

CERTIFICATION TEST REPORT

Report Number. : S-4791615583-E5V2

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

Model : SM-S937U, SM-S937U1

FCC ID : A3LSMS937U

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

Test Standard(s) : FCC CFR47 PART 96

Date Of Issue:

2025-02-27

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2025-02-21	Initial issue	Yeonhee Lim
V2	2025-02-27	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/ NTN 5G NR Phone + BT/BLE, DTS/UNII
a/b/g/n/ac/ax/be, NFC, WPT and UWB

MODEL NUMBER: SM-S937U, SM-S937U1

SERIAL NUMBER: R3CXC0G70TB (CONDUCTED);
R3CXC0G5R3R, R3CXC0G5R9D, R3CXC0G5B4F (RADIATED);

DATE TESTED: 2025-01-20 – 2025-02-21;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 96	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.

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 96.
3. ANSI TIA-603-E, 2016
4. ANSI C63.26, 2015
5. KDB 971168 D01 Power Meas License Digital Systems v03r01
6. KDB 412172 D01 Determining ERP and EIRP v01r01
7. KDB 940660 D01 Part 96 CBRS v03
8. WINNF-TS-0122-v1.0.2.
9. KDB 648474 D03 Wireless Chargers Battery Cover v01r04

3. FACILITIES AND ACCREDITATION

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

218 Maeyeong-ro	
☐	Chamber 1(3m semi-anechoic chamber)
☒	Chamber 2(3m semi-anechoic chamber)
☐	Chamber 3(3m semi-anechoic chamber)
☐	Chamber 4(3m Full-anechoic chamber)
☐	Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	1.84 dB
Radiated Disturbance, 9 kHz to 30 MHz	2.41 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.69 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.18 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/ NTN 5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax/be, NFC, WPT and UWB. This test report addresses the WWAN operational mode.

Representative model	Difference	Derivative model
		SM-S937U1
SM-S937U	Hardware	Same
	Software	The UI has changed according to Service Provider

The model SM-S937U used for final testing and is representative of the test results in this report.

The test utility software used during testing was WINNF-TS-0122 V1.0.2

5.2. MAXIMUM OUTPUT POWER

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

LTE Band 48

FCC Part 96								
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 48	F	3560.00 ~ 3690.00	20	QPSK	22.48	177.01	19.85	96.61
				16QAM	21.89	154.53	19.03	79.98
				64QAM	20.06	101.39		
				256QAM	17.74	59.43		
		3557.50 ~ 3692.50	15	QPSK	22.14	163.68	19.98	99.54
				16QAM	21.95	156.68	19.29	84.92
				64QAM	20.83	121.06		
				256QAM	17.64	58.08		
		3555.00 ~ 3695.00	10	QPSK	22.38	172.98	19.92	98.17
				16QAM	21.50	141.25	19.31	85.31
				64QAM	20.79	119.95		
				256QAM	17.95	62.37		
		3552.50 ~ 3697.50	5	QPSK	22.17	164.82	19.70	93.33
				16QAM	21.85	153.11	19.10	81.28
				64QAM	20.41	109.90		
				256QAM	17.39	54.83		

LTE Band 48C (UL CA)

FCC Part 96								
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Conducted		Radiated	
					Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
48C	F	3560.00 ~ 3690.00	40MHz (20MHz / 20MHz)	QPSK	22.35	171.79	20.41	109.90
				16QAM	21.47	140.28	20.21	104.95
		3557.50 ~ 3690.00	35MHz (15MHz / 20MHz)	QPSK	21.72	148.59		
				16QAM	21.03	126.77		
		3555.00 ~ 3690.00	30MHz (10MHz / 20MHz)	QPSK	21.83	152.41		
				16QAM	20.97	125.03		
		3552.50 ~ 3690.00	25MHz (5MHz / 20MHz)	QPSK	21.99	158.12		
				16QAM	21.12	129.42		

NR Band n48

FCC Part 96									
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Mode	Conducted		Radiated	
						Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n48	F	3570.00 ~ 3679.98	40	DFT-s OFDM	$\pi/2$ BPSK	22.64	183.65		
					QPSK	22.59	181.55	20.09	102.09
					16QAM	21.47	140.28	19.10	81.28
					64QAM	19.94	98.63		
				CP-OFDM	256QAM	18.06	63.97		
					QPSK	20.99	125.60		
					16QAM	20.59	114.55		
					64QAM	19.10	81.28		
		3565.02 ~ 3684.99	30	DFT-s OFDM	256QAM	15.95	39.36		
					$\pi/2$ BPSK	22.56	180.30		
					QPSK	22.42	174.58	19.92	98.17
					16QAM	21.61	144.88	19.30	85.11
				CP-OFDM	64QAM	19.88	97.27		
					256QAM	17.98	62.81		
					QPSK	20.87	122.18		
		3624.99 ~ 3690.00	20	DFT-s OFDM	$\pi/2$ BPSK	22.47	176.60		
					QPSK	22.52	178.65	19.91	97.95
					16QAM	21.33	135.83	18.90	77.62
					64QAM	19.74	94.19		
				CP-OFDM	256QAM	17.79	60.12		
					QPSK	20.86	121.90		
		3557.52 ~ 3692.49	15	DFT-s OFDM	$\pi/2$ BPSK	22.52	178.65		
					QPSK	22.32	170.61	19.71	93.54
					16QAM	21.41	138.36	18.92	77.98
					64QAM	19.98	99.54		
				CP-OFDM	256QAM	18.01	63.24		
					QPSK	20.85	121.62		
		3555.00 ~ 3694.98	10	DFT-s OFDM	$\pi/2$ BPSK	22.73	187.50		
					QPSK	22.75	188.36	20.00	100.00
					16QAM	21.48	140.60	18.78	75.51
					64QAM	19.90	97.72		
				CP-OFDM	256QAM	18.07	64.12		
					QPSK	21.03	126.77		

NR Band n48 (SRS2)

FCC Part 96							
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n48	C	3570.00 ~ 3679.98	40	17.65	58.21		
		3565.02 ~ 3684.99	30	17.73	59.29	20.04	100.93
		3560.00 ~ 3690.00	20	17.61	57.68		
		3575.52 ~ 3692.49	15	17.60	57.54		
		3555.00 ~ 3694.98	10	17.66	58.34		

NR Band n48 (SRS3)

FCC Part 96							
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n48	H	3570.00 ~ 3679.98	40	21.16	130.62		
		3565.02 ~ 3684.99	30	21.15	130.32		
		3560.00 ~ 3690.00	20	21.16	130.62		
		3575.52 ~ 3692.49	15	21.17	130.92		
		3555.00 ~ 3694.98	10	21.18	131.22	20.73	118.30

NR Band n48 (SRS4)

FCC Part 96							
Band	ANT	Frequency Range [MHz]	BandWidth [MHz]	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
n48	K	3570.00 ~ 3679.98	40	16.65	46.24		
		3565.02 ~ 3684.99	30	16.71	46.88		
		3560.00 ~ 3690.00	20	16.81	47.97		
		3575.52 ~ 3692.49	15	16.75	47.32		
		3555.00 ~ 3694.98	10	16.88	48.75	18.19	65.90

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 (dBd)
LTE Band 48 / NR Band n48 3550 ~ 3700 MHz	F	-0.97
	C	-2.7
	H	-4.1
	K	-7.2

5.4. WORST-CASE ORIENTATION

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

- **LTE Band 48**
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.
- **NR Band 48**
The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on $\pi/2$ BPSK, QPSK, 16QAM, 64QAM and 256QAM modulations. It was found QPSK and 16QAM results were worst case.

NR Band	NSA	SA
N48	-	<u>Stand Alone</u>

- **SRS**
The worst-case bandwidth scenario is based on the average conducted output power measurement investigation results.
- **Conducted Spurious Emission**

Highest conducted output power setting for each bands						
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
48	F	3560.00	20	QPSK	1	99
		3625.00			1	99
		3690.00			1	99
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
48	F	3555.00	10	DFT-s OFDM QPSK	1	1
		3625.00			1	22
		3695.00			1	1

- **Uplink CA Conducted Spurious Emission**

Highest conducted output power setting for each bands							
LTE Band	ANT	Component Carrier	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
48C	F	PCC	3560.00	20+20	QPSK + QPSK	1	99
		SCC	3579.80			1	0
		PCC	3615.10			1	99
		SCC	3634.90			1	0
		PCC	3670.20			1	99
		SCC	3690.00			1	0

● Radiated Spurious Emission

Highest EIRP setting for each bands						
LTE Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
48	F	3557.50	15	QPSK	1	37
		3625.00			1	37
		3692.50			1	37
NR Band	ANT	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
48	F	3570.00	40	DFT-s OFDM QPSK	1	104
		3625.00			1	53
		3680.00			1	53
48 (SRS2)	C	3565.02	30	-	-	-
		3625.00			-	-
		3684.99			-	-
48 (SRS3)	H	3555.00	10	-	-	-
		3625.00			-	-
		3694.98			-	-
48 (SRS4)	K	3555.00	10	-	-	-
		3625.00			-	-
		3694.98			-	-

● Uplink CA Radiated Spurious Emission

Highest EIRP setting for each bands							
LTE Band	ANT	Component Carrier	Frequency (MHz)	Bandwidth (MHz)	Modulation	RB size	RB offset
48C	F	PCC	3560.00	20+20	QPSK + QPSK	1	99
		SCC	3579.80			1	0
		PCC	3615.10			1	99
		SCC	3634.90			1	0
		PCC	3670.20			1	99
		SCC	3690.00			1	0

