

CERTIFICATION TEST REPORT

Report Number. : 4791196575-E3V3

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

Model : SM-F956U, SM-F956U1

FCC ID : A3LSMF956U

EUT Description : GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,
NFC, WPT and UWB

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

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Prepared by:

UL KOREA LTD.

26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL KOREA LTD. Suwon Laboratory

218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea

TEL: (031) 337-9902

FAX: (031) 213-5433

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB.

MODEL NUMBER: SM-F956U, SM-F956U1

SERIAL NUMBER: R3CX10W5RBA, R3CX10W5RAL, R3CX10W6A5R, R3CX10EN7PY (CONDUCTED);
R3CX10W662L, R3CX10W66ZL, R3CX10W668D (RADIATED);

DATE TESTED: 2024-02-19 - 2023-04-26;

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:



Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Yeonghwan Hong
Suwon Lab Engineer
UL KOREA LTD.

2. TEST METHODOLOGY

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

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 24.
3. ANSI TIA-603-E, 2016
4. ANSI C63.26, 2015
5. KDB 971168 D01 Power Meas License Digital Systems v03r01
6. KDB 971168 D02 Misc Rev Approv License Devices v02r02
7. KDB 412172 D01 Determining ERP and EIRP v01r01
8. KDB 648474 D03 Wireless Chargers Battery Cover v01r04

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:

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

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	2.79 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.69 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.07 dB
Radiated Disturbance, 1 GHz to 18 GHz	4.99 dB
Radiated Disturbance, Above 18 GHz	5.96 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 Clause 4.3.3 in IEC Guide 115:2023.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB.

This test report addresses the WWAN operational Mode.

Representative model	Difference	Derivative model
		SM-F956U1
SM-F956U	Hardware	Same as SM-F956U
	Software	Different UI

Thus, SM-F956U was set for final test.

5.2. MAXIMUM OUTPUT POWER

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

GSM

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted		Radiated	
			Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
GSM1900_ANT B	1850.20 ~ 1909.80	GSM/GPRS	29.31	853.10	30.64	1158.78
		EGPRS	25.23	333.43	27.67	584.79

WCDMA

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted		Radiated	
			Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2_ANT B	1852.40 ~ 1907.60	Rel. 99	23.87	243.78	26.20	416.87
		HSDPA	22.92	195.88	25.24	334.20

LTE Band 25

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted (ANT B)		Radiated (ANT B)	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25_ANT B	1860.00 ~ 1905.00	20	QPSK	24.07	255.27	25.35	342.77
			16QAM	23.53	225.42	24.73	297.17
			64QAM	22.37	172.58		
			256QAM	19.22	83.56		
	1857.50 ~ 1907.50	15	QPSK	24.09	256.45	25.28	337.29
			16QAM	23.25	211.35	24.48	280.54
			64QAM	22.44	175.39		
			256QAM	19.24	83.95		
	1855.00 ~ 1910.00	10	QPSK	24.24	265.46	25.38	345.14
			16QAM	23.49	223.36	24.91	309.74
			64QAM	22.39	173.38		
			256QAM	19.34	85.90		
	1852.50 ~ 1912.50	5	QPSK	24.21	263.63	25.48	353.18
			16QAM	23.64	231.21	24.78	300.61
			64QAM	22.42	174.58		
			256QAM	19.45	88.10		
	1851.50 ~ 1913.50	3	QPSK	24.17	261.22	25.45	350.75
			16QAM	23.56	226.99	24.92	310.46
			64QAM	22.53	179.06		
			256QAM	19.43	87.70		
1850.70 ~ 1914.30	1.4	QPSK	24.08	255.86	25.51	355.63	
		16QAM	23.34	215.77	24.75	298.54	
		64QAM	22.33	171.00			
		256QAM	19.29	84.92			
FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted (ANT E)		Radiated (ANT E)	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25_ANT E	1860.00 ~ 1905.00	20	QPSK	23.71	234.96	21.86	153.46
			16QAM	23.20	208.93	20.97	125.03
			64QAM	21.96	157.04		
			256QAM	19.00	79.43		
	1857.50 ~ 1907.50	15	QPSK	23.83	241.55	22.17	164.82
			16QAM	23.15	206.54	21.15	130.32
			64QAM	22.01	158.85		
			256QAM	18.88	77.27		
	1855.00 ~ 1910.00	10	QPSK	23.91	246.04	22.37	172.58
			16QAM	23.25	211.35	21.24	133.05
			64QAM	22.15	164.06		
			256QAM	19.03	79.98		
	1852.50 ~ 1912.50	5	QPSK	23.98	250.03	22.06	160.69
			16QAM	23.30	213.80	21.13	129.72
			64QAM	21.97	157.40		
			256QAM	18.99	79.25		
	1851.50 ~ 1913.50	3	QPSK	23.91	246.04	22.18	165.20
			16QAM	23.28	212.81	21.36	136.77
			64QAM	22.15	164.06		
			256QAM	19.07	80.72		
1850.70 ~ 1914.30	1.4	QPSK	23.84	242.10	22.25	167.88	
		16QAM	23.07	202.77	21.36	136.77	
		64QAM	22.00	158.49			
		256QAM	18.96	78.70			

NR Band n25

FCC Part 24								
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted (ANT B)		Radiated (ANT B)	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n25_ANT B	1870.00 ~ 1895.00	40	DFT-s OFDM	$\pi/2$ BPSK	23.74	236.59		
				QPSK	23.61	229.61	25.44	349.95
				16QAM	22.48	177.01	24.55	285.10
				64QAM	21.28	134.28		
				256QAM	18.53	71.29		
			CP-OFDM	QPSK	22.26	168.27		
	1867.50 ~ 1897.50	35	DFT-s OFDM	$\pi/2$ BPSK	23.79	239.33		
				QPSK	23.79	239.33	25.13	325.84
				16QAM	22.76	188.80	24.10	257.04
				64QAM	21.58	143.88		
				256QAM	18.75	74.99		
			CP-OFDM	QPSK	22.64	183.65		
	1865.00 ~ 1900.00	30	DFT-s OFDM	$\pi/2$ BPSK	23.92	246.60		
				QPSK	23.95	248.31	25.10	323.59
				16QAM	22.77	189.23	24.11	257.63
				64QAM	21.63	145.55		
				256QAM	18.88	77.27		
			CP-OFDM	QPSK	22.68	185.35		
	1862.50 ~ 1902.50	25	DFT-s OFDM	$\pi/2$ BPSK	23.34	215.77		
				QPSK	23.37	217.27	25.28	337.29
				16QAM	22.15	164.06	24.36	272.90
				64QAM	20.98	125.31		
				256QAM	18.26	66.99		
			CP-OFDM	QPSK	22.01	158.85		
	1860.00 ~ 1905.00	20	DFT-s OFDM	$\pi/2$ BPSK	23.23	210.38		
				QPSK	23.30	213.80	25.27	336.51
				16QAM	22.13	163.31	24.24	265.46
				64QAM	20.79	119.95		
				256QAM	18.06	63.97		
			CP-OFDM	QPSK	21.89	154.53		
	1857.50 ~ 1907.50	15	DFT-s OFDM	$\pi/2$ BPSK	23.33	215.28		
				QPSK	23.32	214.78	25.34	341.98
				16QAM	22.07	161.06	24.35	272.27
				64QAM	20.93	123.88		
				256QAM	18.21	66.22		
			CP-OFDM	QPSK	21.95	156.68		
	1855.00 ~ 1910.00	10	DFT-s OFDM	$\pi/2$ BPSK	23.28	212.81		
				QPSK	23.27	212.32	25.23	333.43
				16QAM	22.02	159.22	24.24	265.46
				64QAM	20.86	121.90		
256QAM				18.15	65.31			
		CP-OFDM	QPSK	21.86	153.46			
1852.50 ~ 1912.50	5	DFT-s OFDM	$\pi/2$ BPSK	23.21	209.41			
			QPSK	23.16	207.01	24.93	311.17	
			16QAM	22.09	161.81	23.89	244.91	
			64QAM	20.90	123.03			
			256QAM	18.25	66.83			
		CP-OFDM	QPSK	21.86	153.46			

FCC Part 24									
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted (ANT E)		Radiated (ANT E)		
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]	
n25_ANT E	1870.00 ~ 1895.00	40	DFT-s OFDM	$\pi/2$ BPSK	23.27	212.32			
				QPSK	23.16	207.01	21.55	142.89	
				16QAM	22.19	165.58	20.57	114.02	
				64QAM	20.91	123.31			
				256QAM	18.09	64.42			
	1867.50 ~ 1897.50	35	DFT-s OFDM	CP-OFDM	QPSK	21.88	154.17		
					$\pi/2$ BPSK	23.49	223.36		
					QPSK	23.44	220.80	21.27	133.97
					16QAM	22.41	174.18	20.21	104.95
					64QAM	21.13	129.72		
	1865.00 ~ 1900.00	30	DFT-s OFDM	CP-OFDM	256QAM	18.28	67.30		
					QPSK	21.97	157.40		
					$\pi/2$ BPSK	23.63	230.67		
					QPSK	23.58	228.03	21.63	145.55
					16QAM	22.38	172.98	20.54	113.24
	1862.50 ~ 1902.50	25	DFT-s OFDM	CP-OFDM	64QAM	21.03	126.77		
					256QAM	18.31	67.76		
					QPSK	22.08	161.44		
					$\pi/2$ BPSK	23.50	223.87		
					QPSK	23.53	225.42	21.53	142.23
	1860.00 ~ 1905.00	20	DFT-s OFDM	CP-OFDM	16QAM	22.36	172.19	20.49	111.94
					64QAM	21.08	128.23		
					256QAM	18.31	67.76		
					QPSK	22.07	161.06		
					$\pi/2$ BPSK	23.38	217.77		
	1857.50 ~ 1907.50	15	DFT-s OFDM	CP-OFDM	QPSK	23.37	217.27	21.38	137.40
					16QAM	22.23	167.11	20.42	110.15
					64QAM	20.91	123.31		
					256QAM	18.19	65.92		
					QPSK	21.86	153.46		
	1855.00 ~ 1910.00	10	DFT-s OFDM	CP-OFDM	QPSK	23.48	222.84		
					$\pi/2$ BPSK	23.47	222.33	21.51	141.58
16QAM					22.37	172.58	20.46	111.17	
64QAM					21.05	127.35			
256QAM					18.36	68.55			
1852.50 ~ 1912.50	5	DFT-s OFDM	CP-OFDM	QPSK	22.07	161.06			
				QPSK	23.47	222.33			
				QPSK	23.48	222.84	21.41	138.36	
				16QAM	22.31	170.22	20.65	116.14	
				64QAM	20.96	124.74			
1852.50 ~ 1912.50	5	DFT-s OFDM	CP-OFDM	256QAM	18.27	67.14			
				QPSK	21.99	158.12			
				$\pi/2$ BPSK	23.40	218.78			
				QPSK	23.39	218.27	20.84	121.34	
				16QAM	22.36	172.19	19.98	99.54	
1852.50 ~ 1912.50	5	DFT-s OFDM	CP-OFDM	64QAM	21.00	125.89			
				256QAM	18.34	68.23			
				QPSK	22.08	161.44			

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)	Antenna	Peak Gain (dBi)
GSM1900 / WCDMA Band 2 / LTE Band 2, 25 / NR Band n2, 25 1850 - 1915 MHz	B	-2.0
	E	-4.2

5.4. WORST-CASE ORIENTATION

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

- GSM GPRS/EGPRS
- 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. It was found QPSK and 16QAM results were worst case.

This device supports Tx Hopping Mode. So the test case is as below.

LTE Band	Antenna Switching
LTE B25	Tx Hopping

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.

This device supports NSA and SA Mode and Antenna Switching Mode.

Worst case reported both SA Mode and Antenna Switching Mode. So the test case is as below.

NR Band	NSA	SA	Antenna Switching
N25	LTE B12, B66	Stand Alone	Tx Hopping

It was tested for all rf ports and 'Main ANT conducted output power test' is the higher than 'Sub ANT conducted output power test', so we reported with 'Main ANT'.

Band	Main antenna	Tune-up Limit (dBm)	Sub antenna	Tune-up Limit (dBm)
GSM 1900	<u>B</u>	<u>30.5</u>		
WCDMA B2	<u>B</u>	<u>24.8</u>		
LTE B25	<u>B</u>	<u>25.0</u>	E	25.0
NR n25	<u>B</u>	<u>24.5</u>	E	24.5

Test Item	Test case antenna & port
Conducted output power	All
RF port test	All (Worst case reported)
e.i.r.p	All
Radiated Spurious Emissions	All

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.

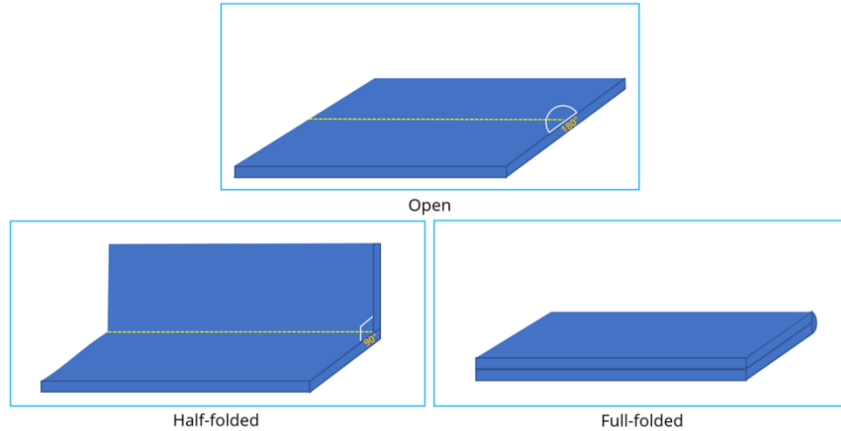
● Conducted Spurious Emission

Highest conducted power setting for each bands					
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	B	1855.0	10	1	0
		1882.5		1	25
		1910.0		1	0
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	B	1865.0	30	1	1
		1882.5		1	1
		1900.0		1	79

● Radiated Spurious Emission

Highest EIRP setting for each bands					
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	B	1850.7	1.4	1	0
		1882.5		1	3
		1914.3		1	0
25	E	1855.0	10	1	25
		1882.5		1	25
		1910.0		1	25
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
25	B	1870.0	40	1	1
		1882.5		1	1
		1895.0		1	1
25	E	1865.0	30	1	1
		1882.5		1	1
		1900.0		1	79

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
GSM 1900	B	-	-	Open	-	-	Half-folded
WCDMA B2	B	-	-	Open	-	Full-folded	-
LTE B25	B	-	-	Open	-	Open	-
	E	Open	-	-	Half-folded	-	-
NR n25	B	-	-	Open	-	Full-folded	-
	E	Open	-	-	-	Full-folded	-

Note1 : For the 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.

Note2 : The EUT supported wireless charging capability. For the radiated spurious testing were performed on wireless charging pad. The worst case is shown in this report.

