

CERTIFICATION TEST REPORT

Report Number. : S-4792147575-E3V2

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

Model : SM-F971U, SM-F971U1

FCC ID : A3LSMF971U

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

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

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Prepared by:
UL KOREA LTD.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL KOREA LTD. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2026-04-17	Initial issue	Yeonghwan Hong
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

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

MODEL NUMBER: SM-F971U, SM-F971U1

SERIAL NUMBER: 9ac255adee507ece, 9ac30a91404d7ece, 9ac30a91824d7ece, 9ac30a90044d7ece, 9bc22e08ee4f7ece, 9bb3df7c2c4f7ece (CONDUCTED); R3GL10KMCMT, R3GL20D3TMF, R3GL20D3TNY, R3GL20D3P4X, R3GL10KMF3N (RADIATED)

DATE TESTED: 2026-02-24 – 2026-04-17

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 24E	Complies

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

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

Approved & Released For
UL KOREA LTD. By:

Tested By:



Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Yeonghwan Hong
Suwon Lab Engineer
UL KOREA LTD.

2. TEST METHODOLOGY

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

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

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%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Clause 4.3.3 in IEC Guide 115:2023.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax/be, NFC, WPT, UWB and NB NTN. This test report addresses the WWAN Operational mode.

Representative model	Comparison Criteria	Derivative model
		SM-F971U1
SM-F971U	Hardware	Identical
	Software	UI modified according to Service Provider specifications

The SM-F971U model was used as the representative model for final testing. All test results in this report apply to both the representative model and its derivative variants.

5.2. MAXIMUM OUTPUT POWER

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

GSM

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted Power (ANT B)		EIRP (ANT B)	
			Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
GSM 1900	1850.20 - 1909.80	GPRS	30.64	1.159	31.69	1.476
		EGPRS	26.20	0.417	31.49	1.409

WCDMA

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted Power (ANT F)		EIRP (ANT F)	
			Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
Band 2	1852.40 - 1907.60	Rel. 99	24.30	0.269	22.45	0.176
		HSDPA	23.21	0.209	21.05	0.127

LTE Band 25

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted Power (ANT B)		EIRP (ANT B)	
				Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
Band 25	1860.00 - 1905.00	20	QPSK	24.67	0.293	24.86	0.306
			16QAM	23.90	0.245	24.50	0.282
			64QAM	22.80	0.191		
			256QAM	19.98	0.100		
	1857.50 - 1907.50	15	QPSK	24.75	0.299	24.85	0.305
			16QAM	23.87	0.244	24.55	0.285
			64QAM	22.97	0.198		
			256QAM	19.93	0.098		
	1855.00 - 1910.00	10	QPSK	24.54	0.284	24.75	0.299
			16QAM	23.70	0.234	24.38	0.274
			64QAM	22.87	0.194		
			256QAM	19.78	0.095		
	1852.50 - 1912.50	5	QPSK	24.78	0.301	24.99	0.316
			16QAM	23.89	0.245	24.34	0.272
			64QAM	22.96	0.198		
			256QAM	19.78	0.095		
	1851.50 - 1913.50	3	QPSK	24.60	0.288	24.81	0.303
			16QAM	23.85	0.243	24.52	0.283
			64QAM	22.86	0.193		
			256QAM	19.85	0.097		
	1850.70 - 1914.30	1.4	QPSK	24.60	0.288	24.73	0.297
			16QAM	24.00	0.251	24.68	0.294
			64QAM	22.98	0.199		
			256QAM	19.73	0.094		
FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted Power (ANT F)		EIRP (ANT F)	
				Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
Band 25	1860.00 - 1905.00	20	QPSK	24.87	0.307	23.81	0.240
			16QAM	23.99	0.251	22.81	0.191
			64QAM	23.00	0.200		
			256QAM	19.93	0.098		
	1857.50 - 1907.50	15	QPSK	24.95	0.313	23.64	0.231
			16QAM	23.80	0.240	22.49	0.177
			64QAM	22.91	0.195		
			256QAM	19.95	0.099		
	1855.00 - 1910.00	10	QPSK	24.74	0.298	23.70	0.234
			16QAM	23.90	0.245	22.72	0.187
			64QAM	22.97	0.198		
			256QAM	19.98	0.100		
	1852.50 - 1912.50	5	QPSK	24.98	0.315	23.94	0.248
			16QAM	23.95	0.248	22.68	0.185
			64QAM	22.99	0.199		
			256QAM	19.98	0.100		
	1851.50 - 1913.50	3	QPSK	24.80	0.302	23.76	0.238
			16QAM	23.96	0.249	22.78	0.190
			64QAM	22.98	0.199		
			256QAM	19.98	0.100		
	1850.70 - 1914.30	1.4	QPSK	24.80	0.302	23.68	0.233
			16QAM	24.00	0.251	22.82	0.191
			64QAM	22.98	0.199		
			256QAM	19.93	0.098		

NR Band n25

FCC Part 24											
Band	Frequency Range [MHz]	BandWidth	Modulation	Mode	Conducted Power (ANT B)		EIRP (ANT B)				
		[MHz]			Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]			
n25	1870.00 - 1895.00	40	DFT-s OFDM	π/2 BPSK	24.85	0.305					
				QPSK	24.89	0.308	25.35	0.343			
				16QAM	23.71	0.235	24.02	0.252			
				64QAM	22.39	0.173					
			CP-OFDM	256QAM	19.80	0.095					
				QPSK	22.88	0.194					
				16QAM	22.15	0.164					
				64QAM	20.52	0.113					
	1867.50 - 1897.50	35	DFT-s OFDM	256QAM	17.62	0.058					
				π/2 BPSK	24.66	0.292					
				QPSK	24.70	0.295	24.83	0.304			
				16QAM	23.46	0.222	23.44	0.221			
			CP-OFDM	64QAM	22.33	0.171					
				256QAM	19.57	0.091					
				QPSK	23.33	0.215					
				π/2 BPSK	24.75	0.299					
	1865.00 - 1900.00	30	DFT-s OFDM	QPSK	24.74	0.298	24.83	0.304			
				16QAM	23.55	0.226	23.44	0.221			
				64QAM	22.38	0.173					
				256QAM	19.68	0.093					
			CP-OFDM	QPSK	23.37	0.217					
				1862.50 - 1902.50	25	DFT-s OFDM	π/2 BPSK	24.79	0.301		
							QPSK	24.72	0.296	24.83	0.304
							16QAM	23.56	0.227	23.62	0.230
	64QAM	22.34	0.171								
	CP-OFDM	256QAM	19.61			0.091					
		QPSK	23.33			0.215					
		1860.00 - 1905.00	20			DFT-s OFDM	π/2 BPSK	24.69	0.294		
							QPSK	24.72	0.296	24.76	0.299
	16QAM			23.46	0.222		23.40	0.219			
	64QAM			22.27	0.169						
	CP-OFDM			256QAM	19.60	0.091					
				QPSK	23.30	0.214					
				1857.50 - 1907.50	15	DFT-s OFDM	π/2 BPSK	24.75	0.299		
							QPSK	24.81	0.303	24.83	0.304
	16QAM	23.57	0.228				23.44	0.221			
	64QAM	22.44	0.175								
	CP-OFDM	256QAM	19.72			0.094					
		QPSK	23.42			0.220					
		1855.00 - 1910.00	10			DFT-s OFDM	π/2 BPSK	24.77	0.300		
							QPSK	24.79	0.301	24.82	0.303
	16QAM			23.52	0.225		23.36	0.217			
	64QAM			22.38	0.173						
	CP-OFDM			256QAM	19.67	0.093					
				QPSK	23.30	0.214					
				1852.50 - 1912.50	5	DFT-s OFDM	π/2 BPSK	24.87	0.307		
							QPSK	24.89	0.308	24.67	0.293
	16QAM	23.56	0.227				23.39	0.218			
	64QAM	22.44	0.175								
	CP-OFDM	256QAM	19.74			0.094					
		QPSK	23.33			0.215					

FCC Part 24								
Band	Frequency Range [MHz]	BandWidth	Modulation	Mode	Conducted Power (ANT F)		EIRP (ANT F)	
		[MHz]			Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]
n25	1870.00 - 1895.00	40	DFT-s OFDM	π/2 BPSK	24.61	0.289		
				QPSK	24.63	0.290	24.05	0.254
				16QAM	23.44	0.221	23.37	0.217
				64QAM	22.14	0.164		
				256QAM	19.40	0.087		
			CP-OFDM	QPSK	22.73	0.187		
				16QAM	22.08	0.161		
				64QAM	20.72	0.118		
				256QAM	17.59	0.057		
	1867.50 - 1897.50	35	DFT-s OFDM	π/2 BPSK	24.71	0.296		
				QPSK	24.68	0.294	24.10	0.257
				16QAM	23.45	0.221	23.33	0.215
				64QAM	22.22	0.167		
				256QAM	19.43	0.088		
			CP-OFDM	QPSK	23.23	0.210		
	1865.00 - 1900.00	30	DFT-s OFDM	π/2 BPSK	24.63	0.290		
				QPSK	24.65	0.292	24.06	0.255
				16QAM	23.45	0.221	23.38	0.218
				64QAM	22.32	0.171		
				256QAM	19.61	0.091		
			CP-OFDM	QPSK	23.28	0.213		
	1862.50 - 1902.50	25	DFT-s OFDM	π/2 BPSK	24.76	0.299		
				QPSK	24.75	0.299	24.17	0.261
				16QAM	23.53	0.225	23.46	0.222
				64QAM	22.32	0.171		
				256QAM	19.60	0.091		
			CP-OFDM	QPSK	23.25	0.211		
	1860.00 - 1905.00	20	DFT-s OFDM	π/2 BPSK	24.74	0.298		
				QPSK	24.92	0.310	24.34	0.272
				16QAM	23.52	0.225	23.44	0.221
				64QAM	22.35	0.172		
				256QAM	19.65	0.092		
			CP-OFDM	QPSK	23.28	0.213		
	1857.50 - 1907.50	15	DFT-s OFDM	π/2 BPSK	24.73	0.297		
				QPSK	24.72	0.296	24.14	0.259
				16QAM	23.60	0.229	23.53	0.225
				64QAM	22.34	0.171		
				256QAM	19.72	0.094		
CP-OFDM			QPSK	23.37	0.217			
1855.00 - 1910.00	10	DFT-s OFDM	π/2 BPSK	24.65	0.292			
			QPSK	24.76	0.299	24.18	0.262	
			16QAM	23.62	0.230	23.55	0.226	
			64QAM	22.32	0.171			
			256QAM	19.62	0.092			
		CP-OFDM	QPSK	23.21	0.209			
1852.50 - 1912.50	5	DFT-s OFDM	π/2 BPSK	24.74	0.298			
			QPSK	24.77	0.300	23.80	0.240	
			16QAM	23.56	0.227	23.40	0.219	
			64QAM	22.31	0.170			
			256QAM	19.70	0.093			
		CP-OFDM	QPSK	23.23	0.210			

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	B	-1.2
	F	-3.7

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 Device Hopping conditions.**
Only the Tx trigger is different and there is no difference in the results regarding the method. It has been verified. Tx Device Hopping can be implemented through the application provided by the manufacturer.

Band	Antenna Switching
LTE B2, B25	Tx Device Hopping

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

Band	Main ANT	Tune up Limit (dBm)	Sub ANT	Tune up Limit (dBm)
LTE B25	B	25.0	F	25.2

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 B, F)

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 measured on $\pi/2$ BPSK, QPSK, 16QAM, 64QAM and 256QAM modulations.

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 B4/5/12/13/14/30/48/66	<u>Stand Alone</u>
n25	LTE B12	<u>Stand Alone</u>

- As for the Antenna Switching supported Tx Device Hopping conditions.
Only the Tx trigger is different and there is no difference in the results regarding the method. It has been verified. Tx Device Hopping can be implemented through the application provided by the manufacturer.

Band	Antenna Switching
NR n2, n25	Tx Device Hopping

- The RF port of NR Band n25 was tested on all antennas and reported as 'Sub ANT' because the output power 'Sub ANT' is same to or higher than 'Main ANT'.
- So the test case is as below.

