CERTIFICATION TEST REPORT

Report Number. : 4790748041-E3V4

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-F946U, SM-F946U1
FCC ID	:	A3LSMF946U
EUT Description	:	GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB
Test Standard(s)	:	FCC CFR47 PART 24 SUBPART E

Date Of Issue:
2023-05-25

Prepared by:
UL KOREA LTD.
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IAS ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-05-15	Initial issue	Yeonhee Lim
V2	2023-05-18	Updated to address TCB's question	Yeonhee Lim
V3	2023-05-23	Updated to address TCB's question	Yeonhee Lim
V4	2023-05-25	Updated to address TCB's question	Yeonhee Lim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB.
MODEL NUMBER:	SM-F946U, SM-F946U1
SERIAL NUMBER:	R3CW20L0JZE, R3CW20NZSHN, R3CW20NZV7D (CONDUCTED); R3CW20P0BFD, R3CW20P0AXJ, R3CW20P0BMZ, R3CW20P0AZT, R3CW30K7FDD, R3CW30K7E1W (RADIATED);
DATE TESTED:	2023-03-13 - 2023-05-25;

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:

Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Tested By:

Yeonhee Lim
Suwon Lab Engineer
UL KOREA LTD.

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2. TEST METHODOLOGY

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

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

3. FACILITIES AND ACCREDITATION

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

218 Maeyeong-ro
☒ 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 = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

4.3. MEASUREMENT UNCERTAINTY

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

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

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

4.4. DECISION RULE

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

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

Representative Model	Difference	Derivative Model
		SM-F946U1
SM-F946U	Hardware	Same as SM-F946U
	Software	Different UI

Thus, SM-F946U was set for final test.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average radiated EIRP output powers as follows:

GSM

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted		Radiated (ANT B)	
			Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
GSM1900	1850 ~ 1910	GPRS	**29.73**	**939.72**	**27.98**	628.06
		EGPRS	25.52	356.45	24.83	304.09

WCDMA

FCC Part 24						
Band	Frequency Range [MHz]	Modulation	Conducted		Radiated (ANT B)	
			Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2	1850 ~ 1910	Rel. 99	**24.22**	**264.24**	**22.76**	**188.80**
		HSDPA	23.23	210.38	21.92	155.60

LTE Band 25 (ANT B)

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted (ANT B)		Radiated (ANT B)	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	1860 ~ 1905	20	QPSK	23.62	230.14	22.48	177.01
			16QAM	22.89	194.54	21.73	148.94
			64QAM	21.76	149.97		
			256QAM	18.88	77.27		
	1857.5 ~ 1907.5	15	QPSK	23.61	229.61	22.37	172.58
			16QAM	22.84	192.31	21.71	148.25
			64QAM	21.84	152.76		
			256QAM	18.85	76.74		
	1855 ~ 1910	10	QPSK	23.74	236.59	**22.90**	**194.98**
			16QAM	22.89	194.54	21.82	152.05
			64QAM	21.92	155.60		
			256QAM	18.95	78.52		
	1852.5 ~ 1912.5	5	QPSK	**23.87**	**243.78**	22.53	179.06
			16QAM	22.96	197.70	21.97	157.40
			64QAM	22.00	158.49		
			256QAM	19.03	79.98		
	1851.5 ~ 1913.5	3	QPSK	23.85	242.66	22.71	186.64
			16QAM	22.98	198.61	21.82	152.05
			64QAM	22.09	161.81		
			256QAM	18.91	77.80		
	1850.7 ~ 1914.3	1.4	QPSK	23.81	240.44	22.55	179.98
			16QAM	22.99	199.07	21.60	144.62
			64QAM	21.96	157.04		
			256QAM	18.94	78.34		

LTE Band 25 (ANT F)

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted (ANT F)		Radiated (ANT F)	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 25	1860 ~ 1905	20	QPSK	23.96	248.89		
			16QAM	23.16	207.01		
			64QAM	22.09	161.81		
			256QAM	19.15	82.22		
	1857.5 ~ 1907.5	15	QPSK	23.90	245.47		
			16QAM	23.12	205.12		
			64QAM	22.09	161.81		
			256QAM	19.18	82.79		
	1855 ~ 1910	10	QPSK	24.14	259.42		
			16QAM	23.31	214.29		
			64QAM	22.41	174.18		
			256QAM	19.20	83.18		
	1852.5 ~ 1912.5	5	QPSK	**24.19**	**262.42**	**22.24**	**167.49**
			16QAM	23.43	220.29	21.44	139.32
			64QAM	22.36	172.19		
			256QAM	19.25	84.14		
	1851.5 ~ 1913.5	3	QPSK	24.14	259.42		
			16QAM	23.33	215.28		
			64QAM	22.19	165.58		
			256QAM	19.31	85.31		
	1850.7 ~ 1914.3	1.4	QPSK	24.13	258.82		
			16QAM	23.36	216.77		
			64QAM	22.24	167.49		
			256QAM	19.26	84.33		

NR Band n25 (ANT B)

FCC Part 24								
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted (ANT B)		Radiated (ANT B)	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n25	1870.0 ~ 1895.0	40	DFT-s OFDM	π/2 BPSK	24.06	254.68		
				QPSK	24.21	263.63	22.91	195.43
				16QAM	23.12	205.12	21.96	157.04
				64QAM	21.93	155.96		
				256QAM	19.23	83.75		
			CP-OFDM	QPSK	22.62	182.81		
	1865.0 ~ 1900.0	30	DFT-s OFDM	π/2 BPSK	24.18	261.82		
				QPSK	24.30	269.15	23.05	201.84
				16QAM	23.31	214.29	22.15	164.06
				64QAM	21.98	157.76		
				256QAM	19.36	86.30		
			CP-OFDM	QPSK	22.78	189.67		
	1862.5 ~ 1902.5	25	DFT-s OFDM	π/2 BPSK	24.03	252.93		
				QPSK	24.11	257.63	24.04	253.51
				16QAM	23.04	201.37	23.73	236.05
				64QAM	21.87	153.82		
				256QAM	19.39	86.90		
			CP-OFDM	QPSK	22.60	181.97		
	1860.0 ~ 1905.0	20	DFT-s OFDM	π/2 BPSK	24.32	270.40		
				QPSK	24.34	271.64	24.49	281.19
				16QAM	23.13	205.59	23.67	232.81
				64QAM	21.98	157.76		
				256QAM	19.45	88.10		
			CP-OFDM	QPSK	22.37	172.58		
	1857.5 ~ 1907.5	15	DFT-s OFDM	π/2 BPSK	**24.40**	**275.42**		
				QPSK	**24.40**	**275.42**	**24.62**	**289.73**
				16QAM	23.28	212.81	23.73	236.05
				64QAM	21.91	155.24		
				256QAM	19.48	88.72		
			CP-OFDM	QPSK	22.89	194.54		
	1855.0 ~ 1910.0	10	DFT-s OFDM	π/2 BPSK	24.22	264.24		
				QPSK	24.24	265.46	24.07	255.27
				16QAM	23.22	209.89	22.85	192.75
				64QAM	21.98	157.76		
				256QAM	19.02	79.80		
			CP-OFDM	QPSK	22.34	171.40		
	1852.5 ~ 1912.5	5	DFT-s OFDM	π/2 BPSK	24.14	259.42		
				QPSK	24.20	263.03	23.99	250.61
				16QAM	23.08	203.24	22.82	191.43
				64QAM	21.99	158.12		
				256QAM	19.05	80.35		
			CP-OFDM	QPSK	22.75	188.36		

NR Band n25 (ANT F)

FCC Part 24								
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted (ANT F)		Radiated (ANT F)	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n25	1870.0 ~ 1895.0	40	DFT-s OFDM	π/2 BPSK	23.40	218.78		
				QPSK	23.50	223.87		
				16QAM	22.48	177.01		
				64QAM	21.18	131.22		
				256QAM	18.58	72.11		
			CP-OFDM	QPSK	22.02	159.22		
	1865.0 ~ 1900.0	30	DFT-s OFDM	π/2 BPSK	23.68	233.35		
				QPSK	**23.70**	**234.42**	**22.26**	**168.10**
				16QAM	22.77	189.23	21.36	136.64
				64QAM	21.45	139.64		
				256QAM	18.81	76.03		
			CP-OFDM	QPSK	22.24	167.49		
	1862.5 ~ 1902.5	25	DFT-s OFDM	π/2 BPSK	23.42	219.79		
				QPSK	23.47	222.33		
				16QAM	22.40	173.78		
				64QAM	21.18	131.22		
				256QAM	18.70	74.13		
			CP-OFDM	QPSK	22.01	158.85		
	1860.0 ~ 1905.0	20	DFT-s OFDM	π/2 BPSK	23.37	217.27		
				QPSK	23.42	219.79		
				16QAM	22.42	174.58		
				64QAM	21.15	130.32		
				256QAM	18.44	69.82		
			CP-OFDM	QPSK	21.95	156.68		
	1857.5 ~ 1907.5	15	DFT-s OFDM	π/2 BPSK	23.64	231.21		
				QPSK	23.69	233.88		
				16QAM	22.78	189.67		
				64QAM	21.38	137.40		
				256QAM	18.83	76.38		
			CP-OFDM	QPSK	22.20	165.96		
	1855.0 ~ 1910.0	10	DFT-s OFDM	π/2 BPSK	23.19	208.45		
				QPSK	23.28	212.81		
				16QAM	22.21	166.34		
				64QAM	21.03	126.77		
				256QAM	18.28	67.30		
			CP-OFDM	QPSK	21.73	148.94		
	1852.5 ~ 1912.5	5	DFT-s OFDM	π/2 BPSK	23.17	207.49		
				QPSK	23.26	211.84		
				16QAM	22.29	169.43		
				64QAM	20.99	125.60		
				256QAM	18.25	66.83		
			CP-OFDM	QPSK	21.75	149.62		

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency (MHz)	Peak Gain (dBi)
GSM1900 / WCDMA Band 2 / LTE Band 2, 25 / NR Band n2, 25 1850 - 1915 MHz	-2.4 (ANT B)
	-4.6 (ANT F)

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5.4. WORST-CASE ORIENTATION

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

- GSM GPRS/EGPRS
- UMTS REL 99/HSDPA

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

This device supports both ANT B and ANT F(Tx Hopping) for LTE Band 25. Both ANT B and ANT F were tested and reported.

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

This device supports both ANT B(NSA/SA Mode) and ANT F(NSA/Tx Hopping Mode) for NR Band 25. Output power measurements were measured on NSA/SA/Tx Hopping Mode. It was found that the worst-case scenario is that ANT B(SA Modes) and ANT F(NSA Modes). Both ANT B and ANT F were tested and worst case is reported.

In case of the same target power ANT B and ANT F. ANT F Radiated tests are perfoemed spot check, because ANT F gain is lower than ANT B (Approximately 2 dB).

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

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

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- Conducted Spurious Emission(ANT B)

Highest conducted power setting for each bands				
LTE Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1852.5	5	1	12
	1882.5		1	12
	1912.5		1	12
NR Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1857.5	15	1	40
	1882.5		1	40
	1907.5		1	40

- Conducted Spurious Emission(ANT F)

Highest conducted power setting for each bands				
LTE Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1852.5	5	1	12
	1882.5		1	12
	1912.5		1	12
NR Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1865.0	30	1	1
	1882.5		1	80
	1900.0		1	1

- Radiated Spurious Emission(ANT B)

Highest EIRP setting for each bands				
LTE Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1855.0	10	1	25
	1882.5		1	25
	1910.0		1	25
NR Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1857.5	15	1	40
	1882.5		1	1
	1912.5		1	1

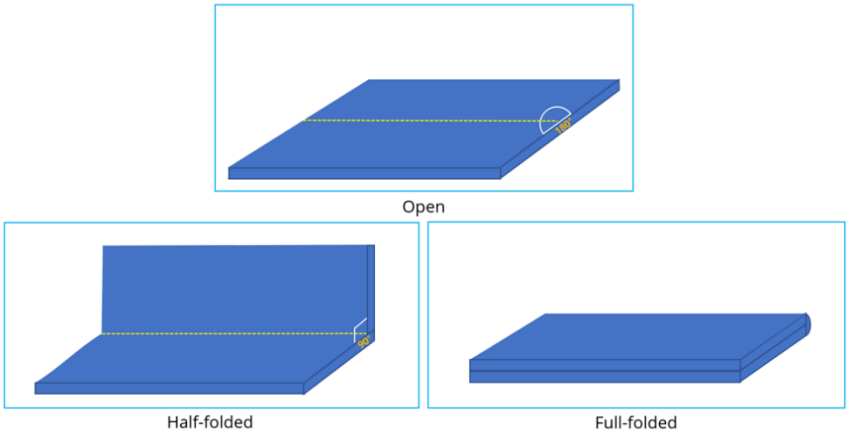
- Radiated Spurious Emission(ANT F)

Highest EIRP setting for each bands				
LTE Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1852.5	5	1	12
	1882.5		1	12
	1912.5		1	12
NR Band	**Frequency (MHz)**	**Bandwidth (MHz)**	**RB size**	**RB offset**
25	1865.0	30	1	1
	1882.5		1	80
	1900.0		1	1

For LTE anchor, the band with highest output power was chosen among the possible combinations with NR Bands.

NR Band	LTE Band
25 (ANT B)	**12**
25 (ANT F)	**66**

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



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

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

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacture**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA800	R37N9QP4SL9DK3	N/A
Data Cable	SAMSUNG	WBR0062M	GH39-02112A	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.

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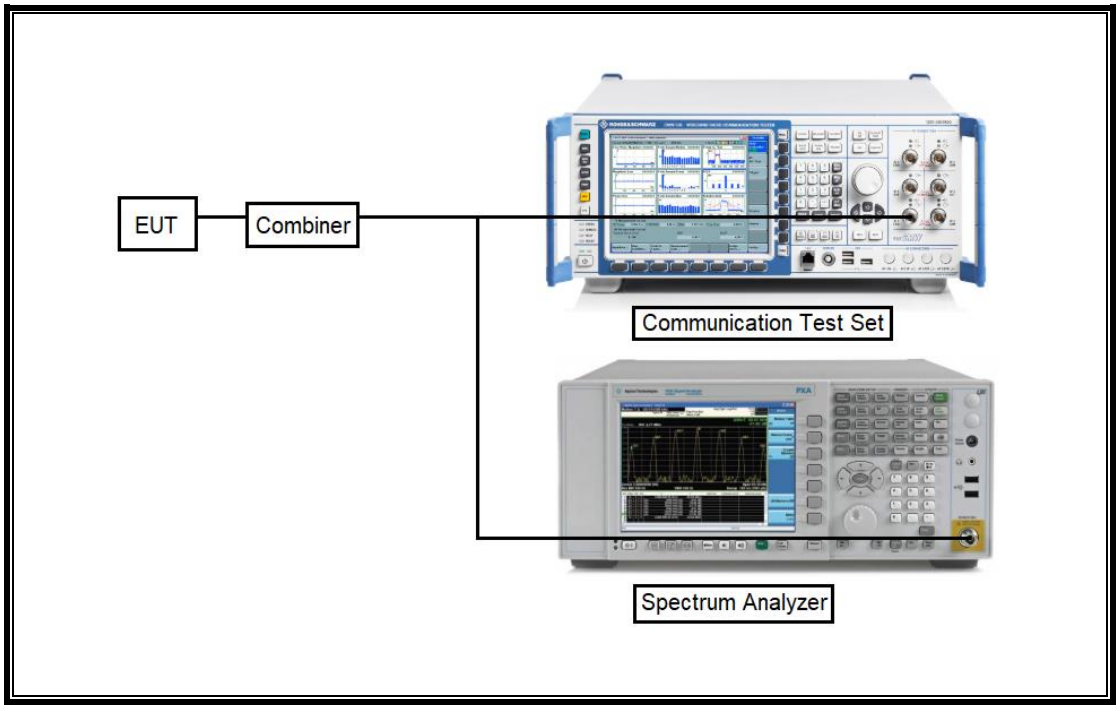
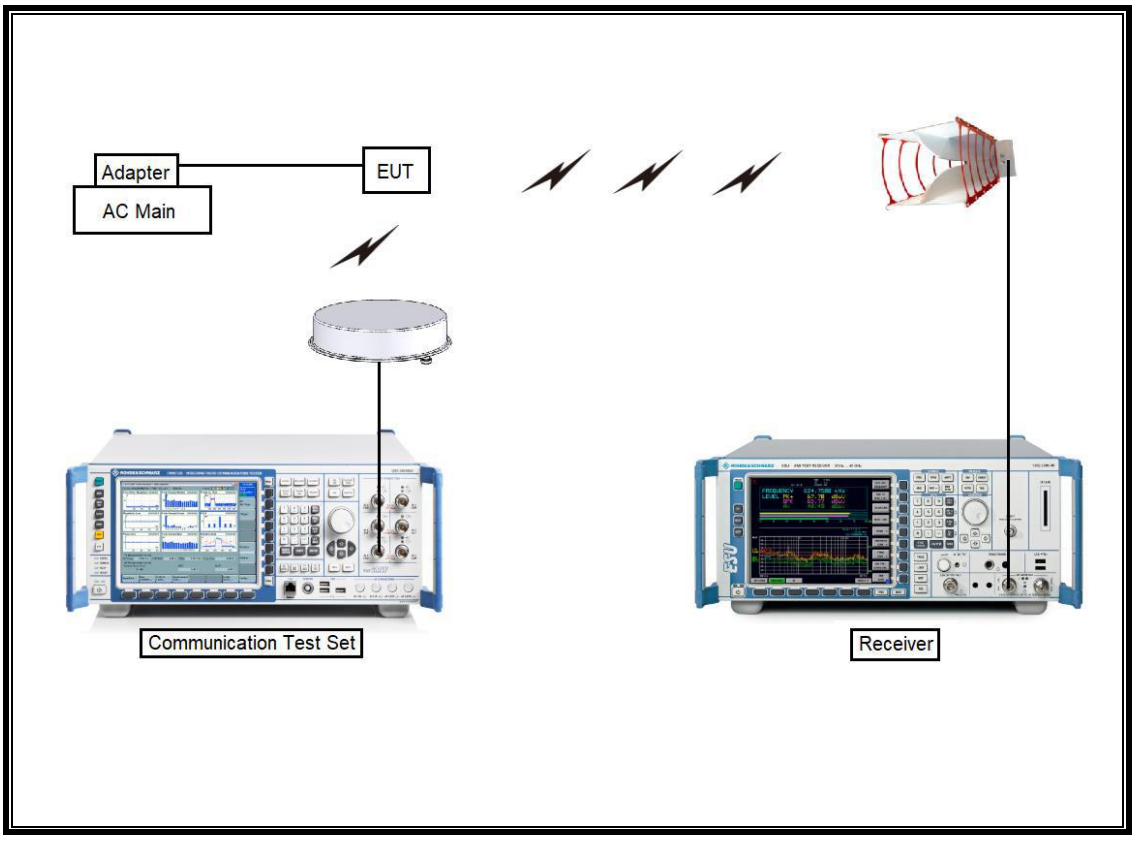
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	2025-01-17
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2023-10-13
Preamplifier	ETS	3115-PA	00167475	2023-08-04
Preamplifier	ETS	3116C-PA	00168841	2023-08-04
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2024-08-15
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Communications Test Set	R&S	CMW500	169796	2024-01-05
DC Power Supply	Agilent / HP	E3640A	MY54226395	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	341282	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2023-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2023-08-01
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2023-08-01
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2023-08-03
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2023-08-01
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2023-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2023-07-29
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2023-08-01
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2023-08-01
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2023-08-01
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2023-08-01
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2023-08-01
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2023-08-01
Attenuator	PASTERNACK	PE7087-10	A009	2023-08-03
Attenuator	PASTERNACK	PE7087-10	A001	2023-08-03
Attenuator	PASTERNACK	PE7087-10	A008	2023-08-03
Attenuator	PASTERNACK	PE7004-10	2	2023-08-01
Attenuator	PASTERNACK	PE7395-10	A011	2023-08-03
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023-10-06
Temperature Chamber	ESPEC	SH-642	93001109	2023-08-01
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2024-01-09
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2024-01-09

UL Software			
Description	**Manufacturer**	**Model**	**Version**
Antenna port test software	UL	CLT	Ver 3.4
Radiated software	UL	UL EMC	Ver 9.5
Antenna port test software (5G NR FR1)	UL	UL iM	Ver 1.06

7. SUMMARY TABLE

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

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8. CONDUCTED RESULTS

8.1. CONDUCTED OUTPUT POWER

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

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

NOTE

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations (π/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.

