FCC RF Test Report

APPLICANT	:	Nokia Shanghai Bell Co., Ltd.
EQUIPMENT	:	Nokia FastMile 5G Receiver High Gain
BRAND NAME	:	Nokia
MODEL NAME	:	5G16-A
FCC ID	:	2ADZR5G16A
STANDARD	:	47 CFR Part 2, 27
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)
TEST DATE(S)	:	Apr. 24, 2023 ~ Jun. 13, 2023

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

This report contains data that were produced under subcontract by Sporton International Inc. (Shenzhen).

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ilac-MRA

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG341901H	Rev. 01	Initial issue of report	Jun. 20, 2023

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power (5G NR n12, n66)	Reporting Only	PASS	-
	§2.1046 §27.50(h)(2)	Conducted Output Power (5G NR n7, n41, n38)	< 2 Watt		
	§27.50(c)(3)	Effective Radiated Power (5G NR n12)	ERP < 1000 Watt		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (5G NR n66)	EIRP < 1 Watt		
3.5	N/A	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §27.53(h) §27.53(g) §27.53(m)(2)(v)	Conducted Band Edge Measurement (5G NR n66) (5G NR n12) (5G NR n7, n41, n38)	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §27.53(h) §27.53(g) §27.53(m)(2)(v)	Conducted Spurious Emission (5G NR n66) (5G NR n12) (5G NR n7, n41, n38)	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §27.54	Frequency Stability Temperature & Voltage	Within Authorized Band	PASS	-
4.4	§2.1053 §27.53(h) §27.53(g) §27.53(m)(2)(v)	Radiated Spurious Emission (5G NR n66) (5G NR n12) (5G NR n7, n41, n38)	< 43+10log10(P[Watts])	PASS	Under limit 17.80 dB at 5092.00 MHz

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Nokia Shanghai Bell Co., Ltd.
388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2 Manufacturer

Nokia Solutions and Networks Oy
Karakaari 7, 02610 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Nokia FastMile 5G Receiver High Gain
Brand Name	Nokia
Model Name	5G16-A
FCC ID	2ADZR5G16A
IMEI Code	Conducted: 355231280005192 Radiation: 355231280005010
HW Version	3TG02369Axxx, x:A~Z
SW Version	5GReceiver-HG-2_D230200B31T0001E0147
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n38 : 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1755 MHz
Rx Frequency	5G NR n7 : 2620 MHz ~ 2690 MHz 5G NR n12: 729 MHz ~ 746 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 2110 MHz~ 2155 MHz
Bandwidth	**For SCS 15kHz:** n7: 5MHz/ 10MHz/ 15MHz/ 20MHz/ 25MHz/ 30MHz/ 40MHz/ 50MHz n12: 5MHz/ 10MHz/ 15MHz n38: 5MHz/ 10MHz/ 15MHz/ 20MHz/ 25MHz/ 30MHz/ 40MHz n41 : 10MHz/ 15MHz/ 20MHz/ 30MHz/ 35MHz/ 40MHz/ 50MHz n66: 5MHz/ 10MHz/ 15MHz/ 20MHz/ 25MHz/ 30MHz/ 35MHz/ 40MHz/ 45MHz **For SCS 30kHz:** n7: 10MHz/ 15MHz/ 20MHz/ 25MHz/ 30MHz/ 40MHz/ 50MHz n12: 10MHz/ 15MHz

<table>
<tr><td></td><td>n38: 10MHz/ 15MHz/ 20MHz/ 25MHz/ 30MHz/ 40MHz
n41 : 10MHz/ 15MHz/ 20MHz/ 30MHz/ 35MHz/ 40MHz/ 50MHz/ 60MHz/ 70MHz/ 80MHz/ 90MHz/ 100MHz
n66: 10MHz/ 15MHz/ 20MHz/ 25MHz/ 30MHz/ 35MHz/ 40MHz/ 45MHz</td></tr>
<tr><td>SCS</td><td>15kHz, 30kHz</td></tr>
<tr><td>Antenna Gain Description</td><td>
<table>
<tr><th>NR Band</th><th>Mode</th><th>Ant. 0</th><th>Ant. 1</th><th>Ant. 4</th><th>Ant. 5</th></tr>
<tr><td rowspan="2">n7</td><td>SA</td><td>15.89dBi</td><td></td><td>-</td><td>-</td></tr>
<tr><td>NSA</td><td></td><td>16.41dBi</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">n12</td><td>SA</td><td>-</td><td>-</td><td>1.25dBi</td><td></td></tr>
<tr><td>NSA</td><td>-</td><td>-</td><td></td><td>1.28dBi</td></tr>
<tr><td rowspan="2">n38</td><td>SA</td><td></td><td>16.41dBi</td><td>-</td><td>-</td></tr>
<tr><td>UL MIMO</td><td>15.89dBi</td><td>16.41dBi</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">n41</td><td>DC_n41AA/ UL MIMO</td><td>15.89dBi</td><td>16.41dBi</td><td>-</td><td>-</td></tr>
<tr><td>SA/ CA/ Other NSA band</td><td></td><td>16.41dBi</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">n66</td><td>SA/ DC_48A_n66A</td><td>13.72dBi</td><td></td><td>-</td><td>-</td></tr>
<tr><td>Other NSA band</td><td></td><td>12.8dBi</td><td>-</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>Type of Modulation</td><td>CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM</td></tr>
</table>

Remark:

1. 5G NR n38 only support SA mode, n7/n12/n41/n66 support SA and NSA mode. According to the maximum power between SA and NSA mode, SA covers NSA mode for n12/n41/n66, and NSA covers SA mode for n7.
2. 5G NR bands support SCS 15kHz and SCS 30kHz, for n7/n12/n38/n66 only full test SCS 15kHz to cover SCS 30kHz by referring to the maximum output power, for n41 full test SCS 15kHz & SCS 30kHz, CA_n41C only supports SCS 30kHz.
3. 5G NR support antenna switch function, SA mode work on Ant.0/4, NSA mode switch to Ant.1/5, conducted items full test the Ant.0/4 by referring to the maximum output power, RSE test Ant.0/4 for SA mode and Ant.1/5 for NSA mode.
4. 5G NR n38 support Power class 2, and n41 support Power class 1.5.
5. 5G NR n38/n41 support UL MIMO, for UL MIMO mode, the conducted BE/Spurious are tested at single antenna port and add 10*log(NANT) according to KDB 662911 D01.
6. All the supported EN-DC combinations are verified conducted power, only the EN-DC combination with highest power are shown in the report.
7. The EN-DC mode combination could be referred to the product spec.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Maximum Conducted Power and ERP/EIRP and Emission Designator

5G NR n7_15kHz		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
5	2502.5 ~ 2567.5	0.2265	4M48G7D	0.1694	4M47W7D
10	2505.0 ~ 2565.0	0.2254	9M27G7D	0.1726	9M29W7D
15	2507.5 ~ 2562.5	0.2291	14M1G7D	0.1746	14M1W7D
20	2510.0 ~ 2560.0	0.2296	18M9G7D	0.1750	18M9W7D
25	2512.5 ~ 2557.5	0.2178	23M8G7D	0.1683	23M8W7D
30	2515.0 ~ 2555.0	0.2244	28M5G7D	0.1698	28M6W7D
40	2520.0 ~ 2550.0	0.2183	38M5G7D	0.1687	38M6W7D
50	2525.0 ~ 2545.0	0.2360	48M2G7D	0.1841	48M2W7D

5G NR n12_15kHz		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	701.5 ~ 713.5	0.2023	4M48G7D	0.1629	4M47W7D
10	704.0~ 711.0	0.2028	9M29G7D	0.1633	9M29W7D
15	706.5 ~ 708.5	0.2032	14M1G7D	0.1633	14M1W7D

5G NR n38_15kHz		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
5	2572.5 ~ 2617.5	0.4508	4M46G7D	0.3319	4M49W7D
10	2575.0 ~ 2615.0	0.4519	9M29G7D	0.3467	9M32W7D
15	2577.5 ~ 2612.5	0.4246	14M1G7D	0.3436	14M1W7D
20	2580.0 ~ 2610.0	0.4416	18M9G7D	0.3396	19M0W7D
25	2582.5 ~ 2607.5	0.4018	23M7G7D	0.3155	23M7W7D
30	2585.0 ~ 2605.0	0.4111	28M6G7D	0.3177	28M6W7D
40	2590.0 ~ 2600.0	0.4519	38M7G7D	0.3396	38M6W7D

Note: n38 MIMO power is higher than SISO power, the maximum ouput power only show MIMO power here.

5G NR n41 – SCS 15k		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
10	2501.01 ~ 2685.00	0.8610	9M29G7D	0.6209	9M32W7D
15	2503.50 ~ 2682.495	0.8570	14M1G7D	0.6194	14M1W7D
20	2506.005 ~ 2679.99	0.8511	18M9G7D	0.6166	19M0W7D
30	2511.00 ~ 2674.995	0.7980	28M6G7D	0.5741	28M6W7D
35	2513.505 ~ 2672.49	0.7762	33M6G7D	0.5675	33M6W7D
40	2516.01 ~ 2670.00	0.7834	38M7G7D	0.5781	38M6W7D
50	2521.005 ~ 2664.99	0.8750	48M3G7D	0.6501	48M3W7D

5G NR n41 – SCS 30k		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
10	2501.01 ~ 2685.00	0.8299	8M60G7D	0.6368	8M60W7D
15	2503.50 ~ 2682.48	0.8072	13M6G7D	0.6295	13M6W7D
20	2506.02 ~ 2679.99	0.8128	18M3G7D	0.6310	18M2W7D
30	2511.00 ~ 2674.98	0.7534	27M9G7D	0.6012	27M8W7D
35	2513.52 ~ 2672.49	0.7430	32M8G7D	0.5929	32M9W7D
40	2516.01 ~ 2670.00	0.7516	37M8G7D	0.5957	37M9W7D
50	2521.02 ~ 2664.99	0.7178	47M5G7D	0.5649	47M5W7D
60	2526.00 ~ 2659.98	0.7211	57M9G7D	0.5957	57M8W7D
70	2531.01 ~ 2655.00	0.7244	67M4G7D	0.5861	67M5W7D
80	2536.02 ~ 2649.99	0.7047	77M4G7D	0.5521	77M5W7D
90	2541.00 ~ 2644.98	0.7015	87M5G7D	0.5445	87M4W7D
100	2546.01 ~ 2640.00	0.8395	97M5G7D	0.6592	97M6W7D

Note: n41 MIMO power is higher than SISO power, the maximum ouput power only show MIMO power here.

NRCA_n41C – SCS 30k	PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
NR BW 100MHz+90MHz	0.1087	185MG7D	0.1074	186MW7D
NR BW 90MHz+100MHz	0.0752	186MG7D	0.0489	186MW7D
NR BW 100MHz+80MHz	0.0752	176MG7D	0.0492	176MW7D
NR BW 80MHz+100MHz	0.0753	176MG7D	0.0496	177MW7D
NR BW 90MHz+90MHz	0.0747	176MG7D	0.0491	175MW7D
NR BW 90MHz+80MHz	0.0759	166MG7D	0.0489	166MW7D
NR BW 80MHz+90MHz	0.0752	165MG7D	0.0484	166MW7D
NR BW 100MHz+60MHz	0.0757	156MG7D	0.0492	157MW7D
NR BW 60MHz+100MHz	0.0718	156MG7D	0.0478	156MW7D
NR BW 80MHz+80MHz	0.0753	156MG7D	0.0496	156MW7D
NR BW 100MHz+50MHz	0.0760	147MG7D	0.0491	147MW7D
NR BW 50MHz+100MHz	0.0710	146MG7D	0.0473	147MW7D
NR BW 90MHz+60MHz	0.0759	147MG7D	0.0496	147MW7D
NR BW 60MHz+90MHz	0.0728	146MG7D	0.0484	146MW7D
NR BW 100MHz+40MHz	0.0787	137MG7D	0.0507	137MW7D
NR BW 40MHz+100MHz	0.0826	137MG7D	0.0543	137MW7D
NR BW 100MHz+30MHz	0.1055	128MG7D	0.0708	127MW7D
NR BW 30MHz+100MHz	0.0785	127MG7D	0.0513	127MW7D
NR BW 90MHz+50MHz	0.0778	137MG7D	0.0500	137MW7D
NR BW 50MHz+90MHz	0.0733	136MG7D	0.0470	137MW7D
NR BW 80MHz+60MHz	0.0780	137MG7D	0.0502	137MW7D
NR BW 60MHz+80MHz	0.0705	137MG7D	0.0460	137MW7D
NR BW 90MHz+40MHz	0.0767	127MG7D	0.0507	127MW7D
NR BW 40MHz+90MHz	0.0726	127MG7D	0.0487	128MW7D
NR BW 80MHz+50MHz	0.0863	127MG7D	0.0574	127MW7D
NR BW 50MHz+80MHz	0.0815	126MG7D	0.0552	128MW7D
NR BW 80MHz+30MHz	0.1069	107MG7D	0.0723	108MW7D
NR BW 30MHz+80MHz	0.0791	106MG7D	0.0529	107MW7D
NR BW 100MHz+20MHz	0.1077	118MG7D	0.0718	118MW7D
NR BW 20MHz+100MHz	0.0716	117MG7D	0.0467	118MW7D
NR BW 80MHz+40MHz	0.0759	117MG7D	0.0500	117MW7D
NR BW 40MHz+80MHz	0.0730	117MG7D	0.0484	117MW7D
NR BW 60MHz+60MHz	0.0747	118MG7D	0.0496	117MW7D
NR BW 100MHz+15MHz	0.1079	113MG7D	0.0723	113MW7D
NR BW 15MHz+100MHz	0.0687	112MG7D	0.0456	113MW7D
NR BW 100MHz+10MHz	0.1079	108MG7D	0.0723	108MW7D
NR BW 10MHz+100MHz	0.0453	107MG7D	0.0306	108MW7D

NR BW 90MHz+20MHz	0.1074	107MG7D	0.0723	108MW7D
NR BW 20MHz+90MHz	0.0716	107MG7D	0.0480	107MW7D
NR BW 90MHz+30MHz	0.1072	116MG7D	0.0723	117MW7D
NR BW 30MHz+90MHz	0.0813	117MG7D	0.0566	117MW7D
NR BW 60MHz+50MHz	0.0747	107MG7D	0.0500	107MW7D
NR BW 50MHz+60MHz	0.0753	107MG7D	0.0500	107MW7D
NR BW 90MHz+15MHz	0.1077	102MG7D	0.0723	103MW7D
NR BW 15MHz+90MHz	0.0678	102MG7D	0.0456	103MW7D

EN_DC_(n)41AA – SCS 15k		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)		Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
NR BW10MHz	LTE BW20MHz	0.3573	26M4G7D	0.2999	26M4W7D
NR BW 15MHz	LTE BW20MHz	0.3597	33M5G7D	0.2958	33M4W7D
NR BW 20MHz	LTE BW20MHz	0.3864	35M6G7D	0.3006	35M9W7D
NR BW 30MHz	LTE BW20MHz	0.3656	48M0G7D	0.2958	48M2W7D
NR BW 35MHz	LTE BW20MHz	0.3784	50M4G7D	0.3034	50M2W7D
NR BW 40MHz	LTE BW20MHz	0.3673	55M4G7D	0.2838	54M9W7D
NR BW 50MHz	LTE BW20MHz	0.4055	64M6G7D	0.3258	65M7W7D