Band	Main ANT	Tune up Limit (dBm)	Sub ANT	Tune up Limit (dBm)
NR n25	B	25.0	<u>F</u>	<u>25.2</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 Band n2 (ANT B, F)

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

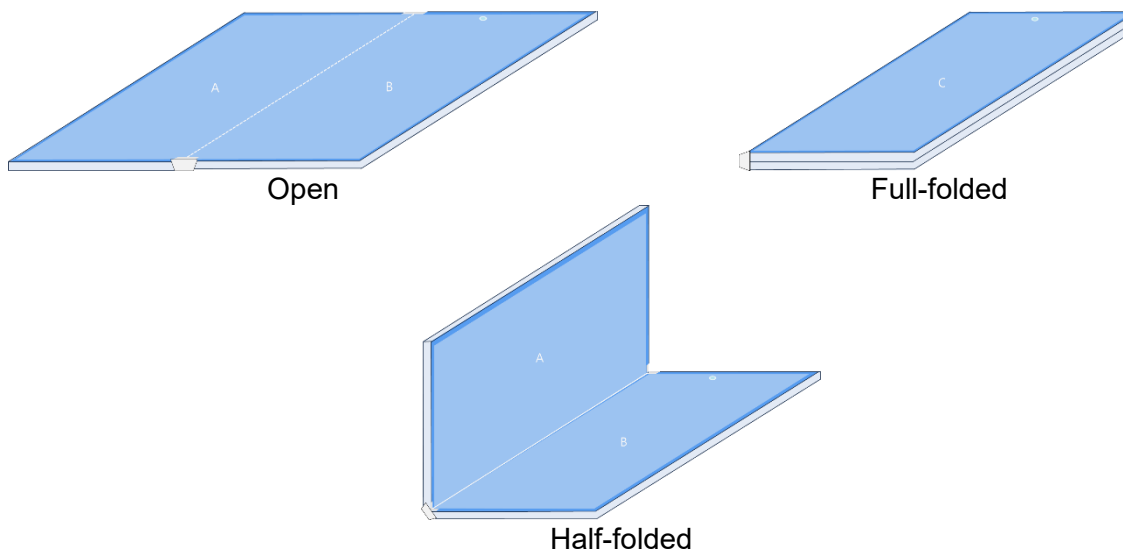
Highest conducted output power setting for each bands						
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	F	1852.50	5	QPSK	1	12
		1882.50			1	24
		1912.50			1	24
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	F	1860.00	20	DFT-s OFDM QPSK	1	104
		1882.50			1	104
		1905.00			1	104

● Radiated Spurious Emission

Highest EIRP setting for each bands						
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	B	1852.50	5	QPSK	1	12
		1882.50			1	24
		1912.50			1	24
	F	1852.50	5	QPSK	1	12
		1882.50			1	24
		1912.50			1	24
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
25	B	1870.00	40	DFT-s OFDM QPSK	1	1
		1882.50			1	1
		1895.00			1	1
	F	1860.00	20	DFT-s OFDM QPSK	1	104
		1882.50			1	104
		1905.00			1	104

Note1 : for radiated emission testing, EN-DC mode was investigated in simultaneous mode. There was no discernible difference in the spurious emission levels when using different LTE and FR1 anchor bands.

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



Band	ANT	EIRP			RSE		
		X	Y	Z	X	Y	Z
GSM 1900	B	Open	-	-	Full-folded	-	-
WCDMA B2	F	Open	-	-	Open	-	-
LTE B25	B	Open	-	-	Full-folded	-	-
	F	Open	-	-	Open	-	-
NR n25	B	Open	-	-	-	-	Full-folded
	F	Open	-	-	Open	-	-

Note1 : For the radiated spurious testing, the EUT attached with travel adapter for the worst case condition. The EUT is continuously communicated with the call box during the tests.

Note2 : Antenna switching-related actions according to foldable conditions were force operated and tested in factory mode.

Note 3: In this report, HF and FF denote Half-folded and Full-folded configurations, respectively.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N3FS0G88DK3	N/A
Data Cable	SAMSUNG	N/A	N/A	N/A

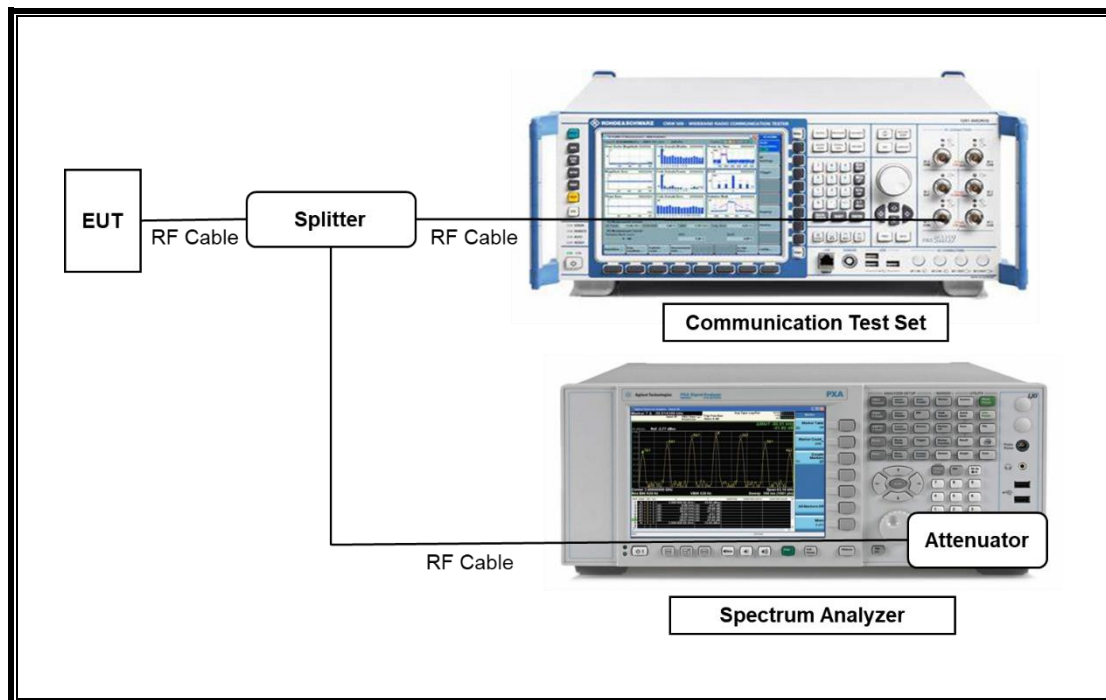
I/O CABLE

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

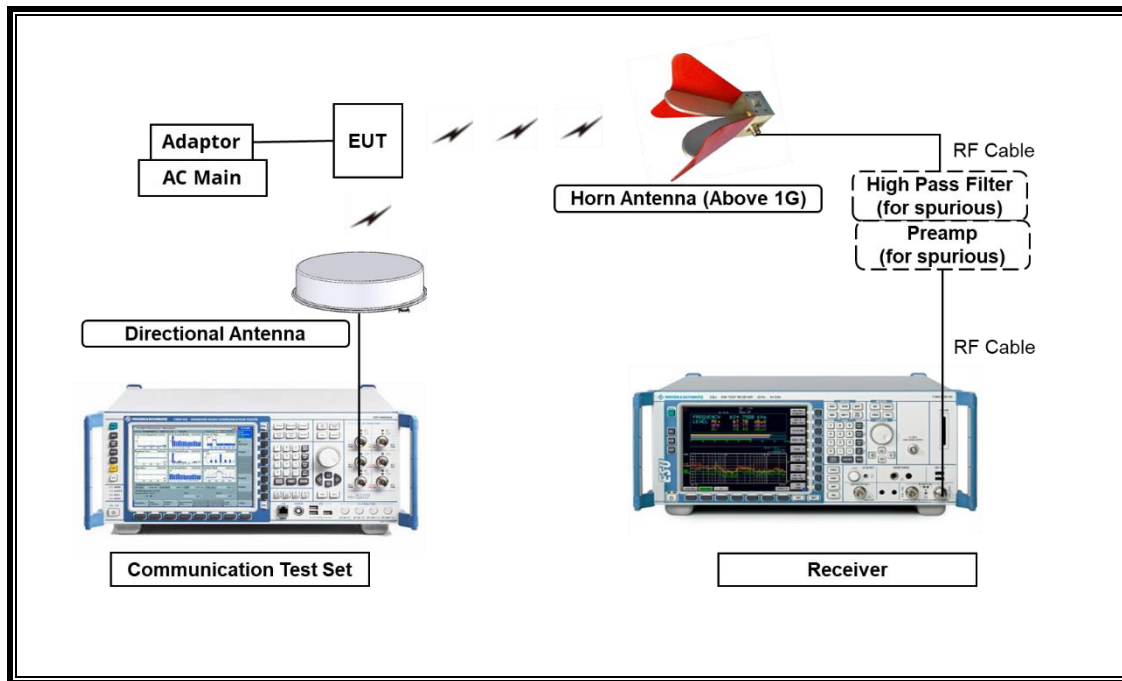
TEST SETUP

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

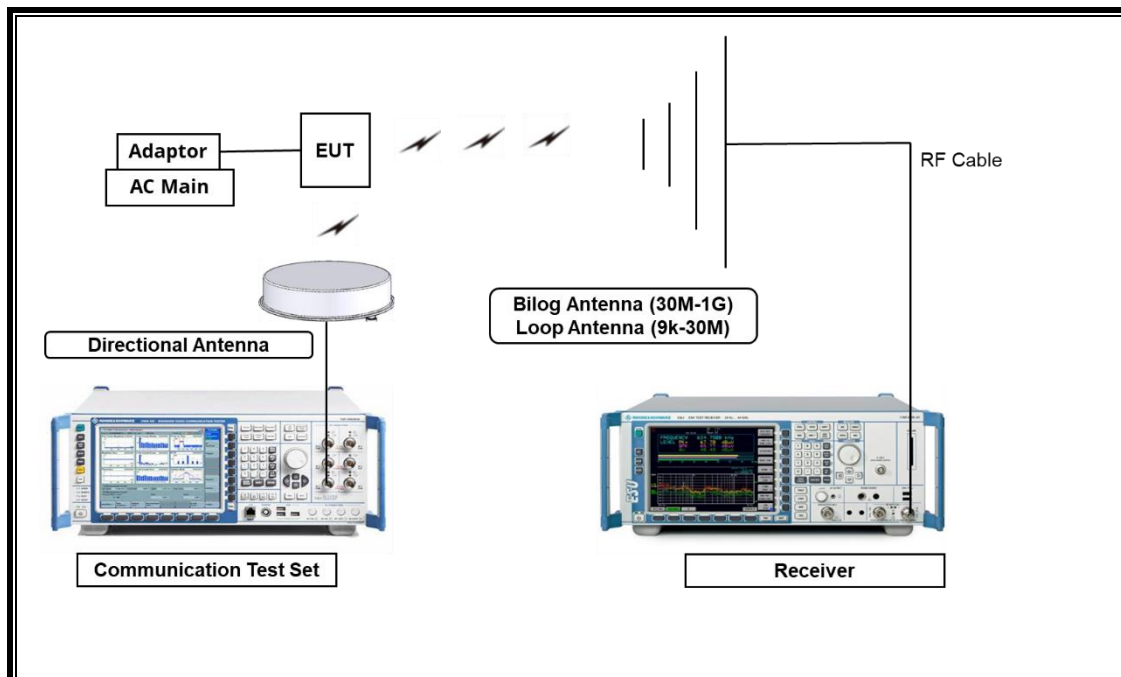
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



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
UXM5G 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

GSM (ANT B)

Mode	Coding Scheme	Time Slots	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	30.60	21.41
			30.31	21.12
			30.36	21.17
GPRS (GMSK)	CS1	1	30.64	21.45
			30.38	21.19
			30.44	21.25
		2	28.37	22.19
			27.91	21.73
			27.70	21.52
		3	27.15	22.73
			26.82	22.40
			26.91	22.49
		4	25.31	22.14
			24.74	21.57
			24.72	21.55
EGPRS (8PSK)	MCS5	1	26.20	17.01
			25.91	16.72
			25.76	16.57
		2	24.05	17.87
			23.86	17.68
			23.64	17.46
		3	22.64	18.22
			22.43	18.01
			22.18	17.76
		4	21.42	18.25
			21.41	18.24
			21.21	18.04

WCDMA B2 (ANT F)

Mode		UL Ch No.	Freq. (MHz)	Measured Pwr
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	24.30
		9400	1880.0	24.21
		9538	1907.6	24.20
HSDPA	Subtest 1	9262	1852.4	23.21
		9400	1880.0	23.17
		9538	1907.6	23.13
	Subtest 2	9262	1852.4	23.04
		9400	1880.0	23.02
		9538	1907.6	23.01
	Subtest 3	9262	1852.4	22.52
		9400	1880.0	22.50
		9538	1907.6	22.48
	Subtest 4	9262	1852.4	22.42
		9400	1880.0	22.44
		9538	1907.6	22.47
HSUPA	Subtest 1	9262	1852.4	23.35
		9400	1880.0	23.16
		9538	1907.6	23.20
	Subtest 2	9262	1852.4	21.27
		9400	1880.0	21.25
		9538	1907.6	21.18
	Subtest 3	9262	1852.4	22.31
		9400	1880.0	22.20
		9538	1907.6	22.21
	Subtest 4	9262	1852.4	21.25
		9400	1880.0	21.19
		9538	1907.6	21.26
	Subtest 5	9262	1852.4	23.22
		9400	1880.0	23.28
		9538	1907.6	23.27
DC-HSDPA	Subtest 1	9262	1852.4	23.19
		9400	1880.0	23.15
		9538	1907.6	23.20
	Subtest 2	9262	1852.4	23.24
		9400	1880.0	23.14
		9538	1907.6	23.28
	Subtest 3	9262	1852.4	22.76
		9400	1880.0	22.72
		9538	1907.6	22.75
	Subtest 4	9262	1852.4	22.82
		9400	1880.0	22.67
		9538	1907.6	22.74

LTE Band 25 (ANT B)