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8.1.1. CONDUCTED AVERAGE OUTPUT POWER

GSM

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm) Pmax			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GSM (Voice)	CS1	1	512	1850.2	29.69	20.66	30.5	21.5
			661	1880.0	29.40	20.37		
			810	1909.8	29.63	20.60		
GPRS (GMSK)	CS1	1	512	1850.2	29.73	20.70	30.5	21.5
			661	1880.0	29.54	20.51		
			810	1909.8	29.50	20.47		
		2	512	1850.2	28.23	22.21	29.0	23.0
			661	1880.0	27.92	21.90		
			810	1909.8	27.99	21.97		
		3	512	1850.2	26.28	22.02	27.5	**23.2**
			661	1880.0	26.11	21.85		
			810	1909.8	26.25	21.99		
		4	512	1850.2	24.68	21.67	25.5	22.5
			661	1880.0	24.59	21.58		
			810	1909.8	24.65	21.64		
EGPRS (8PSK)	MCS5	1	512	1850.2	25.52	16.49	27.0	18.0
			661	1880.0	25.37	16.34		
			810	1909.8	25.50	16.47		
		2	512	1850.2	24.22	18.20	25.0	19.0
			661	1880.0	23.95	17.93		
			810	1909.8	24.06	18.04		
		3	512	1850.2	22.16	17.90	23.0	18.7
			661	1880.0	21.75	17.49		
			810	1909.8	21.87	17.61		
		4	512	1850.2	21.07	18.06	22.0	19.0
			661	1880.0	20.98	17.97		
			810	1909.8	20.99	17.98		

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WCDMA B2

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm) Pmax		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	24.22	N/A	24.8
		9400	1880.0	24.02		
		9538	1907.6	24.00		
HSDPA	Subtest 1	9262	1852.4	23.22	0	23.8
		9400	1880.0	23.05		
		9538	1907.6	23.05		
	Subtest 2	9262	1852.4	23.18	0	23.8
		9400	1880.0	23.03		
		9538	1907.6	23.05		
	Subtest 3	9262	1852.4	22.73	0.5	23.3
		9400	1880.0	22.48		
		9538	1907.6	22.51		
	Subtest 4	9262	1852.4	22.72	0.5	23.3
		9400	1880.0	22.51		
		9538	1907.6	22.53		
HSUPA	Subtest 1	9262	1852.4	23.23	0	23.8
		9400	1880.0	23.00		
		9538	1907.6	23.03		
	Subtest 2	9262	1852.4	21.26	2	21.8
		9400	1880.0	21.03		
		9538	1907.6	21.06		
	Subtest 3	9262	1852.4	22.22	1	22.8
		9400	1880.0	22.03		
		9538	1907.6	22.07		
	Subtest 4	9262	1852.4	21.25	2	21.8
		9400	1880.0	21.04		
		9538	1907.6	21.05		
	Subtest 5	9262	1852.4	22.84	0	23.8
		9400	1880.0	22.63		
		9538	1907.6	22.64		
DC-HSDPA	Subtest 1	9262	1852.4	23.23	0	23.8
		9400	1880.0	23.07		
		9538	1907.6	23.09		
	Subtest 2	9262	1852.4	23.24	0	23.8
		9400	1880.0	23.04		
		9538	1907.6	23.09		
	Subtest 3	9262	1852.4	22.74	0.5	23.3
		9400	1880.0	22.55		
		9538	1907.6	22.56		
	Subtest 4	9262	1852.4	22.73	0.5	23.3
		9400	1880.0	22.57		
		9538	1907.6	22.63		

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LTE Band 25 (ANT B)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm) Pmax			MPR	Tune-up Limit
				Measured Pwr (dBm)				
				26140	26365	26590		
				1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	QPSK	1	0	23.62	23.37	23.39	0.0	25.0
		1	49	23.60	23.38	23.45	0.0	25.0
		1	99	23.48	23.34	23.38	0.0	25.0
		50	0	22.71	22.46	22.41	1.0	24.0
		50	24	22.67	22.45	22.50	1.0	24.0
		50	50	22.53	22.42	22.48	1.0	24.0
		100	0	22.57	22.46	22.50	1.0	24.0
	16QAM	1	0	22.89	22.66	22.68	1.0	24.0
		1	49	22.84	22.65	22.73	1.0	24.0
		1	99	22.71	22.62	22.63	1.0	24.0
		50	0	21.70	21.51	21.42	2.0	23.0
		50	24	21.68	21.48	21.51	2.0	23.0
		50	50	21.55	21.45	21.49	2.0	23.0
		100	0	21.58	21.46	21.52	2.0	23.0
	64QAM	1	0	21.76	21.55	21.66	2.0	23.0
		1	49	21.76	21.56	21.69	2.0	23.0
		1	99	21.68	21.49	21.69	2.0	23.0
		50	0	20.70	20.45	20.42	3.0	22.0
		50	24	20.65	20.45	20.50	3.0	22.0
		50	50	20.55	20.42	20.46	3.0	22.0
		100	0	20.56	20.44	20.49	3.0	22.0
	256QAM	1	0	18.88	18.71	18.67	5.0	20.0
		1	49	18.76	18.63	18.65	5.0	20.0
		1	99	18.72	18.69	18.74	5.0	20.0
		50	0	18.69	18.46	18.40	5.0	20.0
		50	24	18.70	18.46	18.48	5.0	20.0
		50	50	18.56	18.43	18.48	5.0	20.0
		100	0	18.59	18.45	18.53	5.0	20.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26115	26365	26615		
				1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	QPSK	1	0	23.60	23.45	23.42	0.0	25.0
		1	37	23.61	23.41	23.42	0.0	25.0
		1	74	23.59	23.33	23.43	0.0	25.0
		36	0	22.72	22.47	22.44	1.0	24.0
		36	20	22.60	22.43	22.42	1.0	24.0
		36	39	22.56	22.43	22.49	1.0	24.0
		75	0	22.58	22.45	22.43	1.0	24.0
	16QAM	1	0	22.84	22.60	22.56	1.0	24.0
		1	37	22.80	22.51	22.60	1.0	24.0
		1	74	22.74	22.48	22.53	1.0	24.0
		36	0	21.71	21.47	21.43	2.0	23.0
		36	20	21.58	21.44	21.42	2.0	23.0
		36	39	21.57	21.44	21.51	2.0	23.0
		75	0	21.58	21.46	21.44	2.0	23.0
	64QAM	1	0	21.84	21.52	21.57	2.0	23.0
		1	37	21.81	21.47	21.59	2.0	23.0
		1	74	21.78	21.44	21.52	2.0	23.0
		36	0	20.73	20.52	20.43	3.0	22.0
		36	20	20.61	20.46	20.41	3.0	22.0
		36	39	20.59	20.46	20.48	3.0	22.0
		75	0	20.60	20.46	20.41	3.0	22.0
	256QAM	1	0	18.85	18.65	18.61	5.0	20.0
		1	37	18.82	18.57	18.61	5.0	20.0
		1	74	18.73	18.61	18.67	5.0	20.0
		36	0	18.71	18.53	18.43	5.0	20.0
		36	20	18.63	18.47	18.41	5.0	20.0
		36	39	18.59	18.46	18.48	5.0	20.0
		75	0	18.62	18.50	18.40	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	23.66	23.39	23.62	0.0	25.0
		1	25	23.69	23.51	23.74	0.0	25.0
		1	49	23.59	23.44	23.58	0.0	25.0
		25	0	22.66	22.47	22.66	1.0	24.0
		25	12	22.69	22.46	22.68	1.0	24.0
		25	25	22.69	22.46	22.67	1.0	24.0
		50	0	22.71	22.49	22.67	1.0	24.0
	16QAM	1	0	22.85	22.68	22.76	1.0	24.0
		1	25	22.89	22.72	22.82	1.0	24.0
		1	49	22.77	22.64	22.76	1.0	24.0
		25	0	21.70	21.48	21.68	2.0	23.0
		25	12	21.69	21.51	21.68	2.0	23.0
		25	25	21.68	21.48	21.67	2.0	23.0
		50	0	21.72	21.48	21.68	2.0	23.0
	64QAM	1	0	21.83	21.66	21.75	2.0	23.0
		1	25	21.92	21.72	21.88	2.0	23.0
		1	49	21.79	21.68	21.78	2.0	23.0
		25	0	20.67	20.48	20.70	3.0	22.0
		25	12	20.69	20.51	20.69	3.0	22.0
		25	25	20.66	20.49	20.69	3.0	22.0
		50	0	20.68	20.51	20.69	3.0	22.0
	256QAM	1	0	18.89	18.76	18.84	5.0	20.0
		1	25	18.95	18.71	18.93	5.0	20.0
		1	49	18.77	18.61	18.76	5.0	20.0
		25	0	18.68	18.50	18.71	5.0	20.0
		25	12	18.74	18.54	18.75	5.0	20.0
		25	25	18.72	18.53	18.75	5.0	20.0
		50	0	18.68	18.51	18.70	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26065	26365	26665		
				1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	QPSK	1	0	23.80	23.51	23.58	0.0	25.0
		1	12	23.87	23.58	23.69	0.0	25.0
		1	24	23.81	23.48	23.62	0.0	25.0
		12	0	22.83	22.53	22.53	1.0	24.0
		12	7	22.83	22.55	22.57	1.0	24.0
		12	13	22.83	22.50	22.60	1.0	24.0
		25	0	22.81	22.52	22.50	1.0	24.0
	16QAM	1	0	22.83	22.67	22.67	1.0	24.0
		1	12	22.96	22.73	22.79	1.0	24.0
		1	24	22.84	22.63	22.70	1.0	24.0
		12	0	21.83	21.50	21.55	2.0	23.0
		12	7	21.86	21.54	21.58	2.0	23.0
		12	13	21.82	21.51	21.60	2.0	23.0
		25	0	21.83	21.54	21.56	2.0	23.0
	64QAM	1	0	21.95	21.62	21.66	2.0	23.0
		1	12	22.00	21.68	21.72	2.0	23.0
		1	24	21.91	21.63	21.71	2.0	23.0
		12	0	20.85	20.53	20.52	3.0	22.0
		12	7	20.87	20.57	20.57	3.0	22.0
		12	13	20.86	20.55	20.65	3.0	22.0
		25	0	20.82	20.52	20.54	3.0	22.0
	256QAM	1	0	19.00	18.67	18.60	5.0	20.0
		1	12	19.03	18.71	18.76	5.0	20.0
		1	24	18.94	18.66	18.66	5.0	20.0
		12	0	18.84	18.52	18.55	5.0	20.0
		12	7	18.83	18.55	18.57	5.0	20.0
		12	13	18.81	18.52	18.59	5.0	20.0
		25	0	18.82	18.54	18.53	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	23.78	23.48	23.53	0.0	25.0
		1	8	23.85	23.55	23.63	0.0	25.0
		1	14	23.76	23.48	23.56	0.0	25.0
		8	0	22.78	22.50	22.51	1.0	24.0
		8	4	22.84	22.54	22.56	1.0	24.0
		8	7	22.82	22.53	22.53	1.0	24.0
		15	0	22.82	22.51	22.53	1.0	24.0
	16QAM	1	0	22.95	22.71	22.67	1.0	24.0
		1	8	22.98	22.75	22.84	1.0	24.0
		1	14	22.95	22.71	22.69	1.0	24.0
		8	0	21.85	21.54	21.55	2.0	23.0
		8	4	21.87	21.57	21.58	2.0	23.0
		8	7	21.85	21.56	21.57	2.0	23.0
		15	0	21.82	21.53	21.54	2.0	23.0
	64QAM	1	0	22.08	21.66	21.68	2.0	23.0
		1	8	22.09	21.73	21.80	2.0	23.0
		1	14	22.03	21.63	21.72	2.0	23.0
		8	0	20.82	20.54	20.51	3.0	22.0
		8	4	20.83	20.58	20.54	3.0	22.0
		8	7	20.84	20.57	20.53	3.0	22.0
		15	0	20.83	20.53	20.53	3.0	22.0
	256QAM	1	0	18.83	18.61	18.62	5.0	20.0
		1	8	18.91	18.71	18.77	5.0	20.0
		1	14	18.82	18.64	18.67	5.0	20.0
		8	0	18.85	18.52	18.52	5.0	20.0
		8	4	18.84	18.54	18.55	5.0	20.0
		8	7	18.84	18.55	18.57	5.0	20.0
		15	0	18.80	18.50	18.52	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26047	26365	26683		
				1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	23.81	23.50	23.54	0.0	25.0
		1	3	23.79	23.48	23.55	0.0	25.0
		1	5	23.80	23.45	23.48	0.0	25.0
		3	0	23.79	23.50	23.54	0.0	25.0
		3	1	23.80	23.49	23.55	0.0	25.0
		3	3	23.80	23.50	23.57	0.0	25.0
		6	0	22.77	22.46	22.56	1.0	24.0
	16QAM	1	0	22.99	22.63	22.70	1.0	24.0
		1	3	22.99	22.65	22.72	1.0	24.0
		1	5	22.96	22.59	22.71	1.0	24.0
		3	0	22.85	22.62	22.71	1.0	24.0
		3	1	22.89	22.59	22.67	1.0	24.0
		3	3	22.88	22.59	22.69	1.0	24.0
		6	0	21.81	21.49	21.51	2.0	23.0
	64QAM	1	0	21.93	21.59	21.77	2.0	23.0
		1	3	21.95	21.68	21.90	2.0	23.0
		1	5	21.96	21.57	21.82	2.0	23.0
		3	0	21.87	21.54	21.63	2.0	23.0
		3	1	21.85	21.59	21.65	2.0	23.0
		3	3	21.86	21.54	21.64	2.0	23.0
		6	0	20.80	20.55	20.57	3.0	22.0
	256QAM	1	0	18.88	18.52	18.65	5.0	20.0
		1	3	18.94	18.55	18.67	5.0	20.0
		1	5	18.89	18.51	18.62	5.0	20.0
		3	0	18.81	18.50	18.61	5.0	20.0
		3	1	18.81	18.50	18.60	5.0	20.0
		3	3	18.83	18.51	18.61	5.0	20.0
		6	0	18.71	18.53	18.70	5.0	20.0

