



SAR EVALUATION REPORT

Applicant Name:

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Date of Testing:

03/18/20 – 04/06/20

Test Site/Location:

PCTEST, Columbia, MD, USA

Document Serial No.:

1M2003120045-01.A3L

FCC ID:

A3LSMG986W

APPLICANT:

SAMSUNG ELECTRONICS CO., LTD.

DUT Type:

Portable Handset

Application Type:

Class II Permissive Change

FCC Rule Part(s):

CFR §2.1093

Model:

SM-G986W

Permissive Change(s):

Adding DFT-s-OFDM $\pi/2$ BPSK Modulation to NR FR1

Date of Original Certification:

02/21/2020

Note: Please refer to RF Exposure Technical Report S/N: 1M1911010179-01-R1.A3L for original compliance evaluation.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.5 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.


 Randy Ortanez
 President



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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
NR Band n71	Data	665.5 - 695.5 MHz
NR Band n66	Data	1712.5 - 1777.5 MHz
NR Band n41	Data	2506.02 - 2679.99 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
ANT+	Data	2402 - 2480 MHz
MST	Data	555 Hz - 8.33 kHz

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1.2 Time-Averaging Algorithm for RF Exposure Compliance

Exposure Scenario:	Body-Worn	Phablet	Phablet	Head	Hotspot	Phablet	Maximum Tune-up Output Power*
Averaging Volume:	1g	10g	10g	1g	1g	10g	
Spacing:	15 mm	6, 8, 11 mm	0 mm	0 mm	10 mm	0 mm	
DSI:	0	0	1	2	3	4	
Technology/Band	Antenna	Plimit corresponding to 1mW/g (SAR_design_target)					
GSM/GPRS/EDGE 850 MHz	A	31.3	31.3	26.1	31.3	26.1	24.8
GSM/GPRS/EDGE 1900 MHz	A	26.0	26.0	18.8	33.9	18.8	21.3
UMTS B5	A	31.5	31.5	26.0	31.9	26.0	24
UMTS B4	A	25.6	25.6	19.0	33.2	19.0	23.5
UMTS B2	A	25.8	25.8	18.5	34.2	18.5	23.5
CDMA/EVDO BC0	A	31.1	31.1	26.2	32.1	26.2	24.8
LTE FDD B71	A	32.7	32.7	29.8	32.9	29.8	24.5
LTE FDD B12	A	31.4	31.4	29.6	32.6	29.6	24.8
LTE FDD B13	A	30.9	30.9	27.2	32.9	27.2	24.8
LTE FDD B5	A	31.8	31.8	26.1	32.6	26.1	24.8
LTE FDD B4	A	24.3	24.3	19.3	33.7	19.3	23.7
LTE FDD B66	A	24.3	24.3	19.3	33.7	19.3	24
LTE FDD B25/2	A	26.7	26.7	18.5	33.9	18.5	23.5
LTE FDD B30	A	25.5	25.5	20.5	34.3	18.2	22
LTE FDD B7	B	27.6	27.6	20.5	32.0	19.5	23
LTE TDD B38	B	27.5	27.5	19.0	28.0	19.0	22
LTE TDD B41	B	27.5	27.5	21.5	32.6	19.0	22
NR FDD n71	A	32.1	32.1	29.4	34.2	29.4	24.5
NR FDD n66	A	24.7	24.7	19.8	33.1	19.8	24
NR TDD n41	F	22.9	22.9	22.9	14.0	20.9	17.5

Note: The Smart Transmit Algorithm was not affected by the permissive changes. Please see original technical filings 1M1911010179-01-R1.A3L for compliance evaluation.

1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. See RF Exposure Technical Report S/N 1M1911010179-01-R1.A3L for complete maximum and nominal output power specifications.