Note3 : Antenna switching-related actions according to foldable conditions were force operated and tested in factory mode.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N9QP6H39DK3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02111A	N/A
Wireless Charger	SAMSUNG	EP-N5200	RF7T20401XMCIS	A3LEPN5200
Wireless Charger	SAMSUNG	EP-P5400	RF7W800BH1CWSB	A3LEPP5400

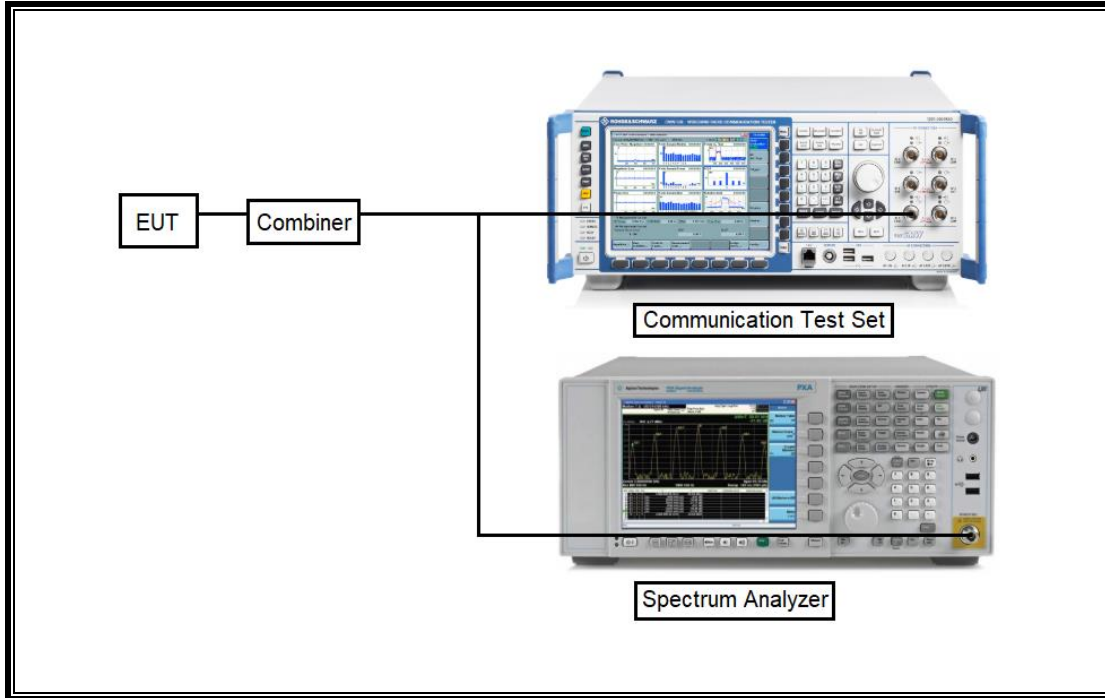
I/O CABLE

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

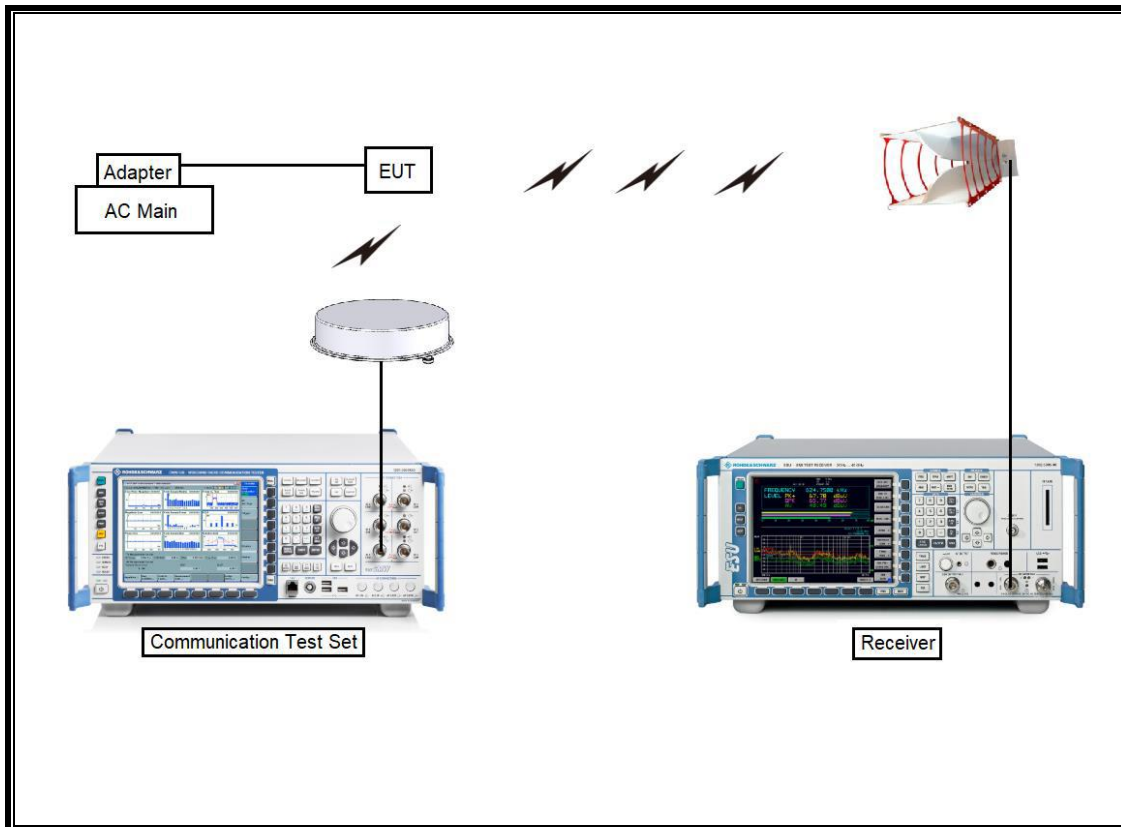
TEST SETUP

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	00166155	2024-08-02
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2025-10-05
Preamplifier	ETS	3115-PA	00167475	2024-07-25
Preamplifier	ETS	3116C-PA	00168841	2024-07-25
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	00167211	2024-08-04
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168724	2024-08-04
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Communications Test Set	R&S	CMW500	169797	2024-07-23
DC Power Supply	Agilent / HP	E3640A	MY54226395	2024-07-24
Preamplifier, 1000 MHz	Sonoma	310N	341282	2024-07-24
Preamplifier, 1000 MHz	Sonoma	310N	370599	2024-07-24
Preamplifier, 1000 MHz	Sonoma	310N	351741	2024-07-24
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2024-07-24
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2024-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2024-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2024-07-24
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2024-07-24
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2024-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2024-07-24
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2024-07-23
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2024-07-23
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2024-07-24
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2024-07-24
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2024-07-24
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A009	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A001	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A008	2024-07-27
Attenuator	PASTERNAK	PE7004-10	2	2024-07-23
Attenuator	PASTERNAK	PE7395-10	A011	2024-07-25
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-06
Temperature Chamber	ESPEC	SH-642	93001109	2024-07-24
Power Splitter	MIN-CIRCUITS	WA1534	UL003	2025-01-02
Power Splitter	MIN-CIRCUITS	WA1534	UL004	2025-01-02
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY57510655	2025-01-03
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

GSM1900

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)			
					Pmax / DSI = 3			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	512	1850.2	29.05	19.86	30.5	21.3
			661	1880.0	29.31	20.12		
			810	1909.8	28.88	19.69		
GPRS (GMSK)	CS1	1	512	1850.2	29.04	19.85	30.5	21.3
			661	1880.0	29.14	19.95		
			810	1909.8	28.66	19.47		
		2	512	1850.2	27.29	21.11	29.0	22.8
			661	1880.0	27.12	20.94		
			810	1909.8	26.65	20.47		
		3	512	1850.2	26.60	22.18	27.5	23.1
			661	1880.0	26.42	22.00		
			810	1909.8	26.00	21.58		
		4	512	1850.2	23.94	20.77	25.5	22.3
			661	1880.0	24.12	20.95		
			810	1909.8	23.58	20.41		
EGPRS (8PSK)	MCS5	1	512	1850.2	24.78	15.59	27.0	17.8
			661	1880.0	25.23	16.04		
			810	1909.8	24.65	15.46		
		2	512	1850.2	23.17	16.99	25.0	18.8
			661	1880.0	23.05	16.87		
			810	1909.8	22.67	16.49		
		3	512	1850.2	21.20	16.78	23.0	18.6
			661	1880.0	20.99	16.57		
			810	1909.8	20.51	16.09		
		4	512	1850.2	20.96	17.79	22.0	18.8
			661	1880.0	20.85	17.68		
			810	1909.8	20.49	17.32		

WCDMA B2

Mode		UL Ch No.	Freq. (MHz)	Maximum Allowed Average Power (dBm)		
				Pmax / DSI = 3		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.87	N/A	24.8
		9400	1880.0	23.65		
		9538	1907.6	23.71		
HSDPA	Subtest 1	9262	1852.4	22.89	0	23.8
		9400	1880.0	22.66		
		9538	1907.6	22.72		
	Subtest 2	9262	1852.4	22.92	0	23.8
		9400	1880.0	22.65		
		9538	1907.6	22.70		
	Subtest 3	9262	1852.4	22.42	0.5	23.3
		9400	1880.0	22.13		
		9538	1907.6	22.19		
	Subtest 4	9262	1852.4	22.36	0.5	23.3
		9400	1880.0	22.10		
		9538	1907.6	22.21		
HSUPA	Subtest 1	9262	1852.4	22.94	0	23.8
		9400	1880.0	22.74		
		9538	1907.6	22.79		
	Subtest 2	9262	1852.4	20.88	2	21.8
		9400	1880.0	20.63		
		9538	1907.6	20.72		
	Subtest 3	9262	1852.4	21.90	1	22.8
		9400	1880.0	21.63		
		9538	1907.6	21.71		
	Subtest 4	9262	1852.4	20.94	2	21.8
		9400	1880.0	20.68		
		9538	1907.6	20.80		
	Subtest 5	9262	1852.4	22.47	0	23.8
		9400	1880.0	22.26		
		9538	1907.6	22.34		
DC-HSDPA	Subtest 1	9262	1852.4	22.97	0	23.8
		9400	1880.0	22.68		
		9538	1907.6	22.72		
	Subtest 2	9262	1852.4	22.96	0	23.8
		9400	1880.0	22.67		
		9538	1907.6	22.72		
	Subtest 3	9262	1852.4	22.44	0.5	23.3
		9400	1880.0	22.16		
		9538	1907.6	22.21		
	Subtest 4	9262	1852.4	22.36	0.5	23.3
		9400	1880.0	22.15		
		9538	1907.6	22.19		

LTE Band 25 (ANT B)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)						
				Pmax / DSI = 3					MPR	Tune-up Limit
				Measured Pwr (dBm)			MPR	Tune-up Limit		
				26140	26365	26590				
1860 MHz	1882.5 MHz	1905 MHz								
20 MHz	QPSK	1	0	24.07	23.90	23.90	0.0	25.0		
		1	49	24.02	23.86	23.86	0.0	25.0		
		1	99	23.95	23.82	23.79	0.0	25.0		
		50	0	23.05	22.92	22.89	1.0	24.0		
		50	24	23.09	22.97	22.91	1.0	24.0		
		50	50	23.02	22.91	22.91	1.0	24.0		
	16QAM	100	0	23.07	22.92	22.94	1.0	24.0		
		1	0	23.53	23.28	23.11	1.0	24.0		
		1	49	23.43	23.35	23.15	1.0	24.0		
		1	99	23.36	23.23	23.04	1.0	24.0		
		50	0	22.08	21.94	21.91	2.0	23.0		
		50	24	22.12	22.01	21.97	2.0	23.0		
	64QAM	50	50	22.05	21.96	21.92	2.0	23.0		
		100	0	22.10	21.97	21.94	2.0	23.0		
		1	0	22.37	22.35	22.15	2.0	23.0		
		1	49	22.28	22.30	22.22	2.0	23.0		
		1	99	22.22	22.22	22.06	2.0	23.0		
		50	0	21.11	20.90	20.89	3.0	22.0		
	256QAM	50	24	21.15	21.02	20.98	3.0	22.0		
		50	50	21.11	20.95	20.91	3.0	22.0		
		100	0	21.12	20.94	20.96	3.0	22.0		
		1	0	19.22	19.05	18.96	5.0	20.0		
		1	49	19.19	19.18	19.03	5.0	20.0		
		1	99	19.12	18.97	18.79	5.0	20.0		
15 MHz	QPSK	50	0	19.08	18.91	18.88	5.0	20.0		
		50	24	19.14	18.99	18.94	5.0	20.0		
		50	50	19.06	18.90	18.88	5.0	20.0		
		100	0	19.09	18.95	18.93	5.0	20.0		
		1	0	24.09	23.96	23.89	0.0	25.0		
		1	37	24.02	23.94	23.88	0.0	25.0		
	16QAM	1	74	23.95	23.85	23.82	0.0	25.0		
		36	0	23.09	22.93	22.85	1.0	24.0		
		36	20	23.08	22.93	22.91	1.0	24.0		
		36	39	23.04	22.95	22.86	1.0	24.0		
		75	0	23.06	22.97	22.88	1.0	24.0		
		1	0	23.20	23.25	23.20	1.0	24.0		
	64QAM	1	37	23.22	23.25	23.18	1.0	24.0		
		1	74	23.21	23.19	23.06	1.0	24.0		
		36	0	22.15	21.99	21.92	2.0	23.0		
		36	20	22.16	21.99	21.99	2.0	23.0		
		36	39	22.11	22.01	21.94	2.0	23.0		
		75	0	22.11	22.04	21.91	2.0	23.0		
	256QAM	1	0	22.34	22.22	22.14	2.0	23.0		
		1	37	22.44	22.15	22.20	2.0	23.0		
		1	74	22.25	22.19	22.09	2.0	23.0		
		36	0	21.22	21.08	20.96	3.0	22.0		
		36	20	21.22	21.04	21.05	3.0	22.0		
		36	39	21.20	21.07	21.00	3.0	22.0		
256QAM	75	0	21.20	21.11	21.00	3.0	22.0			
	1	0	19.18	19.07	19.01	5.0	20.0			
	1	37	19.24	19.15	19.07	5.0	20.0			
	1	74	19.15	19.00	18.92	5.0	20.0			
	36	0	19.22	19.06	18.94	5.0	20.0			
	36	20	19.23	19.05	19.01	5.0	20.0			
36	39	19.18	19.07	18.97	5.0	20.0				
75	0	19.14	19.07	18.95	5.0	20.0				

