TEST REPORT

Report Number. : R14639481-E2

Applicant	:	Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0075, Japan
FCC ID	:	PY7-83376C
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:
2023-03-23

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CERT #0751.06

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-03-13	Initial Review	Noah Bennett
V2	2023-03-20	TCB Feedback	Noah Bennett
V3	2023-03-23	TCB Feedback Round 2	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: QV7700ADFR,QV7700GGFR, QV7700C9FR, QV770017FA, QV7700HUFR

SAMPLE RECEIPT DATE: 2022-12-28, 2023-02-06 2023-02-09

DATE TESTED: 2023-02-24 to 2023-03-20

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
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2. SUMMARY OF TEST RESULTS

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

1) Antenna gain and type (see section 6.4)
2) Cable loss (see section 6.2,8,9)
3) Supported bands and modulations (see section 6.5)

Requirement Description	Band	Requirement Clause Number (FCC)	Result	Remarks
Effective Radiated Power	GSM850	22.913 (a)(5)	Compliant	None.
	12	27.50 (c) (10)		
Equivalent Isotropic Radiated Power	WCDMA4, LTE4	27.50 (d) (4)		
	GSM1900, WCDMA2, LTE2	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), (h)			
Out of Band Emissions	2.1051, 22.917 (a), 24.238 (a), 27.53 (g), (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),(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
☒	Building 2800 Suite Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

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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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

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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 = 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:

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	32.1	-5.51	7.0	24.44	0.278	242.63	243KGXW
	EGPRS	27.4			19.74	0.094	243.32	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	27.0	-3.46	2.0	23.54	0.226	245.05	245KGXW
	EGPRS	26.3			22.84	0.192	244.83	245KG7W

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	18.80	-3.46	2.0	15.34	0.034	4160	4M16F9W
	HSDPA	17.80			14.34	0.027	4161	4M16F9W
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	17.80	-4.51	1.0	13.29	0.021	4158	4M16F9W
	HSDPA	16.80			12.29	0.017	4161	4M16F9W

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LTE BAND 2

Part 24	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-3.46

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	19.1	15.64	0.037	1090	1M09G7W
	16QAM			19.4	15.94	0.039	1098	1M10D7W
3.0	QPSK	1851.5	1908.5	19.2	15.74	0.037	2706	2M71G7W
	16QAM			19.5	16.04	0.040	2709	2M71D7W
5.0	QPSK	1852.5	1907.5	19.2	15.74	0.037	4507	4M51G7W
	16QAM			19.6	16.14	0.041	4503	4M50D7W
10.0	QPSK	1855.0	1905.0	19.2	15.74	0.037	8986	8M99G7W
	16QAM			19.5	16.04	0.040	8984	8M98D7W
15.0	QPSK	1857.5	1902.5	19.1	15.64	0.037	13470	13M5G7W
	16QAM			19.4	15.94	0.039	13470	13M5D7W
20.0	QPSK	1860.0	1900.0	19.1	15.64	0.037	17920	17M9G7W
	16QAM			19.5	16.04	0.040	17920	17M9D7W

LTE BAND 4

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	1754.3	17.8	13.29	0.021	1093	1M09G7W
	16QAM			18.1	13.59	0.023	1093	1M09D7W
3.0	QPSK	1711.5	1753.5	17.7	13.19	0.021	2700	2M70G7W
	16QAM			18.0	13.49	0.022	2707	2M71D7W
5.0	QPSK	1712.5	1752.5	17.7	13.19	0.021	4495	4M50G7W
	16QAM			18.1	13.59	0.023	4503	4M50D7W
10.0	QPSK	1715.0	1750.0	17.7	13.19	0.021	9010	9M01G7W
	16QAM			18.0	13.49	0.022	8997	9M00D7W
15.0	QPSK	1717.5	1747.5	17.6	13.09	0.020	13490	13M5G7W
	16QAM			18.0	13.49	0.022	13480	13M5D7W
20.0	QPSK	1720.0	1745.0	17.6	13.09	0.020	17940	17M9G7W
	16QAM			17.9	13.39	0.022	17980	18M0D7W

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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	20.70	10.55	0.011	1091	1M09G7W
	16QAM			21.10	10.95	0.012	1098	1M10D7W
3.0	QPSK	700.5	714.5	20.80	10.65	0.012	2707	2M71G7W
	16QAM			21.10	10.95	0.012	2701	2M70D7W
5.0	QPSK	701.5	713.5	20.80	10.65	0.012	4506	4M51G7W
	16QAM			21.20	11.05	0.013	4505	4M51D7W
10.0	QPSK	704.0	711.0	20.80	10.65	0.012	8972	8M97G7W
	16QAM			21.10	10.95	0.012	8964	8M96D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.79 for conducted samples, and 0.79 for radiated samples.

6.4. MAXIMUM ANTENNA GAIN

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

LTE Bands	Frequency Range (MHz)	Main 1 Antenna Gain (dBi)	Main 2 Antenna Gain (dBi)
GSM850	824 – 849	-5.51	
GSM1900, WCDMA2, LTE2	1850 - 1910		-3.46
LTE Band 12	699 – 716	-8.00	
WCDMA4, LTE Band 4	1710 – 1780		-4.51

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6.5. WORST-CASE CONFIGURATION AND MODE

The EUT supports the following GSM, WCDMA, and LTE bands:
GSM850, GSM1900, WCDMA Band 2, WCDMA Band 4, LTE Band 2, LTE Band 4, LTE Band 12, and LTE Band 17.

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

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, and QPSK, 16QAM, and 64QAM, modulations for LTE. It was found that Rel 99 and HSDPA were worst case for WCDMA, and QPSK and 16QAM were worst case for LTE. Therefore, all testing was done in these modes only.

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	Z
Mid Band (1GHz<Fc<3GHz)		X
BT & 2.4 WLAN (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 2	Rel 99
LTE	Band 12	16QAM

The following scans were investigated for simultaneous transmission:

Mode	Mode	Mode
LTE B4 1745MHz 20MHz RB1-0	2442MHz BT GFSK C0	5240MHz 11ax HE20 26T/0 MIMO
LTE B4 1745MHz 20MHz RB1-0	2442MHz BT GFSK C1	5240MHz 11ax HE20 26T/0 MIMO
LTE B4 1745MHz 20MHz RB1-0	2442MHz 11ax HE20 106T/54 MIMO	
LTE B4 1745MHz 20MHz RB1-0	5240MHz 11ax HE20 26T/0 MIMO	
LTE B12 704MHz 10MHz RB1-0	2462MHz 11ax HE20 106T/54 MIMO	

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6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

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

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	MDR-EX15AP

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

Please see R14639481-EP3 for Setup Diagrams and Setup Photos.

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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 2)

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				
AT0074	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2022-09-07	2023-09-07
	1-18 GHz				
206211	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-03-21	2023-03-21
	Gain-Loss Chains				
91975	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-10	2023-05-10
91978	Gain-loss string: 25-1000MHz	Various	Various	2022-05-10	2023-05-10
91977	Gain-loss string: 1-18GHz	Various	Various	2022-05-10	2023-05-10
	Receiver & Software				
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-03-08	2023-03-31
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
210642	Environmental Meter	Fisher Scientific	15-077-963 s/n 210701942	2021-08-16	2023-08-16
200540	Environmental Meter	Fisher Scientific	15-077-963 s/n 181474409	2022-10-05	2023-10-05
213025	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2022-09-13	2023-09-13
208720	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2022-05-05	2023-05-05
169106 (BRF008)	1710-1785MHz notch filter, 2W, F_{high} = 9GHz	Micro-Tronics	BRM50713-01	2022-02-17	2023-02-28
82635 (HPF009)	1GHz high-pass filter, 2W, F_{high} =10GHz	Micro-Tronics	HPM17672	2022-02-17	2023-02-28
169108 (BRF010)	1.85-1.97GHz notch filter, 2W, F_{high} = 9GHz	Micro-Tronics	BRM50714-01	2022-02-17	2023-02-28

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

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	30-1000 MHz				
90629 (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
	Gain-Loss Chains				
207639	Gain-loss string: 25-1000MHz	Various	Various	2022-05-20	2023-05-20
207640	Gain-loss string: 1-18GHz	Various	Various	2022-05-20	2023-05-20
	Receiver & Software				
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-02-02	2024-02-02
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
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
169108 (BRF010)	1.85-1.97GHz notch filter, 2W, F_{high} = 9GHz	Micro-Tronics	BRM50714-01	2022-02-17	2023-02-28
82635 (HPF009)	1GHz high-pass filter, 2W, F_{high} =10GHz	Micro-Tronics	HPM17672	2023-02-15	2024-02-29
169106 (BRF008)	1710-1785MHz notch filter, 2W, F_{high} = 9GHz	Micro-Tronics	BRM50713-01	2023-02-15	2024-02-29
150716 (LPF008)	DC-1000MHz low-pass filter	Pasternack	PE8720	2023-02-15	2024-02-29
77412 (BRF001)	900MHz notch filter, 2W, F_{high} =6GHz	Micro-Tronics	BRM50706	2023-02-15	2024-02-29

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

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	1-18 GHz				

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Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0072	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2022-05-11	2023-05-11
	Gain-Loss Chains				
91979	Gain-loss string: 1-18GHz	Various	Various	2022-12-02	2023-12-02
	Receiver & Software				
SA0026	PXA Spectrum Analyzer	Keysight	N9030A	2022-08-02	2023-08-02
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
	Additional Equipment used				
200539	Environmental Meter	Fisher Scientific	15-077-963 s/n 18474341	2022-10-05	2023-10-05
213025	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2022-09-13	2023-09-13
77836 (HPF004)	1GHz high-pass filter, 2W, F_{high} =18GHz	Micro-Tronics	HPM50115-01	2023-02-15	2024-02-29
169106 (BRF008)	1710-1785MHz notch filter, 2W, F_{high} = 9GHz	Micro-Tronics	BRM50713-01	2023-02-15	2024-02-29

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Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	Common Equipment				
	Conducted Room 1				
207726	Temp/Humid Chamber	Thermotron	SM-32-8200	2023-01-20	2024-01-20
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
MY162176088	DC Regulated Power Supply	Keysight	E3633A	NA	NA
SA0027	Spectrum Analyzer	Keysight Technologies	N9030A	2022-05-24	2023-05-24
SA0020	Spectrum Analyzer	Keysight Technologies	E4446A	2022-06-08	2023-06-08
212967	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500	2022-12-14	2023-12-14
208721	Wideband Radio Communications Tester	Rohde and Schwartz	CMW500 (SN 170194)	2022-05-05	2023-05-05
PWM001 (PRE0136343)	RF Power Meter	Keysight Technologies	N1912A	2022-08-30	2023-08-30
PWS005	Peak and Avg Power Sensor, 50MHz to 18GHz	Keysight Technologies	N1921A	2022-06-15	2023-06-15
	Additional Equipment used				
MM0166	True RMS Multimeter	Agilent	U1232A	2022-07-12	2023-07-12
	Attenuators				
226559	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
226564	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
226560	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2023-02-16	2024-02-16
	Cables				
CBL012	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB293C-0-2400-300300	2023-01-05	2024-01-05
CBL093	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz	Carlisle Interconnect Technologies	UFA147A-2-0360-200200	2022-08-24	2023-08-24
CBL099	Micro-Coax UTiFLEX Cable Assembly, Low Loss,40Ghz, 39.3", Connectors 2	Carlisle Interconnect Technologies	UFA147A-0-0180-200200	2023-02-17	2024-02-17
CBL105	Micro-Coax UTiFLEX Cable Assembly, Low Loss	Carlisle Interconnect Technologies	UFB-197C-0-0160-300300	2023-02-17	2024-02-17
	Couplers				
CPL001	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2023-02-17	2024-02-17

TEST AND MEASURMENT EQUIPMENT NOTES:

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

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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	

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RESULT

8.1.1. GSM850

Test Engineer ID:	22797/44389	Test Date:	2023-03-08	EUT Serial Number:	QV7700HUFR

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

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8.1.2. GSM1900

Test Engineer ID:	22797/44389	Test Date:	2023-03-08	EUT Serial Number:	QV7700HUFR

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

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8.1.3. GSM850 DTM

Test Engineer ID:	22797/44389	Test Date:	2023-03-08	EUT Serial Number:	QV7700HUFR

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 (Voice) + GPRS/EDGE (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 (Voice) + EDGE (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

8.1.4. GSM1900 DTM

Test Engineer ID:	22797/44389	Test Date:	2023-03-08	EUT Serial Number:	QV7700HUFR

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 (Voice) + GPRS/EDGE (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 (Voice) + EDGE (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

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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
	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.

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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	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 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.

RESULT

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8.2.1. WCDMA BAND 2

Test Engineer ID:	27465/44389	Test Date:	2023-02-16	EUT Serial Number:	QV7700ADFR

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)
						ANT 1
W-CDMA Band 2 (1900MHz)	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	18.8
			9400	1880.0	N/A	18.8
			9538	1907.6	N/A	**18.8**
	HSDPA	Subtest 1	9262	1852.4	0	17.8
			9400	1880.0	0	17.8
			9538	1907.6	0	**17.8**
		Subtest 2	9262	1852.4	0	17.8
			9400	1880.0	0	17.8
			9538	1907.6	0	17.8
		Subtest 3	9262	1852.4	0.5	17.3
			9400	1880.0	0.5	17.3
			9538	1907.6	0.5	17.3
		Subtest 4	9262	1852.4	0.5	17.5
			9400	1880.0	0.5	17.3
			9538	1907.6	0.5	17.3
	HSPA (HSDPA & HSUPA)	Subtest 1	9262	1852.4	0	17.8
			9400	1880.0	0	17.8
			9538	1907.6	0	17.8
		Subtest 2	9262	1852.4	2	15.8
			9400	1880.0	2	15.8
			9538	1907.6	2	15.8
		Subtest 3	9262	1852.4	1	16.8
			9400	1880.0	1	16.8
			9538	1907.6	1	16.8
		Subtest 4	9262	1852.4	2	15.8
			9400	1880.0	2	15.8
			9538	1907.6	2	15.8
		Subtest 5	9262	1852.4	0	17.3
			9400	1880.0	0	17.4
			9538	1907.6	0	17.4

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8.2.2. WCDMA BAND 4

Test Engineer ID:	27465/44389	Test Date:	2023-02-16	EUT Serial Number:	QV7700ADFR

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)
						ANT 1
W-CDMA Band 4 (1700MHz)	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	17.8
			1413	1732.6	N/A	**17.8**
			1513	1752.6	N/A	**17.8**
	HSDPA	Subtest 1	1312	1712.4	0	16.8
			1413	1732.6	0	**16.8**
			1513	1752.6	0	**16.8**
		Subtest 2	1312	1712.4	0	16.8
			1413	1732.6	0	16.8
			1513	1752.6	0	16.8
		Subtest 3	1312	1712.4	0.5	16.5
			1413	1732.6	0.5	16.3
			1513	1752.6	0.5	16.3
		Subtest 4	1312	1712.4	0.5	16.3
			1413	1732.6	0.5	16.4
			1513	1752.6	0.5	16.4
	HSPA (HSDPA & HSUPA)	Subtest 1	1312	1712.4	0	16.7
			1413	1732.6	0	16.8
			1513	1752.6	0	16.8
		Subtest 2	1312	1712.4	2	14.8
			1413	1732.6	2	14.8
			1513	1752.6	2	14.8
		Subtest 3	1312	1712.4	1	15.8
			1413	1732.6	1	15.8
			1513	1752.6	1	15.8
		Subtest 4	1312	1712.4	2	14.8
			1413	1732.6	2	14.8
			1513	1752.6	2	14.8
		Subtest 5	1312	1712.4	0	16.3
			1413	1732.6	0	16.4
			1513	1752.6	0	16.4

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8.3. 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 TS136.101 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 TS136.101.

