

CERTIFICATION TEST REPORT

Report Number. : S-4791440365-E3V1

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

Model : SM-A166U, SM-A166U1, SM-S166V

FCC ID : A3LSMA166U

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

Test Standard(s) : FCC 47 CFR PART 24 SUBPART E

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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 and NFC.

MODEL NUMBER: SM-A166U, SM-A166U1, SM-S166V

SERIAL NUMBER: R3CX807W0XL, R3CX807W0YN, R3CX807W0VV (CONDUCTED);
86182F51a0347ece, 8618ef519f357ece (RADIATED);

DATE TESTED: 2024-08-22 – 2024-10-10;

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.

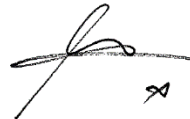
Note: The results documented in this report apply only to the tested sample, under the conditions and Modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration 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
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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

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	
☒	Chamber 1(3m semi-anechoic chamber)
☒	Chamber 2(3m semi-anechoic chamber)
☐	Chamber 3(3m semi-anechoic chamber)
☒	Chamber 4(3m Full-anechoic chamber)
☐	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, and NFC.
This test report addresses the WWAN operational mode.

Representative model	Difference	Derivative model
		SM-A166U1, SM-S166V
SM-A166U	Hardware	Same
	Software	The UI has changed according to Service Provider

The model SM-A166U was used for final testing and is representative of the test results in this report.

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	ANT	Frequency Range [MHz]	Modulation	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
GSM 1900	A	1850.20 ~ 1909.80	GPRS	29.73	939.72	30.85	1216.19
			EGPRS	24.98	314.77	27.13	516.42

WCDMA

FCC Part 24							
Band	ANT	Frequency Range [MHz]	Modulation	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2	A	1852.40 ~ 1907.60	Rel. 99	24.94	311.89	24.82	303.39
			HSDPA	23.45	221.31	24.57	286.42

LTE Band 2

FCC Part 24								
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2	A	1860.00 ~ 1900.00	20	QPSK	24.18	261.82	24.76	299.23
				16QAM	23.53	225.42	24.07	255.27
				64QAM	22.84	192.31		
				256QAM	19.32	85.51		
		1857.50 ~ 1902.50	15	QPSK	24.06	254.68	24.20	263.03
				16QAM	23.40	218.78	23.66	232.27
				64QAM	22.68	185.35		
				256QAM	19.43	87.70		
		1855.00 ~ 1905.00	10	QPSK	24.14	259.42	24.60	288.40
				16QAM	23.26	211.84	23.90	245.47
				64QAM	22.43	174.98		
				256QAM	19.37	86.50		
		1852.50 ~ 1907.50	5	QPSK	24.07	255.27	24.61	289.07
				16QAM	23.46	221.82	23.78	238.78
				64QAM	22.50	177.83		
				256QAM	19.36	86.30		
		1851.50 ~ 1908.50	3	QPSK	24.14	259.42	24.41	276.06
				16QAM	23.46	221.82	23.46	221.82
				64QAM	22.55	179.89		
				256QAM	19.44	87.90		
		1850.70 ~ 1909.30	1.4	QPSK	23.96	248.89	24.44	277.97
				16QAM	23.42	219.79	23.52	224.91
				64QAM	22.51	178.24		
				256QAM	19.46	88.31		
Band 2	B	1860.00 ~ 1900.00	20	QPSK	23.24	210.86	17.16	52.00
				16QAM	22.53	179.06	15.99	39.72
				64QAM	21.32	135.52		
				256QAM	18.31	67.76		
		1857.50 ~ 1902.50	15	QPSK	23.14	206.06	17.06	50.82
				16QAM	22.61	182.39	16.27	42.36
				64QAM	21.62	145.21		
				256QAM	18.28	67.30		
		1855.00 ~ 1905.00	10	QPSK	23.13	205.59	17.05	50.70
				16QAM	22.51	178.24	16.17	41.40
				64QAM	21.35	136.46		
				256QAM	18.30	67.61		
		1852.50 ~ 1907.50	5	QPSK	23.13	205.59	17.05	50.70
				16QAM	22.55	179.89	16.21	41.78
				64QAM	21.49	140.93		
				256QAM	18.25	66.83		
		1851.50 ~ 1908.50	3	QPSK	23.07	202.77	16.99	50.00
				16QAM	22.08	161.44	15.74	37.50
				64QAM	21.21	132.13		
				256QAM	18.20	66.07		
		1850.70 ~ 1909.30	1.4	QPSK	23.13	205.59	17.05	50.70
				16QAM	22.52	178.65	16.18	41.50
				64QAM	21.36	136.77		
				256QAM	18.44	69.82		

LTE Band 25

FCC Part 24								
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	A	1860.00 ~ 1905.00	20	QPSK	24.21	263.63	24.41	276.06
				16QAM	23.50	223.87	23.39	218.27
				64QAM	22.51	178.24		
				256QAM	19.39	86.90		
		1857.50 ~ 1907.50	15	QPSK	24.12	258.23	24.05	254.10
				16QAM	23.44	220.80	23.09	203.70
				64QAM	22.44	175.39		
				256QAM	19.54	89.95		
		1855.00 ~ 1910.00	10	QPSK	24.32	270.40	23.92	246.60
				16QAM	23.31	214.29	23.25	211.35
				64QAM	22.23	167.11		
				256QAM	19.58	90.78		
		1852.50 ~ 1912.50	5	QPSK	24.20	263.03	23.53	225.42
				16QAM	23.11	204.64	22.71	186.64
				64QAM	22.63	183.23		
				256QAM	19.68	92.90		
		1851.50 ~ 1913.50	3	QPSK	24.16	260.62	23.80	239.88
				16QAM	23.38	217.77	23.00	199.53
				64QAM	22.27	168.66		
				256QAM	19.57	90.57		
		1850.70 ~ 1914.30	1.4	QPSK	24.20	263.03	23.85	242.66
				16QAM	23.26	211.84	23.08	203.24
				64QAM	22.35	171.79		
				256QAM	19.48	88.72		

NR Band n2

FCC Part 24									
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted		Radiated	
						Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n2	B	1870.00 ~ 1890.00	40	DFT-s OFDM	$\pi/2$ BPSK	23.87	243.78		
					QPSK	23.86	243.22	17.96	62.52
					16QAM	22.94	196.79	16.80	47.86
					64QAM	21.29	134.59		
				CP-OFDM	256QAM	19.28	84.72		
					QPSK	22.19	165.58		
					16QAM	21.45	139.64		
					64QAM	19.82	95.94		
		1865.00 ~ 1895.00	30	DFT-s OFDM	256QAM	16.77	47.53		
					$\pi/2$ BPSK	23.84	242.10		
					QPSK	23.84	242.10	17.84	60.81
					16QAM	22.88	194.09	16.69	46.67
				CP-OFDM	64QAM	21.26	133.66		
					256QAM	19.23	83.75		
					QPSK	22.32	170.61		
		1862.50 ~ 1897.50	25	DFT-s OFDM	QPSK	22.10	170.61		
					$\pi/2$ BPSK	23.84	242.10		
					QPSK	23.86	243.22	17.64	58.08
					16QAM	22.83	191.87	16.33	42.95
				CP-OFDM	64QAM	21.27	133.97		
					256QAM	19.15	82.22		
					QPSK	22.21	166.34		
		1860.00 ~ 1900.00	20	DFT-s OFDM	QPSK	22.10	166.34		
					$\pi/2$ BPSK	23.84	242.10		
					QPSK	23.85	242.66	17.63	57.94
					16QAM	22.79	190.11	16.20	41.69
				CP-OFDM	64QAM	21.27	133.97		
					256QAM	19.13	81.85		
					QPSK	22.17	164.82		
		1857.50 ~ 1902.50	15	DFT-s OFDM	QPSK	22.10	164.82		
					$\pi/2$ BPSK	23.84	242.10		
					QPSK	23.85	242.66	17.63	57.94
					16QAM	22.80	190.55	16.17	41.40
				CP-OFDM	64QAM	21.24	133.05		
					256QAM	19.20	83.18		
					QPSK	22.19	165.58		
		1855.00 ~ 1905.00	10	DFT-s OFDM	QPSK	22.10	165.58		
					$\pi/2$ BPSK	23.85	242.66		
					QPSK	23.86	243.22	17.64	58.08
					16QAM	22.87	193.64	16.19	41.59
				CP-OFDM	64QAM	21.39	137.72		
					256QAM	19.30	85.11		
					QPSK	22.27	168.66		
		1852.50 ~ 1907.50	5	DFT-s OFDM	QPSK	22.27	168.66		
					$\pi/2$ BPSK	23.88	244.34		
					QPSK	23.90	245.47	17.68	58.61
					16QAM	22.90	194.98	16.14	41.11
				CP-OFDM	64QAM	21.36	136.77		
					256QAM	19.30	85.11		
					QPSK	22.31	170.22		

NR Band n25

FCC Part 24									
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted		Radiated	
						Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n25	A	1870.00 ~ 1895.00	40	DFT-s OFDM	$\pi/2$ BPSK	24.46	279.25		
					QPSK	24.49	281.19	25.34	341.98
					16QAM	23.51	224.39	24.31	269.77
					64QAM	22.04	159.96		
					256QAM	19.96	99.08		
				CP-OFDM	QPSK	22.99	199.07		
					16QAM	22.28	169.04		
					64QAM	20.61	115.08		
					256QAM	17.70	58.88		
		1865.00 ~ 1900.00	30	DFT-s OFDM	$\pi/2$ BPSK	24.17	261.22		
					QPSK	24.22	264.24	25.39	345.94
					16QAM	23.22	209.89	24.56	285.76
					64QAM	21.45	139.64		
					256QAM	19.32	85.51		
				CP-OFDM	QPSK	22.46	176.20		
		1862.50 ~ 1902.50	25	DFT-s OFDM	$\pi/2$ BPSK	24.17	261.22		
					QPSK	24.19	262.42	24.97	314.05
					16QAM	23.19	208.45	24.10	257.04
					64QAM	21.68	147.23		
					256QAM	19.68	92.90		
				CP-OFDM	QPSK	22.64	183.65		
		1860.00 ~ 1905.00	20	DFT-s OFDM	$\pi/2$ BPSK	24.18	261.82		
					QPSK	24.21	263.63	24.68	293.76
					16QAM	23.25	211.35	23.67	232.81
					64QAM	21.81	151.71		
					256QAM	19.65	92.26		
				CP-OFDM	QPSK	22.72	187.07		
		1857.50 ~ 1907.50	15	DFT-s OFDM	$\pi/2$ BPSK	24.18	261.82		
					QPSK	24.17	261.22	24.73	297.17
					16QAM	23.23	210.38	23.86	243.22
					64QAM	21.79	151.01		
					256QAM	19.77	94.84		
				CP-OFDM	QPSK	22.73	187.50		
		1855.00 ~ 1910.00	10	DFT-s OFDM	$\pi/2$ BPSK	24.24	265.46		
					QPSK	24.26	266.69	24.69	294.44
					16QAM	23.24	210.86	23.79	239.33
					64QAM	21.75	149.62		
					256QAM	19.80	95.50		
				CP-OFDM	QPSK	22.72	187.07		
		1852.50 ~ 1912.50	5	DFT-s OFDM	$\pi/2$ BPSK	24.18	261.82		
					QPSK	24.20	263.03	24.69	294.44
					16QAM	23.20	208.93	23.67	232.81
					64QAM	21.76	149.97		
					256QAM	19.83	96.16		
				CP-OFDM	QPSK	22.73	187.50		

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)	ANT	Peak Gain (dBi)
GSM1900 / WCDMA B2 / LTE Band 2,25 / NR Band n2,25 1850 - 1915 MHz	A	-1.38
	B	-2.15

5.4. WORST-CASE ORIENTATION

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

- **GSM GPRS/EGPRS**
The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on GPRS and EGPRS modulations. It was found GPRS results were worst case.
- **UMTS REL 99/HSDPA**
The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on REL 99 and HSDPA modulations. It was found REL 99 results were worst case.
- **LTE Bands**
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.
- As for the Antenna Switching supported Tx Path Switching during EN-DC Conditions

Band	Antenna Switching
LTE B2	Tx Path Switching

- It was tested for all rf ports and, 'Main ANT' conducted test power is the same or higher than 'Sub ANT', so we reported with 'Main ANT'. (LTE B2, B25)
- So the test case is as below.

Band	Main ANT	Tune up Limit (dBm)	Sub ANT	Tune up Limit (dBm)
LTE B2	<u>A</u>	<u>25.5</u>	B	24.0
LTE B25	<u>A</u>	<u>25.0</u>		

Test Item	Test case antenna & port
Conducted output power	All
RF port test	All (Worst case reported)
EIRP	All
Radiated Spurious Emissions	All

- NR Bands
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 QPSK and 16QAM results were worst case.

- As for the Antenna Switching supported Tx Path Switching during EN-DC Conditions

Band	Antenna Switching
NR n2	Tx Path Switching

This device supports NSA and SA Mode and Worst case reported.
So the test case is as below.

NR Band	NSA	SA
n2 (ANT B)	<u>B30</u>	-
n25 (ANT A)	LTE B12, 66	<u>Stand Alone</u>

- It was tested for all rf ports and, 'Main ANT' conducted test power is the same or higher than 'Sub ANT', so we reported with 'Main ANT'. (NR n25)
- So the test case is as below.

Band	Main ANT	Tune up Limit (dBm)	Sub ANT	Tune up Limit (dBm)
NR n25	<u>A</u>	<u>25.5</u>		
NR n2	A (Covered)	25.5	B	25.0

Test Item	Test case antenna & port
Conducted output power	All
RF port test	All (Worst case reported)
EIRP	All
Radiated Spurious Emissions	All

NR Band n2 (ANT A)

NR Band n2 (Frequency range: 1850-1910 MHz) is covered by NR Band n25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

● Conducted Spurious Emission

Highest conducted output power setting for each bands					
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
2	A	1860.00	20	1	49
		1880.00		1	0
		1900.00		1	0
25	A	1855.00	10	1	49
		1882.50		1	49
		1910.00		1	0
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
2	B	1852.50	5	1	23
		1880.00		1	23
		1907.50		1	1
25	A	1870.00	40	1	108
		1882.50		1	108
		1895.00		1	1

● Radiated Spurious Emission

Highest EIRP setting for each bands					
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
2	A	1860.00	20	1	49
		1880.00		1	0
		1900.00		1	0
	B	1860.00	20	1	0
		1880.00		1	99
		1900.00		1	0
25	A	1860.00	20	1	49
		1882.50		1	99
		1905.00		1	0
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	RB size	RB offset
2	B	1870.00	40	1	108
		1880.00		1	108
		1890.00		1	108
25	A	1865.00	30	1	158
		1882.50		1	158
		1900.00		1	80

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	A	O	-	-	O	-	-
WCDMA B2	A	O	-	-	O	-	-
LTE B2	A	O	-	-	-	-	O
	B	O	-	-	O	-	-
LTE B25	A	O	-	-	O	-	-
NR n2	B	-	O	-	O	-	-
NR n25	A	O	-	-	O	-	-

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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37TC7A00JBDKA	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