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
LTE B48	F	-	-	O	-	-	O
LTE B48C	F	-	-	O	-	-	O
NR n48	F	-	-	O	-	-	O
	C (SRS2)	O	-	-	O	-	-
	H (SRS3)	-	-	O	O	-	-
	K (SRS4)	-	-	O	-	O	-

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

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-T2510	RF7X1YF85Z1DKA	N/A
Data Cable	SAMSUNG	EP-DN980	N/A	N/A

I/O CABLE

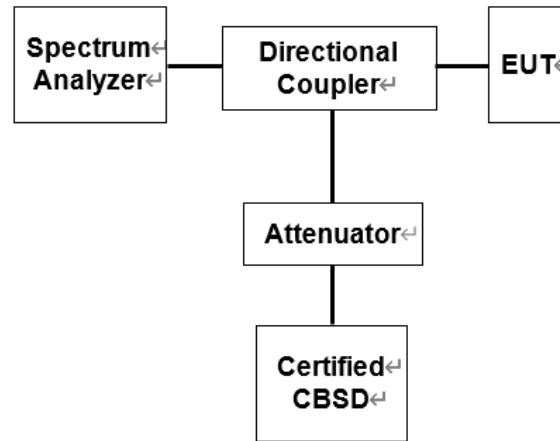
I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

TEST SETUP

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

The diagram illustrates a measurement setup for EUT emissions. It shows a block labeled 'EUT' connected to a 'Combiner'. The output of the 'Combiner' is connected to the input of a 'Communication Test Set' (a Rohde & Schwarz FSW 5037 spectrum analyzer) and also to the input of a 'Spectrum Analyzer' (a Keysight FSA 1000).

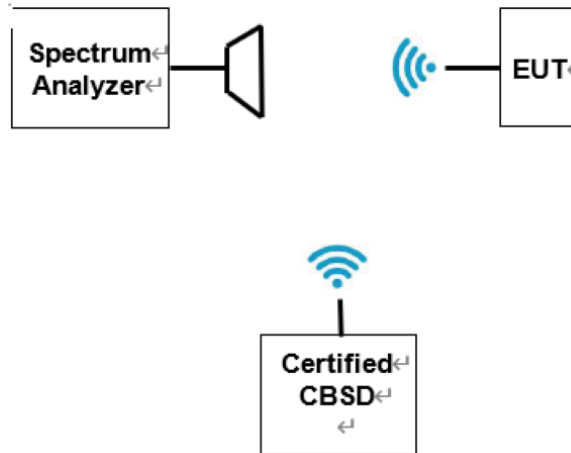
SETUP DIAGRAM FOR TESTS (LTE B48 CBSD TEST SETUP)



Remarks:

Certified CBSD – FCC ID: 2AS48SC-220
Connection between Certified CBSD and EUT is conducted method.
EUT is an End User Device (EUD)

SETUP DIAGRAM FOR TESTS (5G NR n48 CBSD TEST SETUP)



Remarks:

Certified CBSD – FCC ID: PIDAS2900
Connection between Certified CBSD and EUT is radiated method.
EUT is an End User Device (EUD)

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	2025-10-06
Preamplifier	ETS	3116C-PA	00168841	2025-07-25
Antenna, Horn, 18 GHz	ETS	3115	00167211	2026-07-17
Antenna, Horn, 18 GHz	ETS	3115	00161451	2026-07-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	2026-07-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	2026-07-17
Communications Test Set	R&S	CMW500	169797	2025-07-23
DC Power Supply	Agilent / HP	E3640A	MY54226395	2025-07-24
Preamplifier, 1000 MHz	Sonoma	310N	341282	2025-07-22
Preamplifier, 1000 MHz	Sonoma	310N	370599	2025-07-22
Preamplifier, 1000 MHz	Sonoma	310N	351741	2025-07-22
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2025-07-23
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-182020	28451	2025-07-22
Preamplifier, 18 GHz	B&Z Technologies, LLC	BZR-01001800-231040-181515	23576	2025-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2025-07-24
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2026-01-02
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY57143717	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2025-07-22
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2025-07-23
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A009	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A001	2025-07-23
Attenuator	PASTERNAK	PE7087-10	A008	2025-07-23
Attenuator	PASTERNAK	PE7004-10	2	2025-07-23
Attenuator	PASTERNAK	PE7395-10	A011	2025-07-25
Temperature Chamber	ESPEC	SH-642	93001109	2025-07-23
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2026-01-03
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2026-01-03
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY57510655	2026-01-03
UL Software				
Description	Manufacturer	Model	Version	
Antenna port test software	UL	CLT	Ver 3.4	
Antenna port test software (5G NR FR1)	UL	UL iM	Ver 1.06	
CBSD Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Spectrum Analyzer, EXA	Agilent (Keysight) Technology	N9010A	MY54200580	2025-07-23
Step Attenuator	Keysight	8494B	MY42155321	2025-07-24
Directional Coupler	KRYTAR	1850	164429	2025-07-24
CBSD support software and equipment				
Description	Manufacturer	Model	Version	
Laptop (SAS – WINNForum Test Harness)	SAMSUNG	NT550XDA-KC58G	Ver 2.0	
Laptop for n48 CBSD connection	HP	HP EliteBook 830 G5	-	
Laptop for n48 CBSD connection	DELL	Latitude 5520	-	

7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth(99%)	N/A	Conducted	Complies
2.1046	Conducted output power	N/A		Complies
2.1051 96.41(e)(ii)	Out of band emissions	Section 9.2 & 9.3		Complies
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		Complies
96.47	End user device additional requirements (CBSD Protocol)	Section 8.7		Complies
96.41(b)	Equivalent Isotropic Radiated Power	23 dBm/10 MHz	Radiated	Complies
2.1053 96.41(e)	Radiated Spurious Emission	-40 dBm/MHz		Complies

8. CONDUCTED RESULTES

8.1. CONDUCTED AND EIRP VERIFICATION

Test Procedurer

TIA-603-E Clause 2.2.17
KDB 971168 Section 5.6

$$\text{EIRP} = P_{\text{Meas}} + G_{\text{T}} - L_{\text{C}}$$

where:

EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_{T} = gain of the transmitting antenna, in dBi (EIRP);

L_{C} = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2

RESULTS

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

LTE Band 48

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				Measured Pwr (dBm)			MPR	Tune-up Limit
				55340	55990	56640		
				3560 MHz	3625 MHz	3690 MHz		
20 MHz	QPSK	1	0	22.00	21.99	21.87	0.0	23.0
		1	49	22.41	22.03	21.92	0.0	23.0
		1	99	22.48	22.21	22.13	0.0	23.0
		50	0	20.91	20.85	20.88	1.0	22.0
		50	24	21.00	20.98	20.96	1.0	22.0
		50	50	21.09	21.14	21.00	1.0	22.0
		100	0	21.03	20.92	20.87	1.0	22.0
	16QAM	1	0	21.63	21.20	21.61	1.0	22.0
		1	49	21.47	21.09	19.81	1.0	22.0
		1	99	21.89	21.13	19.95	1.0	22.0
		50	0	19.93	19.92	19.84	2.0	21.0
		50	24	20.07	19.95	19.95	2.0	21.0
		50	50	20.03	20.02	19.92	2.0	21.0
		100	0	20.01	19.93	20.17	2.0	21.0
	64QAM	1	0	19.89	20.03	19.56	2.0	21.0
		1	49	19.93	20.06	19.82	2.0	21.0
		1	99	19.75	19.83	19.74	2.0	21.0
		50	0	19.06	18.92	18.78	3.0	20.0
		50	24	19.00	18.85	19.17	3.0	20.0
		50	50	18.99	18.94	19.08	3.0	20.0
		100	0	18.92	18.89	19.00	3.0	20.0
	256QAM	1	0	17.74	17.32	17.33	5.0	18.0
		1	49	17.52	17.33	17.67	5.0	18.0
		1	99	17.12	17.27	17.40	5.0	18.0
		50	0	16.89	16.82	16.90	5.0	18.0
		50	24	17.12	16.92	17.08	5.0	18.0
		50	50	16.88	16.99	17.00	5.0	18.0
		100	0	16.93	16.98	17.10	5.0	18.0
BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
				55315	55990	56665		
				3557.5 MHz	3625 MHz	3692.5 MHz		
15 MHz	QPSK	1	0	21.84	21.83	21.97	0.0	23.0
		1	37	22.14	21.95	22.00	0.0	23.0
		1	74	22.09	21.72	21.98	0.0	23.0
		36	0	20.92	21.11	20.98	1.0	22.0
		36	20	20.93	21.04	21.02	1.0	22.0
		36	39	21.10	21.10	20.96	1.0	22.0
		75	0	21.02	20.80	20.82	1.0	22.0
	16QAM	1	0	21.95	21.34	21.19	1.0	22.0
		1	37	21.64	21.20	21.65	1.0	22.0
		1	74	20.80	21.03	21.22	1.0	22.0
		36	0	19.96	19.94	19.90	2.0	21.0
		36	20	20.15	19.93	20.02	2.0	21.0
		36	39	19.99	20.24	20.03	2.0	21.0
		75	0	20.14	19.92	20.19	2.0	21.0
	64QAM	1	0	20.81	20.68	20.83	2.0	21.0
		1	37	20.33	20.24	20.30	2.0	21.0
		1	74	19.91	19.89	19.83	2.0	21.0
		36	0	18.91	19.01	19.04	3.0	20.0
		36	20	19.16	19.02	19.15	3.0	20.0
		36	39	19.10	19.04	19.09	3.0	20.0
		75	0	19.08	18.68	18.89	3.0	20.0
	256QAM	1	0	16.41	16.68	16.55	5.0	18.0
		1	37	17.63	17.33	17.64	5.0	18.0
		1	74	17.20	17.17	17.10	5.0	18.0
		36	0	17.05	16.98	17.11	5.0	18.0
		36	20	17.06	16.92	17.05	5.0	18.0
		36	39	17.04	17.06	17.16	5.0	18.0
		75	0	17.07	16.87	16.78	5.0	18.0

