

CERTIFICATION TEST REPORT

Report Number. : 4790841154-E3V2

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

Model : SM-X518U

FCC ID : A3LSMX518U

EUT Description : WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax,
and Digitizer.

Test Standard(s) : FCC CFR47 PART 24 SubPART E

Date Of Issue:
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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax, and Digitizer.
MODEL NUMBER: SM-X518U
SERIAL NUMBER: R32W500QLJV, R32W500QM6Y (CONDUCTED);
R32W500QQVJ, R32W500QT0P, R32W500QSXX (RADIATED);
DATE TESTED: 2023-05-24 - 2023-07-14;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 24E	Complies

UL KOREA LTD. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL KOREA LTD. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and Modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL KOREA LTD. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL KOREA LTD. By:

Tested By:



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Suwon Lab Engineer
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UL KOREA LTD.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 24.
3. ANSI TIA-603-E, 2016
4. ANSI C63.26, 2015
5. KDB 971168 D01 Power Meas License Digital Systems v03r01

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
<input checked="" type="checkbox"/>	Chamber 1(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 2(3m semi-anechoic chamber)
<input type="checkbox"/>	Chamber 3(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 4(3m Full-anechoic chamber)
<input type="checkbox"/>	Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{EIRP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)} + \text{Substitution Antenna Factor (dBi)}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.80 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.92 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.06 dB
Radiated Disturbance, 18 GHz to 40 GHz	6.02 dB

Uncertainty figures are valid to a confidence level of 95%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax and Digitizer.
 This test report addresses the WWAN operational mode.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average radiated EIRP output powers as follows:
 Radiated samples were set to a higher power than conducted resulting in radiated ERP greater than conducted measurements.

WCDMA

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted		Radiated	
			Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2	1850.00 ~ 1910.00	Rel. 99	23.42	219.79	25.73	374.11
		HSDPA	23.34	215.77	25.47	352.37

LTE Band 25 (ANT Main1)

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	1860.00 ~ 1905.00	20	QPSK	24.05	254.10	26.67	464.52
			16QAM	23.58	228.03	26.12	409.26
			64QAM	22.99	199.07		
			256QAM	19.95	98.86		
	1857.50 ~ 1907.50	15	QPSK	24.03	252.93	26.28	424.62
			16QAM	23.29	213.30	25.84	383.71
			64QAM	22.50	177.83		
			256QAM	19.56	90.36		
	1855.00 ~ 1910.00	10	QPSK	24.08	255.86	26.23	419.76
			16QAM	23.27	212.32	25.72	373.25
			64QAM	22.23	167.11		
			256QAM	19.32	85.51		
	1852.50 ~ 1912.50	5	QPSK	23.91	246.04	25.89	388.15
			16QAM	23.33	215.28	25.53	357.27
			64QAM	22.23	167.11		
			256QAM	19.26	84.33		
	1851.50 ~ 1913.50	3	QPSK	23.96	248.89	25.90	389.05
			16QAM	23.34	215.77	25.48	353.18
			64QAM	22.25	167.88		
			256QAM	19.13	81.85		
	1850.70 ~ 1914.30	1.4	QPSK	24.02	252.35	25.62	364.75
			16QAM	23.26	211.84	25.26	335.74
			64QAM	22.23	167.11		
			256QAM	19.03	79.98		

LTE Band 25 (ANT Sub2)

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	1860.00 ~ 1905.00	20	QPSK	23.71	234.96	20.15	103.51
			16QAM	22.97	198.15	19.06	80.54
			64QAM	21.84	152.76		
			256QAM	18.77	75.34		
	1857.50 ~ 1907.50	15	QPSK	23.52	224.91		
			16QAM	22.87	193.64		
			64QAM	21.50	141.25		
			256QAM	18.48	70.47		
	1855.00 ~ 1910.00	10	QPSK	23.46	221.82		
			16QAM	22.66	184.50		
			64QAM	21.56	143.22		
			256QAM	18.56	71.78		
	1852.50 ~ 1912.50	5	QPSK	23.42	219.79		
			16QAM	22.97	198.15		
			64QAM	21.59	144.21		
			256QAM	18.45	69.98		
	1851.50 ~ 1913.50	3	QPSK	23.47	222.33		
			16QAM	22.78	189.67		
			64QAM	21.48	140.60		
			256QAM	18.49	70.63		
1850.70 ~ 1914.30	1.4	QPSK	23.44	220.80			
		16QAM	22.76	188.80			
		64QAM	21.78	150.66			
		256QAM	18.64	73.11			

NR Band n25

FCC Part 24								
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n25	1860.00 ~ 1905.00	20	DFT-s OFDM	$\pi/2$ BPSK	23.73	236.05		
				QPSK	24.04	253.51	25.51	355.63
				16QAM	23.09	203.70	25.03	318.42
				64QAM	21.60	144.54		
			256QAM	19.50	89.13			
	CP-OFDM	QPSK	22.49	177.42				
	1857.50 ~ 1907.50	15	DFT-s OFDM	$\pi/2$ BPSK	24.08	255.86		
				QPSK	24.08	255.86	25.45	350.75
				16QAM	23.02	200.45	24.95	312.61
				64QAM	21.70	147.91		
			256QAM	19.68	92.90			
	CP-OFDM	QPSK	22.68	185.35				
	1855.00 ~ 1910.00	10	DFT-s OFDM	$\pi/2$ BPSK	23.89	244.91		
				QPSK	24.10	257.04	25.38	345.14
				16QAM	23.23	210.38	24.78	300.61
				64QAM	22.33	171.00		
			256QAM	19.86	96.83			
	CP-OFDM	QPSK	22.79	190.11				
	1852.50 ~ 1912.50	5	DFT-s OFDM	$\pi/2$ BPSK	23.86	243.22		
				QPSK	24.07	255.27	24.77	299.92
16QAM				23.38	217.77	24.40	275.42	
64QAM				21.87	153.82			
256QAM			19.74	94.19				
CP-OFDM	QPSK	22.79	190.11					

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna for the supported bands with a maximum peak gain as follow:

Frequency (MHz)	Peak Gain (dBi)
WCDMA Band 2 / LTE Band 2, 25 / NR Band n2, 25 1850 - 1915 MHz	-1.1 (Main1)
	-4.2 (Sub2)

5.4. WORST-CASE ORIENTATION

Following Modes should be considered as worst-case scenario for all other measurements.

- UMTS REL 99/HSDPA

For LTE Band 25 the worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, 64QAM and 256QAM modulations. However, the out of band emissions and spurious radiation were only performed on bandwidth and RB offset(with RB size 1) with the highest power in QPSK.

For the sub2 antenna, LTE Band 66 operates on the sub2 antenna in the anchor combination(ENDC) of 5G NR n25.

For 5G NR Band n25 the worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on $\pi/2$ BPSK, QPSK, 16QAM, 64QAM and 256QAM modulations. It was found that QPSK and 16QAM results were worst case as below.

Both NSA and SA modes were tested and worst case is reported. the out of band emissions and spurious radiation were only performed on bandwidth and RB offset(with RB size 1) with the highest conducted power.

LTE Band 2

LTE Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

NR Band 2

NR Band 2 (Frequency range: 1850-1910 MHz) is covered by NR Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

NR Worst case

BAND	NSA or SA	Antenna
n25	SA	Main1

● Conducted Spurious Emission(ANT Main1)

Highest conducted power setting for each bands				
LTE Band	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	1855.00	10	1	49
	1882.50		1	25
	1910.00		1	49
NR Band	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	1855.00	10	1	26
	1882.50		1	50
	1910.00		1	26

● Conducted Spurious Emission(ANT Sub2)

Highest conducted power setting for each bands				
LTE Band	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	1860.00	20	1	99
	1882.50		1	0
	1905.00		1	0

● Radiated Spurious Emission(ANT Main1)

Highest EIRP setting for each bands				
LTE Band	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	1860.00	20	1	99
	1882.50		1	0
	1905.00		1	0
NR Band	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	1860.00	20	1	1
	1882.50		1	104
	1905.00		1	104

● Radiated Spurious Emission(ANT Sub2)

Highest EIRP setting for each bands				
LTE Band	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	1860.00	20	1	99
	1882.50		1	0
	1905.00		1	0

The fundamental and radiated spurious emission were investigated in three orthogonal orientations X, Y and Z, it was determined that below orientation was worst-case orientation for each band.

Band	ANT	EIRP			RSE		
		X	Y	Z	X	Y	Z
WCDMA B2	Main1	-	-	○	-	-	○
LTE B25	Main1	○	-	-	-	○	-
	Sub2	○	-	-	-	-	○
NR n25	Main1	○	-	-	-	○	-

Note : For EIRP testing, the EUT didn't attached with travel adapter. But radiated spurious testing, the EUT attached with travel adapter for the worst case condition. The EUT is continuously communicated with the call box during the tests.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N9QP4SL9DK3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

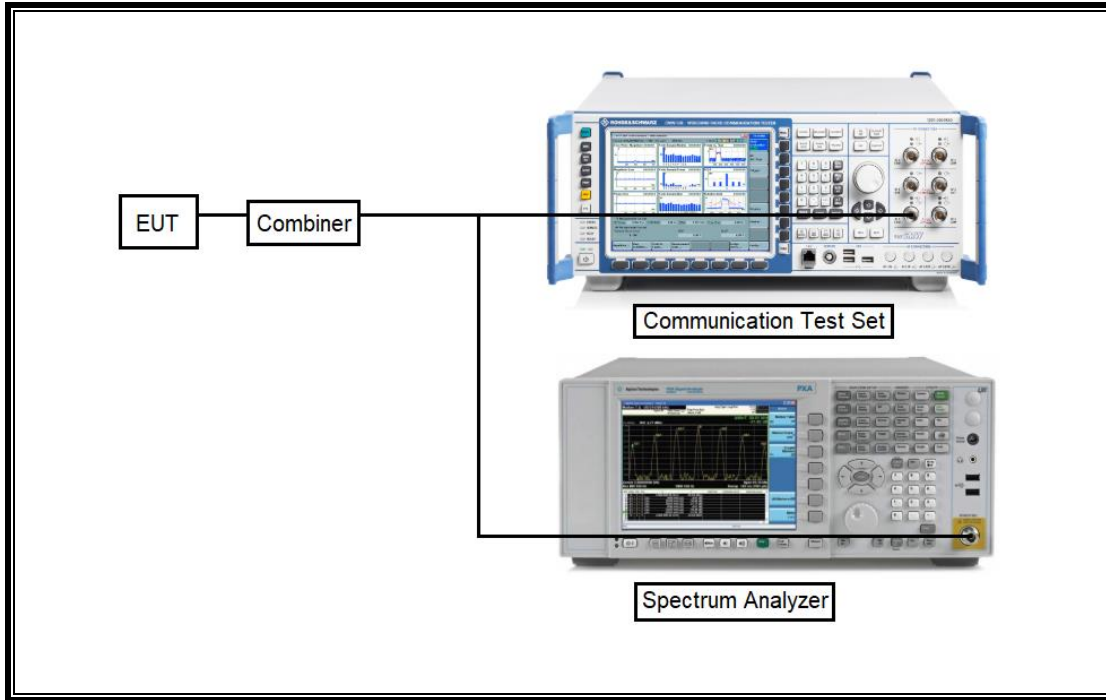
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