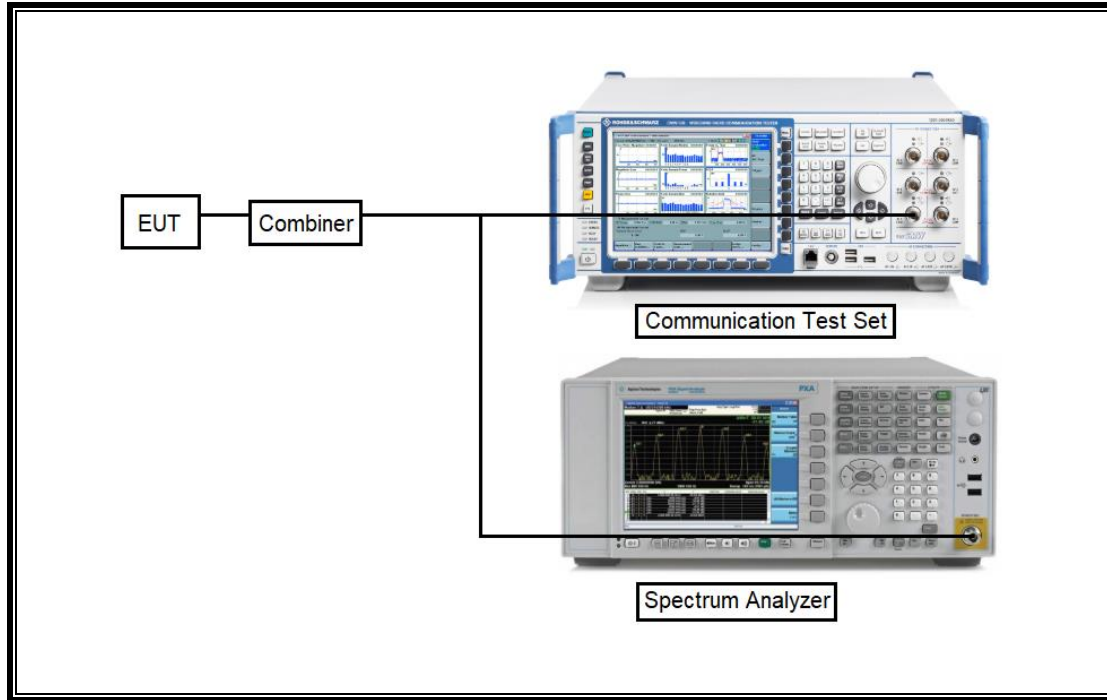
I/O CABLE

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

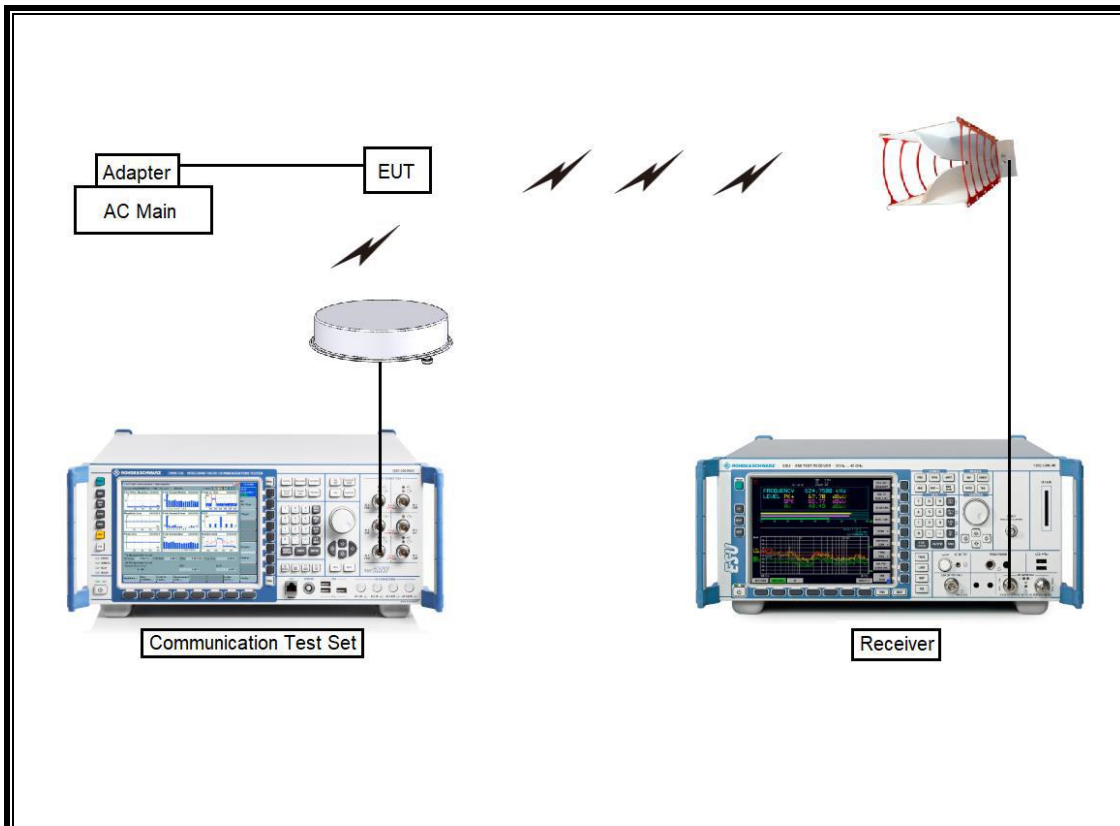
TEST SETUP

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 DB-4	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	2026-07-23
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2025-10-06
Preamplifier	ETS	3116C-PA	00168841	2025-07-25
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB 9163	750	2026-07-30
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB 9163	845	2026-07-30
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB 9163	749	2026-08-12
Antenna, Horn, 18 GHz	ETS	3115	00167211	2026-07-17
Antenna, Horn, 18 GHz	ETS	3115	00161451	2026-07-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	2026-07-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	2026-07-17
Communications Test Set	R&S	CMW500	169797	2025-07-23
DC Power Supply	Agilent / HP	E3640A	MY54226395	2025-07-24
Preamplifier, 1000 MHz	Sonoma	310N	341282	2025-07-22
Preamplifier, 1000 MHz	Sonoma	310N	370599	2025-07-22
Preamplifier, 1000 MHz	Sonoma	310N	351741	2025-07-22
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2025-07-23
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-182020	28451	2025-07-22
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-181515	23576	2025-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2025-07-24
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2025-01-03
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2025-07-22
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2025-07-23
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2025-07-23
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2025-07-23
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2025-07-23
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2025-07-23
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A009	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A001	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A008	2025-07-23
Attenuator	PASTERNAK	PE7004-10	2	2025-07-23
Attenuator	PASTERNAK	PE7395-10	A011	2025-07-25
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-07
Temperature Chamber	ESPEC	SH-642	93001109	2025-07-23
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2025-01-03
Power Splitter	MINI-CIRCUITS	WA1534	UL004	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	

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Results
2.1046	Conducted Output Power	N/A	Conducted	Pass
2.1049	Occupied Bandwidth (99%)	N/A		Pass
24.238(a)	Conducted Band Edge / Conducted Spurious Emission	-13 dBm		Pass
24.235	Frequency Stability	2.5 ppm		Pass
24.232(c)	Effective Isotropic Radiated Power	33 dBm	Radiated	Pass
24.238(a)	Radiated Spurious Emission	-13 dBm		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

GSM

Mode	Coding Scheme	Time Slots	Maximum Average Power (dBm)			
			Measured		Tune-up Limit	
			Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	29.13	19.94	31.5	22.3
			29.67	20.48		
			29.66	20.47		
GPRS (GMSK)	CS1	1	29.29	20.10	31.5	22.3
			29.73	20.54		
			29.68	20.49		
		2	27.22	21.04	29.0	22.8
			27.78	21.60		
			27.68	21.50		
		3	25.86	21.44	27.5	23.1
			26.44	22.02		
			26.27	21.85		
		4	23.67	20.50	25.0	21.8
			24.52	21.35		
			24.40	21.23		
EGPRS (8PSK)	MCS5	1	24.51	15.32	27.0	17.8
			24.98	15.79		
			24.81	15.62		
		2	22.69	16.51	24.0	17.8
			23.20	17.02		
			23.02	16.84		
		3	20.25	15.83	22.0	17.6
			21.18	16.76		
			21.02	16.60		
		4	20.10	16.93	22.5	19.3
			20.74	17.57		
			20.61	17.44		

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	1852.4	24.78	N/A	25.0
		9400	1880.0	24.94		
		9538	1907.6	24.76		
HSDPA	Subtest 1	9262	1852.4	23.25	0	23.5
		9400	1880.0	23.45		
		9538	1907.6	23.44		
	Subtest 2	9262	1852.4	22.45	0	23.5
		9400	1880.0	22.97		
		9538	1907.6	22.66		
	Subtest 3	9262	1852.4	21.60	0.5	23.0
		9400	1880.0	21.93		
		9538	1907.6	21.65		
	Subtest 4	9262	1852.4	21.69	0.5	23.0
		9400	1880.0	22.57		
		9538	1907.6	21.66		
HSUPA	Subtest 1	9262	1852.4	22.51	0	23.5
		9400	1880.0	22.87		
		9538	1907.6	22.53		
	Subtest 2	9262	1852.4	20.61	2	21.5
		9400	1880.0	20.95		
		9538	1907.6	20.53		
	Subtest 3	9262	1852.4	21.67	1	22.5
		9400	1880.0	21.92		
		9538	1907.6	21.60		
	Subtest 4	9262	1852.4	20.61	2	21.5
		9400	1880.0	20.92		
		9538	1907.6	20.55		
	Subtest 5	9262	1852.4	23.09	0	23.5
		9400	1880.0	23.48		
		9538	1907.6	23.41		
DC-HSDPA	Subtest 1	9262	1852.4	23.33	0	23.5
		9400	1880.0	23.47		
		9538	1907.6	23.42		
	Subtest 2	9262	1852.4	22.38	0	23.5
		9400	1880.0	22.93		
		9538	1907.6	22.65		
	Subtest 3	9262	1852.4	21.62	0.5	23.0
		9400	1880.0	21.95		
		9538	1907.6	21.86		
	Subtest 4	9262	1852.4	21.59	0.5	23.0
		9400	1880.0	21.94		
		9538	1907.6	21.67		

LTE Band 2 (ANT A)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				18700	18900	19100		
				1860.00 MHz	1880.00 MHz	1900.00 MHz		
20 MHz	QPSK	1	0	23.36	24.18	23.69	0.0	25.5
		1	49	23.80	24.12	23.52	0.0	25.5
		1	99	23.73	24.04	23.57	0.0	25.5
		50	0	22.91	23.17	22.89	1.0	24.5
		50	24	22.94	23.19	22.83	1.0	24.5
		50	50	22.86	23.18	22.94	1.0	24.5
	16QAM	100	0	22.88	23.19	22.84	1.0	24.5
		1	0	22.76	23.53	22.51	1.0	24.5
		1	49	22.87	22.41	22.51	1.0	24.5
		1	99	22.95	22.90	22.38	1.0	24.5
		50	0	21.93	22.25	21.88	2.0	23.5
		50	24	21.80	22.17	21.85	2.0	23.5
	64QAM	50	50	21.96	22.08	21.86	2.0	23.5
		100	0	21.90	22.13	21.84	2.0	23.5
		1	0	22.56	22.47	21.97	2.0	23.5
		1	49	22.84	22.01	21.97	2.0	23.5
		1	99	22.80	22.14	21.98	2.0	23.5
		50	0	21.77	21.23	20.83	3.0	22.5
	256QAM	50	24	21.80	21.14	20.82	3.0	22.5
		50	50	21.80	21.16	20.81	3.0	22.5
		100	0	21.80	21.18	20.86	3.0	22.5
		1	0	19.32	19.16	18.95	5.0	20.5
		1	49	18.97	19.24	19.05	5.0	20.5
		1	99	18.92	19.05	19.03	5.0	20.5
20 MHz	256QAM	50	0	18.75	19.15	18.93	5.0	20.5
		50	24	18.78	19.02	18.85	5.0	20.5
		50	50	18.75	19.10	18.85	5.0	20.5
		100	0	18.77	19.16	18.90	5.0	20.5
		Measured Pwr (dBm)			MPR	Tune-up Limit		
		18675	18900	19125				
1857.50 MHz	1880.00 MHz	1902.50 MHz						
15 MHz	QPSK	1	0	23.11	24.06	23.80	0.0	25.5
		1	37	23.90	23.92	23.78	0.0	25.5
		1	74	23.50	24.01	23.30	0.0	25.5
		36	0	22.87	23.10	22.82	1.0	24.5
		36	20	22.81	23.17	22.83	1.0	24.5
		36	39	22.83	23.18	22.81	1.0	24.5
	16QAM	75	0	22.81	23.18	22.75	1.0	24.5
		1	0	22.51	23.22	23.01	1.0	24.5
		1	37	22.79	23.40	22.88	1.0	24.5
		1	74	22.81	23.29	22.58	1.0	24.5
		36	0	21.79	22.07	21.77	2.0	23.5
		36	20	21.84	22.06	21.78	2.0	23.5
	64QAM	36	39	21.74	22.19	21.74	2.0	23.5
		75	0	21.86	22.06	21.79	2.0	23.5
		1	0	21.80	22.53	21.93	2.0	23.5
		1	37	21.91	22.18	22.01	2.0	23.5
		1	74	22.12	22.68	22.09	2.0	23.5
		36	0	20.84	21.08	20.74	3.0	22.5
	256QAM	36	20	20.83	21.08	20.78	3.0	22.5
		36	39	20.94	21.03	20.88	3.0	22.5
		75	0	20.75	21.03	20.73	3.0	22.5
		1	0	19.09	19.43	18.61	5.0	20.5
		1	37	19.17	18.96	19.23	5.0	20.5
		1	74	19.10	19.24	18.79	5.0	20.5
20 MHz	256QAM	36	0	18.90	19.15	18.84	5.0	20.5
		36	20	18.78	19.14	18.93	5.0	20.5
		36	39	18.88	19.13	18.80	5.0	20.5
		75	0	18.87	19.03	18.80	5.0	20.5
		Measured Pwr (dBm)			MPR	Tune-up Limit		
		18675	18900	19125				
1857.50 MHz	1880.00 MHz	1902.50 MHz						

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18650	18900	19150		
				1855.00 MHz	1880.00 MHz	1905.00 MHz		
10 MHz	QPSK	1	0	23.24	24.03	23.71	0.0	25.5
		1	25	23.65	24.00	23.71	0.0	25.5
		1	49	23.53	24.14	23.74	0.0	25.5
		25	0	22.76	23.13	22.85	1.0	24.5
		25	12	22.87	23.10	22.81	1.0	24.5
		25	25	22.85	23.12	22.84	1.0	24.5
	16QAM	50	0	22.82	23.21	22.82	1.0	24.5
		1	0	22.49	23.26	22.41	1.0	24.5
		1	25	22.67	23.24	22.60	1.0	24.5
		1	49	22.48	23.10	23.18	1.0	24.5
		25	0	21.78	22.14	21.82	2.0	23.5
		25	12	21.76	22.17	21.80	2.0	23.5
	64QAM	25	25	21.74	22.27	21.70	2.0	23.5
		50	0	21.72	22.07	21.83	2.0	23.5
		1	0	21.96	21.94	21.55	2.0	23.5
		1	25	21.83	22.26	22.43	2.0	23.5
		1	49	21.98	22.05	21.66	2.0	23.5
		25	0	20.81	21.03	20.84	3.0	22.5
	256QAM	25	12	20.67	21.25	20.88	3.0	22.5
		25	25	20.71	21.21	20.83	3.0	22.5
		50	0	20.70	21.08	20.82	3.0	22.5
		1	0	18.60	19.37	18.93	5.0	20.5
		1	25	18.53	19.03	19.11	5.0	20.5
		1	49	18.79	18.97	18.62	5.0	20.5
5 MHz	QPSK	25	0	18.75	19.10	18.88	5.0	20.5
		25	12	18.70	19.16	18.88	5.0	20.5
		25	25	18.75	19.07	18.85	5.0	20.5
		50	0	18.77	19.12	18.79	5.0	20.5
	16QAM	1	0	23.24	24.07	23.71	0.0	25.5
		1	12	23.44	23.96	23.62	0.0	25.5
		1	24	23.54	23.99	23.73	0.0	25.5
		12	0	22.66	23.14	22.84	1.0	24.5
		12	7	22.76	23.15	22.89	1.0	24.5
		12	13	22.73	23.14	22.81	1.0	24.5
	64QAM	25	0	22.75	23.22	22.86	1.0	24.5
		1	0	22.30	23.25	22.55	1.0	24.5
		1	12	22.66	23.46	22.33	1.0	24.5
		1	24	22.83	23.28	23.14	1.0	24.5
		12	0	21.73	21.96	21.81	2.0	23.5
		12	7	21.51	22.13	21.82	2.0	23.5
	256QAM	12	13	21.78	22.18	21.87	2.0	23.5
		25	0	21.76	22.20	21.76	2.0	23.5
		1	0	22.03	22.28	22.26	2.0	23.5
		1	12	21.95	22.25	22.04	2.0	23.5
		1	24	21.63	22.50	21.81	2.0	23.5
		12	0	20.83	21.21	20.82	3.0	22.5
	QPSK	12	7	20.82	21.22	20.90	3.0	22.5
		12	13	20.86	21.14	20.72	3.0	22.5
		25	0	20.70	21.12	20.82	3.0	22.5
	16QAM	1	0	19.20	18.85	18.87	5.0	20.5
		1	12	18.83	19.36	18.94	5.0	20.5
		1	24	18.93	19.18	18.84	5.0	20.5
	64QAM	12	0	18.74	19.07	18.94	5.0	20.5
		12	7	18.68	19.12	18.92	5.0	20.5
		12	13	18.72	19.11	18.80	5.0	20.5
		25	0	18.74	19.07	18.89	5.0	20.5
	256QAM	1	0	18.74	19.07	18.89	5.0	20.5
		1	12	18.83	19.36	18.94	5.0	20.5
		1	24	18.93	19.18	18.84	5.0	20.5
		12	0	18.74	19.07	18.94	5.0	20.5
		12	7	18.68	19.12	18.92	5.0	20.5
		12	13	18.72	19.11	18.80	5.0	20.5
		25	0	18.74	19.07	18.89	5.0	20.5

