



**FCC 47 CFR § 2.1093
IEEE Std 1528-2013**

**SAR EVALUATION REPORT
(Part 1 : Test in Static Transmission Condition)**

FOR

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

MODEL NUMBER: SM-A236V

FCC ID: A3LSMA236V

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Prepared for
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Testing Laboratory

TL-637

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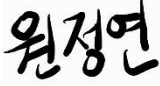
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1. Attestation of Test Results

Applicant Name		SAMSUNG ELECTRONICS CO.,LTD.					
FCC ID		A3LSMA236V					
Model Number		SM-A236V					
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	CBE	DTS	NII	DSS	DXX
Head		0.48	0.28	0.04	0.56	0.17	N/A
Body-worn		0.55	0.26	0.21	0.50	0.05	N/A
Hotspot		0.92	0.63	0.47	0.97	0.13	N/A
Product Specific 10g		2.94	N/A	N/A	1.48	N/A	0.02
Simultaneous TX	Head	1.38	1.38	0.89	1.38	1.38	N/A
	Body-worn	1.57	1.57	1.22	1.57	1.57	N/A
	Hotspot	1.52	1.56	1.39	1.56	1.56	N/A
	Product Specific 10g	N/A	N/A	N/A	N/A	N/A	N/A
Date Tested		9/21/2022 to 11/11/2022					
Test Results		Pass					
<p>UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p>Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.</p>							
Approved & Released By:				Prepared By:			
							
Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory				Jeongyeon Won Laboratory Engineer UL Korea, Ltd. Suwon Laboratory			

1.1. The Highest Reported SAR for RF exposure conditions for each bands

Equipment Class	Band	Antenna	The Highest Reported SAR (W/kg)			
			1g of tissue			10g of tissue
			Head Exposure condition	Body-worn Exposure condition	Hotspot Exposure condition	Product Specific Exposure condition
PCE	GSM 850	Main 1	0.480	0.464	0.919	N/A
	GSM 1900	Main 2	0.187	0.330	0.210	N/A
	WCDMA Band II	Main 2	0.222	0.498	0.482	N/A
	WCDMA Band V	Main 1	0.269	0.377	0.491	N/A
	LTE Band 2	Main 2	0.374	0.553	0.679	1.201
	LTE Band 4	Main 2	N/A	N/A	N/A	N/A
	LTE Band 5	Main 1	0.286	0.251	0.523	N/A
	LTE Band 7	Main 2	0.452	0.494	0.871	2.941
	LTE Band 12	Main 1	0.194	0.347	0.497	N/A
	LTE Band 13	Main 1	0.233	0.436	0.685	N/A
	LTE Band 48	Sub 3	0.277	0.262	0.632	N/A
	LTE Band 66	Main 2	0.225	0.496	0.622	N/A
	NR Band n2	Main 1	0.327	0.535	0.558	N/A
	NR Band n5	Main 1	0.309	0.371	0.656	N/A
	NR Band n66	Main 2	0.219	0.439	0.413	N/A
NR Band n77	Sub 3	0.378	0.463	0.817	N/A	
	Sub 5	0.081	<0.001	0.046	N/A	
	Sub 2	0.371	0.067	0.083	N/A	
	Main 2	0.025	0.096	0.214	N/A	
DTS	2.4GHz WLAN		0.038	0.206	0.468	N/A
UNII	5GHz WLAN		0.564	0.503	0.972	1.482
DSS	Bluetooth		0.166	0.054	0.134	N/A
DXX	NFC		N/A	N/A	N/A	0.018

2. Test Specification, Methods and Procedures

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

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 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, 2014; RF Exposure Procedures Update (Other LTE Considerations)
- [TCB workshop](#) October, 2016; RF Exposure Procedures (DUT Holder Perturbations)
- [TCB workshop](#) May, 2017; RF Exposure Procedures (LTE Test Conditions)
- [TCB workshop](#) November, 2017; RF Exposure Procedures (LTE UL/DL Carrier Aggregation SAR)
- [TCB workshop](#) April, 2018; RF Exposure Procedures (LTE DL CA SAR Test Exclusion Update)
- [TCB workshop](#) April, 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))
- [TCB workshop](#) November, 2019 Page 5, RF Exposure Procedures (SPLSR Hotspot Combination)
- [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)

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.

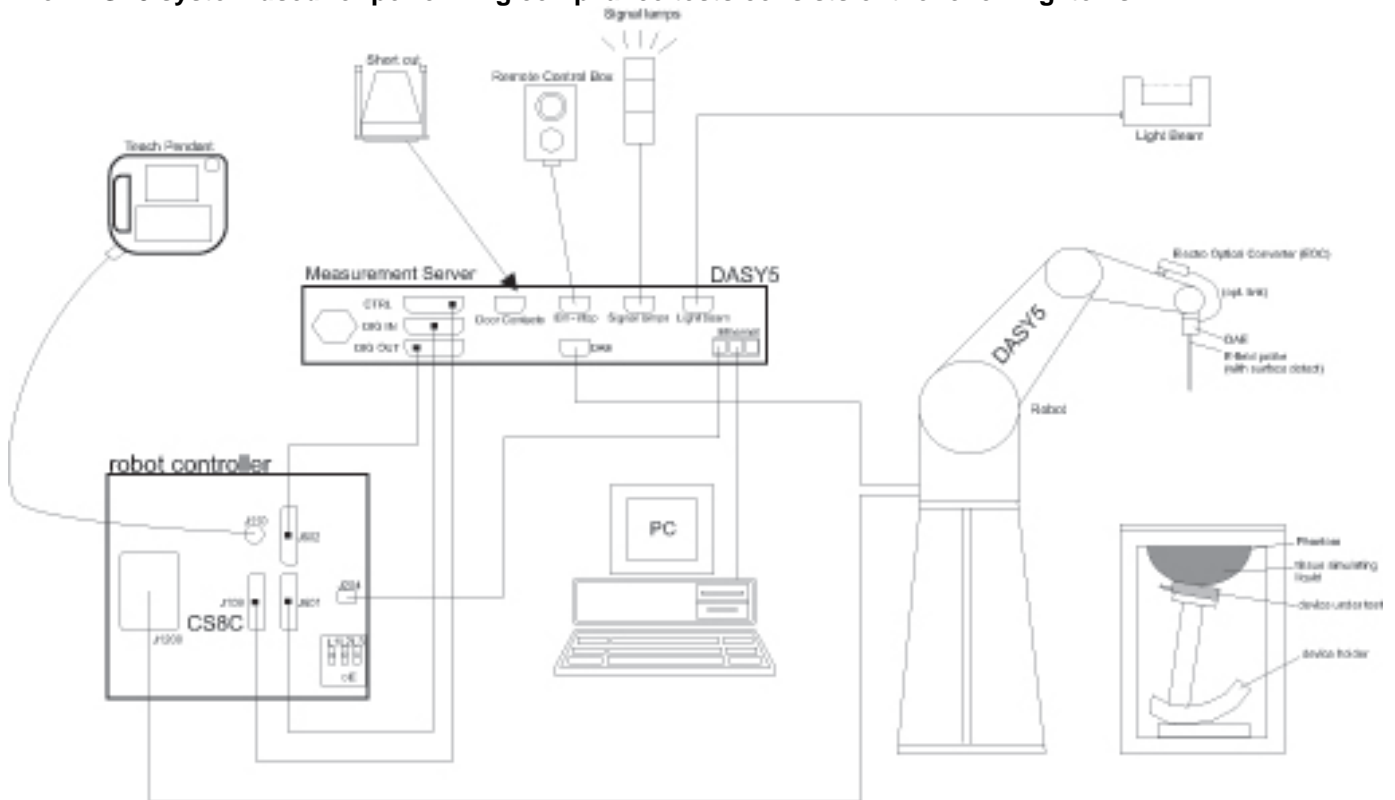
The full scope of accreditation can be viewed at;

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

4. SAR Measurement System & Test Equipment

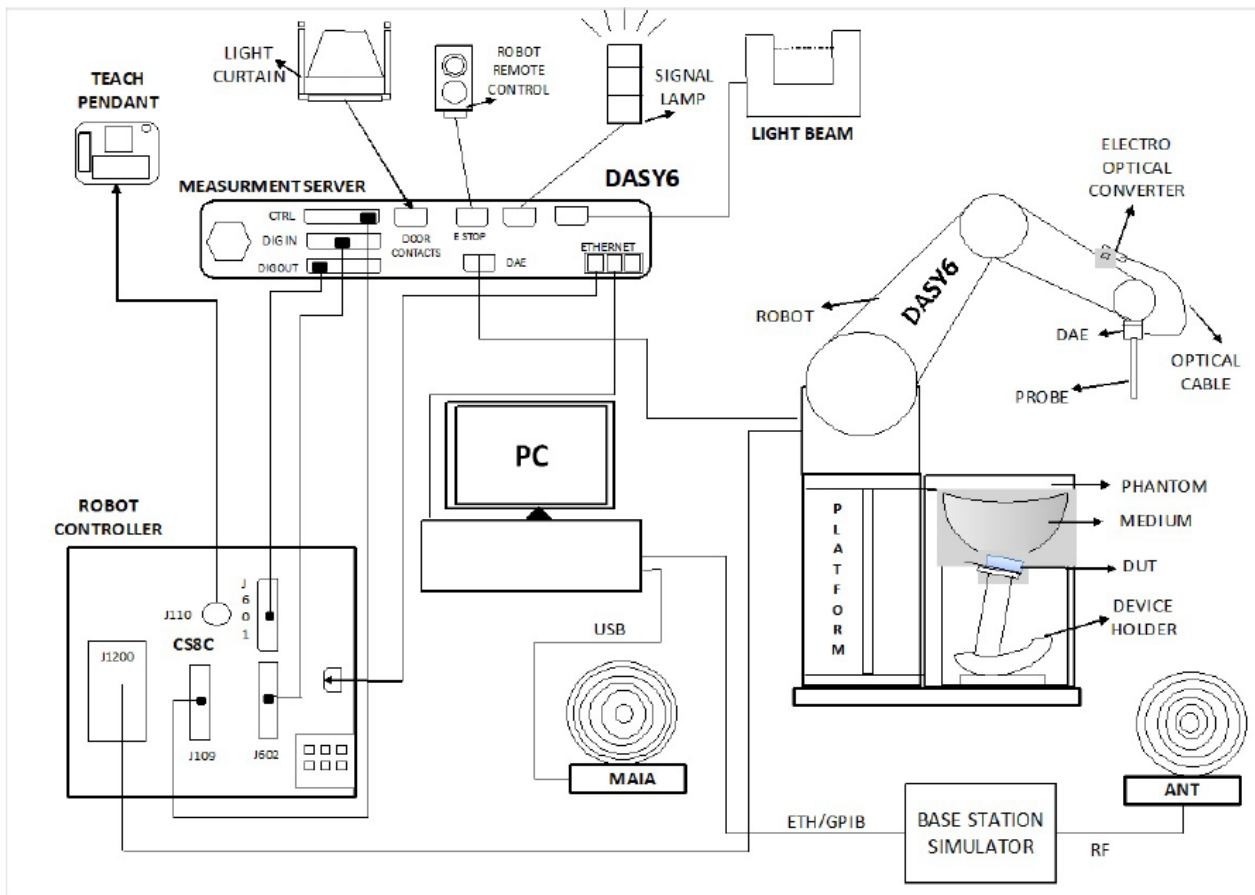
4.1. SAR Measurement System

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	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm $2 - 3$ GHz: ≤ 12 mm	$3 - 4$ GHz: ≤ 12 mm $4 - 6$ GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be \leq the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}, \Delta y_{Zoom}$			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 4: Power drift measurement

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

4.3. Test Equipment

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

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	8-5-2023
Network Analyzer	ROHDE & SCHWARZ	ZNB 20	102256	8-5-2023
Dielectric Assessment Kit	SPEAG	DAK-12	1158	10-20-2022
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	7-25-2023
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3851	8-3-2023
Thermometer	LKM	DTM3000	3862	8-3-2023

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-4-2023
MXG Analog Signal Generator	Keysight	N5181B	MY59100587	8-4-2023
MXG Analog Signal Generator	Keysight	N5173B	MY59101083	8-4-2023
Power Sensor	Keysight	U2000A	MY60180020	8-3-2023
Power Sensor	Agilent	U2000A	MY54260007	8-3-2023
Power Sensor	Keysight	U2000A	MY60490008	8-3-2023
Power Sensor	Keysight	U2000A	MY61060004	8-3-2023
Power Sensor	Keysight	U2000A	MY61010006	8-3-2023
Power Sensor	Keysight	U2000A	MY61010010	8-3-2023
Power Amplifier	MINI-CIRCUITS	TVA-R5-13A+	2111006	2-15-2023
Power Amplifier	EXODUS	AMP2027ADB	10002	3-30-2023
Directional Coupler	Agilent	772D	MY52180193	8-3-2023
Directional Coupler	H.P	778D	16133	8-3-2023
Directional Coupler	MINI-CIRCUITS	ZUDC20-183+	N/A	8-2-2023
Directional Coupler	MINI-CIRCUITS	ZUDC20-183+	N/A	8-3-2023
Low Pass Filter	FILTRON	L14012FL	1410003S	8-3-2023
Low Pass Filter	MICROLAB	LA-60N	3942	8-3-2023
Low Pass Filter	MINI-CIRCUITS	NLP-1200	VUU19301915	8-2-2023
Attenuator	KEYSIGHT	8491B/003	VE2017A0283	8-3-2023
Attenuator	KEYSIGHT	8491B/010	MY39271981	8-3-2023
Attenuator	KEYSIGHT	8491B/010	MY39272011	8-2-2023
Attenuator	KEYSIGHT	8491B/020	MY39271973	8-3-2023
Attenuator	MINI-CIRCUITS	BW-S3W10+	N/A	4-7-2023

Note(s):

1. All equipments were used until Cal.Due data.

Test Equipment (Continued)

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe	SPEAG	EX3DV4	7313	3-2-2023
E-Field Probe	SPEAG	EX3DV4	7652	4-28-2023
E-Field Probe	SPEAG	EX3DV4	7330	1-28-2023
E-Field Probe	SPEAG	EX3DV4	7376	7-27-2023
E-Field Probe	SPEAG	EX3DV4	7545	8-19-2023
E-Field Probe	SPEAG	EX3DV4	7651	5-30-2023
E-Field Probe	SPEAG	EX3DV4	7646	3-29-2023
Data Acquisition Electronics	SPEAG	DAE4	1343	8-18-2023
Data Acquisition Electronics	SPEAG	DAE4	1667	4-27-2023
Data Acquisition Electronics	SPEAG	DAE4	1468	8-18-2023
Data Acquisition Electronics	SPEAG	DAE4	1591	3-24-2023
Data Acquisition Electronics	SPEAG	DAE4	1668	4-27-2023
Data Acquisition Electronics	SPEAG	DAE4	1671	5-31-2023
Data Acquisition Electronics	SPEAG	DAE4	1494	7-18-2023
System Validation Dipole	SPEAG	D750V3	1205	4-27-2023
System Validation Dipole	SPEAG	D835V2	4d194	3-24-2023
System Validation Dipole	SPEAG	D1750V2	1180	9-21-2023
System Validation Dipole	SPEAG	D1900V2	5d190	11-24-2022
System Validation Dipole	SPEAG	D1900V2	5d199	3-25-2023
System Validation Dipole	SPEAG	D2450V2	939	7-21-2023
System Validation Dipole	SPEAG	D2600V2	1178	4-23-2023
System Validation Dipole	SPEAG	D2600V2	1097	9-29-2023
System Validation Dipole	SPEAG	D3500V2	1121	4-21-2023
System Validation Dipole	SPEAG	D3700V2	1036	5-21-2023
System Validation Dipole	SPEAG	D3900V2	1069	4-21-2023
System Validation Dipole	SPEAG	D5GHzV2	1209	11-24-2023
System Validation Dipole	SPEAG	D5GHzV2	1325	4-26-2023
System Validation Dipole	SPEAG	CLA-13	1015	8-23-2023
Thermometer	Lutron	MHB-382SD	AH.91463	8-4-2023
Thermometer	Lutron	MHB-382SD	AH.50215	8-9-2023
Thermometer	Lutron	MHB-382SD	AH.50213	8-4-2023
Thermometer	Lutron	MHB-382SD	AH.45903	8-9-2023
Thermometer	Lutron	MHB-382SD	AK.12123	8-9-2023
Thermometer	Lutron	MHB-382SD	AJ.42446	8-9-2023
Thermometer	Lutron	MHB-382SD	AK.18789	8-9-2023
Thermometer	Lutron	MHB-382SD	AK.12102	8-9-2023

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	150313	8-2-2023
Base Station Simulator	R & S	CMW500	150314	8-2-2023
Base Station Simulator	R & S	CMW500	162790	8-2-2023
Base Station Simulator	R & S	CMW500	169803	5-27-2023
Base Station Simulator	R & S	CMW500	169799	8-2-2023
Base Station Simulator	R & S	CMW500	169800	8-2-2023
Base Station Simulator	R & S	CMW500	169798	8-2-2023
UXM 5G Wireless Test Platform	Keysight	E7515B	MY59150850	12-13-2022
UXM 5G Wireless Test Platform	Keysight	E7515B	MY58120110	1-7-2023
UXM 5G Wireless Test Platform	Keysight	E7515B	MY57510596	8-5-2023
Radio Communication Test Station	Anritsu	MT8000A	6272466165	9-8-2023
Radio Communication Analyzer	Anritsu	MT8821C	6161094351	9-8-2023

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 $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Measurement Uncertainty of 4MHz to 30MHz

Measurement uncertainty for 4 MHz to 30 MHz

(According to IEEE 62209-1528)

a	b	c		d	e f(d,k)	f	g	h =	l =	k
		Tol. 1 g ($\pm\%$)	Tol. 10 g ($\pm\%$)					cx/f/e	cx/g/e	
Uncertainty component	Reference			Prob. Dist.	Div.	c_i (1 g)	c_i (10 g)	1 g u_i ($\pm\%$)	10 g u_i ($\pm\%$)	v_i
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	0.5	0.6	Normal	1	1	1	0.5	0.6	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 $U_c(y) =$								RSS	12.13	12.02
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =									24.26	24.05

5.1. DECISION RULE

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

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Refer to Appendix A.		
Back Cover	<input checked="" type="checkbox"/> The Back Cover is not removable.		
Battery Options	<input checked="" type="checkbox"/> The rechargeable battery is not user accessible		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Mobile Hotspot (Wi-Fi 5.8 GHz)		
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 2.4 GHz) <input checked="" type="checkbox"/> Wi-Fi Direct (Wi-Fi 5.2 GHz_UNII-1, Wi-Fi 5.8 GHz_UNII-3)		
Test Sample Information	No.	S/N	Notes
	1	664a1251cc347ece	Main Conducted
	2	664a125083347ece	Main Conducted
	3	664a124d01347ece	Main Conducted
	4	664a0edc42347ece	Wi-Fi & BT Conducted
	5	664a125001347ece	Wi-Fi & BT Conducted
	6	664a0edd9b347ece	Wi-Fi & BT Conducted
	7	664a124c55347ece	SAR
	8	664a124c57347ece	SAR
	9	664a1251ed347ece	SAR
	10	664a125054347ece	SAR
	11	664a0eddd4347ece	SAR
	12	664a125051347ece	SAR
	13	664a1248e1347ece	SAR

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode		Duty Cycle used for SAR testing
GSM	850 1900	Voice (GMSK)	GPRS Multi-Slot Class:	GSM Voice: 12.5% (E)GPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50%
		GPRS (GMSK)	<input type="checkbox"/> Class 8 - 1 Up, 4 Down	
		EGPRS (8PSK)	<input type="checkbox"/> Class 10 - 2 Up, 4 Down	
			<input type="checkbox"/> Class 12 - 4 Up, 4 Down	
			<input checked="" type="checkbox"/> Class 33 - 4 Up, 5 Down	
Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
W-CDMA (UMTS)	Band II Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Category 24) HSUPA (Category 6) DC-HSDPA (Category 24) HSPA+ (DL only)		100%
LTE	FDD Band 2 FDD Band 4 FDD Band 5 FDD Band 7 FDD Band 12 FDD Band 13 FDD Band 66 TDD Band 48	QPSK 16QAM 64QAM 256QAM Rel. 15 Carrier Aggregation (2 Uplink and 4 Downlinks)		100% (FDD) 63.3% (TDD)
		<u>Uplink intra-band</u> <u>Carrier Aggregation(2CC)</u> 48C		
Does this device support SV-LTE (1xRTT-LTE)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
NR (Sub6)	FDD Band n2 FDD Band n5 FDD Band n66 TDD Band n77-PC3/PC2	DFT-s-OFDM: ■ $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: ■ QPSK, 16QAM, 64QAM, 256QAM		100%
Wi-Fi	2.4 GHz	802.11b / 802.11g 802.11n (HT20)		98.8% (802.11b)
	5 GHz	802.11a / 802.11n (HT20) & (HT40) 802.11ac (VHT20) & (VHT40) & (VHT80)		98.7% (802.11a) 98.5% (802.11ac (VHT80))
	Does this device support bands 5.60 ~ 5.65 GHz? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
	Does this device support Band gap channel(s)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Bluetooth	2.4 GHz	Version 5.3 LE		76.7% (DH5)
NFC	13.56 MHz	Type A/B/C		100%

Notes:

- The Bluetooth protocol is considered source-based averaging. Bluetooth 1Mbps GFSK (DH5) was verified to have the highest duty cycle of 76.7% and was considered and used for SAR Testing.
- Duty cycle for Wi-Fi is referenced from the DTS and UNII report.
- NR TDD Band n77 has support SRS(0,1,2,3) modes.

6.3. Time-Averaging feature

The equipment under test (EUT) contains the Qualcomm modems supporting 2G/3G/4G technologies and 5G NR bands. these modem is enabled with Qualcomm Smart Transmit feature to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement. Refer to Compliance Summary document for detailed description of Qualcomm Smart Transmit feature.

The Smart Transmit 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.

Smart Transmit 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} EFS settings and maximum tune up output power P_{max} configured for this EUT for various transmit conditions (DSI Device State Index).

The maximum time-averaged output power (dBm) for any 2G/3G/4G/5G NR WWAN technology band, and DSI = minimum of “P_{Limit} EFS” and “Maximum tune up output power P_{max}” + 1 dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB 447498 D01.

The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

SAR Characterizations

Exposure condition			Body-Worn	Product Specific 10-g Without	Product Specific 10-g With triggering	Head (RCV)	Hotspot	Ear-jack	P _{max} (Maximum tune-up Power) (dBm)
Spatial-average			1g	10g	10g	1g	1g	10g	
Test distance (mm)			15	13/0/6/7	0	0	10	0	
DSI:			0	0	1	2	3	4	
RF Air Interface	Antenna	Antenn Group	P _{limit} corresponding to 1.0 W/kg (SAR _{design_target}) (1g) / 2.5 W/kg (SAR _{design_target}) (10g)						
GSM 850	Main.1	AG0	29.81	30.48	28.93	29.66	26.91	28.93	25.48
GSM 1900	Main.2	AG0	27.80	23.48	17.49	30.48	17.49	17.49	21.98
WCDMA Band II	Main.2	AG0	27.53	23.97	20.50	31.15	20.50	20.50	23.50
WCDMA Band V	Main.1	AG0	29.44	33.08	27.15	30.91	28.29	27.15	24.20
LTE Band 2	Main.2	AG0	27.58	24.45	21.00	29.41	21.00	21.00	24.00
LTE Band 5	Main.1	AG0	31.51	31.52	26.43	30.94	28.32	26.43	24.50
LTE Band 7	Main.2	AG0	22.00	22.00	20.50	22.00	20.50	20.50	23.50
LTE Band 12	Main.1	AG0	30.09	33.12	27.08	32.62	28.54	27.08	24.50
LTE Band 13	Main.1	AG0	29.10	31.40	28.19	31.83	27.15	28.19	24.50
LTE Band 48	Sub.3	AG1	17.00	17.00	17.00	17.00	17.00	17.00	20.50
LTE Band 66(4)	Main.2	AG0	23.00	23.00	21.00	23.00	21.00	21.00	23.50
NR Band n2	Main.2	AG0	27.72	24.95	21.00	29.94	21.00	21.00	24.00
NR Band n5	Main.1	AG0	29.80	31.46	25.10	30.60	27.33	25.10	24.50
NR Band n66	Main.2	AG0	28.57	28.17	21.00	31.80	21.00	21.00	24.00
NR Band n77 -SRS 0-PC3	Sub.3	AG1	17.00	17.00	17.00	17.00	17.00	17.00	24.00
NR Band n77 -SRS 1-PC3	Sub.5	AG1	9.50	9.50	9.50	9.50	9.50	9.50	15.50
NR Band n77 -SRS 2-PC3	Sub.2	AG1	11.00	11.00	11.00	11.00	11.00	11.00	22.00
NR Band n77 -SRS 3-PC3	Main.2	AG0	16.00	16.00	16.00	16.00	16.00	16.00	22.00
NR Band n77 -SRS 0-PC2	Sub.3	AG1	17.00	17.00	17.00	17.00	17.00	17.00	26.00
NR Band n77 -SRS 1-PC2	Sub.5	AG1	9.50	9.50	9.50	9.50	9.50	9.50	15.50
NR Band n77 -SRS 2-PC2	Sub.2	AG1	11.00	11.00	11.00	11.00	11.00	11.00	22.00
NR Band n77 -SRS 3-PC2	Main.2	AG0	16.00	16.00	16.00	16.00	16.00	16.00	22.00

Notes:

1. All P_{Limit} EFS and maximum tune up output P_{max} levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of LTE TDD modulation schemes.
2. Maximum tune up output power P_{max} 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 report (Part 1 test) were performed by setting Reserve_power_margin (Smart Transmit EFS entry) to 0 dB.
4. If P_{Limit} is higher than P_{max} for some modes / bands, The modes/bands will operate at a power level up to P_{max}.

6.4. Maximum Allowed Output power

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

RF Air interface	Antenna	Mode	Time Slots	Maximum allowed output power (dBm)											
				Pmax		PLimit									
						DSI = 0 (Body-worn & Sensor Off)		DSI = 1 (Proximity sensor On)		DSI = 2 (Head-RCV On)		DSI = 3 (Hotspot)		DSI = 4 (Earjack)	
						Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM850	Main.1 Ant.	Voice	1	33.50	24.47	33.50	24.47	33.50	24.47	33.50	24.47	33.50	24.47	33.50	24.47
		GPRS	1	33.50	24.47	33.50	24.47	33.50	24.47	33.50	24.47	33.50	24.47	33.50	24.47
		GPRS	2	32.50	26.48	32.50	26.48	32.50	26.48	32.50	26.48	32.50	26.48	32.50	26.48
		GPRS	3	30.50	26.24	30.50	26.24	30.50	26.24	30.50	26.24	30.50	26.24	30.50	26.24
		GPRS	4	28.50	25.49	28.50	25.49	28.50	25.49	28.50	25.49	28.50	25.49	28.50	25.49
		EGPRS	1	27.50	18.47	27.50	18.47	27.50	18.47	27.50	18.47	27.50	18.47	27.50	18.47
		EGPRS	2	26.00	19.98	26.00	19.98	26.00	19.98	26.00	19.98	26.00	19.98	26.00	19.98
		EGPRS	3	24.00	19.74	24.00	19.74	24.00	19.74	24.00	19.74	24.00	19.74	24.00	19.74
GSM1900	Main.2 Ant.	Voice	1	30.70	21.67	30.70	21.67	27.50	18.47	30.70	21.67	27.50	18.47	27.50	18.47
		GPRS	1	30.70	21.67	30.70	21.67	27.50	18.47	30.70	21.67	27.50	18.47	27.50	18.47
		GPRS	2	29.00	22.98	29.00	22.98	24.50	18.48	29.00	22.98	24.50	18.48	24.50	18.48
		GPRS	3	27.00	22.74	27.00	22.74	22.70	18.44	27.00	22.74	22.70	18.44	22.70	18.44
		GPRS	4	25.00	21.99	25.00	21.99	21.50	18.49	25.00	21.99	21.50	18.49	21.50	18.49
		EGPRS	1	26.30	17.27	26.30	17.27	26.30	17.27	26.30	17.27	26.30	17.27	26.30	17.27
		EGPRS	2	25.00	18.98	24.50	18.48	24.50	18.48	25.00	18.98	24.50	18.48	24.50	18.48
		EGPRS	3	23.20	18.94	22.50	18.24	22.50	18.24	23.20	18.94	22.50	18.24	22.50	18.24
		EGPRS	4	22.20	19.19	21.40	18.39	21.40	18.39	22.20	19.19	21.40	18.39	21.40	18.39

RF Air interface	Antenna	Mode	Maximum allowed output power (dBm)							
			Pmax	PLimit						
				DSI = 0 (Body-worn & Sensor Off)	DSI = 1 (Proximity sensor On)	DSI = 2 (Head-RCV On)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)		
W-CDMA Band II	Main.2 Ant.	R99	24.50	24.50	21.50	24.50	21.50	21.50		
		HSDPA	24.00	24.00	21.50	24.00	21.50	21.50		
		HSUPA	24.00	24.00	21.50	24.00	21.50	21.50		
		DC-HSDPA	24.00	24.00	21.50	24.00	21.50	21.50		
W-CDMA Band V	Main.1 Ant.	R99	25.20	25.20	25.20	25.20	25.20	25.20		
		HSDPA	24.50	24.50	24.50	24.50	24.50	24.50		
		HSUPA	24.50	24.50	24.50	24.50	24.50	24.50		
		DC-HSDPA	24.50	24.50	24.50	24.50	24.50	24.50		

Note(s):

1. Detail of DSI(Device State Index) conditions, please refer to Sec.6.5.

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

RF Air interface	Antenna	Mode	Maximum allowed output power (dBm)					
			Pmax	PLimit				
				DSI = 0 (Body-worn & Sensor Off)	DSI = 1 (Proximity sensor On)	DSI = 2 (Head-RCV On)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
LTE Band 12	Main.1	QPSK	25.50	25.50	25.50	25.50	25.50	25.50
LTE Band 13	Main.1	QPSK	25.50	25.50	25.50	25.50	25.50	25.50
LTE Band 5	Main.1	QPSK	25.50	25.50	25.50	25.50	25.50	25.50
LTE Band 7	Main.2	QPSK	24.50	23.00	21.50	23.00	21.50	21.50
LTE Band 66	Main.2	QPSK	24.50	24.00	22.00	24.00	22.00	22.00
LTE Band 4	Main.2	QPSK	24.50	24.00	22.00	24.00	22.00	22.00
LTE Band 2	Main.2	QPSK	25.00	25.00	22.00	25.00	22.00	22.00
LTE Band 48	Sub.3	QPSK	23.50	20.00	20.00	20.00	20.00	20.00
NR Band n5	Main.1	DFT-s-OFDM QPSK	25.50	25.50	25.50	25.50	25.50	25.50
NR Band n66	Main.2	DFT-s-OFDM QPSK	25.00	25.00	22.00	25.00	22.00	22.00
NR Band n2	Main.2	DFT-s-OFDM QPSK	25.00	25.00	22.00	25.00	22.00	22.00
NR Band n77-SRS0 PC2	Sub.3	DFT-s-OFDM QPSK	27.00	18.00	18.00	18.00	18.00	18.00
NR Band n77-SRS1 PC2	Sub.5	SRS CW	16.50	10.50	10.50	10.50	10.50	10.50
NR Band n77-SRS2 PC2	Sub.2	SRS CW	23.00	12.00	12.00	12.00	12.00	12.00
NR Band n77-SRS3 PC2	Main.2	SRS CW	23.00	17.00	17.00	17.00	17.00	17.00
NR Band n77-SRS0 PC3	Sub.3	DFT-s-OFDM QPSK	25.00	18.00	18.00	18.00	18.00	18.00
NR Band n77-SRS1 PC3	Sub.5	SRS CW	16.50	10.50	10.50	10.50	10.50	10.50
NR Band n77-SRS2 PC3	Sub.2	SRS CW	23.00	12.00	12.00	12.00	12.00	12.00
NR Band n77-SRS3 PC3	Main.2	SRS CW	23.00	17.00	17.00	17.00	17.00	17.00

Note(s):

1. Detail of DSI(Device State Index) conditions, please refer to Sec.6.5.
2. NR Bands support only NSA mode.

WLAN maximum output power

RF Air interface	Band		Max. RF Output Power (dBm)									
			802.11 mode									
			maximum output power					WLAN reduced output power				
			a	b	g	n	ac	a	b	g	n	ac
WiFi 2.4 GHz	DTS	Ch 1 ~ 11		21	19	19			10	10	10	
		Ch 12		8	6	6			8	6	6	
		Ch 13		8	6	6			8	6	6	
WiFi 5 GHz (BW : 20MHz)	UNII-1 & 2A		16.0			16.0	16.0	11.0			11.0	11.0
	UNII-2C		16.0			16.0	16.0	11.0			11.0	11.0
	UNII-3		16.0			16.0	16.0	11.0			11.0	11.0
	UNII-4		16.0			16.0	16.0	11.0			11.0	11.0
WiFi 5 GHz (BW : 40MHz)	UNII-1 & 2A					15.0	15.0				11.0	11.0
	UNII-2C					15.0	15.0				11.0	11.0
	UNII-3					15.0	15.0				11.0	11.0
	UNII-4					15.0	15.0				11.0	11.0
WiFi 5 GHz (BW : 80MHz)	UNII-1 & 2A						13.0					11.0
	UNII-2C						13.0					11.0
	UNII-3						13.0					11.0
	UNII-4						13.0					11.0

Bluetooth & Bluetooth LE maximum output power

RF Air interface	Max. RF Output Power (dBm)			
	BDR	EDR	LE 2M	LE 125/500k
Bluetooth	16	12.5	8.0	8.0

6.5. DSI (Device State Index) Scenarios

This device supports multiple DSI Scenarios and Each DSIs operate to each RF exposure Conditions.

Please below table;

RF exposure Conditions	Technologies Supported	DSI conditions	Description
Head	All WWAN bands	DSI = 2	Next to the ear exposure condition. Handset's Receiver(ear piece) is active during Voice or VoIP call.
Body-worn	All WWAN bands	DSI = 0	Handset are used with body-worn accessories
Hotspot	All WWAN bands	DSI = 3	SAR test requirements for Handset with wireless router or hotspot mode capabilities.
Product Specific 10-g	All WWAN bands	DSI = 0	Hand use conditions for Handset and proximity sensor is not active.
	All WWAN bands	DSI = 1	Hand use conditions for Handset and proximity sensor is active.
	All WWAN bands	DSI = 4	Connected ear-jack

Note(s):

1. DSI Scenarios priority: DSI=2 → DSI=3 → DSI=4 → DSI=1 → DSI=0

Product Specific 10g Adjusted SAR Calculation

Wireless technologies	Worst DSI's Maximum tune-up limit (dBm)	DSI = 3 Maximum tune-up limit (dBm)	Power Factor	Reported SAR Limit (W/kg)
GSM 1900	22.98	18.49	2.81	0.427
WCDMA Band II	24.50	21.50	2.00	0.601
LTE Band 66/4	24.00	22.00	1.58	0.757
LTE Band 2	25.00	22.00	2.00	0.601
LTE Band 7	23.00	21.50	1.41	0.850
NR Band n66	25.00	22.00	2.00	0.601
NR Band n2	25.00	22.00	2.00	0.601

Note(s):

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

6.6. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	18700/ 1860	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	19100/ 1900	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			20525/ 836.5	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 7	Frequency range: 2500 – 2570 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20850/ 2510	20825/ 2507.5	20800/ 2505	20775/ 2502.5		
	Mid	21100/ 2535	21100/ 2535	21100/ 2535	21100/ 2535		
	High	21350/ 2560	21375/ 2562.5	21400/ 2565	21425/ 2567.5		
	Band 12	Frequency range: 699 – 716 MHz					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
Mid			23095/ 707.5	23095/ 707.5	23095/ 707.5	23095/ 707.5	
High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3	
Band 13	Frequency range: 777 - 787 MHz						
	Channel Bandwidth						
	20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz	
Low				23205/ 779.5			
Mid			23230/ 782	23230/ 782			
High				23255/ 784.5			

General LTE SAR Test and Reporting Considerations (Continued)

Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 48	Frequency range: 3550 - 3700 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
	Low	55340/ 3560	55315/ 3557.5	55290/ 3555	55265/ 3552.5																																																															
	Mid	55990/ 3625	55990/ 3625	55990/ 3625	55990/ 3625																																																															
	High	56640/ 3690	56665/ 3692.5	56690/ 3695	56715/ 3697.5																																																															
	Band 66	Frequency range: 1710 - 1780 MHz																																																																		
		Channel Bandwidth																																																																		
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz																																																													
	Low	132072/ 1720	132047/ 1717.5	132022/ 1715	131997/ 1712.5	131987/ 1711.5	131979/ 1710.7																																																													
Mid	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745	132322/ 1745																																																														
High	132572/ 1770	132597/ 1772.5	132622/ 1775	132647/ 1777.5	132657/ 1778.5	132665/ 1779.3																																																														
LTE transmitter and antenna implementation	Refer to Appendix A.																																																																			
Maximum power reduction (MPR)	<p>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>> 5</td> <td>> 4</td> <td>> 8</td> <td>> 12</td> <td>> 16</td> <td>> 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table> <p>MPR Built-in by design The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values. A-MPR (additional MPR) was disabled during SAR testing</p>						Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
Modulation	Channel bandwidth / Transmission bandwidth (N _{RB})							MPR (dB)																																																												
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																																														
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																																													
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																																													
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																																													
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2																																																													
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3																																																													
256 QAM	≥ 1						≤ 5																																																													
Power reduction	Yes																																																																			
Spectrum plots for RB configurations	A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																																			

Notes:

- Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports Overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE devices.
- 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	$6592 \cdot T_s$	$20480 \cdot T_s$				
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 $\times (T_s) \times \#$ of S + $\#$ of U

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

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

where

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

Note(s):

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

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

Item	Description														
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band n2	Frequency range: 1850 - 1910 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low										372000 /1860	371500 /1857.5	371000 /1855	370500 /1852.5	
	Mid										376000 /1880	376000 /1880	376000 /1880	376000 /1880	
	High										380000 /1900	380500 /1902.5	381000 /1905	381500 /1907.5	
	Band n5	Frequency range: 824 - 849 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low										166800 /834	166300 /831.5	165800 /829	165300 /826.5	
	Mid										167300 /836.5	167300 /836.5	167300 /836.5	167300 /836.5	
	High										167800 /839	168300 /841.5	168800 /844	169300 /846.5	
	Band n66	Frequency range: 1710 - 1780 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low							346000 /1730	345000 /1725		344000 /1720	343500 /1717.5	343000 /1715	342500 /1712.5	
	Mid							349000 /1745	349000 /1745		349000 /1745	349000 /1745	349000 /1745	349000 /1745	
	High							352000 /1760	353000 /1765		354000 /1770	354500 /1772.5	355000 /1775	355500 /1777.5	

Item	Description														
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band n77-DoD	Frequency range: 3450 - 3550 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low						631668 /3475.02	631334 /3470.01	631000 /3465		630668 /3460.02	630500 /3457.5	630334 /3445.01		
	Mid	633334 /3500.01	633334 /3500.01	633334 /3500.01	633334 /3500.01	633334 /3500.01			633334 /3500.01		633334 /3500.01	633334 /3500.01	633334 /3500.01		
	High						635000 /3525	635334 /3530.01	635666 /3534.99		636000 /3540	636166 /3542.49	636322 /3544.98		
	Band n77	Frequency range: 3700 - 3980 MHz													
		Channel Bandwidth (MHz)													
		100	90	80	70	60	50	40	30	25	20	15	10	5	
	Low	650000 /3750	649668 /3745.02	649334 /3740.01	649000 /3735	648668 /3730.02	648334 /3725.01	648000 /3720	647668 /3715.02		647334 /3710.01	647168 /3707.52	647000 /3705		
	Low-Mid				653666 /3804.99	653556 /3803.34	652166 /3782.49	651200 /3768	651000 /3765		650800 /3762	650700 /3760.5	650600 /3759		
	Mid-A		656000 /3840	656000 /3840				654400 /3816	654334 /3815.01		654266 /3813.99	654234 /3813.51	654200 /3813		
	Mid-B						656000 /3840			657600 /3864	657666 /3864.99		657734 /3866.01	657766 /3866.49	
Mid-High				658334 /3875.01	658444 /3876.66	659834 /3897.51	660800 /3912	661000 /3915		661200 /3918	661300 /3919.5	661400 /3921			
High	662000 /3930	662332 /3934.98	662666 /3939.99	663000 /3945	663332 /3949.98	663666 /3954.99	664000 /3960	664332 /3964.98		664666 /3969.99	664832 /3972.48	665000 /3975			
SCS	NR FDD Bands : 15 kHz, NR TDD Bands : 30 kHz														
Modulations Supported in UL	DFT-s-OFDM: $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM														
A-MPR (Additional MPR) disabled for SAR Testing?	Yes														
EN-DC Carrier Aggregation Possible Combinations															
LTE Anchor Bands for NR Band n2	LTE Band 5 / 13														
LTE Anchor Bands for NR Band n5	LTE Band 2 / 48 / 66														
LTE Anchor Bands for NR Band n66	LTE Band 5 / 13 / 48														
LTE Anchor Bands for NR Band n77	LTE Band 2 / 5 / 7 / 13 / 66														

Notes:

- SAR test for NR bands and LTE anchor Bands were performed separately due to limitations in SAR probe calibration factors.
- 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 Bands

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

Notes:

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

WWAN & BT Bands

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

NFC

Wireless technologies	RF Exposure Conditions	Antennaa	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	
				Edge 1 (Top)	< 25 mm	Yes	
				Edge 2 (Right)	> 25 mm	No	1
				Edge 3 (Bottom)	> 25 mm	No	1
				Edge 4 (Left)	< 25 mm	Yes	

Notes:

- SAR is not required because the distance from the antenna to the edge is > 25 mm as per KDB 941225 D06 Hot Spot SAR.
- For Phablet devices: When hotspot mode applies, Product specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
- For Phablet devices: When hotspot mode applies and power reduction applies to hotspot mode, Product specific 10-g SAR is required for each test position that has and adjusted SAR to maximum power that is > 1.2 W/kg.
- For Phablet devices: When hotspot mode is not supported, Product specific 10-g SAR is required for all surfaces and edges with an antenna located at ≤ 25mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions.
- 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 $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The 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 (4MHz to 30MHz). 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 (4MHz to 30MHz)

