C2PC TEST REPORT

Report Number : 14790383-E8V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2651 (Parent Model, Full Test) A2893, A2894, A2895, A2896 (Variant Models)
Brand	:	APPLE
FCC ID	:	BCG-E8141A (Parent Model) BCG-E8154A, BCG-E8155A, BCG-E8156A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR47 PART 2, PART 96

Date Of Issue:
JUNE 22, 2023

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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	6/21/2023	Initial Review	Mengistu Mekuria
V2	6/22/2023	Addressed All TCB Questions at Section 6.3 and 6.8	Mengistu Mekuria

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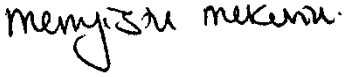
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A2651 (PARENT MODEL, FULL TEST) (Parent Model, Full Test) A2893, A2894, A2895, A2896 (Variant Models)
Brand	APPLE
FCC ID	BCG-E8141A (Parent Model) BCG-E8154A, BCG-E8155A, BCG-E8156A (Variant Models)
EUT Description	SMARTPHONE
Serial Number	CT666X3X0G, C2V3Q7Q7D5 (CONDUCTED), JXM6L16XM3, H7VFKXH4D1 (RADIATED)
Sample Receipt Date	FEBRUARY 22, 2022
Date Tested	MARCH 31, 2022 to JULY 14, 2022
Applicable Standards	FCC CFR47 PART2, PART 96
Test Results	COMPLIES

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released By:	Reviewed By:	Prepared By:
		
Mengistu Mekuria Operations Leader UL LLC.	Tewodros Woldemichael Laboratory Engineer UL LLC.	Binod Sitaula Laboratory Engineer UL LLC.

2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

Requirement Description	Band	Requirement Clause Number (FCC)	Result	Remarks
Equivalent Isotropic Radiated	48	96.41 (b)	Complies	

Requirement Description	Requirement Clause Number (FCC)	Result	Remarks
Occupied Bandwidth	2.1049	Complies	
Band Edge and Emission Mask	96.41(e)	Complies	
Out of Band Emissions	96.41(e)	Complies	
Frequency Stability	2.1055	Complies	
Peak-to-Average Ratio	96.41 (g)	Complies	
Field Strength of Spurious Radiation	96.41(e)	Complies	

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 96
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01. Determining ERP and EIRP

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, California, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, California, USA	US0104	22541	550739
☐	Building 4: 47658 Kato Rd, Fremont, California, USA	US0104	2324B	550739

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{Lab}
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.84 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Occupied Channel Bandwidth	±1.22 %
Temperature	±2.26%
Supply voltages	±0.57 %
Time	±3.39 %

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video),cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G FR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, and NFC. All models except refetence model support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and receiver. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC.

6.2. INTRODUCTION

This application for certification is leveraging the data reuse procedures from KDB 484596 D01 based on reference FCC ID: BCG-E8141A to cover variant model FCC ID: BCG-E8154A, FCC ID: BCG-E8155A, and FCC ID: BCG-E8156A. The major difference between the parent/reference model and the variant model is the depopulation in the variant model of the mmWave transmitter, and some LTE and 5G NR Bands. All other circuitry and features are identical. The data reuse test plan was approved via manufacturer KDB inquiry.

6.3. MODEL DIFFERENCES

The manufacturer hereby declares the following for models A2651, A2893, A2894, A2895, A2896.

A2651, A2894, A2894, A2895, and A2896 are highly similar, with the only differences being listed on the table below:

Model	FCC ID	Model Changes
A2651	BCG-E8141A	Reference model
A2893	BCG-E8154A	Variant model. Removed FR2 from the reference model
A2894	BCG-E8155A	Variant model. Removed FR2, LTE B11/14/21/29/71, and 5G n14/n29/n71 from the reference model
A2895/A2896	BCG-E8156A	Variant model. Removed FR2, LTE B11/14/21/29/53/71, MSS, and 5G NR n14/n29/n53/n71 from the reference Model.

*Note:

They have the same PCB layout, design, common components, antennas, antenna locations and housing cases.

More specifically, their cellular modem, Wi-Fi, BT, NFC, WPT and UWB transmitters are identical, and removal of cellular bands is done by software and depopulation of band-specific components associated with the removed bands.

Spot check verification has been done on models A2893, A28994, A2895, and A2896 in accordance with the test plan approved via KDB inquiry. Comparison of the models, upper deviation is within 0.5dB range, and all tests are under FCC Technical Limits. The results documented for model A2651 may be applied as representative to models A2893, A2894, A2895 and A2896.

6.4. MAXIMUM OUTPUT POWER

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

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 and ERP/EIRP output powers as follows:

Note: for Band48, 5G NR n48, and 5G NR n78 there are three antenna gains for different frequency range within assigined frequency spectrum. As a result, different antennas and conducted power combinaton are used to get the maximum EIRP or output powers.

5G NR n48

LOW CHANNEL

Part 96	
EIRP Limit (W)	0.20
Antenna Gain (dBi)_(Ant8)	-2.80

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
10.0	BPSK	3555.0	3695.0	25.28	22.48	0.177	8589	8M59G7W
	QPSK			25.30	22.50	0.178	8562	8M56G7W
	16QAM			24.48	21.68	0.147	8559	8M56D7W
20.0	BPSK	3560.0	3690.0	25.19	22.39	0.173	17913	17M9G7W
	QPSK			25.24	22.44	0.175	17855	17M9G7W
	16QAM			24.79	21.99	0.158	17841	17M8D7W
30.0	BPSK	3565.0	3685.0	25.11	22.31	0.170	26807	26M8G7W
	QPSK			25.18	22.38	0.173	26810	26M8G7W
	16QAM			24.55	21.75	0.150	26806	26M8D7W
40.0	BPSK	3570.0	3680.0	25.27	22.47	0.177	35652	35M7G7W
	QPSK			25.30	22.50	0.178	35715	35M7G7W
	16QAM			24.70	21.90	0.155	35656	35M7D7W

MIDDLE CHANNEL

Part 96	
EIRP Limit (W)	0.20
Antenna Gain (dBi)_(Ant7)	-2.90

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
10.0	BPSK	3555.0	3695.0	25.26	22.36	0.172	8589	8M59G7W
	QPSK			25.27	22.37	0.173	8562	8M56G7W
	16QAM			24.77	21.87	0.154	8559	8M56D7W
20.0	BPSK	3560.0	3690.0	25.23	22.33	0.171	17913	17M9G7W
	QPSK			25.13	22.23	0.167	17855	17M9G7W
	16QAM			24.66	21.76	0.150	17841	17M8D7W
30.0	BPSK	3565.0	3685.0	24.98	22.08	0.161	26807	26M8G7W
	QPSK			24.97	22.07	0.161	26810	26M8G7W
	16QAM			24.58	21.68	0.147	26806	26M8D7W
40.0	BPSK	3570.0	3680.0	25.17	22.27	0.169	35652	35M7G7W
	QPSK			25.13	22.23	0.167	35715	35M7G7W
	16QAM			24.93	22.03	0.160	35656	35M7D7W

HIGH CHANNEL

Part 96	
EIRP Limit (W)	0.20
Antenna Gain (dBi)_(Ant4)	-2.00

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
10.0	BPSK	3555.0	3695.0	24.37	22.37	0.173	8589	8M59G7W
	QPSK			24.30	22.30	0.170	8562	8M56G7W
	16QAM			23.92	21.92	0.156	8559	8M56D7W
20.0	BPSK	3560.0	3690.0	24.33	22.33	0.171	17913	17M9G7W
	QPSK			24.37	22.37	0.173	17855	17M9G7W
	16QAM			23.83	21.83	0.152	17841	17M8D7W
30.0	BPSK	3565.0	3685.0	24.33	22.33	0.171	26807	26M8G7W
	QPSK			24.40	22.40	0.174	26810	26M8G7W
	16QAM			23.98	21.98	0.158	26806	26M8D7W
40.0	BPSK	3570.0	3680.0	24.30	22.30	0.170	35652	35M7G7W
	QPSK			24.27	22.27	0.169	35715	35M7G7W
	16QAM			23.83	21.83	0.152	35656	35M7D7W

6.5. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2893

A2893 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2651	Sub Model: A2893	Delta (dB)	Remarks
			Frequency (MHz)	FCC ID: BCG-E8141A Power (dBm)	FCC ID: BCG-E8154A Power (dBm)		
5G NR n48	QPSK @ 40 MHz BW	Cond Power	3550-3700	26.00	26.00	0.00	Ant9

6.6. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2894

A2894 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2651	Sub Model: A2894	Delta (dB)	Remarks
			Frequency (MHz)	FCC ID: BCG-E8141A Power (dBm)	FCC ID: BCG-E8155A Power (dBm)		
5G NR n48	QPSK @ 40 MHz BW	Cond Power	3550-3700	26.00	26.00	0.00	Ant9

6.7. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2895 AND A2896

A2895 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2651	Sub Model: A2895/A2896	Delta (dB)	Remarks
			Frequency (MHz)	FCC ID: BCG-E8141A Power (dBm)	FCC ID: BCG-E8156A Power (dBm)		
5G NR n48	QPSK @ 40 MHz BW	Cond Power	3550-3700	26.00	26.00	0.00	Ant9

6.8. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version: 0.15.02.

6.9. MAXIMUM ANTENNA GAIN

The antenna(s) gain and type, as provided by the manufacturer are as follows:

5G NR Band	Frequency Range (MHz)	ANT 4 Antenna Gain (dBi)	ANT 7 Antenna Gain (dBi)	ANT 8 Antenna Gain (dBi)	ANT 9 Antenna Gain (dBi)
5G NR n48 (Low)	3550 – 3600 MHz	-2.2	-3.0	-2.8	-6.5
5G NR n48 (Mid)	3600 – 3650 MHz	-2.1	-2.9	-3.0	-6.6
5G NR n48 (High)	3650 – 3700 MHz	-2.0	-4.6	-3.7	-6.5

6.10. WORST-CASE CONFIGURATION AND MODE

The EUT supports the following 5G NR Band:

5G NR n48.

For 5G NR, conducted spurious emission tests were conducted on wider bandwidth with inner 1RB since this is the worst bandwidth and the highest output power.

BPSK modulation applied only for 5G NR frequencies and has the same tune up power as QPSK modulations.

The DFT-s-OFDM and CP-OFDM waveforms were investigated, and DFT-s-OFDM was found to be the worst case.

The worst-case scenario for all measurements is based on an engineering evaluation made on different modulations. Thn,. BPSK were observed as the worst mode 5G NR bands and set for all conducted and radiated. Output power measurements were measured on BPSK, QPSK, 16QAM, 64QAM, and 256QAM modulations. For testing purposes emissions on sections 8 and 9 were measured while BPSK was set at or above target power for all bands. Conducted tests were performed on the worst case antenna port because it has the highest conducted power. The worst case antenna port is shown in the table below.

5G NR Band	Worst case Antenna Port
5G NR n48	Ant 9

The EUT was investigated in three orthogonal orientations X/Y/Z on all ANT4, ANT7, ANT8 and ANT 9 antennas to determine the worst case orientation. The following table exabit the worst case orientation for different frequency bands. The full tests of the EUT have made upon the orientations that shown in the table below.

Frequency Bands	ANT1	ANT2	ANT3	ANT4	ANT7	ANT8	ANT9
3300 – 3980 MHz	N/A	N/A	N/A	X	Y	X	X

Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

For simultaneous transmission of multiple channels in the 2.4GHz/5GH WLAN, UWB, and Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

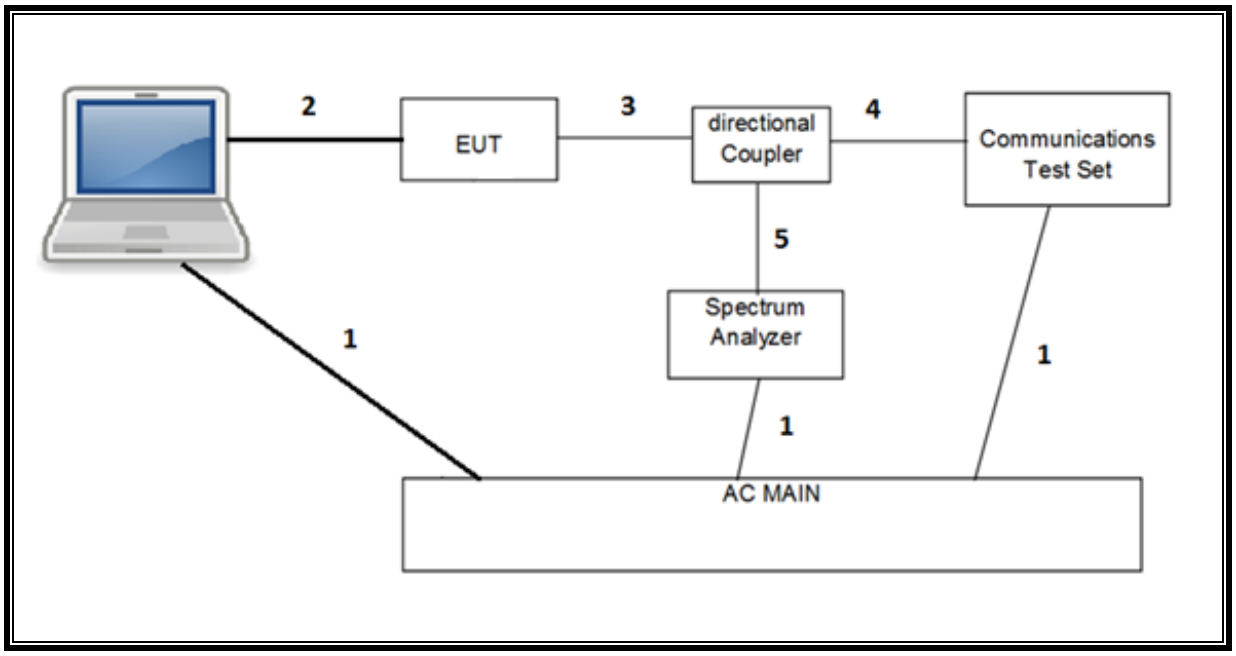
6.11. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**
Laptop	Apple	MacBook Pro	C02VD7SAH22	BCGA1708
AC/DC adapter	Apple	A1718	C4H714302LCGN8RA5	--

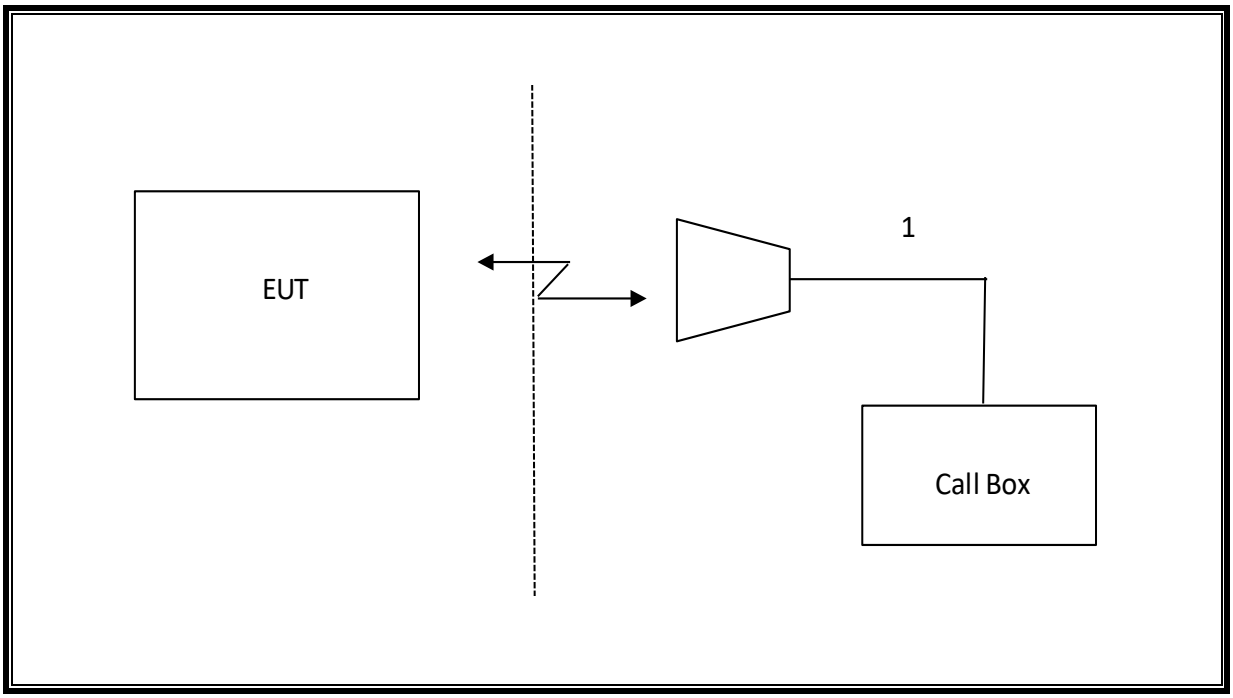
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	DC	Un-shielded	1.0	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2	N/A
5	RF In/Out	1	Barrel	N/A	N/A	N/A

I/O CABLES (RF RADIATED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	RF In/Out	1	Antenna	Un-shielded	5.0	N/A

CONDUCTED SETUP



RADIATED SETUP



7. 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**	**Asset**	**Cal Due**
*Antenna, Horn 1-18GHz	ETS Lindgren	3117	80403	06/13//2022
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	85151	03/21/2023
*Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	06/12/2022
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	85212	0/30/2023
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	N9030A	85213	01/19/2023
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	N9030A	125178	01/24/2023
Directional Coupler	KRYTAR	152610	T1537	09/23/2022
Power Meter, P-series single channel	Keysight	N1912A	90630	01/24/2023
Power Meter, P-series single channel	Keysight	N1912A	90719	01/24/2023
Filter, HPF 1.2GHz	Micro-Tronics	152043	152043	7/29/2022
Filter, BRF 3.4 – 3.8GHz	Micro-Tronics	208398	208398	7/30/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	80397	02/01/2023
5G NR Communication Test Set, Call Box	Keysight	UXM	207269	01/24/2023
5G NR Communication Test Set, Call Box	Keysight	UXM	MY60101138	12/21/2023
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	06/16/2022
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T1154	06/15/2022
Amplifier, 218GHz to 26.5GHz	Amplical	AMP18G26.5-60	215705	02/26/2023
Amplifier, 26.5GHz to 40GHz	Amplical	AMP26G40-65	172346	02/01/2023
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	172362	02/09/2023
Antenna, Horn 26.5GHz to 40GHz	ARA	MWH-2640/B	172365	03/08/2023
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	10/05/2022
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.4, May 20, 2022	
Power Measurement Software	UL	UL RF	Ver 3.1.4, April 29, 2022	
Radiated test software	UL	UL RF	Ver 9.5, Jan 21, 2022	

NOTES:

* Testing is completed before equipment expiration date.
** Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

8. RF OUTPUT POWER VERIFICATION

CONDUCTED OUTPUT POWER MEASUREMENT PROCEDURE

All LTE bands conducted average power is obtained from the CMW500 telecommunication test set.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS136.101 specification.