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18615	18900	19185		
				1851.50 MHz	1880.00 MHz	1908.50 MHz		
3 MHz	QPSK	1	0	23.29	24.14	23.80	0.0	25.5
		1	8	23.34	23.93	23.64	0.0	25.5
		1	14	23.29	24.11	23.82	0.0	25.5
		8	0	22.60	23.10	22.81	1.0	24.5
		8	4	22.65	23.08	22.84	1.0	24.5
		8	7	22.70	23.18	22.90	1.0	24.5
	16QAM	15	0	22.67	23.07	22.84	1.0	24.5
		1	0	22.67	23.12	22.82	1.0	24.5
		1	8	22.75	22.91	22.68	1.0	24.5
		1	14	22.75	23.46	22.44	1.0	24.5
		8	0	21.70	22.14	21.95	2.0	23.5
		8	4	21.64	22.02	21.86	2.0	23.5
	64QAM	8	7	21.96	22.18	21.81	2.0	23.5
		15	0	21.75	22.05	21.93	2.0	23.5
		1	0	21.54	22.09	21.53	2.0	23.5
		1	8	21.73	22.06	21.56	2.0	23.5
		1	14	21.90	22.44	22.55	2.0	23.5
		8	0	20.51	21.12	20.79	3.0	22.5
	256QAM	8	4	20.66	21.13	20.84	3.0	22.5
		8	7	20.82	21.08	20.87	3.0	22.5
		15	0	20.77	21.08	20.79	3.0	22.5
		1	0	18.58	19.26	18.80	5.0	20.5
		1	8	19.06	18.54	18.97	5.0	20.5
		1	14	18.74	19.44	18.85	5.0	20.5
1.4 MHz	QPSK	8	0	18.78	19.22	18.96	5.0	20.5
		8	4	18.63	18.90	18.74	5.0	20.5
		8	7	18.81	19.22	19.00	5.0	20.5
		15	0	18.72	19.13	18.90	5.0	20.5
	16QAM	1	0	23.26	23.80	23.63	0.0	25.5
		1	3	23.30	23.64	23.74	0.0	25.5
		1	5	23.27	23.82	23.76	0.0	25.5
		3	0	23.28	23.84	23.87	1.0	24.5
		3	1	23.30	23.79	23.83	1.0	24.5
		3	3	23.25	23.96	23.81	1.0	24.5
	64QAM	6	0	22.57	23.15	22.78	1.0	24.5
		1	0	22.57	23.20	22.93	1.0	24.5
		1	3	23.18	22.65	22.96	1.0	24.5
		1	5	22.75	23.42	23.04	1.0	24.5
		3	0	22.88	23.12	22.98	2.0	23.5
		3	1	22.46	23.15	22.88	2.0	23.5
	256QAM	3	3	22.47	23.24	22.81	2.0	23.5
		6	0	21.74	22.04	21.84	2.0	23.5
		1	0	22.06	22.51	22.05	2.0	23.5
		1	3	21.63	22.07	21.84	2.0	23.5
		1	5	21.68	22.15	21.77	2.0	23.5
		3	0	21.78	22.10	21.79	3.0	22.5
	QPSK	3	1	21.72	22.10	21.93	3.0	22.5
		3	3	21.63	22.02	21.59	3.0	22.5
		6	0	20.82	21.32	20.71	3.0	22.5
		1	0	18.85	19.35	19.17	5.0	20.5
		1	3	18.83	19.34	18.67	5.0	20.5
		1	5	18.80	19.35	19.04	5.0	20.5
	16QAM	3	0	18.73	19.10	19.18	5.0	20.5
		3	1	18.77	19.46	18.75	5.0	20.5
		3	3	18.65	19.26	19.10	5.0	20.5
		6	0	18.67	19.10	18.74	5.0	20.5
		1	0	18.85	19.35	19.17	5.0	20.5
		1	3	18.83	19.34	18.67	5.0	20.5

LTE Band 2 (ANT B)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				18700	18900	19100		
				1860.00 MHz	1880.00 MHz	1900.00 MHz		
20 MHz	QPSK	1	0	23.07	23.12	22.76	0.0	24.0
		1	49	22.74	22.88	22.73	0.0	24.0
		1	99	22.85	23.24	22.59	0.0	24.0
		50	0	22.05	22.15	21.77	1.0	23.0
		50	24	21.92	22.12	21.80	1.0	23.0
		50	50	21.82	22.21	21.67	1.0	23.0
	16QAM	100	0	21.90	22.14	21.79	1.0	23.0
		1	0	22.31	22.19	22.43	1.0	23.0
		1	49	22.53	22.33	21.60	1.0	23.0
		1	99	21.46	22.31	21.49	1.0	23.0
		50	0	21.07	21.14	20.78	2.0	22.0
		50	24	20.96	21.16	20.76	2.0	22.0
	64QAM	50	50	20.90	21.25	20.70	2.0	22.0
		100	0	20.92	21.07	20.68	2.0	22.0
		1	0	21.32	21.02	20.49	2.0	22.0
		1	49	21.15	21.24	20.70	2.0	22.0
		1	99	21.03	21.11	20.75	2.0	22.0
		50	0	20.02	20.21	19.74	3.0	21.0
	256QAM	50	24	19.88	20.16	19.76	3.0	21.0
		50	50	19.86	20.24	19.79	3.0	21.0
		100	0	19.84	20.05	19.70	3.0	21.0
		1	0	17.81	17.79	18.10	5.0	19.0
		1	49	17.64	18.31	17.60	5.0	19.0
		1	99	17.92	18.07	17.76	5.0	19.0
15 MHz	QPSK	50	0	17.93	18.06	17.77	5.0	19.0
		50	24	17.86	18.12	17.68	5.0	19.0
		50	50	17.83	18.08	17.71	5.0	19.0
		100	0	17.87	18.05	17.65	5.0	19.0
	16QAM							
	64QAM							
	256QAM							

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18650	18900	19150		
				1855.00 MHz	1880.00 MHz	1905.00 MHz		
10 MHz	QPSK	1	0	22.82	23.04	22.66	0.0	24.0
		1	25	22.72	22.93	22.53	0.0	24.0
		1	49	22.75	23.13	22.49	0.0	24.0
		25	0	21.85	22.17	21.73	1.0	23.0
		25	12	21.77	22.11	21.69	1.0	23.0
		25	25	21.76	22.19	21.63	1.0	23.0
	16QAM	50	0	21.80	22.20	21.64	1.0	23.0
		1	0	21.87	22.04	21.71	1.0	23.0
		1	25	21.56	22.51	21.87	1.0	23.0
		1	49	22.11	22.12	21.76	1.0	23.0
		25	0	20.85	21.16	20.76	2.0	22.0
		25	12	20.83	21.11	20.67	2.0	22.0
	64QAM	25	25	20.83	21.16	20.60	2.0	22.0
		50	0	20.81	21.10	20.68	2.0	22.0
		1	0	20.86	21.35	20.68	2.0	22.0
		1	25	20.87	20.61	20.58	2.0	22.0
		1	49	20.93	21.18	20.62	2.0	22.0
		25	0	19.88	20.11	19.66	3.0	21.0
	256QAM	25	12	19.73	20.00	19.72	3.0	21.0
		25	25	19.77	20.24	19.58	3.0	21.0
		50	0	19.80	20.08	19.72	3.0	21.0
		1	0	17.95	18.19	17.73	5.0	19.0
		1	25	17.61	18.25	17.50	5.0	19.0
		1	49	17.73	18.30	17.59	5.0	19.0
		25	0	17.72	18.08	17.70	5.0	19.0
		25	12	17.77	18.05	17.66	5.0	19.0
5 MHz	QPSK	25	25	17.74	18.08	17.53	5.0	19.0
		50	0	17.84	18.12	17.62	5.0	19.0
	16QAM	1	0	22.76	23.00	22.53	0.0	24.0
		1	12	22.72	23.13	22.29	0.0	24.0
		1	24	22.70	23.06	22.50	0.0	24.0
		12	0	21.84	22.09	21.53	1.0	23.0
	64QAM	12	7	21.71	22.08	21.59	1.0	23.0
		12	13	21.77	22.19	21.56	1.0	23.0
		25	0	21.73	22.10	21.56	1.0	23.0
	256QAM	1	0	21.84	22.55	21.79	1.0	23.0
		1	12	21.74	22.20	21.42	1.0	23.0
		1	24	22.37	21.66	21.77	1.0	23.0
		12	0	20.78	21.19	20.64	2.0	22.0
		12	7	20.74	21.09	20.43	2.0	22.0
		12	13	20.79	21.03	20.46	2.0	22.0
	QPSK	25	0	20.74	21.14	20.55	2.0	22.0
		1	0	21.11	21.01	20.64	2.0	22.0
		1	12	21.17	21.49	20.61	2.0	22.0
		1	24	20.73	21.39	20.31	2.0	22.0
		12	0	19.67	19.96	19.50	3.0	21.0
		12	7	19.71	20.09	19.56	3.0	21.0
	16QAM	12	13	19.67	20.13	19.52	3.0	21.0
		25	0	19.71	20.16	19.64	3.0	21.0
		1	0	17.80	18.03	17.43	5.0	19.0
		1	12	18.25	17.98	17.33	5.0	19.0
		1	24	17.68	17.83	17.62	5.0	19.0
		12	0	17.87	18.07	17.57	5.0	19.0
	64QAM	12	7	17.56	18.07	17.41	5.0	19.0
		12	13	17.63	17.99	17.36	5.0	19.0
		25	0	17.69	18.10	17.58	5.0	19.0
		1	0	17.80	18.03	17.43	5.0	19.0
		1	12	18.25	17.98	17.33	5.0	19.0
		1	24	17.68	17.83	17.62	5.0	19.0
	256QAM	12	0	17.87	18.07	17.57	5.0	19.0
		12	7	17.56	18.07	17.41	5.0	19.0
		12	13	17.63	17.99	17.36	5.0	19.0
		25	0	17.69	18.10	17.58	5.0	19.0
		1	0	17.80	18.03	17.43	5.0	19.0
		1	12	18.25	17.98	17.33	5.0	19.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				18615	18900	19185		
				1851.50 MHz	1880.00 MHz	1908.50 MHz		
3 MHz	QPSK	1	0	22.67	23.07	22.46	0.0	24.0
		1	8	22.66	23.01	22.37	0.0	24.0
		1	14	22.77	22.98	22.51	0.0	24.0
		8	0	21.84	22.15	21.51	1.0	23.0
		8	4	21.73	22.07	21.63	1.0	23.0
		8	7	21.84	22.06	21.61	1.0	23.0
	16QAM	15	0	21.72	22.08	21.62	1.0	23.0
		1	0	21.75	22.03	21.72	1.0	23.0
		1	8	21.67	21.94	21.44	1.0	23.0
		1	14	22.03	22.08	20.90	1.0	23.0
		8	0	20.79	20.95	20.59	2.0	22.0
		8	4	20.80	21.15	20.43	2.0	22.0
	64QAM	8	7	20.78	21.07	20.70	2.0	22.0
		15	0	20.73	20.96	20.59	2.0	22.0
		1	0	20.88	20.91	20.37	2.0	22.0
		1	8	20.68	21.21	20.58	2.0	22.0
		1	14	20.79	20.89	20.68	2.0	22.0
		8	0	19.69	20.05	19.50	3.0	21.0
	256QAM	8	4	19.76	19.97	19.51	3.0	21.0
		8	7	19.80	20.13	19.60	3.0	21.0
		15	0	19.65	19.98	19.42	3.0	21.0
		1	0	17.95	17.92	18.06	5.0	19.0
		1	8	17.78	17.77	17.18	5.0	19.0
		1	14	17.79	18.20	17.37	5.0	19.0
1.4 MHz	QPSK	8	0	17.65	17.97	17.63	5.0	19.0
		8	4	17.62	17.87	17.27	5.0	19.0
		8	7	17.66	18.08	17.49	5.0	19.0
		15	0	17.75	17.91	17.37	5.0	19.0
	16QAM	1	0	22.72	23.00	22.61	0.0	24.0
		1	3	22.70	23.13	22.39	0.0	24.0
		1	5	22.60	23.07	22.53	0.0	24.0
		3	0	22.77	23.01	22.60	0.0	24.0
		3	1	22.75	22.98	22.51	0.0	24.0
		3	3	22.60	23.02	22.45	0.0	24.0
	64QAM	6	0	21.78	22.04	21.59	1.0	23.0
		1	0	21.82	22.05	21.28	1.0	23.0
		1	3	21.59	21.84	21.45	1.0	23.0
		1	5	22.03	22.52	21.95	1.0	23.0
		3	0	21.67	21.95	21.61	1.0	23.0
		3	1	21.86	22.23	21.57	1.0	23.0
	256QAM	3	3	21.72	22.11	21.51	1.0	23.0
		6	0	20.77	21.24	20.51	2.0	22.0
		1	0	20.59	21.23	20.98	2.0	22.0
		1	3	20.39	21.36	20.68	2.0	22.0
		1	5	21.07	21.33	20.83	2.0	22.0
		3	0	20.76	21.12	20.76	2.0	22.0
		3	1	20.78	21.00	20.57	2.0	22.0
		3	3	20.65	21.25	20.68	2.0	22.0
		6	0	19.52	19.98	19.55	3.0	21.0
		1	0	17.99	18.13	17.71	5.0	19.0
		1	3	17.28	18.01	17.77	5.0	19.0
		1	5	17.80	18.44	17.98	5.0	19.0
		3	0	17.47	18.04	17.70	5.0	19.0
		3	1	17.84	18.10	17.49	5.0	19.0
		3	3	17.89	18.26	17.47	5.0	19.0
		6	0	17.51	18.08	17.48	5.0	19.0