LTE Band 25 (ANT F)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm) Pmax			MPR	Tune-up Limit
				Measured Pwr (dBm)				
				26140	26365	26590		
				1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	QPSK	1	0	23.96	23.78	23.78	0.0	25.0
		1	49	23.87	23.68	23.77	0.0	25.0
		1	99	23.74	23.73	23.89	0.0	25.0
		50	0	22.94	22.83	22.82	1.0	24.0
		50	24	22.88	22.84	22.84	1.0	24.0
		50	50	22.82	22.80	22.89	1.0	24.0
		100	0	22.80	22.81	22.86	1.0	24.0
	16QAM	1	0	23.12	23.16	23.05	1.0	24.0
		1	49	23.06	22.99	23.10	1.0	24.0
		1	99	22.87	23.15	23.00	1.0	24.0
		50	0	21.97	21.82	21.84	2.0	23.0
		50	24	21.86	21.82	21.87	2.0	23.0
		50	50	21.82	21.76	21.94	2.0	23.0
		100	0	21.89	21.82	21.87	2.0	23.0
	64QAM	1	0	22.05	21.84	21.91	2.0	23.0
		1	49	22.07	21.84	21.99	2.0	23.0
		1	99	22.09	21.83	21.92	2.0	23.0
		50	0	20.95	20.80	20.85	3.0	22.0
		50	24	20.89	20.81	20.86	3.0	22.0
		50	50	20.82	20.79	20.90	3.0	22.0
		100	0	20.89	20.82	20.86	3.0	22.0
	256QAM	1	0	19.11	19.09	19.07	5.0	20.0
		1	49	19.15	19.04	18.81	5.0	20.0
		1	99	19.03	19.14	19.15	5.0	20.0
		50	0	18.98	18.84	18.83	5.0	20.0
		50	24	18.90	18.80	18.83	5.0	20.0
		50	50	18.85	18.79	18.88	5.0	20.0
		100	0	18.87	18.77	18.87	5.0	20.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26115	26365	26615		
				1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	QPSK	1	0	23.89	23.78	23.87	0.0	25.0
		1	37	23.90	23.73	23.79	0.0	25.0
		1	74	23.86	23.72	23.80	0.0	25.0
		36	0	22.95	22.80	22.83	1.0	24.0
		36	20	22.92	22.75	22.80	1.0	24.0
		36	39	22.86	22.77	22.92	1.0	24.0
		75	0	22.86	22.78	22.90	1.0	24.0
	16QAM	1	0	23.05	22.92	22.89	1.0	24.0
		1	37	23.12	22.93	23.04	1.0	24.0
		1	74	22.97	22.87	22.91	1.0	24.0
		36	0	22.00	21.83	21.84	2.0	23.0
		36	20	21.96	21.80	21.82	2.0	23.0
		36	39	21.87	21.80	21.88	2.0	23.0
		75	0	21.86	21.79	21.92	2.0	23.0
	64QAM	1	0	22.09	21.88	22.04	2.0	23.0
		1	37	22.08	21.94	22.01	2.0	23.0
		1	74	22.06	21.92	21.91	2.0	23.0
		36	0	20.96	20.82	20.88	3.0	22.0
		36	20	20.92	20.83	20.84	3.0	22.0
		36	39	20.84	20.80	20.89	3.0	22.0
		75	0	20.87	20.81	20.94	3.0	22.0
	256QAM	1	0	19.18	18.95	18.89	5.0	20.0
		1	37	19.06	18.90	18.98	5.0	20.0
		1	74	19.10	19.05	19.17	5.0	20.0
		36	0	18.98	18.81	18.81	5.0	20.0
		36	20	18.97	18.80	18.84	5.0	20.0
		36	39	18.86	18.82	18.92	5.0	20.0
		75	0	18.87	18.83	18.92	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26090	26365	26640		
				1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	QPSK	1	0	24.10	23.89	23.96	0.0	25.0
		1	25	24.14	23.95	24.02	0.0	25.0
		1	49	24.03	23.85	23.99	0.0	25.0
		25	0	23.11	22.90	22.92	1.0	24.0
		25	12	23.13	22.93	22.95	1.0	24.0
		25	25	23.07	22.89	23.01	1.0	24.0
		50	0	23.08	22.91	22.95	1.0	24.0
	16QAM	1	0	23.26	23.05	23.17	1.0	24.0
		1	25	23.31	23.10	23.12	1.0	24.0
		1	49	23.29	23.12	23.04	1.0	24.0
		25	0	22.10	21.92	21.93	2.0	23.0
		25	12	22.11	21.93	21.96	2.0	23.0
		25	25	22.07	21.93	22.06	2.0	23.0
		50	0	22.11	21.91	21.92	2.0	23.0
	64QAM	1	0	22.41	22.03	22.15	2.0	23.0
		1	25	22.35	22.03	22.22	2.0	23.0
		1	49	22.14	22.07	22.14	2.0	23.0
		25	0	21.11	20.90	20.90	3.0	22.0
		25	12	21.11	20.99	20.94	3.0	22.0
		25	25	21.15	20.92	21.01	3.0	22.0
		50	0	21.14	20.94	20.99	3.0	22.0
	256QAM	1	0	19.18	18.95	19.07	5.0	20.0
		1	25	19.18	19.09	19.20	5.0	20.0
		1	49	19.19	18.99	19.08	5.0	20.0
		25	0	19.10	18.93	18.93	5.0	20.0
		25	12	19.12	18.93	18.99	5.0	20.0
		25	25	19.11	18.92	19.01	5.0	20.0
		50	0	19.10	18.94	18.92	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26065	26365	26665		
				1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	QPSK	1	0	24.03	23.84	24.07	0.0	25.0
		1	12	24.19	23.91	24.09	0.0	25.0
		1	24	23.98	23.87	24.05	0.0	25.0
		12	0	23.10	22.86	22.92	1.0	24.0
		12	7	23.10	22.93	23.05	1.0	24.0
		12	13	23.13	22.88	23.03	1.0	24.0
		25	0	23.10	22.93	23.00	1.0	24.0
	16QAM	1	0	23.43	23.11	23.25	1.0	24.0
		1	12	23.37	23.14	23.35	1.0	24.0
		1	24	23.26	23.09	23.22	1.0	24.0
		12	0	22.07	21.87	21.96	2.0	23.0
		12	7	22.14	21.94	22.07	2.0	23.0
		12	13	22.07	21.87	22.04	2.0	23.0
		25	0	22.15	21.92	22.07	2.0	23.0
	64QAM	1	0	22.32	22.13	22.15	2.0	23.0
		1	12	22.36	22.18	22.30	2.0	23.0
		1	24	22.22	22.12	22.18	2.0	23.0
		12	0	21.11	20.91	21.01	3.0	22.0
		12	7	21.20	21.02	21.10	3.0	22.0
		12	13	21.16	20.96	21.04	3.0	22.0
		25	0	21.09	20.93	21.06	3.0	22.0
	256QAM	1	0	19.15	18.98	18.88	5.0	20.0
		1	12	19.25	19.05	19.17	5.0	20.0
		1	24	19.18	19.05	19.00	5.0	20.0
		12	0	19.11	18.92	18.95	5.0	20.0
		12	7	19.16	18.99	19.07	5.0	20.0
		12	13	19.12	18.92	19.01	5.0	20.0
		25	0	19.10	18.90	19.00	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26055	26365	26675		
				1851.5 MHz	1882.5 MHz	1913.5 MHz		
3 MHz	QPSK	1	0	23.97	23.81	23.92	0.0	25.0
		1	8	24.14	23.98	24.04	0.0	25.0
		1	14	23.98	23.85	23.93	0.0	25.0
		8	0	23.10	22.84	22.91	1.0	24.0
		8	4	23.10	22.91	23.03	1.0	24.0
		8	7	23.07	22.90	23.06	1.0	24.0
		15	0	23.07	22.89	23.01	1.0	24.0
	16QAM	1	0	23.10	22.94	23.30	1.0	24.0
		1	8	23.33	23.07	23.30	1.0	24.0
		1	14	23.14	23.01	23.14	1.0	24.0
		8	0	22.11	21.90	21.96	2.0	23.0
		8	4	22.16	22.00	22.06	2.0	23.0
		8	7	22.15	21.99	22.06	2.0	23.0
		15	0	22.15	21.93	22.05	2.0	23.0
	64QAM	1	0	22.14	21.89	22.09	2.0	23.0
		1	8	22.19	21.97	22.19	2.0	23.0
		1	14	22.12	22.04	22.10	2.0	23.0
		8	0	21.10	20.98	20.94	3.0	22.0
		8	4	21.12	20.99	21.11	3.0	22.0
		8	7	21.14	20.99	21.08	3.0	22.0
		15	0	21.13	20.94	21.06	3.0	22.0
	256QAM	1	0	19.16	18.92	19.00	5.0	20.0
		1	8	19.31	19.00	19.12	5.0	20.0
		1	14	19.20	18.97	19.02	5.0	20.0
		8	0	19.12	18.96	18.94	5.0	20.0
		8	4	19.19	18.97	19.02	5.0	20.0
		8	7	19.12	18.94	19.03	5.0	20.0
		15	0	19.08	18.87	19.02	5.0	20.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				26047	26365	26683		
				1850.7 MHz	1882.5 MHz	1914.3 MHz		
1.4 MHz	QPSK	1	0	24.11	23.81	24.00	0.0	25.0
		1	3	24.05	23.84	24.13	0.0	25.0
		1	5	24.05	23.83	24.04	0.0	25.0
		3	0	24.07	23.87	23.99	0.0	25.0
		3	1	24.03	23.83	24.01	0.0	25.0
		3	3	24.06	23.88	24.01	0.0	25.0
		6	0	23.11	22.82	23.00	1.0	24.0
	16QAM	1	0	23.28	22.94	23.17	1.0	24.0
		1	3	23.28	22.97	23.36	1.0	24.0
		1	5	23.34	22.95	23.21	1.0	24.0
		3	0	23.23	22.91	23.06	1.0	24.0
		3	1	23.17	22.94	23.04	1.0	24.0
		3	3	23.18	22.97	23.06	1.0	24.0
		6	0	22.03	21.85	21.95	2.0	23.0
	64QAM	1	0	22.10	21.75	22.24	2.0	23.0
		1	3	22.21	21.97	22.20	2.0	23.0
		1	5	22.16	21.82	22.13	2.0	23.0
		3	0	22.15	21.96	22.04	2.0	23.0
		3	1	22.22	21.93	22.07	2.0	23.0
		3	3	22.17	21.92	22.09	2.0	23.0
		6	0	21.05	20.87	20.96	3.0	22.0
	256QAM	1	0	19.19	19.02	19.04	5.0	20.0
		1	3	19.26	19.02	19.23	5.0	20.0
		1	5	19.18	18.90	19.18	5.0	20.0
		3	0	19.13	18.80	19.09	5.0	20.0
		3	1	19.13	18.87	19.11	5.0	20.0
		3	3	19.16	18.90	19.05	5.0	20.0
		6	0	19.23	18.78	18.90	5.0	20.0

NR Band n25 (ANT B)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm) Pamx			MPR	Tune-up Limit
					Measured Pwr (dBm)				
					374000	376500	379000		
					1870 MHz	1882.5 MHz	1895 MHz		
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.98	23.95	23.71	0.0	24.5
			1	108	23.91	23.80	23.62	0.0	24.5
			1	214	23.75	23.75	22.92	0.0	24.5
			108	0	23.11	23.01	22.81	0.5	24.0
			108	54	24.06	23.92	23.80	0.0	24.5
			108	108	23.01	22.98	22.75	0.0	24.5
			216	0	23.11	22.97	22.82	0.0	24.5
		QPSK	1	1	24.17	24.21	23.85	0.0	24.5
			1	108	24.06	24.18	23.80	0.0	24.5
			1	214	23.89	23.98	23.27	0.0	24.5
			108	0	23.14	23.08	22.89	1.0	23.5
			108	54	24.06	24.13	23.81	0.0	24.5
			108	108	22.99	22.96	22.79	1.0	23.5
			216	0	23.13	23.00	22.90	1.0	23.5
		16QAM	1	1	23.10	23.12	22.89	1.0	23.5
			1	108	23.09	23.02	22.80	1.0	23.5
			1	214	22.80	22.88	22.38	1.0	23.5
		64QAM	1	1	21.93	21.83	21.60	2.5	22.0
		256QAM	1	1	19.23	19.16	18.95	4.5	20.0
	CP-OFDM	QPSK	1	1	22.62	22.56	22.38	1.5	23.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					373000	376500	380000		
					1865 MHz	1882.5 MHz	1900 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.85	24.12	23.51	0.0	24.5
			1	80	23.78	24.12	23.41	0.0	24.5
			1	158	23.61	24.04	23.38	0.0	24.5
			80	0	22.97	23.20	22.62	0.5	24.0
			80	40	23.98	24.18	23.62	0.0	24.5
			80	80	22.88	23.22	22.55	0.5	24.0
			160	0	22.95	23.21	22.64	0.5	24.0
		QPSK	1	1	24.04	24.30	23.70	0.0	24.5
			1	80	23.93	24.22	23.58	0.0	24.5
			1	158	23.81	24.17	23.50	0.0	24.5
			80	0	23.02	23.28	22.64	1.0	23.5
			80	40	23.99	24.14	23.63	0.0	24.5
			80	80	22.92	23.24	22.58	1.0	23.5
			160	0	23.02	23.26	22.66	1.0	23.5
		16QAM	1	1	23.00	23.31	22.73	1.0	23.5
		64QAM	1	1	21.78	21.98	21.38	2.5	22.0
		256QAM	1	1	19.15	19.36	19.02	4.5	20.0
	CP-OFDM	QPSK	1	1	22.28	22.78	22.18	1.5	23.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372500	376500	380500		
					1862.5 MHz	1882.5 MHz	1902.5 MHz		
25 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.85	23.94	23.51	0.0	24.5
			1	67	23.78	23.81	23.41	0.0	24.5
			1	131	23.61	23.76	23.38	0.0	24.5
			64	0	22.97	23.09	22.62	0.5	24.0
			64	35	23.98	24.03	23.62	0.0	24.5
			64	69	22.88	22.97	22.55	0.5	24.0
			128	0	22.95	23.03	22.64	0.5	24.0
		QPSK	1	1	24.04	24.11	23.70	0.0	24.5
			1	67	23.93	24.00	23.58	0.0	24.5
			1	131	23.81	23.90	23.50	0.0	24.5
			64	0	23.02	23.06	22.64	1.0	23.5
			64	35	23.99	24.05	23.63	0.0	24.5
			64	69	22.92	22.95	22.58	1.0	23.5
			128	0	23.02	23.09	22.66	1.0	23.5
		16QAM	1	1	23.00	23.04	22.73	1.0	23.5
		64QAM	1	1	21.78	21.87	21.38	2.5	22.0
		256QAM	1	1	19.15	19.39	19.02	4.5	20.0
	CP-OFDM	QPSK	1	1	22.28	22.60	22.18	1.5	23.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372000	376500	381000		
					1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.98	24.04	23.68	0.0	24.5
			1	53	24.21	23.56	23.72	0.0	24.5
			1	104	24.10	23.56	22.84	0.0	24.5
			50	0	23.39	23.19	23.03	0.5	24.0
			50	28	24.32	23.69	23.89	0.0	24.5
			50	56	23.32	23.16	23.01	0.5	24.0
			100	0	23.39	23.19	23.07	0.5	24.0
		QPSK	1	1	24.04	24.12	23.92	0.0	24.5
			1	53	24.34	23.70	23.99	0.0	24.5
			1	104	24.24	23.67	23.21	0.0	24.5
			50	0	23.43	23.18	23.10	1.0	23.5
			50	28	24.34	23.72	23.97	0.0	24.5
			50	56	23.37	23.15	23.03	1.0	23.5
			100	0	23.39	23.23	23.10	1.0	23.5
		16QAM	1	1	23.01	23.13	22.87	1.0	23.5
			1	53	23.35	22.77	22.96	1.0	23.5
			1	104	23.14	22.80	22.34	1.0	23.5
		64QAM	1	1	21.98	21.91	21.73	2.5	22.0
		256QAM	1	1	19.45	19.29	19.18	4.5	20.0
	CP-OFDM	QPSK	1	1	22.37	21.87	22.35	1.5	23.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371500	376500	381500		
					1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.11	23.09	23.88	0.0	24.5
			1	40	24.24	22.46	23.81	0.0	24.5
			1	77	24.15	22.42	23.18	0.0	24.5
			36	0	23.43	23.14	23.03	0.5	24.0
			36	22	24.40	23.89	23.90	0.0	24.5
			36	43	23.39	23.09	23.01	0.5	24.0
			75	0	23.42	23.15	23.00	0.5	24.0
		QPSK	1	1	24.23	24.18	24.02	0.0	24.5
			1	40	24.37	23.74	23.93	0.0	24.5
			1	77	24.28	23.73	23.22	0.0	24.5
			36	0	23.14	23.19	23.07	1.0	23.5
			36	22	24.40	23.86	23.94	0.0	24.5
			36	43	23.39	23.18	23.02	1.0	23.5
			75	0	23.46	23.15	23.03	1.0	23.5
		16QAM	1	1	23.28	23.10	23.04	1.0	23.5
		64QAM	1	1	21.27	21.91	21.73	2.5	22.0
		256QAM	1	1	19.48	19.21	19.06	4.5	20.0
	CP-OFDM	QPSK	1	1	22.89	22.68	22.54	1.5	23.0
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371000	376500	382000		
					1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	24.08	23.44	23.64	0.0	24.5
			1	26	23.96	22.77	23.38	0.0	24.5
			1	50	24.04	22.72	22.69	0.0	24.5
			25	0	23.22	23.00	22.83	0.5	24.0
			25	14	24.22	23.77	23.82	0.0	24.5
			25	27	23.21	22.97	22.80	0.5	24.0
			50	0	23.24	23.03	22.86	0.5	24.0
		QPSK	1	1	24.13	24.01	23.74	0.0	24.5
			1	26	24.02	23.53	23.54	0.0	24.5
			1	50	24.17	23.57	22.82	0.0	24.5
			25	0	23.30	23.03	22.87	1.0	23.5
			25	14	24.24	23.68	23.77	0.0	24.5
			25	27	23.26	22.99	22.84	1.0	23.5
			50	0	23.25	23.05	22.86	1.0	23.5
		16QAM	1	1	23.22	22.92	22.83	1.0	23.5
		64QAM	1	1	21.98	21.72	21.56	2.5	22.0
		256QAM	1	1	18.28	19.02	18.84	4.5	20.0
	CP-OFDM	QPSK	1	1	22.05	21.00	22.34	1.5	23.0

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					370500	376500	382500		
					1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.99	23.75	23.41	0.0	24.5
			1	13	23.73	23.40	22.93	0.0	24.5
			1	23	23.85	23.51	22.58	0.0	24.5
			12	0	23.24	23.02	22.82	0.5	24.0
			12	7	24.14	23.86	23.75	0.0	24.5
			12	13	23.19	23.04	22.77	0.5	24.0
			25	0	23.20	23.06	22.80	0.5	24.0
		QPSK	1	1	24.03	23.84	23.70	0.0	24.5
			1	13	23.84	23.46	23.32	0.0	24.5
			1	23	23.91	23.64	22.94	0.0	24.5
			12	0	23.20	23.04	22.85	1.0	23.5
			12	7	24.20	23.85	22.85	0.0	24.5
			12	13	23.22	23.06	22.84	1.0	23.5
			25	0	23.22	23.07	22.81	1.0	23.5
		16QAM	1	1	23.08	22.93	22.75	1.0	23.5
		64QAM	1	1	21.99	21.81	21.53	2.5	22.0
		256QAM	1	1	18.91	19.05	18.83	4.5	20.0
	CP-OFDM	QPSK	1	1	22.52	22.37	22.75	1.5	23.0

