshop](#) October, 2016; RF Exposure Procedures (Bluetooth Duty Factor)
- [TCB workshop](#) October, 2016; RF Exposure Procedures (DUT Holder Perturbations)
- [TCB workshop](#) May, 2017; RF Exposure Procedures (LTE Test Conditions)
- [TCB workshop](#) November, 2017; RF Exposure Procedures (LTE UL/DL Carrier Aggregation SAR)
- [TCB workshop](#) April, 2018; RF Exposure Procedures (LTE DL CA SAR Test Exclusion Update)
- [TCB workshop](#) April, 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

Suwon
SAR 1 Room
SAR 2 Room
SAR 3 Room
SAR 4 Room
SAR 5 Room

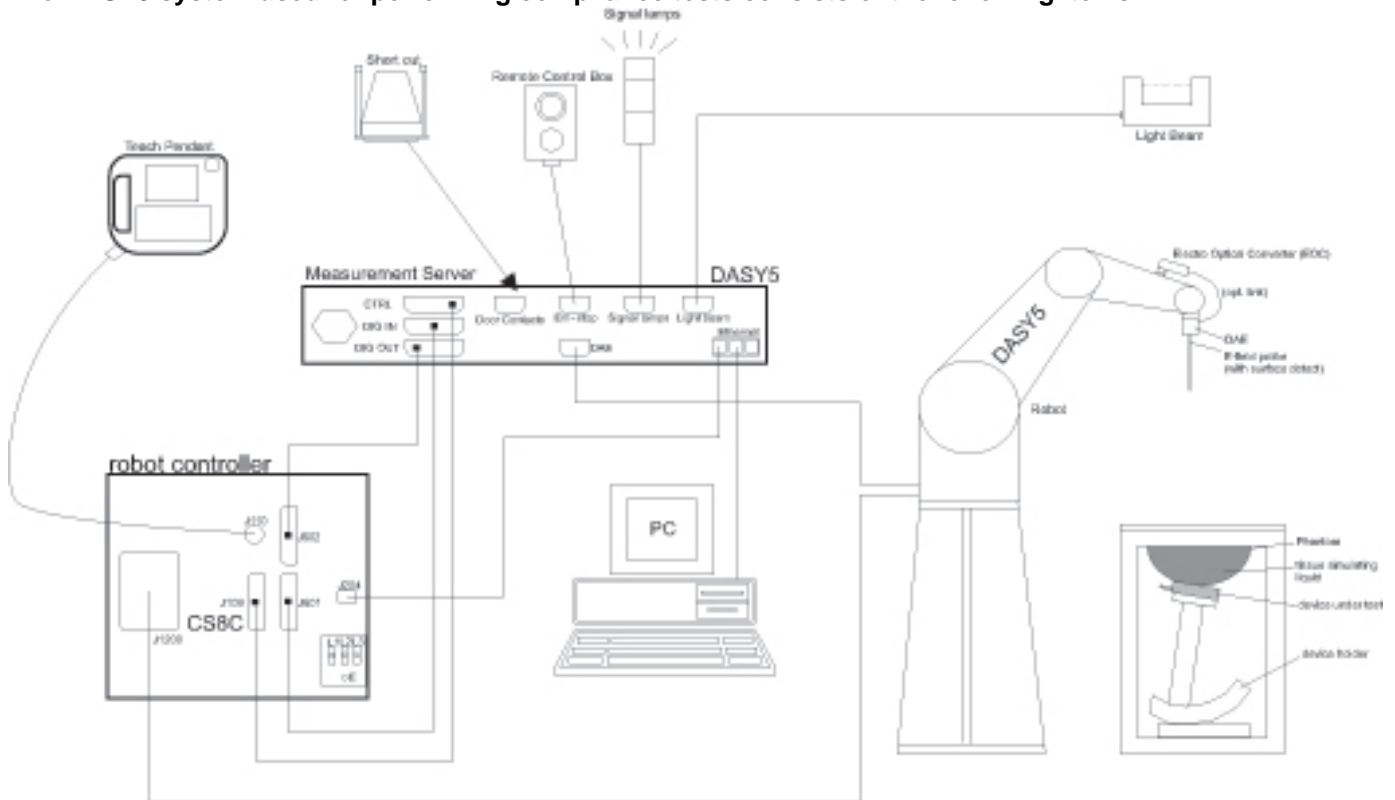
UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.

The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



- A standard high precision 6-axis robot 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 or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: 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 fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

	≤ 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.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$			≤ 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	≤ 1.5 · $\Delta z_{Zoom}(n-1)$	
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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> 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.				

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	8-6-2022
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	7-21-2022
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3851	8-4-2022

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-4-2022
Power Sensor	Agilent	U2000A	MY54260007	8-4-2022
Power Sensor	Agilent	U2000A	MY60180020	8-4-2022
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-4-2022
Directional Coupler	Agilent	772D	MY52180193	8-3-2022
Directional Coupler	Agilent	778D	MY52180432	8-3-2022
Low Pass Filter	MINI-CIRCUITS	NLP-1200	VUU19301915	8-4-2022
Low Pass Filter	MICROLAB	LA-15N	3943	8-3-2022
Low Pass Filter	FILTRON	L14012FL	1410003S	8-3-2022
Low Pass Filter	MICROLAB	LA-60N	3942	8-4-2022
Attenuator	MINI-CIRCUITS	BW-N3W5+	N/A	8-4-2022
Attenuator	Agilent	8491B/003	MY39272275	8-17-2022
Attenuator	Agilent	8491B/010	MY39272011	8-4-2022
Attenuator	Agilent	8491B/020	MY39271973	8-4-2022
E-Field Probe	SPEAG	EX3DV4	7314	5-31-2022
E-Field Probe	SPEAG	EX3DV4	7645	4-15-2022
E-Field Probe	SPEAG	EX3DV4	7545	8-26-2022
E-Field Probe	SPEAG	EX3DV4	7330	1-28-2023
E-Field Probe	SPEAG	EX3DV4	7376	7-30-2022
E-Field Probe	SPEAG	EX3DV4	7646	4-23-2022
Data Acquisition Electronics	SPEAG	DAE4	1591	3-26-2022
Data Acquisition Electronics	SPEAG	DAE4	1468	9-27-2022
Data Acquisition Electronics	SPEAG	DAE4	1494	7-27-2022
Data Acquisition Electronics	SPEAG	DAE4	1447	3-23-2022
Data Acquisition Electronics	SPEAG	DAE4	1671	5-6-2022
Data Acquisition Electronics	SPEAG	DAE4	1343	9-27-2022
System Validation Dipole	SPEAG	D750V3	1205	4-27-2023
System Validation Dipole	SPEAG	D835V2	4d174	3-17-2023
System Validation Dipole	SPEAG	D835V2	4d194	3-20-2022
System Validation Dipole	SPEAG	D1750V2	1180	4-27-2023
System Validation Dipole	SPEAG	D1900V2	5d190	11-24-2022
System Validation Dipole	SPEAG	D1900V2	5d199	3-19-2022
System Validation Dipole	SPEAG	D2450V2	939	7-21-2023
System Validation Dipole	SPEAG	D2450V2	960	3-20-2022
System Validation Dipole	SPEAG	D2600V2	1178	4-21-2023
System Validation Dipole	SPEAG	D5GHzV2	1184	12-3-2022
Thermometer	Lutron	MHB-382SD	AH.50213	8-4-2022
Thermometer	Lutron	MHB-382SD	AJ.45903	8-3-2022
Thermometer	Lutron	MHB-382SD	AK.12123	8-3-2022

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	169799	8-3-2022
Base Station Simulator	R & S	CMW500	169800	8-3-2022
Base Station Simulator	R & S	CMW500	169790	8-3-2022
Base Station Simulator	R & S	CMW500	169798	8-3-2022
Base Station Simulator	R & S	CMW500	150313	8-3-2022
UXM 5G Wireless Test Platform	Keysight	E7515B	MY57510596	8-6-2022
UXM 5G Wireless Test Platform	Keysight	E7515B	MY59150850	12-13-2022
UXM 5G Wireless Test Platform	Keysight	E7515B	MY58460570	12-13-2022

Note(s):

1. For System Validation Dipole, Calibration interval applied every 2 years according to referencing KDB 865664 guidance.
2. Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations. (for blue box items)
3. All equipments were used until Cal.Due data.

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

5.1. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedures 1, Clause 4.4.2 in IEC Guide 115:2007.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Refer to Appendix A.		
Back Cover	<input checked="" type="checkbox"/> The Back Cover is not removable.		
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 5.8 GHz)		
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 5.2 GHz_UNII-1, Wi-Fi 5.8 GHz_UNII-3)		
Test Sample Information	No.	S/N	Notes
	1	R3CT20631LL	Main Conducted
	2	R3CT2062DQR	Main Conducted
	3	R3CT20635NR	SAR
	4	R3CT209Q53Z	SAR
	5	R3CT206354A	SAR
	6	R3CT209Q59L	SAR
	7	R3CT20636YX	SAR
	8	R3CT209QM3W	SAR
	9	R3CT209QM9R	SAR
	10	R3CT209QMEM	SAR
	11	R3CT209QP1M	SAR

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK)	GPRS Multi-Slot Class:	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
		GPRS (GMSK)	<input type="checkbox"/> Class 8 - 1 Up, 4 Down	
		EGPRS (8PSK)	<input type="checkbox"/> Class 10 - 2 Up, 4 Down	
			<input type="checkbox"/> Class 12 - 4 Up, 4 Down	
			<input checked="" type="checkbox"/> Class 33 - 4 Up, 5 Down	
Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Category 24) HSUPA (Category 6) DC-HSDPA (Category 24) HSPA+ (DL only)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 12 FDD Band 17 FDD Band 26 TDD Band 41 FDD Band 66	QPSK 16QAM 64QAM Rel. 10 Carrier Aggregation (1 Uplink and 2 Downlinks)		100% (FDD) 63.3% (TDD)
		Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
5G NR (Sub 6) FDD Bands	NR Band n5	DFT-s-OFDM: ■ $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: ■ QPSK, 16QAM, 64QAM, 256QAM		100%
5G NR (Sub 6) TDD Bands	NR Band n41	DFT-s-OFDM: ■ $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: ■ QPSK, 16QAM, 64QAM, 256QAM		NR TDD bands (Voice/Data = 25.0%)
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20)		SISO mode 99.5% (802.11b)
	5 GHz	802.11a 802.11n (HT20) & (HT40) 802.11ac (VHT20) & (VHT40) & (VHT80)		SISO mode 98.0% (802.11a) 90.3% (802.11ac (VHT80))
	Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Does this device support Band gap channel(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Bluetooth	2.4 GHz	Version 5.0 LE		76.1% (DH5)
NFC	13.56 MHz	Type A/B/F		N/A ⁴

Notes:

1. The Bluetooth protocol is considered source-based averaging. Bluetooth GFSK (DH5) was verified to have the highest duty cycle of 76.1% and was considered and used for SAR Testing.
2. Duty cycle for Wi-Fi is referenced from the DTS and UNII report.
3. Measured Duty Cycle is not required due to SAR test exemption.

6.3. Nominal and Maximum Output Power

KDB 447498 sec.4.1. at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit

RF Air interface	Antenna	Mode	Time Slots	Max. RF Output Power (dBm)		Reduced. RF Output Power (Hotspot back-off) (dBm)		Reduced. RF Output Power (Proximity sensor & Earjack back-off) (dBm)	
				Tune-up Limit	Frame Pwr	Tune-up Limit	Frame Pwr	Tune-up Limit	Frame Pwr
GSM850	Main 1 Ant.	Voice	1	33.50	24.47	30.50	21.47		
		GPRS	1	33.50	24.47	30.50	21.47		
		GPRS	2	31.50	25.48	27.50	21.48		
		GPRS	3	29.50	25.24	25.50	21.24		
		GPRS	4	29.00	25.99	24.50	21.49		
		EGPRS	1	27.00	17.97	23.50	14.47		
		EGPRS	2	25.00	18.98	20.50	14.48		
		EGPRS	3	22.50	18.24	18.50	14.24		
		EGPRS	4	21.50	18.49	17.50	14.49		
GSM1900	Main 2 Ant.	Voice	1	31.00	21.97	28.00	18.97	28.00	18.97
		GPRS	1	31.00	21.97	28.00	18.97	28.00	18.97
		GPRS	2	29.50	23.48	25.50	19.48	25.50	19.48
		GPRS	3	27.50	23.24	23.50	19.24	23.50	19.24
		GPRS	4	26.00	22.99	22.00	18.99	22.00	18.99
		EGPRS	1	25.50	16.47	22.50	13.47	22.50	13.47
		EGPRS	2	24.50	18.48	20.50	14.48	20.50	14.48
		EGPRS	3	22.00	17.74	19.00	14.74	19.00	14.74
		EGPRS	4	21.00	17.99	17.50	14.49	17.50	14.49

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power (Hotspot & Proximity sensor & Earjack back-off) (dBm)
W-CDMA Band II	Main 2 Ant.	R99	25.00	22.00
		HSDPA	24.00	21.00
		HSUPA	23.50	20.50
		DC-HSDPA	24.00	21.00
W-CDMA Band IV	Main 2 Ant.	R99	24.00	22.00
		HSDPA	24.00	21.00
		HSUPA	23.00	20.00
		DC-HSDPA	24.00	21.00
W-CDMA Band V	Main 1 Ant.	R99	25.00	
		HSDPA	24.00	
		HSUPA	23.50	
		DC-HSDPA	24.00	

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power (dBm)
				(Hotspot & Proximity sensor & Ear-jack back-off) (dBm)
LTE Band 2	Main 2 Ant.	QPSK	24.50	21.00
LTE Band 4	Main 2 Ant.	QPSK	24.50	21.00
LTE Band 5	Main 1 Ant.	QPSK	25.00	
LTE Band 12	Main 1 Ant.	QPSK	25.00	
LTE Band 17	Main 1 Ant.	QPSK	25.00	
LTE Band 26	Main 1 Ant.	QPSK	25.00	
LTE Band 66	Main 2 Ant.	QPSK	24.50	
LTE Band 41	Main 2 Ant.	QPSK	24.00	

RF Air interface	Antenna	Mode	Max. RF Output Power (dBm)	Reduced. RF Output Power (dBm)
				(Hotspot & Proximity sensor & Ear-jack back-off) (dBm)
NR Band n5	Main 1 Ant.	DFT-s-OFDM QPSK	25.00	
NR Band n41	Main 2 Ant.	DFT-s-OFDM QPSK	23.50	

Normal WLAN

Band	Mode	Max (dBm)	Reduce (dBm)	Max (dBm)				Reduce (dBm)			
		b	b	a	g	n	ac	a	g	n	ac
2.4GHz	1-10Ch	18.00	14.00		18.00	18.00			14.00	14.00	
	11Ch	18.00	14.00		17.00	17.00			14.00	14.00	
	12Ch	18.00	14.00		14.00	15.00			14.00	14.00	
	13Ch	17.00	14.00		12.00	12.00			12.00	12.00	
5GHz (20MHz)	UNII-1			18.00	17.00	17.00	16.00	13.00	13.00	13.00	13.00
	UNII-2A			18.00	17.00	17.00	16.00	13.00	13.00	13.00	13.00
	UNII-2C			18.00	17.00	17.00	16.00	13.00	13.00	13.00	13.00
	UNII-3			17.50	17.00	17.00	16.00	13.00	13.00	13.00	13.00
5GHz (40MHz)	UNII-1				16.00	15.00			13.00	13.00	13.00
	UNII-2A				16.00	15.00			13.00	13.00	13.00
	UNII-2C				16.00	15.00			13.00	13.00	13.00
	UNII-3				16.00	15.00			13.00	13.00	13.00
5GHz (80MHz)	UNII-1						14.00				13.00
	UNII-2A						14.00				13.00
	UNII-2C						14.00				13.00
	UNII-3						14.00				13.00

Note :

1. This device uses an independent fixed level power reduction mechanism for WLAN mode operations during RCV operation. Detailed descriptions of the power reduction mechanism are included in the operational description.

Bluetooth-Maximum power

Band	Mode	Maximum output power (dBm)
2.4GHz	Bluetooth_GFSK	10.50
2.4GHz	Bluetooth_EDR	8.50
2.4GHz	Bluetooth_1LE	7.00
2.4GHz	Bluetooth_2LE	7.00

6.4. Power Back-off Operation

This device supports multiple power back-off modes: WWAN (Hotspot), WWAN (Proximity sensor), WWAN (ear-jack) and WLAN (RCV). Each of the power back-off operates within specific exposure conditions for certain technologies. For full details on how each power back-off mode operates, refer to the Operational Description.

Power Back-off mode	Technologies Supported	Exposure Conditions Active			
		Head	Body-worn	Hotspot	Product Specific 10-g
WWAN (Hotspot)	GSM 850 & 1900 WCDMA Band II & IV LTE Band 2 & 4 & 66	N/A	N/A	✓	N/A
WWAN (Proximity sensor)	GSM 1900 WCDMA Band II & IV LTE Band 2 & 4 & 66	N/A	N/A	N/A	✓
WWAN (Ear-jack)	GSM 1900 WCDMA Band II & IV LTE Band 2 & 4 & 66	N/A	✓	N/A	✓
WLAN (RCV)	2.4GHz/5GHz WLAN	✓	N/A	N/A	N/A

Note(s):

1. Tune-up Limits for WWAN (Hotspot) and WWAN (Proximity Sensor) are all Reduced Average Powers. Please refer to Sec.9 for all conducted power measurements.
2. WWAN Back-off priority: RCV → Hotspot → Ear-jack → Proximity Sensor
3. Body-worn SAR with ear-jack connected is not required due to Body-worn measured at max power is not over 1.2 W/kg.

Product Specific 10g Adjusted SAR Calculation

Wireless technologies	Max Tune-up Limit (dBm)	Reduced Tune-Up Limit (dBm)	Power Factor	Reported SAR Limit (W/kg)
GSM 1900	23.48	19.48	2.51	0.478
WCDMA Band II	25.00	22.00	2.00	0.601
WCDMA Band IV	24.00	22.00	1.58	0.757
LTE Band 2	24.50	21.00	2.24	0.536
LTE Band 4	24.50	21.00	2.24	0.536
LTE Band 66	24.50	21.50	2.00	0.601

Note(s):

1. Tune-up limit powers for GSM 1900 is frame power(dBm).
2. Hotspot mode supports power reduction. When the measured SAR is scaled to the maximum tune-up limit, the adjusted SAR is < 1.2 W/kg. Therefore, Extremity SAR testing is not required for this band in accordance with KDB 648474 §2.5 b. Refer to §10 for Reported SAR results. If the Reported SAR 1g value in §10 is less than the Reported SAR Limit listed above, then Extremity SAR is not required.
3. LTE 50% RB is scaled up to the Max Tune-Up Limit with MPR included.
4. For Reported SAR limit in above table, it was calculated using Max tune-up Limit & Reduced Tune-up limit & Reported SAR 1.2 W/kg. (Reported SAR Limit = 1.2 W/kg / Power factor, Power factor = 10^[(Max tune-up limit – Reduced tune-up limit)/10])

6.5. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700/ 1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7	
Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5	
High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3	
Band 17	Frequency range: 704 - 716 MHz						
	Channel Bandwidth						
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	
Low			23780/ 709	23755/ 706.5			
Mid			23790/ 710	23790/ 710			
High			23800/ 711	23825/ 713.5			

General LTE SAR Test and Reporting Considerations (Continued)

	Band 26	Frequency range: 814 - 849 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
	Low		26765/ 821.5	26740/ 819	26715/ 816.5	26705/ 815.5	26697/ 814.7																																																													
	Mid		26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5	26865/ 831.5																																																													
	High		26965/ 841.5	26990/ 844	27015/ 846.5	27025/ 847.5	27033/ 848.3																																																													
	Band 41	Frequency range: 2496 - 2690 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
		Low	39750 / 2506.0																																																																	
		Low-Mid	40185 / 2549.5																																																																	
		Mid	40620 / 2593.0																																																																	
		Mid-High	41055 / 2636.5																																																																	
	High	41490 / 2680.0																																																																		
	Band 66	Frequency range: 1710 - 1780 MHz																																																																		
Channel Bandwidth																																																																				
20 MHz		15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																														
Low		132072/ 1720	132047/ 1717.5	132022/ 1715	131997/ 1712.5	131987/ 1711.5	131979/ 1710.7																																																													
Mid		132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745																																																													
High	132572/ 1770	132597/ 1772.5	132622/ 1775	132647/ 1777.5	132657/ 1778.5	132665/ 1779.3																																																														
LTE transmitter and antenna implementation	Refer to Appendix A.																																																																			
Maximum power reduction (MPR)	<p>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table> <p>MPR Built-in by design The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values. A-MPR (additional MPR) was disabled during SAR testing</p>						Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})							MPR (dB)																																																												
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																																														
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																																													
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																													
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																													
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																													
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																													
256 QAM	≥ 1						≤ 5																																																													
Power reduction	Yes																																																																			
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																			

Notes:

- Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. 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 per KDB 941225 D05 SAR for LTE devices.
- LTE Band 41 test channels in accordance with October 2014 TCB workshop for all channels bandwidths.
- SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

6.6. LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

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

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

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$20480 \cdot T_s$				
6	$19760 \cdot T_s$	$23040 \cdot T_s$				
7	$21952 \cdot T_s$	$12800 \cdot T_s$				
8	$24144 \cdot T_s$	-	-	-		
9	$13168 \cdot T_s$	-	-	-	-	

Calculated Duty Cycle

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

Calculated Duty Cycle = Extended cyclic prefix in uplink x (T_s) x # of S + # of U

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

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$ seconds

Note(s):

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% duty cycle.

6.7. NR (Sub 6GHz) SAR Test and Reporting Considerations

Item	Description														
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band n5	Frequency range: 824 - 849 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low										166800 /834	166300 /831.5	165800 /829	165300 /826.5	
	Mid										167300 /836.5	167300 /836.5	167300 /836.5	167300 /836.5	
	High										167800 /839	168300 /841.5	168800 /844	169300 /846.5	
	Band n41	Frequency range: 2496 - 2690 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low							503202 /2516.01	502200 /2511.00		501204 /2506.02	501204 /2506.02	501204 /2506.02		
	Low-Mid	509202 /2546.01	508200 /2541	507204 /2536.02		505200 /2526	504204 /2512.02	513468 /2567.34	510402 /2552.01		509898 /2549.49	509898 /2549.49	509898 /2549.49		
	Mid	518598 /2592.99				518598 /2592.99	518598 /2592.99		518598 /2592.99		518598 /2592.99	518598 /2592.99	518598 /2592.99		
	Mid-High							523734 /2618.67	526800 /2634.00			527298 /2636.49	527298 /2636.49	527298 /2636.49	
	High	528000 /2640	528996 /2644.98	529998 /2649.99		531996 /2659.98	532998 /2664.99	534000 /2670	534996 /2674.98		535998 /2679.99	535998 /2679.99	535998 /2679.99		
SCS	NR FDD Bands: 15 kHz, NR TDD Bands: 30 kHz														
Modulations Supported in UL	DFT-s-OFDM: $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM														
A-MPR (Additional MPR) disabled for SAR Testing?	Yes														
EN-DC Carrier Aggregation Possible Combinations															
LTE Anchor Bands for NR Band n5	N/A														
LTE Anchor Bands for NR Band n41	N/A														

Notes:

- SAR test for NR bands and LTE anchor Bands were performed separately due to limitations in SAR probe calibration factors. And, Due to test setup limitations, SAR testing for NR was performed using test mode software to establish the connection.
- NR configurations of SAR test were determined according to Section 5.2 of KDB 941225 D05.
- All NR Bands has supports only SA mode.

7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	Antenna	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN	Head	All Main Antennas	0 mm	Left Touch	N/A	Yes	
				Left Tilt (15°)	N/A	Yes	
				Right Touch	N/A	Yes	
				Right Tilt (15°)	N/A	Yes	
	Body	All Main Antennas	15 mm	Rear	N/A	Yes	
				Front	N/A	Yes	
	Hotspot	Main 1 Ant.	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Edge 1 (Top)	> 25 mm	No	1
				Edge 2 (Right)	< 25 mm	Yes	
				Edge 3 (Bottom)	< 25 mm	Yes	
				Edge 4 (Left)	< 25 mm	Yes	
	Hotspot	Main 2 Ant.	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Edge 1 (Top)	> 25 mm	No	1
				Edge 2 (Right)	> 25 mm	No	1
				Edge 3 (Bottom)	< 25 mm	Yes	
				Edge 4 (Left)	< 25 mm	Yes	
Product Specific 10-g	All Main Antennas	0 mm	Rear	Refer to notes 2 & 3			
			Front				
			Edge 1 (Top)				
			Edge 2 (Right)				
			Edge 3 (Bottom)				
			Edge 4 (Left)				
WLAN/BT&BLE	Head	WiFi/BT 2.4G & WiFi 5G	0 mm	Left Touch	N/A	Yes	
				Left Tilt (15°)	N/A	Yes	
				Right Touch	N/A	Yes	
				Right Tilt (15°)	N/A	Yes	
	Body	WiFi/BT 2.4G & WiFi 5G	15 mm	Rear	N/A	Yes	
				Front	N/A	Yes	
	Hotspot	WiFi/BT 2.4G & WiFi 5G	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Edge 1 (Top)	< 25 mm	Yes	
				Edge 2 (Right)	> 25 mm	No	1
				Edge 3 (Bottom)	> 25 mm	No	1
				Edge 4 (Left)	< 25 mm	Yes	
	Product Specific 10-g	WiFi/BT 2.4G & WiFi 5G	0 mm	Rear	Refer to notes 2 & 4		
				Front			
				Edge 1 (Top)			
				Edge 2 (Right)			
				Edge 3 (Bottom)			
				Edge 4 (Left)			

Notes:

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- For Phablet devices: When hotspot mode applies, Product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
- For Phablet devices: When hotspot mode applies and power reduction applies to hotspot mode, Product specific 10-g SAR is required for each test position that has and adjusted SAR to maximum power that is > 1.2 W/kg.
- For Phablet devices: When hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.

8. Dielectric Property Measurements & System Check

8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Target Frequency (MHz)	Head	
	ϵ_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 – 2000	40.0	1.40
2450	39.2	1.80
3000	38.5	2.40
5000	36.2	4.45
5100	36.1	4.55
5200	36.0	4.66
5300	35.9	4.76
5400	35.8	4.86
5500	35.6	4.96
5600	35.5	5.07
5700	35.4	5.17
5800	35.3	5.27
6000	35.1	5.48

NOTE: For convenience, permittivity and conductivity values at some frequencies that are not part of the original data from Drossos et al. [B60] or the extension to 5800 MHz are provided (i.e., the values shown in italics). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6000 MHz that were linearly extrapolated from the values at 3000 MHz and 5800 MHz.

SAR test were performed in All RF exposure conditions using Head tissue according to TCB workshop note of April. 2019.