LTE Band 25 (ANT A)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				26140	26365	26590		
				1860.00 MHz	1882.50 MHz	1905.00 MHz		
20 MHz	QPSK	1	0	23.19	24.11	23.83	0.0	25.0
		1	49	23.84	24.07	23.75	0.0	25.0
		1	99	23.78	24.21	22.92	0.0	25.0
		50	0	22.97	23.24	23.04	1.0	24.0
		50	24	22.96	23.24	23.00	1.0	24.0
		50	50	22.97	23.28	22.97	1.0	24.0
	16QAM	100	0	22.88	23.16	22.94	1.0	24.0
		1	0	22.63	23.25	23.05	1.0	24.0
		1	49	22.87	23.50	22.27	1.0	24.0
		1	99	23.30	23.26	22.41	1.0	24.0
		50	0	22.04	22.29	21.93	2.0	23.0
		50	24	21.95	22.22	22.06	2.0	23.0
	64QAM	50	50	21.99	22.22	21.93	2.0	23.0
		100	0	21.97	22.15	21.98	2.0	23.0
		1	0	21.92	22.51	21.98	2.0	23.0
		1	49	22.01	22.16	22.42	2.0	23.0
		1	99	22.03	22.43	21.33	2.0	23.0
		50	0	20.91	21.27	21.02	3.0	22.0
	256QAM	50	24	20.86	21.18	20.91	3.0	22.0
		50	50	20.90	21.22	20.92	3.0	22.0
		100	0	20.91	21.15	21.00	3.0	22.0
		1	0	19.15	19.05	18.90	5.0	20.0
		1	49	19.08	19.39	19.36	5.0	20.0
		1	99	18.84	19.32	19.17	5.0	20.0
15 MHz	QPSK	50	0	18.96	19.28	18.83	5.0	20.0
		50	24	18.82	19.20	18.92	5.0	20.0
		50	50	18.98	19.16	18.92	5.0	20.0
		100	0	18.87	19.21	18.95	5.0	20.0
	16QAM	1	0	22.85	23.91	24.01	0.0	25.0
		1	37	23.69	24.12	24.00	0.0	25.0
		1	74	23.35	23.83	22.71	0.0	25.0
		36	0	22.70	23.14	22.99	1.0	24.0
		36	20	23.00	23.27	22.98	1.0	24.0
		36	39	22.93	23.22	22.96	1.0	24.0
	64QAM	75	0	22.81	23.22	23.01	1.0	24.0
		1	0	22.27	22.87	22.88	1.0	24.0
		1	37	22.80	23.44	23.22	1.0	24.0
		1	74	23.23	23.27	22.69	1.0	24.0
		36	0	21.92	22.20	21.97	2.0	23.0
		36	20	21.88	22.22	22.03	2.0	23.0
	256QAM	36	39	21.96	22.26	22.01	2.0	23.0
		75	0	21.99	22.14	21.95	2.0	23.0
		1	0	21.70	22.16	22.22	2.0	23.0
		1	37	22.08	22.44	22.16	2.0	23.0
		1	74	21.84	22.44	21.43	2.0	23.0
		36	0	20.97	21.21	20.90	3.0	22.0
	16QAM	36	20	20.90	21.24	21.00	3.0	22.0
		36	39	20.93	21.16	21.00	3.0	22.0
		75	0	20.88	21.17	20.92	3.0	22.0
	256QAM	1	0	19.44	19.25	18.94	5.0	20.0
		1	37	19.12	19.00	19.09	5.0	20.0
		1	74	18.78	19.53	19.54	5.0	20.0
	64QAM	36	0	18.98	19.24	19.04	5.0	20.0
		36	20	19.01	19.28	18.92	5.0	20.0
		36	39	18.93	19.24	18.99	5.0	20.0
		75	0	19.02	19.16	18.93	5.0	20.0
	256QAM	1	0	19.44	19.25	18.94	5.0	20.0
		1	37	19.12	19.00	19.09	5.0	20.0
		1	74	18.78	19.53	19.54	5.0	20.0
		36	0	18.98	19.24	19.04	5.0	20.0
		36	20	19.01	19.28	18.92	5.0	20.0
		36	39	18.93	19.24	18.99	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	23.08	24.16	23.97	0.0	25.0
		1	25	23.46	24.16	23.81	0.0	25.0
		1	49	23.51	24.32	23.15	0.0	25.0
		25	0	22.59	23.16	23.00	1.0	24.0
		25	12	22.78	23.27	22.97	1.0	24.0
		25	25	22.86	23.26	22.88	1.0	24.0
	16QAM	50	0	22.72	23.35	23.03	1.0	24.0
		1	0	22.15	23.21	22.81	1.0	24.0
		1	25	22.83	23.31	23.06	1.0	24.0
		1	49	23.13	23.28	22.74	1.0	24.0
		25	0	21.79	22.25	22.08	2.0	23.0
		25	12	21.90	22.27	22.03	2.0	23.0
	64QAM	25	25	21.87	22.27	22.03	2.0	23.0
		50	0	21.92	22.31	22.06	2.0	23.0
		1	0	21.59	22.00	22.23	2.0	23.0
		1	25	21.69	22.16	22.17	2.0	23.0
		1	49	21.77	21.94	21.82	2.0	23.0
		25	0	20.94	21.21	21.09	3.0	22.0
	256QAM	25	12	20.87	21.11	20.99	3.0	22.0
		25	25	20.92	21.23	21.04	3.0	22.0
		50	0	20.90	21.23	21.11	3.0	22.0
		1	0	18.91	19.44	19.05	5.0	20.0
		1	25	19.21	19.35	19.05	5.0	20.0
		1	49	18.82	19.58	19.27	5.0	20.0
5 MHz	QPSK	25	0	18.89	19.28	19.07	5.0	20.0
		25	12	18.91	19.21	19.11	5.0	20.0
		25	25	18.93	19.18	19.00	5.0	20.0
		50	0	18.94	19.19	19.01	5.0	20.0
	16QAM	1	0	23.11	24.11	23.86	0.0	25.0
		1	12	23.28	24.20	23.60	0.0	25.0
		1	24	23.36	24.04	23.22	0.0	25.0
		12	0	22.48	23.19	23.00	1.0	24.0
		12	7	22.58	23.25	22.90	1.0	24.0
		12	13	22.65	23.14	22.71	1.0	24.0
	64QAM	25	0	22.58	23.24	22.90	1.0	24.0
		1	0	22.95	23.11	22.75	1.0	24.0
		1	12	22.72	23.10	22.92	1.0	24.0
		1	24	22.85	23.07	22.12	1.0	24.0
		12	0	21.67	22.15	21.91	2.0	23.0
		12	7	21.76	22.26	21.95	2.0	23.0
	256QAM	12	13	21.72	22.28	21.97	2.0	23.0
		25	0	21.77	22.22	22.07	2.0	23.0
		1	0	21.24	22.39	22.07	2.0	23.0
		1	12	21.75	22.63	21.54	2.0	23.0
		1	24	21.51	22.44	21.72	2.0	23.0
		12	0	20.77	21.22	20.84	3.0	22.0
	QPSK	12	7	20.87	21.34	20.85	3.0	22.0
		12	13	20.76	21.16	20.94	3.0	22.0
		25	0	20.81	21.16	20.99	3.0	22.0
		1	0	18.68	19.53	18.97	5.0	20.0
		1	12	19.16	19.68	19.14	5.0	20.0
		1	24	18.83	19.40	19.12	5.0	20.0
	16QAM	12	0	18.79	19.37	18.89	5.0	20.0
		12	7	18.82	19.20	18.91	5.0	20.0
		12	13	18.88	19.28	18.96	5.0	20.0
		25	0	18.93	19.18	18.89	5.0	20.0
	64QAM	1	0	23.11	24.11	23.86	0.0	25.0
		1	12	23.28	24.20	23.60	0.0	25.0
	256QAM	1	0	23.36	24.04	23.22	0.0	25.0
		12	0	22.48	23.19	23.00	1.0	24.0

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	23.10	24.12	23.87	0.0	25.0
		1	8	23.19	24.14	23.70	0.0	25.0
		1	14	23.21	24.16	23.49	0.0	25.0
		8	0	22.48	23.24	22.98	1.0	24.0
		8	4	22.51	23.22	22.94	1.0	24.0
		8	7	22.54	23.20	22.93	1.0	24.0
	16QAM	15	0	22.49	23.20	22.93	1.0	24.0
		1	0	22.43	23.38	22.89	1.0	24.0
		1	8	22.33	23.12	23.15	1.0	24.0
		1	14	22.63	23.04	23.09	1.0	24.0
		8	0	21.64	22.15	21.96	2.0	23.0
		8	4	21.83	22.16	21.97	2.0	23.0
	64QAM	8	7	21.77	22.17	21.93	2.0	23.0
		15	0	21.69	22.14	21.96	2.0	23.0
		1	0	21.36	22.27	21.59	2.0	23.0
		1	8	21.23	22.22	21.97	2.0	23.0
		1	14	21.80	22.17	21.76	2.0	23.0
		8	0	20.88	21.19	21.07	3.0	22.0
	256QAM	8	4	20.94	21.40	20.91	3.0	22.0
		8	7	20.80	21.22	21.02	3.0	22.0
		15	0	20.76	21.14	21.00	3.0	22.0
		1	0	18.76	19.11	18.75	5.0	20.0
		1	8	18.74	19.15	18.94	5.0	20.0
		1	14	18.77	19.57	19.11	5.0	20.0
1.4 MHz	QPSK	8	0	18.90	19.11	19.06	5.0	20.0
		8	4	18.73	19.20	19.09	5.0	20.0
		8	7	18.69	19.22	19.09	5.0	20.0
		15	0	18.75	19.28	19.01	5.0	20.0
	16QAM	1	0	23.14	23.86	24.11	0.0	25.0
		1	3	23.14	23.60	24.20	0.0	25.0
		1	5	23.10	23.22	24.04	0.0	25.0
		3	0	23.09	23.00	23.19	0.0	25.0
		3	1	23.12	22.90	23.25	0.0	25.0
		3	3	23.11	24.11	23.48	0.0	25.0
	64QAM	6	0	22.47	23.12	22.85	1.0	24.0
		1	0	22.40	23.18	22.29	1.0	24.0
		1	3	22.69	23.03	22.66	1.0	24.0
		1	5	22.43	23.12	22.59	1.0	24.0
		3	0	22.44	23.26	22.87	1.0	24.0
		3	1	22.39	23.03	22.93	1.0	24.0
	256QAM	3	3	22.29	23.03	22.65	1.0	24.0
		6	0	21.83	22.34	21.94	2.0	23.0
		1	0	22.25	22.18	21.94	2.0	23.0
		1	3	22.02	21.83	21.95	2.0	23.0
		1	5	21.60	22.11	22.25	2.0	23.0
		3	0	21.81	22.00	22.13	2.0	23.0
	QPSK	3	1	21.71	22.17	21.92	2.0	23.0
		3	3	21.69	22.35	21.99	2.0	23.0
		6	0	20.89	21.03	21.18	3.0	22.0
	16QAM	1	0	18.62	19.48	19.23	5.0	20.0
		1	3	18.85	18.96	18.94	5.0	20.0
		1	5	18.96	19.45	19.29	5.0	20.0
	64QAM	3	0	18.65	19.27	19.00	5.0	20.0
		3	1	18.80	18.99	18.83	5.0	20.0
		3	3	18.67	19.19	18.92	5.0	20.0
		6	0	18.85	19.40	18.77	5.0	20.0
	256QAM	1	0	18.62	19.48	19.23	5.0	20.0
		1	3	18.85	18.96	18.94	5.0	20.0
		1	5	18.96	19.45	19.29	5.0	20.0
		3	0	18.65	19.27	19.00	5.0	20.0
		3	1	18.80	18.99	18.83	5.0	20.0
		3	3	18.67	19.19	18.92	5.0	20.0

NR Band n2 (ANT B)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					374000	376000	378000		
					1870.00 MHz	1880.00 MHz	1890.00 MHz		
40 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	22.87	22.82	22.97	0.5	24.5
			1	1	23.45	23.69	23.69	0.0	25.0
			1	107	23.75	23.87	23.67	0.0	25.0
			1	214	23.62	23.42	23.23	0.0	25.0
			1	215	22.48	22.69	22.45	0.5	24.5
			108	0	22.68	22.80	22.86	0.5	24.5
			108	54	23.76	23.85	23.74	0.0	25.0
			108	108	22.81	22.72	22.40	0.5	24.5
		QPSK	216	0	22.80	22.87	22.69	0.5	24.5
			1	0	22.10	22.39	22.47	1.0	24.0
			1	1	23.49	23.69	23.69	0.0	25.0
			1	107	23.77	23.85	23.71	0.0	25.0
			1	214	23.66	23.42	23.22	0.0	25.0
			1	215	22.19	21.85	21.94	1.0	24.0
			108	0	22.68	22.81	22.85	1.0	24.0
			108	54	23.80	23.86	23.73	0.0	25.0
			108	108	22.83	22.72	22.42	1.0	24.0
		16QAM	216	0	22.81	22.88	22.69	1.0	24.0
			1	0	22.32	22.16	21.51	2.0	23.0
			1	1	22.54	22.89	22.70	1.0	24.0
			1	107	22.80	22.94	22.70	1.0	24.0
			1	214	22.71	22.37	22.20	1.0	24.0
			1	215	22.32	22.42	21.98	2.0	23.0
			108	0	21.84	22.22	21.60	2.0	23.0
			108	54	21.76	22.03	22.38	1.0	24.0
			108	108	22.13	22.30	21.17	2.0	23.0
		64QAM	216	0	22.23	21.78	21.37	2.0	23.0
			1	1	20.92	21.03	21.29	2.5	22.5
		256QAM	1	1	18.78	19.20	19.28	4.5	20.5
	CP-OFDM	QPSK	1	0	19.94	20.16	20.32	3.0	22.0
			1	1	21.97	22.18	22.19	1.5	23.5
			1	107	21.74	21.92	21.68	1.5	23.5
			1	214	21.66	21.38	21.20	1.5	23.5
			1	215	20.14	19.90	19.71	3.0	22.0
			108	0	20.19	20.21	20.42	3.0	22.0
			108	54	21.88	21.94	21.71	1.5	23.5
			108	108	20.44	20.14	20.01	3.0	22.0
			216	0	20.36	20.40	20.14	3.0	22.0
		16QAM	1	0	19.95	20.11	20.14	3.0	22.0
			1	1	21.04	21.09	21.03	2.0	23.0
			1	107	21.22	21.44	21.05	2.0	23.0
			1	214	21.06	20.97	20.73	2.0	23.0
			1	215	20.00	19.78	19.81	3.0	22.0
			108	0	20.07	20.23	20.40	3.0	22.0
			108	54	21.23	21.45	21.19	2.0	23.0
			108	108	20.34	20.16	19.99	3.0	22.0
			216	0	20.24	20.37	20.14	3.0	22.0
		64QAM	1	1	19.46	19.82	19.66	3.5	21.5
		256QAM	1	1	16.46	16.77	16.64	6.5	18.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					373000	376000	379000		
					1865.00 MHz	1880.00 MHz	1895.00 MHz		
30 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	22.85	23.04	23.13	0.5	24.5
			1	1	23.36	23.62	23.79	0.0	25.0
			1	79	23.66	23.82	23.51	0.0	25.0
			1	158	23.79	23.45	23.27	0.0	25.0
			1	159	23.17	22.84	22.62	0.5	24.5
			80	0	22.50	22.71	22.71	0.5	24.5
			80	40	23.64	23.84	23.51	0.0	25.0
			80	80	22.72	22.73	22.43	0.5	24.5
			160	0	22.67	22.85	22.50	0.5	24.5
		QPSK	1	0	22.37	22.53	22.63	1.0	24.0
			1	1	23.41	23.62	23.82	0.0	25.0
			1	79	23.67	23.82	23.54	0.0	25.0
			1	158	23.82	23.44	23.27	0.0	25.0
			1	159	22.64	22.32	22.13	1.0	24.0
			80	0	22.53	22.72	22.73	1.0	24.0
			80	40	23.68	23.84	23.51	0.0	25.0
			80	80	22.76	22.73	22.43	1.0	24.0
			160	0	22.68	22.84	22.48	1.0	24.0
		16QAM	1	1	22.41	22.59	22.88	1.0	24.0
			1	79	22.65	22.82	22.62	1.0	24.0
			1	158	22.83	22.45	22.33	1.0	24.0
		64QAM	1	1	20.97	21.20	21.26	2.5	22.5
		256QAM	1	1	18.89	19.11	19.23	4.5	20.5
	CP-OFDM	QPSK	1	1	21.92	22.08	22.32	1.5	23.5
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372500	376000	379500		
					1862.50 MHz	1880.00 MHz	1897.50 MHz		
25 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	22.98	23.12	23.17	0.5	24.5
			1	1	23.37	23.65	23.70	0.0	25.0
			1	66	23.49	23.78	23.37	0.0	25.0
			1	131	23.70	23.60	23.24	0.0	25.0
			1	132	23.22	22.94	22.64	0.5	24.5
			64	0	22.48	22.73	22.61	0.5	24.5
			64	34	23.61	23.84	23.46	0.0	25.0
			64	69	22.69	22.78	22.41	0.5	24.5
			128	0	22.61	22.86	22.46	0.5	24.5
		QPSK	1	0	22.45	22.62	22.61	1.0	24.0
			1	1	23.39	23.69	23.73	0.0	25.0
			1	66	23.53	23.79	23.38	0.0	25.0
			1	131	23.71	23.61	23.27	0.0	25.0
			1	132	22.74	22.48	22.17	1.0	24.0
			64	0	22.50	22.74	22.63	1.0	24.0
			64	34	23.62	23.86	23.48	0.0	25.0
			64	69	22.70	22.77	22.40	1.0	24.0
			128	0	22.61	22.86	22.47	1.0	24.0
		16QAM	1	1	22.38	22.67	22.81	1.0	24.0
			1	66	22.47	22.83	22.37	1.0	24.0
			1	131	22.63	22.60	22.29	1.0	24.0
		64QAM	1	1	20.88	21.25	21.27	2.5	22.5
		256QAM	1	1	18.88	19.13	19.15	4.5	20.5
	CP-OFDM	QPSK	1	1	21.91	22.14	22.21	1.5	23.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372000	376000	380000		
					1860.00 MHz	1880.00 MHz	1900.00 MHz		
20 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.01	23.11	22.97	0.5	24.5
			1	1	23.40	23.68	23.53	0.0	25.0
			1	52	23.56	23.84	23.40	0.0	25.0
			1	104	23.68	23.68	23.23	0.0	25.0
			1	105	22.71	23.08	22.62	0.5	24.5
			50	0	22.50	22.75	22.46	0.5	24.5
			50	28	23.56	23.84	23.41	0.0	25.0
			50	56	22.70	22.79	22.34	0.5	24.5
			100	0	22.57	22.84	22.40	0.5	24.5
		QPSK	1	0	22.56	22.61	22.51	1.0	24.0
			1	1	23.43	23.70	23.61	0.0	25.0
			1	52	23.58	23.84	23.47	0.0	25.0
			1	104	23.70	23.70	23.29	0.0	25.0
			1	105	22.19	22.53	22.17	1.0	24.0
			50	0	22.50	22.77	22.48	1.0	24.0
			50	28	23.58	23.85	23.41	0.0	25.0
			50	56	22.71	22.81	22.36	1.0	24.0
			100	0	22.59	22.84	22.40	1.0	24.0
		16QAM	1	1	22.41	22.62	22.60	1.0	24.0
			1	52	22.53	22.79	22.46	1.0	24.0
			1	104	22.63	22.55	22.29	1.0	24.0
		64QAM	1	1	20.89	21.27	21.17	2.5	22.5
		256QAM	1	1	18.92	19.13	18.99	4.5	20.5
	CP-OFDM	QPSK	1	1	21.93	22.17	22.09	1.5	23.5
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371500	376000	380500		
					1857.50 MHz	1880.00 MHz	1902.50 MHz		
15 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	22.85	23.13	22.87	0.5	24.5
			1	1	23.40	23.73	23.43	0.0	25.0
			1	39	23.45	23.75	23.30	0.0	25.0
			1	77	23.66	23.77	23.23	0.0	25.0
			1	78	22.67	23.13	22.57	0.5	24.5
			36	0	22.51	22.80	22.45	0.5	24.5
			36	21	23.56	23.84	23.38	0.0	25.0
			36	43	22.65	22.81	22.31	0.5	24.5
			75	0	22.55	22.85	22.39	0.5	24.5
		QPSK	1	0	22.38	22.62	22.37	1.0	24.0
			1	1	23.45	23.75	23.45	0.0	25.0
			1	39	23.46	23.79	23.29	0.0	25.0
			1	77	23.67	23.76	23.25	0.0	25.0
			1	78	22.19	22.61	22.13	1.0	24.0
			36	0	22.51	22.81	22.45	1.0	24.0
			36	21	23.56	23.85	23.39	0.0	25.0
			36	43	22.65	22.83	22.32	1.0	24.0
			75	0	22.57	22.86	22.40	1.0	24.0
		16QAM	1	1	22.45	22.74	22.44	1.0	24.0
			1	39	22.42	22.80	22.30	1.0	24.0
			1	77	22.63	22.78	22.25	1.0	24.0
		64QAM	1	1	21.04	21.24	20.95	2.5	22.5
		256QAM	1	1	18.87	19.20	18.92	4.5	20.5
	CP-OFDM	QPSK	1	1	21.94	22.19	22.01	1.5	23.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371000	376000	381000		
					1855.00 MHz	1880.00 MHz	1905.00 MHz		
10 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	22.81	23.11	22.72	0.5	24.5
			1	1	23.47	23.76	23.48	0.0	25.0
			1	25	23.52	23.84	23.38	0.0	25.0
			1	50	23.60	23.81	23.36	0.0	25.0
			1	51	22.94	23.08	22.51	0.5	24.5
			25	0	22.52	22.82	22.46	0.5	24.5
			25	13	23.53	23.85	23.40	0.0	25.0
			25	27	22.60	22.85	22.35	0.5	24.5
			50	0	22.55	22.86	22.42	0.5	24.5
		QPSK	1	0	22.35	22.54	22.19	1.0	24.0
			1	1	23.49	23.76	23.52	0.0	25.0
			1	25	23.56	23.84	23.41	0.0	25.0
			1	50	23.64	23.83	23.36	0.0	25.0
			1	51	22.49	22.56	22.03	1.0	24.0
			25	0	22.53	22.84	22.48	1.0	24.0
			25	13	23.55	23.86	23.42	0.0	25.0
			25	27	22.61	22.85	22.37	1.0	24.0
			50	0	22.57	22.86	22.43	1.0	24.0
		16QAM	1	1	22.45	22.81	22.62	1.0	24.0
			1	25	22.55	22.87	22.47	1.0	24.0
			1	50	22.61	22.85	22.42	1.0	24.0
		64QAM	1	1	21.07	21.39	21.08	2.5	22.5
		256QAM	1	1	19.01	19.30	18.84	4.5	20.5
	CP-OFDM	QPSK	1	1	22.00	22.27	22.01	1.5	23.5
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					370500	376000	381500		
					1852.50 MHz	1880.00 MHz	1907.50 MHz		
5 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	1	22.87	23.17	22.75	0.5	24.5
			1	12	23.31	23.86	23.37	0.0	25.0
			1	23	23.30	23.82	23.22	0.0	25.0
			12	0	23.43	23.88	23.29	0.0	25.0
			12	6	22.95	23.12	22.62	0.5	24.5
			12	13	22.40	22.85	22.35	0.5	24.5
			25	0	23.42	23.85	23.30	0.0	25.0
			1	1	22.45	22.85	22.30	0.5	24.5
		QPSK	1	12	22.43	22.85	22.33	0.5	24.5
			1	23	22.41	22.65	22.17	1.0	24.0
			12	0	23.40	23.87	23.35	0.0	25.0
			12	6	23.36	23.82	23.23	0.0	25.0
			12	13	23.46	23.90	23.31	0.0	25.0
			25	0	22.41	22.61	22.10	1.0	24.0
			1	1	22.45	22.84	22.34	1.0	24.0
			1	12	23.45	23.84	23.30	0.0	25.0
			1	23	22.48	22.87	22.29	1.0	24.0
		16QAM	25	0	22.47	22.86	22.33	1.0	24.0
			1	1	22.35	22.90	22.48	1.0	24.0
			1	13	22.32	22.81	22.30	1.0	24.0
		64QAM	1	23	22.39	22.90	22.40	1.0	24.0
			1	1	21.03	21.36	20.87	2.5	22.5
		256QAM	1	1	18.93	19.30	18.70	4.5	20.5
	CP-OFDM	QPSK	1	1	21.91	22.31	21.87	1.5	23.5

