

TEST REPORT

Report Number: R15175160-E1

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

FCC ID : PY7-27433F

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:
2024-04-12

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Revision History

Rev.	Issue Date	Revisions	Revised By
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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:

QV77004EL3, QV7700BLLD, QV7700CDLD

SAMPLE RECEIPT DATE:

2024-02-19

DATE TESTED:

2024-03-27 to 2024-04-11

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC CFR 47 Part 2, Part 22, 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.

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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 6.4)
2. EUT Cable loss (see section 8)
3. Supported bands, bandwidths, modulations, power settings, and MPR configurations. (section 6.5)

Requirement Description	Band	Requirement Clause Number (FCC)	Result	Remarks
Effective Radiated Power	5	22.913 (a)(5)	Complies	N/A
	12	27.50 (c) (10)	Complies	N/A
	13	27.50 (b) (10)	Complies	N/A
	17	27.50 (c) (10)	Complies	N/A
Equivalent Isotropic Radiated Power	2, 25	24.232 (c)	Complies	N/A
	4, 66	27.50 (d) (4)	Complies	N/A
	41	27.50 (h) (2)	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, 22.917 (a), 24.238 (a), 27.53 (h), 27.53 (m)(4) & (m)(6), 27.53 (g), 27.53 (c) (f),	Complies	N/A
Out of Band Emissions		Complies	N/A
Frequency Stability	2.1055, 22.355, 24.235, 27.54	Complies	N/A
Peak-to-Average Ratio	22.913 (d), 24.232(d), 27.50(d)(5),	Complies	N/A
Field Strength of Spurious Radiation	2.1051, 22.917 (a), 24.238 (a), 27.53 (h), 27.53 (m)(4) & (m)(6), 27.53 (g), 27.53 (c) (f),	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 22, 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. This test report covers the WWAN radio portion of the EUT.

The EUT supports the following WWAN Bands and their antenna configurations:

WWAN Bands	Main 1 Antenna	Main 2 Antenna
GSM1900, WCDMA2, LTE Band 2	-	Y
WCDMA4, LTE Band 4	-	Y
GSM850, WCDMA5, LTE Band 5	Y	-
LTE Band 12	Y	-
LTE Band 13	Y	-
LTE Band 17	Y	-
LTE Band 25	-	Y
LTE Band 41	-	Y
LTE Band 66	-	Y

6.2. MAXIMUM OUTPUT POWER

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015

KDB 971168 D01 Section 5.6

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

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

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

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

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

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

GSM MODES

Part 22 850MHz								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824.2-848.8	GPRS	33.10	-5.31	7.0	25.64	0.366	245.71	246KGXW
	EGPRS	27.60			20.14	0.103	252.4	252KG7W
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	28.20	-3.49	2.0	24.71	0.296	240.77	241KGXW
	EGPRS	26.30			22.81	0.191	245.74	246KG7W

WCDMA MODE**Part 22 Band 5**

Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
826.4-846.6	REL 99	22.53	-5.31	7.0	15.07	0.032	4141.3	4M14F9W
	HSUPA	21.57			14.11	0.026	4140.3	4M14F9W

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	-3.49	2.0	15.31	0.034	4153.3	4M15F9W
	HSDPA	18.68			15.19	0.033	4172.8	4M17F9W

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	20.53	-2.88	1.0	17.65	0.058	4177.1	4M18F9W
	HSUPA	20.46			17.58	0.057	4150.1	4M15F9W

LTE BAND 5

Part 22H								
ERP Limit (W)		7.00						
Antenna Gain (dBi)		-5.31						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	824.7	848.3	21.29	13.83	0.024	1093.8	1M09G7W
	64QAM			21.65	14.19	0.026	1102.4	1M10D7W
3.0	QPSK	825.5	847.5	21.40	13.94	0.025	2705.3	2M71G7W
	16QAM			21.82	14.36	0.027	2706.5	2M71D7W
5.0	QPSK	826.5	846.5	21.43	13.97	0.025	4495.8	4M50G7W
	16QAM			21.79	14.33	0.027	4469.1	4M47D7W
10.0	QPSK	829.0	844.0	21.35	13.89	0.024	8970.4	8M97G7W
	16QAM			21.69	14.23	0.026	8982.9	8M98D7W

LTE BAND 12

Part 27								
ERP Limit (W)		3.00						
Antenna Gain (dBi)		-5.15						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	699.7	715.3	21.08	13.78	0.024	1091	1M09G7W
	16QAM			21.40	14.10	0.026	1097	1M10D7W
3.0	QPSK	700.5	714.5	21.16	13.86	0.024	2709.7	2M71G7W
	16QAM			21.47	14.17	0.026	2706.8	2M71D7W
5.0	QPSK	701.5	713.5	21.16	13.86	0.024	4504.5	4M50G7W
	16QAM			21.50	14.20	0.026	4491.6	4M49D7W
10.0	QPSK	704.0	711.0	21.14	13.84	0.024	8975.2	8M98G7W
	64QAM			21.39	14.09	0.026	8967.9	8M97D7W

LTE BAND 13

Part 27								
ERP Limit (W)		3.00						
Antenna Gain (dBi)		-4.52						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	779.5	784.5	21.27	14.60	0.029	4502.4	4M50G7W
	16QAM			21.36	14.69	0.029	4509	4M51D7W
10.0	QPSK	782.0	782.0	21.01	14.34	0.027	8957.9	8M96G7W
	64QAM			21.25	14.58	0.029	8966.4	8M97D7W

LTE BAND 25

Part 24								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		-3.49						
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	1914.3	18.08	14.59	0.029	1092.6	1M09G7W
	64QAM			18.43	14.94	0.031	1098.1	1M10D7W
3.0	QPSK	1851.5	1913.5	18.12	14.63	0.029	2703.3	2M70G7W
	16QAM			18.45	14.96	0.031	2706.1	2M71D7W
5.0	QPSK	1852.5	1912.5	18.18	14.69	0.029	4503.5	4M50G7W
	16QAM			18.56	15.07	0.032	4507.6	4M51D7W
10.0	QPSK	1855.0	1910.0	18.16	14.67	0.029	8991.6	8M99G7W
	64QAM			18.42	14.93	0.031	8980.2	8M98D7W
15.0	QPSK	1857.5	1907.5	18.17	14.68	0.029	13463	13M5G7W
	64QAM			18.40	14.91	0.031	13471	13M5D7W
20.0	QPSK	1860.0	1905.0	18.23	14.74	0.030	17945	17M9G7W
	64QAM			18.55	15.06	0.032	17938	17M9D7W

LTE BAND 41

Part 27								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		-1.17						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	2498.5	2687.5	18.51	17.34	0.054	4493.1	4M49G7W
	16QAM			18.64	17.47	0.056	4503.3	4M50D7W
10.0	QPSK	2501.0	2685.0	18.56	17.39	0.055	8974.4	8M97G7W
	16QAM			18.60	17.43	0.055	8979.1	8M98D7W
15.0	QPSK	2503.5	2682.5	18.53	17.36	0.054	13440	13M4G7W
	64QAM			18.57	17.40	0.055	13462	13M5D7W
20.0	QPSK	2506.0	2680.0	18.55	17.38	0.055	17962	18M0G7W
	16QAM			18.62	17.45	0.056	17957	18M0D7W

LTE BAND 66

Part 27								
EIRP Limit (W)		1.00						
Antenna Gain (dBi)		-2.88						
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	20.06	17.18	0.052	1087.5	1M09G7W
	64QAM			20.41	17.53	0.057	1094.9	1M09D7W
3.0	QPSK	1711.5	1778.5	20.12	17.24	0.053	2705.4	2M71G7W
	64QAM			20.41	17.53	0.057	2710.5	2M71D7W
5.0	QPSK	1712.5	1777.5	20.09	17.21	0.053	4491.6	4M49G7W
	16QAM			20.47	17.59	0.057	4505.5	4M51D7W
10.0	QPSK	1715.0	1775.0	20.01	17.13	0.052	8986.2	8M99G7W
	64QAM			20.31	17.43	0.055	8979.1	8M98D7W
15.0	QPSK	1717.5	1772.5	19.99	17.11	0.051	13482	13M5G7W
	16QAM			20.28	17.40	0.055	13478	13M5D7W
20.0	QPSK	1720.0	1770.0	20.03	17.15	0.052	17947	17M9G7W
	64QAM			20.41	17.53	0.057	17932	17M9D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.555 for conducted samples and 0.553 for radiated samples.

6.4. 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)
LTE Band 5, WCDMA V, GSM850	824 – 849	-5.31	-
LTE Band 12/17	699 – 716	-5.15	-
LTE Band 13	777 – 787	-4.52	-
LTE Band 2/25, WCDMA2, GSM1900	1850 - 1915	-	-3.49
LTE Band 41	2496 – 2690	-	-1.17
LTE Band 4/66, WCDMA4	1710 – 1780	-	-2.88

6.5. WORST-CASE CONFIGURATION AND MODE

LTE Band 2 (1850-1910MHz) is covered by LTE Band 25 because it is a subset of LTE band 25 and they have same output power and supported bandwidths.

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

LTE Band 17 (704-716MHz, 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 an engineering evaluation made on conducted average power on different modulations found during pretesting. Output power measurements were measured on GPRS and EGPRS for GSM, 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 antennas with lower output power. Only the worst-case conducted antenna port band data is reported. Full Radiated Emissions Testing on each antenna was performed and reported. For testing purposes, test data in section 9 and 10 was set at or above target power for all bands.

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

LTE and 5G NR Bands	Worst-case Antenna port for Conducted output power	Worst-case Modulation for Conducted Output Power as tested
GSM1900 WCDMA 2 LTE BAND 25	Main 2	GPRS (GSM) Rel. 99 (WCDMA) 16QAM (LTE)
GSM850 WCDMA 5 LTE BAND 5	Main 1	GPRS (GSM) Rel. 99 (WCDMA) 16QAM (LTE)
LTE BAND 12	Main 1	16QAM
LTE BAND 13	Main 1	16QAM
LTE BAND 41	Main 2	16QAM
WCDMA 4 LTE BAND 66	Main 2	Rel. 99 (WCDMA) 16QAM (LTE)

The EUT was investigated in three orthogonal orientations X/Y/Z on both Low Band (Fundamental Below 1GHz) and Mid Band (Fundamental between 1-3GHz) over all antennas to find the worst-case orientation. For Simultaneous Tx scans in which there are two or more F_c ranges with different worst-case orientations, scans were performed in the orientation with the highest output power, and sufficient margin was added to cover other orientations.

The following is the worst-case orientations:

WWAN Bands	Main 1 Antenna	Main 2 Antenna
Low Band ($F_c < 1\text{GHz}$)	Y	-
Mid Band ($1\text{GHz} < F_c < 3\text{GHz}$)	-	X

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

Radiated Emission tests were performed on the lowest order modulation, at the highest BW configuration, at the lowest RB configuration to maximize emissions.

Worst Case emissions from 9kHz-30MHz, 30-1000MHz, 18-26.5GHz, and 26.5GHz-40GHz 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.

Simultaneous transmission was also investigated for various configurations that yielded the highest power, and least separation in frequencies as a worst-case scenario.

The following scans were investigated for simultaneous transmission:

Scan #	Mode	Mode	Mode
1	LTE B66 QPSK, 20M, RB1-49, 1745MHz (Main2)	BT GFSK C0 2441MHz	WLAN UNII-1 11ax HE20 26T RU4 MCS0 5240MHz (CH 48) MIMO
2	LTE B66 QPSK, 20M, RB1-49, 1745MHz [(Main2)	BT GFSK C1 2441MHz	WLAN UNII-1 11ax HE20 26T RU4 MCS0 5240MHz (CH 48) MIMO
3	LTE B66 QPSK, 20M, RB1-49, 1745MHz (Main2)	2442MHz 11g 6Mbps MIMO	-
4	LTE B41 PC3, QPSK, 20M, RB1-49, 2620MHz (Main 2)	WLAN UNII-5 11ax HE40 484T RU65 MCS0 6365MHz (CH 83) MIMO	-
6	LTE B12 QPSK, 10M, RB1-24, 704MHz (Main1)	2462MHz 11g 6Mbps MIMO	-

6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adaptor	Sony	XQZ-UC1	3223W09206247	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 R15175160-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 - 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				
208721	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2023-06-06	2024-06-06
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					
226552	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2024-03-01	2025-03-01
226562	SMA Coaxial 20dB Attenuator 25MHz-18GHz	CentricRF	C18S2-20	2024-03-01	2025-03-01
226559	SMA Coaxial 10dB Attenuator 25MHz-18GHz	CentricRF	C18S2-10	2024-03-01	2025-03-01
Cables					
CBL034	SMA Cable	Sucoflex	104PEA	2023-11-29	2024-11-29
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
CBL246259	SMA Male to SMA Male Cable – 24"	Pasternack	PE336-24	2024-03-19	2025-03-19
CBL010 245309	SMA Male to SMA Male Cable - 36"	Huber+Suhner	Sucoflex 104PEA	2023-02-17 2024-03-01	2024-02-29 2025-03-01
Couplers					
238020	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2023-07-12	2024-07-12
238018	Ultra-Wideband Directional Coupler 0.5-18GHz	Mini-Circuits	ZUDC10-183+	2023-07-13	2024-07-13

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
	1-18 GHz				
135143	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2024-02-07	2026-02-07
	18-40 GHz				
204704	Horn Antenna, 18-26.5GHz	Com-Power	AH-826	2023-07-20	2025-07-20
204705	Horn Antenna, 26-40GHz	Com-Power	AH-640	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
91979	Gain-loss string: 1-18GHz	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
212967	Wideband Radio Communications Tester	Rohde and Schwarz	CMW500	2024-01-03	2025-01-03
PS216	AC Power Source	Elgar	CW2501M	NA	NA
150716 (LPF008)	DC-1000MHz low-pass filter	Pasternack	PE8720	2024-03-04	2025-03-04
77412 (BRF001)	900MHz notch filter, 2W, Fhigh =6GHz	Micro-Tronics	BRM50706	2024-03-04	2025-03-04
198917	1GHz high-pass filter, 2W, Fhigh =18GHz	Micro-Tronics	HPM18129-02	2024-03-01	2025-03-01
169107 (BRF009)	1.8-2.0GHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50707-01	2024-03-01	2025-03-01
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 4)

Equip. ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
	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				
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
231408 (BRF011)	2.495-2.690GHz notch filter, 2W, Fhigh = 18GHz	Micro-Tronics	BRM50709-01	2024-03-01	2025-03-01
169106 (BRF008)	1710-1785MHz notch filter, 2W, Fhigh = 9GHz	Micro-Tronics	BRM50713-01	2024-03-01	2025-03-01
207620	Wideband Radio Communications Tester	Anritsu	MT8821C	2022-07-03	2023-07-03
PS216	AC Power Source	Elgar	CW2501M	NA	NA

NOTES:

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

8. RF OUTPUT POWER VERIFICATION

8.1. GSM

Using CMW500 Communication Test Set

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

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

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

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

RESULT**8.1.1. GSM850**

Test Engineer ID:	22797/85502	Test Date:	4/1/2024	Sample SN:	QV77004EL3
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pwr	Frame Pwr	Burst Pwr	Frame Pwr
GPRS/EDGE (GMSK)	CS1	1	128	824.2	33.1	24.1	33.5	24.5
			190	836.6	32.8	23.7		
			251	848.8	32.7	23.7		
		2	128	824.2	29.6	23.6	30.5	24.5
			190	836.6	29.5	23.5		
			251	848.8	29.8	23.8		
		3	128	824.2	27.8	23.6	28.7	24.4
			190	836.6	27.9	23.6		
			251	848.8	27.8	23.6		
		4	128	824.2	26.5	23.4	27.5	24.5
			190	836.6	26.8	23.8		
			251	848.8	26.8	23.8		
EDGE (8PSK)	MCS5	1	128	824.2	27.4	18.4	28.0	19.0
			190	836.6	27.5	18.5		
			251	848.8	27.6	18.5		
		2	128	824.2	24.2	18.2	25.0	19.0
			190	836.6	24.3	18.3		
			251	848.8	24.3	18.3		
		3	128	824.2	22.4	18.1	23.2	18.9
			190	836.6	22.4	18.2		
			251	848.8	22.5	18.2		
		4	128	824.2	21.2	18.2	22.0	19.0
			190	836.6	21.3	18.3		
			251	848.8	21.4	18.3		

8.1.2. GSM850 DTM

Test Engineer ID:	22797/85502	Test Date:	4/1/2024 4/5/2024	Sample SN:	QV77004EL3
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)							
					Measured				Tune-up Limit			
					CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr	CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr
GSM (Voice) + GPRS/EDGE (GMSK)	CS1	1	128	824.2	33.1		24.1		33.5		24.5	
			190	836.6	32.8		23.7					
			251	848.8	32.7		23.7					
		2	128	824.2	29.6	29.3	23.6	23.2	30.5	30.5	24.5	24.5
			190	836.6	29.5	28.9	23.5	22.9				
			251	848.8	29.8	29.2	23.8	23.1				
		3	128	824.2	27.8	27.2	23.6	22.9	28.7	28.7	24.4	24.4
			190	836.6	27.9	27.3	23.6	23.1				
			251	848.8	27.8	27.1	23.6	22.9				
GSM (Voice) + EDGE (8PSK)	MCS5	1	128	824.2	33.1		24.1		33.5		24.5	
			190	836.6	32.8		23.7					
			251	848.8	32.7		23.7					
		2	128	824.2	29.6	24.0	23.6	18.0	30.5	25.0	24.5	19.0
			190	836.6	29.5	23.5	23.5	17.5				
			251	848.8	29.8	23.8	23.8	17.8				
		3	128	824.2	27.8	21.2	23.6	16.9	28.7	23.2	24.4	18.9
			190	836.6	27.9	22.0	23.6	17.7				
			251	848.8	27.8	22.0	23.6	17.8				

8.1.3. GSM1900

Test Engineer ID:	22797/85502	Test Date:	4/1/2024	Sample SN:	QV77004EL3
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)			
					Measured		Tune-up Limit	
					Burst Pw r	Frame Pw r	Burst Pw r	Frame Pw r
GPRS/EDGE (GMSK)	CS1	1	512	1850.2	27.6	18.6	29.0	20.0
			661	1880.0	27.4	18.4		
			810	1909.8	28.2	19.1		
		2	512	1850.2	24.9	18.8	26.0	20.0
			661	1880.0	24.9	18.8		
			810	1909.8	25.4	19.3		
		3	512	1850.2	23.1	18.8	24.2	19.9
			661	1880.0	23.2	19.0		
			810	1909.8	23.6	19.4		
		4	512	1850.2	21.8	18.8	23.0	20.0
			661	1880.0	22.1	19.0		
			810	1909.8	22.6	19.6		
EDGE (8PSK)	MCS5	1	512	1850.2	25.8	16.8	27.0	18.0
			661	1880.0	26.0	16.9		
			810	1909.8	26.3	17.3		
		2	512	1850.2	23.2	17.1	24.0	18.0
			661	1880.0	23.2	17.2		
			810	1909.8	23.7	17.7		
		3	512	1850.2	21.4	17.1	22.2	17.9
			661	1880.0	21.7	17.5		
			810	1909.8	22.2	17.9		
		4	512	1850.2	19.9	16.9	21.0	18.0
			661	1880.0	20.3	17.3		
			810	1909.8	20.8	17.8		

8.1.4. GSM1900 DTM

Test Engineer ID:	22797/85502	Test Date:	4/1/2024	Sample SN:	QV77004EL3
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Maximum Average Power (dBm)							
					Measured				Tune-up Limit			
					CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr	CS Burst Pwr	PS Burst Pwr	CS Frame Pwr	PS Frame Pwr
GSM (Voice) + GPRS/EDGE (GMSK)	CS1	1	512	1850.2	27.6		18.6		29.0		20.0	
			661	1880.0	27.4		18.4					
			810	1909.8	28.2		19.1					
		2	512	1850.2	24.9	24.4	18.8	18.4	26.0	26.0	20.0	20.0
			661	1880.0	24.9	24.5	18.8	18.4				
			810	1909.8	25.4	24.8	19.3	18.8				
		3	512	1850.2	23.1	24.1	18.8	19.8	24.2	24.2	19.9	19.9
			661	1880.0	23.2	22.2	19.0	17.9				
			810	1909.8	23.6	22.8	19.4	18.5				
GSM (Voice) + EDGE (8PSK)	MCS5	1	512	1850.2	27.6		18.6		29.0		20.0	
			661	1880.0	27.4		18.4					
			810	1909.8	28.2		19.1					
		2	512	1850.2	24.9	22.4	18.8	16.3	26.0	24.0	20.0	18.0
			661	1880.0	24.9	22.4	18.8	16.4				
			810	1909.8	25.4	23.0	19.3	16.9				
		3	512	1850.2	23.1	20.2	18.8	16.0	24.2	22.2	19.9	17.9
			661	1880.0	23.2	20.4	19.0	16.2				
			810	1909.8	23.6	20.8	19.4	16.5				

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 $\geq$ RBW $\geq$ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

REL 99

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

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

HSDPA REL 5

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

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

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

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

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

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

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

HSPA REL 6 (HSDPA & HSUPA)

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

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

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

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

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

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

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

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

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

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

8.2.1. WCDMA BAND 2

Test Engineer ID:	33499/84740 22797/85502	Test Date:	3/28/2024 4/5/2024	Sample SN:	QV77004EL3
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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	18.61
			9400	1880.0	N/A	18.63
			9538	1907.6	N/A	18.80
	HSDPA	Subtest 1	9262	1852.4	0	18.01
			9400	1880.0	0	18.42
			9538	1907.6	0	18.68
		Subtest 2	9262	1852.4	0	17.56
			9400	1880.0	0	17.63
			9538	1907.6	0	17.81
		Subtest 3	9262	1852.4	0.5	17.14
			9400	1880.0	0.5	17.13
			9538	1907.6	0.5	17.30
		Subtest 4	9262	1852.4	0.5	17.11
			9400	1880.0	0.5	17.14
			9538	1907.6	0.5	17.32
	HSPA (HSDPA & HSUPA)	Subtest 1	9262	1852.4	0	18.31
			9400	1880.0	0	18.22
			9538	1907.6	0	18.61
		Subtest 2	9262	1852.4	2	16.48
			9400	1880.0	2	16.37
			9538	1907.6	2	16.54
		Subtest 3	9262	1852.4	1	17.51
			9400	1880.0	1	17.43
			9538	1907.6	1	17.66
		Subtest 4	9262	1852.4	2	16.49
			9400	1880.0	2	16.44
			9538	1907.6	2	16.67
		Subtest 5	9262	1852.4	0	18.45
			9400	1880.0	0	18.45
			9538	1907.6	0	18.67
	DC-HSDPA	Subtest 1	9262	1852.4	0	17.60
			9400	1880.0	0	17.63
			9538	1907.6	0	17.82
		Subtest 2	9262	1852.4	0	17.58
			9400	1880.0	0	17.62
			9538	1907.6	0	17.85
		Subtest 3	9262	1852.4	0.5	17.86
			9400	1880.0	0.5	17.15
			9538	1907.6	0.5	17.35
		Subtest 4	9262	1852.4	0.5	17.13
			9400	1880.0	0.5	17.15

8.2.2. WCDMA BAND 4

Test Engineer ID:	33499/84740 22797/85502	Test Date:	3/28/2024 4/5/2024	Sample SN:	QV77004EL3
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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	20.40
			1413	1732.6	N/A	20.47
			1513	1752.6	N/A	20.53
	HSDPA	Subtest 1	1312	1712.4	0	20.11
			1413	1732.6	0	20.46
			1513	1752.6	0	20.00
		Subtest 2	1312	1712.4	0	19.42
			1413	1732.6	0	19.48
			1513	1752.6	0	19.53
		Subtest 3	1312	1712.4	0.5	18.91
			1413	1732.6	0.5	18.98
			1513	1752.6	0.5	19.05
		Subtest 4	1312	1712.4	0.5	18.94
			1413	1732.6	0.5	18.97
			1513	1752.6	0.5	19.03
	HSPA (HSDPA & HSUPA)	Subtest 1	1312	1712.4	0	20.39
			1413	1732.6	0	20.34
			1513	1752.6	0	20.37
		Subtest 2	1312	1712.4	2	18.50
			1413	1732.6	2	18.36
			1513	1752.6	2	18.93
		Subtest 3	1312	1712.4	1	19.53
			1413	1732.6	1	19.38
			1513	1752.6	1	19.39
		Subtest 4	1312	1712.4	2	18.41
			1413	1732.6	2	18.36
			1513	1752.6	2	18.37
		Subtest 5	1312	1712.4	0	20.38
			1413	1732.6	0	20.39
			1513	1752.6	0	20.42
	DC-HSDPA	Subtest 1	1312	1712.4	0	19.49
			1413	1732.6	0	19.59
			1513	1752.6	0	19.58
		Subtest 2	1312	1712.4	0	19.47
			1413	1732.6	0	19.52
			1513	1752.6	0	19.62
		Subtest 3	1312	1712.4	0.5	18.99
			1413	1732.6	0.5	19.05
			1513	1752.6	0.5	19.09
		Subtest 4	1312	1712.4	0.5	19.01
			1413	1732.6	0.5	19.08
			1513	1752.6	0.5	19.11

8.2.3. WCDMA BAND 5

Test Engineer ID:	33499/84740	Test Date:	3/28/2024	Sample SN:	QV7700BLLD
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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)
						ANT 1
W-CDMA Band 5 (850MHz)	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	22.51
			4183	836.6	N/A	22.49
			4233	846.6	N/A	22.53
	HSDPA	Subtest 1	4132	826.4	0	21.50
			4183	836.6	0	21.51
			4233	846.6	0	21.53
		Subtest 2	4132	826.4	0	21.51
			4183	836.6	0	21.51
			4233	846.6	0	21.57
		Subtest 3	4132	826.4	0.5	21.01
			4183	836.6	0.5	21.02
			4233	846.6	0.5	21.04
		Subtest 4	4132	826.4	0.5	20.99
			4183	836.6	0.5	21.00
			4233	846.6	0.5	21.03
	HSPA (HSDPA & HSUPA)	Subtest 1	4132	826.4	0	21.44
			4183	836.6	0	21.47
			4233	846.6	0	21.35
		Subtest 2	4132	826.4	2	19.44
			4183	836.6	2	19.43
			4233	846.6	2	19.33
		Subtest 3	4132	826.4	1	20.29
			4183	836.6	1	20.42
			4233	846.6	1	20.31
		Subtest 4	4132	826.4	2	19.55
			4183	836.6	2	19.46
			4233	846.6	2	19.32
		Subtest 5	4132	826.4	0	21.46
			4183	836.6	0	21.45
			4233	846.6	0	21.33
	DC-HSDPA	Subtest 1	4132	826.4	0	21.49
			4183	836.6	0	21.51
			4233	846.6	0	21.52
		Subtest 2	4132	826.4	0	21.52
			4183	836.6	0	21.52
			4233	846.6	0	21.52
		Subtest 3	4132	826.4	0.5	21.01
			4183	836.6	0.5	20.99
			4233	846.6	0.5	21.02
		Subtest 4	4132	826.4	0.5	20.99
			4183	836.6	0.5	20.99
			4233	846.6	0.5	21.04

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 TS 36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS 36.101.

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

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

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

The allowed MPR for SRS, PUCCH formats 0, 1, 3 and 4, and PRACH shall be as specified for QPSK modulated DFTs-OFDM of equivalent RB allocation. The allowed MPR for PUCCH format 2 shall be as specified for QPSK modulated CP-OFDM of equivalent RB allocation.

Table 6.2.2.3-1: Maximum power reduction (MPR) for power class 3

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

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

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

AVERAGE OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

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

PEAK OUTPUT POWER TEST PROCEDURE

The transmitter output is connected to a power meter.