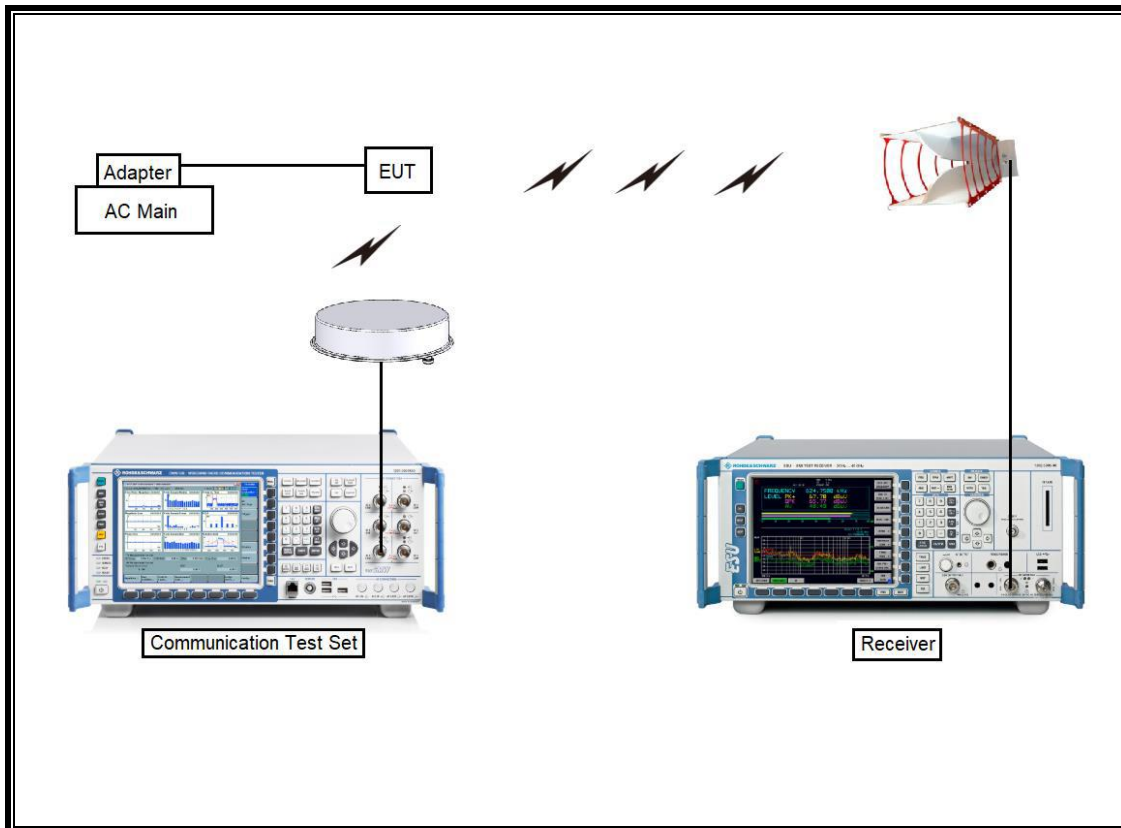
TEST SETUP

The EUT is continuously communicated with the call box during the tests.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	2025-01-17
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2023-10-13
Preamplifier	ETS	3115-PA	00167475	2023-08-04
Preamplifier	ETS	3116C-PA	00168841	2023-08-04
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2024-08-15
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Communications Test Set	R&S	CMM500	169796	2024-01-05
DC Power Supply	Agilent / HP	E3640A	MY54226395	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	341282	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2023-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2023-08-01
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2023-08-01
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2023-08-03
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2023-08-01
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2023-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2023-07-29
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2023-08-01
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2023-08-01
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2023-08-01
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2023-08-01
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2023-08-01
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2023-08-01
Attenuator	PASTERNAK	PE7087-10	A009	2023-08-03
Attenuator	PASTERNAK	PE7087-10	A001	2023-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2023-08-03
Attenuator	PASTERNAK	PE7004-10	2	2023-08-01
Attenuator	PASTERNAK	PE7395-10	A011	2023-08-03
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023-10-06
Temperature Chamber	ESPEC	SH-642	93001109	2023-08-01
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2024-01-09
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2024-01-09
UL Software				
Description	Manufacturer	Model	Version	
Antenna port test software	UL	CLT	Ver 3.4	
Radiated software	UL	UL EMC	Ver 9.5	
Antenna port test software (5G NR FR1)	UL	UL iM	Ver 1.06	

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Band width (99%)	N/A	Conducted	Pass
24.238(a)	Band Edge / Conducted Spurious Emission	-13dBm		Pass
2.1046	Conducted output power	N/A		Pass
24.235	Frequency Stability	2.5PPM		Pass
24.232(c)	Equivalent Isotropic Radiated Power	33dBm	Radiated	Pass
24.238(a)	Radiated Spurious Emission	-13dBm		Pass

8. CONDUCTED RESULTS

8.1. CONDUCTED OUTPUT POWER

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to either CMW500 Test Set or E7515B Test set and configured to operate at maximum power.

NOTE

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All Modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

See the following pages.

8.1.1. CONDUCTED AVERAGE OUTPUT POWER

WCDMA B2

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.40	23.02	N/A	24.5
		9400	1880.00	23.42		
		9538	1907.60	23.10		
HSDPA	Subtest 1	9262	1852.40	23.04	0	24.0
		9400	1880.00	23.34		
		9538	1907.60	22.93		
	Subtest 2	9262	1852.40	22.70	0	24.0
		9400	1880.00	22.92		
		9538	1907.60	22.58		
	Subtest 3	9262	1852.40	22.24	0.5	23.5
		9400	1880.00	22.54		
		9538	1907.60	22.30		
	Subtest 4	9262	1852.40	21.85	0.5	23.5
		9400	1880.00	22.20		
		9538	1907.60	21.96		
HSUPA	Subtest 1	9262	1852.40	22.44	0	24.0
		9400	1880.00	22.49		
		9538	1907.60	22.67		
	Subtest 2	9262	1852.40	19.81	2	22.0
		9400	1880.00	19.94		
		9538	1907.60	20.17		
	Subtest 3	9262	1852.40	22.39	1	23.0
		9400	1880.00	22.46		
		9538	1907.60	22.64		
	Subtest 4	9262	1852.40	20.32	2	22.0
		9400	1880.00	20.40		
		9538	1907.60	20.60		
	Subtest 5	9262	1852.40	22.95	0	24.0
		9400	1880.00	23.57		
		9538	1907.60	23.27		
DC-HSDPA	Subtest 1	9262	1852.40	23.00	0	24.0
		9400	1880.00	23.42		
		9538	1907.60	22.77		
	Subtest 2	9262	1852.40	22.65	0	24.0
		9400	1880.00	22.89		
		9538	1907.60	22.30		
	Subtest 3	9262	1852.40	21.83	0.5	23.5
		9400	1880.00	22.19		
		9538	1907.60	21.71		
	Subtest 4	9262	1852.40	21.99	0.5	23.5
		9400	1880.00	22.20		
		9538	1907.60	21.79		

