

TEST REPORT

Report Number. : R14634918-E1

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

FCC ID : PY7-12907W

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:
2023-03-24

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-03-02	Initial Review	Noah Bennett
V2	2023-03-08	Addressed TCB Feedback. Updated various typographical errors	Noah Bennett
V3	2023-03-24	Removed Tune-up Limit Column from section 8.1 GSM output Power	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: QV7700HTFN, QV77000MFN, QV7700EYFN, QV770071FN, QV77001RFA

SAMPLE RECEIPT DATE: 2023-01-13 & 2023-01-20

DATE TESTED: 2023-01-24 to 2023-03-08

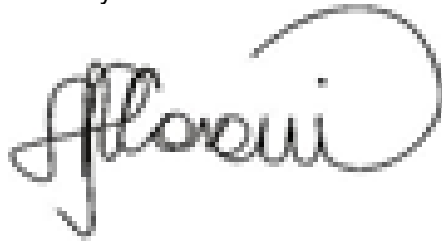
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 2	Complies
CFR 47 Part 22	Complies
CFR 47 Part 24	Complies
CFR 47 Part 27	Complies

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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Prepared By:



Noah Bennett
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UL LLC

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 and modulations (see section 6.5)

Requirement Description	Band	Requirement Clause Number (FCC)	Result	Remarks
Effective Radiated Power	GSM850, WCDMA5, LTE5	22.913 (a)(5)	Compliant	None.
	12	27.50 (c) (10)		
	13	27.50 (b) (10)		
Equivalent Isotropic Radiated Power	66	27.50 (d) (4)		
	41	27.50 (h) (2)		
	GSM1900	24.232 (b) (c)		
Requirement Description	Requirement Clause Number (FCC)		Result	Remarks
Occupied Bandwidth	2.1049		Compliant	None.
Band Edge and Emission Mask	2.1051, 22.917 (a), 24.238 (a), 27.53 (g), (c), (m)(4), (h)			
Out of Band Emissions	2.1051, 22.917 (a), 24.238 (a), 27.53 (g), (c), (m)(4), (h)			
Frequency Stability	2.1055, 22.355, 24.235, 27.54,			
Peak-to-Average Ratio	22.913 (d), 27.50 (d) (5)			
Field Strength of Spurious Radiation	2.1051, 22.917 (a), 24.238 (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 v02r01](#): 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:

GSM MODES

Part 22 850MHz								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824.2-848.8	GPRS	32.3	-5.51	7.0	24.64	0.291	245.15	245KGXW
	EGPRS	26.8			19.14	0.082	243.08	243KG7W
Part 24 1900MHz								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1850.2-1909.8	GPRS	27.6	-3.46	2.0	24.14	0.259	244.78	245KGXW
	EGPRS	26.4			22.94	0.197	239.01	239KG7W

WCDMA MODE

Part 22 Band 5								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
826.4-846.6	REL 99	22.3	-5.51	7.0	14.64	0.029	4138.9	4M14F9W
	HSDPA	21.2			13.54	0.023	4146.6	4M15F9W

LTE BAND 5

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
1.4	QPSK	824.7	848.3	21.20	13.54	0.023	1092.1	1M09G7W
	16QAM			21.60	13.94	0.025	1092.8	1M09D7W
3.0	QPSK	825.5	847.5	21.20	13.54	0.023	2704.2	2M70G7W
	16QAM			21.60	13.94	0.025	2703.4	2M70D7W
5.0	QPSK	826.5	846.5	21.30	13.64	0.023	4504.3	4M50G7W
	16QAM			21.70	14.04	0.025	4496.5	4M50D7W
10.0	QPSK	829.0	844.0	21.30	13.64	0.023	8967.0	8M97G7W
	16QAM			21.60	13.94	0.025	8982.5	8M98D7W

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	BPSK	826.5	846.5	21.90	14.24	0.027	4478.6	4M48G7W
	QPSK			21.80	14.14	0.026	4496.0	4M50G7W
	16QAM			20.60	12.94	0.020	4487.5	4M49D7W
10.0	BPSK	829.0	844.0	21.90	14.24	0.027	8928.7	8M93G7W
	QPSK			21.80	14.14	0.026	8939.8	8M94G7W
	16QAM			20.60	12.94	0.020	8943.9	8M94D7W
15.0	BPSK	831.5	841.5	22.00	14.34	0.027	13424	13M4G7W
	QPSK			22.00	14.34	0.027	13423	13M4G7W
	16QAM			20.80	13.14	0.021	13412	13M4D7W
20.0	BPSK	834.0	839.0	22.00	14.34	0.027	17901	17M9G7W
	QPSK			22.00	14.34	0.027	17838	17M8G7W
	16QAM			20.90	13.24	0.021	17894	17M9D7W

LTE BAND 12

Part 27								
ERP Limit (W)		3.00						
Antenna Gain (dBi)		-8.00						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	699.7	715.3	21.40	11.25	0.013	1090	1M09G7W
	16QAM			21.80	11.65	0.015	1091.9	1M09D7W
3.0	QPSK	700.5	714.5	21.50	11.35	0.014	2689.6	2M69G7W
	16QAM			21.90	11.75	0.015	2683.4	2M68D7W
5.0	QPSK	701.5	713.5	21.50	11.35	0.014	4495.9	4M50G7W
	16QAM			21.90	11.75	0.015	4501.1	4M50D7W
10.0	QPSK	704.0	711.0	21.40	11.25	0.013	8943.6	8M94G7W
	16QAM			21.70	11.55	0.014	8959.8	8M96D7W

LTE BAND 13

Part 27								
ERP Limit (W)		3.00						
Antenna Gain (dBi)		-11.70						
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	779.5	784.5	21.50	7.65	0.006	4499.7	4M50G7W
	16QAM			21.80	7.95	0.006	4491.4	4M49D7W
10.0	QPSK	782.0	782.0	21.40	7.55	0.006	8977.7	8M98G7W
	16QAM			21.70	7.85	0.006	8963.5	8M96D7W

LTE BAND 41

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
5.0	QPSK	2498.5	2687.5	19.50	15.55	0.036	4513.6	4M51G7W
	16QAM			19.60	15.65	0.037	4503.5	4M50D7W
10.0	QPSK	2501.0	2685.0	19.50	15.55	0.036	9006.4	9M01G7W
	16QAM			19.50	15.55	0.036	8996.7	9M00D7W
15.0	QPSK	2503.5	2682.5	19.30	15.35	0.034	13489	13M5G7W
	16QAM			19.30	15.35	0.034	13444	13M4D7W
20.0	QPSK	2506.0	2680.0	19.40	15.45	0.035	17932	17M9G7W
	16QAM			19.70	15.75	0.038	17936	17M9D7W

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	BPSK	2506.5	2680.0	20.00	16.05	0.040	17887	17M9G7W
	QPSK			20.00	16.05	0.040	17918	17M9G7W
	16QAM			18.40	14.45	0.028	17962	18M0D7W
30.0	BPSK	2511.0	2675.0	19.30	15.35	0.034	26787	26M8G7W
	QPSK			19.40	15.45	0.035	26810	26M8G7W
	16QAM			18.50	14.55	0.029	26913	26M9D7W
40.0	BPSK	2516.0	2670.0	19.30	15.35	0.034	35707	35M7G7W
	QPSK			19.30	15.35	0.034	35769	35M8G7W
	16QAM			18.30	14.35	0.027	35727	35M7D7W
50.0	BPSK	2521.0	2665.0	19.20	15.25	0.033	45967	46M0G7W
	QPSK			19.40	15.45	0.035	45770	45M8G7W
	16QAM			18.30	14.35	0.027	45817	45M8D7W
60.0	BPSK	2526.0	2660.0	19.30	15.35	0.034	58012	58M0G7W
	QPSK			19.20	15.25	0.033	57832	57M8G7W
	16QAM			18.20	14.25	0.027	58034	58M0D7W
70.0	BPSK	2531.0	2655.0	19.00	15.05	0.032	64271	64M3G7W
	QPSK			19.00	15.05	0.032	64623	64M6G7W
	16QAM			18.00	14.05	0.025	64666	64M7D7W
80.0	BPSK	2536.0	2650.0	19.00	15.05	0.032	76879	76M9G7W
	QPSK			19.00	15.05	0.032	77417	77M4G7W
	16QAM			18.40	14.45	0.028	77272	77M3D7W
90.0	BPSK	2541.0	2645.0	19.20	15.25	0.033	86836	86M8G7W
	QPSK			19.20	15.25	0.033	86990	87M0G7W
	16QAM			18.20	14.25	0.027	86705	86M7D7W
100.0	BPSK	2546.0	2640.0	19.90	15.95	0.039	96630	96M6G7W
	QPSK			19.90	15.95	0.039	96648	96M6G7W
	16QAM			18.90	14.95	0.031	96330	96M3D7W

LTE BAND 66 – Main Antenna

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
1.4	QPSK	1710.7	1779.3	18.40	13.89	0.024	1087.4	1M09G7W
	16QAM			18.90	14.39	0.027	1090.4	1M09D7W
3.0	QPSK	1711.5	1778.5	18.50	13.99	0.025	3694.7	3M69G7W
	16QAM			18.90	14.39	0.027	2693.4	2M69D7W
5.0	QPSK	1712.5	1777.5	18.50	13.99	0.025	4491.2	4M49G7W
	16QAM			18.90	14.39	0.027	4498.7	4M50D7W
10.0	QPSK	1715.0	1775.0	18.50	13.99	0.025	8962.2	8M96G7W
	16QAM			18.80	14.29	0.027	8969.8	8M97D7W
15.0	QPSK	1717.5	1772.5	18.30	13.79	0.024	13490.8	13M5G7W
	16QAM			18.60	14.09	0.026	13464	13M5D7W
20.0	QPSK	1720.0	1770.0	18.50	13.99	0.025	17863.9	17M9G7W
	16QAM			18.70	14.19	0.026	17895.7	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	16.20	13.76	0.024	1091.9	1M09G7W
	16QAM			16.60	14.16	0.026	1099.9	1M10D7W
3.0	QPSK	1711.5	1778.5	16.30	13.86	0.024	2716.6	2M72G7W
	16QAM			16.70	14.26	0.027	2715.4	2M72D7W
5.0	QPSK	1712.5	1777.5	16.50	14.06	0.025	4498.4	4M50G7W
	16QAM			16.80	14.36	0.027	4490	4M49D7W
10.0	QPSK	1715.0	1775.0	16.50	14.06	0.025	8990.9	8M99G7W
	16QAM			16.80	14.36	0.027	8980.6	8M98D7W
15.0	QPSK	1717.5	1772.5	16.30	13.86	0.024	13469	13M5G7W
	16QAM			16.60	14.16	0.026	13449	13M4D7W
20.0	QPSK	1720.0	1770.0	16.30	13.86	0.024	17915	17M9G7W
	16QAM			16.80	14.36	0.027	17931	17M9D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.71 for Conducted samples, and 0.81 for 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	-5.51		
GSM1900	1850 - 1910		-3.46	
LTE Band 12, LTE Band 17	699 – 716	-8.00		
LTE Band 13	777 – 787	-11.70		
LTE Band 41, 5G NR n41	2496 – 2690		-3.95	
LTE Band 4, LTE Band 66	1710 – 1780		-4.51	-2.44 (B66 Only)

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, Band 66, 5G NR n5, and 5G NR n41.

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. It was found that Rel 99 and HSDPA were worst case for WCDMA, QPSK and 16QAM were worst case for LTE and 5G FR1 n5, and BPSK and 16QAM was Worst Case for 5G FR1 n41. Therefore, all testing was done in these modes only.

For 5G FR1, CP-OFDM vs DFTs-OFDM waveforms were investigated, and it was found that DFTs-OFDM was worst case for both n5 and n41. Therefore, all testing was performed in DFTs-OFDM Waveform mode.

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)		X
Mid Band (1GHz<Fc<3GHz)	Cell Sub	X
BT (For Sim Tx)	BT C0/C1	X
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 as follows:

Technology	Band (Frequency)	Modulation
GSM	850	GPRS
WCDMA	Band 5	Rel 99
LTE	Band 12	16QAM
5G FR1	Band n41	BPSK

The following scans were investigated for simultaneous transmission:

Mode	Mode	Mode
LTE B66 1745MHz 20MHz RB1-0	2442MHz BT GFSK C0	5240MHz 11ax HE20 26T/0 MIMO
LTE B66 1745MHz 20MHz RB1-0	2442MHz BT GFSK C1	5240MHz 11ax HE20 26T/0 MIMO
LTE B66 1745MHz 20MHz RB1-0	2442MHz 11ax HE20 106T/54 MIMO	
LTE B66 1745MHz 20MHz RB1-0	5240MHz 11ax HE20 26T/0 MIMO	
LTE B12 704MHz 10MHz RB1-0	2462MHz 11ax HE20 106T/54 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

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 R14634918-EP1 for Setup Diagrams and Setup Photos.

7. 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					
Conducted Room 2					
PWM005	RF Power Meter	Keysight Technologies	N1912A	2022-09-02	2024-09-02
PWS005	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-06-15	2023-06-15
HI0090	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
Conducted Room 1					
207726	Temp/Humid Chamber	Thermotron	SM-32-8200	2023-01-20	2024-01-20
SA0027	Spectrum Analyzer	Keysight Technologies	N9030A	2022-05-24	2023-05-24
SA0020	Spectrum Analyzer	Keysight Technologies	E4446A	2022-06-08	2023-06-08
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
212967	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500	2022-12-14	2023-12-14
213025	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500	2022-12-08	2023-12-08
PWM003	RF Power Meter	Keysight Technologies	N1911A	2022-09-10	2023-09-10
PWS002	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-09-27	2023-09-27
PWM005	RF Power Meter	Keysight Technologies	N1912A	2022-09-02	2024-09-02
PWS005	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-06-15	2023-06-15
212166	Wideband Radio Communications Tester	Anritsu	MT8000A	2022-04-28	2023-04-28
212167	Wideband Radio Communications Tester	Anritsu	MT8821C	2022-05-14	2023-05-14
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16	NA	NA
SOFTEMI	Conducted License Test (CLT) Software	UL	Version 4.0 b-ph	NA	NA
Additional Equipment used					
208721	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500 (SN 170194)	2022-05-05	2023-05-05
208720	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500 (SN 170193)	2022-05-02	2023-05-02

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	2022-05-03	2023-05-03
226565	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2022-05-03	2023-05-03
226559	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2022-05-03	2023-05-03
226552	SMA Coaxial 20dB Attenuator 25MHz-18GHz	CentricRF	C18S2-20	2022-05-03	2023-05-03
226551	SMA Coaxial 20dB Attenuator 25MHz-18GHz	CentricRF	C18S2-20	2022-05-03	2023-05-03
226562	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2022-05-03	2023-05-03
Cables					
CBL012	Micro-Coax UTIFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB293C-0-2400-300300	2023-01-05	2024-01-05
CBL093	Micro-Coax UTIFLEX Cable Assembly, Low Loss,40Ghz	Carlisle Interconnect Technologies	UFA147A-2-0360-200200	2022-08-24	2023-08-24
CBL098	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
CBL099	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
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,40Ghz	Carlisle Interconnect Technologies	UFA147A-2-0360-200200	2023-01-20	2024-01-20
CBL092	Micro-Coax UTIFLEX Cable Assembly, Low Loss,40Ghz	Carlisle Interconnect Technologies	UFA147A-2-0360-200200	2022-02-15	2023-02-15
Couplers					
CPL001	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2022-02-14	2023-02-14
CPL003-SAR	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2022-06-15	2023-06-15

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
	30-1000 MHz				
AT0075	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2023-01-06	2024-01-06
	1-18 GHz				
AT0067	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-24	2023-05-24
	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				
C4-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-20	2023-05-20
C4-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2022-05-20	2023-05-20
C4-SAC03	Gain-loss string: 1-18GHz	Various	Various	2022-05-20	2023-05-20
C4-SAC04	Gain-loss string: 18-40GHz	Various	Various	2022-10-12	2023-10-12
	Receiver & Software				
SA0026	Spectrum Analyzer	Agilent	N9030A	2022-08-02	2023-08-02
197254	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-02-02	2024-02-02
SA0020	Spectrum Analyzer	Agilent	E4446A	2022-06-08	2023-06-08
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	2022-09-13	2023-09-13
	High-Pass Filters				
HPF009	1GHz high-pass filter, 2W, F _{high} = 10GHz	Micro-Tronics	HPM17672	2022-02-17	2023-02-17
BRF011	2.495-2.690GHz notch filter, 2W, F _{high} = 18GHz	Micro-Tronics	BRM50709-01	2022-02-17	2023-02-17
BRF010	1.85-1.97GHz notch filter, 2W, F _{high} = 9GHz	Micro-Tronics	BRM50714-01	2022-02-17	2023-02-17
HPF012	1GHz high-pass filter, 2W, F _{high} = 18GHz	Micro-Tronics	HPM18129	2022-02-17	2023-02-17
BRF001	900MHz notch filter, 2W, F _{high} = 6GHz	Micro-Tronics	BRM50706	2022-05-27	2023-05-27
169106 (BRF008)	1710-1785MHz notch filter, 2W, F _{high} = 9GHz	Micro-Tronics	BRM50713-01	2022-02-17	2023-02-28

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-11	2023-05-11
	Gain-Loss Chains				
C1-SAC03	Gain-loss string: 1-18GHz	Various	Various	2022-12-02	2023-12-02
	Receiver & Software				
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-02-15	2023-02-27
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
212166	Wideband Radio Communications Tester	Anritsu	MT8000A	2022-04-28	2023-04-28
212167	Wideband Radio Communications Tester	Anritsu	MT8821C	2022-05-14	2023-05-14
BRF011	2.495-2.690GHz notch filter, 2W, F _{high} = 18GHz	Micro-Tronics	BRM50709-01	2022-02-17	2023-02-17

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

8.1. GSM

Using CMW500 Communication Test Set

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press **Connection control** to choose the different menus

Press **RESET** > choose all to reset all settings

Connection	Press Signal Off to turn off the signal and change settings Network Support > GSM+GPRS or GSM+EGPRS Main Service > Packet Data Service selection > Test Mode A – Auto Slot Config. Off
MS Signal	Press Slot Config bottom on the right twice to select and change the number of time slots and power setting > Slot configuration > Uplink/Gamma > 33 dBm for GPRS 850/900 > 27 dBm for EGPRS 850/900 > 30 dBm for GPRS1800/1900 > 26 dBm for EGPRS1800/1900
BS Signal	Enter the same channel number for TCH channel (test channel) and BCCH channel Frequency Offset > + 0 Hz Mode > BCCH and TCH BCCH Level > -85 dBm (May need to adjust if link is not stable) BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] Channel Type > Off P0 > 4 dB Slot Config > Unchanged (if already set under MS Signal) TCH > Choose desired test channel Hopping > Off Main Timeslot > 3 (Default)
Network	Coding Scheme > CS 1 (GPRS) and MCS5 (EGPRS) Bit Stream > 2E9-1PSR Bit Pattern
AF/RF	Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection	Press Signal On to turn on the signal and change settings

RESULT

8.1.1. GSM850

Test Engineer ID:	27129/44389	Test Date:	2023-01-05	EUT Serial Number:	QV77001RFA
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)	
					Measured	
					Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	128	824.2	32.1	23.0
			190	836.6	32.3	23.3
			251	848.8	32.3	23.3
		2	128	824.2	28.9	22.9
			190	836.6	29.0	23.0
			251	848.8	29.0	23.0
		3	128	824.2	27.1	22.8
			190	836.6	27.4	23.2
			251	848.8	27.3	23.1
		4	128	824.2	26.0	23.0
			190	836.6	26.2	23.1
			251	848.8	26.1	23.1
EDGE (8PSK)	MCS5	1	128	824.2	26.7	17.7
			190	836.6	26.8	17.7
			251	848.8	26.7	17.7
		2	128	824.2	24.0	17.9
			190	836.6	24.0	18.0
			251	848.8	24.0	17.9
		3	128	824.2	22.1	17.9
			190	836.6	22.1	17.8
			251	848.8	22.1	17.8
		4	128	824.2	21.1	18.1
			190	836.6	21.0	18.0
			251	848.8	21.0	18.0

8.1.2. GSM850 DTM

Test Engineer ID:	27129/44389	Test Date:	2023-01-10	EUT Serial Number:	QV77001RFA
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)			
					Measured			
					CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr
GSM + GPRS/EDGE (Voice) + (GMSK)	CS1	1	128	824.2	32.2		23.2	
			190	836.6	32.3		23.3	
			251	848.8	32.4		23.4	
		2	128	824.2	28.9	29.1	22.9	23.0
			190	836.6	29.1	29.2	23.0	23.1
			251	848.8	29.1	29.2	23.1	23.2
		3	128	824.2	27.0	27.0	22.8	22.8
			190	836.6	27.2	27.2	23.0	22.9
			251	848.8	27.2	27.1	22.9	22.9
GSM + EDGE (Voice) + (8PSK)	MCS5	1	128	824.2	32.2		23.2	
			190	836.6	32.3		23.2	
			251	848.8	32.4		23.4	
		2	128	824.2	29.0	23.8	23.0	17.7
			190	836.6	29.1	23.8	23.1	17.8
			251	848.8	29.2	23.9	23.2	17.9
		3	128	824.2	27.2	21.8	22.9	17.5
			190	836.6	27.2	21.9	23.0	17.6
			251	848.8	27.1	21.8	22.9	17.6

8.1.3. GSM1900

Test Engineer ID:	27129/44389	Test Date:	2023-01-10	EUT Serial Number:	QV77001RFA
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)	
					Measured	
					Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	512	1850.2	27.0	17.9
			661	1880.0	27.5	18.4
			810	1909.8	27.6	18.6
		2	512	1850.2	24.0	17.9
			661	1880.0	24.1	18.1
			810	1909.8	24.3	18.3
		3	512	1850.2	22.2	17.9
			661	1880.0	22.4	18.1
			810	1909.8	22.6	18.3
		4	512	1850.2	21.1	18.0
			661	1880.0	21.1	18.1
			810	1909.8	21.4	18.4
EDGE (8PSK)	MCS5	1	512	1850.2	26.1	17.0
			661	1880.0	26.2	17.1
			810	1909.8	26.4	17.4
		2	512	1850.2	22.9	16.9
			661	1880.0	23.0	17.0
			810	1909.8	23.2	17.2
		3	512	1850.2	21.0	16.8
			661	1880.0	21.3	17.1
			810	1909.8	21.5	17.2
		4	512	1850.2	19.8	16.8
			661	1880.0	19.8	16.8
			810	1909.8	20.0	17.0

