

TEST REPORT

Report Number. : R14777389-E5

Applicant : Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075, Japan

FCC ID : PY7-95649X

EUT Description : GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC

Test Standard(s) : FCC CFR 47 Part 2, Part 22, Part 24, and Part 27.

Date Of Issue:
2023-08-16

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-07-21	Initial Review	Noah Bennett
V2	2023-08-16	Customer Feedback: -Removed n41 70MHz BW Test Data as EUT does not support	Noah Bennett

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Sony Corporation
 1-7-1 Konan Minato-ku
 Tokyo, 108-0075, Japan

EUT DESCRIPTION: GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC

SERIAL NUMBER: QV7700HBHQ, QV77005VHQ, QV77005ZHQ, QV7700DHHQ, QV7700E5G9

SAMPLE RECEIPT DATE: 2023-06-15

DATE TESTED: 2023-07-06 to 2023-07-18

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 2	Complies
CFR 47 Part 22	Complies
CFR 47 Part 24	Complies
CFR 47 Part 27	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.

Approved & Released For
UL LLC. By:



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2. SUMMARY OF TEST RESULTS

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

Below is a list of the data provided by the customer:

- 1) Antenna gain and type (see section 6.4)
- 2) Cable loss (see section 6.2,8,9)
- 3) Supported bands, bandwidths and modulations (see section 6.5)
- 4) Model Differences (see section 7)

Requirement Description	Band	Requirement Clause Number (FCC)	Result	Remarks
Effective Radiated Power	5	22.913 (a)(5)	Compliant	None.
Equivalent Isotropic Radiated Power	66	27.50 (d) (4)		
	41	27.50 (h) (2)		
Requirement Description	Requirement Clause Number (FCC)		Result	Remarks
Occupied Bandwidth	2.1049		Compliant	None.
Band Edge and Emission Mask	2.1051, 22.917 (a), 27.53 (g), (c), (m)(4), (h)			
Out of Band Emissions	2.1051, 22.917 (a), 27.53 (g), (c), (m)(4), (h)			
Frequency Stability	2.1055, 22.355, 27.54,			
Peak-to-Average Ratio	22.913 (d), 27.50 (d) (5)			
Field Strength of Spurious Radiation	2.1051, 22.917 (a), 27.53 (g), (c), (m)(4), (h)			

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 22, Part 24 and Part 27.
- [FCC KDB 971168 D01 v03r01](#): Power Meas License Digital Systems
- [FCC KDB 971168 D02 v02r02](#): Misc Rev Approv License Devices
- [FCC KDB 412172 D01 v01r01](#). Determining ERP and EIRP

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, 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
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

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}
Radio Frequency (Spectrum Analyzer)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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 EUT is a GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC. This report covers WWAN testing.

6.2. MAXIMUM OUTPUT POWER

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015

KDB 971168 D01 Section 5.6

ERP/EIRP = P_{Meas} + GT - LC

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

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

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:

5G NR n5

Part 22H								
ERP Limit (W)		7.00						
Antenna Gain (dBi)		-5.51						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	826.5	846.5	21.82	14.16	0.026	4465.3	4M47G7W
	16QAM			20.87	13.21	0.021	4465.1	4M47D7W
10.0	QPSK	829.0	844.0	21.85	14.19	0.026	8938.5	8M94G7W
	16QAM			20.96	13.30	0.021	8993.3	8M99D7W
15.0	QPSK	831.5	841.5	21.99	14.33	0.027	13416	13M4G7W
	16QAM			20.95	13.29	0.021	13385	13M4D7W
20.0	QPSK	834.0	839.0	21.96	14.30	0.027	17922	17M9G7W
	16QAM			20.99	13.33	0.022	17823	17M8D7W

5G NR n41

Part 27								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		-3.95						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
20.0	QPSK	2506.5	2680.0	19.44	15.49	0.035	17820	17M8G7W
	16QAM			18.43	14.48	0.028	17888	17M9D7W
30.0	QPSK	2511.0	2675.0	19.46	15.51	0.036	26764	26M8G7W
	16QAM			18.94	14.99	0.032	26758	26M8D7W
40.0	QPSK	2516.0	2670.0	19.51	15.56	0.036	35650	35M7G7W
	16QAM			18.55	14.60	0.029	35811	35M8D7W
50.0	QPSK	2521.0	2665.0	19.35	15.40	0.035	45637	45M6G7W
	16QAM			18.41	14.46	0.028	45577	45M6D7W
60.0	QPSK	2526.0	2660.0	19.90	15.95	0.039	57732	57M7G7W
	16QAM			18.80	14.85	0.031	57855	57M9D7W
80.0	QPSK	2536.0	2650.0	19.61	15.66	0.037	77181	77M2G7W
	16QAM			18.77	14.82	0.030	77073	77M1D7W
90.0	QPSK	2541.0	2645.0	19.80	15.85	0.038	86677	86M7G7W
	16QAM			18.86	14.91	0.031	86659	86M7D7W
100.0	QPSK	2546.0	2640.0	19.97	16.02	0.040	96169	96M2G7W
	16QAM			18.95	15.00	0.032	96357	96M4D7W

5G NR n66

Part 27								
EIRP Limit (W)		1.00						
Antenna Gain (dBi)		-4.51						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	1712.5	1777.5	18.78	14.27	0.027	4488.1	4M49G7W
	16QAM			17.18	12.67	0.018	4476.9	4M48D7W
10.0	QPSK	1715.0	1775.0	18.70	14.19	0.026	8961.7	8M96G7W
	16QAM			17.75	13.24	0.021	8967.5	8M97D7W
15.0	QPSK	1717.5	1772.5	18.93	14.42	0.028	13481	13M5G7W
	16QAM			17.77	13.26	0.021	13469	13M5D7W
20.0	QPSK	1720.0	1770.0	18.86	14.35	0.027	17895	17M9G7W
	16QAM			17.67	13.16	0.021	17917	17M9D7W

LTE BAND 66 – Sub Antenna

Part 27								
EIRP Limit (W)		1.00						
Antenna Gain (dBi)		-2.44						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	1710.7	1779.3	16.80	14.36	0.027	1092.9	1M09G7W
	16QAM			17.00	14.56	0.029	1100.6	1M10D7W
3.0	QPSK	1711.5	1778.5	16.90	14.46	0.028	2713.4	2M71G7W
	16QAM			17.00	14.56	0.029	2709.5	2M71D7W
5.0	QPSK	1712.5	1777.5	16.90	14.46	0.028	4480.4	4M48G7W
	16QAM			17.00	14.56	0.029	4486.2	4M49D7W
10.0	QPSK	1715.0	1775.0	16.60	14.16	0.026	8965.2	8M97G7W
	16QAM			16.80	14.36	0.027	8991.1	8M99D7W
15.0	QPSK	1717.5	1772.5	16.40	13.96	0.025	13442	13M4G7W
	16QAM			16.70	14.26	0.027	13443	13M4D7W
20.0	QPSK	1720.0	1770.0	17.00	14.56	0.029	17909	17M9G7W
	16QAM			17.00	14.56	0.029	17906	17M9D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 2.79 for Conducted and radiated samples.

6.4. MAXIMUM ANTENNA GAIN

The antenna(s) gain as provided by the manufacturer' are as follows:

LTE Bands	Frequency Range (MHz)	Main 1 Antenna Gain (dBi)	Main 2 Antenna Gain (dBi)	Cell Sub Antenna Gain (dBi)
GSM850, WCDMA B5, LTE Band 5, 5G NR n5	824 – 849	-5.31		
GSM1900	1850 - 1910		-3.95	
LTE Band 12, LTE Band 17	699 – 716	-5.15		
LTE Band 13	777 – 787	-4.52		
LTE Band 41, 5G NR n41	2496 – 2690		-1.17	
LTE Band 4, LTE Band 66, 5G NR n66	1710 – 1780		-2.88	-7.75

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT supports the following GSM, WCDMA, LTE and 5G NRs:

GSM850, GSM1900, WCDMA Band 5, LTE Band 4, LTE Band 5, LTE Band 12, LTE Band 13, LTE Band 17, LTE Band 41, LTE Band 66, 5G NR n5, 5G NR n41 and 5G NR n66.

LTE Band 4 (1710-1755MHz, 1.4/3/5/10/15/20MHz bandwidth) is covered by LTE Band 66 because it is a subset of LTE band 66 and they have same output power.

LTE Band 17 (704-716MHz, 1.4/3/5/10MHz bandwidth) is covered by LTE Band 12 because it is a subset of LTE band 12 and they have same output power.

For LTE Band 66 on the Sub antenna, the EUT only supports full power while connected to 5G FR1 NSA Mode DC_66A_n41A. Therefore, testing on the Sub antenna may have an n41 fundamental visible, that is to be ignored against any test limits.

The worst-case scenario for all measurements is based on conducted average power on different modulations. Output power measurements were measured on Rel 99, HSDPA, and HSUPA for WCDMA, QPSK, 16QAM, and 64QAM modulations for LTE, and BPSK, QPSK, 16QAM, 64QAM, and 256QAM for 5G FR1. The following was found as worst case. Therefore, all testing was done in these modes only.

Technology	Modulation
GSM850/1900	GPRS
WCDMA5	Rel 99
LTE (B5, B12, B13)	64QAM
LTE (B41, B66 Main Ant)	16QAM
LTE (B66 Sub Ant)	QPSK
5G FR1	QPSK

For 5G FR1, the manufacturer has declared that DFTs-OFDM was worst case for all 5G FR1 bands. Therefore, all testing was performed in DFTs-OFDM Waveform mode.

Per Customer declaration, 5G NR n41 does not support the 70MHz BW Config, therefore, it is not reported.

The EUT was investigated in three orthogonal orientations X/Y/Z on both Low Band (Fundamental Below 1GHz) Mid Band (Fundamental between 1-3GHz) and High Band (Fundamental above 3GHz) for both the Main Antennas and the Sub antenna. For Sim Tx scans in which there are two or more Fc ranges with different WC orientations, scans were performed in both orientations, and the Worst-Case margin scan was reported as below:

Band (Frequency)	Antenna	Orientation
Low Band (Fc<1GHz)	Main	X
Mid Band (1GHz<Fc<3GHz)		Z
Mid Band (1GHz<Fc<3GHz)	Cell Sub	Z
BT (For Sim Tx)	BT C0/C1	X/Y
5 WLAN (For Sim Tx)	WLAN Main	Y

The EUT was tested while connected to AC Lines via charging cable and brick to represent worst case emissions. Worst Case emissions from 9kHz-30Mhz, 30-1000MHz, and 18-26.5GHz were done on the modes with the highest conducted average power. Only Emissions within 20dB were reported.

The following scans were investigated for simultaneous transmission:

Scan #	Mode	Mode	Mode
1	LTE B66 1745MHz 20MHz RB1-49	2441MHz BT GFSK C0	5240MHz 11ax HE20 SU MIMO
2	LTE B66 1745MHz 20MHz RB1-49	2441MHz BT GFSK C1	5240MHz 11ax HE20 SU MIMO
3	LTE B66 1745MHz 20MHz RB1-49	2442MHz 11g 6Mbps MIMO	
4	LTE B41 2620MHz 20MHz RB1-49	5240MHz 11ax HE20 SU MIMO	
5	LTE B12 704MHz 10MHz RB1-24	2462MHz 11g 6Mbps MIMO	

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adaptor	Sony	XQZ-UC1	1821W34209742	NA
Headphones	Sony	MDR-EX15AP	NA	NA

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB-C	1	USB-C	Shielded	<3m	XQZ-UB1 AI-0164
2	Aux	1	AUX	Shielded	<3m	

Test Setup

The EUT was connected to a base station simulator and set to transmit at max power for GSM/WCDMA/LTE testing. For 5G FR1 testing, Factory Test Mode software was used.

Setup Diagram

Please see R14777389-EP4 for Setup Diagrams and Setup Photos.

7. REUSE OF TEST DATA

7.1. INTRODUCTION

According to the manufacturer the major change between FCC ID: PY7-76732V (Lead Model), and FCC ID: PY7-95649X (This Model) is changing band configuration by software. The FCC ID: PY7-76732V (Lead Model) conducted test data shall remain representative of FCC ID: PY7-95649X so, FCC ID: PY7-95649X (This Model) leverages conducted test data from FCC ID: PY7-76732V (Lead Model).

The applicant takes full responsibility that the test data as referenced in this section represents compliance for this FCC ID.

7.2. DEVICE DIFFERENCES

Difference between PY7-76732V (Lead Model), and FCC ID: PY7-95649X (This Model):

Sony Corporation hereby declares that the PCB layout, components, and all antennas identical between PY7-76732V (lead model), and PY7-95649X (This Model). Therefore, the following conducted output power of licensed band for PY7-76732V can be re-used to PY7-95649X.

7.3. REFERENCE DETAIL

Equipment Class	Reference FCC ID	Report Title	Referenced Testing
Licensed (WWAN)	PY7-76732V	R14777340-E11 v2 FCC WWAN REPORT	GSM850/1900; WCDMA5; LTE5/12/13/41/66

*Notes:

1. Full radiated testing was done on all 5G, LTE, WCDMA and GSM Bands to confirm that the parent model is representative for the variant model.
2. Power spot-checks were performed on all bands at mid channel at worst-case modulations to verify EUT compliance under customer tune-up. See the following section for power spot-checks.

7.4. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device PY7-53752E for Conducted output power. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary.

PY7-95649X SPOT CHECK RESULTS						
Technology	RB/Mode	Data Rate	Measured Frequency (MHz)	PY7-76732V	PY7-95649X	Delta (dB) <+3dB
				Conducted Output Power (dBm)	Conducted Output Power (dBm)	Margin
GSM850	N/A	GPRS	836.6	31.82	31.61	0.21
		EGPRS		26.84	26.85	-0.01
GSM1900	N/A	GPRS	1880.0	27.10	26.77	0.33
		EGPRS		26.11	26.23	-0.12
WCDMA5	Subtest 1	REL 99	836.6	21.88	21.97	-0.09
		HSDPA		20.88	20.90	-0.02
LTE 5	50-0	QPSK	836.5	20.84	20.80	0.04
		64QAM		20.46	20.91	-0.45
LTE 12	50-0	QPSK	707.5	20.96	20.82	0.14
		64QAM		20.47	20.80	-0.33
LTE 13	50-0	QPSK	782.0	20.91	20.88	0.03
		64QAM		20.37	20.79	-0.42
LTE 41	100-0	QPSK	2593	18.96	19.06	-0.1
		16QAM		18.95	18.98	-0.03
LTE 66	100-0	QPSK	1745	18.01	17.32	0.69
		16QAM		18.00	17.31	0.69

8. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Common Equipment					
210642	Environmental Meter	Fisher Scientific	15-077-963	2021-08-16	2023-08-16
Conducted Room 2					
HI0090	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
135123	RF Power Meter	Keysight Technologies	N1911A	2022-09-10	2023-09-10
90779	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2023-04-03	2024-04-03
PWS016	Real-Time Peak Power Sensor	Boonton	RTP5008	2022-11-07	2023-11-07
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
SOFTEMI	Conducted Licensed Test Software	UL	Version 4.0 b-ph	NA	NA
Conducted Room 1					
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-31
210642	Environmental Meter	Fisher Scientific	15-077-963	2021-08-16	2023-08-16
90410	Spectrum Analyzer	Keysight Technologies	N9030A	2023-06-14	2024-06-14
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
SOFTEMI	Conducted Licensed Test Software	UL	Version 4.0 b-ph	NA	NA
213025	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500	2022-12-08	2023-12-08
207620	Wideband Radio Communications Tester	Anritsu	MT8821C	2022-07-03	2023-07-03
207618	Radio Communications Test Set	Anritsu	MT8000A	NA	NA

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.
- No measurements were taken from Equipment ID 207618, as it was only used for signaling.

