TEST REPORT

Report Number: R15110027-E1

Applicant	:	Sony Corporation 1-7-1 Konan Minato-Ku Tokyo, 108-0075, Japan
FCC ID	:	PY7-76709C PY7-54773M
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 24, and Part 27.

Date Of Issue:
2024-04-11

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ACCREDITED
CERT #0751.06

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2024-04-05	Initial Review	Noah Bennett
V2	2024-04-11	Added footnote to section 6.1 clarifying support band and antenna configurations. Added Section 6.2 explaining supported bands on both FCC IDs in this report.	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 NUMBERS:	QV7700R9LQ, QV7700QFLQ, QV7700GJLQ, QV770051L2
SAMPLE RECEIPT DATE:	2024-02-19
DATE TESTED:	2024-03-25 to 2024-04-04

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC CFR 47 Part 2, Part 24, 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. This report must not be used by the client to claim product certification, approval, or endorsement by a2La, NIST, or any agency of the U.S. government.

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2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer 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 6.5)
2. EUT Cable loss (see section 8)
3. Supported bands, bandwidths, modulations, power settings, and MPR configurations. (section 6.6)
4. Model Differences (See section 6.2)

Requirement Description	Band	Requirement Clause Number (FCC)	Result	Remarks
Equivalent Isotropic Radiated Power	2	24.232 (c)	Complies	N/A
	4	27.50 (d) (4)	Complies	N/A

Requirement Description	Requirement Clause Number (FCC)	Result	Remarks
Occupied Bandwidth	2.1049	Complies	N/A
Band Edge and Emission Mask	2.1051, 24.238 (a), 27.53 (h)	Complies	N/A
Out of Band Emissions		Complies	N/A
Frequency Stability	2.1055, 24.235, 27.54	Complies	N/A
Peak-to-Average Ratio	27.50(d)(5)	Complies	N/A
Field Strength of Spurious Radiation	2.1051, 24.238 (a), 27.53 (h)	Complies	N/A

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 24, 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, Certificate Number 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
☒	Building 2800 Suite 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)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 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.

The EUT supports the following bands and their antenna configurations:

LTE and 5G NR Bands	Main 1 Antenna	Main 2 Antenna	Sub Antenna
WCDMA2, LTE Band 2	-	Y	Y (LTE2 Only)[1]
WCDMA4, LTE Band 4	-	Y	-

Notes:

1. FCC ID **PY7-54773M** does not support LTE2 on the Sub Antenna. LTE2 is only supported on the Sub antenna on FCC ID **PY7-76709C**.

6.2. MODEL DIFFERENCES

For FCC ID: **PY7-54773M**, supported bands are enabled/disabled via software, and no hardware was changed. For **PY7-54773M**, the manufacturer has declared that:

- WCDMA2/4 and LTE B2 are enabled for FCC region.
- WCDMA5, LTE B5, B13, B41, B66, and 5G NR n5, n41, n66 are disabled for FCC region.

For FCC ID: **PY7-76709C**, supported bands are enabled/disabled via software, and no hardware was changed. For **PY7-76709C**, the manufacturer has declared that:

- WCDMA2/4 and LTE B2 are enabled for FCC region.
- LTE B66, and 5G NR n5, n41 are disabled for FCC region.

6.3. MAXIMUM OUTPUT POWER

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

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

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

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

WCDMA MODE

Part 24 Band 2

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1852.4-1907.6	REL 99	19.70	-3.05	2.0	16.65	0.046	4151.5	4M15F9W
	HSDPA	18.34			15.29	0.034	4147	4M15F9W

Part 27 Band 4

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1712.4-1752.6	REL 99	21.64	-2.23	1.0	19.41	0.087	4157.5	4M16F9W
	HSDPA	20.69			18.46	0.070	4148.1	4M15F9W

LTE BAND 2

Part 24 / RSS 133	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-3.05

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	1850.7	1909.3	18.32	15.27	0.034	1090.5	1M09G7W
	16QAM			18.74	15.69	0.037	1097.6	1M10D7W
3.0	QPSK	1851.5	1908.5	18.39	15.34	0.034	2703.7	2M70G7W
	16QAM			18.78	15.73	0.037	2705.5	2M71D7W
5.0	QPSK	1852.5	1907.5	18.49	15.44	0.035	4501.6	4M50G7W
	16QAM			18.82	15.77	0.038	4493.9	4M49D7W
10.0	QPSK	1855.0	1905.0	18.42	15.37	0.034	8985.8	8M99G7W
	16QAM			18.70	15.65	0.037	8990.6	8M99D7W
15.0	QPSK	1857.5	1902.5	18.41	15.36	0.034	13460	13M5G7W
	16QAM			18.70	15.65	0.037	13469	13M5D7W
20.0	QPSK	1860.0	1900.0	18.44	15.39	0.035	17915	17M9G7W
	16QAM			18.80	15.75	0.038	17937	17M9D7W

LTE BAND 4

Part 27	
EIRP Limit (W)	1.00
Antenna Gain (dBi)	-2.23

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	20.43	18.20	0.066	1090.5	1M09G7W
	64QAM			20.85	18.62	0.073	1087.2	1M09D7W
3.0	QPSK	1711.5	1778.5	20.65	18.42	0.070	2697.7	2M70G7W
	16QAM			20.81	18.58	0.072	2712.3	2M71D7W
5.0	QPSK	1712.5	1777.5	20.54	18.31	0.068	4494.7	4M49G7W
	64QAM			20.84	18.61	0.073	4504.7	4M50D7W
10.0	QPSK	1715.0	1775.0	20.38	18.15	0.065	8981.9	8M98G7W
	64QAM			20.71	18.48	0.070	8972.2	8M97D7W
15.0	QPSK	1717.5	1772.5	20.45	18.22	0.066	13493	13M5G7W
	64QAM			20.74	18.51	0.071	13455	13M5D7W
20.0	QPSK	1720.0	1770.0	20.45	18.22	0.066	17928	17M9G7W
	64QAM			20.78	18.55	0.072	17905	17M9D7W

6.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.225 for Conducted units, and 0.223 for radiated units.

6.5. MAXIMUM ANTENNA GAIN

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

WWAN Bands	Frequency Range (MHz)	Main 1 Antenna Gain (dBi)	Main 2 Antenna Gain (dBi)	Sub Antenna Gain (dBi)
LTE Band 2, WCDMA2	1850 - 1915	-	-3.05	-2.55
LTE Band 4, WCDMA4	1710 – 1780	-	-2.23	-

6.6. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X/Y/Z on Mid Band (Fundamental between 1-3GHz) for both the Main and Sub Antennas.

Band (Frequency)	Antenna	Orientation
Mid Band (1GHz<Fc<3GHz)	Main 2	X
	Sub Antenna	

The worst-case scenario for all measurements is based on an engineering evaluation made on conducted average power on different modulations found during pretesting. Output power measurements were measured on Rel 99, HSDPA, HSUPA and DC-HSDPA for WCDMA, and QPSK, 16QAM, and 64QAM modulations for LTE. The modulations with the highest output power were selected as worst-case.

Conducted tests were performed on the worst-case antenna port per band, with spot check tests performed on all other antenna ports with equal or lower output power. Only the worst-case conducted antenna port data is reported. Full radiated emissions testing on each antenna was performed and reported.

The following is the worst-case antenna port per band, for Conducted Output Power:

WWAN Band	Worst-case Antenna port for conducted output power	Worst-case modulation for Conducted Output power as tested.
WCDMA 2	Main 2	Rel. 99
WCMDA 4		
LTE Band 2		16QAM
LTE Band 4		64QAM

The EUT was tested while connected to AC Lines via charging cable and brick to represent worst case emissions.

Worst-case emissions from 9kHz to 26.5GHz were done on the modes with the highest conducted average power. This test data is reported in section 10.2, which shows worst-case emissions per antenna.

6.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

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

I/O CABLES

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

Setup Diagram

See R15110027-EP1 for Setup Photos and Setup Diagrams

7. TEST AND MEASUREMENT EQUIPMENT

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

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				
65682	Active Loop Antenna	ETS-Lindgren	6502	2023-10-03	2024-10-03
	30-1000 MHz				
90628	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-02	2026-01-02
	1-18 GHz				
89509	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2023-05-23	2025-05-23
	Gain-Loss Chains				
207638	Gain-loss string: 0.009-30MHz	Various	Various	2023-09-18	2024-09-18
207639	Gain-loss string: 25-1000MHz	Various	Various	2023-09-18	2024-09-18
207640	Gain-loss string: 1-18GHz	Various	Various	2023-05-17	2024-05-17
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-04-10	2024-04-10
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241204	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05
212167	Wideband Radio Communications Tester	Anritsu	MT8821C	2023-06-05	2024-06-05
212967	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2024-01-03	2025-01-03
169106 (BRF008)	1710-1785MHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50713-01	2024-03-01	2025-03-01
169108 (BRF010)	1.85-1.97GHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50714-01	2024-03-01	2025-03-01

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	0.009-30MHz				
135144	Active Loop Antenna	ETS-Lindgren	6502	2024-01-24	2025-01-24
	30-1000 MHz				
90629	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2024-01-30	2026-01-30
	18-40 GHz				
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-826	2023-07-20	2025-07-20
	Gain-Loss Chains				
91974	Gain-loss string: 0.009-30MHz	Various	Various	2023-05-16	2024-05-16
91976	Gain-loss string: 25-1000MHz	Various	Various	2023-05-16	2024-05-16
135999	Gain-loss string: 18-40GHz	Various	Various	2023-05-16	2024-05-16
	Receiver & Software				
206496	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-07-19	2024-07-19
81018	Spectrum Analyzer	Agilent	E4446A	2023-08-01	2024-08-01
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
241205	Environmental Meter	Fisher Scientific	15-077-963	2023-09-05	2025-09-05
207620	Wideband Radio Communications Tester	Anritsu	MT8821C	2022-07-03	2023-07-03
212167	Wideband Radio Communications Tester	Anritsu	MT8821C	2023-06-05	2024-06-05
PS216	AC Power Source	Elgar	CW2501M	NA	NA
150716 (LPF008)	DC-1000MHz low-pass filter	Pasternack	PE8720	2024-03-04	2025-03-04

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Common Equipment				
	Conducted Room 1				
90416	Spectrum Analyzer	Keysight Technologies	N9030A	2023-06-09	2024-06-30
179892	Environmental Meter	Fisher Scientific	15-077-963	2023-07-26	2024-06-31
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	NA	NA
	Conducted Room 2				
238710	Environmental Meter	Fisher Scientific	15-077-963	2023-06-27	2024-06-27
76021	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	NA	NA
	Additional Equipment used				
212967	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2024-01-03	2025-01-03

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

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Attenuators				
	Cables				
CBL091	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz	Sucoflex	UFA147A-2-0360-200200	2024-03-01	2025-03-01
246507	25MHz-18GHz, SMA, 6FT	Pasternack	PE341-72	2024-03-26	2025-03-26
246259	SMA (M) to SMA (M)	Pasternack	PE336-24	2024-03-07	2025-03-07
	Couplers				
238018	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2023-07-13	2024-07-13

NOTES:

1. * Testing is completed before equipment expiration date.
2. 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. 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
	βc/βd	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} *(Note1, 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 Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_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 Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, 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 β_c = 11/15 and β_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} (Note1)	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	209/225	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_{ed}1: 47/15 β_{ed}2: 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 Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_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 β_c = 10/15 and β_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.

DUAL CARRIER HSDPA (DC-HSDPA (REL 8, CAT 24)

The following 4 Sub-tests were for DC-HSDPA were completed according to Release 8 procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of these settings are illustrated below:

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.

Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

RESULT

8.1.1. WCDMA BAND 2

Test Engineer ID:	104412//21193	Test Date:	03-25-24	Sample SN:	QV7700QFLQ

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)
						Main 2
W-CDMA Band 2 (1900MHz)	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	**19.70**
			9400	1880.0	N/A	18.93
			9538	1907.6	N/A	18.84
	HSDPA	Subtest 1	9262	1852.4	0	17.91
			9400	1880.0	0	**18.34**
			9538	1907.6	0	17.84
		Subtest 2	9262	1852.4	0	17.85
			9400	1880.0	0	17.92
			9538	1907.6	0	17.85
		Subtest 3	9262	1852.4	0.5	17.36
			9400	1880.0	0.5	17.41
			9538	1907.6	0.5	17.32
		Subtest 4	9262	1852.4	0.5	17.54
			9400	1880.0	0.5	17.41
			9538	1907.6	0.5	17.32
	HSPA (HSDPA & HSUPA)	Subtest 1	9262	1852.4	0	17.95
			9400	1880.0	0	18.00
			9538	1907.6	0	17.91
		Subtest 2	9262	1852.4	2	16.02
			9400	1880.0	2	15.97
			9538	1907.6	2	15.91
		Subtest 3	9262	1852.4	1	17.00
			9400	1880.0	1	16.99
			9538	1907.6	1	16.85
		Subtest 4	9262	1852.4	2	15.77
			9400	1880.0	2	16.01
			9538	1907.6	2	15.93
		Subtest 5	9262	1852.4	0	18.04
			9400	1880.0	0	17.96
			9538	1907.6	0	17.91
	DC-HSDPA	Subtest 1	9262	1852.4	0	17.66
			9400	1880.0	0	17.82
			9538	1907.6	0	17.81
		Subtest 2	9262	1852.4	0	17.84
			9400	1880.0	0	17.95
			9538	1907.6	0	17.78
		Subtest 3	9262	1852.4	0.5	17.65
			9400	1880.0	0.5	17.42
			9538	1907.6	0.5	17.33
		Subtest 4	9262	1852.4	0.5	17.32
			9400	1880.0	0.5	17.41
			9538	1907.6	0.5	17.33

8.1.2. WCDMA BAND 4

Test Engineer ID:	104412//21193	Test Date:	03-25-24	Sample SN:	QV7700QFLQ

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)
						Main 2
W-CDMA Band 4 (1700MHz)	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	21.45
			1413	1732.6	N/A	21.51
			1513	1752.6	N/A	**21.64**
	HSDPA	Subtest 1	1312	1712.4	0	20.54
			1413	1732.6	0	20.44
			1513	1752.6	0	**20.69**
		Subtest 2	1312	1712.4	0	20.57
			1413	1732.6	0	20.56
			1513	1752.6	0	20.60
		Subtest 3	1312	1712.4	0.5	19.99
			1413	1732.6	0.5	19.99
			1513	1752.6	0.5	20.06
		Subtest 4	1312	1712.4	0.5	19.86
			1413	1732.6	0.5	19.92
			1513	1752.6	0.5	20.03
	HSPA (HSDPA & HSUPA)	Subtest 1	1312	1712.4	0	20.58
			1413	1732.6	0	20.50
			1513	1752.6	0	20.64
		Subtest 2	1312	1712.4	2	18.53
			1413	1732.6	2	18.48
			1513	1752.6	2	18.74
		Subtest 3	1312	1712.4	1	19.42
			1413	1732.6	1	19.55
			1513	1752.6	1	19.18
		Subtest 4	1312	1712.4	2	18.31
			1413	1732.6	2	18.36
			1513	1752.6	2	18.56
		Subtest 5	1312	1712.4	0	20.37
			1413	1732.6	0	20.34
			1513	1752.6	0	20.42
	DC-HSDPA	Subtest 1	1312	1712.4	0	20.52
			1413	1732.6	0	20.47
			1513	1752.6	0	20.56
		Subtest 2	1312	1712.4	0	20.54
			1413	1732.6	0	20.54
			1513	1752.6	0	20.58
		Subtest 3	1312	1712.4	0.5	20.06
			1413	1732.6	0.5	20.04
			1513	1752.6	0.5	20.11
		Subtest 4	1312	1712.4	0.5	20.06
			1413	1732.6	0.5	19.93
			1513	1752.6	0.5	20.01

8.2. LTE

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		
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

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

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

AVERAGE OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

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

PEAK OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

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

8.2.1. LTE BAND 2

Test Engineer ID:	104412//21193	Test Date:	03-25-24	Sample SN:	QV7700QFLQ

OUTPUT POWER FOR LTE BAND 2 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				18607	18900	19193
				1850.7 MHz	1880 MHz	1909.3 MHz
1.4	QPSK	1	0	18.29	18.24	18.31
		1	3	18.31	18.26	18.28
		1	5	18.27	18.31	18.29
		3	0	18.25	18.28	18.26
		3	1	18.29	18.27	18.28
		3	3	18.29	18.27	**18.32**
		6	0	18.28	18.26	18.30
	16QAM	1	0	18.68	18.70	18.68
		1	3	18.71	18.70	18.70
		1	5	18.72	**18.74**	18.72
		3	0	18.47	18.43	18.46
		3	1	18.43	18.45	18.47
		3	3	18.49	18.48	18.47
		6	0	18.40	18.45	18.44
	64QAM	1	0	18.46	18.42	18.44
		1	3	18.48	18.41	**18.51**
		1	5	18.44	18.41	18.49
		3	0	18.35	18.38	18.32
		3	1	18.32	18.35	18.32
		3	3	18.31	18.35	18.32
		6	0	18.21	18.28	18.33

OUTPUT POWER FOR LTE BAND 2 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				18615	18900	19185
				1851.5 MHz	1880 MHz	1908.5 MHz
3.0	QPSK	1	0	18.27	18.27	18.32
		1	8	18.29	**18.39**	18.35
		1	14	18.23	18.28	18.23
		8	0	18.31	18.32	18.38
		8	4	18.31	18.38	18.36
		8	7	18.32	18.38	18.33
		15	0	18.31	18.31	18.32
	16QAM	1	0	18.58	18.74	18.62
		1	8	**18.78**	18.76	18.69
		1	14	18.53	18.67	18.58
		8	0	18.39	18.37	18.39
		8	4	18.39	18.46	18.45
		8	7	18.37	18.45	18.41
		15	0	18.37	18.32	18.38
	64QAM	1	0	18.45	18.38	18.53
		1	8	18.47	18.49	**18.58**
		1	14	18.31	18.30	18.39
		8	0	18.32	18.25	18.28
		8	4	18.36	18.35	18.28
		8	7	18.35	18.36	18.30
		15	0	18.24	18.19	18.23

OUTPUT POWER FOR LTE BAND 2 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				18625	18900	19175
				1852.5 MHz	1880 MHz	1907.5 MHz
5.0	QPSK	1	0	18.35	18.46	**18.49**
		1	12	18.30	18.35	18.33
		1	24	18.28	18.44	18.38
		12	0	18.35	18.35	18.37
		12	7	18.32	18.33	18.38
		12	13	18.30	18.39	18.35
		25	0	18.32	18.33	18.35
	16QAM	1	0	**18.82**	18.77	18.78
		1	12	18.80	18.71	18.58
		1	24	18.79	18.75	18.72
		12	0	18.47	18.39	18.46
		12	7	18.47	18.35	18.47
		12	13	18.43	18.41	18.40
		25	0	18.34	18.32	18.39
	64QAM	1	0	18.53	18.62	**18.71**
		1	12	18.48	18.52	18.63
		1	24	18.45	18.60	18.63
		12	0	18.28	18.25	18.24
		12	7	18.26	18.28	18.23
		12	13	18.24	18.35	18.20
		25	0	18.24	18.22	18.27

OUTPUT POWER FOR LTE BAND 2 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				18650	18900	19150
				1855 MHz	1880 MHz	1905 MHz
10.0	QPSK	1	0	18.30	18.30	18.35
		1	25	18.33	18.38	18.34
		1	49	18.32	18.31	18.31
		25	0	18.33	18.30	18.30
		25	12	18.37	18.33	**18.42**
		25	25	18.36	**18.42**	18.39
		50	0	18.34	18.31	18.30
	16QAM	1	0	18.61	18.43	18.61
		1	25	18.66	18.53	**18.70**
		1	49	18.55	18.49	18.62
		25	0	18.39	18.38	18.35
		25	12	18.39	18.40	18.43
		25	25	18.38	18.47	18.38
		50	0	18.37	18.33	18.32
	64QAM	1	0	18.31	18.48	18.41
		1	25	18.34	**18.60**	18.45
		1	49	18.33	18.51	18.44
		25	0	18.28	18.23	18.22
		25	12	18.29	18.24	18.32
		25	25	18.30	18.33	18.31
		50	0	18.28	18.26	18.22

OUTPUT POWER FOR LTE BAND 2 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				18675	18900	19125
				1857.5 MHz	1880 MHz	1902.5 MHz
15.0	QPSK	1	0	18.33	18.21	18.28
		1	37	18.32	18.35	18.39
		1	74	18.30	18.35	18.36
		36	0	18.28	18.30	18.31
		36	20	18.38	18.31	18.36
		36	39	18.36	18.37	**18.41**
		75	0	18.31	18.29	18.32
	16QAM	1	0	18.52	18.57	18.64
		1	37	18.57	**18.70**	18.67
		1	74	18.50	18.68	18.68
		36	0	18.30	18.33	18.35
		36	20	18.40	18.35	18.35
		36	39	18.38	18.42	18.40
		75	0	18.35	18.31	18.32
	64QAM	1	0	18.53	18.39	18.39
		1	37	**18.57**	18.46	18.46
		1	74	18.45	18.46	18.41
		36	0	18.18	18.21	18.22
		36	20	18.28	18.22	18.25
		36	39	18.25	18.30	18.32
		75	0	18.26	18.21	18.22

OUTPUT POWER FOR LTE BAND 2 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				18700	18900	19100
				1860 MHz	1880 MHz	1900 MHz
20.0	QPSK	1	0	18.31	18.22	18.33
		1	49	18.31	18.36	18.38
		1	99	18.34	18.37	18.36
		50	0	18.29	18.31	18.42
		50	24	18.40	18.33	**18.44**
		50	50	18.39	18.39	18.39
		100	0	18.36	18.30	18.41
	16QAM	1	0	18.48	18.67	18.66
		1	49	18.59	18.78	18.69
		1	99	18.53	**18.80**	18.64
		50	0	18.30	18.33	18.41
		50	24	18.40	18.33	18.46
		50	50	18.36	18.39	18.40
		100	0	18.36	18.31	18.40
	64QAM	1	0	18.43	18.43	18.47
		1	49	18.48	**18.50**	18.49
		1	99	18.36	18.48	18.46
		50	0	18.10	18.14	18.23
		50	24	18.22	18.18	18.29
		50	50	18.20	18.22	18.22
		100	0	18.18	18.16	18.27

8.2.2. LTE BAND 4

Test Engineer ID:	104412//21193	Test Date:	03-25-24	Sample SN:	QV7700QFLQ

OUTPUT POWER FOR LTE BAND 4 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				19957	20175	20393
				1710.7 MHz	1732.5 MHz	1754.3 MHz
1.4	QPSK	1	0	20.37	20.27	20.31
		1	3	20.39	20.34	20.31
		1	5	20.39	**20.43**	20.39
		3	0	20.29	20.30	20.31
		3	1	20.32	20.33	20.33
		3	3	20.36	20.35	20.36
		6	0	20.34	20.38	20.35
	16QAM	1	0	20.38	20.43	20.48
		1	3	20.52	20.55	20.52
		1	5	**20.61**	20.58	**20.61**
		3	0	20.44	20.45	20.44
		3	1	20.46	20.48	20.48
		3	3	20.50	20.52	20.45
		6	0	20.30	20.44	20.42
	64QAM	1	0	20.38	20.72	20.73
		1	3	20.76	20.75	20.72
		1	5	20.84	20.78	**20.85**
		3	0	20.55	20.60	20.53
		3	1	20.61	20.63	20.60
		3	3	20.61	20.60	20.57
		6	0	20.48	20.52	20.52

OUTPUT POWER FOR LTE BAND 4 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				19965	20175	20385
				1711.5 MHz	1732.5 MHz	1753.5 MHz
3.0	QPSK	1	0	20.30	20.28	20.43
		1	7	20.35	20.52	**20.65**
		1	14	20.26	20.34	20.44
		8	0	20.36	20.43	20.42
		8	4	20.36	20.45	20.45
		8	7	20.37	20.41	20.45
		15	0	20.39	20.44	20.43
	16QAM	1	0	20.42	20.50	20.59
		1	7	20.62	20.58	**20.81**
		1	14	20.42	20.47	20.62
		8	0	20.40	20.46	20.54
		8	4	20.42	20.49	20.55
		8	7	20.43	20.48	20.57
		15	0	20.41	20.45	20.48
	64QAM	1	0	20.61	20.61	20.62
		1	7	20.74	20.73	**20.80**
		1	14	20.62	20.62	20.64
		8	0	20.41	20.52	20.53
		8	4	20.44	20.54	20.53
		8	7	20.43	20.50	20.56
		15	0	20.42	20.47	20.54

OUTPUT POWER FOR LTE BAND 4 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				19975	20175	20375
				1712.5 MHz	1732.5 MHz	1752.5 MHz
5.0	QPSK	1	0	20.39	20.39	20.49
		1	12	20.39	20.48	20.50
		1	24	20.38	20.41	20.50
		12	0	20.33	20.37	20.46
		12	6	20.41	20.48	20.49
		12	11	20.36	20.46	**20.54**
		25	0	20.35	20.40	20.51
	16QAM	1	0	20.36	20.39	20.50
		1	12	20.50	20.50	**20.57**
		1	24	20.56	20.54	20.55
		12	0	20.37	20.34	20.42
		12	6	20.43	20.44	20.43
		12	11	20.40	20.44	20.47
		25	0	20.35	20.33	20.37
	64QAM	1	0	20.43	20.70	20.73
		1	12	20.76	20.82	20.79
		1	24	20.81	20.81	**20.84**
		12	0	20.46	20.44	20.47
		12	6	20.47	20.47	20.49
		12	11	20.43	20.43	20.46
		25	0	20.37	20.37	20.38