NR Band n25 (ANT A)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					374000 1870.00 MHz	376500 1882.50 MHz	379000 1895.00 MHz		
40 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.13	23.27	23.58	0.5	25.0
			1	1	24.08	24.07	24.46	0.0	25.5
			1	107	24.35	24.41	24.25	0.0	25.5
			1	214	24.25	24.08	23.17	0.0	25.5
			1	215	23.39	23.18	22.65	0.5	25.0
			108	0	23.08	23.43	23.39	0.5	25.0
			108	54	24.32	24.43	24.33	0.0	25.5
			108	108	23.52	23.26	23.17	0.5	25.0
		QPSK	216	0	23.32	23.42	23.31	0.5	25.0
			1	0	22.67	22.83	23.07	1.0	24.5
			1	1	24.07	24.43	24.42	0.0	25.5
			1	107	24.40	24.49	24.30	0.0	25.5
			1	214	24.29	24.08	23.12	0.0	25.5
			1	215	22.98	22.70	22.06	1.0	24.5
			108	0	23.08	23.45	23.40	1.0	24.5
			108	54	24.32	24.45	24.33	0.0	25.5
			108	108	23.53	23.29	23.18	1.0	24.5
			216	0	23.33	23.43	23.33	1.0	24.5
		16QAM	1	0	21.86	21.90	22.13	2.0	23.5
			1	1	23.03	23.05	23.51	1.0	24.5
			1	107	23.33	23.42	23.32	1.0	24.5
			1	214	23.25	23.28	22.47	1.0	24.5
			1	215	21.93	21.48	21.32	2.0	23.5
			108	0	21.93	22.19	21.99	2.0	23.5
			108	54	23.17	23.18	23.03	1.0	24.5
			108	108	22.22	22.08	21.82	2.0	23.5
			216	0	22.10	22.18	22.01	2.0	23.5
		64QAM	1	1	21.59	21.58	22.04	2.5	23.0
		256QAM	1	1	19.53	19.49	19.96	4.5	21.0
	CP-OFDM	QPSK	1	0	20.66	20.83	21.09	3.0	22.5
			1	1	22.53	22.53	22.99	1.5	24.0
			1	107	22.55	22.69	22.41	1.5	24.0
			1	214	22.54	22.26	21.54	1.5	24.0
			1	215	21.00	20.70	20.39	3.0	22.5
			108	0	20.91	21.19	21.01	3.0	22.5
			108	54	22.65	22.71	22.49	1.5	24.0
			108	108	21.21	21.07	20.80	3.0	22.5
			216	0	21.14	21.19	20.95	3.0	22.5
		16QAM	1	0	20.65	20.90	21.06	3.0	22.5
			1	1	21.77	22.12	22.12	2.0	23.5
			1	107	22.06	22.28	21.93	2.0	23.5
			1	214	22.24	21.77	21.20	2.0	23.5
			1	215	21.30	20.57	20.39	3.0	22.5
			108	0	20.90	21.24	20.99	3.0	22.5
			108	54	22.13	22.20	21.99	2.0	23.5
			108	108	21.19	21.05	20.77	3.0	22.5
			216	0	21.18	21.15	20.96	3.0	22.5
		64QAM	1	1	20.45	20.52	20.61	3.5	22.0
		256QAM	1	1	17.29	17.31	17.70	6.5	19.0

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	$\pi/2$ BPSK	1	0	23.15	23.30	23.16	0.5	25.0
			1	1	23.64	23.92	23.87	0.0	25.5
			1	79	23.89	24.09	23.97	0.0	25.5
			1	158	24.17	24.05	23.48	0.0	25.5
			1	159	23.58	23.29	23.12	0.5	25.0
			80	0	22.80	23.18	23.16	0.5	25.0
			80	40	23.91	24.14	24.00	0.0	25.5
			80	80	23.12	23.14	23.02	0.5	25.0
			160	0	22.90	23.14	23.00	0.5	25.0
		QPSK	1	0	22.72	22.78	22.58	1.0	24.5
			1	1	23.72	23.92	23.90	0.0	25.5
			1	79	23.96	24.08	23.99	0.0	25.5
			1	158	24.22	24.09	23.41	0.0	25.5
			1	159	23.08	22.81	22.65	1.0	24.5
			80	0	22.82	23.19	23.16	1.0	24.5
			80	40	23.94	24.16	24.02	0.0	25.5
			80	80	23.16	23.16	23.04	1.0	24.5
			160	0	22.94	23.15	23.02	1.0	24.5
		16QAM	1	1	22.73	22.98	22.93	1.0	24.5
			1	79	22.94	23.22	23.07	1.0	24.5
			1	158	23.15	23.13	22.77	1.0	24.5
		64QAM	1	1	21.27	21.45	21.44	2.5	23.0
		256QAM	1	1	19.19	19.32	19.29	4.5	21.0
	CP-OFDM	QPSK	1	1	22.21	22.46	22.45	1.5	24.0
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	$\pi/2$ BPSK	1	0	23.24	23.43	23.32	0.5	25.0
			1	1	23.69	24.08	24.12	0.0	25.5
			1	66	23.76	24.07	23.87	0.0	25.5
			1	131	24.13	24.15	23.67	0.0	25.5
			1	132	23.57	23.48	23.21	0.5	25.0
			64	0	22.79	23.22	23.12	0.5	25.0
			64	34	23.85	24.17	23.94	0.0	25.5
			64	69	23.02	23.15	23.04	0.5	25.0
		QPSK	128	0	22.86	23.20	22.94	0.5	25.0
			1	0	22.72	22.95	22.84	1.0	24.5
			1	1	23.70	24.07	24.12	0.0	25.5
			1	66	23.77	24.09	23.89	0.0	25.5
			1	131	24.15	24.16	23.63	0.0	25.5
			1	132	23.10	22.91	22.73	1.0	24.5
			64	0	22.80	23.23	23.14	1.0	24.5
			64	34	23.87	24.19	23.95	0.0	25.5
			64	69	23.03	23.16	23.04	1.0	24.5
			128	0	22.87	23.21	22.95	1.0	24.5
		16QAM	1	1	22.60	23.10	23.15	1.0	24.5
			1	66	22.78	23.09	22.91	1.0	24.5
			1	131	23.17	23.19	22.80	1.0	24.5
		64QAM	1	1	21.12	21.52	21.68	2.5	23.0
		256QAM	1	1	19.28	19.68	19.50	4.5	21.0
	CP-OFDM	QPSK	1	1	22.21	22.59	22.64	1.5	24.0

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	$\pi/2$ BPSK	1	0	23.17	23.37	23.18	0.5	25.0
			1	1	23.64	24.14	24.17	0.0	25.5
			1	52	23.83	24.18	23.99	0.0	25.5
			1	104	23.84	24.18	23.29	0.0	25.5
			1	105	23.48	23.40	22.89	0.5	25.0
			50	0	22.81	23.22	23.08	0.5	25.0
			50	28	23.86	24.18	24.05	0.0	25.5
			50	56	22.95	23.15	23.14	0.5	25.0
			100	0	22.87	23.21	23.04	0.5	25.0
		QPSK	1	0	22.69	22.97	22.77	1.0	24.5
			1	1	23.57	24.15	24.21	0.0	25.5
			1	52	23.83	24.18	24.05	0.0	25.5
			1	104	23.81	24.19	23.23	0.0	25.5
			1	105	23.05	22.94	22.48	1.0	24.5
			50	0	22.82	23.23	23.08	1.0	24.5
			50	28	23.86	24.18	24.07	0.0	25.5
			50	56	22.95	23.15	23.13	1.0	24.5
			100	0	22.88	23.21	23.05	1.0	24.5
		16QAM	1	1	22.74	23.22	23.18	1.0	24.5
			1	52	22.90	23.24	23.07	1.0	24.5
			1	104	23.11	23.25	22.55	1.0	24.5
		64QAM	1	1	21.27	21.72	21.81	2.5	23.0
		256QAM	1	1	19.33	19.65	19.54	4.5	21.0
	CP-OFDM	QPSK	1	1	22.26	22.70	22.72	1.5	24.0
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	$\pi/2$ BPSK	1	0	23.21	23.63	23.15	0.5	25.0
			1	1	23.30	24.05	23.99	0.0	25.5
			1	39	23.81	24.10	23.95	0.0	25.5
			1	77	23.48	24.10	23.17	0.0	25.5
			1	78	23.42	23.37	22.63	0.5	25.0
			36	0	22.82	23.21	23.01	0.5	25.0
			36	21	23.87	24.18	24.06	0.0	25.5
			36	43	22.91	23.16	23.10	0.5	25.0
		QPSK	75	0	22.88	23.20	23.09	0.5	25.0
			1	0	22.68	23.05	22.66	1.0	24.5
			1	1	23.24	23.99	24.02	0.0	25.5
			1	39	23.82	24.10	23.98	0.0	25.5
			1	77	23.46	24.07	23.13	0.0	25.5
			1	78	22.87	22.88	22.11	1.0	24.5
			36	0	22.82	23.23	23.03	1.0	24.5
			36	21	23.87	24.17	24.07	0.0	25.5
			36	43	22.91	23.15	23.10	1.0	24.5
		16QAM	75	0	22.88	23.20	23.09	1.0	24.5
			1	1	22.51	23.23	23.04	1.0	24.5
			1	39	22.84	23.12	23.01	1.0	24.5
			1	77	22.71	23.21	22.47	1.0	24.5
		64QAM	1	1	21.25	21.79	21.60	2.5	23.0
		256QAM	1	1	19.36	19.77	19.54	4.5	21.0
	CP-OFDM	QPSK	1	1	22.03	22.73	22.54	1.5	24.0

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	0	23.11	23.48	23.28	0.5	25.0
			1	1	23.77	24.24	23.98	0.0	25.5
			1	25	23.82	24.20	24.04	0.0	25.5
			1	50	23.90	24.17	23.71	0.0	25.5
			1	51	23.26	23.33	23.09	0.5	25.0
			25	0	22.82	23.22	23.05	0.5	25.0
			25	13	23.83	24.18	24.09	0.0	25.5
			25	27	22.90	23.20	23.09	0.5	25.0
			50	0	22.85	23.19	23.09	0.5	25.0
		QPSK	1	0	22.67	22.97	22.70	1.0	24.5
			1	1	23.73	24.26	24.02	0.0	25.5
			1	25	23.85	24.19	24.05	0.0	25.5
			1	50	23.89	24.17	23.65	0.0	25.5
			1	51	22.83	22.87	22.55	1.0	24.5
			25	0	22.83	23.22	23.07	1.0	24.5
			25	13	23.85	24.17	24.08	0.0	25.5
			25	27	22.90	23.20	23.08	1.0	24.5
			50	0	22.86	23.20	23.09	1.0	24.5
		16QAM	1	1	22.76	23.22	23.09	1.0	24.5
			1	25	22.82	23.24	23.20	1.0	24.5
			1	50	22.93	23.15	22.77	1.0	24.5
		64QAM	1	1	21.31	21.75	21.57	2.5	23.0
		256QAM	1	1	19.44	19.80	19.37	4.5	21.0
	CP-OFDM	QPSK	1	1	22.29	22.72	22.55	1.5	24.0
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	23.35	23.44	23.07	0.5	25.0
			1	12	23.55	24.18	24.07	0.0	25.5
			1	23	23.66	24.07	23.90	0.0	25.5
			12	0	23.77	24.16	23.63	0.0	25.5
			12	6	23.38	23.43	23.20	0.5	25.0
			12	13	22.75	23.19	23.06	0.5	25.0
			25	0	23.73	24.16	23.97	0.0	25.5
			1	1	22.77	23.15	22.97	0.5	25.0
		QPSK	1	12	22.77	23.18	23.06	0.5	25.0
			1	23	22.81	22.92	22.56	1.0	24.5
			12	0	23.50	24.20	24.11	0.0	25.5
			12	6	23.63	24.08	23.85	0.0	25.5
			12	13	23.74	24.18	23.58	0.0	25.5
			25	0	22.82	22.95	22.68	1.0	24.5
			1	1	22.74	23.21	23.08	1.0	24.5
			1	12	23.71	24.16	23.92	0.0	25.5
			1	23	22.76	23.15	22.93	1.0	24.5
			25	0	22.76	23.18	23.07	1.0	24.5
		16QAM	1	1	22.76	23.17	23.05	1.0	24.5
			1	13	22.69	23.11	22.94	1.0	24.5
			1	23	22.80	23.20	22.90	1.0	24.5
		64QAM	1	1	21.29	21.76	21.62	2.5	23.0
		256QAM	1	1	19.31	19.83	19.58	4.5	21.0
	CP-OFDM	QPSK	1	1	22.26	22.73	22.63	1.5	24.0