1.3.1 5G Output Power

Mode / Band		Modulated Average Output Power (in dBm)				
		Max (DSI = 0)	RCV Mode Active (DSI = 2)	Hotspot Mode Active (DSI = 3)	Earjack Active (DSI = 4)	Proximity Sensor Active (DSI = 1)
NR FDD Band n71	Max allowed power	25.5	25.5	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5	24.5	24.5
NR FDD Band n66	Max allowed power	25.0	25.0	20.8	20.8	20.8
	Nominal	24.0	24.0	19.8	19.8	19.8
NR TDD Band n41	Max allowed power	24.5	21.0	24.5	24.5	24.5
	Nominal	23.5	20.0	23.5	23.5	23.5

Note: NR TDD n41 RCV power reduction is only applicable for HAC purposes.

1.4 Miscellaneous SAR Test Considerations

NR implementation of n71, n66, and n41 is limited to EN-DC operations only, with LTE Band 2/7/66/5/12/13 acting as the anchor band. See RF Exposure Technical Report S/N 1M1911010179-01-R1.A3L for SAR compliance evaluation.

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Note: SAR testing for DFT-s-OFDM $\pi/2$ BPSK was not performed since its maximum output power is the same as DFT-s-OFDM QPSK and DFT-s-OFDM QPSK was evaluated for RF Exposure Compliance. Therefore, the SAR data in the original compliance evaluation demonstrate a conservative evaluation for this device. Please see RF Exposure Technical Report S/N 1M1911010179-01-R1.A3L for complete evaluation.

1.5 Guidance Applied

- FCC KDB Publication 941225 D05v02r04, D05Av01r02
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)

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2 NR FR1 INFORMATION

NR Information					
Form Factor	Portable Handset				
Frequency Range of each NR transmission band	NR Band n71 (665.5 - 695.5 MHz)				
	NR Band n66 (1712.5 - 1777.5 MHz)				
	NR Band n41 (2506.02 - 2679.99 MHz)				
Channel Bandwidths	NR Band n71: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	NR Band n66: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	NR Band n41: 20 MHz, 40 MHz, 50 MHz, 60 MHz, 80 MHz, 90 MHz, 100 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
NR Band n71: 5 MHz	665.5 (133100)		680.5 (136100)		695.5 (139100)
NR Band n71: 10 MHz	668 (133600)		680.5 (136100)		693 (138600)
NR Band n71: 15 MHz	670.5 (134100)		680.5 (136100)		690.5 (138100)
NR Band n71: 20 MHz	673.0 (134600)		680.5 (136100)		688.0 (137600)
NR Band n66: 5 MHz	1712.5 (342500)		1745 (349000)		1777.5 (355500)
NR Band n66: 10 MHz	1715 (343000)		1745 (349000)		1775 (355000)
NR Band n66: 15 MHz	1717.5 (343500)		1745 (349000)		1772.5 (354500)
NR Band n66: 20 MHz	1720 (344000)		1745 (349000)		1770 (354000)
NR Band n41: 20 MHz	2506.02 (501204)	2549.49 (509898)	2592.99 (518598)	2636.49 (527298)	2679.99 (535998)
NR Band n41: 40 MHz	2516.01 (503202)	2567.34 (513468)	N/A	2618.67 (523734)	2670 (534000)
NR Band n41: 50 MHz	2521.02 (504204)		2592.99 (518598)		2664.99 (532998)
NR Band n41: 60 MHz	2526 (505200)		2592.99 (518598)		2659.98 (531996)
NR Band n41: 80 MHz	2536.02 (507204)		N/A		2649.99 (529998)
NR Band n41: 90 MHz	2541 (508200)		N/A		2644.98 (528996)
NR Band n41: 100 MHz	N/A		2592.99 (518598)		N/A
NR Band n71/n66 SCS	15 kHz				
NR Band n41 SCS	30 kHz				
Modulations Supported in UL	DFT-s-OFDM: $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM				
NR MPR Permanently implemented per 3GPP TS 38.101	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
EN-DC Carrier Aggregation Possible Combinations	Please see the technical description included with the original filing for the possible carrier aggregation combinations.				
LTE Anchor Bands for NR Band n71	LTE Band 2, LTE Band 7, LTE Band 66				
LTE Anchor Bands for NR Band n66	LTE Band 2, LTE Band 66				
LTE Anchor Bands for NR Band n41	LTE Band 5, LTE Band 12, LTE Band 13				