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	24.24	23.92	23.83	0.0	25.0
		1	25	24.12	23.98	23.80	0.0	25.0
		1	49	23.95	23.85	23.75	0.0	25.0
		25	0	23.13	22.95	22.82	1.0	24.0
		25	12	23.18	23.07	22.86	1.0	24.0
		25	25	23.13	23.03	22.88	1.0	24.0
	16QAM	50	0	22.13	22.02	21.80	1.0	24.0
		1	0	23.42	23.14	23.18	1.0	24.0
		1	25	23.49	23.17	23.11	1.0	24.0
		1	49	23.28	23.04	23.14	1.0	24.0
		25	0	22.19	21.98	21.91	2.0	23.0
		25	12	22.23	22.07	21.91	2.0	23.0
	64QAM	25	25	22.16	22.01	21.96	2.0	23.0
		50	0	22.18	22.06	21.86	2.0	23.0
		1	0	22.37	22.22	22.12	2.0	23.0
		1	25	22.37	22.39	22.14	2.0	23.0
		1	49	22.27	22.20	22.17	2.0	23.0
		25	0	21.23	21.05	20.93	3.0	22.0
	256QAM	25	12	21.26	21.16	20.95	3.0	22.0
		25	25	21.21	21.15	20.99	3.0	22.0
		50	0	21.25	21.14	20.92	3.0	22.0
		1	0	19.32	19.09	18.99	5.0	20.0
		1	25	19.34	19.29	19.08	5.0	20.0
		1	49	19.24	19.08	18.95	5.0	20.0
5 MHz	QPSK	25	0	19.23	19.04	18.91	5.0	20.0
		25	12	19.25	19.18	18.94	5.0	20.0
		25	25	19.20	19.10	18.97	5.0	20.0
		50	0	19.18	19.08	18.86	5.0	20.0
		1	0	24.13	24.02	23.94	0.0	25.0
		1	12	24.21	24.12	23.94	0.0	25.0
	16QAM	1	24	24.14	24.03	23.87	0.0	25.0
		12	0	23.12	22.93	22.83	1.0	24.0
		12	7	23.17	23.05	22.96	1.0	24.0
		12	13	23.18	23.04	22.94	1.0	24.0
		25	0	23.13	23.00	22.92	1.0	24.0
		1	0	23.64	23.46	23.44	1.0	24.0
	64QAM	1	12	23.57	23.55	23.56	1.0	24.0
		1	24	23.62	23.55	23.47	1.0	24.0
		12	0	22.20	22.02	21.93	2.0	23.0
		12	7	22.27	22.14	22.04	2.0	23.0
		12	13	22.23	22.15	22.06	2.0	23.0
		25	0	22.19	22.04	21.96	2.0	23.0
	256QAM	1	0	22.32	22.20	21.96	2.0	23.0
		1	12	22.42	22.38	22.11	2.0	23.0
		1	24	22.39	22.09	22.07	2.0	23.0
		12	0	21.24	21.03	20.93	3.0	22.0
		12	7	21.32	21.18	21.06	3.0	22.0
		12	13	21.27	21.13	21.00	3.0	22.0
256QAM	25	0	21.25	21.12	20.98	3.0	22.0	
	1	0	19.33	18.99	19.02	5.0	20.0	
	1	12	19.45	19.22	19.20	5.0	20.0	
	1	24	19.37	19.24	19.00	5.0	20.0	
	12	0	19.21	19.01	18.86	5.0	20.0	
	12	7	19.27	19.14	19.01	5.0	20.0	
256QAM	12	13	19.26	19.16	18.99	5.0	20.0	
	25	0	19.20	19.04	18.93	5.0	20.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	24.01	23.86	23.76	0.0	25.0
		1	8	24.17	24.08	23.92	0.0	25.0
		1	14	24.03	23.94	23.83	0.0	25.0
		8	0	23.09	22.90	22.79	1.0	24.0
		8	4	23.12	23.01	22.81	1.0	24.0
		8	7	23.13	23.02	22.91	1.0	24.0
	16QAM	15	0	23.12	23.00	22.82	1.0	24.0
		1	0	23.52	23.39	23.24	1.0	24.0
		1	8	23.56	23.49	23.31	1.0	24.0
		1	14	23.50	23.43	23.27	1.0	24.0
		8	0	22.22	22.02	21.90	2.0	23.0
		8	4	22.27	22.15	21.91	2.0	23.0
	64QAM	8	7	22.25	22.17	22.02	2.0	23.0
		15	0	22.21	22.07	21.90	2.0	23.0
		1	0	22.41	22.09	22.10	2.0	23.0
		1	8	22.53	22.41	22.31	2.0	23.0
		1	14	22.36	22.17	22.09	2.0	23.0
		8	0	21.26	21.05	20.88	3.0	22.0
	256QAM	8	4	21.28	21.12	20.91	3.0	22.0
		8	7	21.28	21.16	21.02	3.0	22.0
		15	0	21.24	21.09	20.91	3.0	22.0
1		0	19.23	18.93	18.87	5.0	20.0	
1		8	19.43	19.21	19.23	5.0	20.0	
1		14	19.22	19.15	18.98	5.0	20.0	
1.4 MHz	QPSK	8	0	19.19	19.02	18.90	5.0	20.0
		8	4	19.28	19.09	18.92	5.0	20.0
		8	7	19.25	19.12	19.00	5.0	20.0
		15	0	19.19	19.06	18.86	5.0	20.0
		1	0	24.08	23.96	23.83	0.0	25.0
		1	3	24.06	23.98	23.80	0.0	25.0
	16QAM	1	5	24.04	23.94	23.83	0.0	25.0
		3	0	24.08	23.94	23.78	0.0	25.0
		3	1	24.05	23.95	23.76	0.0	25.0
		3	3	24.05	23.95	23.77	0.0	25.0
		6	0	23.09	22.97	22.83	1.0	24.0
		1	0	23.28	23.31	23.07	1.0	24.0
	64QAM	1	3	23.34	23.33	23.09	1.0	24.0
		1	5	23.26	23.30	23.07	1.0	24.0
		3	0	23.18	23.09	22.97	1.0	24.0
		3	1	23.20	23.06	22.97	1.0	24.0
		3	3	23.17	23.09	22.93	1.0	24.0
		6	0	22.20	22.01	21.89	2.0	23.0
	256QAM	1	0	22.28	22.18	22.03	2.0	23.0
		1	3	22.30	22.21	22.13	2.0	23.0
		1	5	22.33	22.11	22.04	2.0	23.0
3		0	22.20	22.10	21.90	2.0	23.0	
3		1	22.18	22.09	21.90	2.0	23.0	
3		3	22.20	22.03	22.04	2.0	23.0	
256QAM	6	0	21.15	21.05	20.88	3.0	22.0	
	1	0	19.26	19.13	18.97	5.0	20.0	
	1	3	19.29	19.16	18.95	5.0	20.0	
	1	5	19.28	19.11	18.99	5.0	20.0	
	3	0	19.21	19.07	18.94	5.0	20.0	
	3	1	19.17	19.09	18.94	5.0	20.0	
256QAM	3	3	19.28	19.09	18.97	5.0	20.0	
	6	0	19.03	19.11	18.71	5.0	20.0	

LTE Band 25 (ANT E)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)						
				Pmax					MPR	Tune-up Limit
				Measured Pwr (dBm)			MPR	Tune-up Limit		
				26140	26365	26590				
1860 MHz	1882.5 MHz	1905 MHz								
20 MHz	QPSK	1	0	23.71	23.62	23.54	0.0	25.0		
		1	49	23.70	23.63	23.60	0.0	25.0		
		1	99	23.62	23.58	23.54	0.0	25.0		
		50	0	22.76	22.67	22.55	1.0	24.0		
		50	24	22.75	22.66	22.63	1.0	24.0		
		50	50	22.63	22.66	22.58	1.0	24.0		
	100	0	22.73	22.67	22.60	1.0	24.0			
	16QAM	1	0	23.20	23.08	22.81	1.0	24.0		
		1	49	23.14	23.00	22.85	1.0	24.0		
		1	99	23.04	22.94	22.76	1.0	24.0		
		50	0	21.77	21.70	21.57	2.0	23.0		
		50	24	21.79	21.69	21.66	2.0	23.0		
		50	50	21.69	21.68	21.62	2.0	23.0		
	100	0	21.76	21.66	21.65	2.0	23.0			
	64QAM	1	0	21.96	21.83	21.75	2.0	23.0		
		1	49	21.95	21.90	21.75	2.0	23.0		
		1	99	21.91	21.80	21.72	2.0	23.0		
		50	0	20.80	20.65	20.53	3.0	22.0		
		50	24	20.80	20.65	20.61	3.0	22.0		
		50	50	20.70	20.66	20.58	3.0	22.0		
	100	0	20.77	20.65	20.61	3.0	22.0			
	256QAM	1	0	19.00	18.72	18.70	5.0	20.0		
		1	49	18.92	18.67	18.79	5.0	20.0		
		1	99	18.74	18.60	18.66	5.0	20.0		
50		0	18.77	18.65	18.51	5.0	20.0			
50		24	18.80	18.66	18.60	5.0	20.0			
50		50	18.84	18.62	18.55	5.0	20.0			
100	0	18.75	18.64	18.59	5.0	20.0				
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit		
				26115	26365	26615				
				1857.5 MHz	1882.5 MHz	1907.5 MHz				
15 MHz	QPSK	1	0	23.83	23.72	23.54	0.0	25.0		
		1	37	23.82	23.69	23.61	0.0	25.0		
		1	74	23.78	23.69	23.52	0.0	25.0		
		36	0	22.83	22.70	22.55	1.0	24.0		
		36	20	22.77	22.72	22.62	1.0	24.0		
		36	39	22.72	22.71	22.60	1.0	24.0		
	75	0	22.73	22.70	22.64	1.0	24.0			
	16QAM	1	0	23.15	22.88	22.89	1.0	24.0		
		1	37	23.10	22.92	22.87	1.0	24.0		
		1	74	22.98	22.87	22.86	1.0	24.0		
		36	0	21.86	21.76	21.60	2.0	23.0		
		36	20	21.82	21.78	21.68	2.0	23.0		
		36	39	21.79	21.73	21.63	2.0	23.0		
	75	0	21.76	21.75	21.66	2.0	23.0			
	64QAM	1	0	21.98	21.80	21.74	2.0	23.0		
		1	37	22.01	21.91	21.75	2.0	23.0		
		1	74	21.93	21.85	21.66	2.0	23.0		
		36	0	20.85	20.71	20.52	3.0	22.0		
		36	20	20.78	20.72	20.62	3.0	22.0		
		36	39	20.75	20.69	20.56	3.0	22.0		
	75	0	20.77	20.68	20.59	3.0	22.0			
	256QAM	1	0	18.85	18.78	18.55	5.0	20.0		
		1	37	18.88	18.80	18.62	5.0	20.0		
		1	74	18.73	18.74	18.55	5.0	20.0		
36		0	18.82	18.68	18.50	5.0	20.0			
36		20	18.77	18.69	18.59	5.0	20.0			
36		39	18.75	18.64	18.57	5.0	20.0			
75	0	18.74	18.65	18.57	5.0	20.0				

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	23.89	23.67	23.57	0.0	25.0
		1	25	23.91	23.74	23.60	0.0	25.0
		1	49	23.78	23.67	23.55	0.0	25.0
		25	0	22.88	22.79	22.58	1.0	24.0
		25	12	22.88	22.80	22.66	1.0	24.0
		25	25	22.79	22.76	22.62	1.0	24.0
	16QAM	50	0	21.80	21.74	21.62	1.0	24.0
		1	0	23.18	22.88	22.91	1.0	24.0
		1	25	23.25	22.94	22.90	1.0	24.0
		1	49	23.04	22.87	22.83	1.0	24.0
		25	0	21.94	21.80	21.60	2.0	23.0
		25	12	21.96	21.85	21.68	2.0	23.0
	64QAM	25	25	21.85	21.78	21.69	2.0	23.0
		50	0	21.85	21.76	21.67	2.0	23.0
		1	0	22.00	21.84	21.77	2.0	23.0
		1	25	22.15	21.86	21.77	2.0	23.0
		1	49	21.95	21.72	21.85	2.0	23.0
		25	0	20.91	20.70	20.51	3.0	22.0
	256QAM	25	12	20.95	20.76	20.65	3.0	22.0
		25	25	20.80	20.71	20.61	3.0	22.0
		50	0	20.82	20.72	20.61	3.0	22.0
		1	0	18.93	18.80	18.67	5.0	20.0
		1	25	19.03	18.78	18.73	5.0	20.0
		1	49	18.83	18.65	18.63	5.0	20.0
5 MHz	QPSK	25	0	18.86	18.68	18.50	5.0	20.0
		25	12	18.90	18.73	18.62	5.0	20.0
		25	25	18.80	18.70	18.58	5.0	20.0
		50	0	18.79	18.67	18.59	5.0	20.0
		1	0	23.91	23.77	23.62	0.0	25.0
		1	12	23.98	23.84	23.66	0.0	25.0
	16QAM	1	24	23.90	23.78	23.55	0.0	25.0
		12	0	22.91	22.73	22.53	1.0	24.0
		12	7	22.95	22.78	22.69	1.0	24.0
		12	13	22.94	22.74	22.65	1.0	24.0
		25	0	22.91	22.73	22.65	1.0	24.0
		1	0	23.29	23.16	23.10	1.0	24.0
64QAM	1	12	23.30	23.25	23.18	1.0	24.0	
	1	24	23.30	23.16	23.00	1.0	24.0	
	12	0	22.01	21.69	21.61	2.0	23.0	
	12	7	22.06	21.74	21.75	2.0	23.0	
	12	13	22.02	21.73	21.74	2.0	23.0	
	25	0	21.97	21.74	21.67	2.0	23.0	
256QAM	1	0	21.92	21.73	21.76	2.0	23.0	
	1	12	21.97	21.85	21.91	2.0	23.0	
	1	24	21.95	21.77	21.81	2.0	23.0	
	12	0	20.87	20.68	20.51	3.0	22.0	
	12	7	20.97	20.78	20.65	3.0	22.0	
	12	13	20.91	20.70	20.61	3.0	22.0	
256QAM	25	0	20.90	20.68	20.61	3.0	22.0	
	1	0	18.98	18.70	18.57	5.0	20.0	
	1	12	18.99	18.94	18.75	5.0	20.0	
	1	24	18.93	18.73	18.66	5.0	20.0	
	12	0	18.88	18.66	18.48	5.0	20.0	
	12	7	18.96	18.74	18.64	5.0	20.0	
256QAM	12	13	18.91	18.69	18.65	5.0	20.0	
	25	0	18.88	18.65	18.59	5.0	20.0	
	25	0	18.88	18.65	18.59	5.0	20.0	

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	23.81	23.60	23.52	0.0	25.0
		1	8	23.91	23.78	23.68	0.0	25.0
		1	14	23.88	23.66	23.54	0.0	25.0
		8	0	22.89	22.72	22.52	1.0	24.0
		8	4	22.96	22.76	22.56	1.0	24.0
		8	7	22.97	22.73	22.66	1.0	24.0
	16QAM	15	0	22.93	22.71	22.55	1.0	24.0
		1	0	23.18	23.10	22.95	1.0	24.0
		1	8	23.28	23.17	23.07	1.0	24.0
		1	14	23.20	23.18	22.95	1.0	24.0
		8	0	21.98	21.78	21.66	2.0	23.0
		8	4	22.02	21.85	21.70	2.0	23.0
	64QAM	8	7	22.03	21.88	21.83	2.0	23.0
		15	0	22.00	21.81	21.63	2.0	23.0
		1	0	22.10	21.72	21.63	2.0	23.0
		1	8	22.15	21.89	21.88	2.0	23.0
		1	14	22.05	21.78	21.73	2.0	23.0
		8	0	20.94	20.73	20.49	3.0	22.0
	256QAM	8	4	20.96	20.71	20.54	3.0	22.0
		8	7	20.93	20.74	20.69	3.0	22.0
		15	0	20.91	20.67	20.55	3.0	22.0
		1	0	18.87	18.74	18.45	5.0	20.0
		1	8	19.07	18.86	18.75	5.0	20.0
		1	14	18.98	18.70	18.58	5.0	20.0
1.4 MHz	QPSK	8	0	18.88	18.65	18.50	5.0	20.0
		8	4	18.92	18.72	18.56	5.0	20.0
		8	7	18.94	18.70	18.65	5.0	20.0
		15	0	18.89	18.68	18.50	5.0	20.0
		1	0	23.83	23.63	23.59	0.0	25.0
		1	3	23.84	23.62	23.58	0.0	25.0
	16QAM	1	5	23.82	23.63	23.56	0.0	25.0
		3	0	23.78	23.67	23.54	0.0	25.0
		3	1	23.83	23.68	23.61	0.0	25.0
		3	3	23.78	23.64	23.57	0.0	25.0
		6	0	22.82	22.67	22.57	1.0	24.0
		1	0	23.05	22.89	22.95	1.0	24.0
	64QAM	1	3	23.03	22.85	22.90	1.0	24.0
		1	5	23.07	22.83	22.90	1.0	24.0
		3	0	23.00	22.79	22.73	1.0	24.0
		3	1	22.97	22.75	22.72	1.0	24.0
		3	3	22.96	22.75	22.70	1.0	24.0
		6	0	21.97	21.77	21.66	2.0	23.0
	256QAM	1	0	21.97	21.77	21.73	2.0	23.0
		1	3	22.00	21.88	21.78	2.0	23.0
		1	5	21.96	21.78	21.75	2.0	23.0
		3	0	21.91	21.63	21.56	2.0	23.0
		3	1	21.97	21.61	21.59	2.0	23.0
		3	3	21.96	21.59	21.56	2.0	23.0
QPSK	6	0	20.84	20.67	20.66	3.0	22.0	
	1	0	18.93	18.78	18.60	5.0	20.0	
	1	3	18.92	18.76	18.68	5.0	20.0	
	1	5	18.91	18.75	18.57	5.0	20.0	
	3	0	18.79	18.67	18.58	5.0	20.0	
	3	1	18.84	18.67	18.54	5.0	20.0	
16QAM	3	3	18.78	18.71	18.55	5.0	20.0	
	6	0	18.96	18.69	18.54	5.0	20.0	