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

RESULTS

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

8.3.1. LTE BAND 5

Test Engineer ID:	33499/84740	Test Date:	3/27/2024	Sample SN:	QV7700BLLD
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OUTPUT POWER FOR LTE BAND 5 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20407	20525	20643
				824.7 MHz	836.5 MHz	848.3 MHz
1.4	QPSK	1	0	21.20	21.28	21.21
		1	3	21.17	21.27	21.16
		1	5	21.18	21.29	21.22
		3	0	21.15	21.20	21.22
		3	1	21.15	21.19	21.17
		3	3	21.16	21.24	21.17
		6	0	21.19	21.22	21.24
	16QAM	1	0	21.54	21.54	21.46
		1	3	21.57	21.50	21.41
		1	5	21.55	21.60	21.47
		3	0	21.32	21.41	21.34
		3	1	21.32	21.40	21.36
		3	3	21.33	21.43	21.38
		6	0	21.29	21.33	21.33
	64QAM	1	0	21.57	21.47	21.57
		1	3	21.57	21.52	21.65
		1	5	21.52	21.50	21.57
		3	0	21.39	21.43	21.43
		3	1	21.37	21.42	21.40
		3	3	21.36	21.47	21.41
		6	0	21.24	21.40	21.34

OUTPUT POWER FOR LTE BAND 5 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20415	20525	20635
				825.5 MHz	836.5 MHz	847.5 MHz
3.0	QPSK	1	0	21.23	21.28	21.28
		1	7	21.31	21.37	21.38
		1	14	21.24	21.34	21.25
		8	0	21.34	21.34	21.30
		8	4	21.32	21.31	21.30
		8	7	21.33	21.40	21.28
		15	0	21.33	21.31	21.26
	16QAM	1	0	21.59	21.71	21.61
		1	7	21.65	21.82	21.64
		1	14	21.52	21.78	21.55
		8	0	21.37	21.44	21.36
		8	4	21.40	21.41	21.38
		8	7	21.37	21.48	21.37
		15	0	21.33	21.35	21.31
	64QAM	1	0	21.54	21.63	21.49
		1	7	21.60	21.72	21.60
		1	14	21.53	21.65	21.43
		8	0	21.41	21.42	21.39
		8	4	21.42	21.44	21.42
		8	7	21.38	21.51	21.40
		15	0	21.36	21.34	21.34

OUTPUT POWER FOR LTE BAND 5 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	ANT 1		
				Conducted Average (dBm)		
				20425	20525	20625
				826.5 MHz	836.5 MHz	846.5 MHz
5.0	QPSK	1	0	21.33	21.43	21.34
		1	12	21.26	21.33	21.28
		1	24	21.29	21.36	21.32
		12	0	21.30	21.33	21.30
		12	6	21.36	21.32	21.32
		12	11	21.32	21.34	21.32
		25	0	21.28	21.28	21.28
	16QAM	1	0	21.67	21.77	21.79
		1	12	21.63	21.69	21.71
		1	24	21.60	21.72	21.74
		12	0	21.29	21.34	21.45
		12	6	21.39	21.34	21.45
		12	11	21.35	21.41	21.48
		25	0	21.33	21.37	21.28
	64QAM	1	0	21.58	21.61	21.63
		1	12	21.60	21.62	21.72
		1	24	21.58	21.60	21.70
		12	0	21.35	21.41	21.41
		12	6	21.40	21.41	21.46
		12	11	21.36	21.46	21.48
		25	0	21.37	21.36	21.32

OUTPUT POWER FOR LTE BAND 5 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				20450	20525	20600
				829.0 MHz	836.5 MHz	844.0 MHz
10.0	QPSK	1	0	21.26	21.33	21.32
		1	24	21.33	21.32	21.29
		1	49	21.23	21.30	21.27
		25	0	21.29	21.30	21.29
		25	12	21.35	21.31	21.29
		25	24	21.32	21.35	21.33
		50	0	21.32	21.29	21.28
	16QAM	1	0	21.57	21.64	21.69
		1	24	21.45	21.65	21.66
		1	49	21.47	21.69	21.53
		25	0	21.34	21.31	21.33
		25	12	21.43	21.35	21.34
		25	24	21.37	21.38	21.38
		50	0	21.36	21.32	21.28
	64QAM	1	0	21.58	21.62	21.54
		1	24	21.57	21.69	21.55
		1	49	21.53	21.58	21.47
		25	0	21.29	21.35	21.37
		25	12	21.37	21.36	21.33
		25	24	21.34	21.40	21.43
		50	0	21.36	21.33	21.37

8.3.2. LTE BAND 12

Test Engineer ID:	22797/85502	Test Date:	3/28/2024	Sample SN:	QV77004EL3
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OUTPUT POWER FOR LTE BAND 12 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23017	23095	23173
				699.7 MHz	707.5 MHz	715.3 MHz
1.4	QPSK	1	0	21.03	20.99	21.03
		1	3	20.95	21.01	21.03
		1	5	20.98	21.04	21.06
		3	0	21.00	20.97	21.01
		3	1	20.99	20.92	21.04
		3	3	20.98	20.97	21.03
		6	0	21.02	20.98	21.08
	16QAM	1	0	21.22	21.20	21.40
		1	3	21.16	21.25	21.36
		1	5	21.19	21.27	21.34
		3	0	21.14	21.14	21.17
		3	1	21.13	21.08	21.15
		3	3	21.12	21.16	21.18
		6	0	21.09	21.06	21.10
	64QAM	1	0	21.33	21.30	21.37
		1	3	21.27	21.34	21.36
		1	5	21.27	21.34	21.39
		3	0	21.14	21.18	21.20
		3	1	21.16	21.16	21.17
		3	3	21.14	21.17	21.16
		6	0	21.02	21.08	21.11

OUTPUT POWER FOR LTE BAND 12 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23025	23095	23165
				700.5 MHz	707.5 MHz	714.5 MHz
3.0	QPSK	1	0	21.04	21.05	21.10
		1	7	21.15	21.16	21.15
		1	14	21.01	21.00	21.04
		8	0	21.10	21.02	21.08
		8	4	21.10	21.03	21.11
		8	7	21.06	21.02	21.11
		15	0	21.06	21.03	21.11
	16QAM	1	0	21.33	21.40	21.33
		1	7	21.45	21.47	21.44
		1	14	21.27	21.33	21.35
		8	0	21.13	21.09	21.18
		8	4	21.14	21.14	21.18
		8	7	21.15	21.10	21.19
		15	0	21.10	21.06	21.11
	64QAM	1	0	21.31	21.29	21.37
		1	7	21.42	21.43	21.46
		1	14	21.26	21.29	21.31
		8	0	21.20	21.04	21.20
		8	4	21.19	21.08	21.22
		8	7	21.22	21.03	21.25
		15	0	21.12	21.05	21.13

OUTPUT POWER FOR LTE BAND 12 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23035	23095	23155
				701.5 MHz	707.5 MHz	713.5 MHz
5.0	QPSK	1	0	21.12	21.15	21.09
		1	12	21.16	21.16	21.14
		1	24	21.04	21.08	21.13
		12	0	21.03	21.06	21.13
		12	6	21.15	21.06	21.11
		12	11	21.08	21.04	21.11
		25	0	21.06	21.06	21.11
	16QAM	1	0	21.49	21.42	21.42
		1	12	21.50	21.44	21.40
		1	24	21.40	21.42	21.48
		12	0	21.04	21.08	21.24
		12	6	21.12	21.06	21.28
		12	11	21.07	21.02	21.25
		25	0	21.11	21.08	21.14
	64QAM	1	0	21.32	21.42	21.42
		1	12	21.40	21.46	21.41
		1	24	21.26	21.37	21.43
		12	0	21.09	21.06	21.11
		12	6	21.18	21.11	21.12
		12	11	21.13	21.06	21.10
		25	0	21.12	21.08	21.12

OUTPUT POWER FOR LTE BAND 12 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23060	23095	23130
				704.0 MHz	707.5 MHz	711.0 MHz
10.0	QPSK	1	0	21.09	21.00	21.08
		1	24	21.05	21.07	21.06
		1	49	21.06	21.05	21.09
		25	0	21.01	21.06	21.00
		25	12	21.10	21.06	21.13
		25	24	21.09	21.12	21.14
		50	0	21.11	21.02	21.11
	16QAM	1	0	21.30	21.27	21.22
		1	24	21.26	21.27	21.31
		1	49	21.26	21.26	21.23
		25	0	21.07	21.09	21.07
		25	12	21.15	21.09	21.15
		25	24	21.15	21.15	21.16
		50	0	21.13	21.02	21.12
	64QAM	1	0	21.28	21.35	21.38
		1	24	21.32	21.39	21.32
		1	49	21.32	21.38	21.30
		25	0	21.06	21.08	21.04
		25	12	21.15	21.09	21.16
		25	24	21.12	21.14	21.16
		50	0	21.10	21.07	21.14

8.3.3. LTE BAND 13

Test Engineer ID:	22797/85502	Test Date:	3/28/2024	Sample SN:	QV77004EL3
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OUTPUT POWER FOR LTE BAND 13 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				23205	23230	23255
				779.5 MHz	782.0 MHz	784.5 MHz
5.0	QPSK	1	0	21.27	21.01	21.04
		1	12	20.97	21.03	21.10
		1	24	20.99	21.02	21.03
		12	0	20.91	20.94	20.95
		12	6	21.03	21.01	20.95
		12	11	20.97	21.02	20.99
		25	0	20.97	20.92	20.90
	16QAM	1	0	21.33	21.34	21.36
		1	12	21.34	21.33	21.35
		1	24	21.31	21.35	21.35
		12	0	20.90	20.98	21.03
		12	6	21.02	21.00	21.07
		12	11	20.98	21.07	21.08
		25	0	21.00	20.93	20.97
	64QAM	1	0	21.16	21.16	21.23
		1	12	21.18	21.23	21.23
		1	24	21.24	21.22	21.34
		12	0	20.88	20.84	20.98
		12	6	21.02	20.86	21.01
		12	11	20.96	20.88	21.06
		25	0	20.96	20.91	20.90

OUTPUT POWER FOR LTE BAND 13 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				N/A	23230	N/A
				N/A	782.0 MHz	N/A
10.0	QPSK	1	0		20.96	
		1	24		20.99	
		1	49		20.97	
		25	0		20.99	
		25	12		20.98	
		25	24		21.01	
		50	0		20.96	
	16QAM	1	0		21.15	
		1	24		21.17	
		1	49		21.21	
		25	0		20.97	
		25	12		21.01	
		25	24		21.05	
		50	0		20.96	
	64QAM	1	0		21.20	
		1	24		21.25	
		1	49		21.22	
		25	0		20.97	
		25	12		20.95	
		25	24		21.00	
		50	0		20.94	

8.3.4. LTE BAND 25

Test Engineer ID:	22797/85502	Test Date:	04/01/2024	Sample SN:	QV77004EL3
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OUTPUT POWER FOR LTE BAND 25 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				26047	26365	26683
				1850.7 MHz	1882.5 MHz	1914.3 MHz
1.4	QPSK	1	0	18.04	18.00	18.04
		1	3	18.05	17.95	18.03
		1	5	18.05	17.99	18.06
		3	0	18.04	17.95	18.08
		3	1	18.05	17.97	18.02
		3	3	18.05	17.95	18.03
		6	0	18.08	18.00	18.08
	16QAM	1	0	18.29	18.19	18.40
		1	3	18.23	18.22	18.39
		1	5	18.27	18.18	18.39
		3	0	18.15	18.16	18.19
		3	1	18.16	18.15	18.20
		3	3	18.17	18.12	18.18
		6	0	18.14	18.11	18.12
	64QAM	1	0	18.43	18.36	18.29
		1	3	18.40	18.36	18.32
		1	5	18.36	18.32	18.33
		3	0	18.19	18.12	18.18
		3	1	18.20	18.14	18.17
		3	3	18.22	18.18	18.14
		6	0	18.20	18.15	18.11

OUTPUT POWER FOR LTE BAND 25 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				26055	26365	26675
				1851.5 MHz	1882.5 MHz	1913.5 MHz
3.0	QPSK	1	0	18.07	17.98	18.03
		1	8	18.09	18.09	18.12
		1	14	18.02	17.92	18.00
		8	0	18.11	18.04	18.01
		8	4	18.11	18.03	18.03
		8	7	18.10	18.02	18.09
		15	0	18.09	18.01	18.02
	16QAM	1	0	18.36	18.22	18.38
		1	8	18.45	18.38	18.42
		1	14	18.34	18.26	18.31
		8	0	18.14	18.08	18.10
		8	4	18.18	18.08	18.08
		8	7	18.15	18.06	18.17
		15	0	18.09	18.02	18.00
	64QAM	1	0	18.20	18.24	18.19
		1	8	18.38	18.39	18.37
		1	14	18.25	18.25	18.27
		8	0	18.18	18.12	18.11
		8	4	18.15	18.12	18.15
		8	7	18.16	18.15	18.21
		15	0	18.13	18.08	18.04

OUTPUT POWER FOR LTE BAND 25 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				26065	26365	26665
				1852.5 MHz	1882.5 MHz	1912.5 MHz
5.0	QPSK	1	0	18.18	18.07	18.12
		1	12	18.10	17.98	18.07
		1	24	18.17	18.10	18.13
		12	0	18.17	17.98	18.08
		12	7	18.18	18.07	18.14
		12	13	18.11	18.06	18.12
		25	0	18.13	18.02	18.13
	16QAM	1	0	18.45	18.48	18.40
		1	12	18.43	18.32	18.41
		1	24	18.44	18.38	18.56
		12	0	18.21	17.98	18.19
		12	7	18.19	18.05	18.22
		12	13	18.14	18.05	18.19
		25	0	18.10	18.05	18.14
	64QAM	1	0	18.47	18.32	18.33
		1	12	18.38	18.22	18.36
		1	24	18.37	18.25	18.43
		12	0	18.19	18.06	18.04
		12	7	18.17	18.14	18.10
		12	13	18.15	18.12	18.09
		25	0	18.19	18.05	18.14

OUTPUT POWER FOR LTE BAND 25 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				26090	26365	26640
				1855 MHz	1882.5 MHz	1910 MHz
10.0	QPSK	1	0	18.07	17.94	18.08
		1	25	18.14	18.06	18.07
		1	49	18.03	17.97	18.05
		25	0	18.11	17.94	18.06
		25	12	18.14	18.04	18.05
		25	25	18.16	18.06	18.12
		50	0	18.11	18.08	18.06
	16QAM	1	0	18.26	18.14	18.31
		1	25	18.24	18.22	18.30
		1	49	18.23	18.22	18.22
		25	0	18.11	17.93	18.08
		25	12	18.15	18.04	18.09
		25	25	18.15	18.07	18.14
		50	0	18.13	18.04	18.05
	64QAM	1	0	18.27	18.18	18.42
		1	25	18.38	18.30	18.37
		1	49	18.25	18.23	18.33
		25	0	18.18	17.98	18.10
		25	12	18.20	18.09	18.11
		25	25	18.18	18.09	18.13
		50	0	18.20	18.07	18.05

OUTPUT POWER FOR LTE BAND 25 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				26115	26365	26615
				1857.5 MHz	1882.5 MHz	1907.5 MHz
15.0	QPSK	1	0	18.06	17.94	18.10
		1	37	18.06	17.99	18.12
		1	74	18.01	18.08	18.10
		36	0	18.05	17.96	18.08
		36	20	18.14	18.07	18.17
		36	39	18.12	18.10	18.15
		75	0	18.09	18.02	18.12
	16QAM	1	0	18.36	18.14	18.34
		1	37	18.33	18.21	18.35
		1	74	18.21	18.28	18.31
		36	0	18.06	17.96	18.10
		36	20	18.14	18.08	18.18
		36	39	18.12	18.08	18.15
		75	0	18.10	18.03	18.16
	64QAM	1	0	18.39	18.22	18.35
		1	37	18.40	18.28	18.31
		1	74	18.29	18.28	18.26
		36	0	18.09	17.97	18.11
		36	20	18.18	18.11	18.17
		36	39	18.16	18.11	18.15
		75	0	18.15	18.06	18.15

OUTPUT POWER FOR LTE BAND 25 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				26140	26365	26590
				1860 MHz	1882.5 MHz	1905 MHz
20.0	QPSK	1	0	18.06	17.93	18.09
		1	49	18.13	18.03	18.16
		1	99	18.04	18.10	18.09
		50	0	18.11	17.98	18.15
		50	24	18.15	18.11	18.17
		50	50	18.13	18.14	18.23
		100	0	18.10	18.04	18.12
	16QAM	1	0	18.29	18.20	18.42
		1	49	18.29	18.27	18.40
		1	99	18.26	18.30	18.32
		50	0	18.09	18.00	18.16
		50	24	18.16	18.10	18.17
		50	50	18.13	18.15	18.22
		100	0	18.09	18.06	18.10
	64QAM	1	0	18.39	18.30	18.51
		1	49	18.46	18.34	18.55
		1	99	18.40	18.45	18.45
		50	0	18.15	18.05	18.18
		50	24	18.18	18.11	18.13
		50	50	18.14	18.16	18.19
		100	0	18.13	18.11	18.10