UE Power Class: 3 (23 +/- 2dBm). Band 41 UE Power Class: 2 (26 +/-2 dBm).The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS136.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS136.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	N/A
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36, 66, 70	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2, 6.6.3.3.19	41	5, 10, 15, 20	Table 6.2.4-4, Table 6.2.4-4a	

The allowed A-MPR values specified below in Table 6.2.3.3.1-1 of 3GPP TS 38.521-1 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

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:

8.1. 5G NR n48

Test Engineer ID:	50822	Test Date:	5/11/2022

OUTPUT POWER FOR 5G NR n48 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 7			ANT 8			ANT 9			ANT 4		
				637000	641666	646333	637000	641666	646333	637000	641666	646333	637000	641666	646333
				3555.0	3625.0	3695.0	3555.0	3625.0	3695.0	3555.0	3625.0	3695.0	3555.0	3625.0	3695.0
10.0	BPSK	1	0	24.91	25.04	25.10	25.05	25.05	25.01	25.64	25.56	25.67	24.03	24.12	24.11
		1	1	25.17	**25.26**	**25.30**	25.16	25.16	**25.17**	25.88	25.86	25.84	24.18	24.30	24.37
		1	22	**25.21**	25.22	25.19	**25.28**	**25.22**	25.07	**25.92**	25.84	25.78	24.27	**24.40**	24.22
		1	23	24.90	25.08	24.98	25.03	25.13	24.90	25.69	25.66	25.56	24.00	24.10	24.01
		12	6	25.15	25.21	25.23	25.18	25.17	25.12	25.84	25.78	25.79	24.16	24.38	24.22
		24	0	24.93	25.06	25.01	24.96	25.02	24.89	25.53	25.60	25.60	23.97	24.12	24.02
	QPSK	1	0	24.48	24.61	24.62	24.51	24.56	24.58	25.18	25.15	25.23	23.59	23.68	23.62
		1	1	25.17	25.21	**25.30**	25.24	25.26	25.22	25.91	25.83	25.85	24.32	**24.39**	24.30
		1	22	**25.22**	**25.27**	25.26	**25.30**	**25.28**	25.13	**26.00**	25.85	25.75	24.27	**24.39**	24.25
		1	23	24.44	24.50	24.50	24.50	24.54	24.35	25.16	25.09	24.98	23.63	23.60	23.47
		12	6	25.09	25.24	25.28	25.06	25.14	25.14	25.85	25.77	25.79	24.19	24.34	24.25
		24	0	24.39	24.56	24.59	24.48	24.46	24.42	24.99	25.08	25.12	23.51	23.66	23.51
	16QAM	1	0	23.32	23.79	23.81	23.25	23.70	23.67	23.85	24.28	24.56	22.33	22.74	22.65
		1	1	**24.30**	24.62	**24.83**	24.40	24.62	**24.70**	24.96	**25.34**	25.29	23.35	23.67	**23.92**
		1	22	24.20	**24.77**	24.70	24.23	**24.71**	24.68	25.04	**25.34**	25.26	23.40	23.87	23.74
		1	23	23.16	23.76	23.64	23.16	23.66	23.60	23.92	24.32	24.32	22.32	22.85	22.44
		12	6	24.18	24.38	24.58	**24.48**	24.56	24.50	25.12	24.97	25.06	23.44	23.53	23.41
		24	0	23.31	23.50	23.60	23.49	23.54	23.35	24.16	24.00	24.05	22.49	22.46	22.58
	64QAM	1	0	**23.04**	22.94	23.22	22.94	**23.19**	23.08	23.70	23.69	**23.84**	21.90	22.12	22.04
		1	1	23.03	23.16	**23.33**	23.13	23.06	22.99	23.68	23.55	23.61	21.96	22.28	22.26
		1	22	22.97	**23.25**	23.09	**23.19**	23.18	22.92	23.78	23.71	23.54	22.12	**22.38**	22.18
		1	23	23.03	23.12	23.12	23.10	23.15	22.94	23.66	23.74	23.65	22.08	22.35	21.96
		12	6	22.92	22.87	23.03	22.93	22.90	22.74	23.52	23.46	23.54	21.89	22.03	21.91
		24	0	22.90	23.08	23.13	22.94	22.99	22.99	23.62	23.60	23.59	22.02	22.11	22.02
	256QAM	1	0	20.90	20.88	**21.13**	20.93	20.86	20.86	21.59	21.66	21.57	20.01	20.06	19.80
		1	1	20.91	21.00	21.06	20.94	20.87	20.96	**21.79**	21.54	21.72	19.93	20.06	19.97
		1	22	**21.00**	20.83	20.94	20.92	**21.00**	20.69	21.67	21.50	21.44	20.05	19.97	20.12
		1	23	20.89	20.94	20.95	**21.06**	20.83	20.58	21.61	21.46	21.44	20.05	**20.13**	**20.13**
		12	6	20.84	**21.02**	21.00	20.89	20.89	20.84	21.61	21.54	21.53	19.94	20.01	19.90
		24	0	20.84	20.88	20.94	20.84	20.83	20.81	21.57	21.40	21.50	19.85	19.98	20.02

OUTPUT POWER FOR 5G NR n48 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 7			ANT 8			ANT 9			ANT 4		
				637333	641333	646000	637333	641333	646000	637333	641333	646000	637333	641333	646000
				3560.0	3625.0	3690.0	3560.0	3625.0	3690.0	3560.0	3625.0	3690.0	3560.0	3625.0	3690.0
20.0	BPSK	1	0	24.94	25.04	25.03	24.99	25.00	25.01	25.66	25.74	25.70	24.05	24.11	24.19
		1	1	25.14	25.09	**25.30**	25.17	25.18	25.22	25.94	**25.97**	25.89	24.14	24.34	24.33
		1	49	25.13	25.23	25.08	25.19	**25.30**	24.98	25.94	**25.97**	25.71	24.21	**24.40**	24.12
		1	50	24.87	24.98	24.80	24.98	25.07	24.79	25.71	25.76	25.53	24.01	24.21	23.88
		25	12	25.08	25.06	25.09	25.18	25.26	25.11	25.89	25.94	25.86	24.11	24.37	24.22
		50	0	24.95	24.93	24.92	24.97	25.00	24.86	25.69	25.69	25.56	24.00	24.10	23.98
	QPSK	1	0	24.44	24.34	24.55	24.51	24.39	24.52	25.12	25.13	25.19	23.45	23.59	23.60
		1	1	25.10	25.13	**25.24**	**25.24**	25.14	25.16	25.99	25.88	25.90	24.14	24.35	**24.37**
		1	49	25.13	25.11	25.01	**25.24**	**25.24**	24.96	**26.00**	25.92	25.69	24.25	24.35	24.12
		1	50	24.41	24.38	24.37	24.56	24.59	24.28	25.11	25.21	25.01	23.48	23.63	23.34
		25	12	25.00	25.12	25.11	25.15	25.18	25.13	25.90	25.85	25.78	24.11	24.28	24.21
		50	0	24.45	24.35	24.41	24.46	24.46	24.38	25.20	25.15	25.11	23.52	23.60	23.46
	16QAM	1	0	23.62	23.58	23.66	23.76	23.52	23.54	23.84	24.37	24.46	22.70	22.66	22.65
		1	1	24.71	24.39	**24.73**	**24.79**	24.60	24.68	24.92	**25.46**	**25.46**	23.72	23.77	**23.83**
		1	49	24.63	24.66	24.56	24.68	24.49	24.40	25.12	25.36	25.24	**23.83**	23.76	23.63
		1	50	23.64	23.65	23.37	23.87	23.63	23.64	23.97	24.49	24.24	22.83	22.77	22.56
		25	12	24.40	24.33	24.41	24.50	24.49	24.40	25.19	25.14	25.06	23.43	23.50	23.53
		50	0	23.49	23.35	23.41	23.41	23.35	23.30	24.14	24.11	24.04	22.52	22.42	22.41
	64QAM	1	0	23.15	22.94	23.31	23.15	23.06	23.14	23.98	23.66	23.96	22.23	22.19	22.23
		1	1	23.17	23.02	23.13	23.02	23.16	**23.22**	24.02	23.56	**24.08**	22.16	22.17	22.06
		1	49	**23.34**	23.01	22.94	23.15	23.10	23.05	23.88	23.89	23.73	22.03	22.11	21.84
		1	50	23.19	23.09	23.12	23.10	23.08	22.96	23.82	23.65	23.88	22.05	**22.27**	21.90
		25	12	22.94	22.87	22.85	22.91	22.91	22.89	23.62	23.64	23.61	21.91	22.01	21.93
		50	0	22.91	22.83	22.89	22.91	22.86	22.76	23.69	23.60	23.58	21.96	21.95	21.88
	256QAM	1	0	21.05	**21.07**	20.94	20.87	20.83	20.62	21.84	21.51	21.61	20.03	19.92	20.02
		1	1	20.87	20.79	20.94	20.97	20.71	**21.04**	**21.85**	21.53	21.70	19.97	20.02	20.12
		1	49	20.79	20.74	21.06	20.92	20.66	20.64	21.58	21.60	21.55	**20.14**	20.10	19.61
		1	50	20.86	20.80	20.98	20.74	21.03	20.71	21.76	21.49	21.71	19.92	19.90	19.62
		25	12	20.87	20.77	20.86	20.80	20.80	20.89	21.66	21.60	21.62	19.85	19.94	19.82
		50	0	20.90	20.86	20.89	20.89	20.85	20.95	21.73	21.62	21.62	19.94	19.96	19.91

OUTPUT POWER FOR 5G NR n48 (30.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 7			ANT 8			ANT 9			ANT 4		
				637666	641666	645666	637666	641666	645666	637666	641666	645666	637666	641666	645666
				3565.0	3625.0	3685.0	3565.0	3625.0	3685.0	3565.0	3625.0	3685.0	3565.0	3625.0	3685.0
30.0	BPSK	1	0	24.67	24.60	25.02	24.93	24.80	24.95	25.54	25.48	25.81	23.90	24.08	24.22
		1	1	24.89	24.82	**25.12**	25.11	24.92	**25.30**	25.73	25.72	**26.00**	24.16	24.24	**24.33**
		1	76	24.78	24.98	24.85	24.99	25.12	24.80	25.59	25.73	25.56	24.06	24.16	23.93
		1	77	24.63	24.85	24.70	24.76	24.85	24.62	25.41	25.48	25.43	23.82	24.02	23.80
		36	18	24.90	24.90	25.05	25.05	25.05	25.15	25.68	25.73	25.85	24.12	24.19	24.31
		75	0	20.00	24.74	20.00	20.00	24.89	20.00	20.00	25.54	20.00	19.50	23.98	19.50
	QPSK	1	0	24.28	24.28	24.49	24.40	24.30	24.61	25.06	25.04	25.28	23.44	23.54	23.79
		1	1	24.97	24.97	**25.30**	25.18	25.08	**25.30**	25.73	25.72	**25.98**	23.97	24.18	**24.40**
		1	76	24.80	24.97	24.80	25.00	25.17	24.80	25.62	25.80	25.63	24.09	24.24	24.02
		1	77	24.13	24.33	24.23	24.21	24.33	24.16	24.96	25.14	24.83	23.40	23.50	23.42
		36	18	24.81	24.87	25.03	25.02	24.98	25.06	25.67	25.74	25.83	24.07	24.16	24.26
		75	0	20.00	24.25	20.00	20.00	24.31	20.00	20.00	24.97	20.00	19.50	23.43	19.50
	16QAM	1	0	23.40	23.20	23.82	23.51	23.43	23.79	24.29	24.18	24.40	22.68	22.73	22.90
		1	1	24.43	24.34	24.50	24.52	24.52	**24.68**	25.31	25.22	25.35	23.74	23.55	**23.98**
		1	76	24.43	**24.58**	24.37	24.55	24.62	24.36	25.31	**25.44**	25.14	23.72	23.64	23.63
		1	77	23.27	23.51	23.22	23.41	23.68	23.36	24.06	24.27	24.11	22.55	22.49	22.48
		36	18	24.15	24.20	24.38	24.27	24.33	24.39	24.99	24.96	25.03	23.38	23.43	23.57
		75	0	20.00	23.23	20.00	20.00	23.27	20.00	20.00	23.92	20.00	19.50	22.39	19.50
	64QAM	1	0	22.94	22.90	**23.23**	23.01	23.08	**23.24**	23.63	23.42	**23.93**	21.76	21.99	**22.34**
		1	1	22.78	22.72	23.04	23.18	23.11	23.14	23.81	23.61	23.88	22.00	22.11	22.21
		1	76	22.67	22.88	22.61	22.98	22.98	23.00	23.72	23.63	23.57	22.00	22.19	22.00
		1	77	22.81	23.01	22.83	22.98	22.93	22.88	23.62	23.81	23.45	21.98	22.16	21.89
		36	18	22.70	22.69	22.84	22.79	22.80	22.85	23.48	23.49	23.64	21.86	21.98	22.00
		75	0	20.00	22.63	20.00	20.00	22.71	20.00	20.00	23.39	20.00	19.50	21.80	19.50
	256QAM	1	0	20.52	20.69	**20.89**	20.90	20.75	20.93	21.50	21.48	21.74	19.87	19.73	20.16
		1	1	20.61	20.76	20.84	20.88	20.61	**21.03**	21.60	21.43	**21.78**	19.75	19.80	**20.19**
		1	76	20.63	20.76	20.54	20.98	20.99	20.64	21.30	21.50	21.55	19.66	19.88	19.71
		1	77	20.64	20.76	20.59	20.77	20.57	20.50	21.33	21.59	21.33	19.69	19.73	19.78
		36	18	20.57	20.63	20.77	20.79	20.65	20.80	21.39	21.44	21.65	19.79	19.80	19.98
		75	0	20.00	20.72	20.00	20.00	20.76	20.00	20.00	21.46	20.00	19.50	19.85	19.50

OUTPUT POWER FOR 5G NR n48 (40.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)											
				ANT 7			ANT 8			ANT 9			ANT 4		
				638000	641333	645333	638000	641333	645333	638000	641333	645333	638000	641333	645333
				3570.0	3620.0	3680.0	3570.0	3620.0	3680.0	3570.0	3620.0	3680.0	3570.0	3620.0	3680.0
40.0	BPSK	1	0	25.13	24.81	25.08	24.97	24.59	25.00	25.71	25.46	25.67	24.25	23.85	24.08
		1	1	**25.29**	25.00	25.17	**25.27**	24.79	25.18	**26.00**	25.58	25.83	**24.40**	24.13	24.30
		1	104	25.17	25.17	24.93	25.04	25.12	24.99	25.81	25.82	25.61	24.28	24.35	24.10
		1	105	25.00	25.09	24.87	24.86	24.98	24.58	25.62	25.69	25.48	24.03	23.97	23.82
		50	25	25.20	24.96	25.17	25.03	24.81	25.01	25.85	25.57	25.79	24.23	24.11	24.15
		100	0	20.00	24.78	20.00	20.00	24.67	20.00	20.00	25.39	20.00	19.50	23.95	19.50
	QPSK	1	0	24.50	24.29	24.52	24.58	24.14	24.51	25.23	24.90	25.18	23.57	23.38	23.50
		1	1	**25.30**	24.91	25.23	**25.30**	24.80	25.06	**25.95**	25.63	25.91	24.27	24.11	24.27
		1	104	25.16	25.13	25.13	24.95	24.98	24.86	25.80	25.84	25.70	**24.28**	**24.28**	24.20
		1	105	24.41	24.48	24.43	24.34	24.40	24.23	25.21	25.28	24.96	23.58	23.64	23.37
		50	25	25.19	24.97	25.23	25.05	24.86	25.04	25.89	25.56	25.79	24.22	24.10	24.15
		100	0	20.00	24.24	20.00	20.00	24.16	20.00	20.00	24.88	20.00	19.50	23.41	19.50
	16QAM	1	0	23.83	23.52	23.72	23.71	23.25	23.63	24.50	24.07	24.45	22.95	22.52	22.54
		1	1	24.69	24.41	24.72	24.43	24.40	**25.04**	25.50	25.03	**25.54**	23.76	23.72	**23.83**
		1	104	24.58	**24.93**	24.75	24.70	24.71	24.18	25.22	25.35	25.26	23.80	23.77	23.59
		1	105	23.67	23.56	23.43	23.36	23.59	23.25	24.31	24.41	24.18	22.72	22.78	22.48
		50	25	24.53	24.23	24.42	24.39	24.15	24.27	25.10	24.89	25.05	23.50	23.41	23.45
		100	0	20.00	23.25	20.00	20.00	23.13	20.00	20.00	23.87	20.00	19.50	22.35	19.50
	64QAM	1	0	23.36	22.81	23.23	**23.35**	22.47	22.61	23.74	23.52	23.93	22.19	22.00	22.18
		1	1	**23.47**	22.56	23.08	23.04	22.99	23.28	23.83	23.62	23.80	22.18	22.19	22.32
		1	104	23.16	23.38	23.02	23.01	22.86	22.99	23.96	23.77	23.56	22.32	22.01	21.93
		1	105	23.09	22.93	23.24	23.08	23.20	22.73	23.83	**23.97**	23.66	22.04	**22.33**	22.09
		50	25	22.90	22.74	23.00	22.78	22.61	22.75	23.56	23.38	23.48	22.05	21.80	21.91
		100	0	20.00	22.73	20.00	20.00	22.63	20.00	20.00	23.39	20.00	19.50	21.83	19.50
	256QAM	1	0	21.01	20.80	20.82	20.86	20.35	21.03	**21.78**	21.33	21.68	20.16	19.81	20.01
		1	1	20.84	20.80	21.04	21.03	20.68	**21.12**	21.75	21.16	21.60	**20.19**	19.85	19.96
		1	104	20.88	**21.19**	20.82	20.69	20.85	20.46	21.46	21.57	21.54	19.90	19.89	19.83
		1	105	20.97	20.72	20.83	20.77	21.01	20.69	21.41	21.62	21.21	19.94	20.05	19.79
		50	25	20.97	20.82	20.99	20.80	20.74	20.76	21.57	21.39	21.54	20.01	19.85	19.94
		100	0	20.00	20.80	20.00	20.00	20.60	20.00	20.00	21.35	20.00	19.50	19.79	19.50

9. CONDUCTED TEST RESULTS

9.1. 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 middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

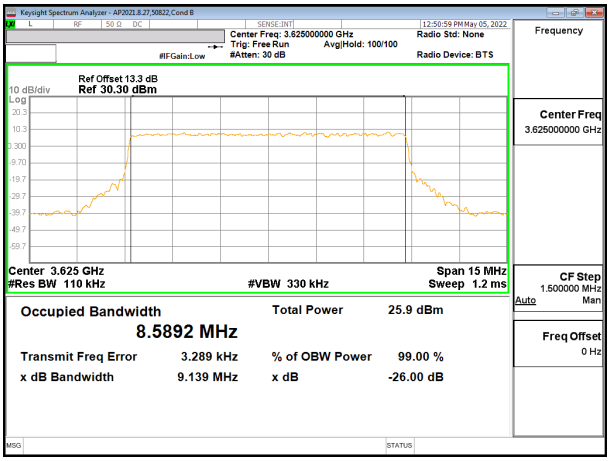
RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested. Worst-case plots (highest bandwidth) are reported only.