BW (MHz)	Mode	RB Allocation	RB offset	26140	26365	26590
				1860.00 MHz	1882.50 MHz	1905.00 MHz
20 MHz	QPSK	1	0	24.40	24.59	24.47
		1	49	24.51	24.18	24.65
		1	99	24.62	24.67	24.59
		100	0	23.50	23.51	23.53
	16QAM	1	0	23.37	23.46	23.82
		1	49	23.57	23.83	23.64
		1	99	23.90	23.53	23.79
		100	0	22.38	22.76	22.57
	64QAM	1	0	22.67	22.80	22.70
		1	49	22.31	22.60	22.79
		1	99	22.31	22.71	22.55
		100	0	21.37	21.42	21.52
	256QAM	1	0	19.28	19.46	19.49
		1	49	19.59	19.73	19.98
		1	99	19.62	19.39	19.33
		100	0	19.38	19.46	19.59
BW (MHz)	Mode	RB Allocation	RB offset	26115	26365	26615
				1857.50 MHz	1882.50 MHz	1907.50 MHz
15 MHz	QPSK	1	0	24.38	24.46	24.44
		1	37	24.33	24.75	24.35
		1	74	24.09	24.37	24.48
		75	0	23.43	23.53	23.60
	16QAM	1	0	23.54	23.60	23.33
		1	37	23.48	23.44	23.87
		1	74	23.00	23.47	23.24
		75	0	22.42	22.55	22.54
	64QAM	1	0	22.81	22.96	22.70
		1	37	22.32	22.48	22.56
		1	74	22.97	22.60	22.71
		75	0	21.41	21.51	21.53
	256QAM	1	0	19.21	19.13	19.93
		1	37	19.35	19.90	19.62
		1	74	19.08	19.75	19.35
		75	0	19.39	19.57	19.64
BW (MHz)	Mode	RB Allocation	RB offset	26090	26365	26640
				1855.00 MHz	1882.50 MHz	1910.00 MHz
10 MHz	QPSK	1	0	24.50	24.17	24.42
		1	25	24.25	24.44	24.41
		1	49	24.27	24.24	24.54
		50	0	23.40	23.48	23.38
	16QAM	1	0	23.63	23.46	23.34
		1	25	23.56	23.23	23.70
		1	49	23.53	23.41	23.46
		50	0	22.42	22.72	22.47
	64QAM	1	0	22.35	22.33	22.87
		1	25	22.76	22.77	22.46
		1	49	22.81	22.05	22.37
		50	0	21.47	21.47	21.54
	256QAM	1	0	19.53	19.54	19.54
		1	25	19.13	19.75	19.33
		1	49	19.62	19.78	19.34
		50	0	19.27	19.47	19.58

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	24.37	24.57
		1	12	24.39	24.58	24.50
		1	24	24.37	24.68	24.78
		25	0	23.35	23.37	23.52
	16QAM	1	0	23.69	23.75	23.66
		1	12	23.83	23.89	23.48
		1	24	23.50	23.68	23.51
		25	0	22.32	22.58	22.51
	64QAM	1	0	22.20	22.43	22.79
		1	12	22.11	22.96	22.63
		1	24	22.69	22.57	22.89
		25	0	21.43	21.42	21.58
	256QAM	1	0	19.61	19.73	19.48
		1	12	19.61	19.71	19.64
		1	24	19.53	19.78	19.16
		25	0	19.43	19.64	19.54
BW (MHz)	Mode	RB Allocation	RB offset	26055	26365	26675
				1851.50 MHz	1882.50 MHz	1913.50 MHz
3 MHz	QPSK	1	0	24.32	24.32	24.21
		1	8	24.35	24.60	24.52
		1	14	24.26	24.60	24.60
		15	0	23.32	23.51	23.41
	16QAM	1	0	23.43	23.71	23.65
		1	8	23.55	23.85	23.76
		1	14	23.12	23.34	23.84
		15	0	22.27	22.46	22.44
	64QAM	1	0	22.69	22.86	22.74
		1	8	22.60	22.81	22.78
		1	14	22.57	22.52	22.66
		15	0	21.38	21.43	21.47
	256QAM	1	0	19.72	19.09	19.85
		1	8	19.78	19.62	19.50
		1	14	19.56	19.55	19.75
		15	0	19.24	19.61	19.35
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	24.35	24.17	24.25
		1	3	24.20	24.60	24.52
		1	5	24.19	24.50	24.08
		6	0	23.17	23.33	23.37
	16QAM	1	0	23.59	23.54	24.00
		1	3	23.27	23.64	23.80
		1	5	23.31	23.51	23.45
		6	0	22.34	22.42	22.47
	64QAM	1	0	22.78	22.38	22.98
		1	3	22.60	22.84	22.61
		1	5	22.72	22.88	22.33
		6	0	21.27	21.39	21.49
	256QAM	1	0	19.14	19.73	19.64
		1	3	19.49	19.53	19.40
		1	5	19.67	19.67	19.29
		6	0	19.14	19.45	19.45

LTE Band 25 (ANT F)

BW (MHz)	Mode	RB Allocation	RB offset	26140	26365	26590
				1860.00 MHz	1882.50 MHz	1905.00 MHz
20 MHz	QPSK	1	0	24.60	24.79	24.67
		1	49	24.71	24.38	24.85
		1	99	24.82	24.87	24.79
		100	0	23.70	23.71	23.73
	16QAM	1	0	23.57	23.66	23.68
		1	49	23.77	23.81	23.84
		1	99	23.87	23.73	23.99
		100	0	22.58	22.96	22.77
	64QAM	1	0	22.87	23.00	22.90
		1	49	22.51	22.80	22.99
		1	99	22.51	22.91	22.75
		100	0	21.57	21.62	21.72
	256QAM	1	0	19.48	19.66	19.69
		1	49	19.79	19.93	19.89
		1	99	19.82	19.59	19.53
		100	0	19.58	19.66	19.79
BW (MHz)	Mode	RB Allocation	RB offset	26115	26365	26615
				1857.50 MHz	1882.50 MHz	1907.50 MHz
15 MHz	QPSK	1	0	24.58	24.66	24.64
		1	37	24.53	24.95	24.55
		1	74	24.29	24.57	24.68
		75	0	23.63	23.73	23.80
	16QAM	1	0	23.74	23.80	23.53
		1	37	23.68	23.64	23.67
		1	74	23.20	23.67	23.44
		75	0	22.62	22.75	22.74
	64QAM	1	0	22.91	22.87	22.90
		1	37	22.52	22.69	22.76
		1	74	22.86	22.80	22.91
		75	0	21.61	21.71	21.73
	256QAM	1	0	19.41	19.33	19.38
		1	37	19.55	19.76	19.82
		1	74	19.28	19.95	19.55
		75	0	19.59	19.77	19.84
BW (MHz)	Mode	RB Allocation	RB offset	26090	26365	26640
				1855.00 MHz	1882.50 MHz	1910.00 MHz
10 MHz	QPSK	1	0	24.70	24.37	24.62
		1	25	24.45	24.64	24.61
		1	49	24.47	24.44	24.74
		50	0	23.60	23.68	23.58
	16QAM	1	0	23.83	23.66	23.54
		1	25	23.76	23.43	23.90
		1	49	23.73	23.61	23.66
		50	0	22.62	22.92	22.67
	64QAM	1	0	22.55	22.53	22.51
		1	25	22.96	22.97	22.66
		1	49	22.49	22.25	22.57
		50	0	21.67	21.67	21.74
	256QAM	1	0	19.73	19.74	19.74
		1	25	19.33	19.95	19.87
		1	49	19.82	19.98	19.54
		50	0	19.47	19.67	19.78

BW (MHz)	Mode	RB Allocation	RB offset	26065	26365	26665
				1852.50 MHz	1882.50 MHz	1912.50 MHz
5 MHz	QPSK	1	0	24.58	24.57	24.77
		1	12	24.59	24.78	24.70
		1	24	24.57	24.88	24.98
		25	0	23.55	23.57	23.72
	16QAM	1	0	23.89	23.95	23.86
		1	12	23.71	23.73	23.68
		1	24	23.70	23.88	23.71
		25	0	22.52	22.78	22.71
	64QAM	1	0	22.40	22.63	22.99
		1	12	22.31	22.69	22.83
		1	24	22.89	22.77	22.84
		25	0	21.63	21.62	21.78
	256QAM	1	0	19.81	19.93	19.68
		1	12	19.81	19.91	19.84
		1	24	19.73	19.98	19.36
		25	0	19.63	19.84	19.74
BW (MHz)	Mode	RB Allocation	RB offset	26055	26365	26675
				1851.50 MHz	1882.50 MHz	1913.50 MHz
3 MHz	QPSK	1	0	24.52	24.52	24.41
		1	8	24.55	24.80	24.72
		1	14	24.46	24.80	24.80
		15	0	23.52	23.71	23.61
	16QAM	1	0	23.63	23.91	23.85
		1	8	23.75	23.91	23.96
		1	14	23.32	23.54	23.64
		15	0	22.47	22.66	22.64
	64QAM	1	0	22.89	22.92	22.94
		1	8	22.80	22.87	22.98
		1	14	22.77	22.72	22.86
		15	0	21.58	21.63	21.67
	256QAM	1	0	19.92	19.29	19.87
		1	8	19.98	19.82	19.70
		1	14	19.76	19.75	19.95
		15	0	19.44	19.81	19.55
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	24.55	24.37	24.45
		1	3	24.40	24.80	24.72
		1	5	24.39	24.70	24.28
		6	0	23.37	23.53	23.57
	16QAM	1	0	23.79	23.74	23.83
		1	3	23.47	23.84	24.00
		1	5	23.51	23.71	23.65
		6	0	22.54	22.62	22.67
	64QAM	1	0	22.98	22.58	22.72
		1	3	22.80	22.79	22.81
		1	5	22.92	22.73	22.53
		6	0	21.47	21.59	21.69
	256QAM	1	0	19.34	19.93	19.84
		1	3	19.69	19.73	19.60
		1	5	19.87	19.87	19.49
		6	0	19.34	19.65	19.65

NR Band n25 (ANT B)

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	23.43	23.61	23.38
			1	1	24.74	24.63	24.85
			1	107	24.46	24.30	24.56
			1	214	24.36	24.15	24.47
			1	215	23.29	23.27	23.29
			216	0	23.47	23.40	23.64
		QPSK	1	0	23.17	23.12	22.99
			1	1	24.73	24.57	24.89
			1	107	24.52	24.27	24.63
			1	214	24.41	24.19	24.52
			1	215	22.84	22.88	22.84
			216	0	23.50	23.43	23.67
		16QAM	1	0	22.14	22.02	21.79
			1	1	23.42	23.46	23.71
			1	107	23.29	23.16	23.44
			1	214	23.21	23.01	23.29
			1	215	21.85	21.78	21.68
			216	0	21.97	21.96	21.92
		64QAM	1	1	22.33	22.18	22.39
		256QAM	1	1	19.65	19.44	19.80
	CP-OFDM	QPSK	1	0	21.15	21.28	21.32
			1	1	22.67	22.88	22.77
			1	107	22.42	22.70	22.62
			1	214	22.52	22.81	22.69
			1	215	20.91	21.22	21.13
			216	0	21.09	21.05	21.01
		16QAM	1	0	21.09	21.03	20.94
			1	1	22.15	21.94	21.80
			1	107	21.94	21.86	21.81
			1	214	22.03	21.80	21.69
			1	215	20.93	20.85	20.87
			216	0	20.98	20.98	20.94
		64QAM	1	1	20.24	20.52	20.21
		256QAM	1	1	17.62	17.36	16.99
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	23.59	23.62	23.29
			1	1	24.66	24.55	24.29
			1	93	24.61	24.40	24.32
			1	186	24.38	24.18	24.12
			1	187	23.38	23.27	23.25
			180	0	23.57	23.37	23.29
		QPSK	1	0	23.23	23.10	23.05
			1	1	24.70	24.49	24.35
			1	93	24.64	24.46	24.37
			1	186	24.30	24.22	24.15
			1	187	22.98	22.83	23.00
			180	0	23.53	23.40	23.37
		16QAM	1	1	23.46	23.37	23.01
			1	93	23.36	23.08	23.13
			1	186	23.09	22.98	22.97
		64QAM	1	1	22.33	22.12	22.09
		256QAM	1	1	19.57	19.36	19.27
	CP-OFDM	QPSK	1	1	23.33	23.05	23.08

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	23.75	23.46	23.40
			1	1	24.75	24.52	24.31
			1	79	24.60	24.27	24.19
			1	158	24.44	24.25	24.14
			1	159	23.41	23.39	23.27
		QPSK	160	0	23.58	23.37	23.30
			1	0	23.26	23.16	23.00
			1	1	24.74	24.50	24.37
			1	79	24.63	24.35	24.23
			1	158	24.39	24.31	24.21
			1	159	23.10	22.99	22.91
			160	0	23.65	23.45	23.24
		16QAM	1	1	23.55	23.33	23.13
			1	79	23.46	23.12	23.02
			1	158	23.05	23.10	22.99
		64QAM	1	1	22.38	22.18	22.09
		256QAM	1	1	19.68	19.40	19.30
	CP-OFDM	QPSK	1	1	23.37	23.10	23.01
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	23.85	23.54	23.49
			1	1	24.79	24.50	24.35
			1	66	24.63	24.36	24.26
			1	131	24.44	24.28	24.22
			1	132	23.54	23.51	23.29
		QPSK	128	0	23.60	23.32	23.25
			1	0	23.46	23.18	23.12
			1	1	24.72	24.53	24.37
			1	66	24.70	24.35	24.31
			1	131	24.49	24.28	24.20
			1	132	23.15	22.98	22.93
			128	0	23.59	23.35	23.27
		16QAM	1	1	23.56	23.21	23.31
			1	66	23.50	23.07	23.02
			1	131	23.22	23.13	23.05
		64QAM	1	1	22.34	22.14	22.04
		256QAM	1	1	19.61	19.47	19.32
	CP-OFDM	QPSK	1	1	23.33	23.19	22.92
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	23.75	23.43	23.39
			1	1	24.69	24.36	24.37
			1	52	24.63	24.22	24.29
			1	104	24.55	24.29	24.26
			1	105	23.54	23.50	23.33
		QPSK	100	0	23.65	23.45	23.26
			1	0	23.37	22.96	22.90
			1	1	24.72	24.44	24.29
			1	52	24.65	24.38	24.29
			1	104	24.56	24.41	24.30
			1	105	23.12	22.97	22.82
			100	0	23.62	23.37	23.25
		16QAM	1	1	23.40	23.20	23.06
			1	52	23.46	23.05	22.95
			1	104	23.28	23.17	23.09
		64QAM	1	1	22.27	22.00	21.90
		256QAM	1	1	19.60	19.34	19.27
	CP-OFDM	QPSK	1	1	23.30	23.03	22.94