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

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

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

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

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

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:

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8.3.1. LTE BAND 2

Test Engineer ID:	28076/21193	Test Date:	2023-02-20	EUT Serial Number:	QV770017FA

OUTPUT POWER FOR LTE2 (1.4MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)		
				18607	18900	19193
				1850.7 MHz	1880.0 MHz	1909.3 MHz
1.4	QPSK	1	0	19.1	18.9	18.8
		1	2	**19.1**	19.0	18.9
		1	5	19.1	19.0	18.9
		3	0	19.1	19.0	18.8
		3	1	19.1	19.0	18.8
		3	2	19.1	19.0	18.8
		6	0	19.1	19.0	18.8
	16QAM	1	0	19.3	19.2	19.1
		1	2	**19.4**	19.2	19.1
		1	5	19.4	19.2	19.1
		3	0	19.3	19.1	19.0
		3	1	19.2	19.3	19.0
		3	2	19.3	19.1	19.0
		6	0	19.1	19.1	18.8
	64QAM	1	0	19.4	19.2	19.1
		1	2	**19.4**	19.3	19.2
		1	5	19.4	19.2	19.1
		3	0	19.3	19.2	19.0
		3	1	19.3	19.2	19.0
		3	2	19.3	19.3	19.0
		6	0	18.1	18.0	17.7

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OUTPUT POWER FOR LTE2 (3MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				18615	18900	19185
				1851.5 MHz	1880.0 MHz	1908.5 MHz
3.0	QPSK	1	0	19.0	19.0	18.8
		1	7	19.1	19.1	18.9
		1	14	19.0	19.0	18.8
		8	0	**19.2**	19.0	18.9
		8	4	19.1	19.1	18.9
		8	7	19.2	19.1	18.9
		15	0	19.1	19.0	18.8
	16QAM	1	0	19.4	19.3	19.2
		1	7	**19.5**	19.5	19.3
		1	14	19.4	19.3	19.2
		8	0	19.2	19.1	18.9
		8	4	19.2	19.2	18.9
		8	7	19.2	19.2	18.9
		15	0	19.2	19.0	18.8
	64QAM	1	0	19.4	19.2	19.0
		1	7	**19.5**	19.3	19.1
		1	14	19.5	19.2	19.1
		8	0	19.2	19.1	18.9
		8	4	19.3	19.2	19.0
		8	7	19.3	19.2	19.0
		15	0	19.2	19.1	18.9

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OUTPUT POWER FOR LTE2 (5MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				18625	18900	19175
				1852.5 MHz	1880.0 MHz	1907.5 MHz
5.0	QPSK	1	0	19.1	19.0	18.8
		1	12	**19.2**	19.2	18.9
		1	24	19.1	19.0	18.8
		12	0	19.2	19.0	18.9
		12	6	19.2	19.0	18.9
		12	11	19.2	19.1	18.8
		25	0	19.2	19.0	18.9
	16QAM	1	0	19.5	19.3	19.2
		1	12	**19.6**	19.5	19.4
		1	24	19.5	19.3	19.3
		12	0	19.1	19.0	18.9
		12	6	19.2	19.0	19.0
		12	11	19.1	19.1	18.9
		25	0	19.2	19.0	18.9
	64QAM	1	0	19.5	19.3	19.2
		1	12	19.6	19.4	19.3
		1	24	**19.6**	19.3	19.2
		12	0	19.3	19.2	19.0
		12	6	19.3	19.3	19.0
		12	11	19.3	19.3	19.0
		25	0	19.2	19.1	18.9

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OUTPUT POWER FOR LTE2 (10MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				18650	18900	19150
				1855.0 MHz	1880.0 MHz	1905.0 MHz
10.0	QPSK	1	0	19.1	19.1	18.9
		1	24	19.2	19.1	18.9
		1	49	19.1	19.0	18.8
		25	0	19.2	19.0	18.9
		25	12	**19.2**	19.0	19.0
		25	24	19.2	19.1	18.9
		50	0	19.2	19.0	18.9
	16QAM	1	0	**19.5**	19.5	19.3
		1	24	19.5	19.4	19.2
		1	49	19.4	19.4	19.3
		25	0	19.2	19.0	19.0
		25	12	19.2	19.0	19.0
		25	24	19.2	19.1	19.0
		50	0	19.2	19.0	19.0
	64QAM	1	0	19.5	19.3	19.2
		1	24	**19.5**	19.3	19.2
		1	49	19.4	19.3	19.2
		25	0	19.2	19.1	19.0
		25	12	19.3	19.1	19.1
		25	24	19.3	19.2	19.0
		50	0	19.2	19.1	19.0

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OUTPUT POWER FOR LTE2 (15MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				18675	18900	19125
				1857.5 MHz	1880.0 MHz	1902.5 MHz
15.0	QPSK	1	0	19.0	18.9	18.8
		1	37	19.0	19.0	18.8
		1	74	19.0	18.9	18.7
		36	0	**19.1**	18.9	18.8
		36	16	19.1	18.9	18.9
		36	35	19.1	19.0	18.9
		75	0	19.0	18.9	18.8
	16QAM	1	0	19.3	19.3	19.1
		1	37	19.3	19.3	19.1
		1	74	**19.4**	19.1	19.0
		36	0	19.1	18.9	18.8
		36	16	19.1	18.9	18.9
		36	35	19.0	19.0	18.9
		75	0	19.0	18.9	18.9
	64QAM	1	0	19.3	19.3	19.0
		1	37	19.3	19.2	19.1
		1	74	**19.4**	19.2	18.9
		36	0	19.1	19.0	18.8
		36	16	19.1	18.9	18.9
		36	35	19.1	19.0	18.9
		75	0	19.1	18.9	18.8

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OUTPUT POWER FOR LTE2 (20MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				18700	18900	19100
				1860.0 MHz	1880.0 MHz	1900.0 MHz
20.0	QPSK	1	0	19.0	18.9	18.8
		1	49	19.0	18.9	18.9
		1	99	19.1	18.9	18.8
		50	0	19.0	19.0	18.9
		50	24	**19.1**	19.0	18.9
		50	49	19.1	19.0	18.9
		100	0	19.1	19.0	18.9
	16QAM	1	0	19.2	19.3	19.1
		1	49	19.3	**19.5**	19.3
		1	99	19.2	19.3	19.2
		50	0	19.0	18.9	18.9
		50	24	19.1	18.9	18.9
		50	49	19.1	19.0	18.9
		100	0	19.1	18.9	18.9
	64QAM	1	0	19.2	19.3	19.1
		1	49	19.4	**19.5**	19.3
		1	99	19.2	19.2	19.0
		50	0	19.0	19.0	18.8
		50	24	19.1	18.9	18.8
		50	49	19.1	19.0	18.9
		100	0	19.1	18.9	18.9

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8.3.2. LTE BAND 4

Test Engineer ID:	27465/44389	Test Date:	2023-03-09 2023-03-10	EUT Serial Number:	QV7700ADFR

OUTPUT POWER FOR LTE4 (1.4MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				19957	20175	20393
				1710.7 MHz	1732.5 MHz	1754.3 MHz
1.4	QPSK	1	0	17.7	17.7	17.5
		1	2	**17.8**	17.7	17.5
		1	5	17.7	17.6	17.4
		3	0	17.7	17.6	17.5
		3	1	17.7	17.6	17.5
		3	2	17.7	17.5	17.5
		6	0	17.7	17.5	17.5
	16QAM	1	0	18.1	17.9	17.8
		1	2	18.1	17.9	17.9
		1	5	**18.1**	17.9	17.9
		3	0	17.9	17.7	17.7
		3	1	17.9	17.7	17.7
		3	2	17.9	17.7	17.6
		6	0	17.8	17.6	17.5
	64QAM	1	0	17.9	17.9	17.8
		1	2	**18.0**	17.9	17.7
		1	5	17.9	17.9	17.7
		3	0	17.9	17.7	17.6
		3	1	17.9	17.7	17.7
		3	2	17.9	17.7	17.7
		6	0	17.8	17.6	17.6

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OUTPUT POWER FOR LTE4 (3MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				19965	20175	20385
				1711.5 MHz	1732.5 MHz	1753.5 MHz
3.0	QPSK	1	0	17.6	17.5	17.5
		1	7	17.7	17.7	17.6
		1	14	17.6	17.5	17.4
		8	0	17.7	17.6	17.5
		8	4	**17.7**	17.6	17.6
		8	7	**17.7**	**17.7**	17.6
		15	0	17.7	17.5	17.5
	16QAM	1	0	17.9	17.9	17.8
		1	7	18.0	**18.0**	17.9
		1	14	17.9	17.9	17.8
		8	0	17.7	17.6	17.6
		8	4	17.8	17.6	17.6
		8	7	17.8	17.7	17.6
		15	0	17.7	17.6	17.6
	64QAM	1	0	17.8	17.8	17.7
		1	7	17.8	**17.9**	17.7
		1	14	17.8	17.8	17.7
		8	0	17.7	17.7	17.6
		8	4	17.7	17.7	17.7
		8	7	17.7	17.8	17.6
		15	0	17.8	17.6	17.6

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OUTPUT POWER FOR LTE4 (5MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				19975	20175	20375
				1712.5 MHz	1732.5 MHz	1752.5 MHz
5.0	QPSK	1	0	17.5	17.5	17.6
		1	12	17.6	17.7	**17.7**
		1	24	17.5	17.6	17.6
		12	0	17.6	17.5	17.7
		12	6	17.6	17.6	17.7
		12	11	17.6	17.6	17.7
		25	0	17.5	17.5	17.7
	16QAM	1	0	17.9	18.0	17.9
		1	12	18.0	18.0	**18.1**
		1	24	17.9	17.9	18.0
		12	0	17.6	17.4	17.8
		12	6	17.6	17.5	17.8
		12	11	17.6	17.5	17.8
		25	0	17.5	17.6	17.7
	64QAM	1	0	17.8	17.9	17.9
		1	12	17.9	**18.0**	**18.0**
		1	24	17.8	17.9	17.9
		12	0	17.7	17.6	17.7
		12	6	17.7	17.6	17.7
		12	11	17.7	17.7	17.7
		25	0	17.6	17.6	17.7

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OUTPUT POWER FOR LTE4 (10MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20000	20175	20350
				1715.0 MHz	1732.5 MHz	1750.0 MHz
10.0	QPSK	1	0	17.6	17.5	17.6
		1	24	17.5	17.6	**17.7**
		1	49	17.5	17.6	17.6
		25	0	17.6	17.6	17.6
		25	12	17.6	17.6	17.6
		25	24	17.6	17.6	**17.7**
		50	0	17.6	17.6	17.6
	16QAM	1	0	17.9	17.9	**18.0**
		1	24	17.8	17.9	17.9
		1	49	17.9	17.9	18.0
		25	0	17.6	17.6	17.6
		25	12	17.6	17.6	17.7
		25	24	17.6	17.7	17.7
		50	0	17.6	17.6	17.6
	64QAM	1	0	17.8	17.9	17.9
		1	24	17.8	17.9	**18.0**
		1	49	17.8	18.0	18.0
		25	0	17.6	17.6	17.7
		25	12	17.6	17.6	17.7
		25	24	17.6	17.7	17.8
		50	0	17.6	17.6	17.6

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OUTPUT POWER FOR LTE4 (15MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20025	20175	20325
				1717.5 MHz	1732.5 MHz	1747.5 MHz
15.0	QPSK	1	0	17.4	17.4	17.5
		1	37	17.4	17.5	17.5
		1	74	17.5	17.6	17.6
		36	0	17.4	17.5	17.5
		36	16	17.5	17.5	**17.6**
		36	35	17.5	17.6	**17.6**
		75	0	17.5	17.5	17.5
	16QAM	1	0	17.6	17.6	17.7
		1	37	17.7	17.8	**18.0**
		1	74	17.7	**18.0**	**18.0**
		36	0	17.4	17.5	17.5
		36	16	17.5	17.5	17.6
		36	35	17.5	17.6	17.6
		75	0	17.5	17.5	17.5
	64QAM	1	0	17.7	17.8	17.8
		1	37	17.7	17.8	17.9
		1	74	17.8	**17.9**	**17.9**
		36	0	17.4	17.5	17.5
		36	16	17.5	17.5	17.6
		36	35	17.5	17.6	17.6
		75	0	17.5	17.5	17.5

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OUTPUT POWER FOR LTE4 (20MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20050	20175	20300
				1720.0 MHz	1732.5 MHz	1745.0 MHz
20.0	QPSK	1	0	17.5	17.5	17.6
		1	49	17.4	17.5	17.5
		1	99	17.5	**17.6**	17.6
		50	0	17.4	17.5	17.5
		50	24	17.5	17.5	17.6
		50	49	17.5	**17.6**	**17.6**
		100	0	17.5	17.5	17.5
	16QAM	1	0	17.7	17.8	17.8
		1	49	17.7	**17.9**	17.8
		1	99	17.8	17.9	17.9
		50	0	17.4	17.5	17.5
		50	24	17.5	17.5	17.6
		50	49	17.5	17.6	17.6
		100	0	17.5	17.5	17.5
	64QAM	1	0	17.7	17.7	17.8
		1	49	17.8	17.8	**17.8**
		1	99	17.8	17.8	17.8
		50	0	17.4	17.5	17.5
		50	24	17.5	17.5	17.6
		50	49	17.5	17.6	17.6
		100	0	17.5	17.5	17.5