NR Band n25 (ANT B)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)				
					Pmax / DSI = 3				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					374000	376500	379000		
1870.00 MHz	1882.50 MHz	1895.00 MHz							
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.74	23.58	23.51	0.0	24.5
			1	107	23.41	23.29	23.22	0.0	24.5
			1	214	23.34	23.30	23.25	0.0	24.5
			108	0	22.47	22.38	22.33	0.5	24.0
			108	54	23.50	23.38	23.31	0.0	24.5
			108	108	22.22	22.23	22.23	0.5	24.0
		216	0	22.50	22.38	22.36	0.5	24.0	
		QPSK	1	1	23.60	23.61	23.50	0.0	24.5
			1	107	23.36	23.31	23.22	0.0	24.5
			1	214	23.27	23.32	23.19	0.0	24.5
			108	0	22.59	22.42	22.26	1.0	23.5
			108	54	23.40	23.45	23.35	0.0	24.5
			108	108	22.29	22.19	22.28	1.0	23.5
		216	0	22.50	22.42	22.40	1.0	23.5	
		16QAM	1	1	22.48	22.45	22.32	1.0	23.5
			1	107	22.43	22.25	22.19	1.0	23.5
64QAM	1	1	22.23	22.20	22.10	1.0	23.5		
	1	214	21.28	21.24	21.04	2.5	22.0		
256QAM	1	1	18.53	18.48	18.44	4.5	20.0		
CP-OFDM	QPSK	1	1	22.26	22.06	22.04	1.5	23.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					373500	376500	379500		
					1867.50 MHz	1882.50 MHz	1897.50 MHz		
					35 MHz	DFT-s-OFDM	π/2 BPSK	1	1
1	93	23.78	23.62	23.52				0.0	24.5
1	186	23.48	23.58	23.04				0.0	24.5
90	0	22.81	22.61	22.57				0.5	24.0
90	49	23.73	23.64	23.66				0.0	24.5
90	98	22.61	22.56	22.57				0.5	24.0
180	0	22.68	22.55	22.64			0.5	24.0	
QPSK	1	1	23.79	23.66			23.56	0.0	24.5
	1	93	23.78	23.66			23.66	0.0	24.5
	1	186	23.57	23.56			22.93	0.0	24.5
	90	0	22.82	22.64			22.58	1.0	23.5
	90	49	23.76	23.61			23.67	0.0	24.5
	90	98	22.59	22.61			22.49	1.0	23.5
180	0	22.60	22.60	22.66			1.0	23.5	
16QAM	1	1	22.76	22.63			22.52	1.0	23.5
	1	93	22.65	22.47			22.57	1.0	23.5
64QAM	1	186	22.41	22.51	22.03	1.0	23.5		
	1	1	21.58	21.37	21.18	2.5	22.0		
256QAM	1	1	18.75	18.58	18.51	4.5	20.0		
CP-OFDM	QPSK	1	1	22.64	22.42	22.32	1.5	23.0	
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					373000	376500	380000		
					1865.00 MHz	1882.50 MHz	1900.00 MHz		
					30 MHz	DFT-s-OFDM	π/2 BPSK	1	1
1	79	23.84	23.67	23.35				0.0	24.5
1	158	23.71	23.73	23.15				0.0	24.5
80	0	22.82	22.76	22.23				0.5	24.0
80	40	23.77	23.67	23.29				0.0	24.5
80	80	22.69	22.64	22.26				0.5	24.0
160	0	22.70	22.60	22.18			0.5	24.0	
QPSK	1	1	23.95	23.82			23.18	0.0	24.5
	1	79	23.77	23.65			23.27	0.0	24.5
	1	158	23.70	23.69			22.92	0.0	24.5
	80	0	22.84	22.67			22.30	1.0	23.5
	80	40	23.78	23.64			23.33	0.0	24.5
	80	80	22.72	22.56			22.23	1.0	23.5
160	0	22.73	22.58	22.26			1.0	23.5	
16QAM	1	1	22.77	22.63			22.09	1.0	23.5
	1	79	22.73	22.44			22.21	1.0	23.5
64QAM	1	158	22.51	22.62	21.89	1.0	23.5		
	1	1	21.63	21.39	20.87	2.5	22.0		
256QAM	1	1	18.88	18.72	18.16	4.5	20.0		
CP-OFDM	QPSK	1	1	22.68	22.46	21.92	1.5	23.0	

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372500	376500	380500		
					1862.50 MHz	1882.50 MHz	1902.50 MHz		
25 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.26	23.24	23.28	0.0	24.5
			1	66	23.20	23.21	23.26	0.0	24.5
			1	131	23.30	23.34	22.70	0.0	24.5
			64	0	22.15	22.24	22.17	0.5	24.0
			64	34	23.20	23.23	23.18	0.0	24.5
			64	69	22.10	22.18	22.23	0.5	24.0
		128	0	22.11	22.18	22.13	0.5	24.0	
		QPSK	1	1	23.31	23.26	23.37	0.0	24.5
			1	66	23.25	23.24	23.21	0.0	24.5
			1	131	23.24	23.24	22.60	0.0	24.5
			64	0	22.19	22.21	22.25	1.0	23.5
			64	34	23.24	23.27	23.21	0.0	24.5
			64	69	22.14	22.15	22.17	1.0	23.5
		16QAM	128	0	22.17	22.16	22.16	1.0	23.5
			1	1	22.11	22.15	22.15	1.0	23.5
			1	66	22.05	22.05	22.08	1.0	23.5
		64QAM	1	131	22.09	22.11	21.74	1.0	23.5
			1	1	20.98	20.84	20.93	2.5	22.0
256QAM	1	1	18.26	18.12	18.24	4.5	20.0		
CP-OFDM	QPSK	1	1	21.99	21.88	22.01	1.5	23.0	
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	23.16	23.13	23.20	0.0	24.5
			1	52	23.18	23.04	23.18	0.0	24.5
			1	104	23.07	23.18	22.90	0.0	24.5
			50	0	22.14	22.07	22.19	0.5	24.0
			50	28	23.17	23.19	23.23	0.0	24.5
			50	56	22.10	22.06	22.16	0.5	24.0
		100	0	22.20	22.17	22.32	0.5	24.0	
		QPSK	1	1	23.19	23.16	23.17	0.0	24.5
			1	52	23.19	23.10	23.26	0.0	24.5
			1	104	23.10	23.09	22.64	0.0	24.5
			50	0	22.15	22.12	22.16	1.0	23.5
			50	28	23.23	23.17	23.30	0.0	24.5
			50	56	22.08	22.09	22.21	1.0	23.5
		16QAM	100	0	22.26	22.25	22.22	1.0	23.5
			1	1	22.02	21.94	22.13	1.0	23.5
			1	52	22.05	21.98	22.09	1.0	23.5
		64QAM	1	104	21.94	21.94	21.72	1.0	23.5
			1	1	20.79	20.72	20.77	2.5	22.0
256QAM	1	1	18.06	17.96	18.03	4.5	20.0		
CP-OFDM	QPSK	1	1	21.82	21.72	21.89	1.5	23.0	
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	23.27	23.18	23.20	0.0	24.5
			1	39	23.15	23.17	23.14	0.0	24.5
			1	77	23.10	23.15	22.83	0.0	24.5
			36	0	22.12	22.12	22.16	0.5	24.0
			36	21	23.18	23.22	23.33	0.0	24.5
			36	43	22.13	22.11	22.18	0.5	24.0
		75	0	22.16	22.07	22.16	0.5	24.0	
		QPSK	1	1	23.27	23.24	23.29	0.0	24.5
			1	39	23.19	23.14	23.26	0.0	24.5
			1	77	23.13	23.07	22.59	0.0	24.5
			36	0	22.16	22.11	22.13	1.0	23.5
			36	21	23.31	23.28	23.32	0.0	24.5
			36	43	22.12	22.10	22.11	1.0	23.5
		16QAM	75	0	22.16	22.10	22.22	1.0	23.5
			1	1	22.07	22.06	22.07	1.0	23.5
			1	39	22.00	21.96	22.11	1.0	23.5
		64QAM	1	77	22.01	21.95	21.65	1.0	23.5
			1	1	20.93	20.89	20.81	2.5	22.0
256QAM	1	1	18.21	18.15	18.15	4.5	20.0		
CP-OFDM	QPSK	1	1	21.95	21.89	21.72	1.5	23.0	

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	23.23	23.17	23.22	0.0	24.5
			1	25	23.23	23.17	23.08	0.0	24.5
			1	50	23.17	23.17	22.51	0.0	24.5
			25	0	22.23	22.07	22.17	0.5	24.0
			25	13	23.28	23.13	23.23	0.0	24.5
			25	27	22.17	22.03	21.91	0.5	24.0
		50	0	22.19	22.07	22.16	0.5	24.0	
		QPSK	1	1	23.27	23.13	23.23	0.0	24.5
			1	25	23.22	23.12	23.03	0.0	24.5
			1	50	23.17	23.09	22.43	0.0	24.5
			25	0	22.21	22.12	22.09	1.0	23.5
			25	13	23.26	23.18	23.02	0.0	24.5
			25	27	22.19	22.10	21.84	1.0	23.5
		16QAM	50	0	22.18	22.08	22.19	1.0	23.5
			1	1	22.02	22.01	22.02	1.0	23.5
			1	25	22.07	21.94	22.06	1.0	23.5
		64QAM	1	50	22.01	21.91	21.58	1.0	23.5
			1	1	20.86	20.75	20.77	2.5	22.0
256QAM	1	1	18.14	18.05	18.15	4.5	20.0		
CP-OFDM	QPSK	1	1	21.82	21.77	21.86	1.5	23.0	
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	π/2 BPSK	1	1	23.21	23.13	23.05	0.0	24.5
			1	12	23.20	23.08	22.90	0.0	24.5
			1	23	23.16	23.07	22.53	0.0	24.5
			12	0	22.18	22.06	22.05	0.5	24.0
			12	6	23.17	23.11	22.88	0.0	24.5
			12	13	22.07	22.00	21.78	0.5	24.0
		25	0	22.13	22.10	21.92	0.5	24.0	
		QPSK	1	1	23.16	23.12	23.11	0.0	24.5
			1	12	23.12	23.11	22.85	0.0	24.5
			1	23	23.10	23.10	22.42	0.0	24.5
			12	0	22.13	22.06	22.05	1.0	23.5
			12	6	23.10	23.09	22.81	0.0	24.5
			12	13	22.07	22.06	21.71	1.0	23.5
		16QAM	25	0	22.13	22.08	22.01	1.0	23.5
			1	1	22.09	22.06	22.00	1.0	23.5
			1	12	21.94	21.92	21.90	1.0	23.5
		64QAM	1	23	22.01	21.97	21.57	1.0	23.5
			1	1	20.90	20.82	20.78	2.5	22.0
256QAM	1	1	18.18	18.19	18.25	4.5	20.0		
CP-OFDM	QPSK	1	1	21.86	21.84	21.74	1.5	23.0	

NR Band n25 (ANT E)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Allowed Average Power (dBm)						
					Pmax					MPR	Tune-up Limit
					Measured Pwr (dBm)			MPR	Tune-up Limit		
					374000	376500	379000				
			1870.00 MHz	1882.50 MHz	1895.00 MHz						
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.27	23.19	23.05	0.0	24.5		
			1	107	22.95	22.79	22.87	0.0	24.5		
			1	214	22.95	22.93	22.93	0.0	24.5		
			108	0	22.10	22.04	21.94	0.5	24.0		
			108	54	23.09	22.89	22.92	0.0	24.5		
			108	108	21.92	21.85	21.97	0.5	24.0		
		216	0	22.15	22.10	22.03	0.5	24.0			
		QPSK	1	1	23.15	23.16	23.07	0.0	24.5		
			1	107	22.98	22.83	22.87	0.0	24.5		
			1	214	22.99	22.80	22.93	0.0	24.5		
			108	0	22.14	21.90	22.34	1.0	23.5		
			108	54	22.81	22.91	22.80	0.0	24.5		
			108	108	21.96	21.85	21.97	1.0	23.5		
		216	0	22.07	21.99	22.01	1.0	23.5			
		16QAM	1	1	22.19	22.15	22.05	1.0	23.5		
1	107		21.99	21.97	21.97	1.0	23.5				
64QAM	1	1	20.91	20.87	20.76	2.5	22.0				
	1	214	22.01	21.94	21.92	1.0	23.5				
256QAM	1	1	18.09	18.09	17.99	4.5	20.0				
CP-OFDM	QPSK	1	1	21.88	21.86	21.79	1.5	23.0			
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit		
					373500	376500	379500				
					1867.50 MHz	1882.50 MHz	1897.50 MHz				
35 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.49	23.33	23.22	0.0	24.5		
			1	93	23.43	23.19	23.40	0.0	24.5		
			1	186	23.19	23.14	22.97	0.0	24.5		
			90	0	22.32	22.22	22.68	0.5	24.0		
			90	49	23.42	23.18	22.19	0.0	24.5		
			90	98	22.17	22.04	22.13	0.5	24.0		
		180	0	22.32	22.19	22.12	0.5	24.0			
		QPSK	1	1	23.38	23.37	23.13	0.0	24.5		
			1	93	23.44	23.23	23.33	0.0	24.5		
			1	186	23.20	23.15	23.08	0.0	24.5		
			90	0	22.38	22.18	22.16	1.0	23.5		
			90	49	23.40	23.14	23.19	0.0	24.5		
			90	98	22.19	22.11	22.15	1.0	23.5		
		180	0	22.33	22.20	22.23	1.0	23.5			
		16QAM	1	1	22.41	22.24	22.15	1.0	23.5		
1	93		22.28	22.09	22.11	1.0	23.5				
64QAM	1	186	22.11	22.10	22.09	1.0	23.5				
	1	1	21.13	20.92	20.82	2.5	22.0				
256QAM	1	1	18.28	18.16	18.02	4.5	20.0				
CP-OFDM	QPSK	1	1	21.97	21.93	21.74	1.5	23.0			
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit		
					373000	376500	380000				
					1865.00 MHz	1882.50 MHz	1900.00 MHz				
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.58	23.42	23.29	0.0	24.5		
			1	79	23.41	23.23	23.22	0.0	24.5		
			1	158	23.40	23.23	23.03	0.0	24.5		
			80	0	22.36	22.17	22.17	0.5	24.0		
			80	40	23.36	23.26	23.21	0.0	24.5		
			80	80	22.31	22.14	22.17	0.5	24.0		
		160	0	22.30	22.15	22.09	0.5	24.0			
		QPSK	1	1	23.63	23.44	23.32	0.0	24.5		
			1	79	23.45	23.26	23.34	0.0	24.5		
			1	158	23.24	23.19	22.97	0.0	24.5		
			80	0	22.35	22.14	22.12	1.0	23.5		
			80	40	23.42	23.22	23.16	0.0	24.5		
			80	80	22.29	22.12	22.18	1.0	23.5		
		160	0	22.33	22.12	22.12	1.0	23.5			
		16QAM	1	1	22.38	22.25	22.18	1.0	23.5		
1	79		22.32	22.13	22.09	1.0	23.5				
64QAM	1	158	22.16	22.09	22.00	1.0	23.5				
	1	1	21.03	20.92	20.83	2.5	22.0				
256QAM	1	1	18.31	18.26	18.11	4.5	20.0				
CP-OFDM	QPSK	1	1	22.08	21.96	21.83	1.5	23.0			

