FCC 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/ax and NFC

MODEL NUMBER: SC-53E, SCG27

FCC ID: A3LSMA556JPN

REPORT NUMBER: 4791083081-S1V3

ISSUE DATE: 2/15/2024

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Prepared by

UL Korea, Ltd.

26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

IAS ACCREDITED

Testing Laboratory

TL-637

Revision History

Rev.	Date	Revisions	Revised By
V1	1/30/2024	Initial Issue	--
V2	2/7/2024	Revised typo in Sec 1.1 Revised supported band info. in Sec 6.3 Revised title in Sec. 6.8 & 9.4	Hakchul Lee
V3	2/15/2024	Added LTE Band 66 in Sec. 6.6	Hakchul Lee

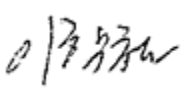
Table of Contents

1. Attestation of Test Results

Applicant Name		SAMSUNG ELECTRONICS CO.,LTD.				
FCC ID		A3LSMA556JPN				
Model Number		SC-53E, SCG27				
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	DXX
Head		1.19	0.21	0.22	0.23	N/A
Body-worn		0.63	0.66	0.26	0.11	N/A
Hotspot		1.12	0.71	N/A	0.12	N/A
Product Specific 10g		N/A	N/A	1.53	N/A	0.02
Simultaneous TX	Head	1.58	1.33	1.58	1.58	N/A
	Body-worn	1.38	1.38	1.17	1.17	N/A
	Hotspot	1.38	1.38	1.17	1.17	N/A
	Product Specific 10g	N/A	N/A	1.74	N/A	1.74
Date Tested		12/12/2023 to 1/30/2024				
Test Results		Pass				

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.

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.

Approved & Released By:	Prepared By:
	
Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory	Hakchul Lee Laboratory Engineer UL Korea, Ltd. Suwon Laboratory

1.1. The Highest Reported SAR Results

Equipment Class	Band	Antenna	The Highest Reported SAR (W/kg) of RF exposure conditions			
			1g of tissue			10g of tissue
			Head Exposure	Body-worn Exposure	Hotspot Exposure	Product Specific Exposure
PCE	GSM 850	Main.1	0.328	0.608	0.608	N/A
	GSM 1900	Main.1	0.055	0.358	0.756	N/A
	WCDMA Band V	Main.1	0.324	0.633	0.633	N/A
	LTE Band 2	Main.1	0.089	0.300	0.478	N/A
	LTE Band 2	Sub.2	1.050	0.171	0.346	N/A
	LTE Band 5	Main.1	0.276	0.620	0.620	N/A
	LTE Band 12	Main.1	0.150	0.369	0.369	N/A
	LTE Band 41	Main.2	0.123	0.246	0.353	N/A
	LTE Band 41	Sub.2	1.064	0.116	0.211	N/A
	LTE Band 66	Main.1	0.190	0.440	1.122	N/A
	LTE Band 66	Sub.2	1.001	0.201	0.326	N/A
	NR Band n5	Main.1	0.273	0.376	0.376	N/A
	NR Band n41	Main.2	0.043	0.249	0.303	N/A
	NR Band n41	Sub.2	1.190	0.213	0.285	N/A
DTS	2.4GHz WLAN	Sub.4 & Sub.6	0.208	0.662	0.712	N/A
NII	5.3/5.2 GHz WLAN	Sub.4 & Sub.1	0.222	0.225	N/A	1.120
	5.5 GHz WLAN		0.197	0.259	N/A	1.147
	5.8 GHz WLAN		0.174	0.148	N/A	1.527
DSS	Bluetooth	Sub.4	0.229	0.113	0.120	N/A
DXX	NFC		N/A	N/A	N/A	0.020

Note(s):

The Highest Reported SAR Results were listed for each RF exposure conditions for each supported bands based on SAR test results of Section.10.

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 D04 Interim General RF Exposure Guidance v01
- 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, 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 May, 2017; RF Exposure Procedures (LTE Band 41 Power Class 2)
- 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))
- TCB workshop October, 2020; 5G RFX Policies (Intra-band and Inter-band NSA-EN-DC evaluation)
- TCB workshop April, 2022; RF Exposure Procedures (5G NR FR1 Measurement)
- TCB workshop October, 2022; RF Exposure Policies & Procedures (SAR test frequencies in multi-rule)

3. Facilities and Accreditation

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

Suwon	
SAR 1 Room	SAR 6 Room
SAR 2 Room	SAR 7 Room
SAR 3 Room	SAR 8 Room
SAR 4 Room	SAR 9 Room
SAR 5 Room	

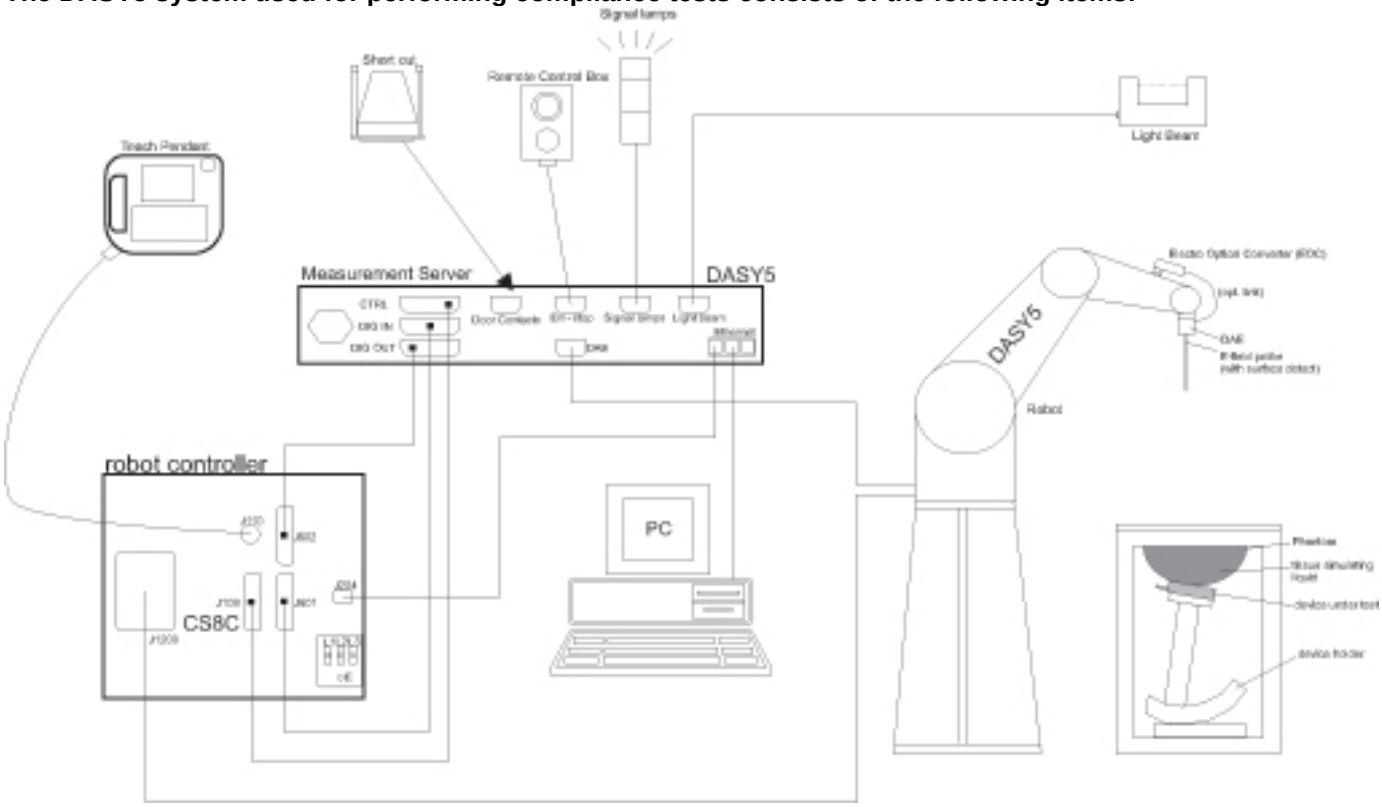
UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.
The full scope of accreditation can be viewed at;

https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

4. SAR Measurement System & Test Equipment

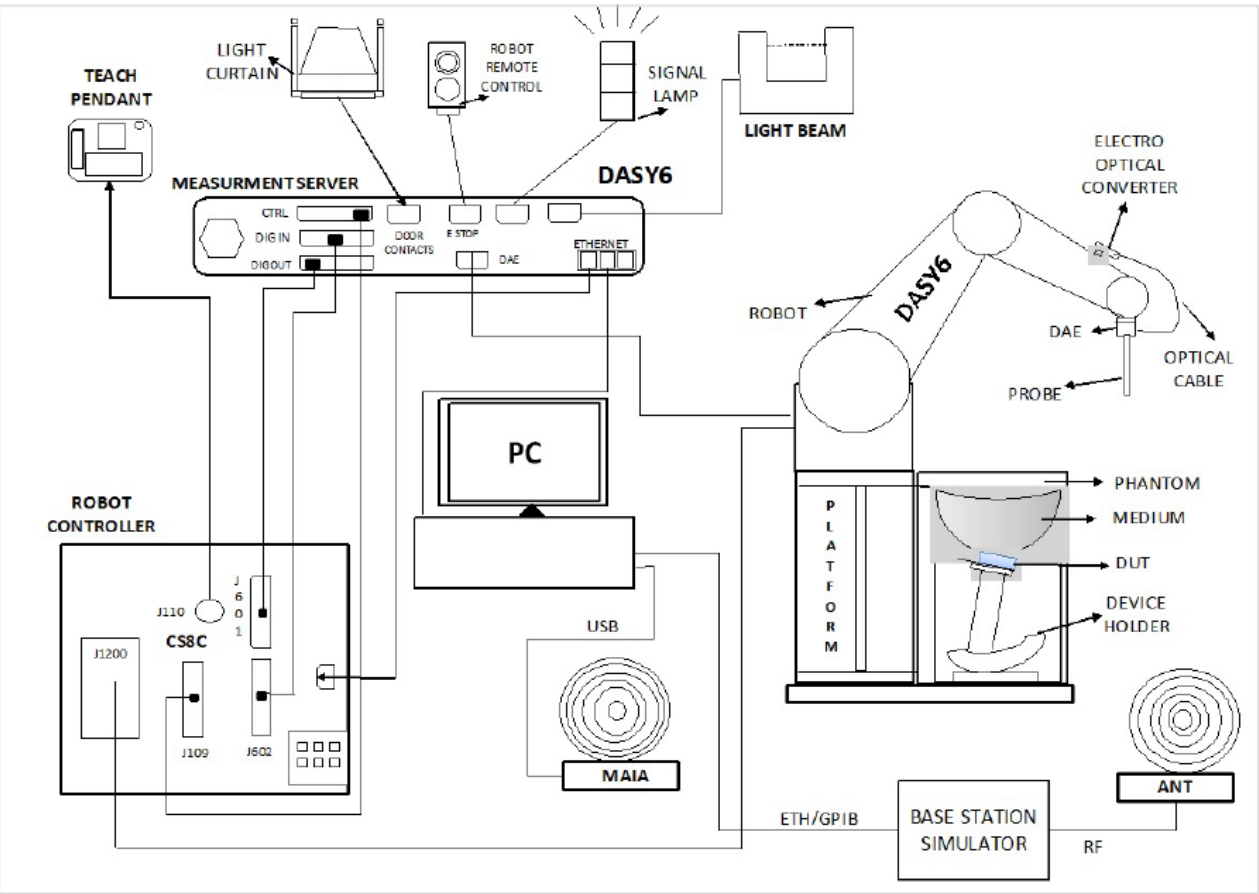
4.1. SAR Measurement System

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.

The DASY6 & 8 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 Win10 and the DASY6 or 8 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	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 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 ≤ 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: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: 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 *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 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.

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	7-24-2024
Network Analyzer	ROHDE & SCHWARZ	ZNB 20	102256	7-24-2024
Dielectric Assessment Kit	SPEAG	DAK-12	1158	9-20-2024
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	7-17-2024
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Shorting block	SPEAG	DAK-12 Short	SM DAK 220 AD	N/A
Thermometer	LKM	DTM3000	3851	7-25-2024
Thermometer	LKM	DTM3000	3862	7-25-2024

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Aglient	N5181A	MY50145882	7-26-2024
MXG Analog Signal Generator	Keysight	N5181B	MY59100587	7-26-2024
MXG Analog Signal Generator	Keysight	N5173B	MY59101083	7-27-2024
Power Sensor	KEYSIGHT	U2000A	MY61280010	1-3-2025
Power Sensor	KEYSIGHT	U2000A	MY60490008	7-25-2024
Power Sensor	KEYSIGHT	U2000A	MY60160004	7-25-2024
Power Sensor	KEYSIGHT	U2000A	MY61010010	7-25-2024
Power Amplifier	MINI-CIRCUITS	TVA-R5-13A+	2111006	**1-6-2024**
				1-3-2025
Power Amplifier	EXODUS	AMP2027ADB	10002	**1-6-2024**
				1-5-2025
Directional Coupler	Aglient	772D	MY52180193	7-25-2024
Directional Coupler	H.P	778D	16133	7-25-2024
Directional Coupler	MINI-CIRCUITS	ZMDC-30-1+	SF569102123	7-25-2024
Directional Coupler	KRYTAR	100318010	215541	1-4-2025
Low Pass Filter	FILTRON	L140012FL	1410003S	7-25-2024
Low Pass Filter	MICROLAB	LA-60N	3942	7-25-2024
Low Pass Filter	MINI-CIRCUITS	NLP-1200	VUU19301915	7-25-2024
Low Pass Filter	NUBICOM	WLKX10-11000-13640-21000-60TS	1	7-25-2024
Attenuator	KEYSIGHT	8491B/003	MY39272276	7-25-2024
Attenuator	KEYSIGHT	8491B/003	MY39272276	7-25-2024
Attenuator	KEYSIGHT	8491B/010	MY39272293	7-25-2024
Attenuator	KEYSIGHT	8491B/010	MY39271981	7-24-2024
Attenuator	KEYSIGHT	8491B/020	MY39271973	7-25-2024
Attenuator	KEYSIGHT	8491B/020	MY39272301	7-25-2024
E-Field Probe	SPEAG	EX3DV4	7651	5-30-2024
E-Field Probe	SPEAG	EX3DV4	7314	5-26-2024
E-Field Probe	SPEAG	EX3DV4	3871	8-25-2024
E-Field Probe	SPEAG	EX3DV4	7313	3-24-2024
E-Field Probe	SPEAG	EX3DV4	7545	8-25-2024
E-Field Probe	SPEAG	EX3DV4	7645	9-20-2024
E-Field Probe	SPEAG	EX3DV4	7646	3-23-2024
E-Field Probe	SPEAG	EX3DV4	7376	7-25-2024
Data Acquisition Electronics	SPEAG	DAE4	1671	5-25-2024
Data Acquisition Electronics	SPEAG	DAE4	1494	7-17-2024
Data Acquisition Electronics	SPEAG	DAE4	1668	4-26-2024
Data Acquisition Electronics	SPEAG	DAE4	1667	4-24-2024
Data Acquisition Electronics	SPEAG	DAE4	1591	3-22-2024
Data Acquisition Electronics	SPEAG	DAE4	1447	3-22-2024
Data Acquisition Electronics	SPEAG	DAE4	1468	8-24-2024
Data Acquisition Electronics	SPEAG	DAE4	1343	6-30-2024

Note(s):

1. For System Validation Dipole, Calibration interval applied every 2 years according to referencing KDB 865664 guidance.
2. All equipments were used until Cal.Due data.

Test Equipment (Continued)

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
System Validation Dipole	SPEAG	CLA-13	1015	8-22-2024
System Validation Dipole	SPEAG	D750V3	1205	4-18-2024
System Validation Dipole	SPEAG	D835V2	4d174	**9-21-2024**
System Validation Dipole	SPEAG	D835V2	4d194	**3-24-2024**
System Validation Dipole	SPEAG	D1750V2	1125	**11-30-2024**
System Validation Dipole	SPEAG	D1750V2	1180	**9-21-2024**
System Validation Dipole	SPEAG	D1900V2	5d190	**11-16-2024**
System Validation Dipole	SPEAG	D1900V2	5d199	**3-25-2024**
System Validation Dipole	SPEAG	D2450V2	960	**3-24-2024**
System Validation Dipole	SPEAG	D2600V2	1178	4-25-2024
System Validation Dipole	SPEAG	D2600V2	1097	9-26-2024
System Validation Dipole	SPEAG	D5GHzV2	1209	2-28-2024
System Validation Dipole	SPEAG	D5GHzV2	1325	4-21-2024
Thermometer	Lutron	MHB-382SD	AH.50215	1-4-2025
Thermometer	Lutron	MHB-382SD	AH.50213	1-4-2025
Thermometer	Lutron	MHB-382SD	AH.921463	1-4-2025
Thermometer	Lutron	MHB-382SD	AJ.45903	1-4-2025
Thermometer	Lutron	MHB-382SD	AK.12123	1-4-2025
Thermometer	Lutron	MHB-382SD	AJ.42446	7-26-2024
Thermometer	Lutron	MHB-382SD	AK.12102	7-31-2024
Thermometer	Lutron	MHB-382SD	AK.12103	7-31-2024
Thermometer	Lutron	MHB-382SD	AK.18789	7-27-2024

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	7-27-2024
Base Station Simulator	R & S	CMW500	150314	7-26-2024
Base Station Simulator	R & S	CMW500	162790	7-26-2024
Base Station Simulator	R & S	CMW500	169803	**1-5-2024**
Base Station Simulator	R & S	CMW500	169803	1-3-2025
Base Station Simulator	R & S	CMW500	169801	**1-5-2024**
Base Station Simulator	R & S	CMW500	169801	1-3-2025
Base Station Simulator	R & S	CMW500	169799	7-26-2024
Base Station Simulator	R & S	CMW500	169800	7-27-2024
Base Station Simulator	R & S	CMW500	169798	7-27-2024
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY57510596	7-27-2024
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY59150850	**1-9-2024**
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY59150850	1-3-2025
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY58120110	**1-10-2024**
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY58120110	1-3-2025
Radio Communication Test Station	Anritsu	MT8000A	6272466165	10-18-2024
Radio Communication Analyzer	Anritsu	MT8821C	6161094351	11-30-2024

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

Measurement Uncertainty of 100MHz to 6GHz

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 ≤ 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.

Measurement Uncertainty of 9MHz to 19MHz

Measurement uncertainty for 9 MHz to 19 MHz
(According to IEEE 62209-1528)

a	b	c		d	e	f	g	h =	l =	k
					f(d,k)			*c×f/e*	*c×g/e*	
Uncertainty component	Reference	Tol. 1 g (±%)	Tol. 10 g (±%)	Prob. Dist.	Div.	*ci* (1 g)	*ci* (10 g)	1 g *ui* (± %)	10 g *ui* (± %)	vi
Measurement System Errors										
Probe Calibration	8.4.1.1	13.3		Normal	2	1	1	6.7	6.7	∞
Probe Calibration Drift	8.4.1.2	1.7		Rectangular	1.732	1	1	1.0	1.0	∞
Probe Linearity	8.4.1.3	4.7		Rectangular	1.732	1	1	2.7	2.7	∞
Broadband Signal	8.4.1.4	0.8		Rectangular	1.732	1	1	0.5	0.5	∞
Probe Isotropy	8.4.1.5	7.6		Rectangular	1.732	1	1	4.4	4.4	∞
Data Acquisition	8.4.1.6	0.3		Normal	1	1	1	0.3	0.3	∞
RF Ambient	8.4.1.7	1.8		Normal	1	1	1	1.8	1.8	∞
Probe Positioning	8.4.1.8	0.006		Normal	1	0.14	0.14	0.10	0.10	∞
Data Processing	8.4.1.9	1.2		Normal	1	1	1	1.2	1.2	∞
Phantom and Device Errors										
Conductivity (meas.)DAK	8.4.2.1	2.5		Normal	1	0.78	0.71	2.0	1.8	∞
Conductivity (temp.)BB	8.4.2.2	5.4		Rectangular	1.732	0.78	0.71	2.4	2.2	∞
Phantom Permittivity	8.4.2.3	14.0		Rectangular	1.732	0	0	0.0	0.0	∞
Distance DUT -TSL	8.4.2.4	2.0		Normal	1	2	2	4.0	4.0	∞
Device Positioning	8.4.2.5	3.3	5.8	Normal	1	1	1	3.3	5.8	40
Device Holder	8.4.2.6	3.6		Normal	1	1	1	3.6	3.6	∞
DUT Modulation	8.4.2.7	2.4		Rectangular	1.732	1	1	1.4	1.4	∞
Time-average SAR	8.4.2.8	1.7		Rectangular	1.732	1	1	1.0	1.0	∞
DUT drift	8.4.2.9	5.0		Normal	1	1	1	5.0	5.0	∞
Correction to the SAR results										
Deviation to Target	8.4.3.1	1.9		Normal	1	1	0.84	1.9	1.6	∞
Combined Standard Uncertainty Uc(y) =				RSS				12.57	13.33	
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =								**25.13**	**26.66**	

5.1. DECISION RULE

Measurement Uncertainty is not applied when providing statements of conformity in accordance with IEC Guide 115:2023, 4.3.3.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Refer to Appendix A.
Back Cover	☒ The Back Cover is not removable.
Battery Options	☒ 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. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz)
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5.2 GHz_UNII-1, Wi-Fi 5.8 GHz_UNII-3)

Test Sample Information

No.	S/N	Notes	No.	S/N	Notes
1	R3CWC03BM2D	Main Conducted	9	R3CWC03BRYM	SAR
2	R3CWC03BMMD	Main Conducted	10	7ab3a2c5e82c7ece	SAR
3	R3CWC03BRGL	SAR	11	7ab3a2c5e52c7ece	SAR
4	R3CWC03BR1K	SAR	12	7ab3a2c5f72c7ece	SAR
5	R3CWC03BRRB	SAR	13	R3CWC03C37F	SAR
6	R3CW03BRVX	SAR			
7	R3CWC03BRKP	SAR			
8	R3CWC03BSQV	SAR			

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK) GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: ☐ Class 8 - 1 Up, 4 Down ☐ Class 10 - 2 Up, 4 Down ☐ Class 12 - 4 Up, 4 Down ☒ Class 33 - 4 Up, 5 Down	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
	Does this device support DTM (Dual Transfer Mode)? ☐ Yes ☒ No			
W-CDMA (UMTS)	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 5 FDD Band 12 TDD Band 41 Power Class 3 FDD Band 66	QPSK 16QAM 64QAM Rel. 15 Carrier Aggregation (1 Uplink and 4 Downlinks)		100% (FDD) 63.3% (TDD) – PC3
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No			
5G NR (Sub 6)	FDD Band n5 TDD Band n41	DFT-s-ODFM: ■ π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-ODFM: ■QPSK, 16QAM, 64QAM, 256QAM		100%
Wi-Fi	2.4 GHz	802.11b, 802.11g, 802.11n (HT20), 802.11ax (HE20)		98.6% (802.11b-SISO)
	5 GHz	802.11a / 802.11n (HT20/40) 802.11ac (VHT20/40/80) 802.11ax (HE20/40/80)		96.9% (802.11a -SISO) 98.1% (802.11n (HT 20 -SISO) 97.9% (802.11n (HT 40 -SISO) 94.0% (802.11ac (VHT80-SISO)
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No			
	Does this device support Band gap channel(s)? ☒ Yes ☐ No			
Bluetooth	2.4 GHz	Version 5.3 LE		77.2%(BDR-DH5)
NFC	13.56 MHz	Type A/B/F		100%

Notes:

1. The Bluetooth protocol is considered source-based averaging. For duty used in Wi-Fi/BT SAR testing, Please refer to section.9.

6.3. Time-Averaging feature

The equipment under test (EUT) contains both S.LSI TAS supporting WWAN technologies (2G/3G/4G/5G-Sub6). TAS chipset is enabled with TAS (Time Average SAR) algorithm has been designed to meet the compliance limits over the required duration, while still allowing dynamic control of transmit power for meeting system performance. And The EUT has also supports to WLAN/BT/NFC technologies, but There are not support to TAS algorithm.

The TAS (Time Average SAR) algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of *SAR_design_target*, below the predefined time-average power limit, for each characterized technology and band.

TAS (Time Average SAR) algorithm allows the device to transmit at higher power instantaneously as high as P_{max}, when needed, but enforces power limiting to maintain time-averaged transmit power to P_{Limit}. Below table shows P_{Limit} NV settings and maximum tune up output power P_{max} configured for this EUT for various transmit conditions (RSI=Radio SAR Index).

The purpose of this SAR report is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

Exposure condition			Head (RCV)	Bodyworn & Hotspot	Phablet 10-g SAR	Pmax (Maximum tune-up Power) (dBm)
Spatial-average			1g	1g	10g	
Test distance (mm)			0	10	0	
DSI :			1	0	0	
RF Air Interface	Antenna	Antenna Group	Plimit corresponding to 1.0 W/kg (SAR_design_target) (1g) / 2.5 W/kg (SAR_design_target) (10g)			
GSM 850	Main.1	AG0	25.6	25.6	25.6	25.6
GSM 1900	Main.1	AG0	22.1	17.8	17.8	22.1
WCDMA 5	Main.1	AG0	24.5	24.5	24.5	24.5
LTE Band 2	Main.1	AG0	23.5	18.0	18.0	23.5
LTE Band 2	Sub.2	AG0	17.5	17.5	17.5	23.5
LTE Band 5	Main.1	AG0	24.5	24.5	24.5	24.5
LTE Band 12	Main.1	AG0	24.5	24.5	24.5	24.5
LTE Band 41	Main.2	AG0	21.5	17.0	17.0	21.5
LTE Band 41	Sub.2	AG0	16.5	16.5	16.5	21.0
LTE Band 66	Main.1	AG1	24.0	19.0	19.0	24.0
LTE Band 66	Sub.2	AG0	16.5	16.5	16.5	23.0
NR Band n5	Main.1	AG0	24.5	24.5	24.5	24.5
NR Band n41	Main.2	AG1	17.0	17.0	17.0	24.0
NR Band n41	Sub.2	AG0	17.0	17.0	17.0	23.0

Notes:

1. All *PLimit* EFS and maximum tune up output *Pmax* levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes (for e.g., GSM/LTE TDD). NR TDD's *Pmax* was listed as burst power.
2. Maximum tune up output power *Pmax* is used to configure EUT during RF tune up procedures. The maximum allowed output power is equal to maximum tune up output power + 1dB device design uncertainty.
3. Measurement Condition : All conducted power and SAR measurements in this SAR report were performed by setting static Power condition.
4. If *PLimit* is higher than *Pmax* for some modes / bands, The modes/bands will operate at a power level up to *Pmax*.

6.4. Maximum Allowed Output power

WWAN Bands maximum allowed output power

Maximum allowed output power means that Pmax or Plimit + 1dB device uncertainty for each RSI.

RF Air interface	Antenna	Mode	Time Slots	Maximum allowed output power (dBm)									
				Pmax		Plimit							
						RSI_Free		RSI_RCV		RSI_Hotspot		RSI_Ear-jack	
				Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM850	Main.1	Voice	1	**34.00**	**24.81**	**34.00**	**24.81**	**34.00**	**24.81**	**34.00**	**24.81**	**34.00**	**24.81**
		GPRS	1	**34.00**	**24.81**	**34.00**	**24.81**	**34.00**	**24.81**	**34.00**	**24.81**	**34.00**	**24.81**
		GPRS	2	**32.00**	**25.82**	**32.00**	**25.82**	**32.00**	**25.82**	**32.00**	**25.82**	**32.00**	**25.82**
		GPRS	3	**31.00**	**26.58**	**31.00**	**26.58**	**31.00**	**26.58**	**31.00**	**26.58**	**31.00**	**26.58**
		GPRS	4	**29.50**	**26.33**	**29.50**	**26.33**	**29.50**	**26.33**	**29.50**	**26.33**	**29.50**	**26.33**
		EGPRS	1	**28.00**	**18.81**	**28.00**	**18.81**	**28.00**	**18.81**	**28.00**	**18.81**	**28.00**	**18.81**
		EGPRS	2	**26.50**	**20.32**	**26.50**	**20.32**	**26.50**	**20.32**	**26.50**	**20.32**	**26.50**	**20.32**
		EGPRS	3	**25.00**	**20.58**	**25.00**	**20.58**	**25.00**	**20.58**	**25.00**	**20.58**	**25.00**	**20.58**
		EGPRS	4	**23.50**	**20.33**	**23.50**	**20.33**	**23.50**	**20.33**	**23.50**	**20.33**	**23.50**	**20.33**
GSM1900	Main.1	Voice	1	**31.00**	**21.81**	**28.00**	**18.81**	**31.00**	**21.81**	**28.00**	**18.81**	**28.00**	**18.81**
		GPRS	1	**31.00**	**21.81**	**28.00**	**18.81**	**31.00**	**21.81**	**28.00**	**18.81**	**28.00**	**18.81**
		GPRS	2	**29.00**	**22.82**	**25.00**	**18.82**	**29.00**	**22.82**	**25.00**	**18.82**	**25.00**	**18.82**
		GPRS	3	**27.50**	**23.08**	**22.50**	**18.08**	**27.50**	**23.08**	**22.50**	**18.08**	**22.50**	**18.08**
		GPRS	4	**25.50**	**22.33**	**21.00**	**17.83**	**25.50**	**22.33**	**21.00**	**17.83**	**21.00**	**17.83**
		EGPRS	1	**26.00**	**16.81**	**26.00**	**16.81**	**26.00**	**16.81**	**26.00**	**16.81**	**26.00**	**16.81**
		EGPRS	2	**24.00**	**17.82**	**24.00**	**17.82**	**24.00**	**17.82**	**24.00**	**17.82**	**24.00**	**17.82**
		EGPRS	3	**23.00**	**18.58**	**23.00**	**18.58**	**23.00**	**18.58**	**23.00**	**18.58**	**23.00**	**18.58**
		EGPRS	4	**21.50**	**18.33**	**21.50**	**18.33**	**21.50**	**18.33**	**21.50**	**18.33**	**21.50**	**18.33**

Note(s):

1. Detail of RSI(Radio SAR Index) conditions, please refer to Sec.6.5.

WWAN Bands maximum allowed output power (Continued)

Maximum allowed output power means that Pmax or Plimit + 1dB device uncertainty for each RSI.

RF Air interface	Antenna	Mode	Maximum allowed output power (dBm)				
			Pmax	Plimit			
				RSI_Free	RSI_RCV	RSI_Hotspot	RSI_Earjack
W-CDMA Band V	Main.1	R99	**25.50**	**25.50**	**25.50**	**25.50**	**25.50**
		HSDPA	**24.00**	**24.00**	**24.00**	**24.00**	**24.00**
		HSUPA	**23.50**	**23.50**	**23.50**	**23.50**	**23.50**
		DC-HSDPA	**24.00**	**24.00**	**24.00**	**24.00**	**24.00**

Note(s):

1. Detail of RSI(Radio SAR Index) conditions, please refer to Sec.6.5.

WWAN Bands maximum allowed output power (Continued)

Maximum allowed output power means that Pmax or Plimit + 1dB device uncertainty for each RSI.

RF Air interface	Antenna	Mode	Maximum allowed output power (dBm)				
			Pmax	Plimit			
				RSI_Free	RSI_RCV	RSI_Hotspot	RSI_Earjack
LTE Band 2	Main.1	QPSK	**24.50**	**19.00**	**24.50**	**19.00**	**19.00**
LTE Band 2	Sub.2	QPSK	**24.50**	**18.50**	**18.50**	**18.50**	**18.50**
LTE Band 5	Main.1	QPSK	**25.50**	**25.50**	**25.50**	**25.50**	**25.50**
LTE Band 12	Main.1	QPSK	**25.50**	**25.50**	**25.50**	**25.50**	**25.50**
LTE Band 41	Main.2	QPSK	**24.50**	**20.00**	**24.50**	**20.00**	**20.00**
LTE Band 41	Sub.2	QPSK	**24.00**	**19.50**	**19.50**	**19.50**	**19.50**
LTE Band 66	Main.1	QPSK	**25.00**	**20.00**	**25.00**	**20.00**	**20.00**
LTE Band 66	Sub.2	QPSK	**24.00**	**17.50**	**17.50**	**17.50**	**17.50**

Note(s):

1. Detail of RSI(Radio SAR Index) conditions, please refer to Sec.6.5.

WWAN Bands maximum allowed output power (Continued)

Maximum allowed output power means that Pmax or Plimit + 1dB device uncertainty for each RSI.

RF Air interface	Antenna	Mode	Maximum allowed output power (dBm)				
			Pmax	Plimit			
				RSI_Free	RSI_RCV	RSI_Hotspot	RSI_Earjack
NR Band n5	Main.1	DFT-s-OFDM	**25.50**	**25.50**	**25.50**	**25.50**	**25.50**
NR Band n41	Main.2	DFT-s-OFDM	**25.00**	**18.00**	**18.00**	**18.00**	**18.00**
NR Band n41	Sub.2	DFT-s-OFDM	**24.00**	**18.00**	**18.00**	**18.00**	**18.00**

Note(s):

1. Detail of RSI(Radio SAR Index) conditions, please refer to Sec.6.5.
2. NR Bands support SA and NSA mode as same target power.

WLAN Bands output power.

Max Power

RF Air interface	Band	Maximum allowed Output Power (dBm)											
		2.4GHz & 5GHz Sub.4 Ant.						2.4GHz Sub.6 Ant. & 5GHz Sub.1 Ant.					
		802.11 mode						802.11 mode					
		a	b	g	n	ac	ax	a	b	g	n	ac	ax
WiFi 2.4 GHz	1ch		19	17	14		17		17	15.5	13		15.5
	2-9ch				16.5						15.5		
	10ch				16		15				15		14
	11ch			13	13		14			11.5	12		13
	12ch		8	8	6		5		7	7	5		4
	13ch		8	-1	1		6		7	-1	1		5
WiFi 5 GHz (BW : 20MHz)	5200MHz	14 48ch: 6			14 48ch: 4.5	14 48ch: 4.5	14 36ch: 13.5 48ch: 6	11 48ch: 3			11 48ch: 2	11 48ch: 2	11 36ch: 10 48ch: 3
	5300MHz	14 64ch: 13			14 64ch: 5	14 64ch: 5	14 64ch: 9	12.5 64ch: 11			13 64ch: 3	13 64ch: 3	12 64ch: 9
	5500MHz	13 100ch: 12.5			13 100ch: 8 140ch: 3	13 100ch: 8 140ch: 3	13.5 100ch: 5 140ch: 6	12 100ch: 11.5			12 100ch: 7 140: 1	12 100ch: 7 140ch: 1	12 100ch: 3 140: 4.5
	5800MHz	13 165ch: 11			13 165ch: 11	13 165ch: 11	13	12.5 165ch: 11			13 165ch: 11	13 165ch: 11	12.5
WiFi 5 GHz (BW : 40MHz)	5200MHz				10.5 46ch: 3.5	10.5 46ch: 3.5	10 36ch: 6				7.5 46ch: -1.5	7.5 46ch: -1.5	7 46ch: 2
	5300MHz				14 62ch: 5	14 62ch: 5	14 62ch: 5				10.5 62ch: 2	10.5 62ch: 2	11 62ch: 1.5
	5500MHz				13 102ch: 4 134ch: 1	13 102ch: 4 134ch: 1	13 102ch: 5 134ch: 12				11.5 102ch: 0 134ch: -0.5	11.5 102ch: 0 134: -0.5	11 102ch: 2
	5800MHz				13	13	12.5 151ch: 11				12	12	12.5 151ch: 9.5
WiFi 5 GHz (BW : 80MHz)	5200MHz					3	2					0	-1
	5300MHz					2	3					0	-1
	5500MHz					11 106ch: 4	11.5 106ch: 4.5					11 106ch: 2	11 106ch: 2.5 138ch: 10
	5800MHz					3	4					3	4

Note(s):

1. 2.4GHz Sub.4 Ant is same Ant.1, and 2.4GHz Sub.6 Ant is same Ant.2 in tune up document.
2. 5GHz Sub.4 Ant is same Ant.1, and 5GHz Sub.1 Ant is same Ant.2 in tune up document.
3. MIMO operates as the sum of each antennas.
4. 2.4GHz/5GHz Sub.4 Ant are support to both SISO and MIMO operations.
5. 2.4GHz Sub.6 Ant and 5GHz Sub.1 Ant are support to only MIMO operation.

Reduced Power (Rcv)

RF Air interface	Band	Maximum allowed Output Power (dBm)											
		2.4GHz & 5GHz Sub.4 Ant.						2.4GHz Sub.6 Ant. & 5GHz Sub.1 Ant.					
		802.11 mode						802.11 mode					
		a	b	g	n	ac	ax	a	b	g	n	ac	ax
WiFi 2.4 GHz	1-11ch		8	8	8		8		7	7	7		7
	12ch				6		5				5		4
	13ch			-1	1		6			-1	1		5
WiFi 5 GHz (BW : 20MHz)	5200MHz	6.5 48ch: 6			6.5 48ch: 4.5	6.5 48ch: 4.5	6.5 48ch: 6	5 36ch: 2 48ch: 3			5 36ch: 2 48ch: 2	5 36ch: 2 48ch: 2	4.5 36ch: 2 48ch: 3
	5300MHz	6.5			6.5 64ch: 5	6.5 64ch: 5	6.5	5.5			5 62ch: 3	5 64ch: 3	4.5
	5500MHz	8			8 140ch: 3	8 140ch: 3	8 100ch: 5 140ch: 6	8			8 140ch: 1	8 140ch: 1	8 100ch: 3 140ch: 4.5
	5800MHz	8.5			8.5	8.5	8.5	9			9	9	8.5
WiFi 5 GHz (BW : 40MHz)	5200MHz				6.5 46ch: 3.5	6.5 46ch: 3.5	6.5 46ch: 6				2 46ch: -1.5	2 46ch: -1.5	2
	5300MHz				6.5 62ch: 5	6.5 62ch: 5	6.5 62ch: 5				4 62ch: 2	4 62ch: 2	2 62ch: 1.5
	5500MHz				8 102ch: 4 134ch: 1	8 102ch: 4 134ch: 1	6.5 102ch: 5				7 102ch: 0 134ch: -0.5	7 102ch: 0 134ch: -0.5	7 102ch: 2
	5800MHz				8.5	8.5	8.5				8.5	8.5	8.5
WiFi 5 GHz (BW : 80MHz)	5200MHz					3	2					0	-1
	5300MHz					2	3					0	-1
	5500MHz					8 106ch: 4	8 106ch: 4.5					8 106ch: 2	8 106ch: 2.5
	5800MHz					3	4					3	4

Note(s):

1. 2.4GHz Sub.4 Ant is same Ant.1, and 2.4GHz Sub.6 Ant is same Ant.2 in tune up document.
2. 5GHz Sub.4 Ant is same Ant.1, and 5GHz Sub.1 Ant is same Ant.2 in tune up document.
3. MIMO operates as the sum of each antennas.
4. 2.4GHz/5GHz Sub.4 Ant are support to both SISO and MIMO operations.
5. 2.4GHz Sub.6 Ant and 5GHz Sub.1 Ant are support to only MIMO operation.