BW (MHz)	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit	
				55290	55990	56690			
				3555 MHz	3625 MHz	3695 MHz			
10 MHz	QPSK	1	0	21.75	21.96	21.97	0.0	23.0	
		1	25	21.91	22.11	22.07	0.0	23.0	
		1	49	21.89	22.19	22.38	0.0	23.0	
		25	0	21.08	21.02	21.10	1.0	22.0	
		25	12	21.06	21.09	21.10	1.0	22.0	
		25	25	21.06	21.08	21.01	1.0	22.0	
	16QAM	50	0	21.08	21.02	21.04	1.0	22.0	
		1	0	21.31	21.02	21.50	1.0	22.0	
		1	25	20.51	20.94	21.08	1.0	22.0	
		1	49	20.99	21.15	21.13	1.0	22.0	
		25	0	20.16	20.06	20.11	2.0	21.0	
		25	12	20.03	20.06	20.20	2.0	21.0	
	64QAM	25	25	19.97	20.10	19.97	2.0	21.0	
		50	0	20.05	20.01	20.06	2.0	21.0	
		1	0	19.91	20.24	20.03	2.0	21.0	
		1	25	20.79	20.21	20.18	2.0	21.0	
		1	49	19.32	20.43	20.18	2.0	21.0	
		25	0	19.03	19.04	19.09	3.0	20.0	
	256QAM	25	12	19.00	19.04	19.06	3.0	20.0	
		25	25	19.04	19.02	19.06	3.0	20.0	
		50	0	18.97	19.04	19.24	3.0	20.0	
		1	0	17.47	17.18	17.95	5.0	18.0	
		1	25	17.03	17.38	17.11	5.0	18.0	
		1	49	17.47	16.91	17.44	5.0	18.0	
	5 MHz	QPSK	25	0	17.10	16.96	17.11	5.0	18.0
			25	12	17.12	17.04	17.05	5.0	18.0
25			25	17.11	17.06	17.02	5.0	18.0	
50			0	17.01	17.12	17.09	5.0	18.0	
Measured Pwr (dBm)			MPR	Tune-up Limit					
55265		55990			56715				
3552.5 MHz		3625 MHz			3697.5 MHz				
5 MHz		QPSK	1	0	21.91	21.95	21.97	0.0	23.0
			1	12	22.17	22.12	21.72	0.0	23.0
			1	24	22.05	21.94	21.60	0.0	23.0
	12		0	20.99	21.07	20.98	1.0	22.0	
	12		7	21.05	21.17	21.13	1.0	22.0	
	12		13	21.02	21.17	21.03	1.0	22.0	
	16QAM	25	0	21.03	21.07	20.91	1.0	22.0	
		1	0	20.96	21.41	21.77	1.0	22.0	
		1	12	20.07	21.32	21.85	1.0	22.0	
		1	24	20.12	21.31	21.13	1.0	22.0	
		12	0	20.03	20.01	19.87	2.0	21.0	
		12	7	20.11	20.11	20.12	2.0	21.0	
	64QAM	12	13	20.04	20.02	20.14	2.0	21.0	
		25	0	20.02	19.99	20.04	2.0	21.0	
		1	0	19.25	20.02	19.91	2.0	21.0	
		1	12	19.43	20.33	20.18	2.0	21.0	
		1	24	20.07	20.41	20.06	2.0	21.0	
		12	0	19.05	19.03	19.06	3.0	20.0	
	256QAM	12	7	19.14	19.19	19.05	3.0	20.0	
		12	13	19.00	19.14	19.10	3.0	20.0	
		25	0	19.03	18.97	19.08	3.0	20.0	
		1	0	17.02	17.30	17.12	5.0	18.0	
		1	12	17.08	17.29	17.39	5.0	18.0	
		1	24	16.85	17.21	17.31	5.0	18.0	
	64QAM	12	0	17.11	17.09	16.99	5.0	18.0	
		12	7	17.08	17.21	17.11	5.0	18.0	
12		13	17.11	16.99	16.98	5.0	18.0		
25		0	17.07	16.93	16.94	5.0	18.0		

LTE Band 48C (UL CA)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power (dBm)	
			Size	Offset	Size	Offset	QPSK	16QAM
40MHz (20MHz / 20MHz)	3560.00	3579.80	1	99	1	0	21.84	20.54
			1	0	1	99	12.87	12.83
			100	0	100	0	19.44	18.59
	3615.10	3634.90	1	99	1	0	21.83	20.19
			1	0	1	99	12.46	12.96
			100	0	100	0	19.33	18.60
	3670.20	3690.00	1	99	1	0	22.35	21.47
			1	0	1	99	13.02	12.83
			100	0	100	0	19.37	18.44
Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power (dBm)	
			Size	Offset	Size	Offset	QPSK	16QAM
35MHz (15MHz / 20MHz)	3557.50	3574.60	1	74	1	0	21.14	20.52
			1	0	1	99	13.00	12.64
			75	0	100	0	19.16	18.40
	3615.20	3632.30	1	74	1	0	21.10	20.38
			1	0	1	99	12.88	12.51
			75	0	100	0	19.42	18.62
	3672.90	3690.00	1	74	1	0	21.72	21.03
			1	0	1	99	13.02	12.81
			75	0	100	0	19.37	18.12
Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power (dBm)	
			Size	Offset	Size	Offset	QPSK	16QAM
30MHz (10MHz / 20MHz)	3555.00	3569.40	1	49	1	0	20.93	20.68
			1	0	1	99	12.07	12.97
			50	0	100	0	19.46	18.55
	3615.40	3629.80	1	49	1	0	20.84	20.25
			1	0	1	99	12.14	12.98
			50	0	100	0	19.05	18.58
	3675.60	3690.00	1	49	1	0	21.83	20.97
			1	0	1	99	12.95	12.92
			50	0	100	0	19.35	18.49
Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB	SCC1 RB	SCC1 RB	Conducted Average Power (dBm)	
			Size	Offset	Size	Offset	QPSK	16QAM
25MHz (5MHz / 20MHz)	3552.50	3564.20	1	24	1	0	21.35	20.54
			1	0	1	99	12.38	12.51
			25	0	100	0	19.41	18.45
	3615.60	3627.30	1	24	1	0	19.39	20.28
			1	0	1	99	12.56	12.86
			25	0	100	0	18.79	18.36
	3678.30	3690.00	1	24	1	0	21.99	21.12
			1	0	1	99	12.98	12.77
			25	0	100	0	19.12	18.44

NR Band n48

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
					Measured Pwr (dBm)			MPR	Tune-up Limit
					638000	641666	645332		
					3570.00 MHz	3624.99 MHz	3679.98 MHz		
40 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	21.65	21.83	22.13	0.5	22.5
			1	1	22.13	22.42	22.39	0.0	23.0
			1	52	22.27	22.39	22.34	0.0	23.0
			1	104	22.23	22.41	22.64	0.0	23.0
			1	105	21.73	21.81	21.80	0.5	22.5
			50	0	21.77	21.94	21.89	0.5	22.5
			50	28	22.28	22.43	22.43	0.0	23.0
			50	56	21.81	21.87	21.84	0.5	22.5
			100	0	21.83	21.90	21.80	0.5	22.5
		QPSK	1	0	21.20	21.22	21.17	1.0	22.0
			1	1	22.08	22.20	21.86	0.0	23.0
			1	52	22.15	22.31	22.43	0.0	23.0
			1	104	22.18	22.27	22.14	0.0	23.0
			1	105	21.29	21.24	21.18	1.0	22.0
			50	0	21.38	21.46	21.28	1.0	22.0
			50	28	22.36	22.45	22.59	0.0	23.0
			50	56	21.34	21.44	21.31	1.0	22.0
			100	0	21.34	21.43	21.30	1.0	22.0
		16QAM	1	0	20.38	20.35	20.17	2.0	21.0
			1	1	21.33	21.28	21.08	1.0	22.0
			1	52	21.34	21.30	21.17	1.0	22.0
			1	104	21.32	20.33	21.07	1.0	22.0
			1	105	20.38	20.22	20.11	2.0	21.0
			50	0	20.38	20.48	20.46	2.0	21.0
			50	28	21.47	21.47	21.33	1.0	22.0
			50	56	20.42	20.45	20.26	2.0	21.0
			100	0	20.40	20.47	20.34	2.0	21.0
		64QAM	1	1	19.94	19.87	19.41	2.5	20.5
		256QAM	1	1	17.61	18.06	17.91	4.5	18.5
	CP-OFDM	QPSK	1	0	19.23	19.37	19.29	3.0	20.0
			1	1	20.69	20.99	20.85	1.5	21.5
			1	52	20.81	20.95	20.93	1.5	21.5
			1	104	20.82	20.82	20.65	1.5	21.5
			1	105	19.33	19.17	19.11	3.0	20.0
			50	0	19.53	19.33	19.27	3.0	20.0
			50	28	20.93	20.87	20.70	1.5	21.5
			50	56	19.33	19.36	19.21	3.0	20.0
			100	0	19.47	19.39	19.39	3.0	20.0
		16QAM	1	0	18.43	19.45	19.23	3.0	20.0
			1	1	19.94	20.25	20.04	2.0	21.0
			1	52	20.46	20.30	20.21	2.0	21.0
			1	104	20.34	20.25	20.18	2.0	21.0
			1	105	19.46	19.18	19.08	3.0	20.0
			50	0	19.24	19.50	19.53	3.0	20.0
			50	28	20.50	20.42	20.59	2.0	21.0
			50	56	19.46	19.39	19.26	3.0	20.0
			100	0	19.38	20.00	19.26	3.0	20.0
		64QAM	1	1	19.10	18.72	18.54	3.5	19.5
		256QAM	1	1	15.95	15.77	15.81	6.5	16.5
BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					637668	641666	645666		
					3565.02 MHz	3624.99 MHz	3684.99 MHz		
30 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	21.73	21.83	21.84	0.5	22.5
			1	1	22.25	22.32	22.52	0.0	23.0
			1	39	22.17	22.28	22.17	0.0	23.0
			1	76	22.26	22.43	22.56	0.0	23.0
			1	77	21.78	21.92	21.86	0.5	22.5
			36	0	21.82	21.87	21.87	0.5	22.5
			36	21	22.30	22.36	22.35	0.0	23.0
			36	42	21.79	21.88	21.73	0.5	22.5
			75	0	21.81	21.87	21.84	0.5	22.5
		QPSK	1	0	21.33	21.35	21.42	1.0	22.0
			1	1	22.30	22.36	22.07	0.0	23.0
			1	39	22.31	22.25	22.25	0.0	23.0
			1	76	22.42	22.42	22.01	0.0	23.0
			1	77	21.44	21.43	21.21	1.0	22.0
			36	0	21.45	21.42	21.34	1.0	22.0
			36	21	22.28	22.31	22.29	0.0	23.0
			36	42	21.43	21.39	21.21	1.0	22.0
			75	0	21.41	21.35	21.29	1.0	22.0
		16QAM	1	1	21.26	21.33	21.61	1.0	22.0
			1	39	21.29	21.39	21.37	1.0	22.0
			1	76	21.43	21.39	21.12	1.0	22.0
			1	1	19.88	19.54	19.64	2.5	20.5
		256QAM	1	1	17.98	17.95	17.72	4.5	18.5
	CP-OFDM	QPSK	1	1	20.77	20.87	20.65	1.5	21.5

BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR	Tune-up Limit
					637333	641666	646000		
					3560.00 MHz	3624.99 MHz	3690.00 MHz		
20 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	21.56	21.74	21.76	0.5	22.5
			1	1	22.05	22.26	22.01	0.0	23.0
			1	26	22.09	22.26	22.47	0.0	23.0
			1	49	22.17	22.29	22.37	0.0	23.0
			1	50	21.67	21.72	21.73	0.5	22.5
			25	0	21.68	21.85	21.82	0.5	22.5
			25	13	22.19	22.36	22.30	0.0	23.0
			25	26	21.80	21.88	21.81	0.5	22.5
		50	0	21.71	21.85	21.80	0.5	22.5	
		QPSK	1	0	21.16	21.32	21.08	1.0	22.0
			1	1	22.08	22.29	22.19	0.0	23.0
			1	26	22.14	22.22	22.23	0.0	23.0
			1	49	22.30	22.20	22.52	0.0	23.0
			1	50	21.41	21.24	21.11	1.0	22.0
			25	0	21.28	21.40	21.23	1.0	22.0
			25	13	22.22	22.36	22.28	0.0	23.0
			25	26	21.49	21.40	21.27	1.0	22.0
		16QAM	50	0	21.33	21.34	21.20	1.0	22.0
			1	1	21.14	21.32	20.95	1.0	22.0
			1	26	21.17	21.33	20.93	1.0	22.0
			1	49	21.31	21.32	20.93	1.0	22.0
		64QAM	1	1	19.38	19.74	19.68	2.5	20.5
		256QAM	1	1	17.79	17.74	17.77	4.5	18.5
		CP-OFDM	QPSK	1	1	20.86	20.79	20.43	1.5
	BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR
637168						641666	646166		
3557.52 MHz						3624.99 MHz	3692.49 MHz		
15 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	21.66	21.81	21.85	0.5	22.5
			1	1	22.18	22.20	22.16	0.0	23.0
			1	19	22.05	22.26	22.52	0.0	23.0
			1	36	22.17	22.36	22.26	0.0	23.0
			1	37	21.68	21.86	21.89	0.5	22.5
			18	0	21.73	21.87	21.78	0.5	22.5
			18	10	22.22	22.33	22.20	0.0	23.0
			18	20	21.79	21.87	21.82	0.5	22.5
		QPSK	36	0	21.68	21.91	21.73	0.5	22.5
			1	0	21.32	21.33	21.15	1.0	22.0
			1	1	22.23	22.26	22.29	0.0	23.0
			1	19	22.21	22.19	22.28	0.0	23.0
			1	36	22.29	22.31	22.32	0.0	23.0
			1	37	21.39	21.34	21.25	1.0	22.0
			18	0	21.31	21.37	21.30	1.0	22.0
			18	10	21.83	22.32	22.30	0.0	23.0
		16QAM	18	20	21.42	21.40	21.23	1.0	22.0
			36	0	21.33	21.36	21.30	1.0	22.0
			1	1	21.21	21.34	21.21	1.0	22.0
			1	19	21.18	21.41	21.13	1.0	22.0
		64QAM	1	36	21.29	21.38	21.19	1.0	22.0
			1	1	19.72	19.98	19.73	2.5	20.5
			256QAM	1	1	17.67	18.01	17.62	4.5
		CP-OFDM	QPSK	1	1	20.68	20.85	20.76	1.5
	BW (MHz)	Modulation	Mode	RB Allocation	RB offset	Measured Pwr (dBm)			MPR
637000						641666	646332		
3555.00 MHz						3624.99 MHz	3694.98 MHz		
10 MHz	DFT-s-OFDM	$\pi/2$ BPSK	1	0	21.67	21.82	21.88	0.5	22.5
			1	1	22.24	22.38	22.73	0.0	23.0
			1	12	22.18	22.34	22.47	0.0	23.0
			1	22	22.20	22.38	22.50	0.0	23.0
			1	23	21.66	21.84	21.88	0.5	22.5
			12	0	21.71	21.91	21.85	0.5	22.5
			12	6	22.21	22.37	22.34	0.0	23.0
			12	12	21.74	21.91	21.83	0.5	22.5
		QPSK	24	0	21.79	21.88	21.79	0.5	22.5
			1	0	21.48	21.32	21.13	1.0	22.0
			1	1	22.32	22.33	22.75	0.0	23.0
			1	12	22.32	22.31	22.23	0.0	23.0
			1	22	22.30	22.39	22.23	0.0	23.0
			1	23	21.41	21.33	21.18	1.0	22.0
			12	0	21.40	21.45	21.29	1.0	22.0
			12	6	22.27	22.44	22.34	0.0	23.0
		16QAM	12	12	21.41	21.45	21.31	1.0	22.0
			24	0	21.38	21.42	21.33	1.0	22.0
			1	1	21.29	21.47	21.03	1.0	22.0
			1	12	21.30	21.44	20.95	1.0	22.0
		64QAM	1	22	21.31	21.48	21.23	1.0	22.0
			1	1	19.47	19.79	19.90	2.5	20.5
		256QAM	1	1	17.93	18.07	17.68	4.5	18.5
			1	1	20.91	21.03	19.97	1.5	21.5
	CP-OFDM	QPSK	1	1	20.91	21.03	19.97	1.5	21.5

NR Band n48 (SRS)

Maximum Average Power (dBm) SRS2			Tune-up Limit	Maximum Average Power (dBm) SRS3			Tune-up Limit	Maximum Average Power (dBm) SRS4			Tune-up Limit
			18.5				22.5				17.5
Measured Pwr (dBm)				Measured Pwr (dBm)				Measured Pwr (dBm)			
40 MHz	638000	641666	645332	40 MHz	638000	641666	645332	40 MHz	638000	641666	645332
	3570 MHz	3624.99 MHz	3679.98 MHz		3570 MHz	3624.99 MHz	3679.98 MHz		3570 MHz	3624.99 MHz	3679.98 MHz
	17.65	17.65	17.65		21.15	21.16	21.05		15.54	16.10	16.65
30 MHz	637668	641666	645666	30 MHz	637668	641666	645666	30 MHz	637668	641666	645666
	3565.02 MHz	3624.99 MHz	3684.99 MHz		3565.02 MHz	3624.99 MHz	3684.99 MHz		3565.02 MHz	3624.99 MHz	3684.99 MHz
	17.73	17.65	17.59		21.13	21.11	21.15		16.55	16.13	16.71
20 MHz	637334	641666	646000	20 MHz	637334	641666	646000	20 MHz	637334	641666	646000
	3560.01 MHz	3624.99 MHz	3690 MHz		3560.01 MHz	3624.99 MHz	3690 MHz		3560.01 MHz	3624.99 MHz	3690 MHz
	17.55	17.56	17.61		21.16	21.15	21.13		15.40	16.15	16.81
15 MHz	637168	641666	646166	15 MHz	637168	641666	646166	15 MHz	637168	641666	646166
	3557.52 MHz	3624.99 MHz	3692.49 MHz		3557.52 MHz	3624.99 MHz	3692.49 MHz		3557.52 MHz	3624.99 MHz	3692.49 MHz
	17.53	17.58	17.60		21.17	21.15	21.10		16.52	16.11	16.75
10 MHz	637000	641666	646332	10 MHz	637000	641666	646332	10 MHz	637000	641666	646332
	3555 MHz	3624.99 MHz	3694.98 MHz		3555 MHz	3624.99 MHz	3694.98 MHz		3555 MHz	3624.99 MHz	3694.98 MHz
	17.61	17.66	17.64		21.13	21.18	21.12		15.57	16.13	16.88