EN_DC_(n)41AA – SCS 30k		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)		Maximum Conducted power (W)	Emission Designator (99%OBW)	Maximum Conducted power (W)	Emission Designator (99%OBW)
NR BW10MHz	LTE BW20MHz	0.3581	26M0G7D	0.2965	26M3W7D
NR BW 15MHz	LTE BW20MHz	0.3614	30M5G7D	0.3041	30M9W7D
NR BW 20MHz	LTE BW20MHz	0.3750	37M9G7D	0.2793	38M0W7D
NR BW 30MHz	LTE BW20MHz	0.3715	45M2G7D	0.3069	45M4W7D
NR BW 35MHz	LTE BW20MHz	0.3882	52M5G7D	0.3055	52M8W7D
NR BW 40MHz	LTE BW20MHz	0.3741	54M6G7D	0.3041	54M8W7D
NR BW 50MHz	LTE BW20MHz	0.3614	67M6G7D	0.2924	67M3W7D
NR BW 60MHz	LTE BW20MHz	0.3540	74M8G7D	0.3062	75M6W7D
NR BW 70MHz	LTE BW20MHz	0.3758	85M2G7D	0.3055	85M2W7D
NR BW 80MHz	LTE BW20MHz	0.3873	94M5G7D	0.3041	97M3W7D
NR BW 90MHz	LTE BW20MHz	0.3589	106MG7D	0.2871	106MW7D
NR BW 100MHz	LTE BW20MHz	0.4121	116MG7D	0.3350	115MW7D

5G NR n66 – SCS 15k		PI/2 BPSK / QPSK		16QAM / 64QAM / 256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)
5	1712.5 ~ 1752.5	0.8035	4M48G7D	0.6668	4M47W7D
10	1715.0 ~ 1750.0	0.8110	9M27G7D	0.6592	9M26W7D
15	1717.5 ~ 1747.5	0.7816	14M0G7D	0.6368	14M1W7D
20	1720.0 ~ 1745.0	0.7780	18M8G7D	0.6412	18M9W7D
25	1722.5 ~ 1742.5	0.7464	23M6G7D	0.6281	23M6W7D
30	1725.0 ~ 1740.0	0.7413	28M5G7D	0.6081	28M4W7D
35	1727.5 ~ 1737.5	0.7534	33M3G7D	0.6095	33M4W7D
40	1730.0 ~ 1735.0	0.7464	38M3G7D	0.5794	38M4W7D
45	1732.5	0.8222	43M1G7D	0.6295	43M0W7D

Note:

1. 5G NR Band n41 overlaps the entire frequency range of Band n38. Therefore, the conducted test results provided in this report covers Band n41 as well as Band n38, and 5G NR n38 additional test BW 5MHz & 25MHz for SCS 15kHz.
2. All modulations have been tested, only the worst test results of PSK & QAM are shown in the report.
3. 5G NR n41AA / n41C supported bandwidth combinations and frequency are followed 3GPP 38.508-1.

1.7 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS	CN1257	314309

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	TH01-SZ	CN1256	421272

Test data subcontracted: Conducted test cases in section 3 of this report.

1.8 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-KS	AUDIX	E3	6.2009-8-24al

1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 27
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.

Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

Test Items	5G NR	Bandwidth (MHz)													Modulation					RB #		Test Channel		
		5	10	15	20	25	30	35	40	45	50	60	70~90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Full	L	M	H
Max. Output Power	n7	v	v	v	v	v	v	-	v	-	v	-	-	-	v	v	v	v	v	v	v	v	v	v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n38	v	v	v	v	v	v	-	v	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n41	-	v	v	v	-	v	v	v	-	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	n66	v	v	v	v	v	v	v	v	v	-	-	-	-	v	v	v	v	v	v	v	v	v	v
Peak-to-Average Ratio	n7				v			-		-		-	-	-	v	v				v	v	v	v	v
	n12		v		-	-	-	-	-	-	-	-	-	-	v	v				v	v	v	v	v
	n41	-			v	-				-					v	v				v	v	v	v	v
	n66				v						-	-	-	-	v	v				v	v	v	v	v
26dB and 99% Bandwidth	n7	v	v	v	v	v	v	-	v	-	v	-	-	-	v	v	v	v	v		v		v	
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v		v		v	
	n38	v				v		-		-	-	-	-	-	v	v	v	v	v		v		v	
	n41	-	v	v	v	-	v	v	v	-	v	v	v	v	v	v	v	v	v		v		v	
	n66	v	v	v	v	v	v	v	v	v	-	-	-	-	v	v	v	v	v		v		v	
Conducted Band Edge	n7	v			v			-		-	v	-	-	-	v	v				v	v	v		v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v				v	v	v		v
	n38	v				v		-		-	-	-	-	-	v	v				v	v	v		v

Test Items	5G NR	Bandwidth (MHz)													Modulation					RB #		Test Channel		
		5	10	15	20	25	30	35	40	45	50	60	70~90	100	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Full	L	M	H
	n41	-	v			-	v			-	v			v	v	v				v	v	v		v
	n66	v				v				v	-	-	-	-	v	v				v	v	v		v
Conducted Spurious Emission	n7	v			v			-		-	v	-	-	-	v	v				v		v	v	v
	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v				v		v	v	v
	n38	v				v		-		-	-	-	-	-	v	v				v		v	v	v
	n41	-	v			-	v			-	v			v	v	v				v		v	v	v
	n66	v				v				v	-	-	-	-	v	v				v		v	v	v
Frequency Stability	n7				v			-		-		-	-	-		v					v		v	
	n12		v		-	-	-	-	-	-	-	-	-	-		v					v		v	
	n41	-			v	-				-						v					v		v	
	n66				v						-	-	-	-		v					v		v	
E.R.P/E.I.R.P	n12	v	v	v	-	-	-	-	-	-	-	-	-	-	v	v	v	v	v	v	v	v	v	v
	n66	v	v	v	v	v	v	v	v	v	-	-	-	-	v	v	v	v	v	v	v	v	v	v
Radiated Spurious Emission	n7	Worst Case																					v	
	n12	Worst Case																					v	
	n41	Worst Case																					v	
	n66	Worst Case																					v	

Note

1. The mark "**v** " means that this configuration is chosen for testing
2. The mark "-" means that this bandwidth is not supported.
3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.
4. Frequency Stability: Normal Voltage = 54V ; Low Voltage = 48V ; High Voltage = 57V.
5. All test items are based on engineering evaluation.

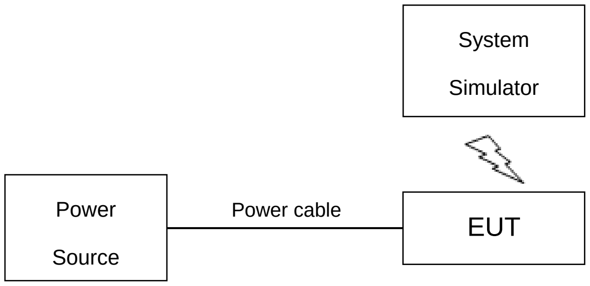
Test Cases	Band	Bandwidth (MHz)	Modulation	RB #	Test Channel
		eg. 10+20M, 15+20M, 20+20, 30+20M, 35+20M, 40+20M, 50+20M, 60+20M, 70+20M, 80+20M, 90+20M, 100+20M	eg. PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L/M/H
Max. Output Power	n41AA	All supported Bandwidth	All Modulation	1RB, Full RB	L, M, H
Peak-to-Average Ratio	n41AA	20+20M	PI/2 BPSK, QPSK	1RB, Full RB	L, M, H
26dB and 99% Bandwidth	n41AA	All supported Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	Full RB	M
Conducted Band Edge	n41AA	10+20M, 30+20M, 50+20M, 100+20M (SCS30k only)	PI/2 BPSK, QPSK	1RB, Full RB	L, H
Conducted Spurious Emission	n41AA	10+20M, 30+20M, 50+20M, 100+20M (SCS30k only)	PI/2 BPSK, QPSK	1RB	L, M, H
Frequency Stability	n41AA	20+20M	PI/2 BPSK	Full RB	M
Radiated Spurious Emission	n41AA	Worst case from maximum power			M

Note:
1. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.
2. All test items are based on engineering evaluation.
3. Frequency Stability: Normal Voltage = 54V ; Low Voltage = 48V ; High Voltage = 57V.

Test Cases	Band	Bandwidth (MHz)	Modulation	RB #	Test Channel
		eg. 10+100M, 15+90M, 15+100, 20+90M, 20+100M, 30+80M, 30+90M, 30+100M, 40+80M, 40+90M, 40+100M, 50+60M, 50+80M, 50+90M, 50+100M, 60+50M, 60+60M, 60+80M, 60+90M, 60+100M, 80+30M, 80+40M, 80+50M, 80+60M, 80+80M, 80+90M, 80+100M, 90+15M, 90+20M, 90+30M, 90+40M, 90+50M, 90+60M, 90+80M, 90+90M, 90+100M, 100+10M, 100+15M, 100+20M, 100+30M, 100+40M, 100+50M, 100+60M, 100+80M, 100+90M	eg. PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1RB, Partial RB, Full RB	L/M/H
Max. Output Power	n41C	All supported Bandwidth	All Modulation	1RB, Full RB	L, M, H
26dB and 99% Bandwidth	n41C	All supported Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	Full RB	M
Conducted Band Edge	n41C	15+90M, 100+40M, 100+90M	PI/2 BPSK, QPSK	1RB, Full RB	L, H
Conducted Spurious Emission	n41C	15+90M, 100+40M, 100+90M	PI/2 BPSK, QPSK	1RB, Full RB	L, M, H
Radiated Spurious Emission	n41C	Worst case from maximum power			M

Note:
1. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.
2. All test items are based on engineering evaluation.

2.2 Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

For detail, please refer to test mode configuration and setup photographs for each test item.

The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application.

2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GW	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss.

Offset = RF cable loss.

Following shows an offset computation example with cable loss 8.4 dB.

Example :

Offset(dB) = RF cable loss(dB).

= 8.4 (dB)

2.5 Frequency List of Low/Middle/High Channels

5G NR n7 Channel and Frequency List for SCS 15k/30k				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
50	Channel	505000	507000	509000
	Frequency	2525	2535	2545
40	Channel	504000	507000	510000
	Frequency	2520	2535	2550
30	Channel	503000	507000	511000
	Frequency	2515	2535	2555
25	Channel	502500	507000	511500
	Frequency	2512.5	2535	2557.5
20	Channel	502000	507000	512000
	Frequency	2510	2535	2560
15	Channel	501500	507000	512500
	Frequency	2507.5	2535	2562.5
10	Channel	501000	507000	513000
	Frequency	2505	2535	2565
5	Channel	500500	507000	513500
	Frequency	2502.5	2535	2567.5

5G NR n12 Channel and Frequency List for SCS 15k/30k				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	141300	141500	141700
	Frequency	706.5	707.5	708.5
10	Channel	140800	141500	142200
	Frequency	704	707.5	711
5	Channel	140300	141500	142700
	Frequency	701.5	707.5	713.5

5G NR n38 Channel and Frequency List for SCS 15k/30k				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	518000	519000	520000
	Frequency	2590	2595	2600
30	Channel	517000	519000	521000
	Frequency	2585	2595	2605
25	Channel	516500	519000	521500
	Frequency	2582.5	2595	2607.5
20	Channel	516000	519000	522000
	Frequency	2580	2595	2610
15	Channel	515500	519000	522500
	Frequency	2577.5	2595	2612.5
10	Channel	515000	519000	523000
	Frequency	2575	2595	2615
5	Channel	514500	519000	523500
	Frequency	2572.5	2595	2617.5

5G NR n41 Channel and Frequency List for SCS 15k				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
50	Channel	504201	518601	532998
	Frequency	2521.005	2593.005	2664.99
40	Channel	503202	518601	534000
	Frequency	2516.01	2593.005	2670
35	Channel	502701	518601	534498
	Frequency	2513.505	2593.005	2672.49
30	Channel	502200	518601	534999
	Frequency	2511	2593.005	2674.995
20	Channel	501201	518601	535998
	Frequency	2506.005	2593.005	2679.99
15	Channel	500700	518601	536499
	Frequency	2503.5	2593.005	2682.495
10	Channel	500202	518601	537000
	Frequency	2501.01	2593.005	2685

5G NR n41 Channel and Frequency List for SCS 30k				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	509202	518598	528000
	Frequency	2546.01	2592.99	2640
90	Channel	508200	518598	528996
	Frequency	2541	2592.99	2644.98
80	Channel	507204	518598	529998
	Frequency	2536.02	2592.99	2649.99
70	Channel	506202	518598	531000
	Frequency	2531.01	2592.99	2655
60	Channel	505200	518598	531996
	Frequency	2526	2592.99	2659.98
50	Channel	504204	518598	532998
	Frequency	2521.02	2592.99	2664.99
40	Channel	503202	518598	534000
	Frequency	2516.01	2592.99	2670
35	Channel	502704	518598	534498
	Frequency	2513.52	2592.99	2672.49
30	Channel	502200	518598	534996
	Frequency	2511	2592.99	2674.98
20	Channel	501204	518598	535998
	Frequency	2506.02	2592.99	2679.99
15	Channel	500700	518598	536496
	Frequency	2503.5	2592.99	2682.48
10	Channel	500202	518598	537000
	Frequency	2501.01	2592.99	2685

5G NR n66 Channel and Frequency List for SCS 15k/30k				
BW [MHz]	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
45	Channel	-	346500	-
	Frequency	-	1732.5	-
40	Channel	346000	346500	347000
	Frequency	1730	1732.5	1735
35	Channel	345500	346500	347500
	Frequency	1727.5	1732.5	1737.5
30	Channel	345000	346500	348000
	Frequency	1725	1732.5	1740
25	Channel	344500	346500	348500
	Frequency	1722.5	1732.5	1742.5
20	Channel	344000	346500	349000
	Frequency	1720	1732.5	1745
15	Channel	343500	346500	349500
	Frequency	1717.5	1732.5	1747.5
10	Channel	343000	346500	350000
	Frequency	1715	1732.5	1750
5	Channel	342500	346500	350500
	Frequency	1712.5	1732.5	1752.5

Note: 5G NR n7/n12/n38/n66 not support BW 5MHz for SCS 30kHz.