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

SAR 1 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
3/7/2022	Head 5250	e'	35.0400	Relative Permittivity (ϵ_r):	35.04	35.93	-2.49	5
		e''	15.5600	Conductivity (σ):	4.54	4.70	-3.40	5
	Head 5260	e'	35.0200	Relative Permittivity (ϵ_r):	35.02	35.92	-2.51	5
		e''	15.5500	Conductivity (σ):	4.55	4.71	-3.49	5
	Head 5600	e'	34.3900	Relative Permittivity (ϵ_r):	34.39	35.53	-3.22	5
		e''	15.6600	Conductivity (σ):	4.88	5.06	-3.64	5
	Head 5750	e'	34.0100	Relative Permittivity (ϵ_r):	34.01	35.36	-3.83	5
		e''	15.7600	Conductivity (σ):	5.04	5.21	-3.36	5
	Head 5825	e'	33.9100	Relative Permittivity (ϵ_r):	33.91	35.30	-3.94	5
		e''	15.7400	Conductivity (σ):	5.10	5.27	-3.26	5

SAR 2 Room

Date	Freq. (MHz)		Liquid Parameters	Measured	Target	Delta (%)	Limit ±(%)		
2/22/2022	Head 5250	e'	36.6700	Relative Permittivity (ϵ_r):	36.67	35.93	2.05	5	
		e''	16.0500	Conductivity (σ):	4.69	4.70	-0.36	5	
	Head 5260	e'	36.6400	Relative Permittivity (ϵ_r):	36.64	35.92	2.00	5	
		e''	16.0700	Conductivity (σ):	4.70	4.71	-0.26	5	
	Head 5600	e'	35.8600	Relative Permittivity (ϵ_r):	35.86	35.53	0.92	5	
		e''	16.5300	Conductivity (σ):	5.15	5.06	1.72	5	
	Head 5750	e'	35.5700	Relative Permittivity (ϵ_r):	35.57	35.36	0.59	5	
		e''	16.7200	Conductivity (σ):	5.35	5.21	2.53	5	
	Head 5825	e'	35.4700	Relative Permittivity (ϵ_r):	35.47	35.30	0.48	5	
		e''	16.8100	Conductivity (σ):	5.44	5.27	3.31	5	
	2/25/2022	Head 835	e'	41.5500	Relative Permittivity (ϵ_r):	41.55	41.50	0.12	5
			e''	19.4800	Conductivity (σ):	0.90	0.90	0.49	5
Head 820		e'	41.7000	Relative Permittivity (ϵ_r):	41.70	41.60	0.23	5	
		e''	19.7600	Conductivity (σ):	0.90	0.90	0.28	5	
Head 850		e'	41.5300	Relative Permittivity (ϵ_r):	41.53	41.50	0.07	5	
		e''	19.3700	Conductivity (σ):	0.92	0.92	0.05	5	
2/25/2022	Head 5250	e'	35.0400	Relative Permittivity (ϵ_r):	35.04	35.93	-2.49	5	
		e''	16.2800	Conductivity (σ):	4.75	4.70	1.07	5	
	Head 5260	e'	35.0200	Relative Permittivity (ϵ_r):	35.02	35.92	-2.51	5	
		e''	16.3000	Conductivity (σ):	4.77	4.71	1.17	5	
	Head 5600	e'	35.2400	Relative Permittivity (ϵ_r):	35.24	35.53	-0.83	5	
		e''	16.5100	Conductivity (σ):	5.14	5.06	1.59	5	
	Head 5750	e'	35.0900	Relative Permittivity (ϵ_r):	35.09	35.36	-0.77	5	
		e''	16.4200	Conductivity (σ):	5.25	5.21	0.69	5	
	Head 5825	e'	34.8800	Relative Permittivity (ϵ_r):	34.88	35.30	-1.19	5	
		e''	16.3000	Conductivity (σ):	5.28	5.27	0.18	5	
2/28/2022	Head 750	e'	41.1800	Relative Permittivity (ϵ_r):	41.18	41.96	-1.86	5	
		e''	22.3700	Conductivity (σ):	0.93	0.89	4.46	5	
	Head 700	e'	40.5100	Relative Permittivity (ϵ_r):	40.51	42.22	-4.05	5	
		e''	23.0500	Conductivity (σ):	0.90	0.89	0.89	5	
	Head 790	e'	40.6100	Relative Permittivity (ϵ_r):	40.61	41.76	-2.75	5	
		e''	20.8500	Conductivity (σ):	0.92	0.90	2.20	5	
2/28/2022	Head 835	e'	39.8100	Relative Permittivity (ϵ_r):	39.81	41.50	-4.07	5	
		e''	20.0500	Conductivity (σ):	0.93	0.90	3.43	5	
	Head 820	e'	39.9100	Relative Permittivity (ϵ_r):	39.91	41.60	-4.07	5	
		e''	20.1200	Conductivity (σ):	0.92	0.90	2.10	5	
	Head 850	e'	39.9000	Relative Permittivity (ϵ_r):	39.90	41.50	-3.86	5	
		e''	20.1100	Conductivity (σ):	0.95	0.92	3.87	5	
2/28/2022	Head 5250	e'	34.8200	Relative Permittivity (ϵ_r):	34.82	35.93	-3.10	5	
		e''	15.7900	Conductivity (σ):	4.61	4.70	-1.97	5	
	Head 5260	e'	34.8600	Relative Permittivity (ϵ_r):	34.86	35.92	-2.96	5	
		e''	15.8100	Conductivity (σ):	4.62	4.71	-1.88	5	
	Head 5600	e'	34.8600	Relative Permittivity (ϵ_r):	34.86	35.53	-1.90	5	
		e''	15.8200	Conductivity (σ):	4.93	5.06	-2.65	5	
	Head 5750	e'	34.6300	Relative Permittivity (ϵ_r):	34.63	35.36	-2.07	5	
		e''	15.8100	Conductivity (σ):	5.05	5.21	-3.05	5	
	Head 5825	e'	34.3900	Relative Permittivity (ϵ_r):	34.39	35.30	-2.58	5	
		e''	15.7900	Conductivity (σ):	5.11	5.27	-2.96	5	
3/8/2022	Head 5250	e'	35.8100	Relative Permittivity (ϵ_r):	35.81	35.93	-0.34	5	
		e''	15.5900	Conductivity (σ):	4.55	4.70	-3.21	5	
	Head 5260	e'	35.8100	Relative Permittivity (ϵ_r):	35.81	35.92	-0.31	5	
		e''	15.6300	Conductivity (σ):	4.57	4.71	-2.99	5	
	Head 5600	e'	35.6700	Relative Permittivity (ϵ_r):	35.67	35.53	0.38	5	
		e''	15.7300	Conductivity (σ):	4.90	5.06	-3.21	5	
	Head 5750	e'	35.3800	Relative Permittivity (ϵ_r):	35.38	35.36	0.05	5	
		e''	15.7900	Conductivity (σ):	5.05	5.21	-3.17	5	
	Head 5825	e'	35.1500	Relative Permittivity (ϵ_r):	35.15	35.30	-0.42	5	
		e''	15.8900	Conductivity (σ):	5.15	5.27	-2.34	5	

SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
3/3/2022	Head 1750	e'	39.3300	Relative Permittivity (ϵ_r):	39.33	40.08	-1.88	5
		e"	14.2200	Conductivity (σ):	1.38	1.37	1.07	5
	Head 1710	e'	39.4400	Relative Permittivity (ϵ_r):	39.44	40.15	-1.76	5
		e"	14.4500	Conductivity (σ):	1.37	1.35	2.04	5
	Head 1755	e'	39.3100	Relative Permittivity (ϵ_r):	39.31	40.08	-1.91	5
		e"	14.1900	Conductivity (σ):	1.38	1.37	0.94	5
3/7/2022	Head 1750	e'	38.8600	Relative Permittivity (ϵ_r):	38.86	40.08	-3.06	5
		e"	13.7300	Conductivity (σ):	1.34	1.37	-2.41	5
	Head 1710	e'	38.8500	Relative Permittivity (ϵ_r):	38.85	40.15	-3.23	5
		e"	13.8500	Conductivity (σ):	1.32	1.35	-2.19	5
	Head 1755	e'	38.8900	Relative Permittivity (ϵ_r):	38.89	40.08	-2.96	5
		e"	13.7200	Conductivity (σ):	1.34	1.37	-2.40	5
3/21/2022	Head 750	e'	43.5200	Relative Permittivity (ϵ_r):	43.52	41.96	3.71	5
		e"	20.7600	Conductivity (σ):	0.87	0.89	-3.06	5
	Head 700	e'	43.7400	Relative Permittivity (ϵ_r):	43.74	42.22	3.61	5
		e"	21.8000	Conductivity (σ):	0.85	0.89	-4.58	5
	Head 790	e'	43.3700	Relative Permittivity (ϵ_r):	43.37	41.76	3.86	5
		e"	20.0400	Conductivity (σ):	0.88	0.90	-1.77	5
3/21/2022	Head 835	e'	43.2700	Relative Permittivity (ϵ_r):	43.27	41.50	4.27	5
		e"	19.2600	Conductivity (σ):	0.89	0.90	-0.64	5
	Head 820	e'	43.3000	Relative Permittivity (ϵ_r):	43.30	41.60	4.08	5
		e"	19.5200	Conductivity (σ):	0.89	0.90	-0.94	5
	Head 850	e'	43.2300	Relative Permittivity (ϵ_r):	43.23	41.50	4.17	5
		e"	19.0100	Conductivity (σ):	0.90	0.92	-1.81	5

SAR 4 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2/22/2022	Head 2450	e'	38.8400	Relative Permittivity (ϵ_r):	38.84	39.20	-0.92	5
		e"	12.5800	Conductivity (σ):	1.71	1.80	-4.79	5
	Head 2400	e'	38.9300	Relative Permittivity (ϵ_r):	38.93	39.30	-0.93	5
		e"	12.5200	Conductivity (σ):	1.67	1.75	-4.62	5
	Head 2480	e'	38.7900	Relative Permittivity (ϵ_r):	38.79	39.16	-0.95	5
		e"	12.6500	Conductivity (σ):	1.74	1.83	-4.81	5
2/28/2022	Head 2450	e'	38.8800	Relative Permittivity (ϵ_r):	38.88	39.20	-0.82	5
		e"	12.7700	Conductivity (σ):	1.74	1.80	-3.35	5
	Head 2400	e'	39.0200	Relative Permittivity (ϵ_r):	39.02	39.30	-0.70	5
		e"	12.7500	Conductivity (σ):	1.70	1.75	-2.87	5
	Head 2480	e'	38.8000	Relative Permittivity (ϵ_r):	38.80	39.16	-0.92	5
		e"	12.7900	Conductivity (σ):	1.76	1.83	-3.75	5
2/28/2022	Head 2600	e'	38.2400	Relative Permittivity (ϵ_r):	38.24	39.01	-1.98	5
		e"	14.0800	Conductivity (σ):	2.04	1.96	3.74	5
	Head 2500	e'	38.6300	Relative Permittivity (ϵ_r):	38.63	39.14	-1.30	5
		e"	13.8000	Conductivity (σ):	1.92	1.85	3.47	5
	Head 2700	e'	37.6900	Relative Permittivity (ϵ_r):	37.69	38.88	-3.07	5
		e"	14.1100	Conductivity (σ):	2.12	2.07	2.32	5
3/3/2022	Head 2600	e'	37.8300	Relative Permittivity (ϵ_r):	37.83	39.01	-3.03	5
		e"	13.1800	Conductivity (σ):	1.91	1.96	-2.89	5
	Head 2500	e'	37.9500	Relative Permittivity (ϵ_r):	37.95	39.14	-3.03	5
		e"	13.1700	Conductivity (σ):	1.83	1.85	-1.26	5
	Head 2700	e'	37.6600	Relative Permittivity (ϵ_r):	37.66	38.88	-3.15	5
		e"	13.1700	Conductivity (σ):	1.98	2.07	-4.50	5
3/21/2022	Head 2600	e'	40.5900	Relative Permittivity (ϵ_r):	40.59	39.01	4.05	5
		e"	13.1500	Conductivity (σ):	1.90	1.96	-3.11	5
	Head 2500	e'	40.7800	Relative Permittivity (ϵ_r):	40.78	39.14	4.20	5
		e"	13.1400	Conductivity (σ):	1.83	1.85	-1.48	5
	Head 2700	e'	40.4400	Relative Permittivity (ϵ_r):	40.44	38.88	4.00	5
		e"	13.2000	Conductivity (σ):	1.98	2.07	-4.28	5

SAR 5 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
3/2/2022	Head 1900	e'	39.3600	Relative Permittivity (ϵ_r):	39.36	40.00	-1.60	5
		e"	13.5200	Conductivity (σ):	1.43	1.40	2.02	5
	Head 1850	e'	39.2200	Relative Permittivity (ϵ_r):	39.22	40.00	-1.95	5
		e"	13.6500	Conductivity (σ):	1.40	1.40	0.29	5
	Head 1910	e'	39.3800	Relative Permittivity (ϵ_r):	39.38	40.00	-1.55	5
		e"	13.5100	Conductivity (σ):	1.43	1.40	2.48	5
3/7/2022	Head 835	e'	41.2600	Relative Permittivity (ϵ_r):	41.26	41.50	-0.58	5
		e"	19.7200	Conductivity (σ):	0.92	0.90	1.73	5
	Head 820	e'	41.3200	Relative Permittivity (ϵ_r):	41.32	41.60	-0.68	5
		e"	19.9600	Conductivity (σ):	0.91	0.90	1.29	5
	Head 850	e'	41.2200	Relative Permittivity (ϵ_r):	41.22	41.50	-0.67	5
		e"	19.4900	Conductivity (σ):	0.92	0.92	0.67	5
3/10/2022	Head 835	e'	40.7900	Relative Permittivity (ϵ_r):	40.79	41.50	-1.71	5
		e"	19.7700	Conductivity (σ):	0.92	0.90	1.99	5
	Head 820	e'	40.8400	Relative Permittivity (ϵ_r):	40.84	41.60	-1.83	5
		e"	20.0200	Conductivity (σ):	0.91	0.90	1.60	5
	Head 850	e'	40.7300	Relative Permittivity (ϵ_r):	40.73	41.50	-1.86	5
		e"	19.5200	Conductivity (σ):	0.92	0.92	0.83	5
3/21/2022	Head 1750	e'	39.0600	Relative Permittivity (ϵ_r):	39.06	40.08	-2.56	5
		e"	13.5600	Conductivity (σ):	1.32	1.37	-3.62	5
	Head 1710	e'	39.1500	Relative Permittivity (ϵ_r):	39.15	40.15	-2.48	5
		e"	13.7100	Conductivity (σ):	1.30	1.35	-3.18	5
	Head 1755	e'	39.0500	Relative Permittivity (ϵ_r):	39.05	40.08	-2.56	5
		e"	13.5500	Conductivity (σ):	1.32	1.37	-3.61	5
3/21/2022	Head 1900	e'	39.0100	Relative Permittivity (ϵ_r):	39.01	40.00	-2.48	5
		e"	12.9000	Conductivity (σ):	1.36	1.40	-2.65	5
	Head 1850	e'	38.9600	Relative Permittivity (ϵ_r):	38.96	40.00	-2.60	5
		e"	13.1200	Conductivity (σ):	1.35	1.40	-3.60	5
	Head 1910	e'	39.0200	Relative Permittivity (ϵ_r):	39.02	40.00	-2.45	5
		e"	12.8700	Conductivity (σ):	1.37	1.40	-2.37	5

8.2. System Check

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. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 2.5 mm.
For 5 GHz band - Distance between probe sensors and phantom surface was set to 1.4 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

Reference Target SAR Values

The reference SAR values can be obtained from the calibration certificate of system validation dipoles.

System Dipole	Serial No.	Cal. Date	Cal. Due Date	Target SAR Values (W/kg)	
				1g/10g	Head
D750V3	1205	4/27/2021	4/27/2023	1g	8.66
				10g	5.65
D835V2	4d174	3/17/2021	3/17/2023	1g	9.70
				10g	6.29
D835V2	4d194	3/20/2020	3/20/2022	1g	9.76
				10g	6.42
D1750V2	1180	4/27/2021	4/27/2023	1g	36.40
				10g	19.10
D1900V2	5d190	11/24/2020	11/24/2022	1g	40.10
				10g	20.70
D1900V2	5d199	3/19/2020	3/19/2022	1g	40.50
				10g	21.00
D2450V2	939	7/21/2021	7/21/2023	1g	53.00
				10g	24.70
D2450V2	960	3/20/2020	3/20/2022	1g	53.20
				10g	24.80
D2600V2	1178	4/21/2021	4/21/2023	1g	56.60
				10g	25.40
D5GHzV2	1184	12/3/2020	12/3/2022	1g	79.10
				10g	22.70
				1g	82.40
				10g	23.30
				1g	79.90
				10g	22.60

Note(s):

1. For System Validation Dipole, Calibration interval applied every 2 years according to referencing KDB 865664 guidance.
2. Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations.
3. All equipments were used until Cal.Due data.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

SAR 1 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
3/7/2022	D5GHzV2 (5750)	1184	Head	1g	8.01	80.1	79.90	0.25	1, 2
				10g	2.32	23.2	22.60	2.65	

SAR 2 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
2/22/2022	D5GHzV2 (5250)	1184	Head	1g	8.24	82.4	79.10	4.17	
				10g	2.43	24.3	22.70	7.05	
2/22/2022	D5GHzV2 (5750)	1184	Head	1g	7.84	78.4	79.90	-1.88	
				10g	2.27	22.7	22.60	0.44	
2/25/2022	D835V2	4d194	Head	1g	0.99	9.9	9.76	1.43	
				10g	0.64	6.4	6.42	-1.09	
2/25/2022	D5GHzV2 (5250)	1184	Head	1g	7.92	79.2	79.10	0.13	
				10g	2.30	23.0	22.70	1.32	
2/25/2022	D5GHzV2 (5600)	1184	Head	1g	8.41	84.1	82.40	2.06	
				10g	2.41	24.1	23.30	3.43	
2/28/2022	D750V3	1205	Head	1g	0.87	8.7	8.66	0.92	
				10g	0.57	5.7	5.65	0.88	
2/28/2022	D835V2	4d194	Head	1g	1.05	10.5	9.76	7.58	3, 4
				10g	0.68	6.8	6.42	5.61	
2/28/2022	D5GHzV2 (5600)	1184	Head	1g	7.84	78.4	82.40	-4.85	5, 6
				10g	2.24	22.4	23.30	-3.86	
3/8/2022	D5GHzV2 (5750)	1184	Head	1g	7.98	79.8	79.90	-0.13	
				10g	2.30	23.0	22.60	1.77	

SAR 3 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta $\pm 10\%$	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
3/3/2022	D1750V2	1180	Head	1g	3.70	37.0	36.40	1.65	
				10g	2.03	20.3	19.10	6.28	
3/7/2022	D1750V2	1180	Head	1g	3.41	34.1	36.40	-6.32	
				10g	1.89	18.9	19.10	-1.05	
3/21/2022	D750V3	1205	Head	1g	0.84	8.4	8.66	-3.58	7, 8
				10g	0.57	5.7	5.65	0.71	
3/21/2022	D835V2	4d174	Head	1g	0.94	9.4	9.70	-3.51	9, 10
				10g	0.60	6.0	6.29	-5.25	

SAR 4 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
2/22/2022	D2450V2	960	Head	1g	5.19	51.9	53.20	-2.44	11, 12
				10g	2.40	24.0	24.80	-3.23	
2/28/2022	D2450V2	939	Head	1g	4.86	48.6	53.00	-8.30	13, 14
				10g	2.25	22.5	24.70	-8.91	
2/28/2022	D2600V2	1178	Head	1g	5.84	58.4	56.60	3.18	
				10g	2.59	25.9	25.40	1.97	
3/3/2022	D2600V2	1178	Head	1g	5.81	58.1	56.60	2.65	
				10g	2.59	25.9	25.40	1.97	
3/21/2022	D2600V2	1178	Head	1g	5.39	53.9	56.60	-4.77	15, 16
				10g	2.38	23.8	25.40	-6.30	

SAR 5 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.	
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W				
3/2/2022	D1900V2	5d199	Head	1g	4.09	40.9	40.50	0.99	17, 18
				10g	2.15	21.5	21.00	2.38	
3/7/2022	D835V2	4d194	Head	1g	1.01	10.1	9.76	3.48	
				10g	0.68	6.8	6.42	6.39	
3/10/2022	D835V2	4d194	Head	1g	0.99	9.9	9.76	1.23	
				10g	0.66	6.6	6.42	3.43	
3/21/2022	D1750V2	1180	Head	1g	3.37	33.7	36.40	-7.42	19, 20
				10g	1.86	18.6	19.10	-2.62	
3/21/2022	D1900V2	5d190	Head	1g	3.93	39.3	40.10	-2.00	21, 22
				10g	2.09	20.9	20.70	0.97	

9. Conducted Output Power Measurements

9.1. GSM

Per KDB 941225 D01 3G SAR Procedures:

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

GSM850 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)				Reduced Average Power (dBm) Hotspot back-off			
					Measured		Tune-up Limit		Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	128	824.2	31.96	22.93	33.50	24.47	29.67	20.64	30.50	21.47
			190	836.6	31.75	22.72			29.44	20.41		
			251	848.8	31.51	22.48			29.21	20.18		
GPRS (GMSK)	CS1	1	128	824.2	32.00	22.97	33.50	24.47	29.68	20.65	30.50	21.47
			190	836.6	31.71	22.68			29.41	20.37		
			251	848.8	31.64	22.61			29.16	20.13		
		2	128	824.2	31.34	25.32	31.50	25.48	26.56	20.54	27.50	21.48
			190	836.6	31.02	25.00			26.34	20.32		
			251	848.8	30.78	24.76			26.05	20.03		
		3	128	824.2	29.27	25.01	29.50	25.24	24.50	20.24	25.50	21.24
			190	836.6	29.01	24.75			24.23	19.98		
			251	848.8	28.83	24.57			23.95	19.69		
		4	128	824.2	28.11	25.10	29.00	25.99	23.49	20.47	24.50	21.49
			190	836.6	27.85	24.84			23.20	20.19		
			251	848.8	27.66	24.65			23.07	20.06		
EGPRS (8PSK)	MCS5	1	128	824.2	25.51	16.48	27.00	17.97	22.92	13.89	23.50	14.47
			190	836.6	25.20	16.17			22.73	13.70		
			251	848.8	25.47	16.44			22.27	13.24		
		2	128	824.2	24.40	18.38	25.00	18.98	19.86	13.84	20.50	14.48
			190	836.6	24.20	18.18			19.72	13.70		
			251	848.8	23.82	17.80			19.36	13.34		
		3	128	824.2	22.32	18.06	22.50	18.24	17.76	13.50	18.50	14.24
			190	836.6	22.36	18.11			17.64	13.38		
			251	848.8	21.93	17.67			17.60	13.34		
		4	128	824.2	21.36	18.35	21.50	18.49	16.42	13.41	17.50	14.49
			190	836.6	21.06	18.05			16.31	13.30		
			251	848.8	20.70	17.69			16.14	13.13		

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 4 time slots for Max power and Reduced power, based on the Tune-up Procedure. Refer to §6.3.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2W/kg.

GSM1900 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)				Reduced Average Power (dBm) Hotspot back-off				Reduced Average Power (dBm) Proximity sensor back-off			
					Measured		Tune-up Limit		Measured		Tune-up Limit		Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	512	1850.2	29.78	20.75	31.00	21.97	27.87	18.84	28.00	18.97	27.78	18.75	28.00	18.97
			661	1880.0	29.32	20.29			27.14	18.11			27.07	18.04		
			810	1909.8	29.48	20.45			27.63	18.60			27.54	18.51		
GPRS (GMSK)	CS1	1	512	1850.2	29.76	20.73	31.00	21.97	27.70	18.67	28.00	18.97	27.69	18.66	28.00	18.97
			661	1880.0	29.27	20.24			27.10	18.07			27.03	18.00		
			810	1909.8	29.43	20.40			27.58	18.55			27.51	18.47		
		2	512	1850.2	28.74	22.72	29.50	23.48	24.71	18.69	25.50	19.48	24.64	18.62	25.50	19.48
			661	1880.0	28.48	22.46			24.00	17.98			23.93	17.91		
			810	1909.8	28.48	22.46			24.51	18.49			24.44	18.42		
	3	512	1850.2	27.28	23.02	27.50	23.24	22.50	18.24	23.50	19.24	22.49	18.23	23.50	19.24	
		661	1880.0	26.67	22.41			21.96	17.70			21.89	17.63			
		810	1909.8	27.13	22.87			22.39	18.13			22.38	18.12			
	4	512	1850.2	25.72	22.71	26.00	22.99	21.64	18.63	22.00	18.99	21.57	18.56	22.00	18.99	
		661	1880.0	25.09	22.08			20.95	17.94			20.88	17.87			
		810	1909.8	25.61	22.60			21.56	18.55			21.49	18.48			
EGPRS (8PSK)	MCS5	1	512	1850.2	25.05	16.02	25.50	16.47	22.23	13.20	22.50	13.47	22.25	13.22	22.50	13.47
			661	1880.0	24.69	15.66			22.01	12.98			22.04	13.01		
			810	1909.8	25.17	16.14			22.47	13.44			22.45	13.42		
		2	512	1850.2	23.75	17.73	24.50	18.48	19.30	13.28	20.50	14.48	19.12	13.10	20.50	14.48
			661	1880.0	23.60	17.58			18.89	12.87			18.95	12.93		
			810	1909.8	24.00	17.98			19.66	13.64			19.65	13.63		
	3	512	1850.2	21.90	17.64	22.00	17.74	17.16	12.90	19.00	14.74	17.16	12.90	19.00	14.74	
		661	1880.0	21.54	17.28			16.70	12.44			16.83	12.57			
		810	1909.8	21.54	17.28			17.59	13.33			17.53	13.27			
	4	512	1850.2	20.87	17.86	21.00	17.99	16.06	13.05	17.50	14.49	16.05	13.04	17.50	14.49	
		661	1880.0	20.54	17.53			15.61	12.60			15.58	12.57			
		810	1909.8	20.97	17.96			16.32	13.31			16.32	13.31			

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 2 time slots for Max power and Reduced power, based on the Tune-up Procedure. Refer to §6.3.
- SAR is not required for EGPRS (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2W/kg.

9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs}=\beta_{hs}/\beta_c$	30/15			

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in table C,11.1.3 of 3GPP TS 34.121-1 v13. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{ed}	1309/225	94/75	47/15	56/75	47/15
CM (dB)	1	3	2	3	1	
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	A _{hs} = β_{hs}/β_c	30/15				
HSUPA Specific Settings	E-DPDCH	6	8	8	5	0
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
Reference E-TFCI PO	27	27	27	27	27	
Maximum Channelization Codes	2xSF2				SF4	

DC-HSDPA Setup Procedures used to establish the test signals

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

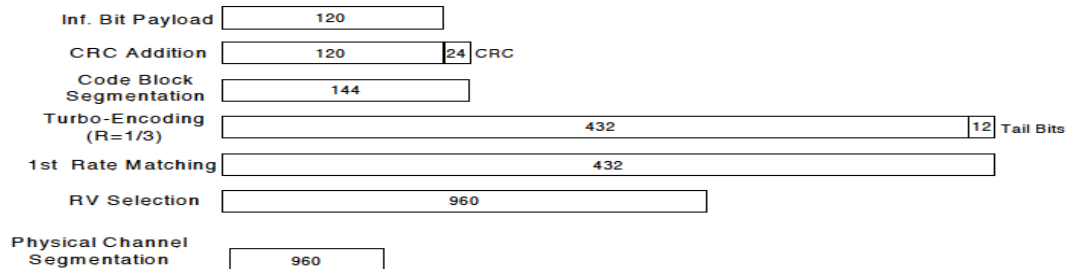


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 12			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	11/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

HSPA+

HSPA+ is only supported to down link. Therefore, the RF conducted power is not measured.

W-CDMA Band II Measured Results

Mode	UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Hotspot back-off			Reduced Average Power (dBm) Proximity sensor back-off			
			Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.96	N/A	25.00	20.96	N/A	22.00	21.18	N/A	22.00
		9400	1880.0	23.40			20.40			20.57		
		9538	1907.6	23.78			20.81			21.07		
HSDPA	Subtest 1	9262	1852.4	22.97	0	24.00	19.96	0	21.00	20.18	0	21.00
		9400	1880.0	22.41			19.40			19.57		
		9538	1907.6	22.80			19.80			20.05		
	Subtest 2	9262	1852.4	22.96	0	24.00	19.90	0	21.00	20.23	0	21.00
		9400	1880.0	22.38			19.39			19.65		
		9538	1907.6	22.76			19.75			19.90		
	Subtest 3	9262	1852.4	22.49	0.5	23.50	19.48	0.5	20.50	19.82	0.5	20.50
		9400	1880.0	21.94			18.95			19.19		
		9538	1907.6	22.33			19.32			19.60		
	Subtest 4	9262	1852.4	22.47	0.5	23.50	19.51	0.5	20.50	19.66	0.5	20.50
		9400	1880.0	21.90			18.91			19.07		
		9538	1907.6	22.29			19.28			19.57		
HSUPA	Subtest 1	9262	1852.4	21.68	0	23.50	18.57	0	20.50	18.59	0	20.50
		9400	1880.0	21.05			18.18			18.19		
		9538	1907.6	21.51			18.41			18.44		
	Subtest 2	9262	1852.4	21.14	2	21.50	18.06	2	18.50	18.07	2	18.50
		9400	1880.0	20.55			17.67			17.70		
		9538	1907.6	21.03			17.94			17.96		
	Subtest 3	9262	1852.4	21.19	1	22.50	19.12	1	19.50	19.11	1	19.50
		9400	1880.0	20.56			18.51			18.52		
		9538	1907.6	21.06			18.98			18.99		
	Subtest 4	9262	1852.4	20.69	2	21.50	17.75	2	18.50	17.78	2	18.50
		9400	1880.0	20.09			17.17			17.16		
		9538	1907.6	20.55			17.64			17.64		
	Subtest 5	9262	1852.4	22.17	0	23.50	18.44	0	20.50	18.23	0	20.50
		9400	1880.0	21.59			18.47			18.47		
		9538	1907.6	22.06			18.98			18.91		
DC-HSDPA	Subtest 1	9262	1852.4	23.01	0	24.00	19.79	0	21.00	19.65	0	21.00
		9400	1880.0	22.44			19.42			19.60		
		9538	1907.6	22.82			19.82			20.08		
	Subtest 2	9262	1852.4	23.00	0	24.00	19.97	0	21.00	20.18	0	21.00
		9400	1880.0	22.43			19.40			19.58		
		9538	1907.6	22.79			19.78			20.06		
	Subtest 3	9262	1852.4	22.47	0.5	23.50	19.44	0.5	20.50	19.66	0.5	20.50
		9400	1880.0	21.92			18.89			19.06		
		9538	1907.6	22.31			19.30			19.57		
	Subtest 4	9262	1852.4	22.48	0.5	23.50	19.51	0.5	20.50	19.51	0.5	20.50
		9400	1880.0	21.92			19.97			19.08		
		9538	1907.6	22.30			19.35			19.56		

W-CDMA Band IV Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm) Hotspot back-off			Reduced Average Power (dBm) Proximity sensor back-off		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	22.84	N/A	24.00	19.66	N/A	22.00	19.74	N/A	22.00
		1413	1732.6	23.58			20.59			20.79		
		1513	1752.6	23.99			21.15			21.19		
HSDPA	Subtest 1	1312	1712.4	21.55	0	24.00	18.55	0	21.00	18.71	0	21.00
		1413	1732.6	22.59			19.59			19.77		
		1513	1752.6	22.96			19.95			20.16		
	Subtest 2	1312	1712.4	21.53	0	24.00	18.50	0	21.00	18.72	0	21.00
		1413	1732.6	22.56			19.56			19.76		
		1513	1752.6	22.96			19.95			20.14		
	Subtest 3	1312	1712.4	21.06	0.5	23.50	18.08	0.5	20.50	18.43	0.5	20.50
		1413	1732.6	22.11			19.11			19.51		
		1513	1752.6	22.48			19.50			19.68		
	Subtest 4	1312	1712.4	21.01	0.5	23.50	18.12	0.5	20.50	18.39	0.5	20.50
		1413	1732.6	22.08			19.07			19.26		
		1513	1752.6	22.47			19.46			19.64		
HSUPA	Subtest 1	1312	1712.4	20.56	0	23.00	17.52	0	20.00	17.53	0	20.00
		1413	1732.6	21.30			18.42			18.43		
		1513	1752.6	21.68			18.60			18.58		
	Subtest 2	1312	1712.4	19.74	1	22.00	16.87	1	19.00	16.87	1	19.00
		1413	1732.6	20.79			17.92			17.93		
		1513	1752.6	21.19			18.29			18.29		
	Subtest 3	1312	1712.4	19.73	1	22.00	17.89	0	20.00	17.91	0	20.00
		1413	1732.6	20.13			17.55			17.56		
		1513	1752.6	21.20			19.12			19.13		
	Subtest 4	1312	1712.4	19.26	2	21.00	16.38	2	18.00	16.36	2	18.00
		1413	1732.6	20.34			17.41			17.42		
		1513	1752.6	20.70			17.79			17.82		
	Subtest 5	1312	1712.4	20.76	0	23.00	17.85	0	20.00	17.91	0	20.00
		1413	1732.6	21.82			18.73			18.77		
		1513	1752.6	22.21			19.09			19.12		
DC-HSDPA	Subtest 1	1312	1712.4	21.56	0	24.00	18.56	0	21.00	18.73	0	21.00
		1413	1732.6	22.59			19.61			19.78		
		1513	1752.6	22.97			19.57			20.16		
	Subtest 2	1312	1712.4	21.52	0	24.00	18.52	0	21.00	18.71	0	21.00
		1413	1732.6	22.57			19.22			19.75		
		1513	1752.6	22.97			19.53			20.12		
	Subtest 3	1312	1712.4	21.07	0.5	23.50	18.31	0.5	20.50	18.39	0.5	20.50
		1413	1732.6	22.11			19.06			19.24		
		1513	1752.6	22.41			19.44			19.61		
	Subtest 4	1312	1712.4	21.04	0.5	23.50	19.07	0.5	20.50	19.14	0.5	20.50
		1413	1732.6	22.07			19.05			19.24		
		1513	1752.6	22.48			19.43			19.62		

W-CDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.00	N/A	25.00
		4183	836.6	23.67		
		4233	846.6	23.52		
HSDPA	Subtest 1	4132	826.4	23.00	0	24.00
		4183	836.6	22.67		
		4233	846.6	22.46		
	Subtest 2	4132	826.4	23.01	0	24.00
		4183	836.6	22.67		
		4233	846.6	22.47		
	Subtest 3	4132	826.4	22.54	0.5	23.50
		4183	836.6	22.20		
		4233	846.6	22.00		
	Subtest 4	4132	826.4	22.50	0.5	23.50
		4183	836.6	22.16		
		4233	846.6	21.96		
HSUPA	Subtest 1	4132	826.4	21.52	0	23.50
		4183	836.6	21.16		
		4233	846.6	21.50		
	Subtest 2	4132	826.4	21.20	1	22.50
		4183	836.6	20.90		
		4233	846.6	20.69		
	Subtest 3	4132	826.4	21.23	1	22.50
		4183	836.6	21.11		
		4233	846.6	20.73		
	Subtest 4	4132	826.4	20.74	2	21.50
		4183	836.6	20.25		
		4233	846.6	20.25		
	Subtest 5	4132	826.4	22.30	0	23.50
		4183	836.6	21.96		
		4233	846.6	21.73		
DC-HSDPA	Subtest 1	4132	826.4	23.01	0	24.00
		4183	836.6	22.68		
		4233	846.6	22.47		
	Subtest 2	4132	826.4	23.03	0	24.00
		4183	836.6	22.69		
		4233	846.6	22.49		
	Subtest 3	4132	826.4	22.50	0.5	23.50
		4183	836.6	22.17		
		4233	846.6	21.96		
	Subtest 4	4132	826.4	22.48	0.5	23.50
		4183	836.6	22.15		
		4233	846.6	21.95		

9.3. LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

The allowed A-MPR values specified below in Table 6.2.4-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	N/A

Maximum Output Power (Tune-up Limit) for LTE

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

- a) The maximum output power, including tolerance, for the smaller band must be ≤ the larger band to qualify for the 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 – 1755 MHz) is covered by LTE Band 66 (1710 – 1780 MHz)
 - LTE Band 5 (824 – 849 MHz) is covered by LTE Band 26 (814 – 849 MHz)
 - LTE Band 17 (704 – 716 MHz) is covered by LTE Band 12 (699 – 716 MHz)

Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths.