8.1.4. GSM1900 DTM

Test Engineer ID:	27129/44389	Test Date:	2023-01-10	EUT Serial Number:	QV77001RFA
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Normal Average Power (dBm)			
					Measured			
					CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr
GSM + GPRS/EDGE (Voice) + (GMSK)	CS1	1	512	1850.2	27.2		18.2	
			661	1880.0	27.5		18.4	
			810	1909.8	27.5		18.5	
		2	512	1850.2	23.6	23.8	17.6	17.8
			661	1880.0	23.6	23.7	17.6	17.7
			810	1909.8	23.7	23.7	17.7	17.7
		3	512	1850.2	21.8	21.9	17.6	17.6
			661	1880.0	22.2	22.2	18.0	17.9
			810	1909.8	22.5	22.5	18.3	18.3
GSM + EDGE (Voice) + (8PSK)	MCS5	1	512	1850.2	27.2		18.2	
			661	1880.0	27.5		18.4	
			810	1909.8	27.5		18.5	
		2	512	1850.2	23.8	23.2	17.8	17.1
			661	1880.0	23.8	23.1	17.7	17.1
			810	1909.8	23.9	23.1	17.9	17.1
		3	512	1850.2	21.9	20.8	17.7	16.6
			661	1880.0	22.1	21.0	17.8	16.7
			810	1909.8	21.3	21.1	17.0	16.9

8.2. WCDMA

TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW ≥ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

REL 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA REL 5

The following 4 Sub-tests were completed according to Release 5 procedures in table C.10.1.4 of 3GPP TS 34.121-1 A summary of these settings are illustrated below:

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

HSPA REL 6 (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in table C.11.1.3 of 3GPP TS 34.121-1. A summary of these settings are illustrated below:

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

RESULT

8.2.1. WCDMA BAND 5

Test Engineer ID:	27129/44389	Test Date:	2023-01-06	EUT Serial Number:	QV77001RFA
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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						ANT 1	
W-CDMA Band 5 (850MHz)	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	22.3	
			4183	836.6	N/A	22.2	
			4233	846.6	N/A	21.6	
	HSDPA	Subtest 1	4132	826.4	0	21.2	
			4183	836.6	0	21.2	
			4233	846.6	0	20.6	
		Subtest 2	4132	826.4	0	21.2	
			4183	836.6	0	21.0	
			4233	846.6	0	20.6	
		Subtest 3	4132	826.4	0.5	20.5	
			4183	836.6	0.5	20.5	
			4233	846.6	0.5	20.1	
		Subtest 4	4132	826.4	0.5	20.6	
			4183	836.6	0.5	20.5	
			4233	846.6	0.5	20.1	
		HSPA (HSDPA & HSUPA)	Subtest 1	4132	826.4	0	21.3
				4183	836.6	0	21.3
				4233	846.6	0	20.5
	Subtest 2		4132	826.4	2	19.3	
			4183	836.6	2	19.2	
			4233	846.6	2	18.6	
	Subtest 3		4132	826.4	1	20.3	
			4183	836.6	1	20.3	
			4233	846.6	1	19.6	
	Subtest 4		4132	826.4	2	19.3	
			4183	836.6	2	19.3	
			4233	846.6	2	18.6	
	Subtest 5		4132	826.4	0	21.2	
			4183	836.6	0	21.3	
			4233	846.6	0	20.5	

8.3. 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 6.2.2.3-1: 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	≤ 3.5 ¹	≤ 1.2 ¹	≤ 0.2 ¹
		≤ 0.5 ²		0 ²
	Pi/2 BPSK w Pi/2 BPSK DMRS	≤ 0.5 ²		0 ²
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
CP-OFDM	256 QAM	≤ 4.5		
	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:

8.3.1. LTE BAND 5

Test Engineer ID:	27129/44389	Test Date:	2023-01-06	EUT Serial Number:	QV77001RFA
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OUTPUT POWER FOR LTE BAND 5 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20407	20525	20643
				824.7 MHz	836.5 MHz	848.3 MHz
1.4	QPSK	1	0	21.2	21.1	21.1
		1	3	21.2	21.1	21.1
		1	5	21.2	21.1	21.1
		3	0	21.2	21.1	21.1
		3	1	21.2	21.2	21.1
		3	3	21.2	21.1	21.1
		6	0	21.2	21.1	21.1
	16QAM	1	0	21.5	21.5	21.5
		1	3	21.6	21.5	21.5
		1	5	21.5	21.5	21.5
		3	0	21.4	21.3	21.3
		3	1	21.4	21.3	21.3
		3	3	21.4	21.3	21.3
		6	0	21.3	21.2	21.2
	64QAM	1	0	21.4	21.4	21.4
		1	3	21.5	21.4	21.4
		1	5	21.4	21.4	21.4
		3	0	21.3	21.2	21.3
		3	1	21.3	21.3	21.3
		3	3	21.3	21.3	21.3
		6	0	21.1	21.3	21.1

OUTPUT POWER FOR LTE BAND 5 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20415	20525	20635
				825.5 MHz	836.5 MHz	847.5 MHz
3.0	QPSK	1	0	21.1	21.1	21.2
		1	7	21.2	21.2	21.2
		1	14	21.1	21.1	21.1
		8	0	21.2	21.1	21.2
		8	4	21.2	21.2	21.2
		8	7	21.2	21.2	21.2
		15	0	21.2	21.2	21.2
	16QAM	1	0	21.5	21.5	21.4
		1	7	21.6	21.6	21.5
		1	14	21.5	21.4	21.3
		8	0	21.2	21.2	21.2
		8	4	21.3	21.2	21.2
		8	7	21.3	21.3	21.2
		15	0	21.2	21.2	21.2
	64QAM	1	0	21.4	21.4	21.3
		1	7	21.6	21.5	21.4
		1	14	21.4	21.4	21.3
		8	0	21.3	21.2	21.2
		8	4	21.3	21.2	21.3
		8	7	21.3	21.3	21.2
		15	0	21.3	21.2	21.2

OUTPUT POWER FOR LTE BAND 5 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	ANT 1		
				Conducted Average (dBm)		
				20425	20525	20625
				826.5 MHz	836.5 MHz	846.5 MHz
5.0	QPSK	1	0	21.2	21.1	21.1
		1	12	21.3	21.3	21.3
		1	24	21.1	21.1	21.1
		12	0	21.2	21.1	21.1
		12	6	21.3	21.2	21.1
		12	11	21.2	21.2	21.2
		25	0	21.2	21.2	21.1
	16QAM	1	0	21.5	21.5	21.5
		1	12	21.7	21.7	21.6
		1	24	21.5	21.5	21.5
		12	0	21.3	21.2	21.2
		12	6	21.4	21.2	21.3
		12	11	21.3	21.3	21.3
		25	0	21.2	21.2	21.1
	64QAM	1	0	21.4	21.4	21.3
		1	12	21.5	21.5	21.5
		1	24	21.5	21.4	21.3
		12	0	21.3	21.1	21.2
		12	6	21.3	21.2	21.2
		12	11	21.3	21.2	21.3
		25	0	21.2	21.2	21.1

OUTPUT POWER FOR LTE BAND 5 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20450	20525	20600
				829.0 MHz	836.5 MHz	844.0 MHz
10.0	QPSK	1	0	21.3	21.2	21.3
		1	24	21.2	21.2	21.3
		1	49	21.3	21.2	21.2
		25	0	21.2	21.2	21.2
		25	12	21.3	21.3	21.2
		25	24	21.3	21.2	21.3
		50	0	21.3	21.2	21.2
	16QAM	1	0	21.6	21.6	21.6
		1	24	21.6	21.5	21.5
		1	49	21.6	21.6	21.5
		25	0	21.3	21.2	21.3
		25	12	21.3	21.3	21.3
		25	24	21.3	21.3	21.3
		50	0	21.3	21.2	21.2
	64QAM	1	0	21.6	21.4	21.6
		1	24	21.6	21.4	21.6
		1	49	21.6	21.4	21.5
		25	0	21.3	21.2	21.2
		25	12	21.3	21.3	21.3
		25	24	21.3	21.2	21.3
		50	0	21.3	21.3	21.3

8.3.2. 5G NR n5

Test Engineer ID:	27465/44389	Test Date:	2023-02-17	EUT Serial Number:	QV77000MFN
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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	21.8	21.9	21.9
		1	12	21.8	21.9	21.8
		1	23	21.9	21.9	21.8
		12	0	21.5	21.4	21.3
		12	6	21.8	21.8	21.8
		12	12	21.5	21.4	21.2
		25	0	21.5	21.3	21.3
	QPSK	1	1	21.7	21.8	21.8
		1	12	21.8	21.8	21.8
		1	23	21.8	21.8	21.8
		12	0	21.5	21.5	21.3
		12	6	21.7	21.8	21.7
		12	12	21.5	21.3	21.2
		25	0	21.6	21.4	21.3
	16QAM	1	1	20.5	20.6	20.4
		1	12	20.4	20.6	20.0
		1	23	20.3	20.5	20.1
		12	0	20.5	20.4	20.3
		12	6	20.6	20.4	20.2
		12	12	20.5	20.3	20.2
		25	0	20.6	20.3	20.3
	64QAM	1	1	19.2	18.6	19.1
		1	12	19.2	18.7	19.1
		1	23	19.2	18.8	19.1
		12	0	19.1	19.0	18.7
		12	6	19.0	18.9	18.7
		12	12	18.9	18.9	18.8
		25	0	19.0	18.9	18.8
	256QAM	1	1	16.9	17.1	16.7
		1	12	16.8	17.1	16.7
1		23	16.8	17.2	16.7	
12		0	17.1	17.0	16.8	
12		6	17.1	17.0	16.7	
12		12	17.0	17.0	16.8	
25		0	17.0	16.9	16.7	

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	21.7	21.8	21.8
		1	25	21.8	21.9	21.9
		1	50	21.8	21.9	21.8
		25	0	21.5	21.5	21.5
		25	12	21.7	21.8	21.9
		25	25	21.4	21.4	21.5
		50	0	21.5	21.5	21.5
	QPSK	1	1	21.7	21.7	21.8
		1	25	21.8	21.8	21.8
		1	50	21.8	21.8	21.8
		25	0	21.5	21.5	21.5
		25	12	21.7	21.7	21.8
		25	25	21.5	21.5	21.4
		50	0	21.4	21.4	21.5
	16QAM	1	1	20.5	20.4	20.4
		1	25	20.4	20.5	20.4
		1	50	20.4	20.4	20.4
		25	0	20.5	20.5	20.5
		25	12	20.6	20.5	20.6
		25	25	20.5	20.5	20.4
		50	0	20.4	20.4	20.5
	64QAM	1	1	18.8	18.9	18.9
		1	25	18.9	18.8	18.7
		1	50	18.8	18.9	18.8
		25	0	19.0	19.0	19.0
		25	12	19.1	18.9	18.9
		25	25	19.0	19.0	19.0
		50	0	19.0	18.9	18.9
	256QAM	1	1	17.0	16.9	17.1
		1	25	17.0	16.9	16.9
1		50	16.9	16.9	16.9	
25		0	17.0	17.1	17.1	
25		12	17.1	17.0	17.1	
25		25	17.1	17.0	17.1	
50		0	17.0	17.0	16.9	

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	21.9	21.9	22.0
		1	39	22.0	22.0	21.9
		1	77	21.9	21.9	21.9
		36	0	21.5	21.6	21.5
		36	18	21.9	21.9	21.8
		36	36	21.6	21.5	21.4
		75	0	21.5	21.5	21.5
	QPSK	1	1	21.9	21.9	21.9
		1	39	21.9	22.0	21.8
		1	77	21.9	21.8	21.8
		36	0	21.7	21.7	21.6
		36	18	21.8	21.9	21.8
		36	36	21.7	21.5	21.5
		75	0	21.6	21.5	21.4
	16QAM	1	1	20.4	20.8	20.6
		1	39	20.4	20.6	20.7
		1	77	20.3	20.7	20.4
		36	0	20.7	20.6	20.5
		36	18	20.6	20.6	20.6
		36	36	20.6	20.6	20.5
		75	0	20.6	20.6	20.5
	64QAM	1	1	18.9	19.2	18.9
		1	39	18.9	19.1	18.7
		1	77	18.9	19.0	18.6
		36	0	19.1	19.1	19.0
		36	18	19.1	19.1	18.9
		36	36	19.2	18.9	18.9
		75	0	19.1	19.0	19.0
	256QAM	1	1	17.2	17.4	17.2
		1	39	17.1	17.2	17.0
1		77	17.0	17.1	16.9	
36		0	17.1	17.2	17.1	
36		18	17.1	17.1	17.1	
36		36	17.1	16.9	17.0	
75		0	17.1	17.0	17.0	

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	21.9	21.9	22.0
		1	52	21.9	21.9	21.9
		1	104	21.8	21.8	21.9
		50	0	21.7	21.6	21.6
		50	25	21.9	22.0	22.0
		50	50	21.6	21.4	21.5
		100	0	21.6	21.6	21.5
	QPSK	1	1	21.9	21.9	22.0
		1	52	21.9	22.0	22.0
		1	104	21.8	21.9	21.9
		50	0	21.7	21.5	21.6
		50	25	21.9	21.9	21.9
		50	50	21.6	21.5	21.6
		100	0	21.6	21.6	21.5
	16QAM	1	1	20.9	20.8	20.7
		1	52	20.7	20.7	20.7
		1	104	20.5	20.5	20.4
		50	0	20.6	20.7	20.6
		50	25	20.7	20.6	20.6
		50	50	20.5	20.6	20.5
		100	0	20.6	20.7	20.5
	64QAM	1	1	18.6	19.2	19.0
		1	52	18.7	19.2	19.0
		1	104	18.6	18.9	18.5
		50	0	19.1	19.1	19.1
		50	25	19.0	19.0	19.0
		50	50	19.0	19.0	19.0
		100	0	19.1	19.1	19.0
	256QAM	1	1	17.2	17.1	17.1
		1	52	17.1	17.1	16.9
1		104	17.1	16.9	16.8	
50		0	17.2	17.2	17.0	
50		25	17.1	17.1	17.0	
50		50	17.0	17.0	16.9	
100		0	17.2	17.2	17.0	

8.3.3. LTE BAND 12

Test Engineer ID:	27129/44389	Test Date:	2023-01-06	EUT Serial Number:	QV77001RFA
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OUTPUT POWER FOR LTE BAND 12 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23017	23095	23173
				699.7 MHz	707.5 MHz	715.3 MHz
1.4	QPSK	1	0	21.3	21.4	21.4
		1	3	21.4	21.4	21.4
		1	5	21.3	21.4	21.4
		3	0	21.3	21.4	21.4
		3	1	21.4	21.4	21.4
		3	3	21.4	21.4	21.4
		6	0	21.3	21.4	21.4
	16QAM	1	0	21.5	21.7	21.7
		1	3	21.6	21.7	21.8
		1	5	21.6	21.7	21.7
		3	0	21.5	21.5	21.6
		3	1	21.6	21.5	21.6
		3	3	21.5	21.6	21.6
		6	0	21.4	21.4	21.5
	64QAM	1	0	21.6	21.5	21.6
		1	3	21.7	21.6	21.7
		1	5	21.6	21.6	21.6
		3	0	21.4	21.5	21.5
		3	1	21.4	21.5	21.5
		3	3	21.5	21.5	21.5
		6	0	21.0	21.0	20.8

OUTPUT POWER FOR LTE BAND 12 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23025	23095	23165
				700.5 MHz	707.5 MHz	714.5 MHz
3.0	QPSK	1	0	21.4	21.3	21.3
		1	7	21.4	21.4	21.5
		1	14	21.3	21.3	21.3
		8	0	21.4	21.4	21.3
		8	4	21.4	21.4	21.4
		8	7	21.4	21.4	21.4
		15	0	21.4	21.3	21.3
	16QAM	1	0	21.7	21.7	21.7
		1	7	21.8	21.9	21.8
		1	14	21.6	21.7	21.7
		8	0	21.5	21.4	21.5
		8	4	21.5	21.5	21.5
		8	7	21.5	21.5	21.6
		15	0	21.5	21.4	21.4
	64QAM	1	0	21.5	21.6	21.7
		1	7	21.6	21.7	21.7
		1	14	21.5	21.5	21.6
		8	0	21.0	20.9	20.9
		8	4	21.0	20.9	20.9
		8	7	21.0	21.0	21.0
		15	0	20.9	20.9	20.9

OUTPUT POWER FOR LTE BAND 12 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23035	23095	23155
				701.5 MHz	707.5 MHz	713.5 MHz
5.0	QPSK	1	0	21.3	21.3	21.3
		1	12	21.4	21.5	21.5
		1	24	21.3	21.3	21.4
		12	0	21.4	21.3	21.3
		12	6	21.4	21.3	21.4
		12	11	21.4	21.4	21.4
		25	0	21.4	21.3	21.4
	16QAM	1	0	21.7	21.7	21.8
		1	12	21.8	21.8	21.9
		1	24	21.7	21.7	21.8
		12	0	21.5	21.4	21.4
		12	6	21.5	21.5	21.4
		12	11	21.5	21.5	21.5
		25	0	21.4	21.3	21.4
	64QAM	1	0	21.7	21.6	21.7
		1	12	21.8	21.7	21.7
		1	24	21.7	21.6	21.7
		12	0	21.0	20.8	20.9
		12	6	21.0	20.8	21.0
		12	11	21.0	20.9	21.0
		25	0	20.9	20.8	20.9

OUTPUT POWER FOR LTE BAND 12 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23060	23095	23130
				704.0 MHz	707.5 MHz	711.0 MHz
10.0	QPSK	1	0	21.4	21.4	21.2
		1	24	21.3	21.4	21.3
		1	49	21.3	21.4	21.1
		25	0	21.1	21.3	21.2
		25	12	21.2	21.4	21.2
		25	24	21.2	21.4	21.2
		50	0	21.1	21.3	21.2
	16QAM	1	0	21.7	21.7	21.5
		1	24	21.7	21.7	21.4
		1	49	21.5	21.7	21.6
		25	0	21.1	21.4	21.1
		25	12	21.1	21.4	21.2
		25	24	21.2	21.5	21.3
		50	0	21.0	21.3	21.2
	64QAM	1	0	21.3	21.6	21.4
		1	24	21.5	21.6	21.4
		1	49	21.5	21.6	21.5
		25	0	21.2	20.9	21.1
		25	12	21.2	20.9	21.2
		25	24	21.3	20.9	21.3
		50	0	21.3	20.9	21.2

8.3.4. LTE BAND 13

Test Engineer ID:	27129/44389	Test Date:	2023-01-06	EUT Serial Number:	QV77001RFA
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OUTPUT POWER FOR LTE BAND 13 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23205	23230	23255
				779.5 MHz	782.0 MHz	784.5 MHz
5.0	QPSK	1	0	21.1	21.3	21.0
		1	12	21.1	21.5	21.1
		1	24	21.0	21.3	20.9
		12	0	21.1	21.3	20.9
		12	6	21.1	21.3	21.0
		12	11	21.0	21.4	21.0
		25	0	21.1	21.3	20.9
	16QAM	1	0	21.4	21.7	21.4
		1	12	21.5	21.8	21.4
		1	24	21.3	21.7	21.4
		12	0	21.2	21.4	21.0
		12	6	21.2	21.4	21.0
		12	11	21.1	21.4	21.1
		25	0	21.0	21.3	21.0
	64QAM	1	0	21.3	21.6	21.2
		1	12	21.3	21.6	21.2
		1	24	21.2	21.6	21.2
		12	0	21.1	20.9	20.9
		12	6	21.2	20.9	21.0
		12	11	21.1	21.0	21.0
		25	0	21.1	20.9	20.9

OUTPUT POWER FOR LTE BAND 13 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				N/A	23230	N/A
				N/A	782.0 MHz	N/A
10.0	QPSK	1	0		21.4	
		1	24		21.4	
		1	49		21.3	
		25	0		21.3	
		25	12		21.3	
		25	24		21.4	
		50	0		21.3	
	16QAM	1	0		21.7	
		1	24		21.7	
		1	49		21.7	
		25	0		21.4	
		25	12		21.4	
		25	24		21.4	
		50	0		21.4	
	64QAM	1	0		21.7	
		1	24		21.6	
		1	49		21.6	
		25	0		21.0	
		25	12		21.0	
		25	24		21.0	
		50	0		21.0	

8.3.5. LTE BAND 41

Test Engineer ID:	27129/44389	Test Date:	2023-01-06 2023-03-08	EUT Serial Number:	QV77001RFA
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OUTPUT POWER FOR LTE BAND 41 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				39675	40620	41565
				2498.5	2593 MHz	2687.5
5.0	QPSK	1	0	19.3	19.4	18.9
		1	12	19.3	19.5	19.1
		1	24	19.2	19.4	18.9
		12	0	19.3	19.4	19.0
		12	6	19.3	19.5	19.1
		12	11	19.3	19.4	19.0
		25	0	19.3	19.4	19.0
	16QAM	1	0	19.3	19.5	18.9
		1	12	19.4	19.6	19.1
		1	24	19.3	19.6	19.0
		12	0	19.4	19.4	19.1
		12	6	19.4	19.5	19.2
		12	11	19.3	19.5	19.2
		25	0	19.3	19.4	19.0
	64QAM	1	0	19.6	19.4	18.8
		1	12	19.8	19.5	18.9
		1	24	19.2	19.4	19.1
		12	0	19.6	19.3	19.3
		12	6	19.5	19.4	19.2
		12	11	19.5	19.4	19.3
		25	0	19.4	19.4	19.3

OUTPUT POWER FOR LTE BAND 41 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				27900	40620	41540
				2501.0	2593 MHz	2685.0
10.0	QPSK	1	0	19.3	19.4	19.0
		1	24	19.3	19.4	19.0
		1	49	19.2	19.4	19.0
		25	0	19.4	19.4	19.1
		25	12	19.4	19.5	19.1
		25	24	19.3	19.5	19.1
		50	0	19.3	19.5	19.1
	16QAM	1	0	19.4	19.3	19.0
		1	24	19.4	19.4	19.0
		1	49	19.4	19.3	18.9
		25	0	19.3	19.4	19.1
		25	12	19.4	19.5	19.1
		25	24	19.4	19.4	19.1
		50	0	19.3	19.5	19.1
	64QAM	1	0	19.6	19.3	19.0
		1	24	19.4	19.5	19.2
		1	49	19.3	19.4	19.4
		25	0	19.5	19.4	19.3
		25	12	19.4	19.5	19.3
		25	24	19.4	19.5	19.3
		50	0	19.5	19.5	19.2