Test Equipment Used - Wireless Conducted Attenuators, Cables, and Couplers

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
Common Equipment					
Attenuators					
226564	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
226565	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
Cables					
CBL012	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB293C-0-2400-300300	2023-01-05	2024-01-05
CBL098	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-02-17	2024-02-17
CBL101	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-01-24	2024-01-24
CBL105	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB-197C-0-0160-300300	2023-02-17	2024-02-17

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	0.009-30MHz				
8939	Passive Loop Antenna	EMCO	EM-6872	2022-07-12	2023-07-31
8940	Passive Loop Antenna	EMCO	EM-6871	2022-07-12	2023-07-31
	30-1000 MHz				
90627	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2022-09-07	2023-09-07
	1-18 GHz				
88761	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-09-13	2023-09-13
	18-40 GHz				
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-626	2022-07-11	2023-07-11
204705	Horn Antenna, 26-40GHz	Com-Power	AH-640	2022-07-11	2023-07-11
	Gain-Loss Chains				
91975	Gain-loss string: 0.009-30MHz	Various	Various	2023-06-06	2024-06-06
91978	Gain-loss string: 25-1000MHz	Various	Various	2023-06-06	2024-06-06
91977	Gain-loss string: 1-18GHz	Various	Various	2023-06-06	2024-06-06
136042	Gain-loss string: 18-40GHz	Various	Various	2023-06-06	2024-06-06
	Receiver & Software				
72823	Spectrum Analyzer	Agilent	E4446A	2022-06-30	2023-06-30
90416	Spectrum Analyzer	Keysight	N9030A	2023-06-09	2024-06-30
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
200540	Environmental Meter	Fisher Scientific	15-077-963 s/n 181474409	2022-10-05	2023-10-05
208721	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2024-06-06	2024-06-06
82635 (HPF009)	1GHz high-pass filter, 2W, Fhigh =10GHz	Micro-Tronics	HPM17672	2023-02-15	2024-02-29
169108 (BRF010)	1.85-1.97GHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50714-01	2023-02-15	2024-02-29
231408 (BRF011)	2.495-2.690GHz notch filter, 2W, Fhigh = 18GHz	Micro-Tronics	BRM50709-01	2023-02-15	2024-02-29
77412 (BRF001)	900MHz notch filter, 2W, Fhigh =6GHz	Micro-Tronics	BRM50706	2023-02-15	2024-02-29

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	0.009-30MHz				
135144	Active Loop Antenna	ETS-Lindgren	6502	2023-01-17	2024-01-17
	Gain-Loss Chains				
207638	Gain-loss string: 0.009-30MHz	Various	Various	2023-05-17	2024-05-17
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-04-10	2024-04-10
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
21642	Environmental Meter	Fisher Scientific	15-077-963 (s/n 210701692)	2021-08-16	2023-08-16
213025	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2022-12-08	2023-12-08

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 1)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-04-06	2024-04-06
	Gain-Loss Chains				
91979	Gain-loss string: 1-18GHz	Various	Various	2023-05-16	2024-05-16
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-02-02	2024-02-02
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
200539	Environmental Meter	Fisher Scientific	15-077-963 s/n 18474341	2022-10-05	2023-10-05
207619	Wideband Radio Communications Tester	Anritsu	MT8821C	2022-06-21	2023-06-21
169106 (BRF008)	1710-1785MHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50713-01	2023-02-15	2024-02-29
77836 (HPF004)	1GHz high-pass filter, 2W, Fhigh = 18GHz	Micro-Tronics	HPM50115-01	2023-02-15	2024-02-29
231408 (BRF011)	2.495-2.690GHz notch filter, 2W, Fhigh = 18GHz	Micro-Tronics	BRM50709-01	2023-02-15	2024-02-29
77414 (BRF003)	2.4GHz notch filter, 2W, Fhigh = 18GHz	Micro-Tronics	BRM50702	2023-02-15	2024-02-29

NOTES:

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

9. RF OUTPUT POWER VERIFICATION

9.1. LTE & 5G NR

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 TS 36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). 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 TS 36.101.

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 following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS 38.521-1 specification.

The allowed MPR for SRS, PUCCH formats 0, 1, 3 and 4, and PRACH shall be as specified for QPSK modulated DFTs-

OFDM of equivalent RB allocation. The allowed MPR for PUCCH format 2 shall be as specified for QPSK modulated CP-OFDM of equivalent RB allocation.

Table 6.2.3-1: Maximum power reduction (MPR) for power class 3

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	$\leq 3.5^1$	$\leq 1.2^1$	$\leq 0.2^1$
		$\leq 0.5^2$		0^2
	Pi/2 BPSK w Pi/2 BPSK DMRS	$\leq 0.5^2$	0^2	
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40% of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

AVERAGE OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with directional coupler connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter.

PEAK OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with directional coupler connected to a power meter via wideband peak power sensor. Peak output power was read directly from power meter.

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:

9.1.1. 5G NR n5

Test Engineer ID:	84740/44389 85502/44389	Test Date:	2023-07-05 2023-07-11	EUT Serial Number:	QV77005ZHQ
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OUTPUT POWER FOR 5G NR n5 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				165300	167300	169300
				826.5 MHz	836.5 MHz	846.5 MHz
5.0	π/2 BPSK	1	1	21.74	21.77	21.77
		1	12	21.73	21.65	21.78
		1	23	21.69	21.67	21.75
		12	0	21.75	21.69	21.79
		12	6	21.68	21.68	21.76
		12	12	21.72	21.70	21.73
		25	0	21.71	21.66	21.71
	QPSK	1	1	21.80	21.82	21.69
		1	12	21.72	21.78	21.78
		1	23	21.67	21.78	21.73
		12	0	21.74	21.73	21.70
		12	6	21.66	21.65	21.67
		12	12	21.75	21.69	21.73
		25	0	21.76	21.71	21.72
	16QAM	1	1	20.60	20.81	20.72
		1	12	20.54	20.71	20.67
		1	23	20.66	20.82	20.74
		12	0	20.85	20.79	20.77
		12	6	20.81	20.76	20.76
		12	12	20.81	20.87	20.78
		25	0	20.73	20.83	20.77
	64QAM	1	1	19.13	19.25	19.51
		1	12	19.06	19.19	19.44
		1	23	19.14	19.34	19.42
		12	0	19.35	19.21	19.43
		12	6	19.30	19.16	19.36
		12	12	19.32	19.28	19.39
		25	0	19.23	19.28	19.29
	256QAM	1	1	17.08	17.06	17.02
		1	12	17.01	17.11	17.02
1		23	17.16	17.14	17.08	
12		0	17.26	17.35	17.32	
12		6	17.22	17.25	17.29	
12		12	17.41	17.39	17.24	
25		0	17.32	17.38	17.32	

OUTPUT POWER FOR 5G NR n5 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				165800	167300	168800
				829 MHz	836.5 MHz	844 MHz
10.0	π/2 BPSK	1	1	21.73	21.77	21.73
		1	25	21.60	21.81	21.78
		1	50	21.70	21.74	21.78
		25	0	21.63	21.71	21.68
		25	12	21.71	21.64	21.75
		25	25	21.66	21.75	21.74
		50	0	21.69	21.70	21.78
	QPSK	1	1	21.75	21.74	21.75
		1	25	21.71	21.74	21.67
		1	50	21.64	21.72	21.77
		25	0	21.74	21.81	21.75
		25	12	21.67	21.70	21.81
		25	25	21.73	21.85	21.82
		50	0	21.80	21.78	21.83
	16QAM	1	1	20.53	20.87	20.87
		1	25	20.57	20.96	20.88
		1	50	20.55	20.86	20.90
		25	0	20.60	20.78	20.87
		25	12	20.65	20.79	20.87
		25	25	20.66	20.82	20.79
		50	0	20.74	20.74	20.82
	64QAM	1	1	19.39	19.34	19.44
		1	25	19.40	19.27	19.10
		1	50	19.39	19.36	19.02
		25	0	19.28	19.26	19.32
		25	12	19.33	19.32	19.29
		25	25	19.29	19.26	19.27
		50	0	19.28	19.22	19.34
	256QAM	1	1	17.08	17.18	17.39
		1	25	17.04	17.18	17.01
		1	50	17.03	17.09	17.43
		25	0	17.33	17.30	17.28
		25	12	17.28	17.33	17.32
		25	25	17.26	17.30	17.23
		50	0	17.34	17.33	17.31

OUTPUT POWER FOR 5G NR n5 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				166300	167300	168300
				831.5 MHz	836.5 MHz	841.5 MHz
15.0	π/2 BPSK	1	1	21.85	21.96	21.97
		1	39	21.96	21.98	21.85
		1	77	21.92	21.81	21.85
		36	0	21.85	21.80	21.86
		36	18	21.80	21.83	21.80
		36	36	21.76	21.81	21.75
		75	0	21.95	21.95	21.85
	QPSK	1	1	21.86	21.99	21.50
		1	39	21.94	21.45	21.98
		1	77	21.93	21.83	21.84
		36	0	21.88	21.93	21.91
		36	18	21.98	21.90	21.87
		36	36	21.92	21.86	21.83
		75	0	21.97	21.93	21.88
	16QAM	1	1	20.95	20.56	20.85
		1	39	20.61	20.60	20.87
		1	77	20.94	20.55	20.77
		36	0	20.89	20.92	20.92
		36	18	20.81	20.84	20.74
		36	36	20.86	20.88	20.86
		75	0	20.90	20.92	20.77
	64QAM	1	1	19.42	19.07	19.28
		1	39	19.47	19.06	19.18
		1	77	19.37	19.07	19.11
		36	0	19.48	19.02	19.30
		36	18	19.46	19.43	19.43
		36	36	19.44	19.41	19.33
		75	0	19.50	19.50	19.31
	256QAM	1	1	17.17	17.35	17.46
		1	39	17.15	17.25	17.46
1		77	17.04	17.31	17.32	
36		0	17.38	17.48	17.23	
36		18	17.47	17.38	17.17	
36		36	17.35	17.32	17.26	
75		0	17.49	17.41	17.30	

OUTPUT POWER FOR 5G NR n5 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				166800	167300	167800
				834 MHz	836.5 MHz	839 MHz
20.0	π/2 BPSK	1	1	21.87	21.92	21.85
		1	52	21.85	21.87	21.97
		1	104	21.74	21.71	21.87
		50	0	21.86	21.91	21.85
		50	25	21.93	12.94	21.94
		50	50	21.97	21.92	21.82
		100	0	21.89	21.87	21.92
	QPSK	1	1	21.90	21.92	21.87
		1	52	21.87	21.68	21.93
		1	104	21.83	21.84	21.85
		50	0	21.88	21.92	21.90
		50	25	21.90	21.46	21.96
		50	50	21.93	21.92	21.87
		100	0	21.88	21.82	21.44
	16QAM	1	1	20.94	20.56	20.69
		1	52	20.95	20.56	20.63
		1	104	20.96	20.97	20.61
		50	0	20.90	20.93	20.94
		50	25	20.94	20.93	20.88
		50	50	20.91	20.82	20.97
		100	0	20.99	20.90	20.91
	64QAM	1	1	19.26	19.17	19.15
		1	52	19.28	19.06	19.12
		1	104	19.26	19.07	19.04
		50	0	19.38	19.43	19.46
		50	25	19.40	19.42	19.40
		50	50	19.33	19.27	19.41
		100	0	19.44	19.35	19.40
	256QAM	1	1	17.21	17.45	17.16
		1	52	17.17	17.31	17.09
1		104	17.28	17.39	17.11	
50		0	17.46	17.44	17.37	
50		25	17.42	17.38	17.39	
50		50	17.30	17.32	17.44	
100		0	17.49	17.43	17.36	

9.1.2. 5G NR n41

Test Engineer ID:	84740/44389	Test Date:	2023-07-07	EUT Serial Number:	QV77005VHQ
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OUTPUT POWER FOR 5G NR n41 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				501198	518598	535998
				2505.99 MHz	2592.99 MHz	2679.99 MHz
20.0	π/2 BPSK	1	1	19.42	19.35	19.33
		1	25	19.28	19.41	19.29
		1	49	19.34	19.39	19.28
		25	0	19.39	19.31	19.36
		25	12	19.35	19.41	19.32
		25	25	19.37	19.39	19.28
		50	0	19.34	19.37	19.26
	QPSK	1	1	19.29	19.33	19.35
		1	25	19.26	19.39	19.34
		1	49	19.27	19.43	19.26
		25	0	19.33	19.29	19.26
		25	12	19.40	19.44	19.31
		25	25	19.33	19.38	19.27
		50	0	19.38	19.30	19.23
	16QAM	1	1	18.22	18.36	18.12
		1	25	18.14	18.27	18.13
		1	49	18.18	18.33	18.05
		25	0	18.34	18.30	18.17
		25	12	18.32	18.36	18.23
		25	25	18.28	18.34	18.18
		50	0	18.36	18.43	18.27
	64QAM	1	1	17.38	17.22	17.18
		1	25	17.34	17.12	17.25
		1	49	17.36	17.08	17.18
		25	0	17.40	17.23	17.35
		25	12	17.36	17.39	17.29
		25	25	17.35	17.36	17.28
		50	0	17.26	17.34	17.28
	256QAM	1	1	15.00	14.73	15.01
		1	25	15.08	14.82	14.95
1		49	15.01	14.75	14.88	
25		0	15.36	15.31	15.29	
25		12	15.31	15.37	15.24	
25		25	15.30	15.33	15.29	
50		0	15.24	15.26	15.21	

OUTPUT POWER FOR 5G NR n41 (30.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				502200	518598	534996
				2511 MHz	2592.99 MHz	2674.98 MHz
30.0	π/2 BPSK	1	1	19.43	19.17	19.30
		1	38	19.28	19.22	19.25
		1	76	19.40	19.33	19.37
		36	0	19.34	19.14	19.17
		36	18	19.31	19.24	19.17
		36	36	19.32	19.29	19.31
		75	0	19.30	19.24	19.24
	QPSK	1	1	19.45	19.23	19.20
		1	38	19.37	19.26	19.18
		1	76	19.46	19.37	19.22
		36	0	19.32	19.19	19.21
		36	18	19.34	19.24	19.20
		36	36	19.28	19.37	19.23
		75	0	19.30	19.25	19.25
	16QAM	1	1	18.84	18.79	18.85
		1	38	18.71	18.73	18.76
		1	76	18.74	18.94	18.84
		36	0	18.91	18.65	18.67
		36	18	18.81	18.65	18.75
		36	36	18.89	18.78	18.80
		75	0	18.87	18.60	18.73
	64QAM	1	1	17.30	17.20	17.21
		1	38	17.28	17.26	17.22
		1	76	17.31	17.40	17.28
		36	0	17.33	17.27	17.33
		36	18	17.34	17.38	17.27
		36	36	17.35	17.40	17.30
		75	0	17.27	17.35	17.37
	256QAM	1	1	15.07	15.03	14.95
		1	38	14.95	15.03	14.99
1		76	15.00	15.19	14.97	
36		0	15.23	15.15	15.25	
36		18	15.23	15.20	15.15	
36		36	15.32	15.24	15.25	
75		0	15.35	15.30	15.23	

OUTPUT POWER FOR 5G NR n41 (40.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				503196	518598	533994
				2515.98 MHz	2592.99 MHz	2669.97 MHz
40.0	π/2 BPSK	1	1	19.50	19.28	19.31
		1	52	19.34	19.18	19.24
		1	104	19.40	19.44	19.27
		50	0	19.33	19.15	19.15
		50	25	19.37	19.24	19.17
		50	50	19.35	19.28	19.19
		100	0	19.27	19.23	19.19
	QPSK	1	1	19.50	19.24	19.36
		1	52	19.40	19.19	19.26
		1	104	19.46	19.39	19.28
		50	0	19.51	19.16	19.29
		50	25	19.28	19.23	19.28
		50	50	19.36	19.28	19.24
		100	0	19.23	19.18	19.18
	16QAM	1	1	18.49	18.20	18.19
		1	52	18.28	18.19	18.08
		1	104	18.37	18.42	18.11
		50	0	18.55	18.15	18.20
		50	25	18.29	18.17	18.26
		50	50	18.36	18.24	18.15
		100	0	18.34	18.23	18.24
	64QAM	1	1	17.23	17.36	17.28
		1	52	17.04	17.42	17.13
		1	104	17.07	17.06	17.19
		50	0	17.32	17.30	17.24
		50	25	17.27	17.16	17.23
		50	50	17.33	17.28	17.24
		100	0	17.36	17.26	17.15
	256QAM	1	1	15.37	14.89	14.86
		1	52	15.23	14.92	14.83
1		104	15.25	15.02	14.85	
50		0	15.26	15.27	15.24	
50		25	15.30	15.30	15.22	
50		50	15.35	15.34	15.30	
100		0	15.26	15.28	15.20	