8.3.5. LTE BAND 41

Test Engineer ID:	33499/84740	Test Date:	3/27/2024	Sample SN:	QV7700BLLD
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OUTPUT POWER FOR LTE BAND 41 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				39675	40620	41565
				2498.5	2593 MHz	2687.5
5.0	QPSK	1	0	18.42	18.47	18.37
		1	12	18.44	18.50	18.35
		1	24	18.48	18.48	18.24
		12	0	18.49	18.46	18.24
		12	6	18.51	18.47	18.25
		12	11	18.48	18.51	18.27
		25	0	18.46	18.41	18.20
	16QAM	1	0	18.50	18.58	18.30
		1	12	18.56	18.64	18.34
		1	24	18.44	18.53	18.25
		12	0	18.52	18.43	18.27
		12	6	18.56	18.42	18.29
		12	11	18.55	18.48	18.35
		25	0	18.50	18.45	18.27
	64QAM	1	0	18.53	18.51	18.33
		1	12	18.57	18.62	18.37
		1	24	18.50	18.54	18.28
		12	0	18.49	18.50	18.26
		12	6	18.50	18.52	18.27
		12	11	18.49	18.56	18.30
		25	0	18.52	18.46	18.25

OUTPUT POWER FOR LTE BAND 41 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				27900	40620	41540
				2501.0	2593 MHz	2685.0
10.0	QPSK	1	0	18.52	18.45	18.26
		1	24	18.45	18.48	18.37
		1	49	18.45	18.49	18.19
		25	0	18.46	18.43	18.25
		25	12	18.56	18.44	18.35
		25	24	18.51	18.54	18.30
		50	0	18.52	18.42	18.32
	16QAM	1	0	18.56	18.53	18.36
		1	24	18.60	18.58	18.37
		1	49	18.55	18.56	18.34
		25	0	18.47	18.50	18.29
		25	12	18.58	18.51	18.37
		25	24	18.56	18.58	18.35
		50	0	18.54	18.44	18.34
	64QAM	1	0	18.44	18.45	18.41
		1	24	18.53	18.60	18.32
		1	49	18.57	18.51	18.29
		25	0	18.48	18.46	18.34
		25	12	18.59	18.49	18.40
		25	24	18.55	18.54	18.37
		50	0	18.55	18.46	18.39

OUTPUT POWER FOR LTE BAND 41 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				39725	40620	41515
				2503.5	2593 MHz	2682.5
15.0	QPSK	1	0	18.49	18.38	18.34
		1	37	18.49	18.50	18.34
		1	74	18.42	18.43	18.24
		36	0	18.42	18.38	18.28
		36	16	18.53	18.41	18.30
		36	35	18.51	18.47	18.33
		75	0	18.47	18.36	18.23
	16QAM	1	0	18.48	18.36	18.32
		1	37	18.52	18.54	18.40
		1	74	18.53	18.41	18.28
		36	0	18.46	18.43	18.32
		36	16	18.56	18.46	18.31
		36	35	18.55	18.51	18.36
		75	0	18.53	18.41	18.27
	64QAM	1	0	18.50	18.37	18.30
		1	37	18.57	18.53	18.34
		1	74	18.48	18.50	18.22
		36	0	18.47	18.41	18.33
		36	16	18.57	18.45	18.33
		36	35	18.55	18.52	18.36
		75	0	18.54	18.41	18.32

OUTPUT POWER FOR LTE BAND 41 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				39750	40620	41490
				2506 MHz	2593 MHz	2680 MHz
20.0	QPSK	1	0	18.51	18.32	18.32
		1	49	18.49	18.51	18.38
		1	99	18.47	18.36	18.20
		50	0	18.46	18.39	18.34
		50	24	18.55	18.45	18.43
		50	49	18.55	18.51	18.34
		100	0	18.54	18.39	18.33
	16QAM	1	0	18.55	18.44	18.43
		1	49	18.57	18.62	18.47
		1	99	18.58	18.50	18.29
		50	0	18.51	18.42	18.34
		50	24	18.60	18.48	18.43
		50	49	18.58	18.51	18.38
		100	0	18.54	18.42	18.39
	64QAM	1	0	18.50	18.48	18.35
		1	49	18.54	18.61	18.52
		1	99	18.54	18.56	18.32
		50	0	18.48	18.42	18.36
		50	24	18.58	18.45	18.45
		50	49	18.56	18.52	18.38
		100	0	18.53	18.44	18.39

8.3.6. LTE BAND 66

Test Engineer ID:	33499/84740 22797/85502	Test Date:	3/28/2024 4/5/2024	Sample SN:	QV77004EL3
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OUTPUT POWER FOR LTE BAND 66 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				131979	132322	132665
				1710.7 MHz	1745.0 MHz	1779.3 MHz
1.4	QPSK	1	0	19.94	20.04	19.95
		1	3	19.98	20.03	19.90
		1	5	19.94	20.03	19.91
		3	0	19.94	19.99	19.88
		3	1	19.94	20.01	19.85
		3	3	19.92	19.98	19.86
		6	0	19.98	20.06	19.91
	16QAM	1	0	20.08	20.23	20.08
		1	3	20.12	20.22	20.07
		1	5	20.14	20.22	20.07
		3	0	20.03	20.14	20.03
		3	1	20.08	20.13	20.03
		3	3	20.03	20.08	20.03
		6	0	19.95	20.12	20.02
	64QAM	1	0	20.25	20.36	20.26
		1	3	20.27	20.41	20.26
		1	5	20.28	20.32	20.25
		3	0	20.14	20.19	20.11
		3	1	20.16	20.22	20.10
		3	3	20.16	20.20	20.15
		6	0	20.11	20.21	20.04

OUTPUT POWER FOR LTE BAND 66 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				131987	132322	132657
				1711.5 MHz	1745.0 MHz	1778.5 MHz
3.0	QPSK	1	0	19.92	20.03	19.88
		1	7	20.02	20.11	20.05
		1	14	19.93	20.00	19.89
		8	0	20.01	20.07	19.94
		8	4	20.04	20.11	19.96
		8	7	20.04	20.12	19.95
		15	0	20.02	20.09	19.95
	16QAM	1	0	20.09	20.14	20.05
		1	7	20.21	20.23	20.18
		1	14	20.08	20.13	20.07
		8	0	20.09	20.16	20.03
		8	4	20.11	20.19	20.05
		8	7	20.12	20.16	20.02
		15	0	20.04	20.14	20.02
	64QAM	1	0	20.15	20.25	20.17
		1	7	20.36	20.41	20.32
		1	14	20.19	20.32	20.17
		8	0	20.15	20.22	20.14
		8	4	20.18	20.26	20.17
		8	7	20.19	20.28	20.18
		15	0	20.12	20.18	20.09

OUTPUT POWER FOR LTE BAND 66 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				131997	132322	132647
				1712.5 MHz	1745.0 MHz	1777.5 MHz
5.0	QPSK	1	0	19.90	20.05	19.92
		1	12	19.97	20.09	19.94
		1	24	19.91	19.99	19.95
		12	0	19.93	19.92	19.91
		12	6	19.98	20.07	19.96
		12	11	19.99	20.05	19.93
		25	0	19.94	19.92	19.88
	16QAM	1	0	20.36	20.31	20.29
		1	12	20.38	20.41	20.28
		1	24	20.47	20.39	20.33
		12	0	20.04	19.98	20.00
		12	6	20.11	20.11	20.06
		12	11	20.03	20.10	20.03
		25	0	20.00	19.97	19.93
	64QAM	1	0	20.10	20.31	20.31
		1	12	20.24	20.34	20.34
		1	24	20.21	20.30	20.29
		12	0	20.08	19.98	20.01
		12	6	20.13	20.13	20.08
		12	11	20.10	20.07	20.04
		25	0	20.00	19.99	20.01

OUTPUT POWER FOR LTE BAND 66 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1		
				Conducted Average (dBm)		
				132022	132322	132622
				1715.0 MHz	1745.0 MHz	1775.0 MHz
10.0	QPSK	1	0	19.82	19.92	19.87
		1	24	19.99	20.01	19.93
		1	49	19.90	19.92	19.79
		25	0	19.87	19.96	19.94
		25	12	19.97	19.99	19.95
		25	24	20.01	19.96	19.94
		50	0	19.95	19.94	19.93
	16QAM	1	0	19.98	20.17	20.04
		1	24	20.14	20.23	20.08
		1	49	20.09	20.15	20.06
		25	0	19.94	20.00	19.93
		25	12	20.07	20.00	19.96
		25	24	20.06	20.07	19.95
		50	0	19.98	19.98	19.95
	64QAM	1	0	20.12	20.31	20.18
		1	24	20.17	20.31	20.18
		1	49	20.22	20.24	20.10
		25	0	19.91	20.00	20.02
		25	12	20.05	20.03	20.03
		25	24	20.05	20.00	20.02
		50	0	20.00	20.00	20.02

OUTPUT POWER FOR LTE BAND 66 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				132047	132322	132597
				1717.5 MHz	1745.0 MHz	1772.5 MHz
15.0	QPSK	1	0	19.88	19.99	19.92
		1	37	19.98	19.98	19.81
		1	74	19.93	19.95	19.82
		36	0	19.93	19.92	19.93
		36	16	19.99	19.93	19.90
		36	35	19.98	19.94	19.88
		75	0	19.93	19.88	19.84
	16QAM	1	0	20.09	20.26	20.18
		1	37	20.21	20.28	20.09
		1	74	20.18	20.16	20.06
		36	0	19.99	19.96	19.95
		36	16	20.02	19.97	19.95
		36	35	20.03	19.96	19.95
		75	0	20.00	19.95	19.90
	64QAM	1	0	20.13	20.27	20.25
		1	37	20.22	20.27	20.23
		1	74	20.22	20.27	20.22
		36	0	20.03	20.00	20.05
		36	16	20.09	20.02	20.03
		36	35	20.10	20.02	20.01
		75	0	20.05	19.99	19.99

OUTPUT POWER FOR LTE BAND 66 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Main 2		
				Conducted Average (dBm)		
				132072	132322	132572
				1720.0 MHz	1745.0 MHz	1770.0 MHz
20.0	QPSK	1	0	19.82	19.93	19.92
		1	49	19.99	19.94	19.90
		1	99	19.91	19.92	19.86
		50	0	19.88	19.96	19.97
		50	24	20.03	19.96	19.92
		50	49	20.03	19.94	19.79
		100	0	19.98	19.92	19.91
	16QAM	1	0	20.07	20.20	20.25
		1	49	20.24	20.22	20.16
		1	99	20.18	20.21	20.08
		50	0	19.93	19.97	19.97
		50	24	20.06	19.98	19.95
		50	49	20.04	19.99	19.79
		100	0	20.00	19.95	19.91
	64QAM	1	0	20.24	20.36	20.39
		1	49	20.40	20.41	20.33
		1	99	20.30	20.39	20.26
		50	0	19.96	19.99	20.02
		50	24	20.09	20.02	20.01
		50	49	20.05	20.00	19.89
		100	0	20.04	19.98	19.99

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.

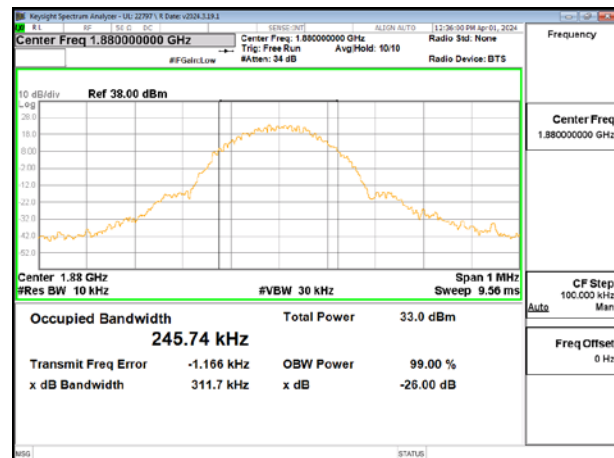
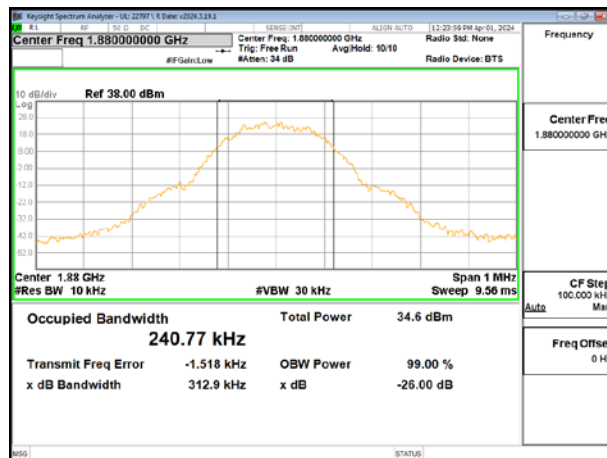
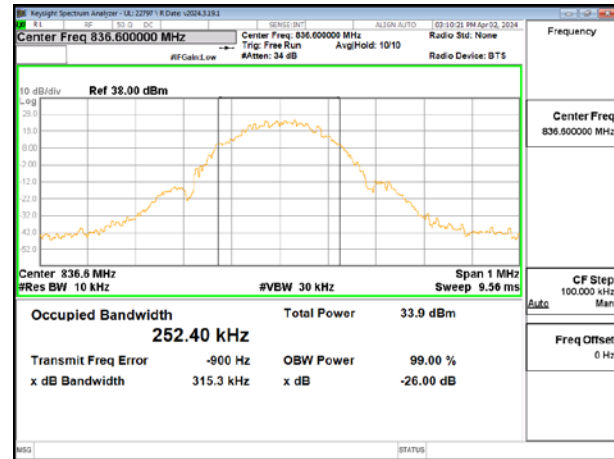
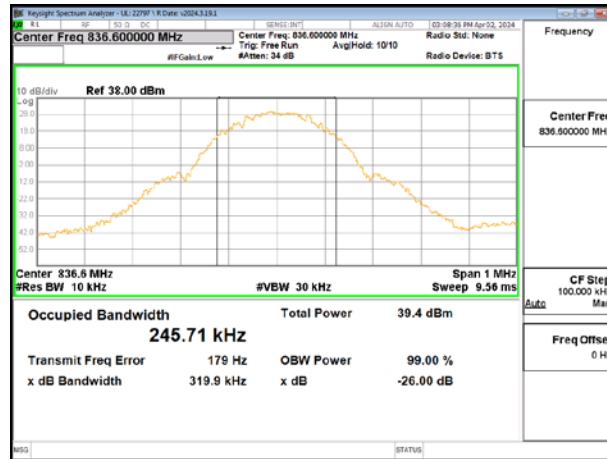
RESULTS