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 per KDB 941225 D05 SAR for LTE Devices.

LTE QPSK configuration has the highest maximum average output power per 3GPP standard.

SAR measurement is not required for Higher order modulations. When the highest maximum output power for Higher order modulations are ≤ 0.5 dB higher than the QPSK or when the reported SAR for QPSK configuration is ≤ 1.45 W/kg.

1. Max power

LTE Band 2 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				18700	18900	19100		
				1860 MHz	1880 MHz	1900 MHz		
20 MHz	QPSK	1	0	23.92	23.48	23.52	0.0	24.50
		1	49	23.34	23.61	23.16	0.0	24.50
		1	99	22.93	22.82	23.14	0.0	24.50
		50	0	22.78	22.53	22.55	1.0	23.50
		50	24	22.75	22.40	22.68	1.0	23.50
		50	50	22.64	22.32	22.59	1.0	23.50
	100	0	22.71	22.35	22.57	1.0	23.50	
	16QAM	1	0	22.57	22.29	22.45	1.0	23.50
		1	49	22.59	22.30	22.79	1.0	23.50
		1	99	22.22	22.24	22.81	1.0	23.50
		50	0	21.77	21.35	21.58	2.0	22.50
		50	24	21.75	21.34	21.70	2.0	22.50
		50	50	21.63	21.28	21.62	2.0	22.50
	100	0	21.69	21.30	21.60	2.0	22.50	
	64QAM	1	0	21.67	22.00	21.56	2.0	22.50
		1	49	21.67	22.00	21.76	2.0	22.50
		1	99	21.82	21.93	21.67	2.0	22.50
		50	0	20.82	20.37	20.52	3.0	21.50
50		24	20.79	20.31	20.67	3.0	21.50	
50		50	20.70	20.29	20.57	3.0	21.50	
100	0	20.71	20.29	20.55	3.0	21.50		
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18675	18900	19125		
				1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	23.31	22.91	22.94	0.0	24.50
		1	37	23.28	22.90	23.09	0.0	24.50
		1	74	23.01	22.87	23.03	0.0	24.50
		36	0	22.85	22.35	22.68	1.0	23.50
		36	20	22.78	22.34	22.69	1.0	23.50
		36	39	22.71	22.34	22.69	1.0	23.50
	75	0	22.82	22.37	22.68	1.0	23.50	
	16QAM	1	0	22.78	22.27	21.95	1.0	23.50
		1	37	22.68	22.22	22.09	1.0	23.50
		1	74	22.45	22.17	22.07	1.0	23.50
		36	0	21.92	21.34	21.68	2.0	22.50
		36	20	21.84	21.32	21.71	2.0	22.50
		36	39	21.77	21.31	21.71	2.0	22.50
	75	0	21.82	21.35	21.69	2.0	22.50	
	64QAM	1	0	21.62	21.56	21.32	2.0	22.50
		1	37	21.51	21.54	21.47	2.0	22.50
		1	74	21.26	21.52	21.45	2.0	22.50
		36	0	20.94	20.36	20.70	3.0	21.50
36		20	20.86	20.35	20.73	3.0	21.50	
36		39	20.81	20.32	20.72	3.0	21.50	
75	0	20.81	20.37	20.67	3.0	21.50		

LTE Band 2 (Measured Results (Continued))

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18650	18900	19150		
				1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	23.37	22.85	23.07	0.0	24.50
		1	25	23.32	22.88	23.10	0.0	24.50
		1	49	23.18	22.80	23.14	0.0	24.50
		25	0	22.94	22.39	22.81	1.0	23.50
		25	12	22.87	22.39	22.74	1.0	23.50
		25	25	22.87	22.38	22.72	1.0	23.50
		50	0	22.93	22.41	22.79	1.0	23.50
	16QAM	1	0	22.80	21.92	22.05	1.0	23.50
		1	25	22.75	21.96	22.09	1.0	23.50
		1	49	22.62	21.88	22.12	1.0	23.50
		25	0	22.00	21.50	21.82	2.0	22.50
		25	12	21.95	21.49	21.78	2.0	22.50
		25	25	21.96	21.46	21.75	2.0	22.50
		50	0	21.93	21.44	21.76	2.0	22.50
	64QAM	1	0	21.68	21.12	21.42	2.0	22.50
		1	25	21.60	21.14	21.46	2.0	22.50
		1	49	21.43	21.07	21.50	2.0	22.50
		25	0	21.00	20.45	20.87	3.0	21.50
		25	12	20.95	20.43	20.79	3.0	21.50
		25	25	20.95	20.42	20.77	3.0	21.50
		50	0	20.92	20.35	20.77	3.0	21.50
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18625	18900	19175		
				1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	23.55	23.04	23.26	0.0	24.50
		1	12	23.54	23.03	23.26	0.0	24.50
		1	24	23.52	23.00	23.30	0.0	24.50
		12	0	22.96	22.34	22.80	1.0	23.50
		12	7	22.97	22.33	22.81	1.0	23.50
		12	13	22.91	22.30	22.81	1.0	23.50
		25	0	22.98	22.40	22.79	1.0	23.50
	16QAM	1	0	22.43	22.10	22.89	1.0	23.50
		1	12	22.42	22.10	22.98	1.0	23.50
		1	24	22.41	22.12	22.98	1.0	23.50
		12	0	21.97	21.43	21.88	2.0	22.50
		12	7	21.98	21.40	21.90	2.0	22.50
		12	13	21.98	21.37	21.88	2.0	22.50
		25	0	21.94	21.41	21.85	2.0	22.50
	64QAM	1	0	21.81	21.14	21.13	2.0	22.50
		1	12	21.84	21.16	21.17	2.0	22.50
		1	24	21.83	21.15	21.19	2.0	22.50
		12	0	20.88	20.37	20.80	3.0	21.50
		12	7	20.84	20.35	20.77	3.0	21.50
		12	13	20.80	20.34	20.74	3.0	21.50
		25	0	20.88	20.38	20.73	3.0	21.50

LTE Band 2 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18615	18900	19185		
				1851.5 MHz	1880 MHz	1908.5 MHz		
3 MHz	QPSK	1	0	23.31	22.86	23.12	0.0	24.50
		1	8	23.36	22.86	23.22	0.0	24.50
		1	14	23.32	22.84	23.22	0.0	24.50
		8	0	22.92	22.31	22.73	1.0	23.50
		8	4	22.91	22.31	22.73	1.0	23.50
		8	7	22.91	22.30	22.75	1.0	23.50
	16QAM	15	0	22.90	22.32	22.75	1.0	23.50
		1	0	22.78	21.90	22.11	1.0	23.50
		1	8	22.80	21.95	22.19	1.0	23.50
		1	14	22.77	21.91	22.14	1.0	23.50
		8	0	21.96	21.36	21.86	2.0	22.50
		8	4	21.95	21.36	21.85	2.0	22.50
	64QAM	8	7	21.96	21.35	21.86	2.0	22.50
		15	0	21.94	21.25	21.81	2.0	22.50
		1	0	21.65	21.15	21.47	2.0	22.50
		1	8	21.66	21.13	21.55	2.0	22.50
		1	14	21.63	21.06	21.56	2.0	22.50
		8	0	20.97	20.25	20.80	3.0	21.50
1.4 MHz	QPSK	8	4	20.96	20.24	20.80	3.0	21.50
		8	7	20.95	20.23	20.79	3.0	21.50
		15	0	20.93	20.32	20.73	3.0	21.50
		1	0	23.30	22.80	23.41	0.0	24.50
		1	3	23.31	22.84	23.42	0.0	24.50
		1	5	23.30	22.82	23.43	0.0	24.50
	16QAM	3	0	23.80	23.28	23.71	0.0	24.50
		3	1	23.78	23.31	23.72	0.0	24.50
		3	3	23.80	23.33	23.75	0.0	24.50
		6	0	22.91	22.30	22.78	1.0	23.50
		1	0	22.80	21.90	22.35	1.0	23.50
		1	3	22.77	21.89	22.34	1.0	23.50
	64QAM	1	5	22.79	21.92	22.37	1.0	23.50
		3	0	23.12	22.48	22.82	1.0	23.50
		3	1	23.09	22.48	22.81	1.0	23.50
		3	3	23.13	22.49	22.81	1.0	23.50
		6	0	21.81	21.50	21.95	2.0	22.50
		1	0	22.16	21.51	21.49	2.0	22.50
64QAM	1	3	22.23	21.45	21.45	2.0	22.50	
	1	5	22.17	21.35	21.52	2.0	22.50	
	3	0	22.18	21.35	21.72	2.0	22.50	
	3	1	22.19	21.35	21.71	2.0	22.50	
	3	3	22.18	21.38	21.73	2.0	22.50	
	6	0	20.86	20.55	20.86	3.0	21.50	

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				23060 704 MHz	23095 707.5 MHz	23130 711 MHz		
10 MHz	QPSK	1	0		24.32		0.0	25.00
		1	25		24.20		0.0	25.00
		1	49		23.80		0.0	25.00
		25	0		23.33		1.0	24.00
		25	12		23.30		1.0	24.00
		25	25		23.26		1.0	24.00
	16QAM	50	0		23.31		1.0	24.00
		1	0		23.07		1.0	24.00
		1	25		23.07		1.0	24.00
		1	49		22.91		1.0	24.00
		25	0		22.55		2.0	23.00
		25	12		22.52		2.0	23.00
	64QAM	25	25		22.50		2.0	23.00
		50	0		22.48		2.0	23.00
		1	0		22.57		2.0	23.00
		1	25		22.58		2.0	23.00
		1	49		22.61		2.0	23.00
		25	0		21.40		3.0	22.00
5 MHz	QPSK	25	12		21.39		3.0	22.00
		25	25		21.30		3.0	22.00
		50	0		21.36		3.0	22.00
		1	0	24.39	24.50	24.48	0.0	25.00
		1	12	24.49	24.47	24.41	0.0	25.00
		1	24	24.46	24.43	24.41	0.0	25.00
	16QAM	12	0	23.37	23.36	23.28	1.0	24.00
		12	7	23.38	23.35	23.19	1.0	24.00
		12	13	23.40	23.31	23.20	1.0	24.00
		25	0	23.41	23.34	23.26	1.0	24.00
		1	0	23.94	23.44	23.54	1.0	24.00
		1	12	23.95	23.44	23.54	1.0	24.00
	64QAM	1	24	23.90	23.33	23.53	1.0	24.00
		12	0	22.64	22.63	22.53	2.0	23.00
		12	7	22.69	22.61	22.47	2.0	23.00
		12	13	22.73	22.55	22.50	2.0	23.00
		25	0	22.66	22.50	22.47	2.0	23.00
		1	0	22.83	22.84	22.40	2.0	23.00
64QAM	1	12	22.99	22.84	22.36	2.0	23.00	
	1	24	22.92	22.80	22.33	2.0	23.00	
	12	0	21.44	21.61	21.49	3.0	22.00	
	12	7	21.48	21.57	21.42	3.0	22.00	
	12	13	21.48	21.55	21.41	3.0	22.00	
	25	0	21.54	21.54	21.40	3.0	22.00	

LTE Band 12 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				23025	23095	23165		
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	24.45	24.34	24.36	0.0	25.00
		1	8	24.36	24.34	24.36	0.0	25.00
		1	14	24.49	24.26	24.19	0.0	25.00
		8	0	23.31	23.30	23.21	1.0	24.00
		8	4	23.36	23.32	23.18	1.0	24.00
		8	7	23.34	23.31	23.24	1.0	24.00
		15	0	23.34	23.34	23.21	1.0	24.00
	16QAM	1	0	23.85	23.41	23.33	1.0	24.00
		1	8	23.82	23.43	23.20	1.0	24.00
		1	14	23.87	23.33	23.06	1.0	24.00
		8	0	22.59	22.55	22.52	2.0	23.00
		8	4	22.60	22.58	22.47	2.0	23.00
		8	7	22.63	22.56	22.51	2.0	23.00
		15	0	22.59	22.47	22.43	2.0	23.00
	64QAM	1	0	22.67	22.78	22.69	2.0	23.00
		1	8	22.73	22.76	22.70	2.0	23.00
		1	14	22.77	22.68	22.68	2.0	23.00
		8	0	21.53	21.44	21.45	3.0	22.00
8		4	21.58	21.47	21.43	3.0	22.00	
8		7	21.54	21.44	21.46	3.0	22.00	
15		0	21.55	21.54	21.37	3.0	22.00	
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				23017	23095	23173		
				699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	24.28	24.31	24.35	0.0	25.00
		1	3	24.27	24.34	24.35	0.0	25.00
		1	5	24.24	24.32	24.34	0.0	25.00
		3	0	24.38	24.35	24.16	0.0	25.00
		3	1	24.45	24.39	24.24	0.0	25.00
		3	3	24.41	24.34	24.20	0.0	25.00
		6	0	23.31	23.36	23.22	1.0	24.00
	16QAM	1	0	23.83	23.38	23.33	1.0	24.00
		1	3	23.83	23.37	23.36	1.0	24.00
		1	5	23.77	23.40	23.33	1.0	24.00
		3	0	23.46	23.50	23.24	1.0	24.00
		3	1	23.45	23.50	23.26	1.0	24.00
		3	3	23.40	23.49	23.27	1.0	24.00
		6	0	22.39	22.73	22.54	2.0	23.00
	64QAM	1	0	22.85	22.70	22.59	2.0	23.00
		1	3	22.89	22.72	22.57	2.0	23.00
		1	5	22.83	22.65	22.59	2.0	23.00
		3	0	22.78	22.61	22.32	2.0	23.00
3		1	22.81	22.60	22.35	2.0	23.00	
3		3	22.79	22.58	22.36	2.0	23.00	
6		0	21.48	21.77	21.45	3.0	22.00	

LTE Band 26 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)					
				Measured Pwr (dBm)				MPR	Tune-up Limit
				26765 821.5 MHz	26790 824 MHz	26865 831.5 MHz	26965 841.5 MHz		
15 MHz	QPSK	1	0		23.89	23.77		0.0	25.00
		1	37		23.96	23.73		0.0	25.00
		1	74		23.83	23.41		0.0	25.00
		36	0		22.91	22.90		1.0	24.00
		36	20		22.94	22.73		1.0	24.00
		36	39		22.83	22.69		1.0	24.00
	16QAM	75	0		22.90	22.82		1.0	24.00
		1	0		23.31	22.75		1.0	24.00
		1	37		23.28	22.67		1.0	24.00
		1	74		23.24	22.40		1.0	24.00
		36	0		21.96	21.92		2.0	23.00
		36	20		21.97	21.73		2.0	23.00
	64QAM	36	39		21.85	21.70		2.0	23.00
		75	0		21.90	21.81		2.0	23.00
		1	0		22.13	21.58		2.0	23.00
		1	37		22.15	21.57		2.0	23.00
		1	74		21.97	21.27		2.0	23.00
		36	0		21.16	20.95		3.0	22.00
10 MHz	QPSK	36	20		21.23	20.90		3.0	22.00
		36	39		21.13	20.81		3.0	22.00
		75	0		21.08	20.91		3.0	22.00
		1	0	23.95	23.96	23.87	23.57	0.0	25.00
		1	25	23.99	23.93	23.85	23.52	0.0	25.00
		1	49	23.90	23.85	23.63	23.46	0.0	25.00
	16QAM	25	0	22.90	22.97	22.94	22.68	1.0	24.00
		25	12	22.97	22.91	22.84	22.54	1.0	24.00
		25	25	22.99	22.84	22.84	22.41	1.0	24.00
		50	0	23.00	22.95	22.94	22.60	1.0	24.00
		1	0	22.97	23.35	22.82	22.92	1.0	24.00
		1	25	23.01	23.30	22.77	22.91	1.0	24.00
	64QAM	1	49	22.91	23.25	22.56	22.84	1.0	24.00
		25	0	22.01	22.02	21.94	21.90	2.0	23.00
		25	12	22.08	21.96	21.85	21.70	2.0	23.00
		25	25	22.08	21.86	21.86	21.63	2.0	23.00
		50	0	21.99	21.90	21.88	21.72	2.0	23.00
		1	0	22.13	22.21	22.07	22.04	2.0	23.00
64QAM	1	25	22.19	22.17	22.01	21.95	2.0	23.00	
	1	49	22.12	22.03	21.97	21.91	2.0	23.00	
	25	0	21.16	21.29	21.19	20.83	3.0	22.00	
	25	12	21.22	21.23	21.08	20.77	3.0	22.00	
	25	25	21.23	21.18	21.08	20.61	3.0	22.00	
	50	0	21.17	21.17	21.06	20.73	3.0	22.00	

LTE Band 26 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit
				26715	26790	26865	27015		
				816.5 MHz	824 MHz	831.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	24.10	24.05	24.06	23.61	0.0	25.00
		1	12	24.09	23.99	23.98	23.52	0.0	25.00
		1	24	24.11	24.03	23.95	23.61	0.0	25.00
		12	0	22.97	23.00	22.86	22.55	1.0	24.00
		12	7	22.95	22.96	22.77	22.47	1.0	24.00
		12	13	22.98	22.90	22.80	22.51	1.0	24.00
		25	0	23.00	22.94	22.85	22.56	1.0	24.00
	16QAM	1	0	23.06	23.40	23.13	23.11	1.0	24.00
		1	12	23.06	23.35	23.07	23.06	1.0	24.00
		1	24	23.05	23.26	23.10	23.17	1.0	24.00
		12	0	21.99	22.07	21.90	21.84	2.0	23.00
		12	7	22.00	22.04	21.82	21.76	2.0	23.00
		12	13	22.01	22.01	21.86	21.82	2.0	23.00
		25	0	21.97	21.99	21.87	21.82	2.0	23.00
	64QAM	1	0	22.35	22.38	22.13	21.57	2.0	23.00
		1	12	22.34	22.35	22.12	21.56	2.0	23.00
		1	24	22.37	22.35	22.12	21.61	2.0	23.00
		12	0	21.05	21.12	21.08	20.74	3.0	22.00
		12	7	21.07	21.09	21.02	20.66	3.0	22.00
		12	13	21.08	21.09	21.02	20.70	3.0	22.00
		25	0	21.14	21.12	21.04	20.73	3.0	22.00
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit
				26705	26790	26865	27025		
				815.5 MHz	824 MHz	831.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	23.93	23.92	23.82	23.44	0.0	25.00
		1	8	24.01	23.98	23.83	23.55	0.0	25.00
		1	14	23.88	23.88	23.79	23.45	0.0	25.00
		8	0	22.93	22.93	22.79	22.44	1.0	24.00
		8	4	22.96	22.92	22.75	22.43	1.0	24.00
		8	7	22.93	22.90	22.76	22.46	1.0	24.00
		15	0	22.96	22.91	22.81	22.46	1.0	24.00
	16QAM	1	0	23.01	23.31	22.83	22.83	1.0	24.00
		1	8	23.08	23.30	22.74	22.89	1.0	24.00
		1	14	22.94	23.31	22.68	22.87	1.0	24.00
		8	0	21.98	22.00	21.87	21.71	2.0	23.00
		8	4	21.98	21.98	21.85	21.68	2.0	23.00
		8	7	21.98	21.98	21.85	21.74	2.0	23.00
		15	0	21.91	21.94	21.83	21.69	2.0	23.00
	64QAM	1	0	22.11	22.14	22.03	21.92	2.0	23.00
		1	8	22.21	22.16	22.02	21.98	2.0	23.00
		1	14	22.13	22.12	21.94	21.99	2.0	23.00
		8	0	21.19	21.17	20.91	20.67	3.0	22.00
		8	4	21.19	21.19	20.92	20.67	3.0	22.00
		8	7	21.16	21.16	20.89	20.70	3.0	22.00
		15	0	21.15	21.16	21.02	20.64	3.0	22.00

LTE Band 26 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit
				26697	26790	26865	27033		
				814.7 MHz	824 MHz	831.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	23.88	23.86	23.92	23.45	0.0	25.00
		1	3	23.90	23.87	23.88	23.45	0.0	25.00
		1	5	23.90	23.86	23.89	23.46	0.0	25.00
		3	0	23.94	23.92	23.78	23.47	0.0	25.00
		3	1	23.97	23.95	23.80	23.45	0.0	25.00
		3	3	23.99	23.92	23.80	23.46	0.0	25.00
		6	0	22.96	22.94	22.80	22.47	1.0	24.00
	16QAM	1	0	22.97	22.94	22.96	22.88	1.0	24.00
		1	3	22.98	22.94	22.97	22.87	1.0	24.00
		1	5	23.00	22.96	22.96	22.89	1.0	24.00
		3	0	23.11	23.07	22.85	22.69	1.0	24.00
		3	1	23.13	23.10	22.84	22.68	1.0	24.00
		3	3	23.12	23.07	22.83	22.67	1.0	24.00
		6	0	22.10	22.09	21.89	21.54	2.0	23.00
	64QAM	1	0	22.10	22.23	22.16	21.84	2.0	23.00
		1	3	22.11	22.32	22.22	21.86	2.0	23.00
		1	5	22.13	22.25	22.16	21.85	2.0	23.00
		3	0	21.88	22.22	22.06	21.74	2.0	23.00
		3	1	21.89	22.25	22.10	21.75	2.0	23.00
		3	3	21.90	22.20	22.07	21.76	2.0	23.00
		6	0	21.18	21.06	20.91	20.90	3.0	22.00

Note(s):

For Orange box's output power results, There are measured for the test of Part.90.

LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	22.91	24.09	24.17	0.0	24.50
		1	49	23.36	24.25	24.27	0.0	24.50
		1	99	23.69	24.20	23.80	0.0	24.50
		50	0	22.02	23.24	23.27	1.0	23.50
		50	24	22.36	23.27	23.32	1.0	23.50
		50	50	22.58	23.24	23.17	1.0	23.50
		100	0	22.28	23.21	23.22	1.0	23.50
	16QAM	1	0	22.39	23.24	23.46	1.0	23.50
		1	49	22.88	23.47	23.48	1.0	23.50
		1	99	23.30	23.39	23.43	1.0	23.50
		50	0	21.03	22.23	22.19	2.0	22.50
		50	24	21.36	22.29	22.26	2.0	22.50
		50	50	21.60	22.24	22.13	2.0	22.50
		100	0	21.31	22.23	22.18	2.0	22.50
	64QAM	1	0	21.24	22.29	22.35	2.0	22.50
		1	49	21.69	22.49	22.44	2.0	22.50
		1	99	22.02	22.44	22.25	2.0	22.50
		50	0	20.00	21.24	21.20	3.0	21.50
		50	24	20.34	21.26	21.31	3.0	21.50
		50	50	20.59	21.21	21.18	3.0	21.50
		100	0	20.26	21.17	21.20	3.0	21.50
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz		
				15 MHz	QPSK	1	0	22.45
1	37	22.72	23.81			23.77	0.0	24.50
1	74	22.94	23.74			23.67	0.0	24.50
36	0	21.98	23.25			23.36	1.0	23.50
36	20	22.18	23.23			23.35	1.0	23.50
36	39	22.34	23.29			23.33	1.0	23.50
75	0	22.21	23.28			23.32	1.0	23.50
16QAM	1	0	21.80		22.94	22.69	1.0	23.50
	1	37	22.09		23.09	22.77	1.0	23.50
	1	74	22.35		23.06	22.68	1.0	23.50
	36	0	21.06		22.24	22.37	2.0	22.50
	36	20	21.24		22.25	22.36	2.0	22.50
	36	39	21.41		22.28	22.34	2.0	22.50
	75	0	21.21		22.29	22.34	2.0	22.50
64QAM	1	0	20.57		22.28	22.03	2.0	22.50
	1	37	20.88		22.44	22.17	2.0	22.50
	1	74	21.15		22.39	22.13	2.0	22.50
	36	0	20.08		21.27	21.37	3.0	21.50
	36	20	20.27		21.26	21.38	3.0	21.50
	36	39	20.43		21.31	21.37	3.0	21.50
	75	0	20.19		21.30	21.34	3.0	21.50

LTE Band 66 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	22.46	23.68	23.79	0.0	24.50
		1	25	22.62	23.76	23.79	0.0	24.50
		1	49	22.76	23.78	23.81	0.0	24.50
		25	0	21.98	23.31	23.44	1.0	23.50
		25	12	22.08	23.31	23.44	1.0	23.50
		25	25	22.22	23.37	23.35	1.0	23.50
		50	0	22.14	23.34	23.42	1.0	23.50
	16QAM	1	0	21.81	22.70	22.75	1.0	23.50
		1	25	21.99	22.82	22.77	1.0	23.50
		1	49	22.18	22.82	22.75	1.0	23.50
		25	0	21.04	22.41	22.47	2.0	22.50
		25	12	21.13	22.41	22.45	2.0	22.50
		25	25	21.27	22.42	22.37	2.0	22.50
		50	0	21.13	22.38	22.40	2.0	22.50
	64QAM	1	0	20.62	21.92	22.11	2.0	22.50
		1	25	20.76	22.06	22.16	2.0	22.50
		1	49	20.99	22.03	22.19	2.0	22.50
		25	0	20.04	21.39	21.48	3.0	21.50
		25	12	20.16	21.37	21.47	3.0	21.50
		25	25	20.31	21.41	21.40	3.0	21.50
		50	0	20.15	21.34	21.40	3.0	21.50
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	22.50	23.84	23.96	0.0	24.50
		1	12	22.55	23.90	23.96	0.0	24.50
		1	24	22.60	23.84	23.97	0.0	24.50
		12	0	21.93	23.27	23.46	1.0	23.50
		12	7	22.01	23.29	23.39	1.0	23.50
		12	13	22.05	23.27	23.36	1.0	23.50
		25	0	22.02	23.27	23.44	1.0	23.50
	16QAM	1	0	21.98	22.74	23.24	1.0	23.50
		1	12	22.06	22.81	23.26	1.0	23.50
		1	24	22.14	22.77	23.29	1.0	23.50
		12	0	21.08	22.34	22.40	2.0	22.50
		12	7	21.13	22.37	22.45	2.0	22.50
		12	13	21.14	22.33	22.42	2.0	22.50
		25	0	21.07	22.24	22.48	2.0	22.50
	64QAM	1	0	20.85	22.04	21.79	2.0	22.50
		1	12	20.96	22.12	21.80	2.0	22.50
		1	24	20.99	22.10	21.81	2.0	22.50
		12	0	19.89	21.34	21.41	3.0	21.50
		12	7	19.93	21.37	21.44	3.0	21.50
		12	13	19.95	21.33	21.43	3.0	21.50
		25	0	19.96	21.31	21.41	3.0	21.50