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

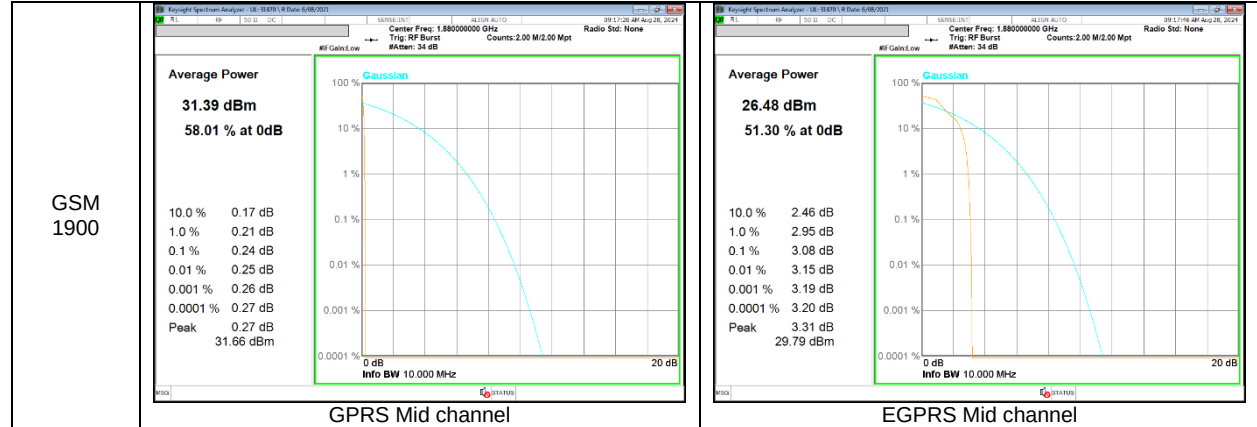
LTE: It was all modulations modulations and worst modulations(QPSK, 256QAM) is reported.
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the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

RESULTS

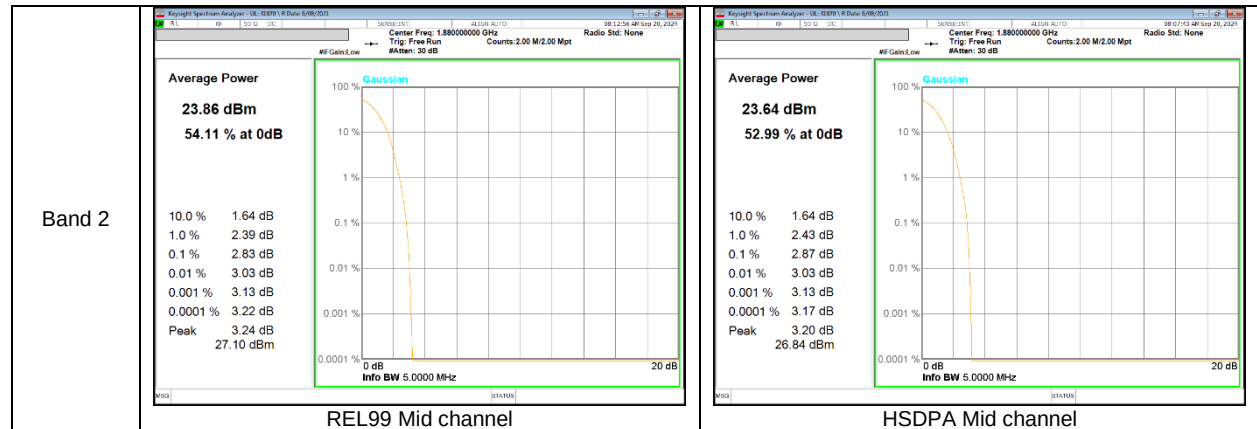
See the following pages.

8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

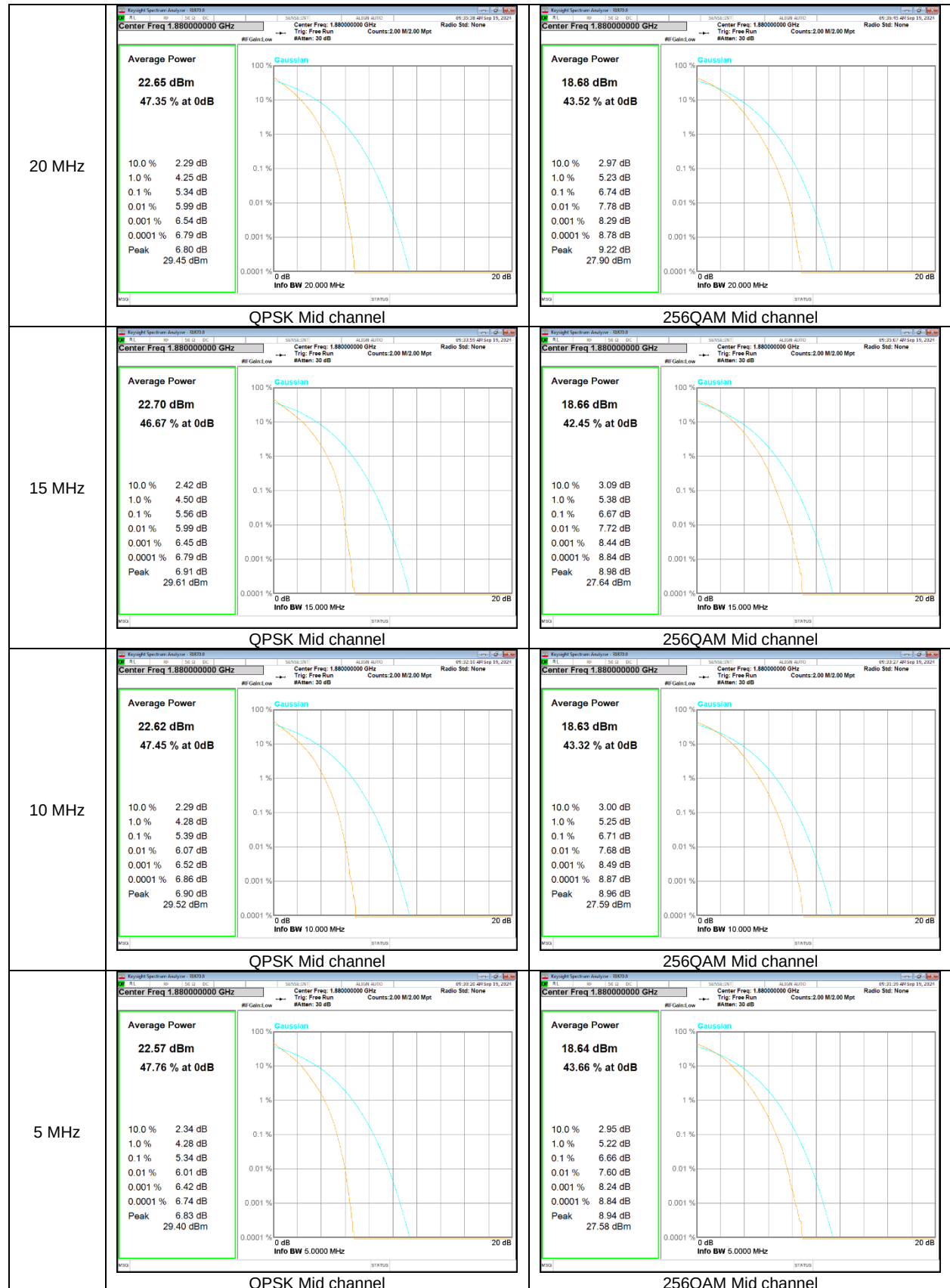
GSM

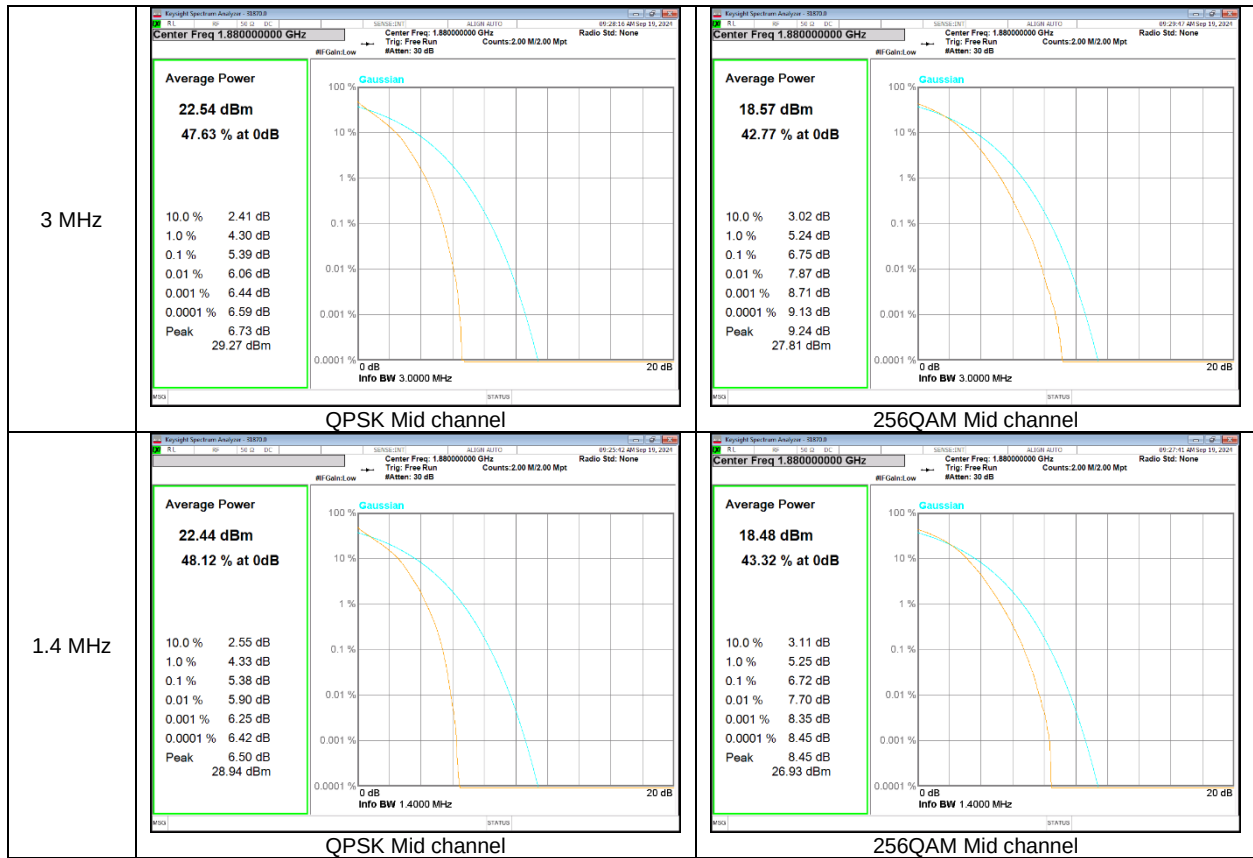


WCDMA

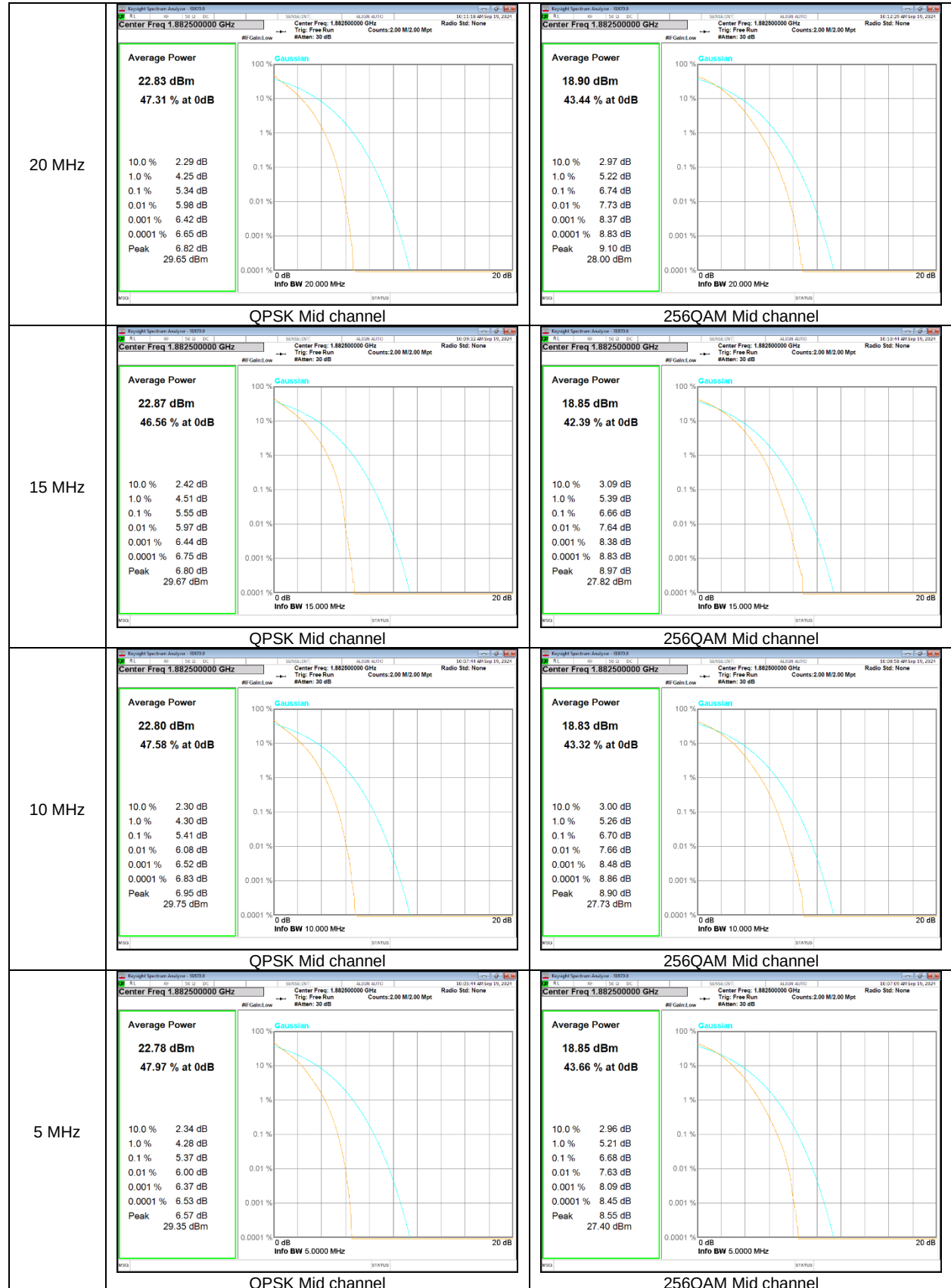


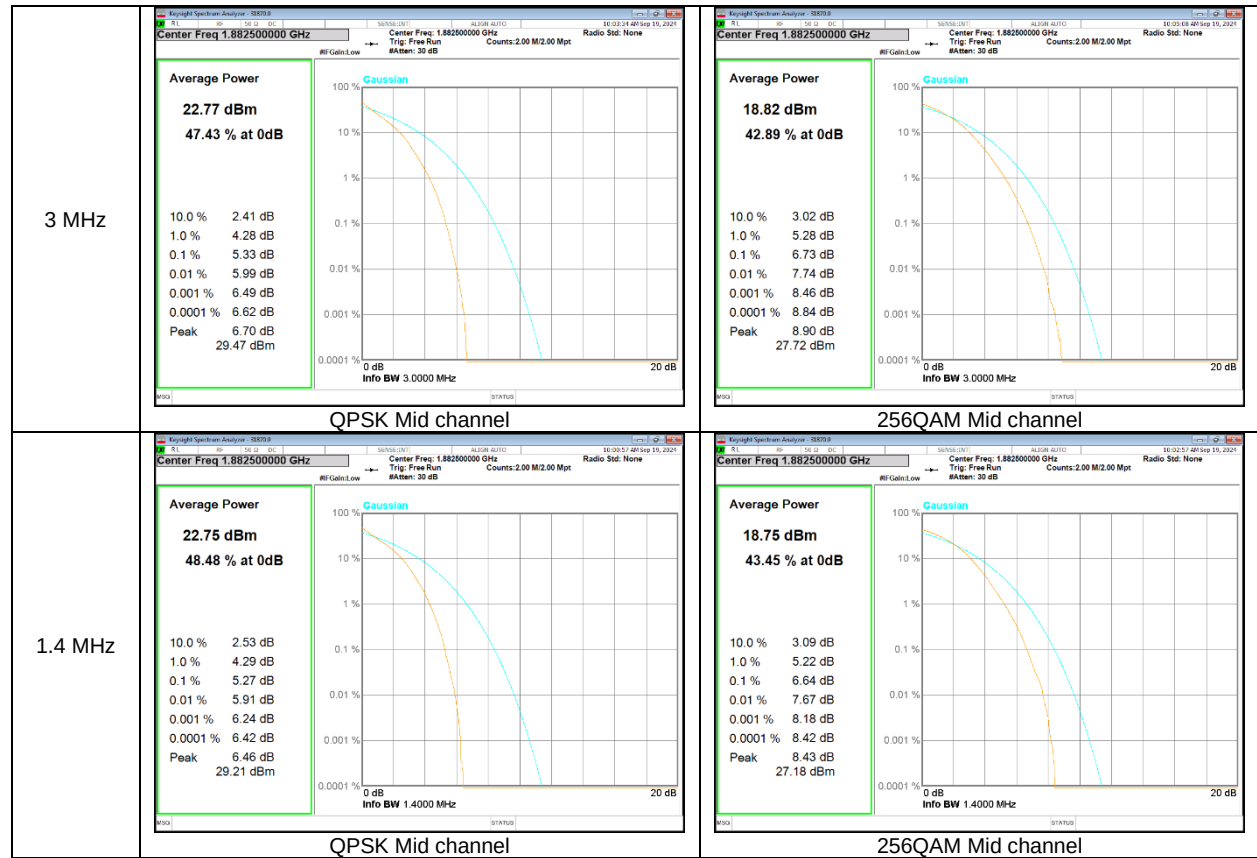
LTE Band 2 (ANT A)