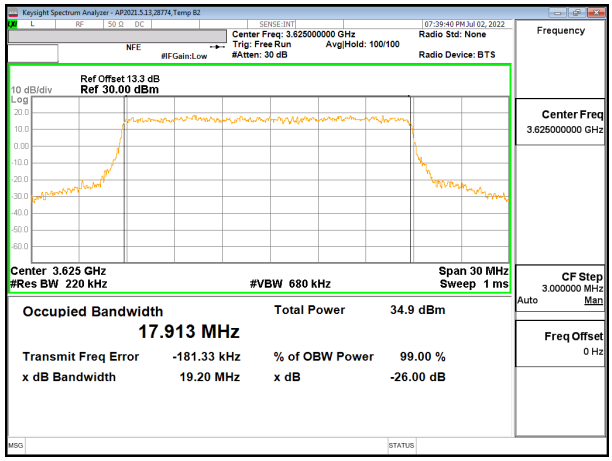
5G NR n48

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n48	10MHz, BPSK	24/0	3625.0	8.589	9.14
	10MHz, QPSK			8.562	9.11
	10MHz, 16QAM			8.559	9.26
	20MHz, BPSK	50/0		17.913	19.20
	20MHz, QPSK			17.855	19.01
	20MHz, 16QAM			17.841	19.17
	30MHz, BPSK	75/0		26.807	28.46
	30MHz, QPSK			26.810	28.40
	30MHz, 16QAM			26.806	28.38
	40MHz, BPSK	100/0		35.652	37.50
	40MHz, QPSK			35.715	37.48
	40MHz, 16QAM			35.656	37.54
	40MHz, BPSK	1/0		0.514	0.83

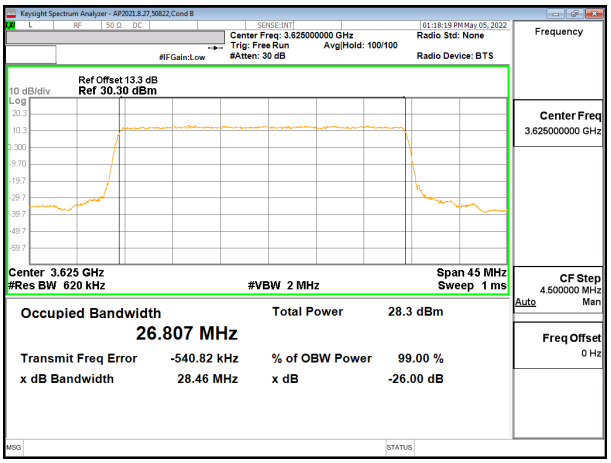
9.1.1. 5G NR n48



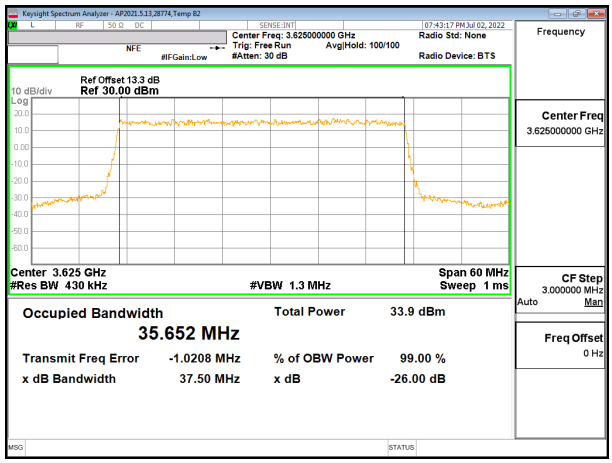
5G NR n48 10MHz BPSK Middle Channel RB24-0



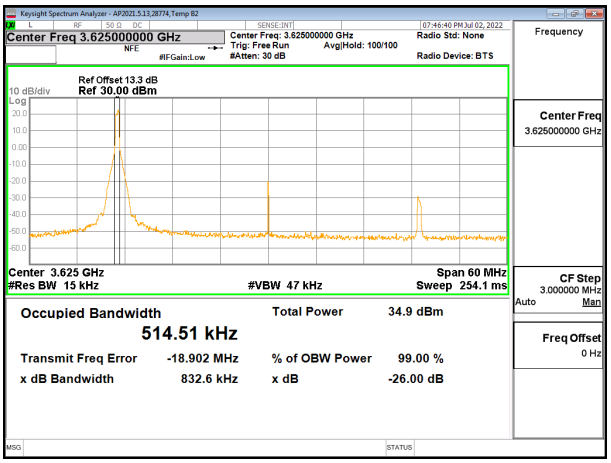
5G NR n48 20MHz BPSK Middle Channel RB50-0



5G NR n48 30MHz BPSK Middle Channel RB75-0



5G NR n48 40MHz BPSK Middle Channel RB100-0



5G NR n48 40MHz BPSK Middle Channel RB100-0

9.2. EMISSION MASK AND ADJACENT CHANNEL POWER

For Spectrum Emission Mask plots, the Keysight PXA N9030A is configured to sweep with a moving integration window, the width of which can be adjusted to different sizes across the sweep. The window width is configured to be greater than or equal to the required reference bandwidth. The center frequencies of the integration window for the different integration windows was set such that the upper and lower edges of the windows are aligned with the transition points in the reference bandwidths. This is achieved by setting the start / stop frequencies of the window with an offset equal to the reference bandwidth / 2 from the transition point.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test 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.

For each Emission Mask measurement:

1. Set the spectrum analyzer span to include the block edge frequency.
2. Set the Spectrum Emission Mask to cover all frequencies at their respective limits
3. Set the Spectrum Emission Mask to use the required Measurement Bandwidth
4. Set resolution bandwidth to at least 1% of emission bandwidth.

TEST PROCEDURE (5G NR n48)

(i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

(iii) Compliance with emission limits shall be demonstrated using either average (RMS)-detected or peak-detected power measurement techniques.

RESULTS

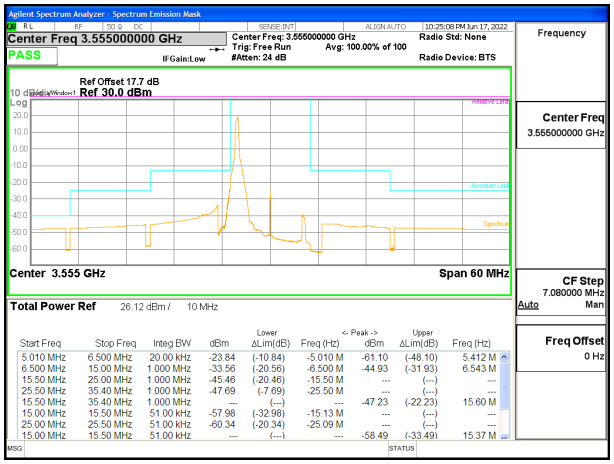
9.2.1. 5G NR n48 EMISSION MASK AND ADJACENT CHANNEL POWER

LIMITS

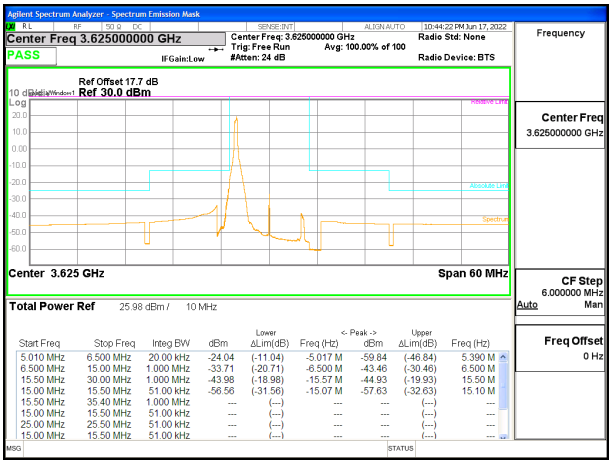
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(1) General protection levels
(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental 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.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

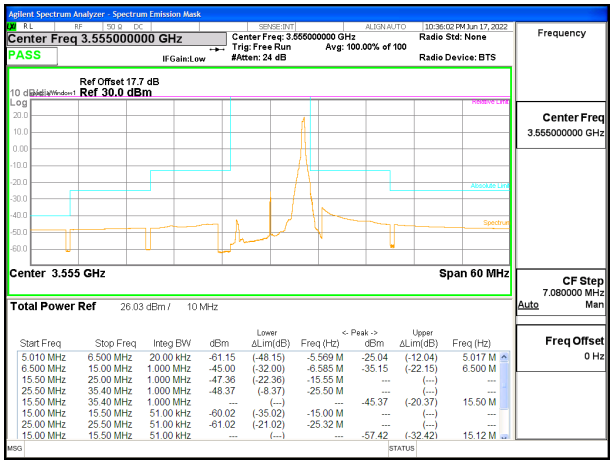
5G NR n48 EMISSION MASK



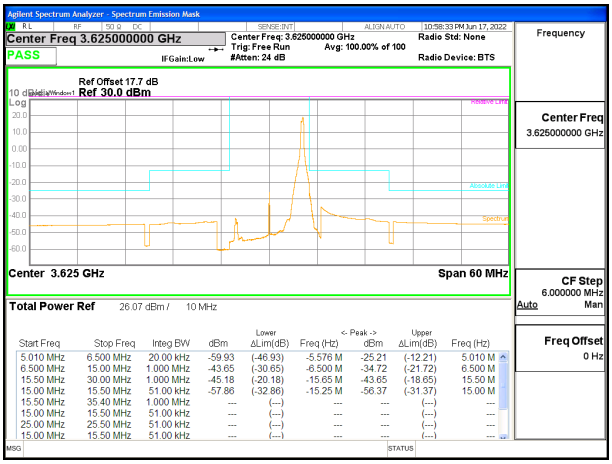
5G NR n48 10MHz BPSK Low Channel RB1-0, ID:50822



5G NR n48 10MHz BPSK Middle Channel RB1-0, ID:50822



5G NR n48 10MHz BPSK Low Channel RB1-23, ID:50822



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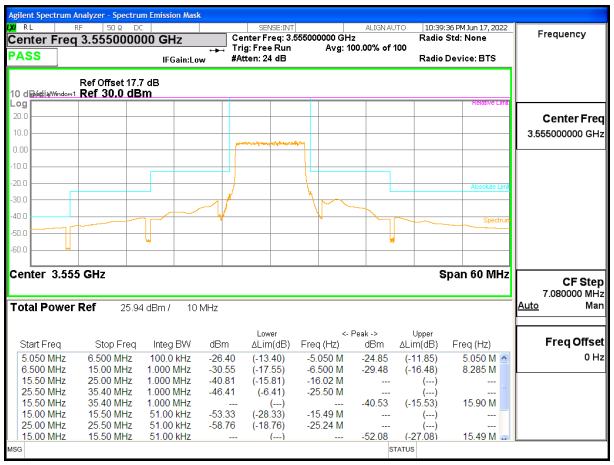
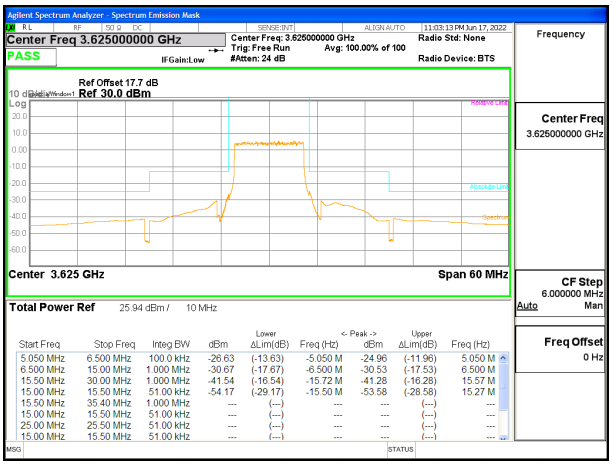


5G NR n48 10MHz BPSK Low Channel RB24-0, ID:50822



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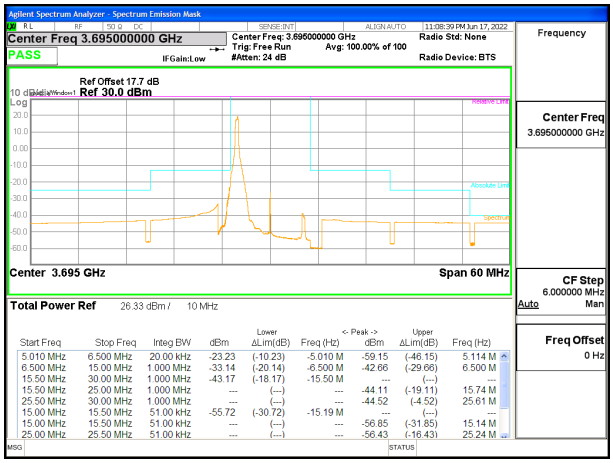

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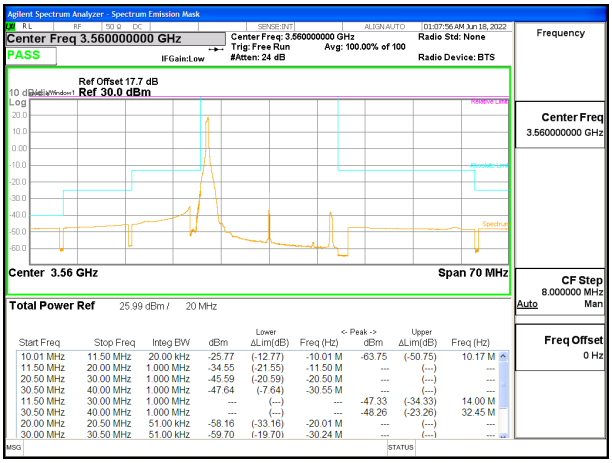

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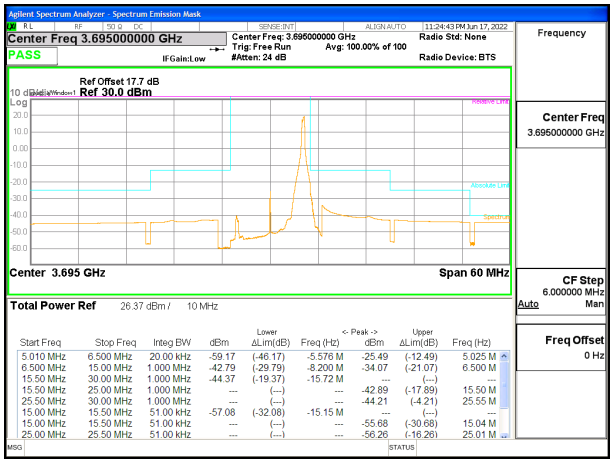

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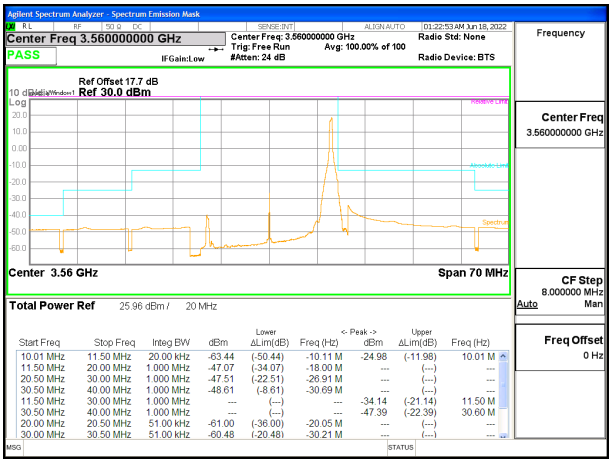

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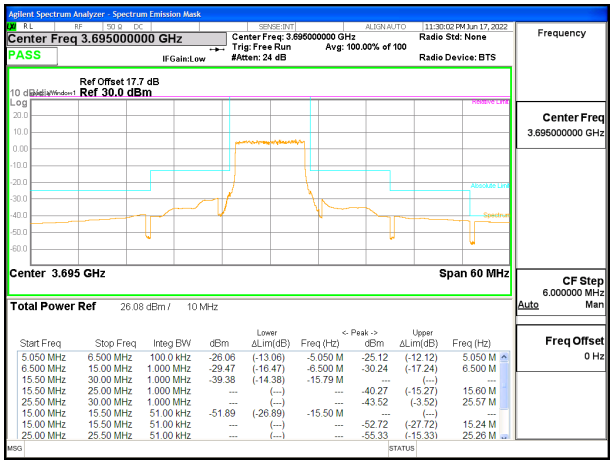

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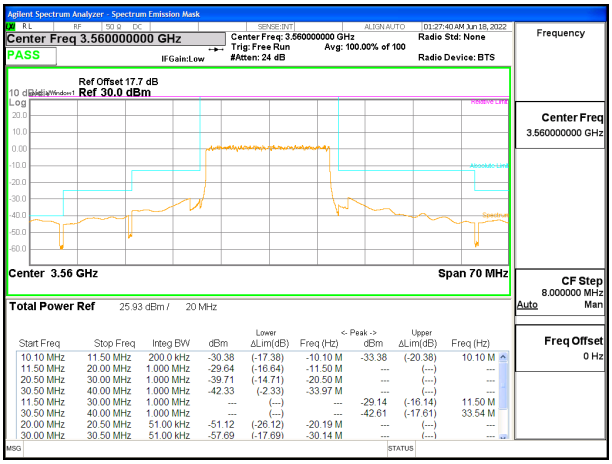

