C2PC TEST REPORT

Report Number : 14790383-E10V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2632 (Parent Model, Full Test) A2885, A2886, A2887, A2888(Variant Models)
Brand	:	APPLE
FCC ID	:	BCG-E8139A BCG-E8146A, BCG-E8147A, BCG-E8148A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR47 PART 2, PART 96

Date Of Issue:
JUNE 22, 2023

PREPARED BY:
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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 5.4, 6.3 and 6.8	Mengistu Mekuria

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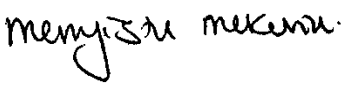
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A2632 (PARENT MODEL, FULL TEST) A2885, A2886, A2887, A2888(Variant Models)
Brand	APPLE
FCC ID	BCG-E8139A (Parent Model) BCG-E8146A, BCG-E8147A, BCG-E8148A (Variant Models)
EUT Description	SMARTPHONE
Serial Number	Conducted (C7205400BJ1LYT2U), Radiated (KFJ2592MFD) and (KCF16NH2M0)
Sample Receipt Date	APRIL 20, 2022
Date Tested	APRIL 21, 2022 to JULY 08, 2022
Applicable Standards	FCC CFR47 2, 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 Senior Test Engineer UL Verification Services Inc.	Eric Ting Test Engineer UL Verification Services Inc.	Tony Li Test Engineer UL Verification Services Inc.

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-E8139A to cover variant model FCC ID: BCG-E8146A, FCC ID: BCG-E8147A, and FCC ID: BCG-E8148A. 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 A2632, A2685, A2686, A2687, A2688.

A2632, A2685, A2686, A2687, and A2688 are highly similar, with the only differences being listed on the table below:

Model	FCC ID	Model Changes
A2632	BCG-E8139A	Reference model
A2685	BCG-E8146A	Variant model. Removed FR2 from the reference model
A2686	BCG-E8147A	Variant model. Removed FR2, LTE B11/14/21/29/71, and 5G n14/n29/n71 from the reference model
A2687/A2688	BCG-E8148A	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 A2685, A2686, A2687 and A2688 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 A2632 may be applied as representative to models A2685, A2686, A2687 and A2688.

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 5G NR n48 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) (Ant 7)	-1.50

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	23.90	22.40	0.174	8604	8M60G7W
	QPSK			23.81	22.31	0.170	8628	8M63G7W
	16QAM			22.98	21.48	0.141	8626	8M63D7W
20.0	BPSK	3560.0	3690.0	23.87	22.37	0.173	17922	17M9G7W
	QPSK			23.90	22.40	0.174	17972	18M0G7W
	16QAM			23.38	21.88	0.154	17967	18M0D7W
30.0	BPSK	3565.0	3685.0	23.90	22.40	0.174	26983	27M0G7W
	QPSK			23.89	22.39	0.173	26975	27M0G7W
	16QAM			23.05	21.55	0.143	26969	27M0D7W
40.0	BPSK	3570.0	3680.0	23.89	22.39	0.173	35798	35M8G7W
	QPSK			23.90	22.40	0.174	35837	35M8G7W
	16QAM			23.37	21.87	0.154	35835	35M8D7W

MIDDLE CHANNEL

Part 96	
EIRP Limit (W)	0.20
Antenna Gain (dBi) (Ant 9)	0.80

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	21.21	22.01	0.159	8604	8M60G7W
	QPSK			21.30	22.10	0.162	8628	8M63G7W
	16QAM			20.91	21.71	0.148	8626	8M63D7W
20.0	BPSK	3560.0	3690.0	21.30	22.10	0.162	17922	17M9G7W
	QPSK			21.24	22.04	0.160	17972	18M0G7W
	16QAM			20.84	21.64	0.146	17967	18M0D7W
30.0	BPSK	3565.0	3685.0	20.03	20.83	0.121	26983	27M0G7W
	QPSK			19.94	20.74	0.119	26975	27M0G7W
	16QAM			19.51	20.31	0.107	26969	27M0D7W
40.0	BPSK	3570.0	3680.0	20.19	20.99	0.126	35798	35M8G7W
	QPSK			20.19	20.99	0.126	35837	35M8G7W
	16QAM			19.65	20.45	0.111	35835	35M8D7W

HIGH CHANNEL

Part 96	
EIRP Limit (W)	0.20
Antenna Gain (dBi) (Ant 9)	1.20

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	21.27	22.47	0.177	8604	8M60G7W
	QPSK			21.30	22.50	0.178	8628	8M63G7W
	16QAM			20.78	21.98	0.158	8626	8M63D7W
20.0	BPSK	3560.0	3690.0	21.30	22.50	0.178	17922	17M9G7W
	QPSK			21.27	22.47	0.177	17972	18M0G7W
	16QAM			20.83	22.03	0.160	17967	18M0D7W
30.0	BPSK	3565.0	3685.0	21.12	22.32	0.171	26983	27M0G7W
	QPSK			21.30	22.50	0.178	26975	27M0G7W
	16QAM			20.72	21.92	0.156	26969	27M0D7W
40.0	BPSK	3570.0	3680.0	21.30	22.50	0.178	35798	35M8G7W
	QPSK			21.17	22.37	0.173	35837	35M8G7W
	16QAM			20.79	21.99	0.158	35835	35M8D7W

6.5. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2685

A2685 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2632	Sub Model: A2685	Delta (dB)	Remarks
			Frequency (MHz)	FCC ID: BCG-E8139A Power (dBm)	FCC ID: BCG-E8146A Power (dBm)		
5G NR n48	QPSK @ 40 MHz BW	Cond Power	3550-3700	23.90	23.90	0.00	Ant7

6.6. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2686

A2686 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2632	Sub Model: A2686	Delta (dB)	Remarks
			Frequency (MHz)	FCC ID: BCG-E8139A Power (dBm)	FCC ID: BCG-E8147A Power (dBm)		
5G NR n48	QPSK @ 40 MHz BW	Cond Power	3550-3700	23.90	23.90	0.00	Ant7

6.7. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2687 AND A2688

A2687 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2632	Sub Model: A2687/A2688	Delta (dB)	Remarks
			Frequency (MHz)	FCC ID: BCG-E8139A Power (dBm)	FCC ID: BCG-E8148A Power (dBm)		
5G NR n48	QPSK @ 40 MHz BW	Cond Power	3550-3700	23.90	23.90	0.00	Ant7

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	-1.5	-1.5	-3.6	0.7
5G NR n48 (Mid)	3600 – 3650 MHz	-1.3	-1.9	-2.4	0.8
5G NR n48 (High)	3650 – 3700 MHz	-0.4	-1.7	-0.8	1.2

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 7

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	Y	X	Z	Y

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.

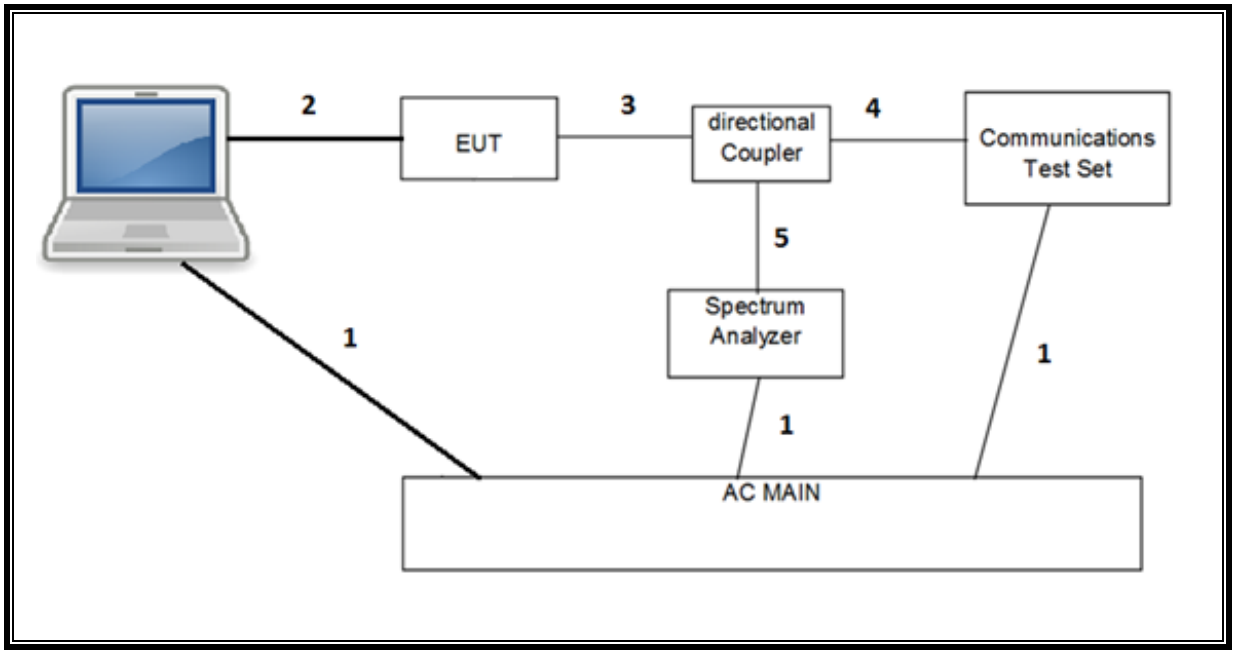
6.11. DESCRIPTION OF TEST SETUP

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

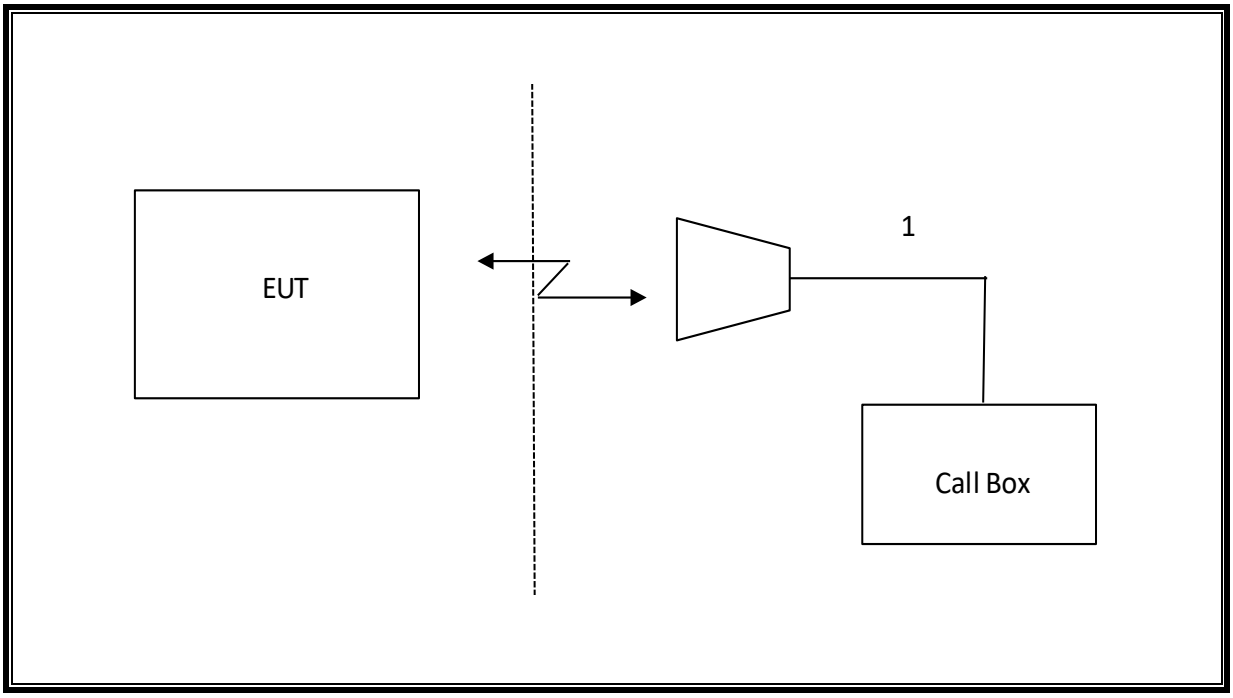
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	DC	Un-shielded	1.0	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	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	79834	06/14/2022
*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
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight	N9030A	T342	02/01/2023
Spectrum Analyzer, PSA 3Hz to 44GHz	Keysight	E4440A	81311	02/02/2023
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:	27979	Test Date:	4/28/2022

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	23.51	23.64	23.68	23.02	23.04	22.46	21.07	20.87	21.06	22.58	22.55	22.05
		1	1	23.82	23.81	23.83	23.16	**23.30**	22.70	21.26	21.11	21.26	**22.80**	22.76	22.24
		1	22	**23.90**	23.85	23.75	22.83	22.87	**23.30**	20.89	21.10	21.21	22.23	22.48	22.68
		1	23	23.60	23.62	23.52	22.74	22.60	23.08	20.63	21.10	21.00	22.00	22.16	22.43
		12	6	23.73	23.81	23.78	22.86	22.99	22.98	21.04	21.21	**21.27**	22.51	22.61	22.46
		24	0	23.51	23.71	23.63	22.74	22.81	22.75	20.83	21.02	21.02	22.20	22.40	22.23
	QPSK	1	0	23.02	23.13	23.19	22.62	22.58	21.95	20.56	20.60	20.62	21.29	21.95	21.53
		1	1	23.79	**23.90**	**23.90**	**23.30**	23.28	22.71	**21.30**	21.27	**21.30**	22.23	**22.80**	22.38
		1	22	23.81	23.84	23.74	23.03	22.91	23.27	20.91	**21.30**	21.26	21.58	22.47	**22.80**
		1	23	23.10	23.10	22.99	22.18	22.16	22.49	20.14	20.56	20.47	20.60	21.66	21.93
		12	6	23.74	23.80	23.78	23.02	23.05	22.95	21.02	21.25	**21.30**	21.97	22.74	22.47
		24	0	23.03	23.20	23.04	22.29	22.37	22.26	20.28	20.57	20.54	21.16	21.89	21.67
	16QAM	1	0	21.81	22.29	22.42	21.37	21.66	21.19	19.59	19.65	19.67	20.84	21.29	20.75
		1	1	22.87	23.23	23.27	22.44	22.82	22.20	20.86	20.64	20.75	21.85	**22.32**	21.71
		1	22	22.87	**23.28**	23.18	22.07	22.31	**22.90**	20.27	**20.91**	20.78	21.19	21.83	22.16
		1	23	21.89	22.28	22.09	20.79	21.13	21.72	19.29	19.78	19.71	20.27	20.96	20.97
		12	6	22.98	23.10	23.02	22.15	22.22	22.31	20.29	20.52	20.42	21.19	21.96	21.75
		24	0	22.00	22.17	21.96	21.25	21.30	21.30	19.31	19.57	19.58	20.29	20.88	20.61
	64QAM	1	0	21.60	21.51	21.67	21.08	21.15	20.64	19.24	**19.30**	19.05	20.48	20.68	20.01
		1	1	21.71	21.52	21.80	**21.32**	21.30	20.64	19.07	19.25	19.15	20.43	**20.71**	20.09
		1	22	**21.81**	21.68	21.74	20.89	20.64	21.27	18.74	19.16	19.18	19.74	20.47	20.54
		1	23	21.68	**21.81**	21.39	20.71	20.71	21.13	18.75	19.18	19.16	19.80	20.48	20.42
		12	6	21.58	21.60	21.54	20.74	20.87	20.92	18.88	19.03	18.92	19.86	20.57	20.07
		24	0	21.56	21.62	21.57	20.71	20.90	20.83	18.77	19.02	18.98	19.86	20.47	20.09
	256QAM	1	0	19.55	19.51	19.64	18.97	18.99	18.24	16.85	17.01	16.99	18.53	18.45	17.75
		1	1	19.66	19.23	19.49	18.82	**19.03**	18.26	17.05	16.89	16.95	18.38	**18.61**	18.01
		1	22	19.62	19.54	19.46	18.53	18.71	18.99	16.56	16.98	17.08	17.70	18.21	18.33
		1	23	**19.70**	19.51	19.28	18.68	18.67	18.98	16.53	**17.08**	16.83	17.61	18.21	18.41
		12	6	19.55	19.44	19.38	18.76	18.77	18.60	16.71	17.05	16.91	18.05	18.42	18.23
		24	0	19.43	19.45	19.36	18.75	18.92	18.69	16.80	17.05	16.94	18.14	18.42	18.24