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372500	376500	380500		
					1862.50 MHz	1882.50 MHz	1902.50 MHz		
25 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.50	23.40	23.31	0.0	24.5
			1	66	23.43	23.25	23.18	0.0	24.5
			1	131	23.31	23.28	22.98	0.0	24.5
			64	0	22.33	22.18	22.16	0.5	24.0
			64	34	23.39	23.26	23.15	0.0	24.5
			64	69	22.26	22.12	22.16	0.5	24.0
		128	0	22.25	22.17	22.07	0.5	24.0	
		QPSK	1	1	23.53	23.43	23.32	0.0	24.5
			1	66	23.34	23.30	23.21	0.0	24.5
			1	131	23.38	23.26	22.93	0.0	24.5
			64	0	22.30	22.15	22.12	1.0	23.5
			64	34	22.40	23.23	23.15	0.0	24.5
			64	69	22.25	22.15	22.03	1.0	23.5
		128	0	22.28	22.15	22.12	1.0	23.5	
		16QAM	1	1	22.36	22.26	22.20	1.0	23.5
1	66		22.30	22.12	22.04	1.0	23.5		
64QAM	1	131	22.14	22.14	21.96	1.0	23.5		
	1	1	21.08	20.95	20.86	2.5	22.0		
256QAM	1	1	18.28	18.31	18.10	4.5	20.0		
CP-OFDM	QPSK	1	1	22.07	22.04	21.86	1.5	23.0	
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	23.38	23.28	23.18	0.0	24.5
			1	52	23.31	23.18	23.22	0.0	24.5
			1	104	23.30	23.12	22.96	0.0	24.5
			50	0	22.24	22.06	22.10	0.5	24.0
			50	28	23.34	23.19	23.31	0.0	24.5
			50	56	22.25	22.02	22.10	0.5	24.0
		100	0	22.29	22.16	22.19	0.5	24.0	
		QPSK	1	1	23.33	23.30	23.21	0.0	24.5
			1	52	23.37	23.15	23.24	0.0	24.5
			1	104	23.25	23.18	22.92	0.0	24.5
			50	0	22.23	22.05	22.06	1.0	23.5
			50	28	23.33	23.17	23.27	0.0	24.5
			50	56	22.25	22.02	22.14	1.0	23.5
		100	0	22.33	22.15	22.16	1.0	23.5	
		16QAM	1	1	22.23	22.13	22.09	1.0	23.5
1	52		22.27	22.04	22.01	1.0	23.5		
64QAM	1	104	22.13	22.01	21.97	1.0	23.5		
	1	1	20.91	20.80	20.80	2.5	22.0		
256QAM	1	1	18.19	18.09	18.00	4.5	20.0		
CP-OFDM	QPSK	1	1	21.86	21.83	21.75	1.5	23.0	
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	23.45	23.25	23.26	0.0	24.5
			1	39	23.36	23.20	23.20	0.0	24.5
			1	77	23.34	23.13	22.91	0.0	24.5
			36	0	22.30	22.15	22.03	0.5	24.0
			36	21	23.48	23.17	23.21	0.0	24.5
			36	43	22.27	22.05	22.08	0.5	24.0
		75	0	22.32	22.08	22.02	0.5	24.0	
		QPSK	1	1	23.47	23.27	23.16	0.0	24.5
			1	39	23.40	23.17	23.24	0.0	24.5
			1	77	23.32	23.19	22.91	0.0	24.5
			36	0	22.29	22.12	22.02	1.0	23.5
			36	21	23.46	23.30	23.22	0.0	24.5
			36	43	22.26	22.05	22.10	1.0	23.5
		75	0	22.31	22.07	22.05	1.0	23.5	
		16QAM	1	1	22.37	22.10	22.05	1.0	23.5
1	39		22.29	22.06	22.13	1.0	23.5		
64QAM	1	77	22.22	22.07	21.93	1.0	23.5		
	1	1	21.05	20.80	20.79	2.5	22.0		
256QAM	1	1	18.36	18.16	18.10	4.5	20.0		
CP-OFDM	QPSK	1	1	22.07	21.88	21.75	1.5	23.0	

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	$\pi/2$ BPSK	1	1	23.47	23.17	23.25	0.0	24.5
			1	25	23.44	23.14	23.11	0.0	24.5
			1	50	23.33	23.13	22.86	0.0	24.5
			25	0	22.32	23.15	22.12	0.5	24.0
			25	13	23.39	22.05	22.95	0.0	24.5
			25	27	22.33	22.07	21.77	0.5	24.0
		QPSK	1	1	23.48	23.20	23.24	0.0	24.5
			1	25	23.41	23.19	23.02	0.0	24.5
			1	50	23.37	23.18	22.79	0.0	24.5
			25	0	22.34	22.09	22.09	1.0	23.5
			25	13	23.44	23.17	22.98	0.0	24.5
			25	27	22.30	22.06	21.86	1.0	23.5
		16QAM	1	1	22.31	22.09	22.02	1.0	23.5
			1	25	22.32	22.07	22.11	1.0	23.5
		64QAM	1	1	20.96	20.74	20.67	2.5	22.0
			1	50	22.26	22.07	21.76	1.0	23.5
256QAM	1	1	18.27	18.06	18.11	4.5	20.0		
CP-OFDM	QPSK	1	1	21.99	21.78	21.67	1.5	23.0	
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	23.40	23.17	23.06	0.0	24.5
			1	12	23.35	23.18	22.86	0.0	24.5
			1	23	23.32	23.10	22.77	0.0	24.5
			12	0	22.32	22.12	21.78	0.5	24.0
			12	6	23.36	23.16	22.81	0.0	24.5
			12	13	22.29	22.06	21.76	0.5	24.0
		QPSK	25	0	22.26	22.08	21.85	0.5	24.0
			1	1	23.39	23.22	22.88	0.0	24.5
			1	12	23.36	23.22	22.79	0.0	24.5
			1	23	23.29	23.13	22.71	0.0	24.5
			12	0	22.30	22.11	21.91	1.0	23.5
			12	6	23.34	23.17	22.76	0.0	24.5
		16QAM	12	13	22.30	22.06	21.73	1.0	23.5
			25	0	22.29	22.08	21.72	1.0	23.5
		64QAM	1	1	22.36	22.15	21.98	1.0	23.5
			1	12	22.26	22.05	21.72	1.0	23.5
256QAM	1	23	22.31	22.14	21.75	1.0	23.5		
	1	1	21.00	20.79	20.59	2.5	22.0		
CP-OFDM	QPSK	1	1	18.34	18.15	18.20	4.5	20.0	
CP-OFDM	QPSK	1	1	22.08	21.75	21.45	1.5	23.0	

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

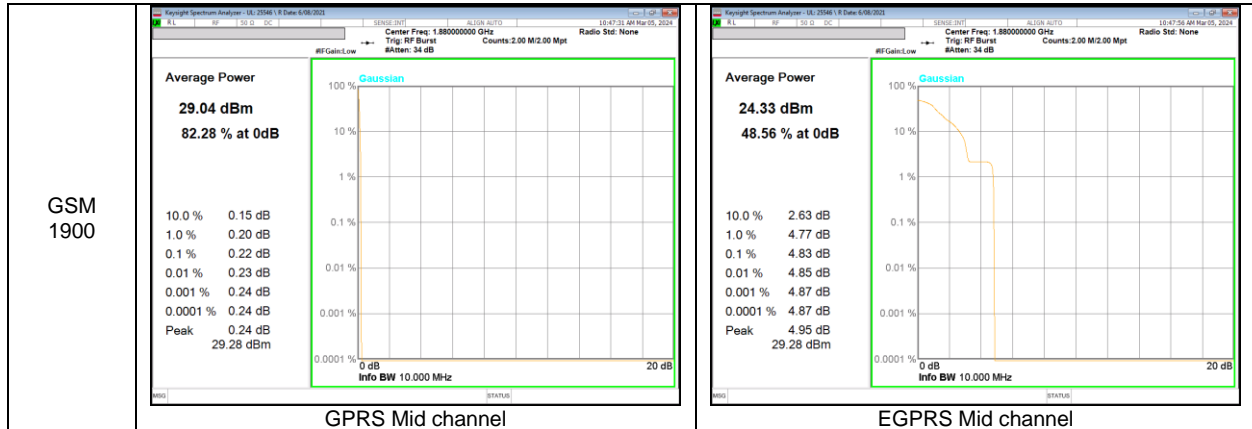
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All Modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

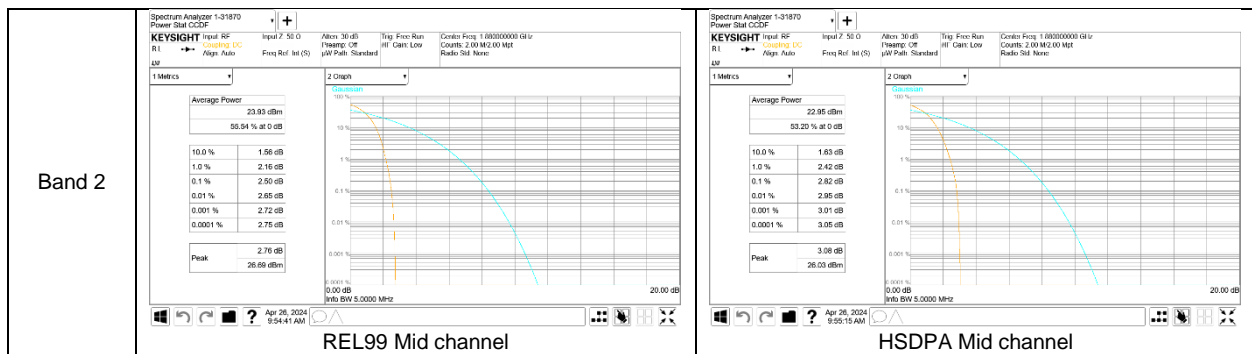
See the following pages.

8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

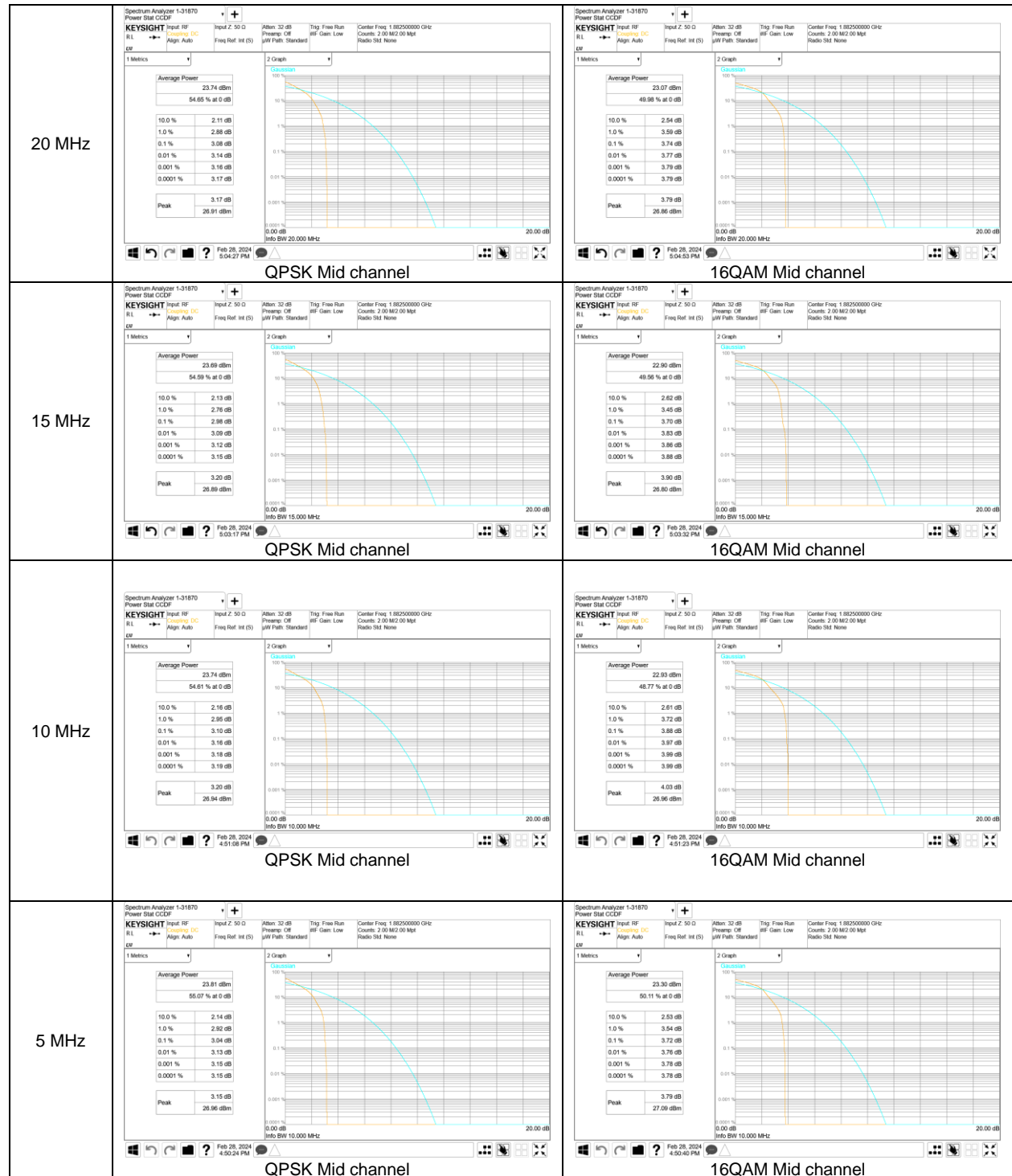
GSM

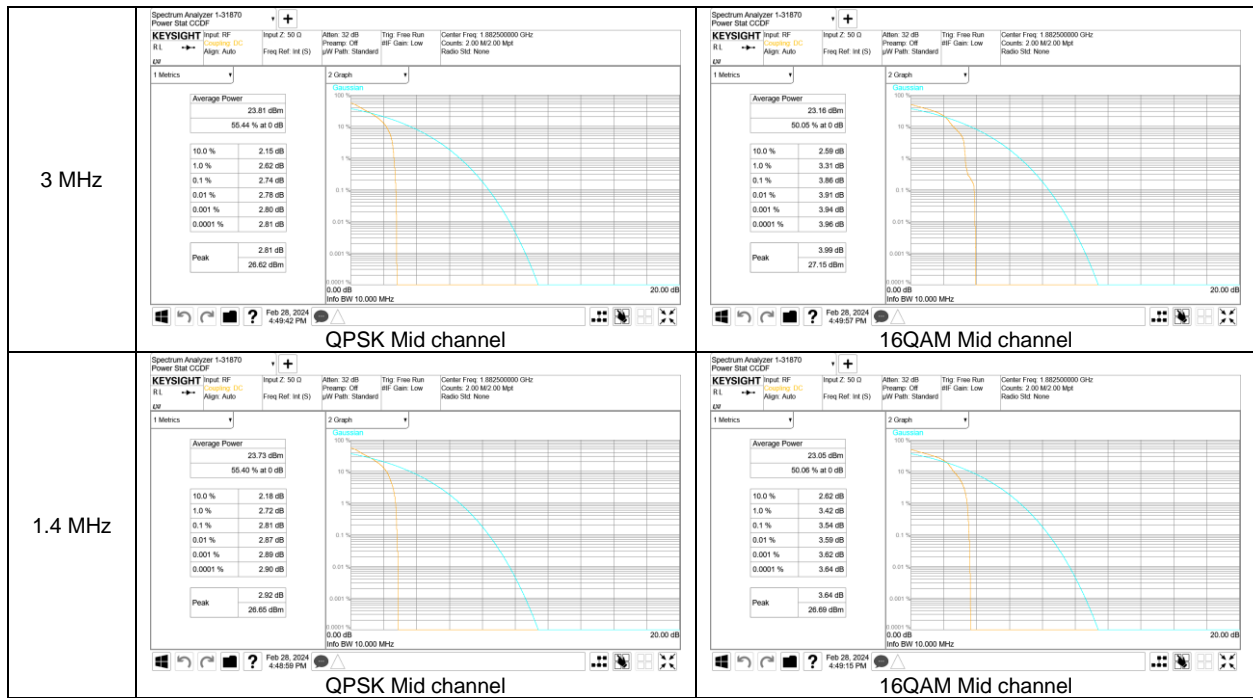


WCDMA



LTE Band 25





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.