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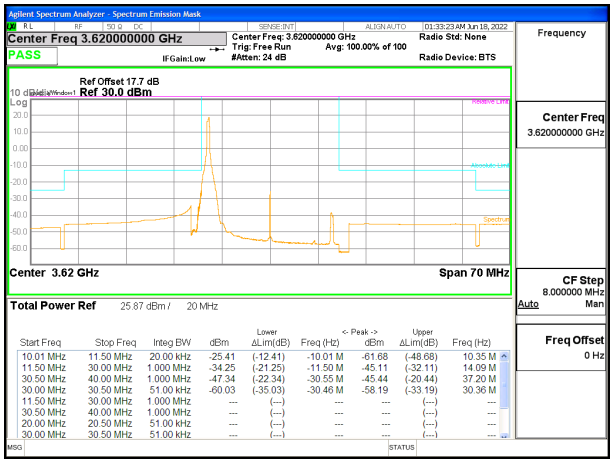
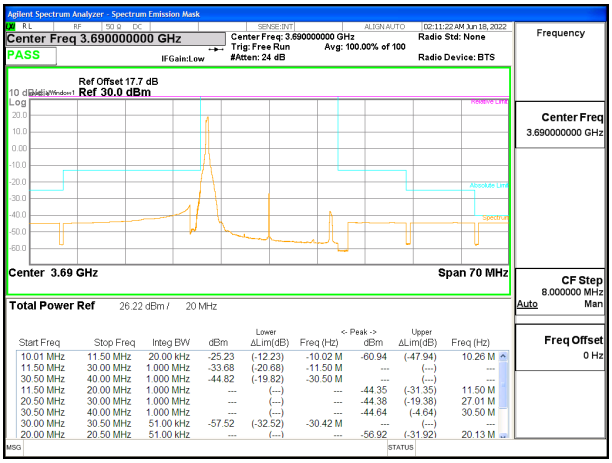


5G NR n48 20MHz BPSK Middle Channel RB1-0, ID:50822



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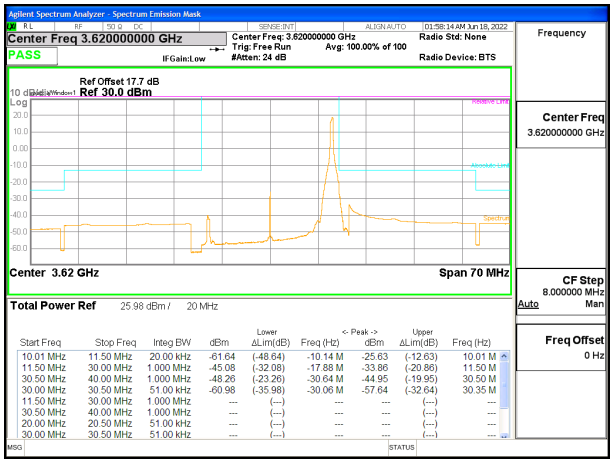

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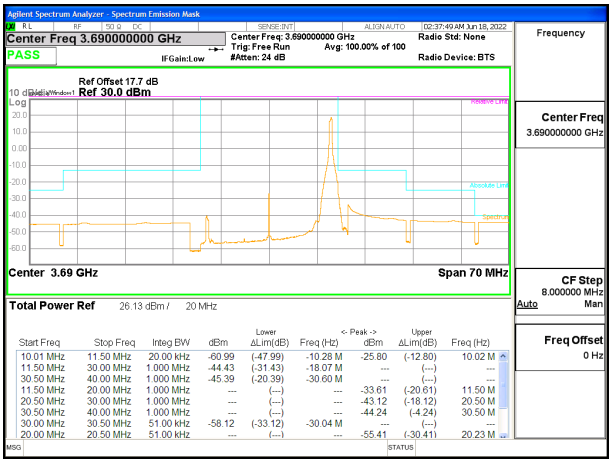

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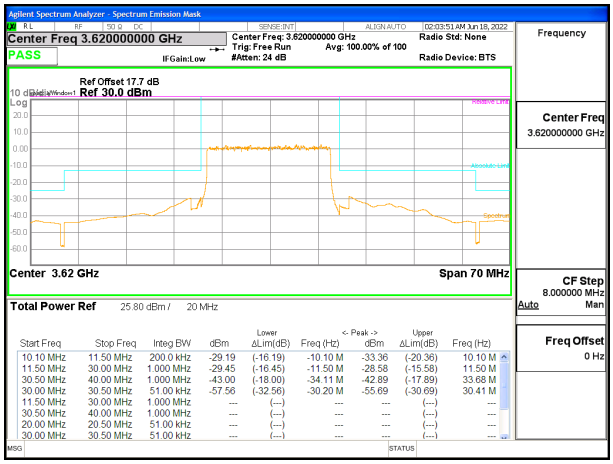
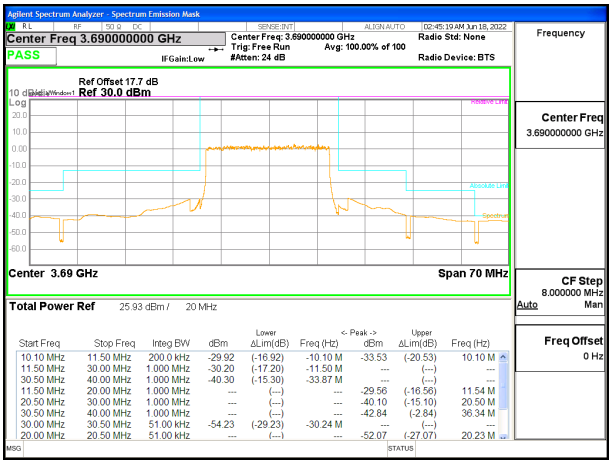


5G NR n48 20MHz BPSK Middle Channel RB50-0, ID:50822



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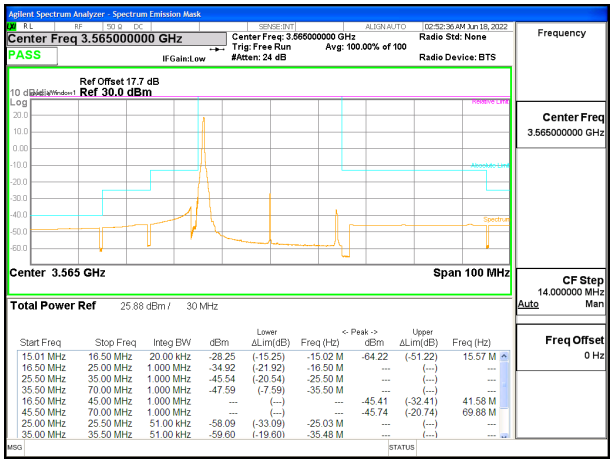
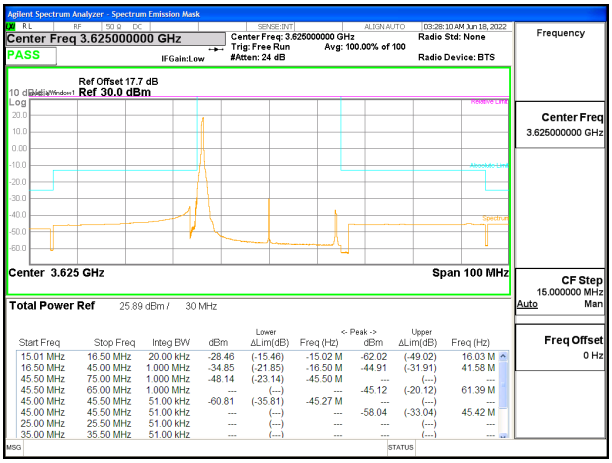
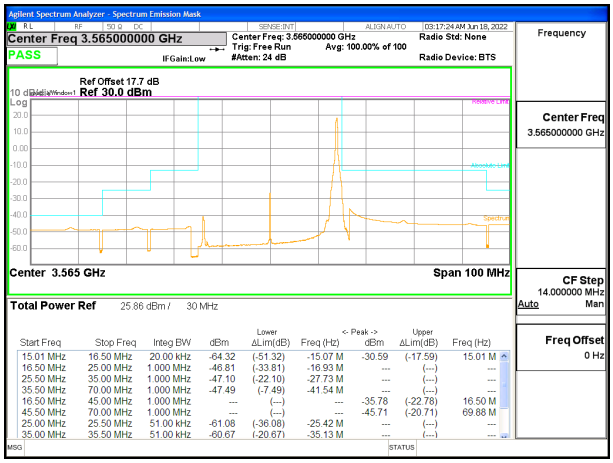


5G NR n48 30MHz BPSK Low Channel RB1-0, ID:50822



5G NR n48 30MHz BPSK Middle Channel RB1-0, ID:50822



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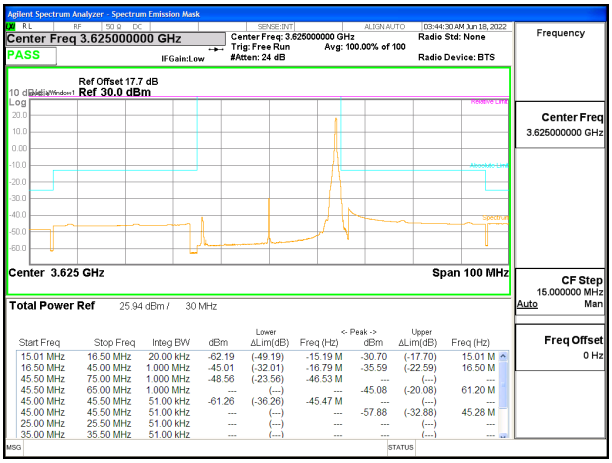
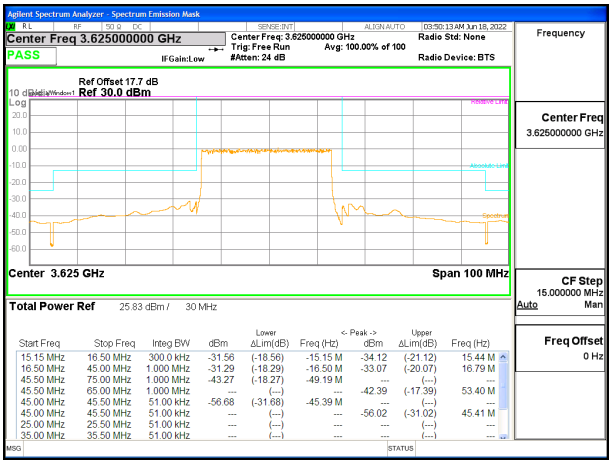


5G NR n48 30MHz BPSK Middle Channel RB1-77, ID:50822

5G NR n48 30MHz BPSK Low Channel RB75-0



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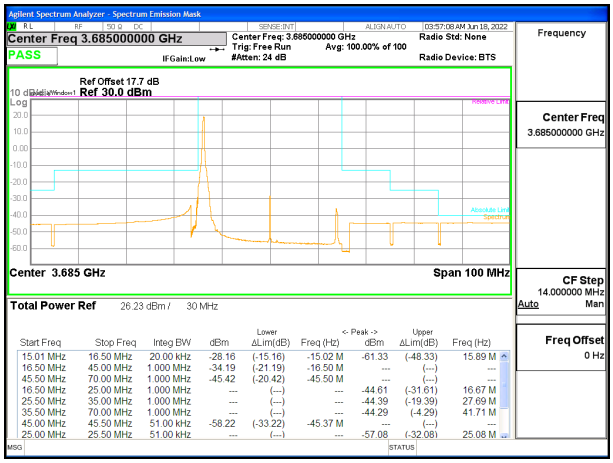
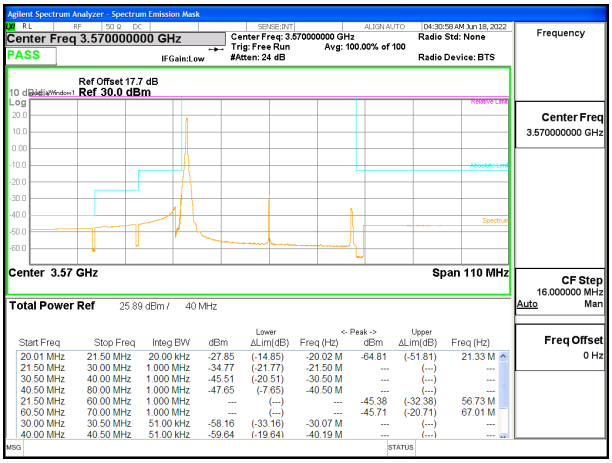
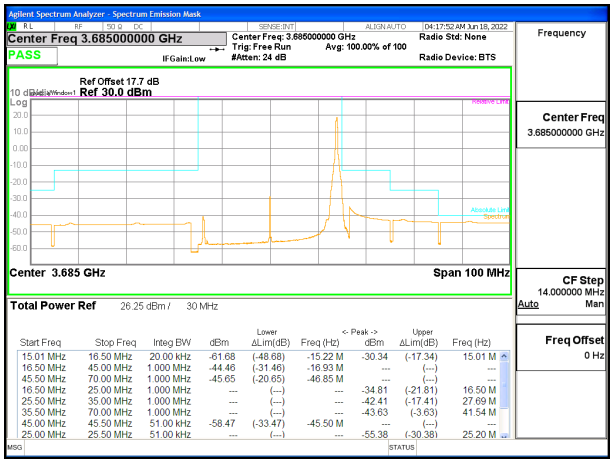


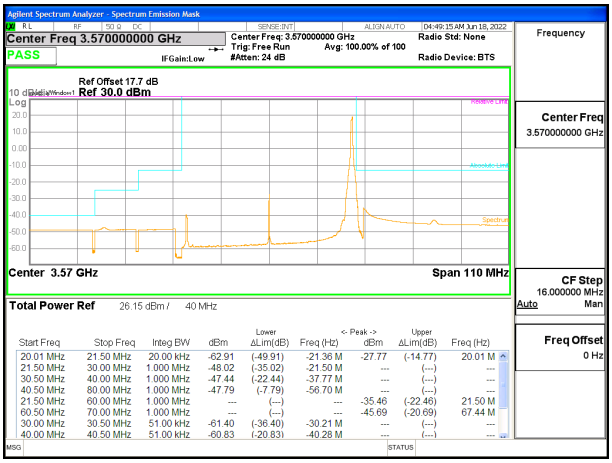
5G NR n48 30MHz BPSK High Channel RB1-0, ID:50822



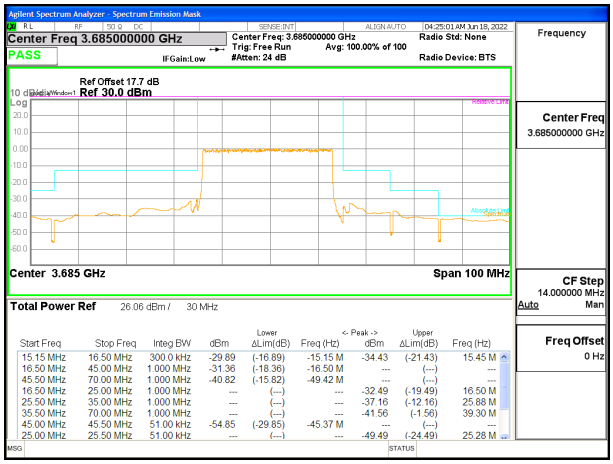
5G NR n48 40MHz BPSK Low Channel RB1-0, ID:50822



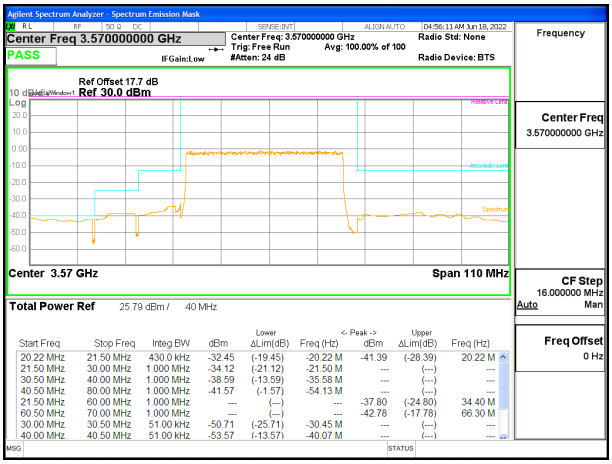
5G NR n48 30MHz BPSK High Channel RB1-77



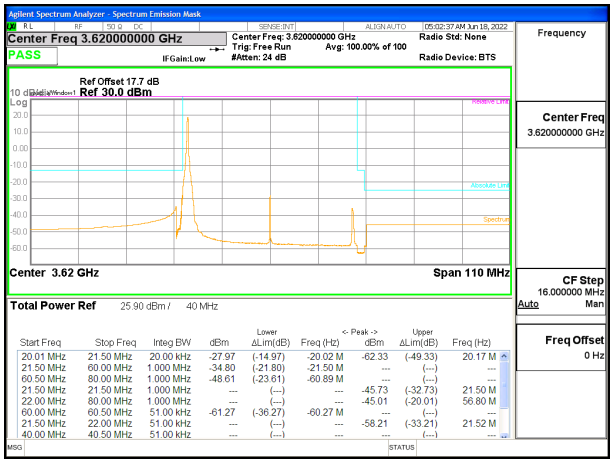
5G NR n48 40MHz BPSK Low Channel RB1-105



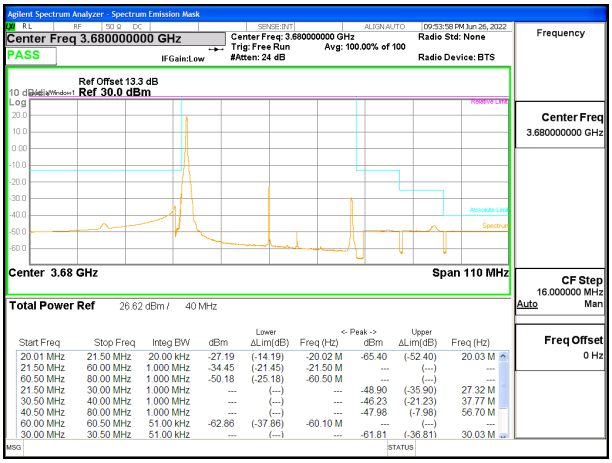
5G NR n48 30MHz BPSK High Channel RB75-0, ID:50822