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	23.67	23.44	23.33
			1	1	24.75	24.52	24.30
			1	39	24.64	24.42	24.11
			1	77	24.55	24.36	24.17
			1	78	23.55	23.63	23.36
			75	0	23.70	23.33	23.34
		QPSK	1	0	23.40	23.08	22.89
			1	1	24.81	24.54	24.37
			1	39	24.65	24.32	24.28
			1	77	24.57	24.30	24.29
			1	78	23.11	23.03	22.88
			75	0	23.70	23.39	23.27
		16QAM	1	1	23.57	23.11	23.00
			1	39	23.48	23.11	23.03
			1	77	23.41	23.15	23.13
		64QAM	1	1	22.44	22.02	21.85
		256QAM	1	1	19.72	19.45	19.32
	CP-OFDM	QPSK	1	1	23.42	23.06	22.98
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	23.75	23.48	23.32
			1	1	24.75	24.47	24.20
			1	25	24.77	24.36	24.22
			1	50	24.63	24.31	24.20
			1	51	23.70	23.38	23.38
			50	0	23.77	23.36	23.29
		QPSK	1	0	23.18	23.04	22.89
			1	1	24.76	24.40	24.20
			1	25	24.79	24.38	24.36
			1	50	24.64	24.34	24.19
			1	51	23.14	22.95	22.78
			50	0	23.69	23.35	23.16
		16QAM	1	1	23.50	23.11	22.99
			1	25	23.52	23.13	23.05
			1	50	23.48	23.15	22.94
		64QAM	1	1	22.38	21.94	21.83
		256QAM	1	1	19.67	19.25	19.13
	CP-OFDM	QPSK	1	1	23.30	22.96	22.75
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	23.86	23.54	23.47
			1	1	24.87	24.59	24.21
			1	12	24.71	24.33	24.14
			1	23	24.77	24.43	24.17
			1	24	23.85	23.66	23.50
			25	0	23.75	23.41	23.13
		QPSK	1	0	23.51	23.12	22.99
			1	1	24.89	24.52	24.21
			1	12	24.70	24.39	24.16
			1	23	24.81	24.42	24.19
			1	24	23.45	23.26	23.01
			25	0	23.64	23.38	23.17
		16QAM	1	1	23.56	23.26	23.05
			1	13	23.37	23.13	22.97
			1	23	23.53	23.15	22.94
		64QAM	1	1	22.44	22.03	21.76
		256QAM	1	1	19.74	19.49	19.18
	CP-OFDM	QPSK	1	1	23.33	23.07	22.65

NR Band n25 (ANT F)

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	23.35	23.48	23.40
			1	1	24.31	24.34	24.53
			1	107	24.39	24.57	24.60
			1	214	24.57	24.61	24.59
			1	215	23.64	23.57	23.57
			216	0	23.41	23.50	23.63
		QPSK	1	0	22.97	23.04	23.14
			1	1	24.30	24.39	24.48
			1	107	24.42	24.49	24.63
			1	214	24.54	24.52	24.62
			1	215	23.17	23.26	23.22
			216	0	23.48	23.50	23.69
		16QAM	1	0	21.93	21.66	21.96
			1	1	23.04	23.16	23.09
			1	107	23.11	23.37	23.44
			1	214	23.42	23.25	23.39
			1	215	22.01	21.80	21.83
			216	0	22.04	22.07	22.04
		64QAM	1	1	21.92	22.05	22.14
		256QAM	1	1	19.10	19.27	19.40
	CP-OFDM	QPSK	1	0	20.90	21.21	21.07
			1	1	22.53	22.60	22.62
			1	107	22.63	22.68	22.73
			1	214	22.61	22.62	22.72
			1	215	21.10	21.12	21.23
			216	0	21.10	21.23	21.15
		16QAM	1	0	20.61	20.92	20.97
			1	1	21.68	21.76	21.88
			1	107	21.67	21.80	21.78
			1	214	21.89	22.08	22.01
			1	215	21.07	21.07	21.08
			216	0	21.06	21.11	21.09
		64QAM	1	1	20.72	20.43	20.53
		256QAM	1	1	17.31	17.38	17.59
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	23.35	23.50	23.60
			1	1	24.24	24.43	23.45
			1	93	24.45	24.71	24.57
			1	186	24.53	24.61	24.46
			1	187	23.63	23.64	23.58
			180	0	23.47	23.52	23.66
		QPSK	1	0	22.91	22.90	22.95
			1	1	24.30	24.38	24.53
			1	93	24.50	24.61	24.68
			1	186	24.59	24.56	24.66
			1	187	23.10	23.11	23.11
			180	0	23.48	23.57	23.68
		16QAM	1	1	23.15	23.12	23.29
			1	93	23.21	23.29	23.33
			1	186	23.45	23.21	23.40
		64QAM	1	1	21.97	22.07	22.22
		256QAM	1	1	19.26	19.25	19.43
	CP-OFDM	QPSK	1	1	23.02	23.06	23.23

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	23.42	23.45	23.62
			1	1	24.42	24.41	24.50
			1	79	24.43	24.50	24.37
			1	158	24.61	24.63	24.50
			1	159	23.52	23.67	23.61
			160	0	23.44	23.62	23.46
		QPSK	1	0	22.87	22.92	23.04
			1	1	24.34	24.41	24.61
			1	79	24.47	24.58	24.64
			1	158	24.63	24.65	24.63
			1	159	23.06	23.10	23.04
			160	0	23.49	23.62	23.71
		16QAM	1	1	23.18	23.17	23.45
			1	79	23.25	23.37	23.32
			1	158	23.33	23.36	23.39
		64QAM	1	1	22.02	22.08	22.32
		256QAM	1	1	19.26	19.36	19.61
	CP-OFDM	QPSK	1	1	23.01	23.11	23.28
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	23.50	23.49	23.64
			1	1	24.38	24.51	24.76
			1	66	24.47	24.62	24.70
			1	131	24.45	24.68	24.72
			1	132	23.54	23.76	23.70
			128	0	23.45	23.62	23.67
		QPSK	1	0	22.94	23.02	23.12
			1	1	24.36	24.52	24.68
			1	66	24.45	24.70	24.71
			1	131	24.50	24.71	24.75
			1	132	23.07	23.18	23.14
			128	0	23.46	23.61	23.73
		16QAM	1	1	23.11	23.10	23.53
			1	66	23.16	23.34	23.42
			1	131	23.18	23.48	23.40
		64QAM	1	1	22.03	22.23	22.32
		256QAM	1	1	19.27	19.47	19.60
	CP-OFDM	QPSK	1	1	22.96	23.25	23.20
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	23.43	23.35	23.55
			1	1	24.35	24.36	24.66
			1	52	24.43	24.63	24.74
			1	104	24.43	24.66	24.69
			1	105	23.48	23.52	23.48
			100	0	23.47	23.64	23.72
		QPSK	1	0	22.77	22.93	23.11
			1	1	24.38	24.49	24.73
			1	52	24.42	24.63	24.70
			1	104	24.48	24.64	24.92
			1	105	22.93	23.08	23.00
			100	0	23.38	23.58	23.75
		16QAM	1	1	23.18	23.09	23.48
			1	52	23.25	23.35	23.46
			1	104	23.04	23.52	23.51
		64QAM	1	1	21.98	22.01	22.35
		256QAM	1	1	19.28	19.38	19.65
	CP-OFDM	QPSK	1	1	22.92	23.00	23.28

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	23.47	23.54	23.54
			1	1	24.42	24.54	24.73
			1	39	24.46	24.58	24.71
			1	77	24.42	24.62	24.72
			1	78	23.40	23.65	23.66
		QPSK	75	0	23.45	23.63	23.69
			1	0	22.91	23.10	23.10
			1	1	24.41	24.59	24.72
			1	39	24.45	24.62	24.55
			1	77	24.50	24.64	24.68
			1	78	22.89	23.04	23.03
			75	0	23.48	23.62	23.77
		16QAM	1	1	23.28	23.26	23.44
			1	39	23.31	23.44	23.55
			1	77	23.20	23.46	23.60
		64QAM	1	1	22.07	22.22	22.34
		256QAM	1	1	19.35	19.48	19.72
	CP-OFDM	QPSK	1	1	22.96	23.23	23.37
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	23.45	23.57	23.60
			1	1	24.41	24.55	24.62
			1	25	24.46	24.65	24.65
			1	50	24.48	24.59	24.59
			1	51	23.38	23.61	23.67
		QPSK	50	0	23.43	23.60	23.68
			1	0	22.80	23.08	23.10
			1	1	24.43	24.54	24.67
			1	25	24.49	24.69	24.76
			1	50	24.45	24.61	24.64
			1	51	22.86	22.96	23.02
			50	0	23.41	23.69	23.81
		16QAM	1	1	23.28	23.29	23.51
			1	25	23.26	23.49	23.62
			1	50	23.27	23.50	23.48
		64QAM	1	1	21.99	22.13	22.32
		256QAM	1	1	19.34	19.42	19.62
	CP-OFDM	QPSK	1	1	22.88	23.05	23.21
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	23.50	23.71	23.80
			1	1	24.47	24.74	23.63
			1	12	24.37	24.59	24.49
			1	23	24.43	24.67	24.54
			1	24	23.55	23.65	23.64
		QPSK	25	0	23.31	23.64	23.29
			1	0	23.00	23.17	23.21
			1	1	24.44	24.77	24.38
			1	12	24.31	24.63	24.37
			1	23	24.33	24.73	24.38
			1	24	22.95	23.07	23.03
			25	0	23.36	23.63	23.57
		16QAM	1	1	23.20	23.54	23.47
			1	13	23.09	23.45	23.42
			1	23	23.24	23.56	23.34
		64QAM	1	1	22.05	22.31	22.25
		256QAM	1	1	19.37	19.64	19.70
	CP-OFDM	QPSK	1	1	22.91	23.23	23.11

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

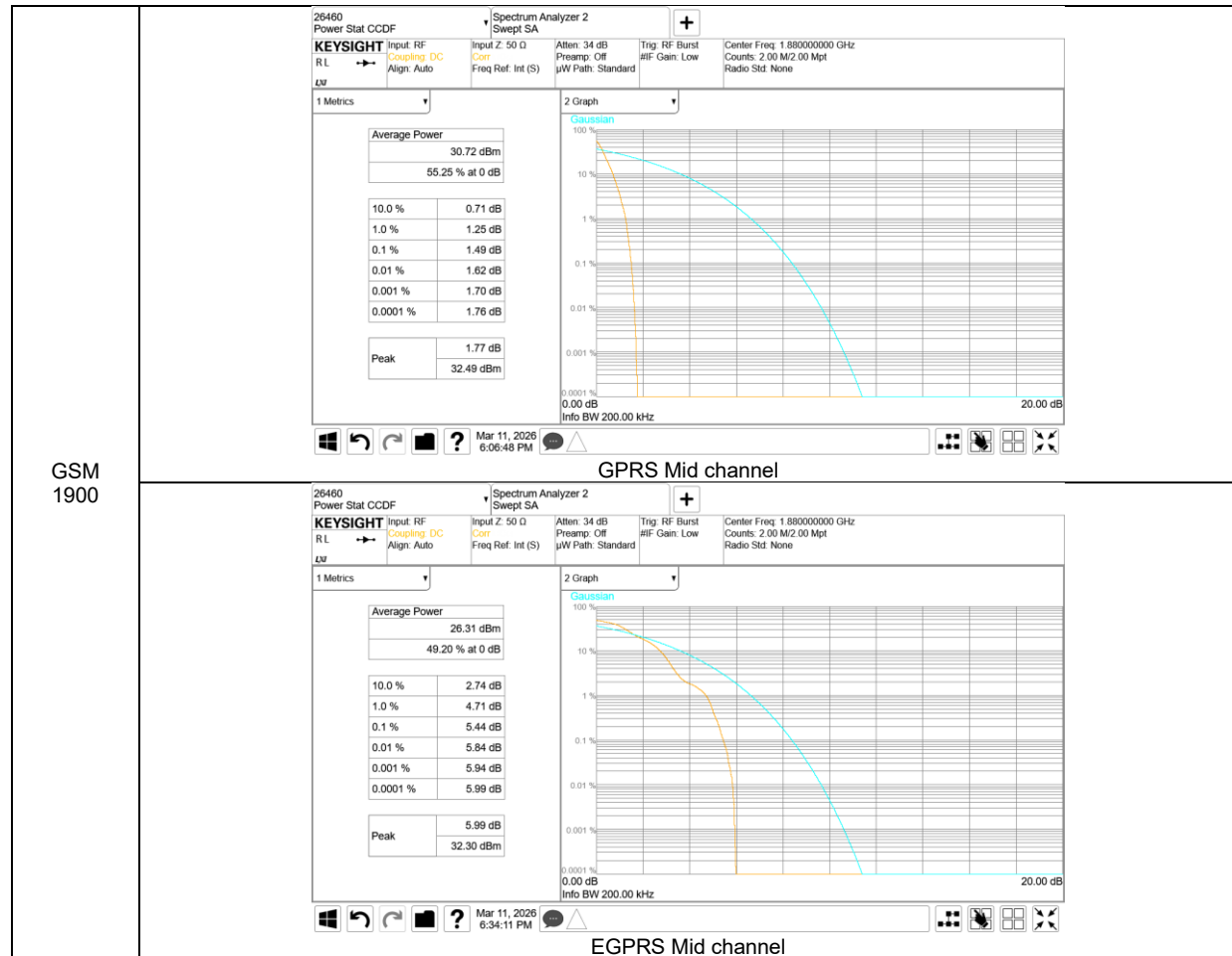
LTE: All modulations were investigated, and the worst modulations (QPSK, 256QAM) are reported.
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated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

RESULTS

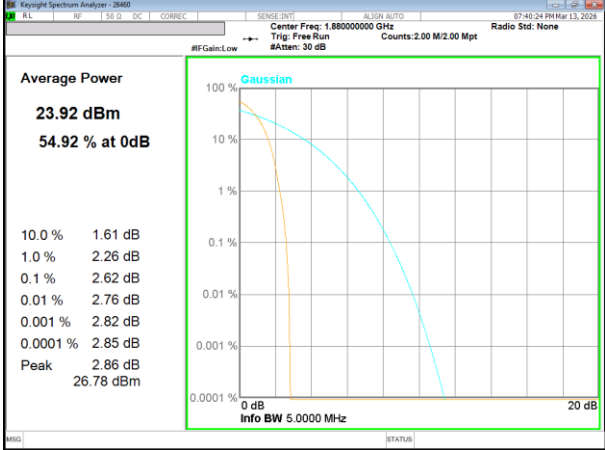
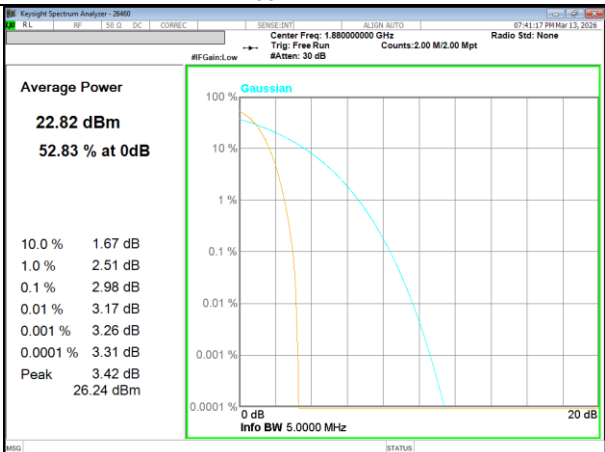
See the following pages.