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NR Band n25 (ANT F)

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
					Measured Pwr (dBm)				
					374000	376500	379000		
					1870 MHz	1882.5 MHz	1895 MHz		
40 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.35	23.33	23.31	0.0	24.0
			1	108	23.33	23.28	23.31	0.0	24.0
			1	214	23.23	23.14	23.17	0.0	24.0
			108	0	22.51	22.33	22.42	0.5	23.5
			108	54	23.40	23.33	23.39	0.0	24.0
			108	108	22.40	22.32	22.36	0.5	23.5
			216	0	22.43	22.36	22.42	0.5	23.5
		QPSK	1	1	23.50	23.39	23.38	0.0	24.0
			1	108	23.44	23.37	23.38	0.0	24.0
			1	214	23.35	23.18	23.25	0.0	24.0
			108	0	22.50	22.39	22.43	1.0	23.0
			108	54	23.41	23.35	23.35	0.0	24.0
			108	108	22.45	22.35	22.39	1.0	23.0
			216	0	22.46	22.35	22.46	1.0	23.0
		16QAM	1	1	22.46	22.45	22.43	1.0	23.0
			1	108	22.44	22.39	22.48	1.0	23.0
			1	214	22.31	22.24	22.35	1.0	23.0
		64QAM	1	1	21.18	21.08	21.09	2.5	21.5
		256QAM	1	1	18.58	18.47	18.48	4.5	19.5
	CP-OFDM	QPSK	1	1	22.02	21.89	21.89	1.5	22.5
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					373000	376500	380000		
					1865 MHz	1882.5 MHz	1900 MHz		
30 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.32	23.32	23.56	0.0	24.0
			1	80	23.40	23.28	23.62	0.0	24.0
			1	158	23.42	23.13	23.54	0.0	24.0
			80	0	22.43	22.33	22.67	0.5	23.5
			80	40	23.39	23.31	23.68	0.0	24.0
			80	80	22.41	22.33	22.67	0.5	23.5
			160	0	22.48	22.33	22.73	0.5	23.5
		QPSK	1	1	23.49	23.37	23.70	0.0	24.0
			1	80	23.41	23.43	23.69	0.0	24.0
			1	158	23.31	23.27	23.64	0.0	24.0
			80	0	22.47	22.36	22.72	1.0	23.0
			80	40	23.46	23.29	23.70	0.0	24.0
			80	80	22.44	22.29	22.66	1.0	23.0
			160	0	22.47	22.35	22.76	1.0	23.0
		16QAM	1	1	22.44	22.43	22.77	1.0	23.0
		64QAM	1	1	21.23	21.06	21.45	2.5	21.5
		256QAM	1	1	18.53	18.43	18.81	4.5	19.5
	CP-OFDM	QPSK	1	1	21.96	21.87	22.24	1.5	22.5
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372500	376500	380500		
					1862.5 MHz	1882.5 MHz	1902.5 MHz		
25 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.33	23.24	23.17	0.0	24.0
			1	67	23.31	23.13	23.08	0.0	24.0
			1	131	23.20	23.20	23.07	0.0	24.0
			64	0	22.42	22.33	22.28	0.5	23.5
			64	35	23.42	23.33	23.21	0.0	24.0
			64	69	22.39	22.31	22.22	0.5	23.5
			128	0	22.46	22.33	22.28	0.5	23.5
		QPSK	1	1	23.47	23.36	23.28	0.0	24.0
			1	67	23.37	23.29	23.20	0.0	24.0
			1	131	23.27	23.19	23.21	0.0	24.0
			64	0	22.42	22.31	22.32	1.0	23.0
			64	35	23.41	23.31	23.23	0.0	24.0
			64	69	22.43	22.32	22.28	1.0	23.0
			128	0	22.49	22.34	22.33	1.0	23.0
		16QAM	1	1	22.40	22.37	22.30	1.0	23.0
		64QAM	1	1	21.18	21.08	21.01	2.5	21.5
		256QAM	1	1	17.80	18.70	18.61	4.5	19.5
	CP-OFDM	QPSK	1	1	22.01	21.83	21.79	1.5	22.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					372000	376500	381000		
					1860 MHz	1882.5 MHz	1905 MHz		
20 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.21	23.20	23.20	0.0	24.0
			1	53	23.25	23.10	23.12	0.0	24.0
			1	104	23.22	23.16	23.12	0.0	24.0
			50	0	22.38	22.33	22.31	0.5	23.5
			50	28	23.37	23.30	23.27	0.0	24.0
			50	56	22.38	22.30	22.30	0.5	23.5
			100	0	22.39	22.31	22.33	0.5	23.5
		QPSK	1	1	23.39	23.25	23.25	0.0	24.0
			1	53	23.33	23.22	23.22	0.0	24.0
			1	104	23.29	23.23	23.17	0.0	24.0
			50	0	22.47	22.34	22.31	1.0	23.0
			50	28	23.42	23.33	23.29	0.0	24.0
			50	56	22.38	22.26	22.32	1.0	23.0
			100	0	22.43	22.28	22.31	1.0	23.0
		16QAM	1	1	22.30	22.32	22.42	1.0	23.0
			1	53	22.42	22.24	22.23	1.0	23.0
			1	104	22.35	22.31	22.27	1.0	23.0
		64QAM	1	1	21.15	20.95	21.00	2.5	21.5
		256QAM	1	1	18.44	18.37	18.36	4.5	19.5
	CP-OFDM	QPSK	1	1	21.95	21.79	21.79	1.5	22.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371500	376500	381500		
					1857.5 MHz	1882.5 MHz	1907.5 MHz		
15 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.37	23.25	23.55	0.0	24.0
			1	40	23.35	23.13	23.50	0.0	24.0
			1	77	23.34	23.19	23.46	0.0	24.0
			36	0	22.50	22.68	22.65	0.5	23.5
			36	22	23.44	22.31	23.64	0.0	24.0
			36	43	22.43	22.29	22.67	0.5	23.5
			75	0	22.46	22.32	22.66	0.5	23.5
		QPSK	1	1	23.51	23.32	23.69	0.0	24.0
			1	40	23.39	23.26	23.61	0.0	24.0
			1	77	23.42	23.27	23.56	0.0	24.0
			36	0	22.48	22.35	22.66	1.0	23.0
			36	22	23.46	23.30	23.67	0.0	24.0
			36	43	22.48	22.31	22.64	1.0	23.0
			75	0	22.49	22.34	22.70	1.0	23.0
		16QAM	1	1	22.46	22.35	22.78	1.0	23.0
		64QAM	1	1	21.26	21.07	21.38	2.5	21.5
		256QAM	1	1	18.52	18.38	18.83	4.5	19.5
	CP-OFDM	QPSK	1	1	22.08	21.86	22.20	1.5	22.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					371000	376500	382000		
					1855 MHz	1882.5 MHz	1910 MHz		
10 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.14	23.09	22.93	0.0	24.0
			1	26	23.17	23.10	22.99	0.0	24.0
			1	50	23.12	23.10	22.93	0.0	24.0
			25	0	22.14	22.17	22.04	0.5	23.5
			25	14	22.22	23.19	23.00	0.0	24.0
			25	27	22.23	22.17	22.03	0.5	23.5
			50	0	22.21	22.18	22.01	0.5	23.5
		QPSK	1	1	23.22	23.18	23.02	0.0	24.0
			1	26	23.23	23.15	23.01	0.0	24.0
			1	50	23.19	23.10	23.09	0.0	24.0
			25	0	22.31	22.22	22.07	1.0	23.0
			25	14	23.28	23.19	23.02	0.0	24.0
			25	27	22.25	22.21	22.01	1.0	23.0
			50	0	22.24	22.19	22.02	1.0	23.0
		16QAM	1	1	22.21	22.20	22.08	1.0	23.0
		64QAM	1	1	21.03	20.91	20.75	2.5	21.5
		256QAM	1	1	18.28	18.17	18.01	4.5	19.5
	CP-OFDM	QPSK	1	1	21.73	21.68	21.54	1.5	22.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					370500	376500	382500		
					1852.5 MHz	1882.5 MHz	1912.5 MHz		
5 MHz	DFT-s-OFDM	π/2 BPSK	1	1	23.16	23.13	22.94	0.0	24.0
			1	13	23.09	23.04	22.92	0.0	24.0
			1	23	23.13	23.12	23.02	0.0	24.0
			12	0	22.20	22.20	21.99	0.5	23.5
			12	7	23.17	23.15	22.95	0.0	24.0
			12	13	22.19	22.19	21.99	0.5	23.5
			25	0	22.19	22.19	22.00	0.5	23.5
		QPSK	1	1	23.21	23.20	22.97	0.0	24.0
			1	13	23.25	23.14	23.02	0.0	24.0
			1	23	23.24	23.26	22.99	0.0	24.0
			12	0	22.25	22.23	22.03	1.0	23.0
			12	7	23.19	23.13	22.98	0.0	24.0
			12	13	22.24	22.23	22.02	1.0	23.0
			25	0	22.22	22.20	22.03	1.0	23.0
		16QAM	1	1	22.29	22.25	22.04	1.0	23.0
		64QAM	1	1	20.99	20.96	20.71	2.5	21.5
		256QAM	1	1	18.25	18.23	18.06	4.5	19.5
	CP-OFDM	QPSK	1	1	21.75	21.73	21.52	1.5	22.5

8.2. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

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

Test Spec

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

NOTE

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations (π/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.

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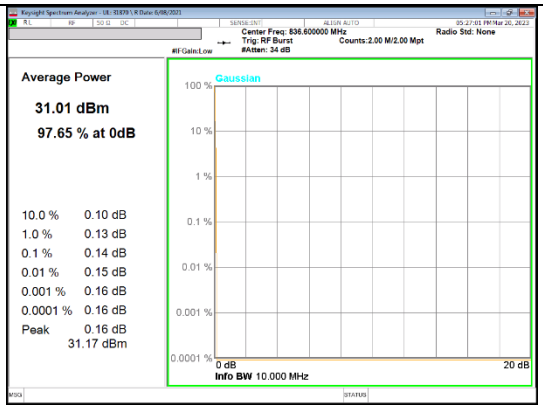
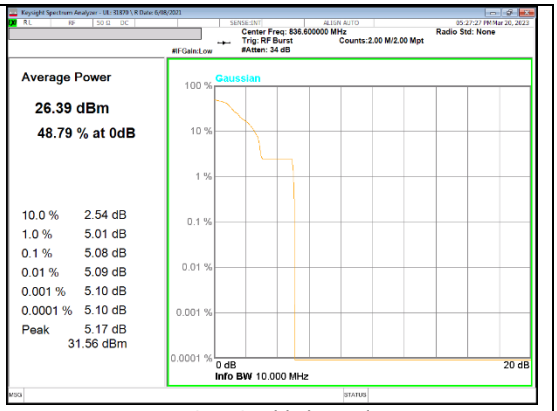
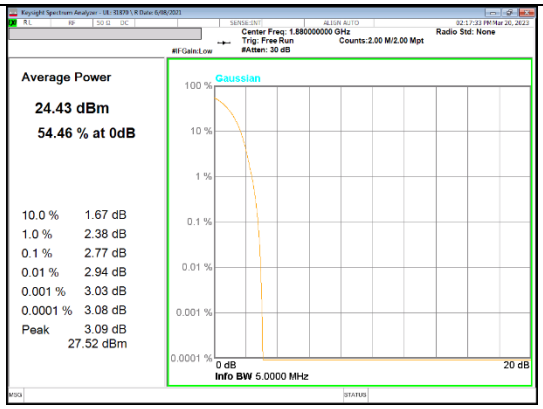
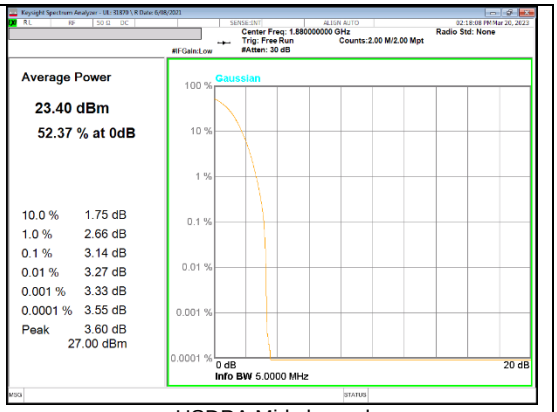
8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

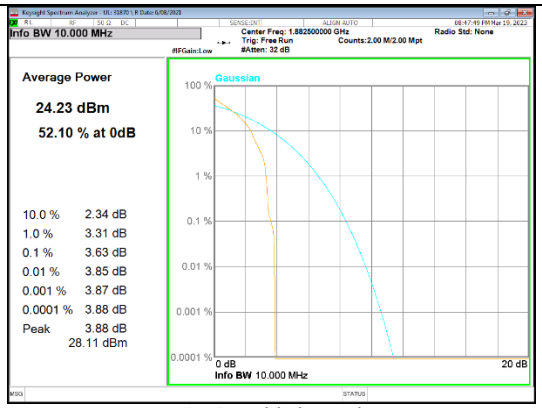
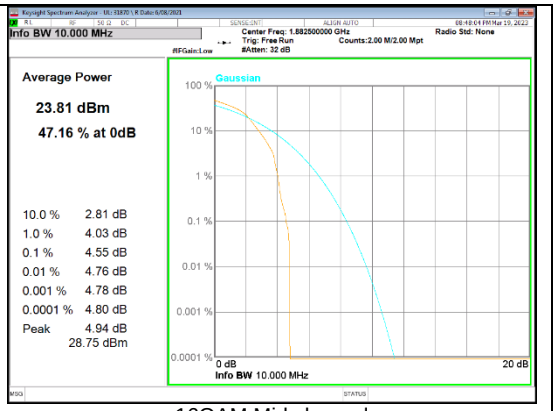
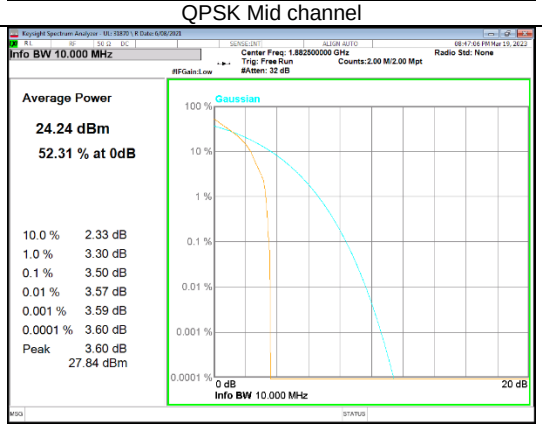
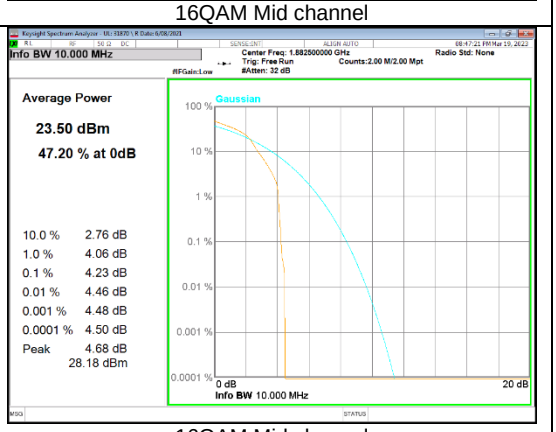
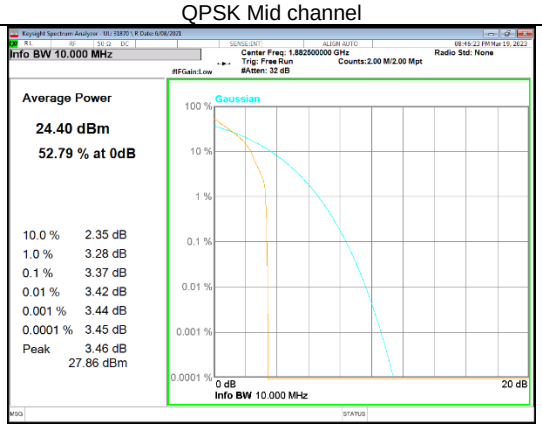
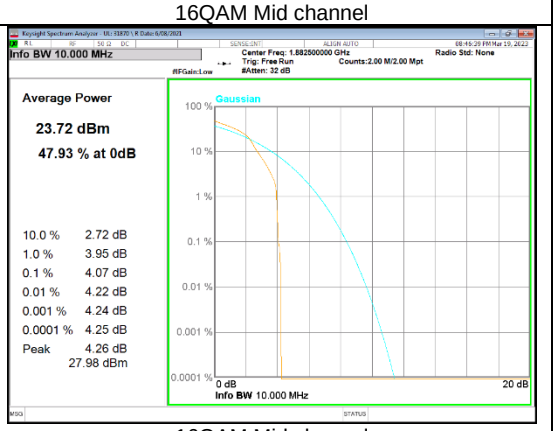
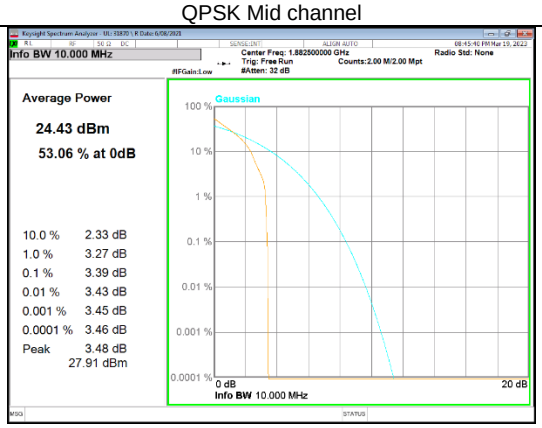
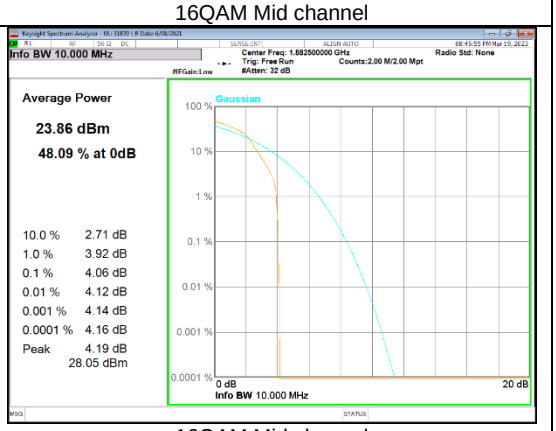
GSM