LTE Band 25 (ANT Main1)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26140 1860.00 MHz	26365 1882.50 MHz	26590 1905.00 MHz		
20 MHz	QPSK	1	0	23.31	23.98	23.96	0.0	25.0
		1	49	23.63	23.85	23.36	0.0	25.0
		1	99	24.05	23.61	23.23	0.0	25.0
		50	0	22.54	23.14	22.84	1.0	24.0
		50	24	22.92	23.13	22.57	1.0	24.0
		50	50	23.20	23.02	22.40	1.0	24.0
	100	0	22.90	23.09	22.23	1.0	24.0	
	16QAM	1	0	22.49	23.47	22.86	1.0	24.0
		1	49	23.18	23.43	22.42	1.0	24.0
		1	99	23.58	23.24	21.88	1.0	24.0
		50	0	22.01	22.59	21.83	2.0	23.0
		50	24	22.40	22.61	21.66	2.0	23.0
		50	50	22.66	22.52	21.58	2.0	23.0
	100	0	22.39	22.56	21.81	2.0	23.0	
	64QAM	1	0	22.44	22.43	22.38	2.0	23.0
		1	49	22.80	22.99	21.82	2.0	23.0
		1	99	22.89	22.69	21.18	2.0	23.0
		50	0	21.67	21.91	21.39	3.0	22.0
		50	24	21.69	21.91	21.22	3.0	22.0
		50	50	21.69	21.90	21.11	3.0	22.0
	100	0	21.69	21.89	21.26	3.0	22.0	
	256QAM	1	0	19.93	19.48	19.94	5.0	20.0
		1	49	19.28	19.29	19.77	5.0	20.0
		1	99	19.92	19.43	19.25	5.0	20.0
50		0	19.64	19.86	19.95	5.0	20.0	
50		24	19.63	19.84	19.86	5.0	20.0	
50		50	19.61	19.82	19.76	5.0	20.0	
100	0	19.59	19.84	19.90	5.0	20.0		
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26115 1857.50 MHz	26365 1882.50 MHz	26615 1907.50 MHz		
				15 MHz	QPSK	1	0	23.07
1	37	23.86	23.93			23.34	0.0	25.0
1	74	23.88	24.00			23.27	0.0	25.0
36	0	22.91	23.09			22.81	1.0	24.0
36	20	23.09	23.06			22.78	1.0	24.0
36	39	23.08	23.05			22.80	1.0	24.0
75	0	23.09	23.07			22.78	1.0	24.0
16QAM	1	0	22.63		23.29	23.15	1.0	24.0
	1	37	23.16		23.19	23.00	1.0	24.0
	1	74	23.17		23.23	22.92	1.0	24.0
	36	0	22.05		22.07	22.09	2.0	23.0
	36	20	22.02		22.02	22.06	2.0	23.0
	36	39	21.98		22.02	22.04	2.0	23.0
	75	0	22.01		21.98	22.03	2.0	23.0
64QAM	1	0	22.03		22.15	22.50	2.0	23.0
	1	37	22.15		22.26	22.32	2.0	23.0
	1	74	22.15		22.16	21.70	2.0	23.0
	36	0	21.23		21.29	21.41	3.0	22.0
	36	20	21.24		21.28	21.39	3.0	22.0
	36	39	21.23		21.28	21.38	3.0	22.0
	75	0	21.24		21.24	21.44	3.0	22.0
256QAM	1	0	19.49		19.26	19.52	5.0	20.0
	1	37	19.50		19.24	19.56	5.0	20.0
	1	74	19.45		19.21	19.43	5.0	20.0
	36	0	19.20	19.15	19.36	5.0	20.0	
	36	20	19.20	19.12	19.34	5.0	20.0	
	36	39	19.18	19.11	19.32	5.0	20.0	
	75	0	19.17	19.12	19.34	5.0	20.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855.00 MHz	1882.50 MHz	1910.00 MHz		
10 MHz	QPSK	1	0	23.57	24.03	23.48	0.0	25.0
		1	25	23.86	24.08	23.53	0.0	25.0
		1	49	24.06	24.02	23.61	0.0	25.0
		25	0	23.08	23.03	22.81	1.0	24.0
		25	12	23.04	22.99	22.95	1.0	24.0
		25	25	23.03	22.98	23.04	1.0	24.0
	16QAM	50	0	23.05	23.00	22.97	1.0	24.0
		1	0	23.09	23.21	23.02	1.0	24.0
		1	25	23.25	23.26	23.19	1.0	24.0
		1	49	23.17	23.22	23.27	1.0	24.0
		25	0	22.04	22.05	22.09	2.0	23.0
		25	12	22.00	22.01	22.05	2.0	23.0
	64QAM	25	25	22.01	22.00	22.03	2.0	23.0
		50	0	22.01	21.96	22.00	2.0	23.0
		1	0	22.23	21.95	22.10	2.0	23.0
		1	25	22.18	22.09	22.08	2.0	23.0
		1	49	22.21	22.00	22.00	2.0	23.0
		25	0	20.89	20.94	20.98	3.0	22.0
	256QAM	25	12	20.89	20.92	20.95	3.0	22.0
		25	25	20.79	20.90	20.92	3.0	22.0
		50	0	20.87	20.89	20.94	3.0	22.0
		1	0	19.32	19.30	19.03	5.0	20.0
		1	25	19.24	19.30	18.79	5.0	20.0
		1	49	19.21	19.22	18.88	5.0	20.0
5 MHz	QPSK	25	0	18.78	18.86	18.95	5.0	20.0
		25	12	18.69	18.86	18.93	5.0	20.0
		25	25	18.90	18.89	18.87	5.0	20.0
		50	0	18.79	18.91	18.85	5.0	20.0
		1	0	23.47	23.84	23.23	0.0	25.0
		1	12	23.46	23.70	23.46	0.0	25.0
	16QAM	1	24	23.48	23.91	23.33	0.0	25.0
		12	0	22.75	22.86	22.73	1.0	24.0
		12	7	22.81	22.86	22.88	1.0	24.0
		12	13	22.84	22.86	22.88	1.0	24.0
		25	0	22.81	22.87	22.86	1.0	24.0
		1	0	22.80	23.33	22.75	1.0	24.0
	64QAM	1	12	22.94	22.94	22.95	1.0	24.0
		1	24	23.03	23.27	22.96	1.0	24.0
		12	0	21.90	21.96	21.92	2.0	23.0
		12	7	21.86	21.94	21.88	2.0	23.0
		12	13	21.89	21.93	21.86	2.0	23.0
		25	0	21.87	21.85	21.84	2.0	23.0
	256QAM	1	0	21.81	22.12	22.23	2.0	23.0
		1	12	21.75	22.10	22.18	2.0	23.0
		1	24	21.90	22.21	22.16	2.0	23.0
		12	0	20.93	20.94	20.91	3.0	22.0
		12	7	20.92	20.91	20.89	3.0	22.0
		12	13	20.93	20.93	20.87	3.0	22.0
256QAM	25	0	20.93	20.89	20.90	3.0	22.0	
	1	0	18.78	18.98	19.26	5.0	20.0	
	1	12	18.44	18.91	19.15	5.0	20.0	
	1	24	18.68	18.97	19.16	5.0	20.0	
	12	0	18.83	18.87	18.87	5.0	20.0	
	12	7	18.82	18.86	18.86	5.0	20.0	
256QAM	12	13	18.80	18.83	18.81	5.0	20.0	
	25	0	18.84	18.83	18.82	5.0	20.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.50 MHz	1882.50 MHz	1913.50 MHz		
3 MHz	QPSK	1	0	23.58	23.96	23.81	0.0	25.0
		1	8	23.65	23.82	23.79	0.0	25.0
		1	14	23.61	23.95	23.54	0.0	25.0
		8	0	22.99	22.97	23.08	1.0	24.0
		8	4	23.04	23.03	23.02	1.0	24.0
		8	7	23.06	22.98	23.04	1.0	24.0
	16QAM	15	0	23.05	23.02	22.95	1.0	24.0
		1	0	23.05	23.31	23.31	1.0	24.0
		1	8	23.06	23.23	23.24	1.0	24.0
		1	14	23.07	23.34	23.21	1.0	24.0
		8	0	22.08	21.99	22.04	2.0	23.0
		8	4	22.12	21.98	21.99	2.0	23.0
	64QAM	8	7	22.04	21.95	21.94	2.0	23.0
		15	0	22.00	21.96	21.94	2.0	23.0
		1	0	22.09	22.13	21.97	2.0	23.0
		1	8	22.07	21.92	21.95	2.0	23.0
		1	14	22.25	22.23	21.94	2.0	23.0
		8	0	21.05	20.99	20.89	3.0	22.0
	256QAM	8	4	21.03	20.95	20.89	3.0	22.0
		8	7	21.06	20.93	20.89	3.0	22.0
		15	0	21.00	20.83	20.93	3.0	22.0
1		0	18.95	19.13	18.92	5.0	20.0	
1		8	18.88	18.94	18.80	5.0	20.0	
1		14	18.88	19.06	18.88	5.0	20.0	
1.4 MHz	QPSK	8	0	18.95	18.93	18.91	5.0	20.0
		8	4	18.90	18.88	18.91	5.0	20.0
		8	7	18.93	18.90	18.84	5.0	20.0
		15	0	18.96	18.89	18.91	5.0	20.0
		1	0	23.49	24.01	23.73	0.0	25.0
		1	3	23.46	23.89	23.57	0.0	25.0
	16QAM	1	5	23.49	24.02	23.45	0.0	25.0
		3	0	23.39	23.95	23.56	0.0	25.0
		3	1	23.41	23.95	23.55	0.0	25.0
		3	3	23.41	23.93	23.52	0.0	25.0
		6	0	22.80	22.93	22.92	1.0	24.0
		1	0	23.16	22.82	23.00	1.0	24.0
	64QAM	1	3	23.21	23.00	22.97	1.0	24.0
		1	5	23.26	22.85	23.01	1.0	24.0
		3	0	22.87	23.10	22.97	1.0	24.0
		3	1	22.89	22.98	22.92	1.0	24.0
		3	3	22.90	23.01	22.96	1.0	24.0
		6	0	22.01	21.92	22.05	2.0	23.0
	256QAM	1	0	22.00	22.01	22.03	2.0	23.0
		1	3	22.23	22.03	22.12	2.0	23.0
		1	5	22.14	21.98	22.12	2.0	23.0
3		0	21.94	21.95	21.98	2.0	23.0	
3		1	21.93	21.95	21.94	2.0	23.0	
3		3	21.88	21.90	21.96	2.0	23.0	
256QAM	6	0	20.99	20.94	20.97	3.0	22.0	
	1	0	19.03	18.92	18.88	5.0	20.0	
	1	3	18.81	18.86	18.94	5.0	20.0	
	1	5	18.97	18.85	18.80	5.0	20.0	
	3	0	18.90	18.73	18.85	5.0	20.0	
	3	1	18.87	18.70	18.81	5.0	20.0	
256QAM	3	3	18.83	18.67	18.74	5.0	20.0	
	6	0	18.82	18.77	18.74	5.0	20.0	

LTE Band 25 (ANT Sub2)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26140 1860.00 MHz	26365 1882.50 MHz	26590 1905.00 MHz		
20 MHz	QPSK	1	0	23.22	23.71	23.71	0.0	24.0
		1	49	23.15	23.68	23.55	0.0	24.0
		1	99	23.42	23.64	22.67	0.0	24.0
		50	0	22.34	22.78	22.68	1.0	23.0
		50	24	22.40	22.77	22.61	1.0	23.0
		50	50	22.44	22.73	22.59	1.0	23.0
	100	0	22.40	22.74	22.64	1.0	23.0	
	16QAM	1	0	22.57	22.87	22.82	1.0	23.0
		1	49	22.69	22.91	22.86	1.0	23.0
		1	99	22.80	22.97	22.47	1.0	23.0
		50	0	21.41	21.80	21.66	2.0	22.0
		50	24	21.46	21.79	21.57	2.0	22.0
		50	50	21.49	21.75	21.54	2.0	22.0
	100	0	21.43	21.73	21.63	2.0	22.0	
	64QAM	1	0	21.49	21.84	21.83	2.0	22.0
		1	49	21.53	21.81	21.67	2.0	22.0
		1	99	21.73	21.76	21.68	2.0	22.0
		50	0	20.36	20.72	20.64	3.0	21.0
		50	24	20.42	20.71	20.59	3.0	21.0
		50	50	20.47	20.68	20.58	3.0	21.0
	100	0	20.40	20.65	20.57	3.0	21.0	
	256QAM	1	0	18.57	18.77	18.76	5.0	19.0
		1	49	18.68	18.63	18.37	5.0	19.0
		1	99	18.72	18.73	18.62	5.0	19.0
50		0	18.31	18.70	18.60	5.0	19.0	
50		24	18.36	18.69	18.54	5.0	19.0	
50		50	18.40	18.64	18.54	5.0	19.0	
100	0	18.32	18.65	18.58	5.0	19.0		
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26115 1857.50 MHz	26365 1882.50 MHz	26615 1907.50 MHz		
				15 MHz	QPSK	1	0	23.23
1	37	23.15	23.52			23.52	0.0	24.0
1	74	23.37	23.35			23.15	0.0	24.0
36	0	22.28	22.42			22.50	1.0	23.0
36	20	22.30	22.41			22.44	1.0	23.0
36	39	22.36	22.38			22.46	1.0	23.0
75	0	22.34	22.43			22.50	1.0	23.0
16QAM	1	0	22.36		22.80	22.70	1.0	23.0
	1	37	22.44		22.87	22.67	1.0	23.0
	1	74	22.48		22.71	22.65	1.0	23.0
	36	0	21.27		21.48	21.52	2.0	22.0
	36	20	21.30		21.46	21.47	2.0	22.0
	36	39	21.33		21.43	21.47	2.0	22.0
	75	0	21.32		21.41	21.49	2.0	22.0
64QAM	1	0	21.03		21.38	21.50	2.0	22.0
	1	37	21.07		21.19	21.35	2.0	22.0
	1	74	21.15		21.38	21.38	2.0	22.0
	36	0	20.13		20.19	20.21	3.0	21.0
	36	20	20.18		20.18	20.17	3.0	21.0
	36	39	20.19		20.13	20.20	3.0	21.0
	75	0	20.10		20.16	20.19	3.0	21.0
256QAM	1	0	18.06		18.26	18.48	5.0	19.0
	1	37	18.10		18.20	18.33	5.0	19.0
	1	74	18.21		18.18	18.46	5.0	19.0
	36	0	18.02	18.13	18.20	5.0	19.0	
	36	20	18.04	18.08	18.16	5.0	19.0	
	36	39	18.07	18.08	18.15	5.0	19.0	
	75	0	18.07	18.12	18.20	5.0	19.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855.00 MHz	1882.50 MHz	1910.00 MHz		
10 MHz	QPSK	1	0	23.24	23.39	22.94	0.0	24.0
		1	25	23.03	23.46	22.45	0.0	24.0
		1	49	23.38	23.40	22.20	0.0	24.0
		25	0	22.31	22.43	21.92	1.0	23.0
		25	12	22.32	22.40	21.82	1.0	23.0
		25	25	22.35	22.36	21.76	1.0	23.0
	16QAM	50	0	22.34	22.41	21.85	1.0	23.0
		1	0	22.60	22.44	22.45	1.0	23.0
		1	25	22.57	22.54	22.11	1.0	23.0
		1	49	22.66	22.33	21.86	1.0	23.0
		25	0	21.39	21.46	21.31	2.0	22.0
		25	12	21.41	21.44	21.24	2.0	22.0
	64QAM	25	25	21.43	21.40	21.21	2.0	22.0
		50	0	21.35	21.44	21.28	2.0	22.0
		1	0	21.24	21.46	21.21	2.0	22.0
		1	25	21.40	21.56	21.22	2.0	22.0
		1	49	21.27	21.47	21.34	2.0	22.0
		25	0	20.19	20.24	20.21	3.0	21.0
	256QAM	25	12	20.21	20.23	20.25	3.0	21.0
		25	25	20.23	20.22	20.26	3.0	21.0
		50	0	20.19	20.23	20.26	3.0	21.0
1		0	18.18	18.49	18.17	5.0	19.0	
1		25	18.23	18.56	18.31	5.0	19.0	
1		49	18.29	18.42	18.24	5.0	19.0	
5 MHz	QPSK	25	0	18.19	18.25	18.22	5.0	19.0
		25	12	18.22	18.24	18.23	5.0	19.0
		25	25	18.22	18.20	18.23	5.0	19.0
		50	0	18.16	18.22	18.21	5.0	19.0
		1	0	23.27	23.34	22.68	0.0	24.0
		1	12	23.42	23.40	22.62	0.0	24.0
	16QAM	1	24	23.37	23.38	22.39	0.0	24.0
		12	0	22.34	22.39	21.95	1.0	23.0
		12	7	22.36	22.39	21.97	1.0	23.0
		12	13	22.35	22.38	21.96	1.0	23.0
		25	0	22.34	22.40	21.97	1.0	23.0
		1	0	22.66	22.97	22.22	1.0	23.0
	64QAM	1	12	22.72	22.91	22.27	1.0	23.0
		1	24	22.68	22.97	22.04	1.0	23.0
		12	0	21.40	21.50	21.36	2.0	22.0
		12	7	21.39	21.50	21.42	2.0	22.0
		12	13	21.40	21.48	21.41	2.0	22.0
		25	0	21.40	21.44	21.42	2.0	22.0
	256QAM	1	0	21.28	21.59	21.38	2.0	22.0
		1	12	21.37	21.55	21.37	2.0	22.0
		1	24	21.36	21.55	21.50	2.0	22.0
12		0	20.18	20.24	20.22	3.0	21.0	
12		7	20.21	20.25	20.24	3.0	21.0	
12		13	20.20	20.23	20.27	3.0	21.0	
256QAM	25	0	20.22	20.24	20.25	3.0	21.0	
	1	0	18.27	18.43	18.19	5.0	19.0	
	1	12	18.09	18.45	18.22	5.0	19.0	
	1	24	18.31	18.45	18.34	5.0	19.0	
	12	0	18.19	18.26	18.17	5.0	19.0	
	12	7	18.21	18.26	18.20	5.0	19.0	
256QAM	12	13	18.19	18.20	18.22	5.0	19.0	
	25	0	18.20	18.18	18.27	5.0	19.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.50 MHz	1882.50 MHz	1913.50 MHz		
3 MHz	QPSK	1	0	23.40	23.32	22.75	0.0	24.0
		1	8	23.21	23.42	22.66	0.0	24.0
		1	14	23.47	23.31	22.42	0.0	24.0
		8	0	22.37	22.39	21.92	1.0	23.0
		8	4	22.35	22.36	21.94	1.0	23.0
		8	7	22.37	22.38	21.91	1.0	23.0
	16QAM	15	0	22.39	22.39	21.93	1.0	23.0
		1	0	22.39	22.71	22.36	1.0	23.0
		1	8	22.45	22.78	22.38	1.0	23.0
		1	14	22.34	22.74	22.16	1.0	23.0
		8	0	21.42	21.44	21.36	2.0	22.0
		8	4	21.44	21.39	21.39	2.0	22.0
	64QAM	8	4	21.42	21.37	21.38	2.0	22.0
		15	0	21.42	21.41	21.38	2.0	22.0
		1	0	21.25	21.44	21.28	2.0	22.0
		1	8	21.35	21.40	21.35	2.0	22.0
		1	14	21.21	21.48	21.42	2.0	22.0
		8	0	20.31	20.28	20.26	3.0	21.0
	256QAM	8	4	20.29	20.24	20.31	3.0	21.0
		8	7	20.29	20.26	20.32	3.0	21.0
		15	0	20.27	20.26	20.25	3.0	21.0
1		0	18.31	18.49	18.36	5.0	19.0	
1		8	18.33	18.41	18.39	5.0	19.0	
1		14	18.33	18.40	18.42	5.0	19.0	
1.4 MHz	QPSK	8	0	18.25	18.23	18.34	5.0	19.0
		8	4	18.27	18.24	18.34	5.0	19.0
		8	7	18.23	18.21	18.37	5.0	19.0
		15	0	18.31	18.27	18.37	5.0	19.0
		1	0	23.24	23.35	22.82	0.0	24.0
		1	3	23.35	23.10	22.68	0.0	24.0
	16QAM	1	5	23.26	23.38	22.56	0.0	24.0
		3	0	23.36	23.44	22.63	0.0	24.0
		3	1	23.33	23.41	22.62	0.0	24.0
		3	3	23.28	23.25	22.57	0.0	24.0
		6	0	22.28	22.37	21.91	1.0	23.0
		1	0	22.37	22.72	22.14	1.0	23.0
	64QAM	1	3	22.34	22.74	22.10	1.0	23.0
		1	5	22.44	22.76	22.02	1.0	23.0
		3	0	22.46	22.49	22.01	1.0	23.0
		3	1	22.37	22.47	22.03	1.0	23.0
		3	3	22.45	22.40	21.99	1.0	23.0
		6	0	21.40	21.33	21.38	2.0	22.0
	256QAM	1	0	21.66	21.52	21.45	2.0	22.0
		1	3	21.78	21.36	21.54	2.0	22.0
		1	5	21.62	21.47	21.44	2.0	22.0
3		0	21.62	21.62	21.46	2.0	22.0	
3		1	21.52	21.57	21.45	2.0	22.0	
3		3	21.60	21.52	21.41	2.0	22.0	
QPSK	6	0	20.42	20.54	20.49	3.0	21.0	
	1	0	18.44	18.42	18.40	5.0	19.0	
	1	3	18.61	18.64	18.56	5.0	19.0	
	1	5	18.40	18.39	18.39	5.0	19.0	
	3	0	18.38	18.37	18.43	5.0	19.0	
	3	1	18.33	18.32	18.35	5.0	19.0	
16QAM	3	3	18.29	18.35	18.33	5.0	19.0	
	6	0	18.38	18.37	18.42	5.0	19.0	
	6	0	18.38	18.37	18.42	5.0	19.0	