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	641666	646000	637333	641666	646000	637333	641666	646000	637333	641666	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	23.69	23.62	23.69	22.44	23.02	21.36	21.08	21.19	20.82	22.68	22.47	21.64
		1	1	23.81	23.83	23.84	22.63	**23.30**	21.72	21.22	**21.30**	21.05	**22.80**	**22.80**	21.91
		1	49	23.82	**23.90**	23.71	**23.30**	22.43	23.28	20.56	21.00	**21.30**	22.42	22.49	**22.80**
		1	50	23.60	23.67	23.44	23.03	22.11	22.99	20.36	20.76	21.04	22.26	22.32	22.53
		25	12	23.87	23.82	23.73	22.43	23.09	22.13	20.80	20.96	21.28	22.25	22.79	22.17
		50	0	23.62	23.65	23.60	22.36	22.85	22.03	20.64	20.76	21.05	21.95	22.48	21.95
	QPSK	1	0	23.11	23.10	23.17	21.92	22.46	20.80	20.54	20.55	20.31	20.89	21.54	20.80
		1	1	23.83	23.83	**23.90**	22.72	23.29	21.66	**21.30**	21.24	21.06	21.88	22.37	21.70
		1	49	23.88	23.89	23.68	23.22	22.33	**23.30**	20.66	20.93	21.27	21.61	22.27	22.59
		1	50	23.16	23.19	22.98	22.60	21.51	22.61	19.86	20.20	20.60	20.68	21.48	21.91
		25	12	**23.90**	23.85	23.80	22.46	23.20	22.11	20.87	20.88	21.24	21.57	**22.71**	22.21
		50	0	23.14	23.12	23.10	21.84	22.31	21.52	20.14	20.23	20.53	20.86	21.76	21.48
	16QAM	1	0	22.34	22.45	22.31	21.33	21.71	20.16	19.75	19.82	19.63	20.57	20.83	20.20
		1	1	**23.38**	**23.38**	**23.38**	22.18	**22.91**	21.10	**20.86**	20.84	20.42	21.52	21.67	21.16
		1	49	23.23	23.30	23.21	22.75	21.64	22.62	20.16	20.36	20.83	21.18	21.76	**22.14**
		1	50	22.24	22.38	22.15	21.76	20.85	21.84	19.09	19.59	19.78	20.12	20.78	21.19
		25	12	23.17	23.10	23.04	21.55	22.50	21.45	20.16	20.32	20.63	20.82	22.10	21.43
		50	0	22.13	22.10	22.05	20.79	21.21	20.52	19.08	19.32	19.50	20.00	20.93	20.42
	64QAM	1	0	21.77	21.70	21.85	20.56	**21.52**	19.39	19.09	19.17	18.94	20.24	20.44	19.70
		1	1	21.94	21.74	21.84	20.52	21.22	19.78	19.22	19.16	19.15	20.09	20.45	19.90
		1	49	21.79	**21.95**	21.65	21.21	20.24	20.90	18.48	18.93	19.05	19.79	20.61	**20.63**
		1	50	21.66	21.62	21.72	21.22	20.10	21.41	18.56	19.24	**19.25**	20.01	20.24	20.53
		25	12	21.60	21.56	21.50	20.14	20.83	19.82	18.55	18.65	19.14	19.42	20.51	19.98
		50	0	21.57	21.64	21.46	20.23	20.73	19.97	18.58	18.80	19.05	19.55	20.47	20.02
	256QAM	1	0	19.54	19.34	19.41	18.28	19.02	17.42	17.08	16.95	16.62	**18.66**	18.24	17.56
		1	1	19.49	19.52	19.52	17.93	18.82	17.09	16.96	16.76	16.89	18.52	18.41	17.57
		1	49	19.57	19.58	19.27	18.89	17.76	**19.15**	16.11	16.83	17.02	18.27	17.95	18.24
		1	50	**19.68**	**19.68**	19.39	18.85	17.99	18.93	15.94	16.75	**17.27**	18.08	18.05	18.26
		25	12	19.55	19.46	19.41	18.15	18.96	17.86	16.55	16.70	17.06	17.96	18.56	17.87
		50	0	19.54	19.54	19.38	18.27	18.71	18.08	16.55	16.72	17.06	18.05	18.43	17.93

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	23.73	22.18	23.71	22.44	21.67	21.36	21.02	19.81	19.86	22.08	22.03	21.12
		1	1	**23.90**	22.41	23.85	22.63	21.95	21.72	**21.29**	**20.03**	20.06	22.21	22.41	21.40
		1	76	23.80	22.38	23.71	**23.30**	21.08	23.28	20.97	19.74	**21.12**	**22.80**	21.61	**22.80**
		1	77	23.58	22.23	23.38	23.03	20.76	22.99	20.80	19.47	20.99	22.60	21.43	22.38
		36	18	19.96	18.44	20.00	19.97	18.44	20.00	19.99	18.33	19.90	19.00	18.50	19.00
		75	0	19.18	20.00	19.09	19.94	20.00	19.94	19.56	20.00	19.32	18.18	19.00	18.13
	QPSK	1	0	23.24	21.66	23.20	21.92	21.11	20.80	20.62	19.17	19.39	20.51	20.99	20.49
		1	1	23.89	22.35	**23.90**	22.72	21.94	21.66	**21.30**	**19.94**	20.02	21.44	21.85	21.29
		1	76	23.88	22.35	23.68	23.22	20.98	**23.30**	20.96	19.61	**21.30**	22.23	21.36	**22.58**
		1	77	23.10	21.68	23.03	22.60	20.16	22.61	20.32	19.05	20.49	21.31	20.44	21.93
		36	18	20.00	18.40	19.94	20.00	18.55	19.98	20.00	18.29	20.00	17.82	18.39	18.13
		75	0	19.18	19.47	19.12	19.94	19.46	19.95	19.76	19.42	19.47	**17.54**	18.23	**19.00**
	16QAM	1	0	21.98	20.88	22.37	21.33	20.36	20.16	19.69	18.32	18.57	20.03	20.27	19.51
		1	1	23.05	21.80	**23.36**	22.18	21.56	21.10	**20.77**	**19.51**	19.81	21.05	21.30	20.67
		1	76	22.83	21.73	23.14	**22.75**	20.29	22.62	20.44	18.99	**20.72**	21.87	20.75	**22.10**
		1	77	21.97	20.81	22.15	21.76	19.50	21.84	19.49	18.25	19.64	21.12	19.82	21.15
		36	18	19.23	17.59	19.32	19.09	17.85	19.32	19.21	17.65	19.17	17.46	17.73	18.13
		75	0	19.18	18.38	19.15	19.94	18.36	20.00	19.76	18.54	19.39	**17.76**	17.42	**18.13**
	64QAM	1	0	21.90	20.26	21.87	20.56	20.17	19.39	**19.35**	17.84	18.15	19.58	19.86	19.34
		1	1	21.81	20.41	**21.92**	20.52	19.87	19.78	19.00	**17.87**	18.00	19.47	19.86	19.46
		1	76	21.63	20.40	21.48	21.21	18.89	20.90	19.01	17.73	19.41	20.63	19.49	**20.74**
		1	77	21.82	20.36	21.64	21.22	18.75	**21.41**	18.90	17.56	19.05	20.49	19.53	20.42
		36	18	18.57	20.02	18.60	18.11	19.48	18.05	18.13	17.40	18.40	17.93	20.07	18.07
		75	0	19.88	**21.87**	18.90	19.50	**21.18**	19.50	18.90	**19.24**	**19.66**	**19.00**	**20.61**	**19.00**
	256QAM	1	0	**19.74**	18.13	19.69	18.28	17.67	17.42	16.93	15.54	15.77	17.98	18.05	17.03
		1	1	19.50	18.04	19.66	17.93	17.47	17.09	**17.10**	**15.80**	15.79	17.98	18.08	16.98
		1	76	19.64	18.16	19.48	18.89	16.41	**19.15**	16.73	15.58	**17.01**	**18.54**	17.37	18.16
		1	77	19.60	18.12	19.34	18.85	16.64	18.93	16.77	15.35	16.88	18.40	17.19	18.12
		36	18	19.54	17.95	19.47	18.15	17.61	17.86	16.35	15.33	16.81	17.28	18.06	17.43
		75	0	19.45	18.04	19.50	18.27	17.36	18.08	16.49	15.42	16.67	17.55	17.97	17.56

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	641666	645333	638000	641666	645333	638000	641666	645333	638000	641666	645333
				3570.0	3625.0	3680.0	3570.0	3625.0	3680.0	3570.0	3625.0	3680.0	3570.0	3625.0	3680.0
40.0	BPSK	1	0	23.70	21.99	23.67	21.51	21.52	21.19	20.01	20.12	18.92	21.16	21.85	20.98
		1	1	23.89	22.23	**23.90**	21.81	21.61	21.37	20.25	20.19	19.23	21.28	21.99	21.06
		1	104	23.69	22.48	23.77	**23.30**	21.07	23.26	21.12	19.66	**21.30**	**22.80**	21.49	**22.80**
		1	105	23.57	22.30	23.53	23.07	20.82	23.01	21.03	19.42	21.11	22.66	21.34	22.56
		50	25	19.84	18.31	19.91	18.60	18.51	18.43	18.51	18.18	19.25	17.73	18.58	17.70
		100	0	19.10	20.00	19.10	19.10	20.00	18.81	18.71	20.00	19.10	17.08	19.00	17.10
	QPSK	1	0	23.15	21.67	23.20	21.10	20.90	20.55	19.49	19.43	18.41	19.53	20.35	19.95
		1	1	**23.90**	22.19	**23.90**	21.84	21.57	21.22	20.29	20.19	19.11	20.54	21.22	20.69
		1	104	23.78	22.37	23.75	23.23	21.11	**23.30**	**21.30**	19.85	21.17	22.17	20.89	**22.61**
		1	105	23.01	21.73	23.12	22.48	20.38	22.56	20.59	18.95	20.52	21.31	20.04	21.77
		50	25	19.87	18.36	19.92	18.67	18.49	18.40	18.49	18.24	19.25	17.06	18.25	17.61
		100	0	19.04	19.46	19.10	19.10	19.43	18.89	18.72	19.46	19.10	16.64	17.71	17.10
	16QAM	1	0	22.32	20.73	22.47	20.61	19.98	19.76	19.03	18.64	17.60	18.73	19.45	19.36
		1	1	23.28	21.83	**23.45**	21.49	21.27	20.83	19.81	19.65	18.85	19.31	20.49	20.26
		1	104	23.37	21.89	23.40	**22.95**	20.52	22.69	**20.82**	19.12	20.79	21.35	20.09	**21.87**
		1	105	22.26	20.93	22.16	21.89	19.67	21.61	20.03	18.02	19.84	20.23	19.20	21.36
		50	25	19.11	17.58	19.18	17.92	17.89	17.70	17.85	17.51	18.49	16.21	17.45	16.81
		100	0	19.05	18.47	19.10	19.10	18.45	18.89	18.67	18.40	19.10	16.64	16.97	17.10
	64QAM	1	0	21.77	20.18	21.84	19.72	19.45	19.22	17.91	17.83	17.01	18.29	19.00	18.68
		1	1	21.83	20.12	**21.85**	19.98	19.63	19.31	18.49	17.93	17.17	18.87	19.11	18.84
		1	104	21.76	20.46	21.67	**21.47**	18.77	21.30	19.29	17.55	18.93	20.29	19.18	20.71
		1	105	21.67	20.37	21.70	20.90	19.13	21.10	**19.56**	17.80	19.31	20.11	18.83	**20.99**
		50	25	17.62	16.13	17.72	16.37	16.26	16.21	16.41	16.05	17.02	14.83	16.15	15.28
		100	0	18.93	17.92	19.10	19.10	17.97	18.87	18.64	18.00	19.10	16.68	16.59	17.10
	256QAM	1	0	19.49	18.05	19.50	17.58	17.36	17.14	15.87	15.85	14.94	16.90	17.53	16.61
		1	1	19.51	17.87	19.52	17.48	17.48	17.02	15.61	16.18	14.61	17.24	17.47	16.75
		1	104	19.34	18.17	19.30	**19.16**	16.70	18.98	**17.21**	15.37	16.94	18.61	17.17	18.34
		1	105	19.60	18.02	19.30	18.79	16.74	18.98	17.16	15.36	16.98	**18.64**	16.84	18.47
		50	25	19.46	18.01	19.55	17.77	17.59	17.57	15.64	15.31	16.21	17.17	18.04	17.08
		100	0	19.51	18.04	**19.62**	17.99	17.46	17.61	15.92	15.39	16.13	17.34	17.77	17.31

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.

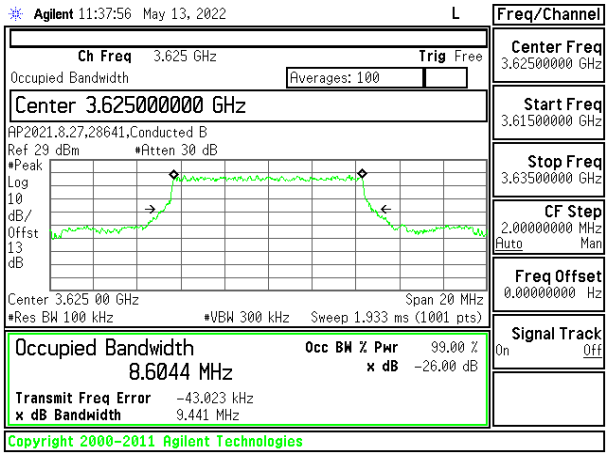
RESULTS

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.

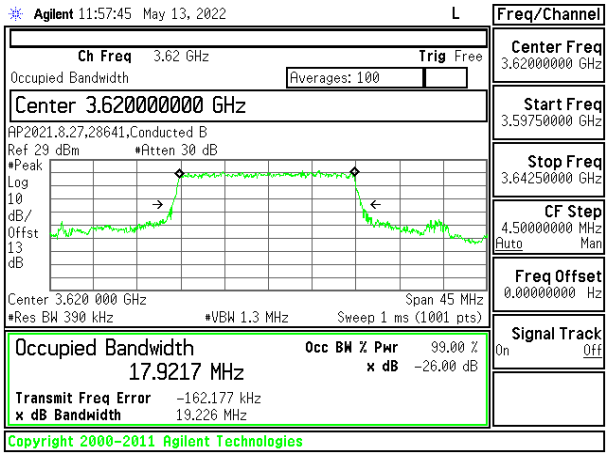
5G NR n48

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n48	10MHz, BPSK	24/0	3625.0	8.604	9.441
	10MHz, QPSK			8.628	9.520
	10MHz, 16QAM			8.626	9.523
	20MHz, BPSK	50/0		17.922	19.226
	20MHz, QPSK			17.972	19.529
	20MHz, 16QAM			17.967	19.610
	30MHz, BPSK	75/0		26.983	29.136
	30MHz, QPSK			26.975	29.137
	30MHz, 16QAM			26.969	29.137
	40MHz, BPSK	100/0		35.798	37.843
	40MHz, QPSK			35.837	38.229
	40MHz, 16QAM			35.835	38.416
	40MHz, BPSK	1/0		0.535	0.851

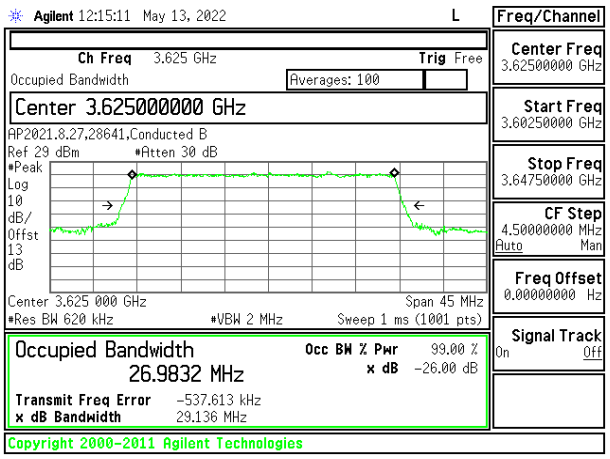
9.1.1. 5G NR n48



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



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



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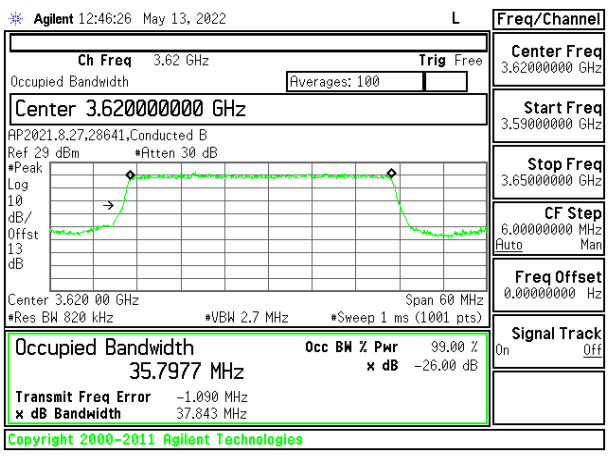
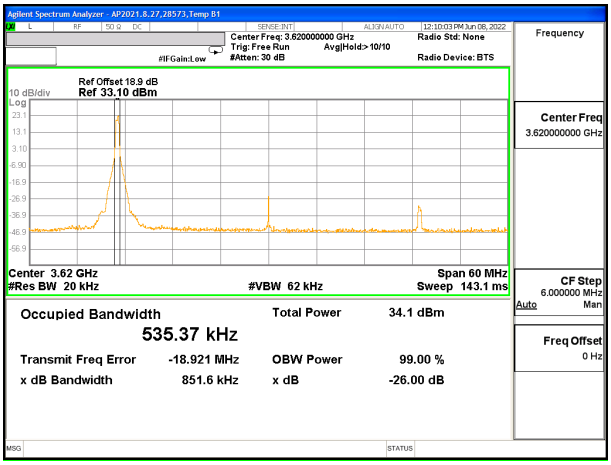


