FCC SAR TEST REPORT

FCC ID	:	**PY321100529**
Equipment	:	**Netgear 5G MHS Travel Router**
Brand Name	:	**Netgear**
Model Name	:	**MR6500**
Applicant	:	**Netgear Inc. 350 E. Plumeria Drive, San Jose, CA 95134, United States**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was received on Oct. 28, 2021 and testing was started from Nov. 03, 2021 and completed on Dec. 21, 2021. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA190614D	01	Initial issue of report	Dec. 29, 2021

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Netgear Inc., Netgear 5G MHS Travel Router, MR6500, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary (Separation 10mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	LTE	LTE Band 2	1.17	1.43
		LTE Band 5	0.72	
		LTE Band 7	1.16	
		LTE Band 12	0.71	
		LTE Band 14	0.78	
		LTE Band 30	1.29	
		LTE Band 48	0.91	
		LTE Band 4 / 66	0.99	
	FR1	FR1 n2	1.13	
		FR1 n5	0.76	
		FR1 n12	0.68	
		FR1 n14	0.82	
		FR1 n30	1.18	
		FR1 n66	0.92	
		FR1 n77	1.29	
DTS	WLAN	2.4GHz WLAN	0.09	1.42
NII		5GHz WLAN	0.09	1.43
6XD		6GHz WLAN	0.06	1.43
Date of Testing:			2021/11/3 ~ 2021/12/21	

Equipment Class	Frequency Band		Reported SAR 1g SAR (W/kg)	APD (W/m^2)	Reported PD (W/m^2)
6XD	WLAN	6GHz WLAN	0.06	0.55	1.88
Date of Testing:			2021/11/16 ~ 2021/12/15		

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No.TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) and power density for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093), Human Exposure to RF Radiation Limits (1.0 mW/cm^2=10 W/m^2) specified in FCC 47 CFR part 1.1310 and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Paula Chen

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01
- IEC/IEEE 62209-1528:2020
- SPEAG DASY6 System Handbook
- SPEAG DASY6 Application Note (Interim Procedure for Device Operation at 6GHz-10GHz)

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Netgear 5G MHS Travel Router
Brand Name	Netgear
Model Name	MR6500
FCC ID	PY321100529
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n30 : 2305 MHz ~ 2315 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz 5G NR n260 : 37 GHz~40 GHz WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 6E: 5925 MHz ~ 6425 MHz, 6425 MHz ~ 6525 MHz, 6525 MHz ~ 6875 MHz, 6875 MHz ~ 7125 MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G FR1: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM 5G FR2: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160
EUT Stage	Identical Prototype

3.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	PY321100529
Equipment Name	Netgear 5G MHS Travel Router
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 14: 5MHz, 10MHz LTE Band 30: 5MHz, 10MHz LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK / 16QAM / 64QAM /256QAM
LTE Voice / Data requirements	Data
LTE MPR permanently built-in by design	**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

LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 12.
LTE Carrier Aggregation Additional Information	This device supports maximum of 5 carriers in the downlink and 2 carriers in the uplink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 7								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

LTE Band 12								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 14				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Channel #	Channel #	Freq.(MHz)
L	23305	790.5	23330	793
M	23330	793		
H	23355	795.5		

LTE Band 30				
	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	27685	2307.5	27710	2310
M	27710	2310		
H	27735	2312.5		

LTE Band 48								
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560
M	55990	3625	55990	3625	55990	3625	55990	3625
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690

LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770

3.3 General 5G NR SAR Test and Reporting Considerations

5G NR Information	
FCC ID	PY321100529
Equipment Name	Netgear 5G MHS Travel Router
Operating Frequency Range of each 5G NR transmission band	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n5: 824 MHz ~ 849 MHz 5G NR n12: 699 MHz ~ 716 MHz 5G NR n14 : 788 MHz ~ 798 MHz 5G NR n30 :2305 MHz ~2315 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n5: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n12: 5MHz, 10MHz, 15MHz 5G NR n14: 5MHz, 10MHz 5G NR n30: 5MHz, 10MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 30MHz, 40MHz 5G NR n77: 10MHz, 15MHz, 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 70MHz, 80MHz, 90MHz, 100MHz
SCS	FDD: SCS15KHz, TDD: SCS30KHz
uplink modulations used	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
LTE Anchor Bands for n2	LTE B5/12/14/30/66
LTE Anchor Bands for n5	LTE B2/12/30/66
LTE Anchor Bands for n12	LTE B2/30/66
LTE Anchor Bands for n14	LTE B2/30/66
LTE Anchor Bands for n30	LTE B2/5/12/14/66
LTE Anchor Bands for n66	LTE B2/5/12/14/30
LTE Anchor Bands for n77	LTE B2/5/12/14/30/66

NR Band 2

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860
M	376000	1880	376000	1880	376000	1880	376000	1880
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900

NR Band 5

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	165300	826.5	165800	829	166300	831.5	166800	834
M	167300	836.5	167300	836.5	167300	836.5	167300	836.5
H	169300	846.5	168800	844	168300	841.5	167800	839

NR Band 12

	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	140300	701.5	140800	704	141300	706.5
M	141500	707.5	141500	707.5	141500	707.5
H	142700	713.5	142200	711	141700	708.5

NR Band 14

	Bandwidth 5MHz		Bandwidth 10MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	158100	790.5	158600	793
M	158600	793		
H	159100	795.5		

NR Band 30				
	Bandwidth 5MHz		Bandwidth 10MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	461500	2307.5	462000	2310
M	462000	2310		
H	462500	2312.5		

NR Band 66												
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	342500	1712.5	343000	1715	343500	1717.5	344000	1720	345000	1725	346000	1730
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353000	1765	352000	1760

NR Band 77(3700 MHz ~ 3980 MHz)																						
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	647000	3705	647168	3707.52	647334	3710.01	647668	3715.02	648000	3720	648334	3725.01	648668	3730.02	649000	3735	649334	3740.01	649668	3745.02	650000	3750
M	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840	656000	3840
H	665000	3975	664832	3972.48	664666	3969.99	664332	3964.98	664000	3960	663666	3954.99	663332	3949.98	663000	3945	662666	3939.99	662332	3934.98	662000	3930

NR Band 77(3450MHz ~ 3550MHz)																						
	Bandwidth10MHz		Bandwidth15MHz		Bandwidth 20MHz		Bandwidth30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630334	3455.01	630500	3457.5	630668	3460.02	631000	3465	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495	633334	3500.01
M	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98	633332	3499.98
H	636332	3544.98	636166	3542.49	636000	3540	635666	3534.99	635332	3529.98	635000	3525	634666	3519.99	634332	3514.98	634000	3510	633666	3504.99	633332	3499.98

4. Smart Transmit feature for RF Exposure compliance

The FCC RF exposure limit is defined based on time-averaged RF exposure. The product implements Qualcomm Smart Transmit feature which controls the instantaneous transmitting power for WWAN transmitter to ensure the product in compliance with FCC RF exposure limit over a defined time window, for SAR (transmit frequency ≤ 6GHz). To control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is compliant to the regulation requirement.

This report describes the procedures for the SAR char generation, and the parameters obtained from SAR characterization (referred to as SAR char, respectively) will be used as input for Smart Transmit. SAR char will be entered via the Embedded File System (EFS) to enable the Smart Transmit Feature.

<Terminologies in this report>

P_{limit}	The time-averaged RF power which corresponds to SAR_design_targer.
P_{max}	Maximum target power level
SAR_design_target:	The design target for SAR compliance. It should be less than regulatory power density limit to account for all device design related uncertainties.
SAR char	P_{limit} for all the technologies/bands for all applicable DSI

<SAR Characterization>

SAR char must be generated to cover all radio configurations and usage scenarios that the wireless device supports for operating at 6 GHz or below. It will then be used as input for Smart Transmit to control and manage RF exposure for f < 6 GHz.

The Smart Transmit algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of SAR_design_target or PD_design_target, below the predefined time-averaged power limit (i.e., input.power.limit for 5G mmW NR), for each characterized technology and band (refer to RF exposure part0 report)

Smart Transmit allows the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit. Below table shows Plimit EFS settings and maximum tune up output power Pmax configured for this EUT for various transmit conditions (Device State Index DSI).

<Plimit for supported technologies and bands (Plimit in EFS file)>

Band	Antenna	SAR design Target (W/kg)	Duty cycle	Total Uncertainty (dB)	P limit (dBm) time-average power	P Max(*) time-average power
LTE B2	1	1.030	100.00%	1.00	24.00	22.50
LTE B5	1	1.030	100.00%	1.00	25.50	23.00
LTE B12	1	1.030	100.00%	1.00	25.60	23.00
LTE B14	1	1.030	100.00%	1.00	25.20	23.00
LTE B48**	1	1.030	63.30%	1.00	21.80	20.00
LTE B66	1	1.030	100.00%	1.00	24.70	23.00
FR1 n2	1	1.030	100.00%	1.00	23.90	22.50
FR1 n5	1	1.030	100.00%	1.00	25.30	23.00
FR1 n12	1	1.030	100.00%	1.00	25.80	23.00
FR1 n14	1	1.030	100.00%	1.00	24.90	23.00
FR1 n66	1	1.030	100.00%	1.00	24.40	23.00
FR1 n77	1	1.030	100.00%	1.00	21.30	22.00
LTE B2	2	1.030	100.00%	1.00	23.40	23.00
LTE B7	2	1.030	100.00%	1.00	22.90	22.50
LTE B30	2	1.030	100.00%	1.00	22.00	22.00
LTE B66/4	2	1.030	100.00%	1.00	24.10	23.00
FR1 n2	2	1.030	100.00%	1.00	23.60	23.00
FR1 n5	2	1.030	100.00%	1.00	26.30	23.00
FR1 n30	2	1.030	100.00%	1.00	22.30	22.00
FR1 n66	2	1.030	100.00%	1.00	25.70	23.00
FR1 n77	2	1.030	100.00%	1.00	21.20	22.00
FR1 n77 (SRS)	5	1.030	100.00%	1.00	21.80	20.50
FR1 n77 (SRS)	6	1.030	100.00%	1.00	19.50	19.50

*P_{max} is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + 1dB uncertainty.

**All P_{limit} power levels entered in the Table correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).

The max allowed output power is the P_{limit} + 1dB device uncertainty, and if P_{limit} is higher than P_{max}, the device output power will be P_{max} instead.

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR_design_target < SAR_{regulatory_limit} \times 10^{\frac{-total\ uncertainty}{10}}$$

5. RF Exposure Limits

5.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

5.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

5.3 RF Exposure limit for above 6GHz

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm^2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

6. Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

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

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

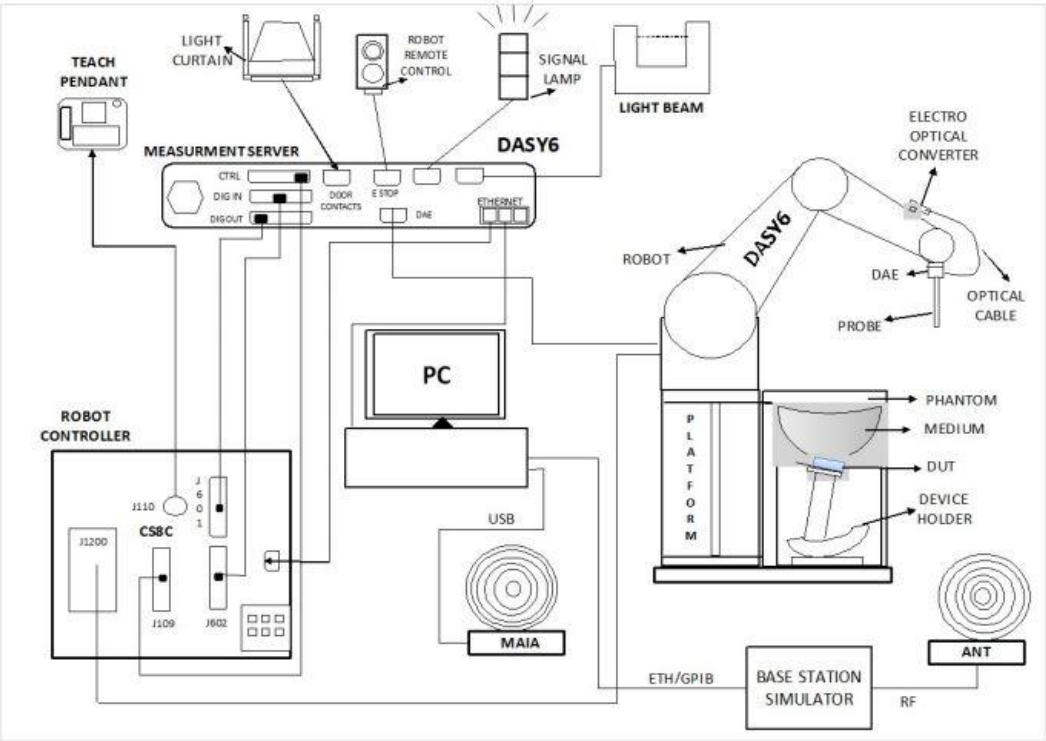
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

7. System Description and Setup

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



- The DASY system in DASY6/DASY5 V5.2 SAR Configuration is shown above
- 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 windows software and the DASY5/DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

7.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No.TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	

7.2 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

7.3 Data Acquisition Electronics (DAE)

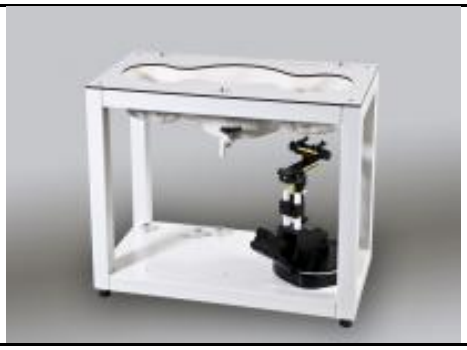
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

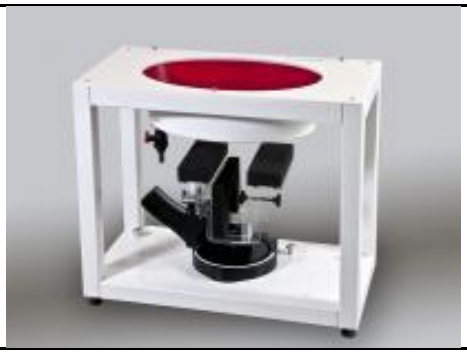
7.4 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

7.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN power measurement, use engineering software to configure EUT WLAN continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

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

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

8.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

8.2 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. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

8.3 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 found in the scanned area, within a range of the global maximum. The range (in dB0 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 FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

8.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes 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 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
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 *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

8.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit(2)	D750V3	1107	Mar. 08, 2019	Mar. 05, 2022
SPEAG	835MHz System Validation Kit(2)	D835V2	4d167	Nov. 25, 2019	Nov. 23, 2021
SPEAG	1750MHz System Validation Kit(2)	D1750V2	1112	Mar. 07, 2019	Mar. 04, 2022
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Aug. 19, 2021	Aug. 18, 2022
SPEAG	2300MHz System Validation Kit(2)	D2300V2	1006	Jan. 28, 2019	Jan. 25, 2022
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 17, 2021	Aug. 17, 2022
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 17, 2021	Aug. 16, 2022
SPEAG	3500MHz System Validation Kit(2)	D3500V2	1014	Jan. 29, 2019	Jan. 26, 2022
SPEAG	3700MHz System Validation Kit(2)	D3700V2	1006	Mar. 05, 2019	Mar. 02, 2022
SPEAG	3900MHz System Validation Kit(2)	D3900V2	1017	Apr. 29, 2019	Apr. 26, 2022
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 15, 2021	Sep. 14, 2022
SPEAG	5GHz System Validation Kit(2)	D5GHzV2	1128	Dec. 16, 2019	Dec. 14, 2021
SPEAG	6500MHz System Validation Kit	D6.5GHzV2	1003	Sep. 24, 2021	Sep. 22, 2023
SPEAG	5G Verification Source	10 GHz	1020	Jan. 18, 2021	Jan. 17, 2022
SPEAG	EUmmWV Probe Tip Protection	EUmmWV3	9424	Mar. 23, 2021	Mar. 22, 2022
SPEAG	Data Acquisition Electronics	DAE4	656	Jan. 22, 2021	Jan. 21, 2022
SPEAG	Data Acquisition Electronics	DAE4	778	May. 21, 2021	May. 20, 2022
SPEAG	Data Acquisition Electronics	DAE4	854	Aug. 19, 2021	Aug. 18, 2022
SPEAG	Data Acquisition Electronics	DAE4	1311	Aug. 20, 2021	Aug. 19, 2022
SPEAG	Data Acquisition Electronics	DAE4	1424	Jan. 19, 2021	Jan. 18, 2022
SPEAG	Data Acquisition Electronics	DAE4	1512	Feb. 11, 2021	Feb. 10, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	Jan. 27, 2021	Jan. 26, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	7439	Feb. 23, 2021	Feb. 22, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Jan. 19, 2021	Jan. 18, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Oct. 28, 2021	Oct. 27, 2022
RCPTWN	Thermometer	HTC-1	TM560-2	Oct. 28, 2021	Oct. 27, 2022
Anritsu	Radio Communication Analyzer	MT8821C	6201074414	Jul. 21, 2021	Jul. 20, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
R&S	Signal Generator	SMA100A	101091	Sep. 07, 2021	Sep. 06, 2022
Keysight	ENA Network Analyzer	E5071C	MY46316648	Jul. 22, 2021	Jul. 21, 2022
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 24, 2021	Sep. 23, 2022
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3252	Jul. 15, 2021	Jul. 14, 2022
Anritsu	Power Meter	ML2495A	1419002	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Meter	ML2496A	2119003	Jun. 09, 2021	Jun. 08, 2022
Anritsu	Power Sensor	MA2411B	1726150	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 19, 2021	Aug. 18, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 12, 2021	Oct. 11, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Sep. 06, 2021	Sep. 05, 2022
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

10. System Verification

10.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18℃ to 25℃ and within ± 2℃ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.
The liquid tissue depth was at least 15cm in the phantom for all SAR testing.

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	22.5	0.889	42.326	0.89	41.90	-0.11	1.02	±5	2021/11/7
835	22.8	0.907	42.409	0.90	41.50	0.78	2.19	±5	2021/11/6
1750	22.6	1.413	39.147	1.37	40.10	3.14	-2.38	±5	2021/11/5
1750	22.7	1.362	40.661	1.37	40.10	-0.58	1.40	±5	2021/11/9
1900	22.3	1.429	40.386	1.40	40.00	2.07	0.97	±5	2021/11/3
1900	22.4	1.443	39.949	1.40	40.00	3.07	-0.13	±5	2021/11/4
2300	22.3	1.659	40.090	1.67	39.50	-0.66	1.49	±5	2021/11/12
2450	22.3	1.819	39.713	1.80	39.20	1.06	1.31	±5	2021/11/12
2600	22.3	1.997	39.038	1.96	39.00	1.89	0.10	±5	2021/11/3
3500	22.2	2.910	37.440	2.91	37.90	0.00	-1.21	±5	2021/11/8
3500	22.7	2.820	36.975	2.91	37.90	-3.09	-2.44	±5	2021/11/9
3500	22.2	2.950	38.417	2.91	37.90	1.37	1.36	±5	2021/12/18
3700	22.2	3.119	37.238	3.12	37.70	-0.03	-1.23	±5	2021/11/8
3700	22.2	3.165	38.095	3.12	37.70	1.44	1.05	±5	2021/12/18
3900	22.2	3.328	37.050	3.33	37.51	-0.06	-1.23	±5	2021/11/8
3900	22.7	3.227	36.585	3.33	37.51	-3.09	-2.47	±5	2021/11/9
5250	22.1	4.599	36.209	4.71	35.95	-2.36	0.72	±5	2021/11/13
5250	22.5	4.650	36.053	4.71	35.95	-1.27	0.29	±5	2021/12/21
5600	22.5	4.946	35.663	5.07	35.50	-2.45	0.46	±5	2021/12/21
5750	22.1	5.107	35.451	5.22	35.35	-2.16	0.29	±5	2021/11/13
6500	22.5	6.230	34.500	6.07	34.50	2.64	0.00	±5	2021/12/15

10.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR12	2021/11/7	750	50	D750V3-1107	EX3DV4 - SN3976	DAE4 Sn1424	0.399	8.32	7.98	-4.09
SAR12	2021/11/6	835	50	D835V2-4d167	EX3DV4 - SN3976	DAE4 Sn1424	0.456	9.55	9.12	-4.50
SAR12	2021/11/5	1750	50	D1750V2-1112	EX3DV4 - SN3976	DAE4 Sn1424	1.93	36.70	38.6	5.18
SAR11	2021/11/9	1750	250	D1750V2-1112	EX3DV4 - SN7625	DAE4 Sn1512	8.76	36.70	35.04	-4.52
SAR12	2021/11/3	1900	50	D1900V2-5d041	EX3DV4 - SN3976	DAE4 Sn1424	1.94	40.60	38.8	-4.43
SAR12	2021/11/4	1900	250	D1900V2-5d041	EX3DV4 - SN3976	DAE4 Sn1424	10.10	40.60	40.4	-0.49
SAR11	2021/11/12	2300	250	D2300V2-1006	EX3DV4 - SN7625	DAE4 Sn1512	12.10	48.70	48.4	-0.62
SAR11	2021/11/12	2450	50	D2450V2-736	EX3DV4 - SN7625	DAE4 Sn1512	2.49	54.20	49.8	-8.12
SAR12	2021/11/3	2600	50	D2600V2-1008	EX3DV4 - SN3976	DAE4 Sn1424	2.96	58.00	59.2	2.07
SAR11	2021/11/8	3500	100	D3500V2-1014	EX3DV4 - SN7625	DAE4 Sn1512	6.55	67.90	65.5	-3.53
SAR11	2021/11/9	3500	100	D3500V2-1014	EX3DV4 - SN7625	DAE4 Sn1512	6.35	67.90	63.5	-6.48
SAR12	2021/12/18	3500	50	D3500V2-1014	EX3DV4 - SN3976	DAE4 Sn778	3.32	67.90	66.4	-2.21
SAR11	2021/11/8	3700	100	D3700V2-1006	EX3DV4 - SN7625	DAE4 Sn1512	6.88	67.30	68.8	2.23
SAR12	2021/12/18	3700	50	D3700V2-1006	EX3DV4 - SN3976	DAE4 Sn778	3.37	67.30	67.4	0.15
SAR11	2021/11/8	3900	100	D3900V2-1017-3900	EX3DV4 - SN7625	DAE4 Sn1512	7.11	69.50	71.1	2.30
SAR11	2021/11/9	3900	100	D3900V2-1017-3900	EX3DV4 - SN7625	DAE4 Sn1512	6.90	69.50	69	-0.72
SAR11	2021/11/13	5250	50	D5GHzV2-1128-5250	EX3DV4 - SN7625	DAE4 Sn1512	3.69	80.00	73.8	-7.75
SAR04	2021/12/21	5250	100	D5GHzV2-1006-5250	EX3DV4 - SN7439	DAE4 Sn1311	7.81	81.70	78.1	-4.41
SAR04	2021/12/21	5600	100	D5GHzV2-1006-5600	EX3DV4 - SN7439	DAE4 Sn1311	7.98	85.10	79.8	-6.23
SAR11	2021/11/13	5750	50	D5GHzV2-1128-5750	EX3DV4 - SN7625	DAE4 Sn1512	3.65	79.10	73	-7.71
SAR12	2021/12/15	6500	100	D6.5GHzV2-1003	EX3DV4 - SN3976	DAE4 Sn854	28.90	299.00	289	-3.34

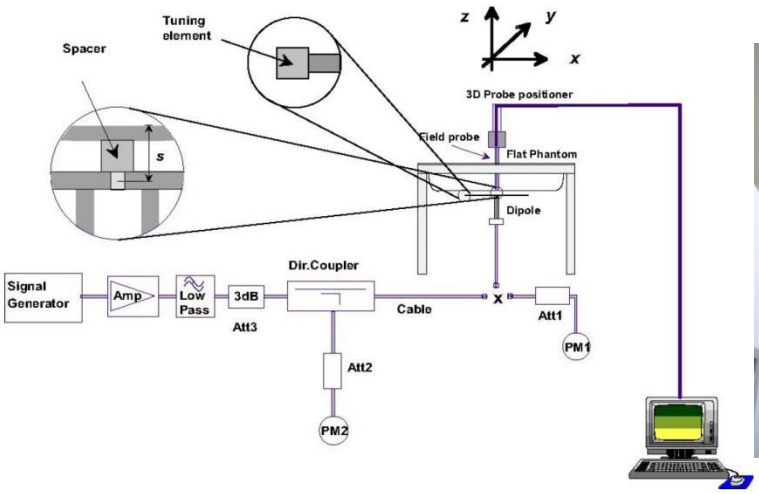


Fig 8.3.1 System Performance Check Setup

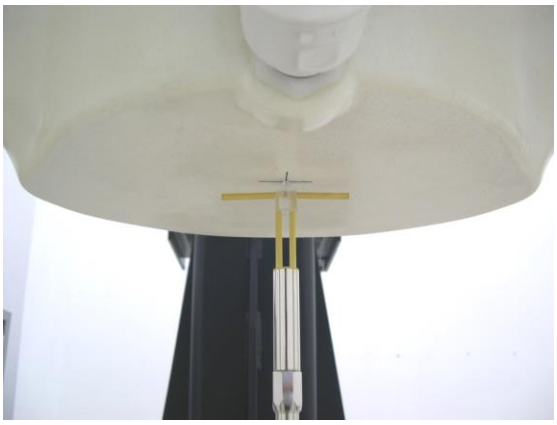


Fig 8.3.2 Setup Photo

10.3 PD System Performance Check Results

The system was verified to be within ±0.66 dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check. The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.

Test Location	Frequency (GHz)	5G Verification Source	Probe S/N	DAE S/N	Distance (mm)	Measured 4 cm^2 (W/m^2)	Targeted 4 cm^2 (W/m^2)	Deviation (dB)	Date
SAR04	10G	10GHz_1020	EUmmWV3-SN9424	DAE4-SN656	10mm	37.7	42.2	-0.49	2021/11/16

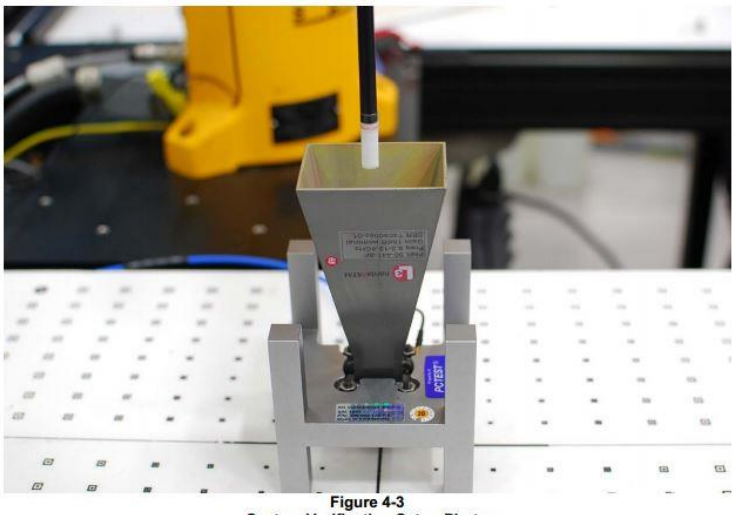


Figure 4-3
System Verification Setup Photo

System Performance Check Setup

11. RF Exposure Positions

11.1 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

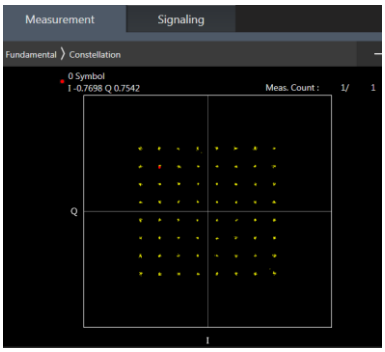
12. LTE Output Power (Unit: dBm)

<LTE Conducted Power>

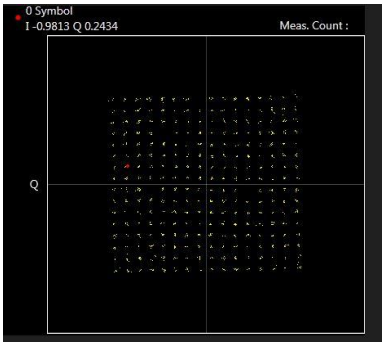
General Note:

1. Anritsu MT8821C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5/B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, 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.
9. LTE band 4 SAR test was covered by Band 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 16QAM, 64QAM, 256QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM, 16QAM and 256QAM signal modulation are correct.