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. GSM

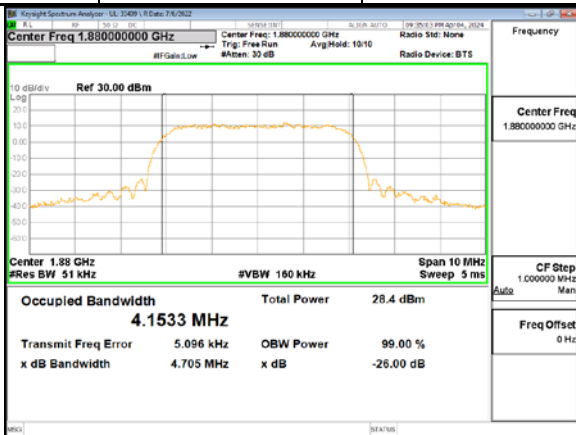
Test Engineer ID:	22797/85502	Test Date:	04-01-24 04-02-24	EUT Serial Number:	QV77004EL3
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Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
GSM850	GPRS	190	836.6	245.71	319.9
	EGPRS			252.4	315.3
GSM1900	GPRS	661	1880.0	240.77	312.9
	EGPRS			245.74	311.7

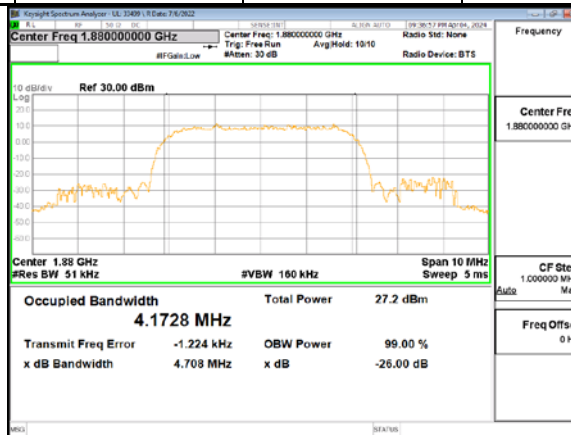


9.1.2. WCDMA

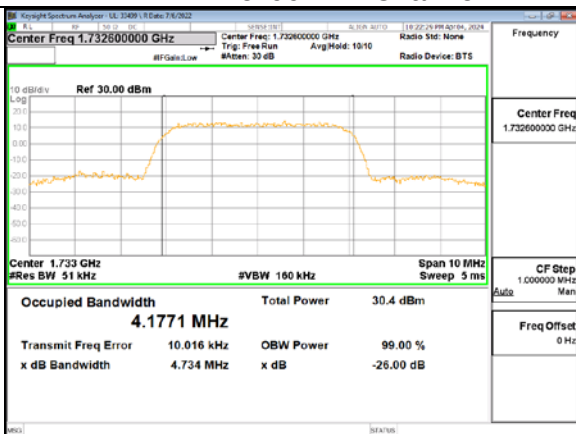
Test Engineer ID:	33499/84740	Test Date:	04-04-24	EUT Serial Number:	QV77004EL3
Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND2	REL 99	9800	1880.0	4.1533	4.705
	HSDPA			4.1728	4.708
BAND4	REL 99	1638	1732.6	4.1771	4.734
	HSDPA			4.1501	4.726
BAND5	REL 99	4408	836.6	4.1413	4.704
	HSDPA			4.1403	4.694



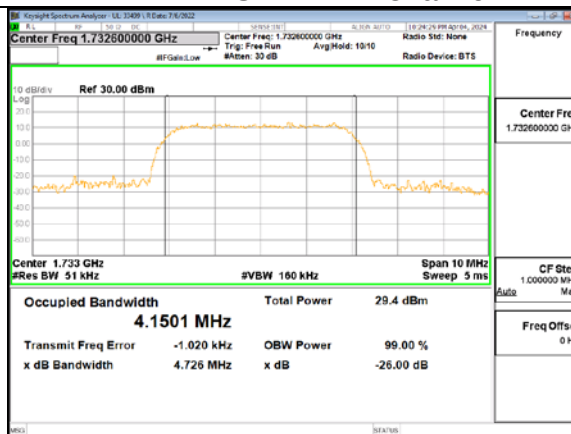
BAND 2 Rel 99 MID Channel



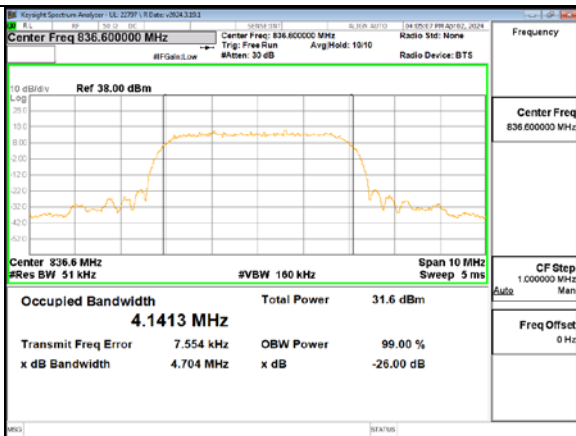
BAND 2 HSDPA MID Channel



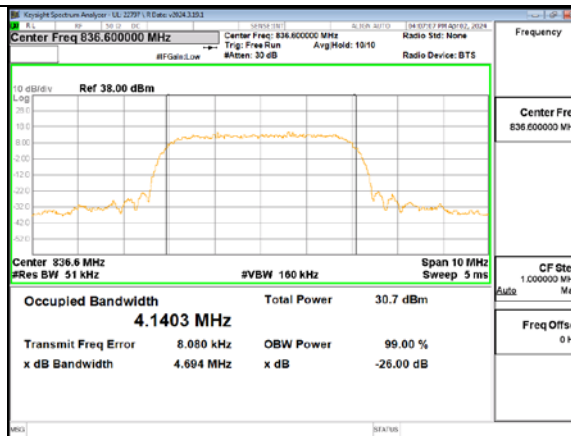
BAND 4 Rel 99 MID Channel



BAND 4 HSDPA MID Channel



BAND 5 Rel 99 MID Channel

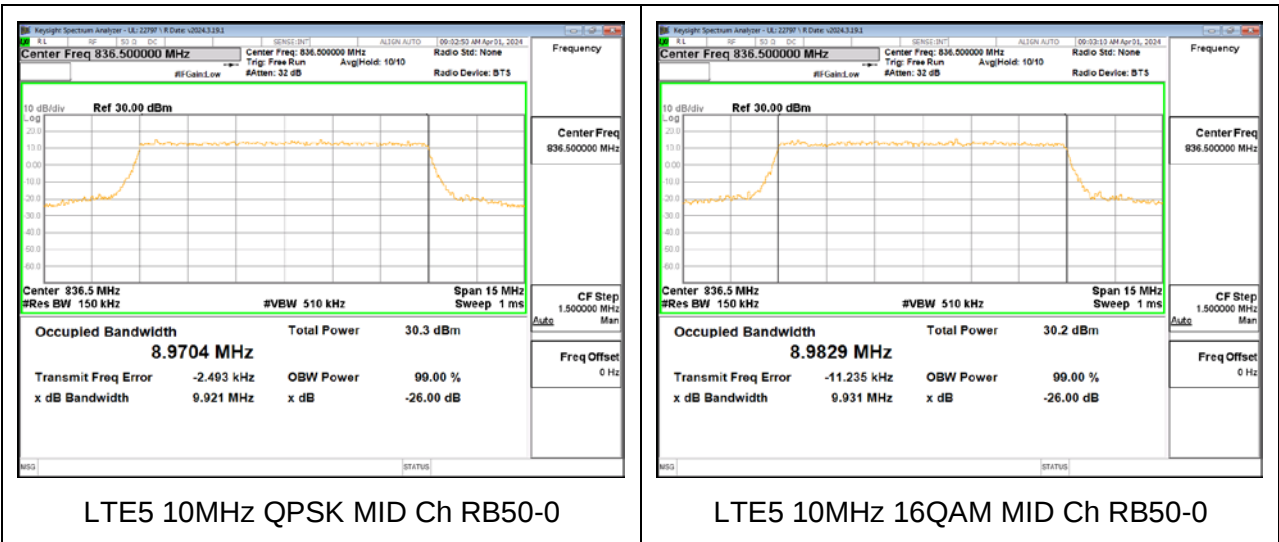


BAND 5 HSDPA MID Channel

9.1.3. LTE5

Test Engineer ID:	22797/85502	Test Date:	04-01-24	Sample SN:	QV77004EL3
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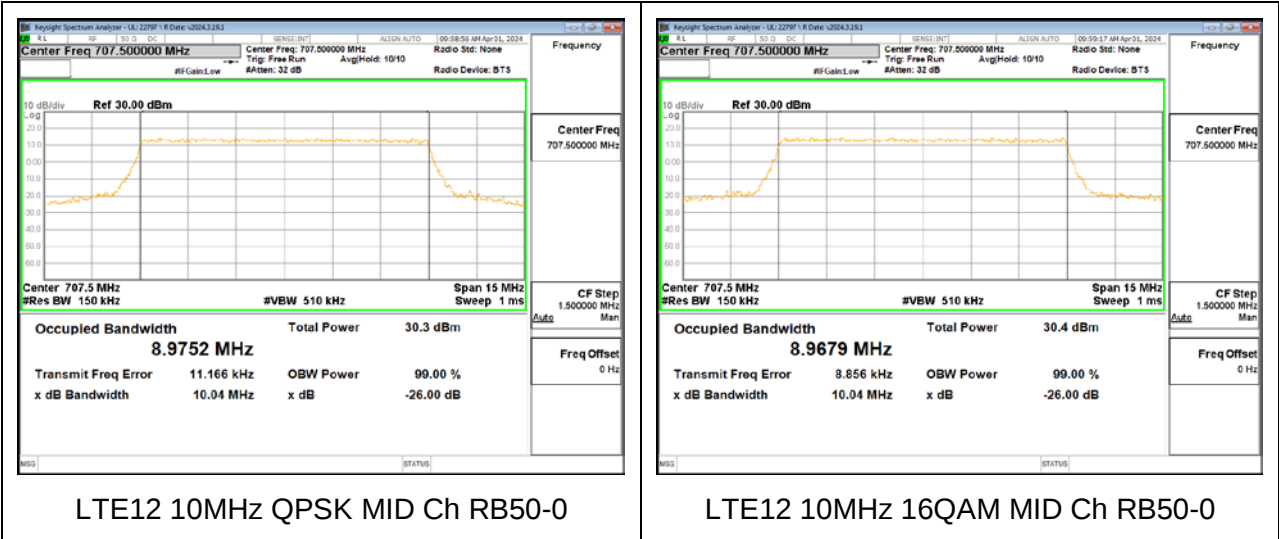
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	1.4MHz, QPSK	6/0	836.5	1.0938	1.369
	1.4MHz, 16QAM			1.1024	1.414
	3MHz, QPSK	15/0		2.7053	3.051
	3MHz, 16QAM			2.7065	3.050
	5MHz, QPSK	25/0		4.4958	5.068
	5MHz, 16QAM			4.4691	4.939
	10MHz, QPSK	50/0		8.9704	9.921
	10MHz, 16QAM			8.9829	9.931



9.1.4. LTE12

Test Engineer ID:	22797/85502	Test Date:	04-01-24	Sample SN:	QV77004EL3
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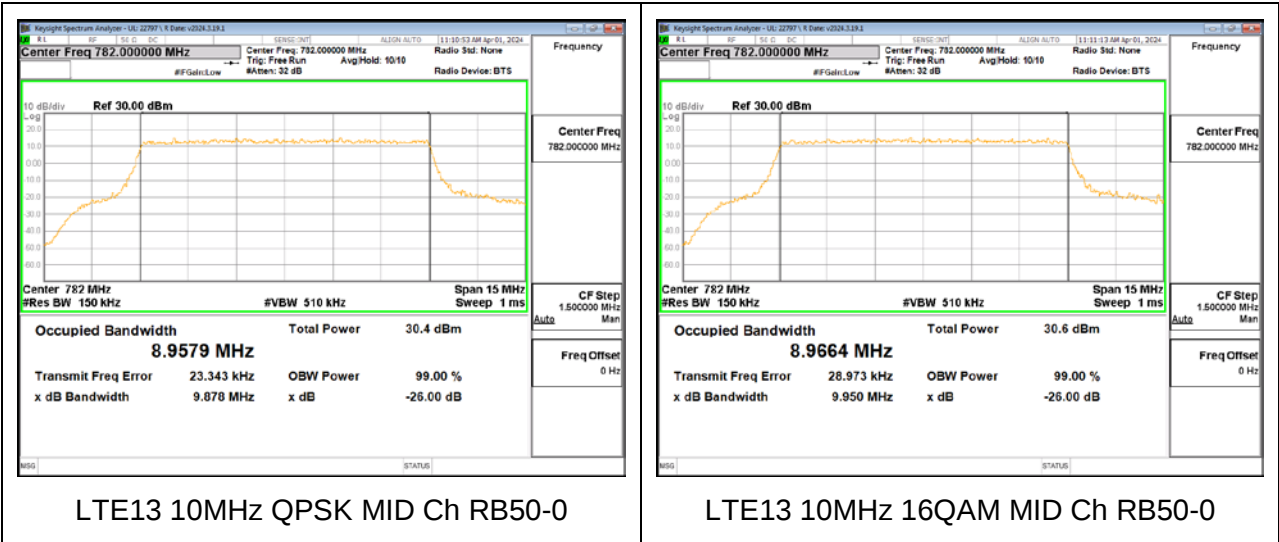
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 12	1.4MHz, QPSK	6/0	707.5	1.0910	1.402
	1.4MHz, 16QAM			1.0970	1.440
	3MHz, QPSK	15/0		2.7097	3.038
	3MHz, 16QAM			2.7068	3.059
	5MHz, QPSK	25/0		4.5045	5.117
	5MHz, 16QAM			4.4916	5.049
	10MHz, QPSK	50/0		8.9752	10.04
	10MHz, 16QAM			8.9679	10.04