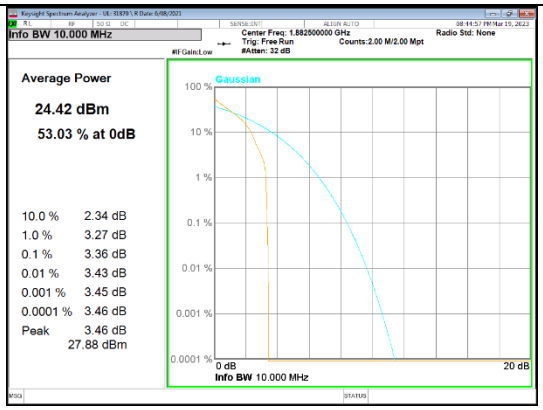
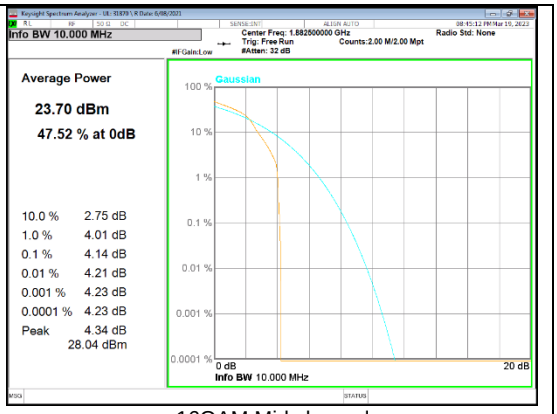
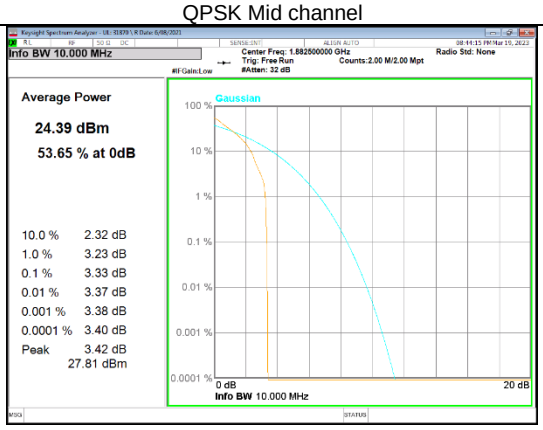
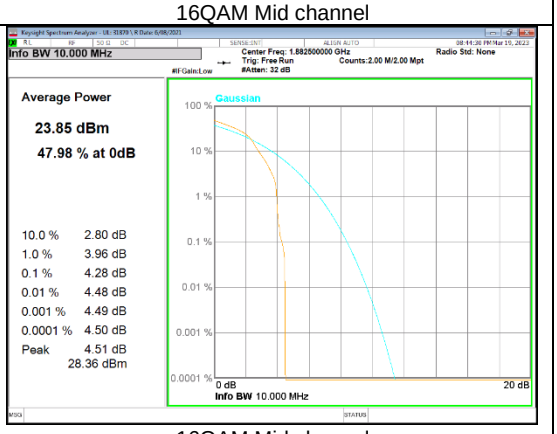
GSM 1900		
	GPRS Mid channel	EGPRS Mid channel

WCDMA

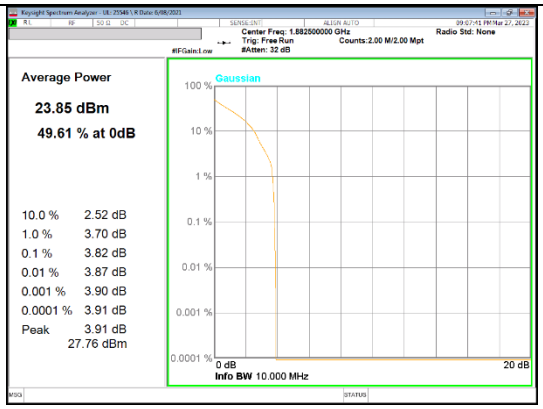
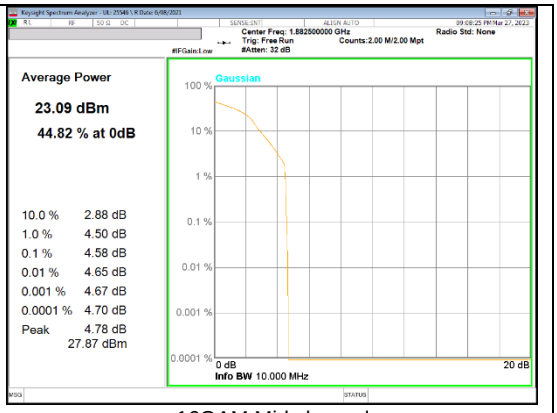
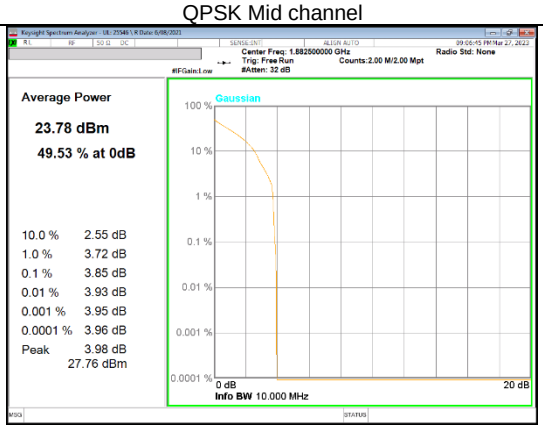
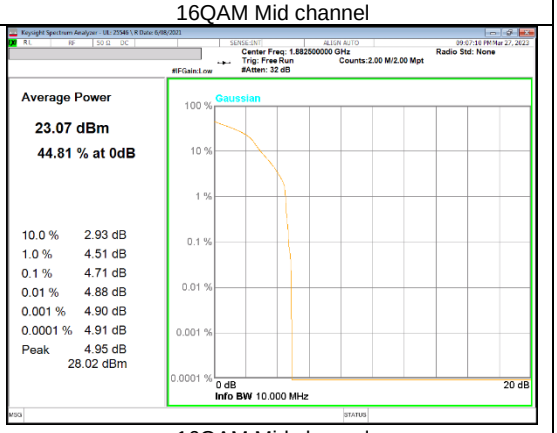
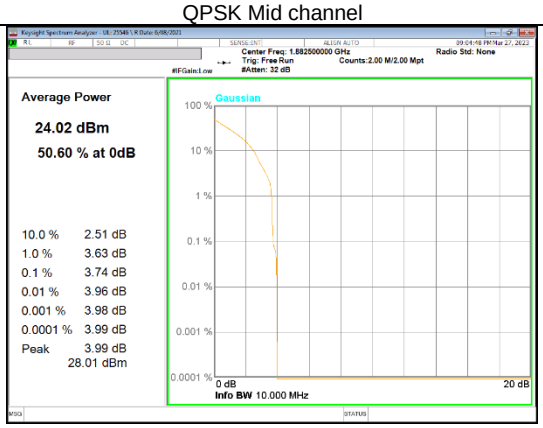
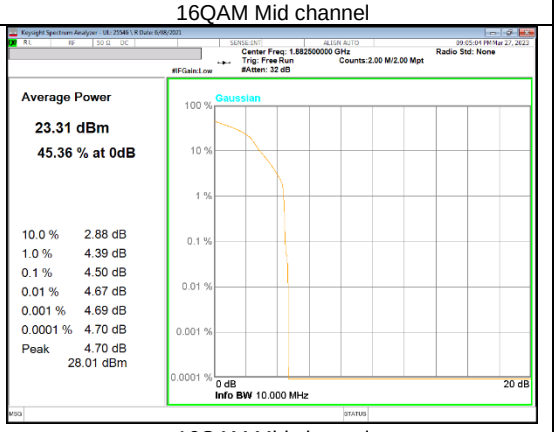
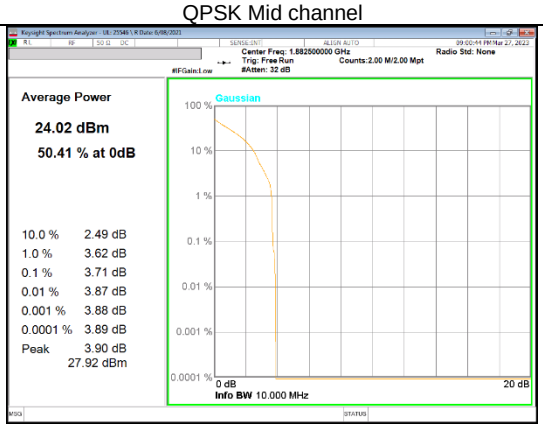
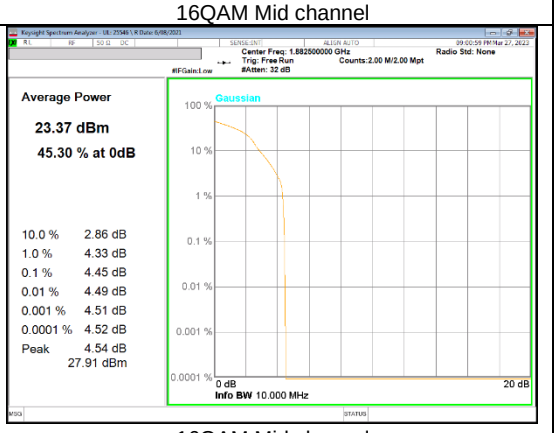
Band 2		
	REL99 Mid channel	HSDPA Mid channel

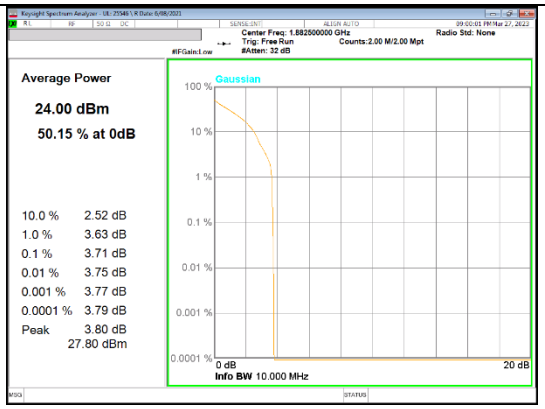
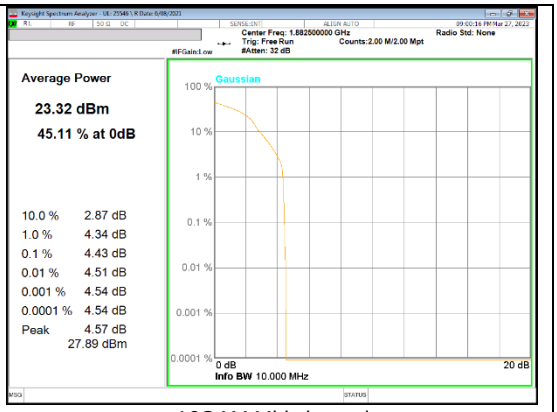
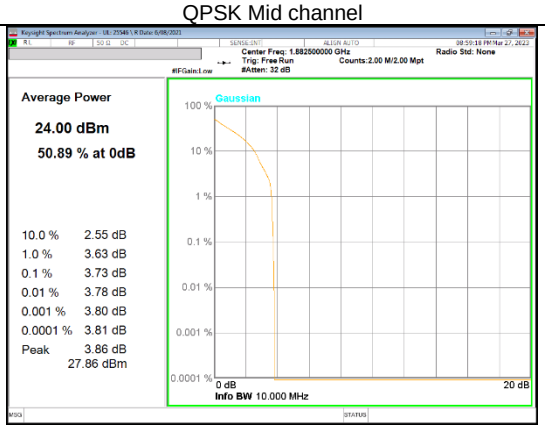
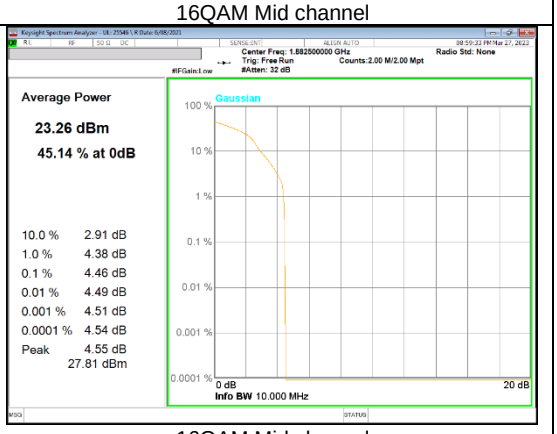
LTE Band 25 (ANT B)

20 MHz	 QPSK Mid channel	 16QAM Mid channel
15 MHz	 QPSK Mid channel	 16QAM Mid channel
10 MHz	 QPSK Mid channel	 16QAM Mid channel
5 MHz	 QPSK Mid channel	 16QAM Mid channel

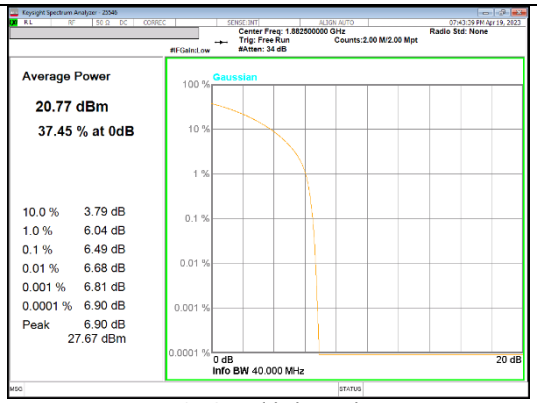
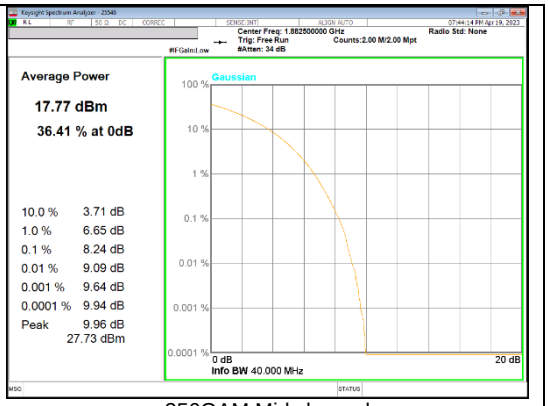
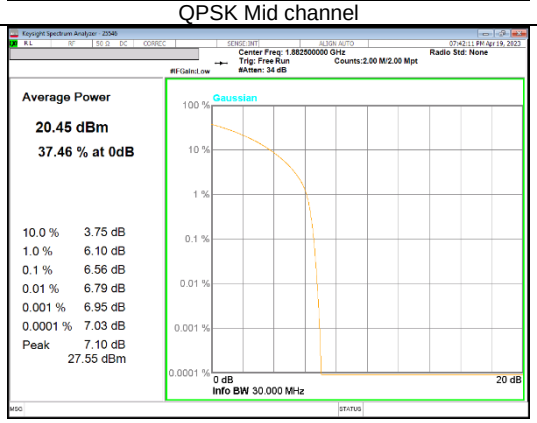
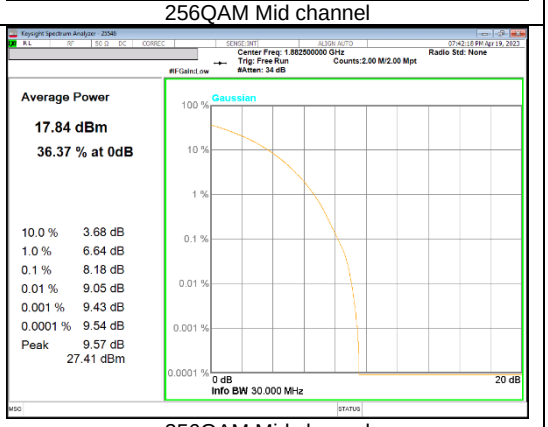
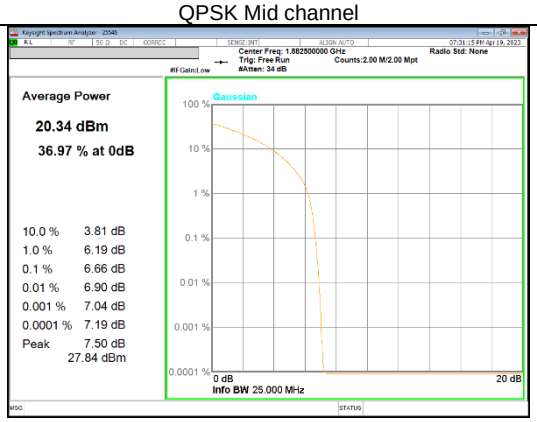
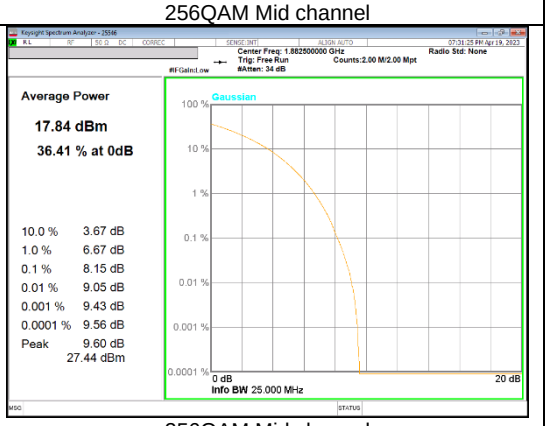
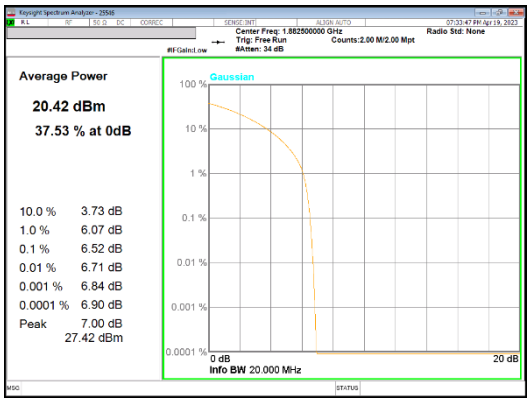
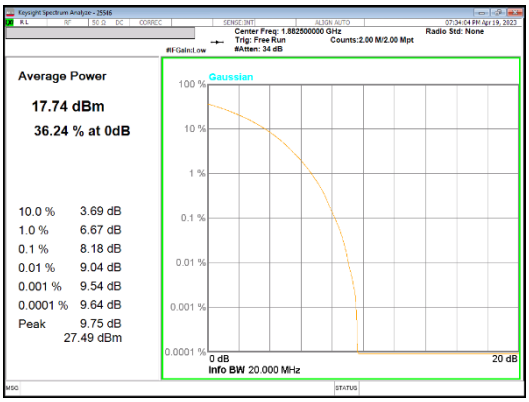
3 MHz	 QPSK Mid channel	 16QAM Mid channel
1.4 MHz	 QPSK Mid channel	 16QAM Mid channel