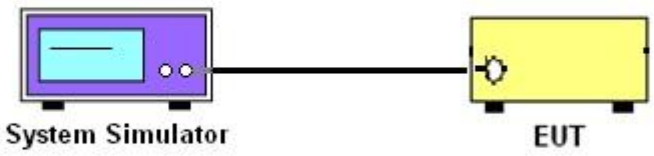
3 Conducted Test Items

3.1 Measuring Instruments

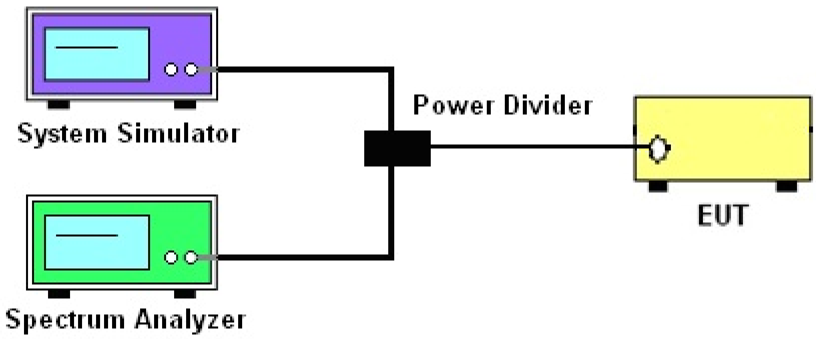
See list of measuring instruments of this test report.

3.2 Test Setup

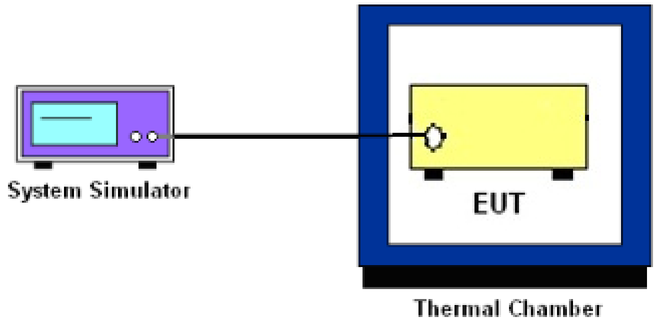
3.2.1 Conducted Output Power



3.2.2 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP/EIRP

3.4.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

All user stations are limited to 2.0 watts transmitter output power for 5G NR n7, n38 and n41.

The ERP of Fixed transmitters must not exceed 1000 Watts for 5G NR n12.

The EIRP of Fixed transmitters must not exceed 1 Watts for 5G NR n66.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

Or use the Peak – Average method:

1. The testing follows ANSI C63.26 Section 5.2.6 (PAPR).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set EUT in maximum power output.
4. Set the RBW = 1MHz, VBW = 3MHz, Detector = Peak, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
5. Set the RBW = 1MHz, VBW = 3MHz, Detector = power averaging, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
6. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission.
7. PAPR (dB) = PPk (dBm) − PAvg (dBm)

   where

   PAPR peak-to-average power ratio, in dB

   P_{Pk} measured peak power level, in dBm

   P_{Avg} measured average power level, in dBm
8. Record the deviation as Peak to Average Ratio.

3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

27.53 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + $10\log_{10}$(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (g)

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

27.53(m)(2)(v)

For all fixed digital user stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used (generally limited to no less than 1% of the OBW) and the measured power was integrated over the full required measurement bandwidth.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.
   Example:
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
9. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10^{th} harmonic.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

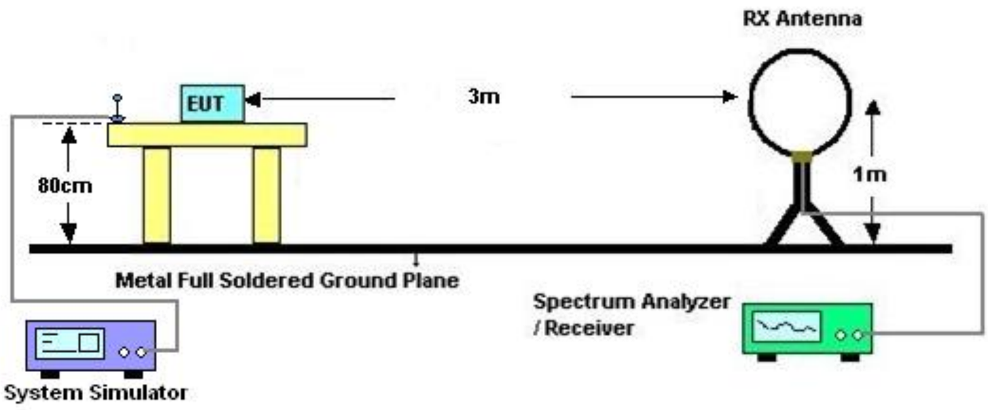
4 Radiated Test Items

4.1 Measuring Instruments

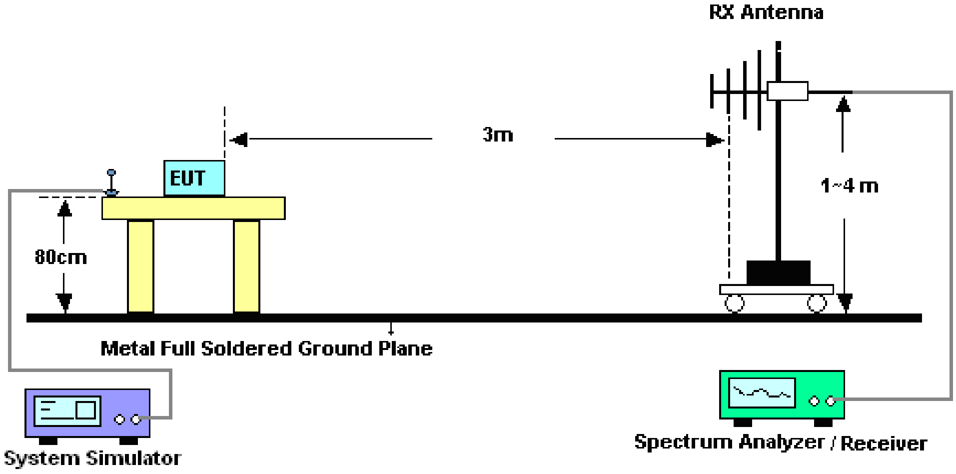
See list of measuring instruments of this test report.

4.2 Test Setup

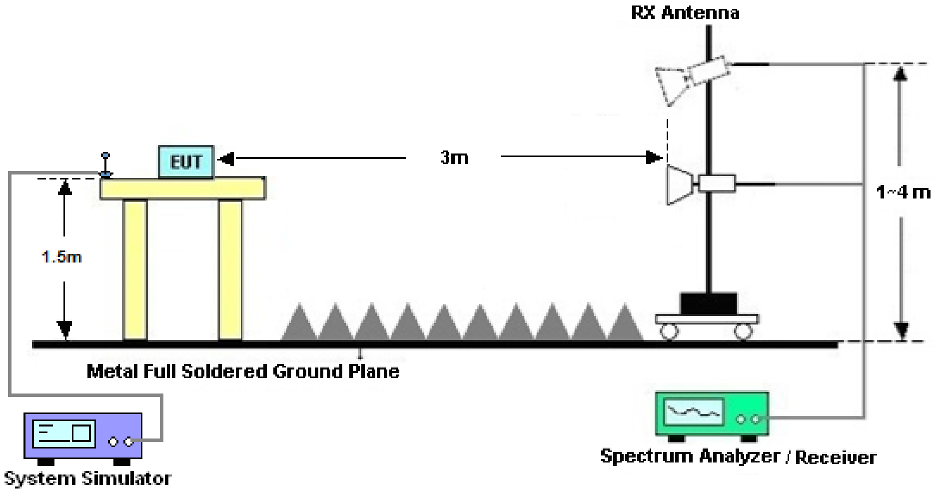
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 07, 2022	Apr. 24, 2023~ Jun. 13, 2023	Jul. 06, 2023	Conducted (TH01-SZ)
Power Divider	TOJOIN	PS-2SM-04 265	60.06.020.007 7	0.4GHz~26.5GHz	Dec. 25, 2022	Apr. 24, 2023~ Jun. 13, 2023	Dec. 24, 2023	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 07, 2022	Apr. 24, 2023~ Jun. 13, 2023	Jul. 06, 2023	Conducted (TH01-SZ)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 12, 2022	May 30, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 16, 2022	May 30, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Apr. 09, 2023	May 30, 2023	Apr. 08, 2024	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Oct. 16, 2022	May 30, 2023	Oct. 15, 2023	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	May 30, 2023	Jan. 07, 2024	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 11, 2022	May 30, 2023	Jul. 10, 2023	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40G GA	060728	18~40GHz	Jan. 05, 2023	May 30, 2023	Jan. 04, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18G A	060840	1Ghz-18Ghz	Oct. 12, 2022	May 30, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 12, 2022	May 30, 2023	Oct. 11, 2023	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 30, 2023	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 30, 2023	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 30, 2023	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±1.34 dB
Conducted Emissions	±1.34 dB
Occupied Channel Bandwidth	±0.13 %

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.82 dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.56 dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.54 dB

----------- THE END -----------

Appendix A. Test Results of Conducted Test

Test Engineer :	Jung Guo	**Temperature :**	22~23℃
		Relative Humidity :	40~42%

Software Version: 23.04.1202

FR1 ENDC_2A_n7A (ANT0+1) – SCS 15k

Transmitter Conducted Output Power

NR Band	SCS	Band Width	Arfcn	Freq (MHz)	Modulation	RB	Conducted Power (dBm)	Conducted Power (W)
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@1	23.42	0.2198
7	15	5	500500	2502.5	DFT-s-OFDM 16 QAM	1@1	22.24	0.1675
7	15	5	507000	2535	DFT-s-OFDM QPSK	1@1	23.55	0.2265
7	15	5	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.29	0.1694
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@1	23.48	0.2228
7	15	5	513500	2567.5	DFT-s-OFDM 16 QAM	1@1	22.24	0.1675
7	15	10	501000	2505	DFT-s-OFDM QPSK	1@1	23.39	0.2183
7	15	10	501000	2505	DFT-s-OFDM 16 QAM	1@1	22.29	0.1694
7	15	10	507000	2535	DFT-s-OFDM QPSK	1@1	23.52	0.2249
7	15	10	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.37	0.1726
7	15	10	513000	2565	DFT-s-OFDM QPSK	1@1	23.53	0.2254
7	15	10	513000	2565	DFT-s-OFDM 16 QAM	1@1	22.36	0.1722
7	15	15	501500	2507.5	DFT-s-OFDM QPSK	1@1	23.41	0.2193
7	15	15	501500	2507.5	DFT-s-OFDM 16 QAM	1@1	22.29	0.1694
7	15	15	507000	2535	DFT-s-OFDM QPSK	1@1	23.6	0.2291
7	15	15	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.42	0.1746
7	15	15	512500	2562.5	DFT-s-OFDM QPSK	1@1	23.49	0.2234
7	15	15	512500	2562.5	DFT-s-OFDM 16 QAM	1@1	22.32	0.1706
7	15	20	502000	2510	DFT-s-OFDM QPSK	1@1	23.43	0.2203
7	15	20	502000	2510	DFT-s-OFDM 16 QAM	1@1	22.37	0.1726
7	15	20	507000	2535	DFT-s-OFDM QPSK	1@1	23.54	0.2259
7	15	20	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.43	0.1750
7	15	20	512000	2560	DFT-s-OFDM QPSK	1@1	23.61	0.2296
7	15	20	512000	2560	DFT-s-OFDM 16 QAM	1@1	22.39	0.1734
7	15	25	502500	2512.5	DFT-s-OFDM QPSK	1@1	23.34	0.2158
7	15	25	502500	2512.5	DFT-s-OFDM 16 QAM	1@1	22.18	0.1652
7	15	25	507000	2535	DFT-s-OFDM QPSK	1@1	23.38	0.2178
7	15	25	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.17	0.1648
7	15	25	511500	2557.5	DFT-s-OFDM QPSK	1@1	23.38	0.2178
7	15	25	511500	2557.5	DFT-s-OFDM 16 QAM	1@1	22.26	0.1683
7	15	30	503000	2515	DFT-s-OFDM QPSK	1@1	23.35	0.2163
7	15	30	503000	2515	DFT-s-OFDM 16 QAM	1@1	22.2	0.1660
7	15	30	507000	2535	DFT-s-OFDM QPSK	1@1	23.43	0.2203
7	15	30	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.29	0.1694
7	15	30	511000	2555	DFT-s-OFDM QPSK	1@1	23.51	0.2244
7	15	30	511000	2555	DFT-s-OFDM 16 QAM	1@1	22.3	0.1698
7	15	40	504000	2520	DFT-s-OFDM QPSK	1@1	23.36	0.2168
7	15	40	504000	2520	DFT-s-OFDM 16 QAM	1@1	22.19	0.1656
7	15	40	507000	2535	DFT-s-OFDM QPSK	1@1	23.38	0.2178
7	15	40	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.27	0.1687

7	15	40	510000	2550	DFT-s-OFDM QPSK	1@1	23.39	0.2183
7	15	40	510000	2550	DFT-s-OFDM 16 QAM	1@1	22.16	0.1644
7	15	50	505000	2525	DFT-s-OFDM PI/2 BPSK	135@67	23.57	0.2275
7	15	50	505000	2525	DFT-s-OFDM PI/2 BPSK	1@1	23.49	0.2234
7	15	50	505000	2525	DFT-s-OFDM PI/2 BPSK	1@268	23.49	0.2234
7	15	50	505000	2525	DFT-s-OFDM QPSK	135@67	23.54	0.2259
7	15	50	505000	2525	DFT-s-OFDM QPSK	1@1	23.49	0.2234
7	15	50	505000	2525	DFT-s-OFDM QPSK	1@268	23.6	0.2291
7	15	50	505000	2525	DFT-s-OFDM 16 QAM	135@67	22.61	0.1824
7	15	50	505000	2525	DFT-s-OFDM 16 QAM	1@1	22.37	0.1726
7	15	50	505000	2525	DFT-s-OFDM 16 QAM	1@268	22.38	0.1730
7	15	50	505000	2525	DFT-s-OFDM 64 QAM	135@67	21.12	0.1294
7	15	50	505000	2525	DFT-s-OFDM 64 QAM	1@1	20.85	0.1216
7	15	50	505000	2525	DFT-s-OFDM 64 QAM	1@268	20.83	0.1211
7	15	50	505000	2525	DFT-s-OFDM 256 QAM	135@67	19.09	0.0811
7	15	50	505000	2525	DFT-s-OFDM 256 QAM	1@1	19.24	0.0839
7	15	50	505000	2525	DFT-s-OFDM 256 QAM	1@268	19.27	0.0845
7	15	50	505000	2525	CP-OFDM QPSK	135@67	22.12	0.1629
7	15	50	505000	2525	CP-OFDM QPSK	1@1	22.21	0.1663
7	15	50	505000	2525	CP-OFDM QPSK	1@268	22.27	0.1687
7	15	50	507000	2535	DFT-s-OFDM PI/2 BPSK	135@67	23.59	0.2286
7	15	50	507000	2535	DFT-s-OFDM PI/2 BPSK	1@1	23.54	0.2259
7	15	50	507000	2535	DFT-s-OFDM PI/2 BPSK	1@268	23.51	0.2244
7	15	50	507000	2535	DFT-s-OFDM QPSK	135@67	23.62	0.2301
7	15	50	507000	2535	DFT-s-OFDM QPSK	1@1	23.64	0.2312
7	15	50	507000	2535	DFT-s-OFDM QPSK	1@268	23.55	0.2265
7	15	50	507000	2535	DFT-s-OFDM 16 QAM	135@67	22.61	0.1824
7	15	50	507000	2535	DFT-s-OFDM 16 QAM	1@1	22.49	0.1774
7	15	50	507000	2535	DFT-s-OFDM 16 QAM	1@268	22.45	0.1758
7	15	50	507000	2535	DFT-s-OFDM 64 QAM	135@67	21.12	0.1294
7	15	50	507000	2535	DFT-s-OFDM 64 QAM	1@1	20.9	0.1230
7	15	50	507000	2535	DFT-s-OFDM 64 QAM	1@268	20.9	0.1230
7	15	50	507000	2535	DFT-s-OFDM 256 QAM	135@67	19.12	0.0817
7	15	50	507000	2535	DFT-s-OFDM 256 QAM	1@1	19.28	0.0847
7	15	50	507000	2535	DFT-s-OFDM 256 QAM	1@268	19.28	0.0847
7	15	50	507000	2535	CP-OFDM QPSK	135@67	22.16	0.1644
7	15	50	507000	2535	CP-OFDM QPSK	1@1	22.3	0.1698
7	15	50	507000	2535	CP-OFDM QPSK	1@268	22.25	0.1679
7	15	50	509000	2545	DFT-s-OFDM PI/2 BPSK	135@67	23.55	0.2265
7	15	50	509000	2545	DFT-s-OFDM PI/2 BPSK	1@1	23.52	0.2249
7	15	50	509000	2545	DFT-s-OFDM PI/2 BPSK	1@268	23.59	0.2286
7	15	50	509000	2545	DFT-s-OFDM QPSK	135@67	23.6	0.2291
7	15	50	509000	2545	DFT-s-OFDM QPSK	1@1	**23.73**	0.2360
7	15	50	509000	2545	DFT-s-OFDM QPSK	1@268	23.58	0.2280
7	15	50	509000	2545	DFT-s-OFDM 16 QAM	135@67	22.65	0.1841
7	15	50	509000	2545	DFT-s-OFDM 16 QAM	1@1	22.46	0.1762
7	15	50	509000	2545	DFT-s-OFDM 16 QAM	1@268	22.54	0.1795
7	15	50	509000	2545	DFT-s-OFDM 64 QAM	135@67	21.19	0.1315