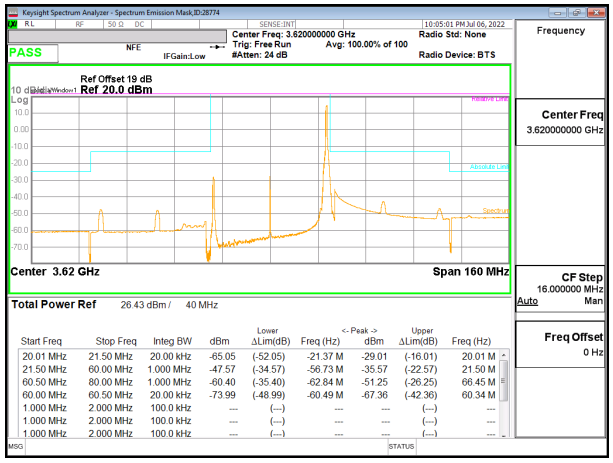
5G NR n48 40MHz BPSK Low Channel RB100-0, ID:50822



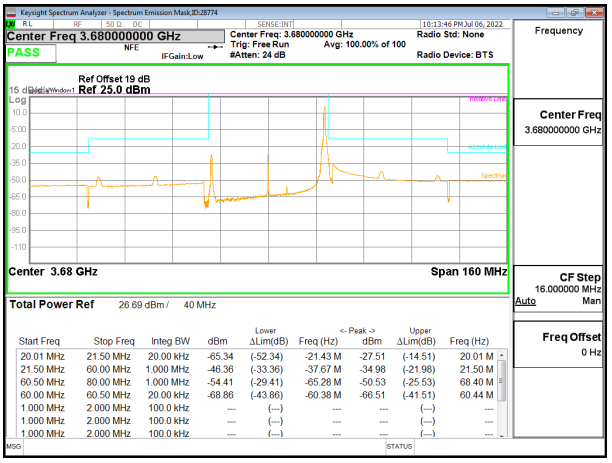
5G NR n48 40MHz BPSK Middle Channel RB1-0, ID:50822



5G NR n48 40MHz BPSK High Channel RB1-0, ID:50822



5G NR n48 40MHz BPSK Middle Channel RB1-105



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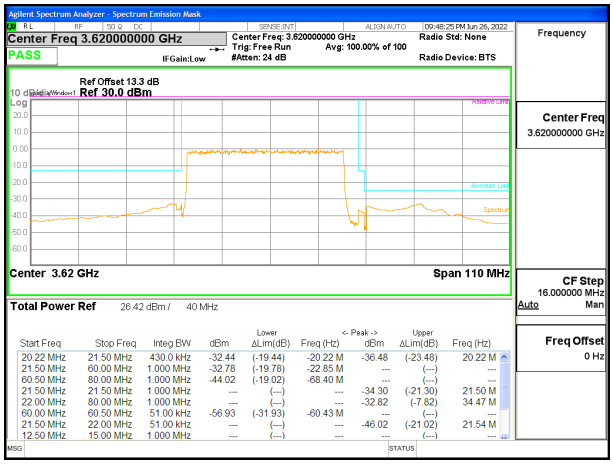
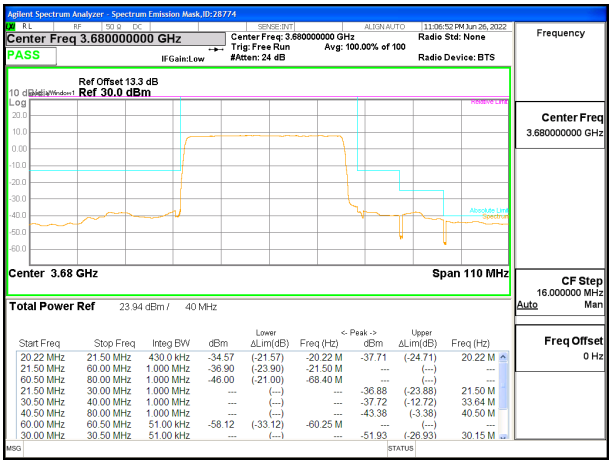
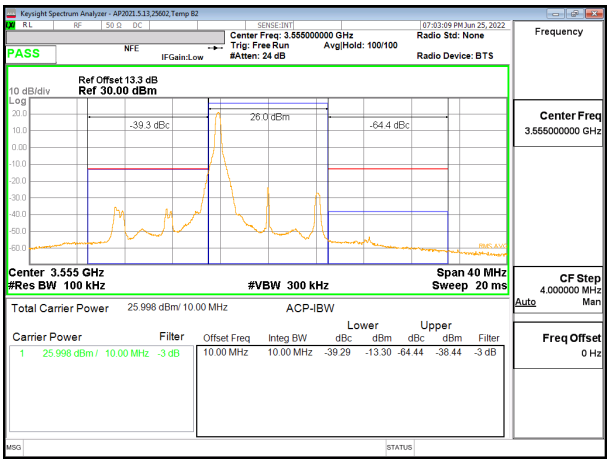


5G NR n48 40MHz BPSK Middle Channel RB100-0, ID:50822

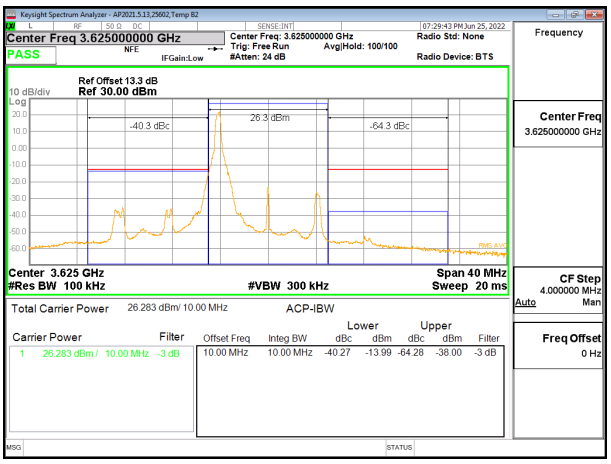


5G NR n48 40MHz BPSK High Channel RB100-0, ID:50822

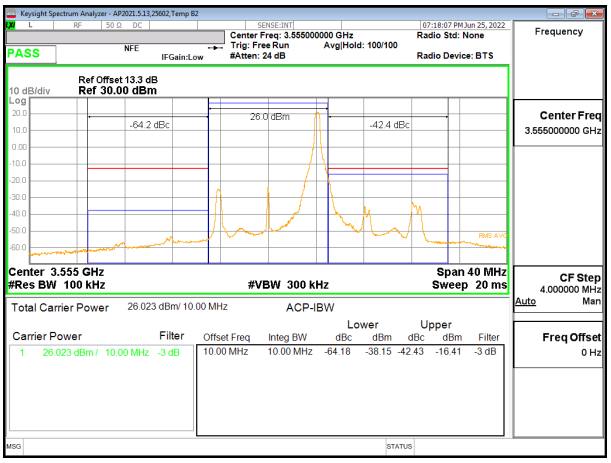
5G NR n48 ADJACENT CHANNEL POWER



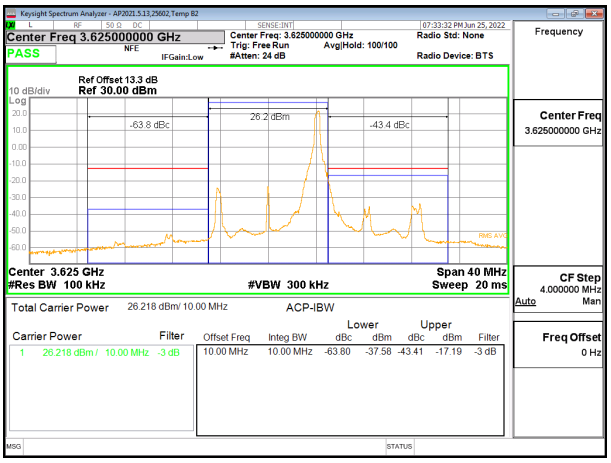
5G NR n48 10MHz BPSK Low Channel RB1-0



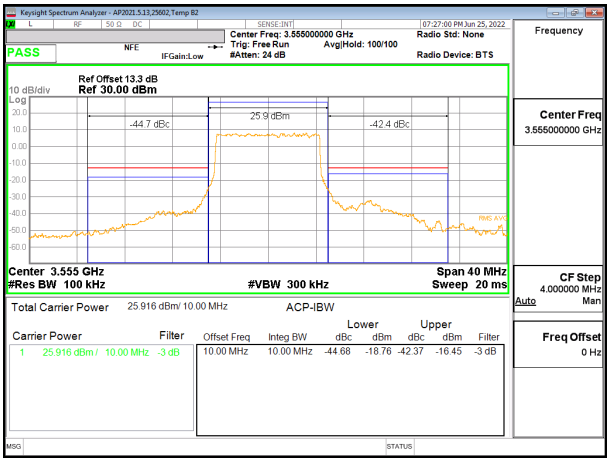
5G NR n48 10MHz BPSK Middle Channel RB1-0



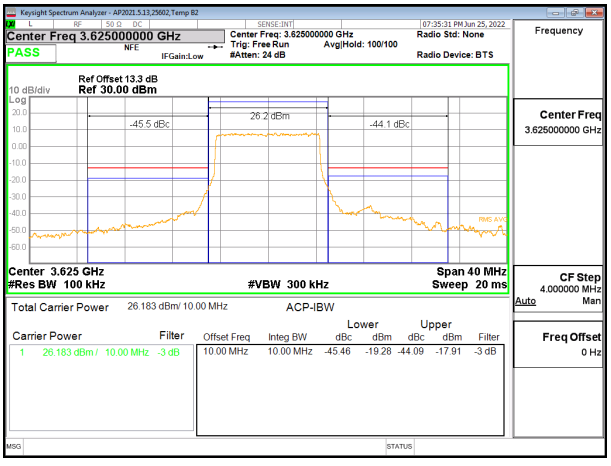
5G NR n48 10MHz BPSK Low Channel RB1-23



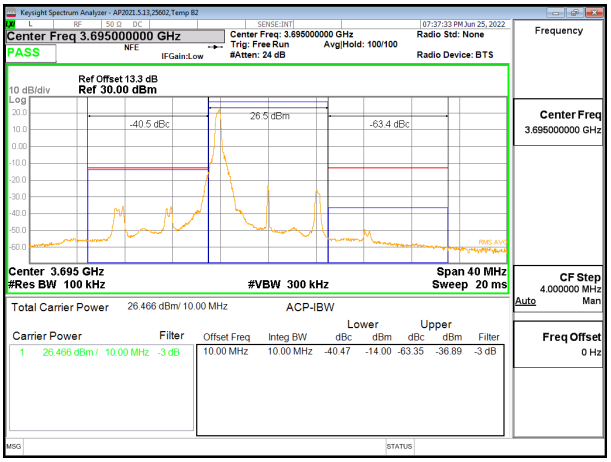
5G NR n48 10MHz BPSK Middle Channel RB1-23



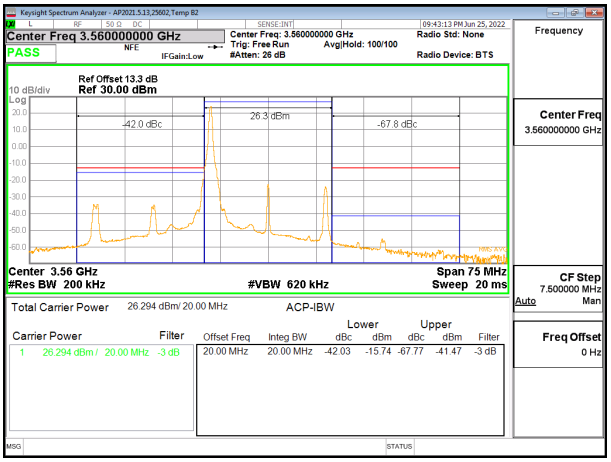
5G NR n48 10MHz BPSK Low Channel RB24-0



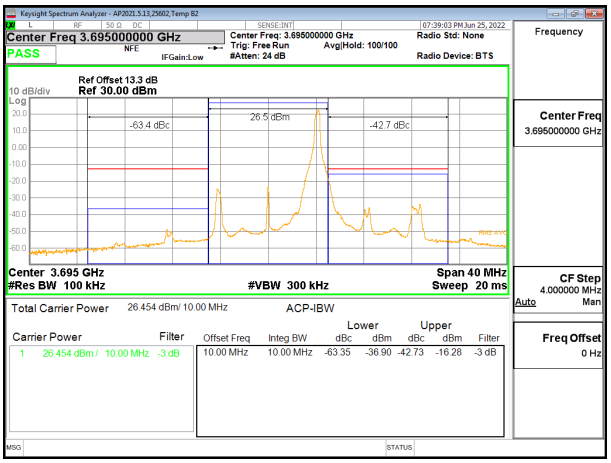
5G NR n48 10MHz BPSK Middle Channel RB24-0



5G NR n48 10MHz BPSK High Channel RB1-0



5G NR n48 20MHz BPSK Low Channel RB1-0



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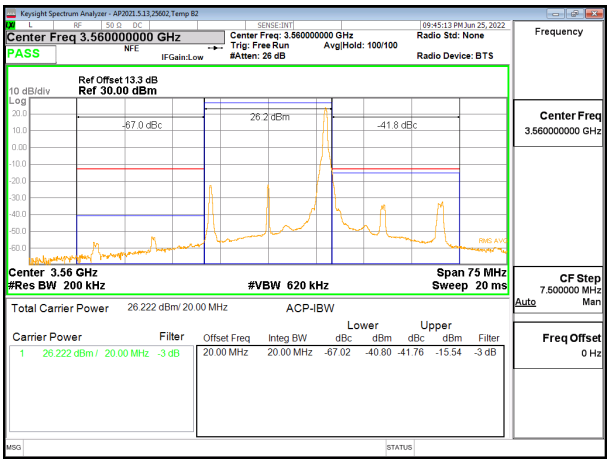
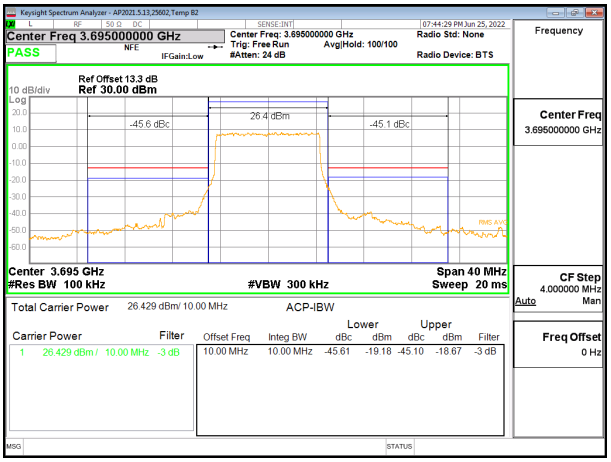
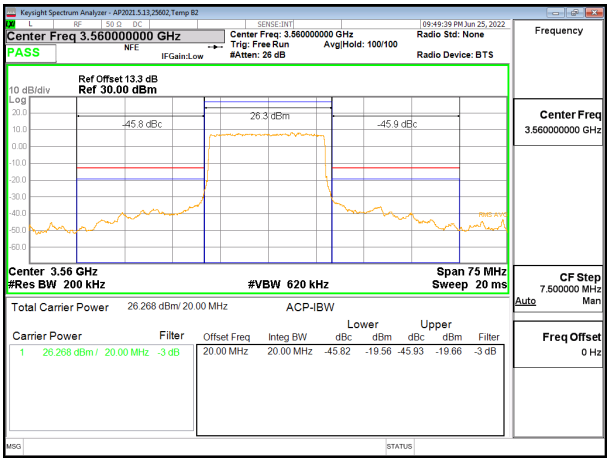


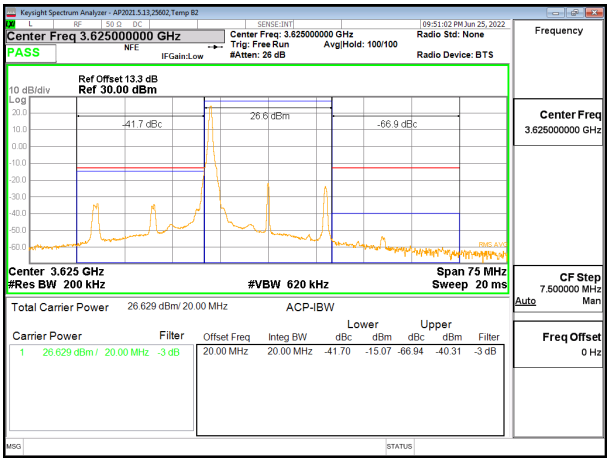
5G NR n48 20MHz BPSK Low Channel RB1-50



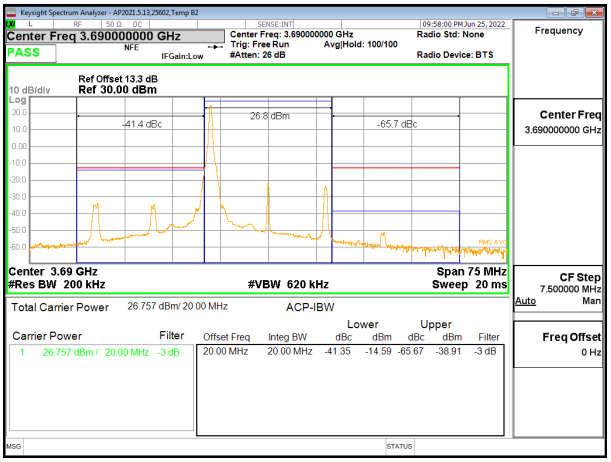
5G NR n48 10MHz BPSK High Channel RB24-0



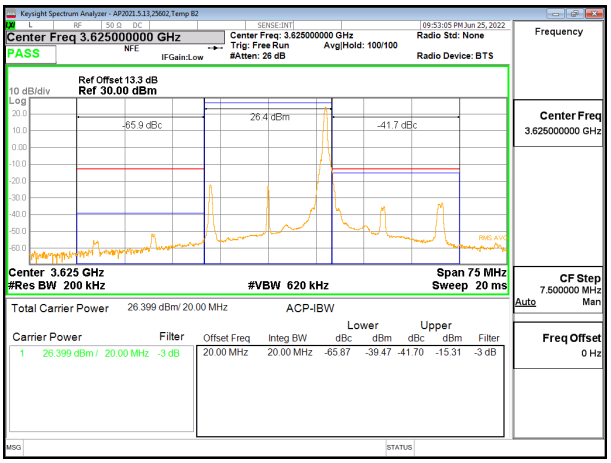
5G NR n48 20MHz BPSK Low Channel RB50-0



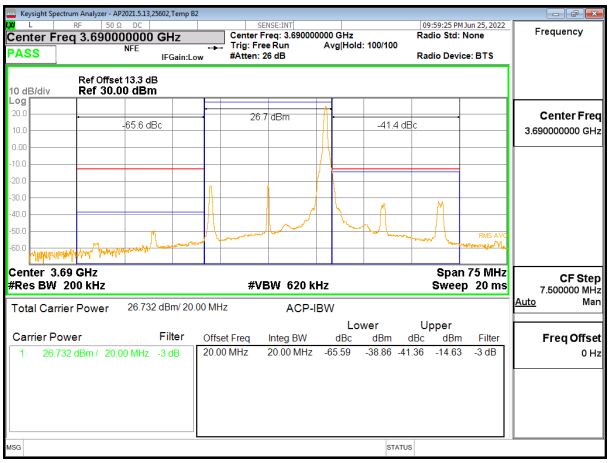
5G NR n48 20MHz BPSK Middle Channel RB1-0