16QAM



64QAM



256QAM

<LTE Band 2_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	23.42	23.48	23.39	23.5
20	QPSK	1	49	23.29	23.43	23.25	
20	QPSK	1	99	23.26	23.40	23.22	
20	QPSK	50	0	22.27	22.38	22.16	22.5
20	QPSK	50	24	22.21	22.37	22.20	
20	QPSK	50	50	22.28	22.42	22.27	
20	QPSK	100	0	22.23	22.40	22.20	
20	16QAM	1	0	22.05	22.26	22.12	22.5
20	16QAM	1	49	22.17	22.32	22.14	
20	16QAM	1	99	22.13	22.25	22.03	
20	16QAM	50	0	21.17	21.34	21.11	21.5
20	16QAM	50	24	21.24	21.42	21.20	
20	16QAM	50	50	21.22	21.43	21.21	
20	16QAM	100	0	21.24	21.35	21.19	
20	64QAM	1	0	21.13	21.24	21.07	21.5
20	64QAM	1	49	21.17	21.36	21.22	
20	64QAM	1	99	21.10	21.25	21.04	
20	64QAM	50	0	20.20	20.33	20.18	20.5
20	64QAM	50	24	20.21	20.41	20.20	
20	64QAM	50	50	20.29	20.40	20.16	
20	64QAM	100	0	20.17	20.38	20.14	
20	256QAM	1	0	18.03	18.18	18.04	18.5
20	256QAM	1	49	18.27	18.39	18.16	
20	256QAM	1	99	18.04	18.19	17.95	
20	256QAM	50	0	18.17	18.30	18.07	18.5
20	256QAM	50	24	18.16	18.34	18.17	
20	256QAM	50	50	18.24	18.35	18.13	
20	256QAM	100	0	18.24	18.40	18.22	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	23.39	23.42	23.36	23.5
15	QPSK	1	37	23.26	23.40	23.23	
15	QPSK	1	74	23.23	23.33	23.20	
15	QPSK	36	0	22.19	22.35	22.16	22.5
15	QPSK	36	20	22.26	22.28	22.14	
15	QPSK	36	39	22.30	22.37	22.20	
15	QPSK	75	0	22.19	22.37	22.20	
15	16QAM	1	0	22.08	22.17	22.06	22.5
15	16QAM	1	37	22.12	22.30	22.08	
15	16QAM	1	74	22.14	22.23	22.02	
15	16QAM	36	0	21.15	21.27	21.20	21.5
15	16QAM	36	20	21.23	21.40	21.19	
15	16QAM	36	39	21.27	21.37	21.25	
15	16QAM	75	0	21.16	21.34	21.21	
15	64QAM	1	0	21.10	21.18	21.10	21.5
15	64QAM	1	37	21.22	21.35	21.19	
15	64QAM	1	74	21.11	21.25	21.10	
15	64QAM	36	0	20.14	20.32	20.18	20.5
15	64QAM	36	20	20.22	20.31	20.20	
15	64QAM	36	39	20.21	20.36	20.19	
15	64QAM	75	0	20.25	20.38	20.20	
15	256QAM	1	0	18.02	18.13	17.97	18.5
15	256QAM	1	37	18.24	18.39	18.15	
15	256QAM	1	74	18.01	18.10	18.05	
15	256QAM	36	0	18.19	18.29	18.09	18.5

15	256QAM	36	20	18.19	18.28	18.18	
15	256QAM	36	39	18.22	18.26	18.19	
15	256QAM	75	0	18.25	18.36	18.17	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	23.38	23.43	23.36	23.5
10	QPSK	1	25	23.30	23.41	23.24	
10	QPSK	1	49	23.24	23.39	23.26	
10	QPSK	25	0	22.19	22.37	22.21	22.5
10	QPSK	25	12	22.16	22.33	22.14	
10	QPSK	25	25	22.28	22.37	22.23	
10	QPSK	50	0	22.25	22.38	22.16	
10	16QAM	1	0	22.15	22.21	22.04	22.5
10	16QAM	1	25	22.21	22.22	22.16	
10	16QAM	1	49	22.13	22.18	22.11	
10	16QAM	25	0	21.16	21.32	21.14	21.5
10	16QAM	25	12	21.28	21.34	21.27	
10	16QAM	25	25	21.32	21.36	21.21	
10	16QAM	50	0	21.19	21.33	21.21	
10	64QAM	1	0	21.05	21.16	21.02	21.5
10	64QAM	1	25	21.25	21.35	21.16	
10	64QAM	1	49	21.13	21.16	21.04	
10	64QAM	25	0	20.16	20.29	20.09	20.5
10	64QAM	25	12	20.22	20.34	20.18	
10	64QAM	25	25	20.25	20.39	20.22	
10	64QAM	50	0	20.23	20.36	20.17	
10	256QAM	1	0	18.01	18.15	18.01	18.5
10	256QAM	1	25	18.21	18.35	18.18	
10	256QAM	1	49	18.05	18.17	17.96	
10	256QAM	25	0	18.09	18.21	18.06	18.5
10	256QAM	25	12	18.15	18.29	18.18	
10	256QAM	25	25	18.14	18.34	18.12	
10	256QAM	50	0	18.23	18.36	18.16	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	23.38	23.46	23.32	23.5
5	QPSK	1	12	23.27	23.36	23.23	
5	QPSK	1	24	23.19	23.39	23.16	
5	QPSK	12	0	22.27	22.28	22.20	22.5
5	QPSK	12	7	22.19	22.35	22.23	
5	QPSK	12	13	22.28	22.37	22.19	
5	QPSK	25	0	22.22	22.32	22.17	
5	16QAM	1	0	22.15	22.23	22.07	22.5
5	16QAM	1	12	22.12	22.22	22.08	
5	16QAM	1	24	22.08	22.20	22.07	
5	16QAM	12	0	21.16	21.30	21.20	21.5
5	16QAM	12	7	21.25	21.41	21.21	
5	16QAM	12	13	21.32	21.34	21.23	
5	16QAM	25	0	21.24	21.33	21.14	
5	64QAM	1	0	21.12	21.20	21.09	21.5
5	64QAM	1	12	21.16	21.29	21.22	
5	64QAM	1	24	21.11	21.24	21.10	
5	64QAM	12	0	20.15	20.24	20.13	20.5
5	64QAM	12	7	20.30	20.38	20.27	
5	64QAM	12	13	20.22	20.35	20.24	
5	64QAM	25	0	20.22	20.31	20.20	
5	256QAM	1	0	18.06	18.17	18.04	18.5
5	256QAM	1	12	18.28	18.31	18.22	
5	256QAM	1	24	17.99	18.09	17.99	
5	256QAM	12	0	18.09	18.25	18.13	18.5

5	256QAM	12	7	18.14	18.26	18.18	
5	256QAM	12	13	18.17	18.27	18.14	
5	256QAM	25	0	18.28	18.33	18.24	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	23.34	23.47	23.33	23.5
3	QPSK	1	8	23.27	23.42	23.27	
3	QPSK	1	14	23.20	23.33	23.19	
3	QPSK	8	0	22.17	22.38	22.23	22.5
3	QPSK	8	4	22.24	22.29	22.13	
3	QPSK	8	7	22.31	22.37	22.18	
3	QPSK	15	0	22.29	22.30	22.23	
3	16QAM	1	0	22.15	22.16	22.11	22.5
3	16QAM	1	8	22.19	22.29	22.16	
3	16QAM	1	14	22.05	22.15	22.11	
3	16QAM	8	0	21.21	21.31	21.20	21.5
3	16QAM	8	4	21.28	21.42	21.27	
3	16QAM	8	7	21.32	21.33	21.21	
3	16QAM	15	0	21.19	21.28	21.13	
3	64QAM	1	0	21.04	21.19	21.09	21.5
3	64QAM	1	8	21.25	21.28	21.17	
3	64QAM	1	14	21.14	21.18	21.05	
3	64QAM	8	0	20.18	20.23	20.10	20.5
3	64QAM	8	4	20.29	20.35	20.24	
3	64QAM	8	7	20.21	20.38	20.16	
3	64QAM	15	0	20.21	20.31	20.15	
3	256QAM	1	0	18.02	18.16	17.99	18.5
3	256QAM	1	8	18.24	18.35	18.23	
3	256QAM	1	14	18.00	18.11	17.97	
3	256QAM	8	0	18.10	18.22	18.07	18.5
3	256QAM	8	4	18.23	18.25	18.16	
3	256QAM	8	7	18.17	18.33	18.14	
3	256QAM	15	0	18.20	18.30	18.18	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	23.36	23.46	23.30	23.5
1.4	QPSK	1	3	23.31	23.42	23.25	
1.4	QPSK	1	5	23.29	23.32	23.22	
1.4	QPSK	3	0	23.33	23.48	23.31	
1.4	QPSK	3	1	23.23	23.43	23.24	
1.4	QPSK	3	3	23.27	23.35	23.21	
1.4	QPSK	6	0	22.23	22.40	22.22	22.5
1.4	16QAM	1	0	22.08	22.17	22.10	22.5
1.4	16QAM	1	3	22.15	22.28	22.16	
1.4	16QAM	1	5	22.06	22.17	22.07	
1.4	16QAM	3	0	22.05	22.24	22.09	
1.4	16QAM	3	1	22.15	22.26	22.16	
1.4	16QAM	3	3	22.09	22.23	22.06	
1.4	16QAM	6	0	21.14	21.27	21.18	21.5
1.4	64QAM	1	0	21.13	21.17	21.05	21.5
1.4	64QAM	1	3	21.16	21.29	21.18	
1.4	64QAM	1	5	21.12	21.24	21.08	
1.4	64QAM	3	0	21.06	21.21	21.07	
1.4	64QAM	3	1	21.17	21.36	21.21	
1.4	64QAM	3	3	21.07	21.21	21.10	
1.4	64QAM	6	0	20.19	20.33	20.16	20.5
1.4	256QAM	1	0	18.02	18.10	17.97	18.5
1.4	256QAM	1	3	18.24	18.35	18.25	
1.4	256QAM	1	5	18.08	18.19	17.96	
1.4	256QAM	3	0	18.07	18.17	18.03	

1.4	256QAM	3	1	18.22	18.35	18.15	
1.4	256QAM	3	3	18.01	18.11	18.00	
1.4	256QAM	6	0	18.28	18.32	18.22	18.5

<LTE Band 2_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				18700	18900	19100	
Frequency (MHz)				1860	1880	1900	
20	QPSK	1	0	22.74	22.90	23.13	24
20	QPSK	1	49	22.75	22.96	23.08	
20	QPSK	1	99	22.76	23.03	22.90	
20	QPSK	50	0	21.72	21.99	22.15	23
20	QPSK	50	24	21.78	21.98	22.09	
20	QPSK	50	50	21.77	22.09	22.03	
20	QPSK	100	0	21.79	21.98	22.01	
20	16QAM	1	0	21.99	22.28	22.40	23
20	16QAM	1	49	22.09	22.32	22.34	
20	16QAM	1	99	22.02	22.34	22.37	
20	16QAM	50	0	20.72	21.00	21.22	22
20	16QAM	50	24	20.79	21.02	21.21	
20	16QAM	50	50	20.78	21.09	21.03	
20	16QAM	100	0	20.80	20.98	21.12	
20	64QAM	1	0	20.88	21.16	21.38	22
20	64QAM	1	49	20.96	21.13	21.32	
20	64QAM	1	99	20.99	21.36	21.19	
20	64QAM	50	0	19.74	20.00	20.23	21
20	64QAM	50	24	19.81	19.99	20.20	
20	64QAM	50	50	19.76	20.06	20.02	
20	64QAM	100	0	19.80	20.02	20.10	
20	256QAM	1	0	18.26	18.43	18.61	19
20	256QAM	1	49	18.29	18.40	18.67	
20	256QAM	1	99	18.27	18.50	18.44	
20	256QAM	50	0	18.25	18.47	18.68	19
20	256QAM	50	24	18.29	18.48	18.64	
20	256QAM	50	50	18.24	18.49	18.47	
20	256QAM	100	0	18.30	18.52	18.59	
Channel				18675	18900	19125	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	QPSK	1	0	22.64	22.90	23.10	24
15	QPSK	1	37	22.75	22.89	23.03	
15	QPSK	1	74	22.66	22.99	22.84	
15	QPSK	36	0	21.63	21.96	22.06	23
15	QPSK	36	20	21.72	21.97	22.03	
15	QPSK	36	39	21.74	22.08	21.96	
15	QPSK	75	0	21.71	21.97	21.98	
15	16QAM	1	0	21.92	22.18	22.38	23
15	16QAM	1	37	22.00	22.22	22.32	
15	16QAM	1	74	21.98	22.27	22.36	
15	16QAM	36	0	20.65	20.95	21.14	22
15	16QAM	36	20	20.76	20.94	21.11	
15	16QAM	36	39	20.73	21.09	21.01	
15	16QAM	75	0	20.73	20.92	21.11	
15	64QAM	1	0	20.95	21.06	21.31	22
15	64QAM	1	37	20.94	21.06	21.23	
15	64QAM	1	74	20.93	21.34	21.14	
15	64QAM	36	0	19.69	19.99	20.13	21
15	64QAM	36	20	19.78	19.95	20.10	
15	64QAM	36	39	19.71	19.99	19.96	
15	64QAM	75	0	19.80	20.01	20.03	

15	256QAM	1	0	18.16	18.39	18.57	19
15	256QAM	1	37	18.26	18.39	18.65	
15	256QAM	1	74	18.26	18.50	18.35	
15	256QAM	36	0	18.29	18.38	18.68	19
15	256QAM	36	20	18.25	18.39	18.63	
15	256QAM	36	39	18.24	18.49	18.39	
15	256QAM	75	0	18.24	18.48	18.50	
Channel				18650	18900	19150	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	QPSK	1	0	22.74	22.87	23.12	24
10	QPSK	1	25	22.70	22.88	23.08	
10	QPSK	1	49	22.75	22.99	22.90	
10	QPSK	25	0	21.70	21.94	22.09	23
10	QPSK	25	12	21.71	21.92	22.09	
10	QPSK	25	25	21.77	22.06	22.02	
10	QPSK	50	0	21.70	21.93	21.97	
10	16QAM	1	0	21.89	22.18	22.31	23
10	16QAM	1	25	22.05	22.26	22.25	
10	16QAM	1	49	22.00	22.30	22.36	
10	16QAM	25	0	20.76	20.99	21.13	22
10	16QAM	25	12	20.77	20.99	21.17	
10	16QAM	25	25	20.78	21.01	21.03	
10	16QAM	50	0	20.70	20.98	21.09	
10	64QAM	1	0	20.92	21.15	21.32	22
10	64QAM	1	25	20.86	21.04	21.26	
10	64QAM	1	49	20.91	21.31	21.12	
10	64QAM	25	0	19.74	19.96	20.18	21
10	64QAM	25	12	19.74	19.92	20.14	
10	64QAM	25	25	19.73	20.05	19.94	
10	64QAM	50	0	19.72	19.92	20.00	
10	256QAM	1	0	18.25	18.39	18.52	19
10	256QAM	1	25	18.20	18.31	18.62	
10	256QAM	1	49	18.21	18.43	18.40	
10	256QAM	25	0	18.21	18.47	18.62	19
10	256QAM	25	12	18.24	18.44	18.54	
10	256QAM	25	25	18.18	18.47	18.39	
10	256QAM	50	0	18.23	18.45	18.56	
Channel				18625	18900	19175	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	QPSK	1	0	22.73	22.82	23.11	24
5	QPSK	1	12	22.66	22.95	23.01	
5	QPSK	1	24	22.71	22.96	22.82	
5	QPSK	12	0	21.63	21.92	22.05	23
5	QPSK	12	7	21.69	21.89	22.09	
5	QPSK	12	13	21.70	22.07	22.03	
5	QPSK	25	0	21.71	21.95	21.96	
5	16QAM	1	0	21.99	22.21	22.34	23
5	16QAM	1	12	22.02	22.32	22.30	
5	16QAM	1	24	21.97	22.33	22.32	
5	16QAM	12	0	20.88	20.98	21.18	22
5	16QAM	12	7	20.85	20.93	21.21	
5	16QAM	12	13	20.79	21.02	21.01	
5	16QAM	25	0	20.72	20.97	21.12	
5	64QAM	1	0	20.95	21.16	21.38	22
5	64QAM	1	12	20.96	21.07	21.30	
5	64QAM	1	24	20.91	21.34	21.14	
5	64QAM	12	0	19.80	19.98	20.14	21
5	64QAM	12	7	19.86	19.96	20.20	
5	64QAM	12	13	19.76	19.98	19.99	
5	64QAM	25	0	19.71	19.92	20.10	

5	256QAM	1	0	18.25	18.34	18.60	19
5	256QAM	1	12	18.27	18.37	18.60	
5	256QAM	1	24	18.24	18.43	18.39	
5	256QAM	12	0	18.19	18.45	18.62	19
5	256QAM	12	7	18.22	18.41	18.58	
5	256QAM	12	13	18.22	18.45	18.43	
5	256QAM	25	0	18.28	18.43	18.53	
Channel				18615	18900	19185	Tune-up limit (dBm)
Frequency (MHz)				1851.5	1880	1908.5	
3	QPSK	1	0	22.73	22.85	23.06	24
3	QPSK	1	8	22.71	22.94	23.05	
3	QPSK	1	14	22.69	22.99	22.80	
3	QPSK	8	0	21.62	21.89	22.06	23
3	QPSK	8	4	21.78	21.88	21.99	
3	QPSK	8	7	21.77	22.03	22.00	
3	QPSK	15	0	21.71	21.95	21.93	
3	16QAM	1	0	21.93	22.28	22.30	23
3	16QAM	1	8	22.01	22.23	22.26	
3	16QAM	1	14	21.97	22.30	22.37	
3	16QAM	8	0	20.67	20.98	21.16	22
3	16QAM	8	4	20.71	21.01	21.16	
3	16QAM	8	7	20.73	21.07	21.02	
3	16QAM	15	0	20.76	20.98	21.07	
3	64QAM	1	0	20.81	21.16	21.28	22
3	64QAM	1	8	20.91	21.03	21.28	
3	64QAM	1	14	20.89	21.27	21.17	
3	64QAM	8	0	19.72	20.00	20.16	21
3	64QAM	8	4	19.80	19.93	20.19	
3	64QAM	8	7	19.76	20.01	19.94	
3	64QAM	15	0	19.74	19.92	20.06	
3	256QAM	1	0	18.21	18.37	18.54	19
3	256QAM	1	8	18.20	18.31	18.57	
3	256QAM	1	14	18.23	18.48	18.44	
3	256QAM	8	0	18.24	18.42	18.58	19
3	256QAM	8	4	18.22	18.47	18.62	
3	256QAM	8	7	18.24	18.42	18.46	
3	256QAM	15	0	18.21	18.43	18.50	
Channel				18607	18900	19193	Tune-up limit (dBm)
Frequency (MHz)				1850.7	1880	1909.3	
1.4	QPSK	1	0	22.64	22.86	23.07	24
1.4	QPSK	1	3	22.75	22.90	23.02	
1.4	QPSK	1	5	22.72	23.02	22.81	
1.4	QPSK	3	0	22.66	22.86	23.12	
1.4	QPSK	3	1	22.66	22.87	23.08	
1.4	QPSK	3	3	22.66	23.03	22.87	
1.4	QPSK	6	0	21.69	21.89	21.92	23
1.4	16QAM	1	0	21.96	22.20	22.35	23
1.4	16QAM	1	3	22.05	22.26	22.33	
1.4	16QAM	1	5	21.98	22.32	22.33	
1.4	16QAM	3	0	21.94	22.24	22.30	
1.4	16QAM	3	1	21.99	22.24	22.33	
1.4	16QAM	3	3	21.96	22.29	22.32	
1.4	16QAM	6	0	20.71	20.90	21.11	22
1.4	64QAM	1	0	20.88	21.11	21.34	22
1.4	64QAM	1	3	20.93	21.06	21.25	
1.4	64QAM	1	5	20.92	21.36	21.14	
1.4	64QAM	3	0	20.93	21.16	21.35	
1.4	64QAM	3	1	20.96	21.05	21.27	
1.4	64QAM	3	3	20.95	21.31	21.09	
1.4	64QAM	6	0	19.72	19.92	20.01	21

1.4	256QAM	1	0	18.24	18.39	18.52	19
1.4	256QAM	1	3	18.25	18.33	18.67	
1.4	256QAM	1	5	18.23	18.47	18.35	
1.4	256QAM	3	0	18.23	18.34	18.54	
1.4	256QAM	3	1	18.23	18.35	18.62	
1.4	256QAM	3	3	18.19	18.47	18.36	
1.4	256QAM	6	0	18.24	18.48	18.55	19

<LTE Band 4_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	22.77	22.89	23.16	24
20	QPSK	1	49	22.69	22.83	23.05	
20	QPSK	1	99	22.70	22.76	22.89	
20	QPSK	50	0	21.65	21.82	21.97	23
20	QPSK	50	24	21.76	21.90	22.05	
20	QPSK	50	50	21.70	21.95	22.13	
20	QPSK	100	0	21.72	21.89	22.04	
20	16QAM	1	0	21.87	22.04	22.32	23
20	16QAM	1	49	22.03	22.18	22.29	
20	16QAM	1	99	22.03	22.24	22.28	
20	16QAM	50	0	20.67	20.82	20.98	22
20	16QAM	50	24	20.76	20.94	21.06	
20	16QAM	50	50	20.74	20.99	21.15	
20	16QAM	100	0	20.72	20.90	21.03	
20	64QAM	1	0	21.00	20.99	21.17	22
20	64QAM	1	49	20.88	21.07	21.37	
20	64QAM	1	99	20.92	21.20	21.32	
20	64QAM	50	0	19.82	19.84	19.98	21
20	64QAM	50	24	19.74	19.90	20.07	
20	64QAM	50	50	19.74	19.96	20.18	
20	64QAM	100	0	19.71	19.91	20.04	
20	256QAM	1	0	18.22	18.28	18.39	19
20	256QAM	1	49	18.17	18.39	18.49	
20	256QAM	1	99	18.17	18.36	18.58	
20	256QAM	50	0	18.31	18.25	18.39	19
20	256QAM	50	24	18.17	18.35	18.57	
20	256QAM	50	50	18.19	18.41	18.65	
20	256QAM	100	0	18.19	18.37	18.51	
Channel				20025	20175	20325	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	22.75	22.80	23.11	24
15	QPSK	1	37	22.86	22.80	22.97	
15	QPSK	1	74	22.80	22.76	22.87	
15	QPSK	36	0	21.59	21.81	21.97	23
15	QPSK	36	20	21.75	21.81	21.97	
15	QPSK	36	39	21.65	21.91	22.08	
15	QPSK	75	0	21.63	21.87	22.01	
15	16QAM	1	0	21.84	21.99	22.23	23
15	16QAM	1	37	21.97	22.09	22.27	
15	16QAM	1	74	22.00	22.17	22.27	
15	16QAM	36	0	20.80	20.79	20.95	22
15	16QAM	36	20	20.77	20.93	21.05	
15	16QAM	36	39	20.84	20.99	21.13	
15	16QAM	75	0	20.71	20.83	21.03	
15	64QAM	1	0	20.99	20.99	21.15	22
15	64QAM	1	37	20.87	21.02	21.27	
15	64QAM	1	74	20.84	21.18	21.31	

15	64QAM	36	0	19.76	19.84	19.91	21
15	64QAM	36	20	19.65	19.88	20.04	
15	64QAM	36	39	19.66	19.87	20.09	
15	64QAM	75	0	19.61	19.83	19.96	
15	256QAM	1	0	18.21	18.22	18.34	19
15	256QAM	1	37	18.08	18.38	18.40	
15	256QAM	1	74	18.17	18.28	18.53	
15	256QAM	36	0	18.29	18.15	18.33	19
15	256QAM	36	20	18.14	18.28	18.57	
15	256QAM	36	39	18.11	18.40	18.60	
15	256QAM	75	0	18.15	18.35	18.45	
Channel				20000	20175	20350	Tune-up limit (dBm)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	22.69	22.83	23.12	24
10	QPSK	1	25	22.64	22.82	23.05	
10	QPSK	1	49	22.67	22.69	22.86	
10	QPSK	25	0	21.78	21.82	21.92	23
10	QPSK	25	12	21.72	21.89	21.97	
10	QPSK	25	25	21.70	21.93	22.09	
10	QPSK	50	0	21.64	21.88	22.02	
10	16QAM	1	0	21.77	22.04	22.26	23
10	16QAM	1	25	21.99	22.16	22.25	
10	16QAM	1	49	21.93	22.18	22.18	
10	16QAM	25	0	20.77	20.76	20.92	22
10	16QAM	25	12	20.75	20.91	20.99	
10	16QAM	25	25	20.73	20.93	21.15	
10	16QAM	50	0	20.70	20.83	20.95	
10	64QAM	1	0	20.90	20.96	21.09	22
10	64QAM	1	25	20.80	20.97	21.27	
10	64QAM	1	49	20.87	21.10	21.24	
10	64QAM	25	0	19.81	19.77	19.97	21
10	64QAM	25	12	19.74	19.85	20.04	
10	64QAM	25	25	19.78	19.86	20.15	
10	64QAM	50	0	19.65	19.87	20.01	
10	256QAM	1	0	18.16	18.26	18.32	19
10	256QAM	1	25	18.13	18.33	18.41	
10	256QAM	1	49	18.15	18.34	18.58	
10	256QAM	25	0	18.22	18.17	18.31	19
10	256QAM	25	12	18.16	18.32	18.47	
10	256QAM	25	25	18.17	18.31	18.64	
10	256QAM	50	0	18.10	18.35	18.42	
Channel				19975	20175	20375	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	22.73	22.85	23.12	24
5	QPSK	1	12	22.67	22.75	23.02	
5	QPSK	1	24	22.70	22.72	22.85	
5	QPSK	12	0	21.61	21.73	21.91	23
5	QPSK	12	7	21.66	21.86	21.96	
5	QPSK	12	13	21.68	21.86	22.09	
5	QPSK	25	0	21.71	21.79	21.97	
5	16QAM	1	0	21.89	21.97	22.31	23
5	16QAM	1	12	22.03	22.16	22.28	
5	16QAM	1	24	22.02	22.15	22.21	
5	16QAM	12	0	20.70	20.77	20.90	22
5	16QAM	12	7	20.77	20.85	21.01	
5	16QAM	12	13	20.74	20.98	21.12	
5	16QAM	25	0	20.68	20.85	20.96	
5	64QAM	1	0	20.92	20.89	21.15	22
5	64QAM	1	12	20.81	21.05	21.28	
5	64QAM	1	24	20.86	21.19	21.23	

5	64QAM	12	0	19.73	19.80	19.91	21
5	64QAM	12	7	19.65	19.80	20.07	
5	64QAM	12	13	19.74	19.90	20.14	
5	64QAM	25	0	19.67	19.81	20.04	
5	256QAM	1	0	18.19	18.25	18.32	19
5	256QAM	1	12	18.14	18.36	18.40	
5	256QAM	1	24	18.09	18.26	18.54	
5	256QAM	12	0	18.23	18.23	18.34	19
5	256QAM	12	7	18.17	18.27	18.55	
5	256QAM	12	13	18.15	18.32	18.49	
5	256QAM	25	0	18.17	18.32	18.51	
Channel				19965	20175	20385	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	22.68	22.84	23.06	24
3	QPSK	1	8	22.67	22.78	23.03	
3	QPSK	1	14	22.69	22.68	22.86	
3	QPSK	8	0	21.65	21.73	21.97	23
3	QPSK	8	4	21.66	21.82	22.01	
3	QPSK	8	7	21.64	21.90	22.11	
3	QPSK	15	0	21.62	21.85	22.01	
3	16QAM	1	0	21.97	22.02	22.30	23
3	16QAM	1	8	21.94	22.09	22.22	
3	16QAM	1	14	21.99	22.19	22.21	
3	16QAM	8	0	20.63	20.77	20.92	22
3	16QAM	8	4	20.68	20.85	21.04	
3	16QAM	8	7	20.68	20.99	21.11	
3	16QAM	15	0	20.62	20.88	21.02	
3	64QAM	1	0	20.99	20.91	21.14	22
3	64QAM	1	8	20.92	21.03	21.35	
3	64QAM	1	14	20.98	21.16	21.22	
3	64QAM	8	0	19.73	19.78	19.88	21
3	64QAM	8	4	19.65	19.90	20.00	
3	64QAM	8	7	19.72	19.96	20.13	
3	64QAM	15	0	19.68	19.86	20.02	
3	256QAM	1	0	18.18	18.20	18.37	19
3	256QAM	1	8	18.09	18.30	18.48	
3	256QAM	1	14	18.14	18.30	18.51	
3	256QAM	8	0	18.23	18.20	18.39	19
3	256QAM	8	4	18.15	18.26	18.55	
3	256QAM	8	7	18.18	18.31	18.56	
3	256QAM	15	0	18.17	18.27	18.48	
Channel				19957	20175	20393	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	22.75	22.87	23.12	24
1.4	QPSK	1	3	22.70	22.76	23.02	
1.4	QPSK	1	5	22.71	22.77	22.88	
1.4	QPSK	3	0	22.69	22.81	23.12	
1.4	QPSK	3	1	22.63	22.83	22.97	
1.4	QPSK	3	3	22.65	22.69	22.79	
1.4	QPSK	6	0	21.71	21.84	21.94	23
1.4	16QAM	1	0	21.89	22.04	22.29	23
1.4	16QAM	1	3	22.02	22.12	22.27	
1.4	16QAM	1	5	21.98	22.22	22.25	
1.4	16QAM	3	0	21.84	21.98	22.30	
1.4	16QAM	3	1	22.03	22.17	22.24	
1.4	16QAM	3	3	21.94	22.24	22.19	
1.4	16QAM	6	0	20.65	20.90	21.00	22
1.4	64QAM	1	0	20.94	20.94	21.09	22
1.4	64QAM	1	3	20.90	21.02	21.37	
1.4	64QAM	1	5	20.88	21.19	21.23	

1.4	64QAM	3	0	20.99	20.94	21.13	
1.4	64QAM	3	1	20.87	20.97	21.35	
1.4	64QAM	3	3	20.90	21.10	21.25	
1.4	64QAM	6	0	19.67	19.84	19.95	21
1.4	256QAM	1	0	18.18	18.22	18.31	19
1.4	256QAM	1	3	18.16	18.35	18.47	
1.4	256QAM	1	5	18.17	18.36	18.52	
1.4	256QAM	3	0	18.17	18.25	18.30	
1.4	256QAM	3	1	18.07	18.36	18.49	
1.4	256QAM	3	3	18.09	18.33	18.50	
1.4	256QAM	6	0	18.17	18.31	18.50	19

<LTE Band 5_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20450	20525	20600	
Frequency (MHz)				829	836.5	844	
10	QPSK	1	0	23.22	23.27	23.21	24
10	QPSK	1	25	23.17	23.17	23.22	
10	QPSK	1	49	23.05	23.06	23.15	
10	QPSK	25	0	22.25	22.21	22.24	23
10	QPSK	25	12	22.24	22.23	22.27	
10	QPSK	25	25	22.21	22.26	22.29	
10	QPSK	50	0	22.30	22.27	22.28	
10	16QAM	1	0	22.38	22.56	22.54	23
10	16QAM	1	25	22.35	22.50	22.68	
10	16QAM	1	49	22.23	22.64	22.71	
10	16QAM	25	0	21.19	21.23	21.29	22
10	16QAM	25	12	21.28	21.24	21.29	
10	16QAM	25	25	21.21	21.29	21.37	
10	16QAM	50	0	21.31	21.32	21.29	
10	64QAM	1	0	21.54	21.39	21.42	22
10	64QAM	1	25	21.45	21.44	21.37	
10	64QAM	1	49	21.53	21.50	21.57	
10	64QAM	25	0	20.30	20.32	20.30	21
10	64QAM	25	12	20.38	20.31	20.29	
10	64QAM	25	25	20.36	20.39	20.36	
10	64QAM	50	0	20.33	20.37	20.28	
10	256QAM	1	0	18.76	18.81	18.73	19
10	256QAM	1	25	18.88	18.71	18.72	
10	256QAM	1	49	18.84	18.80	18.80	
10	256QAM	25	0	18.79	18.77	18.78	19
10	256QAM	25	12	18.82	18.74	18.70	
10	256QAM	25	25	18.86	18.89	18.86	
10	256QAM	50	0	18.79	18.83	18.71	
Channel				20425	20525	20625	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	QPSK	1	0	23.16	23.22	23.11	24
5	QPSK	1	12	23.11	23.12	23.18	
5	QPSK	1	24	22.97	23.02	23.06	
5	QPSK	12	0	22.16	22.16	22.22	23
5	QPSK	12	7	22.14	22.15	22.20	
5	QPSK	12	13	22.11	22.21	22.19	
5	QPSK	25	0	22.27	22.21	22.21	
5	16QAM	1	0	22.36	22.52	22.50	23
5	16QAM	1	12	22.28	22.42	22.62	
5	16QAM	1	24	22.20	22.62	22.65	
5	16QAM	12	0	21.19	21.15	21.23	22
5	16QAM	12	7	21.28	21.14	21.26	
5	16QAM	12	13	21.18	21.23	21.30	