8.2. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

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

Test Spec

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

NOTE

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

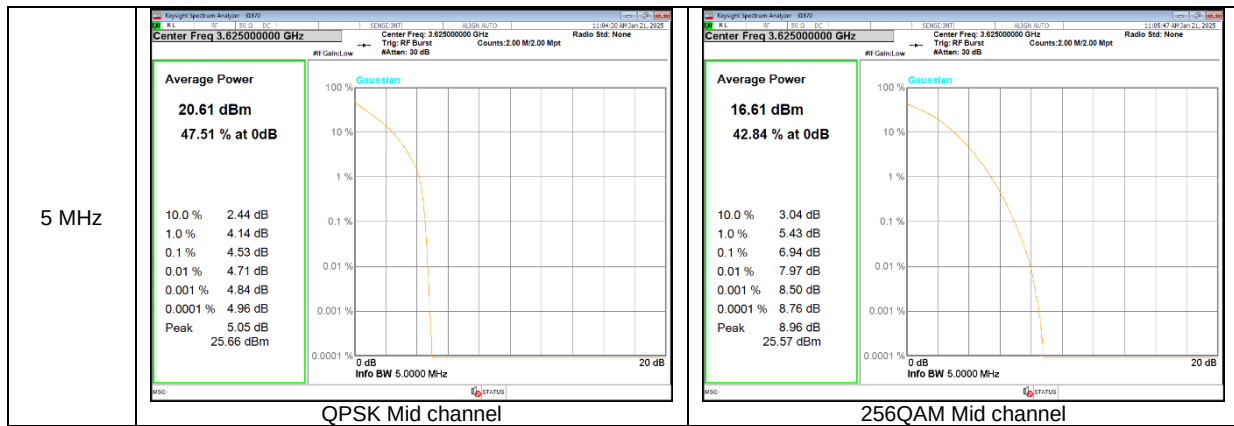
RESULTS

See the following pages.

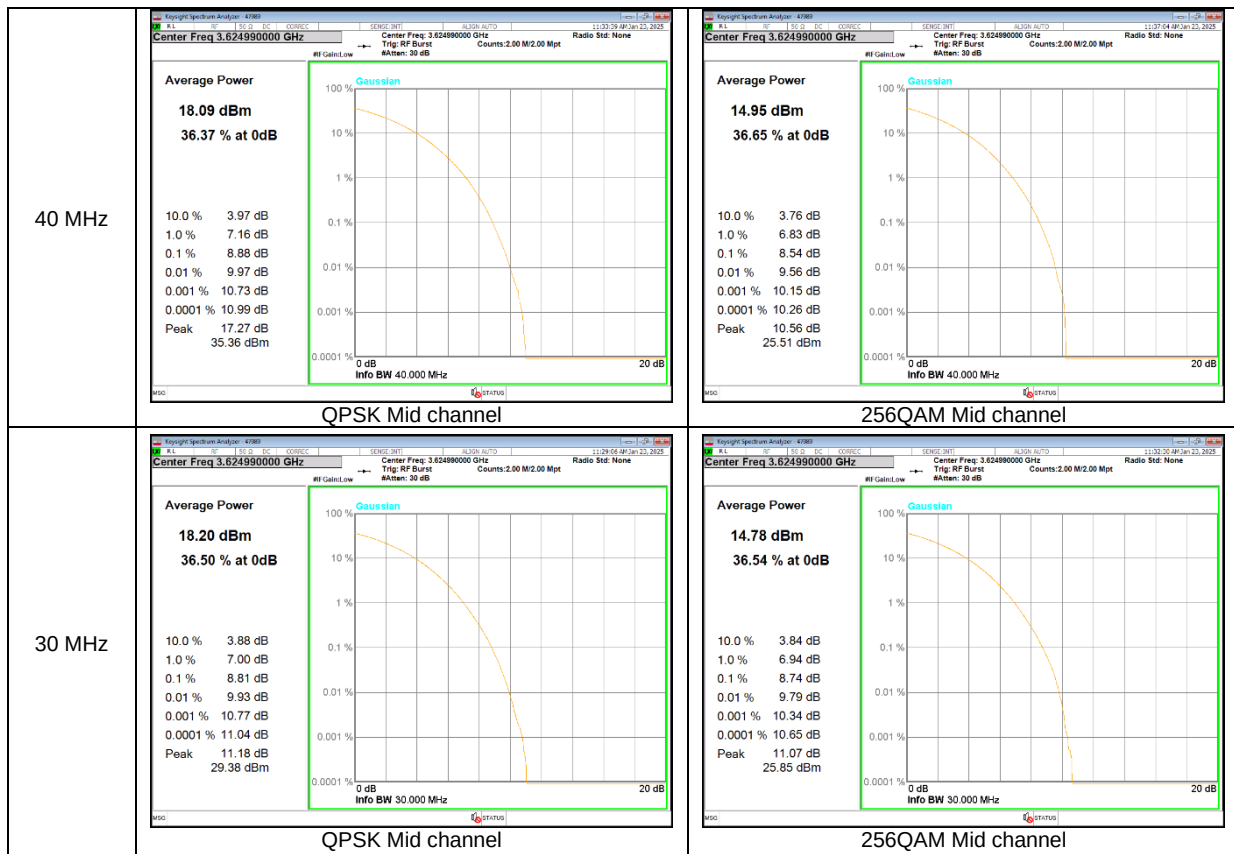
8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

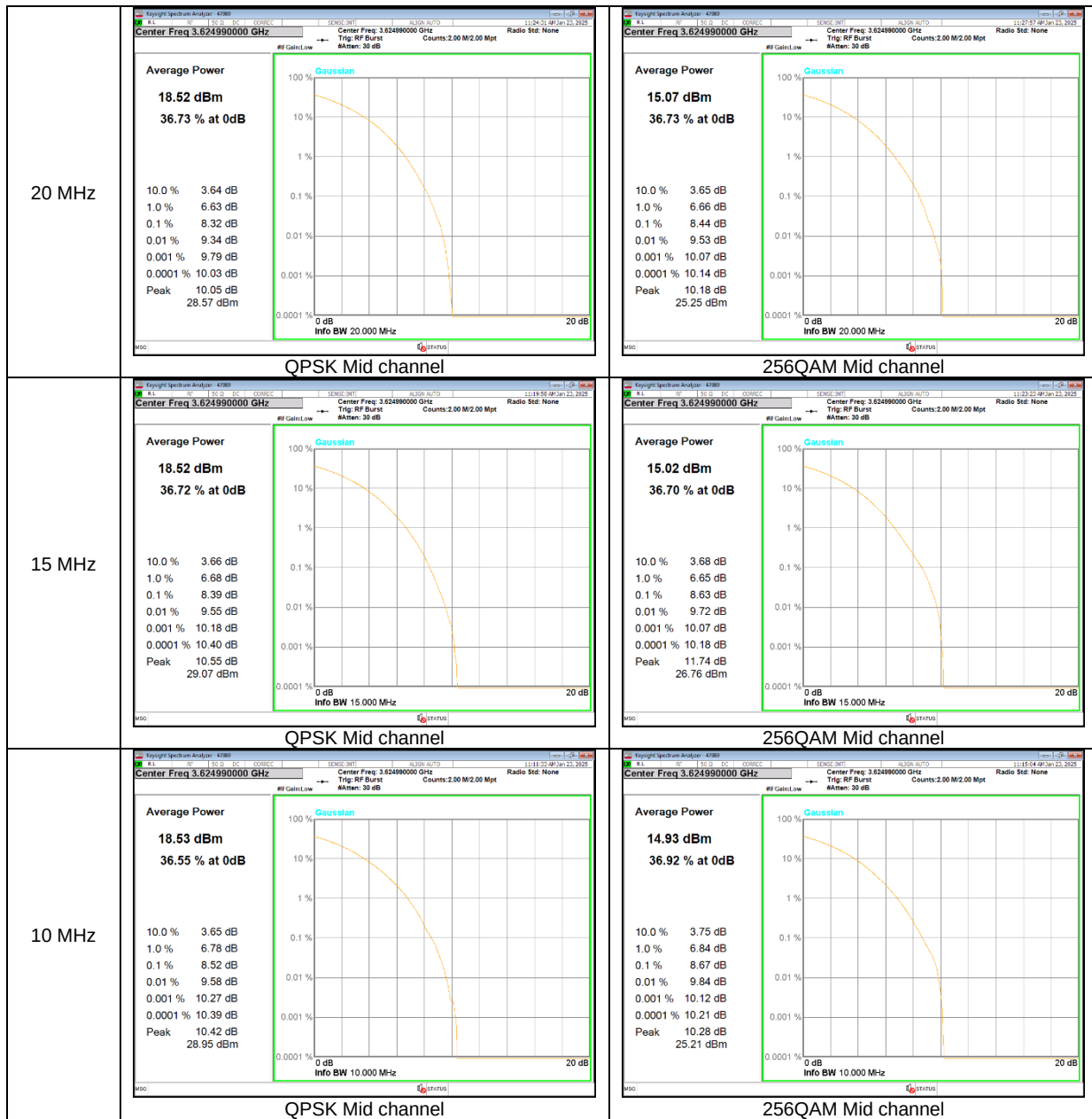
LTE Band 48





NR Band n48 CP-OFDM





8.3. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

OCCUPIED BANDWIDTH RESULTS

See the following pages.