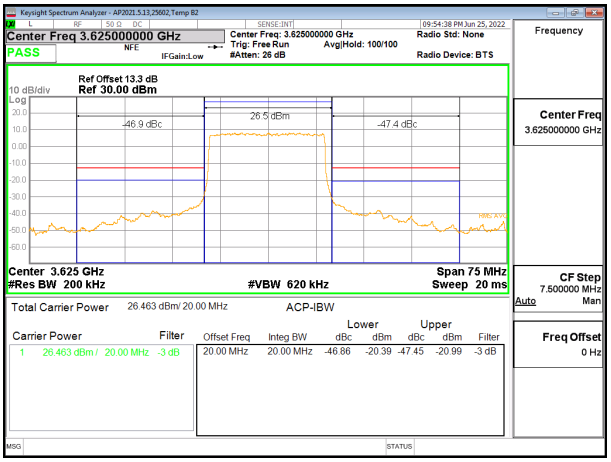
5G NR n48 20MHz BPSK High Channel RB1-0



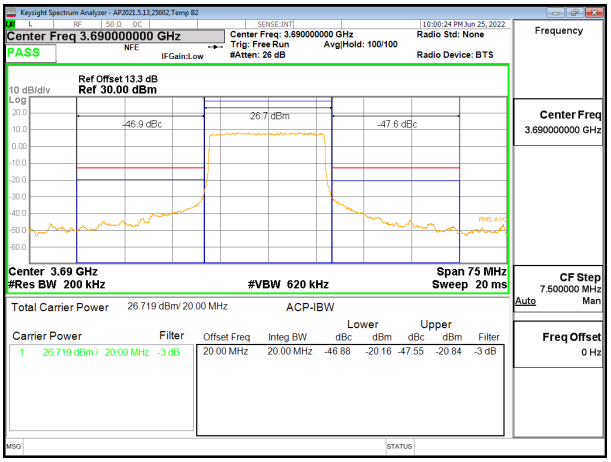
5G NR n48 20MHz BPSK Middle Channel RB1-50



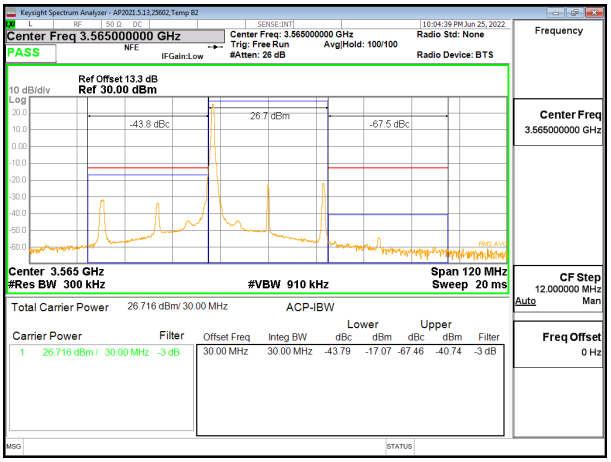
5G NR n48 20MHz BPSK High Channel RB1-50



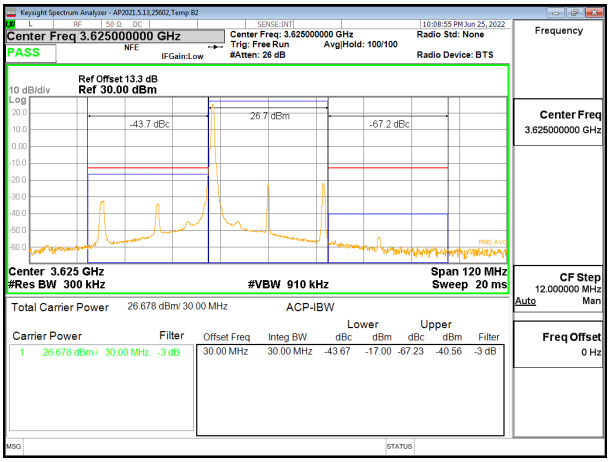
5G NR n48 20MHz BPSK Middle Channel RB50-0



5G NR n48 20MHz BPSK High Channel RB50-0



5G NR n48 30MHz BPSK Low Channel RB1-0



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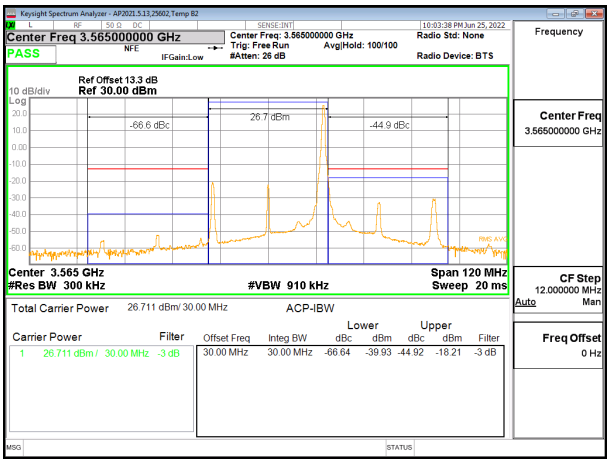
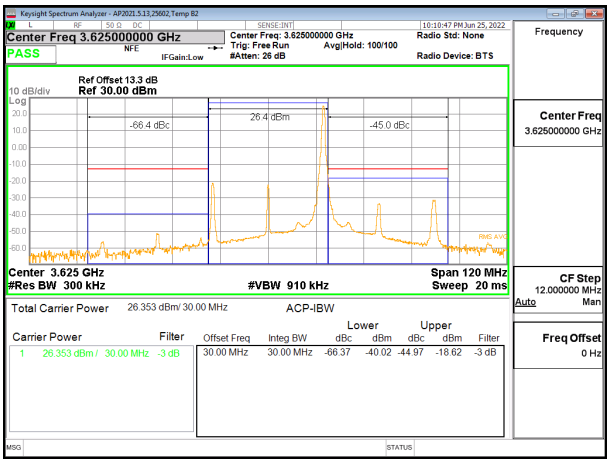
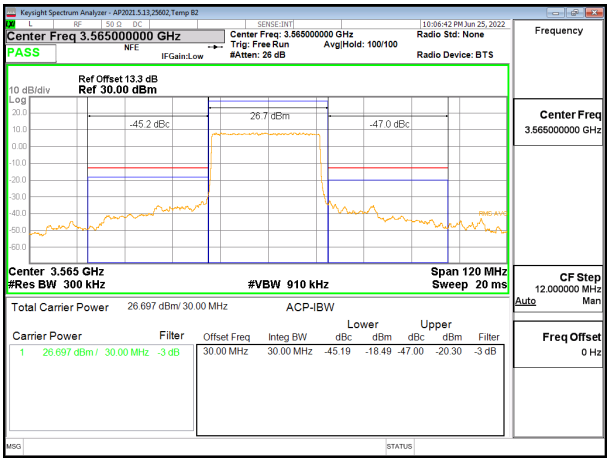


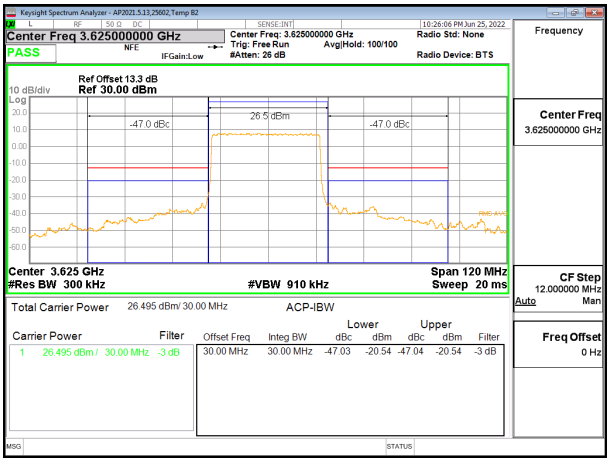
5G NR n48 30MHz BPSK Low Channel RB1-77



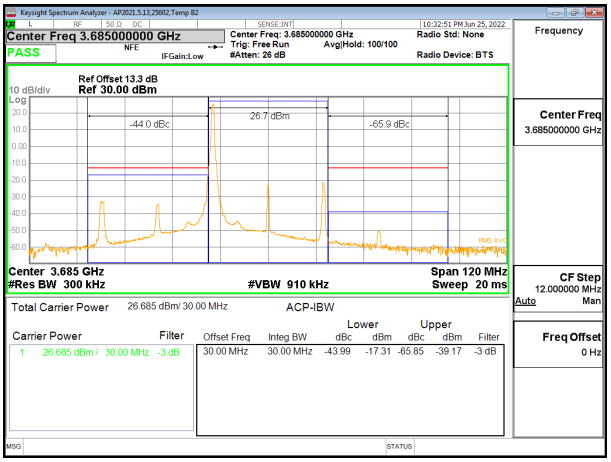
5G NR n48 30MHz BPSK Middle Channel RB1-77



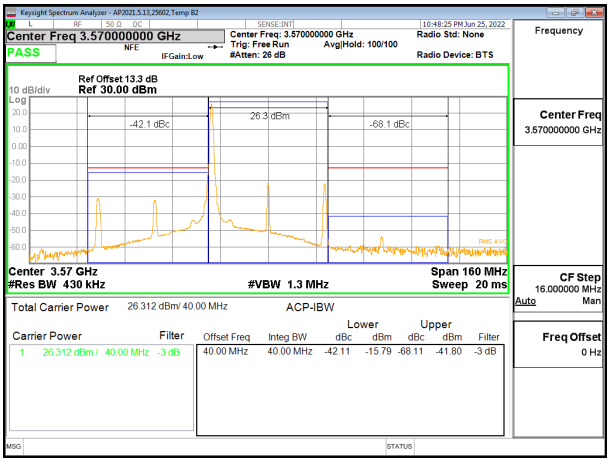
5G NR n48 30MHz BPSK Low Channel RB75-0



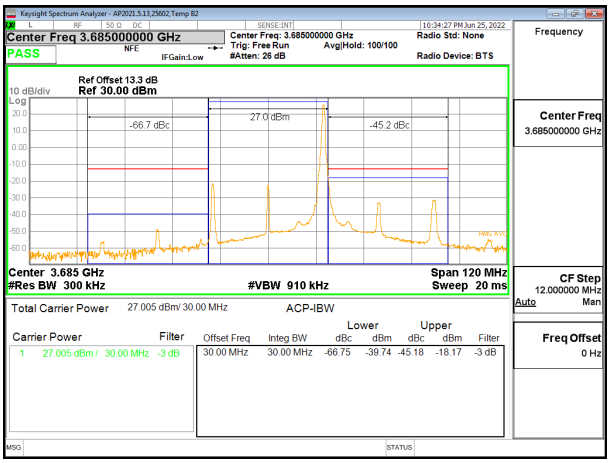
5G NR n48 30MHz BPSK Middle Channel RB75-0



5G NR n48 30MHz BPSK High Channel RB1-0



5G NR n48 40MHz BPSK Low Channel RB1-0



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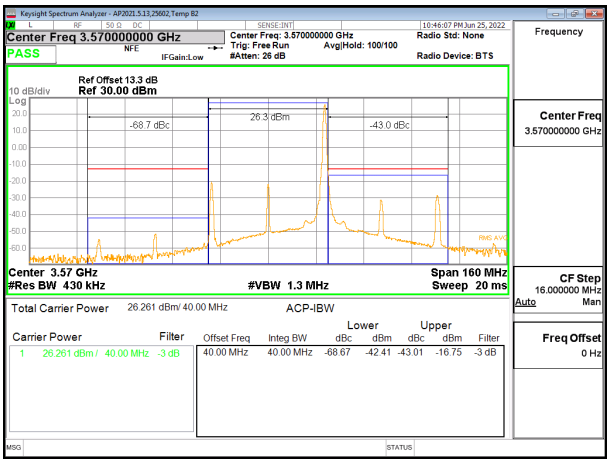
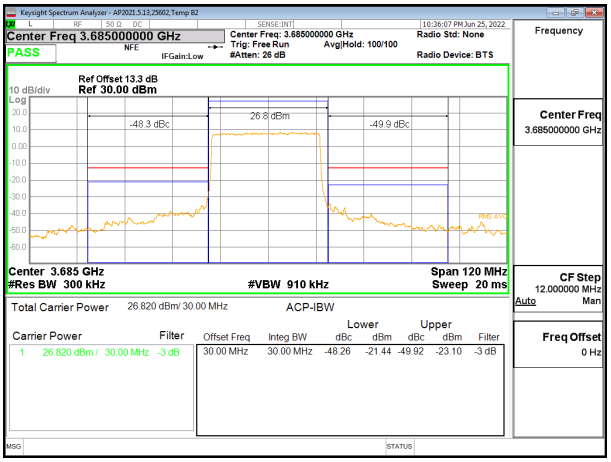


5G NR n48 40MHz BPSK Low Channel RB1-105



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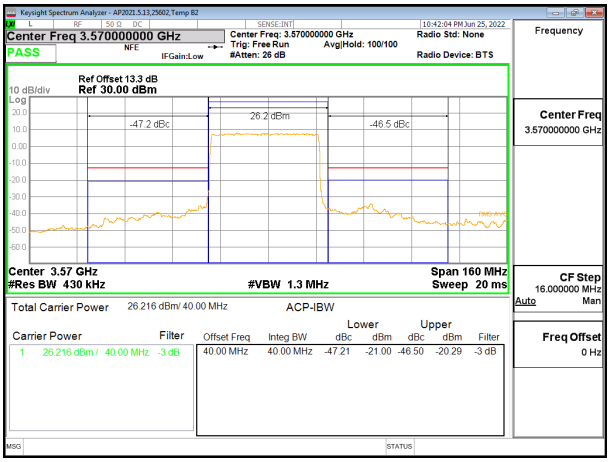
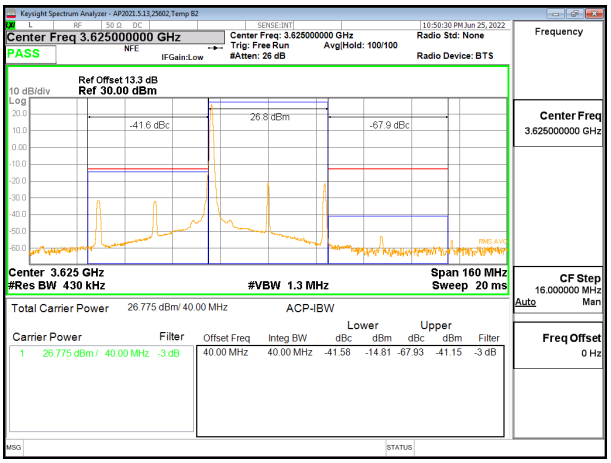
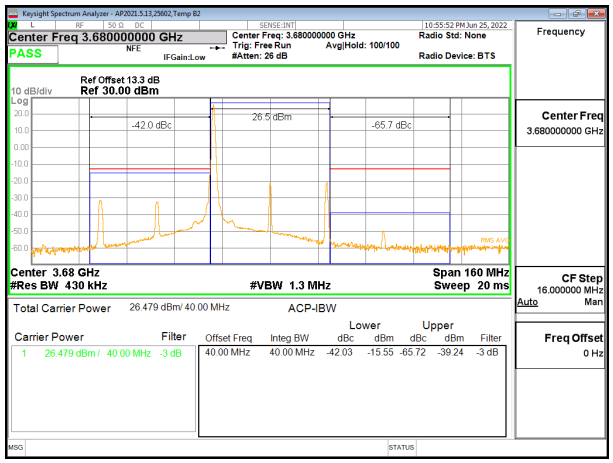


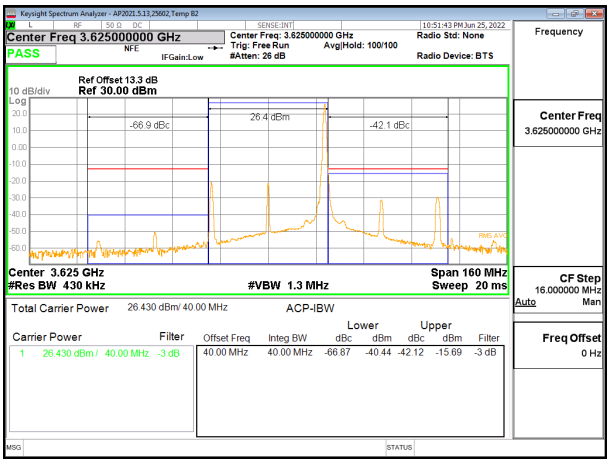
5G NR n48 40MHz BPSK Low Channel RB100-0



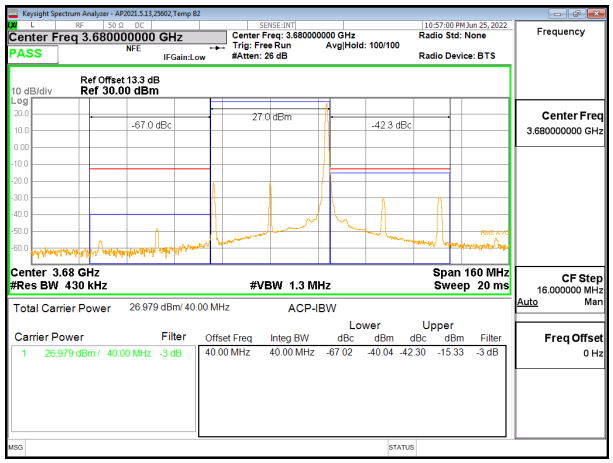
5G NR n48 40MHz BPSK Middle Channel RB1-0



5G NR n48 40MHz BPSK High Channel RB1-0



5G NR n48 40MHz BPSK Middle Channel RB1-105



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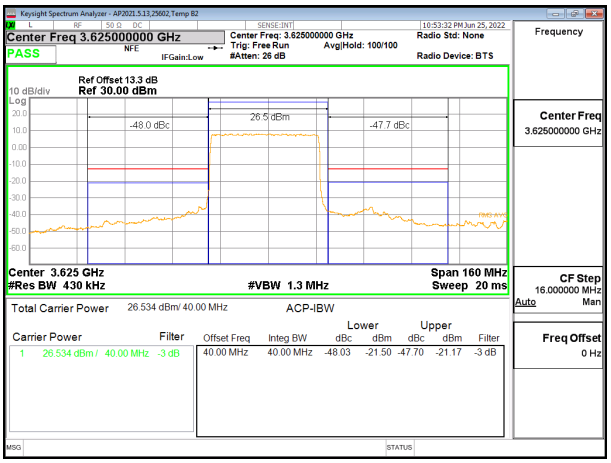

