

CERTIFICATION TEST REPORT

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

Model : SM-X848U

FCC ID : A3LSMX848U

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

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

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2026-06-19	Initial issue	Hyegyeong Eom
V2	2026-06-26	Updated to address TCB's question	Hyegyeong Eom

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

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

MODEL NUMBER: SM-X848U

SERIAL NUMBER: R3GL40GJ6AN, R3GL40GJ63R, R3GL40GJ6GB, R3GL5089K4H (CONDUCTED);
R3GL40GJ3TP, R3GL40GJ57N, R3GL30GJ4LH, R3GL5088FLR, R3GL5089JJE (RADIATED)

DATE TESTED: 2026-04-30 – 2026-06-19

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 24E	Complies

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

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

Approved & Released For
UL KOREA LTD. By:

Tested By:



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UL KOREA LTD.



Hyegyeong Eom
Suwon Lab Engineer
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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:

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

$\text{For Radiated Spurious Emission (dBm)} = \text{SA reading with EUT worst orientation (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + \text{Conversion Factor (dB)}$

$\text{SA reading with EUT worst orientation (dBm)} = \text{Measured amplitude level (dBuV)} + 107$

$\text{Conversion Factor} = 107 + 20 \log(D) - 104.8 = 107 + 9.54 - 104.8 = 11.74 \text{ dB}$
where D is the measurement distance (in the far field) in m

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	1.84 dB
Radiated Disturbance, 9 kHz to 30 MHz	2.41 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.78 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.25 dB
Radiated Disturbance, Above 18 GHz	5.07 dB

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

Note1 : For Radiated Emission measurements (200 MHz - 18 GHz), the EUT support table is made of Expanded Polystyrene (EPS). This material is characterized by a low dielectric constant, as recognized in CISPR 16-1-4, to minimize its influence on field strength measurements. This influence has been considered in the uncertainty budget.

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

5.2. Applicable Rule Part

Band	UL Frequency (MHz)	Applicable Rule Part
WCDMA B2	1850 – 1910	Part 24, Subpart E
LTE B2 / NR n2	1850 – 1910	Part 24, Subpart E
LTE B25 / NR n25	1850 – 1915	Part 24, Subpart E

5.3. 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.

WCDMA

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted Power (ANT Main 1)		EIRP (ANT Main 1)	
			Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
Band 2	1852.40 - 1907.60	Rel. 99	24.16	0.261	27.08	0.511
		HSDPA	23.26	0.212	26.02	0.400

LTE Band 25

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth	Modulation	Conducted Power (ANT Main 1)		EIRP (ANT Main 1)	
		[MHz]		Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
Band 25	1860.00 - 1905.00	20	QPSK	24.27	0.267	26.54	0.451
			16QAM	23.69	0.234	25.86	0.385
			64QAM	22.78	0.190		
			256QAM	19.45	0.088		
	1857.50 - 1907.50	15	QPSK	24.34	0.272	26.69	0.467
			16QAM	23.78	0.239	25.91	0.390
			64QAM	22.76	0.189		
			256QAM	19.41	0.087		
	1855.00 - 1910.00	10	QPSK	24.32	0.270	26.66	0.463
			16QAM	23.46	0.222	26.07	0.405
			64QAM	22.53	0.179		
			256QAM	19.54	0.090		
	1852.50 - 1912.50	5	QPSK	24.38	0.274	26.76	0.474
			16QAM	23.82	0.241	25.72	0.373
			64QAM	22.61	0.182		
			256QAM	19.46	0.088		
	1851.50 - 1913.50	3	QPSK	24.36	0.273	26.60	0.457
			16QAM	23.42	0.220	26.03	0.401
			64QAM	22.57	0.181		
			256QAM	19.45	0.088		
	1850.70 - 1914.30	1.4	QPSK	24.28	0.268	26.72	0.470
			16QAM	23.56	0.227	25.70	0.372
			64QAM	22.67	0.185		
			256QAM	19.44	0.088		
FCC Part 24							
Band	Frequency Range [MHz]	BandWidth	Modulation	Conducted Power (ANT Sub 3)		EIRP (ANT Sub 3)	
		[MHz]		Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
Band 25	1860.00 - 1905.00	20	QPSK	23.78	0.239	23.57	0.228
			16QAM	23.15	0.207	22.53	0.179
			64QAM	22.33	0.171		
			256QAM	18.84	0.077		
	1857.50 - 1907.50	15	QPSK	23.66	0.232	23.45	0.221
			16QAM	23.21	0.209	22.61	0.182
			64QAM	22.27	0.169		
			256QAM	19.11	0.081		
	1855.00 - 1910.00	10	QPSK	23.65	0.232	23.44	0.221
			16QAM	23.16	0.207	22.56	0.180
			64QAM	22.02	0.159		
			256QAM	19.09	0.081		
	1852.50 - 1912.50	5	QPSK	23.79	0.239	23.59	0.229
			16QAM	23.24	0.211	22.64	0.184
			64QAM	21.95	0.157		
			256QAM	18.82	0.076		
	1851.50 - 1913.50	3	QPSK	23.73	0.236	23.53	0.225
			16QAM	23.21	0.209	22.61	0.182
			64QAM	22.03	0.160		
			256QAM	19.02	0.080		
	1850.70 - 1914.30	1.4	QPSK	24.00	0.251	23.79	0.239
			16QAM	22.90	0.195	22.29	0.169
			64QAM	22.14	0.164		
			256QAM	18.84	0.077		

NR Band n25

FCC Part 24								
Band	Frequency Range [MHz]	BandWidth	Modulation	Mode	Conducted Power (ANT Main 1)		EIRP (ANT Main 1)	
		[MHz]			Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
n25	1870.00 - 1895.00	40	DFT-s OFDM	$\pi/2$ BPSK	24.05	0.254		
				QPSK	24.08	0.256	27.25	0.531
				16QAM	23.19	0.208	26.25	0.422
				64QAM	21.77	0.150		
				256QAM	19.54	0.090		
			CP-OFDM	QPSK	22.42	0.175		
				16QAM	21.93	0.156		
				64QAM	20.66	0.116		
				256QAM	17.59	0.057		
	1867.50 - 1897.50	35	DFT-s OFDM	$\pi/2$ BPSK	24.27	0.267		
				QPSK	24.28	0.268	27.38	0.547
				16QAM	23.42	0.220	26.44	0.441
				64QAM	21.98	0.158		
				256QAM	19.76	0.095		
			CP-OFDM	QPSK	22.72	0.187		
	1865.00 - 1900.00	30	DFT-s OFDM	$\pi/2$ BPSK	24.33	0.271		
				QPSK	24.33	0.271	27.33	0.541
				16QAM	23.44	0.221	26.36	0.433
				64QAM	22.03	0.160		
				256QAM	19.78	0.095		
			CP-OFDM	QPSK	22.74	0.188		
	1862.50 - 1902.50	25	DFT-s OFDM	$\pi/2$ BPSK	24.29	0.269		
				QPSK	24.30	0.269	27.29	0.536
				16QAM	23.41	0.219	26.38	0.435
				64QAM	22.00	0.158		
				256QAM	19.77	0.095		
			CP-OFDM	QPSK	22.73	0.187		
	1860.00 - 1905.00	20	DFT-s OFDM	$\pi/2$ BPSK	24.34	0.272		
				QPSK	24.36	0.273	27.32	0.540
				16QAM	23.47	0.222	26.46	0.443
				64QAM	22.05	0.160		
				256QAM	19.80	0.095		
			CP-OFDM	QPSK	22.80	0.191		
	1857.50 - 1907.50	15	DFT-s OFDM	$\pi/2$ BPSK	24.36	0.273		
				QPSK	24.37	0.274	27.34	0.542
				16QAM	23.52	0.225	26.44	0.441
				64QAM	22.08	0.161		
				256QAM	19.84	0.096		
			CP-OFDM	QPSK	22.81	0.191		
	1855.00 - 1910.00	10	DFT-s OFDM	$\pi/2$ BPSK	24.35	0.272		
				QPSK	24.36	0.273	27.28	0.535
				16QAM	23.46	0.222	26.42	0.439
				64QAM	22.03	0.160		
				256QAM	19.80	0.095		
			CP-OFDM	QPSK	22.75	0.188		
	1852.50 - 1912.50	5	DFT-s OFDM	$\pi/2$ BPSK	24.32	0.270		
				QPSK	24.45	0.279	27.30	0.537
				16QAM	23.42	0.220	26.43	0.440
				64QAM	21.99	0.158		
				256QAM	19.77	0.095		
			CP-OFDM	QPSK	22.72	0.187		

5.4. 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)
WCDMA B2 / LTE Band 2, 25 / NR Band n2,25 1850 - 1915 MHz	Main 1	-1.2
LTE Band 2, 25 1850 - 1915 MHz	Sub 3	-1.7

5.5. WORST-CASE ORIENTATION

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

- 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.
- For details on how each LTE band switches to and operates on the sub antenna according to the EN-DC NR Combination, refer to the combination table below, as this device uses Tx path switching during certain EN-DC combinations.

Band	Main Antenna	Sub Antenna	EN-DC NR Combination
LTE B25	Main1	Sub 3	NR n41

- The RF port of LTE Band 25 was tested on all antennas and reported as 'Main ANT' because the test power of 'Main ANT' is same to or higher than 'Sub ANT'.
- So the test case is as below.

Band	Main ANT	Tune up Limit (dBm)	Sub ANT	Tune up Limit (dBm)
LTE B25	<u>Main 1</u>	<u>25.0</u>	Sub 3	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

LTE Band 2 (ANT Main 1, Sub 3)

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 Bands

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were performed for $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, and 256QAM modulation.

The worst-case scenario was determined by distinguishing between PSK-based modulation ($\pi/2$ BPSK, QPSK) and QAM-based modulation (16QAM, 64QAM, 256QAM). Within each modulation group, QPSK and 16QAM showed the worst results

This device supports NSA and SA Mode and Worst case reported.