OUTPUT POWER FOR 5G NR n41 (50.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				504198	518598	532998
				2520.99 MHz	2592.99 MHz	2664.99 MHz
50.0	π/2 BPSK	1	1	19.29	18.98	19.19
		1	66	19.31	19.11	19.16
		1	131	19.25	19.26	19.16
		64	0	19.34	19.14	19.19
		64	32	19.24	19.16	19.06
		64	64	19.24	19.20	19.13
		128	0	19.25	19.12	19.10
	QPSK	1	1	19.35	18.94	19.24
		1	66	19.34	19.22	19.26
		1	131	19.32	19.25	19.30
		64	0	19.29	19.07	19.12
		64	32	19.28	19.18	19.07
		64	64	19.19	19.17	19.05
		128	0	19.19	19.07	19.00
	16QAM	1	1	18.27	18.14	17.97
		1	66	18.35	18.22	17.96
		1	131	18.35	18.41	17.99
		64	0	18.26	18.01	18.14
		64	32	18.19	18.13	18.14
		64	64	18.16	18.14	18.22
		128	0	18.18	18.09	18.06
	64QAM	1	1	17.28	17.08	17.18
		1	66	17.26	17.15	17.25
		1	131	17.17	17.21	17.30
		64	0	17.23	17.05	17.12
		64	32	17.25	17.10	17.13
		64	64	17.17	17.18	17.15
		128	0	17.18	17.03	17.11
	256QAM	1	1	15.27	14.74	15.00
		1	66	15.13	14.98	14.80
1		131	15.18	14.98	14.95	
64		0	15.18	15.14	15.18	
64		32	15.13	15.01	15.15	
64		64	15.12	15.14	15.16	
128		0	15.13	15.01	15.10	

OUTPUT POWER FOR 5G NR n41 (60.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				505200	518598	531996
				2526 MHz	2592.99 MHz	2659.98 MHz
60.0	π/2 BPSK	1	1	19.93	19.64	19.76
		1	80	19.90	19.70	19.66
		1	160	19.77	19.77	19.54
		81	0	19.78	19.60	19.58
		81	40	19.90	19.64	19.60
		81	81	19.87	19.75	19.58
		162	0	19.80	19.73	19.42
	QPSK	1	1	19.81	19.55	19.64
		1	80	19.72	19.73	19.65
		1	160	19.67	19.73	19.48
		81	0	19.80	19.57	19.56
		81	40	19.79	19.76	19.48
		81	81	19.77	19.90	19.56
		162	0	19.83	19.54	19.41
	16QAM	1	1	18.45	18.26	18.16
		1	80	18.49	18.46	18.21
		1	160	18.77	18.80	18.57
		81	0	18.47	18.29	18.05
		81	40	18.47	18.61	18.09
		81	81	18.51	18.68	18.05
		162	0	18.47	18.29	18.03
	64QAM	1	1	17.21	16.76	16.64
		1	80	17.16	17.13	16.62
		1	160	17.05	17.47	16.50
		81	0	17.36	17.10	17.04
		81	40	17.34	17.32	17.02
		81	81	17.30	17.40	17.07
		162	0	17.17	17.30	16.85
	256QAM	1	1	15.25	15.18	14.93
		1	80	15.17	15.45	14.87
1		160	15.07	15.16	14.82	
81		0	14.96	15.02	14.42	
81		40	14.90	15.36	14.42	
81		81	14.93	15.00	14.42	
162		0	15.37	15.06	14.39	

OUTPUT POWER FOR 5G NR n41 (80.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				507198	518598	529998
				2535.99 MHz	2592.99 MHz	2649.99 MHz
80.0	π/2 BPSK	1	1	19.55	19.46	19.53
		1	108	19.52	19.48	19.52
		1	215	19.43	19.55	19.40
		108	0	19.61	19.35	19.44
		108	54	19.54	19.37	19.40
		108	108	19.46	19.38	19.44
		216	0	19.47	19.28	19.30
	QPSK	1	1	19.61	19.42	19.45
		1	108	19.53	19.55	19.40
		1	215	19.35	19.48	19.40
		108	0	19.55	19.37	19.44
		108	54	19.49	19.33	19.37
		108	108	19.41	19.39	19.35
		216	0	19.40	19.23	19.27
	16QAM	1	1	18.36	18.42	18.44
		1	108	18.32	18.52	18.40
		1	215	18.22	18.53	18.77
		108	0	18.54	18.33	18.46
		108	54	18.48	18.43	18.42
		108	108	18.43	18.36	18.32
		216	0	18.45	18.26	18.25
	64QAM	1	1	17.19	16.72	16.91
		1	108	17.12	16.85	16.98
		1	215	17.46	17.31	17.38
		108	0	17.06	16.81	17.10
		108	54	17.46	17.44	17.37
		108	108	17.36	17.32	17.49
		216	0	17.38	17.23	17.31
	256QAM	1	1	15.37	15.30	15.48
		1	108	15.36	15.39	15.46
1		215	15.11	15.29	15.39	
108		0	15.07	14.87	15.04	
108		54	15.48	15.46	15.44	
108		108	15.44	15.39	15.47	
216		0	15.38	15.26	15.32	

OUTPUT POWER FOR 5G NR n41 (90.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				508200	518598	528996
				2541 MHz	2592.99 MHz	2644.98 MHz
90.0	π/2 BPSK	1	1	19.62	19.47	19.43
		1	122	19.49	19.55	19.32
		1	243	19.44	19.52	19.32
		120	0	19.53	19.35	19.43
		120	60	19.51	19.35	19.39
		120	122	19.42	19.36	19.30
		243	0	19.38	19.35	19.28
	QPSK	1	1	19.58	19.37	19.40
		1	122	19.52	19.42	19.33
		1	243	19.41	19.41	19.32
		120	0	19.56	19.33	19.42
		120	60	19.49	19.35	19.36
		120	122	19.40	19.37	19.30
		243	0	19.80	19.65	19.63
	16QAM	1	1	18.78	18.75	18.62
		1	122	18.63	18.83	18.60
		1	243	18.54	18.86	18.62
		120	0	18.49	18.34	18.40
		120	60	18.45	18.36	18.35
		120	122	18.41	18.37	18.30
		243	0	18.75	18.65	18.61
	64QAM	1	1	17.42	17.28	17.44
		1	122	17.32	17.44	17.47
		1	243	17.20	17.42	17.47
		120	0	17.10	16.92	16.93
		120	60	17.45	17.37	17.29
		120	122	17.38	17.36	17.35
		243	0	17.27	17.23	17.13
	256QAM	1	1	15.44	15.11	15.05
		1	122	15.35	15.23	14.98
1		243	15.23	15.12	14.95	
120		0	15.06	14.92	14.87	
120		60	15.44	15.41	15.27	
120		122	15.36	15.44	15.37	
243		0	15.28	15.21	15.26	

OUTPUT POWER FOR 5G NR n41 (100.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				509196	518598	527994
				2545.98 MHz	2592.99 MHz	2639.97 MHz
100.0	π/2 BPSK	1	1	19.79	19.46	19.50
		1	136	19.62	19.52	19.47
		1	271	19.95	19.44	19.94
		135	0	19.63	19.29	19.37
		135	67	19.60	19.40	19.35
		135	135	19.50	19.40	19.35
		270	0	19.94	19.26	19.72
	QPSK	1	1	19.64	19.52	19.37
		1	136	19.55	19.62	19.32
		1	271	19.97	19.44	19.88
		135	0	19.60	19.26	19.34
		135	67	19.50	19.27	19.27
		135	135	19.49	19.34	19.27
		270	0	19.89	19.18	19.62
	16QAM	1	1	18.79	18.72	18.42
		1	136	18.66	18.80	18.49
		1	271	18.58	18.67	18.33
		135	0	18.59	18.32	18.33
		135	67	18.95	18.91	18.75
		135	135	18.73	18.28	18.77
		270	0	18.77	18.14	18.72
	64QAM	1	1	17.17	16.87	17.09
		1	136	17.40	17.42	17.49
		1	271	17.38	17.44	17.41
		135	0	17.07	16.90	16.79
		135	67	17.02	16.80	16.84
		135	135	17.33	17.31	17.27
		270	0	17.38	17.18	17.27
	256QAM	1	1	15.30	15.07	15.48
		1	136	15.20	15.12	15.47
1		271	15.08	15.17	15.40	
135		0	15.13	14.83	14.85	
135		67	15.00	14.84	14.82	
135		135	15.35	15.30	14.75	
270		0	15.34	15.18	14.72	

9.1.3. LTE BAND 66

Test Engineer ID:	32700/44389	Test Date:	2023-06-26	EUT Serial Number:	QV7700E5G9
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OUTPUT POWER FOR LTE BAND 66 - SUB ANTENNA (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Sub Antenna		
				Conducted Average (dBm)		
				131979	132322	132665
				1710.7 MHz	1745.0 MHz	1779.3 MHz
1.4	QPSK	1	0	16.1	16.0	16.8
		1	3	16.2	16.0	16.8
		1	5	16.2	16.0	16.8
		3	0	16.1	16.1	16.8
		3	1	16.2	16.1	16.8
		3	3	16.2	16.1	16.8
		6	0	16.2	16.1	16.8
	16QAM	1	0	16.6	16.5	16.2
		1	3	16.6	16.5	16.3
		1	5	16.7	16.5	16.2
		3	0	16.4	16.3	17.0
		3	1	16.4	16.3	17.0
		3	3	16.4	16.3	17.0
		6	0	16.3	16.3	17.0
	64QAM	1	0	16.5	16.5	16.0
		1	3	16.6	16.5	16.1
		1	5	16.6	16.5	16.0
		3	0	16.4	16.3	17.0
		3	1	16.5	16.4	17.0
		3	3	16.5	16.3	17.0
		6	0	16.3	16.2	16.9

OUTPUT POWER FOR LTE BAND 66 - SUB ANTENNA (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Sub Antenna		
				Conducted Average (dBm)		
				131987	132322	132657
				1711.5 MHz	1745.0 MHz	1778.5 MHz
3.0	QPSK	1	0	16.0	15.9	16.6
		1	7	16.2	15.9	16.8
		1	14	16.3	16.0	16.8
		8	0	16.2	16.0	16.8
		8	4	16.3	16.0	16.8
		8	7	16.3	16.0	16.9
		15	0	16.2	16.0	16.8
	16QAM	1	0	16.5	16.4	15.8
		1	7	16.7	16.5	16.2
		1	14	16.7	16.4	16.1
		8	0	16.4	16.1	16.9
		8	4	16.4	16.2	17.0
		8	7	16.5	16.2	17.0
		15	0	16.3	16.1	16.9
	64QAM	1	0	16.6	16.4	15.8
		1	7	16.8	16.4	16.0
		1	14	16.8	16.5	16.0
		8	0	16.3	16.0	16.9
		8	4	16.4	16.1	16.9
		8	7	16.4	16.2	17.0
		15	0	16.3	16.1	16.9

OUTPUT POWER FOR LTE BAND 66 - SUB ANTENNA (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Sub Antenna		
				Conducted Average (dBm)		
				131997	132322	132647
				1712.5 MHz	1745.0 MHz	1777.5 MHz
5.0	QPSK	1	0	16.1	16.0	16.5
		1	12	16.3	16.0	16.7
		1	24	16.4	16.0	16.9
		12	0	16.3	16.0	16.7
		12	6	16.4	16.1	16.8
		12	11	16.4	16.1	16.9
		25	0	16.3	16.1	16.8
	16QAM	1	0	16.6	16.5	17.0
		1	12	16.8	16.5	16.2
		1	24	16.9	16.5	16.1
		12	0	16.3	16.1	16.8
		12	6	16.4	16.2	16.9
		12	11	16.6	16.2	17.0
		25	0	16.4	16.1	16.8
	64QAM	1	0	16.7	16.5	17.0
		1	12	16.8	16.5	15.9
		1	24	17.0	16.5	16.1
		12	0	16.4	16.1	16.8
		12	6	16.5	16.2	16.9
		12	11	16.5	16.2	17.0
		25	0	16.4	16.1	16.8

OUTPUT POWER FOR LTE BAND 66 - SUB ANTENNA (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Sub Antenna		
				Conducted Average (dBm)		
				132022	132322	132622
				1715.0 MHz	1745.0 MHz	1775.0 MHz
10.0	QPSK	1	0	16.1	15.9	16.3
		1	24	16.1	15.9	16.0
		1	49	16.0	15.8	16.6
		25	0	16.3	16.0	16.3
		25	12	16.3	16.0	16.2
		25	24	16.3	16.1	16.6
		50	0	16.3	16.1	16.4
	16QAM	1	0	16.6	16.4	16.8
		1	24	16.6	16.4	16.5
		1	49	16.5	16.3	16.2
		25	0	16.4	16.1	16.3
		25	12	16.4	16.1	16.3
		25	24	16.3	16.2	16.6
		50	0	16.3	16.1	16.4
	64QAM	1	0	16.6	16.4	16.7
		1	24	16.7	16.4	16.6
		1	49	16.5	16.4	15.9
		25	0	16.3	16.1	16.3
		25	12	16.4	16.1	16.3
		25	24	16.3	16.1	16.6
		50	0	16.3	16.1	16.4

OUTPUT POWER FOR LTE BAND 66 - SUB ANTENNA (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Sub Antenna		
				Conducted Average (dBm)		
				132047	132322	132597
				1717.5 MHz	1745.0 MHz	1772.5 MHz
15.0	QPSK	1	0	15.8	15.5	16.3
		1	37	16.2	16.1	16.0
		1	74	15.6	15.7	16.4
		36	0	16.3	16.0	16.4
		36	16	16.4	16.3	16.2
		36	35	16.1	16.1	16.3
		75	0	16.2	16.1	16.3
	16QAM	1	0	16.2	15.8	16.7
		1	37	16.7	16.5	16.5
		1	74	15.9	16.1	16.7
		36	0	16.4	16.1	16.4
		36	16	16.5	16.3	16.2
		36	35	16.1	16.1	16.4
		75	0	16.3	16.1	16.3
	64QAM	1	0	16.3	16.0	16.8
		1	37	16.7	16.6	16.5
		1	74	16.0	16.2	16.8
		36	0	16.4	16.1	16.4
		36	16	16.5	16.3	16.2
		36	35	16.1	16.1	16.4
		75	0	16.3	16.1	16.3

OUTPUT POWER FOR LTE BAND 66 - SUB ANTENNA (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Sub Antenna		
				Conducted Average (dBm)		
				132072	132322	132572
				1720.0 MHz	1745.0 MHz	1770.0 MHz
20.0	QPSK	1	0	16.0	15.6	16.8
		1	49	16.0	16.1	16.5
		1	99	15.5	15.9	17.0
		50	0	16.2	15.9	16.6
		50	24	16.3	16.2	16.6
		50	49	15.8	16.0	16.4
		100	0	16.0	16.0	16.5
	16QAM	1	0	16.4	15.9	17.0
		1	49	16.6	16.8	16.9
		1	99	15.9	16.2	16.3
		50	0	16.3	16.0	16.6
		50	24	16.3	16.2	16.6
		50	49	15.9	16.1	16.5
		100	0	16.1	16.1	16.5
	64QAM	1	0	16.5	16.0	15.9
		1	49	16.6	16.7	16.9
		1	99	16.0	16.3	16.0
		50	0	16.2	16.0	16.6
		50	24	16.3	16.2	16.6
		50	49	15.9	16.1	16.5
		100	0	16.1	16.0	16.5