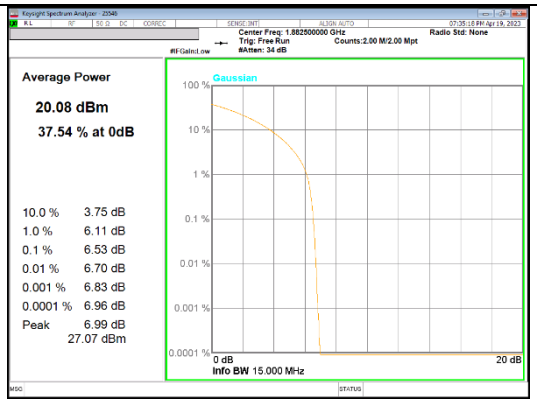
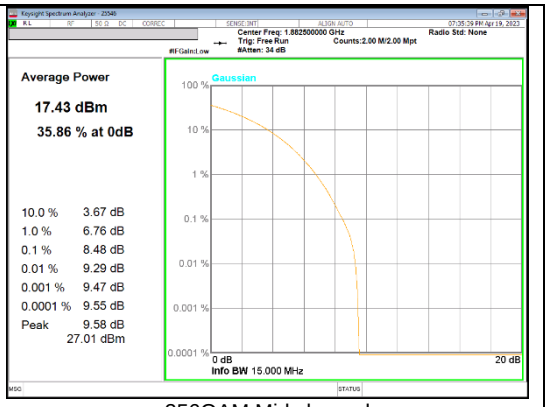
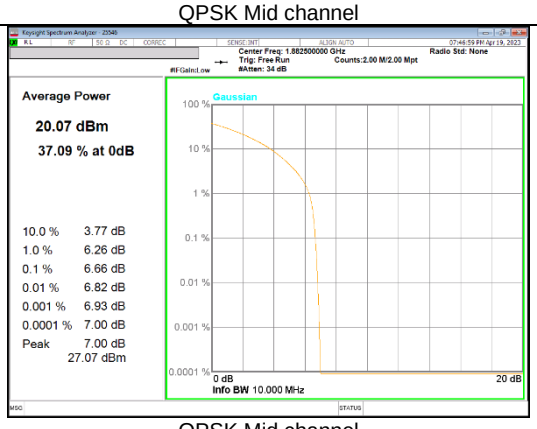
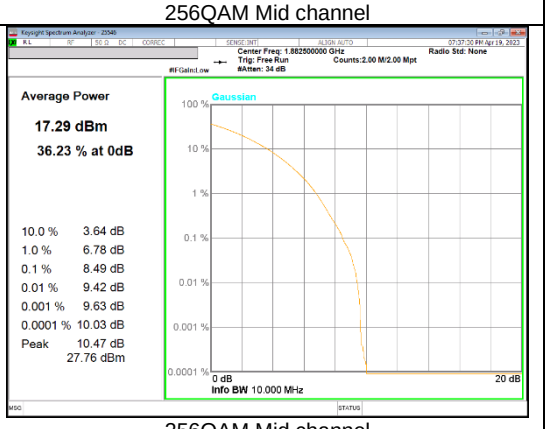
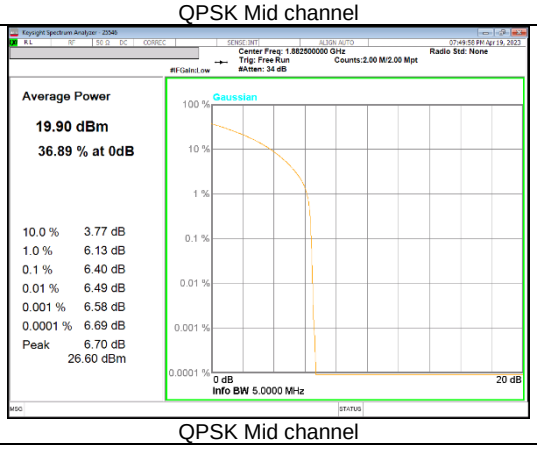
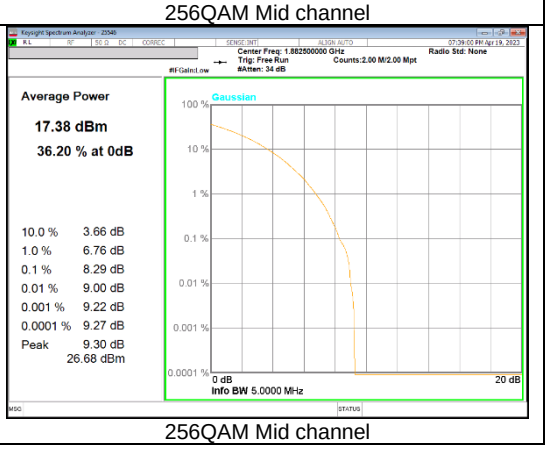
LTE Band 25_(ANT F)

20 MHz	 QPSK Mid channel	 16QAM Mid channel
15 MHz	 QPSK Mid channel	 16QAM Mid channel
10 MHz	 QPSK Mid channel	 16QAM Mid channel
5 MHz	 QPSK Mid channel	 16QAM Mid channel

3 MHz	 QPSK Mid channel	 16QAM Mid channel
1.4 MHz	 QPSK Mid channel	 16QAM Mid channel

NR Band n25 CP-OFDM (ANT B)

40 MHz	 QPSK Mid channel	 256QAM Mid channel
30 MHz	 QPSK Mid channel	 256QAM Mid channel
25 MHz	 QPSK Mid channel	 256QAM Mid channel
20 MHz	 QPSK Mid channel	 256QAM Mid channel

15 MHz	 QPSK Mid channel	 256QAM Mid channel
10 MHz	 QPSK Mid channel	 256QAM Mid channel
5 MHz	 QPSK Mid channel	 256QAM Mid channel

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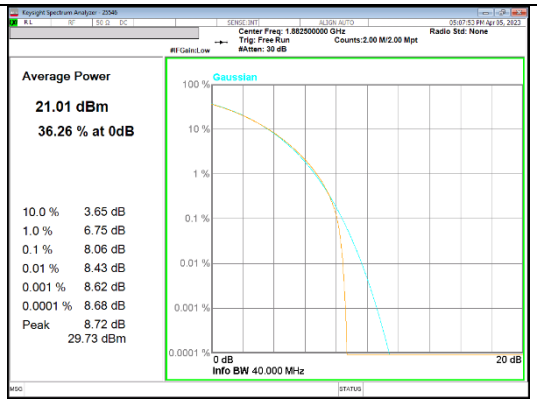
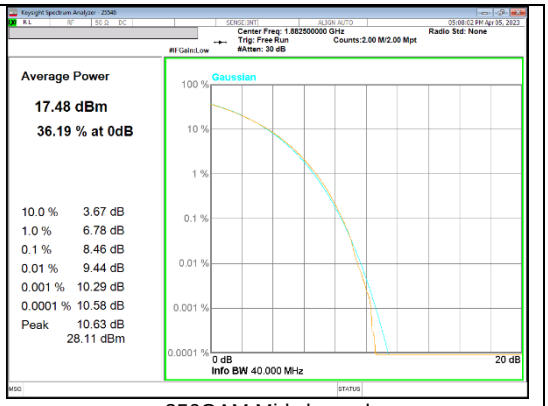
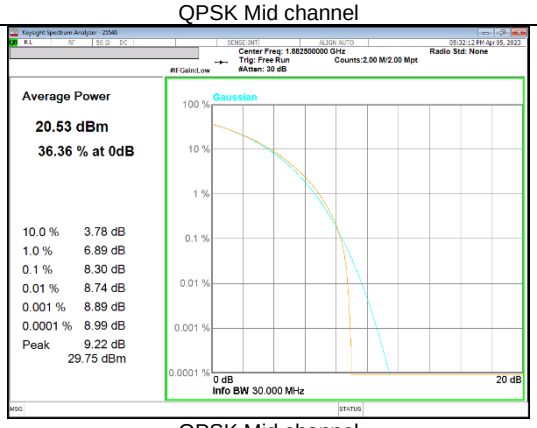
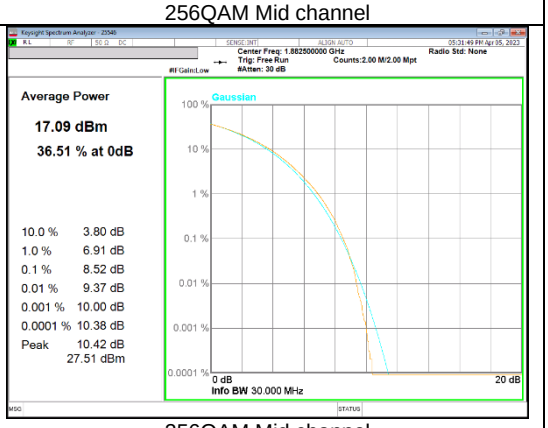
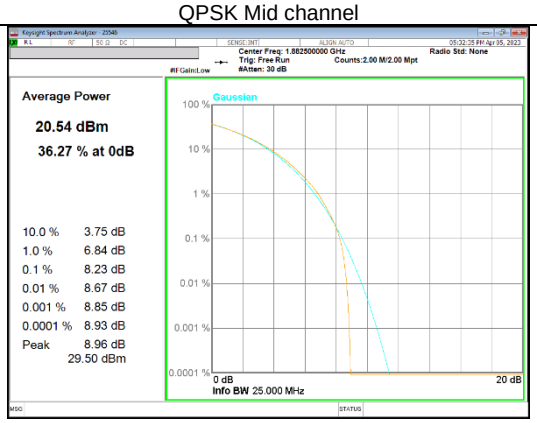
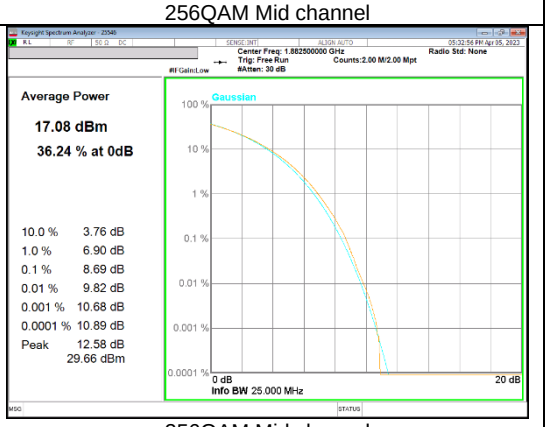
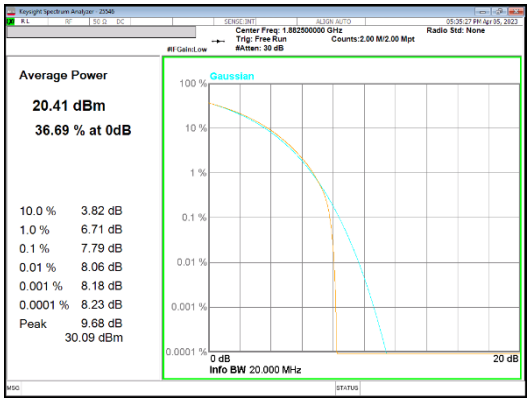
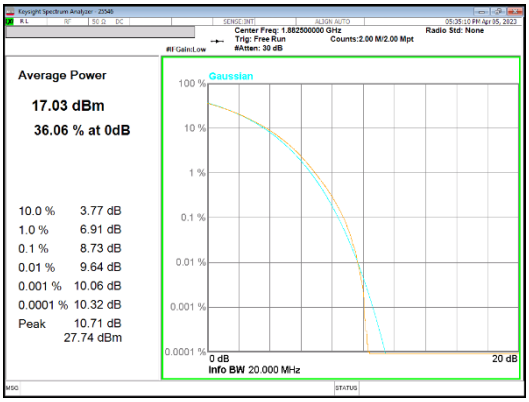
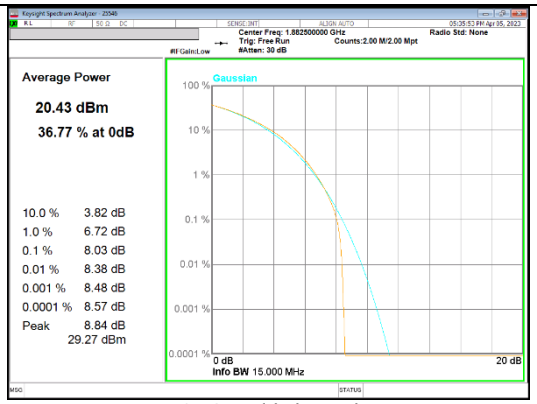
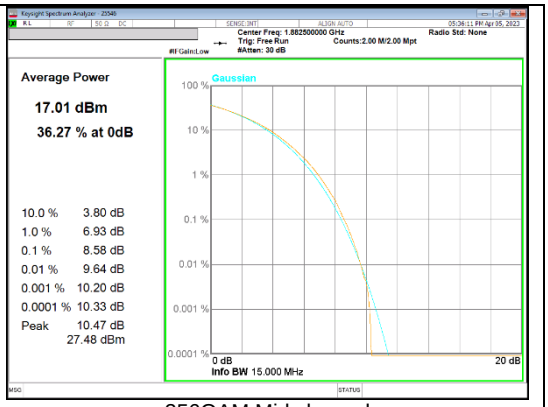
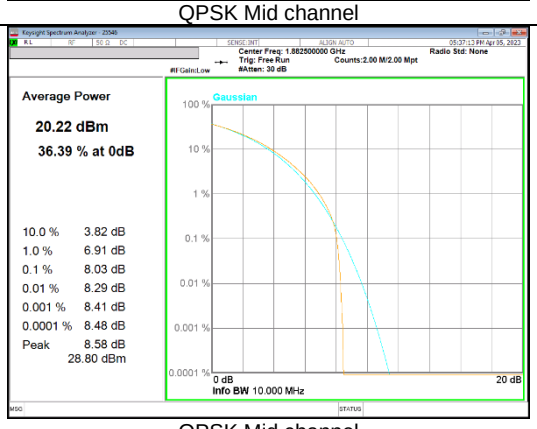
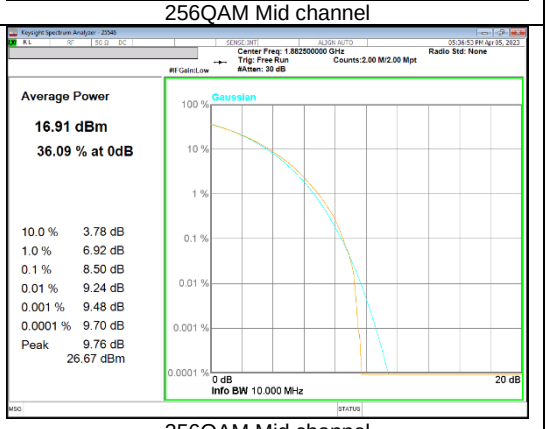
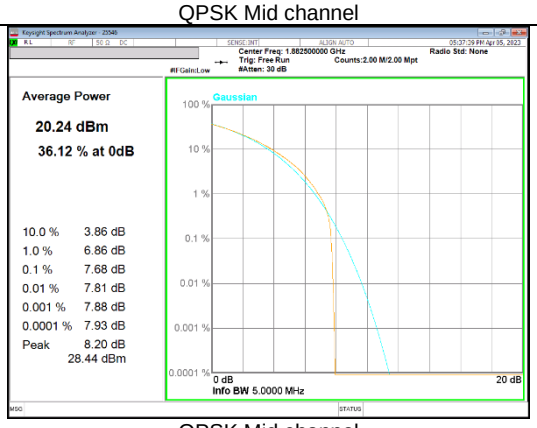
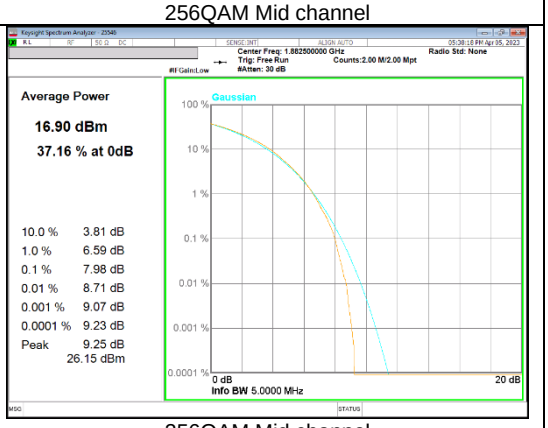
NR Band n25 CP-OFDM (ANT F)

40 MHz	 QPSK Mid channel	 256QAM Mid channel
30 MHz	 QPSK Mid channel	 256QAM Mid channel
25 MHz	 QPSK Mid channel	 256QAM Mid channel
20 MHz	 QPSK Mid channel	 256QAM Mid channel

15 MHz	 QPSK Mid channel	 256QAM Mid channel
10 MHz	 QPSK Mid channel	 256QAM Mid channel
5 MHz	 QPSK Mid channel	 256QAM Mid channel

8.3. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

RESULTS

See the following pages.