OUTPUT POWER FOR LTE BAND 4 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				20000	20175	20350
				1715 MHz	1732.5 MHz	1750 MHz
10.0	QPSK	1	0	20.36	20.27	20.32
		1	24	**20.38**	20.37	20.36
		1	49	20.33	20.30	20.34
		25	0	20.34	20.33	20.32
		25	12	20.34	20.33	20.35
		25	24	20.33	20.31	20.33
		50	0	20.33	20.32	20.34
	16QAM	1	0	20.47	20.47	20.56
		1	24	20.48	20.57	**20.64**
		1	49	20.39	20.43	20.56
		25	0	20.36	20.35	20.40
		25	12	20.40	20.46	20.52
		25	24	20.42	20.45	20.51
		50	0	20.39	20.42	20.51
	64QAM	1	0	20.54	20.65	20.57
		1	24	20.68	**20.71**	20.70
		1	49	20.58	20.61	20.62
		25	0	20.39	20.39	20.45
		25	12	20.43	20.50	20.56
		25	24	20.42	20.47	20.54
		50	0	20.44	20.46	20.51

OUTPUT POWER FOR LTE BAND 4 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				20025	20175	20325
				1717.5 MHz	1732.5 MHz	1747.5 MHz
15.0	QPSK	1	0	20.33	20.33	20.41
		1	37	20.31	20.36	20.42
		1	74	20.28	20.27	20.42
		36	0	20.28	20.30	20.36
		36	16	20.38	20.38	20.36
		36	35	20.36	20.37	**20.45**
		75	0	20.32	20.34	20.33
	16QAM	1	0	20.35	20.46	20.44
		1	37	20.50	20.47	20.48
		1	74	20.56	20.52	**20.58**
		36	0	20.35	20.36	20.37
		36	16	20.37	20.32	20.32
		36	35	20.42	20.41	20.41
		75	0	20.30	20.34	20.32
	64QAM	1	0	20.36	20.70	20.67
		1	37	**20.74**	20.70	20.71
		1	74	20.73	**20.74**	**20.74**
		36	0	20.38	20.37	20.38
		36	16	20.35	20.36	20.34
		36	35	20.42	20.43	20.41
		75	0	20.35	20.33	20.35

OUTPUT POWER FOR LTE BAND 4 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				20050	20175	20300
				1720 MHz	1732.5 MHz	1745 MHz
20.0	QPSK	1	0	20.31	20.29	20.34
		1	49	20.31	20.31	20.38
		1	99	20.28	20.25	20.32
		50	0	20.34	20.33	20.35
		50	24	20.40	20.40	**20.45**
		50	49	20.36	20.37	20.43
		100	0	20.36	20.35	20.40
	16QAM	1	0	20.46	20.42	20.40
		1	49	**20.50**	20.45	20.46
		1	99	20.46	20.42	20.39
		50	0	20.39	20.34	20.37
		50	24	20.42	20.43	20.46
		50	49	20.39	20.39	20.43
		100	0	20.36	20.38	20.44
	64QAM	1	0	20.50	20.68	20.60
		1	49	20.53	**20.78**	20.71
		1	99	20.58	20.66	20.64
		50	0	20.40	20.37	20.38
		50	24	20.41	20.44	20.48
		50	49	20.40	20.37	20.47
		100	0	20.39	20.42	20.46

9. CONDUCTED TEST RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only.

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

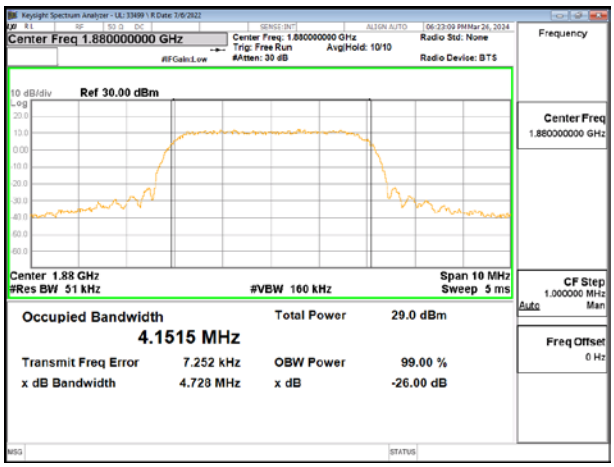
RESULTS

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

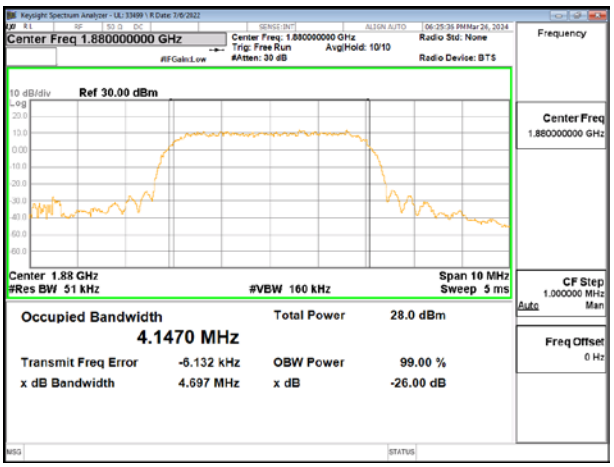
9.1.1. WCDMA

Test Engineer ID:	33499/84740	Test Date:	2024-03-26	EUT Serial Number:	QV7700QFLQ

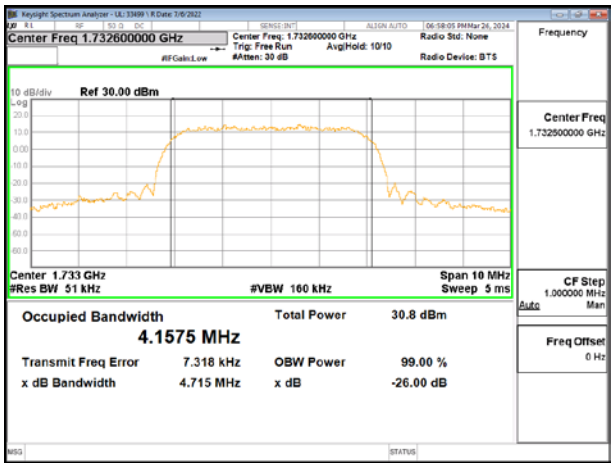
Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND2	REL 99	9800	1880.0	4.1515	4.728
	HSDPA			4.1470	4.697
BAND4	REL 99	1638	1732.6	4.1575	4.715
	HSDPA			4.1481	4.696



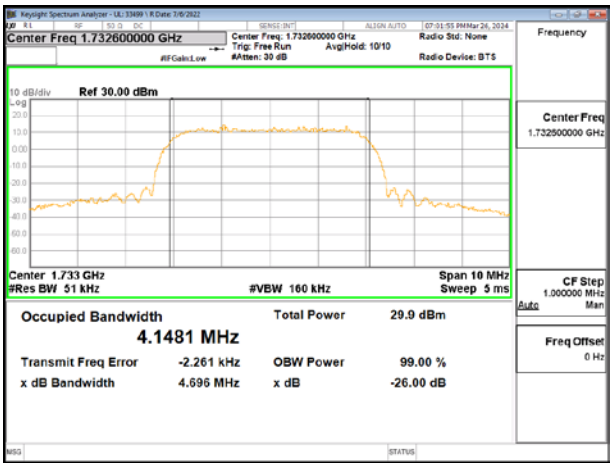
BAND 2 Rel 99 MID Channel



BAND 2 HSDPA MID Channel



BAND 4 Rel 99 MID Channel

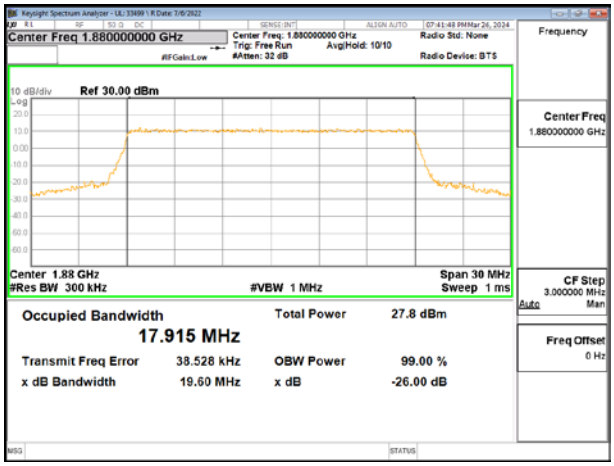


BAND 4 HSDPA MID Channel

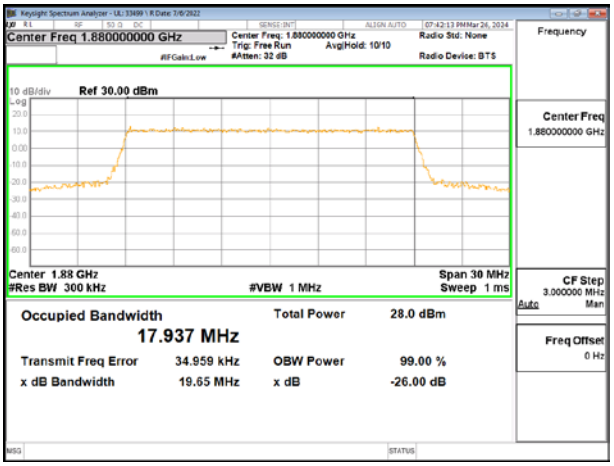
9.1.2. LTE2

Test Engineer ID:	33499/84840	Test Date:	2024-03-26	EUT Serial Number:	QV7700QFLQ

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4MHz, QPSK	6/0	1880.0	1.0905	1.353
	1.4MHz,16QAM			1.0976	1.444
	3MHz, QPSK	15/0		2.7037	3.051
	3MHz, 16QAM			2.7055	3.041
	5MHz, QPSK	25/0		4.5016	5.069
	5MHz, 16QAM			4.4939	5.173
	10MHz, QPSK	50/0		8.9858	10.03
	10MHz, 16QAM			8.9906	9.939
	15MHz, QPSK	75/0		13.46	14.98
	15MHz, 16QAM			13.469	14.83
	20MHz, QPSK	100/0		17.915	19.60
	20MHz, 16QAM			17.937	19.65



LTE2 20MHz QPSK MID Ch RB100-0

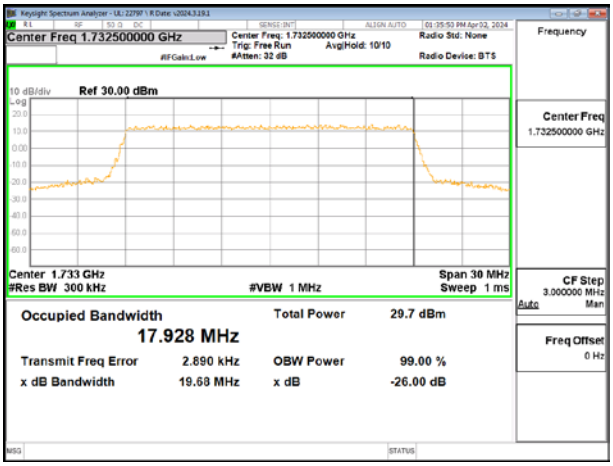


LTE2 20MHz 16QAM MID Ch RB100-0

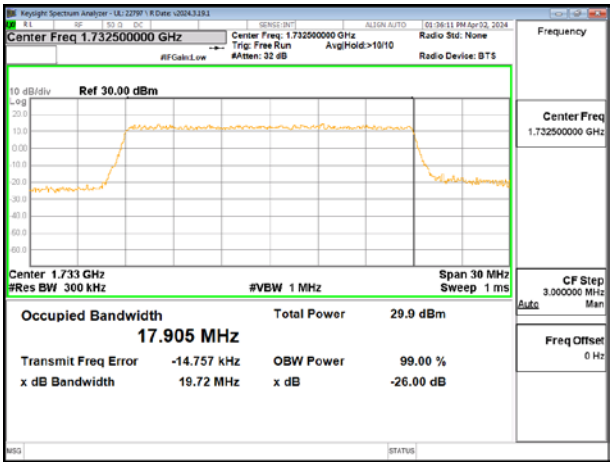
9.1.3. LTE4

Test Engineer ID:	22797/85502	Test Date:	2024-04-02	EUT Serial Number:	QV7700R9LQ

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 4	1.4MHz, QPSK	6/0	1745.0	1.0905	1.349
	1.4MHz, 64QAM			1.0872	1.312
	3MHz, QPSK	15/0		2.6977	3.044
	3MHz, 64QAM			2.7123	3.044
	5MHz, QPSK	25/0		4.4947	5.120
	5MHz, 64QAM			4.5047	5.121
	10MHz, QPSK	50/0		8.9819	10.06
	10MHz, 64QAM			8.9722	10.13
	15MHz, QPSK	75/0		13.493	14.83
	15MHz, 64QAM			13.455	14.87
	20MHz, QPSK	100/0		17.928	19.68
	20MHz, 64QAM			17.905	19.72