9.1.4. 5G NR n66

Test Engineer ID:	85502/44389	Test Date:	2023-07-14	EUT Serial Number:	QV7700DHHQ
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OUTPUT POWER FOR 5G NR n66 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				342500	349000	355500
				1712.5MHz	1745MHz	1777.5MHz
5.0	π/2 BPSK	1	0	18.69	18.70	18.38
		1	12	18.65	18.70	18.48
		1	24	18.64	18.68	18.47
		12	0	18.67	18.68	18.48
		12	6	18.65	18.65	18.38
		12	11	18.63	18.67	18.47
		25	0	18.65	18.64	18.43
	QPSK	1	0	18.78	18.74	18.53
		1	12	18.68	18.68	18.49
		1	24	18.78	18.70	18.42
		12	0	18.66	18.68	18.37
		12	6	18.67	18.66	18.46
		12	11	18.62	18.64	18.37
		25	0	18.65	18.71	18.47
	16QAM	1	0	17.02	16.62	16.71
		1	12	17.14	16.63	16.75
		1	24	17.01	16.56	16.63
		12	0	17.10	17.03	16.93
		12	6	17.11	17.12	16.95
		12	11	17.11	17.03	16.92
		25	0	17.18	17.12	16.91
	64QAM	1	0	16.00	16.26	15.95
		1	12	15.97	16.19	15.91
		1	24	15.98	16.21	15.89
		12	0	16.11	16.08	15.83
		12	6	16.12	16.09	15.81
		12	11	16.12	16.10	15.82
		25	0	16.15	16.10	15.93
	256QAM	1	0	14.29	14.21	13.77
		1	12	14.25	14.20	13.74
1		24	14.24	14.17	13.73	
12		0	14.13	14.07	13.89	
12		6	14.09	14.06	13.90	
12		11	14.10	14.02	13.91	
25		0	14.13	14.07	13.96	

OUTPUT POWER FOR 5G NR n66 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				343000	349000	355000
				1715MHz	1745MHz	1775MHz
10.0	π/2 BPSK	1	1	18.60	18.64	18.52
		1	25	18.68	18.63	18.55
		1	50	18.61	18.58	18.38
		25	0	18.62	18.71	18.43
		25	12	18.63	18.61	18.40
		25	25	18.59	18.58	18.38
		50	0	18.62	18.66	18.40
	QPSK	1	1	18.64	18.70	18.50
		1	25	18.60	18.68	18.50
		1	50	18.54	18.62	18.40
		25	0	18.67	18.67	18.40
		25	12	18.59	18.64	18.35
		25	25	18.62	18.65	18.39
		50	0	18.63	18.70	18.36
	16QAM	1	1	17.73	17.75	16.91
		1	25	17.72	17.71	16.91
		1	50	17.67	17.58	16.82
		25	0	17.73	17.15	16.99
		25	12	17.69	17.13	16.99
		25	25	17.62	17.08	16.95
		50	0	17.65	17.13	16.95
	64QAM	1	1	16.21	16.22	15.93
		1	25	16.26	16.23	15.92
		1	50	16.18	16.19	15.83
		25	0	16.22	16.17	16.02
		25	12	16.20	16.14	15.99
		25	25	16.17	16.11	15.94
		50	0	16.09	16.13	15.97
	256QAM	1	1	14.11	13.90	14.03
		1	25	14.14	13.91	14.00
		1	50	14.06	13.82	13.94
		25	0	14.18	14.14	13.95
		25	12	14.09	14.09	13.96
		25	25	14.07	14.15	13.96
		50	0	14.09	14.11	14.02

OUTPUT POWER FOR 5G NR n66 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				343500	349000	354500
				1717.5MHz	1745MHz	1772.5MHz
15.0	π/2 BPSK	1	1	18.82	18.84	18.78
		1	39	18.76	18.91	18.64
		1	77	18.79	18.88	18.58
		36	0	18.78	18.76	18.61
		36	18	18.68	18.71	18.48
		36	36	18.69	18.71	18.60
		75	0	18.81	18.79	18.59
	QPSK	1	1	18.75	18.91	18.62
		1	39	18.80	18.93	18.54
		1	77	18.81	18.86	18.58
		36	0	18.74	18.77	18.62
		36	18	18.69	18.84	18.53
		36	36	18.66	18.70	18.52
		75	0	18.77	18.73	18.55
	16QAM	1	1	17.72	17.55	17.17
		1	39	17.77	17.61	17.11
		1	77	17.77	17.49	17.09
		36	0	17.67	17.28	17.09
		36	18	17.74	17.35	17.09
		36	36	17.65	17.31	17.02
		75	0	17.74	17.27	17.06
	64QAM	1	1	16.31	16.19	16.01
		1	39	16.23	16.23	15.92
		1	77	16.35	16.20	15.89
		36	0	16.24	16.27	16.17
		36	18	16.21	16.34	16.07
		36	36	16.16	16.31	16.02
		75	0	16.20	16.34	16.12
	256QAM	1	1	14.10	14.21	14.00
		1	39	13.96	14.20	13.83
1		77	14.06	14.23	13.77	
36		0	14.19	14.36	14.17	
36		18	14.12	14.34	14.01	
36		36	14.15	14.28	14.00	
75		0	14.16	14.30	14.03	

OUTPUT POWER FOR 5G NR n66 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				344000	349000	354000
				1720MHz	1745MHz	1770MHz
20.0	π/2 BPSK	1	1	18.74	18.80	18.71
		1	52	18.80	18.90	18.64
		1	104	18.76	18.86	18.61
		50	0	18.69	18.77	18.60
		50	25	18.68	18.86	18.59
		50	50	18.71	18.70	18.60
		100	0	18.67	18.76	18.59
	QPSK	1	1	18.67	18.82	18.70
		1	52	18.69	18.86	18.67
		1	104	18.80	18.70	18.62
		50	0	18.70	18.74	18.68
		50	25	18.68	18.73	18.64
		50	50	18.78	18.69	18.52
		100	0	18.71	18.79	18.57
	16QAM	1	1	17.22	17.63	17.29
		1	52	17.30	17.67	17.24
		1	104	17.27	17.65	17.20
		50	0	17.14	17.26	17.13
		50	25	17.21	17.32	17.08
		50	50	17.24	17.26	17.02
		100	0	17.16	17.21	17.11
	64QAM	1	1	16.26	16.34	16.19
		1	52	16.20	16.26	16.12
		1	104	16.29	16.32	16.08
		50	0	16.18	16.11	16.08
		50	25	16.08	16.14	16.07
		50	50	16.21	16.16	16.01
		100	0	16.19	16.15	16.05
	256QAM	1	1	14.11	14.14	14.00
		1	52	14.14	14.19	13.98
1		104	14.10	14.17	13.92	
50		0	14.16	14.16	14.18	
50		25	14.24	14.22	14.11	
50		50	14.20	14.20	14.00	
100		0	14.14	14.23	14.17	

10. CONDUCTED TEST RESULTS

10.1. 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.

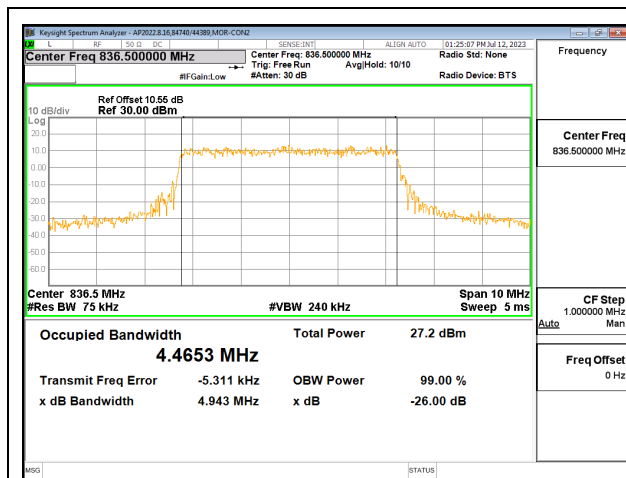
RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested.

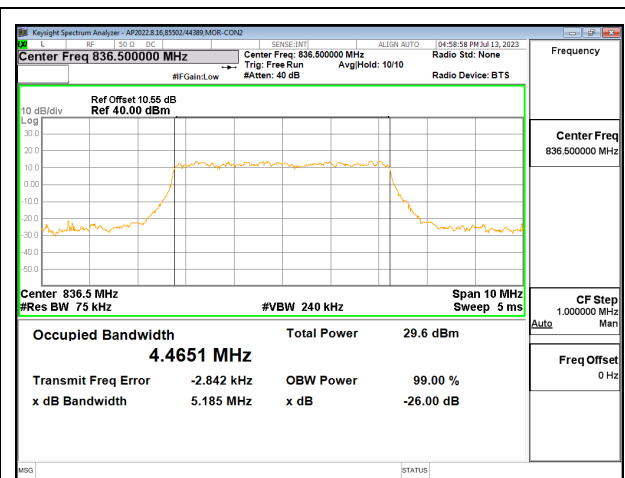
10.1.1. 5G NR n5

Test Engineer ID:	85502/44389	Test Date:	2023-07-13	EUT Serial Number:	QV77005ZHQ
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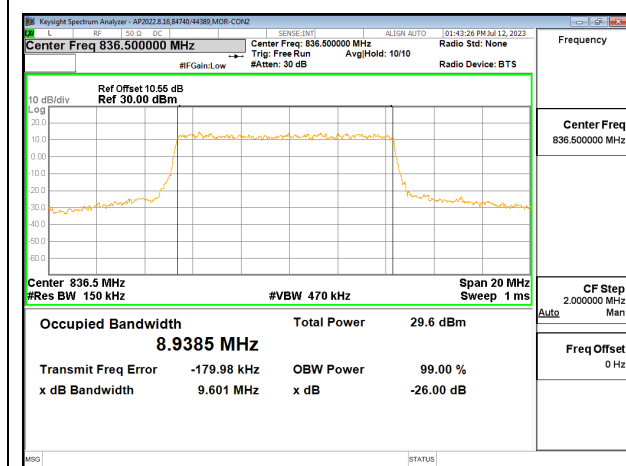
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n5	5MHz, QPSK	Full RB Config	836.5	4.465	4.943
	5MHz, 16QAM			4.465	5.185
	10MHz, QPSK			8.939	9.601
	10MHz, 16QAM			8.993	9.627
	15MHz, QPSK			13.416	14.31
	15MHz, 16QAM			13.385	14.5
	20MHz, QPSK			17.922	18.91
	20MHz, 16QAM			17.823	18.98



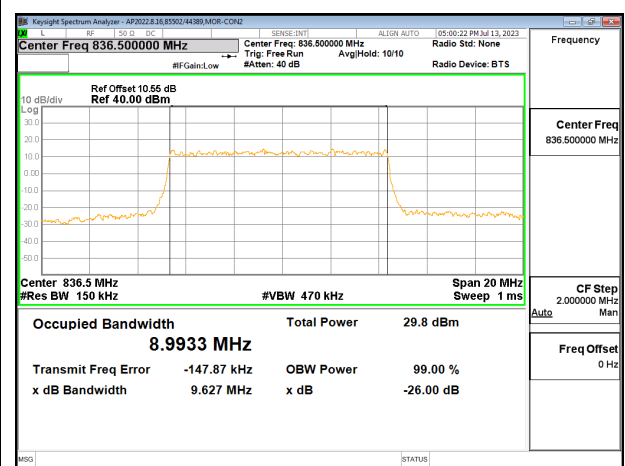
5G NR n5 5MHz QPSK MID Ch RB25-0



5G NR n5 5MHz 16QAM MID Ch RB25-0



5G NR n5 10MHz QPSK MID Ch RB25-0

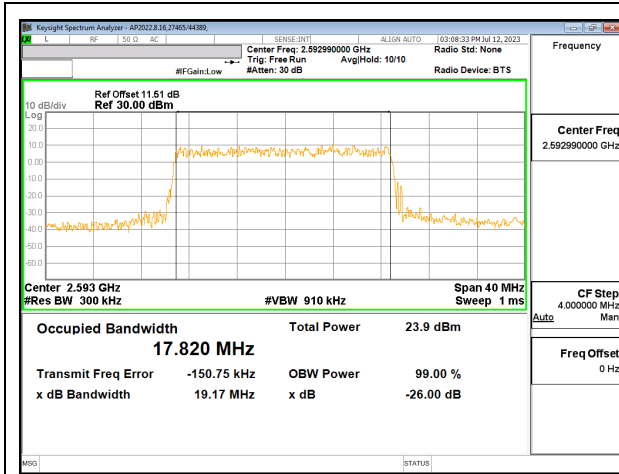


5G NR n5 10MHz 16QAM MID Ch RB50-0

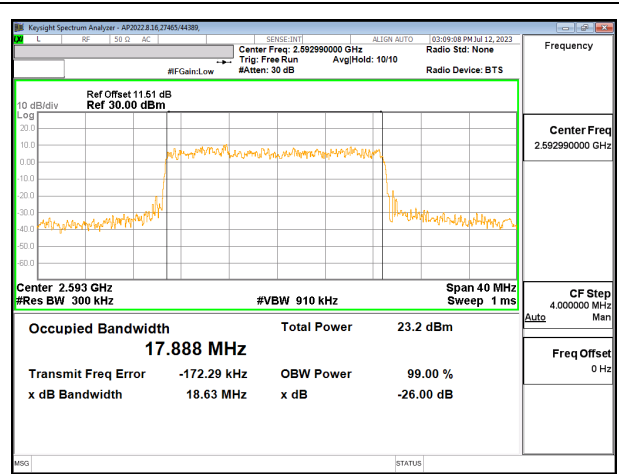
10.1.2. 5G NR n41

Test Engineer ID:	27465/44389	Test Date:	2023-07-12	EUT Serial Number:	QV77005VHQ
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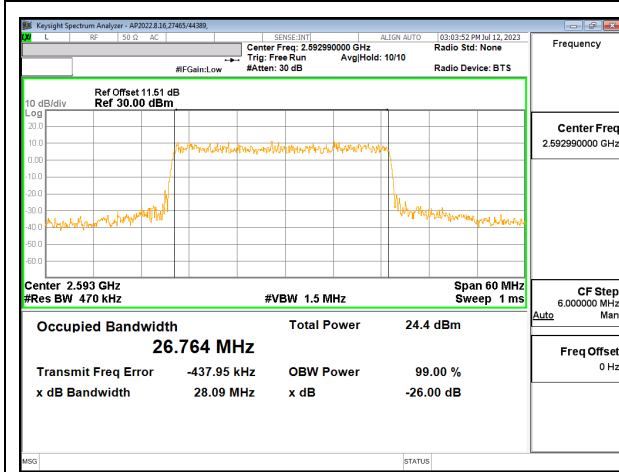
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G FR1 n41	20MHz, QPSK	Full RB Config	2593	17.820	19.17
	20MHz, 16QAM			17.888	18.63
	30MHz, QPSK			26.764	28.09
	30MHz, 16QAM			26.758	28.16
	40MHz, QPSK			35.650	37.71
	40MHz, 16QAM			35.811	37.70
	50MHz, QPSK			45.637	48.21
	50MHz, 16QAM			45.577	47.91
	60MHz, QPSK			57.732	60.28
	60MHz, 16QAM			57.855	60.20
	80MHz, QPSK			77.181	80.22
	80MHz, 16QAM			77.073	80.35
	90MHz, QPSK			86.677	89.90
	90MHz, 16QAM			86.659	89.95
	100MHz, QPSK			96.169	100.20
	100MHz, 16QAM			96.357	100.20



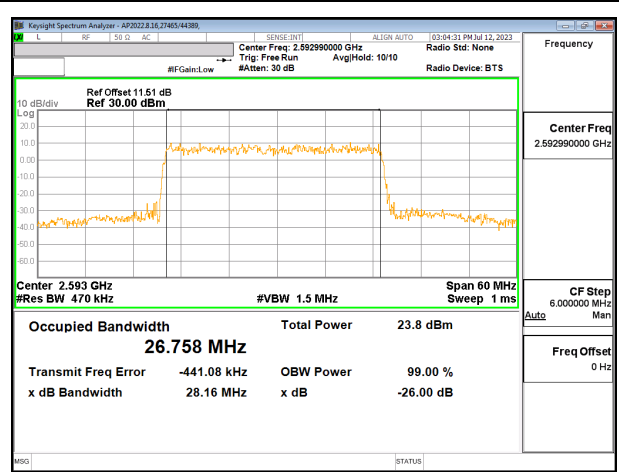
5G NR n41 20MHz QPSK Middle Channel RB50-0



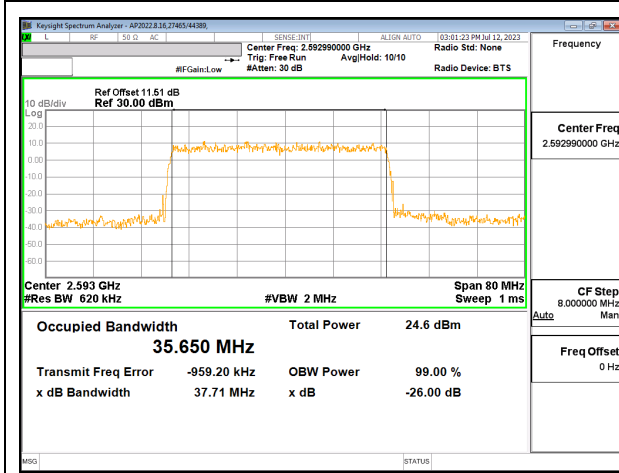
5G NR n41 20MHz 16QAM Middle Channel RB50-0