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3 RF CONDUCTED POWERS

3.1 NR Conducted Powers

3.1.1 NR Band n71

Table 3-1
NR Band n71 Measured P_{max} for all DSI - 20 MHz Bandwidth

NR Band n71 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			136100 (680.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.79	0	0
	1	53	24.72		0
	1	104	24.65		0
	50	0	24.23	0-0.5	0.5
	50	28	24.75	0	0
	50	56	24.22	0-0.5	0.5
	100	0	24.21		0.5
DFT-s-OFDM QPSK	1	1	24.42	0	0
	1	53	24.86		0
	1	104	24.77		0
	50	0	23.58	0-1	1
	50	28	24.74	0	0
	50	56	23.88	0-1	1
	100	0	23.79		1
DFT-s-OFDM 16QAM	1	1	23.48	0-1	1
CP-OFDM QPSK	1	1	23.04	0-1.5	1.5

Note: NR Band n71 at 20 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, 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.

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Table 3-2
NR Band n71 Measured P_{max} for all DSI - 15 MHz Bandwidth

NR Band n71 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			136100 (680.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.79	0	0
	1	40	24.89		0
	1	77	24.88		0
	36	0	24.36	0-0.5	0.5
	36	22	24.85	0	0
	36	43	24.25	0-0.5	0.5
	75	0	24.42		0.5
DFT-s-OFDM QPSK	1	1	24.66	0	0
	1	40	24.90		0
	1	77	24.88		0
	36	0	23.70	0-1	1
	36	22	24.78	0	0
	36	43	23.97	0-1	1
	75	0	23.95		1
DFT-s-OFDM 16QAM	1	1	23.77	0-1	1
CP-OFDM QPSK	1	1	23.14	0-1.5	1.5

Note: NR Band n71 at 15 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, 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.

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Table 3-3
NR Band n71 Measured P_{max} for all DSI - 10 MHz Bandwidth

NR Band n71 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			133600 (668 MHz)	136100 (680.5 MHz)	138600 (693 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.88	24.82	25.06	0	0
	1	26	24.85	24.87	25.00		0
	1	50	24.72	24.93	24.94		0
	25	0	24.38	24.37	24.47	0-0.5	0.5
	25	14	24.81	24.88	24.87	0	0
	25	27	24.24	24.27	24.36	0-0.5	0.5
	50	0	24.35	24.41	24.40		0.5
DFT-s-OFDM QPSK	1	1	24.63	24.41	24.93	0	0
	1	26	24.98	24.99	24.92		0
	1	50	24.25	24.90	24.43		0
	25	0	23.97	23.78	24.14	0-1	1
	25	14	24.77	24.83	24.97	0	0
	25	27	23.65	23.91	23.95	0-1	1
	50	0	23.77	23.98	23.97		1
DFT-s-OFDM 16QAM	1	1	23.83	23.80	24.17	0-1	1
CP-OFDM QPSK	1	1	23.19	23.02	23.46	0-1.5	1.5