8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

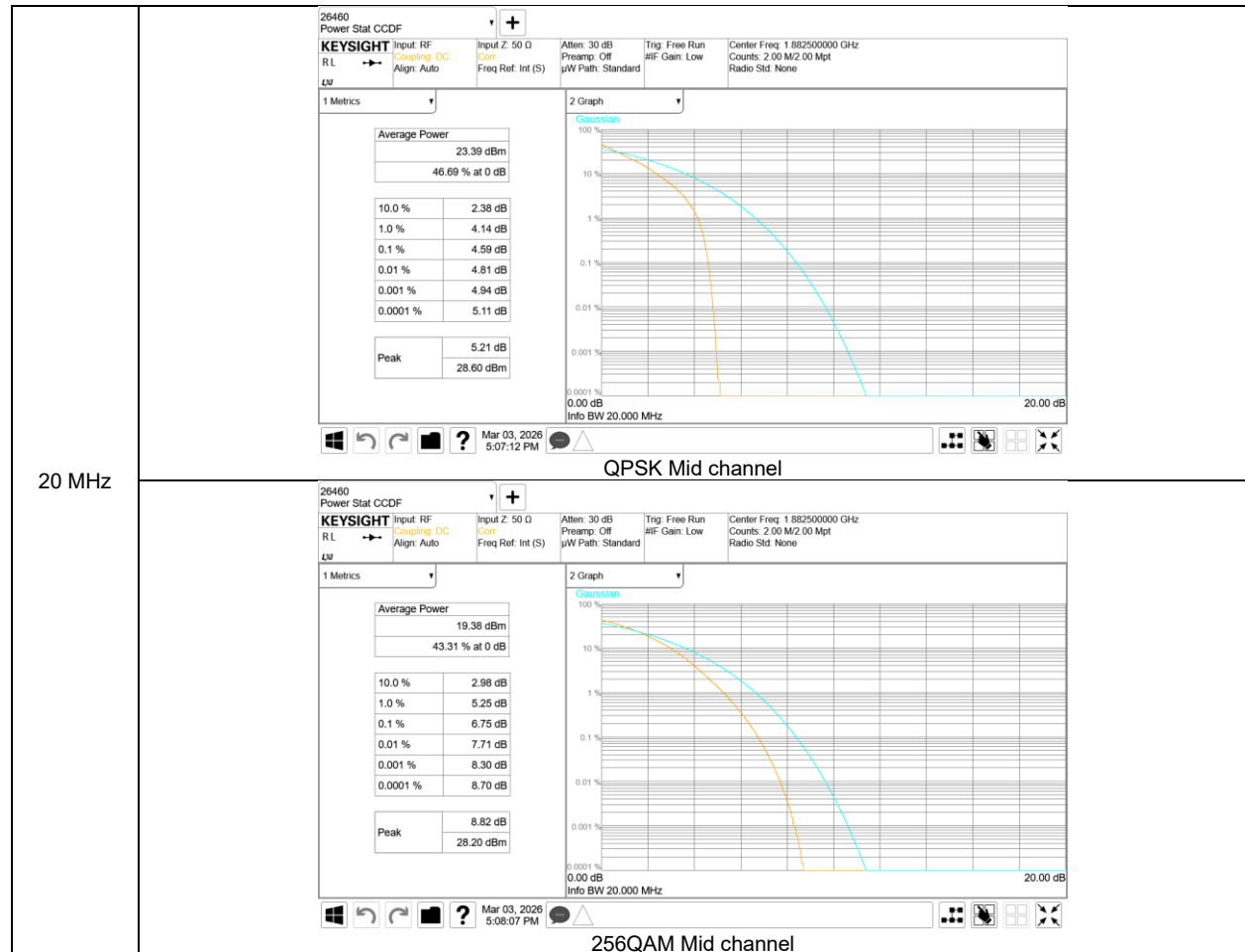
GSM (ANT B)

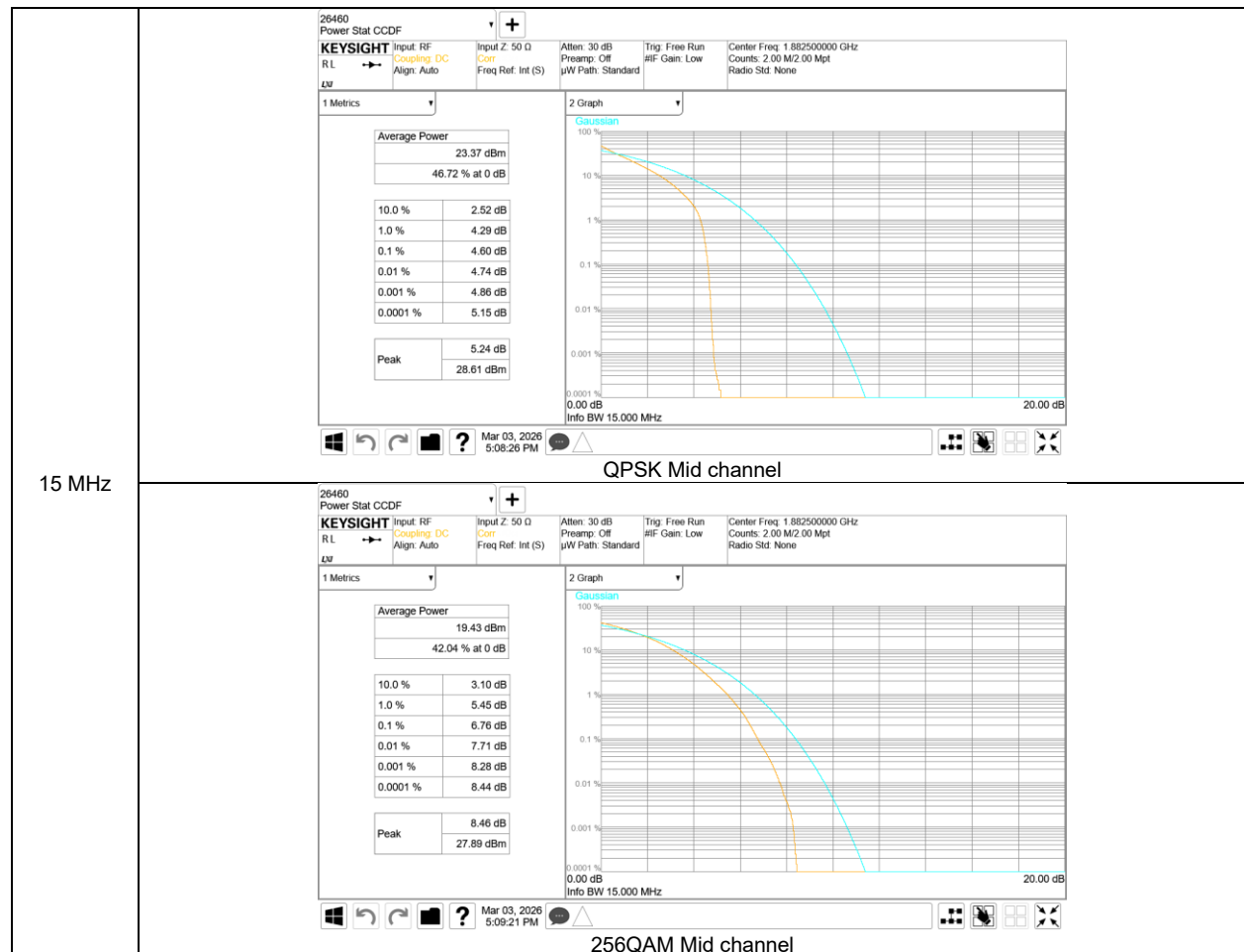


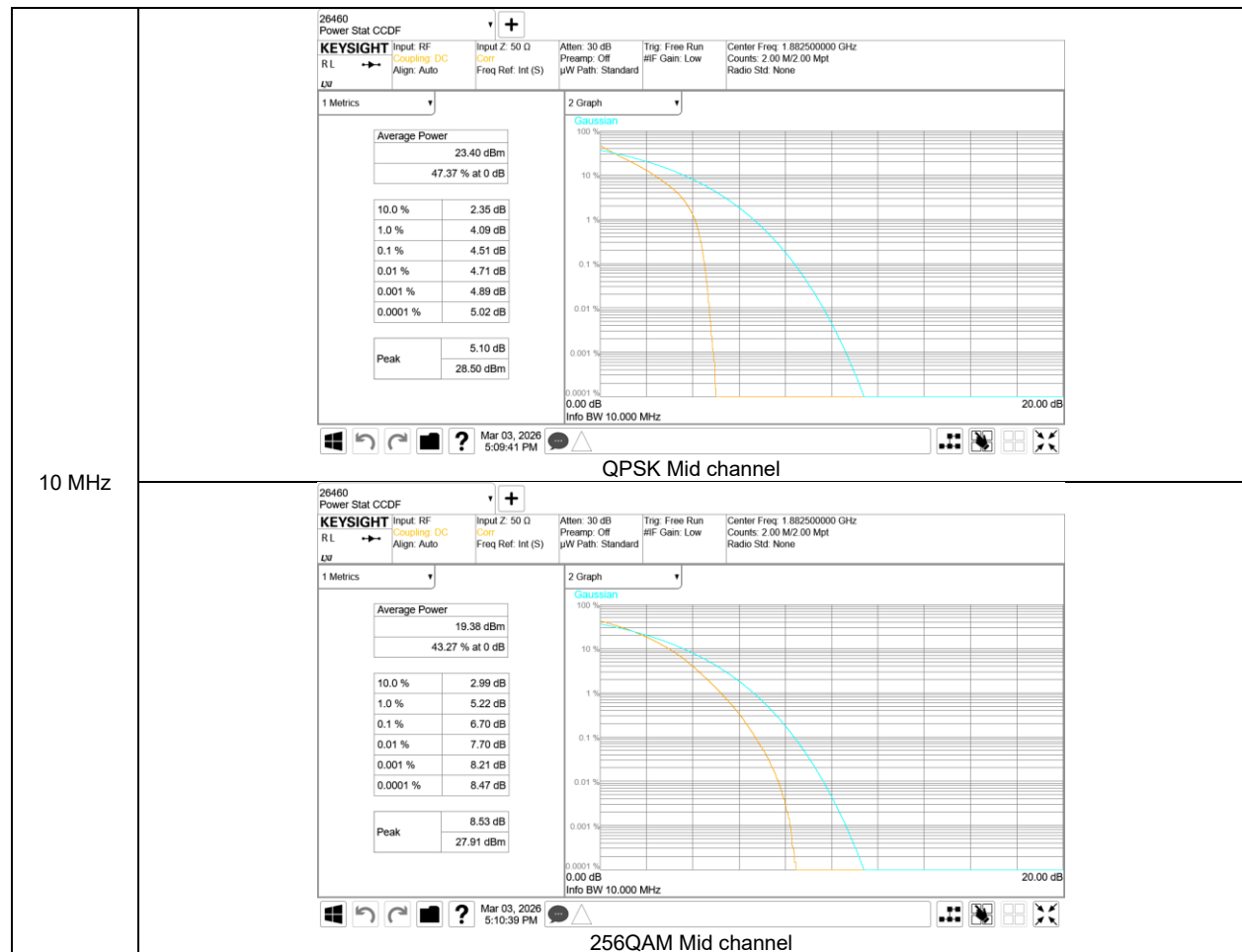
WCDMA (ANT F)