OUTPUT POWER FOR LTE BAND 41 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				39725	40620	41515
				2503.5	2593 MHz	2682.5
15.0	QPSK	1	0	19.1	19.2	19.0
		1	37	19.1	19.3	18.9
		1	74	19.1	19.3	18.9
		36	0	19.2	19.2	19.0
		36	16	19.2	19.3	19.0
		36	35	19.2	19.3	18.9
		75	0	19.2	19.3	18.9
	16QAM	1	0	19.1	19.2	18.8
		1	37	19.1	19.3	18.8
		1	74	19.1	19.3	18.8
		36	0	19.2	19.2	19.0
		36	16	19.2	19.3	18.9
		36	35	19.2	19.3	18.9
		75	0	19.2	19.3	18.9
	64QAM	1	0	19.0	19.2	19.2
		1	37	19.1	19.2	19.4
		1	74	19.0	19.3	19.2
		36	0	19.3	19.2	19.2
		36	16	19.3	19.3	19.2
		36	35	19.4	19.3	19.1
		75	0	19.4	19.3	19.0

OUTPUT POWER FOR LTE BAND 41 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				39750	40620	41490
				2506 MHz	2593 MHz	2680 MHz
20.0	QPSK	1	0	19.3	19.3	19.3
		1	49	19.3	19.3	19.2
		1	99	19.2	19.4	19.2
		50	0	19.3	19.2	19.3
		50	24	19.4	19.3	19.3
		50	49	19.4	19.4	19.3
		100	0	19.4	19.3	19.2
	16QAM	1	0	19.4	19.3	19.4
		1	49	19.7	19.7	19.5
		1	99	19.4	19.4	19.3
		50	0	19.3	19.2	19.3
		50	24	19.4	19.3	19.3
		50	49	19.4	19.3	19.3
		100	0	19.4	19.3	19.2
	64QAM	1	0	19.2	19.3	19.2
		1	49	19.3	19.4	19.3
		1	99	19.1	19.5	19.3
		50	0	19.3	19.2	19.2
		50	24	19.4	19.4	19.2
		50	49	19.4	19.3	19.3
		100	0	19.4	19.3	19.2

8.3.6. 5G NR n41

Test Engineer ID:	84740/44389	Test Date:	2023-02-22 2023-02-23	EUT Serial Number:	QV7700AZF7
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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	20.0	20.0	19.4
		1	25	19.9	19.9	19.9
		1	49	19.8	19.9	19.3
		25	0	18.8	19.2	18.9
		25	12	20.0	19.9	20.0
		25	25	18.8	19.2	18.9
		50	0	18.8	19.1	18.8
	QPSK	1	1	20.0	19.9	20.0
		1	25	20.0	19.9	20.0
		1	49	20.0	19.8	19.8
		25	0	18.8	19.2	18.8
		25	12	20.0	19.7	19.9
		25	25	18.8	19.3	18.8
		50	0	18.7	19.2	18.9
	16QAM	1	1	17.9	18.4	17.8
		1	25	18.0	18.3	17.8
		1	49	17.9	18.4	17.8
		25	0	17.8	18.2	17.9
		25	12	17.8	18.1	17.8
		25	25	17.8	18.3	17.9
		50	0	17.9	18.2	17.9
	64QAM	1	1	16.2	17.0	16.3
		1	25	16.2	16.9	16.1
		1	49	16.2	17.0	16.1
		25	0	16.3	16.8	16.4
		25	12	16.4	16.7	16.3
		25	25	16.3	16.8	16.3
		50	0	16.2	16.7	16.4
	256QAM	1	1	14.5	15.0	14.4
		1	25	14.5	14.8	14.4
1		49	14.4	15.0	14.4	
25		0	14.3	14.7	14.5	
25		12	14.4	14.7	14.3	
25		25	14.3	14.8	14.3	
50		0	14.2	14.6	14.3	

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	18.9	19.2	18.9
		1	38	18.8	19.1	18.9
		1	76	18.8	19.3	18.6
		36	0	18.9	19.2	18.7
		36	18	18.7	19.1	18.3
		36	36	18.8	19.3	18.4
		75	0	18.7	19.1	18.3
	QPSK	1	1	18.9	19.3	19.1
		1	38	18.8	19.2	19.4
		1	76	18.9	19.3	18.3
		36	0	18.8	19.2	19.1
		36	18	18.7	19.2	19.1
		36	36	18.8	19.2	18.1
		75	0	18.4	19.2	18.5
	16QAM	1	1	17.9	18.3	18.2
		1	38	17.9	18.4	18.5
		1	76	17.9	18.5	17.5
		36	0	17.8	18.2	18.2
		36	18	17.8	18.3	18.2
		36	36	17.8	18.2	17.4
		75	0	17.7	18.2	17.4
	64QAM	1	1	16.5	16.9	16.8
		1	38	16.4	16.9	17.0
		1	76	16.5	17.0	16.1
		36	0	16.2	16.7	16.7
		36	18	16.2	16.8	16.8
		36	36	16.3	16.8	16.0
		75	0	16.2	16.7	16.3
	256QAM	1	1	14.7	15.0	14.6
		1	38	14.6	14.9	14.7
1		76	14.7	15.1	14.8	
36		0	14.2	14.6	14.4	
36		18	14.2	14.8	14.4	
36		36	14.1	14.7	14.4	
75		0	14.2	14.7	14.3	

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	19.0	19.3	19.0
		1	52	18.8	19.1	19.0
		1	104	18.8	19.3	19.1
		50	0	18.7	19.2	18.8
		50	25	18.7	19.2	18.9
		50	50	18.7	19.2	19.0
		100	0	18.7	19.1	18.9
	QPSK	1	1	18.9	19.3	19.0
		1	52	18.8	19.2	18.9
		1	104	18.8	19.3	19.1
		50	0	18.8	19.2	18.9
		50	25	18.7	19.2	18.9
		50	50	18.7	19.3	19.0
		100	0	18.7	19.1	18.8
	16QAM	1	1	17.8	18.0	18.2
		1	52	17.8	17.9	18.1
		1	104	17.8	18.1	18.2
		50	0	17.7	18.2	17.9
		50	25	17.7	18.2	17.9
		50	50	17.7	18.3	18.0
		100	0	17.7	18.1	17.9
	64QAM	1	1	16.3	16.7	16.5
		1	52	16.1	16.6	16.4
		1	104	16.2	16.8	16.7
		50	0	16.2	16.6	16.4
		50	25	16.2	16.5	16.3
		50	50	16.2	16.7	16.5
		100	0	16.1	16.5	16.4
	256QAM	1	1	14.6	15.0	15.0
		1	52	14.5	15.0	15.1
1		104	14.6	15.1	14.8	
50		0	14.1	14.7	14.3	
50		25	14.2	14.6	14.4	
50		50	14.2	14.7	14.4	
100		0	14.2	14.6	14.4	

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	18.8	19.1	18.9
		1	66	18.7	19.2	19.0
		1	131	18.7	19.2	19.0
		64	0	18.7	19.1	18.8
		64	32	18.7	19.2	18.8
		64	64	18.6	19.2	18.8
		128	0	18.6	19.1	18.9
	QPSK	1	1	18.8	19.2	18.9
		1	66	18.6	19.4	18.8
		1	131	18.7	19.3	18.8
		64	0	18.7	19.1	18.8
		64	32	18.6	19.2	18.8
		64	64	18.6	19.2	18.9
		128	0	18.6	19.1	18.8
	16QAM	1	1	17.8	18.1	18.1
		1	66	17.6	18.3	18.0
		1	131	17.7	18.3	18.1
		64	0	17.7	18.1	17.8
		64	32	17.7	18.3	17.8
		64	64	17.7	18.2	17.9
		128	0	17.6	18.0	17.8
	64QAM	1	1	16.3	16.4	16.6
		1	66	16.1	16.6	16.5
		1	131	16.2	16.5	16.7
		64	0	16.1	16.6	16.3
		64	32	16.2	16.7	16.3
		64	64	16.1	16.7	16.3
		128	0	16.1	16.6	16.2
	256QAM	1	1	14.5	15.0	14.6
		1	66	14.4	15.1	14.6
		1	131	14.4	15.1	14.7
		64	0	14.1	14.6	14.3
64		32	14.1	14.8	14.3	
64		64	14.0	15.1	14.4	
128		0	14.0	14.8	14.2	

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	18.8	19.0	18.9
		1	80	18.7	19.3	18.8
		1	160	18.7	19.1	18.8
		81	0	18.7	19.1	18.8
		81	40	18.7	19.1	18.9
		81	81	18.7	19.1	18.8
		162	0	18.6	19.0	18.8
	QPSK	1	1	18.7	19.0	18.9
		1	80	18.8	19.2	18.8
		1	160	18.7	19.1	18.8
		81	0	18.7	19.1	18.8
		81	40	18.6	19.2	18.8
		81	81	18.7	19.1	18.8
		162	0	18.6	19.0	18.7
	16QAM	1	1	17.8	18.0	17.9
		1	80	17.7	18.2	17.8
		1	160	17.6	18.0	17.8
		81	0	17.7	18.0	17.8
		81	40	17.7	18.2	17.8
		81	81	17.7	18.1	17.9
		162	0	17.6	18.0	17.6
	64QAM	1	1	16.2	16.6	16.4
		1	80	16.1	16.6	16.3
		1	160	16.2	16.4	16.3
		81	0	16.2	16.6	16.3
		81	40	16.2	16.6	16.3
		81	81	16.2	16.5	16.4
		162	0	16.1	16.6	16.1
	256QAM	1	1	14.5	14.6	14.7
		1	80	14.4	14.7	14.5
1		160	14.4	14.6	14.6	
81		0	14.2	14.6	14.3	
81		40	14.2	14.7	14.3	
81		81	14.1	14.6	14.3	
162		0	14.0	14.5	14.1	

OUTPUT POWER FOR 5G NR n41 (70.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				506196	518598	530994
				2530.98 MHz	2592.99 MHz	2654.97 MHz
70.0	π/2 BPSK	1	1	18.6	18.9	18.9
		1	91	18.5	19.0	18.7
		1	187	18.5	18.8	18.6
		96	0	18.4	18.9	18.8
		96	48	18.5	19.0	18.7
		96	96	18.4	19.0	18.8
		180	0	18.4	18.8	18.7
	QPSK	1	1	18.6	18.9	18.5
		1	91	18.4	19.0	18.7
		1	187	18.4	18.7	18.6
		96	0	18.5	18.9	18.7
		96	48	18.3	19.0	18.6
		96	96	18.4	18.9	18.6
		180	0	18.4	18.8	18.6
	16QAM	1	1	17.5	17.9	17.9
		1	91	17.3	18.0	17.8
		1	187	17.3	17.8	17.7
		96	0	17.5	17.9	17.8
		96	48	17.4	18.0	17.7
		96	96	17.3	17.9	17.7
		180	0	17.3	17.8	17.7
	64QAM	1	1	16.2	16.6	16.5
		1	91	16.1	16.7	16.3
		1	187	16.1	16.5	16.2
		96	0	15.9	16.5	16.3
		96	48	15.9	16.4	16.2
		96	96	16.0	16.5	16.2
		180	0	15.8	16.4	16.2
	256QAM	1	1	14.6	14.6	14.5
		1	91	14.5	14.7	14.2
		1	187	14.4	14.4	14.2
		96	0	13.9	14.4	14.2
		96	48	13.9	14.4	14.2
		96	96	13.8	14.5	14.2
		180	0	13.8	14.3	14.1

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	18.9	18.9	19.0
		1	108	18.8	19.0	18.8
		1	215	18.8	18.8	18.7
		108	0	18.7	18.9	18.9
		108	54	18.9	18.9	18.7
		108	108	18.7	18.9	18.6
		216	0	18.7	18.8	18.7
	QPSK	1	1	18.8	18.8	19.0
		1	108	18.8	19.0	18.8
		1	215	18.7	18.8	18.7
		108	0	18.8	18.9	18.9
		108	54	18.7	18.9	18.6
		108	108	18.7	18.9	18.6
		216	0	18.6	18.8	18.7
	16QAM	1	1	18.0	17.9	18.1
		1	108	17.8	18.1	17.9
		1	215	17.8	17.9	18.4
		108	0	17.8	17.9	18.0
		108	54	17.6	17.9	18.2
		108	108	17.7	17.8	17.8
		216	0	17.7	17.7	17.8
	64QAM	1	1	16.3	16.4	16.5
		1	108	16.3	16.7	16.4
		1	215	16.2	16.3	16.8
		108	0	16.3	16.4	16.9
		108	54	16.2	16.4	16.8
		108	108	16.3	16.3	16.8
		216	0	16.2	16.3	16.8
	256QAM	1	1	14.4	14.6	15.1
		1	108	14.2	14.8	15.0
		1	215	14.6	14.7	15.3
		108	0	14.4	14.4	14.8
		108	54	14.3	14.4	14.7
		108	108	14.3	14.2	14.6
		216	0	14.1	14.3	14.7

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	18.9	19.1	19.2
		1	122	18.9	19.2	18.9
		1	243	18.8	18.9	18.9
		120	0	18.8	19.1	19.1
		120	60	18.8	19.2	18.9
		120	122	18.8	19.0	18.9
		243	0	18.7	19.0	18.9
	QPSK	1	1	18.8	19.2	19.2
		1	122	18.8	19.1	18.9
		1	243	18.9	19.0	19.0
		120	0	18.8	19.1	19.0
		120	60	18.8	19.2	18.8
		120	122	18.7	19.0	18.9
		243	0	18.6	18.9	18.8
	16QAM	1	1	17.9	17.7	18.2
		1	122	17.9	17.8	17.8
		1	243	17.9	17.6	18.0
		120	0	17.8	18.1	18.0
		120	60	17.8	18.1	17.8
		120	122	17.8	18.0	18.0
		243	0	17.6	17.9	17.8
	64QAM	1	1	16.2	16.5	16.6
		1	122	16.1	16.7	16.4
		1	243	16.1	16.4	16.5
		120	0	16.2	16.6	16.5
		120	60	16.2	16.6	16.2
		120	122	16.2	16.5	16.4
		243	0	16.1	16.3	16.2
	256QAM	1	1	14.0	14.6	14.5
		1	122	14.5	14.6	14.1
1		243	15.0	14.5	14.2	
120		0	15.0	14.6	14.5	
120		60	14.8	14.7	14.4	
120		122	15.0	14.6	14.4	
243		0	14.8	14.3	14.2	

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	19.6	19.0	19.2
		1	136	19.8	19.2	18.9
		1	271	19.7	18.9	19.0
		135	0	19.9	19.0	19.0
		135	67	19.5	19.1	18.9
		135	135	19.7	19.0	18.9
		270	0	19.5	18.9	18.9
	QPSK	1	1	19.9	19.1	19.3
		1	136	19.8	19.1	18.9
		1	271	19.8	18.8	19.0
		135	0	19.7	19.1	19.0
		135	67	19.7	19.1	18.9
		135	135	19.6	19.0	18.9
		270	0	19.4	18.8	18.8
	16QAM	1	1	18.9	18.1	18.1
		1	136	18.8	18.1	17.8
		1	271	18.8	18.2	17.9
		135	0	18.7	18.0	18.0
		135	67	18.8	18.2	17.9
		135	135	18.7	18.1	17.9
		270	0	18.6	17.9	17.8
	64QAM	1	1	17.2	16.9	16.7
		1	136	17.3	17.0	16.4
		1	271	17.2	16.7	16.4
		135	0	17.3	16.5	16.6
		135	67	17.2	16.7	16.4
		135	135	17.1	16.5	16.3
		270	0	17.1	16.4	16.4
	256QAM	1	1	15.3	14.9	14.2
		1	136	15.2	14.9	14.2
1		271	15.3	14.7	15.3	
135		0	15.3	14.6	14.8	
135		67	15.1	14.5	14.6	
135		135	15.2	14.5	14.8	
270		0	15.1	14.4	14.6	

8.3.7. LTE BAND 66

Test Engineer ID:	27129/44389 22797/44389	Test Date:	2023-01-06 2023-02-06
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OUTPUT POWER FOR LTE BAND 66 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2			Sub Antenna		
				Conducted Average (dBm)			Conducted Average (dBm)		
				131979 1710.7 MHz	132322 1745.0 MHz	132665 1779.3 MHz	131979 1710.7 MHz	132322 1745.0 MHz	132665 1779.3 MHz
1.4	QPSK	1	0	18.3	18.4	18.3	15.8	16.0	16.2
		1	3	18.3	18.4	18.4	15.7	16.1	16.2
		1	5	18.3	18.4	18.4	15.6	16.1	16.1
		3	0	18.3	18.4	18.3	15.7	16.0	16.1
		3	1	18.3	18.4	18.3	16.0	16.1	16.2
		3	3	18.3	18.4	18.3	15.9	16.1	16.2
	16QAM	6	0	18.3	18.4	18.3	15.6	16.0	16.1
		1	0	18.4	18.8	18.6	15.7	16.4	16.6
		1	3	18.5	18.9	18.6	15.5	16.4	16.5
		1	5	18.4	18.7	18.6	15.5	16.4	16.5
		3	0	18.4	18.6	18.5	15.6	16.2	16.4
		3	1	18.4	18.6	18.5	15.5	16.2	16.3
	64QAM	3	3	18.5	18.6	18.5	15.4	16.2	16.3
		6	0	18.4	18.5	18.4	15.5	16.1	16.3
		1	0	18.6	18.6	18.6	15.3	16.2	16.4
		1	3	18.6	18.7	18.6	15.6	16.3	16.4
		1	5	18.5	18.6	18.6	15.5	16.3	16.3
		3	0	18.4	18.5	18.4	15.4	16.2	16.3
		3	1	18.4	18.6	18.4	15.6	16.1	16.4
		3	3	18.4	18.5	18.4	15.3	16.3	16.3
		6	0	18.4	18.4	18.4	15.3	16.1	16.2

OUTPUT POWER FOR LTE BAND 66 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2			Sub Antenna		
				Conducted Average (dBm)			Conducted Average (dBm)		
				131987 1711.5 MHz	132322 1745.0 MHz	132657 1778.5 MHz	131987 1711.5 MHz	132322 1745.0 MHz	132657 1778.5 MHz
3.0	QPSK	1	0	18.3	18.4	18.3	15.6	15.8	16.3
		1	7	18.4	18.4	18.3	15.6	16.0	16.3
		1	14	18.3	18.4	18.3	15.5	16.0	16.1
		8	0	18.3	18.4	18.4	15.7	16.0	16.3
		8	4	18.3	18.4	18.3	15.6	16.1	16.3
		8	7	18.3	18.5	18.4	15.6	16.1	16.2
	16QAM	15	0	18.4	18.4	18.4	15.6	16.0	16.3
		1	0	18.6	18.7	18.6	15.8	16.3	16.7
		1	7	18.6	18.9	18.7	16.0	16.4	16.7
		1	14	18.6	18.8	18.6	15.8	16.4	16.4
		8	0	18.5	18.4	18.4	15.7	16.1	16.4
		8	4	18.5	18.5	18.5	15.7	16.2	16.4
	64QAM	8	7	18.5	18.5	18.5	15.7	16.2	16.3
		15	0	18.4	18.4	18.4	15.7	16.1	16.3
		1	0	18.3	18.7	18.6	15.8	16.1	16.5
		1	7	18.5	18.8	18.6	16.1	16.3	16.4
		1	14	18.4	18.6	18.5	15.7	16.4	16.4
		8	0	18.4	18.5	18.4	15.7	16.1	16.4
		8	4	18.4	18.5	18.4	15.7	16.2	16.4
		8	7	18.4	18.6	18.4	15.6	16.1	16.3
		15	0	18.4	18.4	18.4	15.7	16.1	16.3

OUTPUT POWER FOR LTE BAND 66 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2			Sub Antenna		
				Conducted Average (dBm)			Conducted Average (dBm)		
				131997	132322	132647	131997	132322	132647
				1712.5 MHz	1745.0 MHz	1777.5 MHz	1712.5 MHz	1745.0 MHz	1777.5 MHz
5.0	QPSK	1	0	18.3	18.3	18.3	15.6	15.9	16.5
		1	12	18.4	18.5	18.3	15.6	16.2	16.5
		1	24	18.3	18.4	18.3	15.6	16.1	16.1
		12	0	18.4	18.3	18.3	15.6	16.0	16.5
		12	6	18.4	18.4	18.3	15.0	16.1	16.3
		12	11	18.4	18.4	18.4	15.7	16.2	16.3
		25	0	18.3	18.3	18.3	15.6	16.1	16.3
	16QAM	1	0	18.6	18.7	18.7	15.9	16.3	16.8
		1	12	18.7	18.9	18.8	16.0	16.5	16.7
		1	24	18.6	18.7	18.7	15.8	16.5	16.6
		12	0	18.4	18.4	18.4	15.7	16.0	16.5
		12	6	18.4	18.4	18.5	15.7	16.1	16.3
		12	11	18.4	18.5	18.4	15.7	16.1	16.2
		25	0	18.4	18.4	18.3	15.6	16.1	15.6
	64QAM	1	0	18.6	18.6	18.6	15.8	16.0	16.6
		1	12	18.7	18.7	18.7	15.8	15.7	16.7
		1	24	18.6	18.7	18.6	15.9	16.2	16.3
		12	0	18.4	18.5	18.2	15.7	15.9	16.4
		12	6	18.4	18.5	18.3	15.7	15.6	16.4
		12	11	18.4	18.6	18.2	15.7	16.0	16.2
		25	0	18.4	18.4	18.3	15.7	15.9	16.3