Table 3-4
NR Band n71 Measured P_{max} for all DSI - 5 MHz Bandwidth

NR Band n71 5 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	133100 (665.5 MHz)	136100 (680.5 MHz)	139100 (695.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.97	25.02	24.93	0	0
	1	13	24.81	24.92	24.92		0
	1	23	24.71	24.83	24.90		0
	12	0	24.48	24.47	24.47	0-0.5	0.5
	12	7	24.91	24.98	24.93	0	0
	12	13	24.31	24.42	23.83	0-0.5	0.5
	25	0	24.22	24.41	24.42		0.5
DFT-s-OFDM QPSK	1	1	24.55	24.81	24.92	0	0
	1	13	24.87	24.85	24.88		0
	1	23	24.74	24.90	24.55		0
	12	0	23.83	23.91	24.08	0-1	1
	12	7	24.95	24.89	24.93	0	0
	12	13	23.89	24.02	23.36	0-1	1
	25	0	23.85	24.07	23.91		1
DFT-s-OFDM 16QAM	1	1	24.02	24.01	24.18	0-1	1
CP-OFDM QPSK	1	1	23.16	23.21	23.45	0-1.5	1.5

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3.1.2

NR Band n66 (AWS)

Table 3-5

NR Band n66 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.48	24.68	24.55	0	0
	1	53	24.56	24.57	24.47		0
	1	104	24.45	24.64	24.42		0
	50	0	24.01	24.27	23.77	0-0.5	0.5
	50	28	24.35	24.58	24.39	0	0
	50	56	23.88	24.15	23.98	0-0.5	0.5
	100	0	23.93	24.16	23.97		0.5
DFT-s-OFDM QPSK	1	1	24.13	24.12	23.99	0	0
	1	53	24.32	24.63	23.83		0
	1	104	24.19	24.32	24.22		0
	50	0	23.32	23.59	22.57	0-1	1
	50	28	24.31	24.64	23.65	0	0
	50	56	23.26	23.55	22.94	0-1	1
	100	0	23.35	23.62	22.77		1
DFT-s-OFDM 16QAM	1	1	23.57	23.32	22.87	0-1	1
CP-OFDM QPSK	1	1	23.08	22.54	22.27	0-1.5	1.5

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Table 3-6

NR Band n66 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 15 MHz Bandwidth

NR Band n66 15 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	343500 (1717.5 MHz)	349000 (1745 MHz)	354500 (1772.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.34	24.53	23.95	0	0
	1	40	24.36	24.61	24.17		0
	1	77	24.45	24.57	24.36		0
	36	0	23.92	24.21	23.56	0-0.5	0.5
	36	22	24.27	24.54	24.12	0	0
	36	43	24.15	24.12	23.77	0-0.5	0.5
	75	0	23.90	24.15	23.85		0.5
DFT-s-OFDM QPSK	1	1	24.25	24.41	23.37	0	0
	1	40	24.25	24.41	23.61		0
	1	77	24.31	24.55	24.17		0
	36	0	23.42	23.54	22.36	0-1	1
	36	22	24.23	24.57	23.51	0	0
	36	43	23.25	23.63	23.12	0-1	1
	75	0	23.32	23.52	22.63		1
DFT-s-OFDM 16QAM	1	1	23.43	23.64	22.56	0-1	1
CP-OFDM QPSK	1	1	22.97	23.02	22.01	0-1.5	1.5

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Table 3-7

NR Band n66 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 10 MHz Bandwidth

NR Band n66 10 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	343000 (1715 MHz)	349000 (1745 MHz)	355000 (1775 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.41	24.54	23.89	0	0
	1	26	24.63	24.86	24.45		0
	1	50	24.32	24.62	24.11		0
	25	0	23.97	24.23	23.90	0-0.5	0.5
	25	14	24.26	24.61	24.21	0	0
	25	27	23.70	24.36	24.15	0-0.5	0.5
	50	0	23.94	24.37	23.91		0.5
DFT-s-OFDM QPSK	1	1	24.25	24.02	23.70	0	0
	1	26	24.43	24.67	24.27		0
	1	50	24.21	24.23	24.10		0
	25	0	23.29	23.60	22.70	0-1	1
	25	14	24.27	24.59	24.15	0	0
	25	27	23.36	23.56	23.22	0-1	1
	50	0	23.31	23.55	23.00		1
DFT-s-OFDM 16QAM	1	1	23.53	23.34	22.66	0-1	1
CP-OFDM QPSK	1	1	23.12	22.64	22.20	0-1.5	1.5