LTE Band 66 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	22.39	23.68	23.79	0.0	24.50
		1	8	22.52	23.72	23.86	0.0	24.50
		1	14	22.43	23.70	23.87	0.0	24.50
		8	0	21.94	23.21	23.37	1.0	23.50
		8	4	21.96	23.24	23.39	1.0	23.50
		8	7	21.94	23.25	23.41	1.0	23.50
		15	0	21.96	23.25	23.41	1.0	23.50
	16QAM	1	0	21.81	22.74	22.78	1.0	23.50
		1	8	21.89	22.80	22.80	1.0	23.50
		1	14	21.89	22.77	22.76	1.0	23.50
		8	0	21.01	22.27	22.41	2.0	22.50
		8	4	21.03	22.31	22.41	2.0	22.50
		8	7	21.03	22.34	22.42	2.0	22.50
		15	0	20.98	22.21	22.47	2.0	22.50
	64QAM	1	0	20.87	22.09	22.19	2.0	22.50
		1	8	20.71	22.13	22.22	2.0	22.50
		1	14	20.73	22.00	22.23	2.0	22.50
		8	0	20.00	21.20	21.48	3.0	21.50
8		4	20.03	21.22	21.41	3.0	21.50	
8		7	20.00	21.24	21.49	3.0	21.50	
15		0	20.01	21.32	21.43	3.0	21.50	
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	23.00	24.18	23.87	0.0	24.50
		1	3	22.98	24.18	23.74	0.0	24.50
		1	5	23.01	24.18	23.75	0.0	24.50
		3	0	22.90	24.17	24.42	0.0	24.50
		3	1	22.92	24.16	24.46	0.0	24.50
		3	3	22.91	24.18	24.49	0.0	24.50
		6	0	21.92	23.24	23.40	1.0	23.50
	16QAM	1	0	22.04	23.46	22.86	1.0	23.50
		1	3	22.04	23.46	22.81	1.0	23.50
		1	5	22.07	23.49	22.86	1.0	23.50
		3	0	21.98	23.49	23.42	1.0	23.50
		3	1	21.97	23.47	23.42	1.0	23.50
		3	3	21.98	23.46	23.42	1.0	23.50
		6	0	21.04	22.13	22.41	2.0	22.50
	64QAM	1	0	21.35	22.44	22.48	2.0	22.50
		1	3	21.40	22.43	22.48	2.0	22.50
		1	5	21.38	22.40	22.24	2.0	22.50
		3	0	21.27	22.35	22.38	2.0	22.50
3		1	21.28	22.36	22.38	2.0	22.50	
3		3	21.28	22.37	22.37	2.0	22.50	
6		0	19.94	21.43	21.43	3.0	21.50	

LTE Band 41 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)						
				Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
20 MHz	QPSK	1	0	22.88	22.86	23.56	22.82	22.14	0.0	24.00
		1	49	22.98	23.17	23.71	22.73	22.41	0.0	24.00
		1	99	22.53	23.22	23.38	22.32	22.44	0.0	24.00
		50	0	21.91	22.48	22.98	22.27	21.76	1.0	23.00
		50	24	21.98	22.61	22.92	22.18	21.84	1.0	23.00
		50	50	22.04	22.65	22.97	22.03	21.85	1.0	23.00
		100	0	21.96	22.57	22.96	22.15	21.79	1.0	23.00
	16QAM	1	0	21.26	21.65	22.57	21.69	20.91	1.0	23.00
		1	49	21.43	21.89	22.72	21.60	21.12	1.0	23.00
		1	99	21.36	21.96	22.38	21.22	21.16	1.0	23.00
		50	0	20.80	21.41	21.99	21.17	20.72	2.0	22.00
		50	24	20.88	21.52	21.98	21.10	20.78	2.0	22.00
		50	50	20.94	21.56	21.92	20.96	20.79	2.0	22.00
		100	0	20.86	21.48	21.95	21.07	20.73	2.0	22.00
	64QAM	1	0	20.75	21.63	21.68	21.15	20.84	2.0	22.00
		1	49	20.97	21.92	21.86	21.13	21.10	2.0	22.00
		1	99	20.87	21.92	21.54	20.69	21.08	2.0	22.00
		50	0	19.78	20.36	20.94	20.13	19.64	3.0	21.00
		50	24	19.86	20.52	20.85	20.05	19.71	3.0	21.00
		50	50	19.92	20.54	20.81	19.92	19.70	3.0	21.00
		100	0	19.84	20.44	20.84	20.02	19.65	3.0	21.00
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
				15 MHz	QPSK	1	0	22.44	22.95	23.52
1	37	22.56	23.09			23.60	22.70	22.33	0.0	24.00
1	74	22.51	23.16			23.37	22.41	22.38	0.0	24.00
36	0	21.97	22.55			22.90	22.25	21.77	1.0	23.00
36	20	22.01	22.56			22.90	22.21	21.81	1.0	23.00
36	39	22.04	22.61			22.93	22.10	21.85	1.0	23.00
75	0	22.04	22.62			22.98	22.20	21.85	1.0	23.00
16QAM	1	0	21.46		21.92	22.42	21.81	21.13	1.0	23.00
	1	37	21.57		22.05	22.48	21.71	21.26	1.0	23.00
	1	74	21.50		22.12	22.27	21.43	21.32	1.0	23.00
	36	0	20.93		21.50	21.95	21.23	20.73	2.0	22.00
	36	20	20.95		21.55	21.91	21.23	20.75	2.0	22.00
	36	39	20.99		21.60	21.85	21.07	20.78	2.0	22.00
	75	0	20.96		21.59	21.91	21.13	20.79	2.0	22.00
64QAM	1	0	19.86		20.86	21.76	20.71	20.41	2.0	22.00
	1	37	19.99		21.05	21.69	20.62	20.51	2.0	22.00
	1	74	19.94		21.12	21.43	20.36	20.48	2.0	22.00
	36	0	19.85		20.40	20.94	20.17	19.62	3.0	21.00
	36	20	19.89		20.44	20.89	20.14	19.66	3.0	21.00
	36	39	19.90		20.50	20.83	20.03	19.64	3.0	21.00
	75	0	19.79		20.51	20.83	20.05	19.73	3.0	21.00

LTE Band 41 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	22.51	23.07	23.53	22.81	22.28	0.0	24.00
		1	25	22.56	23.15	23.57	22.71	22.39	0.0	24.00
		1	49	22.54	23.20	23.42	22.56	22.46	0.0	24.00
		25	0	22.05	22.61	23.00	22.29	21.83	1.0	23.00
		25	12	22.05	22.69	22.96	22.23	21.83	1.0	23.00
		25	25	22.07	22.70	22.92	22.17	21.88	1.0	23.00
	16QAM	50	0	22.08	22.72	22.96	22.24	21.88	1.0	23.00
		1	0	21.60	22.00	22.41	21.89	21.20	1.0	23.00
		1	25	21.64	22.08	22.43	21.78	21.29	1.0	23.00
		1	49	21.61	22.10	22.28	21.63	21.35	1.0	23.00
		25	0	21.01	21.59	21.95	21.25	20.77	2.0	22.00
		25	12	20.99	21.62	21.91	21.21	20.77	2.0	22.00
	64QAM	25	25	21.02	21.63	21.87	21.11	20.79	2.0	22.00
		50	0	21.02	21.62	21.90	21.25	20.81	2.0	22.00
		1	0	20.30	21.53	21.94	20.82	20.71	2.0	22.00
		1	25	20.26	21.62	21.95	20.72	20.78	2.0	22.00
		1	49	20.12	21.63	21.84	20.58	20.83	2.0	22.00
		25	0	19.88	20.42	20.82	20.16	19.62	3.0	21.00
5 MHz	QPSK	25	12	19.90	20.46	20.78	20.09	19.62	3.0	21.00
		25	25	19.95	20.50	20.75	20.06	19.65	3.0	21.00
		50	0	19.86	20.51	20.75	20.07	19.74	3.0	21.00
		1	0	23.10	23.21	23.45	22.81	22.35	0.0	24.00
		1	12	23.12	23.20	23.43	22.73	22.40	0.0	24.00
		1	24	22.85	23.20	23.38	22.70	22.43	0.0	24.00
	16QAM	12	0	22.05	22.60	22.94	22.25	21.86	1.0	23.00
		12	7	22.02	22.63	22.88	22.18	21.86	1.0	23.00
		12	13	22.04	22.62	22.88	22.18	21.82	1.0	23.00
		25	0	22.02	22.65	22.91	22.17	21.81	1.0	23.00
		1	0	21.50	22.20	22.34	21.69	21.33	1.0	23.00
		1	12	21.47	22.26	22.32	21.62	21.38	1.0	23.00
	64QAM	1	24	21.45	22.31	22.27	21.58	21.39	1.0	23.00
		12	0	20.90	21.58	21.86	21.13	20.83	2.0	22.00
		12	7	20.86	21.60	21.79	21.06	20.81	2.0	22.00
		12	13	20.88	21.59	21.79	21.05	20.79	2.0	22.00
		25	0	20.98	21.58	21.84	21.17	20.78	2.0	22.00
		1	0	21.31	21.24	21.96	21.56	20.37	2.0	22.00
64QAM	1	12	21.32	21.26	21.98	21.49	20.44	2.0	22.00	
	1	24	21.30	21.26	21.92	21.44	20.48	2.0	22.00	
	12	0	19.94	20.49	20.72	20.18	19.68	3.0	21.00	
	12	7	19.91	20.47	20.63	20.10	19.68	3.0	21.00	
	12	13	19.91	20.45	20.62	20.11	19.65	3.0	21.00	
	25	0	19.82	20.55	20.67	20.02	19.71	3.0	21.00	

2. Reduced power

LTE Band 2 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm) Hotspot back-off					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18700	18900	19100			18700	18900	19100		
				1860 MHz	1880 MHz	1900 MHz			1860 MHz	1880 MHz	1900 MHz		
20 MHz	QPSK	1	0	20.48	19.82	19.86	0.0	21.00	20.35	19.37	19.66	0.0	21.00
		1	49	19.07	19.84	20.14	0.0	21.00	20.35	19.83	20.15	0.0	21.00
		1	99	19.83	19.78	20.17	0.0	21.00	19.94	19.80	20.22	0.0	21.00
		50	0	20.19	19.87	19.97	0.0	21.00	20.20	19.86	20.00	0.0	21.00
		50	24	20.19	19.80	20.08	0.0	21.00	20.20	19.83	20.11	0.0	21.00
		50	50	20.14	19.75	20.04	0.0	21.00	20.14	19.78	20.07	0.0	21.00
		100	0	20.14	19.81	20.01	0.0	21.00	20.15	19.83	20.01	0.0	21.00
	16QAM	1	0	20.75	20.26	20.38	0.0	21.00	20.49	20.28	20.41	0.0	21.00
		1	49	20.66	20.29	20.55	0.0	21.00	20.36	20.29	20.47	0.0	21.00
		1	99	20.25	20.25	20.51	0.0	21.00	20.06	20.11	20.13	0.0	21.00
		50	0	20.16	19.89	20.01	0.0	21.00	20.17	19.90	20.02	0.0	21.00
		50	24	20.17	19.84	20.13	0.0	21.00	20.16	19.85	20.15	0.0	21.00
		50	50	20.11	19.77	20.04	0.0	21.00	20.11	19.78	20.07	0.0	21.00
		100	0	20.14	19.83	20.02	0.0	21.00	20.13	19.86	20.02	0.0	21.00
	64QAM	1	0	20.73	20.50	20.15	0.0	21.00	20.09	20.46	19.95	0.0	21.00
		1	49	20.67	20.52	20.33	0.0	21.00	20.50	20.39	20.16	0.0	21.00
		1	99	20.30	20.46	20.18	0.0	21.00	20.30	20.35	19.94	0.0	21.00
		50	0	20.25	19.88	19.98	0.0	21.00	20.24	19.91	19.97	0.0	21.00
		50	24	20.23	19.83	20.13	0.0	21.00	20.26	19.84	20.12	0.0	21.00
		50	50	20.19	19.78	20.06	0.0	21.00	20.19	19.80	20.07	0.0	21.00
		100	0	20.18	19.79	20.03	0.0	21.00	20.17	19.81	20.02	0.0	21.00
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18675.00	18900.00	19125.00			18675.00	18900.00	19125.00		
				1857.5 MHz	1880 MHz	1902.5 MHz			1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	20.25	19.84	19.98	0.0	21.00	19.89	19.22	20.20	0.0	21.00
		1	37	20.26	19.85	20.13	0.0	21.00	19.92	19.43	20.01	0.0	21.00
		1	74	19.96	19.78	20.14	0.0	21.00	19.66	19.44	20.04	0.0	21.00
		36	0	20.28	19.82	20.09	0.0	21.00	19.91	19.71	20.06	0.0	21.00
		36	20	20.24	19.79	20.13	0.0	21.00	20.17	19.71	20.07	0.0	21.00
		36	39	20.20	19.76	20.12	0.0	21.00	20.07	19.68	20.05	0.0	21.00
		75	0	20.31	19.78	20.10	0.0	21.00	20.17	19.70	20.15	0.0	21.00
	16QAM	1	0	20.25	20.23	20.49	0.0	21.00	20.33	20.14	20.02	0.0	21.00
		1	37	20.20	20.22	20.56	0.0	21.00	20.24	19.44	20.19	0.0	21.00
		1	74	19.95	20.17	20.53	0.0	21.00	20.09	19.45	20.09	0.0	21.00
		36	0	20.32	19.86	20.09	0.0	21.00	20.27	19.82	20.01	0.0	21.00
		36	20	20.31	19.84	20.17	0.0	21.00	20.17	19.69	20.10	0.0	21.00
		36	39	20.20	19.82	20.13	0.0	21.00	20.12	19.64	20.08	0.0	21.00
		75	0	20.31	19.84	20.13	0.0	21.00	20.18	19.70	20.11	0.0	21.00
	64QAM	1	0	20.07	20.51	20.23	0.0	21.00	20.03	20.01	19.99	0.0	21.00
		1	37	20.19	20.49	20.42	0.0	21.00	19.94	20.13	20.27	0.0	21.00
		1	74	20.11	20.50	20.37	0.0	21.00	19.78	20.18	20.07	0.0	21.00
		36	0	20.37	19.84	20.15	0.0	21.00	20.34	19.75	20.08	0.0	21.00
		36	20	20.34	19.81	20.21	0.0	21.00	20.31	19.74	20.16	0.0	21.00
		36	39	20.30	19.80	20.19	0.0	21.00	20.24	19.72	20.14	0.0	21.00
		75	0	20.28	19.85	20.14	0.0	21.00	20.24	19.78	20.09	0.0	21.00

LTE Band 2 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18650.00	18900.00	19150.00			18650.00	18900.00	19150.00		
				1855 MHz	1880 MHz	1905 MHz			1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	20.56	19.74	20.03	0.0	21.00	20.01	19.32	19.81	0.0	21.00
		1	25	20.18	19.80	20.12	0.0	21.00	19.92	19.49	19.85	0.0	21.00
		1	49	20.01	19.74	20.11	0.0	21.00	19.96	19.49	19.89	0.0	21.00
		25	0	19.67	19.83	20.21	0.0	21.00	20.22	19.51	19.94	0.0	21.00
		25	12	19.60	19.79	20.15	0.0	21.00	20.16	19.49	19.89	0.0	21.00
		25	25	19.67	19.80	20.14	0.0	21.00	20.19	19.49	19.88	0.0	21.00
		50	0	19.91	19.83	20.19	0.0	21.00	20.24	19.53	19.93	0.0	21.00
	16QAM	1	0	20.27	19.89	19.99	0.0	21.00	20.58	19.65	19.76	0.0	21.00
		1	25	20.36	19.94	20.06	0.0	21.00	20.17	19.64	19.79	0.0	21.00
		1	49	20.32	19.88	20.06	0.0	21.00	20.18	19.62	19.73	0.0	21.00
		25	0	20.39	19.94	20.23	0.0	21.00	20.05	19.63	19.97	0.0	21.00
		25	12	20.35	19.89	20.20	0.0	21.00	20.02	19.59	19.92	0.0	21.00
		25	25	20.40	19.88	20.16	0.0	21.00	20.07	19.59	19.91	0.0	21.00
		50	0	20.41	19.84	20.17	0.0	21.00	20.07	19.55	19.91	0.0	21.00
	64QAM	1	0	20.59	20.14	20.37	0.0	21.00	20.61	19.70	20.23	0.0	21.00
		1	25	20.43	20.11	20.43	0.0	21.00	20.03	19.89	20.24	0.0	21.00
		1	49	20.35	20.11	20.44	0.0	21.00	19.93	19.92	20.14	0.0	21.00
		25	0	20.41	19.94	20.31	0.0	21.00	20.37	19.89	20.27	0.0	21.00
		25	12	20.37	19.89	20.24	0.0	21.00	20.33	19.84	20.21	0.0	21.00
		25	25	20.43	19.86	20.23	0.0	21.00	20.39	19.83	20.18	0.0	21.00
		50	0	20.41	19.82	20.20	0.0	21.00	20.36	19.79	20.15	0.0	21.00
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18625.00	18900.00	19175.00			18625.00	18900.00	19175.00		
				1852.5 MHz	1880 MHz	1907.5 MHz			1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	20.77	19.93	20.37	0.0	21.00	20.57	19.57	20.22	0.0	21.00
		1	12	20.51	19.89	20.34	0.0	21.00	20.15	19.69	20.19	0.0	21.00
		1	24	20.26	19.90	20.39	0.0	21.00	20.16	19.74	20.23	0.0	21.00
		12	0	19.75	19.81	20.23	0.0	21.00	20.20	19.68	20.09	0.0	21.00
		12	7	19.74	19.76	20.18	0.0	21.00	20.27	19.62	20.03	0.0	21.00
		12	13	19.69	19.74	20.14	0.0	21.00	20.20	19.58	20.00	0.0	21.00
		25	0	20.38	19.80	20.24	0.0	21.00	20.26	19.66	20.09	0.0	21.00
	16QAM	1	0	20.61	20.01	20.45	0.0	21.00	20.38	19.86	20.28	0.0	21.00
		1	12	20.68	20.00	20.41	0.0	21.00	20.37	19.85	20.22	0.0	21.00
		1	24	20.75	19.97	20.47	0.0	21.00	20.39	19.82	20.25	0.0	21.00
		12	0	20.52	19.86	20.33	0.0	21.00	20.36	19.69	20.19	0.0	21.00
		12	7	20.50	19.82	20.27	0.0	21.00	20.38	19.67	20.13	0.0	21.00
		12	13	20.46	19.78	20.23	0.0	21.00	20.34	19.63	20.10	0.0	21.00
		25	0	20.44	19.75	20.28	0.0	21.00	20.31	19.60	20.16	0.0	21.00
	64QAM	1	0	20.21	19.62	20.16	0.0	21.00	20.61	19.64	19.90	0.0	21.00
		1	12	20.23	19.63	20.12	0.0	21.00	20.64	19.82	19.82	0.0	21.00
		1	24	20.13	19.65	20.19	0.0	21.00	20.61	19.93	19.82	0.0	21.00
		12	0	20.80	20.36	20.27	0.0	21.00	20.19	19.78	20.23	0.0	21.00
		12	7	20.76	20.32	20.21	0.0	21.00	20.19	19.72	20.16	0.0	21.00
		12	13	20.72	19.80	20.17	0.0	21.00	20.13	19.73	20.14	0.0	21.00
		25	0	20.81	19.81	20.22	0.0	21.00	20.22	19.76	20.17	0.0	21.00

LTE Band 2 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18615	18900	19185			18615	18900	19185		
				1851.5 MHz	1880 MHz	1908.5 MHz			1851.5 MHz	1880 MHz	1908.5 MHz		
3 MHz	QPSK	1	0	20.12	19.82	20.13	0.0	21.00	20.12	19.66	19.97	0.0	21.00
		1	8	20.41	19.83	20.21	0.0	21.00	20.11	19.65	20.05	0.0	21.00
		1	14	20.35	19.76	20.21	0.0	21.00	20.19	19.60	20.07	0.0	21.00
		8	0	20.38	19.76	20.20	0.0	21.00	20.21	19.60	20.05	0.0	21.00
		8	4	20.38	19.75	20.17	0.0	21.00	20.21	19.58	20.02	0.0	21.00
		8	7	20.39	19.74	20.22	0.0	21.00	20.20	19.59	20.07	0.0	21.00
		15	0	20.40	19.76	20.21	0.0	21.00	20.20	19.60	20.08	0.0	21.00
	16QAM	1	0	20.83	19.93	20.10	0.0	21.00	20.63	19.77	19.95	0.0	21.00
		1	8	20.86	19.95	20.10	0.0	21.00	20.65	19.80	19.95	0.0	21.00
		1	14	20.81	19.89	20.09	0.0	21.00	20.58	19.76	19.94	0.0	21.00
		8	0	20.47	19.81	20.33	0.0	21.00	20.29	19.64	20.18	0.0	21.00
		8	4	20.48	19.79	20.29	0.0	21.00	20.27	19.63	20.14	0.0	21.00
		8	7	20.47	19.79	20.33	0.0	21.00	20.28	19.62	20.17	0.0	21.00
		15	0	20.43	19.71	20.28	0.0	21.00	20.24	19.55	20.13	0.0	21.00
	64QAM	1	0	20.59	20.02	20.35	0.0	21.00	20.34	19.69	20.38	0.0	21.00
		1	8	20.62	20.07	20.39	0.0	21.00	20.21	19.95	20.33	0.0	21.00
		1	14	20.56	20.02	20.43	0.0	21.00	20.06	19.88	20.23	0.0	21.00
		8	0	20.31	19.80	20.27	0.0	21.00	20.38	19.69	20.26	0.0	21.00
		8	4	20.30	19.80	20.23	0.0	21.00	20.37	19.68	20.23	0.0	21.00
		8	7	20.28	19.79	20.23	0.0	21.00	20.35	19.67	20.26	0.0	21.00
		15	0	20.39	19.73	20.25	0.0	21.00	20.35	19.76	20.21	0.0	21.00
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18607	18900	19193			18607	18900	19193		
				1850.7 MHz	1880 MHz	1909.3 MHz			1850.7 MHz	1880 MHz	1909.3 MHz		
1.4 MHz	QPSK	1	0	20.39	19.90	20.21	0.0	21.00	20.30	19.62	20.18	0.0	21.00
		1	3	20.45	19.89	20.20	0.0	21.00	20.17	19.65	20.17	0.0	21.00
		1	5	20.38	19.88	20.19	0.0	21.00	20.17	19.63	20.20	0.0	21.00
		3	0	20.39	19.79	20.19	0.0	21.00	20.19	19.58	20.03	0.0	21.00
		3	1	20.40	19.82	20.18	0.0	21.00	20.17	19.62	20.06	0.0	21.00
		3	3	20.42	19.80	20.23	0.0	21.00	20.19	19.62	20.07	0.0	21.00
		6	0	20.42	19.85	20.30	0.0	21.00	20.25	19.60	20.14	0.0	21.00
	16QAM	1	0	20.53	20.00	20.71	0.0	21.00	20.67	19.77	20.19	0.0	21.00
		1	3	20.51	19.99	20.68	0.0	21.00	20.67	19.76	20.21	0.0	21.00
		1	5	20.57	20.00	20.72	0.0	21.00	20.67	19.77	20.23	0.0	21.00
		3	0	20.63	19.88	20.50	0.0	21.00	20.47	19.81	20.13	0.0	21.00
		3	1	20.65	19.87	20.51	0.0	21.00	20.47	19.84	20.12	0.0	21.00
		3	3	20.64	19.87	20.50	0.0	21.00	20.46	19.84	20.17	0.0	21.00
		6	0	20.63	19.92	20.19	0.0	21.00	20.15	19.81	20.25	0.0	21.00
	64QAM	1	0	20.04	19.93	20.44	0.0	21.00	20.79	19.91	20.43	0.0	21.00
		1	3	20.81	19.95	20.43	0.0	21.00	20.31	19.92	20.41	0.0	21.00
		1	5	20.74	19.89	20.45	0.0	21.00	20.23	19.87	20.44	0.0	21.00
		3	0	20.66	19.78	20.20	0.0	21.00	20.58	19.76	20.19	0.0	21.00
		3	1	20.66	19.80	20.19	0.0	21.00	20.60	19.77	20.18	0.0	21.00
		3	3	20.68	19.81	20.23	0.0	21.00	20.59	19.78	20.22	0.0	21.00
		6	0	20.33	20.03	20.36	0.0	21.00	20.27	19.99	20.34	0.0	21.00

LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Reduced Average Power (dBm) Hotspot back-off					Reduced Average Power (dBm) Proximity sensor back-off				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132072	132322	132572			132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz			1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	19.32	19.98	20.12	0.0	21.50	20.00	20.42	20.15	0.0	21.50
		1	49	19.82	20.26	20.30	0.0	21.50	19.76	20.75	20.76	0.0	21.50
		1	99	20.22	20.09	20.23	0.0	21.50	20.11	20.60	20.69	0.0	21.50
		50	0	19.45	20.65	20.72	0.0	21.50	19.42	20.62	20.69	0.0	21.50
		50	24	19.84	20.69	20.76	0.0	21.50	19.79	20.68	20.76	0.0	21.50
		50	50	20.05	20.71	20.65	0.0	21.50	20.02	20.70	20.65	0.0	21.50
		100	0	19.75	20.65	20.69	0.0	21.50	19.71	20.66	20.68	0.0	21.50
	16QAM	1	0	19.64	20.20	20.57	0.0	21.50	19.65	20.90	20.88	0.0	21.50
		1	49	19.89	20.52	20.66	0.0	21.50	20.19	20.80	20.78	0.0	21.50
		1	99	20.42	20.46	20.65	0.0	21.50	20.54	20.78	20.66	0.0	21.50
		50	0	19.49	20.65	20.69	0.0	21.50	19.40	20.68	20.73	0.0	21.50
		50	24	19.84	20.72	20.76	0.0	21.50	19.75	20.73	20.80	0.0	21.50
		50	50	20.07	20.74	20.62	0.0	21.50	19.99	20.75	20.67	0.0	21.50
		100	0	19.77	20.68	20.70	0.0	21.50	19.70	20.71	20.70	0.0	21.50
	64QAM	1	0	20.20	20.52	20.32	0.0	21.50	20.17	20.60	20.32	0.0	21.50
		1	49	20.09	20.81	20.35	0.0	21.50	20.11	20.93	20.36	0.0	21.50
		1	99	20.37	20.72	20.20	0.0	21.50	20.54	20.78	20.25	0.0	21.50
		50	0	19.50	20.69	20.72	0.0	21.50	19.52	20.69	20.73	0.0	21.50
		50	24	19.84	20.71	20.79	0.0	21.50	19.87	20.73	20.80	0.0	21.50
		50	50	20.08	20.74	20.67	0.0	21.50	20.10	20.75	20.69	0.0	21.50
		100	0	19.75	20.65	20.70	0.0	21.50	19.77	20.67	20.73	0.0	21.50
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
132047	132322	132597	132047	132322	132597								
1717.5 MHz	1745 MHz	1772.5 MHz	1717.5 MHz	1745 MHz	1772.5 MHz								
15 MHz	QPSK	1	0	19.28	20.19	20.13	0.0	21.50	19.56	20.49	20.48	0.0	21.50
		1	37	19.68	20.67	20.31	0.0	21.50	19.73	20.73	20.72	0.0	21.50
		1	74	19.89	20.58	20.37	0.0	21.50	19.93	20.63	20.69	0.0	21.50
		36	0	19.39	20.64	20.70	0.0	21.50	19.50	20.65	20.74	0.0	21.50
		36	20	19.59	20.65	20.74	0.0	21.50	19.62	20.67	20.77	0.0	21.50
		36	39	19.79	20.69	20.73	0.0	21.50	19.78	20.71	20.77	0.0	21.50
		75	0	19.62	20.67	20.73	0.0	21.50	19.63	20.68	20.75	0.0	21.50
	16QAM	1	0	19.65	20.82	20.32	0.0	21.50	19.67	20.93	20.55	0.0	21.50
		1	37	19.97	20.80	20.28	0.0	21.50	20.00	21.13	20.62	0.0	21.50
		1	74	20.26	20.66	20.22	0.0	21.50	20.33	20.80	20.49	0.0	21.50
		36	0	19.44	20.62	20.76	0.0	21.50	19.47	20.64	20.78	0.0	21.50
		36	20	19.68	20.66	20.80	0.0	21.50	19.68	20.69	20.84	0.0	21.50
		36	39	19.85	20.70	20.80	0.0	21.50	19.87	20.74	20.82	0.0	21.50
		75	0	19.65	20.69	20.77	0.0	21.50	19.67	20.70	20.79	0.0	21.50
	64QAM	1	0	20.48	20.59	20.45	0.0	21.50	19.30	20.67	20.49	0.0	21.50
		1	37	20.88	20.82	20.65	0.0	21.50	19.52	20.99	20.72	0.0	21.50
		1	74	19.61	20.79	20.65	0.0	21.50	19.84	20.91	20.72	0.0	21.50
		36	0	19.49	20.69	20.80	0.0	21.50	19.53	20.69	20.81	0.0	21.50
		36	20	19.73	20.73	20.87	0.0	21.50	19.76	20.75	20.87	0.0	21.50
		36	39	19.90	20.75	20.86	0.0	21.50	19.92	20.78	20.86	0.0	21.50
		75	0	19.67	20.78	20.81	0.0	21.50	19.70	20.79	20.81	0.0	21.50