5G NR n48 40MHz BPSK Mid Channel RB100-0



5G NR n48 40MHz BPSK Middle Channel RB10-0

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

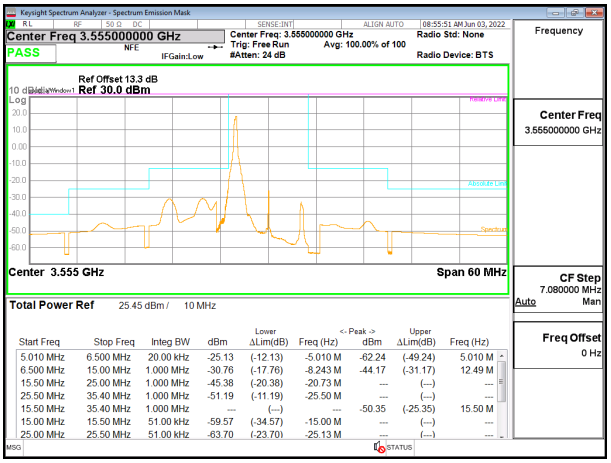
9.2.1. 5G NR n48 EMISSION MASK AND ADJACENT CHANNEL POWER

LIMITS

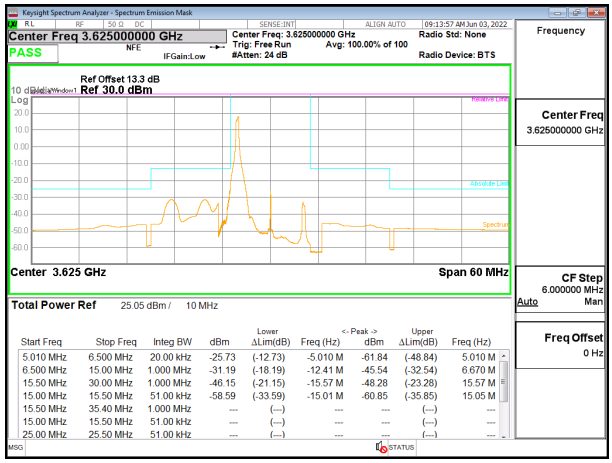
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(1) General protection levels
(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental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

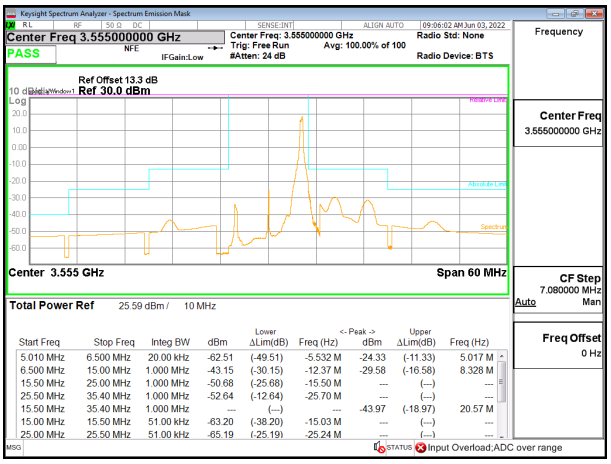
5G NR n48 EMISSION MASK



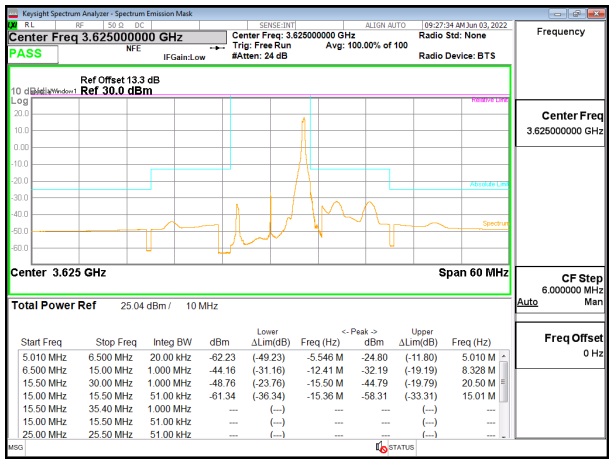
5G NR n48 10MHz BPSK Low Channel RB1-0, ID:28541



5G NR n48 10MHz BPSK Middle Channel RB1-0, ID:28541



5G NR n48 10MHz BPSK Low Channel RB1-23, ID:28541



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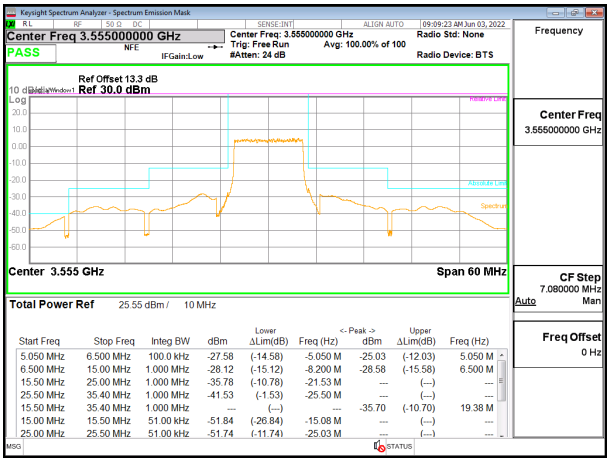
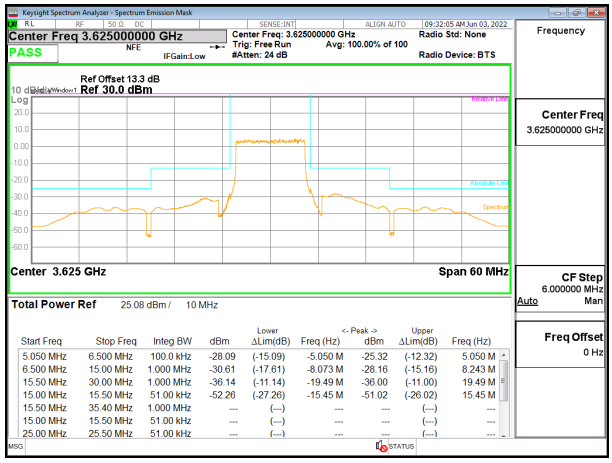


5G NR n48 10MHz BPSK Low Channel RB24-0, ID:28541



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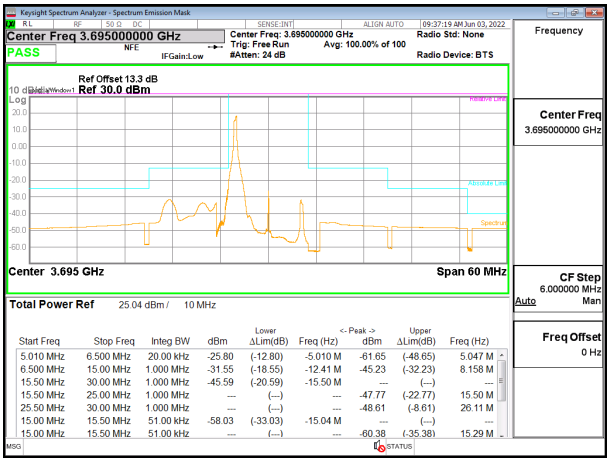

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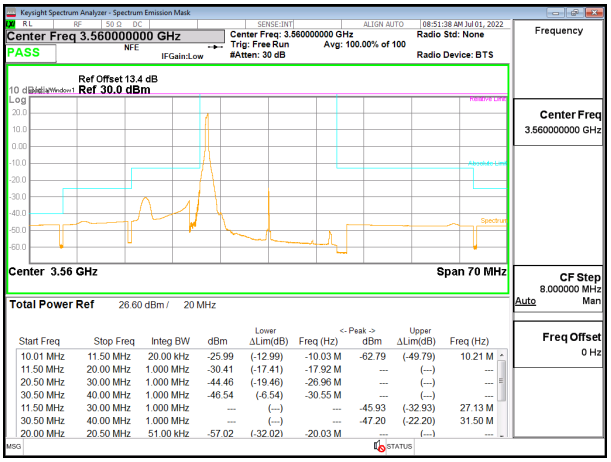

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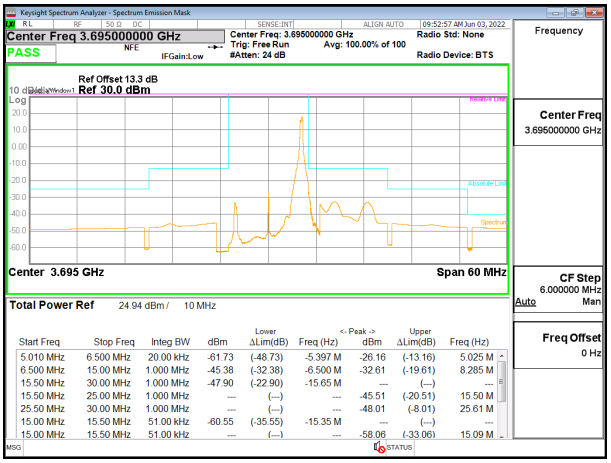

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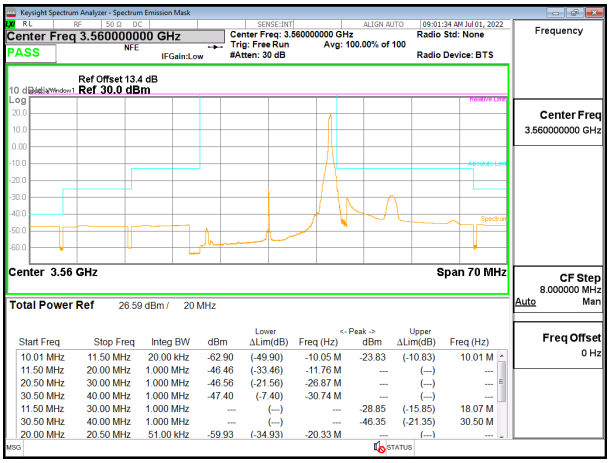

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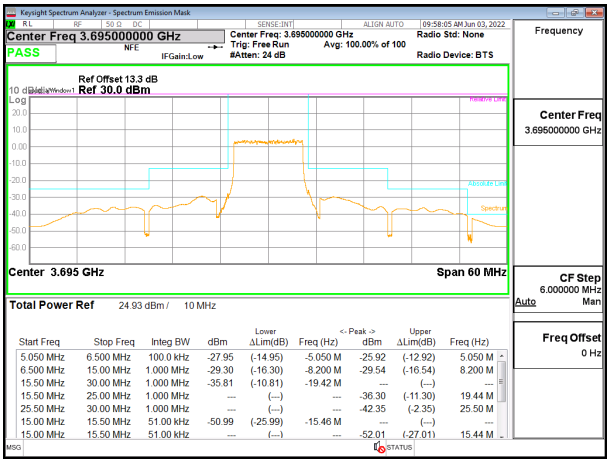

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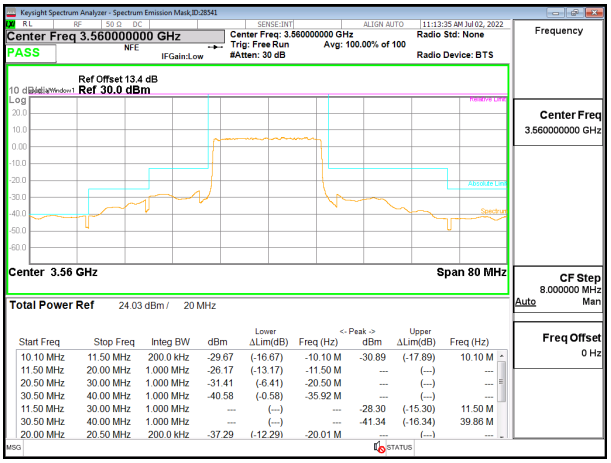

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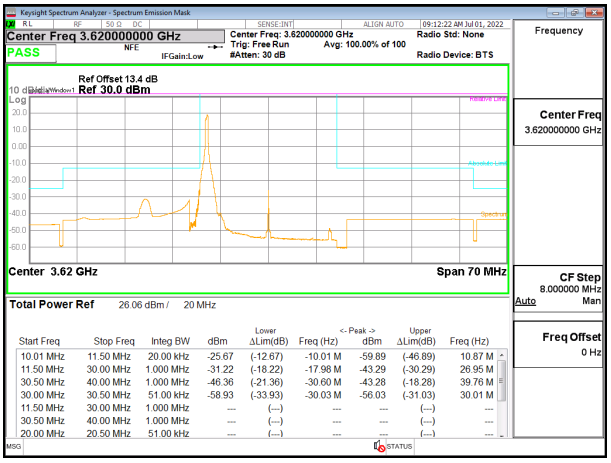

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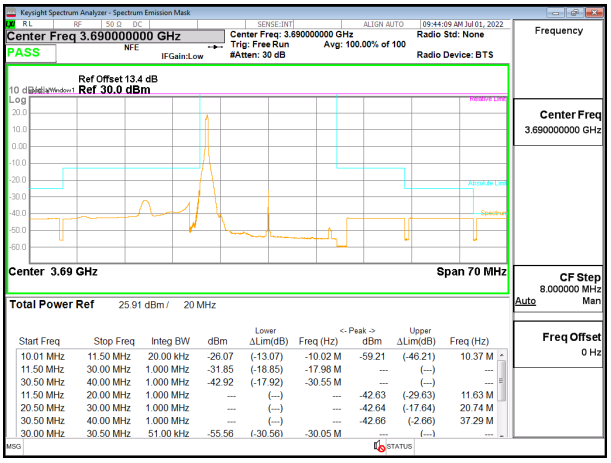

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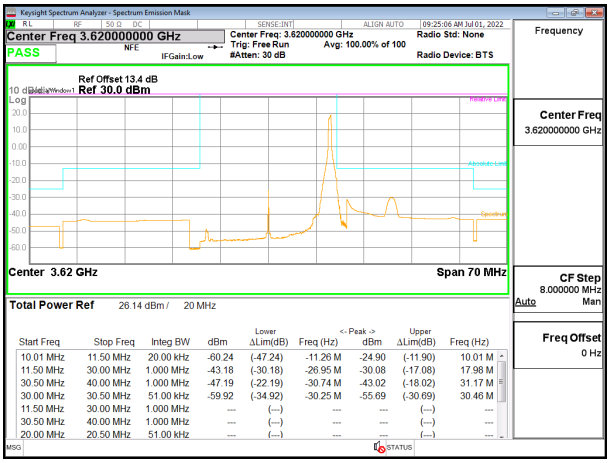

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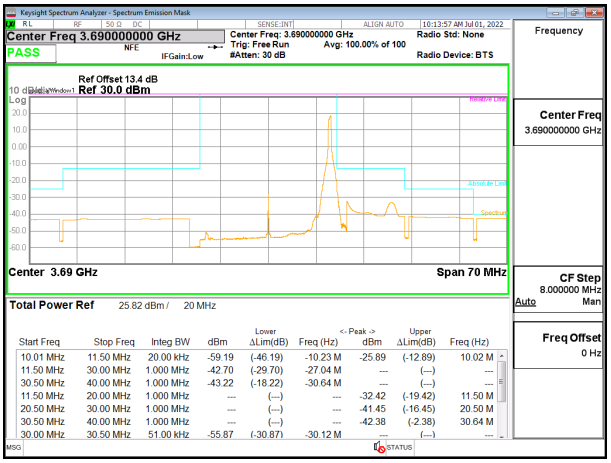

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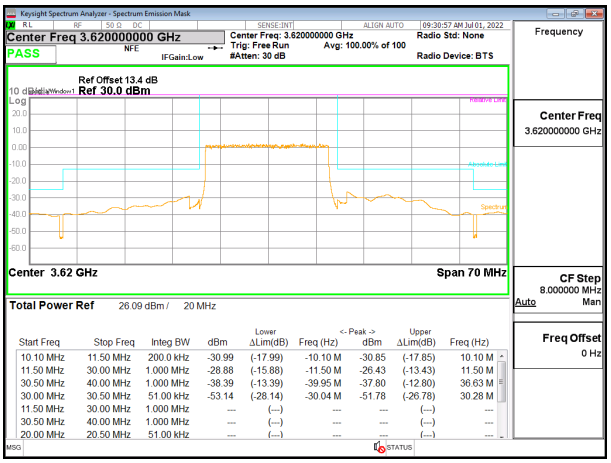

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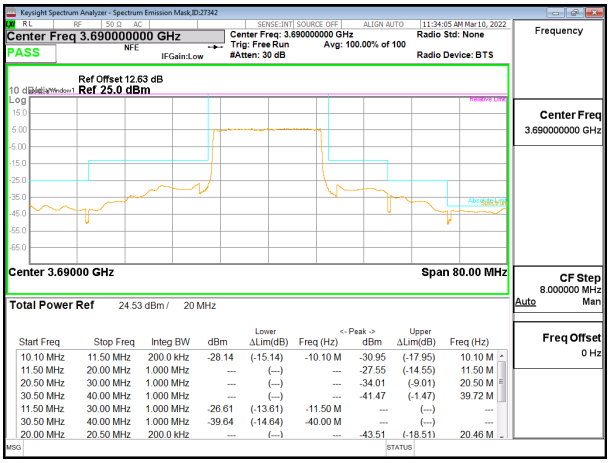