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Table 3-8

NR Band n66 (AWS) Measured P_{max} for DSI = 2 (Head) or DSI = 0 (Body-worn, or Phablet with grip sensor not triggered) - 5 MHz Bandwidth

NR Band n66 5 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	342500 (1712.5 MHz)	349000 (1745 MHz)	355500 (1777.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.27	24.40	24.26	0	0
	1	13	24.26	24.68	24.40		0
	1	23	24.22	24.59	24.44		0
	12	0	23.70	24.19	23.83	0-0.5	0.5
	12	7	24.24	24.61	24.22	0	0
	12	13	24.15	24.10	23.77	0-0.5	0.5
	25	0	24.25	24.12	23.81		0.5
DFT-s-OFDM QPSK	1	1	23.96	24.45	24.27	0	0
	1	13	24.21	24.54	24.27		0
	1	23	24.16	24.47	24.09		0
	12	0	23.11	23.51	23.14	0-1	1
	12	7	24.14	24.49	24.14	0	0
	12	13	23.09	23.63	23.25	0-1	1
	25	0	23.12	23.55	23.12		1
DFT-s-OFDM 16QAM	1	1	23.41	23.72	23.45	0-1	1
CP-OFDM QPSK	1	1	22.86	23.24	22.77	0-1.5	1.5

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Table 3-9
NR Band n66 Measured P_{limit} for DSI = 3 (Hotspot mode) / DSI = 1 (Phablet with grip sensor active) and/or
DSI = 4 (Earjack active) - 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	20.18	20.32	20.21	0	0
	1	53	20.28	20.33	20.13		0
	1	104	20.30	20.28	20.10		0
	50	0	20.16	20.30	20.23	0-0.5	0
	50	28	20.11	20.26	20.13	0	0
	50	56	20.16	20.20	20.04	0-0.5	0
	100	0	20.06	20.24	20.17		0
DFT-s-OFDM QPSK	1	1	20.02	20.33	20.24	0	0
	1	53	19.99	20.34	20.17		0
	1	104	20.05	20.21	20.07		0
	50	0	20.02	20.31	20.17	0-1	0
	50	28	19.98	20.28	20.25	0	0
	50	56	20.09	20.20	20.12	0-1	0
	100	0	20.00	20.25	20.07		0
DFT-s-OFDM 16QAM	1	1	20.29	20.52	20.46	0-1	0
CP-OFDM QPSK	1	1	20.06	20.20	20.17	0-1.5	0

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Table 3-10

NR Band n66 Measured P_{limit} for DSI = 3 (Hotspot mode) / DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack active) - 15 MHz Bandwidth

NR Band n66 15 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	343500 (1717.5 MHz)	349000 (1745 MHz)	354500 (1772.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	20.00	20.35	20.32	0	0
	1	40	19.96	20.32	20.28		0
	1	77	20.12	20.44	20.32		0
	36	0	19.96	20.26	20.17	0-0.5	0
	36	22	19.85	20.23	19.99	0	0
	36	43	19.91	20.21	20.03	0-0.5	0
	75	0	19.95	20.18	20.06		0
DFT-s-OFDM QPSK	1	1	19.95	20.03	20.25	0	0
	1	40	19.87	20.01	20.02		0
	1	77	19.92	20.13	20.14		0
	36	0	20.01	20.30	20.09	0-1	0
	36	22	19.85	20.21	20.07	0	0
	36	43	19.85	20.20	20.00	0-1	0
	75	0	19.89	20.24	20.03		0
DFT-s-OFDM 16QAM	1	1	20.21	20.36	20.41	0-1	0
CP-OFDM QPSK	1	1	19.98	20.19	20.27	0-1.5	0