- GSM

Band	Modulation	f [MHz]	99% BW (kHz)	-26dB BW (kHz)
1900	GPRS	1880.0	243.870	309.000
	EGPRS		237.270	299.600

- WCDMA

Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.0	4.161	4.720
	HSDPA		4.158	4.706

- LTE Band 25

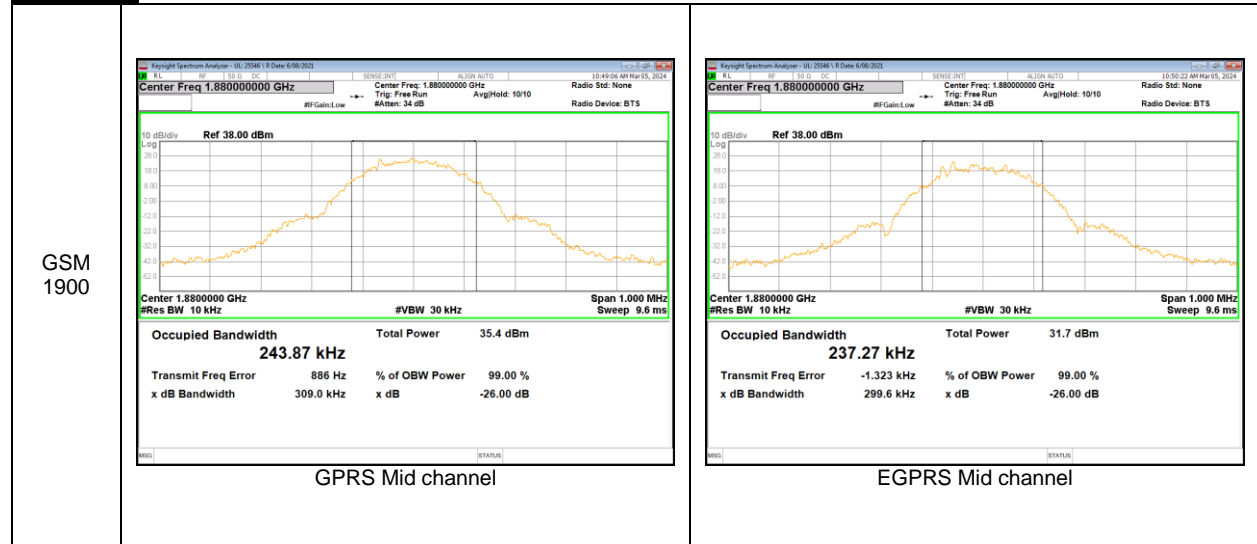
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.5	17.912	19.650
		16QAM		17.926	19.470
	15M	QPSK		13.442	14.770
		16QAM		13.439	14.840
	10M	QPSK		8.969	9.933
		16QAM		8.971	9.886
	5M	QPSK		4.488	5.144
		16QAM		4.495	5.140
	3M	QPSK		2.699	3.062
		16QAM		2.703	3.095
	1.4M	QPSK		1.090	1.347
		16QAM		1.098	1.388

- NR Band n25 CP-OFDM

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	40M	QPSK	1882.5	38.646	40.240
		16QAM		38.659	40.240
	35M	QPSK		33.678	34.970
		16QAM		33.600	34.990
	30M	QPSK		28.645	29.840
		16QAM		28.693	29.840
	25M	QPSK		23.767	25.050
		16QAM		23.734	24.890
	20M	QPSK		18.971	19.950
		16QAM		18.920	19.900
	15M	QPSK		14.104	14.870
		16QAM		14.108	14.920
	10M	QPSK		9.294	10.030
		16QAM		9.286	10.150
	5M	QPSK		4.488	5.104
		16QAM		4.484	5.125

8.3.1. OCCUPIED BANDWIDTH RESULTS

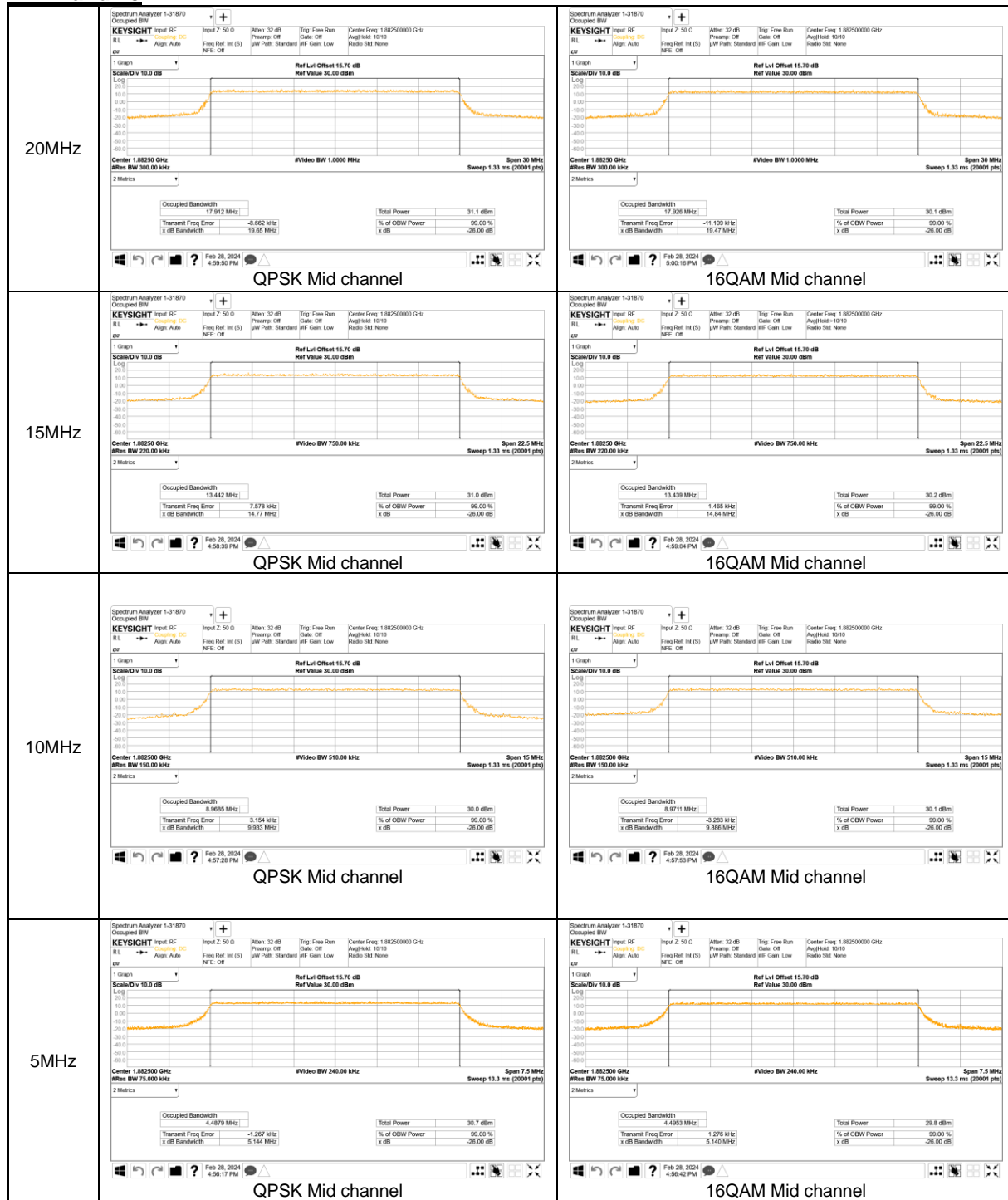
GSM 1900

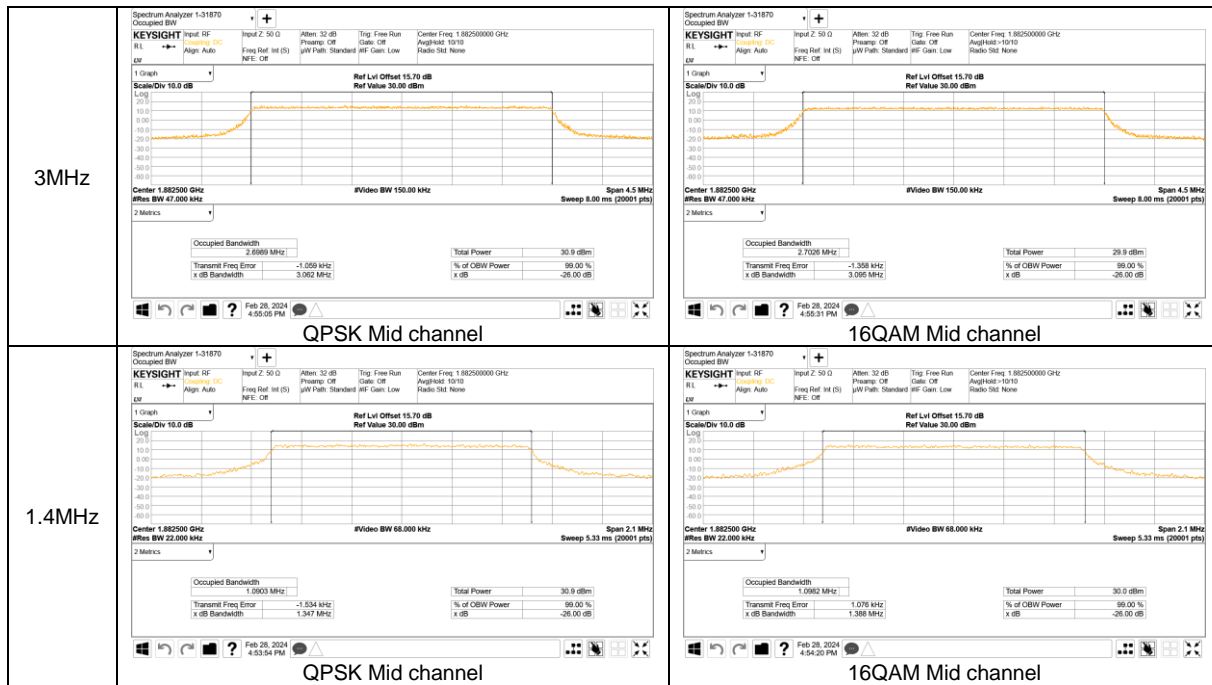


WCDMA Band 2



LTE Band 25





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.

GSM

- a) Set the RBW = 1 - 5% of OBW(GSM1900 – 9.1KHz)
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = 1S ;
- e) Detector = RMS;
- f) Ensure that the number of measurement points $\geq 2 \times$ Span/RBW;
- g) Trace Mode = Average(100);
- h) Add duty cycle correction factor (9dB)

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 additional 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

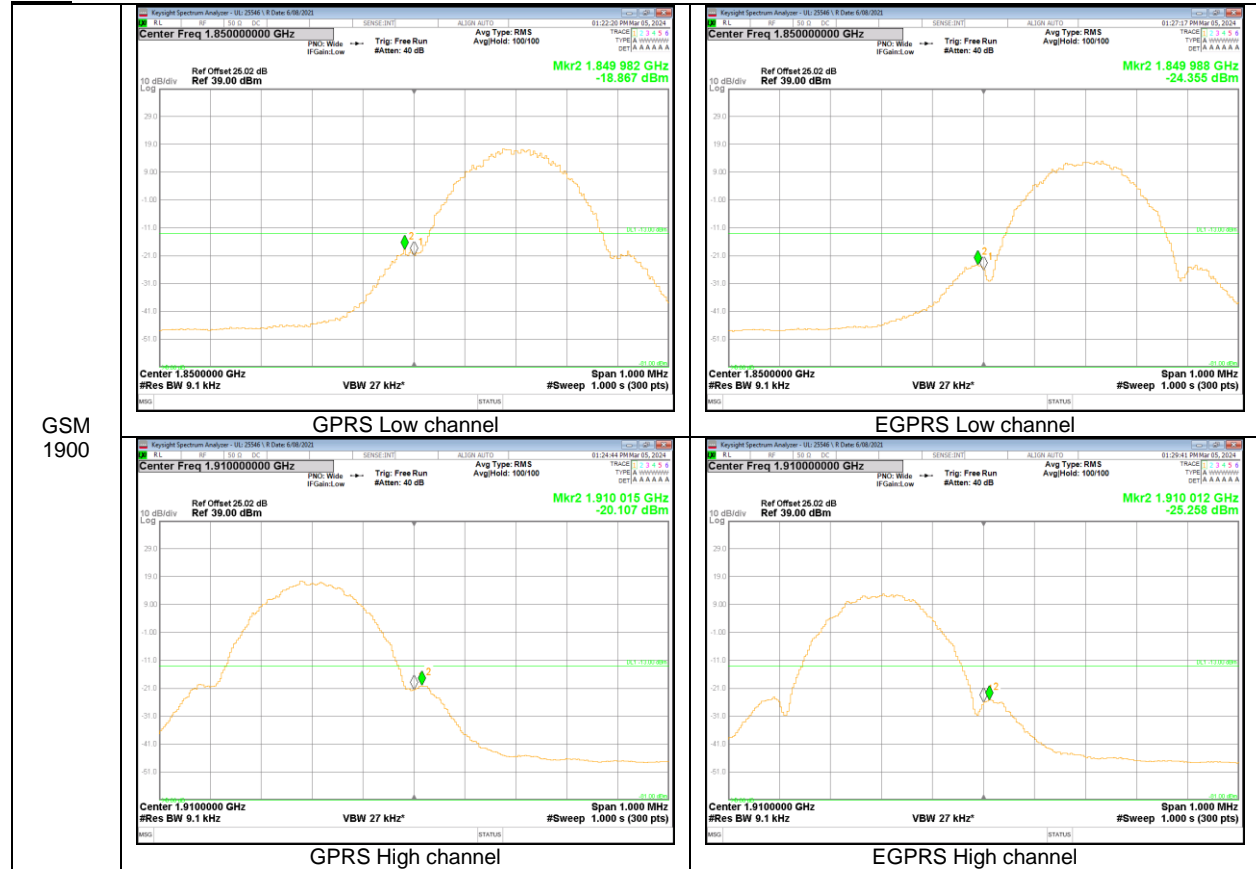
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All Modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