So the test case is as below.

NR Band	NSA	SA
n2	LTE B4/5/7/12/13/14/30/48/66/71	<u>Stand Alone</u>
n25	LTE B7/12/13/26/66	<u>Stand Alone</u>

NR Band n2 (ANT Main 1)

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)	Modulation	RB size	RB offset
25	Main 1	1852.50	5	QPSK	1	0
		1882.50			1	0
		1912.50			1	24
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	Main 1	1852.50	5	DFT-s OFDM QPSK	1	23
		1882.50			1	1
		1912.50			1	23

● Radiated Spurious Emission

Highest EIRP setting for each bands						
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	Main 1	1852.50	5	QPSK	1	0
		1882.50			1	0
		1912.50			1	24
	Sub 3	1850.70	1.4	QPSK	1	5
		1882.50			1	5
		1914.30			1	5
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	Main 1	1867.50	35	DFT-s OFDM QPSK	1	1
		1882.50			1	1
		1897.50			1	1

Note1 : In the radiated emission test, the interband ULCA mode was investigated as a simultaneous transmission. This includes EN-DC and NR-DC modes for band combinations supported by the EUT. No noticeable intermodulation due to transmission between uplink carriers was detected.

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

Band	ANT	EIRP			RSE		
		X	Y	Z	X	Y	Z
WCDMA B2	Main 1	O	-	-	-	O	-
LTE B25	Main 1	-	-	O	-	-	O
	Sub 3	O	-	-	-	-	O
NR n25	Main 1	-	-	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.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA845	R37L12BFWW1DKA	N/A
Data Cable	SAMSUNG	N/A	N/A	N/A

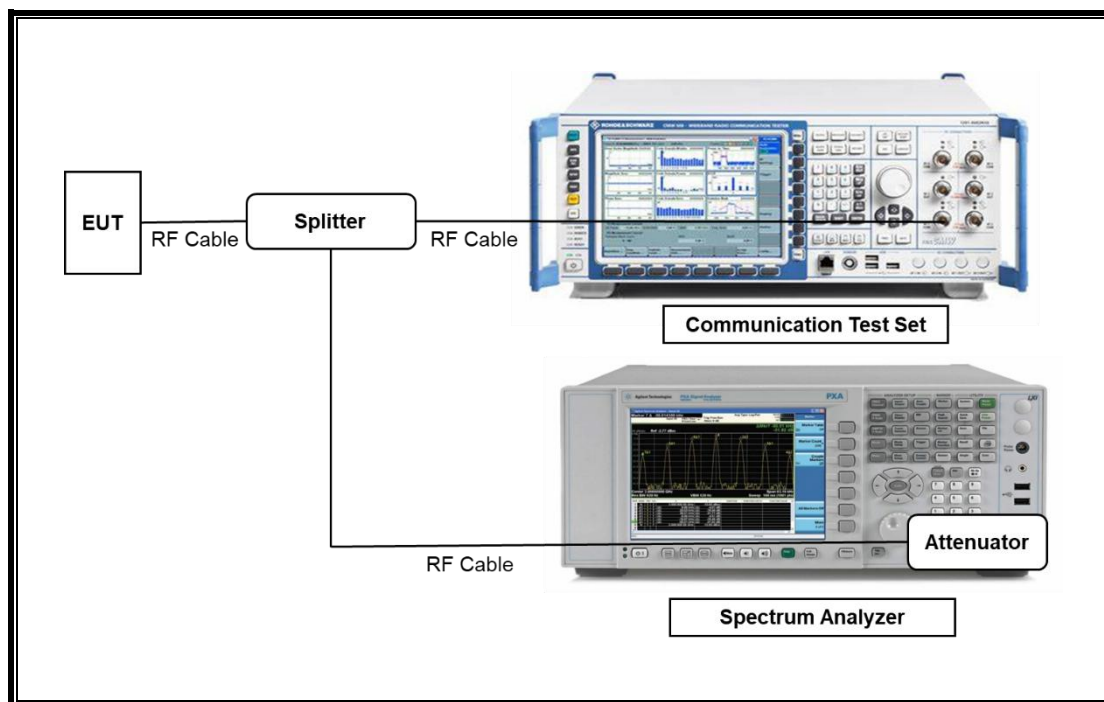
I/O CABLE

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

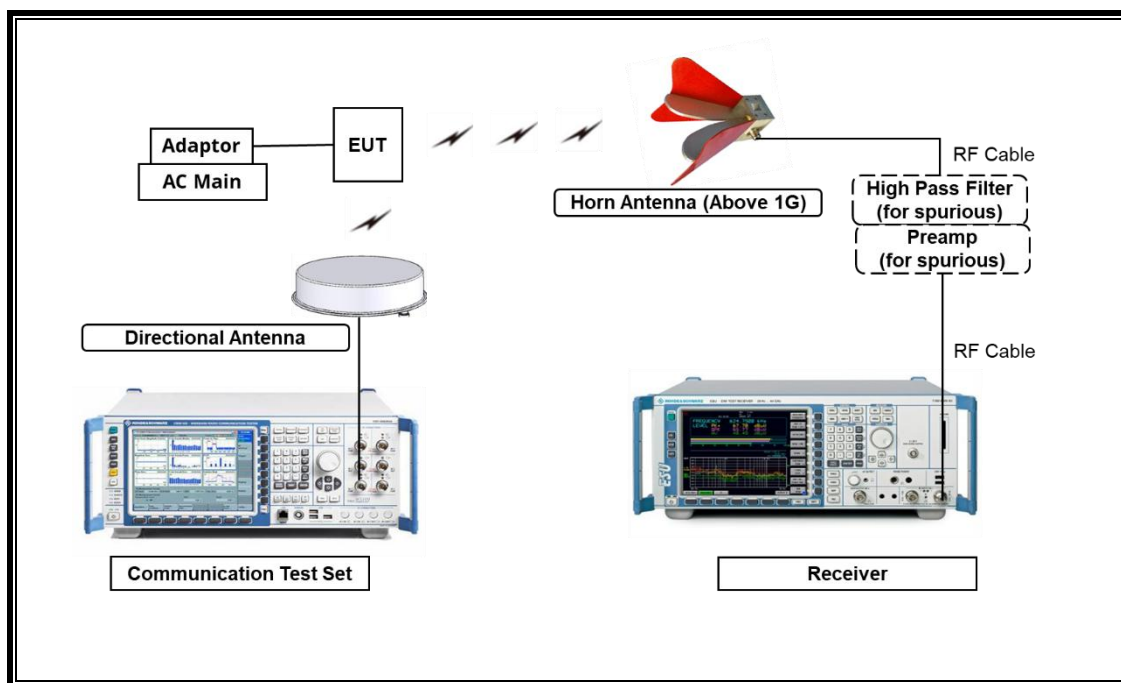
TEST SETUP

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

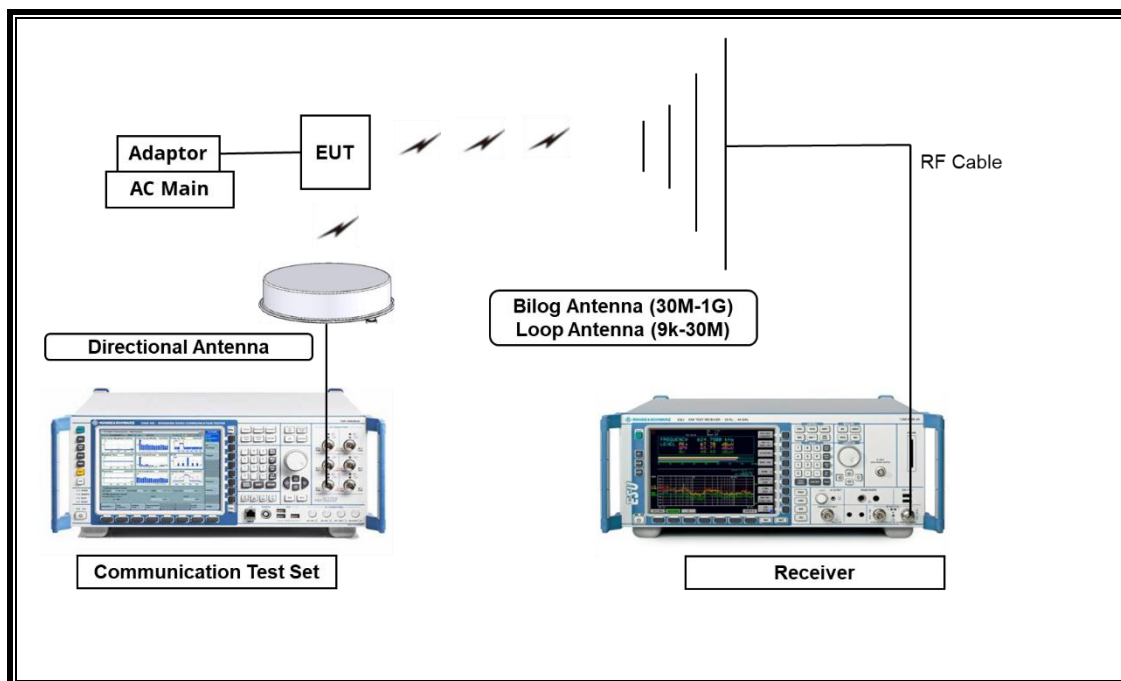
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP) Above 1G