NR Band n25

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372000	376500	381000		
					1860.00 MHz	1882.50 MHz	1905.00 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.51	23.51	23.61	0.0	25.0
			1	53	23.41	23.59	23.45	0.0	25.0
			1	104	23.47	23.73	23.71	0.0	25.0
			50	0	23.07	22.84	22.92	0.5	24.5
			50	28	23.43	23.51	23.41	0.0	25.0
			50	56	23.09	22.92	23.18	0.5	24.5
		100	0	23.08	22.93	23.15	0.5	24.5	
		QPSK	1	1	23.51	23.84	23.94	0.0	25.0
			1	53	23.94	24.04	24.01	0.0	25.0
			1	104	23.93	23.91	23.34	0.0	25.0
			50	0	23.17	23.02	23.04	1.0	24.0
			50	28	23.97	24.01	23.94	0.0	25.0
			50	56	23.16	23.03	23.30	1.0	24.0
		100	0	23.16	23.02	23.24	1.0	24.0	
16QAM	1	1	22.76	23.09	22.87	1.0	24.0		
64QAM	1	1	21.60	21.46	21.47	2.5	22.5		
256QAM	1	1	19.50	19.42	19.29	4.5	20.5		
CP-OFDM	QPSK	1	1	22.17	22.40	22.49	1.5	23.5	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371500	376500	381500		
					1857.50 MHz	1882.50 MHz	1907.50 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.66	23.93	23.84	0.0	25.0
			1	40	23.51	23.93	23.61	0.0	25.0
			1	77	23.65	23.84	23.65	0.0	25.0
			36	0	23.26	23.09	23.17	0.5	24.5
			36	22	23.61	24.08	23.56	0.0	25.0
			36	43	23.22	23.13	23.30	0.5	24.5
		75	0	23.25	23.11	23.33	0.5	24.5	
		QPSK	1	1	23.30	23.60	23.79	0.0	25.0
			1	40	24.05	24.02	23.89	0.0	25.0
			1	77	23.90	23.61	23.11	0.0	25.0
			36	0	23.09	23.14	23.30	1.0	24.0
			36	22	24.08	23.76	23.92	0.0	25.0
			36	43	23.28	23.17	23.30	1.0	24.0
		75	0	23.28	23.14	23.37	1.0	24.0	
16QAM	1	1	22.61	22.98	23.02	1.0	24.0		
64QAM	1	1	21.63	21.65	21.70	2.5	22.5		
256QAM	1	1	19.68	19.58	19.49	4.5	20.5		
CP-OFDM	QPSK	1	1	22.02	22.50	22.68	1.5	23.5	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371000	376500	382000		
					1855.00 MHz	1882.50 MHz	1910.00 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.44	23.50	23.72	0.0	25.0
			1	26	23.68	23.58	23.84	0.0	25.0
			1	50	23.25	23.59	23.30	0.0	25.0
			25	0	23.59	22.65	22.91	0.5	24.5
			25	14	22.65	23.63	23.89	0.0	25.0
			25	27	23.63	23.09	23.32	0.5	24.5
		50	0	23.09	23.07	23.34	0.5	24.5	
		QPSK	1	1	23.07	24.09	23.91	0.0	25.0
			1	26	24.09	24.07	24.07	0.0	25.0
			1	50	23.80	24.10	23.27	0.0	25.0
			25	0	23.78	23.10	23.40	1.0	24.0
			25	14	23.22	24.10	24.05	0.0	25.0
			25	27	23.78	23.13	23.21	1.0	24.0
		50	0	23.67	23.11	23.32	1.0	24.0	
16QAM	1	1	23.21	23.10	23.23	1.0	24.0		
64QAM	1	1	22.33	21.65	21.96	2.5	22.5		
256QAM	1	1	18.99	19.48	19.86	4.5	20.5		
CP-OFDM	QPSK	1	1	21.78	22.51	22.79	1.5	23.5	

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	
					370500	376500	382500			
					1852.50 MHz	1882.50 MHz	1912.50 MHz			
5 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	1	23.54	23.48	23.38	0.0	25.0	
			1	13	23.46	23.41	23.63	0.0	25.0	
			1	23	23.57	23.55	23.74	0.0	25.0	
			12	0	22.64	22.59	22.86	0.5	24.5	
			12	7	23.62	23.59	23.86	0.0	25.0	
			12	13	23.05	23.13	22.90	0.5	24.5	
		25	0	23.06	23.21	22.94	0.5	24.5		
		1	1	23.70	24.03	24.01	0.0	25.0		
		1	13	23.71	23.95	23.97	0.0	25.0		
		1	23	23.78	24.07	23.50	0.0	25.0		
		12	0	23.12	23.06	23.41	1.0	24.0		
		12	7	23.78	24.03	24.03	0.0	25.0		
		12	13	23.11	23.07	23.19	1.0	24.0		
		25	0	23.13	23.07	23.38	1.0	24.0		
		16QAM	1	1	23.05	23.11	23.38	1.0	24.0	
		64QAM	1	1	21.57	21.54	21.87	2.5	22.5	
		256QAM	1	1	19.55	19.47	19.74	4.5	20.5	
		CP-OFDM	QPSK	1	1	22.55	21.55	22.79	1.5	23.5

8.2. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to either CMW500 Test Set or E7515B Test set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

Test Spec

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

NOTE

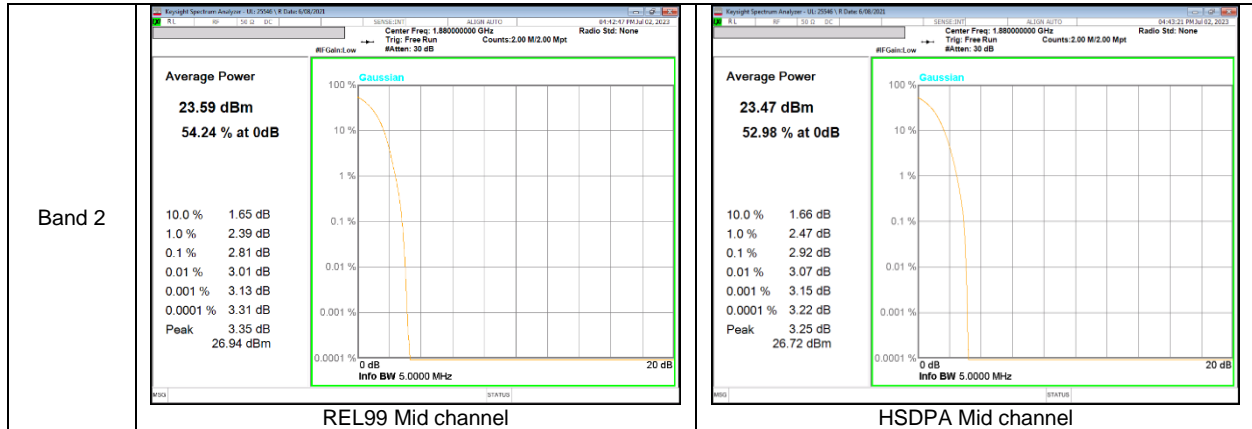
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All Modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