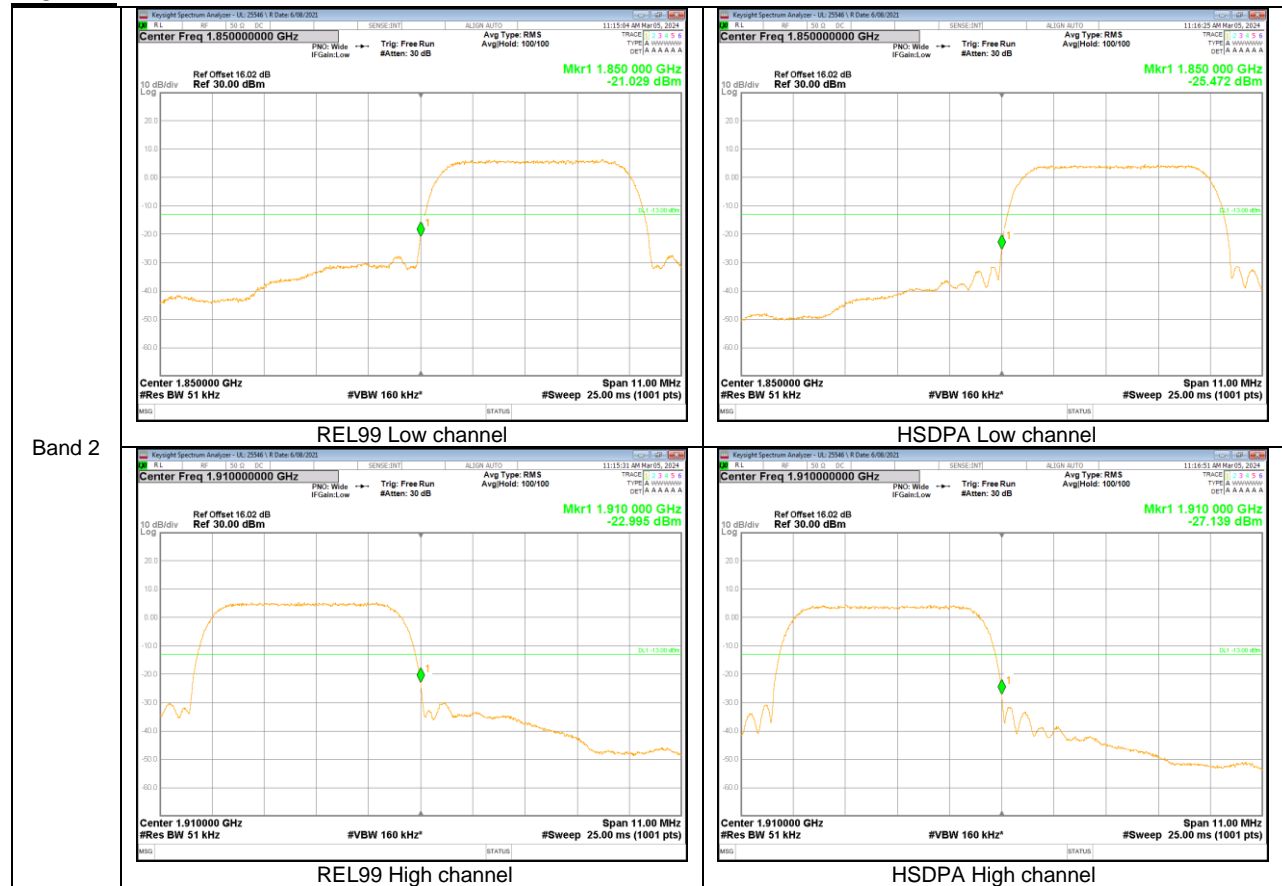
See the following pages.