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP) Below 1G



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	2027-01-08
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	2027-07-23
Preamplifier	ETS	3116C-PA	00168841	2026-07-28
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	2026-07-21
DC Power Supply	KIKUSUI	PWR2001ML	AX001947	2026-07-23
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2026-07-21
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-182020	28451	2026-07-21
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-181515	23576	2026-07-22
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2026-07-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2026-12-29
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2026-07-21
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2026-07-21
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2026-07-21
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2026-07-23
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2026-07-23
Attenuator	PASTERNAK	PE7087-10	A009	2026-07-22
Attenuator	PASTERNAK	PE7087-10	A001	2026-07-22
Attenuator	PASTERNAK	PE7087-10	A008	2026-07-22
Attenuator	PASTERNAK	PE7004-10	2	2026-07-22
Attenuator	PASTERNAK	PE7395-10	A011	2026-07-22
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2E	100900	2027-07-24
Temperature Chamber	ESPEC	SH-642	93001109	2026-07-21
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2026-12-29
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2027-01-06
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY57510655	2026-12-30
Notch Filter	MICRO-TRONICS	BRC50705-02	G024	2026-07-23
Notch Filter	MICRO-TRONICS	BRM50702-02	G036	2026-07-23
Notch Filter	MICRO-TRONICS	BRM50707-02	G002	2026-07-23
Notch Filter	MICRO-TRONICS	BRM50709-02	G001	2026-07-23
Notch Filter	MICRO-TRONICS	BRM50713-02	G001	2026-07-23
Notch Filter	MICRO-TRONICS	BRM50716-2	006	2026-07-23
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 Results
2.1046	Conducted Output Power	N/A	Conducted	Complies
2.1049	Occupied Bandwidth (99%)	N/A		Complies
24.238(a)	Conducted Band Edge / Conducted Spurious Emission	-13 dBm		Complies
24.235	Frequency Stability	2.5 ppm		Complies
24.232(c)	Effective Isotropic Radiated Power	33 dBm	Radiated	Complies
24.238(a)	Radiated Spurious Emission	-13 dBm		Complies

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.

NOTE1

LTE, 5G NR : Conducted output power has been verified across Low, Mid, and High channels for each resource block configuration. Compliance of MPR (Maximum Power Reduction) and Tune-up limits has also been confirmed. Therefore, representative measurements at 1 RB and Full RB configurations are reported for each channel.

NOTE2

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

RESULTS

See the following pages.

8.1.1. CONDUCTED AVERAGE OUTPUT POWER

WCDMA B2 (ANT Main 1)

Mode		UL Ch No.	Freq. (MHz)	Measured Pwr
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	24.16
		9400	1880.0	24.06
		9538	1907.6	23.87
HSDPA	Subtest 1	9262	1852.4	23.22
		9400	1880.0	23.12
		9538	1907.6	22.91
	Subtest 2	9262	1852.4	23.26
		9400	1880.0	23.16
		9538	1907.6	22.93
	Subtest 3	9262	1852.4	22.81
		9400	1880.0	22.72
		9538	1907.6	22.49
	Subtest 4	9262	1852.4	22.77
		9400	1880.0	22.70
		9538	1907.6	22.44
HSUPA	Subtest 1	9262	1852.4	21.11
		9400	1880.0	21.58
		9538	1907.6	21.28
	Subtest 2	9262	1852.4	20.98
		9400	1880.0	20.87
		9538	1907.6	20.78
	Subtest 3	9262	1852.4	21.14
		9400	1880.0	21.09
		9538	1907.6	20.74
	Subtest 4	9262	1852.4	20.68
		9400	1880.0	20.62
		9538	1907.6	20.28
	Subtest 5	9262	1852.4	22.09
		9400	1880.0	22.03
		9538	1907.6	21.72
DC-HSDPA	Subtest 1	9262	1852.4	23.17
		9400	1880.0	23.06
		9538	1907.6	22.84
	Subtest 2	9262	1852.4	23.17
		9400	1880.0	23.05
		9538	1907.6	22.82
	Subtest 3	9262	1852.4	22.66
		9400	1880.0	22.51
		9538	1907.6	22.30
	Subtest 4	9262	1852.4	22.66
		9400	1880.0	22.56
		9538	1907.6	22.26

LTE Band 25 (ANT Main 1)

BW (MHz)	Mode	RB Allocation	RB offset	26140	26365	26590
				1860.00 MHz	1882.50 MHz	1905.00 MHz
20 MHz	QPSK	1	0	24.27	24.25	23.83
		1	49	24.19	24.18	23.74
		1	99	24.21	24.06	23.84
		100	0	23.20	23.03	22.80
	16QAM	1	0	23.69	23.64	23.23
		1	49	23.57	23.53	23.17
		1	99	23.61	23.45	23.25
		100	0	22.19	22.05	21.80
	64QAM	1	0	21.97	22.43	22.78
		1	49	21.90	22.30	22.77
		1	99	22.01	22.21	22.78
		100	0	20.78	21.02	21.16
	256QAM	1	0	18.77	19.29	19.45
		1	49	18.70	19.22	19.36
		1	99	18.76	19.10	19.38
		100	0	18.77	18.97	19.19
BW (MHz)	Mode	RB Allocation	RB offset	26115	26365	26615
				1857.50 MHz	1882.50 MHz	1907.50 MHz
15 MHz	QPSK	1	0	24.34	24.15	23.86
		1	37	24.21	24.01	23.83
		1	74	24.24	23.96	23.99
		75	0	23.26	23.07	22.89
	16QAM	1	0	23.78	23.12	23.21
		1	37	23.66	22.98	23.17
		1	74	23.75	22.93	23.30
		75	0	22.24	22.03	21.83
	64QAM	1	0	22.43	22.76	22.21
		1	37	22.30	22.61	22.14
		1	74	22.37	22.55	22.33
		75	0	21.25	21.07	20.86
	256QAM	1	0	19.07	19.41	19.21
		1	37	18.97	19.30	19.19
		1	74	19.00	19.21	19.32
		75	0	19.17	19.01	18.85
BW (MHz)	Mode	RB Allocation	RB offset	26090	26365	26640
				1855.00 MHz	1882.50 MHz	1910.00 MHz
10 MHz	QPSK	1	0	24.32	24.16	23.90
		1	25	24.29	24.10	23.88
		1	49	24.29	24.01	23.96
		50	0	23.38	23.10	22.96
	16QAM	1	0	23.31	23.15	23.38
		1	25	23.24	23.09	23.36
		1	49	23.23	23.00	23.46
		50	0	22.32	22.10	21.97
	64QAM	1	0	22.53	22.50	21.99
		1	25	22.49	22.48	22.00
		1	49	22.46	22.38	22.08
		50	0	21.32	21.09	20.95
	256QAM	1	0	19.35	19.54	18.63
		1	25	19.32	19.53	18.63
		1	49	19.32	19.41	18.72
		50	0	19.31	19.09	18.85

BW (MHz)	Mode	RB Allocation	RB offset	26065	26365	26665
				1852.50 MHz	1882.50 MHz	1912.50 MHz
5 MHz	QPSK	1	0	24.38	24.23	23.99
		1	12	24.32	24.17	24.00
		1	24	24.36	24.12	24.06
		25	0	23.38	23.07	22.97
	16QAM	1	0	23.82	23.23	23.05
		1	12	23.77	23.16	23.03
		1	24	23.80	23.15	23.11
		25	0	22.44	22.08	21.86
	64QAM	1	0	22.61	22.33	21.79
		1	12	22.56	22.27	21.80
		1	24	22.58	22.27	21.89
		25	0	21.27	21.09	20.83
	256QAM	1	0	19.46	19.19	18.61
		1	12	19.41	19.12	18.59
		1	24	19.44	19.08	18.69
		25	0	19.35	19.06	18.96
BW (MHz)	Mode	RB Allocation	RB offset	26055	26365	26675
				1851.50 MHz	1882.50 MHz	1913.50 MHz
3 MHz	QPSK	1	0	24.34	24.02	23.87
		1	8	24.36	23.96	23.90
		1	14	24.36	23.99	23.88
		15	0	23.31	23.03	22.90
	16QAM	1	0	23.29	23.08	23.38
		1	8	23.24	22.94	23.38
		1	14	23.23	23.00	23.42
		15	0	22.35	21.99	22.03
	64QAM	1	0	22.57	22.42	21.99
		1	8	22.50	22.41	22.03
		1	14	22.50	22.44	22.10
		15	0	21.34	21.08	20.90
	256QAM	1	0	19.29	19.44	18.76
		1	8	19.28	19.44	18.70
		1	14	19.28	19.45	18.74
		15	0	19.39	19.04	19.07
BW (MHz)	Mode	RB Allocation	RB offset	26047	26365	26683
				1850.70 MHz	1882.50 MHz	1914.30 MHz
1.4 MHz	QPSK	1	0	24.27	24.07	23.98
		1	3	24.21	24.03	23.92
		1	5	24.28	24.07	24.02
		6	0	23.30	23.06	22.92
	16QAM	1	0	23.34	23.56	23.07
		1	3	23.28	23.49	23.02
		1	5	23.36	23.54	23.09
		6	0	22.43	21.99	21.98
	64QAM	1	0	22.66	22.16	22.29
		1	3	22.67	22.14	22.31
		1	5	22.66	22.25	22.30
		6	0	21.31	21.07	20.90
	256QAM	1	0	19.40	19.08	19.03
		1	3	19.44	19.10	19.05
		1	5	19.42	19.09	19.03
		6	0	19.18	19.07	18.78

LTE Band 25 (ANT Sub 3)