LTE4 20MHz QPSK MID Ch RB100-0



LTE4 20MHz 64QAM MID Ch RB100-0

9.2. OUT OF BAND EMISSIONS

LIMITS - BAND 2

FCC: §24.238
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts

LIMITS – BAND 4

FCC: §27.53 (m),
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

TEST PROCEDURE

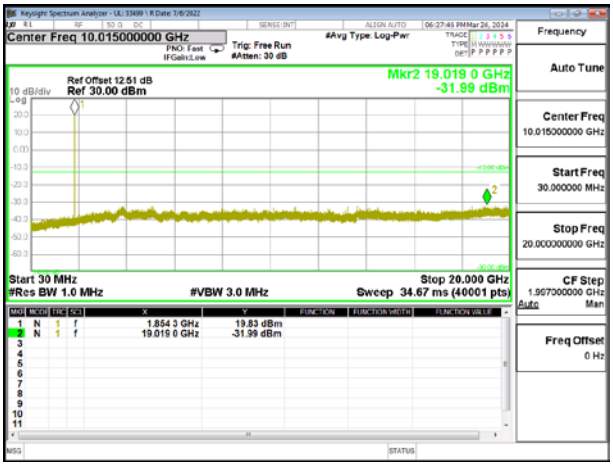
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case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

(i) Set display line at -13 dBm, according to the band Limit
(ii) Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

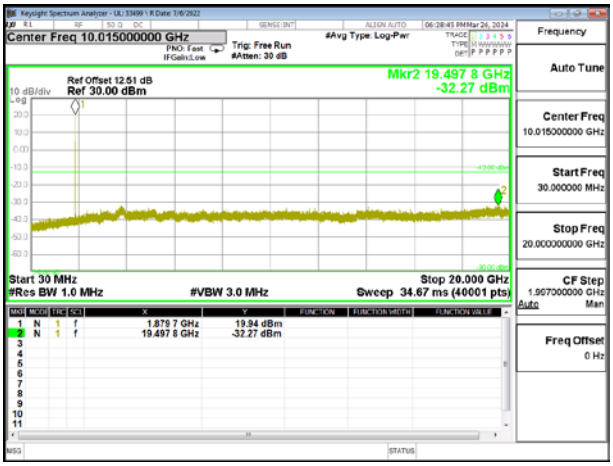
RESULTS

9.2.1. WCDMA BAND 2

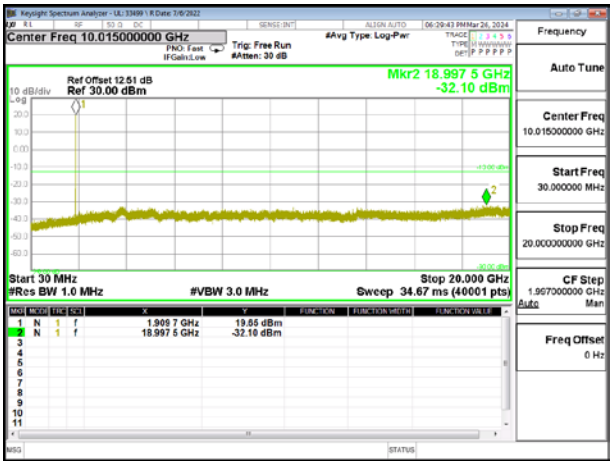
Test Engineer ID:	33499/84740	Test Date:	2024-03-26	EUT Serial Number:	QV7700QFLQ



BAND 2 Rel 99 LOW Channel



BAND 2 Rel 99 MID Channel



BAND 2 Rel 99 HIGH Channel

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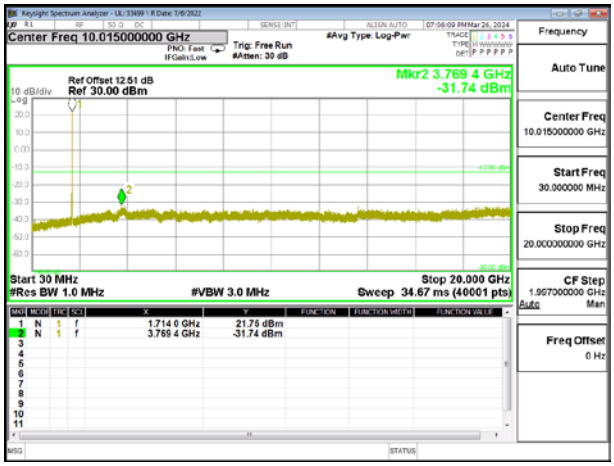
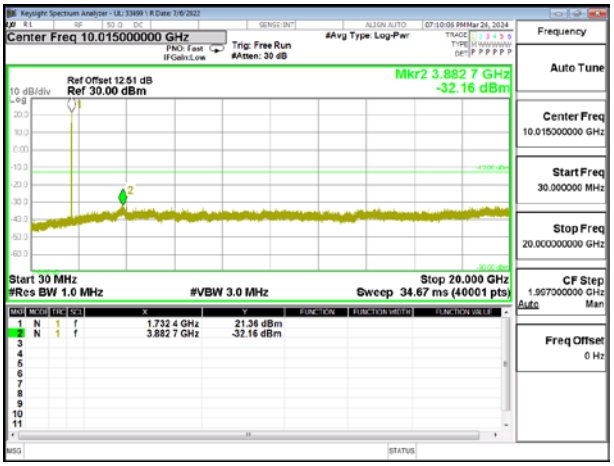
9.2.2. WCDMA BAND 4

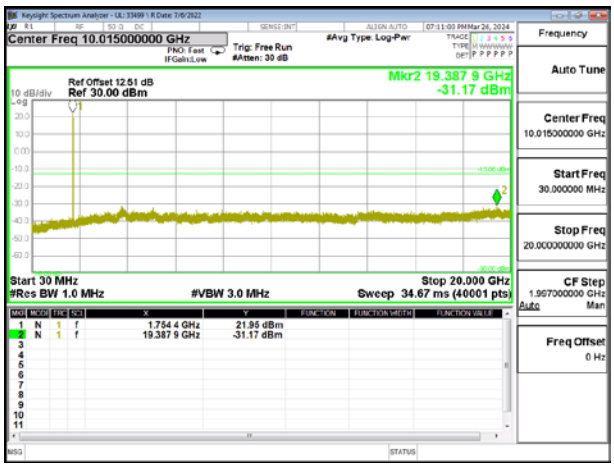
Test Engineer ID:	33499/84740	Test Date:	2024-03-26	EUT Serial Number:	QV7700QFLQ



BAND 4 Rel 99 LOW Channel



BAND 4 Rel 99 MID Channel



BAND 4 Rel 99 HIGH Channel

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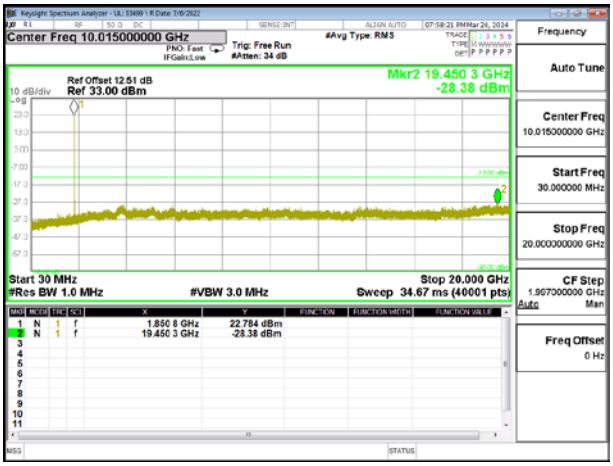
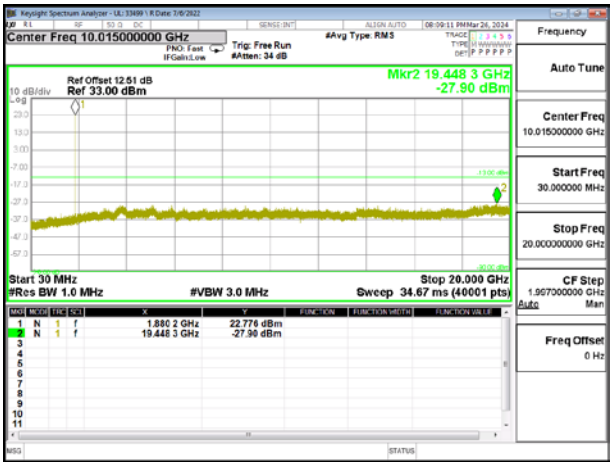
9.2.3. LTE2

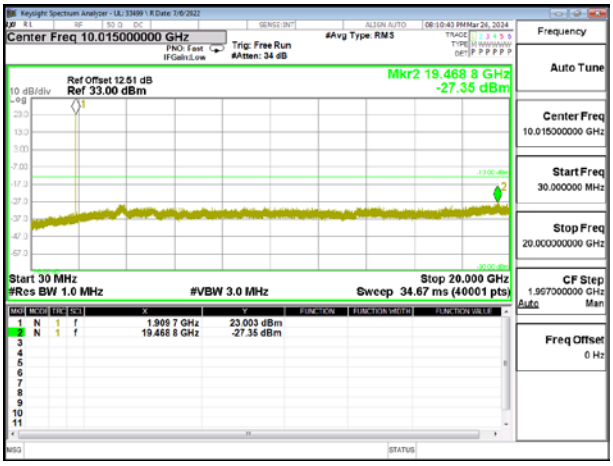
Test Engineer ID:	33499/84840	Test Date:	2024-03-26	EUT Serial Number:	QV7700QFLQ