5	16QAM	25	0	21.24	21.32	21.22	
5	64QAM	1	0	21.46	21.31	21.40	22
5	64QAM	1	12	21.38	21.34	21.32	
5	64QAM	1	24	21.45	21.41	21.56	
5	64QAM	12	0	20.25	20.22	20.23	21
5	64QAM	12	7	20.28	20.31	20.25	
5	64QAM	12	13	20.33	20.39	20.31	
5	64QAM	25	0	20.27	20.31	20.26	
5	256QAM	1	0	18.68	18.81	18.70	19
5	256QAM	1	12	18.88	18.62	18.63	
5	256QAM	1	24	18.75	18.79	18.71	
5	256QAM	12	0	18.77	18.71	18.69	19
5	256QAM	12	7	18.81	18.65	18.67	
5	256QAM	12	13	18.83	18.87	18.79	
5	256QAM	25	0	18.71	18.81	18.62	
Channel				20415	20525	20635	Tune-up limit (dBm)
Frequency (MHz)				825.5	836.5	847.5	
3	QPSK	1	0	23.13	23.19	23.12	24
3	QPSK	1	8	23.11	23.10	23.19	
3	QPSK	1	14	23.05	22.99	23.14	
3	QPSK	8	0	22.20	22.11	22.16	23
3	QPSK	8	4	22.16	22.16	22.18	
3	QPSK	8	7	22.14	22.21	22.28	
3	QPSK	15	0	22.22	22.26	22.28	
3	16QAM	1	0	22.32	22.47	22.46	23
3	16QAM	1	8	22.34	22.44	22.66	
3	16QAM	1	14	22.18	22.56	22.63	
3	16QAM	8	0	21.13	21.21	21.28	22
3	16QAM	8	4	21.21	21.19	21.28	
3	16QAM	8	7	21.16	21.29	21.28	
3	16QAM	15	0	21.25	21.23	21.25	
3	64QAM	1	0	21.47	21.37	21.36	22
3	64QAM	1	8	21.42	21.44	21.29	
3	64QAM	1	14	21.51	21.45	21.49	
3	64QAM	8	0	20.25	20.28	20.20	21
3	64QAM	8	4	20.28	20.27	20.25	
3	64QAM	8	7	20.32	20.39	20.34	
3	64QAM	15	0	20.24	20.27	20.28	
3	256QAM	1	0	18.67	18.78	18.69	19
3	256QAM	1	8	18.78	18.69	18.67	
3	256QAM	1	14	18.74	18.72	18.74	
3	256QAM	8	0	18.78	18.71	18.72	19
3	256QAM	8	4	18.75	18.73	18.65	
3	256QAM	8	7	18.78	18.84	18.86	
3	256QAM	15	0	18.75	18.80	18.61	
Channel				20407	20525	20643	Tune-up limit (dBm)
Frequency (MHz)				824.7	836.5	848.3	
1.4	QPSK	1	0	23.16	23.25	23.12	24
1.4	QPSK	1	3	23.17	23.08	23.13	
1.4	QPSK	1	5	22.97	23.03	23.07	
1.4	QPSK	3	0	23.21	23.27	23.20	
1.4	QPSK	3	1	23.14	23.09	23.16	
1.4	QPSK	3	3	22.96	23.05	23.10	
1.4	QPSK	6	0	22.23	22.27	22.25	23
1.4	16QAM	1	0	22.34	22.52	22.48	23
1.4	16QAM	1	3	22.28	22.48	22.65	
1.4	16QAM	1	5	22.21	22.64	22.62	
1.4	16QAM	3	0	22.28	22.49	22.49	
1.4	16QAM	3	1	22.32	22.48	22.64	
1.4	16QAM	3	3	22.18	22.54	22.68	

1.4	16QAM	6	0	21.30	21.22	21.19	22
1.4	64QAM	1	0	21.47	21.33	21.38	22
1.4	64QAM	1	3	21.44	21.43	21.29	
1.4	64QAM	1	5	21.52	21.45	21.53	
1.4	64QAM	3	0	21.49	21.37	21.32	
1.4	64QAM	3	1	21.45	21.41	21.31	
1.4	64QAM	3	3	21.50	21.41	21.51	
1.4	64QAM	6	0	20.32	20.36	20.23	21
1.4	256QAM	1	0	18.68	18.79	18.72	19
1.4	256QAM	1	3	18.86	18.63	18.68	
1.4	256QAM	1	5	18.77	18.78	18.71	
1.4	256QAM	3	0	18.74	18.75	18.71	
1.4	256QAM	3	1	18.82	18.70	18.66	
1.4	256QAM	3	3	18.74	18.79	18.71	
1.4	256QAM	6	0	18.74	18.77	18.71	19

<LTE Band 7_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				20850	21100	21350	
Frequency (MHz)				2510	2535	2560	
20	QPSK	1	0	22.79	22.81	22.95	23.5
20	QPSK	1	49	22.74	22.94	22.92	
20	QPSK	1	99	22.70	22.73	22.94	
20	QPSK	50	0	21.94	21.90	22.10	22.5
20	QPSK	50	24	21.89	21.97	22.16	
20	QPSK	50	50	21.89	22.07	22.27	
20	QPSK	100	0	21.88	21.96	22.23	
20	16QAM	1	0	22.18	22.12	22.44	22.5
20	16QAM	1	49	22.12	22.26	22.45	
20	16QAM	1	99	22.15	22.39	22.47	
20	16QAM	50	0	20.92	20.93	21.12	21.5
20	16QAM	50	24	20.88	20.96	21.20	
20	16QAM	50	50	20.89	21.08	21.29	
20	16QAM	100	0	20.89	20.95	21.26	
20	64QAM	1	0	21.03	20.99	21.41	21.5
20	64QAM	1	49	21.01	21.10	21.40	
20	64QAM	1	99	21.11	21.24	21.32	
20	64QAM	50	0	19.91	19.92	20.13	20.5
20	64QAM	50	24	19.87	19.97	20.16	
20	64QAM	50	50	19.88	20.06	20.27	
20	64QAM	100	0	19.89	19.94	20.26	
20	256QAM	1	0	18.40	18.33	18.42	18.5
20	256QAM	1	49	18.34	18.46	18.40	
20	256QAM	1	99	18.37	18.47	18.45	
20	256QAM	50	0	18.35	18.39	18.36	18.5
20	256QAM	50	24	18.34	18.47	18.40	
20	256QAM	50	50	18.30	18.45	18.44	
20	256QAM	100	0	18.37	18.35	18.46	
Channel				20825	21100	21375	Tune-up limit (dBm)
Frequency (MHz)				2507.5	2535	2562.5	
15	QPSK	1	0	22.74	22.76	22.86	23.5
15	QPSK	1	37	22.72	22.94	22.84	
15	QPSK	1	74	22.69	22.68	22.92	
15	QPSK	36	0	21.94	21.90	22.05	22.5
15	QPSK	36	20	21.84	21.87	22.14	
15	QPSK	36	39	21.88	21.99	22.21	
15	QPSK	75	0	21.78	21.94	22.19	
15	16QAM	1	0	22.19	22.12	22.44	22.5
15	16QAM	1	37	22.16	22.19	22.48	

15	16QAM	1	74	22.11	22.37	22.47	
15	16QAM	36	0	20.82	20.86	21.08	21.5
15	16QAM	36	20	20.83	20.87	21.18	
15	16QAM	36	39	20.84	21.04	21.20	
15	16QAM	75	0	20.80	20.91	21.16	
15	64QAM	1	0	20.99	20.98	21.37	21.5
15	64QAM	1	37	21.01	21.07	21.34	
15	64QAM	1	74	21.05	21.20	21.30	
15	64QAM	36	0	19.90	19.89	20.04	20.5
15	64QAM	36	20	19.87	19.87	20.14	
15	64QAM	36	39	19.79	19.98	20.17	
15	64QAM	75	0	19.82	19.84	20.22	
15	256QAM	1	0	18.34	18.26	18.41	18.5
15	256QAM	1	37	18.25	18.40	18.39	
15	256QAM	1	74	18.35	18.45	18.47	
15	256QAM	36	0	18.30	18.32	18.37	18.5
15	256QAM	36	20	18.29	18.44	18.37	
15	256QAM	36	39	18.21	18.48	18.50	
15	256QAM	75	0	18.35	18.34	18.43	
Channel				20800	21100	21400	Tune-up limit (dBm)
Frequency (MHz)				2505	2535	2565	
10	QPSK	1	0	22.74	22.73	22.94	23.5
10	QPSK	1	25	22.73	22.88	22.88	
10	QPSK	1	49	22.66	22.67	22.91	
10	QPSK	25	0	21.84	21.84	22.00	22.5
10	QPSK	25	12	21.86	21.90	22.12	
10	QPSK	25	25	21.85	22.03	22.23	
10	QPSK	50	0	21.79	21.94	22.17	
10	16QAM	1	0	22.18	22.03	22.46	22.5
10	16QAM	1	25	22.17	22.20	22.49	
10	16QAM	1	49	22.16	22.29	22.43	
10	16QAM	25	0	20.91	20.88	21.12	21.5
10	16QAM	25	12	20.84	20.96	21.15	
10	16QAM	25	25	20.79	21.02	21.29	
10	16QAM	50	0	20.89	20.94	21.22	
10	64QAM	1	0	20.98	20.89	21.37	21.5
10	64QAM	1	25	20.95	21.07	21.31	
10	64QAM	1	49	21.05	21.16	21.30	
10	64QAM	25	0	19.81	19.88	20.08	20.5
10	64QAM	25	12	19.81	19.91	20.16	
10	64QAM	25	25	19.80	20.04	20.18	
10	64QAM	50	0	19.80	19.85	20.19	
10	256QAM	1	0	18.39	18.25	18.45	18.5
10	256QAM	1	25	18.24	18.40	18.46	
10	256QAM	1	49	18.31	18.40	18.43	
10	256QAM	25	0	18.33	18.35	18.39	18.5
10	256QAM	25	12	18.31	18.39	18.49	
10	256QAM	25	25	18.23	18.50	18.46	
10	256QAM	50	0	18.34	18.27	18.43	
Channel				20775	21100	21425	Tune-up limit (dBm)
Frequency (MHz)				2502.5	2535	2567.5	
5	QPSK	1	0	22.69	22.72	22.85	23.5
5	QPSK	1	12	22.64	22.85	22.90	
5	QPSK	1	24	22.65	22.67	22.90	
5	QPSK	12	0	21.92	21.88	22.08	22.5
5	QPSK	12	7	21.80	21.93	22.13	
5	QPSK	12	13	21.81	22.04	22.27	
5	QPSK	25	0	21.83	21.86	22.18	
5	16QAM	1	0	22.18	22.27	22.40	22.5
5	16QAM	1	12	22.20	22.21	22.46	

5	16QAM	1	24	22.15	22.39	22.45	
5	16QAM	12	0	20.86	20.93	21.04	21.5
5	16QAM	12	7	20.79	20.89	21.11	
5	16QAM	12	13	20.84	21.06	21.20	
5	16QAM	25	0	20.80	20.85	21.17	
5	64QAM	1	0	21.02	20.96	21.37	21.5
5	64QAM	1	12	20.91	21.01	21.30	
5	64QAM	1	24	21.09	21.16	21.26	
5	64QAM	12	0	19.83	19.86	20.03	20.5
5	64QAM	12	7	19.82	19.88	20.13	
5	64QAM	12	13	19.82	20.04	20.21	
5	64QAM	25	0	19.88	19.92	20.24	
5	256QAM	1	0	18.32	18.29	18.32	18.5
5	256QAM	1	12	18.24	18.45	18.38	
5	256QAM	1	24	18.34	18.37	18.46	
5	256QAM	12	0	18.30	18.38	18.31	18.5
5	256QAM	12	7	18.31	18.40	18.31	
5	256QAM	12	13	18.22	18.42	18.43	
5	256QAM	25	0	18.33	18.31	18.50	

<LTE Band 12_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				23060	23095	23130	
Frequency (MHz)				704	707.5	711	
10	QPSK	1	0	23.12	22.99	23.09	24
10	QPSK	1	25	23.08	23.07	23.09	
10	QPSK	1	49	22.98	23.03	23.01	
10	QPSK	25	0	22.06	22.08	22.12	23
10	QPSK	25	12	22.18	22.08	22.11	
10	QPSK	25	25	22.16	22.13	22.13	
10	QPSK	50	0	22.15	22.06	22.12	
10	16QAM	1	0	22.48	22.43	22.44	23
10	16QAM	1	25	22.42	22.44	22.43	
10	16QAM	1	49	22.41	22.50	22.45	
10	16QAM	25	0	21.10	21.11	21.10	22
10	16QAM	25	12	21.17	21.10	21.12	
10	16QAM	25	25	21.17	21.19	21.16	
10	16QAM	50	0	21.16	21.09	21.09	
10	64QAM	1	0	21.22	21.31	21.36	22
10	64QAM	1	25	21.31	21.32	21.40	
10	64QAM	1	49	21.34	21.29	21.37	
10	64QAM	25	0	20.08	20.11	20.08	21
10	64QAM	25	12	20.17	20.08	20.05	
10	64QAM	25	25	20.15	20.17	20.20	
10	64QAM	50	0	20.11	20.08	20.07	
10	256QAM	1	0	18.30	18.32	18.30	19
10	256QAM	1	25	18.47	18.34	18.29	
10	256QAM	1	49	18.44	18.42	18.48	
10	256QAM	25	0	18.28	18.33	18.38	19
10	256QAM	25	12	18.44	18.30	18.33	
10	256QAM	25	25	18.40	18.43	18.50	
10	256QAM	50	0	18.32	18.32	18.36	
Channel				23035	23095	23155	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	QPSK	1	0	23.04	22.90	23.06	24
5	QPSK	1	12	23.07	22.98	23.05	
5	QPSK	1	24	22.95	23.03	22.99	
5	QPSK	12	0	21.99	22.07	22.08	23
5	QPSK	12	7	22.15	22.04	22.04	

5	QPSK	12	13	22.10	22.04	22.13	
5	QPSK	25	0	22.07	22.00	22.04	
5	16QAM	1	0	22.44	22.41	22.41	23
5	16QAM	1	12	22.35	22.37	22.36	
5	16QAM	1	24	22.41	22.49	22.38	
5	16QAM	12	0	21.04	21.07	21.08	22
5	16QAM	12	7	21.17	21.02	21.02	
5	16QAM	12	13	21.13	21.19	21.06	
5	16QAM	25	0	21.14	21.06	21.06	
5	64QAM	1	0	21.20	21.26	21.34	22
5	64QAM	1	12	21.21	21.23	21.34	
5	64QAM	1	24	21.28	21.26	21.29	
5	64QAM	12	0	20.05	20.04	20.04	21
5	64QAM	12	7	20.15	20.06	19.99	
5	64QAM	12	13	20.15	20.13	20.18	
5	64QAM	25	0	20.07	20.01	19.98	
5	256QAM	1	0	18.25	18.30	18.30	19
5	256QAM	1	12	18.41	18.26	18.26	
5	256QAM	1	24	18.43	18.38	18.40	
5	256QAM	12	0	18.28	18.24	18.29	19
5	256QAM	12	7	18.36	18.26	18.31	
5	256QAM	12	13	18.40	18.35	18.49	
5	256QAM	25	0	18.24	18.28	18.29	
Channel				23025	23095	23165	Tune-up limit (dBm)
Frequency (MHz)				700.5	707.5	714.5	
3	QPSK	1	0	23.08	22.89	23.08	24
3	QPSK	1	8	23.07	23.05	23.00	
3	QPSK	1	14	22.91	22.98	23.00	
3	QPSK	8	0	22.05	21.98	22.02	23
3	QPSK	8	4	22.08	22.03	22.07	
3	QPSK	8	7	22.15	22.06	22.12	
3	QPSK	15	0	22.13	22.06	22.08	
3	16QAM	1	0	22.46	22.38	22.38	23
3	16QAM	1	8	22.33	22.39	22.39	
3	16QAM	1	14	22.34	22.50	22.42	
3	16QAM	8	0	21.03	21.09	21.03	22
3	16QAM	8	4	21.12	21.04	21.06	
3	16QAM	8	7	21.07	21.17	21.10	
3	16QAM	15	0	21.11	21.08	21.00	
3	64QAM	1	0	21.20	21.24	21.36	22
3	64QAM	1	8	21.23	21.26	21.40	
3	64QAM	1	14	21.28	21.27	21.34	
3	64QAM	8	0	20.05	20.10	20.07	21
3	64QAM	8	4	20.16	20.05	19.96	
3	64QAM	8	7	20.07	20.17	20.15	
3	64QAM	15	0	20.05	20.04	20.04	
3	256QAM	1	0	18.26	18.32	18.30	19
3	256QAM	1	8	18.47	18.26	18.24	
3	256QAM	1	14	18.40	18.39	18.40	
3	256QAM	8	0	18.22	18.31	18.33	19
3	256QAM	8	4	18.35	18.27	18.29	
3	256QAM	8	7	18.39	18.33	18.48	
3	256QAM	15	0	18.28	18.24	18.29	
Channel				23017	23095	23173	Tune-up limit (dBm)
Frequency (MHz)				699.7	707.5	715.3	
1.4	QPSK	1	0	23.06	22.94	23.01	24
1.4	QPSK	1	3	23.02	23.04	23.07	
1.4	QPSK	1	5	22.91	23.01	23.00	
1.4	QPSK	3	0	23.10	22.97	23.08	
1.4	QPSK	3	1	23.01	22.99	22.99	

1.4	QPSK	3	3	22.93	22.97	22.94	
1.4	QPSK	6	0	22.08	21.99	22.08	23
1.4	16QAM	1	0	22.44	22.35	22.38	23
1.4	16QAM	1	3	22.34	22.38	22.43	
1.4	16QAM	1	5	22.41	22.47	22.40	
1.4	16QAM	3	0	22.42	22.40	22.36	
1.4	16QAM	3	1	22.35	22.35	22.39	
1.4	16QAM	3	3	22.37	22.48	22.45	
1.4	16QAM	6	0	21.11	21.05	21.05	22
1.4	64QAM	1	0	21.20	21.29	21.32	22
1.4	64QAM	1	3	21.26	21.31	21.34	
1.4	64QAM	1	5	21.30	21.22	21.32	
1.4	64QAM	3	0	21.12	21.26	21.26	
1.4	64QAM	3	1	21.21	21.31	21.39	
1.4	64QAM	3	3	21.27	21.23	21.31	
1.4	64QAM	6	0	20.04	20.00	20.01	21
1.4	256QAM	1	0	18.21	18.22	18.21	19
1.4	256QAM	1	3	18.43	18.27	18.25	
1.4	256QAM	1	5	18.35	18.36	18.46	
1.4	256QAM	3	0	18.23	18.24	18.20	
1.4	256QAM	3	1	18.44	18.29	18.26	
1.4	256QAM	3	3	18.35	18.33	18.44	
1.4	256QAM	6	0	18.27	18.31	18.28	19

<LTE Band 14_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					23330		
Frequency (MHz)					793		
10	QPSK	1	0		23.09		24
10	QPSK	1	25		23.03		
10	QPSK	1	49		23.05		
10	QPSK	25	0		22.08		23
10	QPSK	25	12		22.09		
10	QPSK	25	25		22.13		
10	QPSK	50	0		22.07		
10	16QAM	1	0		22.37		23
10	16QAM	1	25		22.45		
10	16QAM	1	49		22.45		
10	16QAM	25	0		21.09		22
10	16QAM	25	12		21.11		
10	16QAM	25	25		21.16		
10	16QAM	50	0		21.09		
10	64QAM	1	0		21.24		22
10	64QAM	1	25		21.32		
10	64QAM	1	49		21.33		
10	64QAM	25	0		20.06		21
10	64QAM	25	12		20.12		
10	64QAM	25	25		20.13		
10	64QAM	50	0		20.08		
10	256QAM	1	0		18.27		19
10	256QAM	1	25		18.32		
10	256QAM	1	49		18.38		
10	256QAM	25	0		18.30		19
10	256QAM	25	12		18.42		
10	256QAM	25	25		18.41		
10	256QAM	50	0		18.31		
Channel				23305	23330	23355	Tune-up limit (dBm)
Frequency (MHz)				790.5	793	795.5	
5	QPSK	1	0	22.95	22.88	23.01	24

5	QPSK	1	12	22.89	22.78	22.86	
5	QPSK	1	24	22.82	22.83	22.87	
5	QPSK	12	0	21.90	21.87	22.00	23
5	QPSK	12	7	21.86	21.84	21.91	
5	QPSK	12	13	21.96	21.83	22.04	
5	QPSK	25	0	21.91	21.81	21.94	
5	16QAM	1	0	22.16	22.09	22.26	23
5	16QAM	1	12	22.31	22.21	22.32	
5	16QAM	1	24	22.23	22.15	22.30	
5	16QAM	12	0	20.91	20.79	20.91	22
5	16QAM	12	7	20.89	20.84	20.93	
5	16QAM	12	13	20.97	20.91	20.98	
5	16QAM	25	0	20.85	20.81	20.98	
5	64QAM	1	0	21.03	20.97	21.12	22
5	64QAM	1	12	21.14	21.10	21.20	
5	64QAM	1	24	21.16	21.07	21.20	
5	64QAM	12	0	19.87	19.81	19.95	21
5	64QAM	12	7	19.95	19.82	20.01	
5	64QAM	12	13	19.90	19.87	20.00	
5	64QAM	25	0	19.88	19.79	19.92	
5	256QAM	1	0	18.12	17.98	18.16	19
5	256QAM	1	12	18.10	18.06	18.16	
5	256QAM	1	24	18.15	18.14	18.29	
5	256QAM	12	0	18.10	18.02	18.21	19
5	256QAM	12	7	18.19	18.14	18.29	
5	256QAM	12	13	18.18	18.17	18.33	
5	256QAM	25	0	18.12	18.09	18.23	

<LTE Band 30_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				27710			
Frequency (MHz)				2310			
10	QPSK	1	0		21.97		23
10	QPSK	1	25		21.94		
10	QPSK	1	49		21.90		
10	QPSK	25	0		20.80		22
10	QPSK	25	12		20.81		
10	QPSK	25	25		20.87		
10	QPSK	50	0		20.84		
10	16QAM	1	0		21.07		22
10	16QAM	1	25		21.24		
10	16QAM	1	49		21.06		
10	16QAM	25	0		19.87		21
10	16QAM	25	12		19.81		
10	16QAM	25	25		19.91		
10	16QAM	50	0		19.83		
10	64QAM	1	0		20.93		21
10	64QAM	1	25		20.13		
10	64QAM	1	49		20.07		
10	64QAM	25	0		18.81		20
10	64QAM	25	12		18.84		
10	64QAM	25	25		18.92		
10	64QAM	50	0		18.86		
10	256QAM	1	0		16.67		18
10	256QAM	1	25		17.08		
10	256QAM	1	49		16.87		
10	256QAM	25	0		16.81		18
10	256QAM	25	12		16.88		
10	256QAM	25	25		16.92		

10	256QAM	50	0		16.82		
Channel				27685	27710	27735	Tune-up limit (dBm)
Frequency (MHz)				2307.5	2310	2312.5	
5	QPSK	1	0	21.93	21.89	21.89	23
5	QPSK	1	12	21.85	21.94	21.88	
5	QPSK	1	24	21.87	21.88	21.84	
5	QPSK	12	0	20.95	20.85	20.88	22
5	QPSK	12	7	20.93	20.86	20.88	
5	QPSK	12	13	20.94	20.99	20.95	
5	QPSK	25	0	20.98	20.90	20.94	
5	16QAM	1	0	21.12	21.13	21.19	22
5	16QAM	1	12	21.31	21.34	21.29	
5	16QAM	1	24	21.14	21.13	21.21	
5	16QAM	12	0	19.93	19.99	19.92	21
5	16QAM	12	7	19.92	19.94	19.86	
5	16QAM	12	13	20.01	19.96	20.03	
5	16QAM	25	0	19.97	19.93	19.96	
5	64QAM	1	0	20.94	20.94	20.97	21
5	64QAM	1	12	20.18	20.27	20.28	
5	64QAM	1	24	20.12	20.16	20.12	
5	64QAM	12	0	18.90	18.94	18.87	20
5	64QAM	12	7	18.90	18.92	18.95	
5	64QAM	12	13	19.04	19.05	18.99	
5	64QAM	25	0	19.00	19.00	18.97	
5	256QAM	1	0	16.78	16.73	16.76	18
5	256QAM	1	12	17.13	17.21	17.16	
5	256QAM	1	24	17.00	17.01	16.99	
5	256QAM	12	0	16.86	16.87	16.86	18
5	256QAM	12	7	17.03	17.00	17.00	
5	256QAM	12	13	17.05	17.06	17.06	
5	256QAM	25	0	16.87	16.96	16.90	

<LTE Band 66_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	23.63	23.83	23.74	24
20	QPSK	1	49	23.45	23.74	23.56	
20	QPSK	1	99	23.57	23.78	23.62	
20	QPSK	50	0	22.49	22.69	22.54	23
20	QPSK	50	24	22.47	22.75	22.61	
20	QPSK	50	50	22.55	22.85	22.70	
20	QPSK	100	0	22.46	22.69	22.57	
20	16QAM	1	0	22.22	22.48	22.31	23
20	16QAM	1	49	22.17	22.46	22.32	
20	16QAM	1	99	22.50	22.65	22.56	
20	16QAM	50	0	21.49	21.70	21.61	22
20	16QAM	50	24	21.52	21.72	21.60	
20	16QAM	50	50	21.46	21.70	21.56	
20	16QAM	100	0	21.46	21.68	21.59	
20	64QAM	1	0	21.63	21.75	21.68	22
20	64QAM	1	49	21.57	21.67	21.61	
20	64QAM	1	99	21.31	21.59	21.43	
20	64QAM	50	0	20.35	20.62	20.53	21
20	64QAM	50	24	20.40	20.64	20.47	
20	64QAM	50	50	20.40	20.61	20.42	
20	64QAM	100	0	20.43	20.68	20.49	
20	256QAM	1	0	18.16	18.42	18.25	19
20	256QAM	1	49	18.20	18.47	18.33	

20	256QAM	1	99	18.25	18.45	18.28	
20	256QAM	50	0	18.42	18.66	18.47	19
20	256QAM	50	24	18.45	18.65	18.48	
20	256QAM	50	50	18.32	18.57	18.42	
20	256QAM	100	0	18.49	18.70	18.54	
Channel				132047	132322	132597	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	23.54	23.78	23.66	24
15	QPSK	1	37	23.47	23.71	23.64	
15	QPSK	1	74	23.50	23.71	23.62	
15	QPSK	36	0	22.46	22.66	22.55	23
15	QPSK	36	20	22.49	22.66	22.66	
15	QPSK	36	39	22.62	22.79	22.69	
15	QPSK	75	0	22.43	22.59	22.53	
15	16QAM	1	0	22.22	22.43	22.32	23
15	16QAM	1	37	22.21	22.42	22.32	
15	16QAM	1	74	22.52	22.70	22.65	
15	16QAM	36	0	21.45	21.65	21.51	22
15	16QAM	36	20	21.45	21.68	21.53	
15	16QAM	36	39	21.47	21.65	21.61	
15	16QAM	75	0	21.46	21.58	21.49	
15	64QAM	1	0	21.59	21.81	21.64	22
15	64QAM	1	37	21.56	21.68	21.68	
15	64QAM	1	74	21.37	21.52	21.48	
15	64QAM	36	0	20.34	20.60	20.49	21
15	64QAM	36	20	20.39	20.63	20.45	
15	64QAM	36	39	20.32	20.56	20.52	
15	64QAM	75	0	20.43	20.63	20.59	
15	256QAM	1	0	18.19	18.37	18.30	19
15	256QAM	1	37	18.23	18.46	18.29	
15	256QAM	1	74	18.16	18.35	18.33	
15	256QAM	36	0	18.44	18.63	18.53	19
15	256QAM	36	20	18.35	18.59	18.52	
15	256QAM	36	39	18.35	18.49	18.43	
15	256QAM	75	0	18.42	18.69	18.51	
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	23.55	23.74	23.72	24
10	QPSK	1	25	23.47	23.69	23.57	
10	QPSK	1	49	23.58	23.78	23.60	
10	QPSK	25	0	22.45	22.69	22.58	23
10	QPSK	25	12	22.49	22.75	22.63	
10	QPSK	25	25	22.65	22.81	22.72	
10	QPSK	50	0	22.45	22.66	22.60	
10	16QAM	1	0	22.24	22.42	22.31	23
10	16QAM	1	25	22.23	22.40	22.35	
10	16QAM	1	49	22.53	22.66	22.58	
10	16QAM	25	0	21.40	21.66	21.54	22
10	16QAM	25	12	21.48	21.64	21.58	
10	16QAM	25	25	21.48	21.65	21.56	
10	16QAM	50	0	21.43	21.62	21.49	
10	64QAM	1	0	21.58	21.70	21.74	22
10	64QAM	1	25	21.47	21.75	21.60	
10	64QAM	1	49	21.29	21.52	21.43	
10	64QAM	25	0	20.32	20.55	20.47	21
10	64QAM	25	12	20.39	20.56	20.49	
10	64QAM	25	25	20.39	20.60	20.42	
10	64QAM	50	0	20.48	20.67	20.50	
10	256QAM	1	0	18.16	18.39	18.27	19
10	256QAM	1	25	18.22	18.38	18.30	

10	256QAM	1	49	18.23	18.35	18.30	
10	256QAM	25	0	18.36	18.64	18.52	19
10	256QAM	25	12	18.38	18.60	18.55	
10	256QAM	25	25	18.33	18.57	18.40	
10	256QAM	50	0	18.40	18.63	18.59	
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	23.55	23.79	23.66	24
5	QPSK	1	12	23.51	23.68	23.59	
5	QPSK	1	24	23.58	23.75	23.67	
5	QPSK	12	0	22.40	22.59	22.52	23
5	QPSK	12	7	22.48	22.72	22.60	
5	QPSK	12	13	22.57	22.83	22.68	
5	QPSK	25	0	22.40	22.60	22.52	
5	16QAM	1	0	22.21	22.47	22.35	23
5	16QAM	1	12	22.21	22.45	22.31	
5	16QAM	1	24	22.55	22.66	22.63	
5	16QAM	12	0	21.48	21.65	21.52	22
5	16QAM	12	7	21.45	21.62	21.55	
5	16QAM	12	13	21.50	21.67	21.60	
5	16QAM	25	0	21.47	21.58	21.58	
5	64QAM	1	0	21.56	21.74	21.69	22
5	64QAM	1	12	21.55	21.76	21.60	
5	64QAM	1	24	21.31	21.53	21.44	
5	64QAM	12	0	20.32	20.59	20.43	21
5	64QAM	12	7	20.37	20.57	20.46	
5	64QAM	12	13	20.36	20.52	20.52	
5	64QAM	25	0	20.43	20.64	20.53	
5	256QAM	1	0	18.21	18.34	18.24	19
5	256QAM	1	12	18.18	18.37	18.36	
5	256QAM	1	24	18.25	18.44	18.27	
5	256QAM	12	0	18.38	18.60	18.54	19
5	256QAM	12	7	18.39	18.55	18.54	
5	256QAM	12	13	18.31	18.48	18.43	
5	256QAM	25	0	18.44	18.70	18.59	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	23.56	23.72	23.70	24
3	QPSK	1	8	23.53	23.73	23.61	
3	QPSK	1	14	23.51	23.69	23.67	
3	QPSK	8	0	22.43	22.65	22.52	23
3	QPSK	8	4	22.45	22.73	22.59	
3	QPSK	8	7	22.65	22.85	22.69	
3	QPSK	15	0	22.42	22.67	22.54	
3	16QAM	1	0	22.24	22.46	22.29	23
3	16QAM	1	8	22.17	22.39	22.34	
3	16QAM	1	14	22.45	22.64	22.61	
3	16QAM	8	0	21.45	21.70	21.57	22
3	16QAM	8	4	21.51	21.62	21.63	
3	16QAM	8	7	21.45	21.64	21.53	
3	16QAM	15	0	21.39	21.61	21.56	
3	64QAM	1	0	21.58	21.75	21.67	22
3	64QAM	1	8	21.47	21.76	21.64	
3	64QAM	1	14	21.31	21.51	21.42	
3	64QAM	8	0	20.42	20.62	20.46	21
3	64QAM	8	4	20.34	20.61	20.53	
3	64QAM	8	7	20.37	20.51	20.44	
3	64QAM	15	0	20.38	20.61	20.55	
3	256QAM	1	0	18.13	18.33	18.28	19
3	256QAM	1	8	18.18	18.39	18.31	