- **GSM**

Band	Modulation	f [MHz]	99% BW (kHz)	-26dB BW (kHz)
1900	GPRS	1880.0	242.14	315.6
	EGPRS		243.21	313.9

- **WCDMA**

Band	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
B2	Rel.99	1880.0	4.158	4.70
	HSDPA		4.155	4.67

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- LTE Band 25 (ANT B)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.5	17.910	19.57
		16QAM		17.941	19.37
	15M	QPSK		13.432	14.60
		16QAM		13.446	14.80
	10M	QPSK		8.975	9.89
		16QAM		8.998	9.92
	5M	QPSK		4.500	5.11
		16QAM		4.492	5.10
	3M	QPSK		2.700	3.04
		16QAM		2.702	3.01
	1.4M	QPSK		1.088	1.33
		16QAM		1.095	1.38

- LTE Band 25 (ANT F)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B25	20M	QPSK	1882.5	17.899	19.55
		16QAM		17.916	19.47
	15M	QPSK		13.419	14.70
		16QAM		13.434	14.66
	10M	QPSK		8.972	9.94
		16QAM		8.972	9.89
	5M	QPSK		4.499	5.13
		16QAM		4.499	5.02
	3M	QPSK		2.700	3.04
		16QAM		2.700	3.03
	1.4M	QPSK		1.091	1.33
		16QAM		1.093	1.35

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- NR Band n25 CP-OFDM (ANT B)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	40M	QPSK	1882.5	38.604	40.26
		16QAM		38.678	40.34
	30M	QPSK		28.610	29.89
		16QAM		28.679	29.93
	25M	QPSK		23.774	24.90
		16QAM		23.776	24.96
	20M	QPSK		18.935	20.18
		16QAM		19.029	19.77
	15M	QPSK		14.114	15.03
		16QAM		14.130	14.89
	10M	QPSK		9.301	10.10
		16QAM		9.301	10.10
	5M	QPSK		4.478	5.20
		16QAM		4.467	5.13

- NR Band n25 CP-OFDM_(ANT F)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n25	40M	QPSK	1882.5	38.532	40.11
		16QAM		38.603	40.24
	30M	QPSK		28.586	29.85
		16QAM		28.595	29.97
	25M	QPSK		23.761	24.87
		16QAM		23.760	24.82
	20M	QPSK		18.905	19.90
		16QAM		18.900	19.99
	15M	QPSK		14.121	15.03
		16QAM		14.132	15.05
	10M	QPSK		9.295	10.12
		16QAM		9.290	10.08
	5M	QPSK		4.478	5.17
		16QAM		4.476	5.08

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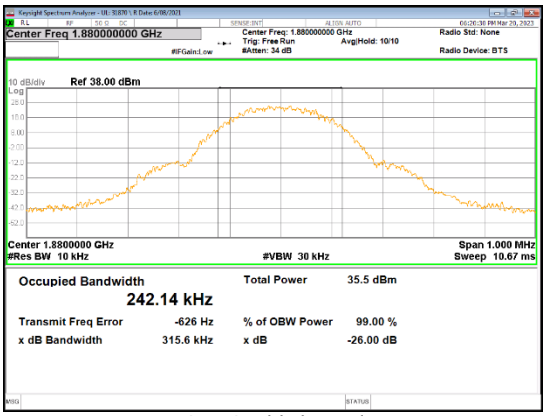
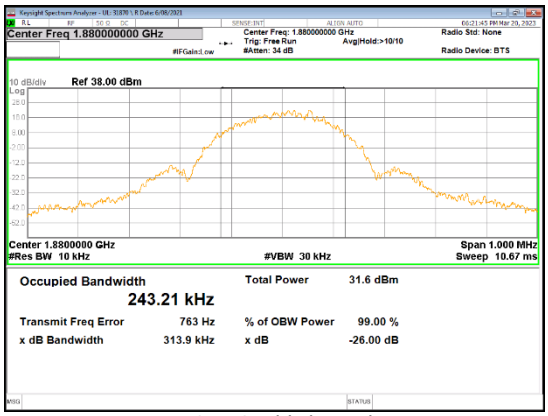
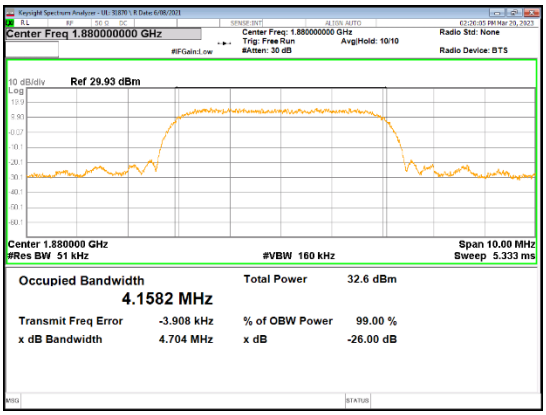
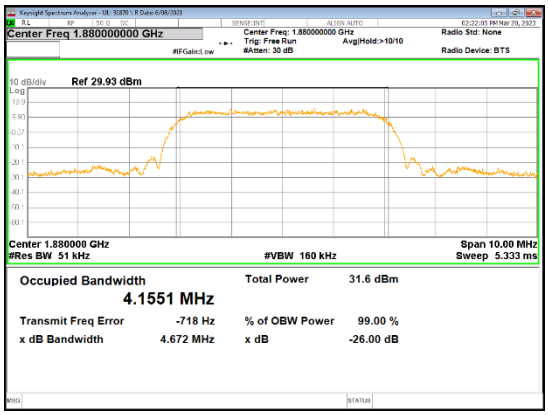
8.3.1. OCCUPIED BANDWIDTH RESULTS

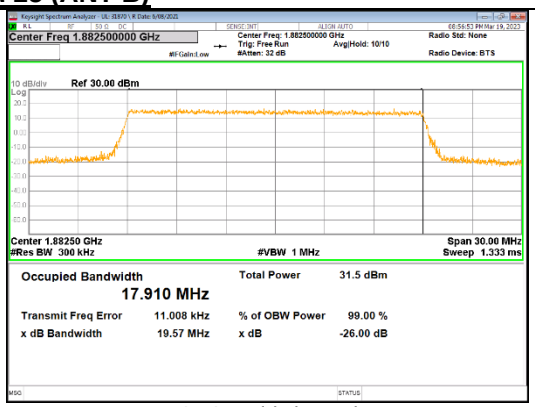
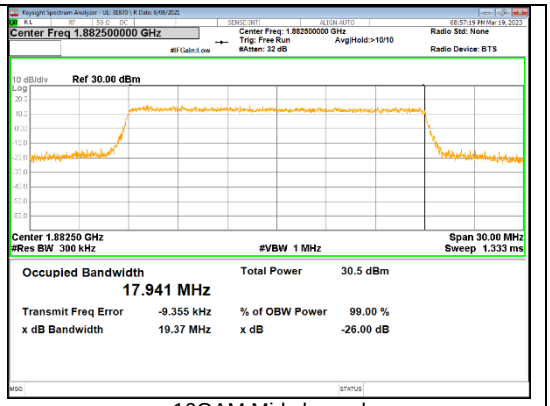
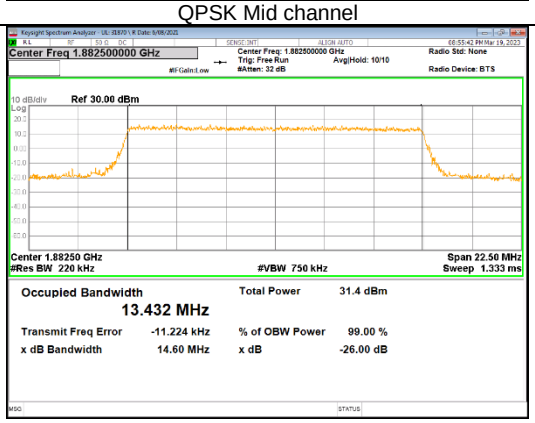
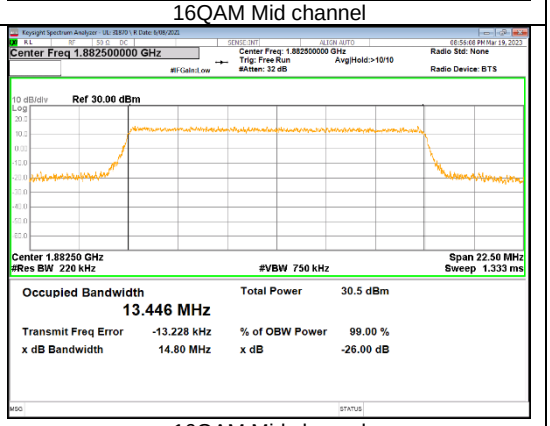
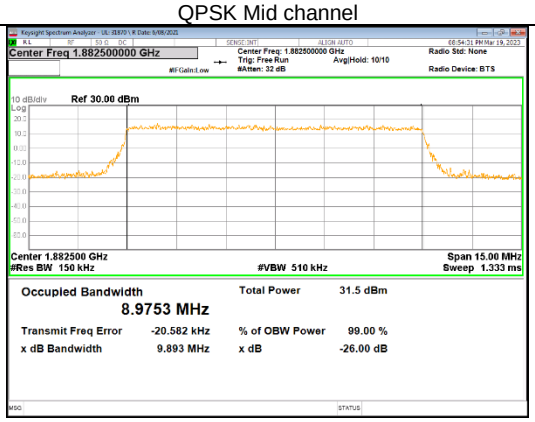
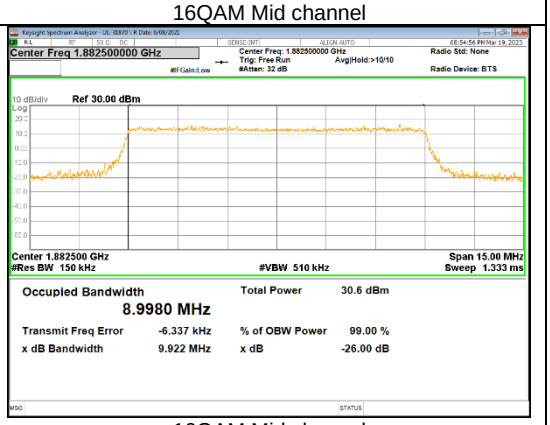
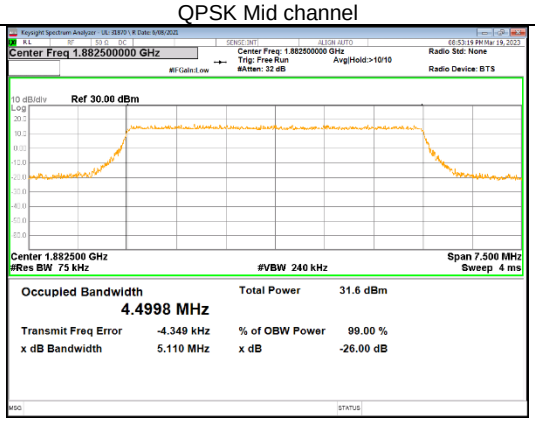
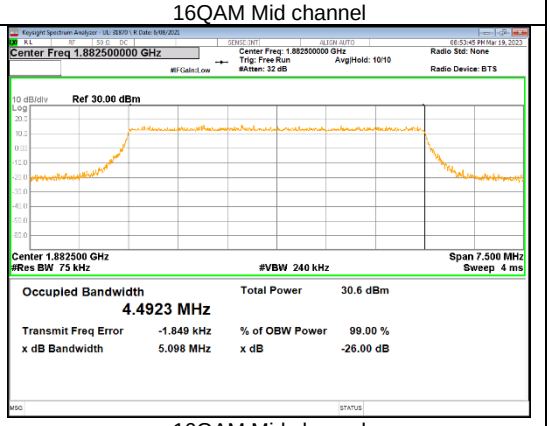
GSM 1900

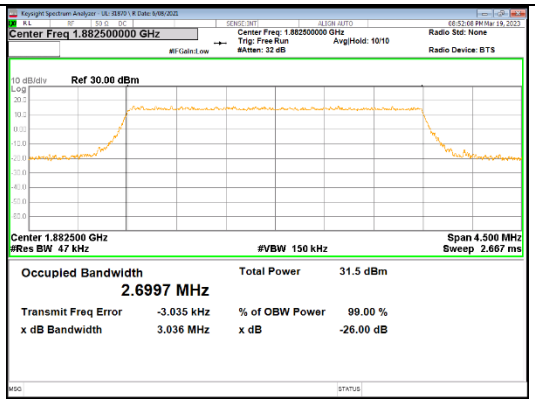
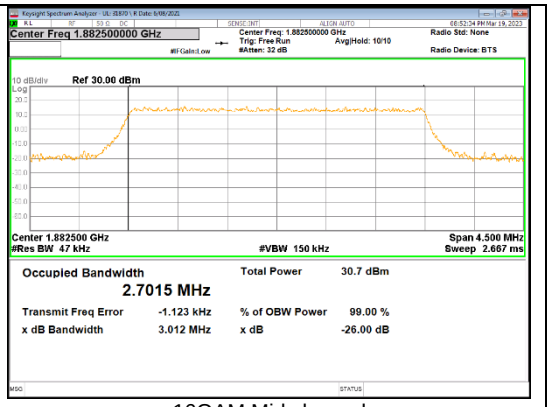
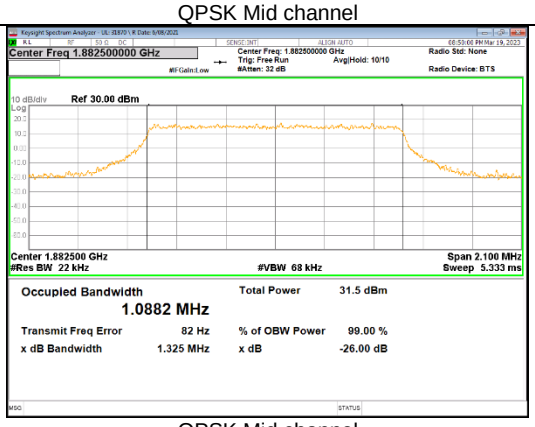
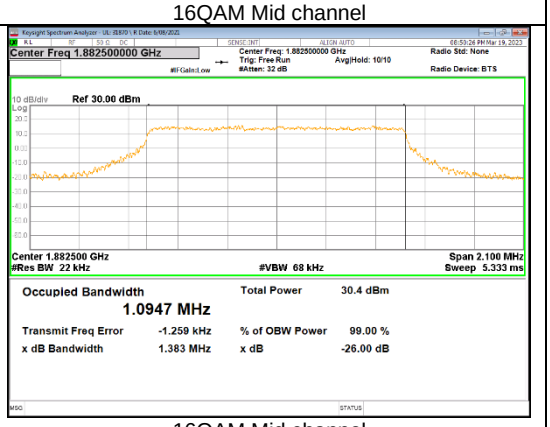
GSM 1900	 GPRS Mid channel	 EGPRS Mid channel

WCDMA Band 2

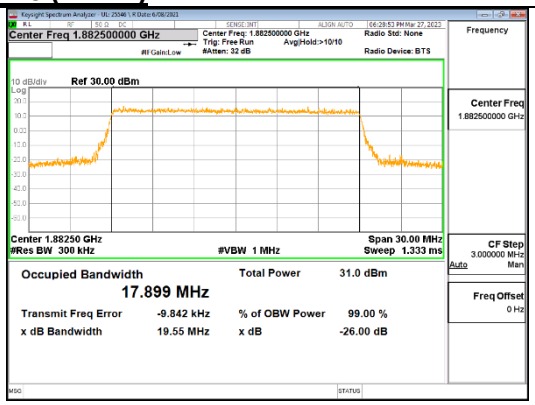
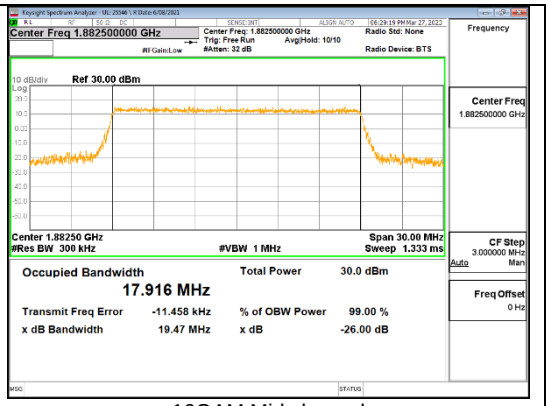
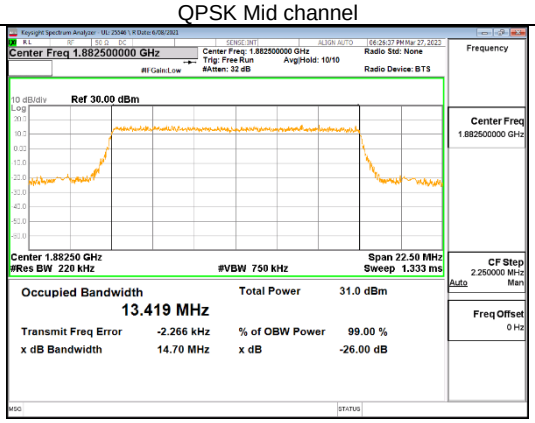
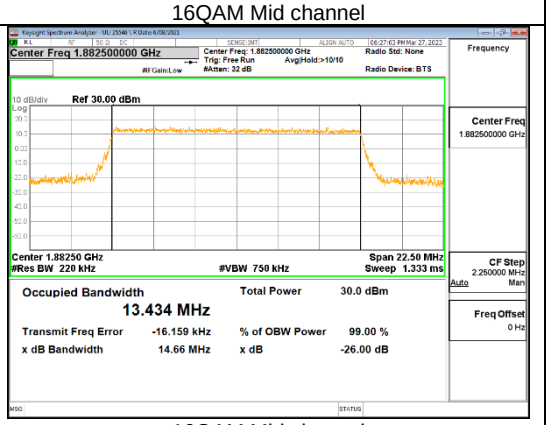
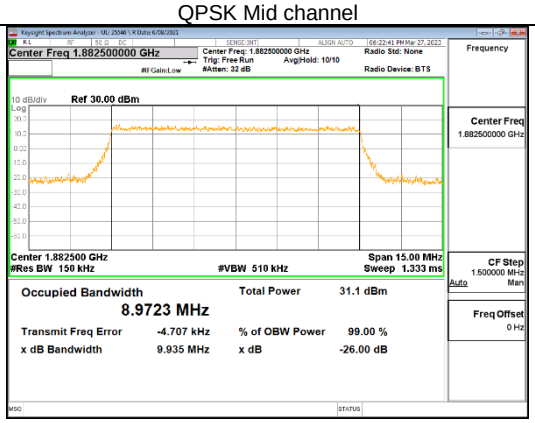
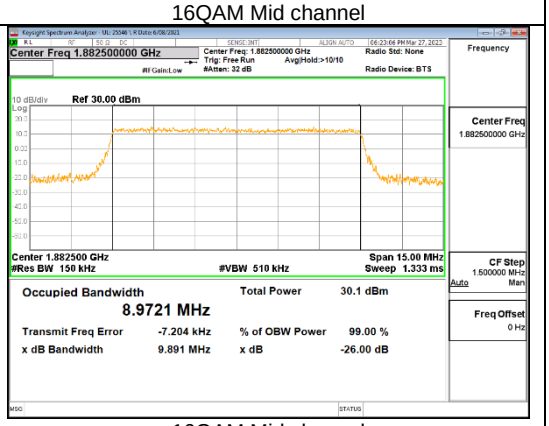
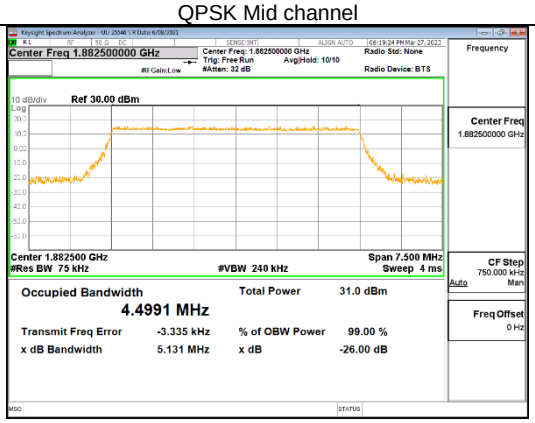
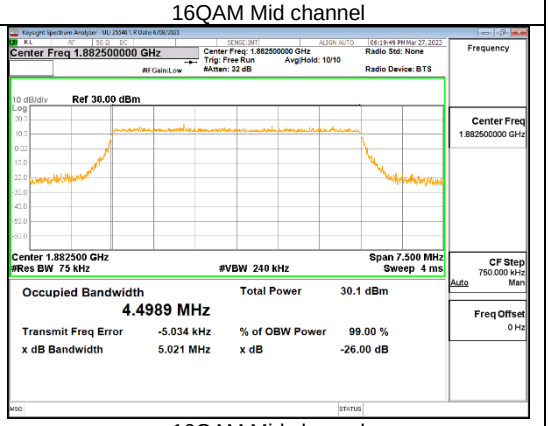
Band 2	 REL99 Mid channel	 HSDPA Mid channel