OUTPUT POWER FOR LTE BAND 66 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				132022	132322	132622	132022	132322	132622
				1715.0 MHz	1745.0 MHz	1775.0 MHz	1715.0 MHz	1745.0 MHz	1775.0 MHz
10.0	QPSK	1	0	18.3	18.3	18.3	15.5	15.8	16.3
		1	24	18.3	18.4	18.4	15.7	16.1	16.4
		1	49	18.3	18.4	18.3	15.8	16.4	16.1
		25	0	18.3	18.4	18.3	15.5	16.0	16.4
		25	12	18.4	18.4	18.3	15.7	16.1	16.5
		25	24	18.3	18.5	18.4	15.8	16.2	16.4
		50	0	18.3	18.4	18.3	15.7	16.1	16.4
	16QAM	1	0	18.6	18.8	18.6	16.1	16.3	16.6
		1	24	18.6	18.8	18.7	16.0	16.4	16.8
		1	49	18.6	18.8	18.7	16.2	16.6	16.2
		25	0	18.4	18.4	18.3	15.6	16.0	16.4
		25	12	18.4	18.5	18.3	15.7	16.1	16.5
		25	24	18.4	18.5	18.4	15.8	16.3	16.4
		50	0	18.4	18.4	18.3	15.7	16.1	16.3
	64QAM	1	0	18.6	18.7	18.5	15.7	16.0	16.3
		1	24	18.6	18.7	18.5	15.9	16.2	16.5
		1	49	18.5	18.7	18.5	16.1	16.5	15.9
		25	0	18.4	18.4	18.3	15.6	16.0	16.4
		25	12	18.4	18.5	18.4	15.7	16.1	16.5
		25	24	18.4	18.5	18.4	15.8	16.3	16.3
		50	0	18.4	18.4	18.3	15.7	16.1	16.2

OUTPUT POWER FOR LTE BAND 66 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2			Sub Antenna		
				Conducted Average (dBm)			Conducted Average (dBm)		
				132047	132322	132597	132047	132322	132597
				1717.5 MHz	1745.0 MHz	1772.5 MHz	1717.5 MHz	1745.0 MHz	1772.5 MHz
15.0	QPSK	1	0	18.1	18.2	18.2	15.3	15.5	15.7
		1	37	18.1	18.3	18.2	15.6	15.8	16.2
		1	74	18.2	18.3	18.1	15.5	15.9	16.0
		36	0	18.2	18.2	18.2	15.5	15.6	15.8
		36	16	18.2	18.2	18.2	15.5	15.8	16.2
		36	35	18.2	18.3	18.2	15.7	16.1	16.3
		75	0	18.2	18.2	18.2	15.5	16.0	16.2
	16QAM	1	0	18.5	18.5	18.5	15.7	15.8	16.1
		1	37	18.6	18.6	18.5	15.7	15.6	16.6
		1	74	18.6	18.6	18.4	15.6	16.2	16.3
		36	0	18.2	18.3	18.2	15.4	15.6	15.8
		36	16	18.3	18.3	18.3	15.6	15.8	16.3
		36	35	18.3	18.3	18.3	15.7	16.0	16.4
		75	0	18.2	18.3	18.3	15.5	15.8	16.2
	64QAM	1	0	18.4	18.6	18.6	15.4	15.8	15.7
		1	37	18.4	18.5	18.6	15.7	15.9	15.7
		1	74	18.4	18.6	18.5	15.7	16.1	16.1
		36	0	18.2	18.3	18.4	15.5	15.7	15.9
		36	16	18.2	18.3	18.4	15.6	15.7	16.3
		36	35	18.2	18.3	18.4	15.6	16.0	16.3
		75	0	18.2	18.2	18.4	15.5	15.8	15.9

OUTPUT POWER FOR LTE BAND 66 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2			Sub Antenna		
				Conducted Average (dBm)			Conducted Average (dBm)		
				132072	132322	132572	132072	132322	132572
				1720.0 MHz	1745.0 MHz	1770.0 MHz	1720.0 MHz	1745.0 MHz	1770.0 MHz
20.0	QPSK	1	0	18.5	18.4	18.5	15.4	15.6	15.6
		1	49	18.4	18.4	18.4	15.5	16.1	16.1
		1	99	18.3	18.3	18.3	15.2	15.9	16.0
		50	0	18.2	18.2	18.2	15.4	15.9	15.8
		50	24	18.2	18.3	18.2	15.6	16.2	16.1
		50	49	18.2	18.3	18.2	15.5	16.3	15.8
		100	0	18.3	18.3	18.2	15.5	16.1	16.1
	16QAM	1	0	18.5	18.5	18.6	15.6	15.9	16.0
		1	49	18.7	18.6	18.7	16.3	16.8	16.5
		1	99	18.6	18.6	18.5	15.4	16.1	16.2
		50	0	18.2	18.3	18.2	15.4	15.9	15.8
		50	24	18.3	18.3	18.2	15.6	16.2	16.1
		50	49	18.3	18.3	18.2	15.5	16.3	16.3
		100	0	18.3	18.3	18.2	15.5	16.1	16.1
	64QAM	1	0	18.5	18.4	18.4	15.5	15.8	15.7
		1	49	18.6	18.5	18.4	15.9	16.4	16.3
		1	99	18.5	18.5	18.4	15.3	16.2	16.2
		50	0	18.1	18.2	18.2	15.4	15.9	15.8
		50	24	18.2	18.3	18.2	15.6	16.2	16.1
		50	49	18.2	18.3	18.2	15.5	16.3	16.3
		100	0	18.2	18.2	18.1	15.5	16.1	16.1

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.

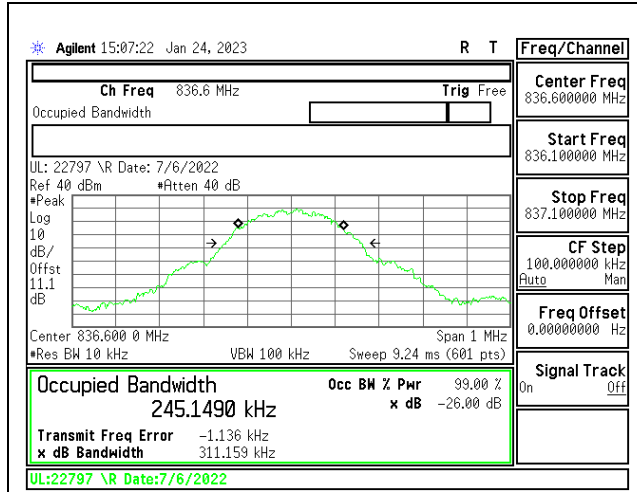
RESULTS

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

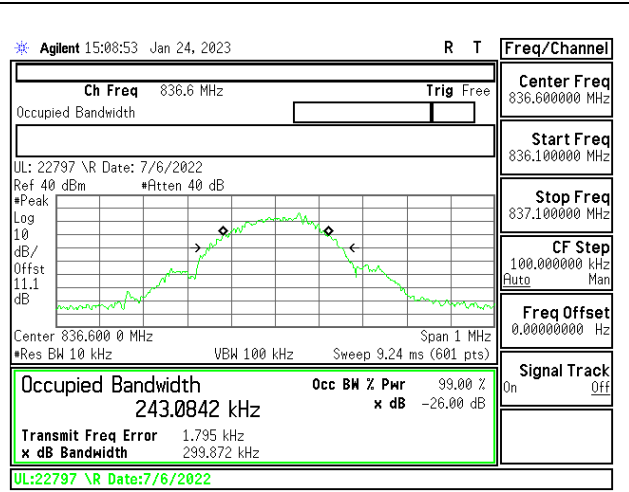
9.1.1. GSM

Test Engineer ID:	27797/44389	Test Date:	2023-01-24	EUT Serial Number:	QV77000MFN
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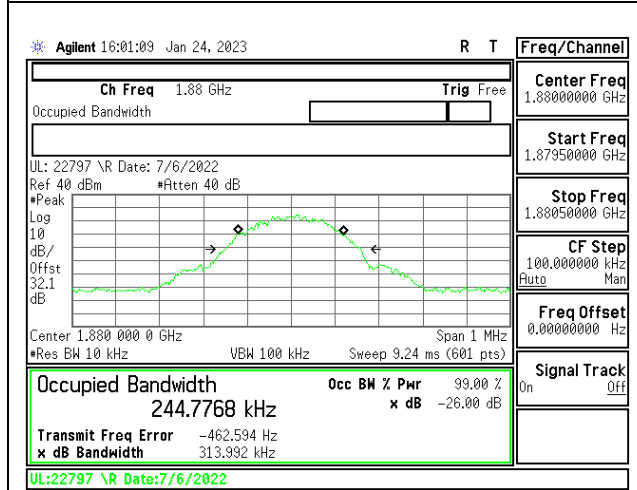
Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
GSM850	GPRS	190	836.6	245.15	311.16
	EGPRS			243.08	299.87
GSM1900	GPRS	661	1880.0	244.78	313.99
	EGPRS			239.01	312.52



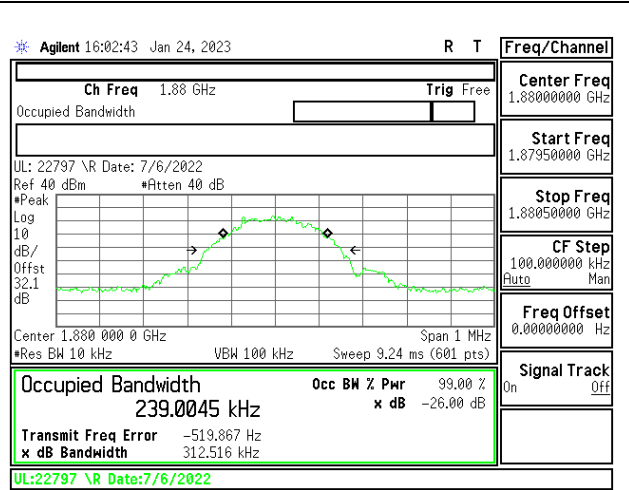
GSM850 GPRS MID Channel



GSM850 EGPRS MID Channel



GSM1900 GPRS MID Channel

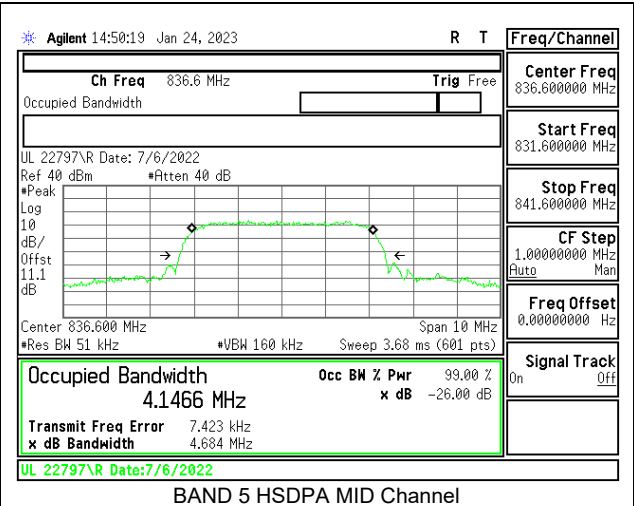
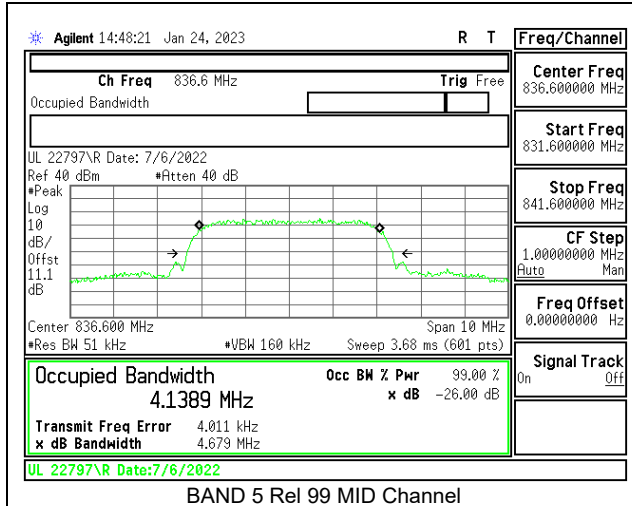


GSM1900 EGPRS MID Channel

9.1.2. WCDMA

Test Engineer ID:	27797/44389	Test Date:	2023-01-24	EUT Serial Number:	QV77000MFN
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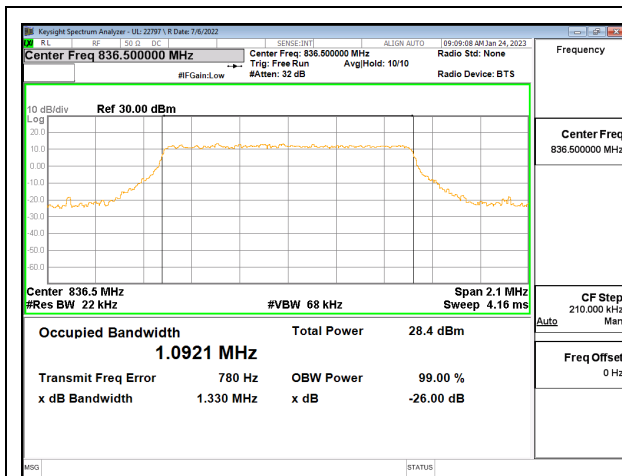
Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND5	REL 99	4408	836.6	4.14	4.68
	HSDPA			4.15	4.68



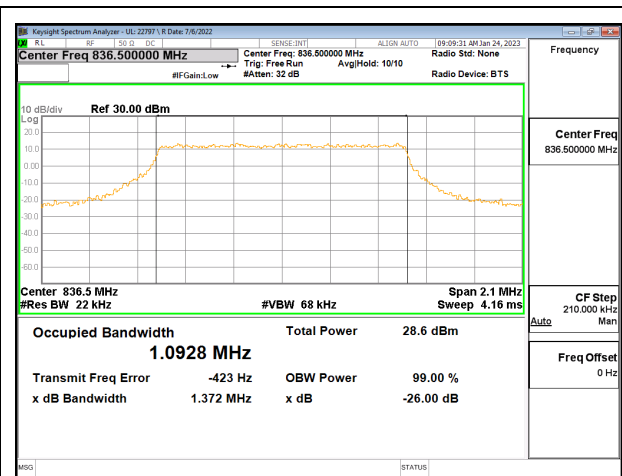
9.1.3. LTE5

Test Engineer ID:	27797/44389	Test Date:	2023-01-24	EUT Serial Number:	QV7700HTFN
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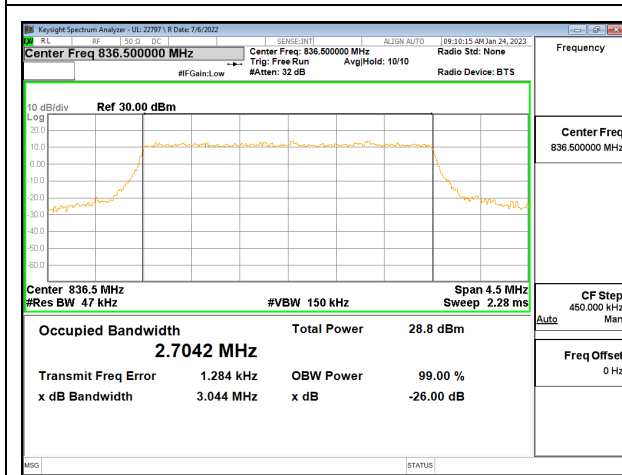
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	1.4MHz, QPSK	6/0	836.5	1.09	1.33
	1.4MHz, 16QAM			1.09	1.37
	3MHz, QPSK	15/0		2.7	3.04
	3MHz, 16QAM			2.7	3.06
	5MHz, QPSK	25/0		4.5	5.12
	5MHz, 16QAM			4.5	5.08
	10MHz, QPSK	50/0		8.97	9.93
	10MHz, 16QAM			8.98	9.93



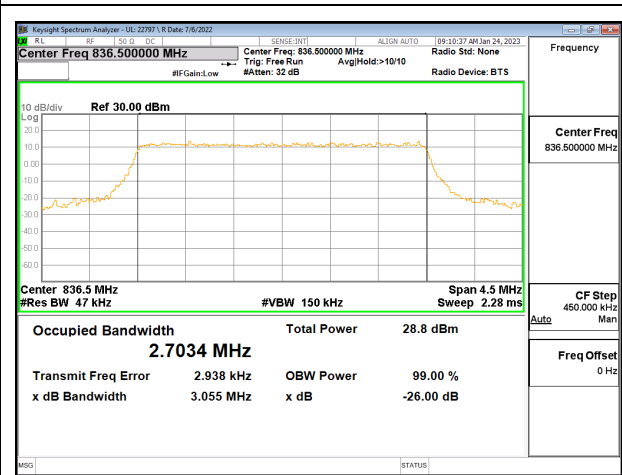
LTE5 1.4MHz QPSK MID Ch RB6-0



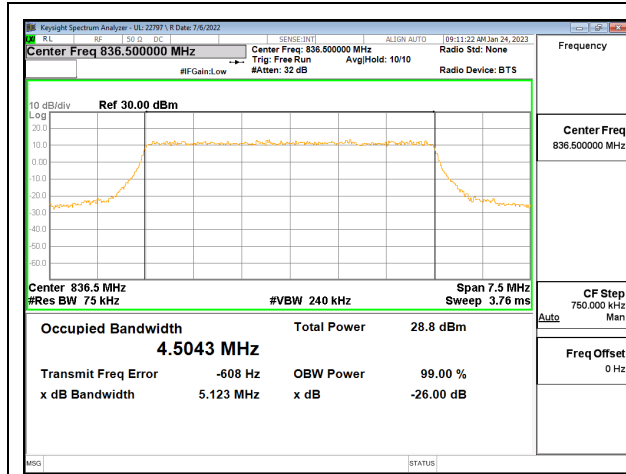
LTE5 1.4MHz 16QAM MID Ch RB6-0



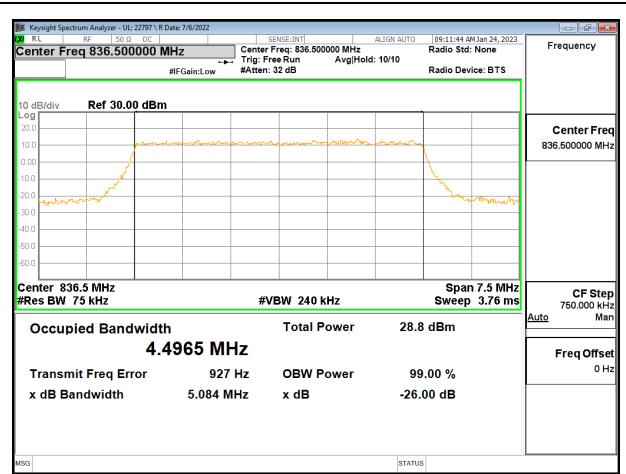
LTE5 3MHz QPSK MID Ch RB15-0



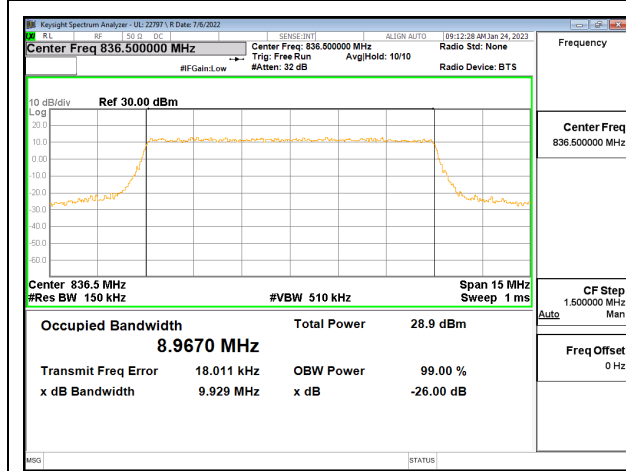
LTE5 3MHz 16QAM MID Ch RB15-0



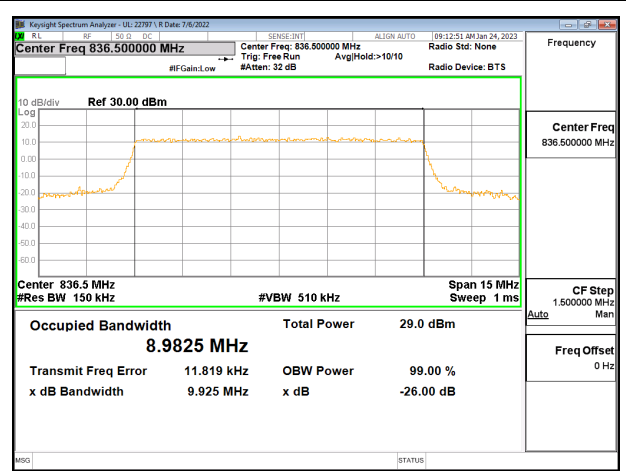
LTE5 5MHz QPSK MID Ch RB25-0



LTE5 5MHz 16QAM MID Ch RB25-0



LTE5 10MHz QPSK MID Ch RB50-0

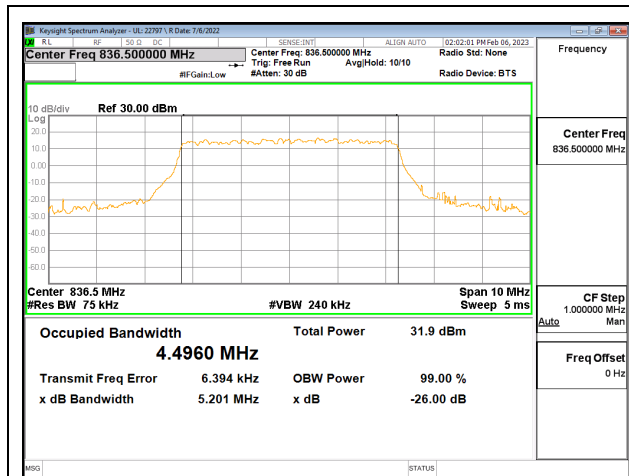


LTE5 10MHz 16QAM MID Ch RB50-0

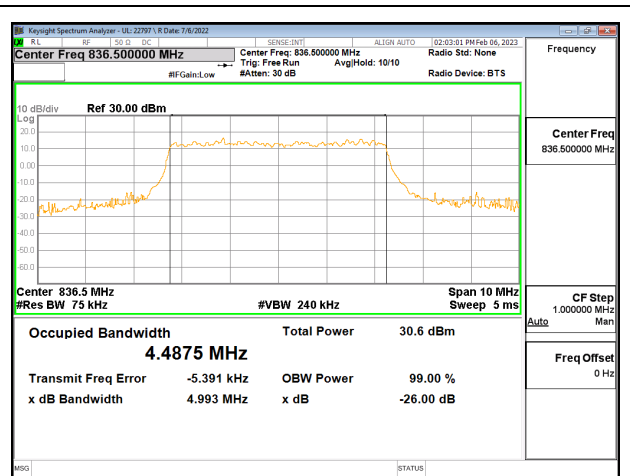
9.1.4. 5G NR n5

Test Engineer ID:	27797/44389 27465/44389	Test Date:	2023-02-06 2023-02-27	EUT Serial Number:	QV7700HTFN
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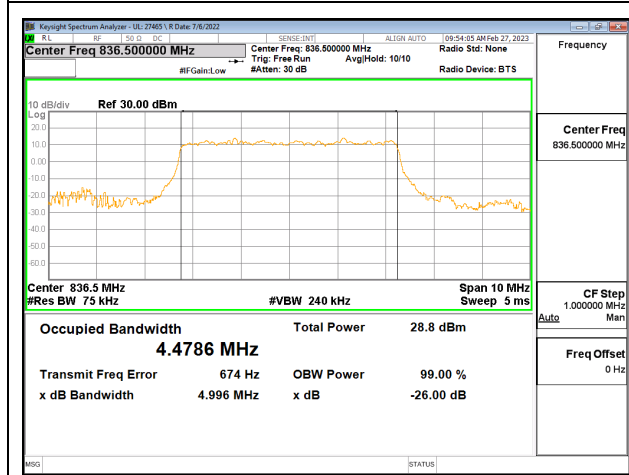
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n5	5MHz, QPSK	6/0	836.5	4.5	5.2
	5MHz, BPSK			4.48	4.99
	5MHz, 16QAM			4.49	4.99
	10MHz, QPSK	15/0		8.94	9.73
	10MHz, BPSK			8.93	9.68
	10MHz, 16QAM			8.94	9.66
	15MHz, QPSK	25/0		13.42	14.45
	15MHz, BPSK			13.42	14.38
	15MHz, 16QAM			13.41	14.42
	20MHz, QPSK	50/0		17.84	19.06
	20MHz, BPSK			17.90	19.14
	20MHz, 16QAM			17.89	18.98