Target Frequency (MHz)	Head	
	ϵ_r	σ (S/m)
4	55.0	0.75
13	55.0	0.75
30	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 ±(%)		
2022-10-18	Head 5250	e'	36.4000	Relative Permittivity (ϵ_r):	36.40	35.93	1.30	5	
		e"	16.3600	Conductivity (σ):	4.78	4.70	1.57	5	
	Head 5260	e'	36.3800	Relative Permittivity (ϵ_r):	36.38	35.92	1.28	5	
		e"	16.3300	Conductivity (σ):	4.78	4.71	1.35	5	
	Head 5600	e'	35.6600	Relative Permittivity (ϵ_r):	35.66	35.53	0.35	5	
		e"	16.4600	Conductivity (σ):	5.13	5.06	1.28	5	
	Head 5750	e'	35.4800	Relative Permittivity (ϵ_r):	35.48	35.36	0.33	5	
		e"	16.5600	Conductivity (σ):	5.29	5.21	1.55	5	
	Head 5800	e'	35.4500	Relative Permittivity (ϵ_r):	35.45	35.30	0.42	5	
		e"	16.6100	Conductivity (σ):	5.36	5.27	1.65	5	
	Head 5925	e'	35.2300	Relative Permittivity (ϵ_r):	35.23	35.20	0.09	5	
		e"	16.5500	Conductivity (σ):	5.45	5.40	0.97	5	
	2022-10-23	Head 2600	e'	38.9000	Relative Permittivity (ϵ_r):	38.90	39.01	-0.28	5
			e"	13.5900	Conductivity (σ):	1.96	1.96	0.13	5
Head 2500		e'	39.0100	Relative Permittivity (ϵ_r):	39.01	39.14	-0.32	5	
		e"	13.4700	Conductivity (σ):	1.87	1.85	0.99	5	
Head 2700		e'	38.6600	Relative Permittivity (ϵ_r):	38.66	38.88	-0.58	5	
		e"	13.6600	Conductivity (σ):	2.05	2.07	-0.94	5	
2022-11-01	Head 5250	e'	35.2300	Relative Permittivity (ϵ_r):	35.23	35.93	-1.96	5	
		e"	15.8100	Conductivity (σ):	4.62	4.70	-1.85	5	
	Head 5260	e'	35.2100	Relative Permittivity (ϵ_r):	35.21	35.92	-1.98	5	
		e"	15.8200	Conductivity (σ):	4.63	4.71	-1.81	5	
	Head 5600	e'	34.5800	Relative Permittivity (ϵ_r):	34.58	35.53	-2.68	5	
		e"	16.0400	Conductivity (σ):	4.99	5.06	-1.30	5	
	Head 5750	e'	34.3100	Relative Permittivity (ϵ_r):	34.31	35.36	-2.98	5	
		e"	16.1600	Conductivity (σ):	5.17	5.21	-0.90	5	
	Head 5800	e'	34.2300	Relative Permittivity (ϵ_r):	34.23	35.30	-3.03	5	
		e"	16.1900	Conductivity (σ):	5.22	5.27	-0.93	5	
	Head 5925	e'	34.0100	Relative Permittivity (ϵ_r):	34.01	35.20	-3.38	5	
		e"	16.2600	Conductivity (σ):	5.36	5.40	-0.80	5	
	2022-11-07	Head 5200	e'	35.6500	Relative Permittivity (ϵ_r):	35.65	35.99	-0.95	5
			e"	16.4400	Conductivity (σ):	4.75	4.65	2.20	5
Head 5250		e'	35.6900	Relative Permittivity (ϵ_r):	35.69	35.93	-0.68	5	
		e"	16.4700	Conductivity (σ):	4.81	4.70	2.25	5	
Head 5600		e'	35.0500	Relative Permittivity (ϵ_r):	35.05	35.53	-1.36	5	
		e"	16.5700	Conductivity (σ):	5.16	5.06	1.96	5	
Head 5750		e'	34.6500	Relative Permittivity (ϵ_r):	34.65	35.36	-2.02	5	
		e"	16.6300	Conductivity (σ):	5.32	5.21	1.98	5	
Head 5800		e'	34.6400	Relative Permittivity (ϵ_r):	34.64	35.30	-1.87	5	
		e"	16.6800	Conductivity (σ):	5.38	5.27	2.07	5	
Head 5925		e'	34.3800	Relative Permittivity (ϵ_r):	34.38	35.20	-2.33	5	
		e"	16.6800	Conductivity (σ):	5.50	5.40	1.76	5	

SAR 2 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2022-10-26	Head 2450	e'	40.3800	Relative Permittivity (ϵ_r):	40.38	39.20	3.01	5
		e"	13.4400	Conductivity (σ):	1.83	1.80	1.72	5
	Head 2400	e'	40.4600	Relative Permittivity (ϵ_r):	40.46	39.30	2.96	5
		e"	13.3900	Conductivity (σ):	1.79	1.75	2.01	5
	Head 2480	e'	40.3200	Relative Permittivity (ϵ_r):	40.32	39.16	2.96	5
		e"	13.4500	Conductivity (σ):	1.85	1.83	1.22	5
2022-10-31	Head 2450	e'	40.3700	Relative Permittivity (ϵ_r):	40.37	39.20	2.98	5
		e"	13.0500	Conductivity (σ):	1.78	1.80	-1.23	5
	Head 2400	e'	40.4500	Relative Permittivity (ϵ_r):	40.45	39.30	2.93	5
		e"	13.0400	Conductivity (σ):	1.74	1.75	-0.66	5
	Head 2480	e'	40.3300	Relative Permittivity (ϵ_r):	40.33	39.16	2.98	5
		e"	13.0700	Conductivity (σ):	1.80	1.83	-1.64	5
2022-10-31	Head 2600	e'	40.1600	Relative Permittivity (ϵ_r):	40.16	39.01	2.95	5
		e"	13.2000	Conductivity (σ):	1.91	1.96	-2.75	5
	Head 2500	e'	40.3100	Relative Permittivity (ϵ_r):	40.31	39.14	3.00	5
		e"	13.0900	Conductivity (σ):	1.82	1.85	-1.86	5
	Head 2700	e'	39.9600	Relative Permittivity (ϵ_r):	39.96	38.88	2.77	5
		e"	13.3100	Conductivity (σ):	2.00	2.07	-3.48	5

SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
2022-10-23	Head 3500	e'	38.1100	Relative Permittivity (ε _r):	38.11	37.93	0.48	5	
		e"	14.9500	Conductivity (σ):	2.91	2.91	-0.07	5	
	Head 3560	e'	38.0000	Relative Permittivity (ε _r):	38.00	37.86	0.37	5	
		e"	15.0100	Conductivity (σ):	2.97	2.97	-0.06	5	
	Head 3600	e'	37.9100	Relative Permittivity (ε _r):	37.91	37.82	0.25	5	
		e"	15.0200	Conductivity (σ):	3.01	3.01	-0.24	5	
	Head 3690	e'	37.7300	Relative Permittivity (ε _r):	37.73	37.71	0.05	5	
		e"	15.0600	Conductivity (σ):	3.09	3.11	-0.52	5	
	Head 3700	e'	37.7100	Relative Permittivity (ε _r):	37.71	37.70	0.02	5	
		e"	15.0700	Conductivity (σ):	3.10	3.12	-0.51	5	
	2022-10-23	Head 3600	e'	37.9100	Relative Permittivity (ε _r):	37.91	37.82	0.25	5
			e"	15.0200	Conductivity (σ):	3.01	3.01	-0.24	5
Head 3650		e'	37.8000	Relative Permittivity (ε _r):	37.80	37.76	0.11	5	
		e"	15.0400	Conductivity (σ):	3.05	3.07	-0.41	5	
Head 3700		e'	37.7100	Relative Permittivity (ε _r):	37.71	37.70	0.02	5	
		e"	15.0700	Conductivity (σ):	3.10	3.12	-0.51	5	
Head 3750		e'	37.5800	Relative Permittivity (ε _r):	37.58	37.64	-0.17	5	
		e"	15.1400	Conductivity (σ):	3.16	3.17	-0.33	5	
Head 3800		e'	37.4600	Relative Permittivity (ε _r):	37.46	37.59	-0.34	5	
		e"	15.2600	Conductivity (σ):	3.22	3.22	0.18	5	
2022-10-23		Head 3750	e'	37.5800	Relative Permittivity (ε _r):	37.58	37.64	-0.17	5
			e"	15.1400	Conductivity (σ):	3.16	3.17	-0.33	5
	Head 3800	e'	37.4600	Relative Permittivity (ε _r):	37.46	37.59	-0.34	5	
		e"	15.2600	Conductivity (σ):	3.22	3.22	0.18	5	
	Head 3900	e'	37.2600	Relative Permittivity (ε _r):	37.26	37.47	-0.57	5	
		e"	15.4100	Conductivity (σ):	3.34	3.32	0.63	5	
	Head 3930	e'	37.2100	Relative Permittivity (ε _r):	37.21	37.44	-0.61	5	
		e"	15.4400	Conductivity (σ):	3.37	3.35	0.67	5	
	Head 3950	e'	37.1800	Relative Permittivity (ε _r):	37.18	37.42	-0.63	5	
		e"	15.4800	Conductivity (σ):	3.40	3.37	0.83	5	
	2022-10-27	Head 3500	e'	38.5400	Relative Permittivity (ε _r):	38.54	37.93	1.61	5
			e"	14.6300	Conductivity (σ):	2.85	2.91	-2.21	5
Head 3560		e'	38.4300	Relative Permittivity (ε _r):	38.43	37.86	1.50	5	
		e"	14.6700	Conductivity (σ):	2.90	2.97	-2.32	5	
Head 3600		e'	38.3700	Relative Permittivity (ε _r):	38.37	37.82	1.47	5	
		e"	14.7400	Conductivity (σ):	2.95	3.01	-2.10	5	
Head 3690		e'	38.2000	Relative Permittivity (ε _r):	38.20	37.71	1.29	5	
		e"	14.8000	Conductivity (σ):	3.04	3.11	-2.23	5	
Head 3700		e'	38.1800	Relative Permittivity (ε _r):	38.18	37.70	1.27	5	
		e"	14.8200	Conductivity (σ):	3.05	3.12	-2.16	5	
2022-10-27		Head 3600	e'	38.3700	Relative Permittivity (ε _r):	38.37	37.82	1.47	5
			e"	14.7400	Conductivity (σ):	2.95	3.01	-2.10	5
	Head 3650	e'	38.3000	Relative Permittivity (ε _r):	38.30	37.76	1.43	5	
		e"	14.7600	Conductivity (σ):	3.00	3.07	-2.27	5	
	Head 3700	e'	38.1800	Relative Permittivity (ε _r):	38.18	37.70	1.27	5	
		e"	14.8200	Conductivity (σ):	3.05	3.12	-2.16	5	
	Head 3750	e'	38.1400	Relative Permittivity (ε _r):	38.14	37.64	1.32	5	
		e"	14.8700	Conductivity (σ):	3.10	3.17	-2.11	5	
	Head 3800	e'	38.0400	Relative Permittivity (ε _r):	38.04	37.59	1.20	5	
		e"	14.9000	Conductivity (σ):	3.15	3.22	-2.18	5	
	2022-10-27	Head 3750	e'	38.1400	Relative Permittivity (ε _r):	38.14	37.64	1.32	5
			e"	14.8700	Conductivity (σ):	3.10	3.17	-2.11	5
Head 3800		e'	38.0400	Relative Permittivity (ε _r):	38.04	37.59	1.20	5	
		e"	14.9000	Conductivity (σ):	3.15	3.22	-2.18	5	
Head 3900		e'	37.8800	Relative Permittivity (ε _r):	37.88	37.47	1.09	5	
		e"	14.9800	Conductivity (σ):	3.25	3.32	-2.18	5	
Head 3930		e'	37.8000	Relative Permittivity (ε _r):	37.80	37.44	0.96	5	
		e"	15.0100	Conductivity (σ):	3.28	3.35	-2.14	5	
Head 3950	e'	37.7600	Relative Permittivity (ε _r):	37.76	37.42	0.92	5		
	e"	15.0400	Conductivity (σ):	3.30	3.37	-2.04	5		

SAR 3 Room (Continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2022-11-07	Head 3500	e'	37.2800	Relative Permittivity (ϵ_r):	37.28	37.93	-1.71	5
		e"	14.8800	Conductivity (σ):	2.90	2.91	-0.54	5
	Head 3560	e'	37.2200	Relative Permittivity (ϵ_r):	37.22	37.86	-1.69	5
		e"	14.8500	Conductivity (σ):	2.94	2.97	-1.13	5
	Head 3600	e'	37.0900	Relative Permittivity (ϵ_r):	37.09	37.82	-1.92	5
		e"	14.8400	Conductivity (σ):	2.97	3.01	-1.44	5
	Head 3690	e'	36.9700	Relative Permittivity (ϵ_r):	36.97	37.71	-1.97	5
		e"	14.7900	Conductivity (σ):	3.03	3.11	-2.30	5
	Head 3700	e'	36.9400	Relative Permittivity (ϵ_r):	36.94	37.70	-2.02	5
		e"	14.7800	Conductivity (σ):	3.04	3.12	-2.42	5
2022-11-07	Head 3600	e'	37.0900	Relative Permittivity (ϵ_r):	37.09	37.82	-1.92	5
		e"	14.8400	Conductivity (σ):	2.97	3.01	-1.44	5
	Head 3650	e'	36.9700	Relative Permittivity (ϵ_r):	36.97	37.76	-2.09	5
		e"	14.7900	Conductivity (σ):	3.00	3.07	-2.07	5
	Head 3700	e'	36.9400	Relative Permittivity (ϵ_r):	36.94	37.70	-2.02	5
		e"	14.7800	Conductivity (σ):	3.04	3.12	-2.42	5
	Head 3750	e'	36.6600	Relative Permittivity (ϵ_r):	36.66	37.64	-2.61	5
		e"	14.8100	Conductivity (σ):	3.09	3.17	-2.50	5
	Head 3800	e'	36.5500	Relative Permittivity (ϵ_r):	36.55	37.59	-2.76	5
		e"	14.9200	Conductivity (σ):	3.15	3.22	-2.05	5
2022-11-07	Head 3750	e'	36.6600	Relative Permittivity (ϵ_r):	36.66	37.64	-2.61	5
		e"	14.8100	Conductivity (σ):	3.09	3.17	-2.50	5
	Head 3800	e'	36.5500	Relative Permittivity (ϵ_r):	36.55	37.59	-2.76	5
		e"	14.9200	Conductivity (σ):	3.15	3.22	-2.05	5
	Head 3900	e'	36.2000	Relative Permittivity (ϵ_r):	36.20	37.47	-3.40	5
		e"	14.9400	Conductivity (σ):	3.24	3.32	-2.44	5
	Head 3930	e'	36.1800	Relative Permittivity (ϵ_r):	36.18	37.44	-3.36	5
		e"	15.0200	Conductivity (σ):	3.28	3.35	-2.07	5
	Head 3950	e'	36.2400	Relative Permittivity (ϵ_r):	36.24	37.42	-3.14	5
		e"	15.0400	Conductivity (σ):	3.30	3.37	-2.04	5

SAR 5 Room

Date	Freq. (MHz)		Liquid Parameters	Measured	Target	Delta (%)	Limit ±(%)	
2022-10-11	Head 835	e'	40.6400	Relative Permittivity (ϵ_r):	40.64	41.50	-2.07	5
		e"	19.1200	Conductivity (σ):	0.89	0.90	-1.37	5
	Head 820	e'	40.6700	Relative Permittivity (ϵ_r):	40.67	41.60	-2.24	5
		e"	19.4200	Conductivity (σ):	0.89	0.90	-1.45	5
	Head 850	e'	40.6100	Relative Permittivity (ϵ_r):	40.61	41.50	-2.14	5
		e"	18.8300	Conductivity (σ):	0.89	0.92	-2.74	5
2022-10-18	Head 1750	e'	39.5800	Relative Permittivity (ϵ_r):	39.58	40.08	-1.26	5
		e"	14.0800	Conductivity (σ):	1.37	1.37	0.08	5
	Head 1710	e'	39.6500	Relative Permittivity (ϵ_r):	39.65	40.15	-1.24	5
		e"	14.1500	Conductivity (σ):	1.35	1.35	-0.07	5
	Head 1755	e'	39.5700	Relative Permittivity (ϵ_r):	39.57	40.08	-1.26	5
		e"	14.0600	Conductivity (σ):	1.37	1.37	0.02	5
2022-10-19	Head 835	e'	41.1200	Relative Permittivity (ϵ_r):	41.12	41.50	-0.92	5
		e"	19.7400	Conductivity (σ):	0.92	0.90	1.83	5
	Head 820	e'	41.2300	Relative Permittivity (ϵ_r):	41.23	41.60	-0.90	5
		e"	19.8600	Conductivity (σ):	0.91	0.90	0.78	5
	Head 850	e'	41.0400	Relative Permittivity (ϵ_r):	41.04	41.50	-1.11	5
		e"	19.6700	Conductivity (σ):	0.93	0.92	1.60	5
2022-10-25	Head 750	e'	43.2000	Relative Permittivity (ϵ_r):	43.20	41.96	2.95	5
		e"	20.8400	Conductivity (σ):	0.87	0.89	-2.69	5
	Head 700	e'	43.3000	Relative Permittivity (ϵ_r):	43.30	42.22	2.56	5
		e"	21.9300	Conductivity (σ):	0.85	0.89	-4.01	5
	Head 790	e'	43.0700	Relative Permittivity (ϵ_r):	43.07	41.76	3.15	5
		e"	20.0800	Conductivity (σ):	0.88	0.90	-1.57	5
2022-10-27	Head 835	e'	41.7300	Relative Permittivity (ϵ_r):	41.73	41.50	0.55	5
		e"	19.4000	Conductivity (σ):	0.90	0.90	0.08	5
	Head 820	e'	41.7800	Relative Permittivity (ϵ_r):	41.78	41.60	0.43	5
		e"	19.6500	Conductivity (σ):	0.90	0.90	-0.28	5
	Head 850	e'	41.6900	Relative Permittivity (ϵ_r):	41.69	41.50	0.46	5
		e"	19.1600	Conductivity (σ):	0.91	0.92	-1.03	5
2022-10-31	Head 835	e'	41.7800	Relative Permittivity (ϵ_r):	41.78	41.50	0.67	5
		e"	19.8700	Conductivity (σ):	0.92	0.90	2.50	5
	Head 820	e'	41.8000	Relative Permittivity (ϵ_r):	41.80	41.60	0.47	5
		e"	20.1100	Conductivity (σ):	0.92	0.90	2.05	5
	Head 850	e'	41.7500	Relative Permittivity (ϵ_r):	41.75	41.50	0.60	5
		e"	19.6100	Conductivity (σ):	0.93	0.92	1.29	5

SAR 6 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
2022-10-18	Head 1900	e'	39.7400	Relative Permittivity (ε _r):	39.74	40.00	-0.65	5
		e"	13.3800	Conductivity (σ):	1.41	1.40	0.97	5
	Head 1850	e'	39.8000	Relative Permittivity (ε _r):	39.80	40.00	-0.50	5
		e"	13.5200	Conductivity (σ):	1.39	1.40	-0.66	5
	Head 1910	e'	39.7100	Relative Permittivity (ε _r):	39.71	40.00	-0.72	5
		e"	13.3500	Conductivity (σ):	1.42	1.40	1.27	5
2022-10-19	Head 1900	e'	38.4600	Relative Permittivity (ε _r):	38.46	40.00	-3.85	5
		e"	13.5900	Conductivity (σ):	1.44	1.40	2.55	5
	Head 1850	e'	38.1300	Relative Permittivity (ε _r):	38.13	40.00	-4.67	5
		e"	13.4200	Conductivity (σ):	1.38	1.40	-1.40	5
	Head 1910	e'	38.5800	Relative Permittivity (ε _r):	38.58	40.00	-3.55	5
		e"	13.6200	Conductivity (σ):	1.45	1.40	3.32	5
2022-10-20	Head 1900	e'	40.6800	Relative Permittivity (ε _r):	40.68	40.00	1.70	5
		e"	13.5900	Conductivity (σ):	1.44	1.40	2.55	5
	Head 1850	e'	40.6300	Relative Permittivity (ε _r):	40.63	40.00	1.58	5
		e"	13.8000	Conductivity (σ):	1.42	1.40	1.40	5
	Head 1910	e'	40.6700	Relative Permittivity (ε _r):	40.67	40.00	1.68	5
		e"	13.5500	Conductivity (σ):	1.44	1.40	2.79	5
2022-10-24	Head 1750	e'	41.3600	Relative Permittivity (ε _r):	41.36	40.08	3.18	5
		e"	13.6500	Conductivity (σ):	1.33	1.37	-2.98	5
	Head 1710	e'	41.4400	Relative Permittivity (ε _r):	41.44	40.15	3.22	5
		e"	13.7700	Conductivity (σ):	1.31	1.35	-2.76	5
	Head 1755	e'	41.3500	Relative Permittivity (ε _r):	41.35	40.08	3.18	5
		e"	13.6400	Conductivity (σ):	1.33	1.37	-2.97	5
2022-10-24	Head 1900	e'	41.2397	Relative Permittivity (ε _r):	41.24	40.00	3.10	5
		e"	13.2933	Conductivity (σ):	1.40	1.40	0.31	5
	Head 1850	e'	41.2580	Relative Permittivity (ε _r):	41.26	40.00	3.15	5
		e"	13.4014	Conductivity (σ):	1.38	1.40	-1.53	5
	Head 1910	e'	41.2344	Relative Permittivity (ε _r):	41.23	40.00	3.09	5
		e"	13.2799	Conductivity (σ):	1.41	1.40	0.74	5

SAR 7 Room

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)		
2022-09-28	Head 750	e'	40.2600	Relative Permittivity (ε _r):	40.26	41.96	-4.05	5	
		e"	21.7600	Conductivity (σ):	0.91	0.89	1.61	5	
	Head 700	e'	40.2700	Relative Permittivity (ε _r):	40.27	42.22	-4.61	5	
		e"	22.8900	Conductivity (σ):	0.89	0.89	0.19	5	
	Head 790	e'	40.2100	Relative Permittivity (ε _r):	40.21	41.76	-3.70	5	
		e"	20.8200	Conductivity (σ):	0.91	0.90	2.05	5	
2022-10-04	Head 750	e'	41.0900	Relative Permittivity (ε _r):	41.09	41.96	-2.08	5	
		e"	21.7000	Conductivity (σ):	0.90	0.89	1.33	5	
	Head 700	e'	40.8700	Relative Permittivity (ε _r):	40.87	42.22	-3.19	5	
		e"	22.6900	Conductivity (σ):	0.88	0.89	-0.68	5	
	Head 790	e'	41.0100	Relative Permittivity (ε _r):	41.01	41.76	-1.79	5	
		e"	20.3600	Conductivity (σ):	0.89	0.90	-0.20	5	
2022-10-04	Head 835	e'	40.5900	Relative Permittivity (ε _r):	40.59	41.50	-2.19	5	
		e"	19.3400	Conductivity (σ):	0.90	0.90	-0.23	5	
	Head 820	e'	40.7300	Relative Permittivity (ε _r):	40.73	41.60	-2.10	5	
		e"	19.5800	Conductivity (σ):	0.89	0.90	-0.64	5	
	Head 850	e'	40.5000	Relative Permittivity (ε _r):	40.50	41.50	-2.41	5	
		e"	19.1600	Conductivity (σ):	0.91	0.92	-1.03	5	
2022-10-19	Head 13	e'	56.3056	Relative Permittivity (ε _r):	56.31	55.00	2.37	5	
		e"	1040.1202	Conductivity (σ):	0.75	0.75	0.25	5	
	Head 12	e'	56.4300	Relative Permittivity (ε _r):	56.43	55.00	2.60	5	
		e"	1127.0009	Conductivity (σ):	0.75	0.75	0.26	5	
	Head 14	e'	56.1892	Relative Permittivity (ε _r):	56.19	55.00	2.16	5	
		e"	965.6735	Conductivity (σ):	0.75	0.75	0.23	5	
2022-10-25	Head 3500	e'	38.2500	Relative Permittivity (ε _r):	38.25	37.93	0.84	5	
		e"	14.5300	Conductivity (σ):	2.83	2.91	-2.88	5	
	Head 3560	e'	38.2600	Relative Permittivity (ε _r):	38.26	37.86	1.05	5	
		e"	14.5900	Conductivity (σ):	2.89	2.97	-2.86	5	
	Head 3600	e'	38.1600	Relative Permittivity (ε _r):	38.16	37.82	0.91	5	
		e"	14.5700	Conductivity (σ):	2.92	3.01	-3.23	5	
	Head 3690	e'	38.1000	Relative Permittivity (ε _r):	38.10	37.71	1.03	5	
		e"	14.6800	Conductivity (σ):	3.01	3.11	-3.03	5	
	Head 3700	e'	38.0700	Relative Permittivity (ε _r):	38.07	37.70	0.98	5	
		e"	14.6700	Conductivity (σ):	3.02	3.12	-3.15	5	
	2022-10-25	Head 3600	e'	38.1600	Relative Permittivity (ε _r):	38.16	37.82	0.91	5
			e"	14.5700	Conductivity (σ):	2.92	3.01	-3.23	5
Head 3650		e'	38.1400	Relative Permittivity (ε _r):	38.14	37.76	1.01	5	
		e"	14.6700	Conductivity (σ):	2.98	3.07	-2.86	5	
Head 3700		e'	38.0700	Relative Permittivity (ε _r):	38.07	37.70	0.98	5	
		e"	14.6700	Conductivity (σ):	3.02	3.12	-3.15	5	
Head 3750		e'	37.9500	Relative Permittivity (ε _r):	37.95	37.64	0.81	5	
		e"	14.7400	Conductivity (σ):	3.07	3.17	-2.97	5	
Head 3800		e'	37.9300	Relative Permittivity (ε _r):	37.93	37.59	0.91	5	
		e"	14.8500	Conductivity (σ):	3.14	3.22	-2.51	5	
2022-10-25		Head 3750	e'	37.9500	Relative Permittivity (ε _r):	37.95	37.64	0.81	5
			e"	14.7400	Conductivity (σ):	3.07	3.17	-2.97	5
	Head 3800	e'	37.9300	Relative Permittivity (ε _r):	37.93	37.59	0.91	5	
		e"	14.8500	Conductivity (σ):	3.14	3.22	-2.51	5	
	Head 3900	e'	37.7000	Relative Permittivity (ε _r):	37.70	37.47	0.61	5	
		e"	15.0000	Conductivity (σ):	3.25	3.32	-2.05	5	
Head 3930	e'	37.6600	Relative Permittivity (ε _r):	37.66	37.44	0.59	5		
	e"	14.9900	Conductivity (σ):	3.28	3.35	-2.27	5		
Head 3950	e'	37.6000	Relative Permittivity (ε _r):	37.60	37.42	0.49	5		
	e"	14.9500	Conductivity (σ):	3.28	3.37	-2.62	5		
2022-11-01	Head 3500	e'	39.5300	Relative Permittivity (ε _r):	39.53	37.93	4.22	5	
		e"	14.8300	Conductivity (σ):	2.89	2.91	-0.88	5	
	Head 3560	e'	39.3700	Relative Permittivity (ε _r):	39.37	37.86	3.99	5	
		e"	14.8900	Conductivity (σ):	2.95	2.97	-0.86	5	
	Head 3600	e'	39.3400	Relative Permittivity (ε _r):	39.34	37.82	4.03	5	
		e"	14.9800	Conductivity (σ):	3.00	3.01	-0.51	5	
	Head 3690	e'	39.0400	Relative Permittivity (ε _r):	39.04	37.71	3.52	5	
		e"	14.9800	Conductivity (σ):	3.07	3.11	-1.05	5	
	Head 3700	e'	39.0200	Relative Permittivity (ε _r):	39.02	37.70	3.50	5	
		e"	15.0100	Conductivity (σ):	3.09	3.12	-0.90	5	

SAR 7 Room (Continued)

Date	Freq. (MHz)		Liquid Parameters	Measured	Target	Delta (%)	Limit ±(%)	
2022-11-01	Head 3600	e'	39.3400	Relative Permittivity (ϵ_r):	39.34	37.82	4.03	5
		e"	14.9800	Conductivity (σ):	3.00	3.01	-0.51	5
	Head 3650	e'	39.2100	Relative Permittivity (ϵ_r):	39.21	37.76	3.84	5
		e"	14.8900	Conductivity (σ):	3.02	3.07	-1.41	5
	Head 3700	e'	39.0200	Relative Permittivity (ϵ_r):	39.02	37.70	3.50	5
		e"	15.0100	Conductivity (σ):	3.09	3.12	-0.90	5
	Head 3750	e'	38.9700	Relative Permittivity (ϵ_r):	38.97	37.64	3.52	5
		e"	14.9800	Conductivity (σ):	3.12	3.17	-1.39	5
	Head 3800	e'	38.7600	Relative Permittivity (ϵ_r):	38.76	37.59	3.12	5
		e"	15.0200	Conductivity (σ):	3.17	3.22	-1.40	5
2022-11-09	Head 3500	e'	38.8300	Relative Permittivity (ϵ_r):	38.83	37.93	2.37	5
		e"	14.8200	Conductivity (σ):	2.88	2.91	-0.94	5
	Head 3560	e'	38.7300	Relative Permittivity (ϵ_r):	38.73	37.86	2.29	5
		e"	15.0800	Conductivity (σ):	2.99	2.97	0.41	5
	Head 3600	e'	38.7900	Relative Permittivity (ϵ_r):	38.79	37.82	2.58	5
		e"	14.9900	Conductivity (σ):	3.00	3.01	-0.44	5
	Head 3690	e'	38.4900	Relative Permittivity (ϵ_r):	38.49	37.71	2.06	5
		e"	15.1800	Conductivity (σ):	3.11	3.11	0.28	5
	Head 3700	e'	38.5200	Relative Permittivity (ϵ_r):	38.52	37.70	2.17	5
		e"	15.1800	Conductivity (σ):	3.12	3.12	0.22	5
2022-11-09	Head 3600	e'	38.7900	Relative Permittivity (ϵ_r):	38.79	37.82	2.58	5
		e"	14.9900	Conductivity (σ):	3.00	3.01	-0.44	5
	Head 3650	e'	38.4500	Relative Permittivity (ϵ_r):	38.45	37.76	1.83	5
		e"	14.9800	Conductivity (σ):	3.04	3.07	-0.81	5
	Head 3700	e'	38.5200	Relative Permittivity (ϵ_r):	38.52	37.70	2.17	5
		e"	15.1800	Conductivity (σ):	3.12	3.12	0.22	5
	Head 3750	e'	38.3300	Relative Permittivity (ϵ_r):	38.33	37.64	1.82	5
		e"	15.0600	Conductivity (σ):	3.14	3.17	-0.86	5
	Head 3800	e'	38.1800	Relative Permittivity (ϵ_r):	38.18	37.59	1.58	5
		e"	15.2700	Conductivity (σ):	3.23	3.22	0.25	5
2022-11-09	Head 3750	e'	38.3300	Relative Permittivity (ϵ_r):	38.33	37.64	1.82	5
		e"	15.0600	Conductivity (σ):	3.14	3.17	-0.86	5
	Head 3800	e'	38.1800	Relative Permittivity (ϵ_r):	38.18	37.59	1.58	5
		e"	15.2700	Conductivity (σ):	3.23	3.22	0.25	5
	Head 3900	e'	37.9100	Relative Permittivity (ϵ_r):	37.91	37.47	1.17	5
		e"	15.2400	Conductivity (σ):	3.30	3.32	-0.48	5
	Head 3930	e'	37.9600	Relative Permittivity (ϵ_r):	37.96	37.44	1.39	5
		e"	15.4200	Conductivity (σ):	3.37	3.35	0.54	5
	Head 3950	e'	38.1100	Relative Permittivity (ϵ_r):	38.11	37.42	1.85	5
		e"	15.4400	Conductivity (σ):	3.39	3.37	0.57	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 4MHz to 30MHz 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 \pm 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 \geq 15.0 cm for SAR measurements \leq 3 GHz and \geq 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 (4MHz to 30MHz):

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 \pm 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 \geq 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	2021-04-27	2023-04-27	1g	8.66
				10g	5.65
D835V2	4d194	2022-03-24	2023-03-24	1g	9.77
				10g	6.39
D1750V2	1180	2022-09-21	2023-09-21	1g	35.60
				10g	18.90
D1900V2	5d190	2020-11-24	2022-11-24	1g	40.10
				10g	20.70
D1900V2	5d199	2022-03-25	2023-03-25	1g	39.40
				10g	20.50
D2450V2	939	2021-07-21	2023-07-21	1g	53.00
				10g	24.70
D2600V2	1097	2021-09-29	2023-09-29	1g	57.10
				10g	25.50
D2600V2	1178	2021-04-23	2023-04-23	1g	56.60
				10g	25.40
D3500V2	1121	2021-04-21	2023-04-21	1g	66.30
				10g	25.00
D3700V2	1036	2021-05-21	2023-05-24	1g	67.90
				10g	24.30
D3900V2	1069	2021-04-21	2023-04-21	1g	70.10
				10g	24.30
D5GHzV2	1209	2021-11-24	2023-11-24	1g	78.00
				10g	22.40
				1g	80.90
				10g	23.10
				1g	79.00
				10g	22.40
D5GHzV2 (5600)	1325	2021-04-26	2023-04-26	1g	84.50
				10g	24.00
CLA-13	1015	2022-08-23	2023-08-23	1g	0.55
				10g	0.34

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				
10-18-2022	D5GHzV2	1209	Head	1g	8.02	80.2	78.00	2.82	
				10g	2.37	23.7	22.40	5.80	
10-18-2022	D5GHzV2	1209	Head	1g	8.15	81.5	80.90	0.74	
				10g	2.37	23.7	23.10	2.60	
10-18-2022	D5GHzV2 (5800)	1209	Head	1g	8.23	82.3	79.00	4.18	
				10g	2.41	24.1	22.40	7.59	
10-23-2022	D2600V2	1097	Head	1g	5.86	58.6	57.10	2.63	1
				10g	2.69	26.9	25.50	5.49	
11-1-2022	D5GHzV2	1209	Head	1g	7.77	77.7	78.00	-0.38	
				10g	2.33	23.3	22.40	4.02	
11-1-2022	D5GHzV2	1209	Head	1g	8.46	84.6	80.90	4.57	2
				10g	2.49	24.9	23.10	7.79	
11-1-2022	D5GHzV2 (5800)	1209	Head	1g	7.98	79.8	79.00	1.01	
				10g	2.35	23.5	22.40	4.91	
11-7-2022	D5GHzV2 (5600)	1325	Head	1g	8.47	84.7	84.50	0.24	3
				10g	2.50	25.0	24.00	4.17	

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				
10-26-2022	D2450V2	939	Head	1g	5.26	52.6	53.00	-0.75	
				10g	2.46	24.6	24.70	-0.40	
10-31-2022	D2450V2	939	Head	1g	5.18	51.8	53.00	-2.26	4
				10g	2.42	24.2	24.70	-2.02	
10-31-2022	D2600V2	1178	Head	1g	5.80	58.0	56.60	2.47	5
				10g	2.62	26.2	25.40	3.15	

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				
10-23-2022	D3500V2	1121	Head	1g	6.62	66.2	66.30	-0.15	
				10g	2.64	26.4	25.00	5.60	
10-23-2022	D3700V2	1036	Head	1g	6.89	68.9	67.90	1.47	6
				10g	2.64	26.4	24.30	8.64	
10-23-2022	D3900V2	1069	Head	1g	6.76	67.6	70.10	-3.57	
				10g	2.50	25.0	24.30	2.88	
10-27-2022	D3500V2	1121	Head	1g	6.37	63.7	66.30	-3.92	
				10g	2.46	24.6	25.00	-1.60	
10-27-2022	D3700V2	1036	Head	1g	6.97	69.7	67.90	2.65	
				10g	2.58	25.8	24.30	6.17	
10-27-2022	D3900V2	1069	Head	1g	6.79	67.9	70.10	-3.14	
				10g	2.42	24.2	24.30	-0.41	
11-7-2022	D3500V2	1121	Head	1g	6.12	61.2	66.30	-7.69	7
				10g	2.32	23.2	25.00	-7.20	
11-7-2022	D3700V2	1036	Head	1g	6.32	63.2	67.90	-6.92	
				10g	2.31	23.1	24.30	-4.94	
11-7-2022	D3900V2	1069	Head	1g	6.91	69.1	70.10	-1.43	
				10g	2.43	24.3	24.30	0.00	

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				
10-11-2022	D835V2	4d194	Head	1g	1.01	10.1	9.77	3.38	
				10g	0.69	6.9	6.39	7.20	
10-18-2022	D1750V2	1180	Head	1g	3.70	37.0	35.60	3.93	8
				10g	2.03	20.3	18.90	7.41	
10-19-2022	D835V2	4d194	Head	1g	1.02	10.2	9.77	4.40	9
				10g	0.69	6.9	6.39	7.82	
10-25-2022	D750V3	1205	Head	1g	0.86	8.6	8.66	-0.35	10
				10g	0.58	5.8	5.65	2.65	
10-27-2022	D835V2	4d194	Head	1g	0.99	9.9	9.77	1.13	
				10g	0.65	6.5	6.39	2.03	
10-31-2022	D835V2	4d194	Head	1g	1.02	10.2	9.77	4.40	
				10g	0.69	6.9	6.39	7.36	

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				
10-18-2022	D1900V2	5d190	Head	1g	3.79	37.9	40.10	-5.49	11
				10g	1.92	19.2	20.70	-7.25	
10-19-2022	D1900V2	5d199	Head	1g	3.90	39.0	39.40	-1.02	
				10g	2.00	20.0	20.50	-2.44	
10-20-2022	D1900V2	5d199	Head	1g	3.98	39.8	39.40	1.02	
				10g	2.04	20.4	20.50	-0.49	
10-24-2022	D1750V2	1180	Head	1g	3.53	35.3	35.60	-0.84	
				10g	1.86	18.6	18.90	-1.59	
10-24-2022	D1900V2	5d199	Head	1g	3.93	39.3	39.40	-0.25	12
				10g	1.97	19.7	20.50	-3.90	

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				
9-28-2022	D750V3	1205	Head	1g	0.87	8.7	8.66	0.46	
				10g	0.57	5.7	5.65	0.18	
10-4-2022	D750V3	1205	Head	1g	0.85	8.5	8.66	-1.50	
				10g	0.56	5.6	5.65	-1.06	
10-4-2022	D835V2	4d194	Head	1g	0.95	9.5	9.77	-2.66	
				10g	0.62	6.2	6.39	-3.44	
10-19-2022	CLA-13	1015	Head	1g	0.06	0.6	0.55	4.01	13
				10g	0.04	0.4	0.34	2.94	
10-25-2022	D3500V2	1121	Head	1g	6.12	61.2	66.30	-7.69	
				10g	2.37	23.7	25.00	-5.20	
10-25-2022	D3700V2	1036	Head	1g	6.26	62.6	67.90	-7.81	
				10g	2.35	23.5	24.30	-3.29	
10-25-2022	D3900V2	1069	Head	1g	6.65	66.5	70.10	-5.14	
				10g	2.40	24.0	24.30	-1.23	
11-1-2022	D3500V2	1121	Head	1g	6.68	66.8	66.30	0.75	
				10g	2.64	26.4	25.00	5.60	
11-1-2022	D3700V2	1036	Head	1g	6.60	66.0	67.90	-2.80	
				10g	2.53	25.3	24.30	4.12	
11-9-2022	D3500V2	1121	Head	1g	6.80	68.0	66.30	2.56	
				10g	2.68	26.8	25.00	7.20	
11-9-2022	D3700V2	1036	Head	1g	6.69	66.9	67.90	-1.47	
				10g	2.55	25.5	24.30	4.94	
11-9-2022	D3900V2	1069	Head	1g	6.88	68.8	70.10	-1.85	14
				10g	2.51	25.1	24.30	3.29	

9. Conducted Output Power Measurements

9.1. GSM

Per KDB 941225 D01 3G SAR Procedures:

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

GSM850 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)			
					DSI = 0, 1, 2, 3, 4			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	128	824.2	33.11	24.08	33.50	24.47
			190	836.6	33.08	24.05		
			251	848.8	33.29	24.26		
GPRS (GMSK)	CS1	1	128	824.2	32.77	23.74	33.50	24.47
			190	836.6	33.11	24.08		
			251	848.8	33.28	24.25		
		2	128	824.2	31.27	25.25	32.50	26.48
			190	836.6	30.87	24.85		
			251	848.8	31.21	25.19		
		3	128	824.2	29.45	25.19	30.50	26.24
			190	836.6	29.35	25.09		
			251	848.8	29.14	24.88		
		4	128	824.2	27.93	24.92	28.50	25.49
			190	836.6	27.74	24.73		
			251	848.8	27.63	24.62		
EGPRS (8PSK)	MCS5	1	128	824.2	26.75	17.72	27.50	18.47
			190	836.6	26.69	17.66		
			251	848.8	26.73	17.70		
		2	128	824.2	25.32	19.30	26.00	19.98
			190	836.6	25.15	19.13		
			251	848.8	25.18	19.16		
		3	128	824.2	23.24	18.98	24.00	19.74
			190	836.6	23.02	18.76		
			251	848.8	23.12	18.86		
		4	128	824.2	22.14	19.13	23.00	19.99
			190	836.6	22.02	19.01		
			251	848.8	22.14	19.13		

Notes:

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

- GMSK (GPRS) mode with 2 time slots for Max power, 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 $\leq 1/4$ dB higher than GMSK GPRS or the adjusted SAR of the highest reported SAR of GMSK GPRS is ≤ 1.2 W/kg.