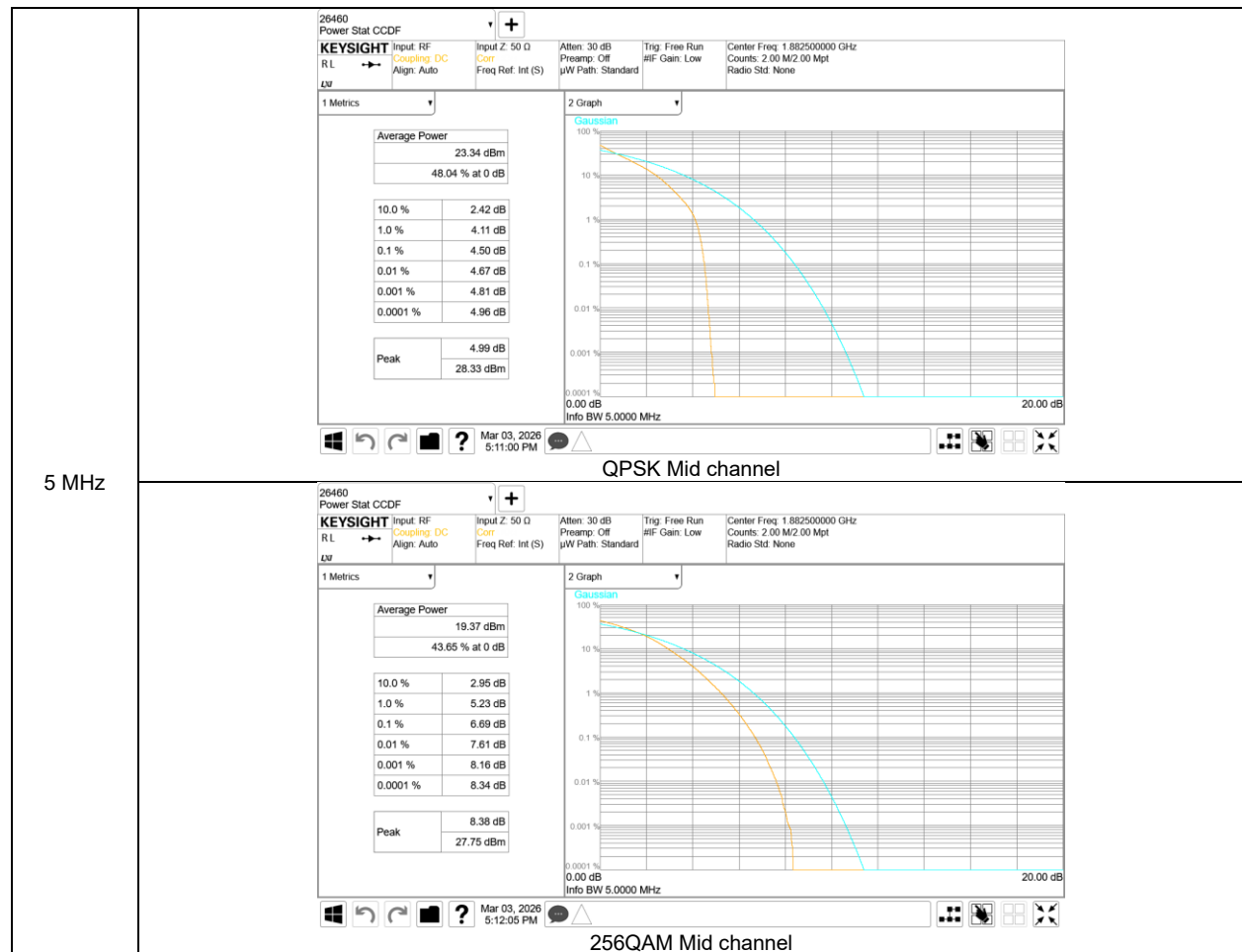
	 Average Power 23.92 dBm 54.92 % at 0dB <table> <tr><td>10.0 %</td><td>1.61 dB</td></tr> <tr><td>1.0 %</td><td>2.26 dB</td></tr> <tr><td>0.1 %</td><td>2.62 dB</td></tr> <tr><td>0.01 %</td><td>2.76 dB</td></tr> <tr><td>0.001 %</td><td>2.82 dB</td></tr> <tr><td>0.0001 %</td><td>2.85 dB</td></tr> <tr><td>Peak</td><td>2.86 dB</td></tr> <tr><td></td><td>26.78 dBm</td></tr> </table> Center Freq: 1.880000000 GHz Trig: Free Run #Att: 30 dB Counts: 2.00 M/2.00 Mpt Radio Std: None Info BW 5.0000 MHz	10.0 %	1.61 dB	1.0 %	2.26 dB	0.1 %	2.62 dB	0.01 %	2.76 dB	0.001 %	2.82 dB	0.0001 %	2.85 dB	Peak	2.86 dB		26.78 dBm
10.0 %	1.61 dB																
1.0 %	2.26 dB																
0.1 %	2.62 dB																
0.01 %	2.76 dB																
0.001 %	2.82 dB																
0.0001 %	2.85 dB																
Peak	2.86 dB																
	26.78 dBm																
Band 2	 Average Power 22.82 dBm 52.83 % at 0dB <table> <tr><td>10.0 %</td><td>1.67 dB</td></tr> <tr><td>1.0 %</td><td>2.51 dB</td></tr> <tr><td>0.1 %</td><td>2.98 dB</td></tr> <tr><td>0.01 %</td><td>3.17 dB</td></tr> <tr><td>0.001 %</td><td>3.26 dB</td></tr> <tr><td>0.0001 %</td><td>3.31 dB</td></tr> <tr><td>Peak</td><td>3.42 dB</td></tr> <tr><td></td><td>26.24 dBm</td></tr> </table> Center Freq: 1.880000000 GHz Trig: Free Run #Att: 30 dB Counts: 2.00 M/2.00 Mpt Radio Std: None Info BW 5.0000 MHz	10.0 %	1.67 dB	1.0 %	2.51 dB	0.1 %	2.98 dB	0.01 %	3.17 dB	0.001 %	3.26 dB	0.0001 %	3.31 dB	Peak	3.42 dB		26.24 dBm
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0.001 %	3.26 dB																
0.0001 %	3.31 dB																
Peak	3.42 dB																
	26.24 dBm																

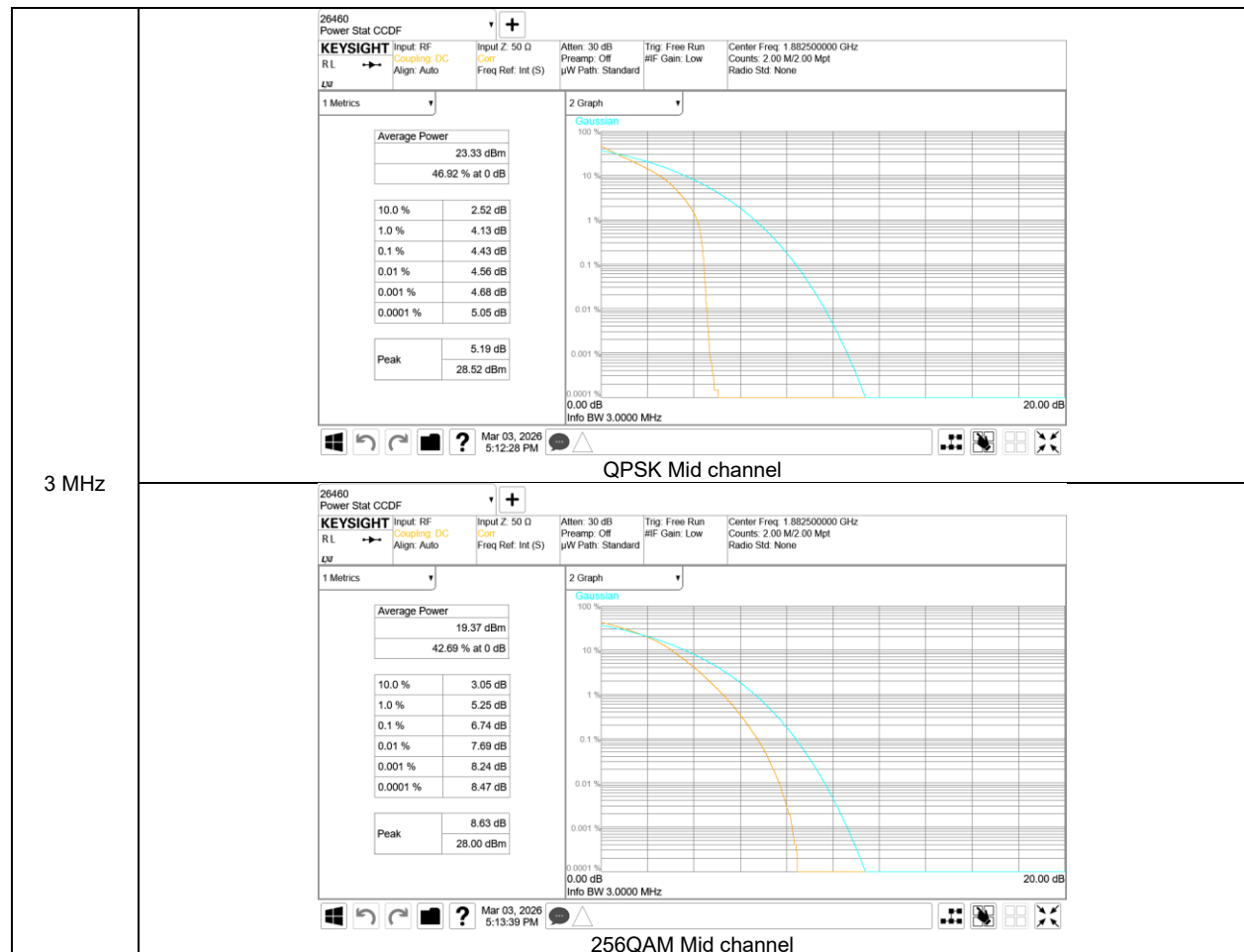
LTE Band 25 (ANT F)

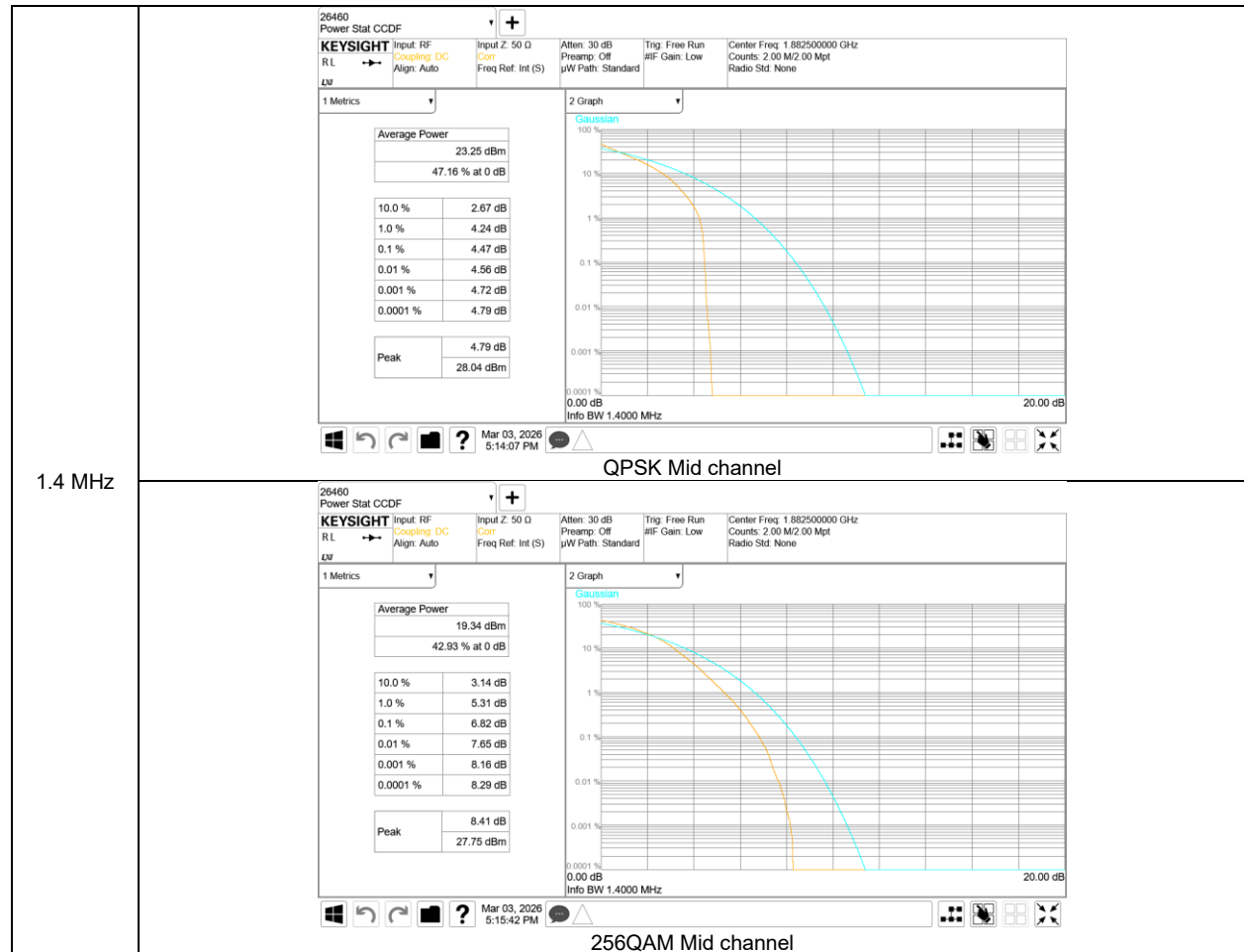












NR Band n25 CP-OFDM (ANT F)





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 (ANT B)

Band	Modulation	f [MHz]	99% BW (kHz)	-26dB BW (kHz)
1900	GPRS	1880.00	239.670	315.000
	EGPRS		241.810	318.700