- LTE Band 48

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B48	20M	QPSK	3625.00	17.880	18.990
		16QAM		17.908	19.200
	15M	QPSK		13.471	14.580
		16QAM		13.444	14.480
	10M	QPSK		8.951	9.771
		16QAM		8.968	9.881
	5M	QPSK		4.493	5.033
		16QAM		4.497	4.988

- LTE Band 48C (UL CA)

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
LTE B48	20+20M	QPSK	3625.00	37.569	39.600
		16QAM		37.574	39.610
	15+20M	QPSK		32.742	34.260
		16QAM		32.624	34.870
	10+20M	QPSK		27.733	29.020
		16QAM		27.826	29.080
	5+20M	QPSK		22.879	23.880
		16QAM		22.912	23.950

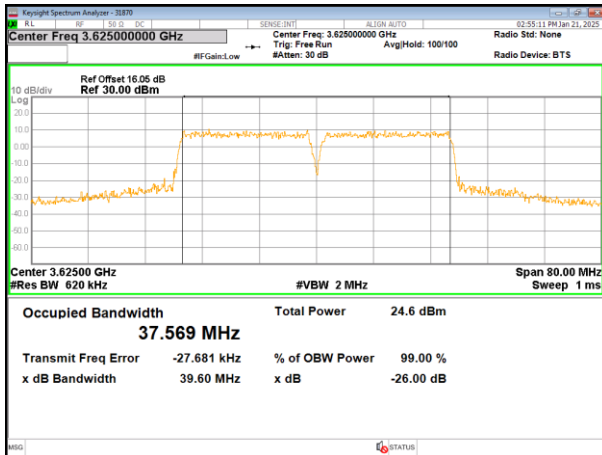
- NR Band n48

Band	BW	Modulation	f [MHz]	99% BW (MHz)	-26dB BW (MHz)
NR n48	40M	QPSK	3624.99	37.975	39.700
		16QAM		38.043	39.870
	30M	QPSK		27.954	29.430
		16QAM		27.967	29.520
	20M	QPSK		18.251	19.330
		16QAM		18.302	19.500
	15M	QPSK		13.631	14.870
		16QAM		13.640	14.610
	10M	QPSK		8.622	9.564
		16QAM		8.595	9.675

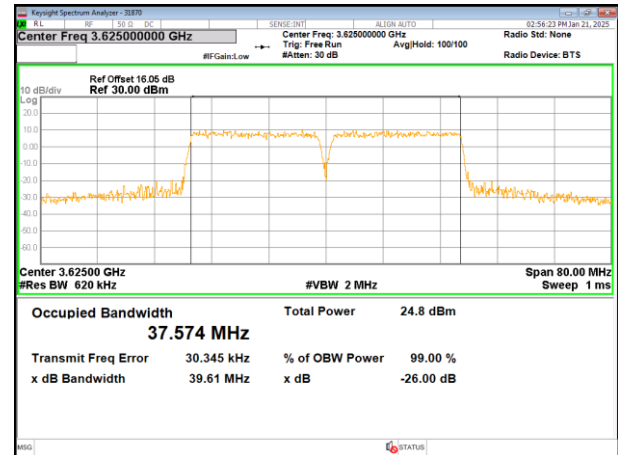
LTE Band 48



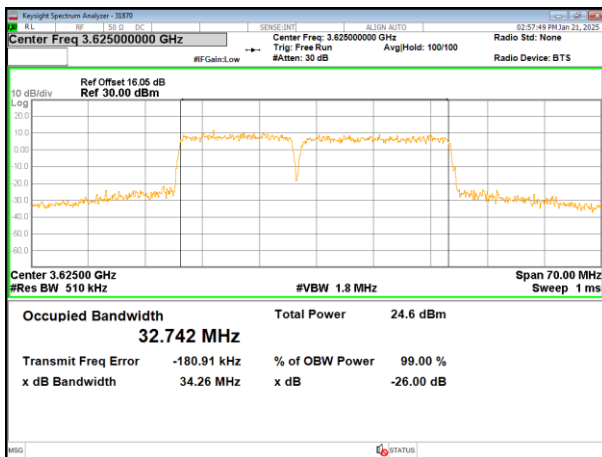
LTE Band 48C (UL CA)



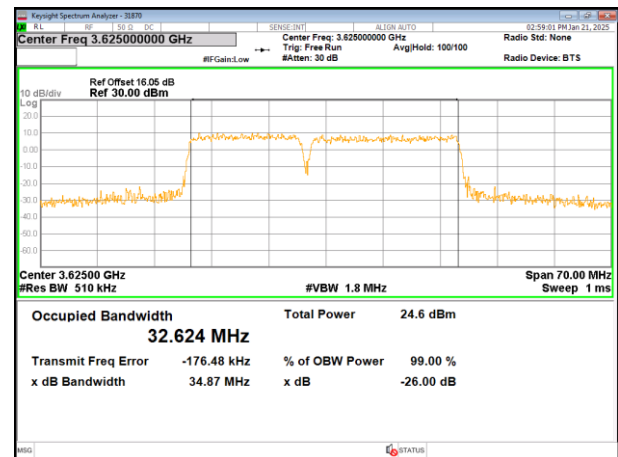
LTE B48 20MHz + 20MHz QPSK RB100-0 + RB100-0



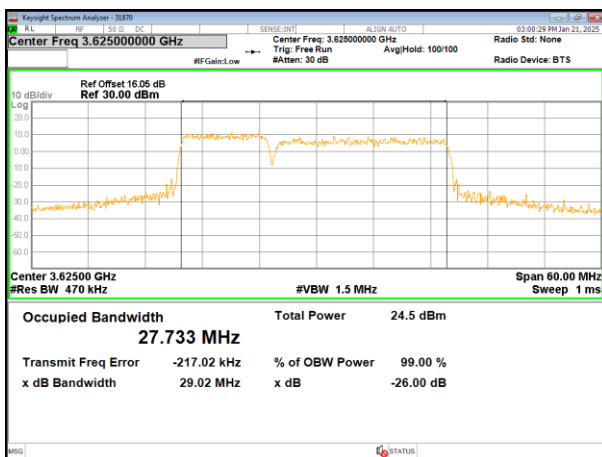
LTE B48 20MHz + 20MHz 16QAM RB100-0 + RB100-0



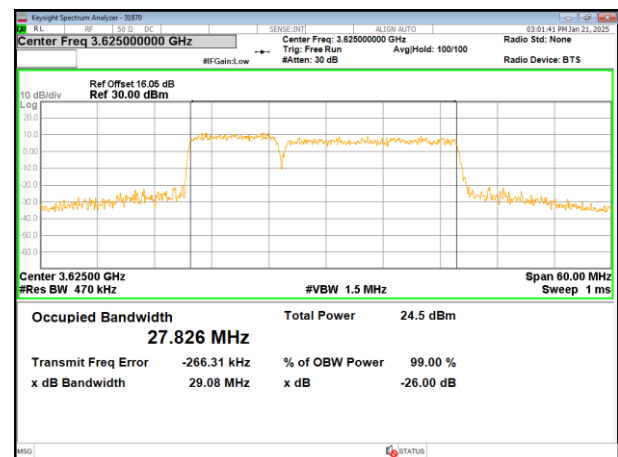
LTE B48 15MHz + 20MHz QPSK RB75-0 + RB100-0



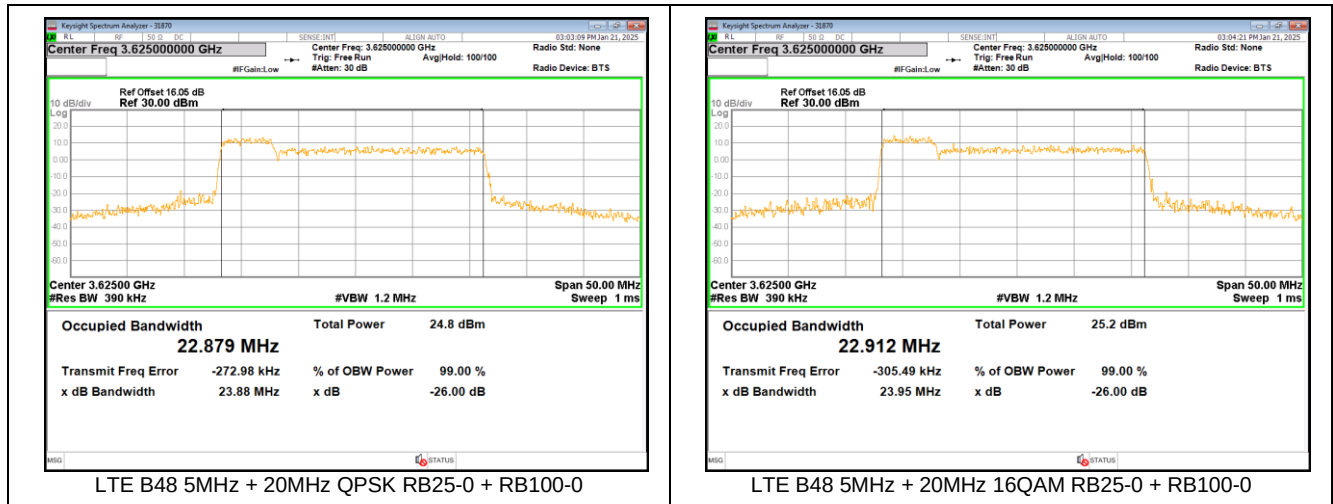
LTE B48 15MHz + 20MHz 16QAM RB75-0 + RB100-0