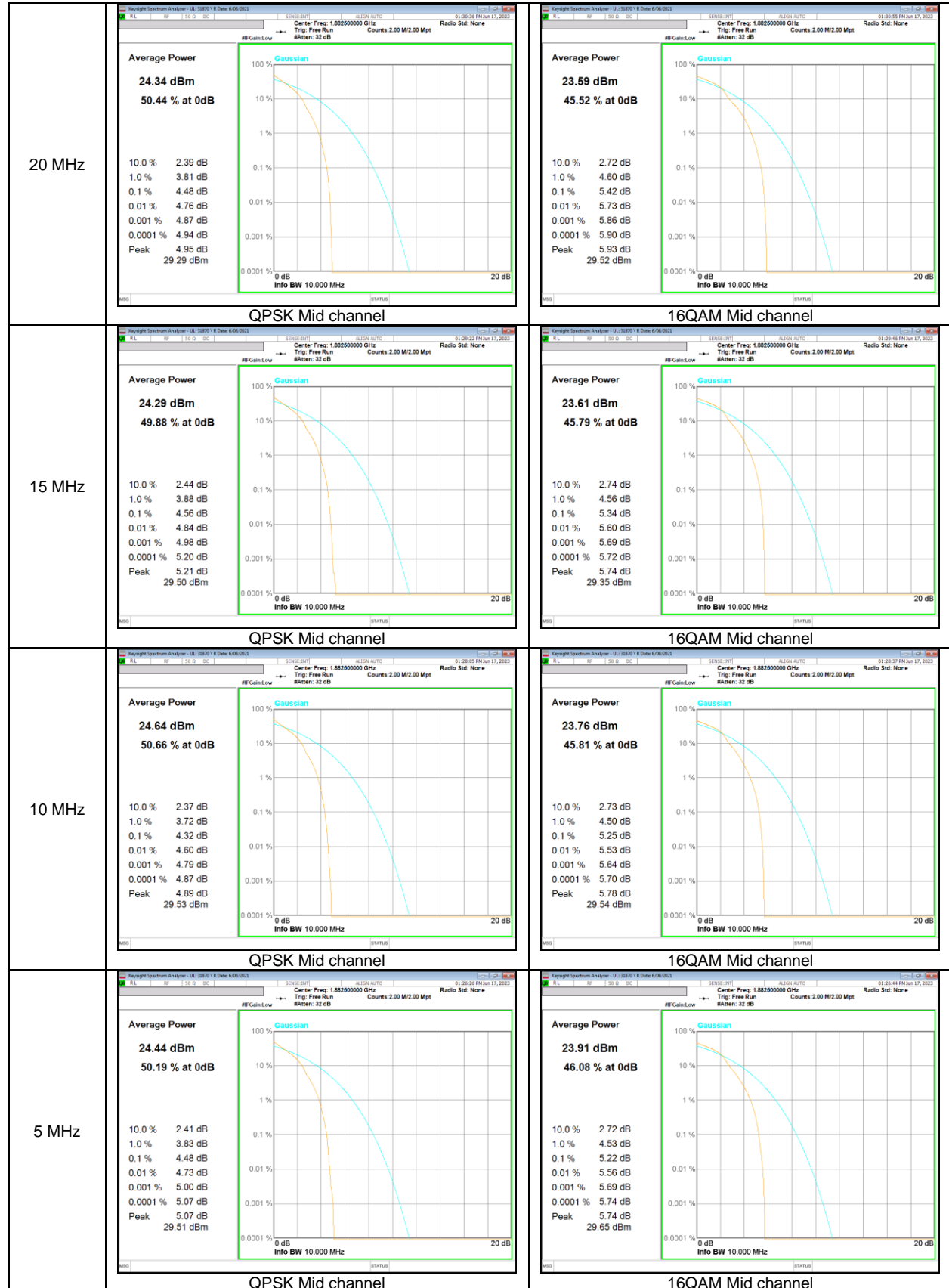
See the following pages.

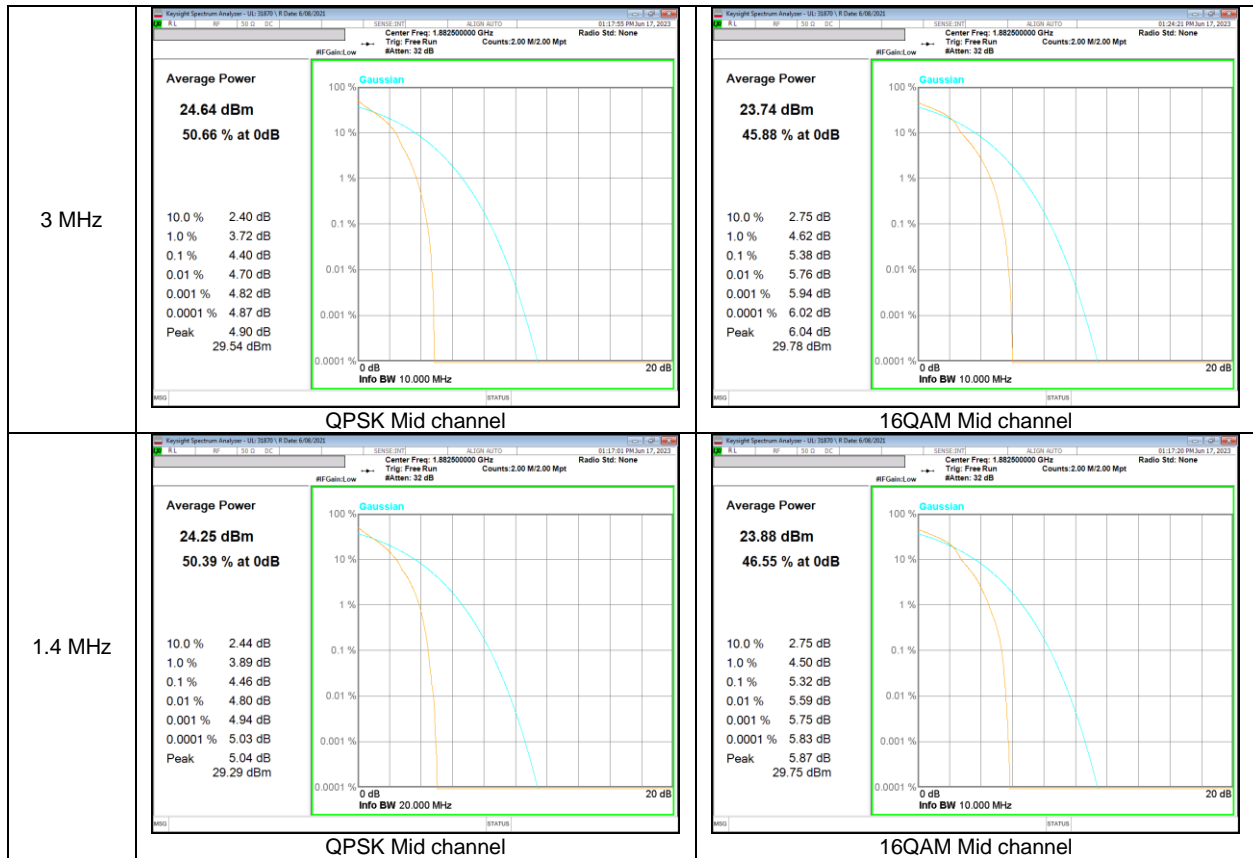
8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

WCDMA



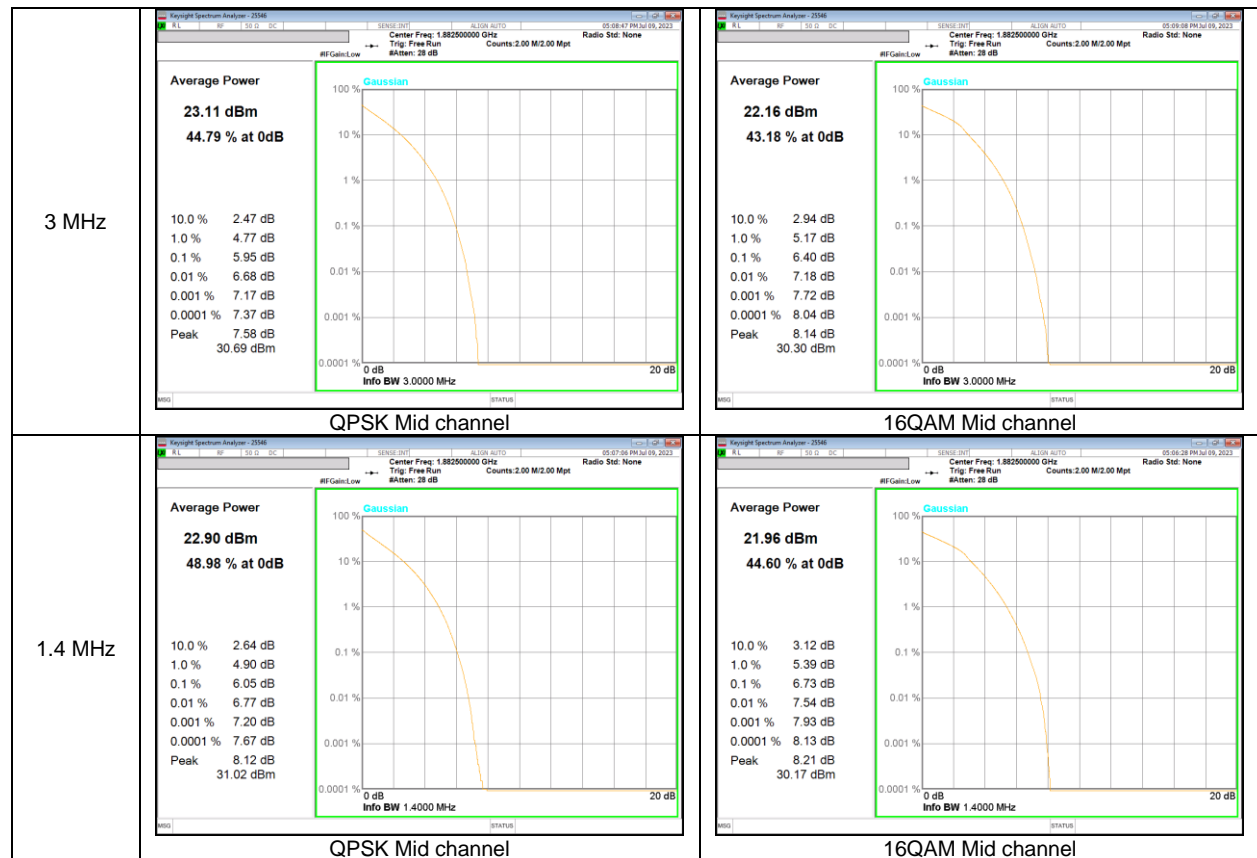
LTE Band 25 (ANT Main1)