BT(Bluetooth) Max / Reduced Output power

RF Air interface	Max. Output Power (dBm)	Reduced Output Power (dBm)
Bluetooth (1Mbps)	15	11.5
Bluetooth (EDR)	10	
Bluetooth LE legacy (1M/2M)	15	
Bluetooth LE Audio(125/500k)	14	

Note(s):

BT has support to reduced power during RCV active.

6.5. RSI (Radio SAR Index) Scenarios

RSI (Radio SAR Index) Scenarios in WWAN Bands

RF exposure Conditions	Technologuies Supported	RSI conditions	Description
Head	All WWAN bands	RCV	1. Device positioned next to head. 2. Receiver Active.
Body-worn	All WWAN bands	Free	1. Device being used with a body-worn accessory.
Hotspot	All WWAN bands	Hotspot	1. Device transmits in hotspot mode near body. 2. Hotspot Mode Active.
Earjack	All WWAN bands	Earjack	1. Insert Earjack
Phablet-10g	All WWAN bands	Free	1. Device is held with hand.

Note(s):

RSI Scenarios priority: Free → RCV → Hotspot → Earjack

6.6. General LTE SAR Test and Reporting Considerations

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Frequency range, Channel Bandwidth, Numbers and Frequencues</td><td>
<table>
<tr><td rowspan="3">Band 2</td><td colspan="6">Frequency range: 1850 - 1910 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>18700/ 1860</td><td>18675/ 1857.5</td><td>18650/ 1855</td><td>18625/ 1852.5</td><td>18615/ 1851.5</td><td>18607/ 1850.7</td></tr>
<tr><td>Mid</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td></tr>
<tr><td>High</td><td>19100/ 1900</td><td>19125/ 1902.5</td><td>19150/ 1905</td><td>19175/ 1907.5</td><td>19185/ 1908.5</td><td>19193/ 1909.3</td></tr>
<tr><td rowspan="3">Band 5</td><td colspan="6">Frequency range: 824 - 849 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>20450/ 829</td><td>20425/ 826.5</td><td>20415/ 825.5</td><td>20407/ 824.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td></tr>
<tr><td>High</td><td></td><td></td><td>20600/ 844</td><td>20625/ 846.5</td><td>20635/ 847.5</td><td>20643/ 848.3</td></tr>
<tr><td rowspan="3">Band 12</td><td colspan="6">Frequency range: 699 - 716 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>23060/ 704</td><td>23035/ 701.5</td><td>23025/ 700.5</td><td>23017/ 699.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>23095/ 707.5</td><td>23095/ 707.5</td><td>23095/ 707.5</td><td>23095/ 707.5</td></tr>
<tr><td>High</td><td></td><td></td><td>23130/ 711</td><td>23155/ 713.5</td><td>23165/ 714.5</td><td>23173/ 715.3</td></tr>
<tr><td rowspan="3">Band 41</td><td colspan="6">Frequency range: 2496 - 2690 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td colspan="4">39750 / 2506.0</td><td></td><td></td></tr>
<tr><td>Low-Mid</td><td colspan="4">40185 / 2549.5</td><td></td><td></td></tr>
<tr><td>Mid</td><td colspan="4">40620 / 2593.0</td><td></td><td></td></tr>
<tr><td>Mid-High</td><td colspan="4">41055 / 2636.5</td><td></td><td></td></tr>
<tr><td>High</td><td colspan="4">41490 / 2680.0</td><td></td><td></td></tr>
<tr><td rowspan="3">Band 66</td><td colspan="6">Frequency range: 1710 - 1780 MHz</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>132072/ 1720</td><td>132047/ 1717.5</td><td>132022/ 1715</td><td>131997/ 1712.5</td><td>131987/ 1711.5</td><td>131979/ 1710.7</td></tr>
<tr><td>Mid</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td></tr>
<tr><td>High</td><td>132572/ 1770</td><td>132597/ 1772.5</td><td>132622/ 1775</td><td>132647/ 1777.5</td><td>132657/ 1778.5</td><td>132665/ 1779.3</td></tr>
</table>
</td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td>Refer to Appendix A.</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<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>
<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>
</table>
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
</td></tr>
<tr><td>Power reduction</td><td>Yes.</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>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.</td></tr>
</table>

Notes:

1. 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.
2. LTE Band 41 test channels in accordance with October 2014 TCB workshop for all channels bandwidths.
3. SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

6.7. 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	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
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 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33%
where
T_s = 1/(15000 x 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 in power class 3.

6.8. NR (Sub 6) SAR Test and Reporting Considerations

<table>
<tr><th>Item</th><th colspan="14">Description</th></tr>
<tr><td rowspan="15">Frequency range, Channel Bandwidth, Numbers and Frequencues</td><td rowspan="3">Band n5</td><td colspan="13">Frequency range: 824 - 849 MHz</td></tr>
<tr><td colspan="13">Channel Bandwidth</td></tr>
<tr><td>100 MHz</td><td>90 MHz</td><td>80 MHz</td><td>70 MHz</td><td>60 MHz</td><td>50 MHz</td><td>40 MHz</td><td>30 MHz</td><td>25 MHz</td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>166800/ 834</td><td>166300/ 831.5</td><td>165800/ 829</td><td>165300/ 826.5</td></tr>
<tr><td>Mid</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>167300/ 836.5</td><td>167300/ 836.5</td><td>167300/ 836.5</td><td>167300/ 836.5</td></tr>
<tr><td>High</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>167800/ 839</td><td>168300/ 841.5</td><td>168800/ 844</td><td>169300/ 846.5</td></tr>
<tr><td rowspan="3">Band n41</td><td colspan="13">Frequency range: 2496 - 2690 MHz</td></tr>
<tr><td colspan="13">Channel Bandwidth</td></tr>
<tr><td>100 MHz</td><td>90 MHz</td><td>80 MHz</td><td>70 MHz</td><td>60 MHz</td><td>50 MHz</td><td>40 MHz</td><td>30 MHz</td><td>25 MHz</td><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td></tr>
<tr><td>Low</td><td rowspan="2">509202/ 2546.01</td><td rowspan="2">508200/ 2541</td><td rowspan="2">507204/ 2536.02</td><td rowspan="2">506202/ 2531.01</td><td rowspan="2">505200/ 2526</td><td rowspan="2">504204/ 2512.02</td><td>503202/ 2516.01</td><td>502200/ 2511</td><td></td><td>501204/ 2506.02</td><td>500700/ 2503.5</td><td>500202/ 2501.01</td><td></td></tr>
<tr><td>Low-Mid</td><td>513468/ 2567.34</td><td>510402/ 2552.01</td><td></td><td>509898/ 2549.49</td><td>509652/ 2548.26</td><td>509400/ 2547</td><td></td></tr>
<tr><td>Mid</td><td>518598/ 2592.99</td><td></td><td></td><td></td><td>518598/ 2592.99</td><td>518598/ 2592.99</td><td></td><td>518598/ 2592.99</td><td></td><td>518598/ 2592.99</td><td>518598/ 2592.99</td><td>518598/ 2592.99</td><td></td></tr>
<tr><td>Mid-High</td><td rowspan="2">528000/ 2640</td><td rowspan="2">528996/ 2644.98</td><td rowspan="2">529998/ 2649.99</td><td rowspan="2">531000/ 2655</td><td rowspan="2">531996/ 2659.99</td><td rowspan="2">523734/ 2618.67</td><td>523734/ 2618.67</td><td>526800/ 2634</td><td></td><td>527298/ 2636.49</td><td>527550/ 2637.75</td><td>527802/ 2639.01</td><td></td></tr>
<tr><td>High</td><td>534000/ 2670</td><td>534996/ 2674.98</td><td></td><td>535998/ 2679.99</td><td>536496/ 2682.48</td><td>537000/ 2685</td><td></td></tr>
<tr><td>SCS</td><td colspan="14">NR FDD Bands : 15 kHz, NR TDD Bands : 30kHz</td></tr>
<tr><td>Modulations Supported in UL</td><td colspan="14">DFT-s-OFDM: π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM & CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM</td></tr>
<tr><td>A-MPR (Additional MPR) disabled for SAR Testing?</td><td colspan="14">Yes</td></tr>
<tr><td colspan="15">EN-DC Carrier Aggregation Possible Combinations</td></tr>
<tr><td>LTE Anchor Bands for NR Band n5</td><td colspan="14">LTE Band 2/66</td></tr>
<tr><td>LTE Anchor Bands for NR Band n41</td><td colspan="14">-</td></tr>
</table>

Notes:

1. 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.
2. NR configurations of SAR test were determined according to Section 5.2 of KDB 941225 D05.

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.

WWAN

Wireless technologies	RF Exposure Conditions	Antenna	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN	Head	All WWAN 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 WWAN Antennas	10 mm	Rear	N/A	Yes	
				Front	N/A	Yes	
	Hotspot	Main 1 Ant.	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Top	> 25 mm	No	1
				Right	< 25 mm	Yes	
				Bottom	< 25 mm	Yes	
				Left	< 25 mm	Yes	
	Hotspot	Main 2 Ant.	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Top	> 25 mm	No	1
				Right	> 25 mm	No	1
				Bottom	< 25 mm	Yes	
				Left	< 25 mm	Yes	
	Hotspot	Sub.2 Ant.	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Top	< 25 mm	Yes	
				Right	> 25 mm	No	1
				Bottom	> 25 mm	No	1
				Left	< 25 mm	Yes	
	Product Specific 10-g	All Main Antennas	0 mm	Rear	Refer to notes 2 & 4		
				Front			
				Top			
				Right			
				Bottom			
				Left			

Notes:

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. 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.
3. 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.
4. 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.

WLAN&BT

Wireless technologies	RF Exposure Conditions	Antenna	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
2.4GHz WLAN & BT & 5GHz WLAN	Head	All WLAN 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		10 mm	Rear	N/A	Yes	
				Front	N/A	Yes	
	Hotspot	WiFi1 2.4G, 5G (Sub.4)	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Top	< 25 mm	Yes	
				Right	> 25 mm	No	1
				Bottom	> 25 mm	No	1
				Left	< 25 mm	Yes	
	Hotspot	WiFi2 2.4G(Sub.6), 5G (Sub.1)	10 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Top	< 25 mm	Yes	
				Right	< 25 mm	Yes	
				Bottom	> 25 mm	No	1
				Left	> 25 mm	No	1
	Product Specific 10-g	All Main Antennas	0 mm	Rear	Refer to notes 2 & 4		
				Front			
				Top			
				Right			
				Bottom			
				Left			

NFC

Wireless technologies	RF Exposure Conditions	Antenna	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
NFC	Product Specific (Hand) 10-g	NFC Ant.	0 mm	Rear	< 25 mm	Yes	
				Front	< 25 mm	Yes	
				Top	< 25 mm	Yes	
				Right	> 25 mm	No	1
				Bottom	> 25 mm	No	1
				Left	< 25 mm	Yes	

Notes:

1. SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
2. 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.
3. 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.
4. 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.
5. Per manufacturer guide, NFC SAR was considered about only hand held condition (Product Specific 10-g).

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 ± 2°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 Tissue Dielectric parameters (100MHz to 6GHz) 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.
For The Tissue Dielectric parameters (9MHz to 19MHz). The parameters must be measured before 24 hours.

1. Tissue Dielectric Parameters (100MHz to 6GHz)
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

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

2. Tissue Dielectric Parameters (9MHz to 19MHz)

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
9	55.0	0.75
13	55.0	0.75
19	55.0	0.75

IEC_IEEE Std 62209-1528 : 2020
Refer to Table 2 within the IEC_IEEE Std 62209-1528 : 2020.

Dielectric Property Measurements Results:

SAR 1 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/03/2024	Head 1750	e'	38.7800	Relative Permittivity (ε_r):	38.78	40.08	-3.25	5
		e''	14.0100	Conductivity (σ):	1.36	1.37	-0.42	5
	Head 1710	e'	38.8800	Relative Permittivity (ε_r):	38.88	40.15	-3.15	5
		e''	14.1000	Conductivity (σ):	1.34	1.35	-0.43	5
	Head 1780	e'	38.7100	Relative Permittivity (ε_r):	38.71	40.04	-3.32	5
		e''	13.9100	Conductivity (σ):	1.38	1.39	-0.66	5
01/03/2024	Head 1900	e'	38.6000	Relative Permittivity (ε_r):	38.60	40.00	-3.50	5
		e''	13.5800	Conductivity (σ):	1.43	1.40	2.48	5
	Head 1850	e'	38.6200	Relative Permittivity (ε_r):	38.62	40.00	-3.45	5
		e''	13.6900	Conductivity (σ):	1.41	1.40	0.59	5
	Head 1915	e'	38.6000	Relative Permittivity (ε_r):	38.60	40.00	-3.50	5
		e''	13.5500	Conductivity (σ):	1.44	1.40	3.06	5

SAR 2 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/11/2024	Head 835	e'	41.4100	Relative Permittivity (ε_r):	41.41	41.50	-0.22	5
		e''	20.1500	Conductivity (σ):	0.94	0.90	3.95	5
	Head 810	e'	41.4700	Relative Permittivity (ε_r):	41.47	41.65	-0.44	5
		e''	20.6000	Conductivity (σ):	0.93	0.90	3.35	5
	Head 850	e'	41.3800	Relative Permittivity (ε_r):	41.38	41.50	-0.29	5
		e''	19.8900	Conductivity (σ):	0.94	0.92	2.74	5
01/15/2024	Head 2600	e'	39.8600	Relative Permittivity (ε_r):	39.25	39.01	0.61	5
		e''	13.3300	Conductivity (σ):	1.91	1.96	-2.86	5
	Head 2495	e'	40.0500	Relative Permittivity (ε_r):	39.37	39.14	0.58	5
		e''	13.2500	Conductivity (σ):	1.82	1.85	-1.71	5
	Head 2700	e'	39.6700	Relative Permittivity (ε_r):	39.03	38.88	0.37	5
		e''	13.4100	Conductivity (σ):	1.99	2.07	-3.83	5
01/15/2024	Head 2450	e'	40.1300	Relative Permittivity (ε_r):	40.13	39.20	2.37	5
		e''	13.2300	Conductivity (σ):	1.80	1.80	0.13	5
	Head 2400	e'	40.2300	Relative Permittivity (ε_r):	40.23	39.30	2.37	5
		e''	13.2200	Conductivity (σ):	1.76	1.75	0.72	5
	Head 2500	e'	40.0400	Relative Permittivity (ε_r):	40.04	39.14	2.31	5
		e''	13.2500	Conductivity (σ):	1.84	1.85	-0.66	5
01/18/2024	Head 2450	e'	37.6600	Relative Permittivity (ε_r):	37.66	39.20	-3.93	5
		e''	13.3500	Conductivity (σ):	1.82	1.80	1.04	5
	Head 2400	e'	37.7400	Relative Permittivity (ε_r):	37.74	39.30	-3.96	5
		e''	13.3700	Conductivity (σ):	1.78	1.75	1.86	5
	Head 2500	e'	37.6000	Relative Permittivity (ε_r):	37.60	39.14	-3.93	5
		e''	13.3300	Conductivity (σ):	1.85	1.85	-0.06	5
01/22/2024	Head 2450	e'	38.3400	Relative Permittivity (ε_r):	38.34	39.20	-2.19	5
		e''	13.0200	Conductivity (σ):	1.77	1.80	-1.46	5
	Head 2400	e'	38.4300	Relative Permittivity (ε_r):	38.43	39.30	-2.21	5
		e''	13.0400	Conductivity (σ):	1.74	1.75	-0.66	5
	Head 2500	e'	38.2700	Relative Permittivity (ε_r):	38.27	39.14	-2.22	5
		e''	13.0300	Conductivity (σ):	1.81	1.85	-2.31	5
01/26/2024	Head 2450	e'	37.9600	Relative Permittivity (ε_r):	37.96	39.20	-3.16	5
		e''	13.4500	Conductivity (σ):	1.83	1.80	1.79	5
	Head 2400	e'	38.0300	Relative Permittivity (ε_r):	38.03	39.30	-3.22	5
		e''	13.4700	Conductivity (σ):	1.80	1.75	2.62	5
	Head 2500	e'	37.9000	Relative Permittivity (ε_r):	37.90	39.14	-3.16	5
		e''	13.4600	Conductivity (σ):	1.87	1.85	0.92	5

SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/09/2024	Head 1750	e'	39.8600	Relative Permittivity (ε_r):	39.86	40.08	-0.56	5
		e''	13.5800	Conductivity (σ):	1.32	1.37	-3.47	5
	Head 1710	e'	39.9400	Relative Permittivity (ε_r):	39.94	40.15	-0.51	5
		e''	13.6300	Conductivity (σ):	1.30	1.35	-3.75	5
	Head 1780	e'	39.7800	Relative Permittivity (ε_r):	39.78	40.04	-0.65	5
		e''	13.5100	Conductivity (σ):	1.34	1.39	-3.52	5
01/09/2024	Head 1900	e'	39.5900	Relative Permittivity (ε_r):	39.59	40.00	-1.02	5
		e''	13.1500	Conductivity (σ):	1.39	1.40	-0.77	5
	Head 1850	e'	39.6400	Relative Permittivity (ε_r):	39.64	40.00	-0.90	5
		e''	13.2900	Conductivity (σ):	1.37	1.40	-2.35	5
	Head 1915	e'	39.5800	Relative Permittivity (ε_r):	39.58	40.00	-1.05	5
		e''	13.1100	Conductivity (σ):	1.40	1.40	-0.29	5
01/15/2024	Head 1750	e'	39.3200	Relative Permittivity (ε_r):	39.32	40.08	-1.91	5
		e''	13.6000	Conductivity (σ):	1.32	1.37	-3.33	5
	Head 1710	e'	39.3500	Relative Permittivity (ε_r):	39.35	40.15	-1.98	5
		e''	13.7100	Conductivity (σ):	1.30	1.35	-3.18	5
	Head 1780	e'	39.2900	Relative Permittivity (ε_r):	39.29	40.04	-1.87	5
		e''	13.5400	Conductivity (σ):	1.34	1.39	-3.30	5
01/15/2024	Head 1900	e'	39.0000	Relative Permittivity (ε_r):	39.00	40.00	-2.50	5
		e''	13.1700	Conductivity (σ):	1.39	1.40	-0.62	5
	Head 1850	e'	39.1100	Relative Permittivity (ε_r):	39.11	40.00	-2.23	5
		e''	13.3600	Conductivity (σ):	1.37	1.40	-1.84	5
	Head 1915	e'	38.9700	Relative Permittivity (ε_r):	38.97	40.00	-2.58	5
		e''	13.1100	Conductivity (σ):	1.40	1.40	-0.29	5
01/18/2024	Head 1750	e'	40.1800	Relative Permittivity (ε_r):	40.18	40.08	0.24	5
		e''	13.5500	Conductivity (σ):	1.32	1.37	-3.69	5
	Head 1710	e'	40.2500	Relative Permittivity (ε_r):	40.25	40.15	0.26	5
		e''	13.6600	Conductivity (σ):	1.30	1.35	-3.54	5
	Head 1780	e'	40.1000	Relative Permittivity (ε_r):	40.10	40.04	0.15	5
		e''	13.4300	Conductivity (σ):	1.33	1.39	-4.09	5
01/18/2024	Head 1900	e'	39.7600	Relative Permittivity (ε_r):	39.76	40.00	-0.60	5
		e''	12.9300	Conductivity (σ):	1.37	1.40	-2.43	5
	Head 1850	e'	39.7900	Relative Permittivity (ε_r):	39.79	40.00	-0.53	5
		e''	13.0200	Conductivity (σ):	1.34	1.40	-4.33	5
	Head 1915	e'	39.7500	Relative Permittivity (ε_r):	39.75	40.00	-0.63	5
		e''	12.9100	Conductivity (σ):	1.37	1.40	-1.81	5
01/22/2024	Head 1750	e'	39.8100	Relative Permittivity (ε_r):	39.81	40.08	-0.69	5
		e''	13.6400	Conductivity (σ):	1.33	1.37	-3.05	5
	Head 1710	e'	39.8800	Relative Permittivity (ε_r):	39.88	40.15	-0.66	5
		e''	13.7500	Conductivity (σ):	1.31	1.35	-2.90	5
	Head 1780	e'	39.7700	Relative Permittivity (ε_r):	39.77	40.04	-0.67	5
		e''	13.5400	Conductivity (σ):	1.34	1.39	-3.30	5
01/22/2024	Head 1900	e'	39.6500	Relative Permittivity (ε_r):	39.65	40.00	-0.88	5
		e''	13.2300	Conductivity (σ):	1.40	1.40	-0.16	5
	Head 1850	e'	39.6900	Relative Permittivity (ε_r):	39.69	40.00	-0.78	5
		e''	13.3500	Conductivity (σ):	1.37	1.40	-1.91	5
	Head 1915	e'	39.6300	Relative Permittivity (ε_r):	39.63	40.00	-0.92	5
		e''	13.2000	Conductivity (σ):	1.41	1.40	0.40	5
01/29/2024	Head 2450	e'	38.7100	Relative Permittivity (ε_r):	38.71	39.20	-1.25	5
		e''	13.3400	Conductivity (σ):	1.82	1.80	0.96	5
	Head 2400	e'	38.7500	Relative Permittivity (ε_r):	38.75	39.30	-1.39	5
		e''	13.4600	Conductivity (σ):	1.80	1.75	2.54	5
	Head 2480	e'	38.6900	Relative Permittivity (ε_r):	38.69	39.16	-1.21	5
		e''	13.2800	Conductivity (σ):	1.83	1.83	-0.06	5

SAR 4 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/05/2024	Head 750	e'	41.1600	Relative Permittivity (ϵ_r):	41.16	41.96	-1.91	5
		e"	21.4600	Conductivity (σ):	0.89	0.89	0.21	5
	Head 660	e'	41.4100	Relative Permittivity (ϵ_r):	41.41	42.42	-2.39	5
		e"	23.6400	Conductivity (σ):	0.87	0.89	-2.10	5
	Head 800	e'	41.0200	Relative Permittivity (ϵ_r):	41.02	41.71	-1.64	5
		e"	20.4500	Conductivity (σ):	0.91	0.90	1.42	5
01/05/2024	Head 835	e'	40.9500	Relative Permittivity (ϵ_r):	40.95	41.50	-1.33	5
		e"	19.8300	Conductivity (σ):	0.92	0.90	2.30	5
	Head 810	e'	41.0100	Relative Permittivity (ϵ_r):	41.01	41.65	-1.55	5
		e"	20.2700	Conductivity (σ):	0.91	0.90	1.70	5
	Head 850	e'	40.9200	Relative Permittivity (ϵ_r):	40.92	41.50	-1.40	5
		e"	19.5900	Conductivity (σ):	0.93	0.92	1.19	5
01/09/2024	Head 750	e'	43.1500	Relative Permittivity (ϵ_r):	43.15	41.96	2.83	5
		e"	21.0100	Conductivity (σ):	0.88	0.89	-1.89	5
	Head 660	e'	43.4200	Relative Permittivity (ϵ_r):	43.42	42.42	2.35	5
		e"	23.1300	Conductivity (σ):	0.85	0.89	-4.21	5
	Head 800	e'	43.0000	Relative Permittivity (ϵ_r):	43.00	41.71	3.10	5
		e"	20.0700	Conductivity (σ):	0.89	0.90	-0.46	5
01/09/2024	Head 835	e'	42.9100	Relative Permittivity (ϵ_r):	42.91	41.50	3.40	5
		e"	19.4900	Conductivity (σ):	0.90	0.90	0.54	5
	Head 810	e'	42.9700	Relative Permittivity (ϵ_r):	42.97	41.65	3.16	5
		e"	19.9000	Conductivity (σ):	0.90	0.90	-0.16	5
	Head 850	e'	42.8700	Relative Permittivity (ϵ_r):	42.87	41.50	3.30	5
		e"	19.2500	Conductivity (σ):	0.91	0.92	-0.57	5
01/09/2024	Head 3500	e'	37.2300	Relative Permittivity (ϵ_r):	37.23	37.93	-1.84	5
		e"	14.5700	Conductivity (σ):	2.84	2.91	-2.61	5
	Head 3600	e'	37.0100	Relative Permittivity (ϵ_r):	37.01	37.82	-2.13	5
		e"	14.7000	Conductivity (σ):	2.94	3.01	-2.37	5
	Head 3700	e'	36.7900	Relative Permittivity (ϵ_r):	36.79	37.70	-2.42	5
		e"	14.8100	Conductivity (σ):	3.05	3.12	-2.23	5
	Head 3800	e'	36.5600	Relative Permittivity (ϵ_r):	36.56	37.59	-2.73	5
		e"	14.9200	Conductivity (σ):	3.15	3.22	-2.05	5
	Head 3900	e'	36.3400	Relative Permittivity (ϵ_r):	36.34	37.47	-3.02	5
		e"	15.0200	Conductivity (σ):	3.26	3.32	-1.92	5
	Head 3980	e'	36.1700	Relative Permittivity (ϵ_r):	36.17	37.38	-3.24	5
		e"	15.1100	Conductivity (σ):	3.34	3.40	-1.73	5
01/15/2024	Head 750	e'	42.6000	Relative Permittivity (ϵ_r):	42.60	41.96	1.52	5
		e"	21.1200	Conductivity (σ):	0.88	0.89	-1.38	5
	Head 660	e'	42.9300	Relative Permittivity (ϵ_r):	42.93	42.42	1.19	5
		e"	23.3000	Conductivity (σ):	0.86	0.89	-3.51	5
	Head 800	e'	42.4600	Relative Permittivity (ϵ_r):	42.46	41.71	1.81	5
		e"	20.1400	Conductivity (σ):	0.90	0.90	-0.12	5
01/15/2024	Head 835	e'	42.3700	Relative Permittivity (ϵ_r):	42.37	41.50	2.10	5
		e"	19.5200	Conductivity (σ):	0.91	0.90	0.70	5
	Head 810	e'	42.4300	Relative Permittivity (ϵ_r):	42.43	41.65	1.86	5
		e"	19.9600	Conductivity (σ):	0.90	0.90	0.14	5
	Head 850	e'	42.3400	Relative Permittivity (ϵ_r):	42.34	41.50	2.02	5
		e"	19.2700	Conductivity (σ):	0.91	0.92	-0.46	5
01/19/2024	Head 5200	e'	36.8900	Relative Permittivity (ϵ_r):	36.89	35.99	2.50	5
		e"	16.0100	Conductivity (σ):	4.63	4.65	-0.47	5
	Head 5250	e'	36.8100	Relative Permittivity (ϵ_r):	36.81	35.93	2.44	5
		e"	16.0500	Conductivity (σ):	4.69	4.70	-0.36	5
	Head 5600	e'	36.1000	Relative Permittivity (ϵ_r):	36.10	35.53	1.59	5
		e"	16.2900	Conductivity (σ):	5.07	5.06	0.24	5
	Head 5750	e'	35.6600	Relative Permittivity (ϵ_r):	35.66	35.36	0.84	5
		e"	16.3600	Conductivity (σ):	5.23	5.21	0.32	5
	Head 5800	e'	35.5400	Relative Permittivity (ϵ_r):	35.54	35.30	0.68	5
		e"	16.4000	Conductivity (σ):	5.29	5.27	0.36	5
	Head 5925	e'	35.1900	Relative Permittivity (ϵ_r):	35.19	35.20	-0.03	5
		e"	16.4300	Conductivity (σ):	5.41	5.40	0.24	5

SAR 5 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/02/2024	Head 2600	e'	37.7300	Relative Permittivity (ε_r):	37.73	39.01	-3.28	5
		e''	13.2100	Conductivity (σ):	1.91	1.96	-2.67	5
	Head 2495	e'	37.9200	Relative Permittivity (ε_r):	37.92	39.14	-3.13	5
		e''	13.1600	Conductivity (σ):	1.83	1.85	-1.24	5
	Head 2700	e'	37.5400	Relative Permittivity (ε_r):	37.54	38.88	-3.46	5
		e''	13.2500	Conductivity (σ):	1.99	2.07	-3.92	5
01/08/2024	Head 2600	e'	39.6100	Relative Permittivity (ε_r):	39.61	39.01	1.54	5
		e''	13.1300	Conductivity (σ):	1.90	1.96	-3.26	5
	Head 2495	e'	39.5700	Relative Permittivity (ε_r):	39.57	39.14	1.09	5
		e''	13.0300	Conductivity (σ):	1.81	1.85	-2.22	5
	Head 2700	e'	39.4000	Relative Permittivity (ε_r):	39.40	38.88	1.33	5
		e''	13.1900	Conductivity (σ):	1.98	2.07	-4.35	5
01/12/2024	Head 2600	e'	39.8200	Relative Permittivity (ε_r):	39.82	39.01	2.07	5
		e''	13.2800	Conductivity (σ):	1.92	1.96	-2.16	5
	Head 2495	e'	40.0800	Relative Permittivity (ε_r):	40.08	39.14	2.39	5
		e''	13.3000	Conductivity (σ):	1.85	1.85	-0.19	5
	Head 2700	e'	39.6700	Relative Permittivity (ε_r):	39.67	38.88	2.02	5
		e''	13.2200	Conductivity (σ):	1.98	2.07	-4.13	5
01/16/2024	Head 2600	e'	38.7300	Relative Permittivity (ε_r):	38.73	39.01	-0.72	5
		e''	13.5400	Conductivity (σ):	1.96	1.96	-0.24	5
	Head 2495	e'	38.9100	Relative Permittivity (ε_r):	38.91	39.14	-0.60	5
		e''	13.8300	Conductivity (σ):	1.92	1.85	3.79	5
	Head 2700	e'	38.6700	Relative Permittivity (ε_r):	38.67	38.88	-0.55	5
		e''	13.2500	Conductivity (σ):	1.99	2.07	-3.92	5
01/22/2024	Head 2600	e'	38.9000	Relative Permittivity (ε_r):	38.90	39.01	-0.28	5
		e''	13.3400	Conductivity (σ):	1.93	1.96	-1.71	5
	Head 2495	e'	39.0300	Relative Permittivity (ε_r):	39.03	39.14	-0.29	5
		e''	13.2100	Conductivity (σ):	1.83	1.85	-0.87	5
	Head 2700	e'	38.6900	Relative Permittivity (ε_r):	38.69	38.88	-0.50	5
		e''	13.4600	Conductivity (σ):	2.02	2.07	-2.39	5

SAR 6 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/22/2024	Head 1750	e'	40.9100	Relative Permittivity (ε_r):	40.91	40.08	2.06	5
		e''	13.5700	Conductivity (σ):	1.32	1.37	-3.55	5
	Head 1710	e'	41.0000	Relative Permittivity (ε_r):	41.00	40.15	2.13	5
		e''	13.6600	Conductivity (σ):	1.30	1.35	-3.54	5
	Head 1780	e'	40.8500	Relative Permittivity (ε_r):	40.85	40.04	2.03	5
		e''	13.4800	Conductivity (σ):	1.33	1.39	-3.73	5
01/22/2024	Head 1900	e'	40.7600	Relative Permittivity (ε_r):	40.76	40.00	1.90	5
		e''	13.1900	Conductivity (σ):	1.39	1.40	-0.47	5
	Head 1850	e'	40.7800	Relative Permittivity (ε_r):	40.78	40.00	1.95	5
		e''	13.2800	Conductivity (σ):	1.37	1.40	-2.42	5
	Head 1915	e'	40.7600	Relative Permittivity (ε_r):	40.76	40.00	1.90	5
		e''	13.1600	Conductivity (σ):	1.40	1.40	0.09	5

SAR 7 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/22/2024	Head 13	e'	54.06	Relative Permittivity (ϵ_r):	54.06	55.00	-1.71	5
		e"	1005.00	Conductivity (σ):	0.73	0.75	-3.14	5
	Head 12	e'	54.10	Relative Permittivity (ϵ_r):	54.10	55.00	-1.64	5
		e"	1089.00	Conductivity (σ):	0.73	0.75	-3.12	5
	Head 14	e'	54.02	Relative Permittivity (ϵ_r):	54.02	55.00	-1.78	5
		e"	933.80	Conductivity (σ):	0.73	0.75	-3.08	5
01/24/2024	Head 5200	e'	35.61	Relative Permittivity (εr):	35.61	35.99	-1.06	5
		e"	15.82	Conductivity (σ):	4.57	4.65	-1.65	5
	Head 5250	e'	35.66	Relative Permittivity (εr):	35.66	35.93	-0.76	5
		e"	16.01	Conductivity (σ):	4.67	4.70	-0.61	5
	Head 5600	e'	34.90	Relative Permittivity (εr):	34.90	35.53	-1.78	5
		e"	16.23	Conductivity (σ):	5.05	5.06	-0.13	5
	Head 5750	e'	35.21	Relative Permittivity (εr):	35.21	35.36	-0.43	5
		e"	16.51	Conductivity (σ):	5.28	5.21	1.24	5
	Head 5800	e'	35.28	Relative Permittivity (εr):	35.28	35.30	-0.06	5
		e"	16.14	Conductivity (σ):	5.21	5.27	-1.23	5
	Head 5925	e'	34.53	Relative Permittivity (εr):	34.53	35.20	-1.90	5
		e"	15.87	Conductivity (σ):	5.23	5.40	-3.18	5
01/26/2024	Head 5200	e'	35.4400	Relative Permittivity (ϵ_r):	35.44	35.99	-1.53	5
		e"	15.6700	Conductivity (σ):	4.53	4.65	-2.58	5
	Head 5250	e'	35.4900	Relative Permittivity (ϵ_r):	35.49	35.93	-1.23	5
		e"	15.6500	Conductivity (σ):	4.57	4.70	-2.84	5
	Head 5600	e'	34.7600	Relative Permittivity (ϵ_r):	34.76	35.53	-2.18	5
		e"	16.0500	Conductivity (σ):	5.00	5.06	-1.24	5
	Head 5750	e'	34.8800	Relative Permittivity (ϵ_r):	34.88	35.36	-1.37	5
		e"	16.3100	Conductivity (σ):	5.21	5.21	0.02	5
	Head 5800	e'	35.0600	Relative Permittivity (ϵ_r):	35.06	35.30	-0.68	5
		e"	15.9000	Conductivity (σ):	5.13	5.27	-2.70	5
	Head 5925	e'	34.2600	Relative Permittivity (ϵ_r):	34.26	35.20	-2.67	5
		e"	15.6700	Conductivity (σ):	5.16	5.40	-4.40	5

SAR 8 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
01/22/2024	Head 5250	e'	35.7100	Relative Permittivity (ϵ_r):	35.71	35.93	-0.62	5
		e"	15.6600	Conductivity (σ):	4.57	4.70	-2.78	5
	Head 5260	e'	35.6900	Relative Permittivity (ϵ_r):	35.69	35.92	-0.65	5
		e"	15.6700	Conductivity (σ):	4.58	4.71	-2.74	5
	Head 5600	e'	35.0800	Relative Permittivity (ϵ_r):	35.08	35.53	-1.28	5
		e"	15.9400	Conductivity (σ):	4.96	5.06	-1.91	5
	Head 5800	e'	34.7100	Relative Permittivity (ϵ_r):	34.71	35.30	-1.67	5
		e"	16.0800	Conductivity (σ):	5.19	5.27	-1.60	5
	Head 5925	e'	34.4800	Relative Permittivity (ϵ_r):	34.48	35.20	-2.05	5
		e"	16.1500	Conductivity (σ):	5.32	5.40	-1.47	5
01/23/2024	Head 5250	e'	36.6100	Relative Permittivity (ϵ_r):	36.61	35.93	1.88	5
		e"	15.9000	Conductivity (σ):	4.64	4.70	-1.29	5
	Head 5260	e'	36.5900	Relative Permittivity (ϵ_r):	36.59	35.92	1.86	5
		e"	15.9100	Conductivity (σ):	4.65	4.71	-1.25	5
	Head 5600	e'	35.9100	Relative Permittivity (ϵ_r):	35.91	35.53	1.06	5
		e"	16.1900	Conductivity (σ):	5.04	5.06	-0.38	5
	Head 5800	e'	35.4000	Relative Permittivity (ϵ_r):	35.40	35.30	0.28	5
		e"	16.3500	Conductivity (σ):	5.27	5.27	0.05	5
	Head 5925	e'	35.1000	Relative Permittivity (ϵ_r):	35.10	35.20	-0.28	5
		e"	16.4300	Conductivity (σ):	5.41	5.40	0.24	5
01/26/2024	Head 5200	e'	35.4000	Relative Permittivity (ϵ_r):	35.40	35.99	-1.64	5
		e"	15.6300	Conductivity (σ):	4.52	4.65	-2.83	5
	Head 5250	e'	35.3000	Relative Permittivity (ϵ_r):	35.30	35.93	-1.76	5
		e"	15.6900	Conductivity (σ):	4.58	4.70	-2.59	5
	Head 5600	e'	34.6300	Relative Permittivity (ϵ_r):	34.63	35.53	-2.54	5
		e"	15.9700	Conductivity (σ):	4.97	5.06	-1.73	5
	Head 5800	e'	34.2500	Relative Permittivity (ϵ_r):	34.25	35.30	-2.97	5
		e"	16.1300	Conductivity (σ):	5.20	5.27	-1.29	5
	Head 5925	e'	34.0200	Relative Permittivity (ϵ_r):	34.02	35.20	-3.35	5
		e"	16.2200	Conductivity (σ):	5.34	5.40	-1.04	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 of 100MHZ to 6GHz frequency range 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.
For The System verification of 9MHz to 19MHz frequency range, The System verification must be performed before 24 hours.