- WCDMA (ANT F)

Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.00	4.160	4.693
	HSDPA		4.160	4.701

- LTE Band 25 (ANT F)

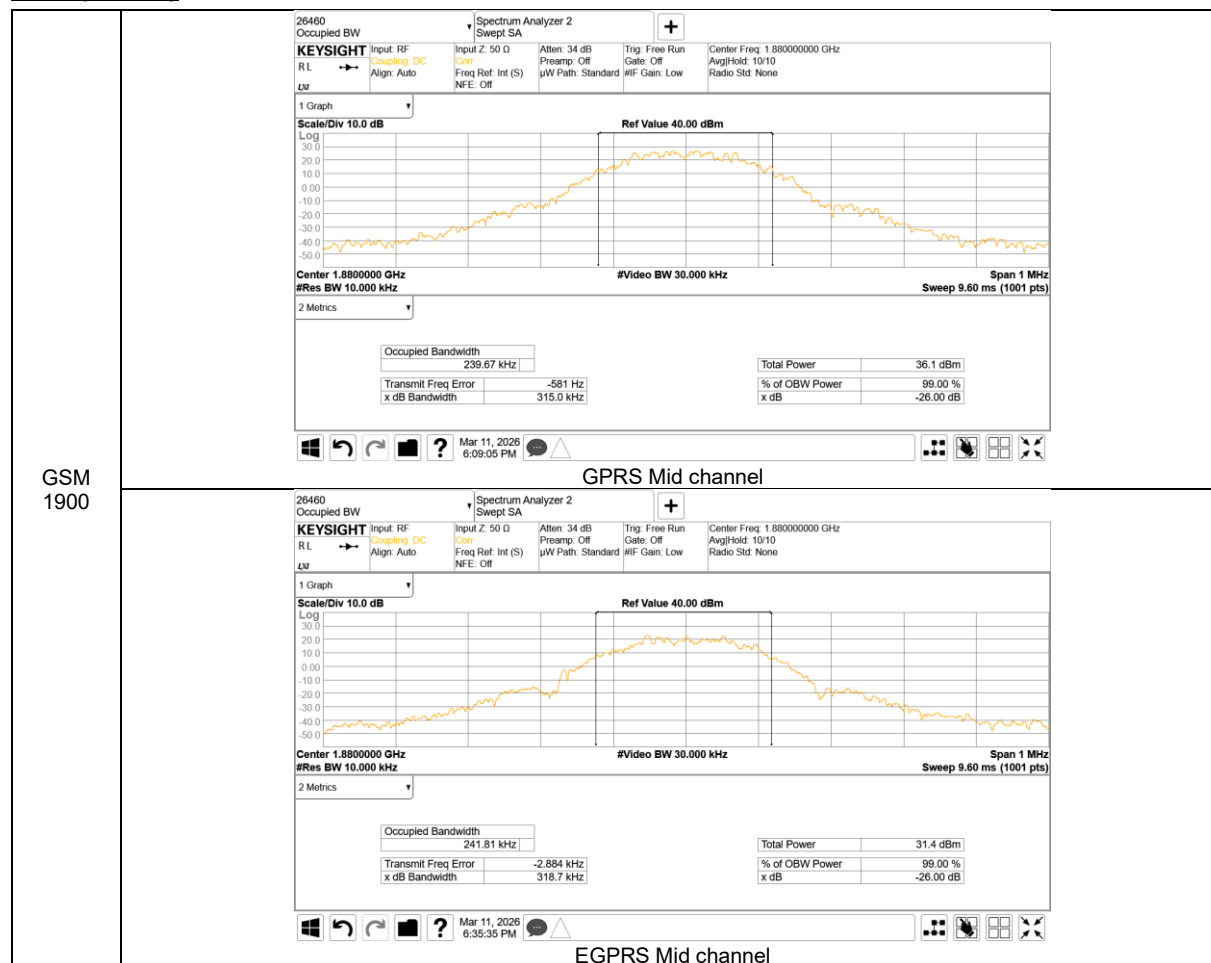
Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.50	17.930	19.290
		16QAM		17.923	19.050
	15M	QPSK		13.429	14.340
		16QAM		13.455	14.480
	10M	QPSK		8.961	9.863
		16QAM		8.964	9.835
	5M	QPSK		4.489	5.131
		16QAM		4.489	5.048
	3M	QPSK		2.691	3.025
		16QAM		2.687	3.004
	1.4M	QPSK		1.087	1.364
		16QAM		1.090	1.368

- NR Band n25 CP-OFDM (ANT F)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	40M	QPSK	1882.50	38.647	40.320
		16QAM		38.648	40.250
	35M	QPSK		33.666	35.010
		16QAM		33.677	34.980
	30M	QPSK		28.621	29.980
		16QAM		28.638	29.850
	25M	QPSK		23.814	24.820
		16QAM		23.802	25.170
	20M	QPSK		18.966	20.090
		16QAM		18.976	20.030
	15M	QPSK		14.147	15.220
		16QAM		14.107	14.920
	10M	QPSK		9.323	10.200
		16QAM		9.310	10.140
	5M	QPSK		4.485	5.130
		16QAM		4.503	5.128

8.3.1. OCCUPIED BANDWIDTH RESULT

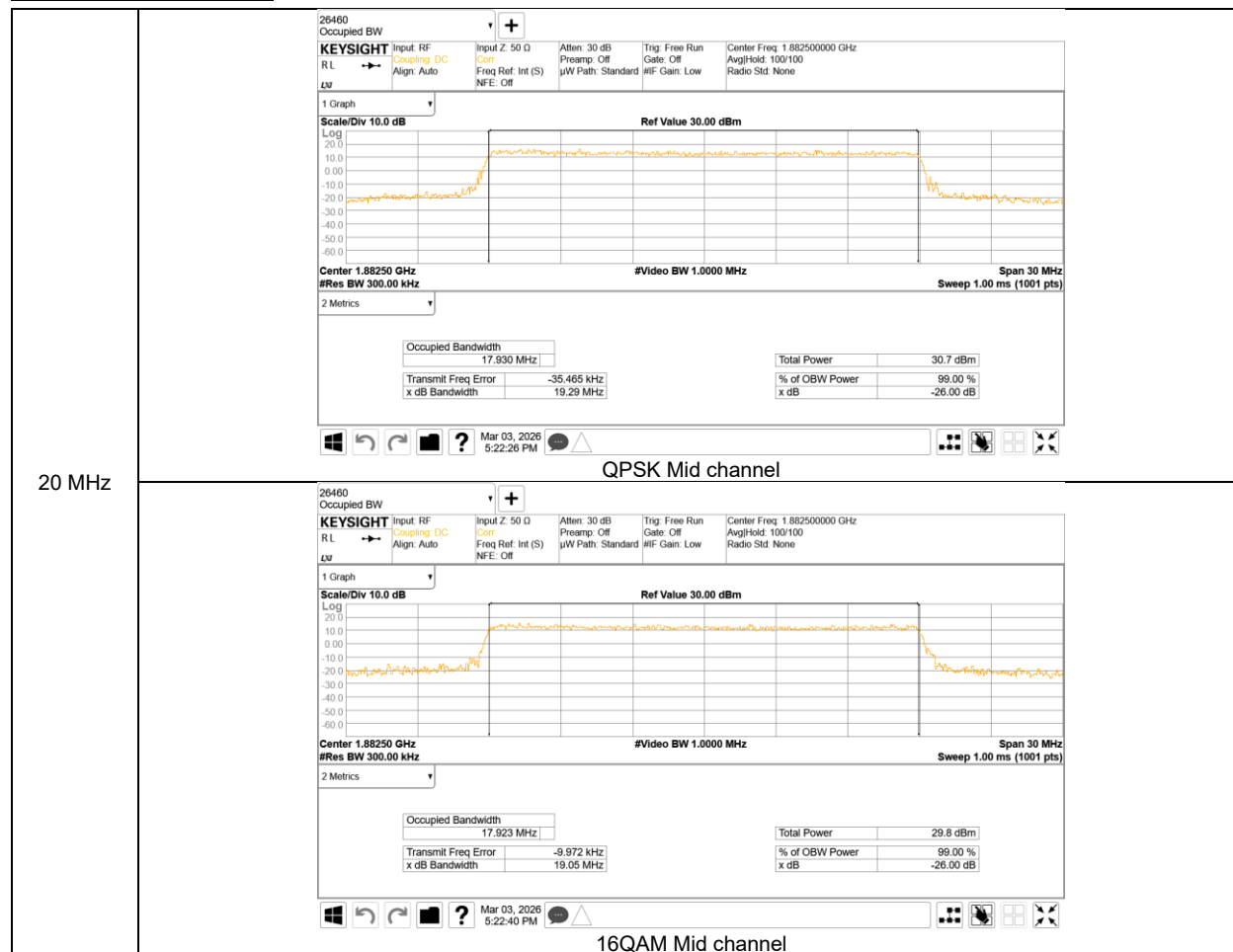
GSM (ANT B)

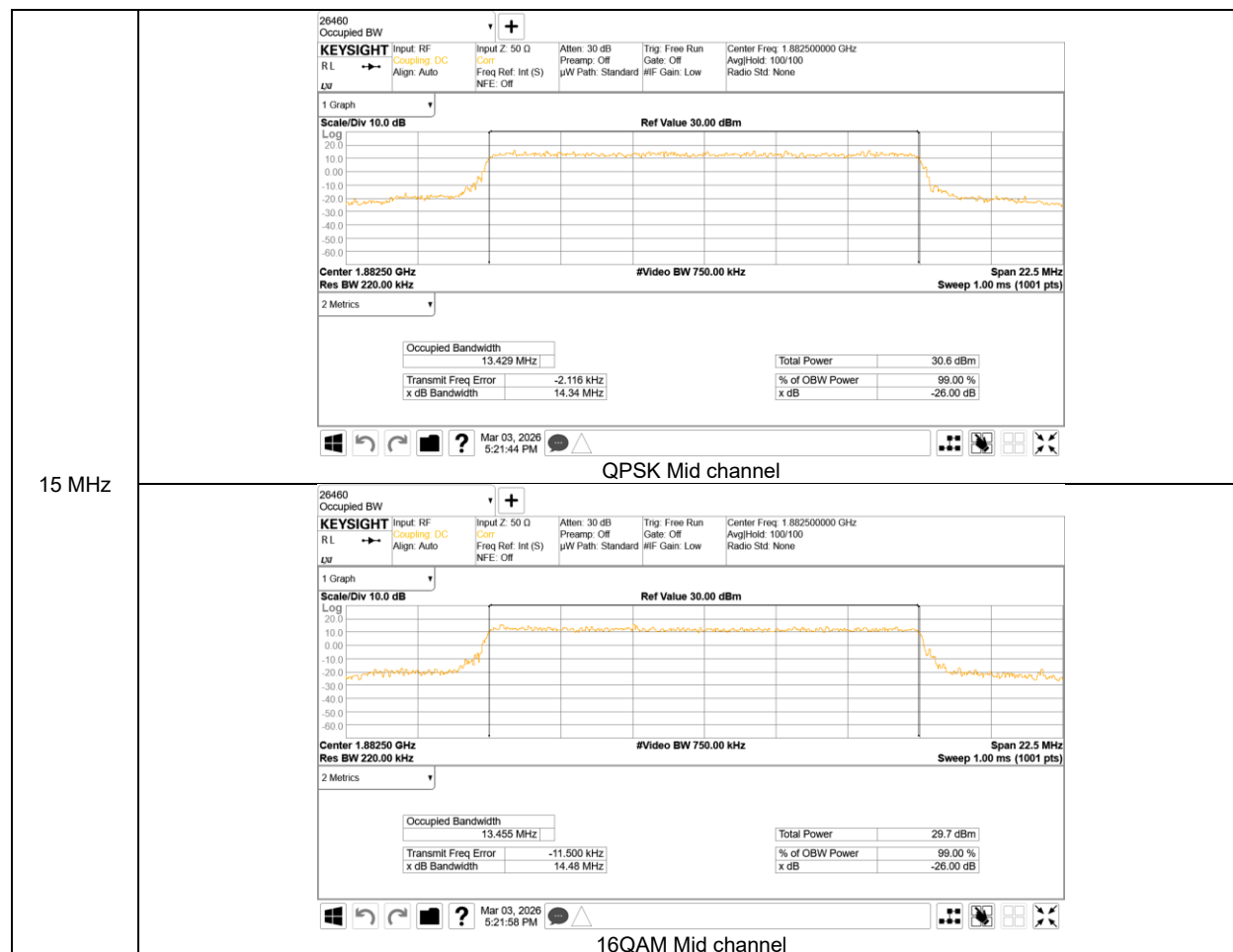


WCDMA (ANT F)