3	256QAM	1	14	18.17	18.41	18.31	
3	256QAM	8	0	18.37	18.63	18.50	19
3	256QAM	8	4	18.35	18.56	18.54	
3	256QAM	8	7	18.33	18.48	18.44	
3	256QAM	15	0	18.42	18.62	18.58	
Channel				131979	132322	132665	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	23.59	23.76	23.71	24
1.4	QPSK	1	3	23.51	23.65	23.62	
1.4	QPSK	1	5	23.53	23.68	23.65	
1.4	QPSK	3	0	23.54	23.75	23.72	
1.4	QPSK	3	1	23.45	23.73	23.55	
1.4	QPSK	3	3	23.51	23.69	23.69	
1.4	QPSK	6	0	22.42	22.62	22.59	23
1.4	16QAM	1	0	22.26	22.41	22.30	23
1.4	16QAM	1	3	22.26	22.42	22.34	
1.4	16QAM	1	5	22.54	22.75	22.57	
1.4	16QAM	3	0	22.27	22.39	22.34	
1.4	16QAM	3	1	22.18	22.43	22.33	
1.4	16QAM	3	3	22.50	22.68	22.58	
1.4	16QAM	6	0	21.45	21.59	21.54	22
1.4	64QAM	1	0	21.60	21.81	21.69	22
1.4	64QAM	1	3	21.47	21.71	21.62	
1.4	64QAM	1	5	21.37	21.53	21.48	
1.4	64QAM	3	0	21.57	21.74	21.69	
1.4	64QAM	3	1	21.51	21.71	21.62	
1.4	64QAM	3	3	21.37	21.59	21.40	
1.4	64QAM	6	0	20.45	20.68	20.49	21
1.4	256QAM	1	0	18.18	18.40	18.29	19
1.4	256QAM	1	3	18.24	18.37	18.38	
1.4	256QAM	1	5	18.15	18.40	18.29	
1.4	256QAM	3	0	18.17	18.40	18.26	
1.4	256QAM	3	1	18.24	18.37	18.28	
1.4	256QAM	3	3	18.16	18.41	18.35	
1.4	256QAM	6	0	18.44	18.62	18.55	19

<LTE Band 66_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				132072	132322	132572	
Frequency (MHz)				1720	1745	1770	
20	QPSK	1	0	23.02	23.13	23.22	24
20	QPSK	1	49	22.98	23.09	23.17	
20	QPSK	1	99	22.91	23.06	23.09	
20	QPSK	50	0	21.88	22.05	22.16	23
20	QPSK	50	24	21.77	22.08	22.22	
20	QPSK	50	50	21.82	22.13	22.19	
20	QPSK	100	0	21.77	22.06	22.23	
20	16QAM	1	0	22.09	22.27	22.52	23
20	16QAM	1	49	22.07	22.54	22.40	
20	16QAM	1	99	22.21	22.49	22.42	
20	16QAM	50	0	20.95	21.07	21.17	22
20	16QAM	50	24	20.80	21.12	21.25	
20	16QAM	50	50	20.85	21.15	21.21	
20	16QAM	100	0	20.76	21.08	21.22	
20	64QAM	1	0	21.28	21.19	21.54	22
20	64QAM	1	49	21.14	21.42	21.47	
20	64QAM	1	99	21.19	21.31	21.29	
20	64QAM	50	0	19.97	20.09	20.18	21
20	64QAM	50	24	19.78	20.09	20.25	

20	64QAM	50	50	19.85	20.15	20.19	
20	64QAM	100	0	19.77	20.07	20.22	
20	256QAM	1	0	18.39	18.53	18.64	19
20	256QAM	1	49	18.35	18.55	18.74	
20	256QAM	1	99	18.30	18.56	18.67	
20	256QAM	50	0	18.42	18.57	18.62	19
20	256QAM	50	24	18.47	18.52	18.74	
20	256QAM	50	50	18.39	18.58	18.66	
20	256QAM	100	0	18.31	18.56	18.71	
Channel				132047	132322	132597	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	QPSK	1	0	22.96	23.07	23.21	24
15	QPSK	1	37	22.95	23.00	23.17	
15	QPSK	1	74	22.83	23.05	23.07	
15	QPSK	36	0	21.80	22.03	22.12	23
15	QPSK	36	20	21.74	22.00	22.21	
15	QPSK	36	39	21.75	22.07	22.14	
15	QPSK	75	0	21.97	22.06	22.23	
15	16QAM	1	0	22.06	22.20	22.46	23
15	16QAM	1	37	22.04	22.53	22.32	
15	16QAM	1	74	22.15	22.39	22.37	
15	16QAM	36	0	20.90	21.05	21.16	22
15	16QAM	36	20	20.79	21.12	21.25	
15	16QAM	36	39	20.76	21.08	21.11	
15	16QAM	75	0	20.67	21.02	21.15	
15	64QAM	1	0	21.24	21.09	21.54	22
15	64QAM	1	37	21.07	21.42	21.42	
15	64QAM	1	74	21.15	21.23	21.22	
15	64QAM	36	0	19.90	20.00	20.12	21
15	64QAM	36	20	19.92	20.03	20.22	
15	64QAM	36	39	19.80	20.09	20.17	
15	64QAM	75	0	19.75	20.03	20.17	
15	256QAM	1	0	18.36	18.46	18.59	19
15	256QAM	1	37	18.34	18.52	18.66	
15	256QAM	1	74	18.27	18.52	18.62	
15	256QAM	36	0	18.36	18.53	18.61	19
15	256QAM	36	20	18.44	18.52	18.66	
15	256QAM	36	39	18.30	18.57	18.63	
15	256QAM	75	0	18.27	18.49	18.68	
Channel				132022	132322	132622	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	QPSK	1	0	22.96	23.05	23.13	24
10	QPSK	1	25	22.94	23.02	23.16	
10	QPSK	1	49	22.86	23.01	23.01	
10	QPSK	25	0	21.88	21.98	22.11	23
10	QPSK	25	12	21.70	22.01	22.20	
10	QPSK	25	25	21.80	22.06	22.09	
10	QPSK	50	0	21.70	22.05	22.18	
10	16QAM	1	0	22.14	22.24	22.44	23
10	16QAM	1	25	22.08	22.54	22.36	
10	16QAM	1	49	22.18	22.41	22.38	
10	16QAM	25	0	20.95	21.02	21.15	22
10	16QAM	25	12	20.72	21.04	21.17	
10	16QAM	25	25	20.85	21.05	21.18	
10	16QAM	50	0	20.68	21.08	21.13	
10	64QAM	1	0	21.28	21.17	21.48	22
10	64QAM	1	25	21.04	21.40	21.39	
10	64QAM	1	49	21.17	21.25	21.23	
10	64QAM	25	0	19.97	19.99	20.08	21
10	64QAM	25	12	19.89	19.99	20.20	

10	64QAM	25	25	19.84	20.12	20.17	
10	64QAM	50	0	19.76	20.02	20.17	
10	256QAM	1	0	18.33	18.47	18.56	19
10	256QAM	1	25	18.34	18.53	18.67	
10	256QAM	1	49	18.27	18.46	18.65	
10	256QAM	25	0	18.37	18.48	18.62	19
10	256QAM	25	12	18.47	18.49	18.66	
10	256QAM	25	25	18.31	18.54	18.57	
10	256QAM	50	0	18.25	18.56	18.67	
Channel				131997	132322	132647	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	QPSK	1	0	22.97	23.11	23.20	24
5	QPSK	1	12	22.93	23.08	23.10	
5	QPSK	1	24	22.82	22.96	23.02	
5	QPSK	12	0	21.88	21.96	22.07	23
5	QPSK	12	7	21.69	21.98	22.15	
5	QPSK	12	13	21.76	22.07	22.12	
5	QPSK	25	0	21.69	22.01	22.15	
5	16QAM	1	0	22.11	22.25	22.42	23
5	16QAM	1	12	22.12	22.54	22.33	
5	16QAM	1	24	22.20	22.43	22.41	
5	16QAM	12	0	20.89	21.07	21.10	22
5	16QAM	12	7	20.73	21.08	21.17	
5	16QAM	12	13	20.79	21.06	21.21	
5	16QAM	25	0	20.68	21.01	21.17	
5	64QAM	1	0	21.18	21.16	21.44	22
5	64QAM	1	12	21.04	21.41	21.44	
5	64QAM	1	24	21.17	21.26	21.23	
5	64QAM	12	0	19.97	20.02	20.14	21
5	64QAM	12	7	19.88	20.04	20.23	
5	64QAM	12	13	19.86	20.10	20.10	
5	64QAM	25	0	19.79	19.99	20.22	
5	256QAM	1	0	18.30	18.50	18.64	19
5	256QAM	1	12	18.34	18.46	18.66	
5	256QAM	1	24	18.27	18.56	18.59	
5	256QAM	12	0	18.42	18.49	18.57	19
5	256QAM	12	7	18.40	18.48	18.68	
5	256QAM	12	13	18.34	18.51	18.62	
5	256QAM	25	0	18.27	18.52	18.68	
Channel				131987	132322	132657	Tune-up limit (dBm)
Frequency (MHz)				1711.5	1745	1778.5	
3	QPSK	1	0	22.95	23.09	23.20	24
3	QPSK	1	8	22.97	23.04	23.07	
3	QPSK	1	14	22.81	22.98	23.01	
3	QPSK	8	0	21.79	22.03	22.10	23
3	QPSK	8	4	21.72	21.99	22.12	
3	QPSK	8	7	21.74	22.04	22.14	
3	QPSK	15	0	21.74	21.98	22.13	
3	16QAM	1	0	22.09	22.21	22.49	23
3	16QAM	1	8	22.06	22.50	22.34	
3	16QAM	1	14	22.11	22.47	22.39	
3	16QAM	8	0	20.88	21.00	21.12	22
3	16QAM	8	4	20.78	21.02	21.20	
3	16QAM	8	7	20.82	21.07	21.18	
3	16QAM	15	0	20.70	21.07	21.18	
3	64QAM	1	0	21.23	21.09	21.50	22
3	64QAM	1	8	21.04	21.41	21.46	
3	64QAM	1	14	21.19	21.31	21.27	
3	64QAM	8	0	19.87	20.03	20.15	21
3	64QAM	8	4	19.73	20.04	20.17	

3	64QAM	8	7	19.82	20.12	20.13	
3	64QAM	15	0	19.87	20.06	20.22	
3	256QAM	1	0	18.37	18.45	18.61	19
3	256QAM	1	8	18.27	18.46	18.67	
3	256QAM	1	14	18.24	18.53	18.64	
3	256QAM	8	0	18.37	18.53	18.58	19
3	256QAM	8	4	18.47	18.52	18.64	
3	256QAM	8	7	18.35	18.58	18.60	
3	256QAM	15	0	18.28	18.54	18.65	
Channel				131979	132322	132665	Tune-up limit (dBm)
Frequency (MHz)				1710.7	1745	1779.3	
1.4	QPSK	1	0	22.97	23.11	23.18	24
1.4	QPSK	1	3	22.97	23.09	23.15	
1.4	QPSK	1	5	22.83	23.02	23.05	
1.4	QPSK	3	0	22.98	23.13	23.17	
1.4	QPSK	3	1	22.92	23.03	23.08	
1.4	QPSK	3	3	22.81	23.06	23.05	
1.4	QPSK	6	0	21.77	21.99	22.14	23
1.4	16QAM	1	0	22.04	22.21	22.49	23
1.4	16QAM	1	3	22.00	22.50	22.31	
1.4	16QAM	1	5	22.15	22.48	22.34	
1.4	16QAM	3	0	22.14	22.26	22.50	
1.4	16QAM	3	1	22.11	22.52	22.37	
1.4	16QAM	3	3	22.19	22.40	22.38	
1.4	16QAM	6	0	20.69	21.02	21.19	22
1.4	64QAM	1	0	21.26	21.18	21.51	22
1.4	64QAM	1	3	21.14	21.32	21.42	
1.4	64QAM	1	5	21.13	21.28	21.23	
1.4	64QAM	3	0	21.28	21.16	21.47	
1.4	64QAM	3	1	21.12	21.42	21.47	
1.4	64QAM	3	3	21.19	21.26	21.25	
1.4	64QAM	6	0	19.76	20.04	20.21	21
1.4	256QAM	1	0	18.29	18.53	18.64	19
1.4	256QAM	1	3	18.31	18.45	18.69	
1.4	256QAM	1	5	18.30	18.47	18.58	
1.4	256QAM	3	0	18.31	18.52	18.58	
1.4	256QAM	3	1	18.31	18.45	18.64	
1.4	256QAM	3	3	18.20	18.50	18.66	
1.4	256QAM	6	0	18.24	18.46	18.62	19

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
b. "special subframe S" contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8821C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.

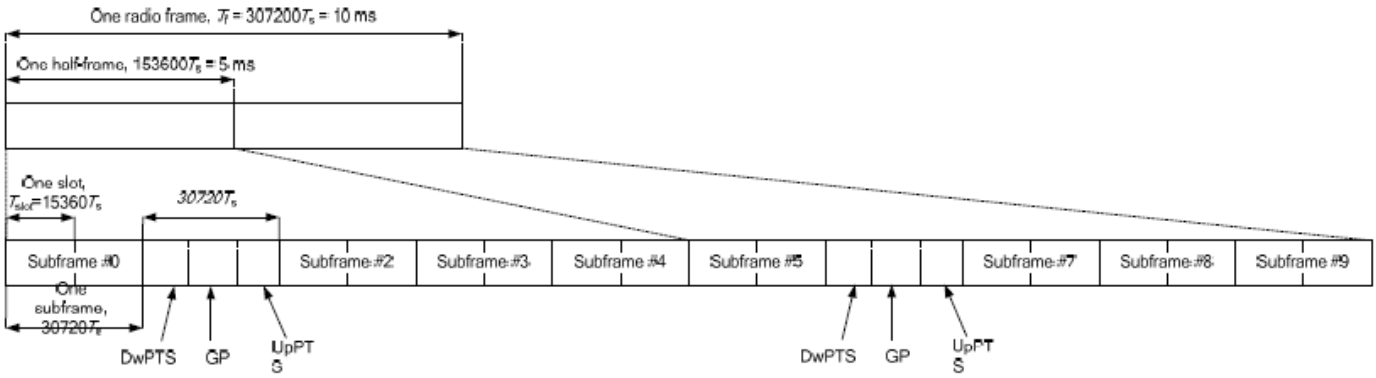


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

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

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

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~4	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~3	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, uplink operation is in 3 uplink subframes and 1 special subframe.

ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink

iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.167)/5 = 63.3%

iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is: (3+0.143)/5 = 62.9%

v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.

<LTE Band 48_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				55340	55990	56640	
Frequency (MHz)				3560	3625	3690	
20	QPSK	1	0	18.45	18.68	18.47	19
20	QPSK	1	49	22.48	22.29	22.49	23
20	QPSK	1	99	18.67	18.61	18.70	19
20	QPSK	50	0	21.15	21.31	21.04	22
20	QPSK	50	24	21.31	21.35	21.09	
20	QPSK	50	50	21.42	21.45	21.21	
20	QPSK	100	0	18.56	18.59	18.51	19
20	16QAM	1	0	17.58	17.80	17.61	19
20	16QAM	1	49	21.33	21.46	21.26	23
20	16QAM	1	99	17.69	17.89	17.76	19
20	16QAM	50	0	20.29	20.36	20.08	22
20	16QAM	50	24	20.38	20.37	20.13	
20	16QAM	50	50	20.43	20.48	20.26	
20	16QAM	100	0	17.56	17.59	17.50	19
20	64QAM	1	0	16.69	16.85	16.67	18
20	64QAM	1	49	20.67	20.67	20.39	22
20	64QAM	1	99	16.77	16.93	16.90	18
20	64QAM	50	0	18.98	19.39	19.07	21
20	64QAM	50	24	19.17	19.41	19.15	
20	64QAM	50	50	19.26	19.52	19.26	
20	64QAM	100	0	16.56	16.58	16.52	18
20	256QAM	1	0	13.53	13.63	13.64	15
20	256QAM	1	49	17.35	17.51	17.24	19

20	256QAM	1	99	13.78	13.82	13.73	15
20	256QAM	50	0	17.13	17.35	17.06	18
20	256QAM	50	24	17.29	17.41	17.11	
20	256QAM	50	50	17.21	17.49	17.28	
20	256QAM	100	0	14.56	14.58	14.52	15
Channel				55315	55990	56665	Tune-up limit (dBm)
Frequency (MHz)				3557.5	3625	3692.5	
15	QPSK	1	0	18.61	18.42	18.47	19
15	QPSK	1	37	22.22	22.26	22.14	23
15	QPSK	1	74	18.71	18.69	18.67	19
15	QPSK	36	0	21.13	21.25	21.15	22
15	QPSK	36	20	21.24	21.28	21.21	
15	QPSK	36	39	21.29	21.37	21.35	
15	QPSK	75	0	19.58	19.63	19.51	20
15	16QAM	1	0	17.58	17.72	17.61	19.
15	16QAM	1	37	21.38	21.49	21.43	23
15	16QAM	1	74	17.64	17.83	17.78	19
15	16QAM	36	0	20.14	20.26	20.17	22
15	16QAM	36	20	20.27	20.29	20.21	
15	16QAM	36	39	20.30	20.43	20.34	
15	16QAM	75	0	18.56	18.60	18.50	19
15	64QAM	1	0	16.83	16.88	16.74	18
15	64QAM	1	37	20.59	20.63	20.53	22
15	64QAM	1	74	16.77	16.96	16.86	18
15	64QAM	36	0	19.15	19.26	19.17	21
15	64QAM	36	20	19.26	19.31	19.21	
15	64QAM	36	39	19.33	19.42	19.33	
15	64QAM	75	0	17.59	17.59	17.53	18
15	256QAM	1	0	13.54	13.52	13.52	15
15	256QAM	1	37	17.46	17.44	17.34	19
15	256QAM	1	74	13.76	13.79	13.69	15
15	256QAM	36	0	17.14	17.21	17.16	18
15	256QAM	36	20	17.26	17.24	17.18	
15	256QAM	36	39	17.29	17.35	17.31	
15	256QAM	75	0	15.57	15.57	15.50	15
Channel				55290	55990	56690	Tune-up limit (dBm)
Frequency (MHz)				3555	3625	3695	
10	QPSK	1	0	22.67	22.68	22.67	23
10	QPSK	1	25	22.42	22.58	22.58	
10	QPSK	1	49	22.74	22.81	22.76	
10	QPSK	25	0	21.37	21.56	21.45	22
10	QPSK	25	12	21.45	21.59	21.48	
10	QPSK	25	25	21.48	21.61	21.55	
10	QPSK	50	0	21.68	21.75	21.62	
10	16QAM	1	0	21.88	21.94	21.84	23
10	16QAM	1	25	21.61	21.75	21.69	
10	16QAM	1	49	21.89	21.97	21.98	
10	16QAM	25	0	20.46	20.57	20.47	22
10	16QAM	25	12	20.49	20.61	20.48	
10	16QAM	25	25	20.51	20.59	20.60	
10	16QAM	50	0	20.69	20.80	20.64	
10	64QAM	1	0	20.92	21.06	20.86	21
10	64QAM	1	25	20.76	20.87	20.83	
10	64QAM	1	49	20.96	21.10	20.92	
10	64QAM	25	0	19.43	19.66	19.45	20
10	64QAM	25	12	19.49	19.66	19.47	
10	64QAM	25	25	19.51	19.64	19.58	
10	64QAM	50	0	19.75	19.79	19.66	
10	256QAM	1	0	17.73	17.90	17.74	18
10	256QAM	1	25	17.63	17.68	17.74	

10	256QAM	1	49	17.83	17.96	17.82	
10	256QAM	25	0	17.48	17.58	17.48	
10	256QAM	25	12	17.49	17.64	17.53	
10	256QAM	25	25	17.49	17.65	19.59	
10	256QAM	50	0	17.74	17.76	17.66	
Channel				55265	55990	56715	Tune-up limit (dBm)
Frequency (MHz)				3552.5	3625	3697.5	
5	QPSK	1	0	22.57	22.62	22.59	23
5	QPSK	1	12	22.18	22.49	22.44	
5	QPSK	1	24	22.70	22.80	22.75	
5	QPSK	12	0	21.18	21.36	21.36	22
5	QPSK	12	7	21.23	21.46	21.41	
5	QPSK	12	13	21.25	21.42	21.35	
5	QPSK	25	0	21.69	21.74	21.69	
5	16QAM	1	0	21.75	21.83	21.78	23
5	16QAM	1	12	21.54	21.63	21.56	
5	16QAM	1	24	21.87	21.96	21.84	
5	16QAM	12	0	20.28	20.38	20.43	22
5	16QAM	12	7	20.35	20.51	20.44	
5	16QAM	12	13	20.28	20.46	20.39	
5	16QAM	25	0	20.69	20.79	20.71	
5	64QAM	1	0	20.89	20.92	20.84	21
5	64QAM	1	12	20.59	20.73	20.72	
5	64QAM	1	24	20.98	21.10	20.99	
5	64QAM	12	0	19.33	19.41	19.39	20
5	64QAM	12	7	19.38	19.53	19.44	
5	64QAM	12	13	19.34	19.44	19.41	
5	64QAM	25	0	19.69	19.76	19.70	
5	256QAM	1	0	18.22	17.83	17.68	18
5	256QAM	1	12	17.49	17.59	17.05	
5	256QAM	1	24	17.80	17.97	17.96	
5	256QAM	12	0	17.31	17.39	17.11	
5	256QAM	12	7	17.33	17.49	17.08	
5	256QAM	12	13	17.31	17.47	17.43	
5	256QAM	25	0	17.70	17.74	17.70	

<LTE Carrier Aggregation combinations>

General Note:

1. This device supports Carrier Aggregation on downlink only for inter and intra band, Uplink CA is not supported. For the device supports combination bands and configurations are according to 3GPP.
2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.
3. 29 Rx only; 46 Rx only.

Intra-Band Contiguous	Intra-Band Non-Contiguous
CA_5B	CA_2A-2A
CA_48C	CA_48A-48A
CA_48D	CA_66A-66A
CA_66B	
CA_66C	

Inter Band							
2 bands / 2 CC	2 bands / 3 CC	2 bands / 4 CC	3 bands / 3 CC	3 bands / 4 CC	3 bands / 5 CC	4 bands / 4 CC	4 bands / 5 CC
CA_2A-5A	CA_2A-5B	CA_2A-46D	CA_2A-2A-5A	CA_2A-2A-46C	CA_2A-2A-46D	CA_2A-5A-30A-66A	CA_2A-5B-30A-66A
CA_2A-12A	CA_2A-46C	CA_66A-46D	CA_2A-2A-12A	CA_2A-5B-30A	CA_2A-46D-66A	CA_2A-14A-30A-66A	CA_5B-2A-30A-66A
CA_2A-14A	CA_5B-2A	CA_5B-66A-66A	CA_2A-2A-14A	CA_2A-5B-66A	CA_2A-66A-46D	CA_2A-66A-5A-30A	CA_30A-2A-5B-66A
CA_2A-29A	CA_5B-30A	CA_66A-5B-66A	CA_2A-2A-30A	CA_2A-46C-66A	CA_66A-2A-46D	CA_2A-66A-12A-30A	CA_66A-2A-5B-30A
CA_2A-30A	CA_5B-66A	CA_66A-46C-66A	CA_2A-2A-46A	CA_2A-66A-46C	CA_2A-2A-5A-66A-66A	CA_5A-2A-30A-66A	CA_2A-2A-5A-30A-66A
CA_2A-46A	CA_30A-5B	CA_2A-2A-66A-66A	CA_2A-2A-66A	CA_5B-2A-30A	CA_2A-2A-12A-66A-66A	CA_12A-2A-30A-66A	CA_2A-2A-12A-30A-66A
CA_2A-66A	CA_66A-5B	CA_2A-66A-2A-66A	CA_2A-5A-30A	CA_5B-2A-66A	CA_2A-2A-14A-66A-66A	CA_14A-2A-30A-66A	CA_2A-2A-14A-30A-66A
CA_5A-2A	CA_66A-46C	CA_66A-2A-2A-66A	CA_2A-5A-66A	CA_5B-30A-66A	CA_2A-66A-2A-12A-66A	CA_30A-2A-5A-66A	CA_2A-5A-30A-66A-66A
CA_5A-12A	CA_2A-66A-2A		CA_2A-12A-2A	CA_30A-2A-5B	CA_5A-2A-2A-66A-66A	CA_30A-2A-12A-66A	CA_2A-12A-2A-30A-66A
CA_5A-30A	CA_2A-66A-66A		CA_2A-12A-30A	CA_30A-5B-66A	CA_12A-2A-2A-66A-66A	CA_30A-2A-14A-66A	CA_2A-12A-30A-66A-66A
CA_5A-66A	CA_5A-2A-2A		CA_2A-12A-66A	CA_66A-2A-5B	CA_14A-2A-2A-66A-66A	CA_66A-2A-5A-30A	CA_2A-14A-30A-66A-66A
CA_12A-2A	CA_5A-66A-66A		CA_2A-14A-30A	CA_66A-2A-46C	CA_66A-2A-2A-5A-66A	CA_66A-2A-12A-30A	CA_2A-66A-2A-5A-30A
CA_12A-5A	CA_12A-2A-2A		CA_2A-14A-66A	CA_66A-5B-30A	CA_66A-2A-2A-12A-66A	CA_66A-2A-14A-30A	CA_2A-66A-2A-12A-30A
CA_12A-30A	CA_14A-2A-2A		CA_2A-29A-30A	CA_2A-2A-5A-30A	CA_66A-2A-2A-14A-66A		CA_5A-2A-2A-30A-66A
CA_12A-66A	CA_14A-66A-66A		CA_2A-30A-66A	CA_2A-2A-5A-66A	CA_2A-5B-66A-66A		CA_5A-2A-30A-66A-66A
CA_14A-2A	CA_30A-2A-2A		CA_2A-46A-66A	CA_2A-2A-12A-30A	CA_5B-2A-66A-66A		CA_12A-2A-2A-30A-66A
CA_14A-30A	CA_30A-66A-66A		CA_2A-66A-5A	CA_2A-2A-12A-66A	CA_2A-66A-2A-5A-66A		CA_12A-2A-30A-66A-66A
CA_14A-66A	CA_66A-2A-2A		CA_2A-66A-12A	CA_2A-2A-14A-30A	CA_66A-2A-5B-66A		CA_14A-2A-2A-30A-66A
CA_30A-2A	CA_66A-2A-66A		CA_2A-66A-30A	CA_2A-2A-14A-66A	CA_2A-12A-2A-66A-66A		CA_2A-66A-12A-30A-66A
CA_30A-5A	CA_66A-12A-66A		CA_2A-66A-46A	CA_2A-2A-30A-66A			CA_14A-2A-30A-66A-66A
CA_30A-12A	CA_66A-14A-66A		CA_5A-2A-30A	CA_2A-5A-66A-66A			CA_30A-2A-2A-5A-66A
CA_30A-14A	CA_66A-30A-66A		CA_5A-2A-66A	CA_2A-12A-2A-30A			CA_30A-2A-2A-12A-66A
CA_30A-29A	CA_66A-46A-66A		CA_5A-30A-66A	CA_2A-12A-2A-66A			CA_30A-2A-2A-14A-66A
CA_30A-66A			CA_12A-2A-30A	CA_2A-12A-30A-66A			CA_30A-2A-5A-66A-66A
CA_66A-2A			CA_12A-2A-66A	CA_2A-12A-66A-66A			CA_30A-2A-12A-66A-66A
CA_66A-5A			CA_12A-30A-66A	CA_2A-14A-66A-66A			CA_30A-2A-14A-66A-66A
CA_66A-12A			CA_12A-66A-66A	CA_2A-30A-66A-66A			CA_66A-2A-2A-5A-30A
CA_66A-14A			CA_14A-2A-30A	CA_2A-66A-2A-5A			CA_66A-2A-2A-12A-30A
CA_66A-30A			CA_14A-2A-66A	CA_2A-66A-2A-12A			CA_66A-2A-2A-14A-30A
CA_66A-46A			CA_14A-30A-66A	CA_2A-66A-2A-30A			CA_66A-2A-5A-30A-66A
			CA_30A-2A-5A	CA_2A-66A-5A-66A			CA_66A-2A-12A-30A-66A
			CA_30A-2A-12A	CA_2A-66A-12A-66A			CA_66A-2A-14A-30A-66A
			CA_30A-2A-14A	CA_2A-66A-30A-66A			
			CA_30A-2A-29A	CA_5A-2A-2A-30A			
			CA_30A-2A-66A	CA_5A-2A-2A-66A			
			CA_30A-5A-66A	CA_5A-2A-66A-66A			
			CA_30A-12A-66A	CA_5A-30A-66A-66A			
			CA_30A-14A-66A	CA_12A-2A-2A-30A			

			CA_66A-2A-5A	CA_12A-2A-2A-66A			
			CA_66A-2A-12A	CA_12A-2A-66A-66A			
			CA_66A-2A-14A	CA_12A-30A-66A-66A			
			CA_66A-2A-30A	CA_14A-2A-2A-30A			
			CA_66A-2A-46A	CA_14A-2A-2A-66A			
			CA_66A-5A-30A	CA_14A-2A-66A-66A			
			CA_66A-5A-66A	CA_14A-30A-66A-66A			
			CA_66A-12A-30A	CA_30A-2A-2A-5A			
			CA_66A-14A-30A	CA_30A-2A-2A-12A			
				CA_30A-2A-2A-14A			
				CA_30A-2A-2A-66A			
				CA_30A-2A-66A-66A			
				CA_30A-5A-66A-66A			
				CA_30A-12A-66A-66A			
				CA_30A-14A-66A-66A			
				CA_66A-2A-2A-5A			
				CA_66A-2A-2A-12A			
				CA_66A-2A-2A-14A			
				CA_66A-2A-2A-30A			
				CA_66A-2A-5A-66A			
				CA_66A-2A-12A-66A			
				CA_66A-2A-14A-66A			
				CA_66A-2A-30A-66A			
				CA_66A-5A-30A-66A			
				CA_66A-12A-30A-66A			
				CA_66A-14A-30A-66A			

<Power verification when LTE Carrier Aggregation Active>

General Note:

i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.

vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lfloor \frac{BW_{Channel(1)} + BW_{Channel(2)} - 0.1\left|BW_{Channel(1)} - BW_{Channel(2)}\right|}{0.6} \right\rfloor 0.3 \ \ [\text{MHz}]$$

<Two Carrier power verification>

Configure		CA Configuration (BCS)	PCC							SCC				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band		CA_5A-12A	5	10	836.5	20525	QPSK	1	0	12	10	737.5	5095	23.21	23.27
Intra-Band	Non-Contiguous	CA_2A-2A	2	20	1900	19100	QPSK	1	0	2	5	1932.5	625	23.03	23.13
		CA_48A-48A	48	20	3625	55990	QPSK	1	49	48	5	3697.5	56715	22.48	22.45
		CA_66A-66A	66	20	1770	132572	QPSK	1	0	66	5	2112.5	66461	23.12	23.22
	Contiguous	CA_5B	5	10	841.5	20575	QPSK	1	0	5	10	886.50	2575	23.21	23.26
		CA_66C	66	20	1770	132572	QPSK	1	0	66	20	2170.20	67038	23.11	23.22

<Three Carrier power verification>

Configure		CA Configuration (BCS)	PCC							SCC1				SCC2				Power	
			LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band		CA_2A-29A-30A	2	20	1900	19100	QPSK	1	0	29	10	722.5	9715	30	10	2355	9820	23.03	23.13
Intra-Band	Contiguous	CA_48D	48	20	3625	55990	QPSK	1	49	48	20	3644.8	56188	48	20	3664.6	56386	22.72	22.45

<Five Carrier power verification>

Configure	CA Configuration (BCS)	PCC							SCC1				SCC2				SCC3				SCC4				Power	
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	CA_2A-2A-46D	2	20	1900	19100	QPSK	1	0	2	5	1932.5	625	46	20	5537.5	50665	46	20	5557.3	50863	46	20	5577.1	51061	23.02	23.13
	CA_2A-14A-30A-66A-66A	2	20	1900	19100	QPSK	1	0	14	10	763	5330	30	10	2355	9820	66	20	2155	66886	66	5	2197.5	67311	23.03	23.13
	CA_2A-66A-2A-5A-30A	2	20	1900	19100	QPSK	1	0	66	20	2155	66886	2	20	1960	900	5	10	881.5	2525	30	10	2355	9820	23.10	23.13
	CA_2A-66A-12A-30A-66A	2	20	1900	19100	QPSK	1	0	66	20	2155	66886	12	10	737.5	5095	30	10	2355	9820	66	5	2197.5	67311	23.11	23.13
	CA_5A-2A-2A-30A-66A	5	10	836.5	20525	QPSK	1	0	2	20	1960	900	2	5	1932.5	625	30	10	2355	9820	66	20	2155	66886	23.12	23.27
	CA_12A-2A-2A-30A-66A	12	10	704	23060	QPSK	1	0	2	20	1960	900	2	5	1932.5	625	30	10	2355	9820	66	20	2155	66886	23.02	23.12
	CA_14A-2A-2A-30A-66A	14	10	793	23330	QPSK	1	0	2	20	1960	900	2	5	1932.5	625	30	10	2355	9820	66	20	2155	66886	23.03	23.09

<LTE Uplink carrier aggregation>

2CC Uplink Carrier Aggregation	
Number	Combination
1	48C
2	66B
3	66C
4	CA_2A-12A
5	CA_12A-2A
6	CA_2A-66A
7	CA_66A-2A

<Intra-band>

General Note:

i. The device supports intra-band uplink carrier aggregation for LTE B66/B41/B48 with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.

ii. The device supports uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre the 3GPP requirement.

iii. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

iv. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.

v. Additional SAR measurement for LTE UL CA whit other DL CA combinations active were not required since the maximum output power for this configuration was not > 0.25dB higher than the maximum output power for UL CA active.