BW (MHz)	Mode	RB Allocation	RB offset	26140	26365	26590
				1860.00 MHz	1882.50 MHz	1905.00 MHz
20 MHz	QPSK	1	0	23.45	23.50	23.69
		1	49	23.50	23.62	23.78
		1	99	23.62	23.66	23.73
		100	0	22.42	22.67	22.70
	16QAM	1	0	22.88	23.00	23.07
		1	49	22.89	23.12	23.13
		1	99	23.06	23.15	23.08
		100	0	21.52	21.69	21.72
	64QAM	1	0	21.67	22.17	21.83
		1	49	21.75	22.27	21.88
		1	99	21.89	22.33	21.80
		100	0	20.50	20.68	20.70
	256QAM	1	0	18.53	18.70	18.58
		1	49	18.51	18.79	18.64
		1	99	18.68	18.84	18.58
		100	0	18.40	18.61	18.65
BW (MHz)	Mode	RB Allocation	RB offset	26115	26365	26615
				1857.50 MHz	1882.50 MHz	1907.50 MHz
15 MHz	QPSK	1	0	23.49	23.54	23.66
		1	37	23.48	23.59	23.63
		1	74	23.54	23.65	23.64
		75	0	22.48	22.64	22.70
	16QAM	1	0	22.83	22.54	23.18
		1	37	22.82	22.59	23.14
		1	74	22.90	22.67	23.21
		75	0	21.42	21.61	21.73
	64QAM	1	0	21.53	21.98	22.24
		1	37	21.50	22.01	22.23
		1	74	21.58	22.06	22.27
		75	0	20.46	20.64	20.74
	256QAM	1	0	18.23	19.01	18.92
		1	37	18.19	19.02	18.84
		1	74	18.29	19.11	18.97
		75	0	18.42	18.63	18.69
BW (MHz)	Mode	RB Allocation	RB offset	26090	26365	26640
				1855.00 MHz	1882.50 MHz	1910.00 MHz
10 MHz	QPSK	1	0	23.38	23.56	23.65
		1	25	23.39	23.63	23.61
		1	49	23.41	23.63	23.59
		50	0	22.40	22.69	22.72
	16QAM	1	0	22.40	22.56	23.16
		1	25	22.43	22.61	23.11
		1	49	22.48	22.58	23.14
		50	0	21.41	21.60	21.71
	64QAM	1	0	21.45	21.95	21.86
		1	25	21.47	22.02	21.85
		1	49	21.49	21.98	21.80
		50	0	20.41	20.62	20.65
	256QAM	1	0	18.18	19.03	18.76
		1	25	18.10	19.01	18.66
		1	49	18.19	19.09	18.78
		50	0	18.37	18.59	18.69

BW (MHz)	Mode	RB Allocation	RB offset	26065	26365	26665
				1852.50 MHz	1882.50 MHz	1912.50 MHz
5 MHz	QPSK	1	0	23.50	23.79	23.73
		1	12	23.49	23.78	23.69
		1	24	23.51	23.79	23.70
		25	0	22.43	22.67	22.76
	16QAM	1	0	22.58	22.76	23.16
		1	12	22.55	22.75	23.15
		1	24	22.59	22.80	23.24
		25	0	21.38	21.68	21.85
	64QAM	1	0	21.71	21.57	21.95
		1	12	21.70	21.54	21.91
		1	24	21.73	21.56	21.90
		25	0	20.38	20.59	20.79
	256QAM	1	0	18.56	18.35	18.79
		1	12	18.54	18.32	18.75
		1	24	18.55	18.36	18.82
		25	0	18.45	18.70	18.75
BW (MHz)	Mode	RB Allocation	RB offset	26055	26365	26675
				1851.50 MHz	1882.50 MHz	1913.50 MHz
3 MHz	QPSK	1	0	23.36	23.66	23.63
		1	8	23.31	23.73	23.61
		1	14	23.35	23.72	23.60
		15	0	22.41	22.62	22.68
	16QAM	1	0	22.41	22.64	23.21
		1	8	22.30	22.62	23.18
		1	14	22.40	22.60	23.14
		15	0	21.35	21.65	21.76
	64QAM	1	0	21.49	22.03	22.00
		1	8	21.50	22.02	21.89
		1	14	21.54	22.01	21.86
		15	0	20.40	20.60	20.77
	256QAM	1	0	18.21	19.00	18.70
		1	8	18.18	19.02	18.64
		1	14	18.19	19.00	18.73
		15	0	18.56	18.54	18.79
BW (MHz)	Mode	RB Allocation	RB offset	26047	26365	26683
				1850.70 MHz	1882.50 MHz	1914.30 MHz
1.4 MHz	QPSK	1	0	23.39	23.63	23.92
		1	3	23.35	23.59	23.92
		1	5	23.41	23.67	24.00
		6	0	22.42	22.66	22.80
	16QAM	1	0	22.89	22.71	22.84
		1	3	22.81	22.63	22.85
		1	5	22.90	22.75	22.89
		6	0	21.36	21.84	21.79
	64QAM	1	0	21.58	21.73	22.09
		1	3	21.51	21.71	22.14
		1	5	21.64	21.72	22.10
		6	0	20.39	20.83	20.66
	256QAM	1	0	18.39	18.42	18.76
		1	3	18.40	18.35	18.84
		1	5	18.42	18.44	18.82
		6	0	18.40	18.65	18.58

NR Band n25 (ANT Main 1)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	374000	376500	379000
					1870.00 MHz	1882.50 MHz	1895.00 MHz
40 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.42	23.15	23.13
			1	1	24.05	23.93	23.95
			1	107	23.92	23.95	23.75
			1	214	23.79	23.68	23.79
			1	215	23.12	22.88	22.97
			216	0	23.05	22.98	22.94
		QPSK	1	0	22.98	22.77	22.73
			1	1	24.08	23.94	23.98
			1	107	23.94	23.95	23.78
			1	214	23.82	23.67	23.85
			1	215	22.67	22.42	22.55
			216	0	23.06	22.98	22.95
		16QAM	1	0	21.76	21.88	21.84
			1	1	23.19	23.07	23.08
			1	107	23.05	23.07	22.93
			1	214	22.92	22.81	23.01
			1	215	21.52	21.55	21.62
			216	0	21.80	21.69	21.56
		64QAM	1	1	21.77	21.63	21.68
		256QAM	1	1	19.54	19.39	19.41
	CP-OFDM	QPSK	1	0	20.91	20.78	20.72
			1	1	22.42	22.29	22.24
			1	107	22.23	22.25	21.97
			1	214	22.15	22.00	22.04
			1	215	20.62	20.43	20.55
			216	0	20.81	20.72	20.58
		16QAM	1	0	20.84	20.97	20.94
			1	1	21.85	21.90	21.90
			1	107	21.67	21.93	21.59
			1	214	21.57	21.63	21.68
			1	215	20.55	20.63	20.66
			216	0	20.81	20.70	20.58
		64QAM	1	1	20.66	20.32	20.27
		256QAM	1	1	17.59	17.56	17.54
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	373500	376500	379500
					1867.50 MHz	1882.50 MHz	1897.50 MHz
35 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.29	23.22	23.22
			1	1	24.27	24.16	24.11
			1	93	24.22	24.13	23.95
			1	186	24.14	23.87	23.97
			1	187	23.08	22.96	23.06
			180	0	23.33	23.20	23.10
		QPSK	1	0	22.87	22.68	22.69
			1	1	24.28	24.15	24.11
			1	93	24.23	24.13	23.95
			1	186	24.16	23.88	23.98
			1	187	22.70	22.43	22.50
			180	0	23.33	23.19	23.10
		16QAM	1	1	23.42	23.33	23.27
			1	93	23.42	23.30	23.16
			1	186	23.30	23.08	23.19
		64QAM	1	1	21.98	21.90	21.85
		256QAM	1	1	19.76	19.65	19.60
	CP-OFDM	QPSK	1	1	22.72	22.60	22.56

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	373000	376500	380000
					1865.00 MHz	1882.50 MHz	1900.00 MHz
30 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.45	23.27	23.15
			1	1	24.33	24.18	24.04
			1	79	24.23	24.12	23.92
			1	158	24.18	23.91	23.99
			1	159	23.36	23.06	22.99
			160	0	23.38	23.21	23.06
		QPSK	1	0	22.91	22.73	22.61
			1	1	24.33	24.17	24.06
			1	79	24.26	24.11	23.91
			1	158	24.23	23.90	24.00
			1	159	22.82	22.53	22.53
			160	0	23.39	23.22	23.05
		16QAM	1	1	23.44	23.33	23.17
			1	79	23.41	23.27	23.11
			1	158	23.38	23.10	23.19
		64QAM	1	1	22.03	21.92	21.77
		256QAM	1	1	19.78	19.66	19.52
	CP-OFDM	QPSK	1	1	22.74	22.63	22.49
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	372500	376500	380500
					1862.50 MHz	1882.50 MHz	1902.50 MHz
25 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.42	23.27	23.06
			1	1	24.29	24.18	23.98
			1	66	24.22	24.12	23.91
			1	131	24.20	23.95	23.99
			1	132	23.25	23.04	23.06
			128	0	23.37	23.24	23.10
		QPSK	1	0	22.92	22.73	22.52
			1	1	24.30	24.18	23.99
			1	66	24.21	24.12	23.93
			1	131	24.23	23.95	24.02
			1	132	22.80	22.49	22.53
			128	0	23.36	23.24	23.09
		16QAM	1	1	23.41	23.36	23.14
			1	66	23.36	23.28	23.10
			1	131	23.40	23.15	23.21
		64QAM	1	1	22.00	21.94	21.72
		256QAM	1	1	19.77	19.67	19.49
	CP-OFDM	QPSK	1	1	22.73	22.65	22.44
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	372000	376500	381000
					1860.00 MHz	1882.50 MHz	1905.00 MHz
20 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.46	23.33	23.04
			1	1	24.34	24.21	24.02
			1	52	24.23	24.13	24.00
			1	104	24.23	24.03	24.08
			1	105	23.39	23.12	23.09
			100	0	23.41	23.26	23.14
		QPSK	1	0	22.92	22.79	22.49
			1	1	24.36	24.21	24.02
			1	52	24.26	24.13	23.99
			1	104	24.23	24.03	24.05
			1	105	22.86	22.58	22.57
			100	0	23.41	23.25	23.15
		16QAM	1	1	23.47	23.39	23.23
			1	52	23.40	23.28	23.17
			1	104	23.44	23.18	23.29
		64QAM	1	1	22.05	21.95	21.79
		256QAM	1	1	19.80	19.69	19.53
	CP-OFDM	QPSK	1	1	22.80	22.65	22.51