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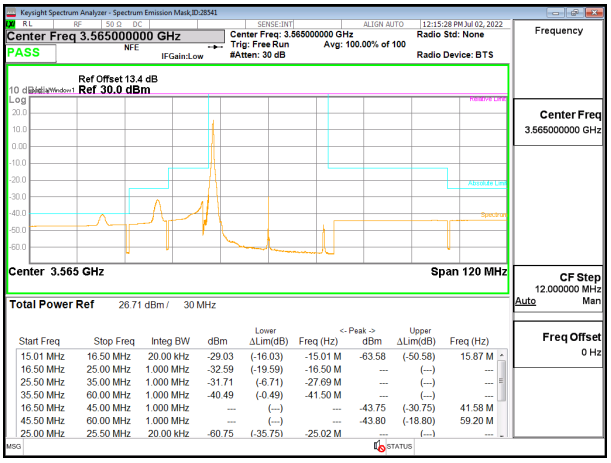
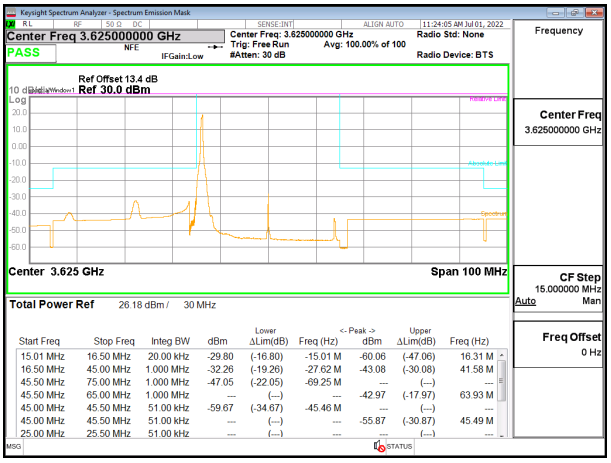


5G NR n48 30MHz BPSK Low Channel RB1-0



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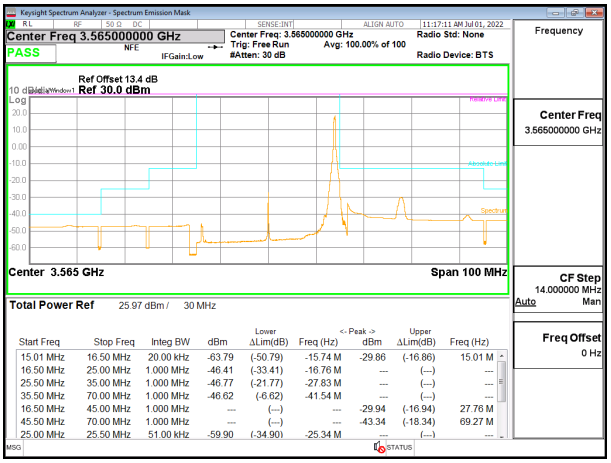

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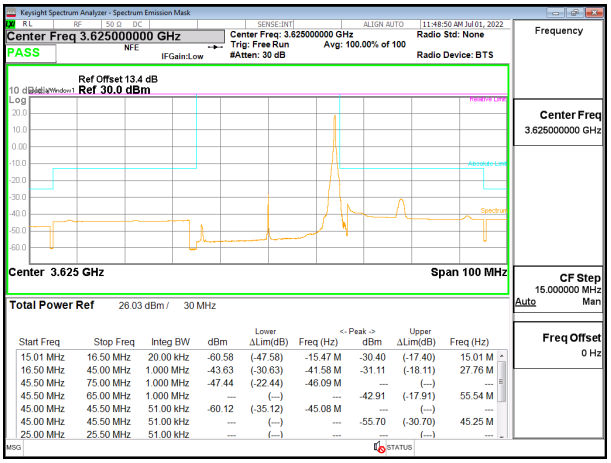

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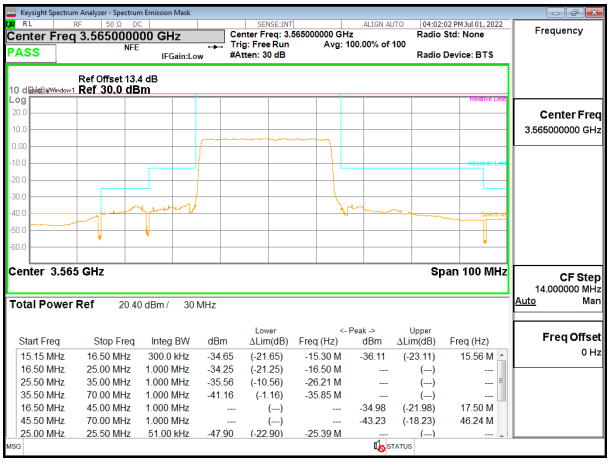

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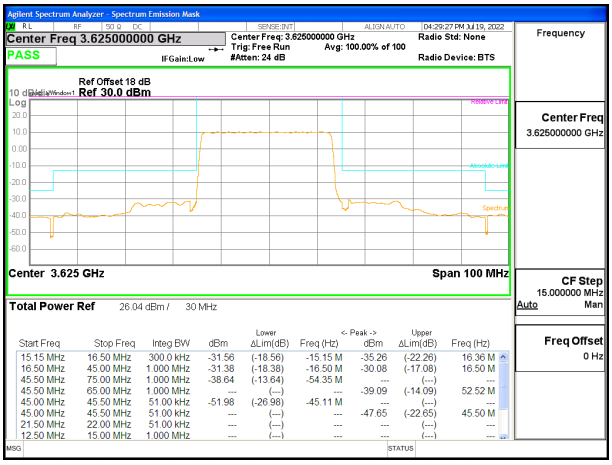

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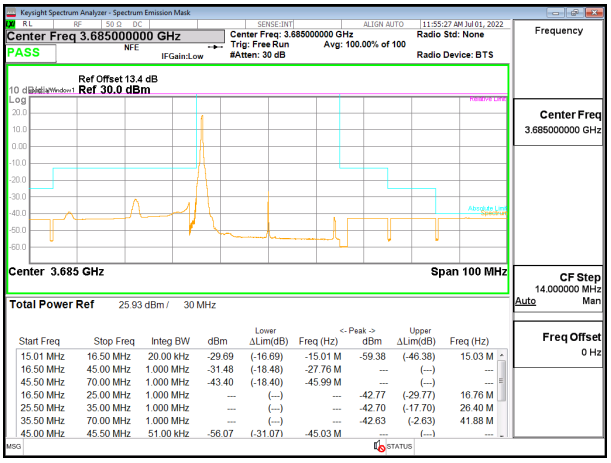

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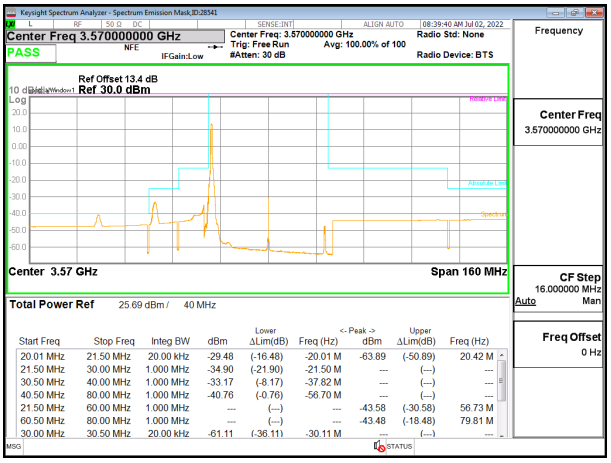
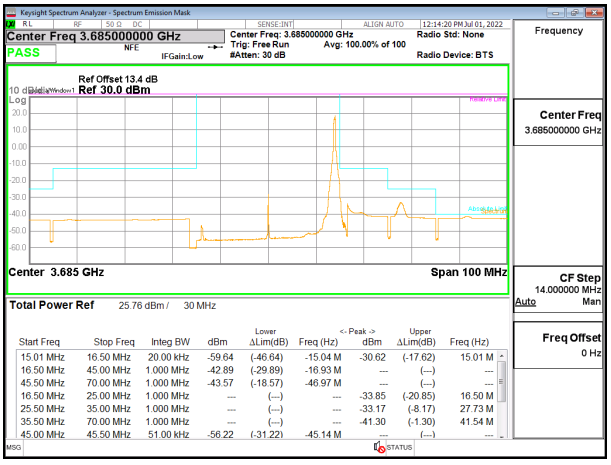


5G NR n48 40MHz BPSK Low Channel RB1-0



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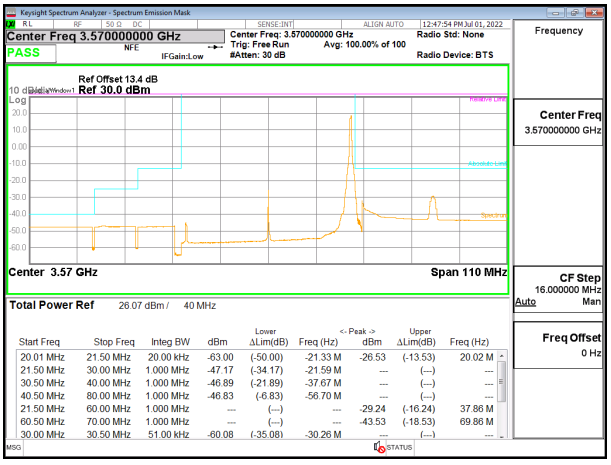

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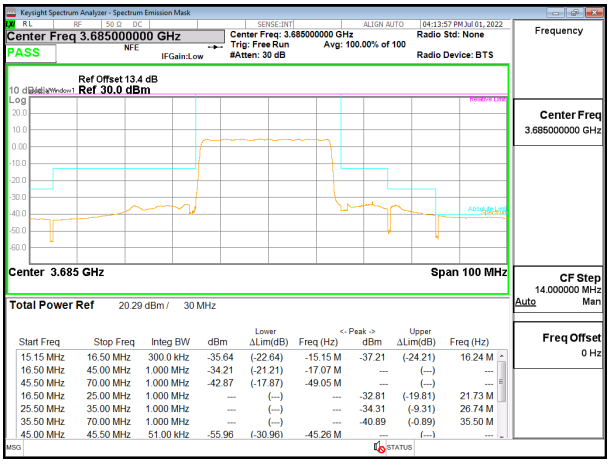

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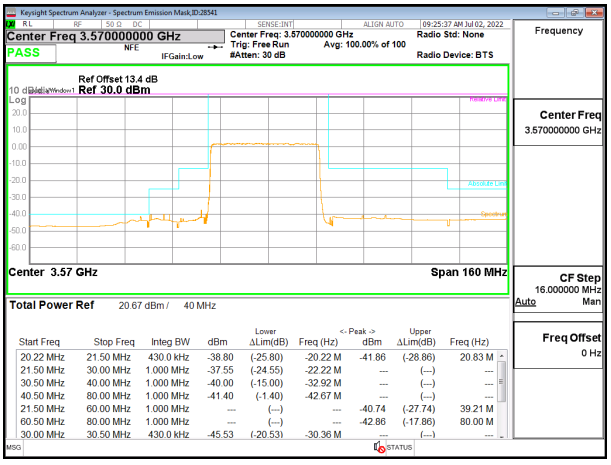
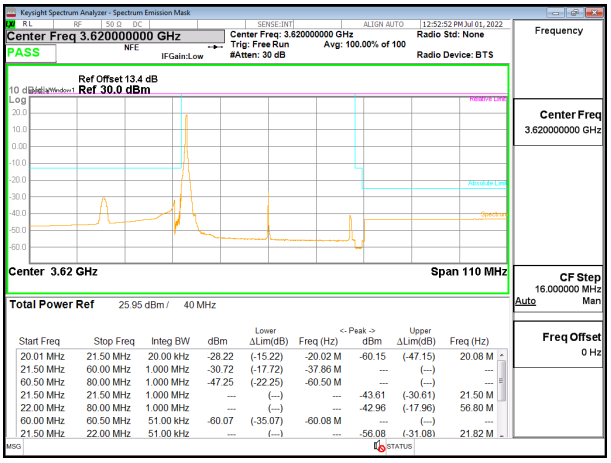
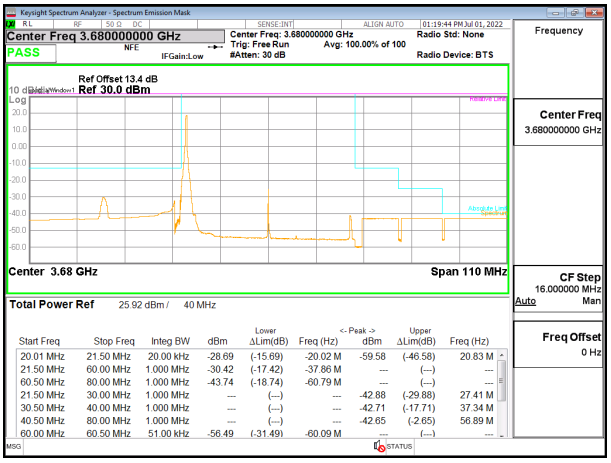


5G NR n48 40MHz BPSK Low Channel RB100-0



5G NR n48 40MHz BPSK Middle Channel RB1-0, ID:28541



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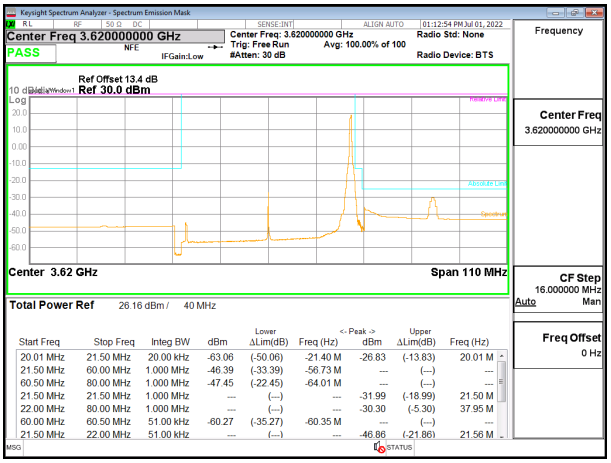

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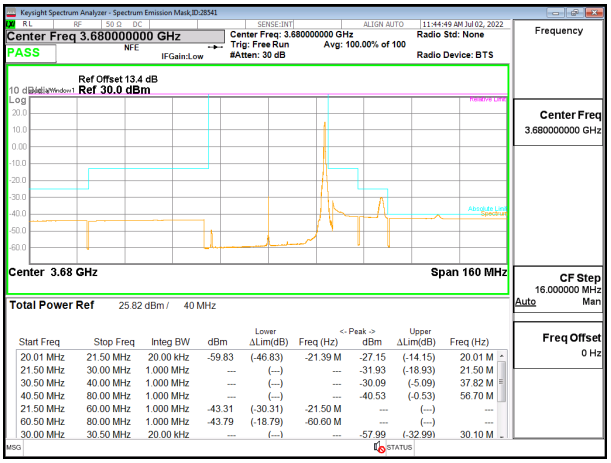
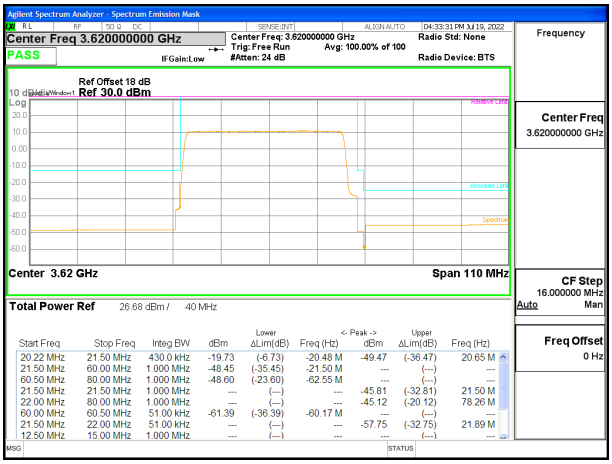
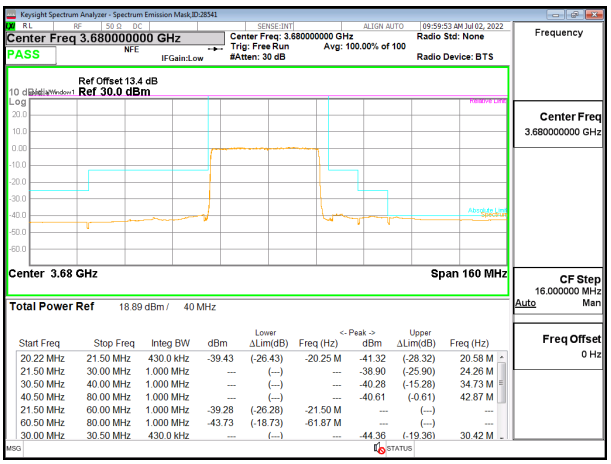