System Performance Check Measurement Conditions (100MHz to 6GHz):

- 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.

System Performance Check Measurement Conditions (13MHz):

- 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
- The DASY system with an E-Field Probe was used for the measurements.
- The CLA(Confined Loop Antennas) was mounted on the small tripod so that the CLA feed point was positioned below the center marking of the flat phantom section and the CLA was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 0 mm separation distance from CLA center to the Phantom surface.
- The CLA 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	04/18/2023	04/18/2024	1g	8.58
				10g	5.65
D835V2	4d174	09/21/2022	09/21/2024	1g	9.63
				10g	6.29
D835V2	4d194	03/24/2022	03/24/2024	1g	9.77
				10g	6.39
D1750V2	1125	11/30/2022	11/30/2023	1g	37.40
				10g	19.70
D1750V2	1180	09/21/2022	09/21/2024	1g	35.60
				10g	18.90
D1900V2	5d190	11/16/2022	11/16/2023	1g	39.70
				10g	20.70
D1900V2	5d199	03/25/2022	03/25/2024	1g	39.40
				10g	20.50
D2450V2	960	03/24/2022	03/24/2024	1g	51.90
				10g	24.00
D2600V2	1097	09/26/2023	09/26/2024	1g	57.30
				10g	25.70
D2600V2	1178	04/25/2023	04/25/2024	1g	57.40
				10g	25.70
D5GHzV2 (5250)	1325	04/21/2023	04/21/2024	1g	79.60
				10g	22.70
D5GHzV2 (5600)				1g	83.90
				10g	23.80
D5GHzV2 (5750)				1g	80.40
				10g	22.70
CLA-13	1015	08/22/2023	08/22/2024	1g	0.53
				10g	0.33

Note(s):

1. For System Validation Dipole, Calibration interval applied every 2 years according to referencing KDB 865664 guidance.
2. For CLA, Calibration interval applied every year.
3. Refer to Appendix F that mentioned about justification

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 ±10 %	Plot No.
	Type	Serial #			Zoom Scan to 100 mW	Normalize to 1 W			
01/03/2024	D1750V2	1180	Head	1g	3.48	34.8	35.60	-2.25	
				10g	1.84	18.4	18.90	-2.65	
01/03/2024	D1900V2	5d199	Head	1g	3.77	37.7	39.40	-4.31	1
				10g	1.94	19.4	20.50	-5.37	

SAR 2 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			
01/11/2024	D835V2	4d174	Head	1g	0.90	9.0	9.63	-6.85	2
				10g	0.59	5.9	6.29	-6.68	
01/15/2024	D2600V2	1097	Head	1g	5.98	59.8	57.30	4.36	
				10g	2.69	26.9	25.70	4.67	
01/15/2024	D2450V2	960	Head	1g	4.91	49.1	51.90	-5.39	
				10g	2.28	22.8	24.00	-5.00	
01/18/2024	D2450V2	960	Head	1g	5.27	52.7	51.90	1.54	
				10g	2.44	24.4	24.00	1.67	
01/22/2024	D2450V2	960	Head	1g	5.15	51.5	51.90	-0.77	
				10g	2.39	23.9	24.00	-0.42	
01/26/2024	D2450V2	960	Head	1g	5.16	51.6	51.90	-0.58	
				10g	2.39	23.9	24.00	-0.42	

SAR 3 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			
01/09/2024	D1750V2	1180	Head	1g	3.39	33.9	35.60	-4.78	3
				10g	1.93	19.3	18.90	2.12	
01/09/2024	D1900V2	5d199	Head	1g	3.90	39.0	39.40	-1.02	
				10g	2.13	21.3	20.50	3.90	
01/15/2024	D1750V2	1125	Head	1g	3.77	37.7	37.40	0.80	
				10g	2.09	20.9	19.70	6.09	
01/15/2024	D1900V2	5d190	Head	1g	3.78	37.8	39.70	-4.79	
				10g	2.07	20.7	20.70	0.00	
01/18/2024	D1750V2	1125	Head	1g	3.86	38.6	37.40	3.21	
				10g	2.14	21.4	19.70	8.63	
01/18/2024	D1900V2	5d190	Head	1g	3.71	37.1	39.70	-6.55	4
				10g	2.00	20.0	20.70	-3.38	
01/22/2024	D1750V2	1125	Head	1g	3.64	36.4	37.40	-2.67	
				10g	2.04	20.4	19.70	3.55	
01/22/2024	D1900V2	5d190	Head	1g	4.00	40.0	39.70	0.76	
				10g	2.20	22.0	20.70	6.28	
01/24/2024	D835V2	4d194	Head	1g	1.00	10.0	9.77	2.35	
				10g	0.69	6.9	6.39	7.67	
01/29/2024	D2450V2	960	Head	1g	4.88	48.8	51.90	-5.97	5
				10g	2.39	23.9	24.00	-0.42	

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			
01/05/2024	D750V3	1205	Head	1g	0.83	8.3	8.55	-2.57	
				10g	0.55	5.5	5.59	-1.07	
01/05/2024	D835V2	4d194	Head	1g	1.00	10.0	9.77	2.15	6
				10g	0.66	6.6	6.39	2.97	
01/09/2024	D750V3	1205	Head	1g	0.84	8.4	8.55	-1.99	
				10g	0.56	5.6	5.59	-0.54	
01/09/2024	D835V2	4d174	Head	1g	1.02	10.2	9.63	5.92	
				10g	0.68	6.8	6.29	7.79	
01/15/2024	D750V3	1205	Head	1g	0.81	8.1	8.55	-5.26	7
				10g	0.56	5.6	5.59	0.00	
01/15/2024	D835V2	4d174	Head	1g	0.90	9.0	9.63	-6.54	
				10g	0.62	6.2	6.29	-2.07	
01/19/2024	D5GHzV2	1209	Head	1g	8.24	82.4	80.40	2.49	
				10g	2.44	24.4	22.90	6.55	
01/19/2024	D5GHzV2	1209	Head	1g	8.65	86.5	83.10	4.09	
				10g	2.53	25.3	23.60	7.20	
01/19/2024	D5GHzV2 (5800)	1209	Head	1g	8.25	82.5	78.90	4.56	
				10g	2.40	24.0	22.90	4.80	

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			
01/02/2024	D2600V2	1178	Head	1g	5.37	53.7	57.40	-6.45	
				10g	2.42	24.2	25.70	-5.84	
01/08/2024	D2600V2	1178	Head	1g	5.44	54.4	57.40	-5.23	
				10g	2.47	24.7	25.70	-3.89	
01/12/2024	D2600V2	1178	Head	1g	5.35	53.5	57.40	-6.79	8
				10g	2.40	24.0	25.70	-6.61	
01/16/2024	D2600V2	1097	Head	1g	5.21	52.1	57.30	-9.08	9
				10g	2.35	23.5	25.70	-8.56	
01/22/2024	D2600V2	1097	Head	1g	5.45	54.5	57.30	-4.89	
				10g	2.39	23.9	25.70	-7.00	

SAR 6 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			
01/22/2024	D1750V2	1125	Head	1g	3.46	34.6	37.40	-7.49	10
				10g	1.84	18.4	19.70	-6.60	
01/22/2024	D1900V2	5d190	Head	1g	3.76	37.6	39.70	-5.29	
				10g	1.95	19.5	20.70	-5.80	

SAR 7 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			
01/22/2024	CLA-13	1015	Head	1g	0.05	0.5	0.53	1.31	11
				10g	0.03	0.3	0.33	-0.90	
01/24/2024	D5GHzV2(5250)	1325	Head	1g	7.91	79.1	79.60	-0.63	
				10g	2.34	23.4	22.70	3.08	
01/24/2024	D5GHzV2(5600)	1325	Head	1g	8.59	85.9	83.90	2.38	
				10g	2.52	25.2	23.80	5.88	
01/24/2024	D5GHzV2 (5800)	1325	Head	1g	7.73	77.3	80.50	-3.98	
				10g	2.26	22.6	22.50	0.44	
01/26/2024	D5GHzV2(5250)	1325	Head	1g	8.25	82.5	79.60	3.64	
				10g	2.45	24.5	22.70	7.93	
01/26/2024	D5GHzV2(5600)	1325	Head	1g	7.78	77.8	83.90	-7.27	12
				10g	2.29	22.9	23.80	-3.78	

SAR 8 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			
01/22/2024	D5GHzV2 (5600)	1325	Head	1g	8.61	86.1	83.90	2.62	
				10g	2.49	24.9	23.80	4.62	
01/22/2024	D5GHzV2 (5800)	1325	Head	1g	7.87	78.7	80.50	-2.24	
				10g	2.28	22.8	22.50	1.33	
01/23/2024	D5GHzV2 (5250)	1325	Head	1g	7.85	78.5	79.60	-1.38	
				10g	2.24	22.4	22.70	-1.32	
01/26/2024	D5GHzV2 (5600)	1325	Head	1g	8.24	82.4	83.90	-1.79	
				10g	2.40	24.0	23.80	0.84	
01/26/2024	D5GHzV2 (5800)	1325	Head	1g	7.85	78.5	80.50	-2.48	
				10g	2.28	22.8	22.50	1.33	
01/30/2024	D5GHzV2 (5800)	1325	Head	1g	7.81	78.10	80.50	-2.98	13
				10g	2.27	22.70	22.50	0.89	

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 (Main.1) Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)			
					RSI=Pmax, Free, Rcv, Hotspot, Earjack			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	128	824.2	33.97	24.78	34.0	24.8
			190	836.6	33.87	24.68		
			251	848.8	33.66	24.47		
GPRS (GMSK)	CS1	1	128	824.2	33.98	24.79	34.0	24.8
			190	836.6	33.39	24.20		
			251	848.8	33.42	24.23		
		2	128	824.2	31.08	24.90	32.0	25.8
			190	836.6	31.33	25.15		
			251	848.8	31.28	25.10		
		3	128	824.2	29.98	25.56	31.0	26.6
			190	836.6	30.17	25.75		
			251	848.8	29.86	25.44		
		4	128	824.2	28.59	25.42	29.5	26.3
			190	836.6	28.80	25.63		
			251	848.8	28.72	25.55		
EGPRS (8PSK)	MCS5	1	128	824.2	27.12	17.93	28.0	18.8
			190	836.6	27.47	18.28		
			251	19.01	27.10	17.91		
		2	128	19.04	25.32	19.14	26.5	20.3
			190	836.6	25.50	19.32		
			251	848.8	25.17	18.99		
		3	128	824.2	23.79	19.37	25.0	20.6
			190	836.6	24.25	19.83		
			251	848.8	23.96	19.54		
		4	128	824.2	22.60	19.43	23.5	20.3
			190	836.6	22.99	19.82		
			251	848.8	22.69	19.52		

Notes:

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

- GMSK (GPRS) mode with 2 time slots for RSI Free, RCV, Hotspot, Earjack 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 (Main.1) Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)				Maximum Allowed Average Power (dBm)			
					RSI=Pmax, Rcv				RSI=Free, Hotspot, Earjack			
					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	512	1850.2	29.64	20.45	31.0	21.8	26.30	17.11	28.0	18.8
			661	1880.0	29.71	20.52			26.24	17.05		
			810	1909.8	29.94	20.75			26.85	17.66		
GPRS (GMSK)	CS1	1	512	1850.2	29.19	20.00	31.0	21.8	26.51	17.32	28.0	18.8
			661	1880.0	29.41	20.22			26.43	17.24		
			810	1909.8	29.92	20.73			27.03	17.84		
		2	512	1850.2	27.28	21.10	29.0	22.8	23.55	17.37	25.0	18.8
			661	1880.0	27.40	21.22			23.88	17.70		
			810	1909.8	27.56	21.38			24.49	18.31		
		3	512	1850.2	25.50	21.08	27.5	23.1	21.05	16.63	22.5	18.1
			661	1880.0	26.11	21.69			21.11	16.69		
			810	1909.8	26.24	21.82			21.83	17.41		
		4	512	1850.2	23.77	20.60	25.5	22.3	19.54	16.37	21.0	17.8
			661	1880.0	23.98	20.81			19.71	16.54		
			810	1909.8	24.16	20.99			20.11	16.94		
EGPRS (8PSK)	MCS5	1	512	1850.2	24.11	14.92	26.0	16.8	24.36	15.17	26.0	16.8
			661	1880.0	24.51	15.32			24.31	15.12		
			810	19.01	24.93	15.74			24.85	15.66		
		2	512	19.04	22.21	16.03	24.0	17.8	22.29	16.11	24.0	17.8
			661	1880.0	23.10	16.92			22.45	16.27		
			810	1909.8	23.24	17.06			22.76	16.58		
		3	512	1850.2	21.90	17.48	23.0	18.6	21.13	16.71	23.0	18.6
			661	1880.0	21.49	17.07			21.36	16.94		
			810	1909.8	21.95	17.53			22.13	17.71		
		4	512	1850.2	19.54	16.37	21.5	18.3	19.55	16.38	21.5	18.3
			661	1880.0	19.94	16.77			19.77	16.60		
			810	1909.8	20.36	17.19			20.46	17.29		

Notes:

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

- GMSK (GPRS) mode with 4 time slots for RSI Rcv GMSK (GPRS) mode with 1 time slots for RSI Free, Hotspot, Earjack 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
	βc/βd	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			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	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			
	Ahs=βhs/βc	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
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	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				
	Ahs = βhs/βc	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	Processes	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.		

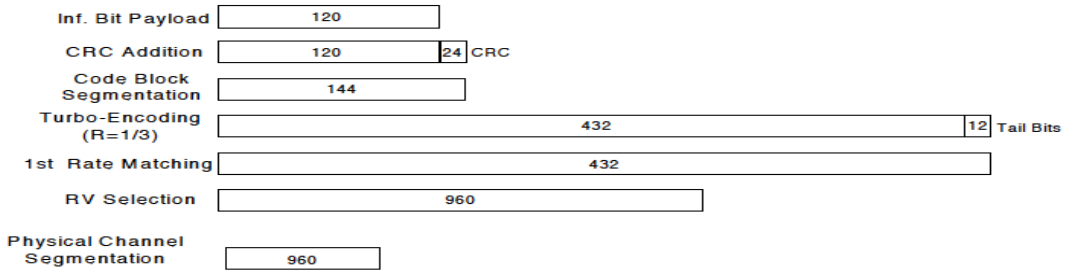


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	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			
	Ahs = βhs/ βc	30/15			

HSPA+

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

W-CDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)		
				RSI=Pmax, Free, Rcv, Hotspot, Earjack		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.68	N/A	25.5
		4183	836.6	24.68		
		4233	846.6	24.63		
HSDPA	Subtest 1	4132	826.4	23.51	0	24.0
		4183	836.6	23.42		
		4233	846.6	23.37		
	Subtest 2	4132	826.4	22.86	0	24.0
		4183	836.6	22.84		
		4233	846.6	22.81		
	Subtest 3	4132	826.4	22.37	0.5	23.5
		4183	836.6	22.38		
		4233	846.6	22.34		
	Subtest 4	4132	826.4	21.86	0.5	23.5
		4183	836.6	21.85		
		4233	846.6	21.83		
HSUPA	Subtest 1	4132	826.4	22.36	0	23.5
		4183	836.6	22.34		
		4233	846.6	22.29		
	Subtest 2	4132	826.4	19.01	2	21.5
		4183	836.6	19.04		
		4233	846.6	19.07		
	Subtest 3	4132	826.4	21.37	1	22.5
		4183	836.6	21.35		
		4233	846.6	21.28		
	Subtest 4	4132	826.4	20.35	2	21.5
		4183	836.6	20.33		
		4233	846.6	20.30		
	Subtest 5	4132	826.4	23.44	0	23.5
		4183	836.6	23.45		
		4233	846.6	23.38		
DC-HSDPA	Subtest 1	4132	826.4	23.44	0	24.0
		4183	836.6	23.43		
		4233	846.6	23.27		
	Subtest 2	4132	826.4	22.85	0	24.0
		4183	836.6	22.86		
		4233	846.6	22.73		
	Subtest 3	4132	826.4	21.41	0.5	23.5
		4183	836.6	21.40		
		4233	846.6	21.24		
	Subtest 4	4132	826.4	21.82	0.5	23.5
		4183	836.6	21.86		
		4233	846.6	21.71		

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.

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.

LTE Band 2 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					Maximum Allowed Average Power (dBm)				
				RSI=Pmax, Rcv					RSI=Free, Hotspot, Earjack				
				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	23.51	23.76	**23.92**	0.0	24.5	18.14	18.13	**18.38**	0.0	19.0
		1	49	23.89	23.58	23.91	0.0	24.5	18.06	18.03	18.29	0.0	19.0
		1	99	23.75	23.80	22.56	0.0	24.5	18.10	18.08	18.31	0.0	19.0
		50	0	22.75	22.81	**22.98**	1.0	23.5	18.15	18.23	**18.47**	0.0	19.0
		50	24	22.72	22.80	22.97	1.0	23.5	18.13	18.22	18.44	0.0	19.0
		50	50	22.68	22.79	22.94	1.0	23.5	18.11	18.24	18.44	0.0	19.0
		100	0	22.70	22.78	22.94	1.0	23.5	18.13	18.22	18.43	0.0	19.0
	16QAM	1	0	23.08	22.66	23.09	1.0	23.5	18.50	18.19	18.69	0.0	19.0
		1	49	23.12	22.77	23.13	1.0	23.5	18.38	18.20	18.63	0.0	19.0
		1	99	22.90	22.70	22.42	1.0	23.5	18.34	18.22	18.64	0.0	19.0
		50	0	21.69	21.75	21.88	2.0	22.5	18.17	18.23	18.44	0.0	19.0
		50	24	21.64	21.75	21.82	2.0	22.5	18.15	18.23	18.40	0.0	19.0
		50	50	21.58	21.73	21.83	2.0	22.5	18.12	18.23	18.41	0.0	19.0
		100	0	21.64	21.72	21.84	2.0	22.5	18.16	18.22	18.50	0.0	19.0
	64QAM	1	0	21.55	21.55	21.80	2.0	22.5	18.34	18.41	18.56	0.0	19.0
		1	49	21.67	21.53	21.74	2.0	22.5	18.26	18.31	18.46	0.0	19.0
		1	99	21.66	21.56	21.26	2.0	22.5	18.28	18.43	18.48	0.0	19.0
		50	0	20.39	20.44	20.68	3.0	21.5	18.23	18.24	18.49	0.0	19.0
		50	24	20.35	20.45	20.64	3.0	21.5	18.21	18.25	18.45	0.0	19.0
		50	50	20.32	20.44	20.68	3.0	21.5	18.17	18.27	18.49	0.0	19.0
		100	0	20.34	20.40	20.65	3.0	21.5	18.18	18.23	18.43	0.0	19.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18675	18900	19125			18675	18900	19125		
				1857.5 MHz	1880 MHz	1902.5 MHz			1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	23.71	23.69	23.87	0.0	24.5	18.10	18.17	18.33	0.0	19.0
		1	37	23.54	23.67	23.83	0.0	24.5	17.99	18.06	18.22	0.0	19.0
		1	74	23.62	23.77	22.43	0.0	24.5	18.00	18.17	18.22	0.0	19.0
		36	0	22.76	22.86	23.03	1.0	23.5	18.14	18.26	18.49	0.0	19.0
		36	20	22.72	22.82	22.98	1.0	23.5	18.16	18.25	18.49	0.0	19.0
		36	39	22.72	22.81	22.98	1.0	23.5	18.14	18.24	18.45	0.0	19.0
		75	0	22.71	22.83	23.00	1.0	23.5	18.15	18.26	18.48	0.0	19.0
	16QAM	1	0	22.73	22.85	22.87	1.0	23.5	18.21	18.18	18.43	0.0	19.0
		1	37	22.61	22.78	22.80	1.0	23.5	18.03	17.98	18.28	0.0	19.0
		1	74	22.58	22.86	22.19	1.0	23.5	18.07	18.19	18.44	0.0	19.0
		36	0	21.65	21.76	21.97	2.0	22.5	18.14	18.21	18.50	0.0	19.0
		36	20	21.60	21.71	21.92	2.0	22.5	18.14	18.17	18.47	0.0	19.0
		36	39	21.60	21.71	21.91	2.0	22.5	18.12	18.20	18.47	0.0	19.0
		75	0	21.59	21.75	21.89	2.0	22.5	18.10	18.25	18.47	0.0	19.0
	64QAM	1	0	21.67	21.48	21.48	2.0	22.5	18.32	18.23	18.57	0.0	19.0
		1	37	21.59	21.32	21.28	2.0	22.5	18.05	18.07	18.53	0.0	19.0
		1	74	21.61	21.48	21.48	2.0	22.5	18.18	18.21	18.63	0.0	19.0
		36	0	20.33	20.44	20.70	3.0	21.5	18.22	18.27	18.40	0.0	19.0
		36	20	20.30	20.42	20.69	3.0	21.5	18.20	18.26	18.38	0.0	19.0
		36	39	20.28	20.44	20.68	3.0	21.5	18.18	18.25	18.36	0.0	19.0
		75	0	20.32	20.38	20.60	3.0	21.5	18.14	18.21	18.41	0.0	19.0

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	18900	19150			18650	18900	19150		
				1855 MHz	1880 MHz	1905 MHz			1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	23.71	23.76	23.85	0.0	24.5	18.08	18.20	18.32	0.0	19.0
		1	25	23.67	23.77	23.82	0.0	24.5	17.98	18.16	18.24	0.0	19.0
		1	49	23.71	23.77	23.42	0.0	24.5	18.07	18.15	18.32	0.0	19.0
		25	0	22.73	22.79	22.97	1.0	23.5	18.13	18.19	18.41	0.0	19.0
		25	12	22.69	22.77	22.93	1.0	23.5	18.12	18.20	18.43	0.0	19.0
		25	25	22.65	22.76	22.95	1.0	23.5	18.10	18.19	18.40	0.0	19.0
		50	0	22.68	22.79	22.97	1.0	23.5	18.15	18.23	18.45	0.0	19.0
	16QAM	1	0	22.62	22.72	23.07	1.0	23.5	18.17	18.26	18.49	0.0	19.0
		1	25	22.50	22.64	22.89	1.0	23.5	18.04	18.22	18.40	0.0	19.0
		1	49	22.48	22.75	23.01	1.0	23.5	18.05	18.29	18.46	0.0	19.0
		25	0	21.66	21.78	21.94	2.0	22.5	18.14	18.23	18.43	0.0	19.0
		25	12	21.61	21.74	21.90	2.0	22.5	18.13	18.24	18.45	0.0	19.0
		25	25	21.59	21.74	21.92	2.0	22.5	18.11	18.24	18.44	0.0	19.0
		50	0	21.66	21.71	21.89	2.0	22.5	18.17	18.24	18.46	0.0	19.0
	64QAM	1	0	21.51	21.50	21.70	2.0	22.5	18.25	18.22	18.59	0.0	19.0
		1	25	21.49	21.55	21.61	2.0	22.5	18.20	18.18	18.49	0.0	19.0
		1	49	21.50	21.61	21.24	2.0	22.5	18.25	18.27	18.57	0.0	19.0
		25	0	20.34	20.45	20.63	3.0	21.5	18.22	18.22	18.47	0.0	19.0
		25	12	20.32	20.45	20.64	3.0	21.5	18.22	18.23	18.49	0.0	19.0
		25	25	20.31	20.45	20.67	3.0	21.5	18.20	18.24	18.48	0.0	19.0
		50	0	20.31	20.43	20.65	3.0	21.5	18.18	18.20	18.44	0.0	19.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				18625	18900	19175			18625	18900	19175		
				1852.5 MHz	1880 MHz	1907.5 MHz			1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	23.02	23.30	22.09	0.0	24.5	18.11	18.16	18.41	0.0	19.0
		1	12	23.07	23.11	23.52	0.0	24.5	17.98	18.11	18.32	0.0	19.0
		1	24	23.20	22.86	23.72	0.0	24.5	18.12	18.19	18.43	0.0	19.0
		12	0	22.47	22.71	21.38	1.0	23.5	18.18	18.25	18.47	0.0	19.0
		12	7	22.57	22.69	21.24	1.0	23.5	18.14	18.22	18.46	0.0	19.0
		12	13	22.65	22.63	21.11	1.0	23.5	18.15	18.24	18.44	0.0	19.0
		25	0	22.57	22.68	21.24	1.0	23.5	18.15	18.25	18.46	0.0	19.0
	16QAM	1	0	22.33	22.74	21.67	1.0	23.5	18.31	18.32	18.51	0.0	19.0
		1	12	22.49	22.55	21.33	1.0	23.5	17.96	18.13	18.28	0.0	19.0
		1	24	22.67	22.49	21.02	1.0	23.5	18.25	18.28	18.56	0.0	19.0
		12	0	21.67	21.69	20.91	2.0	22.5	18.19	18.25	18.41	0.0	19.0
		12	7	21.64	21.68	20.82	2.0	22.5	18.16	18.26	18.40	0.0	19.0
		12	13	21.63	21.69	20.72	2.0	22.5	18.18	18.27	18.42	0.0	19.0
		25	0	21.64	21.70	20.93	2.0	22.5	18.16	18.25	18.48	0.0	19.0
	64QAM	1	0	21.22	21.70	21.64	2.0	22.5	18.14	18.35	18.38	0.0	19.0
		1	12	21.18	21.55	21.64	2.0	22.5	18.12	18.22	18.39	0.0	19.0
		1	24	21.27	21.69	21.42	2.0	22.5	18.18	18.29	18.44	0.0	19.0
		12	0	20.37	20.42	20.65	3.0	21.5	18.19	18.19	18.42	0.0	19.0
		12	7	20.34	20.40	20.64	3.0	21.5	18.16	18.18	18.39	0.0	19.0
		12	13	20.33	20.41	20.66	3.0	21.5	18.16	18.18	18.41	0.0	19.0
		25	0	20.33	20.36	20.65	3.0	21.5	18.15	18.20	18.38	0.0	19.0

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	23.8	23.7	23.9	0.0	24.5	18.2	18.1	18.5	0.0	19.0
		1	8	23.5	23.5	23.6	0.0	24.5	18.0	18.0	18.4	0.0	19.0
		1	14	23.8	23.7	23.4	0.0	24.5	18.2	18.1	18.5	0.0	19.0
		8	0	22.7	22.7	23.0	1.0	23.5	18.2	18.2	18.5	0.0	19.0
		8	4	22.7	22.8	23.0	1.0	23.5	18.2	18.2	18.5	0.0	19.0
		8	7	22.7	22.7	23.0	1.0	23.5	18.2	18.2	18.5	0.0	19.0
		15	0	22.7	22.7	22.9	1.0	23.5	18.2	18.2	18.4	0.0	19.0
	16QAM	1	0	22.7	22.8	23.0	1.0	23.5	18.2	18.4	18.6	0.0	19.0
		1	8	22.6	22.6	22.9	1.0	23.5	17.9	18.2	18.4	0.0	19.0
		1	14	22.6	22.9	22.9	1.0	23.5	18.1	18.4	18.5	0.0	19.0
		8	0	21.8	21.8	21.9	2.0	22.5	18.2	18.3	18.5	0.0	19.0
		8	4	21.7	21.8	21.9	2.0	22.5	18.2	18.3	18.4	0.0	19.0
		8	7	21.7	21.8	21.9	2.0	22.5	18.2	18.3	18.5	0.0	19.0
		15	0	21.6	21.7	21.9	2.0	22.5	18.2	18.2	18.5	0.0	19.0
	64QAM	1	0	21.6	21.6	21.7	2.0	22.5	18.4	18.4	18.7	0.0	19.0
		1	8	21.3	21.5	21.6	2.0	22.5	18.3	18.2	18.4	0.0	19.0
		1	14	21.7	21.7	21.4	2.0	22.5	18.3	18.5	18.8	0.0	19.0
		8	0	20.5	20.4	20.7	3.0	21.5	18.2	18.2	18.4	0.0	19.0
		8	4	20.4	20.4	20.7	3.0	21.5	18.2	18.2	18.4	0.0	19.0
		8	7	20.4	20.4	20.7	3.0	21.5	18.2	18.2	18.5	0.0	19.0
		15	0	20.3	20.5	20.7	3.0	21.5	18.2	18.2	18.4	0.0	19.0

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	23.6	23.5	23.8	0.0	24.5	18.2	18.2	18.5	0.0	19.0
		1	3	23.5	23.4	23.6	0.0	24.5	17.9	18.0	18.3	0.0	19.0
		1	5	23.4	23.3	23.8	0.0	24.5	18.1	18.2	18.4	0.0	19.0
		3	0	23.3	23.4	23.8	0.0	24.5	18.0	18.2	18.5	0.0	19.0
		3	1	23.3	23.4	23.8	0.0	24.5	18.1	18.2	18.5	0.0	19.0
		3	3	23.2	23.3	23.9	0.0	24.5	18.1	18.2	18.4	0.0	19.0
		6	0	22.7	22.8	21.1	1.0	23.5	18.1	18.2	18.5	0.0	19.0
	16QAM	1	0	22.5	22.7	21.1	1.0	23.5	18.2	18.1	18.4	0.0	19.0
		1	3	22.7	22.8	21.1	1.0	23.5	18.3	18.2	18.5	0.0	19.0
		1	5	22.6	22.8	21.0	1.0	23.5	18.2	18.2	18.5	0.0	19.0
		3	0	22.7	22.6	21.2	1.0	23.5	18.1	18.2	18.5	0.0	19.0
		3	1	22.7	22.7	21.2	1.0	23.5	18.2	18.3	18.4	0.0	19.0
		3	3	22.7	22.6	21.1	1.0	23.5	18.2	18.2	18.5	0.0	19.0
		6	0	21.6	21.7	20.7	2.0	22.5	18.1	18.2	18.5	0.0	19.0
	64QAM	1	0	21.4	21.5	21.8	2.0	22.5	18.6	18.5	18.4	0.0	19.0
		1	3	21.5	21.4	21.6	2.0	22.5	18.4	18.3	18.4	0.0	19.0
		1	5	21.5	21.5	21.7	2.0	22.5	18.5	18.4	18.5	0.0	19.0
		3	0	21.4	21.5	21.8	2.0	22.5	18.4	18.2	18.5	0.0	19.0
		3	1	21.4	21.4	21.8	2.0	22.5	18.4	18.2	18.4	0.0	19.0
		3	3	21.5	21.4	21.8	2.0	22.5	18.4	18.2	18.5	0.0	19.0
		6	0	20.5	20.5	20.6	3.0	21.5	18.2	18.4	18.5	0.0	19.0

LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)			MPR	Tune-up Limit
				RSI=Pmax, Free, Rcv, Hotspot, Earjack				
				Measured Pwr (dBm)				
				20450	20525	20600		
				829 MHz	836.5 MHz	844 MHz		
10 MHz	QPSK	1	0		**25.07**		0.0	25.5
		1	25		24.88		0.0	25.5
		1	49		24.92		0.0	25.5
		25	0		**24.01**		1.0	24.5
		25	12		23.98		1.0	24.5
		25	25		23.95		1.0	24.5
		50	0		23.99		1.0	24.5
	16QAM	1	0		24.19		1.0	24.5
		1	25		23.97		1.0	24.5
		1	49		24.05		1.0	24.5
		25	0		23.01		2.0	23.5
		25	12		23.01		2.0	23.5
		25	25		22.99		2.0	23.5
		50	0		22.93		2.0	23.5
	64QAM	1	0		22.81		2.0	23.5
		1	25		22.82		2.0	23.5
		1	49		22.84		2.0	23.5
		25	0		21.82		3.0	22.5
		25	12		21.80		3.0	22.5
		25	25		21.81		3.0	22.5
		50	0		21.79		3.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20425	20525	20625		
				826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	24.85	25.01	24.93	0.0	25.5
		1	12	24.80	24.85	24.79	0.0	25.5
		1	24	24.89	24.93	24.90	0.0	25.5
		12	0	23.88	23.95	23.91	1.0	24.5
		12	7	23.84	23.92	23.86	1.0	24.5
		12	13	23.81	23.91	23.86	1.0	24.5
		25	0	23.80	23.91	23.87	1.0	24.5
	16QAM	1	0	23.88	24.02	23.92	1.0	24.5
		1	12	23.79	23.75	23.71	1.0	24.5
		1	24	23.82	23.97	23.81	1.0	24.5
		12	0	22.76	22.85	22.79	2.0	23.5
		12	7	22.73	22.83	22.76	2.0	23.5
		12	13	22.70	22.87	22.77	2.0	23.5
		25	0	22.76	22.85	22.74	2.0	23.5
	64QAM	1	0	22.28	22.44	22.27	2.0	23.5
		1	12	22.21	22.24	22.17	2.0	23.5
		1	24	22.22	22.36	22.28	2.0	23.5
		12	0	21.64	21.69	21.69	3.0	22.5
		12	7	21.58	21.68	21.63	3.0	22.5
		12	13	21.58	21.66	21.67	3.0	22.5
		25	0	21.61	21.69	21.60	3.0	22.5

LTE Band 5 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20415	20525	20635		
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	24.94	24.97	25.03	0.0	25.5
		1	8	24.72	24.72	24.91	0.0	25.5
		1	14	24.98	24.86	24.99	0.0	25.5
		8	0	23.93	24.00	24.01	1.0	24.5
		8	4	23.89	24.00	23.99	1.0	24.5
		8	7	23.92	23.97	23.98	1.0	24.5
		15	0	23.85	23.94	23.84	1.0	24.5
	16QAM	1	0	23.72	23.94	23.85	1.0	24.5
		1	8	23.55	23.77	23.68	1.0	24.5
		1	14	23.60	23.99	23.77	1.0	24.5
		8	0	22.86	23.02	22.85	2.0	23.5
		8	4	22.80	22.98	22.82	2.0	23.5
		8	7	22.80	22.98	22.79	2.0	23.5
		15	0	22.74	22.86	22.77	2.0	23.5
	64QAM	1	0	22.31	22.36	22.26	2.0	23.5
		1	8	22.06	22.27	22.17	2.0	23.5
		1	14	22.32	22.45	22.17	2.0	23.5
		8	0	21.81	21.86	21.69	3.0	22.5
		8	4	21.77	21.83	21.62	3.0	22.5
		8	7	21.82	21.81	21.69	3.0	22.5
		15	0	21.60	21.77	21.72	3.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20407	20525	20643		
				824.7 MHz	836.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	24.88	25.04	25.03	0.0	25.5
		1	3	24.73	24.76	24.69	0.0	25.5
		1	5	24.83	24.96	24.91	0.0	25.5
		3	0	24.87	24.98	24.76	0.0	25.5
		3	1	24.85	24.93	24.81	0.0	25.5
		3	3	24.80	24.80	24.82	0.0	25.5
		6	0	23.89	24.03	23.97	1.0	24.5
	16QAM	1	0	23.65	23.78	23.59	1.0	24.5
		1	3	23.75	23.87	23.68	1.0	24.5
		1	5	23.73	23.85	23.68	1.0	24.5
		3	0	23.82	23.84	23.80	1.0	24.5
		3	1	23.75	23.83	23.76	1.0	24.5
		3	3	23.75	23.85	23.80	1.0	24.5
		6	0	22.80	22.84	22.78	2.0	23.5
	64QAM	1	0	22.42	22.36	22.14	2.0	23.5
		1	3	22.22	22.22	22.20	2.0	23.5
		1	5	22.34	22.27	22.25	2.0	23.5
		3	0	22.26	22.34	22.25	2.0	23.5
		3	1	22.21	22.33	22.17	2.0	23.5
		3	3	22.27	22.31	22.24	2.0	23.5
		6	0	21.76	21.89	21.77	3.0	22.5

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)			MPR	Tune-up Limit
				RSI=Pmax, Free, Rcv, Hotspot, Earjcak				
				Measured Pwr (dBm)				
				23060	23095	23130		
				704 MHz	707.5 MHz	711 MHz		
10 MHz	QPSK	1	0		**24.97**		0.0	25.5
		1	25		24.81		0.0	25.5
		1	49		24.87		0.0	25.5
		25	0		**24.01**		1.0	24.5
		25	12		23.97		1.0	24.5
		25	25		23.95		1.0	24.5
		50	0		23.98		1.0	24.5
	16QAM	1	0		24.24		1.0	24.5
		1	25		24.10		1.0	24.5
		1	49		24.07		1.0	24.5
		25	0		23.04		2.0	23.5
		25	12		22.99		2.0	23.5
		25	25		22.97		2.0	23.5
		50	0		22.94		2.0	23.5
	64QAM	1	0		22.97		2.0	23.5
		1	25		22.93		2.0	23.5
		1	49		22.94		2.0	23.5
		25	0		21.92		3.0	22.5
		25	12		21.87		3.0	22.5
		25	25		21.85		3.0	22.5
		50	0		21.88		3.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				23035	23095	23155		
				701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	24.67	24.76	24.83	0.0	25.5
		1	12	24.59	24.62	24.78	0.0	25.5
		1	24	24.63	24.72	24.80	0.0	25.5
		12	0	23.67	23.84	23.93	1.0	24.5
		12	7	23.65	23.82	23.91	1.0	24.5
		12	13	23.65	23.80	23.88	1.0	24.5
		25	0	23.64	23.81	23.88	1.0	24.5
	16QAM	1	0	23.92	23.98	24.00	1.0	24.5
		1	12	23.63	23.73	23.83	1.0	24.5
		1	24	23.85	23.83	23.98	1.0	24.5
		12	0	22.63	22.78	22.89	2.0	23.5
		12	7	22.62	22.75	22.86	2.0	23.5
		12	13	22.61	22.75	22.85	2.0	23.5
		25	0	22.64	22.77	22.87	2.0	23.5
	64QAM	1	0	22.66	23.14	23.08	2.0	23.5
		1	12	22.63	22.95	23.04	2.0	23.5
		1	24	22.66	23.06	23.05	2.0	23.5
		12	0	21.70	21.85	22.00	3.0	22.5
		12	7	21.67	21.84	21.96	3.0	22.5
		12	13	21.68	21.82	21.94	3.0	22.5
		25	0	21.72	21.83	21.95	3.0	22.5