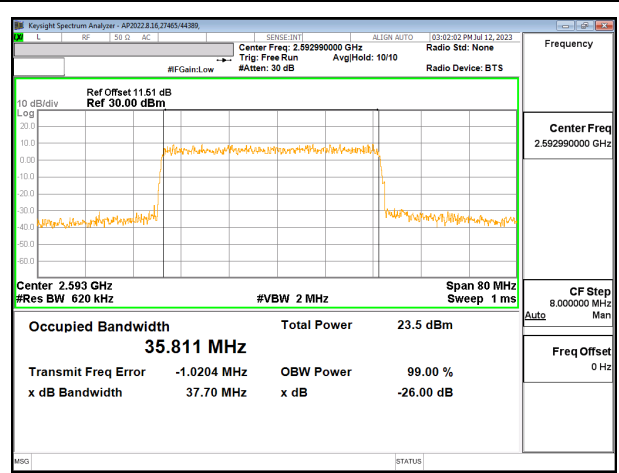
5G NR n41 30MHz QPSK Middle Channel RB75-0



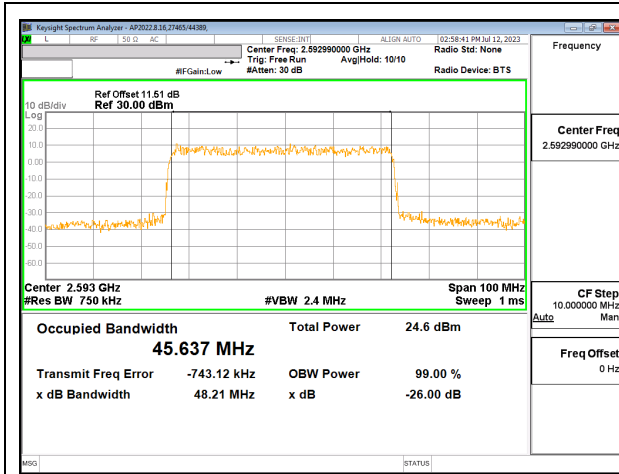
5G NR n41 30MHz 16QAM Middle Channel RB75-0



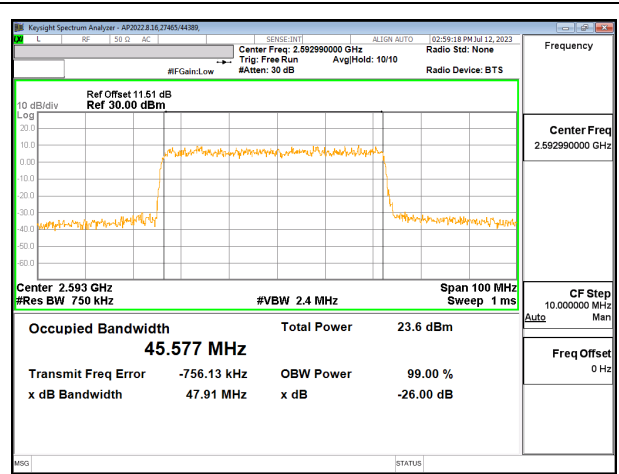
5G NR n41 40MHz QPSK Middle Channel RB100-0



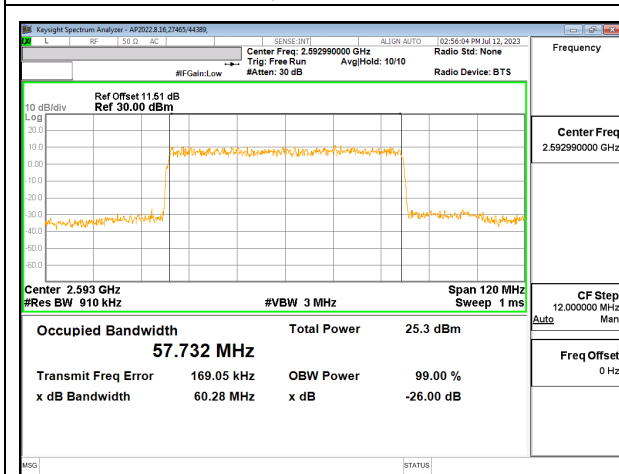
5G NR n41 40MHz 16QAM Middle Channel RB100-0



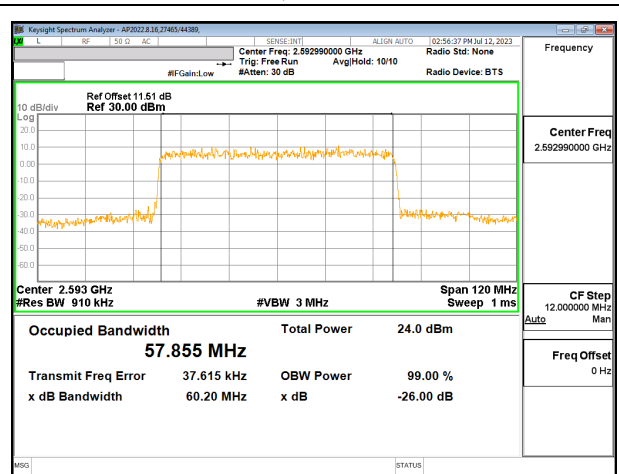
5G NR n41 50MHz QPSK Middle Channel RB128-0



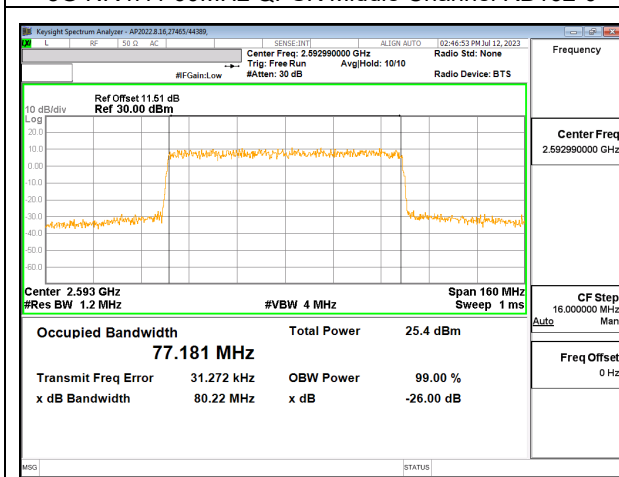
5G NR n41 50MHz 16QAM Middle Channel RB128-0



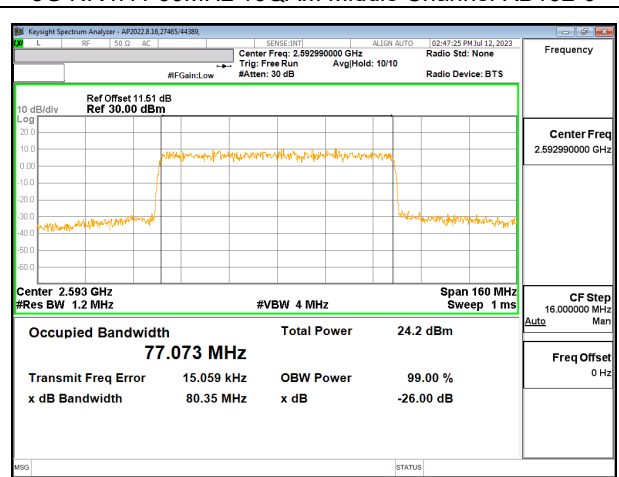
5G NR n41 60MHz QPSK Middle Channel RB162-0



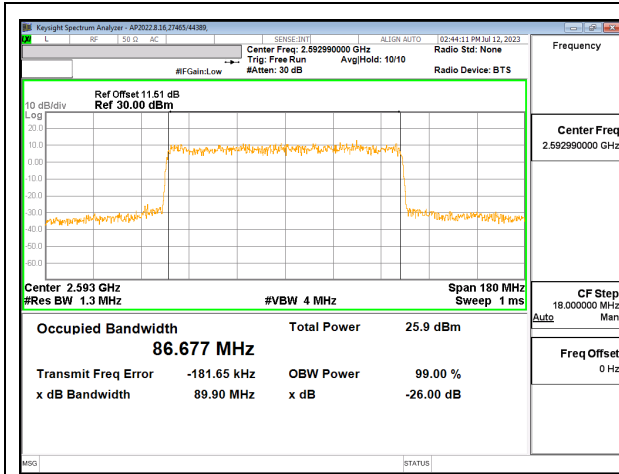
5G NR n41 60MHz 16QAM Middle Channel RB162-0



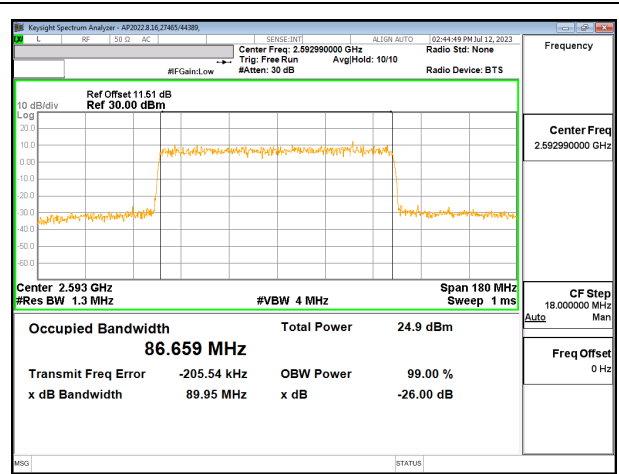
5G NR n41 80MHz QPSK Middle Channel RB216-0



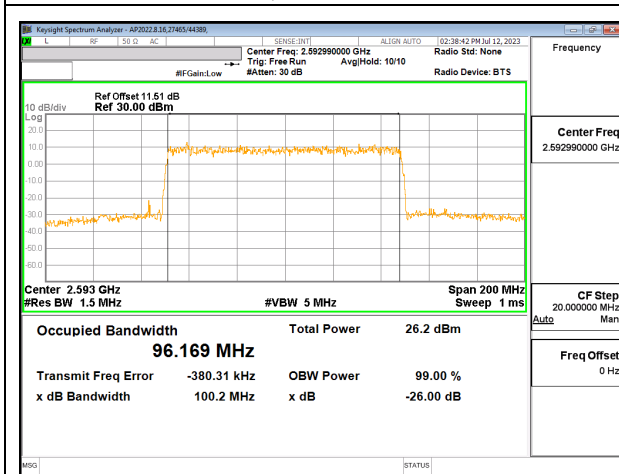
5G NR n41 80MHz 16QAM Middle Channel RB216-0



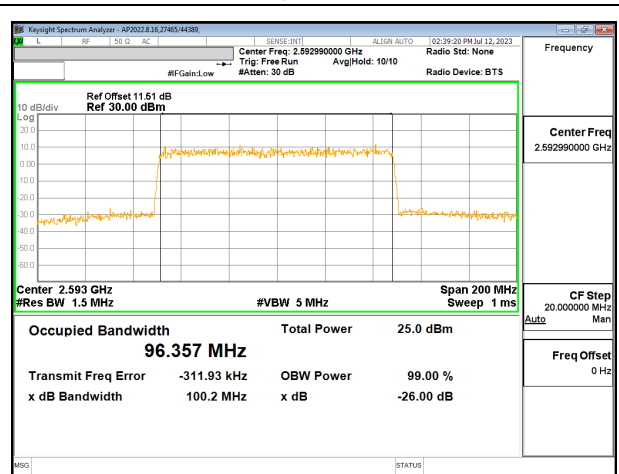
5G NR n41 90MHz QPSK Middle Channel RB243-0



5G NR n41 90MHz 16QAM Middle Channel RB243-0



5G NR n41 100MHz QPSK Middle Channel RB270-0



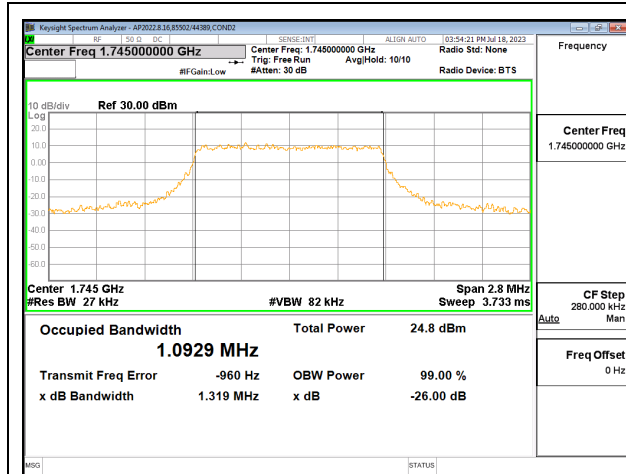
5G NR n41 100MHz 16QAM Middle Channel RB270-0

10.1.3. LTE66

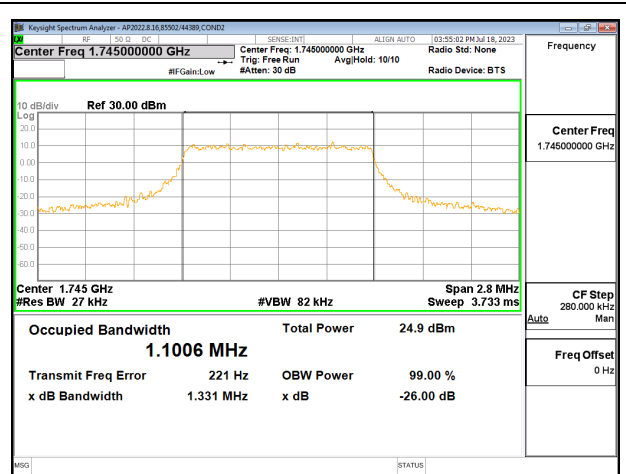
LTE66 – Sub Antenna

Test Engineer ID:	85502/44389	Test Date:	2023-07-18	EUT Serial Number:	QV7700DHHQ
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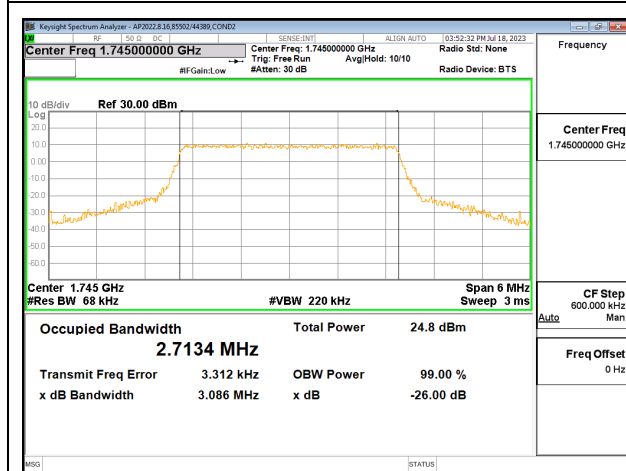
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 66	1.4MHz, QPSK	6/0	1745.0	1.093	1.319
	1.4MHz, 16QAM			1.101	1.331
	3MHz, QPSK	15/0		2.713	3.086
	3MHz, 16QAM			2.710	3.051
	5MHz, QPSK	25/0		4.480	5.047
	5MHz, 16QAM			4.486	5.048
	10MHz, QPSK	50/0		8.965	9.974
	10MHz, 16QAM			8.991	9.908
	15MHz, QPSK	75/0		13.442	14.75
	15MHz, 16QAM			13.443	14.74
	20MHz, QPSK	100/0		17.909	19.62
	20MHz, 16QAM			17.906	19.43