LTE B48 10MHz + 20MHz QPSK RB50-0 + RB100-0

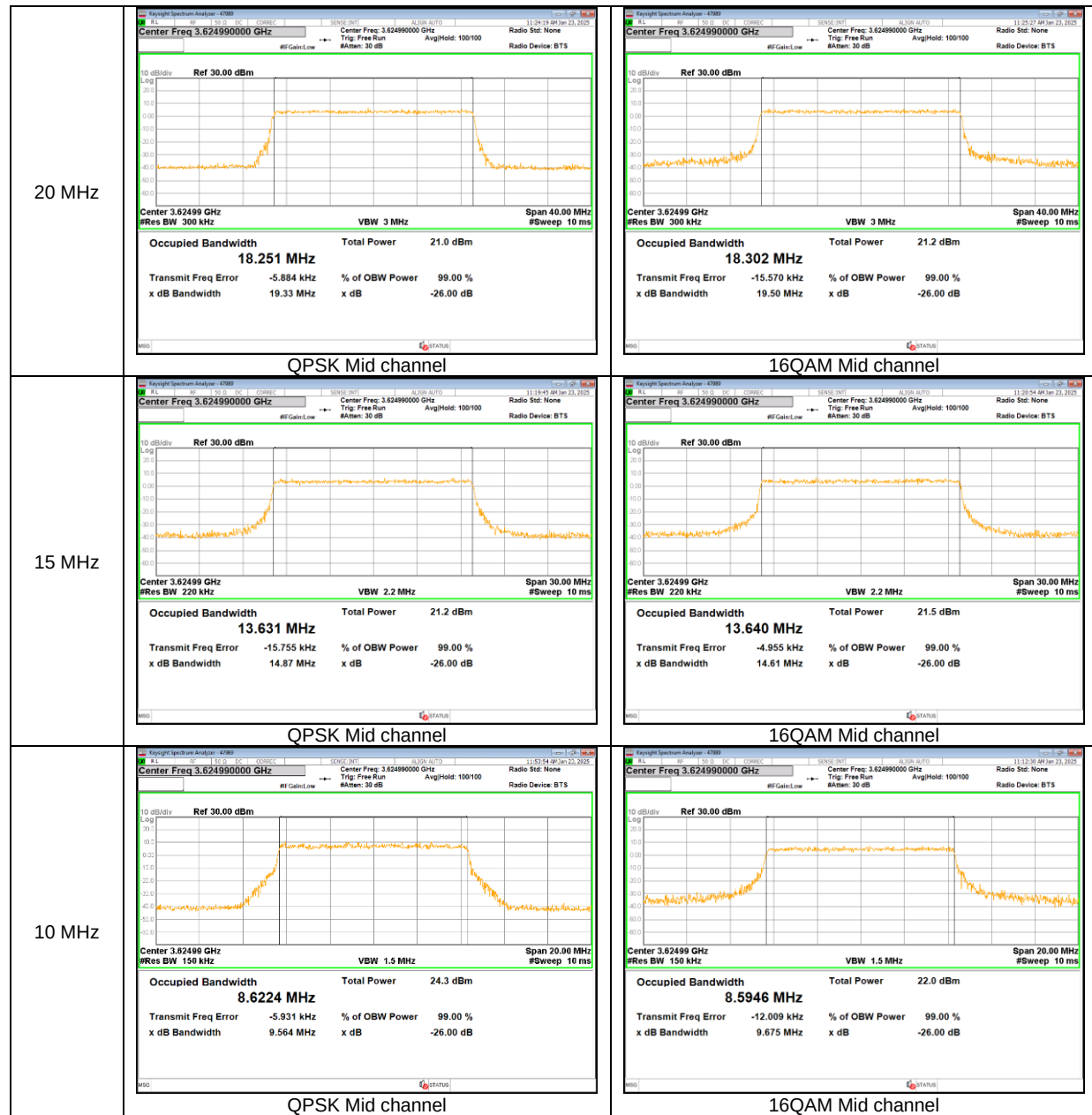


LTE B48 10MHz + 20MHz 16QAM RB50-0 + RB100-0



NR Band n48 CP-OFDM





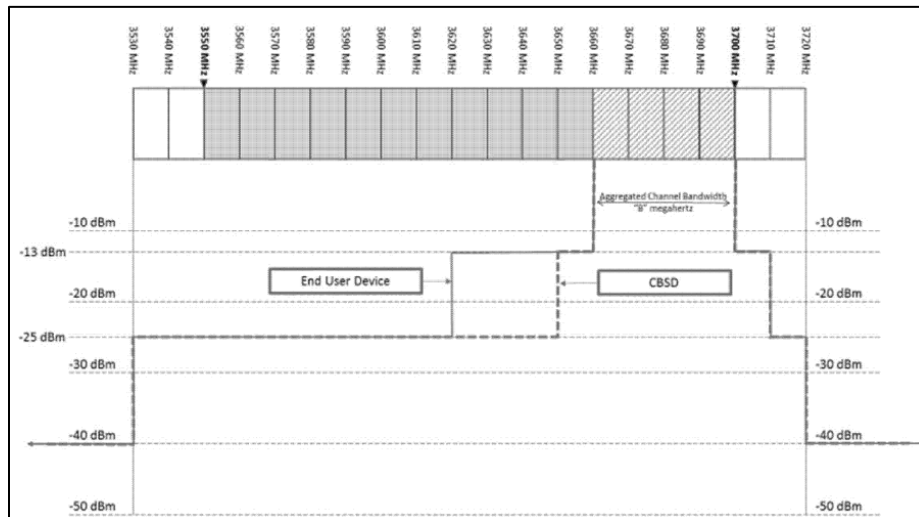
8.4. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §2.1051 and §96.41(e)(1) (ii) & (e)(2).

LIMITS

For channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB. The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.



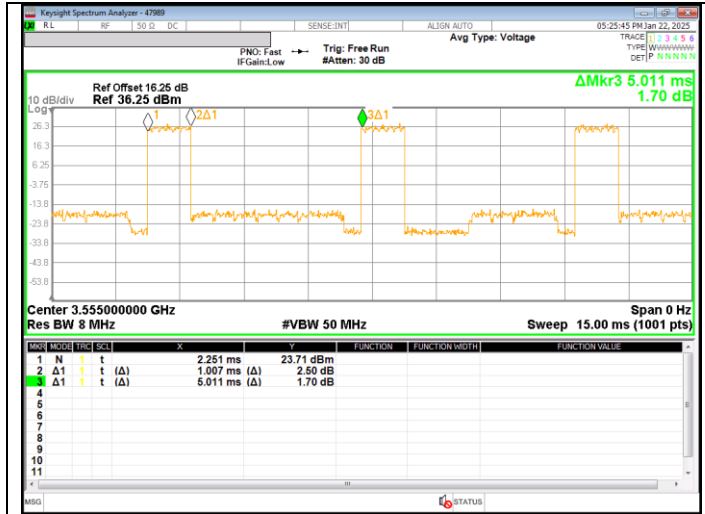
TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The transmitter output was connected to a 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.

- Set the RBW = 1 ~ 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
- Set VBW $\geq 3 \times$ RBW;
- Set span ≥ 1.5 times the OBW;
- Sweep time = Auto;
- Detector = RMS;
- Ensure that the number of measurement points $\geq 2 \times$ span/RBW;
- Trace mode = Average (100);

NOTE1



For NR n48 (Gate trigger off):
RF Path Loss: 16.25 dB & DCF 7 dB: $10\log(1/5)$
Measure offset: 16.25 dB + 7 dB = 23.25 Db

NOTE2

Please refer to section 5.4 for bandwidth and RB setting about LTE, 5G NR bands.

NOTE3

LTE B48C A-MPR is implemented in this EUT when operating the A-MPR Specification in 3GPP TS 36.101 (Table 6.6.2.2A.4-1). Also only Emission mask test item were performed A-MPR condition.

NOTE4

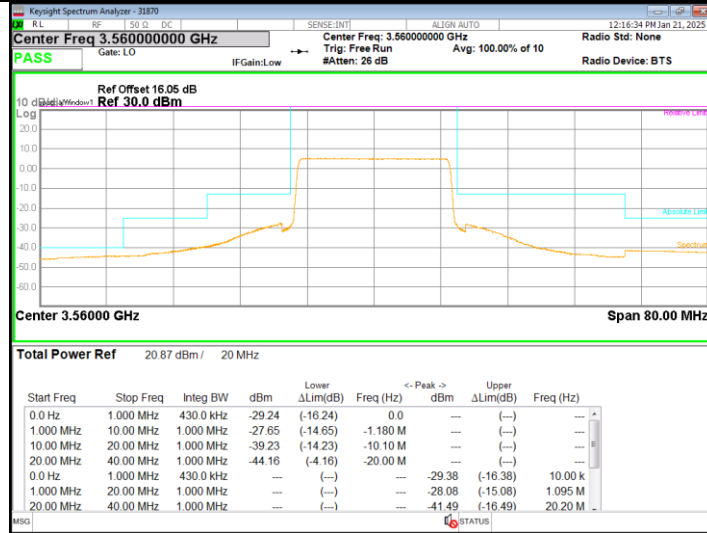
5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

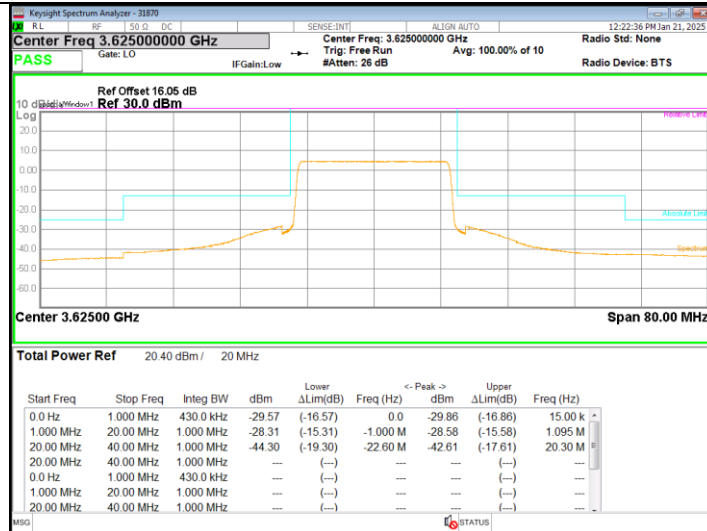
See the following pages.