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8.3.3. LTE BAND 12

Test Engineer ID:	84740/44389	Test Date:	2023-03-08	EUT Serial Number:	QV7700ADFR

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	20.7	20.6	20.6
		1	3	20.7	20.7	20.7
		1	5	20.6	20.6	20.6
		3	0	20.7	20.7	20.6
		3	1	20.7	20.7	20.6
		3	3	**20.7**	20.6	20.7
		6	0	20.7	20.7	20.6
	16QAM	1	0	20.9	21.0	20.9
		1	3	20.9	**21.1**	21.0
		1	5	20.9	21.0	21.0
		3	0	20.9	20.9	20.8
		3	1	20.9	20.8	20.8
		3	3	20.9	20.9	20.8
		6	0	20.8	20.7	20.7
	64QAM	1	0	21.0	20.9	20.6
		1	3	**21.1**	21.0	20.9
		1	5	21.0	21.0	20.9
		3	0	20.9	20.7	20.7
		3	1	20.8	20.8	20.8
		3	3	20.9	20.7	20.7
		6	0	20.8	20.7	20.7

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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	20.6	20.6	20.6
		1	7	20.8	20.7	20.7
		1	14	20.6	20.6	20.5
		8	0	**20.8**	20.6	20.6
		8	4	20.7	20.6	20.7
		8	7	20.8	20.7	20.7
		15	0	20.7	20.7	20.5
	16QAM	1	0	20.9	20.9	20.8
		1	7	**21.1**	21.0	21.0
		1	14	20.9	20.9	20.8
		8	0	20.8	20.7	20.6
		8	4	20.9	20.7	20.7
		8	7	20.8	20.8	20.7
		15	0	20.8	20.8	20.6
	64QAM	1	0	21.0	20.9	20.8
		1	7	**21.0**	21.0	20.9
		1	14	20.9	20.9	20.8
		8	0	20.8	20.7	20.6
		8	4	20.9	20.7	20.7
		8	7	20.8	20.8	20.7
		15	0	20.8	20.7	20.6

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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	20.6	20.6	20.7
		1	12	20.8	20.7	**20.8**
		1	24	20.6	20.6	20.6
		12	0	20.7	20.6	20.6
		12	6	20.7	20.7	20.7
		12	11	20.7	20.7	20.7
		25	0	20.7	20.7	20.6
	16QAM	1	0	21.0	21.0	21.0
		1	12	**21.2**	21.1	21.1
		1	24	21.1	21.0	21.0
		12	0	20.7	20.6	20.6
		12	6	20.7	20.7	20.6
		12	11	20.7	20.7	20.7
		25	0	20.8	20.7	20.6
	64QAM	1	0	21.0	20.5	20.9
		1	12	**21.0**	21.0	21.0
		1	24	21.0	20.9	20.9
		12	0	20.8	20.6	20.7
		12	6	20.8	20.6	20.7
		12	11	20.7	20.7	20.7
		25	0	20.8	20.7	20.6

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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	20.7	20.7	20.7
		1	24	20.7	20.7	20.7
		1	49	20.6	20.6	20.6
		25	0	20.7	20.7	20.6
		25	12	**20.8**	20.7	20.7
		25	24	20.7	20.7	20.7
		50	0	20.7	20.7	20.7
	16QAM	1	0	**21.1**	21.0	21.0
		1	24	20.9	21.0	21.0
		1	49	21.0	21.0	21.0
		25	0	20.7	20.7	20.7
		25	12	20.8	20.7	20.7
		25	24	20.8	20.7	20.7
		50	0	20.7	20.7	20.6
	64QAM	1	0	21.0	**21.0**	20.9
		1	24	20.9	20.9	20.9
		1	49	20.9	20.9	20.8
		25	0	20.7	20.6	20.6
		25	12	20.8	20.7	20.7
		25	24	20.7	20.6	20.7
		50	0	20.8	20.7	20.7

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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.

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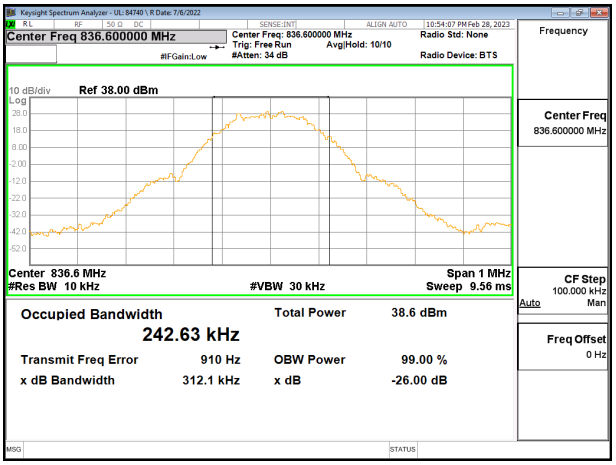
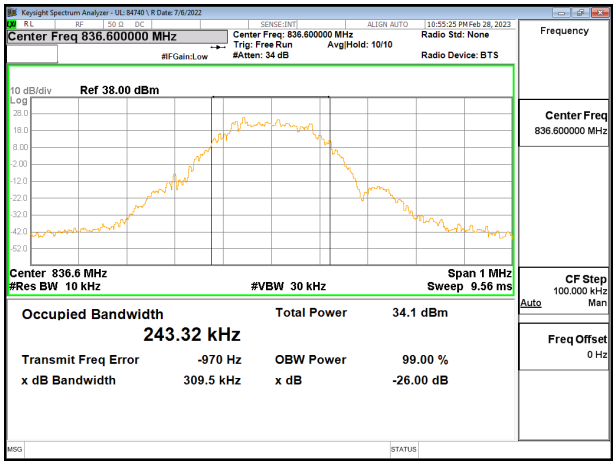
9.1.1. GSM

Test Engineer ID:	84740/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR

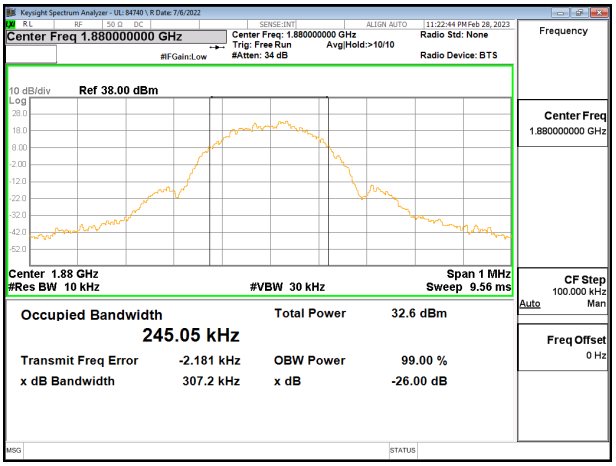
Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
GSM850	GPRS	190	836.6	242.63	312.1
	EGPRS			243.32	309.5
GSM1900	GPRS	661	1880.0	245.05	307.2
	EGPRS			244.83	320.0



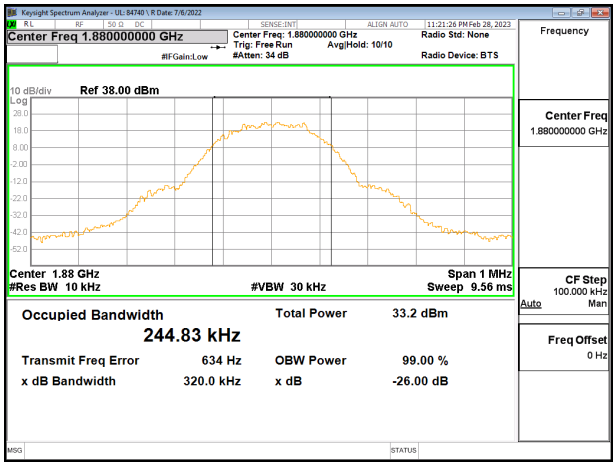
GSM850 GPRS MID Channel



GSM850 EGPRS MID Channel



GSM1900 GPRS MID Channel



GSM1900 EGPRS MID Channel

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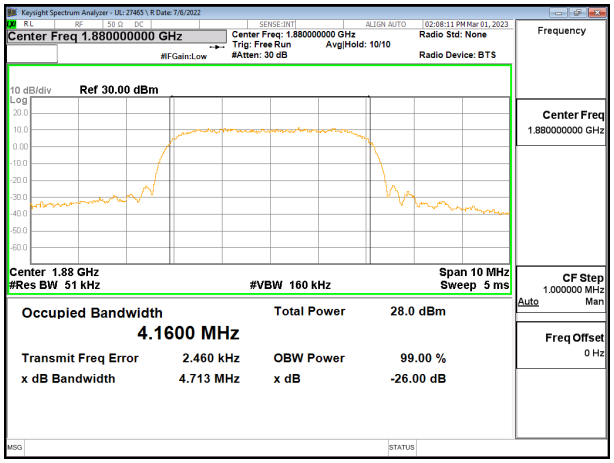
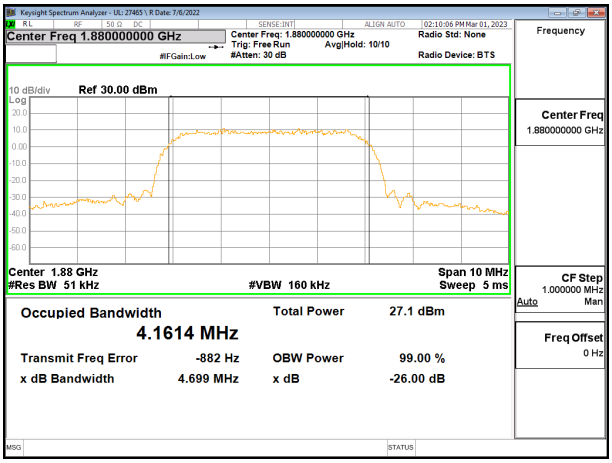
9.1.2. WCDMA

Test Engineer ID:	27465/44389	Test Date:	2023-03-01	EUT Serial Number:	QV7700ADFR

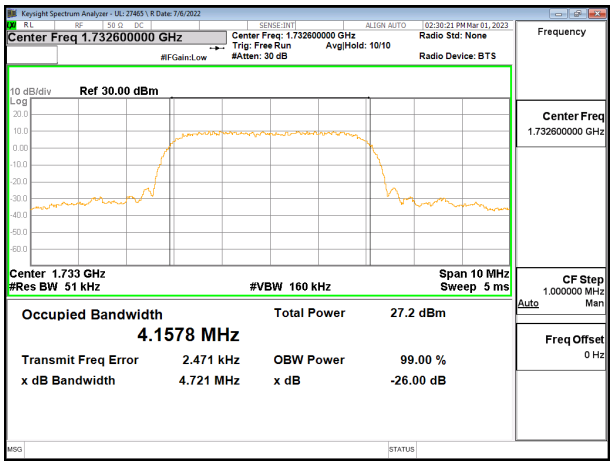
Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND2	REL 99	9400	1880.0	4.160	4.713
	HSDPA			4.161	4.699
BAND4	REL 99	1413	1732.6	4.158	4.721
	HSDPA			4.161	4.692



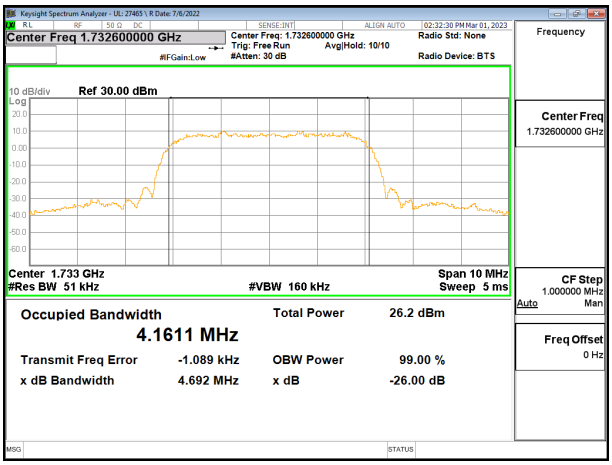
BAND 2 Rel 99 MID Channel



BAND 2 HSDPA MID Channel



BAND 4 Rel 99 MID Channel



BAND 4 HSDPA MID Channel

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9.1.3. LTE2

Test Engineer ID:	27465/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4MHz, QPSK	6/0	1880.0	1.090	1.334
	1.4MHz,16QAM			1.098	1.343
	3MHz, QPSK	15/0		2.706	3.047
	3MHz, 16QAM			2.709	3.086
	5MHz, QPSK	25/0		4.507	5.077
	5MHz, 16QAM			4.503	5.112
	10MHz, QPSK	50/0		8.986	10.00
	10MHz, 16QAM			8.984	10.01
	15MHz, QPSK	75/0		13.47	14.83
	15MHz, 16QAM			13.47	14.78
	20MHz, QPSK	100/0		17.92	19.53
	20MHz, 16QAM			17.92	19.61