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	24.70	24.92	25.00	0.0	25.5
		1	8	24.51	24.80	24.81	0.0	25.5
		1	14	24.61	24.92	25.00	0.0	25.5
		8	0	23.75	23.98	23.98	1.0	24.5
		8	4	23.78	23.92	23.93	1.0	24.5
		8	7	23.77	23.93	23.93	1.0	24.5
		15	0	23.72	23.85	23.93	1.0	24.5
	16QAM	1	0	23.89	23.92	23.89	1.0	24.5
		1	8	23.64	23.69	23.73	1.0	24.5
		1	14	23.92	23.76	23.74	1.0	24.5
		8	0	22.83	22.90	23.04	2.0	23.5
		8	4	22.79	22.86	22.99	2.0	23.5
		8	7	22.80	22.84	22.97	2.0	23.5
		15	0	22.68	22.83	22.87	2.0	23.5
	64QAM	1	0	22.66	22.91	23.17	2.0	23.5
		1	8	22.54	22.76	23.01	2.0	23.5
		1	14	22.56	22.94	23.16	2.0	23.5
		8	0	21.70	21.89	22.08	3.0	22.5
		8	4	21.72	21.89	22.03	3.0	22.5
		8	7	21.77	21.94	22.05	3.0	22.5
		15	0	21.69	21.74	21.99	3.0	22.5

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	24.85	25.02	25.00	0.0	25.5
		1	3	24.71	24.74	24.82	0.0	25.5
		1	5	24.81	24.97	24.96	0.0	25.5
		3	0	24.87	25.00	24.95	0.0	25.5
		3	1	24.83	25.02	24.96	0.0	25.5
		3	3	24.78	24.85	24.95	0.0	25.5
		6	0	23.84	24.01	23.95	1.0	24.5
	16QAM	1	0	23.62	23.95	23.87	1.0	24.5
		1	3	23.75	24.02	23.98	1.0	24.5
		1	5	23.69	24.02	23.92	1.0	24.5
		3	0	23.82	23.90	24.01	1.0	24.5
		3	1	23.84	23.91	24.04	1.0	24.5
		3	3	23.78	23.84	24.02	1.0	24.5
		6	0	22.77	22.91	22.84	2.0	23.5
	64QAM	1	0	22.85	22.81	22.80	2.0	23.5
		1	3	22.72	22.69	22.89	2.0	23.5
		1	5	22.73	22.72	22.88	2.0	23.5
		3	0	22.78	22.95	22.92	2.0	23.5
		3	1	22.71	22.89	22.88	2.0	23.5
		3	3	22.72	22.94	22.90	2.0	23.5
		6	0	21.68	21.97	22.00	3.0	22.5

LTE Band 41 (Power Class 3) (Main.2) Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm) RSI=Pmax, Rcv							Maximum Allowed Average Power (dBm) RSI=Free, Hotspot, Earjack						
				Measured Pwr (dBm)					MPR	Tune-up Limit	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
20 MHz	QPSK	1	0	24.10	24.09	24.31	23.88	24.21	0.0	24.5	18.81	19.03	19.47	19.09	19.03	0.0	20.0
		1	49	24.22	23.99	24.27	23.89	24.18	0.0	24.5	18.56	19.09	19.43	18.96	19.13	0.0	20.0
		1	99	24.08	24.03	**24.35**	23.95	24.23	0.0	24.5	18.60	19.15	**19.48**	18.96	19.16	0.0	20.0
		50	0	23.10	23.05	**23.38**	22.93	23.20	1.0	23.5	18.77	19.16	**19.56**	19.05	19.18	0.0	20.0
		50	24	23.03	23.01	23.34	22.91	23.17	1.0	23.5	18.74	19.16	19.55	19.04	19.18	0.0	20.0
		50	50	23.01	23.00	23.30	22.90	23.21	1.0	23.5	18.73	19.13	19.54	19.03	19.15	0.0	20.0
		100	0	23.04	22.98	23.33	22.89	23.21	1.0	23.5	18.74	19.17	19.56	19.04	19.16	0.0	20.0
	16QAM	1	0	23.12	23.15	23.46	22.57	23.29	1.0	23.5	18.92	19.11	19.08	19.19	19.09	0.0	20.0
		1	49	23.16	23.07	23.42	22.72	23.04	1.0	23.5	18.80	19.11	19.09	19.15	19.20	0.0	20.0
		1	99	23.13	22.81	23.34	22.67	23.19	1.0	23.5	18.95	19.29	19.19	19.11	19.19	0.0	20.0
		50	0	22.08	22.03	22.27	21.88	22.20	2.0	22.5	18.82	19.16	19.60	19.11	19.17	0.0	20.0
		50	24	22.01	21.97	22.26	21.86	22.15	2.0	22.5	18.79	19.15	19.56	19.12	19.16	0.0	20.0
		50	50	21.91	21.97	22.22	21.84	22.11	2.0	22.5	18.76	19.14	19.55	19.10	19.12	0.0	20.0
		100	0	21.99	21.96	22.26	21.82	22.14	2.0	22.5	18.77	19.15	19.55	19.07	19.15	0.0	20.0
	64QAM	1	0	20.89	22.23	22.49	21.51	21.80	2.0	22.5	18.85	19.32	19.48	19.13	19.26	0.0	20.0
		1	49	20.86	21.79	22.48	21.44	21.74	2.0	22.5	18.45	19.11	19.53	19.00	19.17	0.0	20.0
		1	99	21.20	21.98	22.49	22.07	21.73	2.0	22.5	18.82	18.86	19.64	19.13	19.25	0.0	20.0
		50	0	20.51	21.03	21.49	20.94	20.97	3.0	21.5	18.77	19.18	19.60	19.04	19.18	0.0	20.0
		50	24	20.51	21.00	21.47	20.93	20.93	3.0	21.5	18.75	19.17	19.55	19.03	19.15	0.0	20.0
		50	50	20.50	20.99	21.42	20.94	20.93	3.0	21.5	18.74	19.12	19.58	19.02	19.14	0.0	20.0
		100	0	20.49	20.99	21.49	20.92	20.94	3.0	21.5	18.76	19.12	19.57	19.07	19.11	0.0	20.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
15 MHz	QPSK	1	0	23.77	24.03	24.48	23.97	24.17	0.0	24.5	18.74	19.24	19.61	18.98	19.08	0.0	20.0
		1	37	23.72	24.04	24.40	24.00	24.14	0.0	24.5	18.75	19.26	19.60	18.89	19.26	0.0	20.0
		1	74	23.70	23.96	24.48	23.96	24.09	0.0	24.5	18.72	19.14	19.56	18.98	19.14	0.0	20.0
		36	0	22.68	23.04	23.46	22.96	23.09	1.0	23.5	18.80	19.21	19.65	19.10	19.24	0.0	20.0
		36	20	22.64	23.05	23.44	22.94	23.08	1.0	23.5	18.80	19.22	19.63	19.09	19.21	0.0	20.0
		36	39	22.63	23.03	23.43	22.93	23.09	1.0	23.5	18.82	19.20	19.65	19.08	19.22	0.0	20.0
		75	0	22.65	23.04	23.45	22.94	23.06	1.0	23.5	18.80	19.21	19.63	19.09	19.19	0.0	20.0
	16QAM	1	0	22.72	22.91	23.46	22.88	22.81	1.0	23.5	18.51	19.35	19.58	19.05	19.12	0.0	20.0
		1	37	22.49	23.21	23.14	22.72	22.73	1.0	23.5	18.67	18.94	19.29	18.74	19.31	0.0	20.0
		1	74	22.73	23.12	23.40	23.24	22.78	1.0	23.5	18.62	19.00	19.39	19.09	19.12	0.0	20.0
		36	0	21.68	21.97	22.37	21.94	21.97	2.0	22.5	18.79	19.27	19.62	19.17	19.27	0.0	20.0
		36	20	21.60	21.93	22.33	21.93	21.95	2.0	22.5	18.78	19.28	19.59	19.14	19.23	0.0	20.0
		36	39	21.57	21.92	22.30	21.88	21.94	2.0	22.5	18.78	19.30	19.58	19.16	19.24	0.0	20.0
		75	0	21.56	21.94	22.36	21.84	21.96	2.0	22.5	18.78	19.20	19.59	19.08	19.21	0.0	20.0
	64QAM	1	0	21.61	21.78	22.50	21.59	21.99	2.0	22.5	18.94	18.92	19.92	18.70	18.48	0.0	20.0
		1	37	21.36	21.59	22.41	21.85	21.59	2.0	22.5	18.66	19.19	19.60	18.46	19.19	0.0	20.0
		1	74	21.49	21.74	22.16	21.88	22.12	2.0	22.5	18.82	19.11	19.93	19.06	18.81	0.0	20.0
		36	0	20.63	21.06	21.48	20.96	21.05	3.0	21.5	18.81	19.21	19.65	19.08	19.24	0.0	20.0
		36	20	20.59	21.09	21.46	20.93	21.07	3.0	21.5	18.79	19.23	19.64	19.08	19.21	0.0	20.0
		36	39	20.54	21.01	21.41	20.78	21.03	3.0	21.5	18.70	19.23	19.62	19.02	19.21	0.0	20.0
		75	0	20.59	20.98	21.40	20.88	20.99	3.0	21.5	18.78	19.17	19.59	19.05	19.16	0.0	20.0

LTE Band 41 (Power Class 3) (Main.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
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
10 MHz	QPSK	1	0	23.76	24.11	24.44	24.01	24.09	0.0	24.5	18.82	19.23	19.64	19.09	19.22	0.0	20.0
		1	25	23.66	23.98	24.41	23.93	23.99	0.0	24.5	18.74	19.21	19.47	18.94	19.10	0.0	20.0
		1	49	23.64	24.04	24.29	23.99	24.03	0.0	24.5	18.72	19.23	19.55	19.00	19.15	0.0	20.0
		25	0	22.64	23.06	23.44	22.95	23.04	1.0	23.5	18.78	19.20	19.61	19.07	19.15	0.0	20.0
		25	12	22.62	23.02	23.43	22.91	23.00	1.0	23.5	18.76	19.19	19.59	19.06	19.17	0.0	20.0
		25	25	22.59	23.02	23.43	22.91	23.01	1.0	23.5	18.75	19.18	19.60	19.07	19.14	0.0	20.0
		50	0	22.61	23.02	23.43	22.91	23.01	1.0	23.5	18.76	19.18	19.59	19.08	19.14	0.0	20.0
	16QAM	1	0	22.44	22.98	23.40	22.79	22.89	1.0	23.5	18.62	19.12	19.53	18.94	19.08	0.0	20.0
		1	25	22.39	22.85	23.23	22.75	22.78	1.0	23.5	18.58	18.89	19.38	18.78	18.93	0.0	20.0
		1	49	22.46	22.98	23.34	22.83	22.92	1.0	23.5	18.63	19.02	19.58	18.97	19.12	0.0	20.0
		25	0	21.53	21.98	22.40	21.84	21.95	2.0	22.5	18.75	19.20	19.59	19.06	19.16	0.0	20.0
		25	12	21.51	21.94	22.37	21.82	21.91	2.0	22.5	18.72	19.17	19.57	19.05	19.16	0.0	20.0
		25	25	21.49	21.93	22.37	21.82	21.90	2.0	22.5	18.73	19.16	19.57	19.06	19.13	0.0	20.0
		50	0	21.53	21.98	22.34	21.85	21.96	2.0	22.5	18.76	19.14	19.61	19.10	19.18	0.0	20.0
	64QAM	1	0	21.41	21.89	22.30	21.72	21.92	2.0	22.5	18.61	19.08	19.62	18.96	19.09	0.0	20.0
		1	25	21.27	21.81	22.22	21.62	21.79	2.0	22.5	18.55	18.91	19.46	18.92	18.93	0.0	20.0
		1	49	21.43	21.77	22.23	21.78	21.95	2.0	22.5	18.66	18.95	19.56	19.02	18.97	0.0	20.0
		25	0	20.53	21.00	21.36	20.83	20.93	3.0	21.5	18.67	19.17	19.54	18.99	19.13	0.0	20.0
		25	12	20.50	20.98	21.31	20.79	20.88	3.0	21.5	18.67	19.17	19.53	19.00	19.13	0.0	20.0
		25	25	20.48	20.97	21.32	20.80	20.88	3.0	21.5	18.66	19.15	19.53	18.99	19.12	0.0	20.0
		50	0	20.54	20.94	21.31	20.84	20.92	3.0	21.5	18.71	19.12	19.52	19.05	19.09	0.0	20.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit	Measured Pwr (dBm)					MPR	Tune-up Limit
				39750	40185	40620	41055	41490			39750	40185	40620	41055	41490		
				2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz			2506 MHz	2549.5 MHz	2593 MHz	2636.5 MHz	2680 MHz		
5 MHz	QPSK	1	0	23.63	24.08	24.49	23.95	24.03	0.0	24.5	18.78	19.24	19.62	19.10	19.17	0.0	20.0
		1	12	23.59	23.94	24.42	23.86	23.93	0.0	24.5	18.67	19.05	19.48	18.90	19.07	0.0	20.0
		1	24	23.56	24.05	24.48	23.90	23.99	0.0	24.5	18.67	19.19	19.58	19.02	19.13	0.0	20.0
		12	0	22.60	23.04	23.43	22.93	23.00	1.0	23.5	18.76	19.18	19.58	19.04	19.12	0.0	20.0
		12	7	22.58	22.98	23.42	22.91	22.97	1.0	23.5	18.76	19.14	19.57	19.01	19.11	0.0	20.0
		12	13	22.57	23.02	23.43	22.91	22.99	1.0	23.5	18.73	19.16	19.56	19.05	19.11	0.0	20.0
		25	0	22.58	23.03	23.43	22.92	22.99	1.0	23.5	18.76	19.17	19.59	19.05	19.12	0.0	20.0
	16QAM	1	0	22.57	22.92	23.18	22.91	22.83	1.0	23.5	18.63	19.08	19.67	18.95	19.10	0.0	20.0
		1	12	22.46	22.92	23.04	22.83	22.72	1.0	23.5	18.60	18.94	19.45	18.93	18.94	0.0	20.0
		1	24	22.58	23.00	23.11	22.95	22.92	1.0	23.5	18.68	19.13	19.59	19.03	19.01	0.0	20.0
		12	0	21.54	21.94	22.39	21.90	21.92	2.0	22.5	18.76	19.14	19.58	19.05	19.14	0.0	20.0
		12	7	21.50	21.92	22.36	21.87	21.87	2.0	22.5	18.74	19.13	19.57	19.03	19.12	0.0	20.0
		12	13	21.48	21.92	22.36	21.87	21.89	2.0	22.5	18.73	19.12	19.58	19.06	19.12	0.0	20.0
		25	0	21.52	21.90	22.40	21.85	21.87	2.0	22.5	18.78	19.11	19.57	19.00	19.12	0.0	20.0
	64QAM	1	0	21.41	21.98	22.42	21.79	21.91	2.0	22.5	18.68	19.27	19.52	19.16	19.28	0.0	20.0
		1	12	21.35	21.81	22.10	21.63	21.62	2.0	22.5	18.47	19.19	19.29	18.90	19.19	0.0	20.0
		1	24	21.46	21.90	22.31	21.72	21.81	2.0	22.5	18.59	19.33	19.39	19.04	19.36	0.0	20.0
		12	0	20.50	20.94	21.37	20.82	20.98	3.0	21.5	18.66	19.13	19.51	19.03	19.12	0.0	20.0
		12	7	20.48	20.93	21.34	20.79	20.93	3.0	21.5	18.64	19.11	19.50	19.03	19.11	0.0	20.0
		12	13	20.48	20.93	21.35	20.80	20.96	3.0	21.5	18.66	19.11	19.49	19.03	19.12	0.0	20.0
		25	0	20.49	20.87	21.38	20.77	20.98	3.0	21.5	18.71	19.13	19.46	19.07	19.10	0.0	20.0

LTE Band 41 (Power Class 3) (Sub.2) Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)						
				RSI=Free, Rcv, Hotspot, Earjack						
				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	**19.39**	18.74	18.76	19.00	18.98	0.0	19.5
		1	49	19.17	18.68	18.81	19.00	19.02	0.0	19.5
		1	99	19.28	18.80	18.95	19.17	19.04	0.0	19.5
		50	0	**19.28**	18.76	18.87	19.06	19.03	0.0	19.5
		50	24	19.27	18.74	18.90	19.11	19.07	0.0	19.5
		50	50	19.27	18.78	18.90	19.13	19.06	0.0	19.5
		100	0	19.28	18.76	18.89	19.11	19.06	0.0	19.5
	16QAM	1	0	19.10	18.56	18.88	18.84	19.06	0.0	19.5
		1	49	18.97	18.23	19.06	18.89	19.05	0.0	19.5
		1	99	19.31	19.04	19.07	19.29	18.92	0.0	19.5
		50	0	19.17	18.71	18.84	19.06	19.03	0.0	19.5
		50	24	19.20	18.72	18.90	19.07	19.02	0.0	19.5
		50	50	19.18	18.67	18.86	19.11	19.04	0.0	19.5
		100	0	19.19	18.72	18.86	19.08	19.05	0.0	19.5
	64QAM	1	0	18.97	18.61	18.72	18.94	18.88	0.0	19.5
		1	49	18.81	18.36	18.66	18.63	18.88	0.0	19.5
		1	99	19.17	18.40	18.76	18.86	18.97	0.0	19.5
		50	0	19.09	18.65	18.81	18.99	18.98	0.0	19.5
		50	24	19.08	18.65	18.83	19.00	19.04	0.0	19.5
		50	50	19.08	18.67	18.86	19.08	19.07	0.0	19.5
		100	0	19.09	18.67	18.83	19.05	19.01	0.0	19.5
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	19.36	18.72	18.89	19.00	19.10	0.0	19.5
		1	37	19.17	18.71	18.88	19.06	18.93	0.0	19.5
		1	74	19.35	18.76	18.98	19.10	19.04	0.0	19.5
		36	0	19.49	18.85	18.95	19.19	19.11	0.0	19.5
		36	20	19.48	18.85	18.95	19.16	19.14	0.0	19.5
		36	39	19.47	18.87	18.99	19.20	19.16	0.0	19.5
		75	0	19.47	18.84	18.97	19.18	19.14	0.0	19.5
	16QAM	1	0	19.45	18.63	18.75	18.92	18.83	0.0	19.5
		1	37	19.38	18.25	18.88	18.88	18.86	0.0	19.5
		1	74	19.00	18.44	18.67	19.43	19.04	0.0	19.5
		36	0	19.40	18.77	18.92	19.14	19.09	0.0	19.5
		36	20	19.38	18.78	18.96	19.17	19.10	0.0	19.5
		36	39	19.39	18.79	18.94	19.20	19.11	0.0	19.5
		75	0	19.33	18.76	18.94	19.12	19.09	0.0	19.5
	64QAM	1	0	19.09	18.73	18.57	18.90	18.97	0.0	19.5
		1	37	18.96	18.44	18.63	18.87	18.74	0.0	19.5
		1	74	19.04	18.68	18.50	19.15	19.00	0.0	19.5
		36	0	19.30	18.70	18.84	19.11	19.02	0.0	19.5
		36	20	19.31	18.71	18.87	19.10	18.98	0.0	19.5
		36	39	19.25	18.72	18.90	19.10	18.99	0.0	19.5
		75	0	19.26	18.77	18.90	19.02	19.05	0.0	19.5

LTE Band 41 (Power Class 3) (Sub.2) 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	19.37	18.75	18.94	19.11	19.05	0.0	19.5
		1	25	19.23	18.72	18.90	18.99	19.03	0.0	19.5
		1	49	19.29	18.79	18.92	19.10	19.12	0.0	19.5
		25	0	19.25	18.71	18.91	19.09	19.04	0.0	19.5
		25	12	19.26	18.71	18.89	19.10	19.04	0.0	19.5
		25	25	19.26	18.72	18.92	19.13	19.06	0.0	19.5
		50	0	19.24	18.72	18.92	19.11	19.05	0.0	19.5
	16QAM	1	0	19.26	18.60	18.78	19.15	18.90	0.0	19.5
		1	25	19.18	18.45	18.69	19.07	18.74	0.0	19.5
		1	49	19.33	18.56	18.88	19.29	18.88	0.0	19.5
		25	0	19.11	18.66	18.88	19.03	19.04	0.0	19.5
		25	12	19.11	18.65	18.88	19.03	19.03	0.0	19.5
		25	25	19.12	18.65	18.90	19.06	19.04	0.0	19.5
		50	0	19.12	18.63	18.88	19.08	19.00	0.0	19.5
	64QAM	1	0	19.06	18.62	18.77	18.93	18.81	0.0	19.5
		1	25	18.93	18.54	18.65	18.82	18.79	0.0	19.5
		1	49	19.00	18.69	18.78	18.93	18.95	0.0	19.5
		25	0	19.06	18.55	18.80	19.03	18.89	0.0	19.5
		25	12	19.06	18.56	18.79	19.04	18.91	0.0	19.5
		25	25	19.08	18.57	18.81	19.05	18.91	0.0	19.5
		50	0	19.02	18.60	18.79	18.98	18.93	0.0	19.5

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		
5 MHz	QPSK	1	0	19.28	18.76	18.85	19.11	19.07	0.0	19.5
		1	12	19.19	18.63	18.84	19.02	18.89	0.0	19.5
		1	24	19.26	18.71	18.80	19.10	19.02	0.0	19.5
		12	0	19.18	18.68	18.85	19.07	19.01	0.0	19.5
		12	7	19.17	18.66	18.84	19.05	19.01	0.0	19.5
		12	13	19.18	18.68	18.85	19.05	19.04	0.0	19.5
		25	0	19.17	18.66	18.85	19.06	19.01	0.0	19.5
	16QAM	1	0	19.27	18.56	18.89	19.17	18.95	0.0	19.5
		1	12	19.24	18.45	18.81	19.05	18.96	0.0	19.5
		1	24	19.25	18.66	18.97	19.14	19.05	0.0	19.5
		12	0	19.09	18.62	18.80	19.05	18.98	0.0	19.5
		12	7	19.07	18.62	18.80	19.03	18.99	0.0	19.5
		12	13	19.08	18.62	18.80	19.04	18.99	0.0	19.5
		25	0	19.06	18.57	18.85	19.04	18.94	0.0	19.5
	64QAM	1	0	19.01	18.67	18.77	18.89	18.91	0.0	19.5
		1	12	18.84	18.68	18.65	18.85	18.82	0.0	19.5
		1	24	18.93	18.77	18.68	18.79	18.84	0.0	19.5
		12	0	19.02	18.51	18.75	18.90	18.81	0.0	19.5
		12	7	19.03	18.49	18.74	18.90	18.81	0.0	19.5
		12	13	19.03	18.50	18.75	18.89	18.82	0.0	19.5
		25	0	18.94	18.53	18.80	18.83	18.90	0.0	19.5

LTE Band 66(Main.1) Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					Maximum Allowed Average Power (dBm)				
				RSI=Pmax,Rcv					RSI=Free, Hotspot, Earjack				
				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	**24.69**	24.34	24.68	0.0	25.0	**18.64**	18.50	18.53	0.0	20.0
		1	49	24.29	24.49	24.64	0.0	25.0	18.48	18.37	18.44	0.0	20.0
		1	99	24.29	24.48	24.57	0.0	25.0	18.51	18.32	18.37	0.0	20.0
		50	0	**23.71**	23.64	23.66	1.0	24.0	**18.63**	18.51	18.57	0.0	20.0
		50	24	23.70	23.60	23.62	1.0	24.0	18.60	18.47	18.53	0.0	20.0
		50	50	23.67	23.53	23.57	1.0	24.0	18.57	18.44	18.49	0.0	20.0
		100	0	23.69	23.57	23.62	1.0	24.0	18.59	18.48	18.52	0.0	20.0
	16QAM	1	0	23.80	23.93	23.94	1.0	24.0	18.88	18.62	18.77	0.0	20.0
		1	49	23.85	23.93	23.99	1.0	24.0	18.88	18.55	18.72	0.0	20.0
		1	99	23.76	23.75	23.73	1.0	24.0	18.79	18.51	18.59	0.0	20.0
		50	0	22.73	22.57	22.64	2.0	23.0	18.62	18.54	18.56	0.0	20.0
		50	24	22.69	22.53	22.58	2.0	23.0	18.63	18.46	18.53	0.0	20.0
		50	50	22.68	22.49	22.52	2.0	23.0	18.60	18.43	18.46	0.0	20.0
		100	0	22.69	22.54	22.58	2.0	23.0	18.65	18.50	18.54	0.0	20.0
	64QAM	1	0	22.85	22.66	22.67	2.0	23.0	18.88	18.95	19.02	0.0	20.0
		1	49	22.79	22.43	22.69	2.0	23.0	18.85	18.77	18.92	0.0	20.0
		1	99	22.85	22.52	22.49	2.0	23.0	18.80	18.76	18.88	0.0	20.0
		50	0	21.58	21.54	21.61	3.0	22.0	18.89	18.78	18.81	0.0	20.0
		50	24	21.57	21.47	21.55	3.0	22.0	18.89	18.73	18.81	0.0	20.0
		50	50	21.55	21.44	21.50	3.0	22.0	18.88	18.69	18.73	0.0	20.0
		100	0	21.56	21.41	21.52	3.0	22.0	18.87	18.67	18.77	0.0	20.0
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	23.90	23.77	23.89	0.0	25.0	18.60	18.44	18.48	0.0	20.0
		1	37	24.00	24.05	24.16	0.0	25.0	18.45	18.32	18.37	0.0	20.0
		1	74	23.42	24.15	24.14	0.0	25.0	18.49	18.38	18.35	0.0	20.0
		36	0	23.42	23.27	23.28	1.0	24.0	18.63	18.49	18.49	0.0	20.0
		36	20	23.39	23.25	23.25	1.0	24.0	18.61	18.46	18.47	0.0	20.0
		36	39	23.36	23.25	23.23	1.0	24.0	18.58	18.47	18.47	0.0	20.0
		75	0	23.40	23.25	23.25	1.0	24.0	18.61	18.48	18.48	0.0	20.0
	16QAM	1	0	23.42	23.46	23.36	1.0	24.0	18.63	18.48	18.55	0.0	20.0
		1	37	23.24	23.18	23.20	1.0	24.0	18.48	18.20	18.38	0.0	20.0
		1	74	23.14	23.30	23.24	1.0	24.0	18.58	18.37	18.45	0.0	20.0
		36	0	22.36	22.22	22.28	2.0	23.0	18.65	18.48	18.54	0.0	20.0
		36	20	22.32	22.17	22.23	2.0	23.0	18.61	18.42	18.50	0.0	20.0
		36	39	22.32	22.15	22.21	2.0	23.0	18.60	18.43	18.49	0.0	20.0
		75	0	22.28	22.20	22.19	2.0	23.0	18.58	18.48	18.51	0.0	20.0
	64QAM	1	0	22.21	21.88	21.88	2.0	23.0	18.91	18.74	18.67	0.0	20.0
		1	37	22.00	21.65	21.79	2.0	23.0	18.85	18.54	18.40	0.0	20.0
		1	74	22.19	21.72	21.77	2.0	23.0	18.94	18.58	18.50	0.0	20.0
		36	0	21.49	21.37	21.30	3.0	22.0	18.75	18.66	18.59	0.0	20.0
		36	20	21.47	21.35	21.26	3.0	22.0	18.72	18.63	18.57	0.0	20.0
		36	39	21.46	21.34	21.22	3.0	22.0	18.70	18.62	18.51	0.0	20.0
		75	0	21.43	21.28	21.26	3.0	22.0	18.73	18.58	18.50	0.0	20.0

LTE Band 66(Main.1) 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	24.27	24.48	24.44	0.0	25.0	18.68	18.39	18.43	0.0	20.0
		1	25	24.21	24.47	24.37	0.0	25.0	18.62	18.27	18.29	0.0	20.0
		1	49	24.28	24.39	24.39	0.0	25.0	18.60	18.36	18.40	0.0	20.0
		25	0	23.35	23.46	23.42	1.0	24.0	18.64	18.47	18.45	0.0	20.0
		25	12	23.30	23.44	23.40	1.0	24.0	18.64	18.45	18.42	0.0	20.0
		25	25	23.35	23.41	23.34	1.0	24.0	18.63	18.44	18.41	0.0	20.0
		50	0	23.37	23.45	23.39	1.0	24.0	18.65	18.44	18.45	0.0	20.0
	16QAM	1	0	23.40	23.56	23.39	1.0	24.0	18.62	18.68	18.50	0.0	20.0
		1	25	23.33	23.49	23.34	1.0	24.0	18.59	18.53	18.36	0.0	20.0
		1	49	23.39	23.49	23.22	1.0	24.0	18.64	18.53	18.31	0.0	20.0
		25	0	22.41	22.46	22.38	2.0	23.0	18.63	18.49	18.48	0.0	20.0
		25	12	22.37	22.42	22.35	2.0	23.0	18.62	18.47	18.45	0.0	20.0
		25	25	22.37	22.39	22.30	2.0	23.0	18.62	18.45	18.43	0.0	20.0
		50	0	22.36	22.39	22.39	2.0	23.0	18.63	18.44	18.50	0.0	20.0
	64QAM	1	0	21.98	21.97	21.76	2.0	23.0	18.64	18.62	18.72	0.0	20.0
		1	25	21.87	21.94	21.76	2.0	23.0	18.65	18.54	18.56	0.0	20.0
		1	49	21.90	21.93	21.69	2.0	23.0	18.67	18.58	18.53	0.0	20.0
		25	0	21.52	21.31	21.28	3.0	22.0	18.77	18.60	18.59	0.0	20.0
		25	12	21.50	21.28	21.25	3.0	22.0	18.75	18.57	18.54	0.0	20.0
		25	25	21.50	21.27	21.22	3.0	22.0	18.75	18.57	18.52	0.0	20.0
		50	0	21.49	21.28	21.27	3.0	22.0	18.74	18.53	18.51	0.0	20.0

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	24.43	24.35	24.32	0.0	25.0	18.59	18.38	18.35	0.0	20.0
		1	12	24.39	24.20	24.25	0.0	25.0	18.49	18.31	18.21	0.0	20.0
		1	24	24.23	24.38	24.34	0.0	25.0	18.61	18.39	18.34	0.0	20.0
		12	0	23.63	23.43	23.36	1.0	24.0	18.65	18.44	18.42	0.0	20.0
		12	7	23.62	23.41	23.34	1.0	24.0	18.62	18.41	18.40	0.0	20.0
		12	13	23.60	23.40	23.32	1.0	24.0	18.64	18.42	18.40	0.0	20.0
		25	0	23.61	23.43	23.34	1.0	24.0	18.64	18.42	18.38	0.0	20.0
	16QAM	1	0	23.61	23.55	23.41	1.0	24.0	18.77	18.58	18.36	0.0	20.0
		1	12	23.60	23.31	23.25	1.0	24.0	18.48	18.29	18.18	0.0	20.0
		1	24	23.66	23.45	23.31	1.0	24.0	18.70	18.49	18.39	0.0	20.0
		12	0	22.60	22.40	22.32	2.0	23.0	18.63	18.44	18.40	0.0	20.0
		12	7	22.56	22.38	22.29	2.0	23.0	18.62	18.43	18.43	0.0	20.0
		12	13	22.58	22.38	22.29	2.0	23.0	18.66	18.44	18.41	0.0	20.0
		25	0	22.57	22.41	22.30	2.0	23.0	18.60	18.46	18.43	0.0	20.0
	64QAM	1	0	22.13	21.77	21.65	2.0	23.0	18.92	18.54	18.53	0.0	20.0
		1	12	21.95	21.73	21.55	2.0	23.0	18.73	18.46	18.48	0.0	20.0
		1	24	22.08	21.82	21.63	2.0	23.0	18.85	18.55	18.56	0.0	20.0
		12	0	21.42	21.26	21.14	3.0	22.0	18.69	18.54	18.48	0.0	20.0
		12	7	21.42	21.24	21.11	3.0	22.0	18.68	18.49	18.45	0.0	20.0
		12	13	21.42	21.24	21.10	3.0	22.0	18.68	18.49	18.46	0.0	20.0
		25	0	21.44	21.26	21.17	3.0	22.0	18.73	18.52	18.44	0.0	20.0

LTE Band 66(Main.1) 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	24.61	24.38	24.42	0.0	25.0	18.67	18.43	18.41	0.0	20.0
		1	8	24.52	24.21	24.16	0.0	25.0	18.50	18.25	18.29	0.0	20.0
		1	14	24.69	24.35	24.46	0.0	25.0	18.72	18.34	18.43	0.0	20.0
		8	0	23.65	23.44	23.41	1.0	24.0	18.66	18.46	18.41	0.0	20.0
		8	4	23.64	23.42	23.37	1.0	24.0	18.68	18.45	18.39	0.0	20.0
		8	7	23.61	23.42	23.37	1.0	24.0	18.64	18.45	18.38	0.0	20.0
		15	0	23.58	23.42	23.34	1.0	24.0	18.65	18.47	18.37	0.0	20.0
	16QAM	1	0	23.71	23.54	23.30	1.0	24.0	18.55	18.58	18.36	0.0	20.0
		1	8	23.59	23.39	23.16	1.0	24.0	18.34	18.37	18.24	0.0	20.0
		1	14	23.62	23.57	23.19	1.0	24.0	18.47	18.60	18.27	0.0	20.0
		8	0	22.59	22.55	22.40	2.0	23.0	18.70	18.62	18.41	0.0	20.0
		8	4	22.52	22.51	22.34	2.0	23.0	18.67	18.57	18.35	0.0	20.0
		8	7	22.53	22.52	22.34	2.0	23.0	18.69	18.57	18.36	0.0	20.0
		15	0	22.59	22.40	22.27	2.0	23.0	18.64	18.44	18.37	0.0	20.0
	64QAM	1	0	21.94	21.76	21.81	2.0	23.0	18.89	18.77	18.55	0.0	20.0
		1	8	21.81	21.64	21.55	2.0	23.0	18.68	18.43	18.46	0.0	20.0
		1	14	22.02	21.67	21.85	2.0	23.0	18.97	18.81	18.45	0.0	20.0
		8	0	21.44	21.26	21.22	3.0	22.0	18.78	18.60	18.48	0.0	20.0
		8	4	21.40	21.23	21.16	3.0	22.0	18.76	18.53	18.45	0.0	20.0
		8	7	21.42	21.27	21.21	3.0	22.0	18.73	18.51	18.49	0.0	20.0
		15	0	21.47	21.30	21.15	3.0	22.0	18.74	18.45	18.47	0.0	20.0

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	24.72	24.48	24.35	0.0	25.0	18.70	18.54	18.47	0.0	20.0
		1	3	24.56	24.26	24.21	0.0	25.0	18.49	18.29	18.22	0.0	20.0
		1	5	24.68	24.45	24.33	0.0	25.0	18.69	18.50	18.40	0.0	20.0
		3	0	24.61	24.53	24.39	0.0	25.0	18.71	18.57	18.35	0.0	20.0
		3	1	24.58	24.52	24.35	0.0	25.0	18.67	18.51	18.38	0.0	20.0
		3	3	24.60	24.34	24.29	0.0	25.0	18.65	18.38	18.42	0.0	20.0
		6	0	23.56	23.49	23.34	1.0	24.0	18.65	18.51	18.44	0.0	20.0
	16QAM	1	0	23.41	23.52	23.25	1.0	24.0	18.45	18.51	18.28	0.0	20.0
		1	3	23.55	23.66	23.42	1.0	24.0	18.55	18.57	18.37	0.0	20.0
		1	5	23.49	23.60	23.35	1.0	24.0	18.53	18.59	18.37	0.0	20.0
		3	0	23.63	23.36	23.45	1.0	24.0	18.74	18.42	18.49	0.0	20.0
		3	1	23.66	23.32	23.34	1.0	24.0	18.71	18.45	18.51	0.0	20.0
		3	3	23.65	23.32	23.41	1.0	24.0	18.68	18.47	18.48	0.0	20.0
		6	0	22.59	22.41	22.31	2.0	23.0	18.66	18.47	18.29	0.0	20.0
	64QAM	1	0	22.23	21.85	21.42	2.0	23.0	18.83	18.75	18.47	0.0	20.0
		1	3	22.06	21.71	21.44	2.0	23.0	18.67	18.52	18.56	0.0	20.0
		1	5	22.16	21.76	21.50	2.0	23.0	18.73	18.65	18.59	0.0	20.0
		3	0	22.01	21.77	21.59	2.0	23.0	18.69	18.61	18.50	0.0	20.0
		3	1	21.97	21.70	21.55	2.0	23.0	18.59	18.63	18.47	0.0	20.0
		3	3	22.01	21.69	21.54	2.0	23.0	18.69	18.60	18.51	0.0	20.0
		6	0	21.47	21.31	21.18	3.0	22.0	18.80	18.57	18.45	0.0	20.0

LTE Band 66(Sub.2) Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)				
				RSI=Free, Rcv, Hotspot, Earjack				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	16.25	16.18	**16.35**	0.0	17.5
		1	49	16.20	15.90	16.22	0.0	17.5
		1	99	16.08	15.94	16.14	0.0	17.5
		50	0	16.26	16.13	**16.39**	0.0	17.5
		50	24	16.24	16.08	16.34	0.0	17.5
		50	50	16.18	16.02	16.28	0.0	17.5
		100	0	16.23	16.07	16.32	0.0	17.5
	16QAM	1	0	16.51	16.39	16.61	0.0	17.5
		1	49	16.43	16.35	16.59	0.0	17.5
		1	99	16.29	16.22	16.37	0.0	17.5
		50	0	16.34	16.17	16.39	0.0	17.5
		50	24	16.30	16.12	16.30	0.0	17.5
		50	50	16.25	16.06	16.24	0.0	17.5
		100	0	16.31	16.09	16.32	0.0	17.5
	64QAM	1	0	16.60	16.46	16.51	0.0	17.5
		1	49	16.53	16.26	16.52	0.0	17.5
		1	99	16.41	16.29	16.29	0.0	17.5
		50	0	16.40	16.21	16.40	0.0	17.5
		50	24	16.35	16.14	16.36	0.0	17.5
		50	50	16.29	16.11	16.28	0.0	17.5
		100	0	16.30	16.12	16.34	0.0	17.5
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	16.19	16.01	16.34	0.0	17.5
		1	37	15.95	15.85	16.20	0.0	17.5
		1	74	16.04	15.92	16.20	0.0	17.5
		36	0	16.22	16.07	16.32	0.0	17.5
		36	20	16.18	16.04	16.27	0.0	17.5
		36	39	16.15	16.01	16.29	0.0	17.5
		75	0	16.16	16.03	16.28	0.0	17.5
	16QAM	1	0	16.29	16.27	16.51	0.0	17.5
		1	37	16.14	16.04	16.41	0.0	17.5
		1	74	16.13	16.10	16.40	0.0	17.5
		36	0	16.23	16.04	16.37	0.0	17.5
		36	20	16.20	16.00	16.33	0.0	17.5
		36	39	16.18	15.98	16.30	0.0	17.5
		75	0	16.15	16.06	16.32	0.0	17.5
	64QAM	1	0	16.47	16.31	16.62	0.0	17.5
		1	37	16.27	16.11	16.38	0.0	17.5
		1	74	16.40	16.14	16.41	0.0	17.5
		36	0	16.33	16.20	16.52	0.0	17.5
		36	20	16.28	16.18	16.46	0.0	17.5
		36	39	16.25	16.13	16.42	0.0	17.5
		75	0	16.30	16.12	16.36	0.0	17.5