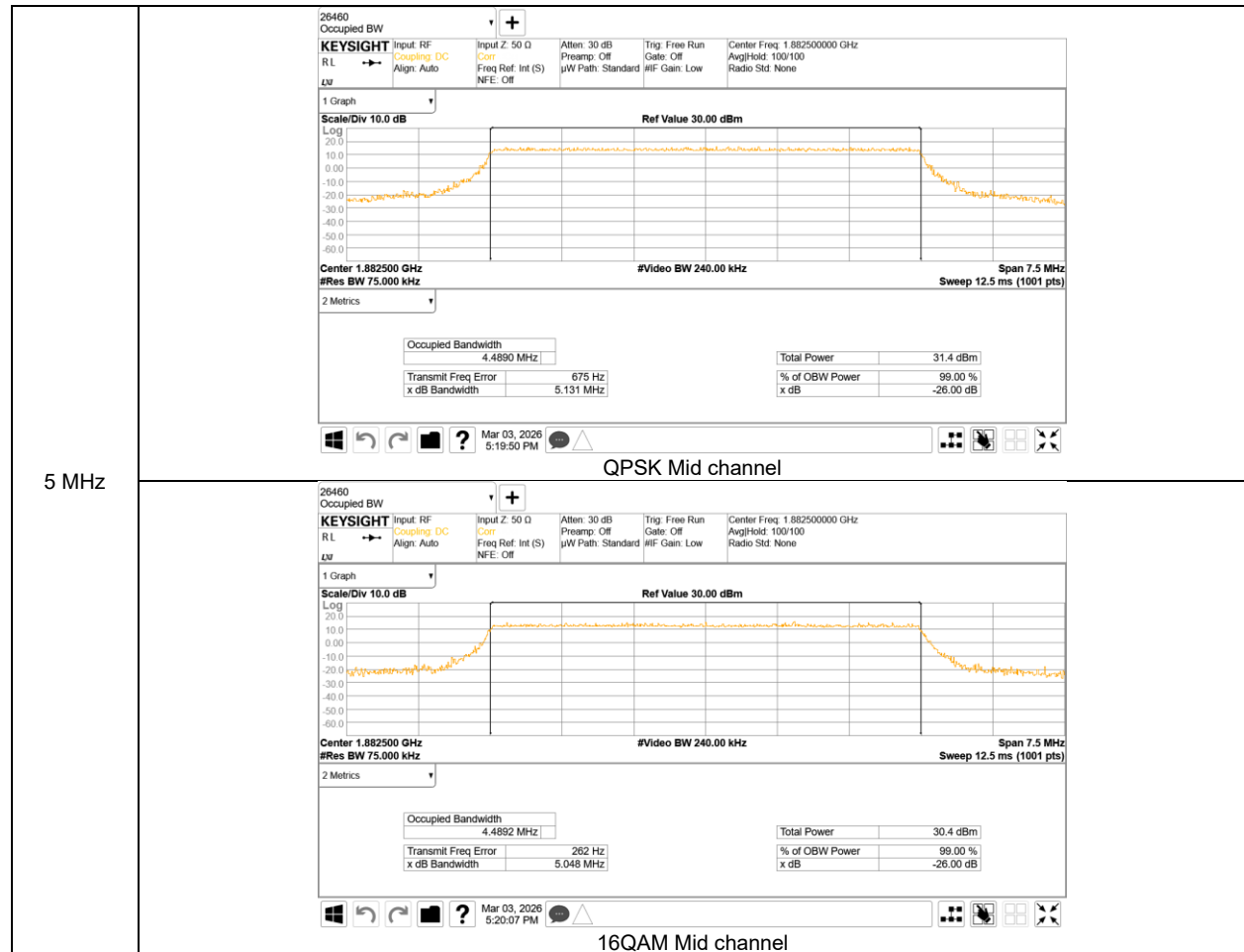


LTE Band 25 (ANT F)

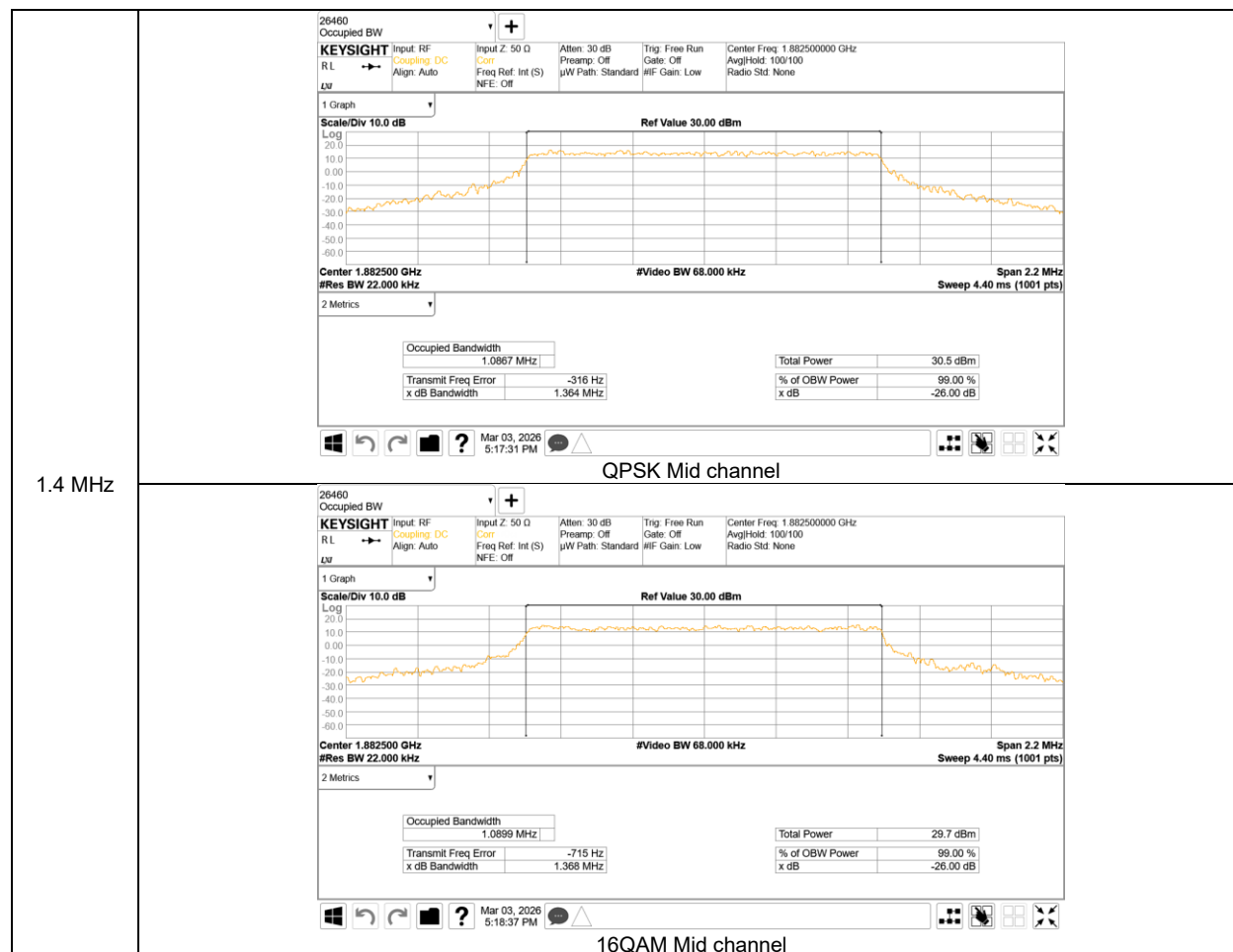












NR Band n25 CP-OFDM (ANT F)





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.

GSM

- a) Set the RBW = 1 - 5% of 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 = 1S ;
- f) Detector = RMS;
- g) Ensure that the number of measurement points $\geq 2 \times$ span/RBW;
- h) Trace Mode = Average(100);
- i) 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)
/ 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

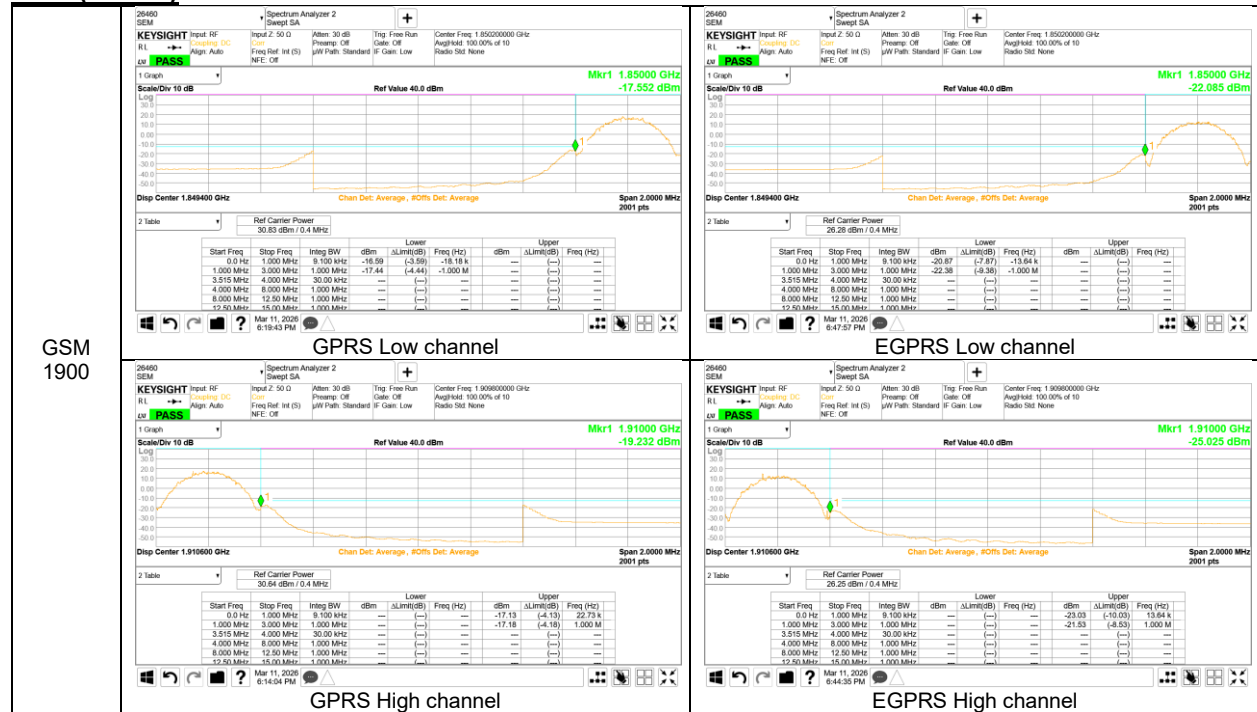
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

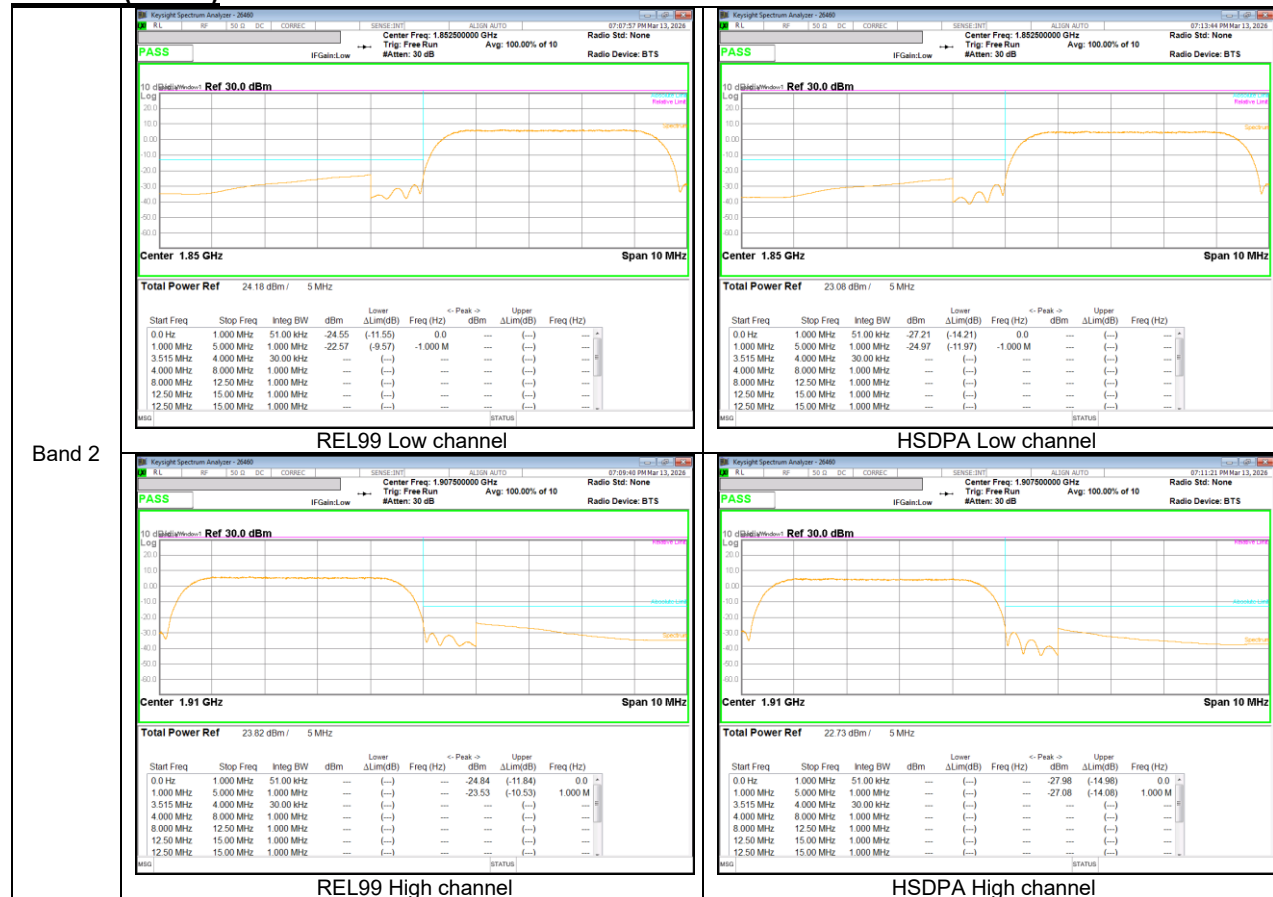
See the following pages.

8.4.1. BAND EDGE RESULT

GSM (ANT B)



WCDMA (ANT F)



LTE Band 25 (ANT F)