5G NR n48 40MHz BPSK High Channel RB1-105

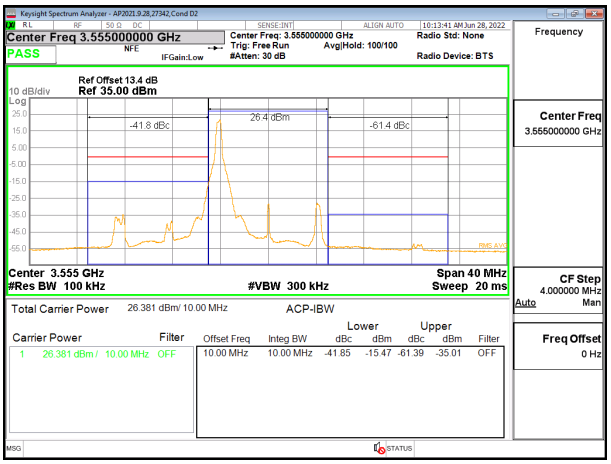


5G NR n48 40MHz BPSK Middle Channel RB100-0, ID:28541

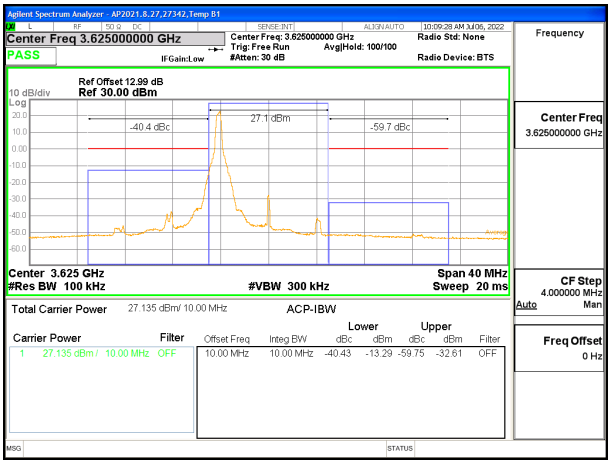


5G NR n48 40MHz BPSK High Channel RB100-0

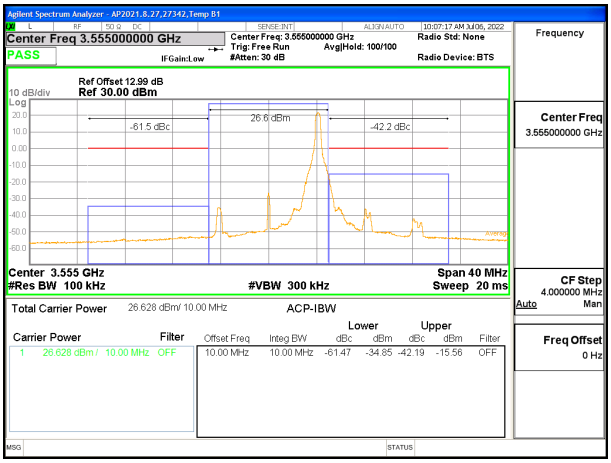
5G NR n48 ADJACENT CHANNEL POWER



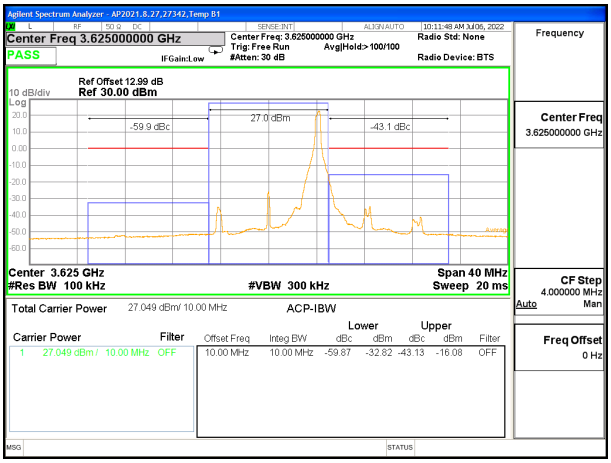
5G NR n48 10MHz BPSK Low Channel RB1-0



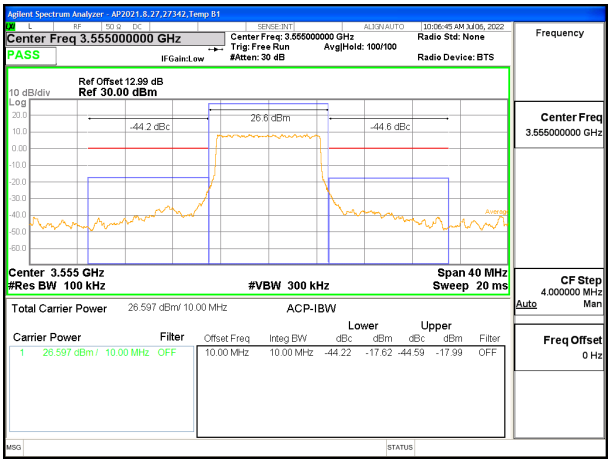
5G NR n48 10MHz BPSK Middle Channel RB1-0



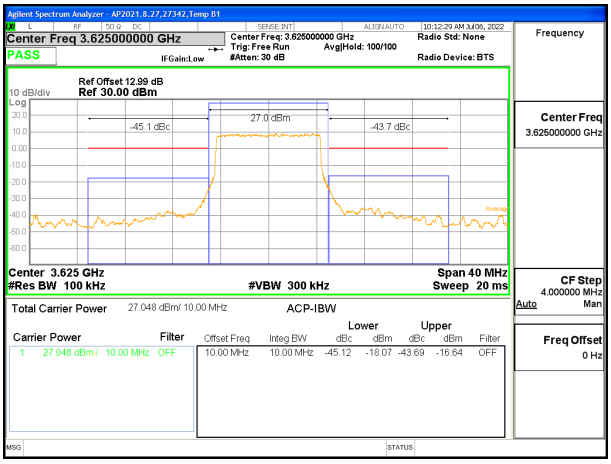
5G NR n48 10MHz BPSK Low Channel RB1-23



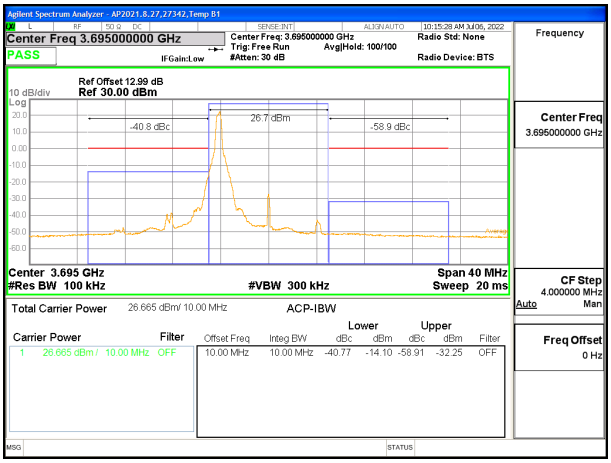
5G NR n48 10MHz BPSK Middle Channel RB1-23



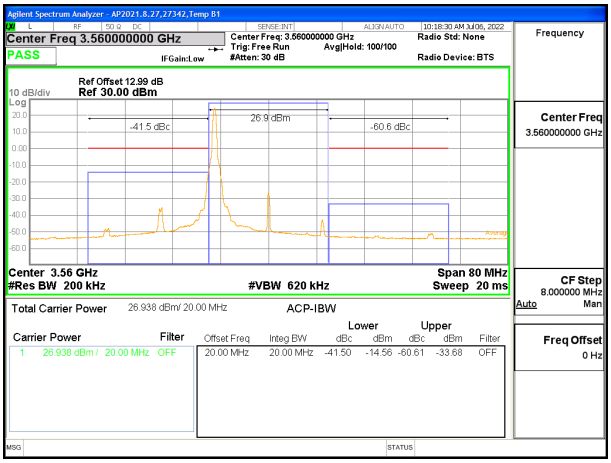
5G NR n48 10MHz BPSK Low Channel RB24-0



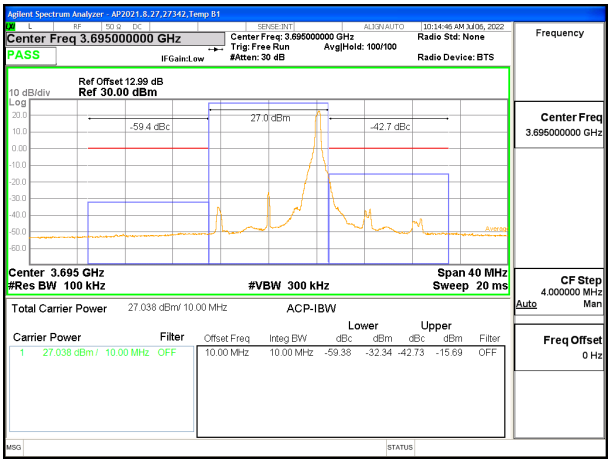
5G NR n48 10MHz BPSK Middle Channel RB24-0



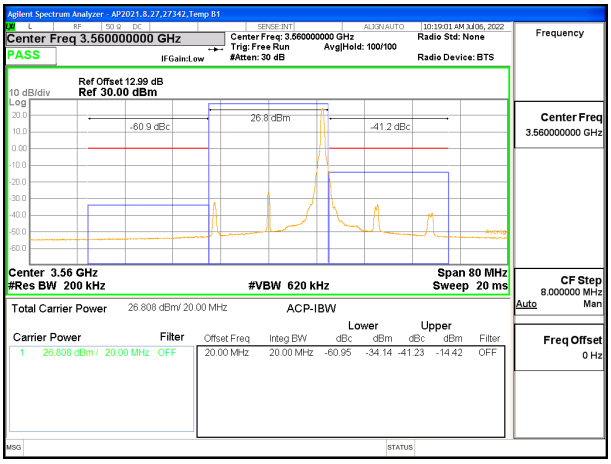
5G NR n48 10MHz BPSK High Channel RB1-0



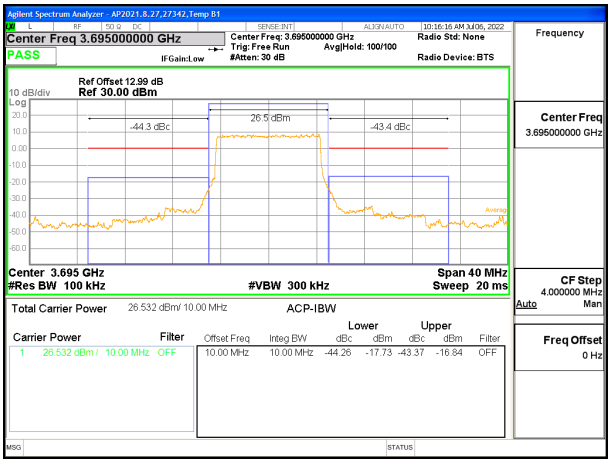
5G NR n48 20MHz BPSK Low Channel RB1-0



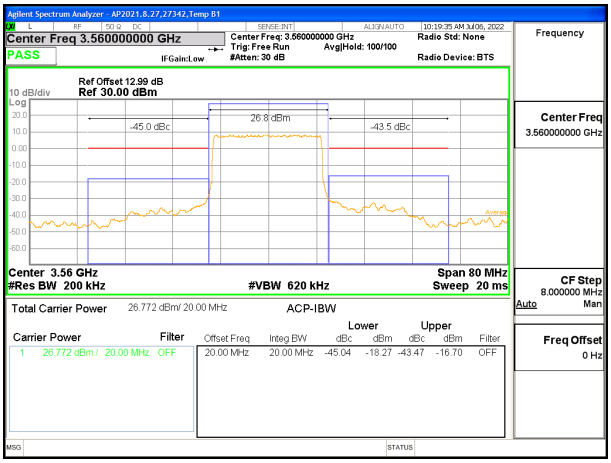
5G NR n48 10MHz BPSK High Channel RB1-23



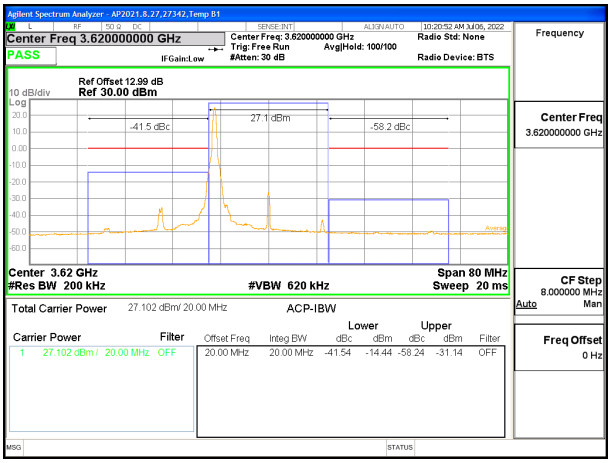
5G NR n48 20MHz BPSK Low Channel RB1-50



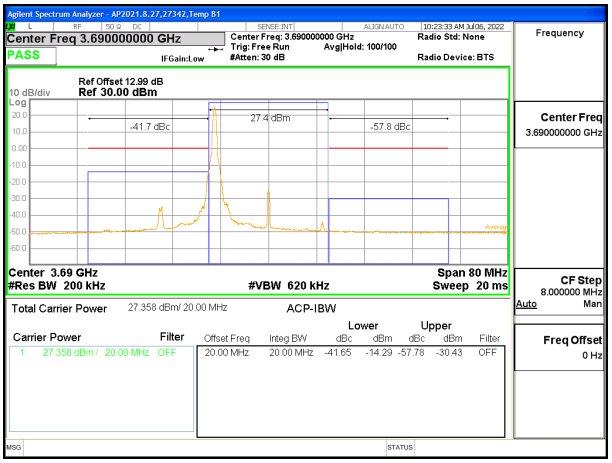
5G NR n48 10MHz BPSK High Channel RB24-0



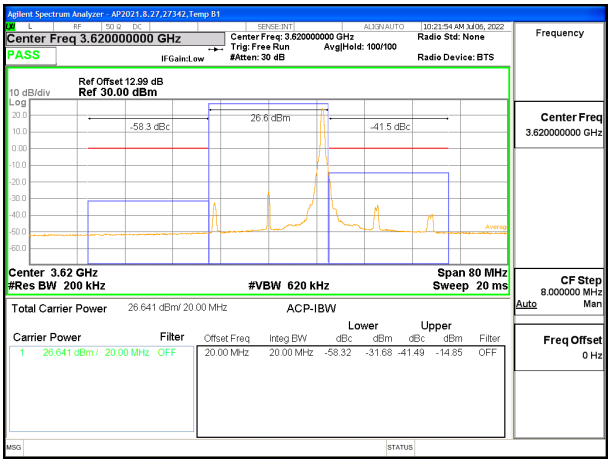
5G NR n48 20MHz BPSK Low Channel RB50-0



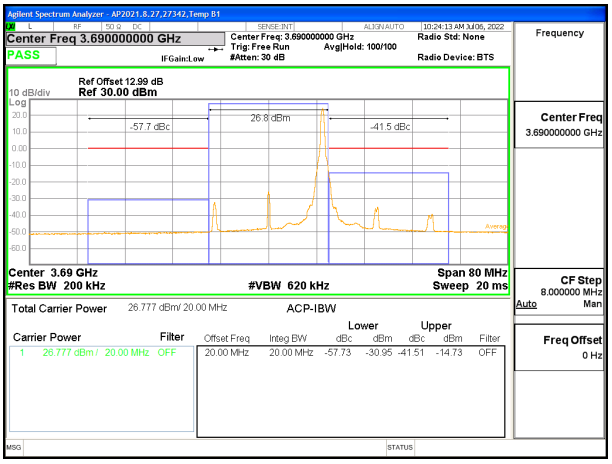
5G NR n48 20MHz BPSK Middle Channel RB1-0



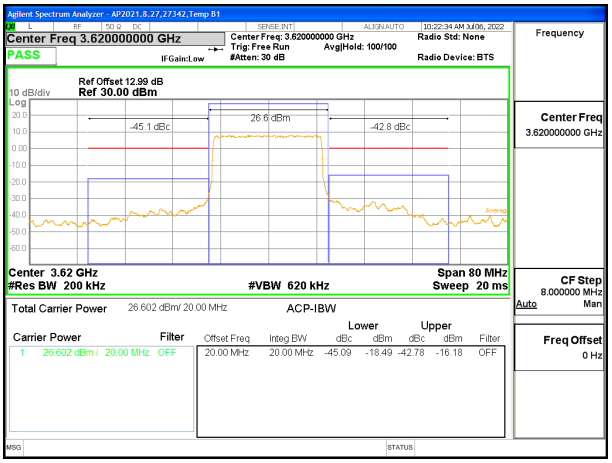
5G NR n48 20MHz BPSK High Channel RB1-0



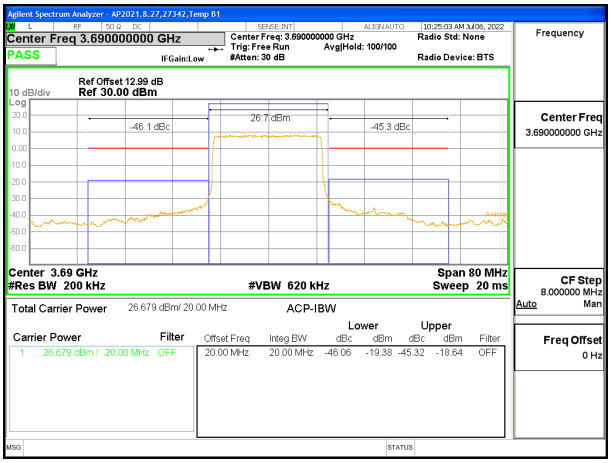
5G NR n48 20MHz BPSK Middle Channel RB1-50