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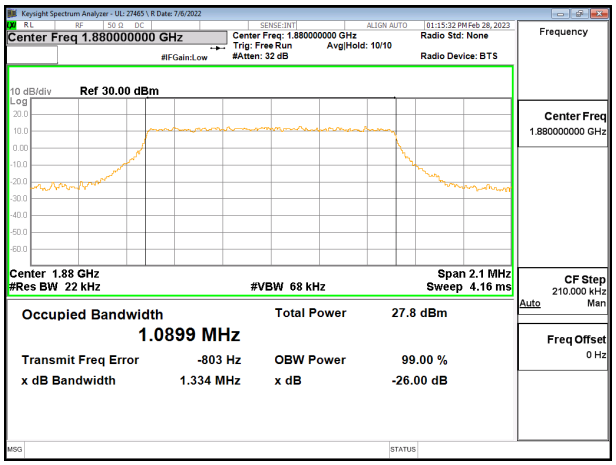
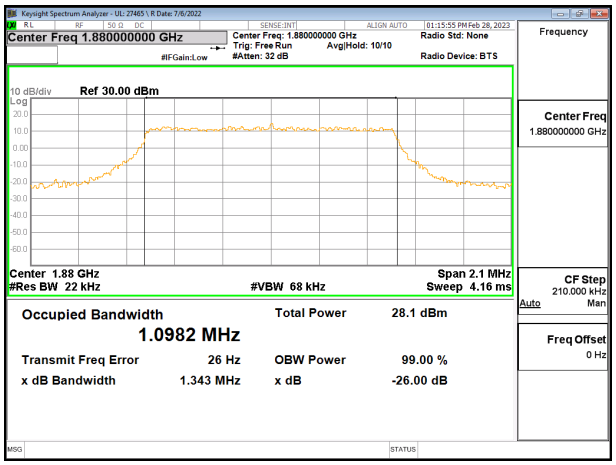
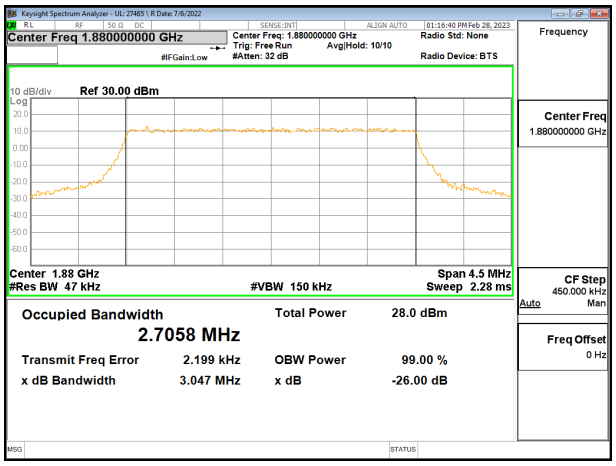


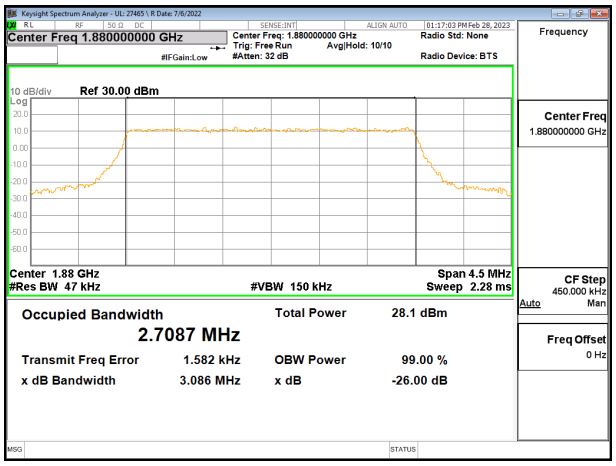
LTE2 1.4MHz QPSK MID Ch RB6-0



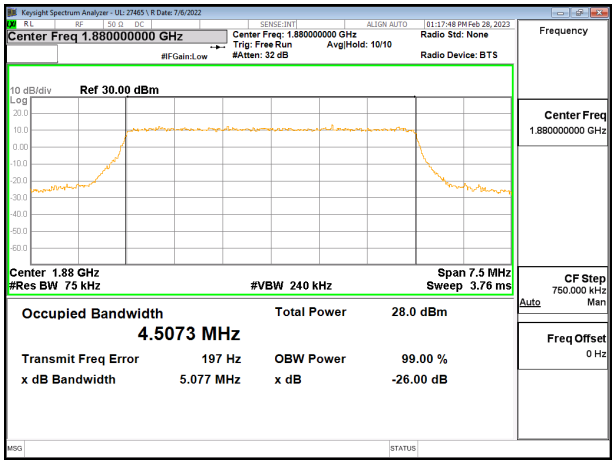
LTE2 1.4MHz 16QAM MID Ch RB6-0



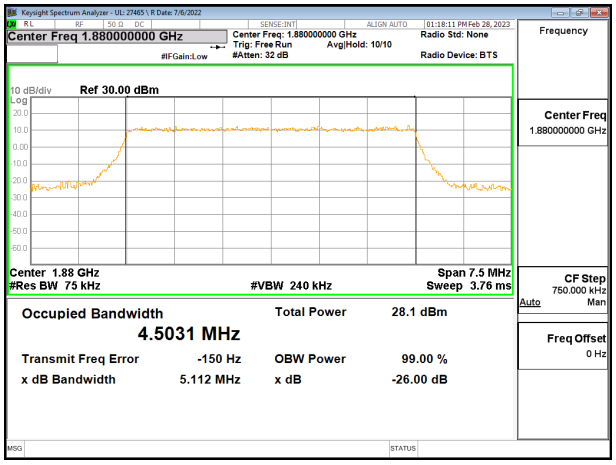
LTE2 3MHz QPSK MID Ch RB15-0



LTE2 3MHz 16QAM MID Ch RB15-0



LTE2 5MHz QPSK MID Ch RB25-0



LTE2 5MHz 16QAM MID Ch RB25-0

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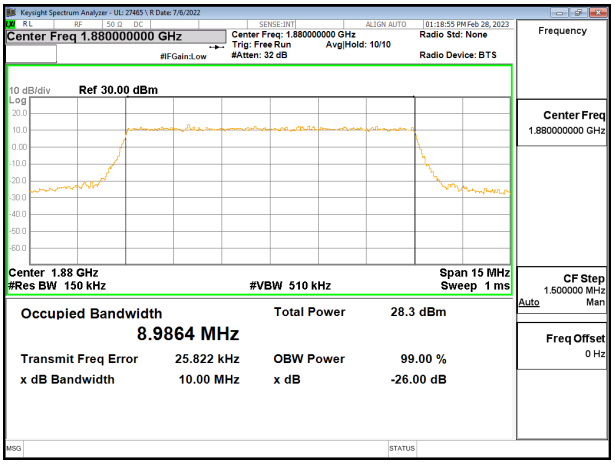
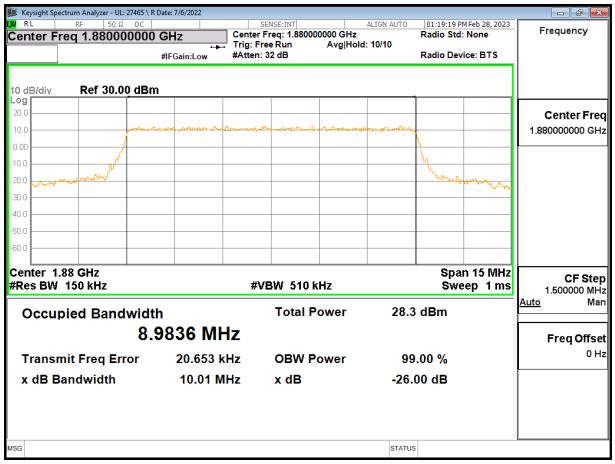
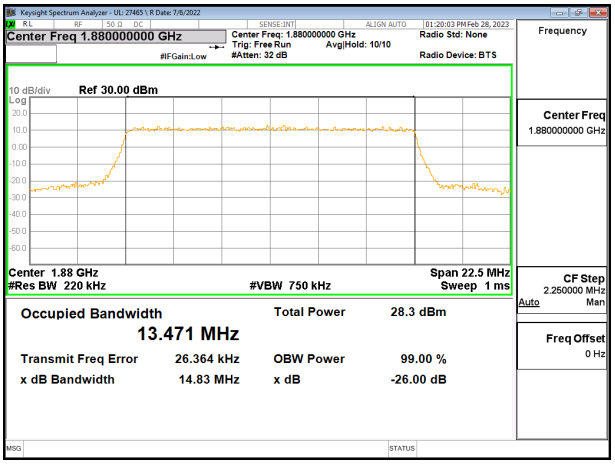


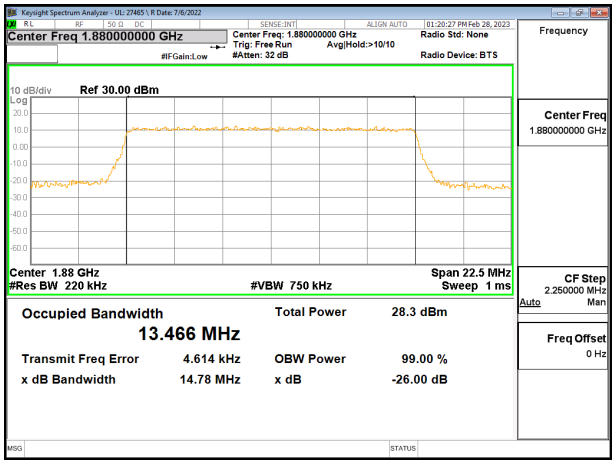
LTE2 10MHz QPSK MID Ch RB50-0



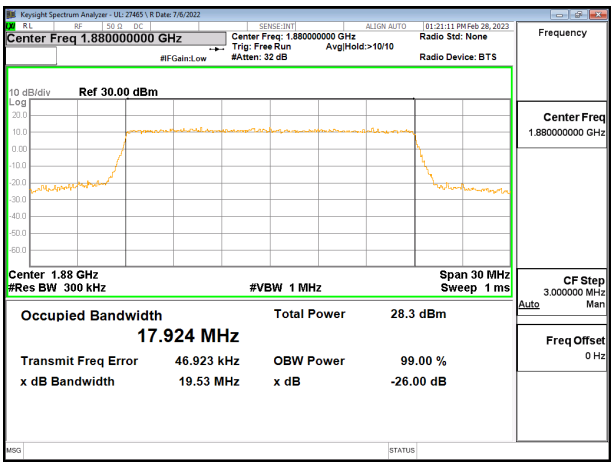
LTE2 10MHz 16QAM MID Ch RB50-0



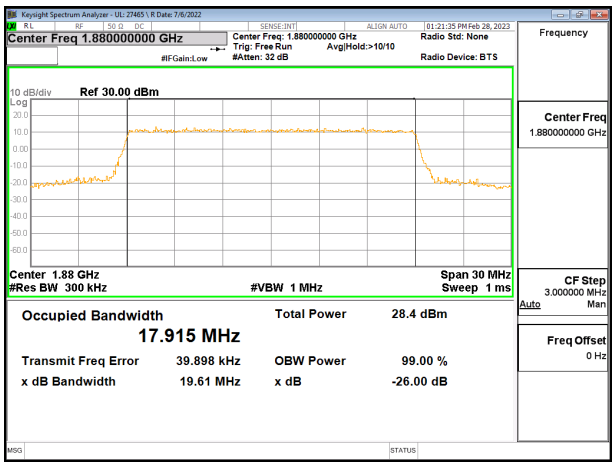
LTE2 15MHz QPSK MID Ch RB75-0



LTE2 15MHz 16QAM MID Ch RB75-0



LTE2 20MHz QPSK MID Ch RB50-24



LTE2 20MHz 16QAM MID Ch RB50-24

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9.1.4. LTE4

Test Engineer ID:	84740/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 4	1.4MHz, QPSK	6/0	1732.5	1.093	1.336
	1.4MHz,16QAM			1.093	1.330
	3MHz, QPSK	15/0		2.700	3.012
	3MHz, 16QAM			2.707	3.071
	5MHz, QPSK	25/0		4.495	5.122
	5MHz, 16QAM			4.503	5.068
	10MHz, QPSK	50/0		9.010	10.05
	10MHz, 16QAM			8.997	9.952
	15MHz, QPSK	75/0		13.49	14.94
	15MHz, 16QAM			13.48	14.81
	20MHz, QPSK	100/0		17.94	19.64
	20MHz, 16QAM			17.98	19.72

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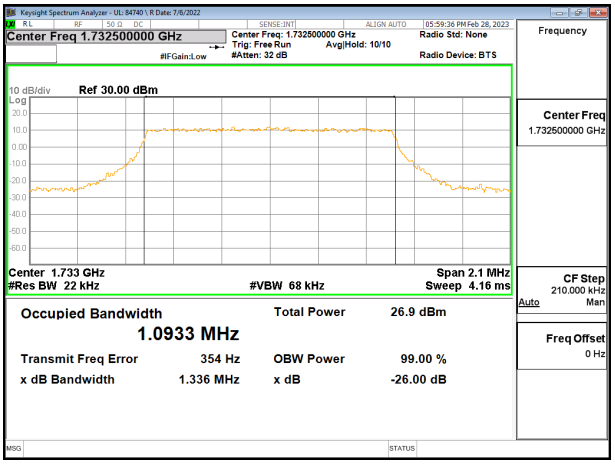
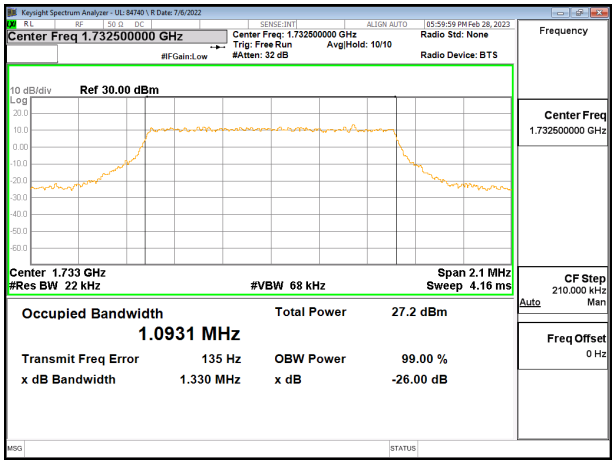
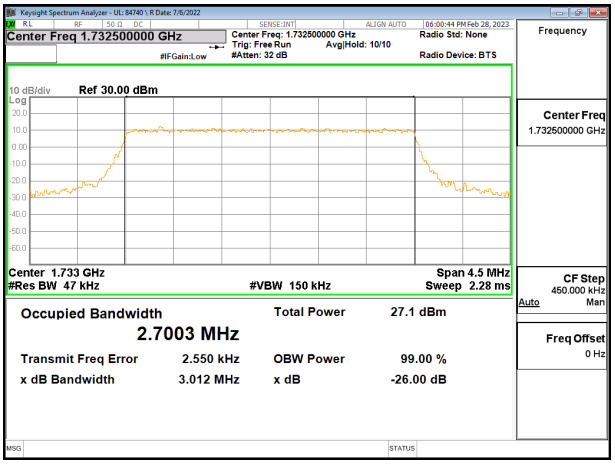