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Table 3-11

NR Band n66 Measured Plimit for DSI = 3 (Hotspot mode) / DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack active) - 10 MHz Bandwidth

NR Band n66 10 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	343000 (1715 MHz)	349000 (1745 MHz)	355000 (1775 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	20.20	20.36	20.05	0	0
	1	26	20.14	20.41	20.41		0
	1	50	20.01	20.36	20.13		0
	25	0	20.00	20.30	19.96	0-0.5	0
	25	14	20.02	20.28	20.03	0	0
	25	27	19.93	20.21	20.01	0-0.5	0
	50	0	20.04	20.25	20.07		0
DFT-s-OFDM QPSK	1	1	19.84	20.25	19.96	0	0
	1	26	20.11	20.32	20.14		0
	1	50	19.94	20.25	19.97		0
	25	0	19.94	20.23	20.04	0-1	0
	25	14	19.97	20.23	20.07	0	0
	25	27	19.91	20.21	19.97	0-1	0
	50	0	19.98	20.25	19.97		0
DFT-s-OFDM 16QAM	1	1	19.99	20.35	20.10	0-1	0
CP-OFDM QPSK	1	1	20.00	20.52	20.05	0-1.5	0

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Table 3-12

NR Band n66 Measured P_{limit} for DSI = 3 (Hotspot mode) / DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack active) - 5 MHz Bandwidth

NR Band n66 5 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	342500 (1712.5 MHz)	349000 (1745 MHz)	355500 (1777.5 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	19.95	20.41	20.15	0	0
	1	13	20.10	20.32	20.13		0
	1	23	19.96	20.44	20.25		0
	12	0	19.77	20.18	20.01	0-0.5	0
	12	7	19.81	20.33	20.01	0	0
	12	13	19.88	20.19	19.94	0-0.5	0
	25	0	19.82	20.19	19.96		0
DFT-s-OFDM QPSK	1	1	19.88	20.26	20.08	0	0
	1	13	19.85	20.17	20.00		0
	1	23	19.77	20.22	19.94		0
	12	0	19.77	20.10	20.01	0-1	0
	12	7	19.87	20.17	19.93	0	0
	12	13	19.84	20.18	19.96	0-1	0
	25	0	19.84	20.18	19.95		0
DFT-s-OFDM 16QAM	1	1	20.05	20.45	20.12	0-1	0
CP-OFDM QPSK	1	1	19.88	20.21	19.89	0-1.5	0

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3.1.3

NR Band n41

Table 3-13
NR Band n41 Measured P_{max} for all DSI - 100 MHz Bandwidth

NR Band n41 100 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			518598 (2592.99 MHz) Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.00	0	0
	1	137	23.96		0
	1	271	23.92		0
	135	0	23.22	0-0.5	0.5
	135	69	23.93	0	0
	135	138	23.50	0-0.5	0.5
	270	0	23.33		0.5
DFT-s-OFDM QPSK	1	1	23.81	0	0
	1	137	23.99		0
	1	271	23.85		0
	135	0	22.83	0-1	1
	135	69	23.81	0	0
	135	138	23.25	0-1	1
	270	0	22.73		1
DFT-s-OFDM 16QAM	1	1	22.69	0-1	1
CP-OFDM QPSK	1	1	22.45	0-1.5	1.5

Note: NR Band n41 at 100 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, 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.