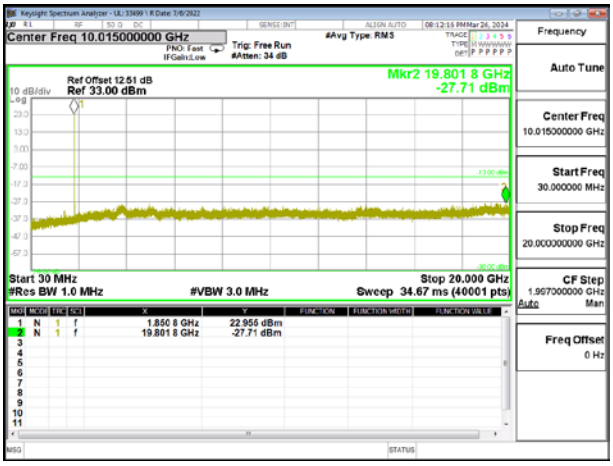
LTE2 1.4MHz 16QAM LOW Ch RB1-0



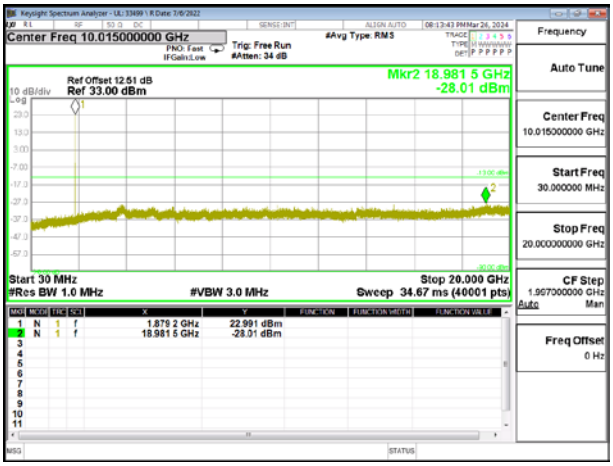
LTE2 1.4MHz 16QAM MID Ch RB1-0



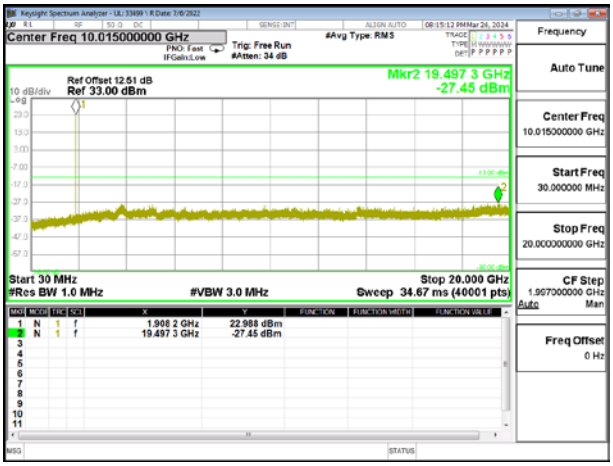
LTE2 1.4MHz 16QAM HIGH Ch RB1-0



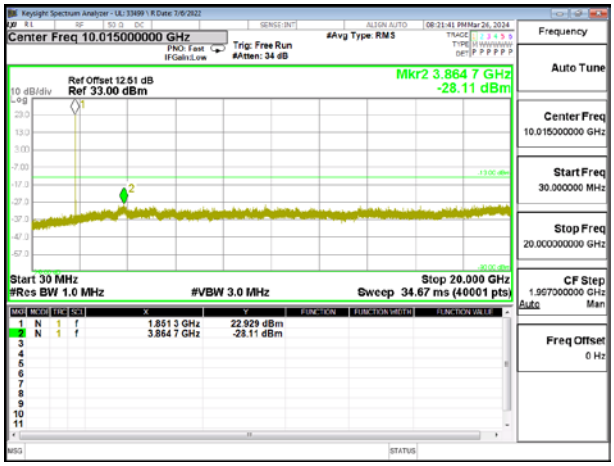
LTE2 3MHz 16QAM LOW Ch RB1-0



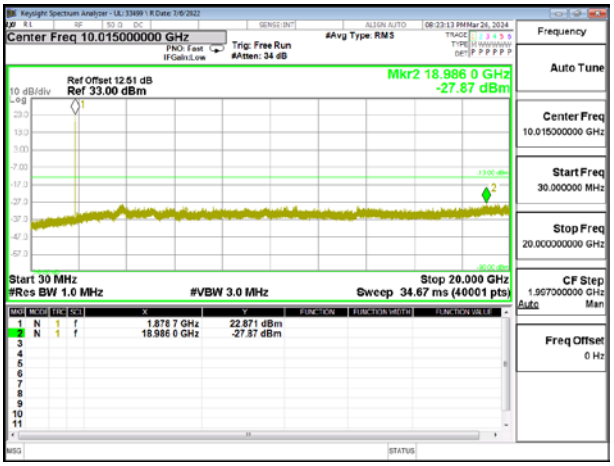
LTE2 3MHz 16QAM MID Ch RB1-0



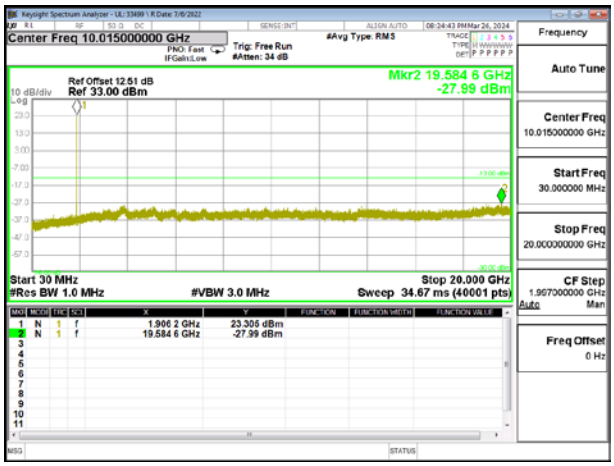
LTE2 3MHz 16QAM HIGH Ch RB1-0



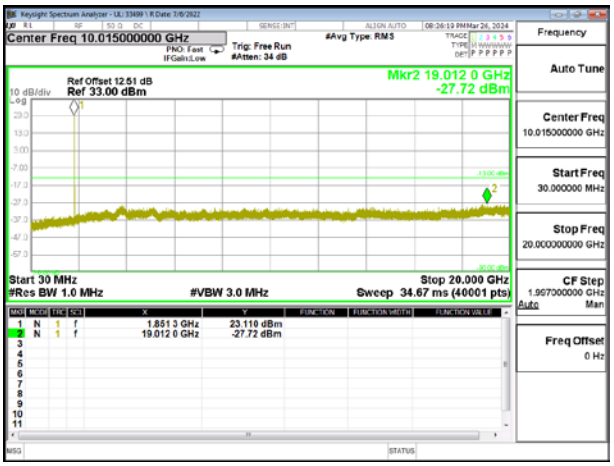
LTE2 5MHz 16QAM LOW Ch RB1-0



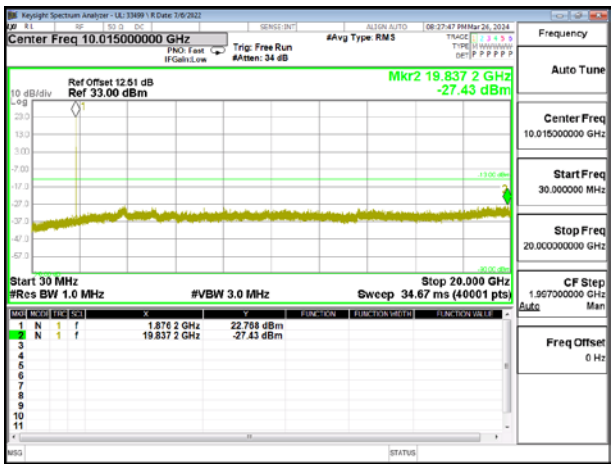
LTE2 5MHz 16QAM MID Ch RB1-0



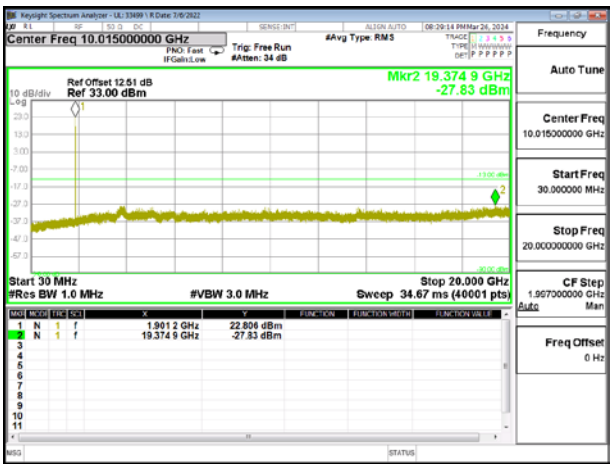
LTE2 5MHz 16QAM HIGH Ch RB1-0



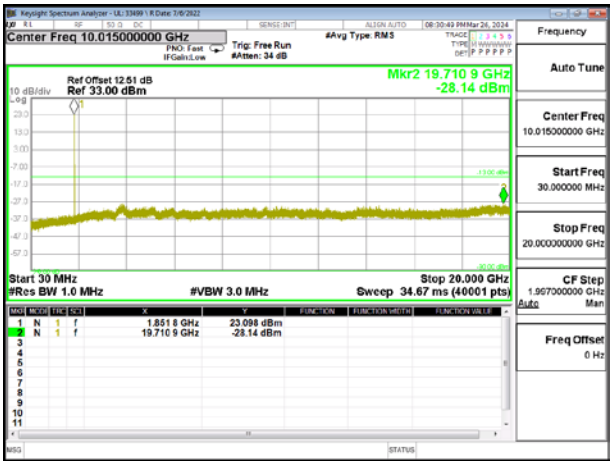
LTE2 10MHz 16QAM LOW Ch RB1-0



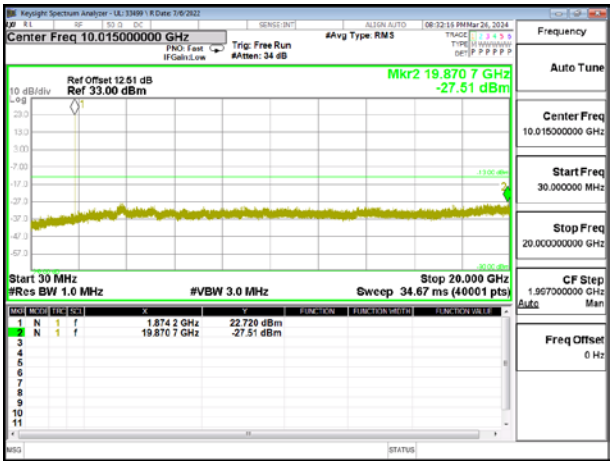
LTE2 10MHz 16QAM MID Ch RB1-0



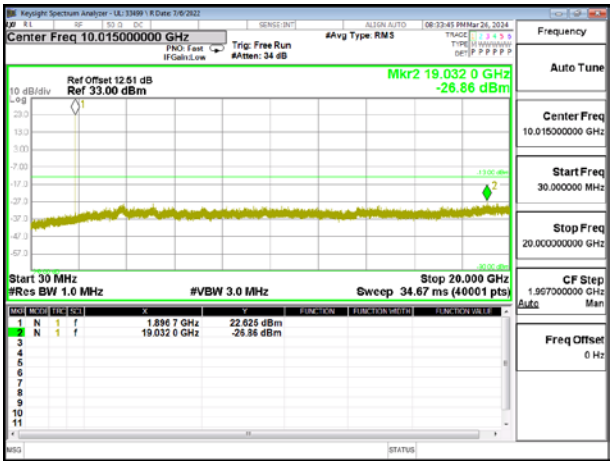
LTE2 10MHz 16QAM HIGH Ch RB1-0



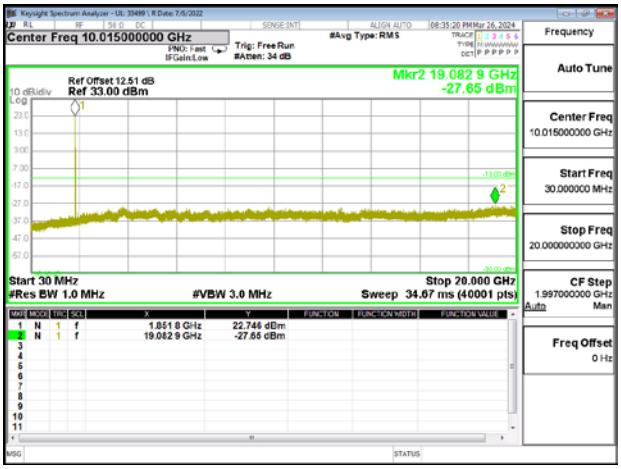
LTE2 15MHz 16QAM LOW Ch RB1-0



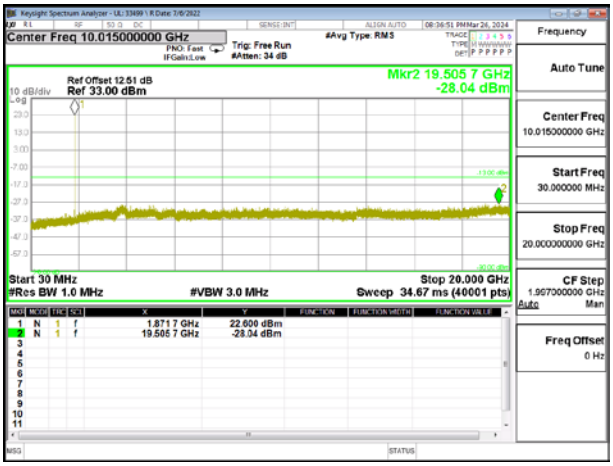
LTE2 15MHz 16QAM MID Ch RB1-0



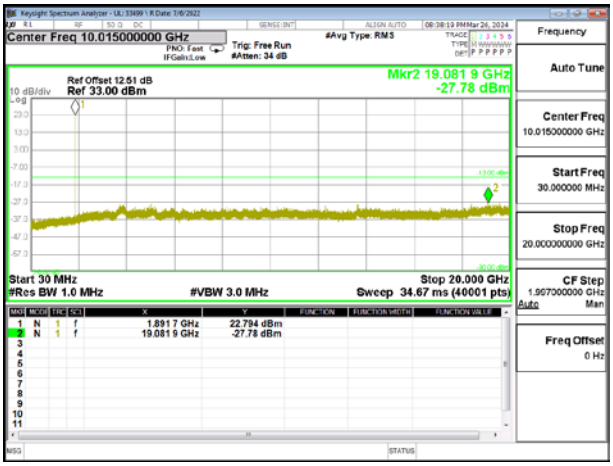
LTE2 15MHz 16QAM HIGH Ch RB1-0



LTE2 20MHz 16QAM LOW Ch RB1-0



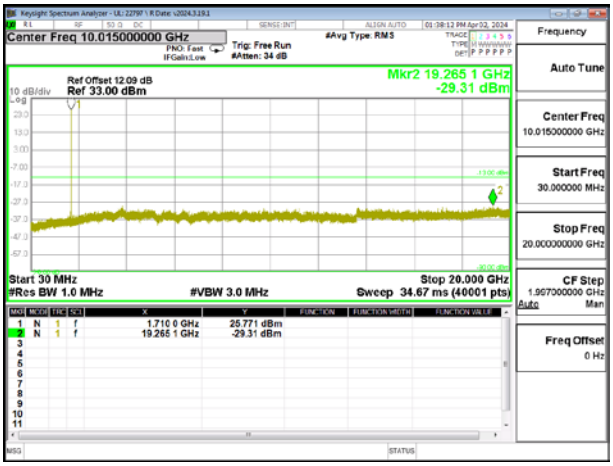
LTE2 20MHz 16QAM MID Ch RB1-0



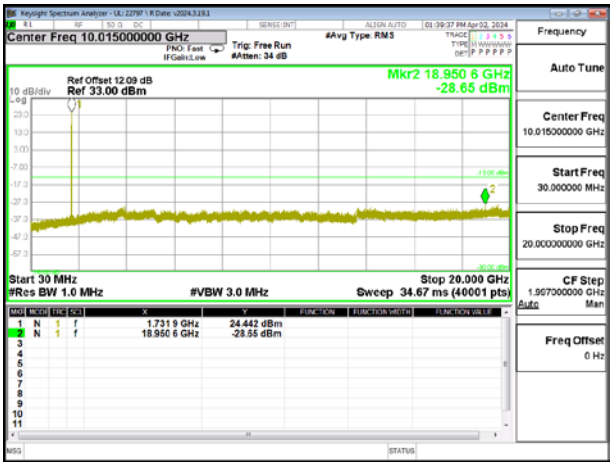
LTE2 20MHz 16QAM HIGH Ch RB1-0

9.2.4. LTE4

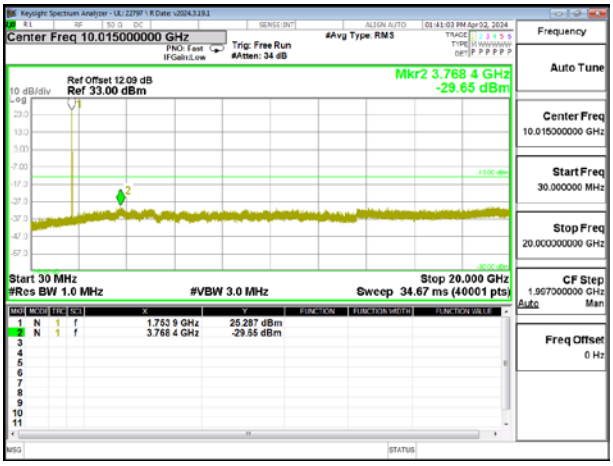
Test Engineer ID:	22797/85502	Test Date:	2024-04-02	EUT Serial Number:	QV7700R9LQ