LTE Band 66 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132022	132322	132622			132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz			1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	19.91	20.16	20.41	0.0	21.50	19.83	20.52	20.74	0.0	21.50
		1	25	19.78	20.59	20.69	0.0	21.50	19.63	20.72	20.77	0.0	21.50
		1	49	19.81	20.71	20.73	0.0	21.50	19.81	20.76	20.83	0.0	21.50
		25	0	19.10	20.66	20.86	0.0	21.50	19.51	20.67	20.88	0.0	21.50
		25	12	19.09	20.70	20.84	0.0	21.50	19.08	20.72	20.84	0.0	21.50
		25	25	19.22	20.76	20.82	0.0	21.50	19.22	20.77	20.82	0.0	21.50
		50	0	19.11	20.74	20.86	0.0	21.50	21.19	20.74	20.85	0.0	21.50
	16QAM	1	0	19.23	20.64	20.72	0.0	21.50	19.55	20.68	20.71	0.0	21.50
		1	25	19.33	20.71	20.63	0.0	21.50	19.88	20.68	20.71	0.0	21.50
		1	49	19.18	20.65	20.61	0.0	21.50	20.04	20.61	20.73	0.0	21.50
		25	0	20.49	20.79	20.90	0.0	21.50	19.43	20.79	20.90	0.0	21.50
		25	12	20.64	20.82	20.87	0.0	21.50	19.59	20.82	20.89	0.0	21.50
		25	25	20.62	20.86	20.84	0.0	21.50	19.73	20.87	20.86	0.0	21.50
		50	0	19.57	20.79	20.87	0.0	21.50	19.59	20.79	20.86	0.0	21.50
	64QAM	1	0	20.65	19.97	20.08	0.0	21.50	19.45	20.34	20.64	0.0	21.50
		1	25	20.82	20.09	20.11	0.0	21.50	19.42	20.53	20.74	0.0	21.50
		1	49	20.90	20.07	20.19	0.0	21.50	19.63	20.55	20.80	0.0	21.50
		25	0	20.00	19.25	19.54	0.0	21.50	19.48	20.80	21.00	0.0	21.50
		25	12	20.12	19.31	19.52	0.0	21.50	19.62	20.83	20.98	0.0	21.50
		25	25	20.27	19.33	19.51	0.0	21.50	19.78	20.87	20.93	0.0	21.50
		50	0	20.06	19.28	19.45	0.0	21.50	19.62	20.77	20.93	0.0	21.50
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131997	132322	132647			131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz			1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	20.01	20.73	20.93	0.0	21.50	19.57	20.76	20.95	0.0	21.50
		1	12	20.10	20.73	20.96	0.0	21.50	19.14	20.81	20.97	0.0	21.50
		1	24	19.61	20.75	20.98	0.0	21.50	19.19	20.82	21.01	0.0	21.50
		12	0	19.35	20.68	20.88	0.0	21.50	19.38	20.67	20.89	0.0	21.50
		12	7	19.39	20.69	20.85	0.0	21.50	19.40	20.68	20.86	0.0	21.50
		12	13	19.41	20.68	20.85	0.0	21.50	19.44	20.68	20.85	0.0	21.50
		25	0	19.42	20.67	20.90	0.0	21.50	19.44	20.69	20.93	0.0	21.50
	16QAM	1	0	19.51	21.22	20.93	0.0	21.50	19.83	20.83	21.10	0.0	21.50
		1	12	19.60	21.24	20.97	0.0	21.50	19.87	20.86	21.14	0.0	21.50
		1	24	19.70	21.25	20.96	0.0	21.50	20.00	20.83	21.19	0.0	21.50
		12	0	19.44	20.82	21.04	0.0	21.50	19.51	20.76	21.00	0.0	21.50
		12	7	19.49	20.82	20.98	0.0	21.50	19.56	20.76	20.95	0.0	21.50
		12	13	19.51	20.83	20.95	0.0	21.50	19.59	20.76	20.94	0.0	21.50
		25	0	19.46	20.77	20.88	0.0	21.50	19.51	20.68	20.96	0.0	21.50
	64QAM	1	0	19.59	20.66	20.61	0.0	21.50	20.80	20.49	20.24	0.0	21.50
		1	12	19.40	20.70	20.69	0.0	21.50	20.92	20.56	20.23	0.0	21.50
		1	24	19.52	20.76	20.75	0.0	21.50	20.99	20.57	20.30	0.0	21.50
		12	0	19.43	20.64	20.99	0.0	21.50	19.86	20.78	21.02	0.0	21.50
		12	7	19.46	20.62	20.97	0.0	21.50	19.89	20.79	20.97	0.0	21.50
		12	13	19.50	20.62	20.96	0.0	21.50	19.51	20.79	20.96	0.0	21.50
		25	0	19.43	20.67	20.95	0.0	21.50	19.41	20.77	20.94	0.0	21.50

LTE Band 66 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131987	132322	132657			131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz			1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	19.38	20.12	20.23	0.0	21.50	19.46	20.24	20.41	0.0	21.50
		1	8	19.45	20.18	20.31	0.0	21.50	19.07	20.60	20.70	0.0	21.50
		1	14	19.46	20.13	20.31	0.0	21.50	19.22	20.63	20.68	0.0	21.50
		8	0	19.27	20.61	20.82	0.0	21.50	19.29	20.65	20.89	0.0	21.50
		8	4	19.29	20.65	20.83	0.0	21.50	19.33	20.66	20.92	0.0	21.50
		8	7	19.32	20.67	20.84	0.0	21.50	19.36	20.72	20.89	0.0	21.50
		15	0	19.30	20.67	20.82	0.0	21.50	19.34	20.68	20.84	0.0	21.50
	16QAM	1	0	19.14	20.18	20.23	0.0	21.50	19.41	20.44	21.10	0.0	21.50
		1	8	19.21	20.25	20.24	0.0	21.50	19.37	20.32	21.04	0.0	21.50
		1	14	19.27	20.21	20.20	0.0	21.50	19.36	20.27	20.94	0.0	21.50
		8	0	20.94	20.70	20.96	0.0	21.50	19.37	20.78	20.96	0.0	21.50
		8	4	20.96	20.72	20.98	0.0	21.50	19.40	20.79	20.97	0.0	21.50
		8	7	19.47	20.75	20.98	0.0	21.50	19.43	20.85	20.96	0.0	21.50
	64QAM	15	0	19.36	20.64	20.89	0.0	21.50	19.32	20.74	20.91	0.0	21.50
		1	0	20.46	20.35	20.69	0.0	21.50	20.49	19.96	20.30	0.0	21.50
		1	8	20.56	20.41	20.73	0.0	21.50	20.61	20.01	20.77	0.0	21.50
		1	14	20.58	20.36	20.74	0.0	21.50	20.61	19.94	20.79	0.0	21.50
		8	0	19.45	20.61	20.94	0.0	21.50	19.92	19.16	21.00	0.0	21.50
		8	4	19.39	20.63	20.96	0.0	21.50	19.95	19.19	21.02	0.0	21.50
		8	7	19.41	20.65	20.95	0.0	21.50	19.97	19.20	21.00	0.0	21.50
	15	0	19.38	20.72	20.86	0.0	21.50	19.94	19.28	20.91	0.0	21.50	
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				131979	132322	132665			131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz			1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	19.83	20.13	20.46	0.0	21.50	19.70	20.67	20.78	0.0	21.50
		1	3	19.09	20.15	20.48	0.0	21.50	19.35	20.68	20.83	0.0	21.50
		1	5	19.06	20.15	20.50	0.0	21.50	19.37	20.67	20.85	0.0	21.50
		3	0	19.28	20.63	20.84	0.0	21.50	19.31	20.64	20.86	0.0	21.50
		3	1	19.29	20.65	20.85	0.0	21.50	19.33	20.65	20.89	0.0	21.50
		3	3	19.32	20.67	20.86	0.0	21.50	19.35	20.65	20.91	0.0	21.50
		6	0	19.33	20.66	20.93	0.0	21.50	19.38	20.70	20.90	0.0	21.50
	16QAM	1	0	19.60	20.21	20.44	0.0	21.50	19.48	21.16	20.93	0.0	21.50
		1	3	19.56	20.19	20.46	0.0	21.50	19.51	21.14	20.94	0.0	21.50
		1	5	19.51	20.25	20.48	0.0	21.50	19.51	21.15	20.98	0.0	21.50
		3	0	19.54	20.85	20.94	0.0	21.50	19.39	20.92	21.07	0.0	21.50
		3	1	19.54	20.87	20.95	0.0	21.50	19.39	20.92	21.08	0.0	21.50
		3	3	19.56	20.87	20.95	0.0	21.50	19.43	20.92	21.08	0.0	21.50
		6	0	19.26	20.87	21.06	0.0	21.50	19.50	20.60	21.12	0.0	21.50
	64QAM	1	0	19.54	20.46	20.51	0.0	21.50	19.55	20.49	20.65	0.0	21.50
		1	3	19.56	20.55	20.52	0.0	21.50	19.41	20.56	20.73	0.0	21.50
		1	5	19.59	20.58	20.56	0.0	21.50	19.43	20.54	20.70	0.0	21.50
		3	0	19.25	21.01	20.89	0.0	21.50	19.30	20.05	20.08	0.0	21.50
		3	1	19.27	21.02	20.88	0.0	21.50	19.31	20.07	20.06	0.0	21.50
		3	3	19.29	21.02	20.88	0.0	21.50	19.33	20.06	20.07	0.0	21.50
		6	0	19.42	20.68	21.03	0.0	21.50	19.46	19.72	20.22	0.0	21.50

9.4. NR (Sub 6GHz)

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS 138.521-1 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS138.521-1.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power 3

Modulation	MPR (dB)		
	Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM Pi/2 BPSK	≤ 3.5 ¹	≤ 1.2 ¹	≤ 0.2 ¹
DFT-s-OFDM QPSK	≤ 1	≤ 0.5 ²	0 ²
DFT-s-OFDM 16 QAM	≤ 2		≤ 1
DFT-s-OFDM 64 QAM		≤ 2.5	
DFT-s-OFDM 256 QAM		≤ 4.5	
CP-OFDM QPSK	≤ 3		≤ 1.5
CP-OFDM 16 QAM	≤ 3		≤ 2
CP-OFDM 64 QAM		≤ 3.5	
CP-OFDM 256 QAM		≤ 6.5	

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40% of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

The allowed A-MPR values specified below in Table 6.2.3.3.1-1 of 3GPP TS138.521-1 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”

Table 6.2.3.3.1-1: Additional maximum power reduction (A-MPR)

Network Signalling label	Requirements (subclause)	NR Band	Channel bandwidth (MHz)	Resources Blocks (N _{RB})	A-MPR (dB)
NS_01		Table 5.2-1	5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 90, 100	Table 5.3.2-1	N/A

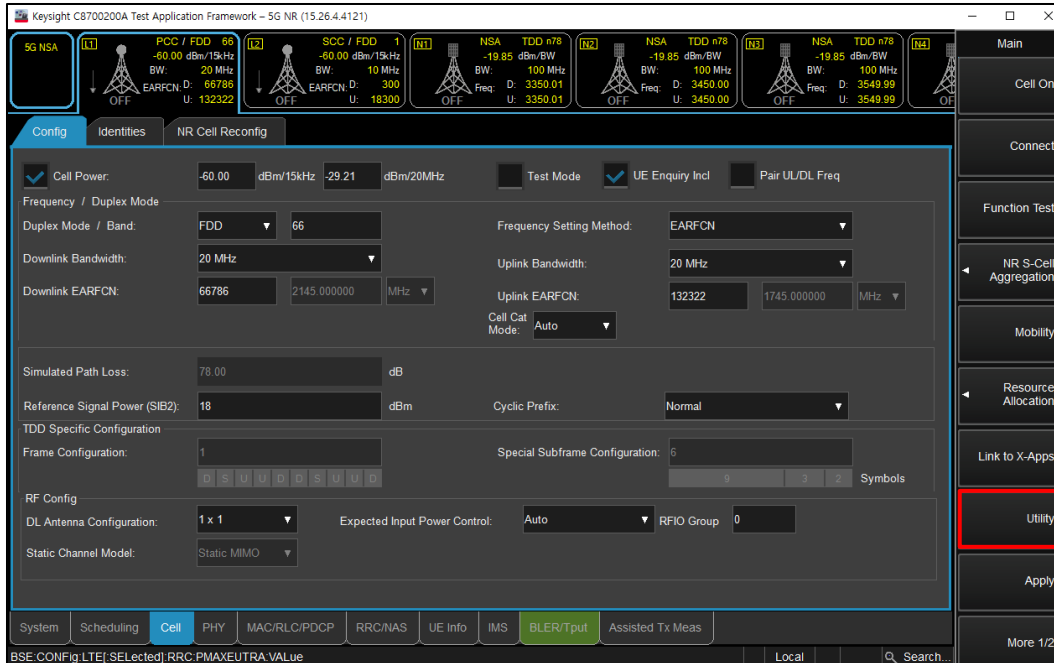
Uplink RB allocations were used to Table 6.1-1 of the 3GPP TS 138.521-1.

Channel Bandwidth	SCS(kHz)	OFDM	RB allocation							
			Edge_Full_Left	Edge_Full_Right	Edge_1RB_Left	Edge_1RB_Right	Outer_Full	Inner_Full	Inner_1RB_Left	Inner_1RB_Right
5MHz	15	DFT-s	2@0	2@23	1@0	1@24	25@0	12@6	1@1	1@23
		CP	2@0	2@23	1@0	1@24	25@0	13@6	1@1	1@23
	30	DFT-s	2@0	2@9	1@0	1@10	10@0	5@2 ¹	1@1	1@9
		CP	2@0	2@9	1@0	1@10	11@0	5@2 ¹	1@1	1@9
	60	DFT-s	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		CP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10MHz	15	DFT-s	2@0	2@50	1@0	1@51	50@0	25@12	1@1	1@50
		CP	2@0	2@50	1@0	1@51	52@0	26@13	1@1	1@50
	30	DFT-s	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22
		CP	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22
	60	DFT-s	2@0	2@9	1@0	1@10	10@0	5@2 ¹	1@1	1@9
		CP	2@0	2@9	1@0	1@10	11@0	5@2 ¹	1@1	1@9
15MHz	15	DFT-s	2@0	2@77	1@0	1@78	75@0	38@18	1@1	1@77
		CP	2@0	2@77	1@0	1@78	79@0	39@19 ¹	1@1	1@77
	30	DFT-s	2@0	2@36	1@0	1@37	36@0	18@9	1@1	1@36
		CP	2@0	2@36	1@0	1@37	38@0	19@9	1@1	1@36
	60	DFT-s	2@0	2@16	1@0	1@17	18@0	9@4	1@1	1@16
		CP	2@0	2@16	1@0	1@17	18@0	9@4	1@1	1@16
20MHz	15	DFT-s	2@0	2@104	1@0	1@105	100@0	50@25	1@1	1@104
		CP	2@0	2@104	1@0	1@105	106@0	53@26	1@1	1@104
	30	DFT-s	2@0	2@49	1@0	1@50	50@0	25@12	1@1	1@49
		CP	2@0	2@49	1@0	1@50	51@0	25@12 ¹	1@1	1@49
	60	DFT-s	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22
		CP	2@0	2@22	1@0	1@23	24@0	12@6	1@1	1@22

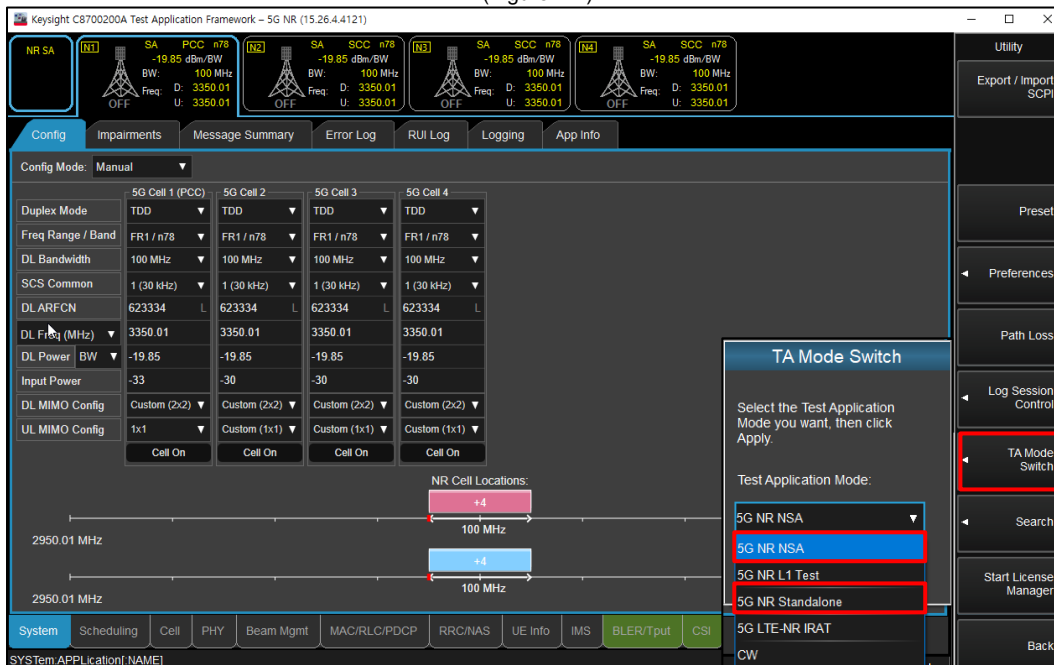
Procedures used to establish power measurement for NR Bands

Switching to NSA mode or SA mode

- Click the “Utility” button in the right of Test application screen
- Select “5G NR NSA” in the “TA Mode Switch” for NSA mode
- Select “5G NR Standalone” in the “TA Mode Switch” for SA mode



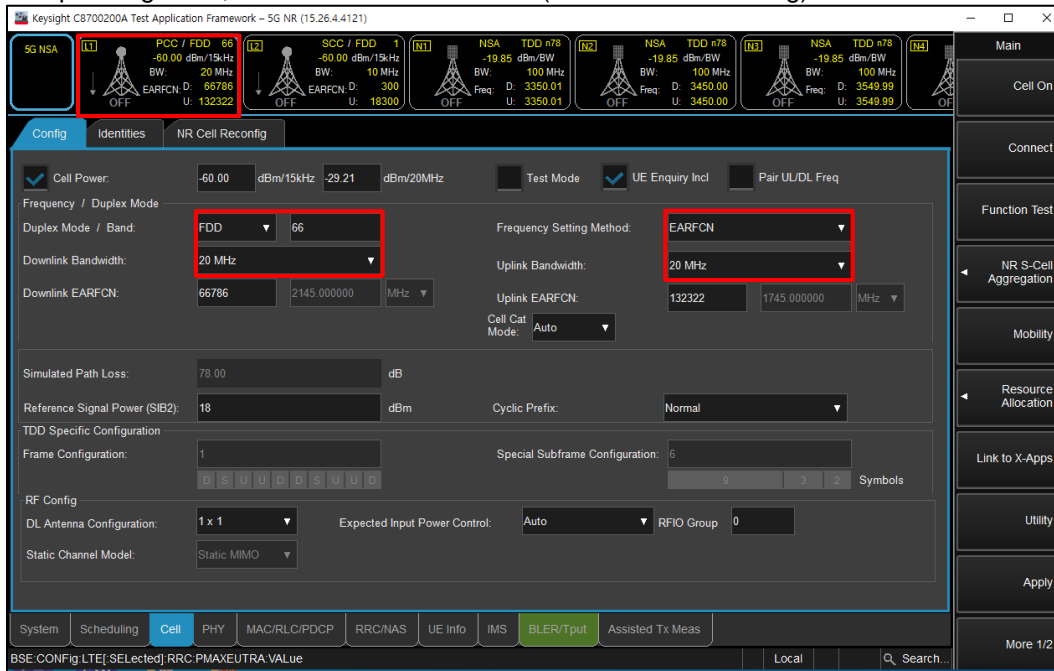
(Figure 1-1)



(Figure 1-2)

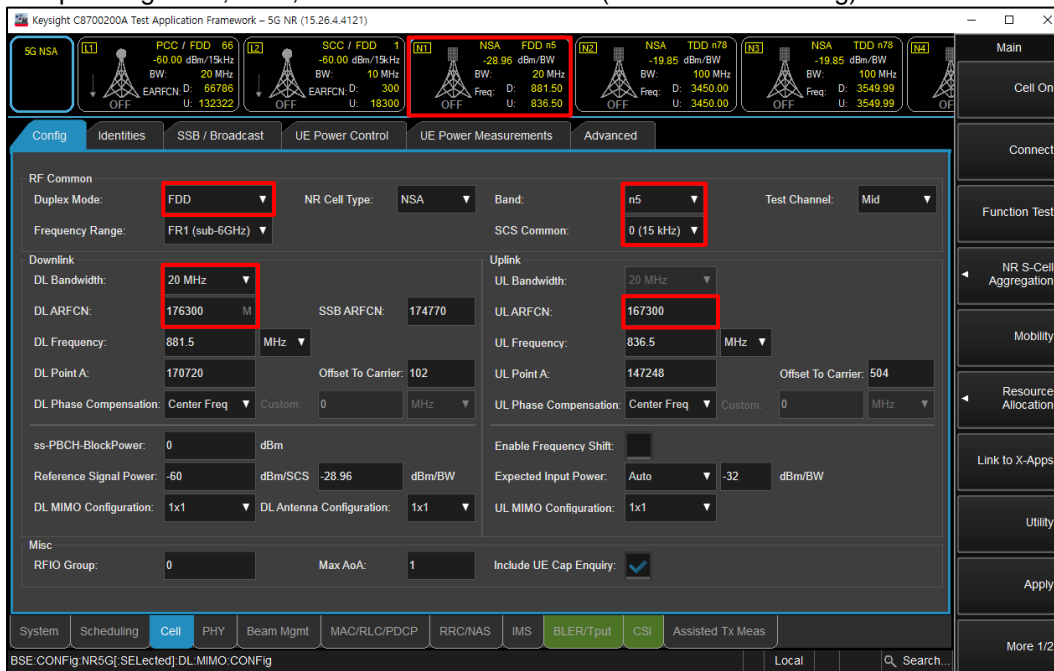
NSA Mode

- Select operating band, BW and Channel for LTE (LTE -> Cell -> Config)



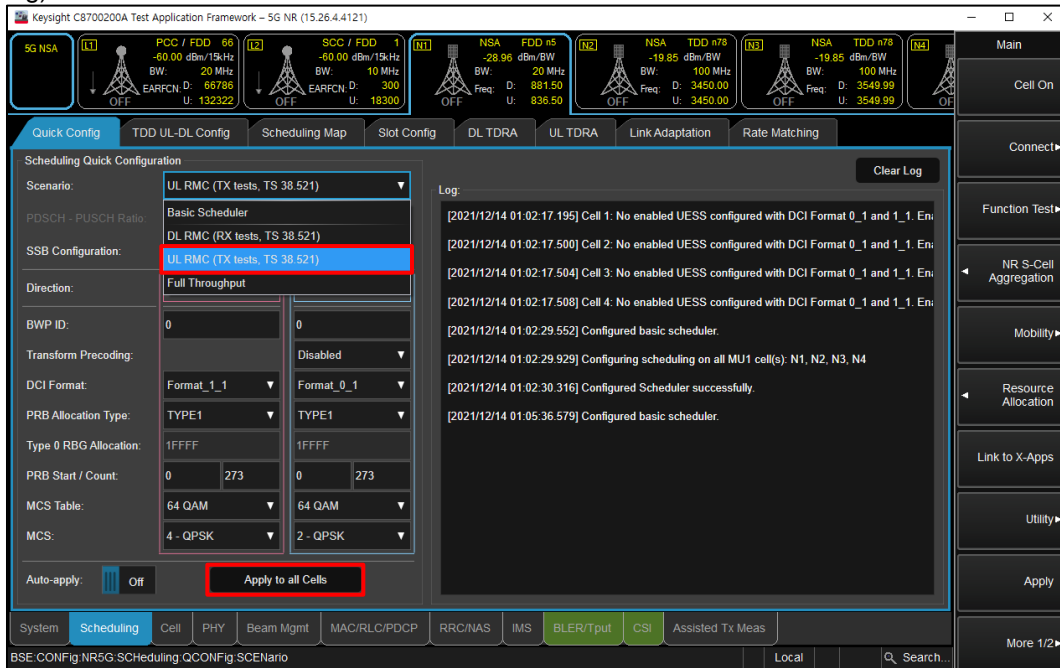
(Figure 2-1)

- Select operating band, SCS, BW and Channel for NR (NR -> Cell -> Config)



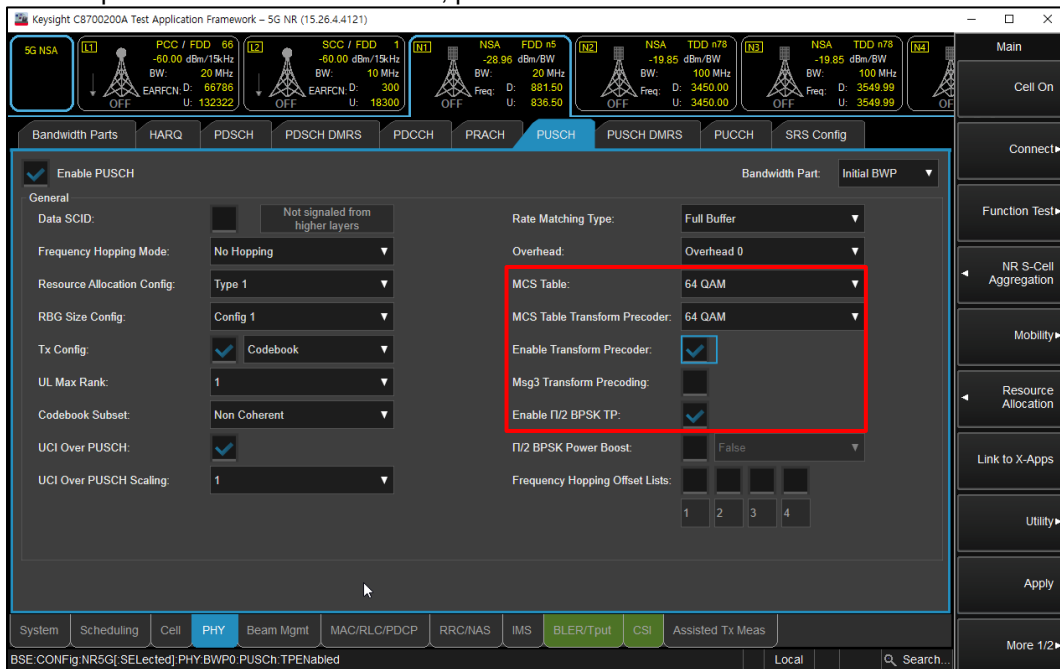
(Figure 2-2)

- Select “UL RMC (TX tests, TS 38.521)” for maximum power RB scheduling (NR -> Scheduling -> Quick Config)



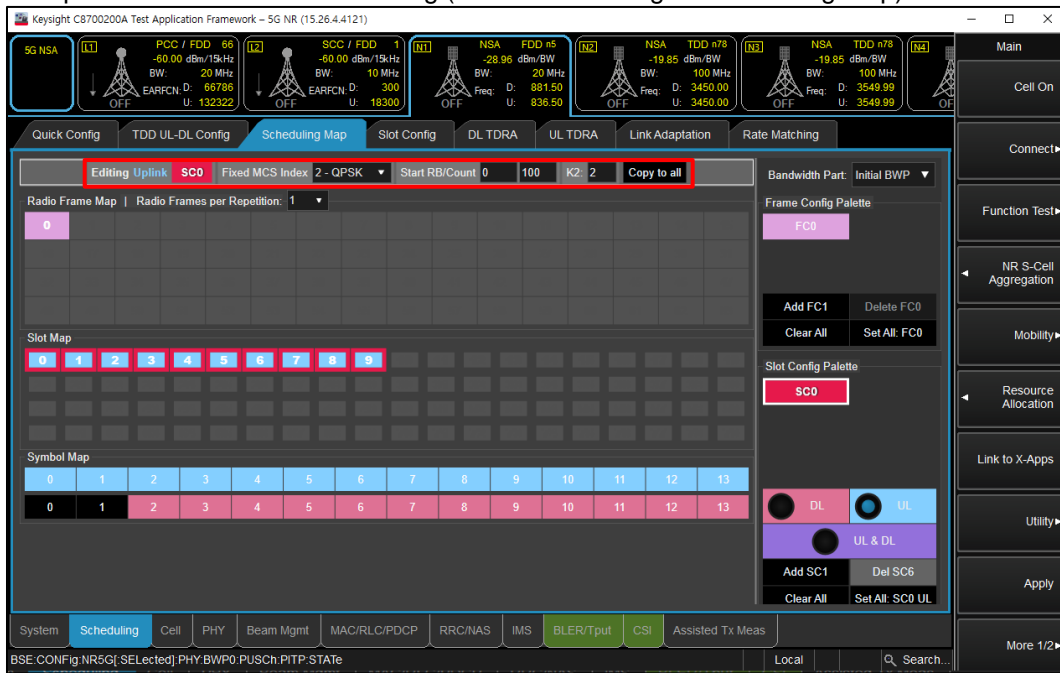
(Figure 2-3)

- To set waveform for NR Band (NR -> PHY -> PUSCH)
 - Select highest modulation in the MCS Table and MCS Table Transform Precoder
 - Enable Transform Precoder: DFT-s-OFDM / disable for CP-OFDM
 - Enable pi/2 BPSK TP: DFT-s-OFDM, pi/2 BPSK modulation