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Table 3-14
NR Band n41 Measured P_{max} for all DSI - 90 MHz Bandwidth

NR Band n41 90 MHz Bandwidth						
			Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	508200 (2541 MHz)	528996 (2644.98 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.14	23.46	0	0
	1	123	23.15	23.86		0
	1	243	23.12	24.03		0
	120	0	22.91	23.47	0-0.5	0.5
	120	63	23.08	24.02	0	0
	120	125	22.51	23.51	0-0.5	0.5
	243	0	22.66	23.56		0.5
DFT-s-OFDM QPSK	1	1	23.23	23.70	0	0
	1	123	23.19	24.02		0
	1	243	23.17	23.99		0
	120	0	22.22	22.78	0-1	1
	120	63	23.23	24.07	0	0
	120	125	22.00	22.76	0-1	1
	243	0	22.11	23.12		1
DFT-s-OFDM 16QAM	1	1	21.92	22.71	0-1	1
CP-OFDM QPSK	1	1	21.50	22.45	0-1.5	1.5

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Table 3-15
NR Band n41 Measured P_{max} for all DSI - 80 MHz Bandwidth

NR Band n41 80 MHz Bandwidth						
			Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	507204 (2536.02 MHz)	529998 (2649.99 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.29	24.15	0	0
	1	109	23.23	24.19		0
	1	215	23.23	24.26		0
	108	0	22.82	23.64	0-0.5	0.5
	108	55	23.33	24.05	0	0
	108	109	22.68	23.48	0-0.5	0.5
	216	0	22.80	23.56		0.5
DFT-s-OFDM QPSK	1	1	23.45	23.85	0	0
	1	109	23.94	24.00		0
	1	215	23.48	24.22		0
	108	0	22.33	23.04	0-1	1
	108	55	23.41	23.80	0	0
	108	109	22.10	23.19	0-1	1
	216	0	22.25	23.14		1
DFT-s-OFDM 16QAM	1	1	22.08	22.70	0-1	1
CP-OFDM QPSK	1	1	21.98	22.57	0-1.5	1.5

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Table 3-16
NR Band n41 Measured P_{max} for all DSI - 60 MHz Bandwidth

NR Band n41 60 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	505200 (2526 MHz)	518598 (2592.99 MHz)	531996 (2659.98 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.44	23.72	23.85	0	0
	1	81	23.63	23.64	24.04		0
	1	160	23.27	23.85	24.08		0
	81	0	22.65	23.00	23.21	0-0.5	0.5
	81	41	23.32	23.65	23.98	0	0
	81	81	22.72	23.36	23.25	0-0.5	0.5
	162	0	22.55	23.36	23.43		0.5
DFT-s-OFDM QPSK	1	1	23.26	23.63	23.92	0	0
	1	81	23.40	23.77	24.06		0
	1	160	23.16	23.75	24.08		0
	81	0	22.29	22.52	23.15	0-1	1
	81	41	23.52	23.57	23.76	0	0
	81	81	22.07	22.76	22.89	0-1	1
	162	0	22.12	22.65	22.97		1
DFT-s-OFDM 16QAM	1	1	22.02	22.78	22.82	0-1	1
CP-OFDM QPSK	1	1	21.82	22.52	22.61	0-1.5	1.5

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Table 3-17
NR Band n41 Measured P_{max} for all DSI - 50 MHz Bandwidth
NR Band n41
50 MHz Bandwidth

			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	504204 (2521.02 MHz)	518598 (2592.99 MHz)	532998 (2664.99 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.29	23.58	24.11	0	0
	1	67	23.36	23.76	24.04		0
	1	131	23.32	23.82	23.72		0
	64	0	22.72	23.31	23.39	0-0.5	0.5
	64	35	23.11	23.84	24.01	0	0
	64	69	22.76	23.59	23.77	0-0.5	0.5
	128	0	22.66	23.15	23.51		0.5
DFT-s-OFDM QPSK	1	1	23.27	23.55	24.04	0	0
	1	67	23.43	23.69	23.92		0
	1	131	23.31	23.83	23.80		0
	64	0	22.29	22.75	23.02	0-1	1
	64	35	23.47	23.80	24.09	0	0
	64	69	22.14	23.07	23.19	0-1	1
	128	0	22.37	22.90	23.12		1
DFT-s-OFDM 16QAM	1	1	21.88	22.54	22.81	0-1	1
CP-OFDM QPSK	1	1	21.70	22.21	22.59	0-1.5	1.5