GSM1900 Measured Results

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)											
					DSI = 0, 2				DSI = 3				DSI = 1, 4			
					Measured		Tune-up Limit		Measured		Tune-up Limit		Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	512	1850.2	29.14	20.11	30.70	21.67	26.15	17.12	27.50	18.47	26.18	17.15	27.50	18.47
			661	1880.0	29.76	20.73			26.55	17.52			26.59	17.56		
			810	1909.8	29.82	20.79			26.66	17.63			26.69	17.66		
GPRS (GMSK)	CS1	1	512	1850.2	29.70	20.67	30.70	21.67	26.92	17.89	27.50	18.47	26.93	17.90	27.50	18.47
			661	1880.0	29.54	20.51			26.79	17.76			26.45	17.42		
			810	1909.8	30.09	21.06			27.14	18.11			26.46	17.43		
		2	512	1850.2	27.76	21.74	29.00	22.98	23.29	17.27	24.50	18.48	23.35	17.33	24.50	18.48
			661	1880.0	27.64	21.62			23.40	17.38			23.47	17.45		
			810	1909.8	27.90	21.88			23.56	17.54			23.42	17.40		
	3	512	1850.2	25.95	21.69	27.00	22.74	21.59	17.33	22.70	18.44	21.66	17.40	22.70	18.44	
		661	1880.0	25.86	21.60			21.69	17.43			21.72	17.46			
		810	1909.8	26.19	21.93			21.75	17.49			21.76	17.50			
	4	512	1850.2	24.52	21.51	25.00	21.99	20.34	17.33	21.50	18.49	20.47	17.46	21.50	18.49	
		661	1880.0	24.45	21.44			20.48	17.47			20.87	17.86			
		810	1909.8	24.70	21.69			20.65	17.64			20.67	17.66			
EGPRS (8PSK)	MCS5	1	512	1850.2	25.23	16.20	26.30	17.27	25.16	16.13	26.30	17.27	25.15	16.12	26.30	17.27
			661	1880.0	25.50	16.47			25.41	16.38			25.34	16.31		
			810	1909.8	25.64	16.61			25.51	16.48			25.28	16.25		
		2	512	1850.2	23.87	17.85	25.00	18.98	23.51	17.49	24.50	18.48	23.54	17.52	24.50	18.48
			661	1880.0	24.15	18.13			23.70	17.68			23.64	17.62		
			810	1909.8	24.28	18.26			23.70	17.68			23.54	17.52		
	3	512	1850.2	22.27	18.01	23.20	18.94	21.62	17.36	22.50	18.24	21.63	17.37	22.50	18.24	
		661	1880.0	22.45	18.19			21.85	17.59			21.84	17.58			
		810	1909.8	22.49	18.23			21.85	17.59			21.68	17.42			
	4	512	1850.2	21.24	18.23	22.20	19.19	20.51	17.50	21.40	18.39	20.43	17.42	21.40	18.39	
		661	1880.0	21.34	18.33			20.55	17.54			20.48	17.47			
		810	1909.8	21.45	18.44			20.56	17.55			20.56	17.55			

Notes:

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

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

9.2. W-CDMA

Release 99 Setup Procedures used to establish the test signals

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

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

HSDPA Setup Procedures used to establish the test signals

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

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

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

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

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

DC-HSDPA Setup Procedures used to establish the test signals

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

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

Table E.5.0: Levels for HSDPA connection setup

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

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

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

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	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.		

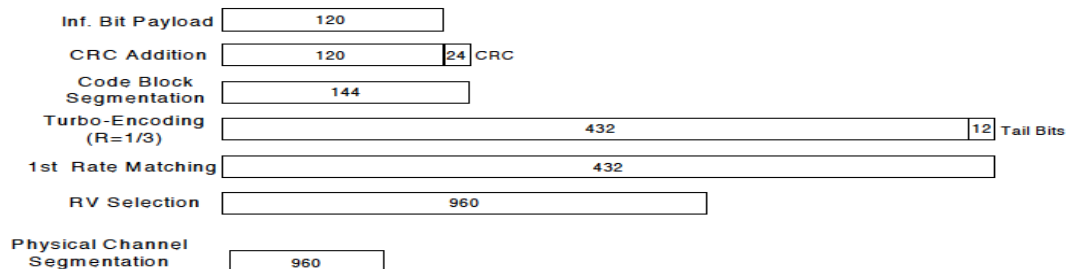


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

HSPA+

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

W-CDMA Band II Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)								
				DSI = 0, 2			DSI = 3			DSI = 1, 4		
				Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit	Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.69	NA	24.50	20.67	NA	21.50	20.67	NA	21.50
		9400	1880.0	23.94			20.90			20.95		
		9538	1907.6	23.90			20.88			20.90		
HSDPA	Subtest 1	9262	1852.4	22.69	0.0	24.00	19.70	0.0	21.50	19.69	0.0	21.50
		9400	1880.0	22.91			19.92			19.92		
		9538	1907.6	22.87			19.88			19.90		
	Subtest 2	9262	1852.4	22.70	0.0	24.00	19.65	0.0	21.50	19.68	0.0	21.50
		9400	1880.0	22.91			19.90			19.91		
		9538	1907.6	22.86			19.89			19.87		
	Subtest 3	9262	1852.4	22.21	0.5	23.50	19.20	0.5	21.00	19.19	0.5	21.00
		9400	1880.0	22.43			19.43			19.43		
		9538	1907.6	22.38			19.39			19.40		
	Subtest 4	9262	1852.4	22.18	0.5	23.50	19.19	0.5	21.00	19.19	0.5	21.00
		9400	1880.0	22.42			19.44			19.43		
		9538	1907.6	22.36			19.40			19.38		
HSUPA	Subtest 1	9262	1852.4	22.72	0.0	24.00	19.73	0.0	21.50	19.66	0.0	21.50
		9400	1880.0	23.04			20.02			19.93		
		9538	1907.6	22.98			19.97			19.87		
	Subtest 2	9262	1852.4	20.75	2.0	22.00	17.72	2.0	19.50	17.68	2.0	19.50
		9400	1880.0	21.02			18.03			17.95		
		9538	1907.6	20.97			17.95			17.89		
	Subtest 3	9262	1852.4	21.72	1.0	23.00	18.71	1.0	20.50	18.66	1.0	20.50
		9400	1880.0	22.00			19.01			18.91		
		9538	1907.6	21.98			18.93			18.90		
	Subtest 4	9262	1852.4	20.74	2.0	22.00	17.71	2.0	19.50	17.67	2.0	19.50
		9400	1880.0	21.00			18.02			17.95		
		9538	1907.6	20.98			17.97			17.91		
	Subtest 5	9262	1852.4	22.29	0.0	24.00	19.28	0.0	21.50	19.23	0.0	21.50
		9400	1880.0	22.57			19.56			19.48		
		9538	1907.6	22.52			19.52			19.42		
DC-HSDPA	Subtest 1	9262	1852.4	22.74	0.0	24.00	19.73	0.0	21.50	19.69	0.0	21.50
		9400	1880.0	23.03			20.03			19.92		
		9538	1907.6	22.99			20.00			19.90		
	Subtest 2	9262	1852.4	22.74	0.0	24.00	19.73	0.0	21.50	19.67	0.0	21.50
		9400	1880.0	23.02			20.00			19.92		
		9538	1907.6	22.96			19.95			19.87		
	Subtest 3	9262	1852.4	22.24	0.5	23.50	19.23	0.5	21.00	19.16	0.5	21.00
		9400	1880.0	22.50			19.50			19.44		
		9538	1907.6	22.47			19.48			19.40		
	Subtest 4	9262	1852.4	22.25	0.5	23.50	19.27	0.5	21.00	19.19	0.5	21.00
		9400	1880.0	22.51			19.50			19.42		
		9538	1907.6	22.46			19.48			19.39		

W-CDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)		
				DSI = 0, 1, 2, 3, 4		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.71	NA	25.20
		4183	836.6	24.69		
		4233	846.6	24.63		
HSDPA	Subtest 1	4132	826.4	23.67	0.0	24.50
		4183	836.6	23.67		
		4233	846.6	23.59		
	Subtest 2	4132	826.4	23.69	0.0	24.50
		4183	836.6	23.70		
		4233	846.6	23.61		
	Subtest 3	4132	826.4	23.18	0.5	24.00
		4183	836.6	23.19		
		4233	846.6	23.10		
	Subtest 4	4132	826.4	23.17	0.5	24.00
		4183	836.6	23.19		
		4233	846.6	23.09		
HSUPA	Subtest 1	4132	826.4	23.56	0.0	24.50
		4183	836.6	23.50		
		4233	846.6	23.40		
	Subtest 2	4132	826.4	21.58	2.0	22.50
		4183	836.6	21.47		
		4233	846.6	21.40		
	Subtest 3	4132	826.4	22.56	1.0	23.50
		4183	836.6	22.46		
		4233	846.6	22.38		
	Subtest 4	4132	826.4	21.57	2.0	22.50
		4183	836.6	21.49		
		4233	846.6	21.36		
	Subtest 5	4132	826.4	23.61	0.0	24.50
		4183	836.6	23.61		
		4233	846.6	23.49		
DC-HSDPA	Subtest 1	4132	826.4	23.59	0.0	24.50
		4183	836.6	23.51		
		4233	846.6	23.41		
	Subtest 2	4132	826.4	23.55	0.0	24.50
		4183	836.6	23.50		
		4233	846.6	23.39		
	Subtest 3	4132	826.4	23.07	0.5	24.00
		4183	836.6	23.00		
		4233	846.6	22.91		
	Subtest 4	4132	826.4	23.08	0.5	24.00
		4183	836.6	22.99		
		4233	846.6	22.91		

9.3. LTE

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

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

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

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

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

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

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

Maximum Output Power (Tune-up Limit) for LTE

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

- a) The maximum output power, including tolerance, for the smaller band must be ≤ the larger band to qualify for the SAR test exclusion.
- b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.
 - LTE Band 4 (1710 – 1755 MHz) is covered by LTE Band 66 (1710 – 1780 MHz)

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 (Continued)

Table with multiple columns: BW (MHz), Mode, RB Allocation, RB offset, Measured Pwr (dBm) for 18650.00, 18900.00, 19150.00 MHz, MPR, Tune-up Limit, Measured Pwr (dBm) for 18650.00, 18900.00, 19150.00 MHz, MPR, Tune-up Limit, Measured Pwr (dBm) for 18650.00, 18900.00, 19150.00 MHz, MPR, Tune-up Limit. Rows are categorized by 10 MHz and 5 MHz bandwidths and various modes like QPSK, 16QAM, 64QAM, and 256QAM.

LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					
				DSI = 0, 1, 2, 3, 4					
				Measured Pwr (dBm)			MPR	Tune-up Limit	
				20450	20525	20600			
829 MHz	836.5 MHz	844 MHz							
10 MHz	QPSK	1	0		24.81		0.0	25.5	
		1	25		24.69		0.0	25.5	
		1	49		24.64		0.0	25.5	
		25	0		23.77		1.0	24.5	
		25	12		23.85		1.0	24.5	
		25	25		23.81		1.0	24.5	
	16QAM	50	0		23.86		1.0	24.5	
		1	0		23.80		1.0	24.5	
		1	25		23.78		1.0	24.5	
		1	49		23.70		1.0	24.5	
		25	0		22.88		2.0	23.5	
		25	12		22.96		2.0	23.5	
	64QAM	25	25		22.91		2.0	23.5	
		50	0		22.91		2.0	23.5	
		1	0		23.09		2.0	23.5	
		1	25		23.12		2.0	23.5	
		1	49		23.08		2.0	23.5	
		25	0		21.83		3.0	22.5	
	256QAM	25	12		21.94		3.0	22.5	
		25	25		21.89		3.0	22.5	
50		0		21.88		3.0	22.5		
1		0		20.34		5.0	20.5		
1		25		20.31		5.0	20.5		
1		49		20.35		5.0	20.5		
5 MHz	QPSK	25	0		19.93		5.0	20.5	
		25	12		19.94		5.0	20.5	
		25	25		19.93		5.0	20.5	
		50	0		19.93		5.0	20.5	
		1	0		24.89	24.89	24.63	0.0	25.5
		1	12		24.88	24.77	24.60	0.0	25.5
	16QAM	1	24		24.91	24.89	24.63	0.0	25.5
		12	0		23.87	23.78	23.63	1.0	24.5
		12	7		23.94	23.82	23.67	1.0	24.5
		12	13		23.94	23.80	23.62	1.0	24.5
		25	0		23.93	23.85	23.63	1.0	24.5
		1	0		24.05	24.02	24.17	1.0	24.5
	64QAM	1	12		23.88	23.89	24.17	1.0	24.5
		1	24		24.02	24.00	24.17	1.0	24.5
		12	0		22.93	22.86	22.79	2.0	23.5
		12	7		22.96	22.92	22.78	2.0	23.5
		12	13		23.01	22.86	22.75	2.0	23.5
		25	0		22.88	22.86	22.69	2.0	23.5
	256QAM	1	0		23.11	23.07	22.92	2.0	23.5
		1	12		23.07	23.15	23.08	2.0	23.5
1		24		23.07	23.11	22.60	2.0	23.5	
12		0		22.11	21.74	21.67	3.0	22.5	
12		7		22.10	21.82	21.70	3.0	22.5	
12		13		22.08	21.77	21.65	3.0	22.5	
5 MHz	256QAM	25	0		21.96	21.86	21.68	3.0	22.5
		1	0		20.18	19.62	19.87	5.0	20.5
		1	12		19.99	19.64	19.82	5.0	20.5
		1	24		20.33	19.64	19.91	5.0	20.5
		12	0		20.27	19.82	19.73	5.0	20.5
		12	7		20.18	19.92	19.74	5.0	20.5
		12	13		19.97	19.88	19.68	5.0	20.5
		25	0		20.01	19.95	19.71	5.0	20.5

LTE Band 5 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				20415.00	20525.00	20635.00		
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	24.90	24.78	24.61	0.0	25.5
		1	8	24.80	24.63	24.47	0.0	25.5
		1	14	24.90	24.73	24.63	0.0	25.5
		8	0	23.91	23.83	23.62	1.0	24.5
		8	4	23.90	23.85	23.70	1.0	24.5
		8	7	23.92	23.84	23.74	1.0	24.5
	16QAM	15	0	23.88	23.83	23.61	1.0	24.5
		1	0	24.28	23.89	23.57	1.0	24.5
		1	8	24.14	23.77	23.48	1.0	24.5
		1	14	24.27	23.84	23.55	1.0	24.5
		8	0	22.92	22.83	22.66	2.0	23.5
		8	4	22.98	22.85	22.83	2.0	23.5
	64QAM	8	7	23.01	22.88	22.82	2.0	23.5
		15	0	22.95	22.79	22.66	2.0	23.5
		1	0	22.73	23.10	22.60	2.0	23.5
		1	8	22.74	23.07	22.62	2.0	23.5
		1	14	22.81	23.06	22.30	2.0	23.5
		8	0	21.98	22.02	21.65	3.0	22.5
	256QAM	8	4	22.01	22.00	21.77	3.0	22.5
		8	7	22.01	22.00	21.68	3.0	22.5
		15	0	21.94	21.85	21.73	3.0	22.5
		1	0	19.91	20.25	19.48	5.0	20.5
		1	8	20.00	20.22	19.53	5.0	20.5
		1	14	19.97	20.19	19.54	5.0	20.5
1.4 MHz	QPSK	8	0	20.05	19.99	19.57	5.0	20.5
		8	4	20.11	19.97	19.72	5.0	20.5
		8	7	20.12	19.97	19.73	5.0	20.5
		15	0	20.03	19.93	19.69	5.0	20.5
		1	0	24.79	24.65	24.49	0.0	25.5
		1	3	24.87	24.67	24.49	0.0	25.5
	16QAM	1	5	24.77	24.63	24.47	0.0	25.5
		3	0	24.71	24.69	24.47	0.0	25.5
		3	1	24.79	24.72	24.49	0.0	25.5
3		3	24.77	24.76	24.52	0.0	25.5	
6		0	23.80	23.77	23.60	1.0	24.5	
1		0	23.92	24.19	23.50	1.0	24.5	
64QAM	1	3	24.04	24.19	23.63	1.0	24.5	
	1	5	23.92	24.09	23.52	1.0	24.5	
	3	0	23.81	23.92	23.73	1.0	24.5	
	3	1	23.87	23.95	23.75	1.0	24.5	
	3	3	23.87	23.86	23.77	1.0	24.5	
	6	0	22.96	22.61	22.75	2.0	23.5	
256QAM	1	0	23.00	22.80	22.55	2.0	23.5	
	1	3	23.15	22.85	22.47	2.0	23.5	
	1	5	22.98	22.76	22.18	2.0	23.5	
	3	0	22.90	23.02	22.60	2.0	23.5	
	3	1	22.94	23.03	22.57	2.0	23.5	
	3	3	22.93	23.04	22.50	2.0	23.5	
256QAM	6	0	21.91	21.89	21.49	3.0	22.5	
	1	0	19.95	19.83	19.71	5.0	20.5	
	1	3	20.10	19.97	19.82	5.0	20.5	
	1	5	19.97	19.82	19.71	5.0	20.5	
	3	0	19.84	19.73	19.60	5.0	20.5	
	3	1	19.88	19.75	19.59	5.0	20.5	
256QAM	3	3	19.87	19.70	19.56	5.0	20.5	
	6	0	19.81	19.70	19.57	5.0	20.5	
	6	0	19.81	19.70	19.57	5.0	20.5	

LTE Band 7 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				20800.00	21100.00	21400.00			20800.00	21100.00	21400.00			18650.00	18900.00	19150.00		
				2505 MHz	2535 MHz	2565 MHz			2505 MHz	2535 MHz	2565 MHz			1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	21.78	21.87	22.20	0.0	23.0	20.27	20.27	20.54	0.0	21.5	20.25	20.30	20.65	0.0	21.5
		1	25	21.83	21.81	22.20	0.0	23.0	20.28	20.26	20.58	0.0	21.5	20.26	20.28	20.65	0.0	21.5
		1	49	21.88	21.86	22.26	0.0	23.0	20.32	20.36	20.61	0.0	21.5	20.29	20.35	20.70	0.0	21.5
		25	0	21.95	21.96	22.22	0.0	23.0	20.43	20.41	20.63	0.0	21.5	20.40	20.42	20.64	0.0	21.5
		25	12	21.97	21.96	22.22	0.0	23.0	20.43	20.44	20.65	0.0	21.5	20.43	20.43	20.70	0.0	21.5
		25	25	21.92	21.94	22.31	0.0	23.0	20.43	20.38	20.72	0.0	21.5	20.39	20.42	20.75	0.0	21.5
	50	0	21.96	21.92	22.21	0.0	23.0	20.43	20.41	20.66	0.0	21.5	20.41	20.44	20.67	0.0	21.5	
	16QAM	1	0	22.50	22.48	22.29	0.0	23.0	20.39	20.45	20.65	0.0	21.5	20.39	20.38	20.73	0.0	21.5
		1	25	22.31	22.46	22.30	0.0	23.0	20.45	20.46	20.77	0.0	21.5	20.43	20.44	20.77	0.0	21.5
		1	49	22.48	22.50	22.35	0.0	23.0	20.49	20.51	20.81	0.0	21.5	20.46	20.43	20.81	0.0	21.5
		25	0	21.51	21.51	21.76	1.0	22.0	20.51	20.51	20.73	0.0	21.5	20.48	20.48	20.76	0.0	21.5
		25	12	21.52	21.50	21.78	1.0	22.0	20.50	20.54	20.74	0.0	21.5	20.52	20.50	20.77	0.0	21.5
		25	25	21.51	21.49	21.85	1.0	22.0	20.50	20.50	20.81	0.0	21.5	20.47	20.50	20.85	0.0	21.5
	50	0	21.47	21.47	21.71	1.0	22.0	20.43	20.45	20.69	0.0	21.5	20.43	20.45	20.72	0.0	21.5	
	64QAM	1	0	21.36	21.67	21.49	1.0	22.0	20.64	20.67	20.87	0.0	21.5	20.65	20.66	20.89	0.0	21.5
		1	25	21.38	21.62	21.49	1.0	22.0	20.62	20.63	20.92	0.0	21.5	20.60	20.63	20.92	0.0	21.5
		1	49	21.49	21.73	21.61	1.0	22.0	20.68	20.70	21.00	0.0	21.5	20.68	20.70	21.01	0.0	21.5
		25	0	20.55	20.53	20.80	2.0	21.0	20.51	20.53	20.73	0.5	21.0	20.50	20.52	20.77	0.5	21.0
		25	12	20.56	20.55	20.83	2.0	21.0	20.54	20.55	20.78	0.5	21.0	20.55	20.56	20.80	0.5	21.0
		25	25	20.56	20.51	20.88	2.0	21.0	20.52	20.54	20.83	0.5	21.0	20.49	20.51	20.84	0.5	21.0
	50	0	20.55	20.49	20.74	2.0	21.0	20.49	20.49	20.70	0.5	21.0	20.47	20.46	20.71	0.5	21.0	
	256QAM	1	0	18.27	18.95	18.67	3.5	19.5	18.92	18.99	19.17	2.0	19.5	18.92	18.93	19.18	2.0	19.5
		1	25	18.23	18.90	18.78	3.5	19.5	18.86	18.86	19.15	2.0	19.5	18.87	18.87	19.20	2.0	19.5
		1	49	18.30	19.01	18.80	3.5	19.5	19.00	19.07	19.32	2.0	19.5	18.99	18.98	19.30	2.0	19.5
		25	0	18.45	18.51	18.74	3.5	19.5	18.46	18.51	18.73	2.0	19.5	18.48	18.48	18.72	2.0	19.5
25		12	18.51	18.51	18.82	3.5	19.5	18.50	18.52	18.75	2.0	19.5	18.49	18.49	18.78	2.0	19.5	
25		25	18.53	18.52	18.88	3.5	19.5	18.49	18.54	18.84	2.0	19.5	18.50	18.53	18.84	2.0	19.5	
50	0	18.44	18.47	18.74	3.5	19.5	18.51	18.48	18.72	2.0	19.5	18.49	18.50	18.74	2.0	19.5		
5 MHz	QPSK	1	0	21.96	21.93	22.20	0.0	23.0	20.38	20.36	20.75	0.0	21.5	20.40	20.39	20.70	0.0	21.5
		1	12	21.89	21.86	22.19	0.0	23.0	20.37	20.40	20.69	0.0	21.5	20.37	20.38	20.69	0.0	21.5
		1	24	21.94	21.94	22.25	0.0	23.0	20.40	20.41	20.77	0.0	21.5	20.42	20.40	20.73	0.0	21.5
		12	0	21.85	21.84	22.19	0.0	23.0	20.37	20.37	20.63	0.0	21.5	20.33	20.37	20.71	0.0	21.5
		12	7	21.93	21.93	22.31	0.0	23.0	20.48	20.45	20.74	0.0	21.5	20.37	20.43	20.79	0.0	21.5
		12	13	21.97	21.93	22.31	0.0	23.0	20.48	20.47	20.75	0.0	21.5	20.40	20.47	20.81	0.0	21.5
	25	0	21.93	21.94	22.25	0.0	23.0	20.42	20.39	20.72	0.0	21.5	20.38	20.40	20.76	0.0	21.5	
	16QAM	1	0	21.77	21.76	22.50	0.0	23.0	20.44	20.44	20.61	0.0	21.5	20.22	20.46	20.78	0.0	21.5
		1	12	21.82	21.97	22.50	0.0	23.0	20.54	20.51	20.68	0.0	21.5	20.37	20.54	20.86	0.0	21.5
		1	24	21.81	21.84	22.55	0.0	23.0	20.52	20.49	20.64	0.0	21.5	20.31	20.48	20.81	0.0	21.5
		12	0	21.36	21.38	21.76	0.0	23.0	20.38	20.34	20.67	0.0	21.5	20.32	20.31	20.69	0.0	21.5
		12	7	21.44	21.45	21.83	0.0	23.0	20.45	20.42	20.71	0.0	21.5	20.41	20.40	20.76	0.0	21.5
		12	13	21.46	21.48	21.83	0.0	23.0	20.46	20.45	20.77	0.0	21.5	20.44	20.42	20.83	0.0	21.5
	25	0	21.48	21.48	21.76	0.0	23.0	20.50	20.46	20.77	0.0	21.5	20.42	20.46	20.85	0.0	21.5	
	64QAM	1	0	21.64	21.67	21.95	0.0	23.0	20.65	20.64	20.98	0.0	21.5	20.64	20.65	20.98	0.0	21.5
		1	12	21.69	21.80	21.95	0.0	23.0	20.76	20.75	21.06	0.0	21.5	20.72	20.74	20.87	0.0	21.5
		1	24	21.60	21.70	21.89	0.0	23.0	20.72	20.75	21.05	0.0	21.5	20.63	20.70	21.01	0.0	21.5
		12	0	20.58	20.39	20.65	1.0	22.0	20.33	20.31	20.69	0.5	21.0	20.55	20.55	20.68	0.5	21.0
		12	7	20.64	20.46	20.77	1.0	22.0	20.44	20.43	20.75	0.5	21.0	20.62	20.63	20.75	0.5	21.0
		12	13	20.67	20.49	20.74	1.0	22.0	20.38	20.44	20.76	0.5	21.0	20.68	20.64	20.78	0.5	21.0
	25	0	20.51	20.46	20.77	1.0	22.0	20.42	20.44	20.78	0.5	21.0	20.47	20.49	20.79	0.5	21.0	
	256QAM	1	0	18.43	18.56	18.45	3.5	19.5	18.11	18.12	18.51	2.0	19.5	18.43	18.46	18.44	2.0	19.5
		1	12	18.55	18.56	18.53	3.5	19.5	18.22	18.19	18.53	2.0	19.5	18.54	18.55	18.56	2.0	19.5
		1	24	18.50	18.62	18.50	3.5	19.5	18.18	18.20	18.49	2.0	19.5	18.53	18.54	18.49	2.0	19.5
		12	0	18.40	18.38	18.76	3.5	19.5	18.38	18.38	18.72	2.0	19.5	18.44	18.42	18.73	2.0	19.5
12		7	18.54	18.47	18.83	3.5	19.5	18.48	18.49	18.82	2.0	19.5	18.49	18.52	18.81	2.0	19.5	
12		13	18.48	18.48	18.86	3.5	19.5	18.48	18.48	18.85	2.0	19.5	18.53	18.54	18.85	2.0	19.5	
25	0	18.47	18.45	18.82	3.5	19.5	18.51	18.50	18.82	2.0	19.5	18.47	18.48	18.80	2.0	19.5		

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					
				DSI = 0, 1, 2, 3, 4					
				Measured Pwr (dBm)			MPR	Tune-up Limit	
				23060	23095	23130			
704 MHz	707.5 MHz	711 MHz							
10 MHz	QPSK	1	0		24.47		0.0	25.5	
		1	25		24.40		0.0	25.5	
		1	49		24.33		0.0	25.5	
		25	0		23.52		1.0	24.5	
		25	12		23.55		1.0	24.5	
		25	25		23.51		1.0	24.5	
	16QAM	50	0		23.54		1.0	24.5	
		1	0		23.57		1.0	24.5	
		1	25		23.49		1.0	24.5	
		1	49		23.39		1.0	24.5	
		25	0		22.61		2.0	23.5	
		25	12		22.67		2.0	23.5	
	64QAM	25	25		22.62		2.0	23.5	
		50	0		22.62		2.0	23.5	
		1	0		22.17		2.0	23.5	
		1	25		22.73		2.0	23.5	
		1	49		21.85		2.0	23.5	
		25	0		21.60		3.0	22.5	
	256QAM	25	12		21.65		3.0	22.5	
		25	25		21.25		3.0	22.5	
50		0		21.36		3.0	22.5		
1		0		20.02		5.0	20.5		
1		25		20.06		5.0	20.5		
1		49		20.12		5.0	20.5		
5 MHz	QPSK	25	0		19.66		5.0	20.5	
		25	12		19.68		5.0	20.5	
		25	25		19.66		5.0	20.5	
		50	0		19.66		5.0	20.5	
		1	0		24.42	24.52	24.55	0.0	25.5
		1	12		24.55	24.53	24.50	0.0	25.5
	16QAM	1	24		24.48	24.45	24.49	0.0	25.5
		12	0		23.53	23.49	23.54	1.0	24.5
		12	7		23.63	23.59	23.61	1.0	24.5
		12	13		23.57	23.51	23.55	1.0	24.5
		25	0		23.55	23.51	23.55	1.0	24.5
		1	0		23.49	23.65	23.64	1.0	24.5
	64QAM	1	12		23.55	23.53	23.49	1.0	24.5
		1	24		23.64	23.57	23.67	1.0	24.5
		12	0		22.60	22.57	22.56	2.0	23.5
		12	7		22.69	22.59	22.63	2.0	23.5
		12	13		22.60	22.56	22.60	2.0	23.5
		25	0		22.55	22.46	22.51	2.0	23.5
	256QAM	1	0		22.30	22.71	22.15	2.0	23.5
		1	12		22.09	22.84	21.81	2.0	23.5
1		24		22.46	22.56	22.43	2.0	23.5	
12		0		20.72	21.44	20.61	3.0	22.5	
12		7		20.73	21.53	20.60	3.0	22.5	
12		13		20.78	21.47	20.72	3.0	22.5	
5 MHz	256QAM	25	0		20.80	21.55	20.74	3.0	22.5
		1	0		19.31	19.26	19.27	5.0	20.5
		1	12		19.38	19.34	19.37	5.0	20.5
		1	24		19.29	19.25	19.32	5.0	20.5
		12	0		19.58	19.55	19.54	5.0	20.5
		12	7		19.68	19.61	19.66	5.0	20.5
		12	13		19.59	19.57	19.58	5.0	20.5
		25	0		19.65	19.62	19.65	5.0	20.5

LTE Band 12 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	
				23025.00	23095.00	23165.00			
				700.5 MHz	707.5 MHz	714.5 MHz			
3 MHz	QPSK	1	0	24.50	24.44	24.44	0.0	25.5	
		1	8	24.37	24.35	24.38	0.0	25.5	
		1	14	24.43	24.38	24.40	0.0	25.5	
		8	0	23.56	23.55	23.47	1.0	24.5	
		8	4	23.56	23.57	23.62	1.0	24.5	
		8	7	23.54	23.52	23.55	1.0	24.5	
	16QAM	15	0	23.57	23.51	23.54	1.0	24.5	
		1	0	23.61	23.57	23.41	1.0	24.5	
		1	8	23.47	23.45	23.51	1.0	24.5	
		1	14	23.49	23.47	23.52	1.0	24.5	
		8	0	22.62	22.60	22.51	2.0	23.5	
		8	4	22.66	22.56	22.62	2.0	23.5	
	64QAM	8	7	22.64	22.58	22.59	2.0	23.5	
		15	0	22.54	22.48	22.50	2.0	23.5	
		1	0	22.28	22.71	21.91	2.0	23.5	
		1	8	21.91	22.79	22.06	2.0	23.5	
		1	14	22.06	22.70	22.44	2.0	23.5	
		8	0	20.90	21.73	20.84	3.0	22.5	
	256QAM	8	4	20.88	21.69	21.01	3.0	22.5	
		8	7	20.91	21.69	21.11	3.0	22.5	
		15	0	20.73	21.53	20.85	3.0	22.5	
		1	0	19.91	19.84	19.93	5.0	20.5	
		1	8	19.94	19.85	19.92	5.0	20.5	
		1	14	19.87	19.85	19.87	5.0	20.5	
	256QAM	8	0	19.72	19.64	19.63	5.0	20.5	
		8	4	19.72	19.66	19.69	5.0	20.5	
		8	7	19.68	19.66	19.67	5.0	20.5	
15		0	19.65	19.61	19.61	5.0	20.5		
BW (MHz)		Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					23017.00	23095.00	23173.00		
	699.7 MHz				707.5 MHz	715.3 MHz			
1.4 MHz	QPSK	1	0	24.39	24.39	24.38	0.0	25.5	
		1	3	24.40	24.36	24.40	0.0	25.5	
		1	5	24.38	24.33	24.39	0.0	25.5	
		3	0	24.23	24.37	24.46	0.0	25.5	
		3	1	24.33	24.39	24.48	0.0	25.5	
		3	3	24.37	24.35	24.48	0.0	25.5	
	16QAM	6	0	23.44	23.48	23.39	1.0	24.5	
		1	0	23.43	23.41	23.85	1.0	24.5	
		1	3	23.45	23.49	23.90	1.0	24.5	
		1	5	23.41	23.38	23.83	1.0	24.5	
		3	0	23.46	23.62	23.67	1.0	24.5	
		3	1	23.53	23.69	23.65	1.0	24.5	
	64QAM	3	3	23.64	23.64	23.62	1.0	24.5	
		6	0	22.65	22.62	22.25	2.0	23.5	
		1	0	21.88	22.38	21.80	2.0	23.5	
		1	3	21.44	22.37	21.91	2.0	23.5	
		1	5	21.70	22.29	21.96	2.0	23.5	
		3	0	21.76	22.34	21.78	2.0	23.5	
	256QAM	3	1	21.69	22.32	21.88	2.0	23.5	
		3	3	21.73	22.25	21.92	2.0	23.5	
		6	0	20.72	21.45	20.97	3.0	22.5	
		1	0	19.54	19.59	19.53	5.0	20.5	
		1	3	19.72	19.63	19.67	5.0	20.5	
		1	5	19.55	19.52	19.53	5.0	20.5	
	256QAM	3	0	19.48	19.53	19.46	5.0	20.5	
		3	1	19.51	19.53	19.53	5.0	20.5	
		3	3	19.46	19.51	19.55	5.0	20.5	
6		0	19.47	19.56	19.50	5.0	20.5		

LTE Band 13 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)					
				DSI = 0, 1, 2, 3, 4					
				Measured Pwr (dBm)			MPR	Tune-up Limit	
				23230	782 MHz	23230			
10 MHz	QPSK	1	0	24.01			0.0	25.5	
		1	25	24.38			0.0	25.5	
		1	49	24.22			0.0	25.5	
		25	0	23.51			1.0	24.5	
		25	12	23.42			1.0	24.5	
		25	25	23.35			1.0	24.5	
	16QAM	50	0	23.43			1.0	24.5	
		1	0	23.02			1.0	24.5	
		1	25	23.45			1.0	24.5	
		1	49	23.31			1.0	24.5	
		25	0	22.62			2.0	23.5	
		25	12	22.51			2.0	23.5	
	64QAM	25	25	22.41			2.0	23.5	
		50	0	22.49			2.0	23.5	
		1	0	21.52			2.0	23.5	
		1	25	22.52			2.0	23.5	
		1	49	22.56			2.0	23.5	
		25	0	21.48			3.0	22.5	
	256QAM	25	12	21.47			3.0	22.5	
		25	25	21.40			3.0	22.5	
		50	0	21.50			3.0	22.5	
		1	0	20.07			5.0	20.5	
		1	25	19.98			5.0	20.5	
		1	49	19.86			5.0	20.5	
5 MHz	QPSK	25	0	19.62			5.0	20.5	
		25	12	19.48			5.0	20.5	
		25	25	19.44			5.0	20.5	
		50	0	19.50			5.0	20.5	
		1	0	24.33			0.0	25.5	
		1	12	24.30			0.0	25.5	
	16QAM	1	24	24.26			0.0	25.5	
		12	0	23.21			1.0	24.5	
		12	7	23.24			1.0	24.5	
		12	13	23.24			1.0	24.5	
		25	0	23.25			1.0	24.5	
		1	0	23.42			1.0	24.5	
	64QAM	1	12	23.42			1.0	24.5	
		1	24	23.39			1.0	24.5	
		12	0	22.29			2.0	23.5	
		12	7	22.36			2.0	23.5	
		12	13	22.29			2.0	23.5	
		25	0	22.25			2.0	23.5	
	256QAM	1	0	22.33			2.0	23.5	
		1	12	21.83			2.0	23.5	
		1	24	22.32			2.0	23.5	
		12	0	20.78			3.0	22.5	
		12	7	20.63			3.0	22.5	
		12	13	20.65			3.0	22.5	
5 MHz	256QAM	25	0	20.77			3.0	22.5	
		1	0	19.01			5.0	20.5	
		1	12	19.11			5.0	20.5	
		1	24	18.92			5.0	20.5	
		12	0	19.26			5.0	20.5	
		12	7	19.30			5.0	20.5	
	5 MHz	256QAM	12	13	19.26			5.0	20.5
			25	0	19.30			5.0	20.5

LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)														
				DSI = 0, 2					DSI = 3					DSI = 1, 4				
				Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				132072 1720 MHz	132322 1745 MHz	132572 1770 MHz			132072 1720 MHz	132322 1745 MHz	132572 1770 MHz			132072 1720 MHz	132322 1745 MHz	132572 1770 MHz		
20 MHz	QPSK	1	0	23.20	23.13	22.83	0.0	24.0	21.18	21.17	20.83	0.0	22.0	21.20	21.16	20.83	0.0	22.0
		1	49	23.13	22.83	22.76	0.0	24.0	21.12	20.85	20.78	0.0	22.0	21.13	20.84	20.78	0.0	22.0
		1	99	23.14	22.82	22.78	0.0	24.0	21.10	20.87	20.79	0.0	22.0	21.12	20.85	20.80	0.0	22.0
		50	0	23.23	22.96	22.86	0.0	24.0	21.24	20.95	20.86	0.0	22.0	21.23	20.94	20.82	0.0	22.0
		50	24	23.24	22.93	22.83	0.0	24.0	21.25	20.93	20.85	0.0	22.0	21.25	20.90	20.83	0.0	22.0
		50	50	23.23	22.89	22.84	0.0	24.0	21.21	20.90	20.83	0.0	22.0	21.23	20.90	20.83	0.0	22.0
	100	0	23.23	22.91	22.84	0.0	24.0	21.25	20.92	20.84	0.0	22.0	21.22	20.92	20.86	0.0	22.0	
	16QAM	1	0	23.42	23.68	23.27	0.0	24.0	21.74	21.66	21.25	0.0	22.0	21.73	21.66	21.28	0.0	22.0
		1	49	23.37	23.41	23.19	0.0	24.0	21.69	21.32	21.20	0.0	22.0	21.71	21.33	21.21	0.0	22.0
		1	99	23.32	23.37	23.22	0.0	24.0	21.71	21.30	21.23	0.0	22.0	21.72	21.31	21.20	0.0	22.0
		50	0	22.47	22.18	22.04	1.0	23.0	21.29	20.99	20.84	0.0	22.0	21.27	20.99	20.83	0.0	22.0
		50	24	22.50	22.15	22.04	1.0	23.0	21.28	20.95	20.86	0.0	22.0	21.28	20.93	20.84	0.0	22.0
		50	50	22.47	22.12	22.03	1.0	23.0	21.25	20.91	20.81	0.0	22.0	21.24	20.92	20.82	0.0	22.0
	64QAM	100	0	22.48	22.13	22.05	1.0	23.0	21.29	20.94	20.87	0.0	22.0	21.29	20.93	20.83	0.0	22.0
		1	0	22.75	22.45	22.29	1.0	23.0	21.52	21.67	21.07	0.0	22.0	21.55	21.70	21.06	0.0	22.0
		1	49	22.74	22.72	22.22	1.0	23.0	21.55	21.52	21.00	0.0	22.0	21.58	21.51	21.00	0.0	22.0
		1	99	22.74	22.69	22.22	1.0	23.0	21.56	21.49	21.01	0.0	22.0	21.57	21.45	21.01	0.0	22.0
		50	0	21.52	21.19	21.03	2.0	22.0	21.31	20.98	20.87	0.0	22.0	21.34	20.98	20.84	0.0	22.0
		50	24	21.53	21.14	21.06	2.0	22.0	21.31	20.94	20.87	0.0	22.0	21.30	20.94	20.85	0.0	22.0
	256QAM	50	50	21.49	21.12	21.04	2.0	22.0	21.29	20.91	20.84	0.0	22.0	21.29	20.89	20.85	0.0	22.0
		100	0	21.50	21.13	21.07	2.0	22.0	21.26	20.92	20.86	0.0	22.0	21.29	20.91	20.88	0.0	22.0
		1	0	19.62	19.62	19.00	3.0	21.0	19.62	19.61	18.99	2.0	20.0	19.62	19.60	18.98	2.0	20.0
		1	49	19.61	19.26	18.97	3.0	21.0	19.58	19.26	18.97	2.0	20.0	19.59	19.23	18.96	2.0	20.0
		1	99	19.59	19.27	18.98	3.0	21.0	19.59	19.27	18.96	2.0	20.0	19.59	19.25	18.97	2.0	20.0
50		0	19.50	19.18	19.08	3.0	21.0	19.46	19.17	19.08	2.0	20.0	19.45	19.18	19.06	2.0	20.0	
15 MHz	QPSK	1	0	23.05	22.68	22.69	0.0	24.0	21.04	20.76	20.68	0.0	22.0	21.08	20.74	20.70	0.0	22.0
		1	37	23.03	22.64	22.60	0.0	24.0	21.01	20.74	20.60	0.0	22.0	21.06	20.70	20.63	0.0	22.0
		1	74	23.03	22.63	22.64	0.0	24.0	20.99	20.73	20.61	0.0	22.0	21.05	20.70	20.64	0.0	22.0
		36	0	23.12	22.73	22.66	0.0	24.0	21.13	20.73	20.69	0.0	22.0	21.10	20.78	20.70	0.0	22.0
		36	20	23.13	22.74	22.67	0.0	24.0	21.13	20.76	20.67	0.0	22.0	21.13	20.81	20.71	0.0	22.0
		36	39	23.08	22.70	22.63	0.0	24.0	21.09	20.72	20.64	0.0	22.0	21.12	20.75	20.68	0.0	22.0
		75	0	23.08	22.70	22.66	0.0	24.0	21.12	20.76	20.67	0.0	22.0	21.11	20.75	20.68	0.0	22.0
	16QAM	1	0	23.50	23.38	22.96	0.0	24.0	21.03	21.25	21.13	0.0	22.0	21.56	20.76	21.11	0.0	22.0
		1	37	23.51	23.32	22.91	0.0	24.0	21.02	21.25	21.14	0.0	22.0	21.58	20.72	21.14	0.0	22.0
		1	74	23.48	23.30	22.93	0.0	24.0	20.99	21.21	21.07	0.0	22.0	21.55	20.68	21.09	0.0	22.0
		36	0	22.29	21.96	21.90	1.0	23.0	21.15	20.74	20.73	0.0	22.0	21.15	20.78	20.74	0.0	22.0
		36	20	22.31	21.95	21.89	1.0	23.0	21.13	20.75	20.72	0.0	22.0	21.11	20.78	20.75	0.0	22.0
		36	39	22.26	21.91	21.87	1.0	23.0	21.13	20.72	20.73	0.0	22.0	21.10	20.78	20.72	0.0	22.0
		75	0	22.28	21.94	21.85	1.0	23.0	21.11	20.76	20.68	0.0	22.0	21.15	20.79	20.68	0.0	22.0
	64QAM	1	0	22.50	22.22	21.93	1.0	23.0	21.46	20.99	20.75	0.0	22.0	21.31	21.05	20.75	0.0	22.0
		1	37	22.26	22.23	21.87	1.0	23.0	21.47	20.97	20.69	0.0	22.0	21.33	21.09	20.67	0.0	22.0
		1	74	22.49	22.25	21.88	1.0	23.0	21.48	20.96	20.69	0.0	22.0	21.30	21.10	20.68	0.0	22.0
		36	0	21.35	20.95	21.02	2.0	22.0	21.17	20.87	20.84	0.0	22.0	21.22	20.77	20.84	0.0	22.0
		36	20	21.23	20.97	21.03	2.0	22.0	21.18	20.85	20.84	0.0	22.0	21.22	20.79	20.83	0.0	22.0
		36	39	21.25	20.90	20.99	2.0	22.0	21.15	20.84	20.80	0.0	22.0	21.19	20.73	20.80	0.0	22.0
		75	0	21.29	20.95	20.93	2.0	22.0	21.16	20.80	20.73	0.0	22.0	21.17	20.75	20.75	0.0	22.0
	256QAM	1	0	19.77	19.22	18.77	3.0	21.0	19.62	19.39	18.78	2.0	20.0	19.76	19.23	18.77	2.0	20.0
		1	37	19.69	19.14	18.69	3.0	21.0	19.64	19.35	18.78	2.0	20.0	19.72	19.17	18.78	2.0	20.0
		1	74	19.69	19.20	18.75	3.0	21.0	19.62	19.34	18.75	2.0	20.0	19.72	19.24	18.75	2.0	20.0
36		0	19.33	18.95	18.92	3.0	21.0	19.36	19.04	18.95	2.0	20.0	19.37	18.95	18.94	2.0	20.0	
36		20	19.37	18.98	18.93	3.0	21.0	19.38	19.06	18.94	2.0	20.0	19.38	18.97	18.94	2.0	20.0	
36		39	19.35	18.94	18.92	3.0	21.0	19.35	19.01	18.92	2.0	20.0	19.37	18.97	18.93	2.0	20.0	
75		0	19.36	18.96	18.90	3.0	21.0	19.36	19.02	18.92	2.0	20.0	19.38	18.97	18.92	2.0	20.0	