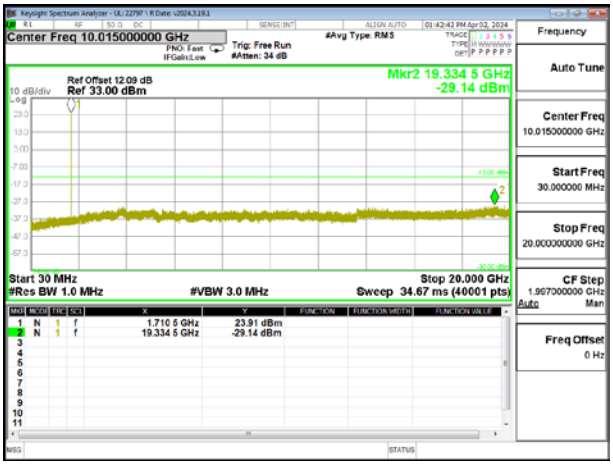
LTE4 1.4MHz 64QAM LOW Ch RB1-0



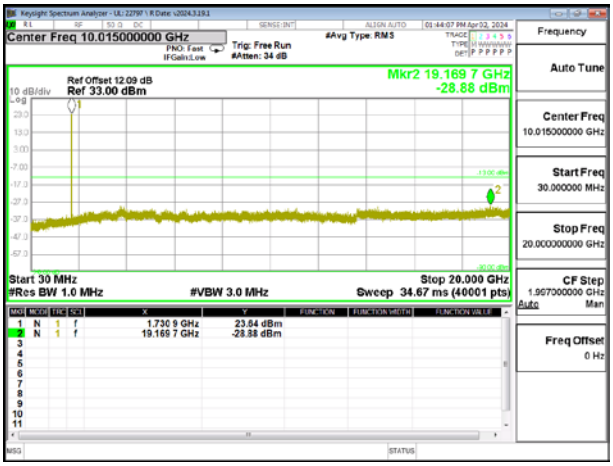
LTE4 1.4MHz 64QAM MID Ch RB1-0



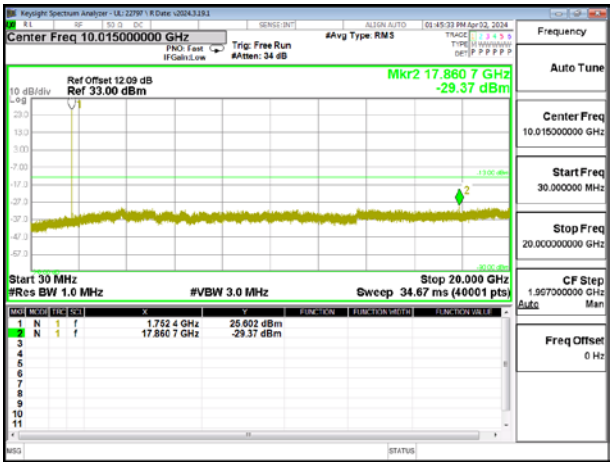
LTE4 1.4MHz 64QAM HIGH Ch RB1-0



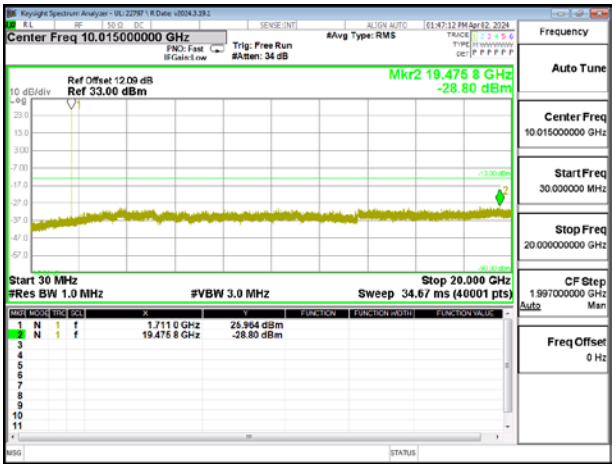
LTE4 3MHz 64QAM LOW Ch RB1-0



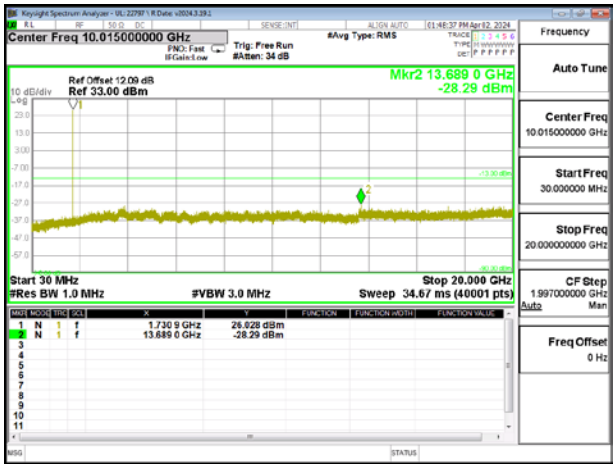
LTE4 3MHz 64QAM MID Ch RB1-0



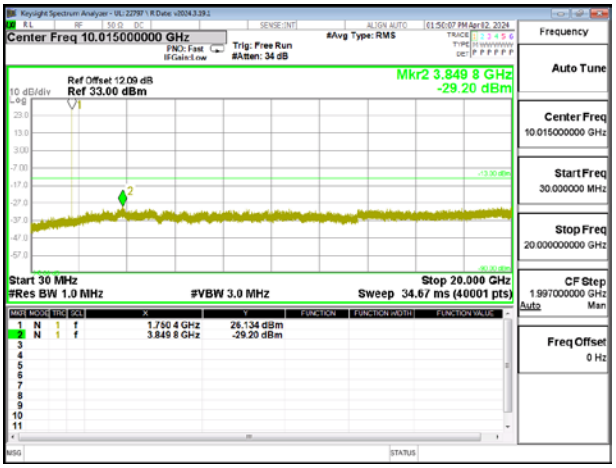
LTE4 3MHz 64QAM HIGH Ch RB1-0



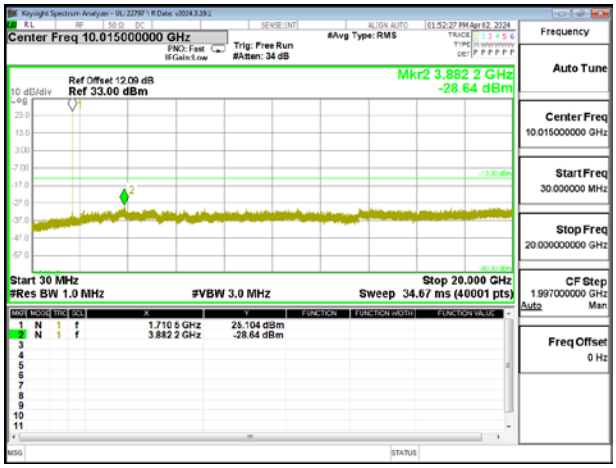
LTE4 5MHz 64QAM LOW Ch RB1-0



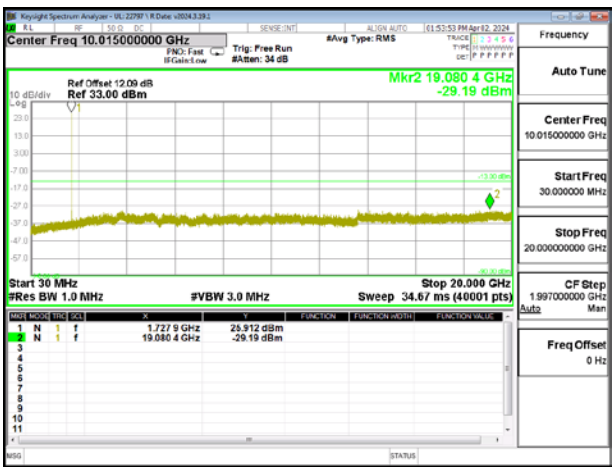
LTE4 5MHz 64QAM MID Ch RB1-0



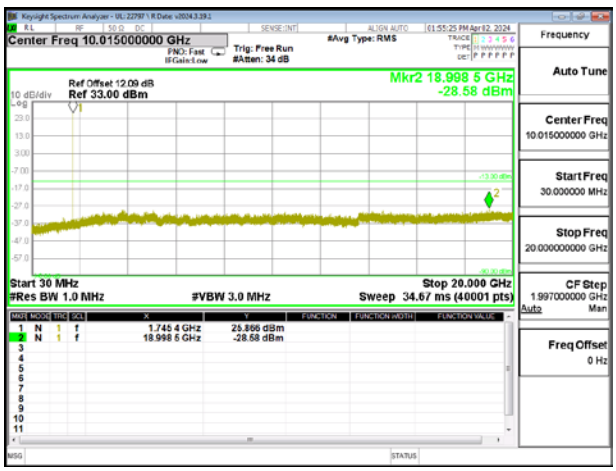
LTE4 5MHz 64QAM HIGH Ch RB1-0



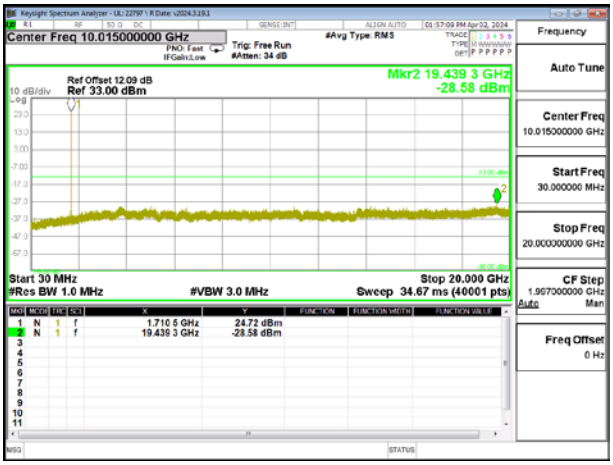
LTE4 10MHz 64QAM LOW Ch RB1-0



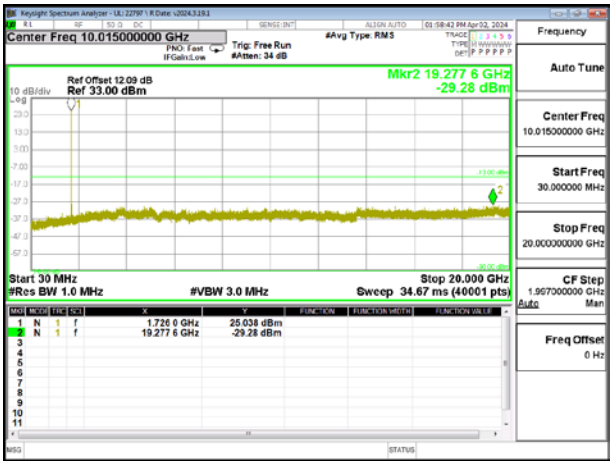
LTE4 10MHz 64QAM MID Ch RB1-0



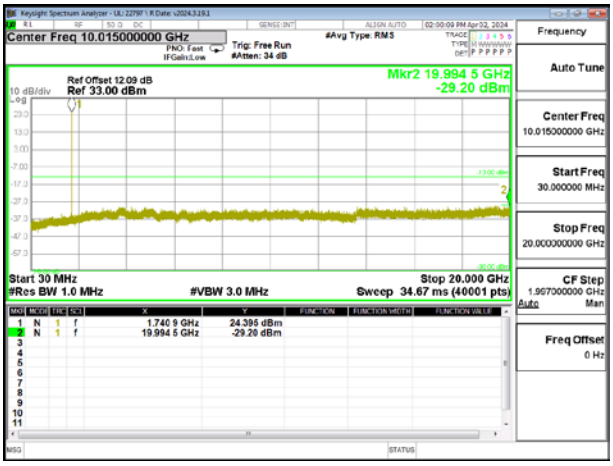
LTE4 10MHz 64QAM HIGH Ch RB1-0



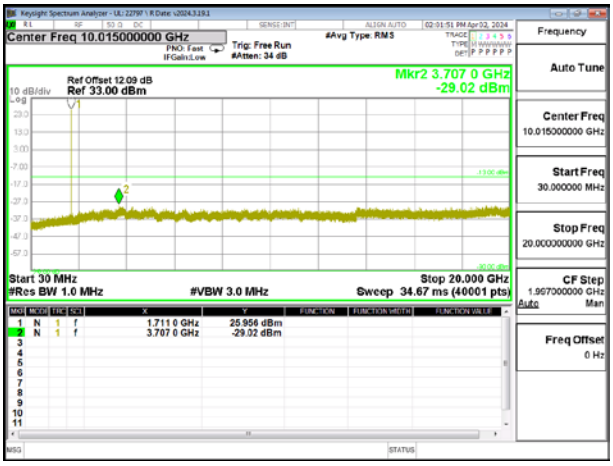
LTE4 15MHz 64QAM LOW Ch RB1-0



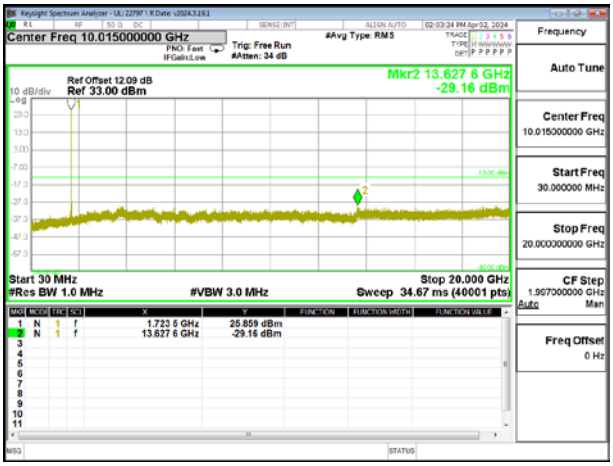
LTE4 15MHz 64QAM MID Ch RB1-0



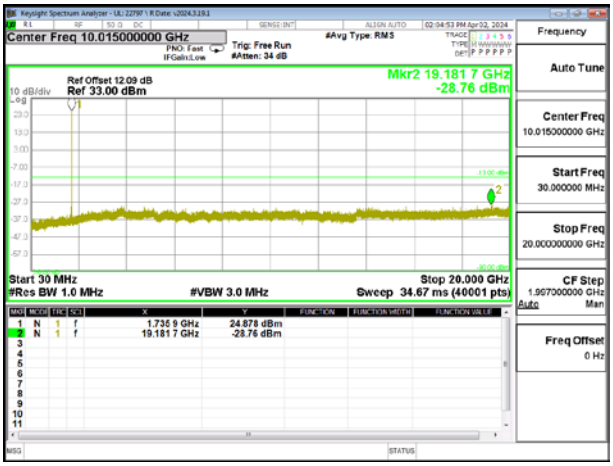
LTE4 15MHz 64QAM HIGH Ch RB1-0



LTE4 20MHz 64QAM LOW Ch RB1-0



LTE4 20MHz 64QAM MID Ch RB1-0



LTE4 20MHz 64QAM HIGH Ch RB1-0