7	15	50	509000	2545	DFT-s-OFDM 64 QAM	1@1	21.01	0.1262
7	15	50	509000	2545	DFT-s-OFDM 64 QAM	1@268	20.89	0.1227
7	15	50	509000	2545	DFT-s-OFDM 256 QAM	135@67	19.15	0.0822
7	15	50	509000	2545	DFT-s-OFDM 256 QAM	1@1	19.34	0.0859
7	15	50	509000	2545	DFT-s-OFDM 256 QAM	1@268	19.3	0.0851
7	15	50	509000	2545	CP-OFDM QPSK	135@67	22.17	0.1648
7	15	50	509000	2545	CP-OFDM QPSK	1@1	22.36	0.1722
7	15	50	509000	2545	CP-OFDM QPSK	1@268	22.38	0.1730

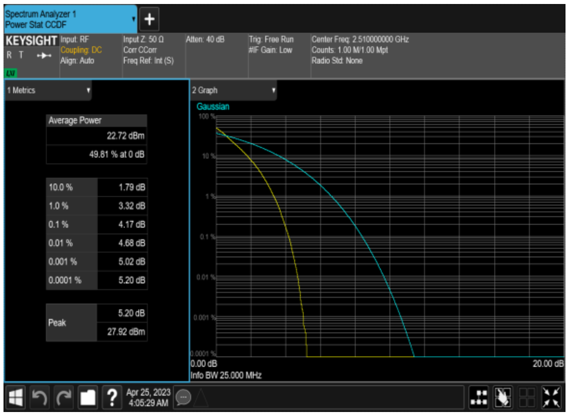
Frequency Stability

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Deviation (ppm)	Verdict	Environment
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0065	**PASS**	NV
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0031	**PASS**	LV
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0053	**PASS**	HV
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0034	**PASS**	-30℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0033	**PASS**	-20℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0028	**PASS**	-10℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0045	**PASS**	0℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0025	**PASS**	10℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0065	**PASS**	20℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0040	**PASS**	30℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0024	**PASS**	40℃
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	0.0030	**PASS**	50℃

Peak to Average Ratio

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
7	15	20	502000	2510.0	DFT-s-OFDM PI/2 BPSK	100@0	4.17	13	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM PI/2 BPSK	1@0	3.66	13	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	100@0	5.15	13	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	4.29	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM PI/2 BPSK	100@0	4.0	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM PI/2 BPSK	1@0	3.86	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	5.06	13	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	4.66	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM PI/2 BPSK	100@0	4.04	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM PI/2 BPSK	1@0	4.1	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	100@0	5.16	13	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	4.95	13	**PASS**

B2_N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_526000_CH



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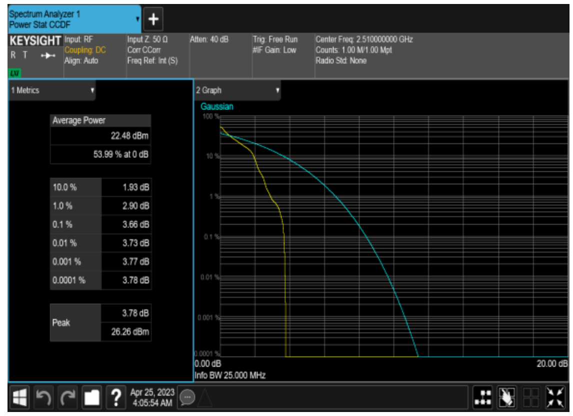
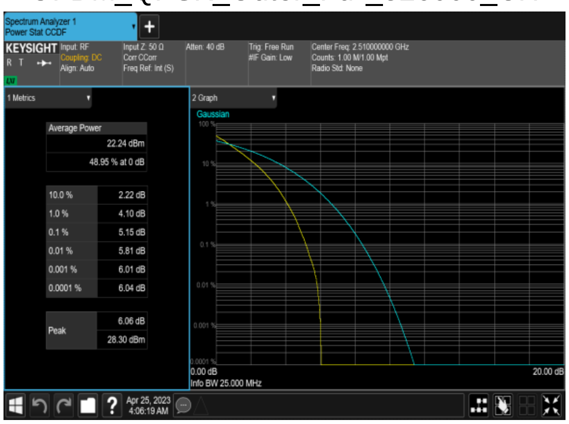
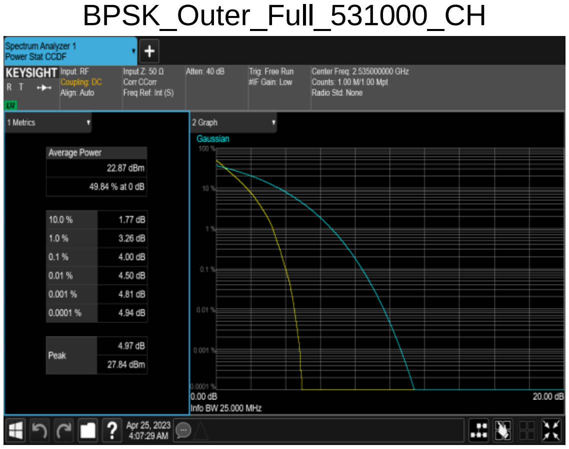


B2_N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_526000_CH



B2_N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_526000_CH

B2_N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH



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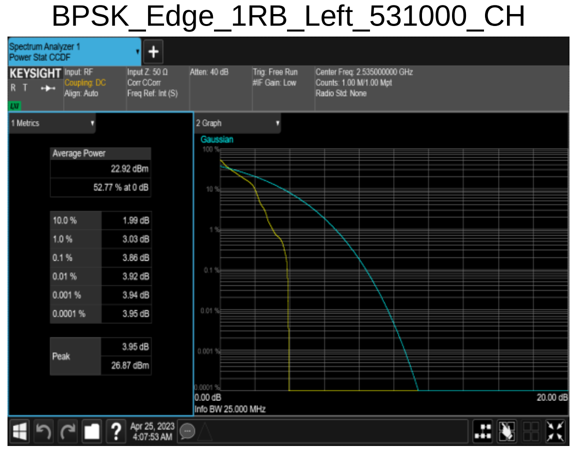

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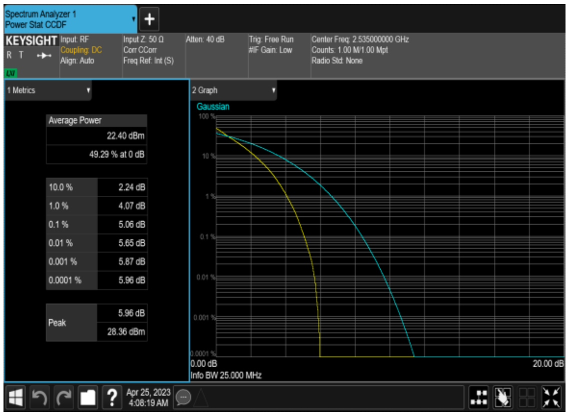
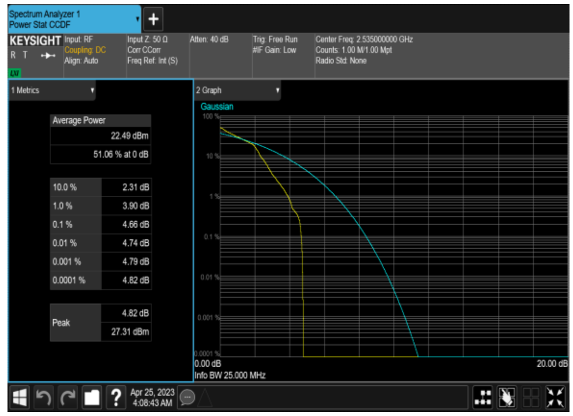
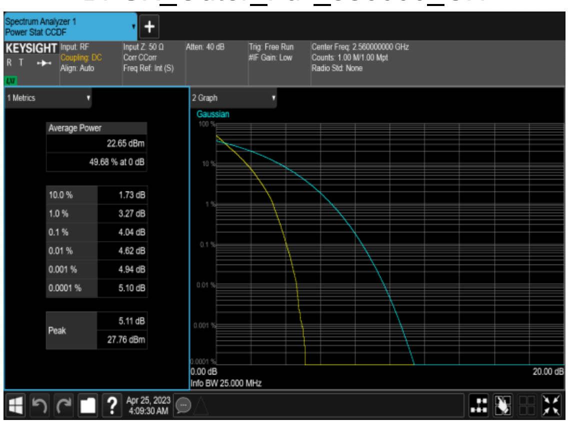


B2_N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_531000_CH

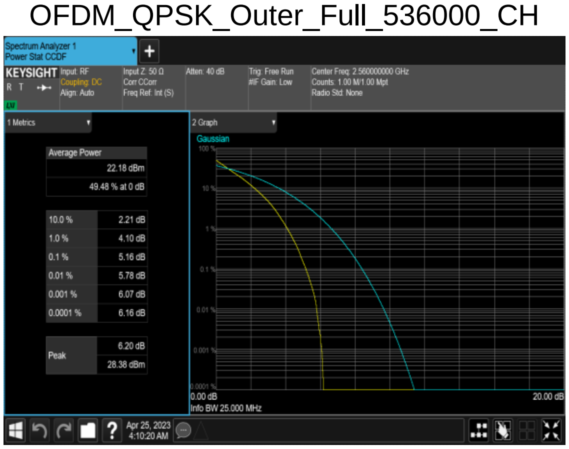


B2_N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_536000_CH

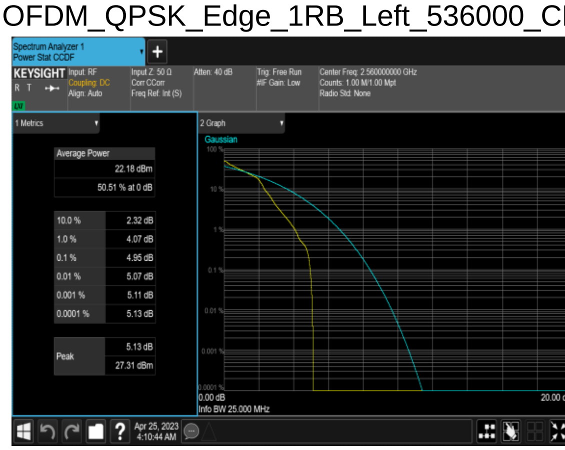


B2_N7(20M)_DFT-s-OFDM_PI_2-BPSK_Edge_1RB_Left_536000_CH

B2_N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_536000_CH



B2_N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_536000_CH

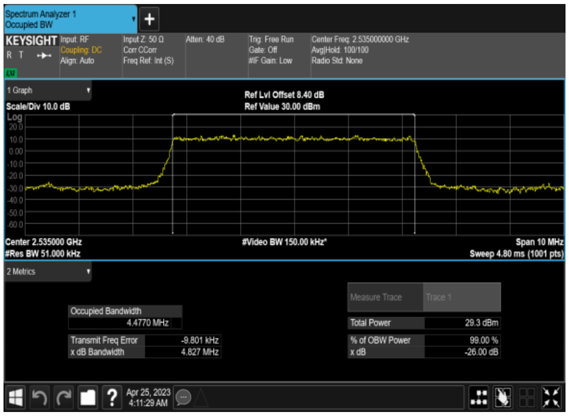


Occupied Bandwidth

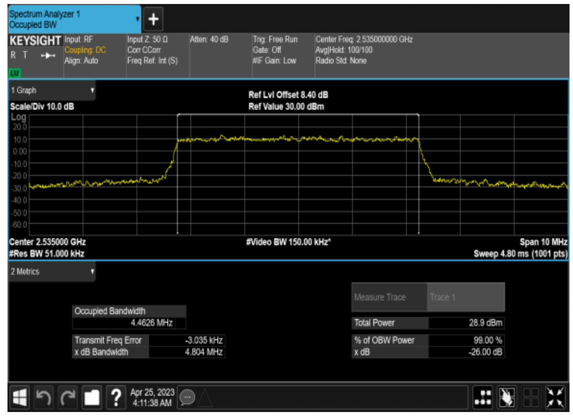
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	OBW (MHz)	26dB BW (MHz)
7	15	5	507000	2535.0	DFT-s-OFDM PI/2 BPSK	25@0	4.477	4.827
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	25@0	4.4626	4.804
7	15	5	507000	2535.0	CP-OFDM QPSK	25@0	4.4595	4.811
7	15	5	507000	2535.0	CP-OFDM 16 QAM	25@0	4.4647	4.764
7	15	5	507000	2535.0	CP-OFDM 64 QAM	25@0	4.4645	4.825
7	15	5	507000	2535.0	CP-OFDM 256 QAM	25@0	4.4726	4.801
7	15	10	507000	2535.0	DFT-s-OFDM PI/2 BPSK	50@0	8.9143	9.386
7	15	10	507000	2535.0	DFT-s-OFDM QPSK	50@0	8.8936	9.313
7	15	10	507000	2535.0	CP-OFDM QPSK	52@0	9.2671	9.694
7	15	10	507000	2535.0	CP-OFDM 16 QAM	52@0	9.2945	9.768
7	15	10	507000	2535.0	CP-OFDM 64 QAM	52@0	9.2723	9.737
7	15	10	507000	2535.0	CP-OFDM 256 QAM	52@0	9.2766	9.749
7	15	15	507000	2535.0	DFT-s-OFDM PI/2 BPSK	75@0	13.375	13.96
7	15	15	507000	2535.0	DFT-s-OFDM QPSK	75@0	13.376	13.93
7	15	15	507000	2535.0	CP-OFDM QPSK	79@0	14.109	14.66
7	15	15	507000	2535.0	CP-OFDM 16 QAM	79@0	14.096	14.71
7	15	15	507000	2535.0	CP-OFDM 64 QAM	79@0	14.096	14.62
7	15	15	507000	2535.0	CP-OFDM 256 QAM	79@0	14.088	14.72
7	15	20	507000	2535.0	DFT-s-OFDM PI/2 BPSK	100@0	17.815	18.55
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	100@0	17.846	18.52
7	15	20	507000	2535.0	CP-OFDM QPSK	106@0	18.945	19.63
7	15	20	507000	2535.0	CP-OFDM 16 QAM	106@0	18.909	19.63
7	15	20	507000	2535.0	CP-OFDM 64 QAM	106@0	18.924	19.65
7	15	20	507000	2535.0	CP-OFDM 256 QAM	106@0	18.917	19.75