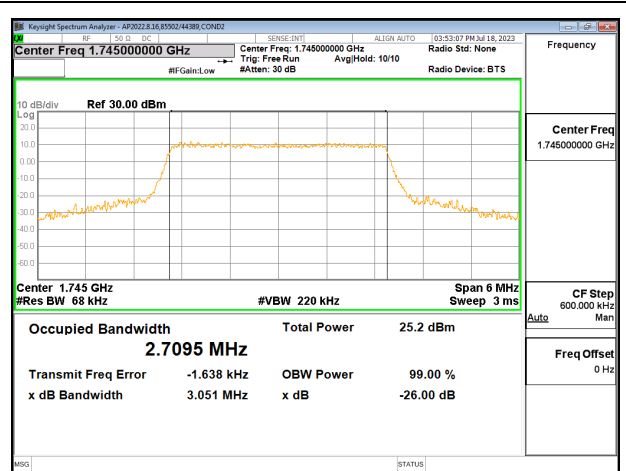
LTE66 1.4MHz QPSK MID Ch RB6-0



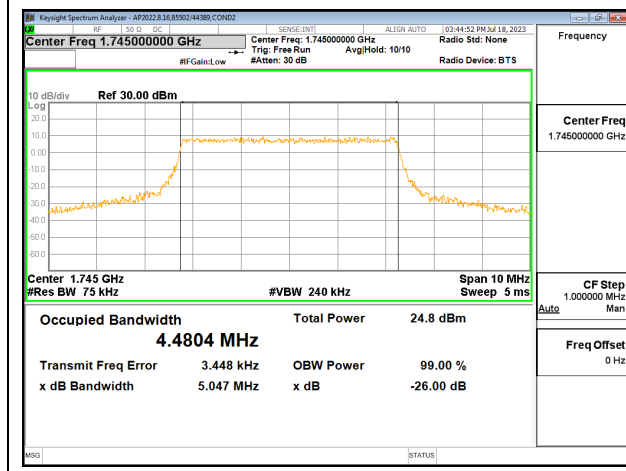
LTE66 1.4MHz 16QAM MID Ch RB6-0



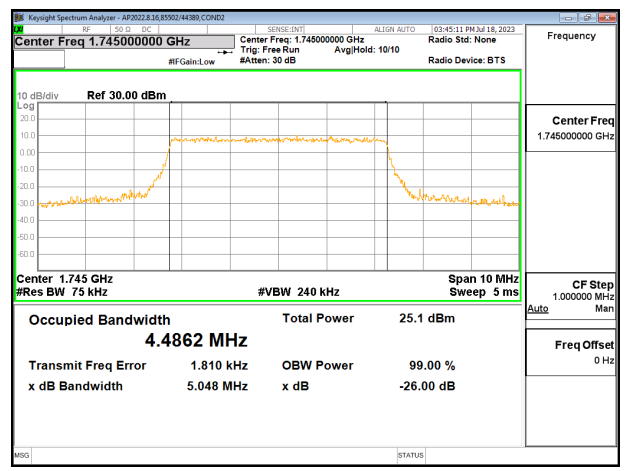
LTE66 3MHz QPSK MID Ch RB15-0



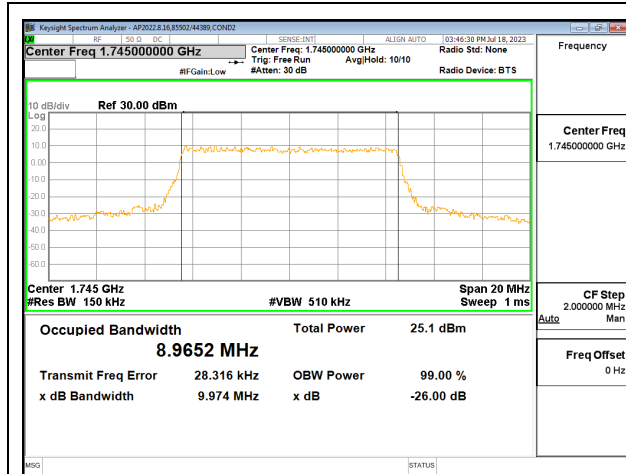
LTE66 3MHz 16QAM MID Ch RB15-0



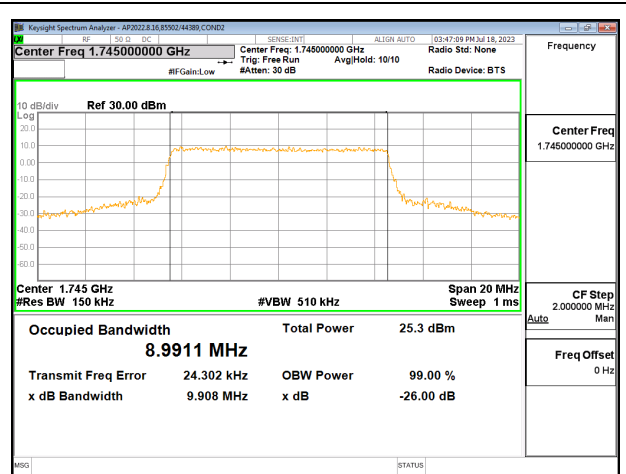
LTE66 5MHz QPSK MID Ch RB25-0



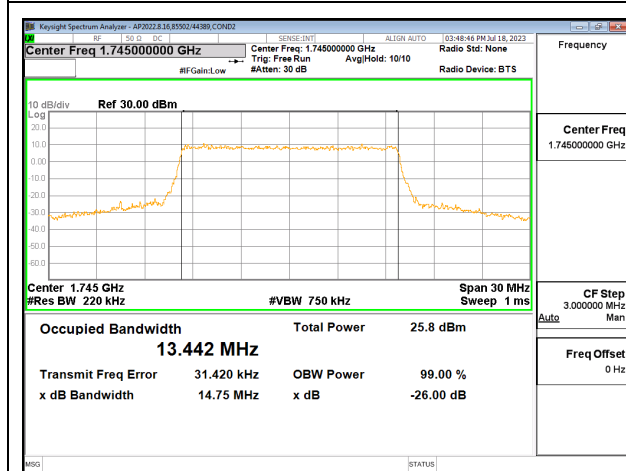
LTE66 5MHz 16QAM MID Ch RB25-0



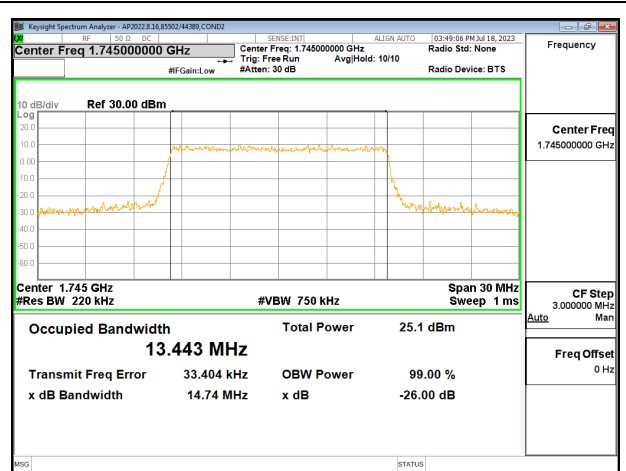
LTE66 10MHz QPSK MID Ch RB50-0



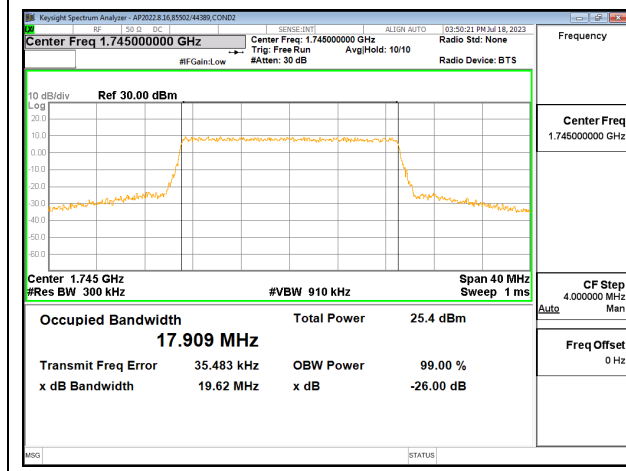
LTE66 10MHz 16QAM MID Ch RB50-0



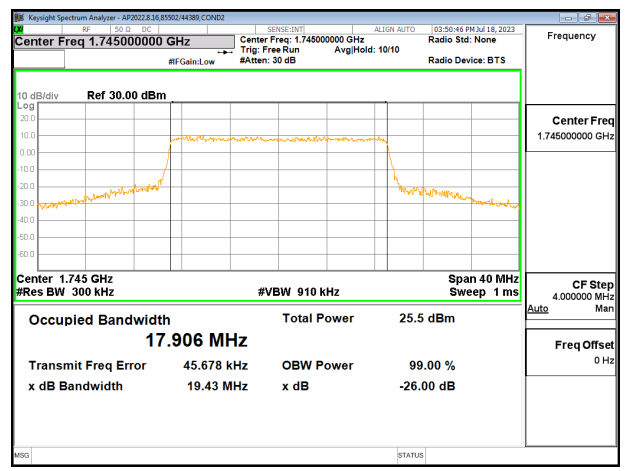
LTE66 15MHz QPSK MID Ch RB75-0



LTE66 15MHz 16QAM MID Ch RB75-0



LTE66 20MHz QPSK MID Ch RB100-0

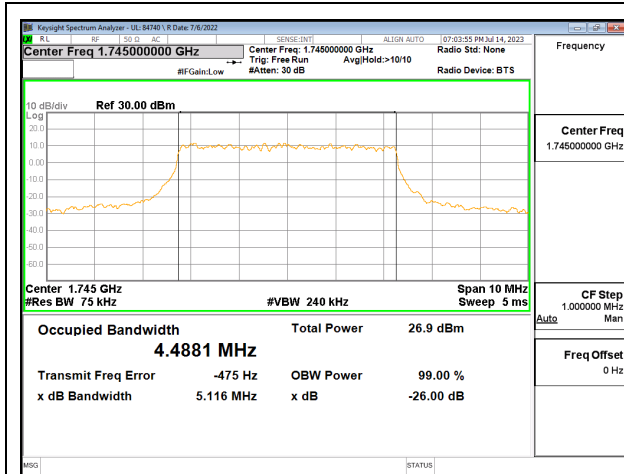


LTE66 20MHz 16QAM MID Ch RB100-0

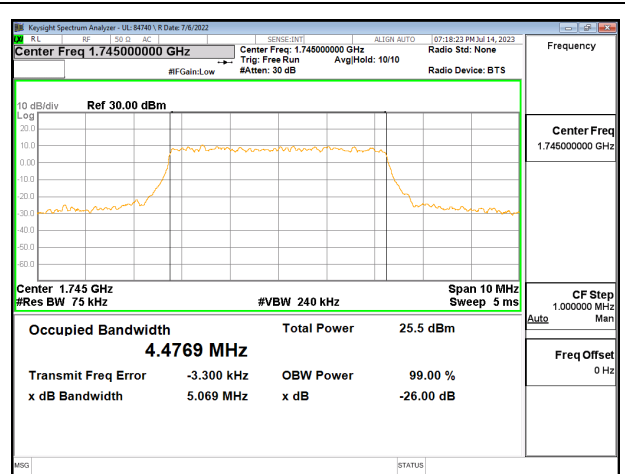
10.1.4. 5G NR n66

Test Engineer ID:	84740/44389	Test Date:	2023-07-06	EUT Serial Number:	QV7700DHHQ
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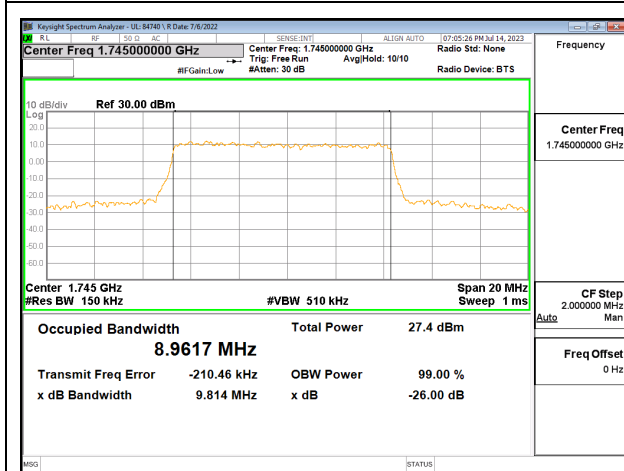
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n66	5MHz, QPSK	25/0	1745.0	4.488	5.116
	5MHz, 16QAM			4.477	5.069
	10MHz, QPSK	50/0		8.962	9.814
	10MHz, 16QAM			8.968	9.791
	15MHz, QPSK	75/0		13.481	14.60
	15MHz, 16QAM			13.469	14.39
	20MHz, QPSK	100/0		17.895	18.99
	20MHz, 16QAM			17.917	18.97



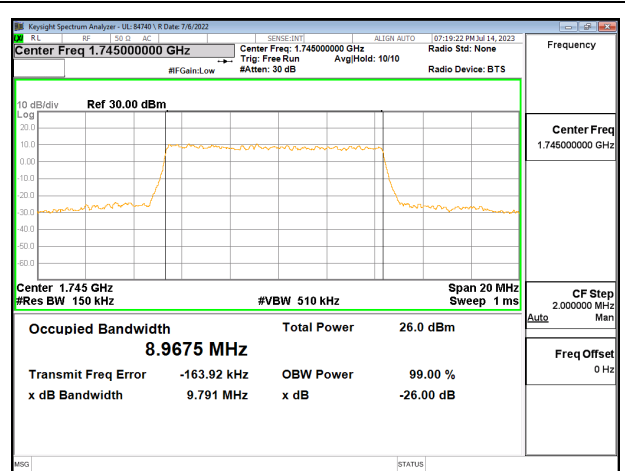
5G NR N66 5MHz QPSK MID Ch RB25-0



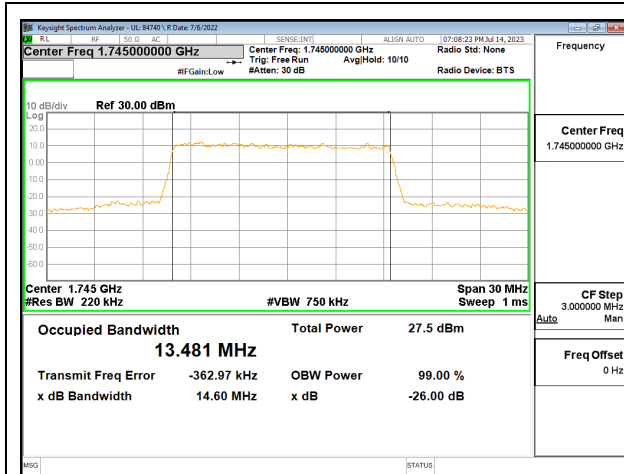
5G NR N66 5MHz 16QAM MID Ch RB25-0



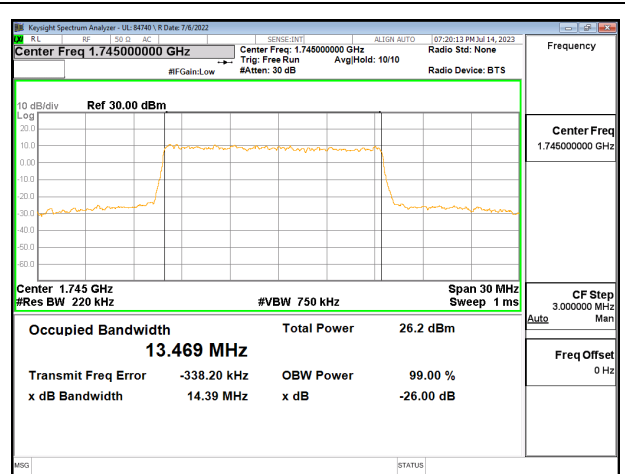
5G NR N66 10MHz QPSK MID Ch RB50-0



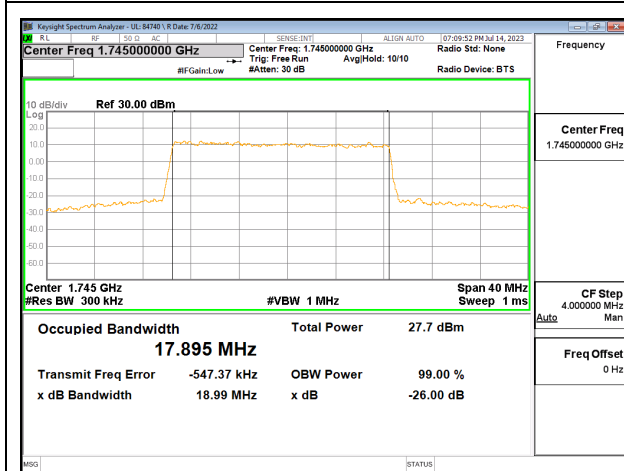
5G NR N66 10MHz 16QAM MID Ch RB50-0



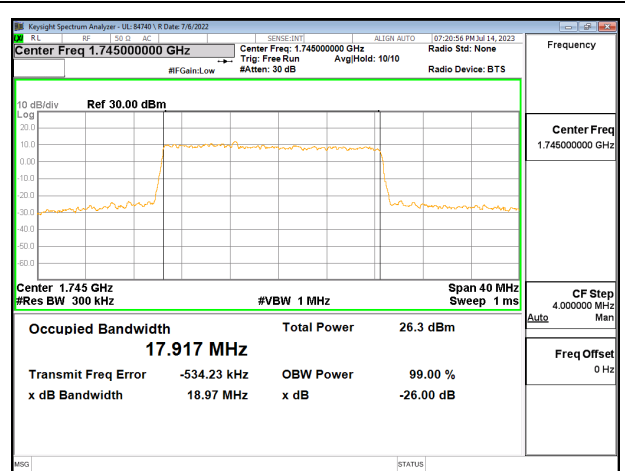
5G NR N66 15MHz QPSK MID Ch RB75-0



5G NR N66 15MHz 16QAM MID Ch RB75-0



5G NR N66 20MHz QPSK MID Ch RB100-0



5G NR N66 20MHz 16QAM MID Ch RB100-0

10.2. EMISSION MASK AND BAND EDGE

TEST PROCEDURE

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

1. Set the spectrum analyzer span to include the block edge frequency.
2. Set a marker to point the corresponding band edge frequency in each test case.
3. Set display line at -13 dBm
4. Set resolution bandwidth to at least 1% of emission bandwidth.