LTE Band 48

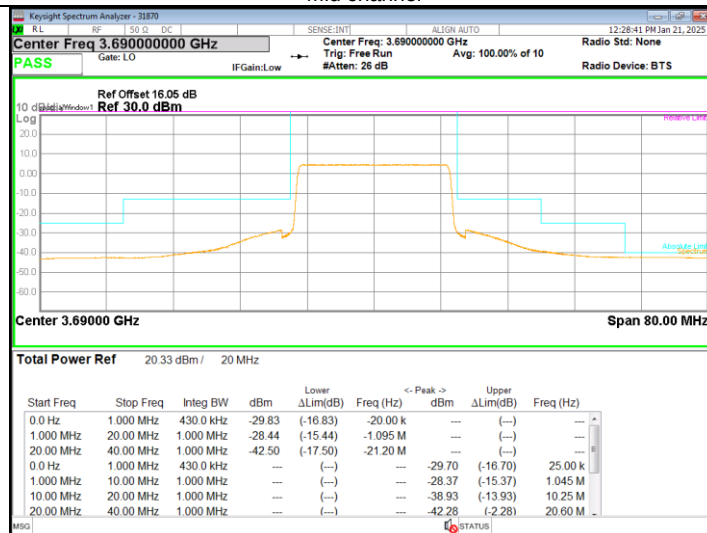
20 MHz
QPSK
FRB



Low channel

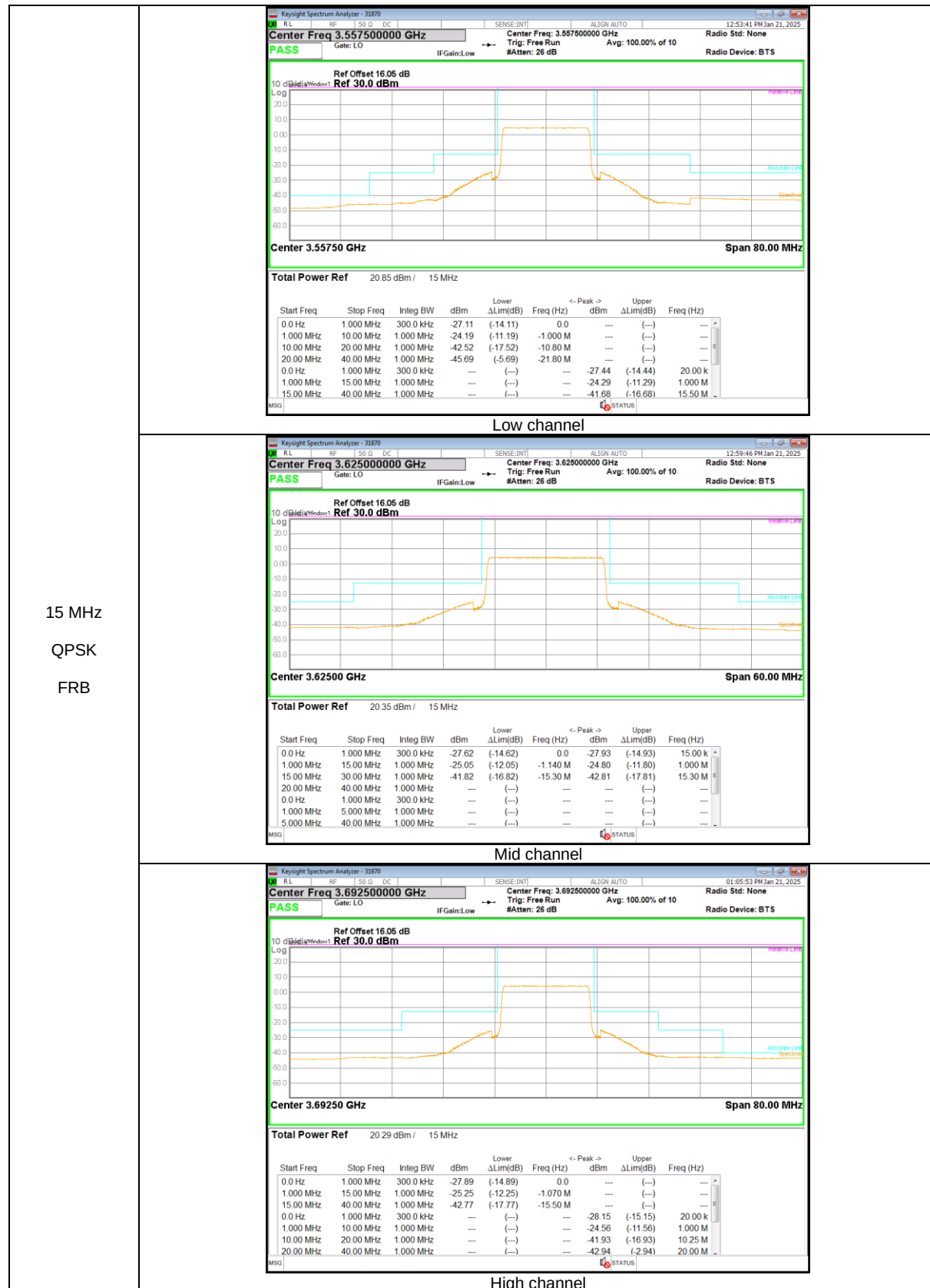


Mid channel

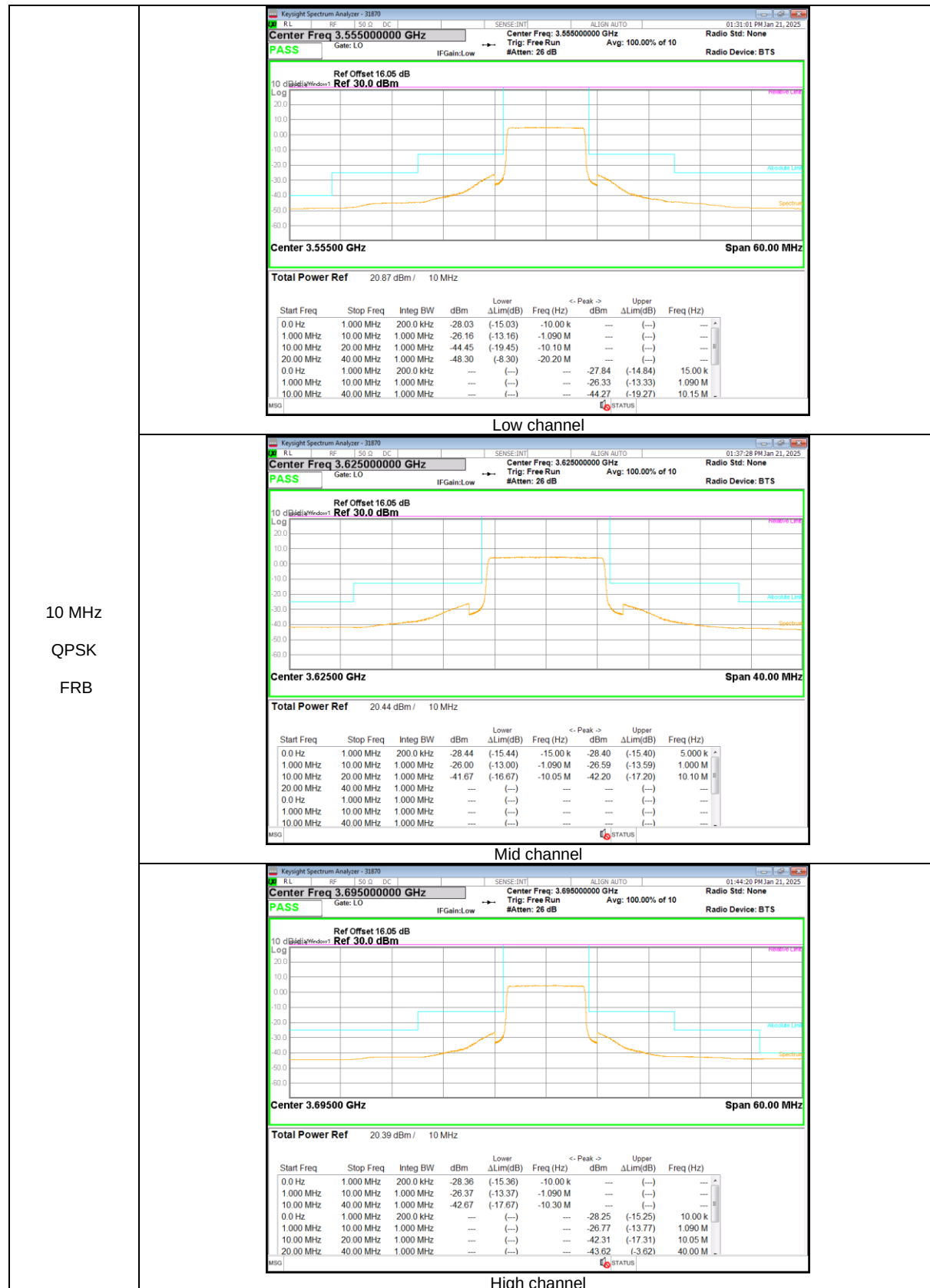


High channel















LTE Band 48 1 RB (Worst Case)