7	15	25	507000	2535.0	DFT-s-OFDM PI/2 BPSK	128@0	22.862	23.6
7	15	25	507000	2535.0	DFT-s-OFDM QPSK	128@0	22.826	23.69
7	15	25	507000	2535.0	CP-OFDM QPSK	133@0	23.766	24.55
7	15	25	507000	2535.0	CP-OFDM 16 QAM	133@0	23.741	24.6
7	15	25	507000	2535.0	CP-OFDM 64 QAM	133@0	23.75	24.53
7	15	25	507000	2535.0	CP-OFDM 256 QAM	133@0	23.666	24.54
7	15	30	507000	2535.0	DFT-s-OFDM PI/2 BPSK	160@0	28.502	29.52
7	15	30	507000	2535.0	DFT-s-OFDM QPSK	160@0	28.538	29.62
7	15	30	507000	2535.0	CP-OFDM QPSK	160@0	28.549	29.49
7	15	30	507000	2535.0	CP-OFDM 16 QAM	160@0	28.498	29.59
7	15	30	507000	2535.0	CP-OFDM 64 QAM	160@0	28.599	29.63
7	15	30	507000	2535.0	CP-OFDM 256 QAM	160@0	28.577	29.53
7	15	40	507000	2535.0	DFT-s-OFDM PI/2 BPSK	216@0	38.481	39.8
7	15	40	507000	2535.0	DFT-s-OFDM QPSK	216@0	38.517	39.85
7	15	40	507000	2535.0	CP-OFDM QPSK	216@0	38.454	39.89
7	15	40	507000	2535.0	CP-OFDM 16 QAM	216@0	38.537	39.9
7	15	40	507000	2535.0	CP-OFDM 64 QAM	216@0	38.453	39.9
7	15	40	507000	2535.0	CP-OFDM 256 QAM	216@0	38.567	39.87
7	15	50	507000	2535.0	DFT-s-OFDM PI/2 BPSK	270@0	48.063	49.81
7	15	50	507000	2535.0	DFT-s-OFDM QPSK	270@0	48.224	49.81
7	15	50	507000	2535.0	CP-OFDM QPSK	270@0	48.166	49.8
7	15	50	507000	2535.0	CP-OFDM 16 QAM	270@0	48.104	49.7
7	15	50	507000	2535.0	CP-OFDM 64 QAM	270@0	48.18	49.77
7	15	50	507000	2535.0	CP-OFDM 256 QAM	270@0	48.188	49.68

B2_N7(5M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH

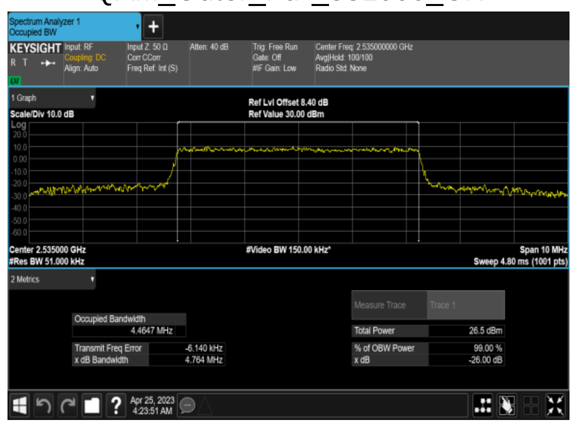


B2_N7(5M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH

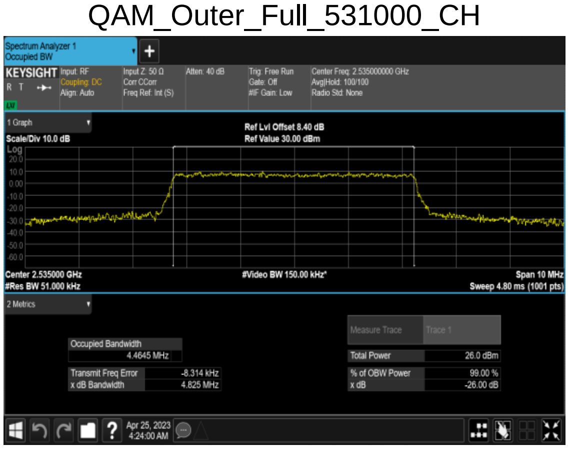


B2_N7(5M)_CP-OFDM_QPSK_Outer_Full_531000_CH

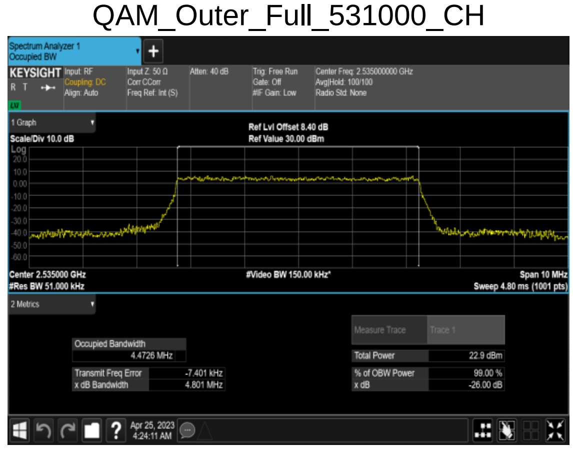
B2_N7(5M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



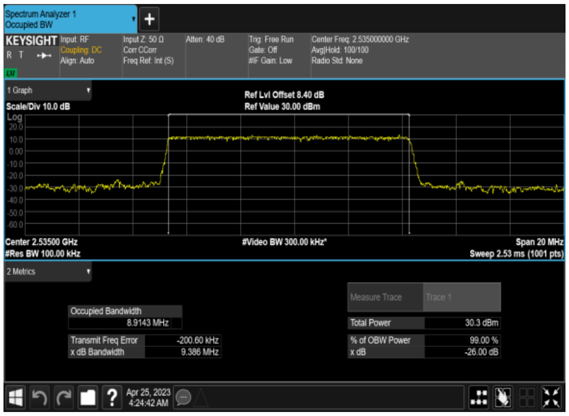
B2_N7(5M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



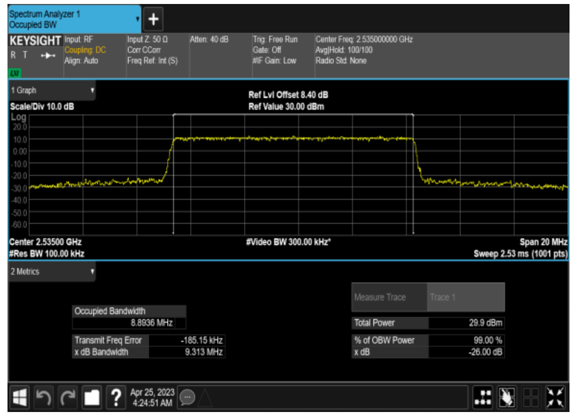
B2_N7(5M)_CP-OFDM_256 QAM_Outer_Full_531000_CH



B2_N7(10M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH

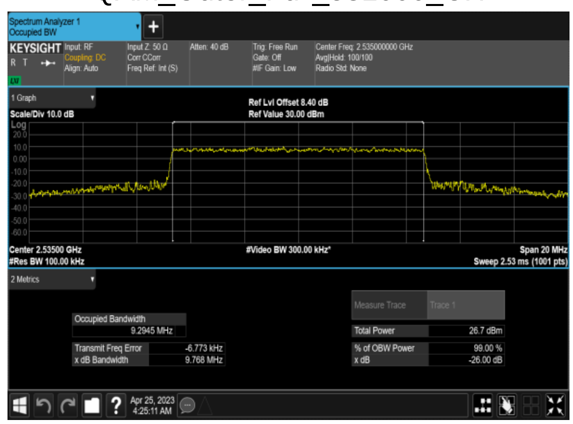


B2_N7(10M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH

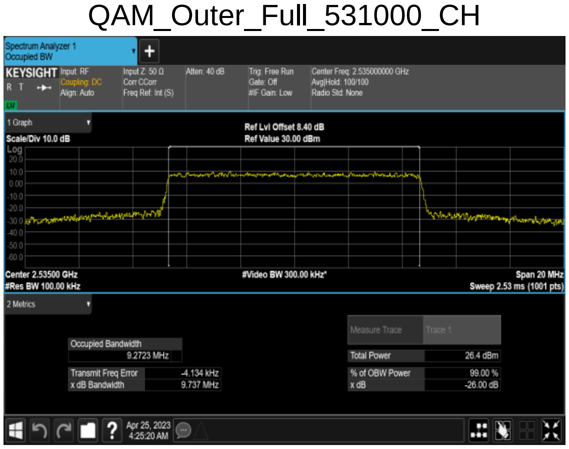


B2_N7(10M)_CP-OFDM_QPSK_Outer_Full_531000_CH

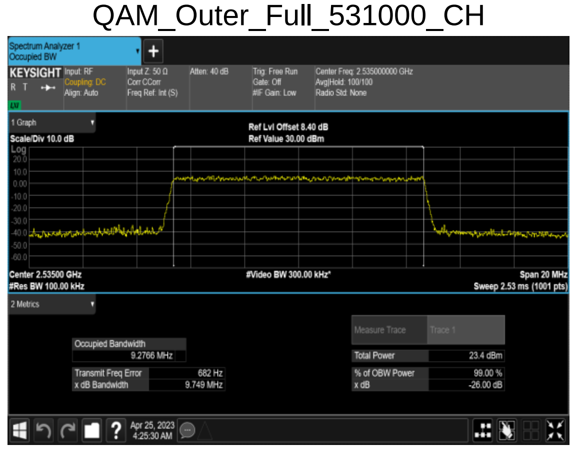
B2_N7(10M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



B2_N7(10M)_CP-OFDM_64 QAM_Outer_Full_531000_CH

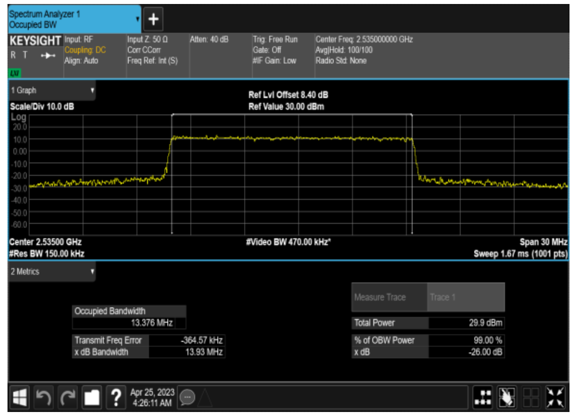


B2_N7(10M)_CP-OFDM_256 QAM_Outer_Full_531000_CH

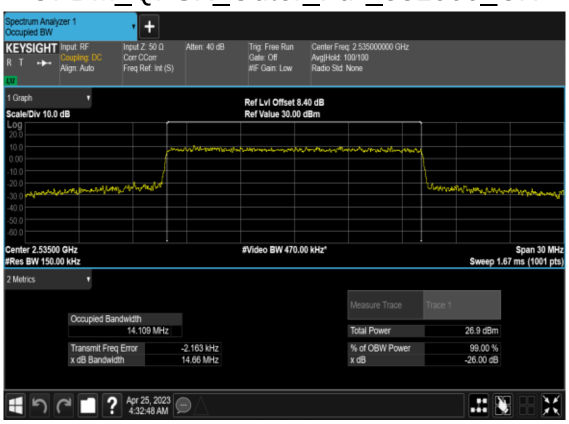


B2_N7(15M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH

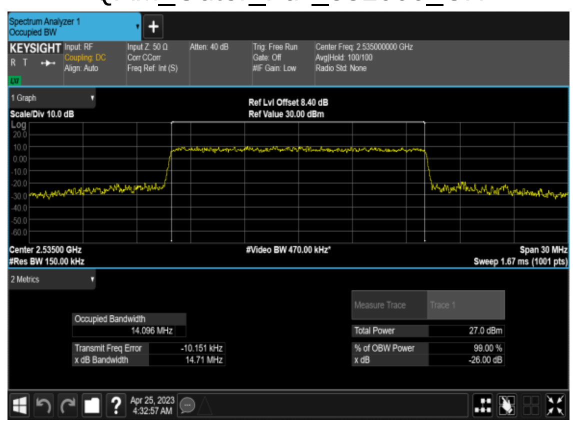
B2_N7(15M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH



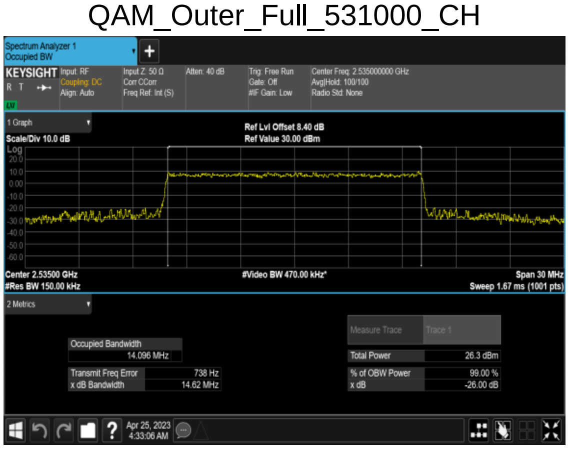
B2_N7(15M)_CP-OFDM_QPSK_Outer_Full_531000_CH



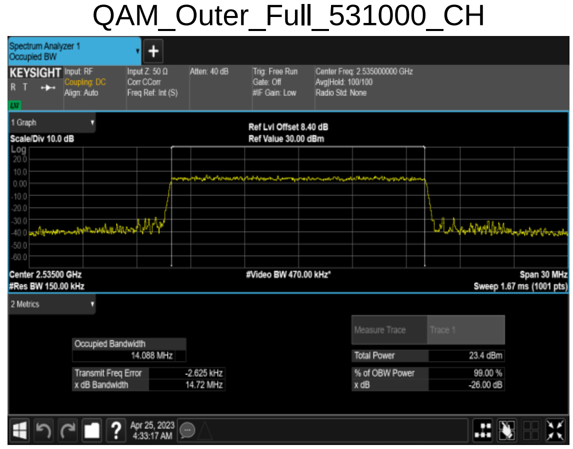
B2_N7(15M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