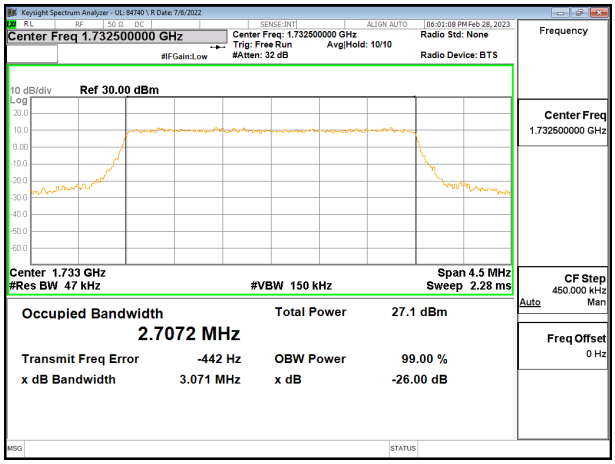
LTE4 1.4MHz QPSK MID Ch RB6-0



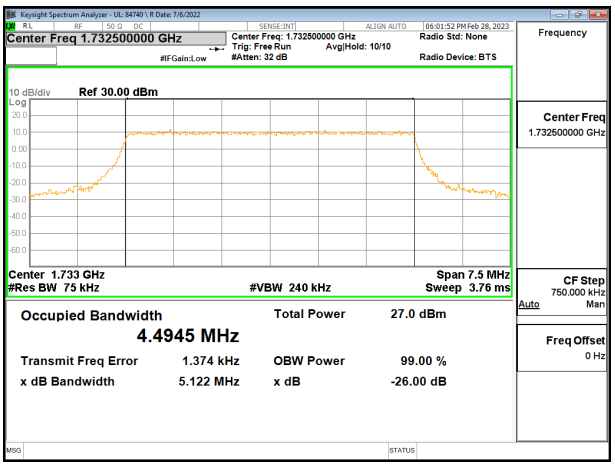
LTE4 1.4MHz 16QAM MID Ch RB6-0



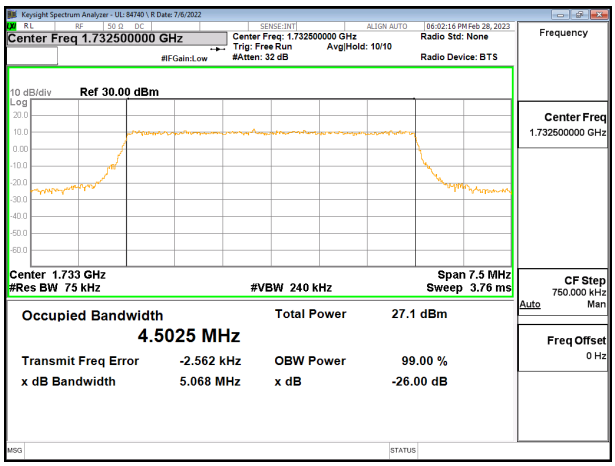
LTE4 3MHz QPSK MID Ch RB15-0



LTE4 3MHz 16QAM MID Ch RB15-0



LTE4 5MHz QPSK MID Ch RB25-0



LTE4 5MHz 16QAM MID Ch RB25-0

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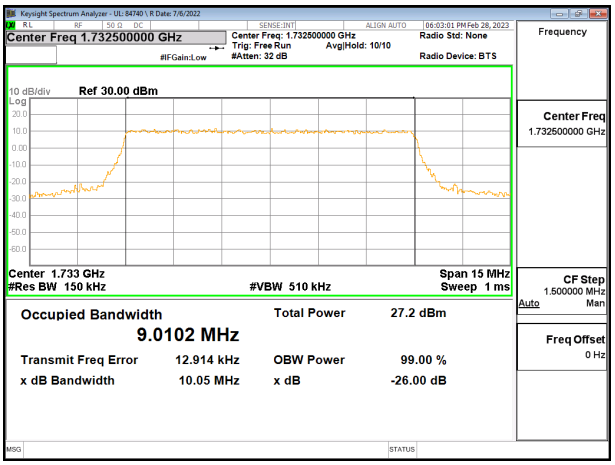
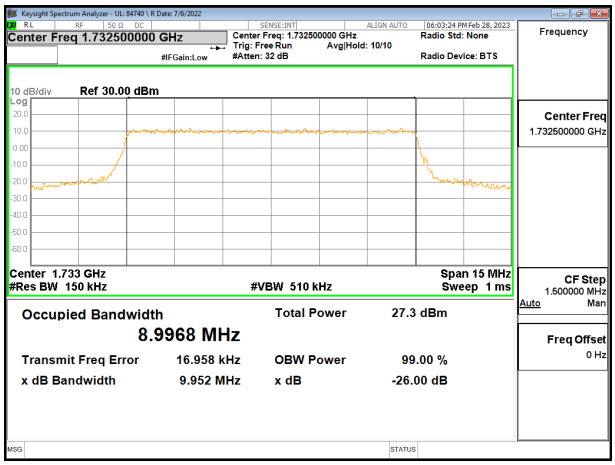
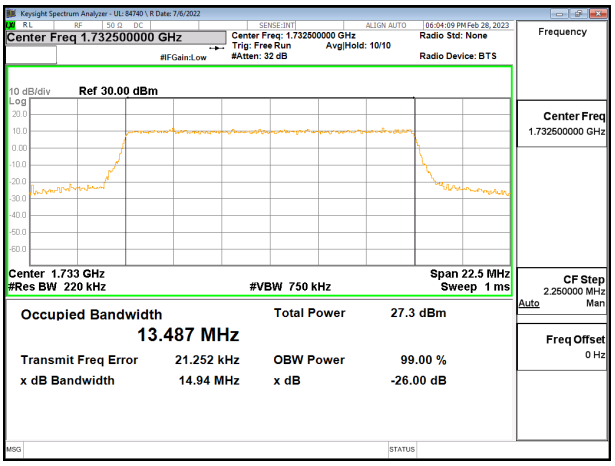


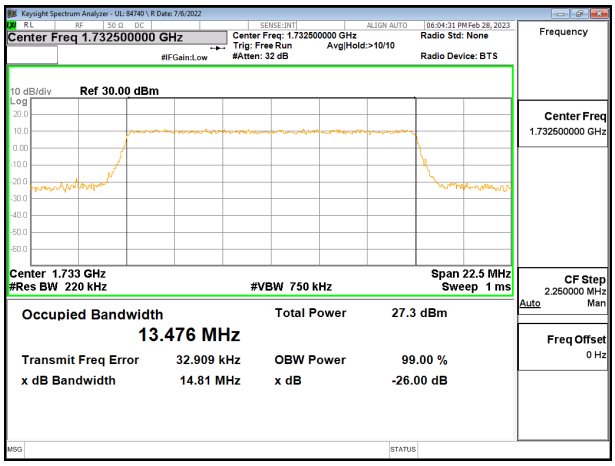
LTE4 10MHz QPSK MID Ch RB50-0



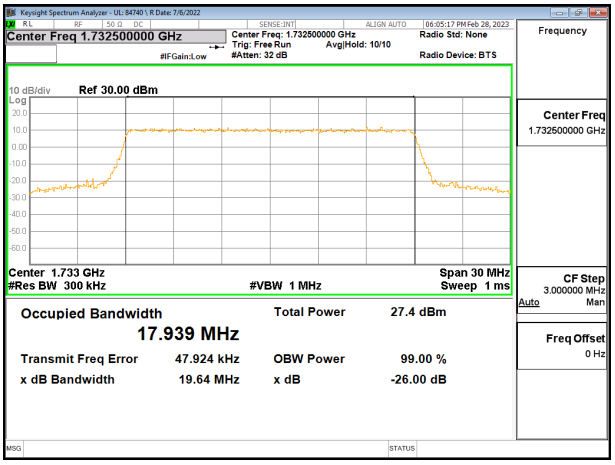
LTE4 10MHz 16QAM MID Ch RB50-0



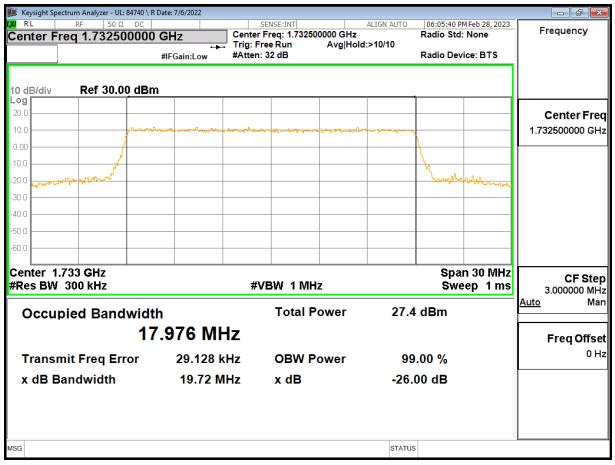
LTE4 15MHz QPSK MID Ch RB75-0



LTE4 15MHz 16QAM MID Ch RB75-0



LTE4 20MHz QPSK MID Ch RB100-0



LTE4 20MHz 16QAM MID Ch RB100-0

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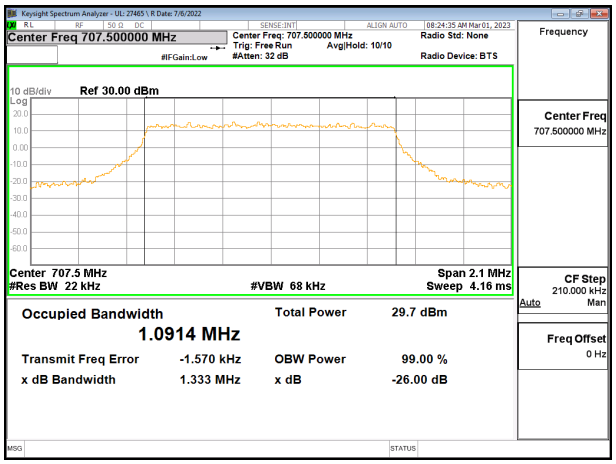
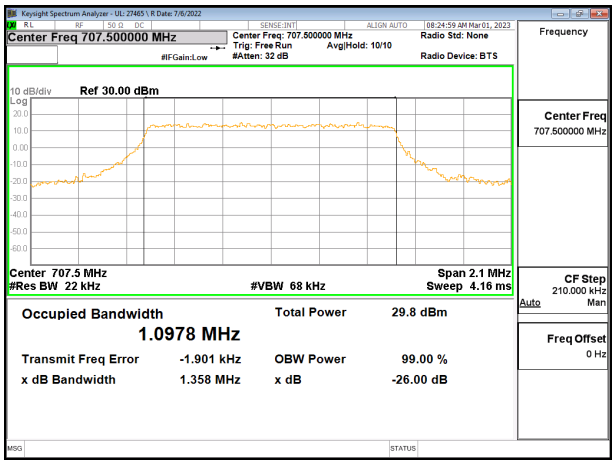
9.1.5. LTE12

Test Engineer ID:	27465/44389	Test Date:	2023-03-01	EUT Serial Number:	QV7700ADFR

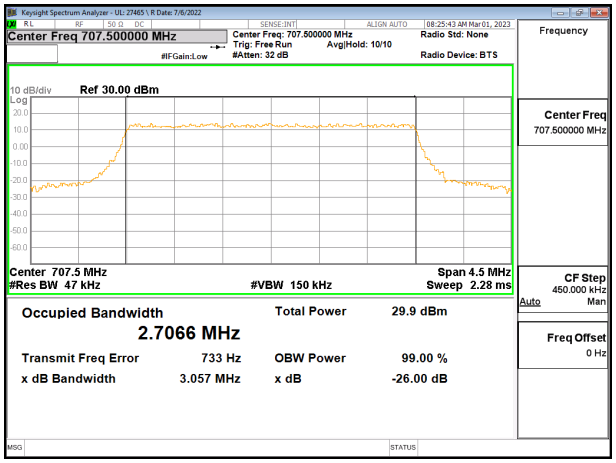
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 12	1.4MHz, QPSK	6/0	707.5	1.091	1.333
	1.4MHz,16QAM			1.098	1.358
	3MHz, QPSK	15/0		2.707	3.057
	3MHz, 16QAM			2.701	3.049
	5MHz, QPSK	25/0		4.506	5.137
	5MHz, 16QAM			4.505	5.142
	10MHz, QPSK	50/0		8.972	9.953
	10MHz, 16QAM			8.964	9.963



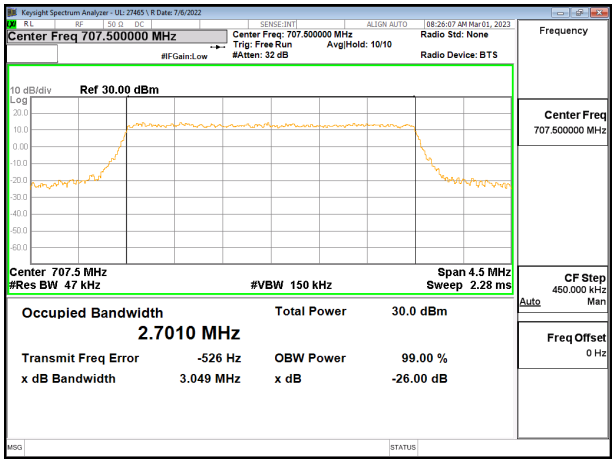
LTE12 1.4MHz QPSK MID Ch RB6-0



LTE12 1.4MHz 16QAM MID Ch RB6-0



LTE12 3MHz QPSK MID Ch RB15-0



LTE12 3MHz 16QAM MID Ch RB15-0

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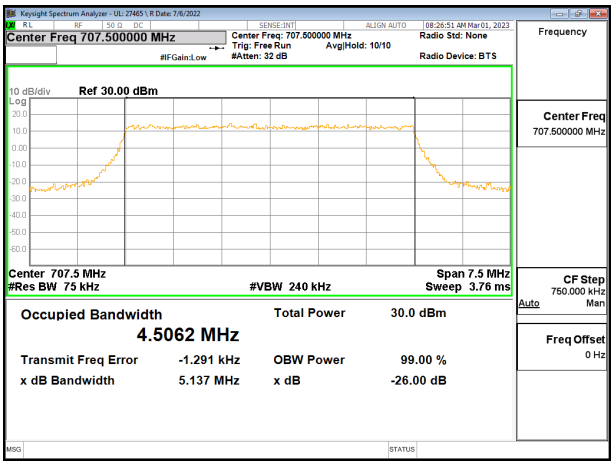
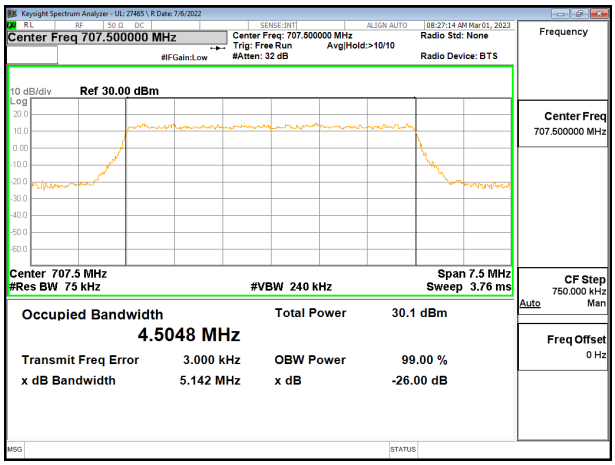
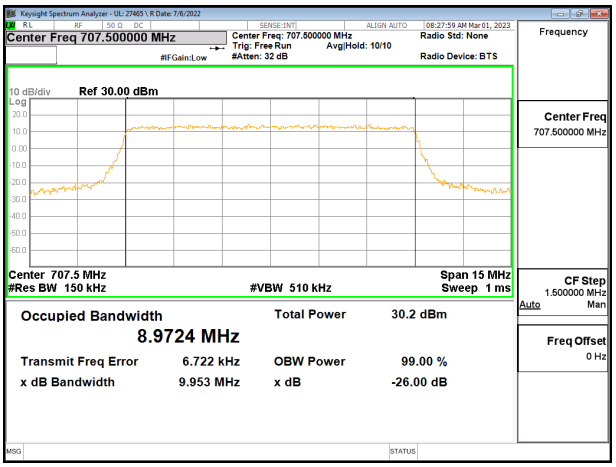