9.1.5. LTE13

Test Engineer ID:	22797/85502	Test Date:	04-01-24	Sample SN:	QV77004EL3
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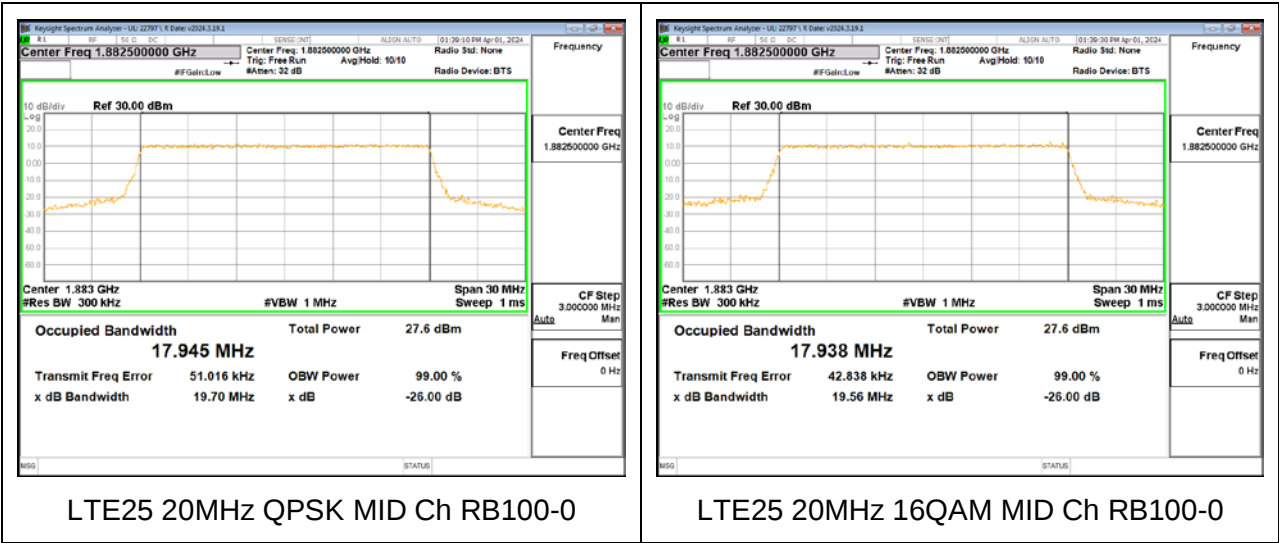
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 13	5MHz, QPSK	25/0	782	4.5024	5.100
	5MHz, 16QAM			4.509	5.119
	10MHz, QPSK	50/0		8.9579	9.878
	10MHz, 16QAM			8.9664	9.950



9.1.6. LTE25

Test Engineer ID:	22797/85502	Test Date:	04-01-24	Sample SN:	QV77004EL3
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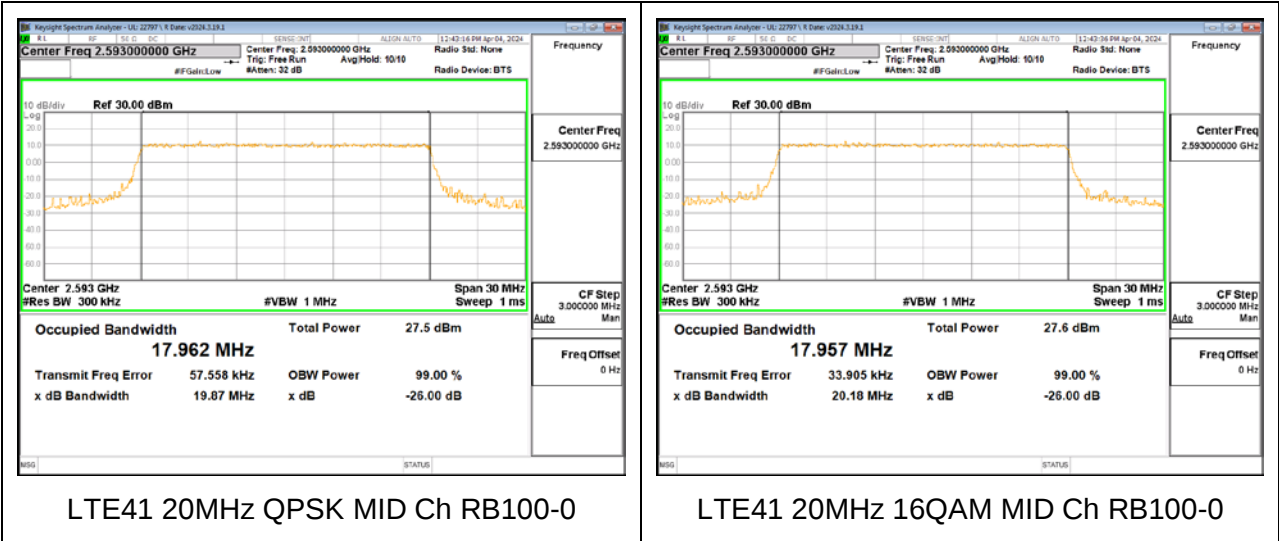
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 25	1.4MHz, QPSK	6/0	1882.5	1.0926	1.340
	1.4MHz, 16QAM			1.0981	1.465
	3MHz, QPSK	15/0		2.7033	3.036
	3MHz, 16QAM			2.7061	3.116
	5MHz, QPSK	25/0		4.5035	5.174
	5MHz, 16QAM			4.5076	5.163
	10MHz, QPSK	50/0		8.9916	9.922
	10MHz, 16QAM			8.9802	9.948
	15MHz, QPSK	75/0		13.463	15.00
	15MHz, 16QAM			13.471	14.73
	20MHz, QPSK	100/0		17.945	19.70
	20MHz, 16QAM			17.938	19.56



9.1.7. LTE41

Test Engineer ID:	22797/85502	Test Date:	04-04-24	Sample SN:	QV77004EL3
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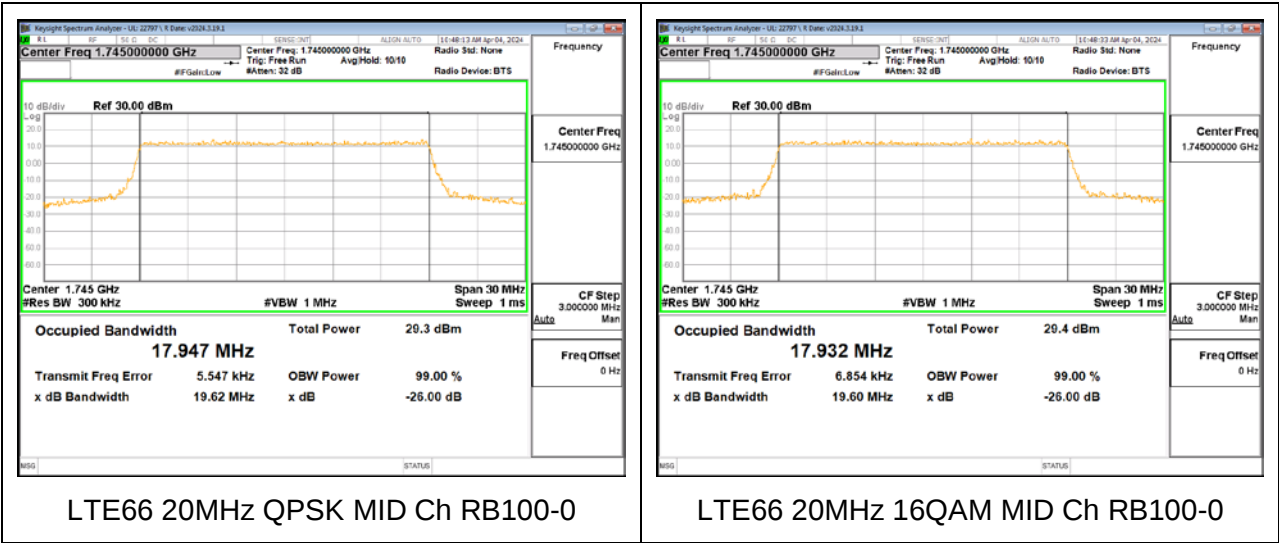
Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 41	5MHz, QPSK	25/0	2593.0	4.4931	5.084
	5MHz, 16QAM			4.5033	5.115
	10MHz, QPSK	50/0		8.9744	9.926
	10MHz, 16QAM			8.9791	9.961
	15MHz, QPSK	75/0		13.440	15.65
	15MHz, 16QAM			13.462	15.04
	20MHz, QPSK	100/0		17.962	19.87
	20MHz, 16QAM			17.957	20.18



9.1.8. LTE66

Test Engineer ID:	22797/85502	Test Date:	04-04-24	Sample SN:	QV77004EL3
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Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 66	1.4MHz, QPSK	6/0	1745.0	1.0875	1.360
	1.4MHz, 16QAM			1.0949	1.350
	3MHz, QPSK	15/0		2.7054	3.030
	3MHz, 16QAM			2.7105	3.074
	5MHz, QPSK	25/0		4.4916	5.093
	5MHz, 16QAM			4.5055	5.120
	10MHz, QPSK	50/0		8.9862	9.975
	10MHz, 16QAM			8.9791	9.951
	15MHz, QPSK	75/0		13.482	14.80
	15MHz, 16QAM			13.478	14.79
	20MHz, QPSK	100/0		17.947	19.62
	20MHz, 16QAM			17.932	19.60



9.2. OUT OF BAND EMISSIONS

LIMITS

FCC: §22.917 (a), 24.238 (a), 27.53 (h), 27.53 (m)(4) & (m)(6), 27.53 (g)

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts.

FCC: §27.53 (c), (f)

The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log (P)$ dB where transmitting power (P) in Watts. The band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotopically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

Note: Radiated data in section 9.1.6 confirms a compliance for the emissions in GPS 1559 - 1610 MHz band were wideband emissions therefore the -40 dBm / MHz limit was used.

TEST PROCEDURE

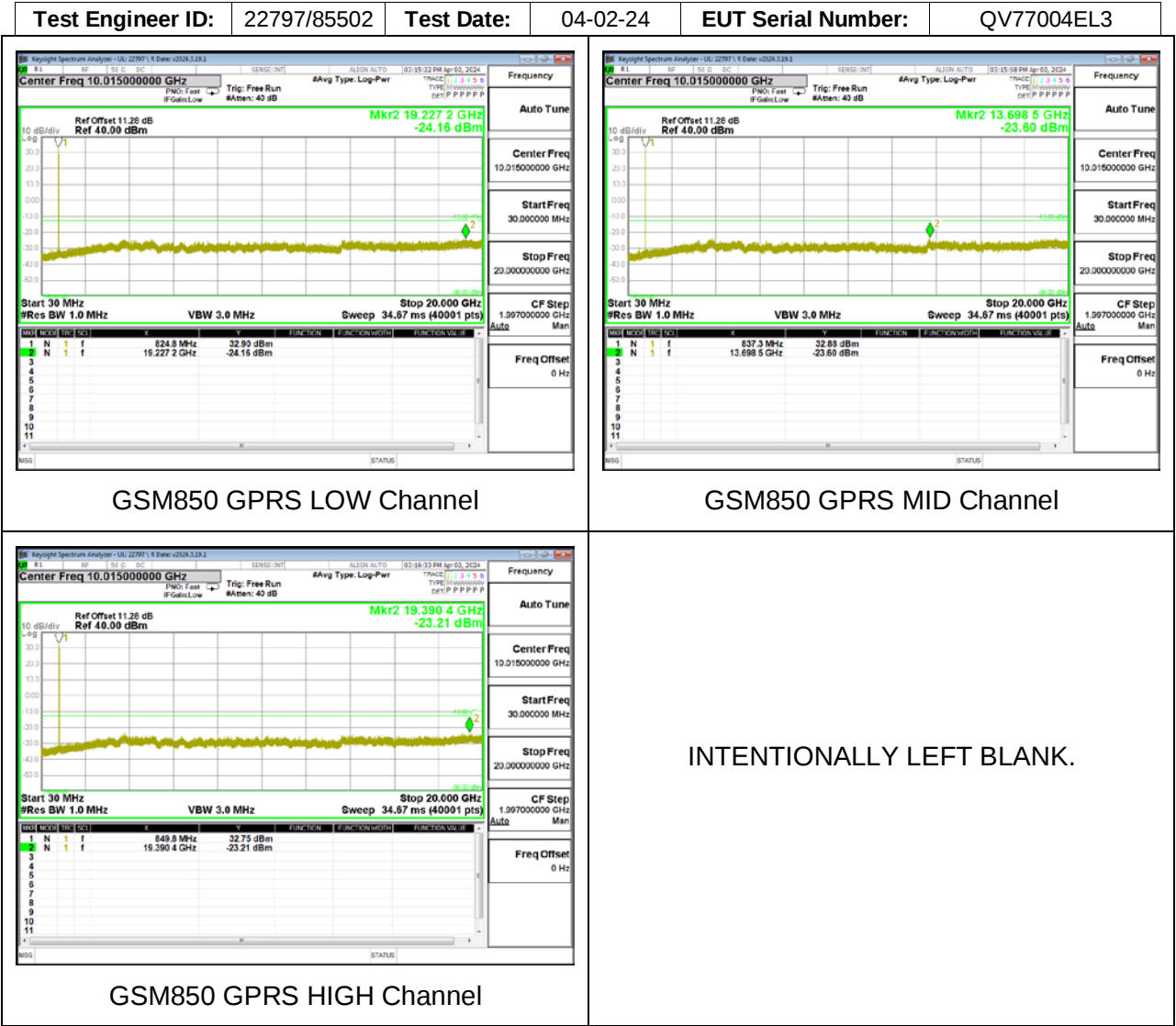
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case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

For each out of band emissions measurement:

- (i) Set display line at -13 dBm, -25 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