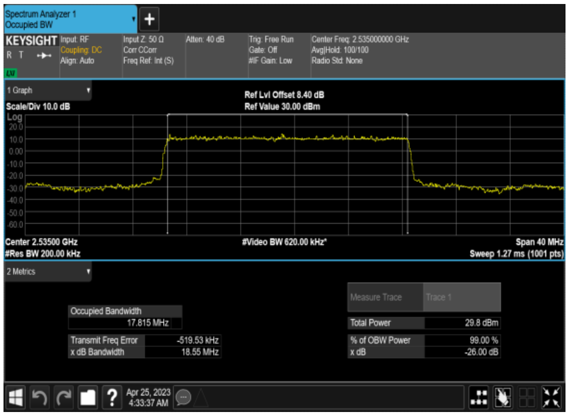
B2_N7(15M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



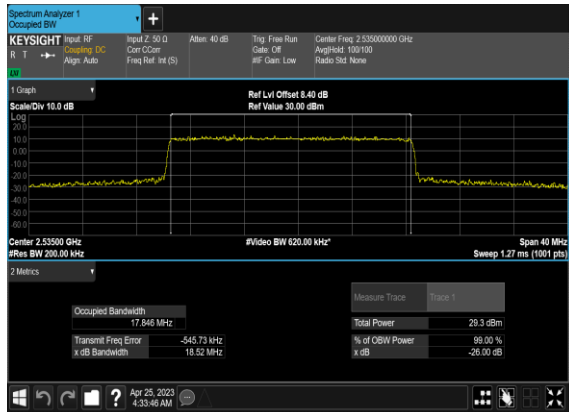
B2_N7(15M)_CP-OFDM_256 QAM_Outer_Full_531000_CH



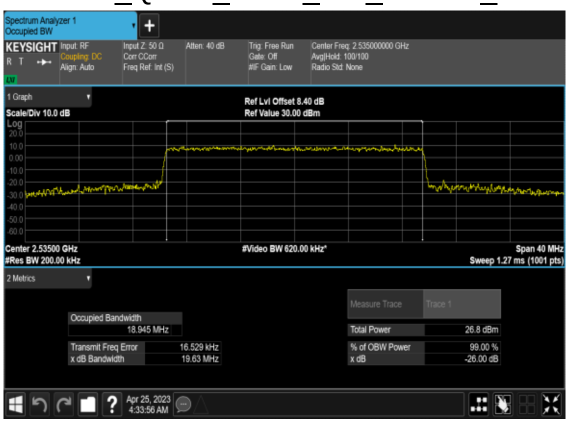
B2_N7(20M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH



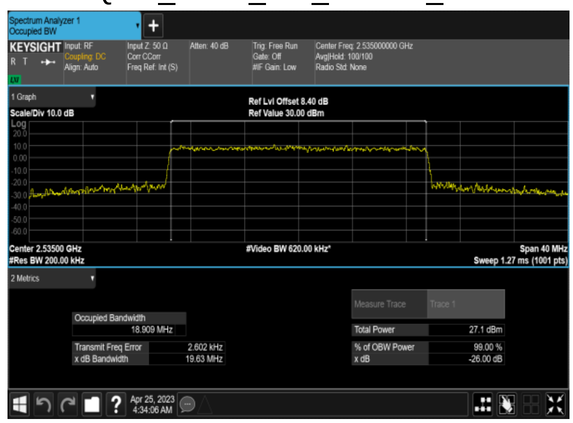
B2_N7(20M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH



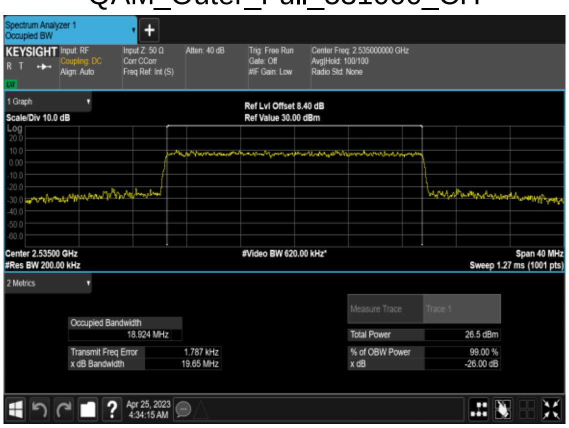
B2_N7(20M)_CP-OFDM_QPSK_Outer_Full_531000_CH



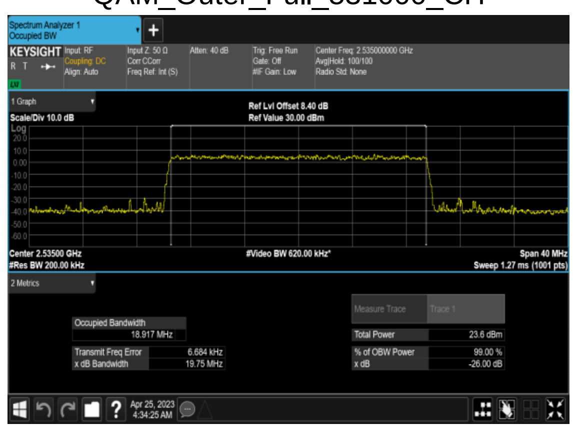
B2_N7(20M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



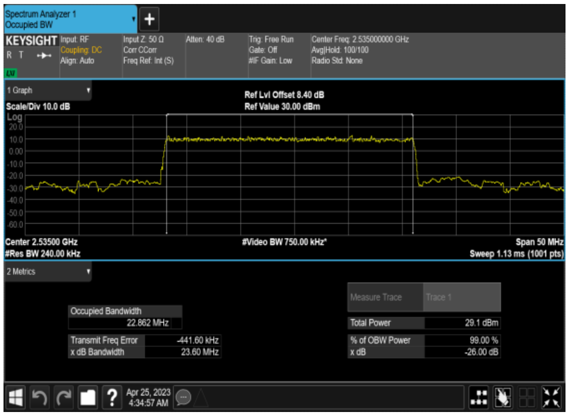
B2_N7(20M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



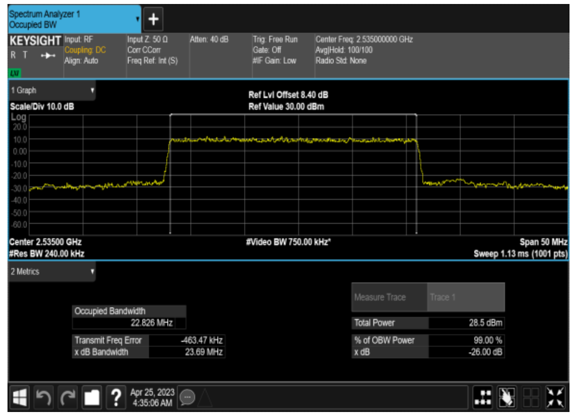
B2_N7(20M)_CP-OFDM_256 QAM_Outer_Full_531000_CH



B2_N7(25M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH

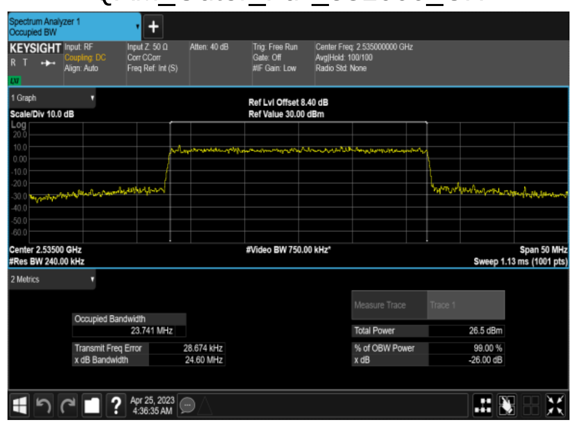


B2_N7(25M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH

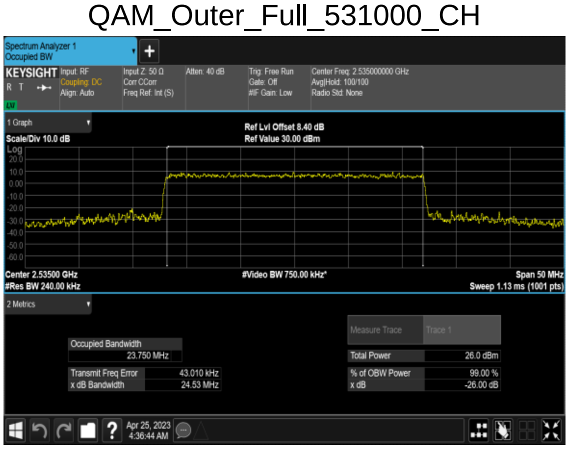


B2_N7(25M)_CP-OFDM_QPSK_Outer_Full_531000_CH

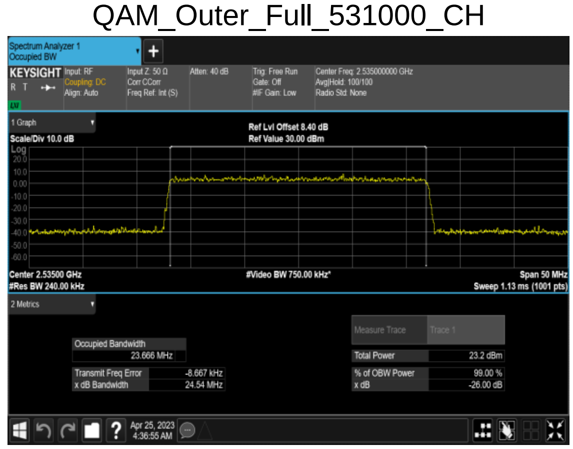
B2_N7(25M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



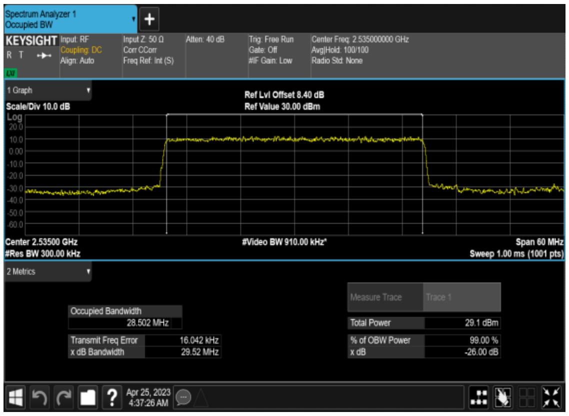
B2_N7(25M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



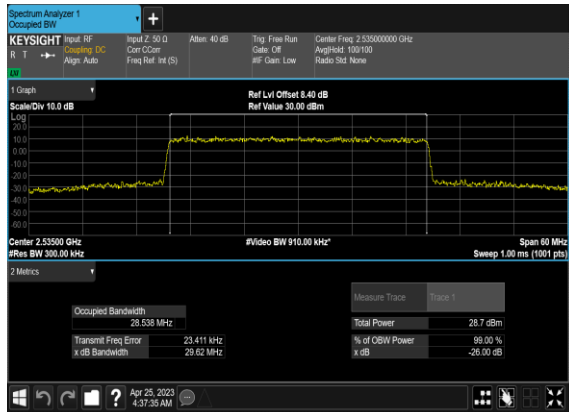
B2_N7(25M)_CP-OFDM_256 QAM_Outer_Full_531000_CH



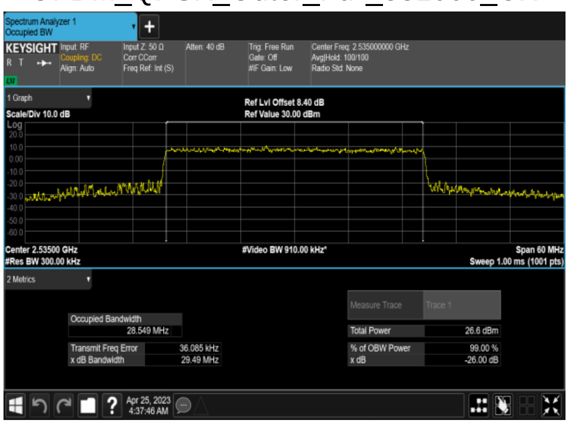
B2_N7(30M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH



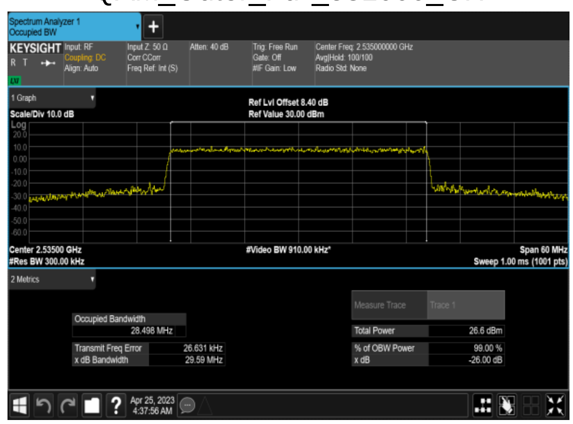
B2_N7(30M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH



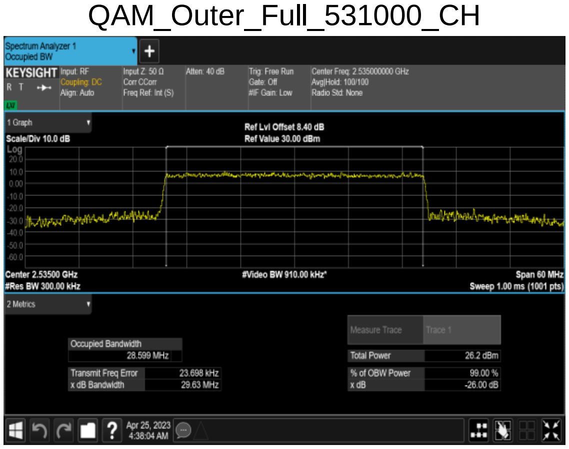
B2_N7(30M)_CP-OFDM_QPSK_Outer_Full_531000_CH



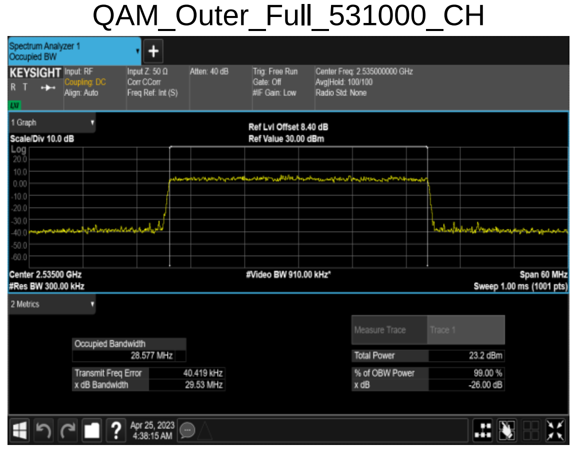
B2_N7(30M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