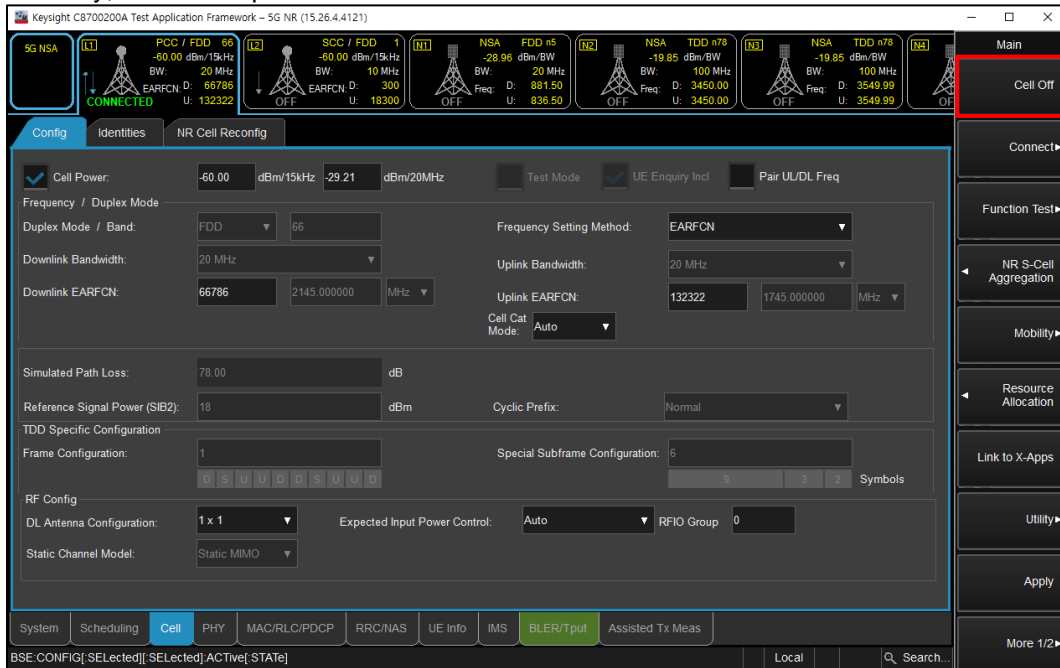
(Figure 2-4)

- Select Uplink Modulation and RB setting (NR -> Scheduling -> Scheduling Map)



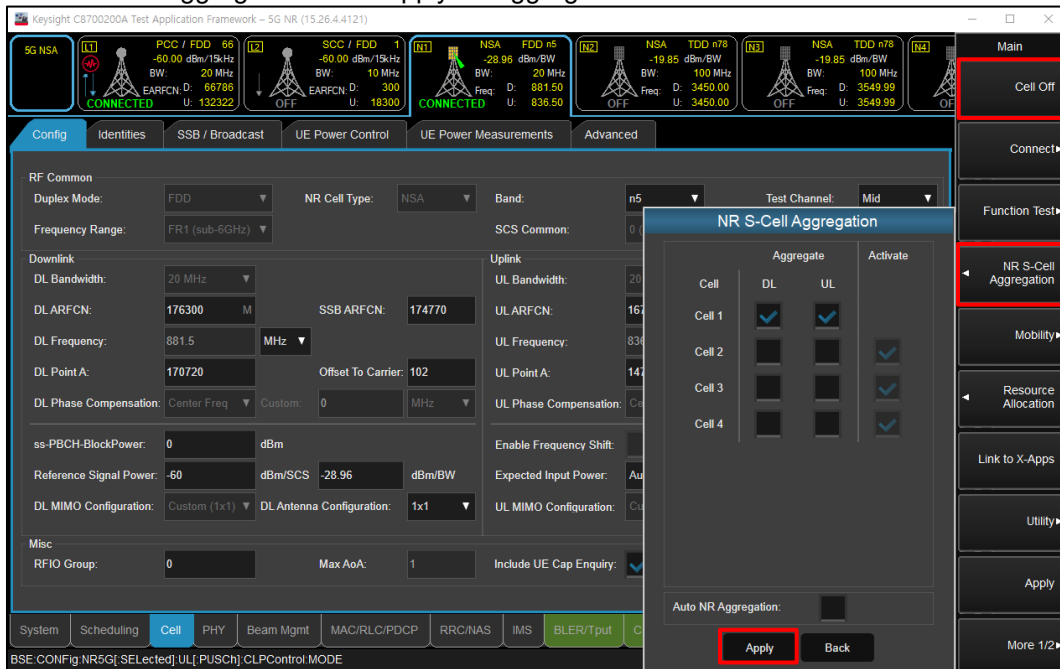
(Figure 2-5)

- Click “Cell On” button in the right of Test application screen in the LTE tab
- If necessary, turn the Airplane Mode on/off in the DUT



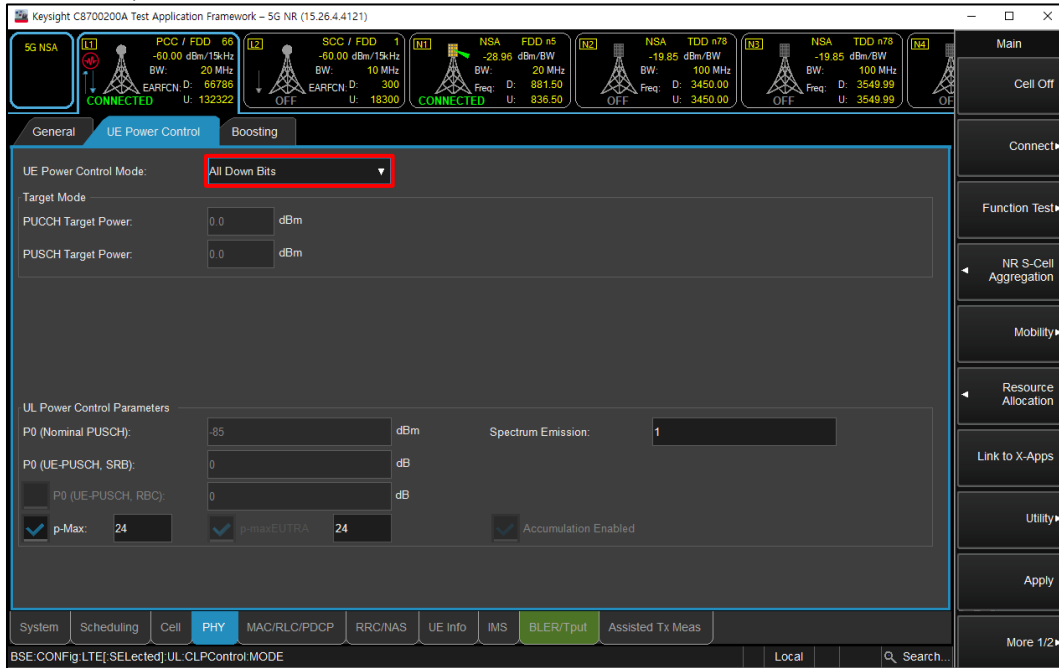
(Figure 2-6)

- Click “Cell On” button in the right of Test application screen in the NR tab
- Click “NR S-Cell Aggregation” and “Apply” to aggregate NR band



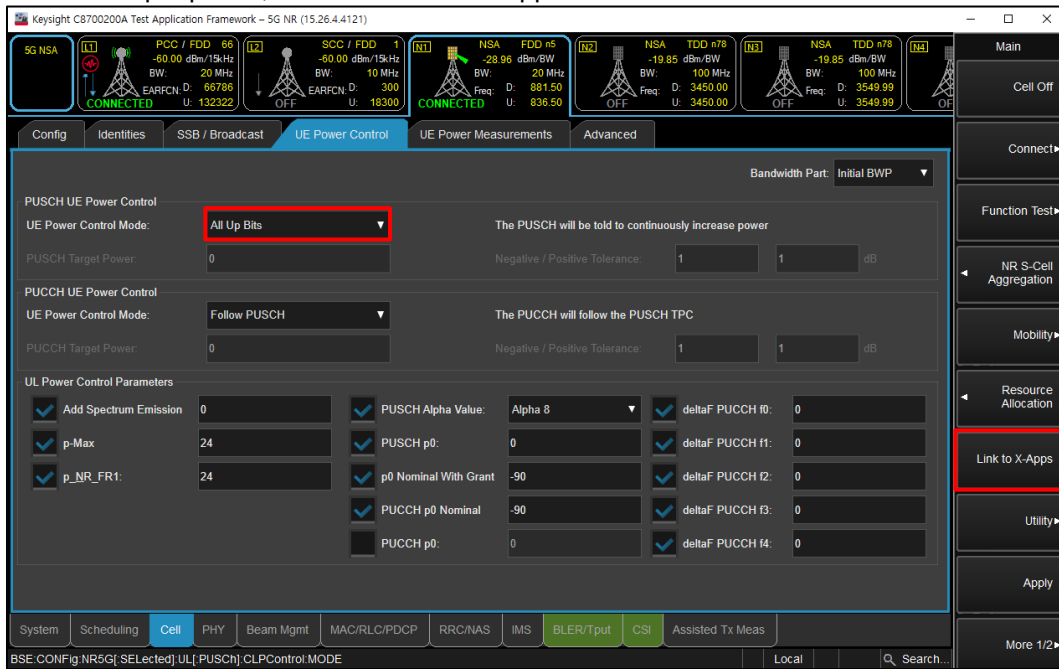
(Figure 2-7)

- Select “All Down Bits” of UL Power control Mode in LTE tab for NR maximum power (LTE -> PHY -> UE Power Control)



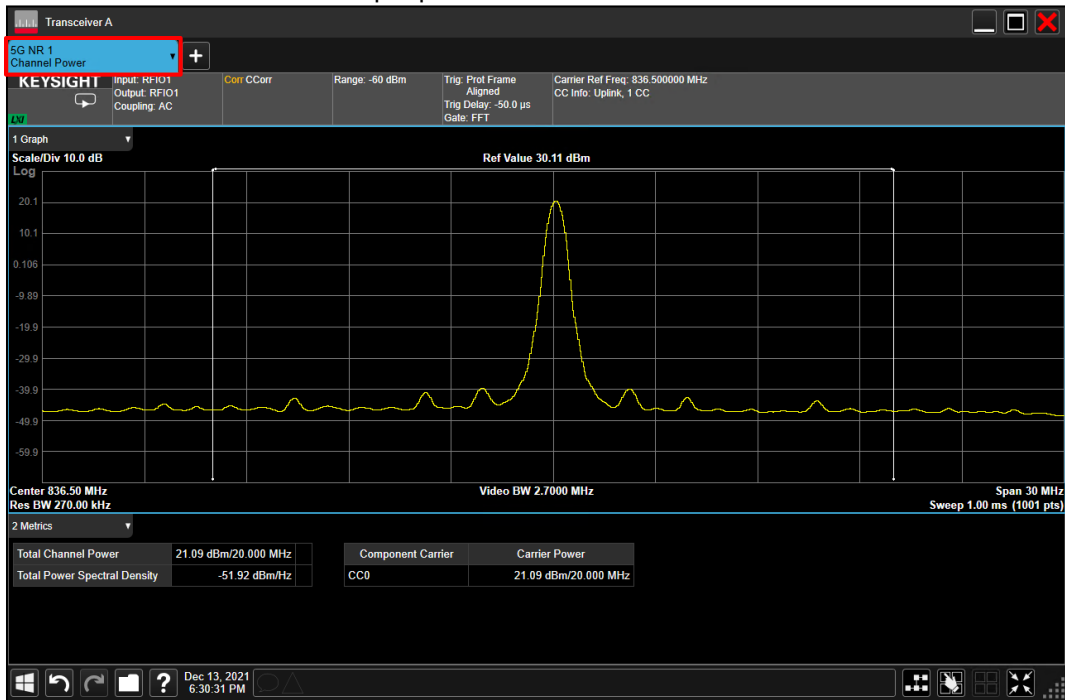
(Figure 2-8)

- Select “All Up Bits” of UL Power control Mode in NR tab for NR maximum power (NR -> Cell -> UE Power Control)
- To read the output power, click the “Link to X-Apps”



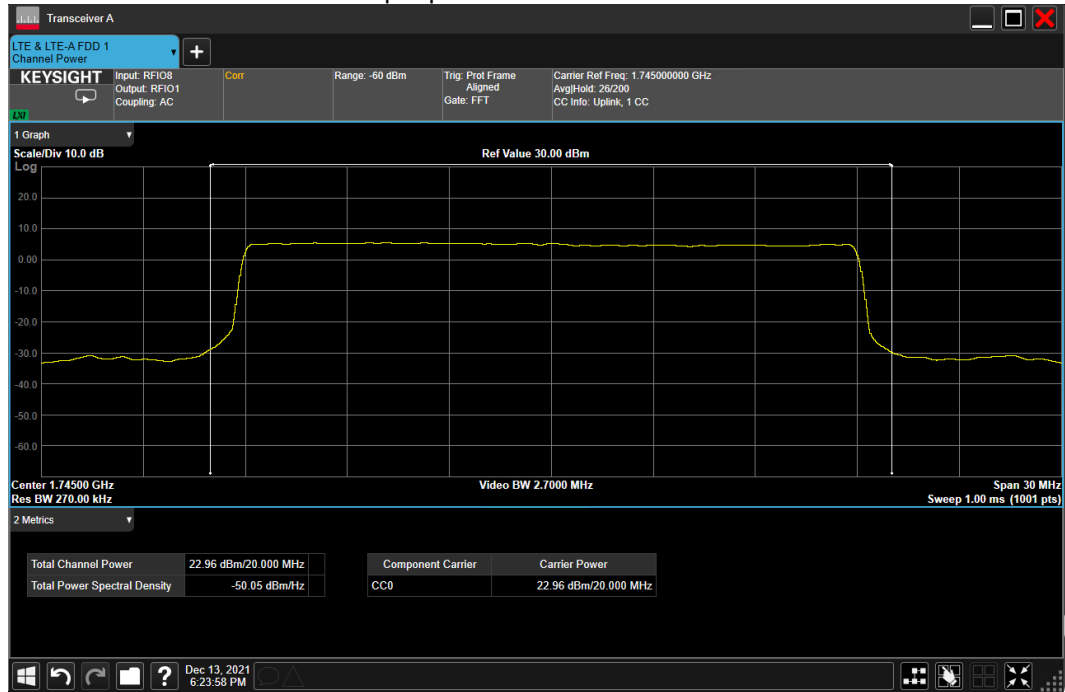
(Figure 2-9)

- Select “Channel Power” for NR output power



(Figure 2-10)

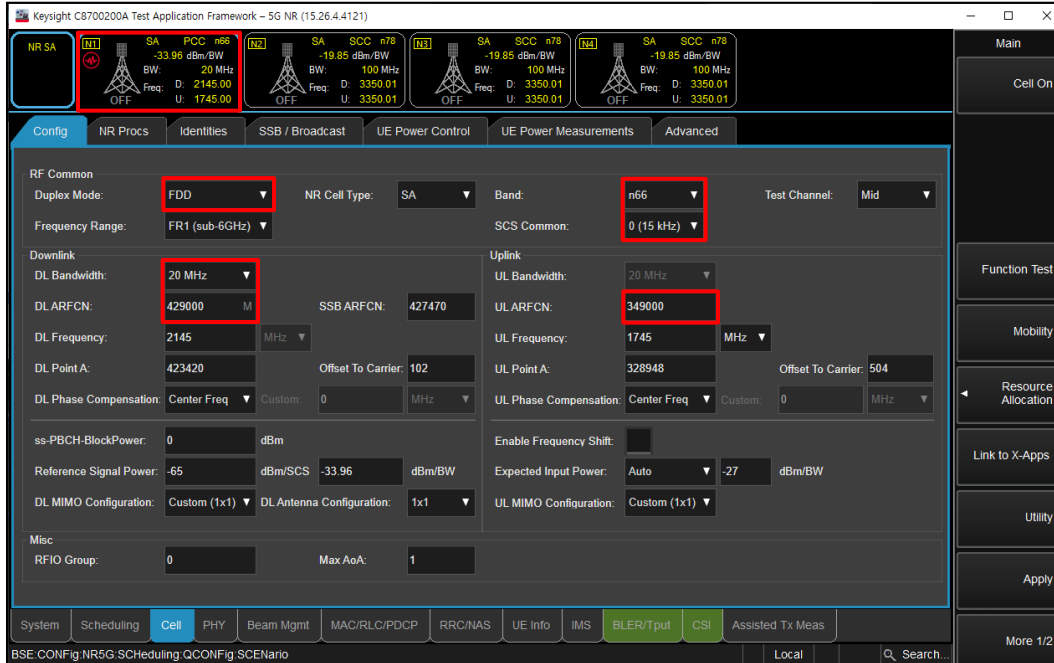
- Select “Channel Power” for LTE output power



(Figure 2-11)

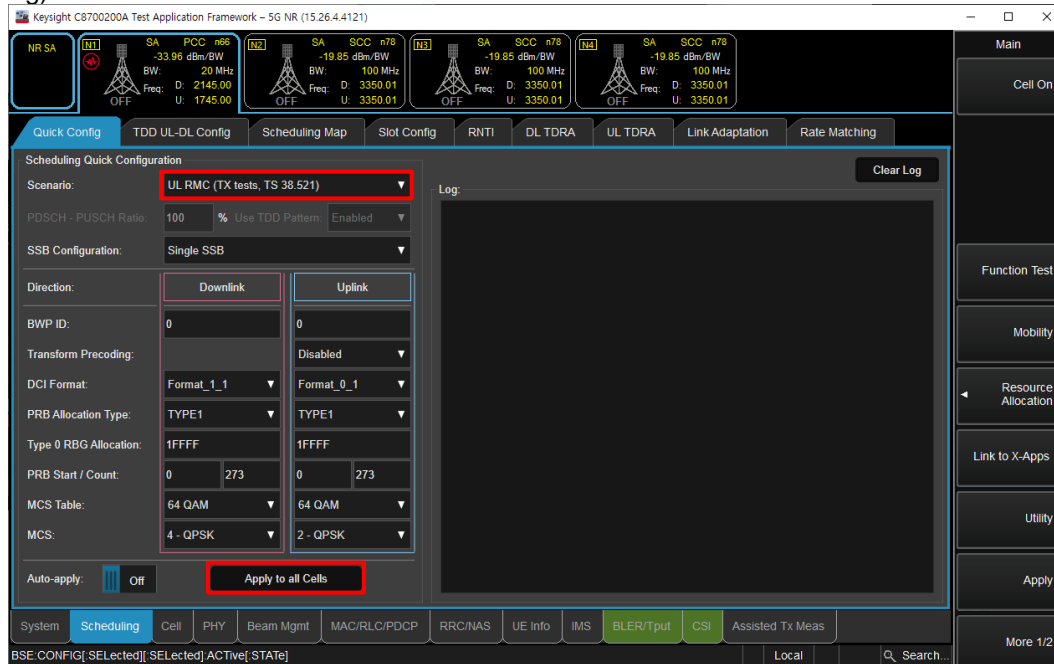
SA Mode

- Select operating band, SCS, BW and Channel for NR (NR -> Cell -> Config)



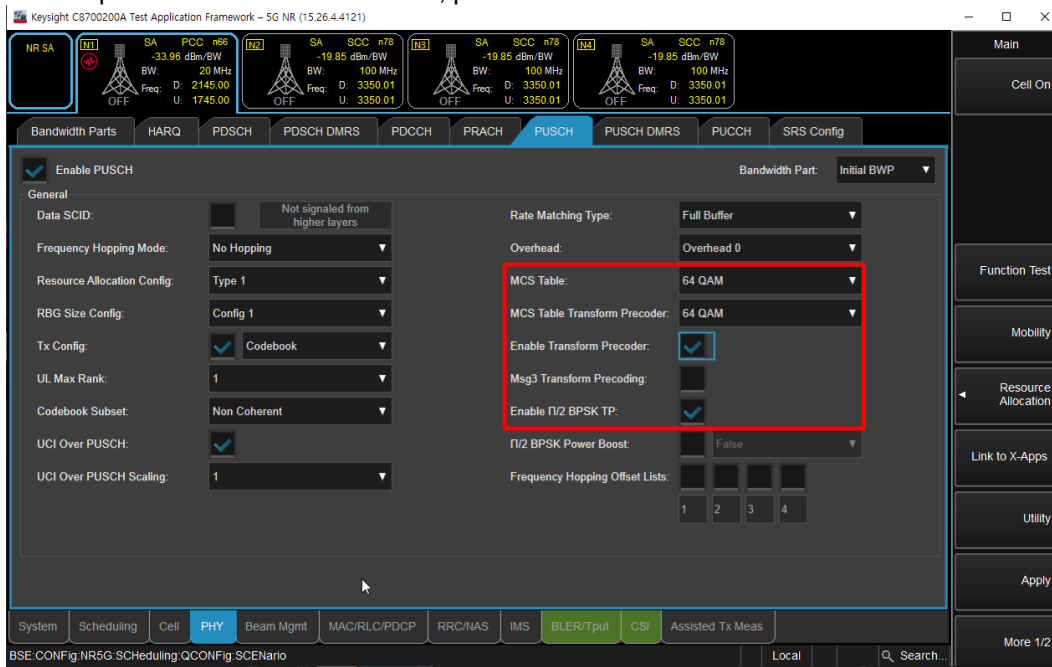
(Figure 3-1)

- Select "UL RMC (TX tests, TS 38.521)" for maximum power RB scheduling (NR -> Scheduling -> Quick Config)



(Figure 3-2)

- To set waveform for NR Band (NR -> PHY -> PUSCH)
 - Select highest modulation in the MCS Table and MCS Table Transform Precoder
 - Enable Transform Precoder: DFT-s-OFDM / disable for CP-OFDM
 - Enable pi/2 BPSK TP: DFT-s-OFDM, pi/2 BPSK modulation



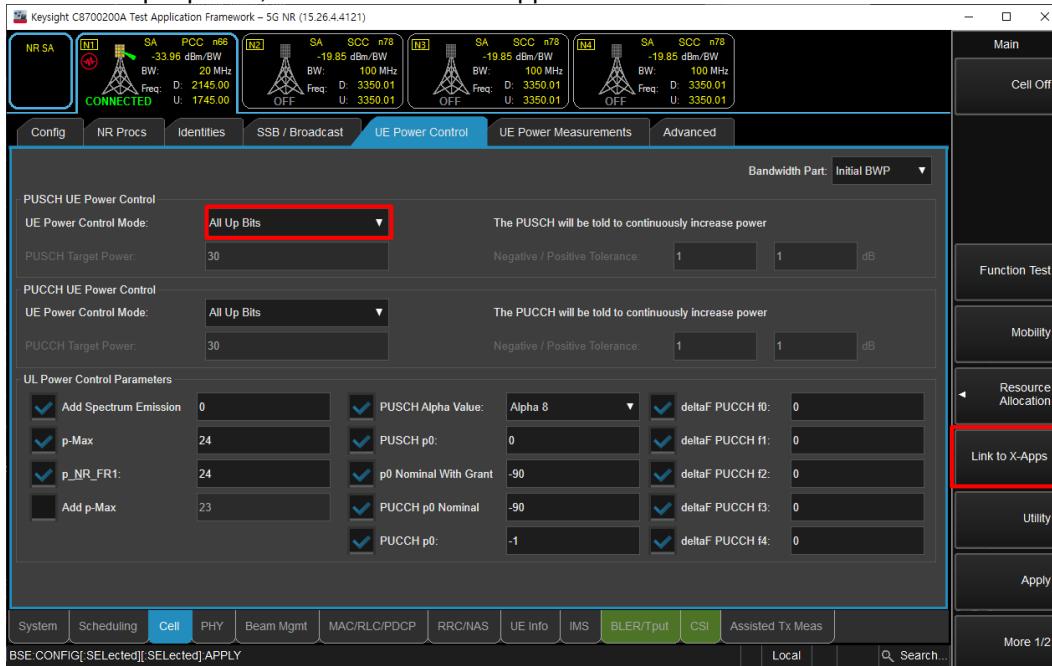
(Figure 3-3)

- Select Uplink Modulation and RB setting (NR -> Scheduling -> Scheduling Map)



(Figure 3-4)

- Click “Cell On” button in the right of Test application screen
- If necessary, turn the Airplane Mode on/off in the DUT
- Select “All Up Bits” of UL Power control Mode (Cell -> UE Power Control)
- To read the output power, click the “Link to X-Apps”



(Figure 3-5)

- Select “Channel Power”



(Figure 3-6)

1. Max power

NR Band n5 Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					166800 834 MHz	167300 836.5 MHz	167800 839 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1		24.16		0.0	25.00
			1	53		24.06		0.0	25.00
			1	104		23.86		0.0	25.00
			50	0		23.67		0.5	24.50
			50	28		24.07		0.0	25.00
			50	56		23.18		0.5	24.50
		100	0		23.45		0.5	24.50	
		1	1		24.14		0.0	25.00	
		1	53		24.01		0.0	25.00	
		1	104		23.78		0.0	25.00	
		50	0		23.13		1.0	24.00	
		50	28		24.10		0.0	25.00	
	50	56		22.78		1.0	24.00		
	100	0		23.01		1.0	24.00		
	16QAM	1	1		23.12		1.0	24.00	
	16QAM	1	53		23.01		1.0	24.00	
16QAM	1	104		23.13		1.0	24.00		
64QAM	1	1		22.01		2.5	22.50		
256QAM	1	1		20.08		4.5	20.50		
CP-OFDM	QPSK	1	1		22.78		1.5	23.50	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					166300 831.5 MHz	167300 836.5 MHz	168300 841.5 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1		24.05		0.0	25.00
			1	40		23.99		0.0	25.00
			1	77		23.85		0.0	25.00
			36	0		23.62		0.5	24.50
			36	22		24.07		0.0	25.00
			36	43		23.31		0.5	24.50
		75	0		23.51		0.5	24.50	
		1	1		23.97		0.0	25.00	
		1	40		23.85		0.0	25.00	
		1	77		23.62		0.0	25.00	
		36	0		22.95		1.0	24.00	
		36	22		23.93		0.0	25.00	
	36	43		22.76		1.0	24.00		
	75	0		23.05		1.0	24.00		
	16QAM	1	1		23.07		1.0	24.00	
	16QAM	1	40		22.97		1.0	24.00	
16QAM	1	77		22.77		1.0	24.00		
64QAM	1	1		21.74		2.5	22.50		
256QAM	1	1		19.88		4.5	20.50		
CP-OFDM	QPSK	1	1		22.44		1.5	23.50	

NR Band n5 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					165800	167300	168800		
					829 MHz	836.5 MHz	844 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1		23.77		0.0	25.00
			1	26		23.76		0.0	25.00
			1	50		23.60		0.0	25.00
			25	0		23.31		0.5	24.50
			25	14		23.83		0.0	25.00
			25	27		23.06		0.5	24.50
		QPSK	1	1		23.82		0.0	25.00
			1	26		23.70		0.0	25.00
			1	50		23.56		0.0	25.00
			25	0		22.79		1.0	24.00
			25	14		23.79		0.0	25.00
			25	27		22.74		1.0	24.00
		16QAM	50	0		22.74		1.0	24.00
			1	1		23.27		1.0	24.00
			1	26		23.10		1.0	24.00
			1	50		22.85		1.0	24.00
64QAM	1	1		21.71		2.5	22.50		
	1	1		19.92		4.5	20.50		
256QAM	1	1		19.92		4.5	20.50		
CP-OFDM	QPSK	1	1		22.32		1.5	23.50	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					165300	167300	169300		
					826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.23	23.96	23.76	0.0	25.00
			1	13	24.16	23.89	23.70	0.0	25.00
			1	23	24.14	23.90	23.63	0.0	25.00
			12	0	23.85	23.57	23.31	0.5	24.50
			12	7	24.26	24.00	23.73	0.0	25.00
			12	13	23.69	23.53	23.25	0.5	24.50
		QPSK	25	0	23.75	23.49	23.23	0.5	24.50
			1	1	24.07	23.04	23.73	0.0	25.00
			1	13	24.10	23.87	23.70	0.0	25.00
			1	23	24.04	23.87	23.74	0.0	25.00
			12	0	23.32	23.03	22.98	1.0	24.00
			12	7	24.25	24.09	23.90	0.0	25.00
		16QAM	12	13	23.13	23.01	22.81	1.0	24.00
			25	0	23.26	22.94	22.82	1.0	24.00
			1	1	23.40	23.08	23.00	1.0	24.00
			1	13	23.13	22.94	22.94	1.0	24.00
		64QAM	1	23	23.08	22.95	22.91	1.0	24.00
			1	1	21.90	22.07	21.65	2.5	22.50
			1	1	20.15	20.00	19.86	4.5	20.50
256QAM	1	1	20.15	20.00	19.86	4.5	20.50		
CP-OFDM	QPSK	1	1	22.61	22.32	22.22	1.5	23.50	