LTE Band 66(Sub.2) 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	16.08	16.09	16.29	0.0	17.5
		1	25	15.97	16.09	16.12	0.0	17.5
		1	49	16.03	15.97	16.25	0.0	17.5
		25	0	16.16	16.06	16.30	0.0	17.5
		25	12	16.13	16.04	16.28	0.0	17.5
		25	25	16.10	16.01	16.25	0.0	17.5
		50	0	16.15	16.05	16.27	0.0	17.5
	16QAM	1	0	16.23	16.26	16.45	0.0	17.5
		1	25	16.13	16.22	16.24	0.0	17.5
		1	49	16.05	16.20	16.30	0.0	17.5
		25	0	16.18	16.09	16.34	0.0	17.5
		25	12	16.16	16.05	16.31	0.0	17.5
		25	25	16.14	16.03	16.29	0.0	17.5
		50	0	16.19	16.05	16.29	0.0	17.5
	64QAM	1	0	16.46	16.19	16.33	0.0	17.5
		1	25	16.45	16.15	16.32	0.0	17.5
		1	49	16.33	16.14	16.29	0.0	17.5
		25	0	16.34	16.21	16.39	0.0	17.5
		25	12	16.29	16.17	16.37	0.0	17.5
		25	25	16.28	16.15	16.33	0.0	17.5
		50	0	16.30	16.20	16.37	0.0	17.5

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	16.13	16.07	16.22	0.0	17.5
		1	12	16.11	16.06	15.99	0.0	17.5
		1	24	16.15	16.04	16.21	0.0	17.5
		12	0	16.17	16.06	16.29	0.0	17.5
		12	7	16.15	16.05	16.27	0.0	17.5
		12	13	16.15	16.04	16.26	0.0	17.5
		25	0	16.15	16.05	16.28	0.0	17.5
	16QAM	1	0	16.33	16.30	16.59	0.0	17.5
		1	12	16.20	16.05	16.26	0.0	17.5
		1	24	16.35	16.18	16.50	0.0	17.5
		12	0	16.12	16.03	16.30	0.0	17.5
		12	7	16.09	16.02	16.27	0.0	17.5
		12	13	16.12	16.02	16.28	0.0	17.5
		25	0	16.17	16.05	16.27	0.0	17.5
	64QAM	1	0	16.53	16.29	16.44	0.0	17.5
		1	12	16.40	16.24	16.35	0.0	17.5
		1	24	16.46	16.30	16.44	0.0	17.5
		12	0	16.24	16.12	16.33	0.0	17.5
		12	7	16.22	16.09	16.31	0.0	17.5
		12	13	16.22	16.12	16.29	0.0	17.5
		25	0	16.24	16.14	16.31	0.0	17.5

LTE Band 66(Sub.2) 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	16.14	15.95	16.28	0.0	17.5
		1	8	15.86	15.75	16.19	0.0	17.5
		1	14	16.17	15.88	16.31	0.0	17.5
		8	0	16.09	15.99	16.24	0.0	17.5
		8	4	16.06	16.00	16.25	0.0	17.5
		8	7	16.10	16.03	16.25	0.0	17.5
		15	0	16.07	16.02	16.20	0.0	17.5
	16QAM	1	0	16.12	16.33	16.22	0.0	17.5
		1	8	16.00	16.14	16.12	0.0	17.5
		1	14	16.02	16.35	16.11	0.0	17.5
		8	0	16.16	16.15	16.22	0.0	17.5
		8	4	16.11	16.11	16.16	0.0	17.5
		8	7	16.10	16.11	16.19	0.0	17.5
		15	0	16.12	16.03	16.24	0.0	17.5
	64QAM	1	0	16.18	16.56	16.56	0.0	17.5
		1	8	16.15	16.28	16.42	0.0	17.5
		1	14	16.11	16.61	16.62	0.0	17.5
		8	0	16.29	16.20	16.38	0.0	17.5
		8	4	16.22	16.18	16.41	0.0	17.5
		8	7	16.27	16.20	16.40	0.0	17.5
		15	0	16.27	16.10	16.41	0.0	17.5

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	16.14	16.08	16.31	0.0	17.5
		1	3	15.95	15.98	16.02	0.0	17.5
		1	5	16.09	16.04	16.25	0.0	17.5
		3	0	16.08	16.05	16.29	0.0	17.5
		3	1	16.06	15.98	16.28	0.0	17.5
		3	3	16.07	15.95	16.06	0.0	17.5
		6	0	16.00	15.97	16.25	0.0	17.5
	16QAM	1	0	16.06	15.95	16.21	0.0	17.5
		1	3	16.26	16.11	16.29	0.0	17.5
		1	5	16.14	16.06	16.32	0.0	17.5
		3	0	16.17	16.17	16.25	0.0	17.5
		3	1	16.18	16.13	16.29	0.0	17.5
		3	3	16.17	16.12	16.22	0.0	17.5
		6	0	16.09	16.07	16.23	0.0	17.5
	64QAM	1	0	16.47	16.35	16.20	0.0	17.5
		1	3	16.35	16.23	16.47	0.0	17.5
		1	5	16.43	16.25	16.28	0.0	17.5
		3	0	16.34	16.34	16.25	0.0	17.5
		3	1	16.32	16.24	16.24	0.0	17.5
		3	3	16.32	16.22	16.16	0.0	17.5
		6	0	16.20	16.22	16.34	0.0	17.5

9.4. NR (Sub 6)

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 6.2.2.3-1: 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]
	≤ 0.5[2]		0[2]
DFT-s-OFDM QPSK	≤ 1		0
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

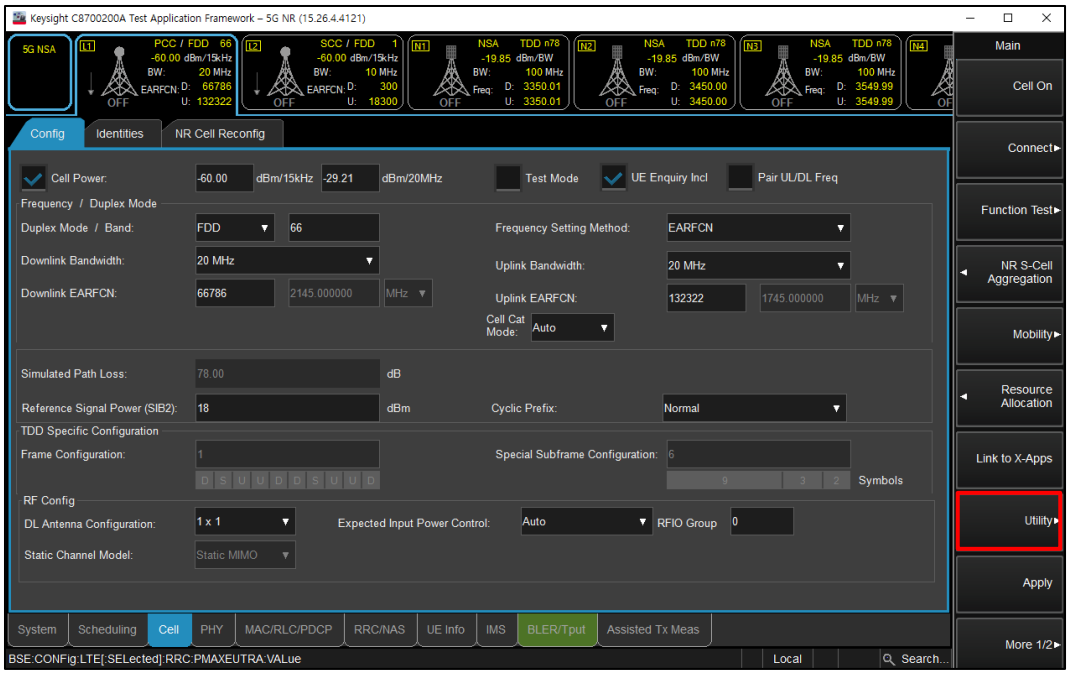
Uplink RB allocations were used to Table 6.1-1 of the 3GPP TS 138.521-1.

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	36@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

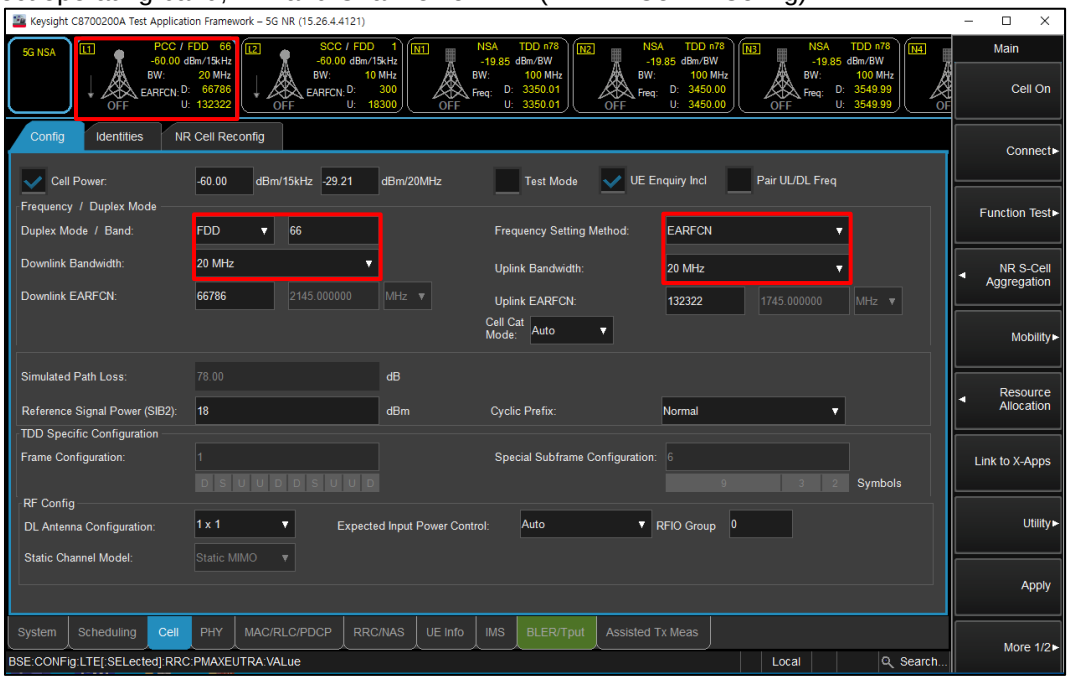


(Figure 1-1)

(Figure 1-2)

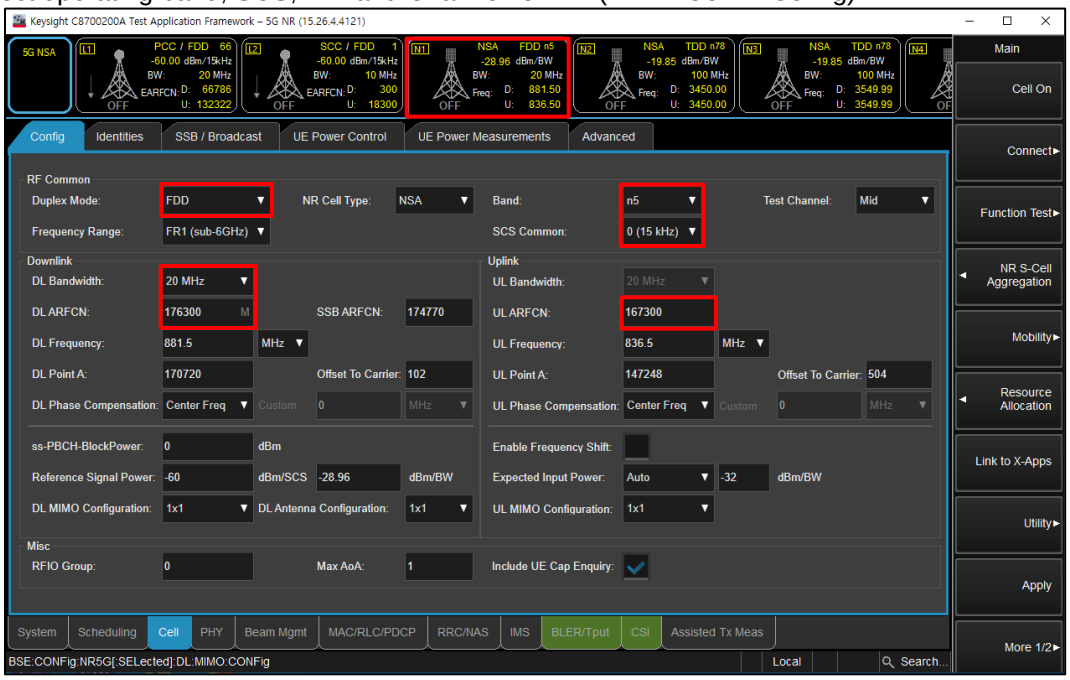
NSA Mode

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



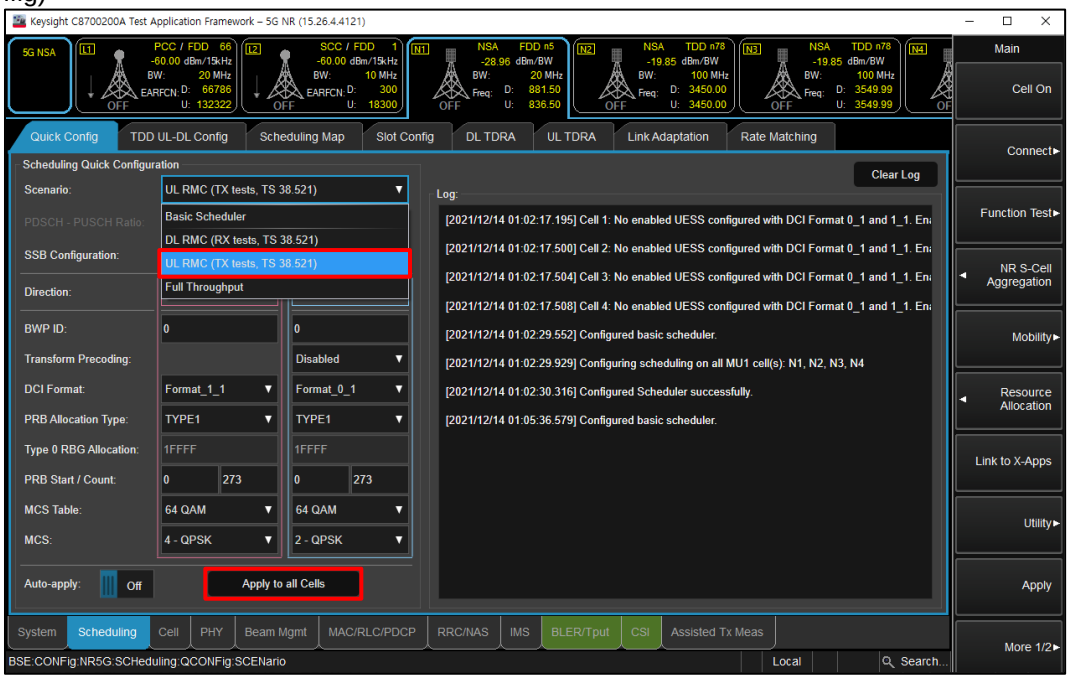
(Figure 2-1)

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



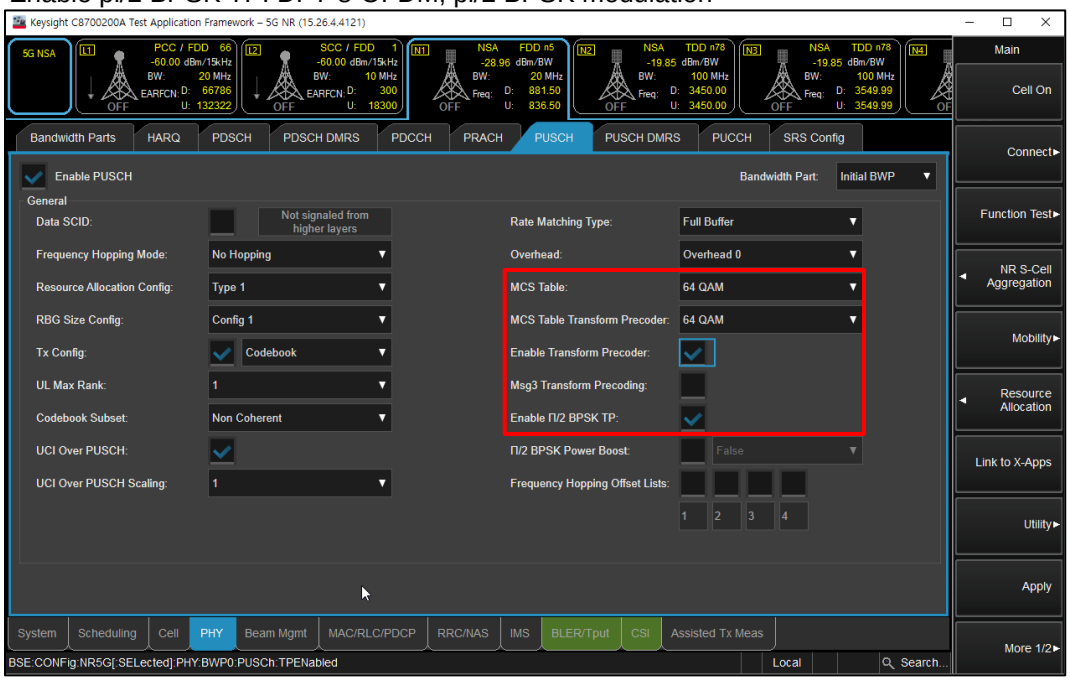
(Figure 2-2)

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



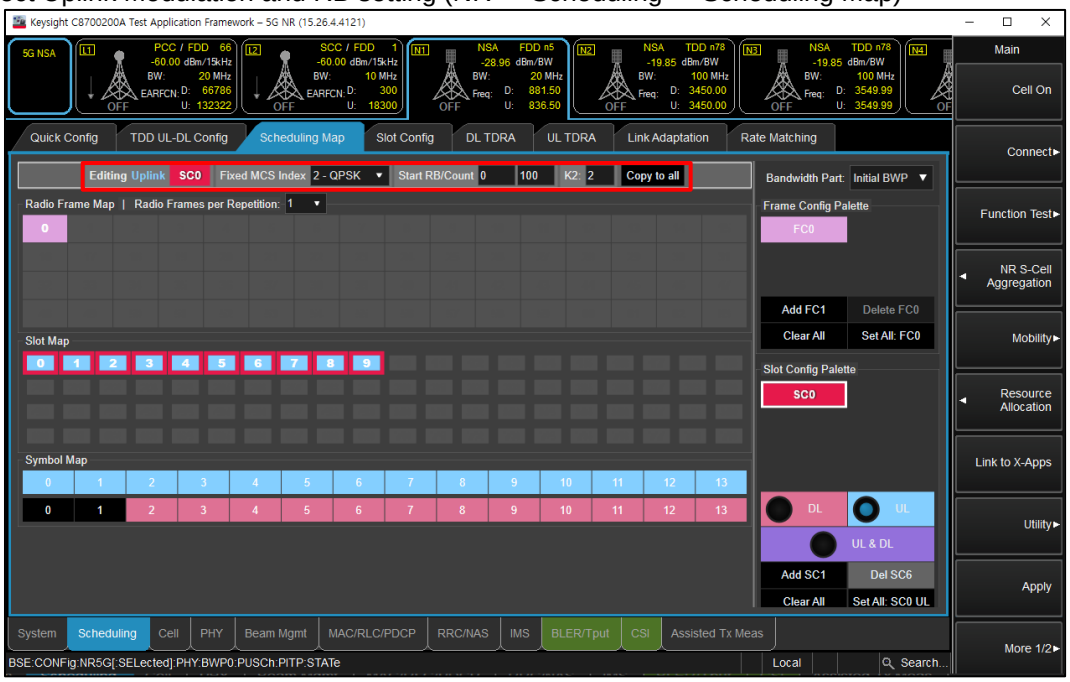
(Figure 2-3)

- 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



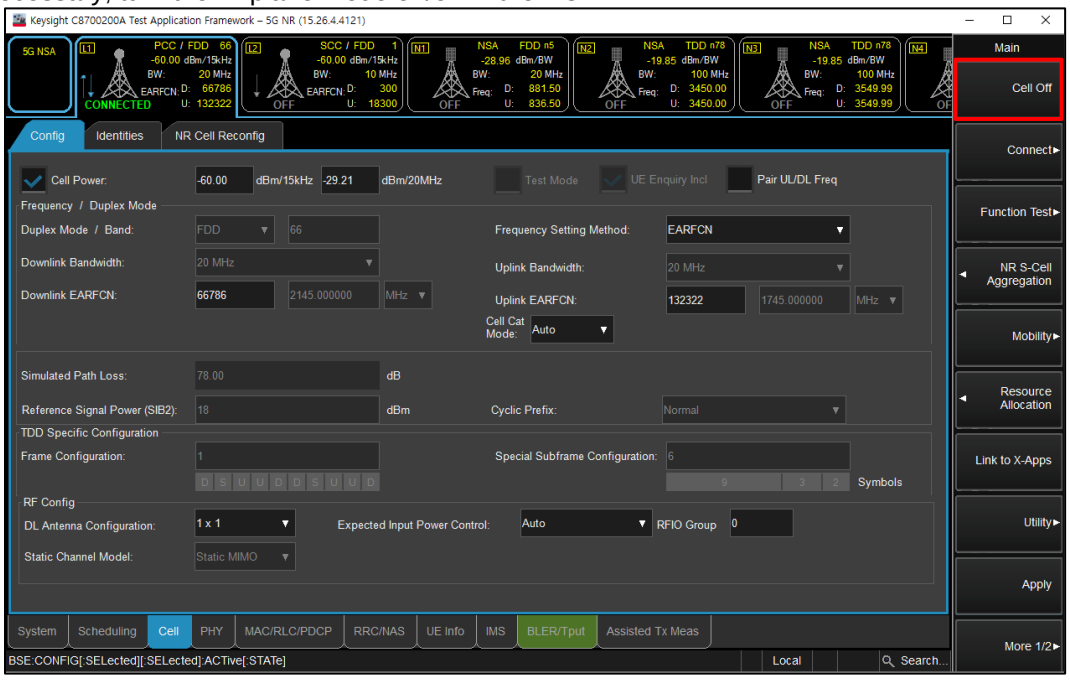
(Figure 2-4)

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



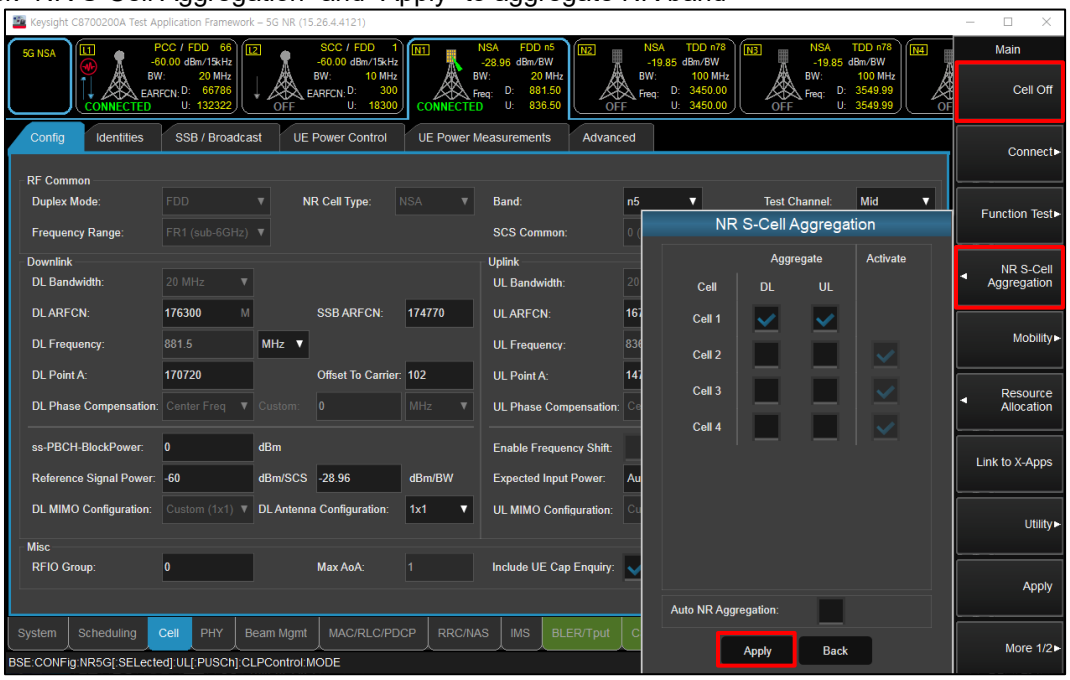
(Figure 2-5)

- 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



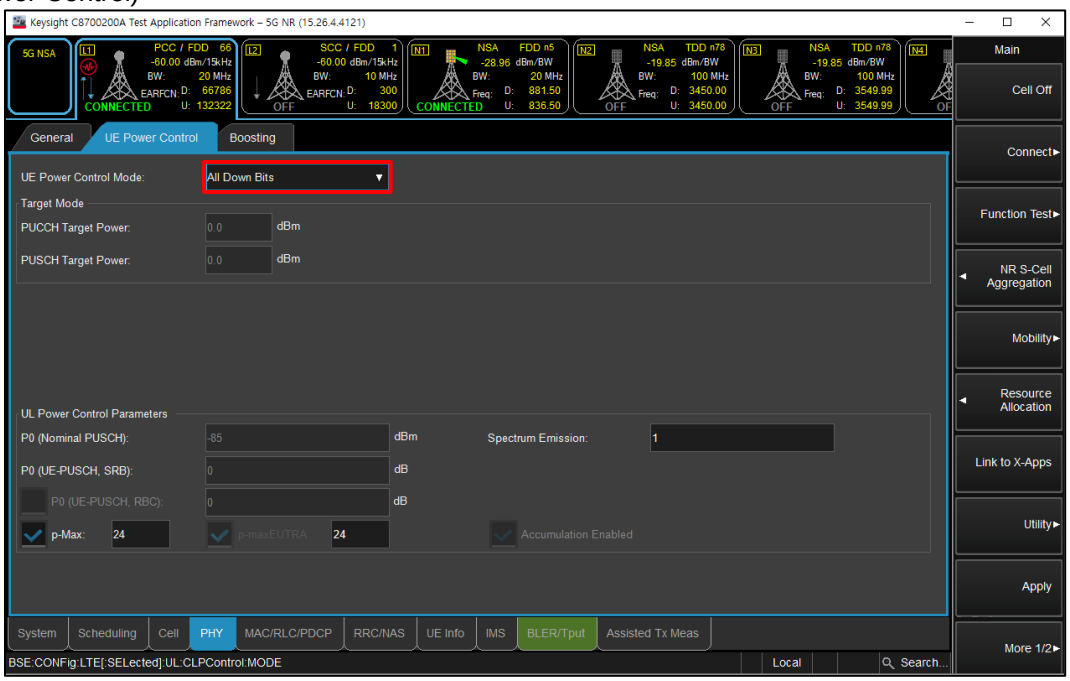
(Figure 2-6)

- 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



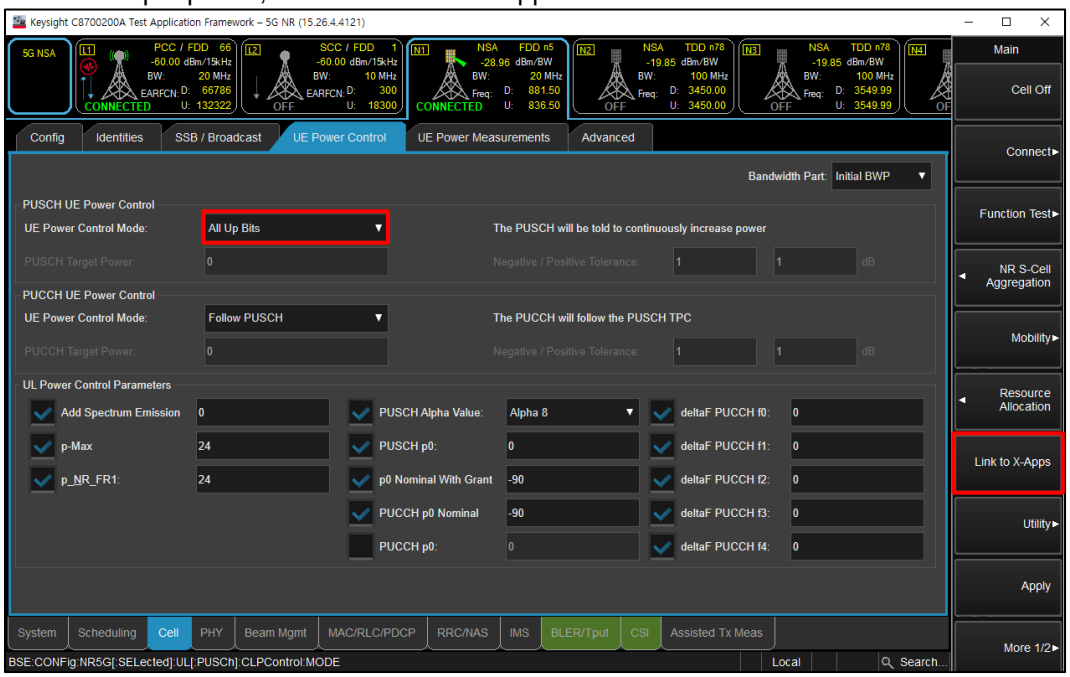
(Figure 2-7)

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



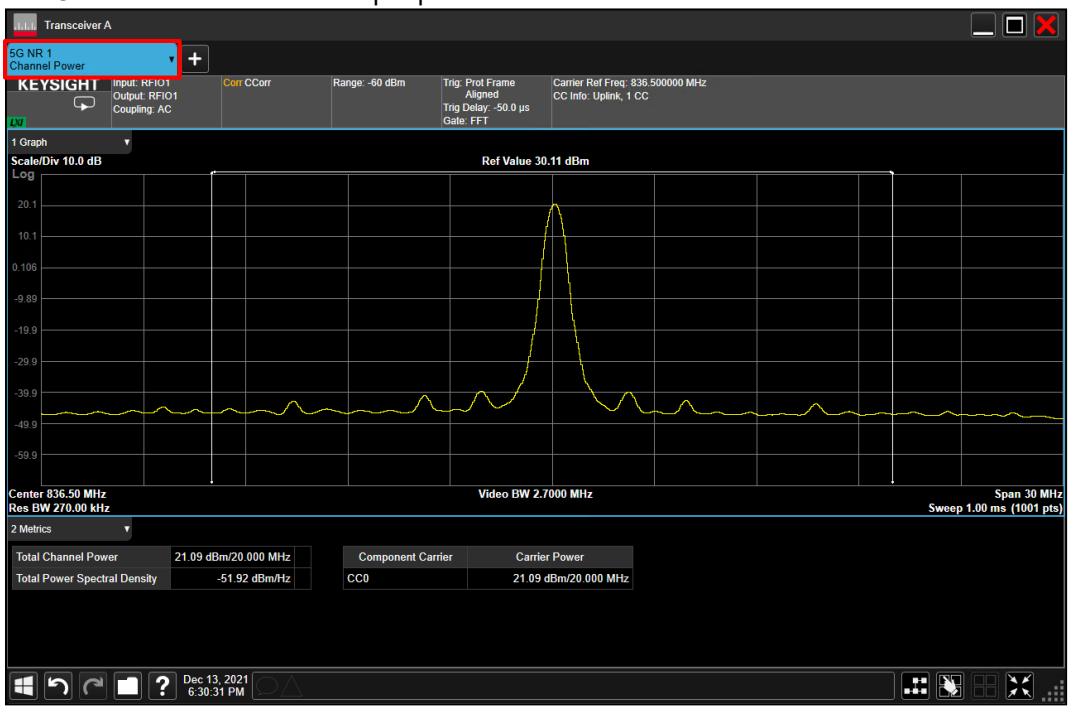
(Figure 2-8)

- 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”



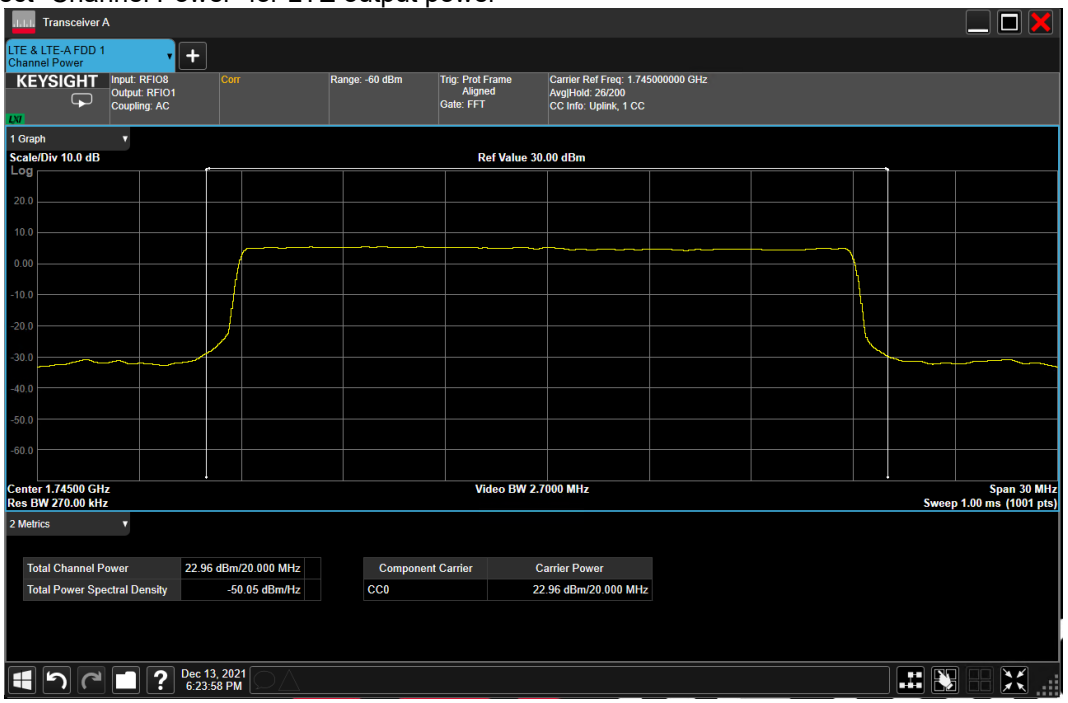
(Figure 2-9)

- Select “Channel Power” for NR output power



(Figure 2-10)

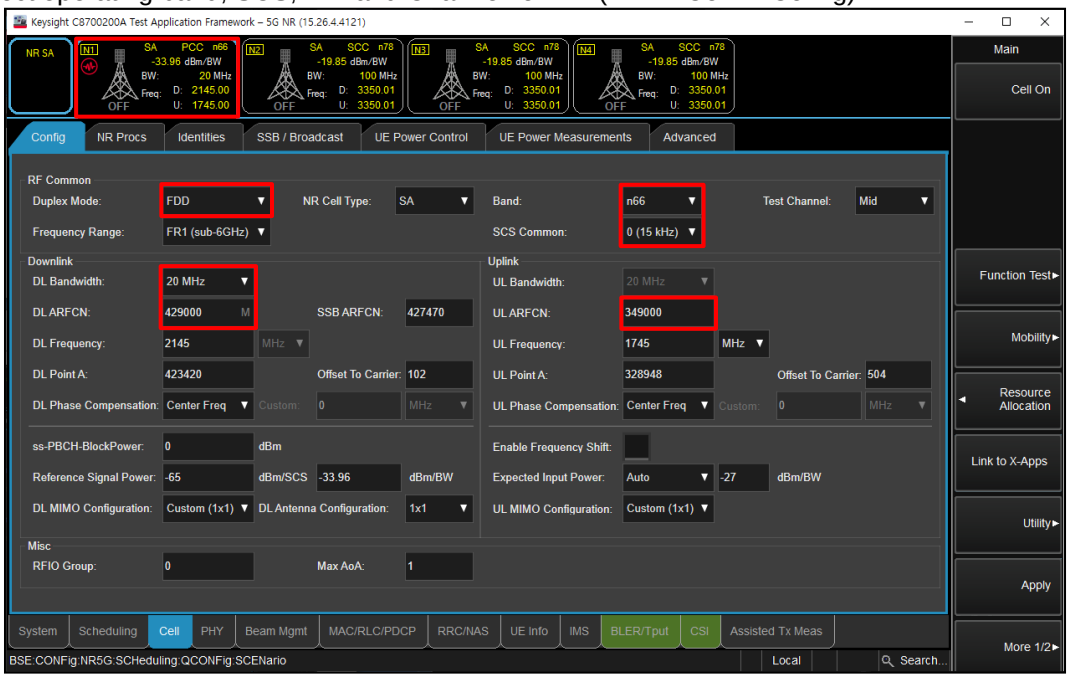
- Select “Channel Power” for LTE output power



(Figure 2-11)