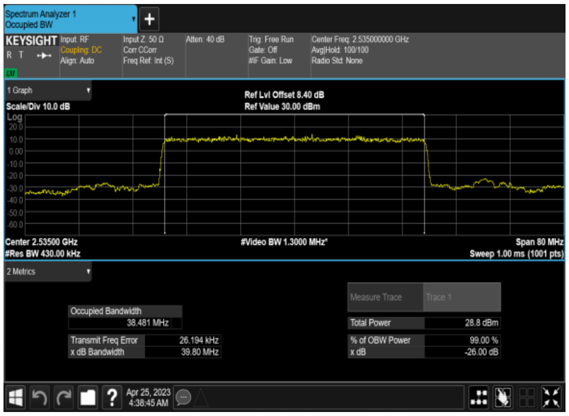
B2_N7(30M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



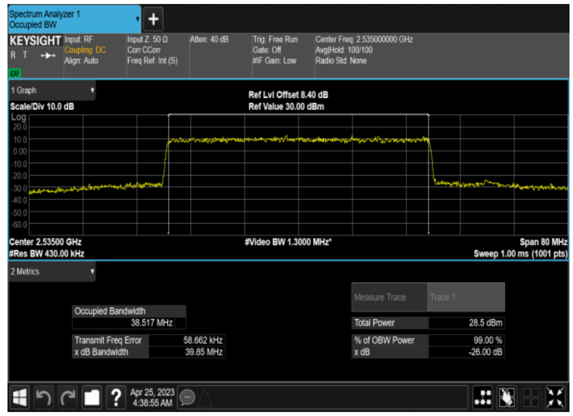
B2_N7(30M)_CP-OFDM_256 QAM_Outer_Full_531000_CH



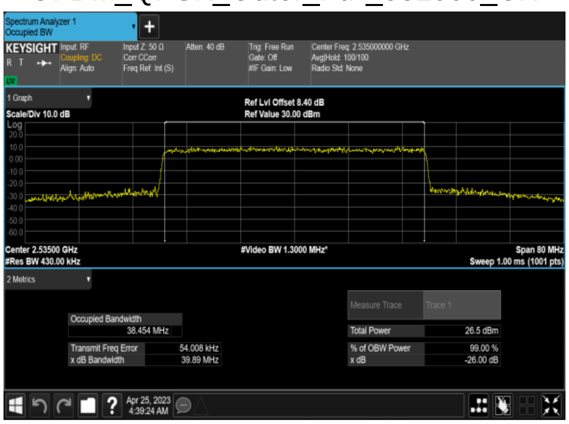
B2_N7(40M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH



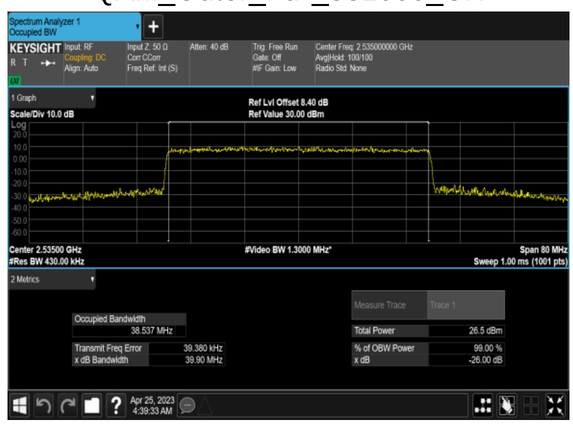
B2_N7(40M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH



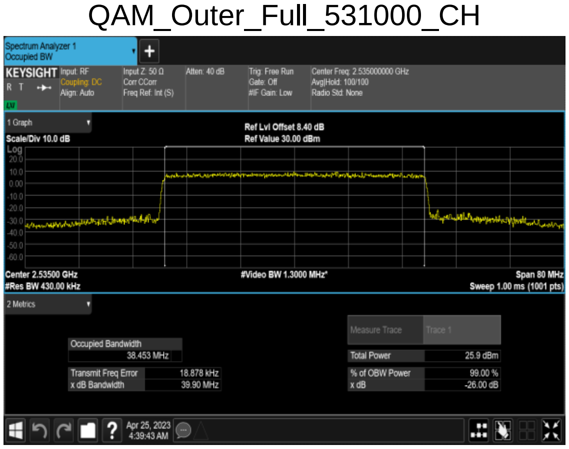
B2_N7(40M)_CP-OFDM_QPSK_Outer_Full_531000_CH



B2_N7(40M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



B2_N7(40M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



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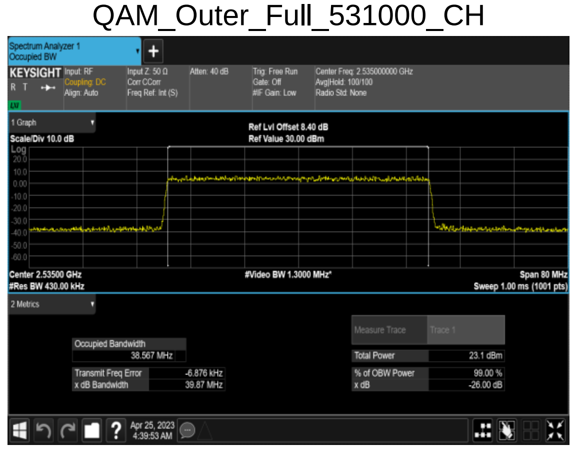
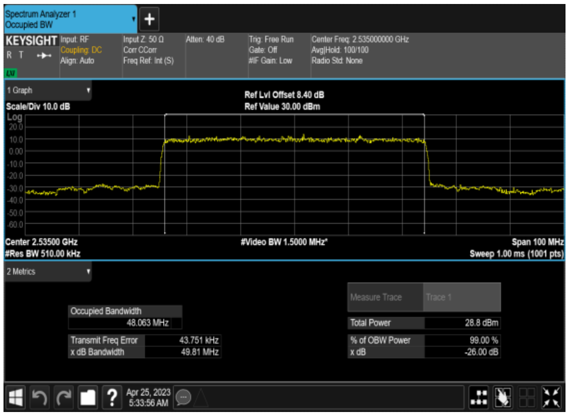
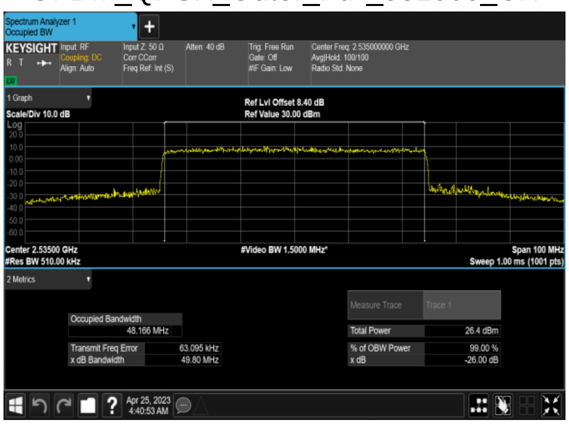


B2_N7(50M)_DFT-s-OFDM_PI_2-BPSK_Outer_Full_531000_CH

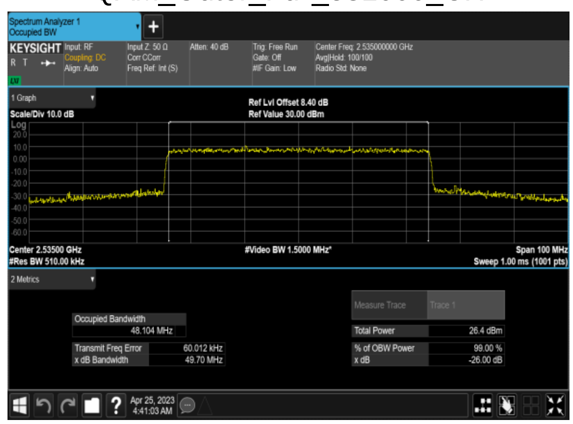


B2_N7(50M)_DFT-s-OFDM_QPSK_Outer_Full_531000_CH

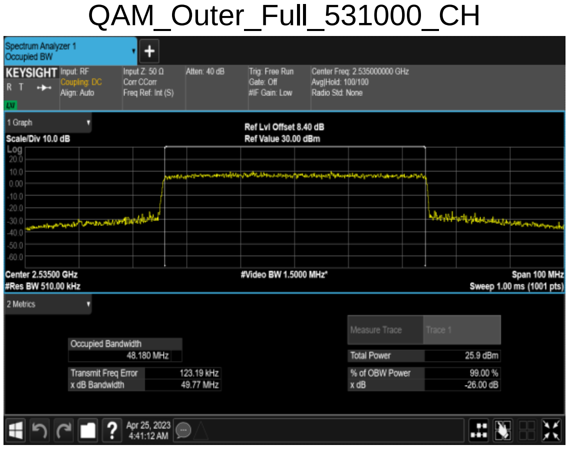
B2_N7(50M)_CP-OFDM_QPSK_Outer_Full_531000_CH



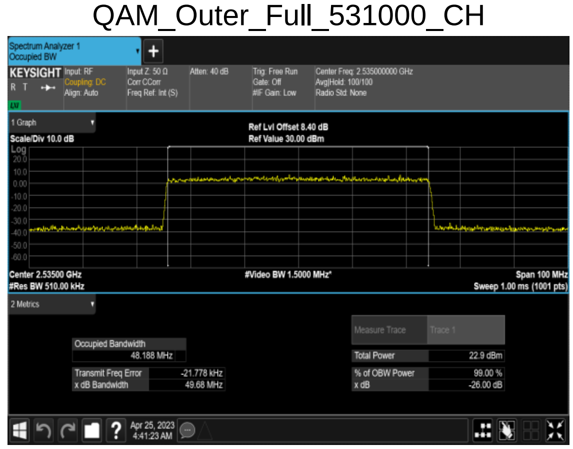
B2_N7(50M)_CP-OFDM_16 QAM_Outer_Full_531000_CH



B2_N7(50M)_CP-OFDM_64 QAM_Outer_Full_531000_CH



B2_N7(50M)_CP-OFDM_256 QAM_Outer_Full_531000_CH



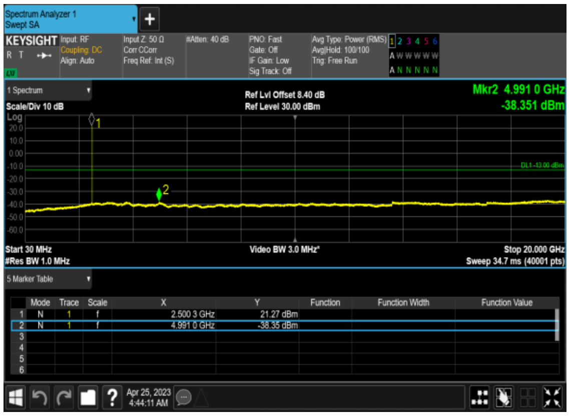
Conducted Spurious Emissions

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
7	15	5	500500	2502.5	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	5	500500	2502.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	500500	2502.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	500500	2502.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	5	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	5	513500	2567.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	5	513500	2567.5	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	20	502000	2510.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	see graph	**---**

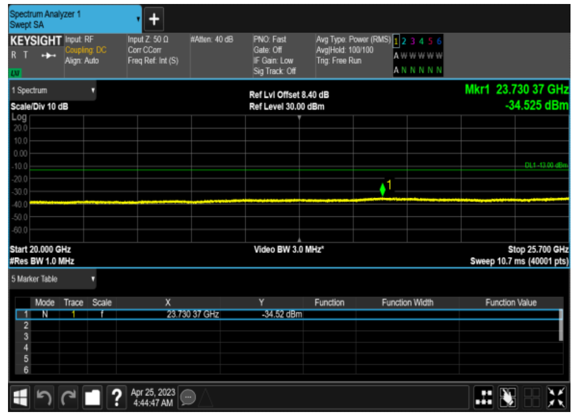
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	502000	2510.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	20	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	20	512000	2560.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	20	512000	2560.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	50	505000	2525.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	50	505000	2525.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	50	505000	2525.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	50	505000	2525.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	50	505000	2525.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	50	505000	2525.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	50	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	50	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	50	507000	2535.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	50	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**---**

7	15	50	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	50	507000	2535.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	50	509000	2545.0	DFT-s-OFDM BPSK	1@0	see graph	**---**
7	15	50	509000	2545.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	50	509000	2545.0	DFT-s-OFDM BPSK	1@0	see graph	**PASS**
7	15	50	509000	2545.0	DFT-s-OFDM QPSK	1@0	see graph	**---**
7	15	50	509000	2545.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**
7	15	50	509000	2545.0	DFT-s-OFDM QPSK	1@0	see graph	**PASS**

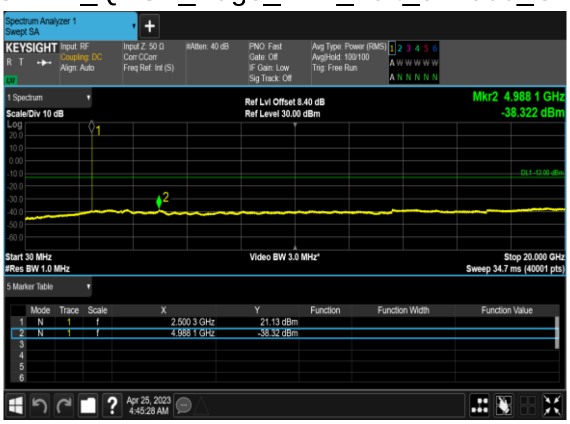
B2_N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_524500_CH



B2_N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_524500_CH



B2_N7(5M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_524500_CH



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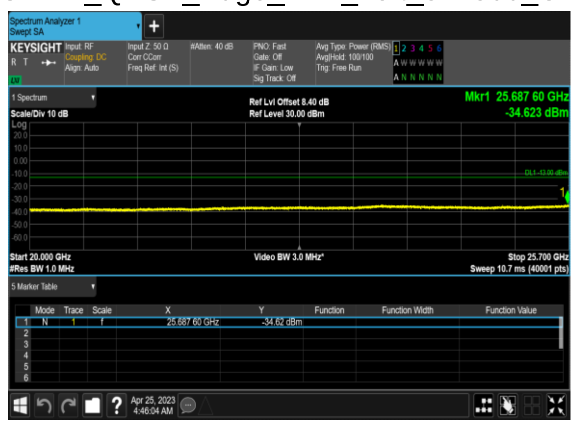
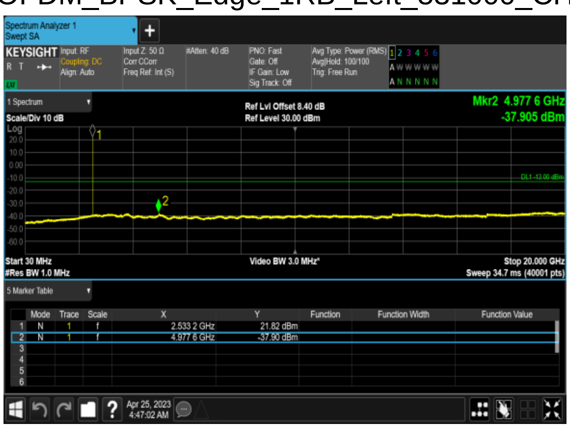