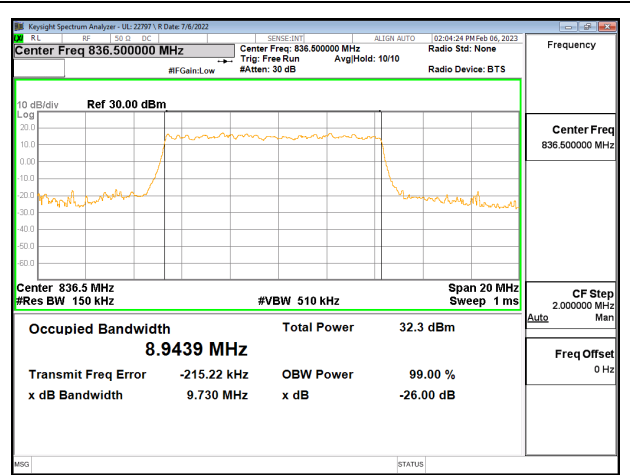
5G NR n5 5MHz QPSK MID Ch RB25-0



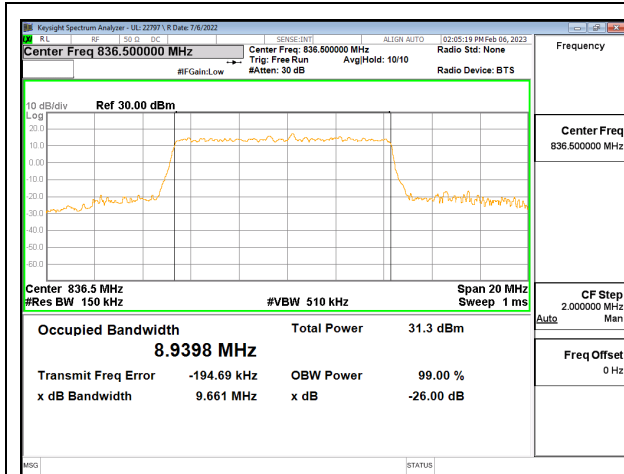
5G NR n5 5MHz 16QAM MID Ch RB25-0



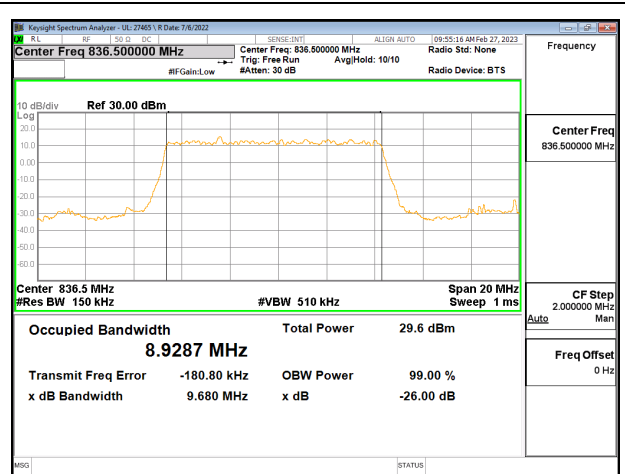
5G NR n5 5MHz BPSK MID Ch RB25-0



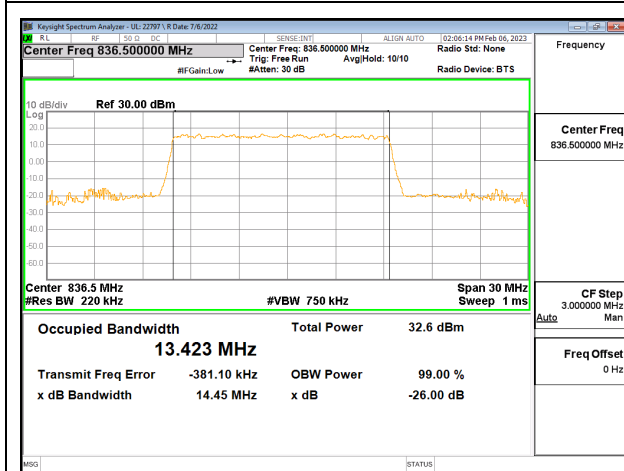
5G NR n5 10MHz QPSK MID Ch RB25-0



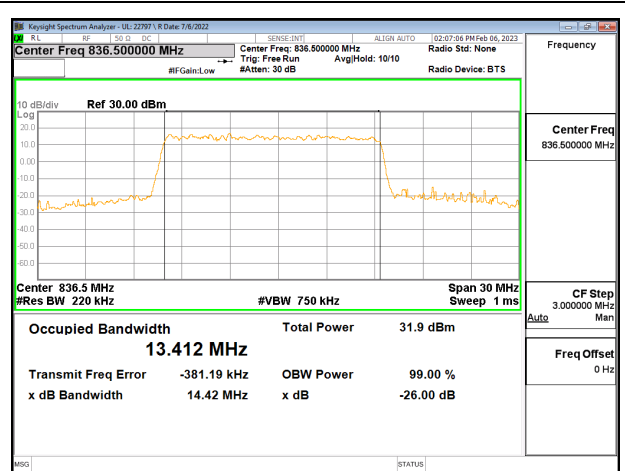
5G NR n5 10MHz 16QAM MID Ch RB50-0



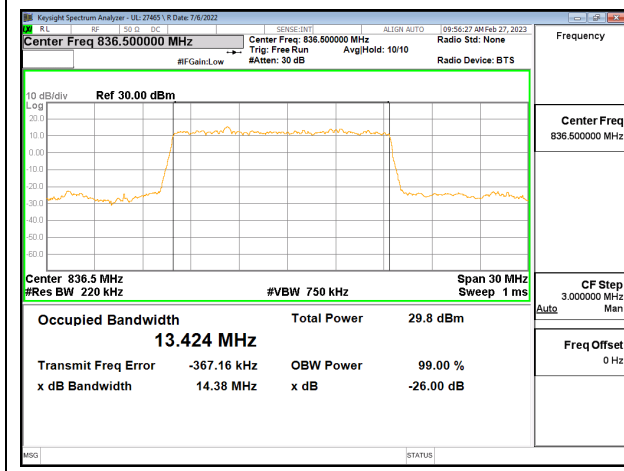
5G NR n5 10MHz BPSK MID Ch RB50-0



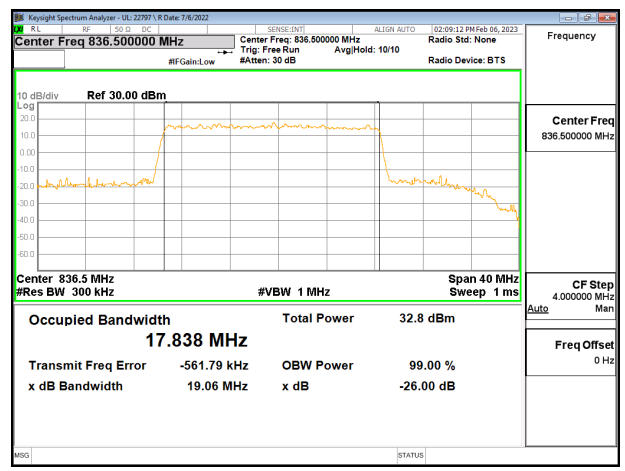
5G NR n5 15MHz QPSK MID Ch RB75-0



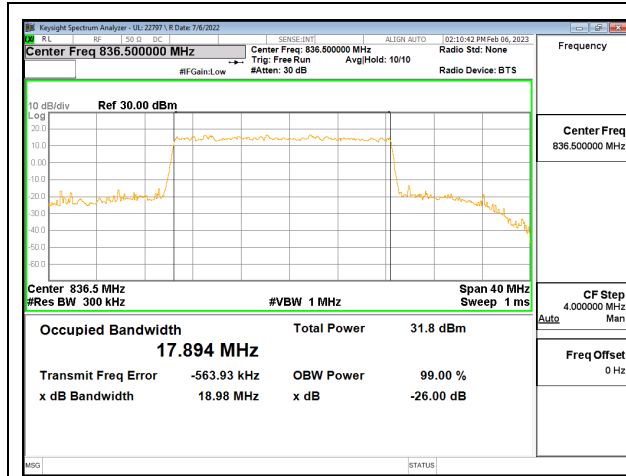
5G NR n5 15MHz 16QAM MID Ch RB75-0



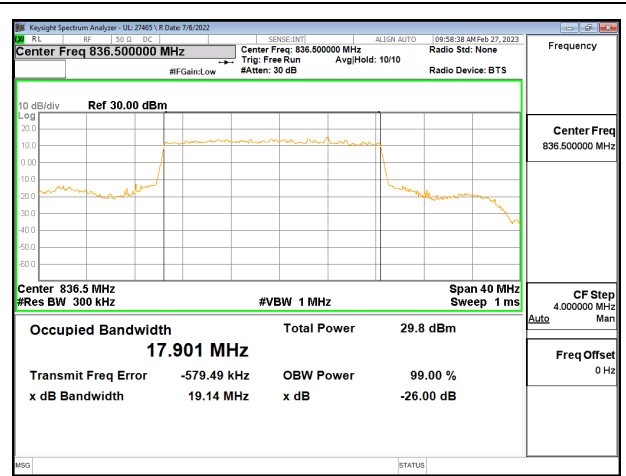
5G NR n5 15MHz BPSK MID Ch RB75-0



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



5G NR n5 20MHz 16QAM MID Ch RB100-0

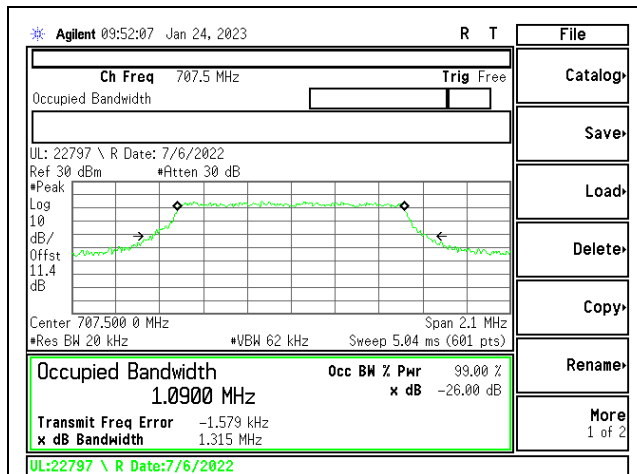


5G NR n5 20MHz BPSK MID Ch RB100-0

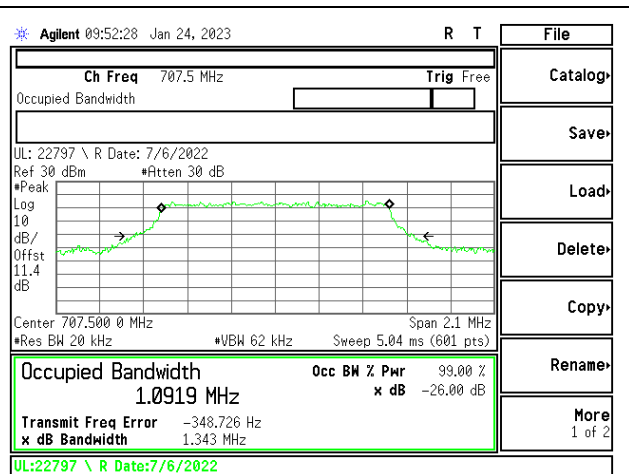
9.1.5. LTE12

Test Engineer ID:	27797/44389	Test Date:	2023-01-24	EUT Serial Number:	QV77000MFN
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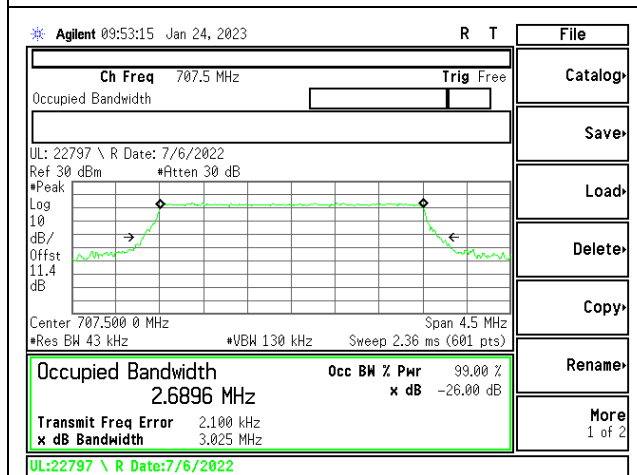
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 12	1.4MHz, QPSK	6/0	707.5	1.09	1.31
	1.4MHz, 16QAM			1.09	1.34
	3MHz, QPSK	15/0		2.69	3.03
	3MHz, 16QAM			2.68	3.00
	5MHz, QPSK	25/0		4.50	5.01
	5MHz, 16QAM			4.50	5.08
	10MHz, QPSK	50/0		8.94	9.86
	10MHz, 16QAM			8.96	9.85



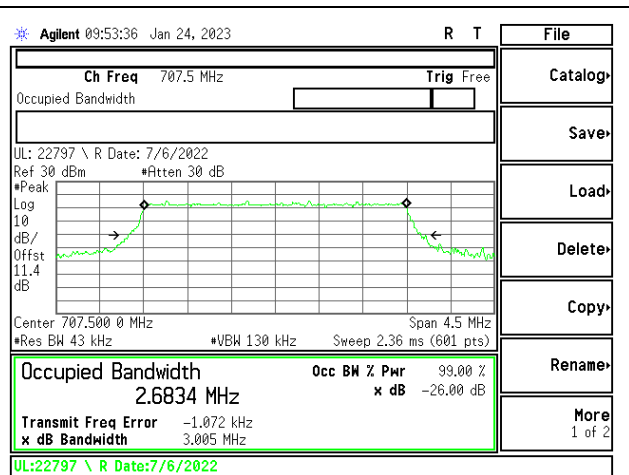
LTE12 1.4MHz QPSK MID Ch RB6-0



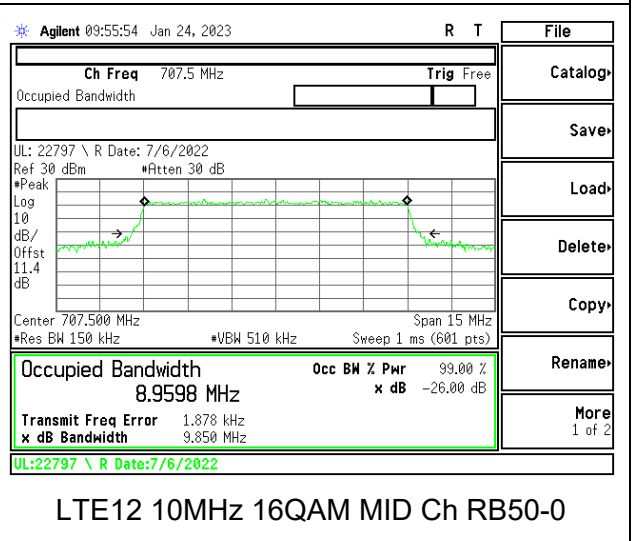
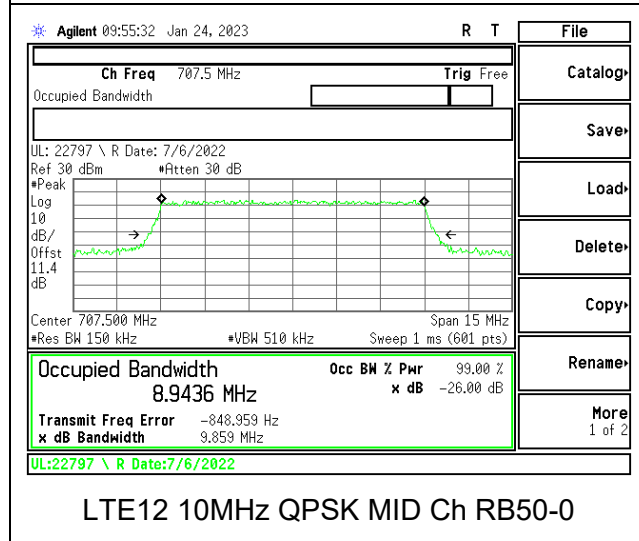
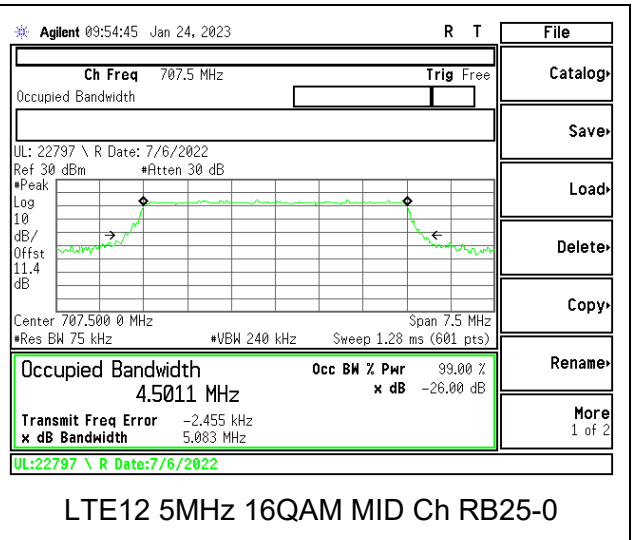
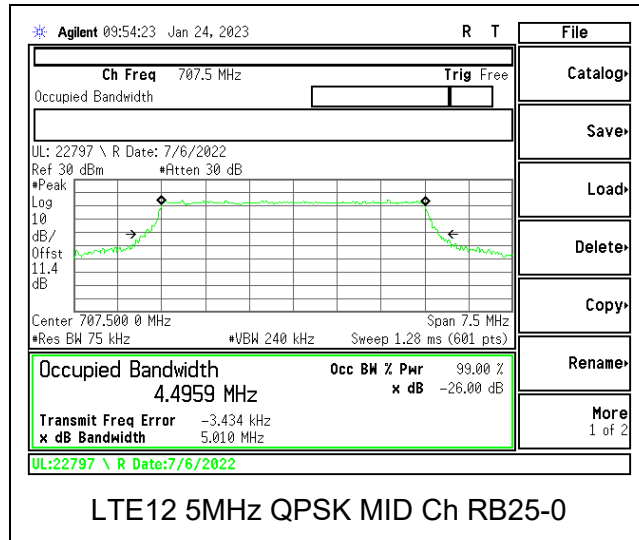
LTE12 1.4MHz 16QAM MID Ch RB6-0



LTE12 3MHz QPSK MID Ch RB15-0



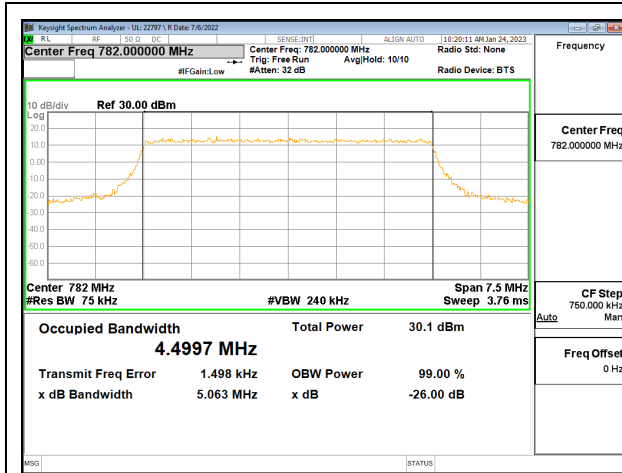
LTE12 3MHz 16QAM MID Ch RB15-0



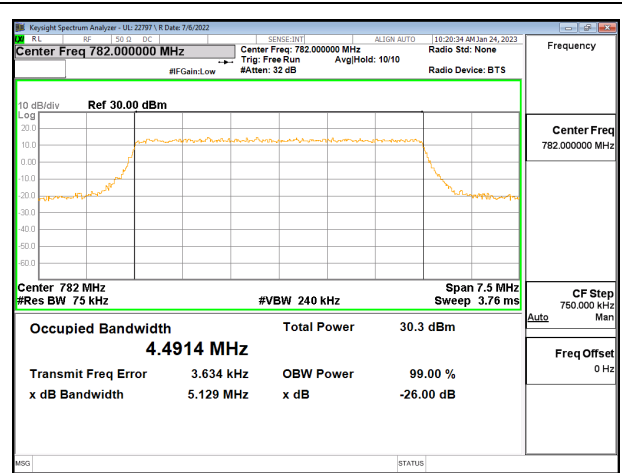
9.1.6. LTE13

Test Engineer ID:	27797/44389	Test Date:	2023-01-24	EUT Serial Number:	QV7700HTFN
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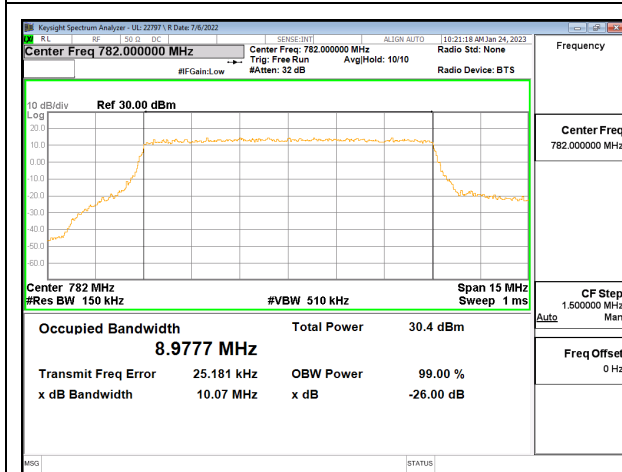
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 13	5MHz, QPSK	25/0	782.0	4.50	5.06
	5MHz, 16QAM			4.49	5.13
	10MHz, QPSK	50/0		8.98	10.07
	10MHz, 16QAM			8.96	9.85