LTE Band 66 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	
				132022.00	132322.00	132622.00			132022.00	132322.00	132622.00			132022.00	132322.00	132622.00			
				1715 MHz	1745 MHz	1775 MHz			1715 MHz	1745 MHz	1775 MHz			1715 MHz	1745 MHz	1775 MHz			
10 MHz	QPSK	1	0	23.10	22.71	22.74	0.0	24.0	21.21	20.83	20.68	0.0	22.0	21.16	20.83	20.85	0.0	22.0	
		1	25	23.06	22.78	22.69	0.0	24.0	21.14	20.83	20.70	0.0	22.0	21.14	20.85	20.78	0.0	22.0	
		1	49	23.02	22.72	22.68	0.0	24.0	21.16	20.76	20.64	0.0	22.0	21.07	20.80	20.77	0.0	22.0	
		25	0	23.23	22.86	22.76	0.0	24.0	21.28	20.90	20.76	0.0	22.0	21.26	20.91	20.83	0.0	22.0	
		25	12	23.24	22.84	22.79	0.0	24.0	21.28	20.89	20.80	0.0	22.0	21.29	20.90	20.84	0.0	22.0	
		25	25	23.20	22.84	22.72	0.0	24.0	21.22	20.89	20.76	0.0	22.0	21.26	20.88	20.79	0.0	22.0	
	50	0	23.24	22.85	22.74	0.0	24.0	21.26	20.90	20.78	0.0	22.0	21.27	20.89	20.84	0.0	22.0		
	16QAM	1	0	23.30	23.41	22.86	0.0	24.0	21.63	20.79	20.84	0.0	22.0	21.25	20.95	21.28	0.0	22.0	
		1	25	23.18	23.43	22.82	0.0	24.0	21.60	20.78	20.79	0.0	22.0	21.18	20.82	21.24	0.0	22.0	
		1	49	23.20	23.38	22.85	0.0	24.0	21.61	20.71	20.76	0.0	22.0	21.20	20.78	21.24	0.0	22.0	
		25	0	22.51	22.16	22.02	1.0	23.0	21.35	20.91	20.90	0.0	22.0	21.40	20.95	20.87	0.0	22.0	
		25	12	22.52	22.16	22.02	1.0	23.0	21.37	20.95	20.88	0.0	22.0	21.39	20.96	20.89	0.0	22.0	
		25	25	22.48	22.13	21.99	1.0	23.0	21.33	20.89	20.85	0.0	22.0	21.36	20.92	20.88	0.0	22.0	
	50	0	22.48	22.10	21.93	1.0	23.0	21.30	20.88	20.82	0.0	22.0	21.35	20.93	20.84	0.0	22.0		
	64QAM	1	0	22.68	21.87	21.98	1.0	23.0	21.32	20.70	21.02	0.0	22.0	21.47	20.69	20.80	0.0	22.0	
		1	25	22.39	21.83	21.94	1.0	23.0	21.19	20.61	20.96	0.0	22.0	21.41	20.63	20.75	0.0	22.0	
		1	49	22.51	21.83	21.92	1.0	23.0	21.25	20.65	20.92	0.0	22.0	21.41	20.62	20.75	0.0	22.0	
		25	0	21.47	21.22	21.14	2.0	22.0	21.42	20.99	20.87	0.0	22.0	21.35	20.99	20.93	0.0	22.0	
		25	12	21.38	21.21	21.13	2.0	22.0	21.39	21.02	20.86	0.0	22.0	21.34	20.98	20.94	0.0	22.0	
		25	25	21.37	21.20	21.08	2.0	22.0	21.37	20.97	20.82	0.0	22.0	21.32	20.96	20.90	0.0	22.0	
	50	0	21.39	21.14	21.05	2.0	22.0	21.32	20.91	20.80	0.0	22.0	21.30	20.92	20.86	0.0	22.0		
	256QAM	1	0	19.98	19.10	18.69	3.0	21.0	19.32	19.14	19.57	2.0	20.0	20.00	19.12	18.86	2.0	20.0	
		1	25	19.92	19.08	18.69	3.0	21.0	19.29	19.09	19.48	2.0	20.0	19.89	19.10	18.82	2.0	20.0	
		1	49	19.94	19.01	18.79	3.0	21.0	19.28	19.07	19.52	2.0	20.0	19.94	19.02	18.83	2.0	20.0	
		25	0	19.55	19.19	19.05	3.0	21.0	19.54	19.20	19.10	2.0	20.0	19.52	19.20	19.07	2.0	20.0	
		25	12	19.51	19.20	19.07	3.0	21.0	19.58	19.21	19.06	2.0	20.0	19.54	19.21	19.08	2.0	20.0	
		25	25	19.50	19.17	19.04	3.0	21.0	19.52	19.20	19.06	2.0	20.0	19.52	19.15	19.06	2.0	20.0	
	50	0	19.48	19.14	19.03	3.0	21.0	19.49	19.14	19.03	2.0	20.0	19.53	19.15	19.03	2.0	20.0		
	5 MHz	QPSK	1	0	22.85	22.84	22.77	0.0	24.0	21.28	20.93	20.72	0.0	22.0	21.20	20.94	20.88	0.0	22.0
			1	12	22.77	22.77	22.74	0.0	24.0	21.25	20.88	20.85	0.0	22.0	21.11	20.92	20.84	0.0	22.0
1			24	22.81	22.80	22.75	0.0	24.0	21.24	20.89	20.71	0.0	22.0	21.17	20.91	20.83	0.0	22.0	
12			0	22.82	22.81	22.75	0.0	24.0	21.23	20.89	20.71	0.0	22.0	21.24	20.91	20.76	0.0	22.0	
12			7	22.88	22.85	22.78	0.0	24.0	21.25	20.90	20.80	0.0	22.0	21.31	20.93	20.77	0.0	22.0	
12			13	22.81	22.81	22.73	0.0	24.0	21.23	20.88	20.73	0.0	22.0	21.22	20.90	20.75	0.0	22.0	
25		0	22.81	22.80	22.73	0.0	24.0	21.26	20.88	20.74	0.0	22.0	21.25	20.88	20.77	0.0	22.0		
16QAM		1	0	23.15	23.15	22.85	0.0	24.0	21.39	21.11	21.34	0.0	22.0	21.73	21.09	20.98	0.0	22.0	
		1	12	23.09	23.11	22.92	0.0	24.0	21.31	20.95	21.29	0.0	22.0	21.72	20.99	20.90	0.0	22.0	
		1	24	23.12	23.12	22.80	0.0	24.0	21.40	21.10	21.34	0.0	22.0	21.66	21.12	20.99	0.0	22.0	
		12	0	22.11	22.12	21.92	1.0	23.0	21.33	20.94	20.93	0.0	22.0	21.42	20.94	20.84	0.0	22.0	
		12	7	22.12	22.11	21.94	1.0	23.0	21.37	20.90	20.91	0.0	22.0	21.43	20.95	20.89	0.0	22.0	
		12	13	22.08	22.11	21.95	1.0	23.0	21.32	20.91	20.89	0.0	22.0	21.38	20.93	20.84	0.0	22.0	
25		0	22.04	22.05	21.99	1.0	23.0	21.28	20.78	20.83	0.0	22.0	21.31	20.83	20.82	0.0	22.0		
64QAM		1	0	22.65	22.32	22.35	1.0	23.0	21.63	21.13	21.05	0.0	22.0	21.48	21.14	21.15	0.0	22.0	
		1	12	22.40	22.32	22.30	1.0	23.0	21.60	21.15	21.13	0.0	22.0	21.54	21.13	21.16	0.0	22.0	
		1	24	22.42	22.29	22.23	1.0	23.0	21.53	21.11	21.03	0.0	22.0	21.48	21.09	21.06	0.0	22.0	
		12	0	21.27	21.26	20.98	2.0	22.0	21.29	21.03	20.72	0.0	22.0	21.18	21.02	20.78	0.0	22.0	
		12	7	21.21	21.26	20.99	2.0	22.0	21.31	21.03	20.74	0.0	22.0	21.23	21.02	20.79	0.0	22.0	
		12	13	21.15	21.23	20.95	2.0	22.0	21.26	21.00	20.67	0.0	22.0	21.17	21.02	20.76	0.0	22.0	
25		0	21.27	21.13	20.97	2.0	22.0	21.29	20.91	20.79	0.0	22.0	21.29	20.89	20.78	0.0	22.0		
256QAM		1	0	19.21	19.15	19.18	3.0	21.0	19.67	19.16	18.74	2.0	20.0	19.21	19.14	19.16	2.0	20.0	
		1	12	19.21	19.23	19.06	3.0	21.0	19.60	19.19	18.75	2.0	20.0	19.23	19.20	19.07	2.0	20.0	
		1	24	19.15	19.13	19.16	3.0	21.0	19.64	19.14	18.70	2.0	20.0	19.19	19.13	19.15	2.0	20.0	
		12	0	19.47	19.12	18.99	3.0	21.0	19.50	19.12	18.98	2.0	20.0	19.50	19.11	19.00	2.0	20.0	
		12	7	19.50	19.15	19.01	3.0	21.0	19.50	19.13	19.01	2.0	20.0	19.53	19.11	19.02	2.0	20.0	
		12	13	19.46	19.07	18.97	3.0	21.0	19.47	19.11	18.98	2.0	20.0	19.46	19.08	18.98	2.0	20.0	
25		0	19.53	19.05	19.00	3.0	21.0	19.48	19.06	19.01	2.0	20.0	19.53	19.11	18.99	2.0	20.0		

LTE Band 66 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	
				131987.00	132322.00	132657.00			131987.00	132322.00	132657.00			131987.00	132322.00	132657.00			
				1711.5 MHz	1745 MHz	1778.5 MHz			1711.5 MHz	1745 MHz	1778.5 MHz			1711.5 MHz	1745 MHz	1778.5 MHz			
3 MHz	QPSK	1	0	22.79	22.76	22.69	0.0	24.0	21.16	20.85	20.77	0.0	22.0	21.19	20.86	20.80	0.0	22.0	
		1	8	22.67	22.66	22.57	0.0	24.0	21.04	20.72	20.76	0.0	22.0	21.09	20.68	20.73	0.0	22.0	
		1	14	22.74	22.73	22.72	0.0	24.0	21.21	20.79	20.73	0.0	22.0	21.15	20.86	20.75	0.0	22.0	
		8	0	22.81	22.80	22.69	0.0	24.0	21.25	20.86	20.75	0.0	22.0	21.25	20.85	20.75	0.0	22.0	
		8	4	22.83	22.84	22.71	0.0	24.0	21.26	20.90	20.76	0.0	22.0	21.30	20.88	20.75	0.0	22.0	
		8	7	22.85	22.80	22.75	0.0	24.0	21.30	20.89	20.75	0.0	22.0	21.30	20.90	20.76	0.0	22.0	
	15	0	22.80	22.78	22.72	0.0	24.0	21.28	20.89	20.74	0.0	22.0	21.27	20.88	20.73	0.0	22.0		
	16QAM	1	0	22.92	22.89	23.27	0.0	24.0	21.20	20.97	21.15	0.0	22.0	21.32	20.78	21.16	0.0	22.0	
		1	8	22.87	22.88	23.16	0.0	24.0	21.15	20.92	21.15	0.0	22.0	21.27	20.82	21.11	0.0	22.0	
		1	14	22.92	22.87	23.20	0.0	24.0	21.10	20.94	21.14	0.0	22.0	21.28	20.76	21.13	0.0	22.0	
		8	0	22.12	22.11	22.07	1.0	23.0	21.35	20.88	20.75	0.0	22.0	21.26	20.98	20.78	0.0	22.0	
		8	4	22.14	22.17	22.11	1.0	23.0	21.37	20.92	20.82	0.0	22.0	21.36	20.97	20.84	0.0	22.0	
		8	7	22.18	22.14	22.15	1.0	23.0	21.41	20.93	20.83	0.0	22.0	21.34	21.05	20.83	0.0	22.0	
	15	0	22.09	22.11	21.92	1.0	23.0	21.26	20.84	20.78	0.0	22.0	21.22	20.93	20.79	0.0	22.0		
	64QAM	1	0	22.34	22.24	21.82	1.0	23.0	21.16	21.06	20.69	0.0	22.0	21.16	21.04	20.64	0.0	22.0	
		1	8	22.23	22.28	21.79	1.0	23.0	21.07	21.14	20.87	0.0	22.0	21.31	21.13	20.61	0.0	22.0	
		1	14	22.21	22.20	21.77	1.0	23.0	21.17	21.06	20.71	0.0	22.0	21.19	21.04	20.59	0.0	22.0	
		8	0	21.40	21.19	21.00	2.0	22.0	21.33	20.98	20.81	0.0	22.0	21.34	21.00	20.85	0.0	22.0	
		8	4	21.40	21.22	21.04	2.0	22.0	21.34	21.01	20.81	0.0	22.0	21.35	20.99	20.88	0.0	22.0	
		8	7	21.38	21.26	21.03	2.0	22.0	21.36	21.02	20.86	0.0	22.0	21.37	21.03	20.91	0.0	22.0	
	15	0	21.42	21.07	20.97	2.0	22.0	21.30	20.86	20.85	0.0	22.0	21.33	20.85	20.78	0.0	22.0		
	256QAM	1	0	19.22	19.44	18.94	3.0	21.0	19.45	19.47	18.77	2.0	20.0	19.25	19.46	18.95	2.0	20.0	
		1	8	19.21	19.50	19.03	3.0	21.0	19.51	19.49	18.72	2.0	20.0	19.23	19.49	19.04	2.0	20.0	
		1	14	19.19	19.48	18.94	3.0	21.0	19.43	19.50	18.71	2.0	20.0	19.22	19.46	18.94	2.0	20.0	
		8	0	19.32	19.15	19.02	3.0	21.0	19.57	19.17	18.87	2.0	20.0	19.37	19.16	19.10	2.0	20.0	
		8	4	19.48	19.15	19.13	3.0	21.0	19.65	19.18	19.00	2.0	20.0	19.42	19.14	19.14	2.0	20.0	
		8	7	19.51	19.16	19.13	3.0	21.0	19.66	19.17	18.92	2.0	20.0	19.43	19.18	19.16	2.0	20.0	
	15	0	19.52	19.11	19.13	3.0	21.0	19.56	19.13	19.02	2.0	20.0	19.51	19.12	19.04	2.0	20.0		
	1.4 MHz	QPSK	1	0	23.01	22.78	22.58	0.0	24.0	21.18	20.70	20.66	0.0	22.0	21.09	20.85	20.65	0.0	22.0
			1	3	23.05	22.79	22.62	0.0	24.0	21.20	20.78	20.69	0.0	22.0	21.10	20.88	20.66	0.0	22.0
1			5	23.01	22.75	22.58	0.0	24.0	21.13	20.75	20.65	0.0	22.0	21.07	20.81	20.65	0.0	22.0	
3			0	23.03	22.67	22.63	0.0	24.0	21.04	20.73	20.70	0.0	22.0	21.07	20.70	20.69	0.0	22.0	
3			1	23.05	22.73	22.68	0.0	24.0	21.13	20.79	20.74	0.0	22.0	21.11	20.84	20.71	0.0	22.0	
3			3	23.03	22.74	22.66	0.0	24.0	21.14	20.77	20.76	0.0	22.0	21.12	20.79	20.71	0.0	22.0	
16QAM		6	0	23.12	22.69	22.69	0.0	24.0	21.13	20.75	20.75	0.0	22.0	21.20	20.78	20.74	0.0	22.0	
		1	0	23.26	22.73	22.82	0.0	24.0	21.31	20.84	21.11	0.0	22.0	21.14	20.95	21.13	0.0	22.0	
		1	3	23.31	22.77	22.84	0.0	24.0	21.45	20.94	21.18	0.0	22.0	21.24	21.05	21.15	0.0	22.0	
		1	5	23.21	22.76	22.80	0.0	24.0	21.28	20.84	21.10	0.0	22.0	21.20	21.00	21.12	0.0	22.0	
		3	0	23.23	22.96	22.66	0.0	24.0	21.21	21.05	20.94	0.0	22.0	21.36	20.89	20.95	0.0	22.0	
		3	1	23.30	22.95	22.79	0.0	24.0	21.24	21.03	20.91	0.0	22.0	21.37	20.89	20.87	0.0	22.0	
3		3	23.29	23.04	22.72	0.0	24.0	21.26	21.08	20.95	0.0	22.0	21.39	20.96	20.93	0.0	22.0		
6		0	22.31	21.99	21.91	1.0	23.0	21.31	20.97	20.60	0.0	22.0	21.36	20.94	20.58	0.0	22.0		
64QAM		1	0	22.46	21.98	22.09	1.0	23.0	21.34	20.80	21.50	0.0	22.0	21.46	20.84	20.96	0.0	22.0	
		1	3	22.50	22.08	22.15	1.0	23.0	21.42	20.86	21.56	0.0	22.0	21.54	20.92	21.02	0.0	22.0	
		1	5	22.41	21.95	22.04	1.0	23.0	21.34	20.81	21.50	0.0	22.0	21.48	20.83	20.92	0.0	22.0	
		3	0	22.37	22.11	22.02	1.0	23.0	21.20	20.93	21.40	0.0	22.0	21.39	20.95	20.80	0.0	22.0	
		3	1	22.38	22.24	21.98	1.0	23.0	21.28	21.05	21.40	0.0	22.0	21.39	21.05	20.78	0.0	22.0	
		3	3	22.34	22.27	21.97	1.0	23.0	21.27	21.09	21.41	0.0	22.0	21.38	21.07	20.81	0.0	22.0	
256QAM		6	0	22.42	21.13	20.98	1.0	23.0	21.22	20.89	21.32	0.0	22.0	21.31	20.91	20.82	0.0	22.0	
		1	0	19.27	19.25	19.06	3.0	21.0	19.56	19.84	19.50	2.0	20.0	19.48	19.78	19.11	2.0	20.0	
		1	3	19.33	19.34	19.23	3.0	21.0	19.66	19.61	19.57	2.0	20.0	19.54	19.58	19.22	2.0	20.0	
		1	5	19.25	19.29	19.07	3.0	21.0	19.54	19.51	19.50	2.0	20.0	19.49	19.51	19.12	2.0	20.0	
		3	0	19.48	19.50	18.87	3.0	21.0	19.29	19.65	19.50	2.0	20.0	19.51	19.64	18.90	2.0	20.0	
		3	1	19.49	19.50	18.90	3.0	21.0	19.43	19.68	19.51	2.0	20.0	19.50	19.66	18.95	2.0	20.0	
3		3	19.46	19.50	18.86	3.0	21.0	19.32	19.67	19.51	2.0	20.0	19.48	19.62	18.90	2.0	20.0		
6		0	19.28	19.30	18.89	3.0	21.0	19.32	19.37	19.51	2.0	20.0	19.48	19.36	18.90	2.0	20.0		

LTE Band 48 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	DIS = 0, 1, 2, 3, 4					
				Measured Pwr (dBm)				MPR	Tune-up Limit
				55340	55773	56207	56640		
				3560 MHz	3603.3 MHz	3646.7 MHz	3690 MHz		
20 MHz	QPSK	1	0	19.26	19.13	19.45	19.39	0.0	20.0
		1	49	19.25	19.16	19.41	19.30	0.0	20.0
		1	99	19.36	19.23	19.40	19.23	0.0	20.0
		50	0	19.42	19.21	19.62	19.43	0.0	20.0
		50	24	19.46	19.31	19.61	19.44	0.0	20.0
		50	50	19.49	19.35	19.54	19.36	0.0	20.0
	16QAM	100	0	19.44	19.34	19.60	19.44	0.0	20.0
		1	0	19.20	19.26	19.54	19.49	0.0	20.0
		1	49	19.21	19.32	19.47	19.44	0.0	20.0
		1	99	19.27	19.36	19.44	19.40	0.0	20.0
		50	0	19.41	19.25	19.60	19.50	0.0	20.0
		50	24	19.46	19.37	19.60	19.49	0.0	20.0
	64QAM	50	50	19.48	19.42	19.50	19.40	0.0	20.0
		100	0	19.46	19.37	19.62	19.44	0.0	20.0
		1	0	19.17	19.30	19.55	19.81	0.0	20.0
		1	49	19.25	19.39	19.57	19.74	0.0	20.0
		1	99	19.28	19.42	19.46	19.63	0.0	20.0
		50	0	19.45	19.49	19.64	19.51	0.0	20.0
	256QAM	50	24	19.48	19.59	19.66	19.51	0.0	20.0
		50	50	19.51	19.62	19.58	19.42	0.0	20.0
		100	0	19.47	19.57	19.65	19.49	0.0	20.0
		1	0	17.77	17.88	18.31	17.90	1.0	19.0
		1	49	17.74	17.85	18.14	17.76	1.0	19.0
		1	99	17.89	17.96	18.21	17.71	1.0	19.0
15 MHz	QPSK	50	0	17.84	17.88	18.00	17.86	1.0	19.0
		50	24	17.86	17.95	18.02	17.87	1.0	19.0
		50	50	17.89	17.99	17.99	17.79	1.0	19.0
		100	0	17.87	17.96	18.04	17.85	1.0	19.0
		1	0	19.25	19.13	19.43	19.36	0.0	20.0
		1	37	19.26	19.10	19.40	19.26	0.0	20.0
	16QAM	1	74	19.33	19.17	19.39	19.27	0.0	20.0
		36	0	19.41	19.19	19.57	19.47	0.0	20.0
		36	20	19.42	19.32	19.58	19.47	0.0	20.0
		36	39	19.45	19.33	19.52	19.47	0.0	20.0
		75	0	19.41	19.28	19.58	19.45	0.0	20.0
		1	0	19.29	19.12	19.45	19.38	0.0	20.0
	64QAM	1	37	19.34	19.12	19.41	19.27	0.0	20.0
		1	74	19.35	19.16	19.40	19.27	0.0	20.0
		36	0	19.43	19.25	19.61	19.54	0.0	20.0
		36	20	19.41	19.33	19.61	19.49	0.0	20.0
		36	39	19.44	19.36	19.55	19.48	0.0	20.0
		75	0	19.44	19.31	19.60	19.49	0.0	20.0
	256QAM	1	0	19.19	19.18	19.13	19.66	0.0	20.0
		1	37	19.10	19.20	19.05	19.57	0.0	20.0
		1	74	19.14	19.27	19.02	19.53	0.0	20.0
		36	0	19.38	19.41	19.64	19.54	0.0	20.0
		36	20	19.38	19.49	19.66	19.51	0.0	20.0
		36	39	19.40	19.51	19.59	19.53	0.0	20.0
256QAM	75	0	19.45	19.54	19.59	19.49	0.0	20.0	
	1	0	17.68	17.80	18.00	17.59	1.0	19.0	
	1	37	17.76	17.88	17.97	17.50	1.0	19.0	
	1	74	17.88	18.00	18.01	17.54	1.0	19.0	
	36	0	17.78	17.80	18.01	17.90	1.0	19.0	
	36	20	17.82	17.93	18.01	17.88	1.0	19.0	
256QAM	36	39	17.82	17.93	17.95	17.89	1.0	19.0	
	75	0	17.82	17.94	18.01	17.85	1.0	19.0	

LTE Band 48 Measured Results (Continued)

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)				MPR	Tune-up Limit	
				55290.00	55757.00	56223.00	56690.00			
				3555 MHz	3601.7 MHz	3648.3 MHz	3695 MHz			
10 MHz	QPSK	1	0	19.53	19.52	19.48	19.48	0.0	20.0	
		1	25	19.61	19.55	19.38	19.43	0.0	20.0	
		1	49	19.49	19.55	19.37	19.45	0.0	20.0	
		25	0	19.57	19.65	19.53	19.57	0.0	20.0	
		25	12	19.59	19.68	19.53	19.58	0.0	20.0	
		25	25	19.62	19.70	19.53	19.58	0.0	20.0	
	16QAM	50	0	19.60	19.66	19.51	19.60	0.0	20.0	
		1	0	19.52	19.70	19.58	19.53	0.0	20.0	
		1	25	19.52	19.70	19.55	19.48	0.0	20.0	
		1	49	19.53	19.71	19.56	19.49	0.0	20.0	
		25	0	19.55	19.65	19.50	19.66	0.0	20.0	
		25	12	19.63	19.70	19.55	19.63	0.0	20.0	
	64QAM	25	25	19.62	19.70	19.52	19.61	0.0	20.0	
		50	0	19.61	19.74	19.57	19.59	0.0	20.0	
		1	0	19.72	19.11	19.78	19.76	0.0	20.0	
		1	25	19.59	19.20	19.73	19.73	0.0	20.0	
		1	49	19.65	19.19	19.67	19.72	0.0	20.0	
		25	0	19.51	19.70	19.68	19.56	0.0	20.0	
	256QAM	25	12	19.56	19.67	19.71	19.59	0.0	20.0	
		25	25	19.56	19.73	19.68	19.60	0.0	20.0	
		50	0	19.58	19.68	19.71	19.60	0.0	20.0	
		1	0	17.99	18.07	18.11	17.64	1.0	19.0	
		1	25	17.89	18.15	17.98	17.65	1.0	19.0	
		1	49	17.90	18.14	17.95	17.57	1.0	19.0	
	5 MHz	QPSK	25	0	17.93	18.05	18.10	18.03	1.0	19.0
			25	12	18.04	18.09	18.15	18.06	1.0	19.0
			25	25	18.00	18.09	18.10	17.99	1.0	19.0
50			0	18.00	18.09	18.14	17.94	1.0	19.0	
1			0	19.49	19.43	19.37	19.55	0.0	20.0	
1			12	19.47	19.42	19.34	19.49	0.0	20.0	
16QAM	QPSK	1	24	19.55	19.51	19.37	19.58	0.0	20.0	
		12	0	19.60	19.64	19.47	19.59	0.0	20.0	
		12	7	19.64	19.67	19.47	19.64	0.0	20.0	
		12	13	19.60	19.66	19.47	19.57	0.0	20.0	
		25	0	19.57	19.64	19.46	19.57	0.0	20.0	
		1	0	19.58	19.49	19.53	19.51	0.0	20.0	
	16QAM	1	12	19.54	19.51	19.45	19.50	0.0	20.0	
		1	24	19.67	19.59	19.53	19.56	0.0	20.0	
		12	0	19.60	19.69	19.53	19.57	0.0	20.0	
		12	7	19.63	19.69	19.53	19.62	0.0	20.0	
64QAM	12	13	19.63	19.64	19.51	19.55	0.0	20.0		
	25	0	19.58	19.67	19.49	19.59	0.0	20.0		
	1	0	19.30	19.84	19.25	19.72	0.0	20.0		
	1	12	19.34	19.99	19.27	19.68	0.0	20.0		
	1	24	19.36	19.23	19.20	19.75	0.0	20.0		
	12	0	19.59	19.78	19.52	19.56	0.0	20.0		
256QAM	12	7	19.60	19.81	19.51	19.54	0.0	20.0		
	12	13	19.61	19.77	19.82	19.52	0.0	20.0		
	25	0	19.61	19.59	19.68	19.48	0.0	20.0		
	1	0	18.16	17.94	18.12	18.03	1.0	19.0		
	1	12	18.30	18.02	18.07	18.16	1.0	19.0		
	1	24	18.24	18.08	18.08	18.08	1.0	19.0		
5 MHz	256QAM	12	0	17.99	18.01	18.11	18.01	1.0	19.0	
		12	7	18.00	18.08	18.13	18.00	1.0	19.0	
		12	13	17.96	18.01	18.08	17.96	1.0	19.0	
		25	0	18.00	18.02	18.09	17.93	1.0	19.0	
		25	0	18.00	18.02	18.09	17.93	1.0	19.0	

9.4. NR (Sub 6GHz)

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

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

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

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

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

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

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

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

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

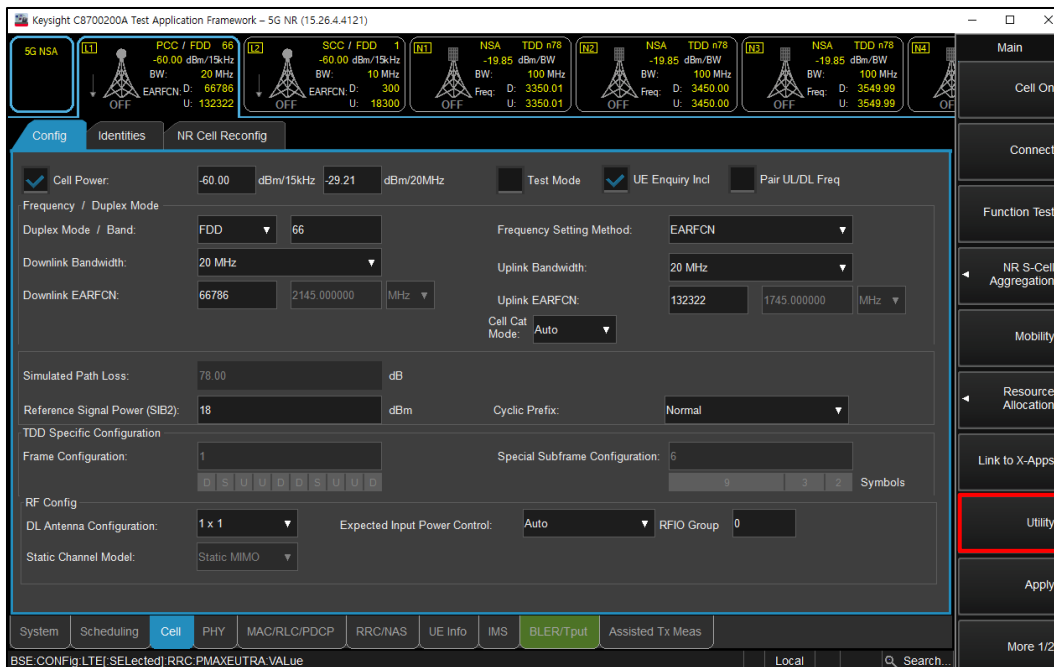
Uplink RB allocations were used to Table 6.1-1 of the 3GPP TS 138.521-1.

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

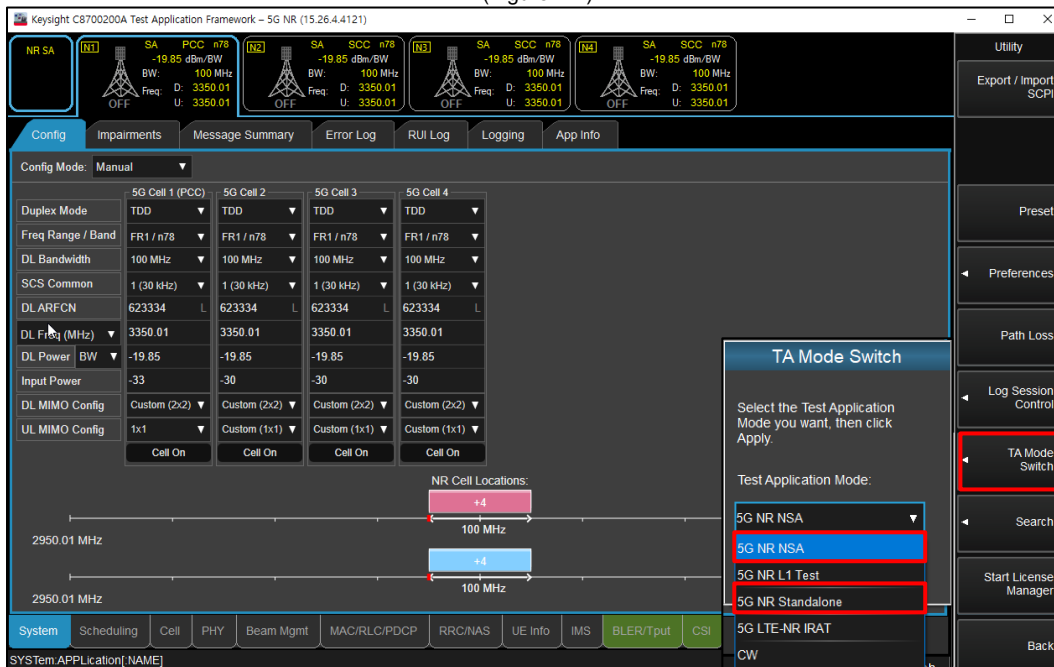
Procedures used to establish power measurement for NR Bands

Switching to NSA mode or SA mode

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



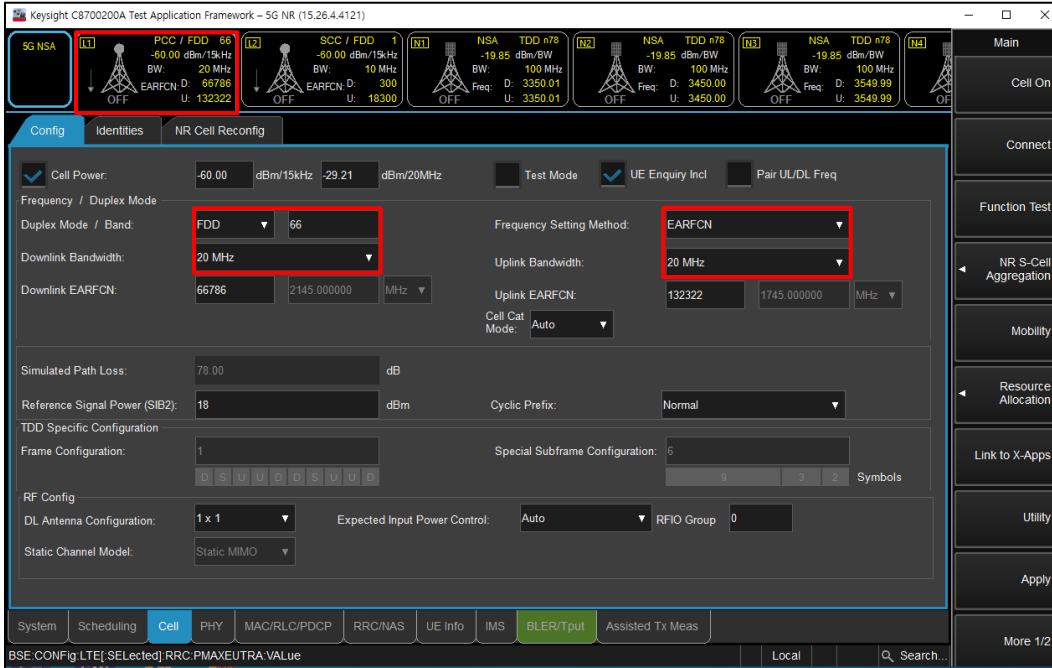
(Figure 1-1)



(Figure 1-2)

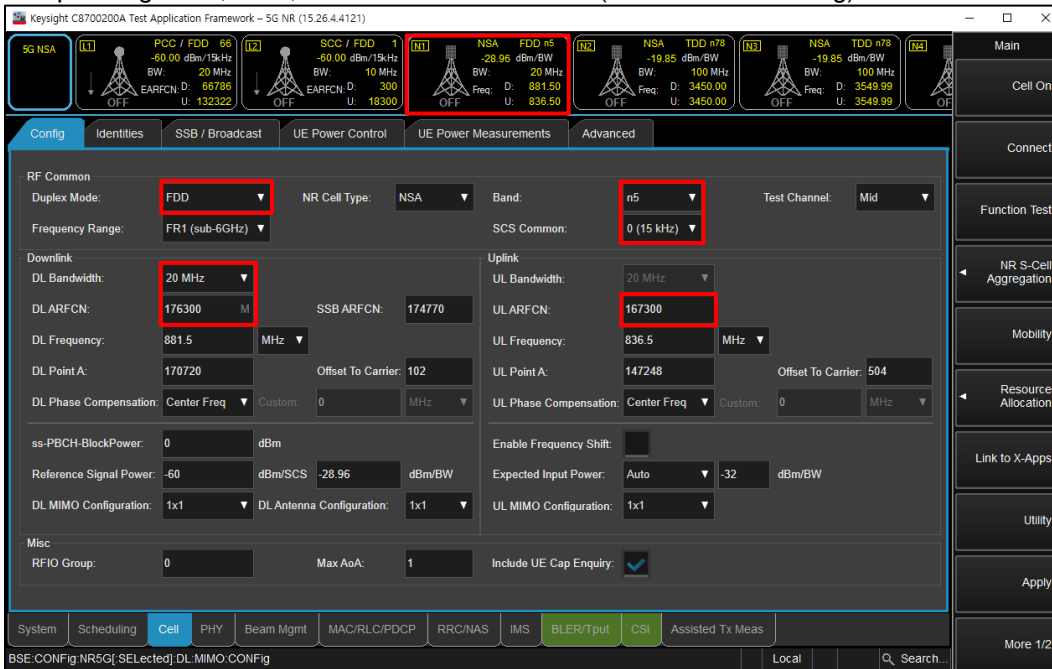
NSA Mode

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



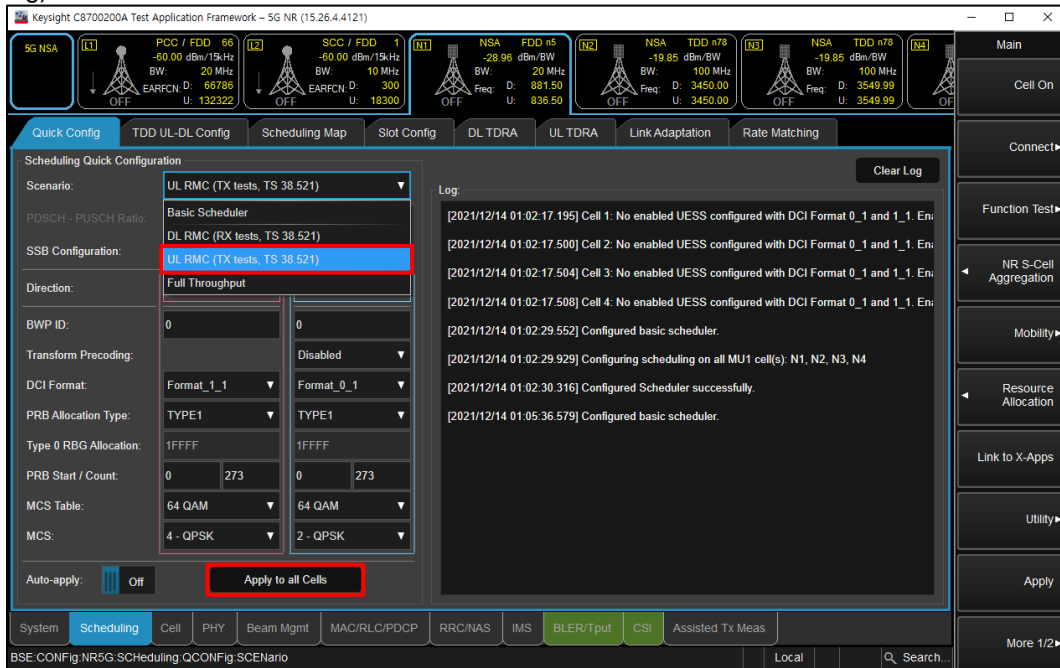
(Figure 2-1)

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



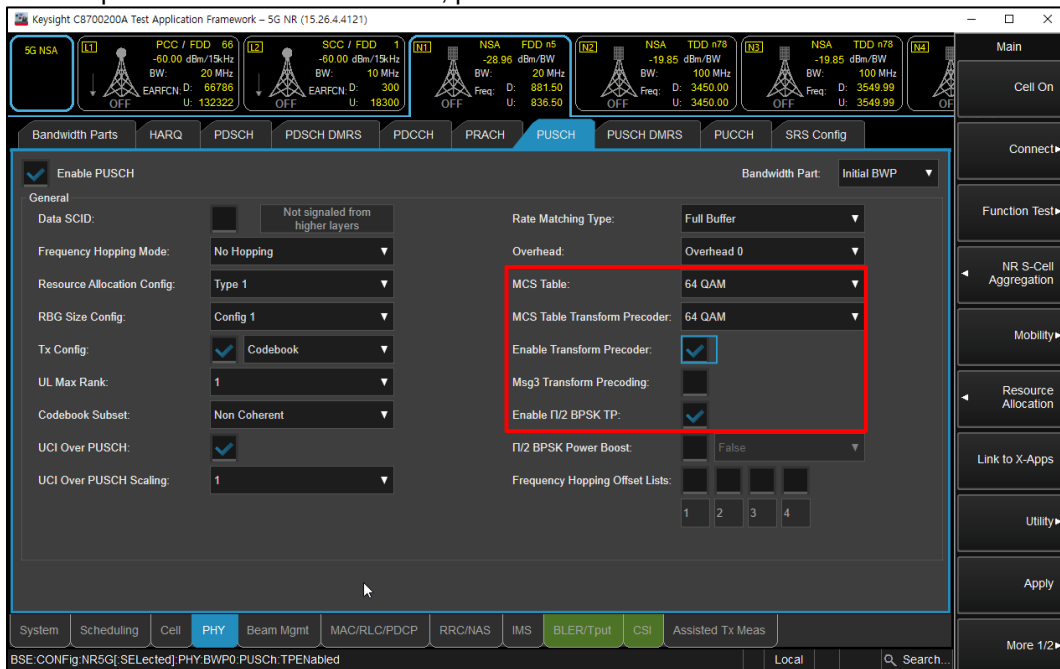
(Figure 2-2)