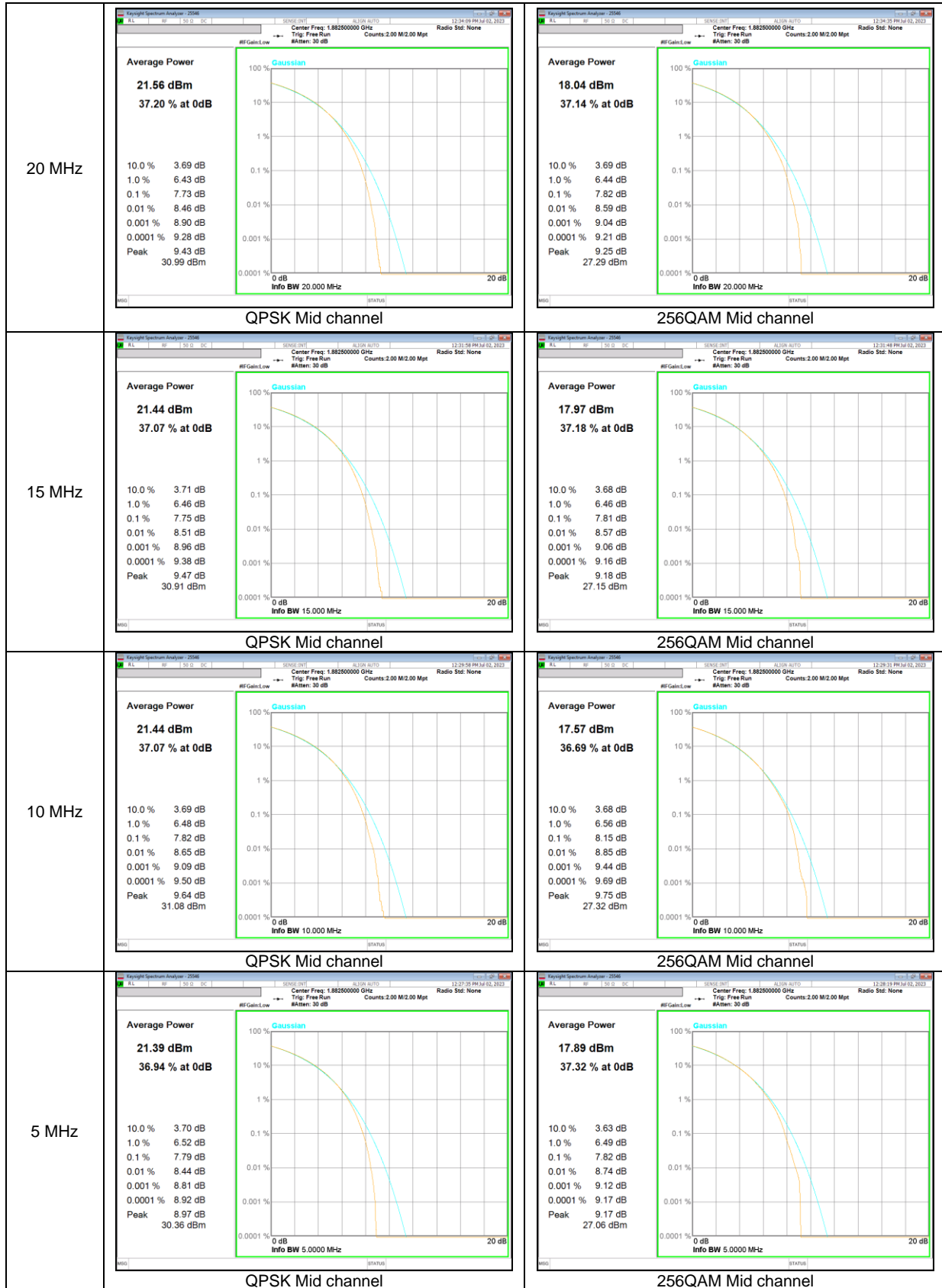


LTE Band 25 (ANT Sub2)





NR Band n25 CP-OFDM



8.3. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at middle channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

RESULTS

See the following pages.

- WCDMA

Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.0	4.174	4.724
	HSDPA		4.175	4.700

- LTE Band 25 (ANT Main1)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.5	17.897	19.620
		16QAM		17.898	19.690
	15M	QPSK		13.418	15.160
		16QAM		13.440	15.080
	10M	QPSK		8.973	10.300
		16QAM		8.972	10.200
	5M	QPSK		4.504	5.265
		16QAM		4.507	5.224
	3M	QPSK		2.692	3.047
		16QAM		2.698	3.081
	1.4M	QPSK		1.076	1.272
		16QAM		1.090	1.325

- LTE Band 25 (ANT Sub2)

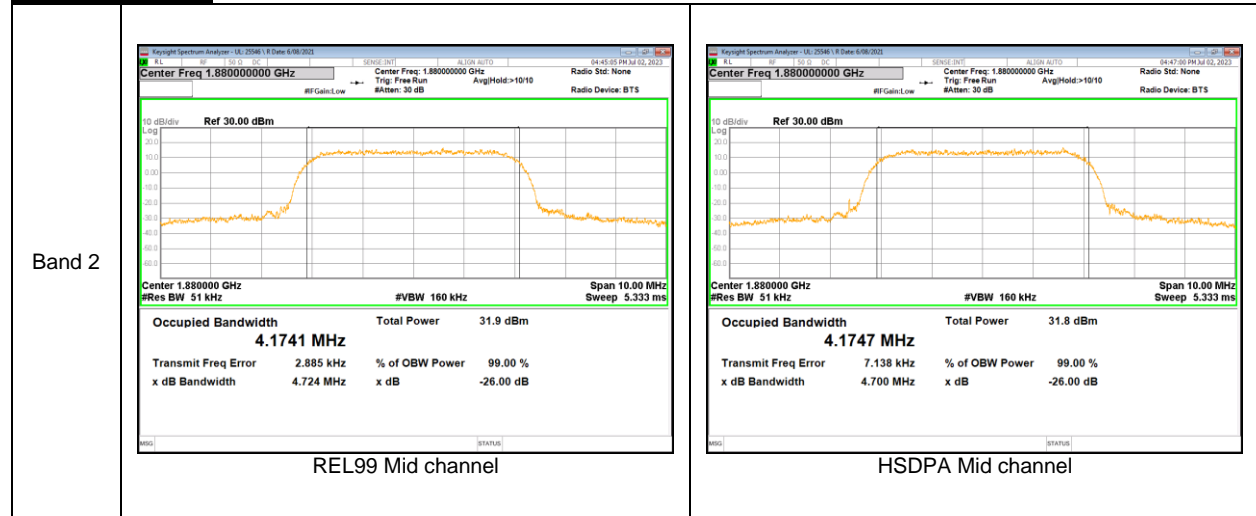
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.5	17.882	19.480
		16QAM		17.888	19.450
	15M	QPSK		13.451	14.990
		16QAM		13.441	14.800
	10M	QPSK		8.960	10.090
		16QAM		8.972	9.909
	5M	QPSK		4.486	5.216
		16QAM		4.487	5.187
	3M	QPSK		2.702	3.006
		16QAM		2.711	3.044
	1.4M	QPSK		1.085	1.277
		16QAM		1.087	1.300

- NR Band n25 CP-OFDM

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	20M	QPSK	1882.5	18.893	20.320
		16QAM		18.906	20.250
	15M	QPSK		14.062	15.090
		16QAM		14.133	15.000
	10M	QPSK		9.270	10.230
		16QAM		9.269	10.080
	5M	QPSK		4.471	5.287
		16QAM		4.464	5.119

8.3.1. OCCUPIED BANDWIDTH RESULTS

WCDMA Band 2



LTE Band 25 (ANT Main1)