<Inter-band>

vi. LTE inter band uplink PCC and SCC transmission are managed and controlled by Qualcomm® Smart Transmit.

CA_48C Ant 1										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
55340	55538	QPSK	1	99	1	0	1	0	18.4	19
55990	55792	QPSK	1	0	1	99	2	0	21.87	23
56640	56442	QPSK	1	0	1	99	2	0	18.1	19

CA_66B Ant 2										
Combination 15MHz+5MHz (75RB+25RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132047	132140	QPSK	1	0	0	0	1	0	22.68	24
132322	132229	QPSK	1	0	1	24	2	0	22.6	24
132597	132504	QPSK	1	0	1	24	2	0	22.62	24

CA_66C Ant 2										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
132072	132270	QPSK	1	0	0	0	1	0	22.77	24
132322	132124	QPSK	1	0	1	99	2	0	22.65	24
132572	132374	QPSK	1	0	1	99	2	0	22.6	24

13. 5G NR Output Power (Unit: dBm)

General Note:

1. Referencing the procedure in KDB 941225, the test procedures are outlined as below
   a. For DFT-OFDM output power measurement, full measurement was done for Pi/2 BPSK and QPSK and for the largest supported bandwidth, repeat test for 16QAM/64QAM/256QAM under 1RB 1Offset configuration. For smaller bandwidth, measure conducted power for Pi/2 BPSK and 1RB 1Offset configuration.
   b. According to the tune-up, CP-OFDM output power is not ½ dB higher than DFT-OFDM mode, and the reported SAR of DFT-OFDM mode reported SAR is ≤ 1.45 W/kg, SAR test and thus conducted power for CP-OFDM mode is not required.
   c. To start SAR test for the largest channel bandwidth for PI/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. Also do SAR test for 50% RB allocation for PI/2 BPSK SAR testing using 1RB PI/2 BPSK allocation procedure
   d. For PI/2 BPSK with 100% RB allocation, SAR test is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
   e. For higher modulation QPSK/16QAM/64QAM/256QAM, according to tune-up document the power level is not ½ dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
   f. Smaller bandwidth output power for each RB allocation configuration for this device is not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
2. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.
3. Ant 5 and Ant 6 dedicated is used for SRS only, different from Tx antennas, then the SAR measurement at Plimit for SRS dedicated antenna(s) can be performed using FTM mode with CW modulation with 100% duty cycle(as SRS operates at very low duty cycle in online mode).

<3GPP 38.101 MPR for EN-DC>

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

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

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

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation 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.

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

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

<n2_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				372000	376000	380000	
Frequency (MHz)				1860	1880	1900	
20	PI/2 BPSK	1	1	23.26	23.44	23.37	23.5
20	PI/2 BPSK	1	53	23.16	23.32	23.28	
20	PI/2 BPSK	1	104	23.19	23.32	23.25	
20	PI/2 BPSK	50	0	22.99	22.95	22.96	23.0
20	PI/2 BPSK	50	28	23.22	23.37	23.25	23.5
20	PI/2 BPSK	50	56	22.96	22.92	22.99	23.0
20	PI/2 BPSK	100	0	22.99	22.96	22.99	
20	QPSK	1	1	23.18	23.35	23.33	23.5
20	QPSK	1	53	23.17	23.37	23.31	
20	QPSK	1	104	23.11	23.27	23.23	
20	QPSK	50	0	22.46	22.46	22.49	22.5
20	QPSK	50	28	23.17	23.29	23.25	23.5
20	QPSK	50	56	22.40	22.42	22.46	22.5
20	QPSK	100	0	22.41	22.49	22.49	
20	16QAM	1	1	22.46	22.42	22.42	22.5
20	64QAM	1	1	20.99	21.00	20.91	21.0
20	256QAM	1	1	18.98	18.94	18.96	19.0
Channel				371500	376000	380500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	PI/2 BPSK	1	1	23.26	23.41	23.32	23.5
Channel				371000	376000	381000	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	PI/2 BPSK	1	1	23.18	23.43	23.28	23.5
Channel				370500	376000	381500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	PI/2 BPSK	1	1	23.19	23.35	23.29	23.5

<n2_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				372000	376000	380000	
Frequency (MHz)				1860	1880	1900	
20	PI/2 BPSK	1	1	23.24	23.46	23.41	24.0
20	PI/2 BPSK	1	53	23.17	23.39	23.35	
20	PI/2 BPSK	1	104	23.03	23.24	23.23	
20	PI/2 BPSK	50	0	23.00	23.21	23.23	23.5
20	PI/2 BPSK	50	28	23.10	23.28	23.23	24.0
20	PI/2 BPSK	50	56	23.12	23.34	23.29	23.5
20	PI/2 BPSK	100	0	23.08	23.35	23.33	
20	QPSK	1	1	23.09	23.33	23.25	24.0
20	QPSK	1	53	23.15	23.35	23.36	
20	QPSK	1	104	23.07	23.34	23.29	
20	QPSK	50	0	22.93	22.96	22.99	23.0
20	QPSK	50	28	23.04	23.25	23.30	24.0
20	QPSK	50	56	22.95	22.96	22.92	23.0
20	QPSK	100	0	22.92	22.95	22.98	
20	16QAM	1	1	22.92	22.96	22.99	23.0
20	64QAM	1	1	21.43	21.49	21.46	21.5
20	256QAM	1	1	19.38	19.44	19.41	19.5
Channel				371500	376000	380500	Tune-up limit (dBm)
Frequency (MHz)				1857.5	1880	1902.5	
15	PI/2 BPSK	1	1	23.15	23.43	23.32	24.0
Channel				371000	376000	381000	Tune-up limit (dBm)
Frequency (MHz)				1855	1880	1905	
10	PI/2 BPSK	1	1	23.18	23.43	23.39	24.0
Channel				370500	376000	381500	Tune-up limit (dBm)
Frequency (MHz)				1852.5	1880	1907.5	
5	PI/2 BPSK	1	1	23.22	23.38	23.31	24.0

<n5_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				166800	167300	167800	
Frequency (MHz)				834	836.5	839	
20	PI/2 BPSK	1	1	23.56	23.61	23.57	24.0
20	PI/2 BPSK	1	53	23.28	23.35	23.26	
20	PI/2 BPSK	1	104	23.44	23.54	23.41	
20	PI/2 BPSK	50	0	23.45	23.49	23.47	23.5
20	PI/2 BPSK	50	28	23.45	23.50	23.43	24.0
20	PI/2 BPSK	50	56	23.50	23.43	23.45	23.5
20	PI/2 BPSK	100	0	23.20	23.21	23.18	
20	QPSK	1	1	23.45	23.46	23.47	24.0
20	QPSK	1	53	23.13	23.18	23.16	
20	QPSK	1	104	23.39	23.51	23.43	
20	QPSK	50	0	22.93	22.92	22.96	23.0
20	QPSK	50	28	23.45	23.45	23.39	24.0
20	QPSK	50	56	22.91	22.94	22.96	23.0
20	QPSK	100	0	22.99	22.92	22.95	
20	16QAM	1	1	22.97	22.94	22.97	23.0
20	64QAM	1	1	21.46	21.33	21.29	21.5
20	256QAM	1	1	19.44	19.42	19.49	19.5
Channel				166300	167300	168300	Tune-up limit (dBm)
Frequency (MHz)				831.5	836.5	841.5	
15	PI/2 BPSK	1	1	23.55	23.53	23.54	24.0
Channel				165800	167300	168800	Tune-up limit (dBm)
Frequency (MHz)				829	836.5	844	
10	PI/2 BPSK	1	1	23.47	23.59	23.53	24.0
Channel				165300	167300	169300	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	PI/2 BPSK	1	1	23.54	23.52	23.50	24.0

<n5_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				166800	167300	167800	
Frequency (MHz)				834	836.5	839	
20	PI/2 BPSK	1	1	23.63	23.60	23.67	24.0
20	PI/2 BPSK	1	53	23.49	23.45	23.55	
20	PI/2 BPSK	1	104	23.51	23.57	23.63	
20	PI/2 BPSK	50	0	23.50	23.46	23.47	23.5
20	PI/2 BPSK	50	28	23.46	23.44	23.57	24.0
20	PI/2 BPSK	50	56	23.39	23.37	23.48	23.5
20	PI/2 BPSK	100	0	23.41	23.47	23.44	
20	QPSK	1	1	23.35	23.35	23.45	24.0
20	QPSK	1	53	23.51	23.48	23.57	
20	QPSK	1	104	23.50	23.39	23.55	
20	QPSK	50	0	22.49	22.45	22.43	23.0
20	QPSK	50	28	23.48	23.53	23.55	24.0
20	QPSK	50	56	22.92	22.96	22.95	23.0
20	QPSK	100	0	22.94	22.99	22.94	
20	16QAM	1	1	22.95	22.95	22.95	23.0
20	64QAM	1	1	21.46	21.41	21.44	21.5
20	256QAM	1	1	19.45	19.41	19.43	19.5
Channel				166300	167300	168300	Tune-up limit (dBm)
Frequency (MHz)				831.5	836.5	841.5	
15	PI/2 BPSK	1	1	23.56	23.52	23.59	24.0
Channel				165800	167300	168800	Tune-up limit (dBm)
Frequency (MHz)				829	836.5	844	
10	PI/2 BPSK	1	1	23.61	23.59	23.64	24.0
Channel				165300	167300	169300	Tune-up limit (dBm)
Frequency (MHz)				826.5	836.5	846.5	
5	PI/2 BPSK	1	1	23.62	23.56	23.64	24.0

<n12_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				141300	141500	141700	
Frequency (MHz)				706.5	707.5	708.5	
15	PI/2 BPSK	1	1	23.61	23.68	23.67	24.0
15	PI/2 BPSK	1	40	23.49	23.60	23.52	
15	PI/2 BPSK	1	77	23.49	23.55	23.59	
15	PI/2 BPSK	36	0	23.47	23.41	23.48	23.5
15	PI/2 BPSK	36	22	23.39	23.42	23.50	24.0
15	PI/2 BPSK	36	43	23.50	23.43	23.42	23.5
15	PI/2 BPSK	75	0	23.41	23.47	23.46	
15	QPSK	1	1	23.50	23.53	23.57	24.0
15	QPSK	1	40	23.47	23.56	23.60	
15	QPSK	1	77	23.47	23.56	23.55	
15	QPSK	36	0	22.95	22.95	22.99	23.0
15	QPSK	36	22	23.35	23.41	23.41	24.0
15	QPSK	36	43	22.93	22.95	22.99	23.0
15	QPSK	75	0	22.95	22.96	22.92	
15	16QAM	1	1	22.96	22.97	22.91	23.0
15	64QAM	1	1	21.46	21.42	21.40	21.5
	256QAM	1	1	19.48	19.45	19.43	19.5
Channel				140800	141500	142200	Tune-up limit (dBm)
Frequency (MHz)				704	707.5	711	
10	PI/2 BPSK	1	1	23.55	23.63	23.67	24.0
Channel				140300	141500	142700	Tune-up limit (dBm)
Frequency (MHz)				701.5	707.5	713.5	
5	PI/2 BPSK	1	1	23.60	23.60	23.58	24.0

<n14_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					158600		
Frequency (MHz)					793		
10	PI/2 BPSK	1	1		23.17		24.0
10	PI/2 BPSK	1	26		23.12		
10	PI/2 BPSK	1	50		23.08		
10	PI/2 BPSK	25	0		23.05		23.5
10	PI/2 BPSK	25	14		23.13		24.0
10	PI/2 BPSK	25	27		23.04		23.5
10	PI/2 BPSK	50	0		22.61		
10	QPSK	1	1		23.13		24.0
10	QPSK	1	26		23.08		
10	QPSK	1	50		23.04		
10	QPSK	25	0		22.95		23.0
10	QPSK	25	14		23.07		24.0
10	QPSK	25	27		22.72		23.0
10	QPSK	50	0		22.72		
10	16QAM	1	1		22.85		23.0
10	64QAM	1	1		21.42		21.5
10	256QAM	1	1		19.24		19.5
Channel				158100	158600	159100	Tune-up limit (dBm)
Frequency (MHz)				790.5	793	795.5	
5	PI/2 BPSK	1	1	23.11	23.08	23.14	24.0

<n30_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					462000		
Frequency (MHz)					2310		
10	PI/2 BPSK	1	1		22.40		23.0
10	PI/2 BPSK	1	26		22.38		
10	PI/2 BPSK	1	50		22.35		
10	PI/2 BPSK	25	0		22.25		22.5
10	PI/2 BPSK	25	14		22.21		23.0
10	PI/2 BPSK	25	27		22.18		22.5
10	PI/2 BPSK	50	0		22.25		
10	QPSK	1	1		22.14		23.0
10	QPSK	1	26		22.34		
10	QPSK	1	50		22.21		
10	QPSK	25	0		21.83		22.0
10	QPSK	25	14		22.22		23.0
10	QPSK	25	27		21.88		22.0
10	QPSK	50	0		21.98		
10	16QAM	1	1		21.95		22.0
10	64QAM	1	1		20.44		20.5
10	256QAM	1	1		18.34		18.5
Channel				461500	462000	462500	Tune-up limit (dBm)
Frequency (MHz)				2307.5	2310	2312.5	
5	PI/2 BPSK	1	1	22.35	22.38	22.31	23.0

<n66_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				346000	349000	352000	
Frequency (MHz)				1730	1745	1760	
40	PI/2 BPSK	1	1	23.86	23.88	23.80	24.0
40	PI/2 BPSK	1	108	23.78	23.73	23.69	
40	PI/2 BPSK	1	214	23.82	23.81	23.73	
40	PI/2 BPSK	108	0	23.45	23.43	23.46	23.5
40	PI/2 BPSK	108	54	23.77	23.78	23.74	24.0
40	PI/2 BPSK	108	108	23.48	23.49	23.43	23.5
40	PI/2 BPSK	216	0	23.06	23.10	23.03	
40	QPSK	1	1	23.75	23.76	23.68	24.0
40	QPSK	1	108	23.78	23.84	23.76	
40	QPSK	1	214	23.70	23.79	23.74	
40	QPSK	108	0	22.76	22.80	22.71	23.0
40	QPSK	108	54	23.73	23.79	23.72	24.0
40	QPSK	108	108	22.93	22.92	22.99	23.0
40	QPSK	216	0	22.93	22.95	22.96	
40	16QAM	1	1	22.99	22.98	22.92	23.0
40	64QAM	1	1	21.49	21.45	21.47	21.5
40	256QAM	1	1	19.44	19.43	19.46	19.5
Channel				345000	349000	353000	Tune-up limit (dBm)
Frequency (MHz)				1725	1745	1765	
30	PI/2 BPSK	1	1	23.83	23.79	23.80	24.0
Channel				344000	349000	354000	Tune-up limit (dBm)
Frequency (MHz)				1720	1745	1770	
20	PI/2 BPSK	1	1	23.76	23.81	23.77	24.0
Channel				343500	349000	354500	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	PI/2 BPSK	1	1	23.80	23.78	23.70	24.0
Channel				343000	349000	355000	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	PI/2 BPSK	1	1	23.84	23.78	23.71	24.0
Channel				342500	349000	355500	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	PI/2 BPSK	1	1	23.81	23.78	23.79	24.0

<n66_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				346000	349000	352000	
Frequency (MHz)				1730	1745	1760	
40	PI/2 BPSK	1	1	23.73	23.75	23.98	24.0
40	PI/2 BPSK	1	108	23.61	23.59	23.88	
40	PI/2 BPSK	1	214	23.57	23.54	23.84	
40	PI/2 BPSK	108	0	23.41	23.41	23.44	23.5
40	PI/2 BPSK	108	54	23.55	23.54	23.86	24.0
40	PI/2 BPSK	108	108	23.42	23.41	23.40	23.5
40	PI/2 BPSK	216	0	23.43	23.41	23.44	
40	QPSK	1	1	23.47	23.51	23.85	24.0
40	QPSK	1	108	23.53	23.49	23.84	
40	QPSK	1	214	23.20	23.29	23.55	
40	QPSK	108	0	22.98	22.91	22.92	23.0
40	QPSK	108	54	23.57	23.63	23.87	24.0
40	QPSK	108	108	22.99	22.97	22.95	23.0
40	QPSK	216	0	22.92	22.95	22.99	
40	16QAM	1	1	22.96	22.83	22.81	23.0
40	64QAM	1	1	21.45	21.45	21.41	21.5
40	256QAM	1	1	19.47	19.48	19.45	19.5
Channel				345000	349000	353000	Tune-up limit (dBm)
Frequency (MHz)				1725	1745	1765	
30	PI/2 BPSK	1	1	23.68	23.68	23.96	24.0
Channel				344000	349000	354000	Tune-up limit (dBm)
Frequency (MHz)				1720	1745	1770	
20	PI/2 BPSK	1	1	23.71	23.72	23.93	24.0
Channel				343500	349000	354500	Tune-up limit (dBm)
Frequency (MHz)				1717.5	1745	1772.5	
15	PI/2 BPSK	1	1	23.72	23.75	23.88	24.0
Channel				343000	349000	355000	Tune-up limit (dBm)
Frequency (MHz)				1715	1745	1775	
10	PI/2 BPSK	1	1	23.64	23.69	23.96	24.0
Channel				342500	349000	355500	Tune-up limit (dBm)
Frequency (MHz)				1712.5	1745	1777.5	
5	PI/2 BPSK	1	1	23.72	23.75	23.97	24.0

<n77 (3700 MHz ~ 3980 MHz)_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	PI/2 BPSK	1	1	21.05	21.38	21.09	22.3
100	PI/2 BPSK	1	137	20.97	21.35	21.06	
100	PI/2 BPSK	1	271	20.79	21.17	20.84	
100	PI/2 BPSK	135	0	20.90	21.30	20.93	21.8
100	PI/2 BPSK	135	69	20.99	21.35	21.00	22.3
100	PI/2 BPSK	135	138	20.87	21.21	20.84	21.8
100	PI/2 BPSK	270	0	20.87	21.30	20.93	
100	QPSK	1	1	20.89	21.27	20.96	22.3
100	QPSK	1	137	20.95	21.32	20.93	
100	QPSK	1	271	20.67	21.06	20.77	
100	QPSK	135	0	20.95	21.28	20.92	22.3
100	QPSK	135	69	20.98	21.32	20.99	
100	QPSK	135	138	20.79	21.18	20.89	
100	QPSK	270	0	20.87	21.19	20.90	21.3
100	16QAM	1	1	20.87	21.15	20.91	21.3
100	64QAM	1	1	19.37	19.70	19.35	19.8
100	256QAM	1	1	17.13	17.49	17.19	17.8
Channel				649668	656000	662332	Tune-up limit (dBm)
Frequency (MHz)				3745.02	3840	3934.98	
90	PI/2 BPSK	1	1	20.98	21.28	21.02	22.3
Channel				649334	656000	662666	Tune-up limit (dBm)
Frequency (MHz)				3740.01	3840	3939.99	
80	PI/2 BPSK	1	1	21.02	21.36	21.09	22.3
Channel				649000	656000	663000	Tune-up limit (dBm)
Frequency (MHz)				3735	3840	3945	
70	PI/2 BPSK	1	1	20.95	21.29	21.09	22.3
Channel				648668	656000	663332	Tune-up limit (dBm)
Frequency (MHz)				3730.02	3840	3949.98	
60	PI/2 BPSK	1	1	21.04	21.36	21.04	22.3
Channel				648334	656000	663666	Tune-up limit (dBm)
Frequency (MHz)				3725.01	3840	3954.99	
50	PI/2 BPSK	1	1	20.99	21.31	21.07	22.3
Channel				648000	656000	664000	Tune-up limit (dBm)
Frequency (MHz)				3720	3840	3960	
40	PI/2 BPSK	1	1	21.05	21.30	21.02	22.3
Channel				647668	656000	664332	Tune-up limit (dBm)
Frequency (MHz)				3715.02	3840	3964.98	
30	PI/2 BPSK	1	1	20.97	21.37	21.07	22.3
Channel				647334	656000	664666	Tune-up limit (dBm)
Frequency (MHz)				3710.01	3840	3969.99	
20	PI/2 BPSK	1	1	21.04	21.29	21.01	22.3
Channel				647168	656000	664832	Tune-up limit (dBm)
Frequency (MHz)				3707.52	3840	3972.48	
15	PI/2 BPSK	1	1	20.97	21.34	21.08	22.3
Channel				647000	656000	665000	Tune-up limit (dBm)
Frequency (MHz)				3705	3840	3975	
10	PI/2 BPSK	1	1	21.05	21.36	21.02	22.3

<n77 (3450MHz ~ 3550MHz)_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	PI/2 BPSK	1	1		21.48		22.3
100	PI/2 BPSK	1	137		21.43		
100	PI/2 BPSK	1	271		21.41		
100	PI/2 BPSK	135	0		21.44		21.8
100	PI/2 BPSK	135	69		21.47		22.3
100	PI/2 BPSK	135	138		21.38		21.8
100	PI/2 BPSK	270	0		21.47		
100	QPSK	1	1		21.45		22.3
100	QPSK	1	137		21.40		
100	QPSK	1	271		21.37		
100	QPSK	135	0		21.35		22.3
100	QPSK	135	69		21.43		
100	QPSK	135	138		21.36		
100	QPSK	270	0		21.26		21.3
100	16QAM	1	1		21.22		21.3
100	64QAM	1	1		19.77		19.8
100	256QAM	1	1		17.43		17.8
Channel				633000	633332	633666	Tune-up limit (dBm)
Frequency (MHz)				3495	3499.98	3504.99	
90	PI/2 BPSK	1	1	21.37	21.34	21.34	22.3
Channel				632668	633332	634000	Tune-up limit (dBm)
Frequency (MHz)				3490.02	3499.98	3510	
80	PI/2 BPSK	1	1	21.27	21.39	21.29	22.3
Channel				632334	633332	634332	Tune-up limit (dBm)
Frequency (MHz)				3485.01	3499.98	3514.98	
70	PI/2 BPSK	1	1	21.32	21.34	21.37	22.3
Channel				632000	633332	634666	Tune-up limit (dBm)
Frequency (MHz)				3480	3499.98	3519.99	
60	PI/2 BPSK	1	1	21.34	21.35	21.33	22.3
Channel				631668	633332	635000	Tune-up limit (dBm)
Frequency (MHz)				3475.02	3499.98	3525	
50	PI/2 BPSK	1	1	21.45	21.37	21.32	22.3
Channel				631334	633332	635332	Tune-up limit (dBm)
Frequency (MHz)				3470.01	3499.98	3529.98	
40	PI/2 BPSK	1	1	21.37	21.43	21.35	22.3
Channel				631000	633332	635666	Tune-up limit (dBm)
Frequency (MHz)				3465	3499.98	3534.99	
30	PI/2 BPSK	1	1	21.29	21.31	21.34	22.3
Channel				630668	633332	636000	Tune-up limit (dBm)
Frequency (MHz)				3460.02	3499.98	3540	
20	PI/2 BPSK	1	1	21.27	21.43	21.31	22.3
Channel				630500	633332	636166	Tune-up limit (dBm)
Frequency (MHz)				3457.5	3499.98	3542.49	
15	PI/2 BPSK	1	1	21.28	21.40	21.28	22.3
Channel				630334	633332	636332	Tune-up limit (dBm)
Frequency (MHz)				3455.01	3499.98	3544.98	
10	PI/2 BPSK	1	1	21.35	21.43	21.29	22.3

<n77 (3700 MHz ~ 3980 MHz)_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	PI/2 BPSK	1	1	22.13	21.76	21.85	22.2
100	PI/2 BPSK	1	137	22.07	21.72	21.78	
100	PI/2 BPSK	1	271	21.83	21.47	21.60	
100	PI/2 BPSK	135	0	21.66	21.48	21.58	21.7
100	PI/2 BPSK	135	69	21.98	21.66	21.72	22.2
100	PI/2 BPSK	135	138	21.65	21.58	21.59	21.7
100	PI/2 BPSK	270	0	21.61	21.52	21.66	
100	QPSK	1	1	21.72	21.42	21.43	22.2
100	QPSK	1	137	21.98	21.62	21.73	
100	QPSK	1	271	21.76	21.44	21.51	
100	QPSK	135	0	21.87	21.53	21.61	22.2
100	QPSK	135	69	21.98	21.63	21.79	
100	QPSK	135	138	21.87	21.55	21.61	
100	QPSK	270	0	21.17	21.00	21.09	21.2
100	16QAM	1	1	21.12	20.88	20.90	21.2
100	64QAM	1	1	19.66	19.52	19.41	19.7
100	256QAM	1	1	17.66	17.30	17.43	17.7
Channel				649668	656000	662332	Tune-up limit (dBm)
Frequency (MHz)				3745.02	3840	3934.98	
90	PI/2 BPSK	1	1	22.06	21.71	21.84	22.2
Channel				649334	656000	662666	Tune-up limit (dBm)
Frequency (MHz)				3740.01	3840	3939.99	
80	PI/2 BPSK	1	1	22.09	21.75	21.76	22.2
Channel				649000	656000	663000	Tune-up limit (dBm)
Frequency (MHz)				3735	3840	3945	
70	PI/2 BPSK	1	1	22.08	21.66	21.80	22.2
Channel				648668	656000	663332	Tune-up limit (dBm)
Frequency (MHz)				3730.02	3840	3949.98	
60	PI/2 BPSK	1	1	22.06	21.70	21.85	22.2
Channel				648334	656000	663666	Tune-up limit (dBm)
Frequency (MHz)				3725.01	3840	3954.99	
50	PI/2 BPSK	1	1	22.04	21.72	21.84	22.2
Channel				648000	656000	664000	Tune-up limit (dBm)
Frequency (MHz)				3720	3840	3960	
40	PI/2 BPSK	1	1	22.06	21.69	21.83	22.2
Channel				647668	656000	664332	Tune-up limit (dBm)
Frequency (MHz)				3715.02	3840	3964.98	
30	PI/2 BPSK	1	1	22.10	21.67	21.84	22.2
Channel				647334	656000	664666	Tune-up limit (dBm)
Frequency (MHz)				3710.01	3840	3969.99	
20	PI/2 BPSK	1	1	22.08	21.69	21.85	22.2
Channel				647168	656000	664832	Tune-up limit (dBm)
Frequency (MHz)				3707.52	3840	3972.48	
15	PI/2 BPSK	1	1	22.12	21.74	21.79	22.2
Channel				647000	656000	665000	Tune-up limit (dBm)
Frequency (MHz)				3705	3840	3975	
10	PI/2 BPSK	1	1	22.09	21.73	21.78	22.2

<n77 (3450MHz ~ 3550MHz)_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	PI/2 BPSK	1	1		21.40		22.2
100	PI/2 BPSK	1	137		21.14		
100	PI/2 BPSK	1	271		21.35		
100	PI/2 BPSK	135	0		21.05		21.7
100	PI/2 BPSK	135	69		21.18		22.2
100	PI/2 BPSK	135	138		21.17		21.7
100	PI/2 BPSK	270	0		21.20		
100	QPSK	1	1		20.85		22.2
100	QPSK	1	137		21.08		
100	QPSK	1	271		21.28		
100	QPSK	135	0		21.01		22.2
100	QPSK	135	69		21.14		
100	QPSK	135	138		21.22		
100	QPSK	270	0		21.17		21.2
100	16QAM	1	1		21.08		21.2
100	64QAM	1	1		19.23		19.7
100	256QAM	1	1		16.76		17.7
Channel				633000	633332	633666	Tune-up limit (dBm)
Frequency (MHz)				3495	3499.98	3504.99	
90	PI/2 BPSK	1	1	21.35	21.28	21.23	22.2
Channel				632668	633332	634000	Tune-up limit (dBm)
Frequency (MHz)				3490.02	3499.98	3510	
80	PI/2 BPSK	1	1	21.33	21.22	21.27	22.2
Channel				632334	633332	634332	Tune-up limit (dBm)
Frequency (MHz)				3485.01	3499.98	3514.98	
70	PI/2 BPSK	1	1	21.28	21.35	21.31	22.2
Channel				632000	633332	634666	Tune-up limit (dBm)
Frequency (MHz)				3480	3499.98	3519.99	
60	PI/2 BPSK	1	1	21.24	21.35	21.36	22.2
Channel				631668	633332	635000	Tune-up limit (dBm)
Frequency (MHz)				3475.02	3499.98	3525	
50	PI/2 BPSK	1	1	21.33	21.28	21.39	22.2
Channel				631334	633332	635332	Tune-up limit (dBm)
Frequency (MHz)				3470.01	3499.98	3529.98	
40	PI/2 BPSK	1	1	21.35	21.23	21.29	22.2
Channel				631000	633332	635666	Tune-up limit (dBm)
Frequency (MHz)				3465	3499.98	3534.99	
30	PI/2 BPSK	1	1	21.37	21.30	21.26	22.2
Channel				630668	633332	636000	Tune-up limit (dBm)
Frequency (MHz)				3460.02	3499.98	3540	
20	PI/2 BPSK	1	1	21.19	21.38	21.34	22.2
Channel				630500	633332	636166	Tune-up limit (dBm)
Frequency (MHz)				3457.5	3499.98	3542.49	
15	PI/2 BPSK	1	1	21.36	21.23	21.19	22.2
Channel				630334	633332	636332	Tune-up limit (dBm)
Frequency (MHz)				3455.01	3499.98	3544.98	
10	PI/2 BPSK	1	1	21.36	21.31	21.23	22.2

<n77 (3700 MHz ~ 3980 MHz)_Ant 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	CW	-	-	20.24	20.33	19.85	21.5

<n77(3450MHz ~ 3550MHz)_Ant 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	CW	-	-		21.12		21.5

<n77(3700 MHz ~ 3980 MHz)_Ant 6>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel				650000	656000	662000	
Frequency (MHz)				3750	3840	3930	
100	CW	-	-	18.95	19.08	18.63	20.5

<n77(3450MHz ~ 3550MHz)_Ant 6>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)
Channel					633332		
Frequency (MHz)					3499.98		
100	CW	-	-		20.06		20.5

14. WiFi Output Power (Unit: dBm)

General Note:

1. For each antenna, transmit power in SISO operation is larger than (or equal to) the power in MIMO operation, RF exposure compliance of MIMO mode can be deduced from the compliance simultaneous transmission of antennas operating in SISO mode.
2. Per KDB 248227 D01v02r02, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6W/kg and SAR peak to location ratio ≤ 0.04, no additional SAR measurements for MIMO.
3. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. 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, additional output power measurements were not necessary.
4. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
5. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
6. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, 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 for each frequency band.
7. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of 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 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode 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 report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
8. Per 201904 TCBC workshops, General principles of FCC KDB Publication 248227 D01 can be applied to determine the SAR Initial Test Configurations and test reduction for 802.11ax SAR testing. For the table below the 802.11ax maximum power is SU (non-OFDMA), and the SU maximum power also higher than RU (OFDMA)
9. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing
10. For modes with the same maximum output power, the guidance from section 5.3.2 a) of FCC KDB Publication 248227 D01 should be applied, with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency bands
11. When SAR testing for 802.11ax is required
    a. If the maximum output power is highest for OFDMA scenarios, choose the tone size with the maximum number of tones and the highest maximum output power
    b. Otherwise, consider the fully allocated channel for SAR testing
    c. When SAR testing is required on RU sizes less than the fully allocated channel, use the RU number closest to the middle of the channel, choosing the higher RU number when two RUs are equidistant to the middle of the channel

2.4GHz WLAN				Ant 3			Ant 4			Ant 3+4		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	9.90	10.00	98.20	9.50	10.00	98.20	Not Required	13.00	Not Required
		6	2437	9.90	10.00		9.50	10.00			13.00	
		11	2462	9.70	10.00		9.50	10.00			13.00	
	802.11g 6Mbps	1	2412	Not Required	10.00	Not Required	Not Required	10.00	Not Required		13.00	
		6	2437		10.00			10.00			13.00	
		11	2462		10.00			10.00			13.00	
	802.11n-HT20 MCS0	1	2412		10.00			10.00			13.00	
		6	2437		10.00			10.00			13.00	
		11	2462		10.00			10.00			13.00	
	802.11n-HT40 MCS0	3	2422		10.00			10.00			13.00	
		6	2437		10.00			10.00			13.00	
		9	2452		10.00			10.00			13.00	
	802.11ac-VHT20 MCS0	1	2412		10.00			10.00			13.00	
		6	2437		10.00			10.00			13.00	
		11	2462		10.00			10.00			13.00	
	802.11ac-VHT40 MCS0	3	2422		10.00			10.00			13.00	
		6	2437		10.00			10.00			13.00	
		9	2452		10.00			10.00			13.00	
	802.11ax-HE20 MCS0	1	2412		10.00			10.00			13.00	
		6	2437		10.00			10.00			13.00	
		11	2462		10.00			10.00			13.00	
	802.11ax-HE40 MCS0	3	2422		10.00			10.00			13.00	
		6	2437		10.00			10.00			13.00	
		9	2452		10.00			10.00			13.00	

5.2GHz WLAN				Ant 3			Ant 4			Ant 3+4		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not Required	10.00	Not Required	Not Required	10.00	Not Required	Not Required	13.00	Not Required
		40	5200		10.00			10.00			13.00	
		44	5220		10.00			10.00			13.00	
		48	5240		10.00			10.00			13.00	
	802.11n-HT20 MCS0	36	5180		10.00			10.00			13.00	
		40	5200		10.00			10.00			13.00	
		44	5220		10.00			10.00			13.00	
		48	5240		10.00			10.00			13.00	
	802.11n-HT40 MCS0	38	5190		10.00			10.00			13.00	
		46	5230		10.00			10.00			13.00	
	802.11ac-VHT20 MCS0	36	5180		10.00			10.00			13.00	
		40	5200		10.00			10.00			13.00	
		44	5220		10.00			10.00			13.00	
		48	5240		10.00			10.00			13.00	
	802.11ac-VHT40 MCS0	38	5190		10.00			10.00			13.00	
		46	5230		10.00			10.00			13.00	
	802.11ac-VHT80 MCS0	42	5210		10.00			10.00			13.00	
	802.11ax-HE20 MCS0	36	5180		10.00			10.00			13.00	
		40	5200		10.00			10.00			13.00	
		44	5220		10.00			10.00			13.00	
		48	5240		10.00			10.00			13.00	
	802.11ax-HE40 MCS0	38	5190		10.00			10.00			13.00	
		46	5230		10.00			10.00			13.00	
	802.11ax-HE80 MCS0	42	5210		10.00			10.00			13.00	

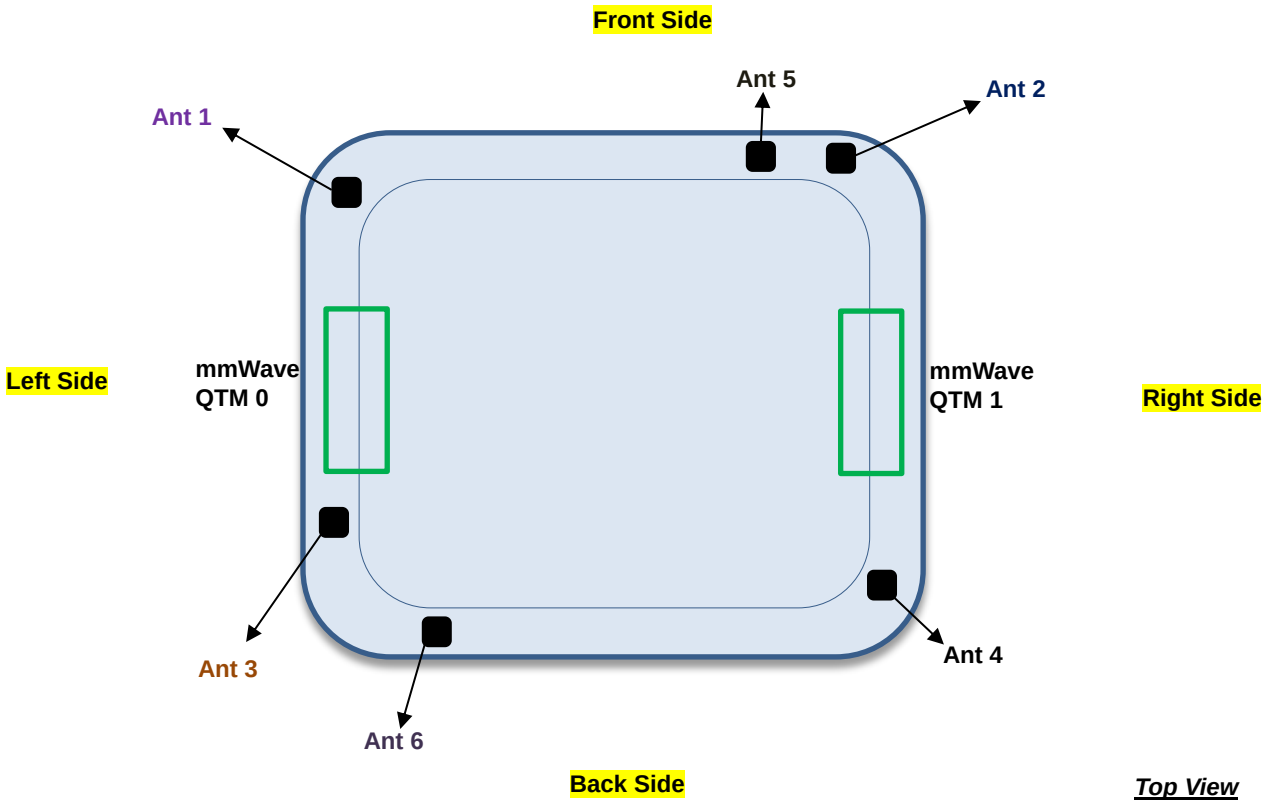
5.3GHz WLAN				Ant 3			Ant 4			Ant 3+4		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not Required	10.00	Not Required	Not Required	10.00	Not Required	Not Required	13.00	Not Required
		56	5280		10.00			10.00			13.00	
		60	5300		10.00			10.00			13.00	
		64	5320		10.00			10.00			13.00	
	802.11n-HT20 MCS0	52	5260		10.00			10.00			13.00	
		56	5280		10.00			10.00			13.00	
		60	5300		10.00			10.00			13.00	
		64	5320		10.00			10.00			13.00	
	802.11n-HT40 MCS0	54	5270		10.00			10.00			13.00	
		62	5310		10.00			10.00			13.00	
	802.11ac-VHT20 MCS0	52	5260		10.00			10.00			13.00	
		56	5280		10.00			10.00			13.00	
		60	5300		10.00			10.00			13.00	
		64	5320		10.00			10.00			13.00	
	802.11ac-VHT40 MCS0	54	5270		10.00			10.00			13.00	
		62	5310		10.00			10.00			13.00	
	802.11ac-VHT80 MCS0	58	5290		10.00			10.00			13.00	
	802.11ac-VHT160 MCS0	50	5250	9.70	10.00	99.50	9.60	10.00	99.30		13.00	
	802.11ax-HE20 MCS0	52	5260	Not Required	10.00	Not Required	Not Required	10.00	Not Required		13.00	
		56	5280		10.00			10.00			13.00	
		60	5300		10.00			10.00			13.00	
		64	5320		10.00			10.00			13.00	
	802.11ax-HE40 MCS0	54	5270		10.00			10.00			13.00	
		62	5310		10.00			10.00			13.00	
	802.11ax-HE80 MCS0	58	5290		10.00			10.00			13.00	
	802.11ax-HE160 MCS0	50	5250		10.00			10.00			13.00	

5.5GHz WLAN				Ant 3			Ant 4			Ant 3+4		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	10.00	Not Required	Not Required	10.00	Not Required	Not Required	13.00	Not Required
		116	5580		10.00			10.00			13.00	
		124	5620		10.00			10.00			13.00	
		132	5660		10.00			10.00			13.00	
		144	5720		10.00			10.00			13.00	
	802.11n-HT20 MCS0	100	5500		10.00			10.00			13.00	
		116	5580		10.00			10.00			13.00	
		124	5620		10.00			10.00			13.00	
		132	5660		10.00			10.00			13.00	
		144	5720		10.00			10.00			13.00	
	802.11n-HT40 MCS0	102	5510		10.00			10.00			13.00	
		110	5550		10.00			10.00			13.00	
		126	5630		10.00			10.00			13.00	
		134	5670		10.00			10.00			13.00	
		142	5710		10.00			10.00			13.00	
	802.11ac-VHT20 MCS0	100	5500		10.00			10.00			13.00	
		116	5580		10.00			10.00			13.00	
		124	5620		10.00			10.00			13.00	
		132	5660		10.00			10.00			13.00	
		144	5720		10.00			10.00			13.00	
	802.11ac-VHT40 MCS0	102	5510		10.00			10.00			13.00	
		110	5550		10.00			10.00			13.00	
		126	5630		10.00			10.00			13.00	
		134	5670		10.00			10.00			13.00	
		142	5710		10.00			10.00			13.00	
	802.11ac-VHT80 MCS0	106	5530		10.00			10.00			13.00	
		122	5610		10.00			10.00			13.00	
		138	5690		10.00			10.00			13.00	
	802.11ac-VHT160 MCS0	114	5570	9.70	10.00	99.30	9.50	10.00	99.30		13.00	
	802.11ax-HE20 MCS0	100	5500	Not Required	10.00	Not Required	Not Required	10.00	Not Required		13.00	
		116	5580		10.00			10.00			13.00	
		124	5620		10.00			10.00			13.00	
		132	5660		10.00			10.00			13.00	
		144	5720		10.00			10.00			13.00	
	802.11ax-HE40 MCS0	102	5510		10.00			10.00			13.00	
		110	5550		10.00			10.00			13.00	
		126	5630		10.00			10.00			13.00	
		134	5670		10.00			10.00			13.00	
		142	5710		10.00			10.00			13.00	
	802.11ax-HE80 MCS0	106	5530		10.00			10.00			13.00	
		122	5610		10.00			10.00			13.00	
		138	5690		10.00			10.00			13.00	
	802.11ax-HE160 MCS0	114	5570		10.00			10.00			13.00	

5.8GHz WLAN				Ant 3			Ant 4			Ant 3+4		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not Required	10.00	Not Required	Not Required	10.00	Not Required	Not Required	13.00	Not Required
		157	5785		10.00			10.00			13.00	
		165	5825		10.00			10.00			13.00	
	802.11n-HT20 MCS0	149	5745		10.00			10.00			13.00	
		157	5785		10.00			10.00			13.00	
		165	5825		10.00			10.00			13.00	
	802.11n-HT40 MCS0	151	5755		10.00			10.00			13.00	
		159	5795		10.00			10.00			13.00	
	802.11ac-VHT20 MCS0	149	5745		10.00			10.00			13.00	
		157	5785		10.00			10.00			13.00	
		165	5825		10.00			10.00			13.00	
	802.11ac-VHT40 MCS0	151	5755		10.00			10.00			13.00	
		159	5795		10.00			10.00			13.00	
	802.11ac-VHT80 MCS0	155	5775	9.70	10.00	99.50	9.30	10.00	99.50		13.00	
	802.11ax-HE20 MCS0	149	5745	Not Required	10.00	Not Required	Not Required	10.00	Not Required		13.00	
		157	5785		10.00			10.00			13.00	
		165	5825		10.00			10.00			13.00	
	802.11ax-HE40 MCS0	151	5755		10.00			10.00			13.00	
		159	5795		10.00			10.00			13.00	
	802.11ax-HE80 MCS0	155	5775		10.00			10.00			13.00	

WiFi 6E				Ant 3			Ant 4			Ant 3+4		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
WiFi 6E	802.11a 6Mbps	1	5955	Not Required	1.00	Not Required	Not Required	1.00	Not Required	Not Required	4.00	Not Required
		57	6235		1.00			1.00			4.00	
		113	6515		-1.00			-1.00			2.00	
		173	6815		-1.00			-1.00			2.00	
		233	7115		-0.50			-0.50			2.50	
	802.11ax-HE20 MCS0	1	5955		1.00			1.00			4.00	
		57	6235		1.00			1.00			4.00	
		113	6515		-1.00			-1.00			2.00	
		173	6815		-1.00			-1.00			2.00	
		233	7115		-0.50			-0.50			2.50	
	802.11ax-HE40 MCS0	3	5965		3.50			3.50			6.50	
		59	6245		3.50			3.50			6.50	
		107	6485		2.00			2.00			5.00	
		171	6805		2.50			2.50			5.50	
		227	7085		3.00			3.00			6.00	
	802.11ax-HE80 MCS0	7	5985		7.00			7.00			10.00	
		71	6305		7.00			7.00			10.00	
		119	6545		5.00			5.00			8.00	
		167	6785		5.00			5.00			8.00	
		215	7025		6.50			6.50			9.50	
	802.11ax-HE160 MCS0	15	6025	9.40	9.50	99.00	8.70	9.50	99.00		12.50	
		47	6185	9.40	9.50		8.30	9.50			12.50	
		111	6505	8.30	8.50		7.50	8.50			11.50	
		175	6825	8.00	8.00		7.50	8.00			11.00	
		207	6985	8.90	9.00		8.50	9.00			12.00	

15. Antenna Location



Antenna	Support Band-SA mode
Ant 1	Ant. Tx: LTE:5/12/14 FR1:5/12/14//77
Ant 2	Ant. Tx: LTE 2/4/7/30/48/66 FR1:2/30/66
Ant 3	Ant. Tx:WLAN2.4G & WLAN5G & 6E
Ant 4	Ant. Tx:WLAN2.4G & WLAN5G & 6E
Ant 5	FR1:n77(SRS only)
Ant 6	FR1:n77(SRS only)

16. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
   e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, 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
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. Operation of WiFi 6E can be enabled only when the device connects to AC mains or connects to the PC via USB. According to KDB 447498, SAR test should be tested at no less than 15mm. In this report 10mm test separation was select for SAR measurement conservatively.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5/B12 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, 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.
7. LTE band 4 SAR test was covered by Band 66; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

5G NR Note:

1. Referencing the procedure in KDB 941225, the test procedures are outlined as below:
   a. To start SAR test for the largest channel bandwidth for PI/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. Also do SAR test for 50% RB allocation for PI/2 BPSK SAR testing using 1RB PI/2 BPSK allocation procedure
   b. For PI/2 BPSK with 100% RB allocation, SAR test is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
   c. For higher modulation QPSK/16QAM/64QAM/256QAM, according to tune-up document the power level is not ½ dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
   d. Smaller bandwidth output power for each RB allocation configuration for this device is not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
   e. For 5G FR1 n5/n12/n77, the maximum channel bandwidth does not support three non-overlapping channels in the frequency band, the middle channel of the group of overlapping channels were selected for testing.
   f. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.
   g. Ant 5 and Ant 6 dedicated is used for SRS only, different from Tx antennas, then the SAR measurement at Plimit for SRS dedicated antenna(s) can be performed using FTM mode with CW modulation with 100% duty cycle(as SRS operates at very low duty cycle in online mode).

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, WLAN5.2GHz SAR testing is not required when the WLAN5.3GHz band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for WLAN5.2GHz band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode 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 report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. For WLAN SAR testing was performed on single antenna RF power in SISO mode is larger or equal to the single antenna RF power in MIMO mode, and for RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode.
6. Per KDB 248227 D01v02r02, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6W/kg and SAR peak to location ratio ≤ 0.04, no additional SAR measurements for MIMO.
7. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

WLAN PD Note:

1. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
2. Absorbed power density (APD) using a 4cm2 averaging area is reported based on SAR measurements.
3. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools.
4. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 1.52 dB (41.9%) was used to determine the psPD measurement scaling factor.
5. The PD measurement separation distance was performed at 10mm, which is >= λ/5, therefore based on SPEAG iPDn assessment to determine grid step is not required, lgrid λ/4 was used for PD measurement.

16.1 Hotspot SAR

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2_Ant 1	20M	QPSK	1	0	Top Surface	10mm	18900	1880	23.48	23.50	1.005	-0.11	0.899	0.903
	LTE Band 2_Ant 1	20M	QPSK	1	0	Top Surface	10mm	18700	1860	23.42	23.50	1.019	-0.13	0.774	0.788
	LTE Band 2_Ant 1	20M	QPSK	1	0	Top Surface	10mm	19100	1900	23.39	23.50	1.026	-0.13	0.874	0.896
	LTE Band 2_Ant 1	20M	QPSK	50	50	Top Surface	10mm	18900	1880	22.42	22.50	1.019	-0.11	0.658	0.670
	LTE Band 2_Ant 1	20M	QPSK	100	0	Top Surface	10mm	18900	1880	22.40	22.50	1.023	-0.19	0.665	0.680
	LTE Band 2_Ant 1	20M	QPSK	1	0	Bottom Surface	10mm	18900	1880	23.48	23.50	1.005	-0.03	0.674	0.677
	LTE Band 2_Ant 1	20M	QPSK	50	50	Bottom Surface	10mm	18900	1880	22.42	22.50	1.019	-0.05	0.539	0.549
	LTE Band 2_Ant 1	20M	QPSK	1	0	Left Side	10mm	18900	1880	23.48	23.50	1.005	-0.06	0.653	0.656
	LTE Band 2_Ant 1	20M	QPSK	50	50	Left Side	10mm	18900	1880	22.42	22.50	1.019	-0.18	0.526	0.536
	LTE Band 2_Ant 1	20M	QPSK	1	0	Front Side	10mm	18900	1880	23.48	23.50	1.005	0.13	0.398	0.400
	LTE Band 2_Ant 1	20M	QPSK	50	50	Front Side	10mm	18900	1880	22.42	22.50	1.019	0.15	0.320	0.326
01	LTE Band 2_Ant 2	20M	QPSK	1	0	Top Surface	10mm	19100	1900	23.13	24.00	1.222	-0.19	0.956	1.168
	LTE Band 2_Ant 2	20M	QPSK	1	99	Top Surface	10mm	18700	1860	22.76	24.00	1.330	-0.14	0.769	1.023
	LTE Band 2_Ant 2	20M	QPSK	1	99	Top Surface	10mm	18900	1880	23.03	24.00	1.250	-0.19	0.897	1.121
	LTE Band 2_Ant 2	20M	QPSK	50	0	Top Surface	10mm	19100	1900	22.15	23.00	1.216	-0.19	0.788	0.958
	LTE Band 2_Ant 2	20M	QPSK	50	24	Top Surface	10mm	18700	1860	21.78	23.00	1.324	-0.1	0.593	0.785
	LTE Band 2_Ant 2	20M	QPSK	50	50	Top Surface	10mm	18900	1880	22.09	23.00	1.233	-0.13	0.742	0.915
	LTE Band 2_Ant 2	20M	QPSK	100	0	Top Surface	10mm	19100	1900	22.01	23.00	1.256	-0.12	0.769	0.966
	LTE Band 2_Ant 2	20M	QPSK	1	0	Bottom Surface	10mm	19100	1900	23.13	24.00	1.222	-0.16	0.946	1.156
	LTE Band 2_Ant 2	20M	QPSK	1	99	Bottom Surface	10mm	18700	1860	22.76	24.00	1.330	-0.12	0.713	0.949
	LTE Band 2_Ant 2	20M	QPSK	1	99	Bottom Surface	10mm	18900	1880	23.03	24.00	1.250	-0.13	0.857	1.071
	LTE Band 2_Ant 2	20M	QPSK	50	0	Bottom Surface	10mm	19100	1900	22.15	23.00	1.216	-0.19	0.750	0.912
	LTE Band 2_Ant 2	20M	QPSK	50	24	Bottom Surface	10mm	18700	1860	21.78	23.00	1.324	-0.12	0.551	0.730
	LTE Band 2_Ant 2	20M	QPSK	50	50	Bottom Surface	10mm	18900	1880	22.09	23.00	1.233	-0.14	0.707	0.872
	LTE Band 2_Ant 2	20M	QPSK	100	0	Bottom Surface	10mm	19100	1900	22.01	23.00	1.256	-0.18	0.802	1.007
	LTE Band 2_Ant 2	20M	QPSK	1	0	Right Side	10mm	19100	1900	23.13	24.00	1.222	-0.01	0.838	1.024
	LTE Band 2_Ant 2	20M	QPSK	1	99	Right Side	10mm	18700	1860	22.76	24.00	1.330	-0.05	0.590	0.785
	LTE Band 2_Ant 2	20M	QPSK	1	99	Right Side	10mm	18900	1880	23.03	24.00	1.250	-0.11	0.727	0.909
	LTE Band 2_Ant 2	20M	QPSK	50	0	Right Side	10mm	19100	1900	22.15	23.00	1.216	-0.08	0.713	0.867
	LTE Band 2_Ant 2	20M	QPSK	50	24	Right Side	10mm	18700	1860	21.78	23.00	1.324	-0.1	0.573	0.759
	LTE Band 2_Ant 2	20M	QPSK	50	50	Right Side	10mm	18900	1880	22.09	23.00	1.233	-0.09	0.653	0.805
	LTE Band 2_Ant 2	20M	QPSK	100	0	Right Side	10mm	19100	1900	22.01	23.00	1.256	-0.03	0.641	0.805
	LTE Band 2_Ant 2	20M	QPSK	1	0	Front Side	10mm	19100	1900	23.13	24.00	1.222	-0.15	0.450	0.550
	LTE Band 2_Ant 2	20M	QPSK	50	0	Front Side	10mm	19100	1900	22.15	23.00	1.216	-0.11	0.369	0.449
02	LTE Band 5_Ant 1	10M	QPSK	1	0	Top Surface	10mm	20525	836.5	23.27	24.00	1.183	-0.13	0.607	0.718
	LTE Band 5_Ant 1	10M	QPSK	25	25	Top Surface	10mm	20525	836.5	22.26	23.00	1.186	-0.12	0.509	0.604
	LTE Band 5_Ant 1	10M	QPSK	1	0	Bottom Surface	10mm	20525	836.5	23.27	24.00	1.183	-0.14	0.581	0.687
	LTE Band 5_Ant 1	10M	QPSK	25	25	Bottom Surface	10mm	20525	836.5	22.26	23.00	1.186	-0.15	0.471	0.558
	LTE Band 5_Ant 1	10M	QPSK	1	0	Left Side	10mm	20525	836.5	23.27	24.00	1.183	-0.05	0.282	0.334
	LTE Band 5_Ant 1	10M	QPSK	25	25	Left Side	10mm	20525	836.5	22.26	23.00	1.186	-0.06	0.237	0.281
	LTE Band 5_Ant 1	10M	QPSK	1	0	Front Side	10mm	20525	836.5	23.27	24.00	1.183	-0.09	0.154	0.182
	LTE Band 5_Ant 1	10M	QPSK	25	25	Front Side	10mm	20525	836.5	22.26	23.00	1.186	-0.11	0.126	0.149

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7_Ant 2	20M	QPSK	1	0	Top Surface	10mm	21350	2560	22.95	23.50	1.135	-0.16	0.586	0.665
	LTE Band 7_Ant 2	20M	QPSK	50	50	Top Surface	10mm	21350	2560	22.27	22.50	1.054	-0.17	0.458	0.483
	LTE Band 7_Ant 2	20M	QPSK	1	0	Bottom Surface	10mm	21350	2560	22.95	23.50	1.135	-0.07	0.369	0.419
	LTE Band 7_Ant 2	20M	QPSK	50	50	Bottom Surface	10mm	21350	2560	22.27	22.50	1.054	-0.14	0.305	0.322
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Side	10mm	21350	2560	22.95	23.50	1.135	-0.07	0.972	1.103
	LTE Band 7_Ant 2	20M	QPSK	1	0	Right Side	10mm	20850	2510	22.79	23.50	1.178	-0.03	0.969	1.141
03	LTE Band 7_Ant 2	20M	QPSK	1	49	Right Side	10mm	21100	2535	22.94	23.50	1.138	0.07	1.020	1.160
	LTE Band 7_Ant 2	20M	QPSK	50	50	Right Side	10mm	21350	2560	22.27	22.50	1.054	-0.09	0.758	0.799
	LTE Band 7_Ant 2	20M	QPSK	100	0	Right Side	10mm	21350	2560	22.23	22.50	1.064	-0.04	0.792	0.843
	LTE Band 7_Ant 2	20M	QPSK	1	0	Front Side	10mm	21350	2560	22.95	23.50	1.135	-0.05	0.272	0.309
	LTE Band 7_Ant 2	20M	QPSK	50	50	Front Side	10mm	21350	2560	22.27	22.50	1.054	0.01	0.245	0.258
04	LTE Band 12_Ant 1	10M	QPSK	1	25	Top Surface	10mm	23095	707.5	23.07	24.00	1.239	0.13	0.575	0.712
	LTE Band 12_Ant 1	10M	QPSK	25	25	Top Surface	10mm	23095	707.5	22.13	23.00	1.222	0.03	0.483	0.590
	LTE Band 12_Ant 1	10M	QPSK	1	25	Bottom Surface	10mm	23095	707.5	23.07	24.00	1.239	-0.12	0.410	0.508
	LTE Band 12_Ant 1	10M	QPSK	25	25	Bottom Surface	10mm	23095	707.5	22.13	23.00	1.222	-0.16	0.327	0.400
	LTE Band 12_Ant 1	10M	QPSK	1	25	Left Side	10mm	23095	707.5	23.07	24.00	1.239	-0.03	0.278	0.344
	LTE Band 12_Ant 1	10M	QPSK	25	25	Left Side	10mm	23095	707.5	22.13	23.00	1.222	-0.16	0.208	0.254
	LTE Band 12_Ant 1	10M	QPSK	1	25	Front Side	10mm	23095	707.5	23.07	24.00	1.239	0.19	0.212	0.263
	LTE Band 12_Ant 1	10M	QPSK	25	25	Front Side	10mm	23095	707.5	22.13	23.00	1.222	-0.18	0.185	0.226
05	LTE Band 14_Ant 1	10M	QPSK	1	0	Top Surface	10mm	23330	793	23.09	24.00	1.233	-0.18	0.632	0.779
	LTE Band 14_Ant 1	10M	QPSK	25	25	Top Surface	10mm	23330	793	22.13	23.00	1.222	-0.16	0.538	0.657
	LTE Band 14_Ant 1	10M	QPSK	1	0	Bottom Surface	10mm	23330	793	23.09	24.00	1.233	-0.13	0.624	0.769
	LTE Band 14_Ant 1	10M	QPSK	25	25	Bottom Surface	10mm	23330	793	22.13	23.00	1.222	-0.11	0.497	0.607
	LTE Band 14_Ant 1	10M	QPSK	1	0	Left Side	10mm	23330	793	23.09	24.00	1.233	-0.08	0.237	0.292
	LTE Band 14_Ant 1	10M	QPSK	25	25	Left Side	10mm	23330	793	22.13	23.00	1.222	-0.01	0.196	0.239
	LTE Band 14_Ant 1	10M	QPSK	1	0	Front Side	10mm	23330	793	23.09	24.00	1.233	-0.07	0.236	0.291
	LTE Band 14_Ant 1	10M	QPSK	25	25	Front Side	10mm	23330	793	22.13	23.00	1.222	-0.06	0.174	0.213
	LTE Band 30_Ant 2	10M	QPSK	1	0	Top Surface	10mm	27710	2310	21.97	23.00	1.268	-0.12	0.729	0.924
	LTE Band 30_Ant 2	10M	QPSK	25	25	Top Surface	10mm	27710	2310	20.87	22.00	1.297	-0.1	0.584	0.758
	LTE Band 30_Ant 2	10M	QPSK	50	0	Top Surface	10mm	27710	2310	20.84	22.00	1.306	-0.16	0.556	0.726
	LTE Band 30_Ant 2	10M	QPSK	1	0	Bottom Surface	10mm	27710	2310	21.97	23.00	1.268	-0.1	0.841	1.066
	LTE Band 30_Ant 2	10M	QPSK	25	25	Bottom Surface	10mm	27710	2310	20.87	22.00	1.297	-0.15	0.640	0.830
	LTE Band 30_Ant 2	10M	QPSK	50	0	Bottom Surface	10mm	27710	2310	20.84	22.00	1.306	-0.15	0.634	0.828
06	LTE Band 30_Ant 2	10M	QPSK	1	0	Right Side	10mm	27710	2310	21.97	23.00	1.268	-0.18	1.020	1.293
	LTE Band 30_Ant 2	10M	QPSK	25	25	Right Side	10mm	27710	2310	20.87	22.00	1.297	-0.12	0.806	1.046
	LTE Band 30_Ant 2	10M	QPSK	50	0	Right Side	10mm	27710	2310	20.84	22.00	1.306	-0.13	0.787	1.028
	LTE Band 30_Ant 2	10M	QPSK	1	0	Front Side	10mm	27710	2310	21.97	23.00	1.268	-0.13	0.307	0.389
	LTE Band 30_Ant 2	10M	QPSK	25	25	Front Side	10mm	27710	2310	20.87	22.00	1.297	-0.18	0.245	0.318