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



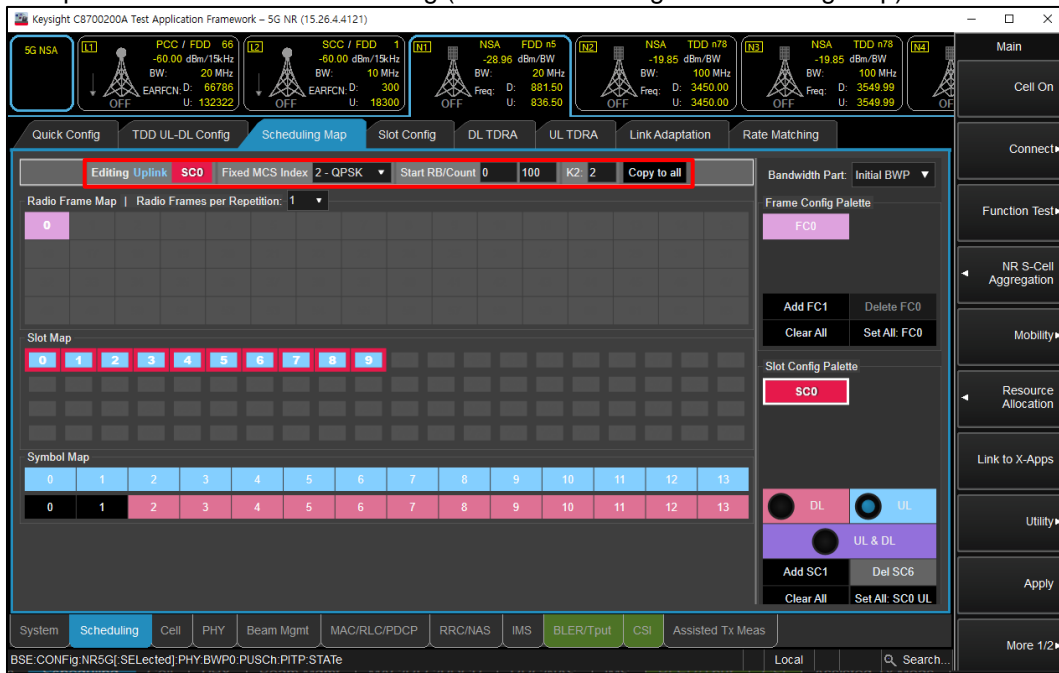
(Figure 2-3)

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



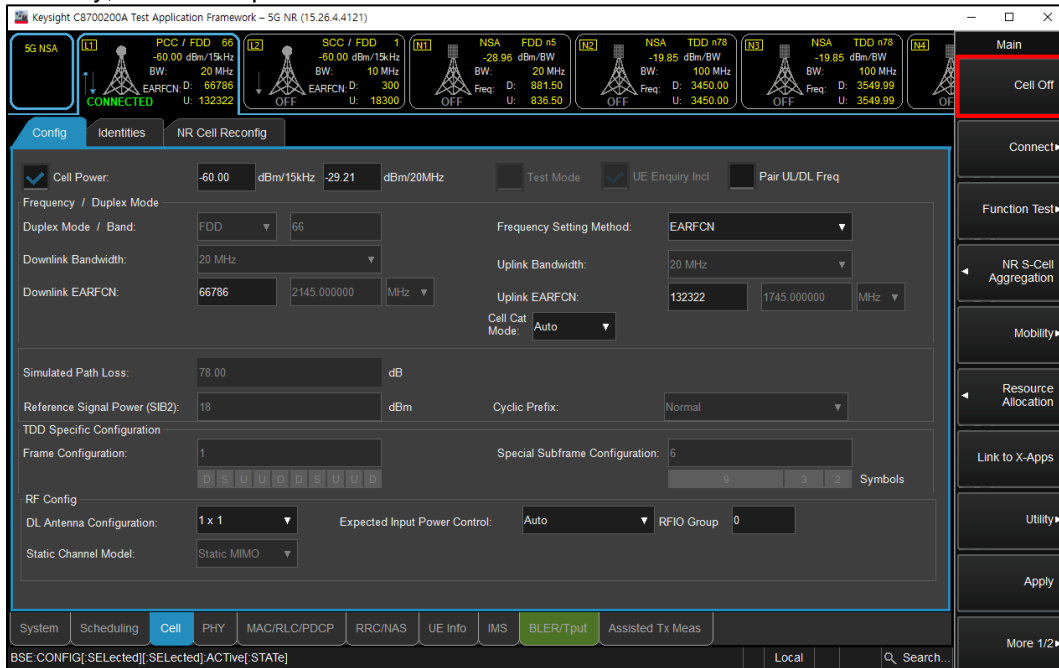
(Figure 2-4)

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



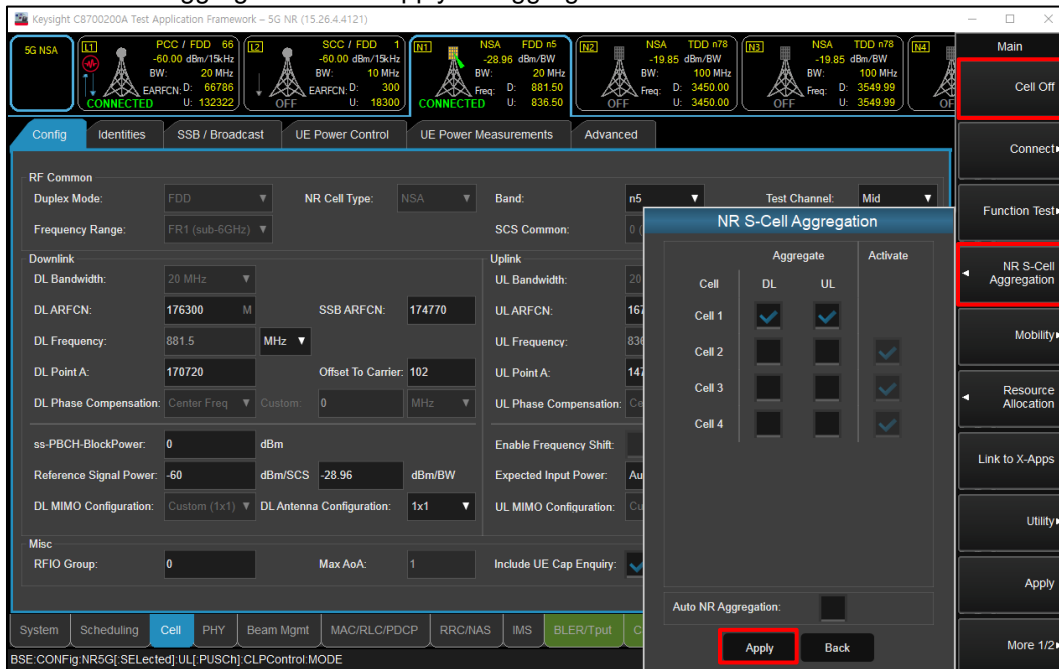
(Figure 2-5)

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



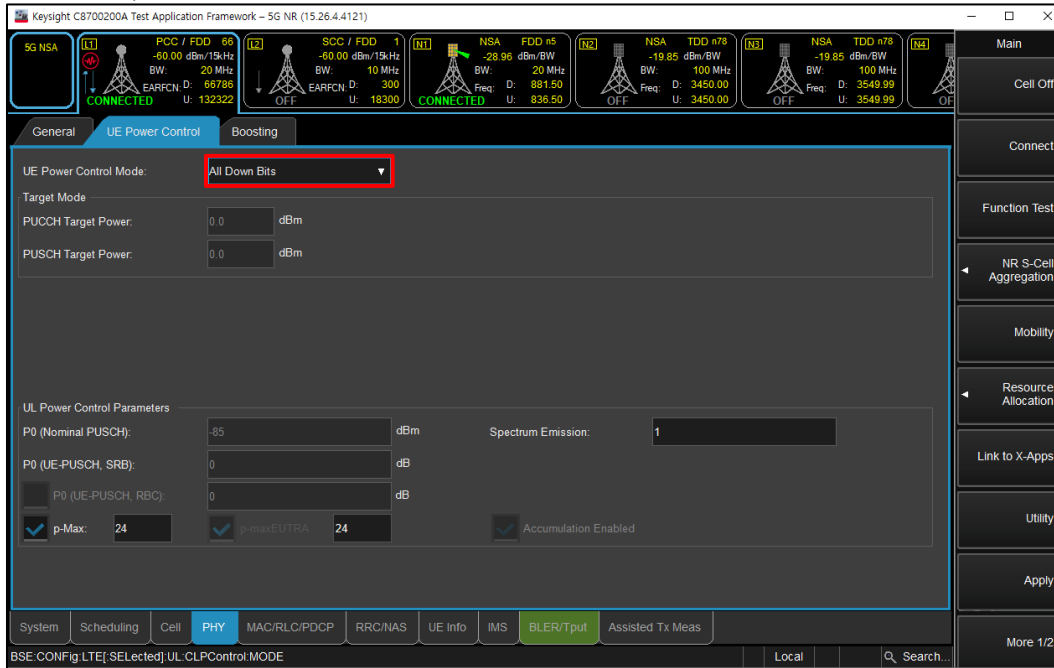
(Figure 2-6)

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



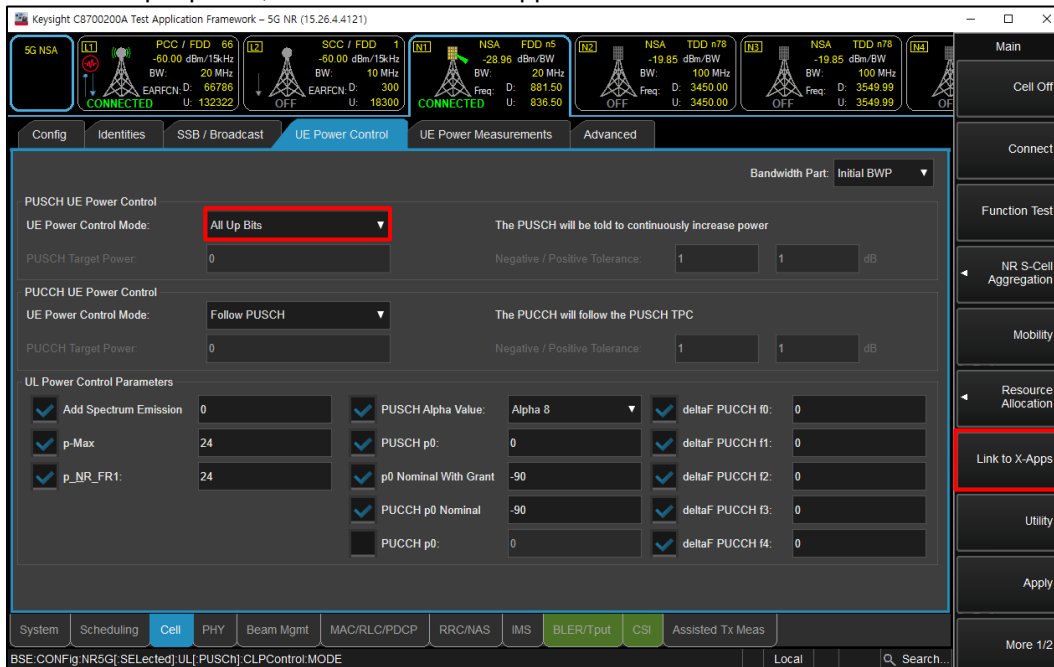
(Figure 2-7)

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



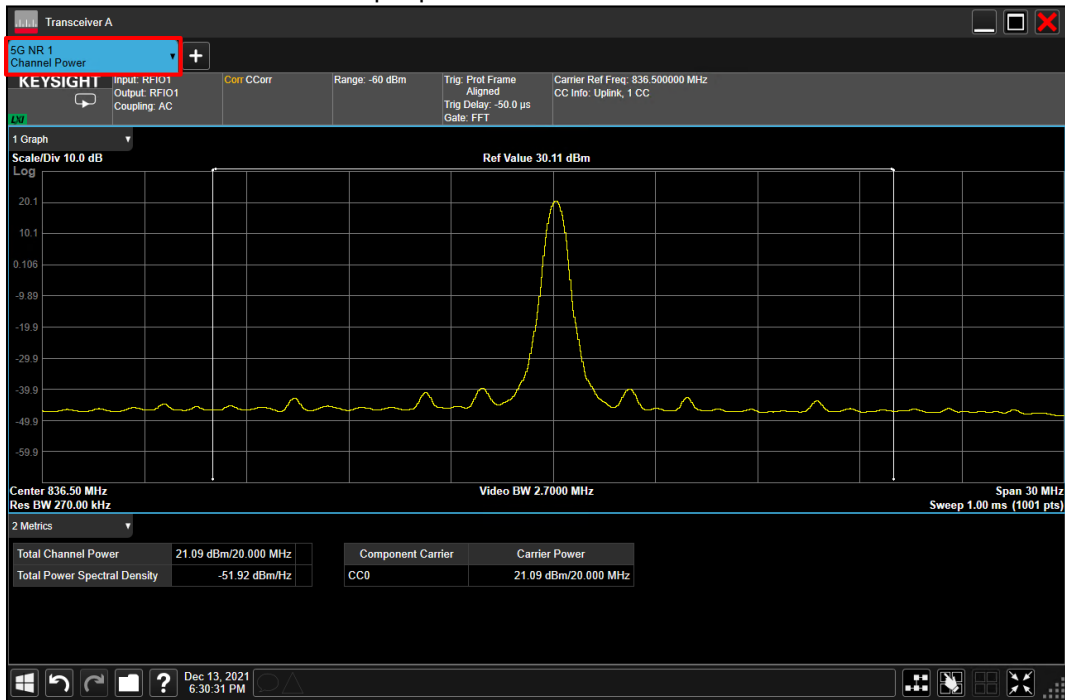
(Figure 2-8)

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



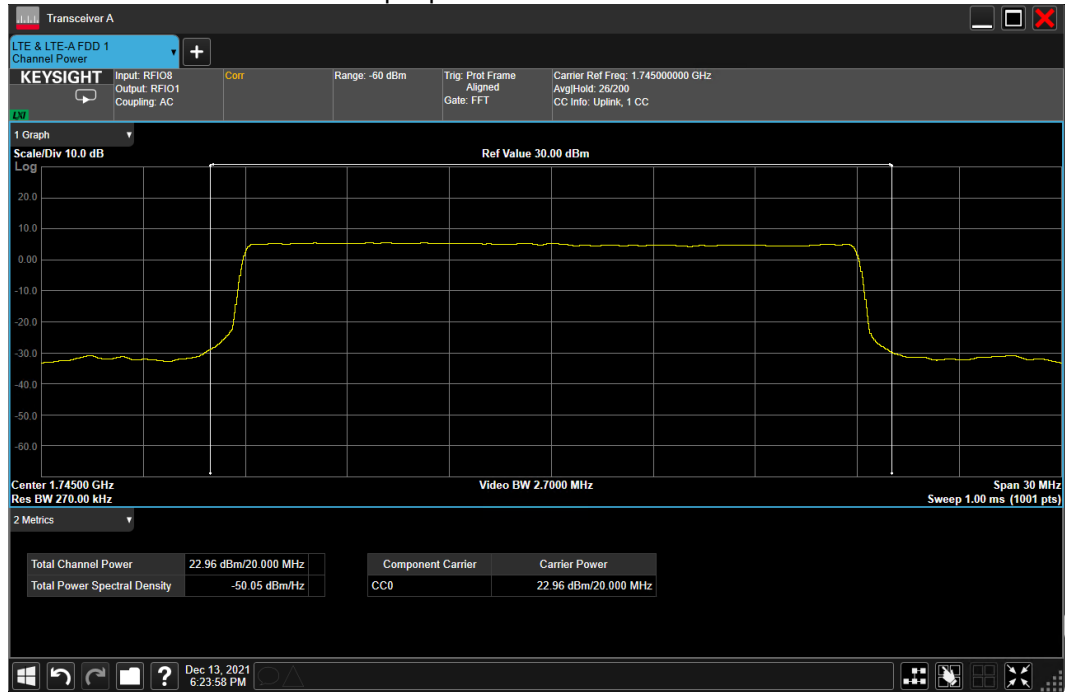
(Figure 2-9)

- Select "Channel Power" for NR output power



(Figure 2-10)

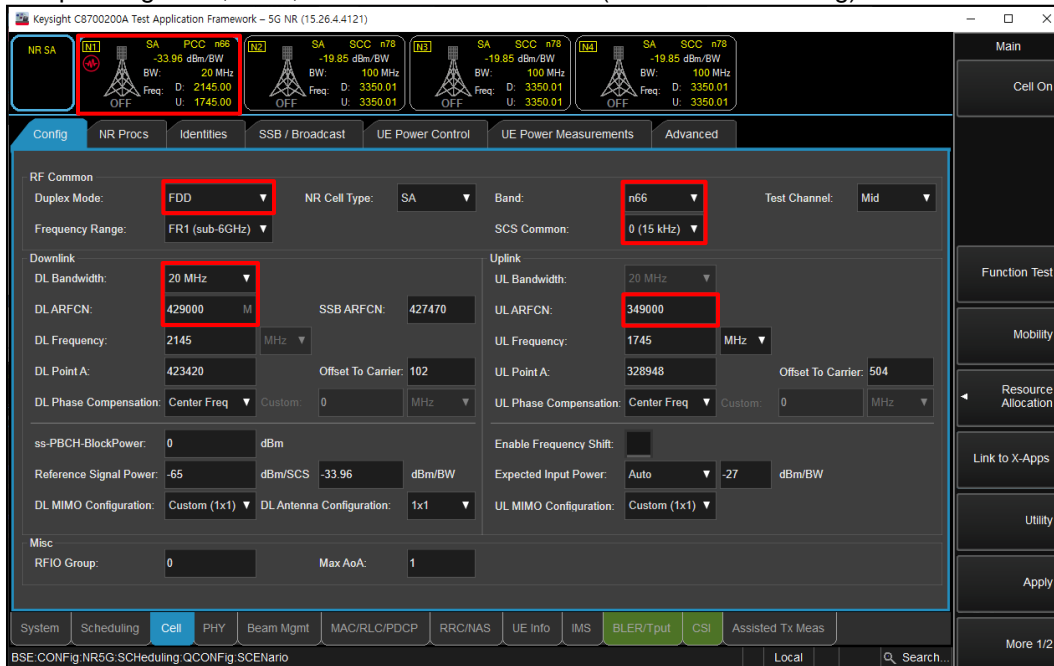
- Select "Channel Power" for LTE output power



(Figure 2-11)

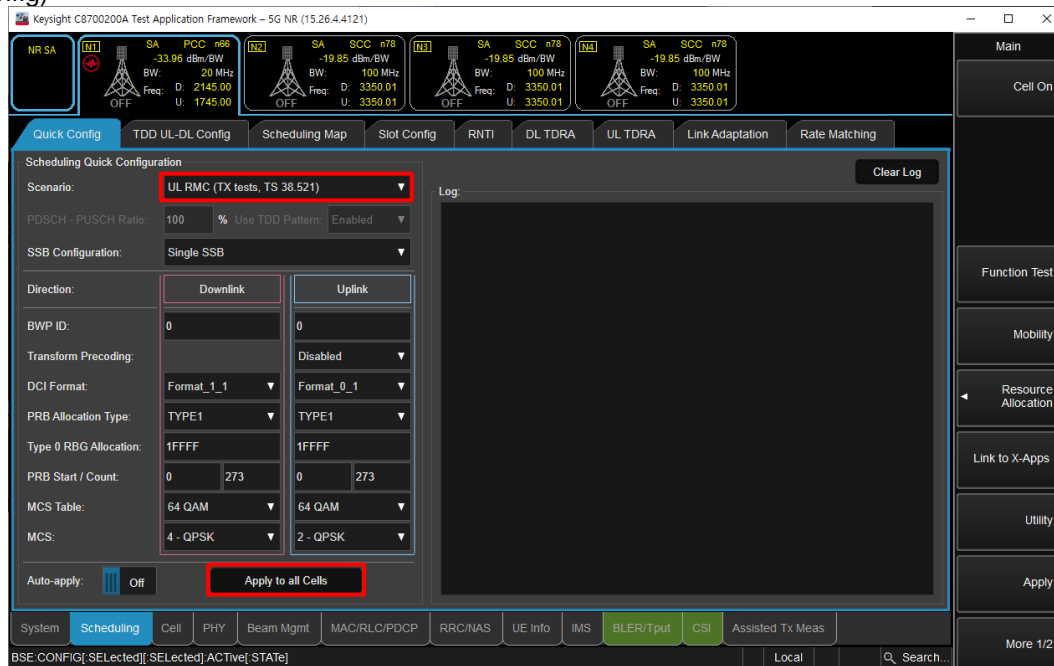
SA Mode

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



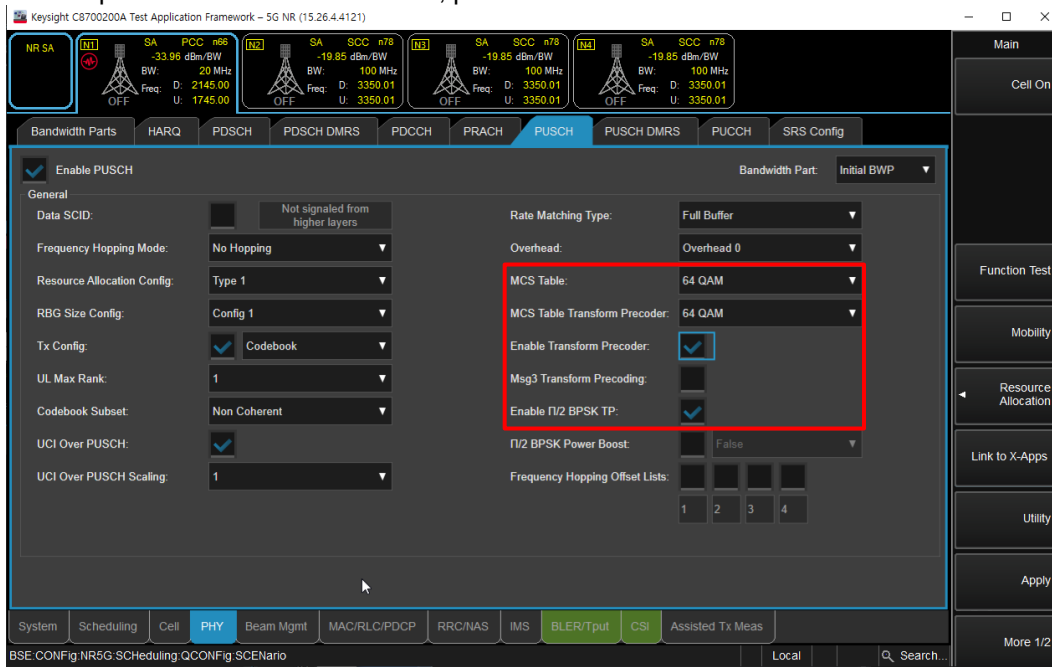
(Figure 3-1)

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



(Figure 3-2)

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



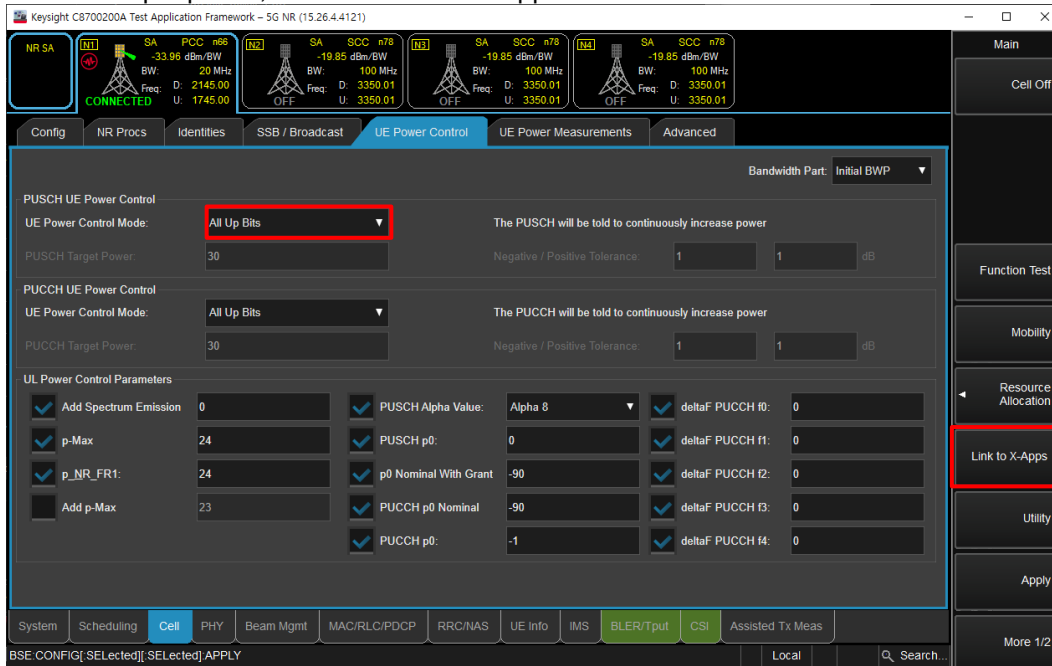
(Figure 3-3)

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



(Figure 3-4)

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



(Figure 3-5)

- Select “Channel Power”



(Figure 3-6)

NR Band n2 Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)														
					DSI = 0, 2					DSI = 3					DSI = 1, 4				
					Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
					372000 1860 MHz	376000 1880 MHz	380000 1900 MHz			372000 1860 MHz	376000 1880 MHz	380000 1900 MHz			372000 1860 MHz	376000 1880 MHz	380000 1900 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.71	23.70	23.73	0.0	25.0	20.93	20.54	20.82	0.0	22.0	20.87	20.76	20.84	0.00	22.0
			1	53	23.67	23.74	23.73	0.0	25.0	20.83	20.47	20.80	0.0	22.0	20.85	20.74	20.86	0.00	22.0
			1	104	23.70	23.63	23.75	0.0	25.0	20.79	20.59	20.84	0.0	22.0	20.82	20.70	20.85	0.00	22.0
			50	0	22.82	22.89	22.93	0.5	24.5	20.97	20.85	20.97	0.0	22.0	21.00	20.86	20.97	0.00	22.0
			50	28	23.89	23.87	23.96	0.0	25.0	20.99	20.90	21.02	0.0	22.0	21.00	20.91	21.03	0.00	22.0
			50	56	22.83	22.85	22.98	0.5	24.5	20.96	20.81	20.96	0.0	22.0	20.95	20.84	20.99	0.00	22.0
		100	0	22.90	22.88	22.96	0.5	24.5	20.99	20.90	20.97	0.0	22.0	21.01	20.86	21.00	0.00	22.0	
		QPSK	1	1	23.88	23.91	23.95	0.0	25.0	21.00	20.94	20.98	0.0	22.0	21.01	20.96	20.95	0.00	22.0
			1	53	23.87	23.88	23.93	0.0	25.0	20.99	20.90	21.02	0.0	22.0	21.01	20.96	21.02	0.00	22.0
			1	104	23.81	23.89	23.96	0.0	25.0	20.99	20.97	21.03	0.0	22.0	21.00	20.99	21.04	0.00	22.0
			50	0	22.90	22.91	22.96	1.0	24.0	21.01	20.98	20.92	0.0	22.0	20.99	20.95	20.96	0.00	22.0
			50	28	23.90	23.90	23.92	0.0	25.0	21.00	21.00	21.02	0.0	22.0	21.02	21.01	21.07	0.00	22.0
	50		56	22.81	22.84	22.93	1.0	24.0	20.95	20.94	21.00	0.0	22.0	20.93	20.98	21.05	0.00	22.0	
	16QAM	1	1	22.80	22.78	22.87	1.0	24.0	20.95	20.99	20.95	0.0	22.0	21.01	21.00	20.89	0.00	22.0	
		1	53	22.81	22.81	22.85	1.0	24.0	20.95	21.00	20.91	0.0	22.0	20.92	21.06	20.89	0.00	22.0	
1		104	22.79	22.75	22.83	1.0	24.0	20.87	20.91	20.90	0.0	22.0	20.91	20.90	20.92	0.00	22.0		
64QAM		1	1	21.68	21.62	21.62	2.5	22.5	21.18	21.18	21.19	0.0	22.0	21.19	21.20	21.27	0.00	22.0	
256QAM	1	1	18.75	18.93	18.98	4.5	20.5	18.72	18.90	18.93	1.5	20.5	18.56	18.95	18.98	1.50	20.5		
CP-OFDM	QPSK	1	1	22.46	22.40	22.54	1.5	23.5	20.93	21.01	21.04	0.0	22.0	20.95	20.99	21.11	0.00	22.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
				387500.00 1857.5 MHz	392000.00 1880 MHz	396500.00 1902.5 MHz	387500.00 1857.5 MHz			392000.00 1880 MHz	396500.00 1902.5 MHz	387500.00 1857.5 MHz			392000.00 1880 MHz	396500.00 1902.5 MHz			
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.74	23.62	23.65	0.0	25.0	21.03	20.85	20.81	0.0	22.0	20.99	20.82	20.76	0.00	22.0
			1	40	23.63	23.72	23.67	0.0	25.0	20.93	20.79	20.78	0.0	22.0	20.90	20.80	20.83	0.00	22.0
			1	77	23.66	23.59	23.71	0.0	25.0	20.93	20.80	20.81	0.0	22.0	20.91	20.75	20.83	0.00	22.0
			36	0	22.85	22.79	22.88	0.5	24.5	21.06	20.86	20.92	0.0	22.0	21.06	20.91	20.93	0.00	22.0
			36	22	23.83	23.81	23.87	0.0	25.0	21.03	20.94	20.87	0.0	22.0	21.06	20.90	20.85	0.00	22.0
			36	43	22.78	22.79	22.85	0.5	24.5	21.01	20.89	20.77	0.0	22.0	21.05	20.84	20.87	0.00	22.0
		75	0	22.80	22.84	22.87	0.5	24.5	21.03	20.96	20.93	0.0	22.0	21.04	20.90	20.90	0.00	22.0	
		QPSK	1	1	23.91	23.85	23.83	0.0	25.0	21.16	20.93	20.93	0.0	22.0	21.12	20.97	20.89	0.00	22.0
			1	40	23.83	23.76	23.86	0.0	25.0	21.01	20.94	20.87	0.0	22.0	21.04	20.88	20.87	0.00	22.0
			1	77	23.84	23.78	23.87	0.0	25.0	21.03	20.93	20.91	0.0	22.0	21.08	20.95	20.94	0.00	22.0
			36	0	22.74	22.86	22.90	1.0	24.0	21.09	20.93	20.91	0.0	22.0	21.15	20.94	20.88	0.00	22.0
			36	22	23.85	23.76	23.87	0.0	25.0	21.06	20.91	20.87	0.0	22.0	21.03	20.95	20.91	0.00	22.0
	36		43	22.81	22.77	22.87	1.0	24.0	21.03	20.91	20.88	0.0	22.0	21.08	20.88	20.92	0.00	22.0	
	75	0	22.87	22.85	22.90	1.0	24.0	21.08	20.93	20.92	0.0	22.0	21.12	20.93	20.94	0.00	22.0		
	16QAM	1	1	22.82	22.68	22.77	1.0	24.0	21.08	20.97	20.90	0.0	22.0	21.12	20.91	20.93	0.00	22.0	
64QAM		1	1	21.65	21.54	21.57	2.5	22.5	21.31	21.18	21.13	0.0	22.0	21.34	21.14	21.07	0.00	22.0	
256QAM		1	1	18.75	18.92	18.96	4.5	20.5	18.82	18.94	18.94	1.5	20.5	18.78	18.98	18.97	1.50	20.5	
CP-OFDM		QPSK	1	1	22.41	22.42	22.41	1.5	23.5	21.17	21.00	20.90	0.0	22.0	21.21	21.02	20.88	0.00	22.0

NR Band n2 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
					387000.00	392000.00	397000.00			387000.00	392000.00	397000.00			387000.00	392000.00	397000.00		
					1855 MHz	1880 MHz	1905 MHz			1855 MHz	1880 MHz	1905 MHz			1855 MHz	1880 MHz	1905 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.70	23.67	23.87	0.0	25.0	20.90	20.78	20.89	0.0	22.0	20.94	20.81	20.91	0.0	22.0
			1	26	23.68	23.64	23.80	0.0	25.0	20.96	20.77	20.93	0.0	22.0	20.92	20.78	20.96	0.0	22.0
			1	50	23.60	23.57	23.83	0.0	25.0	20.89	20.72	20.94	0.0	22.0	20.90	20.73	20.91	0.0	22.0
			25	0	22.80	22.78	22.94	0.5	24.5	21.02	20.90	20.99	0.0	22.0	21.01	20.90	21.00	0.0	22.0
			25	14	23.75	23.74	24.00	0.0	25.0	21.04	20.85	21.01	0.0	22.0	21.07	20.86	21.02	0.0	22.0
			25	27	22.80	22.72	22.99	0.5	24.5	20.98	20.87	20.97	0.0	22.0	21.01	20.89	20.99	0.0	22.0
			50	0	22.82	22.82	23.01	0.5	24.5	20.98	20.86	21.04	0.0	22.0	21.00	20.84	21.07	0.0	22.0
		QPSK	1	1	23.86	23.79	24.04	0.0	25.0	21.08	20.89	21.06	0.0	22.0	21.02	20.88	21.08	0.0	22.0
			1	26	23.81	23.77	23.98	0.0	25.0	21.02	20.85	20.99	0.0	22.0	21.04	20.87	21.00	0.0	22.0
			1	50	23.72	23.74	24.00	0.0	25.0	20.99	20.87	21.02	0.0	22.0	20.97	20.87	20.94	0.0	22.0
			25	0	22.88	22.81	23.07	1.0	24.0	21.04	20.88	21.03	0.0	22.0	21.07	20.90	21.03	0.0	22.0
			25	14	23.82	23.73	24.04	0.0	25.0	21.02	20.83	20.99	0.0	22.0	21.05	20.86	20.99	0.0	22.0
			25	27	22.77	22.75	23.02	1.0	24.0	20.97	20.84	20.99	0.0	22.0	21.00	20.85	20.99	0.0	22.0
			50	0	22.81	22.82	23.02	1.0	24.0	21.03	20.88	21.02	0.0	22.0	21.02	20.86	21.05	0.0	22.0
		16QAM	1	1	22.80	22.75	22.97	1.0	24.0	21.16	20.89	21.03	0.0	22.0	21.12	21.00	21.06	0.0	22.0
64QAM	1	1	21.58	21.55	21.75	2.5	22.5	21.27	21.08	21.16	0.0	22.0	21.24	21.14	21.17	0.0	22.0		
256QAM	1	1	18.88	18.88	19.09	4.5	20.5	18.88	18.87	19.08	1.5	20.5	18.91	18.86	19.07	1.5	20.5		
CP-OFDM	QPSK	1	1	22.30	22.32	22.50	1.5	23.5	21.07	20.90	21.10	0.0	22.0	21.05	20.92	21.16	0.0	22.0	
5 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.66	23.66	23.83	0.0	25.0	20.88	20.76	20.95	0.0	22.0	20.89	20.75	20.93	0.0	22.0
			1	13	23.63	23.59	23.83	0.0	25.0	20.83	20.74	20.90	0.0	22.0	20.85	20.74	20.88	0.0	22.0
			1	23	23.57	23.54	23.77	0.0	25.0	20.77	20.71	20.87	0.0	22.0	20.78	20.70	20.88	0.0	22.0
			12	0	22.81	22.79	22.95	0.5	24.5	21.05	20.90	21.01	0.0	22.0	20.98	20.91	21.00	0.0	22.0
			12	7	23.76	23.74	23.89	0.0	25.0	20.97	20.86	21.00	0.0	22.0	20.96	20.86	20.99	0.0	22.0
			12	13	22.65	22.69	22.87	0.5	24.5	20.84	20.78	20.95	0.0	22.0	20.85	20.78	20.96	0.0	22.0
			25	0	22.80	22.80	22.99	0.5	24.5	20.93	20.86	20.96	0.0	22.0	20.93	20.87	20.95	0.0	22.0
		QPSK	1	1	23.81	23.80	23.92	0.0	25.0	20.99	20.88	21.02	0.0	22.0	20.99	20.96	21.01	0.0	22.0
			1	13	23.75	23.79	23.99	0.0	25.0	20.92	20.91	20.98	0.0	22.0	21.01	20.90	21.00	0.0	22.0
			1	23	23.68	23.68	23.87	0.0	25.0	20.97	20.82	20.89	0.0	22.0	20.97	20.83	20.98	0.0	22.0
			12	0	22.81	22.83	23.00	1.0	24.0	21.00	20.96	21.05	0.0	22.0	20.99	20.96	21.05	0.0	22.0
			12	7	23.69	23.71	23.95	0.0	25.0	21.02	20.83	20.98	0.0	22.0	20.96	20.91	20.99	0.0	22.0
			12	13	22.69	22.69	22.90	1.0	24.0	20.95	20.79	20.94	0.0	22.0	20.97	20.86	20.94	0.0	22.0
			25	0	22.71	22.80	23.02	1.0	24.0	20.93	20.87	20.97	0.0	22.0	20.95	20.88	20.95	0.0	22.0
		16QAM	1	1	22.72	22.75	22.93	1.0	24.0	21.13	20.92	21.06	0.0	22.0	21.10	20.95	21.05	0.0	22.0
64QAM	1	1	21.50	21.54	21.69	2.5	22.5	21.21	21.06	21.19	0.0	22.0	21.22	21.07	21.19	0.0	22.0		
256QAM	1	1	18.87	18.84	19.06	4.5	20.5	18.88	18.86	19.02	1.5	20.5	18.89	18.78	19.10	1.5	20.5		
CP-OFDM	QPSK	1	1	22.31	22.27	22.56	1.5	23.5	21.05	21.01	20.98	0.0	22.0	20.97	20.92	20.97	0.0	22.0	

NR Band n5 Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)				
					DSI = 0, 1, 2, 3, 4				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					166800 834 MHz	167300 836.5 MHz	167800 839 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1		24.17		0.0	25.5
			1	53		24.29		0.0	25.5
			1	104		24.31		0.0	25.5
			50	0		23.25		0.5	25.0
			50	28		24.29		0.0	25.5
			50	56		23.30		0.5	25.0
		100	0		23.37		0.5	25.0	
		QPSK	1	1		24.20		0.0	25.5
			1	53		24.32		0.0	25.5
			1	104		24.56		0.0	25.5
			50	0		23.31		1.0	24.5
			50	28		24.42		0.0	25.5
			50	56		23.33		1.0	24.5
		16QAM	100	0		23.35		1.0	24.5
	1		1		23.24		1.0	24.5	
1	53			23.28		1.0	24.5		
64QAM	1	104		23.35		1.0	24.5		
	1	1		21.92		2.5	23.0		
256QAM	1	1		19.24		4.5	21.0		
	CP-OFDM	QPSK	1	1		22.71		1.5	24.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					166300.00 831.5 MHz	167300.00 836.5 MHz	168300.00 841.5 MHz		
					15 MHz	DFT-s-OFDM	π/2 BPSK		
1	40	24.2	24.3	24.3				0.0	25.5
1	77	24.3	24.4	24.3				0.0	25.5
36	0	23.3	23.3	23.3				0.5	25.0
36	22	24.3	24.4	24.4				0.0	25.5
36	43	23.4	23.4	23.4				0.5	25.0
75	0	23.3	23.4	23.4				0.5	25.0
QPSK	1	1	24.4	24.3			24.4	0.0	25.5
	1	40	24.3	24.4			24.4	0.0	25.5
	1	77	24.3	24.5			24.5	0.0	25.5
	36	0	23.2	23.3			23.3	1.0	24.5
	36	22	24.3	24.4			24.3	0.0	25.5
	36	43	23.3	23.4			23.4	1.0	24.5
75	0	23.3	23.3	23.5			1.0	24.5	
16QAM	1	1	23.3	23.3		23.3	1.0	24.5	
64QAM	1	1	22.0	22.0	22.1	2.5	23.0		
256QAM	1	1	19.3	19.3	19.4	4.5	21.0		
	CP-OFDM	QPSK	1	1	22.8	22.8	22.9	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
					165800.00	167300.00	168800.00		
					829 MHz	836.5 MHz	844 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.11	24.16	24.31	0.0	25.5
			1	26	24.13	24.32	24.39	0.0	25.5
			1	50	24.27	24.35	24.31	0.0	25.5
			25	0	23.25	23.34	23.41	0.5	25.0
			25	14	24.23	24.44	24.50	0.0	25.5
			25	27	23.31	23.37	23.44	0.5	25.0
		50	0	23.17	23.44	23.49	0.5	25.0	
		QPSK	1	1	24.27	24.27	24.46	0.0	25.5
			1	26	24.20	24.47	24.49	0.0	25.5
			1	50	24.32	24.48	24.40	0.0	25.5
			25	0	23.30	23.40	23.46	1.0	24.5
			25	14	24.24	24.48	24.56	0.0	25.5
			25	27	23.28	23.42	23.49	1.0	24.5
	50	0	23.23	23.41	23.53	1.0	24.5		
16QAM	1	1	23.19	23.17	23.38	1.0	24.5		
64QAM	1	1	21.85	21.88	22.10	2.5	23.0		
256QAM	1	1	19.25	19.24	19.43	4.5	21.0		
CP-OFDM	QPSK	1	1	22.77	22.74	22.93	1.5	24.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					165300.00	167300.00	169300.00		
					826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.22	24.26	24.50	0.0	25.5
			1	13	24.16	24.30	24.40	0.0	25.5
			1	23	24.19	24.33	24.38	0.0	25.5
			12	0	23.27	23.34	23.52	0.5	25.0
			12	7	24.19	24.37	24.43	0.0	25.5
			12	13	23.26	23.36	23.51	0.5	25.0
		25	0	23.25	23.41	23.45	0.5	25.0	
		QPSK	1	1	24.38	24.44	24.57	0.0	25.5
			1	13	24.27	24.36	24.46	0.0	25.5
			1	23	24.31	24.43	24.55	0.0	25.5
			12	0	23.25	23.27	23.48	1.0	24.5
			12	7	24.24	24.32	24.47	0.0	25.5
			12	13	23.22	23.40	23.46	1.0	24.5
	25	0	23.27	23.38	23.50	1.0	24.5		
16QAM	1	1	23.32	23.38	23.54	1.0	24.5		
64QAM	1	1	21.97	22.04	22.22	2.5	23.0		
256QAM	1	1	19.34	19.39	19.58	4.5	21.0		
CP-OFDM	QPSK	1	1	22.84	22.86	23.05	1.5	24.0	