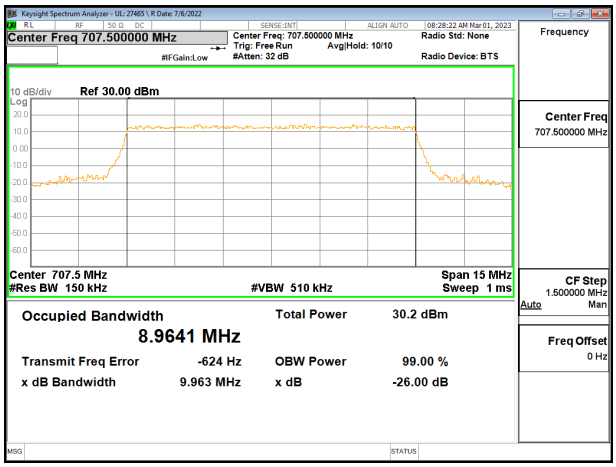
LTE12 5MHz QPSK MID Ch RB25-0



LTE12 5MHz 16QAM MID Ch RB25-0



LTE12 10MHz QPSK MID Ch RB50-0



LTE12 10MHz 16QAM MID Ch RB50-0

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9.2. BAND EDGE AND EMISSION MASK

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

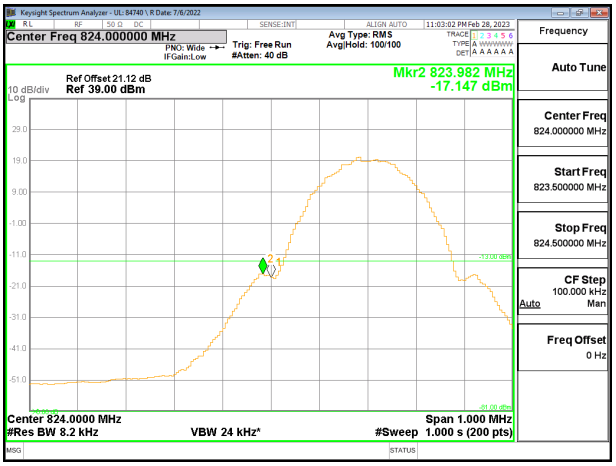
This report shall not be reproduced except in full, without the written approval of UL LLC.

9.2.1. GSM850

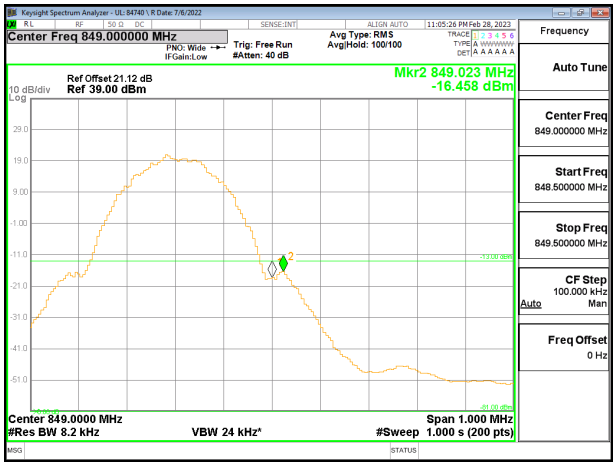
LIMITS

FCC: §22.917 (a)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

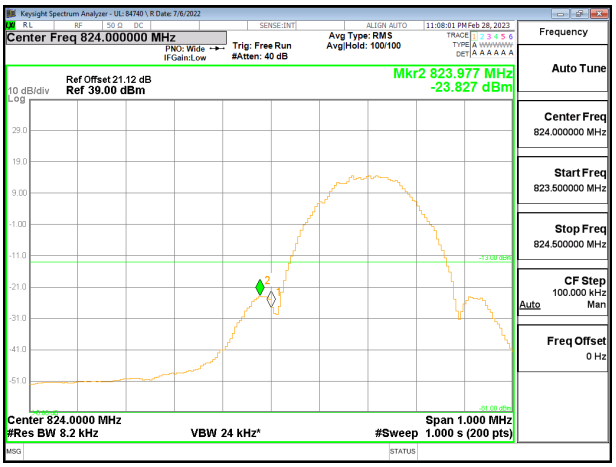
Test Engineer ID:	84740/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR



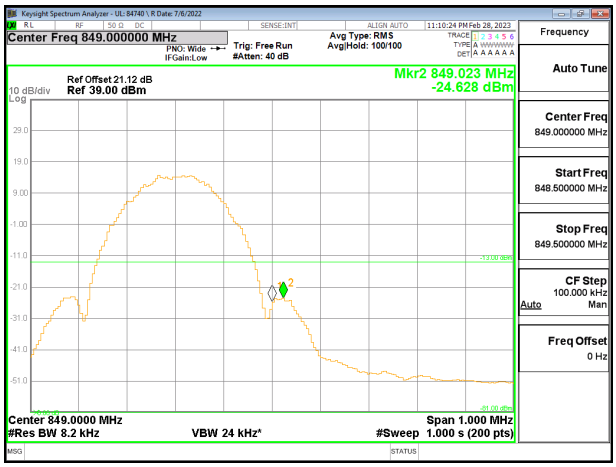
GSM850 GPRS LOW Channel



GSM850 GPRS HIGH Channel



GSM850 EGPRS LOW Channel



GSM850 EGPRS HIGH Channel

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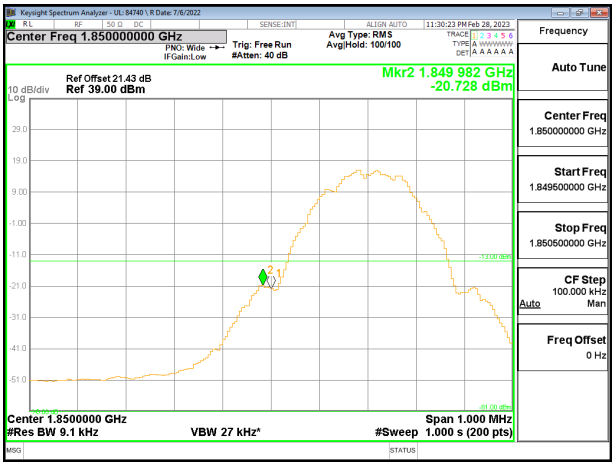
9.2.2. GSM1900

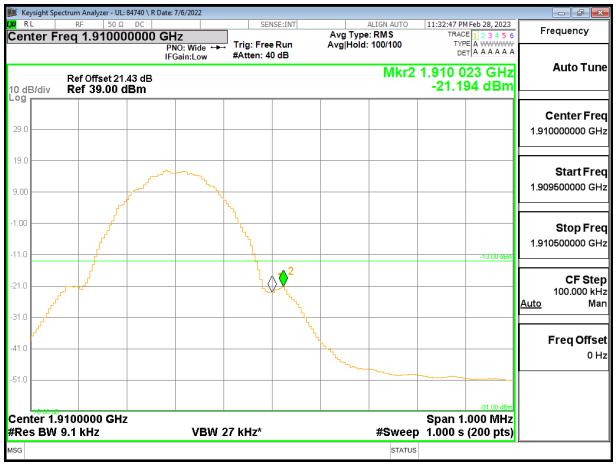
LIMITS

FCC: §24.238 (a)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

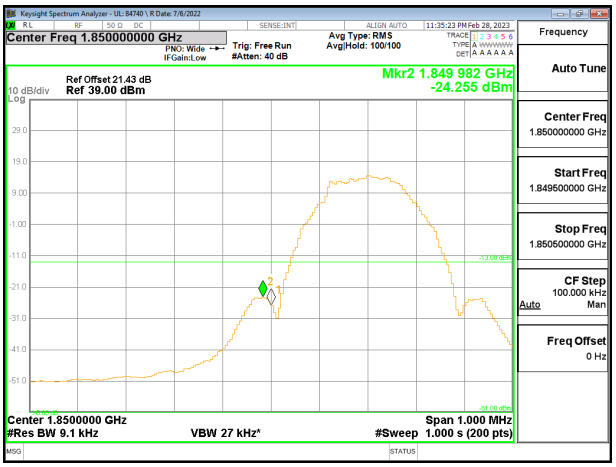
Test Engineer ID:	84740/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR



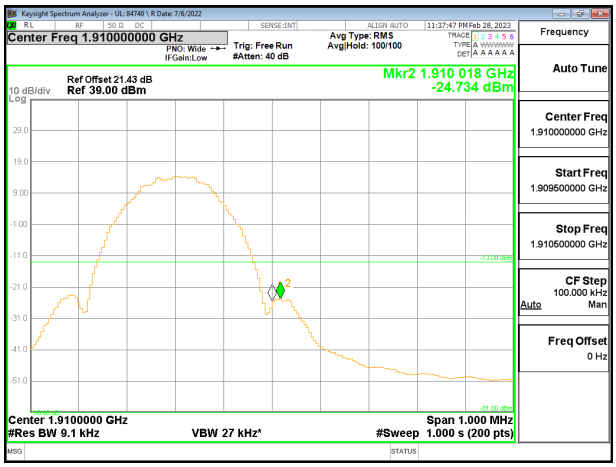
GSM1900 GPRS LOW Channel



GSM1900 GPRS HIGH Channel



GSM1900 EGPRS LOW Channel



GSM1900 EGPRS HIGH Channel

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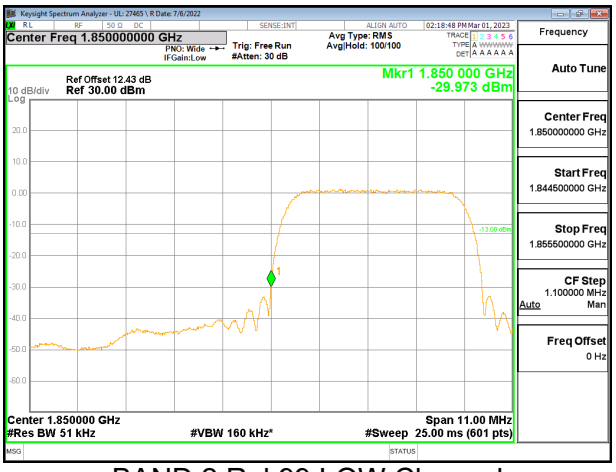
9.2.3. WCMDA2

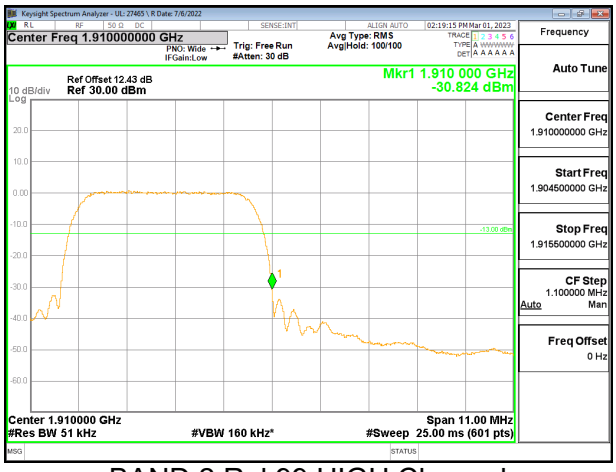
LIMITS

FCC: §24.238
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

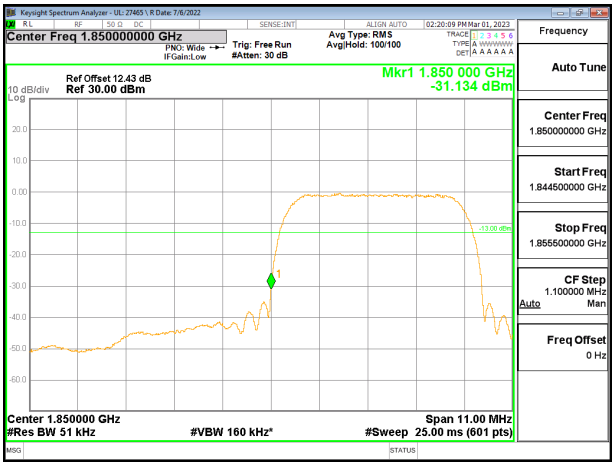
Test Engineer ID:	84740/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR