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 were 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 (5G NR n41)

Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent 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 required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). 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. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

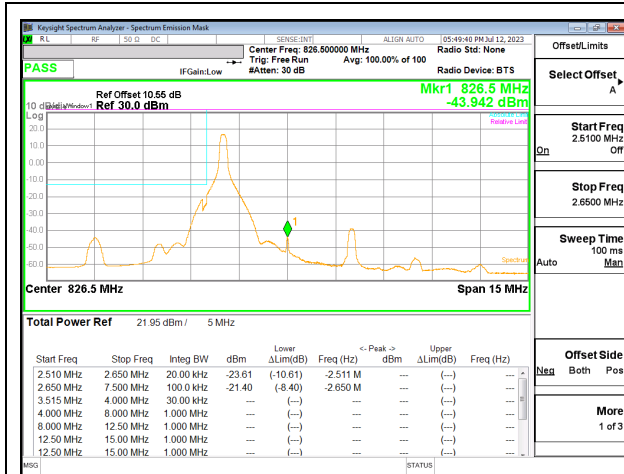
RESULTS

10.2.1. 5G NR n5**LIMITS**

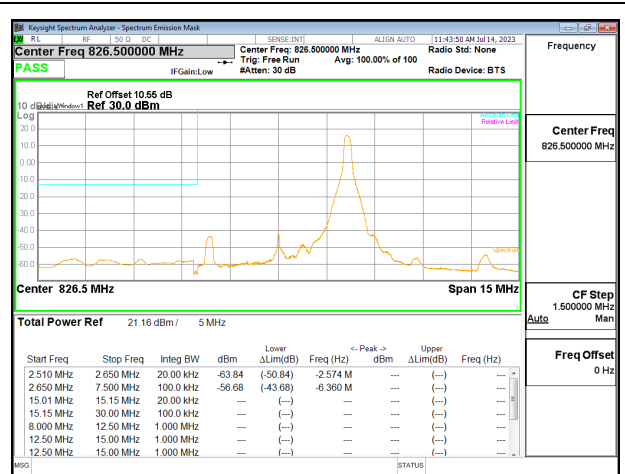
FCC: §22.917 (a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

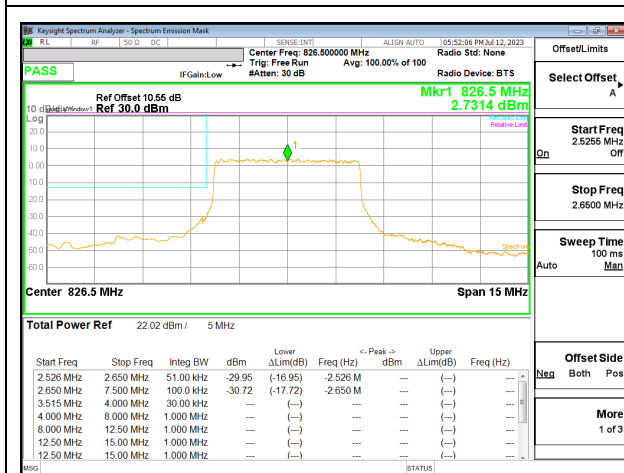
Test Engineer ID:	85502/44389	Test Date:	2023-07-12 2023-07-14	EUT Serial Number:	QV77005ZHQ
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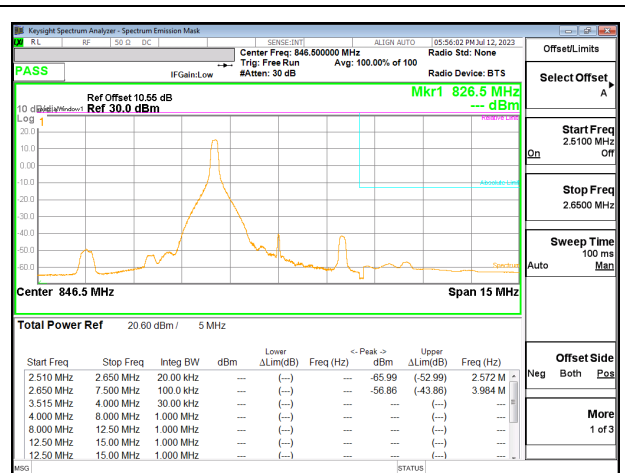
5G NR n5 5MHz QPSK LOW Ch RB1-1



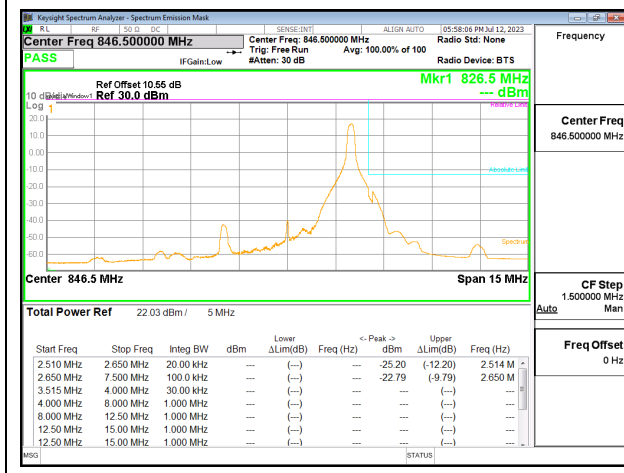
5G NR n5 5MHz QPSK LOW Ch RB1-24



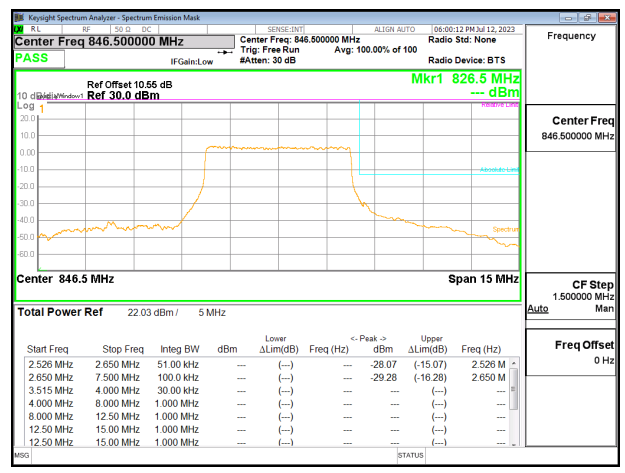
5G NR n5 5MHz QPSK LOW Ch RB25-0



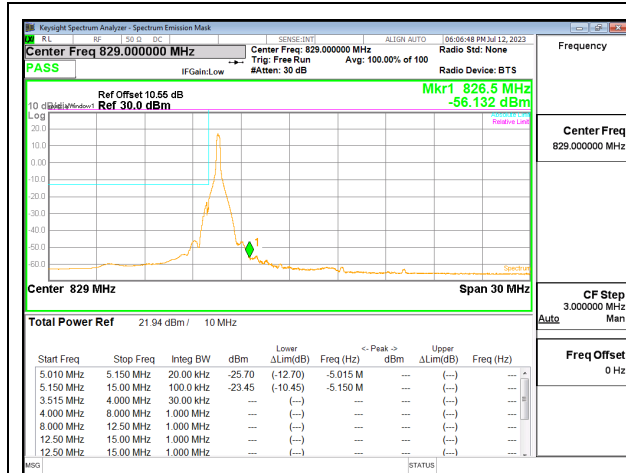
5G NR n5 5MHz QPSK HIGH Ch RB1-1



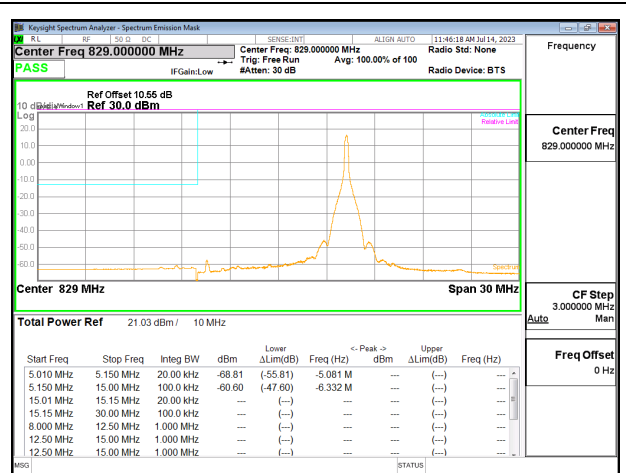
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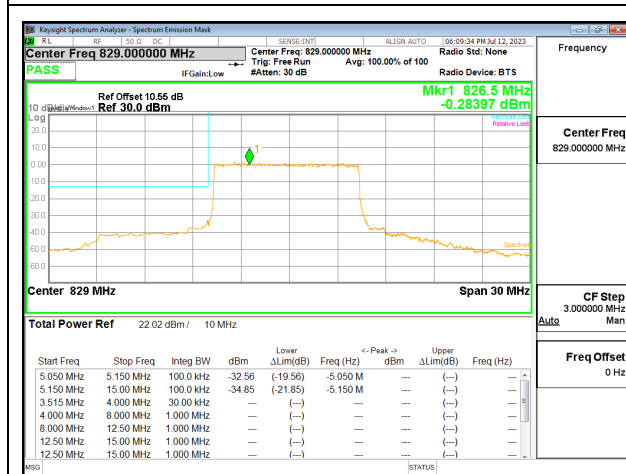
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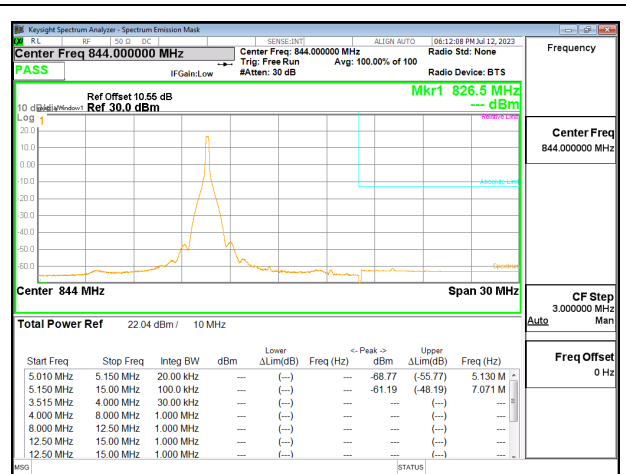
5G NR n5 10MHz QPSK LOW Ch RB1-1



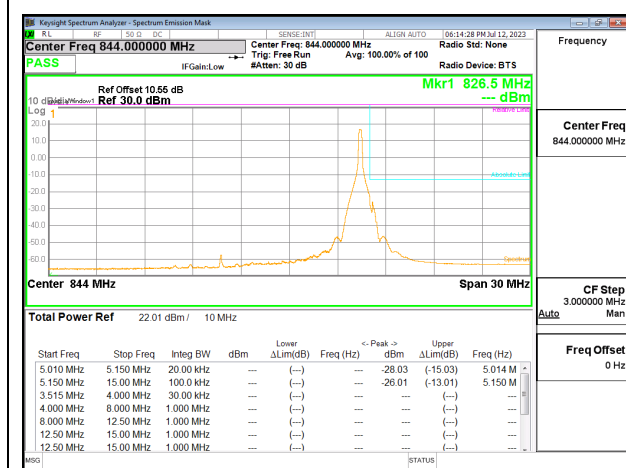
5G NR n5 10MHz QPSK LOW Ch RB1-49



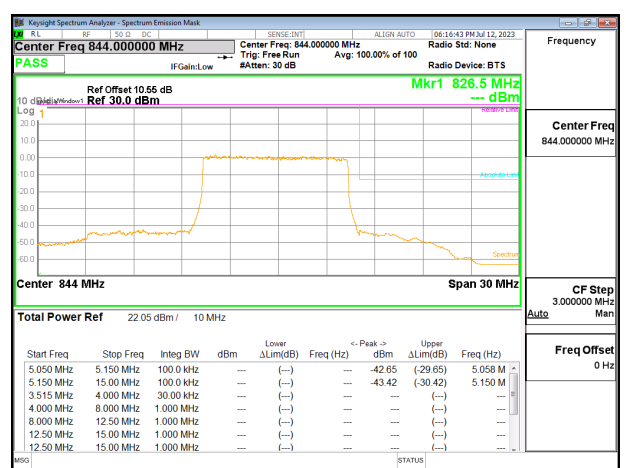
5G NR n5 10MHz QPSK LOW Ch RB50-0



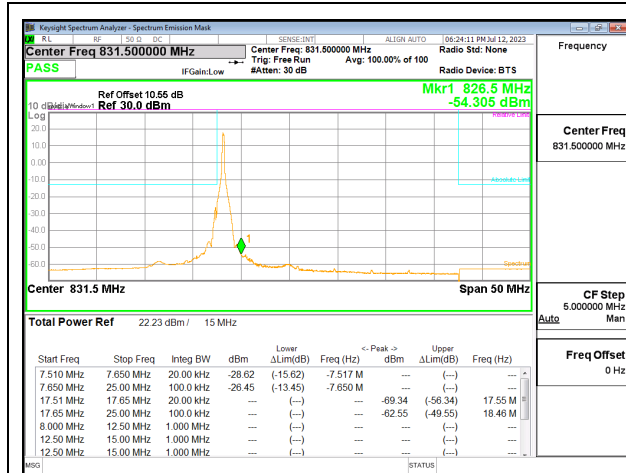
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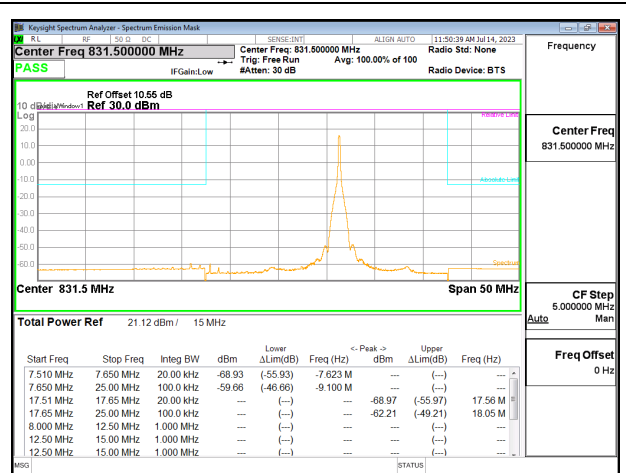
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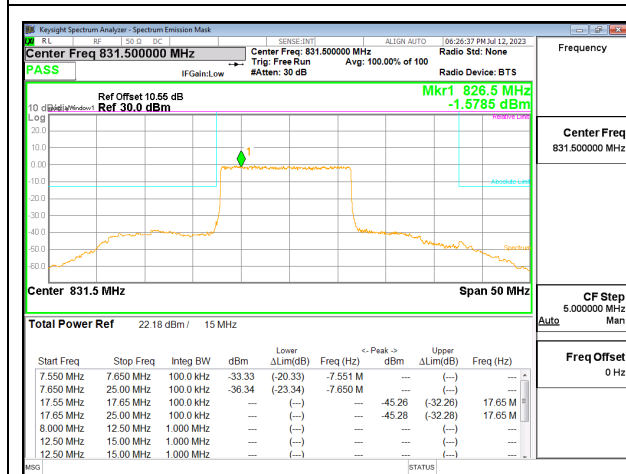
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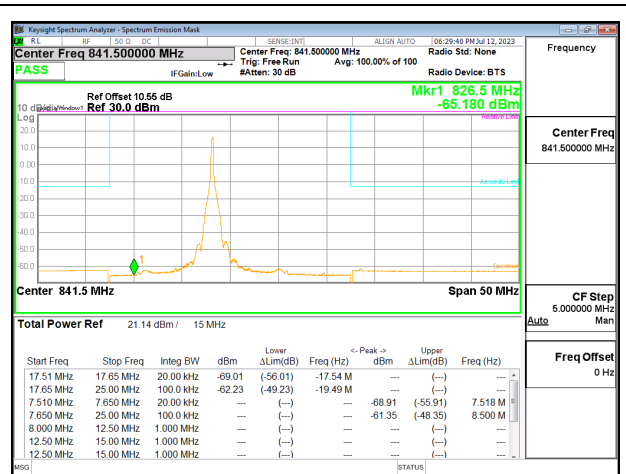
5G NR n5 15MHz QPSK LOW Ch RB1-1