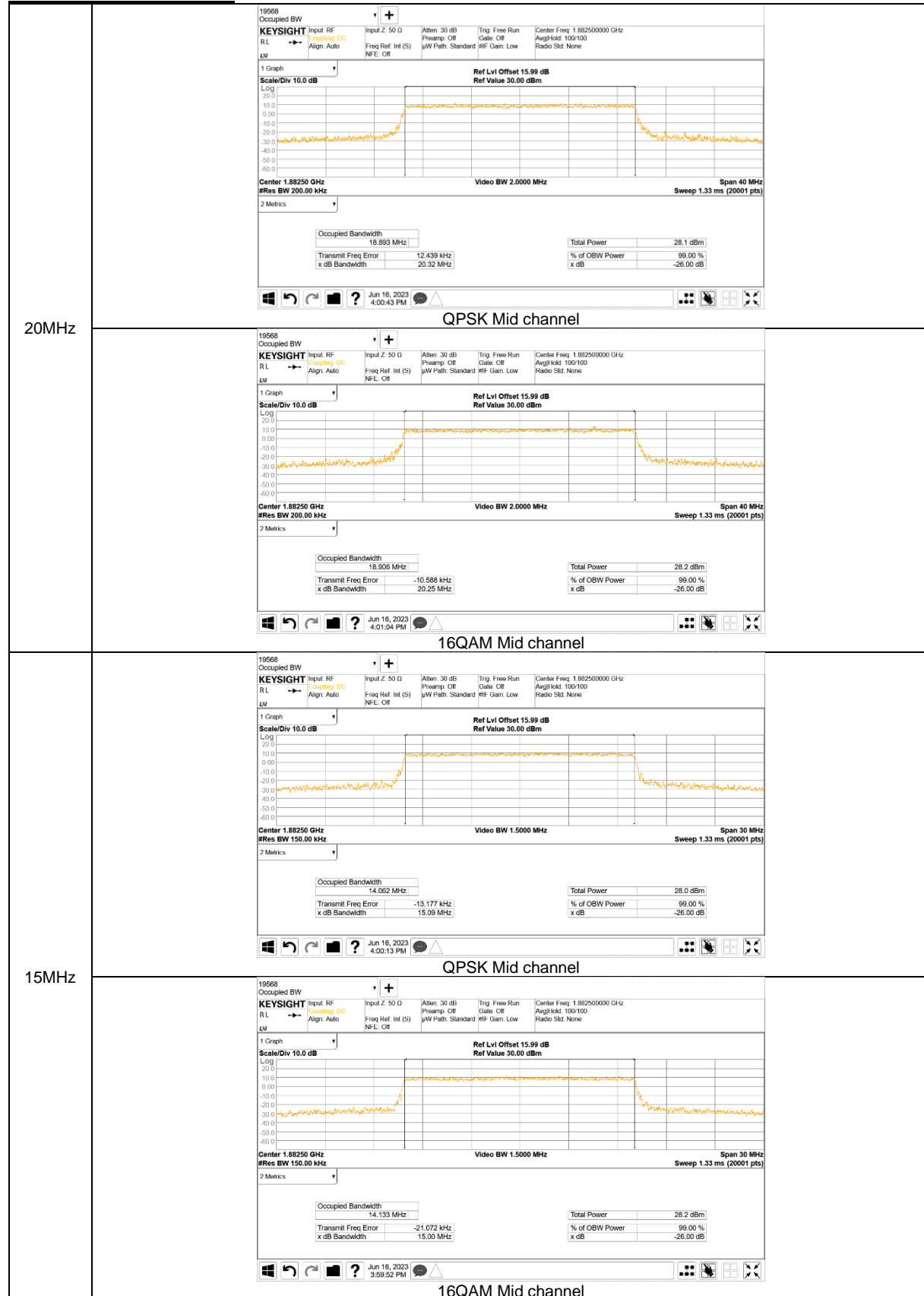


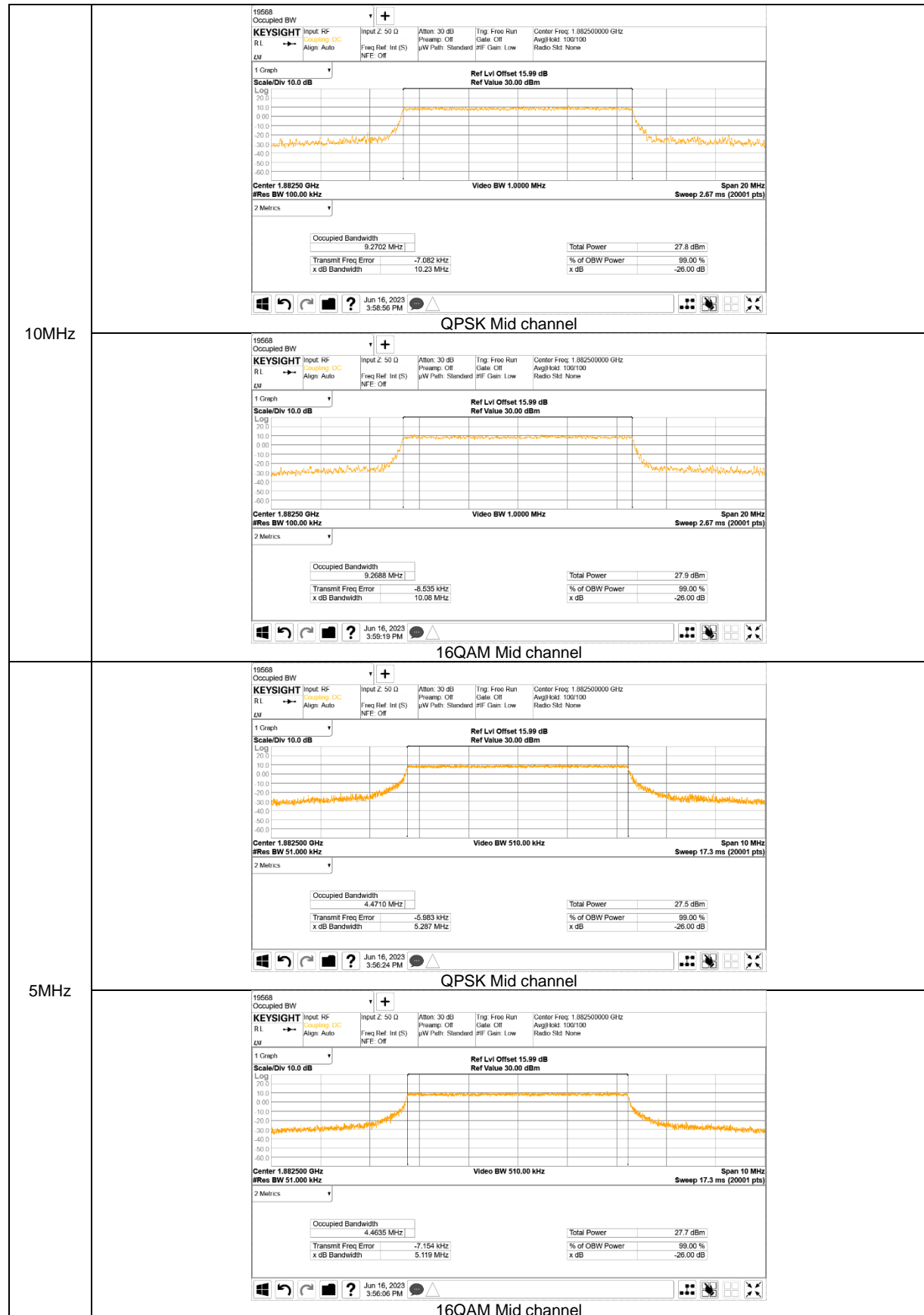
LTE Band 25 (ANT Sub2)





NR Band n25 CP-OFDM





8.4. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §24.238

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The transmitter output was connected to either CMW500 Test Set or E7515B Test set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

WCDMA/LTE/5G NR

- a) Set the RBW = 1 - 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points $\geq 2 \times$ Span/RBW;
- g) Trace Mode = Average (100);

NOTE1

Note that the spurious emissions outside of the channel include narrowband signals. These signals are all below the -13dBm limits. Although the measurement bandwidth is less than the reference bandwidth of 1MHz no addental correction is applied as ANSI C63.26 section 4.2.3 only requires the correction to be applied when the OBW of the emission being measured is wider than the measurement bandwidth (Where the OBW of the signal under measurement is less than the RBW of the measuring instrument, no bandwidth correction or integration will be required.) Plots for low and high channels show the level of the emission measured with the reduced bandwidth and the level of the same emission measured using the integration method over the 1MHz reference bandwidth are very close, indicating the emissions are narrowband.

NOTE2

For Band-Edge extended:

CH BW (MHz)	RB Used (kHz)	CF for emissions more than 100kHz	CF for emissions more than 1MHz
1.4	15	+8.2 dB	+18.2 dB
3	30	+5.2 dB	+15.2 dB
5	51	+2.9 dB	+12.9 dB
10	100	N/A	+10.0 dB
15	150	N/A	+8.2 dB
20	200	N/A	+7.0 dB

For the band edge value measured in [RB Used], even if [CF for emissions reference bandwidth 100kHz/1MHz] is applied, it is below -13dBm.

NOTE3

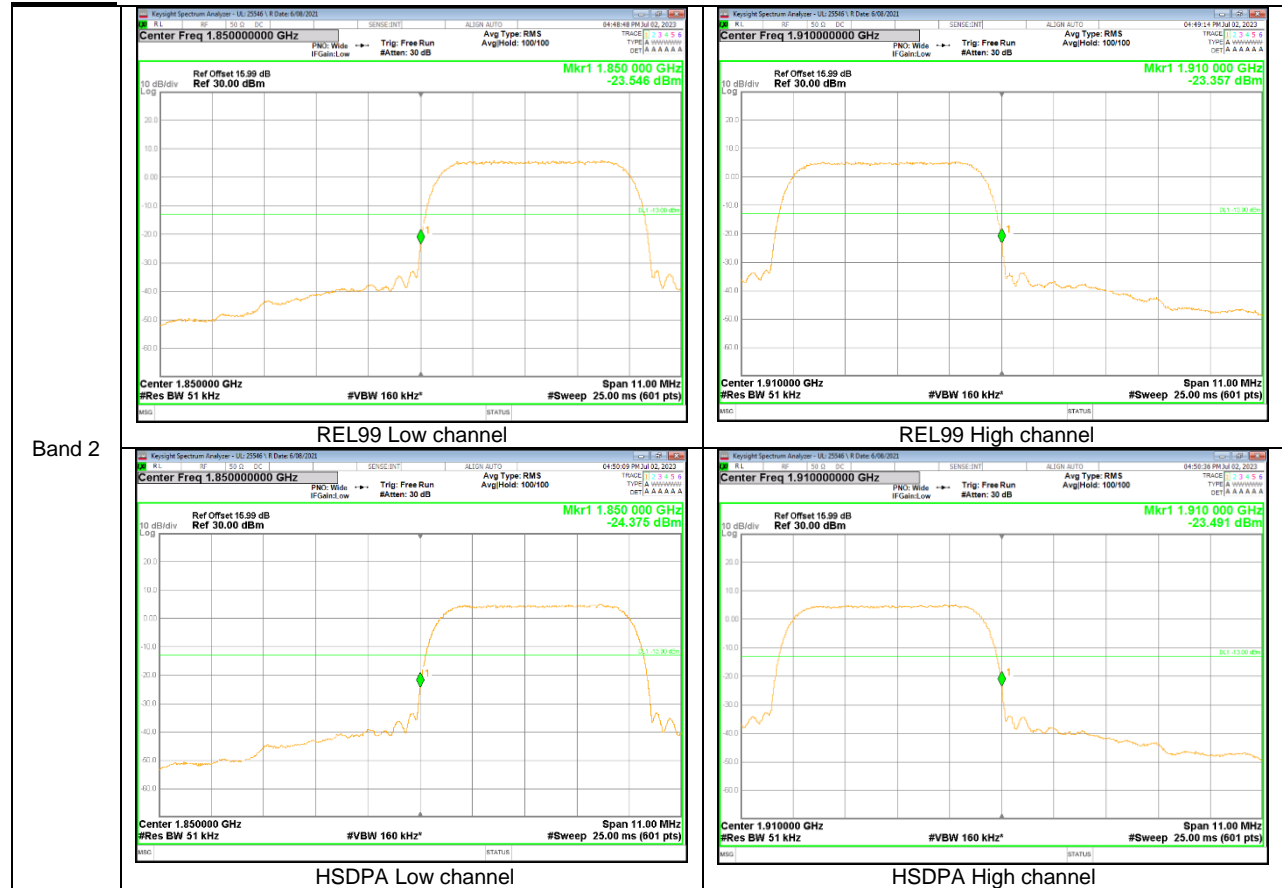
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All Modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

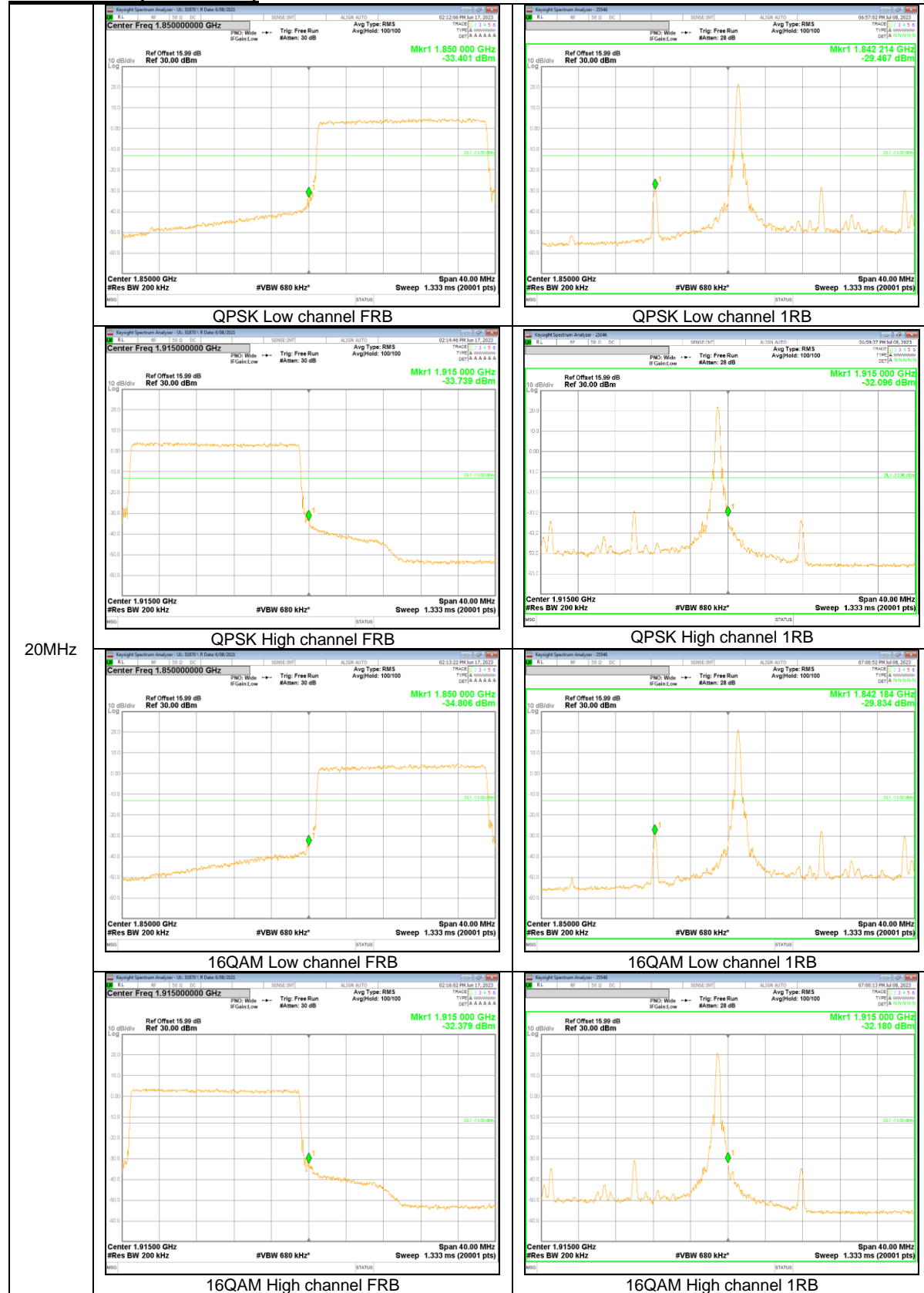
See the following pages.