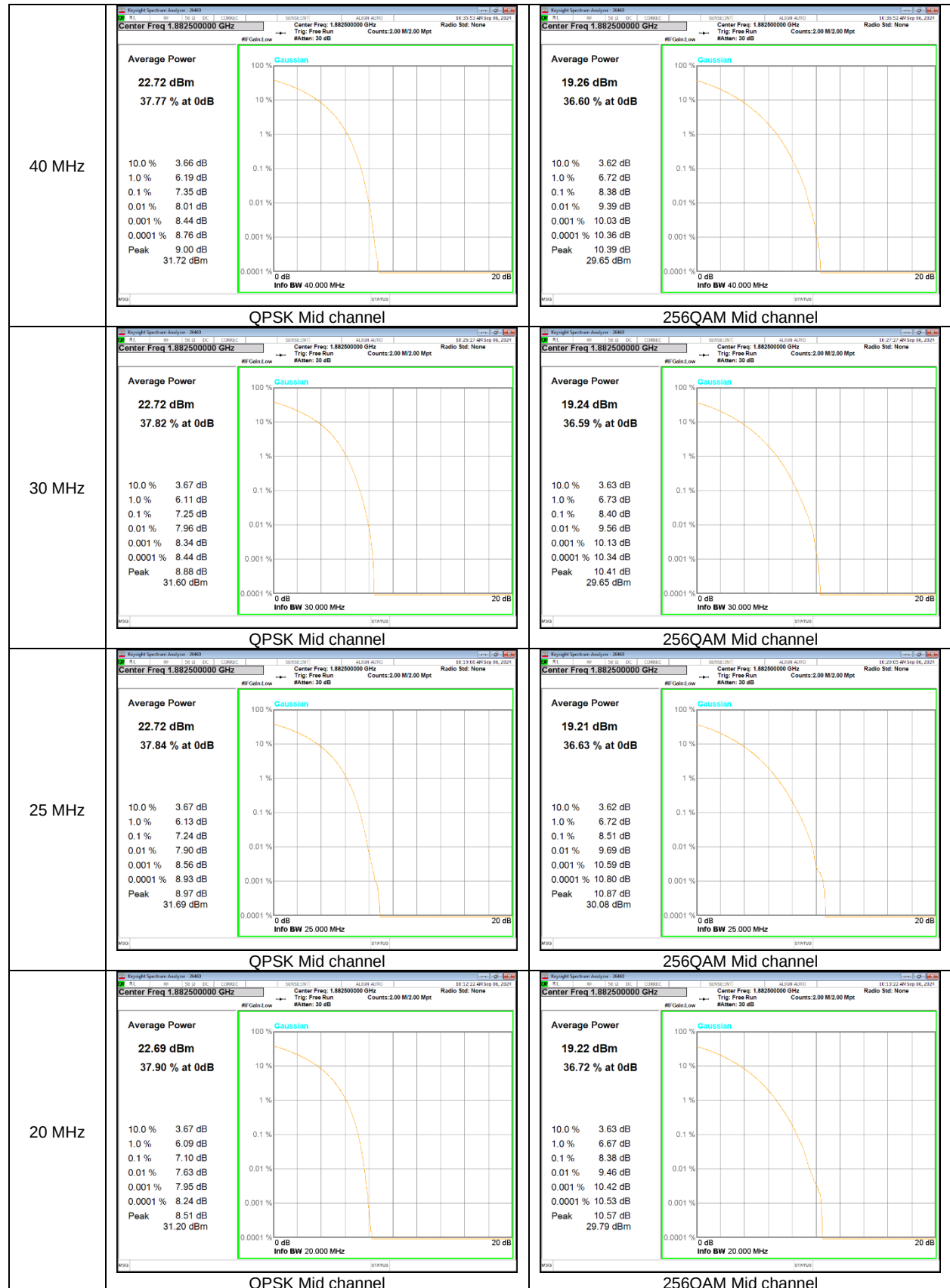


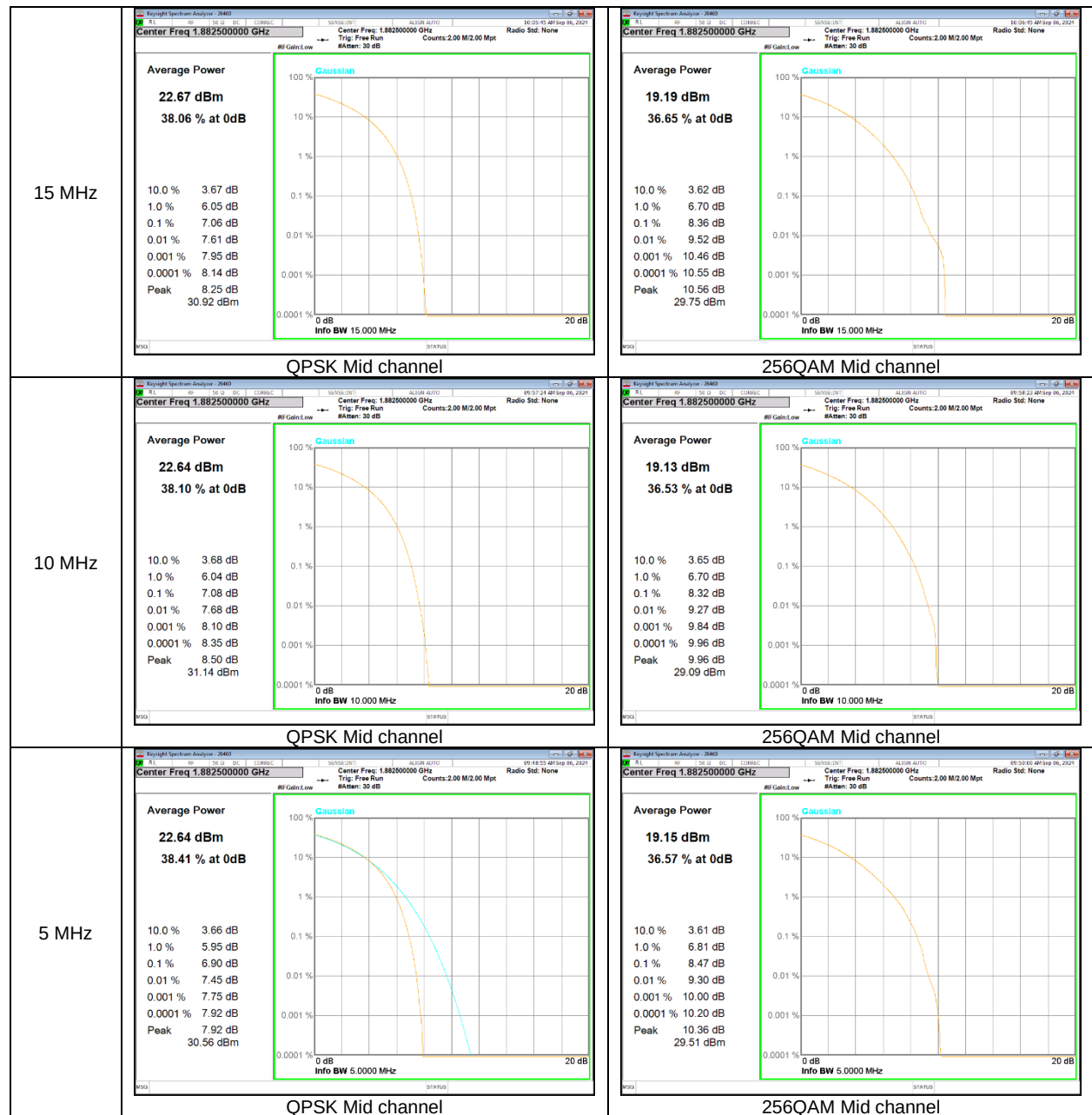
LTE Band 25 (ANT A)





NR Band n25 CP-OFDM (ANT A)





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	1880.00	246.28	318.50
	EGPRS		242.72	300.00

- WCDMA

Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.00	4.178	4.777
	HSDPA		4.175	4.737

- LTE Band 2 (ANT A)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B2	20M	QPSK	1880.00	17.924	19.970
		16QAM		17.885	19.460
	15M	QPSK		13.427	14.930
		16QAM		13.406	14.640
	10M	QPSK		8.973	10.190
		16QAM		8.969	10.120
	5M	QPSK		4.486	5.228
		16QAM		4.487	5.163
	3M	QPSK		2.701	2.970
		16QAM		2.703	3.038
	1.4M	QPSK		1.086	1.282
		16QAM		1.087	1.307

- LTE Band 25 (ANT A)

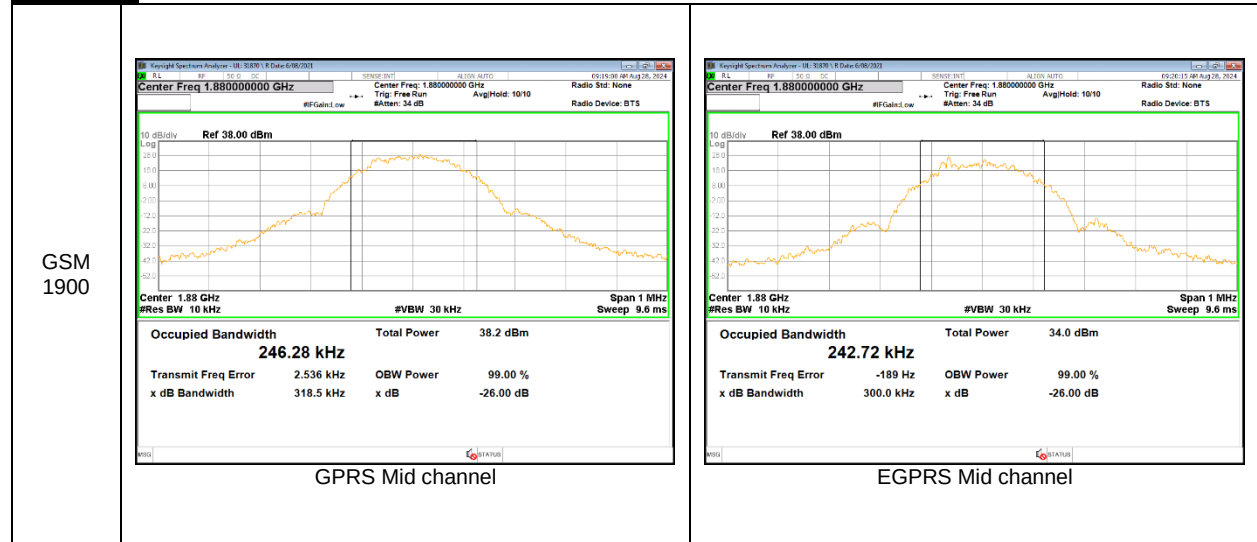
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.50	17.884	19.580
		16QAM		17.856	19.340
	15M	QPSK		13.482	14.590
		16QAM		13.410	14.870
	10M	QPSK		8.989	10.050
		16QAM		8.973	9.999
	5M	QPSK		4.500	5.255
		16QAM		4.491	5.183
	3M	QPSK		2.691	3.066
		16QAM		2.697	3.028
	1.4M	QPSK		1.084	1.308
		16QAM		1.089	1.294

- NR Band n25 (ANT A)

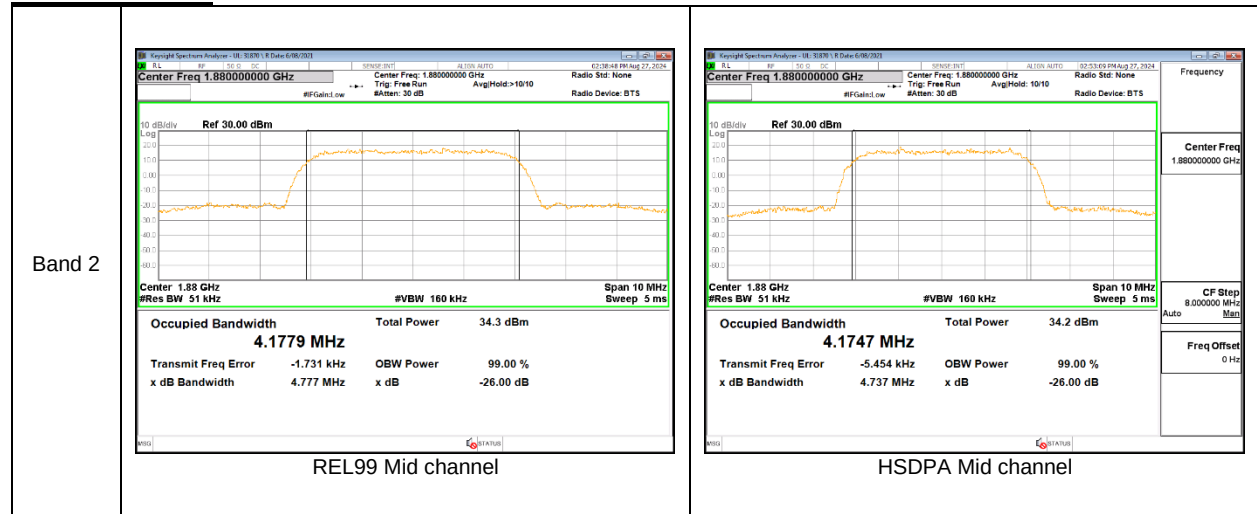
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	40M	QPSK	1882.50	38.574	42.560
		16QAM		38.655	41.060
	30M	QPSK		28.670	30.910
		16QAM		28.685	31.010
	25M	QPSK		23.812	25.480
		16QAM		23.842	25.880
	20M	QPSK		19.034	20.390
		16QAM		18.960	20.600
	15M	QPSK		14.084	15.090
		16QAM		14.125	15.050
	10M	QPSK		9.307	10.210
		16QAM		9.316	10.400
	5M	QPSK		4.490	5.489
		16QAM		4.492	5.560