B2_N7(5M)_DFT-s-OFDM_BPSK_Edge_1RB_Left_531000_CH



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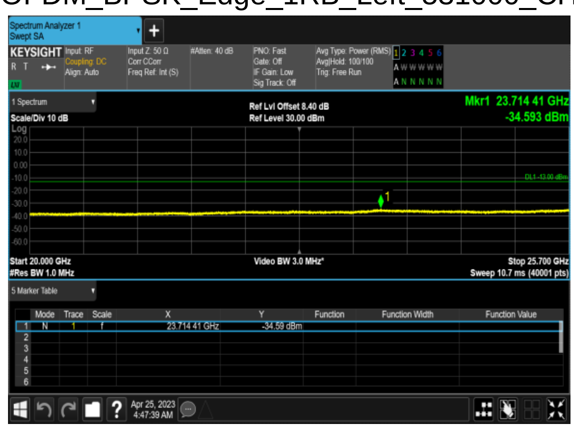

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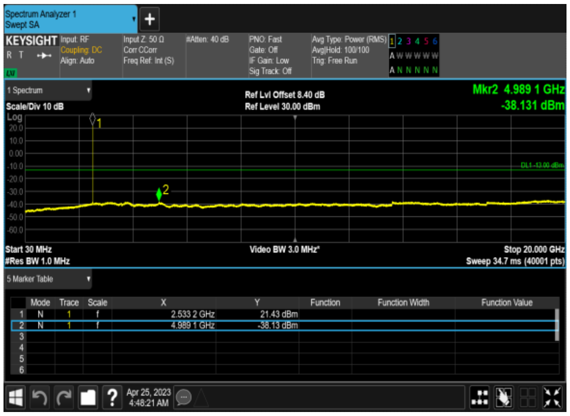

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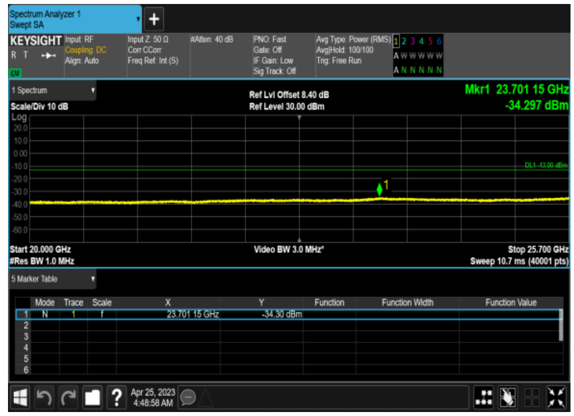

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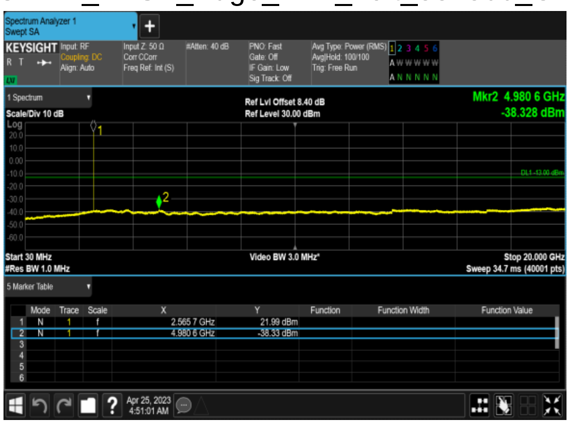

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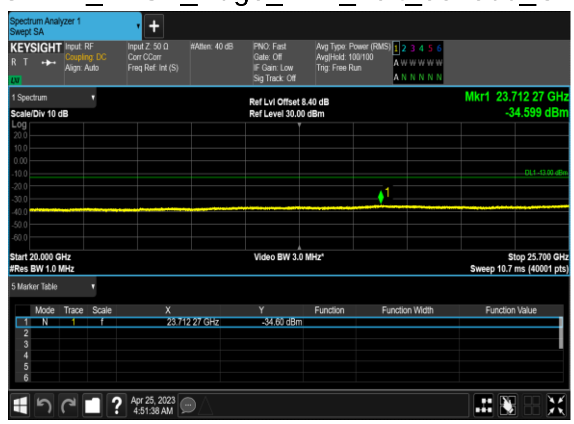

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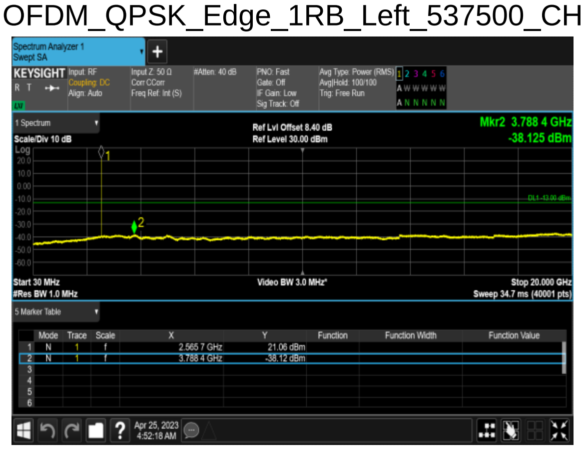

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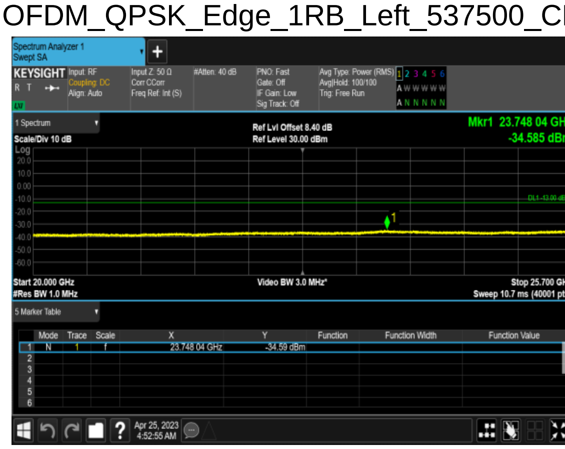

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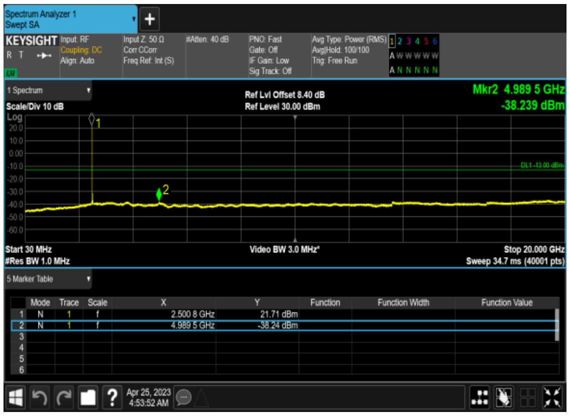

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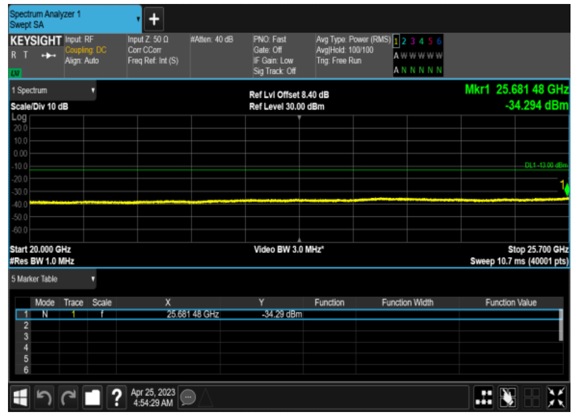

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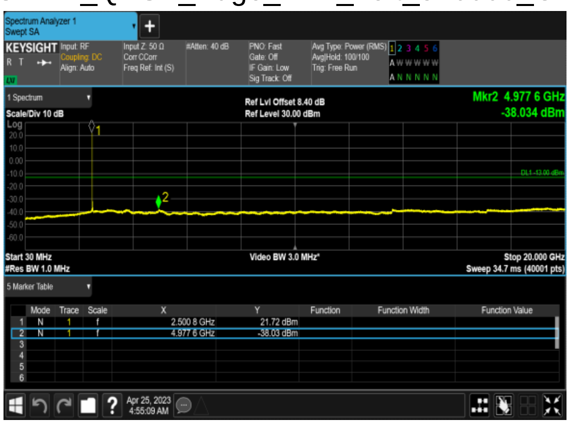

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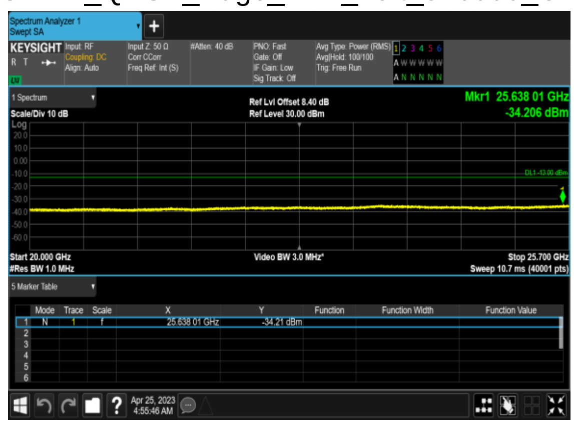

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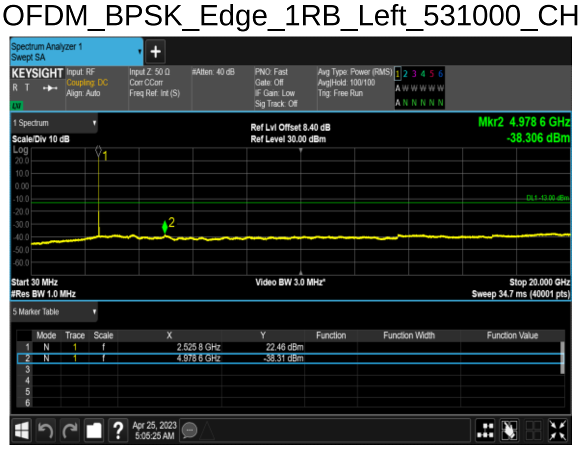

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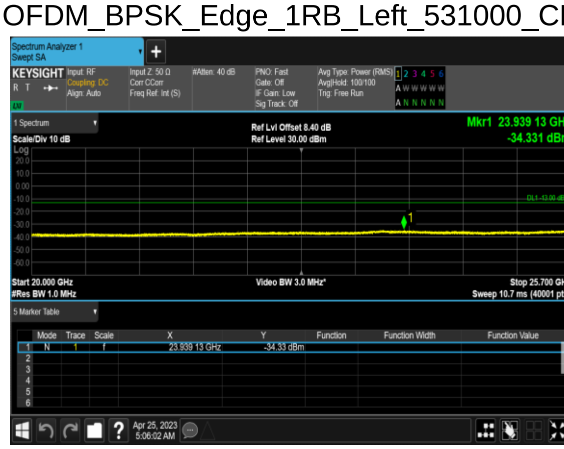

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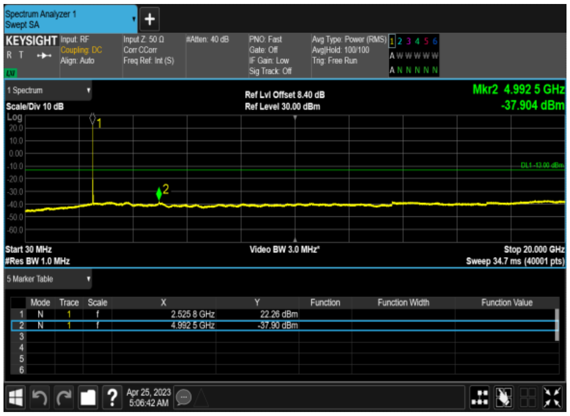

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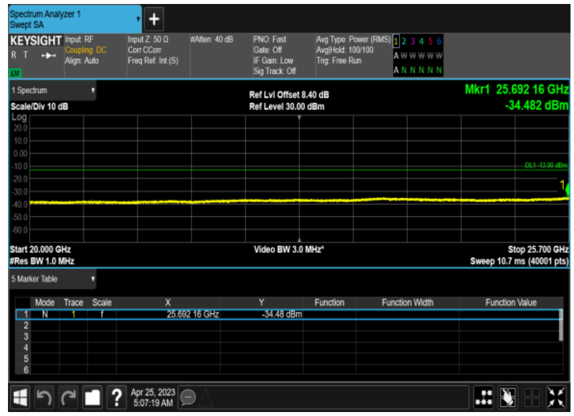

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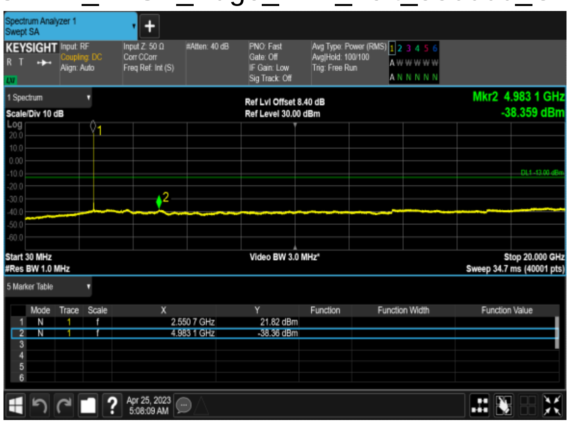

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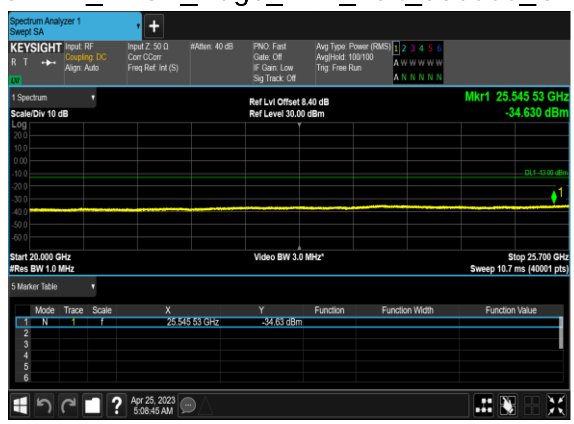

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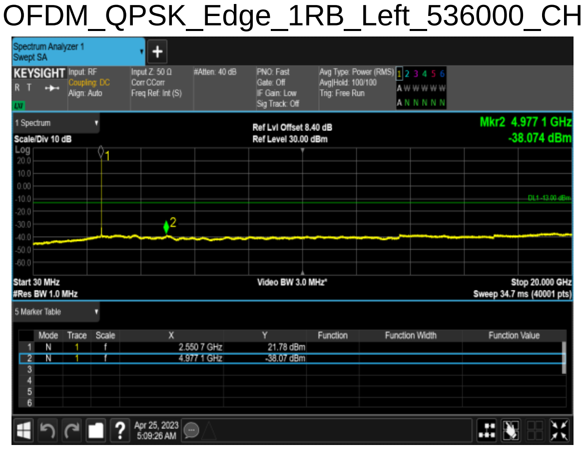

B2_N7(20M)_DFT-s-OFDM_QPSK_Edge_1RB_Left_536000_CH