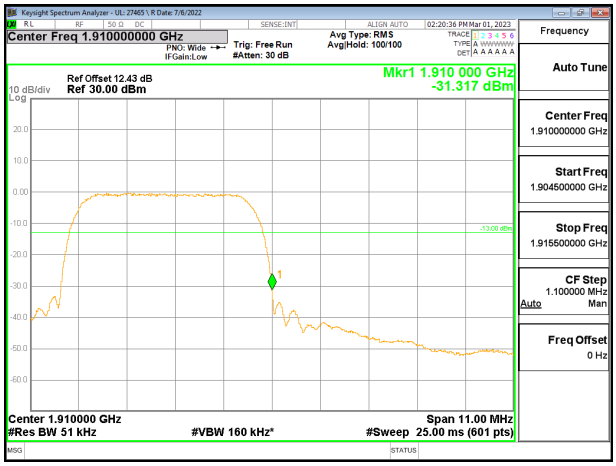
BAND 2 Rel 99 LOW Channel



BAND 2 Rel 99 HIGH Channel



BAND 2 HSDPA LOW Channel



BAND 2 HSDPA HIGH Channel

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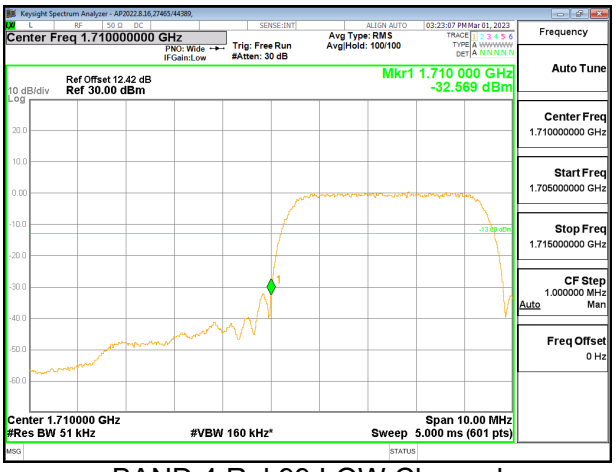
9.2.4. WCDMA4

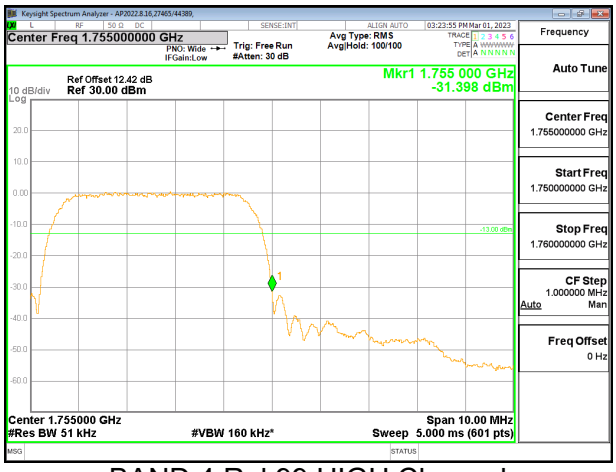
LIMITS

FCC: §27.53(h)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

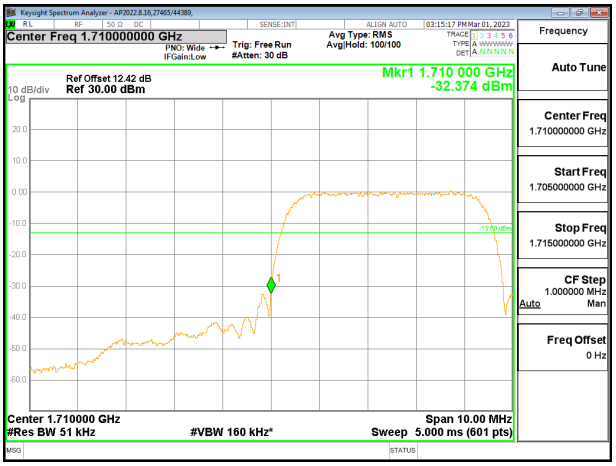
Test Engineer ID:	27465/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR



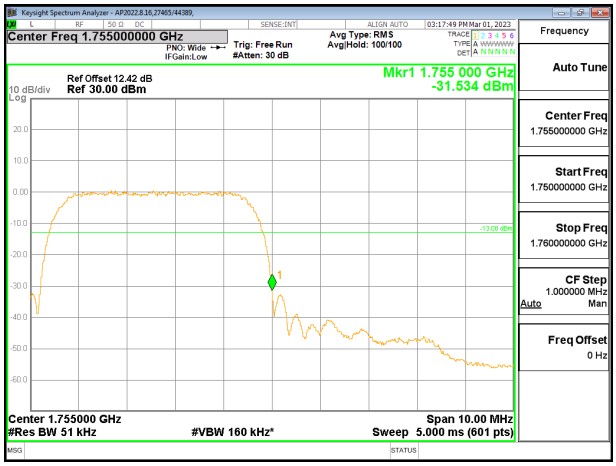
BAND 4 Rel 99 LOW Channel



BAND 4 Rel 99 HIGH Channel



BAND 4 HSDPA LOW Channel



BAND 4 HSDPA HIGH Channel

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9.2.5. LTE2

LIMITS

FCC: §24.238
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Test Engineer ID:	84740/44389	Test Date:	2023-02-28	EUT Serial Number:	QV7700ADFR

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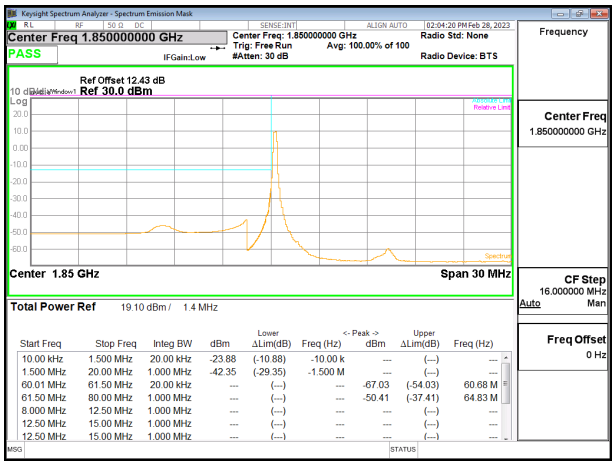
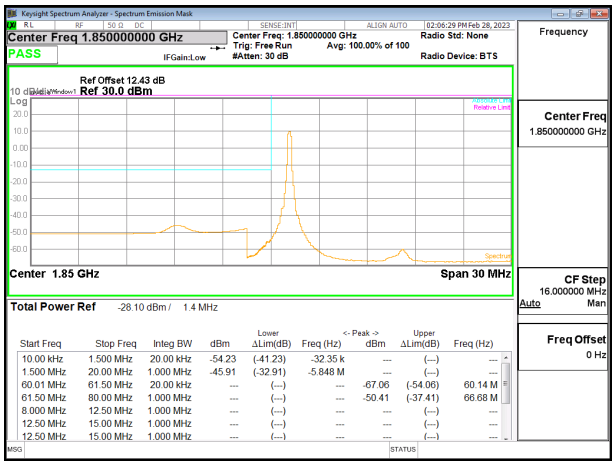
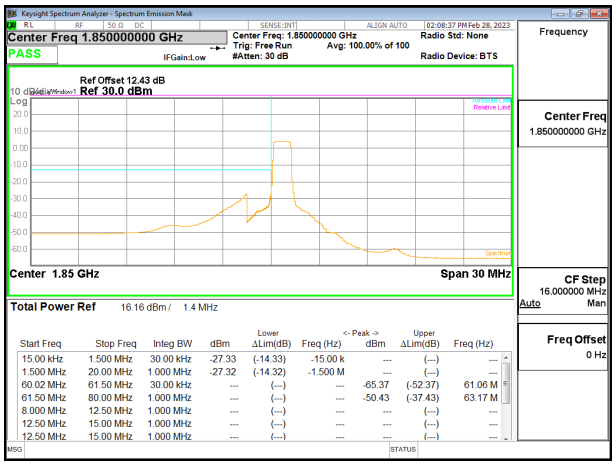


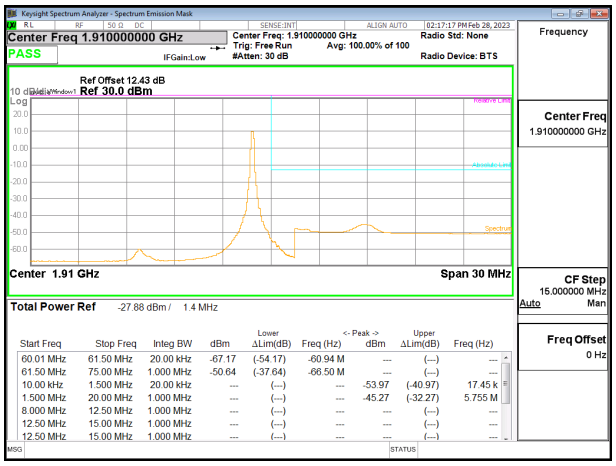
LTE2 1.4MHz QPSK LOW Ch RB1-0



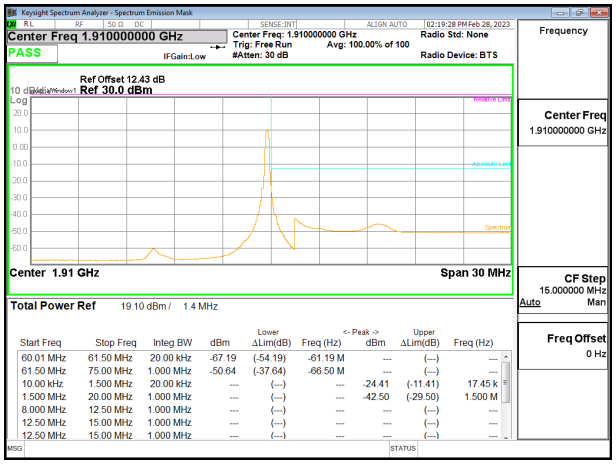
LTE2 1.4MHz QPSK LOW Ch RB1-5



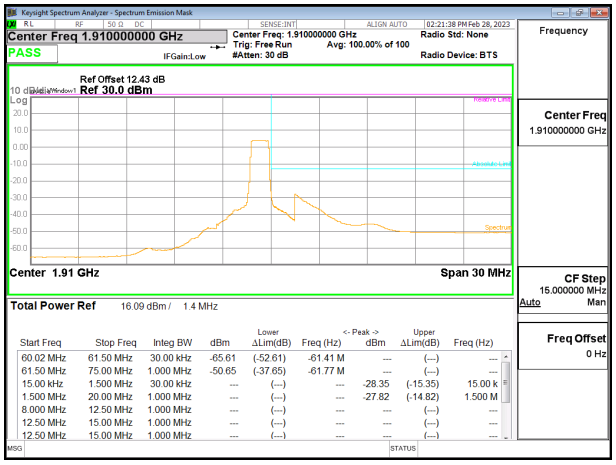
LTE2 1.4MHz QPSK LOW Ch RB6-0



LTE2 1.4MHz QPSK HIGH Ch RB1-0



LTE2 1.4MHz QPSK HIGH Ch RB1-5



LTE2 1.4MHz QPSK HIGH Ch RB6-0

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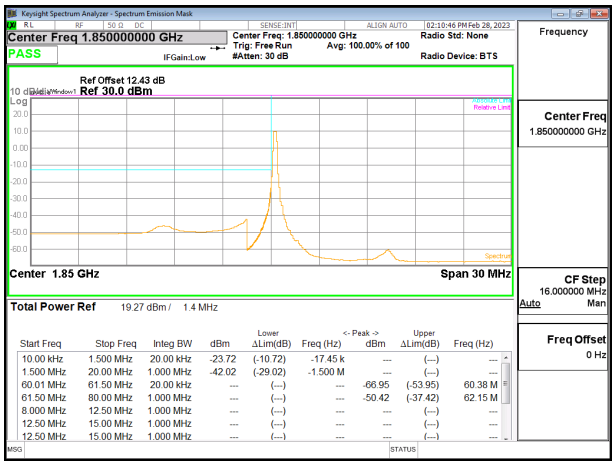
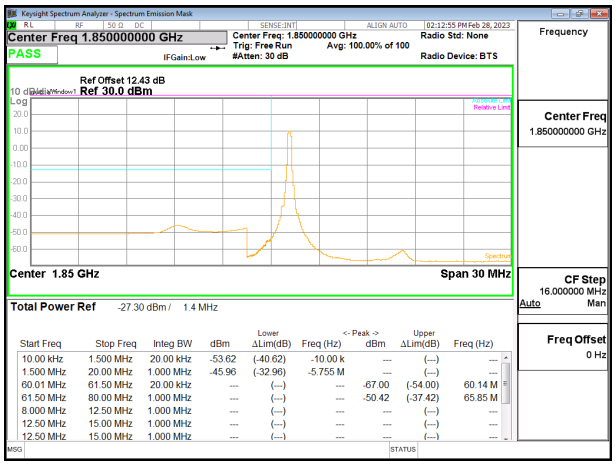
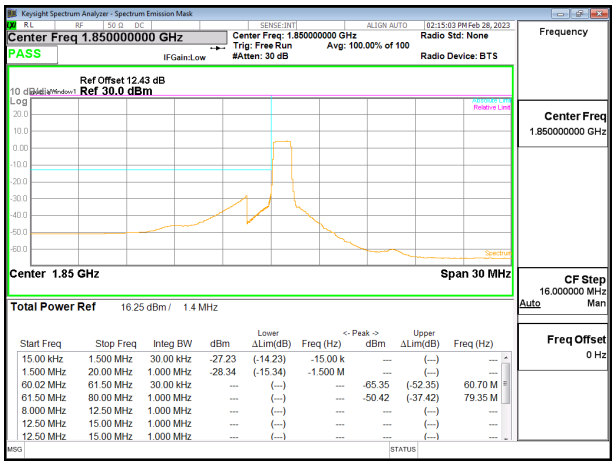