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	371500	376500	381500
					1857.50 MHz	1882.50 MHz	1907.50 MHz
15 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.42	23.30	22.96
			1	1	24.36	24.21	24.00
			1	39	24.26	24.14	24.00
			1	77	24.28	24.06	24.08
			1	78	23.34	23.11	23.05
			75	0	23.44	23.22	23.13
		QPSK	1	0	22.93	22.80	22.46
			1	1	24.37	24.22	24.01
			1	39	24.26	24.13	23.99
			1	77	24.26	24.06	24.07
			1	78	22.89	22.64	22.58
			75	0	23.43	23.22	23.12
		16QAM	1	1	23.52	23.38	23.20
			1	39	23.41	23.29	23.16
			1	77	23.45	23.18	23.27
		64QAM	1	1	22.08	21.97	21.80
		256QAM	1	1	19.84	19.68	19.50
	CP-OFDM	QPSK	1	1	22.81	22.65	22.46
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	371000	376500	382000
					1855.00 MHz	1882.50 MHz	1910.00 MHz
10 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.46	23.32	22.99
			1	1	24.35	24.17	23.97
			1	25	24.32	24.12	23.99
			1	50	24.30	24.06	23.99
			1	51	23.39	23.18	23.07
			50	0	23.43	23.22	23.10
		QPSK	1	0	22.96	22.81	22.53
			1	1	24.36	24.18	23.97
			1	25	24.32	24.11	23.99
			1	50	24.31	24.07	24.01
			1	51	22.89	22.67	22.57
			50	0	23.43	23.22	23.14
		16QAM	1	1	23.46	23.32	23.14
			1	25	23.41	23.26	23.14
			1	50	23.41	23.18	23.25
		64QAM	1	1	22.03	21.87	21.72
		256QAM	1	1	19.80	19.66	19.44
	CP-OFDM	QPSK	1	1	22.75	22.61	22.42
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	370500	376500	382500
					1852.50 MHz	1882.50 MHz	1912.50 MHz
5 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	23.45	23.32	23.02
			1	1	24.32	24.18	24.00
			1	12	24.23	24.12	23.96
			1	23	24.30	24.11	24.02
			1	24	23.43	23.33	23.04
			25	0	23.46	23.25	23.18
		QPSK	1	0	22.90	22.73	22.48
			1	1	24.33	24.19	24.02
			1	12	24.22	24.11	23.95
			1	23	24.45	24.11	24.03
			1	24	22.91	22.73	22.50
			25	0	23.45	23.25	23.18
		16QAM	1	1	23.42	23.30	23.18
			1	13	23.34	23.26	23.14
			1	23	23.41	23.23	23.26
		64QAM	1	1	21.99	21.89	21.72
		256QAM	1	1	19.77	19.64	19.49
	CP-OFDM	QPSK	1	1	22.72	22.61	22.43

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

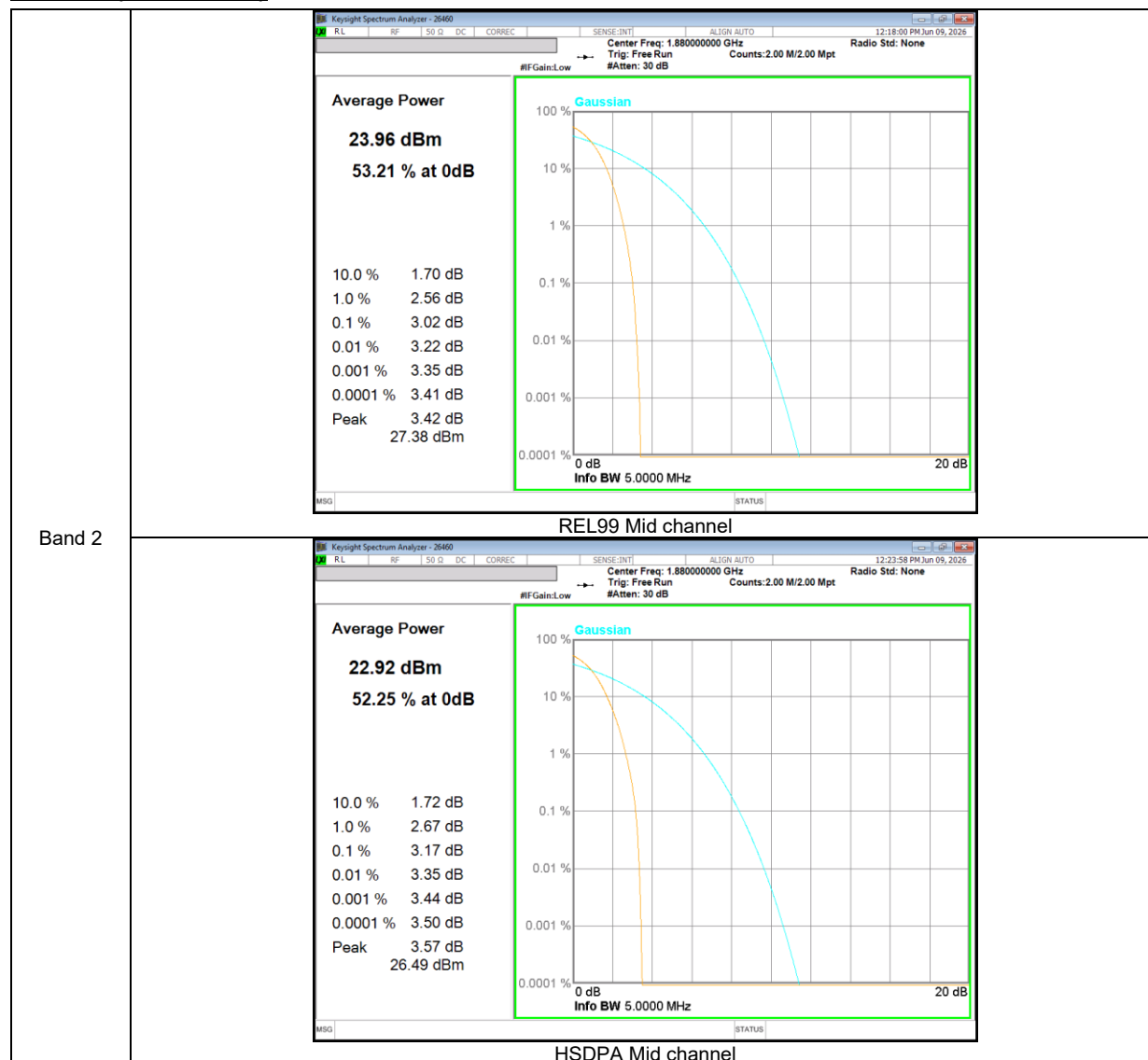
LTE: All modulations were investigated, and the worst modulations (QPSK, 256QAM) are reported.
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated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

RESULTS

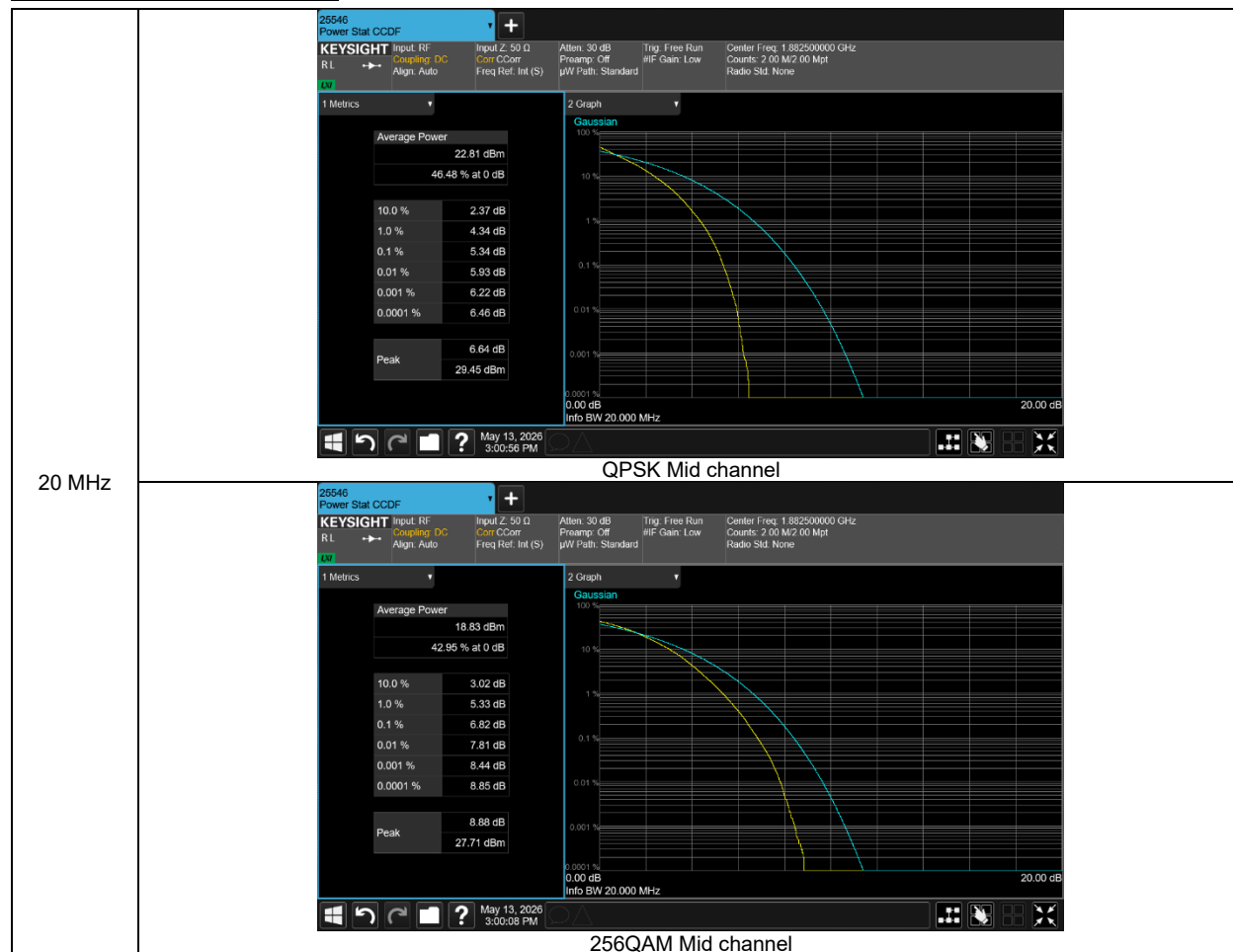
See the following pages.