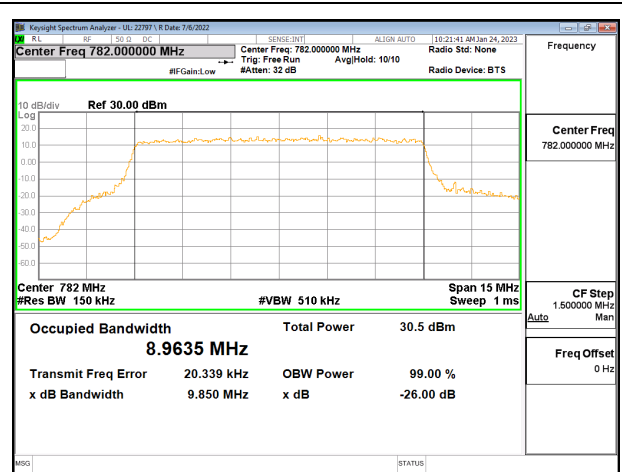
LTE13 5MHz QPSK MID Ch RB25-0



LTE13 5MHz 16QAM MID Ch RB25-0



LTE13 10MHz QPSK MID Ch RB50-0

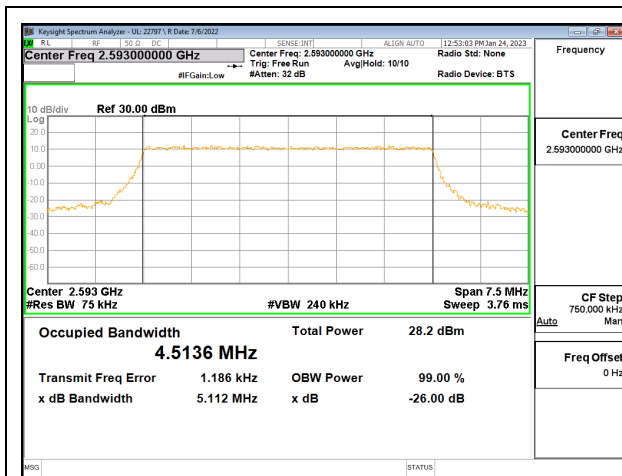


LTE13 10MHz 16QAM MID Ch RB50-0

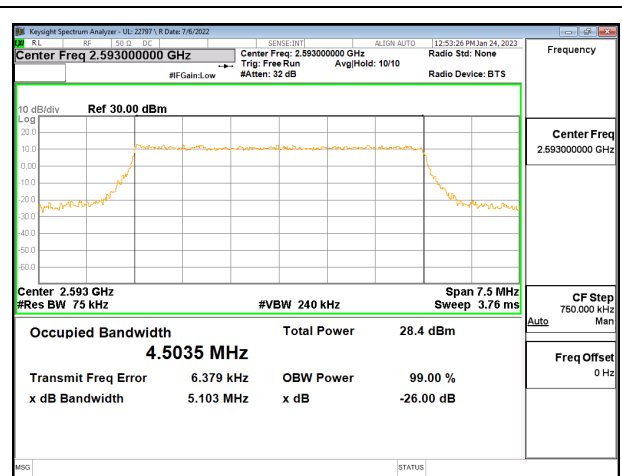
9.1.7. LTE41

Test Engineer ID:	27797/44389	Test Date:	2023-01-24	EUT Serial Number:	QV7700HTFN
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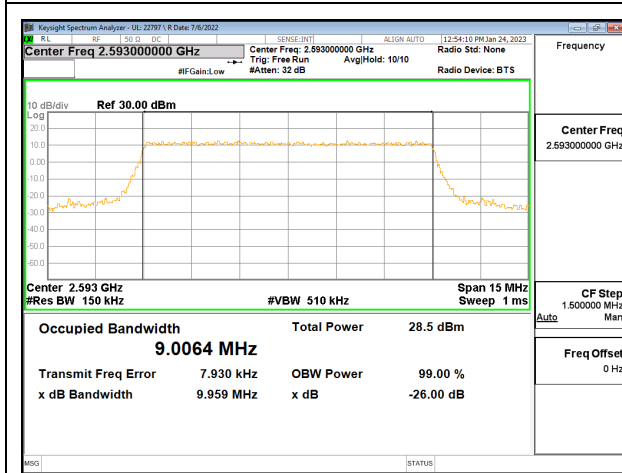
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 41	5MHz, QPSK	25/0	2593.0	4.51	5.11
	5MHz, 16QAM			4.50	5.10
	10MHz, QPSK	50/0		9.00	9.96
	10MHz, 16QAM			9.00	10.00
	15MHz, QPSK	75/0		13.49	14.91
	15MHz, 16QAM			13.44	14.79
	20MHz, QPSK	100/0		17.92	19.73
	20MHz, 16QAM			17.94	19.68



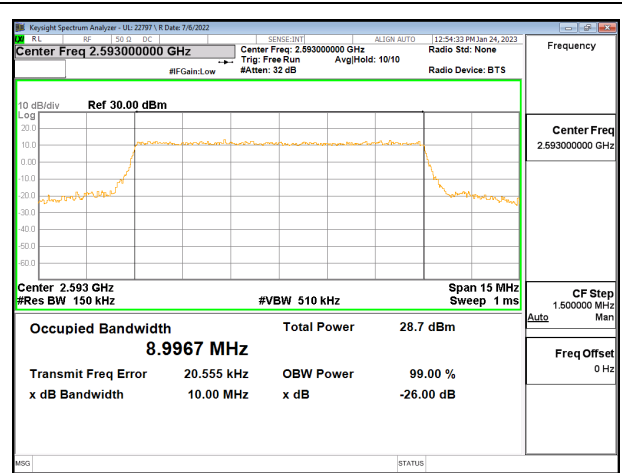
LTE41 5MHz QPSK MID Ch RB25-0



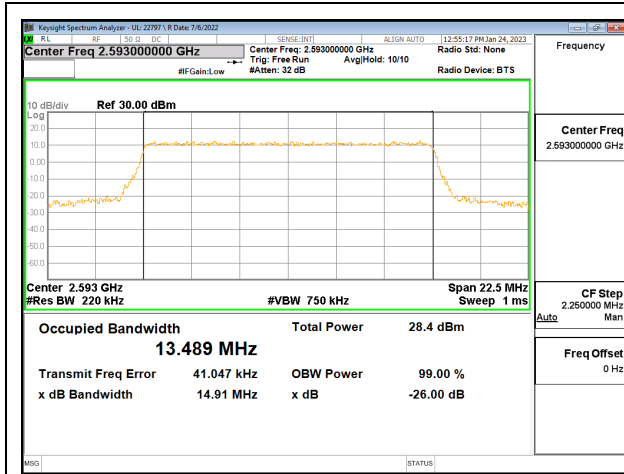
LTE41 5MHz 16QAM MID Ch RB25-0



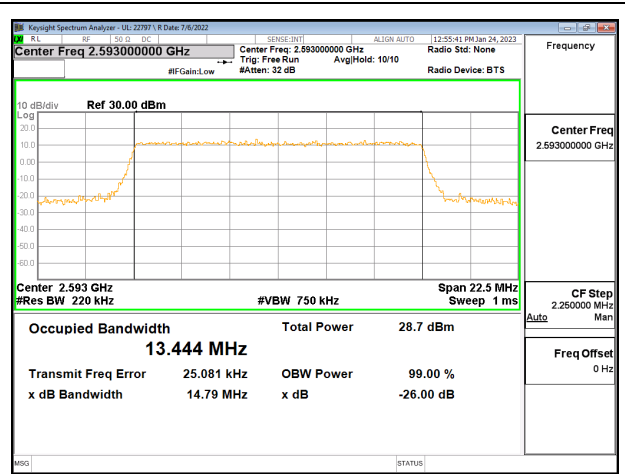
LTE41 10MHz QPSK MID Ch RB50-0



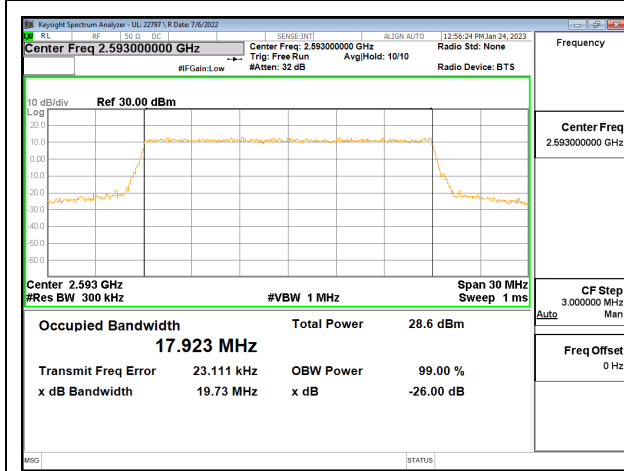
LTE41 10MHz 16QAM MID Ch RB50-0



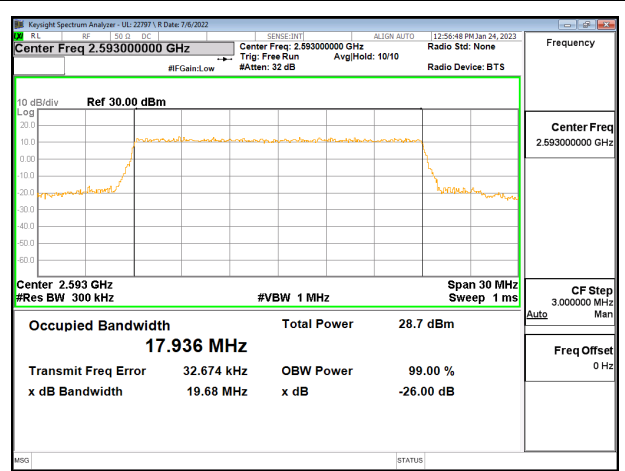
LTE41 15MHz QPSK MID Ch RB75-0



LTE41 15MHz 16QAM MID Ch RB75-0



LTE41 20MHz QPSK MID Ch RB100-0

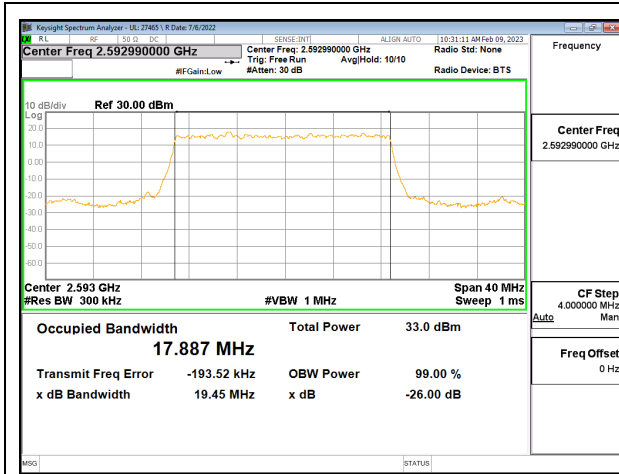


LTE41 20MHz 16QAM MID Ch RB100-0

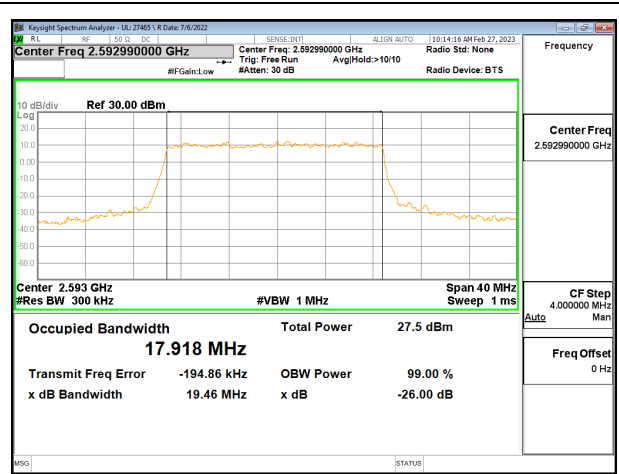
9.1.8. 5G NR n41

Test Engineer ID:	27465/44389	Test Date:	2023-02-09 2023-02-20 2023-02-27	EUT Serial Number:	QV7700HTFN
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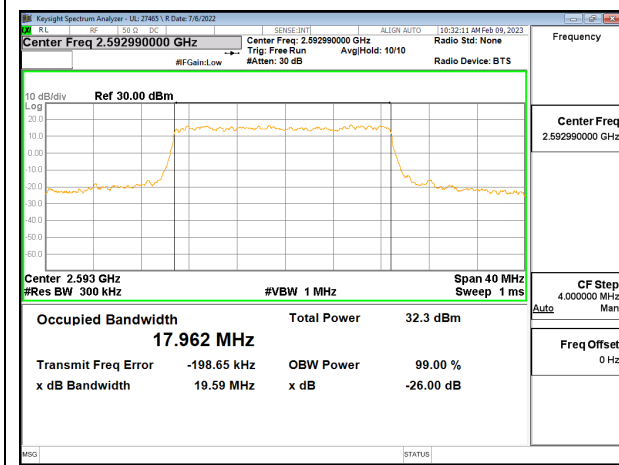
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
5G NR n41	20MHz, BPSK	50/0	2593.0	17.89	19.45
	20MHz, QPSK			17.92	19.46
	20MHz, 16QAM			17.96	19.59
	30MHz, BPSK	75/0		26.79	28.76
	30MHz, QPSK			26.81	28.81
	30MHz, 16QAM			26.91	38.09
	40MHz, BPSK	100/0		35.71	37.97
	40MHz, QPSK			35.77	37.86
	40MHz, 16QAM			35.73	38.09
	50MHz, BPSK	128/0		45.97	48.46
	50MHz, QPSK			45.77	48.40
	50MHz, 16QAM			45.82	48.20
	60MHz, BPSK	162/0		58.01	60.78
	60MHz, QPSK			57.83	60.57
	60MHz, 16QAM			58.03	60.92
	70MHz, BPSK	180/0		64.27	67.68
	70MHz, QPSK			64.62	67.54
	70MHz, 16QAM			64.67	67.48
	80MHz, BPSK	216/0		76.88	80.06
	80MHz, QPSK			77.42	80.78
	80MHz, 16QAM			77.27	80.59
	90MHz, BPSK	243/0		86.84	90.62
	90MHz, QPSK			86.99	90.59
	90MHz, 16QAM			86.71	90.33
100MHz, BPSK	270/0	96.63	100.8		
100MHz, QPSK		96.65	100.8		
100MHz, 16QAM		96.33	100.7		



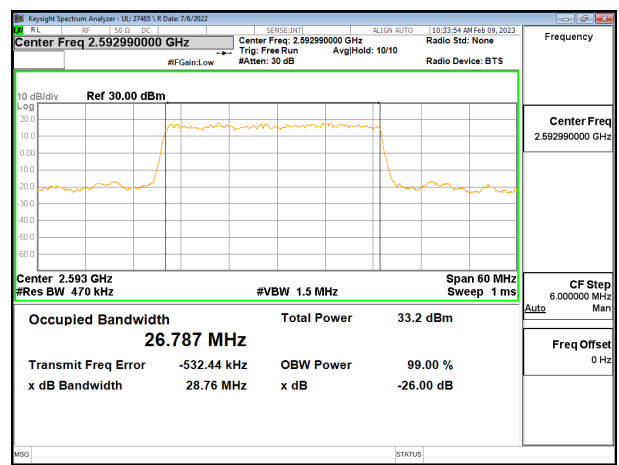
5G NR n41 20MHz BPSK Middle Channel RB50-0



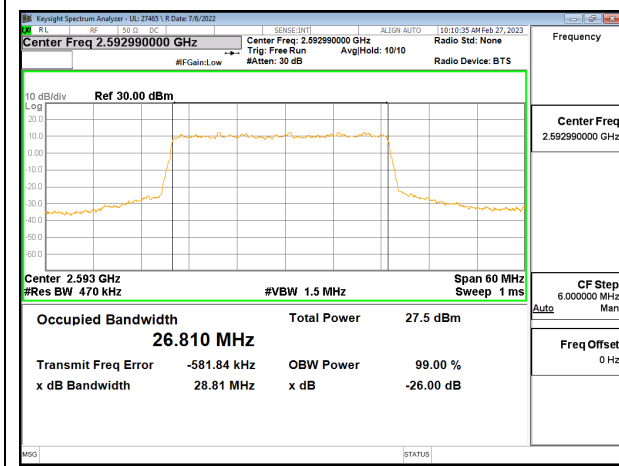
5G NR n41 20MHz QPSK Middle Channel RB50-0



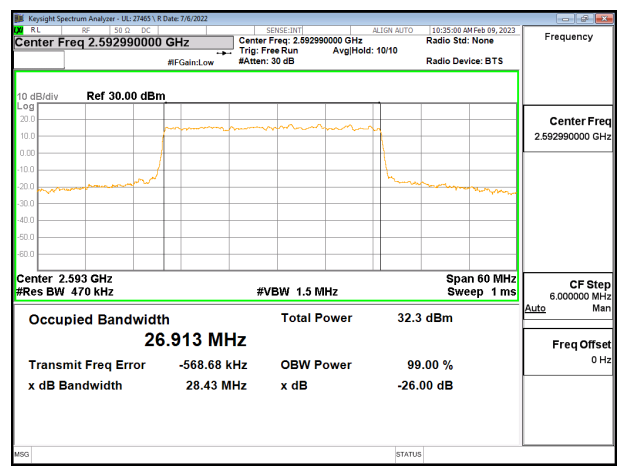
5G NR n41 20MHz 16QAM Middle Channel RB50-0



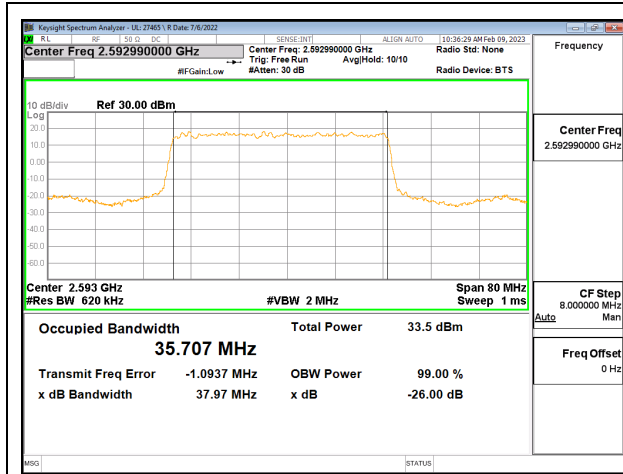
5G NR n41 30MHz BPSK Middle Channel RB75-0



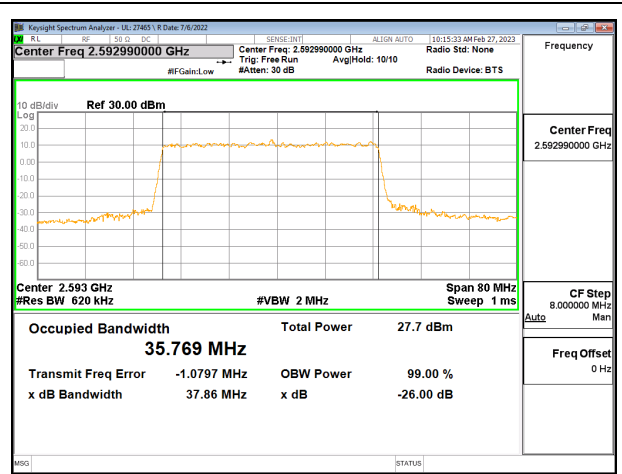
5G NR n41 30MHz QPSK Middle Channel RB75-0



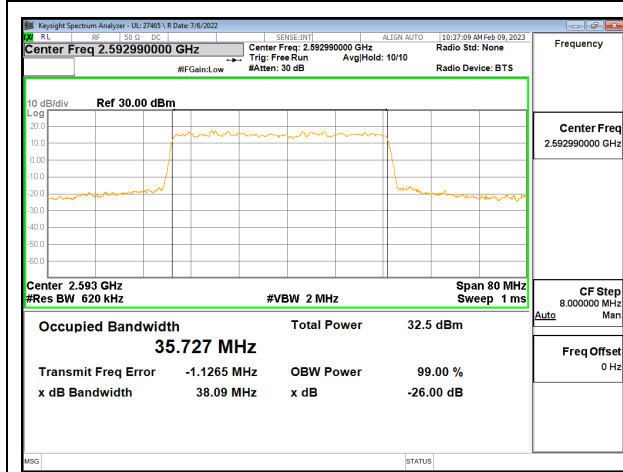
5G NR n41 30MHz 16QAM Middle Channel RB75-0