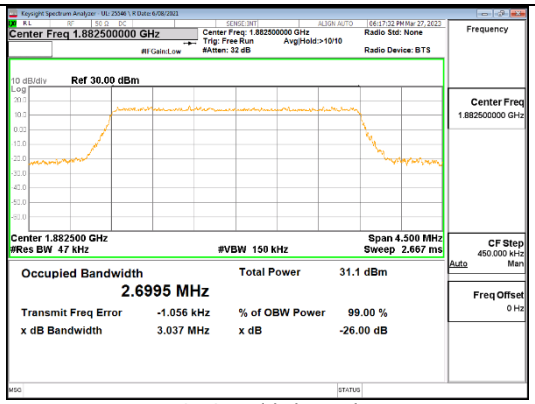
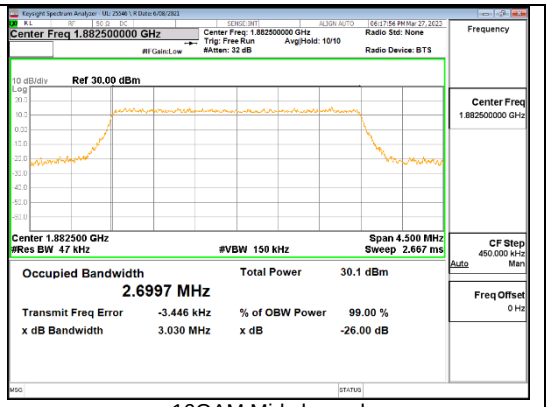
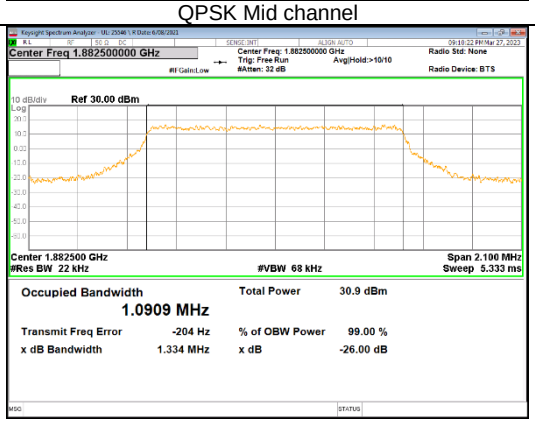
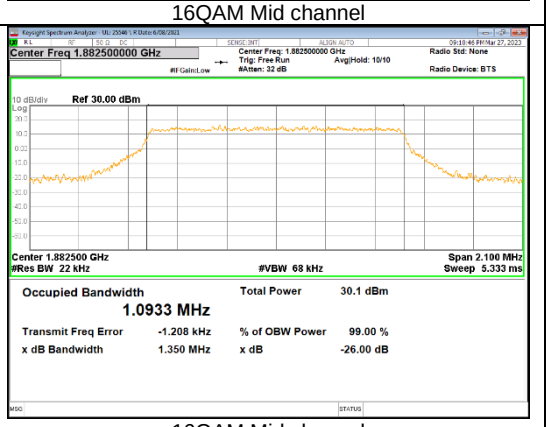
LTE Band 25 (ANT B)

20MHz	 QPSK Mid channel	 16QAM Mid channel
15MHz	 QPSK Mid channel	 16QAM Mid channel
10MHz	 QPSK Mid channel	 16QAM Mid channel
5MHz	 QPSK Mid channel	 16QAM Mid channel

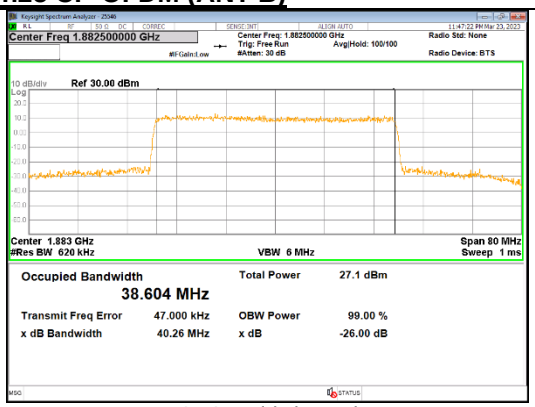
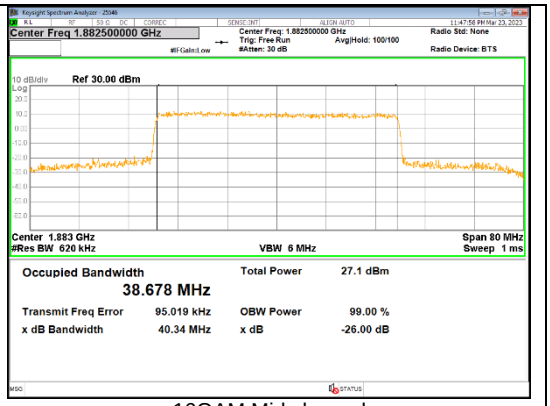
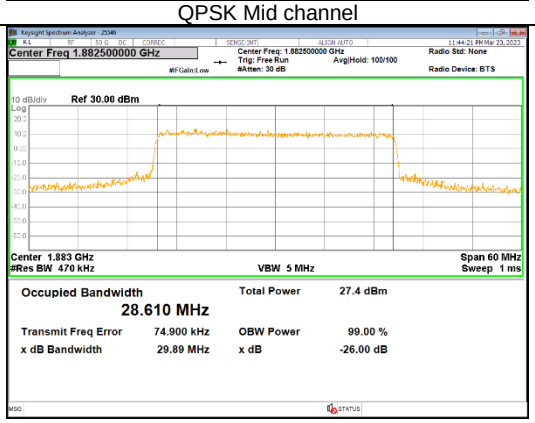
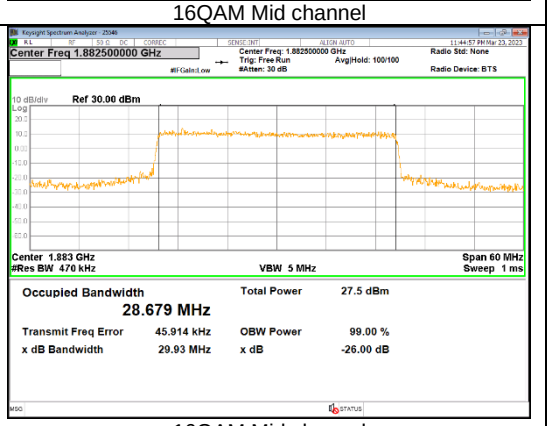
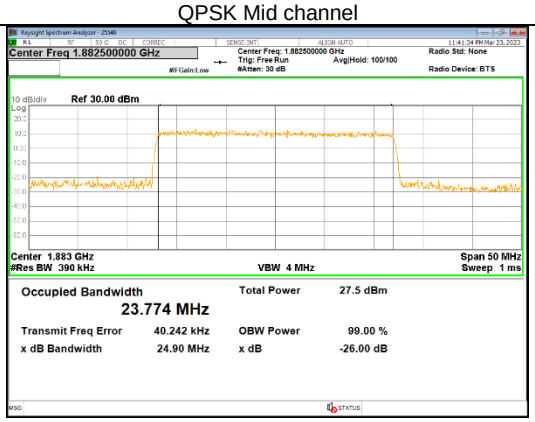
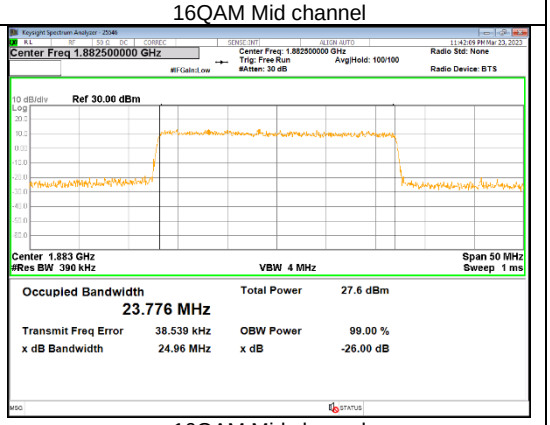
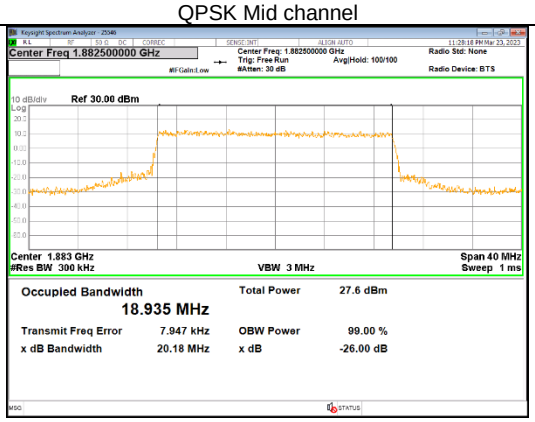
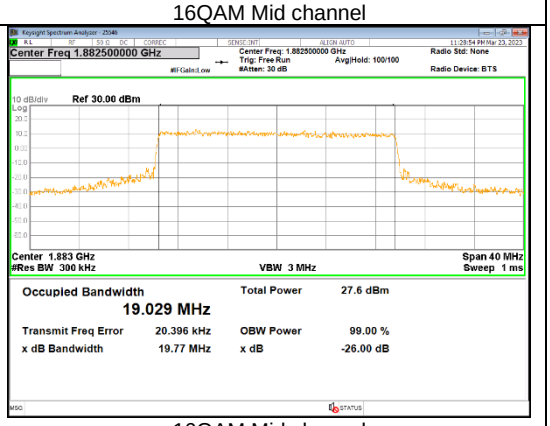
3MHz	 QPSK Mid channel	 16QAM Mid channel
1.4MHz	 QPSK Mid channel	 16QAM Mid channel

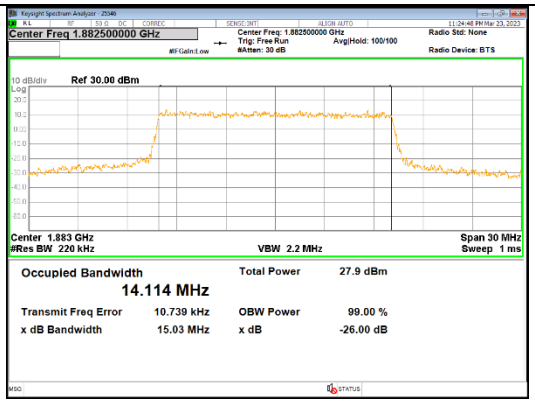
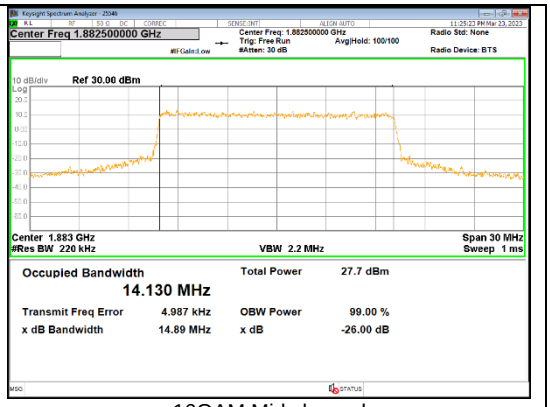
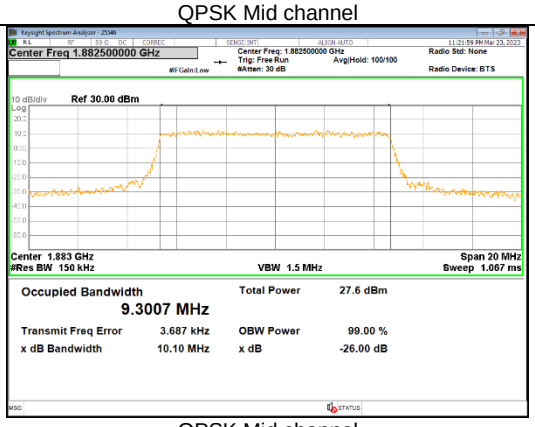
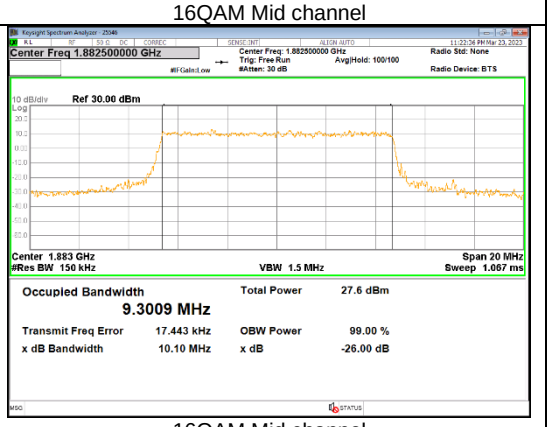
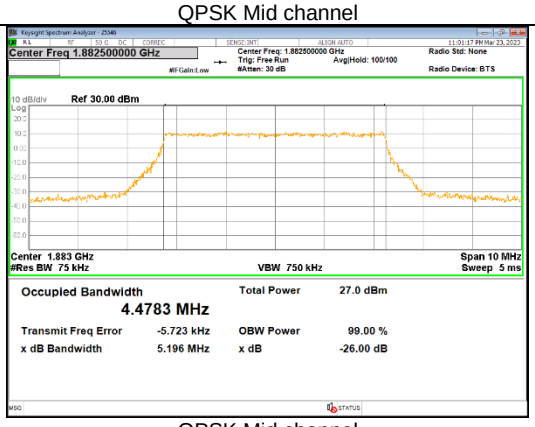
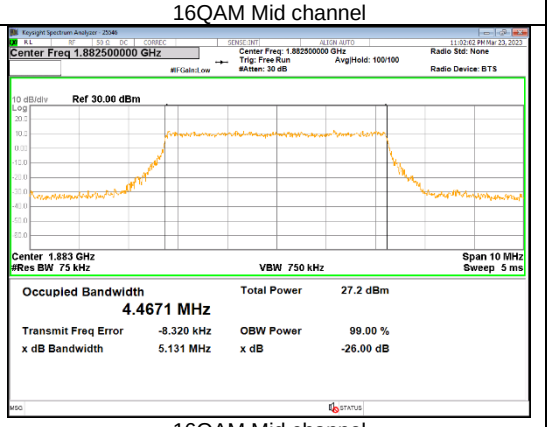
LTE Band 25 (ANT F)

20MHz	 QPSK Mid channel	 16QAM Mid channel
15MHz	 QPSK Mid channel	 16QAM Mid channel
10MHz	 QPSK Mid channel	 16QAM Mid channel
5MHz	 QPSK Mid channel	 16QAM Mid channel

3MHz	 QPSK Mid channel	 16QAM Mid channel
1.4MHz	 QPSK Mid channel	 16QAM Mid channel

NR Band n25 CP-OFDM (ANT B)

40MHz	 QPSK Mid channel	 16QAM Mid channel
30MHz	 QPSK Mid channel	 16QAM Mid channel
25MHz	 QPSK Mid channel	 16QAM Mid channel
20MHz	 QPSK Mid channel	 16QAM Mid channel

15MHz	 QPSK Mid channel	 16QAM Mid channel
10MHz	 QPSK Mid channel	 16QAM Mid channel
5MHz	 QPSK Mid channel	 16QAM Mid channel