NR Band n66 Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)																			
					DSI = 0, 2					DSI = 3					DSI = 1, 4									
					Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit					
					346000 1730 MHz	349000 1745 MHz	352000 1760 MHz			346000 1730 MHz	349000 1745 MHz	352000 1760 MHz			346000 1730 MHz	349000 1745 MHz	352000 1760 MHz							
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.75	23.78	23.74	0.0	25.0	21.70	21.69	21.30	0.0	22.0	19.65	21.54	21.52	0.0	22.0					
			1	108	23.78	23.77	23.77	0.0	25.0	21.72	21.47	21.36	0.0	22.0	21.75	21.09	21.51	0.0	22.0					
			1	214	23.47	23.74	23.77	0.0	25.0	21.33	21.43	21.28	0.0	22.0	21.42	21.56	20.52	0.0	22.0					
			108	0	22.92	23.10	22.93	0.5	24.5	21.80	21.71	21.60	0.0	22.0	21.65	21.50	21.86	0.0	22.0					
			108	54	23.93	24.07	23.97	0.0	25.0	21.78	21.61	21.55	0.0	22.0	21.68	21.82	21.55	0.0	22.0					
			108	108	22.78	23.08	22.94	0.5	24.5	21.69	21.59	21.53	0.0	22.0	21.33	21.62	21.86	0.0	22.0					
		QPSK	216	0	22.81	23.11	23.03	0.5	24.5	21.74	21.68	21.55	0.0	22.0	19.51	21.48	21.85	0.0	22.0					
			1	1	23.92	24.10	23.97	0.0	25.0	21.56	21.58	21.52	0.0	22.0	21.40	21.52	21.47	0.0	22.0					
			1	108	23.94	23.87	23.99	0.0	25.0	21.54	21.53	21.48	0.0	22.0	21.32	21.51	20.43	0.0	22.0					
			1	214	23.59	23.91	23.91	0.0	25.0	21.50	21.49	21.43	0.0	22.0	21.34	21.50	21.51	0.0	22.0					
			108	0	22.98	23.22	22.87	1.0	24.0	21.56	21.61	21.50	0.0	22.0	21.41	21.60	21.55	0.0	22.0					
			108	54	24.00	24.05	24.03	0.0	25.0	21.58	21.63	21.59	0.0	22.0	21.32	21.61	21.47	0.0	22.0					
		16QAM	108	108	22.82	23.09	23.05	1.0	24.0	21.61	21.62	21.58	0.0	22.0	20.35	21.60	21.51	0.0	22.0					
			216	0	22.89	23.15	23.02	1.0	24.0	21.72	21.69	21.53	0.0	22.0	21.68	21.11	21.47	0.0	22.0					
			1	1	22.78	23.17	22.90	1.0	24.0	21.73	21.73	21.41	0.0	22.0	21.58	21.63	21.15	0.0	22.0					
			1	108	22.82	22.95	23.03	1.0	24.0	21.80	21.44	21.45	0.0	22.0	21.72	21.58	21.70	0.0	22.0					
			1	214	22.48	22.91	22.84	1.0	24.0	21.36	21.49	21.34	0.0	22.0	21.67	21.83	21.59	0.0	22.0					
			64QAM	1	1	21.66	21.96	21.71	2.5	22.5	21.66	21.98	21.68	0.0	22.0	21.58	21.55	21.73	0.0	22.0				
256QAM	1	1	19.00	19.36	19.09	4.5	20.5	18.96	19.38	19.12	1.5	20.5	21.81	21.45	21.68	0.0	22.0							
CP-OFDM	QPSK	1	1	22.51	22.92	22.60	1.5	23.5	21.97	21.89	21.51	0.0	22.0	21.57	20.66	21.58	0.0	22.0						
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit					
					345000.00 1725 MHz	349000.00 1745 MHz	353000.00 1765 MHz			345000.00 1725 MHz	349000.00 1745 MHz	353000.00 1765 MHz			345000.00 1725 MHz	349000.00 1745 MHz	353000.00 1765 MHz							
					30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.85	24.20	24.01	0.0	25.0	21.82	21.61	21.41	0.0	22.0	21.92	21.48	21.60	0.0	22.0
								1	80	23.84	23.91	24.01	0.0	25.0	21.84	21.59	21.39	0.0	22.0	21.93	21.47	21.54	0.0	22.0
1	158	23.50	23.90	23.95				0.0	25.0	21.44	21.38	21.32	0.0	22.0	21.54	21.43	21.83	0.0	22.0					
80	0	23.00	23.32	23.18				0.5	24.5	21.91	21.68	21.50	0.0	22.0	21.87	21.40	21.65	0.0	22.0					
80	40	24.00	24.04	24.21				0.0	25.0	21.85	21.55	21.55	0.0	22.0	21.88	21.10	21.21	0.0	22.0					
80	80	23.09	23.15	23.24				0.5	24.5	21.89	21.53	21.62	0.0	22.0	21.48	21.30	20.05	0.0	22.0					
QPSK	160	0	23.03	23.25			23.25	0.5	24.5	21.88	21.64	21.53	0.0	22.0	21.80	21.60	21.64	0.0	22.0					
	1	1	23.97	24.37			24.20	0.0	25.0	21.95	21.84	21.50	0.0	22.0	21.44	21.50	21.47	0.0	22.0					
	1	80	23.98	24.07			24.16	0.0	25.0	21.92	21.56	21.52	0.0	22.0	21.43	21.70	21.63	0.0	22.0					
	1	158	23.72	24.03			24.20	0.0	25.0	21.62	21.50	21.48	0.0	22.0	21.36	21.50	21.68	0.0	22.0					
	80	0	23.04	23.15			23.19	1.0	24.0	21.96	21.65	21.52	0.0	22.0	21.50	21.77	21.47	0.0	22.0					
	80	40	24.02	24.06			24.19	0.0	25.0	21.88	21.54	21.56	0.0	22.0	21.52	21.90	20.26	0.0	22.0					
16QAM	80	80	23.05	23.11			23.29	1.0	24.0	21.89	21.62	21.57	0.0	22.0	21.31	21.71	21.60	0.0	22.0					
	160	0	23.03	23.21			23.31	1.0	24.0	21.86	21.71	21.59	0.0	22.0	21.76	21.68	21.58	0.0	22.0					
	1	1	22.90	23.33			23.09	1.0	24.0	21.89	21.75	21.46	0.0	22.0	21.49	22.00	21.68	0.0	22.0					
	64QAM	1	1	21.74			22.02	21.92	2.5	22.5	21.78	21.98	21.73	0.0	22.0	21.39	21.60	19.68	0.0	22.0				
	256QAM	1	1	19.10			19.51	19.33	4.5	20.5	19.10	19.42	19.35	1.5	20.5	21.12	21.50	21.50	0.0	22.0				
	CP-OFDM	QPSK	1	1			22.59	22.90	22.84	1.5	23.5	21.98	21.84	21.61	0.0	22.0	21.44	20.24	21.49	0.0	22.0			

NR Band n66 Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)														
					DSI = 0, 2					DSI = 3					DSI = 1, 4				
					Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
					344000	349000	354000			344000	349000	354000			344000	349000	354000		
					1720 MHz	1745 MHz	1770 MHz			1720 MHz	1745 MHz	1770 MHz			1720 MHz	1745 MHz	1770 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.75	24.12	23.99	0.0	25.0	21.50	20.95	21.24	0.0	22.0	21.54	20.94	21.28	0.0	22.0
			1	53	24.23	23.94	23.95	0.0	25.0	21.97	20.97	21.22	0.0	22.0	21.99	20.94	21.28	0.0	22.0
			1	104	23.75	23.91	24.00	0.0	25.0	21.59	20.99	21.26	0.0	22.0	21.58	20.98	21.32	0.0	22.0
			50	0	23.33	23.26	23.07	0.5	24.5	21.97	21.25	21.32	0.0	22.0	21.95	21.23	21.38	0.0	22.0
			50	28	24.35	24.15	24.18	0.0	25.0	21.80	21.31	21.39	0.0	22.0	21.76	21.27	21.41	0.0	22.0
			50	56	23.30	23.18	23.19	0.5	24.5	21.99	21.23	21.38	0.0	22.0	21.95	21.33	21.43	0.0	22.0
		100	0	23.21	23.13	23.17	0.5	24.5	21.90	21.36	21.41	0.0	22.0	21.99	21.33	21.39	0.0	22.0	
		QPSK	1	1	23.87	24.40	24.17	0.0	25.0	21.69	21.53	21.37	0.0	22.0	21.69	21.57	21.40	0.0	22.0
			1	53	24.33	24.06	24.11	0.0	25.0	21.87	21.33	21.30	0.0	22.0	21.84	21.31	21.36	0.0	22.0
			1	104	23.92	24.08	24.23	0.0	25.0	21.67	21.38	21.38	0.0	22.0	21.71	21.37	21.36	0.0	22.0
			50	0	23.34	23.14	23.19	1.0	24.0	21.98	21.56	21.35	0.0	22.0	21.93	21.57	21.40	0.0	22.0
			50	28	24.35	24.21	24.21	0.0	25.0	21.96	21.57	21.39	0.0	22.0	21.96	21.54	21.43	0.0	22.0
			50	56	23.32	23.16	23.22	1.0	24.0	21.98	21.54	21.39	0.0	22.0	21.98	21.58	21.37	0.0	22.0
		100	0	23.23	23.20	23.19	1.0	24.0	21.99	21.56	21.41	0.0	22.0	22.00	21.56	21.39	0.0	22.0	
		16QAM	1	1	22.80	23.18	23.03	1.0	24.0	21.59	21.75	21.30	0.0	22.0	21.63	21.61	21.28	0.0	22.0
			1	53	23.37	23.16	23.19	1.0	24.0	21.98	21.58	21.39	0.0	22.0	21.97	21.56	21.34	0.0	22.0
			1	104	22.99	23.13	23.24	1.0	24.0	21.65	21.59	21.41	0.0	22.0	21.68	21.61	21.51	0.0	22.0
		64QAM	1	1	21.63	22.04	21.89	2.5	22.5	21.80	21.96	21.60	0.0	22.0	21.50	22.00	21.56	0.0	22.0
256QAM	1	1	18.77	19.25	19.11	4.5	20.5	18.79	19.24	19.14	1.5	20.5	18.78	19.25	19.17	1.5	20.5		
CP-OFDM	QPSK	1	1	22.46	22.88	22.78	1.5	23.5	21.64	21.78	21.37	0.0	22.0	21.65	21.81	21.36	0.0	22.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit	Measured Pwr (dBm)			MPR	Tune-up Limit
					343500.00	349000.00	354500.00			343500.00	349000.00	354500.00			343500.00	349000.00	354500.00		
					1717.5 MHz	1745 MHz	1772.5 MHz			1717.5 MHz	1745 MHz	1772.5 MHz			1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.70	23.71	23.73	0.0	25.0	21.33	21.07	21.03	0.0	22.0	21.54	21.25	21.18	0.0	22.0
			1	40	23.91	23.68	23.75	0.0	25.0	21.56	21.04	21.02	0.0	22.0	21.77	21.21	21.13	0.0	22.0
			1	77	23.79	23.82	23.78	0.0	25.0	21.37	21.11	21.14	0.0	22.0	21.63	21.32	21.05	0.0	22.0
			36	0	23.10	22.94	22.89	0.5	24.5	21.61	21.20	21.17	0.0	22.0	21.89	21.39	21.09	0.0	22.0
			36	22	24.11	23.92	23.93	0.0	25.0	21.69	21.16	21.15	0.0	22.0	21.95	21.34	21.08	0.0	22.0
			36	43	22.99	22.86	22.97	0.5	24.5	21.55	21.18	21.21	0.0	22.0	21.91	21.32	21.11	0.0	22.0
		75	0	23.09	22.93	22.91	0.5	24.5	21.62	21.25	21.19	0.0	22.0	21.86	21.35	21.15	0.0	22.0	
		QPSK	1	1	23.87	23.94	23.90	0.0	25.0	21.39	21.24	21.16	0.0	22.0	21.68	21.35	21.10	0.0	22.0
			1	40	24.20	23.89	23.88	0.0	25.0	21.68	21.31	21.08	0.0	22.0	21.95	21.33	21.10	0.0	22.0
			1	77	23.95	24.00	23.96	0.0	25.0	21.46	21.35	21.23	0.0	22.0	21.70	21.38	21.20	0.0	22.0
			36	0	23.02	22.95	23.02	1.0	24.0	21.54	21.35	21.19	0.0	22.0	21.84	21.37	21.20	0.0	22.0
			36	22	24.15	23.91	23.96	0.0	25.0	21.66	21.39	21.20	0.0	22.0	21.97	21.35	21.18	0.0	22.0
			36	43	23.01	22.95	22.92	1.0	24.0	21.61	21.40	21.18	0.0	22.0	21.99	21.42	21.14	0.0	22.0
		75	0	23.11	22.95	22.95	1.0	24.0	21.62	21.34	21.19	0.0	22.0	21.90	21.37	21.14	0.0	22.0	
		16QAM	1	1	22.79	22.95	22.85	1.0	24.0	21.37	21.30	21.11	0.0	22.0	21.63	21.34	21.13	0.0	22.0
		64QAM	1	1	21.36	21.63	21.63	2.5	22.5	21.61	21.51	21.37	0.0	22.0	21.56	21.58	21.28	0.0	22.0
		256QAM	1	1	18.82	18.89	18.91	4.5	20.5	18.82	18.90	18.93	1.5	20.5	18.80	18.91	18.87	1.5	20.5
		CP-OFDM	QPSK	1	1	22.40	22.47	22.44	1.5	23.5	21.39	21.37	21.13	0.0	22.0	21.81	21.29	21.13	0.0

NR Band n66 Measured Results (Continued)

Table with columns: BW (MHz), Modulation, Mode, RB Allocation, RB offset, Measured Pwr (dBm) (343000.00, 349000.00, 355000.00), MPR, Tune-up Limit, Measured Pwr (dBm) (343000.00, 349000.00, 355000.00), MPR, Tune-up Limit, Measured Pwr (dBm) (343000.00, 349000.00, 355000.00), MPR, Tune-up Limit. Rows include configurations for 10 MHz and 5 MHz bandwidths using various modulation schemes like DFT-s-OFDM and CP-OFDM.

NR Band n77-DoD (Voice/data/SRS0) Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)				
					DSI = 0, 1, 2, 3, 4				
					Measured Pwr (dBm)			MPR	Tune-up Limit
633000.00	633334.00	633666.00							
100 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.81	0.0	18.0		
			1	137	16.59	0.0	18.0		
			1	271	16.54	0.0	18.0		
			135	0	16.59	0.0	18.0		
			135	69	16.51	0.0	18.0		
			135	138	16.46	0.0	18.0		
			270	0	16.48	0.0	18.0		
		QPSK	1	1	16.62	0.0	18.0		
			1	137	16.72	0.0	18.0		
			1	271	16.53	0.0	18.0		
			135	0	16.48	0.0	18.0		
			135	69	16.52	0.0	18.0		
			135	138	16.58	0.0	18.0		
			270	0	16.47	0.0	18.0		
		16QAM	1	1	17.03	0.0	18.0		
			1	137	16.77	0.0	18.0		
			1	271	16.77	0.0	18.0		
		64QAM	1	1	16.84	0.0	18.0		
256QAM	1	1	16.84	0.0	18.0				
CP-OFDM	QPSK	1	1	16.81	0.0	18.0			
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					633000.00	633334.00	633666.00		
					3495 MHz	3500.01 MHz	3504.99 MHz		
90 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.47	0.0	18.0		
			1	123	16.32	0.0	18.0		
			1	243	16.31	0.0	18.0		
			120	0	16.48	0.0	18.0		
			120	63	16.41	0.0	18.0		
			120	125	16.34	0.0	18.0		
			243	0	16.45	0.0	18.0		
		QPSK	1	1	16.54	0.0	18.0		
			1	123	16.42	0.0	18.0		
			1	243	16.39	0.0	18.0		
			120	0	16.55	0.0	18.0		
			120	63	16.48	0.0	18.0		
			120	125	16.67	0.0	18.0		
			243	0	16.38	0.0	18.0		
		16QAM	1	1	16.62	0.0	18.0		
		64QAM	1	1	16.77	0.0	18.0		
		256QAM	1	1	16.57	0.0	18.0		
		CP-OFDM	QPSK	1	1	16.51	0.0	18.0	

Notes:

NR Band n77-DoD (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					632668.00	633334.00	634000.00		
					3490.02 MHz	3500.01 MHz	3510 MHz		
80 MHz	DFT-s-OFDM	π/2 BPSK	1	1		16.52		0.0	18.0
			1	109		16.31		0.0	18.0
			1	215		16.24		0.0	18.0
			108	0		16.41		0.0	18.0
			108	55		16.37		0.0	18.0
			108	109		16.23		0.0	18.0
			216	0		16.32		0.0	18.0
		QPSK	1	1		16.52		0.0	18.0
			1	109		16.32		0.0	18.0
			1	215		16.18		0.0	18.0
			108	0		16.42		0.0	18.0
			108	55		16.32		0.0	18.0
			108	109		16.26		0.0	18.0
			216	0		16.38		0.0	18.0
		16QAM	1	1		16.60		0.0	18.0
		64QAM	1	1		16.74		0.0	18.0
256QAM	1	1		16.49		0.0	18.0		
CP-OFDM	QPSK	1	1		16.51		0.0	18.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					632334.00	633334.00	634332.00		
					3485.01 MHz	3500.01 MHz	3514.98 MHz		
70 MHz	DFT-s-OFDM	π/2 BPSK	1	1		16.61		0.0	18.0
			1	95		16.37		0.0	18.0
			1	188		16.23		0.0	18.0
			90	0		16.47		0.0	18.0
			90	50		16.41		0.0	18.0
			90	99		16.35		0.0	18.0
			180	0		16.46		0.0	18.0
		QPSK	1	1		16.62		0.0	18.0
			1	95		16.41		0.0	18.0
			1	188		16.24		0.0	18.0
			90	0		16.59		0.0	18.0
			90	50		16.47		0.0	18.0
			90	99		16.36		0.0	18.0
			180	0		16.45		0.0	18.0
		16QAM	1	1		16.72		0.0	18.0
		64QAM	1	1		16.90		0.0	18.0
256QAM	1	1		16.69		0.0	18.0		
CP-OFDM	QPSK	1	1		16.62		0.0	18.0	

Notes:

NR Band n77-DoD (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					632000.00	633334.00	634666.00		
					3480 MHz	3500.01 MHz	3519.99 MHz		
60 MHz	DFT-s-OFDM	π/2 BPSK	1	1		16.69		0.0	18.0
			1	81		16.67		0.0	18.0
			1	160		16.44		0.0	18.0
			81	0		16.72		0.0	18.0
			81	41		16.61		0.0	18.0
			81	81		16.50		0.0	18.0
		162	0		16.57		0.0	18.0	
		QPSK	1	1		16.64		0.0	18.0
			1	81		16.65		0.0	18.0
			1	160		16.43		0.0	18.0
			81	0		16.71		0.0	18.0
			81	41		16.62		0.0	18.0
			81	81		16.55		0.0	18.0
		162	0		16.59		0.0	18.0	
16QAM	1	1		16.75		0.0	18.0		
64QAM	1	1		16.91		0.0	18.0		
256QAM	1	1		16.70		0.0	18.0		
CP-OFDM	QPSK	1	1		16.65		0.0	18.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					631668.00	633334.00	635000.00		
					3475.02 MHz	3500.01 MHz	3525 MHz		
50 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.83		16.62	0.0	18.0
			1	67	16.55		16.45	0.0	18.0
			1	131	16.44		16.29	0.0	18.0
			64	0	16.67		16.45	0.0	18.0
			64	35	16.54		16.41	0.0	18.0
			64	69	16.53		16.31	0.0	18.0
		128	0	16.61		16.44	0.0	18.0	
		QPSK	1	1	16.84		16.61	0.0	18.0
			1	67	16.57		16.43	0.0	18.0
			1	131	16.44		16.15	0.0	18.0
			64	0	16.64		16.38	0.0	18.0
			64	35	16.52		16.37	0.0	18.0
			64	69	16.56		16.26	0.0	18.0
		128	0	16.54		16.35	0.0	18.0	
16QAM	1	1	16.84		16.65	0.0	18.0		
64QAM	1	1	17.04		16.78	0.0	18.0		
256QAM	1	1	16.81		16.57	0.0	18.0		
CP-OFDM	QPSK	1	1	16.78		16.54	0.0	18.0	

Notes:

NR Band n77-DoD (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					631334.00	633334.00	635332.00		
					3470.01 MHz	3500.01 MHz	3529.98 MHz		
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.89		16.74	0.0	18.0
			1	53	16.75		16.55	0.0	18.0
			1	104	16.80		16.62	0.0	18.0
			50	0	16.85		16.64	0.0	18.0
			50	28	16.71		16.49	0.0	18.0
			50	56	16.77		16.55	0.0	18.0
			100	0	16.75		16.53	0.0	18.0
		QPSK	1	1	16.88		16.71	0.0	18.0
			1	53	16.67		16.49	0.0	18.0
			1	104	16.74		16.56	0.0	18.0
			50	0	16.84		16.62	0.0	18.0
			50	28	16.70		16.47	0.0	18.0
			50	56	16.77		16.60	0.0	18.0
			100	0	16.73		16.56	0.0	18.0
		16QAM	1	1	16.93		16.77	0.0	18.0
64QAM	1	1	17.09		16.90	0.0	18.0		
256QAM	1	1	16.88		16.67	0.0	18.0		
CP-OFDM	QPSK	1	1	16.92		16.72	0.0	18.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					631000.00	633334.00	635666.00		
					3465 MHz	3500.01 MHz	3534.99 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.88	16.77	16.77	0.0	18.0
			1	39	16.81	16.72	16.61	0.0	18.0
			1	76	16.84	16.71	16.64	0.0	18.0
			36	0	16.84	16.68	16.63	0.0	18.0
			36	21	16.77	16.67	16.58	0.0	18.0
			36	42	16.75	16.59	16.64	0.0	18.0
			75	0	16.82	16.66	16.59	0.0	18.0
		QPSK	1	1	16.87	16.72	16.72	0.0	18.0
			1	39	16.74	16.60	16.54	0.0	18.0
			1	76	16.79	16.62	16.56	0.0	18.0
			36	0	16.83	16.75	16.63	0.0	18.0
			36	21	16.77	16.69	16.57	0.0	18.0
			36	42	16.74	16.63	16.63	0.0	18.0
			75	0	16.92	16.74	16.64	0.0	18.0
		16QAM	1	1	16.99	16.84	16.87	0.0	18.0
64QAM	1	1	17.14	17.04	17.01	0.0	18.0		
256QAM	1	1	16.90	16.82	16.78	0.0	18.0		
CP-OFDM	QPSK	1	1	16.93	16.86	16.80	0.0	18.0	

Notes:

NR Band n77-DoD (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					630668.00	633334.00	636000.00		
					3460.02 MHz	3500.01 MHz	3540 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.93	16.83	16.51	0.0	18.0
			1	26	16.92	16.81	16.45	0.0	18.0
			1	49	16.89	16.76	16.55	0.0	18.0
			25	0	16.87	16.77	16.58	0.0	18.0
			25	13	16.88	16.79	16.55	0.0	18.0
			25	26	16.92	16.77	16.53	0.0	18.0
			50	0	16.90	16.82	16.62	0.0	18.0
		QPSK	1	1	16.95	16.98	16.73	0.0	18.0
			1	26	16.88	16.83	16.62	0.0	18.0
			1	49	16.79	16.80	16.58	0.0	18.0
			25	0	16.88	16.80	16.68	0.0	18.0
			25	13	16.88	16.81	16.66	0.0	18.0
			25	26	16.93	16.83	16.60	0.0	18.0
			50	0	16.93	16.79	16.65	0.0	18.0
		16QAM	1	1	17.03	16.92	16.80	0.0	18.0
		64QAM	1	1	17.21	17.07	16.85	0.0	18.0
		256QAM	1	1	16.93	16.86	16.73	0.0	18.0
		CP-OFDM	QPSK	1	1	16.97	16.86	16.80	0.0

Notes:

NR Band n77-DoD (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77 (Voice/data/SRS0) Measured Results

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)										
					DSI = 0, 1, 2, 3, 4							MPR	Tune-up Limit		
					Measured Pwr (dBm)										
					650000.00		656000.00		662000.00						
3750 MHz		3840 MHz		3930 MHz											
100 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.74					16.47		0.0	18.0		
			1	137	17.25					16.77		0.0	18.0		
			1	271	17.19					16.75		0.0	18.0		
			135	0	16.93					16.56		0.0	18.0		
			135	69	17.09					16.71		0.0	18.0		
			135	138	17.07					16.71		0.0	18.0		
			270	0	17.05					16.60		0.0	18.0		
		QPSK	1	1	16.75					16.51		0.0	18.0		
			1	137	17.21					16.76		0.0	18.0		
			1	271	17.14					16.72		0.0	18.0		
			135	0	16.89					16.62		0.0	18.0		
			135	69	17.09					16.73		0.0	18.0		
			135	138	17.14					16.77		0.0	18.0		
			270	0	17.05					16.63		0.0	18.0		
		16QAM	1	1	17.12					16.73		0.0	18.0		
			1	137	17.56					17.02		0.0	18.0		
			1	271	17.47					17.05		0.0	18.0		
		64QAM	1	1	16.86					16.48		0.0	18.0		
1	1		16.91					16.57		0.0	18.0				
CP-OFDM	QPSK	1	1	16.86				16.53		0.0	18.0				
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)										
					649668.00		656000.00		662332.00						
					3745.02 MHz		3840 MHz		3934.98 MHz						
90 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.91					17.05		16.76		0.0	18.0
			1	123	17.25					16.66		16.95		0.0	18.0
			1	243	17.30					16.82		16.97		0.0	18.0
			120	0	17.04					16.89		16.81		0.0	18.0
			120	63	17.23					16.60		16.90		0.0	18.0
			120	125	17.20					16.44		16.84		0.0	18.0
			243	0	17.10					16.64		16.85		0.0	18.0
		QPSK	1	1	16.90					17.01		16.73		0.0	18.0
			1	123	17.23					16.61		16.90		0.0	18.0
			1	243	17.29					16.69		16.89		0.0	18.0
			120	0	17.06					16.81		16.85		0.0	18.0
			120	63	17.21					16.53		16.91		0.0	18.0
			120	125	17.23					16.52		16.92		0.0	18.0
			243	0	17.08					16.67		16.92		0.0	18.0
		16QAM	1	1	16.96					17.08		16.69		0.0	18.0
			1	1	17.08					17.16		16.83		0.0	18.0
		256QAM	1	1	16.92					16.99		16.56		0.0	18.0
		CP-OFDM	QPSK	1	1	16.90				16.93		16.68		0.0	18.0

Notes:

NR Band n77 (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77 (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit	
					649334.00	656000.00	662666.00					
					3740.01 MHz	3840 MHz	3939.99 MHz					
80 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.83		17.05		16.92		0.0	18.0
			1	109	17.23		16.69		17.09		0.0	18.0
			1	215	17.23		16.61		16.90		0.0	18.0
			108	0	17.02		16.72		16.85		0.0	18.0
			108	55	17.20		16.59		16.88		0.0	18.0
			108	109	17.22		16.54		16.92		0.0	18.0
			216	0	17.11		16.70		16.94		0.0	18.0
		QPSK	1	1	16.89		17.04		16.82		0.0	18.0
			1	109	17.23		16.60		16.99		0.0	18.0
			1	215	17.23		16.59		16.88		0.0	18.0
			108	0	17.05		16.78		16.88		0.0	18.0
			108	55	17.25		16.65		16.92		0.0	18.0
			108	109	17.26		16.54		16.94		0.0	18.0
		16QAM	1	1	16.96		17.13		16.83		0.0	18.0
			1	1	17.10		17.19		16.94		0.0	18.0
			1	1	16.92		17.04		16.69		0.0	18.0
		CP-OFDM	QPSK	1	1	16.87		16.90		16.77		0.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)					MPR	Tune-up Limit		
					649000.00	653666.00			658334.00			663000.00	
					3735 MHz	3804.99 MHz			3875.01 MHz			3945 MHz	
70 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.82	17.32			16.56	17.01	0.0	18.0	
			1	95	17.13	17.09			16.64	17.10	0.0	18.0	
			1	188	17.26	16.63			16.86	16.88	0.0	18.0	
			90	0	16.89	17.20			16.54	16.85	0.0	18.0	
			90	50	17.08	17.00			16.57	17.02	0.0	18.0	
			90	99	17.25	16.73			16.66	16.95	0.0	18.0	
			180	0	17.09	16.99			16.63	16.87	0.0	18.0	
		QPSK	1	1	16.93	17.25			16.62	16.92	0.0	18.0	
			1	95	17.14	17.07			16.66	17.04	0.0	18.0	
			1	188	17.26	16.62			16.82	16.82	0.0	18.0	
			90	0	17.03	17.18			16.55	16.92	0.0	18.0	
			90	50	17.15	17.03			16.66	17.01	0.0	18.0	
			90	99	17.33	16.78			16.68	16.89	0.0	18.0	
		180	0	17.01	17.06			16.63	16.94	0.0	18.0		
			16QAM	1	1	17.03	17.29			16.74	16.99	0.0	18.0
			64QAM	1	1	17.12	17.43			16.89	17.12	0.0	18.0
		256QAM	1	1	16.94	17.14			16.64	16.88	0.0	18.0	
CP-OFDM	QPSK	1	1	16.93	17.13			16.66	16.82	0.0	18.0		

Notes:

NR Band n77 (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77 (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)						MPR	Tune-up Limit
					648668.00	653556.00			658444.00	663332.00		
					3730.02 MHz	3803.34 MHz			3876.66 MHz	3949.98 MHz		
60 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.88	17.39			16.66	17.04	0.0	18.0
			1	81	17.21	17.07			16.67	17.19	0.0	18.0
			1	160	17.43	16.86			16.94	17.07	0.0	18.0
			81	0	17.08	17.17			16.58	17.03	0.0	18.0
			81	41	17.19	17.02			16.65	17.11	0.0	18.0
			81	81	17.26	16.93			16.70	17.06	0.0	18.0
			162	0	17.18	17.02			16.64	17.11	0.0	18.0
		QPSK	1	1	16.92	17.27			16.66	16.99	0.0	18.0
			1	81	17.19	17.01			16.63	17.13	0.0	18.0
			1	160	17.44	16.80			16.88	17.00	0.0	18.0
			81	0	17.08	17.18			16.64	17.06	0.0	18.0
			81	41	17.26	17.04			16.65	17.09	0.0	18.0
			81	81	17.31	16.92			16.77	17.04	0.0	18.0
			162	0	17.15	17.04			16.70	17.09	0.0	18.0
		16QAM	1	1	17.00	17.31			16.72	17.08	0.0	18.0
		64QAM	1	1	17.18	17.41			16.88	17.20	0.0	18.0
		256QAM	1	1	16.91	17.23			16.70	16.94	0.0	18.0
CP-OFDM	QPSK	1	1	16.92	17.17			16.69	16.88	0.0	18.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)						MPR	Tune-up Limit
					648334.00	652166.00	656000.00		659834.00	663666.00		
					3725.01 MHz	3782.49 MHz	3840 MHz		3897.51 MHz	3954.99 MHz		
50 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.92	17.52	16.93		16.84	17.29	0.0	18.0
			1	67	17.21	17.40	16.68		16.89	17.23	0.0	18.0
			1	131	17.38	17.15	16.71		17.09	17.23	0.0	18.0
			64	0	17.08	17.35	16.82		16.80	17.27	0.0	18.0
			64	35	17.16	17.18	16.68		16.88	17.21	0.0	18.0
			64	69	17.26	17.02	16.62		16.89	17.17	0.0	18.0
			128	0	17.19	17.29	16.62		16.84	17.18	0.0	18.0
		QPSK	1	1	16.96	17.47	16.93		16.76	17.36	0.0	18.0
			1	67	17.26	17.31	16.66		16.86	17.22	0.0	18.0
			1	131	17.43	17.10	16.63		16.99	17.17	0.0	18.0
			64	0	17.15	17.33	16.83		16.80	17.31	0.0	18.0
			64	35	17.18	17.22	16.68		16.85	17.23	0.0	18.0
			64	69	17.26	17.02	16.59		16.86	17.15	0.0	18.0
			128	0	17.19	17.28	16.65		16.84	17.36	0.0	18.0
		16QAM	1	1	17.02	17.49	16.99		16.81	17.44	0.0	18.0
		64QAM	1	1	17.16	17.61	17.15		16.94	17.55	0.0	18.0
		256QAM	1	1	16.99	17.44	16.98		16.66	17.31	0.0	18.0
CP-OFDM	QPSK	1	1	16.99	17.33	16.94		16.62	17.36	0.0	18.0	

Notes:

NR Band n77 (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77 (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)						MPR	Tune-up Limit
					648000.00	651200.00	654400.00	657600.00	660800.00	664000.00		
					3720 MHz	3768 MHz	3816 MHz	3864 MHz	3912 MHz	3960 MHz		
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.28	17.65	17.35	16.97	17.04	17.45	0.0	18.0
			1	53	17.28	17.51	17.01	16.88	17.09	17.43	0.0	18.0
			1	104	17.59	17.44	16.95	16.95	17.20	17.46	0.0	18.0
			50	0	17.18	17.65	17.16	16.74	17.03	17.23	0.0	18.0
			50	28	17.32	17.49	16.95	16.78	17.04	17.33	0.0	18.0
			50	56	17.43	17.36	16.97	16.77	17.01	17.27	0.0	18.0
			100	0	17.33	17.49	17.05	16.86	17.09	17.39	0.0	18.0
		QPSK	1	1	17.28	17.64	17.39	16.91	17.08	17.40	0.0	18.0
			1	53	17.28	17.44	16.97	16.78	17.09	17.33	0.0	18.0
			1	104	17.53	17.38	17.17	16.85	17.13	17.35	0.0	18.0
			50	0	17.30	17.66	17.12	16.79	17.06	17.28	0.0	18.0
			50	28	17.33	17.46	16.99	16.80	17.10	17.34	0.0	18.0
			50	56	17.46	17.35	16.98	16.81	17.06	17.34	0.0	18.0
			100	0	17.33	17.47	17.02	16.81	17.09	17.32	0.0	18.0
		16QAM	1	1	17.40	17.66	17.49	16.98	17.19	17.42	0.0	18.0
64QAM	1	1	17.57	17.66	17.60	17.07	17.29	17.57	0.0	18.0		
256QAM	1	1	17.35	17.62	17.37	16.86	17.06	17.32	0.0	18.0		
CP-OFDM	QPSK	1	1	17.38	17.68	17.39	16.81	17.08	17.29	0.0	18.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)						MPR	Tune-up Limit
					647668.00	651000.00	654334.00	657666.00	661000.00	664332.00		
					3715.02 MHz	3765 MHz	3815.01 MHz	3864.99 MHz	3915 MHz	3964.98 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	17.05	17.52	17.29	16.79	17.10	17.51	0.0	18.0
			1	39	17.21	17.61	17.11	16.88	17.18	17.48	0.0	18.0
			1	76	17.48	17.44	16.94	16.96	17.29	17.48	0.0	18.0
			36	0	17.17	17.63	17.12	16.75	17.13	17.36	0.0	18.0
			36	21	17.24	17.47	17.01	16.79	17.14	17.39	0.0	18.0
			36	42	17.27	17.46	16.98	16.78	17.26	17.41	0.0	18.0
			75	0	17.21	17.49	17.09	16.77	17.14	17.48	0.0	18.0
		QPSK	1	1	17.13	17.68	17.20	16.77	17.15	17.42	0.0	18.0
			1	39	17.17	17.57	17.05	16.77	17.18	17.40	0.0	18.0
			1	76	17.38	17.39	16.89	16.86	17.24	17.35	0.0	18.0
			36	0	17.19	17.60	17.12	16.75	17.14	17.36	0.0	18.0
			36	21	17.26	17.46	16.99	16.78	17.14	17.42	0.0	18.0
			36	42	17.28	17.43	16.95	16.75	17.25	17.39	0.0	18.0
			75	0	17.21	17.51	17.11	16.82	17.21	17.43	0.0	18.0
		16QAM	1	1	17.19	17.64	17.32	16.79	17.26	17.45	0.0	18.0
64QAM	1	1	17.29	17.66	17.48	16.91	17.37	17.66	0.0	18.0		
256QAM	1	1	17.07	17.64	17.22	16.70	17.12	17.39	0.0	18.0		
CP-OFDM	QPSK	1	1	17.15	17.62	17.25	16.67	17.19	17.33	0.0	18.0	

Notes:

NR Band n77 (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77 (Voice/data/SRS0) Measured Results (Continued)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)						MPR	Tune-up Limit
					647334.00	650800.00	654266.00	657734.00	661200.00	664666.00		
					3710.01 MHz	3762 MHz	3813.99 MHz	3866.01 MHz	3918 MHz	3969.99 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	16.99	17.58	16.98	16.76	17.02	17.47	0.0	18.0
			1	26	17.03	17.43	16.98	16.79	17.03	17.45	0.0	18.0
			1	49	17.19	17.42	16.92	16.93	17.14	17.41	0.0	18.0
			25	0	17.01	17.48	16.95	16.68	17.04	17.39	0.0	18.0
			25	13	17.06	17.47	16.97	16.72	17.05	17.39	0.0	18.0
			25	26	17.18	17.42	16.91	16.77	17.11	17.32	0.0	18.0
		50	0	17.02	17.49	16.97	16.79	17.05	17.29	0.0	18.0	
		QPSK	1	1	16.99	17.49	17.02	16.66	17.08	17.44	0.0	18.0
			1	26	17.03	17.35	16.96	16.76	17.02	17.38	0.0	18.0
			1	49	17.15	17.33	16.92	16.88	17.12	17.35	0.0	18.0
			25	0	17.03	17.43	17.04	16.69	17.09	17.33	0.0	18.0
			25	13	17.03	17.41	16.99	16.73	17.06	17.33	0.0	18.0
			25	26	17.13	17.38	16.92	16.79	17.12	17.35	0.0	18.0
		50	0	17.07	17.44	17.08	16.79	17.10	17.31	0.0	18.0	
		16QAM	1	1	17.07	17.70	17.15	16.76	17.12	17.46	0.0	18.0
		64QAM	1	1	17.24	17.63	17.30	16.88	17.32	17.64	0.0	18.0
		256QAM	1	1	16.96	17.58	17.04	16.61	17.10	17.36	0.0	18.0

Notes:

NR Band n77 (Voice/data/SRS0) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (SRS1) & NR Band n77 (SRS1) Measured Results

BW (MHz)	Mode	Maximum Allowed Average Power (dBm) - NR Band n77-DoD (SRS1)			Maximum Allowed Average Power (dBm) - NR Band n77 (SRS1)							
		DSI = 0, 1, 2, 3, 4			DSI = 0, 1, 2, 3, 4							
		Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
	633334		650000			656000		662000				
		3500.01 MHz		3750 MHz		3840 MHz		3930 MHz				
100 MHz	SRS CW		9.82		10.50	9.54			8.60		10.50	
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		633000.00	633334.00	633666.00		649668.00		656000.00		662332.00		
		3495 MHz	3500.01 MHz	3504.99 MHz	3745.02 MHz		3840 MHz		3934.98 MHz			
90 MHz	SRS CW		9.75		10.50	9.44		8.27		8.13	10.50	
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632668.00	633334.00	634000.00		649334.00		656000.00		662666.00		
		3490.02 MHz	3500.01 MHz	3510 MHz	3740.01 MHz		3840 MHz		3939.99 MHz			
80 MHz	SRS CW		9.71		10.50	9.28		8.24		8.12	10.50	
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632334.00	633334.00	634332.00		649000.00	653666.00		658334.00	663000.00		
		3485.01 MHz	3500.01 MHz	3514.98 MHz	3735 MHz	3804.99 MHz		3875.01 MHz	3945 MHz			
70 MHz	SRS CW		9.72		10.50	9.24	8.78		8.13	8.07	10.50	
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632000.00	633334.00	634666.00		648668.00	653556.00		658444.00	663332.00		
		3480 MHz	3500.01 MHz	3519.98 MHz	3730.02 MHz	3803.34 MHz		3876.66 MHz	3949.98 MHz			
60 MHz	SRS CW		9.81		10.50	9.17	8.79		8.08	8.23	10.50	
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631668.00	633334.00	635000.00		648334.00	652166.00	656000.00		659834.00	663666.00	
		3475.02 MHz	3500.01 MHz	3525 MHz	3725.01 MHz	3782.49 MHz	3840 MHz		3897.51 MHz	3954.99 MHz		
50 MHz	SRS CW	10.01		9.63	10.50	9.38	9.02	8.31		8.17	8.23	10.50
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631334.00	633334.00	635332.00		648000.00	651200.00	654400.00	657600.00	660800.00	664000.00	
		3470.01 MHz	3500.01 MHz	3529.98 MHz	3720 MHz	3768 MHz	3816 MHz	3864 MHz	3912 MHz	3960 MHz		
40 MHz	SRS CW	10.18		9.80	10.50	9.56	9.52	8.86	8.48	8.49	8.42	10.50
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631000.00	633334.00	635666.00		647668.00	651000.00	654334.00	657666.00	661000.00	664332.00	
		3465 MHz	3500.01 MHz	3534.99 MHz	3715.02 MHz	3765 MHz	3815.01 MHz	3864.99 MHz	3915 MHz	3964.98 MHz		
30 MHz	SRS CW	10.25	10.00	9.78	10.50	9.42	9.52	8.87	8.44	8.47	8.41	10.50
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		630668.00	633334.00	636000.00		647334.00	650800.00	654266.00	657734.00	661200.00	664666.00	
		3460.02 MHz	3500.01 MHz	3540 MHz	3710.01 MHz	3762 MHz	3813.99 MHz	3866.01 MHz	3918 MHz	3969.99 MHz		
20 MHz	SRS CW	10.25	10.04	9.76	10.50	9.48	9.63	8.96	8.41	8.49	8.44	10.50

Notes:

NR Band n77-DoD (SRS1) & NR Band n77 (SRS1) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (SRS2) & NR Band n77 (SRS2) Measured Results

BW (MHz)	Mode	Maximum Allowed Average Power (dBm) - NR Band n77-DoD (SRS2)			Maximum Allowed Average Power (dBm) - NR Band n77 (SRS2)							
		DSI = 0, 1, 2, 3, 4			DSI = 0, 1, 2, 3, 4							
		Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
			633334.00			650000.00		656000.00		662000.00		
	3500.01 MHz		3750 MHz		3840 MHz		3930 MHz					
100 MHz	SRS CW		10.61		12.00	11.27			10.83		12.00	
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		633000.00	633334.00	633666.00		649668.00		656000.00		662332.00		
		3495 MHz	3500.01 MHz	3504.99 MHz	3745.02 MHz		3840 MHz		3934.98 MHz			
		90 MHz	SRS CW		10.49		12.00	11.14		10.37		10.67
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632668.00	633334.00	634000.00		649334.00		656000.00		662666.00		
		3490.02 MHz	3500.01 MHz	3510 MHz	3740.01 MHz		3840 MHz		3939.99 MHz			
		80 MHz	SRS CW		10.46		12.00	11.12		10.37		10.73
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632334.00	633334.00	634332.00		649000.00	653666.00		658334.00	663000.00		
		3485.01 MHz	3500.01 MHz	3514.98 MHz	3735 MHz	3804.99 MHz		3875.01 MHz	3945 MHz			
		70 MHz	SRS CW		10.46		12.00	11.13	10.76		10.37	10.80
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632000.00	633334.00	634666.00		648668.00	653556.00		658444.00	663332.00		
		3480 MHz	3500.01 MHz	3519.99 MHz	3730.02 MHz	3803.34 MHz		3876.66 MHz	3949.98 MHz			
		60 MHz	SRS CW		10.61		12.00	11.09	10.79		10.37	10.89
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631668.00	633334.00	635000.00		648334.00	652166.00	656000.00	659834.00	663666.00		
		3475.02 MHz	3500.01 MHz	3525 MHz	3725.01 MHz	3782.49 MHz	3840 MHz	3897.51 MHz	3954.99 MHz			
		50 MHz	SRS CW	10.66		10.35	12.00	11.17	11.03	10.39		10.50
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631334.00	633334.00	635332.00		648000.00	651200.00	654400.00	657600.00	660800.00	664000.00	
		3470.01 MHz	3500.01 MHz	3529.98 MHz	3720 MHz	3768 MHz	3816 MHz	3864 MHz	3912 MHz	3960 MHz		
		40 MHz	SRS CW	10.95		10.63	12.00	11.33	11.49	10.95	10.66	10.94
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631000.00	633334.00	635666.00		647668.00	651000.00	654334.00	657666.00	661000.00	664332.00	
		3465 MHz	3500.01 MHz	3534.99 MHz	3715.02 MHz	3765 MHz	3815.01 MHz	3864.99 MHz	3915 MHz	3964.98 MHz		
		30 MHz	SRS CW	10.92	10.70	10.53	12.00	11.35	11.48	10.93	10.61	10.86
BW (MHz)	Mode	Measured Pwr (dBm)			Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		630668.00	633334.00	636000.00		647334.00	650800.00	654266.00	657734.00	661200.00	664666.00	
		3460.02 MHz	3500.01 MHz	3540 MHz	3710.01 MHz	3762 MHz	3813.99 MHz	3866.01 MHz	3918 MHz	3969.99 MHz		
		20 MHz	SRS CW	11.03	10.64	10.45	12.00	11.24	11.42	10.87	10.59	10.96

Notes:

NR Band n77-DoD (SRS2) & NR Band n77 (SRS2) were measured output power through FTM mode provided by manufacturer.