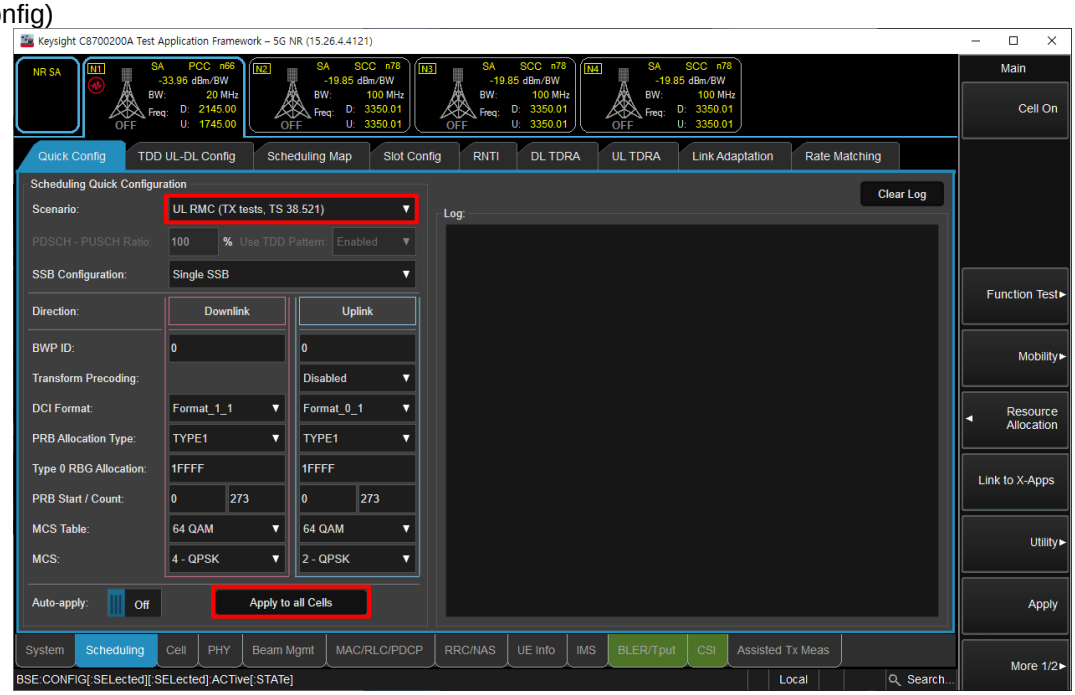
SA Mode

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



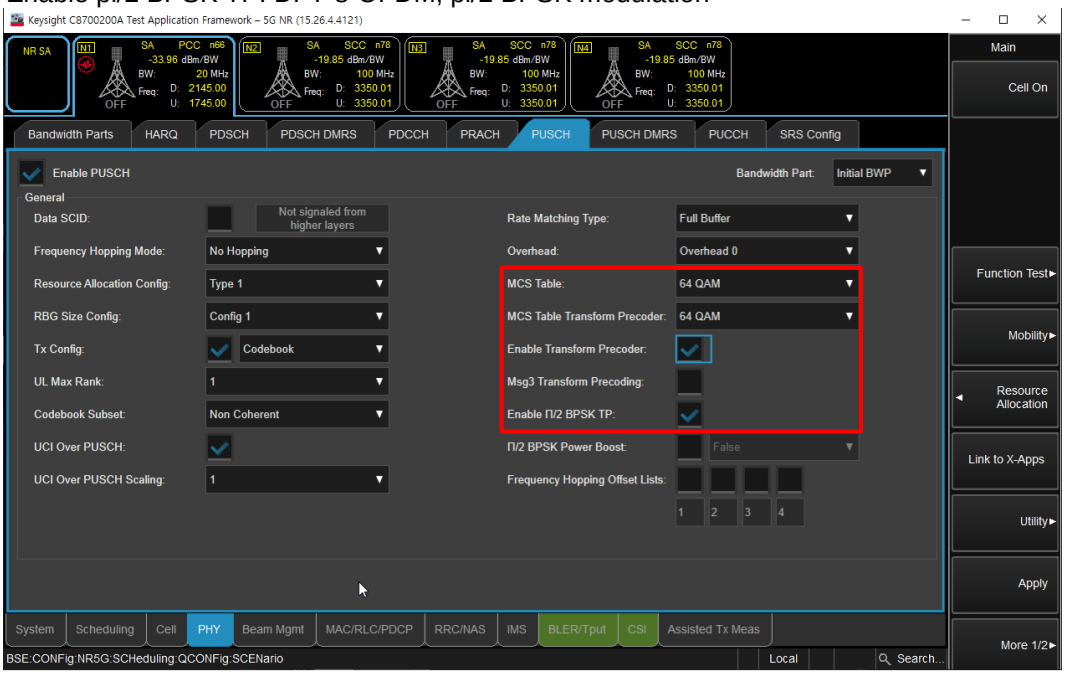
(Figure 3-1)

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



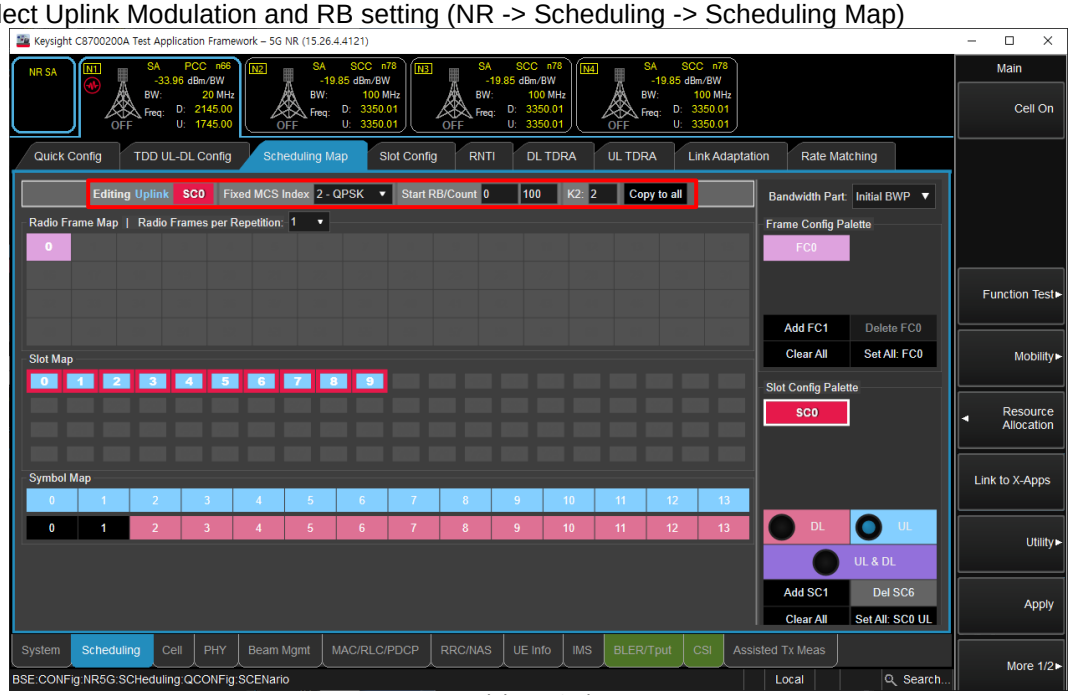
(Figure 3-2)

- 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



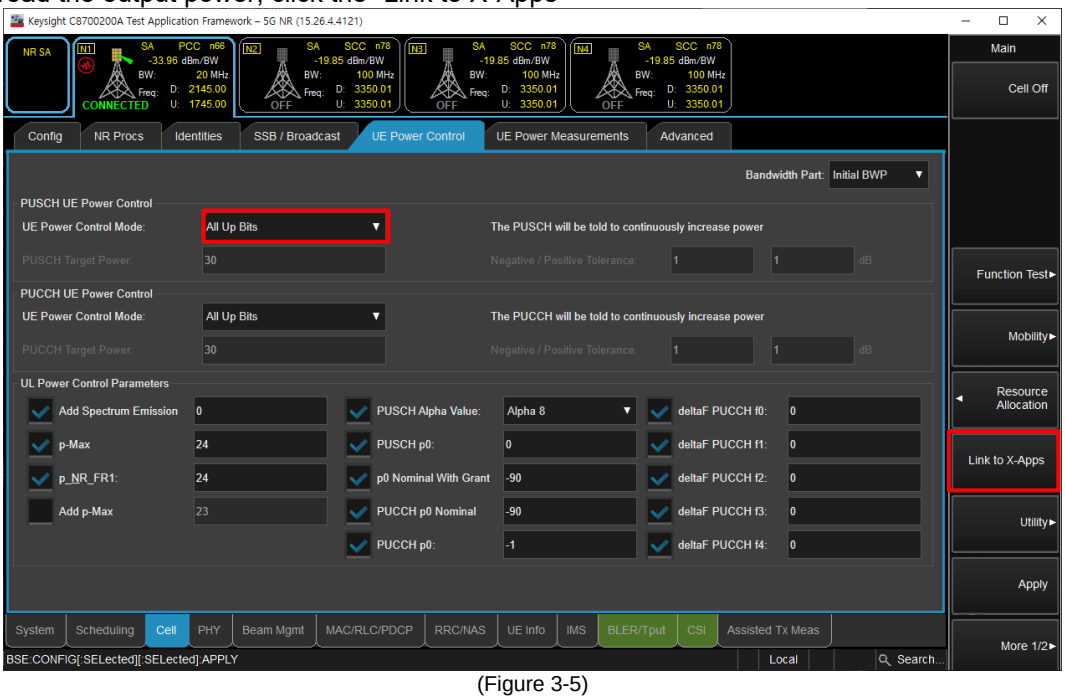
(Figure 3-3)

- 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)

NR Band n5 Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)				
					RSI=Pmax, Free, Rcv, Hotspot, Earjack				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					166800	167300	167800		
					834.00 MHz	836.50 MHz	839.00 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1		24.68		0.0	25.5
			1	52		24.88		0.0	25.5
			1	104		24.62		0.0	25.5
			50	0		23.72		0.5	25.0
			50	28		24.72		0.0	25.5
			50	56		23.69		0.5	25.0
			100	0		23.74		0.5	25.0
		QPSK	1	1		24.66		0.0	25.5
			1	52		**24.79**		0.0	25.5
			1	104		24.63		0.0	25.5
			50	0		23.72		1.0	24.5
			50	28		**24.72**		0.0	25.5
			50	56		23.71		1.0	24.5
			100	0		23.75		1.0	24.5
		16QAM	1	1		23.68		1.0	24.5
			1	52		23.76		1.0	24.5
			1	104		23.65		1.0	24.5
		64QAM	1	1		22.16		2.5	23.0
		256QAM	1	1		20.08		4.5	21.0
	CP-OFDM	QPSK	1	1		23.15		1.5	24.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					166300	167300	168300		
					831.50 MHz	836.50 MHz	841.50 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1		24.71		0.0	25.5
			1	39		24.65		0.0	25.5
			1	77		24.62		0.0	25.5
			36	0		23.64		0.5	25.0
			36	21		24.67		0.0	25.5
			36	43		23.62		0.5	25.0
			75	0		23.43		0.5	25.0
		QPSK	1	1		24.67		0.0	25.5
			1	39		24.64		0.0	25.5
			1	77		23.38		0.0	25.5
			36	0		23.11		1.0	24.5
			36	21		23.73		0.0	25.5
			36	43		22.89		1.0	24.5
			75	0		23.7		1.0	24.5
		16QAM	1	1		23.81		1.0	24.5
			1	39		23.06		1.0	24.5
			1	77		23.74		1.0	24.5
		64QAM	1	1		22.24		2.5	23.0
		256QAM	1	1		20.1		4.5	21.0
	CP-OFDM	QPSK	1	1		23.2		1.5	24.0

NR Band n5 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					165800	167300	168800		
					829.00 MHz	836.50 MHz	844.00 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.43		23.64	0.0	25.5
			1	25	24.53		24.06	0.0	25.5
			1	50	24.46		24.04	0.0	25.5
			25	0	23.46		23.09	0.5	25.0
			25	13	24.43		24.65	0.0	25.5
			25	27	23.45		22.92	0.5	25.0
			50	0	23.44		22.65	0.5	25.0
		QPSK	1	1	24.42		23.69	0.0	25.5
			1	25	24.5		24.06	0.0	25.5
			1	50	24.44		23.25	0.0	25.5
			25	0	23.46		23.02	1.0	24.5
			25	13	24.44		24	0.0	25.5
			25	27	23.47		22.95	1.0	24.5
			50	0	23.44		22.95	1.0	24.5
		16QAM	1	1	23.44		22.87	1.0	24.5
			1	25	23.59		23.19	1.0	24.5
			1	50	23.52		22.71	1.0	24.5
		64QAM	1	1	21.97		21.24	2.5	23.0
		256QAM	1	1	19.9		19.56	4.5	21.0
	CP-OFDM	QPSK	1	1	22.94		22.62	1.5	24.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					165300	167300	169300		
					826.50 MHz	836.50 MHz	846.50 MHz		
5 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.69	24.7	24.73	0.0	25.5
			1	12	24.6	24.61	24.53	0.0	25.5
			1	23	24.71	24.72	24.58	0.0	25.5
			12	0	23.71	23.72	23.68	0.5	25.0
			12	6	24.68	24.72	24.65	0.0	25.5
			12	13	23.69	23.73	23.63	0.5	25.0
			25	0	23.7	23.74	23.67	0.5	25.0
		QPSK	1	1	24.7	24.71	24.72	0.0	25.5
			1	12	24.63	24.61	24.55	0.0	25.5
			1	23	24.72	24.71	24.63	0.0	25.5
			12	0	23.71	23.72	23.71	1.0	24.5
			12	6	24.67	24.71	24.71	0.0	25.5
			12	13	23.69	23.73	23.59	1.0	24.5
			25	0	23.71	23.74	23.61	1.0	24.5
		16QAM	1	1	23.76	23.74	23.74	1.0	24.5
			1	12	23.56	23.68	23.6	1.0	24.5
			1	23	23.76	23.7	23.61	1.0	24.5
		64QAM	1	1	22.34	22.29	22.25	2.5	23.0
		256QAM	1	1	20.14	20.14	20.18	4.5	21.0
	CP-OFDM	QPSK	1	1	23.2	23.21	23.24	1.5	24.0

NR Band n41 (Main.2) Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					MPR	Tune-up Limit
					RSI=Free, Rcv, Hotspot, Earjack						
					Measured Pwr (dBm)						
							518598				
							2592.99 MHz				
100 MHz	DFT-s-OFDM	π/2 BPSK	1	1			16.95			0.0	18.0
			1	136			17.23			0.0	18.0
			1	271			16.83			0.0	18.0
			135	0			16.99			0.0	18.0
			135	69			17.18			0.0	18.0
			135	138			16.97			0.0	18.0
			270	0			17.19			0.0	18.0
		QPSK	1	1			16.92			0.0	18.0
			1	136			**17.20**			0.0	18.0
			1	271			16.82			0.0	18.0
			135	0			16.97			0.0	18.0
			135	69			**17.20**			0.0	18.0
			135	138			16.97			0.0	18.0
			270	0			17.15			0.0	18.0
		16QAM	1	1			16.89			0.0	18.0
			1	136			17.25			0.0	18.0
			1	271			16.79			0.0	18.0
		64QAM	1	1			16.79			0.0	18.0
		256QAM	1	1			16.73			0.0	18.0
	CP-OFDM	QPSK	1	1			16.85			0.0	18.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					508200				528996		
					2541.00 MHz				2644.98 MHz		
90 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.34				17.02	0.0	18.0
			1	122	16.98				16.80	0.0	18.0
			1	243	17.02				16.88	0.0	18.0
			120	0	16.66				16.93	0.0	18.0
			120	62	16.97				16.88	0.0	18.0
			120	125	17.01				16.89	0.0	18.0
			243	0	16.93				16.84	0.0	18.0
		QPSK	1	1	16.33				17.08	0.0	18.0
			1	122	16.95				16.85	0.0	18.0
			1	243	17.01				16.93	0.0	18.0
			120	0	16.64				16.92	0.0	18.0
			120	62	16.97				16.83	0.0	18.0
			120	125	17.02				16.85	0.0	18.0
			243	0	16.94				16.79	0.0	18.0
		16QAM	1	1	16.34				17.03	0.0	18.0
			1	122	17.06				16.91	0.0	18.0
			1	243	17.03				16.92	0.0	18.0
		64QAM	1	1	16.26				16.97	0.0	18.0
		256QAM	1	1	16.24				16.99	0.0	18.0
	CP-OFDM	QPSK	1	1	16.27				16.93	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Main.2) 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	16.71				17.01	0.0	18.0
			1	108	17.09				16.89	0.0	18.0
			1	215	17.11				16.95	0.0	18.0
			108	0	17.02				16.85	0.0	18.0
			108	54	17.12				16.86	0.0	18.0
			108	109	17.11				16.87	0.0	18.0
			216	0	17.06				16.77	0.0	18.0
		QPSK	1	1	16.70				16.88	0.0	18.0
			1	108	17.08				16.74	0.0	18.0
			1	215	17.12				16.89	0.0	18.0
			108	0	16.99				16.79	0.0	18.0
			108	54	17.09				16.77	0.0	18.0
			108	109	17.11				16.81	0.0	18.0
			216	0	17.05				16.72	0.0	18.0
		16QAM	1	1	16.68				16.85	0.0	18.0
			1	108	17.17				16.85	0.0	18.0
			1	215	17.09				16.87	0.0	18.0
		64QAM	1	1	16.61				16.76	0.0	18.0
		256QAM	1	1	16.62				16.78	0.0	18.0
	CP-OFDM	QPSK	1	1	16.62				16.88	0.0	18.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					506202				531000		
					2531.01 MHz				2655.00 MHz		
70 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.32				16.84	0.0	18.0
			1	94	16.80				16.79	0.0	18.0
			1	187	16.99				16.90	0.0	18.0
			90	0	16.46				16.77	0.0	18.0
			90	49	16.74				16.77	0.0	18.0
			90	99	16.96				16.83	0.0	18.0
			180	0	16.72				16.77	0.0	18.0
		QPSK	1	1	16.24				16.82	0.0	18.0
			1	94	16.75				16.77	0.0	18.0
			1	187	16.97				16.88	0.0	18.0
			90	0	16.44				16.76	0.0	18.0
			90	49	16.75				16.77	0.0	18.0
			90	99	16.96				16.83	0.0	18.0
			180	0	16.68				16.75	0.0	18.0
		16QAM	1	1	16.27				16.83	0.0	18.0
			1	94	16.74				16.77	0.0	18.0
			1	187	16.95				16.87	0.0	18.0
		64QAM	1	1	16.22				16.80	0.0	18.0
		256QAM	1	1	16.22				16.76	0.0	18.0
	CP-OFDM	QPSK	1	1	16.23				16.81	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Main.2) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					505200		518598		531996		
					2526.00 MHz		2592.99 MHz		2659.98 MHz		
60 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.21		16.93		16.68	0.0	18.0
			1	80	16.65		17.11		16.72	0.0	18.0
			1	160	16.91		16.86		16.85	0.0	18.0
			81	0	16.51		16.99		16.73	0.0	18.0
			81	40	16.72		17.14		16.78	0.0	18.0
			81	81	16.88		16.98		16.82	0.0	18.0
			162	0	16.69		17.08		16.70	0.0	18.0
		QPSK	1	1	16.21		16.83		16.66	0.0	18.0
			1	80	16.64		17.07		16.65	0.0	18.0
			1	160	16.91		16.82		16.78	0.0	18.0
			81	0	16.49		16.98		16.65	0.0	18.0
			81	40	16.70		17.11		16.71	0.0	18.0
			81	81	16.87		16.96		16.75	0.0	18.0
			162	0	16.68		17.10		16.69	0.0	18.0
		16QAM	1	1	16.25		16.84		16.65	0.0	18.0
			1	80	16.65		17.06		16.66	0.0	18.0
			1	160	16.93		16.85		16.81	0.0	18.0
		64QAM	1	1	16.20		16.79		16.59	0.0	18.0
		256QAM	1	1	16.22		16.81		16.58	0.0	18.0
	CP-OFDM	QPSK	1	1	16.16		16.81		16.61	0.0	18.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					504204		518598		532998		
					2521.02 MHz		2592.99 MHz		2664.99 MHz		
50 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.27		16.86		16.65	0.0	18.0
			1	66	16.64		17.09		16.74	0.0	18.0
			1	131	16.86		16.85		16.81	0.0	18.0
			64	0	16.45		16.94		16.66	0.0	18.0
			64	34	16.65		17.09		16.74	0.0	18.0
			64	69	16.73		16.95		16.79	0.0	18.0
			128	0	16.63		17.08		16.74	0.0	18.0
		QPSK	1	1	16.26		16.84		16.63	0.0	18.0
			1	66	16.63		17.04		16.72	0.0	18.0
			1	131	16.87		16.81		16.82	0.0	18.0
			64	0	16.43		16.93		16.67	0.0	18.0
			64	34	16.64		17.08		16.74	0.0	18.0
			64	69	16.72		16.96		16.81	0.0	18.0
			128	0	16.61		17.07		16.72	0.0	18.0
		16QAM	1	1	16.22		16.81		16.64	0.0	18.0
			1	66	16.71		17.16		16.82	0.0	18.0
			1	131	16.86		16.84		16.82	0.0	18.0
		64QAM	1	1	16.19		16.77		16.57	0.0	18.0
		256QAM	1	1	16.21		16.79		16.62	0.0	18.0
	CP-OFDM	QPSK	1	1	16.22		16.77		16.59	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Main.2) Measured Results (Continued)

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	2670.00 MHz		
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.36	16.91		16.97	16.63	0.0	18.0
			1	52	16.57	16.92		16.81	16.72	0.0	18.0
			1	104	16.78	17.01		16.67	16.85	0.0	18.0
			50	0	16.41	16.97		16.92	16.71	0.0	18.0
			50	28	16.61	16.95		16.89	16.79	0.0	18.0
			50	56	16.69	16.97		16.74	16.84	0.0	18.0
			100	0	16.56	16.96		16.87	16.77	0.0	18.0
		QPSK	1	1	16.29	16.92		16.98	16.62	0.0	18.0
			1	52	16.54	16.89		16.82	16.74	0.0	18.0
			1	104	16.77	17.01		16.69	16.85	0.0	18.0
			50	0	16.41	16.97		16.92	16.70	0.0	18.0
			50	28	16.58	16.94		16.87	16.77	0.0	18.0
			50	56	16.68	16.95		16.74	16.86	0.0	18.0
			100	0	16.57	16.92		16.86	16.77	0.0	18.0
		16QAM	1	1	16.28	16.92		16.99	16.62	0.0	18.0
			1	52	16.54	16.88		16.81	16.72	0.0	18.0
			1	104	16.74	17.01		16.69	16.85	0.0	18.0
		64QAM	1	1	16.29	16.81		16.91	16.54	0.0	18.0
		256QAM	1	1	16.24	16.82		16.94	16.57	0.0	18.0
	CP-OFDM	QPSK	1	1	16.22	16.86		16.92	16.55	0.0	18.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					502200	510402	518598	526800	534996		
					2511.00 MHz	2552.01 MHz	2592.99 MHz	2634.00 MHz	2674.98 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.37	16.87	16.97	16.84	16.67	0.0	18.0
			1	39	16.62	17.09	17.19	16.82	16.87	0.0	18.0
			1	76	16.71	16.98	16.99	16.72	16.88	0.0	18.0
			36	0	16.38	16.94	17.04	16.78	16.75	0.0	18.0
			36	21	16.54	17.02	17.13	16.76	16.82	0.0	18.0
			36	42	16.65	17.00	17.08	16.73	16.87	0.0	18.0
			75	0	16.53	17.01	17.11	16.76	16.82	0.0	18.0
		QPSK	1	1	16.32	16.84	16.96	16.83	16.71	0.0	18.0
			1	39	16.59	17.06	17.16	16.79	16.86	0.0	18.0
			1	76	16.68	16.95	16.96	16.71	16.88	0.0	18.0
			36	0	16.37	16.94	17.02	16.79	16.77	0.0	18.0
			36	21	16.52	17.01	17.12	16.76	16.82	0.0	18.0
			36	42	16.64	17.00	17.06	16.74	16.88	0.0	18.0
			75	0	16.52	16.99	17.11	16.76	16.81	0.0	18.0
		16QAM	1	1	16.31	16.84	16.92	16.85	16.72	0.0	18.0
			1	39	16.58	17.05	17.13	16.77	16.84	0.0	18.0
			1	76	16.66	16.95	16.96	16.71	16.86	0.0	18.0
		64QAM	1	1	16.26	16.75	16.87	16.77	16.63	0.0	18.0
		256QAM	1	1	16.27	16.77	16.88	16.81	16.67	0.0	18.0
	CP-OFDM	QPSK	1	1	16.29	16.76	16.89	16.77	16.62	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Main.2) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					501204	509904	518598	527298	535998		
					2506.02 MHz	2549.52 MHz	2592.99 MHz	2636.49 MHz	2679.99 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.41	16.89	17.03	16.74	16.73	0.0	18.0
			1	25	16.46	16.97	17.14	16.77	16.87	0.0	18.0
			1	49	16.61	16.99	17.09	16.76	16.91	0.0	18.0
			25	0	16.41	16.97	17.07	16.78	16.82	0.0	18.0
			25	13	16.46	16.98	17.14	16.76	16.88	0.0	18.0
			25	26	16.55	17.01	17.09	16.78	16.92	0.0	18.0
			50	0	16.45	16.99	17.15	16.76	16.88	0.0	18.0
		QPSK	1	1	16.38	16.90	17.04	16.79	16.78	0.0	18.0
			1	25	16.43	16.98	17.11	16.73	16.86	0.0	18.0
			1	49	16.58	17.01	17.08	16.73	16.92	0.0	18.0
			25	0	16.40	16.97	17.06	16.78	16.81	0.0	18.0
			25	13	16.45	16.99	17.12	16.75	16.87	0.0	18.0
			25	26	16.54	16.98	17.09	16.77	16.91	0.0	18.0
			50	0	16.43	17.01	17.12	16.74	16.88	0.0	18.0
		16QAM	1	1	16.34	16.87	17.03	16.77	16.77	0.0	18.0
			1	25	16.52	17.08	17.21	16.82	16.96	0.0	18.0
			1	49	16.57	17.01	17.08	16.74	16.91	0.0	18.0
		64QAM	1	1	16.26	16.83	16.96	16.72	16.70	0.0	18.0
		256QAM	1	1	16.30	16.86	16.97	16.71	16.73	0.0	18.0
	CP-OFDM	QPSK	1	1	16.32	16.83	16.92	16.69	16.69	0.0	18.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					500700	509652	518598	527550	536496		
					2503.50 MHz	2548.26 MHz	2592.99 MHz	2637.75 MHz	2682.48 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.31	16.87	17.04	16.75	16.83	0.0	18.0
			1	18	16.30	16.92	17.06	16.72	16.85	0.0	18.0
			1	36	16.49	16.99	17.09	16.74	16.92	0.0	18.0
			18	0	16.35	16.93	17.08	16.77	16.87	0.0	18.0
			18	10	16.37	16.98	17.11	16.74	16.91	0.0	18.0
			18	20	16.44	17.00	17.09	16.77	16.92	0.0	18.0
			36	0	16.36	16.98	17.12	16.76	16.91	0.0	18.0
		QPSK	1	1	16.33	16.87	16.99	16.75	16.79	0.0	18.0
			1	18	16.34	16.93	17.04	16.69	16.83	0.0	18.0
			1	36	16.51	16.99	17.09	16.75	16.88	0.0	18.0
			18	0	16.35	16.93	17.07	16.76	16.86	0.0	18.0
			18	10	16.39	16.97	17.10	16.74	16.89	0.0	18.0
			18	20	16.43	17.00	17.08	16.77	16.90	0.0	18.0
			36	0	16.38	16.97	17.12	16.76	16.91	0.0	18.0
		16QAM	1	1	16.33	16.89	17.04	16.77	16.81	0.0	18.0
			1	18	16.34	16.92	17.05	16.71	16.83	0.0	18.0
			1	36	16.51	16.99	17.09	16.76	16.92	0.0	18.0
		64QAM	1	1	16.27	16.83	16.96	16.71	16.73	0.0	18.0
		256QAM	1	1	16.28	16.85	16.98	16.71	16.76	0.0	18.0
	CP-OFDM	QPSK	1	1	16.29	16.82	16.96	16.67	16.71	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Main.2) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					500202	509400	518598	527802	537000		
					2501.01 MHz	2547.00 MHz	2592.99 MHz	2639.01 MHz	2685.00 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.37	16.94	17.19	16.82	16.95	0.0	18.0
			1	12	16.48	17.05	17.26	16.89	17.04	0.0	18.0
			1	22	16.49	17.04	17.22	16.85	17.00	0.0	18.0
			12	0	16.43	16.99	17.19	16.83	16.98	0.0	18.0
			12	6	16.45	17.02	17.21	16.85	17.01	0.0	18.0
			12	12	16.47	17.05	17.18	16.83	16.99	0.0	18.0
			24	0	16.45	17.01	17.20	16.88	17.02	0.0	18.0
		QPSK	1	1	16.42	16.92	17.14	16.83	16.96	0.0	18.0
			1	12	16.48	17.06	17.24	16.91	17.05	0.0	18.0
			1	22	16.48	17.01	17.18	16.85	16.99	0.0	18.0
			12	0	16.43	16.98	17.19	16.83	16.98	0.0	18.0
			12	6	16.47	17.01	17.23	16.87	17.01	0.0	18.0
			12	12	16.46	17.04	17.18	16.86	16.99	0.0	18.0
			24	0	16.44	17.02	17.21	16.85	17.00	0.0	18.0
		16QAM	1	1	16.41	16.91	17.13	16.84	16.95	0.0	18.0
			1	12	16.47	17.02	17.25	16.92	17.07	0.0	18.0
			1	22	16.49	17.00	17.18	16.88	16.98	0.0	18.0
		64QAM	1	1	16.33	16.87	17.06	16.74	16.85	0.0	18.0
		256QAM	1	1	16.37	16.88	17.08	16.76	16.89	0.0	18.0
	CP-OFDM	QPSK	1	1	16.34	16.89	17.05	16.75	16.86	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41(Sub.2) Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					MPR	Tune-up Limit
					RSI=Free, Rcv, Hotspot, Earjack						
					Measured Pwr (dBm)						
							518598				
							2592.99 MHz				
100 MHz	DFT-s-OFDM	π/2 BPSK	1	1			17.33			0.0	18.0
			1	136			17.59			0.0	18.0
			1	271			17.81			0.0	18.0
			135	0			17.11			0.0	18.0
			135	69			17.57			0.0	18.0
			135	138			17.51			0.0	18.0
			270	0			17.53			0.0	18.0
		QPSK	1	1			17.21			0.0	18.0
			1	136			17.52			0.0	18.0
			1	271			**17.77**			0.0	18.0
			135	0			17.07			0.0	18.0
			135	69			**17.58**			0.0	18.0
			135	138			17.47			0.0	18.0
			270	0			17.51			0.0	18.0
		16QAM	1	1			17.18			0.0	18.0
			1	136			17.61			0.0	18.0
			1	271			17.79			0.0	18.0
		64QAM	1	1			17.16			0.0	18.0
		256QAM	1	1			17.21			0.0	18.0
	CP-OFDM	QPSK	1	1			17.22			0.0	18.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					508200				528996		
					2541.00 MHz				2644.98 MHz		
90 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.02				17.15	0.0	18.0
			1	122	17.17				17.24	0.0	18.0
			1	243	17.08				17.39	0.0	18.0
			120	0	17.09				17.09	0.0	18.0
			120	62	17.14				17.21	0.0	18.0
			120	125	17.06				17.26	0.0	18.0
			243	0	17.12				17.12	0.0	18.0
		QPSK	1	1	17.02				17.15	0.0	18.0
			1	122	17.18				17.22	0.0	18.0
			1	243	17.09				17.36	0.0	18.0
			120	0	17.05				17.07	0.0	18.0
			120	62	17.15				17.18	0.0	18.0
			120	125	17.05				17.25	0.0	18.0
			243	0	17.14				17.11	0.0	18.0
		16QAM	1	1	17.04				17.16	0.0	18.0
			1	122	17.27				17.29	0.0	18.0
			1	243	17.08				17.37	0.0	18.0
		64QAM	1	1	16.98				17.09	0.0	18.0
		256QAM	1	1	16.99				17.12	0.0	18.0
	CP-OFDM	QPSK	1	1	17.02				17.14	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Sub.2) 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	17.22				17.24	0.0	18.0
			1	108	17.36				17.33	0.0	18.0
			1	215	17.20				17.38	0.0	18.0
			108	0	17.24				17.16	0.0	18.0
			108	54	17.31				17.16	0.0	18.0
			108	109	17.28				17.33	0.0	18.0
			216	0	17.27				17.19	0.0	18.0
		QPSK	1	1	17.17				17.24	0.0	18.0
			1	108	17.30				17.31	0.0	18.0
			1	215	17.18				17.36	0.0	18.0
			108	0	17.21				17.15	0.0	18.0
			108	54	17.27				17.27	0.0	18.0
			108	109	17.26				17.34	0.0	18.0
			216	0	17.23				17.19	0.0	18.0
		16QAM	1	1	17.17				17.22	0.0	18.0
			1	108	17.29				17.31	0.0	18.0
			1	215	17.17				17.37	0.0	18.0
		64QAM	1	1	17.10				17.15	0.0	18.0
		256QAM	1	1	17.11				17.16	0.0	18.0
	CP-OFDM	QPSK	1	1	17.12				17.19	0.0	18.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					506202				531000		
					2531.01 MHz				2655.00 MHz		
70 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.24				17.27	0.0	18.0
			1	94	17.36				17.34	0.0	18.0
			1	187	17.31				17.41	0.0	18.0
			90	0	17.26				17.17	0.0	18.0
			90	49	17.31				17.28	0.0	18.0
			90	99	17.35				17.36	0.0	18.0
			180	0	17.30				17.25	0.0	18.0
		QPSK	1	1	17.18				17.22	0.0	18.0
			1	94	17.32				17.32	0.0	18.0
			1	187	17.28				17.41	0.0	18.0
			90	0	17.24				17.15	0.0	18.0
			90	49	17.29				17.26	0.0	18.0
			90	99	17.32				17.37	0.0	18.0
			180	0	17.27				17.20	0.0	18.0
		16QAM	1	1	17.16				17.21	0.0	18.0
			1	94	17.31				17.31	0.0	18.0
			1	187	17.29				17.38	0.0	18.0
		64QAM	1	1	17.12				17.13	0.0	18.0
		256QAM	1	1	17.13				17.15	0.0	18.0
	CP-OFDM	QPSK	1	1	17.16				17.18	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Sub.2) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					505200		518598		531996		
					2526.00 MHz		2592.99 MHz		2659.98 MHz		
60 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.13		17.35		17.21	0.0	18.0
			1	80	17.25		17.31		17.32	0.0	18.0
			1	160	17.34		17.32		17.42	0.0	18.0
			81	0	17.16		17.24		17.17	0.0	18.0
			81	40	17.24		17.29		17.28	0.0	18.0
			81	81	17.28		17.37		17.36	0.0	18.0
			162	0	17.22		17.29		17.26	0.0	18.0
		QPSK	1	1	17.13		17.32		17.20	0.0	18.0
			1	80	17.24		17.28		17.30	0.0	18.0
			1	160	17.31		17.33		17.41	0.0	18.0
			81	0	17.13		17.23		17.16	0.0	18.0
			81	40	17.22		17.29		17.27	0.0	18.0
			81	81	17.24		17.36		17.35	0.0	18.0
			162	0	17.20		17.28		17.25	0.0	18.0
		16QAM	1	1	17.12		17.32		17.18	0.0	18.0
			1	80	17.21		17.28		17.28	0.0	18.0
			1	160	17.43		17.32		17.32	0.0	18.0
		64QAM	1	1	17.22		17.25		17.15	0.0	18.0
		256QAM	1	1	17.20		17.27		17.16	0.0	18.0
	CP-OFDM	QPSK	1	1	17.23		17.28		17.19	0.0	18.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					504204		518598		532998		
					2521.02 MHz		2592.99 MHz		2664.99 MHz		
50 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.32		17.30		17.33	0.0	18.0
			1	66	17.39		17.42		17.49	0.0	18.0
			1	131	17.38		17.25		17.54	0.0	18.0
			64	0	17.32		17.38		17.41	0.0	18.0
			64	34	17.39		17.43		17.48	0.0	18.0
			64	69	17.37		17.38		17.50	0.0	18.0
			128	0	17.36		17.41		17.45	0.0	18.0
		QPSK	1	1	17.26		17.31		17.32	0.0	18.0
			1	66	17.35		17.41		17.48	0.0	18.0
			1	131	17.37		17.29		17.53	0.0	18.0
			64	0	17.31		17.35		17.38	0.0	18.0
			64	34	17.36		17.42		17.45	0.0	18.0
			64	69	17.36		17.38		17.48	0.0	18.0
			128	0	17.34		17.41		17.45	0.0	18.0
		16QAM	1	1	17.25		17.30		17.29	0.0	18.0
			1	66	17.41		17.47		17.51	0.0	18.0
			1	131	17.34		17.27		17.49	0.0	18.0
		64QAM	1	1	17.20		17.28		17.20	0.0	18.0
		256QAM	1	1	17.23		17.28		17.22	0.0	18.0
	CP-OFDM	QPSK	1	1	17.22		17.27		17.25	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Sub.2) Measured Results (Continued)