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



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



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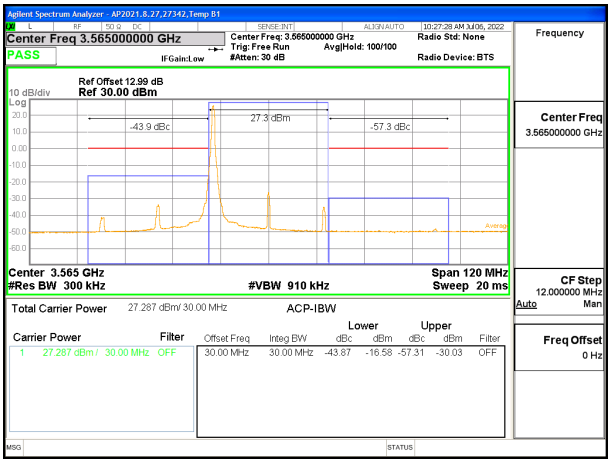
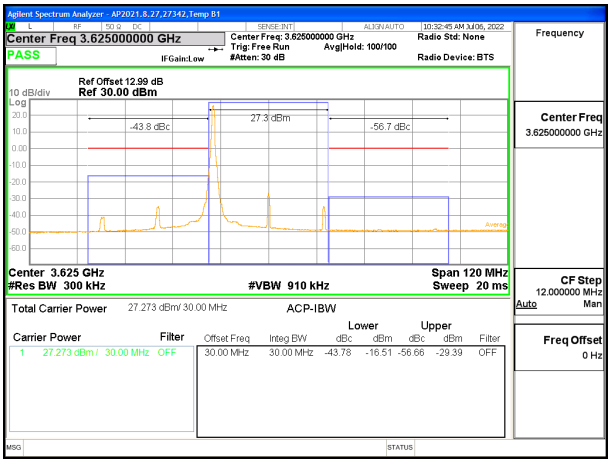
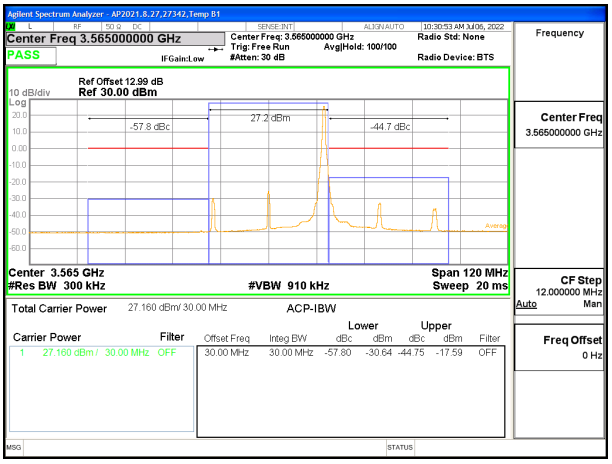


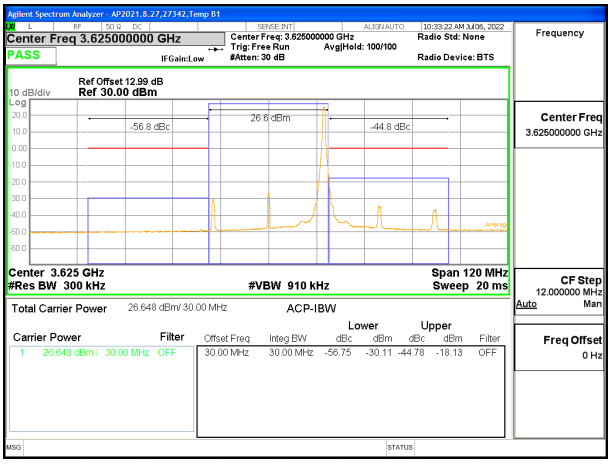
5G NR n48 30MHz BPSK Low Channel RB1-0



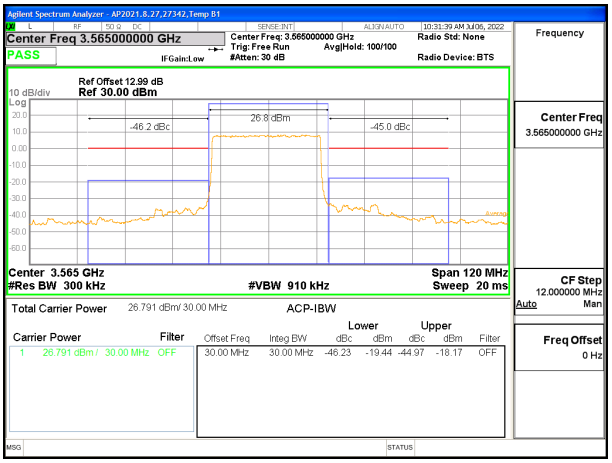
5G NR n48 30MHz BPSK Middle Channel RB1-0



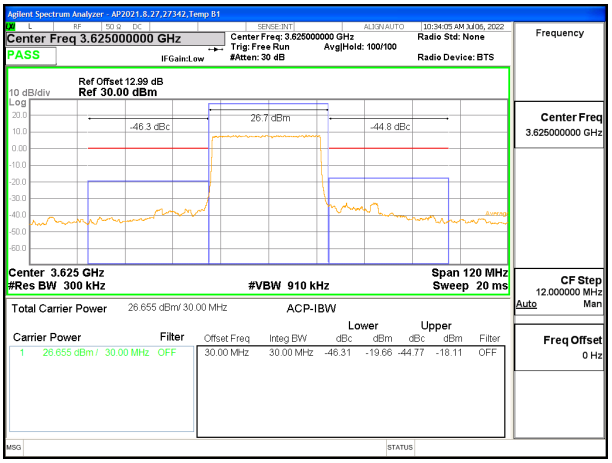
5G NR n48 30MHz BPSK Low Channel RB1-77



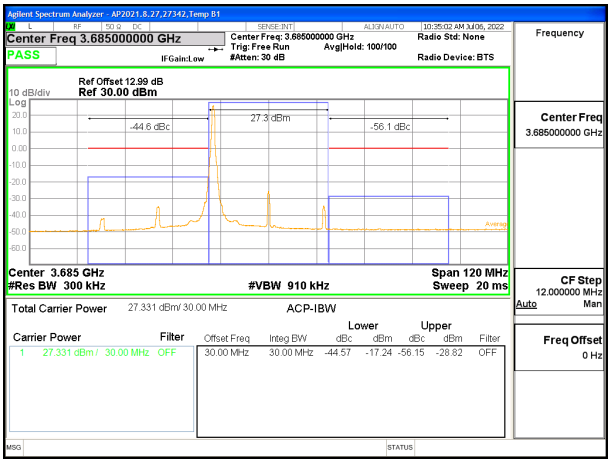
5G NR n48 30MHz BPSK Middle Channel RB1-77



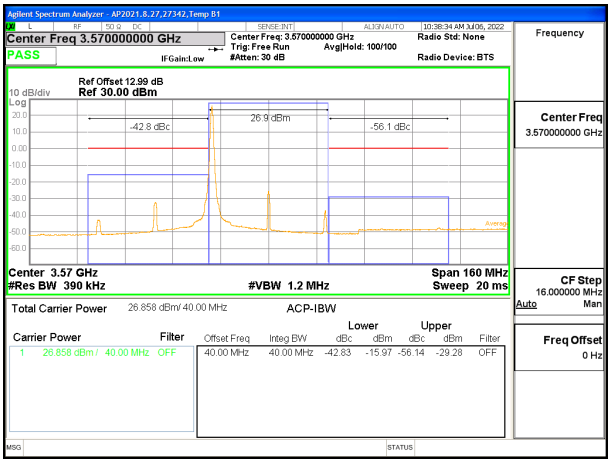
5G NR n48 30MHz BPSK Low Channel RB75-0



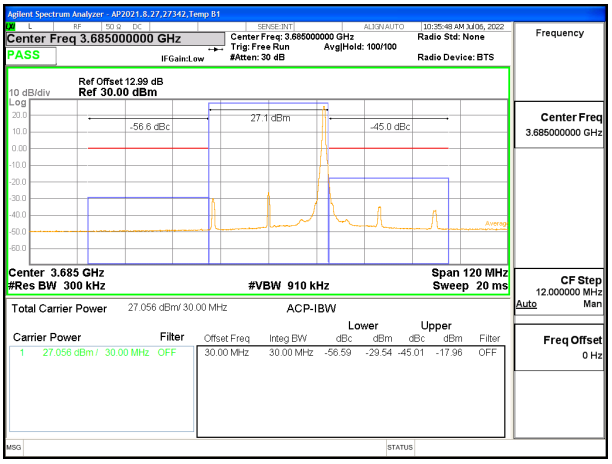
5G NR n48 30MHz BPSK Middle Channel RB75-0



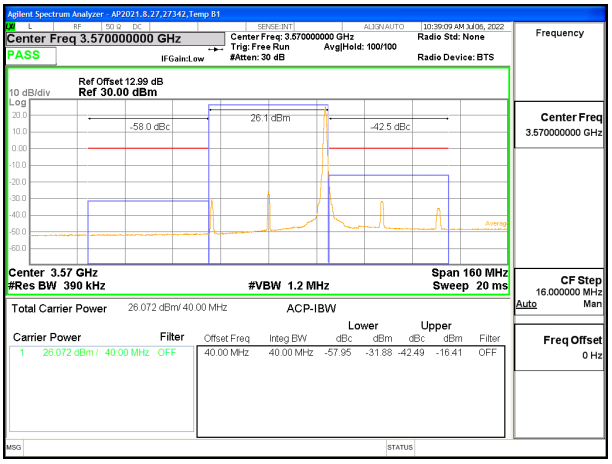
5G NR n48 30MHz BPSK High Channel RB1-0



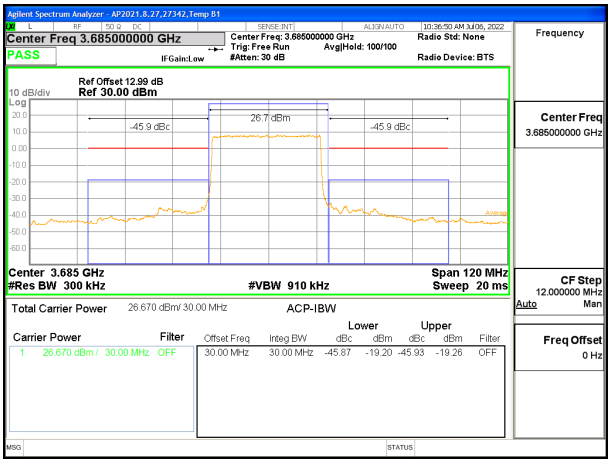
5G NR n48 40MHz BPSK Low Channel RB1-0



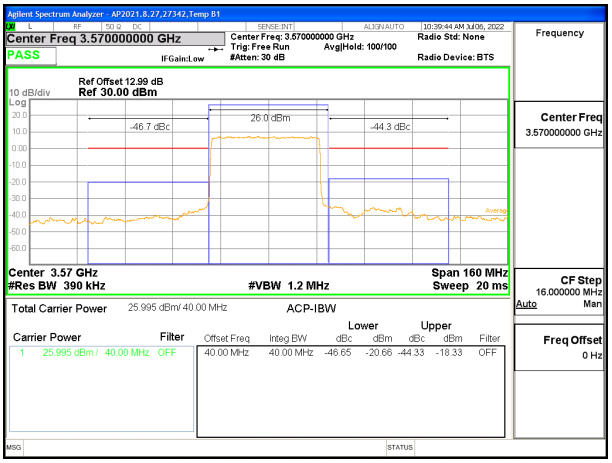
5G NR n48 30MHz BPSK High Channel RB1-77



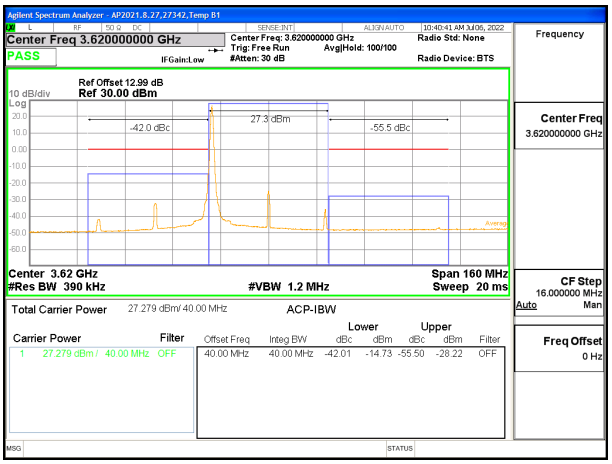
5G NR n48 40MHz BPSK Low Channel RB1-105



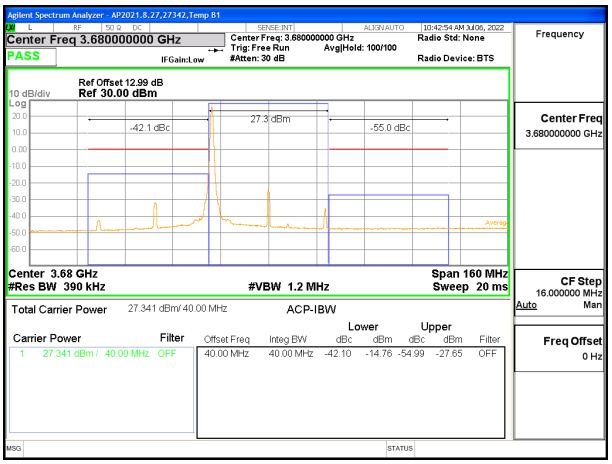
5G NR n48 30MHz BPSK High Channel RB75-0



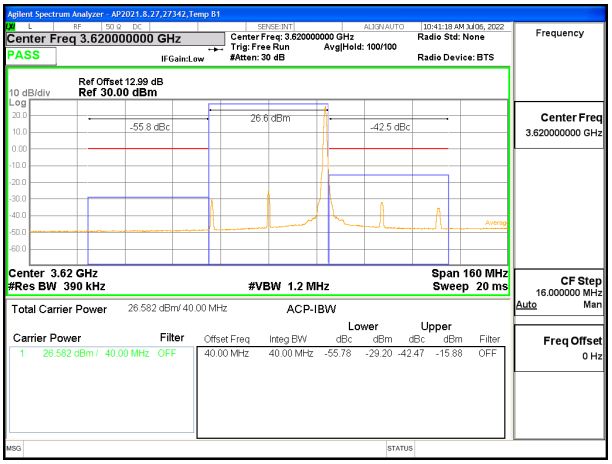
5G NR n48 40MHz BPSK Low Channel RB100-0



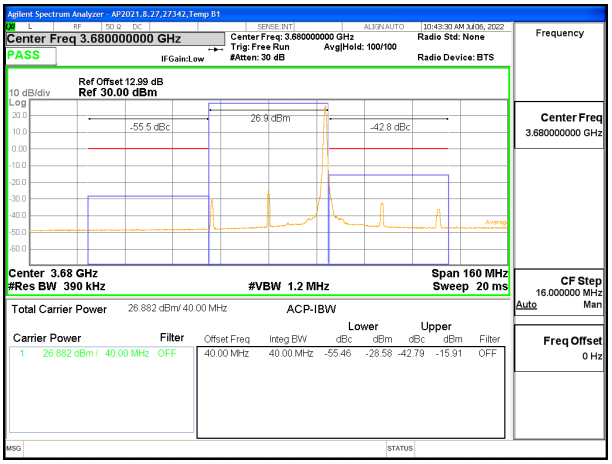
5G NR n48 40MHz BPSK Middle Channel RB1-0



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



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



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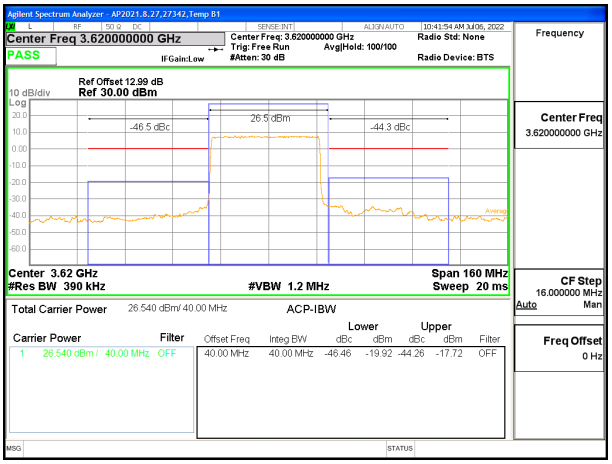
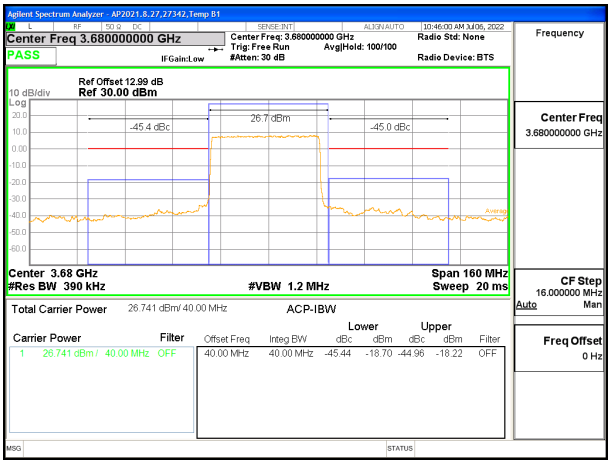


5G NR n48 40MHz BPSK Middle Channel RB100-0



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

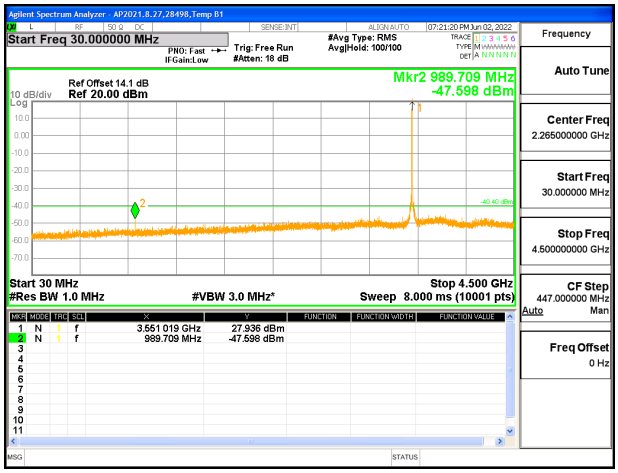
Both BPSK and 16QAM modes are tested, BPSK bandwidths results are reported as worst case.