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66_Ant 1	20M	QPSK	1	0	Top Surface	10mm	132322	1745	23.83	24.00	1.040	-0.18	0.780	0.811
	LTE Band 66_Ant 1	20M	QPSK	1	0	Top Surface	10mm	132072	1720	23.63	24.00	1.089	-0.11	0.797	0.868
	LTE Band 66_Ant 1	20M	QPSK	1	0	Top Surface	10mm	132572	1770	23.74	24.00	1.062	-0.1	0.777	0.825
	LTE Band 66_Ant 1	20M	QPSK	50	50	Top Surface	10mm	132322	1745	22.85	23.00	1.035	-0.12	0.606	0.627
	LTE Band 66_Ant 1	20M	QPSK	100	0	Top Surface	10mm	132322	1745	22.69	23.00	1.074	-0.1	0.659	0.708
	LTE Band 66_Ant 1	20M	QPSK	1	0	Bottom Surface	10mm	132322	1745	23.83	24.00	1.040	-0.04	0.673	0.700
	LTE Band 66_Ant 1	20M	QPSK	50	50	Bottom Surface	10mm	132322	1745	22.85	23.00	1.035	-0.07	0.507	0.525
	LTE Band 66_Ant 1	20M	QPSK	1	0	Left Side	10mm	132322	1745	23.83	24.00	1.040	-0.1	0.504	0.524
	LTE Band 66_Ant 1	20M	QPSK	50	50	Left Side	10mm	132322	1745	22.85	23.00	1.035	-0.16	0.403	0.417
	LTE Band 66_Ant 1	20M	QPSK	1	0	Front Side	10mm	132322	1745	23.83	24.00	1.040	-0.16	0.388	0.403
	LTE Band 66_Ant 1	20M	QPSK	50	50	Front Side	10mm	132322	1745	22.85	23.00	1.035	-0.14	0.314	0.325
07	LTE Band 66_Ant 2	20M	QPSK	1	0	Top Surface	10mm	132572	1770	23.22	24.00	1.197	-0.09	0.830	0.993
	LTE Band 66_Ant 2	20M	QPSK	1	0	Top Surface	10mm	132072	1720	23.02	24.00	1.253	-0.09	0.672	0.842
	LTE Band 66_Ant 2	20M	QPSK	1	0	Top Surface	10mm	132322	1745	23.13	24.00	1.222	-0.04	0.773	0.944
	LTE Band 66_Ant 2	20M	QPSK	50	24	Top Surface	10mm	132572	1770	22.22	23.00	1.197	-0.1	0.680	0.814
	LTE Band 66_Ant 2	20M	QPSK	50	0	Top Surface	10mm	132072	1720	21.88	23.00	1.294	-0.07	0.556	0.720
	LTE Band 66_Ant 2	20M	QPSK	50	50	Top Surface	10mm	132322	1745	22.13	23.00	1.222	-0.06	0.657	0.803
	LTE Band 66_Ant 2	20M	QPSK	100	0	Top Surface	10mm	132572	1770	22.23	23.00	1.194	-0.09	0.635	0.758
	LTE Band 66_Ant 2	20M	QPSK	1	0	Bottom Surface	10mm	132572	1770	23.22	24.00	1.197	-0.07	0.748	0.895
	LTE Band 66_Ant 2	20M	QPSK	1	0	Bottom Surface	10mm	132072	1720	23.02	24.00	1.253	-0.05	0.639	0.801
	LTE Band 66_Ant 2	20M	QPSK	1	0	Bottom Surface	10mm	132322	1745	23.13	24.00	1.222	-0.16	0.725	0.886
	LTE Band 66_Ant 2	20M	QPSK	50	24	Bottom Surface	10mm	132572	1770	22.22	23.00	1.197	-0.13	0.604	0.723
	LTE Band 66_Ant 2	20M	QPSK	100	0	Bottom Surface	10mm	132572	1770	22.23	23.00	1.194	-0.12	0.587	0.701
	LTE Band 66_Ant 2	20M	QPSK	1	0	Right Side	10mm	132572	1770	23.22	24.00	1.197	-0.01	0.576	0.689
	LTE Band 66_Ant 2	20M	QPSK	50	24	Right Side	10mm	132572	1770	22.22	23.00	1.197	-0.09	0.442	0.529
	LTE Band 66_Ant 2	20M	QPSK	1	0	Front Side	10mm	132572	1770	23.22	24.00	1.197	0.04	0.343	0.410
	LTE Band 66_Ant 2	20M	QPSK	50	24	Front Side	10mm	132572	1770	22.22	23.00	1.197	0.05	0.265	0.317
	LTE Band 66B_Ant 2	15M	QPSK	1	0	Top Surface	10mm	132047	1717.5	22.68	24.00	1.355	-0.18	0.607	0.823
	LTE Band 66B_Ant 2	15M	QPSK	1	0	Top Surface	10mm	132322	1745	22.60	24.00	1.380	0.05	0.591	0.816
	LTE Band 66B_Ant 2	15M	QPSK	1	0	Top Surface	10mm	132597	1722.5	22.62	24.00	1.374	-0.12	0.588	0.808
	LTE Band 66C_Ant 2	20M	QPSK	1	0	Top Surface	10mm	132072	1720	22.77	24.00	1.327	-0.07	0.612	0.812
	LTE Band 66C_Ant 2	20M	QPSK	1	0	Top Surface	10mm	132322	1745	22.65	24.00	1.365	0.03	0.596	0.813
	LTE Band 66C_Ant 2	20M	QPSK	1	0	Top Surface	10mm	132572	1770	22.60	24.00	1.380	0.01	0.584	0.806

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 48_Ant 1	20M	QPSK	1	49	Top Surface	10mm	56640	3690	22.49	23.00	1.125	62.9	1.006	0.09	0.684	0.774
08	LTE Band 48_Ant 1	20M	QPSK	1	49	Top Surface	10mm	55340	3560	22.48	23.00	1.127	62.9	1.006	0.07	0.799	0.906
	LTE Band 48_Ant 1	20M	QPSK	1	49	Top Surface	10mm	55990	3625	22.29	23.00	1.178	62.9	1.006	0.05	0.752	0.891
	LTE Band 48_Ant 1	20M	QPSK	50	50	Top Surface	10mm	55340	3560	21.45	22.00	1.135	62.9	1.006	0.08	0.658	0.751
	LTE Band 48_Ant 1	20M	QPSK	50	50	Top Surface	10mm	55990	3625	21.42	22.00	1.143	62.9	1.006	-0.19	0.583	0.670
	LTE Band 48_Ant 1	20M	QPSK	50	50	Top Surface	10mm	56640	3690	21.21	22.00	1.199	62.9	1.006	0.16	0.546	0.658
	LTE Band 48_Ant 1	20M	QPSK	100	0	Top Surface	10mm	55990	3625	18.59	19.00	1.099	62.9	1.006	-0.13	0.298	0.329
	LTE Band 48_Ant 1	10M	QPSK	50	0	Top Surface	10mm	55990	3625	21.75	22.00	1.059	62.9	1.006	0	0.611	0.651
	LTE Band 48_Ant 1	20M	QPSK	1	49	Bottom Surface	10mm	56640	3690	22.49	23.00	1.125	62.9	1.006	-0.02	0.374	0.423
	LTE Band 48_Ant 1	20M	QPSK	50	50	Bottom Surface	10mm	55340	3560	21.45	22.00	1.135	62.9	1.006	-0.12	0.314	0.359
	LTE Band 48_Ant 1	20M	QPSK	1	49	Left Side	10mm	56640	3690	22.49	23.00	1.125	62.9	1.006	0.16	0.382	0.432
	LTE Band 48_Ant 1	20M	QPSK	50	50	Left Side	10mm	55340	3560	21.45	22.00	1.135	62.9	1.006	-0.09	0.309	0.353
	LTE Band 48_Ant 1	20M	QPSK	1	49	Front Side	10mm	56640	3690	22.49	23.00	1.125	62.9	1.006	0.02	0.141	0.160
	LTE Band 48_Ant 1	20M	QPSK	50	50	Front Side	10mm	55340	3560	21.45	22.00	1.135	62.9	1.006	-0.08	0.109	0.125
	LTE Band 48C_Ant 1	20M	QPSK	1	0	Top Surface	10mm	55990	3625	21.87	23.00	1.297	62.9	1.006	0.04	0.677	0.883
	LTE Band 48C_Ant 1	20M	QPSK	1	99	Top Surface	10mm	55340	3560	18.40	19.00	1.148	62.9	1.006	0.06	0.339	0.392
	LTE Band 48C_Ant 1	20M	QPSK	1	0	Top Surface	10mm	56640	3690	18.10	19.00	1.230	62.9	1.006	-0.03	0.311	0.385

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n2_Ant 1	20M	BPSK	1	1	Top Surface	10mm	376000	1880	23.44	23.50	1.014	-0.16	0.787	0.798
	FR1 n2_Ant 1	20M	BPSK	50	28	Top Surface	10mm	376000	1880	23.37	23.50	1.030	-0.13	0.828	0.853
	FR1 n2_Ant 1	20M	BPSK	50	28	Top Surface	10mm	372000	1860	23.22	23.50	1.067	-0.1	0.780	0.832
	FR1 n2_Ant 1	20M	BPSK	50	28	Top Surface	10mm	380000	1900	23.25	23.50	1.059	0.05	0.876	0.928
	FR1 n2_Ant 1	20M	BPSK	100	0	Top Surface	10mm	372000	1860	22.99	23.00	1.002	-0.08	0.690	0.692
	FR1 n2_Ant 1	20M	BPSK	1	1	Bottom Surface	10mm	376000	1880	23.44	23.50	1.014	-0.07	0.630	0.639
	FR1 n2_Ant 1	20M	BPSK	50	28	Bottom Surface	10mm	376000	1880	23.37	23.50	1.030	-0.17	0.651	0.671
	FR1 n2_Ant 1	20M	BPSK	1	1	Left Side	10mm	376000	1880	23.44	23.50	1.014	0.15	0.604	0.612
	FR1 n2_Ant 1	20M	BPSK	50	28	Left Side	10mm	376000	1880	23.37	23.50	1.030	0.11	0.643	0.663
	FR1 n2_Ant 1	20M	BPSK	1	1	Front Side	10mm	376000	1880	23.44	23.50	1.014	-0.15	0.380	0.385
	FR1 n2_Ant 1	20M	BPSK	50	28	Front Side	10mm	376000	1880	23.37	23.50	1.030	-0.17	0.393	0.405
	FR1 n2_Ant 2	20M	BPSK	1	1	Top Surface	10mm	376000	1880	23.46	24.00	1.132	-0.15	0.846	0.958
	FR1 n2_Ant 2	20M	BPSK	1	1	Top Surface	10mm	372000	1860	23.24	24.00	1.191	-0.15	0.783	0.933
09	FR1 n2_Ant 2	20M	BPSK	1	1	Top Surface	10mm	380000	1900	23.41	24.00	1.146	-0.04	0.984	1.127
	FR1 n2_Ant 2	20M	BPSK	50	56	Top Surface	10mm	376000	1880	23.34	23.50	1.038	-0.18	0.821	0.852
	FR1 n2_Ant 2	20M	BPSK	50	56	Top Surface	10mm	372000	1860	23.12	23.50	1.091	-0.14	0.703	0.767
	FR1 n2_Ant 2	20M	BPSK	50	56	Top Surface	10mm	380000	1900	23.29	23.50	1.050	-0.15	0.845	0.887
	FR1 n2_Ant 2	20M	BPSK	100	0	Top Surface	10mm	376000	1880	23.35	23.50	1.035	-0.19	0.788	0.816
	FR1 n2_Ant 2	20M	BPSK	1	1	Bottom Surface	10mm	376000	1880	23.46	24.00	1.132	-0.17	0.822	0.931
	FR1 n2_Ant 2	20M	BPSK	1	1	Bottom Surface	10mm	372000	1860	23.24	24.00	1.191	-0.12	0.765	0.911
	FR1 n2_Ant 2	20M	BPSK	1	1	Bottom Surface	10mm	380000	1900	23.41	24.00	1.146	-0.17	0.965	1.105
	FR1 n2_Ant 2	20M	BPSK	50	56	Bottom Surface	10mm	376000	1880	23.34	23.50	1.038	-0.15	0.785	0.814
	FR1 n2_Ant 2	20M	BPSK	50	56	Bottom Surface	10mm	372000	1860	23.12	23.50	1.091	-0.18	0.673	0.735
	FR1 n2_Ant 2	20M	BPSK	50	56	Bottom Surface	10mm	380000	1900	23.29	23.50	1.050	-0.19	0.895	0.939
	FR1 n2_Ant 2	20M	BPSK	100	0	Bottom Surface	10mm	376000	1880	23.35	23.50	1.035	-0.12	0.777	0.804
	FR1 n2_Ant 2	20M	BPSK	1	1	Right Side	10mm	376000	1880	23.46	24.00	1.132	-0.17	0.600	0.679
	FR1 n2_Ant 2	20M	BPSK	50	56	Right Side	10mm	376000	1880	23.34	23.50	1.038	-0.12	0.684	0.710
	FR1 n2_Ant 2	20M	BPSK	1	1	Front Side	10mm	376000	1880	23.46	24.00	1.132	-0.16	0.370	0.419
	FR1 n2_Ant 2	20M	BPSK	50	56	Front Side	10mm	376000	1880	23.34	23.50	1.038	-0.17	0.400	0.415
	FR1 n5_Ant 1	20M	BPSK	1	1	Top Surface	10mm	167300	836.5	23.61	24.00	1.094	-0.12	0.635	0.695
10	FR1 n5_Ant 1	20M	BPSK	50	28	Top Surface	10mm	167300	836.5	23.50	24.00	1.122	-0.17	0.673	0.755
	FR1 n5_Ant 1	20M	BPSK	1	1	Bottom Surface	10mm	167300	836.5	23.61	24.00	1.094	-0.17	0.619	0.677
	FR1 n5_Ant 1	20M	BPSK	50	28	Bottom Surface	10mm	167300	836.5	23.50	24.00	1.122	-0.17	0.660	0.741
	FR1 n5_Ant 1	20M	BPSK	1	1	Left Side	10mm	167300	836.5	23.61	24.00	1.094	-0.03	0.294	0.322
	FR1 n5_Ant 1	20M	BPSK	50	28	Left Side	10mm	167300	836.5	23.50	24.00	1.122	0.05	0.311	0.349
	FR1 n5_Ant 1	20M	BPSK	1	1	Front Side	10mm	167300	836.5	23.61	24.00	1.094	-0.01	0.159	0.174
	FR1 n5_Ant 1	20M	BPSK	50	28	Front Side	10mm	167300	836.5	23.50	24.00	1.122	-0.07	0.164	0.184
	FR1 n5_Ant 2	20M	BPSK	1	1	Top Surface	10mm	167300	836.5	23.60	24.00	1.096	-0.1	0.541	0.593
	FR1 n5_Ant 2	20M	BPSK	50	28	Top Surface	10mm	167300	836.5	23.44	24.00	1.138	-0.08	0.496	0.564
	FR1 n5_Ant 2	20M	BPSK	1	1	Bottom Surface	10mm	167300	836.5	23.60	24.00	1.096	-0.07	0.518	0.568
	FR1 n5_Ant 2	20M	BPSK	50	28	Bottom Surface	10mm	167300	836.5	23.44	24.00	1.138	-0.14	0.463	0.527
	FR1 n5_Ant 2	20M	BPSK	1	1	Right Side	10mm	167300	836.5	23.60	24.00	1.096	-0.08	0.227	0.249
	FR1 n5_Ant 2	20M	BPSK	50	28	Right Side	10mm	167300	836.5	23.44	24.00	1.138	-0.03	0.224	0.255
	FR1 n5_Ant 2	20M	BPSK	1	1	Front Side	10mm	167300	836.5	23.60	24.00	1.096	-0.05	0.186	0.204
	FR1 n5_Ant 2	20M	BPSK	50	28	Front Side	10mm	167300	836.5	23.44	24.00	1.138	-0.1	0.169	0.192
	FR1 n12_Ant 1	15M	BPSK	1	1	Top Surface	10mm	141500	707.5	23.68	24.00	1.076	-0.15	0.584	0.629
11	FR1 n12_Ant 1	15M	BPSK	36	22	Top Surface	10mm	141500	707.5	23.42	24.00	1.143	0.02	0.591	0.675
	FR1 n12_Ant 1	15M	BPSK	1	1	Bottom Surface	10mm	141500	707.5	23.68	24.00	1.076	-0.13	0.462	0.497
	FR1 n12_Ant 1	15M	BPSK	36	22	Bottom Surface	10mm	141500	707.5	23.42	24.00	1.143	-0.12	0.449	0.513
	FR1 n12_Ant 1	15M	BPSK	1	1	Left Side	10mm	141500	707.5	23.68	24.00	1.076	-0.12	0.333	0.358
	FR1 n12_Ant 1	15M	BPSK	36	22	Left Side	10mm	141500	707.5	23.42	24.00	1.143	0.06	0.290	0.331
	FR1 n12_Ant 1	15M	BPSK	1	1	Front Side	10mm	141500	707.5	23.68	24.00	1.076	0.04	0.188	0.202
	FR1 n12_Ant 1	15M	BPSK	36	22	Front Side	10mm	141500	707.5	23.42	24.00	1.143	-0.11	0.223	0.255

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
12	FR1 n14_Ant 1	10M	BPSK	1	1	Top Surface	10mm	158600	793	23.17	24.00	1.211	0.16	0.680	0.823
	FR1 n14_Ant 1	10M	BPSK	25	14	Top Surface	10mm	158600	793	23.13	24.00	1.222	-0.18	0.655	0.800
	FR1 n14_Ant 1	10M	BPSK	50	0	Top Surface	10mm	158600	793	22.61	23.50	1.227	-0.12	0.538	0.660
	FR1 n14_Ant 1	10M	BPSK	1	1	Bottom Surface	10mm	158600	793	23.17	24.00	1.211	-0.17	0.596	0.722
	FR1 n14_Ant 1	10M	BPSK	25	14	Bottom Surface	10mm	158600	793	23.13	24.00	1.222	-0.19	0.551	0.673
	FR1 n14_Ant 1	10M	BPSK	1	1	Left Side	10mm	158600	793	23.17	24.00	1.211	0.03	0.252	0.305
	FR1 n14_Ant 1	10M	BPSK	25	14	Left Side	10mm	158600	793	23.13	24.00	1.222	-0.14	0.193	0.236
	FR1 n14_Ant 1	10M	BPSK	1	1	Front Side	10mm	158600	793	23.17	24.00	1.211	-0.16	0.236	0.286
	FR1 n14_Ant 1	10M	BPSK	25	14	Front Side	10mm	158600	793	23.13	24.00	1.222	-0.12	0.246	0.301
	FR1 n30_Ant 2	10M	BPSK	1	1	Top Surface	10mm	462000	2310	22.40	23.00	1.148	-0.1	0.719	0.826
	FR1 n30_Ant 2	10M	BPSK	25	14	Top Surface	10mm	462000	2310	22.21	23.00	1.199	-0.1	0.707	0.848
	FR1 n30_Ant 2	10M	BPSK	50	0	Top Surface	10mm	462000	2310	22.25	22.50	1.059	-0.15	0.668	0.708
	FR1 n30_Ant 2	10M	BPSK	1	1	Bottom Surface	10mm	462000	2310	22.40	23.00	1.148	-0.05	0.823	0.945
	FR1 n30_Ant 2	10M	BPSK	25	14	Bottom Surface	10mm	462000	2310	22.21	23.00	1.199	-0.14	0.826	0.991
	FR1 n30_Ant 2	10M	BPSK	50	0	Bottom Surface	10mm	462000	2310	22.25	22.50	1.059	-0.12	0.818	0.866
	FR1 n30_Ant 2	10M	BPSK	1	1	Right Side	10mm	462000	2310	22.40	23.00	1.148	-0.15	0.989	1.136
13	FR1 n30_Ant 2	10M	BPSK	25	14	Right Side	10mm	462000	2310	22.21	23.00	1.199	-0.16	0.986	1.183
	FR1 n30_Ant 2	10M	BPSK	50	0	Right Side	10mm	462000	2310	22.25	22.50	1.059	-0.18	1.010	1.070
	FR1 n30_Ant 2	10M	BPSK	1	1	Front Side	10mm	462000	2310	22.40	23.00	1.148	-0.11	0.314	0.361
	FR1 n30_Ant 2	10M	BPSK	25	14	Front Side	10mm	462000	2310	22.21	23.00	1.199	-0.12	0.303	0.363
14	FR1 n66_Ant 1	40M	BPSK	1	1	Top Surface	10mm	349000	1745	23.88	24.00	1.028	-0.17	0.897	0.922
	FR1 n66_Ant 1	40M	BPSK	108	54	Top Surface	10mm	349000	1745	23.78	24.00	1.052	-0.18	0.860	0.905
	FR1 n66_Ant 1	40M	BPSK	216	0	Top Surface	10mm	349000	1745	23.10	23.50	1.096	-0.1	0.797	0.874
	FR1 n66_Ant 1	40M	BPSK	1	1	Bottom Surface	10mm	349000	1745	23.88	24.00	1.028	0.03	0.766	0.787
	FR1 n66_Ant 1	40M	BPSK	108	54	Bottom Surface	10mm	349000	1745	23.78	24.00	1.052	0.02	0.751	0.790
	FR1 n66_Ant 1	40M	BPSK	1	1	Left Side	10mm	349000	1745	23.88	24.00	1.028	-0.17	0.535	0.550
	FR1 n66_Ant 1	40M	BPSK	108	54	Left Side	10mm	349000	1745	23.78	24.00	1.052	-0.1	0.562	0.591
	FR1 n66_Ant 1	40M	BPSK	1	1	Front Side	10mm	349000	1745	23.88	24.00	1.028	-0.14	0.432	0.444
	FR1 n66_Ant 1	40M	BPSK	108	54	Front Side	10mm	349000	1745	23.78	24.00	1.052	-0.16	0.449	0.472
	FR1 n66_Ant 2	40M	BPSK	1	1	Top Surface	10mm	349000	1745	23.75	24.00	1.059	0.02	0.643	0.681
	FR1 n66_Ant 2	40M	BPSK	108	54	Top Surface	10mm	349000	1745	23.54	24.00	1.112	-0.03	0.574	0.638
	FR1 n66_Ant 2	40M	BPSK	1	1	Bottom Surface	10mm	349000	1745	23.75	24.00	1.059	-0.07	0.582	0.616
	FR1 n66_Ant 2	40M	BPSK	108	54	Bottom Surface	10mm	349000	1745	23.54	24.00	1.112	-0.14	0.534	0.594
	FR1 n66_Ant 2	40M	BPSK	1	1	Right Side	10mm	349000	1745	23.75	24.00	1.059	-0.06	0.510	0.540
	FR1 n66_Ant 2	40M	BPSK	108	54	Right Side	10mm	349000	1745	23.54	24.00	1.112	-0.09	0.470	0.523
	FR1 n66_Ant 2	40M	BPSK	1	1	Front Side	10mm	349000	1745	23.75	24.00	1.059	-0.15	0.352	0.373
	FR1 n66_Ant 2	40M	BPSK	108	54	Front Side	10mm	349000	1745	23.54	24.00	1.112	-0.15	0.285	0.317

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n77_Ant 1	100M	BPSK	1	1	Top Surface	10mm	656000	3840	21.38	22.30	1.236	-0.12	0.766	0.947
	FR1 n77_Ant 1	100M	BPSK	135	69	Top Surface	10mm	656000	3840	21.35	22.30	1.245	-0.11	0.737	0.917
	FR1 n77_Ant 1	100M	BPSK	270	0	Top Surface	10mm	656000	3840	21.30	21.80	1.122	0.06	0.708	0.794
	FR1 n77_Ant 1	100M	BPSK	1	1	Bottom Surface	10mm	656000	3840	21.38	22.30	1.236	-0.13	0.559	0.691
	FR1 n77_Ant 1	100M	BPSK	135	69	Bottom Surface	10mm	656000	3840	21.35	22.30	1.245	-0.16	0.582	0.724
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Side	10mm	656000	3840	21.38	22.30	1.236	-0.11	0.482	0.596
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Side	10mm	656000	3840	21.35	22.30	1.245	-0.15	0.409	0.509
	FR1 n77_Ant 1	100M	BPSK	1	1	Front Side	10mm	656000	3840	21.38	22.30	1.236	-0.16	0.220	0.272
	FR1 n77_Ant 1	100M	BPSK	135	69	Front Side	10mm	656000	3840	21.35	22.30	1.245	-0.14	0.228	0.284
	FR1 n77_Ant 1	100M	BPSK	1	1	Top Surface	10mm	633332	3499.98	21.48	22.30	1.208	-0.12	0.954	1.152
	FR1 n77_Ant 1	100M	BPSK	135	69	Top Surface	10mm	633332	3499.98	21.47	22.30	1.211	-0.19	0.864	1.046
	FR1 n77_Ant 1	100M	BPSK	270	0	Top Surface	10mm	633332	3499.98	21.47	21.80	1.079	-0.19	0.908	0.980
	FR1 n77_Ant 1	100M	BPSK	1	1	Bottom Surface	10mm	633332	3499.98	21.48	22.30	1.208	-0.09	0.413	0.499
	FR1 n77_Ant 1	100M	BPSK	135	69	Bottom Surface	10mm	633332	3499.98	21.47	22.30	1.211	0	0.402	0.487
	FR1 n77_Ant 1	100M	BPSK	1	1	Left Side	10mm	633332	3499.98	21.48	22.30	1.208	-0.07	0.276	0.333
	FR1 n77_Ant 1	100M	BPSK	135	69	Left Side	10mm	633332	3499.98	21.47	22.30	1.211	-0.11	0.308	0.373
	FR1 n77_Ant 1	100M	BPSK	1	1	Front Side	10mm	633332	3499.98	21.48	22.30	1.208	-0.15	0.188	0.227
	FR1 n77_Ant 1	100M	BPSK	135	69	Front Side	10mm	633332	3499.98	21.47	22.30	1.211	-0.09	0.164	0.199
	FR1 n77_Ant 2	100M	BPSK	1	1	Top Surface	10mm	656000	3840	21.76	22.20	1.107	-0.14	0.686	0.759
	FR1 n77_Ant 2	100M	BPSK	135	69	Top Surface	10mm	656000	3840	21.66	22.20	1.132	-0.19	0.724	0.820
	FR1 n77_Ant 2	100M	BPSK	270	0	Top Surface	10mm	656000	3840	21.52	21.70	1.042	-0.11	0.619	0.645
	FR1 n77_Ant 2	100M	BPSK	1	1	Bottom Surface	10mm	656000	3840	21.76	22.20	1.107	-0.11	0.307	0.340
	FR1 n77_Ant 2	100M	BPSK	135	69	Bottom Surface	10mm	656000	3840	21.66	22.20	1.132	-0.15	0.330	0.374
	FR1 n77_Ant 2	100M	BPSK	1	1	Right Side	10mm	656000	3840	21.76	22.20	1.107	-0.16	0.579	0.641
	FR1 n77_Ant 2	100M	BPSK	135	69	Right Side	10mm	656000	3840	21.66	22.20	1.132	-0.11	0.471	0.533
	FR1 n77_Ant 2	100M	BPSK	1	1	Front Side	10mm	656000	3840	21.76	22.20	1.107	-0.15	0.162	0.179
	FR1 n77_Ant 2	100M	BPSK	135	69	Front Side	10mm	656000	3840	21.66	22.20	1.132	-0.16	0.125	0.142
	FR1 n77_Ant 2	100M	BPSK	1	1	Top Surface	10mm	633332	3499.98	21.40	22.20	1.202	-0.15	0.917	1.102
	FR1 n77_Ant 2	100M	BPSK	135	69	Top Surface	10mm	633332	3499.98	21.18	22.20	1.265	-0.14	0.991	1.253
	FR1 n77_Ant 2	100M	BPSK	270	0	Top Surface	10mm	633332	3499.98	21.20	21.70	1.122	-0.1	0.971	1.089
	FR1 n77_Ant 2	100M	BPSK	1	1	Bottom Surface	10mm	633332	3499.98	21.40	22.20	1.202	-0.18	0.697	0.838
	FR1 n77_Ant 2	100M	BPSK	135	69	Bottom Surface	10mm	633332	3499.98	21.18	22.20	1.265	-0.15	0.720	0.911
	FR1 n77_Ant 2	100M	BPSK	270	0	Bottom Surface	10mm	633332	3499.98	21.20	21.70	1.122	-0.15	0.718	0.806
	FR1 n77_Ant 2	100M	BPSK	1	1	Right Side	10mm	633332	3499.98	21.40	22.20	1.202	-0.17	0.336	0.404
	FR1 n77_Ant 2	100M	BPSK	135	69	Right Side	10mm	633332	3499.98	21.18	22.20	1.265	-0.19	0.415	0.525
	FR1 n77_Ant 2	100M	BPSK	1	1	Front Side	10mm	633332	3499.98	21.40	22.20	1.202	-0.17	0.150	0.180
	FR1 n77_Ant 2	100M	BPSK	135	69	Front Side	10mm	633332	3499.98	21.18	22.20	1.265	-0.12	0.154	0.195
	FR1 n77_Ant 5	-	CW	-	-	Top Surface	10mm	656000	3840	20.33	21.50	1.309	-0.13	0.723	0.947
	FR1 n77_Ant 5	-	CW	-	-	Bottom Surface	10mm	656000	3840	20.33	21.50	1.309	-0.05	0.379	0.496
	FR1 n77_Ant 5	-	CW	-	-	Left Side	10mm	656000	3840	20.33	21.50	1.309	-0.1	0.033	0.043
	FR1 n77_Ant 5	-	CW	-	-	Right Side	10mm	656000	3840	20.33	21.50	1.309	-0.09	0.082	0.107
	FR1 n77_Ant 5	-	CW	-	-	Front Side	10mm	656000	3840	20.33	21.50	1.309	-0.12	0.480	0.628
	FR1 n77_Ant 5	-	CW	-	-	Top Surface	10mm	633332	3499.98	21.12	21.50	1.091	-0.11	0.569	0.621
	FR1 n77_Ant 5	-	CW	-	-	Bottom Surface	10mm	633332	3499.98	21.12	21.50	1.091	-0.16	0.330	0.360
	FR1 n77_Ant 5	-	CW	-	-	Left Side	10mm	633332	3499.98	21.12	21.50	1.091	-0.13	0.048	0.052
	FR1 n77_Ant 5	-	CW	-	-	Right Side	10mm	633332	3499.98	21.12	21.50	1.091	-0.12	0.082	0.089
	FR1 n77_Ant 5	-	CW	-	-	Front Side	10mm	633332	3499.98	21.12	21.50	1.091	-0.16	0.342	0.373
	FR1 n77_Ant 6	-	CW	-	-	Top Surface	10mm	656000	3840	19.08	20.50	1.387	-0.09	0.660	0.915
	FR1 n77_Ant 6	-	CW	-	-	Bottom Surface	10mm	656000	3840	19.08	20.50	1.387	-0.17	0.286	0.397
	FR1 n77_Ant 6	-	CW	-	-	Left Side	10mm	656000	3840	19.08	20.50	1.387	0.1	0.067	0.093
	FR1 n77_Ant 6	-	CW	-	-	Right Side	10mm	656000	3840	19.08	20.50	1.387	-0.19	0.024	0.033
15	FR1 n77_Ant 6	-	CW	-	-	Back Side	10mm	656000	3840	19.08	20.50	1.387	-0.15	0.932	1.292
	FR1 n77_Ant 6	-	CW	-	-	Top Surface	10mm	633332	3499.98	20.06	20.50	1.107	-0.03	1.160	1.284
	FR1 n77_Ant 6	-	CW	-	-	Bottom Surface	10mm	633332	3499.98	20.06	20.50	1.107	-0.16	0.338	0.374
	FR1 n77_Ant 6	-	CW	-	-	Left Side	10mm	633332	3499.98	20.06	20.50	1.107	-0.15	0.148	0.164
	FR1 n77_Ant 6	-	CW	-	-	Right Side	10mm	633332	3499.98	20.06	20.50	1.107	-0.18	0.019	0.021
	FR1 n77_Ant 6	-	CW	-	-	Back Side	10mm	633332	3499.98	20.06	20.50	1.107	-0.13	0.939	1.039