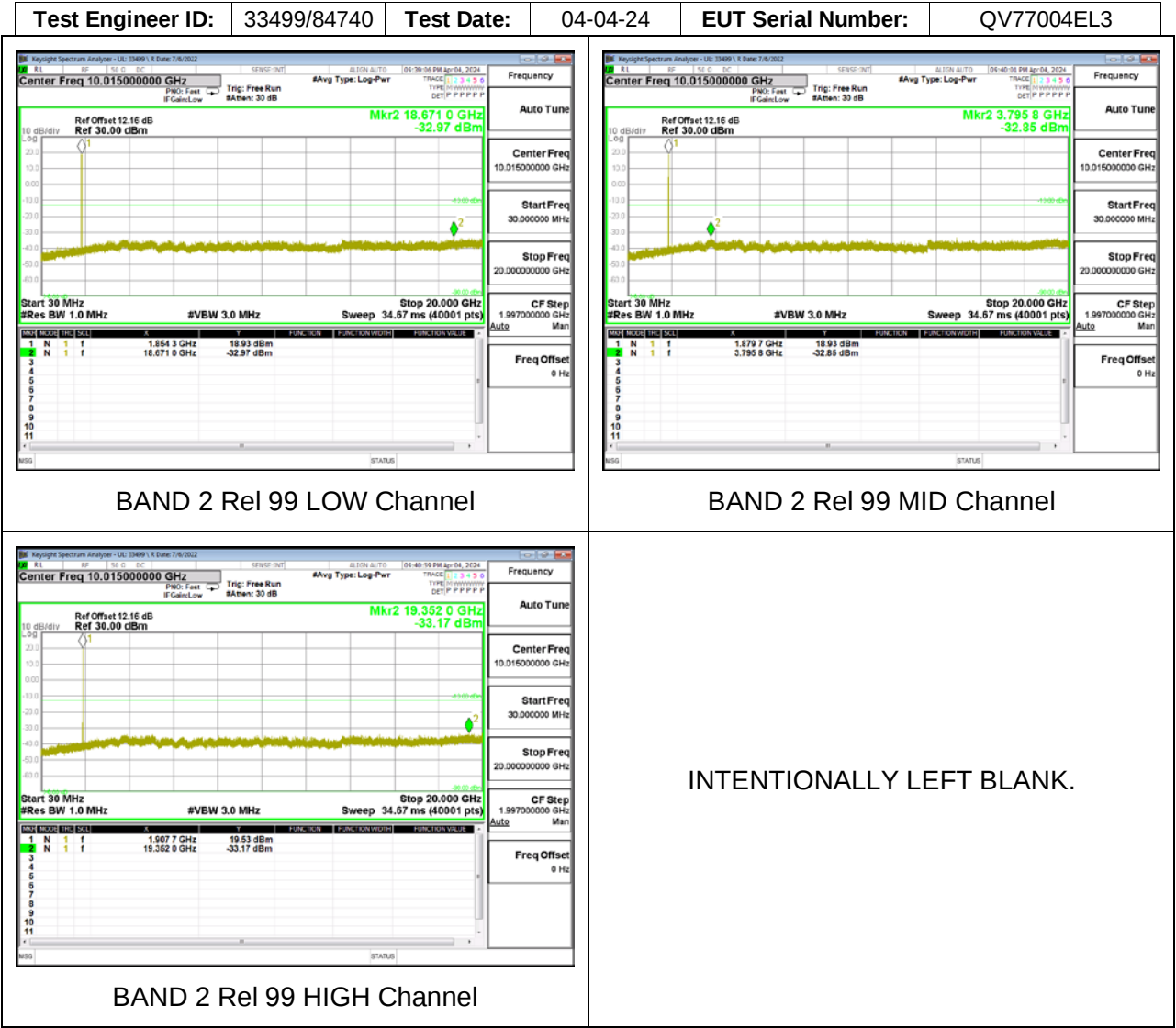
9.2.1. GSM GSM850



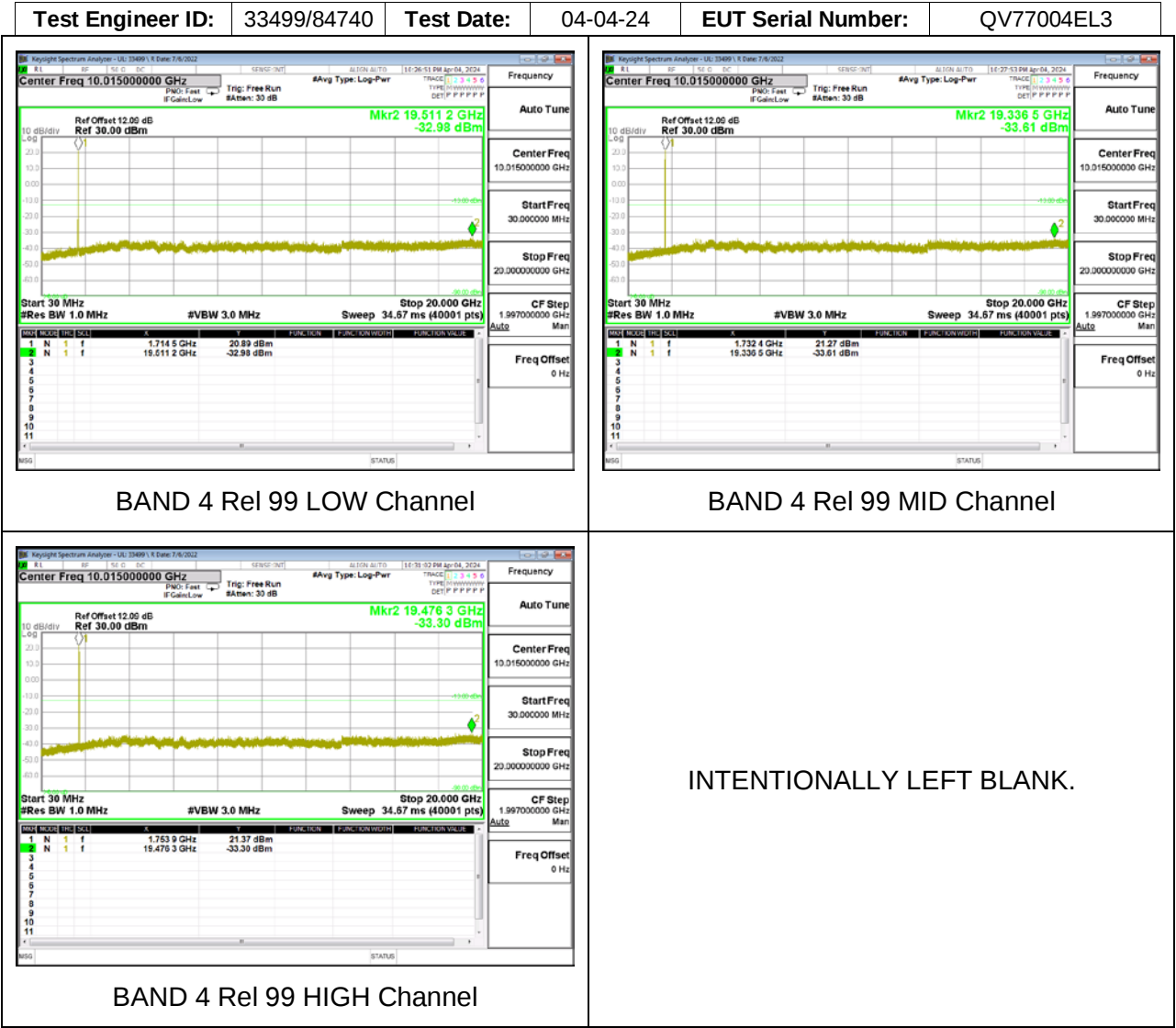
9.2.2. GSM GSM1900

[illegible]