8.4.1. BAND EDGE RESULT

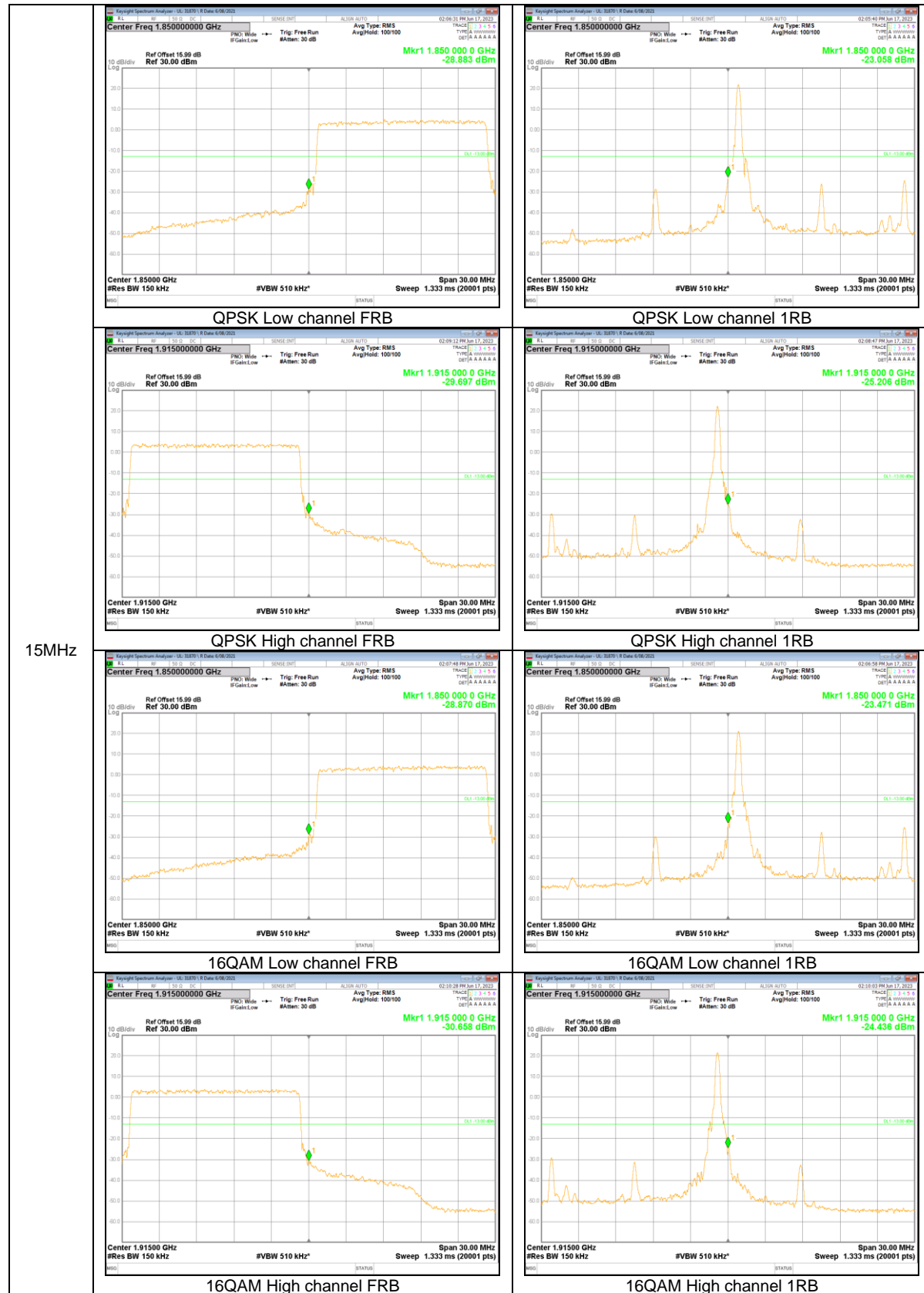
WCDMA



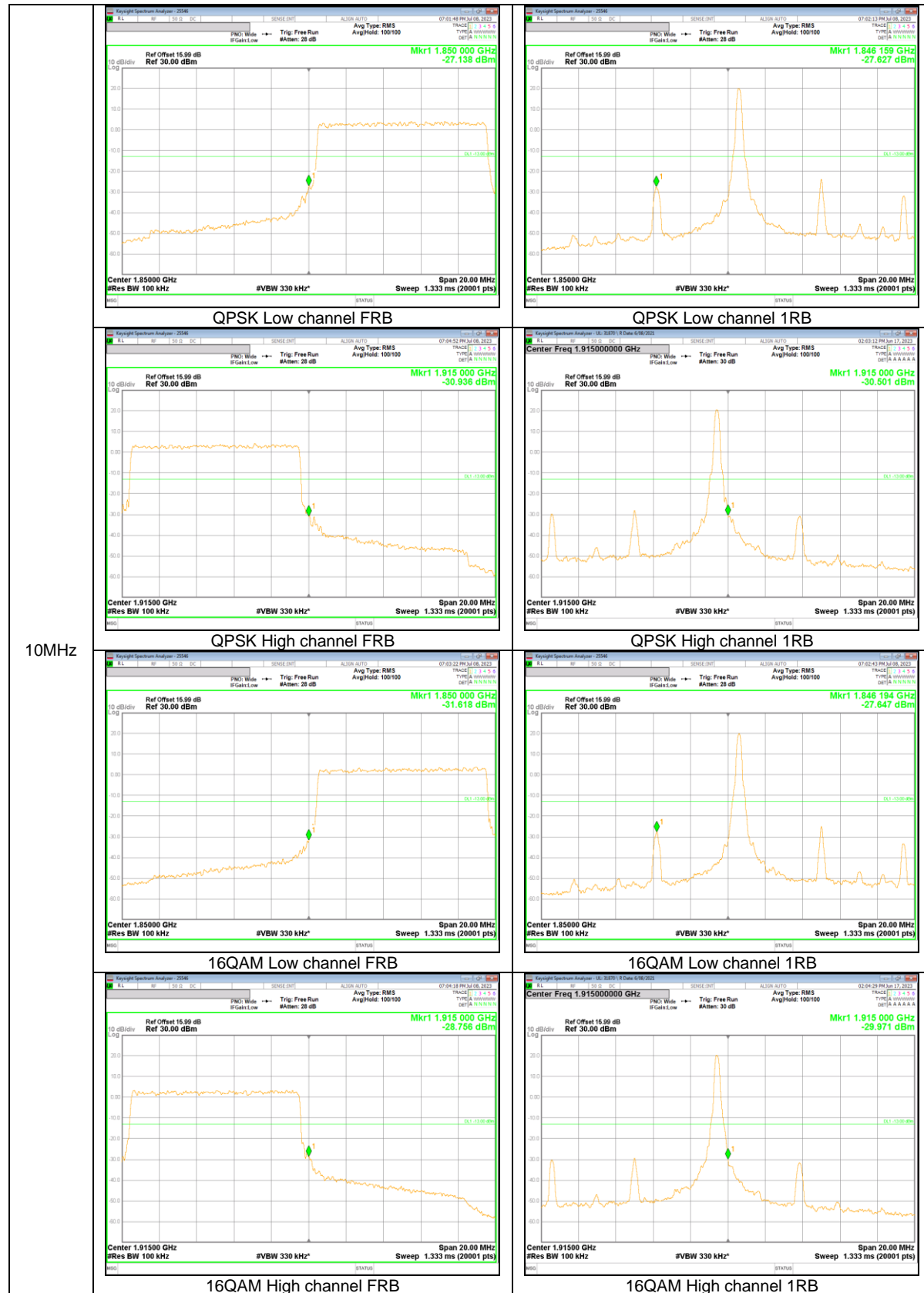
LTE Band 25 (ANT Main1)

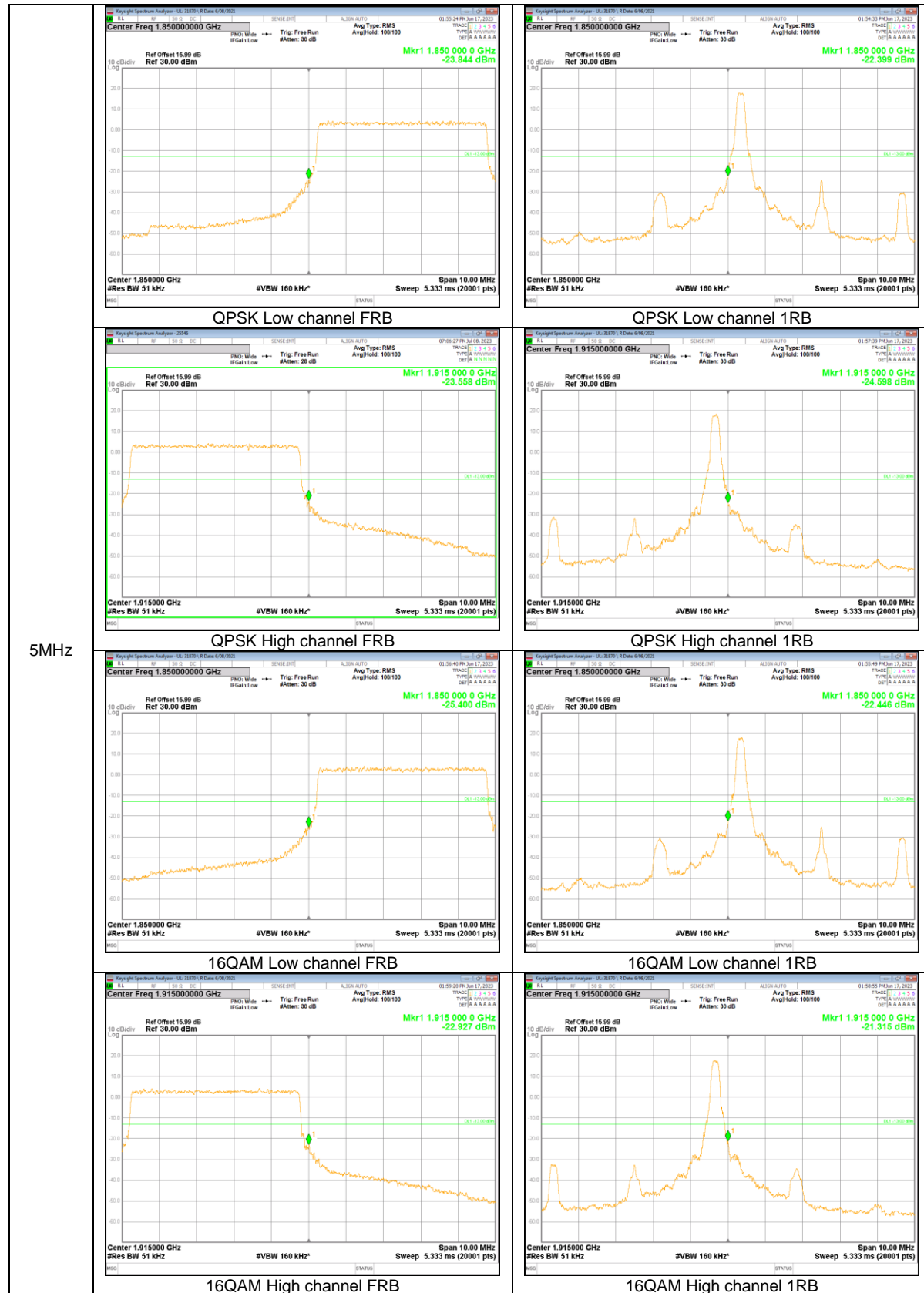


20MHz



15MHz





5MHz