NR Band n77-DoD (SRS3) & NR Band n77 (SRS3) Measured Results

BW (MHz)	Mode	Maximum Allowed Average Power (dBm) - NR Band n77-DoD (SRS3)				Maximum Allowed Average Power (dBm) - NR Band n77 (SRS3)							
		DSI = 0, 1, 2, 3, 4				DSI = 0, 1, 2, 3, 4							
		Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		633334.00					650000.00		656000.00		662000.00		
3500.01 MHz				3750 MHz		3840 MHz		3930 MHz					
100 MHz	SRS CW		16.34		17.00	16.33			15.92		17.00		
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		633000.00	633334.00	633666.00			649668.00		656000.00		662332.00		
		3495 MHz	3500.01 MHz	3504.99 MHz		3745.02 MHz		3840 MHz		3934.98 MHz			
90 MHz	SRS CW		16.29		17.00	16.32		15.47	16.01		17.00		
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632668.00	633334.00	634000.00			649334.00		656000.00		662666.00		
		3490.02 MHz	3500.01 MHz	3510 MHz		3740.01 MHz		3840 MHz		3939.99 MHz			
80 MHz	SRS CW		16.31		17.00	16.33		15.41	15.98		17.00		
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632334.00	633334.00	634332.00			649000.00	653666.00			658334.00	663000.00	
		3485.01 MHz	3500.01 MHz	3514.98 MHz		3735 MHz	3804.99 MHz			3875.01 MHz	3945 MHz		
70 MHz	SRS CW		16.34		17.00	16.22	15.81		15.54	15.97	17.00		
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		632000.00	633334.00	634666.00			648668.00	653556.00			658444.00	663332.00	
		3480 MHz	3500.01 MHz	3519.99 MHz		3730.02 MHz	3803.34 MHz			3876.66 MHz	3949.98 MHz		
60 MHz	SRS CW		16.44		17.00	16.14	15.89		15.59	16.21	17.00		
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631668.00	633334.00	635000.00			648334.00	652166.00	656000.00		659834.00	663666.00	
		3475.02 MHz	3500.01 MHz	3525 MHz		3725.01 MHz	3782.49 MHz	3840 MHz		3897.51 MHz	3954.99 MHz		
50 MHz	SRS CW	16.52		16.28	17.00	16.32	16.03	15.46	15.73	16.20	17.00		
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631334.00	633334.00	635332.00			648000.00	651200.00	654400.00	657600.00	660800.00	664000.00	
		3470.01 MHz	3500.01 MHz	3529.98 MHz		3720 MHz	3768 MHz	3816 MHz	3864 MHz	3912 MHz	3960 MHz		
40 MHz	SRS CW	16.75		16.42	17.00	16.58	16.48	15.56	15.79	16.13	16.46	17.00	
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		631000.00	633334.00	635666.00			647668.00	651000.00	654334.00	657666.00	661000.00	664332.00	
		3465 MHz	3500.01 MHz	3534.99 MHz		3715.02 MHz	3765 MHz	3815.01 MHz	3864.99 MHz	3915 MHz	3964.98 MHz		
30 MHz	SRS CW	16.84	16.62	16.43	17.00	16.47	16.51	15.93	15.79	16.16	16.44	17.00	
BW (MHz)	Mode	Measured Pwr (dBm)				Tune-up Limit	Measured Pwr (dBm)						Tune-up Limit
		630668.00	633334.00	636000.00			647334.00	650800.00	654266.00	657734.00	661200.00	664666.00	
		3460.02 MHz	3500.01 MHz	3540 MHz		3710.01 MHz	3762 MHz	3813.99 MHz	3866.01 MHz	3918 MHz	3969.99 MHz		
20 MHz	SRS CW	16.82	16.62	16.37	17.00	16.45	16.55	15.98	15.72	16.18	16.45	17.00	

Notes:
 NR Band n77-DoD (SRS3) & NR Band n77 (SRS3) were measured output power through FTM mode provided by manufacturer.

9.5. Wi-Fi 2.4 GHz (DTS Band)

WLAN output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
					Max. Average Power			Reduced Average Power		
					Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
WiFi 2.4G Ant.	802.11b	1 Mbps	1	2412.0	20.37	21.0	Yes	9.49	10.0	Yes
			6	2437.0	20.51			9.60		
			11	2462.0	20.25			9.24		
			12	2467.0	Not Required	8.0	Not Required	8.0		
			13	2472.0	Not Required	8.0	Not Required	8.0		
	802.11g	6 Mbps	Not Required			19.0	No	Not Required	10.0	No
	802.11n	6.5 Mbps	Not Required			19.0		Not Required	10.0	

Note(s):

- SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11n/g/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.
- 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.
- Head (RCV on) exposure conditions are tested using Reduced power.

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

WLAN output power results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
						Max. Average Power			Reduced Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz Ant.	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260	15.28	16.0	Yes	Not Required	11.0	No
				56	5280	15.22					
				60	5300	15.13					
				64	5320	15.18					
		802.11n (HT20)	6.5 Mbps	Not Required			16.0	No	Not Required	11.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			15.0	No	Not Required	11.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			16.0	No	Not Required	11.0	No
	802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	11.0	No	
	802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	13.0	No	10.30	11.0	Yes	
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500	15.09	16.0	Yes	Not Required	11.0	No
				120	5600	15.10					
				124	5620	15.07					
				144	5720	15.19					
		802.11n (HT20)	6.5 Mbps	Not Required			16.0	No	Not Required	11.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			15.0	No	Not Required	11.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			16.0	No	Not Required	11.0	No
	802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	11.0	No	
	802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	13.0	No	10.32	11.0	Yes	
	122	5610.0	Not Required	10.85							
	138	5690.0	Not Required	10.76							
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745	15.34	16.0	Yes	Not Required	11.0	No
				157	5785	15.33					
				165	5825	15.41					
		802.11n (HT20)	6.5 Mbps	149	5745	Not Required	16.0	No	Not Required	11.0	No
157				5785							
165				5825							
802.11n (HT40)		13.5 Mbps	151	5755	Not Required	15.0	No	Not Required	11.0	No	
			159	5795							
802.11ac (VHT20)		6.5 Mbps	149	5745	Not Required	16.0	No	Not Required	11.0	No	
			157	5785							
	165		5825								
802.11ac (VHT40)	13.5 Mbps	151	5755	Not Required	15.0	No	Not Required	11.0	No		
		159	5795								
802.11ac (VHT80)	29.3 Mbps	155	5775	Not Required	13.0	No	10.7	11.0	Yes		

Note(s):

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

9.7. Bluetooth

Bluetooth output power Results

Band (GHz)	Antenna	Mode	Ch #	Freq. (MHz)	Max. Average Power (dBm)	
					Meas Pwr	Tune-up Limit
2.4	BT Ant.	Bluetooth(1Mbps)	0	2402	15.21	16.0
			39	2441	14.89	
			78	2480	13.14	14.5

Duty Factor Measured Results

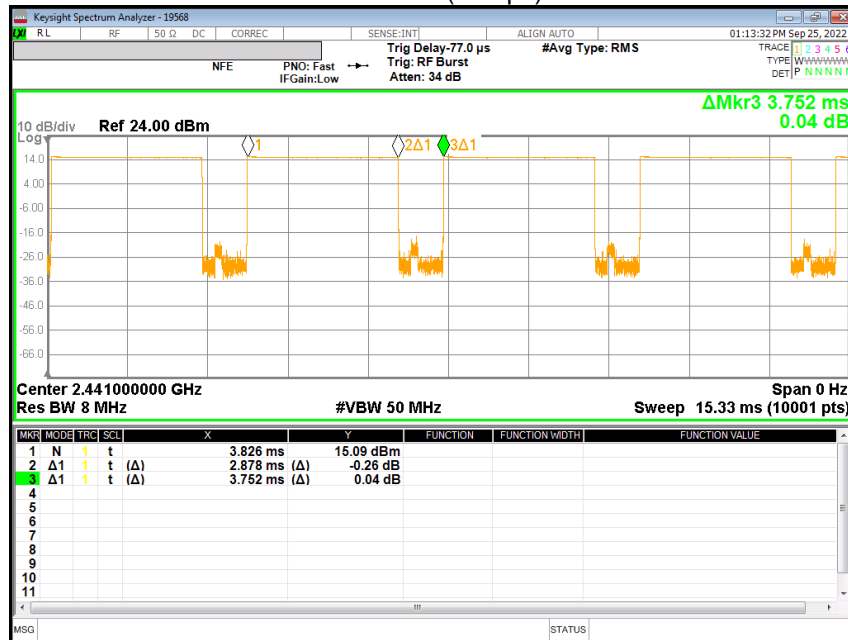
Mode	Type	T on (ms)	Period (ms)	Measured Duty Cycle
GFSK	DH5	2.878	3.752	76.71%

Note(s):

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

Duty Cycle plots

Bluetooth (1Mbps)



10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

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

KDB 447498 D01 General RF Exposure Guidance:

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

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

KDB 648474 D04 Handset SAR:

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

KDB 648474 D04 Handset SAR (Phablet Only):

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

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

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

KDB 941225 D01 SAR test for 3G devices:

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

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

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

KDB 248227 D01 SAR meas for 802.11:

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

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

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

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

10.1. GSM 850

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	GPRS 2 Slots	0	Left Touch	190	836.6	32.50	30.87	0.261	0.380	1
				Left Tilt	190	836.6	32.50	30.87	0.148	0.215	
				Right Touch	190	836.6	32.50	30.87	0.330	0.480	
				Right Tilt	190	836.6	32.50	30.87	0.164	0.239	
	Body-worn	GPRS 2 Slots	15	Rear	190	836.6	32.50	30.87	0.319	0.464	2
				Front	190	836.6	32.50	30.87	0.228	0.332	
	Hotspot	GPRS 2 Slots	10	Rear	128	824.4	32.50	31.27	0.458	0.608	3
					190	836.6	32.50	30.87	0.622	0.905	
					251	848.8	32.50	31.21	0.683	0.919	
				Front	190	836.6	32.50	30.87	0.224	0.326	
Edge 2				190	836.6	32.50	30.87	0.274	0.399		
Edge 3				190	836.6	32.50	30.87	0.422	0.614		
Edge 4	190	836.6	32.50	30.87	0.118	0.172					

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 2 Ant.	Head	GPRS 2 Slots	0	Left Touch	661	1880.0	29.00	27.64	0.137	0.187	4
				Left Tilt	661	1880.0	29.00	27.64	0.086	0.118	
				Right Touch	661	1880.0	29.00	27.64	0.129	0.176	
				Right Tilt	661	1880.0	29.00	27.64	0.078	0.107	
	Body-worn	GPRS 2 Slots	15	Rear	661	1880.0	29.00	27.64	0.241	0.330	5
				Front	661	1880.0	29.00	27.64	0.215	0.294	
	Hotspot	GPRS 4 Slots	10	Rear	661	1880.0	21.50	20.48	0.166	0.210	6
				Front	661	1880.0	21.50	20.48	0.138	0.175	
				Edge 3	661	1880.0	21.50	20.48	0.166	0.210	
				Edge 4	661	1880.0	21.50	20.48	0.072	0.091	

10.3. WCDMA Band II

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 2 Ant.	Head	Rel 99 RMC	0	Left Touch	9400	1880.0	24.50	23.94	0.195	0.222	8
				Left Tilt	9400	1880.0	24.50	23.94	0.161	0.183	
				Right Touch	9400	1880.0	24.50	23.94	0.159	0.181	
				Right Tilt	9400	1880.0	24.50	23.94	0.140	0.159	
	Body-worn	Rel 99 RMC	15	Rear	9400	1880.0	24.50	23.94	0.438	0.498	9
				Front	9400	1880.0	24.50	23.94	0.343	0.390	
	Hotspot	Rel 99 RMC	10	Rear	9400	1880.0	21.50	20.90	0.420	0.482	10
				Front	9400	1880.0	21.50	20.90	0.280	0.321	
				Edge 3	9400	1880.0	21.50	20.90	0.377	0.433	
				Edge 4	9400	1880.0	21.50	20.90	0.177	0.203	

10.4. 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 Ant.	Head	Rel 99 RMC	0	Left Touch	4183	836.6	25.20	24.69	0.218	0.245	11
				Left Tilt	4183	836.6	25.20	24.69	0.137	0.154	
				Right Touch	4183	836.6	25.20	24.69	0.239	0.269	
				Right Tilt	4183	836.6	25.20	24.69	0.151	0.170	
	Body-worn	Rel 99 RMC	15	Rear	4183	836.6	25.20	24.69	0.335	0.377	12
				Front	4183	836.6	25.20	24.69	0.217	0.244	
	Hotspot	Rel 99 RMC	10	Rear	4183	836.6	25.20	24.69	0.437	0.491	13
				Front	4183	836.6	25.20	24.69	0.206	0.232	
				Edge 2	4183	836.6	25.20	24.69	0.272	0.306	
				Edge 3	4183	836.6	25.20	24.69	0.399	0.449	
Edge 4				4183	836.6	25.20	24.69	0.110	0.124		

10.5. LTE Band 2 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main.2 Ant.	Head	QPSK	0	Left Touch	19100	1900.0	1	99	25.00	24.03	0.299	0.374	14
							50	0	24.00	23.07	0.245	0.304	
				Left Tilt	19100	1900.0	1	99	25.00	24.03	0.130	0.163	
							50	0	24.00	23.07	0.102	0.126	
				Right Touch	19100	1900.0	1	99	25.00	24.03	0.217	0.271	
							50	0	24.00	23.07	0.172	0.213	
				Right Tilt	19100	1900.0	1	99	25.00	24.03	0.116	0.145	
							50	0	24.00	23.07	0.086	0.107	
	Body-worn	QPSK	15	Rear	19100	1900.0	1	99	25.00	24.03	0.442	0.553	15
							50	0	24.00	23.07	0.374	0.463	
				Front	19100	1900.0	1	99	25.00	24.03	0.377	0.471	
							50	0	24.00	23.07	0.331	0.410	
	Hotspot	QPSK	10	Rear	19100	1900.0	1	99	22.00	21.06	0.372	0.462	
							50	0	22.00	21.13	0.380	0.464	
				Front	19100	1900.0	1	99	22.00	21.06	0.298	0.370	
							50	0	22.00	21.13	0.303	0.370	
Edge 3				19100	1900.0	1	99	22.00	21.06	0.528	0.656		
						50	0	22.00	21.13	0.556	0.679	16	
Edge 4				19100	1900.0	1	99	22.00	21.06	0.211	0.262		
						50	0	22.00	21.13	0.196	0.239		
Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		10-g SAR (W/kg)		Plot No.
Main.2 Ant.	Product specific 10-g SAR (Max)	QPSK	7	Edge 3	19100	1900.0	1	99	25.00	24.03	0.657	0.821	
	Product specific 10-g SAR (Reduce)		0				1	99	22.00	21.06	0.967	1.201	17

10.6. LTE Band 5 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	QPSK	0	Left Touch	20525	836.5	1	0	25.50	24.81	0.237	0.278	
							25	12	24.50	23.85	0.189	0.220	
				Left Tilt	20525	836.5	1	0	25.50	24.81	0.156	0.183	
							25	12	24.50	23.85	0.125	0.145	
				Right Touch	20525	836.5	1	0	25.50	24.81	0.244	0.286	18
							25	12	24.50	23.85	0.215	0.250	
				Right Tilt	20525	836.5	1	0	25.50	24.81	0.175	0.205	
							25	12	24.50	23.85	0.152	0.177	
	Body-worn	QPSK	15	Rear	20525	836.5	1	0	25.50	24.81	0.192	0.225	
							25	12	24.50	23.85	0.167	0.194	
				Front	20525	836.5	1	0	25.50	24.81	0.214	0.251	19
							25	12	24.50	23.85	0.173	0.201	
	Hotspot	QPSK	10	Rear	20525	836.5	1	0	25.50	24.81	0.446	0.523	20
							25	12	24.50	23.85	0.411	0.477	
				Front	20525	836.5	1	0	25.50	24.81	0.203	0.238	
							25	12	24.50	23.85	0.165	0.192	
				Edge 2	20525	836.5	1	0	25.50	24.81	0.307	0.360	
							25	12	24.50	23.85	0.249	0.289	
				Edge 3	20525	836.5	1	0	25.50	24.81	0.402	0.471	
							25	12	24.50	23.85	0.343	0.398	
Edge 4				20525	836.5	1	0	25.50	24.81	0.128	0.150		
						25	12	24.50	23.85	0.104	0.121		

10.7. LTE Band 7 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.				
									Tune-up limit	Meas.	Meas.	Scaled					
Main.2 Ant.	Head	QPSK	0	Left Touch	21350	2560.0	1	99	23.00	21.94	0.354	0.452	21				
									50	50	23.00	22.08	0.348	0.430			
				Left Tilt	21350	2560.0	1	99	23.00	21.94	0.098	0.125					
															50	50	23.00
				Right Touch	21350	2560.0	1	99	23.00	21.94	0.157	0.200					
															50	50	23.00
				Right Tilt	21350	2560.0	1	99	23.00	21.94	0.166	0.212					
															50	50	23.00
	Body-worn	QPSK	15	Rear	21350	2560.0	1	99	23.00	21.94	0.387	0.494	22				
									50	50	23.00	22.08	0.395	0.488			
				Front	21350	2560.0	1	99	23.00	21.94	0.179	0.228					
															50	50	23.00
	Hotspot	QPSK	10	Rear	20850	2510.0	1	99	21.50	20.22	0.580	0.779					
									50	50	21.50	20.31	0.592	0.779			
					21100	2535.0	1	99	21.50	20.24	0.608	0.813					
															50	50	21.50
					21350	2560.0	1	99	21.50	20.42	0.663	0.850					
															50	50	21.50
					100	0	21.50	20.53	0.697	0.871	23						
				Front	21350	2560.0	1	99	21.50	20.42	0.455	0.583					
															50	50	21.50
				Edge 3	21350	2560.0	1	99	21.50	20.42	0.447	0.573					
															50	50	21.50
				Edge 4	21350	2560.0	1	99	21.50	20.42	0.216	0.277					
															50	50	21.50
				Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		10-g SAR (W/kg)		Plot No.
				Main.2 Ant.	Product specific 10-g SAR (Max)	QPSK	13	Rear	21350	2560.0	1	99	23.00	21.94	1.030	1.315	
Product specific 10-g SAR (Reduce)	0	20850	2510.0		21.50		20.24		2.200	2.941			24				
		21100	2535.0		21.50		20.26		2.210	2.940							
		21350	2560.0											21.50	20.44	2.140	2.732

10.8. LTE Band 12 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	QPSK	0	Left Touch	23095	707.5	1	0	25.50	24.47	0.137	0.174	
							25	12	24.50	23.55	0.129	0.161	
				Left Tilt	23095	707.5	1	0	25.50	24.47	0.074	0.094	
							25	12	24.50	23.55	0.069	0.086	
				Right Touch	23095	707.5	1	0	25.50	24.47	0.153	0.194	25
							25	12	24.50	23.55	0.146	0.182	
				Right Tilt	23095	707.5	1	0	25.50	24.47	0.079	0.100	
							25	12	24.50	23.55	0.077	0.096	
	Body-w orn	QPSK	15	Rear	23095	707.5	1	0	25.50	24.47	0.274	0.347	26
							25	12	24.50	23.55	0.244	0.304	
				Front	23095	707.5	1	0	25.50	24.47	0.169	0.214	
							25	12	24.50	23.55	0.157	0.195	
	Hotspot	QPSK	10	Rear	23095	707.5	1	0	25.50	24.47	0.392	0.497	27
							25	12	24.50	23.55	0.361	0.449	
				Front	23095	707.5	1	0	25.50	24.47	0.137	0.174	
							25	12	24.50	23.55	0.130	0.162	
				Edge 2	23095	707.5	1	0	25.50	24.47	0.209	0.265	
							25	12	24.50	23.55	0.179	0.223	
				Edge 3	23095	707.5	1	0	25.50	24.47	0.174	0.221	
							25	12	24.50	23.55	0.173	0.215	
				Edge 4	23095	707.5	1	0	25.50	24.47	0.167	0.212	
							25	12	24.50	23.55	0.138	0.172	

10.9. LTE Band 13 (10MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main 1 Ant.	Head	QPSK	0	Left Touch	23230	782.0	1	25	25.50	24.38	0.170	0.220	
							25	0	24.50	23.51	0.144	0.181	
				Left Tilt	23230	782.0	1	25	25.50	24.38	0.097	0.126	
							25	0	24.50	23.51	0.082	0.103	
				Right Touch	23230	782.0	1	25	25.50	24.38	0.180	0.233	28
							25	0	24.50	23.51	0.152	0.191	
				Right Tilt	23230	782.0	1	25	25.50	24.38	0.110	0.142	
							25	0	24.50	23.51	0.092	0.116	
	Body-w orn	QPSK	15	Rear	23230	782.0	1	25	25.50	24.38	0.337	0.436	29
							25	0	24.50	23.51	0.277	0.348	
				Front	23230	782.0	1	25	25.50	24.38	0.219	0.283	
							25	0	24.50	23.51	0.184	0.231	
	Hotspot	QPSK	10	Rear	23230	782.0	1	25	25.50	24.38	0.529	0.685	30
							25	0	24.50	23.51	0.431	0.541	
				Front	23230	782.0	1	25	25.50	24.38	0.184	0.238	
							25	0	24.50	23.51	0.152	0.191	
				Edge 2	23230	782.0	1	25	25.50	24.38	0.300	0.388	
							25	0	24.50	23.51	0.248	0.311	
				Edge 3	23230	782.0	1	25	25.50	24.38	0.222	0.287	
							25	0	24.50	23.51	0.182	0.229	
				Edge 4	23230	782.0	1	25	25.50	24.38	0.144	0.186	
							25	0	24.50	23.51	0.114	0.143	

10.10. LTE Band 48 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Sub 3 Ant.	Head	QPSK	0	Left Touch	56207	3646.7	1	0	20.00	19.45	0.050	0.057	
							50	0	20.00	19.62	0.058	0.063	
				Left Tilt	56207	3646.7	1	0	20.00	19.45	0.053	0.060	
							50	0	20.00	19.62	0.057	0.062	
				Right Touch	56207	3646.7	1	0	20.00	19.45	0.237	0.269	
							50	0	20.00	19.62	0.254	0.277	31
				Right Tilt	56207	3646.7	1	0	20.00	19.45	0.090	0.102	
							50	0	20.00	19.62	0.094	0.103	
	Body-w orn	QPSK	15	Rear	56207	3646.7	1	0	20.00	19.45	0.229	0.260	
							50	0	20.00	19.62	0.240	0.262	32
				Front	56207	3646.7	1	0	20.00	19.45	0.035	0.040	
							50	0	20.00	19.62	0.037	0.040	
	Hotspot	QPSK	10	Rear	56207	3646.7	1	0	20.00	19.45	0.520	0.590	
							50	0	20.00	19.62	0.542	0.592	
				Front	56207	3646.7	1	0	20.00	19.45	0.065	0.074	
							50	0	20.00	19.62	0.072	0.078	
				Edge 1	56207	3646.7	1	0	20.00	19.45	0.050	0.057	
							50	0	20.00	19.62	0.054	0.059	
				Edge 4	55340	3560.0	1	0	20.00	19.26	0.301	0.357	
							50	0	20.00	19.42	0.318	0.363	
					55773	3603.3	1	0	20.00	19.13	0.397	0.485	
							50	0	20.00	19.21	0.405	0.486	
				56207	3646.7	1	0	20.00	19.45	0.557	0.632	33	
						50	0	20.00	19.62	0.578	0.631		
56640	3690.0	1	0	20.00	19.39	0.466	0.536						
		50	0	20.00	19.43	0.495	0.564						

10.11. LTE Band 66 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up limit	Meas.	Meas.	Scaled	
Main 2. Ant	Head	QPSK	0	Left Touch	132072	1720.0	1	0	24.00	23.20	0.160	0.192	
							50	24	24.00	23.24	0.165	0.197	
				Left Tilt	132072	1720.0	1	0	24.00	23.20	0.104	0.125	
							50	24	24.00	23.24	0.096	0.114	
				Right Touch	132072	1720.0	1	0	24.00	23.20	0.168	0.202	
							50	24	24.00	23.24	0.189	0.225	34
	Right Tilt	132072	1720.0	1	0	24.00	23.20	0.078	0.094				
				50	24	24.00	23.24	0.074	0.088				
	Body-w orn	QPSK	15	Rear	132072	1720.0	1	0	24.00	23.20	0.380	0.457	
							50	24	24.00	23.24	0.416	0.496	35
				Front	132072	1720.0	1	0	24.00	23.20	0.366	0.440	
							50	24	24.00	23.24	0.392	0.467	
	Hotspot	QPSK	10	Rear	132072	1720.0	1	0	22.00	21.18	0.456	0.551	
							50	24	22.00	21.25	0.485	0.576	
				Front	132072	1720.0	1	0	22.00	21.18	0.364	0.440	
							50	24	22.00	21.25	0.386	0.459	
				Edge 3	132072	1720.0	1	0	22.00	21.18	0.495	0.598	
							50	24	22.00	21.25	0.523	0.622	36
Edge 4				132072	1720.0	1	0	22.00	21.18	0.231	0.279		
						50	24	22.00	21.25	0.229	0.272		

10.12. NR Band n2 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
Main 2 Ant.	Head	DFT-s-OFDM	QPSK	0	Left Touch	380000	1900.0	1	104	25.00	23.96	0.242	0.307	
								50	28	25.00	23.92	0.255	0.327	37
					Left Tilt	380000	1900.0	1	104	25.00	23.96	0.129	0.164	
								50	28	25.00	23.92	0.131	0.168	
					Right Touch	380000	1900.0	1	104	25.00	23.96	0.196	0.249	
								50	28	25.00	23.92	0.188	0.241	
	Right Tilt	380000	1900.0	1	104	25.00	23.96	0.084	0.107					
				50	28	25.00	23.92	0.106	0.136					
	Body-w orn	CP-OFDM	QPSK	0	Left Touch	380000	1900.0	1	1	23.50	22.54	0.152	0.190	
								50	1	23.50	22.54	0.152	0.190	
					Rear	380000	1900.0	1	104	25.00	23.96	0.416	0.529	
								50	28	25.00	23.92	0.417	0.535	38
	Front	380000	1900.0	1	104	25.00	23.96	0.334	0.424					
				50	28	25.00	23.92	0.346	0.444					
	Hotspot	DFT-s-OFDM	QPSK	10	Rear	380000	1900.0	1	104	22.00	21.03	0.401	0.501	
								50	28	22.00	21.02	0.404	0.506	
					Front	380000	1900.0	1	104	22.00	21.03	0.287	0.359	
								50	28	22.00	21.02	0.294	0.368	
Edge 3					380000	1900.0	1	104	22.00	21.03	0.439	0.549		
							50	28	22.00	21.02	0.445	0.558	39	
Edge 4					380000	1900.0	1	104	22.00	21.03	0.164	0.205		
							50	28	22.00	21.02	0.173	0.217		
Edge 3	380000	1900.0	1	1	22.00	21.04	0.411	0.513						
			50	1	22.00	21.04	0.411	0.513						

Note(s):

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

10.13. NR Band n5 (20MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot No.			
										Tune-up limit	Meas.	Meas.	Scaled				
Main 1 Ant.	Head	DFT-s-OFDM	QPSK	0	Left Touch	167300	836.5	1	104	25.50	24.56	0.212	0.263				
								50	28	25.50	24.42	0.195	0.250				
					Left Tilt	167300	836.5	1	104	25.50	24.56	0.129	0.160				
								50	28	25.50	24.42	0.123	0.158				
				Right Touch	167300	836.5	1	104	25.50	24.56	0.231	0.287					
							50	28	25.50	24.42	0.241	0.309	40				
				Right Tilt	167300	836.5	1	104	25.50	24.56	0.130	0.161					
							50	28	25.50	24.42	0.141	0.181					
	CP-OFDM	QPSK	0	Left Touch	167300	836.5	1	1	24.00	22.71	0.146	0.196					
	Body-w orn	DFT-s-OFDM	QPSK	15	Rear	167300	836.5	1	104	25.50	24.56	0.299	0.371	41			
								50	28	25.50	24.42	0.277	0.355				
					Front	167300	836.5	1	104	25.50	24.56	0.171	0.212				
								50	28	25.50	24.42	0.182	0.233				
	CP-OFDM	QPSK	15	Rear	167300	836.5	1	1	24.00	22.71	0.205	0.276					
	Hotspot	DFT-s-OFDM	QPSK	10	Rear	167300	836.5	1	104	25.50	24.56	0.528	0.656	42			
								50	28	25.50	24.42	0.413	0.530				
								Front	167300	836.5	1	104	25.50	24.56	0.146	0.181	
											50	28	25.50	24.42	0.168	0.215	
					Edge 2	167300	836.5	1	104	25.50	24.56	0.310	0.385				
								50	28	25.50	24.42	0.318	0.408				
					Edge 3	167300	836.5	1	104	25.50	24.56	0.498	0.618				
50								28	25.50	24.42	0.447	0.573					
Edge 4					167300	836.5	1	104	25.50	24.56	0.152	0.189					
							50	28	25.50	24.42	0.162	0.208					
CP-OFDM					QPSK	10	Rear	167300	836.5	1	1	24.00	22.71	0.461	0.620		

Note(s):

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

10.14. NR Band n66 (40MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Plot			
										Tune-up limit	Meas.	Meas.	Scaled				
Main 2 Ant.	Head	DFT-s-OFDM	QPSK	0	Left Touch	349000	1745.0	1	1	25.00	24.10	0.178	0.219	43			
								108	54	25.00	24.05	0.167	0.208				
					Left Tilt	349000	1745.0	1	1	25.00	24.10	0.111	0.137				
								108	54	25.00	24.05	0.107	0.133				
				Right Touch	349000	1745.0	1	1	25.00	24.10	0.174	0.214					
							108	54	25.00	24.05	0.161	0.200					
				Right Tilt	349000	1745.0	1	1	25.00	24.10	0.085	0.105					
							108	54	25.00	24.05	0.094	0.117					
	CP-OFDM	QPSK	0	Left Touch	349000	1745.0	1	1	23.50	22.92	0.127	0.145					
	Body-w orn	DFT-s-OFDM	QPSK	15	Rear	349000	1745.0	1	1	25.00	24.10	0.357	0.439	44			
								108	54	25.00	24.05	0.326	0.406				
					Front	349000	1745.0	1	1	25.00	24.10	0.342	0.421				
								108	54	25.00	24.05	0.316	0.393				
	CP-OFDM	QPSK	15	Rear	349000	1745.0	1	1	23.50	22.92	0.163	0.186					
	Hotspot	DFT-s-OFDM	QPSK	10	Rear	349000	1745.0	1	1	22.00	21.58	0.342	0.377				
								108	54	22.00	21.63	0.331	0.360				
								Front	349000	1745.0	1	1	22.00	21.58	0.285	0.314	
											108	54	22.00	21.63	0.273	0.297	
					Edge 3	349000	1745.0	1	1	22.00	21.58	0.375	0.413	45			
								108	54	22.00	21.63	0.348	0.379				
					Edge 4	349000	1745.0	1	1	22.00	21.58	0.196	0.216				
108								54	22.00	21.63	0.197	0.215					
CP-OFDM	QPSK	10	Edge 3	349000	1745.0	1	1	22.00	21.89	0.302	0.310						

Note(s):

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

10.15. NR Band n77 (Voice/Data/SRS0) (100MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Power (dBm)		1-g SAR (W/kg)		Note.	Plot No.				
										Tune-up limit	Meas.	Meas.	Scaled						
Sub.3 Ant.	Head	DFT-s-OFDM	QPSK	0	Left Touch	650000	3750.0	1	137	18.00	17.21	0.058	0.070						
								135	138	18.00	17.14	0.059	0.072						
					Left Tilt	650000	3750.0	1	137	18.00	17.21	0.029	0.035						
								135	138	18.00	17.14	0.033	0.040						
					Right Touch	633334	3500.0	1	137	18.00	16.72	0.138	0.185	1					
								650000	3750.0	1	137	18.00	17.21	0.311	0.373				
						662000	3930.0	1		137	18.00	16.76	0.278	0.370					
								135	138	18.00	17.21	0.101	0.121						
					Right Tilt	650000	3750.0	1	137	18.00	17.21	0.128	0.156						
								135	138	18.00	17.14	0.128	0.156						
	CP-OFDM	QPSK	0	Right Touch	650000	3750.0	1	1	18.00	16.86	0.281	0.365							
	Body-w orn	DFT-s-OFDM	QPSK	15	Rear	633334	3500.0	1	137	18.00	16.72	0.136	0.183	1					
								650000	3750.0	1	137	18.00	17.21	0.333	0.399				
								135		138	18.00	17.14	0.380	0.463		47			
					Front	650000	3750.0	1	137	18.00	17.21	0.042	0.050						
								135	138	18.00	17.14	0.039	0.048						
					CP-OFDM	QPSK	15	Rear	650000	3750.0	1	1	18.00	16.86	0.285	0.371			
					Hotspot	DFT-s-OFDM	QPSK	10	Rear	633334	3500.0	1	137	18.00	16.72	0.322	0.432	1	
												1	137	18.00	17.21	0.632	0.758		
	135	138	18.00	17.14								0.670	0.817		48				
	270	0	18.00	17.05								0.626	0.779						
	1	137	18.00	16.76								0.495	0.659						
	135	138	18.00	16.77								0.293	0.389						
	Front	650000	3750.0	1					137	18.00	17.21	0.075	0.090						
				135					138	18.00	17.14	0.077	0.094						
	Edge 1	650000	3750.0	1					137	18.00	17.21	0.049	0.059						
				135					138	18.00	17.14	0.041	0.050						
	Edge 4	650000	3750.0	1					137	18.00	17.21	0.514	0.617						
135				138					18.00	17.14	0.514	0.627							
1				137					18.00	16.76	0.333	0.443							
135				138					18.00	16.77	0.297	0.394							
CP-OFDM	QPSK	10	Rear	650000	3750.0	1	1	18.00	16.86	0.530	0.689								

Note(s):

1. NR Band n77-DoD are tested at worst configuration of NR Band n77 band.
2. CP-OFDM mode were evaluated at worst configuration of DFT-s-OFDM in standalone exposure conditions.
3. NR Band n77 tested using FTM mode.

10.16. NR Band n77 (SRS1/SRS2/SRS3) (100MHz Bandwidth)

Antenna	RF Exposure Conditions	Modulation	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note.	Plot No.
							Tune-up limit	Meas.	Meas.	Scaled		
Sub.5 Ant. (SRS 1)	Head	SRS CW	0	Left Touch	633334	3500.0	10.50	9.82	0.056	0.065		
				Left Tilt	633334	3500.0	10.50	9.82	0.069	0.081		
					650000	3750.0	10.50	9.54	0.005	0.006	1	
					662000	3930.0	10.50	8.60	<0.001	<0.001	1	
				Right Touch	633334	3500.0	10.50	9.82	0.003	0.004		
	Right Tilt	633334	3500.0	10.50	9.82	<0.001	<0.001					
	Body-w orn	SRS CW	15	Rear	633334	3500.0	10.50	9.82	<0.001	<0.001		
					650000	3750.0	10.50	9.54	<0.001	<0.001	1	
					662000	3930.0	10.50	8.60	<0.001	<0.001	1	
				Front	633334	3500.0	10.50	9.54	<0.001	<0.001		
	Hotspot	SRS CW	10	Rear	633334	3500.0	10.50	9.82	0.039	0.046		
					650000	3750.0	10.50	9.54	0.006	0.007	1	
					662000	3930.0	10.50	8.60	0.003	0.005	1	
				Front	633334	3500.0	10.50	9.82	0.015	0.018		
				Edge 1	633334	3500.0	10.50	9.82	0.031	0.036		
Edge 4				633334	3500.0	10.50	9.82	<0.001	<0.001			
Sub.2 Ant. (SRS 2)	Head	SRS CW	0	Left Touch	650000	3750.0	12.00	11.27	0.169	0.200		
				Left Tilt	650000	3750.0	12.00	11.27	0.210	0.248		
				Right Touch	650000	3750.0	12.00	11.27	0.246	0.291		
				Right Tilt	633334	3500.0	12.00	10.60	0.108	0.149	2	
					650000	3750.0	12.00	11.27	0.314	0.371		49
					662000	3930.0	12.00	10.83	0.187	0.245		
	Body-w orn	SRS CW	15	Rear	633334	3500.0	12.00	10.60	0.005	0.007	2	
					650000	3750.0	12.00	11.27	0.057	0.067		
					662000	3930.0	12.00	10.83	0.029	0.038		
				Front	650000	3750.0	12.00	11.27	0.039	0.046		
	Hotspot	SRS CW	10	Rear	650000	3750.0	12.00	11.27	0.070	0.083		
				Front	650000	3750.0	12.00	11.27	0.035	0.041		
				Edge 1	633334	3500.0	12.00	10.60	0.010	0.014	2	
					650000	3750.0	12.00	11.27	0.071	0.083		
					662000	3930.0	12.00	10.83	0.034	0.045		
Edge 4				650000	3750.0	12.00	11.27	0.015	0.018			
Main 2 Ant. (SRS 3)	Head	SRS CW	0	Left Touch	633334	3500.0	17.00	16.34	0.017	0.019		
				Left Tilt	633334	3500.0	17.00	16.34	0.009	0.010		
				Right Touch	633334	3500.0	17.00	16.34	0.012	0.014		
				Right Tilt	633334	3500.0	17.00	16.34	0.022	0.025		
					650000	3750.0	17.00	16.33	0.002	0.002	1	
					662000	3930.0	17.00	15.92	0.002	0.002	1	
	Body-w orn	SRS CW	15	Rear	633334	3500.0	17.00	16.34	0.045	0.052	2	
					650000	3750.0	17.00	16.33	0.065	0.076		
					662000	3930.0	17.00	15.92	0.075	0.096		50
				Front	662000	3930.0	17.00	15.92	0.010	0.013		
	Hotspot	SRS CW	10	Rear	633334	3500.0	17.00	16.34	0.125	0.146	2	
					650000	3750.0	17.00	16.33	0.154	0.180		
					662000	3930.0	17.00	15.92	0.167	0.214		51
				Front	662000	3930.0	17.00	15.92	0.021	0.027		
				Edge 3	662000	3930.0	17.00	15.92	0.071	0.090		
Edge 4				662000	3930.0	17.00	15.92	0.026	0.033			

Note(s):

1. NR Band n77 are tested at worst configuration of NR Band n77-DoD band.
2. NR Band n77-DoD are tested at worst configuration of NR Band n77 band.
3. NR Band n77 tested using FTM mode.