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz_Ant 3	802.11b 1Mbps	Top Surface	10mm	6	2437	9.90	10.00	1.023	98.2	1.018	-0.17	0.039	0.041
	WLAN2.4GHz_Ant 3	802.11b 1Mbps	Bottom Surface	10mm	6	2437	9.90	10.00	1.023	98.2	1.018	-0.01	0.050	0.052
16	WLAN2.4GHz_Ant 3	802.11b 1Mbps	Left Side	10mm	6	2437	9.90	10.00	1.023	98.2	1.018	-0.19	0.087	0.091
	WLAN2.4GHz_Ant 3	802.11b 1Mbps	Back Side	10mm	6	2437	9.90	10.00	1.023	98.2	1.018	-0.07	0.017	0.018
	WLAN2.4GHz_Ant 4	802.11b 1Mbps	Top Surface	10mm	6	2437	9.50	10.00	1.122	98.2	1.018	-0.06	0.056	0.064
	WLAN2.4GHz_Ant 4	802.11b 1Mbps	Bottom Surface	10mm	6	2437	9.50	10.00	1.122	98.2	1.018	-0.12	0.031	0.035
	WLAN2.4GHz_Ant 4	802.11b 1Mbps	Right Side	10mm	6	2437	9.50	10.00	1.122	98.2	1.018	-0.1	0.037	0.042
	WLAN2.4GHz_Ant 4	802.11b 1Mbps	Back Side	10mm	6	2437	9.50	10.00	1.122	98.2	1.018	-0.19	0.021	0.024
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Top Surface	10mm	50	5250	9.70	10.00	1.072	99.5	1.005	0.01	0.066	0.071
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Bottom Surface	10mm	50	5250	9.70	10.00	1.072	99.5	1.005	0.12	0.047	0.051
17	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Left Side	10mm	50	5250	9.70	10.00	1.072	99.5	1.005	-0.13	0.075	0.081
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Back Side	10mm	50	5250	9.70	10.00	1.072	99.5	1.005	0.03	0.048	0.052
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Top Surface	10mm	50	5250	9.60	10.00	1.096	99.3	1.007	-0.04	0.022	0.024
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Bottom Surface	10mm	50	5250	9.60	10.00	1.096	99.3	1.007	-0.08	0.021	0.023
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Right Side	10mm	50	5250	9.60	10.00	1.096	99.3	1.007	-0.02	0.039	0.043
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Back Side	10mm	50	5250	9.60	10.00	1.096	99.3	1.007	0.02	0.035	0.039
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Top Surface	10mm	114	5570	9.70	10.00	1.072	99.3	1.007	0.19	0.046	0.050
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Bottom Surface	10mm	114	5570	9.70	10.00	1.072	99.3	1.007	0.04	0.043	0.046
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Left Side	10mm	114	5570	9.70	10.00	1.072	99.3	1.007	-0.03	0.063	0.068
	WLAN5GHz_Ant 3	802.11ac-VHT160 MCS0	Back Side	10mm	114	5570	9.70	10.00	1.072	99.3	1.007	0.07	0.018	0.019
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Top Surface	10mm	114	5570	9.50	10.00	1.122	99.3	1.007	-0.11	0.058	0.066
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Bottom Surface	10mm	114	5570	9.50	10.00	1.122	99.3	1.007	0.08	0.055	0.062
	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Right Side	10mm	114	5570	9.50	10.00	1.122	99.3	1.007	0.05	0.062	0.070
18	WLAN5GHz_Ant 4	802.11ac-VHT160 MCS0	Back Side	10mm	114	5570	9.50	10.00	1.122	99.3	1.007	-0.17	0.073	0.082
	WLAN5GHz_Ant 3	802.11ac-VHT80 MCS0	Top Surface	10mm	155	5775	9.70	10.00	1.072	99.5	1.005	-0.17	0.033	0.036
	WLAN5GHz_Ant 3	802.11ac-VHT80 MCS0	Bottom Surface	10mm	155	5775	9.70	10.00	1.072	99.5	1.005	-0.19	0.054	0.058
	WLAN5GHz_Ant 3	802.11ac-VHT80 MCS0	Left Side	10mm	155	5775	9.70	10.00	1.072	99.5	1.005	0.13	0.070	0.075
	WLAN5GHz_Ant 3	802.11ac-VHT80 MCS0	Back Side	10mm	155	5775	9.70	10.00	1.072	99.5	1.005	-0.12	0.018	0.019
	WLAN5GHz_Ant 4	802.11ac-VHT80 MCS0	Top Surface	10mm	155	5775	9.30	10.00	1.175	99.5	1.005	0.12	0.055	0.065
	WLAN5GHz_Ant 4	802.11ac-VHT80 MCS0	Bottom Surface	10mm	155	5775	9.30	10.00	1.175	99.5	1.005	-0.16	0.027	0.032
	WLAN5GHz_Ant 4	802.11ac-VHT80 MCS0	Right Side	10mm	155	5775	9.30	10.00	1.175	99.5	1.005	-0.17	0.062	0.073
19	WLAN5GHz_Ant 4	802.11ac-VHT80 MCS0	Back Side	10mm	155	5775	9.30	10.00	1.175	99.5	1.005	-0.11	0.072	0.085

16.2 6GHz WLAN SAR Test Result

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	APD (W/m2)
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Top Surface	10mm	15	6025	9.40	9.50	1.023	99	1.010	0.09	0.018	0.019	0.325
20	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Bottom Surface	10mm	15	6025	9.40	9.50	1.023	99	1.010	0.14	0.058	0.060	0.551
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Left Side	10mm	15	6025	9.40	9.50	1.023	99	1.010	0.05	0.027	0.028	0.519
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Back Side	10mm	15	6025	9.40	9.50	1.023	99	1.010	-0.14	0.002	0.002	0.156
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Bottom Surface	10mm	47	6185	9.40	9.50	1.023	99	1.010	-0.02	0.051	0.053	0.538
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Bottom Surface	10mm	111	6505	8.30	8.50	1.047	99	1.010	-0.09	0.032	0.034	0.487
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Bottom Surface	10mm	175	6825	8.00	9.00	1.259	99	1.010	0.03	0.025	0.032	0.466
	WLAN6GHz_Ant 3	802.11ax-HE160 MCS0	Bottom Surface	10mm	207	6985	8.90	9.50	1.148	99	1.010	-0.01	0.039	0.045	0.531
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Top Surface	10mm	15	6025	8.70	9.50	1.202	99	1.010	0.05	0.049	0.060	0.4
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Bottom Surface	10mm	15	6025	8.70	9.50	1.202	99	1.010	0.02	0.010	0.012	0.275
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Right Side	10mm	15	6025	8.70	9.50	1.202	99	1.010	-0.15	0.032	0.039	0.386
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Back Side	10mm	15	6025	8.70	9.50	1.202	99	1.010	-0.13	0.012	0.015	0.281
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Top Surface	10mm	47	6185	8.30	9.50	1.318	99	1.010	0.09	0.038	0.051	0.342
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Top Surface	10mm	111	6505	7.50	8.50	1.259	99	1.010	0.02	0.023	0.029	0.291
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Top Surface	10mm	175	6825	7.50	8.00	1.122	99	1.010	-0.05	0.036	0.041	0.333
	WLAN6GHz_Ant 4	802.11ax-HE160 MCS0	Top Surface	10mm	207	6985	8.50	9.00	1.122	99	1.010	0.03	0.042	0.048	0.374

16.3 6GHz PD Test Result

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Duty Cycle %	Grid Step (λ)	Scaling Factor for measurement uncertainty	Power Drift (dB)	Normal psPD (W/m^2)	Scaled Normal psPD (W/m^2)	Total psPD (W/m^2)	Scaled Total psPD (W/m^2)
	WLAN6GHz	802.11ax-HE160 MCS0	Left Side	10mm	Ant 3	15	6025	9.40	9.50	99.00	0.25	1.119	-0.19	0.741	0.86	0.775	0.90
	WLAN6GHz	802.11ax-HE160 MCS0	Left Side	10mm	Ant 3	47	6185	9.40	9.50	99.00	0.25	1.119	-0.17	0.732	0.85	0.73	0.84
	WLAN6GHz	802.11ax-HE160 MCS0	Left Side	10mm	Ant 3	111	6505	8.30	8.50	99.00	0.25	1.119	0.11	0.704	0.83	0.74	0.88
	WLAN6GHz	802.11ax-HE160 MCS0	Left Side	10mm	Ant 3	175	6825	8.00	8.00	99.00	0.25	1.119	-0.08	0.301	0.34	0.429	0.48
	WLAN6GHz	802.11ax-HE160 MCS0	Left Side	10mm	Ant 3	207	6985	8.90	9.00	99.00	0.25	1.119	0.12	0.295	0.34	0.393	0.45
	WLAN6GHz	802.11ax-HE160 MCS0	Top Surface	10mm	Ant 4	15	6025	8.70	9.50	99.00	0.25	1.119	-0.07	0.945	1.28	1.03	1.40
01	WLAN6GHz	802.11ax-HE160 MCS0	Top Surface	10mm	Ant 4	47	6185	8.30	9.50	99.00	0.25	1.119	-0.03	1.22	1.82	1.26	1.88
	WLAN6GHz	802.11ax-HE160 MCS0	Top Surface	10mm	Ant 4	111	6505	7.50	8.50	99.00	0.25	1.119	-0.07	1.26	1.79	1.31	1.86
	WLAN6GHz	802.11ax-HE160 MCS0	Top Surface	10mm	Ant 4	175	6825	7.50	8.00	99.00	0.25	1.119	-0.11	1.31	1.66	1.35	1.71
	WLAN6GHz	802.11ax-HE160 MCS0	Top Surface	10mm	Ant 4	207	6985	8.50	9.00	99.00	0.25	1.119	-0.15	1.02	1.29	1.07	1.36

16.4 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 7_Ant 2	20M_QPSK_1_49	Right Side	10mm	21100	2535	22.94	23.50	1.138	0.07	1.020	-	1.160
2nd	LTE Band 7_Ant 2	20M_QPSK_1_49	Right Side	10mm	21100	2535	22.94	23.50	1.138	-0.13	0.998	1.022	1.135
1st	LTE Band 30_Ant 2	10M_QPSK_1_0	Right Side	10mm	27710	2310	21.97	23.00	1.268	-0.18	1.020	-	1.293
2nd	LTE Band 30_Ant 2	10M_QPSK_1_0	Right Side	10mm	27710	2310	21.97	23.00	1.268	-0.12	1.000	1.02	1.268
1st	FR1 n2_Ant 2	20M_BPSK_1_1	Top Surface	10mm	380000	1900	23.41	24.00	1.146	-0.04	0.984	-	1.127
2nd	FR1 n2_Ant 2	20M_BPSK_1_1	Top Surface	10mm	380000	1900	23.41	24.00	1.146	-0.13	0.975	1.009	1.117
1st	FR1 n66_Ant 1	40M_BPSK_1_1	Top Surface	10mm	349000	1745	23.88	24.00	1.028	-0.17	0.897	-	0.922
2nd	FR1 n66_Ant 1	40M_BPSK_1_1	Top Surface	10mm	349000	1745	23.88	24.00	1.028	-0.15	0.863	1.039	0.887
1st	FR1 n77_Ant 6	CW	Top Surface	10mm	633332	3499.98	20.06	20.50	1.107	-0.03	1.160	-	1.284
2nd	FR1 n77_Ant 6	CW	Top Surface	10mm	633332	3499.98	20.06	20.50	1.107	-0.19	1.140	1.018	1.262

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

17. Simultaneous Transmission Analysis

Exposure condition	NO.	Simultaneous Transmission Configurations	Support
Body condition	1	WWAN + 2.4GHz Ant3 + 2.4GHz Ant4	V
	2	WWAN + 5GHz Ant3 + 5GHz Ant4	V
	3	WWAN + 2.4GHz Ant3 + 5GHz Ant4	V
	4	WWAN + 2.4GHz Ant4 + 5GHz Ant3	V
	5	LTE + FR1 + 2.4GHz Ant3 + 2.4GHz Ant4	V
	6	LTE + FR1+ 5GHz Ant3 + 5GHz Ant4	V
	7	LTE + FR1+ 2.4GHz Ant3 + 5GHz Ant4	V
	8	LTE + FR1+ 2.4GHz Ant4 + 5GHz Ant3	V
	9	LTE + FR2 + 2.4GHz Ant3 + 2.4GHz Ant4	V
	10	LTE + FR2 + 5GHz Ant3 + 5GHz Ant4	V
	11	LTE + FR2+ 2.4GHz Ant3 + 5GHz Ant4	V
	12	LTE + FR2+ 2.4GHz Ant4 + 5GHz Ant3	V
	13(1)	WWAN + 6GHz Ant3 + 6GHz Ant4	V
	14(1)	WWAN + 2.4GHz Ant3 + 6GHz Ant4	V
	15(1)	WWAN + 2.4GHz Ant4 + 6GHz Ant3	V
	16(1)	LTE + FR1+ 6GHz Ant3 + 6GHz Ant4	V
	17(1)	LTE + FR1+ 2.4GHz Ant3 + 6GHz Ant4	V
	18(1)	LTE + FR1+ 2.4GHz Ant4 + 6GHz Ant3	V
	19(1)	LTE + FR2 + 2.4GHz Ant3 + 2.4GHz Ant4	V
	20(1)	LTE + FR2 + 6GHz Ant3 + 6GHz Ant4	V
	21(1)	LTE + FR2+ 2.4GHz Ant3 + 6GHz Ant4	V
	22(1)	LTE + FR2+ 2.4GHz Ant4 + 6GHz Ant3	V
	23(3)	2.4GHz Ant3 (client) + 5GHz Ant4(AP)	V
	24(3)	5GHz Ant3 (Client) + 2.4GHz Ant4 (AP)	V
	25(2,3)	6GHz Ant3 (Client) + 2.4GHz Ant4 (AP)	V

General Note:

1. WiFi 6E AP mode is enabled only when it's connected to AC mains, the compliance is justified in MPE test report no.: FA160614E.
2. When device is connected to the PC, 2.4GHz and 6GHz simultaneous transmission is possible while the device supports AP mode in 2.4GHz and client mode in WiFi 6E
3. When the WWAN operation is offloading which the WiFi 2.4GHz/5GHz/6GHz at ant3 only operate client and WiFi 2.4GHz/5GHz ant4 operate AP mode
4. The worst case WLAN reported SAR for each antenna combination was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
5. The 1g SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) 1g SAR summation SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

17.1 5G NR + LTE + WLAN Sim-Tx analysis

In 5G NR + LTE + WLAN or LTE inter band uplink CA +WLAN simultaneous transmission, 5G NR and LTE or LTE inter band uplink PCC and SCC transmission are managed and controlled by Qualcomm® Smart Transmit, while the RF exposure from WLAN radios is managed using legacy approach, i.e., through a fixed power back-off if needed.

Since WLAN do not employ time-averaging, 1gSAR and 10gSAR measurement for WLAN need to be conducted at their corresponding rated power following current FCC test procedures to determine reported SAR values.

Smart Transmit current implementation assumes hotspots from 5G NR and LTE are collocated. Therefore, for a total of 100% exposure margin, if LTE or LTE PCC uses x%, then the exposure margin left for 5G NR or LTE SCC is capped to (100-x)%. Thus, the compliance equation for LTE + 5G NR or LTE PCC + LTE SCC is

$$x\% * A + (100-x)\% * B \leq 1.0,$$

Where, A is normalized reported time-averaged SAR exposure ratio from LTE or LTE PCC, and A ≤ 1.0; B is normalized reported time-averaged exposure ratio from LTE PCC or 5G NR (i.e., PD exposure for mmW NR or SAR exposure for sub6 NR), and B ≤1.0.

Let C = normalized reported SAR exposure ratio from WLAN, then for compliance,

$$x\% * A + (100-x)\% * B + C \leq 1.0 \qquad (1)$$

$$x\% * A + (100-x)\% * B \leq x\% * \max(A, B) + (100-x)\% * \max(A, B) \leq \max(A, B)$$

$$x\% * A + (100-x)\% * B + C \leq \max(A, B) + C \leq 1.0 \qquad (2)$$

if A + C ≤ 1.0 and B + C ≤ 1.0 can be proven, then “x% * A + (100-x)% * B + C ≤ 1.0”. Therefore simultaneous transmission analysis for 5G NR + LTE + WLAN or LTE inter band Uplink CA+ WLAN can be performed in two steps

Step 1: Prove total exposure ratio (TER) of LTE + WLAN < 1 or LTE PCC+ WLAN<1
Step 2: Prove total exposure ratio (TER) of 5G NR + WLAN < 1or LTE SCC+WLAN<1

Else, if A + C > 1.0 and/or B + C > 1.0, then the followings need to hold true for compliance:

i. Since A and C are decoupled based on the SAR distribution, and
ii. (100-x)% * B + C ≤ 1.0, and
iii. x% * A + (100-x)% * B ≤ 1.0

Note iii. is covered in Part 2 report; i. and ii. is addressed in Part 1 report.

17.2 Body Exposure Conditions

WWAN Band	Exposure Position	1	2	3	4	5	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+2+5 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN Ant 3	2.4GHz WLAN Ant 4	5/6GHz WLAN Ant 3	5/6GHz WLAN Ant 4				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
LTE Band 2_Ant 1	Top Surface	0.903	0.041	0.064	0.071	0.066	**1.008**	**1.040**	**1.010**	**1.038**
	Bottom Surface	0.677	0.052	0.035	0.058	0.062	**0.764**	**0.797**	**0.791**	**0.770**
	Left Side	0.656	0.091		0.081		**0.747**	**0.737**	**0.747**	**0.737**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.400					**0.400**	**0.400**	**0.400**	**0.400**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 5_Ant 1	Top Surface	0.718	0.041	0.064	0.071	0.066	**0.823**	**0.855**	**0.825**	**0.853**
	Bottom Surface	0.687	0.052	0.035	0.058	0.062	**0.774**	**0.807**	**0.801**	**0.780**
	Left Side	0.334	0.091		0.081		**0.425**	**0.415**	**0.425**	**0.415**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.182					**0.182**	**0.182**	**0.182**	**0.182**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 12_Ant 1	Top Surface	0.712	0.041	0.064	0.071	0.066	**0.817**	**0.849**	**0.819**	**0.847**
	Bottom Surface	0.508	0.052	0.035	0.058	0.062	**0.595**	**0.628**	**0.622**	**0.601**
	Left Side	0.344	0.091		0.081		**0.435**	**0.425**	**0.435**	**0.425**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.263					**0.263**	**0.263**	**0.263**	**0.263**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 14_Ant 1	Top Surface	0.779	0.041	0.064	0.071	0.066	**0.884**	**0.916**	**0.886**	**0.914**
	Bottom Surface	0.769	0.052	0.035	0.058	0.062	**0.856**	**0.889**	**0.883**	**0.862**
	Left Side	0.292	0.091		0.081		**0.383**	**0.373**	**0.383**	**0.373**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.291					**0.291**	**0.291**	**0.291**	**0.291**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 48_Ant 1	Top Surface	0.906	0.041	0.064	0.071	0.066	**1.011**	**1.043**	**1.013**	**1.041**
	Bottom Surface	0.423	0.052	0.035	0.058	0.062	**0.510**	**0.543**	**0.537**	**0.516**
	Left Side	0.432	0.091		0.081		**0.523**	**0.513**	**0.523**	**0.513**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.160					**0.160**	**0.160**	**0.160**	**0.160**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 66_Ant 1	Top Surface	0.868	0.041	0.064	0.071	0.066	**0.973**	**1.005**	**0.975**	**1.003**
	Bottom Surface	0.700	0.052	0.035	0.058	0.062	**0.787**	**0.820**	**0.814**	**0.793**
	Left Side	0.524	0.091		0.081		**0.615**	**0.605**	**0.615**	**0.605**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.403					**0.403**	**0.403**	**0.403**	**0.403**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n2_Ant 1	Top Surface	0.928	0.041	0.064	0.071	0.066	**1.033**	**1.065**	**1.035**	**1.063**
	Bottom Surface	0.671	0.052	0.035	0.058	0.062	**0.758**	**0.791**	**0.785**	**0.764**
	Left Side	0.663	0.091		0.081		**0.754**	**0.744**	**0.754**	**0.744**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.405					**0.405**	**0.405**	**0.405**	**0.405**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n5_Ant 1	Top Surface	0.755	0.041	0.064	0.071	0.066	**0.860**	**0.892**	**0.862**	**0.890**
	Bottom Surface	0.741	0.052	0.035	0.058	0.062	**0.828**	**0.861**	**0.855**	**0.834**
	Left Side	0.349	0.091		0.081		**0.440**	**0.430**	**0.440**	**0.430**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.184					**0.184**	**0.184**	**0.184**	**0.184**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**

WWAN Band	Exposure Position	1	2	3	4	5	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+2+5 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN Ant 3	2.4GHz WLAN Ant 4	5/6GHz WLAN Ant 3	5/6GHz WLAN Ant 4				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
FR1 n12_Ant 1	Top Surface	0.675	0.041	0.064	0.071	0.066	**0.780**	**0.812**	**0.782**	**0.810**
	Bottom Surface	0.513	0.052	0.035	0.058	0.062	**0.600**	**0.633**	**0.627**	**0.606**
	Left Side	0.358	0.091		0.081		**0.449**	**0.439**	**0.449**	**0.439**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.255					**0.255**	**0.255**	**0.255**	**0.255**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n14_Ant 1	Top Surface	0.823	0.041	0.064	0.071	0.066	**0.928**	**0.960**	**0.930**	**0.958**
	Bottom Surface	0.722	0.052	0.035	0.058	0.062	**0.809**	**0.842**	**0.836**	**0.815**
	Left Side	0.305	0.091		0.081		**0.396**	**0.386**	**0.396**	**0.386**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.301					**0.301**	**0.301**	**0.301**	**0.301**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n66_Ant 1	Top Surface	0.922	0.041	0.064	0.071	0.066	**1.027**	**1.059**	**1.029**	**1.057**
	Bottom Surface	0.790	0.052	0.035	0.058	0.062	**0.877**	**0.910**	**0.904**	**0.883**
	Left Side	0.591	0.091		0.081		**0.682**	**0.672**	**0.682**	**0.672**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.472					**0.472**	**0.472**	**0.472**	**0.472**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n77_Ant 1	Top Surface	1.152	0.041	0.064	0.071	0.066	**1.257**	**1.289**	**1.259**	**1.287**
	Bottom Surface	0.724	0.052	0.035	0.058	0.062	**0.811**	**0.844**	**0.838**	**0.817**
	Left Side	0.596	0.091		0.081		**0.687**	**0.677**	**0.687**	**0.677**
	Right Side			0.042		0.073	**0.042**	**0.073**	**0.073**	**0.042**
	Front Side	0.284					**0.284**	**0.284**	**0.284**	**0.284**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**

WWAN Band	Exposure Position	1	2	3	4	5	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+2+5 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN Ant 3	2.4GHz WLAN Ant 4	5/6GHz WLAN Ant 3	5/6GHz WLAN Ant 4				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
LTE Band 2_Ant 2	Top Surface	1.168	0.041	0.064	0.071	0.066	**1.273**	**1.305**	**1.275**	**1.303**
	Bottom Surface	1.156	0.052	0.035	0.058	0.062	**1.243**	**1.276**	**1.270**	**1.249**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	1.024		0.042		0.073	**1.066**	**1.097**	**1.097**	**1.066**
	Front Side	0.550					**0.550**	**0.550**	**0.550**	**0.550**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 7_Ant 2	Top Surface	0.665	0.041	0.064	0.071	0.066	**0.770**	**0.802**	**0.772**	**0.800**
	Bottom Surface	0.419	0.052	0.035	0.058	0.062	**0.506**	**0.539**	**0.533**	**0.512**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	1.160		0.042		0.073	**1.202**	**1.233**	**1.233**	**1.202**
	Front Side	0.309					**0.309**	**0.309**	**0.309**	**0.309**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
LTE Band 30_Ant 2	Top Surface	0.924	0.041	0.064	0.071	0.066	**1.029**	**1.061**	**1.031**	**1.059**
	Bottom Surface	1.066	0.052	0.035	0.058	0.062	**1.153**	**1.186**	**1.180**	**1.159**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	1.293		0.042		0.073	**1.335**	**1.366**	**1.366**	**1.335**
	Front Side	0.389					**0.389**	**0.389**	**0.389**	**0.389**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**

WWAN Band	Exposure Position	1	2	3	4	5	1+2+3 Summed 1g SAR (W/kg)	1+4+5 Summed 1g SAR (W/kg)	1+2+5 Summed 1g SAR (W/kg)	1+3+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN Ant 3	2.4GHz WLAN Ant 4	5/6GHz WLAN Ant 3	5/6GHz WLAN Ant 4				
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
LTE Band 66_Ant 2	Top Surface	0.993	0.041	0.064	0.071	0.066	**1.098**	**1.130**	**1.100**	**1.128**
	Bottom Surface	0.895	0.052	0.035	0.058	0.062	**0.982**	**1.015**	**1.009**	**0.988**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	0.689		0.042		0.073	**0.731**	**0.762**	**0.762**	**0.731**
	Front Side	0.410					**0.410**	**0.410**	**0.410**	**0.410**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n2_Ant 2	Top Surface	1.127	0.041	0.064	0.071	0.066	**1.232**	**1.264**	**1.234**	**1.262**
	Bottom Surface	1.105	0.052	0.035	0.058	0.062	**1.192**	**1.225**	**1.219**	**1.198**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	0.710		0.042		0.073	**0.752**	**0.783**	**0.783**	**0.752**
	Front Side	0.419					**0.419**	**0.419**	**0.419**	**0.419**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n5_Ant 2	Top Surface	0.593	0.041	0.064	0.071	0.066	**0.698**	**0.730**	**0.700**	**0.728**
	Bottom Surface	0.568	0.052	0.035	0.058	0.062	**0.655**	**0.688**	**0.682**	**0.661**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	0.255		0.042		0.073	**0.297**	**0.328**	**0.328**	**0.297**
	Front Side	0.204					**0.204**	**0.204**	**0.204**	**0.204**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n30_Ant 2	Top Surface	0.848	0.041	0.064	0.071	0.066	**0.953**	**0.985**	**0.955**	**0.983**
	Bottom Surface	0.991	0.052	0.035	0.058	0.062	**1.078**	**1.111**	**1.105**	**1.084**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	1.183		0.042		0.073	**1.225**	**1.256**	**1.256**	**1.225**
	Front Side	0.363					**0.363**	**0.363**	**0.363**	**0.363**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n66_Ant 2	Top Surface	0.681	0.041	0.064	0.071	0.066	**0.786**	**0.818**	**0.788**	**0.816**
	Bottom Surface	0.616	0.052	0.035	0.058	0.062	**0.703**	**0.736**	**0.730**	**0.709**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	0.540		0.042		0.073	**0.582**	**0.613**	**0.613**	**0.582**
	Front Side	0.373					**0.373**	**0.373**	**0.373**	**0.373**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n77_Ant 2	Top Surface	1.253	0.041	0.064	0.071	0.066	**1.358**	**1.390**	**1.360**	**1.388**
	Bottom Surface	0.911	0.052	0.035	0.058	0.062	**0.998**	**1.031**	**1.025**	**1.004**
	Left Side		0.091		0.081		**0.091**	**0.081**	**0.091**	**0.081**
	Right Side	0.641		0.042		0.073	**0.683**	**0.714**	**0.714**	**0.683**
	Front Side	0.195					**0.195**	**0.195**	**0.195**	**0.195**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n77_Ant 5	Top Surface	0.947	0.041	0.064	0.071	0.066	**1.052**	**1.084**	**1.054**	**1.082**
	Bottom Surface	0.496	0.052	0.035	0.058	0.062	**0.583**	**0.616**	**0.610**	**0.589**
	Left Side	0.052	0.091		0.081		**0.143**	**0.133**	**0.143**	**0.133**
	Right Side	0.107		0.042		0.073	**0.149**	**0.180**	**0.180**	**0.149**
	Front Side	0.628					**0.628**	**0.628**	**0.628**	**0.628**
	Back Side		0.018	0.024	0.052	0.085	**0.042**	**0.137**	**0.103**	**0.076**
FR1 n77_Ant 6	Top Surface	1.284	0.041	0.064	0.071	0.066	**1.389**	**1.421**	**1.391**	**1.419**
	Bottom Surface	0.397	0.052	0.035	0.058	0.062	**0.484**	**0.517**	**0.511**	**0.490**
	Left Side	0.164	0.091		0.081		**0.255**	**0.245**	**0.255**	**0.245**
	Right Side	0.033		0.042		0.073	**0.075**	**0.106**	**0.106**	**0.075**
	Front Side						**0.000**	**0.000**	**0.000**	**0.000**
	Back Side	1.292	0.018	0.024	0.052	0.085	**1.334**	**1.429**	**1.395**	**1.368**

<WWAN is offloading>

Exposure Position	2 2.4GHz WLAN Ant 3 1g SAR (W/kg)	3 2.4GHz WLAN Ant 4 1g SAR (W/kg)	4 5/6GHz WLAN Ant 3 1g SAR (W/kg)	5 5/6GHz WLAN Ant 4 1g SAR (W/kg)	**2+3 Summed 1g SAR (W/kg)**	**2+5 Summed 1g SAR (W/kg)**	**3+4 Summed 1g SAR (W/kg)**
Top Surface	0.041	0.064	0.071	0.066	**0.105**	**0.107**	**0.135**
Bottom Surface	0.052	0.035	0.058	0.062	**0.087**	**0.114**	**0.093**
Left Side	0.091		0.081		**0.091**	**0.091**	**0.081**
Right Side		0.042		0.073	**0.042**	**0.073**	**0.042**
Front Side					**0.000**	**0.000**	**0.000**
Back Side	0.018	0.024	0.052	0.085	**0.042**	**0.103**	**0.076**

Test Engineer：Mood Huang, Tommy Chen, Charles Shen and Jordar Jhuang

18. Uncertainty Assessment

Declaration of Conformity:
The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Applicable for SAR Measurements:

Uncertainty Budget (4 MHz - 10 GHz range)							
Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	18.60	N	2	1	1	9.3	9.3
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Linearity	4.70	R	1.732	1	1	2.7	2.7
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Post-processing	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Holder	3.60	N	1	1	1	3.6	3.6
Test sample Positioning	3.03	N	1	1	1	3.0	3.0
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Phantom and Setup							
Phantom Uncertainty	7.60	R	1.732	1	1	4.4	4.4
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.77	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.77	2.3	2.2
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.77	1.1	1.1
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.77	1.7	1.6
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						14.5%	14.2%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						29.0%	28.4%

Applicable for Power Density Measurements:

Error Description	Uncertainty Value (±dB)	Probability	Divisor	(Ci)	Standard Uncertainty (±dB)
Probe Calibration	0.49	N	1	1	0.49
Probe correction	0.00	R	1.732	1	0.00
Frequency response (BW ≤ 1 GHz)	0.20	R	1.732	1	0.12
Sensor cross coupling	0.00	R	1.732	1	0.00
Isotropy	0.50	R	1.732	1	0.29
Linearity	0.20	R	1.732	1	0.12
Probe scattering	0.00	R	1.732	1	0.00
Probe positioning offset	0.30	R	1.732	1	0.17
Probe positioning repeatability	0.04	R	1.732	1	0.02
Sensor mechanical offset	0.00	R	1.732	1	0.00
Probe spatial resolution	0.00	R	1.732	1	0.00
Field impedance dependance	0.00	R	1.732	1	0.00
Amplitude and phase drift	0.00	R	1.732	1	0.00
Amplitude and phase noise	0.04	R	1.732	1	0.02
Measurement area truncation	0.00	R	1.732	1	0.00
Data acquisition	0.03	N	1	1	0.03
Sampling	0.00	R	1.732	1	0.00
Field reconstruction	0.60	R	1.732	1	0.35
Forward transformation	0.00	R	1.732	1	0.00
Power density scaling	0.00	R	1.732	1	0.00
Spatial averaging	0.10	R	1.732	1	0.06
System detection limit	0.04	R	1.732	1	0.02
Uncertainty terms dep endent on the DUT and environmental factors					
Probe coupling with DUT	0.00	R	1.732	1	0.0
Modulation response	0.40	R	1.732	1	0.2
Integration time	0.00	R	1.732	1	0.0
Response time	0.00	R	1.732	1	0.0
Device holder influence	0.10	R	1.732	1	0.1
DUT alignment	0.00	R	1.732	1	0.0
RF ambient conditions	0.04	R	1.732	1	0.0
Ambient reflections	0.04	R	1.732	1	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.0
Drift of the DUT		R	1.732	1	
Combined Std. Uncertainty					0.76
Expanded STD Uncertainty (95%)					**1.52**

19. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[8] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

[9] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[10] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[11] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

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