9.3. BAND EDGE AND EMISSION MASK

LIMITS - BAND 2

FCC: §24.238
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts

LIMITS – BAND 4

FCC: §27.53 (m),
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

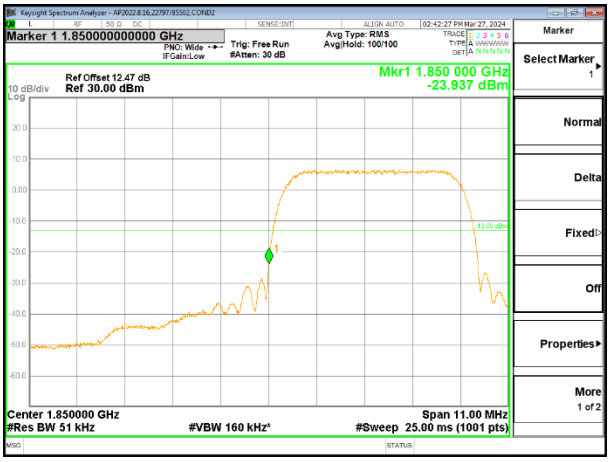
For each band edge measurement:
(i) Set the spectrum analyzer span to include the block edge frequency.
(ii) Set a marker to point the corresponding band edge frequency in each test case.
(iii) Set display line at -13 dBm
(iv) Set resolution bandwidth to at least 1% of emission bandwidth.

RESULTS

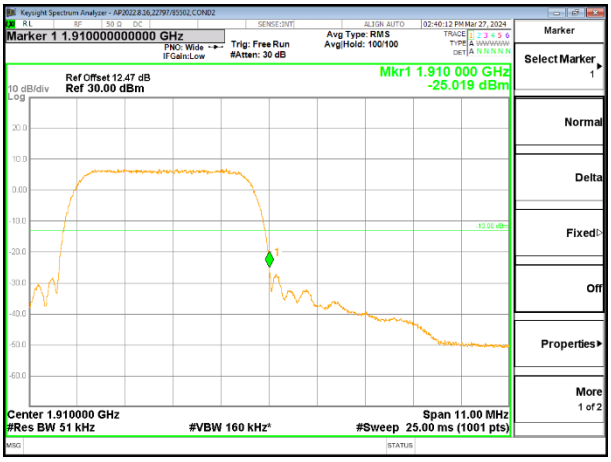
9.3.1. WCDMA BAND 2

LIMITS

Test Engineer ID:	22797/85502	Test Date:	2024-03-27	EUT Serial Number:	QV7700QFLQ



BAND 2 Rel 99 LOW Channel

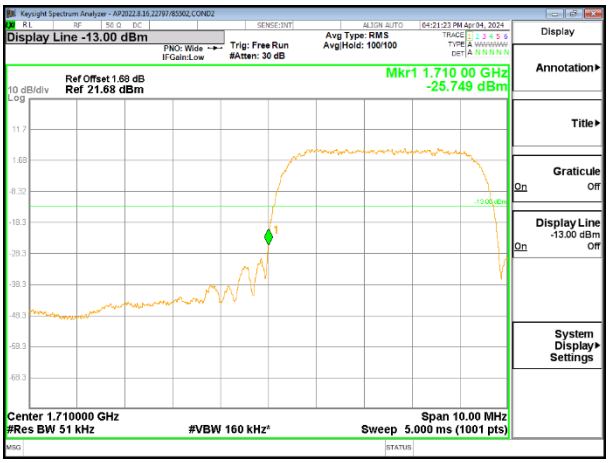


BAND 2 Rel 99 HIGH Channel

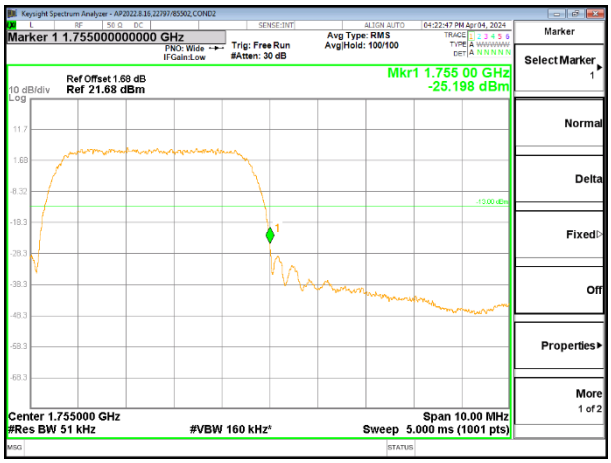
9.3.2. WCDMA BAND 4

LIMITS

Test Engineer ID:	22797/85502	Test Date:	2024-04-04	EUT Serial Number:	QV7700QFLQ



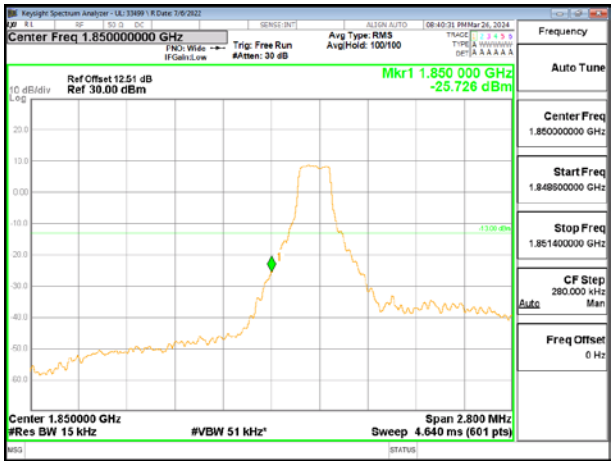
BAND 4 Rel 99 LOW Channel



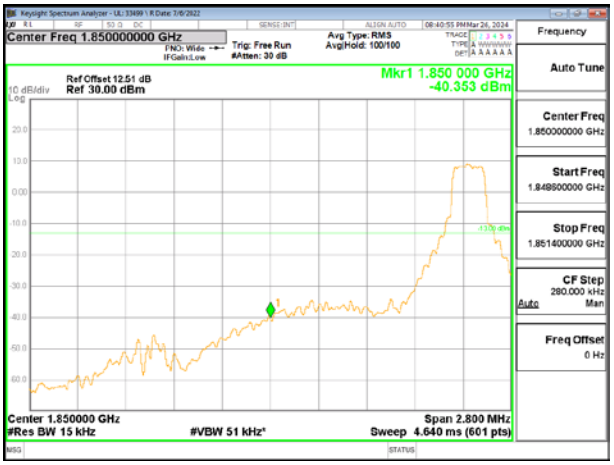
BAND 4 Rel 99 HIGH Channel

9.3.3. LTE2

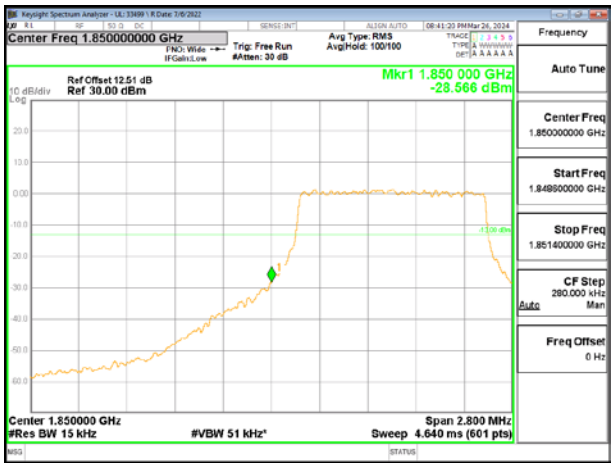
Test Engineer ID:	33499/84740	Test Date:	2024-03-26	EUT Serial Number:	QV7700QFLQ