9.3.1. 5G NR n48

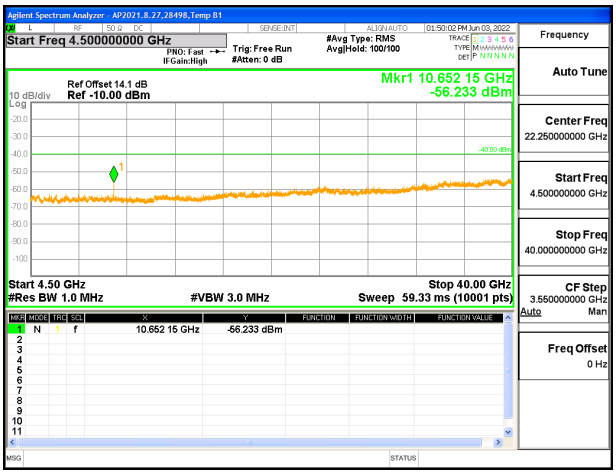
LIMITS

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.

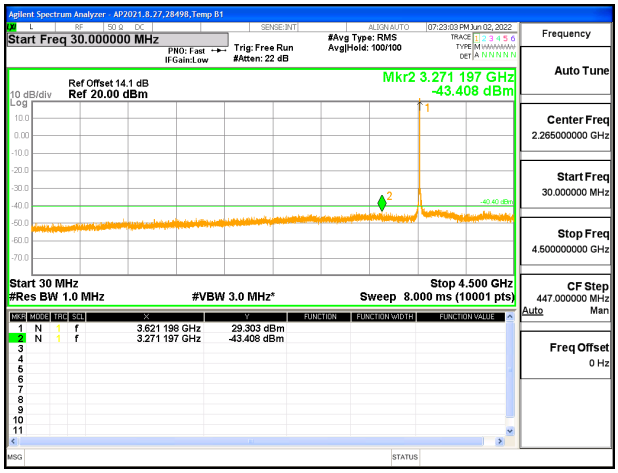
5G NR n48



5G NR n48 10MHz BPSK Low Channel RB1-0 (30MHz to 4.5GHz)

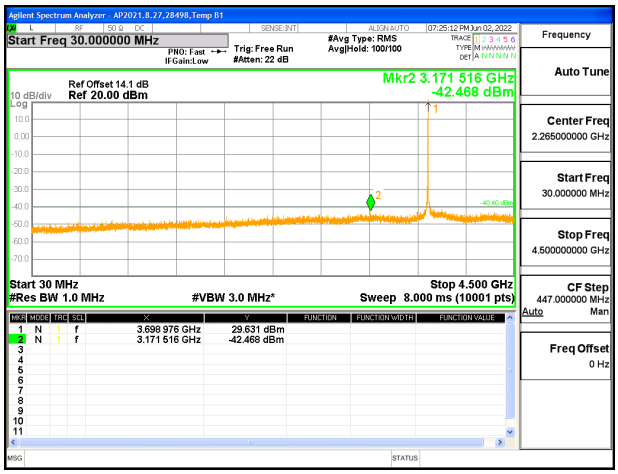


5G NR n48 10MHz BPSK Low Channel RB1-0 (4.5G to 40G)

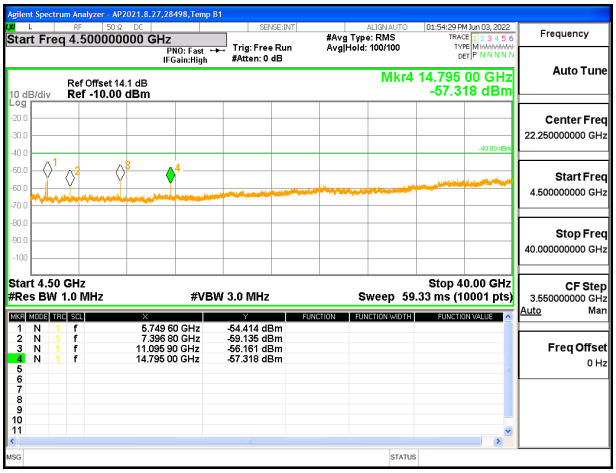


5G NR n48 10MHz BPSK Mid Channel RB1-1 (30MHz to 4.5GHz)

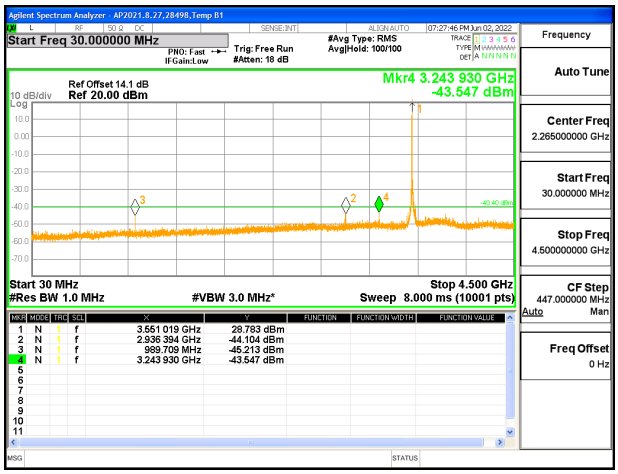
5G NR n48 10MHz BPSK Mid Channel RB1-1 (4.5G to 40G)



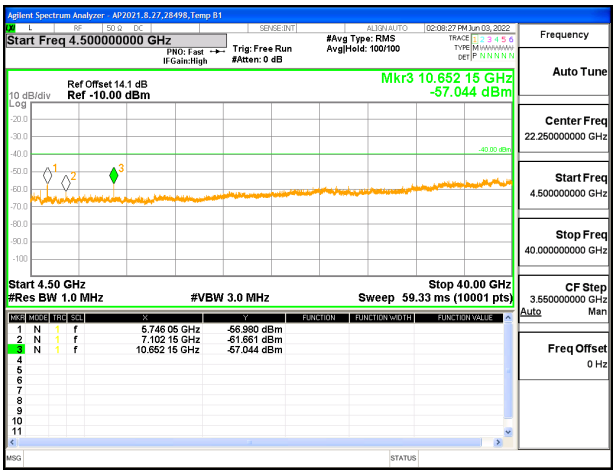
5G NR n48 10MHz BPSK High Channel RB1-23 (30MHz to 4.5GHz)



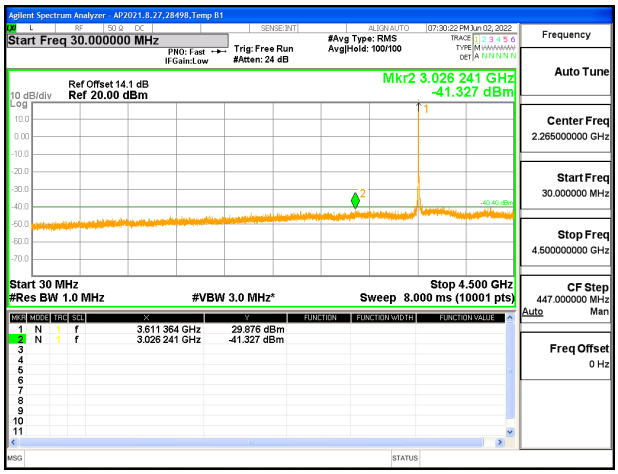
5G NR n48 10MHz BPSK High Channel RB1-23 (4.5G to 40G)



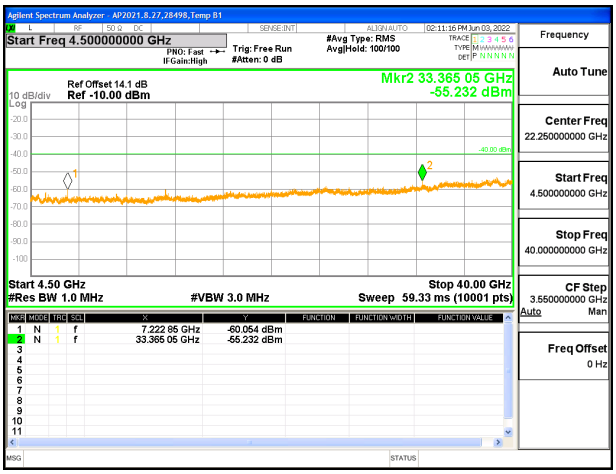
5G NR n48 20MHz BPSK Low Channel RB1-0 (30MHz to 4.5GHz)



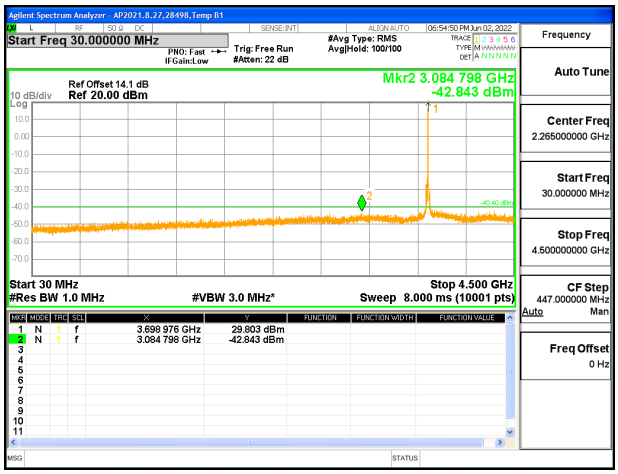
5G NR n48 20MHz BPSK Low Channel RB1-0 (4.5G to 40G)



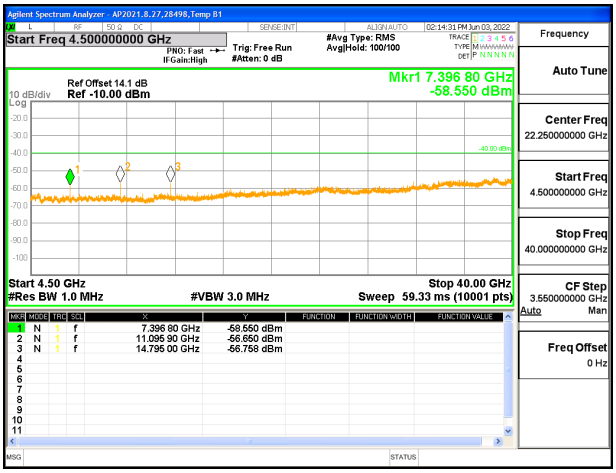
5G NR n48 20MHz BPSK Mid Channel RB1-1 (30MHz to 4.5GHz)



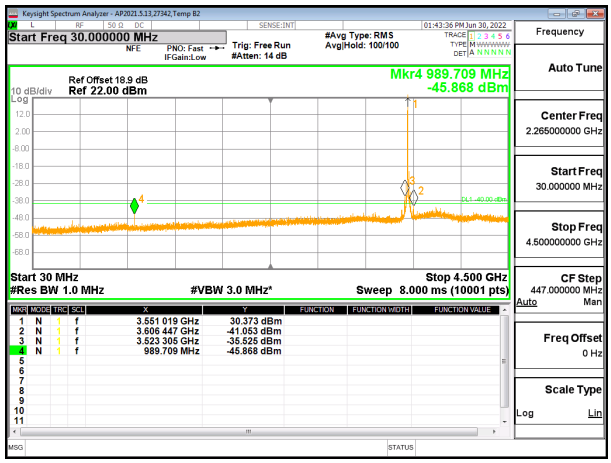
5G NR n48 20MHz BPSK Mid Channel RB1-1 (4.5G to 40G)



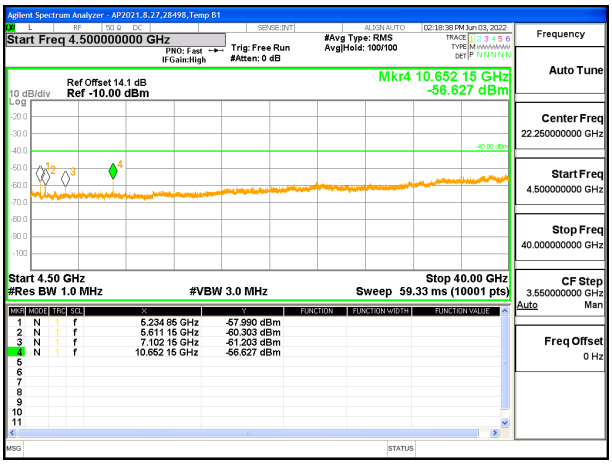
5G NR n48 20MHz BPSK High Channel RB1-50 (30MHz to 4.5GHz)



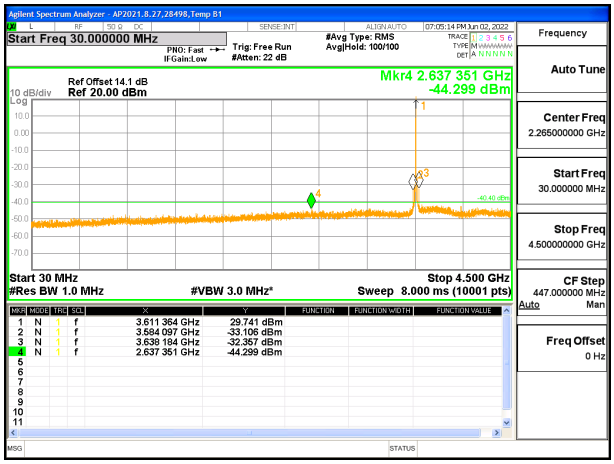
5G NR n48 20MHz BPSK High Channel RB1-50 (4.5G to 40G)



5G NR n48 30MHz BPSK Low Channel RB1-0 (30MHz to 4.5GHz)

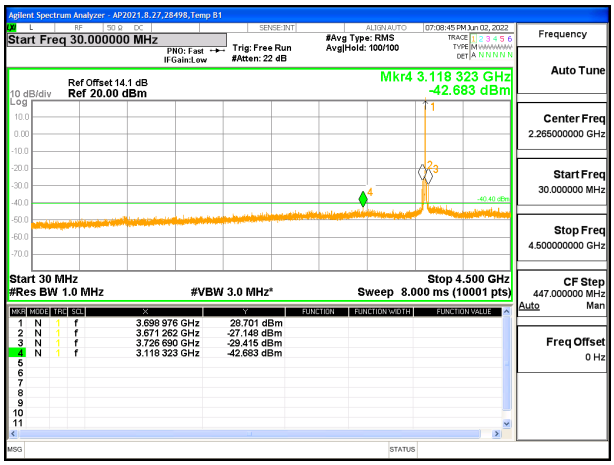


5G NR n48 30MHz BPSK Low Channel RB1-0 (4.5G to 40G)

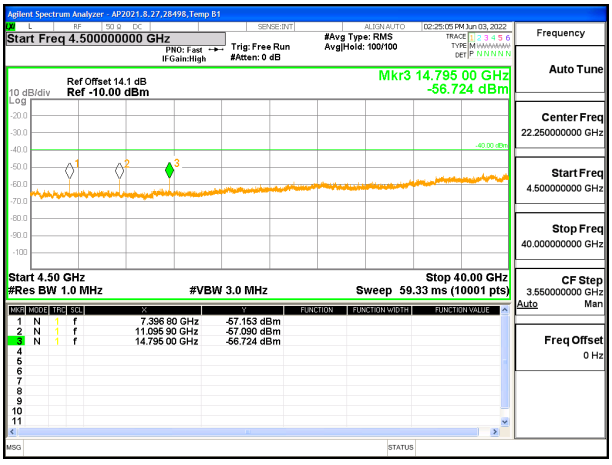


5G NR n48 30MHz BPSK Mid Channel RB1-1 (30MHz to 4.5GHz)

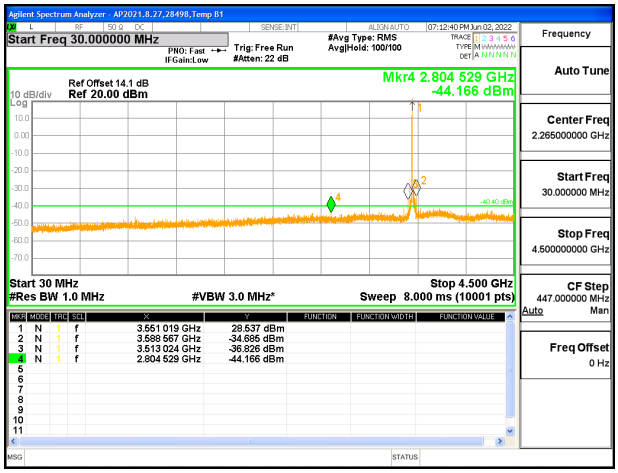
5G NR n48 30MHz BPSK Mid Channel RB1-1 (4.5G to 40G)