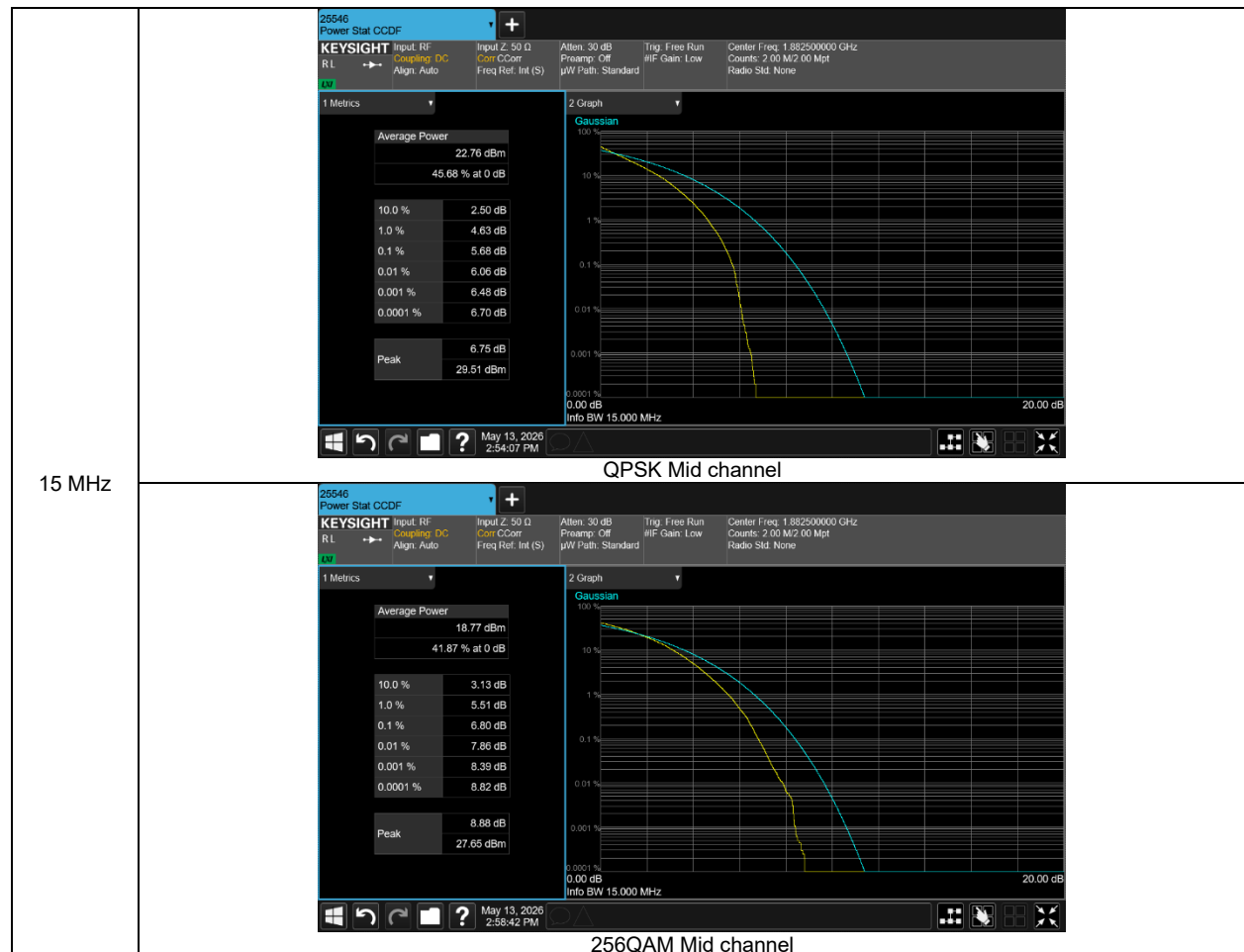
8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

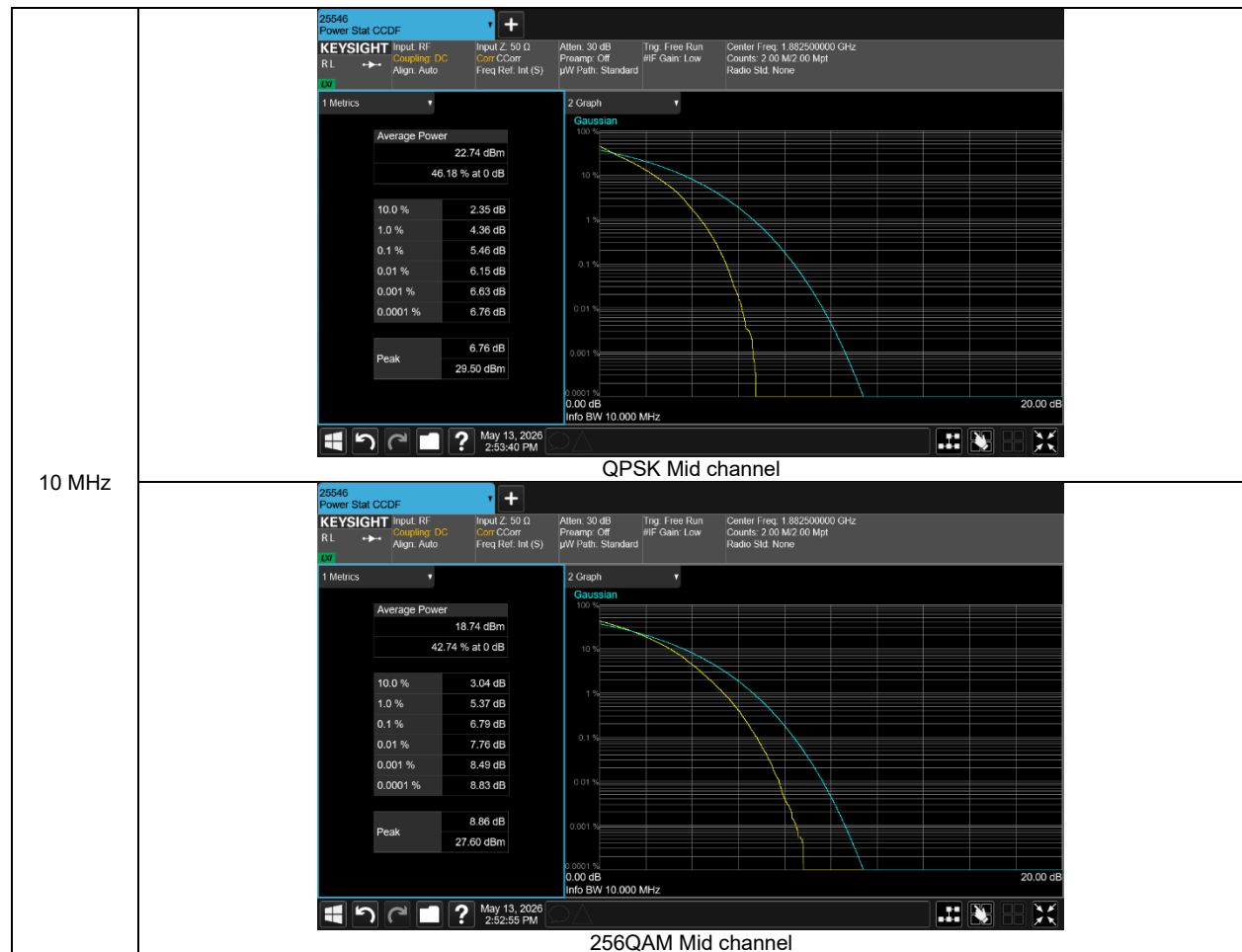
WCDMA (ANT Main 1)