LTE2 1.4MHz 16QAM LOW Ch RB1-0

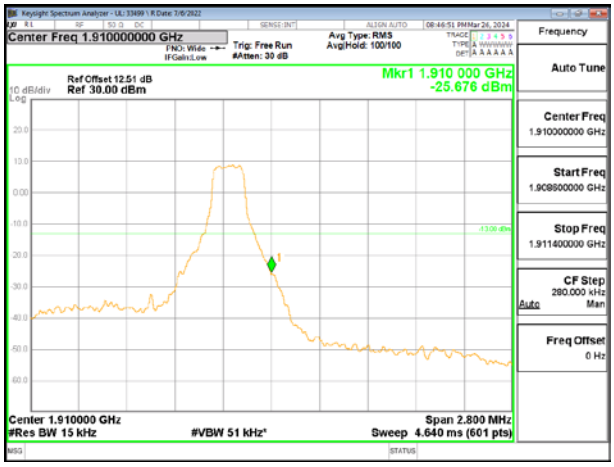


LTE2 1.4MHz 16QAM LOW Ch RB1-5

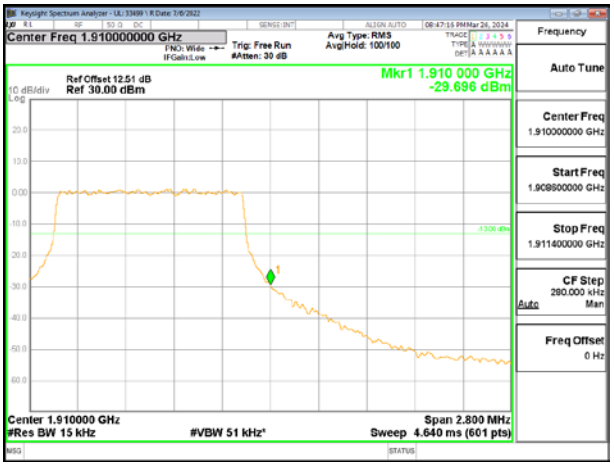


LTE2 1.4MHz 16QAM LOW Ch RB6-0

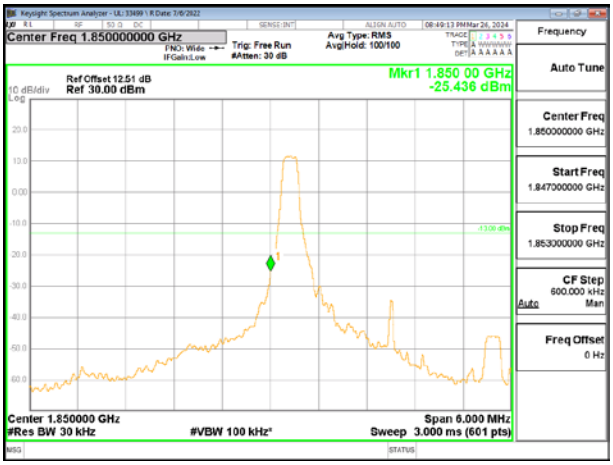
LTE2 1.4MHz 16QAM HIGH Ch RB1-0



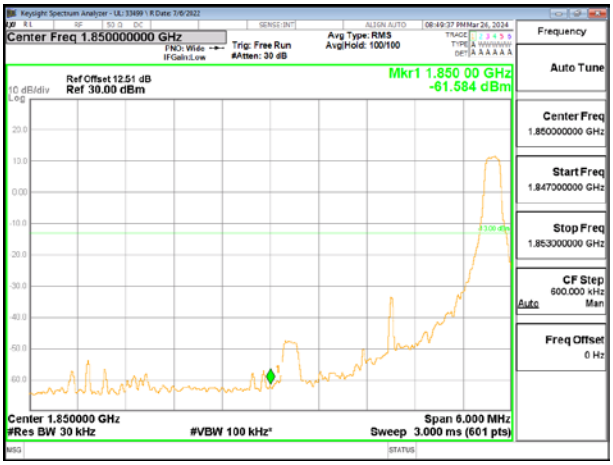
LTE2 1.4MHz 16QAM HIGH Ch RB1-5



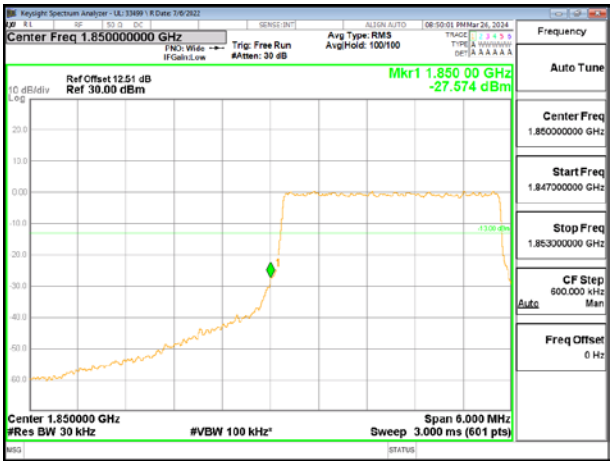
LTE2 1.4MHz 16QAM HIGH Ch RB6-0



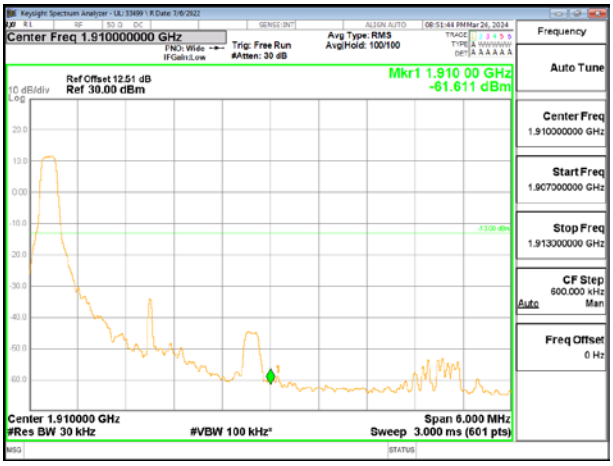
LTE2 3MHz 16QAM LOW Ch RB1-0



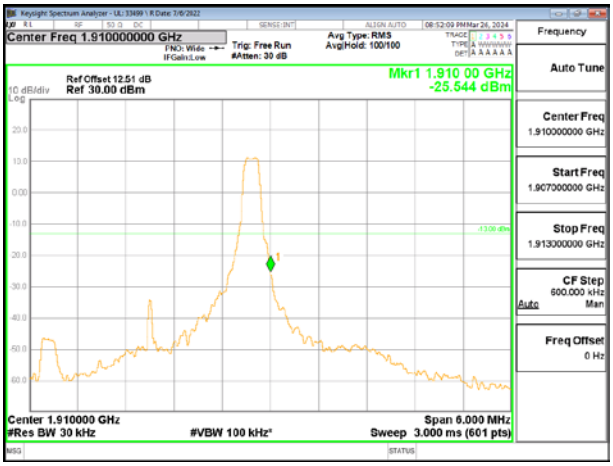
LTE2 3MHz 16QAM LOW Ch RB1-14



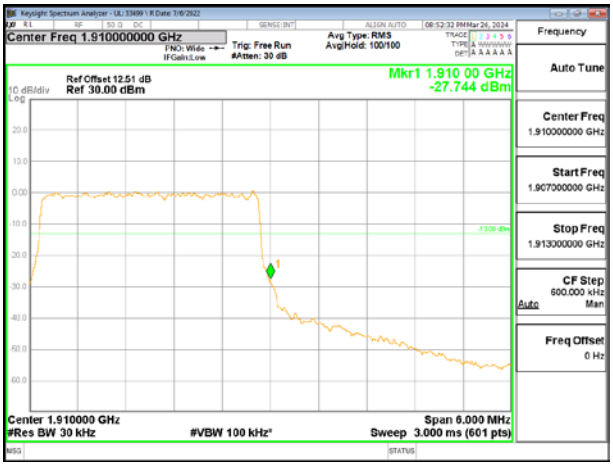
LTE2 3MHz 16QAM LOW Ch RB15-0



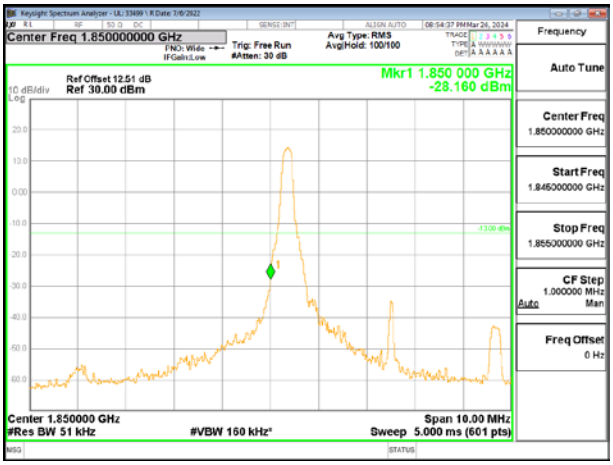
LTE2 3MHz 16QAM HIGH Ch RB1-0



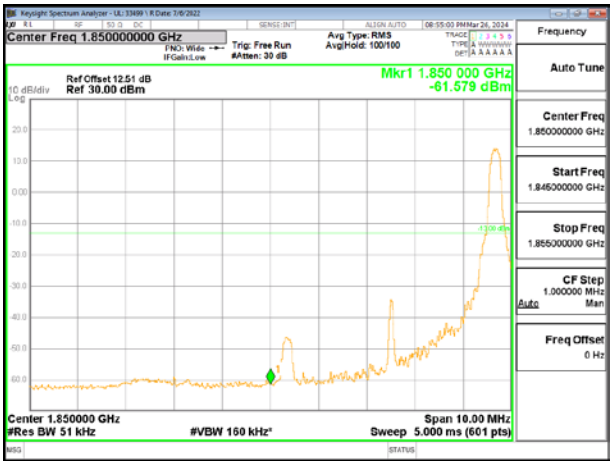
LTE2 3MHz 16QAM HIGH Ch RB1-14



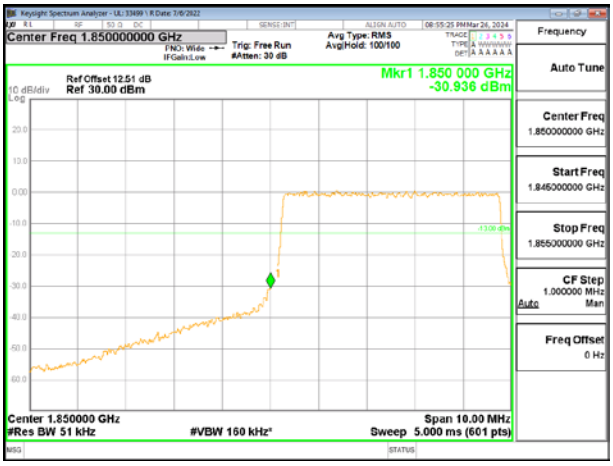
LTE2 3MHz 16QAM HIGH Ch RB15-0



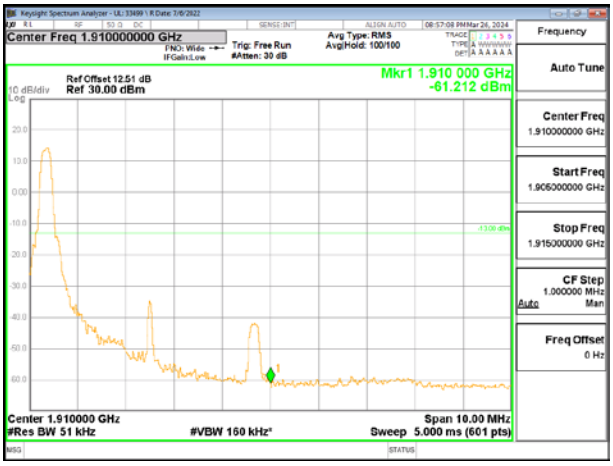
LTE2 5MHz 16QAM LOW Ch RB1-0



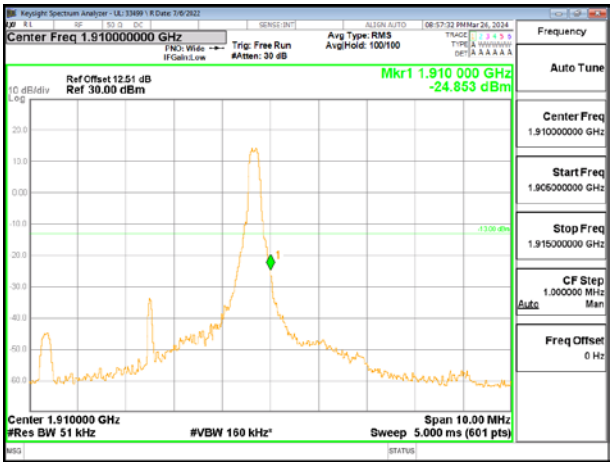
LTE2 5MHz 16QAM LOW Ch RB1-24



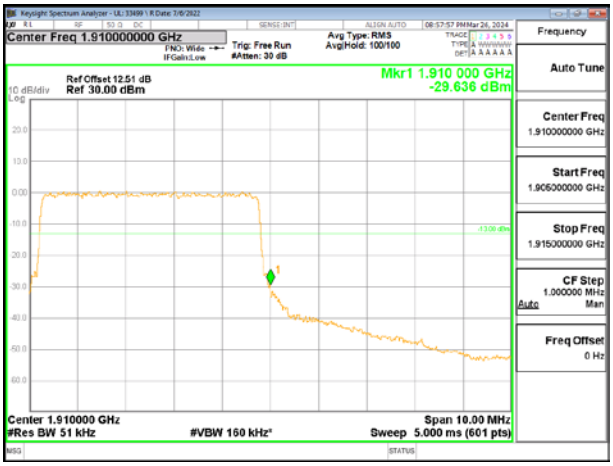
LTE2 5MHz 16QAM LOW Ch RB25-0



LTE2 5MHz 16QAM HIGH Ch RB1-0



LTE2 5MHz 16QAM HIGH Ch RB1-24



LTE2 5MHz 16QAM HIGH Ch RB25-0