8.3.1. OCCUPIED BANDWIDTH RESULT

GSM 1900

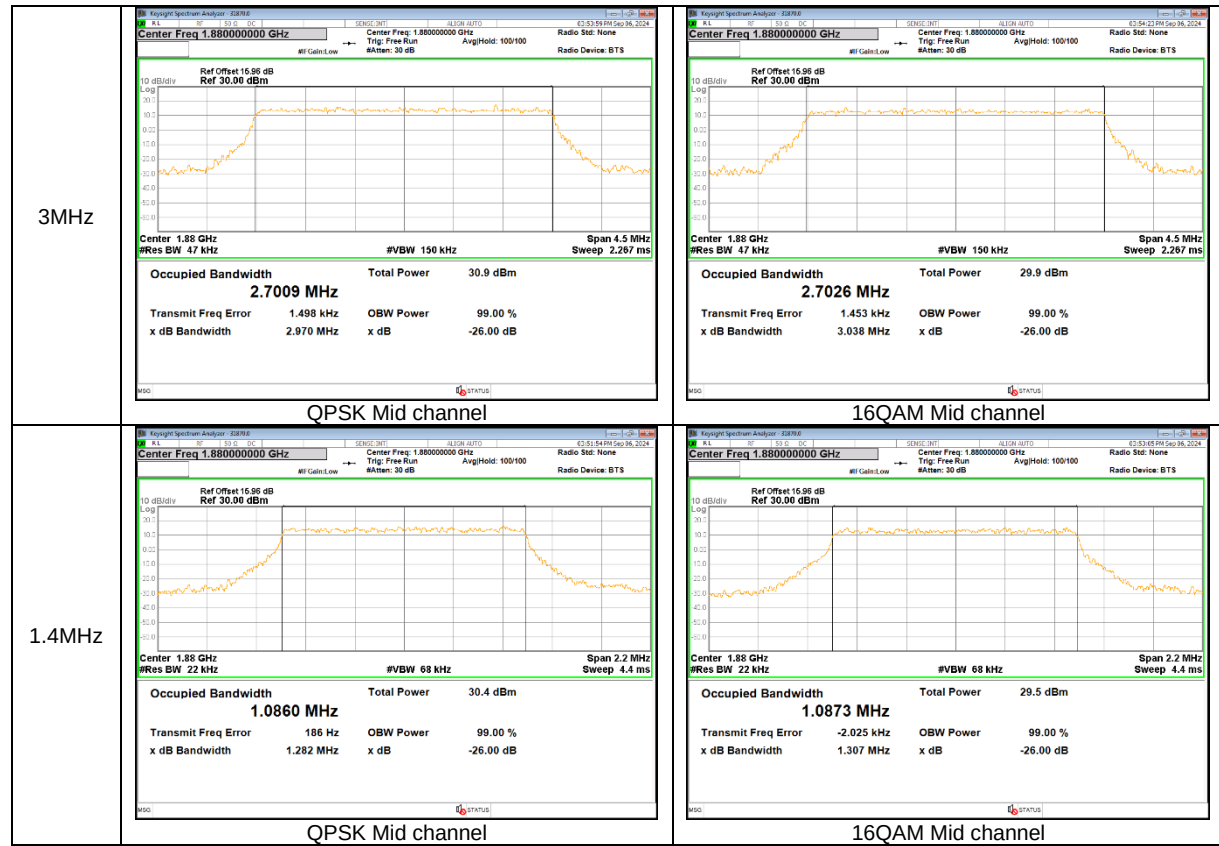


WCDMA Band 2



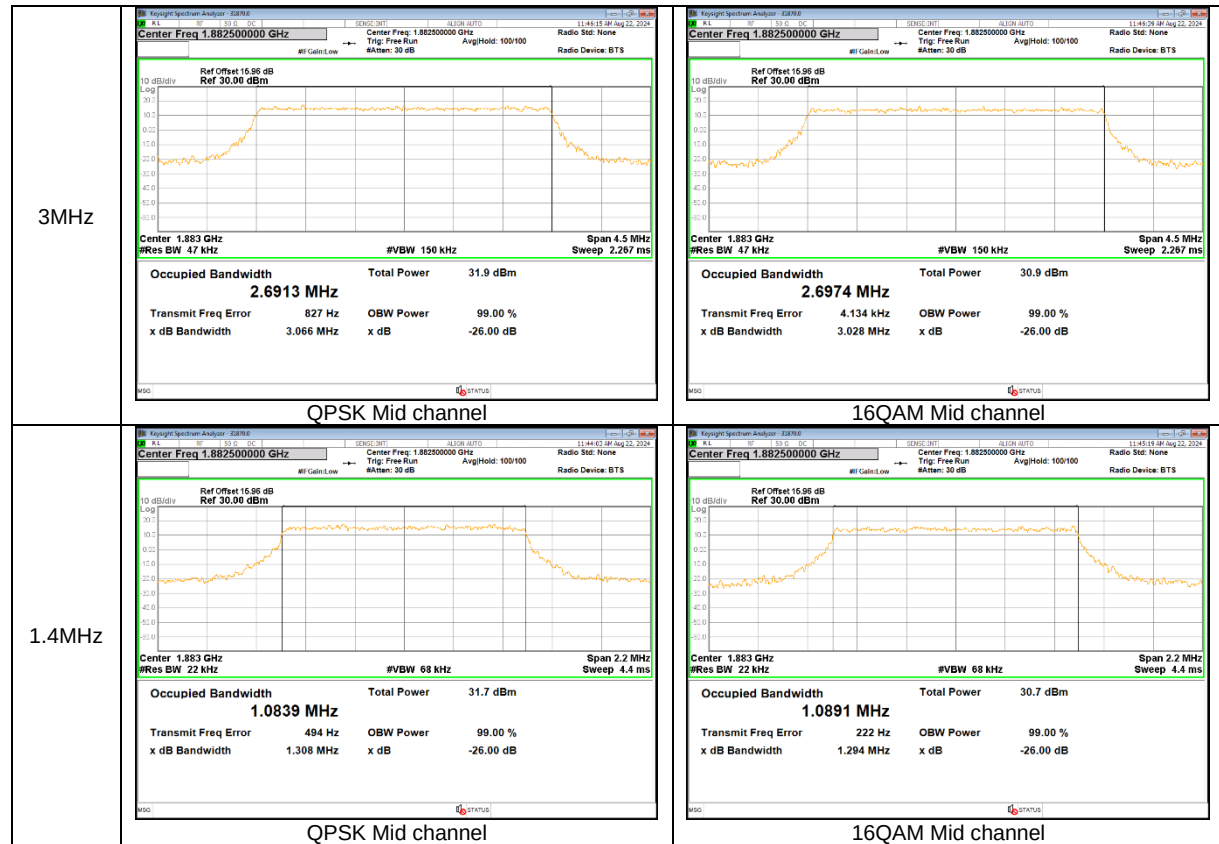
LTE Band 2 (ANT A)





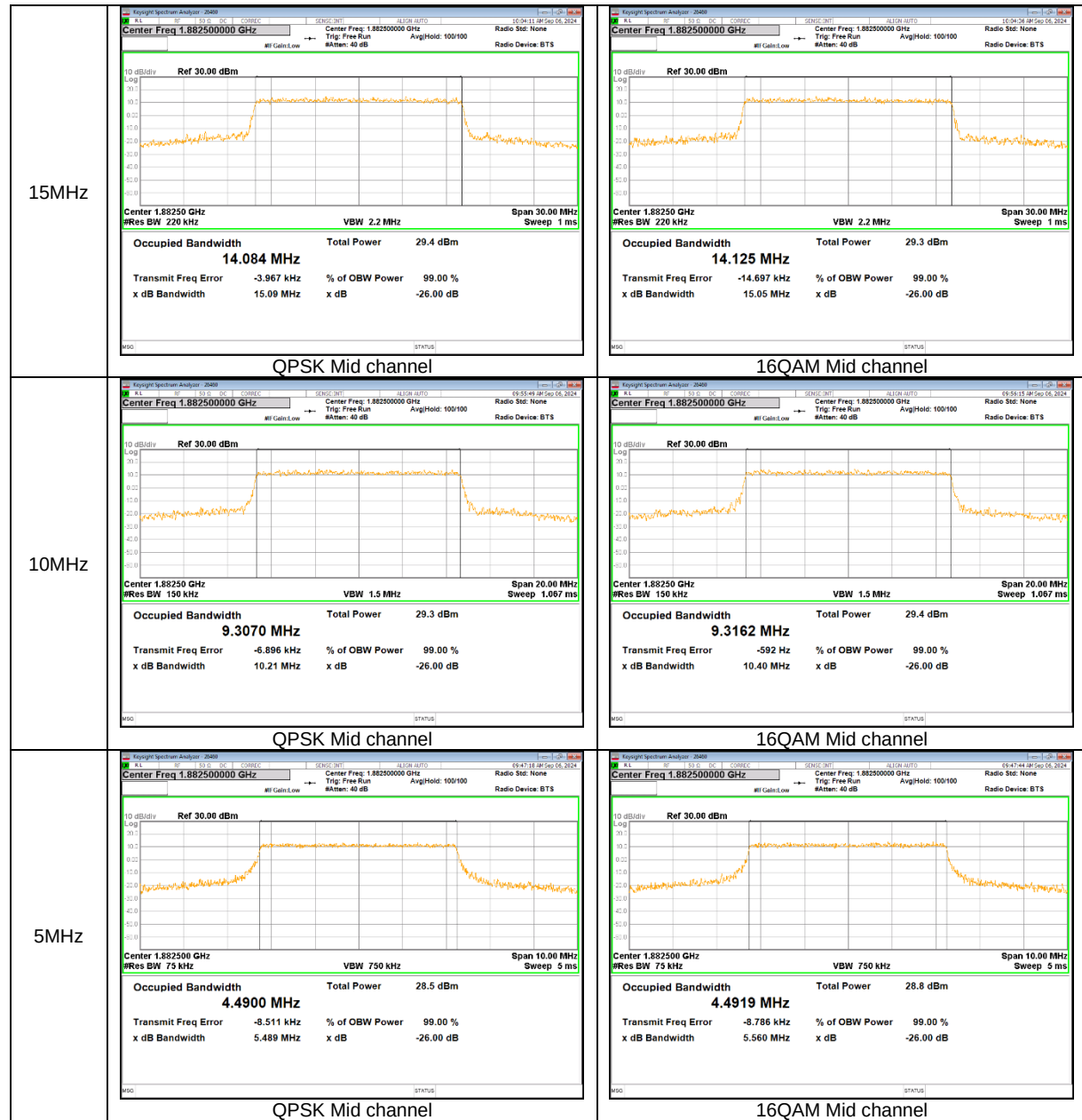
LTE Band 25 (ANT A)





NR Band n25 (ANT A)





8.4. BAND EDGE EMISSIONS

RULE PART

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 CMW500 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 $\geq 2 \times \text{Span} / \text{RBW}$;
- 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 $\geq 2 \times \text{Span} / \text{RBW}$;
- 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 addtional 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
25	250	N/A	+ 6.0 dB
30	300	N/A	+ 5.2 dB
35	350	N/A	+ 4.6 dB
40	400	N/A	+ 4.0 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

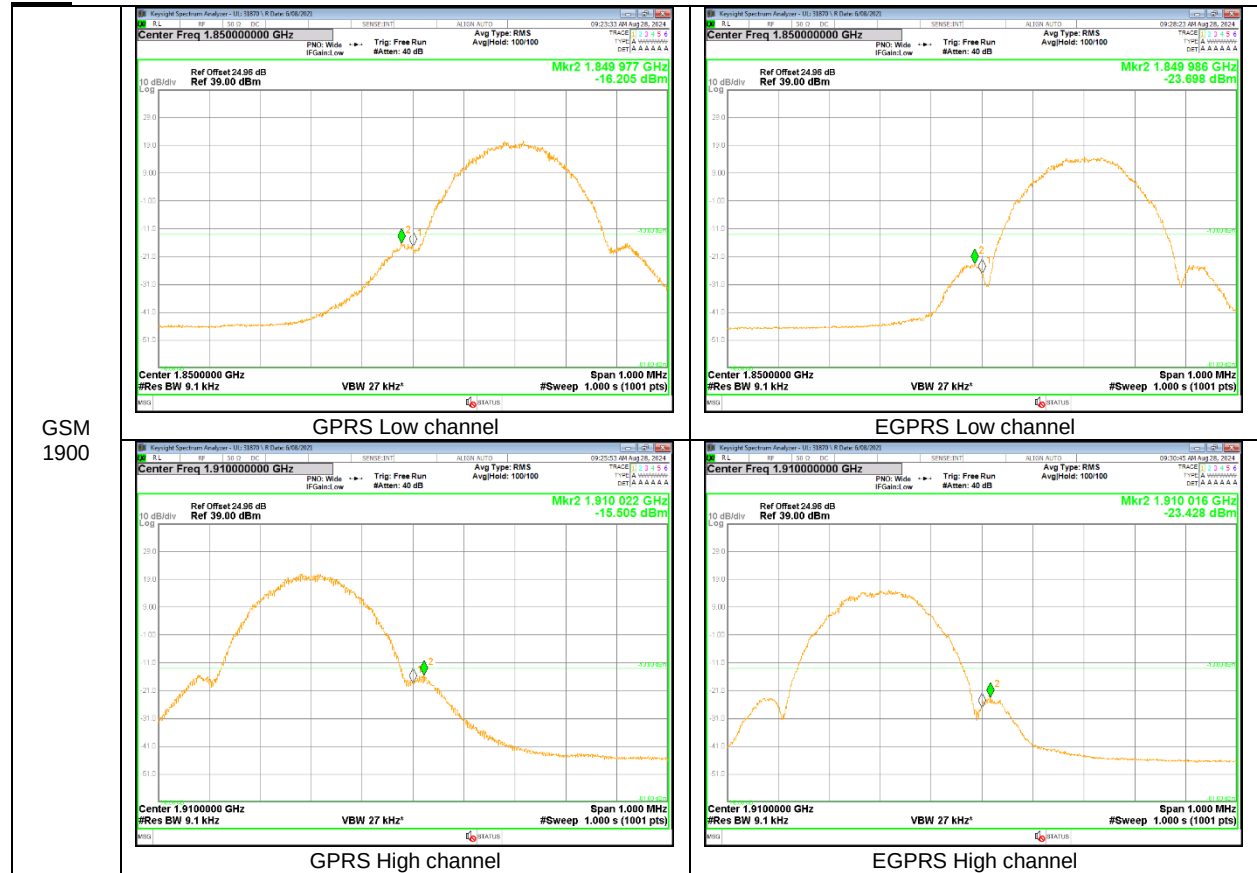
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

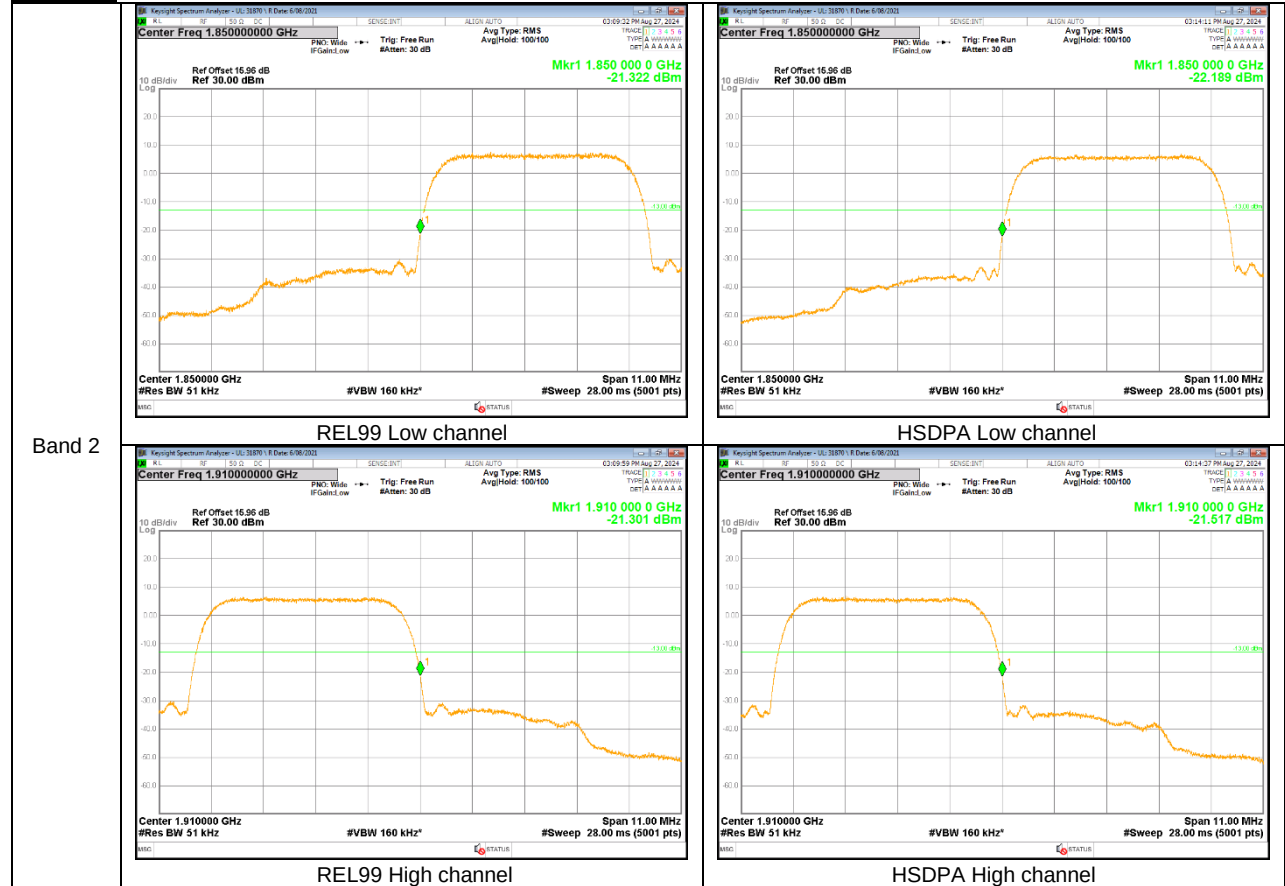
See the following pages.

8.4.1. BAND EDGE RESULT

GSM



WCDMA



LTE Band 2 (ANT A)