8.4.1. BAND EDGE RESULT

GSM

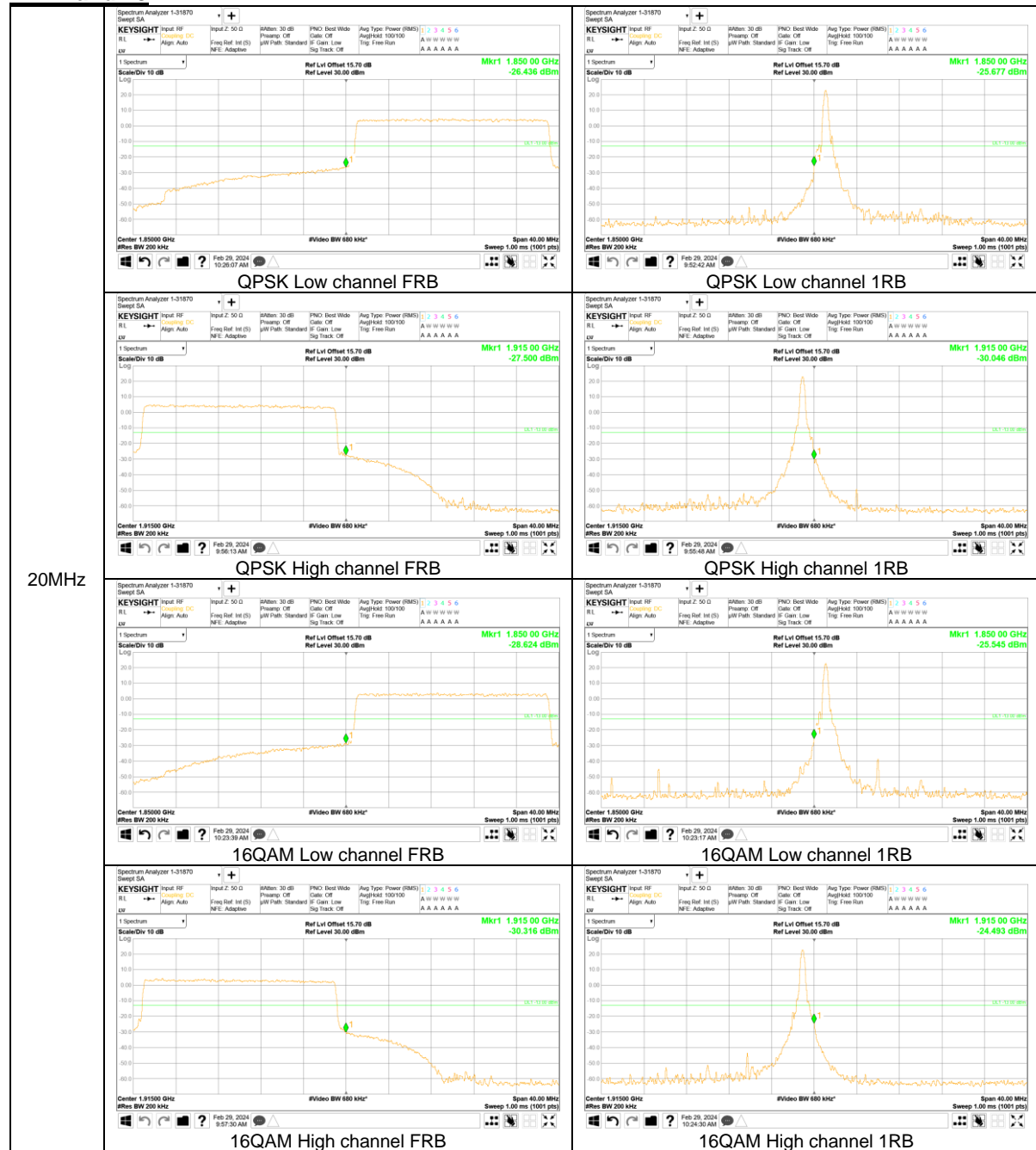


WCDMA

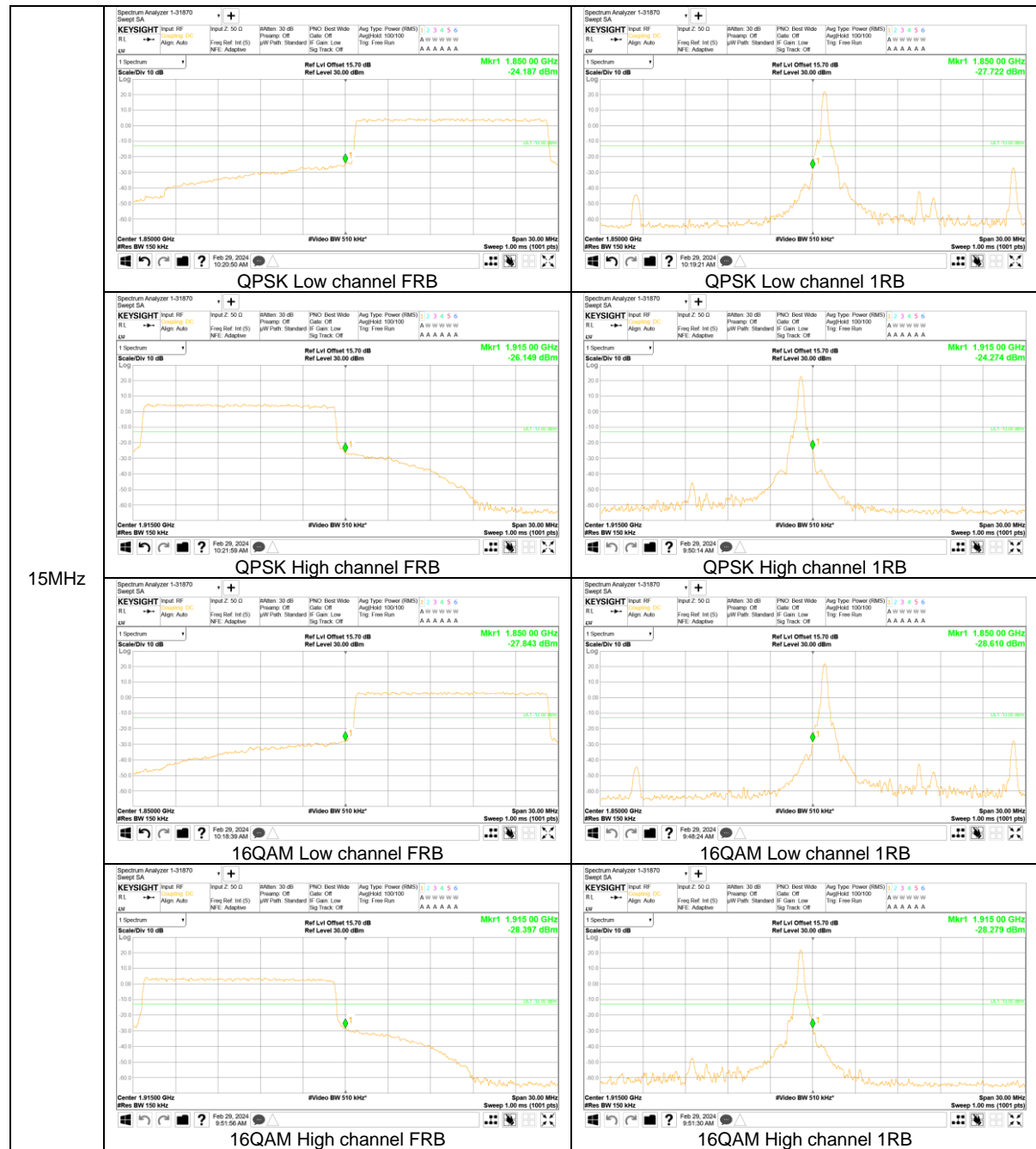


Band 2

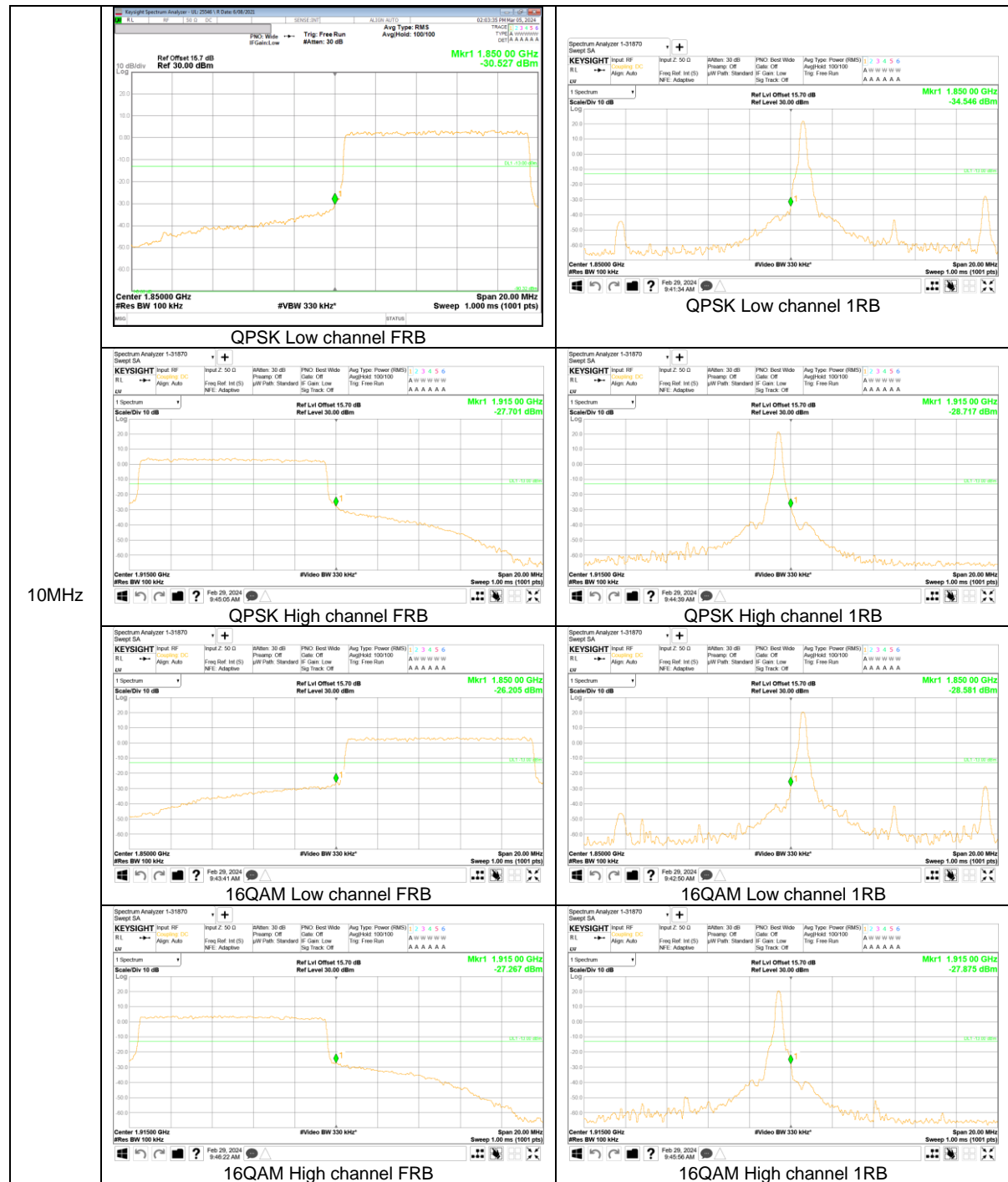
LTE Band 25



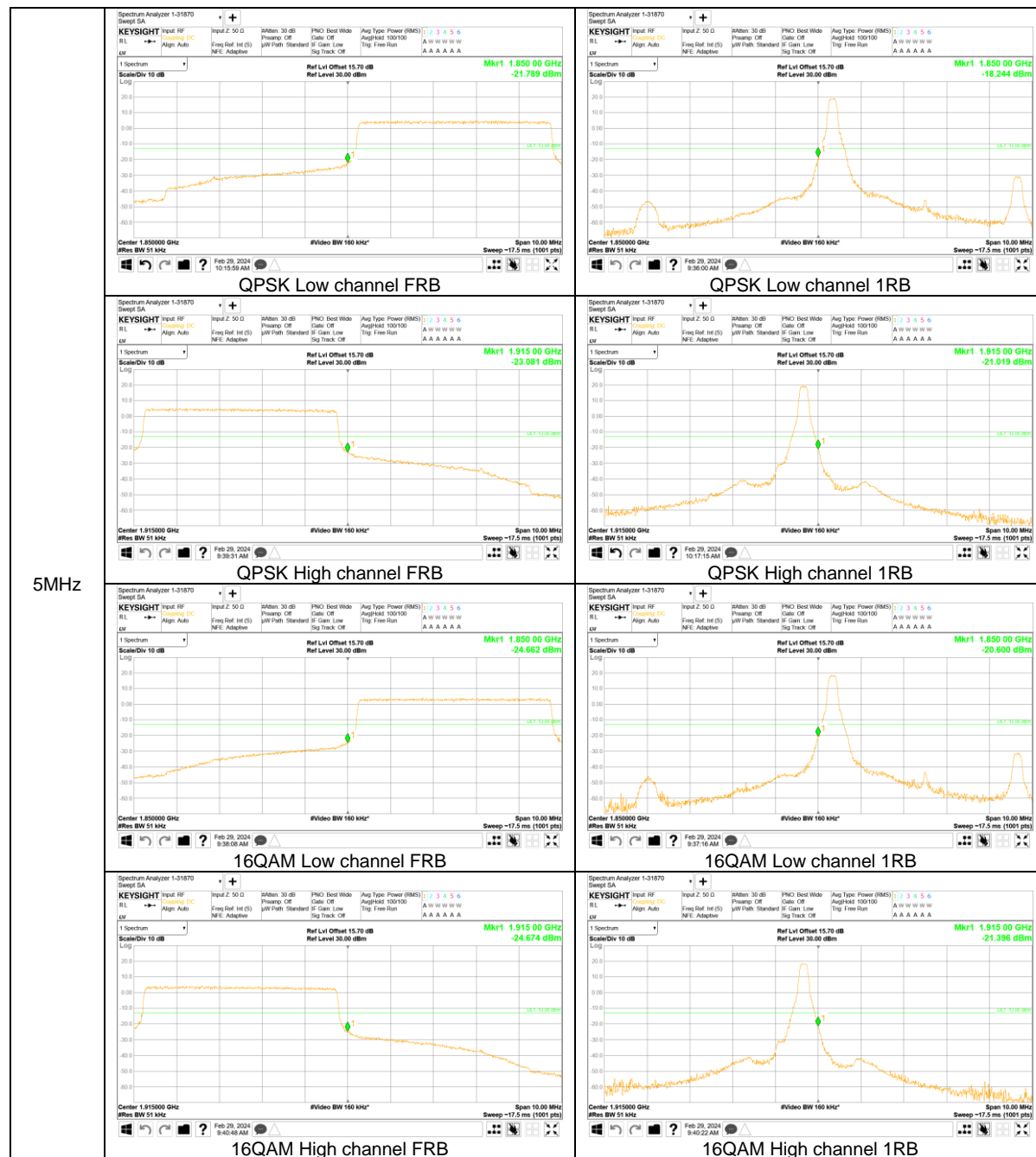
20MHz

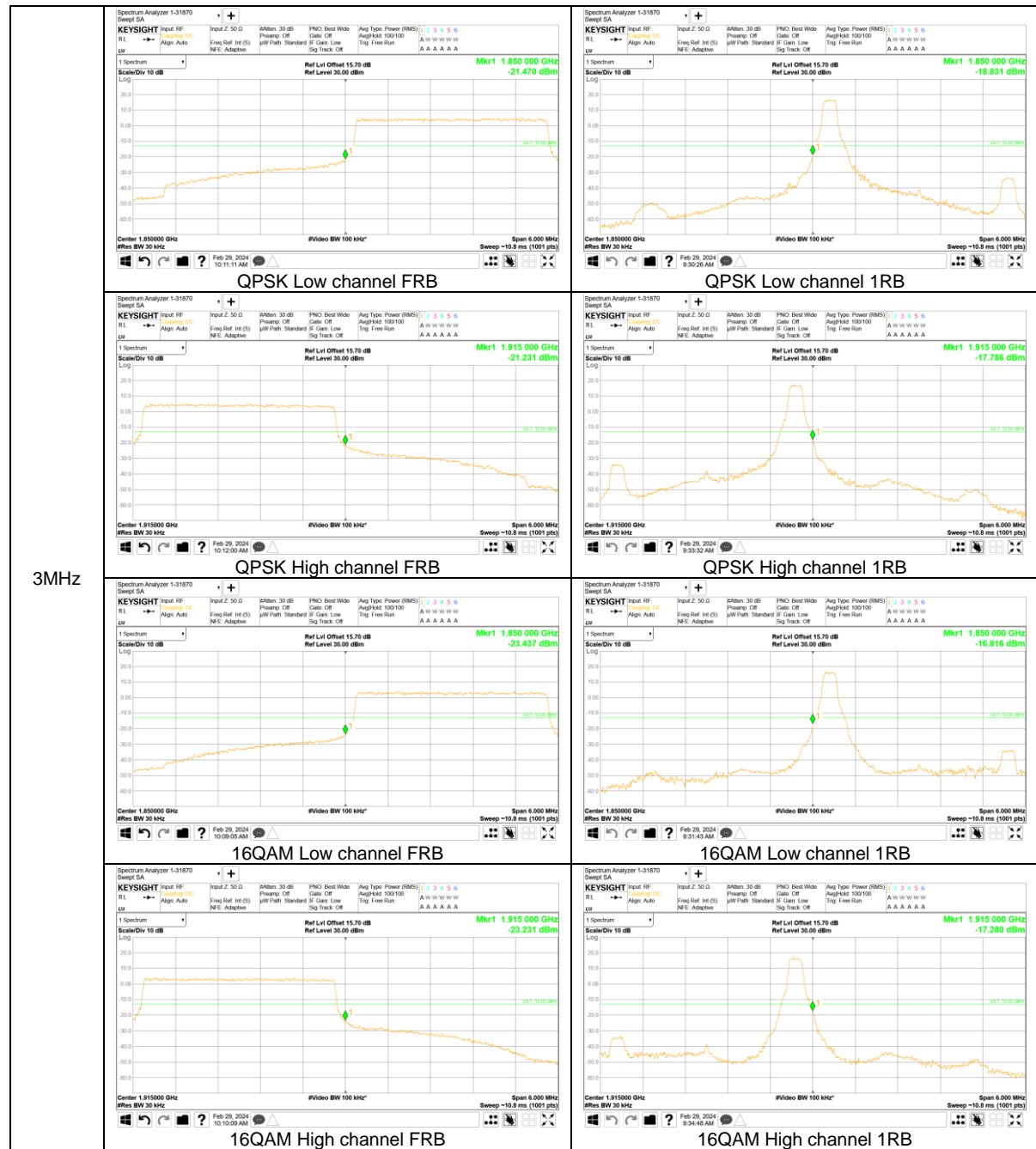


15MHz

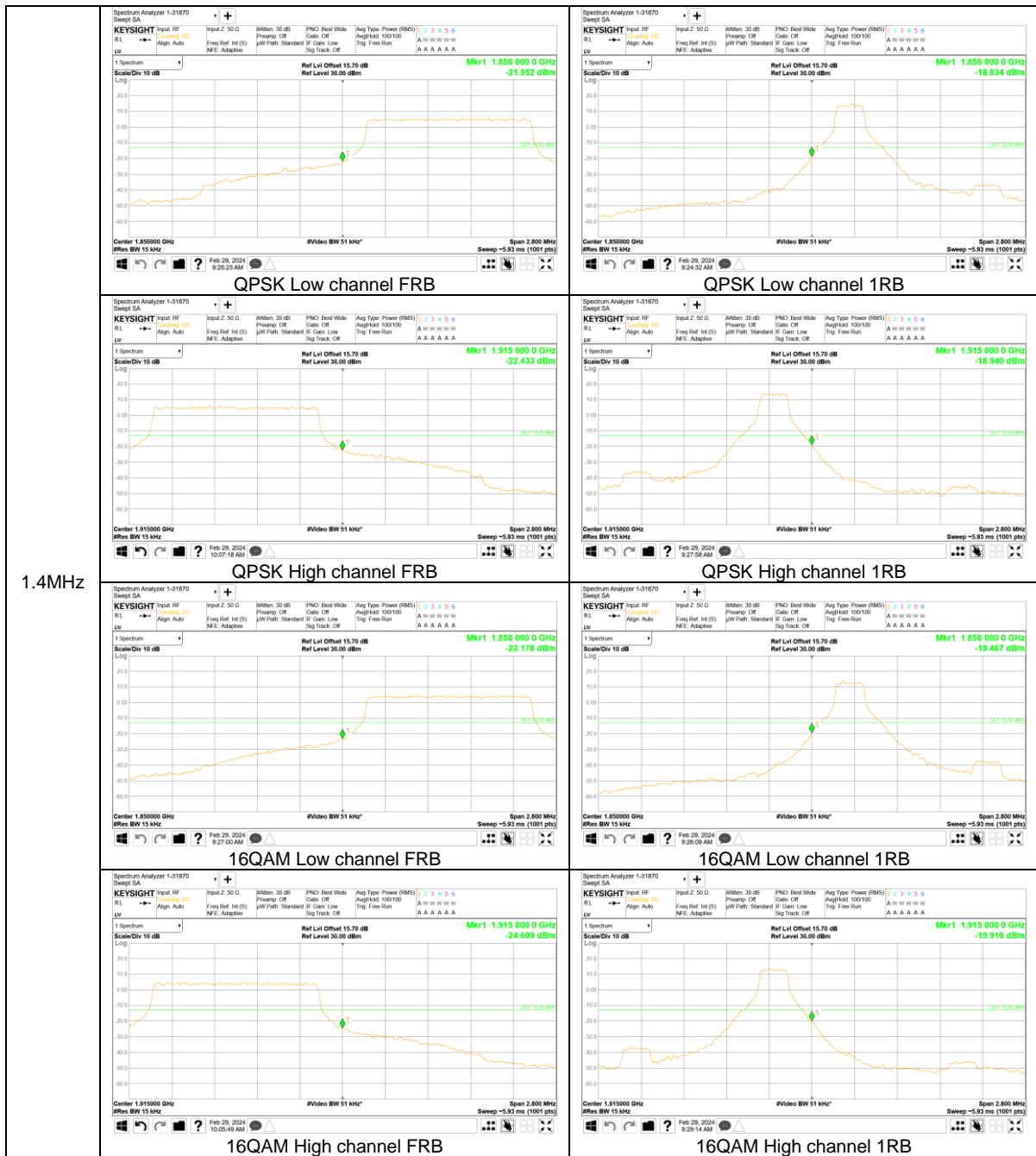


10MHz

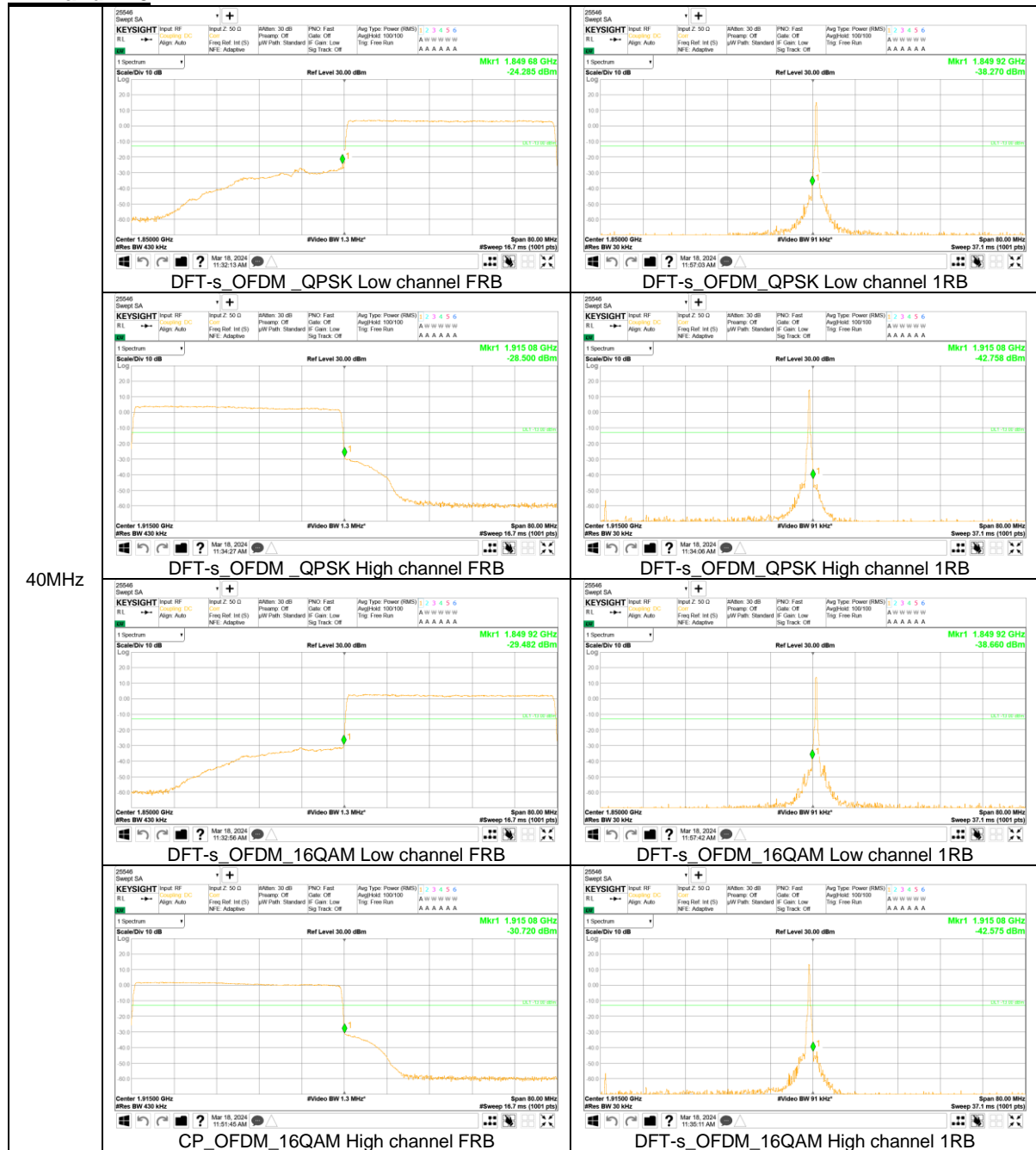




3MHz



NR Band n25



40MHz