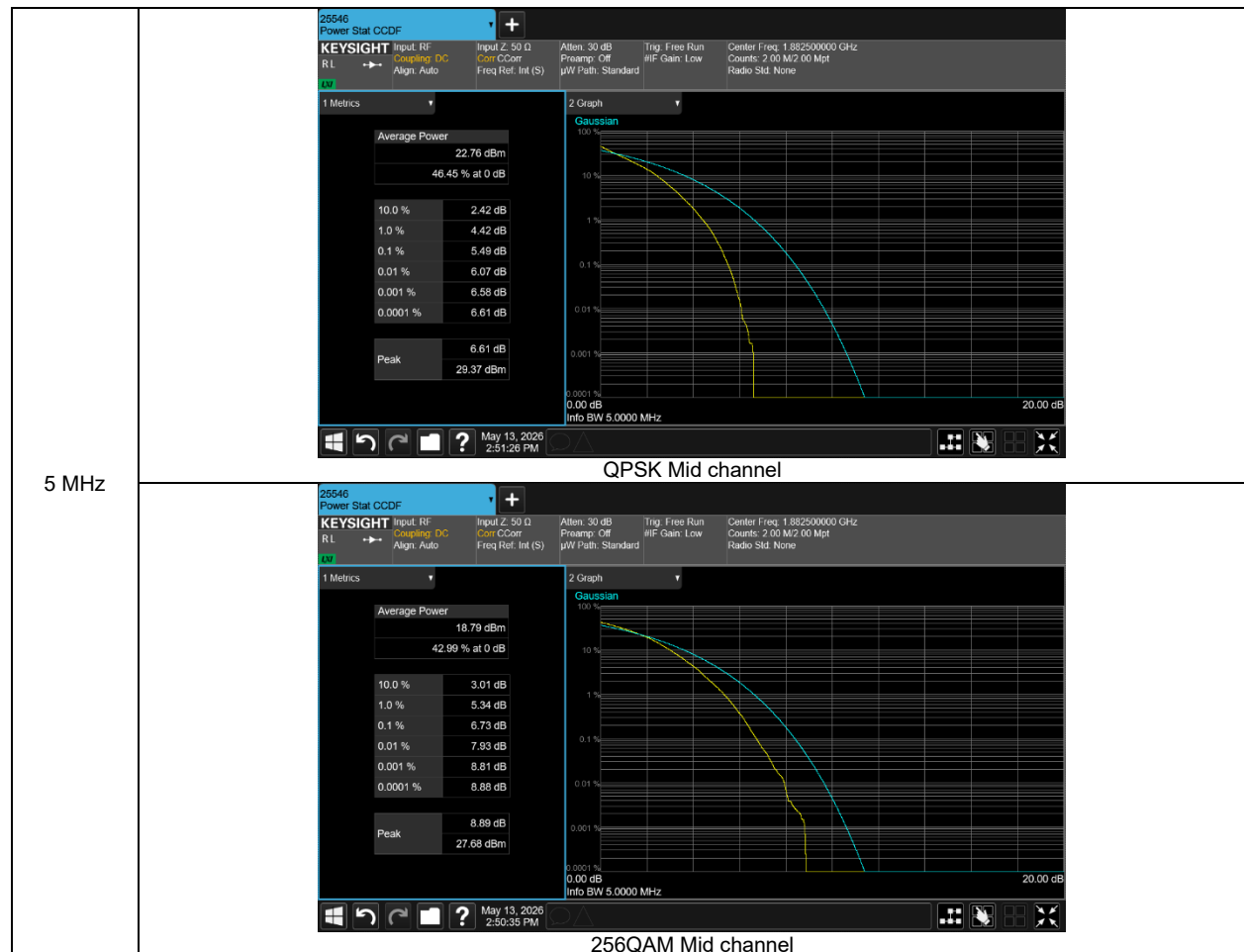


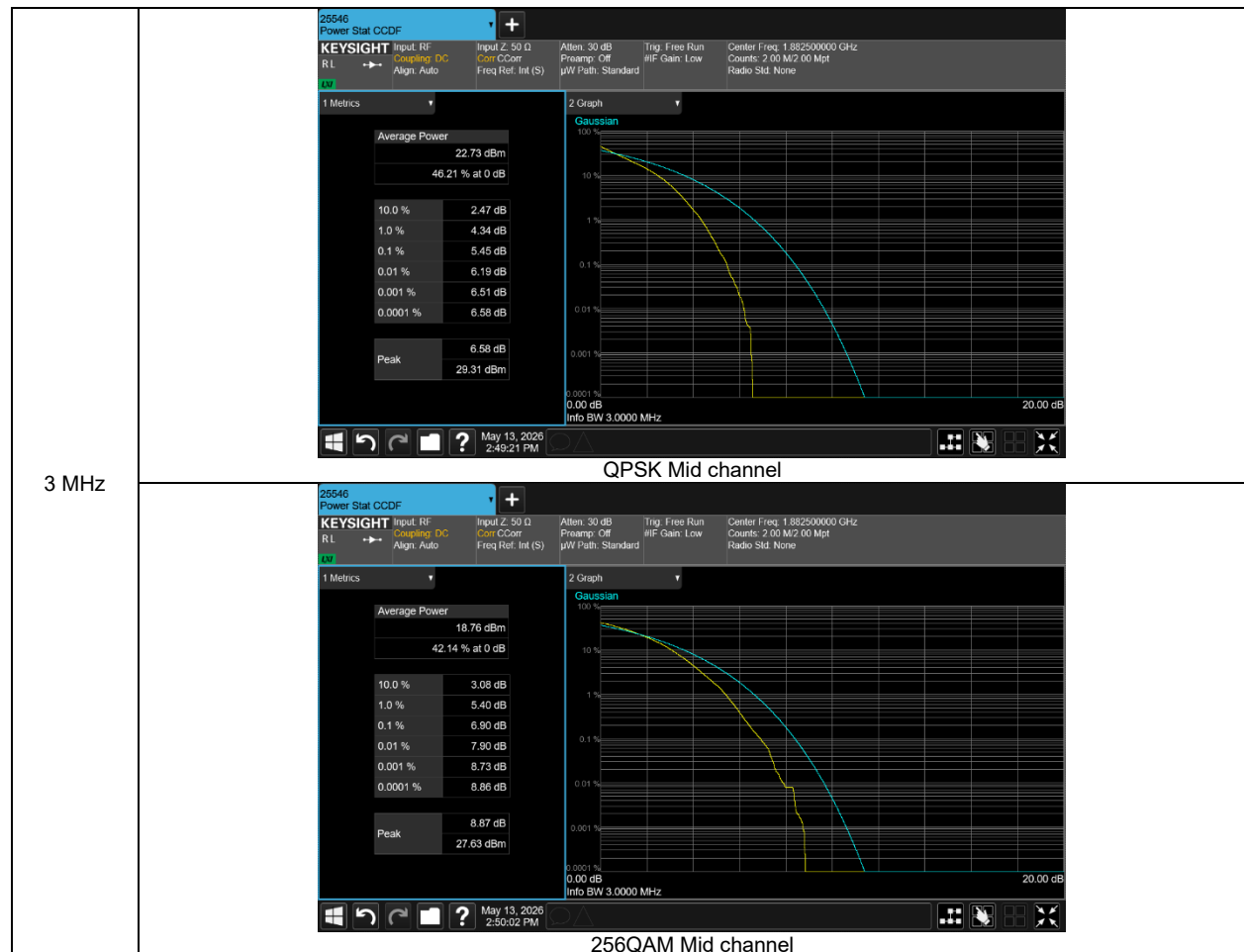
LTE Band 25 (ANT Main 1)

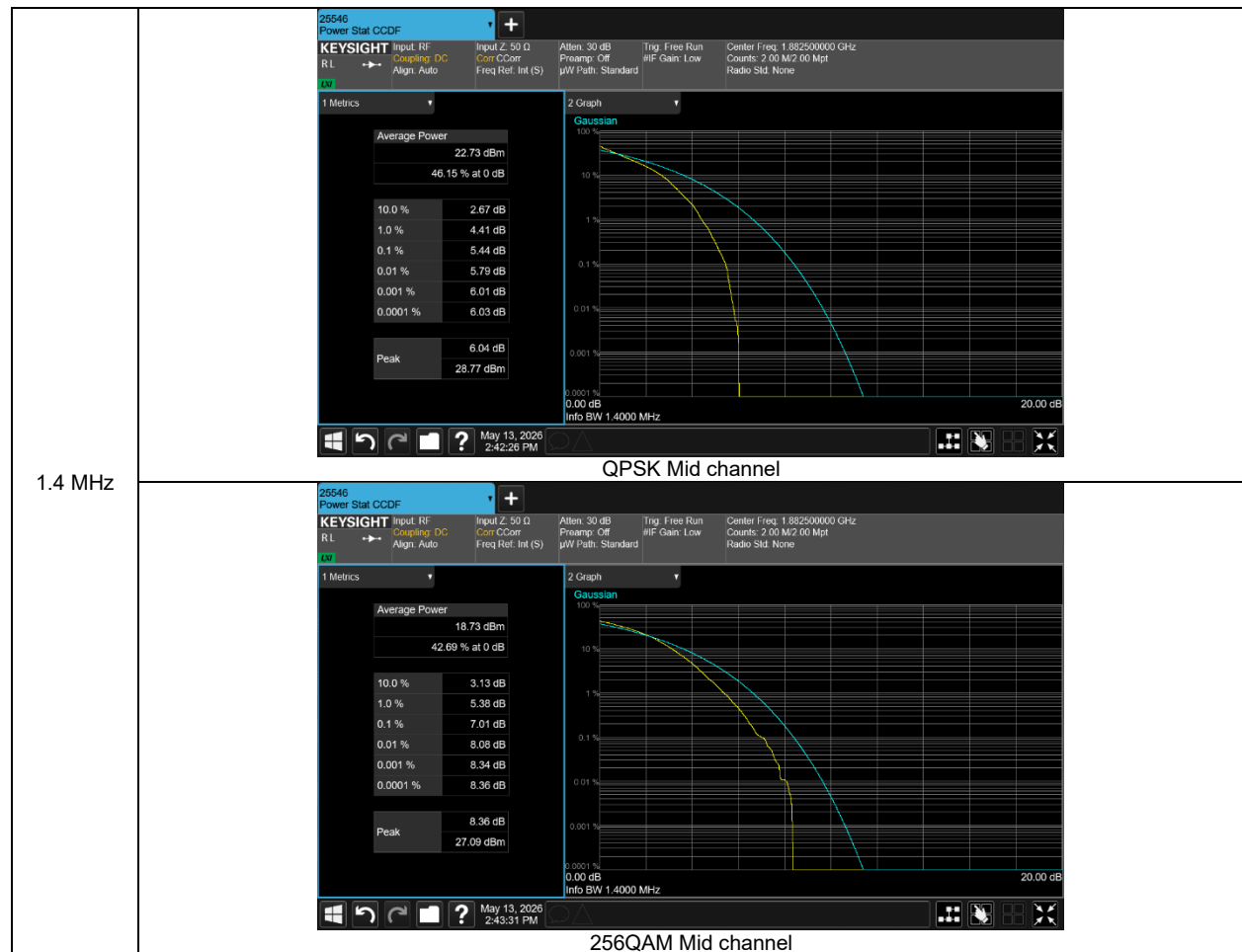












NR Band n25 CP-OFDM (ANT Main 1)





8.3. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

RESULTS

See the following pages.