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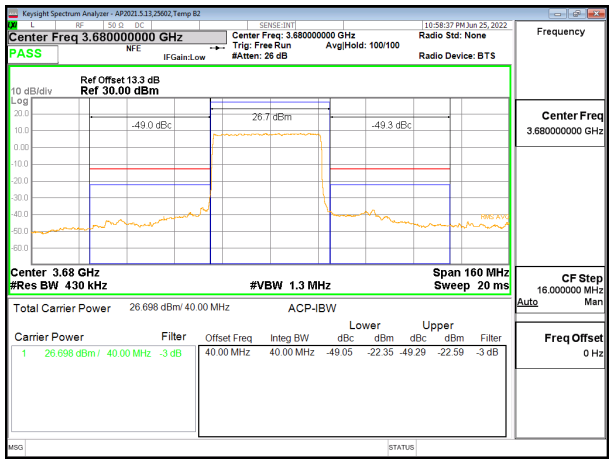


5G NR n48 40MHz BPSK High Channel RB100-0

9.3. OUT OF BAND EMISSIONS

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -40dBm according to the band Limit
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

RESULTS

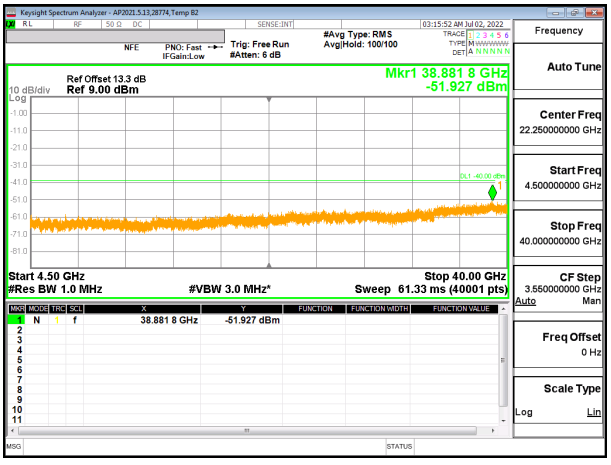
9.3.1. 5G NR n48

LIMITS

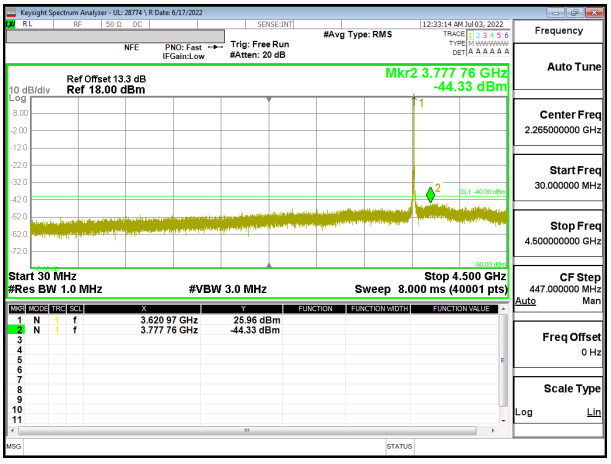
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

5G NR n48

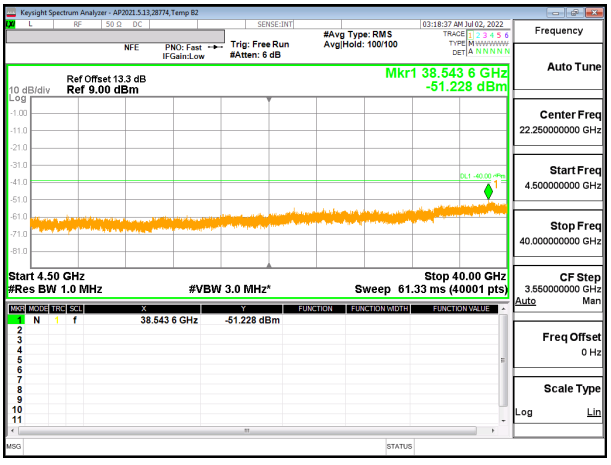
5G NR n48 10MHz BPSK Low Channel RB1-0 (30MHz to 4GHz)



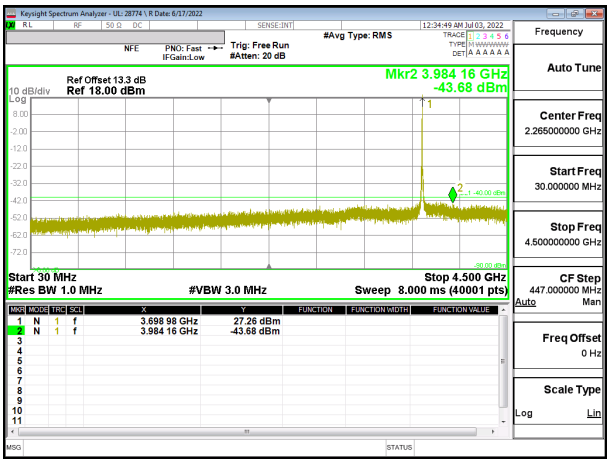
5G NR n48 10MHz BPSK Low Channel RB1-0 (4G to 40G)



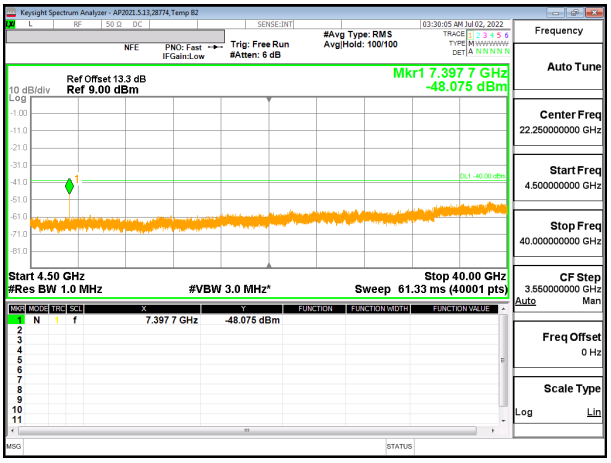
5G NR n48 10MHz BPSK Mid Channel RB1-1 (30MHz to 4GHz)



5G NR n48 10MHz BPSK Mid Channel RB1-1 (4G to 40G)

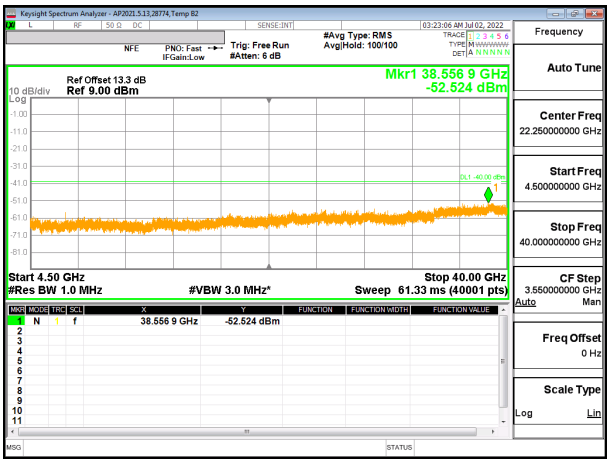


5G NR n48 10MHz BPSK High Channel RB1-23 (30MHz to 4GHz)

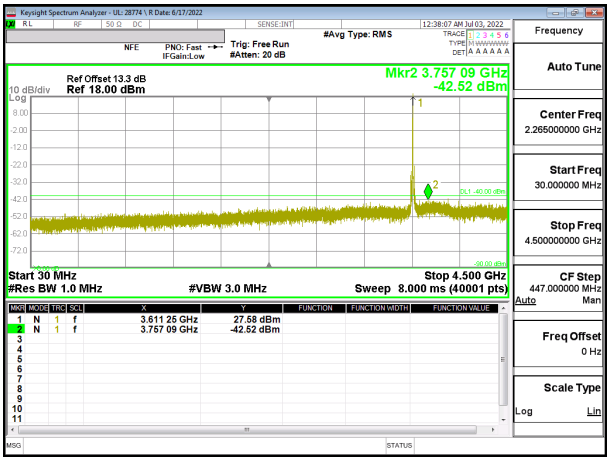


5G NR n48 10MHz BPSK High Channel RB1-23 (4G to 40G)

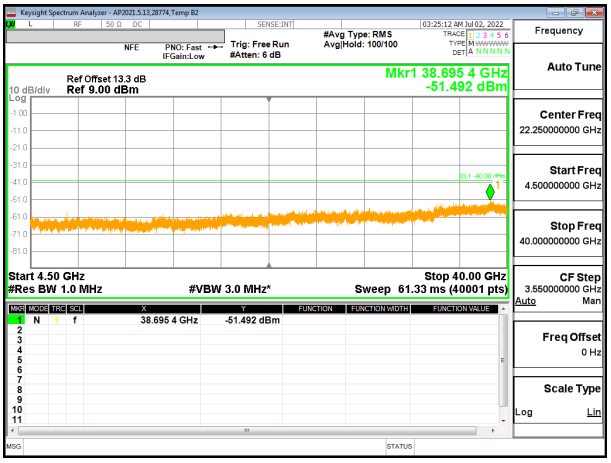
5G NR n48 20MHz BPSK Low Channel RB1-0 (30MHz to 4GHz)



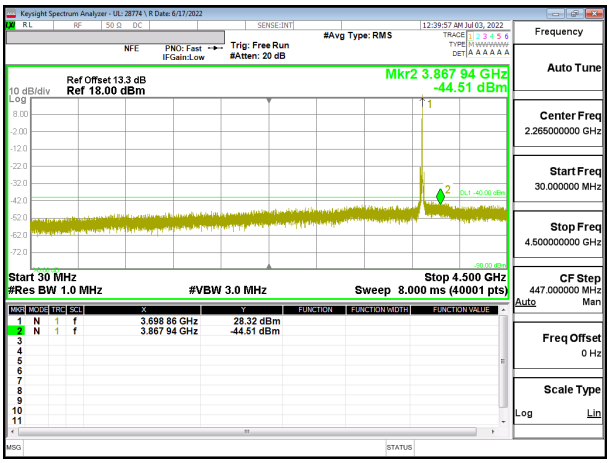
5G NR n48 20MHz BPSK Low Channel RB1-0 (4G to 40G)



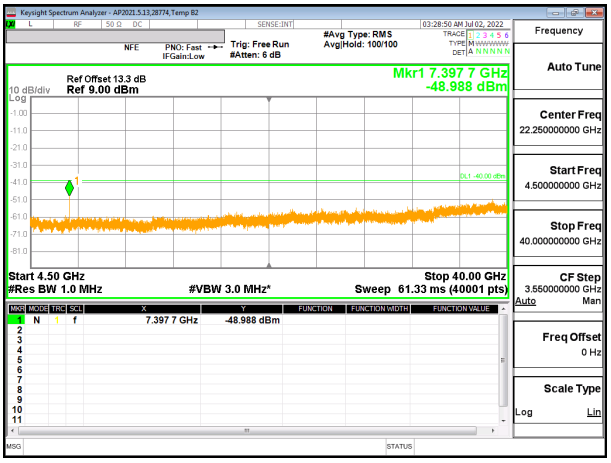
5G NR n48 20MHz BPSK Mid Channel RB1-1 (30MHz to 4GHz)



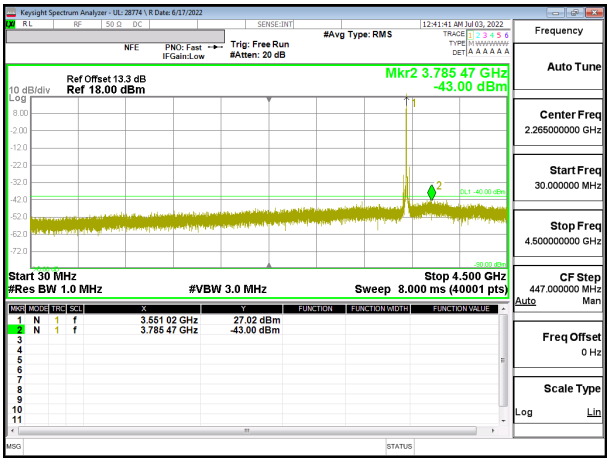
5G NR n48 20MHz BPSK Mid Channel RB1-1 (4G to 40G)



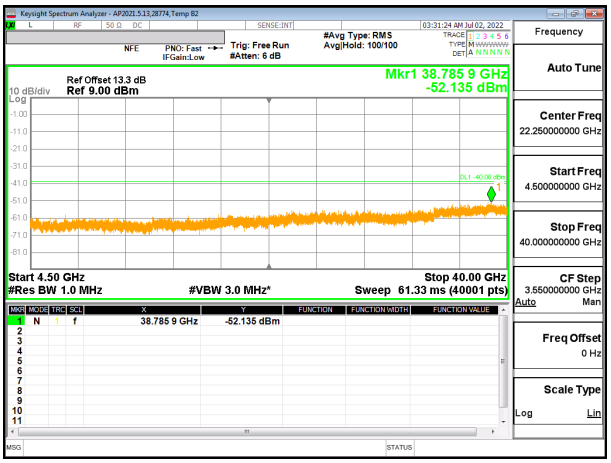
5G NR n48 20MHz BPSK High Channel RB1-50 (30MHz to 4GHz)



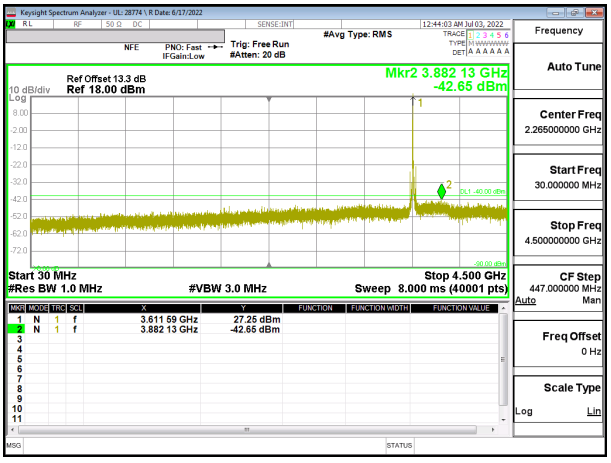
5G NR n48 20MHz BPSK High Channel RB1-50 (4G to 40G)



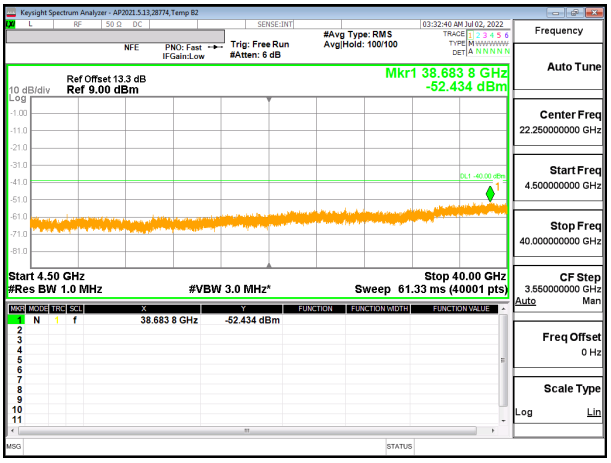
5G NR n48 30MHz BPSK Low Channel RB1-0 (30MHz to 4GHz)



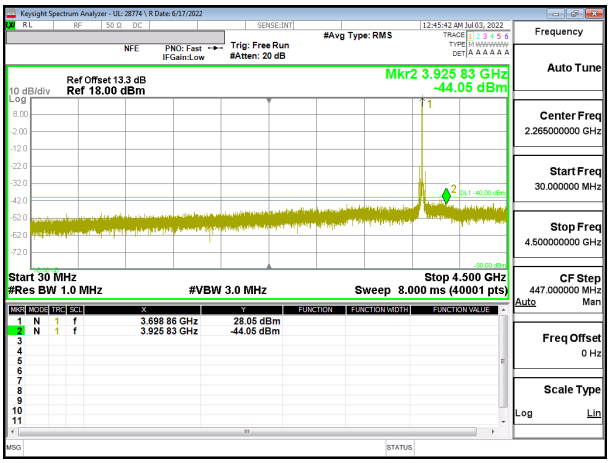
5G NR n48 30MHz BPSK Low Channel RB1-0 (4G to 40G)



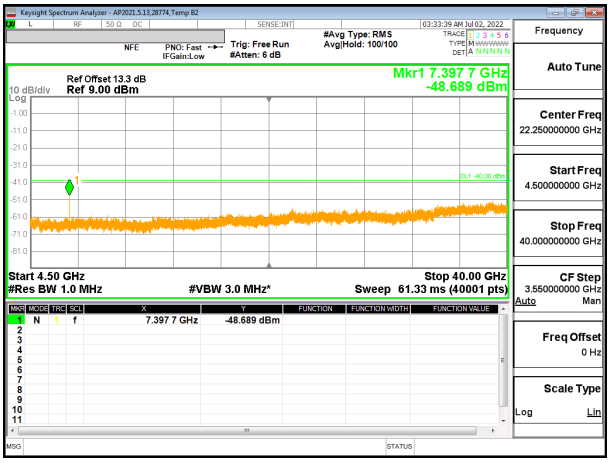
5G NR n48 30MHz BPSK Mid Channel RB1-1 (30MHz to 4GHz)



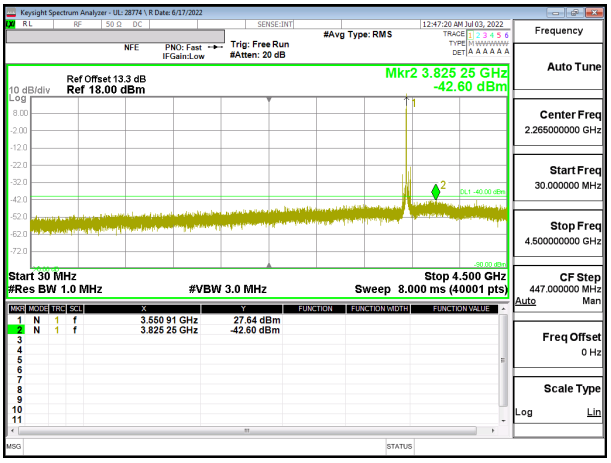
5G NR n48 30MHz BPSK Mid Channel RB1-1 (4G to 40G)