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Table 3-18
NR Band n41 Measured P_{max} for all DSI - 40 MHz Bandwidth

NR Band n41 40 MHz Bandwidth								
			Channel				MPR Allowed per 3GPP [dB]	MPR Allowed per 3GPP [dB]
Modulation	RB Size	RB Offset	503202 (2516.01 MHz)	513468 (2567.34 MHz)	523734 (2618.67 MHz)	534000 (2670 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.51	23.81	24.33	24.45	0	0
	1	53	23.80	24.09	24.32	24.36		0
	1	104	23.69	24.11	24.10	24.47		0
	50	0	23.22	23.39	23.96	23.86	0-0.5	0.5
	50	28	23.64	23.84	24.23	24.32	0	0
	50	56	23.14	23.56	23.92	23.87	0-0.5	0.5
	100	0	22.45	23.22	23.56	23.57		0.5
DFT-s-OFDM QPSK	1	1	23.54	23.81	23.99	24.44	0	0
	1	53	23.77	23.87	24.40	24.32		0
	1	104	23.64	24.17	24.45	24.41		0
	50	0	22.54	22.70	23.15	23.36	0-1	1
	50	28	23.63	23.95	24.31	24.34	0	0
	50	56	22.55	23.01	23.20	23.32	0-1	1
	100	0	22.52	22.92	23.34	23.42		1
DFT-s-OFDM 16QAM	1	1	22.35	22.61	23.01	23.09	0-1	1
CP-OFDM QPSK	1	1	22.06	22.36	22.69	22.86	0-1.5	1.5

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Table 3-19
NR Band n41 Measured P_{max} for all DSI - 20 MHz Bandwidth

NR Band n41 20 MHz Bandwidth									
			Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	501204 (2506.02 MHz)	509898 (2549.49 MHz)	518598 (2592.99 MHz)	527298 (2636.49 MHz)	535998 (2679.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.79	23.38	24.17	24.38	24.04	0	0
	1	26	23.66	23.33	24.14	24.09	24.09		0
	1	49	23.88	23.49	24.30	24.26	24.26		0
	25	0	22.97	22.54	23.54	23.66	23.83	0-0.5	0.5
	25	13	23.87	23.55	24.05	24.33	24.20	0	0
	25	26	22.89	22.49	23.28	23.51	23.57	0-0.5	0.5
	50	0	22.88	22.59	23.31	23.41	23.84		0.5
DFT-s-OFDM QPSK	1	1	23.77	23.26	24.16	24.12	24.37	0	0
	1	26	23.85	23.44	24.15	24.15	24.33		0
	1	49	23.65	23.36	24.05	24.25	24.19		0
	25	0	22.31	22.06	23.09	23.07	23.26	0-1	1
	25	13	23.65	23.08	23.92	24.08	24.15	0	0
	25	26	22.38	22.21	22.83	22.84	23.27	0-1	1
	50	0	22.37	22.05	22.92	22.97	23.26		1
DFT-s-OFDM 16QAM	1	1	22.45	22.37	23.23	23.24	23.21	0-1	1
CP-OFDM QPSK	1	1	21.96	22.06	22.28	22.35	22.51	0-1.5	1.5

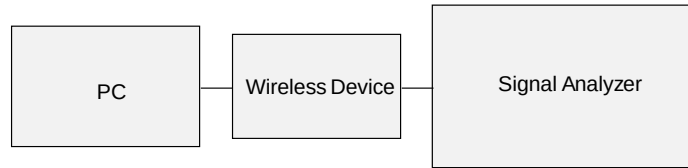


Figure 3-1
Power Measurement Setup

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4 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9020A	MXA Signal Analyzer	4/20/2019	Annual	4/20/2020	US46470561
Pasternack	NC-100	Torque Wrench	5/23/2018	Biennial	5/23/2020	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406

Note: 1) CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

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