- WCDMA (ANT Main 1)

Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.00	4.141	4.629
	HSDPA		4.197	4.636

- LTE Band 25 (ANT Main 1)

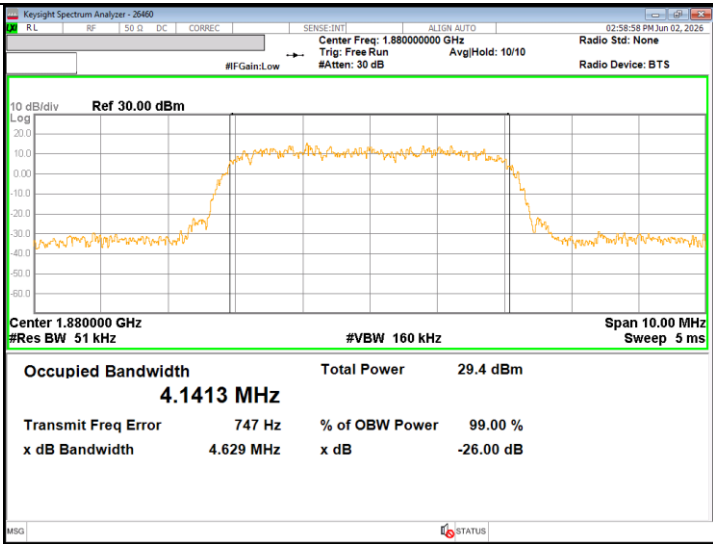
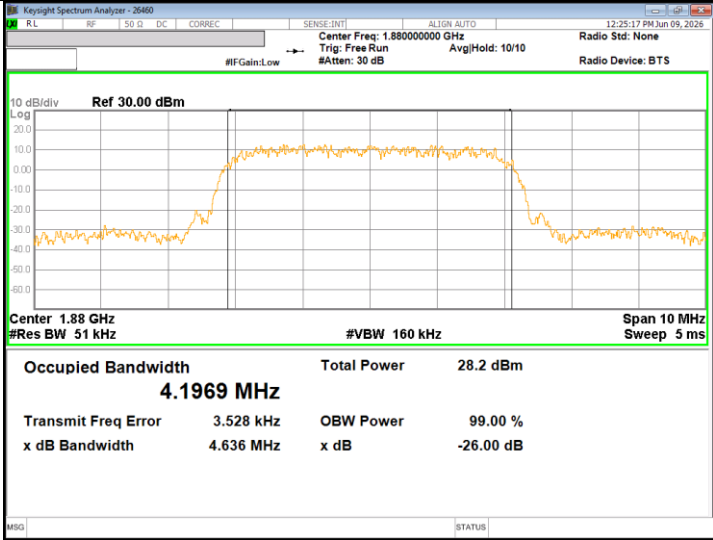
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.50	17.902	19.000
		16QAM		17.867	18.970
	15M	QPSK		13.398	14.390
		16QAM		13.401	14.370
	10M	QPSK		8.975	9.745
		16QAM		8.958	9.590
	5M	QPSK		4.488	4.877
		16QAM		4.483	4.828
	3M	QPSK		2.681	2.908
		16QAM		2.680	2.890
	1.4M	QPSK		1.086	1.280
		16QAM		1.092	1.291

- NR Band n25 CP-OFDM (ANT Main 1)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	40M	QPSK	1882.50	38.603	40.250
		16QAM		38.639	40.230
	35M	QPSK		33.562	34.980
		16QAM		33.547	34.980
	30M	QPSK		28.590	30.190
		16QAM		28.579	29.930
	25M	QPSK		23.750	24.770
		16QAM		23.733	25.730
	20M	QPSK		18.939	19.840
		16QAM		18.979	19.840
	15M	QPSK		14.129	14.790
		16QAM		14.098	14.780
	10M	QPSK		9.293	9.854
		16QAM		9.318	9.828
	5M	QPSK		4.476	4.916
		16QAM		4.480	4.877

8.3.1. OCCUPIED BANDWIDTH RESULT

WCDMA Band 2

Band 2	 Center Freq: 1.880000 GHz #Res BW 51 kHz #VBW 160 kHz Span 10.00 MHz Sweep 5 ms Ref 30.00 dBm Occupied Bandwidth 4.1413 MHz Total Power 29.4 dBm Transmit Freq Error 747 Hz % of OBW Power 99.00 % x dB Bandwidth 4.629 MHz x dB -26.00 dB Radio Device: BTS
Band 2	 Center Freq: 1.880000000 GHz #Res BW 51 kHz #VBW 160 kHz Span 10 MHz Sweep 5 ms Ref 30.00 dBm Occupied Bandwidth 4.1969 MHz Total Power 28.2 dBm Transmit Freq Error 3.528 kHz OBW Power 99.00 % x dB Bandwidth 4.636 MHz x dB -26.00 dB Radio Device: BTS

LTE Band 25





NR Band n25 CP-OFDM





8.4. BAND EDGE EMISSIONS

RULE PART

FCC: §24.238

LIMITS

§24.238

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.

WCDMA/LTE/5G NR

- a) Set the RBW = 1 - 1.5 % of OBW (Typically limited to a minimum RBW of 1% of the OBW) / within 1 MHz from the edge of the authorized frequency block/band.
- b) Set the RBW = 1 MHz / above 1 MHz from the edge of the authorized frequency block/band.
- c) Set VBW $\geq 3 \times$ RBW;
- d) Set span $\geq 2 \times$ OBW;
- e) Sweep time = Auto;
- f) Detector = RMS;
- g) Ensure that the number of measurement points $\geq 2 \times$ span/RBW;
- h) 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

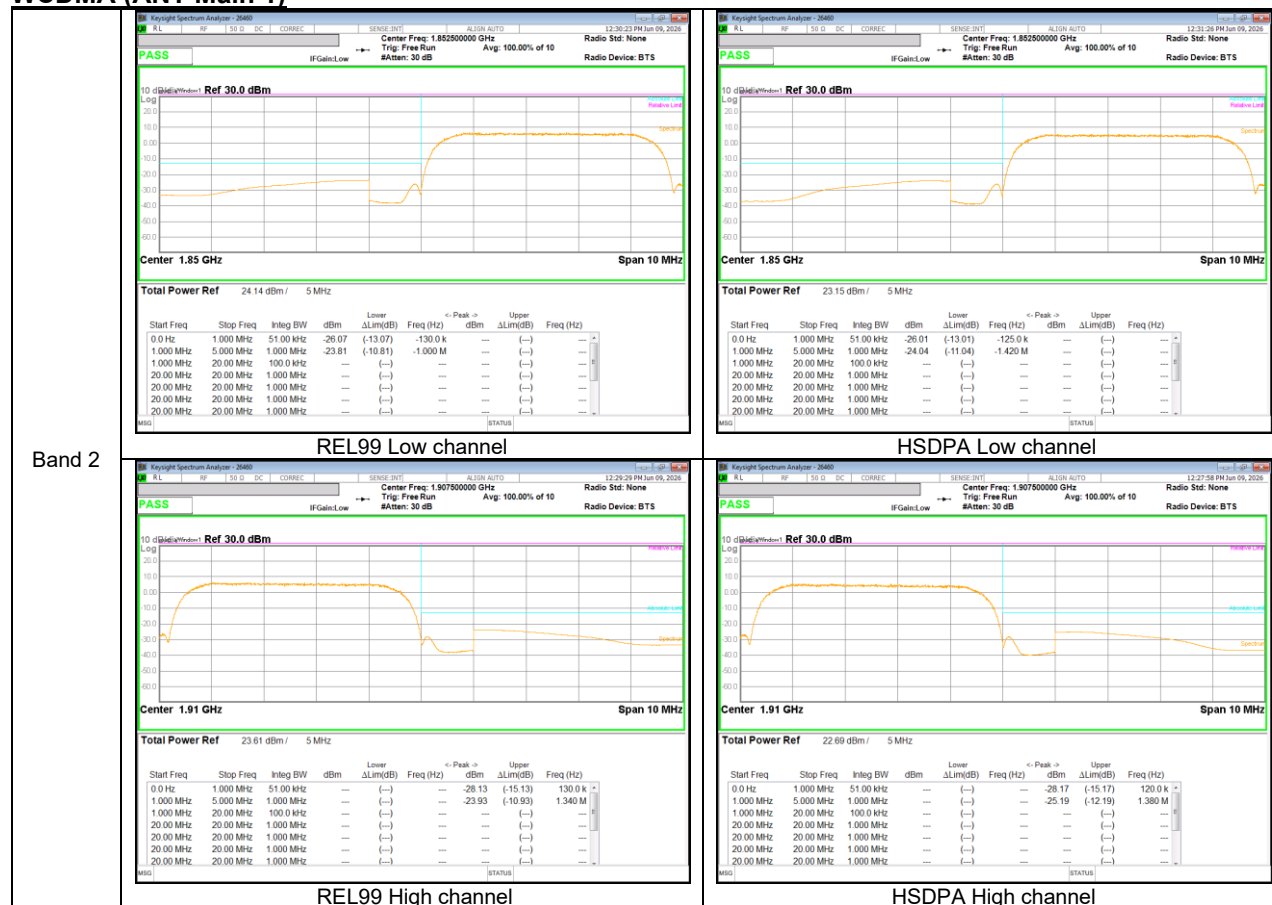
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

See the following pages.

8.4.1. BAND EDGE RESULT

WCDMA (ANT Main 1)



LTE Band 25 (ANT Main 1)