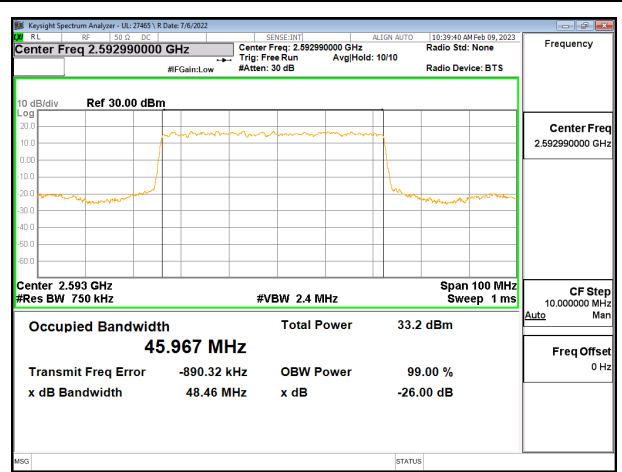
5G NR n41 40MHz BPSK Middle Channel RB100-0



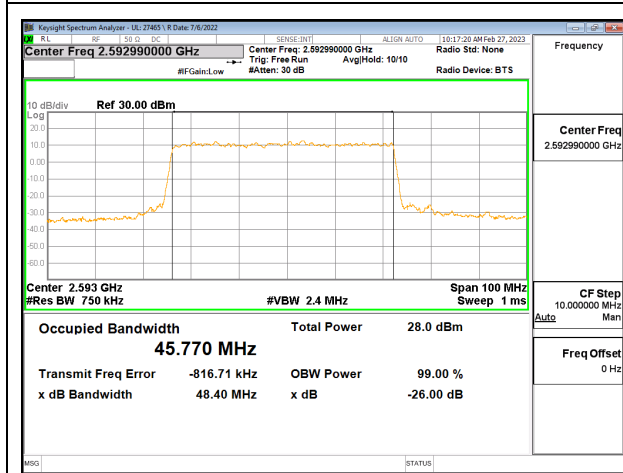
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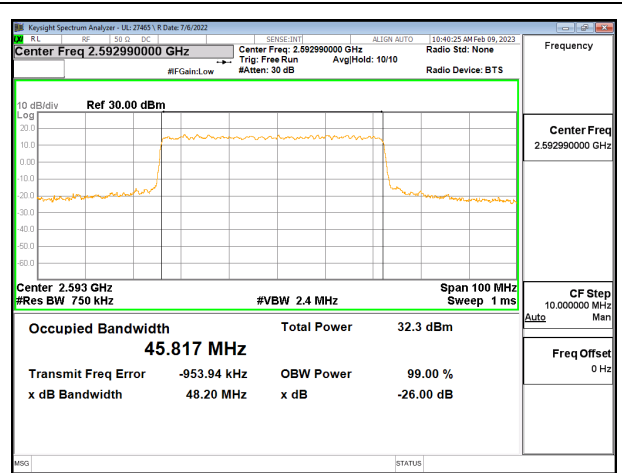
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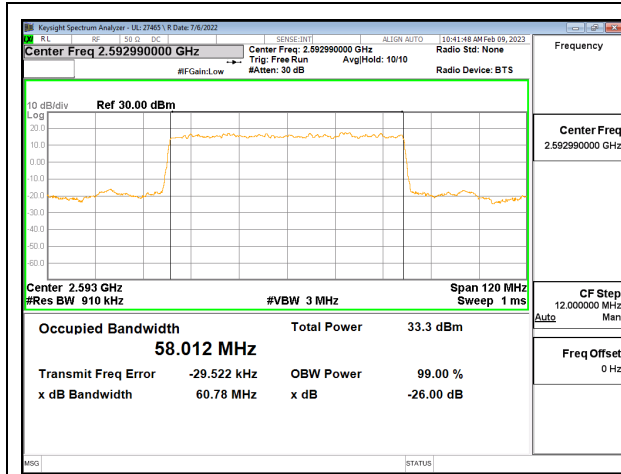
5G NR n41 50MHz BPSK Middle Channel RB128-0



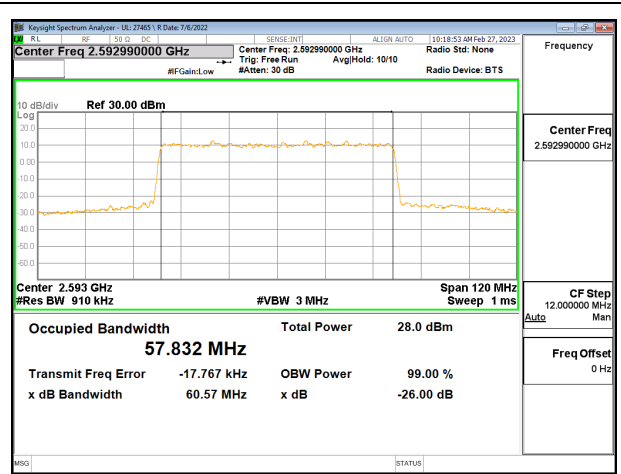
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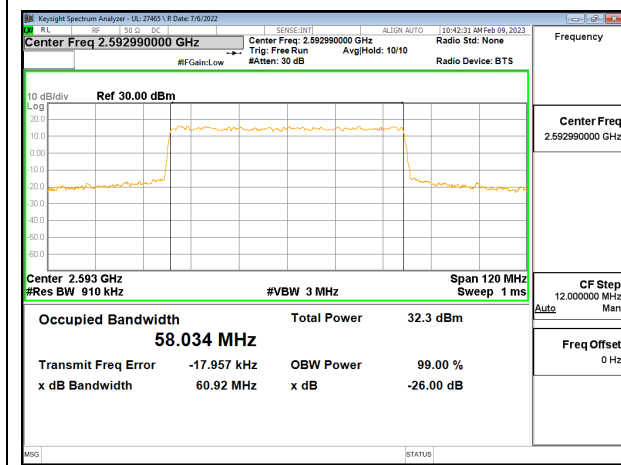
5G NR n41 50MHz 16QAM Middle Channel RB128-0



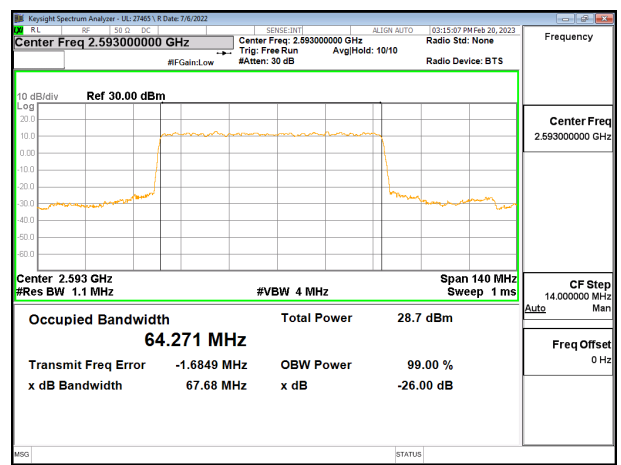
5G NR n41 60MHz BPSK Middle Channel RB162-0



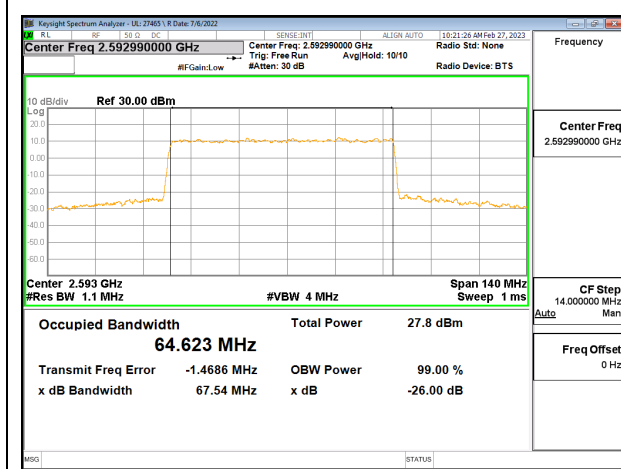
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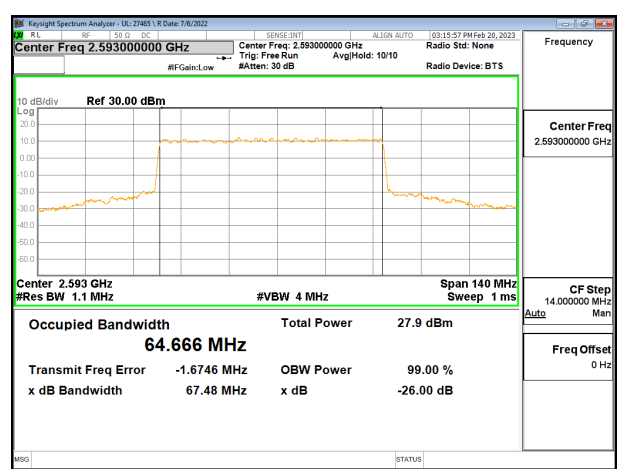
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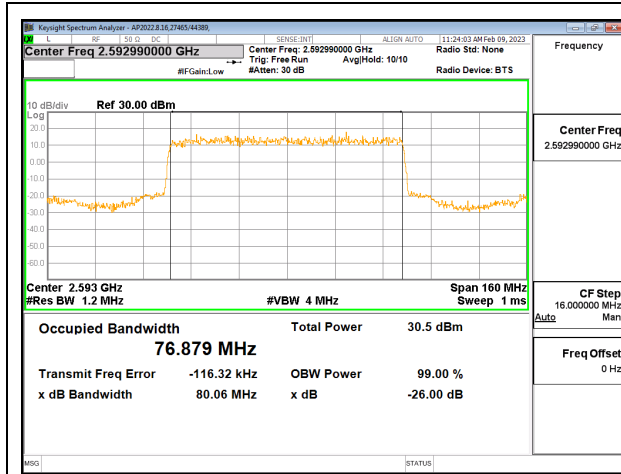
5G NR n41 70MHz BPSK Middle Channel RB180-0



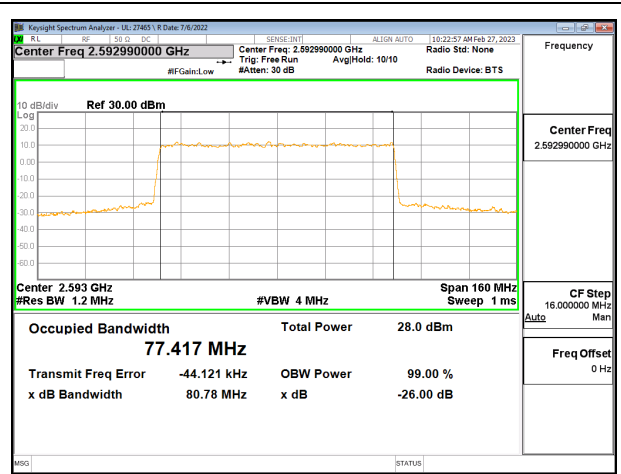
5G NR n41 70MHz QPSK Middle Channel RB180-0



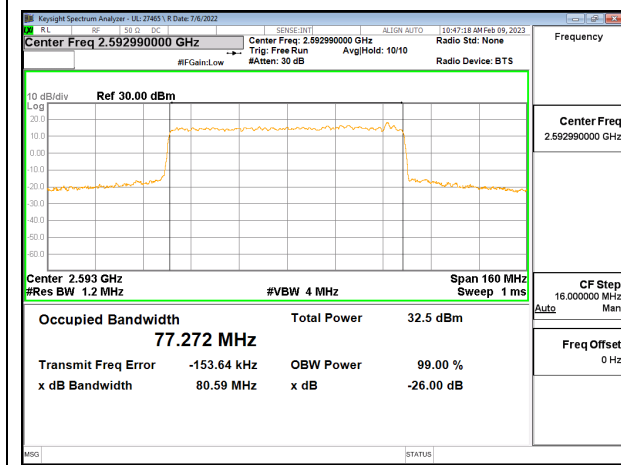
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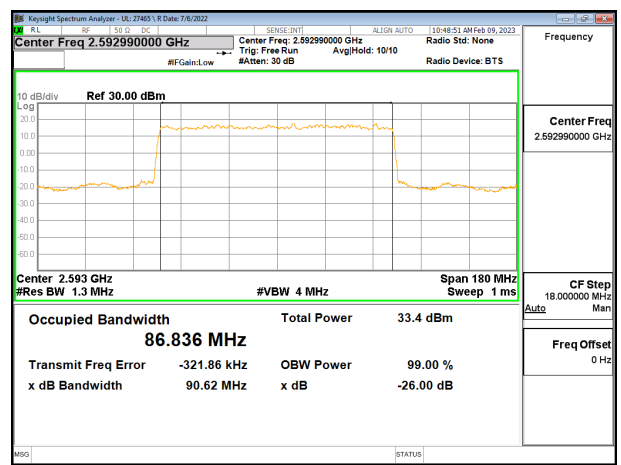
5G NR n41 80MHz BPSK Middle Channel RB216-0



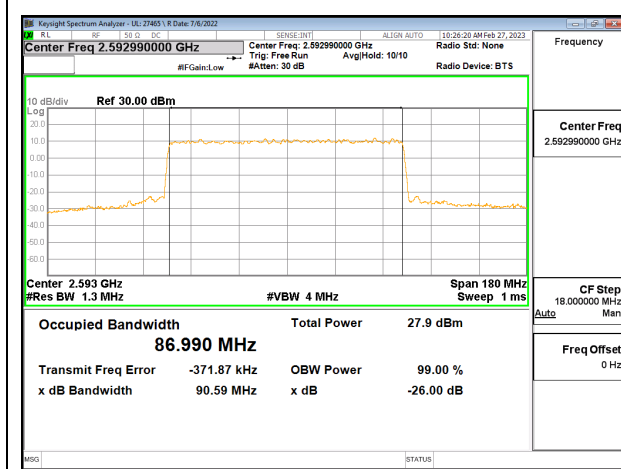
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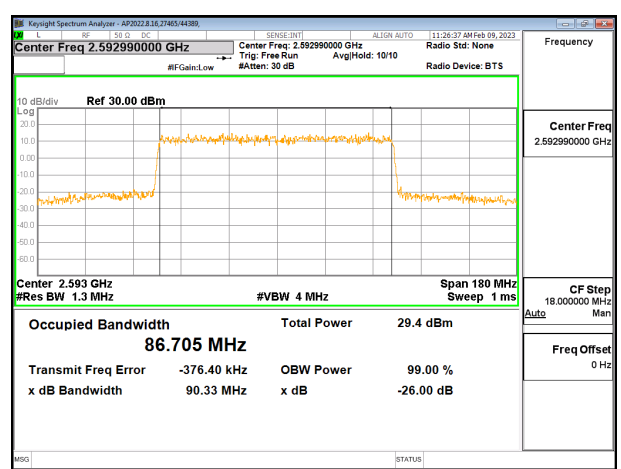
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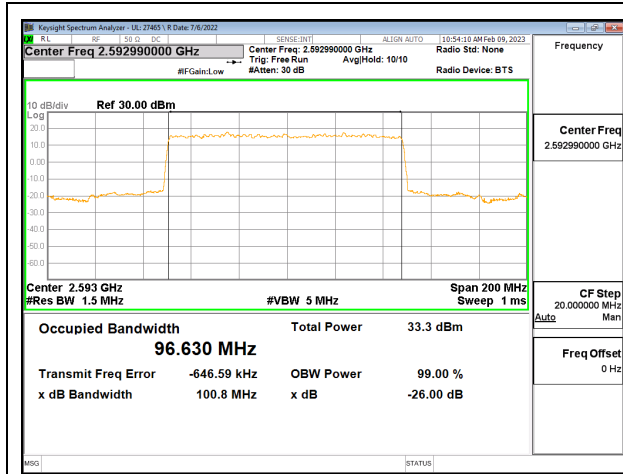
5G NR n41 90MHz BPSK Middle Channel RB243-0



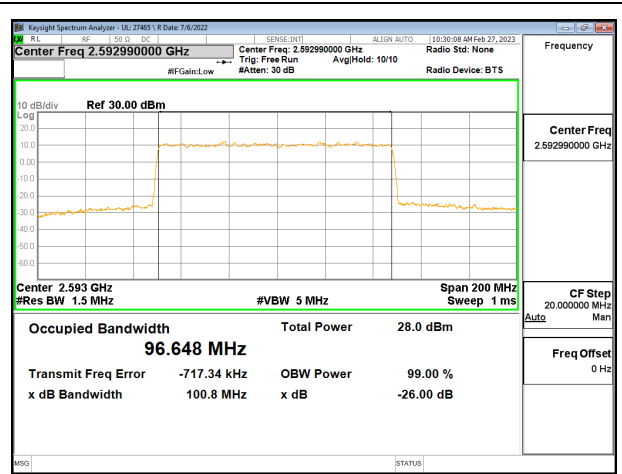
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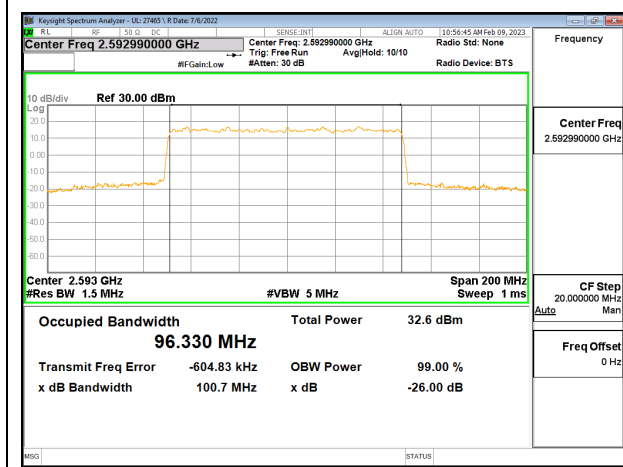
5G NR n41 90MHz 16QAM Middle Channel RB243-0



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



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



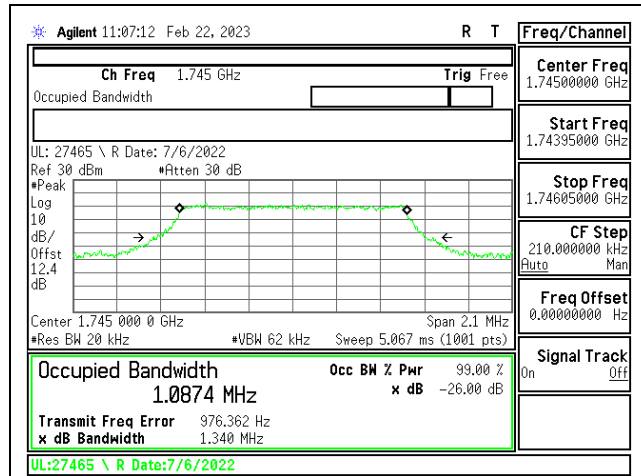
5G NR n41 100MHz 16QAM Middle Channel RB270-0

9.1.9. LTE66

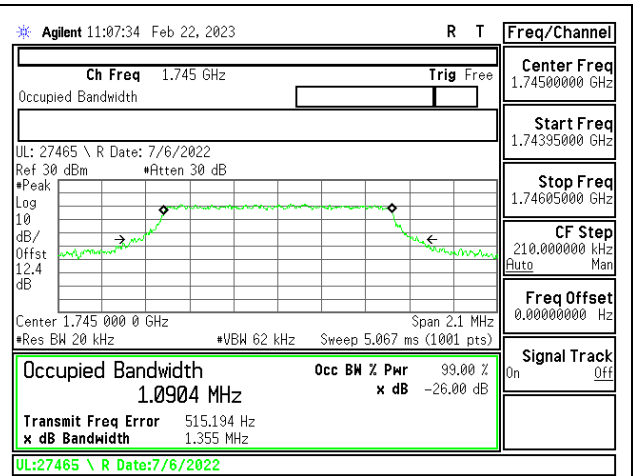
LTE66 – Main Antenna

Test Engineer ID:	22797/44389 27465/44389	Test Date:	2023-01-24 2023-02-22	EUT Serial Number:	QV77000MFN
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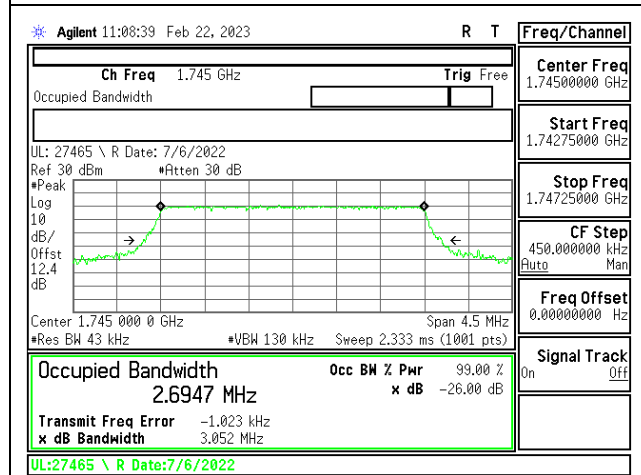
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 66	1.4MHz, QPSK	6/0	1745.0	1.09	1.34
	1.4MHz, 16QAM			1.09	1.36
	3MHz, QPSK	15/0		2.69	3.05
	3MHz, 16QAM			2.69	2.99
	5MHz, QPSK	25/0		4.49	5.09
	5MHz, 16QAM			4.50	5.08
	10MHz, QPSK	50/0		8.96	9.84
	10MHz, 16QAM			8.97	9.81
	15MHz, QPSK	75/0		13.49	14.67
	15MHz, 16QAM			13.46	14.77
	20MHz, QPSK	100/0		17.86	19.60
	20MHz, 16QAM			17.90	19.31