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	2670.00 MHz		
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.31	17.34		17.38	17.35	0.0	18.0
			1	52	17.33	17.29		17.29	17.43	0.0	18.0
			1	104	17.38	17.35		17.43	17.54	0.0	18.0
			50	0	17.37	17.37		17.32	17.41	0.0	18.0
			50	28	17.36	17.35		17.29	17.48	0.0	18.0
			50	56	17.38	17.38		17.28	17.53	0.0	18.0
			100	0	17.36	17.35		17.29	17.46	0.0	18.0
		QPSK	1	1	17.27	17.42		17.34	17.35	0.0	18.0
			1	52	17.29	17.28		17.25	16.70	0.0	18.0
			1	104	17.38	17.34		17.26	16.78	0.0	18.0
			50	0	17.32	17.35		17.28	16.77	0.0	18.0
			50	28	17.34	17.32		17.31	16.84	0.0	18.0
			50	56	17.35	17.33		17.28	16.93	0.0	18.0
			100	0	17.34	17.34		17.33	16.88	0.0	18.0
		16QAM	1	1	17.26	17.40		17.28	16.83	0.0	18.0
			1	52	17.28	17.34		17.31	16.88	0.0	18.0
			1	104	17.38	17.39		17.27	17.03	0.0	18.0
		64QAM	1	1	17.21	17.41		17.23	16.79	0.0	18.0
		256QAM	1	1	17.24	17.36		17.24	16.80	0.0	18.0
	CP-OFDM	QPSK	1	1	17.26	17.37		17.27	16.83	0.0	18.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					502200	510402	518598	526800	534996		
					2511.00 MHz	2552.01 MHz	2592.99 MHz	2634.00 MHz	2674.98 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.84	16.82	17.25	17.21	17.34	0.0	18.0
			1	39	16.88	17.02	17.35	17.29	17.47	0.0	18.0
			1	76	17.01	16.90	17.26	17.28	17.48	0.0	18.0
			36	0	17.12	16.93	17.23	17.20	17.35	0.0	18.0
			36	21	17.14	17.23	17.27	17.21	17.39	0.0	18.0
			36	42	17.13	17.22	17.25	17.24	17.43	0.0	18.0
			75	0	17.14	17.21	17.28	17.18	17.38	0.0	18.0
		QPSK	1	1	17.11	17.26	17.21	17.17	17.33	0.0	18.0
			1	39	17.18	17.27	17.31	17.24	17.43	0.0	18.0
			1	76	17.16	17.19	17.22	17.26	17.45	0.0	18.0
			36	0	17.12	17.25	17.23	17.15	17.34	0.0	18.0
			36	21	17.14	17.23	17.26	17.19	17.38	0.0	18.0
			36	42	17.16	17.18	17.27	17.23	17.42	0.0	18.0
			75	0	17.15	17.23	17.26	17.16	17.36	0.0	18.0
		16QAM	1	1	17.10	17.24	17.21	17.13	17.34	0.0	18.0
			1	39	17.21	17.31	17.34	17.26	17.43	0.0	18.0
			1	76	17.16	17.19	17.23	17.25	17.44	0.0	18.0
		64QAM	1	1	17.03	17.19	17.15	17.08	17.24	0.0	18.0
		256QAM	1	1	17.03	17.18	17.18	17.09	17.27	0.0	18.0
	CP-OFDM	QPSK	1	1	17.08	17.21	17.19	17.14	17.31	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Sub.2) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					501204	509904	518598	527298	535998		
					2506.02 MHz	2549.52 MHz	2592.99 MHz	2636.49 MHz	2679.99 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.26	17.18	17.09	17.12	17.34	0.0	18.0
			1	25	17.28	17.14	17.11	17.15	17.41	0.0	18.0
			1	49	17.29	17.12	17.09	17.23	17.44	0.0	18.0
			25	0	17.22	17.14	17.04	17.09	17.35	0.0	18.0
			25	13	17.24	17.11	17.21	17.15	17.38	0.0	18.0
			25	26	17.26	17.08	17.19	17.17	17.37	0.0	18.0
			50	0	17.22	17.09	17.20	17.14	17.39	0.0	18.0
		QPSK	1	1	17.18	17.14	17.19	17.10	17.34	0.0	18.0
			1	25	17.24	17.08	17.18	17.13	17.37	0.0	18.0
			1	49	17.23	17.07	17.17	17.18	17.41	0.0	18.0
			25	0	17.18	17.13	17.14	17.10	17.31	0.0	18.0
			25	13	17.23	17.09	17.20	17.11	17.38	0.0	18.0
			25	26	17.24	17.08	17.18	17.17	17.52	0.0	18.0
			50	0	17.21	17.09	17.20	17.10	17.49	0.0	18.0
		16QAM	1	1	16.40	17.14	17.17	17.08	17.42	0.0	18.0
			1	25	16.35	17.15	17.25	17.18	17.56	0.0	18.0
			1	49	16.37	17.04	17.17	17.17	17.53	0.0	18.0
		64QAM	1	1	16.28	17.01	17.11	17.08	17.35	0.0	18.0
		256QAM	1	1	16.31	17.03	17.10	17.07	17.34	0.0	18.0
	CP-OFDM	QPSK	1	1	16.32	17.07	17.14	17.08	17.36	0.0	18.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					500700	509652	518598	527550	536496		
					2503.50 MHz	2548.26 MHz	2592.99 MHz	2637.75 MHz	2682.48 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.29	17.39	17.32	17.31	17.45	0.0	18.0
			1	18	17.32	17.34	17.37	17.34	17.53	0.0	18.0
			1	36	17.31	17.32	17.36	17.36	17.52	0.0	18.0
			18	0	17.25	17.35	17.31	17.26	17.45	0.0	18.0
			18	10	17.29	17.34	17.32	17.28	17.48	0.0	18.0
			18	20	17.31	17.32	17.34	17.29	17.49	0.0	18.0
			36	0	17.27	17.34	17.33	17.27	17.51	0.0	18.0
		QPSK	1	1	17.26	17.34	17.32	17.24	17.44	0.0	18.0
			1	18	17.28	17.35	17.33	17.26	17.51	0.0	18.0
			1	36	17.29	17.31	17.35	17.32	17.52	0.0	18.0
			18	0	17.22	17.32	17.28	17.22	17.42	0.0	18.0
			18	10	17.24	17.33	17.32	17.25	17.48	0.0	18.0
			18	20	17.28	17.28	17.33	17.27	17.47	0.0	18.0
			36	0	17.25	17.31	17.29	17.25	17.46	0.0	18.0
		16QAM	1	1	17.24	17.33	17.28	17.21	17.43	0.0	18.0
			1	18	17.26	17.31	17.32	17.25	17.49	0.0	18.0
			1	36	17.27	17.29	17.34	17.31	17.51	0.0	18.0
		64QAM	1	1	17.19	17.25	17.22	17.15	17.36	0.0	18.0
		256QAM	1	1	17.18	17.28	17.24	17.14	17.38	0.0	18.0
	CP-OFDM	QPSK	1	1	17.20	17.29	17.26	17.16	17.39	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

NR Band n41 (Sub.2) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit
					500202	509400	518598	527802	537000		
					2501.01 MHz	2547.00 MHz	2592.99 MHz	2639.01 MHz	2685.00 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.44	17.38	17.52	17.61	17.51	0.0	18.0
			1	12	17.67	17.39	17.58	17.76	17.65	0.0	18.0
			1	22	17.68	17.28	17.53	17.75	17.64	0.0	18.0
			12	0	17.59	17.33	17.54	17.72	17.59	0.0	18.0
			12	6	17.34	17.32	17.57	17.74	17.64	0.0	18.0
			12	12	17.67	17.29	17.53	17.75	17.65	0.0	18.0
			24	0	17.63	17.33	17.55	17.74	17.63	0.0	18.0
		QPSK	1	1	17.59	17.38	17.53	17.64	17.47	0.0	18.0
			1	12	17.68	17.35	17.61	17.76	17.62	0.0	18.0
			1	22	17.61	17.26	17.52	17.74	17.62	0.0	18.0
			12	0	17.60	17.34	17.56	17.71	17.58	0.0	18.0
			12	6	17.62	17.32	17.58	17.76	17.63	0.0	18.0
			12	12	17.59	17.27	17.56	17.75	17.64	0.0	18.0
			24	0	17.63	17.31	17.58	17.72	17.62	0.0	18.0
		16QAM	1	1	17.52	17.32	17.49	17.65	17.54	0.0	18.0
			1	12	17.61	17.28	17.55	17.71	17.62	0.0	18.0
			1	22	17.64	17.24	17.51	17.75	17.64	0.0	18.0
		64QAM	1	1	17.52	17.23	17.41	17.59	17.45	0.0	18.0
		256QAM	1	1	17.53	17.29	17.43	17.62	17.47	0.0	18.0
	CP-OFDM	QPSK	1	1	17.52	17.28	17.38	17.58	17.42	0.0	18.0

Notes:

NR TDD Bands were measured output power through FTM mode provided by manufacturer.

9.5. Wi-Fi 2.4 GHz (DTS Band)

WLAN each antennas(Sub4 and Sub6) output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Maximum Average Power (dBm)			Reduced Average Power (dBm)		
					Meas. Avg Pwr	Tune-up Limit	SAR Test (Yes/No)	Meas. Avg Pwr	Max. Tune-up Limit	SAR Test (Yes/No)
WiFi 2.4G Sub.4 Ant.	802.11b	1 Mbps	1	2412.0	17.78	19.0	Yes	7.49	8.0	Yes
			6	2437.0	18.42			7.37		
			11	2462.0	17.00			6.84		
	802.11g	6 Mbps	1-13	2412-2474	Not Required	17.0	No	Not Required	8.0	No
	802.11n	6.5 Mbps	1-13	2412-2474	Not Required	16.5	No	Not Required	8.0	No
	802.11ax	7.3 Mbps	1-13	2412-2474	Not Required	17.0	No	Not Required	8.0	No
WiFi 2.4G Sub.6 Ant	802.11b	1 Mbps	1	2412.0	16.05	17.0	Yes	6.02	7.0	Yes
			6	2437.0	15.99			5.56		
			11	2462.0	16.50			5.70		
	802.11g	6 Mbps	1-13	2412-2474	Not Required	15.5	No	Not Required	7.0	No
	802.11n	6.5 Mbps	1-13	2412-2474	Not Required	15.5	No	Not Required	7.0	No
	802.11ax	7.3 Mbps	1-13	2412-2474	Not Required	15.5	No	Not Required	7.0	No

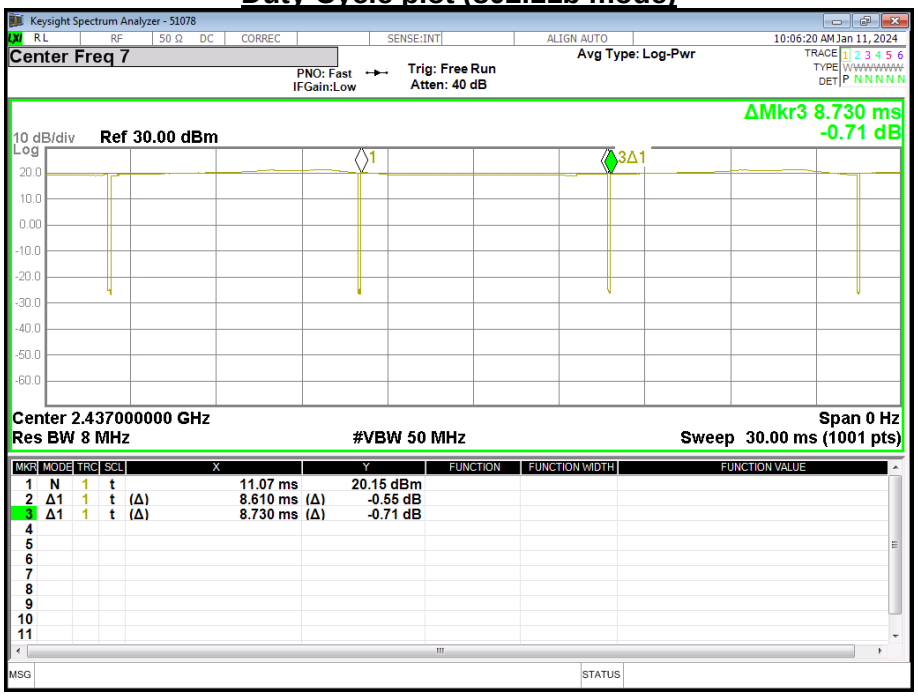
Note(s):

1. SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
2. 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/ax 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.
3. Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels. Refer to §6.3.

Duty Factor Measured Results (SISO mode)

Mode	Data Rate	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11b	1 Mbps	8.610	8.730	98.6%	1.01

Duty Cycle plot (802.11b mode)



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

WLAN Sub.4 Ant output power Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Maximum Averag power (dBm)			Reduced Averag power (dBm)		
						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 Sub.4 Ant	5.3 (UNII 2A)	802.11a	6 Mbps	Not Requied			14.0	No	Not Required	6.5	No
		802.11n (HT20)	6.5 Mbps	Not Requied			14.0	No	Not Required	6.5	No
		802.11n (HT40)	13.5 Mbps	54	5270.0	13.03	14.0	Yes	5.85	6.5	Yes
				62	5310.0	4.41	5.0		4.41	5.0	
		802.11ac (VHT20)	6.5 Mbps	Not Requied			14.0	No	Not Required	6.5	No
		802.11ac (VHT40)	13.5 Mbps	Not Requied			14.0	No	Not Required	6.5	No
		802.11ac (VHT80)	29.3 Mbps	Not Requied			2.0	No	Not Required	2.0	No
		802.11ax (HE20)	7.3 Mbps	Not Requied			14.0	No	Not Required	6.5	No
		802.11ax (HE40)	14.6 Mbps	Not Requied			14.0	No	Not Required	6.5	No
		802.11ax (HE80)	36.0 Mbps	Not Requied			3.0	No	Not Required	3.0	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	Not Requied			13.0	No	Not Required	8.0	No
		802.11n (HT20)	6.5 Mbps	Not Requied			13.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	102	5510.0	3.3	4.0	Yes	Not Required	8.0	No
				118	5590.0	12.1	13.0		Not Required		
				126	5630.0	11.9	13.0		Not Required		
				142	5710.0	12.0	13.0		Not Required		
		802.11ac (VHT20)	6.5 Mbps	Not Requied			13.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Requied			13.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530	Not Required	11.0	No	3.18	4.0	Yes
				122	5610	Not Required			6.91	8.0	
				138	5690	Not Required			6.82		
		802.11ax (HE20)	7.3 Mbps	Not Requied			13.0	No	Not Required	8.0	No
		802.11ax (HE40)	14.6 Mbps	Not Requied			13.0	No	Not Required	6.5	No
		802.11ax (HE80)	36.0 Mbps	Not Requied			11.5	No	Not Required	8.0	No
	5.8 (UNII 3)	802.11a	6 Mbps	Not Requied			13.0	No	Not Required	8.5	No
		802.11n (HT20)	6.5 Mbps	Not Requied			13.0	No	Not Required	8.5	No
		802.11n (HT40)	13.5 Mbps	151	5755.0	12.2	13.0	Yes	7.6	8.5	Yes
				159	5795.0	11.7			7.8		
		802.11ac (VHT20)	6.5 Mbps	Not Requied			13.0	No	Not Required	8.5	No
		802.11ac (VHT40)	13.5 Mbps	Not Requied			13.0	No	Not Required	8.5	No
		802.11ac (VHT80)	29.3 Mbps	Not Requied			3.0	No	Not Required	3.0	No
		802.11ax (HE20)	7.3 Mbps	Not Requied			13.0	No	Not Required	8.5	No
		802.11ax (HE40)	14.6 Mbps	Not Requied			12.5	No	Not Required	8.5	No
		802.11ax (HE80)	36.0 Mbps	Not Requied			4.0	No	Not Required	4.0	No

Note(s):

1. 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/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
2. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
3. 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.

WLAN Sub.1 Ant output power Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	Maximum Averag power (dBm)			Reduced Averag power (dBm)		
						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 Sub.1 Ant	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	Not Required	12.5	No	4.37	5.5	Yes
				56	5280.0	Not Required			4.46		
				60	5300.0	Not Required			4.28		
				64	5320.0	Not Required			4.39		
		802.11n (HT20)	6.5 Mbps	52	5260.0	11.32	13.0	Yes	Not Required	5.0	No
				56	5280.0	11.74			Not Required		
				60	5300.0	11.83			Not Required		
				64	5320.0	1.92	3.0		Not Required		
		802.11n (HT40)	13.5 Mbps	Not Required			10.5	No	Not Required	4.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			13.0	No	Not Required	5.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			10.5	No	Not Required	4.0	No
		802.11ac (VHT80)	29.3 Mbps	Not Required			0.0	No	Not Required	0.0	No
		802.11ax (HE20)	7.3 Mbps	Not Required			12.0	No	Not Required	4.5	No
		802.11ax (HE40)	14.6 Mbps	Not Required			11.0	No	Not Required	2.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			-1.0	No	Not Required	-1.0	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	10.45	11.5	Yes	Not Required	8.0	No
				120	5600.0	11.12	12.0		Not Required		
				124	5620.0	10.97			Not Required		
				144	5720.0	10.88			Not Required		
		802.11n (HT20)	6.5 Mbps	Not Required			12.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			11.5	No	Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			12.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			11.5	No	Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	11.0	No	0.89	2.0	Yes
				122	5610.0	Not Required			7.38	8.0	
				138	5690.0	Not Required			7.04		
		802.11ax (HE20)	7.3 Mbps	Not Required			12.0	No	Not Required	8.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			11.0	No	Not Required	7.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			11.0	No	Not Required	8.0	No
	5.8 (UNII 3)	802.11a	6 Mbps	149	5745.0	Not Required	12.5	No	8.14	9.0	Yes
				157	5785.0	Not Required			8.44		
				165	5825.0	Not Required			8.22		
		802.11n (HT20)	6.5 Mbps	149	5745.0	11.63	13.0	Yes	Not Required	9.0	No
				157	5785.0	11.85			Not Required		No
				165	5825.0	10.45	11.0		Not Required		No
		802.11n (HT40)	13.5 Mbps	Not Required			12.0	No	Not Required	8.5	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			13.0	No	Not Required	9.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			12.0	No	Not Required	8.5	No
		802.11ac (VHT80)	29.3 Mbps	Not Required			3.0	No	Not Required	3.0	No
		802.11ax (HE20)	7.3 Mbps	Not Required			12.5	No	Not Required	8.5	No
		802.11ax (HE40)	14.6 Mbps	Not Required			12.5	No	Not Required	8.5	No
		802.11ax (HE80)	36.0 Mbps	Not Required			4.0	No	Not Required	4.0	No

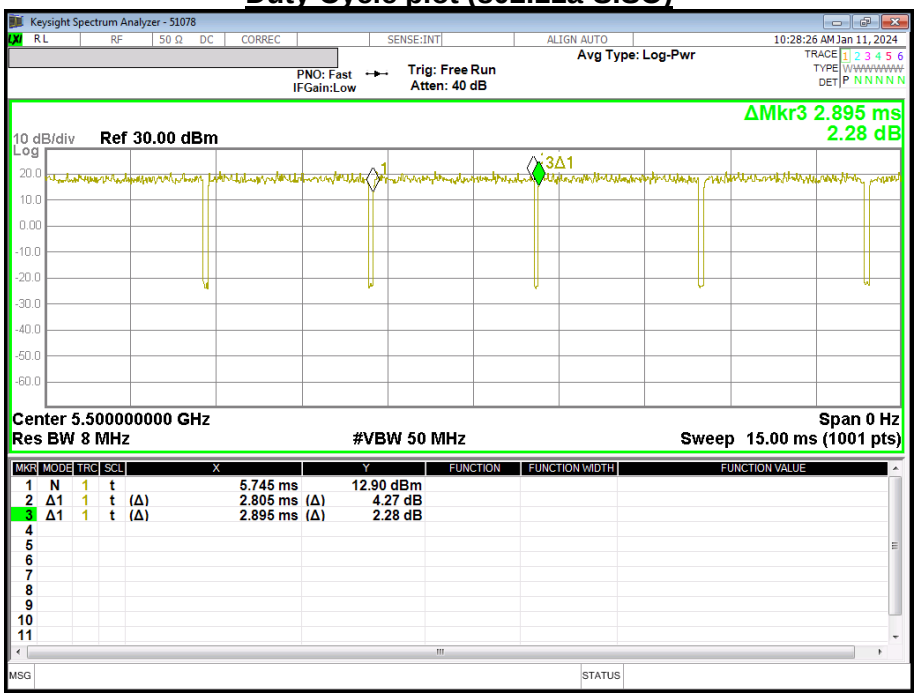
Note(s):

1. 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/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
2. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
3. 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.

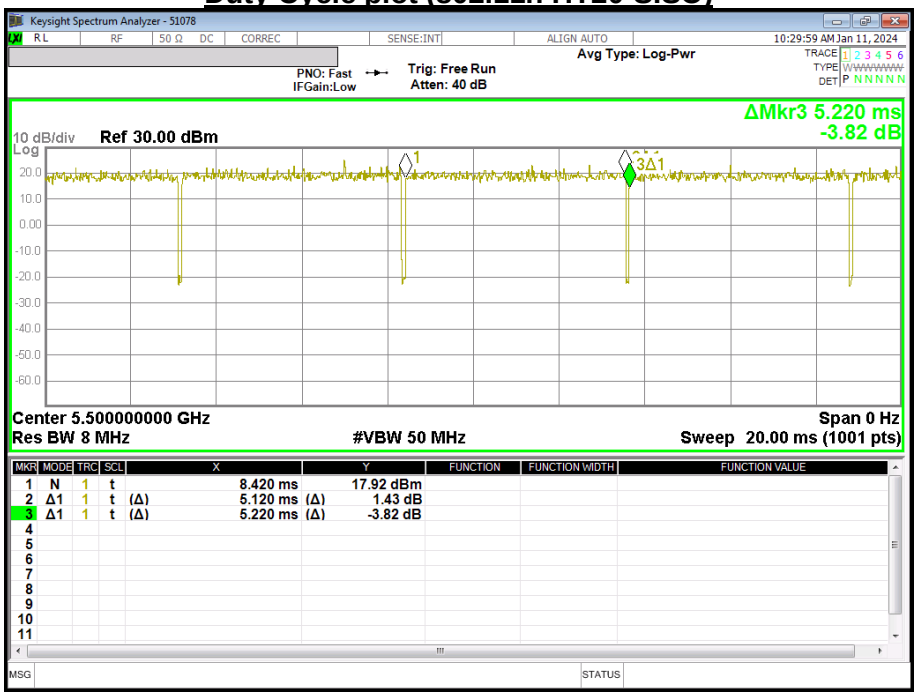
Duty Factor Measured Results (SISO mode)

Mode	Data Rate	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11a	6 Mbps	2.805	2.895	96.9%	1.03
802.11n (HT20)	6.5 Mbps	5.120	5.220	98.1%	1.02

Duty Cycle plot (802.11a-SISO)



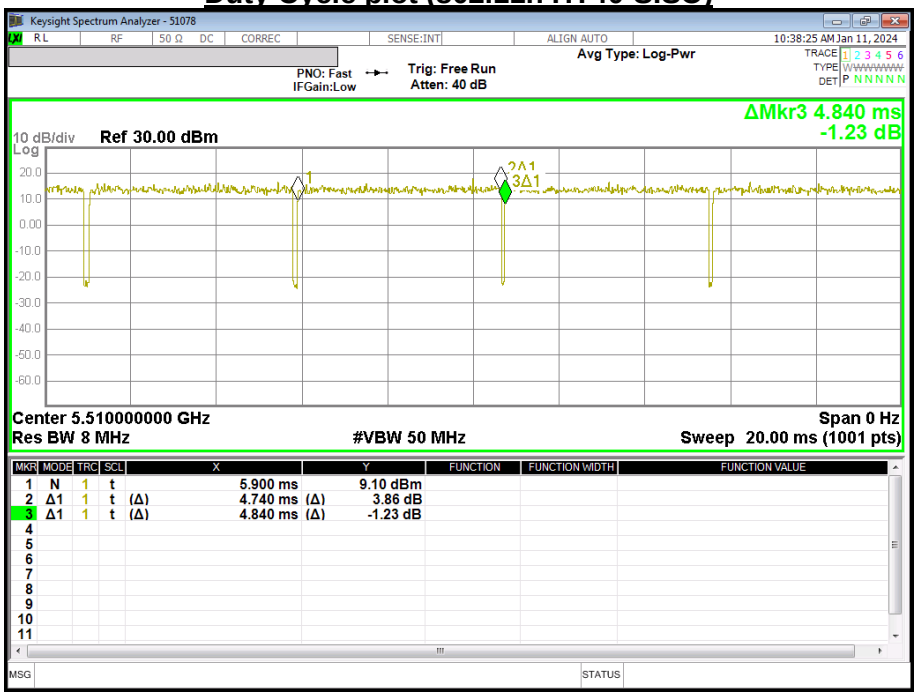
Duty Cycle plot (802.11n HT20-SISO)



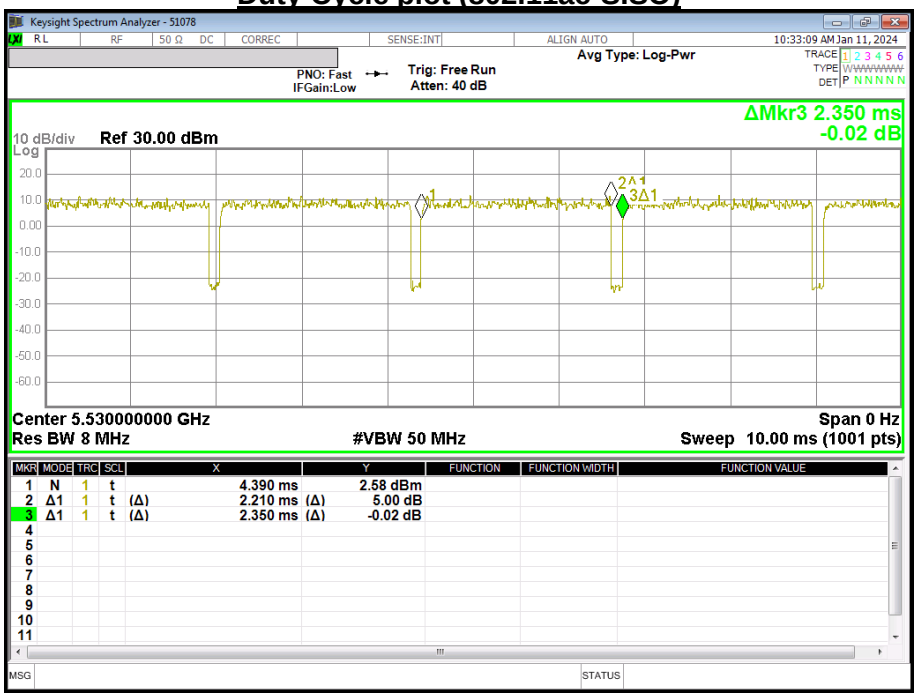
Duty Factor Measured Results (SISO mode) (Continued)

Mode	Data Rate	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
802.11n (HT 40)	13.5 Mbps	4.740	4.840	97.9%	1.02
802.11ac (VHT 80)	29.3 Mbps	2.210	2.350	94.0%	1.06

Duty Cycle plot (802.11n HT40-SISO)



Duty Cycle plot (802.11ac-SISO)



9.7. Bluetooth

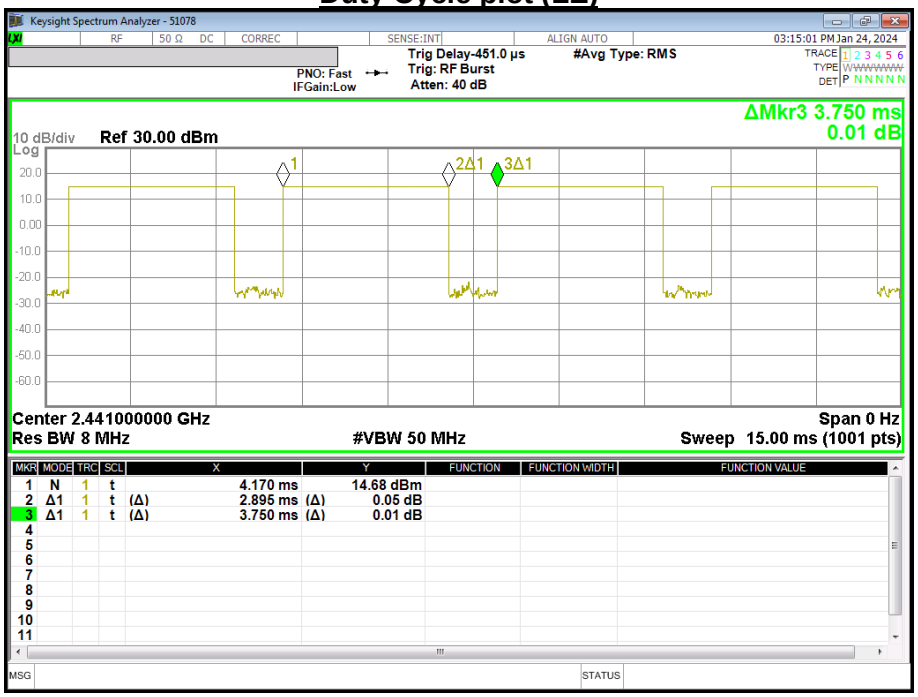
Bluetooth SISO output power Results

Band (GHz)	Antenna		Ch #	Freq. (MHz)	Max. Average Power (dBm)		Reduced Average Power (dBm)	
					Meas Pwr	Tune-up Limit	Meas Pwr	Tune-up Limit
2.4	BT SISO Ant.1	GFSK (1Mbps)	0	2402	14.73	15.0	11.09	11.5
			39	2441	14.16		10.63	
			78	2480	13.07		9.51	
		EDR	0	2402	9.57	10.0		
			39	2441	8.37			
			78	2480	7.28			
		LE (1M/2M)	0	2402	9.79	10.5		
			19	2440	9.71			
			39	2480	9.03			
		LE (125/500k)	0	2402	9.69	10.5		
			39	2441	9.52			
			78	2480	8.99			

Duty Factor Measured Results (SISO mode)

Mode	Type	T on (ms)	Period (ms)	Maximum Duty Cyle	Measured Duty Cycle	Crest Factor (maximum duty/ measured duty cycle)
BDR	GFSK	2.895	3.750	78.00%	77.20%	1.01

Duty Cycle plot (LE)



Note(s):

Maximum Duty Cycle is mentioned in Operational description. Detail of BT Duty Cycle refer to Operational description.

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
- Wi-Fi Duty Cycle scaling factor = 1 / Duty cycle (%)
- BT Duty Cycle scaling factor = Maximum Duty cycle / 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 ≤ 25mm 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 ≤ ¼ 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	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	GPRS 3 Slots	0	Left Touch	190	836.6	31.00	30.17	0.160	0.194	
				Left Tilt	190	836.6	31.00	30.17	0.116	0.140	
				Right Touch	190	836.6	31.00	30.17	0.271	0.328	1
				Right Tilt	190	836.6	31.00	30.17	0.111	0.134	
	Body-worn & Hotspot	GPRS 3 Slots	10	Rear	190	836.6	31.00	30.17	0.502	0.608	2
				Front	190	836.6	31.00	30.17	0.428	0.518	
	Hotspot	GPRS 3 Slots	10	Left	190	836.6	31.00	30.17	0.081	0.098	
				Bottom	190	836.6	31.00	30.17	0.316	0.383	
				Right	190	836.6	31.00	30.17	0.311	0.376	

10.2. GSM 1900

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	GPRS 3 Slots	0	Left Touch	810	1909.8	27.50	26.24	0.041	0.055	3
				Left Tilt	810	1909.8	27.50	26.24	0.017	0.022	
				Right Touch	810	1909.8	27.50	26.24	0.017	0.023	
				Right Tilt	810	1909.8	27.50	26.24	0.018	0.024	
	Body-worn & Hotspot	GPRS 2 Slots	10	Rear	810	1909.8	25.00	24.49	0.318	0.358	
				Front	810	1909.8	25.00	24.49	0.274	0.308	
	Hotspot	GPRS 2 Slots	10	Left	810	1909.8	25.00	24.49	0.083	0.094	
				Bottom	810	1909.8	25.00	24.49	0.672	0.756	4
				Right	810	1909.8	25.00	24.49	0.041	0.046	

10.3. WCDMA Band V

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	Rel 99 RMC	0	Left Touch	4183	836.6	25.50	24.68	0.188	0.227	
				Left Tilt	4183	836.6	25.50	24.68	0.120	0.145	
				Right Touch	4183	836.6	25.50	24.68	0.268	0.324	5
				Right Tilt	4183	836.6	25.50	24.68	0.133	0.161	
	Body-worn & Hotspot	Rel 99 RMC	10	Rear	4183	836.6	25.50	24.68	0.524	0.633	6
				Front	4183	836.6	25.50	24.68	0.443	0.535	
	Hotspot	Rel 99 RMC	10	Left	4183	836.6	25.50	24.68	0.089	0.107	
				Bottom	4183	836.6	25.50	24.68	0.376	0.454	
				Right	4183	836.6	25.50	24.68	0.195	0.236	

10.4. LTE Band 2 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	QPSK	0	Left Touch	19100	1900.0	1	0	24.50	23.92	0.078	0.089	7
							50	0	23.50	22.98	0.074	0.084	
				Left Tilt	19100	1900.0	1	0	24.50	23.92	0.027	0.031	
							50	0	23.50	22.98	0.027	0.030	
				Right Touch	19100	1900.0	1	0	24.50	23.92	0.037	0.043	
							50	0	23.50	22.98	0.039	0.044	
				Right Tilt	19100	1900.0	1	0	24.50	23.92	0.028	0.032	
							50	0	23.50	22.98	0.025	0.028	
	Body-worn & Hotspot	QPSK	10	Rear	19100	1900.0	1	0	19.00	18.38	0.260	0.300	
							50	0	19.00	18.47	0.264	0.298	
				Front	19100	1900.0	1	0	19.00	18.38	0.218	0.251	
							50	0	19.00	18.47	0.219	0.247	
	Hotspot	QPSK	10	Left	19100	1900.0	1	0	19.00	18.38	0.040	0.046	
							50	0	19.00	18.47	0.086	0.097	
				Bottom	19100	1900.0	1	0	19.00	18.38	0.410	0.473	
							50	0	19.00	18.47	0.423	0.478	8
				Right	19100	1900.0	1	0	19.00	18.38	0.052	0.060	
							50	0	19.00	18.47	0.050	0.056	

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Sub.2	Head	QPSK	0	Left Touch	19100	1900.0	1	99	18.50	17.84	0.428	0.498	
							50	0	18.50	17.84	0.431	0.502	
				Left Tilt	19100	1900.0	1	99	18.50	17.84	0.483	0.562	
							50	0	18.50	17.84	0.460	0.535	
				Right Touch	18700	1860.0	1	99	18.50	17.50	0.834	1.050	9
							50	0	18.50	17.59	0.844	1.041	
					18900	1880.0	1	99	18.50	17.83	0.754	0.880	
							50	0	18.50	17.67	0.804	0.973	
					19100	1900.0	1	99	18.50	17.84	0.732	0.852	
							50	0	18.50	17.84	0.743	0.865	
							100	0	18.50	17.83	0.744	0.868	
				Right Tilt	18700	1860.0	1	99	18.50	17.50	0.792	0.997	
							50	0	18.50	17.59	0.790	0.974	
					18900	1880.0	1	99	18.50	17.83	0.708	0.826	
							50	0	18.50	17.67	0.764	0.925	
					19100	1900.0	1	99	18.50	17.84	0.714	0.831	
							50	0	18.50	17.84	0.739	0.860	
							100	0	18.50	17.83	0.715	0.834	
	Body-worn & Hotspot	QPSK	10	Rear	19100	1900.0	1	99	18.50	17.84	0.147	0.171	
							50	0	18.50	17.84	0.138	0.161	
				Front	19100	1900.0	1	99	18.50	17.84	0.098	0.114	
							50	0	18.50	17.84	0.093	0.108	
	Hotspot	QPSK	10	Top	19100	1900.0	1	99	18.50	17.84	0.297	0.346	10
							50	0	18.50	17.84	0.220	0.256	
				Left	19100	1900.0	1	99	18.50	17.84	0.016	0.019	
							50	0	18.50	17.84	0.033	0.038	

10.5. LTE Band 5 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	QPSK	0	Left Touch	20525	836.5	1	0	25.50	25.07	0.151	0.167	
							25	0	24.50	24.01	0.132	0.148	
				Left Tilt	20525	836.5	1	0	25.50	25.07	0.098	0.108	
							25	0	24.50	24.01	0.083	0.093	
				Right Touch	20525	836.5	1	0	25.50	25.07	0.250	0.276	11
							25	0	24.50	24.01	0.218	0.244	
				Right Tilt	20525	836.5	1	0	25.50	25.07	0.128	0.141	
							25	0	24.50	24.01	0.112	0.125	
	Body-worn & Hotspot	QPSK	10	Rear	20525	836.5	1	0	25.50	25.07	0.562	0.620	12
							25	0	24.50	24.01	0.513	0.574	
				Front	20525	836.5	1	0	25.50	25.07	0.492	0.543	
							25	0	24.50	24.01	0.440	0.493	
	Hotspot	QPSK	10	Left	20525	836.5	1	0	25.50	25.07	0.075	0.083	
							25	0	24.50	24.01	0.064	0.072	
				Bottom	20525	836.5	1	0	25.50	25.07	0.374	0.413	
							25	0	24.50	24.01	0.335	0.375	
				Right	20525	836.5	1	0	25.50	25.07	0.189	0.209	
							25	0	24.50	24.01	0.177	0.198	

10.6. LTE Band 12 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	QPSK	0	Left Touch	23095	707.5	1	0	25.50	24.97	0.102	0.115	
							25	0	24.50	24.01	0.089	0.100	
				Left Tilt	23095	707.5	1	0	25.50	24.97	0.081	0.092	
							25	0	24.50	24.01	0.065	0.073	
				Right Touch	23095	707.5	1	0	25.50	24.97	0.133	0.150	13
							25	0	24.50	24.01	0.116	0.130	
				Right Tilt	23095	707.5	1	0	25.50	24.97	0.062	0.070	
							25	0	24.50	24.01	0.052	0.058	
	Body-worn & Hotspot	QPSK	10	Rear	23095	707.5	1	0	25.50	24.97	0.327	0.369	14
							25	0	24.50	24.01	0.266	0.298	
				Front	23095	707.5	1	0	25.50	24.97	0.216	0.244	
							25	0	24.50	24.01	0.198	0.222	
	Hotspot	QPSK	10	Left	23095	707.5	1	0	25.50	24.97	0.058	0.066	
							25	0	24.50	24.01	0.055	0.062	
				Bottom	23095	707.5	1	0	25.50	24.97	0.215	0.243	
							25	0	24.50	24.01	0.201	0.225	
				Right	23095	707.5	1	0	25.50	24.97	0.114	0.129	
							25	0	24.50	24.01	0.103	0.115	