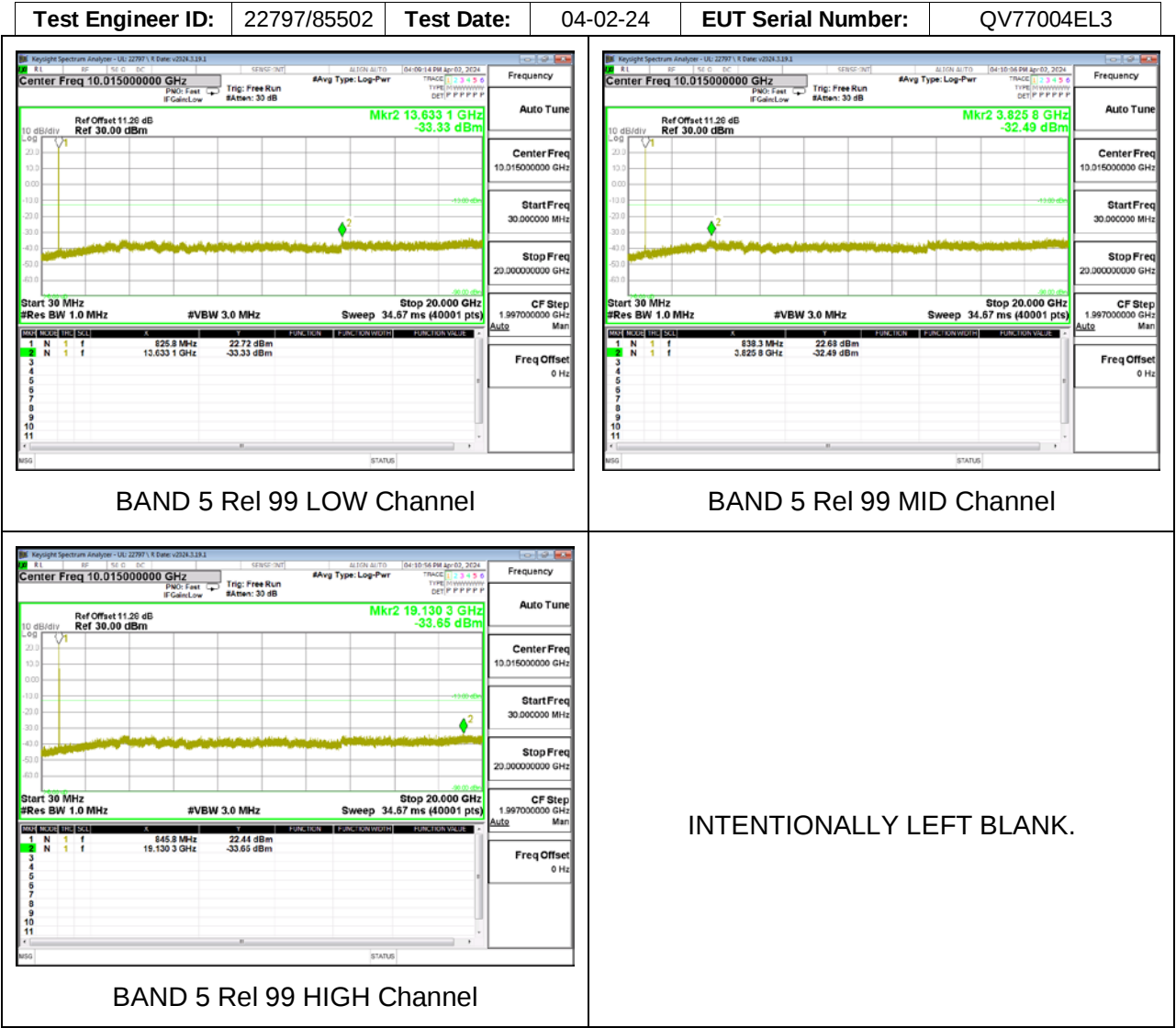
9.2.3. WCDMA BAND 2



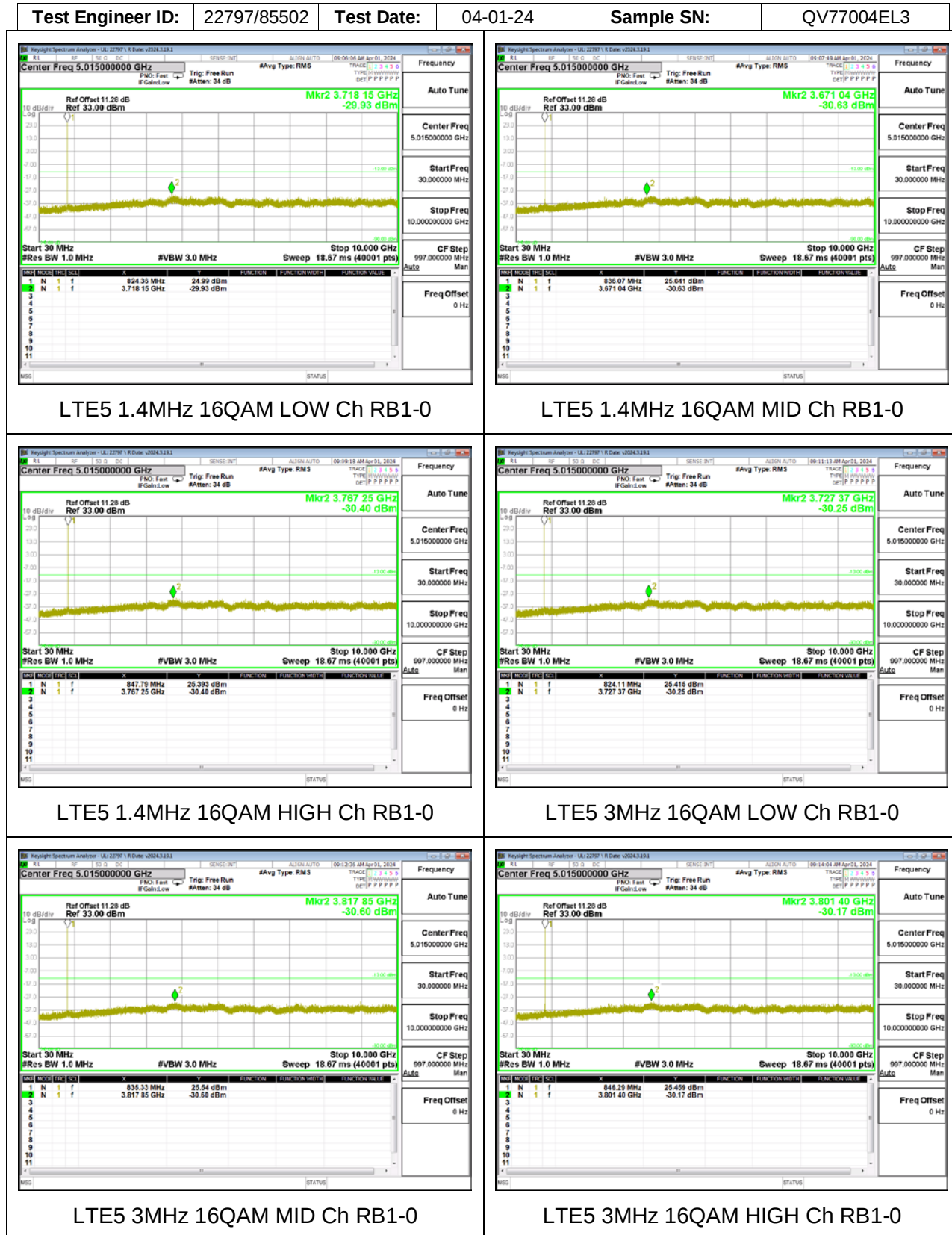
9.2.4. WCDMA BAND 4

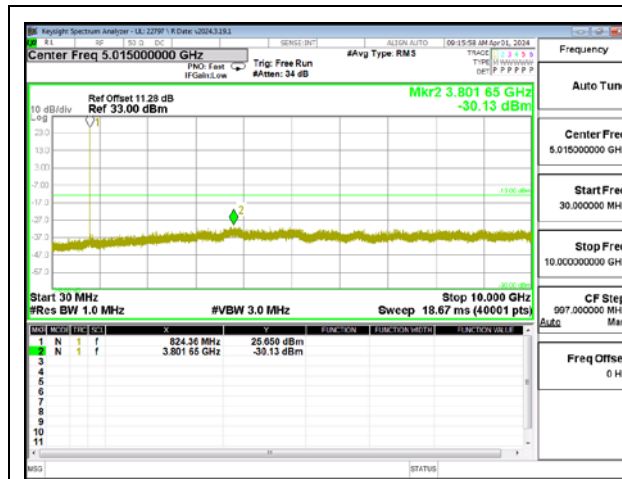


9.2.5. WCDMA BAND 5

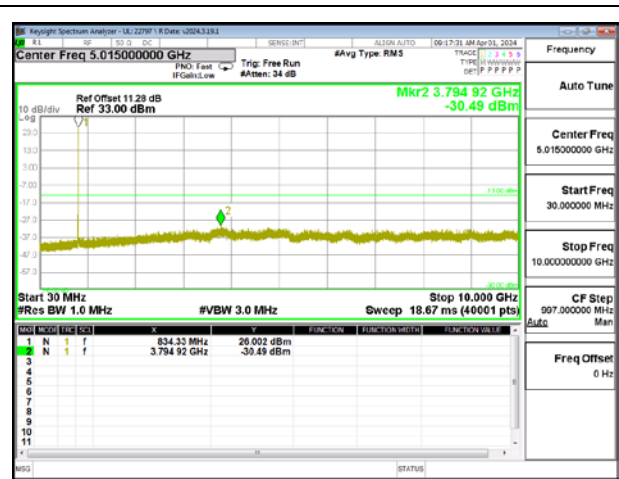


9.2.6. LTE5

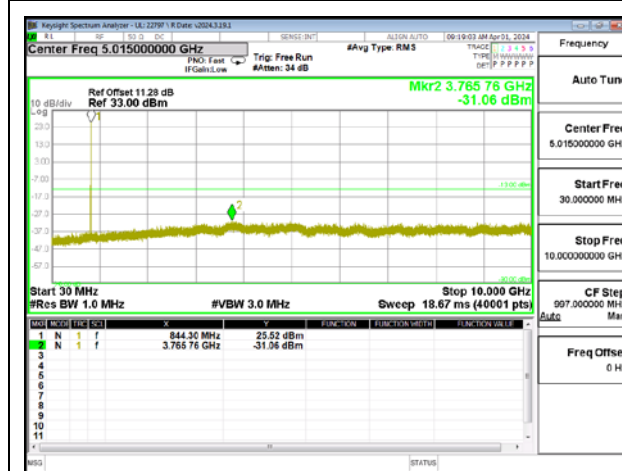




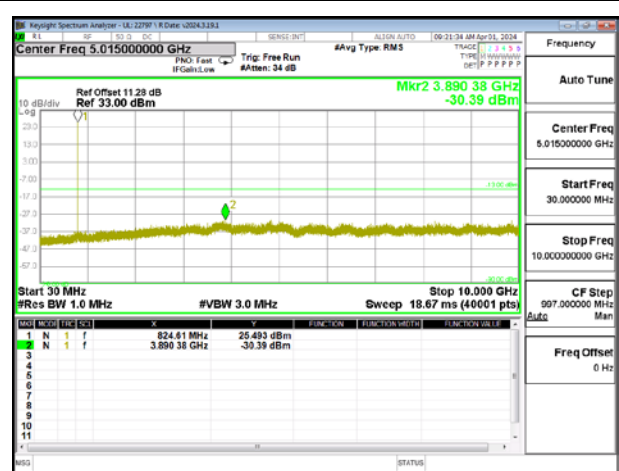
LTE5 5MHz 16QAM LOW Ch RB1-0



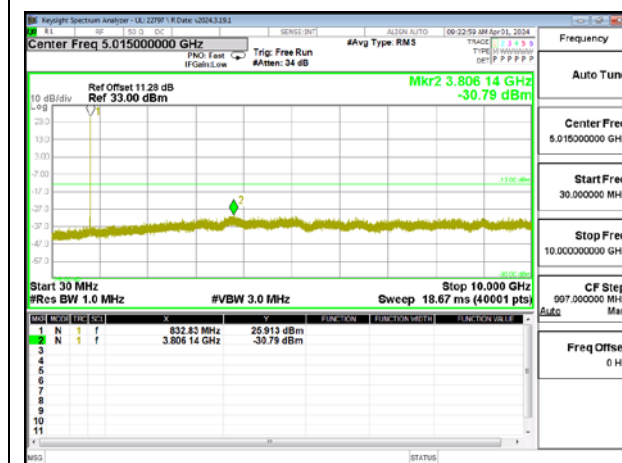
LTE5 5MHz 16QAM MID Ch RB1-0



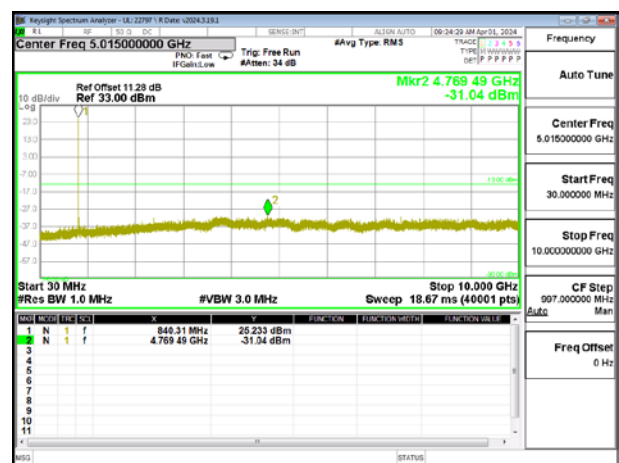
LTE5 5MHz 16QAM HIGH Ch RB1-0



LTE5 10MHz 16QAM LOW Ch RB1-0

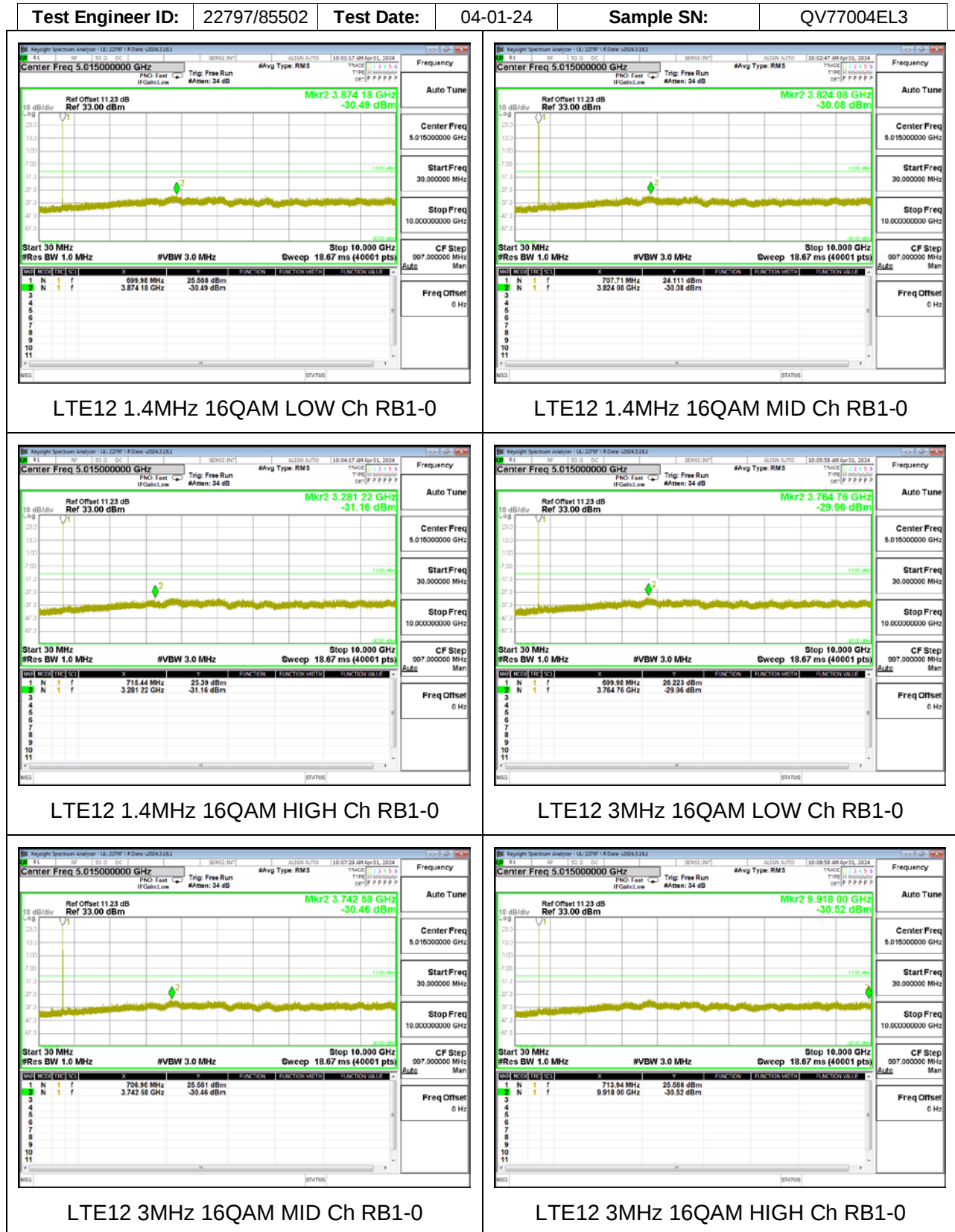


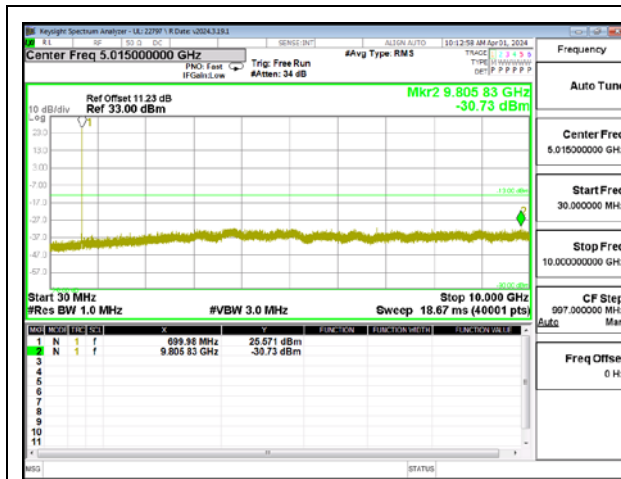
LTE5 10MHz 16QAM MID Ch RB1-0



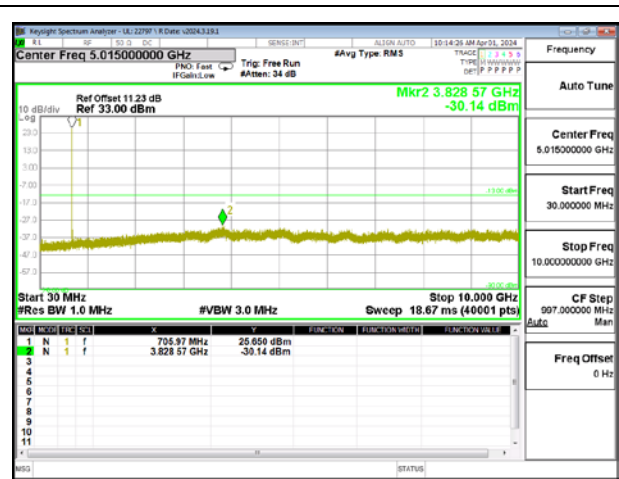
LTE5 10MHz 16QAM HIGH Ch RB1-0

9.2.7. LTE12

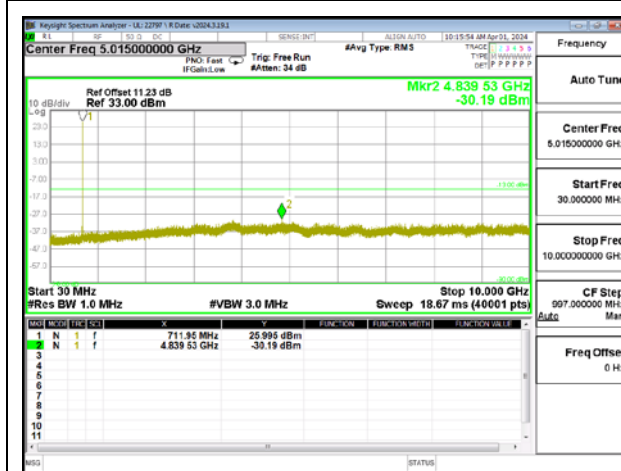




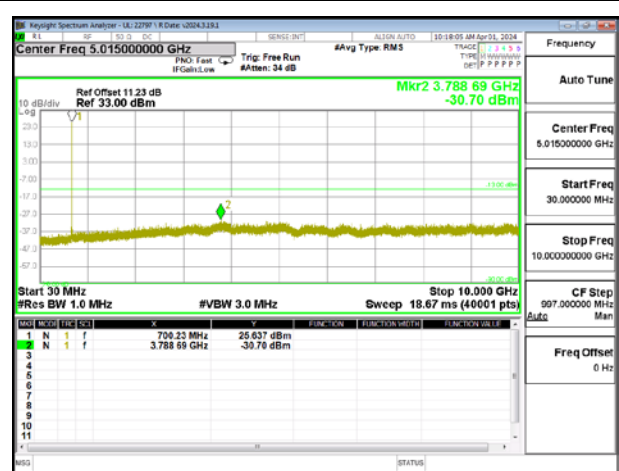
LTE12 5MHz 16QAM LOW Ch RB1-0



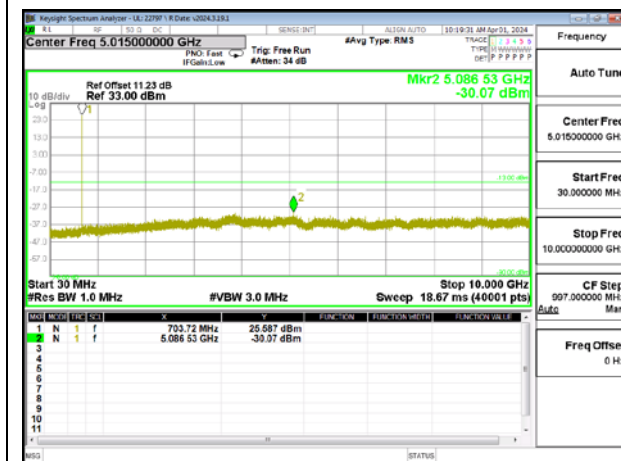
LTE12 5MHz 16QAM MID Ch RB1-0



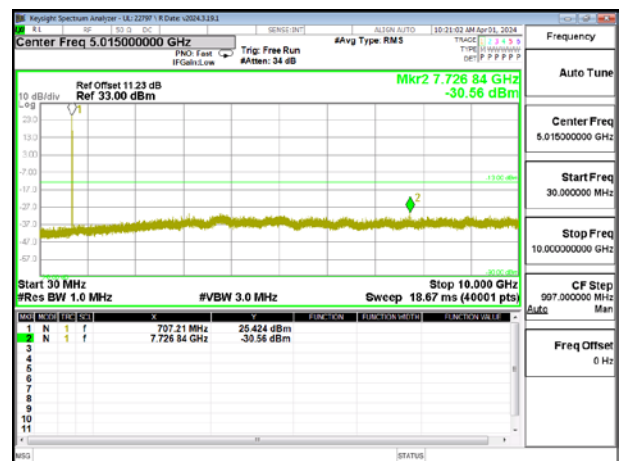
LTE12 5MHz 16QAM HIGH Ch RB1-0



LTE12 10MHz 16QAM LOW Ch RB1-0



LTE12 10MHz 16QAM MID Ch RB1-0



LTE12 10MHz 16QAM HIGH Ch RB1-0

9.2.8. LTE13