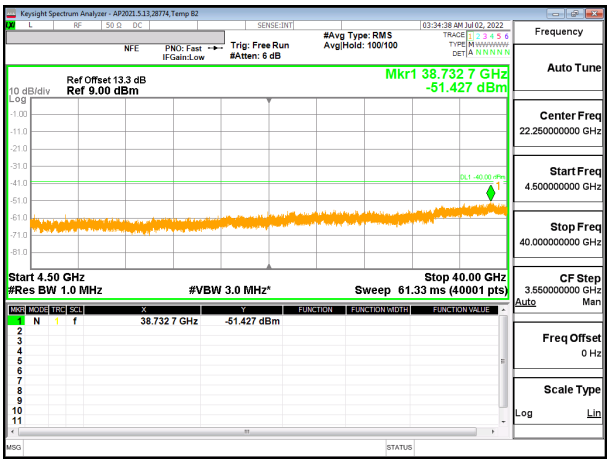
5G NR n48 30MHz BPSK High Channel RB1-77 (30MHz to 4GHz)



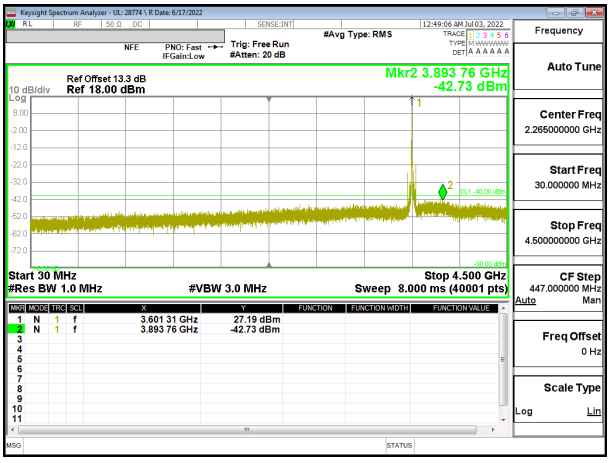
5G NR n48 30MHz BPSK High Channel RB1-77 (4G to 40G)



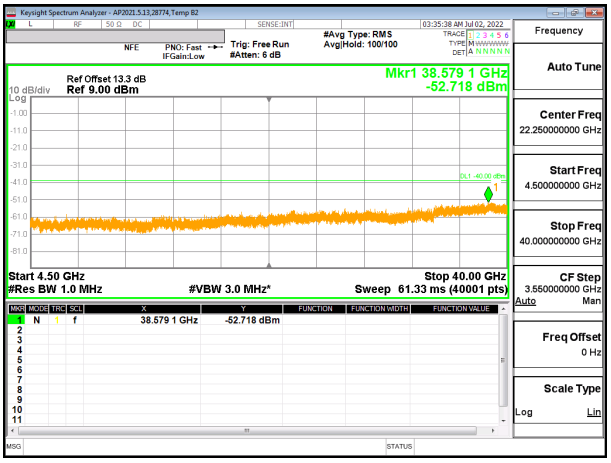
5G NR n48 40MHz BPSK Low Channel RB1-0 (30MHz to 4GHz)



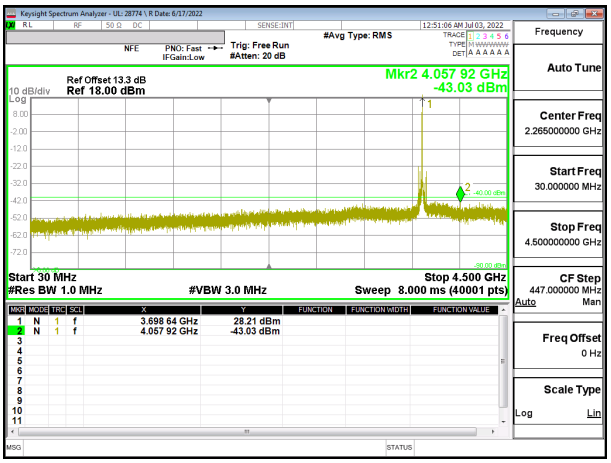
5G NR n48 40MHz BPSK Low Channel RB1-0 (4G to 40G)



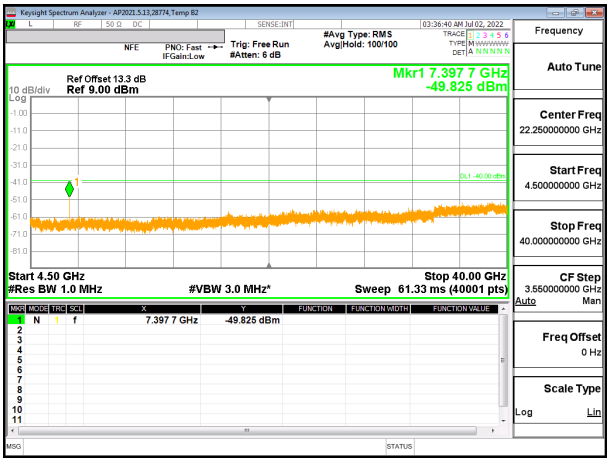
5G NR n48 40MHz BPSK Mid Channel RB1-1 (30MHz to 4GHz)



5G NR n48 40MHz BPSK Mid Channel RB1-1 (4G to 40G)



5G NR n48 40MHz BPSK High Channel RB1-105 (30MHz to 4GHz)



5G NR n48 40MHz BPSK High Channel RB1-105 (4G to 40G)

9.4. FREQUENCY STABILITY

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.23VDC, Normal, 3.80VDC and High voltage, 4.37VDC.
  End Voltage, 2.9VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

9.4.1. 5G NR n48

Test Engineer ID:	25602	Test Date:	5/8/2022

5G NR n48 QPSK (40MHz BANDWIDTH)

Band	48	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		3550	3700			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	3551.0163	3696.7892			
Extreme (50°C)		3551.0163	3696.7892	-5.0	-0.001	Yes
Extreme (40°C)		3551.0163	3696.7892	-3.9	-0.001	Yes
Extreme (30°C)		3551.0163	3696.7892	-2.2	-0.001	Yes
Extreme (10°C)		3551.0163	3696.7892	1.7	0.000	Yes
Extreme (0°C)		3551.0163	3696.7892	-3.1	-0.001	Yes
Extreme (-10°C)		3551.0163	3696.7892	-2.6	-0.001	Yes
Extreme (-20°C)		3551.0163	3696.7892	5.0	0.001	Yes
Extreme (-30°C)		3551.0163	3696.7892	-4.1	-0.001	Yes
20°C	15%	3551.0163	3696.7892	-3.6	-0.001	Yes
	-15%	3551.0163	3696.7892	-2.0	-0.001	Yes
	End Point Voltage	3551.0163	3696.7892	-3.3	-0.001	Yes

9.5. PEAK-TO-AVERAGE POWER RATIO

LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

RESULT

Antenna 1 or 7 was used to measure as the worst case; full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average power ratio criteria.

9.5.1. 5G NR n48

Test Engineer ID:	25602	Test Date:	4/2/2022

Band	Bandwidth (MHz)	Frequency (MHz)	RB Allocation	RB OffSet	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
						Peak	Average	
5G NR n48	10MHz	3625.0	24	0	BPSK	30.45	26.04	4.41
					16QAM	31.31	24.43	6.88
	20MHz		50	0	BPSK	30.31	26.08	4.23
					16QAM	31.29	24.55	6.74
	30MHz		75	0	BPSK	30.42	26.21	4.21
					16QAM	31.39	24.63	6.76
	40MHz		100	0	BPSK	30.36	25.15	5.21
					16QAM	31.09	24.56	6.53

10. RADIATED TEST RESULTS

Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, We measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

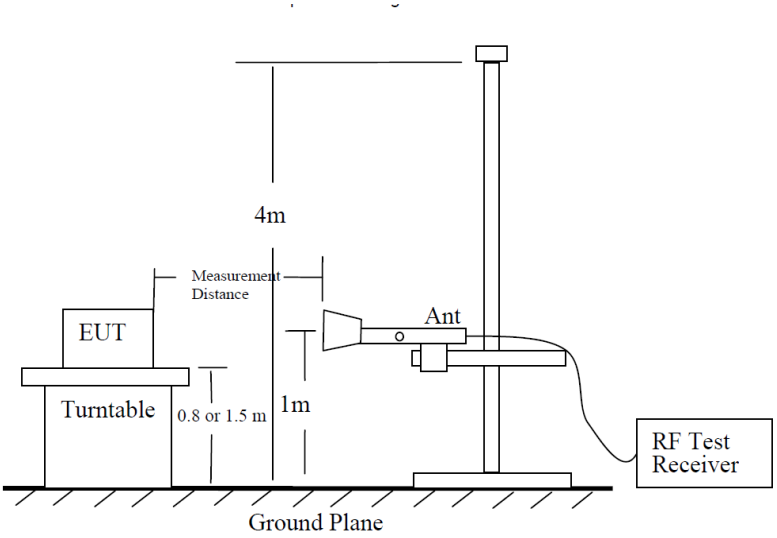


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

Radiated Power Measurement Calculation According to ANSI C63.26-2015

a) E (dBμV/m) = Measured amplitude level (dBμV) + Cable Loss (dB) + Antenna Factor (dB/m).

b) E (dBμV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).

c) E (dBμV/m) = EIRP (dBm) − 20log(D) + 104.8; where D is the measurement distance (in the far field region) in m.

d) EIRP (dBm) = E (dBμV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m.

So, from d)

The measuring distance is usually at 3m, then 20*Log(3)=9.5424

Then, EIRP (dBm) = E (dBμV/m) + 9.5424 − 104.8 = E (dBμV/m) – 95.2576

Note: Confidence check of each chamber is performed daily to see if any degradation from expected/normal reading reference data. Ambient check of each chamber is performed monthly.

TEST PROCEDURE

KDB 971168 D01 v03r01/D02 v02/r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

LIMITS

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

RESULTS

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 4

BPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040866
Date:	6/3/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	n48 BPSK 40MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	208398 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.130222	33.45	RMS	35.9	-27.0	.5	-95.2	-52.35	-40	-12.35	H
7.139034	33.82	RMS	36.0	-27.0	.6	-95.2	-51.78	-40	-11.78	V
10.743788	31.20	RMS	37.7	-24.1	.6	-95.2	-49.80	-40	-9.80	V
10.744228	31.50	RMS	37.7	-24.1	.6	-95.2	-49.50	-40	-9.50	H
14.293022	30.22	RMS	39.5	-20.1	.7	-95.2	-44.88	-40	-4.88	V
14.337525	29.81	RMS	39.5	-19.6	.8	-95.2	-44.69	-40	-4.69	V
Mid Channel, 3625MHz										
7.255800	33.57	RMS	35.7	-26.8	.6	-95.2	-52.13	-40	-12.13	V
7.266816	33.39	RMS	35.7	-26.7	.6	-95.2	-52.21	-40	-12.21	H
10.892278	32.14	RMS	37.9	-23.9	.6	-95.2	-48.46	-40	-8.46	H
10.912988	31.34	RMS	37.9	-23.7	.6	-95.2	-49.06	-40	-9.06	V
14.545059	30.28	RMS	39.8	-20.2	.8	-95.2	-44.52	-40	-4.52	H
14.575903	29.57	RMS	39.7	-19.8	.9	-95.2	-44.83	-40	-4.83	V
High Channel, 3680MHz										
7.33335	33.55	RMS	35.6	-26.8	.5	-95.2	-52.35	-40	-12.35	H
7.336434	32.56	RMS	35.7	-26.8	.5	-95.2	-53.24	-40	-13.24	V
11.058834	31.46	RMS	37.8	-23.4	.6	-95.2	-48.74	-40	-8.74	H
11.076459	31.56	RMS	37.8	-23.4	.7	-95.2	-48.54	-40	-8.54	V
14.780353	30.05	RMS	39.9	-20.0	.8	-95.2	-44.45	-40	-4.45	H
14.815603	29.9	RMS	39.9	-20.0	.9	-95.2	-44.5	-40	-4.50	V

10.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 7

BPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040866
Date:	6/3/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	N48 BPSK 40MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	208398 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.106428	32.17	RMS	35.9	-26.8	.5	-95.2	-53.43	-40	-13.43	V
7.120528	32.36	RMS	35.9	-26.9	.5	-95.2	-53.34	-40	-13.34	H
10.721756	31.62	RMS	37.8	-24.0	.5	-95.2	-49.28	-40	-9.28	H
10.730128	31.4	RMS	37.8	-24.1	.6	-95.2	-49.50	-40	-9.50	V
14.25645	30.13	RMS	39.5	-20.0	.8	-95.2	-44.77	-40	-4.77	H
14.264822	29.68	RMS	39.5	-19.9	.8	-95.2	-45.12	-40	-5.12	V
Mid Channel, 3625MHz										
7.247869	33.54	RMS	35.7	-26.8	.6	-95.2	-52.16	-40	-12.16	H
7.257563	32.49	RMS	35.7	-26.8	.6	-95.2	-53.21	-40	-13.21	V
10.888313	31.73	RMS	37.9	-23.9	.5	-95.2	-48.97	-40	-8.97	H
10.890956	31.14	RMS	37.9	-23.9	.6	-95.2	-49.46	-40	-9.46	V
14.515538	29.25	RMS	39.8	-19.8	.8	-95.2	-45.15	-40	-5.15	V
14.536247	29.39	RMS	39.8	-19.9	.8	-95.2	-45.11	-40	-5.11	H
High Channel, 3680MHz										
7.339519	33.98	RMS	35.7	-26.8	.6	-95.2	-51.72	-40	-11.72	V
7.355822	33.38	RMS	35.7	-26.7	.7	-95.2	-52.12	-40	-12.12	H
11.044734	31.37	RMS	37.8	-23.3	.6	-95.2	-48.73	-40	-8.73	V
11.050022	31.28	RMS	37.8	-23.3	.6	-95.2	-48.82	-40	-8.82	H
14.675484	29.90	RMS	39.7	-19.5	.9	-95.2	-44.20	-40	-4.20	V
14.718225	30.02	RMS	39.8	-19.6	.9	-95.2	-44.08	-40	-4.08	H

10.3 FIELD STRENGTH OF SPURIOUS RADIATION, ANT 8

BPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040866
Date:	6/3/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	N48 BPSK 40MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.147847	33.56	RMS	36.0	-27.0	.6	-95.2	-52.04	-40	-12.04	V
7.155338	33.62	RMS	36.0	-27.0	.6	-95.2	-51.98	-40	-11.98	H
10.686947	32.67	RMS	37.7	-24.3	.6	-95.2	-48.53	-40	-8.53	V
10.712503	32.18	RMS	37.7	-24.1	.5	-95.2	-48.92	-40	-8.92	H
14.307563	30.27	RMS	39.5	-20.0	.7	-95.2	-44.73	-40	-4.73	H
14.332238	29.77	RMS	39.5	-19.6	.8	-95.2	-44.73	-40	-4.73	V
Mid Channel, 3625MHz										
7.214822	32.81	RMS	35.8	-26.9	.6	-95.2	-52.89	-40	-12.89	V
7.222753	33.61	RMS	35.8	-26.8	.5	-95.2	-52.09	-40	-12.09	H
10.881263	31.65	RMS	37.9	-24.0	.5	-95.2	-49.15	-40	-9.15	H
10.883906	31.75	RMS	37.9	-24.0	.5	-95.2	-49.05	-40	-9.05	V
14.575903	29.65	RMS	39.7	-19.8	.9	-95.2	-44.75	-40	-4.75	H
14.582953	29.63	RMS	39.7	-19.7	.9	-95.2	-44.67	-40	-4.67	V
High Channel, 3680MHz										
7.348331	32.89	RMS	35.7	-26.7	.6	-95.2	-52.71	-40	-12.71	V
7.356263	33.13	RMS	35.7	-26.7	.7	-95.2	-52.37	-40	-12.37	H
11.009925	31.75	RMS	37.9	-23.5	.7	-95.2	-48.35	-40	-8.35	V
11.037684	31.53	RMS	37.8	-23.2	.6	-95.2	-48.47	-40	-8.47	H
14.805469	30.08	RMS	39.9	-20	1	-95.2	-44.22	-40	-4.22	H
14.810316	29.26	RMS	39.9	-20	.9	-95.2	-45.14	-40	-5.14	V

10.4 FIELD STRENGTH OF SPURIOUS RADIATION, ANT 9

KPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040866
Date:	6/3/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	n48 BPSK 40MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	208398 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.128900	33.64	RMS	35.9	-27.0	.5	-95.2	-52.16	-40	-12.16	V
7.139475	33.67	RMS	36.0	-27.0	.6	-95.2	-51.93	-40	-11.93	H
10.738941	32.47	RMS	37.7	-24.1	.6	-95.2	-48.53	-40	-8.53	H
10.741584	31.72	RMS	37.7	-24.1	.6	-95.2	-49.28	-40	-9.28	V
14.223844	30.20	RMS	39.5	-19.9	.8	-95.2	-44.60	-40	-4.60	H
14.226488	30.12	RMS	39.5	-19.9	.8	-95.2	-44.68	-40	-4.68	V
Mid Channel, 3625MHz										
7.272544	33.49	RMS	35.7	-26.7	.5	-95.2	-52.21	-40	-12.21	H
7.280475	33.38	RMS	35.7	-26.6	.5	-95.2	-52.22	-40	-12.22	V
10.863197	32.14	RMS	37.8	-23.8	.4	-95.2	-48.66	-40	-8.66	V
10.866281	31.85	RMS	37.9	-23.9	.4	-95.2	-48.95	-40	-8.95	H
14.538891	30.57	RMS	39.8	-20.0	.8	-95.2	-44.03	-40	-4.03	V
14.541975	30.25	RMS	39.8	-20.1	.8	-95.2	-44.45	-40	-4.45	H
High Channel, 3680MHz										
7.336434	33.37	RMS	35.7	-26.8	.5	-95.2	-52.43	-40	-12.43	H
7.339519	32.50	RMS	35.7	-26.8	.6	-95.2	-53.20	-40	-13.20	V
11.06985	32.07	RMS	37.8	-23.5	.6	-95.2	-48.23	-40	-8.23	H
11.101575	30.84	RMS	37.8	-23.2	.7	-95.2	-49.06	-40	-9.06	V
14.781234	30.04	RMS	39.9	-20.0	.8	-95.2	-44.46	-40	-4.46	H
14.801063	29.27	RMS	39.9	-20.0	1	-95.2	-45.03	-40	-5.03	V

11 SETUP PHOTOS

Please refer to 14790383-EP3V1 Setup Photo Report for setup photos

END OF REPORT