NR Band n41 Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)						
					Measured Pwr (dBm)				MPR	Tune-up Limit	
					509202		518598				528000
2546.01 MHz		2592.99 MHz		2640 MHz							
100 MHz	DFT-s-OFDM	π/2 BPSK	1	1			21.82			0.0	23.50
			1	137			23.16			0.0	23.50
			1	271			21.41			0.0	23.50
			135	0			22.46			0.5	23.00
			135	69			23.16			0.0	23.50
			135	138			22.14			0.5	23.00
		270	0			22.32			0.5	23.00	
		QPSK	1	1			21.81			0.0	23.50
			1	137			23.11			0.0	23.50
			1	271			21.46			0.0	23.50
			135	0			21.97			1.0	22.50
			135	69			23.14			0.0	23.50
	135		138			21.64			1.0	22.50	
	16QAM	270	0			21.82			1.0	22.50	
		1	1			20.53			1.0	22.50	
		1	137			21.06			1.0	22.50	
64QAM	1	271			20.21			1.0	22.50		
	1	1			19.62			2.5	21.00		
256QAM	1	1			17.38			4.5	19.00		
CP-OFDM	QPSK	1	1			20.23			1.5	22.00	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit	
					508200			528996			
					2541 MHz			2644.98 MHz			
90 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.15			22.15	0.0	23.50	
			1	123	22.42			21.86	0.0	23.50	
			1	243	22.30			21.41	0.0	23.50	
			120	0	21.36			21.74	0.5	23.00	
			120	63	22.50			21.97	0.0	23.50	
			120	125	22.16			21.10	0.5	23.00	
		243	0	21.79			21.47	0.5	23.00		
		QPSK	1	1	21.21			22.14	0.0	23.50	
			1	123	22.42			22.02	0.0	23.50	
			1	243	22.26			21.39	0.0	23.50	
			120	0	20.86			21.19	1.0	22.50	
			120	63	22.52			22.03	0.0	23.50	
	120		125	21.70			20.65	1.0	22.50		
	243	0	21.28			20.97	1.0	22.50			
	16QAM	1	1	20.16			21.01	1.0	22.50		
		1	123	20.87			20.14	1.0	22.50		
		1	243	20.66			20.30	1.0	22.50		
	64QAM	1	1	18.59			19.70	2.5	21.00		
	256QAM	1	1	16.61			17.72	4.5	19.00		
CP-OFDM	QPSK	1	1	19.61			20.57	1.5	22.00		

NR Band n41 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit	
					507204			529998			
					2536.02 MHz			2649.99 MHz			
80 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.22				22.02	0.0	23.50
			1	109	22.41				21.82	0.0	23.50
			1	215	22.53				21.51	0.0	23.50
			108	0	21.41				21.64	0.5	23.00
			108	55	22.68				21.95	0.0	23.50
			108	109	22.32				21.22	0.5	23.00
		216	0	21.95				21.41	0.5	23.00	
		QPSK	1	1	21.32				22.08	0.0	23.50
			1	109	22.42				21.76	0.0	23.50
			1	215	22.52				21.50	0.0	23.50
			108	0	20.95				21.13	1.0	22.50
			108	55	22.53				21.98	0.0	23.50
			108	109	21.76				20.72	1.0	22.50
		216	0	21.34				20.92	1.0	22.50	
		16QAM	1	1	20.21				20.95	1.0	22.50
			1	109	20.79				20.05	1.0	22.50
			1	215	20.81				20.21	1.0	22.50
64QAM	1	1	18.74				19.47	2.5	21.00		
256QAM	1	1	16.84				17.59	4.5	19.00		
CP-OFDM	QPSK	1	1	19.72				20.51	1.5	22.00	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit	
					505200		518598	531996			
					2526 MHz		2592.99 MHz	2659.98 MHz			
60 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.41		22.61		21.81	0.0	23.50
			1	81	22.09		22.96		21.66	0.0	23.50
			1	160	22.32		21.95		21.69	0.0	23.50
			81	0	21.21		22.61		21.37	0.5	23.00
			81	41	22.23		23.02		21.75	0.0	23.50
			81	81	21.98		22.24		21.22	0.5	23.00
		162	0	21.62		22.49		21.26	0.5	23.00	
		QPSK	1	1	21.39		22.89		21.89	0.0	23.50
			1	81	22.12		23.00		21.66	0.0	23.50
			1	160	22.32		22.81		21.73	0.0	23.50
			81	0	20.64		22.08		20.90	1.0	22.50
			81	41	22.27		23.05		21.79	0.0	23.50
			81	81	21.52		21.74		20.71	1.0	22.50
		162	0	21.11		21.96		20.78	1.0	22.50	
		16QAM	1	1	20.80		21.55		20.83	1.0	22.50
			1	81	20.71		21.28		20.02	1.0	22.50
			1	160	20.76		20.42		20.04	1.0	22.50
64QAM	1	1	19.09		20.02		19.51	2.5	21.00		
256QAM	1	1	17.18		18.34		17.54	4.5	19.00		
CP-OFDM	QPSK	1	1	19.92		20.89		21.79	1.5	22.00	

NR Band n41 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit		
					504204		518598				532998	
					2521.02 MHz		2592.99MHz				2664.99 MHz	
50 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.60		22.83		21.73	0.0	23.50	
			1	67	22.02		22.98		21.66	0.0	23.50	
			1	131	22.28		22.31		21.82	0.0	23.50	
			64	0	21.26		22.62		21.33	0.5	23.00	
			64	35	22.17		23.04		21.81	0.0	23.50	
			64	69	21.92		22.31		21.31	0.5	23.00	
		QPSK	128	0	21.67		22.51		21.31	0.5	23.00	
			1	1	21.57		22.78		21.69	0.0	23.50	
			1	67	22.04		22.93		21.71	0.0	23.50	
			1	131	22.31		22.28		21.82	0.0	23.50	
			64	0	20.75		22.16		20.86	1.0	22.50	
			64	35	22.16		23.10		21.89	0.0	23.50	
		16QAM	64	69	21.44		21.84		20.84	1.0	22.50	
			128	0	21.09		22.02		20.87	1.0	22.50	
			1	1	20.53		21.87		20.62	1.0	22.50	
64QAM	1	67	20.54		21.23		20.51	1.0	22.50			
	1	131	20.55		20.61		20.02	1.0	22.50			
	1	1	19.01		20.22		19.12	2.5	21.00			
256QAM	1	1	17.21		18.36		17.32	4.5	19.00			
CP-OFDM	QPSK	1	1	20.08		21.32		20.30	1.5	22.00		
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit		
					503202	513468		523734			534000	
					2516.01 MHz	2567.34 MHz		2618.67 MHz			2670 MHz	
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.39	22.23		22.37	21.31	0.0	23.50	
			1	53	22.01	23.02		22.40	21.71	0.0	23.50	
			1	104	21.93	22.60		21.61	21.58	0.0	23.50	
			50	0	21.24	22.34		22.07	21.24	0.5	23.00	
			50	28	22.05	23.10		22.54	21.83	0.0	23.50	
			50	56	21.69	22.51		21.73	21.31	0.5	23.00	
			100	0	21.42	22.48		21.96	21.33	0.5	23.00	
		QPSK	1	1	21.36	22.20		22.31	21.24	0.0	23.50	
			1	53	22.04	22.97		22.41	21.77	0.0	23.50	
			1	104	21.86	22.58		21.65	21.55	0.0	23.50	
			50	0	20.73	21.82		21.58	20.74	1.0	22.50	
			50	28	22.07	23.10		22.55	21.82	0.0	23.50	
			50	56	21.20	22.03		21.23	20.81	1.0	22.50	
			100	0	20.92	21.98		21.49	20.81	1.0	22.50	
		16QAM	1	1	20.31	21.14		21.30	20.20	1.0	22.50	
			1	53	20.45	21.41		20.83	20.04	1.0	22.50	
			1	104	20.20	20.82		20.06	20.04	1.0	22.50	
		64QAM	1	1	18.96	19.70		19.97	18.81	2.5	21.00	
		256QAM	1	1	16.88	17.85		17.91	16.87	4.5	19.00	
		CP-OFDM	QPSK	1	1	19.76	20.63		20.83	19.77	1.5	22.00

NR Band n41 Measured Results (Continued)

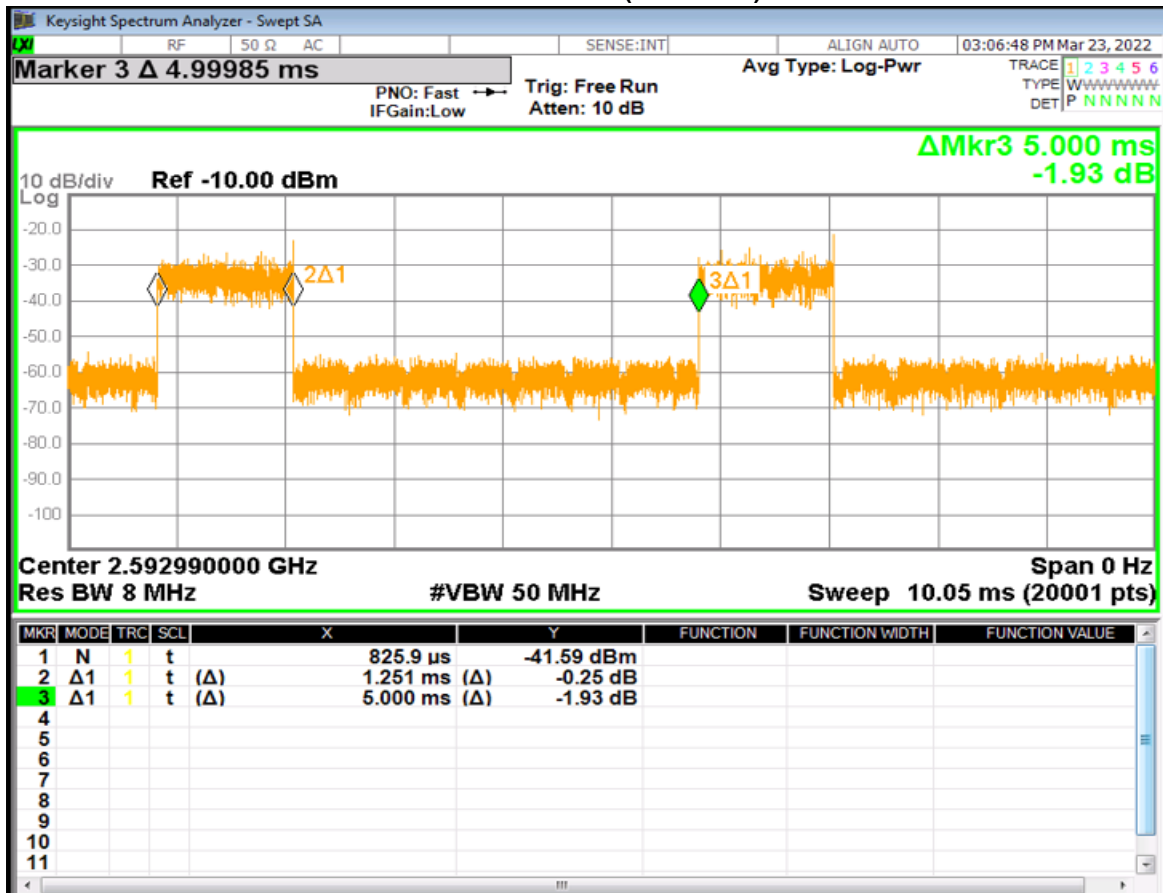
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					502200	510402	518598	526800	534996		
					2511 MHz	2552.01 MHz	2592.99 MHz	2634 MHz	2674.98 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.58	22.27	22.71	22.14	21.45	0.0	23.50
			1	39	21.95	22.70	22.91	22.10	21.84	0.0	23.50
			1	76	21.92	22.77	22.42	21.56	21.81	0.0	23.50
			36	0	21.34	22.16	22.51	21.83	21.25	0.5	23.00
			36	21	22.03	22.80	22.97	22.21	21.92	0.0	23.50
			36	42	21.63	22.44	22.32	21.47	21.44	0.5	23.00
			75	0	21.55	22.30	22.44	21.66	21.34	0.5	23.00
		QPSK	1	1	21.73	22.32	22.65	22.28	21.38	0.0	23.50
			1	39	21.98	22.91	22.89	22.32	21.81	0.0	23.50
			1	76	21.91	22.81	22.64	21.55	21.86	0.0	23.50
			36	0	20.87	21.64	22.03	21.25	20.75	1.0	22.50
			36	21	22.02	22.86	22.99	22.21	21.89	0.0	23.50
			36	42	21.09	21.92	21.82	20.99	20.95	1.0	22.50
			75	0	21.00	21.84	21.94	21.14	20.88	1.0	22.50
16QAM	1	1	20.57	21.17	21.67	21.03	20.31	1.0	22.50		
	1	39	20.31	21.05	21.36	20.57	20.03	1.0	22.50		
	1	76	20.21	21.06	20.93	20.05	20.04	1.0	22.50		
64QAM	1	1	19.17	19.62	20.34	19.61	18.86	2.5	21.00		
256QAM	1	1	17.39	17.77	18.39	17.84	17.09	4.5	19.00		
CP-OFDM	QPSK	1	1	20.03	20.72	21.21	20.58	20.13	1.5	22.00	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					501204	509898	518598	527298	535998		
					2506.02 MHz	2549.49 MHz	2592.99 MHz	2636.49 MHz	2679.99 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.65	21.71	22.87	22.12	21.57	0.0	23.50
			1	26	21.81	21.86	22.94	22.06	21.91	0.0	23.50
			1	49	21.88	21.87	22.71	21.81	21.96	0.0	23.50
			25	0	21.26	21.27	22.61	21.71	21.36	0.5	23.00
			25	13	21.97	21.94	23.03	22.17	21.94	0.0	23.50
			25	26	21.58	21.50	22.47	21.56	21.55	0.5	23.00
			50	0	21.45	21.42	22.53	21.68	21.48	0.5	23.00
		QPSK	1	1	21.63	21.72	22.87	22.16	21.69	0.0	23.50
			1	26	21.87	21.87	23.21	22.01	21.80	0.0	23.50
			1	49	21.83	21.80	22.78	21.74	21.86	0.0	23.50
			25	0	20.76	20.76	22.14	21.21	20.87	1.0	22.50
			25	13	21.95	21.92	23.07	22.17	21.97	0.0	23.50
			25	26	21.01	20.99	21.98	21.04	21.05	1.0	22.50
			50	0	20.93	20.93	22.04	21.16	20.98	1.0	22.50
		16QAM	1	1	20.63	20.59	21.89	20.98	20.57	0.0	23.50
			1	26	20.38	20.99	21.24	20.45	20.12	0.0	23.50
			1	49	20.37	21.05	20.98	20.02	20.12	1.0	22.50
		64QAM	1	1	19.07	19.21	20.39	19.64	19.19	2.5	21.00
		256QAM	1	1	17.37	17.25	18.67	17.76	17.44	4.5	19.00
CP-OFDM	QPSK	1	1	20.17	20.17	21.41	20.53	20.12	1.5	22.00	

NR Band n41 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					501204	509898	518598	527298	535998		
					2506.02 MHz	2549.49 MHz	2592.99 MHz	2636.49 MHz	2679.99 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.72	22.54	22.93	22.12	21.67	0.0	23.50
			1	19	21.87	22.67	22.99	22.02	21.89	0.0	23.50
			1	36	21.89	22.77	22.77	21.88	21.94	0.0	23.50
			18	0	21.36	22.25	22.59	21.75	21.34	0.5	23.00
			18	10	21.94	22.74	23.04	22.18	21.99	0.0	23.50
			18	20	21.53	22.35	22.52	21.60	21.59	0.5	23.00
		QPSK	36	0	21.43	22.27	22.55	21.75	21.51	0.5	23.00
			1	1	21.80	21.61	22.90	22.11	21.63	0.0	23.50
			1	19	22.03	22.68	22.94	22.18	21.87	0.0	23.50
			1	36	21.87	22.74	23.04	21.85	21.99	0.0	23.50
			18	0	20.92	21.73	22.10	21.23	20.92	1.0	22.50
			18	10	21.92	22.74	23.01	22.13	22.03	0.0	23.50
		16QAM	18	20	21.06	21.85	22.03	21.15	21.06	1.0	22.50
			36	0	20.96	21.80	22.07	21.22	20.98	1.0	22.50
			1	1	20.73	21.54	21.97	21.08	20.68	1.0	22.50
		64QAM	1	19	20.34	21.01	21.24	20.53	21.20	1.0	22.50
1	36		20.36	21.05	21.05	20.25	21.02	1.0	22.50		
256QAM	1	1	19.11	20.01	20.38	19.52	19.07	2.5	21.00		
CP-OFDM	QPSK	1	1	17.39	18.27	18.82	17.77	17.23	4.5	19.00	
					20.15	21.01	21.42	20.61	20.08	1.5	22.00
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					501204	509898	518598	527298	535998		
					2506.02 MHz	2549.49 MHz	2592.99 MHz	2636.49 MHz	2679.99 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	21.79	22.59	22.95	22.11	21.73	0.0	23.50
			1	12	21.87	22.69	23.04	22.05	21.87	0.0	23.50
			1	22	21.91	22.73	22.89	21.94	21.89	0.0	23.50
			12	0	21.34	22.24	22.59	21.75	21.43	0.5	23.00
			12	6	21.96	22.78	23.02	22.20	22.01	0.0	23.50
			12	12	21.49	22.32	22.53	21.61	21.53	0.5	23.00
		QPSK	24	0	21.51	22.33	22.54	21.72	21.49	0.5	23.00
			1	1	21.74	22.51	22.96	22.07	21.79	0.0	23.50
			1	12	21.90	22.67	22.97	22.32	21.89	0.0	23.50
			1	22	21.98	22.72	22.91	21.97	21.92	0.0	23.50
			12	0	20.91	21.74	22.12	21.24	20.95	1.0	22.50
			12	6	21.97	22.81	23.02	22.22	22.04	0.0	23.50
		16QAM	12	12	21.10	21.86	22.04	21.13	21.08	1.0	22.50
			24	0	20.99	21.82	22.06	21.19	21.02	1.0	22.50
			1	1	20.81	21.46	21.96	21.06	20.74	1.0	22.50
		64QAM	1	12	20.81	21.03	21.85	21.08	20.71	1.0	22.50
1	22		20.83	21.02	21.78	20.94	20.61	1.0	22.50		
256QAM	1	1	19.29	20.17	20.42	19.63	19.16	2.5	21.00		
CP-OFDM	QPSK	1	1	17.72	18.35	18.52	17.84	17.34	4.5	19.00	
					20.22	21.05	21.46	20.69	20.28	1.5	22.00

NR TDD Bands Duty Cycle plots

NR TDD Band n41 (Voice/Data)



T on (ms)	Period (ms)	Duty Cycle
1.251	5.000	25.0%

9.5. Wi-Fi 2.4 GHz (DTS Band)

WLAN output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power							
					Max. Average Power			Reduced Average Power				
					Meas. Avg Power (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Meas. Avg Power (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)		
WiFi 2.4G Ant	802.11b	1 Mbps	1	2412.0	17.31	18.00	Yes	13.44	14.00	Yes		
			6	2437.0	17.71			13.88				
			11	2462.0	17.52			13.64				
			12	2467.0	17.37	18.00	13.46	14.00			No	
			13	2472.0	15.36	17.00	13.36	14.00				
	802.11g	6 Mbps	1	2412.0	Not Required	18.00	No	Not Required	14.00	No		
			6	2437.0		17.00						
			11	2462.0		14.00	No				12.00	No
			12	2467.0		12.00						
	802.11n	MCS 0	1	2412.0	Not Required	18.00	No	Not Required	14.00	No		
			6	2437.0		17.00						
			11	2462.0		15.00						
			12	2467.0		12.00	No				12.00	No
			13	2472.0		12.00						

Note(s):

- SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11n/g mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.
- Additionally, SAR is not required for Channels 12 and 13 because the measured output power for these two channels are no greater than those for the default test channels. Refer to §6.3.

9.6. Wi-Fi 5GHz (U-NII Bands)

WLAN output power Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
						Max. Average Power			Reduced Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz Ant	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260	17.90	18.00	Yes	Not Required	13.00	No
				56	5280	17.90					
				60	5300	18.00					
				64	5320	17.90					
		802.11n (HT20)	6.5 Mbps	Not Required			17.00	No	Not Required	13.00	No
		802.11n (HT40)	13.5 Mbps	Not Required			16.00	No	Not Required	13.00	No
	802.11ac (VHT20)	6.5 Mbps	Not Required			16.00	No	Not Required	13.00	No	
	802.11ac (VHT40)	13.5 Mbps	Not Required			15.00	No	Not Required	13.00	No	
	802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.00	No	12.95	13.00	Yes	
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	15.20	18.00	Yes	Not Required	13.00	No
				120	5600	17.20					
				124	5620	17.30					
				144	5720	17.30					
		802.11n (HT20)	6.5 Mbps	Not Required			17.00	No	Not Required	13.00	No
		802.11n (HT40)	13.5 Mbps	Not Required			16.00	No	Not Required	13.00	No
	802.11ac (VHT20)	6.5 Mbps	Not Required			16.00	No	Not Required	13.00	No	
	802.11ac (VHT40)	13.5 Mbps	Not Required			15.00	No	Not Required	13.00	No	
	802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.00	No	12.20	13.00	Yes	
	122	5610.0	Not Required	12.30							
	138	5690.0	Not Required	12.40							
	5.8 (UNII 3)	802.11a	6 Mbps	149	5745	17.30	17.50	Yes	Not Required	15.00	No
				157	5785	17.40					
				165	5825	17.40					
				Not Required							
802.11n (HT40)		13.5 Mbps	Not Required			16.00	No	Not Required	13.00	No	
802.11ac (VHT20)		6.5 Mbps	Not Required			16.00	No	Not Required	13.00	No	
802.11ac (VHT40)	13.5 Mbps	Not Required			15.00	No	Not Required	13.00	No		
802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.00	No	12.53	13.00	Yes		

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n, ac) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band I
 - > 1.2 W/kg, both bands should be tested independently for SAR.

9.7. Bluetooth

Bluetooth Measured Results

Band (GHz)	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up Limit	
2.4	GFSK	0	2402	9.70	10.50	
		39	2441	10.10		
		78	2480	10.30		
	EDR 8-DPSK	0	2402	7.20	8.50	
		39	2441	8.10		
		78	2480	8.20		
	LE GFSK, 1M (37 pkt)	LE GFSK, 1M (37 pkt)	0	2402	5.30	7.00
			19	2440	6.10	
			39	2480	6.10	
		LE GFSK, 2M (37 pkt)	0	2402	5.01	
			19	2440	5.80	
			39	2480	5.80	

Note(s):

For All exposure conditions, SAR test is evaluated at GFSK mode in Bluetooth using maximum power condition.

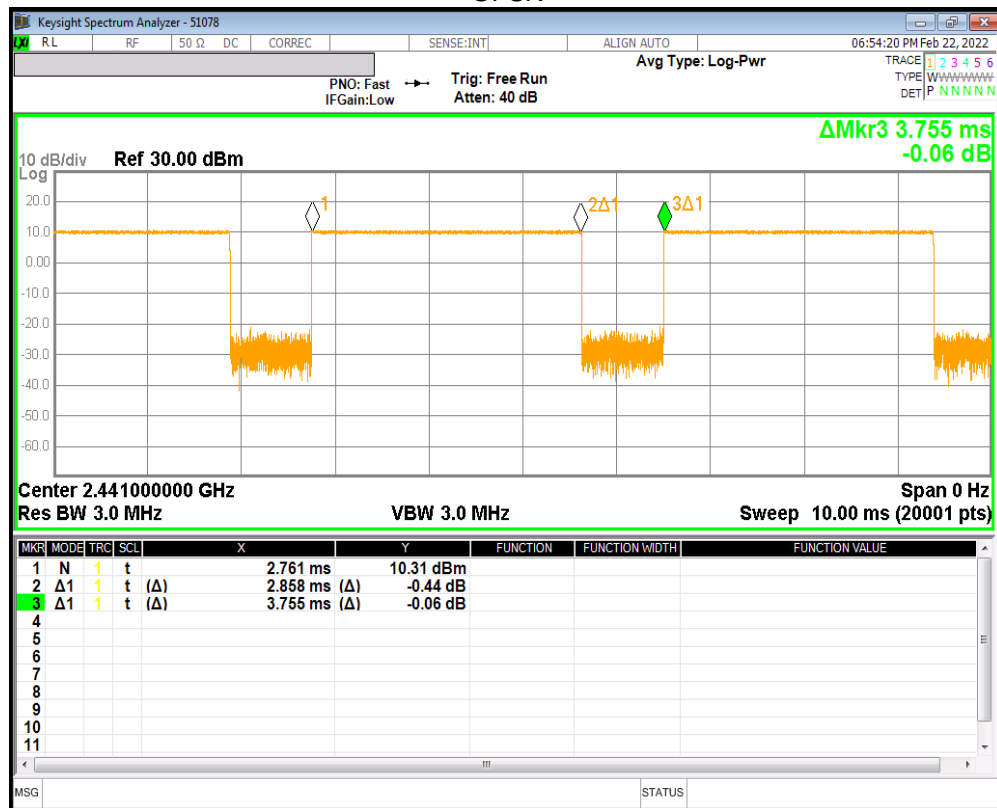
Bluetooth (Continued)

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	DH5	2.858	3.755	76.1%	1.31

Duty Cycle plots

GFSK



10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN= Measured SAR *Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi and Bluetooth= Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

KDB 648474 D04 Handset SAR (Phablet Only):

For smart phones, with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm.

When hotspot mode does not apply, 10-g extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; However, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Additional 1-g SAR testing at 5 mm is not required when hotspot mode 10-g extremity SAR is not required for the surfaces and edges; since all 1-g reported SAR < 1.2 W/kg.

KDB 941225 D01 SAR test for 3G devices:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% 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 for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. 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; therefore, the requirement for H, M and L channels may not fully apply.

KDB 248227 D01 SAR meas for 802.11:

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.
 - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
 - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.
 - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the initial test position, Area Scans were performed to determine the position with the *Maximum Value of SAR (measured)*. The position that produced the highest *Maximum Value of SAR* is considered the worst case position; thus used as the initial test position.

10.1. GSM 850

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	GPRS 4 Slots	OFF	0	Left Touch	190	836.6	29.00	27.85	0.244	0.318	1
					Left Tilt	190	836.6	29.00	27.85	0.150	0.195	
					Right Touch	190	836.6	29.00	27.85	0.292	0.380	
					Right Tilt	190	836.6	29.00	27.85	0.153	0.199	
	Body-worn	GPRS 4 Slots	OFF	15	Rear	190	836.6	29.00	27.85	0.314	0.409	2
					Front	190	836.6	29.00	27.85	0.204	0.266	
	Hotspot	GPRS 4 Slots	ON	10	Rear	190	836.6	24.50	23.20	0.235	0.317	3
					Front	190	836.6	24.50	23.20	0.062	0.083	
					Edge 2	190	836.6	24.50	23.20	0.061	0.082	
					Edge 3	190	836.6	24.50	23.20	0.091	0.122	
				Edge 4	190	836.6	24.50	23.20	0.041	0.056		

10.2. GSM 1900

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	GPRS 2 Slots	Off	0	Left Touch	661	1880.0	29.50	28.48	0.178	0.225	4
					Left Tilt	661	1880.0	29.50	28.48	0.089	0.112	
					Right Touch	661	1880.0	29.50	28.48	0.101	0.128	
					Right Tilt	661	1880.0	29.50	28.48	0.054	0.068	
	Body-worn	GPRS 2 Slots	Off	15	Rear	661	1880.0	29.50	28.48	0.239	0.302	5
					Front	661	1880.0	29.50	28.48	0.187	0.237	
	Hotspot	GPRS 2 Slots	On	10	Rear	512	1850.2	25.50	24.71	0.203	0.243	6
					Front	512	1850.2	25.50	24.71	0.105	0.126	
					Edge 3	512	1850.2	25.50	24.71	0.146	0.175	
					Edge 4	512	1850.2	25.50	24.71	0.082	0.098	

10.3. WCDMA Band II

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	Rel 99 RMC	Off	0	Left Touch	9262	1852.4	25.00	23.96	0.179	0.228	7
					Left Tilt	9262	1852.4	25.00	23.96	0.087	0.111	
					Right Touch	9262	1852.4	25.00	23.96	0.147	0.187	
					Right Tilt	9262	1852.4	25.00	23.96	0.069	0.087	
	Body-worn	Rel 99 RMC	Off	15	Rear	9262	1852.4	25.00	23.96	0.286	0.364	8
					Front	9262	1852.4	25.00	23.96	0.193	0.245	
	Hotspot	Rel 99 RMC	On	10	Rear	9262	1852.4	22.00	20.96	0.376	0.478	9
					Front	9262	1852.4	22.00	20.96	0.199	0.253	
					Edge 3	9262	1852.4	22.00	20.96	0.351	0.446	
					Edge 4	9262	1852.4	22.00	20.96	0.166	0.211	

10.4. WCDMA Band IV

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	Rel 99 RMC	Off	0	Left Touch	1513	1752.6	24.00	23.99	0.182	0.182	10
					Left Tilt	1513	1752.6	24.00	23.99	0.123	0.123	
					Right Touch	1513	1752.6	24.00	23.99	0.138	0.138	
					Right Tilt	1513	1752.6	24.00	23.99	0.103	0.103	
	Body-worn	Rel 99 RMC	Off	15	Rear	1513	1752.6	24.00	23.99	0.303	0.303	11
					Front	1513	1752.6	24.00	23.99	0.299	0.299	
	Hotspot	Rel 99 RMC	On	10	Rear	1513	1752.6	22.00	21.15	0.305	0.371	12
					Front	1513	1752.6	22.00	21.15	0.239	0.291	
					Edge 3	1513	1752.6	22.00	21.15	0.271	0.330	
Edge 4					1513	1752.6	22.00	21.15	0.178	0.216		

10.5. WCDMA Band V

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	Rel 99 RMC	N/A	0	Left Touch	4183	836.6	25.00	23.67	0.168	0.228	
					Left Tilt	4183	836.6	25.00	23.67	0.096	0.130	
					Right Touch	4183	836.6	25.00	23.67	0.200	0.272	13
					Right Tilt	4183	836.6	25.00	23.67	0.097	0.132	
	Body-worn	Rel 99 RMC	N/A	15	Rear	4183	836.6	25.00	23.67	0.271	0.368	14
					Front	4183	836.6	25.00	23.67	0.192	0.261	
	Hotspot	Rel 99 RMC	N/A	10	Rear	4183	836.6	25.00	23.67	0.550	0.747	15
					Front	4183	836.6	25.00	23.67	0.188	0.255	
					Edge 2	4183	836.6	25.00	23.67	0.219	0.297	
Edge 3					4183	836.6	25.00	23.67	0.315	0.428		
Edge 4	4183	836.6	25.00	23.67	0.148	0.201						