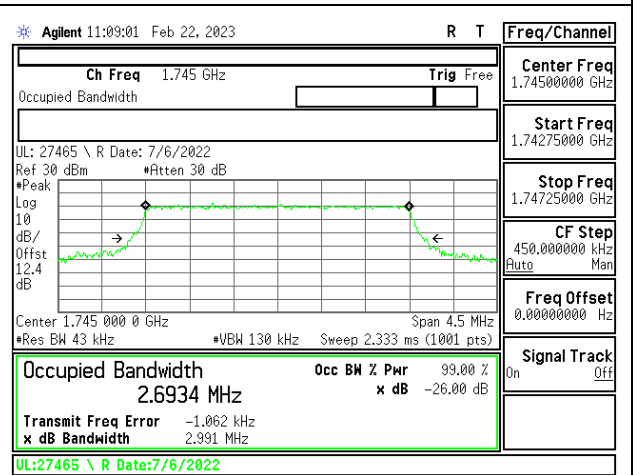
LTE66 1.4MHz QPSK MID Ch RB6-0



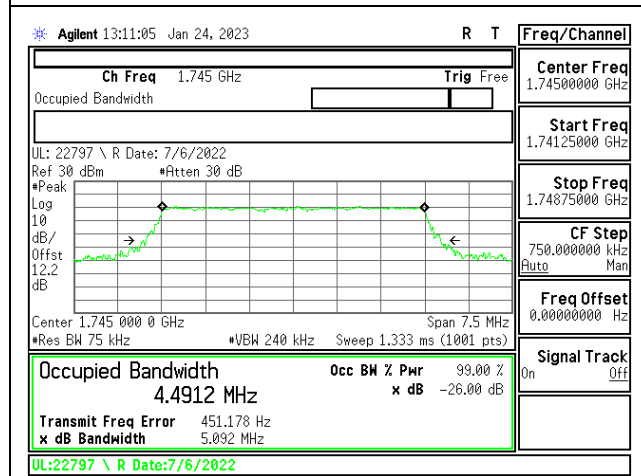
LTE66 1.4MHz 16QAM MID Ch RB6-0



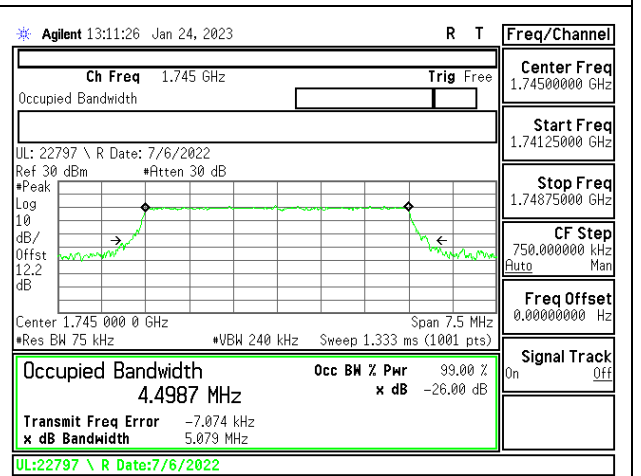
LTE66 3MHz QPSK MID Ch RB15-0



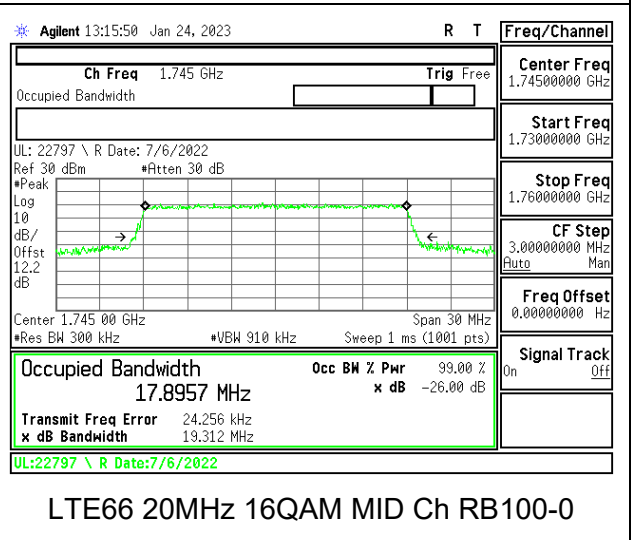
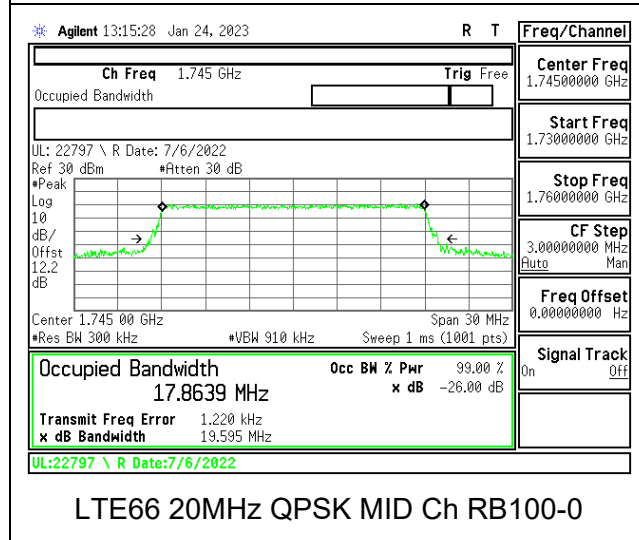
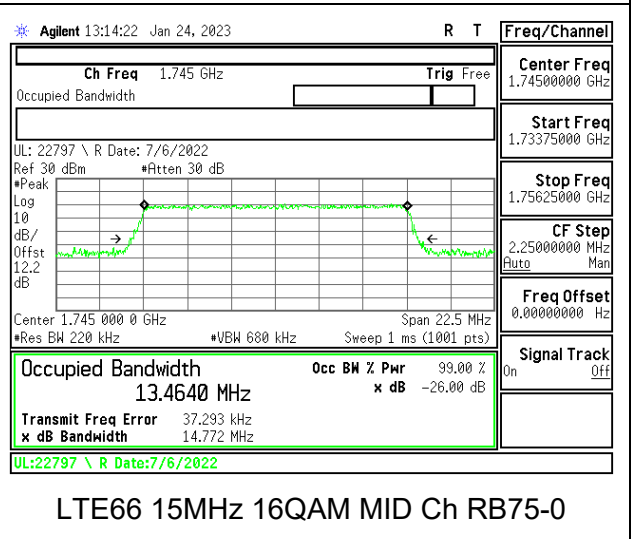
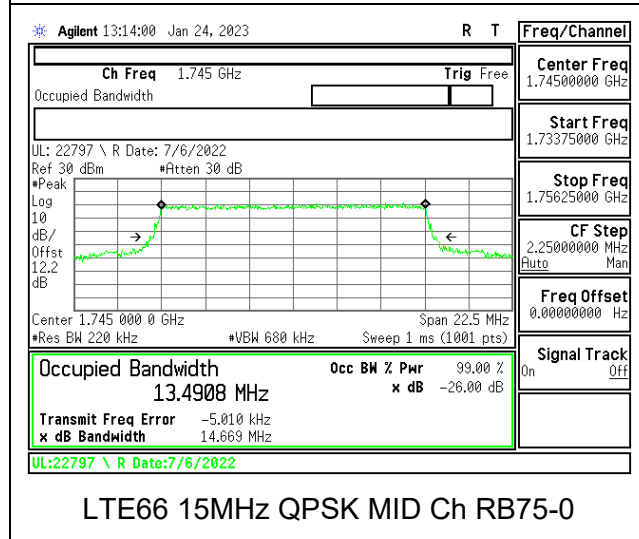
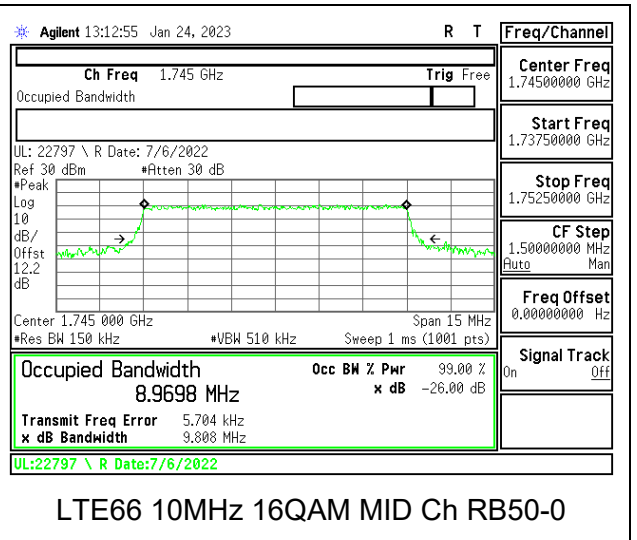
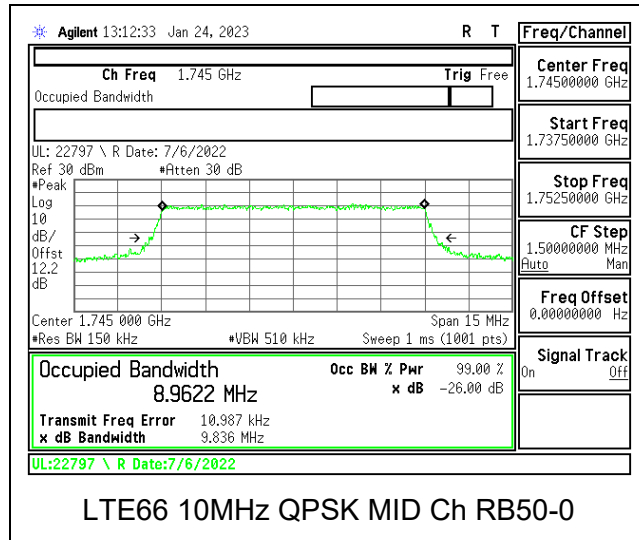
LTE66 3MHz 16QAM MID Ch RB15-0



LTE66 5MHz QPSK MID Ch RB25-0



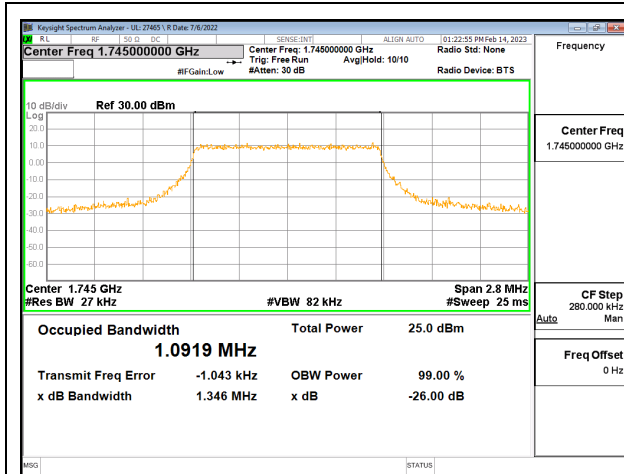
LTE66 5MHz 16QAM MID Ch RB25-0



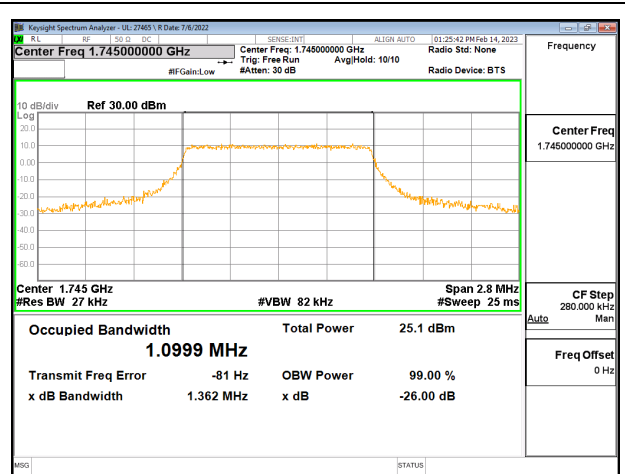
LTE66 – Sub Antenna

Test Engineer ID:	2746544389	Test Date:	2023-02-14	EUT Serial Number:	QV77000MFN
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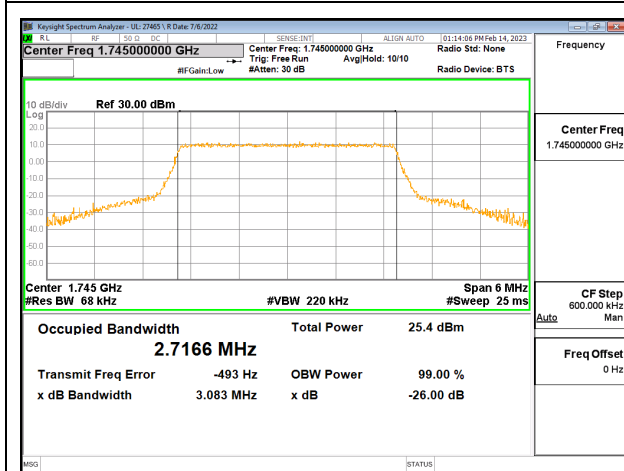
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 66	1.4MHz, QPSK	6/0	1745.0	1.09	1.35
	1.4MHz, 16QAM			1.10	1.36
	3MHz, QPSK	15/0		2.72	3.08
	3MHz, 16QAM			2.72	3.08
	5MHz, QPSK	25/0		4.50	5.05
	5MHz, 16QAM			4.49	5.16
	10MHz, QPSK	50/0		8.90	10.02
	10MHz, 16QAM			8.98	9.95
	15MHz, QPSK	75/0		13.47	14.74
	15MHz, 16QAM			13.45	14.70
	20MHz, QPSK	100/0		17.92	19.56
	20MHz, 16QAM			17.93	19.62



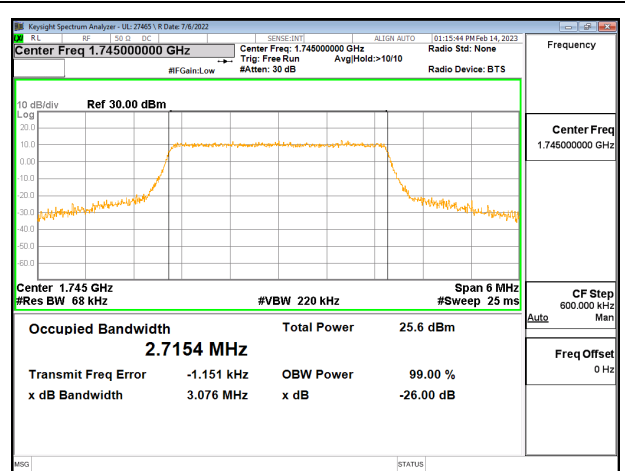
LTE66 1.4MHz QPSK MID Ch RB6-0



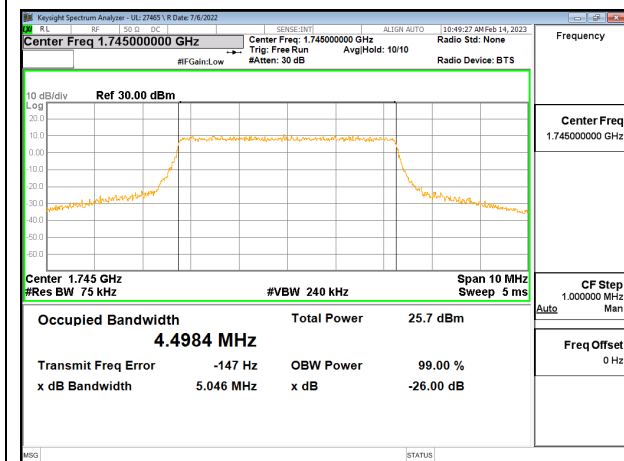
LTE66 1.4MHz 16QAM MID Ch RB6-0



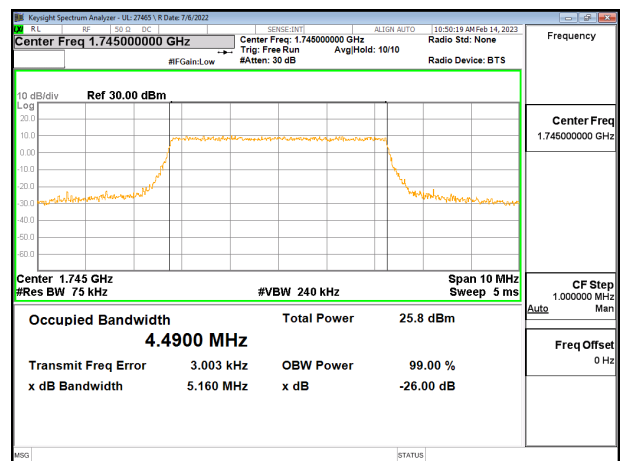
LTE66 3MHz QPSK MID Ch RB15-0



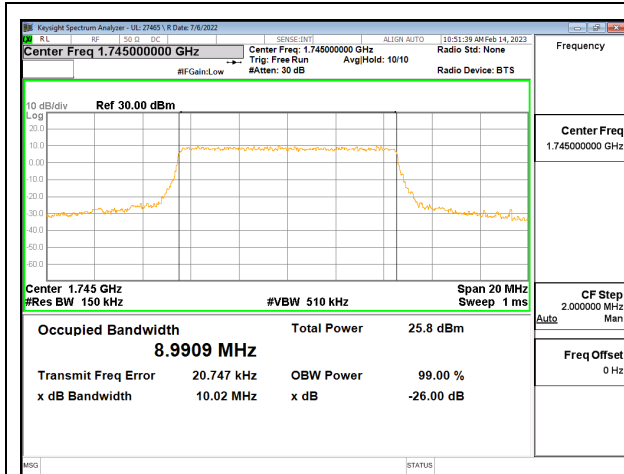
LTE66 3MHz 16QAM MID Ch RB15-0



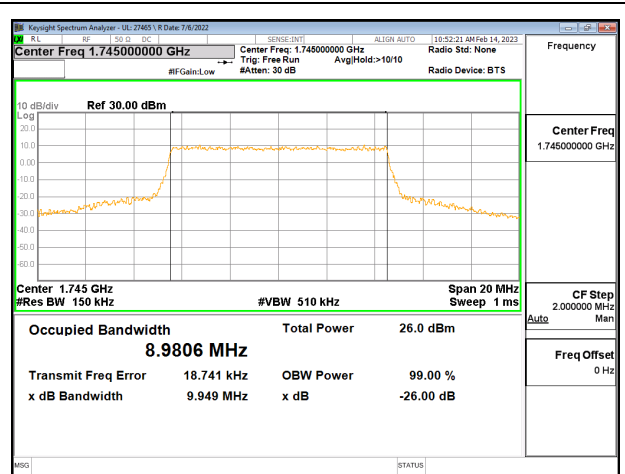
LTE66 5MHz QPSK MID Ch RB25-0



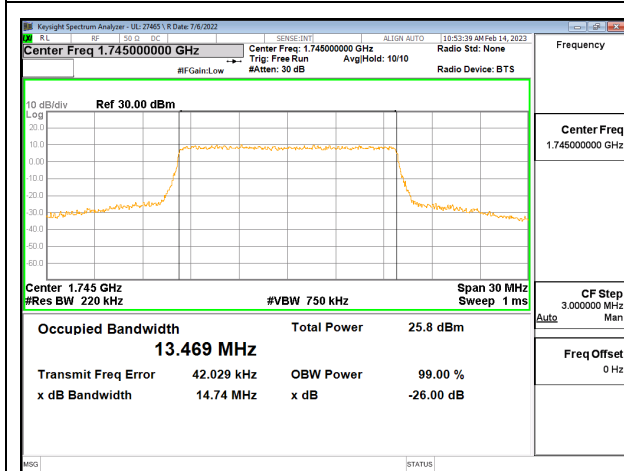
LTE66 5MHz 16QAM MID Ch RB25-0



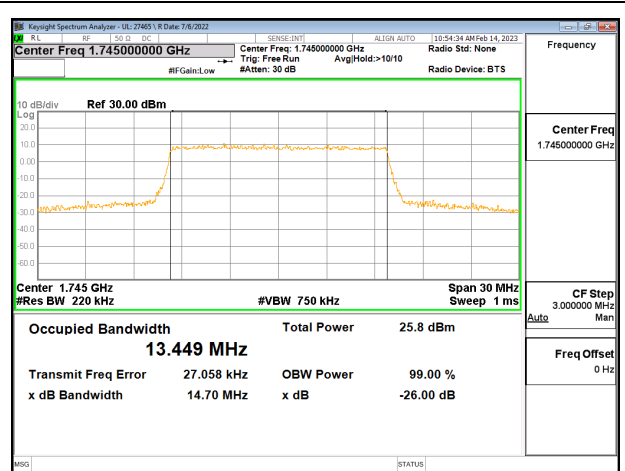
LTE66 10MHz QPSK MID Ch RB50-0



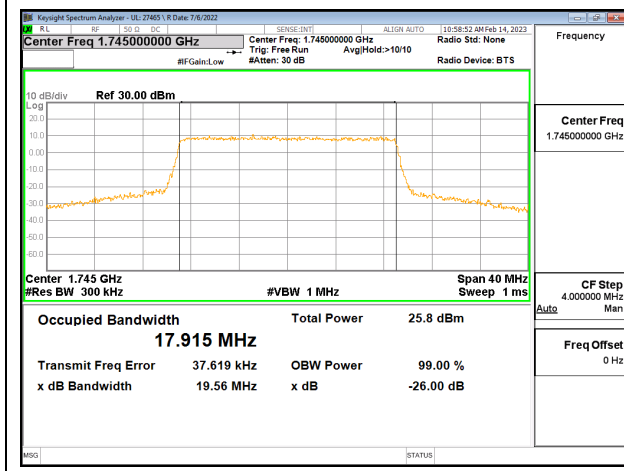
LTE66 10MHz 16QAM MID Ch RB50-0



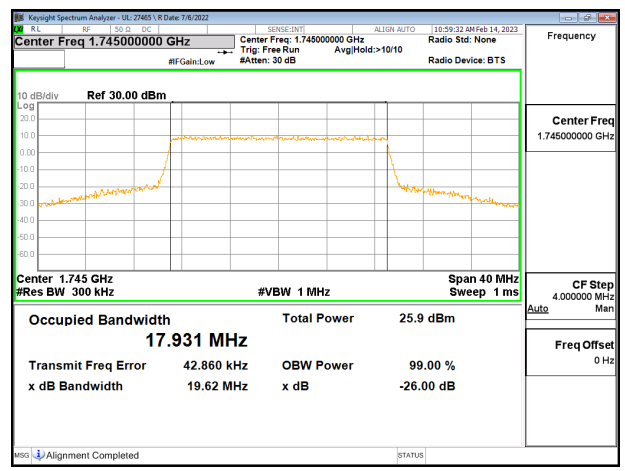
LTE66 15MHz QPSK MID Ch RB75-0



LTE66 15MHz 16QAM MID Ch RB75-0



LTE66 20MHz QPSK MID Ch RB100-0



LTE66 20MHz 16QAM MID Ch RB100-0

9.2. 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 (LTE BAND 41)

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