10.7. LTE Band 41 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main.2	Head	QPSK	0	Left Touch	40620	2593.0	1	99	24.50	24.35	0.119	0.123	15
							50	0	23.50	23.38	0.118	0.121	
				Left Tilt	40620	2593.0	1	99	24.50	24.35	0.032	0.033	
							50	0	23.50	23.38	0.028	0.028	
				Right Touch	40620	2593.0	1	99	24.50	24.35	0.050	0.051	
							50	0	23.50	23.38	0.040	0.041	
				Right Tilt	40620	2593.0	1	99	24.50	24.35	0.034	0.035	
							50	0	23.50	23.38	0.026	0.027	
	Body-worn & Hotspot	QPSK	10	Rear	40620	2593.0	1	99	20.00	19.48	0.211	0.238	
							50	0	20.00	19.56	0.222	0.246	
				Front	40620	2593.0	1	99	20.00	19.48	0.188	0.212	
							50	0	20.00	19.56	0.187	0.207	
	Hotspot	QPSK	10	Left	40620	2593.0	1	99	20.00	19.48	0.130	0.147	
							50	0	20.00	19.56	0.137	0.152	
				Bottom	40620	2593.0	1	99	20.00	19.48	0.310	0.349	
							50	0	20.00	19.56	0.319	0.353	16

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Sub.2	Head	QPSK	0	Left Touch	39750	2506.0	1	0	19.50	19.39	0.291	0.298	
							50	0	19.50	19.28	0.334	0.351	
				Left Tilt	39750	2506.0	1	0	19.50	19.39	0.328	0.336	
							50	0	19.50	19.28	0.374	0.393	
				Right Touch	39750	2506.0	1	0	19.50	19.39	0.722	0.741	
							50	0	19.50	19.28	0.761	0.801	
							100	0	19.50	19.28	0.864	0.909	
					40185	2549.5	1	0	19.50	18.74	0.787	0.938	
							50	0	19.50	18.76	0.791	0.938	
					40620	2593.0	1	0	19.50	18.76	0.882	1.046	
							50	0	19.50	18.87	0.856	0.990	
					41055	2636.5	1	0	19.50	19.00	0.831	0.932	
							50	0	19.50	19.06	0.771	0.853	
					41490	2680.0	1	0	19.50	18.98	0.771	0.869	
							50	0	19.50	19.03	0.721	0.803	
				Right Tilt	39750	2506.0	1	0	19.50	19.39	0.769	0.789	
							50	0	19.50	19.28	0.851	0.895	
							100	0	19.50	19.28	0.906	0.953	
					40185	2549.5	1	0	19.50	18.74	0.887	1.057	
							50	0	19.50	18.76	0.897	1.064	17
					40620	2593.0	1	0	19.50	18.76	0.878	1.041	
							50	0	19.50	18.87	0.908	1.050	
					41055	2636.5	1	0	19.50	19.00	0.827	0.928	
							50	0	19.50	19.06	0.841	0.931	
					41490	2680.0	1	0	19.50	18.98	0.797	0.898	
							50	0	19.50	19.03	0.813	0.906	
	Body-worn & Hotspot	QPSK	10	Rear	39750	2506.0	1	0	19.50	19.39	0.104	0.107	
							50	0	19.50	19.28	0.110	0.116	
				Front	39750	2506.0	1	0	19.50	19.39	0.078	0.079	
							50	0	19.50	19.28	0.085	0.089	
	Hotspot	QPSK	10	Top	39750	2506.0	1	0	19.50	19.39	0.204	0.209	
							50	0	19.50	19.28	0.201	0.211	18
				Left	39750	2506.0	1	0	19.50	19.39	0.011	0.011	
							50	0	19.50	19.28	0.013	0.013	

10.8. LTE Band 66 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	QPSK	0	Left Touch	132072	1720.0	1	0	25.00	24.69	0.177	0.190	19
							50	0	24.00	23.71	0.130	0.139	
				Left Tilt	132072	1720.0	1	0	25.00	24.69	0.115	0.124	
							50	0	24.00	23.71	0.077	0.083	
				Right Touch	132072	1720.0	1	0	25.00	24.69	0.120	0.129	
							50	0	24.00	23.71	0.092	0.099	
				Right Tilt	132072	1720.0	1	0	25.00	24.69	0.082	0.088	
							50	0	24.00	23.71	0.053	0.057	
	Body-worn & Hotspot	QPSK	10	Rear	132072	1720.0	1	0	20.00	18.64	0.321	0.439	
							50	0	20.00	18.63	0.321	0.440	
				Front	132072	1720.0	1	0	20.00	18.64	0.271	0.371	
							50	0	20.00	18.63	0.271	0.372	
	Hotspot	QPSK	10	Left	132072	1720.0	1	0	20.00	18.64	0.065	0.089	
							50	0	20.00	18.63	0.065	0.089	
				Bottom	132072	1720.0	1	0	20.00	18.64	0.668	0.914	
							50	0	20.00	18.63	0.713	0.977	
							100	0	20.00	18.59	0.709	0.981	
					132322	1745.0	1	0	20.00	18.50	0.741	1.047	
							50	0	20.00	18.51	0.728	1.026	
					132572	1770.0	1	0	20.00	18.53	0.800	1.122	20
							50	0	20.00	18.57	0.803	1.116	
				Right	132072	1720.0	1	0	20.00	18.64	0.045	0.062	
							50	0	20.00	18.63	0.037	0.051	

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Sub.2	Head	QPSK	0	Left Touch	132572	1770.0	1	0	17.50	16.35	0.455	0.593	
							50	0	17.50	16.39	0.445	0.575	
				Left Tilt	132572	1770.0	1	0	17.50	16.35	0.537	0.700	
							50	0	17.50	16.39	0.532	0.687	
				Right Touch	132072	1720.0	1	0	17.50	16.25	0.687	0.916	
							50	0	17.50	16.26	0.672	0.894	
					132322	1745.0	1	0	17.50	16.18	0.682	0.924	
							50	0	17.50	16.13	0.667	0.914	
					132572	1770.0	1	0	17.50	16.35	0.698	0.910	
							50	0	17.50	16.39	0.680	0.878	
							100	0	17.50	16.32	0.673	0.883	
				Right Tilt	132072	1720.0	1	0	17.50	16.25	0.741	0.988	
							50	0	17.50	16.26	0.715	0.951	
					132322	1745.0	1	0	17.50	16.18	0.734	0.995	
							50	0	17.50	16.13	0.723	0.991	
					132572	1770.0	1	0	17.50	16.35	0.768	1.001	21
							50	0	17.50	16.39	0.754	0.974	
							100	0	17.50	16.32	0.750	0.984	
	Body-worn & Hotspot	QPSK	10	Rear	132572	1770.0	1	0	17.50	16.35	0.154	0.201	
							50	0	17.50	16.39	0.153	0.198	
				Front	132572	1770.0	1	0	17.50	16.35	0.109	0.142	
							50	0	17.50	16.39	0.108	0.139	
	Hotspot	QPSK	10	Top	132572	1770.0	1	0	17.50	16.35	0.250	0.326	22
							50	0	17.50	16.39	0.250	0.323	
				Left	132572	1770.0	1	0	17.50	16.35	0.027	0.035	
							50	0	17.50	16.39	0.029	0.037	

10.9. NR Band n5 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main.1	Head	DFT-s-OFDM	QPSK	0	Left Touch	167300	836.5	1	52	25.50	24.79	0.141	0.166	
								50	28	25.50	24.72	0.141	0.169	
					Left Tilt	167300	836.5	1	52	25.50	24.79	0.096	0.113	
								50	28	25.50	24.72	0.098	0.117	
					Right Touch	167300	836.5	1	52	25.50	24.79	0.224	0.264	
								50	28	25.50	24.72	0.228	0.273	23
					Right Tilt	167300	836.5	1	52	25.50	24.79	0.112	0.132	
								50	28	25.50	24.72	0.115	0.138	
		CP-OFDM	QPSK	0	Right Touch	167300	836.5	1	1	24.00	23.15	0.152	0.185	
	Body-worn & Hotspot	DFT-s-OFDM	QPSK	10	Rear	167300	836.5	1	52	25.50	24.79	0.319	0.376	24
								50	28	25.50	24.72	0.305	0.365	
					Front	167300	836.5	1	52	25.50	24.79	0.247	0.291	
								50	28	25.50	24.72	0.244	0.292	
	Hotspot	DFT-s-OFDM	QPSK	10	Left	167300	836.5	1	52	25.50	24.79	0.018	0.021	
								50	28	25.50	24.72	0.017	0.020	
					Bottom	167300	836.5	1	52	25.50	24.79	0.293	0.345	
								50	28	25.50	24.72	0.295	0.353	
					Right	167300	836.5	1	52	25.50	24.79	0.079	0.093	
								50	28	25.50	24.72	0.083	0.100	
		CP-OFDM	QPSK	10	Rear	167300	836.5	1	1	24.00	23.15	0.214	0.260	

Note(s):

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

10.10. NR Band n41 (100MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main.2	Head	DFT-s-OFDM	QPSK	0	Left Touch	518598	2593.0	1	136	18.00	17.20	0.036	0.043	25
								135	69	18.00	17.20	0.031	0.037	
					Left Tilt	518598	2593.0	1	136	18.00	17.20	0.007	0.008	
								135	69	18.00	17.20	0.006	0.007	
					Right Touch	518598	2593.0	1	136	18.00	17.20	0.010	0.012	
								135	69	18.00	17.20	0.012	0.014	
					Right Tilt	518598	2593.0	1	136	18.00	17.20	0.008	0.009	
								135	69	18.00	17.20	0.006	0.007	
		CP-OFDM	QPSK	0	Left Touch	518598	2593.0	1	1	18.00	16.85	0.031	0.040	
	Body-worn & Hotspot	DFT-s-OFDM	QPSK	10	Rear	518598	2593.0	1	136	18.00	17.20	0.204	0.245	
								135	69	18.00	17.20	0.207	0.249	
					Front	518598	2593.0	1	136	18.00	17.20	0.143	0.172	
								135	69	18.00	17.20	0.160	0.192	
	Hotspot	DFT-s-OFDM	QPSK	10	Left	518598	2593.0	1	136	18.00	17.20	0.116	0.139	
								135	69	18.00	17.20	0.119	0.143	
					Bottom	518598	2593.0	1	136	18.00	17.20	0.252	0.303	26
								135	69	18.00	17.20	0.246	0.296	
		CP-OFDM	QPSK	10	Bottom	518598	2593.0	1	1	18.00	16.85	0.196	0.255	

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Sub.2	Head	DFT-s-OFDM	QPSK	0	Left Touch	518598	2593.0	1	271	18.00	17.77	0.402	0.424	
								135	69	18.00	17.58	0.416	0.458	
					Left Tilt	518598	2593.0	1	271	18.00	17.77	0.461	0.486	
								135	69	18.00	17.58	0.485	0.534	
					Right Touch	518598	2593.0	1	271	18.00	17.77	0.865	0.912	
								135	69	18.00	17.58	0.922	1.016	
								270	0	18.00	17.51	0.948	1.061	
					Right Tilt	518598	2593.0	1	271	18.00	17.77	0.987	1.041	
								135	69	18.00	17.58	1.080	1.190	27
								270	0	18.00	17.51	1.020	1.142	
		CP-OFDM	QPSK	0	Right Tilt	518598	2593.0	1	1	18.00	17.22	0.964	1.154	
	Body-worn & Hotspot	DFT-s-OFDM	QPSK	10	Rear	518598	2593.0	1	271	18.00	17.77	0.197	0.208	
								135	69	18.00	17.58	0.193	0.213	
					Front	518598	2593.0	1	271	18.00	17.77	0.130	0.137	
								135	69	18.00	17.58	0.154	0.170	
	Hotspot	DFT-s-OFDM	QPSK	10	Top	518598	2593.0	1	271	18.00	17.77	0.225	0.237	
								135	69	18.00	17.58	0.259	0.285	28
					Left	518598	2593.0	1	271	18.00	17.77	0.027	0.029	
								135	69	18.00	17.58	0.032	0.035	
		CP-OFDM	QPSK	10	Top	518598	2593.0	1	1	18.00	17.22	0.181	0.217	

Note(s):

1. CP-OFDM mode were evaluated at worst configuration of DFT-s-OFDM in standalone exposure conditions.
2. NR Band n41 tested using FTM mode.

10.11. Wi-Fi (DTS Band)

DTS SAR results

Antenna	Frequency Band	Mode	RF Exposure Conditions	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 Sub.4 Ant.	2.4GHz	802.11b 1 Mbps	Head	0	Left Touch	1	2412.0	0.067	98.6%	8.0	7.49				
					Left Tilt	1	2412.0	0.071	98.6%	8.0	7.49				
					Right Touch	1	2412.0	0.218	98.6%	8.0	7.49	0.182	0.208		29
					Rightt Tilt	1	2412.0	0.283	98.6%	8.0	7.49	0.150	0.171	2	
			Body-worn & Hotspot	10	Rear	6	2437.0	0.866	98.6%	19.0	18.42	0.571	0.662		
					Front	6	2437.0	0.469	98.6%	19.0	18.42				
			Hotspot	10	Top	6	2437.0	0.736	98.6%	19.0	18.42				
					Left	6	2437.0	0.958	98.6%	19.0	18.42	0.614	0.712		30
WLAN Sub.6 Ant.	2.4GHz	802.11b 1 Mbps	Head	0	Left Touch	1	2412.0	0.041	98.6%	7.0	6.02				
					Left Tilt	1	2412.0	0.003	98.6%	7.0	6.02				
					Right Touch	1	2412.0	0.062	98.6%	7.0	6.02	0.050	0.063		
					Rightt Tilt	1	2412.0	0.003	98.6%	7.0	6.02				
			Body-worn & Hotspot	10	Rear	11	2462.0	0.119	98.6%	17.0	16.50	0.071	0.081		
					Front	11	2462.0	0.081	98.6%	17.0	16.50				
			Hotspot	10	Top	11	2462.0	0.001	98.6%	17.0	16.50				
					Right	11	2462.0	0.033	98.6%	17.0	16.50				

Note(s):
1. 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).
2. 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.
3. additional measurement due to simultaneous transmission combination

10.12. Wi-Fi (U-NII Bands)

U-NII 2A SAR results

Antenna	Frequency Band	Mode	RF Exposure Conditions	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 Sub.4 Ant	5.3 GHz U-NII 2A	802.11n HT 40 13.5 Mbps	Head	0	Left Touch	54	5270.0	0.047	97.9%	6.5	5.85						
					Left Tilt	54	5270.0	0.016	97.9%	6.5	5.85						
					Right Touch	54	5270.0	0.250	97.9%	6.5	5.85	0.187	0.222				31
					Right Tilt	54	5270.0	0.108	97.9%	6.5	5.85	0.068	0.081			2	
			Body-worn	10	Rear	54	5270.0	0.268	97.9%	14.0	13.03	0.176	0.225				
					Front	54	5270.0	0.232	97.9%	14.0	13.03						
			Product Specific 10-g	0	Rear	54	5270.0	1.710	97.9%	14.0	13.03						
					Front	54	5270.0	2.390	97.9%	14.0	13.03			0.712	0.909		
					Top	54	5270.0	0.595	97.9%	14.0	13.03						
					Left	54	5270.0	5.700	97.9%	14.0	13.03			0.877	1.120		32
WLAN Sub.1 Ant	5.3 GHz U-NII 2A	802.11a 6Mbps	Head	0	Left Touch	56	5280.0	0.017	96.9%	5.5	4.46						
					Left Tilt	56	5280.0	0.010	96.9%	5.5	4.46						
					Right Touch	56	5280.0	0.019	96.9%	5.5	4.46	0.000	0.000				
					Right Tilt	56	5280.0	0.010	96.9%	5.5	4.46						
		802.11n HT 20 6.5 Mbps	Body-worn	10	Rear	60	5300.0	0.098	98.1%	13.0	11.83	0.059	0.079				
					Front	60	5300.0	0.029	98.1%	13.0	11.83						
			Product Specific 10-g	0	Rear	60	5300.0	0.427	98.1%	13.0	11.83			0.076	0.101		
					Front	60	5300.0	0.415	98.1%	13.0	11.83						
					Top	60	5300.0	0.274	98.1%	13.0	11.83						
					Right	60	5300.0	0.383	98.1%	13.0	11.83						

Note(s):
1. 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).
2. additional measurement due to simultaneous transmission combination

U-NII 2C SAR results

Antenna	Frequency Band	Mode	RF Exposure Conditions	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 Sub.4 Ant.	5.5 GHz U-NII 2C	802.11ac VHT 80 29.3 Mbps	Head	0	Left Touch	122	5610.0	0.033	94.0%	8.0	6.91						
					Left Tilt	122	5610.0	0.024	94.0%	8.0	6.91						
					Right Touch	122	5610.0	0.191	94.0%	8.0	6.91	0.144	0.197				33
					Right Tilt	122	5610.0	0.058	94.0%	8.0	6.91	0.033	0.045			2	
		802.11n HT40 13.5 Mbps	Body-worn	10	Rear	118	5590.0	0.313	97.9%	13.0	12.06	0.204	0.259				
					Front	118	5590.0	0.075	97.9%	13.0	12.06						
			Product Specific 10-g	0	Rear	118	5590.0	1.790	97.9%	13.0	12.06						
					Front	118	5590.0	3.600	97.9%	13.0	12.06			0.480	0.609		
					Top	118	5590.0	0.237	97.9%	13.0	12.06						
					Left	118	5590.0	4.200	97.9%	13.0	12.06			0.905	1.147		34
WLAN Sub.1 Ant.	5.5 GHz U-NII 2C	802.11ac VHT 80 29.3 Mbps	Head	0	Left Touch	122	5610.0	0.132	94.0%	8.0	7.38	0.076	0.093				
					Left Tilt	122	5610.0	0.118	94.0%	8.0	7.38						
					Right Touch	122	5610.0	0.060	94.0%	8.0	7.38	0.055	0.067			2	
					Right Tilt	122	5610.0	0.064	94.0%	8.0	7.38	0.049	0.060			2	
		802.11a 6 Mbps	Body-worn	10	Rear	132	5660.0	0.147	96.9%	12.0	11.26	0.100	0.122				
					Front	132	5660.0	0.024	96.9%	12.0	11.26						
			Product Specific 10-g	0	Rear	132	5660.0	0.732	96.9%	12.0	11.26			0.136	0.166		
					Front	132	5660.0	0.496	96.9%	12.0	11.26						
					Top	132	5660.0	0.293	96.9%	12.0	11.26						
					Right	132	5660.0	0.087	96.9%	12.0	11.26						

Note(s):

1. 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).
2. additional measurement due to simultaneous transmission combination

U-NII 3 SAR results

Antenna	Frequency Band	Mode	RF Exposure Conditions	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 Sub.4 Ant.	5.8 GHz U-NII 3	802.11n HT 40 13.5 Mbps	Head	0	Left Touch	159	5795.0	0.025	97.9%	8.5	7.84						
					Left Tilt	159	5795.0	0.022	97.9%	8.5	7.84						
					Right Touch	159	5795.0	0.234	97.9%	8.5	7.84	0.146	0.174				35
					Right Tilt	159	5795.0	0.088	97.9%	8.5	7.84	0.058	0.069			2	
			Body-worn	10	Rear	151	5755.0	0.160	97.9%	13.0	12.15	0.119	0.148				
					Front	151	5755.0	0.141	97.9%	13.0	12.15						
			Product Specific 10-g	0	Rear	151	5755.0	1.780	97.9%	13.0	12.15						
					Front	151	5755.0	3.120	97.9%	13.0	12.15			0.496	0.616		
					Top	151	5755.0	0.967	97.9%	13.0	12.15						
					Left	151	5755.0	7.880	97.9%	13.0	12.15			1.230	1.527		36
WLAN Sub.1 Ant.	5.8 GHz U-NII 3	802.11a 6 Mbps	Head	0	Left Touch	157	5785.0	0.029	96.9%	9.0	8.44	0.022	0.026				
					Left Tilt	157	5785.0	0.015	96.9%	9.0	8.44						
					Right Touch	157	5785.0	0.013	96.9%	9.0	8.44	0.013	0.015			2	
					Right Tilt	157	5785.0	0.015	96.9%	9.0	8.44	0.001	0.001			2	
		802.11n HT 20 6.5 Mbps	Body-worn	10	Rear	157	5785.0	0.165	98.1%	13.0	11.85	0.121	0.161				
					Front	157	5785.0	0.024	98.1%	13.0	11.85						
			Product Specific 10-g	0	Rear	157	5785.0	0.698	98.1%	13.0	11.85			0.146	0.194		
					Front	157	5785.0	0.432	98.1%	13.0	11.85						
					Top	157	5785.0	0.370	98.1%	13.0	11.85						
					Right	157	5785.0	0.185	98.1%	13.0	11.85						

Note(s):

1. 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).
2. additional measurement due to simultaneous transmission combination

10.13. Bluetooth

Bluetooth SISO SAR results

Antenna	Frequency Band	Mode	RF Exposure Conditions	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 Sub.4 Ant	2.4GHz	GFSK DH5	Head	0	Left Touch	0	2402.0	77.1%	11.50	11.09	0.060	0.066	
					Left Tilt	0	2402.0	77.1%	11.50	11.09	0.071	0.079	
					Right Touch	0	2402.0	77.1%	11.50	11.09	0.206	0.229	37
					Rightt Tilt	0	2402.0	77.1%	11.50	11.09	0.201	0.224	
			Body-worn & Hotspot	10	Rear	0	2402.0	77.1%	15.00	14.73	0.105	0.113	
					Front	0	2402.0	77.1%	15.00	14.73	0.080	0.086	
			Hotspot	10	Top	0	2402.0	77.1%	15.00	14.73	0.091	0.098	
					Left	0	2402.0	77.1%	15.00	14.73	0.111	0.120	38

10.14. NFC

Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Test setup		Freq. (MHz)	10-g SAR (W/kg)	Plot No.
				Type	Bitrate		Meas.	
PBRS	Product Specific 10-g	0	Rear	A	106	13.6	0.019	
				A	212	13.6	0.020	39
				A	424	13.6	0.018	
				B	106	13.6	0.019	
				F	106	13.6	0.000	
			Front	A	106	13.6	0.000	
			Top	A	106	13.6	0.000	
			Left	A	106	13.6	0.000	

Note(s):

NFC SAR tested using worst configuration in all test positions.

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 (~ 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	Antenna	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
750	LTE Band 12	Main.1	Hotspot	Rear	No	0.327	N/A	N/A
850	GSM 850	Main.1	Hotspot	Rear	No	0.502	N/A	N/A
	WCDMA Band V	Main.1	Hotspot	Rear	No	0.524	N/A	N/A
	LTE Band 5	Main.1	Hotspot	Rear	No	0.560	N/A	N/A
	NR Band n5	Main.1	Hotspot	Rear	No	0.319	N/A	N/A
1700	LTE Band 66	Main.1	Hotspot	Bottom	Yes	0.803	0.797	1.01
1900	GSM 1900	Main.1	Hotspot	Bottom	No	0.672	N/A	N/A
	LTE Band 2	Sub.2	Head	Right Touch	Yes	0.844	0.811	1.04
2600	LTE Band 41	Sub.2	Head	Right Tilt	Yes	0.908	0.907	1.00
	NR Band n41	Sub.2	Head	Right Tilt	Yes	1.080	1.080	1.00

Peak spatial-average (10g of tissue)

Frequency Band (MHz)	Air Interface	Antenna	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
5800	UNII-3	Sub.4	Product 10-g	Left	No	1.230	N/A	N/A

Note(s):

1. In above table, Only some bands above 0.8 or 2.0 W/kg (1-g or 10-g Measured SAR) were listed.
2. 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	Simultaneous transmission scenarios								
Head & Body-worn & Hotspot & Phablet-10g	1	WWAN (2G/3G/LTE/NR)	+	(DTS Sub.4 Ant.)						
	2	WWAN (2G/3G/LTE/NR)	+	(DTS Sub.4 Ant.)	and	(DTS Sub.6 Ant.)				
	3	WWAN (2G/3G/LTE/NR)	+	(UNII Sub.4 Ant.)						
	4	WWAN (2G/3G/LTE/NR)	+	(UNII Sub.4 Ant.)	and	(UNII Sub.1 Ant.)				
	5	WWAN (2G/3G/LTE/NR)	+	(BT Ant.1)						
	6	WWAN (2G/3G/LTE/NR)	+	(UNII Sub.4 Ant.)	+	(BT Ant.1)				
	7	WWAN (2G/3G/LTE/NR)	+	(UNII Sub.4 Ant.)	and	(UNII Sub.1 Ant.)	+	(BT Ant.1)		
	8	WWAN (ENDC/ULCA)	+	(DTS Sub.4 Ant.)						
	9	WWAN (ENDC/ULCA)	+	(DTS Sub.4 Ant.)	and	(DTS Sub.6 Ant.)				
	10	WWAN (ENDC/ULCA)	+	(UNII Sub.4 Ant.)						
	11	WWAN (ENDC/ULCA)	+	(UNII Sub.4 Ant.)	and	(UNII Sub.1 Ant.)				
	12	WWAN (ENDC/ULCA)	+	(BT Ant.1)						
	13	WWAN (ENDC/ULCA)	+	(UNII Sub.4 Ant.)	+	(BT Ant.1)				
	14	WWAN (ENDC/ULCA)	+	(UNII Sub.4 Ant.)	and	(UNII Sub.1 Ant.)	+	(BT Ant.1)		
Phablet-10g	15	Scenatios item (1-14)	+	NFC						

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. NR Radio support to both SA and NSA(ENDC) Radio.
6. LTE Radio support to ULCA Radio.
7. BT tethering is considered about each RF exposure conditions.
8. NFC can transmit simultaneously with other Radios in Phablet-10g condition.
9. DTS Sub.6 Ant and UNII Sub.1 Ant works only MIMO operation.

Note(s):

For EN-DC mode in same antenna group, LSI TAS algorithm in WWAN adds directly the time-averaged RF exposure from 4G(LTE) and time-averaged RF exposure from 5G NR. LSI TAS algorithm controls the total RF exposure from both 4G and 5G NR to not exceed the RF exposure from each 4G or 5G individually. Therefore, simultaneous transmission compliance between 4G+5G NR operation is demonstrated in the TAS validation Report during algorithm validation.

For ULCA mode in same antenna group, LSI TAS algorithm in WWAN adds directly the time-averaged RF exposure from PCC(LTE) and time-averaged RF exposure from SCC(LTE). LSI TAS algorithm controls the total RF exposure from both PCC and SCC to not exceed the RF exposure from each PCC or SCC individually. Therefore, simultaneous transmission compliance between PCC+SCC NR operation is demonstrated in the TAS validation Report during algorithm validation.

In this SAR Report, simultaneous transmission compliance was evaluated individually with WLAN and/or other radios using one of 4G or 5G NR.

12.1. Antenna group consideration

In WWAN TAS algorithm, it was assumed that all antennas are correlated regardless of their direction of transmission in space. Thus, the main concept was to split the SAR/TER on the transmitting RATs even they are transmitting on different antennas. Such approach is considered as a worst case scenario in terms of transmitting power. Thus, to enhance the performance of the transmission power RATs, we should consider the spatial properties of each antenna and the correlations between the antennas transmissions.

For a DUT with N antennas, a spatial correlation matrix (R) can be constructed to map the correlation between each two antennas when they transmit simultaneously. Thus this correlation matrix is given as

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1N} \\ r_{21} & r_{22} & \cdots & r_{2N} \\ \vdots & \vdots & \ddots & \vdots \\ r_{N1} & r_{N2} & \cdots & r_{NN} \end{bmatrix}$$

And it has the following characteristics

a) r_{ij} is the correlation between antenna i and antenna j

b) The value of r_{ij} is either 0 or 1, where 1 means fully correlated and 0 means fully uncorrelated.

c) r_{ii} is the self-correlation of each antenna and it is always 1.

Since the R matrix entries depends on the antenna distribution of each DUT, then our spatial TAS algorithm is implemented to operate with any R matrix (antenna distribution agnostic).
The values of the R matrix entries should be determined by the OEM based on the DUT used. One way to determine the values of the R matrix entries is to use the SPLSR test mentioned in FCC KDB 447498 guide.

The table below shows the antenna groups and R matrix declared by manufacturer:

Antenna Group	Antenna	Band list
AG0	Main.1	GSM 850, 1900 WCDMA B5 LTE B2, B5, B12, B66 NR Bn5
	Main.2	LTE B41, NR Bn 41
AG1	Sub.2	LTE B2, B41, B66, NR Bn41

R =

Antenna Group		AG0		AG1
	Antenna	Main.1	Main.2	Sub.2
AG0	Main.1	1	1	0
	Main.2	1	1	0
AG1	Sub.2	0	0	1

SPLSR criteria verification according to matrix (R) verifies only RF exposure configurations where AG0+AG1 result exceeds the FCC limit.

12.1.1 Head/ Body-worn & Hotspot exposure Antenna group analysis

Antenna Group: AG0 Main.1 & Main.2

RF exposure	Test position	AG0 Main.1								Main.1 Worst SAR	AG0 Main.2		Main.2 Worst SAR	AG0 Worst SAR
		GSM 850	GSM 1900	WCMDA B5	LTE B2	LTE B5	LTE B12	LTE B66	NR Bn5		LTE B41	NR Bn41		
Head	Left Touch	0.194	0.055	0.227	0.089	0.167	0.115	0.190	0.169	0.227	0.123	0.043	0.123	0.227
	Left Tilt	0.140	0.022	0.145	0.031	0.108	0.092	0.124	0.117	0.145	0.033	0.008	0.033	0.145
	Right Touch	0.328	0.023	0.324	0.043	0.276	0.150	0.129	0.273	0.328	0.051	0.014	0.051	0.328
	Right Tilt	0.134	0.024	0.161	0.032	0.141	0.070	0.088	0.138	0.161	0.035	0.009	0.035	0.161
Body-worn & Hotspot	Rear	0.608	0.358	0.633	0.300	0.620	0.369	0.440	0.376	0.633	0.246	0.249	0.249	0.633
	Front	0.518	0.308	0.535	0.251	0.543	0.244	0.372	0.292	0.543	0.212	0.192	0.212	0.543
Hotspot	Top									0.000			0.000	0.000
	Left	0.098	0.094	0.107	0.097	0.083	0.066	0.089	0.021	0.107	0.152	0.143	0.152	0.152
	Bottom	0.383	0.756	0.454	0.478	0.413	0.243	1.122	0.353	1.122	0.353	0.303	0.353	1.122
	Right	0.376	0.046	0.236	0.060	0.209	0.129	0.062	0.100	0.376			0.000	0.376

Antenna Group: AG1 Sub.2

RF exposure	Test position	AG1 Sub.2				Worst SAR
		LTE B2	LTE B41	LTE B66	NR Bn41	
Head	Left Touch	0.502	0.351	0.593	0.458	0.593
	Left Tilt	0.562	0.393	0.700	0.534	0.700
	Right Touch	1.050	1.046	0.924	1.061	1.061
	Right Tilt	0.997	1.064	1.001	1.190	1.190
Body-worn & Hotspot	Rear	0.171	0.116	0.201	0.213	0.213
	Front	0.114	0.089	0.142	0.170	0.170
Hotspot	Top	0.346	0.211	0.326	0.285	0.346
	Left	0.038	0.013	0.037	0.035	0.038
	Bottom					0.000
	Right					0.000

Summation of AG0 / AG1

RF exposure	Test position	AG0			AG1	SUM	FCC Limit
		Main.1 Worst SAR	Main.2 Worst SAR	AG0 Worst SAR	AG1 Worst SAR		
Head	Left Touch	0.227	0.123	0.227	0.593	0.820	1.6
	Left Tilt	0.145	0.033	0.145	0.700	0.845	
	Right Touch	0.328	0.051	0.328	1.061	1.389	
	Right Tilt	0.161	0.035	0.161	1.190	1.351	
Body-worn & Hotspot	Rear	0.633	0.249	0.633	0.213	0.846	
	Front	0.543	0.212	0.543	0.170	0.713	
Hotspot	Top	0.000	0.000	0.000	0.346	0.346	
	Left	0.107	0.152	0.152	0.038	0.190	
	Bottom	1.122	0.353	1.122	0.000	1.122	
	Right	0.376	0.000	0.376	0.000	0.376	

Note(s):

Both Antenna group's summation results are below FCC limit. So additional test is not required.

12.2. Simultaneous transmission analysis

Simultaneous transmission SAR test exclusion considerations

KDB 447498 D04 Interim General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR

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.

SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri$$

Where:

SAR_1 is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR_2 is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$$[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$$

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

$$(SAR_1 + SAR_2)^{1.5} / Ri \leq 0.04$$

When an individual antenna transmits at on two bands simultaneously, the sum of the highest *reported* SAR for the frequency bands should be used to determine SAR_1.or SAR_2. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

The antennas for the unlicensed transmitters are closely situated. As a result, the associated SAR hotspots are also closely situated. Some of the sum of SAR calculations yielded results over 1.6 W/kg. The SPSLR calculations for these situations were performed by treating the unlicensed SAR values as a single transmitter. The most conservative distance between all the unlicensed hotspots to the licensed hotspot was used for the value of *d* in the SPSLR calculation.

12.2.1 Head exposure simultaneous transmission analysis

SAR (DTS & BT & UNII)

RF Exposure	Test Position	WLAN/BT's SAR (W/kg)									Worst case Combination
		BT Ant.1	2.4G Sub.4	2.4G Sub.6	2.4G MIMO (Sub.4+Sub6)	5GHz Sub.4	5GHz Sub.1	5G MIMO (Sub.4+Sub.1)	5GHz Sub.4 + BT Ant.1	5GHz MIMO + BT Ant.1	
		1	2	3	4	5	6	7	1+7	1+9	
Head (1-g SAR)	Left Touch	0.066	0.208	0.063	0.271	0.222	0.093	0.315	0.288	0.381	0.381
	Left Tilt	0.079	0.208	0.063	0.271	0.222	0.093	0.315	0.301	0.394	0.394
	Right Touch	0.229	0.208	0.063	0.271	0.222	0.067	0.289	0.451	0.518	0.518
	Right Tilt	0.224	0.171	0.063	0.234	0.081	0.060	0.141	0.305	0.365	0.365

WWAN(AG0 and AG1) + WLAN + BT summation results

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)
		AG0	AG1	WLAN	AG0+WLAN
Head (1-g SAR)	Left Touch	0.227		0.381	0.608
			0.593	0.381	0.974
	Left Tilt	0.145		0.394	0.539
			0.700	0.394	1.094
	Right Touch	0.328		0.518	0.846
			1.061	0.518	1.579
	Right Tilt	0.161		0.365	0.526
			1.190	0.365	1.555

Note(s):
1. Green value is estimated SAR value.
2. All techs are operated multi Tx (ENDC and/or ULCA) in same AG.

12.2.2 Body-worn & Hotspot exposure simultaneous transmission analysis

SAR (DTS & BT & UNII)

RF Exposure	Test Position	WLAN/BT's SAR (W/kg)									Worst case Combination
		BT Ant.1	2.4G Sub.4	2.4G Sub.6	2.4G MIMO (Sub.4+Sub6)	5GHz Sub.4	5GHz Sub.1	5G MIMO (Sub.4+Sub.1)	5GHz Sub.4 + BT Ant.1	5GHz MIMO + BT Ant.1	
		1	2	3	4	5	6	7	1+5	1+7	
Body-worn & Hotspot (1-g SAR)	Rear	0.113	0.662	0.081	0.743	0.259	0.161	0.420	0.372	0.533	0.743
	Front	0.086	0.712	0.081	0.793	0.259	0.161	0.420	0.345	0.506	0.793
	Top	0.098	0.712	0.081	0.793			0.000	0.098	0.098	0.793
	Left	0.120	0.712		0.712			0.000	0.120	0.120	0.712
	Bottom				0.000			0.000	0.000	0.000	0.000
	Right			0.081	0.081			0.000	0.000	0.000	0.081

WWAN(AG0 and AG1) + WLAN + BT summation results

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)
		AG0	AG1	WLAN	AG0+WLAN
Body-Worn & Hotspot	Rear	0.633		0.743	1.376
			0.213	0.743	0.956
	Front	0.543		0.793	1.336
			0.170	0.793	0.963
Hotspot	Top		0.346	0.793	1.139
	Left	0.107		0.712	0.819
			0.038	0.712	0.750
	Bottom	1.122			1.122
	Right	0.376		0.081	0.457

Note(s):

1. Green value is estimated SAR value.
2. All techs are operated multi Tx (ENDC and/or ULCA) in same AG.

12.2.3 Product Specific 10-g exposure simultaneous transmission analysis

SAR (DTS & BT & UNII)

RF Exposure	Test Position	WLAN/BT's SAR (W/kg)									Worst case Combination
		BT Ant.1	2.4G Sub.4	2.4G Sub.6	2.4G MIMO (Sub.4+Sub6)	5GHz Sub.4	5GHz Sub.1	5G MIMO (Sub.4+Sub.1)	5GHz Sub.4 + BT Ant.1	5GHz MIMO + BT Ant.1	
		1	2	3	4	5	6	7	1+5	1+7	
Product Specific 10-g (10-g SAR)	Rear					1.527	0.194	1.721	1.527	1.721	1.721
	Front					0.909	0.194	1.103	0.909	1.103	1.103
	Top					1.527	0.194	1.721	1.527	1.721	1.721
	Left					1.527		1.527	1.527	1.527	1.527
	Bottom							0.000	0.000	0.000	0.000
	Right						0.194	0.194	0.000	0.194	0.194

WWAN(AG0 and AG1) + WLAN + BT + NFC summation results

RF Exposure	Test Position	Highest SAR (W/kg)				Sum SAR (W/kg)
		AG0	AG1	WLAN	NFC	
Product Specific 10-g (10-g SAR)	Rear			1.721	0.020	1.741
	Front			1.103	0.000	1.103
	Top			1.721	0.000	1.721
	Left			1.527	0.000	1.527
	Bottom					0.000
	Right			0.194		0.194

Note(s):

1. Green value is estimated SAR value.

Conclusion:

Simultaneous Transmission SAR analysis results is satisfied the FCC Limit requirement according to follow procedures with “Sum of SAR”

Appendixes

Refer to separated files for the following appendixes.

4791083081-S1 FCC Report SAR_App A_Photos & Ant. Locations

4791083081-S1 FCC Report SAR_App B_Highest SAR Test Plots

4791083081-S1 FCC Report SAR_App C_System Check Plots

4791083081-S1 FCC Report SAR_App D_SAR Tissue Ingredients

4791083081-S1 FCC Report SAR_App E_Probe Cal. Certificates

4791083081-S1 FCC Report SAR_App F_Dipole Cal. Certificates

4791083081-S1 FCC Report SAR_App G_LTE Carrier Aggregation

END OF REPORT