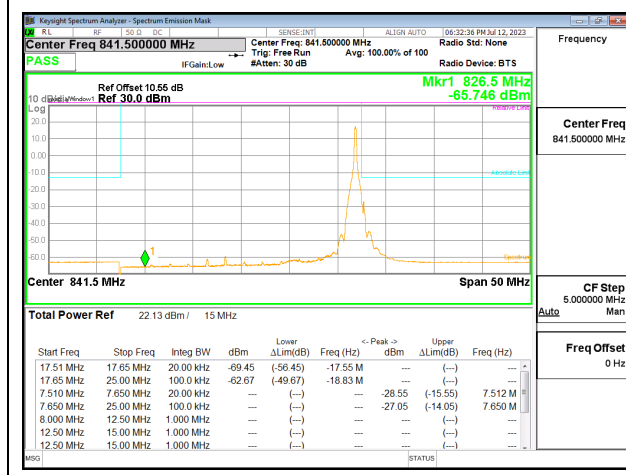
5G NR n5 15MHz QPSK LOW Ch RB1-77



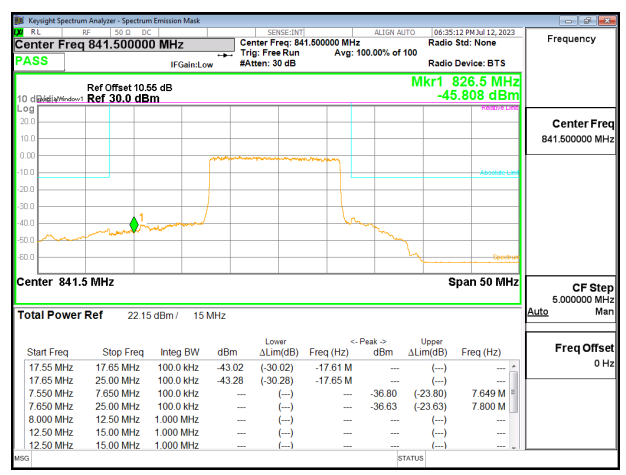
5G NR n5 15MHz QPSK LOW Ch RB75-0



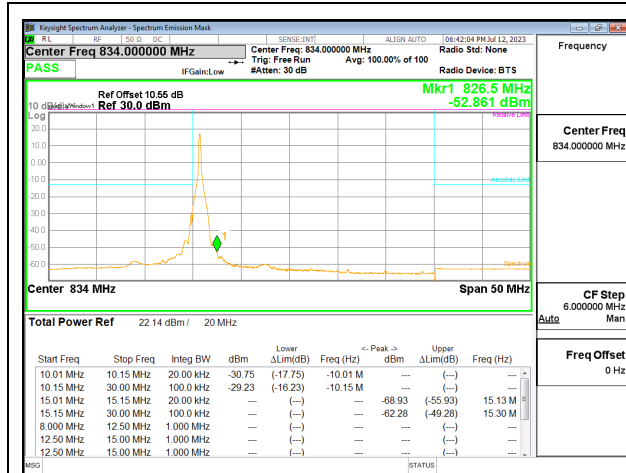
5G NR n5 15MHz QPSK HIGH Ch RB1-1



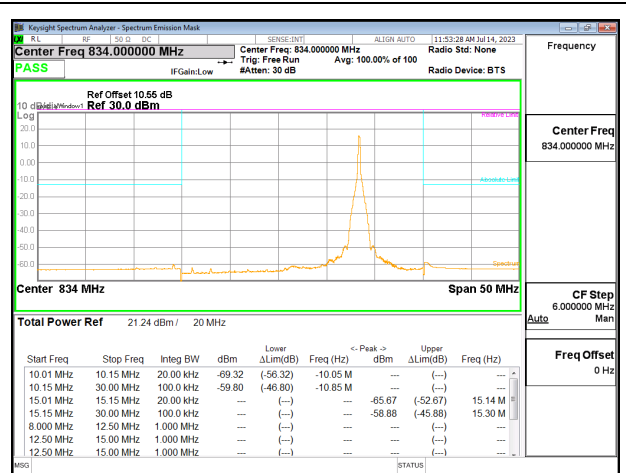
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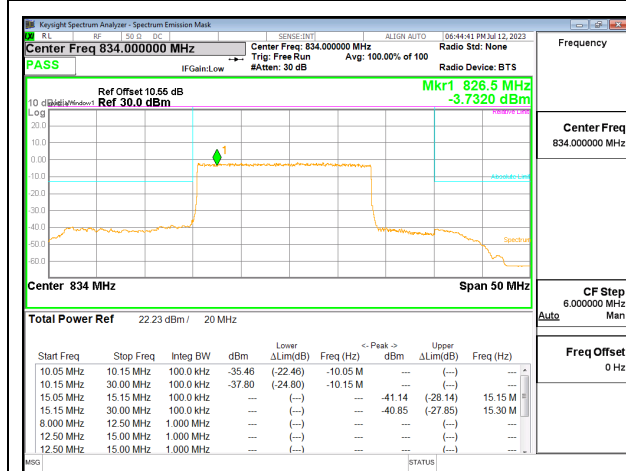
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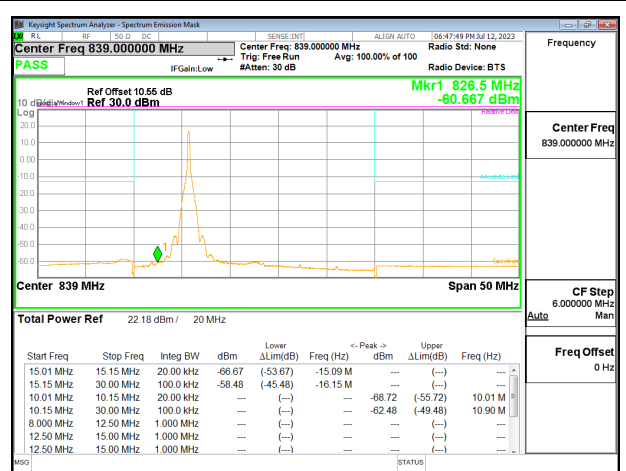
5G NR n5 20MHz QPSK LOW Ch RB1-1



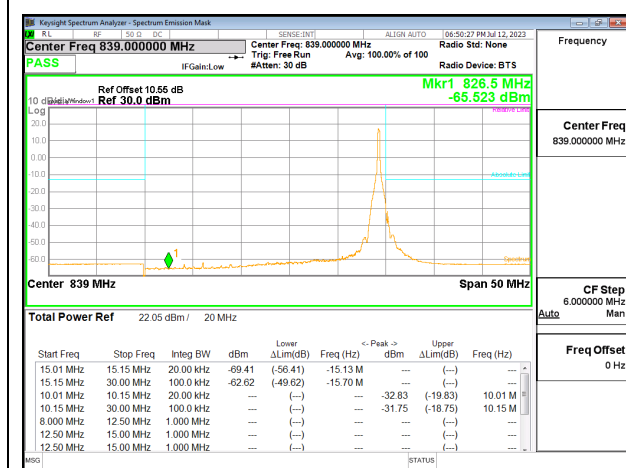
5G NR n5 20MHz QPSK LOW Ch RB1-104



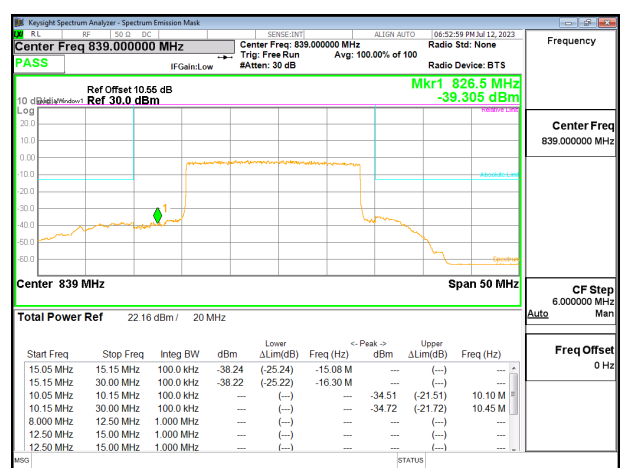
5G NR n5 20MHz QPSK LOW Ch RB100-0



5G NR n5 20MHz QPSK HIGH Ch RB1-1



5G NR n5 20MHz QPSK HIGH Ch RB1-104



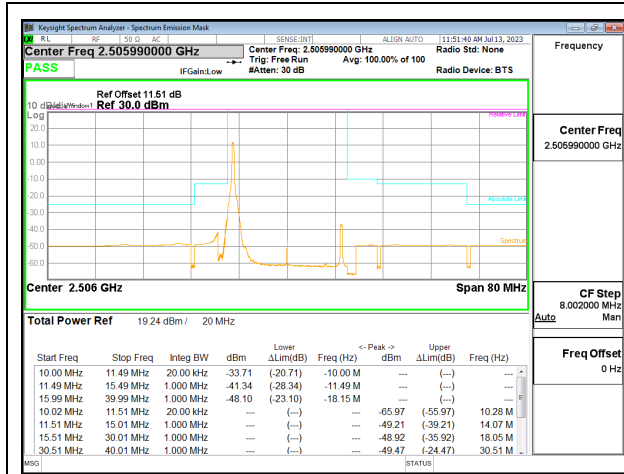
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10.2.2. 5G NR n41**LIMITS**

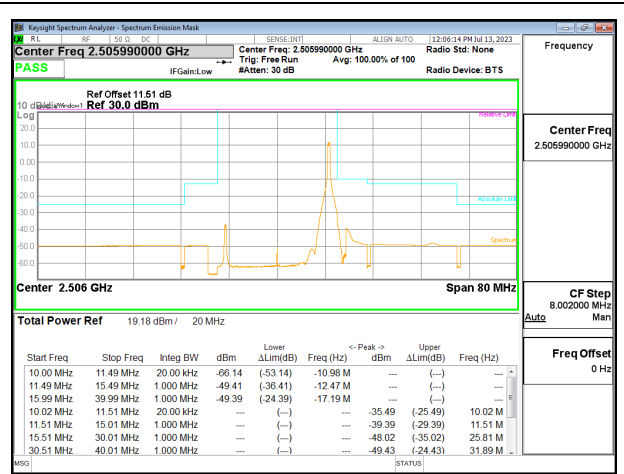
FCC: §27.53

(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

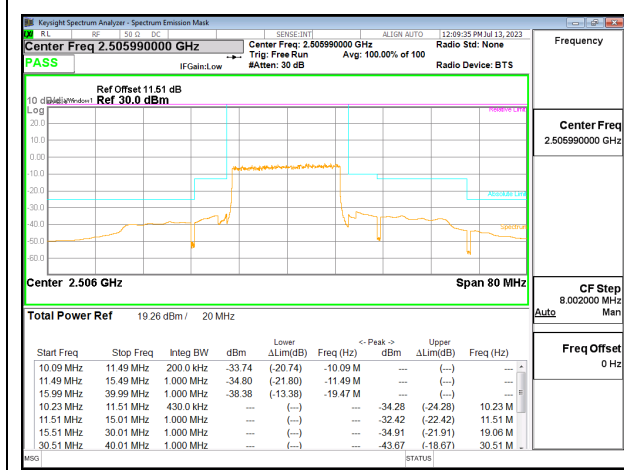
Test Engineer ID:	27465/44389	Test Date:	2023-07-13	EUT Serial Number:	QV770005VHQ
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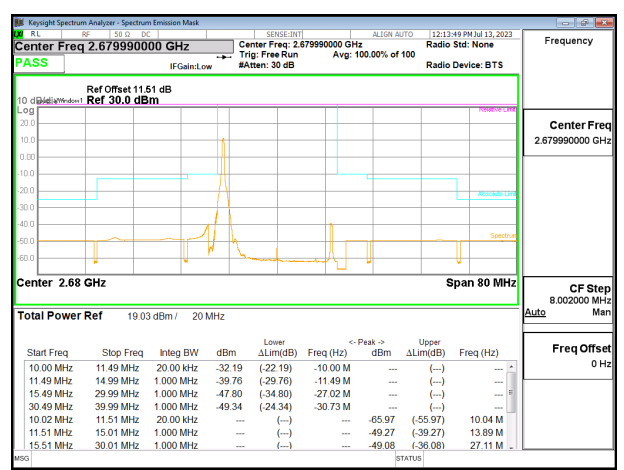
5G NR n41 20MHz QPSK Low Channel RB1-0



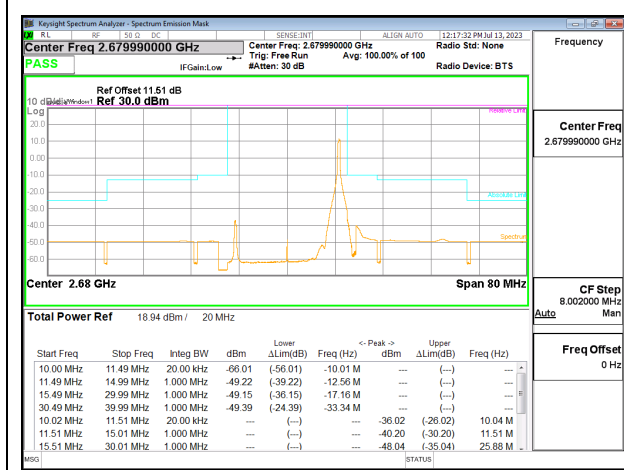
5G NR n41 20MHz QPSK Low Channel RB1-49



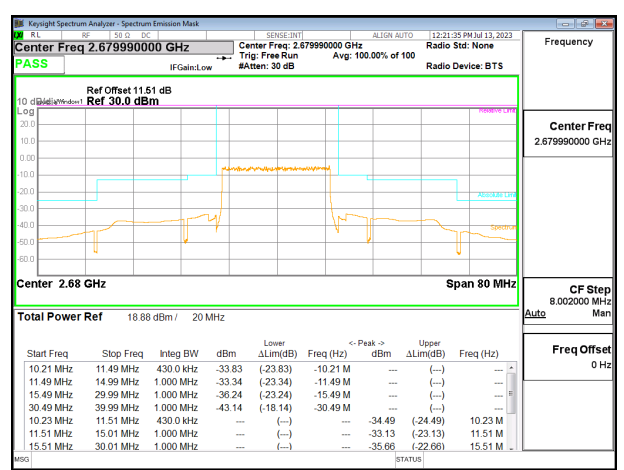
5G NR n41 20MHz QPSK Low Channel RB50-0



5G NR n41 20MHz QPSK High Channel RB1-0



5G NR n41 20MHz QPSK High Channel RB1-49



5G NR n41 20MHz QPSK High Channel RB50-0