10.6. LTE Band 2 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.				
										tune-up limit	Meas.	Meas.	Scaled					
Main 2 Ant.	Head	QPSK	Off	0	Left Touch	18700	1860.0	1	0	24.50	23.92	0.191	0.218	16				
								50	0	23.50	22.78	0.166	0.196					
					Left Tilt	18700	1860.0	1	0	24.50	23.92	0.103	0.118					
								50	0	23.50	22.78	0.101	0.119					
					Right Touch	18700	1860.0	1	0	24.50	23.92	0.155	0.177					
								50	0	23.50	22.78	0.141	0.166					
					Right Tilt	18700	1860.0	1	0	24.50	23.92	0.077	0.088					
								50	0	23.50	22.78	0.068	0.080					
					Body-worn	QPSK	Off	15	Rear	18700	1860.0	1	0	24.50	23.92	0.253	0.289	17
												50	0	23.50	22.78	0.225	0.266	
	Front	18700	1860.0	1					0	24.50	23.92	0.202	0.231					
				50					0	23.50	22.78	0.191	0.225					
	Hotspot	QPSK	On	10	Rear	18700	1860.0	1	0	21.00	20.48	0.247	0.278					
								50	0	21.00	20.19	0.285	0.343	18				
					Front	18700	1860.0	1	0	21.00	20.48	0.185	0.208					
								50	0	21.00	20.19	0.200	0.241					
					Edge 3	18700	1860.0	1	0	21.00	20.48	0.274	0.309					
								50	0	21.00	20.19	0.280	0.337					
Edge 4					18700	1860.0	1	0	21.00	20.48	0.153	0.172						
							50	0	21.00	20.19	0.162	0.195						

10.7. LTE Band 12 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	QPSK	N/A	0	Left Touch	23095	707.5	1	0	25.00	24.32	0.071	0.083	
								25	0	24.00	23.33	0.060	0.070	
					Left Tilt	23095	707.5	1	0	25.00	24.32	0.029	0.034	
								25	0	24.00	23.33	0.028	0.032	
					Right Touch	23095	707.5	1	0	25.00	24.32	0.180	0.210	19
								25	0	24.00	23.33	0.144	0.168	
	Right Tilt	23095	707.5	1	0	25.00	24.32	0.047	0.055					
				25	0	24.00	23.33	0.036	0.042					
	Body-w orn	QPSK	N/A	15	Rear	23095	707.5	1	0	25.00	24.32	0.293	0.343	20
								25	0	24.00	23.33	0.216	0.252	
					Front	23095	707.5	1	0	25.00	24.32	0.106	0.124	
								25	0	24.00	23.33	0.063	0.074	
	Hotspot	QPSK	N/A	10	Rear	23095	707.5	1	0	25.00	24.32	0.389	0.455	21
								25	0	24.00	23.33	0.267	0.311	
					Front	23095	707.5	1	0	25.00	24.32	0.144	0.168	
								25	0	24.00	23.33	0.118	0.138	
					Edge 2	23095	707.5	1	0	25.00	24.32	0.247	0.289	
								25	0	24.00	23.33	0.204	0.238	
					Edge 3	23095	707.5	1	0	25.00	24.32	0.155	0.181	
								25	0	24.00	23.33	0.124	0.145	
					Edge 4	23095	707.5	1	0	25.00	24.32	0.134	0.157	
25								0	24.00	23.33	0.114	0.133		

10.8. LTE Band 26 (15MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.				
										Tune-up limit	Meas.	Meas.	Scaled					
Main 1 Ant.	Head	QPSK	N/A	0	Left Touch	26865	831.5	1	0	25.00	23.77	0.145	0.193					
								36	0	24.00	22.90	0.118	0.152					
					Left Tilt	26865	831.5	1	0	25.00	23.77	0.064	0.085					
								36	0	24.00	22.90	0.054	0.069					
					Right Touch	26865	831.5	1	0	25.00	23.77	0.185	0.246	22				
								36	0	24.00	22.90	0.145	0.187					
					Right Tilt	26865	831.5	1	0	25.00	23.77	0.080	0.106					
								36	0	24.00	22.90	0.065	0.083					
					Body-w orn	QPSK	N/A	15	Rear	26865	831.5	1	0	25.00	23.77	0.226	0.300	23
												36	0	24.00	22.90	0.158	0.204	
									Front	26865	831.5	1	0	25.00	23.77	0.169	0.225	
												36	0	24.00	22.90	0.135	0.174	
	Hotspot	QPSK	N/A	10	Rear	26865	831.5	1	0	25.00	23.77	0.531	0.706	24				
								36	0	24.00	22.90	0.343	0.442					
					Front	26865	831.5	1	0	25.00	23.77	0.164	0.218					
								36	0	24.00	22.90	0.132	0.170					
					Edge 2	26865	831.5	1	0	25.00	23.77	0.167	0.222					
								36	0	24.00	22.90	0.133	0.171					
					Edge 3	26865	831.5	1	0	25.00	23.77	0.246	0.327					
								36	0	24.00	22.90	0.204	0.263					
					Edge 4	26865	831.5	1	0	25.00	23.77	0.121	0.161					
36								0	24.00	22.90	0.097	0.125						

10.9. LTE Band 41 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	QPSK	Off	0	Left Touch	40620	2593.0	1	49	24.00	23.71	0.302	0.323	25
								50	0	23.00	22.98	0.274	0.275	
					Left Tilt	40620	2593.0	1	49	24.00	23.71	0.054	0.058	
								50	0	23.00	22.98	0.043	0.043	
					Right Touch	40620	2593.0	1	49	24.00	23.71	0.125	0.134	
								50	0	23.00	22.98	0.108	0.108	
					Right Tilt	40620	2593.0	1	49	24.00	23.71	0.098	0.105	
								50	0	23.00	22.98	0.086	0.087	
	Body-worn	QPSK	Off	15	Rear	40620	2593.0	1	49	24.00	23.71	0.236	0.253	26
								50	0	23.00	22.98	0.202	0.203	
					Front	40620	2593.0	1	49	24.00	23.71	0.158	0.169	
								50	0	23.00	22.98	0.137	0.138	
	Hotspot	QPSK	Off	10	Rear	40620	2593.0	1	49	24.00	23.71	0.525	0.562	27
								50	0	23.00	22.98	0.478	0.480	
					Front	40620	2593.0	1	49	24.00	23.71	0.397	0.425	
								50	0	23.00	22.98	0.353	0.355	
Edge 3					40620	2593.0	1	49	24.00	23.71	0.333	0.356		
							50	0	23.00	22.98	0.301	0.302		
Edge 4					40620	2593.0	1	49	24.00	23.71	0.239	0.256		
							50	0	23.00	22.98	0.217	0.218		

10.10. LTE Band 66 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	QPSK	Off	0	Left Touch	132572	1770.0	1	49	24.50	24.27	0.149	0.157	28
								50	24	23.50	23.32	0.112	0.117	
					Left Tilt	132572	1770.0	1	49	24.50	24.27	0.091	0.096	
								50	24	23.50	23.32	0.078	0.081	
					Right Touch	132572	1770.0	1	49	24.50	24.27	0.122	0.129	
								50	24	23.50	23.32	0.107	0.111	
					Right Tilt	132572	1770.0	1	49	24.50	24.27	0.084	0.088	
								50	24	23.50	23.32	0.073	0.076	
	Body-worn	QPSK	Off	15	Rear	132572	1770.0	1	49	24.50	24.27	0.212	0.224	29
								50	24	23.50	23.32	0.196	0.204	
					Front	132572	1770.0	1	49	24.50	24.27	0.199	0.210	
								50	24	23.50	23.32	0.177	0.184	
	Hotspot	QPSK	On	10	Rear	132572	1770.0	1	49	21.50	20.30	0.226	0.298	
								50	24	21.50	20.76	0.229	0.271	
					Front	132572	1770.0	1	49	21.50	20.30	0.168	0.221	
								50	24	21.50	20.76	0.185	0.219	
Edge 3					132572	1770.0	1	49	21.50	20.30	0.252	0.332	30	
							50	24	21.50	20.76	0.254	0.301		
Edge 4					132572	1770.0	1	49	21.50	20.30	0.174	0.229		
							50	24	21.50	20.76	0.173	0.205		

10.11. NR Band n5 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
											Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	DFT-s-OFDM	QPSK	N/A	0	Left Touch	167300	836.5	1	1	25.00	24.14	0.158	0.193	
									50	28	25.00	24.10	0.158	0.194	
						Left Tilt	167300	836.5	1	1	25.00	24.14	0.089	0.109	
									50	28	25.00	24.10	0.086	0.105	
		Right Touch	167300	836.5	1	1	25.00	24.14	0.255	0.311					
					50	28	25.00	24.10	0.294	0.362					
		Right Tilt	167300	836.5	1	1	25.00	24.14	0.088	0.108					
					50	28	25.00	24.10	0.094	0.115					
	CP-OFDM	QPSK	N/A	0	Right Touch	167300	836.5	1	1	23.50	22.78	0.134	0.158		
	Body-worn	DFT-s-OFDM	QPSK	N/A	15	Rear	167300	836.5	1	1	25.00	24.14	0.267	0.325	
						50	28	25.00	24.10	0.310	0.381				
		Front	167300	836.5	1	1	25.00	24.14	0.136	0.166					
					50	28	25.00	24.10	0.144	0.177					
	CP-OFDM	QPSK	N/A	15	Rear	167300	836.5	1	1	23.50	22.78	0.157	0.185		
	Hotspot	DFT-s-OFDM	QPSK	N/A	10	Rear	167300	836.5	1	1	25.00	24.14	0.451	0.550	
									50	28	25.00	24.10	0.521	0.641	
						Front	167300	836.5	1	1	25.00	24.14	0.139	0.169	
									50	28	25.00	24.10	0.147	0.181	
						Edge 2	167300	836.5	1	1	25.00	24.14	0.136	0.166	
									50	28	25.00	24.10	0.143	0.176	
		Edge 3	167300	836.5	1	1	25.00	24.14	0.242	0.295					
50					28	25.00	24.10	0.253	0.311						
Edge 4		167300	836.5	1	1	25.00	24.14	0.163	0.199						
				50	28	25.00	24.10	0.187	0.230						
CP-OFDM		QPSK	N/A	10	Rear	167300	836.5	1	1	23.50	22.78	0.346	0.408		

Note(s):

CP-OFDM mode were evaluated at worst configuration of DFT-s-OFDM in each exposure conditions.

10.12. NR Band n41 (100MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
											Tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	DFT-s-OFDM	QPSK	N/A	0	Left Touch	518598	2592.99	1	137	23.50	23.11	0.128	0.140	34
									135	69	23.50	23.14	0.120	0.130	
						Left Tilt	518598	2592.99	1	137	23.50	23.11	0.018	0.020	
									135	69	23.50	23.14	0.017	0.019	
		Right Touch	518598	2592.99	1	137	23.50	23.11	0.039	0.042					
					135	69	23.50	23.14	0.037	0.041					
		Right Tilt	518598	2592.99	1	137	23.50	23.11	0.034	0.037					
					135	69	23.50	23.14	0.034	0.037					
	CP-OFDM	QPSK	N/A	0	Left Touch	518598	2592.99	1	1	22.00	20.23	0.044	0.066		
	Body-worn	DFT-s-OFDM	QPSK	N/A	15	Rear	518598	2592.99	1	137	23.50	23.11	0.110	0.120	35
						135	69	23.50	23.14	0.099	0.108				
		Front	518598	2592.99	1	137	23.50	23.11	0.042	0.046					
					135	69	23.50	23.14	0.043	0.046					
	CP-OFDM	QPSK	N/A	15	Rear	518598	2592.99	1	1	22.00	20.23	0.034	0.052		
	Hotspot	DFT-s-OFDM	QPSK	N/A	10	Rear	518598	2592.99	1	137	23.50	23.11	0.224	0.245	
									135	69	23.50	23.14	0.235	0.255	
						Front	518598	2592.99	1	137	23.50	23.11	0.077	0.084	
									135	69	23.50	23.14	0.076	0.083	
		Edge 3	518598	2592.99	1	137	23.50	23.11	0.066	0.072					
					135	69	23.50	23.14	0.068	0.074					
		Edge 4	518598	2592.99	1	137	23.50	23.11	0.058	0.063					
135					69	23.50	23.14	0.057	0.061						
CP-OFDM	QPSK	N/A	10	Rear	518598	2592.99	1	1	22.00	20.23	0.075	0.113			

Note(s):

CP-OFDM mode were evaluated at worst configuration of DFT-s-OFDM in each exposure conditions.

10.13. Wi-Fi (DTS Band)

WLAN SAR results

Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
									Tune-up limit	Meas.	Meas.	Scaled		
802.11b 1 Mbps	Head	On	0	Left Touch	6	2437.0	0.153	99.5%	14.00	13.88				
				Left Tilt	6	2437.0	0.183	99.5%	14.00	13.88				
				Right Touch	6	2437.0	0.338	99.5%	14.00	13.88				
				Right Tilt	6	2437.0	0.344	99.5%	14.00	13.88	0.211	0.218	1	37
	Body-worn	Off	15	Rear	6	2437.0	0.153	99.5%	18.00	17.71	0.105	0.113	1	38
				Front	6	2437.0	0.103	99.5%	18.00	17.71				
	Hotspot	Off	10	Rear	6	2437.0	0.375	99.5%	18.00	17.71	0.257	0.276	1	39
				Front	6	2437.0	0.201	99.5%	18.00	17.71				
				Edge 1	6	2437.0	0.131	99.5%	18.00	17.71				
				Edge 4	6	2437.0	0.114	99.5%	18.00	17.71				

Note(s):

- When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
- Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
- Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
- Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
- SAR testing is not required for OFDM mode(s) 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.

10.14. Wi-Fi (U-NII Bands)

U-NII 2A Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Note	Plot No.		
											Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled				
WLAN Ant	5.3 GHz U-NII 2A	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	58	5290.0	0.509	90.3%	13.00	12.95								
						Left Tilt	58	5290.0	0.635	90.3%	13.00	12.95	0.275	0.308			1	40		
						Right Touch	58	5290.0	0.393	90.3%	13.00	12.95								
						Right Tilt	58	5290.0	0.535	90.3%	13.00	12.95								
		Body-worn	Off	15	Rear	60	5300.0	1.245	98.0%	18.00	17.97	0.615	0.632					41		
					Front	60	5300.0	0.266	98.0%	18.00	17.97	0.023	0.024					2		
		Product Specific 10-g	Off	0	Rear	60	5300.0	13.935	98.0%	18.00	17.97					1.780	1.828			42
					Front	60	5300.0	2.698	98.0%	18.00	17.97									
					Edge 1	60	5300.0	16.159	98.0%	18.00	17.97					1.640	1.684			2
					Edge 4	60	5300.0	2.091	98.0%	18.00	17.97									

U-NII 2C Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Note	Plot No.		
											Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled				
WLAN Ant	5.5 GHz U-NII 2C	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	138	5690.0	0.422	90.3%	13.00	12.38								
						Left Tilt	138	5690.0	0.627	90.3%	13.00	12.38								
						Right Touch	138	5690.0	0.251	90.3%	13.00	12.38	0.261	0.333					1	43
						Right Tilt	138	5690.0	0.514	90.3%	13.00	12.38								
		Body-worn	Off	15	Rear	124	5620.0	1.069	98.0%	18.00	17.28	0.506	0.609						44	
					Front	124	5620.0	0.244	98.0%	18.00	17.28	0.121	0.146						2	
		Product Specific 10-g	Off	0	Rear	124	5620.0	16.725	98.0%	18.00	17.28					1.330	1.601			45
					Front	124	5620.0	2.582	98.0%	18.00	17.28									
					Edge 1	124	5620.0	13.050	98.0%	18.00	17.28					1.240	1.493			2
					Edge 4	124	5620.0	0.591	98.0%	18.00	17.28									

U-NII 3 Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
											Tune-up limit	Meas.	Meas.	Scaled		
WLAN Ant	5.8 GHz U-NII 3	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	155	5775.0	0.406	90.3%	13.00	12.53				
						Left Tilt	155	5775.0	0.609	90.3%	13.00	12.53	0.258	0.318	1	46
						Right Touch	155	5775.0	0.437	90.3%	13.00	12.53				
						Right Tilt	155	5775.0	0.502	90.3%	13.00	12.53				
	802.11a 6 Mbps	Body-w orn	Off	15	Rear	157	5785.0	0.881	98.0%	17.50	17.38	0.410	0.430		47	
					Front	157	5785.0	0.257	98.0%	17.50	17.38	0.110	0.115	2		
		Hotspot	Off	10	Rear	149	5745.0	1.165	98.0%	17.50	17.33	0.509	0.540		48	
					Front	149	5745.0	0.469	98.0%	17.50	17.33					
					Edge 1	149	5745.0	0.964	98.0%	17.50	17.33	0.434	0.460	2		
					Edge 4	149	5745.0	0.512	98.0%	17.50	17.33					

Note(s):

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.

10.15. Bluetooth

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
BT Ant	2.4 GHz	GFSK	Head	Off	0	Left Touch	78	2480.0	76.1%	10.50	10.31	0.045	0.062	
						Left Tilt	78	2480.0	76.1%	10.50	10.31	0.041	0.056	
						Right Touch	78	2480.0	76.1%	10.50	10.31	0.097	0.134	49
						Right Tilt	78	2480.0	76.1%	10.50	10.31	0.081	0.111	
		GFSK	Body-w orn	Off	15	Rear	78	2480.0	76.1%	10.50	10.31	0.017	0.024	50
						Front	78	2480.0	76.1%	10.50	10.31	0.009	0.012	
		GFSK	Hotspot	Off	10	Rear	78	2480.0	76.1%	10.50	10.31	0.048	0.066	51
						Front	78	2480.0	76.1%	10.50	10.31	0.018	0.025	
	Edge 1					78	2480.0	76.1%	10.50	10.31	0.016	0.022		
	Edge 4					78	2480.0	76.1%	10.50	10.31	0.012	0.016		

11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is <0.8 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), repeat that measurement once.
- 3) Perform a second repeated measurement only if the **ratio of largest to smallest SAR** for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg ($\sim 10\%$ from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

Peak spatial-average (1g of tissue)

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 12	Hotspot	Rear	No	0.389	N/A	N/A
835	GSM 850	Body-w orn	Rear	No	0.314	N/A	N/A
	WCDMA Band V	Hotspot	Rear	No	0.550	N/A	N/A
	LTE Band 26	Hotspot	Rear	No	0.531	N/A	N/A
	NR Band n5	Hotspot	Rear	No	0.521	N/A	N/A
1750	WCDMA Band IV	Body-w orn	Rear	No	0.305	N/A	N/A
	LTE Band 66	Hotspot	Edge 3	No	0.252	N/A	N/A
1900	GSM 1900	Body-w orn	Rear	No	0.239	N/A	N/A
	WCDMA Band II	Hotspot	Rear	No	0.376	N/A	N/A
	LTE Band 2	Hotspot	Rear	No	0.285	N/A	N/A
2400	Wi-Fi 802.11b/g/n	Hotspot	Rear	No	0.257	N/A	N/A
	Bluetooth	Head	Right Touch	No	0.097	N/A	N/A
2600	LTE Band 41	Hotspot	Rear	No	0.525	N/A	N/A
	NR Band n41	Hotspot	Rear	No	0.235	N/A	N/A
5300	Wi-Fi 802.11a/n	Body-w orn	Rear	No	0.615	N/A	N/A
5500	Wi-Fi 802.11a/n	Body-w orn	Rear	No	0.506	N/A	N/A
5800	Wi-Fi 802.11a/n	Hotspot	Rear	No	0.509	N/A	N/A

Peak spatial-average (10g of tissue)

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
5300	Wi-Fi 802.11a/n	Product Specific 10-g	Rear	No	1.780	N/A	N/A
5500	Wi-Fi 802.11a/n	Product Specific 10-g	Rear	No	1.330	N/A	N/A

Note(s):

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20 .

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations				Scenarios
Head & Body-worn & Hotspot & Phablet-10g	1	WWAN (2G/3G/LTE/NR)	+	DTS		
	2	WWAN (2G/3G/LTE/NR)	+	UNII		
	3	WWAN (2G/3G/LTE/NR)	+	BT		
	4	WWAN (2G/3G/LTE/NR)	+	UNII	+ BT	

Notes:

1. DTS supports Wi-Fi Direct, Hotspot and VoIP.
2. U-NII supports Wi-Fi Direct, Hotspot and VoIP.
3. GPRS, W-CDMA, LTE, NR supports Hotspot and VoIP
4. U-NII Radio can transmit simultaneously with Bluetooth Radio.
5. DTS Radio cannot transmit simultaneously with UNII Radio.
6. DTS Radio cannot transmit simultaneously with Bluetooth Radio.
7. BT tethering is considered about each RF exposure conditions.
8. NR Radio support to SA Radio.

Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

12.1. Sum of the SAR for GSM850 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.380	0.218	0.333	0.134	0.598	0.713	0.514	0.847
Body-Worn (1-g SAR)	All position	0.409	0.113	0.632	0.024	0.522	1.041	0.433	1.065
Hotspot (1-g SAR)	Rear	0.317	0.276	0.540	0.066	0.593	0.857	0.383	0.923
	Front	0.083	0.276	0.540	0.025	0.359	0.623	0.108	0.648
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2	0.082							
	Edge 3	0.122							
	Edge 4	0.056	0.276	0.540	0.016	0.332	0.596	0.072	0.612
Product Specific 10-g (10-g SAR)	All position			1.828					

12.2. Sum of the SAR for GSM1900 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.225	0.218	0.333	0.133	0.443	0.558	0.358	0.691
Body-Worn (1-g SAR)	All position	0.302	0.113	0.632	0.023	0.415	0.934	0.325	0.957
Hotspot (1-g SAR)	Rear	0.243	0.276	0.540	0.066	0.519	0.783	0.309	0.849
	Front	0.126	0.276	0.540	0.025	0.402	0.666	0.151	0.691
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.175							
	Edge 4	0.098	0.276	0.540	0.016	0.374	0.638	0.114	0.654
Product Specific 10-g (10-g SAR)	All position			1.828					

12.3. Sum of the SAR for WCDMA Band II & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.228	0.218	0.333	0.133	0.446	0.561	0.361	0.694
Body-Worn (1-g SAR)	All position	0.364	0.113	0.632	0.023	0.477	0.996	0.387	1.019
Hotspot (1-g SAR)	Rear	0.478	0.276	0.540	0.066	0.754	1.018	0.544	1.084
	Front	0.253	0.276	0.540	0.025	0.529	0.793	0.278	0.818
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.446							
	Edge 4	0.211	0.276	0.540	0.016	0.487	0.751	0.227	0.767
Product Specific 10-g (10-g SAR)	All position			1.828					

Note(s):

- Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

12.4. Sum of the SAR for WCDMA Band IV & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.182	0.218	0.333	0.133	0.400	0.515	0.315	0.648
Body-Worn (1-g SAR)	All position	0.303	0.113	0.632	0.023	0.416	0.935	0.326	0.958
Hotspot (1-g SAR)	Rear	0.371	0.276	0.540	0.066	0.647	0.911	0.437	0.977
	Front	0.291	0.276	0.540	0.025	0.567	0.831	0.316	0.856
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.330							
Edge 4	0.216	0.276	0.540	0.016	0.492	0.756	0.232	0.772	
Product Specific 10-g (10-g SAR)	All position			1.828					

12.5. Sum of the SAR for WCDMA Band V & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.272	0.218	0.333	0.133	0.490	0.605	0.405	0.738
Body-Worn (1-g SAR)	All position	0.368	0.113	0.632	0.023	0.481	1.000	0.391	1.023
Hotspot (1-g SAR)	Rear	0.747	0.276	0.540	0.066	1.023	1.287	0.813	1.353
	Front	0.255	0.276	0.540	0.025	0.531	0.795	0.280	0.820
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2	0.297							
	Edge 3	0.428							
Edge 4	0.201	0.276	0.540	0.016	0.477	0.741	0.217	0.757	
Product Specific 10-g (10-g SAR)	All position			1.828					

12.6. Sum of the SAR for LTE Band 2 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.218	0.218	0.333	0.133	0.436	0.551	0.351	0.684
Body-Worn (1-g SAR)	All position	0.289	0.113	0.632	0.023	0.402	0.921	0.312	0.944
Hotspot (1-g SAR)	Rear	0.343	0.276	0.540	0.066	0.619	0.883	0.409	0.949
	Front	0.241	0.276	0.540	0.025	0.517	0.781	0.266	0.806
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.337							
Edge 4	0.195	0.276	0.540	0.016	0.471	0.735	0.211	0.751	
Product Specific 10-g (10-g SAR)	All position			1.828					

Note(s):

- Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

12.7. Sum of the SAR for LTE Band 12 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.210	0.218	0.333	0.133	0.428	0.543	0.343	0.676
Body-Worn (1-g SAR)	All position	0.343	0.113	0.632	0.023	0.456	0.975	0.366	0.998
Hotspot (1-g SAR)	Rear	0.455	0.276	0.540	0.066	0.731	0.995	0.521	1.061
	Front	0.168	0.276	0.540	0.025	0.444	0.708	0.193	0.733
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2	0.289							
	Edge 3	0.181							
	Edge 4	0.157	0.276	0.540	0.016	0.433	0.697	0.173	0.713
Product Specific 10-g (10-g SAR)	All position			1.828					

12.8. Sum of the SAR for LTE Band 26 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.246	0.218	0.333	0.133	0.464	0.579	0.379	0.712
Body-Worn (1-g SAR)	All position	0.300	0.113	0.632	0.023	0.413	0.932	0.323	0.955
Hotspot (1-g SAR)	Rear	0.706	0.276	0.540	0.066	0.982	1.246	0.772	1.312
	Front	0.218	0.276	0.540	0.025	0.494	0.758	0.243	0.783
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2	0.222							
	Edge 3	0.327							
	Edge 4	0.161	0.276	0.540	0.016	0.437	0.701	0.177	0.717
Product Specific 10-g (10-g SAR)	All position			1.828					

12.9. Sum of the SAR for LTE Band 41 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.323	0.218	0.333	0.133	0.541	0.656	0.456	0.789
Body-Worn (1-g SAR)	All position	0.253	0.113	0.632	0.023	0.366	0.885	0.276	0.908
Hotspot (1-g SAR)	Rear	0.562	0.276	0.540	0.066	0.838	1.102	0.628	1.168
	Front	0.425	0.276	0.540	0.025	0.701	0.965	0.450	0.990
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.356							
	Edge 4	0.256	0.276	0.540	0.016	0.532	0.796	0.272	0.812
Product Specific 10-g (10-g SAR)	All position			1.828					

Note(s):

- Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

12.10. Sum of the SAR for LTE Band 66 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.157	0.218	0.333	0.133	0.375	0.490	0.290	0.623
Body-Worn (1-g SAR)	All position	0.224	0.113	0.632	0.023	0.337	0.856	0.247	0.879
Hotspot (1-g SAR)	Rear	0.298	0.276	0.540	0.066	0.574	0.838	0.364	0.904
	Front	0.221	0.276	0.540	0.025	0.497	0.761	0.246	0.786
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.332							
Edge 4	0.229	0.276	0.540	0.016	0.505	0.769	0.245	0.785	
Product Specific 10-g (10-g SAR)	All position			1.828					

12.11. Sum of the SAR for NR Band n5 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.362	0.218	0.333	0.133	0.580	0.695	0.495	0.828
Body-Worn (1-g SAR)	All position	0.381	0.113	0.632	0.023	0.494	1.013	0.404	1.036
Hotspot (1-g SAR)	Rear	0.641	0.276	0.540	0.066	0.917	1.181	0.707	1.247
	Front	0.181	0.276	0.540	0.025	0.457	0.721	0.206	0.746
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2	0.176							
	Edge 3	0.311							
Edge 4	0.230	0.276	0.540	0.016	0.506	0.770	0.246	0.786	
Product Specific 10-g (10-g SAR)	All position			1.828					

12.12. Sum of the SAR for NR Band n41 & Wi-Fi & BT

RF Exposure	Test Position	Standalone SAR (W/kg)				Sum of SAR (W/kg)			
		WWAN	DTS	UNII	BT	WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + BT + UNII
		1	2	3	4	1 + 2	1 + 3	1 + 4	1 + 3 + 4
Head (1-g SAR)	All position	0.140	0.218	0.333	0.133	0.358	0.473	0.273	0.606
Body-Worn (1-g SAR)	All position	0.120	0.113	0.632	0.023	0.233	0.752	0.143	0.775
Hotspot (1-g SAR)	Rear	0.255	0.276	0.540	0.066	0.531	0.795	0.321	0.861
	Front	0.084	0.276	0.540	0.025	0.360	0.624	0.109	0.649
	Edge 1		0.276	0.460	0.022				0.482
	Edge 2								
	Edge 3	0.074							
Edge 4	0.063	0.276	0.540	0.016	0.339	0.603	0.079	0.619	
Product Specific 10-g (10-g SAR)	All position			1.828					

Note(s):

1. Green values are reference from highest SAR value of initial test position procedure in each RF exposure of each bands.

Conclusion:

1. Simultaneous Transmission SAR analysis results is satisfied the FCC Limit requirement according to procedure of "Sum of SAR"

Appendixes

Refer to separated files for the following appendixes.

4790302419-S1 FCC Report SAR_App A_Photos & Ant. Locations

4790302419-S1 FCC Report SAR_App B_Highest SAR Test Plots

4790302419-S1 FCC Report SAR_App C_System Check Plots

4790302419-S1 FCC Report SAR_App D_SAR Tissue Ingredients

4790302419-S1 FCC Report SAR_App E_Probe Cal. Certificates

4790302419-S1 FCC Report SAR_App F_Dipole Cal. Certificates

4790302419-S1 FCC Report SAR_App G_Proximity Sensor feature

4790302419-S1 FCC Report SAR_App H_LTE Carrier Aggregation

END OF REPORT