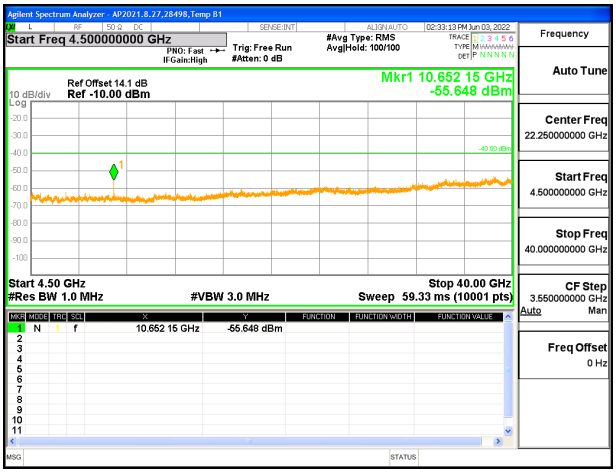
5G NR n48 30MHz BPSK High Channel RB1-77 (30MHz to 4.5GHz)



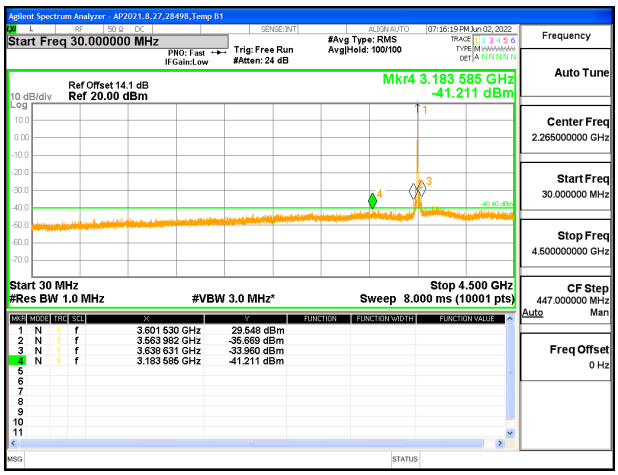
5G NR n48 30MHz BPSK High Channel RB1-77 (4.5G to 40G)



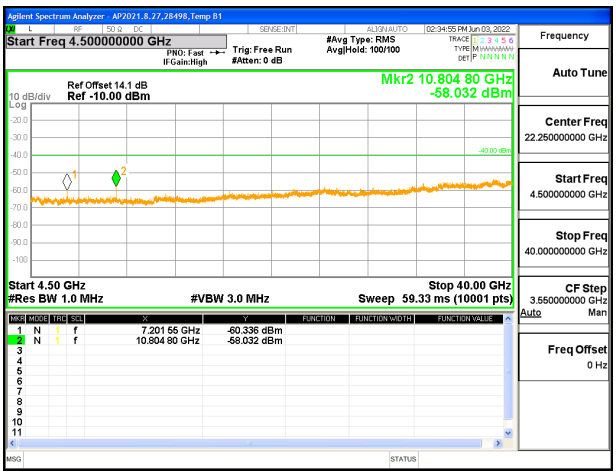
5G NR n48 40MHz BPSK Low Channel RB1-0 (30MHz to 4.5GHz)



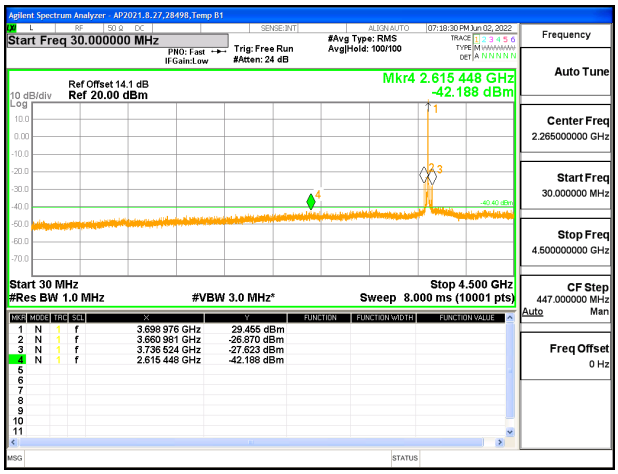
5G NR n48 40MHz BPSK Low Channel RB1-0 (4.5G to 40G)



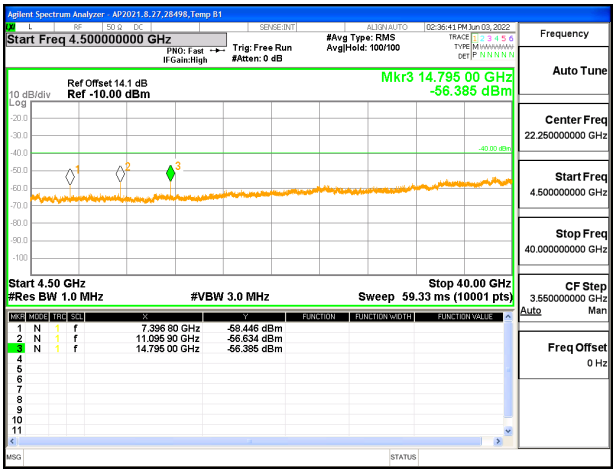
5G NR n48 40MHz BPSK Mid Channel RB1-1 (30MHz to 4.5GHz)



5G NR n48 40MHz BPSK Mid Channel RB1-1 (4.5G to 40G)



5G NR n48 40MHz BPSK High Channel RB1-105 (30MHz to 4.5GHz)



5G NR n48 40MHz BPSK High Channel RB1-105 (4.5G 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:	27979	Test Date:	5/20/2022

5G NR n48 QPSK (40MHz BANDWIDTH)

Band	48	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		3550	3700			
		Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage					
Normal (20°C)	Normal	3550.9985	3697.0051			
Extreme (50°C)		3550.9985	3697.0050	-16.45	-0.005	Yes
Extreme (40°C)		3550.9985	3697.0051	-7.98	-0.002	Yes
Extreme (30°C)		3550.9985	3697.0051	-5.11	-0.001	Yes
Extreme (10°C)		3550.9985	3697.0051	-9.58	-0.003	Yes
Extreme (0°C)		3550.9985	3697.0051	-4.68	-0.001	Yes
Extreme (-10°C)		3550.9985	3697.0051	-12.61	-0.003	Yes
Extreme (-20°C)		3550.9985	3697.0051	-12.24	-0.003	Yes
Extreme (-30°C)		3550.9985	3697.0051	1.89	0.001	Yes
20°C	15%	3550.9985	3697.0051	-10.73	-0.003	Yes
	-15%	3550.9985	3697.0051	-9.41	-0.003	Yes
	End Point Voltage	3550.9985	3697.0051	-6.5	-0.002	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:	39004	Test Date:	6/6/2022

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	30.08	25.80	4.28
					16QAM	31.32	24.37	6.95
	20MHz		50	0	BPSK	30.39	26.00	4.39
					16QAM	31.39	24.60	6.79
	30MHz		75	0	BPSK	30.36	26.00	4.36
					16QAM	31.21	24.41	6.80
	40MHz		100	0	BPSK	30.22	25.92	4.30
					16QAM	31.12	24.47	6.65

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.

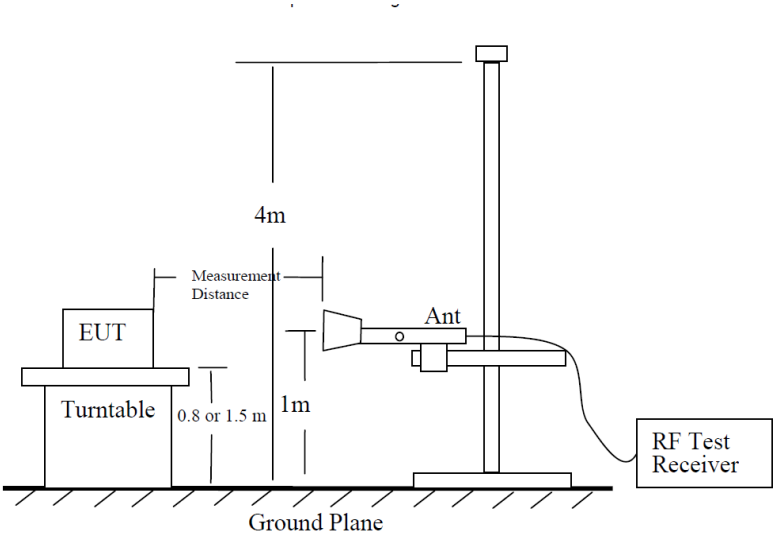


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

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 #:	14040868
Date:	6/7/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	n48 BPSK 40MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl (dB)	172654 HPF (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.139916	27.86	RMS	35.6	-20.6	.6	-95.2	-51.74	-40	-11.74	H
7.139916	25.55	RMS	35.6	-20.6	.6	-95.2	-54.05	-40	-14.05	V
10.710741	25.78	RMS	37.9	-17.1	.5	-95.2	-48.12	-40	-8.12	H
10.710741	24.61	RMS	37.9	-17.1	.5	-95.2	-49.29	-40	-9.29	V
14.279363	23.73	RMS	39.2	-15.9	.7	-95.2	-47.47	-40	-7.47	H
14.279363	22.83	RMS	39.2	-15.9	.7	-95.2	-48.37	-40	-8.37	V
Mid Channel, 3625MHz										
7.250072	26.1	RMS	35.5	-20.5	.6	-95.2	-53.50	-40	-13.50	H
7.250072	28.38	RMS	35.5	-20.5	.6	-95.2	-51.22	-40	-11.22	V
10.875534	23.93	RMS	37.8	-16.7	.5	-95.2	-49.67	-40	-9.67	H
10.875534	24.77	RMS	37.8	-16.7	.5	-95.2	-48.83	-40	-8.83	V
14.500556	25.87	RMS	39.7	-16.5	.8	-95.2	-45.33	-40	-5.33	H
14.500556	24.87	RMS	39.7	-16.5	.8	-95.2	-46.33	-40	-6.33	V
High Channel, 3680MHz										
7.360669	27.46	RMS	35.6	-20.3	.7	-95.2	-51.74	-40	-11.74	H
7.360669	26.2	RMS	35.6	-20.3	.7	-95.2	-53.00	-40	-13.00	V
11.040328	24.64	RMS	37.8	-16.4	.6	-95.2	-48.56	-40	-8.56	H
11.040328	24.86	RMS	37.8	-16.4	.6	-95.2	-48.34	-40	-8.34	V
14.719547	24.35	RMS	39.9	-15.7	.9	-95.2	-45.75	-40	-5.75	V
14.719988	24.08	RMS	39.9	-15.7	.9	-95.2	-46.02	-40	-6.02	H

10.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 7

BPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040868
Date:	6/7/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	N48 BPSK 40MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.140797	26.48	RMS	35.6	-20.6	.6	-95.2	-53.12	-40	-13.12	H
7.140797	25.85	RMS	35.6	-20.6	.6	-95.2	-53.75	-40	-13.75	V
10.710741	25.36	RMS	37.9	-17.1	.5	-95.2	-48.54	-40	-8.54	H
10.710741	24.57	RMS	37.9	-17.1	.5	-95.2	-49.33	-40	-9.33	V
14.279363	24.08	RMS	39.2	-15.9	.7	-95.2	-47.12	-40	-7.12	H
14.280244	23.51	RMS	39.2	-15.9	.7	-95.2	-47.69	-40	-7.69	V
Mid Channel, 3620MHz										
7.250072	29.04	RMS	35.5	-20.5	.6	-95.2	-50.56	-40	-10.56	H
7.250072	27.57	RMS	35.5	-20.5	.6	-95.2	-52.03	-40	-12.03	V
10.875094	24.75	RMS	37.8	-16.7	.5	-95.2	-48.85	-40	-8.85	H
10.875094	24.5	RMS	37.8	-16.7	.5	-95.2	-49.10	-40	-9.10	V
14.502319	24.23	RMS	39.7	-16.5	.8	-95.2	-46.97	-40	-6.97	H
14.5032	24.98	RMS	39.7	-16.5	.8	-95.2	-46.22	-40	-6.22	V
High Channel, 3680MHz										
7.360228	27.31	RMS	35.6	-20.3	.7	-95.2	-51.89	-40	-11.89	H
7.360228	25.5	RMS	35.6	-20.3	.7	-95.2	-53.70	-40	-13.70	V
11.040769	24.61	RMS	37.8	-16.4	.6	-95.2	-48.59	-40	-8.59	H
11.040769	24.52	RMS	37.8	-16.4	.6	-95.2	-48.68	-40	-8.68	V
14.719106	24.47	RMS	39.9	-15.7	.9	-95.2	-45.63	-40	-5.63	H
14.719547	24.41	RMS	39.9	-15.7	.9	-95.2	-45.69	-40	-5.69	V

10.3 FIELD STRENGTH OF SPURIOUS RADIATION, ANT 8

BPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040868
Date:	6/7/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	n48 BPSK 40MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.140797	26.48	RMS	35.6	-20.6	.6	-95.2	-53.12	-40	-13.12	H
7.140797	25.85	RMS	35.6	-20.6	.6	-95.2	-53.75	-40	-13.75	V
10.710741	25.36	RMS	37.9	-17.1	.5	-95.2	-48.54	-40	-8.54	H
10.710741	24.57	RMS	37.9	-17.1	.5	-95.2	-49.33	-40	-9.33	V
14.279363	24.08	RMS	39.2	-15.9	.7	-95.2	-47.12	-40	-7.12	H
14.280244	23.51	RMS	39.2	-15.9	.7	-95.2	-47.69	-40	-7.69	V
Mid Channel, 3620MHz										
7.250072	29.04	RMS	35.5	-20.5	.6	-95.2	-50.56	-40	-10.56	H
7.250072	27.57	RMS	35.5	-20.5	.6	-95.2	-52.03	-40	-12.03	V
10.875094	24.75	RMS	37.8	-16.7	.5	-95.2	-48.85	-40	-8.85	H
10.875094	24.5	RMS	37.8	-16.7	.5	-95.2	-49.10	-40	-9.10	V
14.502319	24.23	RMS	39.7	-16.5	.8	-95.2	-46.97	-40	-6.97	H
14.5032	24.98	RMS	39.7	-16.5	.8	-95.2	-46.22	-40	-6.22	V
High Channel, 3680MHz										
7.360228	27.31	RMS	35.6	-20.3	.7	-95.2	-51.89	-40	-11.89	H
7.360228	25.5	RMS	35.6	-20.3	.7	-95.2	-53.70	-40	-13.70	V
11.040769	24.61	RMS	37.8	-16.4	.6	-95.2	-48.59	-40	-8.59	H
11.040769	24.52	RMS	37.8	-16.4	.6	-95.2	-48.68	-40	-8.68	V
14.719106	24.47	RMS	39.9	-15.7	.9	-95.2	-45.63	-40	-5.63	H
14.719547	24.41	RMS	39.9	-15.7	.9	-95.2	-45.69	-40	-5.69	V

10.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 9

BPSK 5G NR n48 (40.0MHZ BANDWIDTH)

Project #:	14040868
Date:	6/7/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	n48 BPSK 40MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	limit	Margin (dB)	Polarity
Low Channel, 3570MHz										
7.140797	26.48	RMS	35.6	-20.6	.6	-95.2	-53.12	-40	-13.12	H
7.140797	25.85	RMS	35.6	-20.6	.6	-95.2	-53.75	-40	-13.75	V
10.710741	25.36	RMS	37.9	-17.1	.5	-95.2	-48.54	-40	-8.54	H
10.710741	24.57	RMS	37.9	-17.1	.5	-95.2	-49.33	-40	-9.33	V
14.279363	24.08	RMS	39.2	-15.9	.7	-95.2	-47.12	-40	-7.12	H
14.280244	23.51	RMS	39.2	-15.9	.7	-95.2	-47.69	-40	-7.69	V
Mid Channel, 3620MHz										
7.250072	29.04	RMS	35.5	-20.5	.6	-95.2	-50.56	-40	-10.56	H
7.250072	27.57	RMS	35.5	-20.5	.6	-95.2	-52.03	-40	-12.03	V
10.875094	24.75	RMS	37.8	-16.7	.5	-95.2	-48.85	-40	-8.85	H
10.875094	24.5	RMS	37.8	-16.7	.5	-95.2	-49.10	-40	-9.10	V
14.502319	24.23	RMS	39.7	-16.5	.8	-95.2	-46.97	-40	-6.97	H
14.5032	24.98	RMS	39.7	-16.5	.8	-95.2	-46.22	-40	-6.22	V
High Channel, 3680MHz										
7.360228	27.31	RMS	35.6	-20.3	.7	-95.2	-51.89	-40	-11.89	H
7.360228	25.5	RMS	35.6	-20.3	.7	-95.2	-53.70	-40	-13.70	V
11.040769	24.61	RMS	37.8	-16.4	.6	-95.2	-48.59	-40	-8.59	H
11.040769	24.52	RMS	37.8	-16.4	.6	-95.2	-48.68	-40	-8.68	V
14.719106	24.47	RMS	39.9	-15.7	.9	-95.2	-45.63	-40	-5.63	H
14.719547	24.41	RMS	39.9	-15.7	.9	-95.2	-45.69	-40	-5.69	V

11 SETUP PHOTOS

Please refer to 14790383-EP5V1 Setup Photo Report for setup photos

END OF REPORT