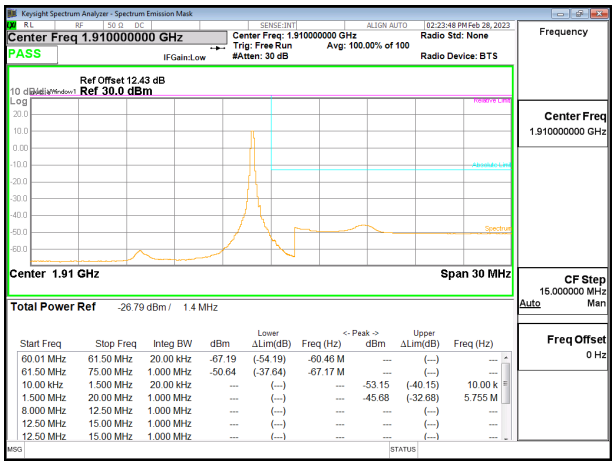
LTE2 1.4MHz 16QAM LOW Ch RB1-0



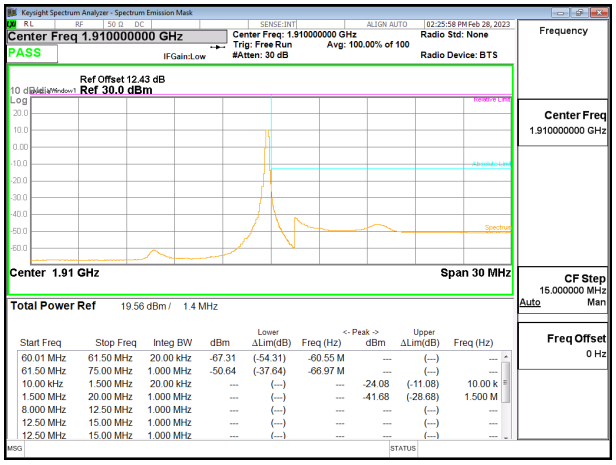
LTE2 1.4MHz 16QAM LOW Ch RB1-5



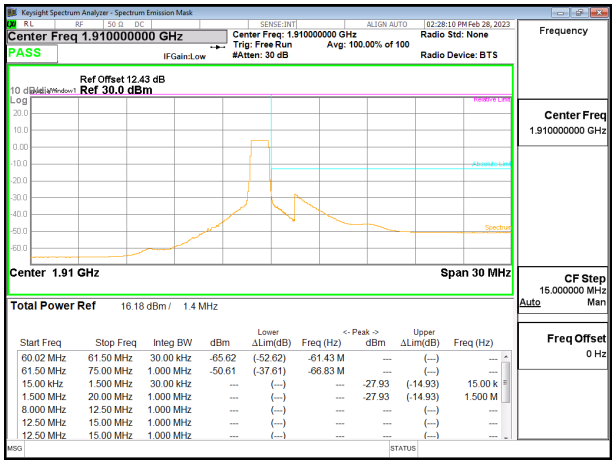
LTE2 1.4MHz 16QAM LOW Ch RB6-0



LTE2 1.4MHz 16QAM HIGH Ch RB1-0



LTE2 1.4MHz 16QAM HIGH Ch RB1-5



LTE2 1.4MHz 16QAM HIGH Ch RB6-0

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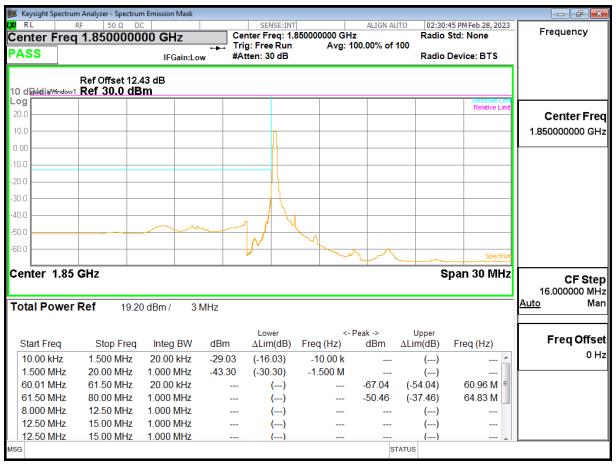
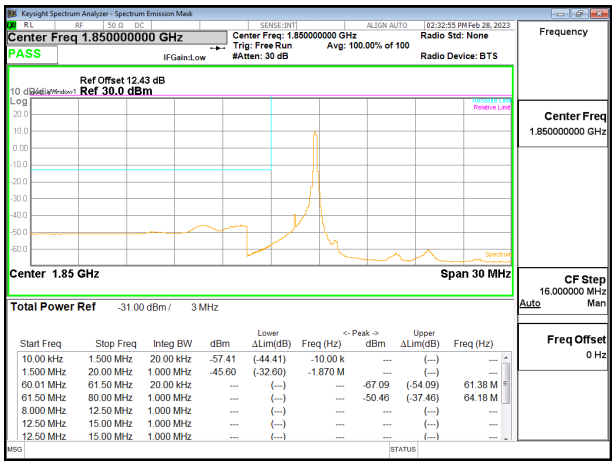
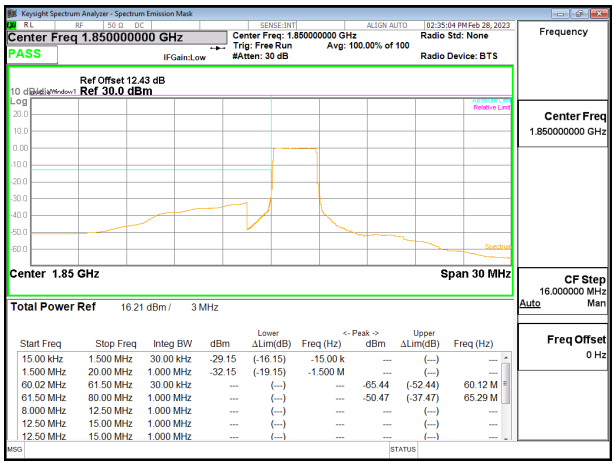


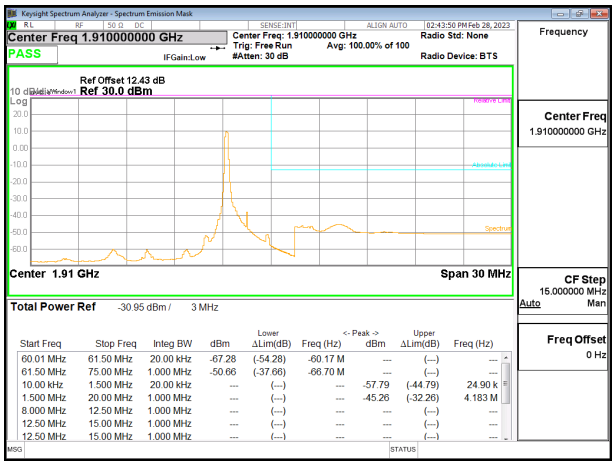
LTE2 3MHz QPSK LOW Ch RB1-0



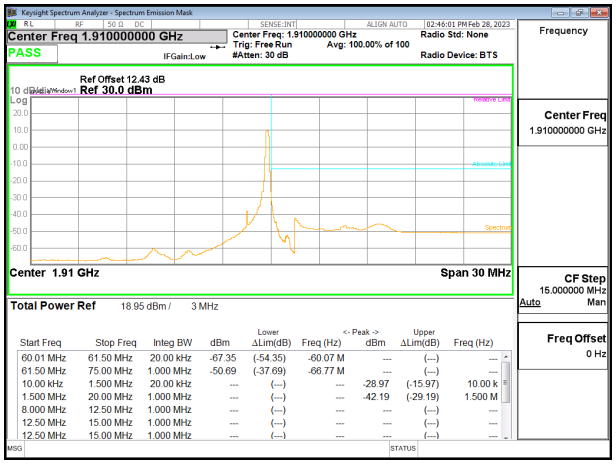
LTE2 3MHz QPSK LOW Ch RB1-14



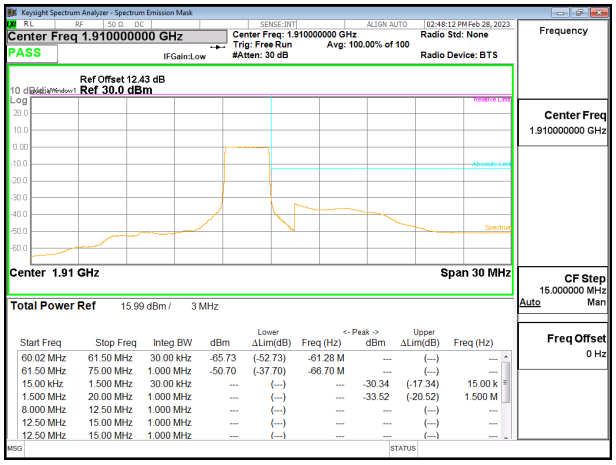
LTE2 3MHz QPSK LOW Ch RB15-0



LTE2 3MHz QPSK HIGH Ch RB1-0



LTE2 3MHz QPSK HIGH Ch RB1-14



LTE2 3MHz QPSK HIGH Ch RB15-0

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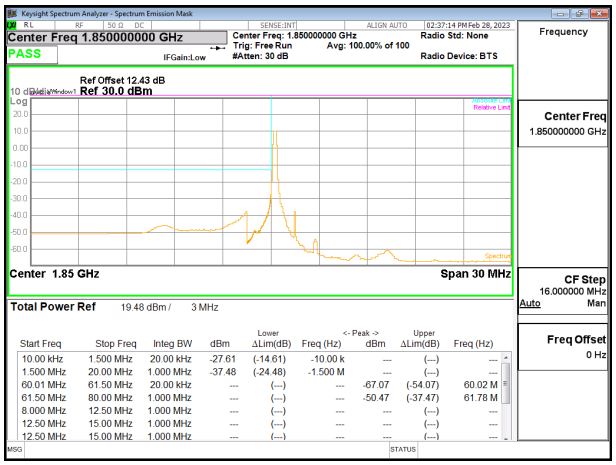
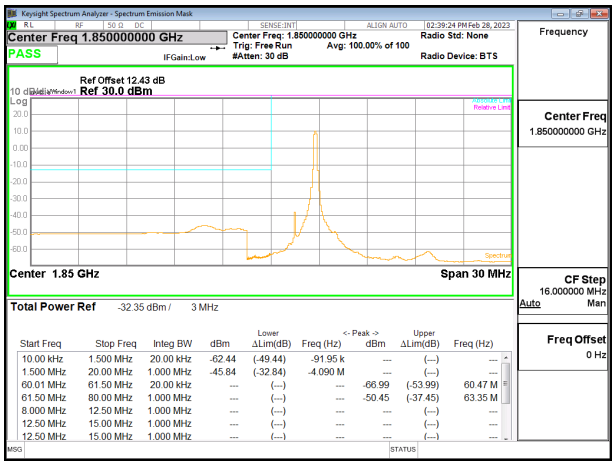
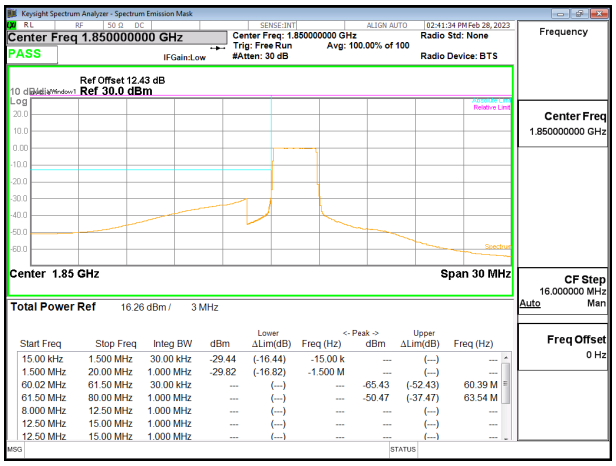


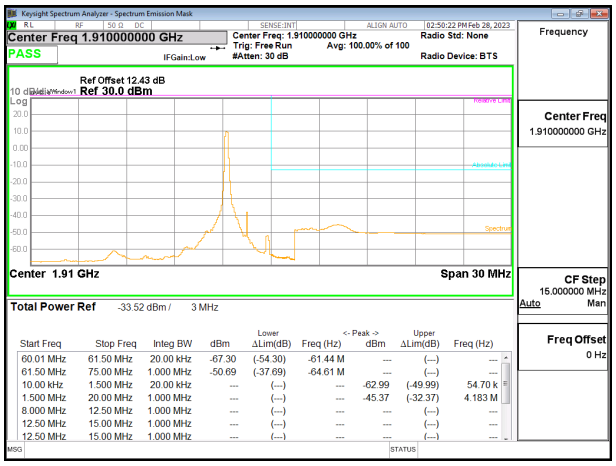
LTE2 3MHz 16QAM LOW Ch RB1-0



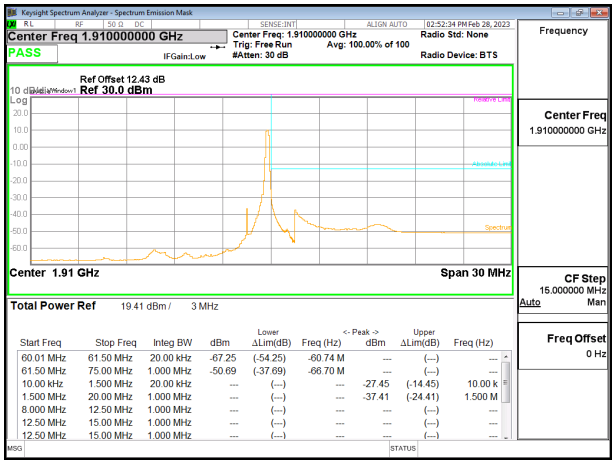
LTE2 3MHz 16QAM LOW Ch RB1-14



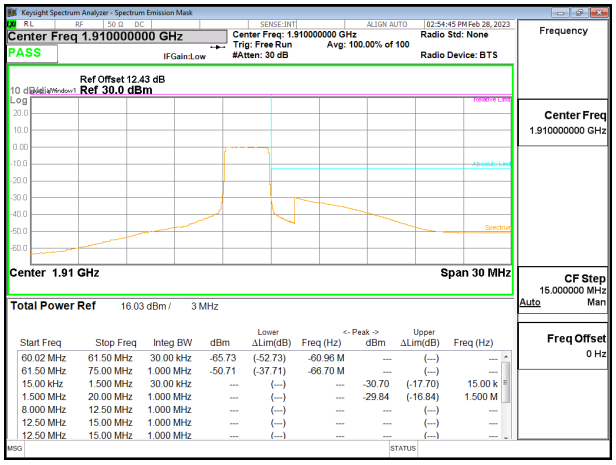
LTE2 3MHz 16QAM LOW Ch RB15-0



LTE2 3MHz 16QAM HIGH Ch RB1-0



LTE2 3MHz 16QAM HIGH Ch RB1-14



LTE2 3MHz 16QAM HIGH Ch RB15-0

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