10.17. LTE-uplink 2CA Band 48 (20MHz + 20MHz)

Antenna	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	FCC UL				SCC UL				Power (dBm)		1-g SAR (W/kg)		Plot No.
					Ch #.	Freq. (MHz)	RB Allocation	RB offset	Ch #.	Freq. (MHz)	RB Allocation	RB offset	Tune-up limit	Meas.	Meas.	Scaled	
	Body-worn	QPSK	15	Rear	56207	3646.7	50	0	56405	3666.5	50	50	20.00	19.56	0.328	0.363	53
	Hotspot	QPSK	10	Edge 4	56207	3646.7	1	0	56009	3626.9	1	99	20.00	19.41	0.275	0.315	54

10.18. Wi-Fi (DTS Band)

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.	
											Tune-up limit	Meas.	Meas.	Scaled			
WLAN Ant.	2.4GHz	802.11b 1 Mbps	Head	On	0	Left Touch	6	2437.0	0.031	98.8%	10.0	9.60					
						Left Tilt	6	2437.0	0.033	98.8%	10.0	9.60					
						Right Touch	6	2437.0	0.042	98.8%	10.0	9.60					
						Righttt Tilt	6	2437.0	0.048	98.8%	10.0	9.60	0.034	0.038	1	55	
			Body-worn	Off	15	Rear	6	2437.0	0.306	98.8%	21.0	20.51	0.182	0.206	1	56	
						Front	6	2437.0	0.090	98.8%	21.0	20.51					
			Hotspot	Off	10	Rear	6	2437.0	0.731	98.8%	21.0	20.51	0.413	0.468			57
						Front	6	2437.0	0.190	98.8%	21.0	20.51					
						Edge 1	6	2437.0	0.277	98.8%	21.0	20.51	0.186	0.211	2		
						Edge 4	6	2437.0	0.098	98.8%	21.0	20.51					

Note(s):

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

10.19. Wi-Fi (U-NII Bands)

U-NII 2A Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Note	Plot No.	
											Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled			
WLAN Ant.	5.3 GHz U-NII 2A	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	58	5290.0	0.466	98.5%	11.0	10.30							
						Left Tilt	58	5290.0	0.634	98.5%	11.0	10.30	0.311	0.371			1	58	
						Right Touch	58	5290.0	0.547	98.5%	11.0	10.30							
						Right Tilt	58	5290.0	0.568	98.5%	11.0	10.30							
	802.11a 6 Mbps	Body-worn	Off	15	Rear	52	5260.0	0.850	98.7%	16.0	15.28	0.421	0.503					59	
					Front	52	5260.0	0.227	98.7%	16.0	15.28	0.099	0.118			2			
		Product Specific 10-g	Off	0	Rear	52	5260.0	16.003	98.7%	16.0	15.28			1.240	1.482			60	
					Front	52	5260.0	1.476	98.7%	16.0	15.28								
					Edge 1	52	5260.0	15.146	98.7%	16.0	15.28					1.170	1.399	2	
					Edge 4	52	5260.0	3.449	98.7%	16.0	15.28								

U-NII 2C Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		10-g SAR (W/kg)		Note	Plot No.	
											Tune-up limit	Meas.	Meas.	Scaled	Meas.	Scaled			
WLAN Ant.	5.5 GHz U-NII 2C	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	122	5610.0	0.855	98.5%	11.0	10.85	0.444	0.467				2	
						Left Tilt	122	5610.0	1.064	98.5%	11.0	10.85	0.534	0.561				61	
						Right Touch	122	5610.0	0.619	98.5%	11.0	10.85							
						Right Tilt	122	5610.0	0.812	98.5%	11.0	10.85							
	802.11a 6 Mbps	Body-worn	Off	15	Rear	144	5720.0	0.533	98.7%	16.0	15.19	0.227	0.277				1	62	
					Front	144	5720.0	0.423	98.7%	16.0	15.19								
		Product Specific 10-g	Off	0	Rear	144	5720.0	9.958	98.7%	16.0	15.19			0.798	0.974	1	63		
					Front	144	5720.0	4.636	98.7%	16.0	15.19								
					Edge 1	144	5720.0	9.511	98.7%	16.0	15.19								
					Edge 4	144	5720.0	5.672	98.7%	16.0	15.19								

U-NII 3 Results

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Area Scan Max. SAR (W/kg)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.	
											Tune-up limit	Meas.	Meas.	Scaled			
WLAN Ant.	5.8 GHz U-NII 3	802.11ac VHT 80 29.3 Mbps	Head	On	0	Left Touch	155	5775.0	0.688	98.5%	11.0	10.70					
						Left Tilt	155	5775.0	0.770	98.5%	11.0	10.70	0.396	0.431	2		
						Right Touch	155	5775.0	0.770	98.5%	11.0	10.70	0.359	0.391	2		
						Right Tilt	155	5775.0	1.346	98.5%	11.0	10.70	0.518	0.564		64	
	802.11a 6 Mbps	Body-worn	Off	15	Rear	165	5825.0	0.389	98.7%	16.0	15.41	0.154	0.179			65	
					Front	165	5825.0	0.388	98.7%	16.0	15.41						
		Hotspot	Off	10	Rear	149	5745.0	1.217	98.7%	16.0	15.34	0.513	0.605	2			
					Front	149	5745.0	0.635	98.7%	16.0	15.34	0.312	0.368	4			
					Edge 1	149	5745.0	1.810	98.7%	16.0	15.34	0.824	0.972		66		
					Edge 4	149	5745.0	0.511	98.7%	16.0	15.34	0.196	0.231	4			

Note(s):

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

10.20. Bluetooth

Antenna	Frequency Band	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
BT Ant.	2.4GHz	GFSK (1 Mbps) DH5	Head	Off	0	Left Touch	0	2402.0	76.7%	16.0	15.21	0.065	0.102	
						Left Tilt	0	2402.0	76.7%	16.0	15.21	0.072	0.112	
						Right Touch	0	2402.0	76.7%	16.0	15.21	0.088	0.138	
						Righttt Tilt	0	2402.0	76.7%	16.0	15.21	0.106	0.166	67
			Body-w orn	Off	15	Rear	0	2402.0	76.7%	16.0	15.21	0.035	0.054	68
						Front	0	2402.0	76.7%	16.0	15.21	0.014	0.022	
			Hotspot	Off	10	Rear	0	2402.0	76.7%	16.0	15.21	0.086	0.134	69
						Front	0	2402.0	76.7%	16.0	15.21	0.028	0.044	
						Edge 1	0	2402.0	76.7%	16.0	15.21	0.046	0.071	
						Edge 4	0	2402.0	76.7%	16.0	15.21	0.017	0.027	

10.21. NFC

Antenna	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Test setup		Freq. (MHz)	10-g SAR (W/kg)	Plot No.
					Type	Bitrate		Meas.	
NFC	PBRS	Product Specific 10-g	0	Rear	A	106	13.6	0.018	70
					A	212	13.6	0.018	71
					A	423	13.6	0.016	
					B	212	13.6	0.017	
					C	212	13.6	0.015	
				Front	A	212	13.6	0.000	
				Edge 1	A	212	13.6	0.000	
				Edge 4	A	212	13.6	0.000	

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	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	Hotspot	Rear	No	0.392	N/A	N/A
	LTE Band 13	Hotspot	Rear	No	0.529	N/A	N/A
835	GSM 850	Hotspot	Rear	No	0.683	N/A	N/A
	WCDMA Band V	Hotspot	Rear	No	0.437	N/A	N/A
	LTE Band 5	Hotspot	Rear	No	0.446	N/A	N/A
	NR Band n5	Hotspot	Rear	No	0.528	N/A	N/A
1750	LTE Band 66	Hotspot	Edge 3	No	0.523	N/A	N/A
	NR Band n66	Hotspot	Edge 3	No	0.375	N/A	N/A
1900	GSM 1900	Body-w orn	Rear	No	0.241	N/A	N/A
	WCDMA Band II	Body-w orn	Rear	No	0.438	N/A	N/A
	LTE Band 2	Hotspot	Edge 3	No	0.556	N/A	N/A
	NR Band n2	Hotspot	Edge 3	No	0.445	N/A	N/A
2450	WiFi 2.4GHz	Hotspot	Rear	No	0.413	N/A	N/A
	Bluetooth	Head	Right Tilt	No	0.106	N/A	N/A
2600	LTE Band 7	Hotspot	Rear	No	0.697	N/A	N/A
3600	LTE Band 48	Hotspot	Edge 4	No	0.578	N/A	N/A
3700	NR Band n77	Hotspot	Rear	No	0.670	N/A	N/A
5250	WiFi 5.3GHz	Body-w orn	Rear	No	0.421	N/A	N/A
5600	WiFi 5.6GHz	Head	Left Tilt	No	0.534	N/A	N/A
5750	WiFi 5.8GHz	Hotspot	Edge 1	Yes	0.824	0.786	1.05

Peak spatial-average (10g of tissue)

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
1900	LTE Band 2	Product Specific 10-g	Edge 3	No	0.967	N/A	N/A
2600	LTE Band 7	Product Specific 10-g	Rear	Yes	2.210	2.200	1.00
5250	WiFi 5.3GHz	Product Specific 10-g	Rear	No	1.240	N/A	N/A
5600	WiFi 5.6GHz	Product Specific 10-g	Rear	No	0.798	N/A	N/A

Note(s):

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

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations				
Head & Body-w orn & Hotspot & Phablet-10g	1	WWAN (2G/3G/LTE/NR)	+	DTS Ant.		
	2	WWAN (2G/3G/LTE/NR)	+	BT Ant.		
	3	WWAN (2G/3G/LTE/NR)	+	UNII Ant.		
	4	WWAN (2G/3G/LTE/NR)	+	NFC		
	5	WWAN (2G/3G/LTE/NR)	+	BT Ant.	+	UNII Ant.
	6	WWAN (2G/3G/LTE/NR)	+	NFC	+	UNII Ant.
	7	ENDC or ULCA	+	DTS Ant.		
	8	ENDC or ULCA	+	BT Ant.		
	9	ENDC or ULCA	+	UNII Ant.		
	10	ENDC or ULCA	+	NFC		
	11	ENDC or ULCA	+	BT Ant.	+	UNII Ant.
	12	ENDC or ULCA	+	NFC	+	UNII Ant.

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. BT tethering is considered about each RF exposure conditions.

Note(s):

For EN-DC mode, Qualcomm Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G(LTE) and time-averaged RF exposure from 5G NR. Smart Transmit algorithm controls the total RF exposure from both 4G and 5G NR to not exceed FCC limit. Therefore, simultaneous transmission compliance between 4G+5G NR operation is demonstrated in the Part 2 Report during algorithm validation. In Part 1 Report, simultaneous transmission compliance was evaluated individually with other Radios (WLAN or BT) using one of 4G or 5G NR.

12.1. Sub6 Antenna Groups

The 2nd generation of Smart Transmit (GEN2) operates based on pre-defined sub6 antenna groups(AG). Sub6 Tx antennas in UE are grouped based on spatial variation of RF exposure distributions, where the RF exposure of one AG is mutually exclusive from the other AG. This is accomplished by demonstrating below conditions for all RF exposure scenarios (This procedures are follow according to Qualcomm’s document (80-W2112-4));

1. (Condition#1 Sum of SAR) : Demonstrate that the sum of maximum *reported* SAR from each of the sub6 AGs and the *reported* SAR values from radios outside Smart Transmit (WLAN/BT/NFC/UWB) should be less than the regulatory limit for each supported DSI.

2. If the condition#1 is not met, then for a given antenna grouping scheme plus external radios/antennas (ERs), demonstrate all AG pairs, all ER pairs and all (AG, ER) pairs in the configuration meet SPLSR (SAR to Peak Location Ratio) criteria for each supported DSI (each RF exposure scenarios).
 For a conservative assessment of SPLSR, the separation distance between each AGs were determined using only the y-axis coordinates of the peak locations.

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

For a conservative assessment of SPLSR in Head exposure condition, the y-axis coordinates of the peak locations was used based on the ERP of each Right and Left phantoms.

This device supports antenna groups like below table.

Antenna Groups	Grouped antenna list		
AG0	Main.1	Main.2	
AG1	Sub.3	Sub.2	Sub.5
ER(s)	WLAN/BT Ant.	NFC Ant.	
ER = Exteral radios/antennas supported ourtside of Smart Transmit (ex; WLAN/BT...)			

This section is a step in evaluating whether each AGs are mutually exclusive using Condition#1 and Condition#2 guide. And If it is evaluated that each AGs are mutually exclusive for all DSIs (each RF exposure scenarios),

Additional analysis for Simultaneous transmission SAR test exclusion for Both AGs and ER(s) compliance demonstration evaluate at Section.12.2.

12.1.1 Head exposure (DSI = 2) Antenna group analysis

Condition#1

Antenna group : AG0

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)		
			Antenna Group : AG0		Highest SAR level
			Main.1	Main.2	
Head (1-g SAR)	DSI=2	Left Touch	0.380	0.452	0.452
		Left Tilt	0.215	0.183	0.215
		Right Touch	0.480	0.271	0.480
		Right Tilt	0.239	0.212	0.239

Antenna group : AG1

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Group : AG1			Highest SAR level
			Sub.3	Sub.5	Sub.2	
Head (1-g SAR)	DSI=2	Left Touch	0.072	0.065	0.200	
		Left Tilt	0.062	0.081	0.248	
		Right Touch	0.373	0.004	0.291	
		Right Tilt	0.156	0.000	0.371	

SUM for Antenna groups

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Groups			SUM SAR
			AG0 Highest SAR	AG1 Highest SAR	ER Highest SAR	
Head (1-g SAR)	DSI=2	Left Touch	0.452	0.200	0.569	1.221
		Left Tilt	0.215	0.248	0.673	1.136
		Right Touch	0.480	0.373	0.529	1.382
		Right Tilt	0.239	0.371	0.730	1.340

ER = External radios/antennas supported outside of Smart Transmit (ex; WLAN/BT...)

Note(s):

1. For ER' Highest SAR, please refer to section.12.2.
2. Additional evaluation is not required due to below FCC limit.

12.1.2 Body-worn exposure (DSI = 0) Antenna group analysis

Condition#1

Antenna group : AG0

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)		
			Antenna Group : AG0		Highest SAR level
			Main.1	Main.2	
Body-worn (1-g SAR)	0	Rear	0.464	0.553	0.553
		Front	0.332	0.471	0.471

Antenna group : AG1

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Group : AG1		Highest SAR level	
			Sub.3	Sub.5		Sub.2
Body-worn (1-g SAR)	0	Rear	0.463	0.000	0.067	0.463
		Front	0.050	0.000	0.046	0.050

SUM for Antenna groups

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			SUM SAR
			Antenna Groups			
			AG0 Highest SAR	AG1 Highest SAR	ER Highest SAR	
Body-worn (1-g SAR)	0	Rear	0.553	0.463	0.557	1.573
		Front	0.471	0.050	0.206	0.727

ER = Exteral radios/antennas suppered outside of Smart Transmit (ex; WLAN/BT...)

Note(s):

1. For ER' Highest SAR, please refer to section.12.2.
2. Additional evaluation is not required due to below FCC limit.

12.1.3 Hotspot exposure (DSI = 3) Antenna group analysis

Condition#1

Antenna group : AG0

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)		
			Antenna Group : AG0		Highest SAR level
			Main.1	Main.2	
Hotspot (1-g SAR)	3	Rear	0.919	0.871	0.919
		Front	0.326	0.583	0.583
		Edge 1			0.000
		Edge 2	0.408		0.408
		Edge 3	0.618	0.679	0.679
		Edge 4	0.212	0.279	0.279

Antenna group : AG1

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Group : AG1			Highest SAR level
			Sub.3	Sub.5	Sub.2	
Hotspot (1-g SAR)	3	Rear	0.817	0.046	0.817	
		Front	0.094	0.018	0.094	
		Edge 1	0.059	0.036	0.059	
		Edge 2			0.000	
		Edge 3			0.000	
		Edge 4	0.632	0.000	0.632	

SUM for Antenna groups

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Groups			SUM SAR
			AG0 Highest SAR	AG1 Highest SAR	ER Highest SAR	
Hotspot (1-g SAR)	3	Rear	0.919	0.817	0.739	2.475
		Front	0.583	0.094	0.468	1.145
		Edge 1	0.000	0.059	1.043	1.102
		Edge 2	0.408	0.000	0.000	0.408
		Edge 3	0.679	0.000	0.000	0.679
		Edge 4	0.279	0.632	0.468	1.379

Note.2

ER = Exteral radios/antennas suppered outside of Smart Transmit (ex; WLAN/BT...)

Note(s):

1. For ER' Highest SAR, please refer to section.12.2.
2. Additional evaluation is required due to over FCC limit. So please refer to Condition#2.

Condition#2

Test position	No.	Antenna pairs		AG0		AG1		ER SAR (W/kg)	AG0+AG1+ER SUM SAR (W/kg)	SPLSR of AG0 & AG1
		AG0	AG1	SAR (W/kg)	Y-axis location (mm)	SAR (W/kg)	Y-axis location (mm)			
Rear -10mm	1	Main 1 Ant.	Sub.3 Ant.	0.919	-81.7	0.817	53.6	0.739	2.475	0.02
	2	Main 2 Ant.	Sub.3 Ant.	0.871	-65.8	0.817	53.6	0.739	2.427	0.02
	3	Main 1 Ant.	Sub.5 Ant.	0.919	-81.7	0.046	87.0	0.739	1.704	0.01
	4	Main 2 Ant.	Sub.5 Ant.	0.871	-65.8	0.046	87.0	0.739	1.656	0.01
	5	Main 1 Ant.	Sub.2 Ant.	0.919	-81.7	0.083	76.8	0.739	1.741	0.01
	6	Main 2 Ant.	Sub.2 Ant.	0.871	-65.8	0.083	76.8	0.739	1.693	0.01

Highest Reported SAR and Peak SAR location (only Y-axis location) in each WWAN Bands in each Antennas

Antenna Group	Antenna	Bands	SAR (W/kg)	Y-axis(mm) from ERP point	Antenna Group	Antenna	Bands	SAR (W/kg)	Y-axis(mm) from ERP point
AG0	Main.1 Ant.	GSM 850	0.919	-81.7	AG1	Sub.3 Ant.	LTE Band 48	0.592	51.4
		WCDMA Band V	0.491	-79.2			NR Band n77-SRS0	0.817	53.6
		LTE Band 5	0.523	-80.9			Worst configuration	0.817	53.6
		LTE Band 12	0.497	-79.2		Sub.5 Ant.	NR Band n77-SRS1	0.046	87.0
		LTE Band 13	0.685	-79.2			Worst configuration	0.046	87.0
		NR Band n5	0.656	-81.5		Sub.2 Ant.	NR Band n77-SRS2	0.083	76.8
		Worst configuration	0.919	-81.7			Worst configuration	0.083	76.8
	Main.2 Ant.	GSM 1900	0.210	-78.1					
		WCDMA Band II	0.482	-78.1					
		LTE Band 2	0.464	-68.9					
		LTE Band 7	0.871	-65.8					
		LTE Band 66(4)	0.576	-72.0					
		NR Band n2	0.506	-75.6					
		NR Band n66	0.377	-72.8					
NR Band n77-SRS3	0.167	-78.8							
Worst configuration	0.871	-65.8							

Note(s):

1. If Antenna pair's SUM SAR results are below 1.6 or 4.0 W/kg (1-g or 10-g respectively), then Condition#2 is not required.
2. If SPLSR criteria is below 0.04 or 0.10 (1-g or 10-g respectively) in all antenna pair (AG0 & AG1), additional evaluation is not required.

12.1.4 Product Specific 10-g exposure (DSI = 0, 1, 4) Antenna group analysis

Condition#1

Antenna group : AG0

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)		
			Antenna Group : AG0		Highest SAR level
			Main.1	Main.2	
Product Specific 10-g (10-g SAR)	0,1,4	Rear	N/A	2.941	2.941
		Front	N/A	N/A	0.000
		Edge 1	N/A	N/A	0.000
		Edge 2	N/A	N/A	0.000
		Edge 3	N/A	1.201	1.201
		Edge 4	N/A	N/A	0.000

Antenna group : AG1

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Group : AG1			Highest SAR level
			Sub.3	Sub.5	Sub.2	
Product Specific 10-g (10-g SAR)	0,1,4	Rear	N/A	N/A	N/A	N/A
		Front	N/A	N/A	N/A	N/A
		Edge 1	N/A	N/A	N/A	N/A
		Edge 2	N/A	N/A	N/A	N/A
		Edge 3	N/A	N/A	N/A	N/A
		Edge 4	N/A	N/A	N/A	N/A

SUM for Antenna groups

RF Exposure	DSI state	Test Position	Standalone SAR (W/kg)			
			Antenna Groups			SUM SAR
			AG0 Highest SAR	AG1 Highest SAR	ER Highest SAR	
Product Specific 10-g (10-g SAR)	0,1,4	Rear	2.941	N/A	1.500	4.441
		Front	0.000	N/A	1.482	1.482
		Edge 1	0.000	N/A	1.390	1.390
		Edge 2	0.000	N/A	0.000	0.000
		Edge 3	1.201	N/A	0.000	1.201
		Edge 4	0.000	N/A	1.482	1.482

Note.2

ER = Exteral radios/antennas suppered outside of Smart Transmit (ex; WLAN/BT...)

Note(s):

1. For ER' Highest SAR, please refer to section.12.2.
2. Additional evaluation is required due to over FCC limit. So please refer to Sec 12.2

Conclusion:

1. Head & Body-worn exposure condition (DSI = 0, 2) : AG0+AG1+ER's sum is below FCC limit. So additional analysis is not required for AG0 and AG1.
2. Hotspot exposure condition (DSI =3) : Sub6 antenna group is demonstrated to show that AG0 is mutually exclusive from AG1 according to SPLSR criteria.
3. Product Specific 10-g (DSI = 0, 1, 4) : AG1 does not need to be measured. Therefore, the conditions for excluding simultaneous radiation are verified for the AG0+ER combination.

Simultaneous transmission SAR test exclusion considerations

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

Sum of SAR

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

SAR to Peak Location Separation 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:

SAR₁ 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

SAR₂ 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 **SAR₁** or **SAR₂**. 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 SPLSR 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 SPLSR calculation.

Sum to Peak Location Separation Ratio

Instead of doing a small volume scan over a co-located antenna pair (Hybrid SPLSR guide), Simultaneous transmission SAR test exclusion may algebraically sum the SAR values of the co-located pair and use that value in SPLSR calculation;

-In the calculation Separation distance must use the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.

12.2. Simultaneous transmission analysis

12.2.1. Head exposure condition

ER's SAR (DTS & BT & UNII)

RF Exposure	Test Position	ER's SAR (W/kg)		
		DTS Ant.	UNII Ant.	BT
		1	2	3
Head (1-g SAR)	Left Touch	0.038	0.467	0.102
	Left Tilt	0.038	0.561	0.112
	Right Touch	0.038	0.391	0.138
	Right Tilt	0.038	0.564	0.166
	Test Position	ER's SAR (W/kg)		Worst case Combination
		BT + 5G Ant		
		2 + 3		
	Left Touch	0.569	0.569	
	Left Tilt	0.673	0.673	
	Right Touch	0.529	0.529	
Right Tilt	0.730	0.730		

Simultaneous Transmission Analysis

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)
		AG0	AG1	ER	AG0 + AG1 + ER
				BT + 5GHz Ant	
Head (1-g SAR)	Left Touch	0.452	0.200	0.569	1.221
	Left Tilt	0.215	0.248	0.673	1.136
	Right Touch	0.480	0.373	0.529	1.382
	Right Tilt	0.239	0.371	0.730	1.340

Highest simultaneous transmission value of both section 12.1.1 & 12.2.1

RF Exposure	Test Position	Highest SAR (W/kg)				Sum SAR (W/kg)	
		AG0 (Main 1 Ant)	AG1 (Sub.3 Ant)	ER		AG0 + AG1 + ER(DTS)	AG0 + AG1 + ER(BT + 5GHz Ant)
				DTS	BT + 5GHz Ant		
Head (1-g SAR)	Right Touch	0.480	0.373	0.038	0.529	0.891	1.382

Note(s):

- Green value is estimated SAR value.

12.2.2. Body-worn exposure condition

ER's SAR (DTS & BT & UNII)

RF Exposure	Test Position	ER's SAR (W/kg)			
		DTS Ant	UNII Ant	BT	
		1	2	3	
Body-worn (1-g SAR)	Rear	0.206	0.503	0.054	
	Front	0.206	0.118	0.022	
	Test Position	ER's SAR (W/kg)			Worst case Combination
		DTS Ant	UNII Ant + BT		
		1	2 + 3		
	Rear	0.206	0.557	0.557	
Front	0.206	0.140	0.206		

Simultaneous Transmission Analysis

RF Exposure	Test Position	Highest SAR (W/kg)				Sum SAR (W/kg)	
		AG0	AG1	ER		AG0 + AG1 +ER(DTS)	AG0 + AG1 +ER(UNII+BT)
				DTS	UNII Ant + BT		
Body-worn (1-g SAR)	Rear	0.553	0.463	0.206	0.557	1.222	1.573
	Front	0.471	0.050	0.206	0.140	0.727	0.661

Highest simultaneous transmission of both section 12.1.2 & 12.2.2

RF Exposure	Test Position	Highest SAR (W/kg)				Sum SAR (W/kg)	
		AG0 (Main 2 Ant)	AG1 (Sub.3 Ant)	ER		AG0 + AG1 +ER(DTS)	AG0 + AG1 +ER(UNII+BT)
				DTS	UNII Ant + BT		
Body-worn (1-g SAR)	Rear	0.553	0.463	0.206	0.557	1.222	1.573

Note(s):

- Green value is estimated SAR value.

12.2.3. Hotspot exposure condition

ER's SAR (DTS & BT & UNII)

RF Exposure	Test Position	ER's SAR (W/kg)		
		DTS Ant	UNII Ant	BT
		1	2	3
Hotspot (1-g SAR)	Rear	0.468	0.605	0.134
	Front	0.468	0.368	0.044
	Edge 1	0.211	0.972	0.071
	Edge 2	0.000	0.000	0.000
	Edge 3	0.000	0.000	0.000
	Edge 4	0.468	0.231	0.134
	Test Position	ER's SAR (W/kg)		Worst case Combination
		DTS Ant	UNII Ant + BT	
		1	2 + 3	
	Rear	0.468	0.739	0.739
	Front	0.468	0.412	0.468
	Edge 1	0.211	1.043	1.043
	Edge 2	0.000	0.000	0.000
	Edge 3	0.000	0.000	0.000
Edge 4	0.468	0.365	0.468	

Simultaneous Transmission Analysis

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)		
		AG0	AG1	ER	AG0 + ER	AG1 + ER	AG0 + AG1 + ER
Hotspot (1-g SAR)	Rear	0.919	0.817	0.739	1.658	1.556	
	Front	0.583	0.094	0.468			1.145
	Edge 1	0.000	0.059	1.043			1.102
	Edge 2	0.408	0.000	0.000			0.408
	Edge 3	0.679	0.000	0.000			0.679
	Edge 4	0.279	0.632	0.468			1.379

Simultaneous Transmission Analysis (AG0 + ER)

RF Exposure	Test Position	Highest SAR (W/kg)						Sum SAR (W/kg)			
		AG0		ER				WWAN + DTS	WWAN + UNII	WWAN + BT	WWAN + UNII + BT
		Bands	SAR (W/kg)	DTS	UNII	BT	BT + UNII				
Hotspot (1-g SAR)	Rear	GSM 850	0.919	0.468	0.605	0.134	0.739	1.387	1.524	1.053	1.658
		GSM 1900	0.210	0.468	0.605	0.134	0.739	0.678	0.815	0.344	0.949
		WCDMA Band II	0.482	0.468	0.605	0.134	0.739	0.950	1.087	0.616	1.221
		WCDMA Band V	0.491	0.468	0.605	0.134	0.739	0.959	1.096	0.625	1.230
		LTE Band 2	0.464	0.468	0.605	0.134	0.739	0.932	1.069	0.598	1.203
		LTE Band 5	0.523	0.468	0.605	0.134	0.739	0.991	1.128	0.657	1.262
		LTE Band 7	0.871	0.468	0.605	0.134	0.739	1.339	1.476	1.005	1.610
		LTE Band 12	0.497	0.468	0.605	0.134	0.739	0.965	1.102	0.631	1.236
		LTE Band 13	0.685	0.468	0.605	0.134	0.739	1.153	1.290	0.819	1.424
		LTE Band 66	0.576	0.468	0.605	0.134	0.739	1.044	1.181	0.710	1.315
		NR Band n2	0.506	0.468	0.605	0.134	0.739	0.974	1.111	0.640	1.245
		NR Band n5	0.656	0.468	0.605	0.134	0.739	1.124	1.261	0.790	1.395
		NR Band n66	0.377	0.468	0.605	0.134	0.739	0.845	0.982	0.511	1.116
NR Band n77 SRS-3	0.167	0.468	0.605	0.134	0.739	0.635	0.772	0.301	0.906		

Sum-Peak Location Separation Ratio

RF Exposure	Test Position	Highest SAR (W/kg)				Sum SAR (W/kg) (1-g or 10-g)		Calculated Distance (mm)	1-g SPLSR (= < 0.04) or 10-g SPLSR (= < 0.10)	Volume Scan (Yes/No)	Figure
		AG0 (Main 1 Ant)		UNII	BT	GSM850+UNII+BT	GSM850+UNII+BT				
Hotspot (1-g SAR)	Rear	GSM 850	0.919	0.605	0.134	GSM850+UNII+BT	1.658				1
		GSM 850	0.919	0.739		GSM850+UNII+BT	1.658	164.11	0.01	No	
Sum-Peak Location Separation <i>Note 2</i>				0.739		UNII+BT					
RF Exposure	Test Position	Highest SAR (W/kg)				Sum SAR (W/kg) (1-g or 10-g)		Calculated Distance (mm)	1-g SPLSR (= < 0.04) or 10-g SPLSR (= < 0.10)	Volume Scan (Yes/No)	Figure
		AG0 (Main 2 Ant)		UNII	BT	LTE B7+UNII+BT	LTE B7+UNII+BT				
Hotspot (1-g SAR)	Rear	LTE Band 7	0.871	0.605	0.134	LTE B7+UNII+BT	1.610				2
		LTE Band 7	0.871	0.739		LTE B7+UNII+BT	1.610	141.87	0.01	No	
Sum-Peak Location Separation <i>Note 2</i>				0.739		UNII+BT					

Highest simultaneous transmission of both section 12.1.3 & 12.2.3

RF Exposure	Test Position	Highest SAR (W/kg)						Sum SAR (W/kg)			
		AG0 (Main 2 Ant)	AG1 (Sub.3 Ant)	ER				AG0 +ER(DTS)	AG0 +ER(UNII)	AG0 +ER(BT)	AG1 +ER(UNII+BT)
				DTS	UNII Ant	BT	UNII Ant + BT				
Hotspot (1-g SAR)	Rear	0.919	0.817	0.468	0.605	0.134	0.739	1.387	1.524	1.053	1.556

Note(s):

- For Rear at 10mm, AG0 and AG1 were individually considered with ER for satisfy simultaneous transmission analysis according to Antenna group analysis. So Rear at 10mm was considered AG0+ER and AG1+ER, respectively. And to find the highest simultaneous transmission value, the highest value among Section 12.1.3 and 12.2.3 were considered.
- Per April.2022 TCBC workshop note (Sum-Peak Location Separation Ratio), co-located pair's sum SAR and minimum distance are used for SPLSR calculation.
- Green value is estimated SAR value.

12.2.4. Product Specific 10-g exposure condition

ER's SAR (UNII & NFC)

RF Exposure	Test Position	ER's SAR (W/kg)			Worst case Combination
		UNII	NFC	UNII + NFC	
		1	2	1 + 2	
Product Specific (10-g SAR)	Rear	1.482	0.018	1.500	1.500
	Front	1.482	0.000	1.482	1.482
	Edge 1	1.399	0.000	1.399	1.399
	Edge 2	0.000	0.000	0.000	0.000
	Edge 3	0.000	0.000	0.000	0.000
	Edge 4	1.482	0.000	1.482	1.482

Simultaneous Transmission Analysis

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)
		AG0	AG1	ER	AG0 + AG1 + ER
				UNII + NFC	
Product Specific (10-g SAR)	Rear	2.941		1.500	4.441
	Front			1.482	
	Edge 1			1.399	
	Edge 2				
	Edge 3	1.201			
	Edge 4			1.482	

Highest simultaneous transmission of both section 12.1.4 & 12.2.4

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)
		AG0	AG1	ER	AG0 + AG1 + ER
				UNII + NFC	
Product Specific (10-g SAR)	Rear	2.941		1.500	4.441

Simultaneous Transmission Analysis (AG0 + ER)

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg)
		AG0		ER	AG0 + ER (UNII + NFC)
		Bands	SAR (W/kg)	UNII + NFC	
Product Specific (10-g SAR)	Rear	GSM 850	N/A	1.500	N/A
		GSM 1900	N/A	1.500	N/A
		WCDMA Band II	N/A	1.500	N/A
		WCDMA Band V	N/A	1.500	N/A
		LTE Band 2	N/A	1.500	N/A
		LTE Band 5	N/A	1.500	N/A
		LTE Band 7	2.941	1.500	4.441
		LTE Band 12	N/A	1.500	N/A
		LTE Band 13	N/A	1.500	N/A
		LTE Band 66	N/A	1.500	N/A
		NR Band n2	N/A	1.500	N/A
		NR Band n5	N/A	1.500	N/A
NR Band n66	N/A	1.500	N/A		

Sum-Peak Location Separation Ratio

RF Exposure	Test Position	Highest SAR (W/kg)			Sum SAR (W/kg) (1-g or 10-g)	Calculated Distance (mm)	1-g SPLSR (= < 0.04) or 10-g SPLSR (= < 0.10)	Volume Scan (Yes/No)	Figure	
		AG0 (Main 1 Ant)	UNII	NFC						
Product Specific (10-g SAR)	Rear	LTE Band 7	2.941	1.482	0.018	LTE B7+UNII+NFC	4.441			3
		LTE Band 7	2.941	1.500		LTE B7+UNII+NFC	4.441	116.32	0.08	
Sum-Peak Location Separation <i>Note 2</i>			1.500			UNII+NFC				

Note(s):

- Green value is estimated SAR value.
- Per April.2022 TCBC workshop note (Sum-Peak Location Separation Ratio), co-located pair's sum SAR and minimum distance are used for SPLSR calculation.

Conclusion:

Simultaneous Transmission SAR analysis results is satisfied the FCC Limit requirement according to follow procedures with "Sum of SAR" or "Sum-Peak Location Separation Ratio".

Figure (1)

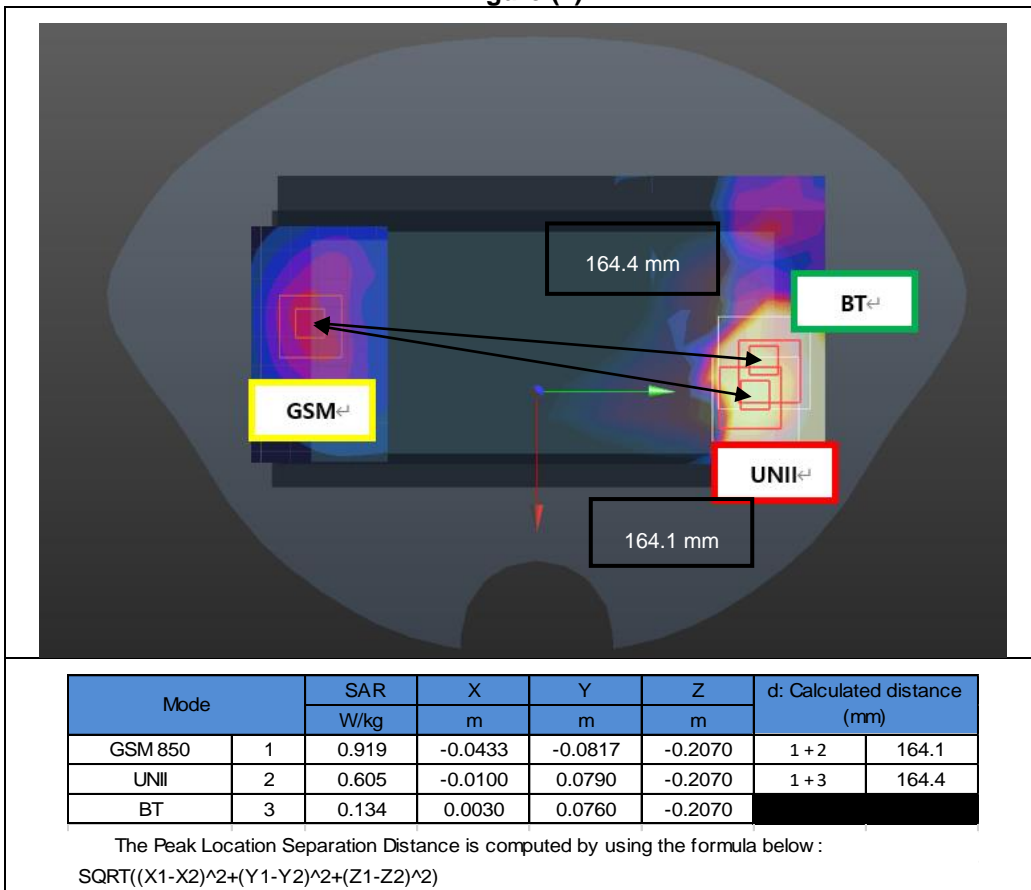


Figure (2)

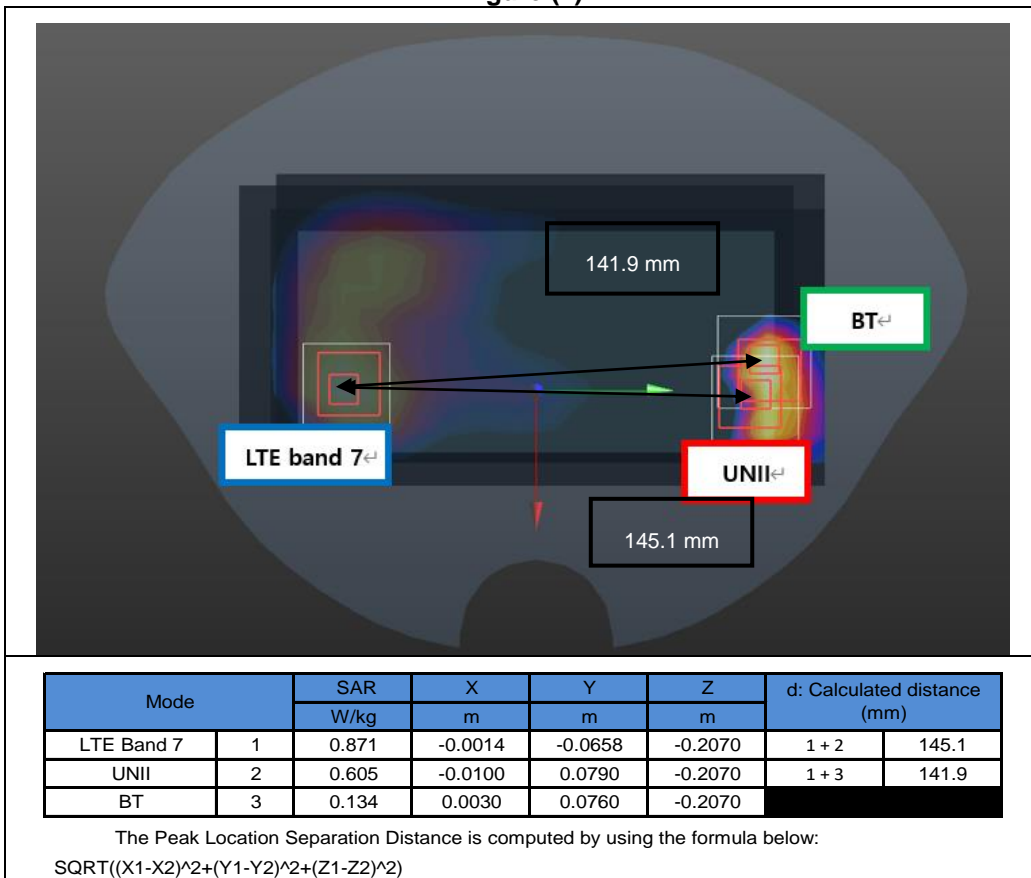
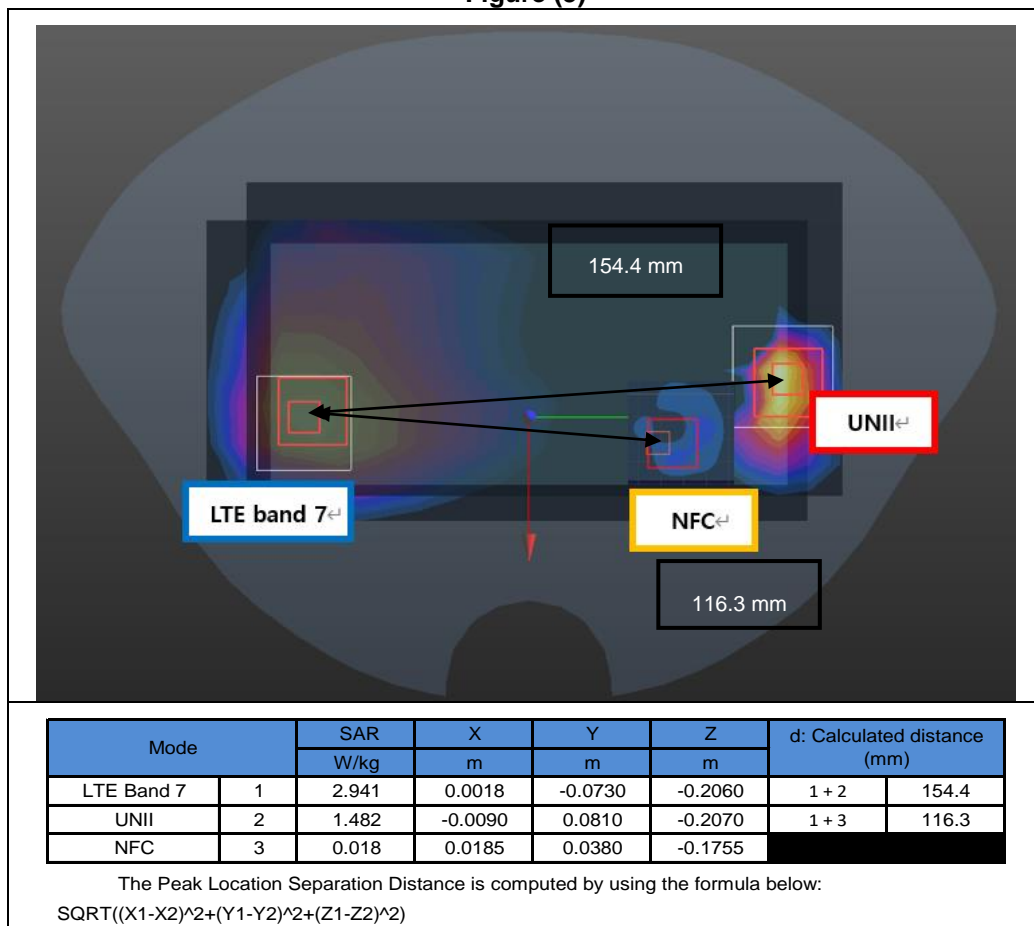


Figure (3)



Appendixes

Refer to separated files for the following appendixes.

4790558569-S1 FCC Report SAR_App A_Photos & Ant. Locations

4790558569-S1 FCC Report SAR_App B_Highest SAR Test Plots

4790558569-S1 FCC Report SAR_App C_System Check Plots

4790558569-S1 FCC Report SAR_App D_SAR Tissue Ingredients

4790558569-S1 FCC Report SAR_App E_Probe Cal. Certificates

4790558569-S1 FCC Report SAR_App F_Dipole Cal. Certificates

4790558569-S1 FCC Report SAR_App G_Proximity Sensor feature

4790558569-S1 FCC Report SAR_App H_LTE Carrier Aggregation

END OF REPORT